

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.	U-5808	1	17

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.

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- 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.

**ROADWAY
SUBSURFACE INVESTIGATION**

COUNTY UNION
PROJECT DESCRIPTION CHESTNUT LANE CONNECTOR
(SR 1362) FROM MATTHEWS INDIAN TRAIL ROAD
(SR 1367) TO GRIBBLE ROAD (SR 1368)

INVENTORY

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-L1-	41+00 - 43+84	4	8
-L2-	45+30 - 72+00	4-7	8-9
-Y1A-	10+25 - 11+96	4	10
-Y1B-	10+69 - 13+00	4	10
-Y2-	10+40 - 17+40	6	10

CROSS SECTIONS

LINE	STATION	SHEETS
-L1-	41+00 - 43+84	11
-L2-	53+81 - 56+19	12-13
-L2-	59+00	14
-L2-	63+00 - 64+00	15
-Y1B-	10+69 - 13+00	16-17

REFERENCE: U-5808

PROJECT: 44381.1.1

PERSONNEL

P. ZHANG

C. MEATYARD

C. TREMBLAY

INVESTIGATED BY WOOD E&S, INC.

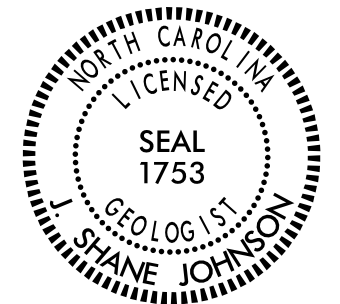
DRAWN BY P. ZHANG

CHECKED BY S. JOHNSON

SUBMITTED BY S. JOHNSON

DATE SEPTEMBER, 2018

NC Engineering F-1253 NC Geology C-247



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
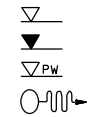
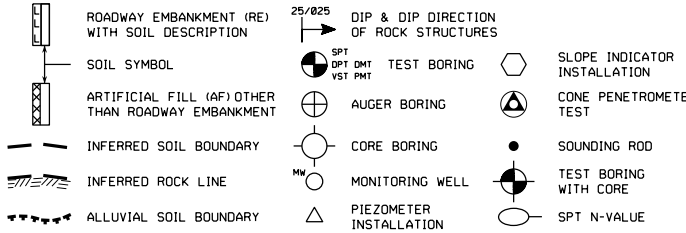
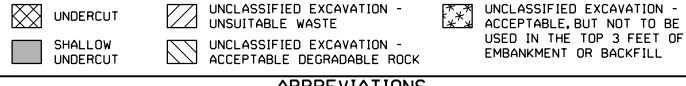
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SIGNATURE

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**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 THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.										WEATHERED ROCK (WR) 										CRYSTALLINE ROCK (CR) 										NON-CRYSTALLINE ROCK (NCR) 										COASTAL PLAIN SEDIMENTARY ROCK (CP) 																																
MINERALOGICAL COMPOSITION MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.										COMPRESSION SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50										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. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i> 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. <i>IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF</i> 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. <i>IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF</i> 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.																																																														
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CONTRACT: U-5808 TIP PROJECT: U-5808

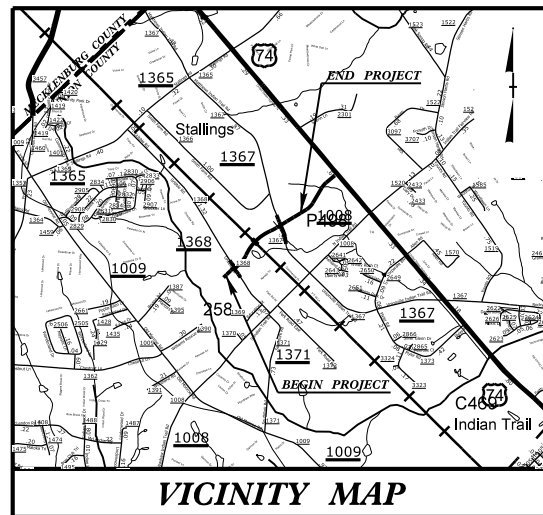
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UNION COUNTY

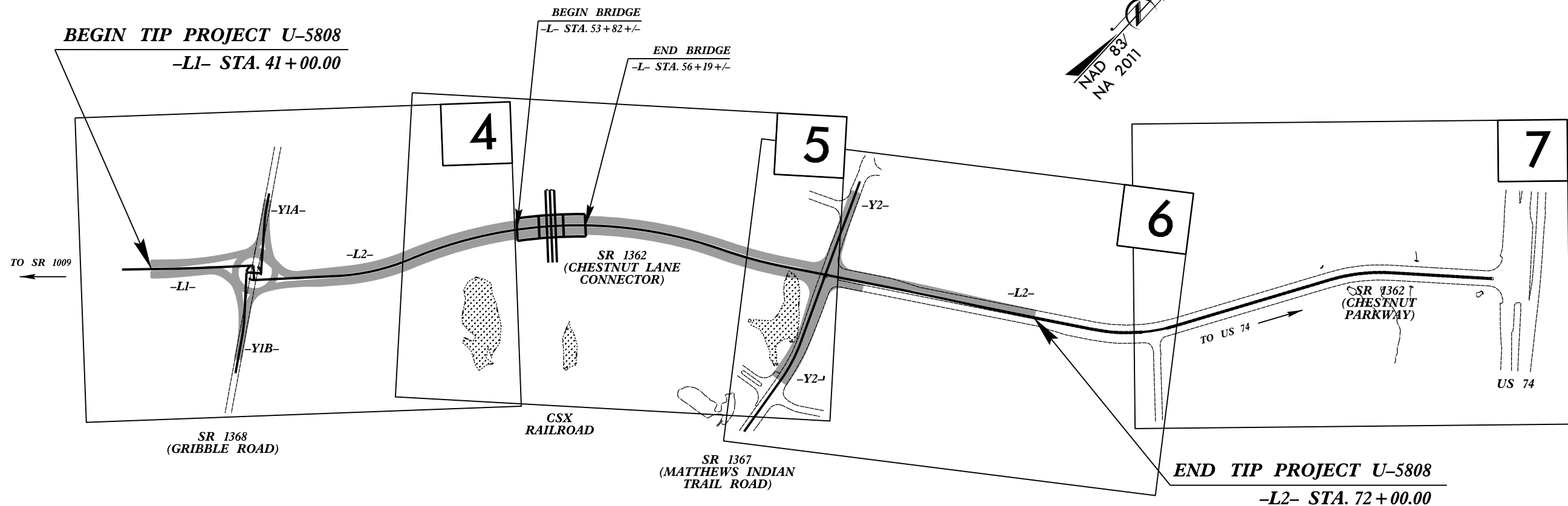
LOCATION: CHESTNUT LANE CONNECTOR (SR 1362) FROM MATTHEWS INDIAN TRAIL ROAD (SR 1367) TO GRIBBLE ROAD (SR 1368)
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5808	3	17
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
44381.1.1	N/A	PE	

25% PLANS



BEGIN TIP PROJECT U-5808
-L1- STA. 41+00.00



END TIP PROJECT U-5808
-L2- STA. 72+00.00

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ____.
THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE TOWN OF INDIAN TRAIL.

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

<p>GRAPHIC SCALES</p> <p>50 25 0 50 100 PLANS</p> <p>50 25 0 50 100 PROFILE (HORIZONTAL)</p> <p>10 5 0 10 20 PROFILE (VERTICAL)</p>	<p>DESIGN DATA</p> <p>ADT 2021 = 21,650 ADT 2041 = 24,650 K = 7 % D = 60 % T = 4 % * V = 40 MPH * TTST = 3% DUAL = 1% FUNC CLASS = MINOR ARTERIAL REGIONAL TIER</p>	<p>PROJECT LENGTH</p> <p>LENGTH ROADWAY TIP PROJECT U-5808 = 0.544 MILES LENGTH STRUCTURE TIP PROJECT U-5808 = 0.043 MILES TOTAL LENGTH TIP PROJECT U-5808 = 0.587 MILES</p>	<p>Prepared for NCDOT Division 10 In the Office of: Mead&Hunt 133 Fayetteville Street, Suite 210 Raleigh, North Carolina 27601 919-714-8670 meadhunt.com NC License No. F-1235</p>	<p>HYDRAULICS ENGINEER</p> <p>SIGNATURE: _____ P.E.</p> <p>ROADWAY DESIGN ENGINEER</p> <p>SIGNATURE: _____ P.E.</p>	

September 25, 2018

WBS Number: 44381.1.1
 TIP Number: U-5808
 COUNTY: Union
 DESCRIPTION: Chestnut Lane Connector (SR 1362) from Matthews Indian Trail Road (SR 1367) to Gribble Road (SR 1368)
 WOOD E&IS Number: 6468188045
 SUBJECT: Geotechnical Inventory Report

Project Description

The project area lies on the north side of the town of Indian Trail, NC between Highway 74 and SR1009. This project consists of approximately 2,000 feet of new location roadway that will extend from Gribble Road to Matthews Indian Trail Road. A potential roundabout is planned at the intersection of the new alignment and Gribble Road. Roadway widening is planned on Gribble Road and Matthews Indian Trail Road near the intersection with the new alignment. A grade separation bridge is planned to carry the new alignment over the existing CSX Railroad.

