

REFERENCE: 50197

PROJECT: R-5739

SEE SHEET 3 FOR PLAN SHEET LAYOUT
AT TIME OF INVESTIGATION

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<u>LINE</u>	<u>STATION</u>	<u>PLAN</u>	<u>PROFILE</u>
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-Y2-	12+35 TO 22+90	4	7

CROSS SECTIONS

<u>LINE</u>	<u>STATION</u>	<u>SHEET</u>
-L-	157+50 TO 160+00	8-11
-Y2-	15+00 TO 19+50	12-16

CULVERTS

<u>LINE</u>	<u>STATION</u>	<u>SHEET</u>
-L-	38+74	17
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

ROADWAY
SUBSURFACE INVESTIGATION

COUNTY NORTHAMPTON
PROJECT DESCRIPTION NC 46 FROM NC 48 IN
GASTON TO THE VIRGINIA LINE UPGRADE
AND WIDEN EXISTING FACILITY

INVENTORY – ADDENDUM

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5739	1	23

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF PREPARING THE SCOPE OF WORK TO BE INCLUDED IN THE REQUEST FOR PROPOSAL. 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.

SOIL AND ROCK BOUNDARIES WITHIN A BOREHOLE ARE BASED ON GEOTECHNICAL INTERPRETATION UNLESS ENCOUNTERED IN A SAMPLE. INTERPRETED BOUNDARIES MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN SAMPLED STRATA AND BOREHOLE INFORMATION MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS. 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.

PERSONNEL

CATLIN PERSONNEL

INVESTIGATED BY S. HUDSON, PG

DRAWN BY L. STONE, PG

CHECKED BY S. HUDSON, PG

SUBMITTED BY L. STONE, PG

DATE _____



DocuSigned by:
Joseph L. Stone 9/23/2019
10FDBDD34BEE4404 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

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-2-7		A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7	
SYMBOL															
% PASSING	50 MX	30 MX	50 MX	51 MN	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	
MATERIAL PASSING #40	LL	PI	6 MX	NP	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		
GROUP INDEX	0	0	0	0	4 MX	8 MX	12 MX	16 MX	NO MX			HIGHLY ORGANIC SOILS			
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	UNSATURABLE		

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.)
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GRAIN SIZE	MM IN.	305 12	75 3	2.0	0.25	0.05	0.005
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SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
LL PLASTIC RANGE (PI) 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	LL < 31
MODERATELY COMPRESSIBLE	LL = 31 - 50
HIGHLY COMPRESSIBLE	LL > 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE
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

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

DIP & DIP DIRECTION OF ROCK STRUCTURES

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

☐

☐

ADVANCING TOOLS:

☐ CLAY BITS

☐ 6" CONTINUOUS FLIGHT AUGER

☒ 8" HOLLOW AUGERS

☐ HARD FACED FINGER BITS

☐ TUNG-CARBIDE INSERTS

☒ CASING ☐ W/ ADVANCER

☒ TRICONE 2 1/16" STEEL TEETH

☐ TRICONE " TUNG.-CARB.

☐ CORE BIT

☐

HAMMER TYPE:

☒ AUTOMATIC ☐ MANUAL

CORE SIZE:

☐ -B

☐ -H

☐ -N

HAND TOOLS:

☐ POST HOLE DIGGER

☒ HAND AUGER

☒ SOUNDING ROD

☐ VANE SHEAR TEST

☒ SOIL PROBE

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 SL.)

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 (SL.)

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 (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.

BENCH MARK: R5739_Is.tin.tin

ELEVATION: FEET

NOTES:

FIAD = FILLED IMMEDIATELY AFTER DRILLING

U.T.D. = UNDIVIDED TERTIARY DEPOSITS

DATE: 8-15-14

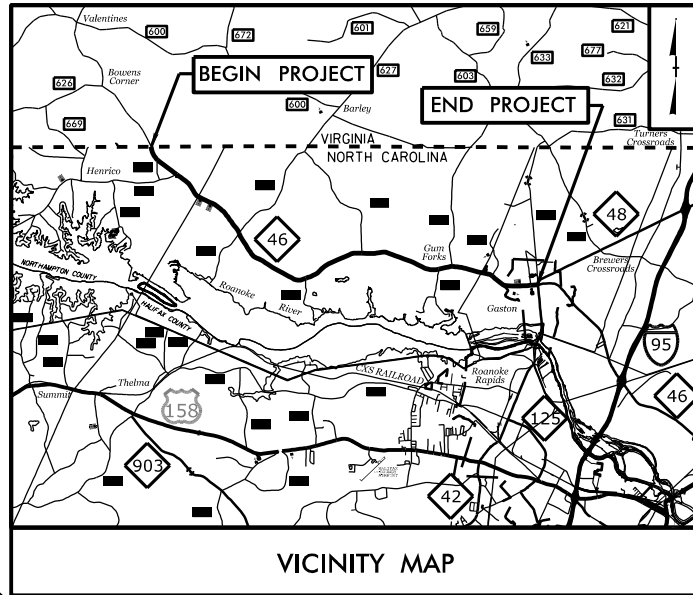
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Lee Stone AT LSTONE-CAD-PC

09/08/99

TIP PROJECT: R-5739

CONTRACT:

See Sheet 1-A For Index of Sheets



VICINITY MAP

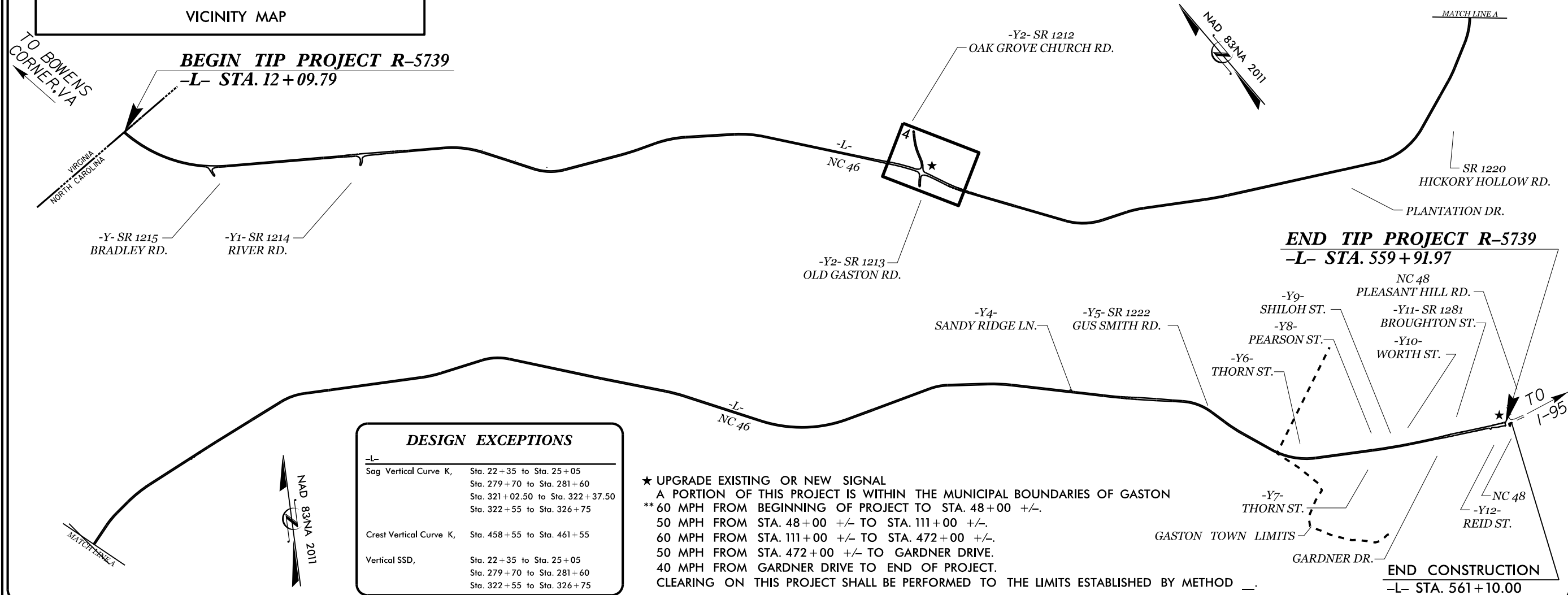
STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS NORTHAMPTON COUNTY

LOCATION: NC 46 FROM NC 48 IN GASTON TO THE VIRGINIA
STATE LINE UPGRADE AND WIDEN EXISTING FACILITY

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, AND SIGNALS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5739	3	23
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
50197.1.1		PE	

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

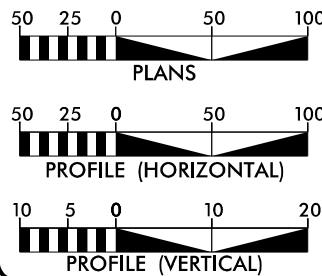


DESIGN EXCEPTIONS

-L-	
Sag Vertical Curve K,	Sta. 22+35 to Sta. 25+05 Sta. 279+70 to Sta. 281+60 Sta. 321+02.50 to Sta. 322+37.50 Sta. 322+55 to Sta. 326+75
Crest Vertical Curve K,	Sta. 458+55 to Sta. 461+55
Vertical SSD,	Sta. 22+35 to Sta. 25+05 Sta. 279+70 to Sta. 281+60 Sta. 322+55 to Sta. 326+75

★ UPGRADE EXISTING OR NEW SIGNAL
A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF GASTON
** 60 MPH FROM BEGINNING OF PROJECT TO STA. 48+00 +/-.
50 MPH FROM STA. 48+00 +/- TO STA. 111+00 +/-.
60 MPH FROM STA. 111+00 +/- TO STA. 472+00 +/-.
50 MPH FROM STA. 472+00 +/- TO GARDNER DRIVE.
40 MPH FROM GARDNER DRIVE TO END OF PROJECT.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ____.

GRAPHIC SCALES



DESIGN DATA

ADT 2016 = 8,400
V = 40 TO 60 MPH**
FUNC CLASS =
PRINCIPAL ARTERIAL
R-R-R DESIGN

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-5739 = 10.375 mile
TOTAL LENGTH TIP PROJECT R-5739 = 10.375 mile

Prepared For:
DIVISION OF HIGHWAYS
113 Airport Drive, Suite 100, Edenton, NC 27932



TGS ENGINEERS
706 HILLSBOROUGH ST
SUITE 200
RALEIGH, NC 27603

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

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MARCH 29, 2019

LETTING DATE:
JUNE 6, 2020

BURKE EVANS, PE
PROJECT ENGINEER

PAUL SCHULKEN, EI
PROJECT DESIGN ENGINEER

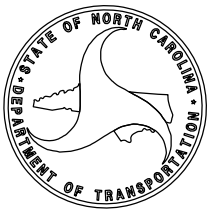
BARRY HOBBS, PE
PROJECT ENGINEER
NCDOT DIVISION 1

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN
ENGINEER

SIGNATURE: P.E.



STATE PROJECT:	50197.1.1 (R-5739)
COUNTY:	Northampton
DESCRIPTION:	NC 46 from NC 48 in Gaston to the Virginia State Line Upgrade and Widen Existing Facility
SUBJECT:	Geotechnical Inventory Report – Addendum

PROJECT DESCRIPTION

This project addendum begins approximately 544± feet west/northwest of the intersection of NC 46 and Oak Grove Church Rd in Northampton County and extends east/southeast along NC 46 for approximately 1300 feet. This geotechnical investigation was confined to areas of proposed construction. This Subsurface Inventory Report is an Addendum to the report submitted by others.

Fieldwork was conducted in June and August 2019. Standard Penetration Tests (SPT) borings, penetrometer test borings, and hand auger borings were completed along and at various offsets from the proposed project alignments. Representative soil samples have been collected for visual classification in the field and for laboratory analysis.

The following alignments were investigated. Subsurface profiles and selected cross sections of these alignments are included in this report.

Line	Station (±)
-L-	156+00 to 171+00
-Y2-	12+35 to 22+90

The following culvert locations were also investigated. Subsurface profiles of these locations are also included in this report.

Line	Station (±)
-L-	38+74
-L-	280+87
-L-	324+27
-L-	451+96
-L-	499+65
-L-	520+58
-L-	529+02

Areas of Special Geotechnical Interest

- 1) The following sections of the project exhibit high groundwater.

Line	Station (±)
-L-	156+00 to 162+50
-L-	165+00 to 170+50
-Y2-	12+35 to 15+00
-Y2-	22+50 to 22+90

- 2) The following section contains organic soils that have the potential to cause embankment/subgrade and or slope stability problems during construction.

Line	Station(±)
-L-	159+56 to 160+27

- 3) The entire project contains cohesive soils that have the potential to cause embankment/subgrade and or slope stability problems during construction.

Physiography and Geology

This project corridor is located within Piedmont Physiographic Province. Topography along the project is gently sloping with ground elevations ranging from 316± to 332± feet above sea level.

Surficial soils in this area are generally classified as residual in nature.

Ground Water

Ground water data was collected in June 2019 and was found between 307± to 317± feet above sea level.

Soil Properties

Soils encountered at the project site have been classified as roadway embankment, undivided tertiary deposits, and residual.

Roadway Embankment soils were identified beneath and adjacent to existing roadways and consists of 1± to 6± feet of loose to medium dense sand (A-2-4).

Undivided Tertiary Deposits consist of 2± feet of loose sand (A-2-4) with trace organics and 2± feet of medium stiff sandy clay with little organics (A-6).

Residual soils in this area are comprised of 3± feet to 12 or more feet of medium stiff to hard silty, sandy, clay and clayey silt (A-6, A-7-6, A-7-5, and A-5) with 1± to 12± feet of very loose to very dense sand and clayey sand (A-2-4, A-2-6).

Culvert at -L- Sta. 38+74±

Natural ground elevations range from 291± feet along the bed of Barnes Branch to 201± feet along the adjacent floodplain. Borings completed in the vicinity show approximately 7± feet of alluvial soil made up of 3± feet of soft sandy silt (A-4) and 4± feet of loose sand (A-2-4). Residual soils made up of 1± foot of very stiff sandy clay (A-6) and very dense sand (A-2-4) underlie the alluvial at an elevation of 287 feet at this location.

Culvert at -L- Sta. 280+87±

Natural ground elevations range from 201± feet along the bed of Roanoke River Tributary 14A, to 206± feet along the adjacent floodplain. Borings completed in the vicinity show approximately 7± feet of alluvial soil made up of 2± feet of soft to medium stiff sandy silt (A-4) and 2± to 5± feet of loose to very dense sand (A-2-4). Residual soils made up of 1+to 5± feet of hard sandy clay and sandy silt (A-4, A-6) underly the alluvial at elevations ranging from 196± to 200± feet at this location. Weathered rock was encountered at elevations ranging from 195± to 197± feet.

