REFERENCE: B-5833

PROJECT: 45786

SEE SHEET 3 FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5833	1	12

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

ROADWAY SUBSURFACE INVESTIGATION

COUNTY *YADKIN*

PROJECT DESCRIPTION *BRIDGE NO. 29 ON US 21 BUSINESS OVER I-77*

INVENTORY

CONTENTS

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

J.K. STICKNEY

C.L. SMITH

B.E. FOSTER

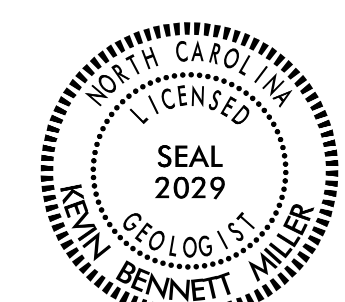
INVESTIGATED BY *J.E. BEVERLY*

DRAWN BY *J.E. BEVERLY*

CHECKED BY *C.R. LAVENDER III*

SUBMITTED BY *K.B. MILLER*

DATE *AUGUST 2020*



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SIGNATURE 8/11/2020 DATE

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PROJECT REFERENCE NO.	SHEET NO.
B-5833	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
- [ ] CME-55
- [X] 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
- [ ] 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: ELEVATIONS TAKEN FROM TIN FILE "B5833 LS TIN.TIN"
DATED 10-17-19
ELEVATION: FEET

NOTES:

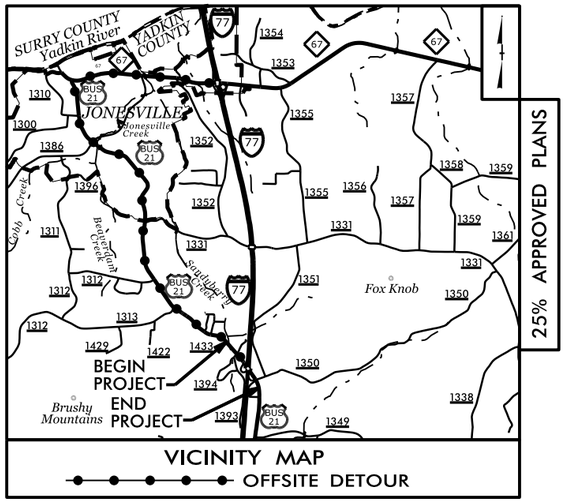
DATE: 8-15-14

09/08/99

TIP PROJECT: B-5833

CONTRACT:

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Plan Symbols
See Sheet RW01 thru RW04 For Survey Control & Right-of-Way Sheets