The geotechnical field investigation was conducted in August, 2018. A CME 550X drill rig mounted on a rubber tracked all-terrain carrier and equipped with an automatic hammer was used to advance borings for the subsurface exploration. Hollow stem auger drilling procedures were used to advance borings to the required depths. Standard Penetration Tests were performed at approximately 2.5-foot to 5.0-foot intervals to termination in selected borings. Representative soil samples were collected for visual classification in the field and selected samples were submitted for laboratory analysis.

The following alignments were explored. Subsurface profiles and/or cross sections of these alignments are included in this report.

<u>Alignment</u>	<u>Station (±)</u>
-L1-	41+00 to 43+84
-L2-	45+30 to 72+00
-Y1A-	10+25 to 11+96
-Y1B-	10+69 to 13+00
-Y2-	10+40 to 17+40

Areas of Special Geotechnical Interest

- 1) **Loose/Soft Soils:** The following sections contain very soft or very loose, compressible soils (n-value < 4) which have the potential to cause embankment/subgrade and/or slope stability problems during construction.

<u>Line</u>	<u>Stations (±)</u>	<u>Offsets (ft.)</u>
-L2-	63+30 – 63+80	LT & RT

- 2) **Fine Grained Soils:** The following sections contain fine grained/cohesive soils which have the potential to cause embankment/subgrade and/or slope stability problems during construction.

<u>Line</u>	<u>Stations (±)</u>	<u>Offsets (ft.)</u>
-L1-	41+00 – 43+84	LT & RT
-Y1B-	10+69 – 13+00	LT & RT

- 3) **Groundwater:** Groundwater was only encountered at two boring locations at depths greater than 20 feet below existing grades.

- 4) **Water wells:** Two existing residential water supply wells were found within or in close proximity to the proposed right of way at the following locations:

<u>Line</u>	<u>Station (±)</u>	<u>Offset (ft.)</u>
-L2-	44+80	15 RT
-Y1B-	15+40	108 RT

- 5) **Ponds:** Several ponds occur on or within close proximity to the right of way on this project at the following locations:

<u>Line</u>	<u>Station (±)</u>	<u>Offset (ft.)</u>
-L2-	60+40 – 63+50	480 RT to 590 RT
-L2-	62+45 – 62+55	200 RT to 215 RT
-L2-	62+30 – 62+60	665 RT to 700 RT
-L2-	83+04 – 83+35	40 RT to 70 RT
-L2-	84+27 – 84+37	49 RT to 62 RT

Physiography and Geology

The project is located in the Piedmont Province. Land use along the project corridor consists of residential, agricultural, commercial businesses and woods. Geologically, the project is located within the Charlotte Belt. metavolcanic rock (CZv) was encountered at the project site. Fourmile Creek and its tributaries and a few ditches drain the project towards south and southeast in general.

Soil Properties

Soils encountered at the project site include roadway embankment, agricultural till, alluvial, residual, weathered metavolcanic rock and crystalline metavolcanic rock.

Roadway Embankment soils are present along existing SR 1368 and SR1362.

Alluvial deposits are located within the floodplains of Fourmile Creek's tributaries, ditches and wetland areas that traverse the project. These soils are primarily brown and gray, very soft to soft, silty clay (A-7).

Residual soils were encountered throughout the project. These soils consist primarily of gray, tan and brown, stiff to hard silt and clay (A-4, A-7) with Liquid Limit ranging from 42 to 59 and Plasticity Indices ranging from 21 to 28.

Rock Properties

Weathered rock was encountered during the roadway investigation at elevations ranging from approximately 697 to 670 feet. It originates from the underlying metavolcanic rock.

Crystalline rock was encountered during the roadway investigation at elevations ranging from approximately 687 to 661 feet, and consists of metavolcanic rock.

Ground Water

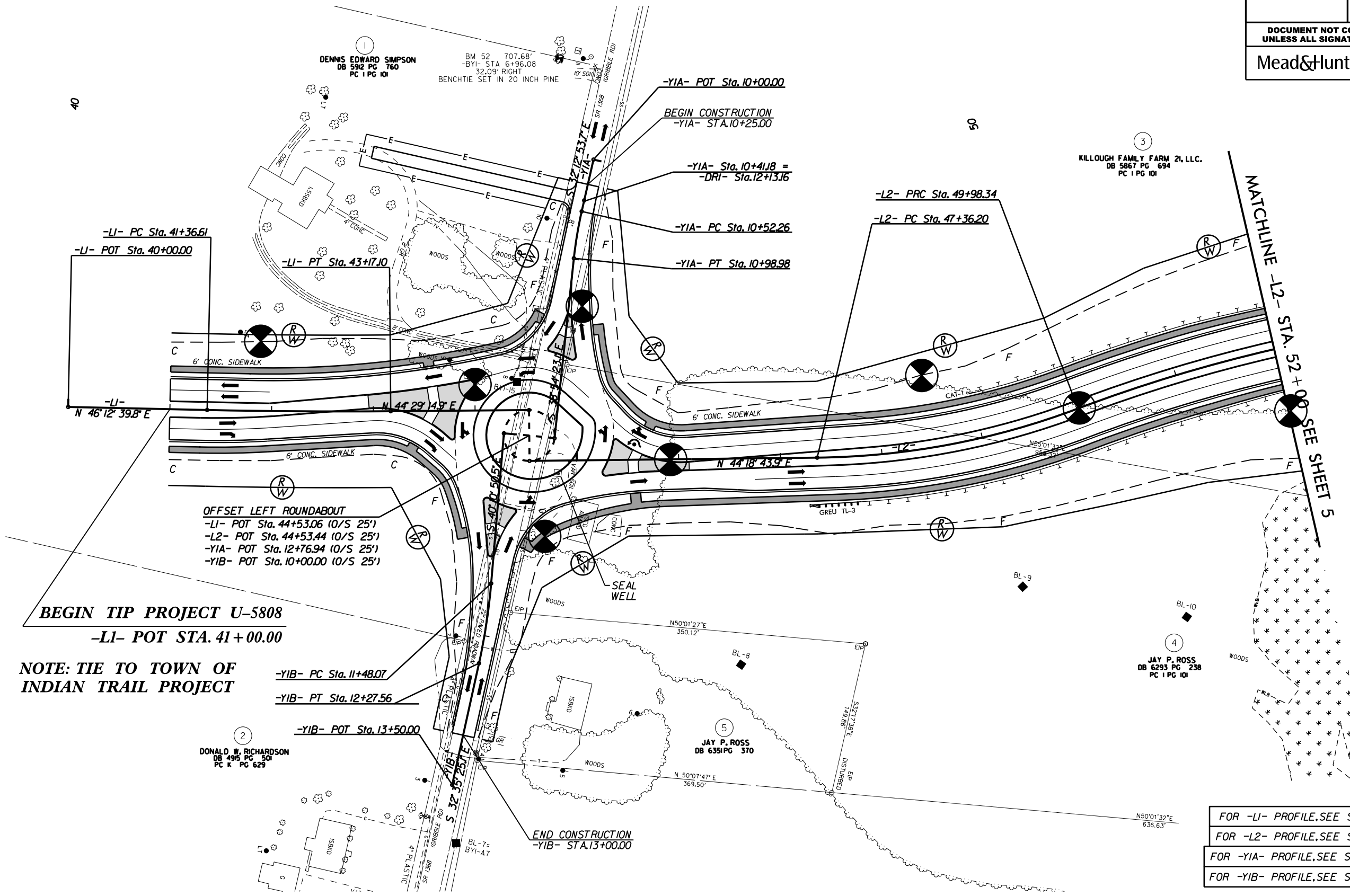
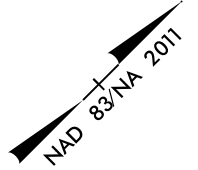
Groundwater was encountered in two borings and ranges in elevation from approximately 671 to 675 feet. Groundwater may fluctuate with seasonal precipitation.