Culvert at -L- Sta. 324+27±

Natural ground elevations range from 177± feet along the bed of the UT to the Roanoke River, to 184± feet along the adjacent floodplain. Borings completed in the vicinity show approximately 1± to 3± feet of alluvial soil made up of 1± to 3± feet of stiff sandy silt and sandy clay (A-4, A-6), 2± feet of dense sand and gravel (A-1-b) and 1± feet of soft brown sandy silt (A-4) with little organics. Laboratory analysis of this soil show an organic content of 6.7%. Residual soils made up of 3 or more feet of hard sandy silt (A-4) and very dense sand and gravel (A-1-b) underly the alluvial at elevations ranging from 176± to 179± feet at this location. Weathered rock was encountered at elevations ranging from 173± to 177± feet.

Culvert at -L- Sta. 451+96

Natural ground elevations range from 174± feet along the bed of Roanoke River Tributary 12, to 187± feet along the adjacent floodplain. Borings completed in the vicinity show approximately 2± to 5± feet of alluvial soil made up of loose to dense sand (A-2-4) with little organic matter. Laboratory analysis of this soil show an organic content of 3.9%. Residual soils made up of medium dense to very dense sand and gravel (A-1-b) underly the alluvial at elevations ranging from 172± to 174± feet. Weathered rock was not encountered at this site.

Culvert at -L- Sta. 499+65±

Natural ground elevations range from 125± feet along the bed of Black Duck Creek, to 133± feet along the adjacent floodplain. Borings completed in the vicinity show approximately 1± to 3± feet of alluvial soil made up of 1± foot of soft brown sandy silt with little to moderate organic content (A-4) with 2± feet of loose to very dense sand (A-2-4). Laboratory analysis of this soil show an organic content ranging from 8.2% to 12.9%. No residual soils were found at this site, while weathered rock was encountered at elevations ranging from 125± to 126± feet.

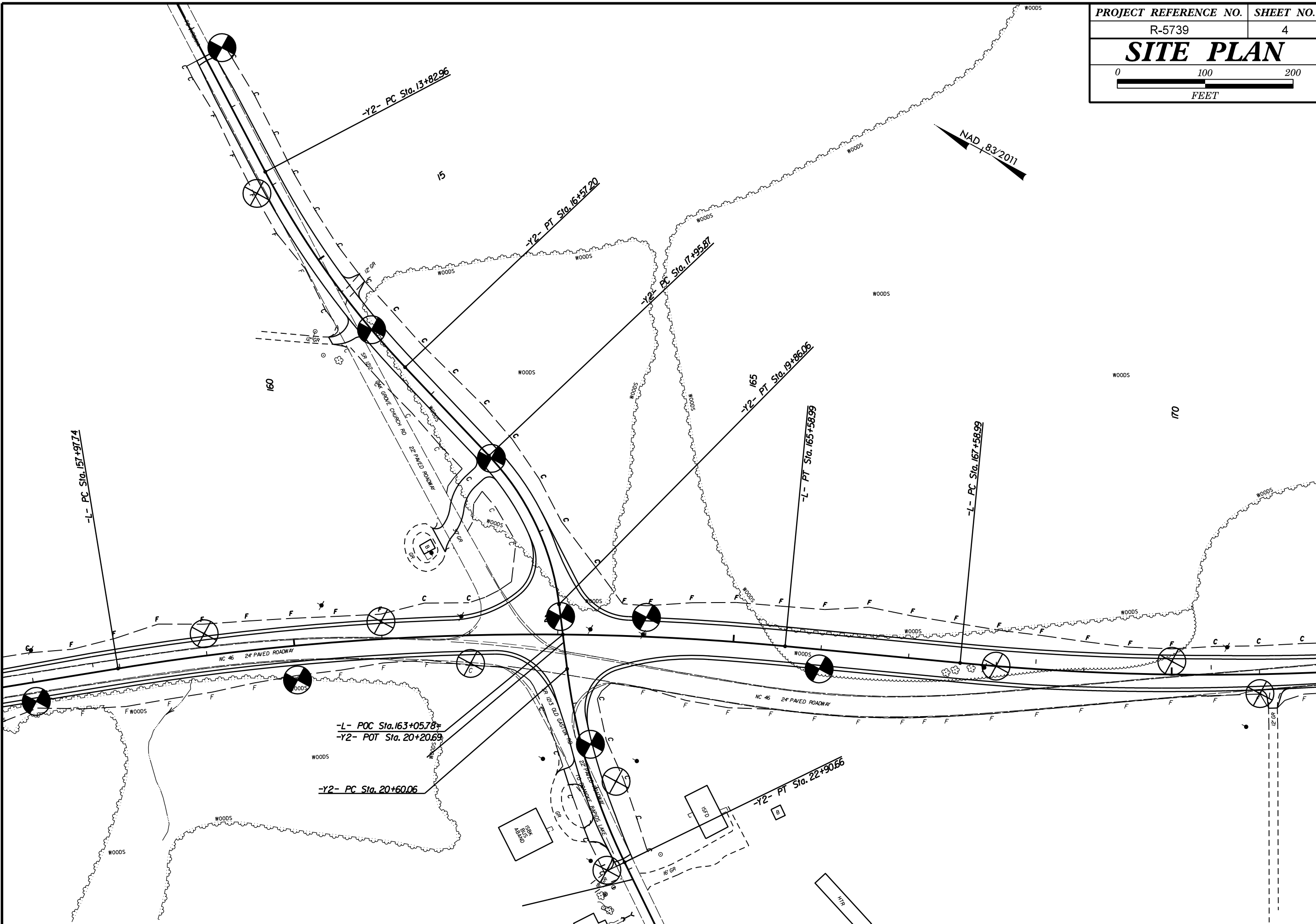
Culvert at -L- Sta. 520+58±

Natural ground elevations range from 121± feet along the bed of UT to Black Duck Creek, to 129± feet along the adjacent floodplain. Borings completed in the vicinity show approximately 3± feet of alluvial soil made up of very loose to loose sand (A-2-4). Residual soils made up of loose to very dense sand and gravel (A-1-b) underly the alluvial right of -L- at an elevation of 118± feet. These same soils are found at the land surface left

of -L- or at elevation 126± feet. Weathered rock was encountered at an elevation of 123± feet left of -L-. Weathered rock was not found right of -L-.

Culvert at -L- Sta. 529+02±

Natural ground elevations range from 108± feet along the bed of Unnamed Tributary to the Roanoke River to 117± feet along the adjacent floodplain. Borings completed in the vicinity show 6± feet of residual soil made up of stiff to hard sandy silt (A-4).



PROJECT REFERENCE NO.
R-5739

SHEET NO.
5

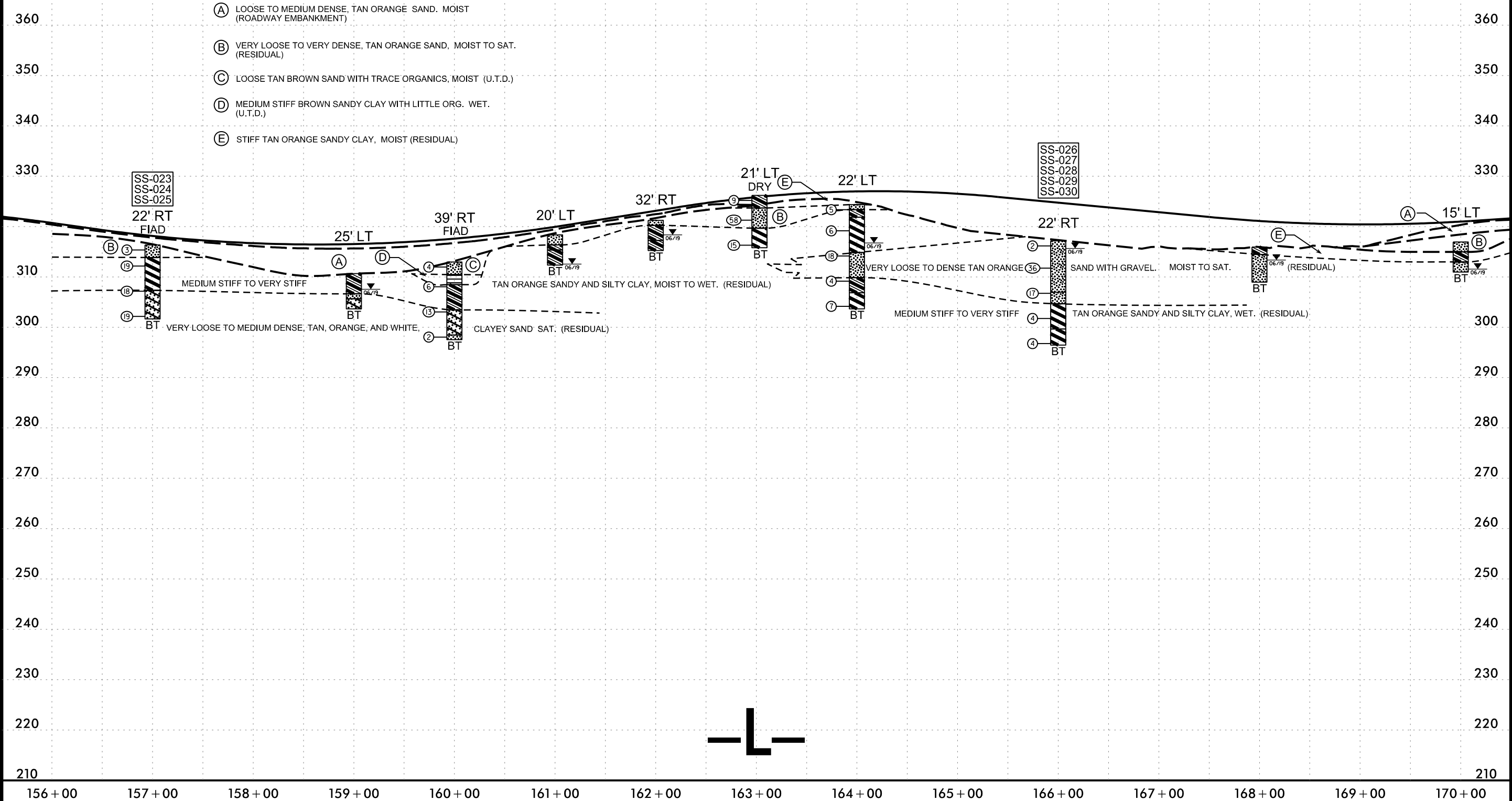
ROADWAY DESIGN
ENGINEER

HYDRAULICS
ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

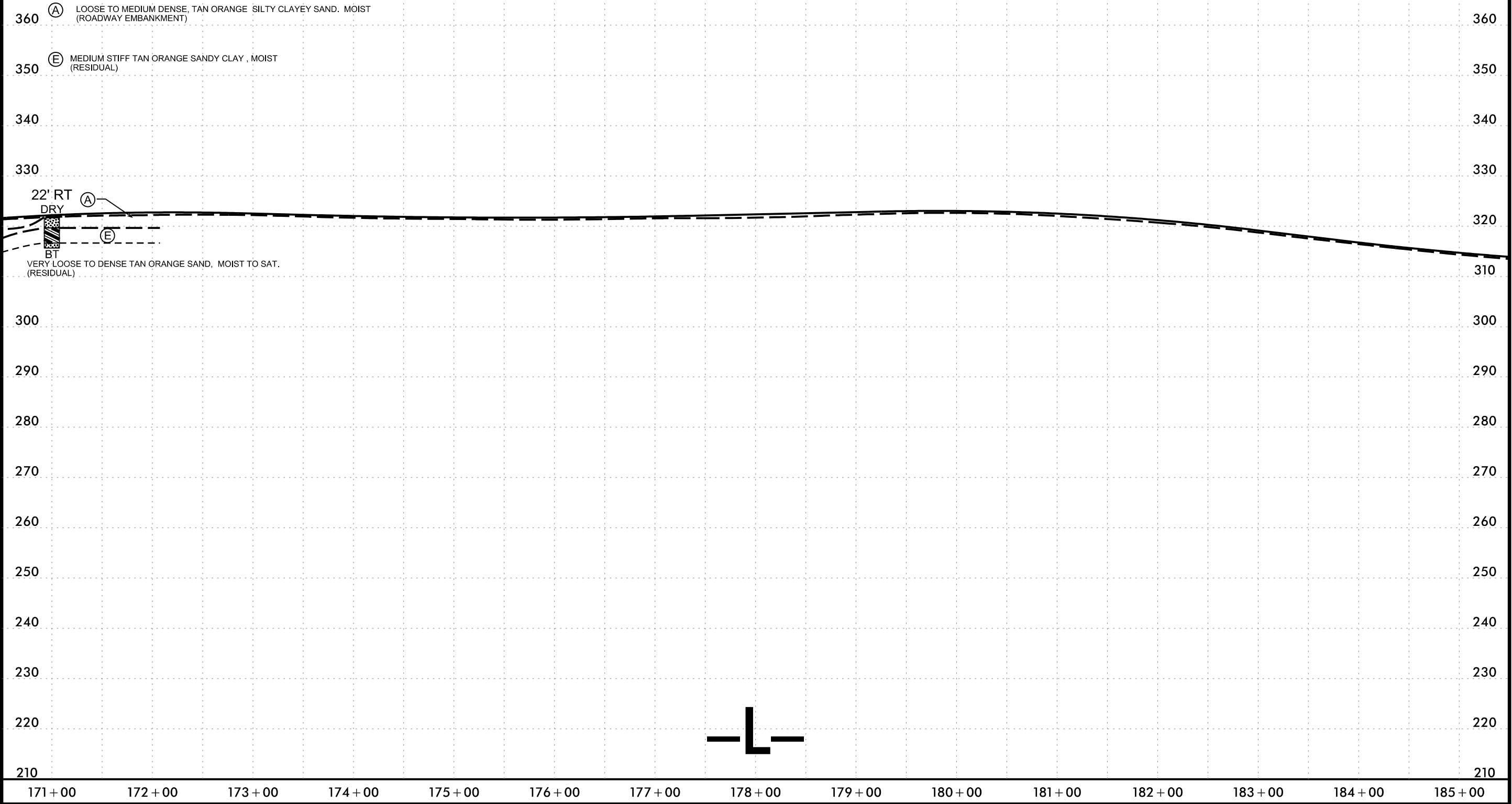
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UNLESS ALL SIGNATURES COMPLETED