VICINITY MAP
OFFSITE DETOUR

25% APPROVED PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

YADKIN COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5833	3	12

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
45786.1.1	NHP-0021(023)	PE

LOCATION: REPLACE BRIDGE NO. 29 OVER I-77 ON US 21 BUS

TYPE OF WORK: GRADING, DRAINAGE, PAVING, RETAINING WALLS, AND STRUCTURE

NAD 83/
NA 2011

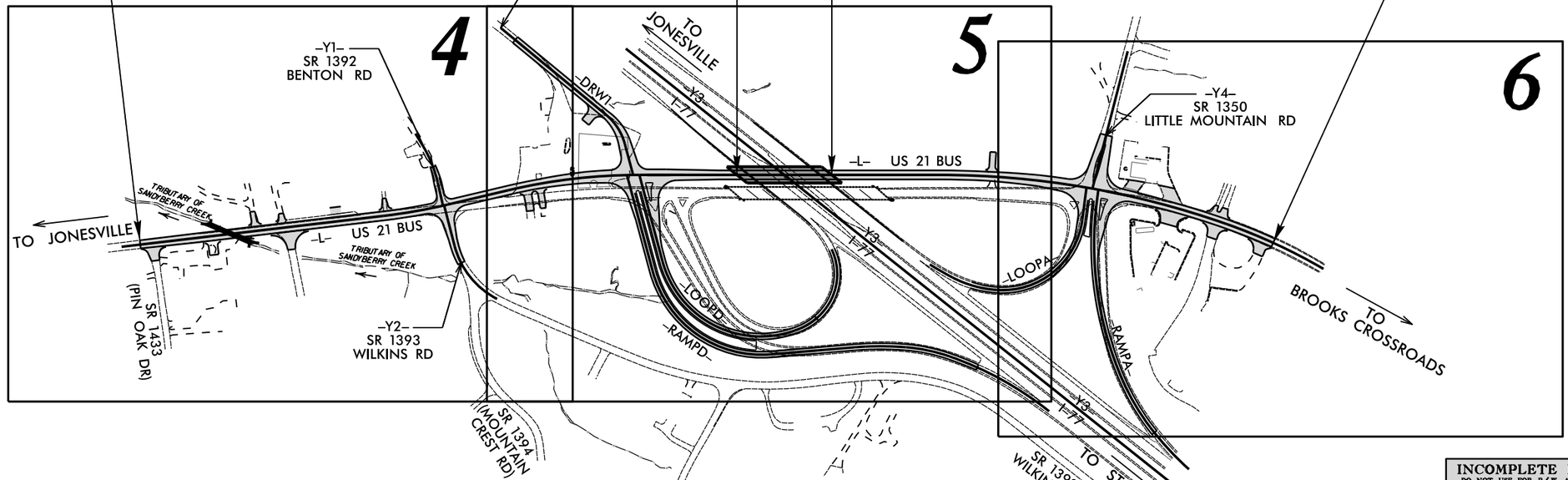
BEGIN BRIDGE
-L- STA. 26+50 +/-

END BRIDGE
-L- STA. 29+03 +/-

BEGIN TIP PROJECT B-5833
-L- STA. 10+50.00

BEGIN CONSTRUCTION
-DRW1- STA. 10+00.00

END TIP PROJECT B-5833
-L- STA. 41+00.00



CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD _____.
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

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

GRAPHIC SCALES

PLANS 50 25 0 50 100
PROFILE (HORIZONTAL) 50 25 0 50 100
PROFILE (VERTICAL) 10 5 0 10 20

DESIGN DATA

ADT 2021 = 4100
ADT 2041 = 4550
K = 11 %
D = 65 %
T = 5 % *
V = 50 MPH
* (TTST 1% + DUAL 4%)
FUNC CLASS= MAJOR COLLECTOR
STATEWIDE TIER DESIGN

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-5833	=	*0.530 mile*
LENGTH STRUCTURES TIP PROJECT B-5833	=	*0.048 mile*
TOTAL LENGTH TIP PROJECT B-5833	=	*0.578 mile*

Prepared For:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

TGS ENGINEERS
TGS ENGINEERS
706 HILLSBOROUGH ST.
SUITE 200
RALEIGH, NC 27603

By:
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
OCTOBER 16, 2020

LETTING DATE:
OCTOBER 19, 2021

V. MARCUS LOWERY, P.E.
PROJECT ENGINEER

DAVID STUTTS, P.E.
NCDOT CONTACT

HYDRAULICS ENGINEER

SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

SIGNATURE: *P.E.*

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J. ERIC BOYETTE
SECRETARY

July 28, 2020

WBS NO: 45786.1.2
TIP NO: B-5833
COUNTY: Yadkin

DESCRIPTION: Bridge No. 29 on US 21 Business over I-77

SUBJECT: Geotechnical Inventory Report

Project Description

This report presents findings for the proposed roadway revisions associated with the relocation of Bridge No. 29. The newly proposed structure will be on new location to the North of the existing bridge over I-77. Shifting the new bridge to the North requires a portion of the roadway to be on new location. In addition to the newly proposed bridge there will be widening and drainage improvements, two retaining walls, a culvert, and ramp and loop improvements at the I-77 interchange. The roadway project trends west to east along US Business 21 and lies in the northwest quadrant of Yadkin County. Beginning and ending station limits along -L- are between 10+50 – 41+00. Total length of project is 0.58 miles.

The geotechnical field investigation was conducted during the month of June 2020. An ATV mounted CME 550X drill machine equipped with automatic drop hammer was utilized to perform 6 test borings along the proposed corridor. An abundance of utilities hampered drilling in many locations. The following survey lines are addressed in this report.

Line	Station
-L-	10+50 – 41+00
Ramp A	10+00 – 15+80.4
Ramp D	10+00 – 22+38.9

Physiography and Geography

The project area lies in northwestern Yadkin County along the US Business 21 highway corridor, between the cities of Jonesville and Brooks Crossroads. Topography is flat to rolling and traverses along open fields, residential structures, and businesses adjacent to I-77. Elevation ranges from approximately 1,065 to 1,130 feet.

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT
1589 MAIL SERVICE CENTER
RALEIGH NC 27699-1589

Telephone: 919-707-6850
Fax: 919-250-4237
Customer Service: 1-877-368-4968

Website: www.ncdot.gov

Location:
CENTURY CENTER COMPLEX
ENTRANCE B-2
1020 BIRCH RIDGE DRIVE
RALEIGH NC

Geologically, the project area falls within the Inner Piedmont Belt and is underlain by Cambrian to Ordovician age rock types (C-Cg) comprised of metamorphosed granite.