Prepared By,

DocuSigned by:
Pu Zhang 9/25/2018 6:46:41 AM PDT
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Pu Zhang, P.E.
Geotechnical Engineer

PROJECT REFERENCE NO. U-5808		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			
Mead&Hunt		133 Fayetteville Street, Suite 210 Raleigh, North Carolina 27601 919-714-8670 meadhunt.com NC License No. F-1235	



BEGIN TIP PROJECT U-5808
-LI- POT STA. 41+00.00

NOTE: TIE TO TOWN OF INDIAN TRAIL PROJECT

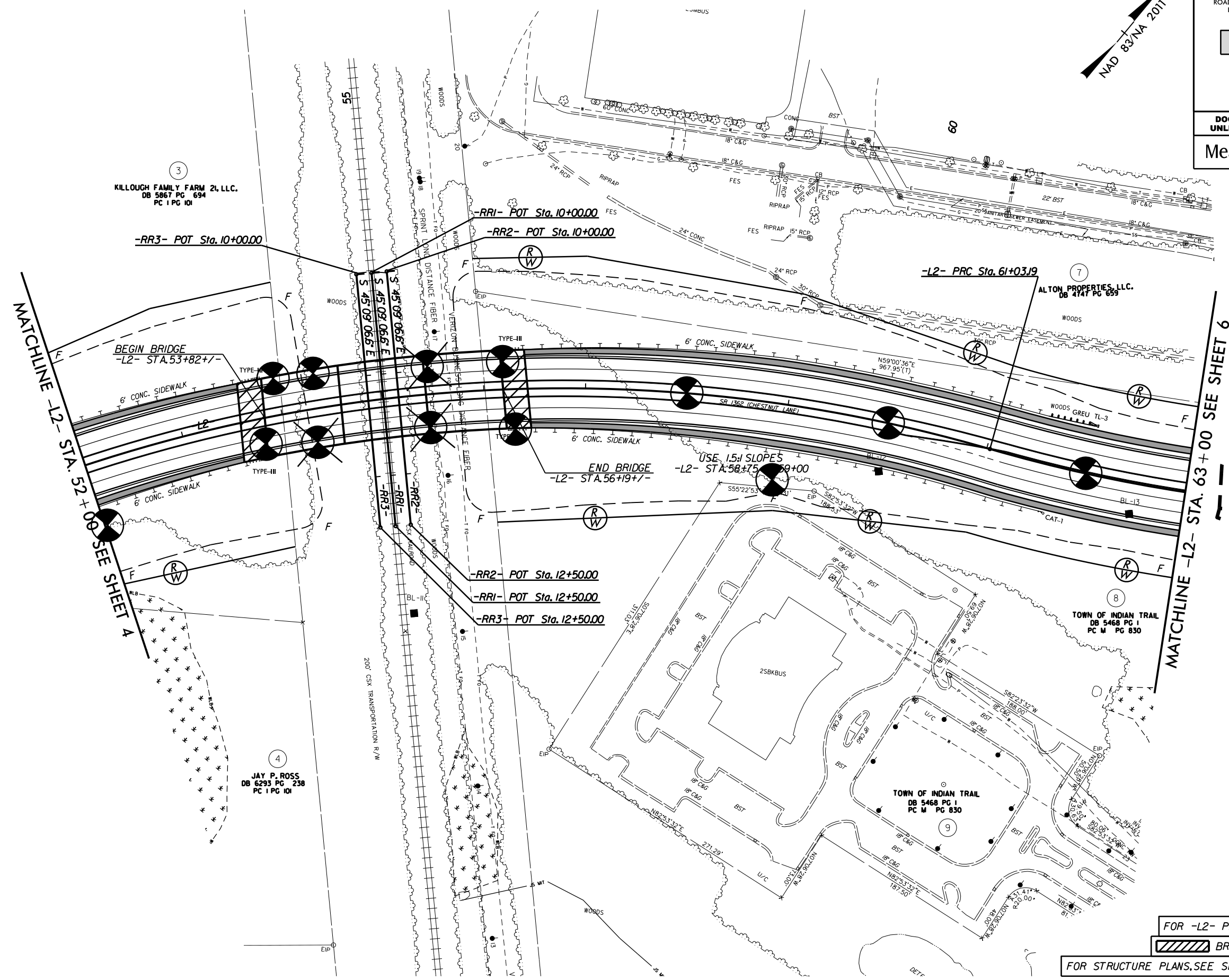
OFFSET LEFT ROUNDABOUT
-LI- POT Sta. 44+53.06 (O/S 25')
-L2- POT Sta. 44+53.44 (O/S 25')
-YIA- POT Sta. 12+76.94 (O/S 25')
-YIB- POT Sta. 10+00.00 (O/S 25')

FOR -LI- PROFILE, SEE SHEET 8
FOR -L2- PROFILE, SEE SHEET 8
FOR -YIA- PROFILE, SEE SHEET 10
FOR -YIB- PROFILE, SEE SHEET 10

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PROJECT REFERENCE NO. U-5808	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
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133 Fayetteville Street, Suite 210 Raleigh, North Carolina 27601 919-714-8670 mead@meadandhunt.com NC License No. F-1235	



REVISIONS

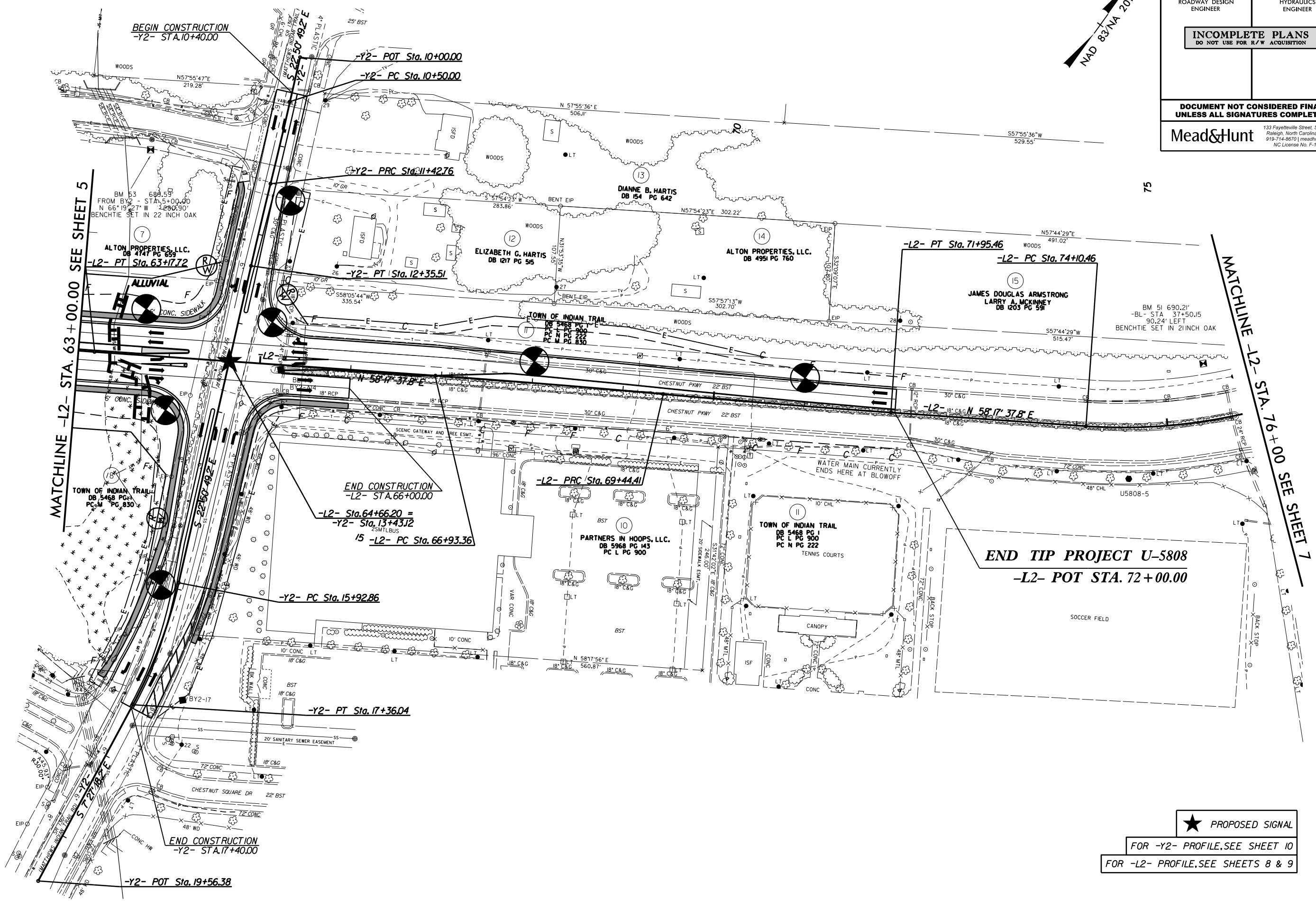
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FOR -L2- PROFILE, SEE SHEET 8

BRIDGE APPROACH SLAB

FOR STRUCTURE PLANS, SEE SHEET S-1 THRU S-??

