PROJECT: 47133

REFERENCE: U-5996

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5996	1	48

SEE SHEET 3 FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

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

ROADWAY SUBSURFACE INVESTIGATION

COUNTY *NASH*

PROJECT DESCRIPTION *SR 1603 (OLD CARRIAGE RD.) FROM SR 1770 (EASTERN AVE/SUNSET AVE.) TO SR 1601 (REGES STORE RD.)/SR1609 (GREEN HILLS RD.)*

INVENTORY

CONTENTS

LINE	STATION	PLAN	PROFILE
L1	30+70 TO 93+25	4-9	11-14
L1RPA	10+50 TO 15+46	6, 10	-
L1RPB	12+95 TO 18+62	6, 10	16
L1RPC	12+00 TO 16+77	6, 10	-
L1RPD	11+00 TO 16+42	6, 10	-
RAB8	10+00 TO 15+34	4	-
RAB9	10+00 TO 15+34	6	15
RAB10	10+00 TO 15+34	6	-
RAB11	10+00 TO 14+71	9	15
Y19	10+85 TO 11+65	4	17
Y20	12+64 TO 13+48	5	17
Y21	10+00 TO 12+50	5	17
Y23	8+00 TO 30+36	6, 10	-
Y24	11+25 TO 13+56	9	17
Y25	10+00 TO 11+75	9	17

CROSS SECTIONS

LINE	STATION	SHEETS
L1	54+00 TO 56+50	18-23
L1	69+50 TO 70+50	24-25
L1	72+00 TO 73+00	26
L1	75+00 TO 82+00	27-32
L1RPA	11+00 TO 14+50	33-35
L1RPC	12+50 TO 15+50	36-38
L1RPD	11+50 TO 15+50	39-41

APPENDICES

APPENDIX	TITLE	SHEETS
A	SOIL TEST RESULTS	42-46
B	BORELOGS	47-48

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

N.O. MOORE

A.N. JONES

D.G. PINTER

I.C.E. OF CAROLINAS

INVESTIGATED BY *I.C.E. OF CAROLINAS*

DRAWN BY *N.O. MOORE*

CHECKED BY *N.T. ROBERSON*

SUBMITTED BY *N.T. ROBERSON*

DATE *MARCH 2020*

NORTH CAROLINA LICENSED GEOLOGIST SEAL 2627 NICHOLAS O'NEIL MOORE

DocuSigned by:
Nick Moore
8636AEA78511411...

3/10/2020

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
U-5996	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE,
VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5, A-7-6			
SYMBOL														
% PASSING #10	50 MX											GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
#40	30 MX	50 MX	51 MN											
#200	15 MX	25 MX	10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN			
MATERIAL PASSING #40 LL	—		—	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		HIGHLY ORGANIC SOILS
PI	6 MX		NP	10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN			
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	NO MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT^2)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE	< 4	N/A
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	
	DENSE	30 TO 50	
	VERY DENSE	> 50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	< 2	< 0.25
	SOFT	2 TO 4	0.25 TO 0.5
	MEDIUM STIFF	4 TO 8	0.5 TO 1.0
	STIFF	8 TO 15	1 TO 2
	VERY STIFF	15 TO 30	2 TO 4
	HARD	> 30	> 4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.00	0.42	0.25	0.075	0.053

BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F SD.)	SILT (SL.)	CLAY (CL.)

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

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
PLASTIC RANGE (PI): LL - LIQUID LIMIT	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL - PLASTIC LIMIT		
OM - OPTIMUM MOISTURE; SL - SHRINKAGE LIMIT	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NON PLASTIC	0-5	VERY LOW
SLIGHTLY PLASTIC	6-15	SLIGHT
MODERATELY PLASTIC	16-25	MEDIUM
HIGHLY PLASTIC	26 OR MORE	HIGH

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.
UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE.
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LL < 31
MODERATELY COMPRESSIBLE	LL = 31 - 50
HIGHLY COMPRESSIBLE	LL > 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	1 - 10%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	10 - 20%
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	20 - 35%
HIGHLY ORGANIC	> 10%	> 20%	HIGHLY	35% AND ABOVE

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING
- STATIC WATER LEVEL AFTER 24 HOURS
- PW: PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA
- SPRING OR SEEP

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
- INFERRED SOIL BOUNDARY
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 DIP & DIP DIRECTION OF ROCK STRUCTURES
- SPT DPT DMT VST PMT TEST BORING
- AUGER BORING
- CORE BORING
- MW MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING WITH CORE
- SPT N-VALUE

RECOMMENDATION SYMBOLS

- UNDERCUT
- SHALLOW UNDERCUT
- UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE
- UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK
- UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL

ABBREVIATIONS

AR - AUGER REFUSAL	MED. - MEDIUM	VST - VANE SHEAR TEST
BT - BORING TERMINATED	MICA. - MICACEOUS	WEA. - WEATHERED
CL. - CLAY	MOD. - MODERATELY	γ - UNIT WEIGHT
CPT - CONE PENETRATION TEST	NP - NON PLASTIC	γ_d - DRY UNIT WEIGHT
CSE. - COARSE	ORG. - ORGANIC	
DMT - DILATOMETER TEST	PMT - PRESSUREMETER TEST	SAMPLE ABBREVIATIONS
DPT - DYNAMIC PENETRATION TEST	SAP. - SAPROLITIC	S - BULK
e - VOID RATIO	SD. - SAND, SANDY	SS - SPLIT SPOON
F - FINE	SL. - SILT, SILTY	ST - SHELBY TUBE
FOSS. - FOSSILIFEROUS	SLI. - SLIGHTLY	RS - ROCK
FRAC. - FRACTURED, FRACTURES	TCR - TRICONE REFUSAL	RT - RECOMPACTED TRIAXIAL
FRAGS. - FRAGMENTS	w - MOISTURE CONTENT	CBR - CALIFORNIA BEARING RATIO
HI. - HIGHLY	V - VERY	

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] CME-45C
- [x] CME-55
- [ ] CME-550
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [ ] ______
- [ ] ______

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [x] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [ ] CASING [ ] W/ ADVANCER
- [ ] TRICONE ____" STEEL TEETH
- [ ] TRICONE ____" TUNG.-CARB.
- [ ] CORE BIT
- [ ] ______

HAMMER TYPE:
- [x] AUTOMATIC
- [ ] MANUAL

CORE SIZE:
- [ ] -B ____
- [ ] -H ____
- [ ] -N ____

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [x] HAND AUGER
- [ ] SOUNDING ROD
- [ ] VANE SHEAR TEST
- [ ] ______

ROCK DESCRIPTION

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

WEATHERED ROCK (WR)	NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
CRYSTALLINE ROCK (CR)	FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
NON-CRYSTALLINE ROCK (NCR)	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
COASTAL PLAIN SEDIMENTARY ROCK (CP)	COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *IF TESTED, WOULD YIELD SPT REFUSAL*
SEVERE (SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF*
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
MEDIUM HARD	CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO 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 DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.

SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.

SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.

STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.

STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK:

ELEVATION: FEET

NOTES:

ROADWAY BORING ELEVATIONS WERE TAKEN FROM TIN FILE u5026_ls_tin.tin DATED 10/23/2019

DATE: 8-15-14

TIP PROJECT: U-5996

CONTRACT:

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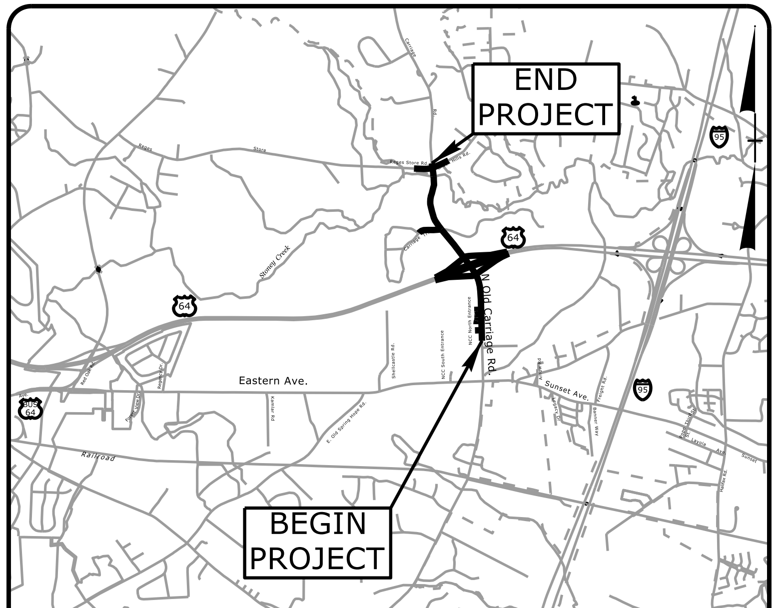
09/08/99

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols



VICINITY MAP

NOT TO SCALE

RIGHT OF WAY PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

NASH COUNTY

LOCATION: WIDEN SR 1603 (N. OLD CARRIAGE RD.) FROM NORTH OF SR 1770 (EASTERN AVE./SUNSET AVE.) TO SR 1601 (REGES STORE RD.)/SR 1609 (GREEN HILLS RD.).

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5996	3	48

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
47133.1.1		PE
47133.2.1		R/W & UTILITIES
47133.3.1		CONSTRUCTION

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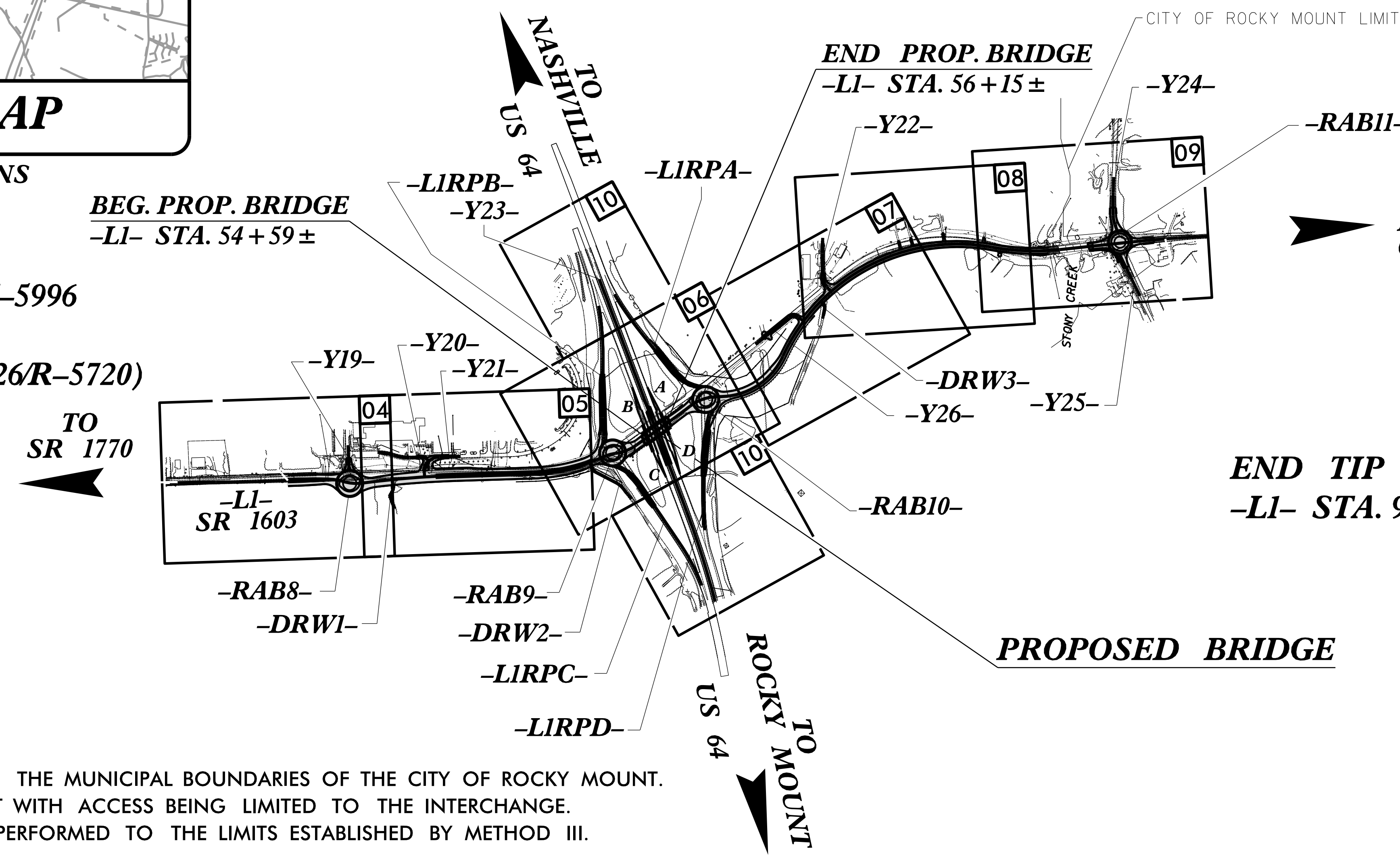
NAD 83/2011



BEGIN TIP PROJECT U-5996
-L1- STA. 30+70.00 =
-L1- STA. 30+69.99 (U-5026/R-5720)

END TIP PROJECT U-5996
-L1- STA. 93+25.00

A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF ROCKY MOUNT.
THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO THE INTERCHANGE.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2020 = 13,322
ADT 2040 = 18,800
K = 9 %
D = 55 %
T = 4 % *
V = 50 MPH**

* TTST = 1% DUAL 3%
** V = 40 MPH B/W RAMPS
FUNC CLASS = ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-5996	=	1.155 MI.
LENGTH STRUCTURE TIP PROJECT U-5996	=	0.030 MI.
TOTAL LENGTH OF TIP PROJECT U-5996	=	1.185 MI.

Prepared for the North Carolina Department of Transportation
In the Office of:

vhb — 940 Main Campus Drive, Suite 500, Raleigh, NC 27606, NC License No. C-3705

M ENGINEERING — 1011 Schaub Drive, Suite 100, Raleigh, NC 27606, Firm PE No. P-0671

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
December 13, 2019

LETTING DATE:
July 21, 2020

JONATHAN SOIKA, PE
PROJECT ENGINEER

JOHN TOWNSEND, PE
PROJECT DESIGN ENGINEER

NCDOT CONTACT
RUSSELL BROADWELL, PE
NCDOT PROJECT ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J. ERIC BOYETTE
SECRETARY

March 5, 2020

STATE PROJECT: 47133.1.1 (U-5996)
FEDERAL PROJECT:
COUNTY: NASH

DESCRIPTION: SR 1603 (Old Carriage Road) from north of SR 1770 (Eastern Avenue/Sunset Avenue) to SR 1601 (Reges Store Road)/SR 1609 (Green Hills Road).

SUBJECT: Geotechnical Report – Inventory

The Geotechnical Engineering Unit has completed a subsurface investigation for this project and presents the following inventory.

Project Description

This project consists of widening SR 1603 (Old Carriage Road) from north of SR 1770 (Eastern Avenue/Sunset Avenue) to SR 1601 (Reges Store Road)/SR 1609 (Green Hills Road).

A geotechnical investigation was conducted during January, February, and October of 2019. Twenty-eight hand auger borings, 23 SPT roadway borings, and 7 SPT structure borings were performed by ICE of Carolinas, PLLC and the Geotechnical Engineering Unit. Representative soil samples were collected for visual classification in the field and selected samples were submitted for laboratory analysis by the Materials and Tests Unit.

The following alignments, totaling 1.194 miles, were investigated. Subsurface plans and profiles of these alignments are included in this report.

Line	Stations
-L1-	30+70 to 93+75
-L1RPA-	10+50 to 15+00
-L1PRB-	12+95 to 18+50
-L1RPC-	12+00 to 16+50
-L1RPD-	11+00 to 16+00
-RAB8-	10+00 to 15+00
-RAB9-	10+00 to 15+00
-RAB10-	10+00 to 15+00
-RAB11-	10+00 to 15+00
-Y19-	11+00 to 11+50
-Y20-	12+50 to 13+00
-Y21-	10+50 to 12+50
-Y24-	11+00 to 13+50
-Y25-	10+00 to 12+00

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

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

Website: www.ncdot.gov

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

Physiography and Geology

The project is located outside the city limits of the town of Rocky Mount, and within the Coastal Plain and Piedmont physiographic province of North Carolina. Tertiary-aged sands and gravels of terrace deposits and upland sediment overlay residual clay and sand. The topography is gently rolling. The widening project consists of a mixture of woods, agriculture land, businesses and residences.

Soils Properties

Soils encountered during this investigation are roadway embankment, artificial fill, undivided coastal plain, and residual.

Roadway Embankment soils are present throughout the entire project. These soils primarily consist of brown, tan, and orange, moist, loose, silty sand (A-2-4). Plastic indices for these soils range from non-plastic to 7.

Artificial soils are only present at the end of the project associated with utility fill. These soils are characterized by red, moist, medium stiff, silty clay (A-7-6) and orange-brown, moist, loose to medium dense, silty sand (A-2-4).

Undivided Coastal Plain soils are present throughout the southern half of the project. These soils are characterized by brown, yellow, tan, orange, and gray, mottled, moist, loose, clayey sand (A-2-6) and coarse sand (A-1-b). Plastic indices for these soils range from 13 to 25.

Residual soils were only encountered in northern half of the project. These soils are characterized by brown, orange, red, orange, and gray, moist, very stiff to hard, sandy clay (A-6) and silty clay (A-7). Plastic indices for these soils range from 11 to 62.

Groundwater

Groundwater measurements were taken in January, February, and October of 2019 during average rainfall conditions. Groundwater was present in some borings and ranged from 2.0 to 26.5 feet from the ground surface.