Soil Properties

1. Residual Soils:

These soils are derived from in place weathering of parent materials. They occur in a variety of consistencies, classifications, and stratigraphic sequences. Residual soils are further subdivided into clays, silts, and sands. In most instances residual soils in this area are micaceous with mica amounts ranging from trace to highly.

Predominant residual soils encountered were clayey sandy silt (A-4), clayey silty sand (A-2-4), and silty sandy clay (A-7-5, A-6). Generally residual soils seem to contain high percentages of sand with fair to good consistency and denseness. Plasticity index for clay soils range from 12 to 26.

2. Alluvial Soils:

Alluvial soils originate from water transportation and deposition in a floodplain environment. The potential for alluvial soils along the project is confined to the tributary of Sandyberry Creek which crosses US Business 21, and Wilkins Rd. (-Y2-). The creek terminates into a drainage feature at Ramp D and Loop D. No alluvial samples were taken; however, soil type is anticipated to be loose clayey silty or silty clayey sand.

3. Roadway Embankment:

Roadway embankment fill soils are present beneath existing US Business 21 and its connectors. Roadway embankment soils will be close in composition to the local residual soil it was sourced from.

Rock Properties

Crystalline rock and weathered crystalline rock were not encountered during the course of this investigation.

Areas of Special Geotechnical Interest

1. Groundwater:

There were two instances in which groundwater was encountered during this investigation. Static groundwater was encountered along Ramp D at 2.4 and 6.5 feet. The area between Ramp D stations 12+00 and 14+00 where groundwater was noted corresponds to a drainage basin for the project interchange. Groundwater in this location will be well below proposed grade.

2. Alluvial Soils:

The proposed culvert around -L- station 12+90 will encounter some alluvial soils associated with Sandberry Creek. This small area of alluvial soils should have little impact on road improvements in this location. A separate culvert report will further address this area.

The drainage basin between Ramp D stations 11+00 and 16+00, and Loop D stations 12+00 to 14+00 have the potential for some loose wet silty sandy soils. Drainage improvements installed in the fill beneath the roadway should mitigate any major impact. Maximum fill height at Loop D is approximately 15 feet. Max fill height at Ramp D is approximately 40 feet.

Bridge and Retaining Walls

There is a proposed bridge replacement between -L- stations 26+50.45 and 29+02.51. The new bridge will be relocated to the north of the existing structure. Preliminary data for the new bridge design has yet to be released. The structure will be accompanied by two proposed retaining walls at each end of the bridge. The bridge and walls will be addressed under a separate report once the PGD becomes available.

Respectfully Submitted,

DocuSigned by:
J. Eddie Beverly
8BF22D1890734D0...

Eddie Beverly
Project Geologic Engineer

PROJECT REFERENCE NO.	SHEET NO.
B-5833	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

TGS ENGINEERS
706 HILLSBOROUGH ST, SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

NAD 83
NA 2011

8/17/99

REVISIONS

-L-

PI Sta 17+87.66
△ = 6° 34' 02.4" (LT)
D = 3° 47' 39.9"
L = 173.08'
T = 86.63'
R = 1,510.00'
SE = 0.05
Lr = 125'

PI Sta 22+16.73
△ = 13° 17' 34.0" (RT)
D = 3° 47' 39.9"
L = 350.32'
T = 175.95'
R = 1,510.00'
SE = 0.05
Lr = 125'

-Y1-

PI Sta 10+91.08
△ = 18° 34' 00.5" (RT)
D = 17° 37' 46.1"
L = 105.32'
T = 53.12'
R = 325.00'

-Y2-

PI Sta 12+09.78
△ = 48° 13' 26.2" (LT)
D = 25° 48' 32.1"
L = 186.85'
T = 99.36'
R = 222.00'

BEGIN TIP PROJECT B-5833
-L- POT Sta. 10+50.00

-L- POT Sta. 10+00.00

-L- PC Sta. 17+01.03

BEGIN CONSTRUCTION
-Y1- POC 11+00.00

-Y1- POT Sta. 10+00.00
S 24° 11' 15.5" W
-Y1- PC Sta. 10+37.96
-Y1- PT Sta. 11+43.27

-L- POC Sta. 18+61.28=
-Y1- POT Sta. 12+06.74
-L- POC Sta. 18+64.39=
-Y2- POT Sta. 10+00.00
-L- PT Sta. 18+74.11