PROJECT REFERENCE NO. U-5808		SHEET NO. 6	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
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★ PROPOSED SIGNAL
 FOR -Y2- PROFILE, SEE SHEET 10
 FOR -L2- PROFILE, SEE SHEETS 8 & 9

8/17/99

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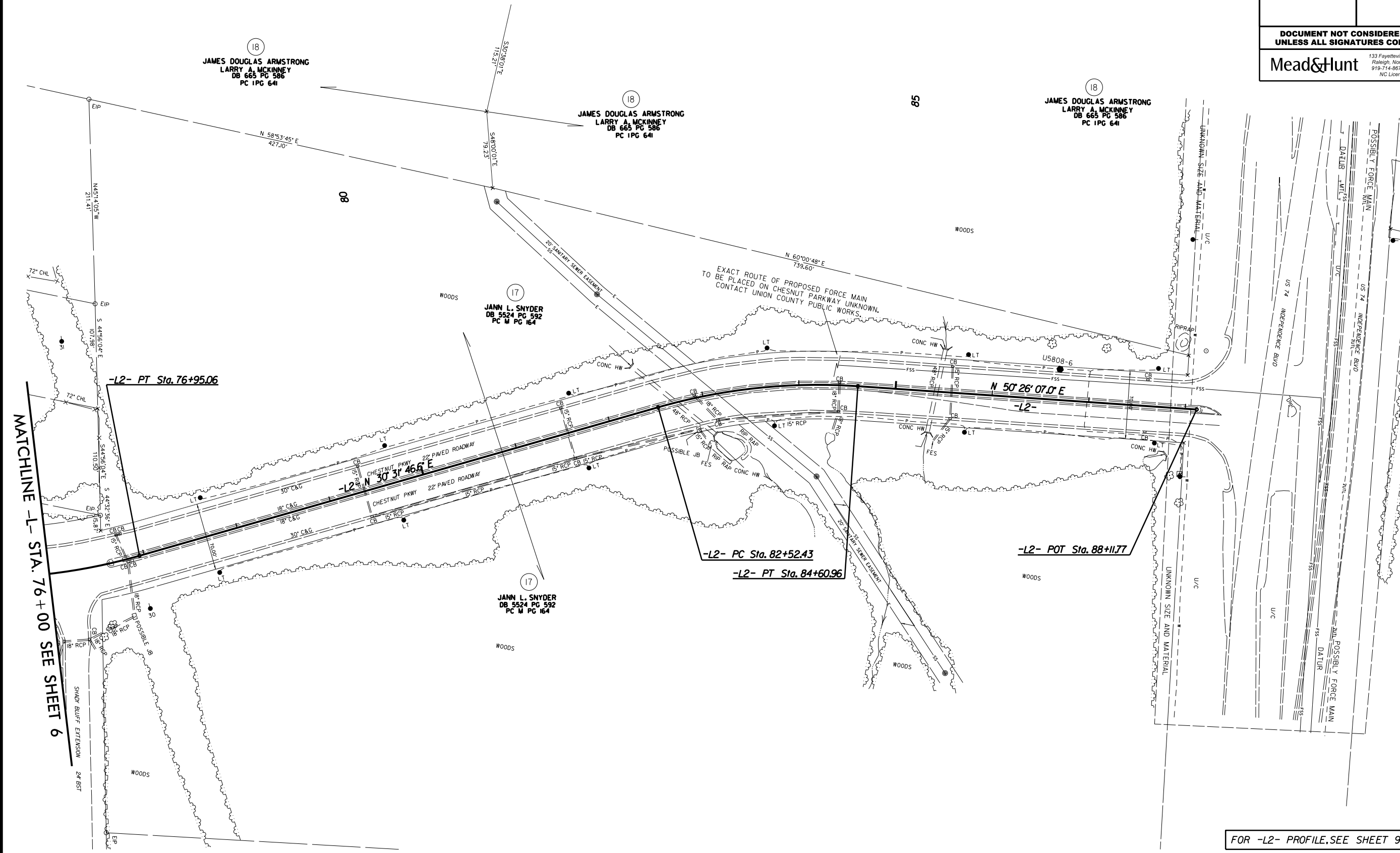
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IT IS INTENDED FOR FUTURE USE**

-L2- CURVE DATA

PI Sta 75+55.62	PI Sta 83+57.76
$\Delta = 27^\circ 45' 51.2" (LT)$	$\Delta = 19^\circ 54' 20.5" (RT)$
$D = 9^\circ 45' 19.9"$	$D = 9^\circ 32' 45.8"$
$L = 284.60'$	$L = 208.52'$
$T = 145.5'$	$T = 105.32'$
$R = 587.32'$	$R = 600.20'$



PROJECT REFERENCE NO. U-5808	SHEET NO. 7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
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Mead&Hunt	
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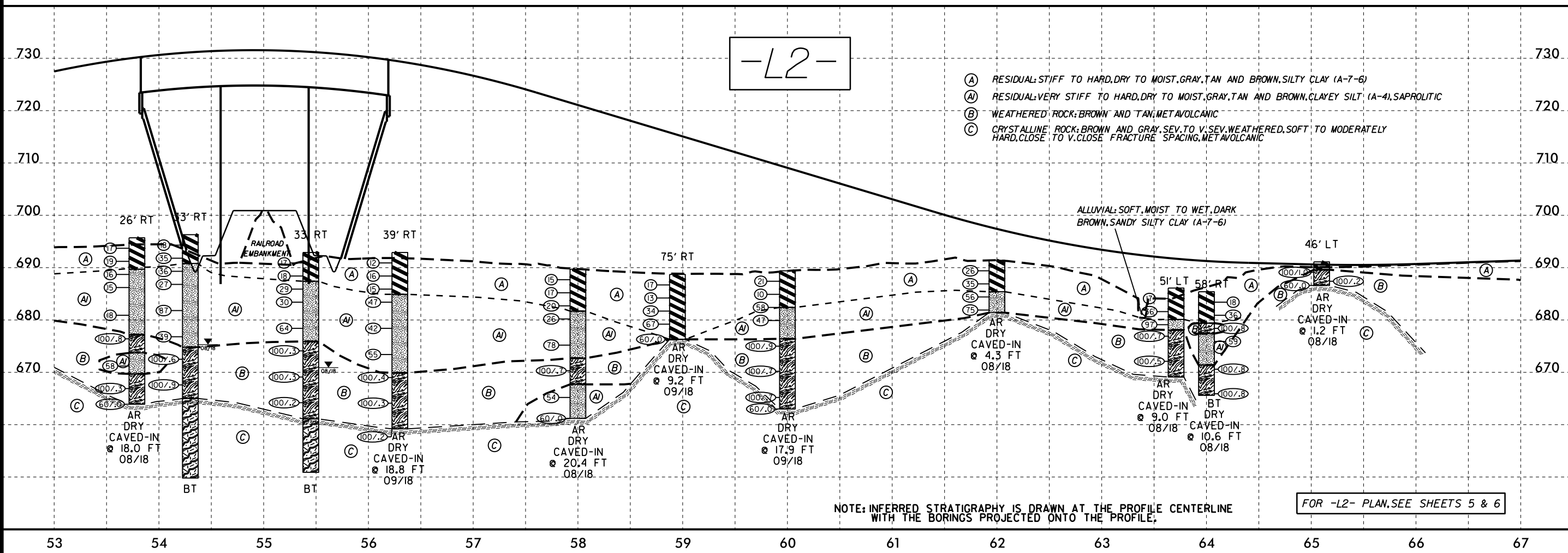
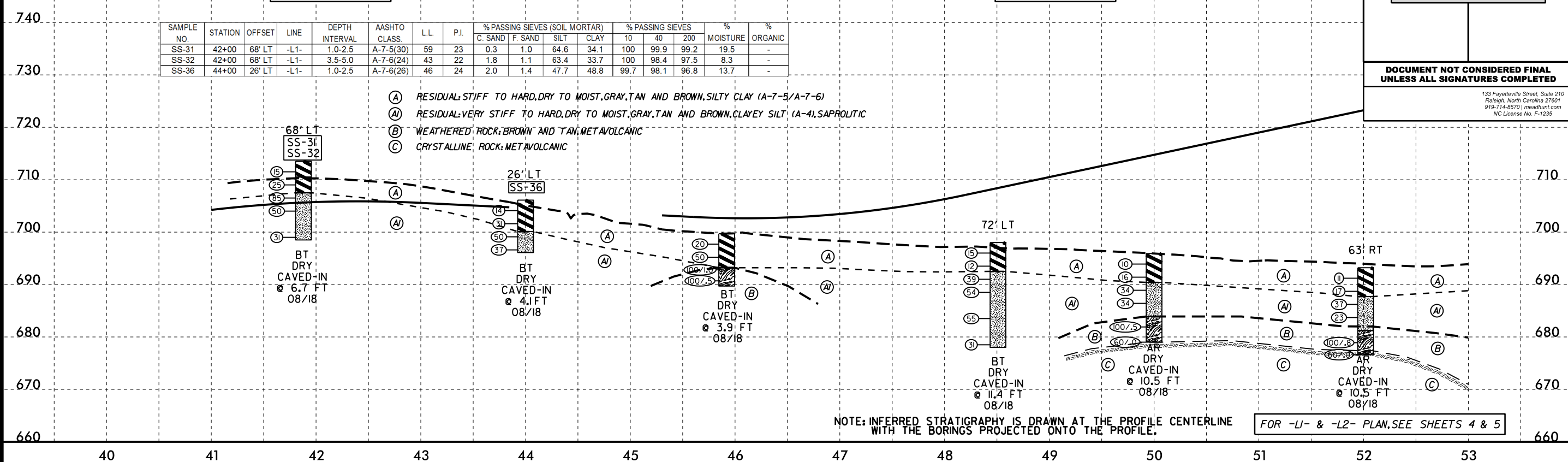
MATCHLINE -L- STA. 76+00 SEE SHEET 6