Areas of Special Geotechnical Interests

1. The following sections were found to contain highly plastic clays:

Line	Stations
-L1-	76+25 to 78+25
-L1-	79+25 to 80+75
-L1RPA-	11+25 to 15+00
-L1RPC-	12+25 to 14+75
-L1RPD-	11+25 to 13+75

2. The following sections were found to contain artificial fill:

Line	Stations
-RAB11-	11+10 to 11+30
-RAB11-	14+55 to 14+75

3. The following sections were found to contain high ground water (6 feet below grade or higher):

Line	Stations
-L1-	74+00 to 83+50

PROJECT REFERENCE NO.	SHEET NO.
U-5996	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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NC License No. C-3705

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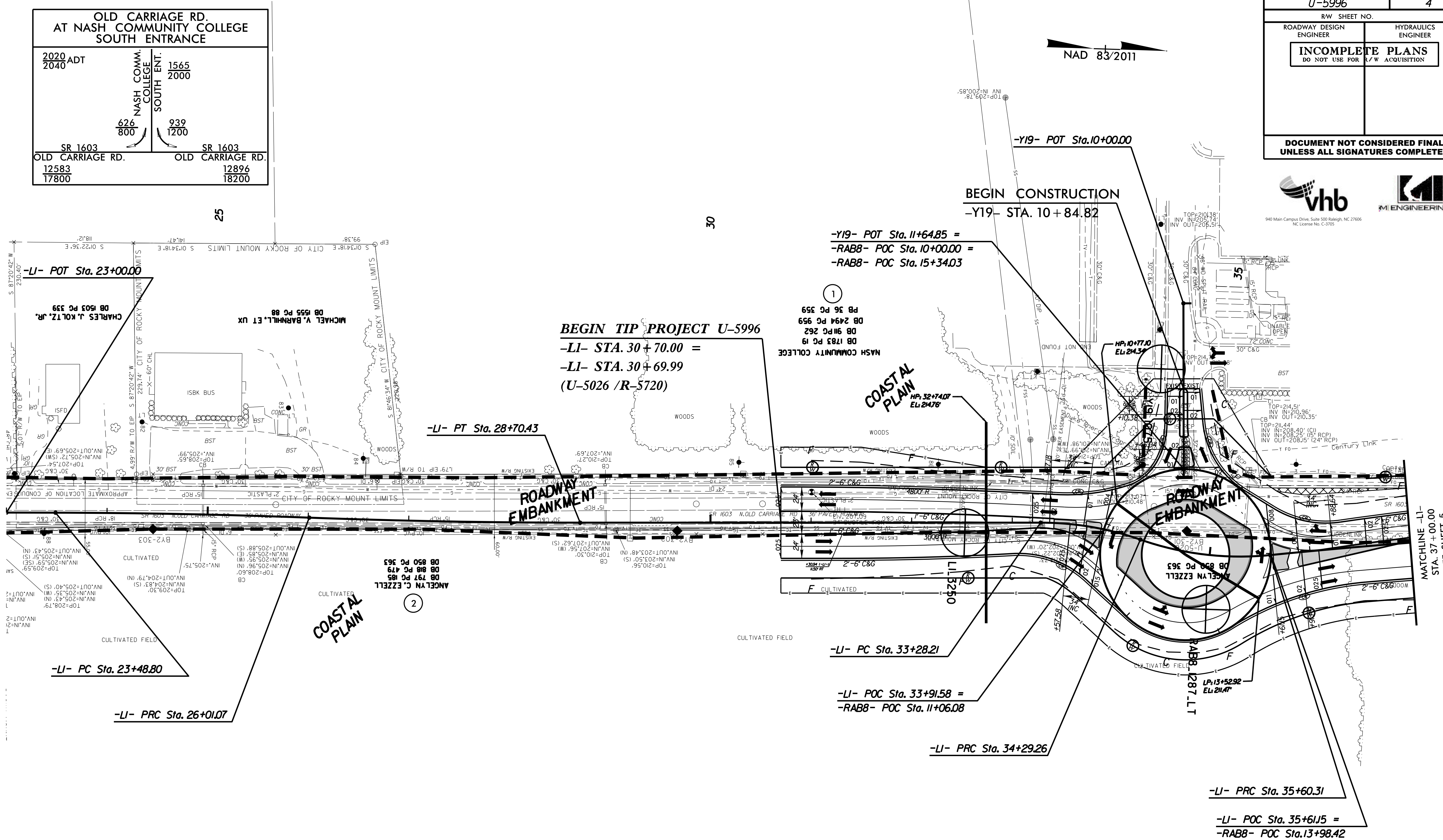

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PROJECT REFERENCE NO.	SHEET NO.
U-5996	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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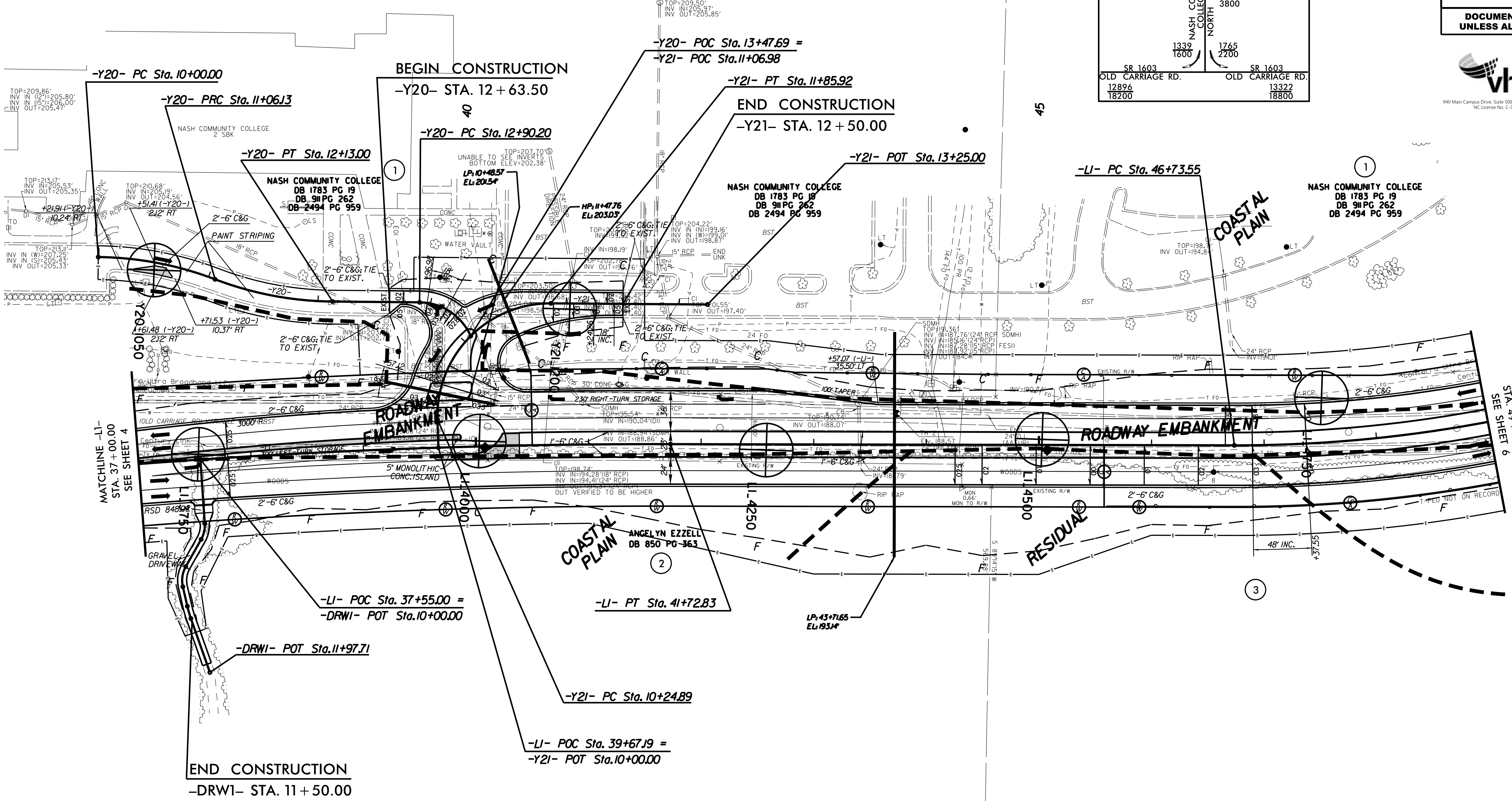
N. OLD CARRIAGE RD.
AT NASH COMMUNITY COLLEGE
NORTH ENTRANCE

2020 ADT
2040
NASH COMM. COLLEGE NORTH ENT.
3800
NAD 83/2011
1339 / 1600
1765 / 2200
SR 1603 OLD CARRIAGE RD.
12896 / 18200
SR 1603 OLD CARRIAGE RD.
13322 / 18800



NOTE: ASSUME ALL ISLANDS ARE 5" MONOLITHIC CONCRETE UNLESS OTHERWISE NOTED

NOTE: DRIVEWAY RADII = 10 FT UNLESS OTHERWISE NOTED

8/17/99

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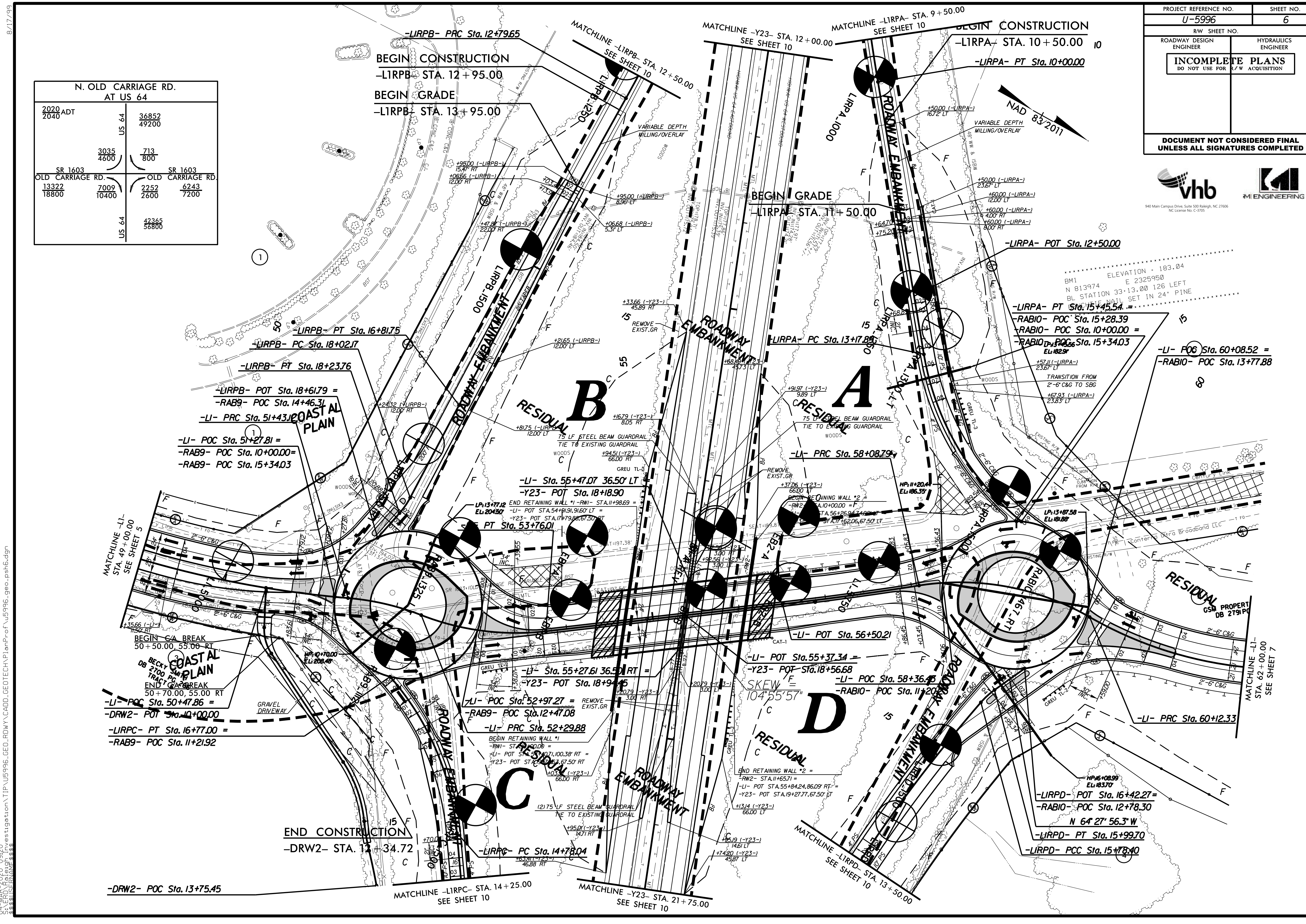
PROJECT REFERENCE NO.
SHEET NO.
U-5996
6
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
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M ENGINEERING
N. OLD CARRIAGE RD. AT US 64
2020 ADT
2040
US 64
36852
49200
3035
4600
713
800
SR 1603
OLD CARRIAGE RD.
13322
18800
7009
10400
2252
2600
6243
7200
42365
56800
MATCHLINE -L1RPB- STA. 12+50.00 SEE SHEET 10
MATCHLINE -Y23- STA. 12+00.00 SEE SHEET 10
MATCHLINE -L1RPA- STA. 9+50.00 SEE SHEET 10
-L1RPB- PRC Sta. 12+79.65
BEGIN CONSTRUCTION
-L1RPB- STA. 12+95.00
BEGIN GRADE
-L1RPB- STA. 13+95.00
BEGIN CONSTRUCTION
-L1RPA- STA. 10+50.00
-L1RPA- PT Sta. 10+00.00
NAD 83/2011
BEGIN GRADE
-L1RPA- STA. 11+50.00
-L1RPA- POT Sta. 12+50.00
BM1 ELEVATION = 183.04
N 813974 E 2325950
BL STATION 33+13.00 126 LEFT
-L1RPA- PT Sta. 15+45.54 =
-RAB10- POC Sta. 15+28.39
-RAB10- POC Sta. 10+00.00 =
-RAB10- POC Sta. 15+34.03
-L1- POC Sta. 60+08.52 =
-RAB10- POC Sta. 13+77.88
-L1RPA- PC Sta. 13+17.89
-L1RPB- PT Sta. 16+81.75
-L1RPB- PC Sta. 18+02.17
-L1RPB- PT Sta. 18+23.76
-L1RPB- POT Sta. 18+61.79 =
-RAB9- POC Sta. 14+46.31
-L1- PRC Sta. 51+43.12
COASTAL PLAIN
-L1- POC Sta. 51+27.81 =
-RAB9- POC Sta. 10+00.00 =
-RAB9- POC Sta. 15+34.03
B
A
RESIDUAL
ROADWAY EMBANKMENT
75 LF STEEL BEAM GUARDRAIL TIE TO EXISTING GUARDRAIL
-L1- PRC Sta. 58+08.79
-L1- Sta. 55+47.07 36.50' LT =
-Y23- POT Sta. 18+18.90
END RETAINING WALL *1 -RW1- STA. 11+98.69 =
BEGIN RETAINING WALL *2
-L1- PT Sta. 53+76.01
MATCHLINE -L1- STA. 49+00.00 SEE SHEET 5
MATCHLINE -L1- STA. 62+00.00 SEE SHEET 7
RESIDUAL
GSD PROPERTY DB 2791 PG
BEGIN CA BREAK
50+50.00, 55.00 RT
END CA BREAK
50+70.00, 55.00 RT
-L1- POT Sta. 56+50.21
-L1- POT Sta. 55+37.34 =
-Y23- POT Sta. 18+56.68
-L1- Sta. 55+27.61 36.50' RT =
-Y23- POT Sta. 18+94.45
SKEW = 104°55'57"
-L1- POC Sta. 58+36.45 =
-RAB10- POC Sta. 11+20
-L1- POC Sta. 50+47.86 =
-DRW2- POT Sta. 10+00.00
-L1RPC- PT Sta. 16+77.00 =
-RAB9- POC Sta. 11+21.92
GRAVEL DRIVEWAY
-L1- POC Sta. 52+97.27 =
-RAB9- POC Sta. 12+47.08
-L1- PRC Sta. 52+29.88
BEGIN RETAINING WALL *1
D
-L1- PRC Sta. 60+12.33
C
END RETAINING WALL *2
(2) 75 LF STEEL BEAM GUARDRAIL TIE TO EXISTING GUARDRAIL
END CONSTRUCTION
-DRW2- STA. 12+34.72
-L1RPC- PC Sta. 14+78.04
-L1RPD- POT Sta. 16+42.27 =
-RAB10- POC Sta. 12+78.30
N 64°27'56.3" W
-L1RPD- PT Sta. 15+99.70
-L1RPD- PCC Sta. 15+78.40
-DRW2- POC Sta. 13+75.45
MATCHLINE -L1RPC- STA. 14+25.00 SEE SHEET 10
MATCHLINE -Y23- STA. 21+75.00 SEE SHEET 10
MATCHLINE -L1RPD- STA. 13+50.00 SEE SHEET 10
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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-5996	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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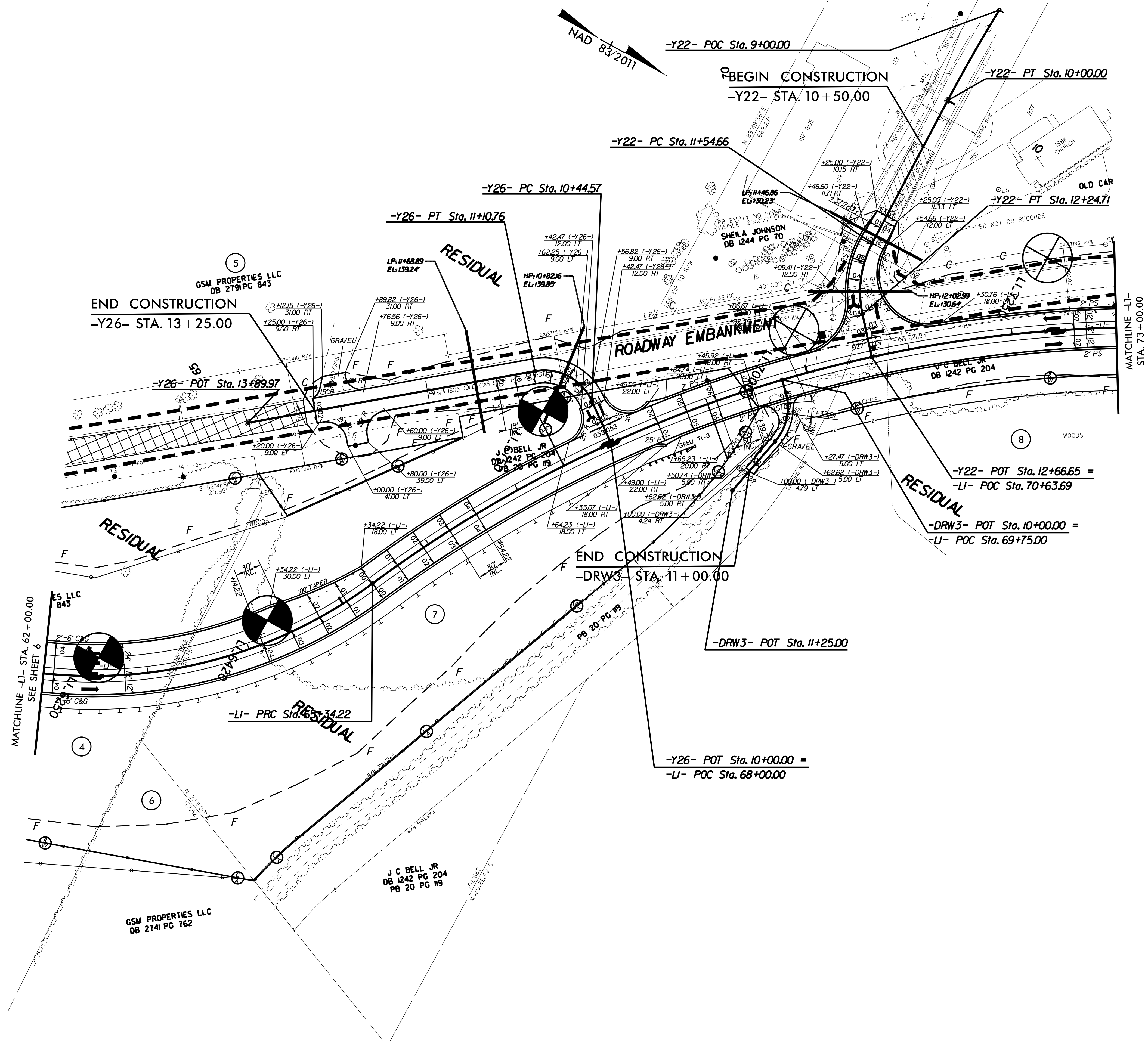