-Y2- PC Sta. 11+10.42

END CONSTRUCTION
-Y2- POC 11+60.00

-Y2- PT Sta. 12+97.27

MATCHLINE -L- STA 21+00.00
SEE SHEET 05

S 42° 45' 15.6" W

S 41° 43' 56.5" E

S 41° 09' 54" E

S 41° 03' 48.1" W

BY1-27
BY1-26
BY2-20
BL-3
BL-4

PROP. BOX CULVERT

ALLUVIAL

TO DEAD END
TO JONESVILLE
US HWY 21
WILKINS RD SR 1393
MOUNT AIRY CREST RD SR 1394
PIN OAK RD SR 1433

SEE SHEET 2B-1
FOR INTERSECTION DETAILS

SEE SHEET 07 FOR -L- PROFILE
SEE SHEET 08 FOR -Y1- & -Y2- PROFILES

DRIVE RADII ARE 10' UNLESS OTHERWISE NOTED
CHANNELIZATION RADII ARE 3' UNLESS OTHERWISE NOTED
RADII DIMENSIONS ARE TO FACE OF CURB (F/C) UNLESS OTHERWISE NOTED

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PROJECT REFERENCE NO.	SHEET NO.
B-5833	5

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

TGS ENGINEERS
TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

8/17/99

REVISIONS

-DRW1- POT Sta. 10+00.00
BEGIN CONSTRUCTION

-L-

PI Sta 22+16.73	PI Sta 35+80.40
Δ = 13° 17' 34.0" (RT)	Δ = 19° 22' 00.5" (RT)
D = 3° 47' 39.9"	D = 2° 29' 28.0"
L = 350.32'	L = 777.43'
T = 175.95'	T = 392.46'
R = 1,510.00'	R = 2,300.00'
SE = 0.05	SE = 0.04
Lr = 125'	Lr = 100'

-DRW1-

PI Sta 14+11.25
Δ = 35° 30' 50.8" (RT)
D = 38° 11' 49.9"
L = 92.98'
T = 48.04'
R = 150.00'
SE = 0.04

-Y3- POT Sta. 10+00.00

① = -L- POC Sta. 23+58.07 = -RAMPD- POT Sta. 10+00.00
② = -L- POC Sta. 23+74.56 = -DRW1- POT Sta. 15+41.78
③ = -L- PT Sta. 23+91.10 = -LOOPD- POT Sta. 10+00.00

-RAMPD-

PI Sta 15+14.80	PI Sta 19+19.36	PI Sta 19+87.87	PI Sta 21+00.74
Δ = 79° 48' 27.8" (LT)	Δ = 2° 11' 19.2" (RT)	Δ = 7° 10' 02.0" (RT)	Δ = 14° 39' 00.9" (RT)
D = 19° 05' 54.9"	D = 7° 09' 43.1"	D = 6° 44' 26.4"	D = 12° 19' 18.0"
L = 417.87'	L = 30.56'	L = 106.33'	L = 118.90'
T = 250.87'	T = 15.28'	T = 53.23'	T = 59.78'
R = 300.00'	R = 800.00'	R = 850.00'	R = 465.00'
SE = 0.08			
(MATCH EXIST)			

PI Sta 23+13.12
Δ = 19° 19' 38.4" (RT)
D = 6° 21' 58.3"
L = 303.59'
T = 153.25'
R = 900.00'