SOIL TEST RESULTS															
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							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-023	22 ft RT	157+00	0.0 - 1.5	A-2-4(0)	NP	NP	37.2	38.6	15.3	8.9	96.3	88	27	-	-
SS-024	22 ft RT	157+00	3.2 - 4.7	A-7-6(12)	50	31	32.4	17.7	4.1	45.8	100	91	51	-	-
SS-025	22 ft RT	157+00	9.0 - 9.7	A-2-6(2)	38	21	47.3	21.2	6.7	24.8	98.3	81	33	-	-
SS-026	22 ft RT	166+00	1.0 - 1.5	A-2-4(0)	NP	NP	39.2	31.2	12.8	16.7	98.0	86	31	-	-
SS-027	22 ft RT	166+00	5.2 - 5.9	A-2-4(0)	NP	NP	36.3	38.2	15.7	9.8	69.4	86	28	-	-
SS-028	22 ft RT	166+00	9.4 - 10.2	A-2-4(0)	21	8	37.4	33.5	8.1	21.0	94.6	87	31	-	-
SS-029	22 ft RT	166+00	14.4 - 15.9	A-7-6(10)	44	19	23.9	16.3	27.1	32.7	95.3	82	62	-	-
SS-030	22 ft RT	166+00	19.4 - 20.9	A-7-5(14)	49	13	5.9	12.6	50.6	30.9	95	97	85	-	-



5/14/99

PROJECT REFERENCE NO.		SHEET NO.	
R-5739		6	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



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Lee Stone AUSTIN TEXAS

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PROJECT REFERENCE NO.
R-5739

SHEET NO.
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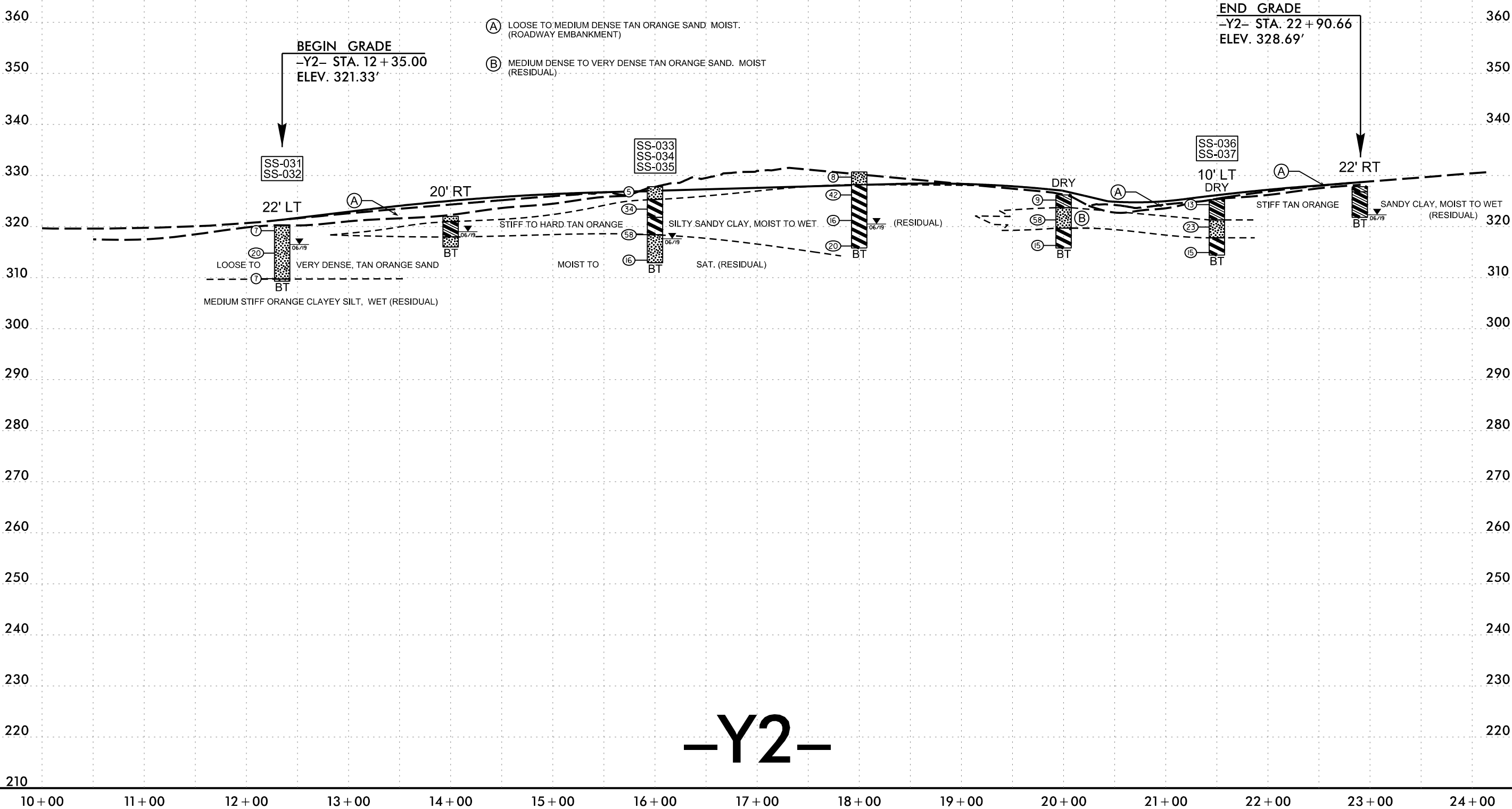
ROADWAY DESIGN
ENGINEER

HYDRAULICS
ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

SOIL TEST RESULTS															
SAMPLE NUMBER	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-031	22 ft LT	12+35	0.0 - 1.5	A-2-4(0)	NP	NP	38.7	36.9	19.8	4.6	38.1	77	27	-	-
SS-032	22 ft LT	12+35	10.5 - 10.9	A-5(9)	44	9	12.6	13.8	48.3	25.3	99.4	93	79	-	-
SS-033	CL	16+00	0.0 - 1.5	A-2-4(0)	NP	NP	38.4	38.5	15.0	8.1	61.2	82	26	-	-
SS-034	CL	16+00	3.4 - 4.9	A-7-6(8)	54	29	37.2	20.5	16.7	25.6	62.7	78	44	-	-
SS-035	CL	16+00	9.4 - 9.9	A-2-4(0)	24	7	30.6	43.1	15.3	11.0	54.2	83	29	-	-
SS-036	10 ft LT	21+50	0.0 - 1.5	A-6(3)	35	18	38.7	22.3	14.6	24.4	79.9	75	41	-	-
SS-037	10 ft LT	21+50	9.4 - 10.9	A-7-5(14)	48	18	12.7	19.6	37.6	30.1	95.4	90	73	-	-

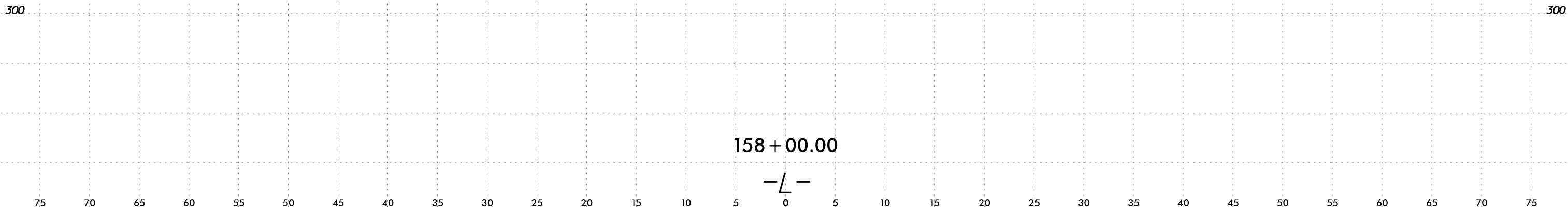
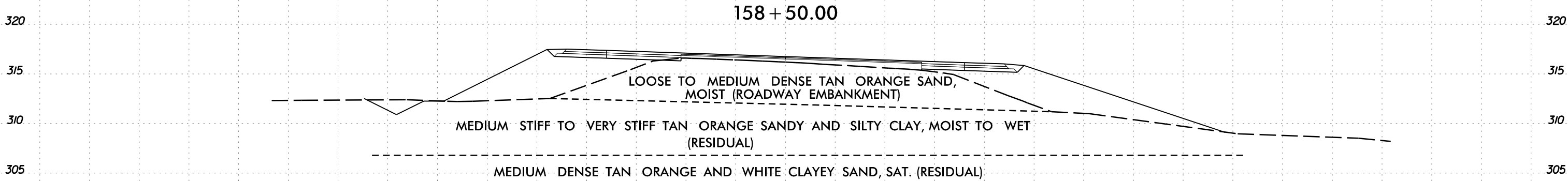
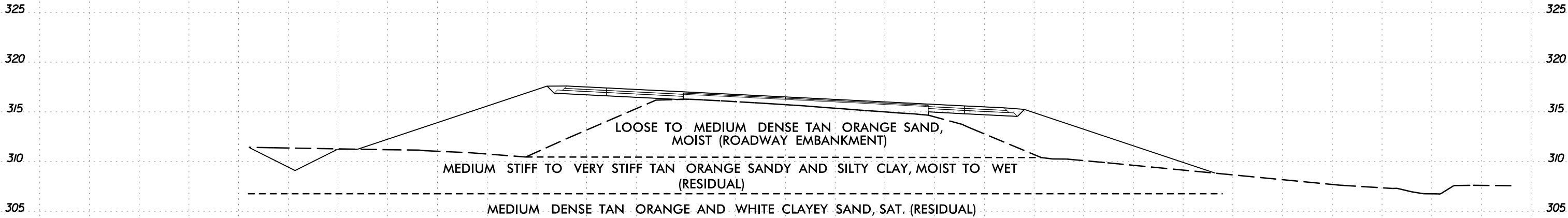


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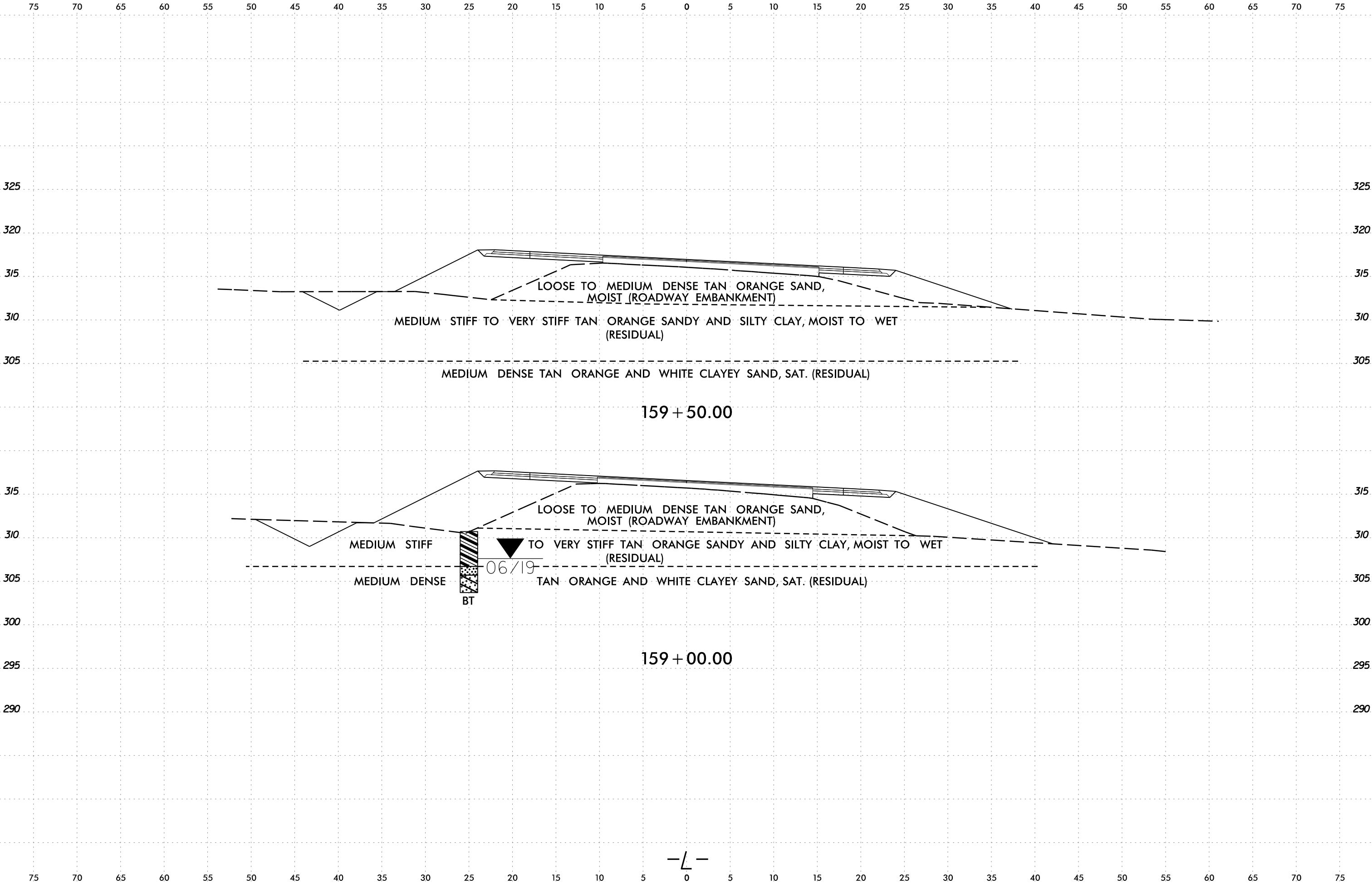
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Lee Stone