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U-5996	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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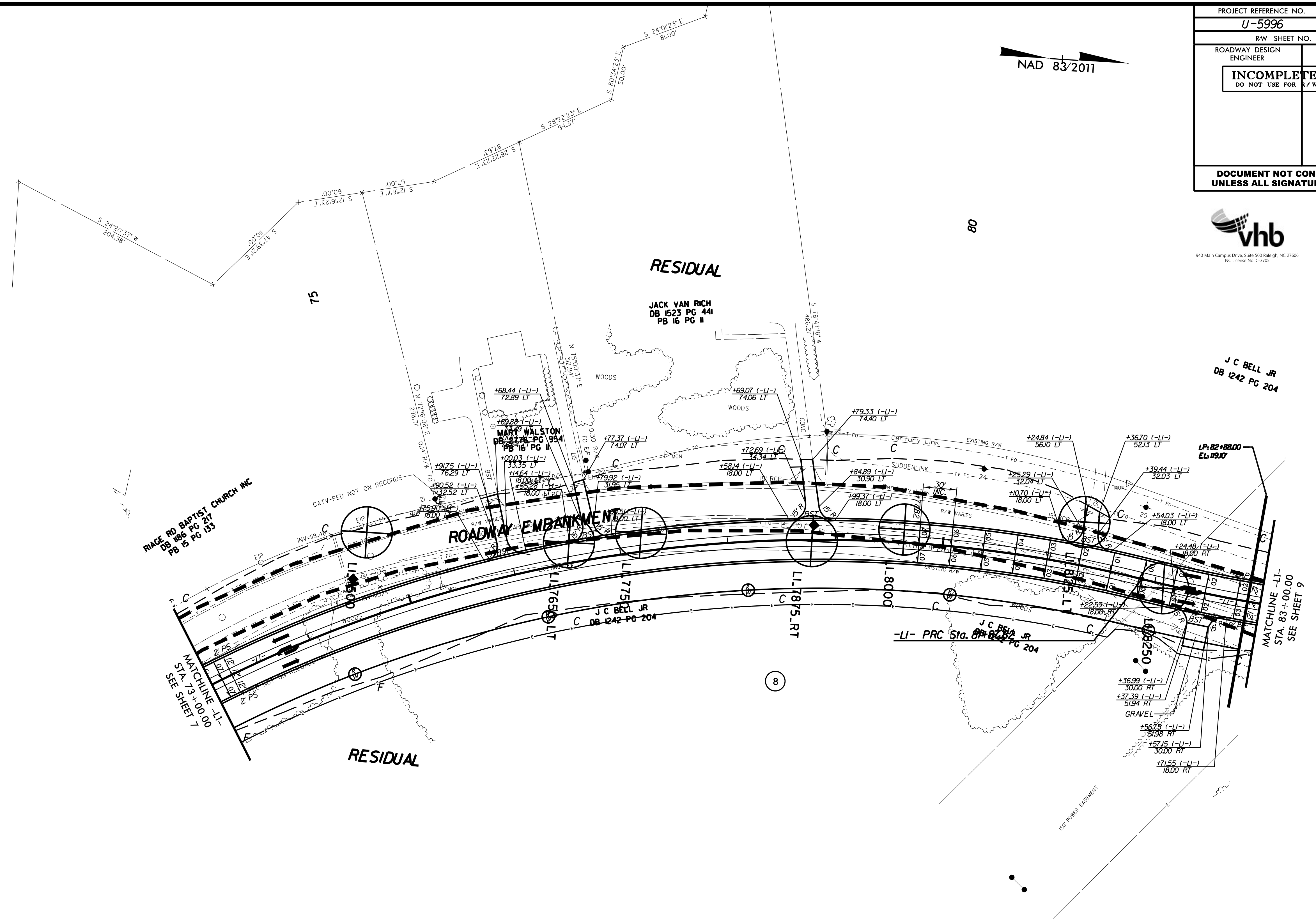

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PROJECT REFERENCE NO.	SHEET NO.
U-5996	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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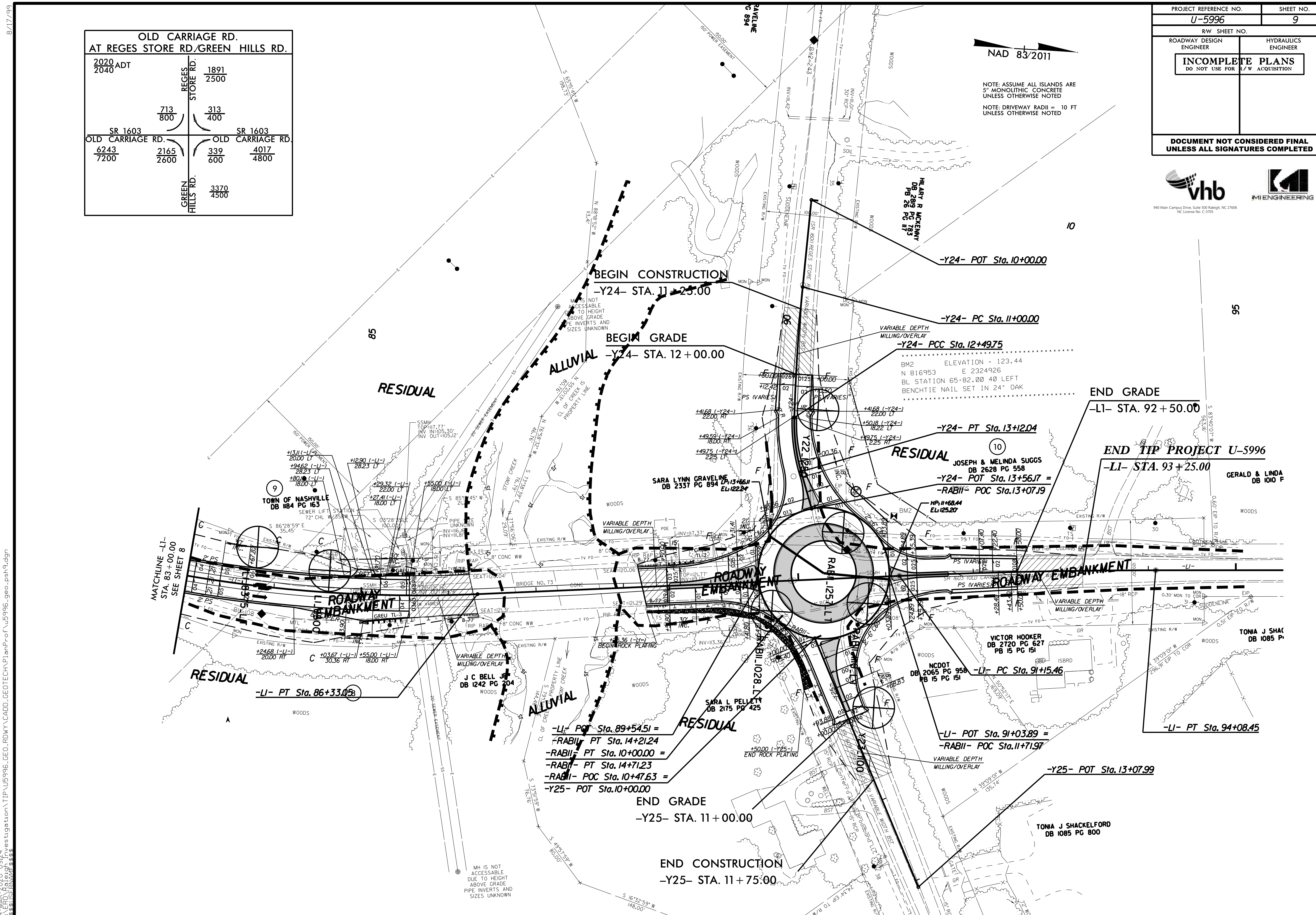

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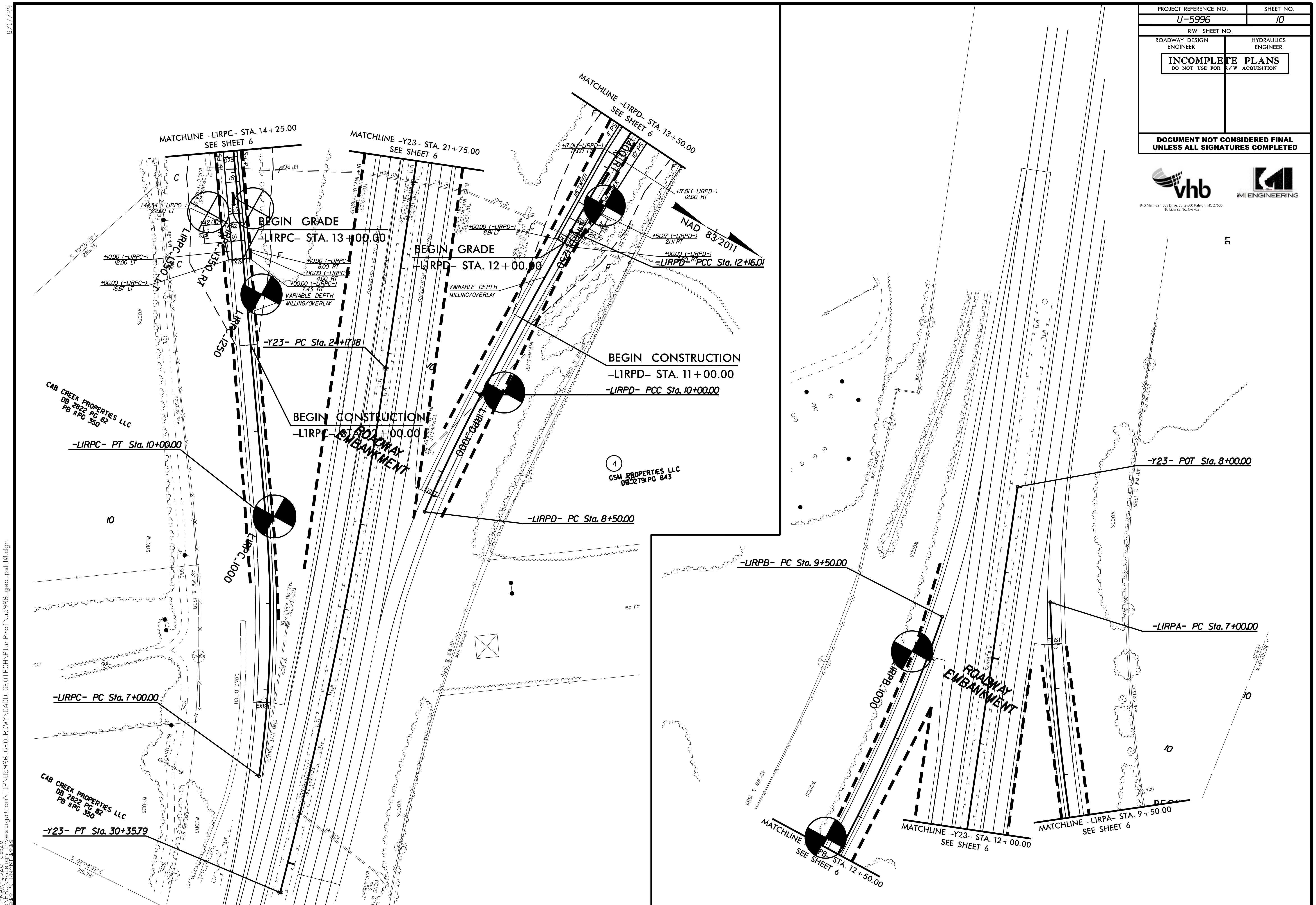

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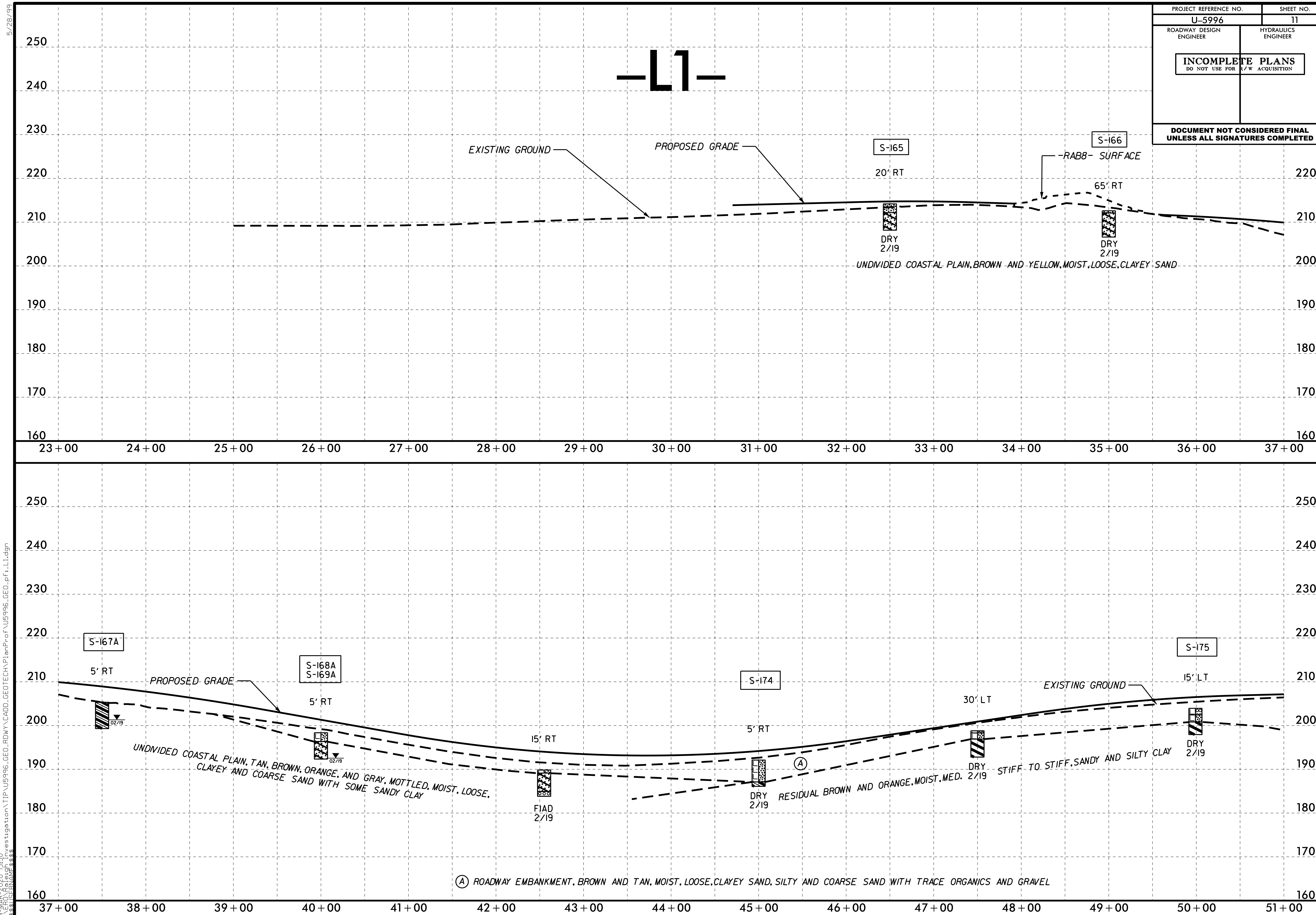
PROJECT REFERENCE NO.
SHEET NO.
U-5996
11
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
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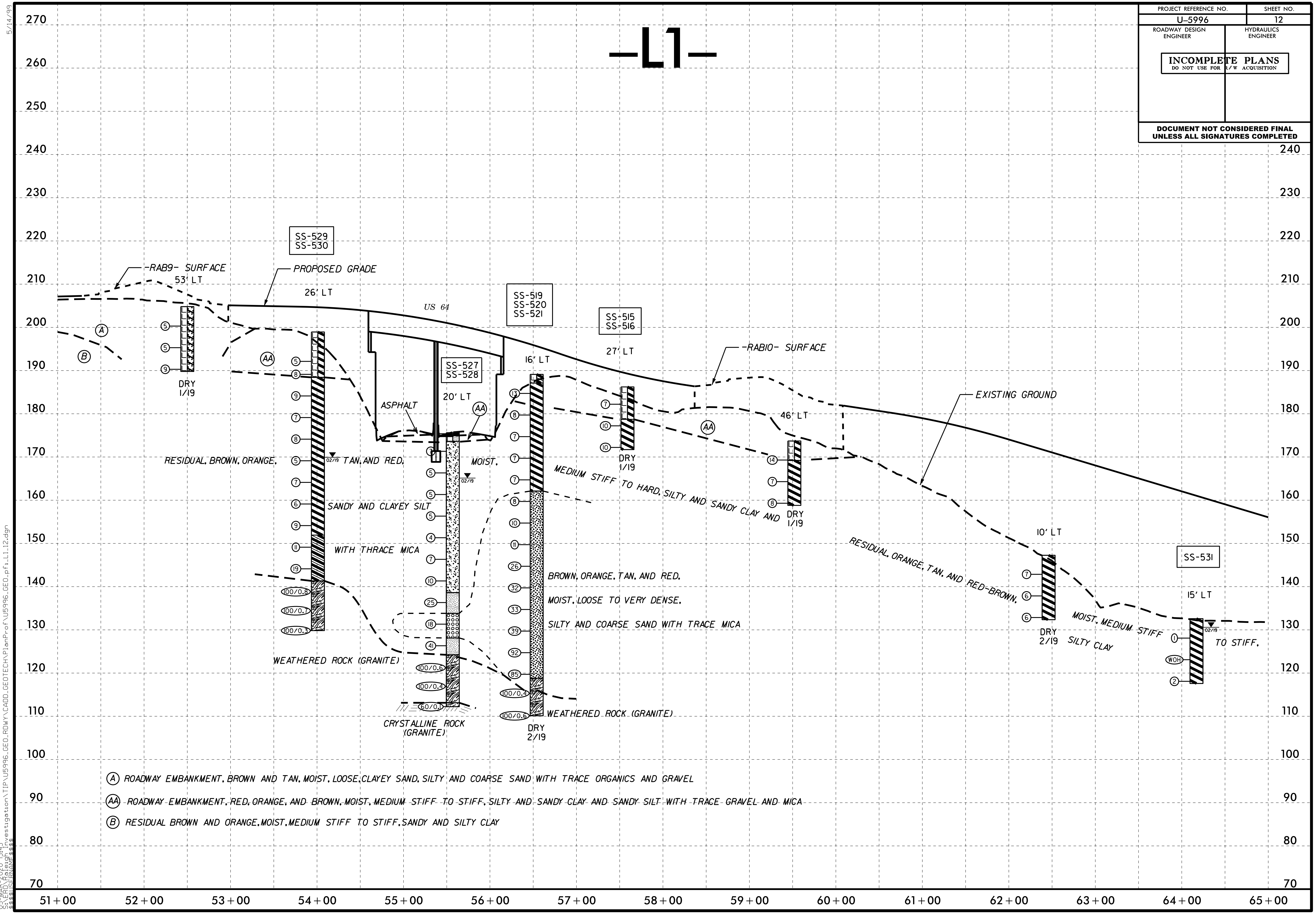
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
-L1-
EXISTING GROUND
PROPOSED GRADE
S-165
20' RT
DRY 2/19
S-166
-RAB8- SURFACE
65' RT
DRY 2/19
UNDIVIDED COASTAL PLAIN, BROWN AND YELLOW, MOIST, LOOSE, CLAYEY SAND
250
240
230
220
210
200
190
180
170
160
23+00
24+00
25+00
26+00
27+00
28+00
29+00
30+00
31+00
32+00
33+00
34+00
35+00
36+00
37+00
S-167A
5' RT
PROPOSED GRADE
S-168A
S-169A
5' RT
15' RT
FIAD 2/19
S-174
5' RT
DRY 2/19
30' LT
DRY 2/19
EXISTING GROUND
S-175
15' LT
DRY 2/19
UNDIVIDED COASTAL PLAIN, TAN, BROWN, ORANGE, AND GRAY, MOTTLED, MOIST, LOOSE, CLAYEY AND COARSE SAND WITH SOME SANDY CLAY
RESIDUAL BROWN AND ORANGE, MOIST, MED. STIFF TO STIFF, SANDY AND SILTY CLAY
A
A ROADWAY EMBANKMENT, BROWN AND TAN, MOIST, LOOSE, CLAYEY SAND, SILTY AND COARSE SAND WITH TRACE ORGANICS AND GRAVEL
37+00
38+00
39+00
40+00
41+00
42+00
43+00
44+00
45+00
46+00
47+00
48+00
49+00
50+00
51+00

