REFERENCE: U-5797

PROJECT: 44367

SEE SHEET 2A FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

CONTENTS

APPENDICES

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

ROADWAY SUBSURFACE INVESTIGATION

COUNTY *ROBESON*

PROJECT DESCRIPTION *FAYETTEVILLE ROAD (SR 1997) FROM EAST OF 22nd STREET TO FARRINGDOM STREET*

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5797	1	42

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

CAROLINA DRILLING

WEIS, J.M.

INVESTIGATED BY *FALCON ENG.*

DRAWN BY *HILL, M.J.*

CHECKED BY *HUNSBERGER, W.S.*

SUBMITTED BY *FALCON ENG.*

DATE *MARCH 2019*

NORTH CAROLINA PROFESSIONAL SEAL 36283 ENGINEER W. SCOTT HUNSBERGER

DocuSigned by:
W. Scott Hunsberger
5A469AC80FCD49E...
3/5/2019

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
U-5797	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

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

SOIL LEGEND AND AASHTO CLASSIFICATION

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

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

CONSISTENCY OR DENSENESS

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

TEXTURE OR GRAIN SIZE

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

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

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

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

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

COLOR

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

GRADATION

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

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

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

GROUND WATER

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

MISCELLANEOUS SYMBOLS

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

RECOMMENDATION SYMBOLS

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

ABBREVIATIONS

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

SAMPLE ABBREVIATIONS

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

EQUIPMENT USED ON SUBJECT PROJECT

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

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

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

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

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

ROCK DESCRIPTION

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

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

WEATHERING

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

ROCK HARDNESS

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

FRACTURE SPACING

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

BEDDING

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

INDURATION

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

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

TERMS AND DEFINITIONS

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

AQUIFER - A WATER BEARING FORMATION OR STRATA.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

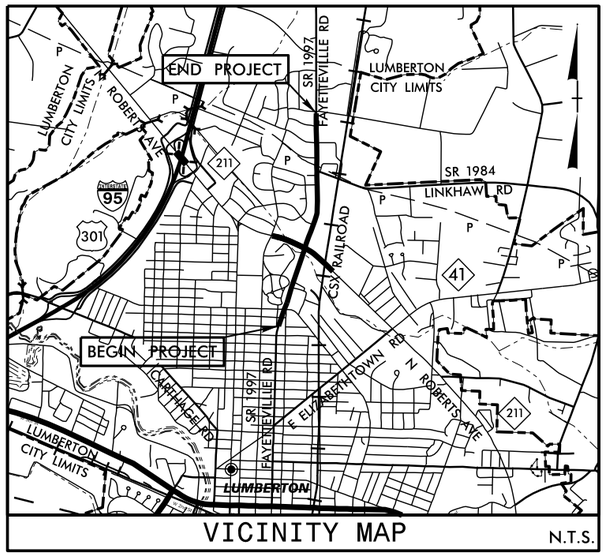
BENCH MARK:
BORING ELEVATIONS TAKEN FROM u5797_ls_tin_180723.tin
DATED 09/24/2018 ELEVATION: FEET

NOTES:
FIAD - FILLED IMMEDIATELY AFTER DRILLING

DATE: 1-XX-17

TIP PROJECT: U-5797

CONTRACT: 44367



VICINITY MAP N.T.S.

25% PRELIMINARY PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ROBESON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5797	3	42
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
44367.1.1	N/A	PE	

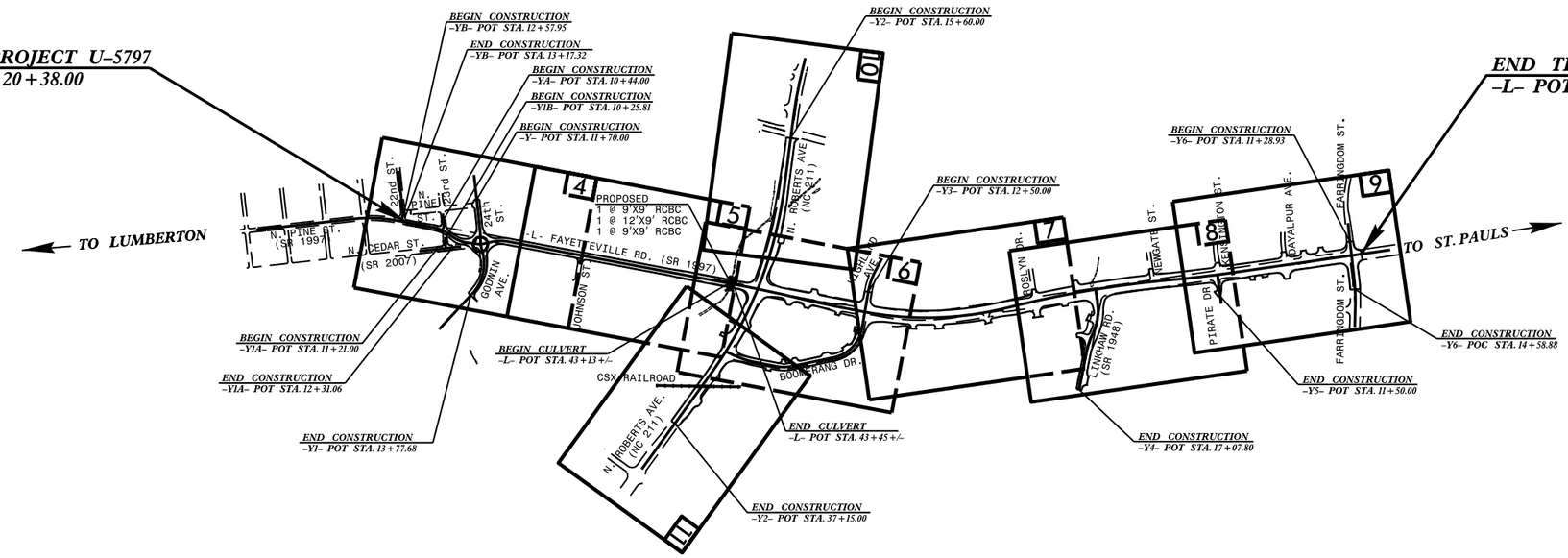
LOCATION: FAYETTEVILLE ROAD (SR 1997) FROM EAST OF 22nd STREET TO FARRINGDOM STREET

TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND CULVERTS

NAD 83/NA 2011

BEGIN TIP PROJECT U-5797
-L- POT STA. 20+38.00

END TIP PROJECT U-5797
-L- POT STA. 87+20.00



THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF LUMBERTON.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ___.

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2020 = 31,800
ADT 2040 = 38,800
K = 55 %
D = 9 %
T = 4 % *
V = 50 MPH
* TTST = 3% DUAL = 1%
FUNC CLASS = URBAN ARTERIAL

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT U-5797 = 1.260 MILES
LENGTH OF STRUCTURE TIP PROJECT U-5797 = 0.006 MILES
TOTAL LENGTH OF TIP PROJECT U-5797 = 1.266 MILES

NCDOT CONTACT: CRAIG A. FREEMAN JR., PE
NCDOT DIVISION 6

PLANS PREPARED FOR THE NCDOT BY:
STV ENGINEERS, INC.
1600 Perimeter Park Drive, Ste 225, Morrisville, NC 27560
NC License Number F-0991

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: NOVEMBER 15, 2018

LETTING DATE: AUGUST 6, 2020

PATRICK A. LIVINGSTON, PE
PROJECT ENGINEER

WESTON D. MURPHY, EI
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

Roadway Subsurface Investigation Report - Inventory

Fayetteville Road (SR 1997) From East of 22nd Street to Farringdom Street
Robeson County, North Carolina
WBS: 44367.1.1, TIP: U-5797
Falcon Project No.: G17057.00

Prepared for:
STV Engineers, Inc.
1500 Perimeter Park Drive, Suite 200
Morrisville, NC 27560

Submitted by:
Falcon Engineering, Inc.
1210 Trinity Road, Suite 110
Cary, North Carolina 27513
(919) 871-0800
www.falconengineers.com

March 5, 2019

TIP:	U-5797
WBS:	44367.1.1
COUNTY:	Robeson
DESCRIPTION:	Fayetteville Road (SR 1997) From East of 22nd Street to Farringdom Street
SUBJECT:	Roadway Subsurface Investigation – Inventory

PROJECT DESCRIPTION

This project consists of 1.26 miles of proposed widening and intersection improvements on Fayetteville Road in Lumberton in Robeson County. Fayetteville Road will be widened from east of 22nd Street to Farringdom Street. The intersection of Fayetteville Road and Godwin Avenue will be converted to a new roundabout. Boomerang Drive will be improved to facilitate additional traffic while eliminating left turns from Fayetteville Road onto Roberts Avenue. In addition to the roadway widening, two reinforced concrete box culverts will be constructed. Tie-ins and minor improvements to Y-lines and small drives are also included at various locations.

The investigation was conducted between October 24th and November 7th, 2018 in general accordance with our Scope and Fee Estimate for Geotechnical Investigation and Engineering Services. The information provided in this report is based solely on our site reconnaissance, soil test borings and laboratory test data, engineering evaluation of these data, and generally accepted soil and foundation engineering practices and principles.

A total of forty four (44) Standard Penetration Test (SPT) and five (5) hand auger borings were drilled for the proposed roadway alignments and culverts. All mechanical borings were drilled using a CME 55 ATV mounted drill rig equipped with mud rotary drilling equipment, and SPT testing was performed with an automatic hammer. Representative soil samples, collected with a split-barrel sampler were selected for laboratory testing to verify visual field classifications. In addition, bulk samples were collected for standard Proctor compaction and California Bearing Ratio (CBR) testing.

Portions of the following alignments, totaling approximately 2.1 miles were investigated. Other minor Y-lines and driveways are included on the project but improvements are not anticipated to be significant enough to warrant investigation.

Alignment	Station (ft)
-L- (Fayetteville Road)	20+38 to 87+20
-Y2- (N. Roberts Avenue)	15+60 to 37+15
-Y3- (Boomerang Drive)	12+50 to 25+65
-Y4- (Linkhaw Road)	10+00 to 17+08
-Y5- (Pirate Drive)	10+00 to 11+50

AREAS OF SPECIAL GEOTECHNICAL INTEREST

I. The following locations encountered groundwater within six feet of the proposed subgrade:

Alignment	Station (ft)
-L-	25+55
-L-	26+64
-L-	69+89
-Y4-	12+03
-Y4-	14+00

II. The following locations contain very soft to soft/very loose soils with an N-value less than 4 near the ground surface:

Alignment	Station (ft)
-L-	42+91
-L-	43+07
-L-	73+83
-L-	77+71
-L-	82+24
-L-	84+03
-Y2-	34+35

PHYSIOGRAPHY AND GEOLOGY

The project site is in the Coastal Plain Physiographic Province of North Carolina. According to the ***Geologic Map of North Carolina*** (1985), the site is underlain by one major geologic unit in the Coastal Plain Physiographic Provence. The primary unit is the Duplin Formation (**Tpy**) of the Tertiary Period.

The Duplin Formation is noted to consist of shelly, bluish gray medium- to coarse-grained sand, sandy marl, and limestone.

Existing site topography is flat in the general project vicinity, typical of this area of the Coastal Plain. Drainage swales and ditches parallel existing roadway alignments, and carry roadway drainage toward various natural drainage features. Meadow Branch Creek runs from the northwest to the southwest of the corridor crossing under both Fayetteville Road and Roberts Avenue.

SOIL PROPERTIES

A variety of soils were encountered along the project, including existing Roadway Embankments and Undivided Coastal Plain soils.

Roadway Embankment soils were encountered at the ground surface beneath and adjacent to existing roadways. These soils consist of up to 3 feet of moist, loose, clayey sand (A-2-6).

Undivided Coastal Plain soils were encountered at ground surface or beneath the roadway embankment fills. These soils consist of moist to saturated, very loose to medium dense, clean, silty and clayey sand (A-2-4, A-2-6, A-2-7, A-3) and very soft to very stiff, sandy silt and sandy and silty clay (A-4, A-6, A-7).

GROUNDWATER PROPERTIES

Groundwater levels were measured at the time of boring completion, and in many cases after a waiting period of at least 24 hours. Borings drilled within and in close proximity to existing roadways, and within residential or commercial areas were backfilled immediately after completion due to safety considerations.

Detailed groundwater measurements are included in the attached subsurface profiles and cross sections, and noted areas of shallow groundwater are included in the Areas of Special Geotechnical Interest earlier in this report.

ADDITIONAL LABORATORY TESTING

The following bulk samples were obtained:

Sample	Location	Depth (ft)	Test
BS-1	26+64, 25' RT, -L-	3.5 – 8.5	California Bearing Ratio, Standard Proctor
BS-2	77+71, 54' LT, -L-	1.0 – 5.0	California Bearing Ratio, Standard Proctor
BS-3	15+00, 27' LT, -Y3-	3.5 – 8.5	California Bearing Ratio, Standard Proctor

Classification test results for bulk samples are included in the subsurface profiles and cross sections and Standard Proctor and California Bearing Ratio (CBR) data is attached in the Appendix.

CLOSING

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:

W. Scott Hunsberger, PE
Geotechnical Engineer

Report Reviewed By:

Jeremy R. Hamm, PE
Geotechnical Engineering Manager

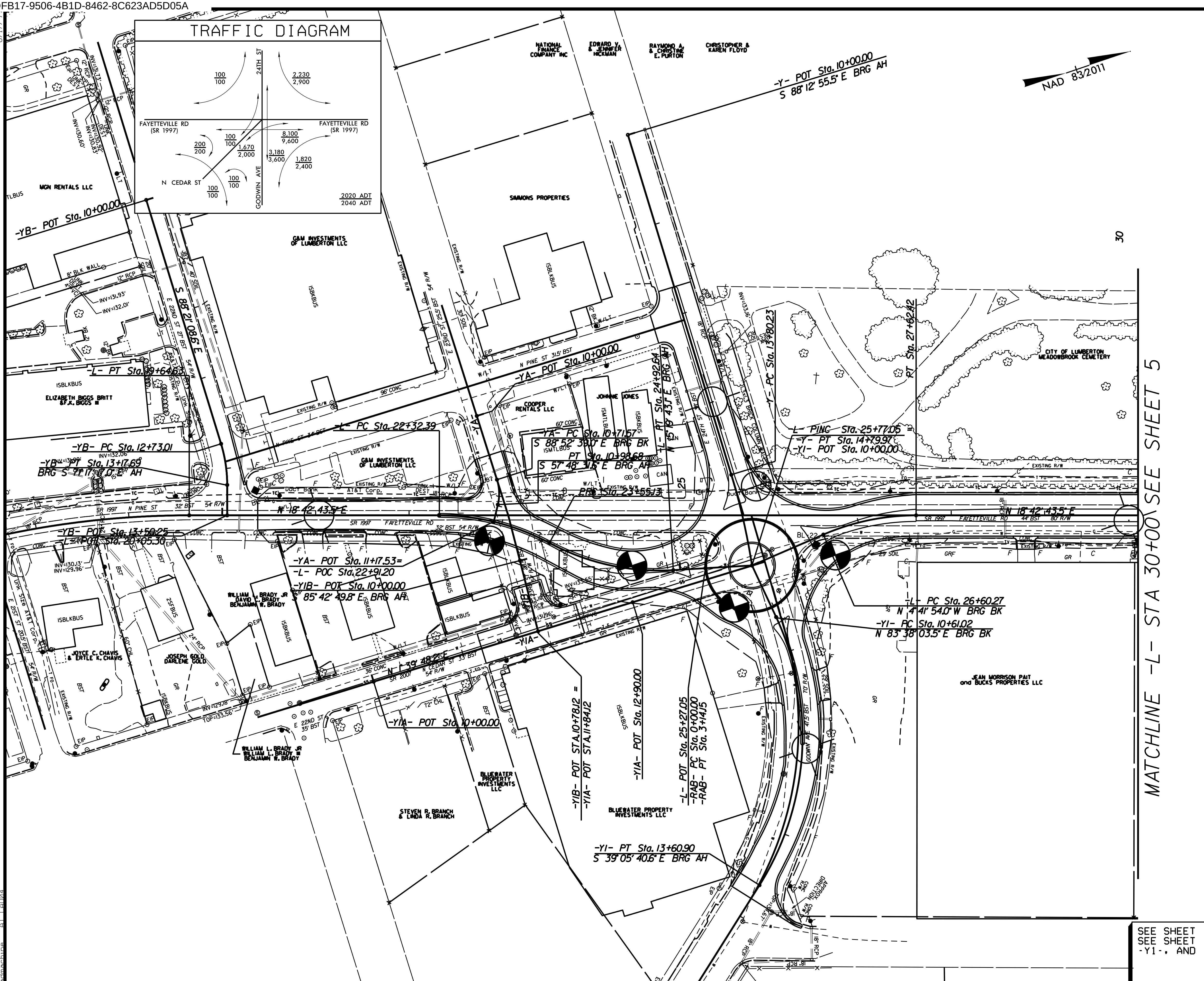
PROJECT REFERENCE NO.	SHEET NO.
U-5797	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991

PAVEMENT REMOVAL


TRAFFIC DIAGRAM
FAYETTEVILLE RD (SR 1997)
N CEDAR ST
GODWIN AVE
24TH ST
2020 ADT
2040 ADT
NAD 83/2011
-Y- POT Sta. 10+00.00
S 88° 12' 55.5" E BRG AH
MATCHLINE -L- STA 30+00 SEE SHEET 5
CITY OF LUMBERTON MEADOWBROOK CEMETERY
JEAN MORRISON PAIT and BUCKS PROPERTIES LLC
BLUEWATER PROPERTY INVESTMENTS LLC
STEVEN R. BRANCH & LINDA R. BRANCH
SIMMONS PROPERTIES
G&M INVESTMENTS OF LUMBERTON LLC
COOPER RENTALS LLC
MGN RENTALS LLC
ELIZABETH BIGGS BRITT & F.A. BIGGS III
JOYCE C. CHAVIS & ERTLE K. CHAVIS
JOSEPH GOLD DARLENE GOLD
-L- PC Sta. 22+32.39
-L- PC Sta. 26+60.27
N 4° 41' 54.0" W BRG BK
-YI- PC Sta. 10+61.02
N 83° 38' 03.5" E BRG BK
-YI- PT Sta. 13+60.90
S 39° 05' 40.6" E BRG AH
-YIA- POT Sta. 10+00.00
-L- POT Sta. 25+27.05
-RAB- PC Sta. 0+00.00
-RAB- PT Sta. 3+14.15

SEE SHEET 12 FOR -L- PROFILE
SEE SHEET 15 FOR -Y-, -RAB-, -Y1-, AND -YA- PROFILES

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PROJECT REFERENCE NO.	SHEET NO.
U-5797	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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STV Engineers, Inc.
1600 Perimeter Park Dr.
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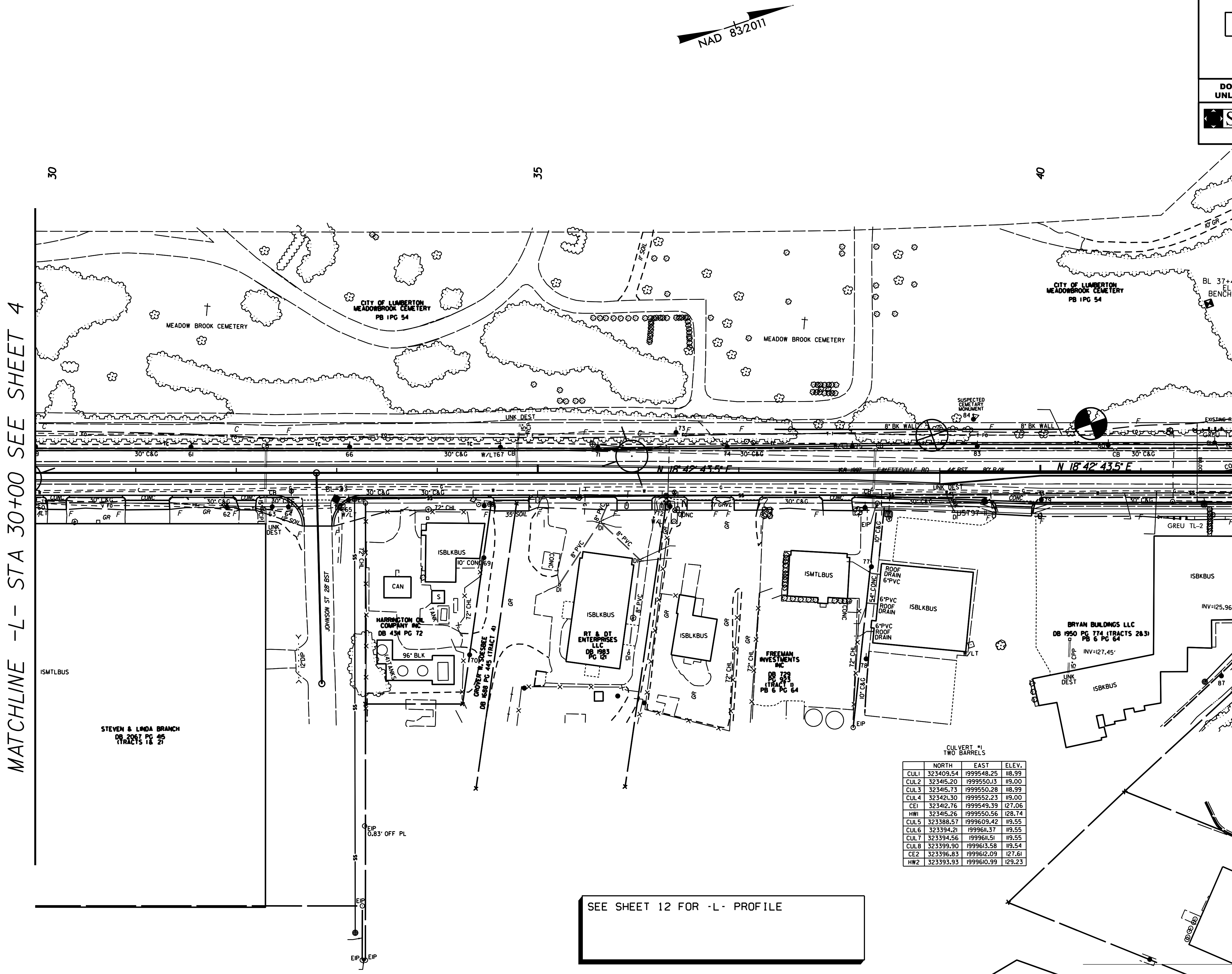
Morrisville, NC 27560
NC License Number F-0991