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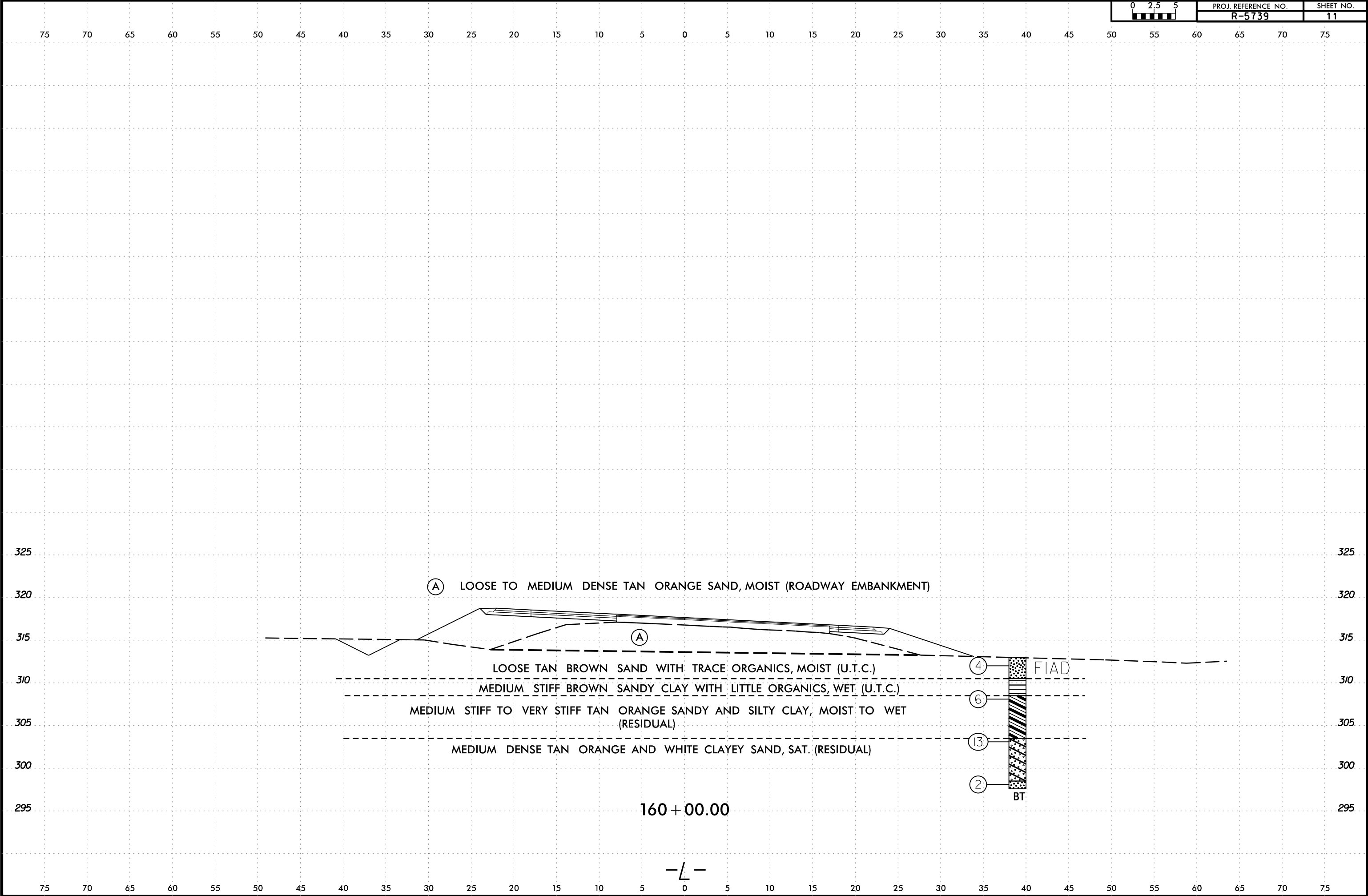


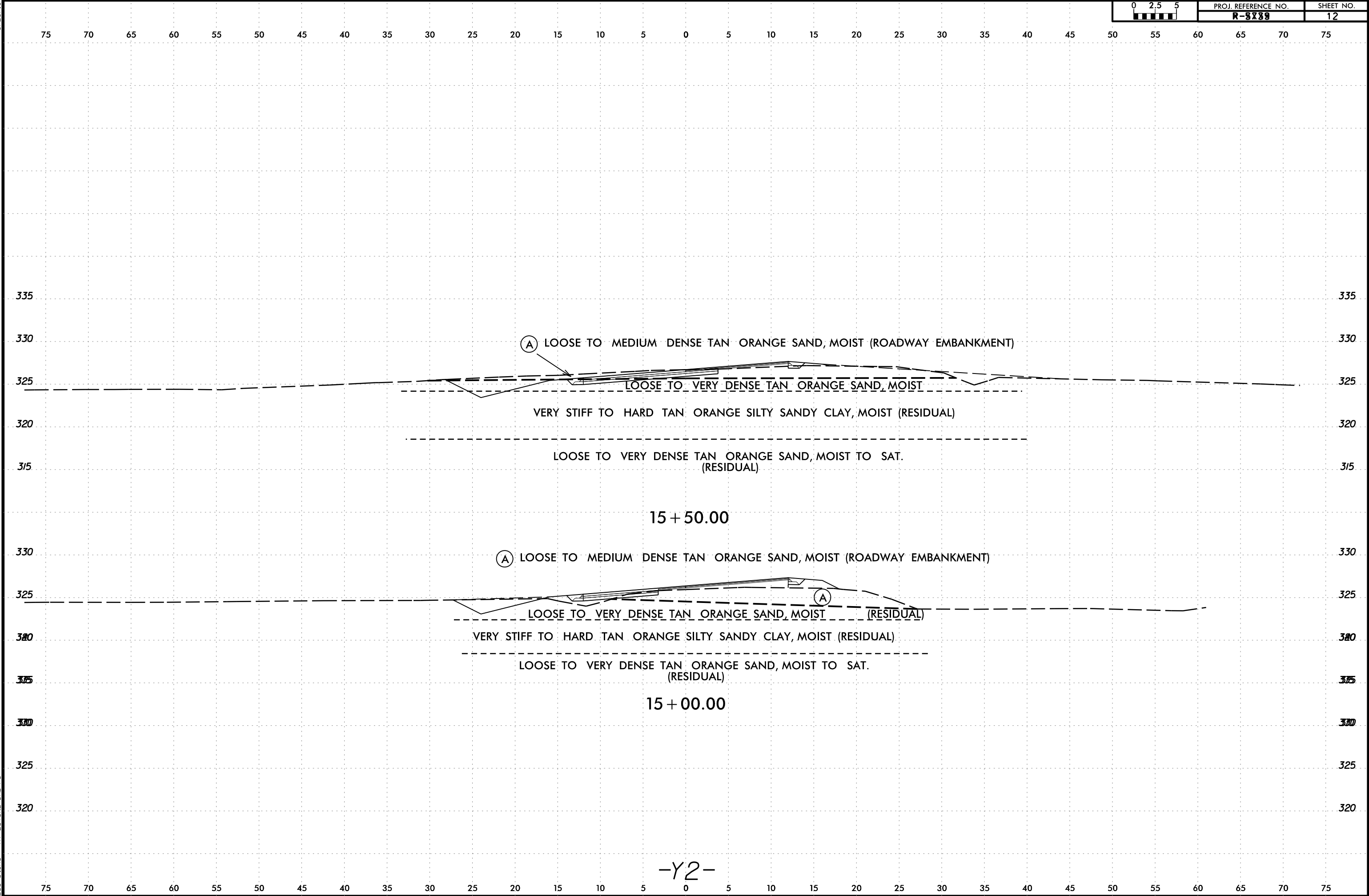
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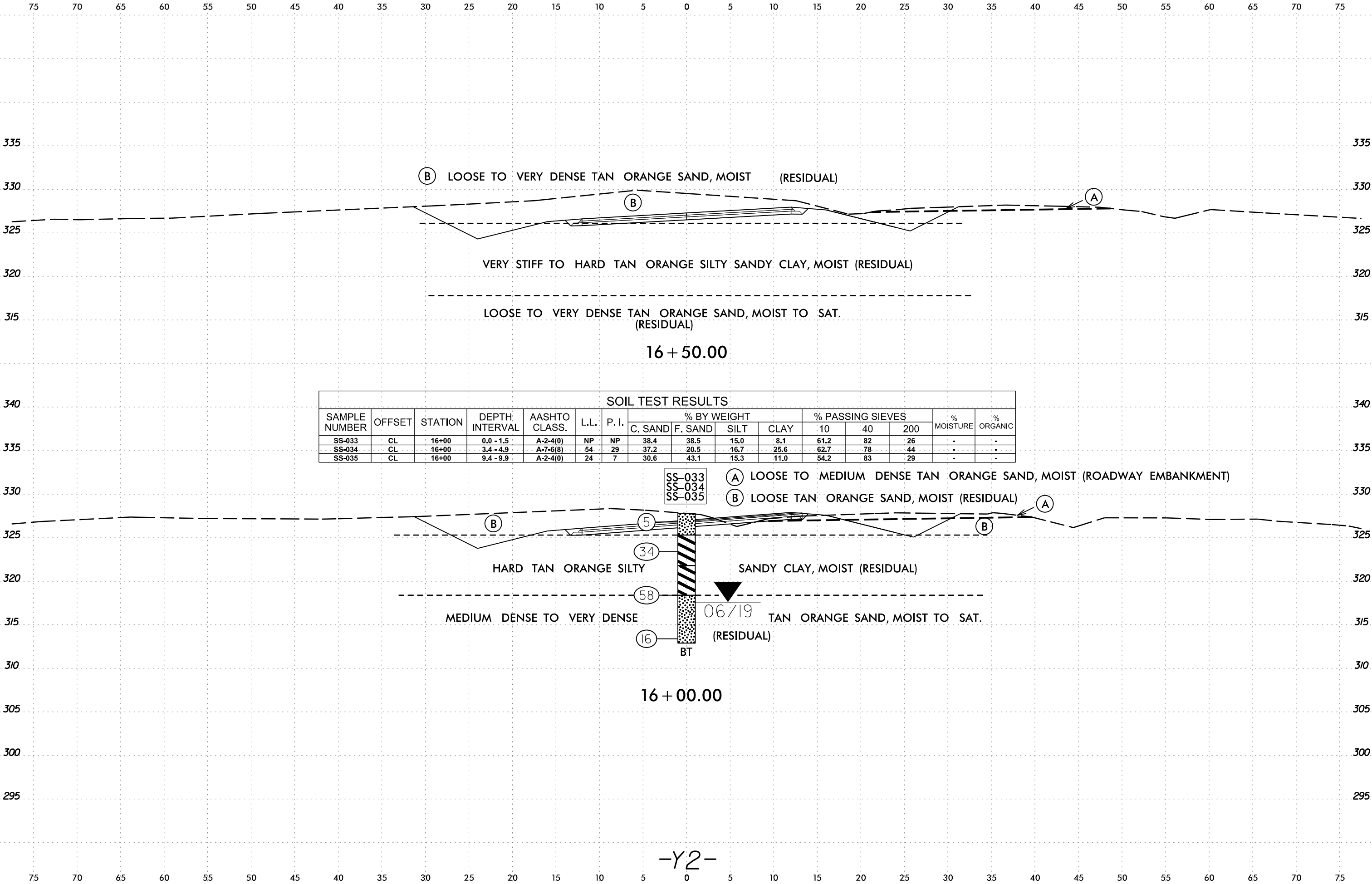
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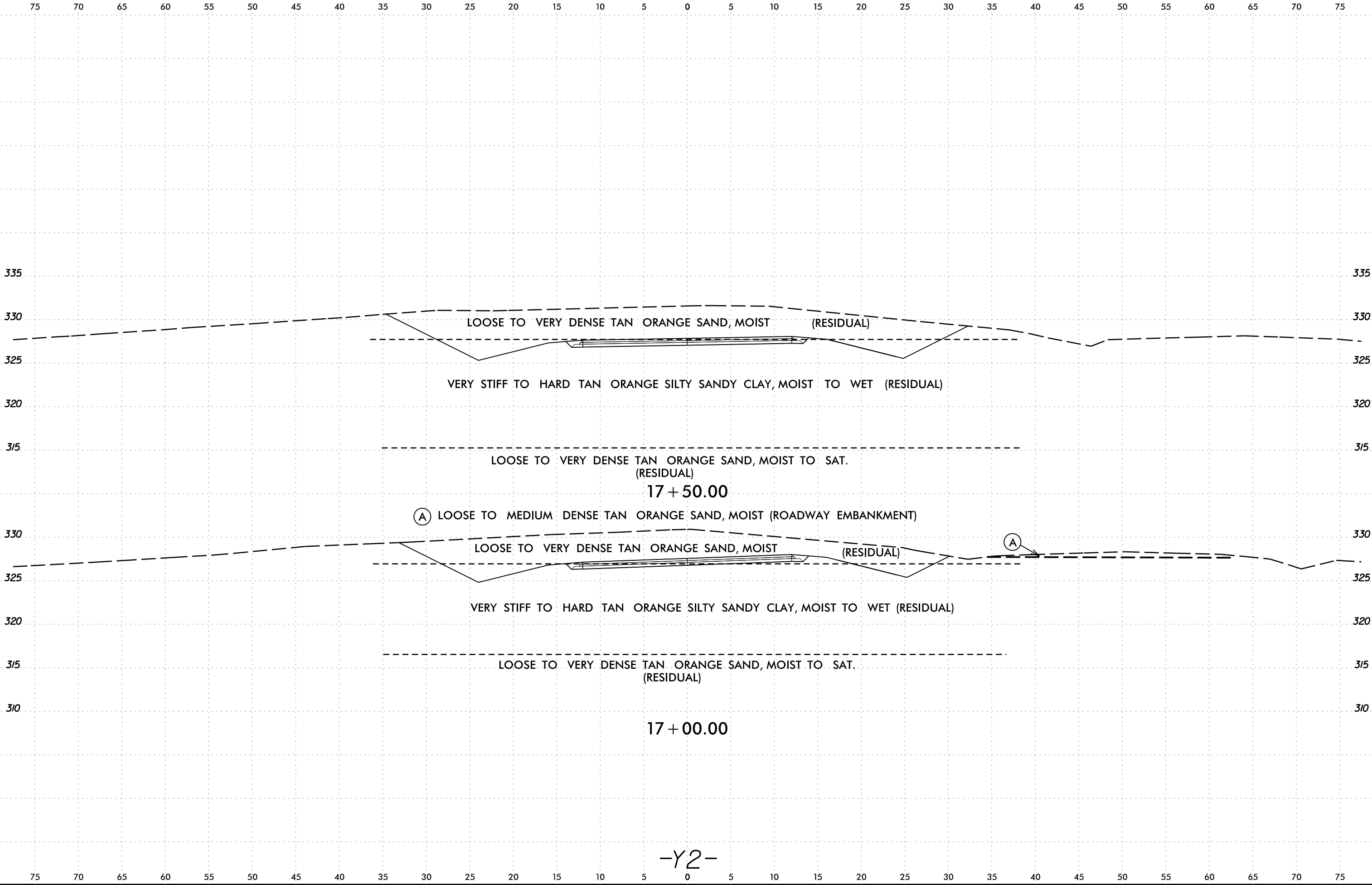