5/14/99



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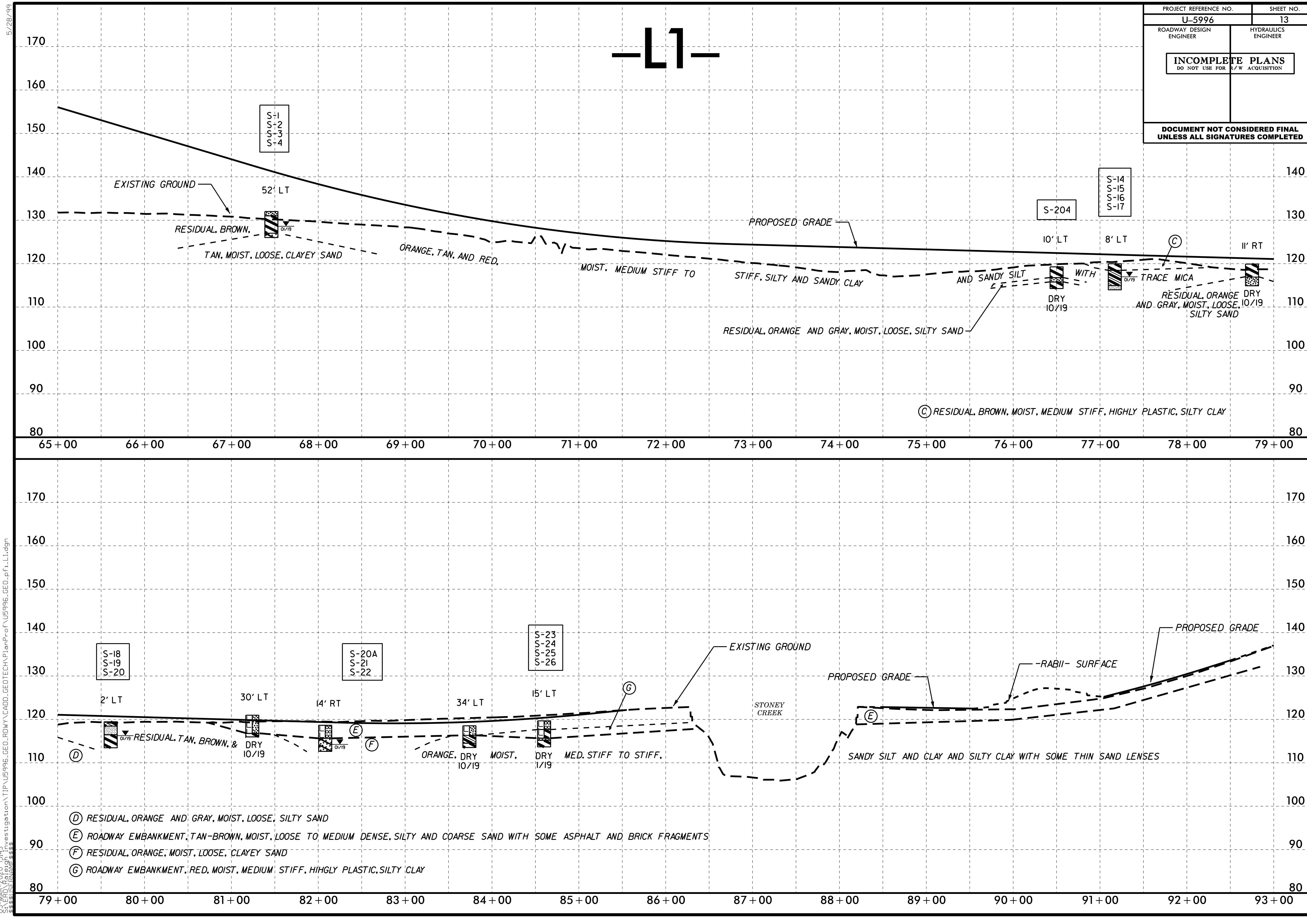

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PROJECT REFERENCE NO.	SHEET NO.
U-5996	14

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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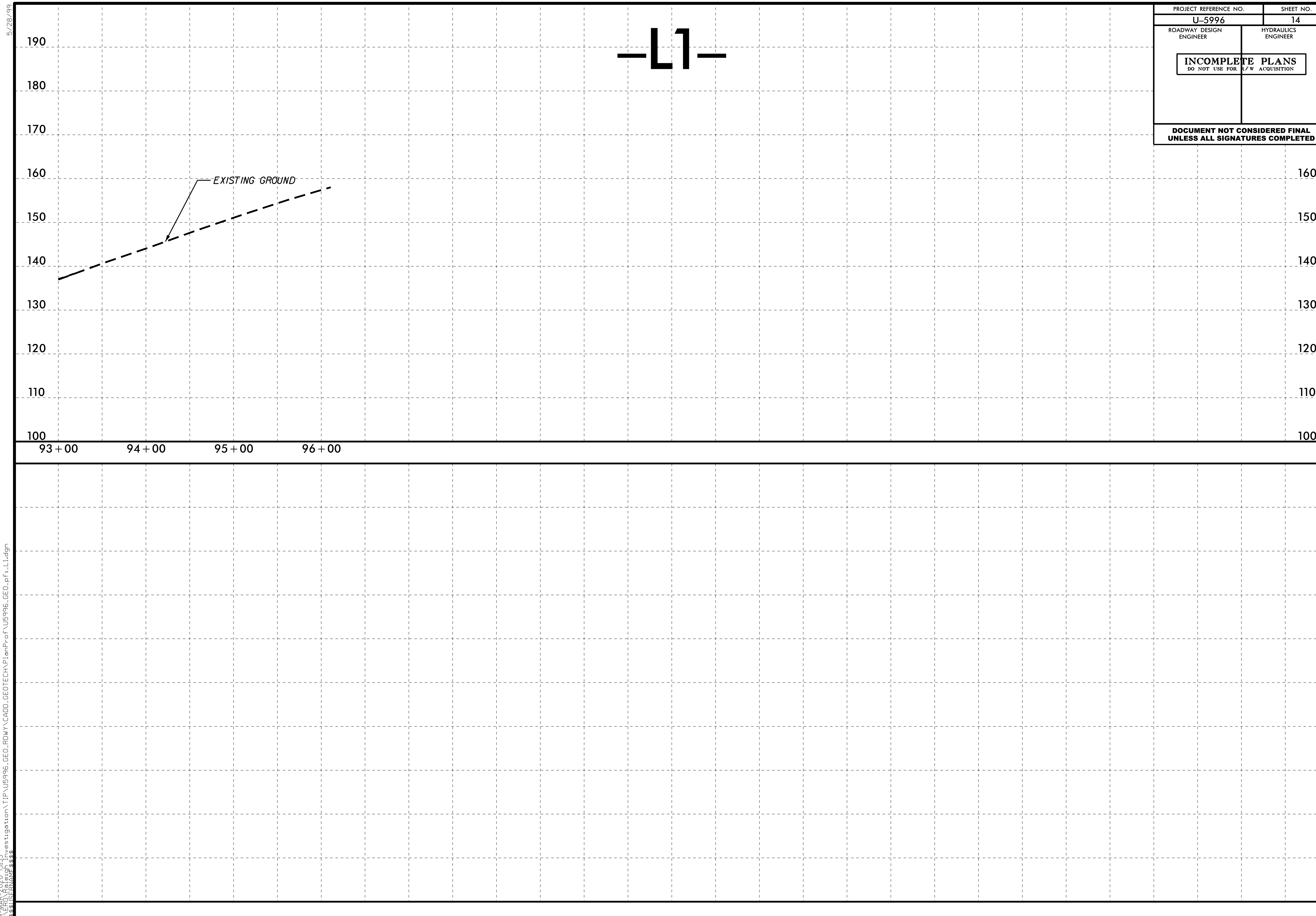
-L1-



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PROJECT REFERENCE NO.	SHEET NO.
U-5996	15

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
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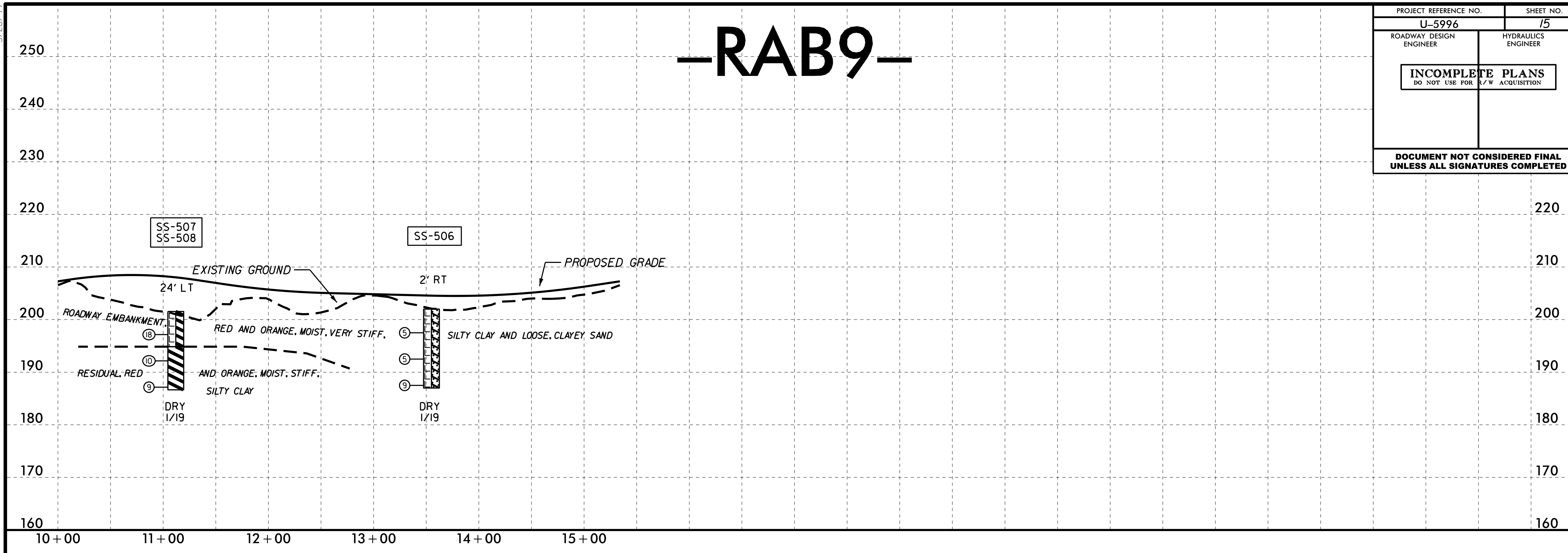