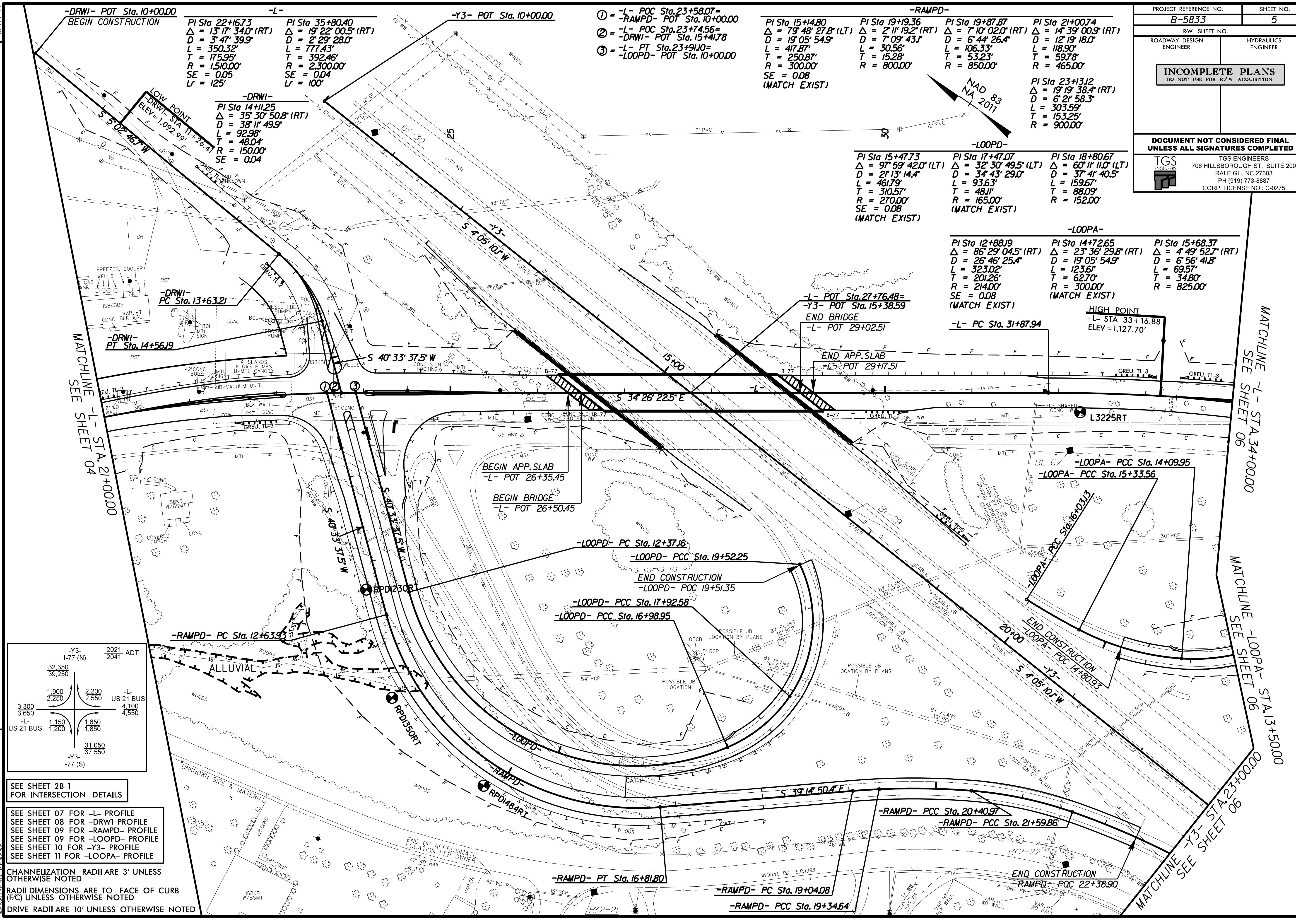
NAD 83 NA 2011

-LOOPD-

PI Sta 15+47.73	PI Sta 17+47.07	PI Sta 18+80.67
Δ = 97° 59' 42.0" (LT)	Δ = 32° 30' 49.5" (LT)	Δ = 60° 11' 11.0" (LT)
D = 21° 13' 14.4"	D = 34° 43' 29.0"	D = 37° 41' 40.5"
L = 461.79'	L = 93.63'	L = 159.67'
T = 310.57'	T = 48.11'	T = 88.09'
R = 270.00'	R = 165.00'	R = 152.00'
SE = 0.08	(MATCH EXIST)	(MATCH EXIST)
(MATCH EXIST)		

-LOOPA-

PI Sta 12+88.19	PI Sta 14+72.65	PI Sta 15+68.37
Δ = 86° 29' 04.5" (RT)	Δ = 23° 36' 29.8" (RT)	Δ = 4° 49' 52.7" (RT)
D = 26° 46' 25.4"	D = 19° 05' 54.9"	D = 6° 56' 41.8"
L = 323.02'	L = 123.61'	L = 69.57'
T = 201.26'	T = 62.70'	T = 34.80'
R = 214.00'	R = 300.00'	R = 825.00'
SE = 0.08	(MATCH EXIST)	
(MATCH EXIST)		



-Y3- I-77 (N)	2021 / 2041 ADT
32,350 / 39,250	

3,300 / 3,650 -L- US 21 BUS	1,900 / 2,250	2,200 / 2,550	-L- US 21 BUS 4,100 / 4,550
	1,150 / 1,200	1,650 / 1,850	

31,050 / 37,550
-Y3- I-77 (S)