NAD 83/2011
30
35
40
MATCHLINE -L- STA 30+00 SEE SHEET 4
MATCHLINE -L- STA 42+00 SEE SHEET 6
CITY OF LUMBERTON MEADOWBROOK CEMETERY PB 1 PG 54
MEADOW BROOK CEMETERY
SUSPECTED CEMETARY MONUMENT
N 18° 42' 43.5" E
FAYETTEVILLE RD
JOHNSON ST 28' BST
HARRINGTON OIL COMPANY INC. DB 434 PG 72
GROVER W. DESBEE DB 1688 PG 445 (TRACT 4)
RT & DT ENTERPRISES LLC DB 1983 PG 121
FREEMAN INVESTMENTS INC DB 729 PG 263 (TRACT 1) PB 6 PG 64
BRYAN BUILDINGS LLC DB 1950 PG 774 (TRACTS 2&3) PB 6 PG 64
STEVEN & LINDA BRANCH DB 2067 PG 415 (TRACTS 1 & 2)
ISMTLBUS
ISBLKBUS
ISBKBUS
CAN
INV=125.96'
INV=127.45'
EIP 0.83' OFF PL
BL 37+41

CULVERT #1
TWO BARRELS

	NORTH	EAST	ELEV.
CUL1	323409.54	1999548.25	118.99
CUL2	323415.20	1999550.13	119.00
CUL3	323415.73	1999550.28	118.99
CUL4	323421.30	1999552.23	119.00
CE1	323412.76	1999549.39	127.06
HW1	323415.26	1999550.56	128.74
CUL5	323388.57	1999609.42	119.55
CUL6	323394.21	1999611.37	119.55
CUL7	323394.56	1999611.51	119.55
CUL8	323399.90	1999613.58	119.54
CE2	323396.83	1999612.09	127.61
HW2	323393.93	1999610.99	129.23

SEE SHEET 12 FOR -L- PROFILE

PROJECT REFERENCE NO.	SHEET NO.
U-5797	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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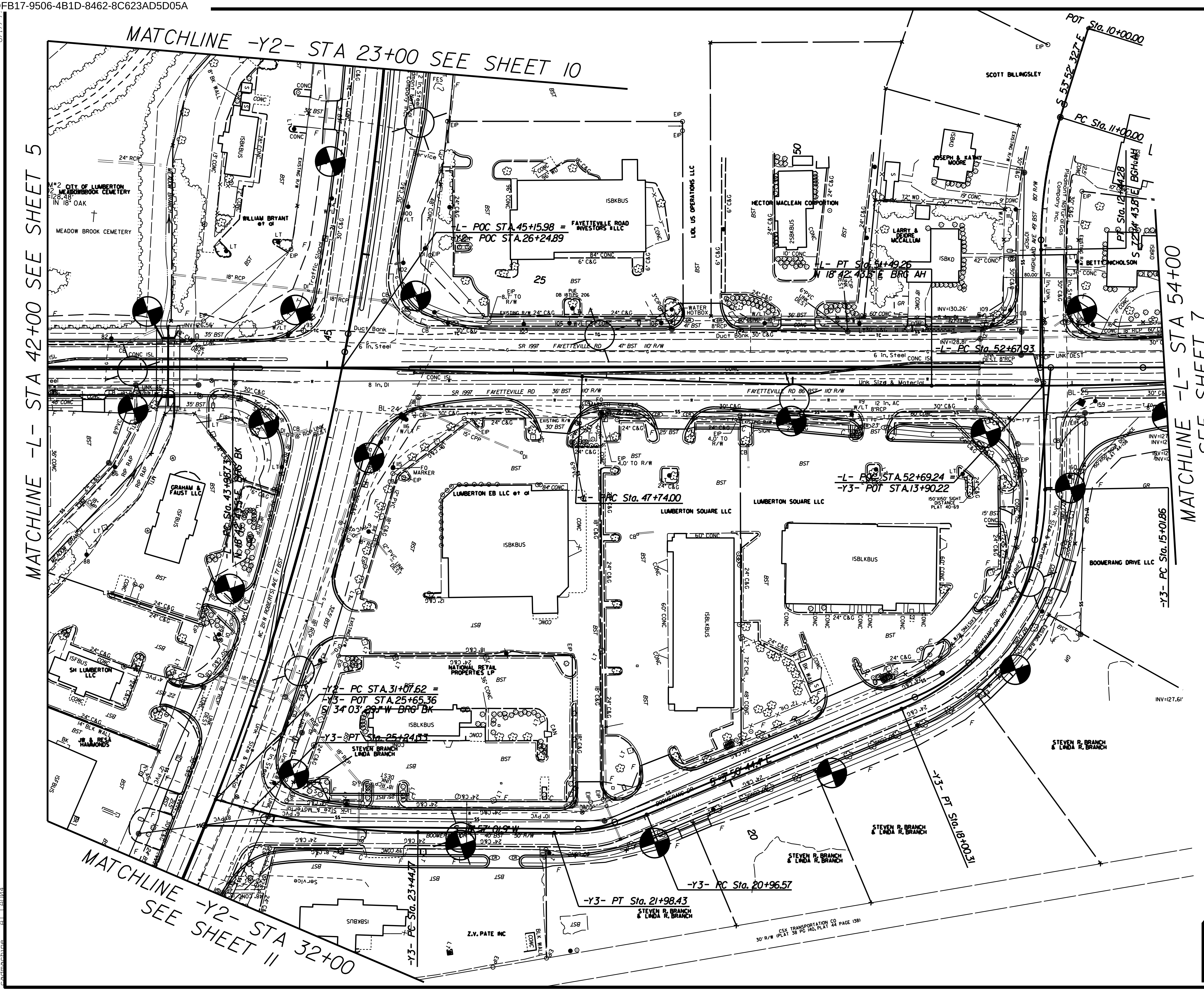
Morrisville, NC 27560
NC License Number F-0991



MATCHLINE -Y2- STA 23+00 SEE SHEET 10
MATCHLINE -L- STA 42+00 SEE SHEET 5
MATCHLINE -L- STA 54+00 SEE SHEET 7
MATCHLINE -Y2- STA 32+00 SEE SHEET 11
NAD 83/2011
POT Sta. 10+00.00
S 53°52'32.7" E
PC Sta. 11+00.00
SCOTT BILLINGSLEY
JOSEPH & KATHY MOORE
HECTOR MACLEAN CORPORTION
LIOL US OPERATIONS LLC
FAYETTEVILLE ROAD INVESTORS II LLC
-L- POC STA.45+15.98 =
-Y2- POC STA.26+24.89
-L- PT Sta. 51+49.26
N 18°42'43.5" E BRG AH
LARRY & DEIDRE MCCALLUM
BETTY NICHOLSON
-L- PC Sta. 52+67.93
SR 1997 FAYETTEVILLE RD
CITY OF LUMBERTON
MEADOW BROOK CEMETERY
WILLIAM BRYANT et al
GRAHAM & FAUST LLC
LUMBERTON EB LLC et al
-L- PC Sta. 47+74.00
LUMBERTON SQUARE LLC
-L- POC STA.52+69.24 =
-Y3- POT STA.13+90.22
BOOMERANG DRIVE LLC
-Y3- PC Sta. 15+01.86
NATIONAL RETAIL PROPERTIES LP
-Y2- PC STA.31+07.62 =
-Y3- POT STA.25+65.36
S 34°03'29.7" W BRG BK
-Y3- PT Sta. 25+24.63
STEVEN BRANCH LINDA BRANCH
SH LUMBERTON LLC
JR & RESA HAMMONDS
STEVEN R. BRANCH & LINDA R. BRANCH
-Y3- PT Sta. 18+00.31
-Y3- PC Sta. 20+96.57
-Y3- PT Sta. 21+98.43
CSX TRANSPORTATION CO
Z.V. PATE INC
-Y3- PC Sta. 23+44.37

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PROJECT REFERENCE NO.	SHEET NO.
U-5797	7

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
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STV Engineers, Inc.
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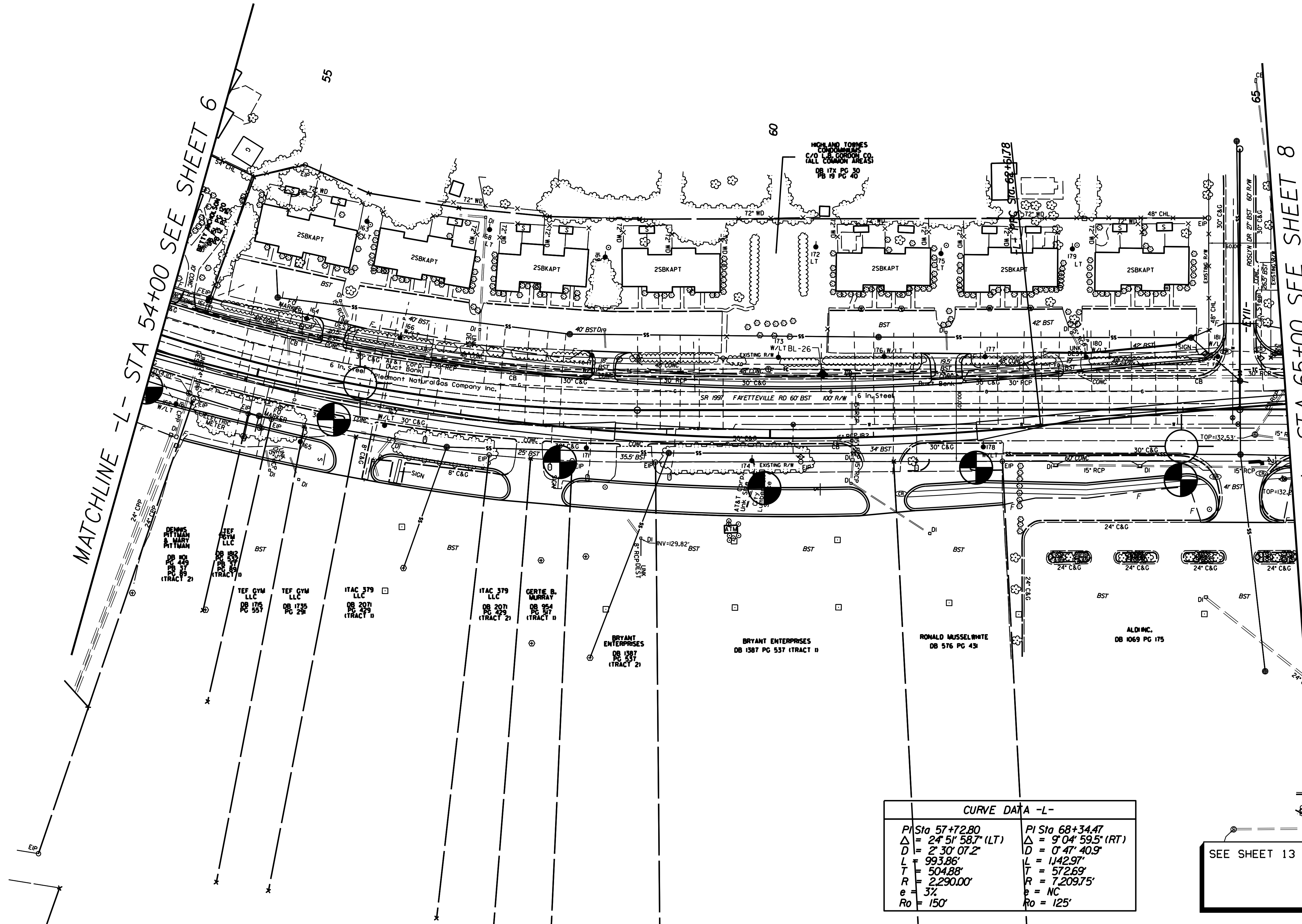
Morrisville, NC 27560
NC License Number F-0991


NAD 83/2011
MATCHLINE -L- STA 54+00 SEE SHEET 6
MATCHLINE -L- STA 65+00 SEE SHEET 8
HIGHLAND TOWNES CONDOMINIUMS C/O L.B. GORDON CO. (ALL COMMON AREAS) DB 17X PG 30 PB 19 PG 40
SR 1997 FAYETTEVILLE RD 60' BST 100' R/W
Piedmont Natural Gas Company Inc.
DENNIS PITTMAN & MARY PITTMAN
TEF GYM LLC
ITAC 379 LLC
GERTIE B. MURRAY
BRYANT ENTERPRISES
BRYANT ENTERPRISES DB 1387 PG 537 (TRACT 1)
RONALD MUSSELWHITE DB 576 PG 431
ALDI INC. DB 1069 PG 175

CURVE DATA -L-	
PI Sta 57+72.80	PI Sta 68+34.47
Δ = 24° 51' 58.7" (LT)	Δ = 9° 04' 59.5" (RT)
D = 2° 30' 07.2"	D = 0° 47' 40.9"
L = 993.86'	L = 1,142.97'
T = 504.88'	T = 572.69'
R = 2,290.00'	R = 7,209.75'
e = 3%	e = NC
Ro = 150'	Ro = 125'

SEE SHEET 13 FOR -L- PROFILE

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PROJECT REFERENCE NO.	SHEET NO.
U-5797	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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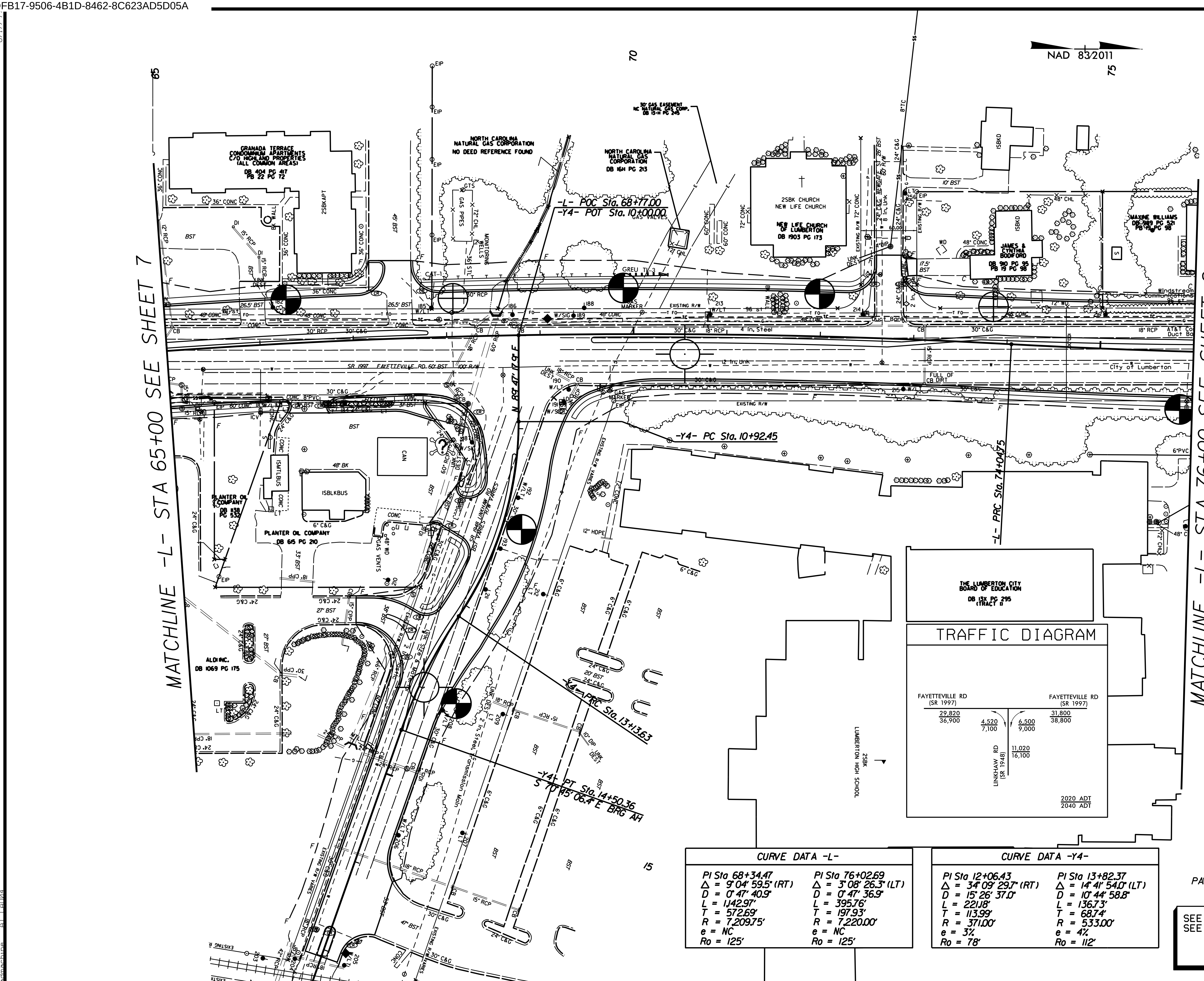
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991


NAD 83/2011
MATCHLINE -L- STA 65+00 SEE SHEET 7
MATCHLINE -L- STA 76+00 SEE SHEET 9
GRANADA TERRACE CONDOMINIUM APARTMENTS C/O HIGHLAND PROPERTIES (ALL COMMON AREAS) DB 404 PG 417 PB 22 PG 72
NORTH CAROLINA NATURAL GAS CORPORATION NO DEED REFERENCE FOUND
NORTH CAROLINA NATURAL GAS CORPORATION DB 16H PG 213
2SBK CHURCH NEW LIFE CHURCH
NEW LIFE CHURCH OF LUMBERTON DB 1903 PG 173
JAMES & CYNTHIA BODFORD DB 910 PG 95 PB 19 PG 98
MAXINE WILLIAMS DB 989 PG 521 PB 49 PG 98
-L- POC Sta. 68+77.00
-Y4- POT Sta. 10+00.00
-Y4- PC Sta. 10+92.45
-L- PRC Sta. 74+04.75
-Y4- PRC Sta. 13+13.63
-Y4- PT Sta. 14+50.36
S 70°15' 06.4" E BRG AH
SR 1997 FAYETTEVILLE RD. 60' BST
PLANTER OIL COMPANY DB 615 PG 210
ALDI INC. DB 1069 PG 175
THE LUMBERTON CITY BOARD OF EDUCATION DB 13X PG 295 (TRACT 1)
LUMBERTON HIGH SCHOOL
TRAFFIC DIAGRAM
FAYETTEVILLE RD (SR 1997)
29,820
36,900
4,520
7,100
6,500
9,000
31,800
38,800
11,020
16,100
LINKHAW RD (SR 1948)
2020 ADT
2040 ADT

CURVE DATA -L-

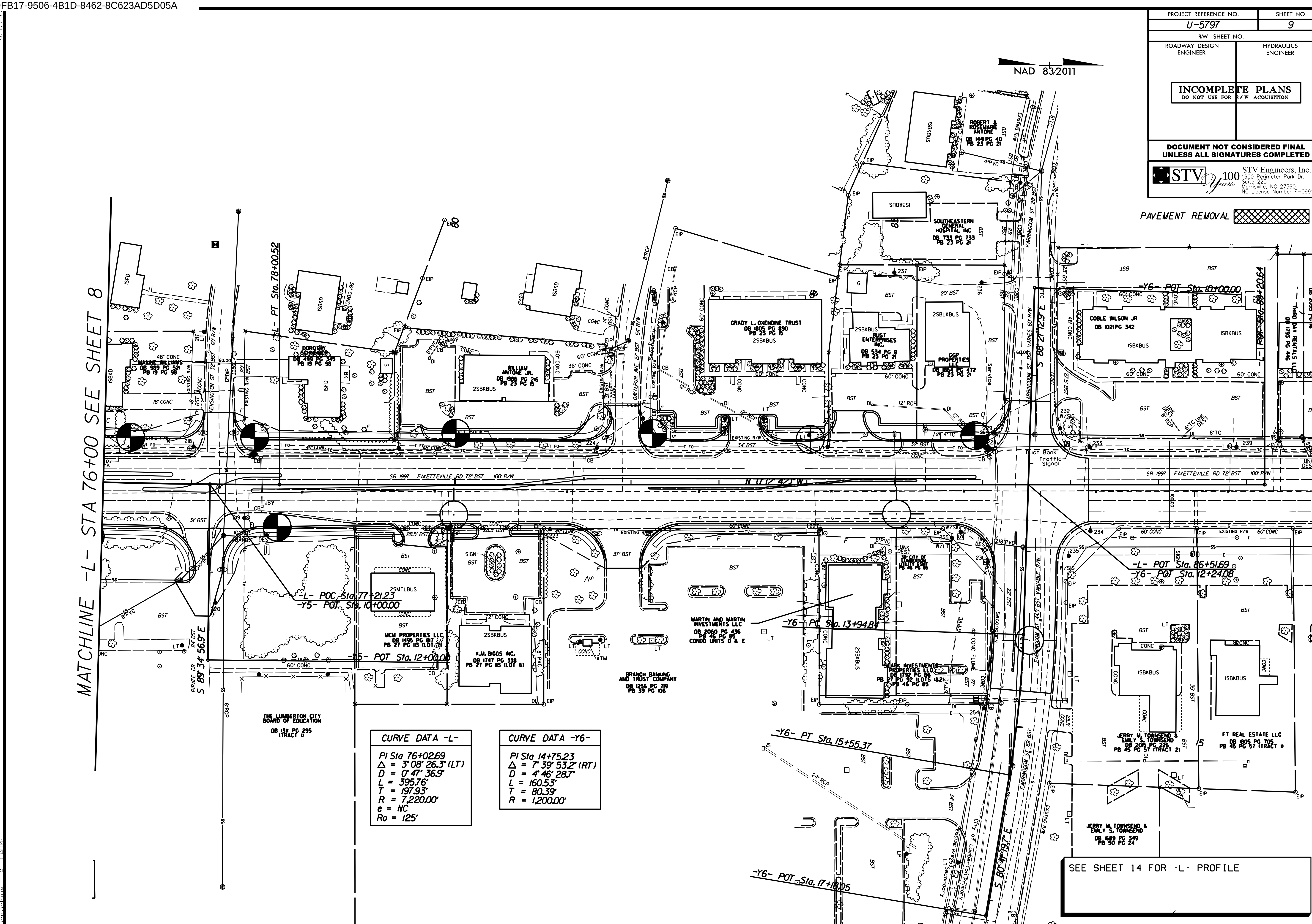
PI Sta 68+34.47	PI Sta 76+02.69
Δ = 9°04' 59.5" (RT)	Δ = 3°08' 26.3" (LT)
D = 0°47' 40.9"	D = 0°47' 36.9"
L = 1,142.97'	L = 395.76'
T = 572.69'	T = 197.93'
R = 7,209.75'	R = 7,220.00'
e = NC	e = NC
Ro = 125'	Ro = 125'