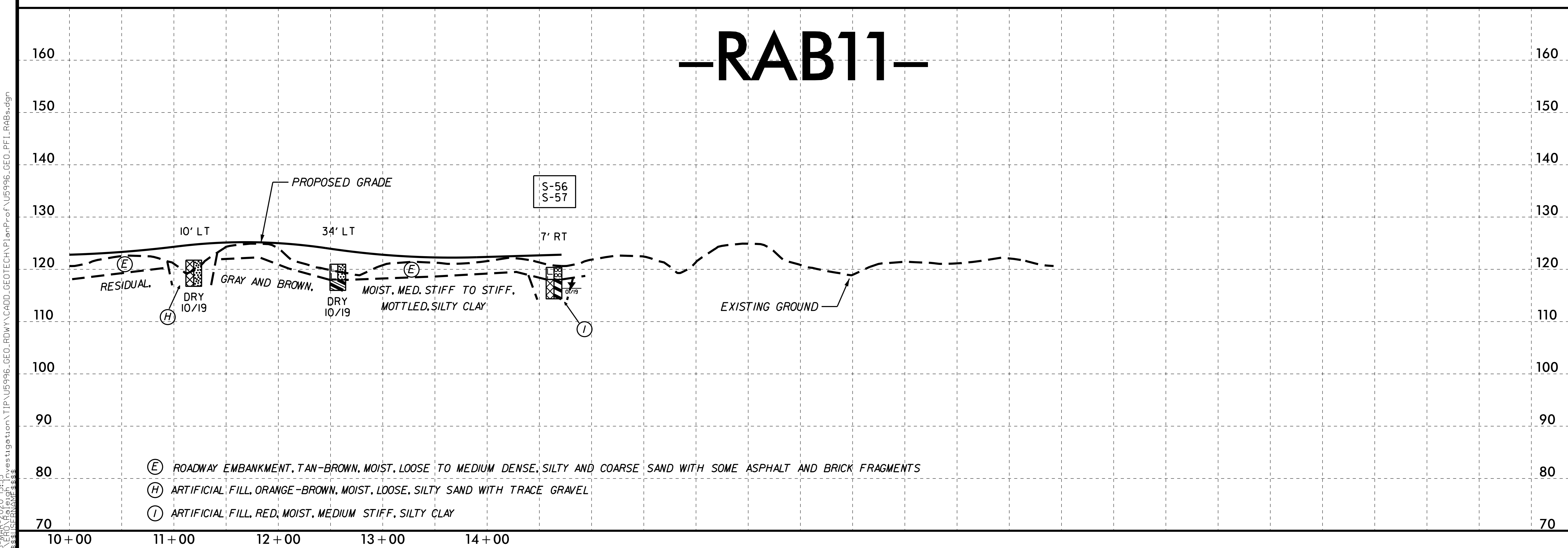

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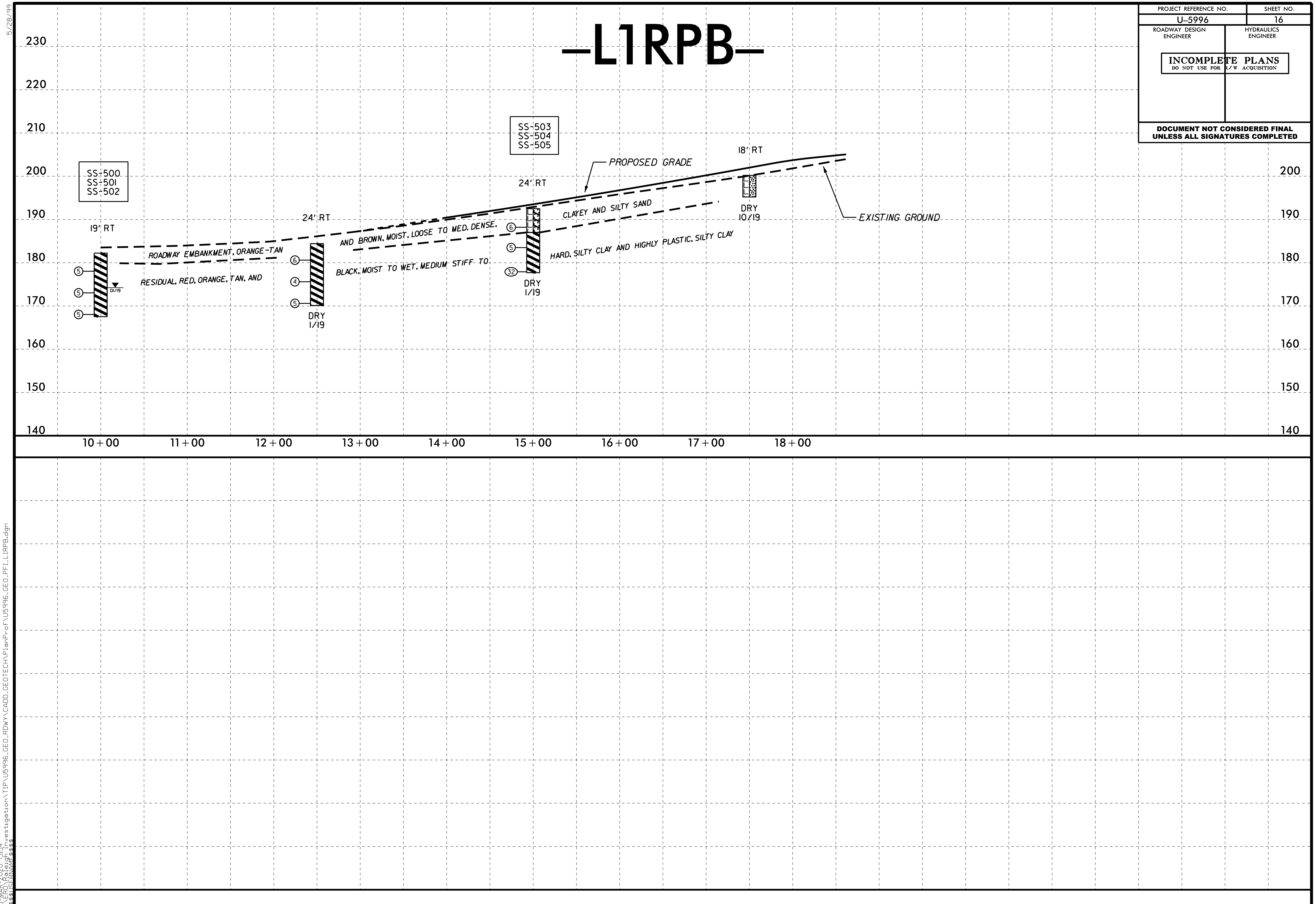
-L1RPB-
PROJECT REFERENCE NO.
U-5996
SHEET NO.
16
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
SS-500
SS-501
SS-502
SS-503
SS-504
SS-505
19' RT
24' RT
24' RT
18' RT
PROPOSED GRADE
EXISTING GROUND
ROADWAY EMBANKMENT, ORANGE-TAN
AND BROWN, MOIST, LOOSE TO MED. DENSE,
CLAYEY AND SILTY SAND
RESIDUAL, RED, ORANGE, TAN, AND
BLACK, MOIST TO WET, MEDIUM STIFF TO
HARD, SILTY CLAY AND HIGHLY PLASTIC, SILTY CLAY
DRY
1/19
DRY
1/19
DRY
10/19
01/19
5
5
5
6
4
5
6
5
32
230
220
210
200
190
180
170
160
150
140
10+00
11+00
12+00
13+00
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17+00
18+00
5/28/99
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PROJECT REFERENCE NO.	SHEET NO.
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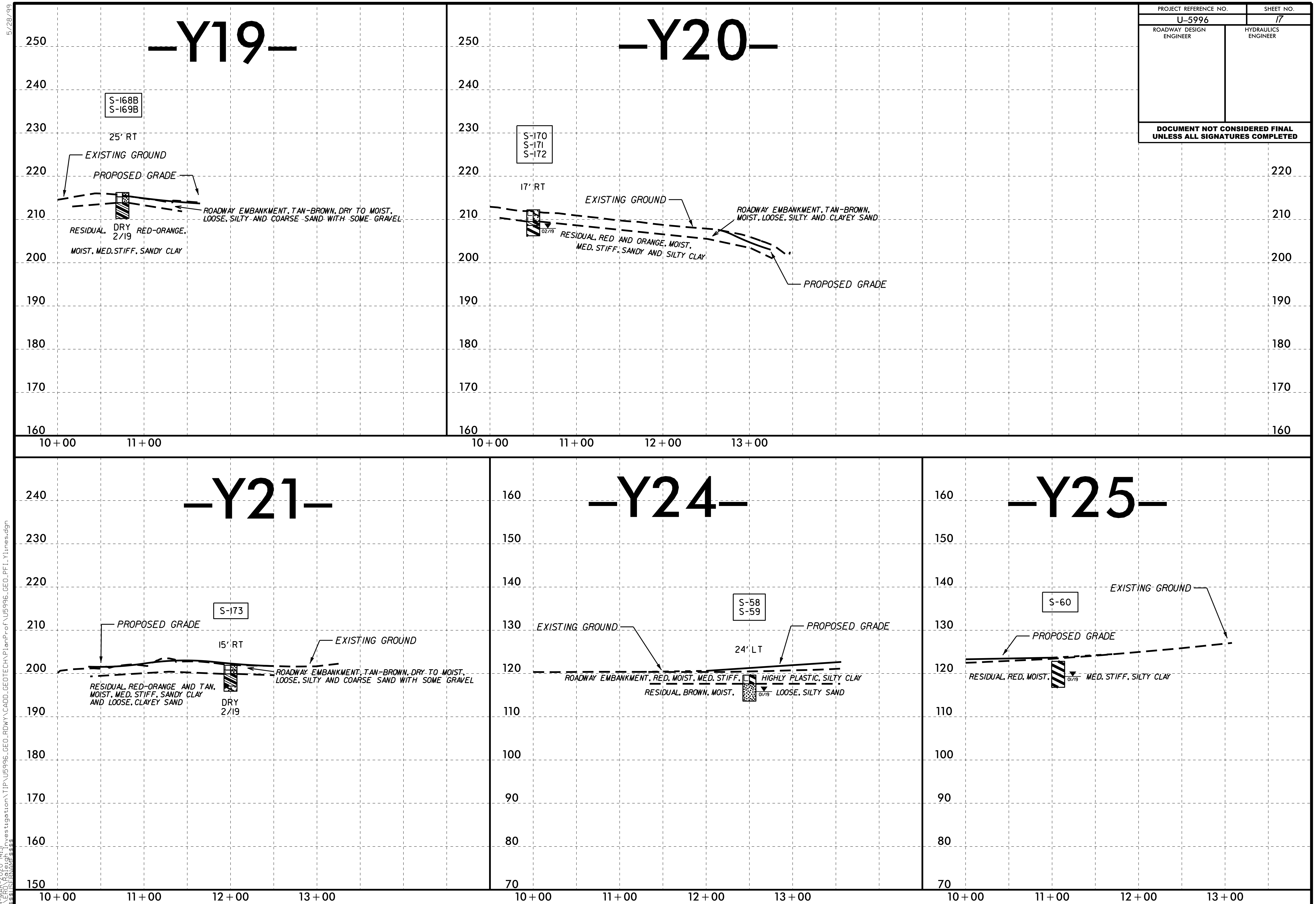
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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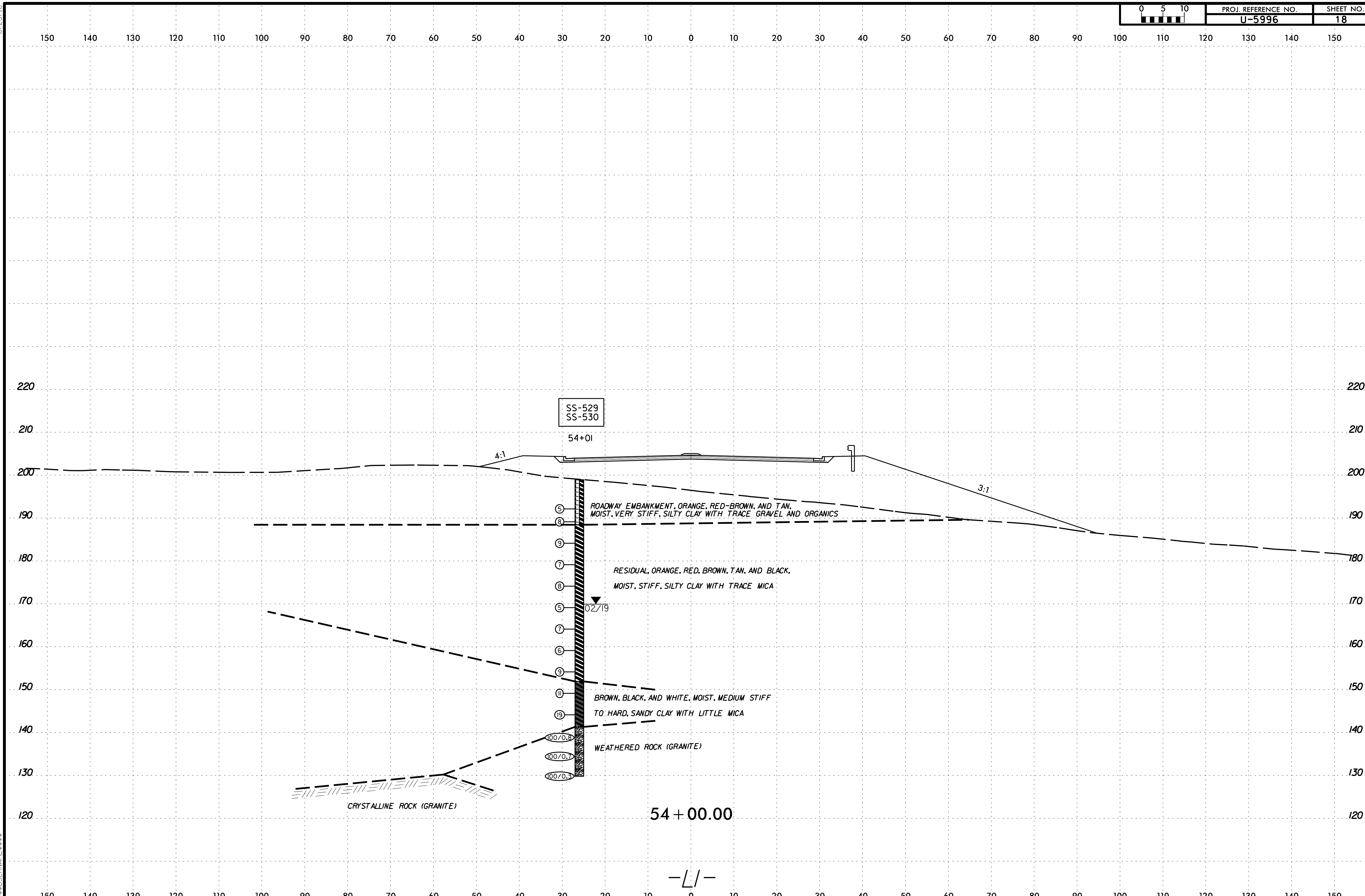

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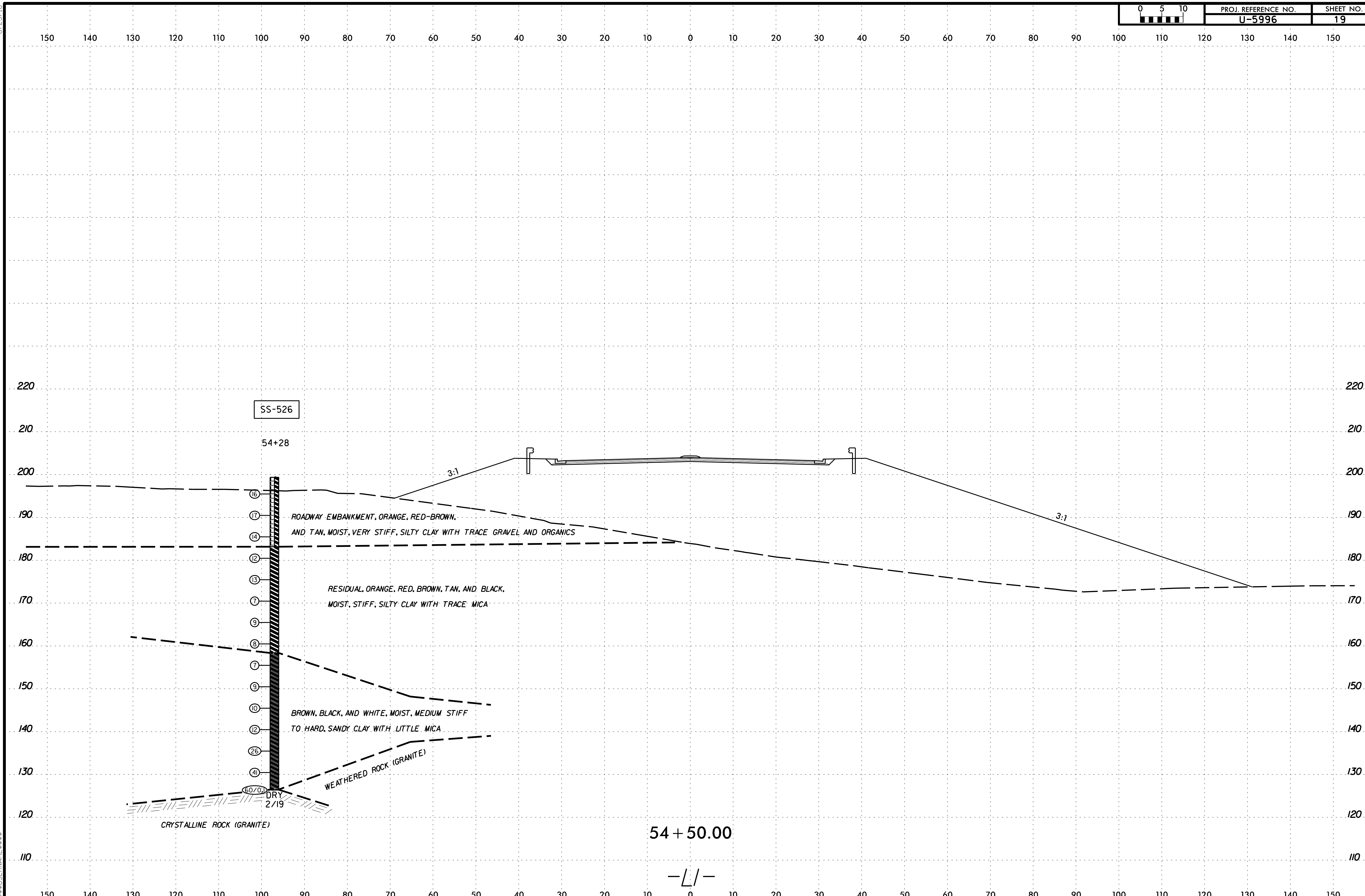

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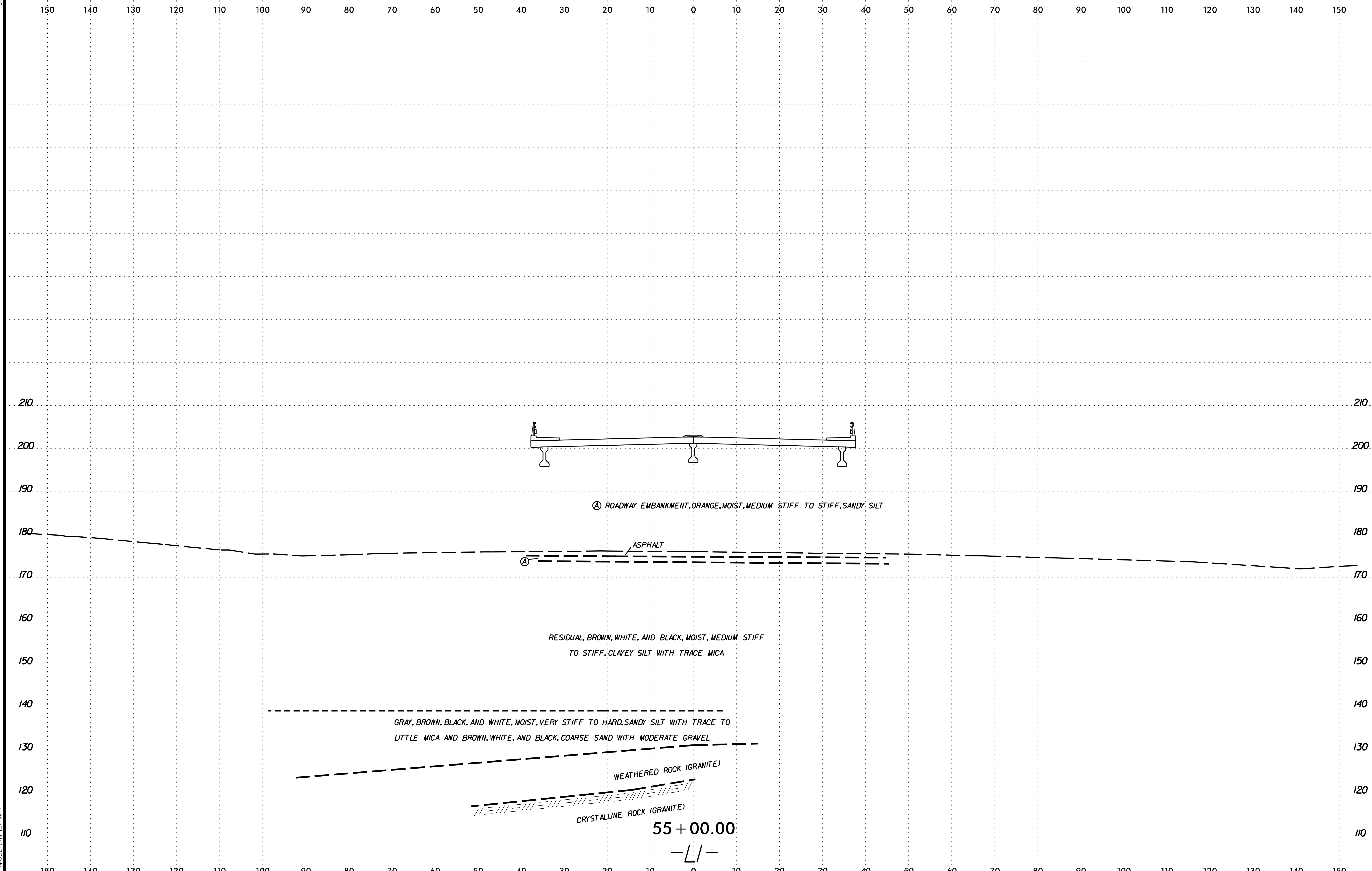