SEE SHEET 2B-1 FOR INTERSECTION DETAILS

SEE SHEET 07 FOR -L- PROFILE
SEE SHEET 08 FOR -DRW1 PROFILE
SEE SHEET 09 FOR -RAMPD- PROFILE
SEE SHEET 09 FOR -LOOPD- PROFILE
SEE SHEET 10 FOR -Y3- PROFILE
SEE SHEET 11 FOR -LOOPA- PROFILE

CHANNELIZATION RADII ARE 3' UNLESS OTHERWISE NOTED

RADII DIMENSIONS ARE TO FACE OF CURB (F/C) UNLESS OTHERWISE NOTED

DRIVE RADII ARE 10' UNLESS OTHERWISE NOTED

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8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-5833	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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TGS ENGINEERS
706 HILLSBOROUGH ST, SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

NAD 83
NA 2011

① = -L- POC Sta. 35+81.31=
-LOOPA- POT Sta. 10+00.00
② = -L- POC Sta. 35+97.31=
-Y4- POT Sta. 13+76.70
③ = -L- POC Sta. 36+13.35=
-RAMPA- POT Sta. 10+00.00
④ = -RAMPA- PC Sta. 10+29.17

-L-

PI Sta 35+80.40	PI Sta 41+08.44
Δ = 19° 22' 00.5" (RT)	Δ = 10° 53' 48.1" (RT)
D = 2° 29' 28.0"	D = 3° 49' 11.0"
L = 777.43'	L = 285.27'
T = 392.46'	T = 143.07'
R = 2,300.00'	R = 1,500.00'
SE = 0.04	SE = EXIST.
Lr = 100'	

-RAMPA-

PI Sta 12+79.27	PI Sta 15+90.37	PI Sta 17+39.05
Δ = 31° 03' 34.4" (LT)	Δ = 13° 37' 04.8" (LT)	Δ = 10° 51' 43.1" (LT)
D = 6° 21' 58.3"	D = 9° 19' 53.6"	D = 7° 09' 43.1"
L = 487.88'	L = 145.93'	L = 151.66'
T = 250.10'	T = 73.31'	T = 76.06'
R = 900.00'	R = 614.00'	R = 800.00'
SE = 0.06 (MATCH EXIST)	(MATCH EXIST)	(MATCH EXIST)

-LOOPA-

PI Sta 12+88.19
Δ = 86° 29' 04.5" (RT)
D = 26° 46' 25.4"
L = 323.02'
T = 201.26'
R = 214.00'
SE = 0.08
(MATCH EXIST)

-Y4-
SR 1350
LITTLE MOUNTAIN RD

4,100 / 4,550	850 / 1,050	3,900 / 4,350
	550 / 600	350 / 400

-L-
US 21 BUS

2021 / 2041 ADT

-Y3-
I-77 (N)

2021 / 2041 ADT

3,300 / 3,650	32,350 / 39,250	-L- US 21 BUS 4,100 / 4,550
	1,900 / 2,250	2,200 / 2,550
-L- US 21 BUS	1,150 / 1,200	1,650 / 1,850
	31,050 / 37,550	

-Y3-
I-77 (S)

SEE SHEET 2B-1
FOR INTERSECTION DETAILS

SEE SHEETS 07 & 08 FOR -L- PROFILE
SEE SHEET 10 FOR -Y3- PROFILE
SEE SHEET 10 FOR -Y4- PROFILE
SEE SHEET 11 FOR -LOOPA- PROFILE
SEE SHEET 11 FOR -RAMPA- PROFILE

DRIVE RADII ARE 10' UNLESS OTHERWISE NOTED
CHANNELIZATION RADII ARE 3' UNLESS OTHERWISE NOTED
RADII DIMENSIONS ARE TO FACE OF CURB (F/C) UNLESS OTHERWISE NOTED

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6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-5833	7

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

1140 1130 1120 1110 1100

L3425RT
34+25
35' RT

0.040 0.040 2:1 6:1 6:1

RESIDUAL -
RED-ORANGE, MOIST, STIFF, SILTY SANDY CLAY (A-7-5), SOME MICA

BT

34+00.00

0.040 0.040 2:1 6:1 6:1

RESIDUAL -
RED-ORANGE, MOIST, STIFF, SILTY SANDY CLAY (A-7-5), SOME MICA

33+50.00

0.040 0.040 2:1 6:1 6:1

RESIDUAL -
RED-ORANGE, MOIST, STIFF, SILTY SANDY CLAY (A-7-5), SOME MICA

33+00.00

SS-2
SS-3

L3225RT
32+25
22' RT

0.040 0.040 2:1 6:1 6:1

RESIDUAL -
RED-ORANGE, MOIST, STIFF, SILTY SANDY CLAY (A-7-5), SOME MICA

TAN-GRAY-WHITE, MOIST, MEDIUM STIFF, CLAYEY SANDY SILT (A-4)