FOR -L2- PROFILE, SEE SHEET 9

5/28/99

PROJECT REFERENCE NO. U-5808	SHEET NO. 8
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
<small>133 Fayetteville Street, Suite 210 Raleigh, North Carolina 27601 919-714-8670 meadhunt.com NC License No. F-1235</small>	

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS	L.L.	P.I.	% PASSING SIEVES (SOIL MORTAR)				% PASSING SIEVES			% MOISTURE	% ORGANIC
								C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-31	42+00	68' LT	-L1-	1.0-2.5	A-7-5(30)	59	23	0.3	1.0	64.6	34.1	100	99.9	99.2	19.5	-
SS-32	42+00	68' LT	-L1-	3.5-5.0	A-7-6(24)	43	22	1.8	1.1	63.4	33.7	100	98.4	97.5	8.3	-
SS-36	44+00	26' LT	-L1-	1.0-2.5	A-7-6(26)	46	24	2.0	1.4	47.7	48.8	99.7	98.1	96.8	13.7	-



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 5/28/99

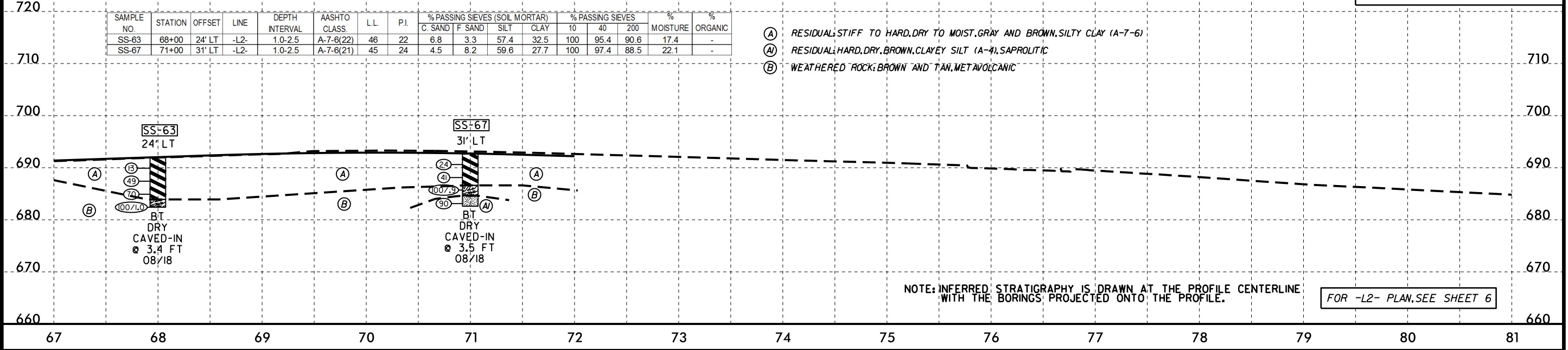
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PROJECT REFERENCE NO. <i>U-5808</i>	SHEET NO. 9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
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-L2-

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% PASSING SIEVES (SOIL MORTAR)				% PASSING SIEVES			% MOISTURE	% ORGANIC
								C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-63	68+00	24' LT	-L2-	1.0-2.5	A-7-6(22)	46	22	6.8	3.3	57.4	32.5	100	95.4	90.6	17.4	-
SS-67	71+00	31' LT	-L2-	1.0-2.5	A-7-6(21)	45	24	4.5	8.2	59.6	27.7	100	97.4	88.5	22.1	-

- (A) RESIDUAL, STIFF TO HARD, DRY TO MOIST, GRAY AND BROWN, SILTY CLAY (A-7-6)
- (A) RESIDUAL, HARD, DRY, BROWN, CLAYEY SILT (A-4), SAPROLITIC
- (B) WEATHERED ROCK, BROWN AND TAN, METAVOLCANIC



-L2-

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5/28/99

PROJECT REFERENCE NO. U-5808	SHEET NO. 10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
<small>133 Fayetteville Street, Suite 210 Raleigh, North Carolina 27601 919-714-8670 meadhunt.com NC License No. F-1235</small>	

-Y1A-

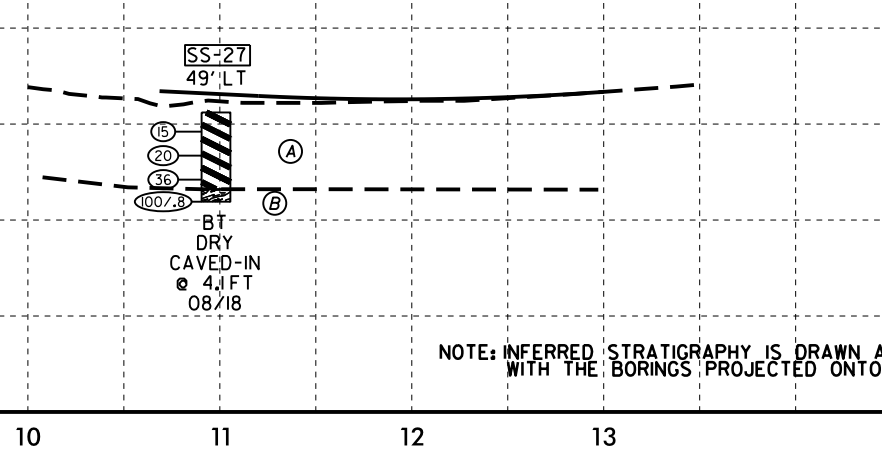
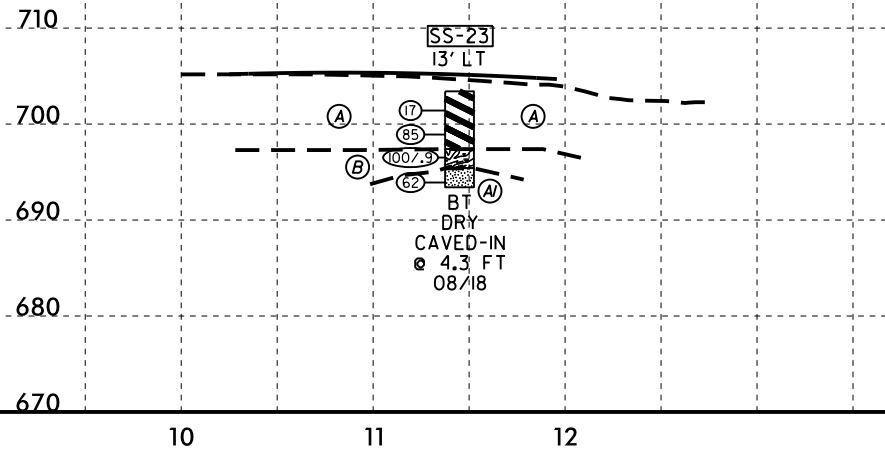
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SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.
SS-23	11+45	13' LT	-Y1A-	1.0-2.5	A-7-6(26)	45	24
% PASSING SIEVES (SOIL MORTAR)				% PASSING SIEVES			
C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE
1.0	1.1	54.9	43.0	100	99.3	98.3	18.4
				% ORGANIC			
				-			

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% PASSING SIEVES (SOIL MORTAR)				% PASSING SIEVES				
C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	% ORGANIC								
SS-27	10+98	49' LT	-Y1B-	1.0-2.5	A-7-6(28)	46	28	3.7	1.7	44.2	50.4	99.3	96.5	94.5	14.5	-

- (A) RESIDUAL: VERY STIFF TO HARD, MOIST TO DRY, GRAY AND BROWN, SILTY CLAY (A-7-6)
- (A) RESIDUAL: HARD, DRY, BROWN, CLAYEY SILT (A-4), SAPROLITIC
- (B) WEATHERED ROCK: BROWN, METAVOLCANIC