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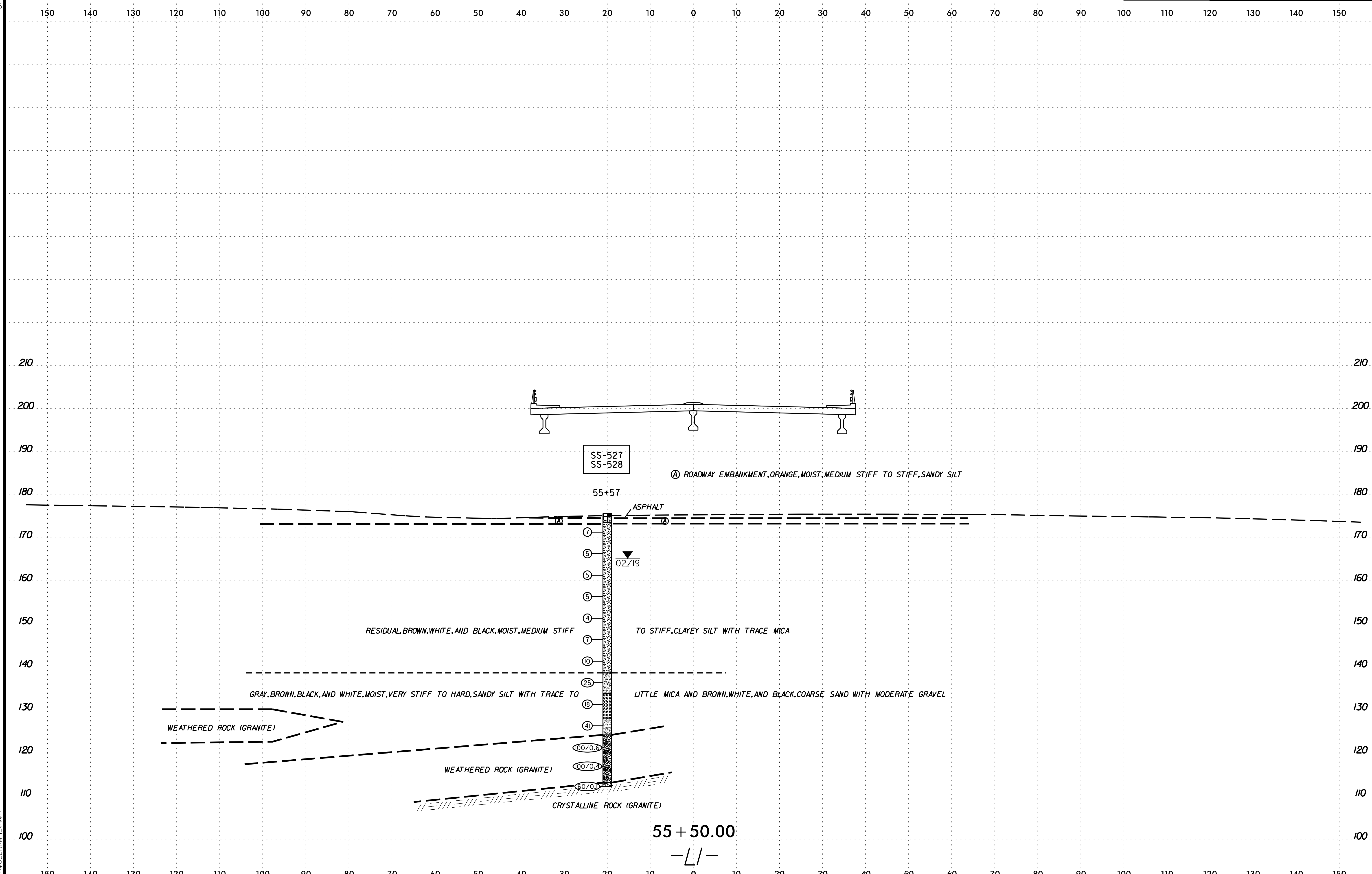

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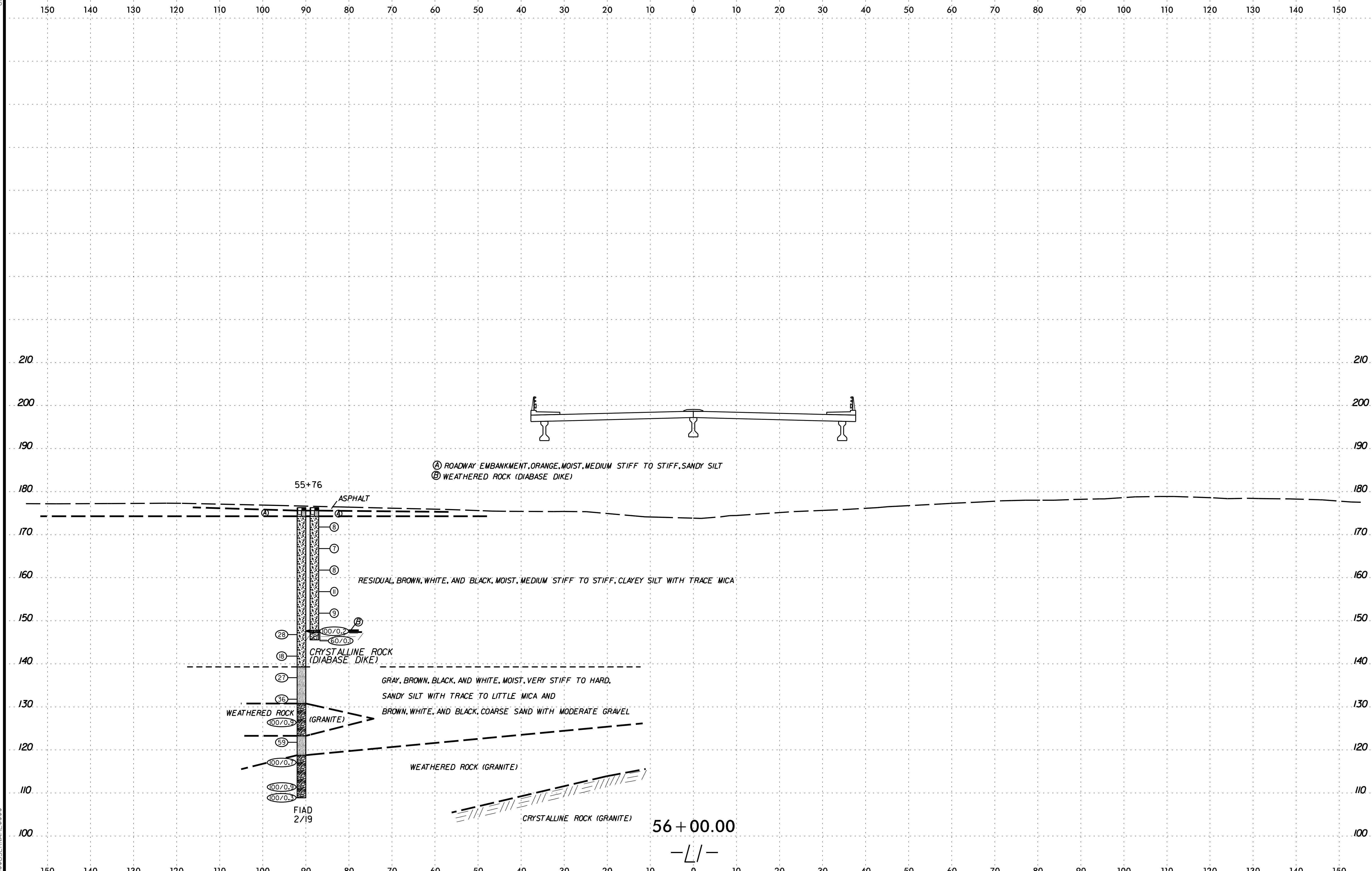

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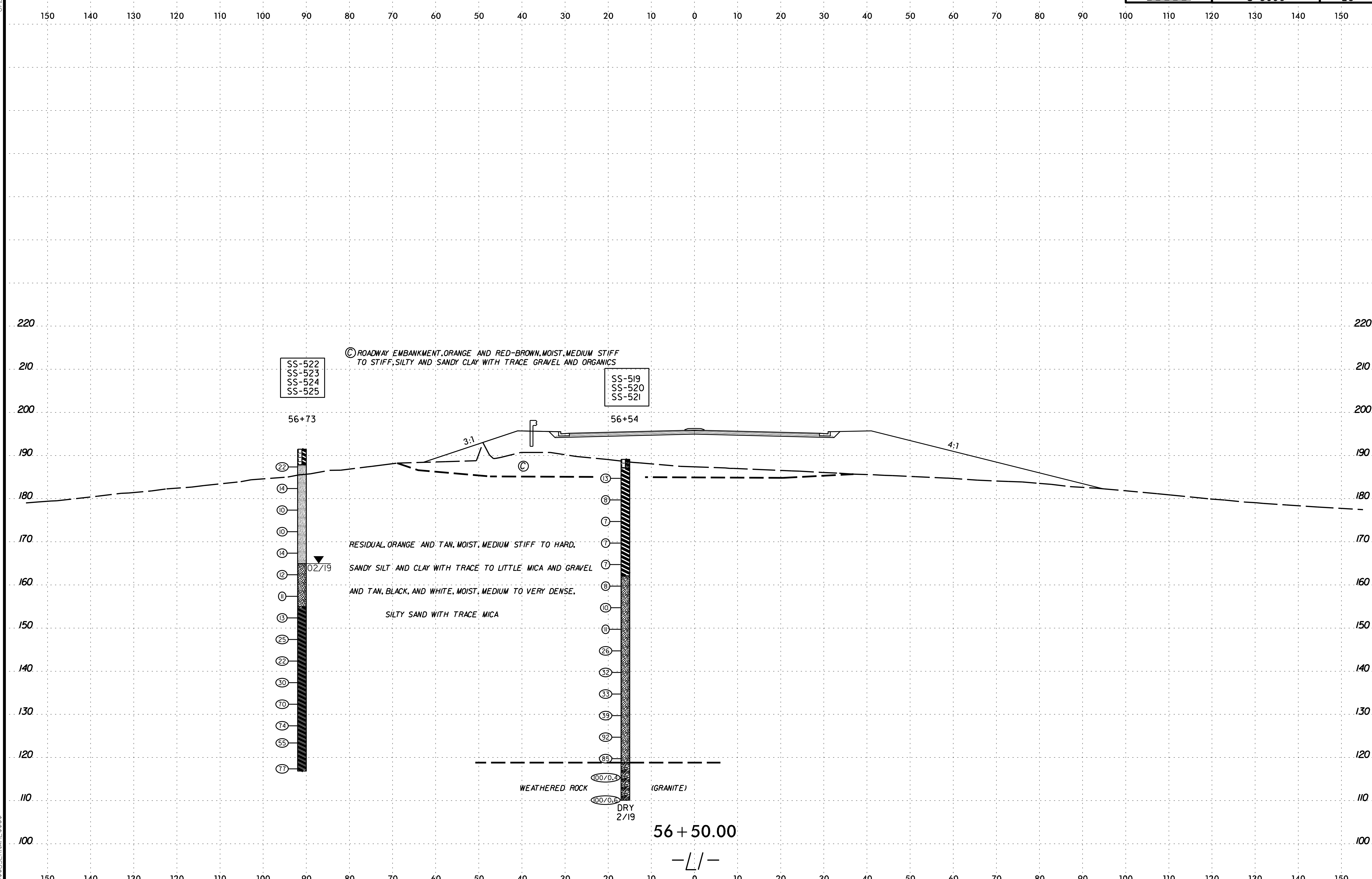

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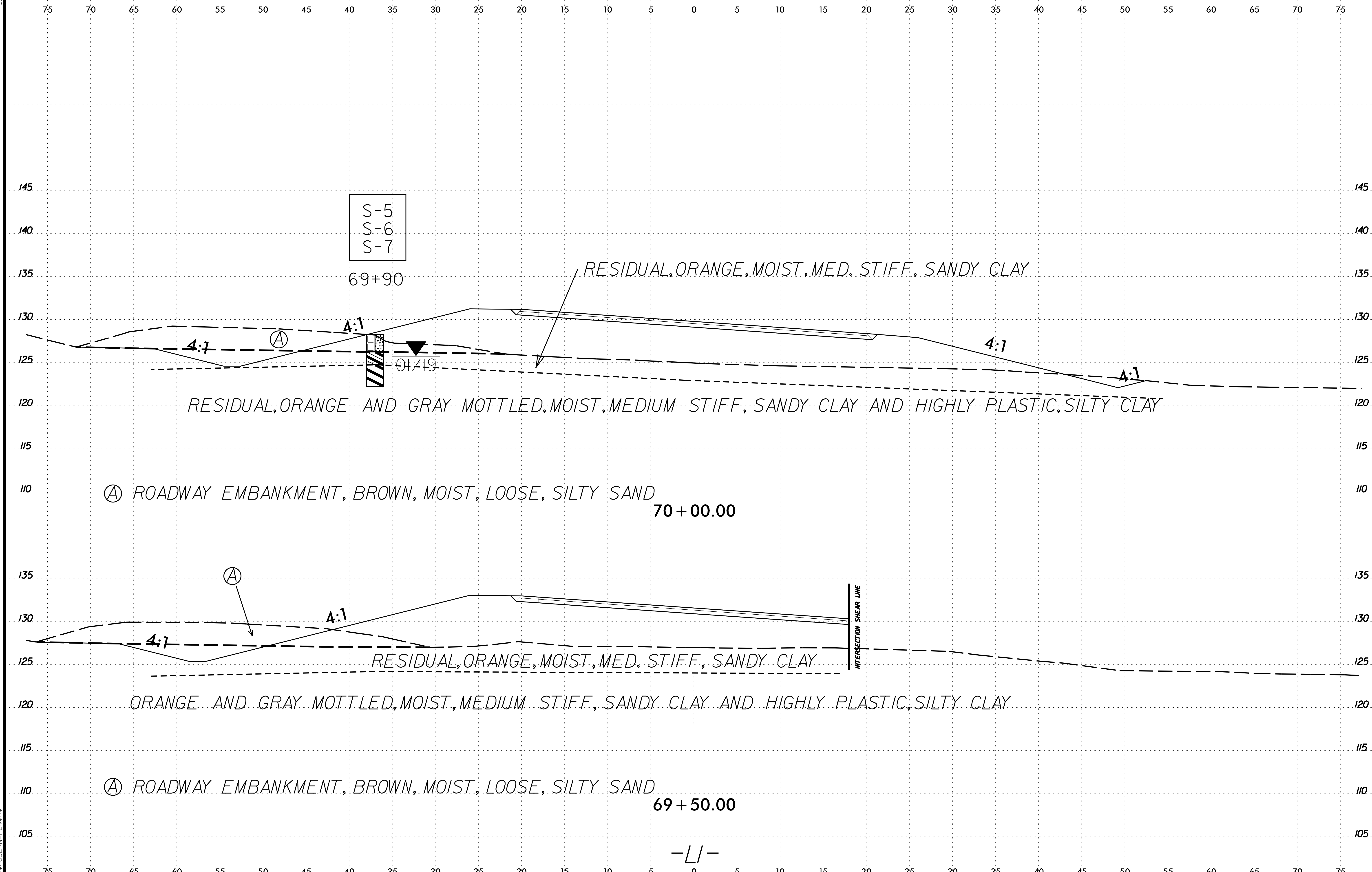

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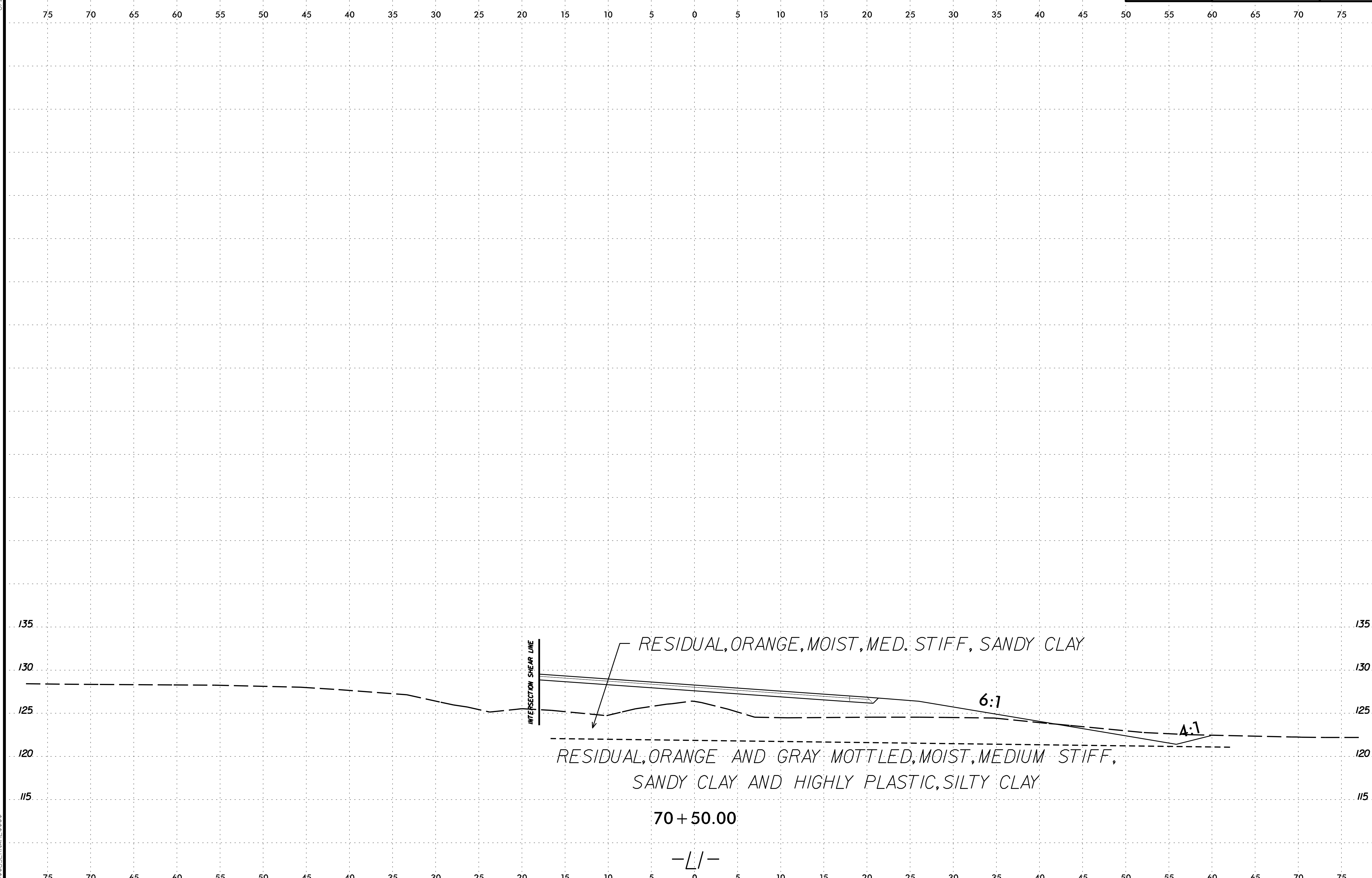

