

PROJECT: 48392

REFERENCE: U-6146

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

ROADWAY
SUBSURFACE INVESTIGATION

COUNTY GASTON
PROJECT DESCRIPTION US 29/US 74 (WILKINSON
BLVD) FROM SR 2209 (WESLEYAN DRIVE/MARKET
ST) TO SR 2016/SR 2017 (GEORGIA BELLE AVENUE/
HUBBARD ST)
PAVEMENT AND SUBGRADE INVESTIGATION

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-6146	1	32

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.

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 - 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

M. BREWER

CG2 EXPLORATION

TERRACON

INVESTIGATED BY CG2

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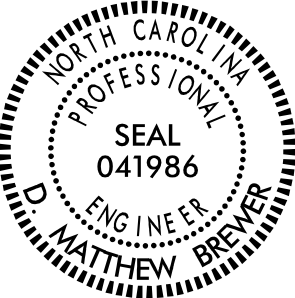
DATE JANUARY 2020

Prepared in the Office of:



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SIGNATURE

1/10/2020
DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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-4, A-5		
SYMBOL	A-1-a	A-1-b	A-2-4		A-2-5		A-2-6		A-2-7		A-4		A-5		A-6		A-7		
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	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 11 MN	40 MX 10 MX	41 MN 11 MN	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 RESISTANCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	< 4 4 TO 10 10 TO 30 30 TO 50 > 50	N/A
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30	< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE OPENING (MM)	4	10	40	60	200	270
	4.75	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

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

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
LL PL	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
OM SL	- 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	MODERATELY COMPRESSIBLE	HIGHLY COMPRESSIBLE
LL < 31	LL = 31 - 50	LL > 50

PERCENTAGE OF MATERIAL

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

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 DMT VST PMT

TEST BORING

AUGER BORING

CORE BORING

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
HL - HIGHLY
MED. - MEDIUM
MICA - MICACEOUS
MOD. - MODERATELY
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
w - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT
SAMPLE ABBREVIATIONS
S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:

☐ CME-45C

☐ CME-55

☐ CME-550

☐ VANE SHEAR TEST

☐ PORTABLE HOIST

☒ DIEDRICH D-50

☐

ADVANCING TOOLS:

☐ CLAY BITS

☐ 6" CONTINUOUS FLIGHT AUGER

☐ 8" HOLLOW AUGERS

☐ HARD FACED FINGER BITS

☐ TUNG-CARBIDE INSERTS

☐ CASING ☐ W/ ADVANCER

☐ TRICONE ☐ STEEL TEETH

☐ TRICONE ☐ TUNG-CARB.

☒ CORE BIT (4-INCH DIAMETER)

☐

HAMMER TYPE:

☐ AUTOMATIC

☐ MANUAL

CORE SIZE:

☐ -B

☐ -H

☐ -N

HAND TOOLS:

☐ POST HOLE DIGGER

☐ HAND AUGER

☐ SOUNDING ROD

☐ VANE SHEAR TEST

☒ DUAL MASS DCP

ROCK DESCRIPTION

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

WEATHERED ROCK (WR)

CRYSTALLINE ROCK (CR)

NON-CRYSTALLINE ROCK (NCR)

COASTAL PLAIN SEDIMENTARY ROCK (CP)

NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.

FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.

FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.

COASTAL PLAIN 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 PIECES 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 DISLOGGED 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 (SROD) - 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: N/A

ELEVATION: FEET

NOTES:

ROADWAY DESIGN FILES DATED 10/31/2019 PROVIDED BY TGS ENGINEERS

PAVEMENT CORE WITH DCP

CBR SAMPLE, SEE ROADWAY INVENTORY REPORT

DATE: 8-15-14

Tip No. U-6146| WBS No. 48392.1.1 | Gaston County

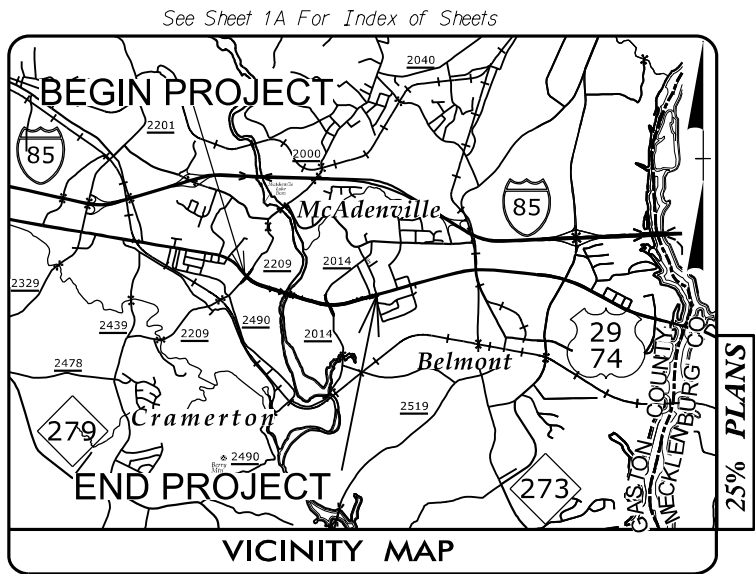
ABBREVIATIONS

- RT LN = Right Lane
- LT LN = Left Lane
- PS = Paved Shoulder
- LTL = Left Turn Lane
- RTL = Right Turn Lane
- MID = Middle Lane
- ISWP = Inside Wheel Path
- OSWP = Outside Wheel Path
- EB = Eastbound
- WB = Westbound
- ABC = Aggregate Base Course
- C = Cut
- F = Fill
- DCP = Dynamic Cone Penetrometer
- M = Moist
- W = Wet
- N/A = Not Observed
- NSR = No Sample Recovered
- Ref- = Soil Reference Sample
- S- = Soil Grab Sample
- M- = Moisture Grab Sample
- R.E. = Roadway Embankment
- Res. = Residual
- Alluv. = Alluvial

12/31/2019 C:\Users\mbrewer\OneDrive - Carolinas Geotechnical Group, PLLC\Projects\0007 - U-6146 Cramerton Bridge and Widening\CADD\ORIGINAL\U-6146_Rdy_.tsh - Copy.dgn

TIP PROJECT: U-6146

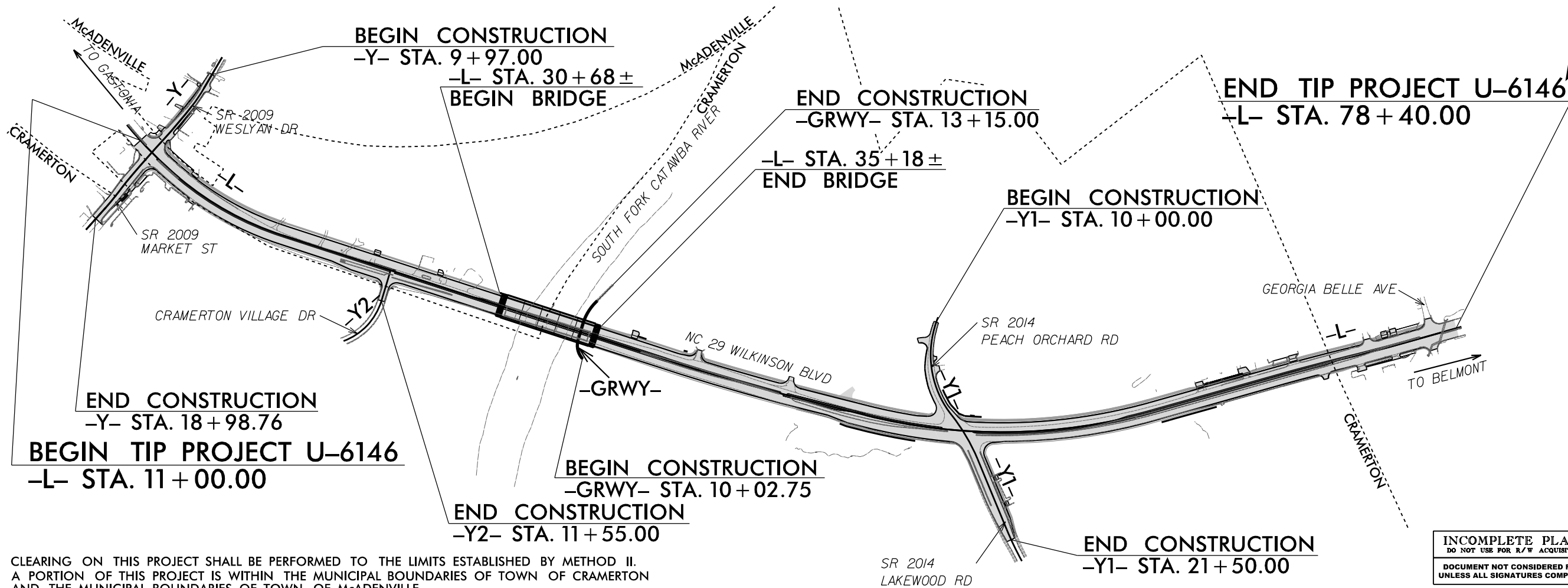
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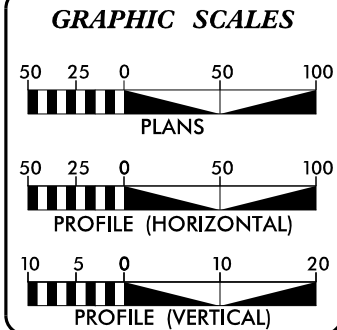
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
GASTON COUNTY

LOCATION: US 29/US 74 (WILKINSON BLVD) FROM SR 2209
(WESLEYAN DR/MARKET ST) TO SR 2016/SR 2017
(GEORGIA BELLE AVE/HUBBARD ST) AND BRIDGE #350082
OVER SOUTH FORK CATAWBA RIVER
GRADING, PAVING, DRAINAGE, CURB & GUTTER,
AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-6146	3	32
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
48392.1.1	N/A	PE	
48392.2.1	N/A	ROW, UTIL.	



CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.
A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF TOWN OF CRAMERTON
AND THE MUNICIPAL BOUNDARIES OF TOWN OF McADENVILLE.

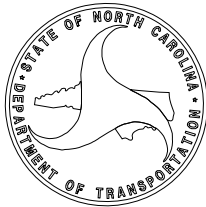


DESIGN DATA	
ADT 2016 =	22,600
ADT 2040 =	26,100
K =	12 %
D =	70 %
T =	4 % *
V =	50 MPH
* TTST = 1% DUAL = 3%	
FUNC CLASS =	
URBAN ARTERIAL	
REGIONAL TIER	

PROJECT LENGTH	
LENGTH ROADWAY TIP PROJECT U-6146	= 1.192 MILES
LENGTH STRUCTURE TIP PROJECT U-6146	= 0.085 MILES
TOTAL LENGTH TIP PROJECT U-6146	= 1.277 MILES

NCDOT CONTACT: THAD DUNCAN, PE	
PLANS PREPARED BY:	PLANS PREPARED FOR:
TGS ENGINEERS 804-C N. LAFAYETTE ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION 12 1710 E. Marion St Shelby, NC 28150
RIGHT OF WAY DATE:	JIMMY L. TERRY, PE PROJECT ENGINEER
LETTING DATE:	SANDRA MELVIN PROJECT DESIGN ENGINEER
2018 STANDARD SPECIFICATIONS	

HYDRAULICS ENGINEER	
SIGNATURE:	P.E.
ROADWAY DESIGN ENGINEER	
SIGNATURE:	P.E.



NAD 83/2011

C-1 EBL OSL/RTL		C-2 EBL MID	
-L- 10+72, 35' RT		-L- 10+72, 25' RT	
PAVEMENT SECTION		PAVEMENT SECTION	
ASPHALT	8.75 in	ASPHALT	9.50 in
CONCRETE	N/A	CONCRETE	N/A
ABC	15.25 in	ABC	14.50 in
C-3 EBL ISL		C-4 EBL LTL	
-L- 10+72, 13' RT		-L- 10+72, 2' RT	
PAVEMENT SECTION		PAVEMENT SECTION	
ASPHALT	9.25 in	ASPHALT	9.50 in
CONCRETE	N/A	CONCRETE	N/A
ABC	16.25 in	ABC	14.50 in

C-5 WBL LTL		C-6 WBL ISL	
-L- 12+90, 4' LT		-L- 12+90, 14' LT	
PAVEMENT SECTION		PAVEMENT SECTION	
ASPHALT	9.50 in	ASPHALT	10.00 in
CONCRETE	N/A	CONCRETE	N/A
ABC	15.50 in	ABC	14.00 in
C-7 WBL MID		C-8 WBL OSL/RTL	
-L- 12+90, 25' LT		-L- 12+90, 34' LT	
PAVEMENT SECTION		PAVEMENT SECTION	
ASPHALT	10.00 in	ASPHALT	11.00 in
CONCRETE	N/A	CONCRETE	N/A
ABC	14.00 in	ABC	13.00 in



NC GRID
NAD 83 NA 2011

CBR-1

25+00

C-12 WBL LTL	
-L- 25+18, 22' RT	
PAVEMENT SECTION	
ASPHALT	10.50 in
CONCRETE	6.50 in

C-11 CONCRETE MEDIAN

C-10 EBL ISL

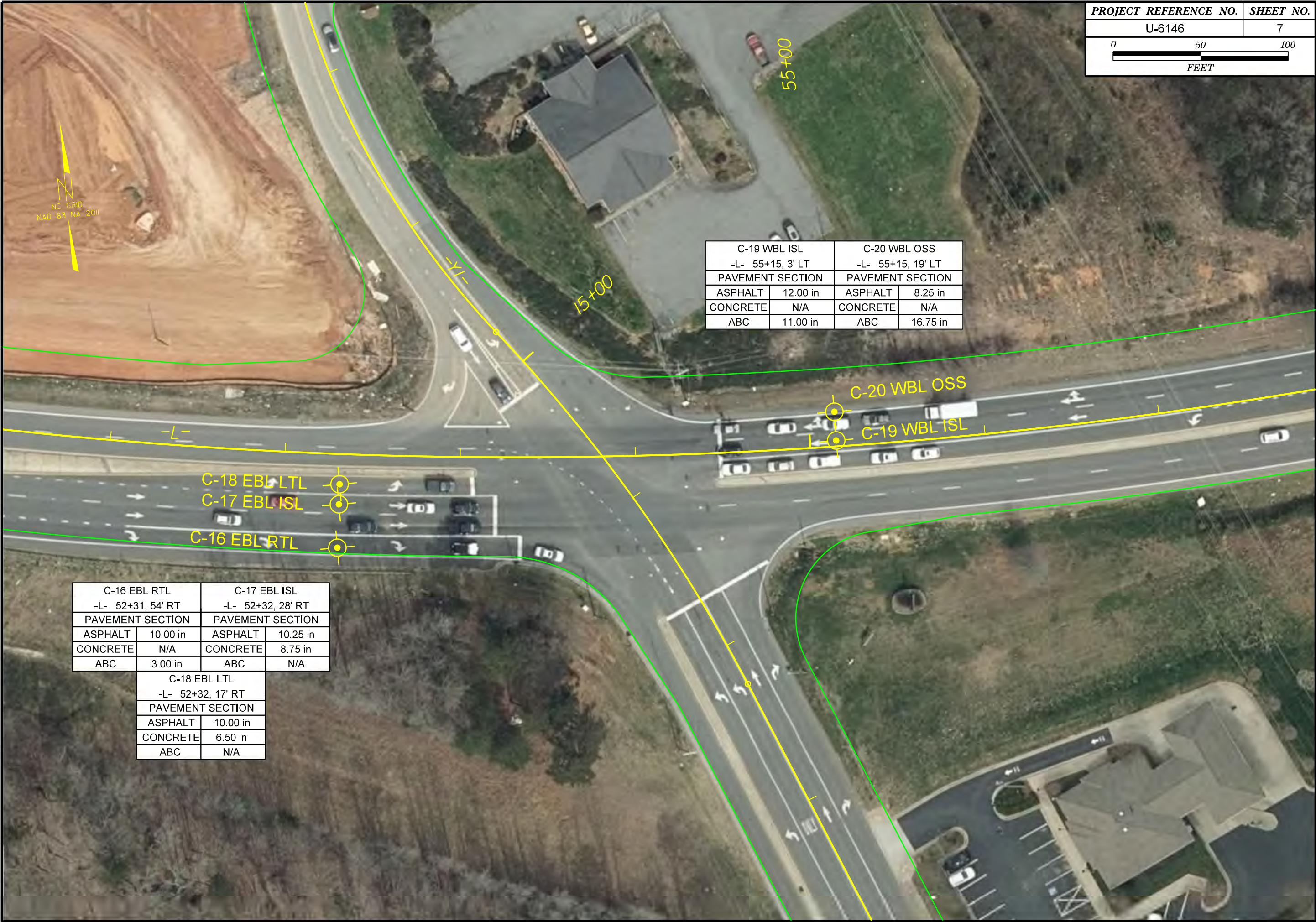
C-9 EBL OSL

C-12 WBL LTL

C-9 EBL OSL		C-10 EBL ISL	
-L- 24+06, 53' RT		-L- 24+06, 39' RT	
PAVEMENT SECTION		PAVEMENT SECTION	
ASPHALT	10.50 in	ASPHALT	11.00 in
CONCRETE	N/A	CONCRETE	N/A
ABC	11.50 in	ABC	11.00 in
C-11 CONCRETE MEDIAN			
-L- 24+06, 25' RT			
PAVEMENT SECTION			
CONCRETE	2.50 in		
ABC	5.50 in		
ASPHALT	10.00 in		
CONCRETE	6.00 in		

-Y2- PC 11+56.35





C-19 WBL ISL		C-20 WBL OSS	
-L- 55+15, 3' LT		-L- 55+15, 19' LT	
PAVEMENT SECTION		PAVEMENT SECTION	
ASPHALT	12.00 in	ASPHALT	8.25 in
CONCRETE	N/A	CONCRETE	N/A
ABC	11.00 in	ABC	16.75 in

C-16 EBL RTL		C-17 EBL ISL	
-L- 52+31, 54' RT		-L- 52+32, 28' RT	
PAVEMENT SECTION		PAVEMENT SECTION	
ASPHALT	10.00 in	ASPHALT	10.25 in
CONCRETE	N/A	CONCRETE	8.75 in
ABC	3.00 in	ABC	N/A
C-18 EBL LTL			
-L- 52+32, 17' RT			
PAVEMENT SECTION			
ASPHALT	10.00 in		
CONCRETE	6.50 in		
ABC	N/A		



PROJECT REFERENCE NO.	SHEET NO.
U-6146	8
050100 FEET	

C-21 WBL OSS		C-22 WBL OSL	
-L- 63+10, 24' LT		-L- 63+10, 16' LT	
PAVEMENT SECTION		PAVEMENT SECTION	
ASPHALT	5.50 in	ASPHALT	12.25 in
CONCRETE	N/A	CONCRETE	N/A
ABC	17.50 in	ABC	12.75 in

C-24 EBL OSL		C-25 EBL OSS	
-L- 63+10, 35' RT		-L- 63+10, 42' RT	
PAVEMENT SECTION		PAVEMENT SECTION	
ASPHALT	14.75 in	ASPHALT	6.00 in
CONCRETE	N/A	CONCRETE	N/A
ABC	9.25 in	ABC	16.00 in
C-23 CONCRETE MEDIAN			
-L- 63+10, 10' RT			
PAVEMENT SECTION			
CONCRETE	2.50 in		
ABC	5.50 in		
ASPHALT	9.50 in		
CONCRETE	6.50 in		

C-26 WBL OSL		C-27 WBL MID	
-L- 72+65, 31' LT		-L- 72+66, 20' LT	
PAVEMENT SECTION		PAVEMENT SECTION	
ASPHALT	11.25 in	ASPHALT	11.00 in
CONCRETE	N/A	CONCRETE	N/A
ABC	12.75 in	ABC	12.00 in
C-28 WBL ISL		C-29 CONCRETE MEDIAN	
-L- 72+66, 8' LT		-L- 72+66, 3' RT	
PAVEMENT SECTION		PAVEMENT SECTION	
ASPHALT	10.75 in	CONCRETE	2.50 in
CONCRETE	9.00 in	ABC	5.50 in
ABC	N/A	ASPHALT	5.50 in
		CONCRETE	6.25 in

C-30 EBL LTL		C-31 EBL ISL	
-L- 75+74, 3' RT		-L- 75+75, 13' RT	
PAVEMENT SECTION		PAVEMENT SECTION	
ASPHALT	10.50 in	ASPHALT	13.50 in
CONCRETE	6.50 in	CONCRETE	8.50 in
ABC	N/A	ABC	N/A
C-32 EBL OSL/RTL			
-L- 75+75, 34' RT			
PAVEMENT SECTION			
ASPHALT	11.00 in		
CONCRETE	N/A		
ABC	13.00 in		

PAVEMENT INVESTIGATION DATA SHEET

Project:	48392.1.1
TIP:	U-6146

Route:	US 29/ US 74 from SR 2209 to SR 2016/SR 2017
County:	Gaston

Date Performed:	11/12/19 to 11/14/19 (2 nights)
Field Personnel:	M. Brewer

		Width (ft)		(ft)	(in)	Thickness (in)						Subgrade							GPS Coordinates	
Test Location	Cut/Fill (Est. of Amount) (ft)	Lane	Shoulder	Offset Distance (See Notes)	Crown "C" or Super "S"	Gross to Top of Soil	Asphalt	ABC	Stabilized Subgrade	Concrete	Pavement Layering	Description (Depth - ft)	Soil Sample Number	AASHTO Classification	Soil Moisture	Boring Depth (ft)	Asphalt Notes	Northing	Easting	
C-1 EBL OSL/RTL -L- 10+72, 35' RT	At Grade	12.0	Concrete Curb	6.5 LT Back of Curb	C	24.00	8.75	15.25	N/A	N/A	Asphalt ABC Soil Subgrade	2.0-3.0: Roadway Embankment - Red, Silty Fine Sand 3.0-4.0: Residual - Red, Silty Clay	S-1 R-4	A-2-4 A-7-5	M M	4	Low Severity Longitudinal Cracking, Polished Aggregate	552,892	1,379,124	
C-2 EBL MID -L- 10+72, 25' RT	At Grade	12.0	None	17.5 LT Back of Curb	C	24.00	9.50	14.50	N/A	N/A	Asphalt ABC Soil Subgrade	2.0-3.0: Roadway Embankment - Red-Brown, Silty Fine Sand 3.0-4.0: Residual - Red, Silty Clay	S-2 R-4	A-2-4 A-7-5	M M	4	Low Severity Longitudinal Cracking, Polished Aggregate	552,899	1,379,132	
C-3 EBL ISL -L- 10+72, 13' RT	At Grade	12.0	None	16 RT Yellow Line	C	25.50	9.25	16.25	N/A	N/A	Asphalt ABC Soil Subgrade	2.1-3.0: Roadway Embankment - Red, Silty Fine Sand 3.0-4.0: Residual - Red, Silty Clay	R-1 S-3	A-2-4 A-7-5	M M	4	Low Severity Longitudinal Cracking, Polished Aggregate	552,907	1,379,141	
C-4 EBL LTL -L- 10+72, 2' RT	At Grade	10.0	Concrete Curb	6 RT Yellow Line	C	24.00	9.50	14.50	N/A	N/A	Asphalt ABC Soil Subgrade	2.0-3.0: Roadway Embankment - Red, Silty Fine Sand 3.0-4.0: Residual - Red, Silty Clay	R-1 S-4	A-2-4 A-7-5	M M	4	Low Severity Longitudinal Cracking, Polished Aggregate	552,914	1,379,149	
C-5 WBL LTL -L- 12+90, 4' LT	At Grade	11.0	Concrete Median	5 RT Yellow Line	C	25.00	9.50	15.50	N/A	N/A	Asphalt ABC Soil Subgrade	2.1-4.0: Roadway Embankment - Red, Silty Clay	S-5	A-7-5	M	4	No Observable Pavement Distress	552,763	1,379,306	
C-6 WBL ISL -L- 12+90, 14' LT	At Grade	11.0	None	16 RT Yellow Line	C	24.00	10.00	14.00	N/A	N/A	Asphalt ABC Soil Subgrade	2.0-4.0: Roadway Embankment - Red, Silty Clay	S-6	A-7-5	M	4	No Observable Pavement Distress	552,771	1,379,312	
C-7 WBL MID -L- 12+90, 25' LT	At Grade	11.0	None	17.5 LT Back of Curb	C	24.00	10.00	14.00	N/A	N/A	Asphalt ABC Soil Subgrade	2.0-4.0: Residual - Red-Tan, Fine Sandy Silt	S-7	A-4	M	4	No Observable Pavement Distress	552,779	1,379,320	
C-8 WBL OSL/RTL -L- 12+90, 34' LT	At Grade	12.0	Concrete Curb	9 LT Back of Curb	C	24.00	11.00	13.00	N/A	N/A	Asphalt ABC Soil Subgrade	2.0-4.0: Residual - Red-Tan, Fine Sandy Silt	S-8	A-4	M	4	No Observable Pavement Distress	552,786	1,379,326	
C-9 EBL OSL -L- 24+06, 53' RT	10 C	11.0	4 ft Paved Shoulder	15.5 LT White Line	C	22.00	10.50	11.50	N/A	N/A	Asphalt ABC Soil Subgrade	1.8-4.0: Residual - Tan, Fine Sandy Silt	S-9	A-4	M	4	Low Severity Transverse Cracking	552,240	1,380,287	
C-10 EBL ISL -L- 24+06, 39' RT	10 C	12.0	Concrete Curb	4 RT Yellow Line	C	22.00	11.00	11.00	N/A	N/A	Asphalt ABC Soil Subgrade	1.8-4.0: Residual - Tan, Fine Sandy Silt	S-10	A-4	M	4	No Observable Pavement Distress	552,254	1,380,291	
C-11 CONCRETE MEDIAN -L- 24+06, 25' RT	10 C	14.0	N/A	9.5 LT Yellow Line	C	24.00	10.00	5.50	N/A	2.50 6.00	Concrete/ABC Asphalt/Concrete Soil Subgrade	2.0-4.0: Residual - Tan, Fine Sandy Silt	S-11	A-4	M	4	Polished Aggregate Auger Used to Advance from 0.2 - 4.0 ft.	552,267	1,380,295	
C-12 WBL LTL -L- 25+18, 22' RT	10 C	9.0	N/A	5 RT Yellow Line	C	17.00	10.50	N/A	N/A	6.50	Asphalt Concrete Soil Subgrade	1.4-4.0: Residual - Tan, Fine Sandy Silt	S-12	A-4	M	4	No Observable Pavement Distress	552,235	1,380,403	
C-13 CONCRETE MEDIAN -L- 41+15, 2' LT	10 C	14.0 Median	N/A	5 LT Yellow Line	C	24.00	16.00	5.50	N/A	2.50	Concrete/ABC Asphalt Soil Subgrade	2.0-4.0: Residual - Red-Tan, Fine Sandy Silt	S-13	A-4	M	4	No Observable Pavement Distress	551,767	1,381,930	
C-14 WBL OSL -L- 41+15, 24' LT	10 C	12.0	1.5 ft Paved Shoulder	15 LT White Line	C	24.00	11.00	13.00	N/A	N/A	Asphalt ABC Soil Subgrade	2.0-4.0: Residual - Tan, Fine Sandy Silt	S-14	A-4	M	4	No Observable Pavement Distress	551,788	1,381,936	
C-15 WBL RTL -L- 41+15, 34' LT	10 C	11.0	1.5 ft Paved Shoulder	5.5 LT White Line	C	26.00	13.00	13.00	N/A	N/A	Asphalt ABC Soil Subgrade	2.2-4.0: Residual - Orange-Tan, Fine Sandy Silt	S-15	A-4	M	4	No Observable Pavement Distress	551,798	1,381,939	

Notes:

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EOP = Edge of Pavement

ABC = Aggregate Base Course
RTL = Right Turn Lane
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EBL = East Bound Lane
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Prepared by: DMB
Reviewed by: REK

PAVEMENT INVESTIGATION DATA SHEET

Project:	48392.1.1
TIP:	U-6146

Route:	US 29/ US 74 from SR 2209 to SR 2016/SR 2017
County:	Gaston

Date Performed:	11/12/19 to 11/14/19 (2 nights)
Field Personnel:	M. Brewer

		Width (ft)		(ft)	(in)	Thickness (in)						Subgrade							GPS Coordinates	
Test Location	Cut/Fill (Est. of Amount) (ft)	Lane	Shoulder	Offset Distance (See Notes)	Crown "C" or Super "S"	Gross to Top of Soil	Asphalt	ABC	Stabilized Subgrade	Concrete	Pavement Layering	Description (Depth - ft)	Soil Sample Number	AASHTO Classification	Soil Moisture	Boring Depth (ft)	Asphalt Notes	Northing	Easting	
C-16 EBL RTL -L- 52+31, 54' RT	20 F	12.0	6 ft Paved Shoulder	4 LT White Line	C	13.00	10.00	3.00	N/A	N/A	Asphalt ABC Soil Subgrade	1.1-4.0: Roadway Embankment - Red, Silty Clay	S-16	A-7-5	M	4	No Observable Pavement Distress	551,447	1,383,006	
C-17 EBL ISL -L- 52+32, 28' RT	20 F	11.0	None	16 RT Yellow Line	C	19.00	10.25	N/A	N/A	8.75	Asphalt Concrete Soil Subgrade	1.6-4.0: Roadway Embankment - Red, Silty Clay	S-17	A-7-5	M	4	Low Severity Transverse Cracking	551,472	1,383,010	
C-18 EBL LTL -L- 52+32, 17' RT	20 F	11.0	None	5 RT Yellow Line	C	16.50	10.00	N/A	N/A	6.50	Asphalt Concrete Soil Subgrade	1.4-4.0: Roadway Embankment - Red, Silty Clay	R-17	A-7-5	M	4	No Observable Pavement Distress	551,483	1,383,011	
C-19 WBL ISL -L- 55+15, 3' LT	15 C	11.0	None	16 RT Yellow Line	C	23.00	12.00	11.00	N/A	N/A	Asphalt ABC Soil Subgrade	1.9-4.0: Residual - Red-Tan, Fine Sandy Silt	S-19	A-4	M	4	No Observable Pavement Distress	551,483	1,383,296	
C-20 WBL OSS -L- 55+15, 19' LT	15 C	12.0	4 ft Paved Shoulder	0.5 RT White Line	C	25.00	8.25	16.75	N/A	N/A	Asphalt ABC Soil Subgrade	2.1-4.0: Residual - Red-Tan, Fine Sandy Silt	S-20	A-4	M	4	Low Severity Longitudinal Cracking, Low Severity Edge Cracking	551,499	1,383,296	
C-21 WBL OSS -L- 63+10, 24' LT	25 F	12.0	3 ft Paved Shoulder	2 RT White Line	C	23.00	5.50	17.50	N/A	N/A	Asphalt ABC Soil Subgrade	1.9-4.0: Roadway Embankment - Red-Brown, Silty Clay	S-21	A-6	M	4	No Observable Pavement Distress	551,603	1,384,075	
C-22 WBL OSL -L- 63+10, 16' LT	25 F	12.0	3 ft Paved Shoulder	5 LT White Line	C	25.00	12.25	12.75	N/A	N/A	Asphalt ABC Soil Subgrade	2.1-4.0: Roadway Embankment - Red-Brown, Fine Sandy Clay	S-22	A-6	M	4	No Observable Pavement Distress	551,595	1,384,077	
C-23 CONCRETE MEDIAN -L- 63+10, 10' RT	15 F	14.0 Median	N/A	6.5 LT Yellow Line	C	24.00	9.50	5.50	N/A	2.50 6.50	Concrete/ABC Asphalt/Concrete Soil Subgrade	2.0-4.0: Roadway Embankment - Red, Silty Clay	R-25	A-7-5	M	4	No Observable Pavement Distress	551,570	1,384,084	
C-24 EBL OSL -L- 63+10, 35' RT	15 F	12.0	4 ft Paved Shoulder	5.5 LT White Line	C	24.00	14.75	9.25	N/A	N/A	Asphalt ABC Soil Subgrade	2.0-4.0: Residual - Tan-Red, Clayey Silt	S-24	A-5	M	4	No Observable Pavement Distress	551,546	1,384,091	
C-25 EBL OSS -L- 63+10, 42' RT	15 F	12.0	4 ft Paved Shoulder	2.5 RT White Line	C	22.00	6.00	16.00	N/A	N/A	Asphalt ABC Soil Subgrade	1.8-4.0: Roadway Embankment - Red, Silty Clay	S-25	A-7-5	M	4	No Observable Pavement Distress	551,539	1,384,093	
C-26 WBL OSL -L- 72+65, 31' LT	6 C	12.0	Concrete Curb	6 LT Back of Curb	C	24.00	11.25	12.75	N/A	N/A	Asphalt ABC Soil Subgrade	2.0-4.0: Residual - Tan, Fine Sandy Silt	S-26	A-4	M	4	No Observable Pavement Distress	551,863	1,384,995	
C-27 WBL MID -L- 72+66, 20' LT	6 C	11.0	None	18 LT Back of Curb	C	23.00	11.00	12.00	N/A	N/A	Asphalt ABC Soil Subgrade	1.9-4.0: Residual - Red-Tan, Fine Sandy Silt	S-27	A-4	M	4	No Observable Pavement Distress	551,852	1,384,998	
C-28 WBL ISL -L- 72+66, 8' LT	10 F	12.0	None	3.5 RT Yellow Line	C	19.75	10.75	N/A	N/A	9.00	Asphalt Concrete Soil Subgrade	1.6-4.0: Roadway Embankment - Red, Silty Clay	S-28	A-7-5	M	4	No Observable Pavement Distress	551,841	1,385,001	
C-29 CONCRETE MEDIAN -L- 72+66, 3' RT	10 F	14.0 Median	None	7 LT Yellow Line	C	19.75	5.50	5.50	N/A	2.50 6.25	Concrete/ABC Asphalt/Concrete Soil Subgrade	1.6-4.0: Roadway Embankment - Red, Silty Clay	R-31	A-7-5	M	4	No Observable Pavement Distress	551,830	1,385,004	
C-30 EBL LTL -L- 75+74, 3' RT	5 F	13.0	None	5 RT Yellow Line	C	17.00	10.50	N/A	N/A	6.50	Asphalt Concrete Soil Subgrade	1.4-4.0: Roadway Embankment - Red, Fine Sandy Silt	S-30	A-4	M	4	No Observable Pavement Distress	551,909	1,385,302	

Notes:

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ABC = Aggregate Base Course
RTL = Right Turn Lane
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Prepared by: DMB
Reviewed by: REK

PAVEMENT INVESTIGATION DATA SHEET

Project:	48392.1.1
TIP:	U-6146

Route:	US 29/ US 74 from SR 2209 to SR 2016/SR 2017
County:	Gaston

Date Performed:	11/12/19 to 11/14/19 (2 nights)
Field Personnel:	M. Brewer

[illegible]

Notes:

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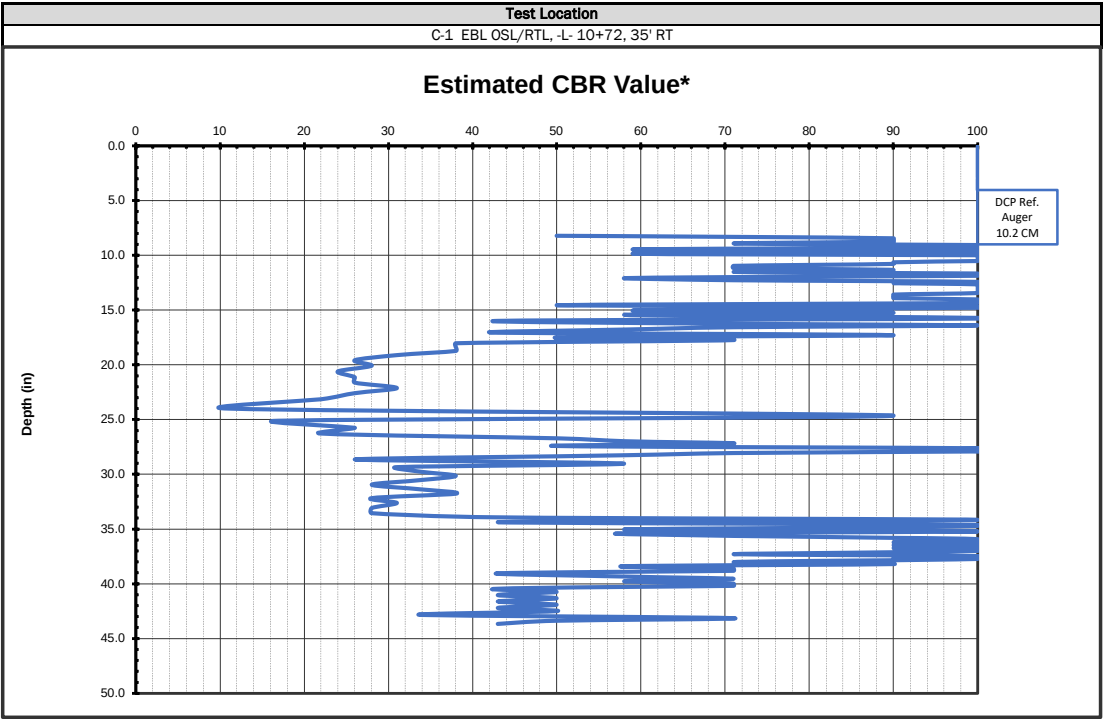
EBL = East Bound Lane
WBL = West Bound Lane

Prepared by:
Reviewed by:

DMB
REK

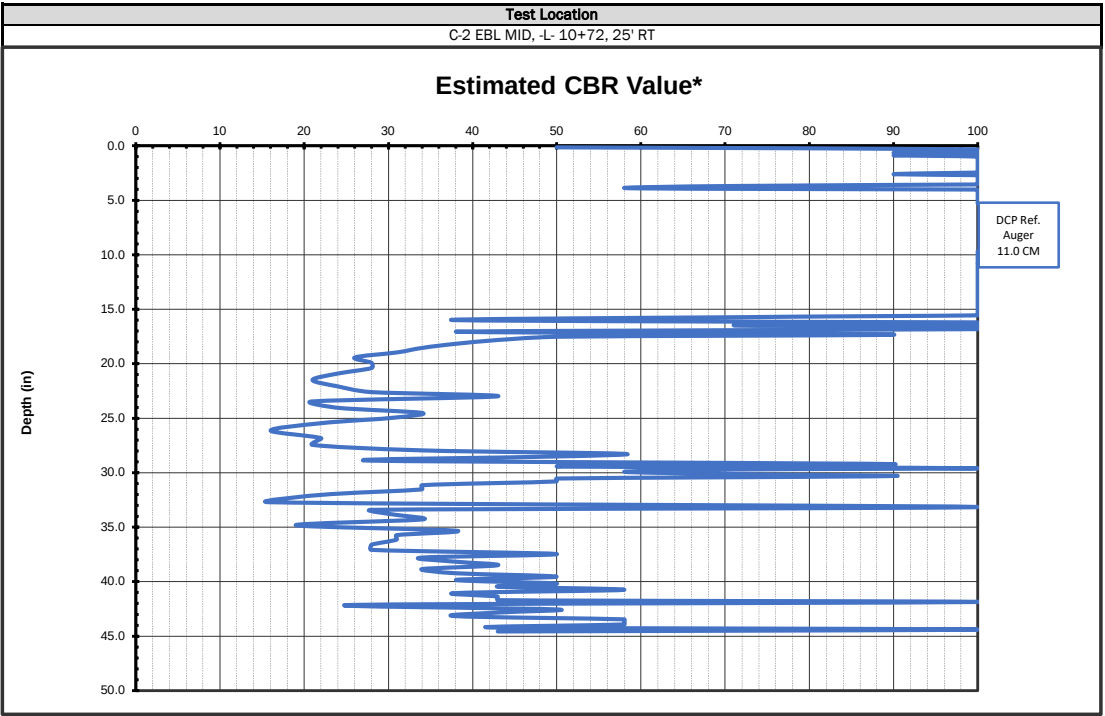


DUAL MASS DYNAMIC CONE PENETROMETER DATA SHEET							WBS NO.	PROJECT TIP I.D.				ROUTE			
							48392.1.1	U-6146				US 29/US 74 from SR 2209 to SR 2016/SR 2017			
							COUNTY	FIELD PROFESSIONAL				DRILLER/HELPER			
							Gaston	M. Brewer				C. Odom			
Test Location							Date Run	Test Location						Date Run	
C-1 EBL OSL/RTL, -L- 10+72, 35' RT							11/12/2019	C-2 EBL MID, -L- 10+72, 25' RT						11/12/2019	
Type	Test Interval			Datum or reference surface				Type	Test Interval			Datum or reference surface			
DCP	Cumulative cm per blow			Top of ABC				DCP	Cumulative cm per blow			Top of ABC			
0.10	6.51	29.50	71.50					0.70	11.76	27.66	35.64	77.90			
0.19	6.61	29.70	72.10					0.90	11.82	27.70	35.70	78.60			
0.29	6.70	30.00	73.40					1.10	11.88	27.74	36.00	79.60			
0.39	6.80	30.30	74.00					1.40	11.94	27.78	36.30	80.60			
0.49	6.90	30.90	75.10					1.80	11.99	27.82	36.40	82.10			
0.58	7.00	31.40	76.10					2.00	12.05	27.86	36.60	84.10			
0.68	7.09	31.60	77.00					2.40	12.11	27.90	36.80	84.30			
0.78	7.19	32.00	78.00					2.60	12.17	27.96	36.90	85.50			
0.87	7.29	32.20	79.20					2.90	12.23	28.02	37.10	86.60			
0.97	7.38	32.50	80.20					3.10	12.28	28.08	37.20	87.60			
1.07	7.48	32.70	81.10					3.20	12.34	28.14	37.30	89.30			
1.17	7.58	32.90	82.30					3.50	12.40	28.20	37.50	90.20			
1.26	7.68	33.10	83.40					3.80	12.46	28.30	37.60	91.30			
1.36	7.77	33.30	84.60					4.10	12.52	28.50	37.70	92.40			
1.46	7.87	33.60	85.80					4.20	12.57	28.58	37.80	93.60			
1.55	7.97	33.80	86.60					4.50	12.63	28.66	37.90	94.80			
1.65	8.07	34.00	86.90					4.70	12.69	28.74	38.00	95.50			
1.75	8.16	34.30	87.70					4.80	12.75	28.82	38.10	96.50			
1.85	8.26	34.70	88.00					5.00	12.81	28.90	38.42	97.40			
1.94	8.36	35.10	88.30					5.30	12.86	28.98	38.74	98.20			
2.04	8.45	35.50	88.70					5.40	12.92	29.06	39.06	99.20			
2.14	8.55	35.70	89.30					5.60	12.98	29.14	39.38	100.10			
2.23	8.65	36.00	89.60					5.70	13.04	29.22	39.70	100.80			
2.33	8.75	36.30	90.20					5.80	13.09	29.30	40.20	101.70			
2.43	8.84	36.60	90.70					6.10	13.15	29.36	41.10	102.40			
2.53	8.94	37.30	91.10					6.40	13.21	29.42	41.30	103.20			
2.62	9.04	37.50	91.30					6.80	13.27	29.48	41.50	103.80			
2.72	9.13	37.90	91.60					6.90	13.33	29.54	41.60	104.70			
2.82	9.23	38.50	91.80					7.20	13.38	29.60	42.10	105.50			
2.92	9.33	38.90	92.20					7.40	13.44	29.72	42.30	106.30			
3.01	9.43	39.50	92.40					7.50	13.50	29.84	42.60	106.40			
3.11	9.52	39.90	92.80					7.60	AUGER	29.96	42.90	107.70			
3.21	9.62	40.20	93.10					7.90	24.50	30.08	43.80	108.40			
3.30	9.72	41.00	93.50					8.15	24.66	30.20	44.20	109.20			
3.40	9.81	41.50	93.80					8.40	24.82	30.36	44.90	110.10			
3.50	9.91	41.80	94.10					8.65	24.98	30.52	45.70	110.70			
3.60	10.01	42.30	94.50					8.90	25.14	30.68	46.60	111.30			
3.69	10.11	42.90	95.00					9.10	25.30	30.84	47.60	111.90			
3.79	10.20	43.70	95.30					9.60	25.40	31.00	48.70	112.70			
3.89	10.30	44.10	95.70					10.20	25.50	31.30	50.00	112.80			
3.98	AUGER	44.80	95.90					10.26	25.60	31.50	51.20	113.60			
4.08	20.50	45.30	96.30					10.32	25.70	31.70	52.40				
4.18	21.20	46.20	96.80					10.37	25.80	31.90	53.80				
4.28	21.60	47.10	97.20					10.43	25.92	32.00	55.40				
4.37	22.00	48.00	97.80					10.49	26.04	32.10	56.80				
4.47	22.40	49.10	98.30					10.55	26.16	32.20	58.00				
4.57	22.90	50.40	98.80					10.61	26.28	32.40	58.80				
4.66	23.10	51.60	99.60					10.66	26.40	32.50	60.40				
4.76	23.40	53.00	100.20					10.72	26.50	32.70	61.80				
4.86	23.70	54.30	100.70					10.78	26.60	32.80	62.80				
4.96	24.30	55.60	101.30					10.84	26.70	32.90	63.90				
5.05	24.50	56.70	101.80					10.89	26.80	33.10	65.40				
5.15	24.70	58.00	102.30					10.95	26.90	33.30	67.40				
5.25	25.30	59.50	103.10					11.01	26.98	33.50	68.90				
5.34	25.40	62.40	103.80					11.07	27.06	33.60	70.50				
5.44	25.60	62.80	104.60					11.13	27.14	33.80	71.50				
5.54	25.70	64.70	105.30					11.18	27.22	34.00	72.10				
5.64	26.00	66.00	106.10					11.24	27.30	34.30	72.80				
5.73	26.30	67.50	106.80					11.30	27.34	34.40	74.00				
5.83	26.60	68.20	107.60					11.36	27.38	34.70	74.40				
5.93	26.80	68.80	108.30					11.42	27.42	34.80	75.10				
6.02	27.20	69.30	109.30					11.47	27.46	35.10	75.20				
6.12	27.60	70.00	109.80					11.53	27.50	35.40	75.70				
6.22	28.10	70.30	110.50					11.59	27.54	35.46	76.30				
6.32	28.60	70.70	111.30					11.65	27.58	35.52	76.80				
6.41	29.00	71.00						11.71	27.62	35.58	77.20				



