

REFERENCE: B-5360

PROJECT: 46074

SEE SHEET 3 FOR PLAN SHEET LAYOUT
AT TIME OF INVESTIGATION

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5360	1	21

CONTENTS

<u>LINE</u>	<u>STATION</u>	<u>PLAN</u>	<u>PROFILE</u>	<u>XSECT</u>
-L-	13+00 to 33+15	4-5	6	7-15
-DRV3-	10+00 to 12+39	5	6	16-18

<u>DESCRIPTION</u>	<u>SHEET</u>
SOIL TEST RESULTS	19

ROADWAY SUBSURFACE INVESTIGATION

COUNTY RANDOLPH
PROJECT DESCRIPTION BRIDGE NO. 374 OVER SANDY
CREEK ON SR 2481 (LOW BRIDGE RD.)

INVENTORY

CAUTION NOTICE

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

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

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

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

PERSONNEL

B. BOYCE

S. CROCKETT

P. ZHANG

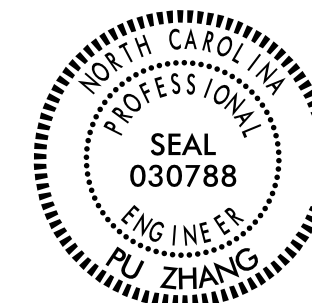
INVESTIGATED BY S. CROCKETT

DRAWN BY S. CROCKETT

CHECKED BY P. ZHANG

SUBMITTED BY P. ZHANG

DATE NOVEMBER 2014



DocuSigned by:

Paul Zhang

12/12/2014

SIGNATURE

DATE

SIGNATURE

DATE

**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																																																																																																																																										
<p>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></p>										<p>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.</p>										<p>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:</p>										<p>ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (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.</p>																																																																																																																																										
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<p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.</p>										<p>SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50</p>										<p>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.</p>										<p>COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.</p>																																																																																																																																										
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<p>DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-BROWN). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.</p>										<p>DRILL UNITS: <input type="checkbox"/> CME-45C <input type="checkbox"/> CME-55 <input checked="" type="checkbox"/> CME-550 <input type="checkbox"/> VANE SHEAR TEST <input type="checkbox"/> PORTABLE HOIST</p>										<p>ADVANCING TOOLS: <input type="checkbox"/> CLAY BITS <input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER <input checked="" type="checkbox"/> 8" HOLLOW AUGERS <input type="checkbox"/> HARD FACED FINGER BITS <input type="checkbox"/> TUNG-CARBIDE INSERTS <input type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER <input type="checkbox"/> TRICONE * STEEL TEETH <input type="checkbox"/> TRICONE * TUNG-CARB. <input type="checkbox"/> CORE BIT</p>										<p>HAMMER TYPE: <input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL CORE SIZE: <input type="checkbox"/> -B <input type="checkbox"/> -H <input checked="" type="checkbox"/> -N Q HAND TOOLS: <input type="checkbox"/> POST HOLE DIGGER <input checked="" type="checkbox"/> HAND AUGER <input type="checkbox"/> SOUNDING ROD <input type="checkbox"/> VANE SHEAR TEST</p>										<p>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.</p>										<p>ADDITIONAL ABBREVIATIONS: FIAD - BORING FILLED IN AFTER DRILLING HAR - HAND AUGER REFUSAL</p>																																																																																																																						
PLASTICITY										FRAC. MARK: BM#1, BL STA. 15+57 42' RT, RR SPIKE IN BASE OF 18 IN. SYCAMORE TREE, BL-103 EL=517.09 STA 13+36										ELEVATION: 494.77 FEET										DATE: 8-15-14																																																																																																																																										

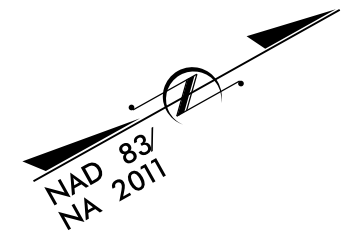
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N.C.	B-5360	2A	21
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
46074.1.1	BRZ-2481(2)	PE	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

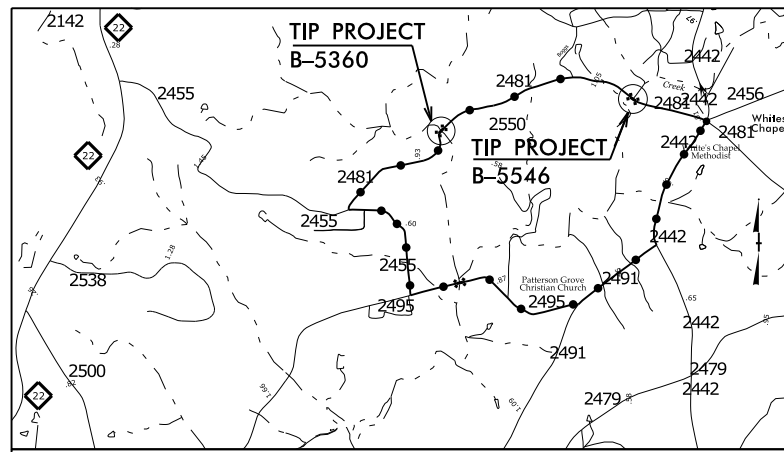
RANDOLPH COUNTY

LOCATION: BRIDGE NO 374 OVER SANDY CREEK ON SR 2481 (LOW BRIDGE RD.)

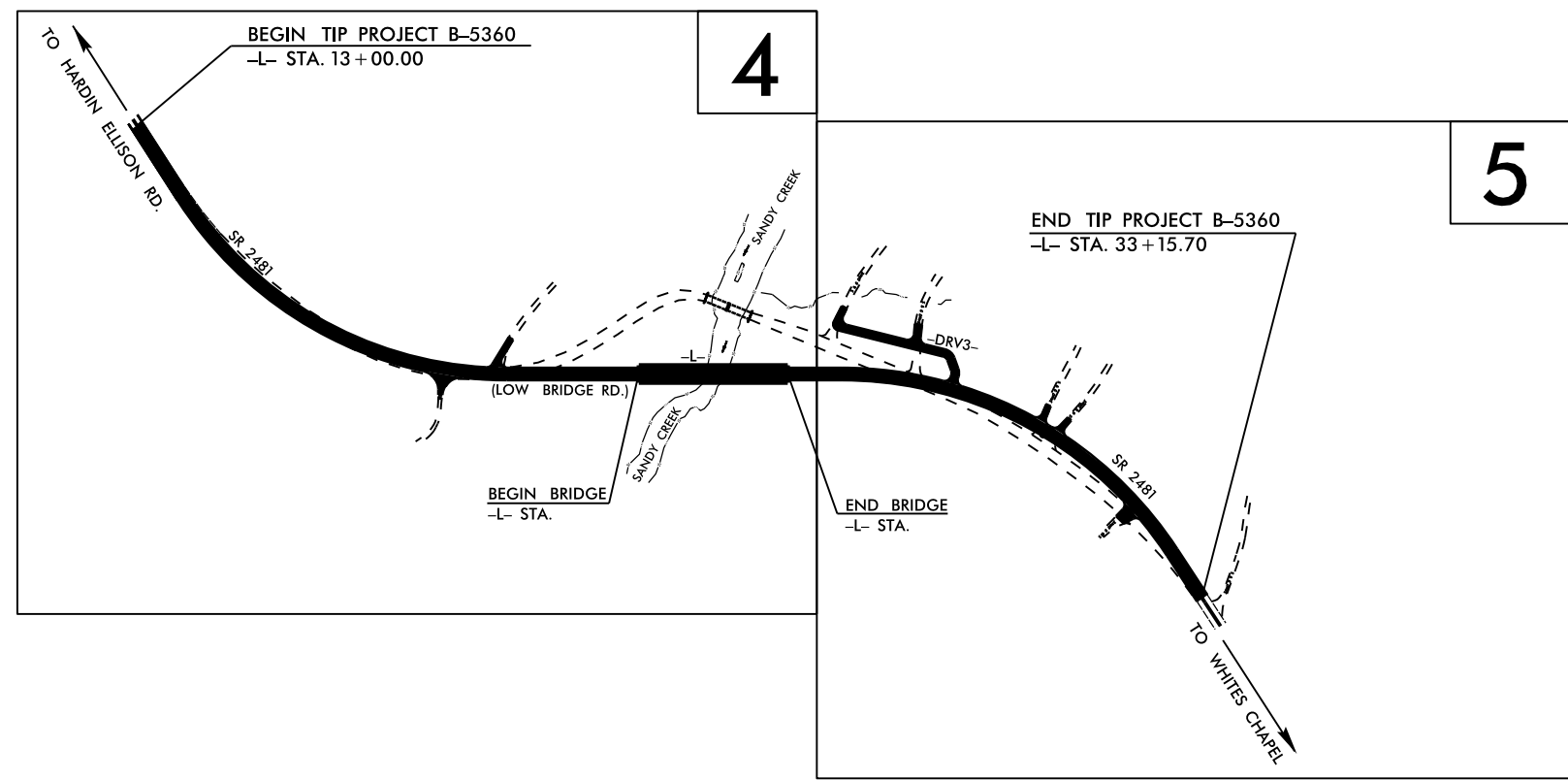
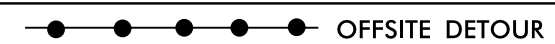
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE



See Sheet 1-A For Index of Sheets



VICINITY MAP



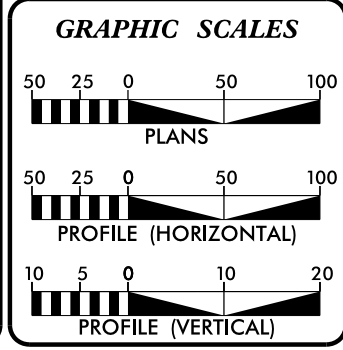
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ____
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

** DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED AND SAG VERTICAL CURVE
AND NIGHTTIME STOPPING SIGHT DISTANCE

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONTRACT: TIP PROJECT: B-5360

CONTRACT:



DESIGN DATA

ADT 2014 =	420 VPD
ADT 2040 =	700 VPD
K =	13 %
D =	60 %
T =	9 % *
**V =	40 MPH
* TTST =	1% DUAL 8%
FUNC CLASS =	RURAL, LOCAL
SUBREGIONAL TIER	

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-5360 =	MI
LENGTH OF STRUCTURE TIP PROJECT B-5360 =	MI
TOTAL LENGTH OF STATE TIP PROJECT B-5360 =	0.379 MI

Prepared in the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

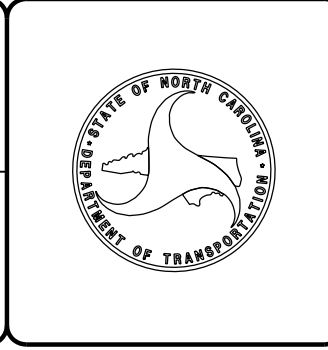
2012 STANDARD SPECIFICATIONS	
RIGHT OF WAY DATE: OCTOBER 16, 2015	JAMES A. SPEER, PE PROJECT ENGINEER
LETTING DATE: OCTOBER 18, 2016	ALLISON K. WHITE PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.



24-NOV-2014 09:49 S:\contracts\investigations\TIP\B5360_GEO_RDWY\CADD_GEO\TECH\PlanPr of B5360_GEO_tsh_2A.dgn cmbruinsma AT 66050



URS Corporation – North Carolina
1600 Perimeter Park Drive, Suite 400
Morrisville, NC 27560
Tel: 919-461-1100
Fax: 919-46-1415

November 12, 2014

STATE PROJECT: 46074.1.1 (B-5360)
FEDERAL PROJECT: BRZ-2481(2)
COUNTY: Randolph

DESCRIPTION: Bridge No. 374 over Sandy Creek on SR 2481 (Low Bridge Rd)

SUBJECT: Geotechnical Report –Inventory

Project Description

The project consists of the replacement of the existing bridge currently crossing Sandy Creek and associated roadway construction. The project begins at SR 2481 (Low Bridge Rd.), approximately 1,000 feet southwest of Sandy Creek, and extends northeast for approximately 2,000 feet in Randolph County. The existing SR 2481 within the project limits consists of an asphalt paved section at the beginning of the project, a single lane two span bridge, and gravel surfaced sections for the remaining of the project. The proposed facility consists of a two lane paved road with a single span bridge crossing Sandy Creek at the location of approximately 120 feet south of the existing bridge.

A geotechnical investigation was conducted in August of 2014. Borings were advanced utilizing an ATV mounted CME-550 drill machine with an automatic hammer or by hand auger. Standard Penetration Tests were performed at selected locations and additional borings were advanced using hand augers. Representative soil samples were collected for visual classification in the field and selected samples were submitted for laboratory analysis. The following alignments were investigated.

<u>Line</u>	<u>Station(±)</u>
-L-	13+00 to 33+16
-DRV3-	10+00 to 12+39

Areas of Special Geotechnical Interest

- 1) Highly Plastic Clays: Highly plastic ($PI \geq 26$) clays were encountered on the project at the following intervals.

<u>Line</u>	<u>Stations (±)</u>	<u>Offsets</u>
-L-	18+10 to 20+10	LT to RT
-L-	29+25 to 33+16	LT to RT

- 2) Artificial Fill: Several small areas of artificial fill are present throughout the project corridor and are related to gravel and soil driveways, as well as previous construction of utility lines.

- 3) Crystalline Rock: Crystalline rock was encountered within 6 feet of proposed grade at the following locations:

<u>Line</u>	<u>Station (±)</u>	<u>Offset</u>
-DRV3-	10+50 to 11+20	RT

Physiography and Geology

The project is located in the Piedmont Physiographic Province. Land use along the project corridor consists of residential, commercial businesses and woods. Geologically, the project is located within the Carolina Slate Belt. Felsic metavolcanic rock (CZfv) was encountered at the project site. Sandy Creek and a few ditches drain the project towards southeast.

Soil Properties

Soils encountered at the project site include roadway embankment, artificial fill, alluvial, residual, weathered rock and crystalline rock of felsic metavolcanic tuff.

Roadway Embankment soils are present along the existing SR 2481. These soils consist of red and brown, medium stiff to stiff, silty clay and sandy silt (A-7-5, A-4) with Plasticity Index ranging from 5 to 20.

Alluvial deposits are located within the floodplain of Sandy Creek.

Residual soils were encountered throughout the project. These soils consist primarily of red, brown and gray, medium stiff to hard silt and clay (A-4, A-5, A-6, A-7) with Liquid Limit ranging from non-plastic to 73 and Plasticity Index ranging from non-plastic to 43, to gray, dense, silty sand (A-2-4).

Rock Properties

Weathered rock was encountered during the roadway investigation at elevations ranging from 486.3 to 543.7 feet. It originates from the underlying felsic tuff.

Crystalline rock was encountered during the roadway investigation at elevations ranging from 485.1 to 542.3 feet, and consists of felsic tuff. Refer to the "Areas of Special Geotechnical Interest" for areas of encountered within 6 feet of proposed grade.

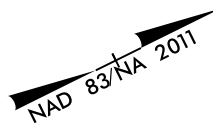
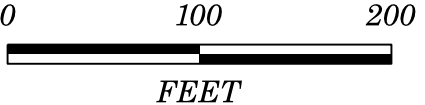
Ground Water

Groundwater was not encountered during the roadway investigation. However, groundwater may fluctuate with seasonal precipitation.

Prepared by,

Pu Zhang, P.E.
Geotechnical Engineer

PROJECT REFERENCE NO.	SHEET NO.
B-5360	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