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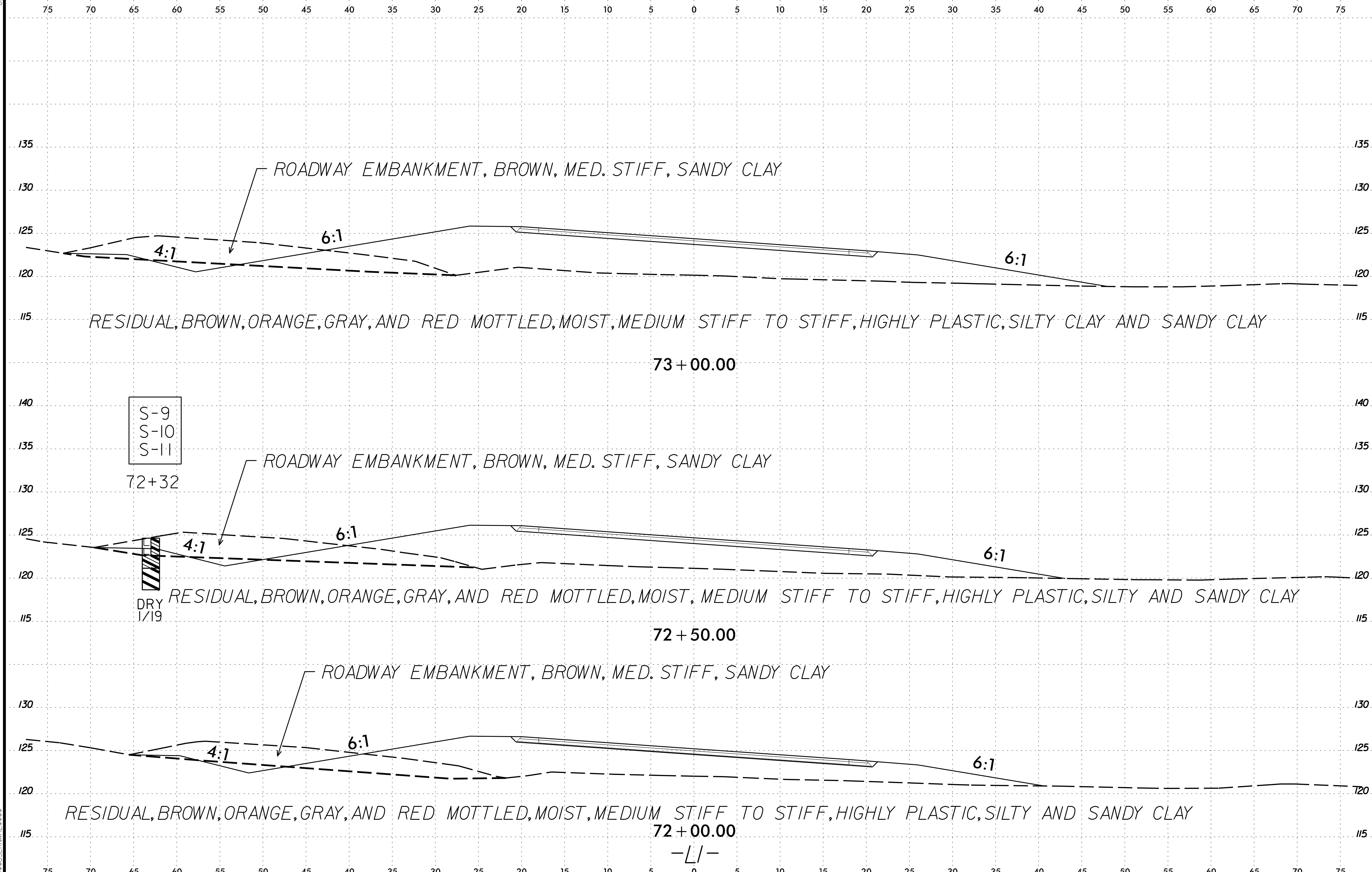

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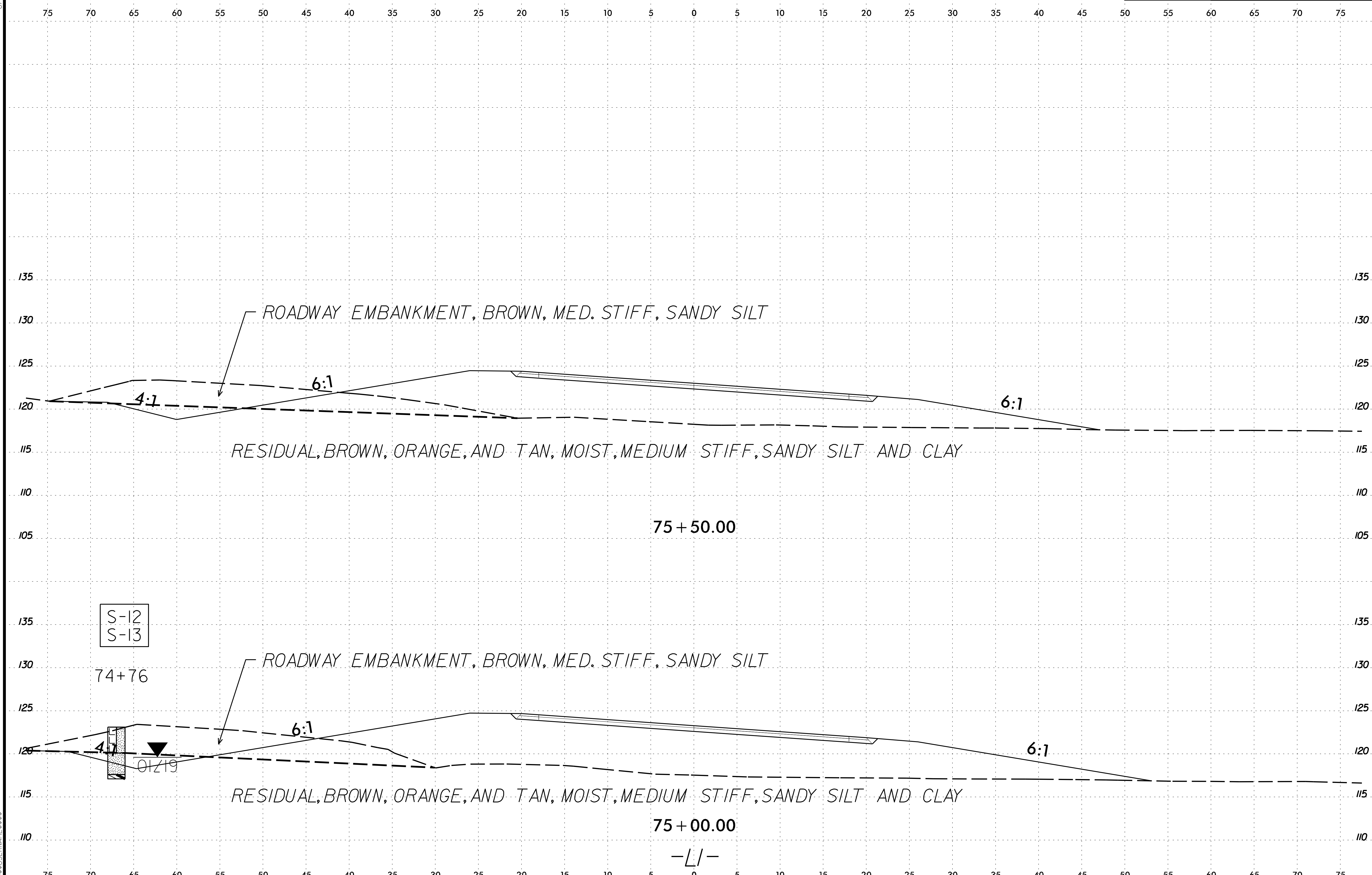

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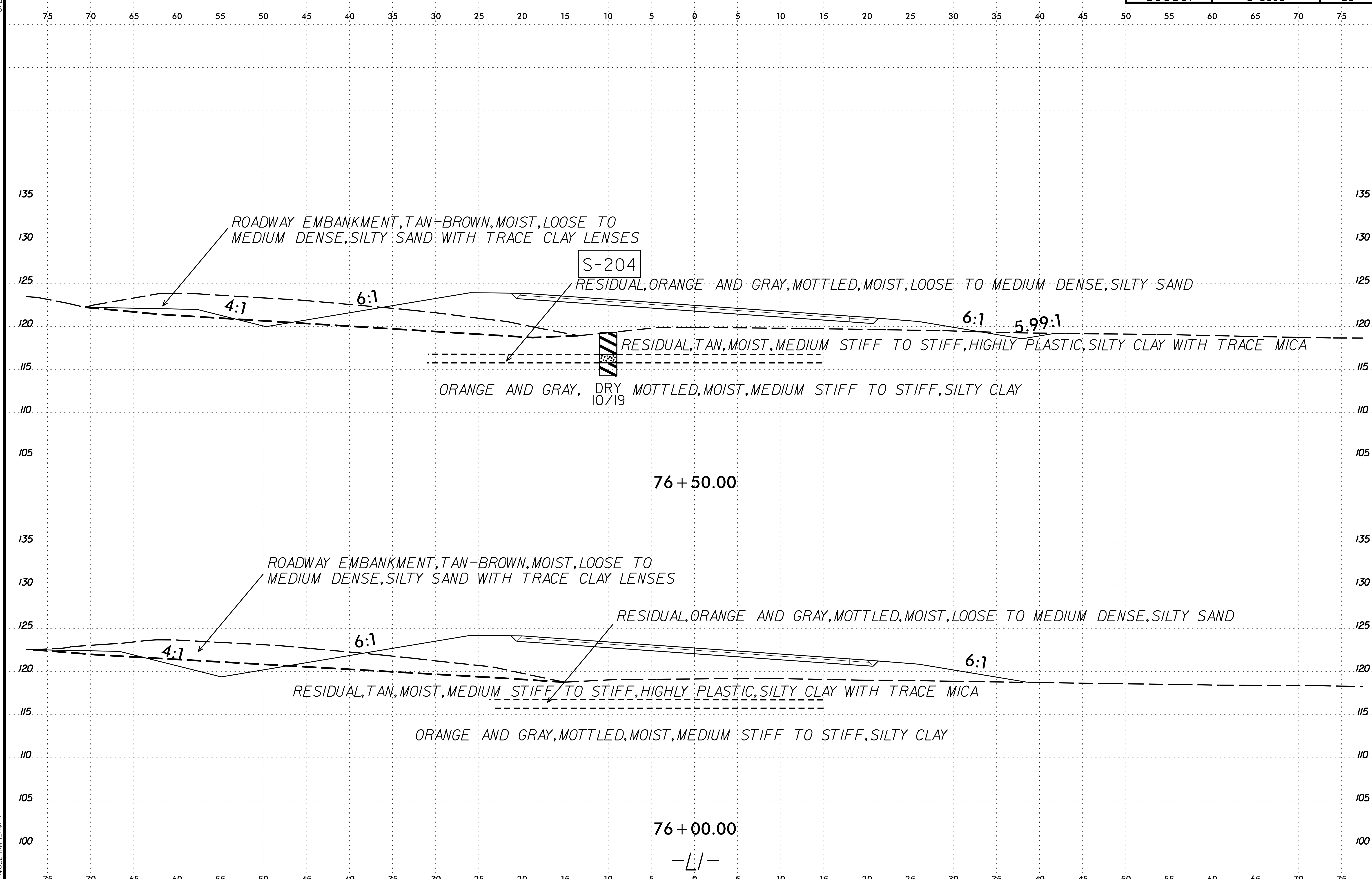

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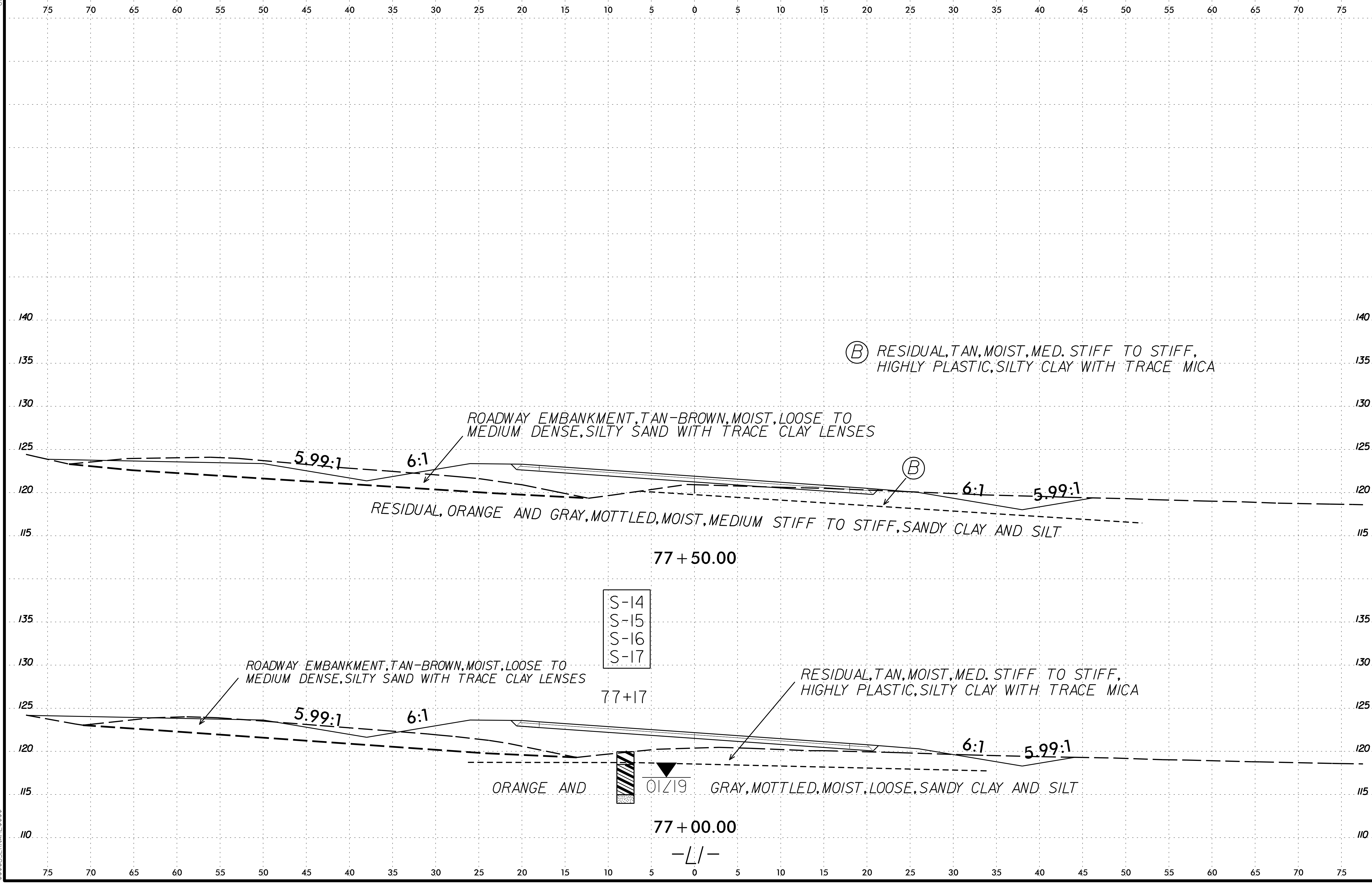

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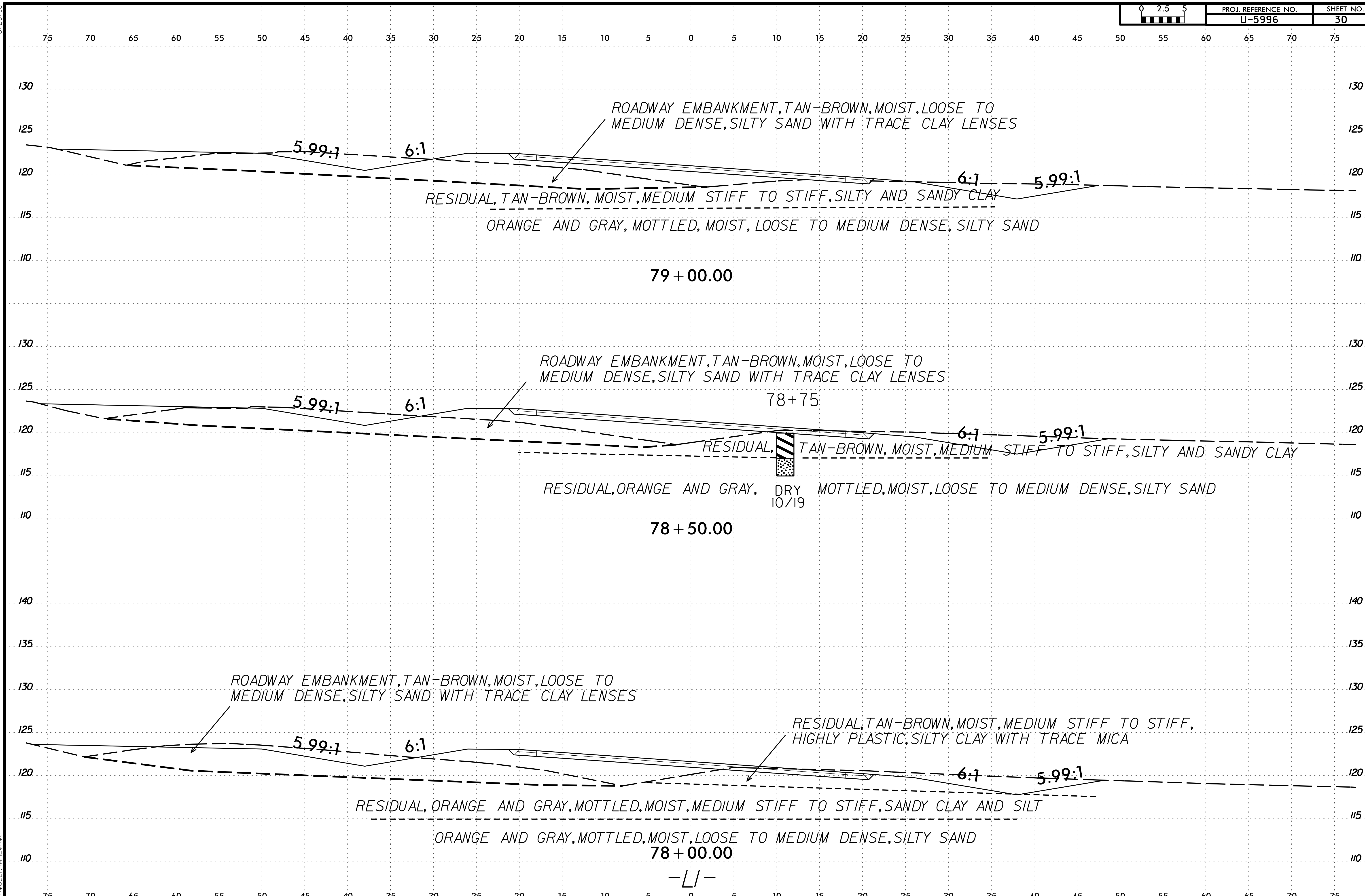