ABC	
ABC Thickness (in)	15.3
Average CBR	96
Weighted CBR Average	90
Maximum CBR Value	100
Minimum CBR Value	50

Soil Subgrade	
Average CBR	61
Weighted Average	47
Max CBR	100
Min CBR	11



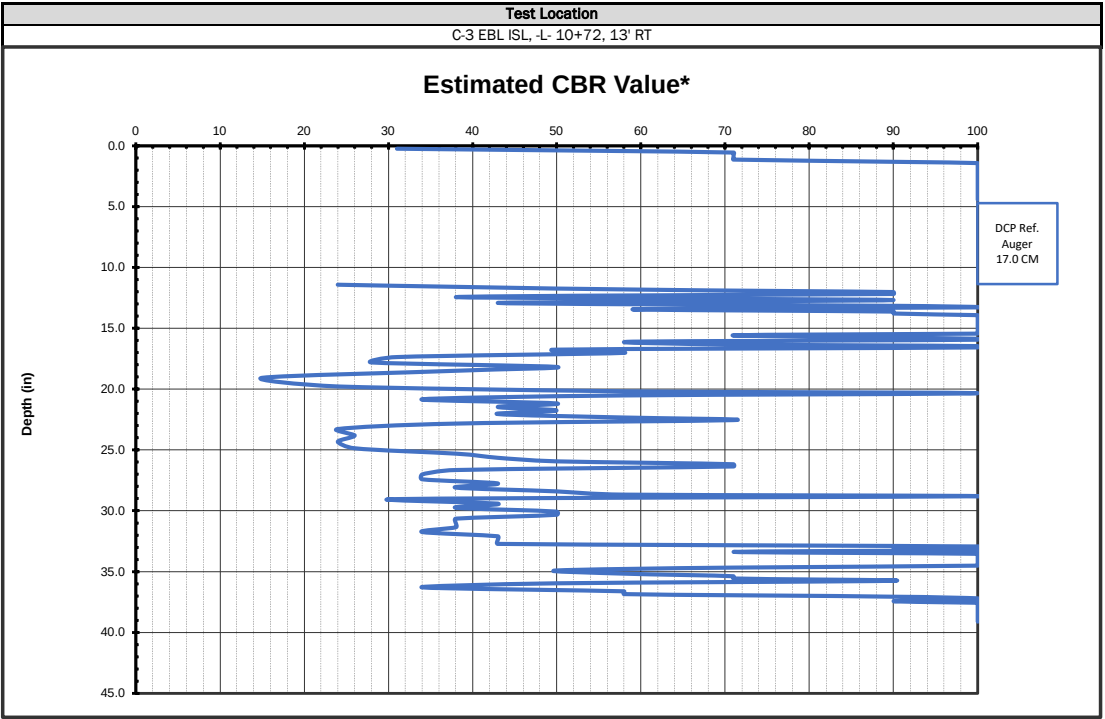
ABC	
ABC Thickness (in)	14.0
Average CBR	99
Weighted CBR Average	96
Maximum CBR Value	100
Minimum CBR Value	50

Soil Subgrade	
Average CBR	59
Weighted Average	40
Max CBR	100
Min CBR	16

*Estimated CBR Value obtained using published correlation provided by NCDOT (Chemical Stabilization QA Subgrade/Base Field Testing, 2015)

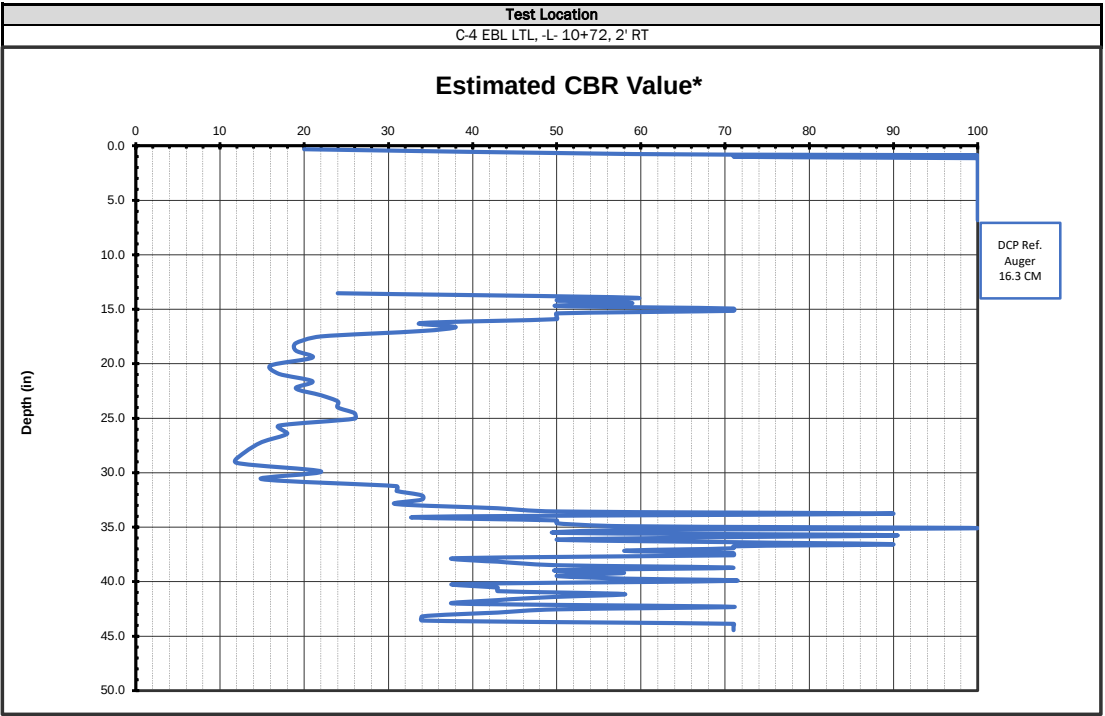


DUAL MASS DYNAMIC CONE PENETROMETER DATA SHEET								WBS NO.	PROJECT TIP I.D.				ROUTE			
								48392.1.1	U-6146				US 29/US 74 from SR 2209 to SR 2016/SR 2017			
								COUNTY	FIELD PROFESSIONAL				DRILLER/HELPER			
								Gaston	M. Brewer				C. Odom			
Test Location								Date Run	Test Location						Date Run	
C-3 EBL ISL, -L- 10+72, 13' RT								11/12/2019	C-4 EBL LTL, -L- 10+72, 2' RT						11/12/2019	
Type	Test Interval			Datum or reference surface				Type	Test Interval			Datum or reference surface				
DCP	Cumulative cm per blow			Top of ABC				DCP	Cumulative cm per blow			Top of ABC				
1.10	10.66	52.40	95.60					1.60	11.52	37.70	104.80					
1.60	10.72	53.40	95.70					2.20	11.60	38.20	105.50					
2.10	10.78	54.10	95.80					2.30	11.80	38.70	106.30					
2.60	10.84	54.90	95.92					2.80	12.10	39.40	107.20					
3.10	10.90	55.60	96.04					3.00	12.30	40.10	107.70					
3.50	10.98	56.40	96.16					3.30	12.50	40.80	108.40					
3.60	11.06	57.00	96.28					3.50	12.70	41.80	109.20					
3.90	11.14	57.50	96.40					3.80	12.80	42.70	110.20					
4.20	11.22	58.40	96.48					3.90	13.00	43.70	111.20					
4.50	11.30	59.80	96.56					4.00	13.20	45.20	111.70					
4.60	AUGER	61.10	96.64					4.10	13.40	46.90	112.20					
4.90	28.30	62.50	96.72					4.20	13.50	48.60	112.70					
5.10	29.70	63.80	96.80					4.40	13.60	50.20	113.20					
5.20	30.30	64.70	96.90					4.48	13.70	52.20						
5.30	30.70	65.50	97.00					4.56	13.80	54.10						
5.40	31.10	66.20	97.10					4.64	13.90	55.70						
5.50	32.00	66.70	97.20					4.72	14.00	57.40						
5.60	32.40	67.20	97.30					4.80	14.10	58.90						
5.70	33.20	68.10	97.36					4.88	14.40	60.30						
5.80	33.60	69.10	97.42					4.96	14.50	61.70						
5.90	33.80	70.10	97.48					5.04	14.70	63.00						
6.00	34.40	70.90	97.54					5.12	14.80	64.30						
6.10	34.80	71.80	97.60					5.20	14.90	66.20						
6.20	35.20	72.50	97.68					5.30	14.96	68.00						
6.30	35.50	73.10	97.76					5.40	15.02	70.20						
6.46	35.60	73.20	97.84					5.50	15.08	72.60						
6.62	35.70	74.30	97.92					5.60	15.14	75.20						
6.78	35.84	75.10	98.00					5.70	15.20	76.70						
6.94	35.98	76.00	98.06					5.82	15.30	78.80						
7.10	36.12	76.70	98.12					5.94	15.50	79.90						
7.18	36.26	77.40	98.18					6.06	15.58	81.00						
7.26	36.40	78.30	98.24					6.18	15.66	82.00						
7.34	36.56	79.20	98.30					6.30	15.74	83.00						
7.42	36.72	80.10	98.38					6.48	15.82	84.10						
7.50	36.88	81.10	98.46					6.66	15.90	84.90						
7.60	37.04	81.90	98.54					6.84	16.02	85.60						
7.70	37.20	82.70	98.62					7.02	16.14	86.00						
7.80	37.32	83.50	98.70					7.20	16.26	87.00						
7.90	37.44	83.80	98.78					7.34	16.38	87.70						
8.00	37.56	84.20	98.86					7.48	16.50	88.40						
8.10	37.68	84.50	98.94					7.62	16.54	89.00						
8.20	37.80	85.00	99.02					7.76	16.58	89.30						
8.30	38.06	85.30	99.10					7.90	16.62	89.90						
8.40	38.32	85.50	99.16					7.96	16.66	90.60						
8.50	38.58	85.80	99.22					8.02	16.70	91.00						
8.70	38.84	86.14	99.28					8.08	16.72	91.50						
8.90	39.10	86.48	99.34					8.14	16.74	92.20						
9.10	39.30	86.82	99.40					8.20	16.76	92.70						
9.30	39.80	87.16						8.36	16.78	93.10						
9.50	40.20	87.50						8.52	16.80	93.60						
9.54	40.40	87.80						8.68	16.86	94.10						
9.58	40.60	88.30						8.84	16.92	94.70						
9.62	41.20	89.00						9.00	16.98	95.20						
9.66	41.70	89.60						9.22	17.04	95.70						
9.70	41.90	90.10						9.44	17.10	96.60						
9.82	42.20	90.60						9.66	17.16	97.40						
9.94	42.90	91.00						9.88	17.22	98.10						
10.06	43.50	91.70						10.10	17.28	98.60						
10.18	44.60	92.70						10.32	17.34	99.30						
10.30	45.80	93.30						10.54	17.40	99.90						
10.35	46.50	93.90						10.76	AUGER	100.60						
10.40	47.40	94.30						10.98	33.70	101.20						
10.45	49.50	94.60						11.20	35.10	101.70						
10.50	50.90	94.90						11.28	35.70	102.60						
10.55	51.50	95.30						11.36	36.40	103.40						
10.60	51.80	95.50						11.44	37.00	104.20						



ABC	
ABC Thickness (in)	16.3
Average CBR	94
Weighted CBR Average	81
Maximum CBR Value	100
Minimum CBR Value	24

Soil Subgrade	
Average CBR	75
Weighted Average	52
Max CBR	100
Min CBR	15



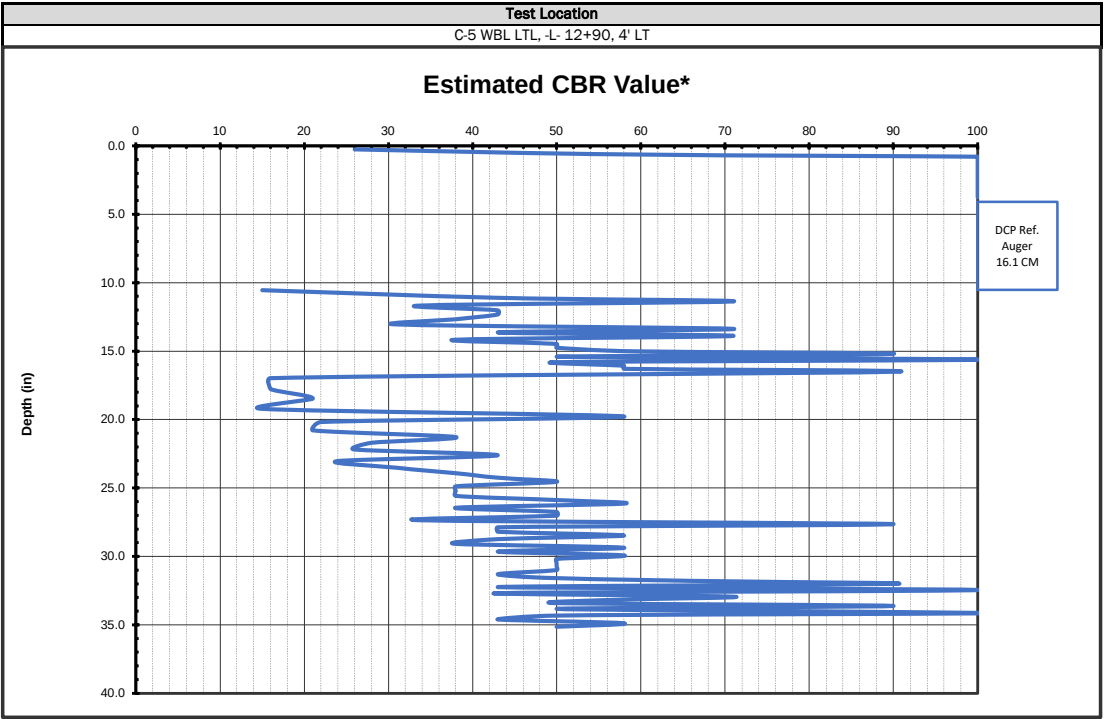
ABC	
ABC Thickness (in)	14.5
Average CBR	97
Weighted CBR Average	83
Maximum CBR Value	100
Minimum CBR Value	20

Soil Subgrade	
Average CBR	46
Weighted Average	36
Max CBR	100
Min CBR	12

*Estimated CBR Value obtained using published correlation provided by NCDOT (Chemical Stabilization QA Subgrade/Base Field Testing, 2015)

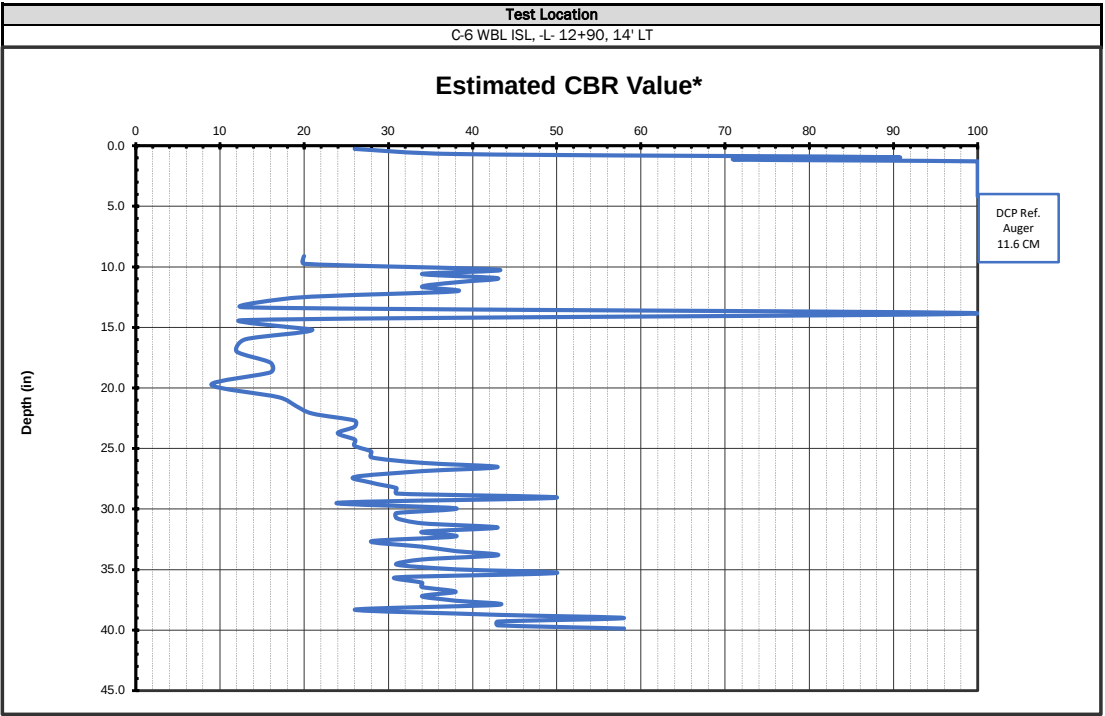


DUAL MASS DYNAMIC CONE PENETROMETER DATA SHEET							WBS NO.	PROJECT TIP I.D.				ROUTE			
							48392.1.1	U-6146				US 29/US 74 from SR 2209 to SR 2016/SR 2017			
							COUNTY	FIELD PROFESSIONAL				DRILLER/HELPER			
							Gaston	M. Brewer				C. Odom			
Test Location							Date Run	Test Location						Date Run	
C-5 WBL LTL, -L- 12+90, 4' LT							11/13/2019	C-6 WBL ISL, -L- 12+90, 14' LT						11/13/2019	
Type	Test Interval			Datum or reference surface				Type	Test Interval			Datum or reference surface			
DCP	Cumulative cm per blow			Top of ABC				DCP	Cumulative cm per blow			Top of ABC			
1.30	34.20	87.50						1.30	35.30						
1.90	35.00	88.30						2.20	37.80						
2.10	35.50	88.90						2.60	39.40						
2.30	36.40	89.60						3.10	41.80						
2.40	37.10							3.46	44.50						
2.66	37.80							3.82	46.50						
2.92	38.40							4.18	48.50						
3.18	38.80							4.54	51.80						
3.44	39.50							4.90	53.70						
3.70	39.80							5.20	55.40						
3.83	40.50							5.50	57.00						
3.96	41.10							5.80	58.30						
4.08	41.70							6.10	59.60						
4.21	42.10							6.40	61.00						
4.34	44.10							6.56	62.30						
4.47	46.10							6.72	63.60						
4.60	47.70							6.88	64.80						
4.73	49.90							7.04	66.00						
4.85	50.50							7.20	67.00						
4.98	52.00							7.38	67.80						
5.11	53.60							7.56	68.80						
5.24	54.50							7.74	70.10						
5.37	55.70							7.92	71.30						
5.50	57.00							8.10	72.40						
5.62	57.80							8.16	73.50						
5.75	59.20							8.22	74.20						
5.88	60.30							8.28	75.60						
6.01	61.20							8.34	76.50						
6.14	62.00							8.40	77.60						
6.27	62.70							8.48	78.70						
6.39	63.60							8.56	79.70						
6.52	64.50							8.64	80.50						
6.65	65.40							8.72	81.50						
6.78	66.10							8.80	82.40						
6.91	66.70							8.88	83.60						
7.03	67.60							8.96	84.60						
7.16	68.30							9.04	85.50						
7.29	69.00							9.12	86.30						
7.42	70.00							9.20	87.30						
7.55	70.40							9.26	88.40						
7.68	71.20							9.32	89.30						
7.80	72.00							9.38	90.00						
7.93	72.60							9.44	91.10						
8.06	73.40							9.50	92.10						
8.19	74.30							9.62	93.10						
8.32	74.90							9.74	94.00						
8.45	75.70							9.86	95.00						
8.57	76.30							9.98	95.90						
8.70	77.00							10.10	96.70						
8.83	77.70							10.22	98.00						
8.96	78.40							10.34	98.80						
9.09	79.10							10.46	99.40						
9.22	79.90							10.58	100.20						
9.34	80.60							10.70	101.00						
9.47	81.10							AUGER	101.60						
9.60	81.50							22.30							
AUGER	82.30							23.95							
25.70	82.60							25.60							
27.80	83.40							26.40							
28.60	83.90							27.40							
29.10	84.50							28.20							
30.10	85.20							29.10							
30.90	85.60							30.10							
31.70	86.30							31.00							
32.60	86.70							32.70							
33.70	86.80							35.10							



ABC	
ABC Thickness (in)	15.5
Average CBR	87
Weighted CBR Average	61
Maximum CBR Value	100
Minimum CBR Value	15

Soil Subgrade	
Average CBR	50
Weighted Average	41
Max CBR	100
Min CBR	15



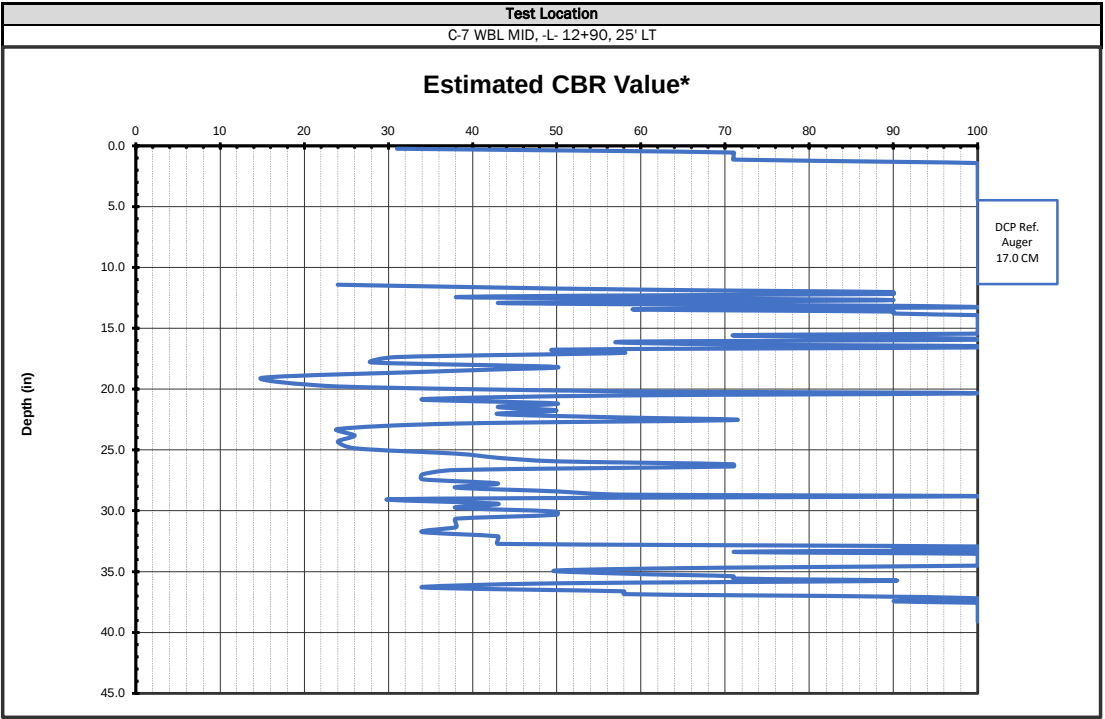
ABC	
ABC Thickness (in)	14.0
Average CBR	87
Weighted CBR Average	53
Maximum CBR Value	100
Minimum CBR Value	13

Soil Subgrade	
Average CBR	32
Weighted Average	27
Max CBR	58
Min CBR	9

*Estimated CBR Value obtained using published correlation provided by NCDOT (Chemical Stabilization QA Subgrade/Base Field Testing, 2015)

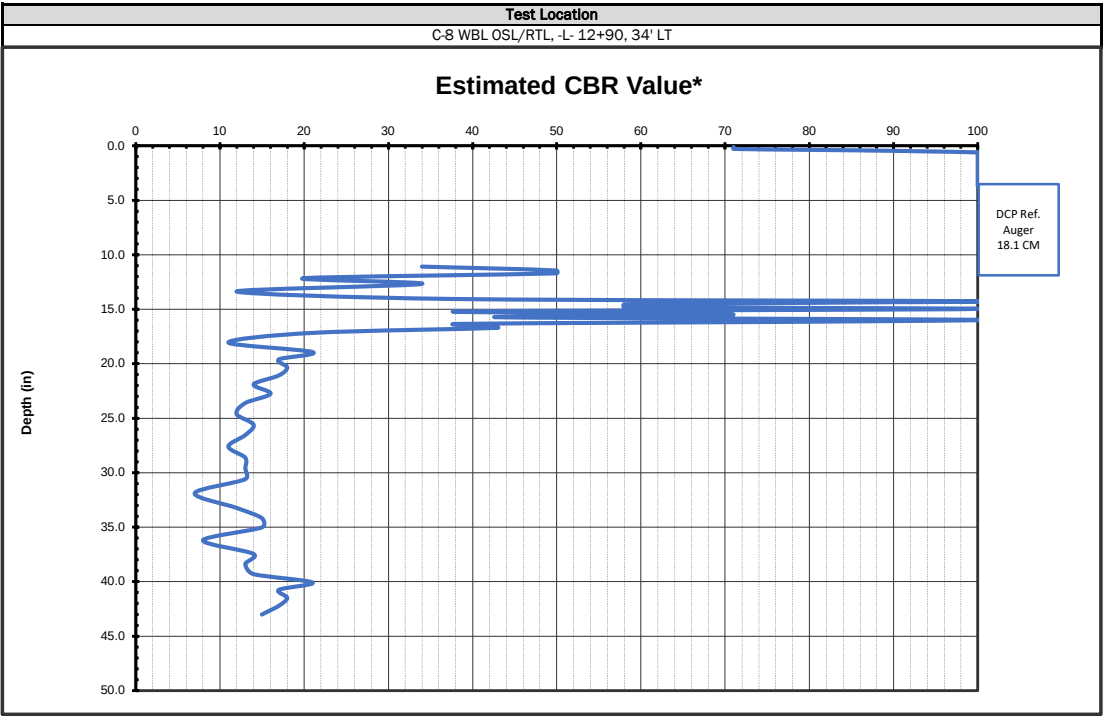


DUAL MASS DYNAMIC CONE PENETROMETER DATA SHEET							WBS NO.	PROJECT TIP I.D.				ROUTE			
							48392.1.1	U-6146				US 29/US 74 from SR 2209 to SR 2016/SR 2017			
							COUNTY	FIELD PROFESSIONAL				DRILLER/HELPER			
							Gaston	M. Brewer				C. Odom			
Test Location							Date Run	Test Location						Date Run	
C-7 WBL MID, -L- 12+90, 25' LT							11/13/2019	C-8 WBL OSL/RTL, -L- 12+90, 34' LT						11/13/2019	
Type	Test Interval			Datum or reference surface				Type	Test Interval			Datum or reference surface			
DCP	Cumulative cm per blow			Top of ABC				DCP	Cumulative cm per blow			Top of ABC			
1.10	10.66	52.40	95.60					0.50	8.92						
1.60	10.72	53.40	95.70					1.00	9.03						
2.10	10.78	54.10	95.80					1.40	9.14						
2.60	10.84	54.90	95.92					1.70	9.26						
3.10	10.90	55.60	96.04					1.90	9.37						
3.50	10.98	56.40	96.16					2.00	9.49						
3.60	11.06	57.00	96.28					2.10	9.60						
3.90	11.14	57.50	96.40					2.20	AUGER						
4.20	11.22	58.40	96.48					2.31	27.70						
4.50	11.30	59.80	96.56					2.43	28.70						
4.60	AUGER	61.10	96.64					2.54	29.40						
4.90	28.30	62.50	96.72					2.66	30.10						
5.10	29.70	63.80	96.80					2.77	31.70						
5.20	30.30	64.70	96.90					2.88	32.70						
5.30	30.70	65.50	97.00					3.00	35.30						
5.40	31.10	66.20	97.10					3.11	36.20						
5.50	32.00	66.70	97.20					3.22	36.30						
5.60	32.40	67.20	97.30					3.34	36.70						
5.70	33.20	68.10	97.36					3.45	37.30						
5.80	33.60	69.10	97.42					3.57	37.90						
5.90	33.80	70.10	97.48					3.68	38.20						
6.00	34.40	70.90	97.54					3.79	39.10						
6.10	34.80	71.80	97.60					3.91	39.60						
6.20	35.20	72.50	97.68					4.02	40.40						
6.30	35.50	73.10	97.76					4.14	40.70						
6.46	35.60	73.20	97.84					4.25	41.10						
6.62	35.70	74.30	97.92					4.36	42.00						
6.78	35.84	75.10	98.00					4.48	42.80						
6.94	35.98	76.00	98.06					4.59	44.40						
7.10	36.12	76.70	98.12					4.70	47.30						
7.18	36.26	77.40	98.18					4.82	48.90						
7.26	36.40	78.30	98.24					4.93	50.80						
7.34	36.56	79.20	98.30					5.05	52.60						
7.42	36.72	80.10	98.38					5.16	54.50						
7.50	36.88	81.10	98.46					5.27	56.80						
7.60	37.04	81.90	98.54					5.39	58.80						
7.70	37.20	82.70	98.62					5.50	61.20						
7.80	37.32	83.50	98.70					5.62	63.90						
7.90	37.44	83.80	98.78					5.73	66.20						
8.00	37.56	84.20	98.86					5.84	68.70						
8.10	37.68	84.50	98.94					5.96	71.50						
8.20	37.80	85.00	99.02					6.07	74.00						
8.30	38.06	85.30	99.10					6.18	76.50						
8.40	38.32	85.50	99.16					6.30	78.90						
8.50	38.58	85.80	99.22					6.41	83.10						
8.70	38.84	86.14	99.28					6.53	85.70						
8.90	39.10	86.48	99.34					6.64	87.90						
9.10	39.30	86.82	99.40					6.75	90.00						
9.30	39.80	87.16						6.87	94.00						
9.50	40.20	87.50						6.98	96.30						
9.54	40.40	87.80						7.10	98.70						
9.58	40.60	88.30						7.21	101.00						
9.62	41.20	89.00						7.32	102.60						
9.66	41.70	89.60						7.44	104.50						
9.70	41.90	90.10						7.55	106.30						
9.82	42.20	90.60						7.66	108.20						
9.94	42.90	91.00						7.78	110.30						
10.06	43.50	91.70						7.89							
10.18	44.60	92.70						8.01							
10.30	45.80	93.30						8.12							
10.35	46.50	93.90						8.23							
10.40	47.40	94.30						8.35							
10.45	49.50	94.60						8.46							
10.50	50.90	94.90						8.58							
10.55	51.50	95.30						8.69							
10.60	51.80	95.50						8.80							



ABC	
ABC Thickness (in)	14.0
Average CBR	94
Weighted CBR Average	77
Maximum CBR Value	100
Minimum CBR Value	24

Soil Subgrade	
Average CBR	79
Weighted Average	55
Max CBR	100
Min CBR	15

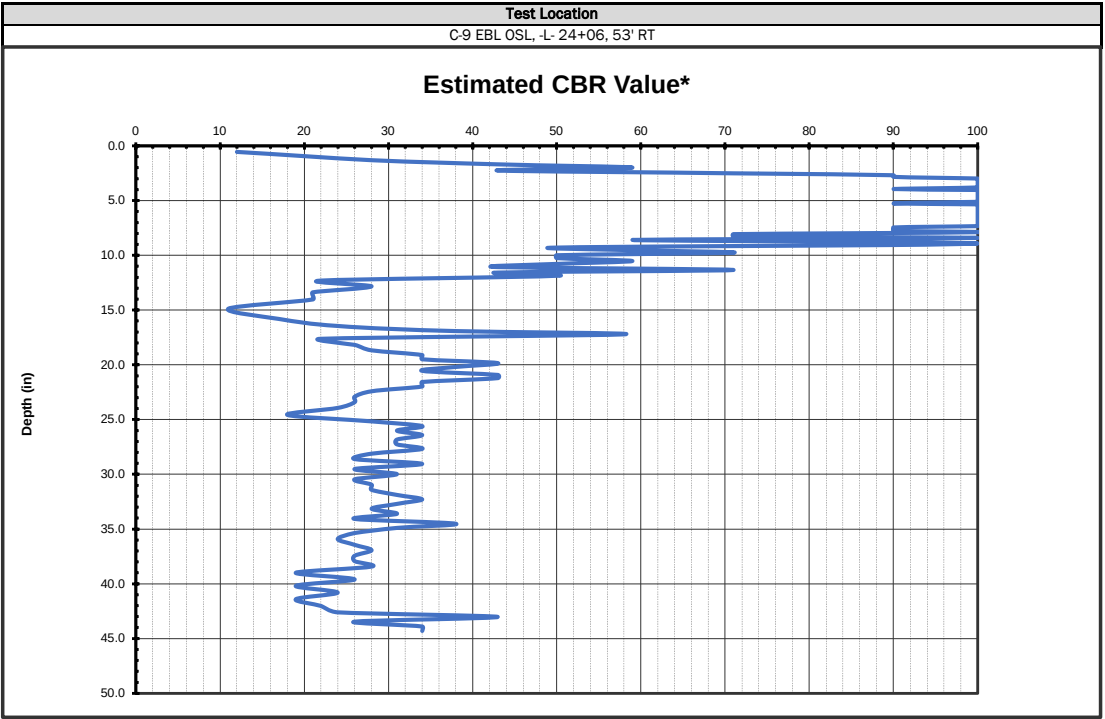


ABC	
ABC Thickness (in)	13.0
Average CBR	95
Weighted CBR Average	75
Maximum CBR Value	100
Minimum CBR Value	20

Soil Subgrade	
Average CBR	30
Weighted Average	18
Max CBR	100
Min CBR	7

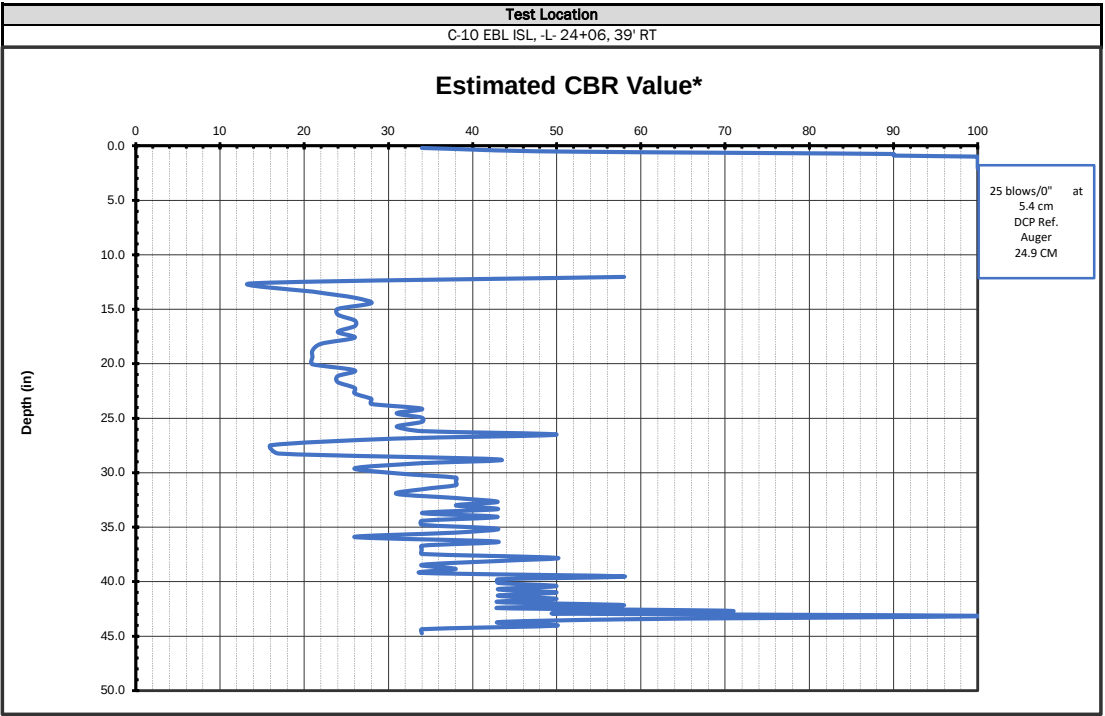
*Estimated CBR Value obtained using published correlation provided by NCDOT (Chemical Stabilization QA Subgrade/Base Field Testing, 2015)

DUAL MASS DYNAMIC CONE PENETROMETER DATA SHEET							WBS NO.	PROJECT TIP I.D.				ROUTE			
							48392.1.1	U-6146				US 29/US 74 from SR 2209 to SR 2016/SR 2017			
							COUNTY	FIELD PROFESSIONAL				DRILLER/HELPER			
							Gaston	M. Brewer				C. Odom			
Test Location							Date Run	Test Location						Date Run	
C-9 EBL OSL, -L- 24+06, 53' RT							11/12/2019	C-10 EBL ISL, -L- 24+06, 39' RT						11/12/2019	
Type	Test Interval			Datum or reference surface			Type	Test Interval			Datum or reference surface				
DCP	Cumulative cm per blow			Top of ABC			DCP	Cumulative cm per blow			Top of ABC				
2.70	25.00	101.20					1.00	64.90							
3.90	25.70	102.90					1.70	66.00							
4.70	26.40	104.30					2.10	67.00							
5.30	27.00	106.00					2.50	67.70							
6.10	27.70	107.50					2.60	68.80							
6.60	28.50	108.90					2.80	70.80							
7.00	29.00	109.70					3.00	72.70							
7.40	29.80	111.00					3.10	73.50							
7.70	30.50	112.00					3.24	74.50							
7.90	32.00	113.00					3.38	75.80							
8.20	33.20						3.52	76.90							
8.50	34.80						3.66	77.80							
8.70	36.40						3.80	78.70							
9.00	39.20						3.84	79.60							
9.20	41.10						3.88	80.60							
9.30	42.50						3.92	81.70							
9.50	43.40						3.96	82.60							
9.80	44.00						4.00	83.40							
10.20	45.50						4.02	84.30							
10.30	46.80						4.04	85.10							
10.50	48.00						4.06	86.10							
10.70	49.00						4.08	86.90							
11.00	50.00						4.10	87.90							
11.20	50.80						4.14	88.90							
11.40	51.70						4.18	89.70							
11.60	52.70						4.22	90.60							
11.90	53.50						4.26	91.90							
12.00	54.30						4.30	92.70							
12.30	55.30						4.32	93.70							
12.50	56.30						4.34	94.70							
12.80	57.50						4.36	95.70							
13.10	58.80						4.38	96.40							
13.50	60.10						4.40	97.20							
13.60	61.50						4.56	98.20							
13.80	63.30						4.72	99.10							
14.10	64.50						4.88	100.10							
14.40	65.50						5.04	100.70							
14.70	66.60						5.20	101.50							
15.00	67.60						5.40	102.30							
15.20	68.70						AUGER	103.00							
15.50	69.80						30.30	103.80							
15.80	70.80						30.90	104.50							
16.10	72.00						33.20	105.30							
16.40	73.30						34.80	106.00							
16.60	74.30						36.10	106.80							
16.90	75.60						37.30	107.40							
17.20	76.70						38.70	108.20							
17.50	78.00						40.10	108.70							
17.70	79.20						41.40	109.40							
18.00	80.40						42.70	109.70							
18.30	81.50						44.10	110.10							
18.50	82.50						45.40	110.70							
18.70	83.60						46.90	111.50							
19.10	84.80						48.50	112.20							
19.50	85.90						50.10	113.20							
19.90	87.20						51.70	114.20							
20.20	88.10						53.00								
20.70	89.20						54.40								
21.20	90.50						55.80								
21.50	91.90						57.10								
22.10	93.20						58.40								
22.50	94.40						59.60								
22.80	95.70						60.80								
23.20	97.00						61.80								
23.90	98.20						62.90								
24.50	99.90						63.90								