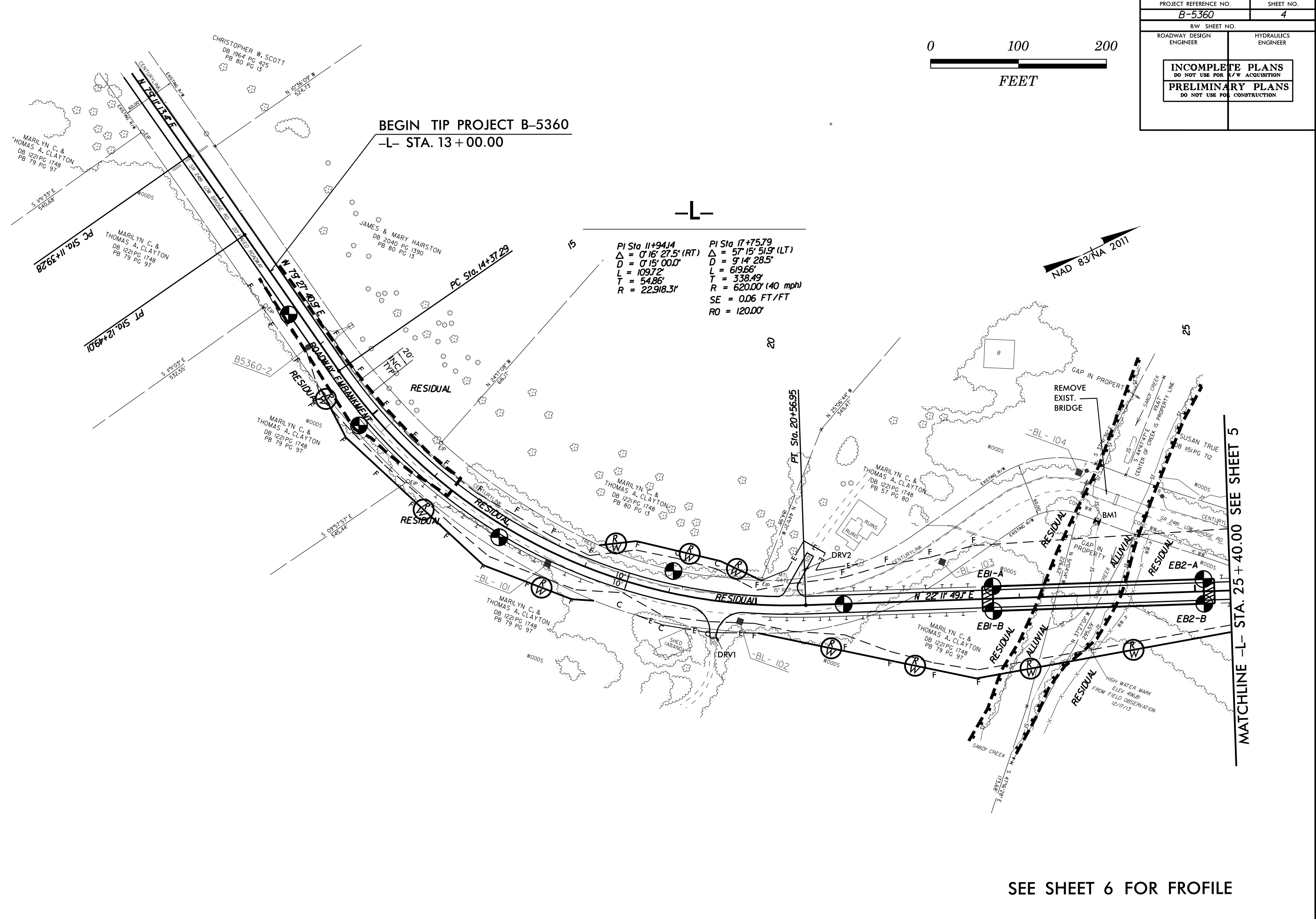


BEGIN TIP PROJECT B-5360
 -L- STA. 13+00.00

-L-

PI Sta 11+94.14	PI Sta 17+75.79
$\Delta = 0^\circ 16' 27.5''$ (RT)	$\Delta = 57^\circ 15' 51.9''$ (LT)
$D = 0^\circ 15' 00.0''$	$D = 9^\circ 14' 28.5''$
$L = 109.72'$	$L = 619.66'$
$T = 54.86'$	$T = 338.49'$
$R = 22,918.31'$	$R = 620.00'$ (40 mph)
	$SE = 0.06$ FT/FT
	$RO = 120.00'$

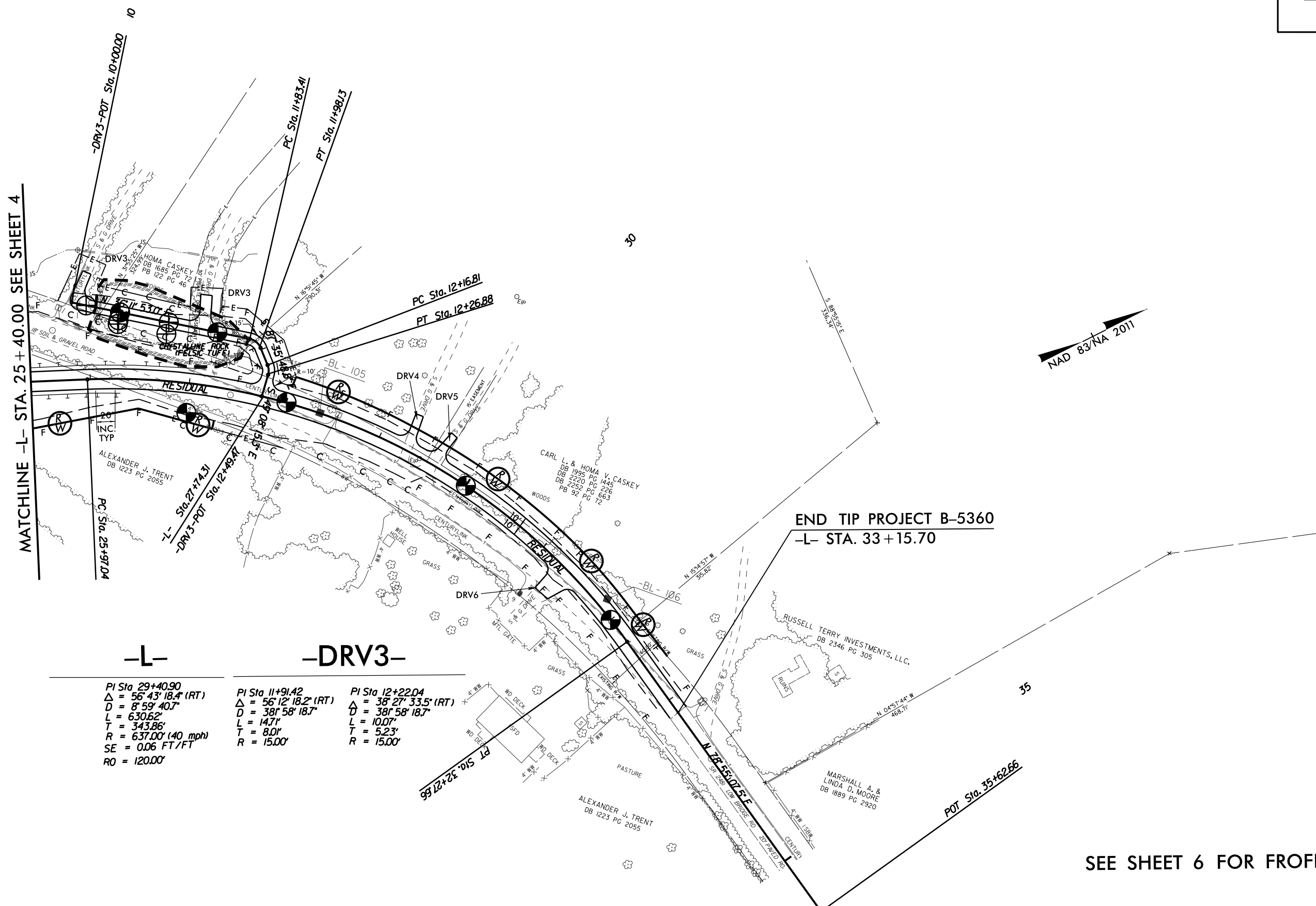
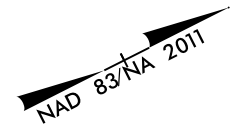
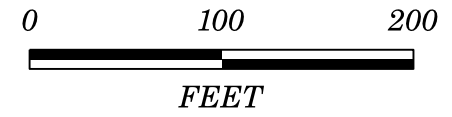
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 Stephen Crockett



MATCHLINE -L- STA. 25+40.00 SEE SHEET 5

SEE SHEET 6 FOR PROFILE

PROJECT REFERENCE NO. B-5360	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