- (A) RESIDUAL: STIFF TO HARD, DRY, GRAY AND BROWN, SILTY CLAY (A-7-6)
- (B) WEATHERED ROCK: BROWN, METAVOLCANIC



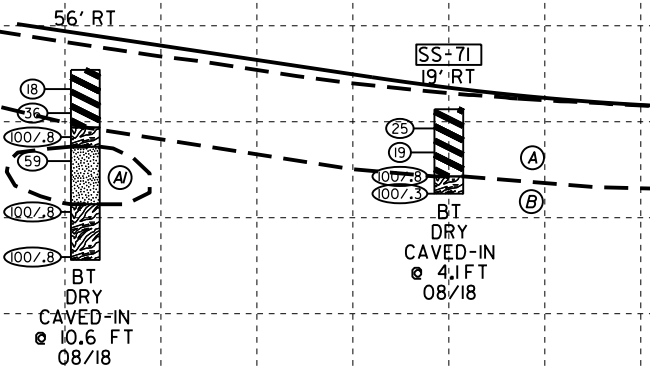
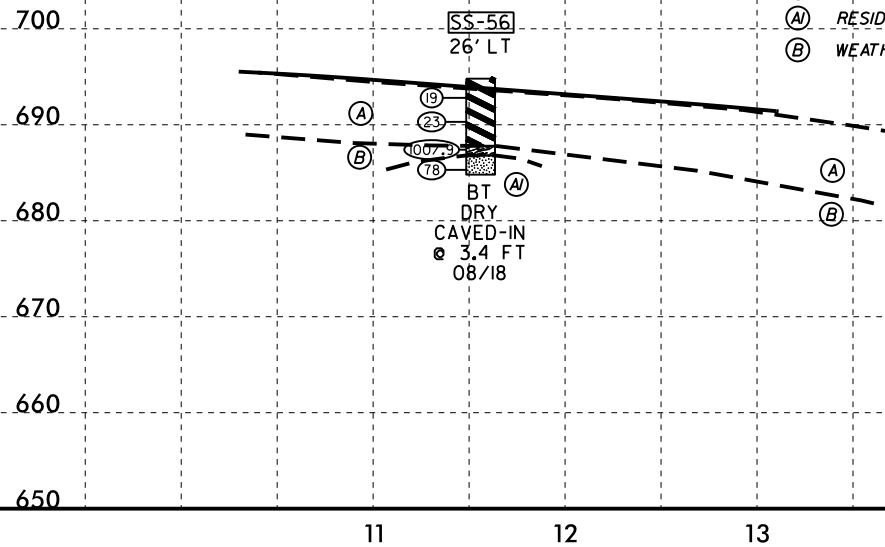
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FOR -Y1A- & -Y1B- PLAN, SEE SHEET 4

-Y2-

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% PASSING SIEVES (SOIL MORTAR)				% PASSING SIEVES				
C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	% ORGANIC								
SS-56	11+56	26' LT	-Y2-	1.0-2.5	A-7-6(21)	44	21	4.6	3.8	55.7	35.9	100	96.5	92.7	8.9	-
SS-71	16+00	19' RT	-Y2-	1.0-2.5	A-7-6(19)	42	21	10.5	2.3	52.8	34.3	99.0	90.4	87.1	6.6	-

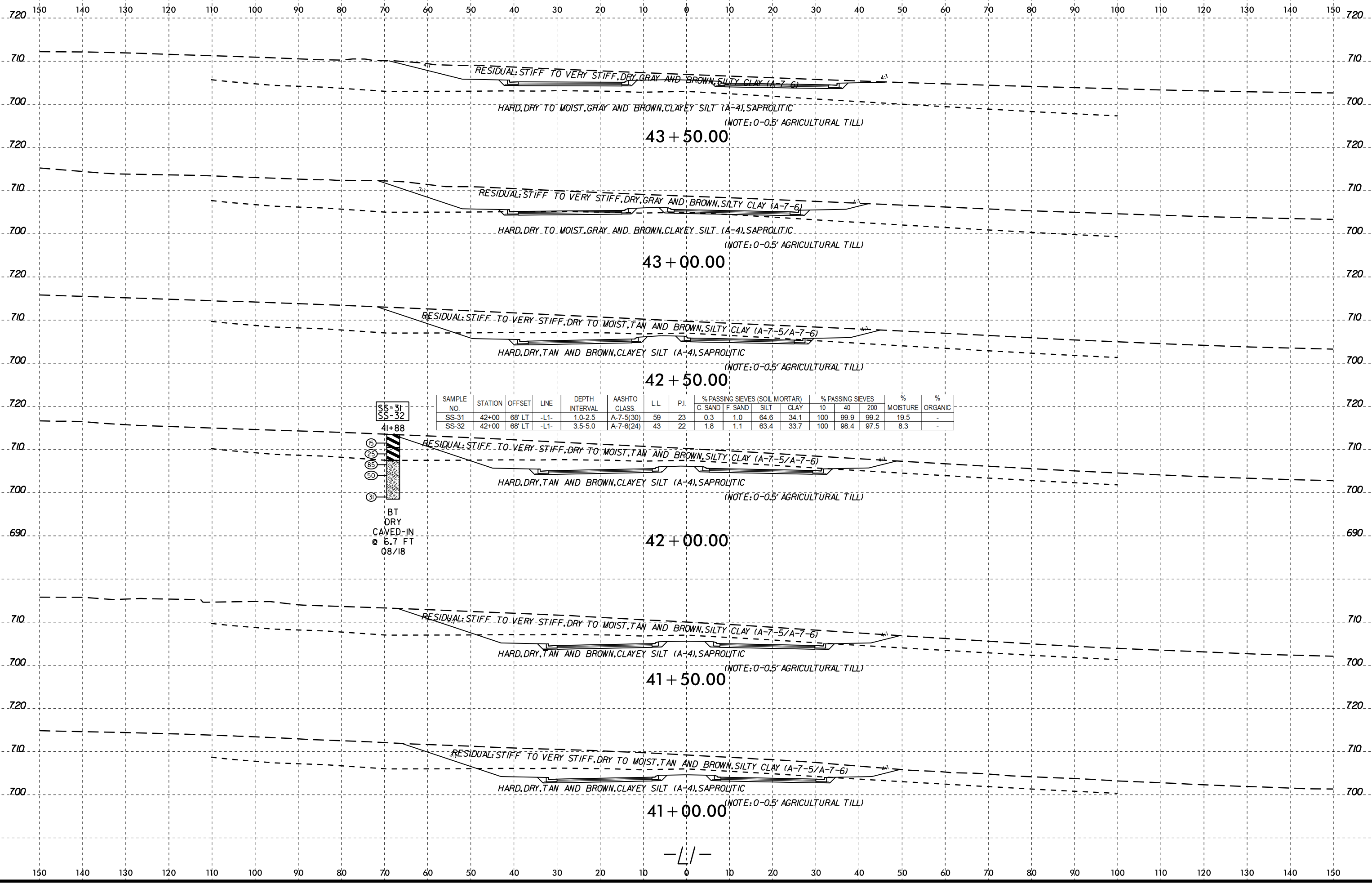
- (A) RESIDUAL: VERY STIFF TO HARD, DRY TO MOIST, GRAY AND BROWN, SILTY CLAY (A-7-6)
- (A) RESIDUAL: HARD, MOIST, GRAY AND BROWN, CLAYEY SILT (A-4), SAPROLITIC
- (B) WEATHERED ROCK: GRAY AND BROWN, METAVOLCANIC



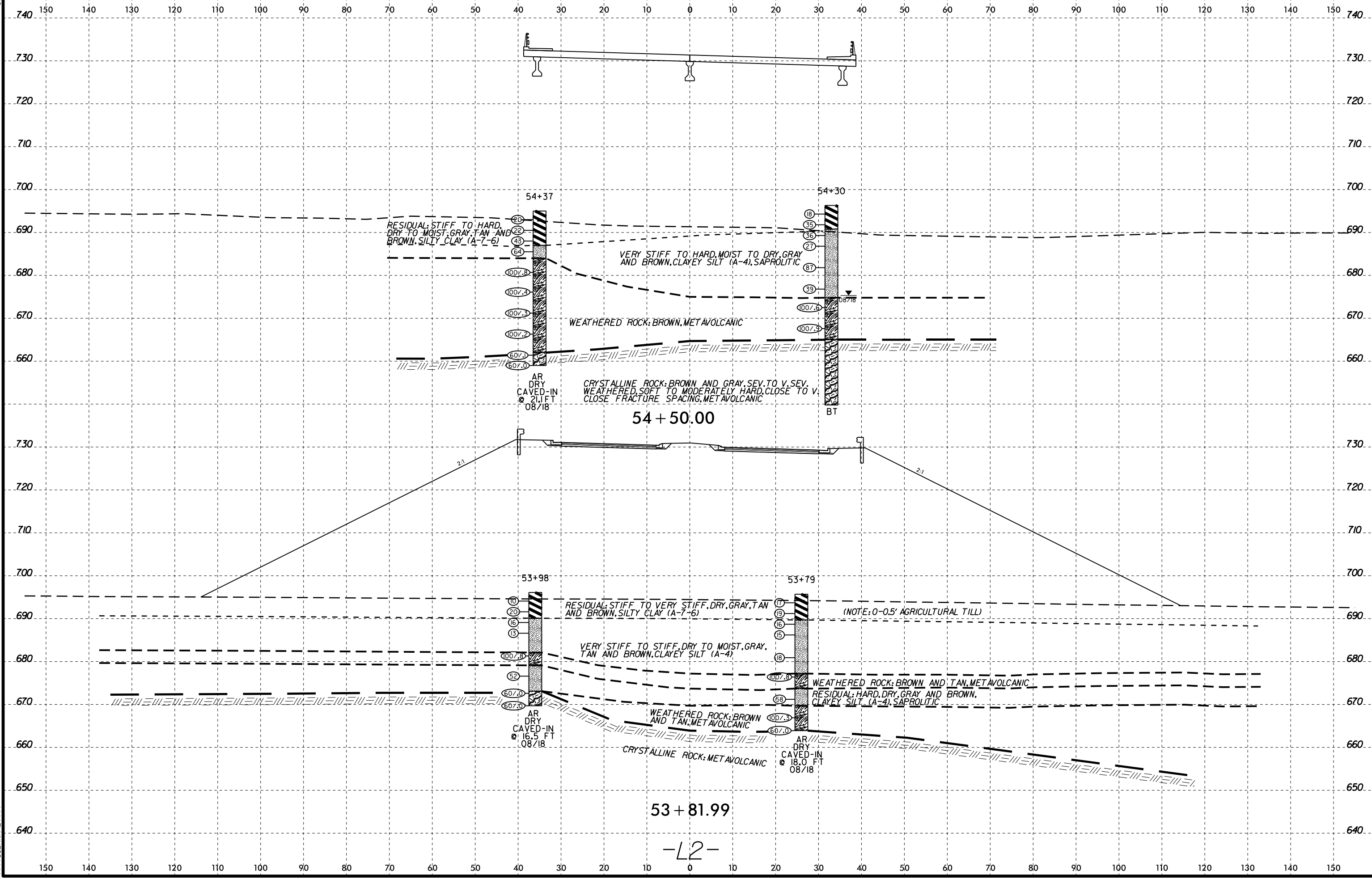
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FOR -Y2- PLAN, SEE SHEET 6