ABC	
ABC Thickness (in)	11.5
Average CBR	87
Weighted CBR Average	72
Maximum CBR Value	100
Minimum CBR Value	12

Soil Subgrade	
Average CBR	30
Weighted Average	28
Max CBR	58
Min CBR	11



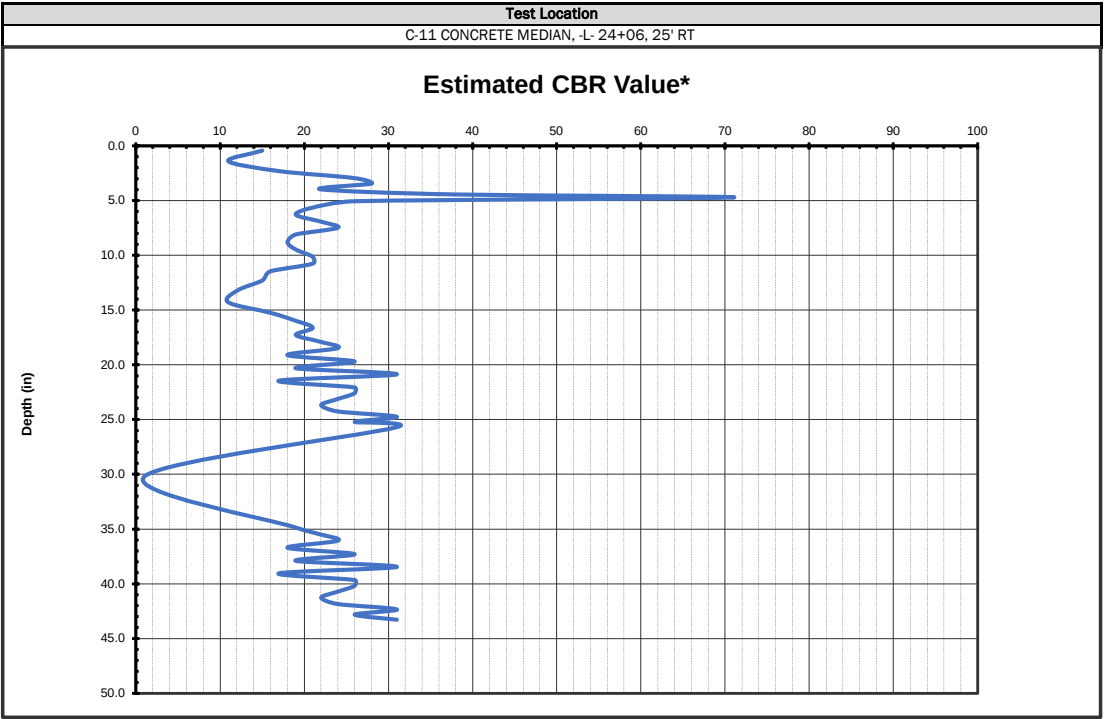
ABC	
ABC Thickness (in)	11.0
Average CBR	97
Weighted CBR Average	80
Maximum CBR Value	100
Minimum CBR Value	34

Soil Subgrade	
Average CBR	37
Weighted Average	33
Max CBR	100
Min CBR	14

*Estimated CBR Value obtained using published correlation provided by NCDOT (Chemical Stabilization QA Subgrade/Base Field Testing, 2015)

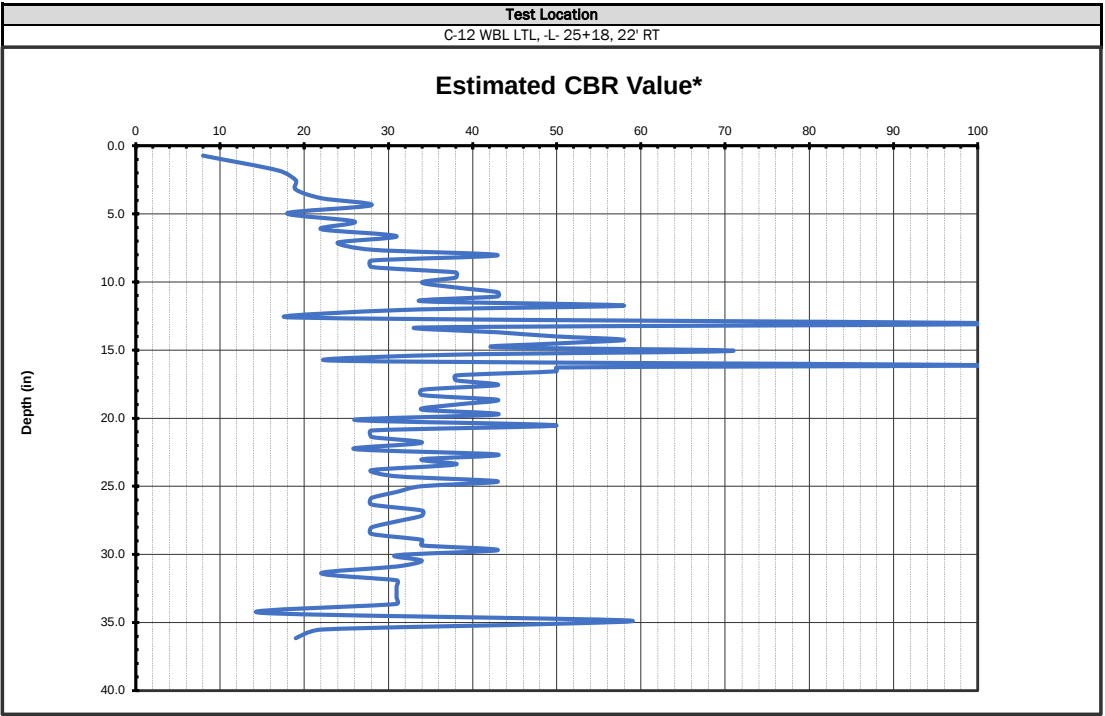


DUAL MASS DYNAMIC CONE PENETROMETER DATA SHEET						WBS NO.	PROJECT TIP I.D.				ROUTE				
						48392.1.1	U-6146				US 29/US 74 from SR 2209 to SR 2016/SR 2017				
						COUNTY	FIELD PROFESSIONAL				DRILLER/HELPER				
Gaston						M. Brewer				C. Odom					
Test Location						Date Run		Test Location						Date Run	
C-11 CONCRETE MEDIAN, -L- 24+06, 25' RT						11/12/2019		C-12 WBL LTL, -L- 25+18, 22' RT						11/13/2019	
Type	Test Interval			Datum or reference surface			Type	Test Interval			Datum or reference surface				
DCP	Cumulative cm per blow			Top of Soil Subgrade			DCP	Cumulative cm per blow			Top of Soil Subgrade				
2.10							3.70	70.60							
4.90							5.60	71.80							
6.80							7.30	73.00							
8.10							9.00	74.00							
9.30							10.50	75.00							
10.80							11.70	75.80							
11.70							13.50	76.90							
12.20							14.80	77.90							
13.50							16.30	79.00							
15.10							17.40	80.50							
16.80							18.80	81.60							
18.30							20.00	82.70							
19.70							20.80	83.80							
21.40							22.00	84.90							
23.20							23.20	86.00							
24.90							24.10	88.20							
26.50							25.00	88.80							
28.10							26.00	89.50							
30.10							26.90	91.00							
32.30							27.70	92.70							
34.90							28.50								
37.70							29.50								
39.70							30.10								
41.40							31.20								
43.00							32.90								
44.70							33.20								
46.20							33.40								
47.60							34.40								
49.40							35.20								
50.70							35.90								
52.40							36.50								
53.50							37.20								
55.40							38.00								
56.70							38.50								
58.00							39.40								
59.40							40.80								
60.90							41.00								
62.30							41.70								
63.40							42.40								
64.70							43.30								
65.80							44.20								
87.70							45.00								
89.40							46.00								
90.90							47.00								
92.30							47.80								
94.10							48.70								
95.40							49.70								
97.10							50.50								
98.20							51.80								
100.10							52.50								
101.40							53.70								
102.70							54.90								
104.10							55.90								
105.60							57.20								
107.00							58.00								
108.10							59.00								
109.40							59.90								
110.50							61.10								
							62.20								
							63.00								
							64.00								
							65.10								
							66.30								
							67.50								
							68.50								
							69.50								



ABC	
ABC Thickness (in)	
Average CBR	
Weighted CBR Average	
Maximum CBR Value	
Minimum CBR Value	

Soil Subgrade	
Average CBR	23
Weighted Average	17
Max CBR	71
Min CBR	1

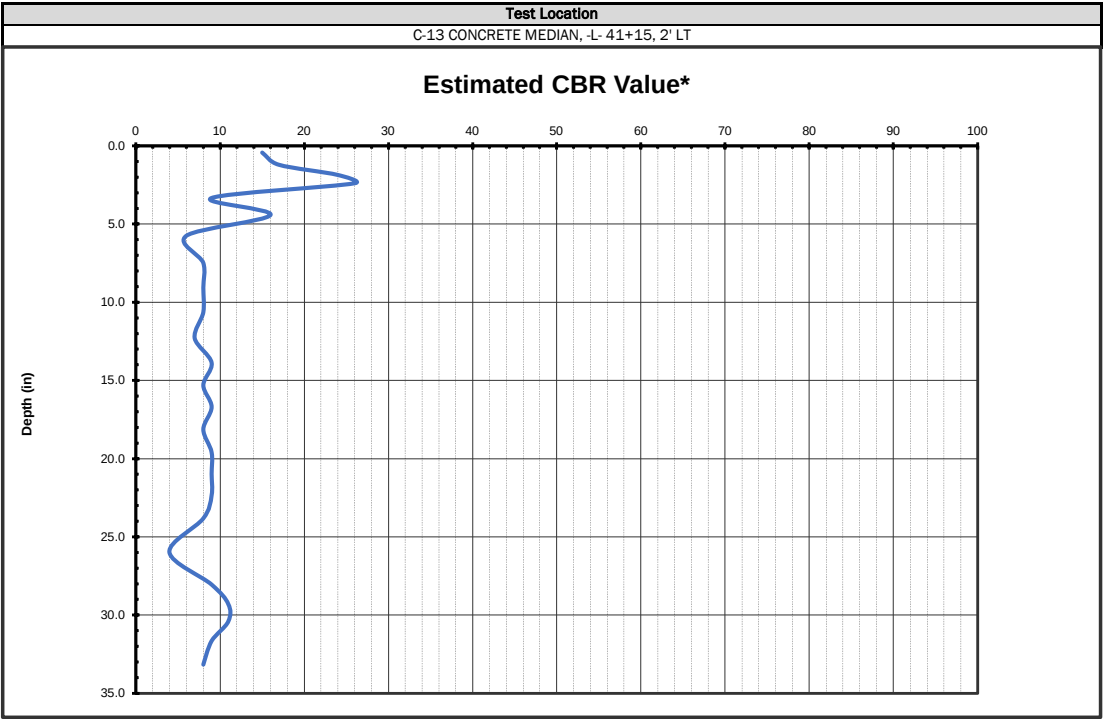


ABC	
ABC Thickness (in)	
Average CBR	
Weighted CBR Average	
Maximum CBR Value	
Minimum CBR Value	

Soil Subgrade	
Average CBR	36
Weighted Average	31
Max CBR	100
Min CBR	8

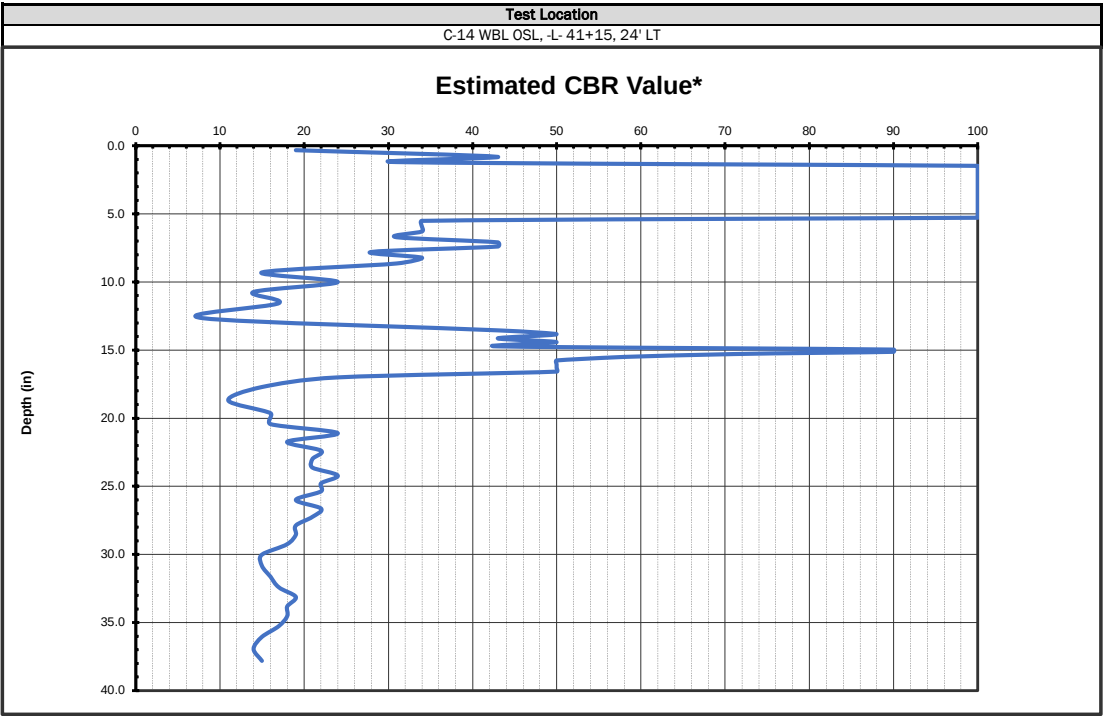
*Estimated CBR Value obtained using published correlation provided by NCDOT (Chemical Stabilization QA Subgrade/Base Field Testing, 2015)

DUAL MASS DYNAMIC CONE PENETROMETER DATA SHEET							WBS NO.	PROJECT TIP I.D.				ROUTE			
							48392.1.1	U-6146				US 29/US 74 from SR 2209 to SR 2016/SR 2017			
							COUNTY	FIELD PROFESSIONAL				DRILLER/HELPER			
							Gaston	M. Brewer				C. Odom			
Test Location							Date Run	Test Location						Date Run	
C-13 CONCRETE MEDIAN, -L- 41+15, 2' LT							11/13/2019	C-14 WBL OSL, -L- 41+15, 24' LT						11/13/2019	
Type	Test Interval			Datum or reference surface			Type	Test Interval			Datum or reference surface				
DCP	Cumulative cm per blow			Top of Soil Subgrade			DCP	Cumulative cm per blow			Top of ABC				
2.10							1.70	26.10							
4.00							2.50	28.40							
5.40							3.60	30.30							
6.70							3.90	34.00							
10.20							4.20	34.80							
12.20							4.38	35.50							
17.00							4.56	36.30							
21.00							4.75	37.00							
25.00							4.93	37.80							
29.00							5.11	38.20							
33.40							5.29	38.60							
37.00							5.48	39.10							
40.70							5.66	39.70							
44.10							5.84	40.40							
48.00							6.02	41.10							
51.50							6.21	41.80							
55.00							6.39	42.50							
58.50							6.57	43.90							
62.50							6.75	46.10							
69.50							6.94	48.90							
73.00							7.12	50.90							
75.80							7.30	52.90							
78.60							7.48	54.30							
82.20							7.66	56.10							
86.30							7.85	57.60							
							8.03	59.20							
							8.21	60.80							
							8.39	62.20							
							8.58	63.70							
							8.76	65.20							
							8.94	66.90							
							9.12	68.40							
							9.31	70.00							
							9.49	71.70							
							9.67	73.40							
							9.85	75.20							
							10.04	77.30							
							10.22	79.40							
							10.40	81.40							
							10.58	83.30							
							10.76	85.00							
							10.95	86.80							
							11.13	88.60							
							11.31	90.50							
							11.49	92.70							
							11.68	95.00							
							11.86	97.10							
							12.04								
							12.22								
							12.41								
							12.59								
							12.77								
							12.95								
							13.14								
							13.32								
							13.50								
							14.50								
							15.50								
							16.50								
							17.60								
							18.40								
							19.20								
							20.40								
							21.40								
							22.50								
							24.70								



ABC	
ABC Thickness (in)	
Average CBR	
Weighted CBR Average	
Maximum CBR Value	
Minimum CBR Value	

Soil Subgrade	
Average CBR	11
Weighted Average	9
Max CBR	26
Min CBR	4

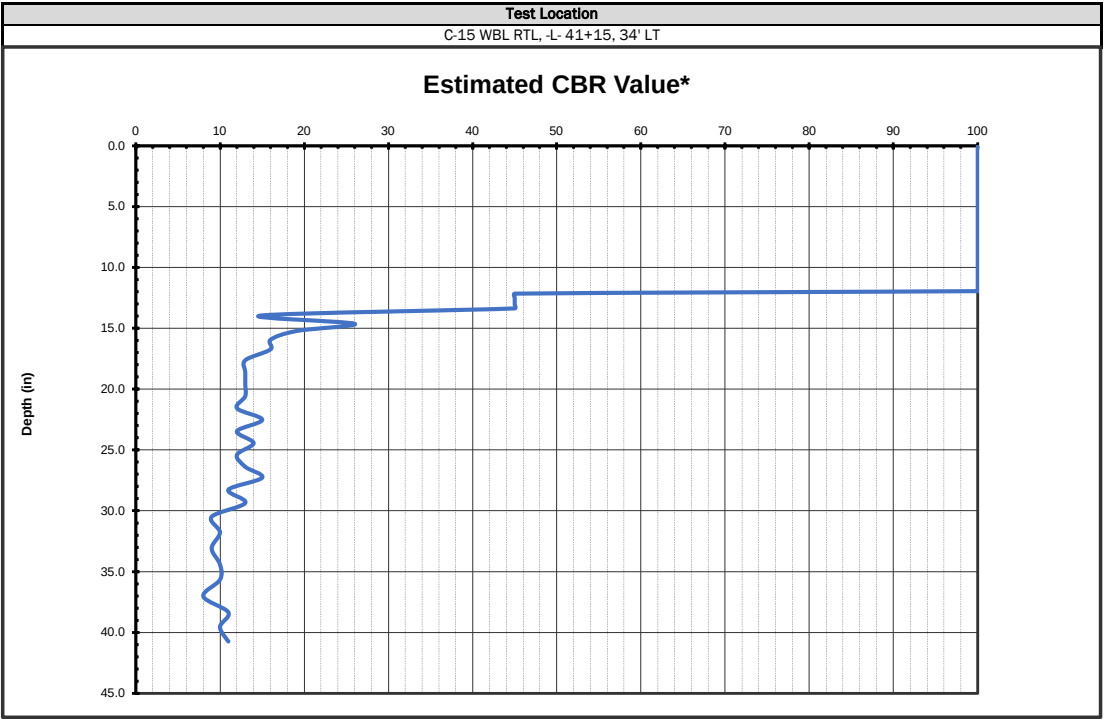


ABC	
ABC Thickness (in)	13.0
Average CBR	83
Weighted CBR Average	46
Maximum CBR Value	100
Minimum CBR Value	8

Soil Subgrade	
Average CBR	30
Weighted Average	23
Max CBR	90
Min CBR	11

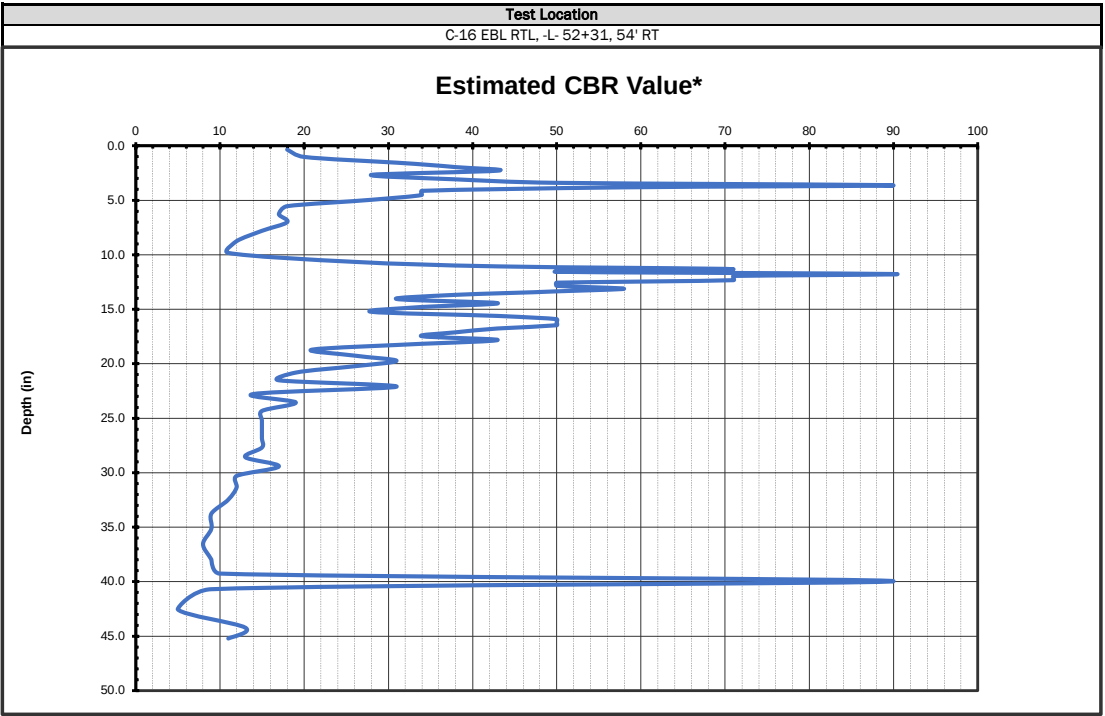
*Estimated CBR Value obtained using published correlation provided by NCDOT (Chemical Stabilization QA Subgrade/Base Field Testing, 2015)

DUAL MASS DYNAMIC CONE PENETROMETER DATA SHEET							WBS NO.	PROJECT TIP I.D.				ROUTE			
							48392.1.1	U-6146				US 29/US 74 from SR 2209 to SR 2016/SR 2017			
							COUNTY	FIELD PROFESSIONAL				DRILLER/HELPER			
							Gaston	M. Brewer				C. Odom			
Test Location							Date Run	Test Location						Date Run	
C-15 WBL RTL, -L- 41+15, 34' LT							11/13/2019	C-16 EBL RTL, -L- 52+31, 54' RT						11/12/2019	
Type	Test Interval			Datum or reference surface			Type	Test Interval			Datum or reference surface				
DCP	Cumulative cm per blow			Top of ABC			DCP	Cumulative cm per blow			Top of ABC				
0.20	10.74	17.12	33.54				1.80	94.70							
0.40	10.82	17.36	34.30				3.40	98.20							
0.60	10.90	17.60	36.50				4.50	101.30							
0.80	10.96	17.84	37.80				5.40	101.70							
1.00	11.02	18.08	39.50				6.20	105.00							
1.20	11.08	18.32	41.50				7.40	111.10							
1.40	11.14	18.56	43.50				8.30	113.50							
1.60	11.20	18.80	46.00				9.00	116.30							
1.80	11.28	18.94	48.50				9.40								
2.00	11.36	19.08	51.00				10.00								
2.22	11.44	19.22	53.50				11.00								
2.44	11.52	19.36	56.10				12.00								
2.66	11.60	19.50	58.30				13.20								
2.88	11.76	19.58	60.90				15.00								
3.10	11.92	19.66	63.20				16.90								
3.38	12.08	19.74	65.80				18.70								
3.65	12.24	19.82	68.20				20.90								
3.93	12.40	19.90	70.30				23.60								
4.20	12.46	20.06	73.30				26.40								
4.36	12.52	20.22	75.80				27.70								
4.52	12.58	20.38	79.10				28.50								
4.68	12.64	20.54	82.30				29.00								
4.84	12.70	20.70	85.80				29.70								
5.00	12.92	20.86	89.00				30.10								
5.18	13.14	21.02	92.20				30.60								
5.36	13.36	21.18	95.90				31.10								
5.54	13.58	21.34	98.90				31.60								
5.72	13.80	21.50	102.00				32.30								
5.90	13.90	21.64	105.00				33.00								
6.18	14.00	21.78					33.60								
6.46	14.10	21.92					34.30								
6.74	14.20	22.06					35.20								
7.02	14.30	22.20					36.30								
7.30	14.34	22.42					37.10								
7.40	14.38	22.64					38.10								
7.50	14.42	22.86					39.30								
7.60	14.46	23.08					40.10								
7.70	14.50	23.30					40.80								
7.80	14.56	23.54					41.50								
7.92	14.62	23.78					42.20								
8.04	14.68	24.02					43.00								
8.16	14.74	24.26					43.90								
8.28	14.80	24.50					44.90								
8.40	14.90	24.80					45.70								
8.52	15.00	25.10					46.70								
8.64	15.10	25.40					48.30								
8.76	15.20	25.70					49.60								
8.88	15.30	26.00					50.70								
9.00	15.40	26.24					52.00								
9.12	15.46	26.48					53.70								
9.24	15.52	26.72					55.60								
9.36	15.58	26.96					56.70								
9.48	15.64	27.20					59.00								
9.60	15.70	27.50					60.70								
9.66	15.80	27.80					62.90								
9.72	15.90	28.10					65.10								
9.78	16.00	28.40					67.20								
9.84	16.10	28.70					69.30								
9.90	16.20	29.06					71.40								
10.02	16.24	29.42					73.80								
10.14	16.28	29.78					75.70								
10.26	16.32	30.14					78.30								
10.38	16.36	30.50					81.00								
10.50	16.40	31.26					84.00								
10.58	16.64	32.02					87.60								
10.66	16.88	32.78					91.00								



ABC	
ABC Thickness (in)	13.0
Average CBR	99
Weighted CBR Average	96
Maximum CBR Value	100
Minimum CBR Value	45

Soil Subgrade	
Average CBR	15
Weighted Average	13
Max CBR	45
Min CBR	8

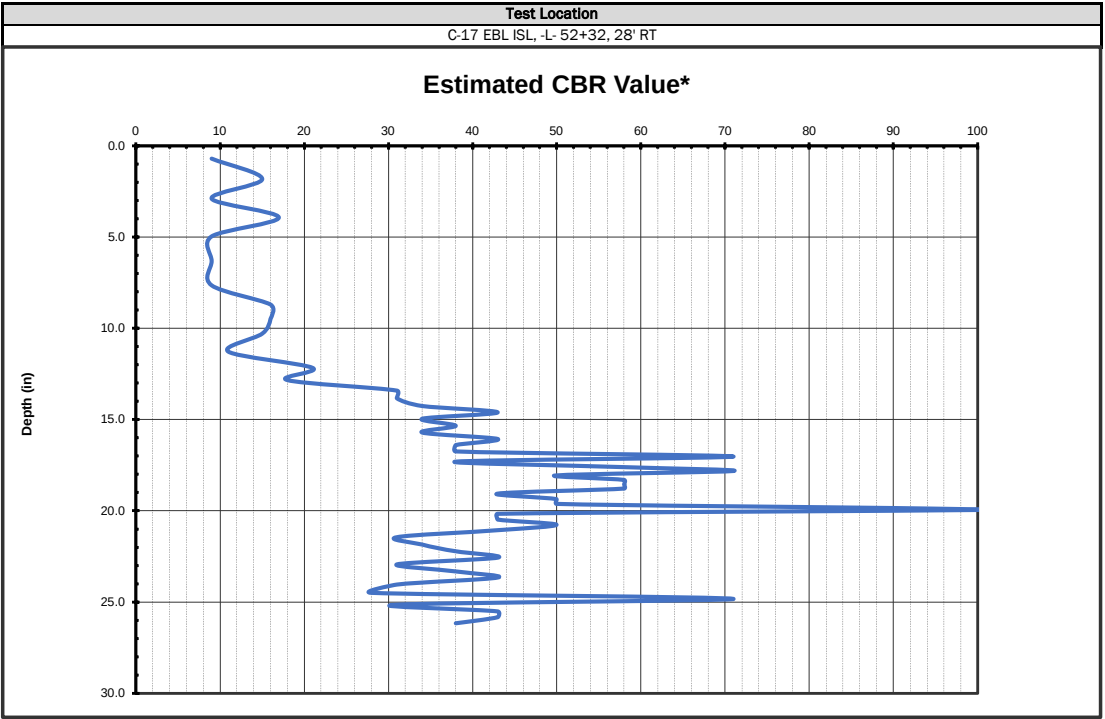


ABC	
ABC Thickness (in)	3.0
Average CBR	30
Weighted CBR Average	27
Maximum CBR Value	43
Minimum CBR Value	18

Soil Subgrade	
Average CBR	32
Weighted Average	21
Max CBR	90
Min CBR	5

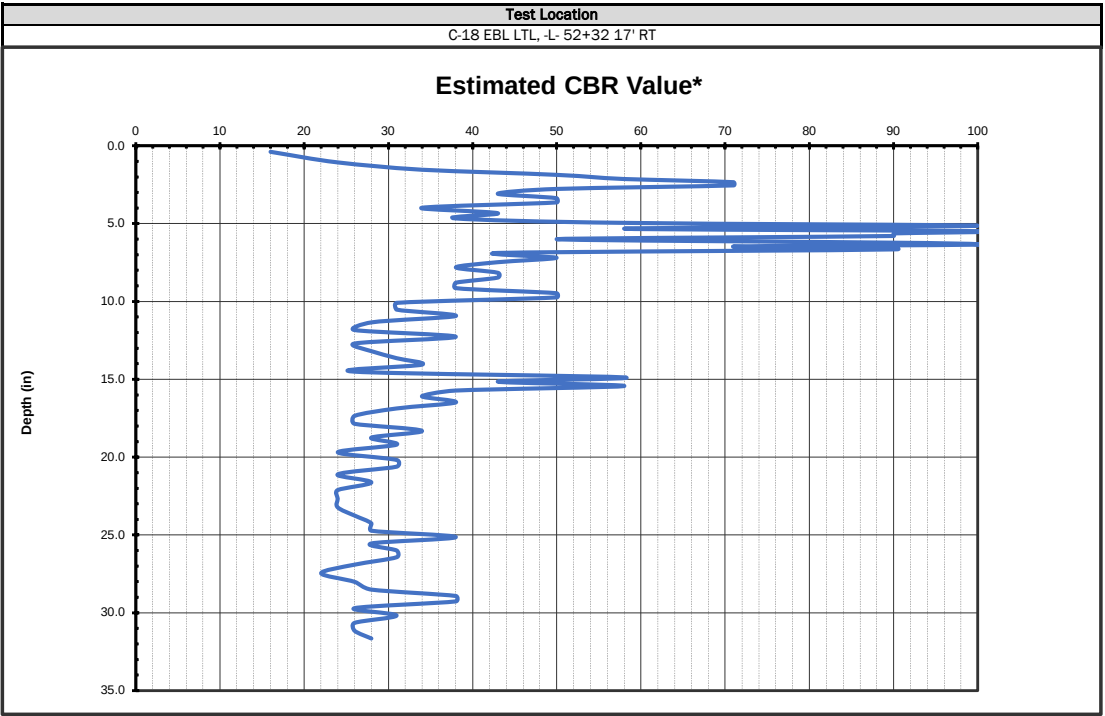
*Estimated CBR Value obtained using published correlation provided by NCDOT (Chemical Stabilization QA Subgrade/Base Field Testing, 2015)

DUAL MASS DYNAMIC CONE PENETROMETER DATA SHEET							WBS NO.	PROJECT TIP I.D.				ROUTE			
							48392.1.1	U-6146				US 29/US 74 from SR 2209 to SR 2016/SR 2017			
							COUNTY	FIELD PROFESSIONAL				DRILLER/HELPER			
Test Location							Date Run	Test Location				Date Run			
C-17 EBL ISL, -L- 52+32, 28' RT							11/13/2019	C-18 EBL LTL, -L- 52+32 17' RT				11/13/2019			
Type	Test Interval			Datum or reference surface			Type	Test Interval			Datum or reference surface				
DCP	Cumulative cm per blow			Top of Soil Subgrade			DCP	Cumulative cm per blow			Top of Soil Subgrade				
3.50							2.00	61.00							
5.70							3.40	62.20							
9.00							4.40	63.40							
10.90							5.10	64.30							
14.30							5.70	65.50							
17.70							6.20	66.60							
21.10							6.70	67.70							
23.10							7.40	69.00							
25.10							8.20	70.50							
27.20							8.90	71.80							
30.10							9.60	73.00							
31.70							10.60	73.90							
33.50							11.40	74.80							
34.60							12.30	76.10							
35.70							12.90	77.20							
36.70							13.20	78.50							
37.50							13.80	79.80							
38.50							14.10	81.00							
39.40							14.50								
40.40							14.90								
41.20							15.60								
42.10							16.00								
43.00							16.20								
43.50							16.70								
44.40							17.10								
45.00							17.90								
45.50							18.60								
46.20							19.40								
46.80							20.30								
47.40							21.10								
48.00							21.90								
48.80							22.80								
49.50							23.70								
50.20							24.40								
50.60							25.10								
50.80							26.20								
51.60							27.30								
52.40							28.20								
53.10							29.40								
53.90							30.70								
55.00							31.60								
56.00							32.90								
56.90							34.10								
57.70							35.20								
58.80							36.20								
59.70							37.50								
60.50							38.10								
61.60							38.90								
62.80							39.50								
63.30							40.40								
64.40							41.40								
65.20							42.30								
66.00							43.40								
66.90							44.70								
							46.00								
							47.00								
							48.20								
							49.30								
							50.70								
							51.80								
							52.90								
							54.30								
							55.50								
							56.90								
							58.30								
							59.70								



ABC	
ABC Thickness (in)	
Average CBR	
Weighted CBR Average	
Maximum CBR Value	
Minimum CBR Value	

Soil Subgrade	
Average CBR	38
Weighted Average	27
Max CBR	100
Min CBR	9

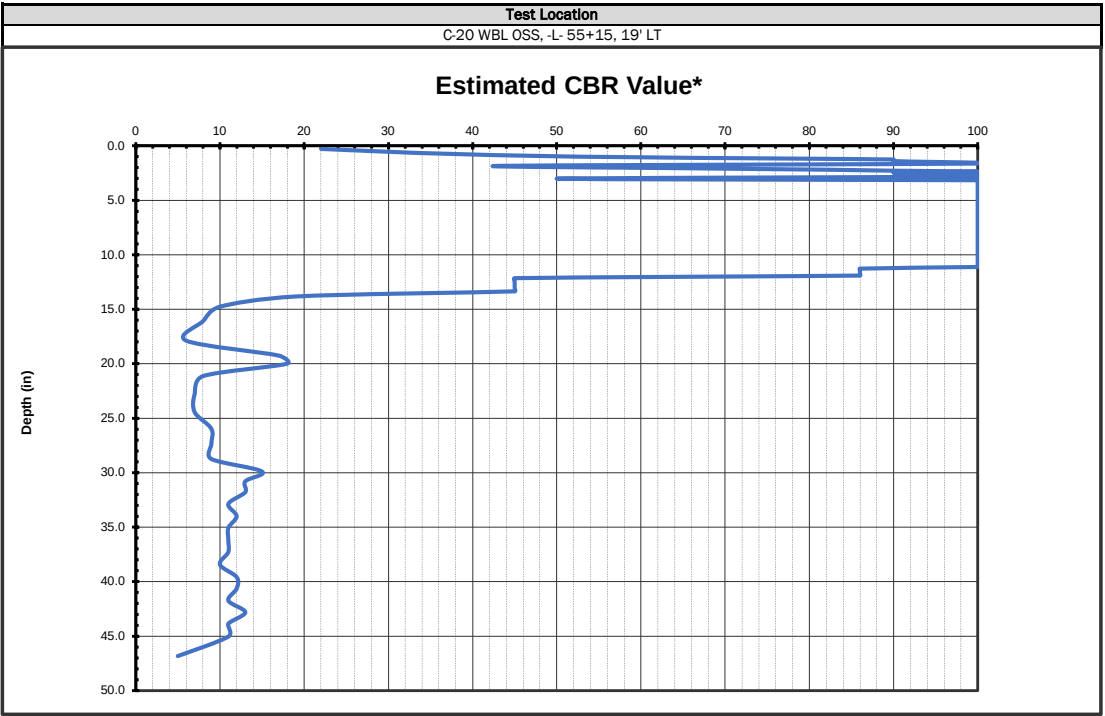
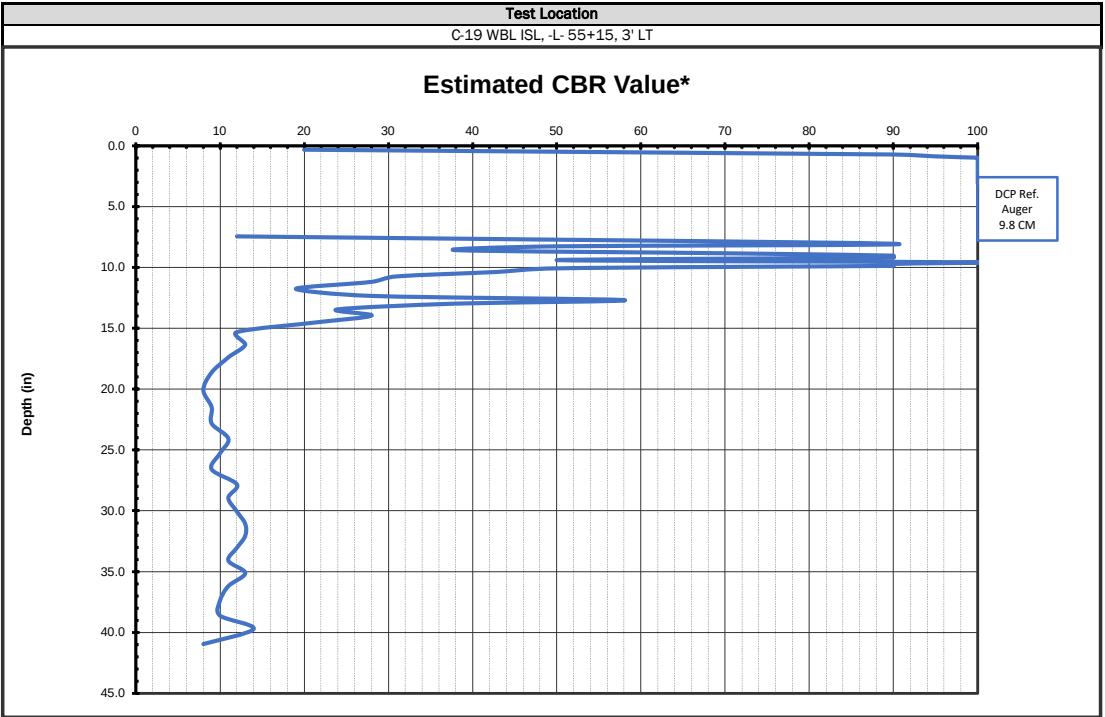


ABC	
ABC Thickness (in)	
Average CBR	
Weighted CBR Average	
Maximum CBR Value	
Minimum CBR Value	

Soil Subgrade	
Average CBR	41
Weighted Average	35
Max CBR	100
Min CBR	16

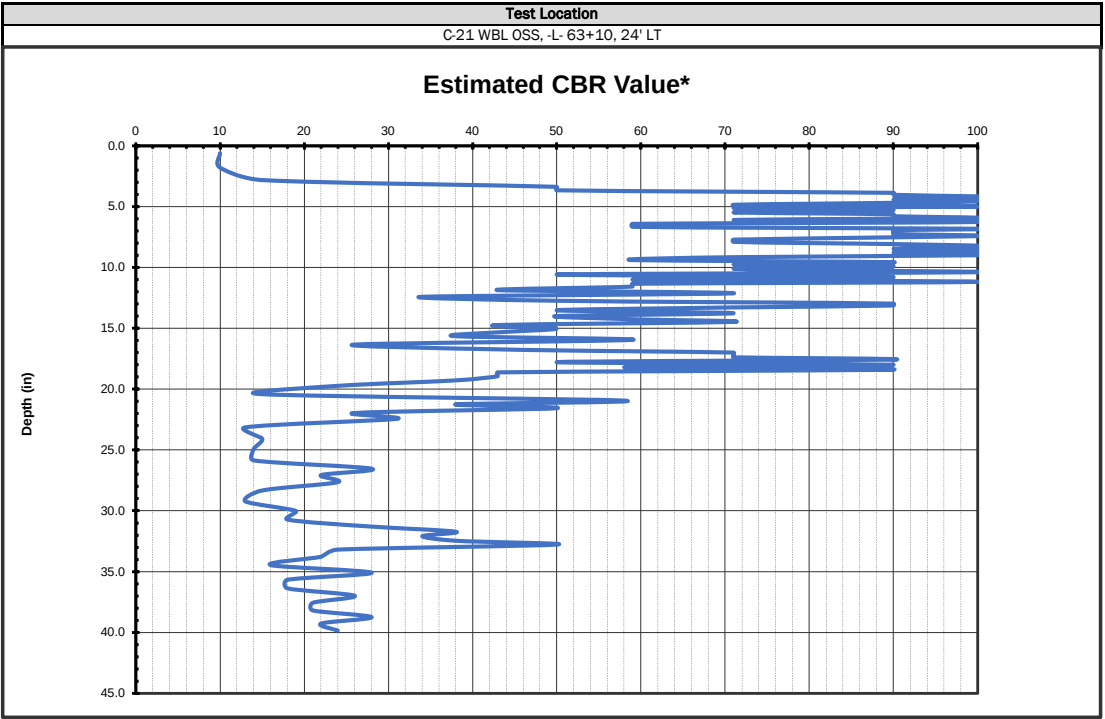
*Estimated CBR Value obtained using published correlation provided by NCDOT (Chemical Stabilization QA Subgrade/Base Field Testing, 2015)