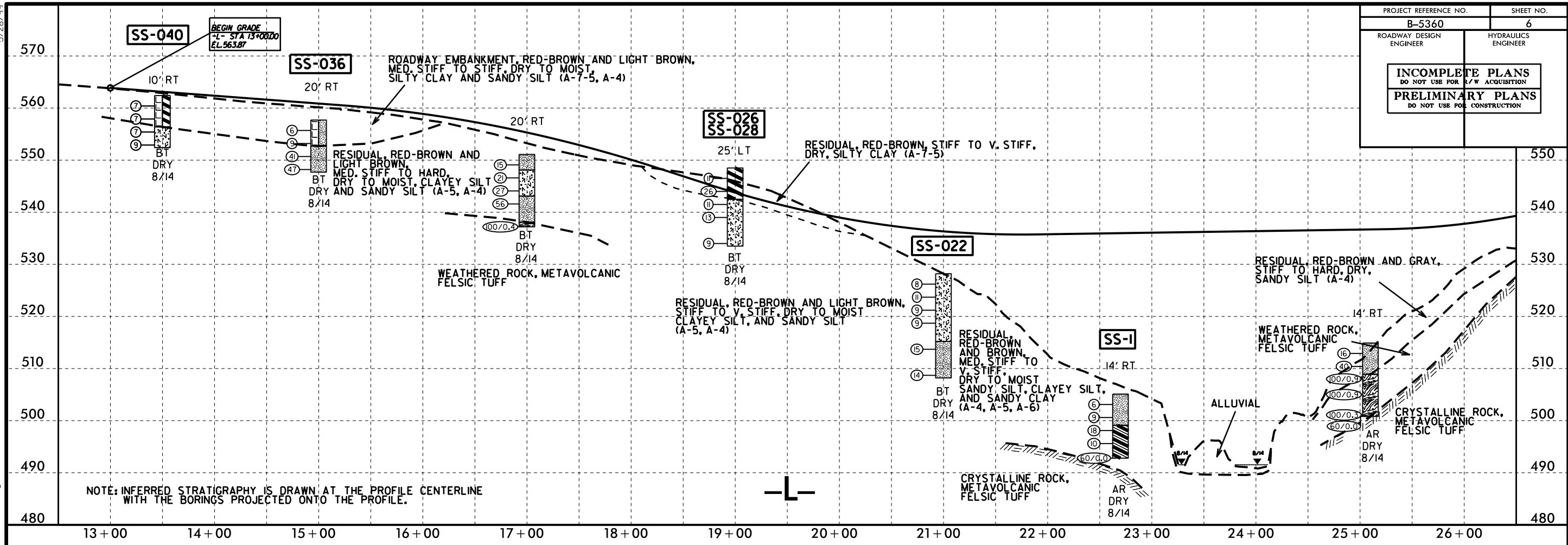
MATCHLINE -L- STA. 25 + 40.00 SEE SHEET 4

END TIP PROJECT B-5360
-L- STA. 33 + 15.70

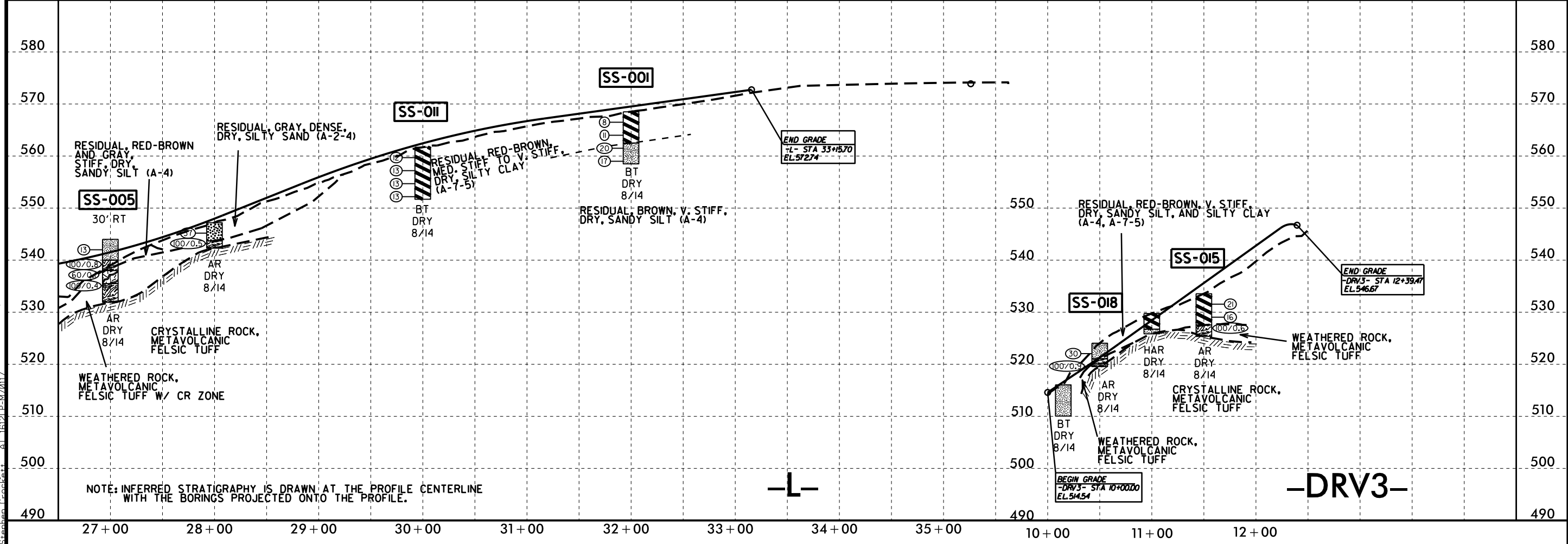
-L-	-DRV3-	
PI Sta 29+40.90	PI Sta 11+91.42	PI Sta 12+22.04
$\Delta = 56^\circ 43' 18.4''$ (RT)	$\Delta = 56^\circ 12' 18.2''$ (RT)	$\Delta = 38^\circ 27' 33.5''$ (RT)
D = 8' 59' 40.7"	D = 38' 58' 18.7"	D = 38' 58' 18.7"
L = 630.62'	L = 14.71'	L = 10.07'
T = 343.86'	T = 8.01'	T = 5.23'
R = 637.00' (40 mph)	R = 15.00'	R = 15.00'
SE = 0.06 FT/FT		
RO = 120.00'		

REVISIONS
 8/17/99
 11/3/2014
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 Stephen Crockett

SEE SHEET 6 FOR PROFILE



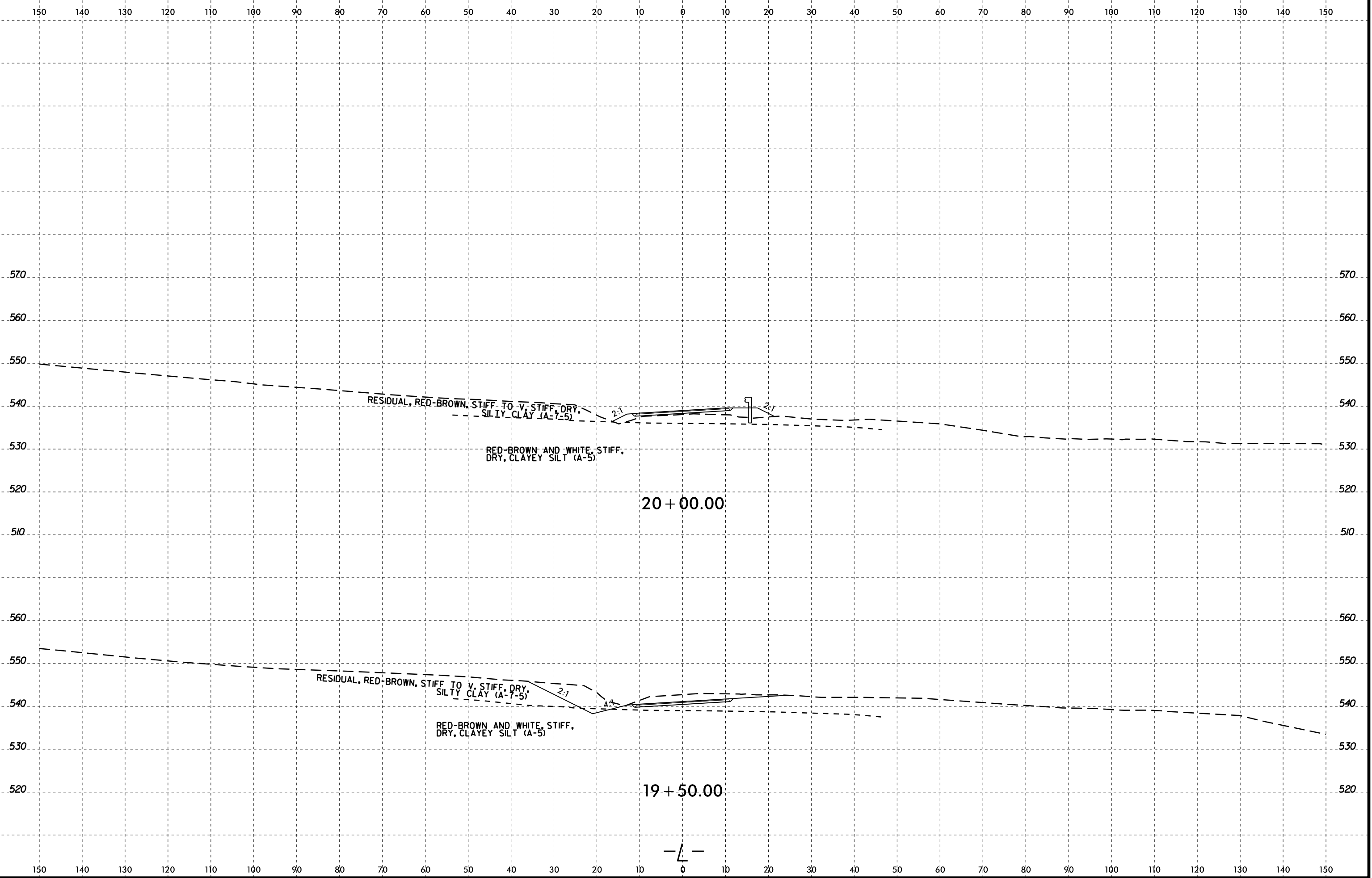
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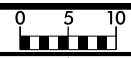
NOTE: INFERRED STRATIGRAPHY IS DRAWN AT THE PROFILE CENTERLINE WITH THE BORINGS PROJECTED ONTO THE PROFILE.