CURVE DATA -Y4-

PI Sta 12+06.43	PI Sta 13+82.37
Δ = 34°09' 29.7" (RT)	Δ = 14°41' 54.0" (LT)
D = 15°26' 37.0"	D = 10°44' 58.8"
L = 221.18'	L = 136.73'
T = 113.99'	T = 68.74'
R = 371.00'	R = 533.00'
e = 3%	e = 4%
Ro = 78'	Ro = 112'

PAVEMENT REMOVAL

SEE SHEET 14 FOR -L- PROFILE
SEE SHEET 17 FOR -Y4- PROFILE


PROJECT REFERENCE NO. U-5797
SHEET NO. 9
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
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STV Engineers, Inc.
1600 Perimeter Park Dr. Suite 225 Morrisville, NC 27560 NC License Number F-0991
NAD 83/2011
PAVEMENT REMOVAL
MATCHLINE -L- STA 76+00 SEE SHEET 8
SR 1997 FAYETTEVILLE RD 72' BST 100' R/W
-L- PT Sta. 78+00.52
-L- POC Sta. 77+21.23
-Y5- POT Sta. 10+00.00
-Y5- POT Sta. 12+00.00
-Y6- POT Sta. 10+00.00
-Y6- PC Sta. 13+94.84
-Y6- PT Sta. 15+55.37
-Y6- POT Sta. 17+18.05
-L- POT Sta. 86+51.69
-Y6- POT Sta. 12+24.08
CURVE DATA -L-
PI Sta 76+02.69
Δ = 3° 08' 26.3" (LT)
D = 0° 47' 36.9"
L = 395.76'
T = 197.93'
R = 7,220.00'
e = NC
Ro = 125'
CURVE DATA -Y6-
PI Sta 14+75.23
Δ = 7° 39' 53.2" (RT)
D = 4° 46' 28.7"
L = 160.53'
T = 80.39'
R = 1,200.00'
SEE SHEET 14 FOR -L- PROFILE
ROBERT & ROSEMARIE ANTONE DB 1441 PG 40 PB 23 PG 21
SOUTHEASTERN GENERAL HOSPITAL INC DB 733 PG 733 PB 23 PG 21
MAXINE WILLIAMS DB 989 PG 521 PB 19 PG 98
DOROTHY SCHNEIDER DB 499 PG 545 PB 19 PG 98
WILLIAM ANTONE JR. DB 1986 PG 216 PB 23 PG 15
GRADY L. OXENDINE TRUST DB 1805 PG 890 PB 23 PG 15
RUST ENTERPRISES INC. DB 534 PG 8 PB 23 PG 21
GGP PROPERTIES LLC DB 1862 PG 472 PB 23 PG 21
COBLE WILSON JR DB 1021 PG 342
MCM PROPERTIES LLC DB 1495 PG 817 PB 27 PG 83 (LOT 2)
K.M. BIGGS INC. DB 1747 PG 338 PB 27 PG 83 (LOT 6)
MARTIN AND MARTIN INVESTMENTS LLC DB 2060 PG 436 PB 46 PG 85 CONDO UNITS D & E
BRANCH BANKING AND TRUST COMPANY DB 1256 PG 719 PB 39 PG 106
THE LUMBERTON CITY BOARD OF EDUCATION DB 13X PG 295 (TRACT 1)
JERRY M. TOWNSEND & EMILY S. TOWNSEND DB 2016 PG 226 PB 45 PG 57 (TRACT 2)
FT REAL ESTATE LLC DB 1805 PG 705 PB 45 PG 57 (TRACT 1)
JERRY M. TOWNSEND & EMILY S. TOWNSEND DB 1689 PG 349 PB 50 PG 24
KENSINGTON ST
DAVALPUR AVE
FARRINGDON ST
PIRATE DR
N 0° 12' 42" W
S 89° 34' 56.5" E
S 80° 41' 19.7" E
Duct Bank Traffic Signal

PROJECT REFERENCE NO.	SHEET NO.
U-5797	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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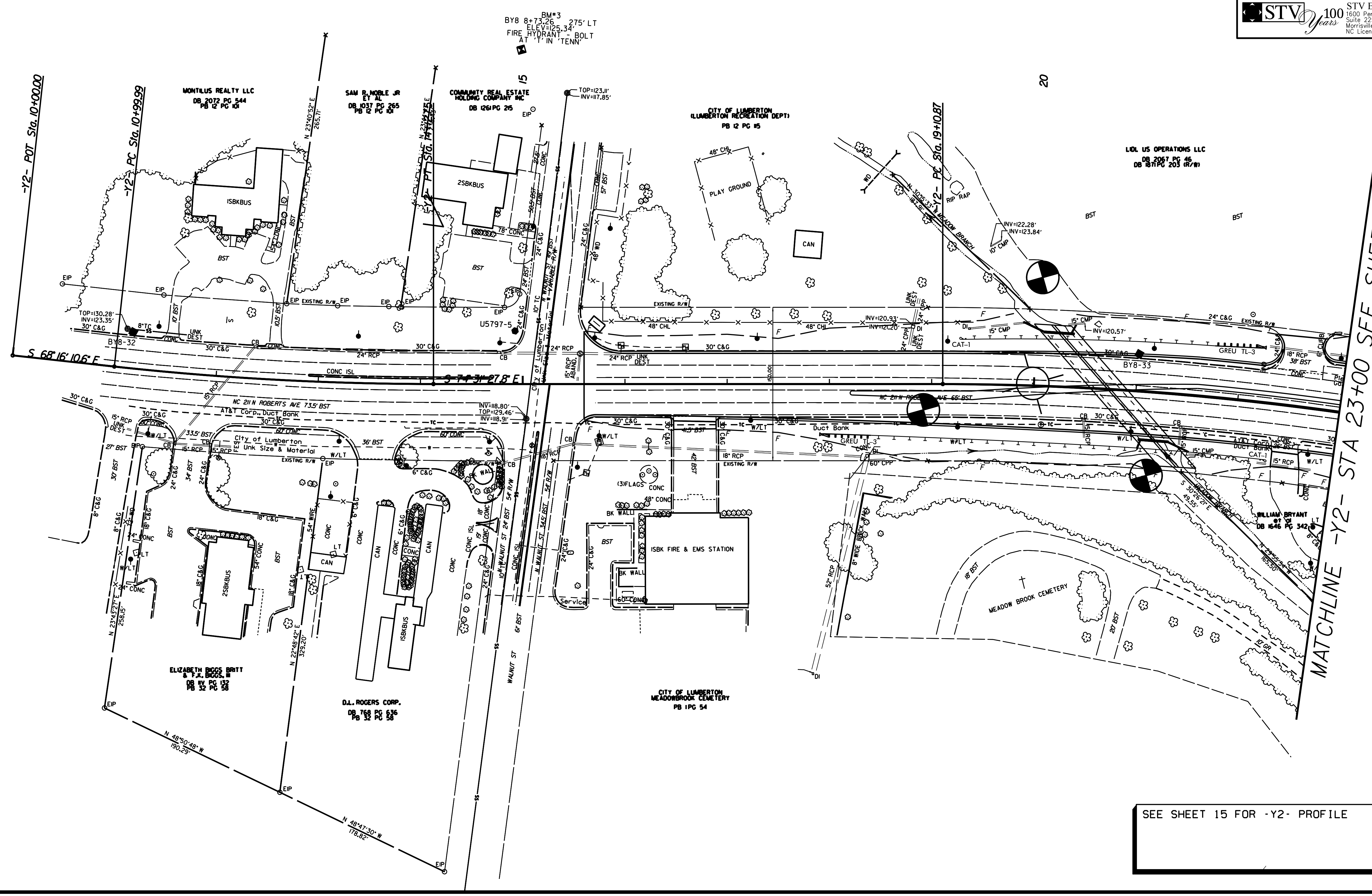
STV 100 Years
STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991

CURVE DATA -Y2-	
PI Sta 12+56.52	PI Sta 26+21.60
Δ = 6° 15' 17.1" (LT)	Δ = 28° 29' 08.5" (RT)
D = 1° 59' 59.5"	D = 2° 02' 46.6"
L = 312.76'	L = 1,392.07'
T = 156.54'	T = 710.74'
R = 2,865.00'	R = 2,800.00'
	e = 3%
	Ro = 150'

NAD 83/2011



SEE SHEET 15 FOR -Y2- PROFILE

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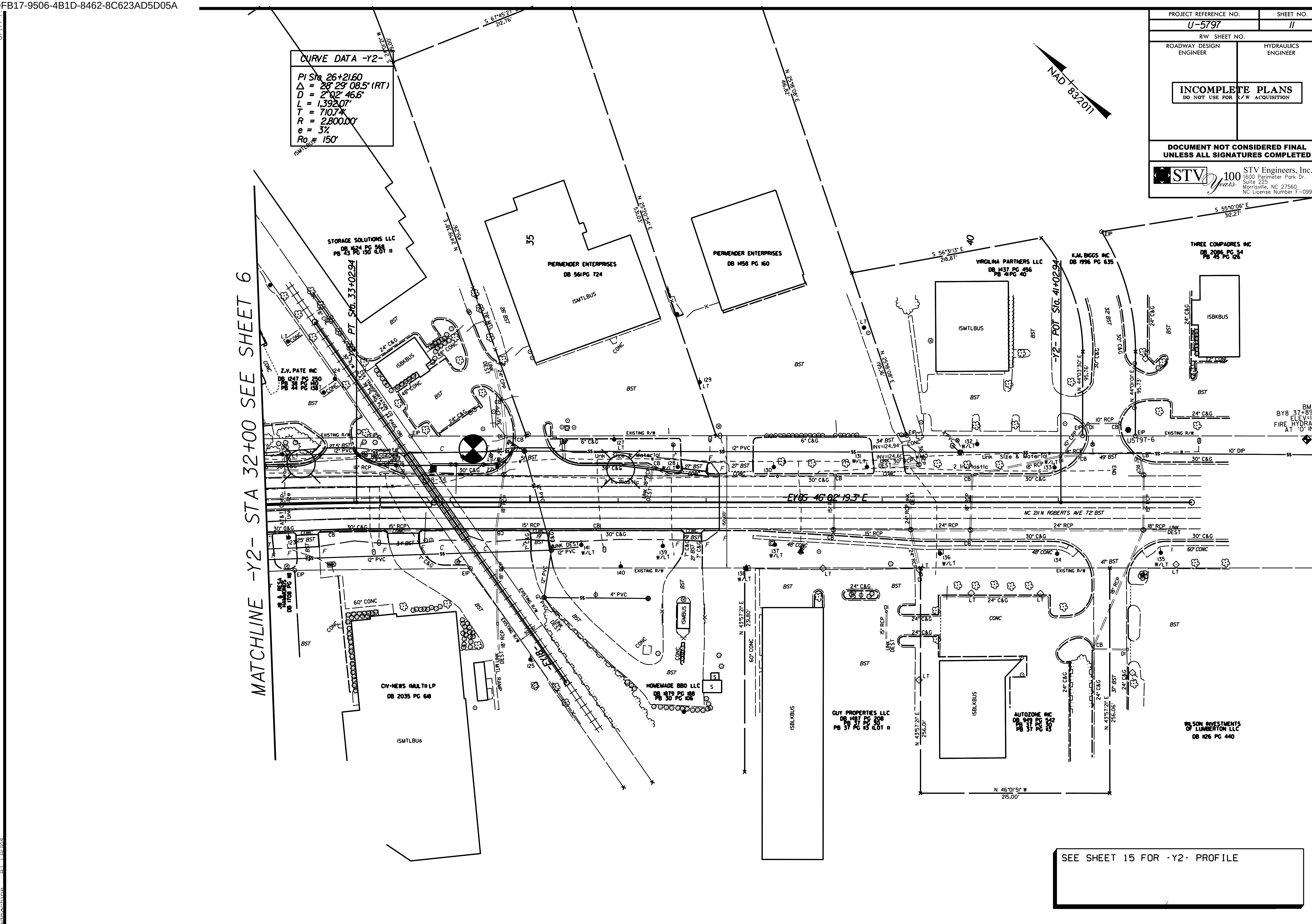
PROJECT REFERENCE NO.	SHEET NO.
U-5797	11
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991


CURVE DATA -Y2-
PI Sta 26+21.60
Δ = 28° 29' 08.5" (RT)
D = 2° 02' 46.6"
L = 1,392.07'
T = 710.74'
R = 2,800.00'
e = 3%
Ro = 150'
NAD 83/2011
MATCHLINE -Y2- STA 32+00 SEE SHEET 6
PT Sta. 33+02.94
-Y2- POT Sta. 41+02.94
STORAGE SOLUTIONS LLC
DB 1624 PG 568
PB 43 PG 150 (LOT 1)
PIERMENDER ENTERPRISES
DB 561 PG 724
PIERMENDER ENTERPRISES
DB 1458 PG 160
VIRGILINA PARTNERS LLC
DB 1437 PG 456
PB 41 PG 40
K.M. BIGGS INC
DB 1996 PG 635
THREE COMPADRES INC
DB 2086 PG 54
PB 45 PG 126
Z.V. PATE INC
DB 1247 PG 250
CIV-NEWS BAULT LP
DB 2035 PG 618
HOMEMADE BBQ LLC
GUY PROPERTIES LLC
DB 1487 PG 208
AUTOZONE INC
DB 949 PG 542
WILSON INVESTMENTS OF LUMBERTON LLC
DB 826 PG 440
NC 211 N ROBERTS AVE 72' BST
BM#4
BY8 37+89.51
FIRE HYDRANT
U5797-6
ISMTLBUS
ISBKBUS
ISBLKBUS
EXISTING R/W
N 46°01'51" W
215.00'
S 55°10'06" E
312.27'
S 56°31'13" E
218.87'

SEE SHEET 15 FOR -Y2- PROFILE

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ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
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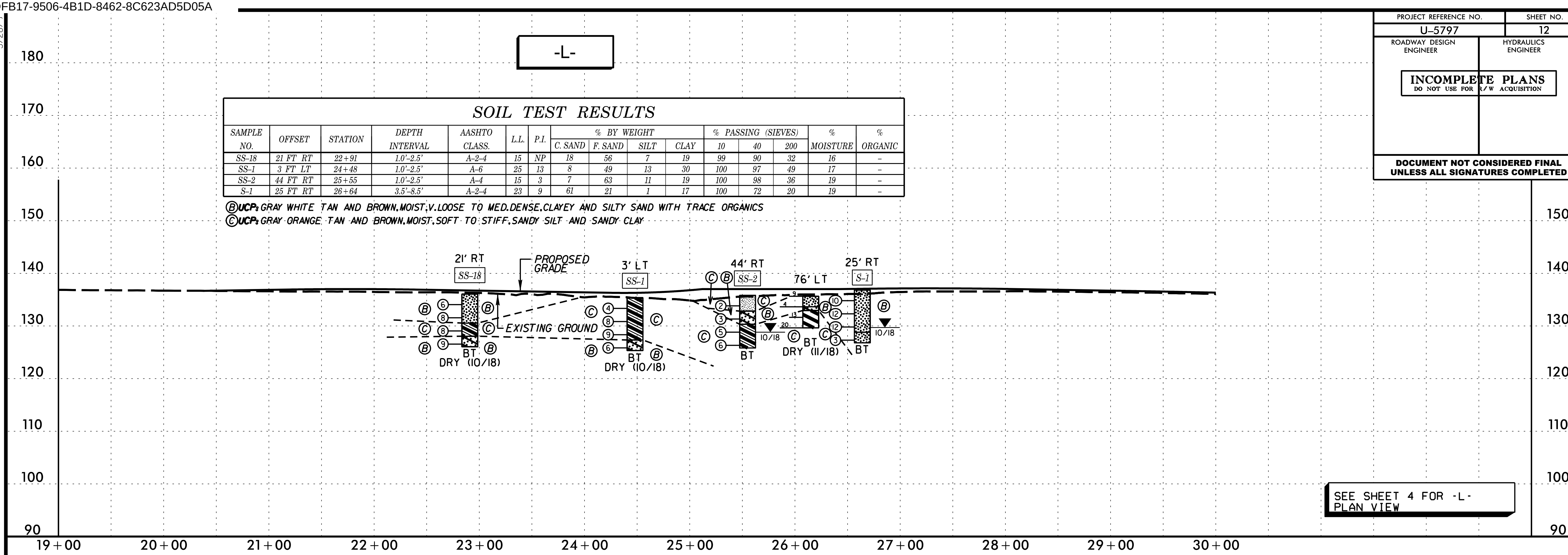
-L-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-18	21 FT RT	22+91	1.0'-2.5'	A-2-4	15	NP	18	56	7	19	99	90	32	16	-
SS-1	3 FT LT	24+48	1.0'-2.5'	A-6	25	13	8	49	13	30	100	97	49	17	-
SS-2	44 FT RT	25+55	1.0'-2.5'	A-4	15	3	7	63	11	19	100	98	36	19	-
S-1	25 FT RT	26+64	3.5'-8.5'	A-2-4	23	9	61	21	1	17	100	72	20	19	-

(B) UCP: GRAY WHITE TAN AND BROWN, MOIST, V. LOOSE TO MED. DENSE, CLAYEY AND SILTY SAND WITH TRACE ORGANICS

(C) UCP: GRAY ORANGE TAN AND BROWN, MOIST, SOFT TO STIFF, SANDY SILT AND SANDY CLAY



SEE SHEET 4 FOR -L- PLAN VIEW

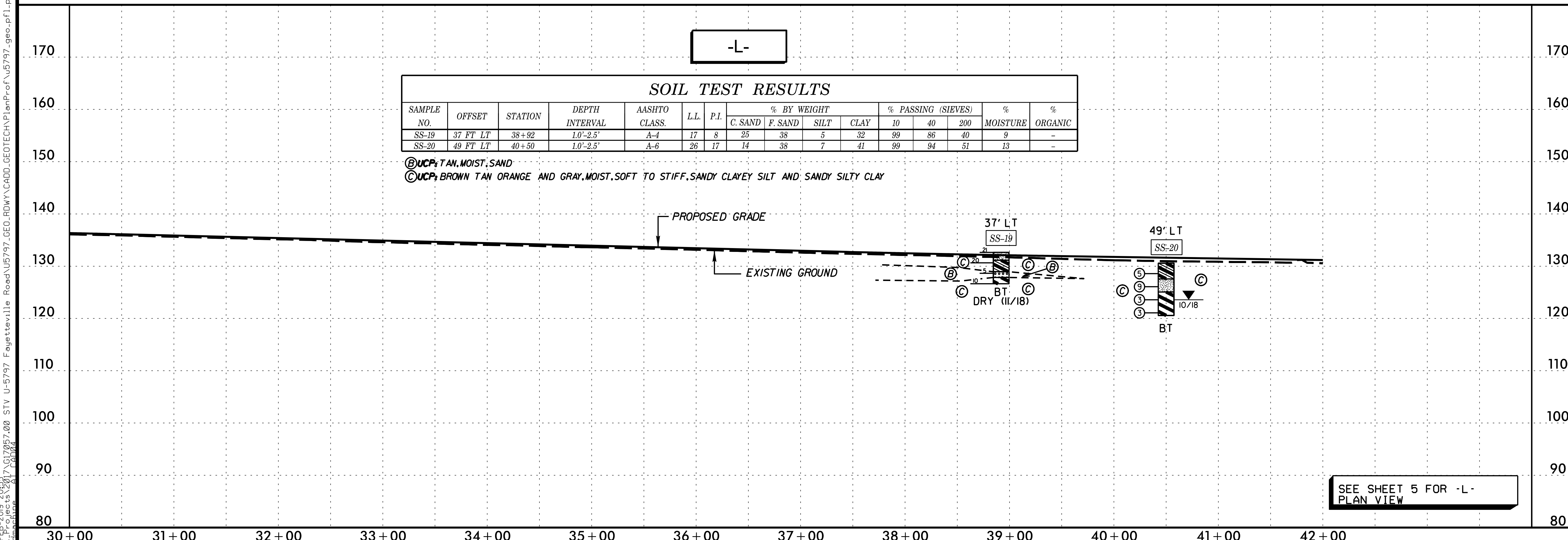
-L-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-19	37 FT LT	38+92	1.0'-2.5'	A-4	17	8	25	38	5	32	99	86	40	9	-
SS-20	49 FT LT	40+50	1.0'-2.5'	A-6	26	17	14	38	7	41	99	94	51	13	-

(B) UCP: TAN, MOIST, SAND

(C) UCP: BROWN TAN ORANGE AND GRAY, MOIST, SOFT TO STIFF, SANDY CLAYEY SILT AND SANDY SILTY CLAY



SEE SHEET 5 FOR -L- PLAN VIEW

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PROJECT REFERENCE NO.	SHEET NO.
U-5797	13
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

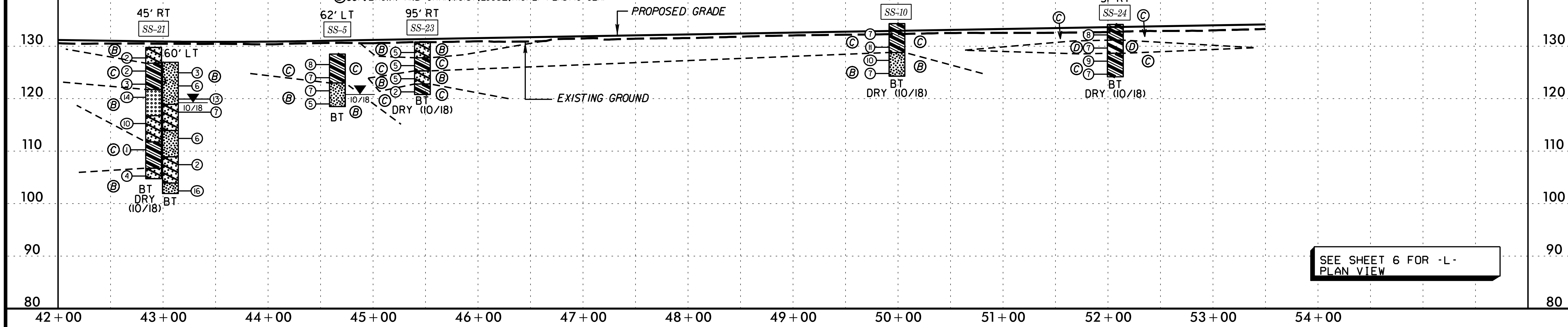
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-21	45 FT RT	42+91	3.5'-5.0'	A-6	25	12	23	36	6	35	98	85	43	30	-
SS-5	62 FT LT	44+66	1.0'-2.5'	A-6	28	14	13	44	12	31	100	96	48	14	-
SS-23	95 FT RT	45+47	3.5'-5.0'	A-6	25	14	25	44	3	28	100	90	38	15	-
SS-10	40 FT RT	49+99	1.0'-2.5'	A-6	37	19	31	35	5	29	98	77	37	13	-
SS-24	51 FT RT	52+07	3.5'-5.0'	A-7-6	43	28	3	34	14	49	100	99	69	21	-