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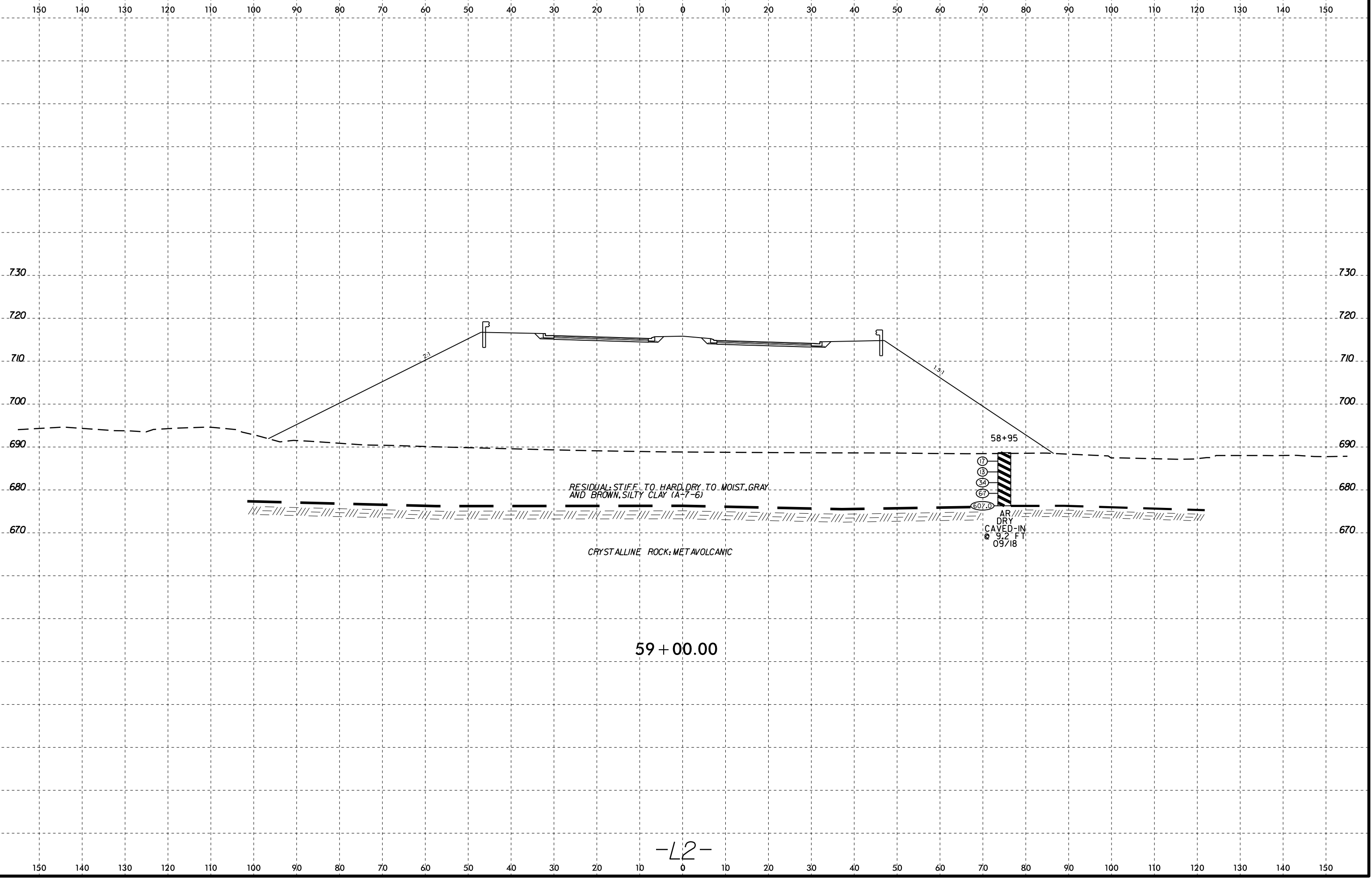
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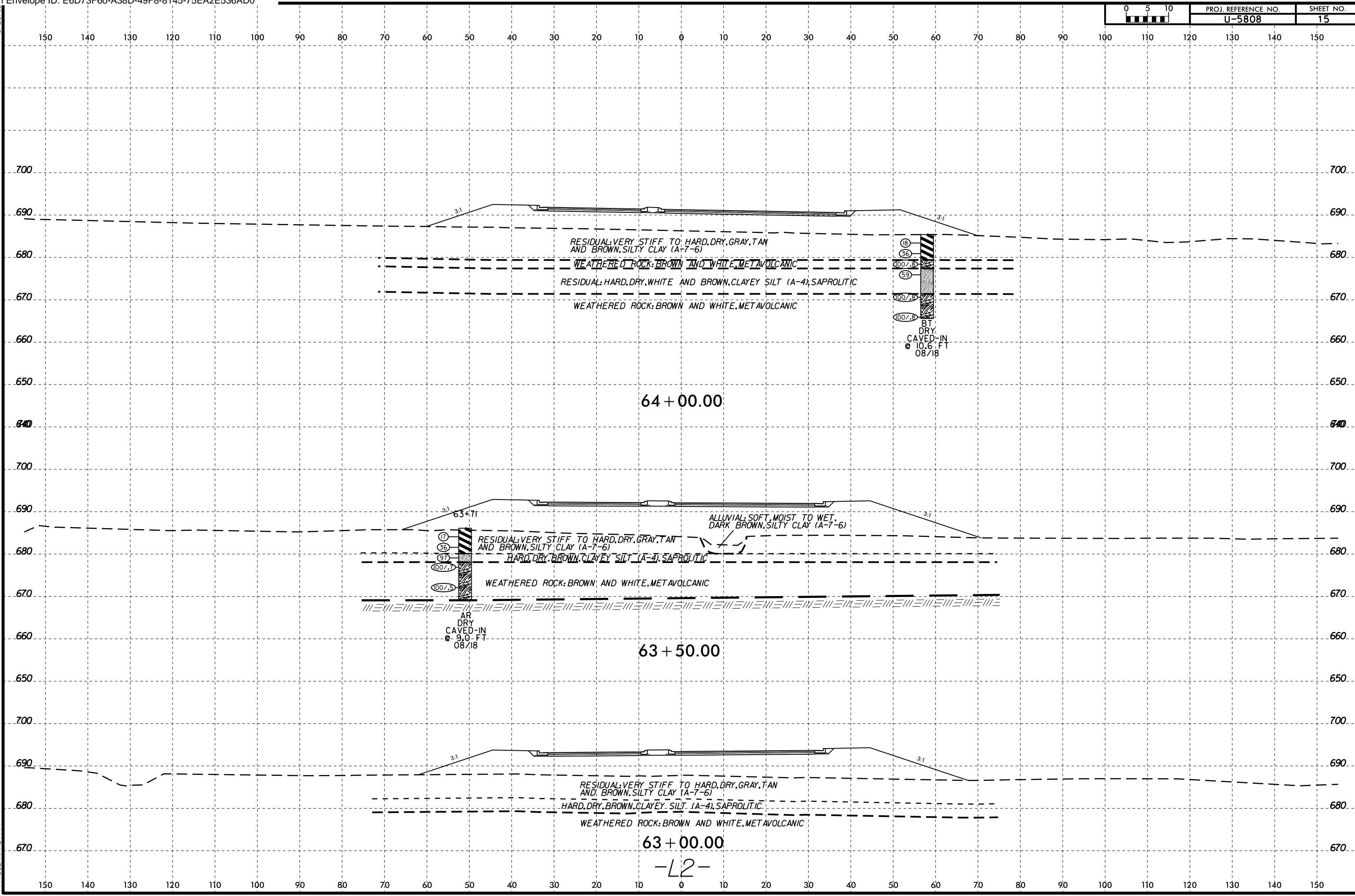
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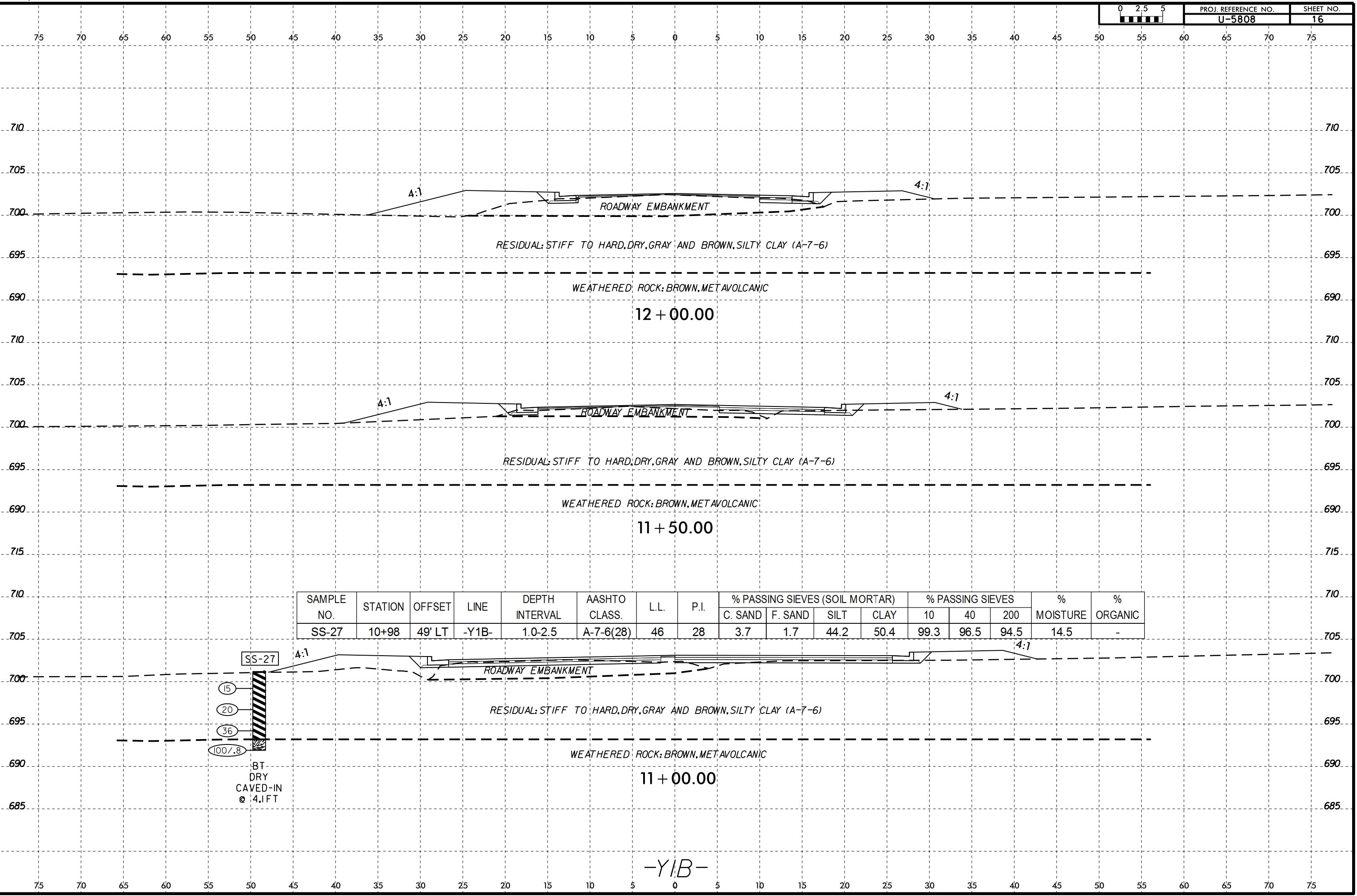
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-L2-