-DRV3-

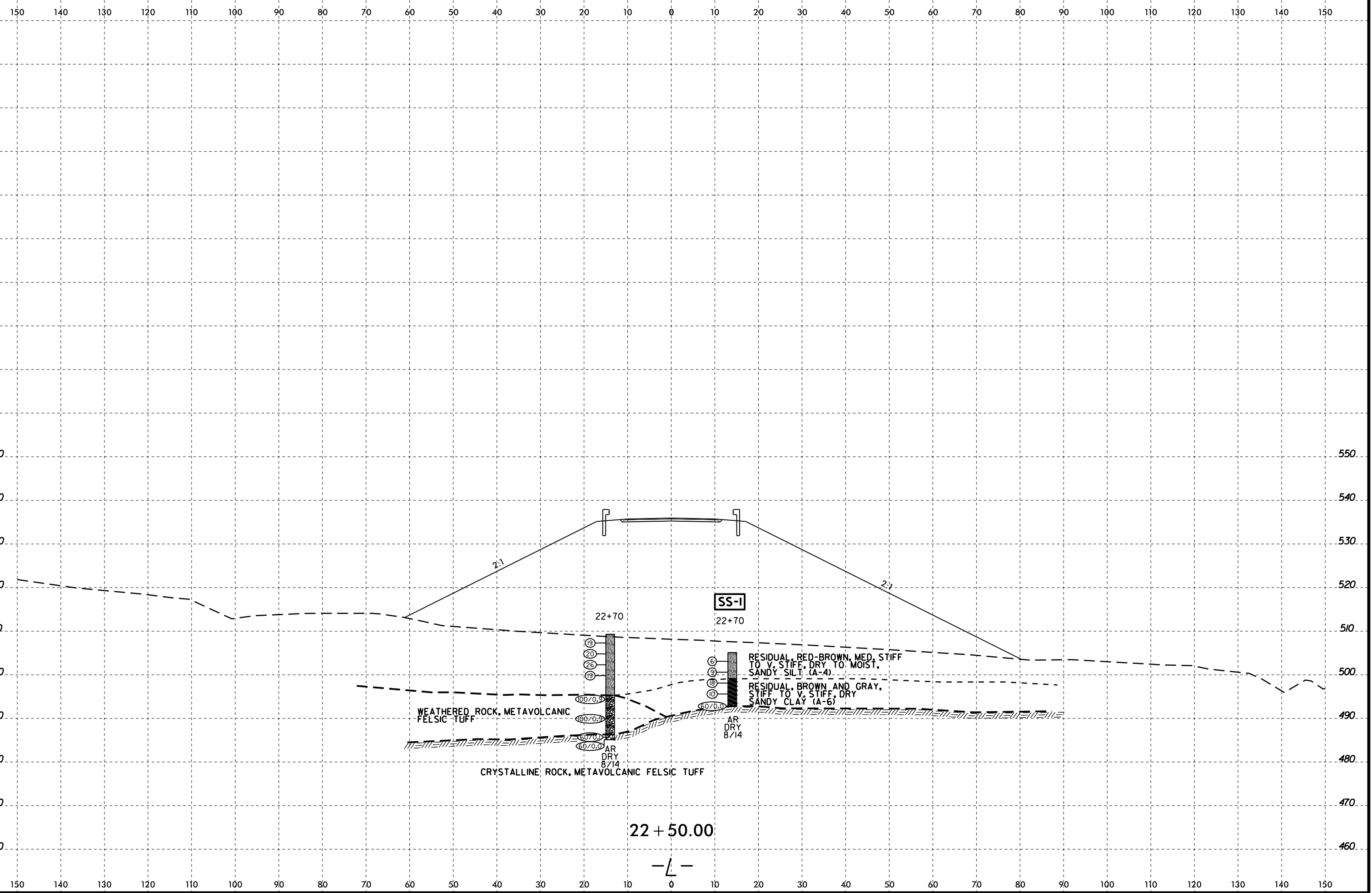
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8/23/99