DUAL MASS DYNAMIC CONE PENETROMETER DATA SHEET							WBS NO.	PROJECT TIP I.D.				ROUTE			
							48392.1.1	U-6146				US 29/US 74 from SR 2209 to SR 2016/SR 2017			
							COUNTY	FIELD PROFESSIONAL				DRILLER/HELPER			
Gaston							M. Brewer				C. Odom				
Test Location							Date Run	Test Location						Date Run	
C-19 WBL ISL, -L- 55+15, 3' LT							11/13/2019	C-20 WBL OSS, -L- 55+15, 19' LT						11/13/2019	
Type	Test Interval			Datum or reference surface			Type	Test Interval			Datum or reference surface				
DCP	Cumulative cm per blow			Top of ABC			DCP	Cumulative cm per blow			Top of ABC				
1.60	24.20						1.50	14.48	20.80	25.28	110.00				
2.00	24.40						2.40	14.52	20.85	25.35	112.90				
2.38	24.80						3.00	14.56	20.90	25.42	115.90				
2.56	25.20						3.40	14.60	20.96	25.49	122.00				
2.74	25.90						3.80	14.72	21.02	25.56					
2.92	26.70						4.10	14.84	21.08	25.63					
3.10	27.80						4.30	14.96	21.14	25.70					
3.34	29.00						5.10	15.08	21.20	25.73					
3.58	30.70						5.60	15.20	21.26	25.76					
3.82	31.90						6.00	15.32	21.32	25.79					
4.06	32.50						6.10	15.44	21.38	25.82					
4.30	33.40						6.50	15.56	21.44	25.85					
4.52	34.80						6.70	15.68	21.50	25.88					
4.74	36.00						7.00	15.80	21.61	25.91					
4.96	37.50						7.10	15.90	21.72	25.94					
5.18	40.20						7.30	16.00	21.83	25.97					
5.40	42.70						8.00	16.10	21.94	26.00					
5.47	45.60						8.10	16.20	22.05	26.10					
5.54	49.00						8.20	16.30	22.16	26.20					
5.61	52.90						8.30	16.36	22.27	26.30					
5.68	56.30						8.42	16.42	22.38	26.40					
5.75	59.60						8.54	16.48	22.49	26.50					
5.82	62.60						8.66	16.54	22.60	26.60					
5.89	65.80						8.78	16.60	22.68	26.70					
5.96	69.30						8.90	16.68	22.76	26.80					
6.03	72.00						9.12	16.76	22.84	26.90					
6.10	75.00						9.34	16.84	22.92	27.00					
6.14	77.70						9.56	16.92	23.00	27.28					
6.18	80.20						9.78	17.00	23.08	27.56					
6.22	82.60						10.00	17.12	23.16	27.84					
6.26	85.20						10.20	17.24	23.24	28.12					
6.30	88.00						10.40	17.36	23.32	28.40					
6.34	90.40						10.60	17.48	23.40	28.82					
6.38	93.40						10.80	17.60	23.48	29.24					
6.42	96.50						11.00	17.76	23.56	29.66					
6.46	99.70						11.08	17.92	23.64	30.08					
6.50	102.00						11.16	18.08	23.72	30.50					
6.56	106.00						11.24	18.24	23.80	31.26					
6.62							11.32	18.40	23.88	32.02					
6.68							11.40	18.54	23.96	32.78					
6.74							11.56	18.68	24.04	33.54					
6.80							11.72	18.82	24.12	34.30					
6.86							11.88	18.96	24.20	36.00					
6.92							12.04	19.10	24.23	39.00					
6.98							12.20	19.24	24.26	42.80					
7.04							12.34	19.38	24.29	48.00					
7.10							12.48	19.52	24.32	49.90					
7.17							12.62	19.66	24.35	51.70					
7.24							12.76	19.80	24.38	55.70					
7.31							12.90	19.86	24.41	60.00					
7.38							13.00	19.92	24.44	64.20					
7.45							13.10	19.98	24.47	67.80					
7.52							13.20	20.04	24.50	71.20					
7.59							13.30	20.10	24.55	74.80					
7.66							13.40	20.16	24.60	77.00					
7.73							13.52	20.22	24.65	79.50					
7.80							13.64	20.28	24.70	82.00					
AUGER							13.76	20.34	24.75	85.00					
17.60							13.88	20.40	24.80	87.70					
20.20							14.00	20.45	24.85	90.50					
20.60							14.08	20.50	24.90	93.30					
21.30							14.16	20.55	24.95	96.10					
22.20							14.24	20.60	25.00	99.20					
22.70							14.32	20.65	25.07	101.90					
23.10							14.40	20.70	25.14	104.50					
23.50							14.44	20.75	25.21	107.50					



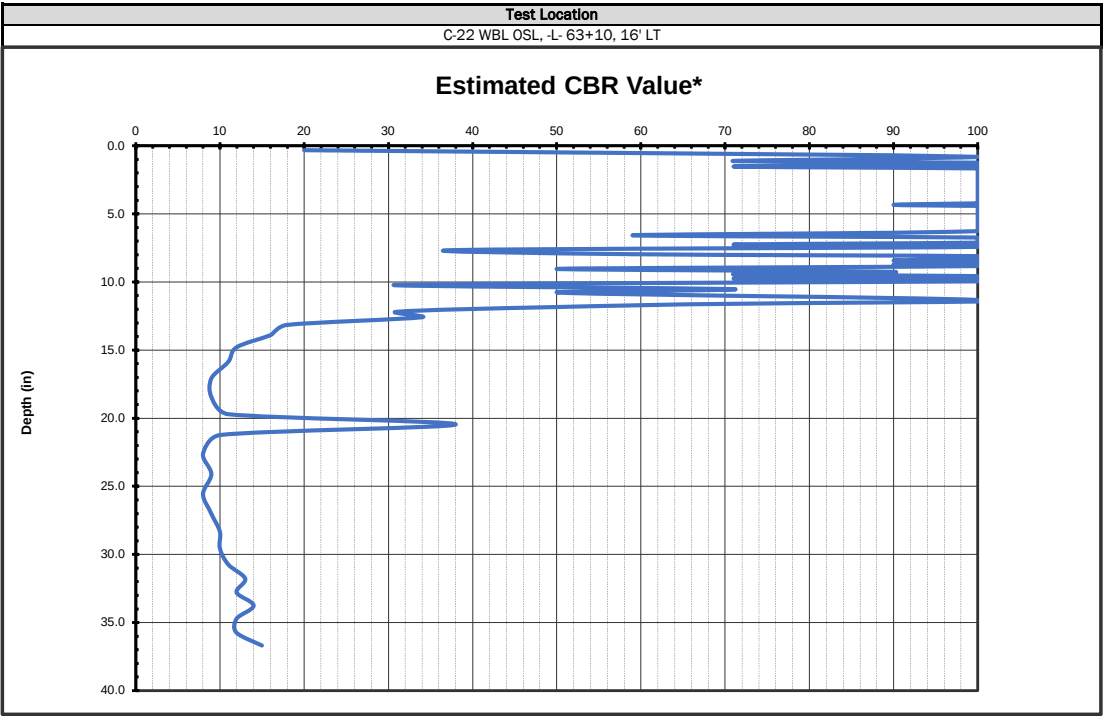
*Estimated CBR Value obtained using published correlation provided by NCDOT (Chemical Stabilization QA Subgrade/Base Field Testing, 2015)

DUAL MASS DYNAMIC CONE PENETROMETER DATA SHEET							WBS NO.	PROJECT TIP I.D.				ROUTE				
							48392.1.1	U-6146				US 29/US 74 from SR 2209 to SR 2016/SR 2017				
							COUNTY	FIELD PROFESSIONAL				DRILLER/HELPER				
							Gaston	M. Brewer				C. Odom				
Test Location							Date Run	Test Location						Date Run		
C-21 WBL OSS, -L- 63+10, 24' LT							11/13/2019	C-22 WBL OSL, -L- 63+10, 16' LT						11/13/2019		
Type	Test Interval			Datum or reference surface				Type	Test Interval			Datum or reference surface				
DCP	Cumulative cm per blow			Top of ABC				DCP	Cumulative cm per blow			Top of ABC				
3.00	37.00							1.60	13.80	79.50						
6.10	37.80							2.00	13.90	82.00						
8.20	38.50							2.20	14.00	84.60						
8.90	39.30							2.60	14.10	86.90						
9.60	40.20							3.10	14.24	89.50						
10.00	40.80							3.20	14.38	92.10						
10.40	42.10							3.40	14.52	94.30						
10.70	42.90							3.60	14.66							
11.00	43.40							4.10	14.80							
11.40	43.90							4.30	15.00							
11.70	44.40							4.60	15.20							
12.10	44.80							4.90	15.40							
12.60	45.50							5.10	15.60							
12.70	45.90							5.40	15.80							
13.20	46.50							5.60	16.00							
13.60	46.90							5.70	16.40							
14.10	47.70							5.80	17.00							
14.50	48.50							5.90	17.20							
14.90	49.40							6.00	17.40							
15.20	50.80							6.10	17.60							
15.70	52.90							6.20	17.90							
16.00	53.50							6.40	18.20							
16.60	54.40							6.70	18.70							
17.20	55.10							6.98	19.00							
17.40	56.40							7.26	19.90							
17.80	57.50							7.54	20.50							
18.20	60.00							7.82	20.60							
18.60	62.20							8.10	20.90							
18.80	64.50							8.32	21.20							
18.90	66.80							8.54	21.60							
19.30	68.00							8.76	21.90							
19.80	69.50							8.98	22.30							
20.30	70.90							9.20	22.60							
20.70	73.00							9.30	23.30							
21.00	75.40							9.40	23.70							
21.30	77.10							9.50	24.20							
21.70	78.90							9.60	24.50							
22.00	80.10							9.70	25.00							
22.40	81.00							9.80	25.20							
22.70	82.00							9.90	25.40							
23.00	82.90							10.00	26.50							
23.50	83.60							10.10	27.00							
24.10	85.00							10.20	27.70							
24.50	86.50							10.30	28.20							
25.00	88.50							10.40	28.60							
25.40	89.70							10.50	28.90							
25.90	91.50							10.60	29.20							
26.30	93.30							10.70	29.70							
26.50	94.60							10.80	30.40							
27.20	96.20							11.20	31.50							
27.60	97.80							11.26	32.50							
28.20	99.00							11.32	34.30							
28.50	100.50							11.38	36.30							
29.10	101.90							11.44	38.90							
29.70								11.50	41.70							
30.50								11.76	45.10							
31.00								12.02	48.60							
32.00								12.28	51.50							
32.70								12.54	52.40							
33.10								12.80	55.50							
33.50								12.96	59.40							
34.00								13.12	63.00							
34.70								13.28	66.90							
35.20								13.44	70.40							
35.90								13.60	73.60							
36.50								13.70	76.70							



ABC	
ABC Thickness (in)	17.5
Average CBR	74
Weighted CBR Average	58
Maximum CBR Value	100
Minimum CBR Value	10

Soil Subgrade	
Average CBR	32
Weighted Average	25
Max CBR	90
Min CBR	13

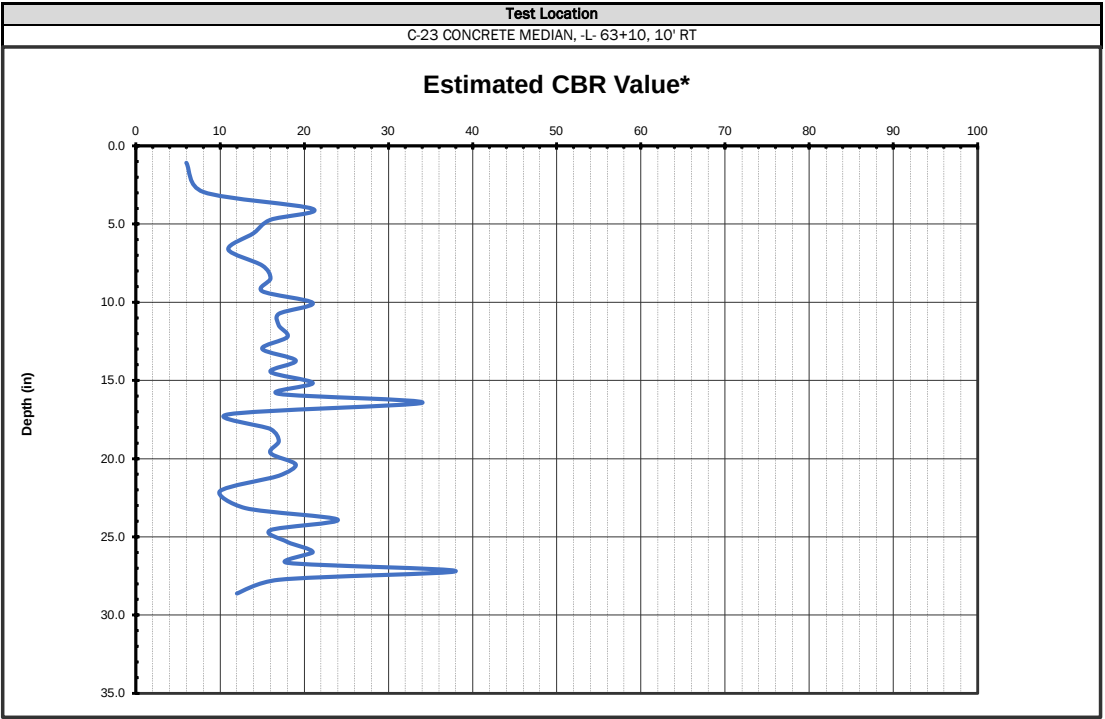


ABC	
ABC Thickness (in)	12.8
Average CBR	92
Weighted CBR Average	78
Maximum CBR Value	100
Minimum CBR Value	20

Soil Subgrade	
Average CBR	13
Weighted Average	11
Max CBR	38
Min CBR	8

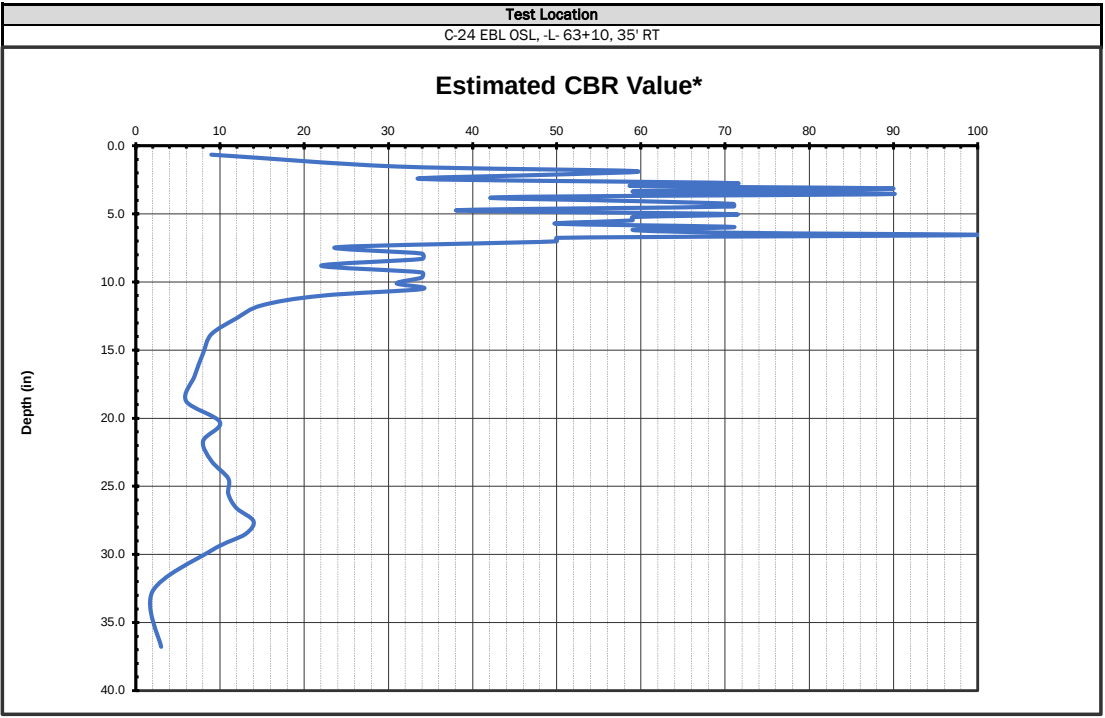
*Estimated CBR Value obtained using published correlation provided by NCDOT (Chemical Stabilization QA Subgrade/Base Field Testing, 2015)

DUAL MASS DYNAMIC CONE PENETROMETER DATA SHEET						WBS NO.	PROJECT TIP I.D.			ROUTE			
						48392.1.1	U-6146			US 29/US 74 from SR 2209 to SR 2016/SR 2017			
						COUNTY	FIELD PROFESSIONAL			DRILLER/HELPER			
Gaston						M. Brewer			C. Odom				
Test Location						Date Run		Test Location				Date Run	
C-23 CONCRETE MEDIAN, L- 63+10, 10' RT						11/12/2019		C-24 EBL OSL, L- 63+10, 35' RT				11/12/2019	
Type	Test Interval		Datum or reference surface				Type	Test Interval		Datum or reference surface			
DCP	Cumulative cm per blow		Top of Soil Subgrade				DCP	Cumulative cm per blow		Top of ABC			
5.50							3.30						
9.40							4.40						
11.00							5.00						
13.00							5.70						
15.30							6.70						
18.30							7.20						
20.50							7.80						
22.50							8.20						
24.70							8.80						
26.30							9.20						
28.20							10.00						
30.10							10.60						
31.90							11.10						
34.00							11.60						
35.70							12.50						
37.70							13.00						
39.30							13.60						
41.20							14.20						
42.20							14.90						
45.00							15.40						
47.00							16.00						
48.90							16.50						
50.90							16.80						
52.60							17.50						
54.50							18.20						
57.60							19.60						
60.00							20.60						
61.40							21.60						
63.40							23.10						
65.20							24.10						
66.80							25.10						
68.60							26.20						
69.50							27.20						
71.40							28.70						
74.00							30.80						
							33.50						
							36.80						
							40.60						
							45.20						
							50.00						
							53.10						
							57.00						
							60.60						
							63.50						
							66.30						
							68.90						
							71.20						
							73.70						
							77.30						
							89.00						
							97.90						
										</			



ABC	
ABC Thickness (in)	
Average CBR	
Weighted CBR Average	
Maximum CBR Value	
Minimum CBR Value	

Soil Subgrade	
Average CBR	17
Weighted Average	15
Max CBR	38
Min CBR	6

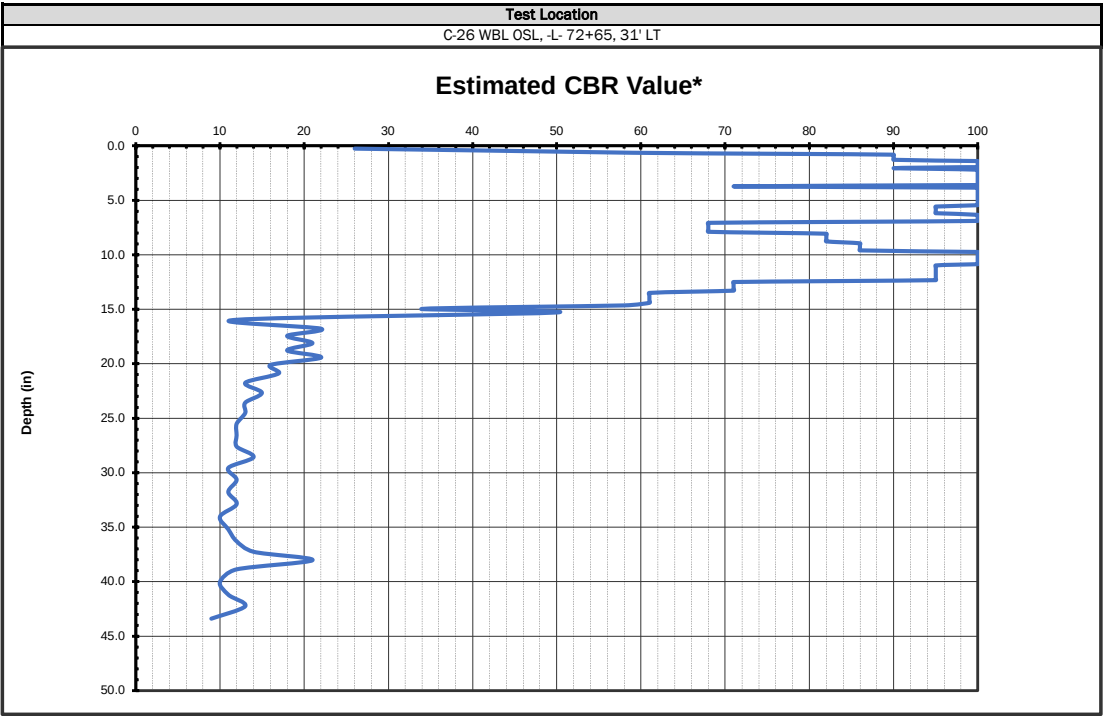
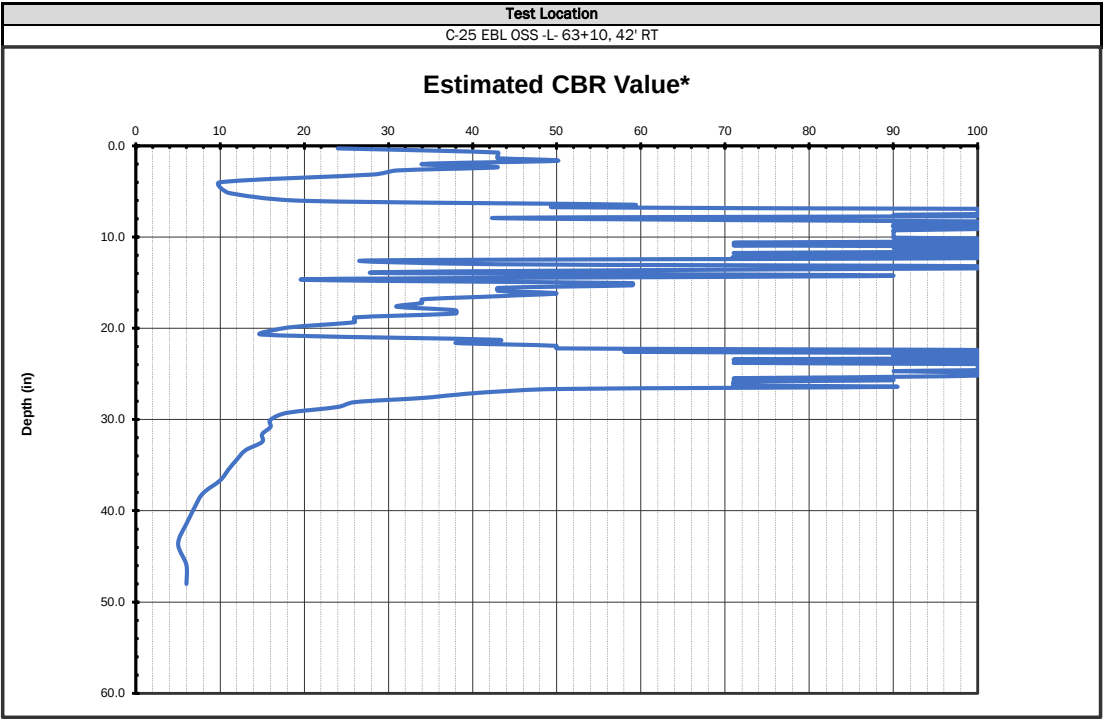


ABC	
ABC Thickness (in)	9.3
Average CBR	55
Weighted CBR Average	43
Maximum CBR Value	100
Minimum CBR Value	9

Soil Subgrade	
Average CBR	14
Weighted Average	9
Max CBR	34
Min CBR	2

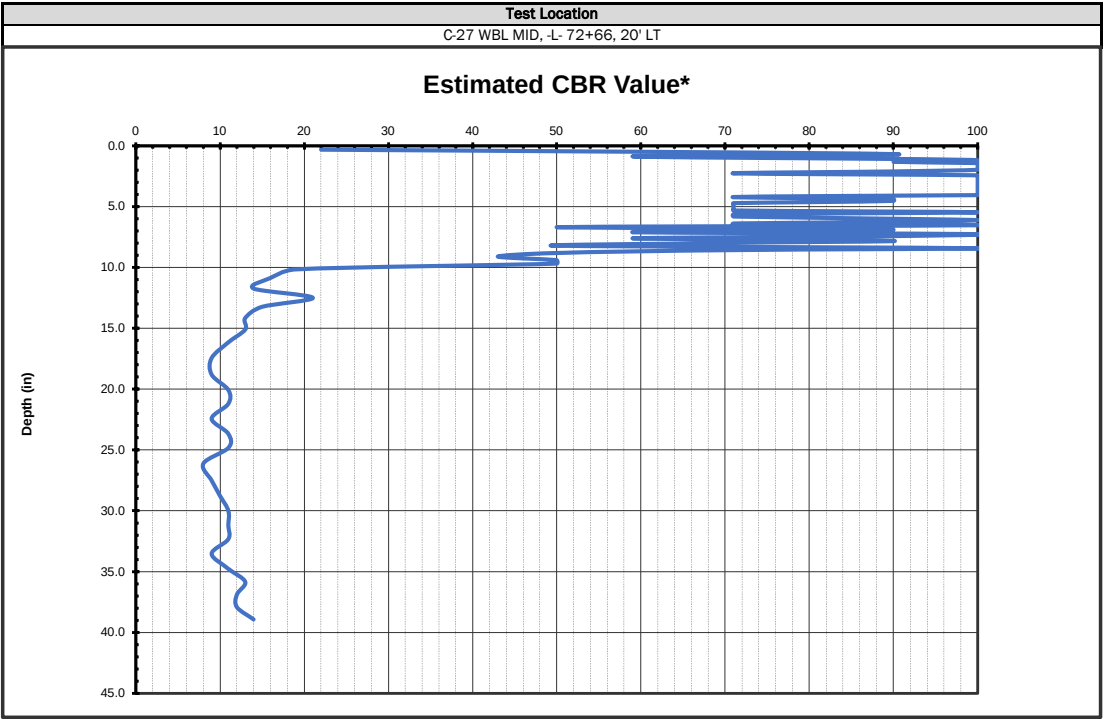
*Estimated CBR Value obtained using published correlation provided by NCDOT (Chemical Stabilization QA Subgrade/Base Field Testing, 2015)

DUAL MASS DYNAMIC CONE PENETROMETER DATA SHEET						WBS NO.	PROJECT TIP I.D.				ROUTE			
						48392.1.1	U-6146				US 29/US 74 from SR 2209 to SR 2016/SR 2017			
						COUNTY	FIELD PROFESSIONAL				DRILLER/HELPER			
						Gaston	M. Brewer				C. Odom			
Test Location						Date Run	Test Location				Date Run			
C-25 EBL OSS -L- 63+10, 42' RT						11/12/2019	C-26 WBL OSL, -L- 72+65, 31' LT				11/13/2019			
Type	Test Interval			Datum or reference surface			Type	Test Interval			Datum or reference surface			
DCP	Cumulative cm per blow			Top of ABC			DCP	Cumulative cm per blow			Top of ABC			
1.40	37.90	94.70					1.30	19.78	90.90					
2.20	38.50	98.50					1.90	20.30	93.50					
3.00	39.10	102.70					2.30	20.74	95.80					
3.80	39.90	107.70					2.70	21.18	97.40					
4.50	40.70	114.00					3.10	21.62	100.10					
5.50	41.40	119.30					3.50	22.06	103.20					
6.30	42.20	124.50					3.70	22.50	106.10					
7.40	43.20						3.90	22.92	108.50					
8.60	44.20						4.20	23.34	112.00					
11.60	45.30						4.40	23.76						
14.50	46.20						4.70	24.18						
16.10	47.10						4.90	24.60						
16.70	48.40						5.00	24.96						
17.40	49.70						5.40	25.32						
17.70	51.50						5.70	25.68						
18.00	53.60						6.00	26.04						
18.30	54.40						6.20	26.40						
18.50	55.30						6.40	26.66						
18.80	56.00						6.60	26.92						
19.00	56.70						6.80	27.18						
19.40	57.00						7.00	27.44						
19.50	57.60						7.30	27.70						
19.60	57.80						7.50	28.08						
20.40	58.20						7.80	28.46						
20.90	58.60						8.00	28.84						
21.10	59.00						8.20	29.22						
21.20	59.20						8.50	29.60						
21.60	59.70						8.70	29.98						
21.90	59.80						9.00	30.36						
22.30	59.90						9.10	30.74						
22.70	60.10						9.20	31.12						
23.00	60.60						9.70	31.50						
23.30	60.80						9.80	32.00						
23.70	61.00						9.94	32.50						
24.10	61.30						10.08	33.00						
24.50	61.50						10.22	33.50						
24.90	61.70						10.36	34.00						
25.30	62.00						10.50	34.58						
25.70	62.30						10.62	35.16						
25.80	62.50						10.74	35.74						
26.10	62.90						10.86	36.32						
26.40	63.20						10.98	36.90						
26.70	63.50						11.10	37.50						
27.20	63.80						11.38	38.50						
27.40	64.10						11.66	39.20						
27.90	64.50						11.94	41.90						
28.00	65.00						12.22	43.40						
28.20	65.40						12.50	45.20						
28.60	65.90						12.80	46.80						
28.90	66.40						13.10	48.60						
29.10	66.90						13.40	50.10						
29.30	67.30						13.70	52.10						
29.60	68.00						14.00	54.00						
30.10	68.80						14.38	56.50						
30.30	69.70						14.76	58.70						
30.70	70.70						15.14	61.10						
31.20	72.00						15.52	63.50						
31.30	73.40						15.90	66.20						
32.50	75.20						16.26	68.80						
33.30	77.20						16.62	71.40						
33.60	79.20						16.98	73.70						
33.90	81.30						17.34	76.50						
34.20	83.50						17.70	79.20						
34.70	86.00						18.22	82.20						
35.90	88.60						18.74	84.90						
36.30	91.60						19.26	88.00						



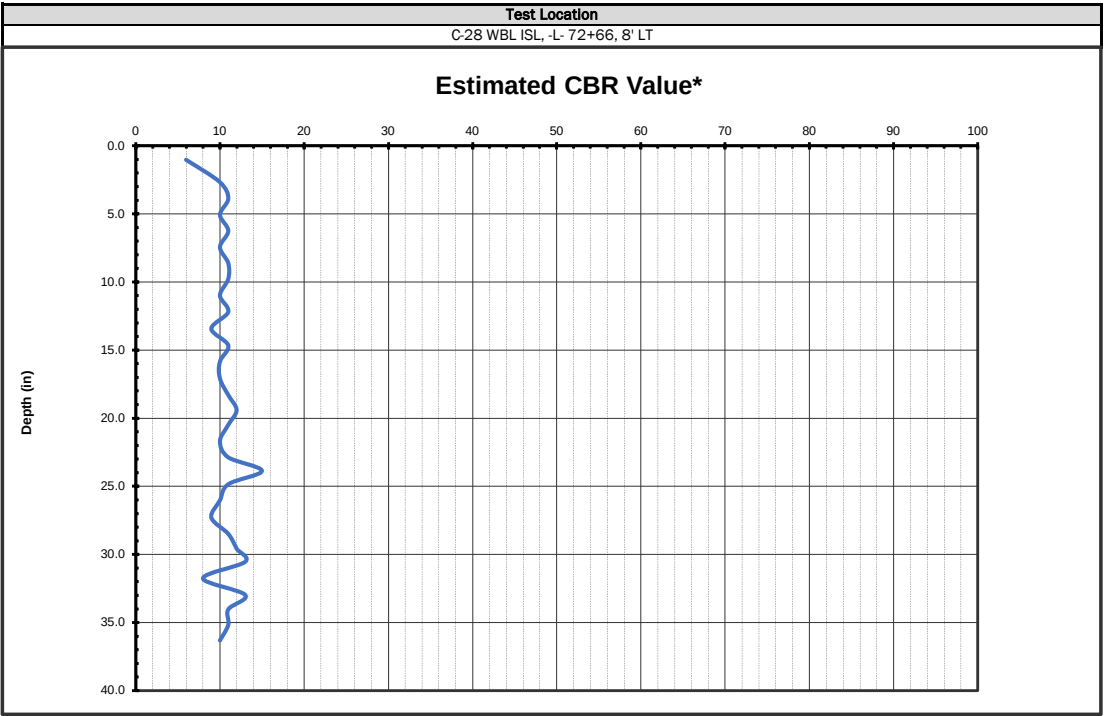
*Estimated CBR Value obtained using published correlation provided by NCDOT (Chemical Stabilization QA Subgrade/Base Field Testing, 2015)

DUAL MASS DYNAMIC CONE PENETROMETER DATA SHEET							WBS NO.	PROJECT TIP I.D.				ROUTE			
							48392.1.1	U-6146				US 29/US 74 from SR 2209 to SR 2016/SR 2017			
							COUNTY	FIELD PROFESSIONAL				DRILLER/HELPER			
Gaston							M. Brewer				C. Odom				
Test Location							Date Run	Test Location						Date Run	
C-27 WBL MID, -L- 72+66, 20' LT							11/13/2019	C-28 WBL ISL, -L- 72+66, 8' LT						11/13/2019	
Type	Test Interval			Datum or reference surface				Type	Test Interval			Datum or reference surface			
DCP	Cumulative cm per blow			Top of ABC				DCP	Cumulative cm per blow			Top of Soil Subgrade			
1.50	37.10							5.20							
1.90	39.50							8.40							
2.50	42.50							11.30							
2.90	46.00							14.40							
3.10	49.50							17.30							
3.50	52.40							20.50							
3.70	55.30							23.30							
4.00	58.60							26.30							
4.30	61.60							29.50							
4.60	64.50							32.40							
4.90	68.20							35.80							
5.10	71.50							38.70							
5.50	74.70							41.80							
6.00	77.70							45.00							
6.20	80.70							48.00							
6.50	83.50							50.60							
6.70	86.80							53.50							
7.00	89.80							56.70							
7.30	92.30							59.50							
7.60	95.00							61.70							
7.80	97.70							64.50							
8.00	100.00							67.70							
8.30								71.00							
8.60								73.80							
8.80								76.40							
9.00								78.80							
9.30								82.50							
9.60								85.00							
9.90								87.90							
10.10								90.70							
10.40								93.80							
10.90															
11.30															
11.70															
12.20															
12.70															
13.20															
13.70															
14.00															
14.50															
15.00															
15.40															
15.60															
16.00															
16.50															
16.60															
17.30															
17.70															
18.30															
18.60															
19.00															
19.60															
20.00															
20.50															
21.20															
21.50															
22.00															
22.70															
23.50															
24.20															
24.90															
26.60															
28.60															
30.90															
32.50															
34.70															



ABC	
ABC Thickness (in)	12.0
Average CBR	81
Weighted CBR Average	64
Maximum CBR Value	100
Minimum CBR Value	14

Soil Subgrade	
Average CBR	11
Weighted Average	11
Max CBR	21
Min CBR	8

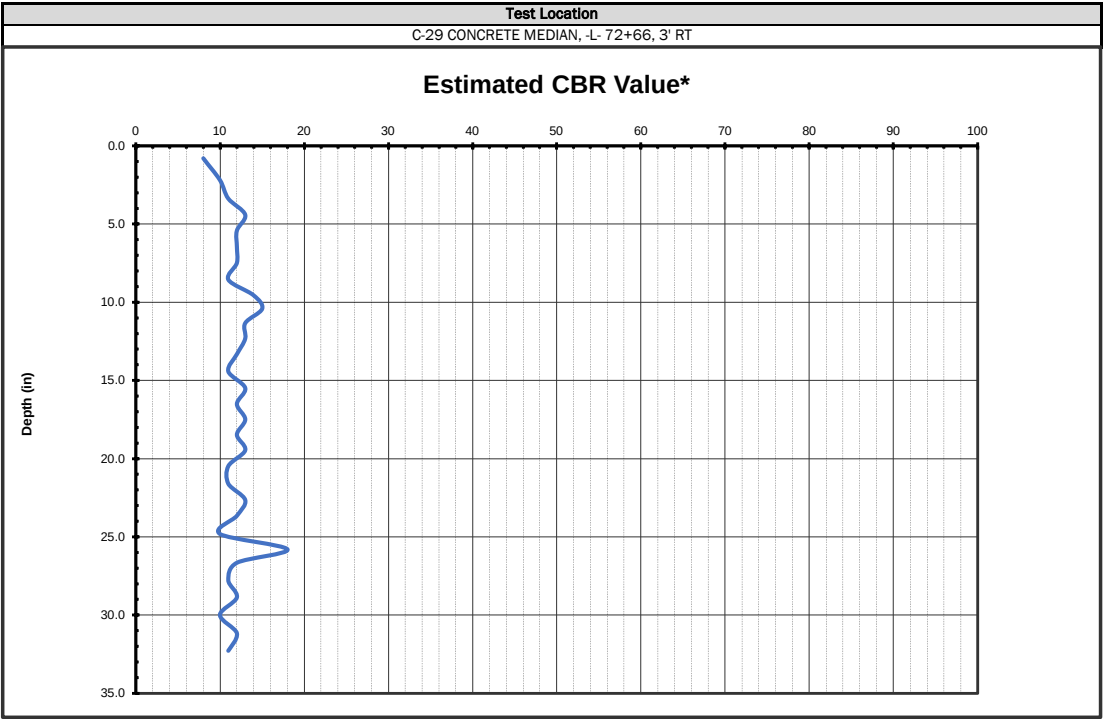


ABC	
ABC Thickness (in)	
Average CBR	
Weighted CBR Average	
Maximum CBR Value	
Minimum CBR Value	

Soil Subgrade	
Average CBR	11
Weighted Average	10
Max CBR	15
Min CBR	6

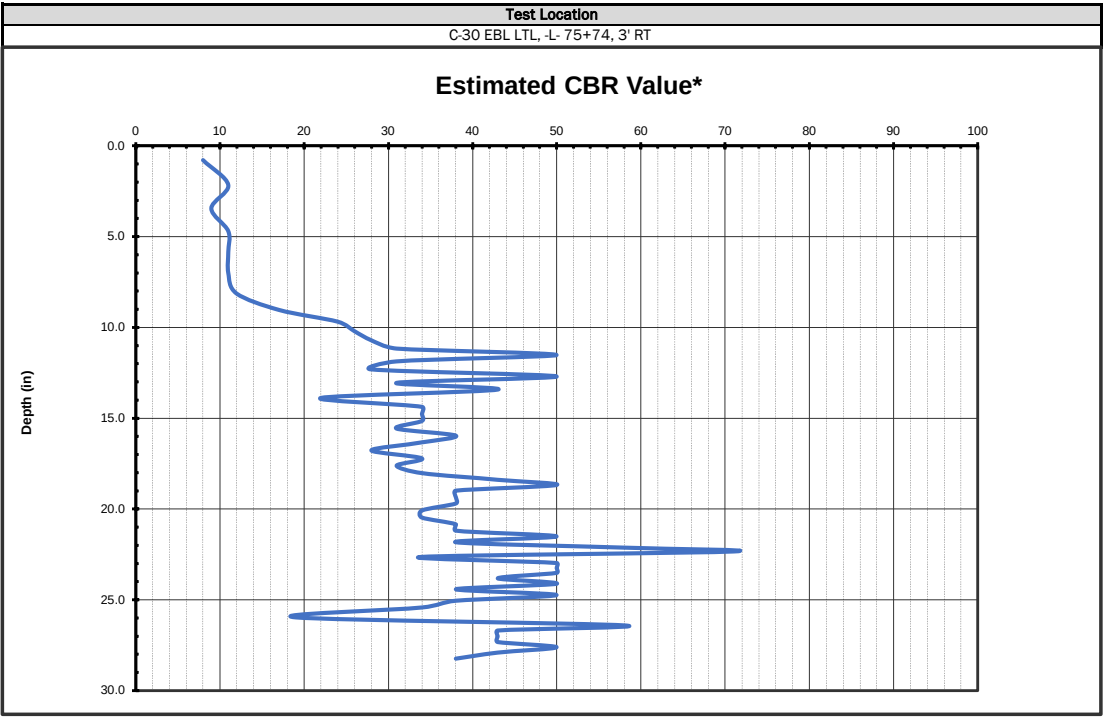
*Estimated CBR Value obtained using published correlation provided by NCDOT (Chemical Stabilization QA Subgrade/Base Field Testing, 2015)