(B) UCP: BROWN TAN RED AND GRAY, MOIST TO SAT., V.LOOSE TO MED.DENSE, CLAYEY SAND AND SILTY SAND
(C) UCP: GRAY BROWN TAN AND GRAY, MOIST TO SAT., V.SOFT TO STIFF, SANDY CLAY WITH TRACE ORGANICS
(D) UCP: BROWN AND GRAY, MOIST, LOOSE, HIGHLY PLASTIC CLAY

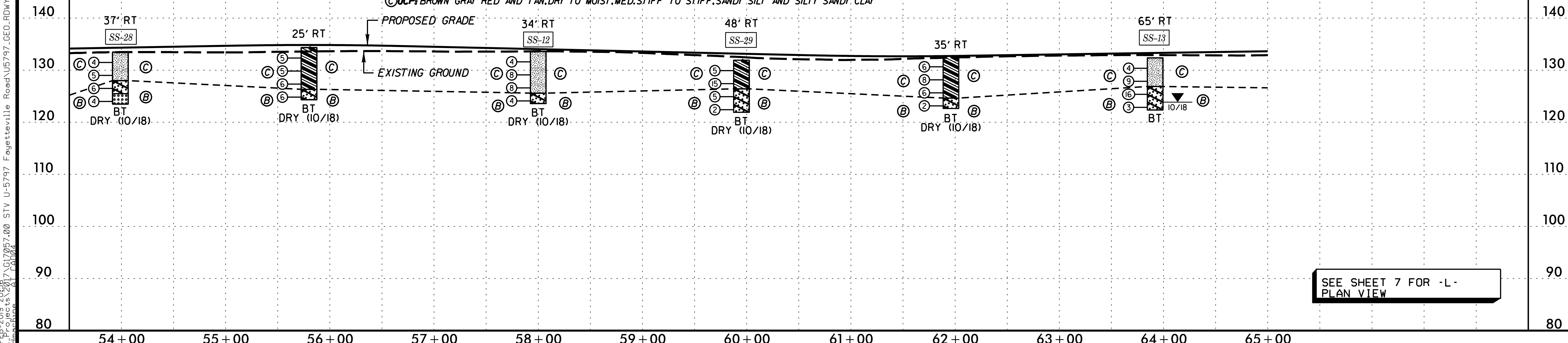


-L-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-28	37 FT RT	53+99	1.0'-2.5'	A-4	21	9	3	55	11	31	100	99	51	16	-
SS-12	34 FT RT	58+00	1.0'-2.5'	A-4	19	6	5	55	17	23	100	99	48	16	-
SS-29	48 FT RT	59+95	1.0'-2.5'	A-6	29	15	5	50	9	36	100	99	52	16	-
SS-13	65 FT RT	63+92	1.0'-2.5'	A-4	24	10	7	56	7	30	100	98	41	16	-

(B) UCP: GRAY WHITE RED TAN AND ORANGE, MOIST TO WET, V.LOOSE TO MED.DENSE, CLAYEY AND CLEAN SAND
(C) UCP: BROWN GRAY RED AND TAN, DRY TO MOIST, MED.STIFF TO STIFF, SANDY SILT AND SILTY SANDY CLAY



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ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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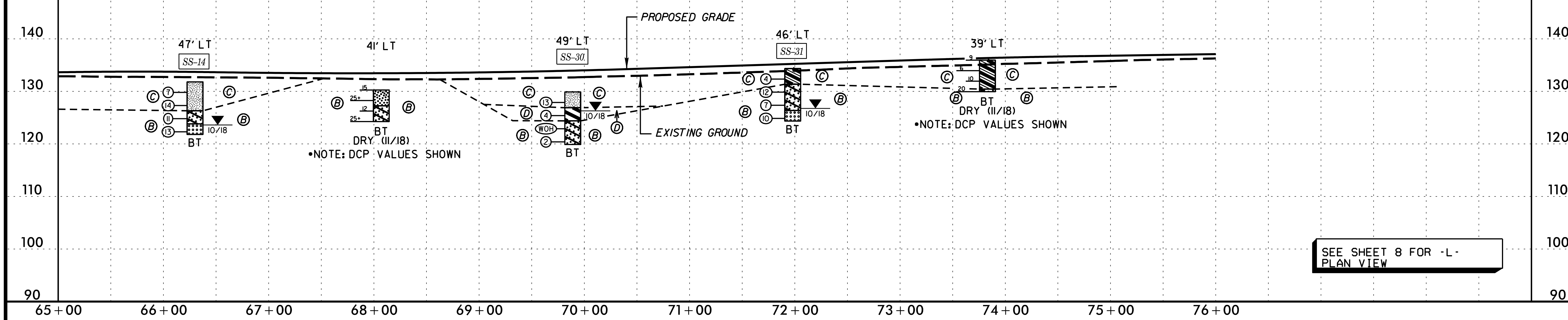
-L-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-14	47 FT LT	66+30	1.0'-2.5'	A-4	26	10	8	57	5	30	100	98	39	15	–
SS-30	49 FT LT	69+89	3.5'-5.0'	A-7-6	43	28	27	28	0	45	100	89	48	26	–
SS-31	46 FT LT	71+98	1.0'-2.5'	A-6	23	13	17	47	1	35	100	94	40	16	–

(B) UCP: ORANGE TAN GRAY AND BROWN, MOIST, V.LOOSE TO MED.DENSE, CLAYEY AND SILTY SAND
(C) UCP: BROWN AND TAN, MOIST, SOFT TO STIFF, SANDY SILT AND SANDY CLAY
(D) UCP: TAN-GRAY, MOIST, SOFT, HIGHLY PLASTIC SILTY CLAY



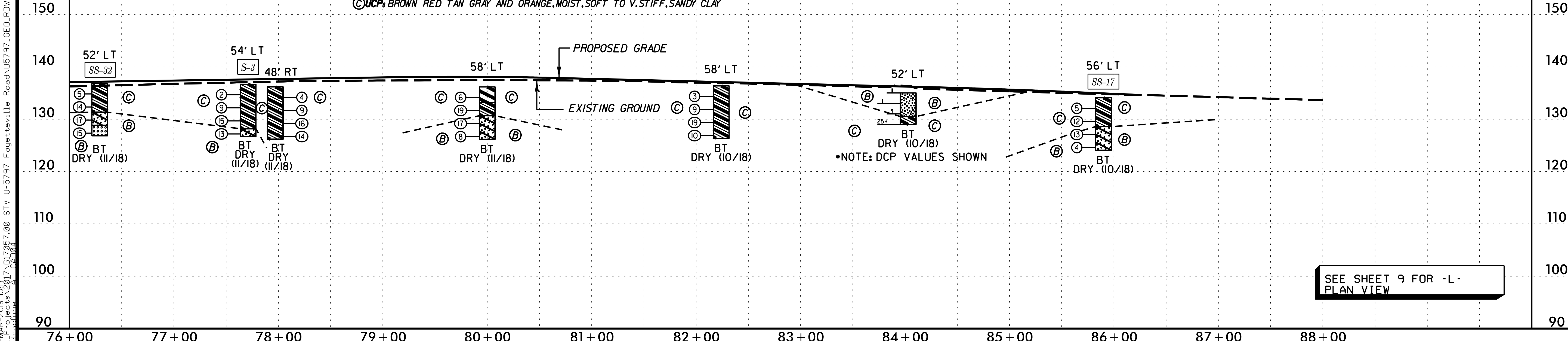
SEE SHEET 8 FOR -L- PLAN VIEW

-L-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-32	52 FT LT	76+29	1.0'-2.5'	A-6	36	18	12	37	1	50	100	95	54	22	–
S-3	54 FT LT	77+71	3.5'-8.5'	A-6	35	18	14	42	6	38	100	96	48	20	–
SS-17	56 FT LT	85+90	1.0'-2.5'	A-6	35	19	17	41	7	35	100	96	45	17	–

(B) UCP: RED TAN BROWN AND GRAY, MOIST, LOOSE TO MED.DENSE, CLAYEY SAND AND SILTY SAND
(C) UCP: BROWN RED TAN GRAY AND ORANGE, MOIST, SOFT TO V.STIFF, SANDY CLAY



SEE SHEET 9 FOR -L- PLAN VIEW

PROJECT REFERENCE NO.	SHEET NO.
U-5797	15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

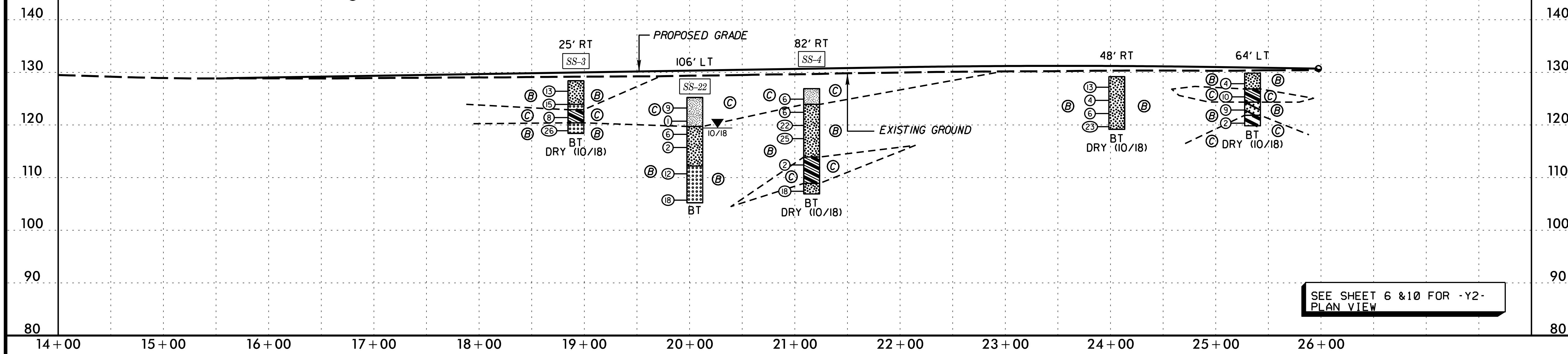
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-Y2-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-3	25 FT RT	18+92	1.0'-2.5'	A-2-4	18	4	31	49	4	16	99	84	23	12	-
SS-22	106 FT LT	20+05	1.0'-2.5'	A-4	19	9	7	51	11	31	100	98	49	13	-
SS-4	82 FT RT	21+16	1.0'-2.5'	A-4	19	8	10	55	12	23	100	98	40	12	-

(B) UCP: BROWN GRAY AND TAN, MOIST TO SAT., V. LOOSE TO MED. DENSE, SILTY SAND AND CLAYEY SAND
(C) UCP: GRAY BROWN AND TAN, MOIST TO SAT., V. SOFT TO STIFF, SANDY CLAY AND SANDY SILT WITH TRACE ORGANICS



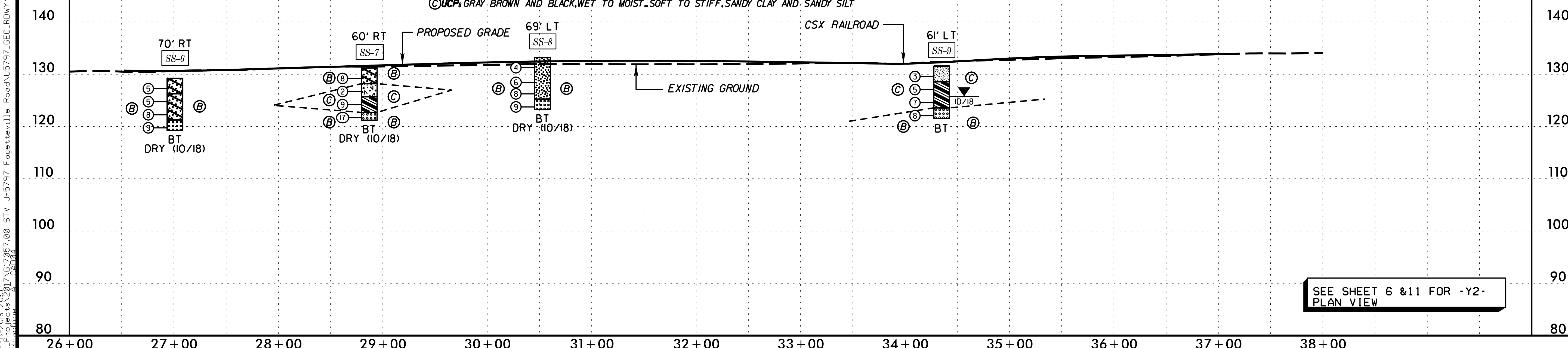
SEE SHEET 6 &10 FOR -Y2- PLAN VIEW

-Y2-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-6	70 FT RT	27+01	1.0'-2.5'	A-2-6	24	13	34	33	8	25	100	81	35	12	-
SS-7	60 FT RT	28+87	1.0'-2.5'	A-2-6	23	11	44	32	3	21	99	77	25	11	-
SS-8	69 FT LT	30+53	1.0'-2.5'	A-2-4	21	10	33	39	8	20	99	79	33	13	-
SS-9	61 FT LT	34+35	1.0'-2.5'	A-4	21	7	9	36	30	25	100	97	62	18	-

(B) UCP: BROWN GRAY AND TAN, MOIST, LOOSE, CLAYEY SAND AND SILTY SAND WITH TRACE ROCK FRAGMENTS
(C) UCP: GRAY BROWN AND BLACK, WET TO MOIST., SOFT TO STIFF, SANDY CLAY AND SANDY SILT



SEE SHEET 6 &11 FOR -Y2- PLAN VIEW

PROJECT REFERENCE NO.	SHEET NO.
U-5797	16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

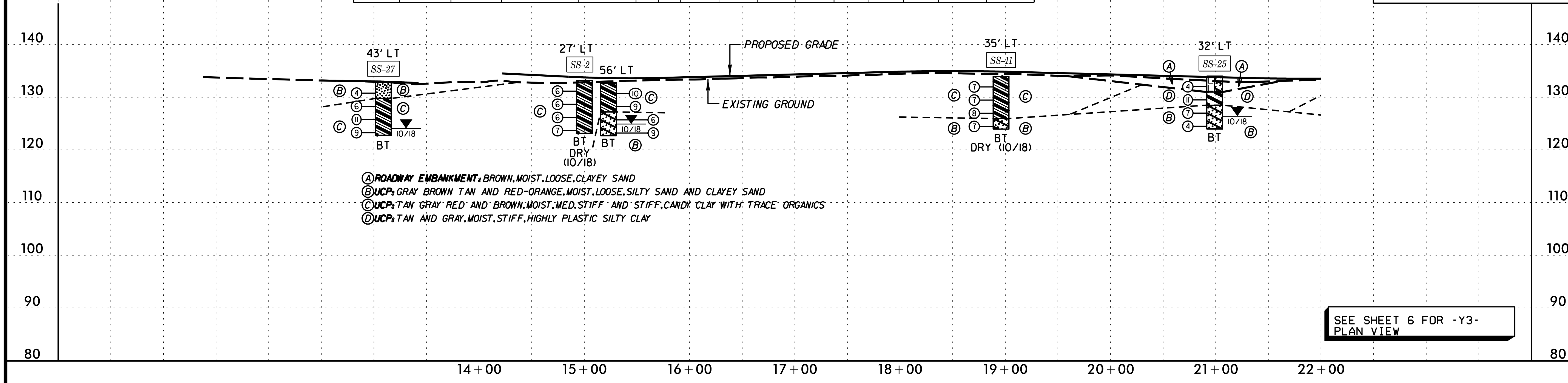
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-Y3-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-27	43 FT LT	13+09	3.5'-5.0'	A-6	33	20	3	40	13	44	100	99	63	17	-
S-2	27 FT LT	15+00	1.0'-5.0'	A-6	32	18	7	47	11	35	100	96	53	18	-
SS-11	35 FT LT	18+96	1.0'-2.5'	A-6	27	13	7	53	12	28	100	98	48	15	-
SS-25	32 FT LT	20+99	3.5'-5.0'	A-7-6	51	36	1	46	2	51	100	100	64	24	-



Ⓐ **ROADWAY EMBANKMENT:** BROWN, MOIST, LOOSE, CLAYEY SAND
Ⓑ **UCP:** GRAY BROWN TAN AND RED-ORANGE, MOIST, LOOSE, SILTY SAND AND CLAYEY SAND
Ⓒ **UCP:** TAN GRAY RED AND BROWN, MOIST, MED. STIFF AND STIFF, CANDY CLAY WITH TRACE ORGANICS
Ⓓ **UCP:** TAN AND GRAY, MOIST, STIFF, HIGHLY PLASTIC SILTY CLAY

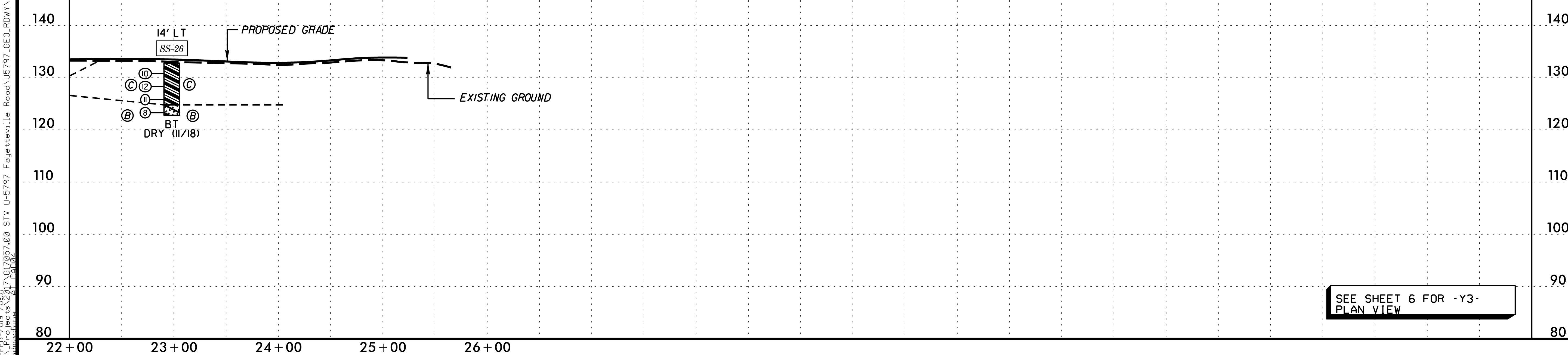
SEE SHEET 6 FOR -Y3- PLAN VIEW

-Y3-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-26	14 FT RT	22+98	1.0'-2.5'	A-6	38	23	4	45	10	41	100	99	59	16	-

Ⓑ **UCP:** WHITE AND RED, MOIST, LOOSE, CLAYEY SAND
Ⓒ **UCP:** BROWN GRAY AND TAN, MOIST, STIFF, SANDY CLAY



SEE SHEET 6 FOR -Y3- PLAN VIEW

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PROJECT REFERENCE NO.	SHEET NO.
U-5797	17

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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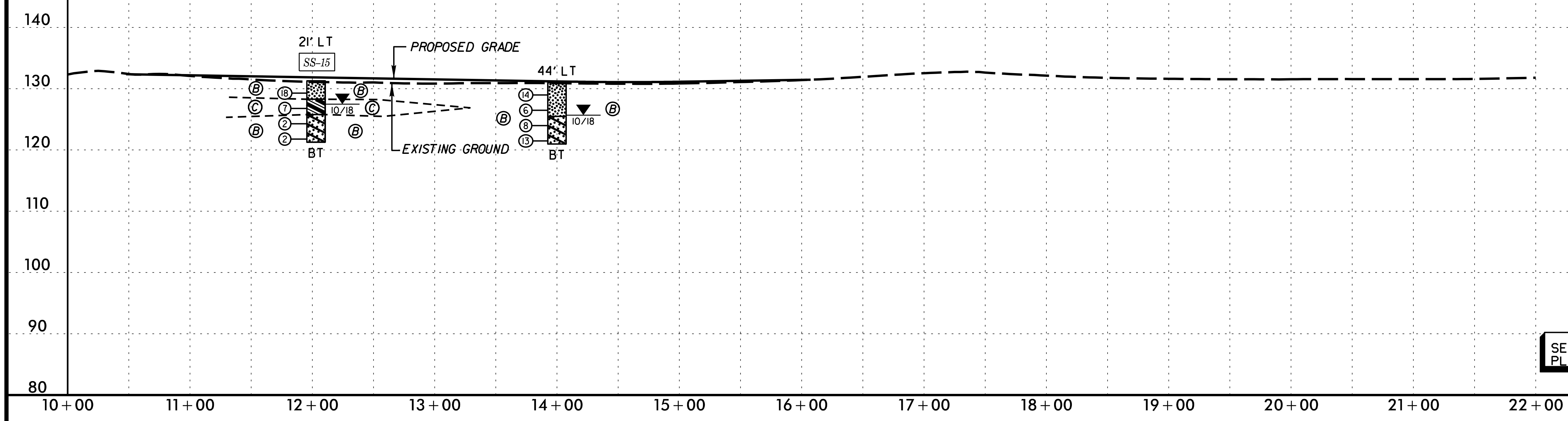
-Y4-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-15	21 FT LT	12+03	1.0'-2.5'	A-2-4	17	NP	20	62	4	14	100	92	20	11	-

(B) UCP: WHITE AND RED, MOIST, V. LOOSE TO MED. DENSE, CLAYEY AND SILTY SAND
(C) UCP: BROWN GRAY AND TAN, MOIST, MED. STIFF, SANDY CLAY