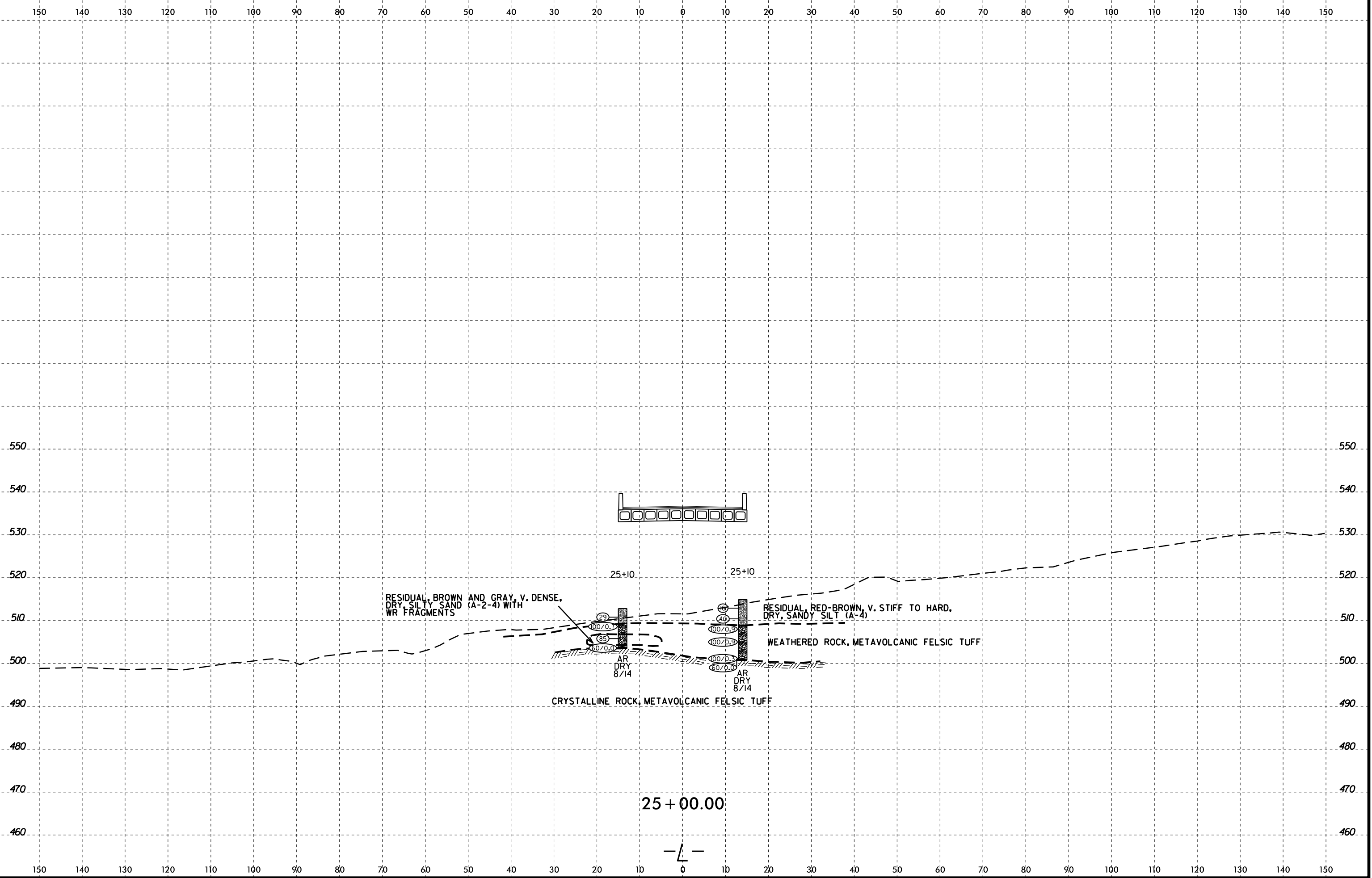


PROJ. REFERENCE NO.	SHEET NO.
B-5360	10



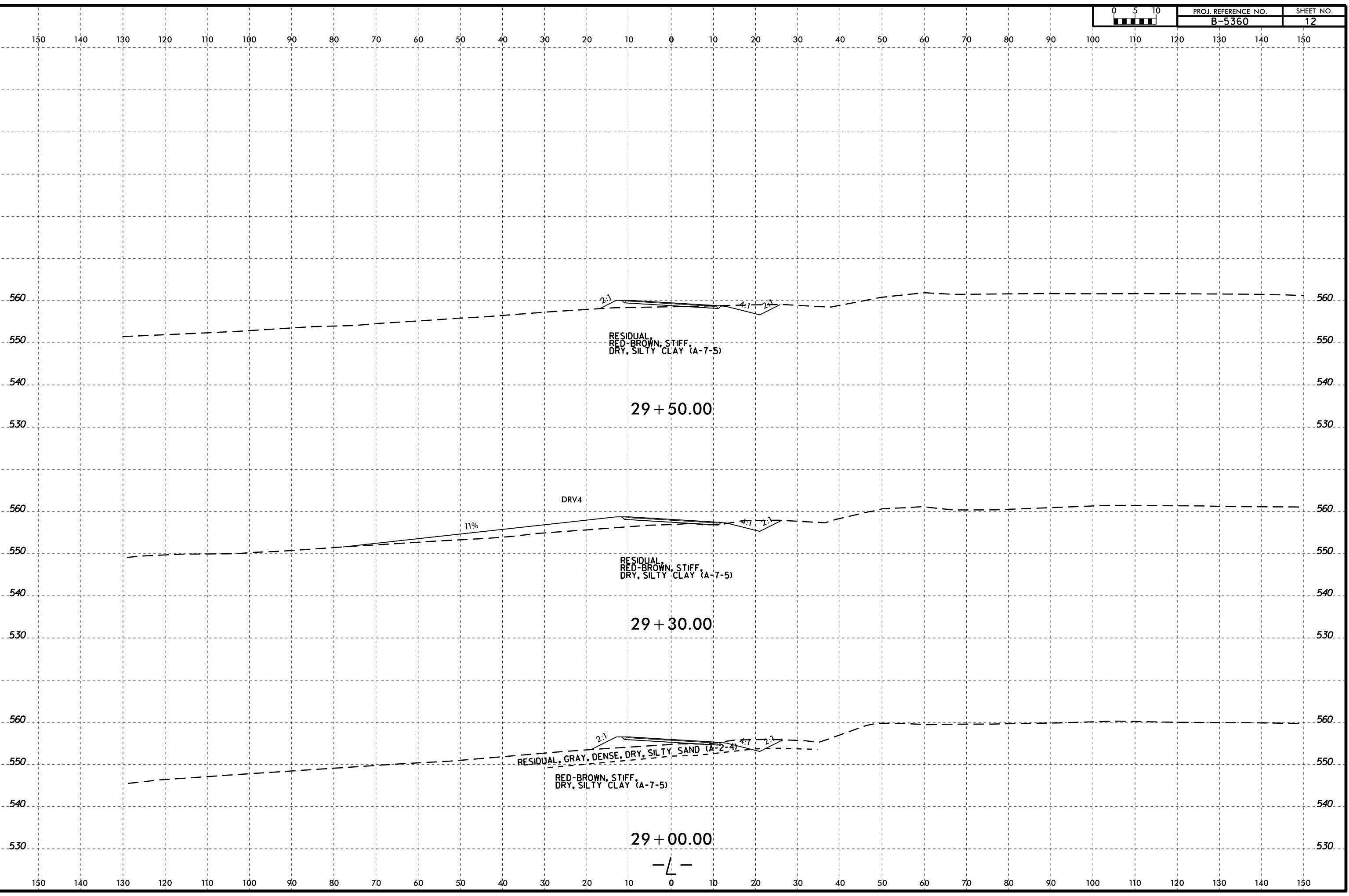
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 Stephen Crockett

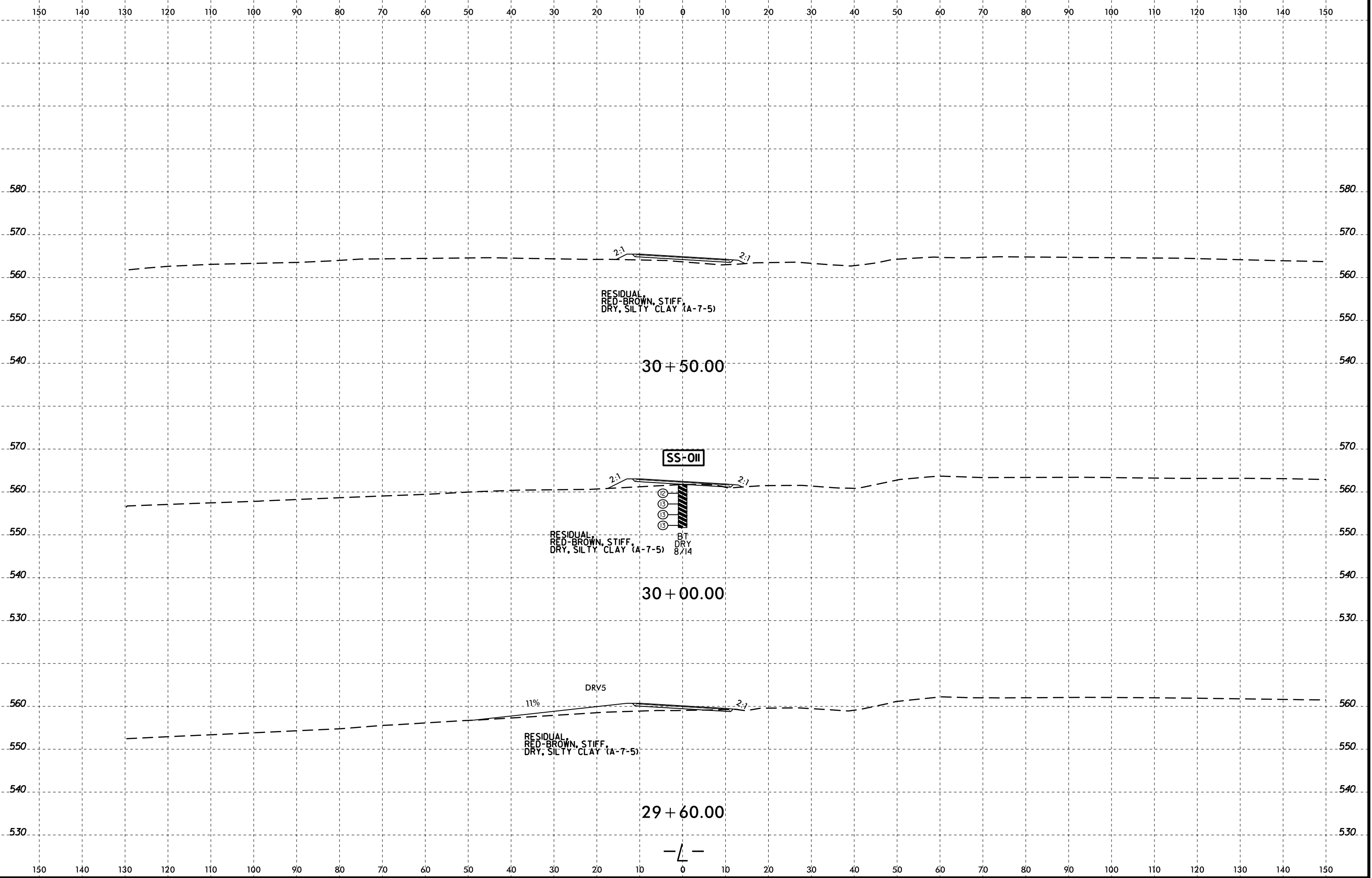
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 Stephen Crockett