DUAL MASS DYNAMIC CONE PENETROMETER DATA SHEET						WBS NO.	PROJECT TIP I.D.			ROUTE		
						48392.1.1	U-6146			US 29/US 74 from SR 2209 to SR 2016/SR 2017		
						COUNTY	FIELD PROFESSIONAL			DRILLER/HELPER		
						Gaston	M. Brewer			C. Odom		
Test Location						Date Run	Test Location				Date Run	
C-29 CONCRETE MEDIAN, -L- 72+66, 3' RT						11/13/2019	C-30 EBL LTL, -L- 75+74, 3' RT				11/12/2019	
Type	Test Interval		Datum or reference surface			Type	Test Interval		Datum or reference surface			
DCP	Cumulative cm per blow		Top of Soil Subgrade			DCP	Cumulative cm per blow		Top of Soil Subgrade			
4.00						4.00						
7.10						7.00						
10.00						10.50						
12.40						13.40						
15.10						16.30						
17.70						19.30						
20.30						22.00						
23.10						23.90						
25.40						25.30						
27.50						26.60						
30.00						27.80						
32.50						28.90						
35.10						29.60						
38.10						30.70						
40.60						31.90						
43.20						32.60						
45.60						33.70						
48.20						34.50						
50.60						36.00						
53.40						37.00						
56.30						38.00						
58.70						39.00						
61.40						40.10						
64.60						41.00						
66.40						42.00						
69.00						43.20						
72.00						44.20						
74.60						45.30						
77.80						46.30						
80.50						47.10						
83.50						47.80						
						48.70						
						49.60						
						50.50						
						51.50						
						52.50						
						53.40						
						54.30						
						55.00						
						55.90						
						56.50						
						57.00						
						58.00						
						58.70						
						59.40						
						60.10						
						60.90						
						61.60						
						62.50						
						63.20						
						64.10						
						65.10						
						66.80						
						67.40						
						68.20						
						69.00						
						69.80						
						70.50						
						71.30						
						72.20						



ABC	
ABC Thickness (in)	
Average CBR	
Weighted CBR Average	
Maximum CBR Value	
Minimum CBR Value	

Soil Subgrade	
Average CBR	12
Weighted Average	12
Max CBR	18
Min CBR	8

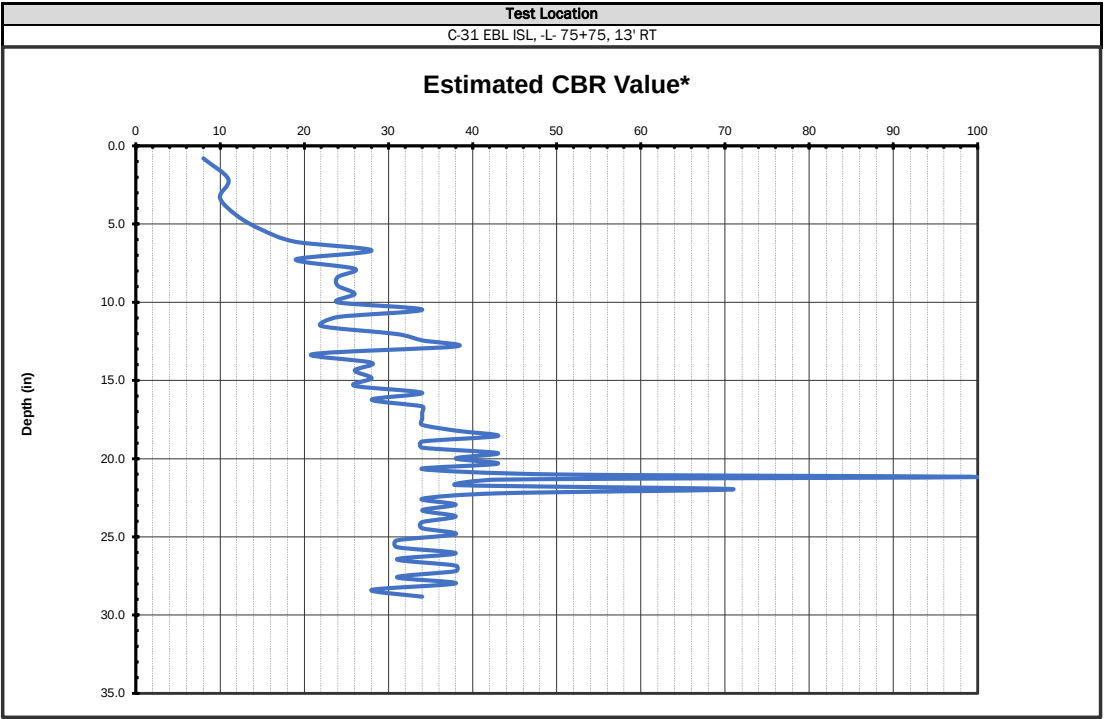


ABC	
ABC Thickness (in)	
Average CBR	
Weighted CBR Average	
Maximum CBR Value	
Minimum CBR Value	

Soil Subgrade	
Average CBR	35
Weighted Average	28
Max CBR	71
Min CBR	8

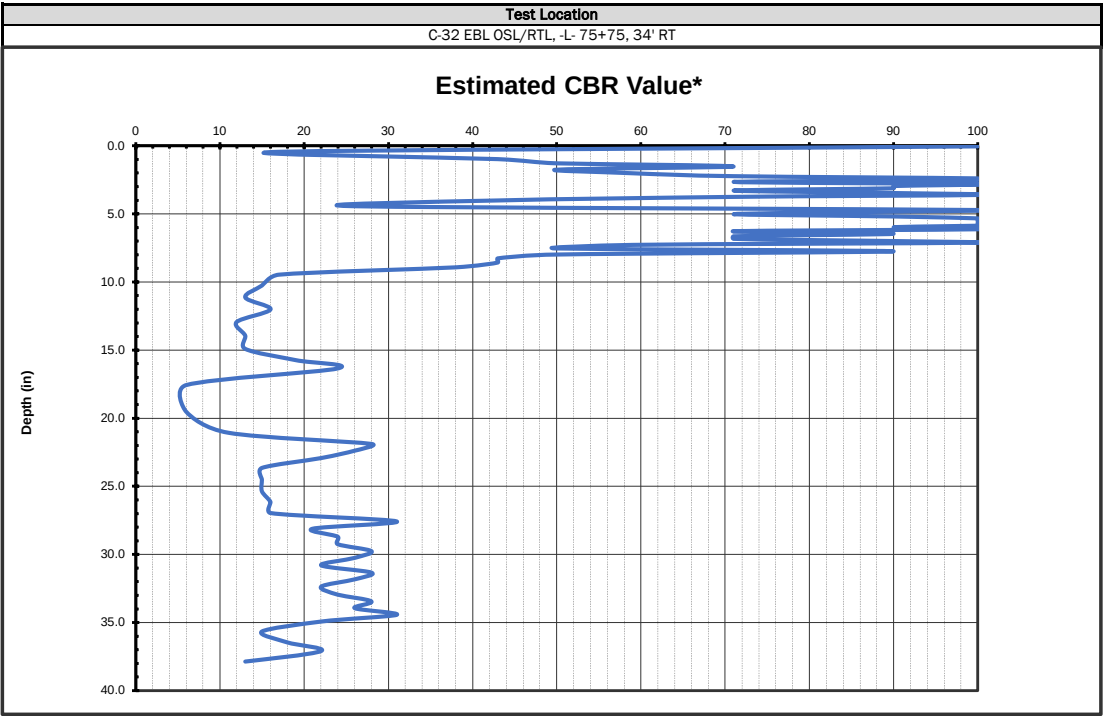
*Estimated CBR Value obtained using published correlation provided by NCDOT (Chemical Stabilization QA Subgrade/Base Field Testing, 2015)

DUAL MASS DYNAMIC CONE PENETROMETER DATA SHEET							WBS NO.	PROJECT TIP I.D.				ROUTE				
							48392.1.1	U-6146				US 29/US 74 from SR 2209 to SR 2016/SR 2017				
							COUNTY	FIELD PROFESSIONAL				DRILLER/HELPER				
							Gaston	M. Brewer				C. Odom				
Test Location							Date Run		Test Location						Date Run	
C-31 EBL ISL, -L- 75+75, 13' RT							11/12/2019		C-32 EBL OSL/RTL, -L- 75+75, 34' RT						11/12/2019	
Type	Test Interval			Datum or reference surface			Type	Test Interval			Datum or reference surface					
DCP	Cumulative cm per blow			Top of Soil Subgrade			DCP	Cumulative cm per blow			Top of ABC					
4.00							0.20	72.20								
6.80							2.10	73.60								
10.00							2.90	75.00								
12.60							3.60	76.20								
14.70							4.10	77.50								
16.40							4.80	79.00								
17.60							5.40	80.20								
19.30							5.90	81.50								
20.60							6.20	83.00								
22.00							6.50	84.40								
23.40							7.00	85.60								
24.70							7.30	86.90								
26.10							7.70	88.00								
27.10							8.10	89.50								
28.50							8.60	91.70								
30.00							9.00	93.50								
31.10							9.30	95.00								
32.10							9.80	97.40								
33.00							10.60									
34.60							11.90									
35.80							12.10									
37.10							12.50									
38.30							13.00									
39.60							13.40									
40.60							13.70									
41.80							14.00									
42.80							14.30									
43.80							14.60									
44.80							14.80									
45.80							15.00									
46.70							15.40									
47.50							15.70									
48.50							16.20									
49.50							16.60									
50.30							17.10									
51.20							17.60									
52.00							18.00									
53.00							18.20									
53.70							18.80									
53.80							19.50									
54.60							19.90									
55.50							20.60									
56.00							21.40									
56.80							22.20									
57.80							23.10									
58.70							25.00									
59.70							27.10									
60.60							29.50									
61.60							31.50									
62.60							34.20									
63.50							36.70									
64.60							39.10									
65.70							40.80									
66.60							42.20									
67.70							47.10									
68.60							52.10									
69.50							55.00									
70.60							56.20									
71.50							57.50									
72.70							59.00									
73.70							61.20									
							63.40									
							65.50									
							67.50									
							69.50									
							70.60									



ABC	
ABC Thickness (in)	
Average CBR	
Weighted CBR Average	
Maximum CBR Value	
Minimum CBR Value	

Soil Subgrade	
Average CBR	33
Weighted Average	28
Max CBR	100
Min CBR	8

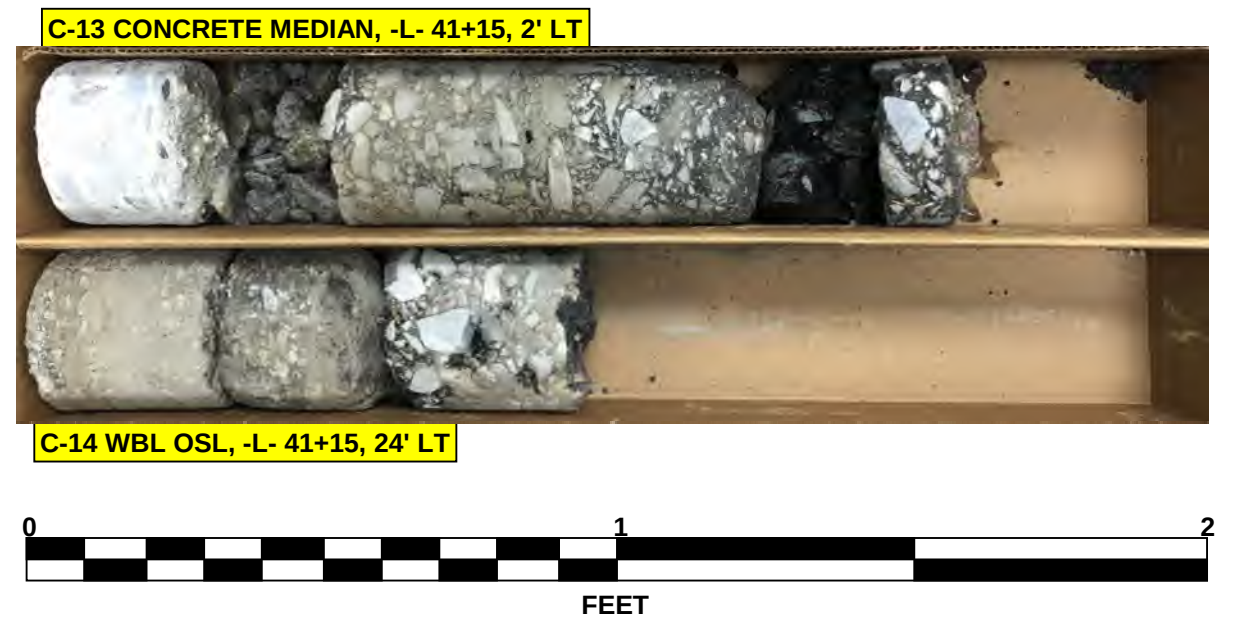
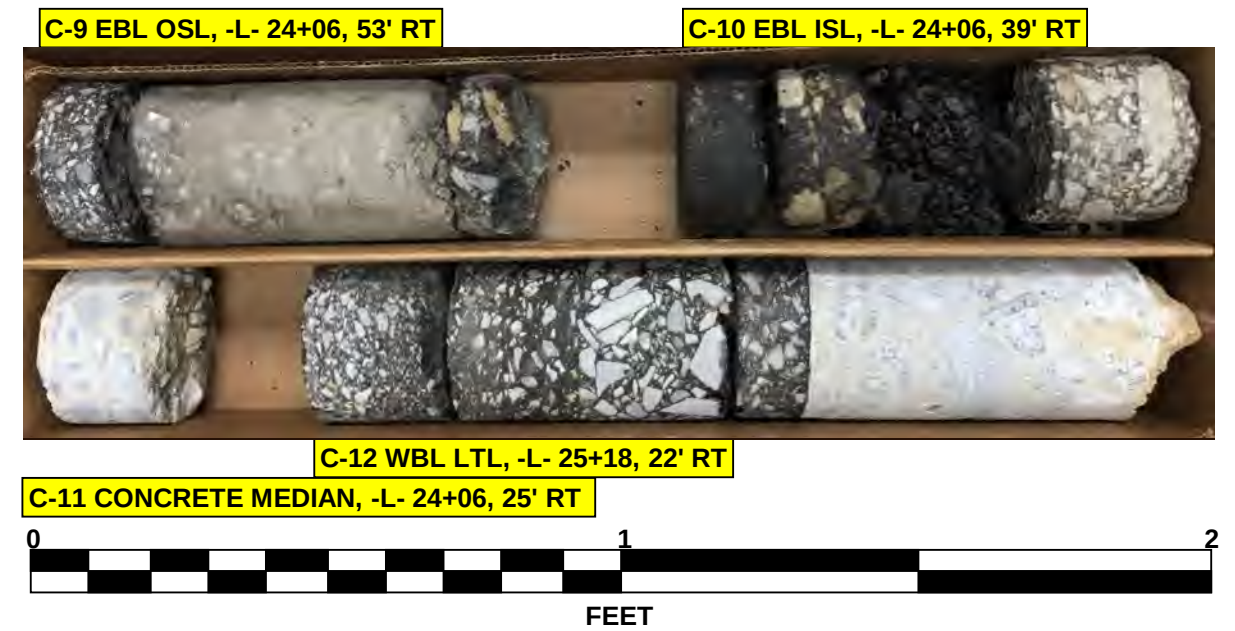
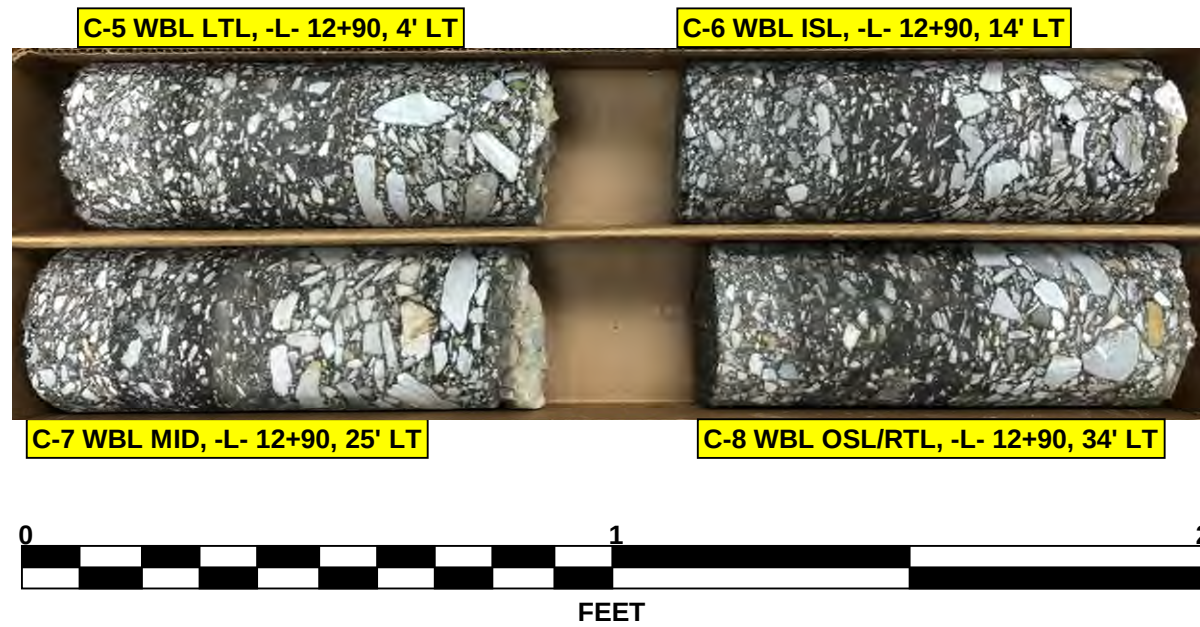
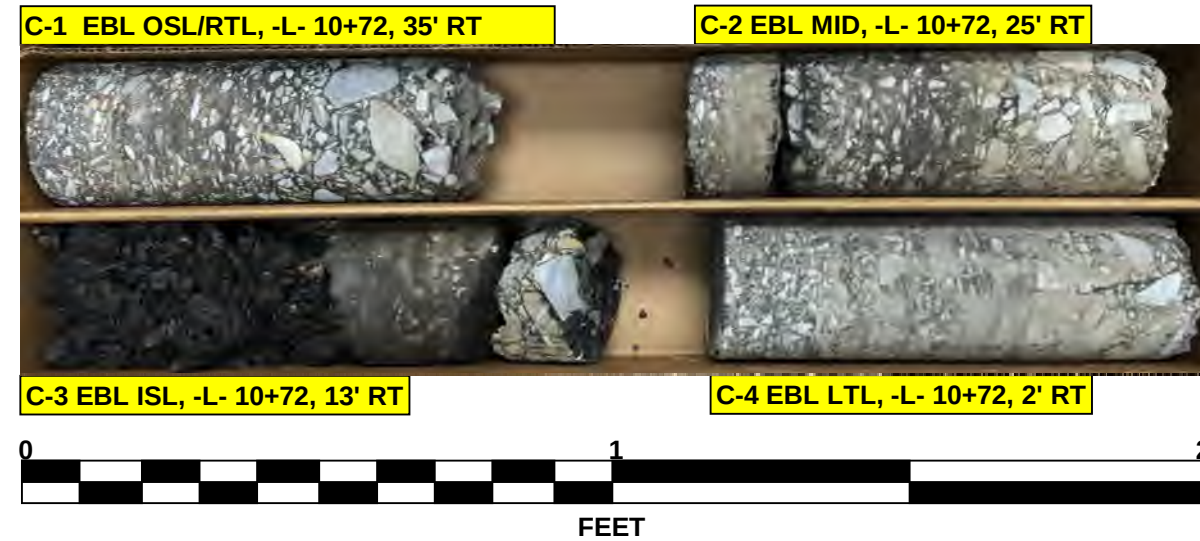


ABC	
ABC Thickness (in)	11.0
Average CBR	73
Weighted CBR Average	56
Maximum CBR Value	100
Minimum CBR Value	15

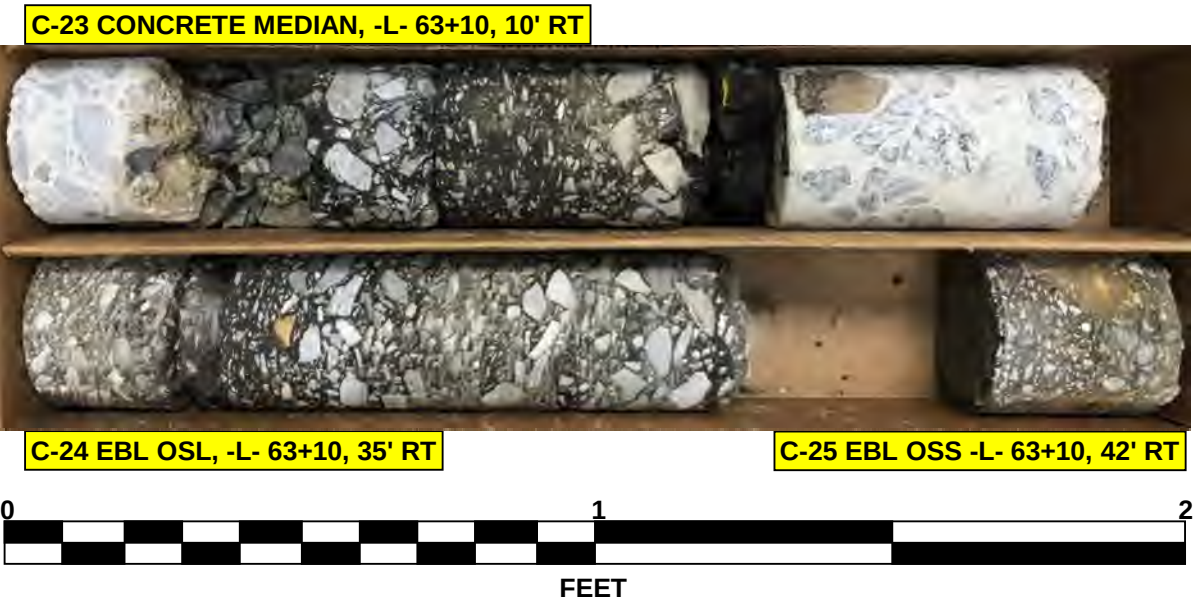
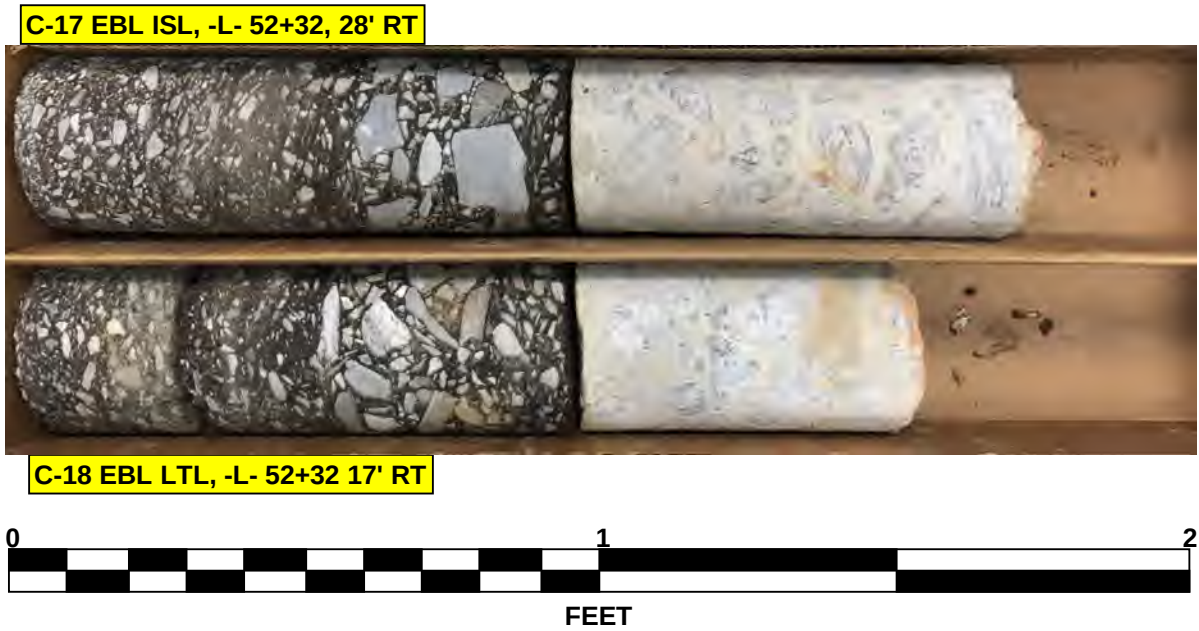
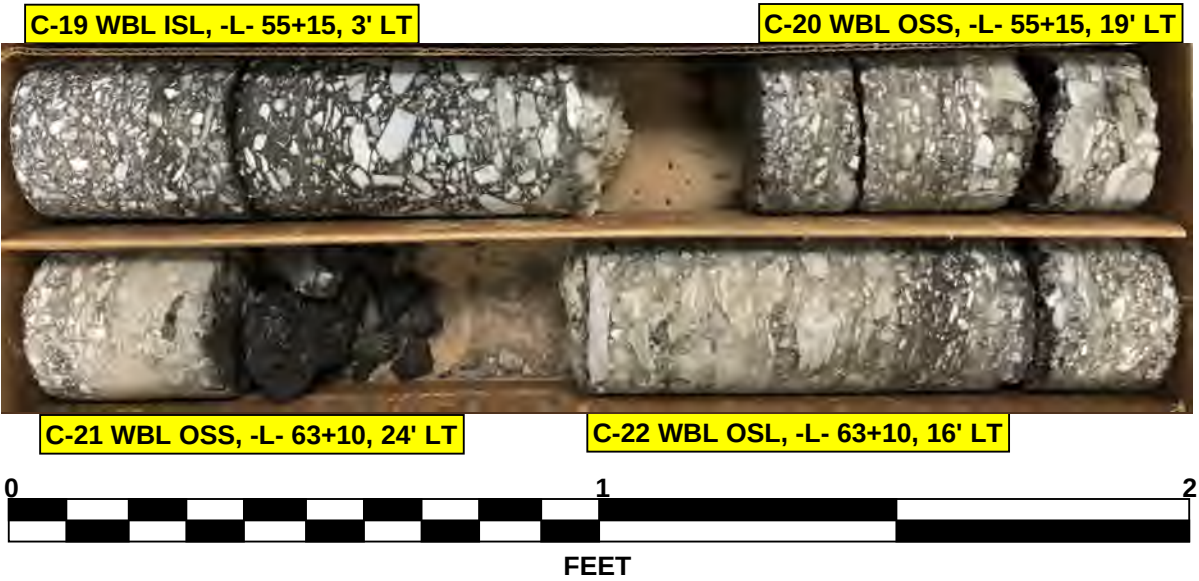
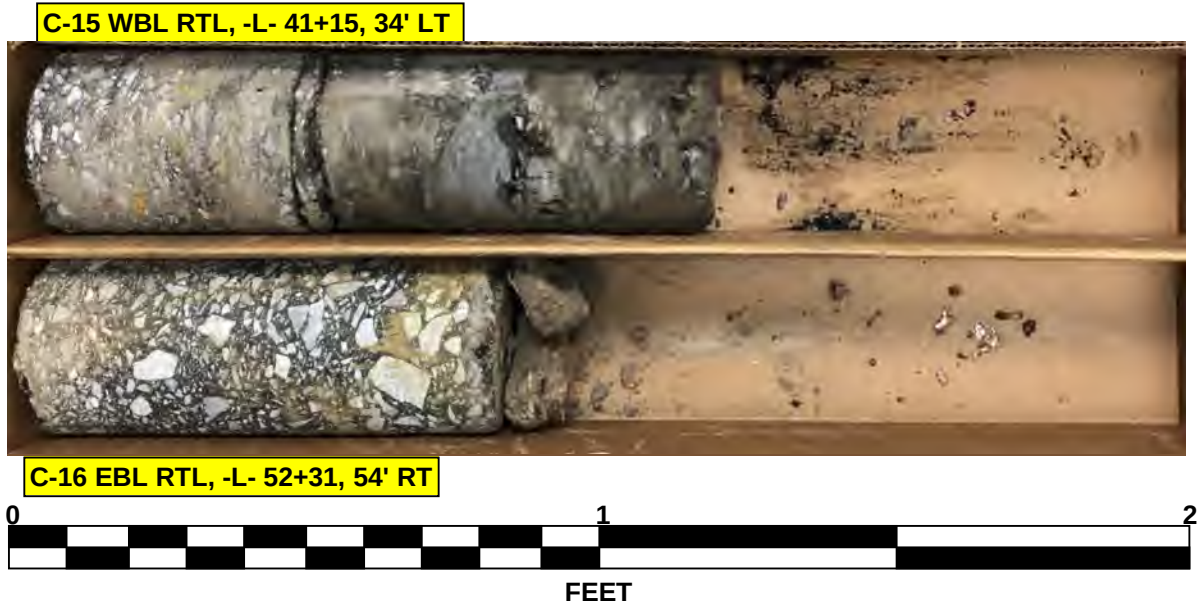
Soil Subgrade	
Average CBR	20
Weighted Average	17
Max CBR	31
Min CBR	6

*Estimated CBR Value obtained using published correlation provided by NCDOT (Chemical Stabilization QA Subgrade/Base Field Testing, 2015)

US 29/ US 74 from SR 2209 to SR 2016/SR 2017 Pavement Core Photographs



US 29/ US 74 from SR 2209 to SR 2016/SR 2017
Pavement Core Photographs



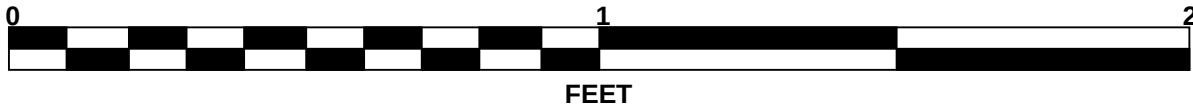
US 29/ US 74 from SR 2209 to SR 2016/SR 2017
Pavement Core Photographs

C-26 WBL OSL, -L- 72+65, 31' LT

C-27 WBL MID, -L- 72+66, 20' LT



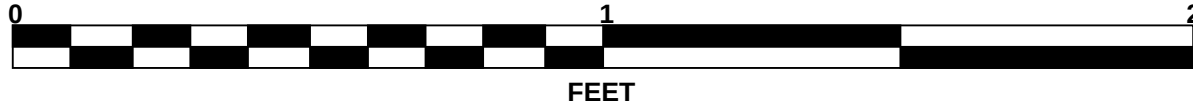
C-28 WBL ISL, -L- 72+66, 8' LT



C-31 EBL ISL, -L- 75+75, 13' RT



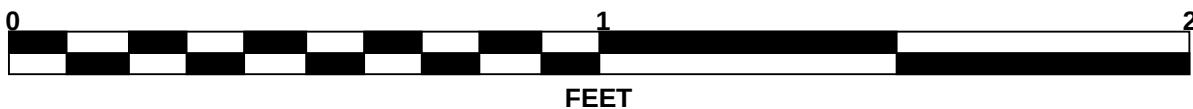
C-32 EBL OSL/RTL, -L- 75+75, 34' RT



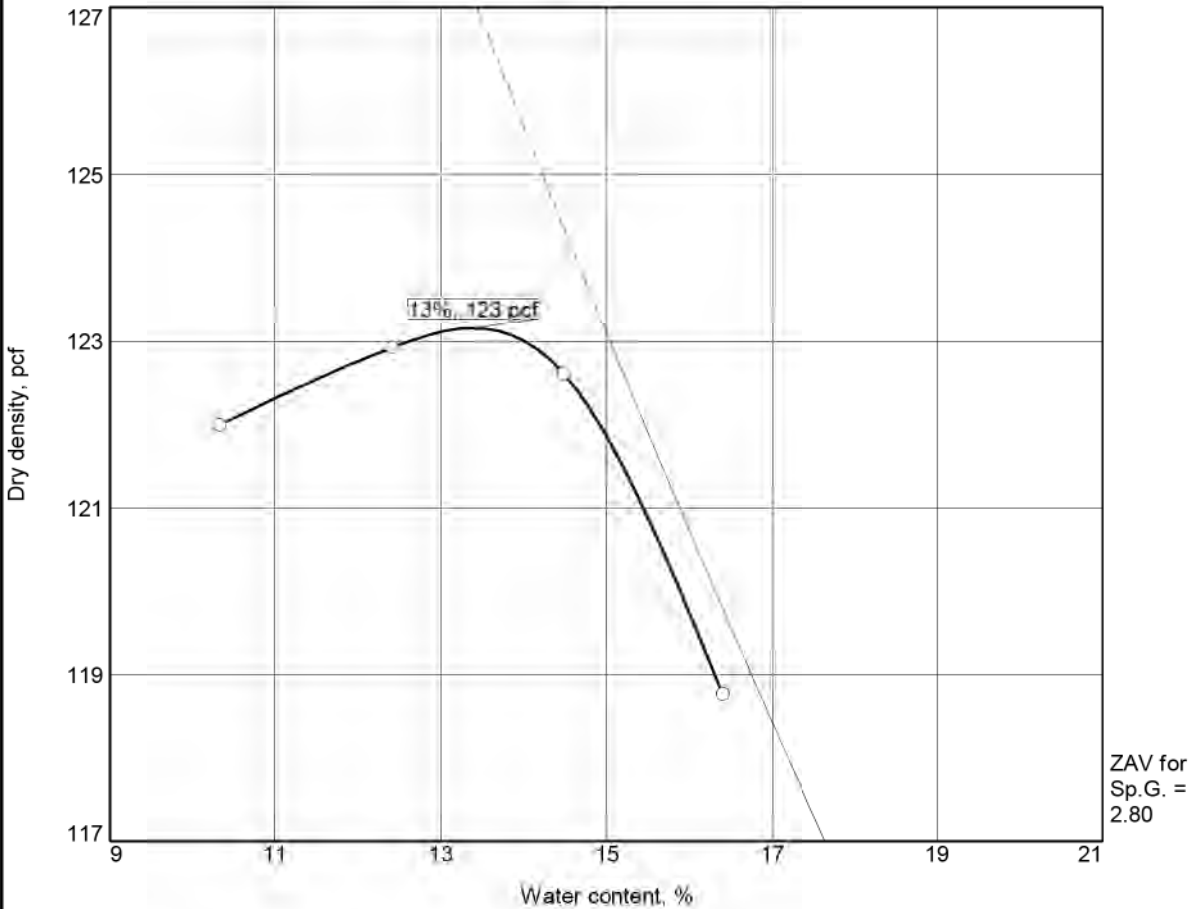
C-29 CONCRETE MEDIAN, -L- 72+66, 3' RT



C-30 EBL LTL, -L- 75+74, 3' RT



COMPACTION TEST REPORT

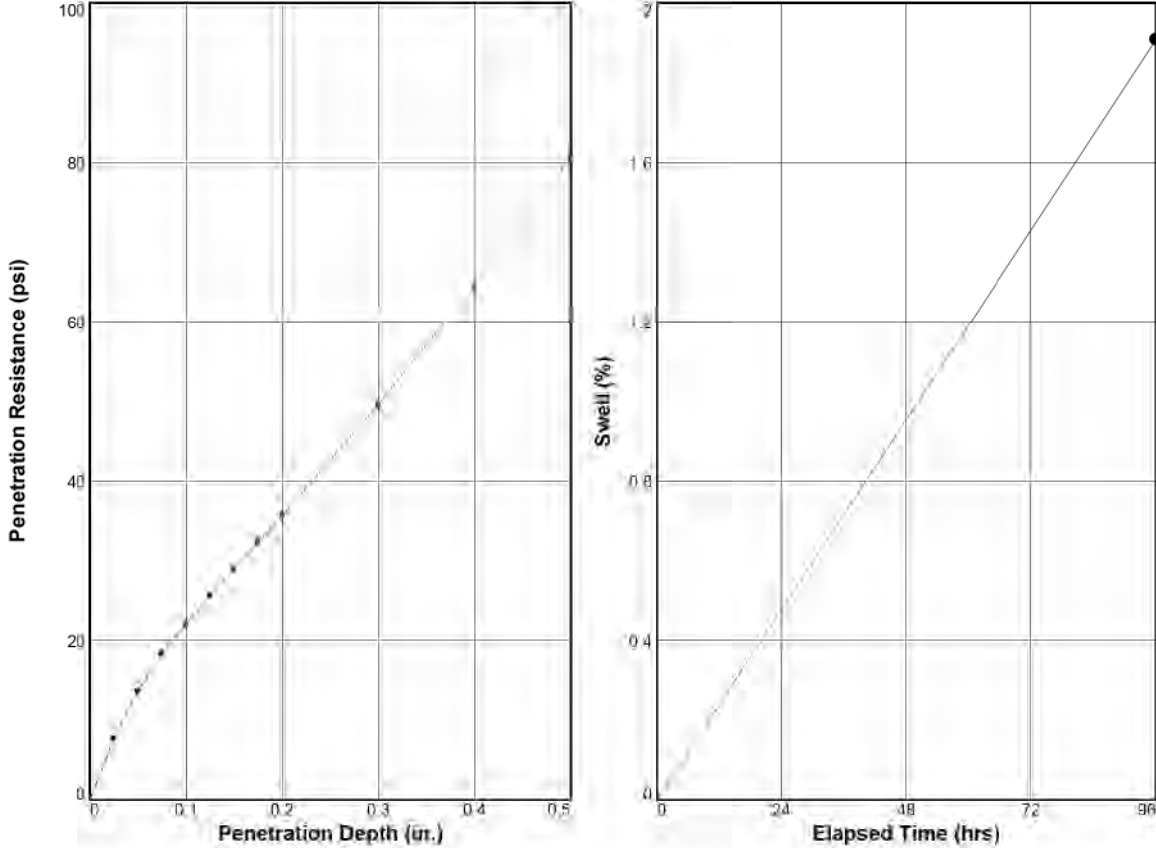


Test specification: AASHTO T 99-15 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
5.5-14.0 ft	CL	A-4	14.1		29	8	4.9	67.7

TEST RESULTS		MATERIAL DESCRIPTION
Maximum dry density = 123 pcf		Light Brown Sandy CLAY
Optimum moisture = 13 %		
Project No. 71191022 Client: Carolina Geotechnical Group		Remarks:
Project: NCDOT-U6146		
o Location: Charlotte, NC Sample Number: L-2100L		
Terracon Consultants, Inc.		
Charlotte, North Carolina		Figure L-2100L

BEARING RATIO TEST REPORT
ASTM D1883-16



	Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)	Max Swell (%)
	Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.10 in.	0.20 in.			
1	120.6	98	13.5	118.4	96.2	19.0	2.2	2.4	0.000	10	1.9
2											
3											

Material Description							USCS	Max. Dens. (pcf)	Optimum Moisture (%)	LL	PI
Light Brown Sandy CLAY											
							CL	123	13	29	8

Project No: 71191022							Test Description/Remarks: ASTM D-1883				
Project: NCDOT-U6146											
Location: Charlotte, NC											
Sample Number: L-2100L Depth: 3.5-14.0 ft											
Date: 8-8-2019											
BEARING RATIO TEST REPORT											
Terracon Consultants, Inc.											

Figure L-2100L

REFERENCE: U-6146

PROJECT: 48392

SEE SHEET 3 FOR PLAN SHEET LAYOUT
AT TIME OF INVESTIGATION

CONTENTS

<u>LINE</u>	<u>STATION</u>	<u>PLAN</u>	<u>PROFILE</u>
-L-	III+00 - 78+40	4-8	N/A
-Y-	9+97 - 18+98	4	N/A
-YI-	10+00 - 21+50	7	N/A
-Y2-	10+00 - 11+55	5	N/A
-GRWY-	10+02 - 13+15	5	N/A

CROSS SECTIONS

<u>LINE</u>	<u>STATION</u>	<u>SHEETS</u>
-L-	I5+00 - 76+00	9-27
-Y-	11+50 - 17+00	28-29
-YI-	11+50 - 17+50	30-31

APPENDICES

<u>APPENDIX</u>	<u>TITLE</u>	<u>SHEETS</u>
A	LAB TEST RESULTS	32-35

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

ROADWAY
SUBSURFACE INVESTIGATION

COUNTY GASTON

PROJECT DESCRIPTION US 29/US74 (WILKINSON BLVD)
FROM SR 2209 (WESLEYAN DR/MARKET ST) TO
SR 2016/SR 2017 (GEORGIA BELLE AVE/HUBBARD ST)
AND BRIDGE #350082 OVER SOUTH FORK
CATAWBA RIVER

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-6146	1	35

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:
- 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.
 - 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.

CG2 PERSONNEL	OTHER PERSONNEL
<u>M. BREWER, P.E.</u>	<u>TERRACON</u>
<u>R. KRAL, P.E.</u>	<u>ITHIR TESTING</u>
<u>N. MCLAREN</u>	
<u>C. KEETEN</u>	
<u>C. ODOM</u>	
<u>J. ESTEP</u>	
<u>D. UNDERWOOD</u>	

INVESTIGATED BY CG2, PLLC

DRAWN BY M. BREWER, P.E.