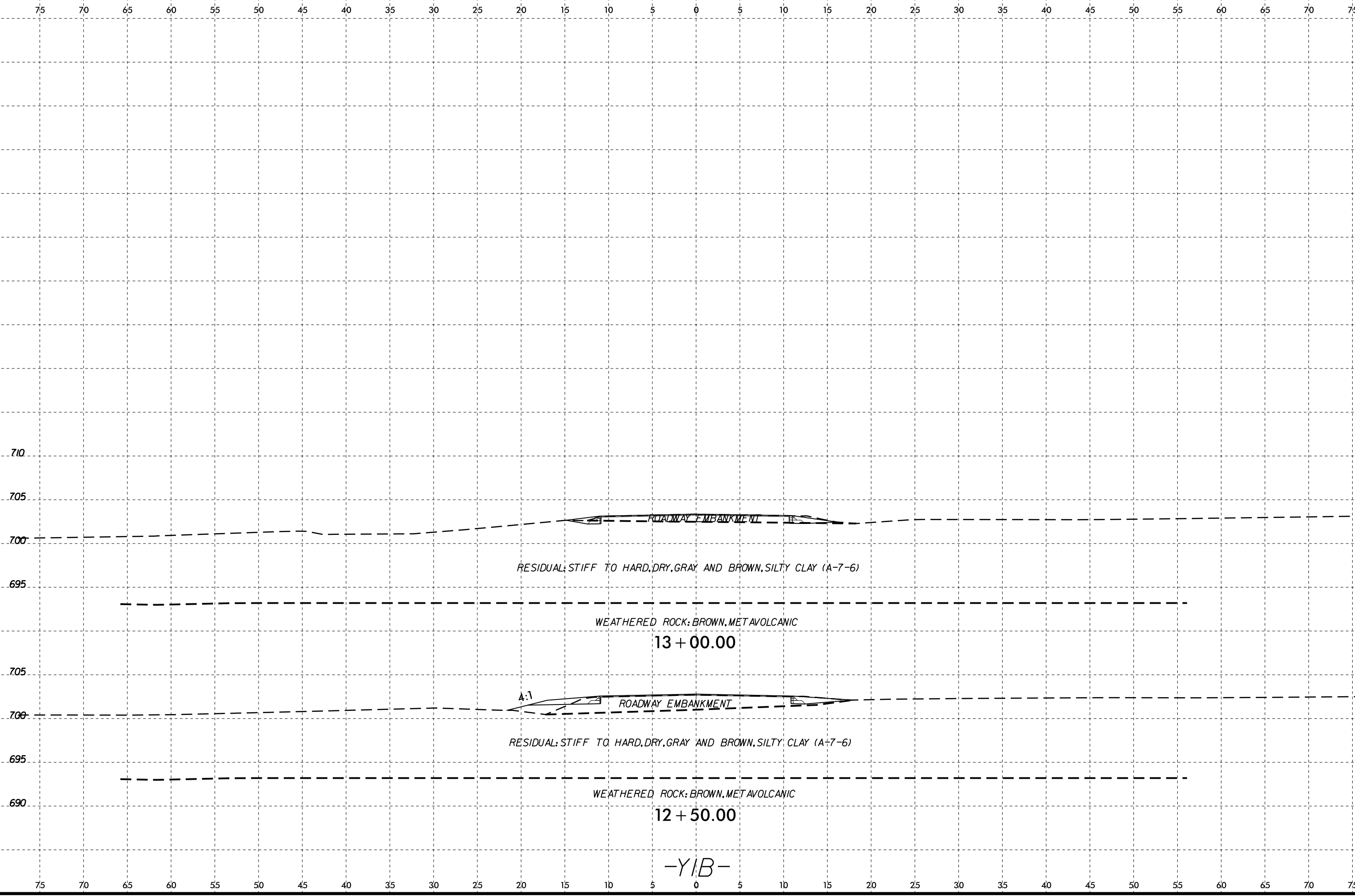
SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% PASSING SIEVES (SOIL MORTAR)				% PASSING SIEVES			% MOISTURE	% ORGANIC
								C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-27	10+98	49' LT	-Y1B-	1.0-2.5	A-7-6(28)	46	28	3.7	1.7	44.2	50.4	99.3	96.5	94.5	14.5	-

SS-27
 15
 20
 36
 100/.8
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 DRY
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