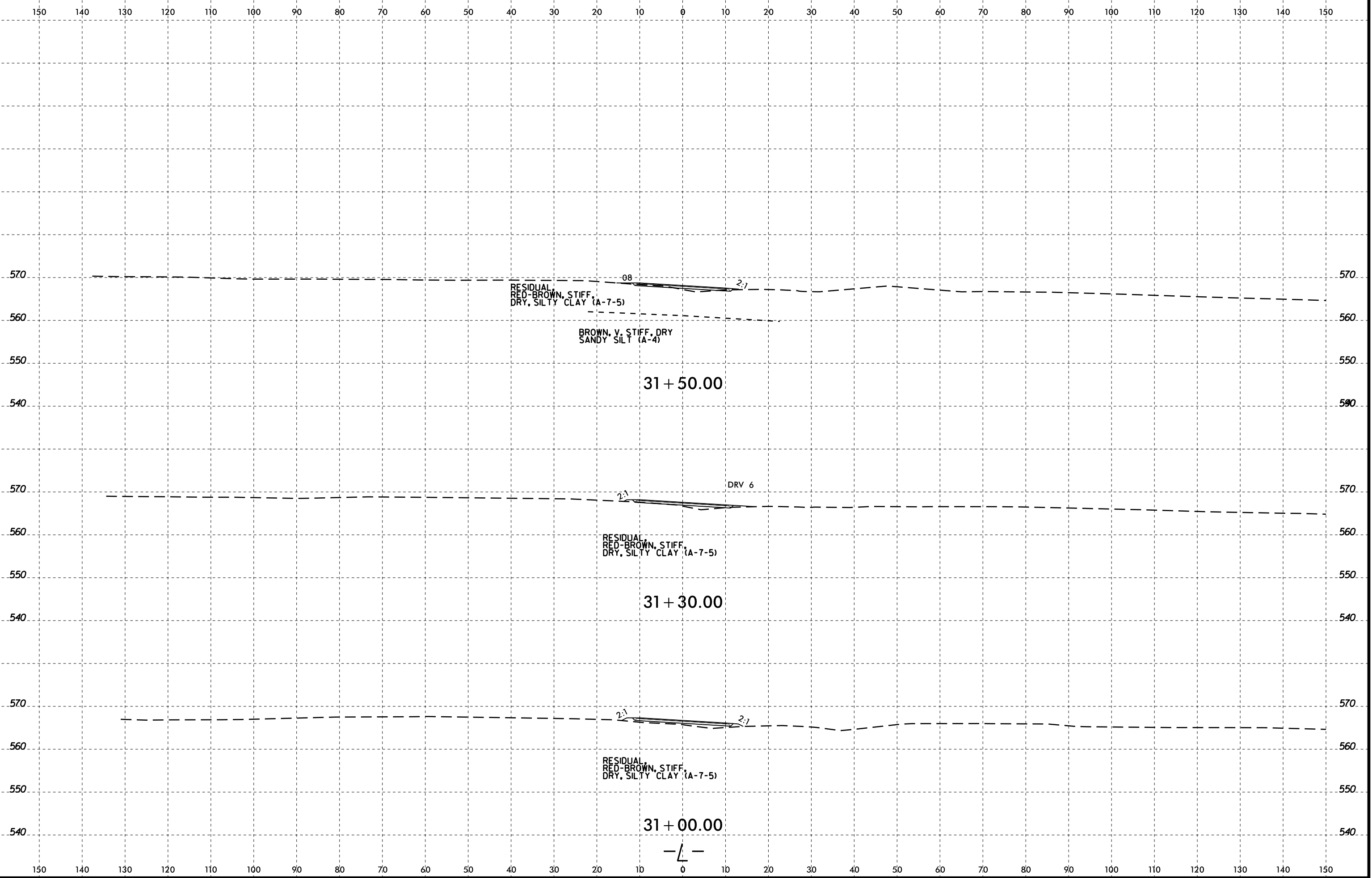
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Stephen Crockett





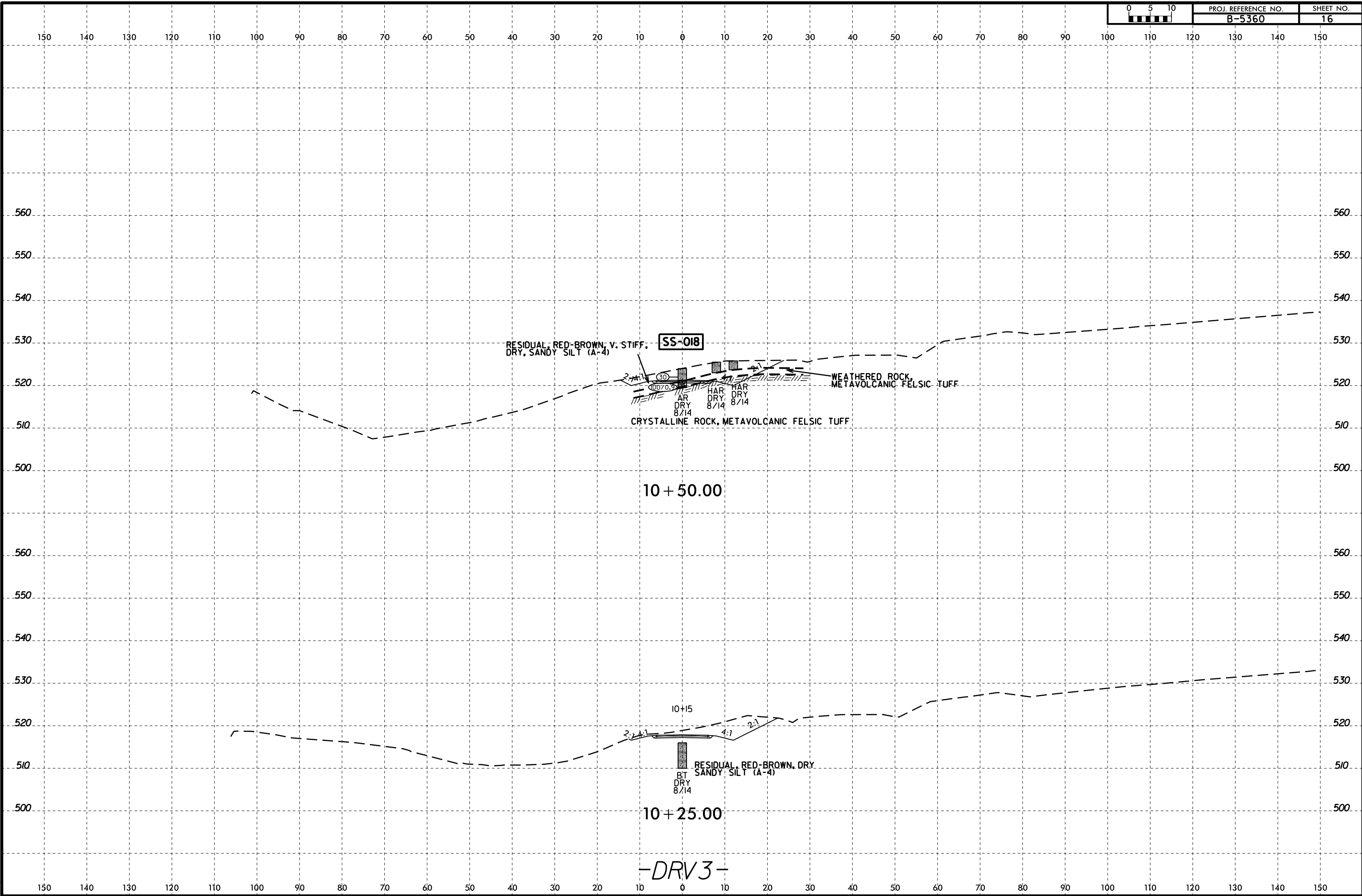
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 Stephen Crockett