BT

32+50.00

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0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-5833	8

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

1140 1130 1120 1110 1100

– LOOPA –
STA 11+59.65

SS-1
RPA II68RT
II+68
30' RT

0.057 0.057 0.060 0.063

6:1 6:1 4:1 4.3:1

⑦ RESIDUAL - RED-ORANGE, MOIST, MEDIUM STIFF, SILTY SANDY CLAY (A-7-5), SOME MICA
⑥ BT

11+50.00

– LOOPA –
STA 11+04.30

0.038 0.038 0.034 0.036

5.4:1 5.7:1 6.3:1

RESIDUAL - RED-ORANGE, MOIST, MEDIUM STIFF, SILTY SANDY CLAY (A-7-5), SOME MICA

11+00.00

– LOOPA –
STA 10+52.30

0.019 0.019 0.019 0.010 0.010

6:1 6:1 6:1

RESIDUAL - RED-ORANGE, MOIST, MEDIUM STIFF, SILTY SANDY CLAY (A-7-5), SOME MICA

10+50.00

– LOOPA –
STA 10+16.33

SHEAR LINE SHEAR LINE

0.005 0.005 0.004

10+14.77

BEGIN CONSTRUCTION B-5833 –RAMPA– STA 10+14.77

–RAMPA–

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-5833	9

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

1130 1120 1110 1100 1090 1080 1070

– LOOPD –
STA 12+41.80

4:1 0.052 0.052 0.050 0.050 2:1

SS–4
SS–5
SS–6
RPDI230RT
12+30
15' RT

06/20

BT

12+50.00

Ⓐ RESIDUAL - RED-ORANGE, MOIST, STIFF, CLAYEY SANDY SILT (A-4), SOME MICA
Ⓑ TAN-ORANGE-GRAY, MOIST, MEDIUM STIFF, SILTY SANDY CLAY (A-6)
Ⓒ TAN-BROWN, MOIST, MEDIUM STIFF, SANDY SILT (A-4), SOME MICA

– LOOPD –
STA 11+91.80

4:1 0.031 0.031 0.030 0.030 2:1

RESIDUAL -

RED-ORANGE-GRAY, MOIST, STIFF, CLAYEY SANDY SILT,
AND MEDIUM STIFF SILTY SANDY CLAY, SOME MICA

12+00.00

-RAMPD-

27-JUL-2020 10:48
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6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-5833	10

– LOOPD –
STA 13+75.45

0.080 0.080 0.080 0.080

4:1

2:1

RESIDUAL - TAN-ORANGE-GRAY, MOIST, MEDIUM STIFF, SILTY SANDY CLAY

TAN-GRAY-WHITE, MOIST TO DRY, LOOSE TO MEDIUM DENSE, SILTY SAND (A-2-4), HIGHLY MICACEOUS

14+00.00

– LOOPD –
STA 13+31.88

0.081 0.081 0.080 0.080

4:1

2:1

RESIDUAL - TAN-ORANGE-GRAY, MOIST, MEDIUM STIFF, SILTY SANDY CLAY

TAN-GRAY-WHITE, MOIST TO DRY, LOOSE TO MEDIUM DENSE, SILTY SAND (A-2-4), HIGHLY MICACEOUS

DRAINAGE

13+50.00

SS-7
SS-8
RPDI350RT
13+50
32' RT

RESIDUAL - TAN-ORANGE-GRAY, MOIST, MEDIUM STIFF, SILTY SANDY CLAY (A-6)

06/20

8
5
3
24
17

TAN-GRAY-WHITE, MOIST TO DRY, LOOSE TO MEDIUM DENSE, SILTY SAND (A-2-4), HIGHLY MICACEOUS

BT

– LOOPD –
STA 12+87.83

0.071 0.070 0.070 0.070

4:1

2:1

RESIDUAL - TAN-ORANGE-GRAY, MOIST, MEDIUM STIFF, SILTY SANDY CLAY

TAN-GRAY-WHITE, MOIST TO DRY, LOOSE TO MEDIUM DENSE, SILTY SAND (A-2-4), HIGHLY MICACEOUS

13+00.00

–RAMPD–

27-JUL-2020 10:52
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$$$$USERNAME$$$$