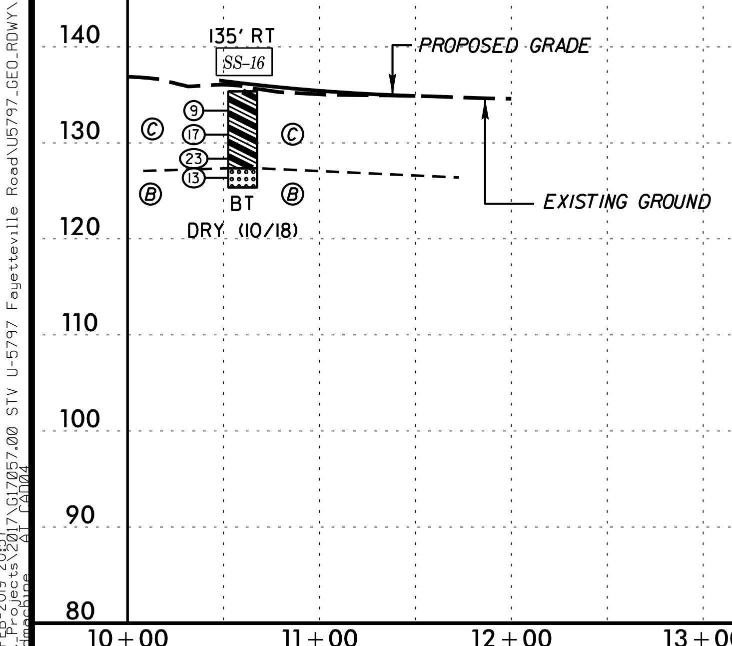
SEE SHEET 8 FOR -Y4- PLAN VIEW

-Y5-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-16	135 FT RT	10+60	1.0'-2.5'	A-6	32	13	18	47	4	31	100	94	38	14	-

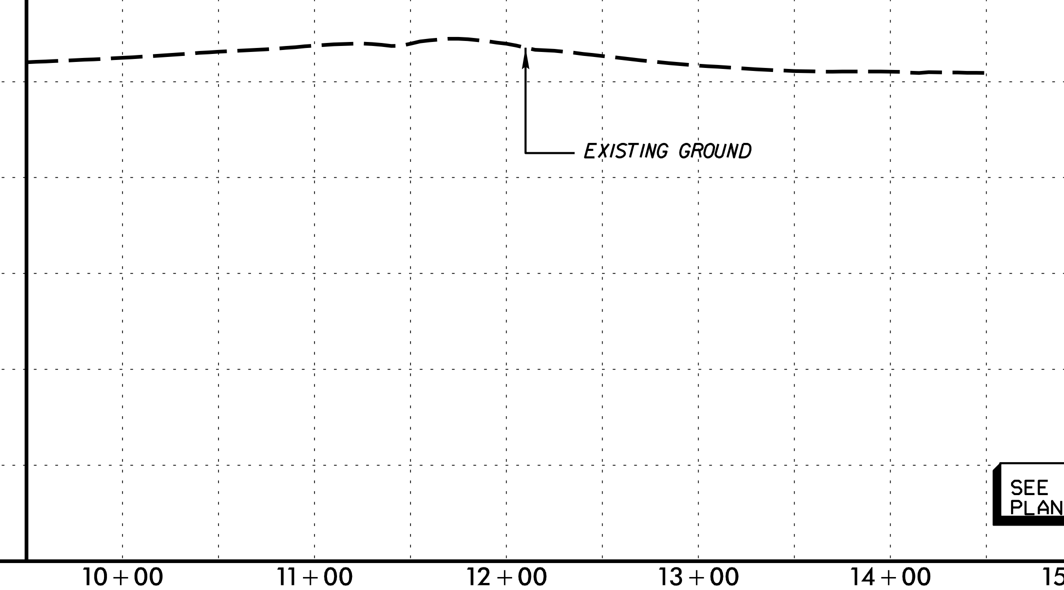
(B) UCP: TAN, MOIST, MED. DENSE, SAND
(C) UCP: TAN, MOIST, STIFF TO V. STIFF, SANDY CLAY



SEE SHEET 9 FOR -Y5- PLAN VIEW

-Y6-

NO BORINGS ON THIS ALIGNMENT



SEE SHEET 9 FOR -Y6- PLAN VIEW

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PROJECT REFERENCE NO.	SHEET NO.
U–5797	18

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

APPENDIX A
PAVEMENT INVESTIGATION

REFERENCE: U–5797

PROJECT: 44367

DS
WSH 3/5/2019
INITIALS DATE

Falcon Engineering, Inc. 1210 Trinity Road, Suite 110 Cary, NC 27513

PAVEMENT SECTION AND SUBGRADE CONDITION SUMMARY

FAYETTEVILLE ROAD (SR 1997) FROM EAST OF 22ND STREET TO FARRINGDOM STREET

ROBESON COUNTY, NORTH CAROLINA
TIP No.: U-5797 WBS No.: 44367.1.1
Falcon Project No.: G17057.00

TEST LOCATION				PAVEMENT SECTION THICKNESS (INCHES)				SUBGRADE	NOTES
ALIGNMENT	STATION	OFFSET	LANE	HMA	CONCRETE	AGGREGATE BASE	TOTAL	IN-SITU CBR	
-L-	21+04	CL	CENTRAL TURN LANE	6.00	6.00	0.00	12.00	20	Asphalt over concrete, Multiple Layers
-L-	29+90	5' RT	NORTHBOUND, ISL	5.00	6.00	0.00	11.00	15	Asphalt over concrete, Multiple Layers
-L-	35+94	17' LT	SOUTHBOUND, OSL	7.00	6.00	0.00	13.00	10	Asphalt over concrete, Multiple Layers, delaminated at 6 inches
-L-	42+91	4' RT	NORTHBOUND, ISL	6.00	6.00	0.00	12.00	9	Asphalt over concrete, Multiple Layers, delaminated at 5 inches
-L-	50+02	16' LT	NORTHBOUND, OSL	6.00	0.00	5.00	11.00	10	Multiple Layers
-L-	55+99	14' LT	CENTRAL TURN LANE	12.00	7.00	0.00	19.00	8	Asphalt over concrete, Multiple Layers
-L-	63+96	33' RT	NORTHBOUND, OTL	7.00	0.00	5.00	12.00	6	Multiple Layers
-L-	70+50	21' RT	CENTRAL TURN LANE	7.00	5.00	0.00	12.00	25	Asphalt over concrete, Multiple Layers
-L-	79+99	35' RT	NORTHBOUND, OTL	5.00	0.00	0.00	5.00	6	Multiple Layers
-L-	85+02	33' RT	NORTHBOUND, OTL	11.00	0.00	0.00	11.00	10	Multiple Layers
-Y-	12+00	3' LT	CENTRAL TURN LANE	6.00	0.00	10.00	16.00	6	Multiple Layers, base course crumbling
-Y1-	12+06	5' LT	WESTBOUND, ISL	8.00	0.00	0.00	8.00	12	Multiple Layers
-Y2-	19+99	2' LT	CENTRAL TURN LANE	8.00	0.00	8.00	16.00	10	Multiple Layers
-Y2-	23+53	43' LT	WESTBOUND, OTL	6.00	0.00	3.00	9.00	12	Multiple Layers
-Y2-	29+48	38' LT	WESTBOUND, OTL	6.00	0.00	6.00	12.00	9	Multiple Layers
-Y2-	32+41	44' LT	WESTBOUND, OTL	8.00	0.00	6.00	14.00	20	Multiple Layers
-Y2-	36+03	38' LT	WESTBOUND, OTL	6.00	0.00	6.00	12.00	8	Multiple Layers
-Y3-	16+02	1' LT	WESTBOUND, ISL	4.00	0.00	4.00	8.00	20	Multiple Layers
-Y3-	22+99	5' LT	NORTHBOUND, TL	3.00	0.00	3.00	6.00	15	Multiple Layers
-Y4-	13+99	5' LT	WESTBOUND, ITL	7.00	0.00	5.00	12.00	6	Multiple Layers, base course intact
-Y6-	14+01	7' LT	WESTBOUND, ITL	4.00	0.00	3.00	7.00	10	Multiple Layers
REPRESENTATIVE AVERAGE				6.6	1.7	3.0	11.3	N/A	-

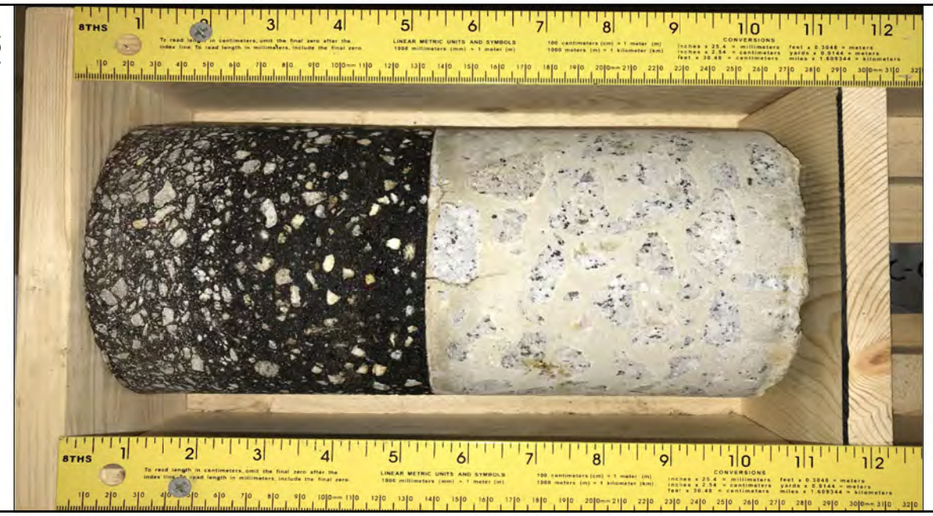
Legend: TL - Travel Lane, ISL - Inside Travel Lane, OSL - Outside Travel Lane, ITL - Inside Turn Lane, OTL - Outside Turn Lane

TOP

BOTTOM

PAVEMENT CORE - L_21+04

TOP



BOTTOM

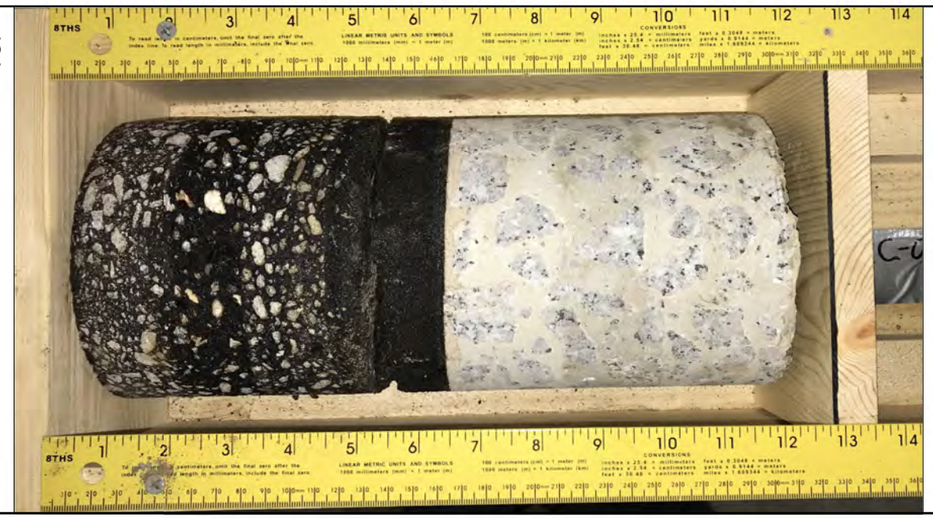
PAVEMENT CORE - L_29+90_5RT

TOP

BOTTOM

PAVEMENT CORE - L_35+94_17LT

TOP



BOTTOM

PAVEMENT CORE - L_42+91_4RT

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CARY, NC 27513

PHONE: 919.871.0800
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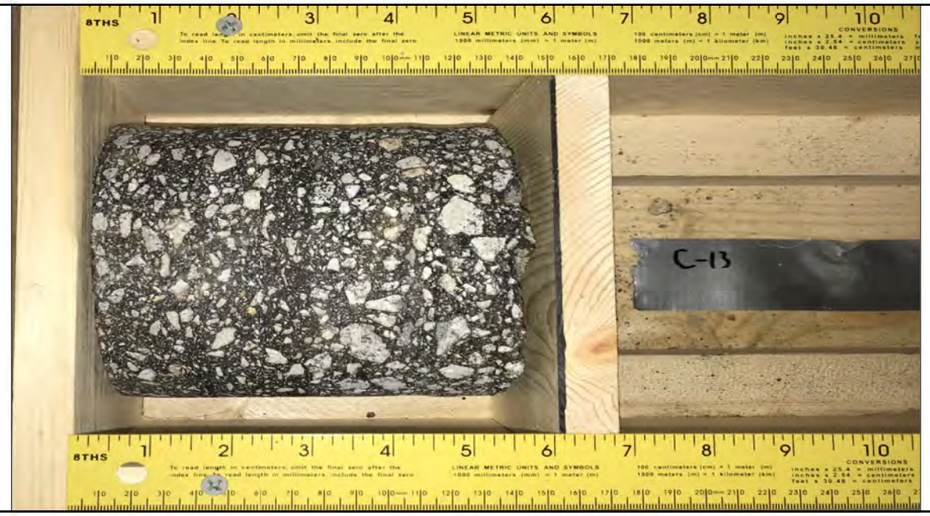
PAVEMENT CORE PHOTOGRAPHS

FAYETTEVILLE ROAD (SR 1997) FROM EAST OF 22nd STREET TO FARRINGDOM STREET
ROBESON / LUMBERTON, NORTH CAROLINA
WBS NO.:44367.1.1 | TIP NO.: U-5797
FALCON PROJECT NO.: G17057.00

TOP



BOTTOM

PAVEMENT CORE - L_50+02_16LT

TOP

BOTTOM

PAVEMENT CORE - L_55+99_14LT

TOP

BOTTOM

PAVEMENT CORE - L_63+96_33RT

TOP

BOTTOM

PAVEMENT CORE - L_70+50_21RT

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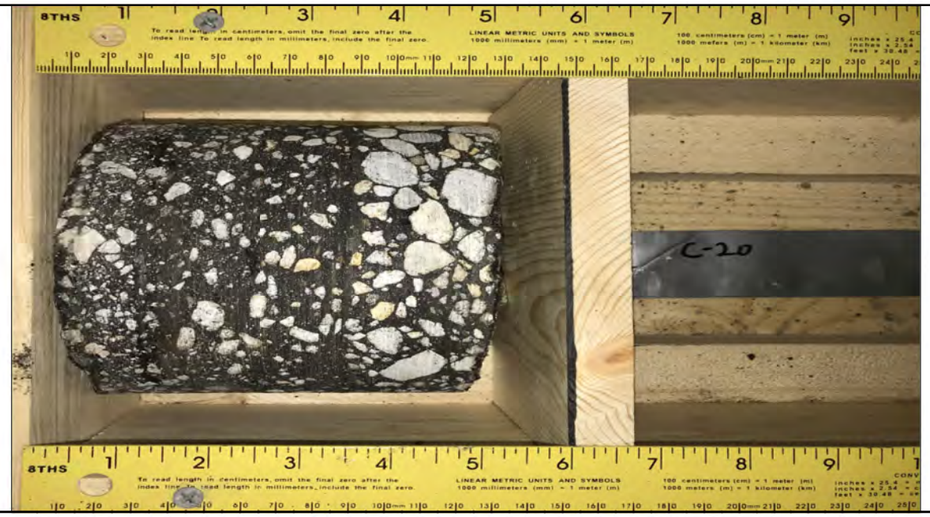
PAVEMENT CORE PHOTOGRAPHS

FAYETTEVILLE ROAD (SR 1997) FROM EAST OF 22nd STREET TO FARRINGDOM STREET
ROBESON / LUMBERTON, NORTH CAROLINA
WBS NO.:44367.1.1 | TIP NO.: U-5797
FALCON PROJECT NO.: G17057.00

TOP



BOTTOM

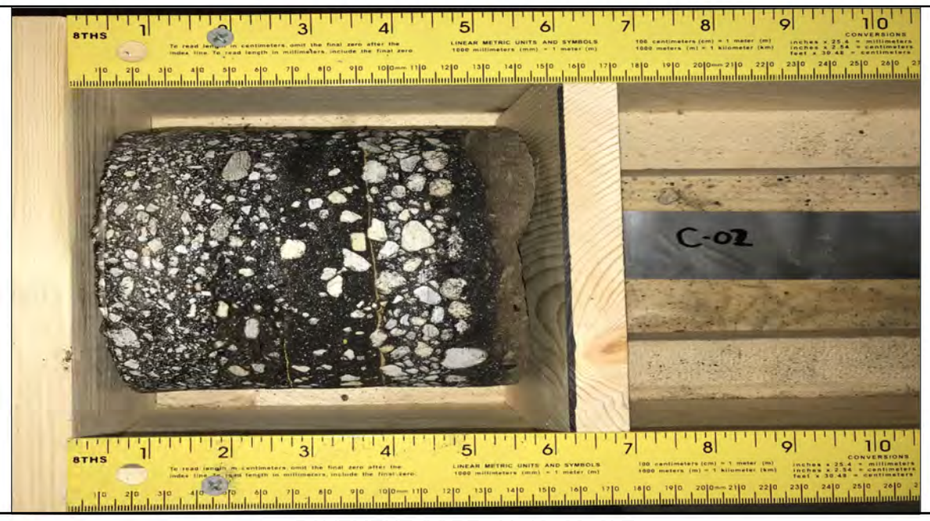
PAVEMENT CORE - L_79+99_35RT

TOP

BOTTOM

PAVEMENT CORE - L_85+02_33RT

TOP



BOTTOM

PAVEMENT CORE - Y_12+00_3LT

TOP

BOTTOM

PAVEMENT CORE - Y1_12+06_5LT

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PAVEMENT CORE PHOTOGRAPHS

FAYETTEVILLE ROAD (SR 1997) FROM EAST OF 22nd STREET TO FARRINGDOM STREET
ROBESON / LUMBERTON, NORTH CAROLINA
WBS NO.:44367.1.1 | TIP NO.: U-5797
FALCON PROJECT NO.: G17057.00

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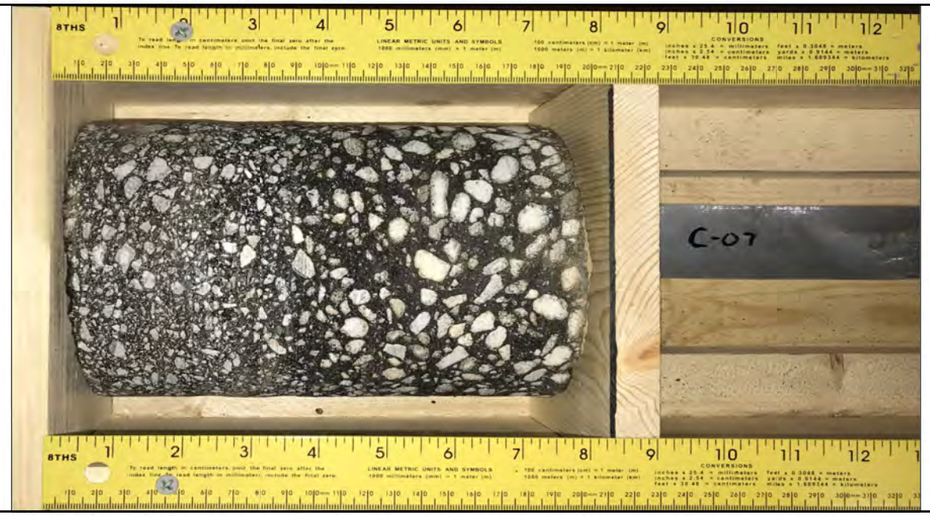


BOTTOM

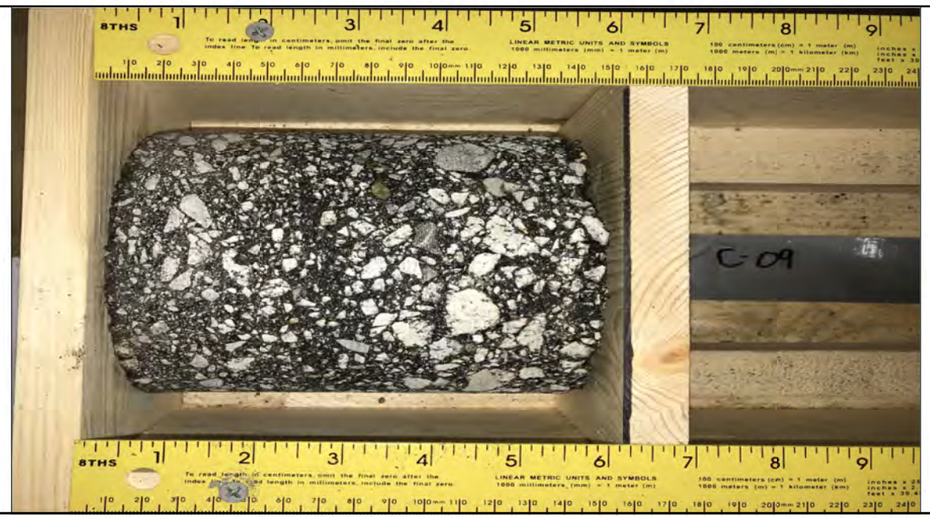
PAVEMENT CORE - Y2_19+99_2LT

TOP

BOTTOM

PAVEMENT CORE - Y2_23+53_43LT

TOP



BOTTOM

PAVEMENT CORE - Y2_29+48_38LT

TOP

BOTTOM

PAVEMENT CORE - Y2_32+41_44LT

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PAVEMENT CORE PHOTOGRAPHS

FAYETTEVILLE ROAD (SR 1997) FROM EAST OF 22nd STREET TO FARRINGDOM STREET
ROBESON / LUMBERTON, NORTH CAROLINA
WBS NO.:44367.1.1 | TIP NO.: U-5797
FALCON PROJECT NO.: G17057.00