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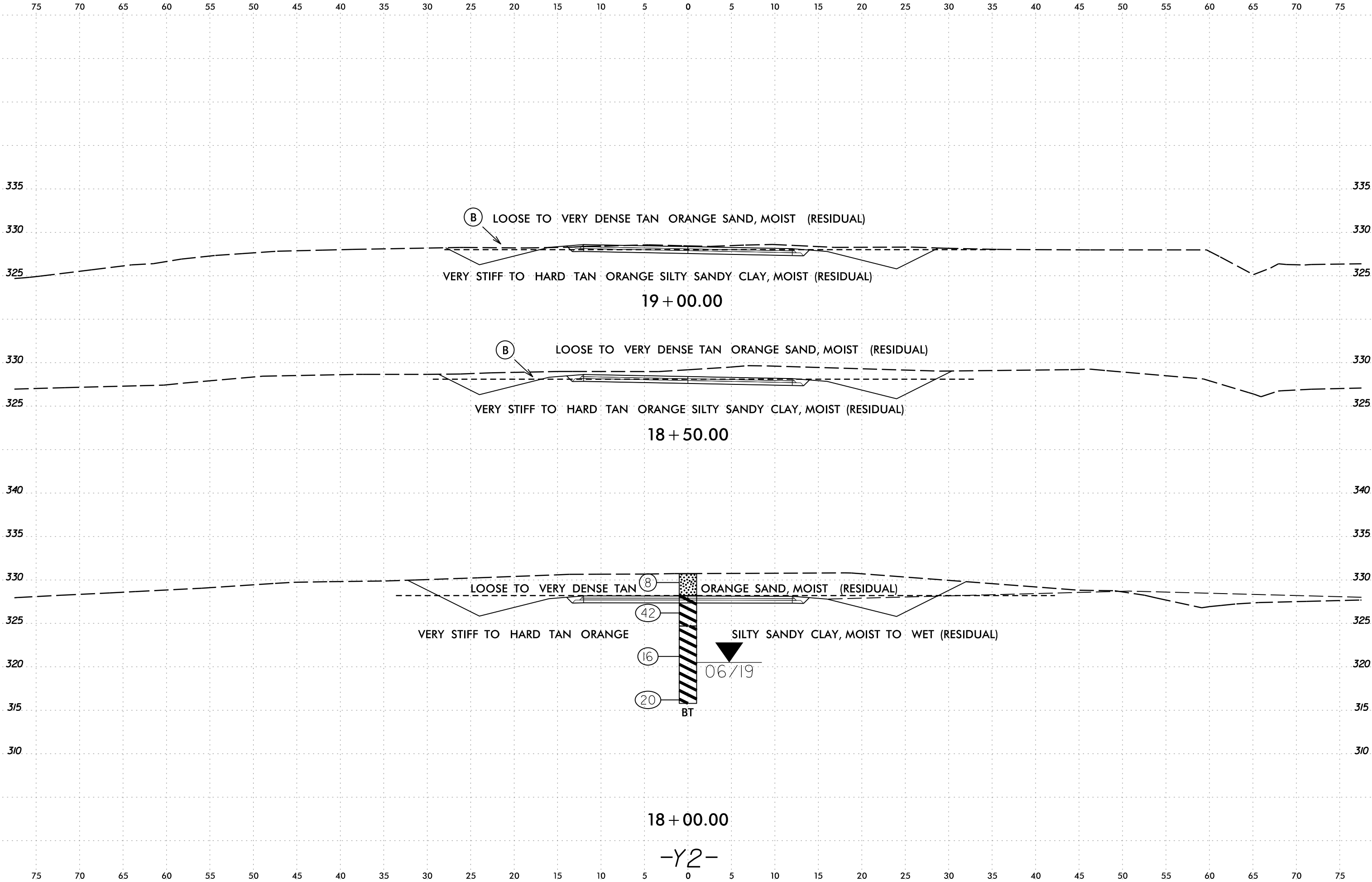


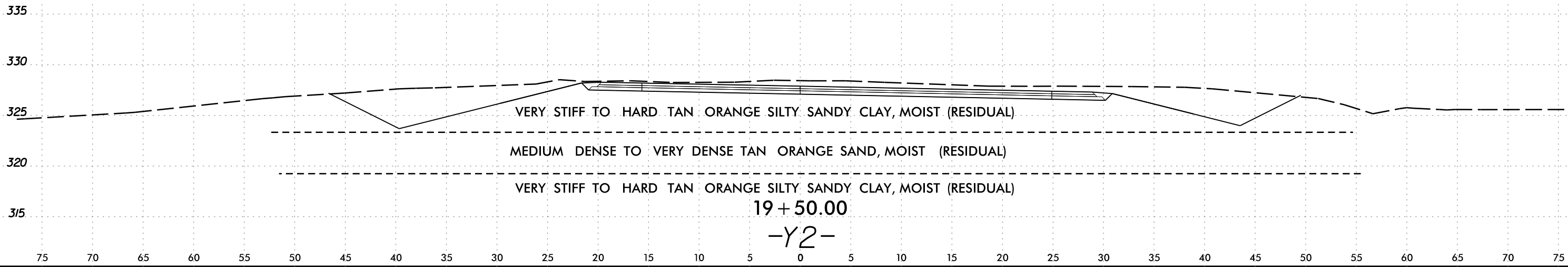
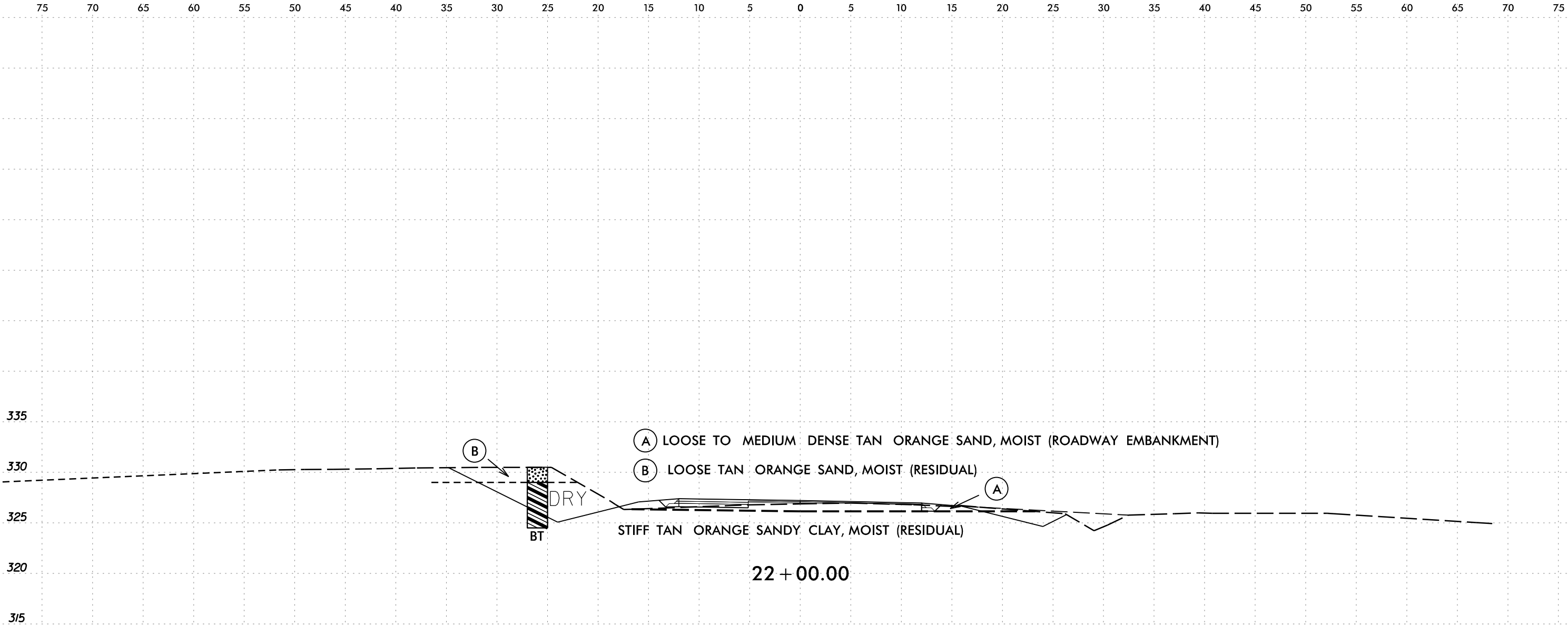
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R-5739

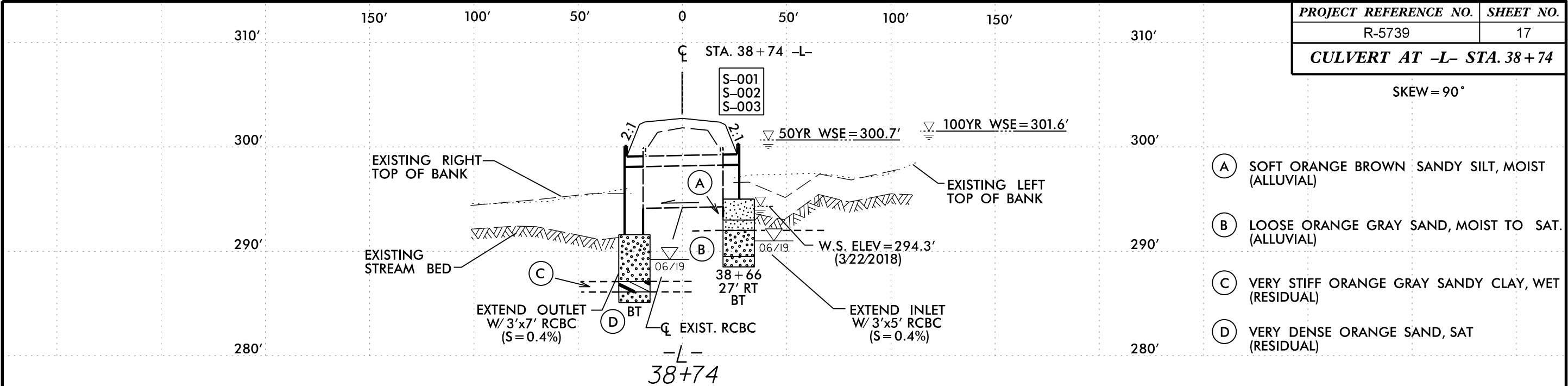
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14