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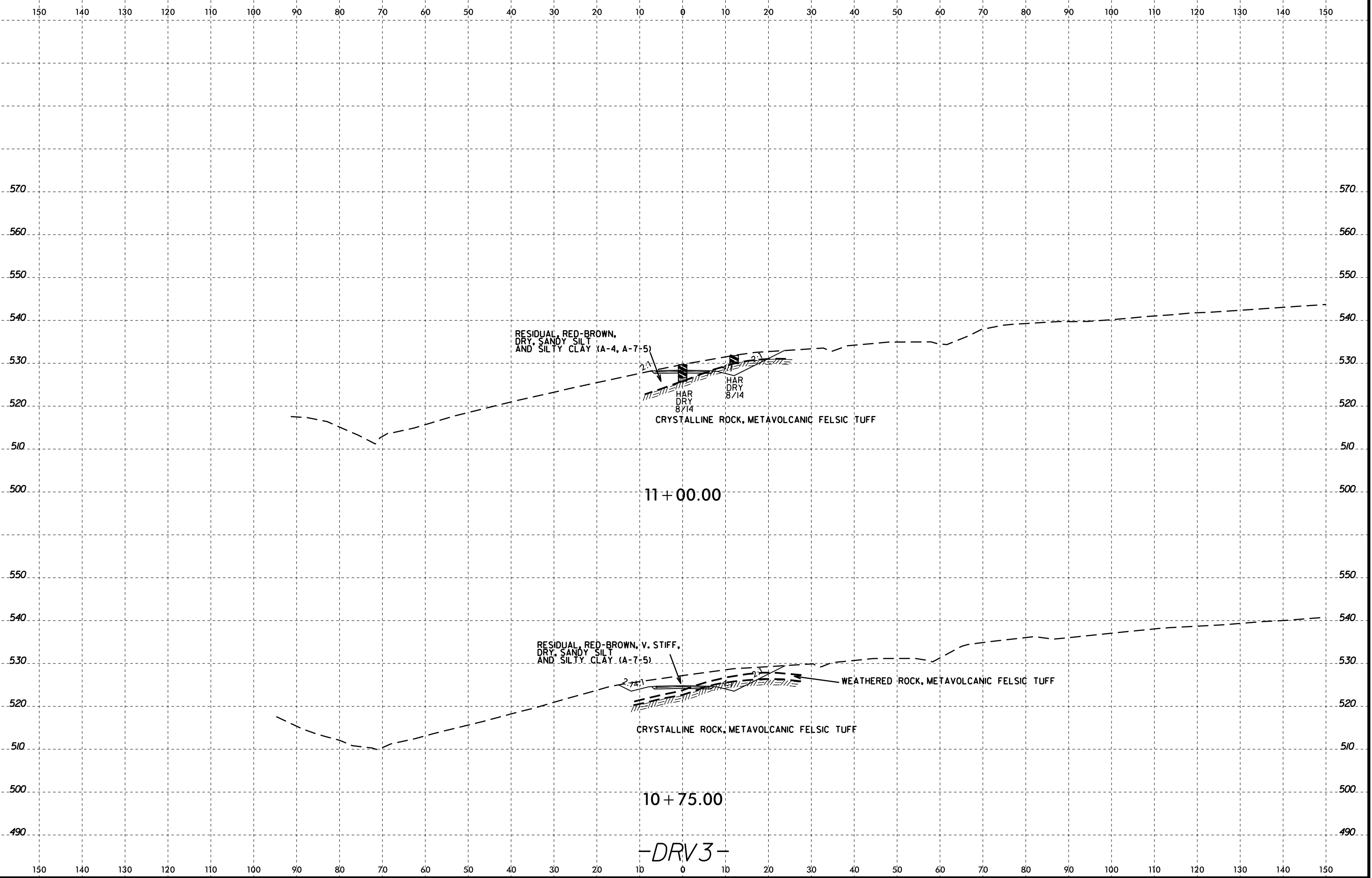


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 Stephen Crockett

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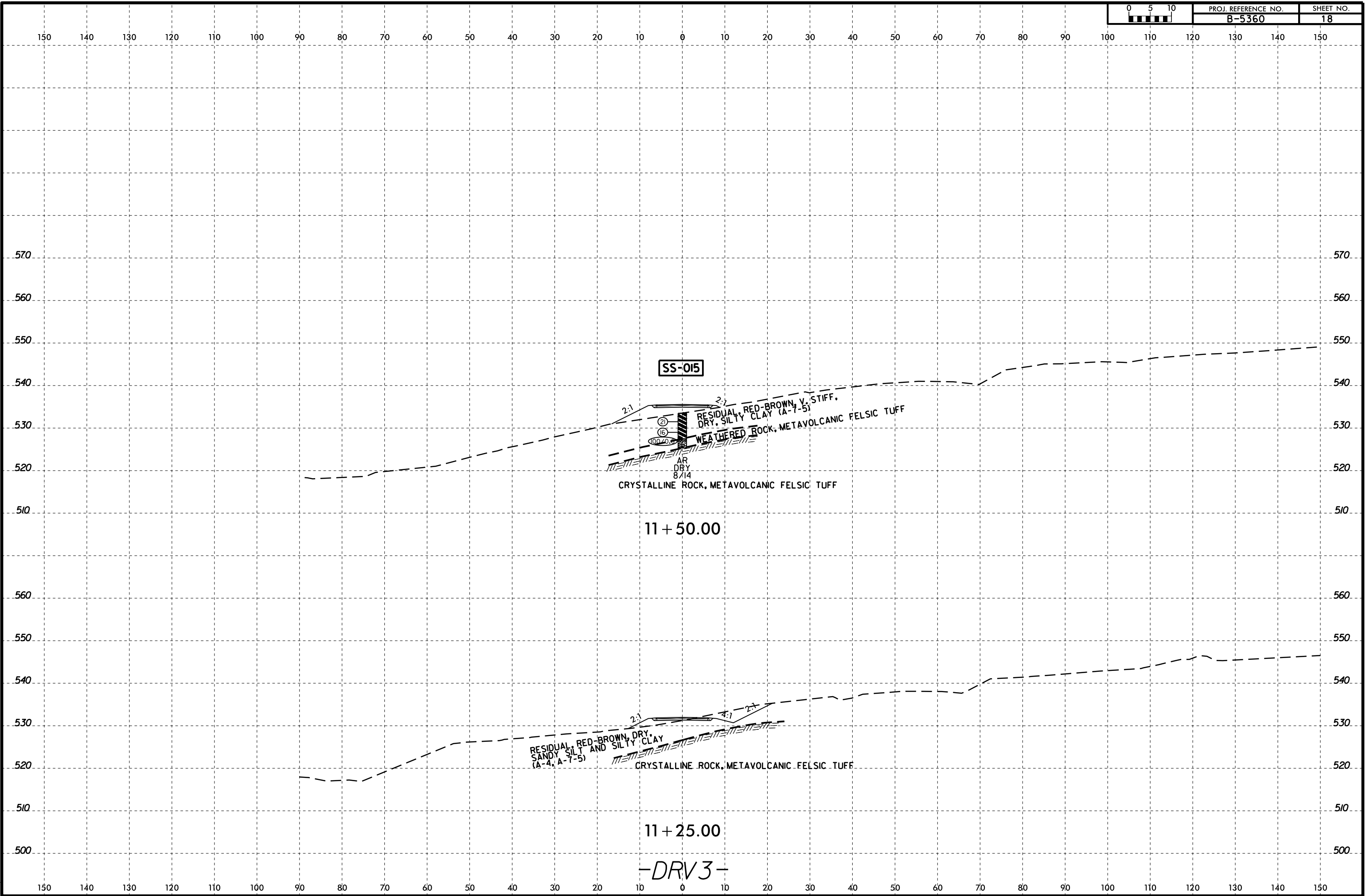


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Stephen Crockett



-DRV3-

8/23/99



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Stephen Crockett

-DRV3-

SOIL TEST RESULTS																
SAMPLE NO.	OFFSET	STATION	ALIGNMENT	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
								C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS- 1*	14' RT	22+70	- L -	1.0-2.5	A-4	0	NP	9.0	55.7	22.2	13.1	100	99.2	42.7	6.1	-
SS-001	CL	32+00	- L -	1.0-2.5	A-7-5	64	23	4.3	9.0	37.9	48.8	99.7	97.6	89.3	38.8	-
SS-005	30' RT	27+00	- L -	1.0-2.5	A-4	31	4	16.9	39.9	21.7	21.6	98.1	92.6	42.5	20.5	-
SS-011	CL	30+00	- L -	1.0-2.5	A-7-5	73	30	4.1	12.8	28.1	55.0	99.9	98.7	86.1	34.3	-
SS-015	CL	11+50	- DRV3-	1.0-2.5	A-7-5	49	19	9.4	21.9	28.6	40.1	99.6	96.6	68.5	18.0	-
SS-018	CL	10+50	- DRV3-	1.0-2.5	A-4	37	7	7.7	18.5	35.0	38.7	86.8	83.6	64.0	20.5	-
SS-022	CL	21+00	- L -	6.0-7.5	A-5	53	9	3.9	12.2	55.1	28.8	100.0	99.0	85.8	35.4	-
SS-026	25' LT	19+00	- L -	1.0-2.5	A-7-5	73	43	7.6	15.3	14.4	62.7	99.0	96.6	80.3	27.5	-
SS-028	25' LT	19+00	- L -	6.0-7.5	A-5	45	8	4.6	15.0	50.0	30.4	97.7	96.3	81.4	18.1	-
SS-036	20' RT	15+00	- L -	1.0-2.5	A-4	26	5	12.8	32.7	32.3	22.2	94.1	90.3	56.8	16.2	-
SS-040	10' RT	13+50	- L -	1.0-2.5	A-7-6	45	20	10.3	19.9	29.6	40.2	92.4	88.4	68.3	18.4	-

*SAMPLE IS FROM BRIDGE BORING EB1-B.

TESTED BY: Michael P. Sumner

NCDOT NO.: 129-03-0411