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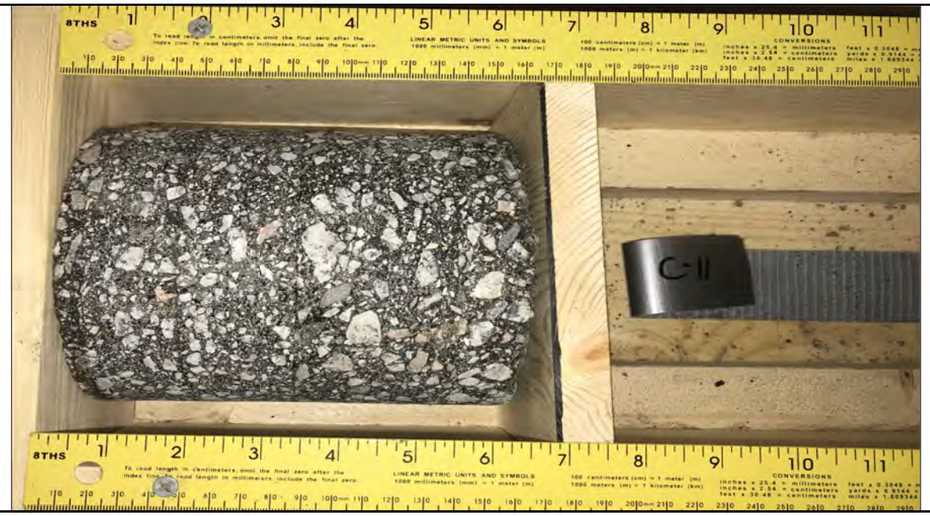
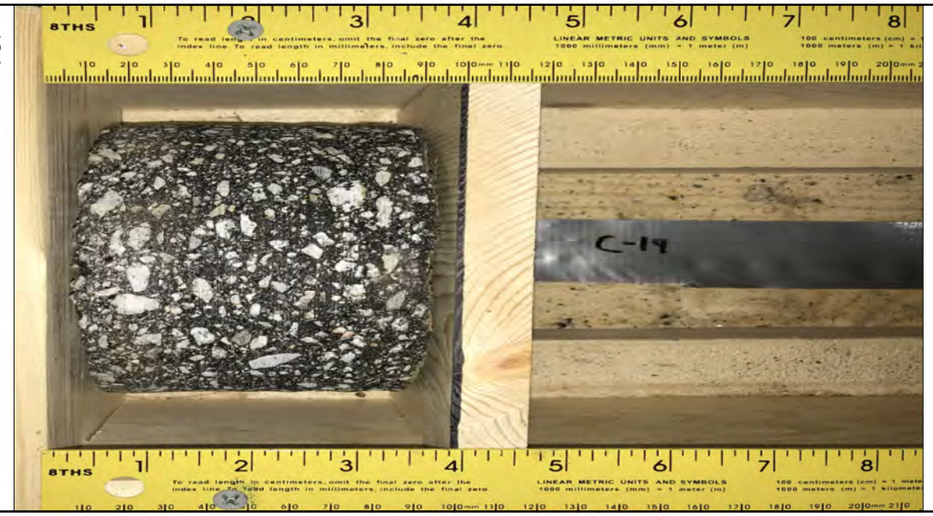


BOTTOM

PAVEMENT CORE - Y2_36+03_38LT

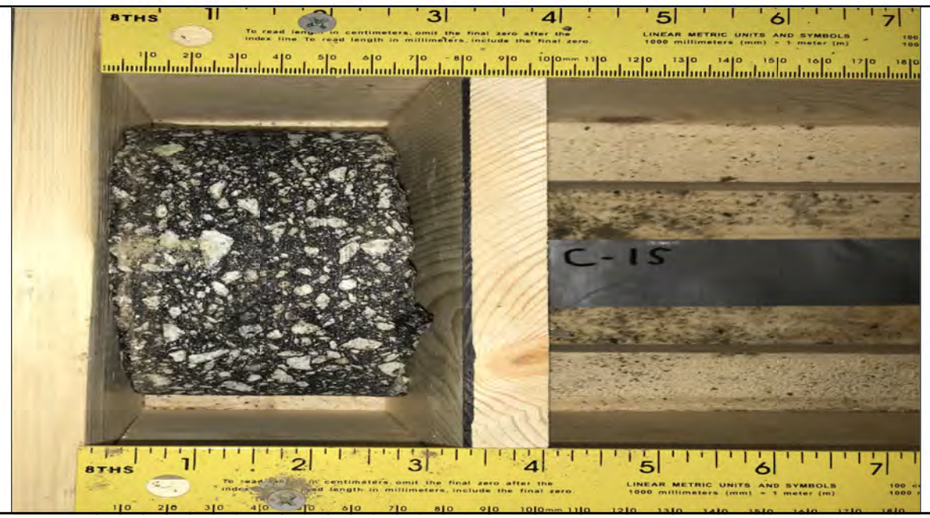
TOP



BOTTOM

PAVEMENT CORE - Y3_16+02_1LT

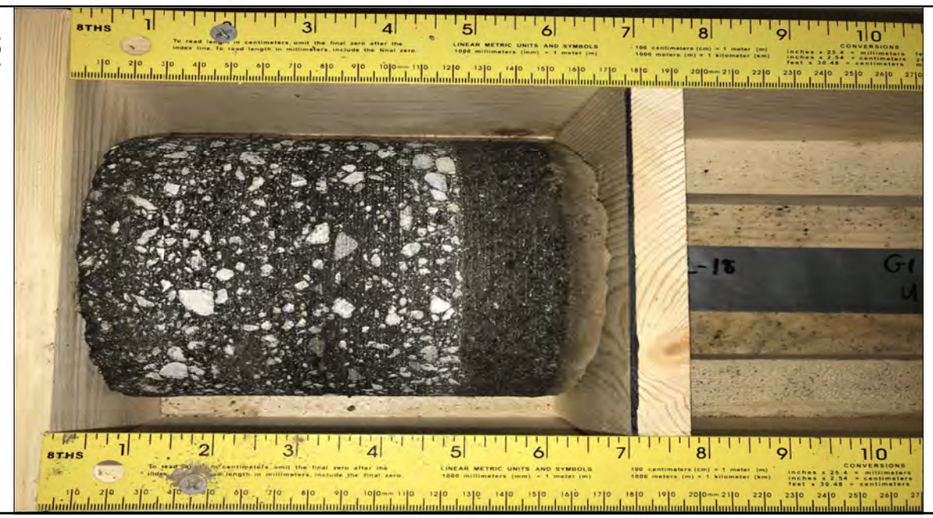
TOP



BOTTOM

PAVEMENT CORE - Y3_22+99_5LT

TOP



BOTTOM

PAVEMENT CORE - Y4_13+99_5LT

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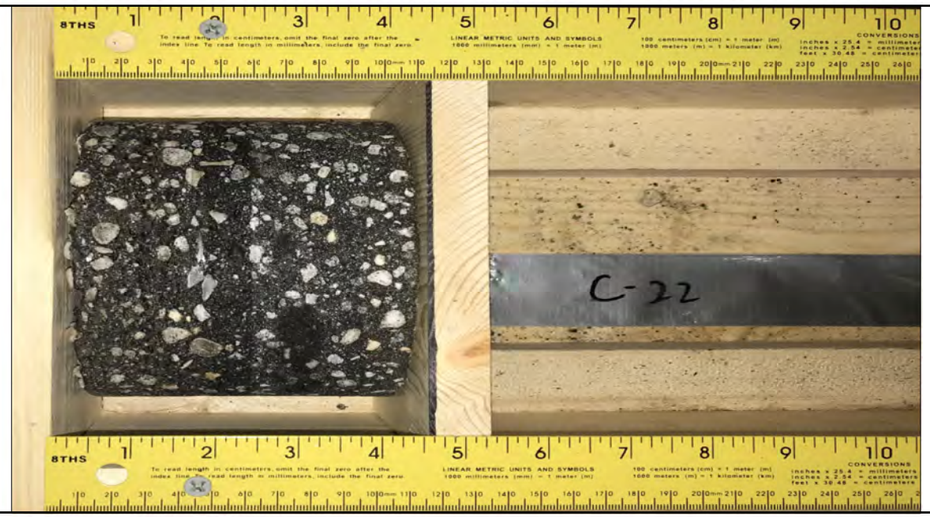
FAX: 919.871.0803

PAVEMENT CORE PHOTOGRAPHS

FAYETTEVILLE ROAD (SR 1997) FROM EAST OF 22nd STREET TO FARRINGDOM STREET
ROBESON / LUMBERTON, NORTH CAROLINA
WBS NO.:44367.1.1 | TIP NO.: U-5797
FALCON PROJECT NO.: G17057.00

TOP



BOTTOM

PAVEMENT CORE - Y6_14+01_7LT

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FAX: 919.871.0803

PAVEMENT CORE PHOTOGRAPHS

FAYETTEVILLE ROAD (SR 1997) FROM EAST OF 22nd STREET TO FARRINGDOM STREET
ROBESON / LUMBERTON, NORTH CAROLINA
WBS NO.:44367.1.1 | TIP NO.: U-5797
FALCON PROJECT NO.: G17057.00

DCP TEST DATA

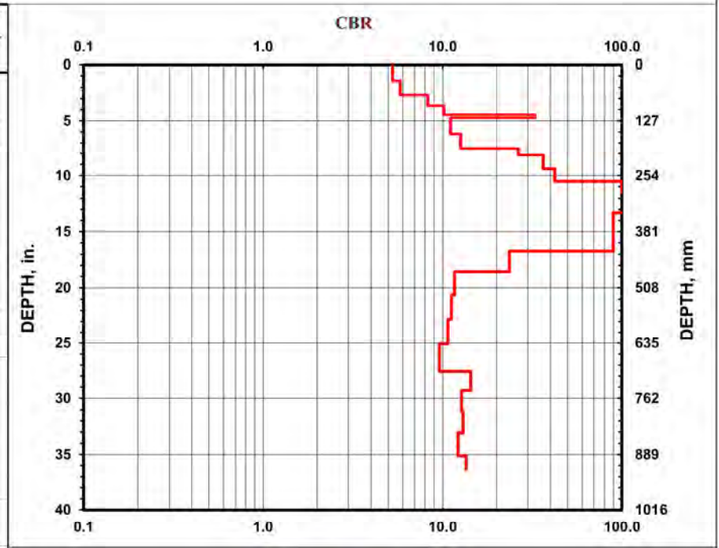
File Name: G17057.00

Project: *Fayetteville Road Widening*
Location: L_21+04
Date: 29-Oct-18
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
Start	0	1
1	36	1
1	69	1
1	93	1
1	113	1
1	120	1
2	157	1
2	190	1
2	207	1
5	239	1
5	267	1
10	293	1
10	315	1
10	339	1
15	382	1
15	425	1
5	472	1
3	525	1
3	580	1
3	637	1
3	700	1
3	744	1
3	793	1
3	841	1
3	892	1
2	923	1



DCP TEST DATA

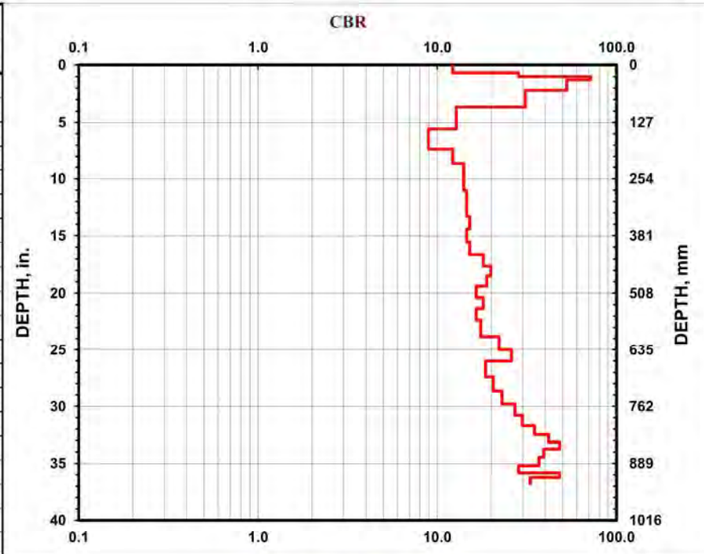
File Name: G17057.00

Project: *Fayetteville Rd Widening*
Location: L_29+90_5RT
Date: 29-Oct-18
Soil Type(s): A-6 (Red Tan Fine SandyClay)

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
Start	0	1
1	17	1
1	25	1
2	32	1
5	55	1
5	92	1
3	141	1
2	186	1
2	220	1
2	250	1
2	280	1
2	309	1
2	338	1
2	366	1
2	395	1
2	423	1
2	447	1
2	469	1
2	492	1
2	518	1
2	542	1
2	568	1
3	605	1
3	635	1
3	661	1
3	696	1
3	728	1
3	757	1
3	782	1
3	805	1
3	825	1
3	842	1
3	857	1
3	875	1
3	894	1
2	910	1
2	920	1
2	934	1



DCP TEST DATA

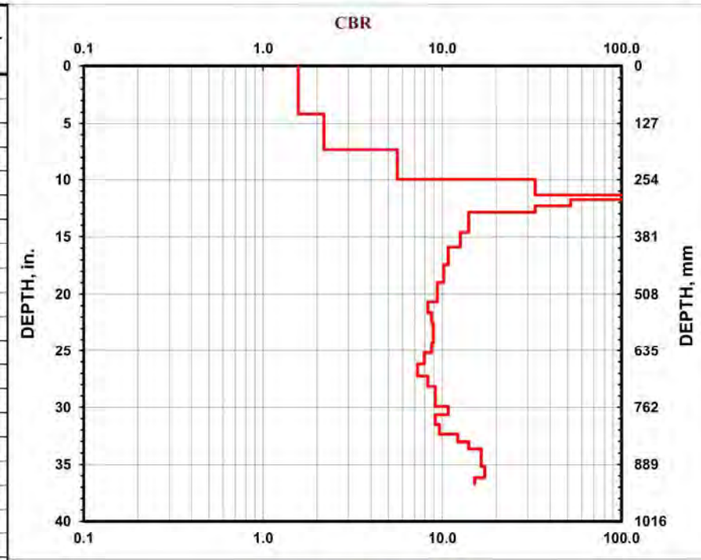
File Name: G17057.00

Project: *Fayetteville Rd Widening*
Location: L_35+94_17LT
Date: 29-Oct-18
Soil Type(s): A-7 (Tan Gray Clay)

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
Start	0	1
1	106	1
1	185	1
2	253	1
5	288	1
5	298	1
3	312	1
2	326	1
3	371	1
2	404	1
2	442	1
2	482	1
2	525	1
1	549	1
1	572	1
2	617	1
1	640	1
1	665	1
1	692	1
1	716	1
1	738	1
1	760	1
1	779	1
1	801	1
1	822	1
1	839	1
1	854	1
1	867	1
2	893	1
2	918	1
1	932	1



DCP TEST DATA

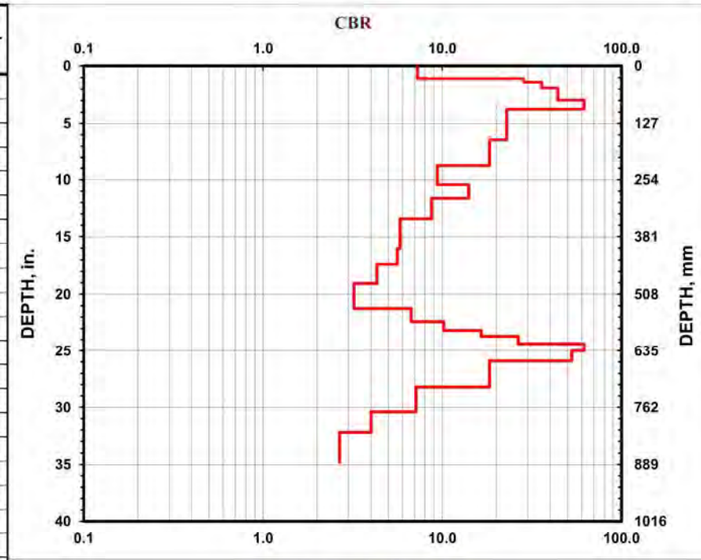
File Name: G17057.00

Project: *Fayetteville Rd Widening*
Location: L_42+91_4RT
Date: 29-Oct-18
Soil Type(s): A-2-6

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
Start	0	1
1	27	1
1	35	1
2	48	1
5	75	1
5	95	1
7	163	1
5	222	1
2	265	1
2	295	1
2	341	1
2	407	1
1	441	1
1	484	1
1	540	1
1	569	1
1	569	1
1	589	1
1	602	1
2	619	1
4	635	1
5	658	1
5	717	1
2	772	1
1	818	1
1	884	1



DCP TEST DATA

File Name: G17057

Project: *Fayetteville Rd. Widening*
Location: L_50+02_16LT
Date: 30-Oct-18
Soil Type(s): A-6

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
Start	0	1
1	6	1
2	10	1
5	36	1
5	47	1
10	61	1
1	78	1
14	123	1
5	166	1
5	220	1
3	268	1
2	302	1
2	338	1
2	377	1
2	417	1
2	454	1
2	503	1
1	525	1
1	546	1
2	587	1
2	626	1
2	666	1
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2	783	1
2	823	1
2	858	1
2	899	1
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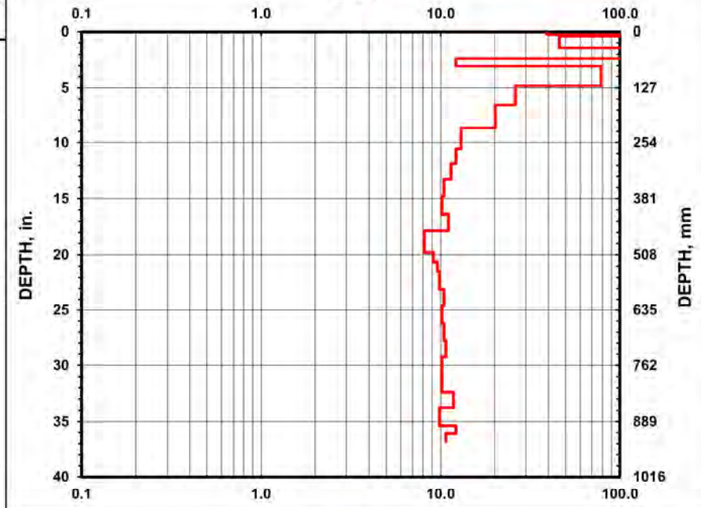
1	935	1



DCP TEST DATA

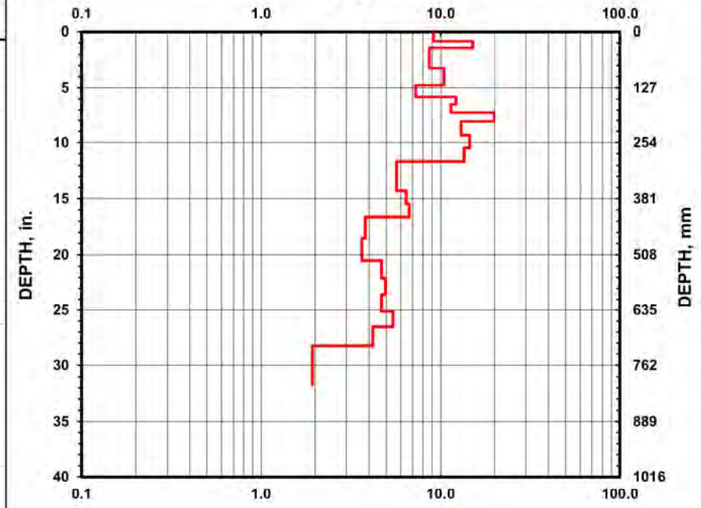
File Name: G17057

Project: *Fayetteville Rd. Widening*
Location: L_55+99_14LT
Date: 30-Oct-18
Soil Type(s): Dark Brown, Sandy CLAY (A-6)

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
Start	0	1
1	22	1
1	36	1
2	82	1
2	121	1
1	148	1
1	165	1
1	183	1
2	205	1
2	237	1
2	266	1
2	297	1
2	364	1
1	394	1
1	423	1
1	471	1
1	521	1
1	561	1
1	599	1
1	639	1
1	674	1
1	718	1
1	806	1



DCP TEST DATA

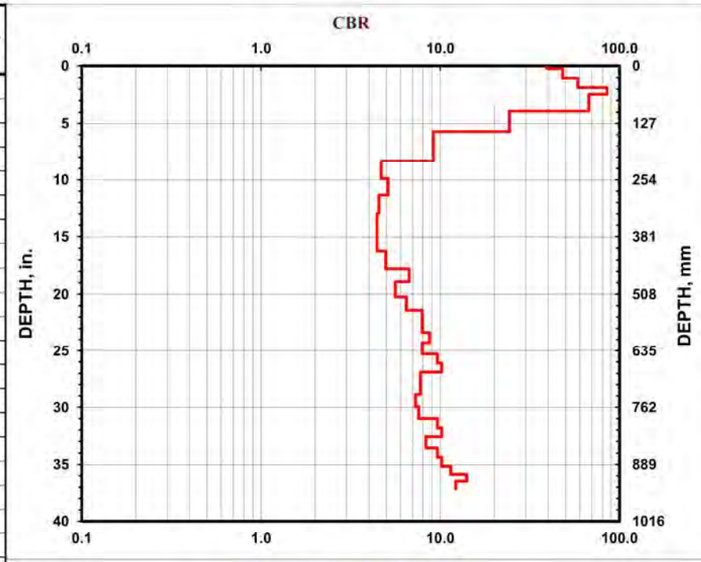
File Name: G17057.00

Project: *Fayetteville Rd Widening*
Location: L_63+96_33RT
Date: 11-Nov-18
Soil Type(s): A-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
Start	0	1
1	6	1
1	11	1
3	26	1
5	47	1
5	62	1
10	99	1
5	145	1
3	211	1
1	251	1
1	288	1
1	329	1
1	371	1
1	413	1
1	451	1
1	480	1
1	514	1
1	544	1
1	569	1
1	594	1
1	617	1
1	642	1
1	663	1
1	683	1
2	734	1
1	761	1
1	787	1
1	808	1
1	828	1
1	852	1
1	873	1
1	893	1
1	911	1
1	926	1
1	943	1