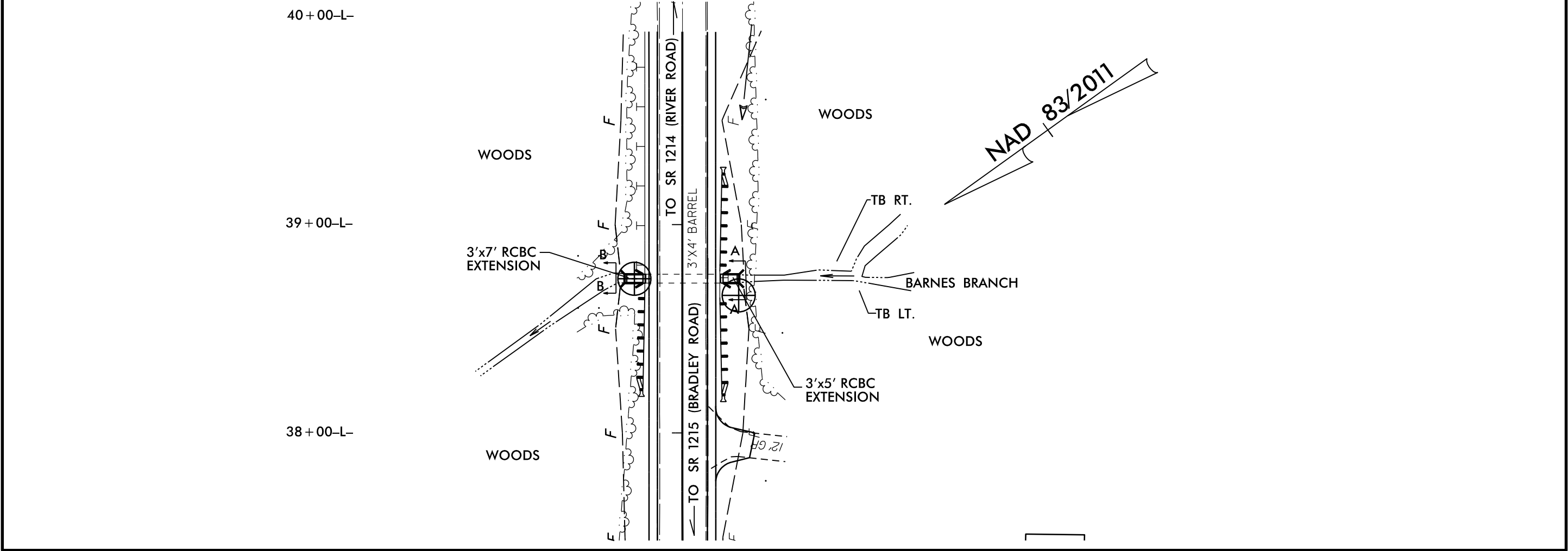
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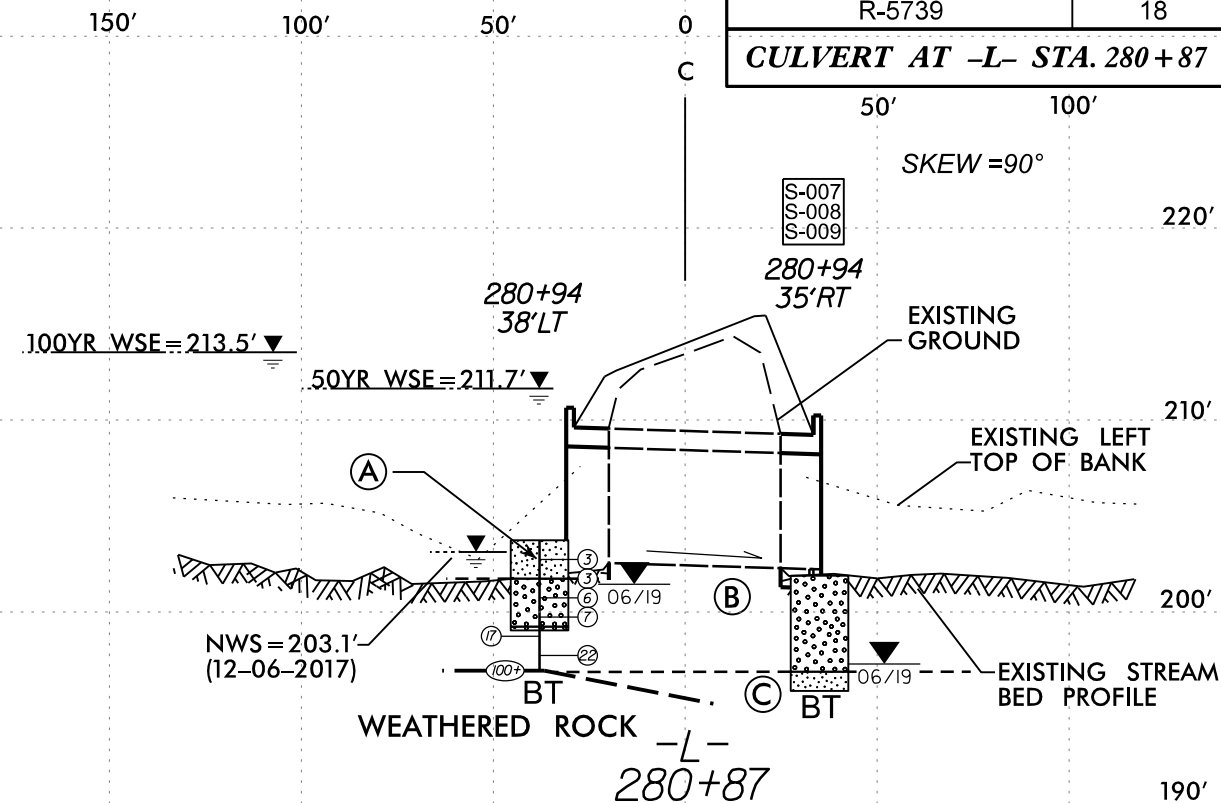
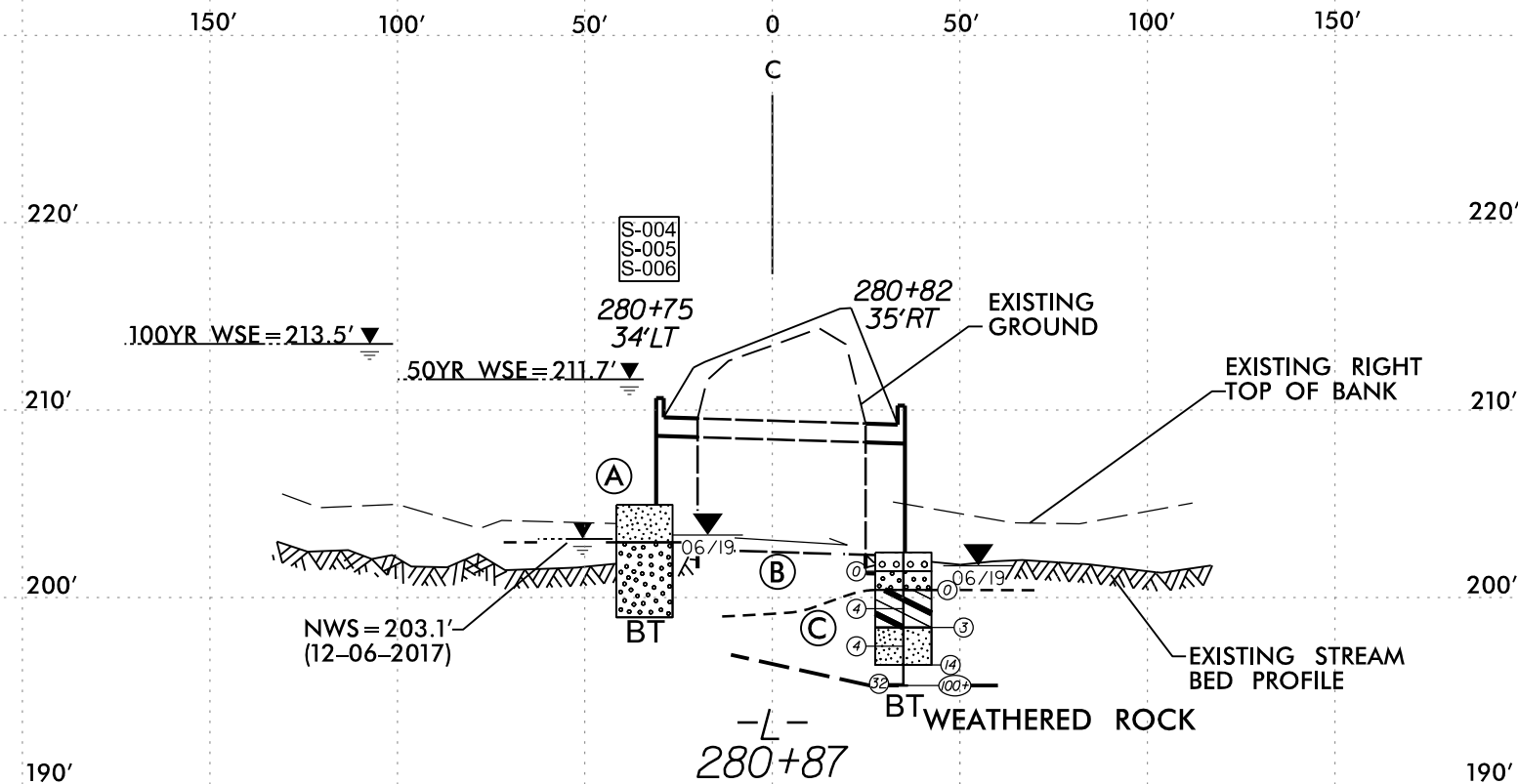




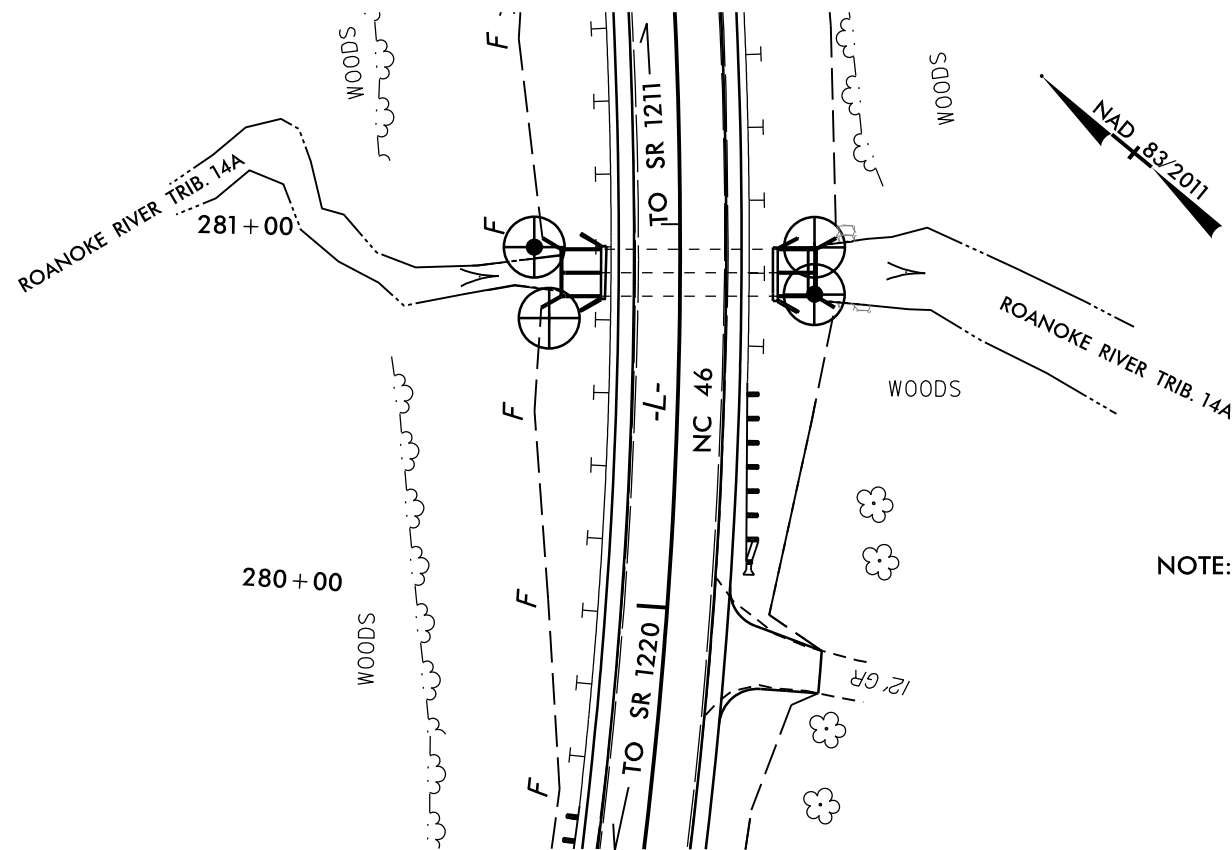


SOIL TEST RESULTS															
SAMPLE NUMBER	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P. I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-001	27 ft RT	38+66	0.0 - 1.0	A-4(0)	22	7	31.6	30.5	21.9	16.0	92.1	82	42	-	-
S-002	27 ft RT	38+66	2.0 - 3.0	A-4(1)	23	10	32.5	30.9	18.4	18.2	88.9	82	40	-	-
S-003	27 ft RT	38+66	5.5 - 6.5	A-2-4(0)	21	9	39.9	32.4	11.7	16.0	88.0	77	31	-	-



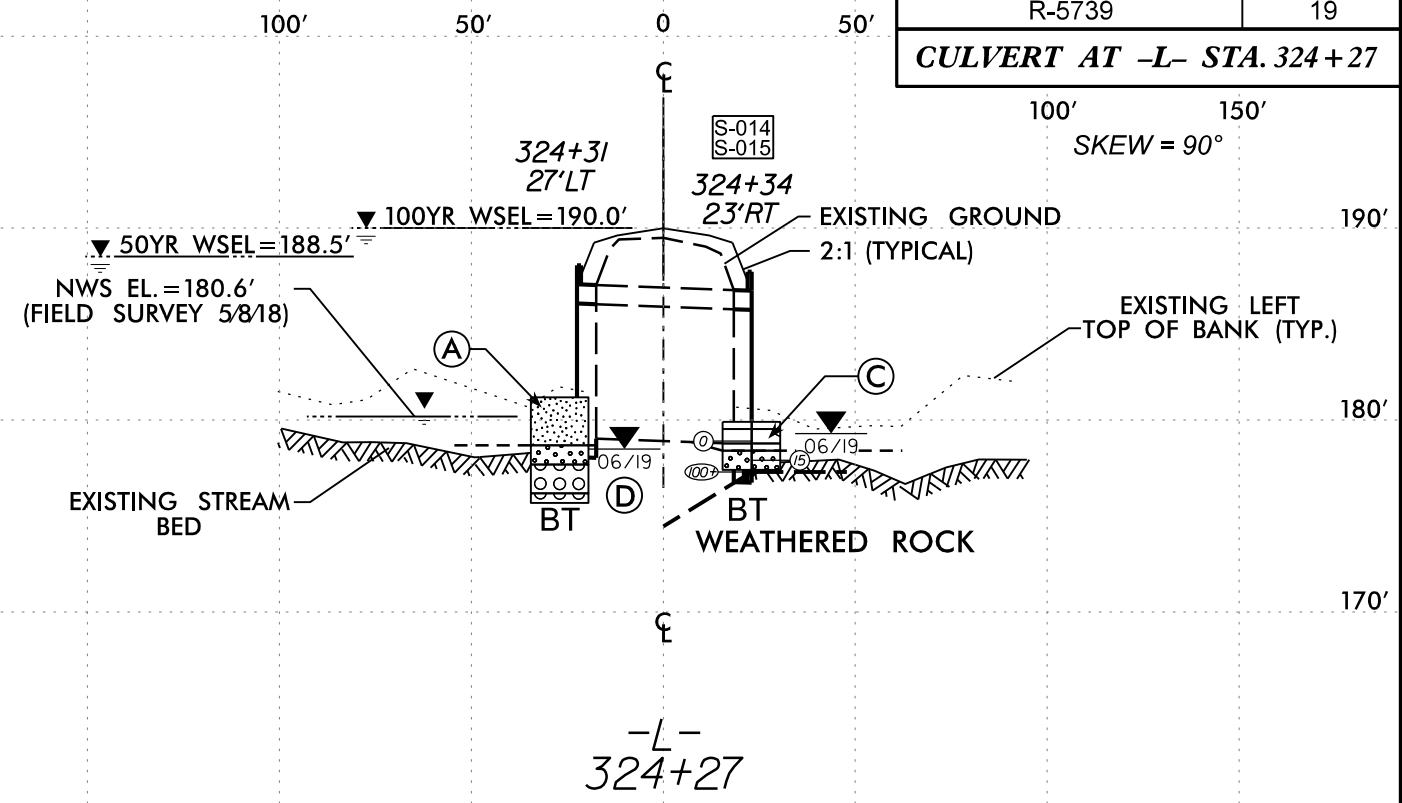
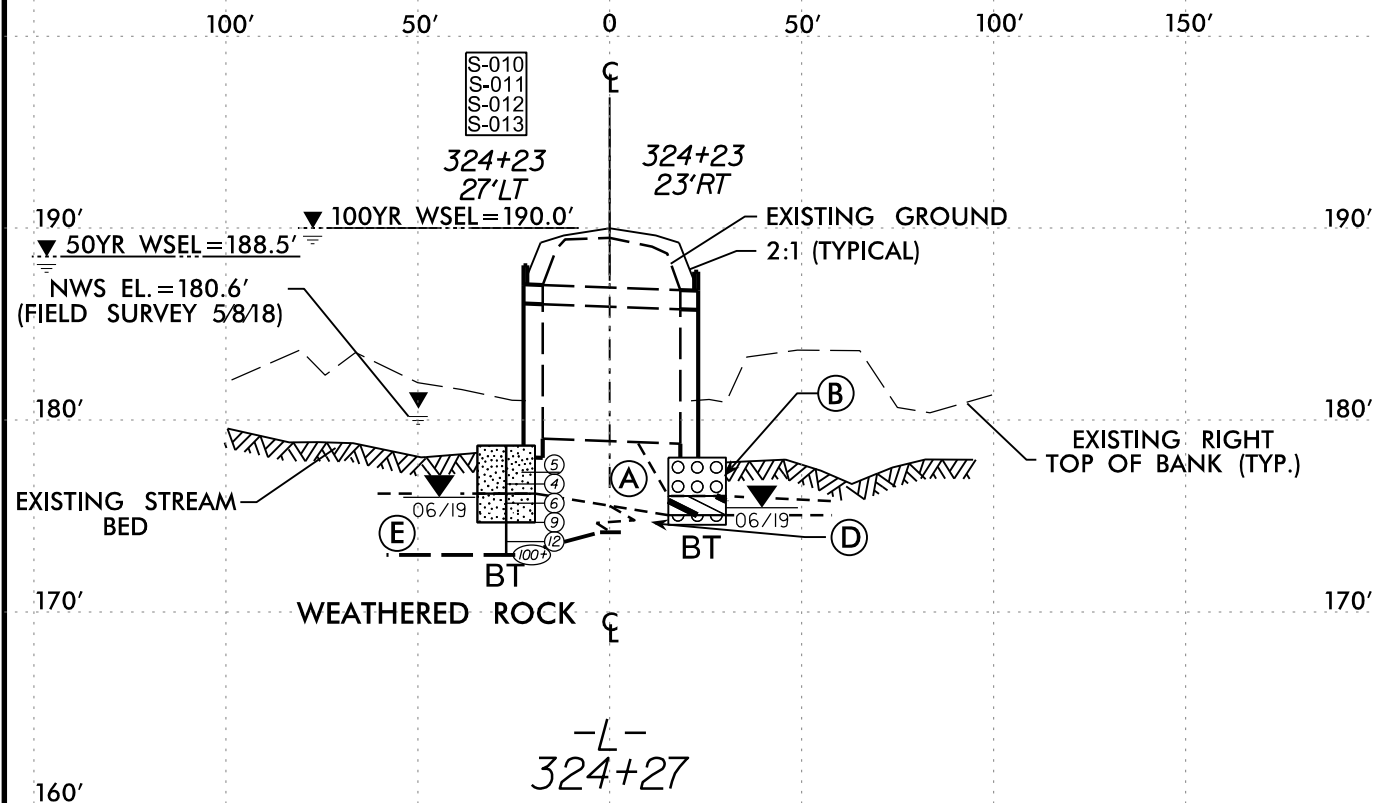