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-5833	11

– LOOPD –
STA 15+45.91

4:1 0.080 0.080 0.080 0.080 2:1

RESIDUAL - RED-ORANGE, MOIST, STIFF, SILTY SANDY CLAY (A-7-5), SOME MICA

16+00.00

– LOOPD –
STA 15+03.74

4:1 0.080 0.080 0.080 0.080 2:1

RESIDUAL - RED-ORANGE, MOIST, STIFF, SILTY SANDY CLAY (A-7-5), SOME MICA

15+50.00

– LOOPD –
STA 14+61.32

4:1 0.080 0.080 0.080 0.080

RPDI484RT
14+84
27' RT

2:1

RESIDUAL - RED-ORANGE, MOIST, (19) STIFF, SILTY SANDY CLAY (A-7-5), SOME MICA

15+00.00

TAN-GRAY-WHITE, MOIST, MEDIUM (15) DENSE, SILTY SAND (A-2-4)

BT

– LOOPD –
STA 14+18.58

4:1 0.080 0.080 0.080 0.080 2:1

RESIDUAL - RED-ORANGE, MOIST, STIFF, SILTY SANDY CLAY (A-7-5), SOME MICA

14+50.00

-RAMPD-

27-JUL-2020 10:55
\\RDU-Harrisburg Investigation\TIP\B5833_GEO_RDWY_YADKIN\CADD_GEOTECH\xsc\B5833_GEO_xpl_RAMPD.dgn
$$$$USERNAME$$$$

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
MATERIALS & TESTS UNIT
SOILS LABORATORY

T. I. P. No. B-5833

REPORT ON SAMPLES OF SOILS FOR QUALITY

Project 45786.1.1 **County** YADKIN **Owner**

Date: Sampled 6/2/20 **Received** 7/6/20 **Reported** 7/7/20

Sampled from ROADWAY **By** K B MILLER

Submitted by J L PILIPCHUK 2012 **Standard Specifications**

813091 TO 813098
7/27/20

TEST RESULTS

Proj. Sample No.		SS-1	SS-2	SS-3	SS-4	SS-5	SS-6
Lab. Sample No.		813091	813092	813093	813094	813095	813096
Retained #4 Sieve	%	-	-	-	1	-	-
Passing #10 Sieve	%	98	100	100	98	99	100
Passing #40 Sieve	%	88	97	90	88	86	98
Passing #200 Sieve	%	60	67	36	54	48	52

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	17.7	8.8	24.1	19.1	24.7	8.4
Fine Sand Ret - #270	%	26.3	30.3	47.2	32.5	31.5	51.4
Silt 0.05 - 0.005 mm	%	23.9	16.7	18.7	26.3	17.7	32.1
Clay < 0.005 mm	%	32.1	44.2	10.0	22.1	26.1	8.0
Passing #40 Sieve	%	-	-	-	-	-	-
Passing #200 Sieve	%	-	-	-	-	-	-

L. L.		42	58			31	
P. I.		12	26	NP	NP	13	NP
AASHTO Classification		A-7-5(6)	A-7-5(18)	A-4(0)	A-4(0)	A-6(3)	A-4(0)
Station		11+68	32+25	32+25	12+30	12+30	12+30
Offset		30' RT	22' RT	22' RT	15' RT	15' RT	15' RT
Alignment		RP-A	-L-	-L-	RP-D	RP-D	RP-D
Location							
Depth (Ft)		4.20	4.40	9.40	0.00	4.80	9.80
	to	5.20	5.40	10.40	1.50	5.80	10.80

cc: K B MILLER

Soils Engineer

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
MATERIALS & TESTS UNIT
SOILS LABORATORY

T. I. P. No. B-5833

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Submitted by J L PILIPCHUK 2012 **Standard Specifications**

813091 TO 813098
7/27/20

TEST RESULTS

Proj. Sample No.		SS-7	SS-8				
Lab. Sample No.		813097	813098				
Retained #4 Sieve	%	4	-				
Passing #10 Sieve	%	91	98				
Passing #40 Sieve	%	70	67				
Passing #200 Sieve	%	33	27				

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	35.7	46.0				
Fine Sand Ret - #270	%	34.7	31.9				
Silt 0.05 - 0.005 mm	%	21.5	16.1				
Clay < 0.005 mm	%	8.0	6.0				
Passing #40 Sieve	%	-	-				
Passing #200 Sieve	%	-	-				

L. L.							
P. I.		NP	NP				
AASHTO Classification		A-2-4(0)	A-2-4(0)				
Station		13+50	13+50				
Offset		15' RT	32' RT				
Alignment		RP-D	RP-D				
Location							
Depth (Ft)		9.00	19.00				
	to	10.00	20.00				

cc: K B MILLER

Soils Engineer