CHECKED BY P.Q. LOCKAMY

SUBMITTED BY CG2, PLLC

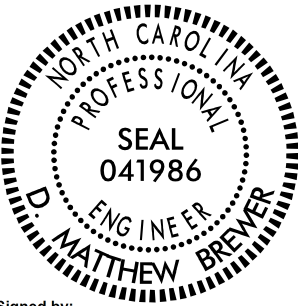
DATE JANUARY 2020



Prepared in the Office of:

**CAROLINAS
GEOTECHNICAL
GROUP**

2400 CROWNPOINT EXECUTIVE DRIVE
SUITE 800
CHARLOTTE, NC 28227
(980) 339-8684



DocuSigned by:
D. Matthew Brewer
386129C0A4C1462...
01/30/2020

SIGNATURE	DATE
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

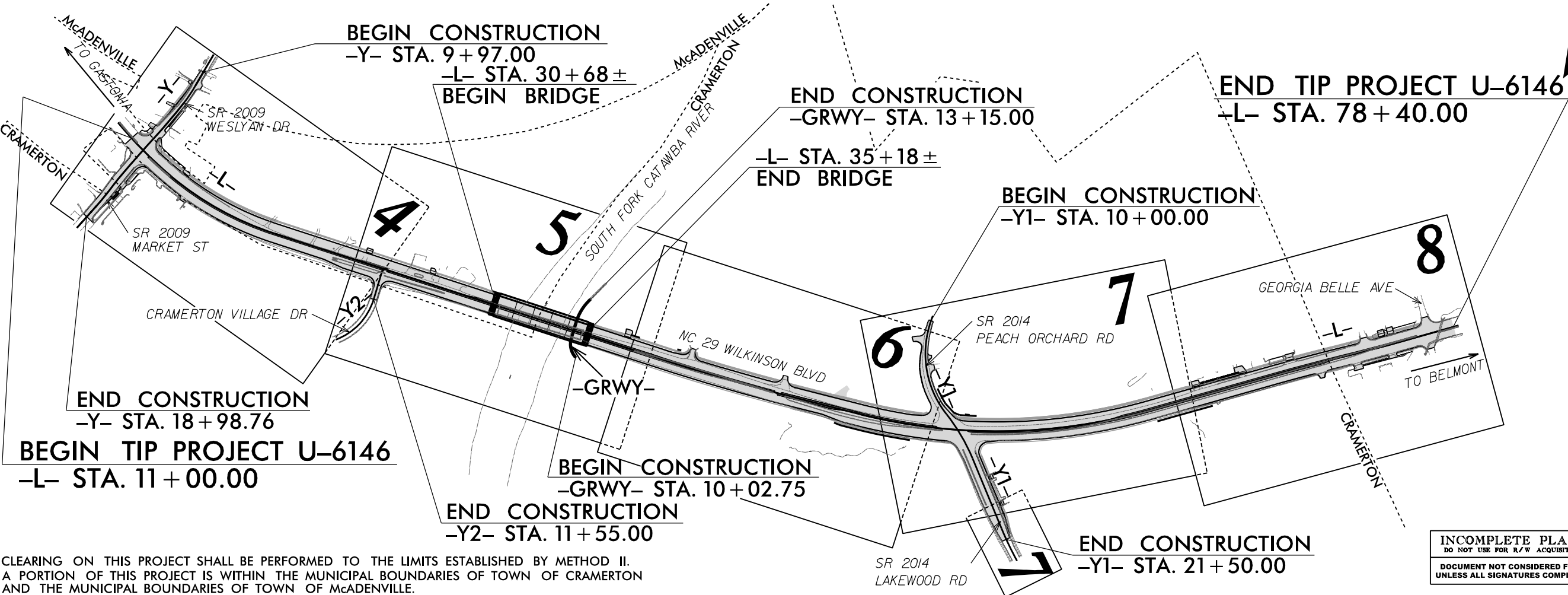
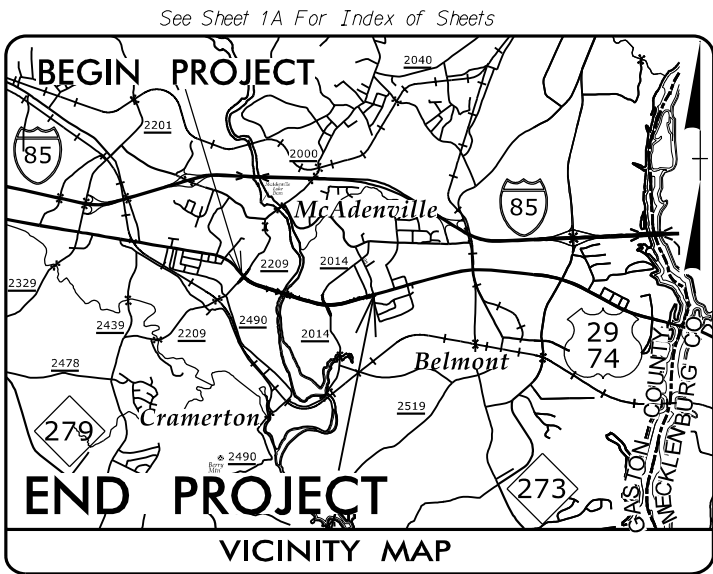
SOIL DESCRIPTION												GRADATION												ROCK DESCRIPTION												TERMS AND DEFINITIONS											
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING 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, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>												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.												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:												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 DISLOGGED 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 (ROD) - 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 (SROD) - 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.											
SOIL LEGEND AND AASHTO CLASSIFICATION												ANGULARITY OF GRAINS												WEATHERED ROCK (WR)												CRISTALLINE ROCK (CR)											
GENERAL CLASS.		GRANULAR MATERIALS (≤ 35% PASSING #200)						SILT-CLAY MATERIALS (> 35% PASSING #200)						ORGANIC MATERIALS				CRYSTALLINE ROCK (CR)		NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.																											
GROUP CLASS.	A-1-a	A-1-b	A-3	A-2-4	A-2	A-2-6	A-2-7	A-4	A-5	A-6	A-7	A-1, A-2	A-4, A-5	A-6, A-7	NON-CRYSTALLINE ROCK (NCR)		FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.																														
SYMBOL																																															
% PASSING												GRANULAR SOILS		SILT-CLAY SOILS		MUCK, PEAT																															
% PASSING #10																																															
% PASSING #40																																															
% PASSING #200																																															
MATERIAL PASSING #40																																															
LL																																															
PI																																															
GROUP INDEX																																															
USUAL TYPES OF MAJOR MATERIALS																																															
GEN. RATING AS SUBGRADE																																															
PI OF A-7-5 SUBGROUP IS ≤ LL - 30; PI OF A-7-6 SUBGROUP IS > LL - 30																																															
CONSISTENCY OR DENSENESS												MISCELLANEOUS SYMBOLS												ROCK HARDNESS																							
PRIMARY SOIL TYPE		COMPACTNESS OR CONSISTENCY		RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)				RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)				ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION		25/025 DIP & DIP DIRECTION OF ROCK STRUCTURES		SLOPE INDICATOR INSTALLATION		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																											
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)		VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE		< 4 4 TO 10 10 TO 30 30 TO 50				N/A				SOIL SYMBOL		SPT DMT VST PMT TEST BORING						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																											
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				INFERRED SOIL BOUNDARY		AUGER BORING						VERY SEVERE (V SEV.)																											
												INFERRED ROCK LINE		CORE BORING						COMPLETE																											
												ALLUVIAL SOIL BOUNDARY		MONITORING WELL						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.																											
														PIEZOMETER INSTALLATION																																	
TEXTURE OR GRAIN SIZE												RECOMMENDATION SYMBOLS												ROCK HARDNESS																							
U.S. STD. SIEVE SIZE OPENING (MM)		4		10		40		60		200		270								VERY HARD		CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.																									
		4.76		2.00		0.42		0.25		0.075		0.053								HARD		CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.																									
BOULDER (BLDR.)		COBBLE (COB.)		GRAVEL (GR.)		COARSE SAND (CSE, SD.)		FINE SAND (F SD.)		SILT (SL.)		CLAY (CL.)								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.																									
GRAIN SIZE		305		75		2.0		0.25		0.05		0.005								MEDIUM HARD		CAN BE GROUDED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.																									
SOIL MOISTURE - CORRELATION OF TERMS												ABBREVIATIONS												ROCK HARDNESS																							
SOIL MOISTURE SCALE (ATTERBERG LIMITS)		FIELD MOISTURE DESCRIPTION		GUIDE FOR FIELD MOISTURE DESCRIPTION								AR - AUGER REFUSAL		MED. - MEDIUM		VST - VANE SHEAR TEST		VERY HARD		CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.																											
												CL. - CLAY		MICA - MICACEOUS		WEA. - WEATHERED		HARD		CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.																											
												CPT - CONE PENETRATION TEST		MOD. - MODERATELY		UNIT WEIGHT		MODERATELY HARD		CAN BE GROUDED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.																											
												CSE. - COARSE		NP - NON PLASTIC		DRY UNIT WEIGHT		SOFT		CAN BE GROUDED 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.																											
												DPT - DILATOMETER TEST		ORG. - ORGANIC		SAMPLE ABBREVIATIONS		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.																											
												DMT - DYNAMIC PENETRATION TEST		PMT - PRESSUREMETER TEST																																	
												e - VOID RATIO		SAP. - SAPROLITIC																																	
												F - FINE		SD. - SAND, SANDY																																	
												FOSS. - FOSSILIFEROUS		SL. - SILT, SILTY																																	
												FRAC. - FRACTURED, FRACTURES		SLR. - SLIGHTLY																																	
												FRAGS. - FRAGMENTS		TRI. - TRICONE REFUSAL																																	
												HL. - HIGHLY		w - MOISTURE CONTENT																																	
PLASTICITY												EQUIPMENT USED ON SUBJECT PROJECT												ROCK HARDNESS																							
LL - LIQUID LIMIT		- SATURATED - (SAT.)		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE								DRILL UNITS:		ADVANCING TOOLS:		HAMMER TYPE:		TERM		SPACING		THICKNESS																									
PL - PLASTIC LIMIT		- WET - (W)		SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE								☐ CME-45C		☐ CLAY BITS		☒ AUTOMATIC ☐ MANUAL		VERY WIDE		MORE THAN 10 FEET		VERY THICKLY BEDDED																									
												☐ CME-55		☐ 6" CONTINUOUS FLIGHT AUGER				WIDE		3 TO 10 FEET		THICKLY BEDDED																									
												☒ CME-550		☒ 8" HOLLOW AUGERS				MODERATELY CLOSE		1 TO 3 FEET		THINLY BEDDED																									
												☐ VANE SHEAR TEST		☐ HARD FACED FINGER BITS				CLOSE		0.16 TO 1 FOOT		VERY THINLY BEDDED																									
												☐ PORTABLE HOIST		☐ TUNG.-CARBIDE INSERTS				VERY CLOSE		LESS THAN 0.16 FEET		THICKLY LAMINATED																									
												☒ DEIDRICH D-50		☒ CASING ☒ W/ ADVANCER								THINLY LAMINATED																									
												☐ TRICONE		☐ * STEEL TEETH								< 0.008 FEET																									
												☐ TRICONE		☐ * TUNG.-CARB.																																	
												☐ CORE BIT																																			
COLOR												INDURATION												ROCK HARDNESS																							
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.												FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.												FRIABLE																							
																								MODERATELY INDURATED																							
																								INDURATED																							
																								EXTREMELY INDURATED																							

DATE: 8-15-14

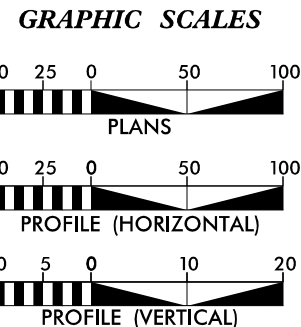
09/28/99
1/5/2020
C:\Users\mbrewer\OneDrive - Carolinas Geotechnical Group, PLLC\Projects\0007 - U-6146 Cramerton Bridge and Widening\CADD\ORIGINAL\U-6146_Rdy.-tsh.dgn
User:mbrewer

TIP PROJECT: U-6146

CONTRACT:



CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.
A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF TOWN OF CRAMERTON
AND THE MUNICIPAL BOUNDARIES OF TOWN OF McADENVILLE.

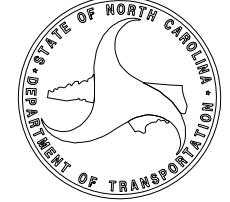


DESIGN DATA	
ADT 2016 =	22,600
ADT 2040 =	26,100
K =	12 %
D =	70 %
T =	4 % *
V =	50 MPH
* TTST = 1% DUAL = 3%	
FUNC CLASS =	
URBAN ARTERIAL	
REGIONAL TIER	

PROJECT LENGTH	
LENGTH ROADWAY TIP PROJECT U-6146	= 1.192 MILES
LENGTH STRUCTURE TIP PROJECT U-6146	= 0.085 MILES
TOTAL LENGTH TIP PROJECT U-6146	= 1.277 MILES

NCDOT CONTACT: THAD DUNCAN, PE	
PLANS PREPARED BY:	PLANS PREPARED FOR:
TGS ENGINEERS 804-C N. LAFAYETTE ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION 12 1710 E. Marion St Shelby, NC 28150
RIGHT OF WAY DATE:	JIMMY L. TERRY, PE PROJECT ENGINEER
LETTING DATE:	SANDRA MELVIN PROJECT DESIGN ENGINEER
2018 STANDARD SPECIFICATIONS	

HYDRAULICS ENGINEER	
SIGNATURE:	P.E.
ROADWAY DESIGN ENGINEER	
SIGNATURE:	P.E.



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
GASTON COUNTY

**LOCATION: US 29/US 74 (WILKINSON BLVD) FROM SR 2209
(WESLEYAN DR/MARKET ST) TO SR 2016/SR 2017
(GEORGIA BELLE AVE/HUBBARD ST) AND BRIDGE #350082
OVER SOUTH FORK CATAWBA RIVER
GRADING, PAVING, DRAINAGE, CURB & GUTTER,
AND STRUCTURE**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-6146	3	35
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
48392.1.1	N/A	PE	
48392.2.1	N/A	ROW, UTIL.	



1/30/2020

STATE PROJECT:

48392.1.1

TIP NUMBER:

U-6146

F/A NUMBER:

N/A

COUNTY:

Gaston

DESCRIPTION:

US 29/US 74 from SR 2209 to SR 2016/SR 2017 and Bridge #350082

SUBJECT:

Geotechnical Roadway Inventory Report

PROJECT DESCRIPTION

This roadway widening project consists of improvements to US 29/US 74 beginning just west of the intersection with SR 2209 (Wesleyan Dr/Market St) and extends just east of the intersection with Georgia Belle Ave / Hubbard St. The project is approximately 1.3 miles in length, measured along -L- (US 29/US 74) from Station 11+00 to 78+40. The construction consists of widening the existing four to six-lane facility to six-lanes with concrete median section. The project will also include intersection improvements with secondary roadways and driveway improvements, additional sidewalk and multi-use path, and supporting infrastructure for the widening. The following alignments are included as part of this investigation:

Alignment	Stations
-L- (US 29/US 74)	11+00 to 78+40
-Y- (SR 2209)	9+97 to 18+98
-Y1- (SR 2014)	10+00 to 21+50
-Y2- (Cramerton Village Dr)	10+00 to 11+55
-GRWY- (Future Greenway)	10+02 to 13+15

The following structures are included as part of this investigation:

Structure	Stations
Bridge on US 29/US 74 over South Fork Catawba River	30+68 to 35+18

The following retaining walls are included as part of this investigation:

Wall	Stations	Offset
Retaining Wall No. 1	17+10 to 17+55 (-L-)	39 to 44' LT
Retaining Wall No. 2	37+32 to 37+75 (-L-)	66 LT
Retaining Wall No. 3	39+65 to 39+85 (-L-)	68 to 70' LT
Retaining Wall No. 4	47+90 to 51+60 (-L-)	70 to 74' RT
Retaining Wall No. 5	63+40 to 66+17 (-L-)	62' RT
Retaining Wall No. 6	13+44 (-Y1-) to 54+70 (-L-)	26' LT to 72' RT
Retaining Wall No. 7	64+84 to 67+82 (-L-)	52' LT

The project has been divided into sections to describe the change in grades in a more descriptive manner across the entire project. A summary of the proposed grade changes and construction improvements listed below:

Section No. 1: -L- Station 11+00 to 30+00

This section of the project contains relatively flat grades along the right side of the alignment, resulting in proposed cuts and fills on the order of 5 feet or less. One larger cut is present along the left side of the alignment from -L- Station 14+50 to 27+00, which contains cuts on the order of 10 to 25 feet. The new construction for this section contains improvements to the intersections of -L- with -Y- and -Y2with the addition of new turn lanes and widened travel lanes. Grade changes along -Y- and -Y2 are minimal, however, a curb and gutter section will be constructed along -Y- and -Y2-. Retaining Wall No. 1 will be constructed along the left side of the alignment in this section.

Section No. 2: -L- Station 30+00 to 36+50

This section of the project contains the floodplain of the South Fork Catawba River, and existing US 29/US 74 is supported by a built-up roadway embankment section on the order of 15 feet in height. In order to accommodate the widening, fill sections will be constructed on both sides of existing US 29/US 74 along -L-. These proposed fills range from 15 to 20 feet in height. This section also contains the New Bridge over the South Fork Catawba River. The southern side slope of End Bent 1 will receive rock plating for slope protection.

Section No. 3: -L- Station 36+50 to 61+00

Most of this section of the project contains a large cut slope on the left sides of existing US 29/US 74. The existing slope geometry is on the order of 2:1 (H:V). The proposed cuts through this section are on the order of 10 to 20 feet in depth. The new construction for this section includes improvements to the intersections of -L- with -Y1- with the addition of new turn lanes and widened travel lanes. Grade changes along -Y1- will be minimal. Retaining Wall No. 2, 3, 4, and 6 will be constructed along -L- and -Y1- in this section.

Section No. 4: -L- Station 61+00 to 78+40:

This section of the project contains relatively flat grades, resulting in proposed cuts and fills on the order of 5 feet or less. One larger cut is present along the left side of the alignment at -L- Station 72+00 and which contains a cut on the order of 10 feet or less. The new construction for this section of the project includes improvements with the addition of new turn lanes, new travel lanes and widened travel lanes. In order to accommodate the widened roadway section Retaining Wall No. 5 will be constructed as a fill wall along the right side of the alignment in this section. Retaining Wall No. 7, a small retaining wall, will also be constructed in this section.

The geotechnical field investigation was conducted by CG2 during the period of May through July 2019. Subcontracted drill crews were used to drill, sample, and log 41 of the borings in this report. The subcontractor drill rigs were ATV-mounted CME-550s and a track-mounted Diedrich D-50 equipped with automatic hammers. Standard Penetration Tests were performed at selected depths for the 41borings. Hand auger borings were performed at thirteen locations due to utility and access conflicts.

Representative soil samples were collected for visual-manual classification in the field and selected samples were submitted for laboratory analysis by an approved NCDOT M&T testing facility.

PHYSIOGRAGHY AND GEOLOGY

In general, a majority of the project corridor is relatively flat, with rolling terrain that is moderately wooded with gently sloping hills. The project corridor is located within the Charlotte Belt Geologic Province of North Carolina. According to the 1985 Geologic Map of North Carolina, the bedrock under the site consists of Granodiorite, massive to foliated Granite, and foliated to massive Metamorphosed Quartz Diorite. The rock encountered during the investigation was classified as Metamorphosed Quartz Diorite, Granodiorite, and Granite.

Some of the project footprint is in an area that contains near surface soils with recent alluvial deposits from the South Fork Catawba River overlying residual soils. These alluvial deposits were encountered immediately adjacent to existing waterways.

Residual soils are derived from the continued in situ chemical and physical weathering of the rocks in the area. Residual soils are typically finer grained and have higher clay content near the surface because of the advanced weathering. Similarly, the soils typically become coarser grained with increasing depth because of decreased weathering. As the degree of weathering decreases, the residual soils generally retain the overall appearance and fabric of the parent rock. The boundary between soil and rock is not always sharply defined. A transitional zone termed “weathered rock” is normally found overlying the parent bedrock.

Soil Properties

A pavement system containing varying amounts of asphalt pavement, concrete pavement, aggregate base course (ABC) and varying amounts of roadway embankment soils was sampled during the Roadway Investigation and the Pavement Subgrade and Design Investigation (PDI). General descriptions of the pavement sections and roadway embankment soils encountered during the PDI are used periodically in the graphics for this roadway inventory report for consistency. For more specific information regarding the findings of the pavement investigation, please see the PDI report for this project which is submitted under separate cover.

Soils and rock encountered during this investigation include roadway embankment, artificial fill, alluvial, residual, weathered rock, and crystalline rock.

A pavement system consisting of asphalt pavement and aggregate base course (ABC) was encountered at several of the boring locations in the existing travel lanes. The asphalt pavement encountered was on the order of 0.4 ft to 1.2 ft thick overlying a layer of ABC on the order of 0.8 ft to 1.5 ft. A separate pavement investigation is provided under separate cover.

Roadway Embankment soils are similar in nature to residual soils and may be derived from nearby sources. These soils consist of red-tan-pink-brown-black-white-orange, very soft to very stiff, fine sandy silt (A-4), clayey silt (A-5), and slightly to highly plastic silty clay (A-7-5/A-7-6), with trace mica, organics, and asphalt fragments; and red-tan-black, loose, silty fine sand (A-2-4), with trace mica.

Artificial Fill soils were encountered in borings L_1900L, L_2000L, L_2100L, L_2500L, L_2900L, EB1-A, L_3700L, L_4700L, L_4830L, L_4900L, L_5000L, L_5100L, L_5200L, and Y_HA_1700L. Artificial fill soils are materials that have been moved and/or placed by man or mechanical means. These soils consist of orange-tan-brown-gray-red-white, very soft to stiff, fine to coarse sandy silt (A-4), fine to coarse sandy clay (A-6), and moderately to highly plastic silty clay (A-7-5) with trace gravel, and varying amounts of construction debris, wood debris, rock fragments organics, mica and roots; and tan-brown-red, very loose to dense, silty fine to coarse sand (A-2-4), with trace to little gravel, trace organics and trace mica.

Alluvial soils were encountered in borings EB1-A, EB1-B, EB1-C, EB2-A, EB2-B, and EB2-C. These soils consist of gray-tan-orange-brown-red, very soft to stiff, slightly plastic fine to coarse sandy clay (A-6), slightly plastic fine to coarse sandy silt (A-4), fine sandy clay (A-6), and silty clay (A-7-5), with trace organics, mica, rounded gravel, and pea gravel; and orange-tan-brown-white-gray, loose to very dense, silty fine to coarse sand (A-2-4) and silty fine to coarse sandy gravel (A-1-a), with trace pea gravel.

Residual soils are derived from the weathering of underlying rock in the area. These soils consist of orange-gray-tan-brown-white-black-green-red, soft to hard, fine to coarse sandy silt (A-4), clayey silt (A-5), fine sandy clay (A-6), and slightly to highly plastic silty clay (A-7-5), with trace organics, mica, and gravel size rock fragments; and brown-white-blue-tan, loose to very dense, silty fine to coarse sand (A-2-4), with trace mica.

Weathered rock was also encountered along the project corridor within eight boring locations (EB1-A, EB1-B, EB2-B, EB2-C, L_2000L, L_2100L, L_2300L, and L_5100L). The weathered rock consists of gray-tan-orange-brown-white, Metamorphosed Quartz Diorite, Granite, and Granodiorite and was encountered at an approximate depth of 14 to 49 feet below existing grades.

Crystalline rock was encountered along the project corridor within Borings EB1-A, EB1-B, EB1-C, EB2-A, EB2-B, EB2-C, and L_2100L, L_2100L. The crystalline rock was classified as Metamorphosed Quartz Diorite, Granodiorite and Granite was encountered at depths ranging from 28 to 63 feet below existing grades.

Groundwater

Groundwater measurements were taken in May 2019 through July 2019 during our investigation. Groundwater was encountered in 10 of the borings and hand augers at depths ranging from 3.1 feet to 28.5 feet below existing grades at the completion of drilling activities. Groundwater was encountered in 11 of the borings and hand augers at depths ranging from 4.6 feet to 34.0 feet below existing grades after a stabilization period of at least 24 hours. Twenty-six of the borings were backfilled immediately upon completion of the borings for safety reasons, due to being located in an active roadway, and/or at the request of the property owner. The remaining hand augers and borings were recorded as dry at the bottom of the boring cylinder. Groundwater is not expected to cause significant impacts for construction. The soils encountered were generally described as moist to wet above the groundwater elevation and moist to saturated below groundwater elevation.

Water wells and monitoring wells were encountered within the project corridor. Water wells and monitoring wells could be encountered at other locations due to the presence of dwellings and businesses.

<u>Alignment</u>	<u>Stations</u>	<u>Offsets (ft)</u>
-L-	18+94	110 LT
-L-	19+40	53 LT
-L-	27+60	34 LT
-L-	59+61	120 LT
-L- (Multiple Monitoring Wells)	10+93 to 11+41	78 RT to 175 RT
-L- (Multiple Monitoring Wells)	12+05 to 13+58	74 LT to 175 LT

Areas of Special Geotechnical Interest

The following borehole locations encountered very soft to soft or very loose to loose soils which have the potential to cause embankment stability and/or long-term settlement problems:

<u>Alignment</u>	<u>Stations</u>	<u>Offsets (ft)</u>
-L-	25+00 to 30+62	50 LT to 37 RT
-L-	35+18	62 LT to 54 RT
-L-	48+50	85 LT
-L-	50+00 to 51+62	85 LT to 60 RT
-L-	54+00	70 LT
-L-	64+00 to 66+15	55 LT to 45 RT

Highly Plastic Clays: Highly plastic clays ($PI > 25$) were encountered on the project at the following borehole locations:

<u>Alignment</u>	<u>Stations</u>	<u>Offsets (ft)</u>
-L-	45+00	70 LT
-L-	51+00	60 RT

Shallow groundwater was not encountered within 6 feet of proposed subgrade at any of the borehole locations. Shallow groundwater was encountered within 3 feet of the existing ground surface in the floodplain areas adjacent to the South Fork Catawba River.

Artificial Fill soils with significant amounts of construction debris was observed on the project at the following locations:

<u>Alignment</u>	<u>Stations</u>	<u>Offsets (ft)</u>
-L-	27+50 to 31+50	LT

Artificial fill encountered at other locations appears to consist of local soils placed to level out building pads for residences. Artificial fill soils from 45+50 to 52+50, LT were placed by a contractor for a new multi-family apartment complex. These soils do not appear to be a concern.

Geotechnical Testing

Bulk samples for standard Proctor and California Bearing Ratio (CBR) testing were collected on the project at the following borehole locations:

Sample No.	Alignment	Station	Offset (ft)	Sample Depth (ft)
CBR-1	-L-	21+00	85 LT	5.5 - 14.0

Relatively undisturbed thin wall (Shelby Tubes) samples were collected on the project at the following borehole locations:

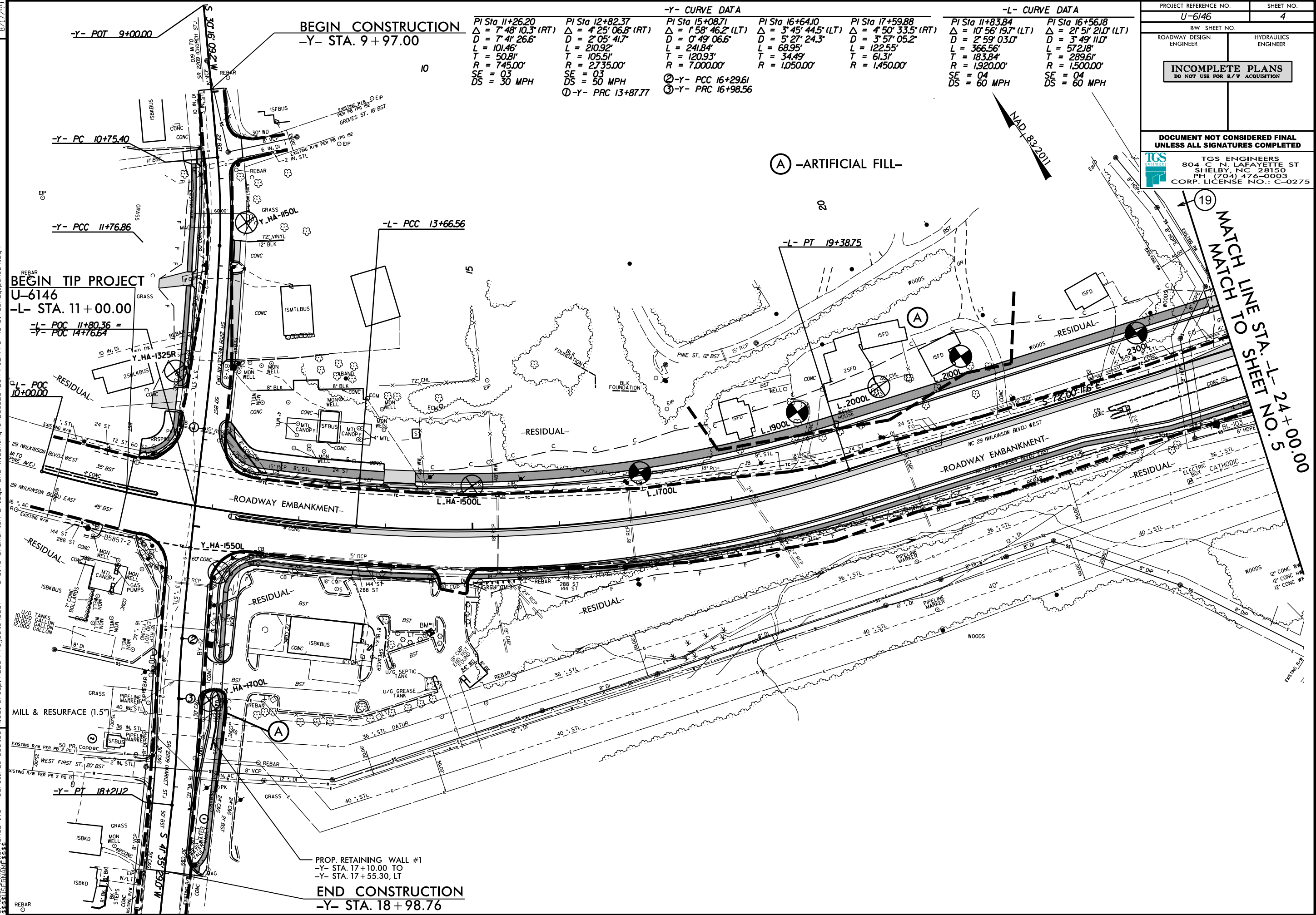
Sample No.	Alignment	Station	Offset (ft)	Sample Depth (ft)
ST-1	-L-	35+18	62 LT	2.0 - 4.0

Sincerely,
Carolinan Geotechnical Group, PLLC

DocuSigned by:
Robert E. Kral
8AD703B2A8484F4...
Robert E. Kral, PE
Senior Project Engineer

DocuSigned by:
D. Matthew Brewer
386129CDA4C1462...
D. Matthew Brewer, PE
Senior Project Engineer

REVISIONS



BEGIN CONSTRUCTION
-Y- STA. 9+97.00

PI Sta 11+26.20
 $\Delta = 7' 48' 10.3''$ (RT)
 $D = 7' 41' 26.6''$
 $L = 101.46'$
 $T = 50.81'$
 $R = 745.00'$
 $SE = 03$
 $DS = 30$ MPH

PI Sta 12+82.37
 $\Delta = 4' 25' 06.8''$ (RT)
 $D = 2' 05' 41.7''$
 $L = 210.92'$
 $T = 105.51'$
 $R = 2735.00'$
 $SE = 03$
 $DS = 50$ MPH
①-Y- PRC 13+87.77

-Y- CURVE DATA

PI Sta 15+08.71
 $\Delta = 1' 58' 46.2''$ (LT)
 $D = 0' 49' 06.6''$
 $L = 241.84'$
 $T = 120.93'$
 $R = 7,000.00'$
②-Y- PCC 16+29.61
③-Y- PRC 16+98.56

PI Sta 16+64.10
 $\Delta = 3' 45' 44.5''$ (LT)
 $D = 5' 27' 24.3''$
 $L = 68.95'$
 $T = 34.49'$
 $R = 1,050.00'$

PI Sta 17+59.88
 $\Delta = 4' 50' 33.5''$ (RT)
 $D = 3' 57' 05.2''$
 $L = 122.55'$
 $T = 61.31'$
 $R = 1,450.00'$

-L- CURVE DATA

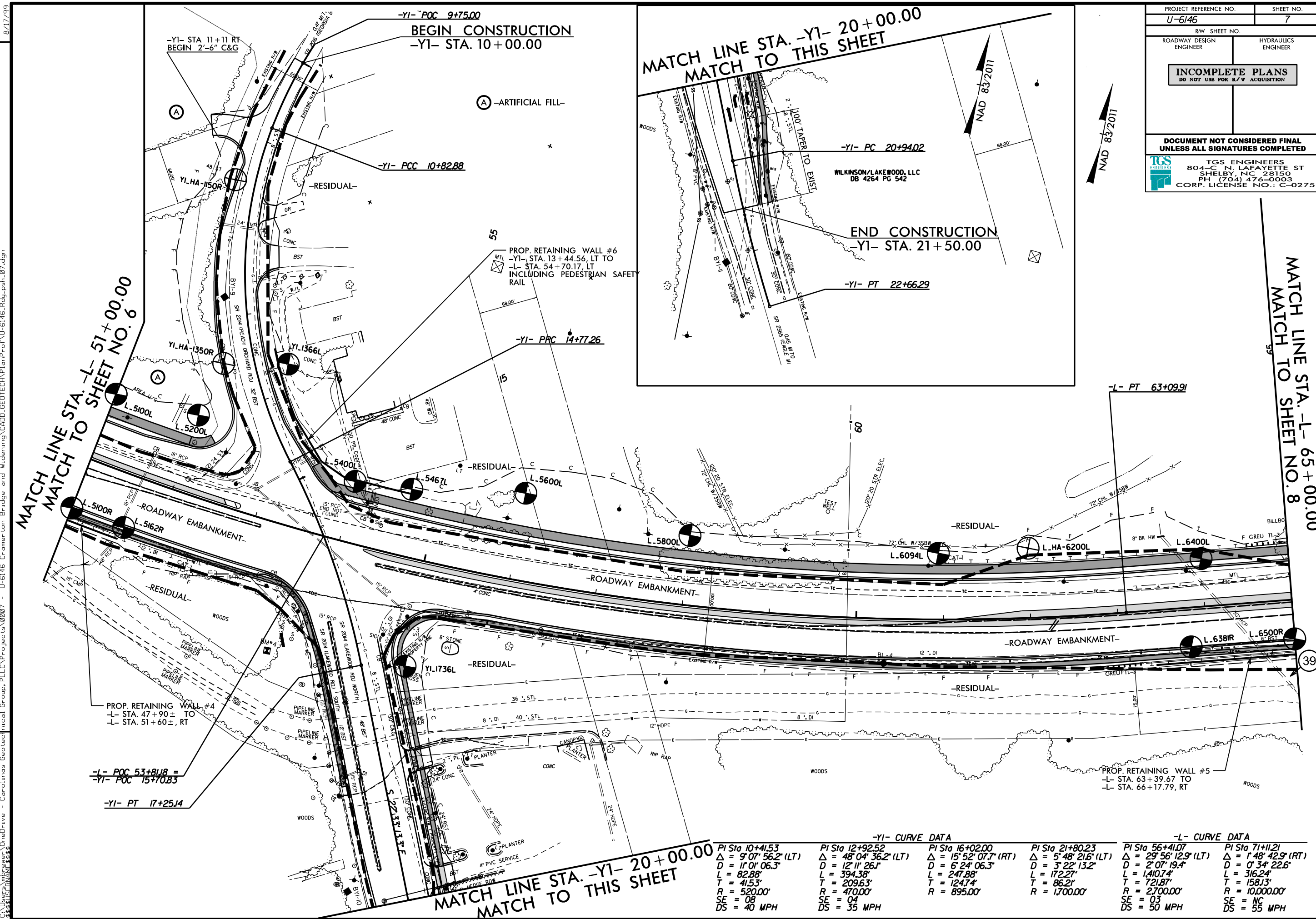
PI Sta 11+83.84
 $\Delta = 10' 56' 19.7''$ (LT)
 $D = 2' 59' 03.0''$
 $L = 366.56'$
 $T = 183.84'$
 $R = 1,920.00'$
 $SE = 04$
 $DS = 60$ MPH

PI Sta 16+56.18
 $\Delta = 2' 51' 21.0''$ (LT)
 $D = 3' 49' 11.0''$
 $L = 572.18'$
 $T = 289.61'$
 $R = 1,500.00'$
 $SE = 04$
 $DS = 60$ MPH

PROJECT REFERENCE NO. U-6146		SHEET NO. 4
RW 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 804-C N. LAFAYETTE ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275		

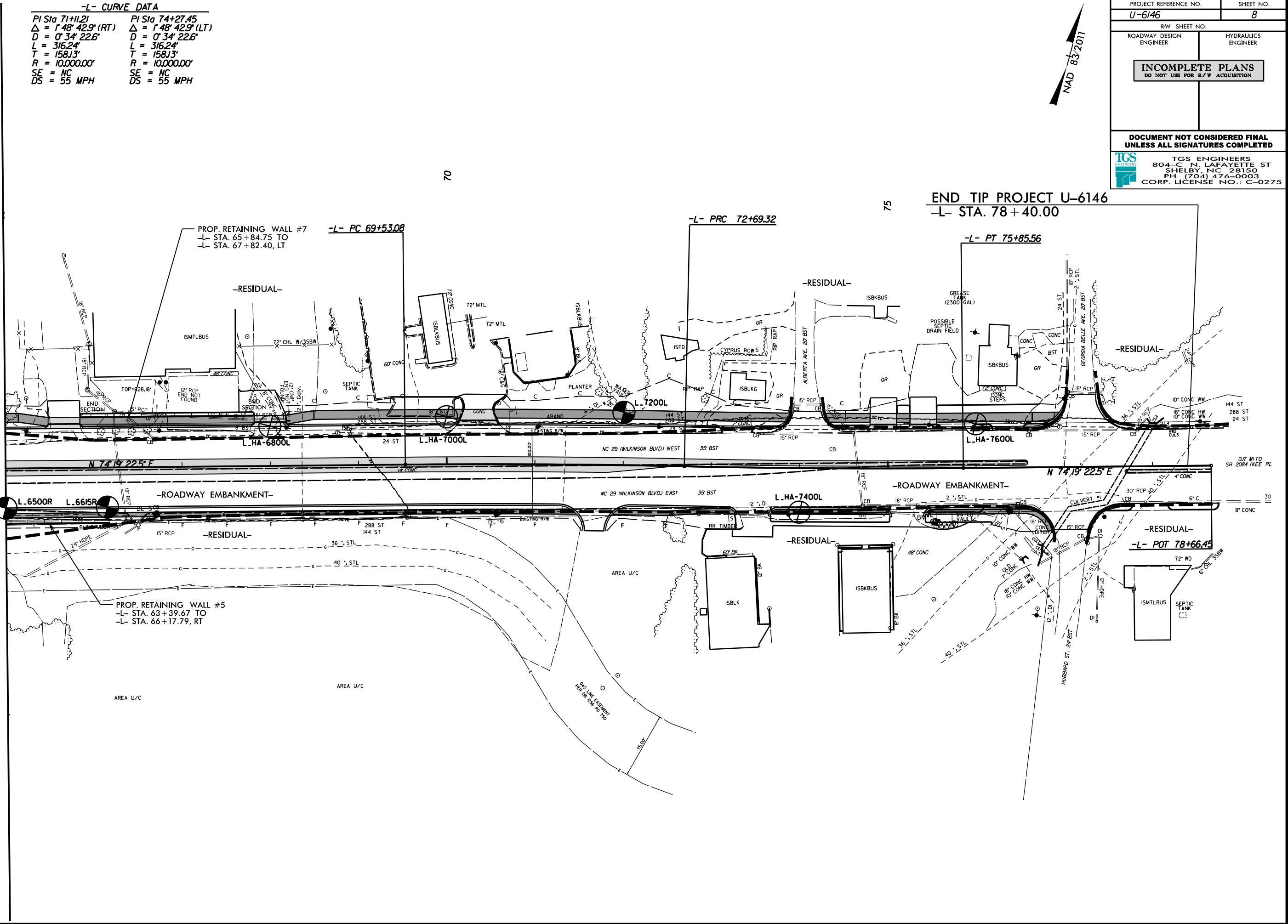
(A) -ARTIFICIAL FILL-

MATCH LINE TO STA. 18+21.12
SHEET NO. 5



MATCH LINE STA. -L- 65+00.00
MATCH TO SHEET NO. 7

-L- CURVE DATA	
PI Sta 71+11.21	PI Sta 74+27.45
$\Delta = 1^{\circ}48'42.9"$ (RT)	$\Delta = 1^{\circ}48'42.9"$ (LT)
$D = 0^{\circ}34'22.6"$	$D = 0^{\circ}34'22.6"$
$L = 316.24'$	$L = 316.24'$
$T = 158.13'$	$T = 158.13'$
$R = 10,000.00'$	$R = 10,000.00'$
SE = NC	SE = NC
DS = 55 MPH	DS = 55 MPH



PROJECT REFERENCE NO. U-6146		SHEET NO. 8
RW 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 804-C N. LAFAYETTE ST SHELBY, NC 28150 PH: (704) 476-0003 CORP. LICENSE NO.: C-0275		

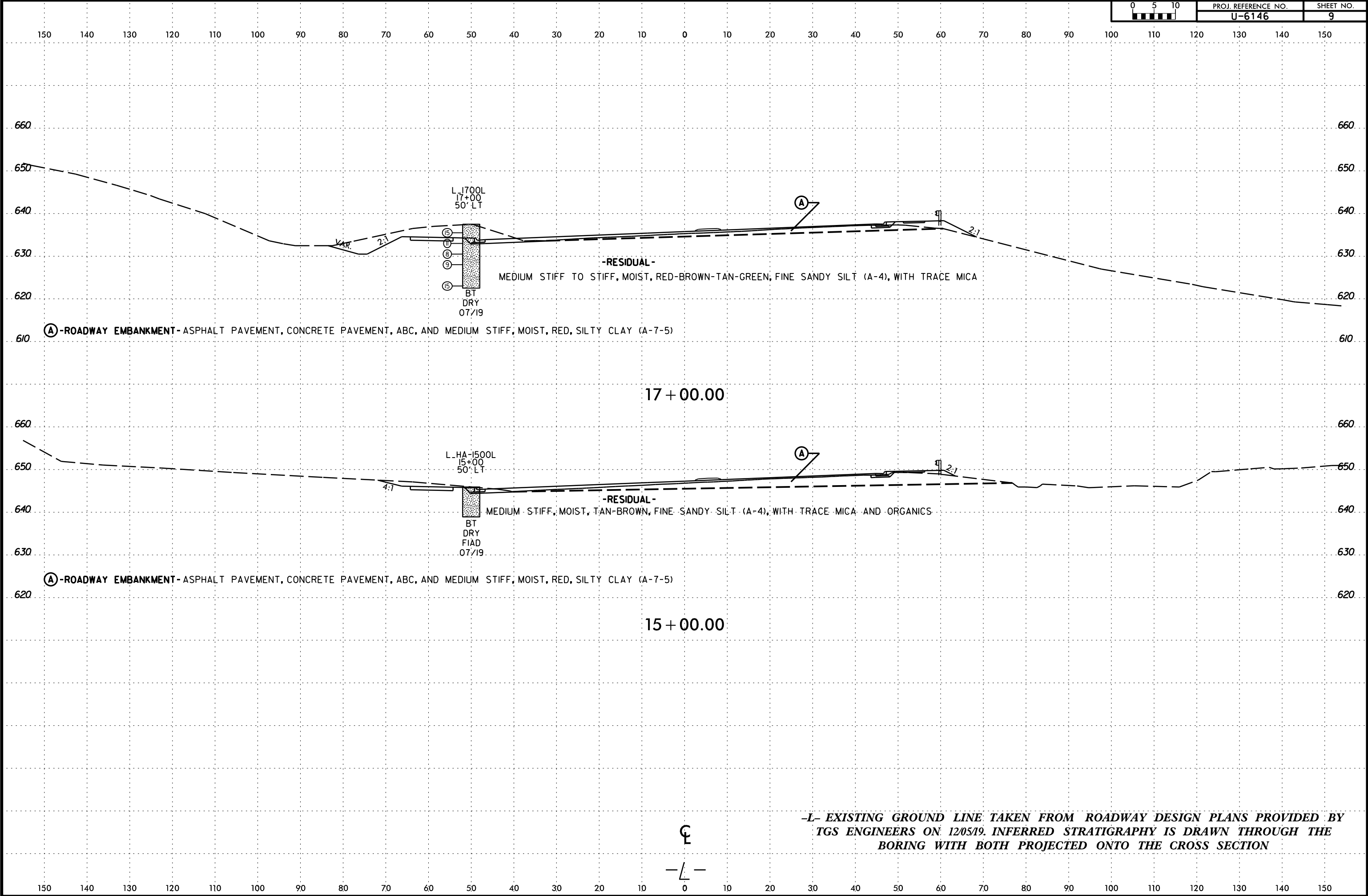
END TIP PROJECT U-6146
-L- STA. 78+40.00