SOIL TEST RESULTS															
SAMPLE NUMBER	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P. I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-004	34 ft LT	280+75	0.0 - 1.0	A-4(0)	29	8	26.4	39.5	25.2	9.0	98.5	88	38	-	-
S-005	34 ft LT	280+75	1.0 - 2.0	A-4(0)	21	5	25.6	42.1	17.8	14.5	96.2	90	36	-	-
S-006	34 ft LT	280+75	2.0 - 6.0	A-2-4(0)	NP	NP	30.5	48.8	13.1	7.5	83.2	88	23	-	-
S-007	35 ft RT	280+94	0.0 - 1.0	A-2-4(0)	22	3	28.6	43.4	19.6	8.4	64.0	87	31	-	-
S-008	35 ft RT	280+94	2.0 - 3.0	A-2-4(0)	NP	NP	20.3	56.7	9.9	13.1	92.9	96	27	-	-
S-009	35 ft RT	280+94	5.0 - 6.0	A-4(0)	15	3	18.8	39.6	19.5	22.1	91.2	95	44	-	-

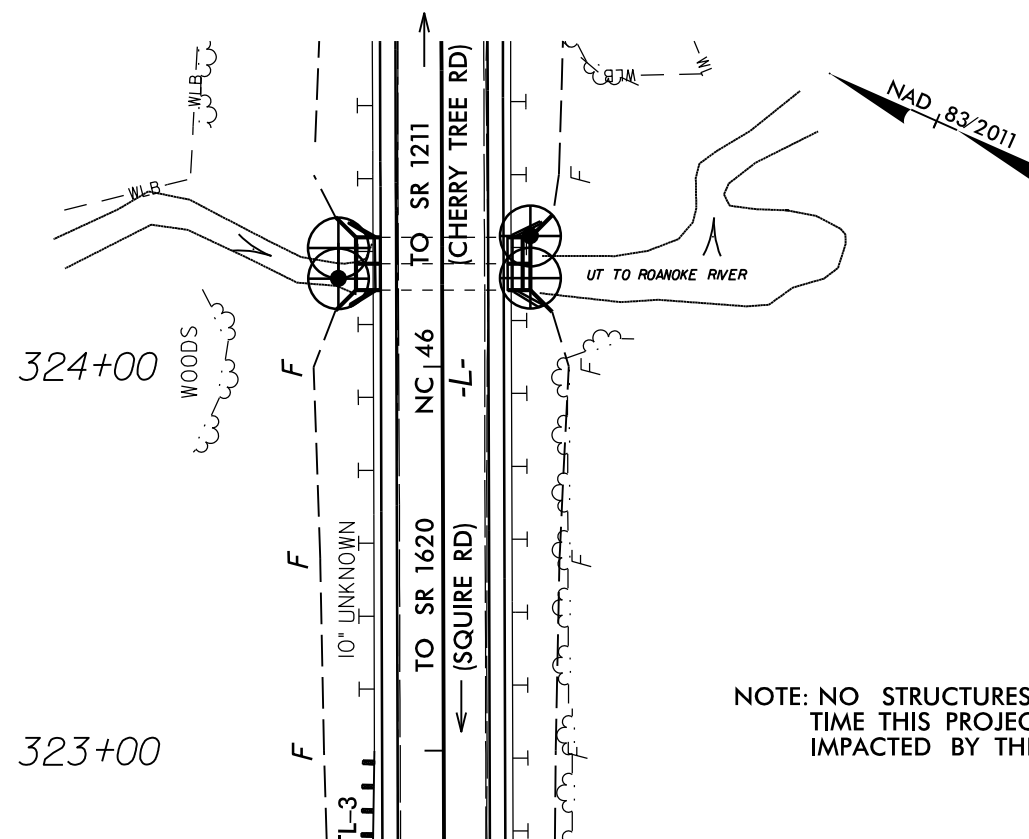


- (A) SOFT TO MED. STIFF ORANGE BROWN, SANDY SILT, MOIST (ALLUVIAL)
- (B) LOOSE TO VERY DENSE ORANGE GRAY SAND, MOIST TO SAT. (ALLUVIAL)
- (C) HARD ORANGE GRAY, SANDY CLAY AND SANDY SILT, WET (RESIDUAL)

NOTE: NO STRUCTURES THAT WERE IN PLACE AT THE TIME THIS PROJECT WAS DESIGNED WILL BE ADVERSELY IMPACTED BY THE PROPOSED STRUCTURE.

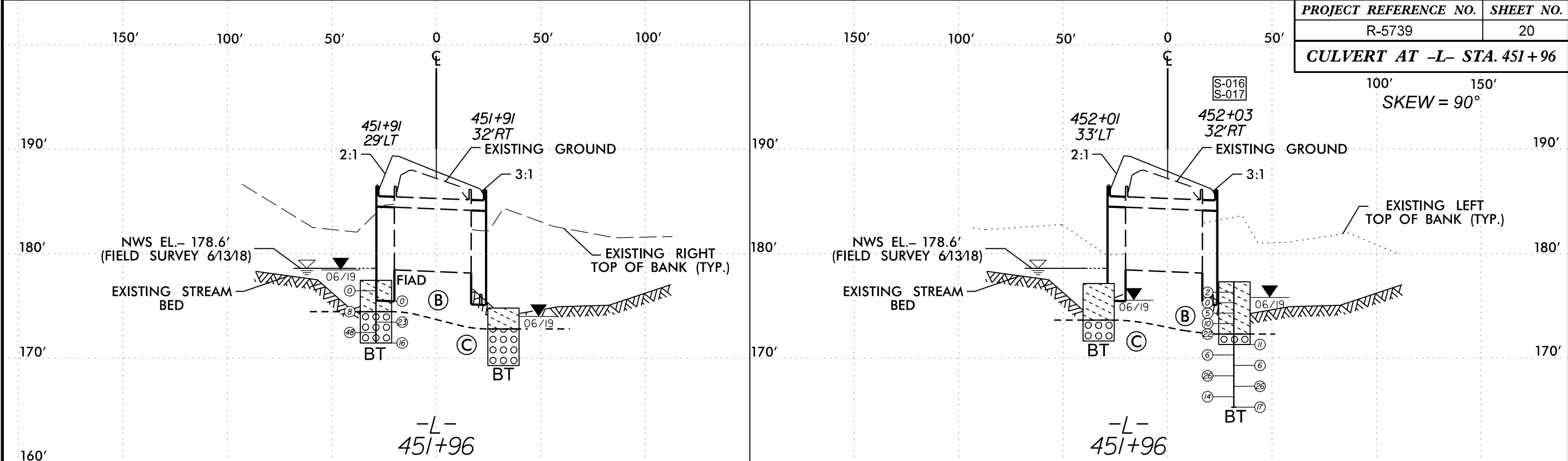


SOIL TEST RESULTS															
SAMPLE NUMBER	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P. I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-010	27 ft LT	324+23	0.0 - 1.0	A-4(3)	30	10	14.2	38.4	31.8	15.6	77.1	93	51	-	-
S-011	27 ft LT	324+23	1.5 - 2.5	A-4(0)	29	7	15.2	45.6	28.2	11.0	90.8	95	43	-	-
S-012	27 ft LT	324+23	2.5 - 3.5	A-4(2)	29	8	16.3	36.4	27.9	19.4	87.2	92	51	-	-
S-013	27 ft LT	324+23	3.5 - 4.0	A-4(5)	32	9	9.4	22.5	44.2	24.0	94.1	96	71	-	-
S-014	23 ft RT	324+34	0.0 - 1.0	A-5(3)	43	7	13.3	35.9	37.7	13.1	99.0	93	57	-	6.7
S-015	23 ft RT	324+34	1.5 - 2.5	A-2-4(0)	NP	NP	50.0	38.9	7.1	4.1	77.9	73	13	-	-

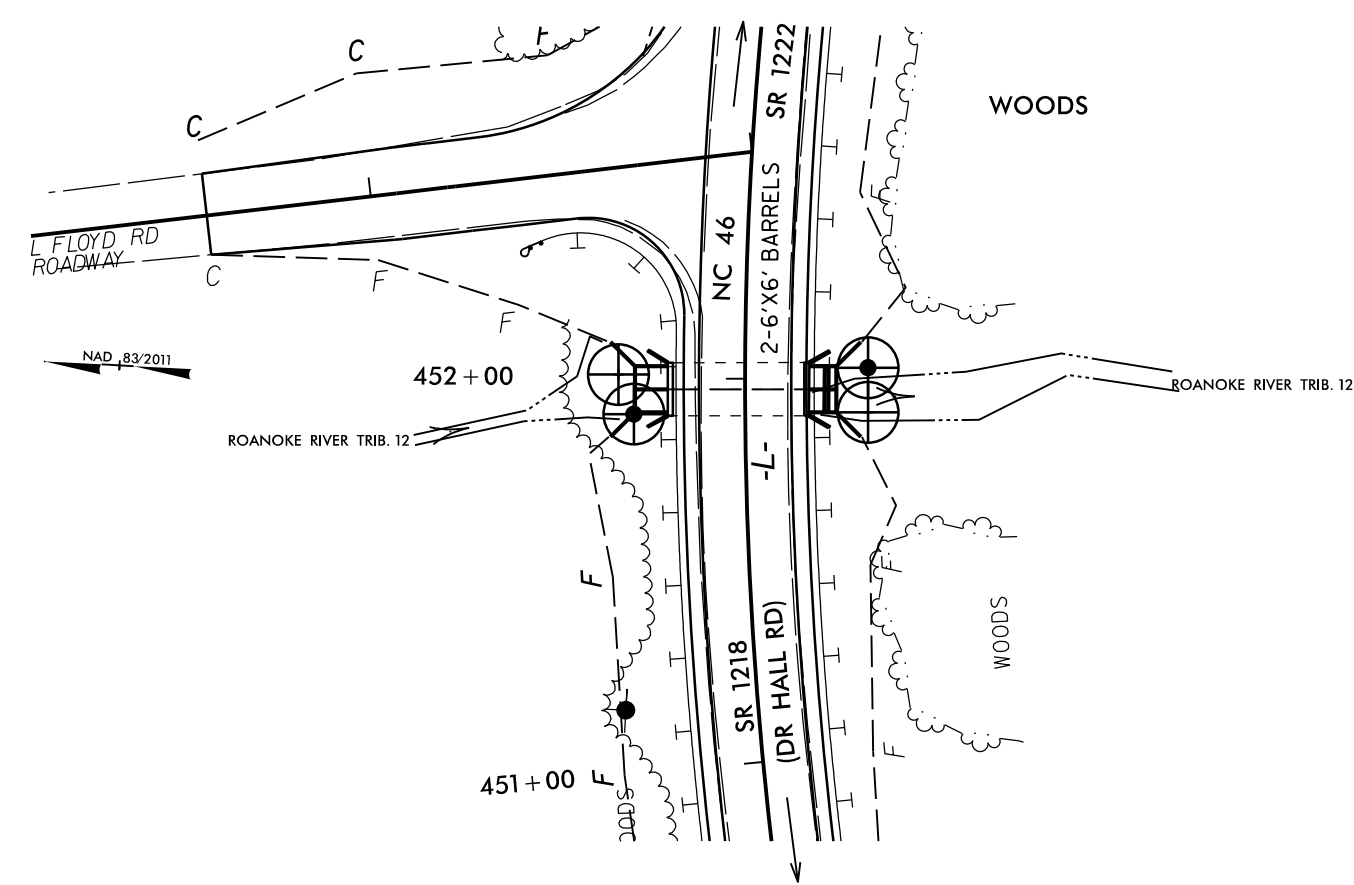


- (A) STIFF BROWN SANDY SILT AND CLAY, MOIST TO WET. (ALLUVIAL)
- (B) DENSE GRAY SAND AND GRAVEL, MOIST TO SAT. (ALLUVIAL)
- (C) SOFT BROWN, SANDY SILT WITH LITTLE ORGANICS, MOIST TO WET (ALLUVIAL)
- (D) VERY DENSE ORANGE GRAY SAND AND GRAVEL, MOIST TO SAT. (RESIDUAL)
- (E) HARD ORANGE GRAY SANDY SILT, MOIST TO WET (RESIDUAL)

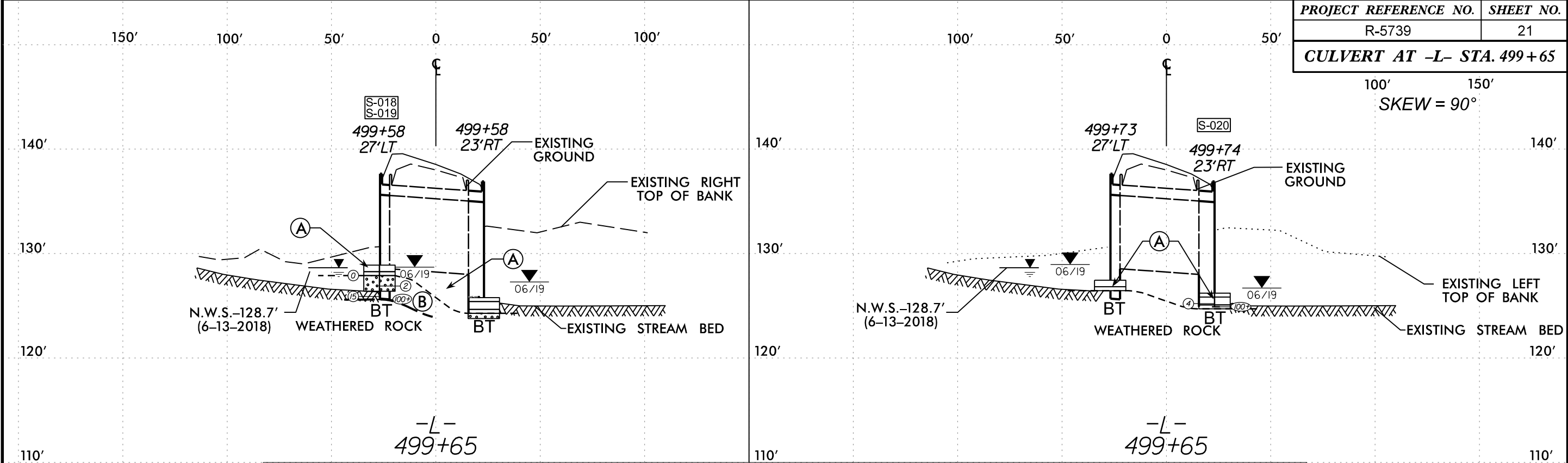
NOTE: NO STRUCTURES THAT WERE IN PLACE AT THE TIME THIS PROJECT WAS DESIGNED WILL BE ADVERSELY IMPACTED BY THE PROPOSED STRUCTURE.