DCP TEST DATA

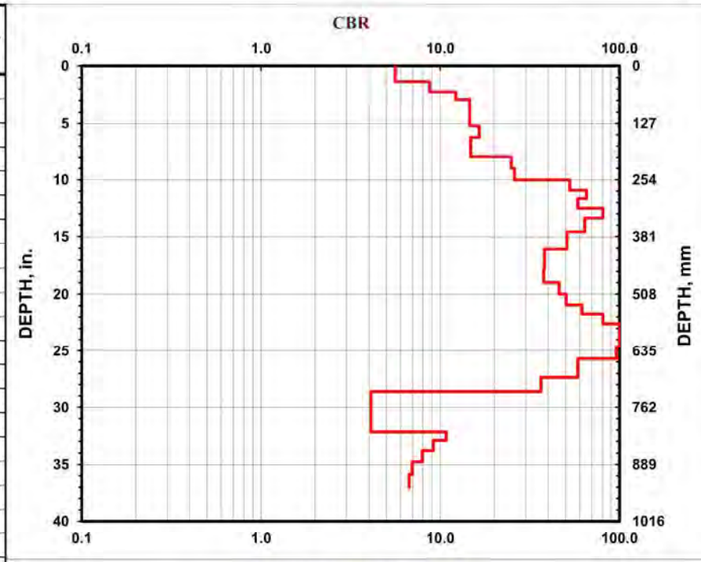
File Name: G17057.00

Project: *Fayetteville Rd Widening*
Location: L_70+50_21RT
Date: 11-Nov-18
Soil Type(s): A-6

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
Start	0	1
1	34	1
1	57	1
1	74	1
2	103	1
2	132	1
2	158	1
3	201	1
3	228	1
3	254	1
5	277	1
5	296	1
5	317	1
7	339	1
8	370	1
8	408	1
7	451	1
5	482	1
5	508	1
5	532	1
5	552	1
7	574	1
10	600	1
10	626	1
10	653	1
10	695	1
5	727	1
2	817	1
1	836	1
1	858	1
1	883	1
1	911	1
1	940	1



DCP TEST DATA

File Name: G17057.00

Project: *Fayetteville Road Widening*
Location: Y_12+00_3LT
Date: 28-Oct-18
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
Start	0	1
2	13	1
2	32	1
2	44	1
3	57	1
5	76	1
5	92	1
10	121	1
10	153	1
10	185	1
10	212	1
10	237	1
7	289	1
3	331	1
2	373	1
1	408	1
1	453	1
1	496	1
1	538	1
1	576	1
1	612	1
1	646	1
1	678	1
1	708	1
1	739	1
1	770	1
1	800	1
1	829	1
1	857	1
1	883	1
1	911	1
1	943	1

DCP TEST DATA

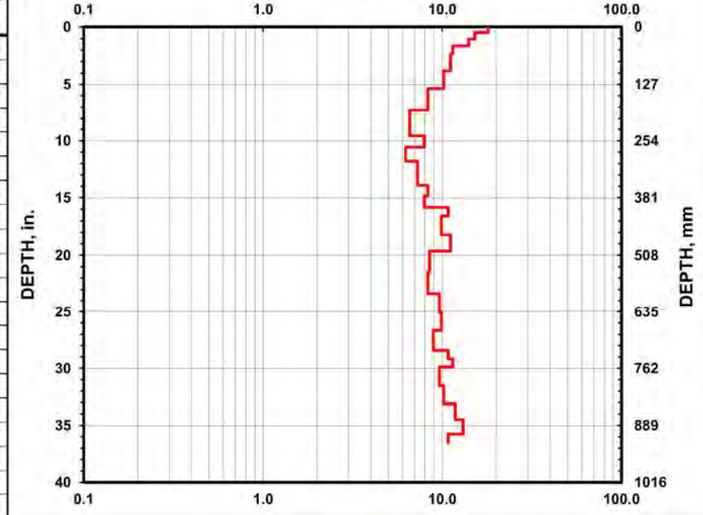
File Name: G17057.00

Project: *Fayetteville Road Widening*
Location: Y1_12+06_5LT
Date: 29-Oct-18
Soil Type(s): A-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
Start	0	1
1	12	1
1	26	1
1	41	1
1	59	1
2	96	1
2	136	1
2	184	1
2	243	1
1	268	1
1	299	1
1	326	1
1	353	1
1	377	1
1	402	1
1	421	1
2	462	1
2	499	1
2	546	1
2	594	1
2	636	1
2	677	1
2	722	1
1	741	1
1	759	1
2	801	1
2	841	1
2	876	1
1	892	1
1	908	1
1	927	1



DCP TEST DATA

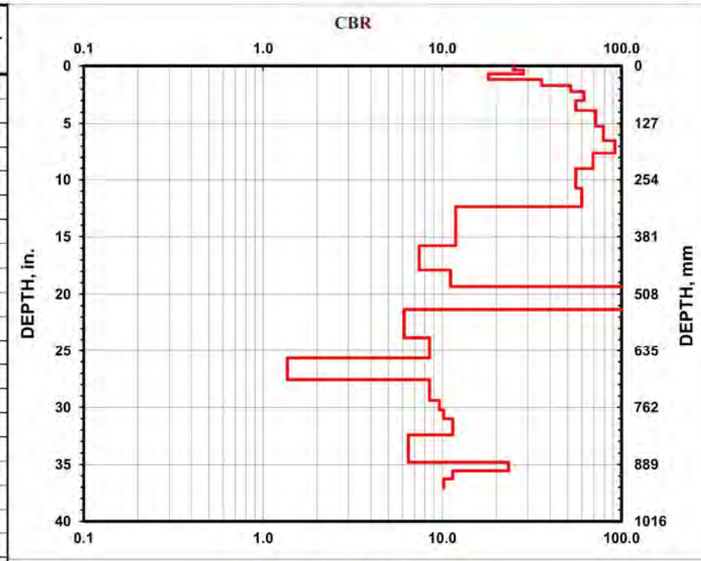
File Name: G17057

Project: *Fayetteville Rd. Widening*
Location: Y2_19+99_2LT
Date: 30-Oct-18
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
Start	0	1
1	9	1
1	17	1
1	29	1
2	42	1
3	56	1
5	76	1
5	98	1
10	133	1
10	165	1
10	193	1
10	229	1
10	273	1
10	314	1
5	401	1
2	454	1
2	491	1
32	542	1
2	605	1
2	652	5
2	700	1
2	747	1
1	768	1
1	788	1
2	824	1
2	884	1
2	903	1
1	921	1
1	941	1



DCP TEST DATA

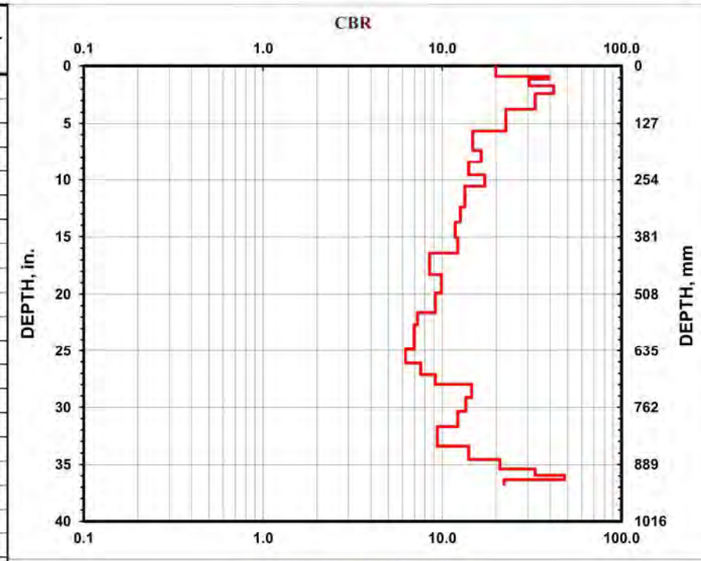
File Name: G17057

Project: *Fayetteville Rd. Widening*
Location: Y2_23+53_43LT
Date: 30-Oct-18
Soil Type(s): Gray, Clayey SAND (A-2-6)

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
Start	0	1
1	11	1
1	22	1
1	28	1
2	43	1
3	60	1
5	95	1
5	144	1
3	187	1
2	213	1
2	243	1
2	268	1
3	315	1
2	348	1
2	383	1
2	417	1
2	464	1
2	505	1
2	549	1
1	576	1
1	604	1
1	632	1
1	663	1
1	689	1
1	711	1
2	740	1
2	771	1
2	805	1
2	848	1
2	878	1
2	899	1
2	913	1
2	923	1
1	933	1



DCP TEST DATA

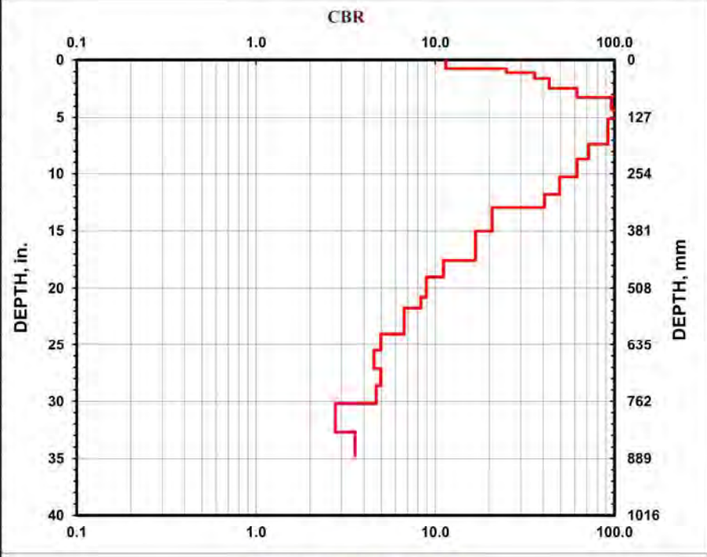
File Name: G17057

Project: *Fayetteville Rd. Widening*
Location: Y2_29+48_38LT
Date: 30-Oct-18
Soil Type(s): Tan-Brown, Clayey SAND (A-2-6)

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
Start	0	1
1	18	1
1	27	1
2	40	1
4	62	1
5	82	1
10	109	1
10	130	1
10	158	1
10	186	1
10	221	1
10	261	1
8	300	1
5	329	1
5	382	1
5	446	1
2	483	1
2	528	1
1	552	1
1	581	1
1	610	1
1	648	1
1	689	1
1	727	1
1	767	1
1	831	1
1	882	1



DCP TEST DATA

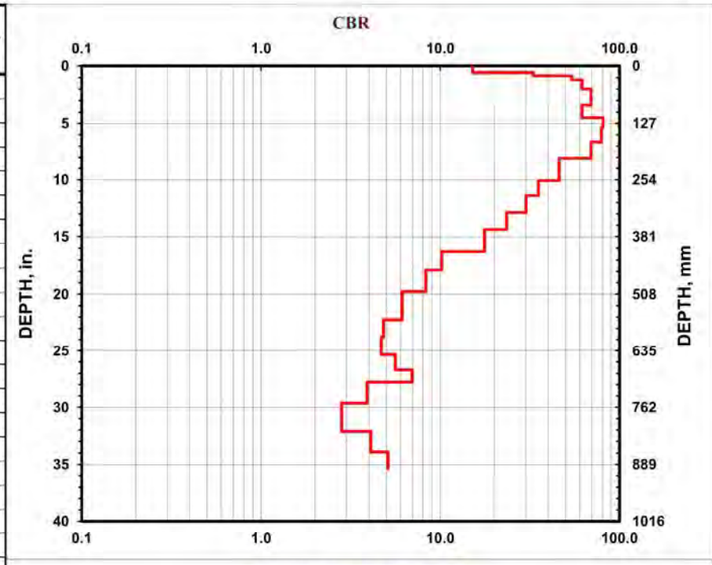
File Name: G17057

Project: *Fayetteville Rd. Widening*
Location: Y2_32+41_44LT
Date: 30-Oct-18
Soil Type(s): Brown-Tan, Sandy Clay (A-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
Start	0	1
1	14	1
1	21	1
2	30	1
5	50	1
10	86	1
7	114	1
7	136	1
10	168	1
10	204	1
10	256	1
5	289	1
5	327	1
4	365	1
4	414	1
2	454	1
2	502	1
2	565	1
1	604	1
1	644	1
1	678	1
1	706	1
1	753	1
1	706	1
1	753	1
1	816	1
1	861	1
1	898	1



DCP TEST DATA

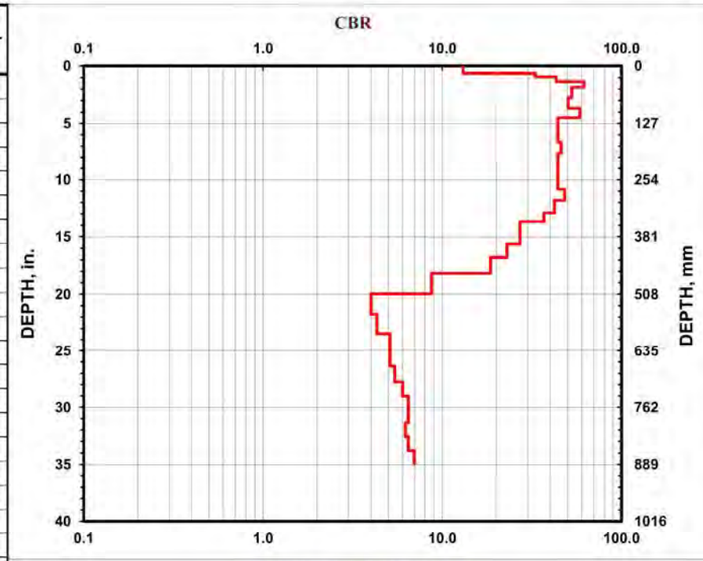
File Name: G17057

Project: *Fayetteville Rd. Widening*
Location: Y2_36+03_38LT
Date: 1-Nov-18
Soil Type(s): A-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
Start	0	1
1	16	1
1	23	1
2	34	1
3	46	1
5	69	1
5	93	1
5	114	1
5	141	1
5	168	1
5	194	1
5	221	1
5	248	1
5	275	1
5	300	1
5	328	1
3	347	1
3	372	1
3	397	1
3	426	1
3	461	1
2	507	1
1	553	1
1	596	1
1	633	1
1	670	1
1	705	1
1	737	1
1	767	1
1	797	1
1	828	1
1	858	1
1	886	1



DCP TEST DATA

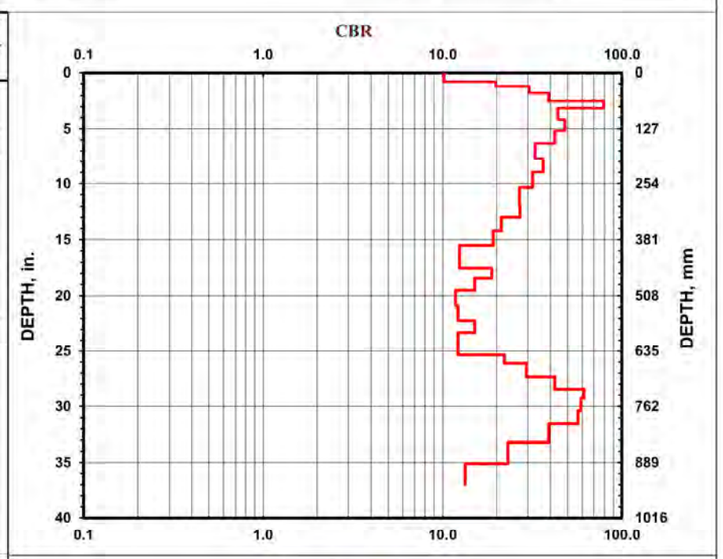
File Name: G17057

Project: *Fayetteville Rd. Widening*
Location: Y3_16+02_1LT
Date: 30-Oct-18
Soil Type(s): A-6

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
Start	0	1
1	20	1
1	31	1
2	46	1
3	64	1
5	80	1
5	107	1
5	132	1
5	160	1
5	195	1
5	227	1
5	263	1
5	305	1
3	330	1
3	361	1
3	395	1
3	445	1
2	468	1
2	496	1
2	531	1
2	565	1
2	593	1
3	644	1
2	664	1
4	695	1
5	723	1
5	743	1
7	772	1
7	802	1
7	844	1
5	892	1
3	939	1



DCP TEST DATA

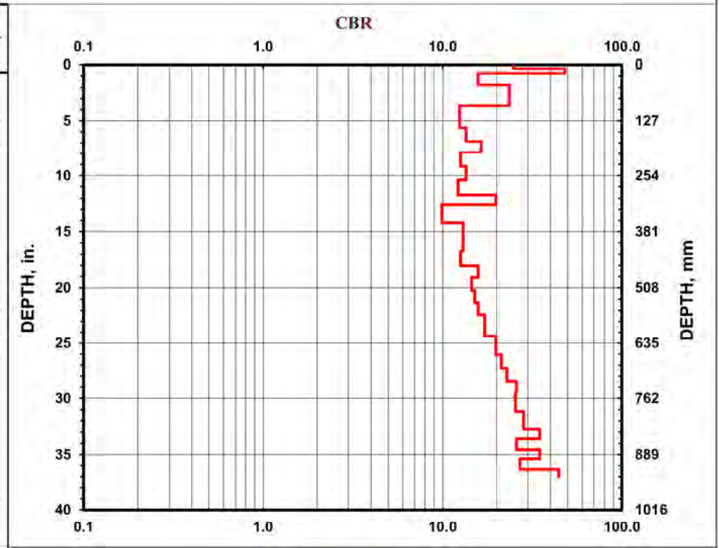
File Name: G17057

Project: *Fayetteville Rd. Widening*
Location: Y3_22+99_5LT
Date: 30-Oct-18
Soil Type(s): A-6

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
Start	0	1
1	9	1
2	19	1
2	46	1
5	93	1
3	143	1
2	174	1
2	200	1
2	233	1
2	264	1
2	298	1
2	320	1
2	361	1
2	393	1
2	425	1
2	458	1
2	485	1
2	514	1
2	542	1
2	569	1
2	594	1
2	619	1
2	641	1
2	663	1
3	694	1
3	723	1
3	749	1
5	793	1
5	833	1
3	853	1
3	879	1
3	899	1
3	924	1
3	940	1



DCP TEST DATA

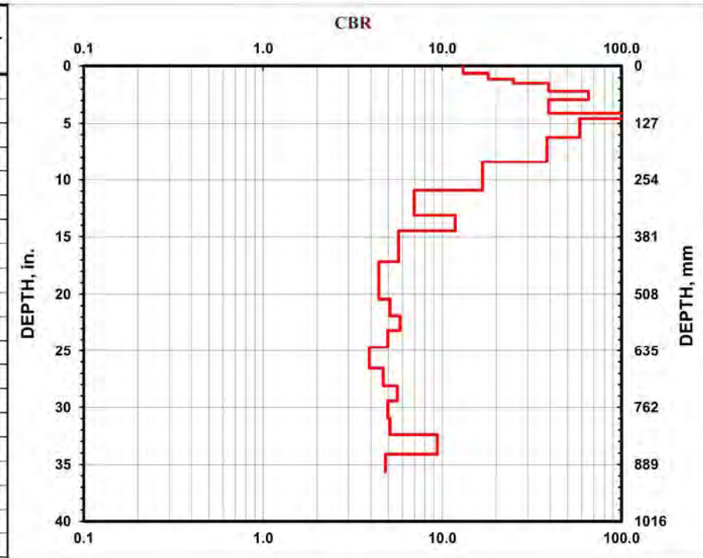
File Name: G17057.00

Project: *Fayetteville Rd Widening*
Location: Y4_13+99_5LT
Date: 11-Nov-18
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
Start	0	1
1	16	1
1	28	1
1	37	1
3	55	1
5	74	1
5	104	1
5	116	1
10	158	1
9	213	1
5	277	1
2	333	1
2	368	1
2	435	1
1	477	1
1	519	1
1	556	1
1	589	1
1	627	1
1	674	1
1	714	1
1	748	1
1	786	1
1	823	1
2	866	1
1	905	1



DCP TEST DATA

File Name: G17057.00

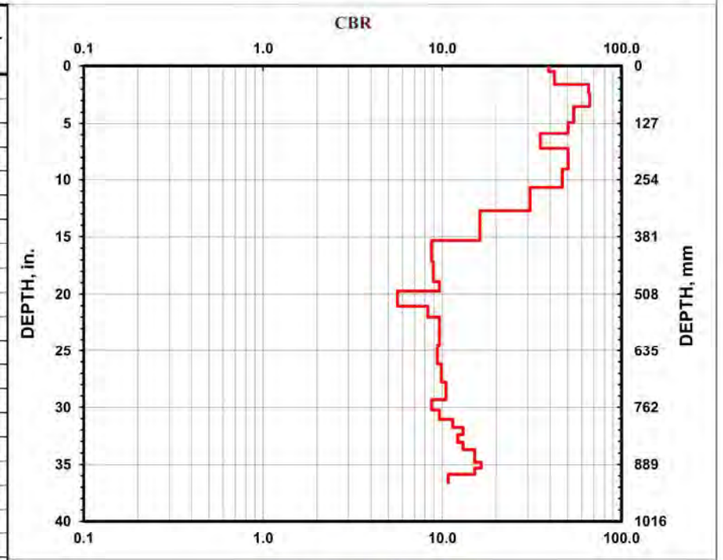
Project: *Fayetteville Rd Widening* **Date:** 11-Nov-18

Location: Y6_14+01_7LT **Soil Type(s):** A-6

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
Start	0	1
2	12	1
5	40	1
5	59	1
8	89	1
8	125	1
5	149	1
5	182	1
5	206	1
5	230	1
8	271	1
7	323	1
5	389	1
2	435	1
2	480	1
1	501	1
1	535	1
1	559	1
1	580	1
1	601	1
1	622	1
2	665	1
2	706	1
2	745	1
1	768	1
1	789	1
1	807	1
1	823	1
1	840	1
1	856	1
1	870	1
1	884	1
1	897	1
1	911	1
1	930	1