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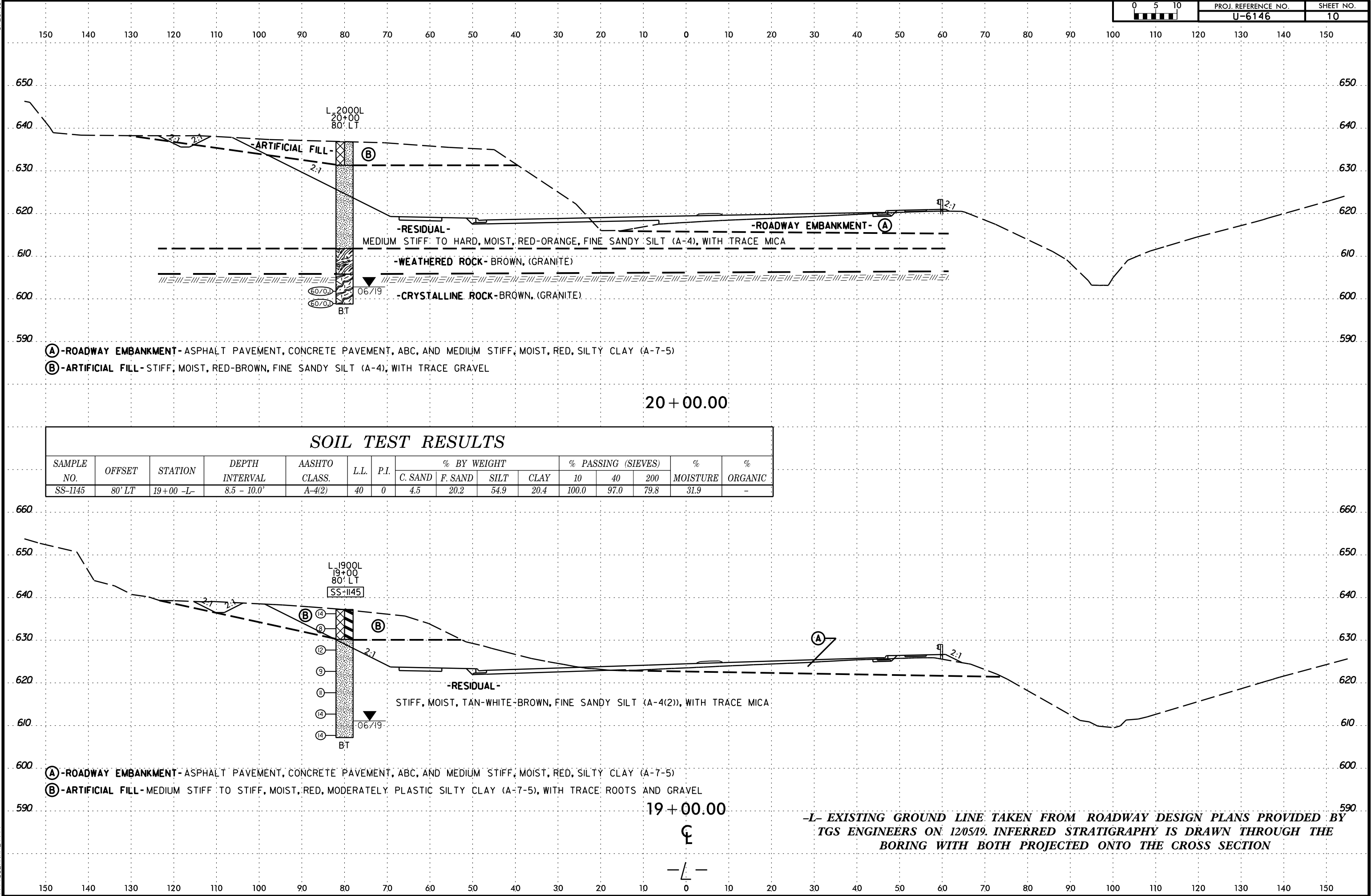
PROJ. REFERENCE NO.	SHEET NO.
U-6146	9



-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY
TGS ENGINEERS ON 12/05/19. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE
BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

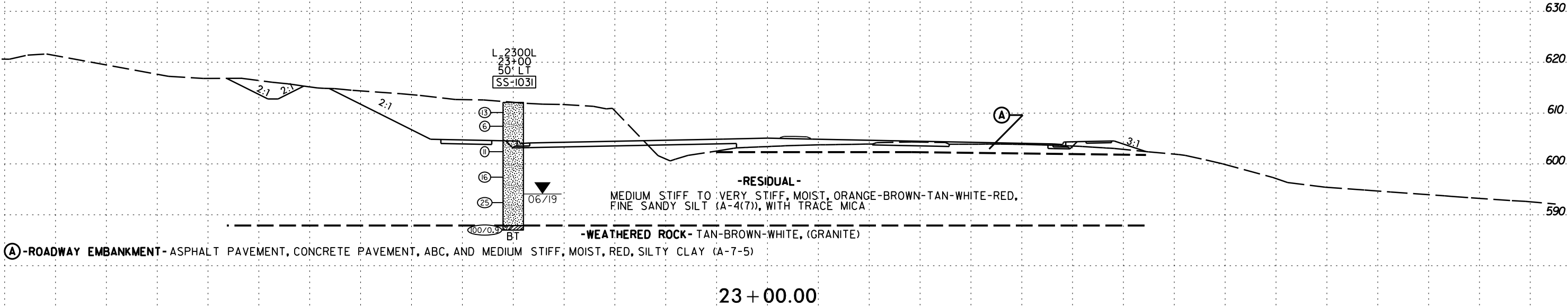
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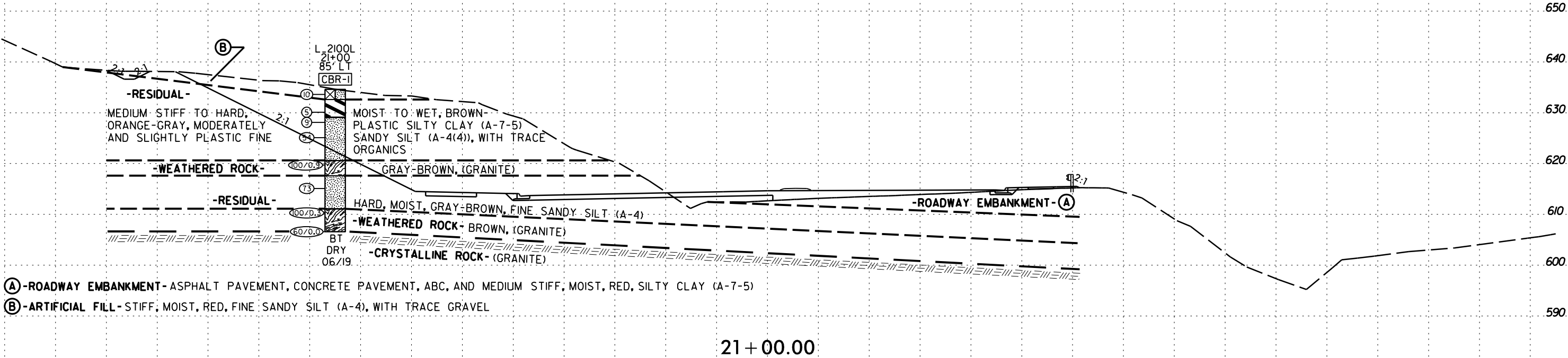


150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

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-1031	50' LT	23+00 -L-	1.0 - 2.5'	A-4(7)	40	9	8.5	22.7	30.1	38.7	99.0	93.0	73.0	26.4	-



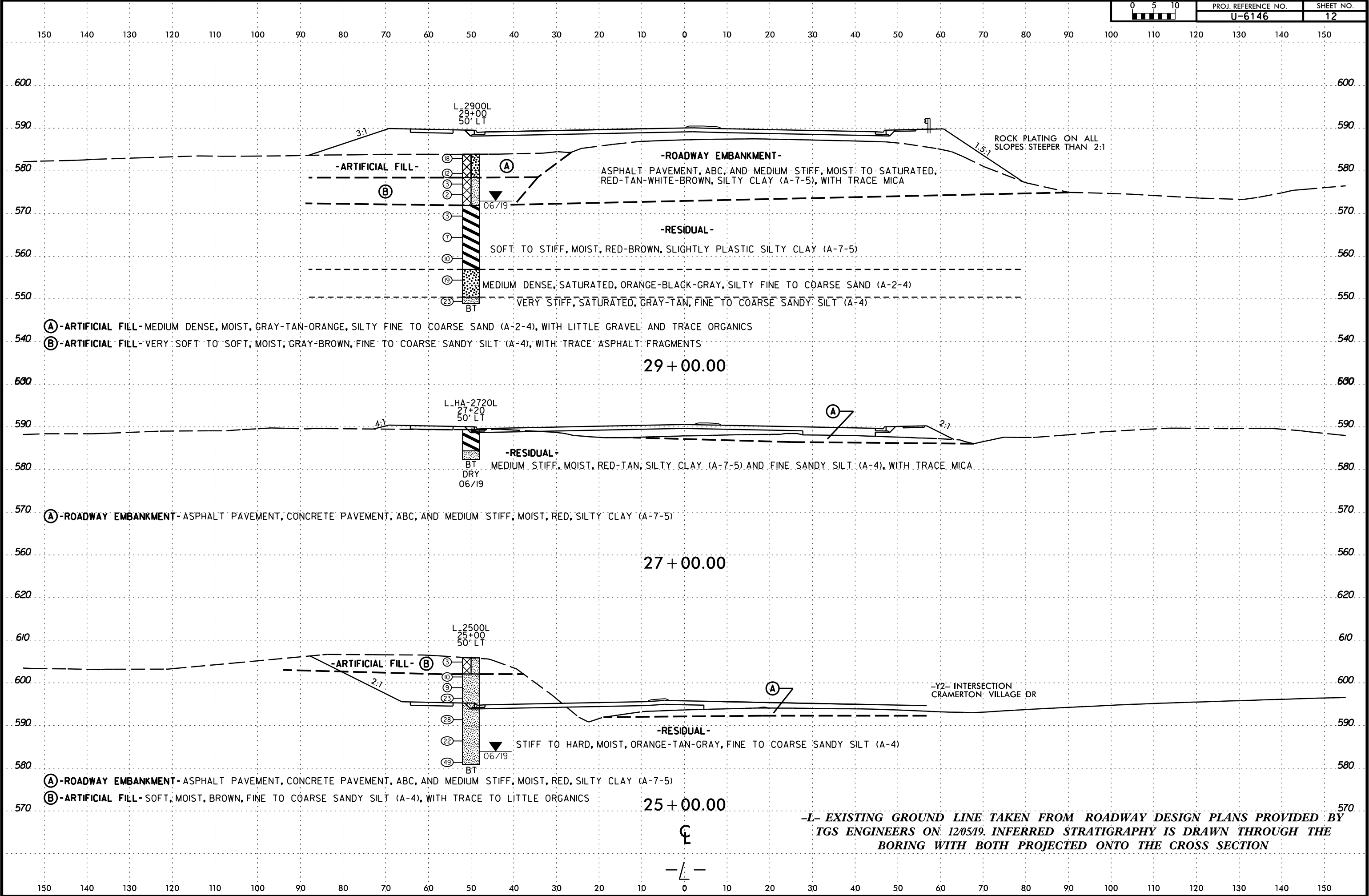
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SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
CBR-1	85' LT	21+00 -L-	5.5 - 14.0'	A-4(4)	29	8	8.4	30.8	39.7	21.1	96.5	94.9	70.2	14.1	-

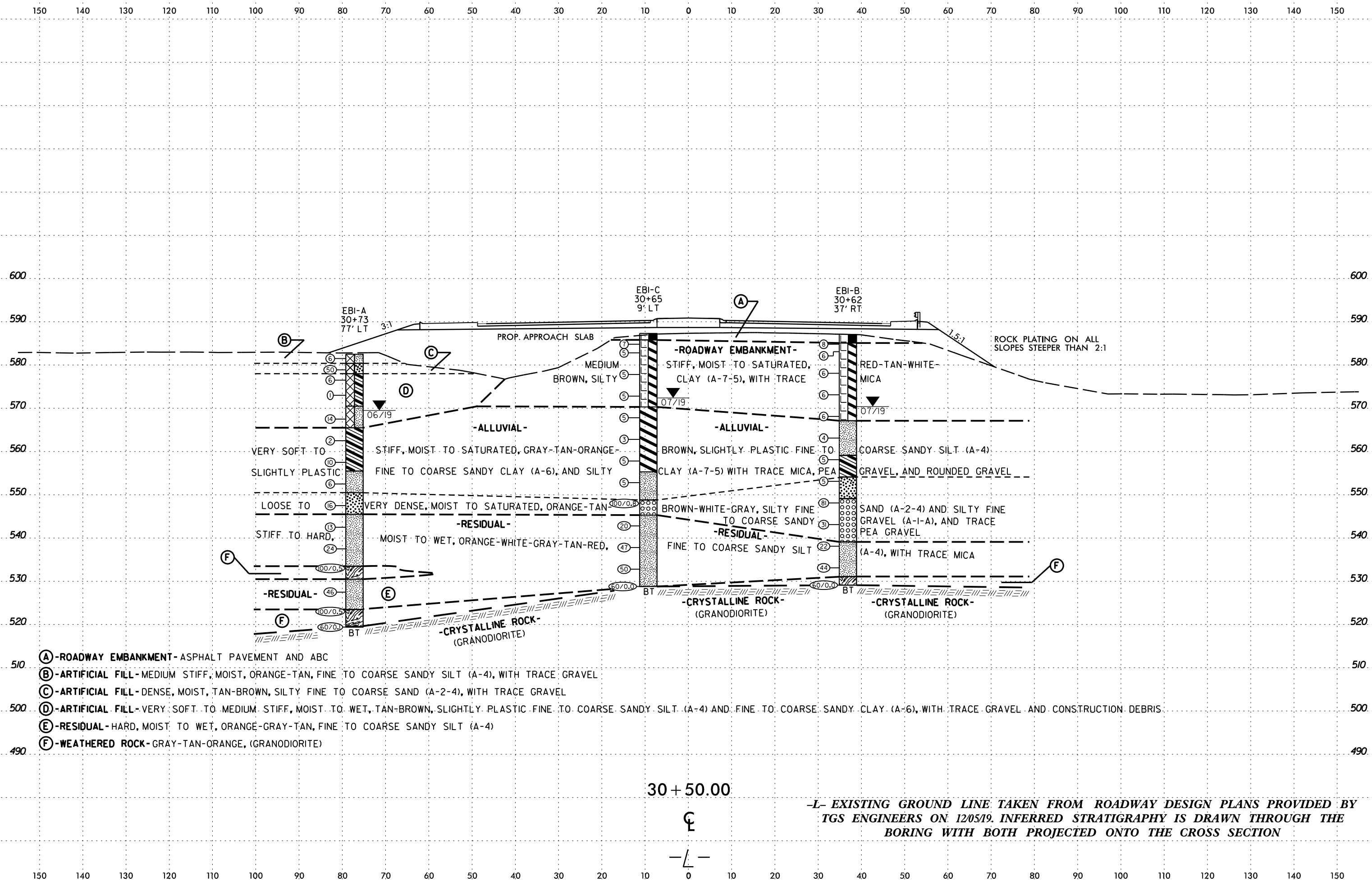


-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY
TGS ENGINEERS ON 12/05/19. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE
BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

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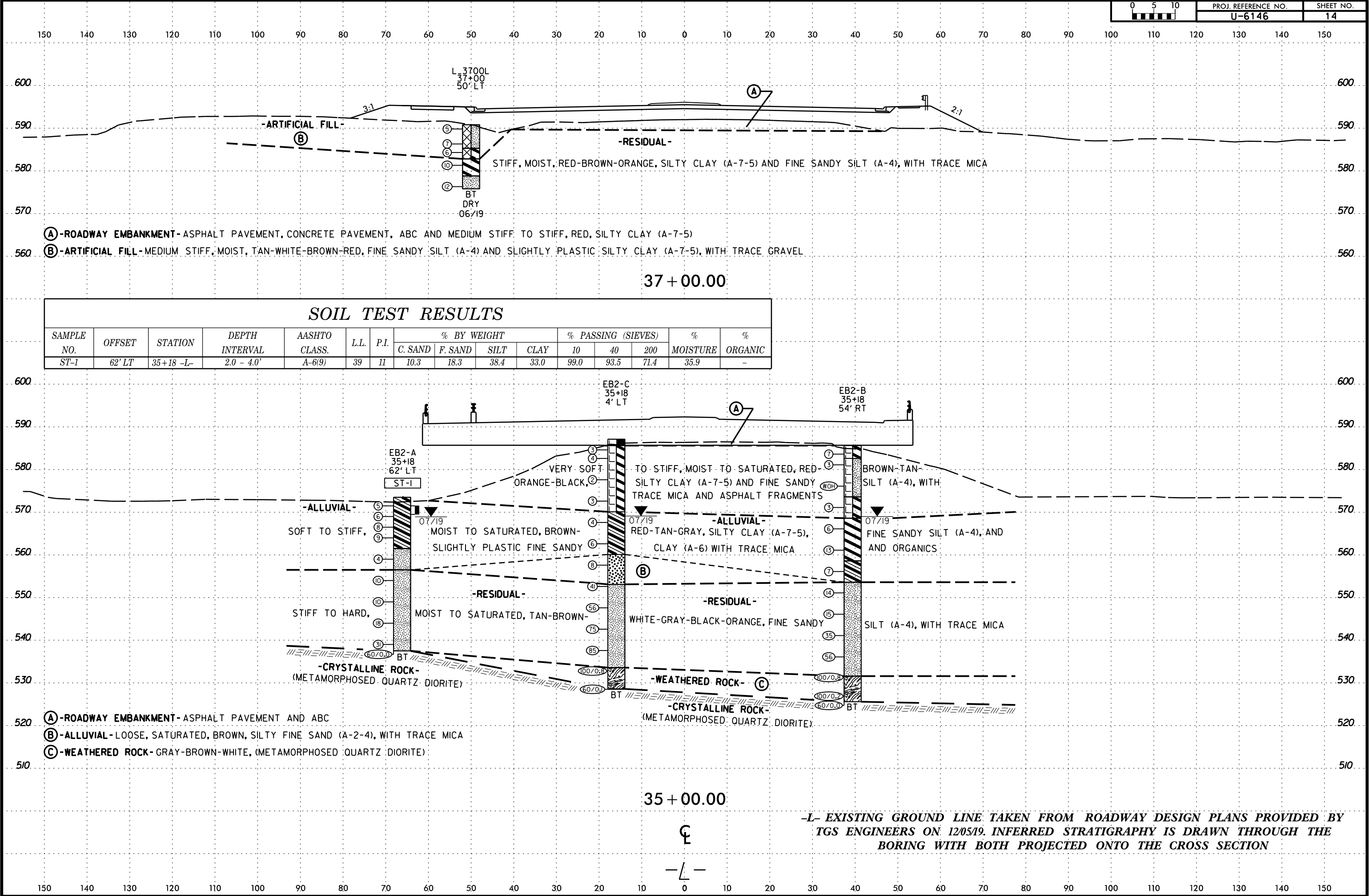
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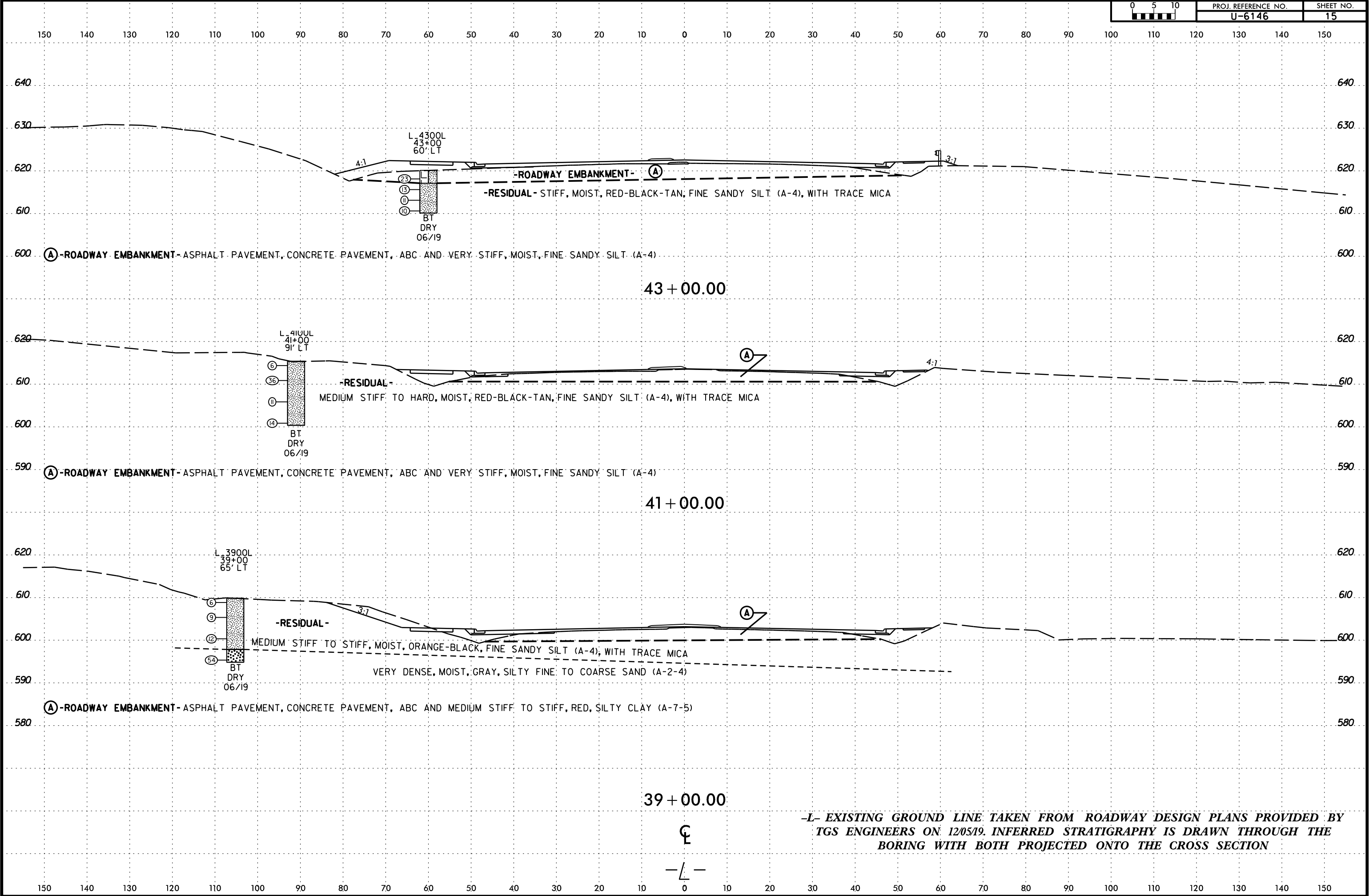
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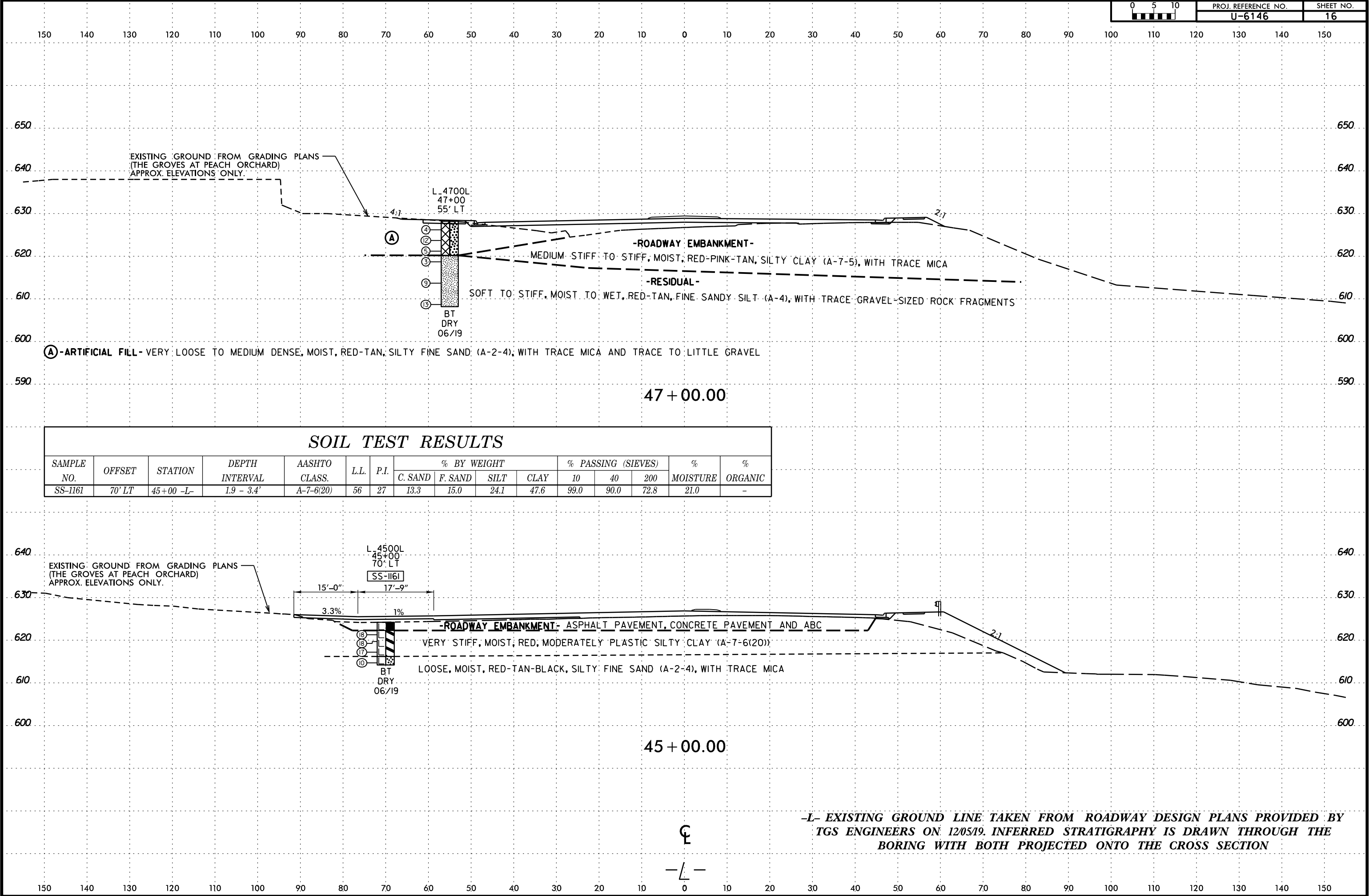


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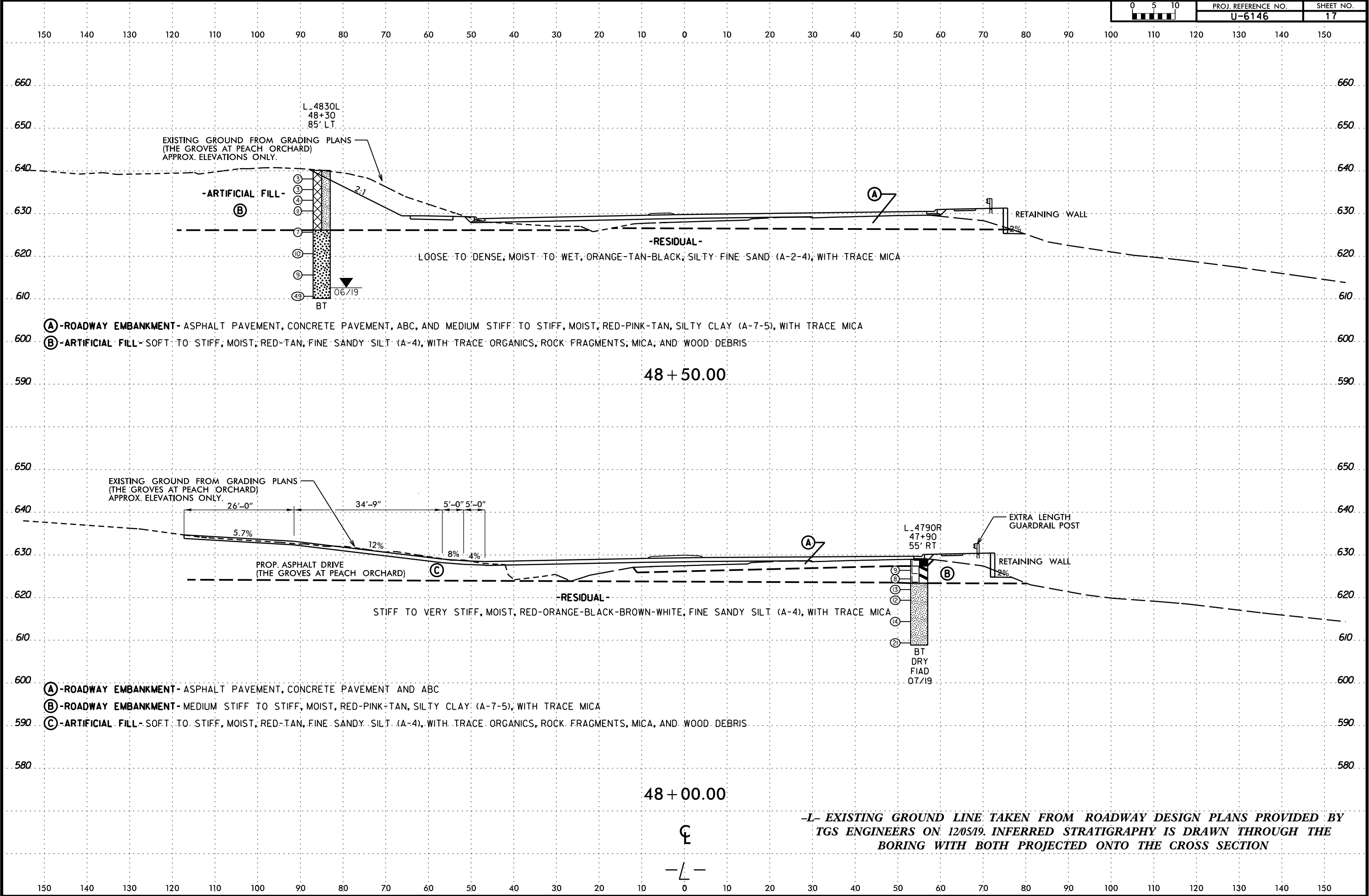
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SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-1161	70' LT	45+00 -L-	1.9 - 3.4'	A-7-6(20)	56	27	13.3	15.0	24.1	47.6	99.0	90.0	72.8	21.0	-

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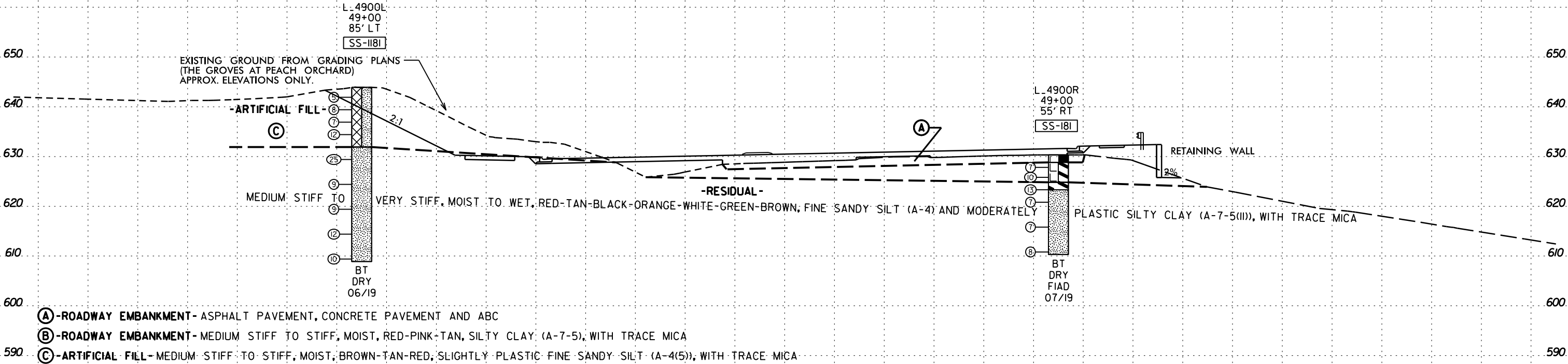


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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-1181	85' LT	49+00 -L-	6.0 - 7.5'	A-4(5)	40	10	14.3	24.8	26.8	34.1	95.0	87.0	61.7	22.2	-
SS-181	55' RT	49+00 -L-	6.0 - 7.5'	A-7-5(11)	48	18	18.1	17.5	25.8	38.6	97.0	86.0	65.8	23.4	-



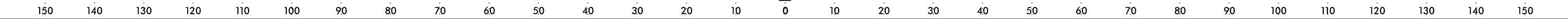
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-L-

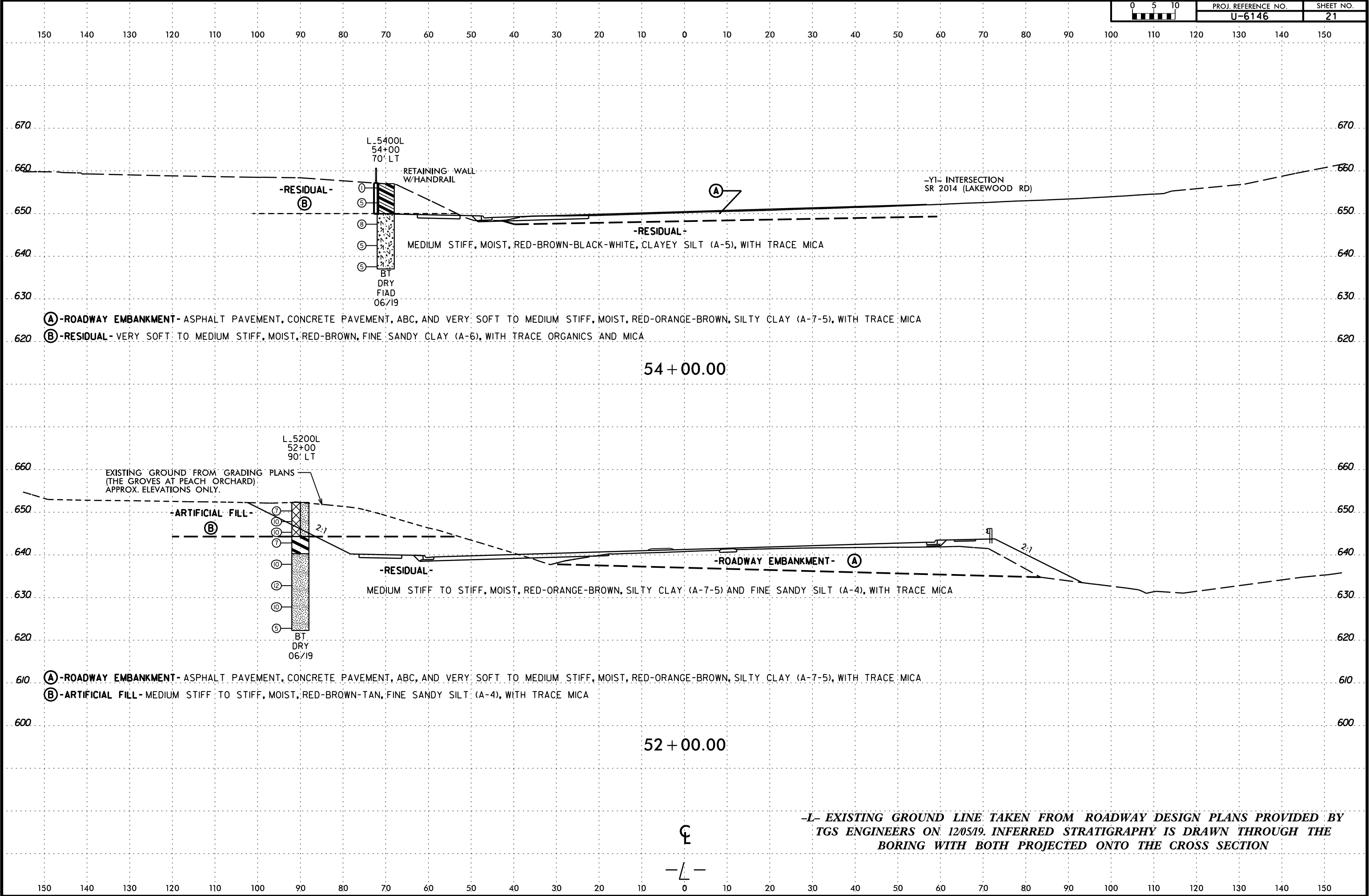
-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY
TGS ENGINEERS ON 12/05/19. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE
BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

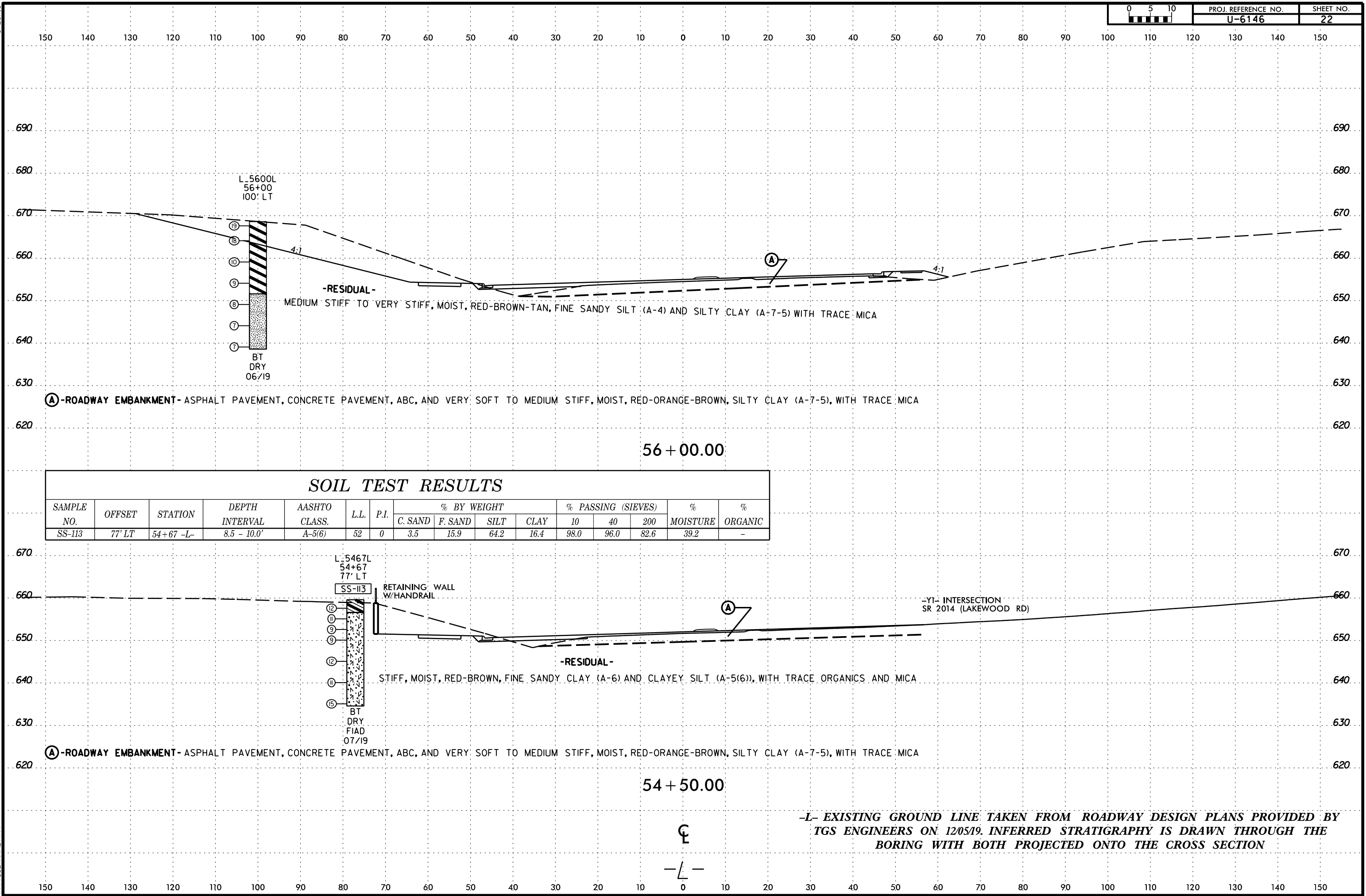




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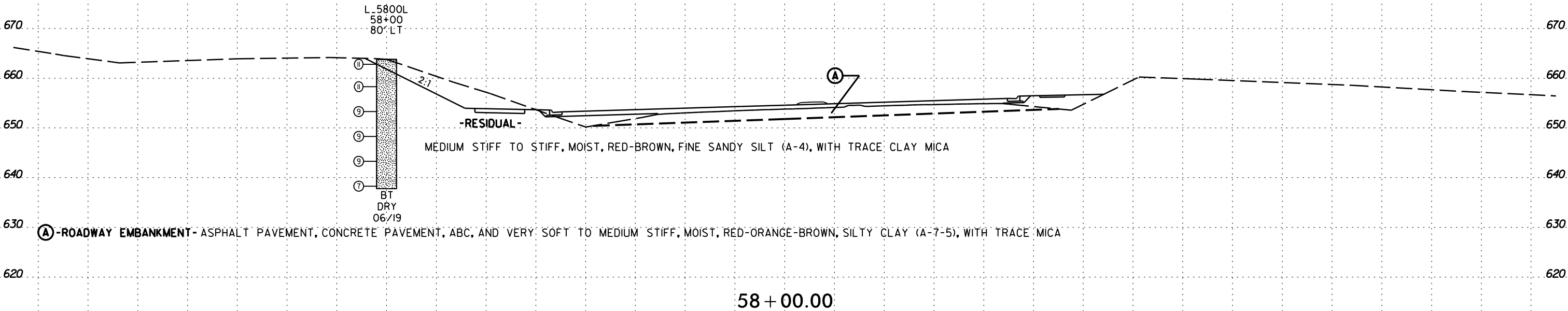
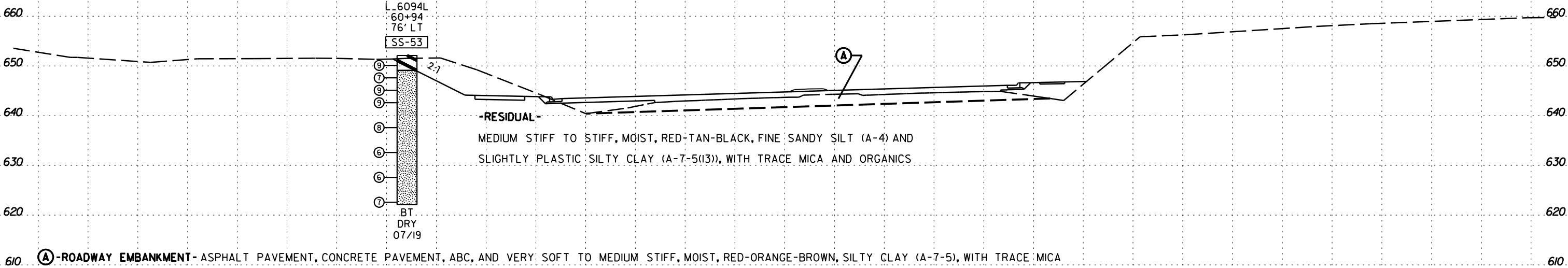
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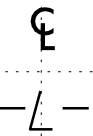