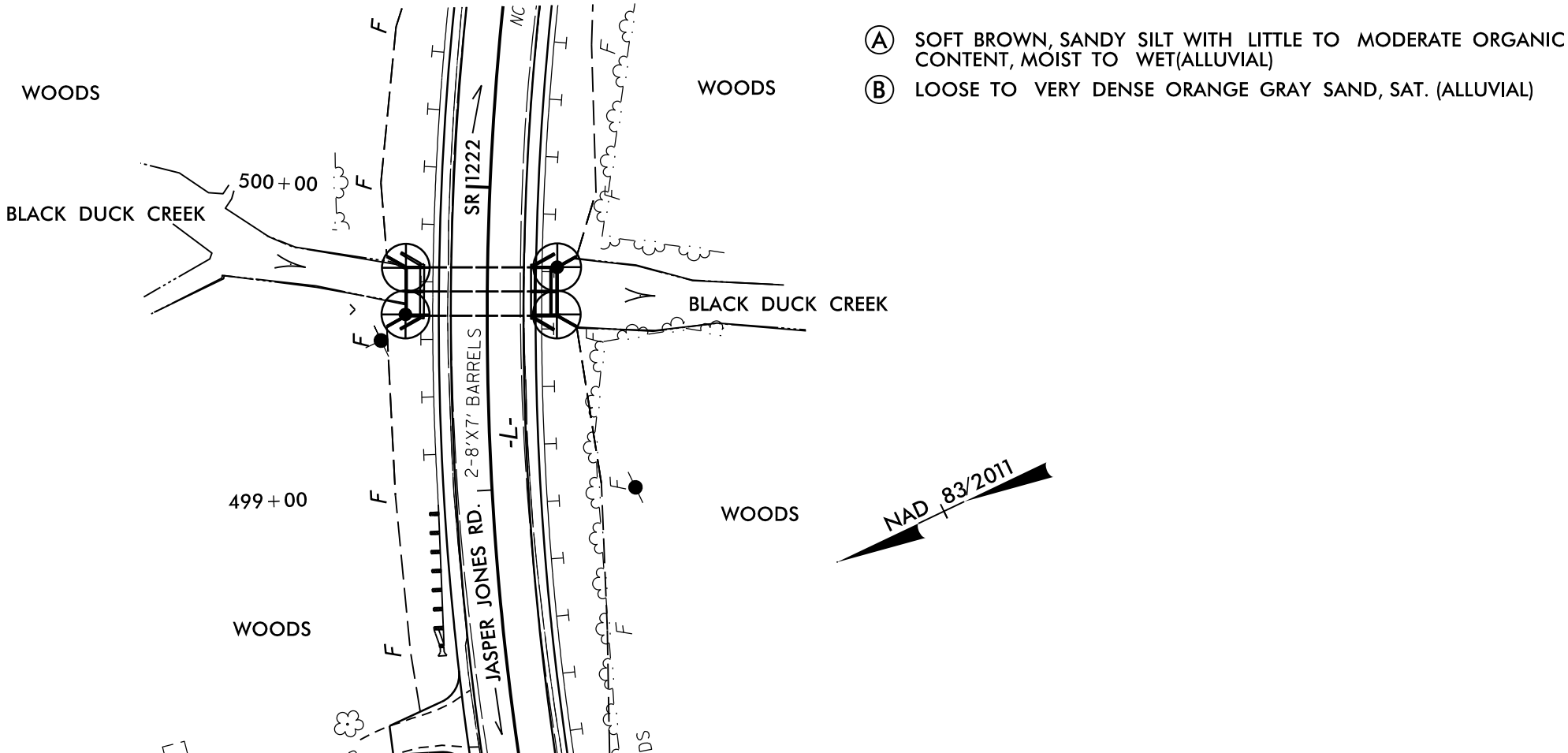
SOIL TEST RESULTS															
SAMPLE NUMBER	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P. I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-016	32 ft RT	452+03	0.0 - 1.0	A-2-4(0)	NP	NP	44.6	39.3	10.5	5.6	89.8	79	19	-	-
S-017	32 ft RT	452+03	1.5 - 2.5	A-2-4(0)	NP	NP	41.6	31.5	21.2	5.7	90.8	80	30	-	3.9



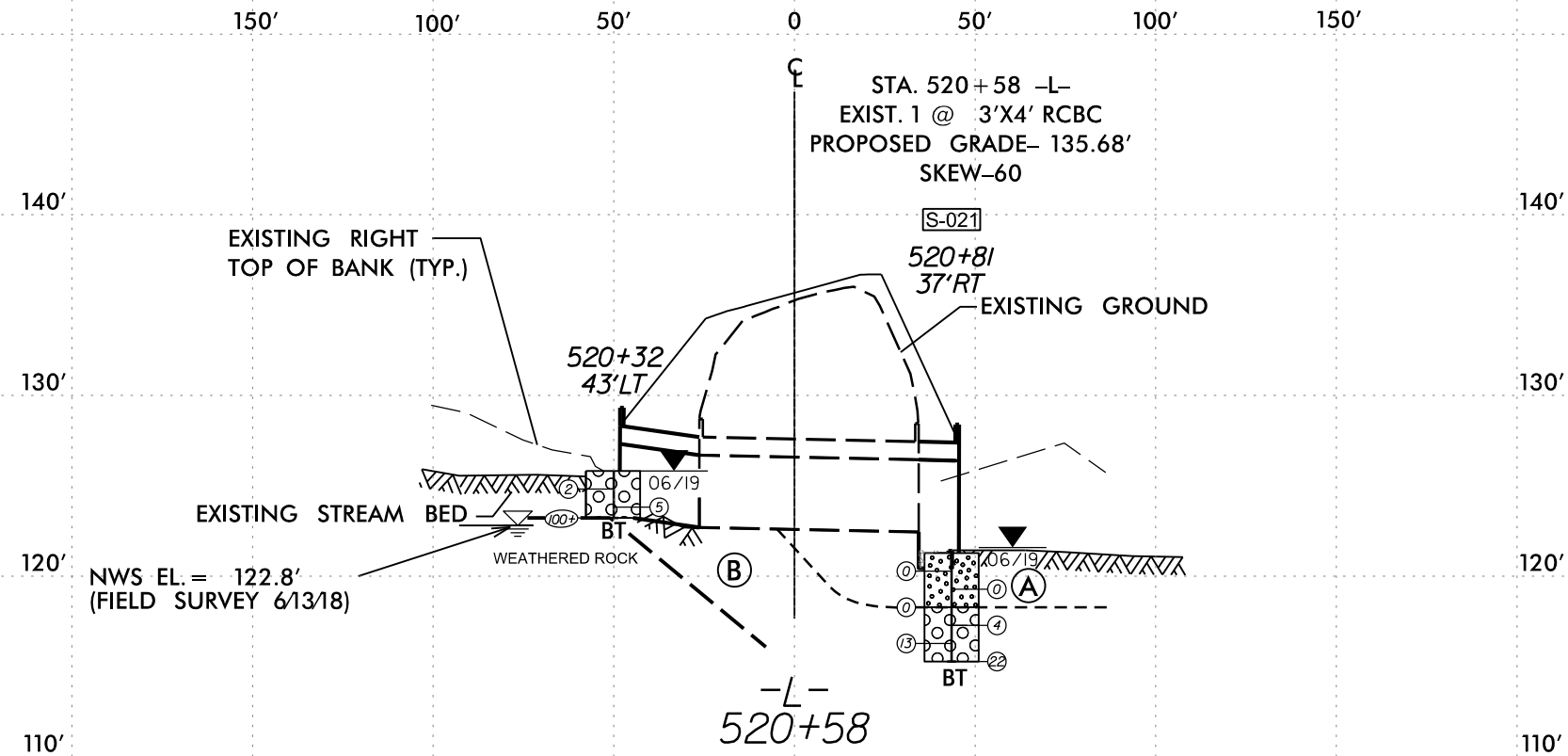
- (B) LOOSE TO DENSE BROWN SAND WITH LITTLE ORGANICS, MOIST TO SAT. (ALLUVIAL)
- (C) MEDIUM DENSE TO VERY DENSE ORANGE SAND AND GRAVEL, SAT. (RESIDUAL)



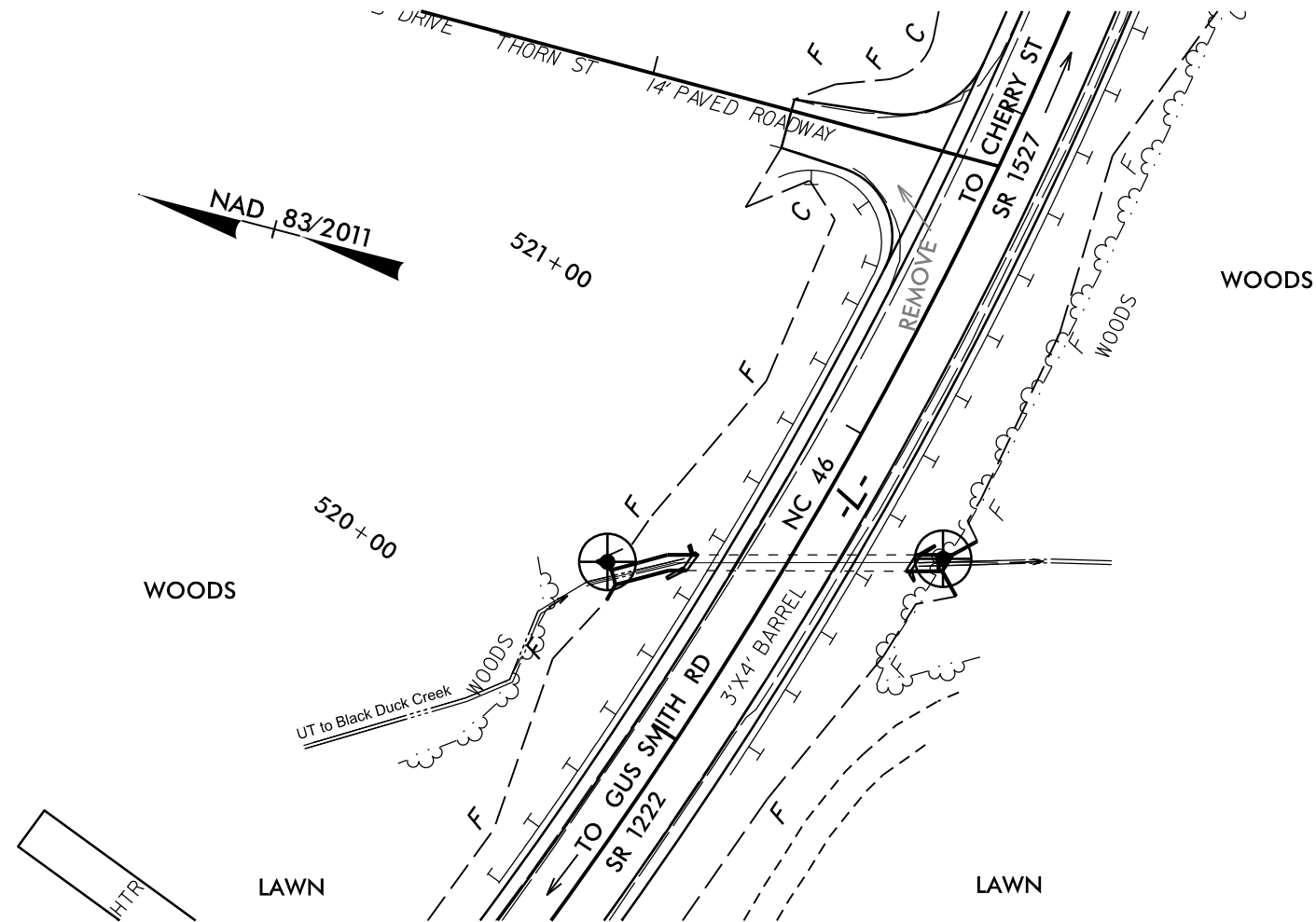
SOIL TEST RESULTS															
SAMPLE NUMBER	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P. I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-018	27 ft LT	499+58	0.0 - 1.0	A-4(0)	NP	NP	27.1	11.4	59.5	1.9	87.6	82	62	-	8.2
S-019	27 ft LT	499+58	1.0 - 2.0	A-2-4(0)	22	6	41.0	29.6	15.1	14.4	93.9	74	32	-	-
S-020	23 ft RT	499+74	0.0 - 1.0	A-4(0)	NP	NP	44.3	17.4	32.8	5.6	87.6	70	40	-	12.9



SKEW = 60°



SOIL TEST RESULTS															
SAMPLE NUMBER	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		
S-021	37 ft RT	520+81	0.0 - 1.0	A-2-4(0)	NP	NP	74.9	14.6	5.9	4.5	86.8	45	11	-	-



- Ⓐ VERY LOOSE ORANGE GRAY SAND MOIST TO SAT. (ALLUVIAL)
- Ⓑ LOOSE TO VERY DENSE ORANGE SAND AND GRAVEL, MOIST TO SAT. (RESIDUAL)