PROJECT REFERENCE NO.	SHEET NO.
U–5797	36

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

APPENDIX B
LABORATORY RESULTS

REFERENCE: U–5797

PROJECT: 44367

DS
WSH 3/5/2019
INITIALS DATE

FALCON ENGINEERING
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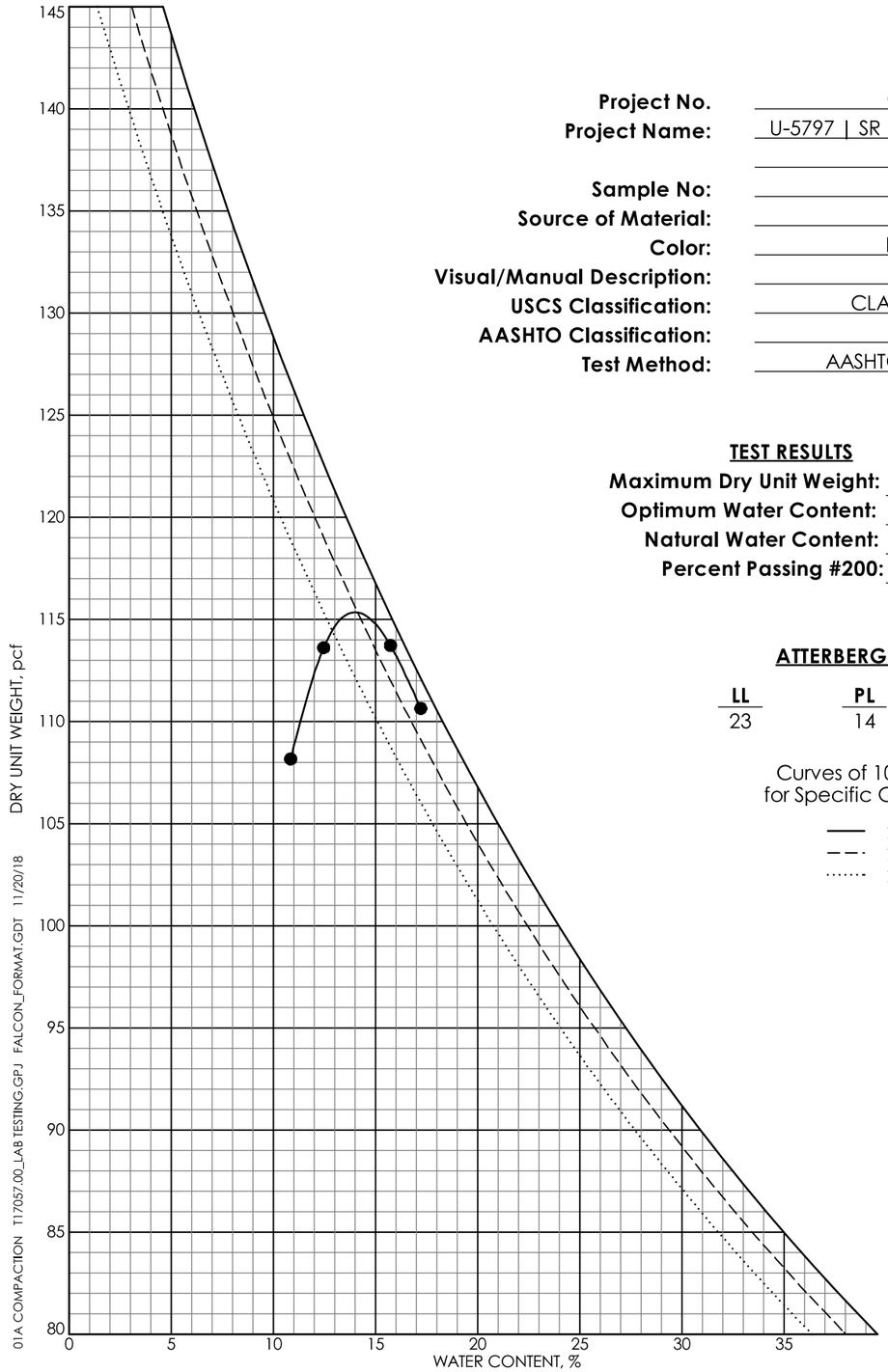
CARY, NC 27513
PHONE: 919.871.0800
www.falconengineers.com

LABORATORY COMPACTION TEST RESULTS



Project No.	G17057.00
Project Name:	U-5797 | SR 1997 Fayetteville Road Widening
Sample No:	BS-01
Source of Material:	B-05
Color:	Red Brown
Visual/Manual Description:	
USCS Classification:	CLAYEY SAND(SC)
AASHTO Classification:	A-2-4
Test Method:	AASHTO T-99 Method A

TEST RESULTS

Maximum Dry Unit Weight:	115.5 PCF
Optimum Water Content:	14.3 %
Natural Water Content:	19.1 %
Percent Passing #200:	19.7 %

ATTERBERG LIMITS

LL	PL	PI
23	14	9

Curves of 100% Saturation for Specific Gravity Equal to:

2.6
2.5
2.4

01A COMPACTION T17057.00_LAB TESTING.GPJ FALCON_FORMAT.GDT 11/20/18

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CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

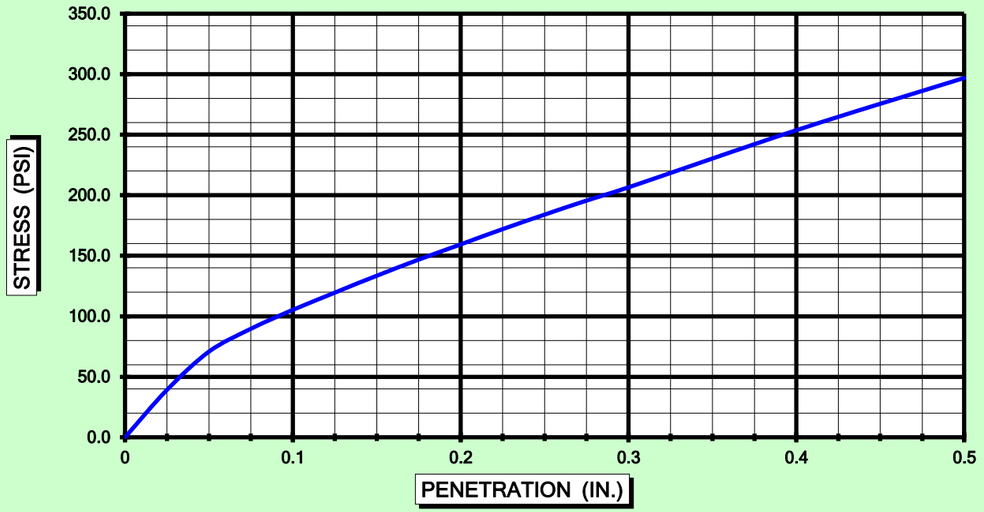
AASHTO T-193 \ ASTM D-1883

PROJECT #:	G17057.00			**DATE:**	11/20/2018
PROJECT NAME:	U-5797 | SR 1997 Fayetteville Road Widening				
BORING:	B-05	**SAMPLE:**	BS-01	**DEPTH:**	3.5-8.5
SOIL DESCRIPTION:	Red Brown Clayey Sand (A-2-4)				

COMPACTION METHOD	**AASHTO T-99A**	**SOAK**	**96 HRS.**
MAXIMUM DRY DENSITY	**115.5 PCF**	**STRAIN RATE**	**.05 IN / MIN.**
OPTIMUM MOISTURE CONTENT	**14.3%**	**LOAD CELL**	**6000**
TEST DATA		**SURCHARGE WEIGHT**	**10 lb.**
DRY DENSITY	**112.9 PCF**	**SURCHARGE PER SQUARE FOOT**	**51 lbs/sq.ft.**
MOISTURE CONTENT	**14.7%**	**FINAL MOISTURE CONTENT**	**N/A**
PERCENT COMPACTION	**97.7%**	**SWELL**	**0.04%**

	ACTUAL	CORRECTED
CBR VALUE AT .1"	**10.5**	**10.5**
CBR VALUE AT .2"	**10.6**	**10.6**

STRESS-PENETRATION CURVE



LIQUID LIMIT	**23**	**PLASTIC LIMIT**	**14**	**PLASTIC INDEX**	**9**

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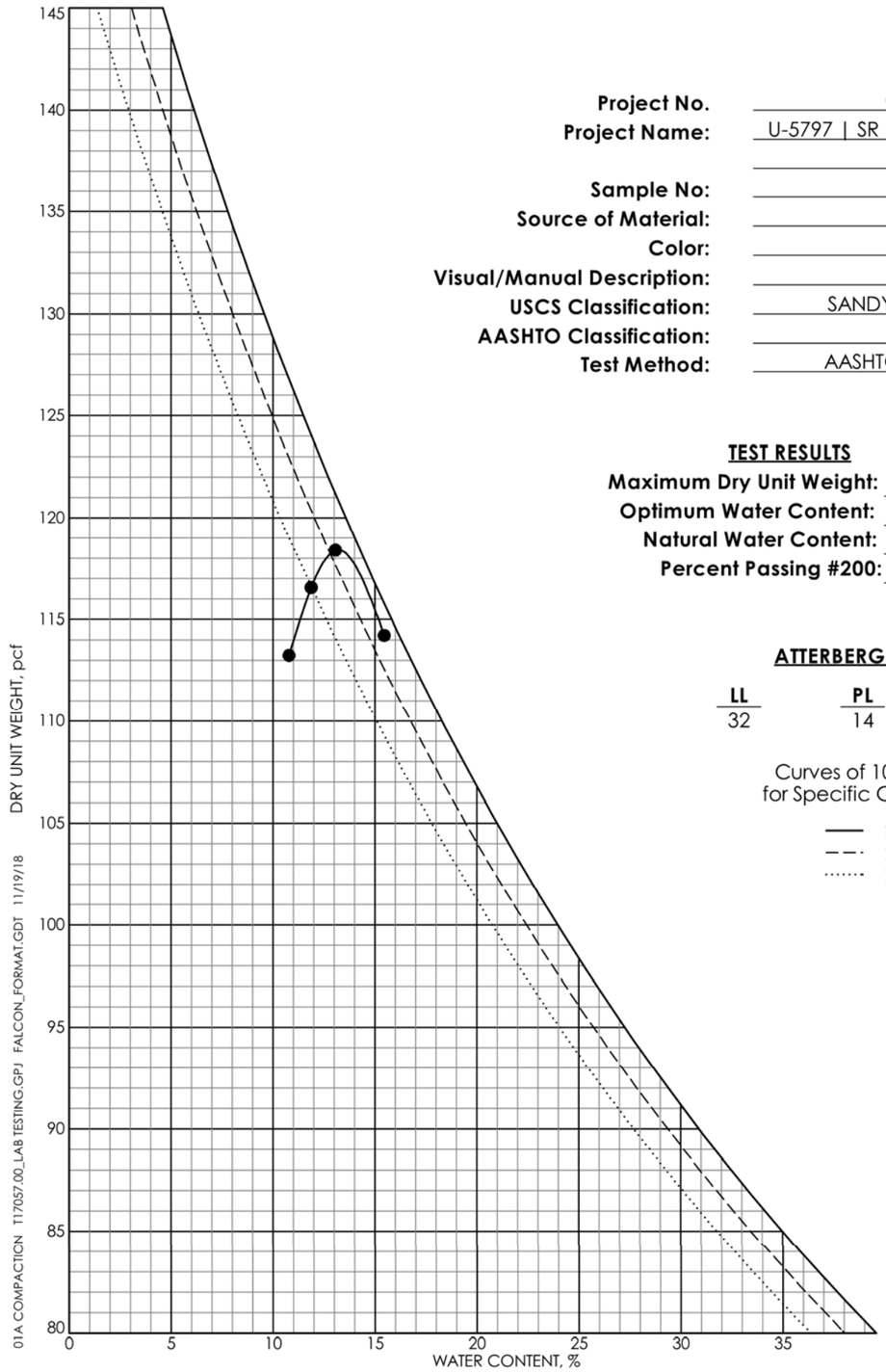
LABORATORY COMPACTION TEST RESULTS



Project No.	G17057.00
Project Name:	U-5797 | SR 1997 Fayetteville Road Widening
Sample No:	BS-02
Source of Material:	B-23
Color:	Brown
Visual/Manual Description:	
USCS Classification:	SANDY LEAN CLAY(CL)
AASHTO Classification:	A-6
Test Method:	AASHTO T-99 Method A

TEST RESULTS

Maximum Dry Unit Weight:	118.4 PCF
Optimum Water Content:	13.2 %
Natural Water Content:	18.2 %
Percent Passing #200:	52.6 %

ATTERBERG LIMITS

LL	PL	PI
32	14	18

Curves of 100% Saturation for Specific Gravity Equal to:

— 2.6
– – – 2.5
····· 2.4

FALCON ENGINEERING 1210 TRINITY RD., SUITE 110, Cary, NC 27513

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

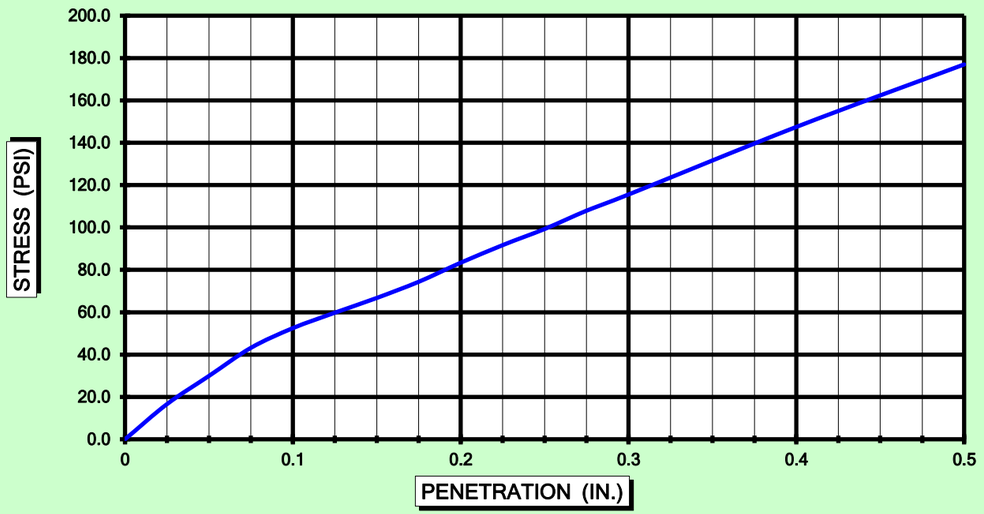
AASHTO T-193 \ ASTM D-1883

PROJECT #:	G17057.00			**DATE:**	11/20/2018
PROJECT NAME:	U-5797 | SR 1997 Fayetteville Road Widening				
BORING:	B-23	**SAMPLE:**	BS-02	**DEPTH:**	1.0-5.0
SOIL DESCRIPTION:	Brown Sandy Clay (A-6)				

COMPACTION METHOD	AASHTO T-99A	SOAK	96 HRS.
MAXIMUM DRY DENSITY	118.4 PCF	STRAIN RATE	.05 IN / MIN.
OPTIMUM MOISTURE CONTENT	13.2%	LOAD CELL	6000
TEST DATA		SURCHARGE WEIGHT	10 lb.
DRY DENSITY	116.0 PCF	SURCHARGE PER SQUARE FOOT	51 lbs/sq.ft.
MOISTURE CONTENT	13.3%	FINAL MOISTURE CONTENT	N/A
PERCENT COMPACTION	98.0%	SWELL	0.15%

	ACTUAL	CORRECTED
CBR VALUE AT .1"	5.2	5.2
CBR VALUE AT .2"	5.6	5.6

STRESS-PENETRATION CURVE



LIQUID LIMIT	32	PLASTIC LIMIT	14	PLASTIC INDEX	18

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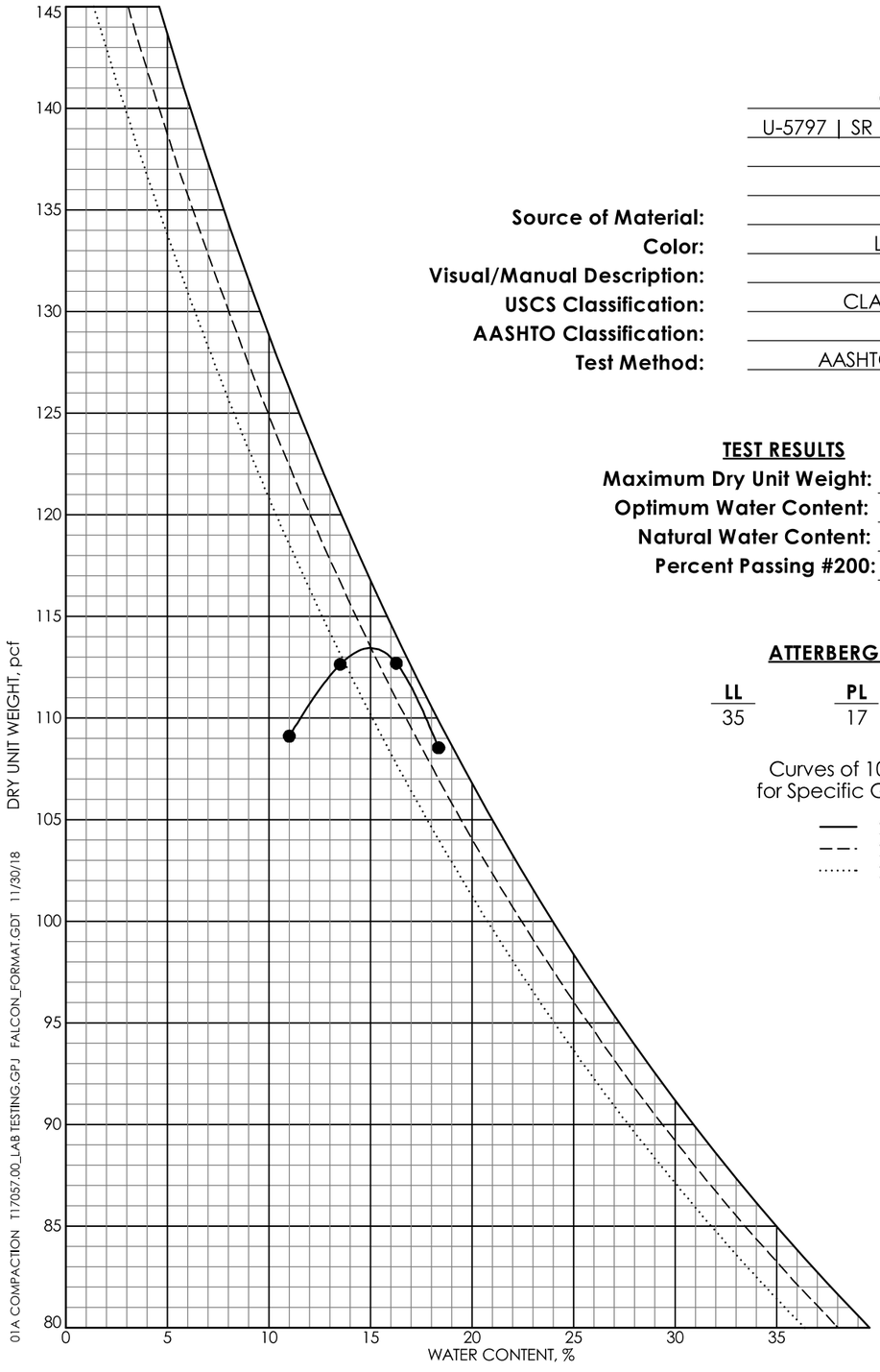
LABORATORY COMPACTION TEST RESULTS



	G17057.00
	U-5797 | SR 1997 Fayetteville Road Widening
Source of Material:	B-44
Color:	Light Brown
Visual/Manual Description:	
USCS Classification:	CLAYEY SAND(SC)
AASHTO Classification:	A-6
Test Method:	AASHTO T-99 Method A

TEST RESULTS

Maximum Dry Unit Weight:	113.5 PCF
Optimum Water Content:	15.0 %
Natural Water Content:	19.8 %
Percent Passing #200:	48.2 %

ATTERBERG LIMITS

LL	PL	PI
35	17	18

Curves of 100% Saturation for Specific Gravity Equal to:

—— 2.6
– – – 2.5
····· 2.4

01A COMPACTION T17057.00_LAB TESTING.GPJ FALCON_FORMAT.GDT 11/30/18

FALCON ENGINEERING 1210 TRINITY RD., SUITE 110, Cary, NC 27513

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

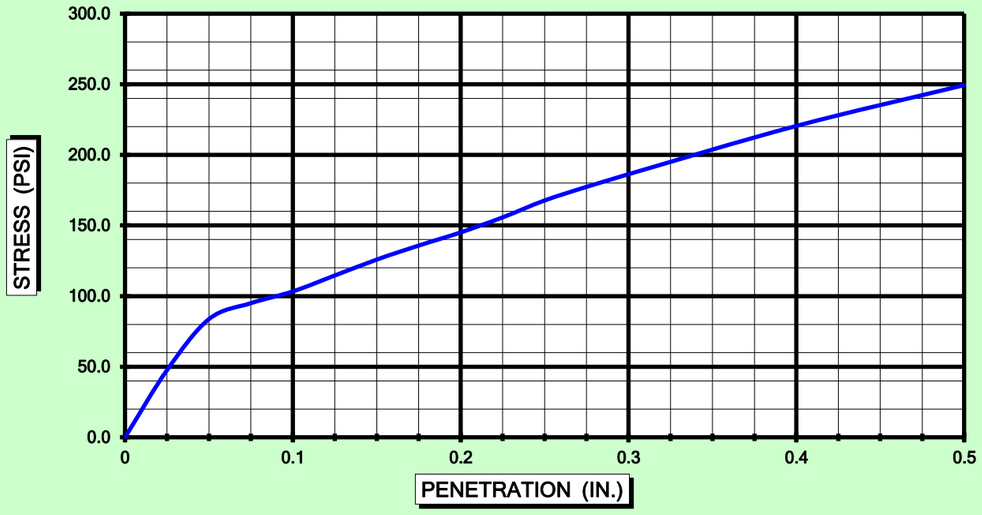
AASHTO T-193 \ ASTM D-1883

PROJECT #:	G17057.00			**DATE:**	11/21/2018
PROJECT NAME:	U-5797 | SR 1997 Fayetteville Road Widening				
BORING:	B-44	**SAMPLE:**	BS-03	**DEPTH:**	3.5-8.5
SOIL DESCRIPTION:	Light Brown Sandy Clay (A-6)				

COMPACTION METHOD	AASHTO T-99A	SOAK	96 HRS.
MAXIMUM DRY DENSITY	113.5 PCF	STRAIN RATE	.05 IN / MIN.
OPTIMUM MOISTURE CONTENT	15.0%	LOAD CELL	6000
TEST DATA		SURCHARGE WEIGHT	10 lb.
DRY DENSITY	112.1 PCF	SURCHARGE PER SQUARE FOOT	51 lbs/sq.ft.
MOISTURE CONTENT	14.4%	FINAL MOISTURE CONTENT	N/A
PERCENT COMPACTION	98.8%	SWELL	0.15%

	ACTUAL	CORRECTED
CBR VALUE AT .1"	10.3	10.3
CBR VALUE AT .2"	9.7	9.7

STRESS-PENETRATION CURVE



LIQUID LIMIT	35	PLASTIC LIMIT	17	PLASTIC INDEX	18