PROJ. REFERENCE NO.	SHEET NO.
U-6146	23

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-53	76' LT	60+94 -L-	1.0 - 2.5'	A-7-5(13)	56	14	18.9	12.1	30.7	38.3	99.0	86.0	72.1	26.9	-



-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 12/05/19. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION



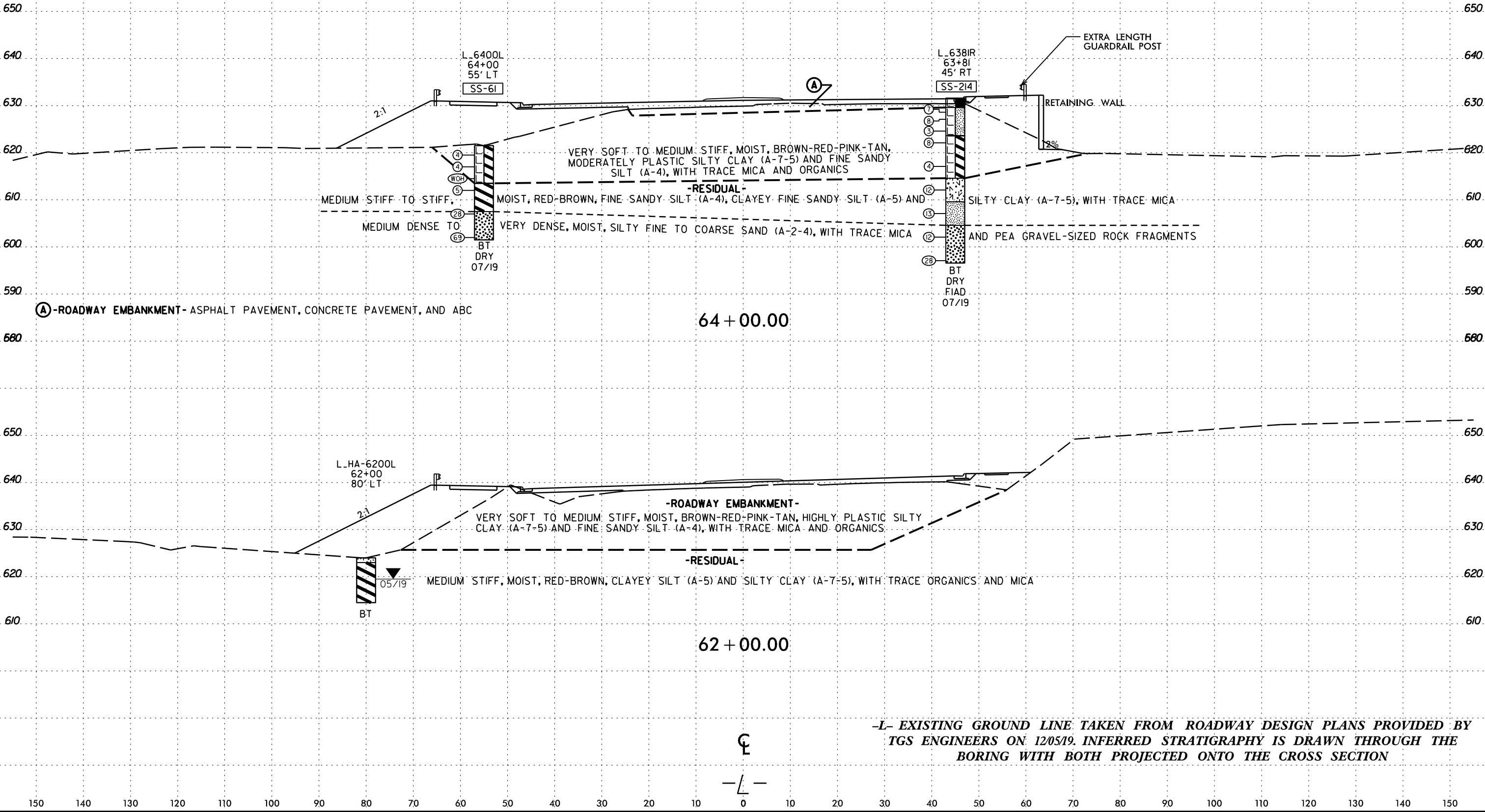
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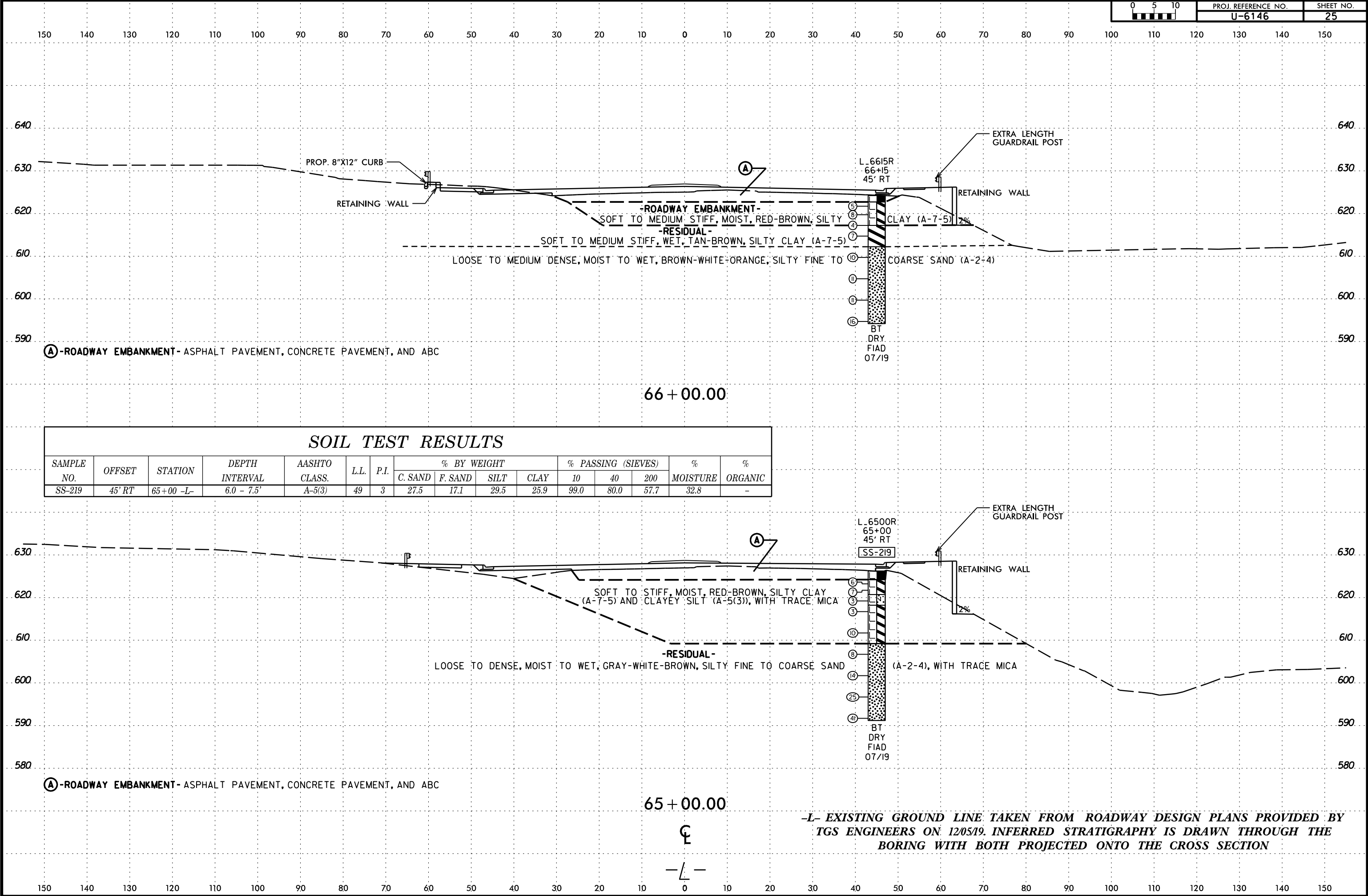


PROJ. REFERENCE NO.	SHEET NO.
U-6146	24

140																130																120																110																100																90																80																70																60																50																40																30																20																10																0																10																20															
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SAMPLE NO.																OFFSET																STATION																DEPTH INTERVAL																AASHTO CLASS.																L.L.																P.I.																% BY WEIGHT																% PASSING (SIEVES)																%																%																																																																																																															
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SS-61																55' LT																64+00 -L-																6.0 - 7.5'																A-7-5(17)																54																20																11.6																16.8																29.3																42.3																99.0																92.0																74.2																31.1																-																															
SS-214																45' RT																63+81 -L-																13.5 - 15.0'																A-7-5(14)																54																20																16.6																18.2																23.0																42.2																98.0																88.0																67.0																25.9																-																															

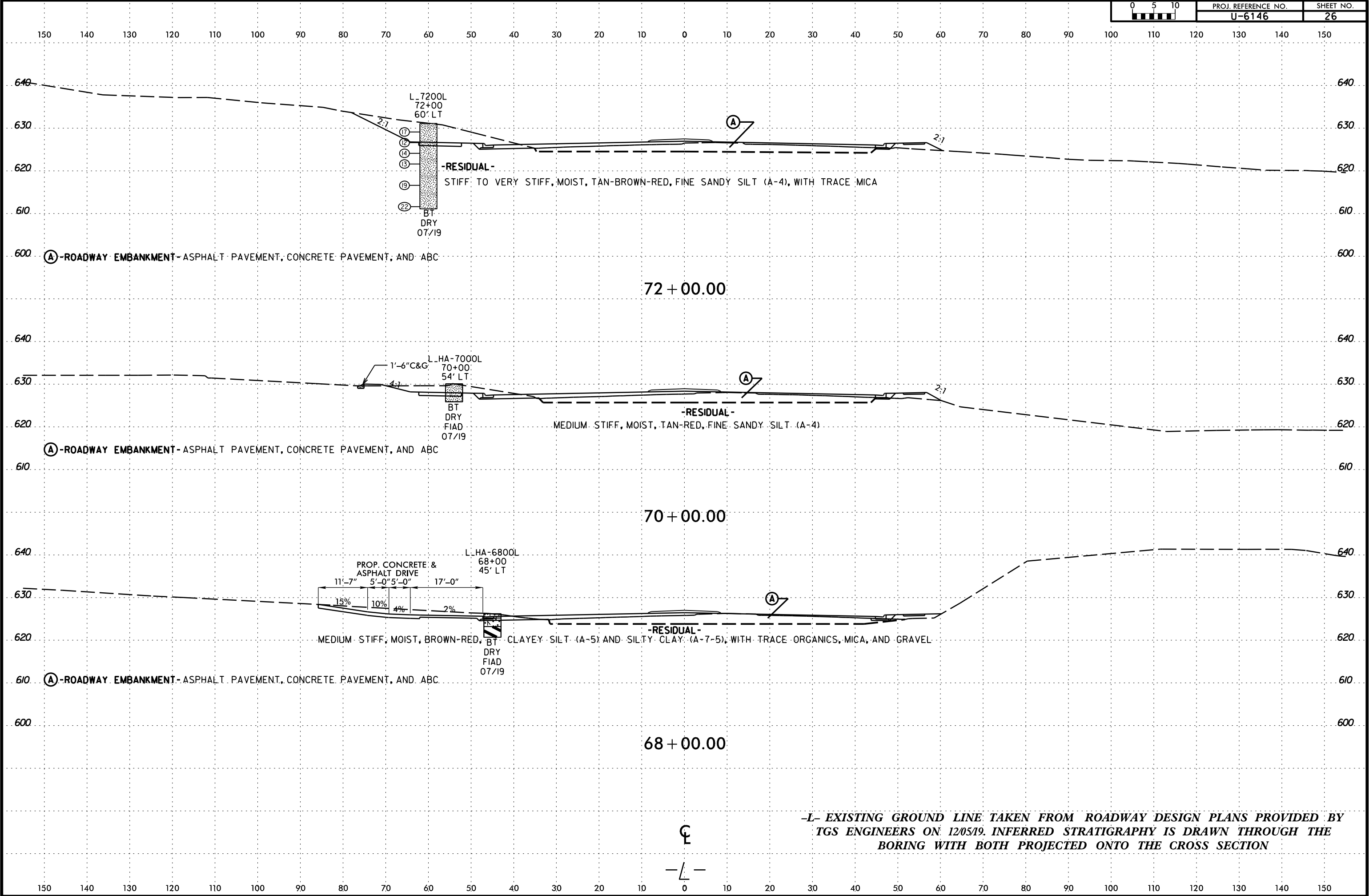


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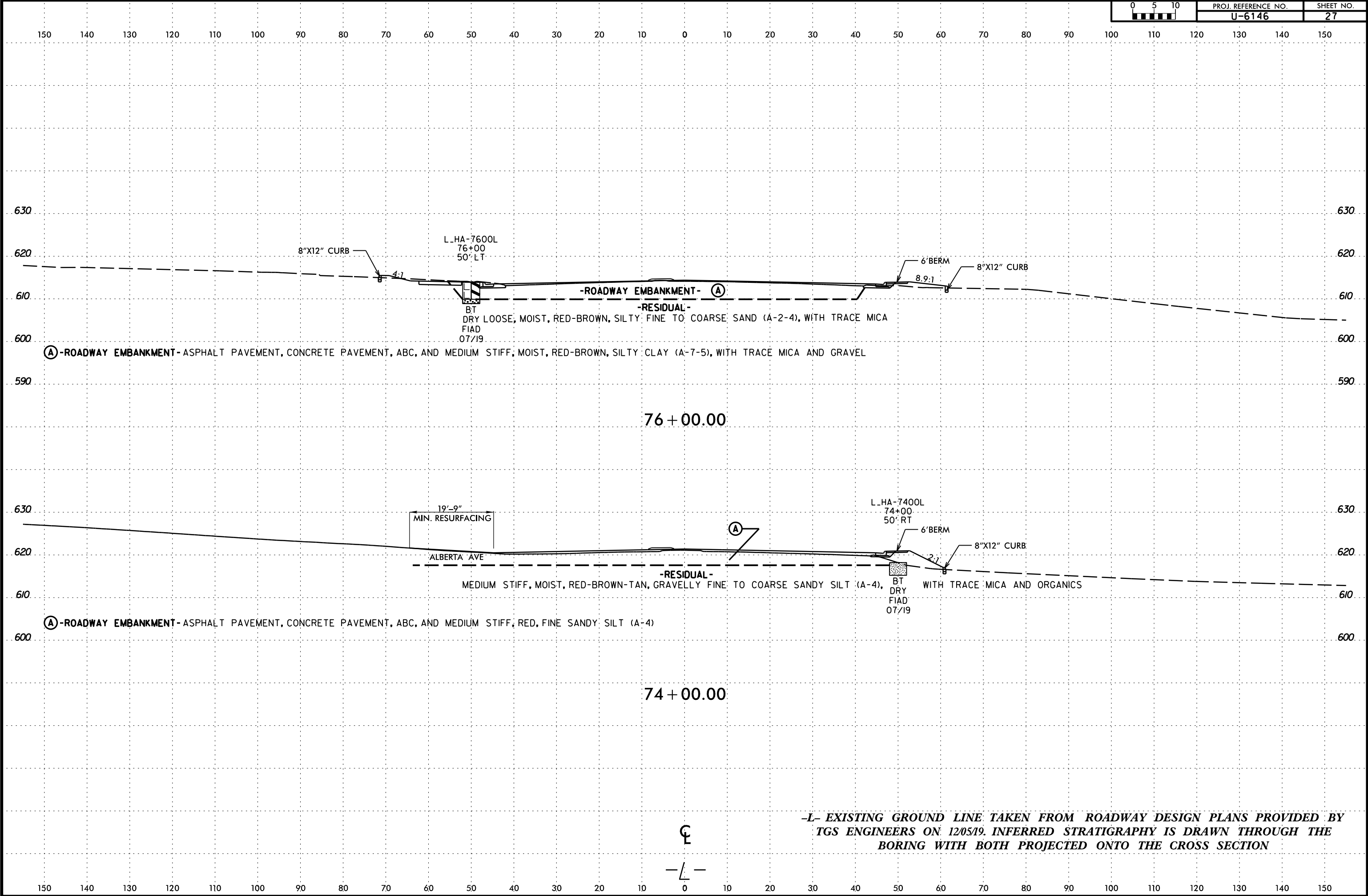
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6/23/16

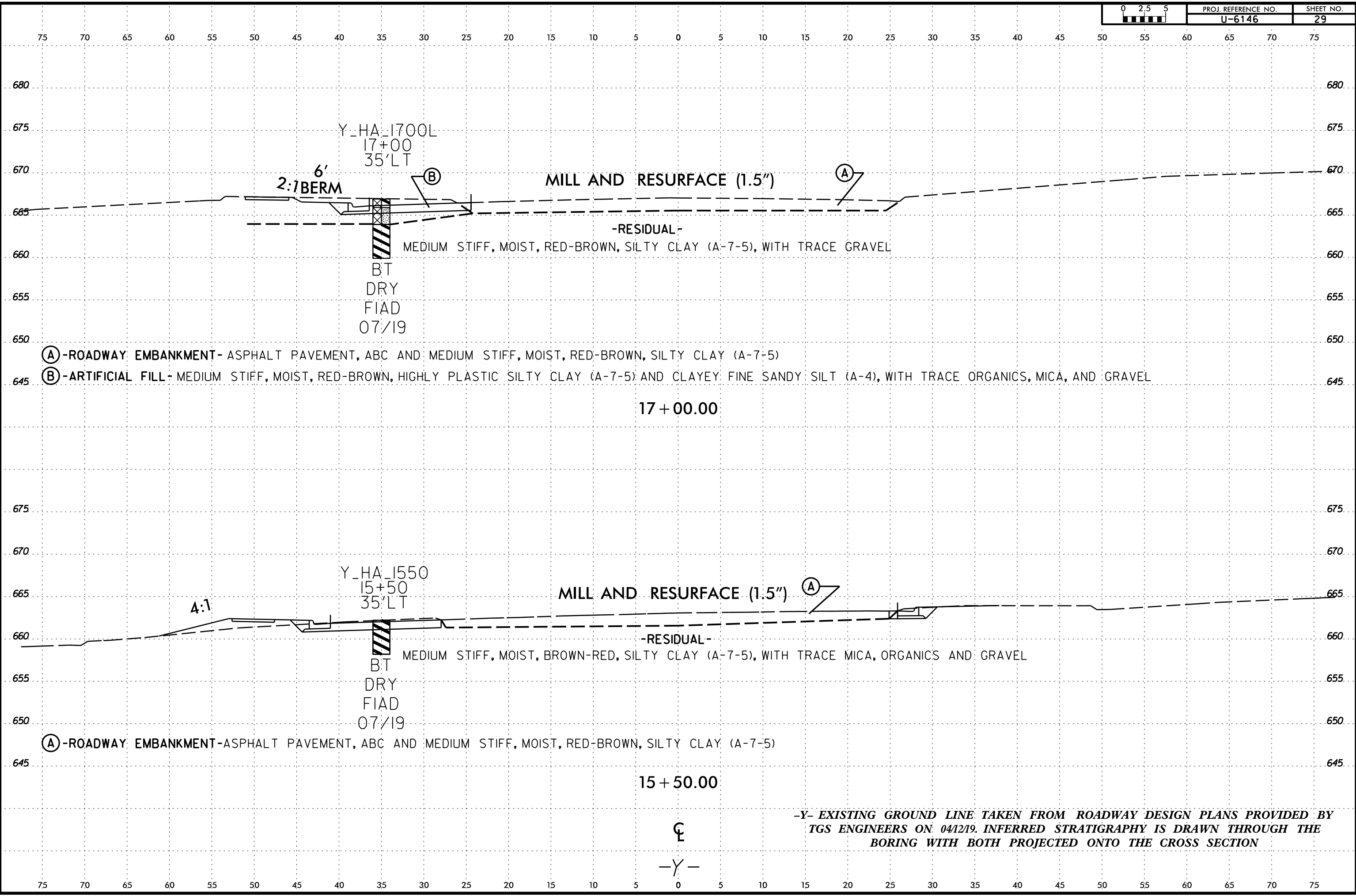
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PROJ. REFERENCE NO.	SHEET NO.
U-6146	27





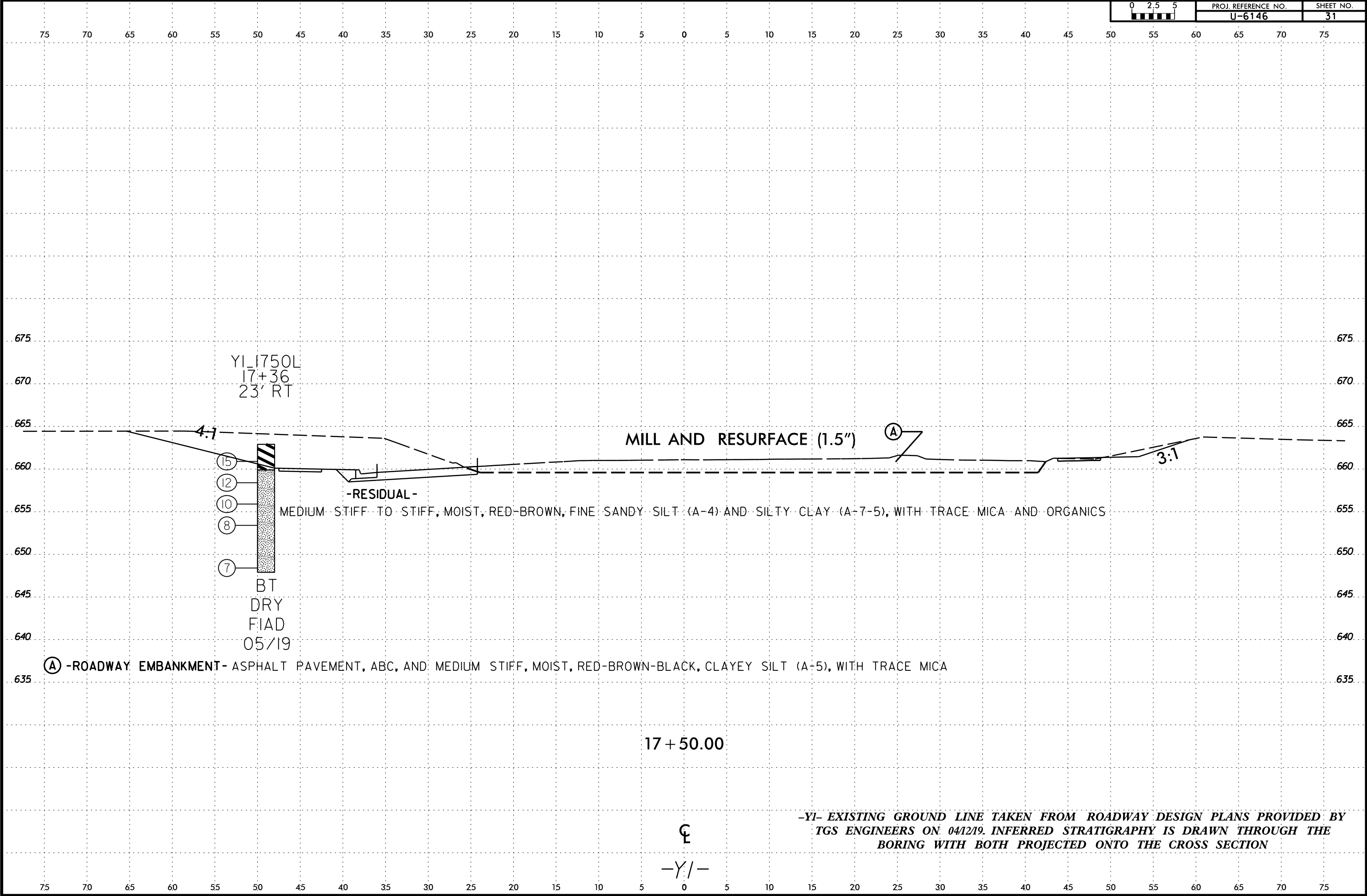
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0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-6146	31



PROJECT: 48392

REFERENCE: U-6146

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
APPENDIX B
LAB TEST RESULTS

PROJECT REFERENCE NO.	SHEET NO.
U-6146	32

Prepared in the Office of:



ITHIR TESTING, LLC
NCDOT CERT NO. 138-0147
9908 Raddington Lane
Charlotte, NC 28269
(704)-659-5277

Prepared in the Office of:
TERRACON - CHARLOTTE, NC
NCDOT LAB CERT NO. 126-0910
DOUG DeESCH - 126-01-0910

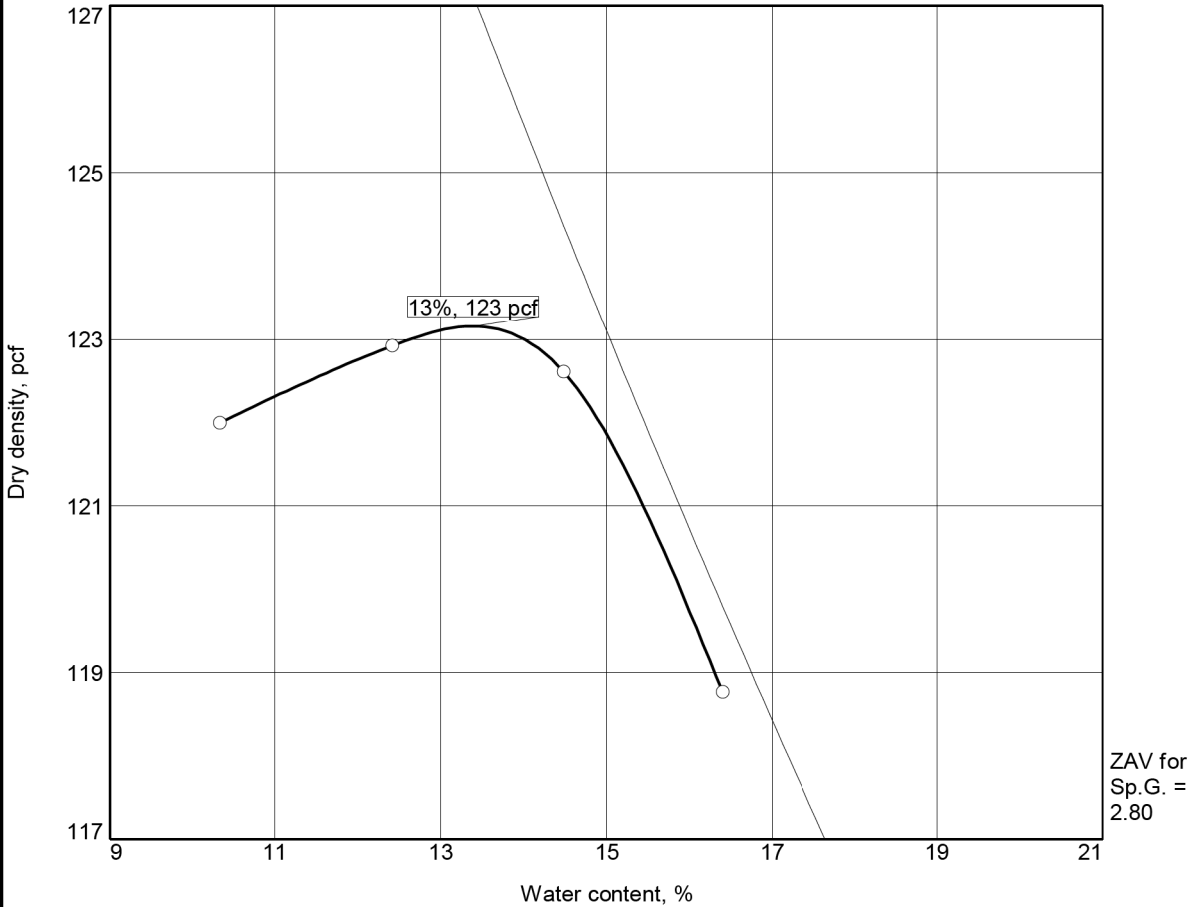
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-1145	80' LT	19+00 -L-	8.5 - 10.0'	A-4(2)	40	0	4.5	20.2	54.9	20.4	100.0	97.0	79.8	31.9	-
SS-1031	50' LT	23+00 -L-	1.0 - 2.5'	A-4(7)	40	9	8.5	22.7	30.1	38.7	99.0	93.0	73.0	26.4	-
SS-1161	70' LT	45+00 -L-	1.9 - 3.4'	A-7-6(20)	56	27	13.3	15.0	24.1	47.6	99.0	90.0	72.8	21.0	-
SS-1181	85' LT	49+00 -L-	6.0 - 7.5'	A-4(5)	40	10	14.3	24.8	26.8	34.1	95.0	87.0	61.7	22.2	-
SS-181	55' RT	49+00 -L-	6.0 - 7.5'	A-7-5(11)	48	18	18.1	17.5	25.8	38.6	97.0	86.0	65.8	23.4	-
SS-178	58' RT	50+00 -L-	13.5 - 15.0'	A-4(0)	33	0	23.5	32.0	30.8	13.7	98.0	83.0	47.8	20.0	-
SS-1199	80' LT	51+00 -L-	3.5 - 5.0'	A-4(2)	39	4	23.0	21.5	27.7	27.8	96.0	82.0	56.6	24.5	-
SS-169	60' RT	51+00 -L-	3.5 - 5.0'	A-7-5(28)	65	33	8.0	16.2	25.1	50.7	99.0	95.0	77.3	29.0	-
SS-113	77' LT	54+67 -L-	8.5 - 10.0'	A-5(6)	52	0	3.5	15.9	64.2	16.4	98.0	96.0	82.6	39.2	-
SS-53	76' LT	61+00 -L-	1.0 - 2.5'	A-7-5(13)	56	14	18.9	12.1	30.7	38.3	99.0	86.0	72.1	26.9	-
SS-214	55' LT	63+81 -L-	13.5 - 15.0'	A-7-5(14)	54	20	16.6	18.2	23.0	42.2	98.0	88.0	67.0	25.9	-
SS-61	45' RT	64+00 -L-	6.0 - 7.5'	A-7-5(17)	54	20	11.6	16.8	29.3	42.3	99.0	92.0	74.2	31.1	-
SS-219	45' RT	65+00 -L-	6.0 - 7.5'	A-5(3)	49	3	27.5	17.1	29.5	25.9	99.0	80.0	57.7	32.8	-
SS-240	37' LT	13+66 -Y1-	6.0 - 7.5'	A-4(3)	39	0	1.8	18.8	61.0	18.4	99.0	98.0	85.7	26.0	-

LAB TESTING PERFORMED BY ITHIR TESTING, LLC: STEVEN PUTNAM - 124-02-0610

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		
CBR-1	85' LT	21+00 -L-	5.5 - 14.0'	A-4(4)	29	8	8.4	30.8	39.7	21.1	96.5	94.9	70.2	14.1	-
ST-1	62' LT	35+18 -L-	1.0 - 2.5'	A-6(9)	39	11	10.3	18.3	38.4	33.0	99.0	93.5	71.4	35.9	-

LAB TESTING PERFORMED BY NCDOT LAB CERT NO. 126-0910 : DOUG DeSCH - 126-01-0910

COMPACTION TEST REPORT



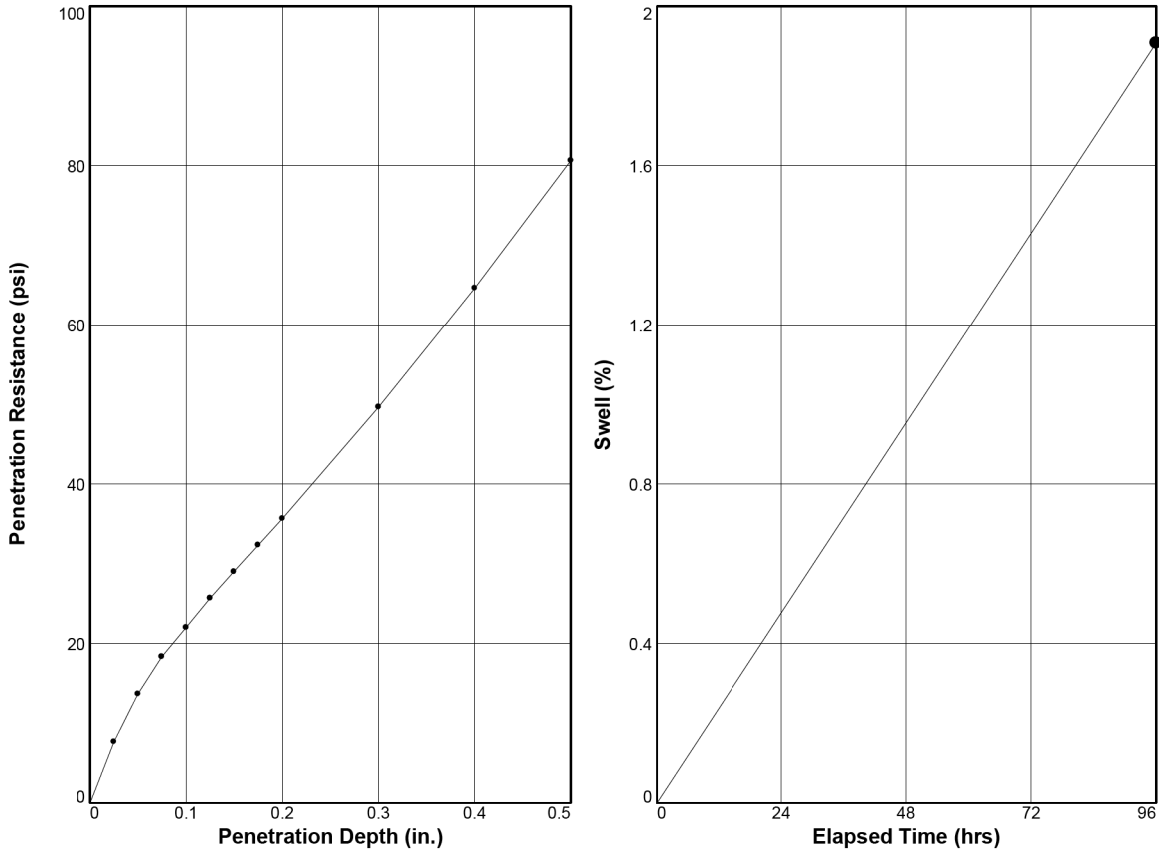
Test specification: AASHTO T 99-15 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
5.5-14.0 ft	CL	A-4	14.1		29	8	4.9	67.7

TEST RESULTS		MATERIAL DESCRIPTION	
Maximum dry density = 123 pcf Optimum moisture = 13 %		Light Brown Sandy CLAY	
Project No. 71191022 Client: Carolinas Geotechnical Group Project: NCDOT-U6146		Remarks:	
o Location: Charlotte, NC Sample Number: L-2100L			
Terracon Consultants, Inc. Charlotte, North Carolina			
		Figure L-2100L	

Figure L-2100L

BEARING RATIO TEST REPORT
ASTM D1883-16

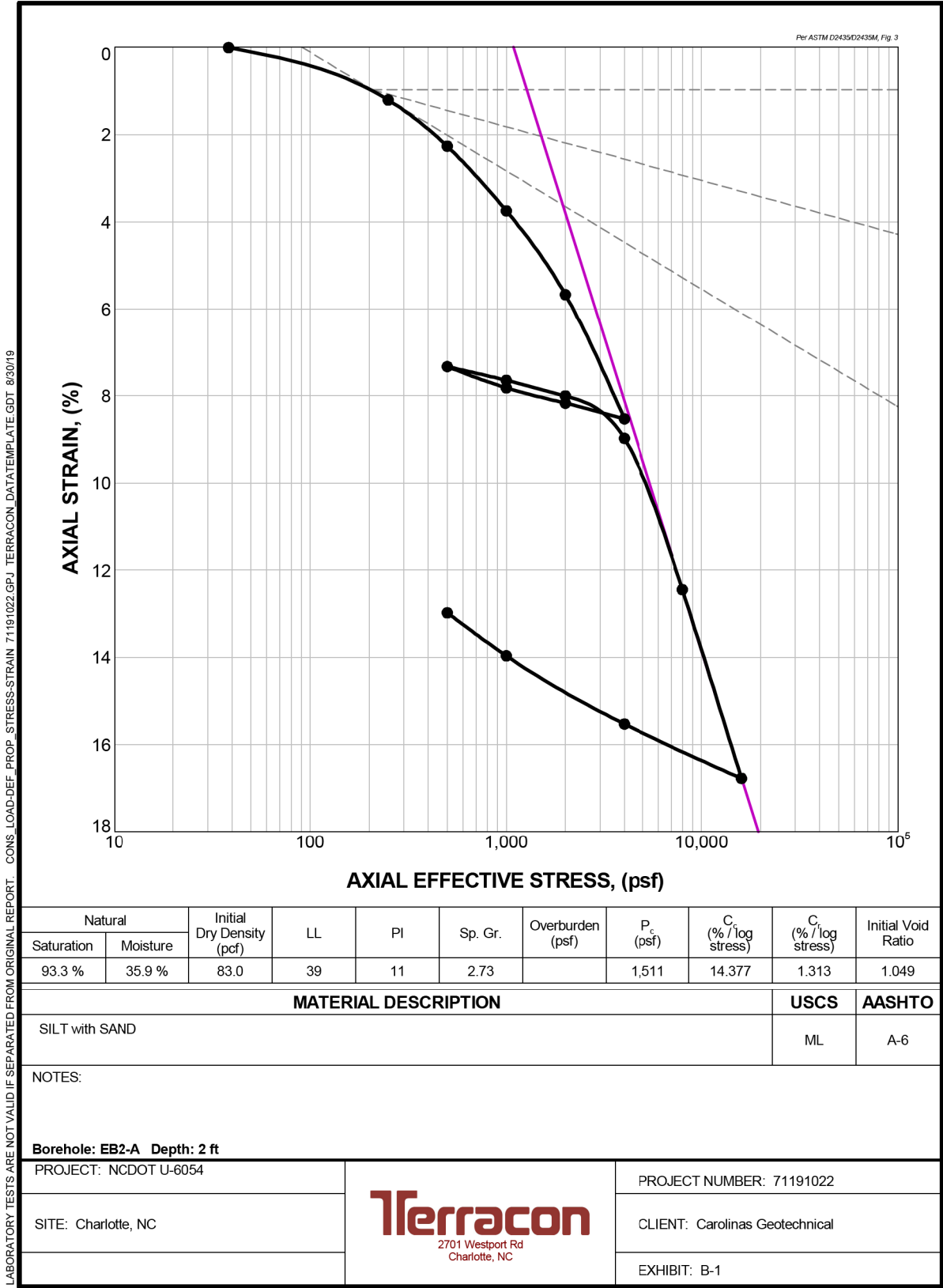


	Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)	Max. Swell (%)
	Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.10 in.	0.20 in.			
1 ○	120.6	98	13.5	118.4	96.2	19.0	2.2	2.4	0.000	10	1.9
2 △											
3 □											

Material Description	USCS	Max. Dens. (pcf)	Optimum Moisture (%)	LL	PI
Light Brown Sandy CLAY					

Project No: 71191022		Test Description/Remarks: ASTM D-1883
Project: NCDOT-U6146		
Location: Charlotte, NC		
Sample Number: L-2100L	Depth: 5.5-14.0 ft	
Date: 8-8-2019		Figure L-2100L
BEARING RATIO TEST REPORT		
Terracon Consultants, Inc.		

CONSOLIDATION TEST (D2435)



CONSOLIDATION TEST (D2435)