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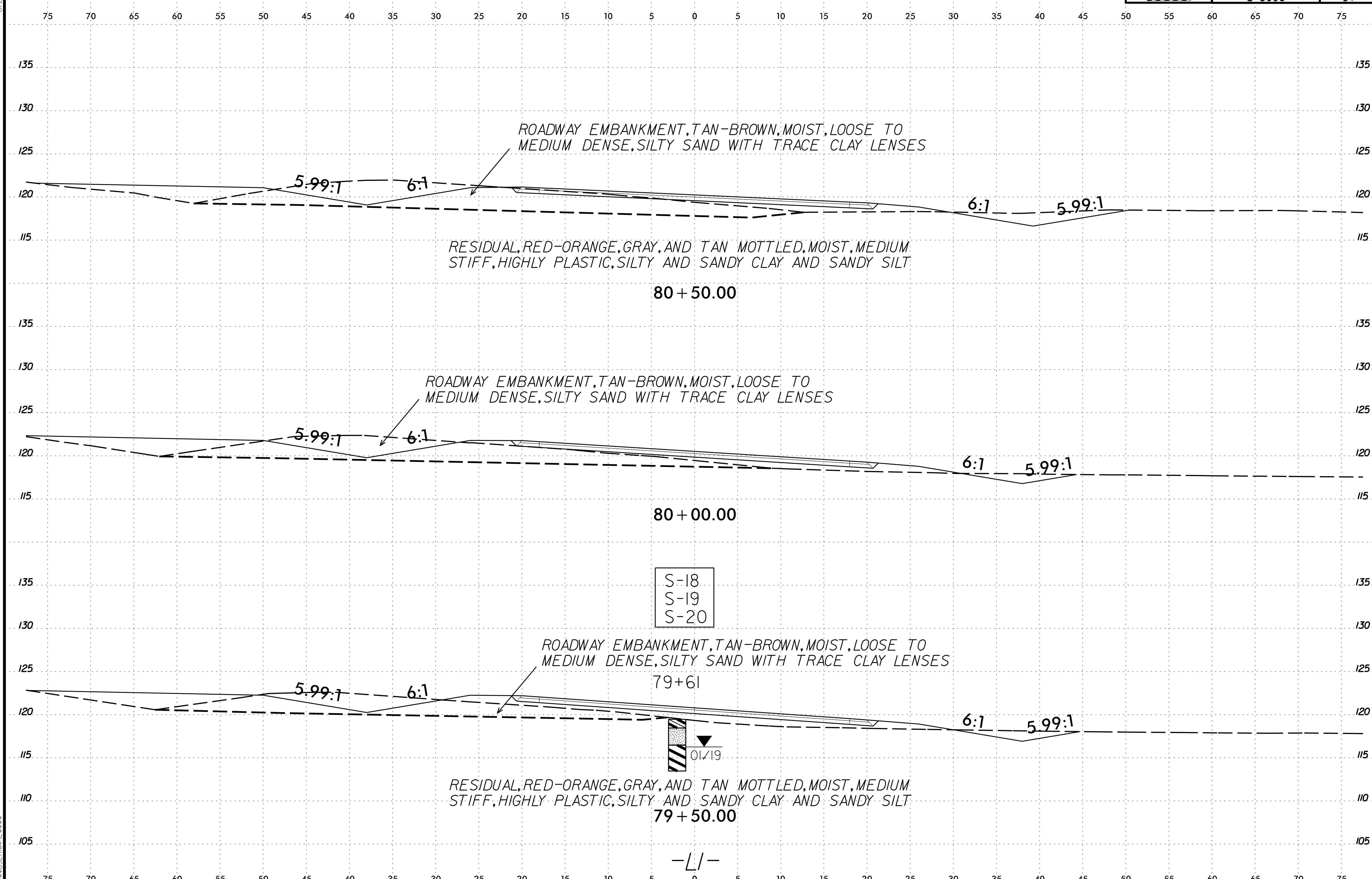

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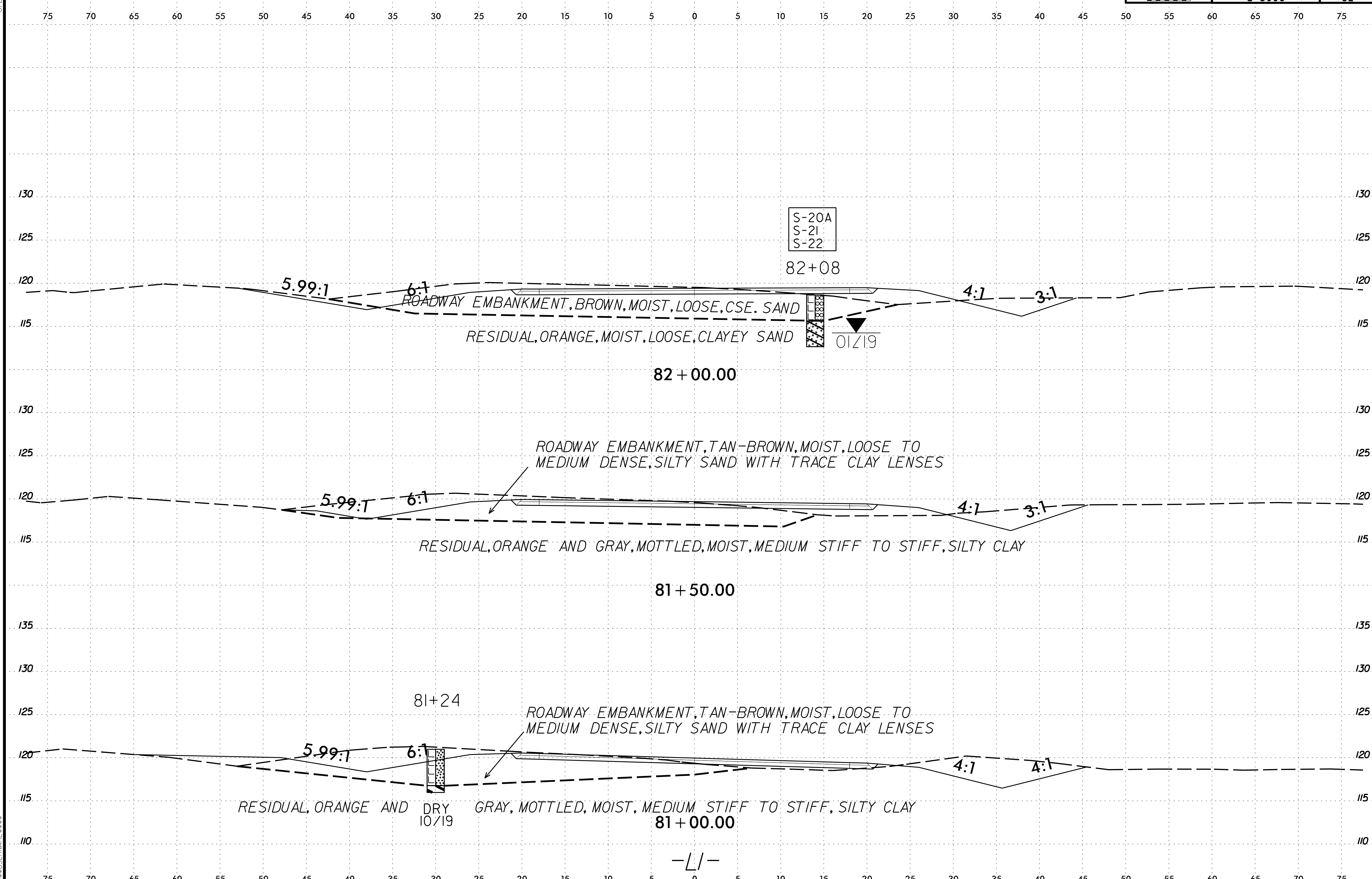

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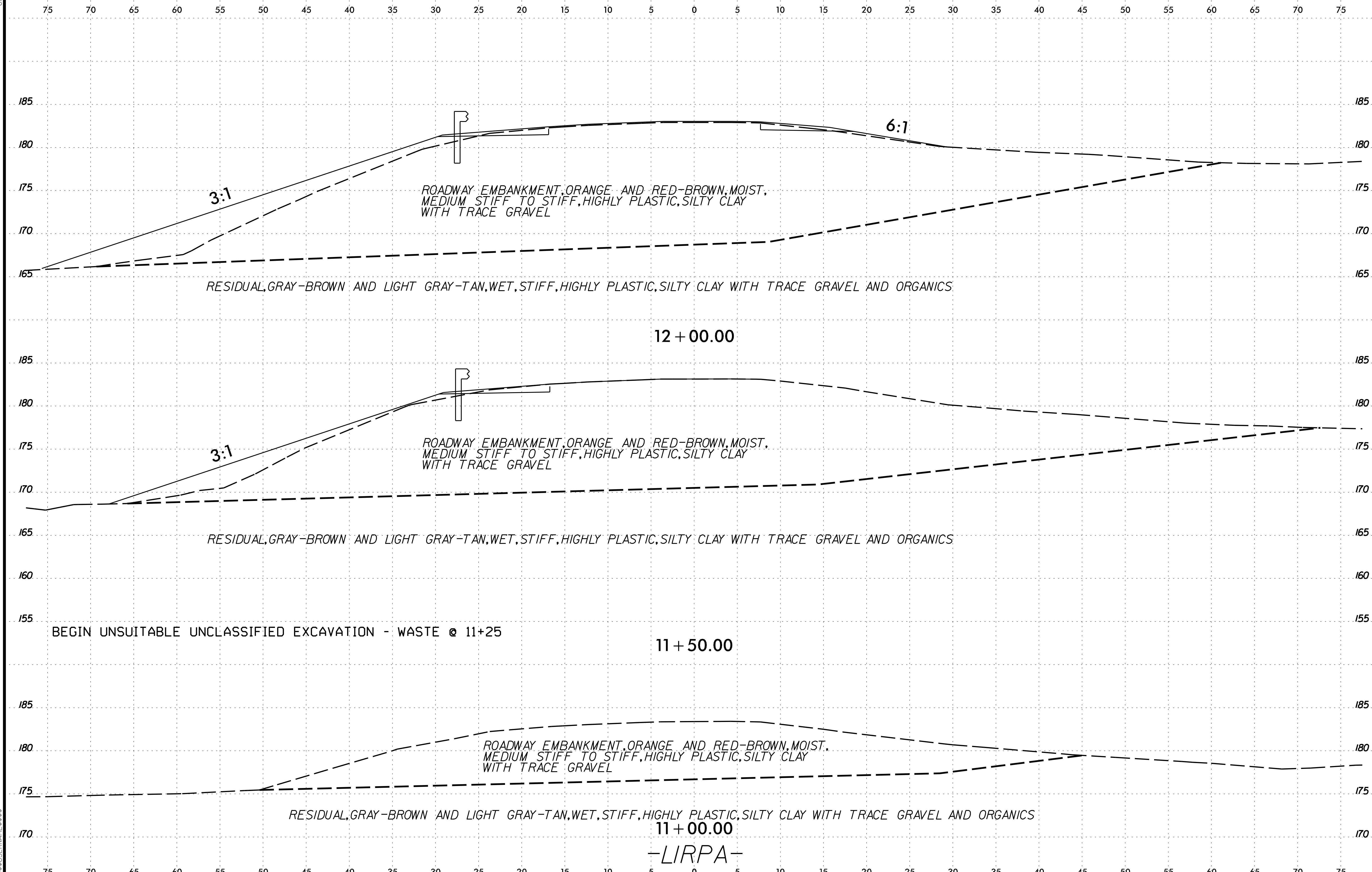

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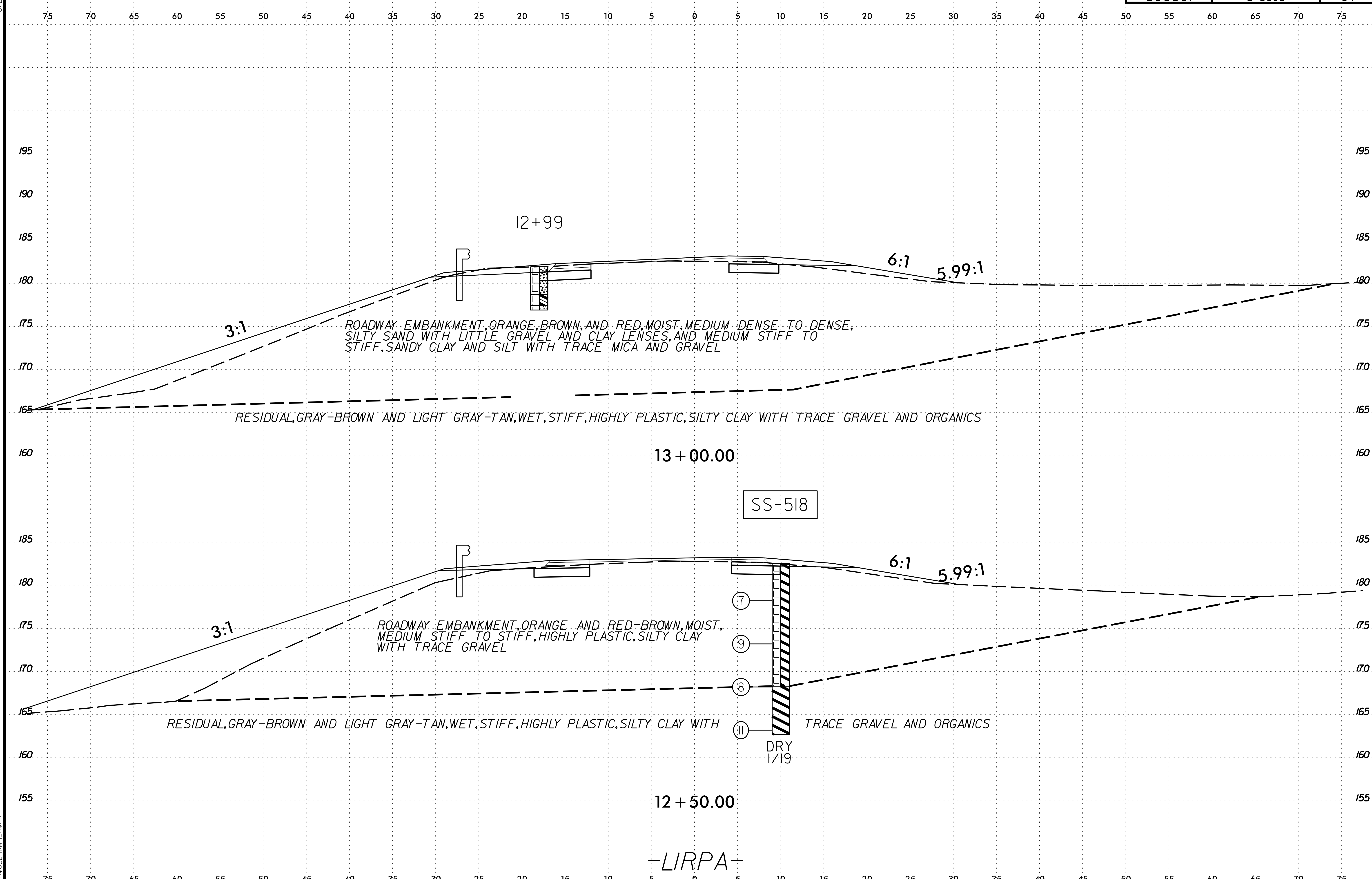

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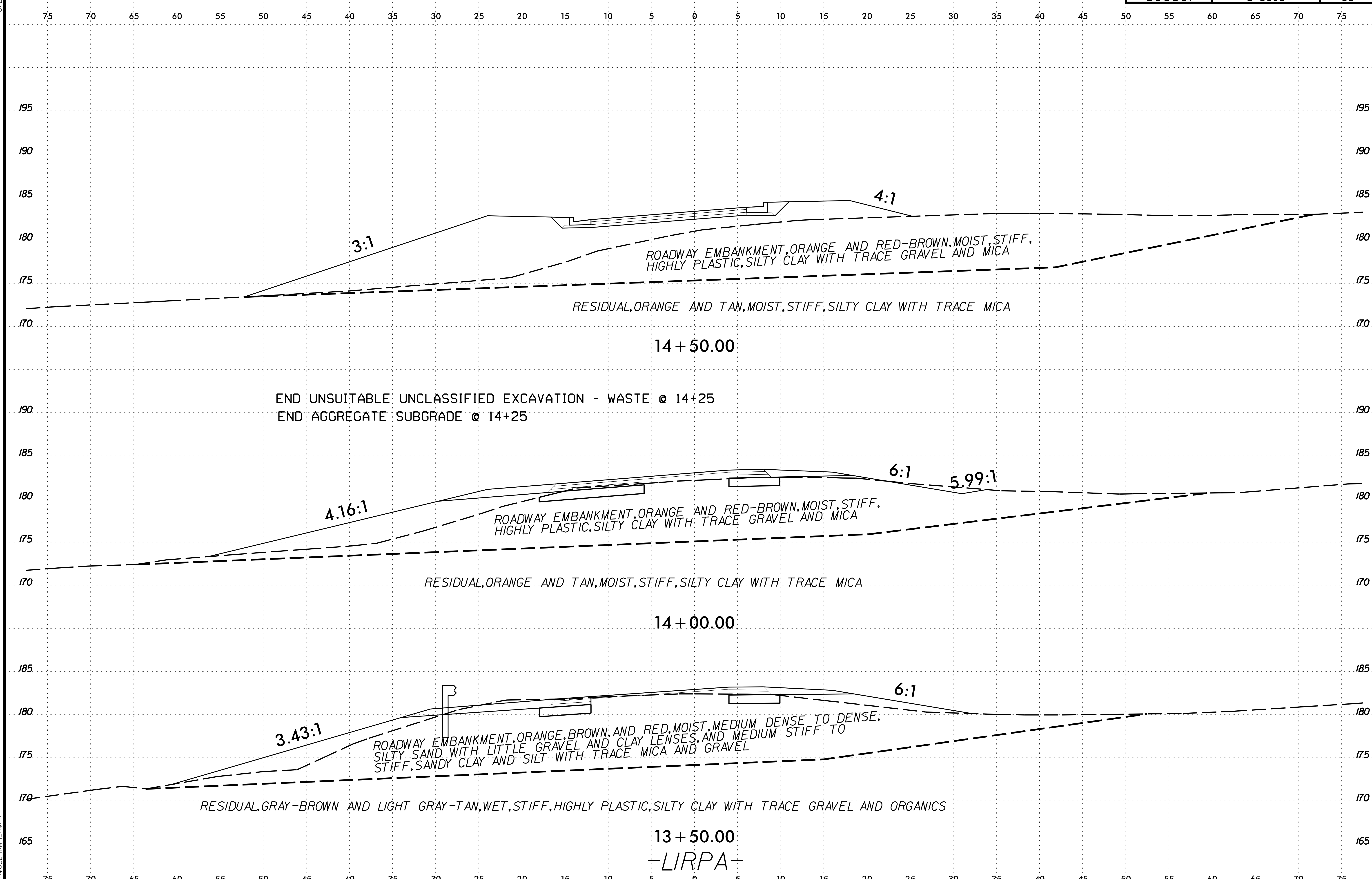

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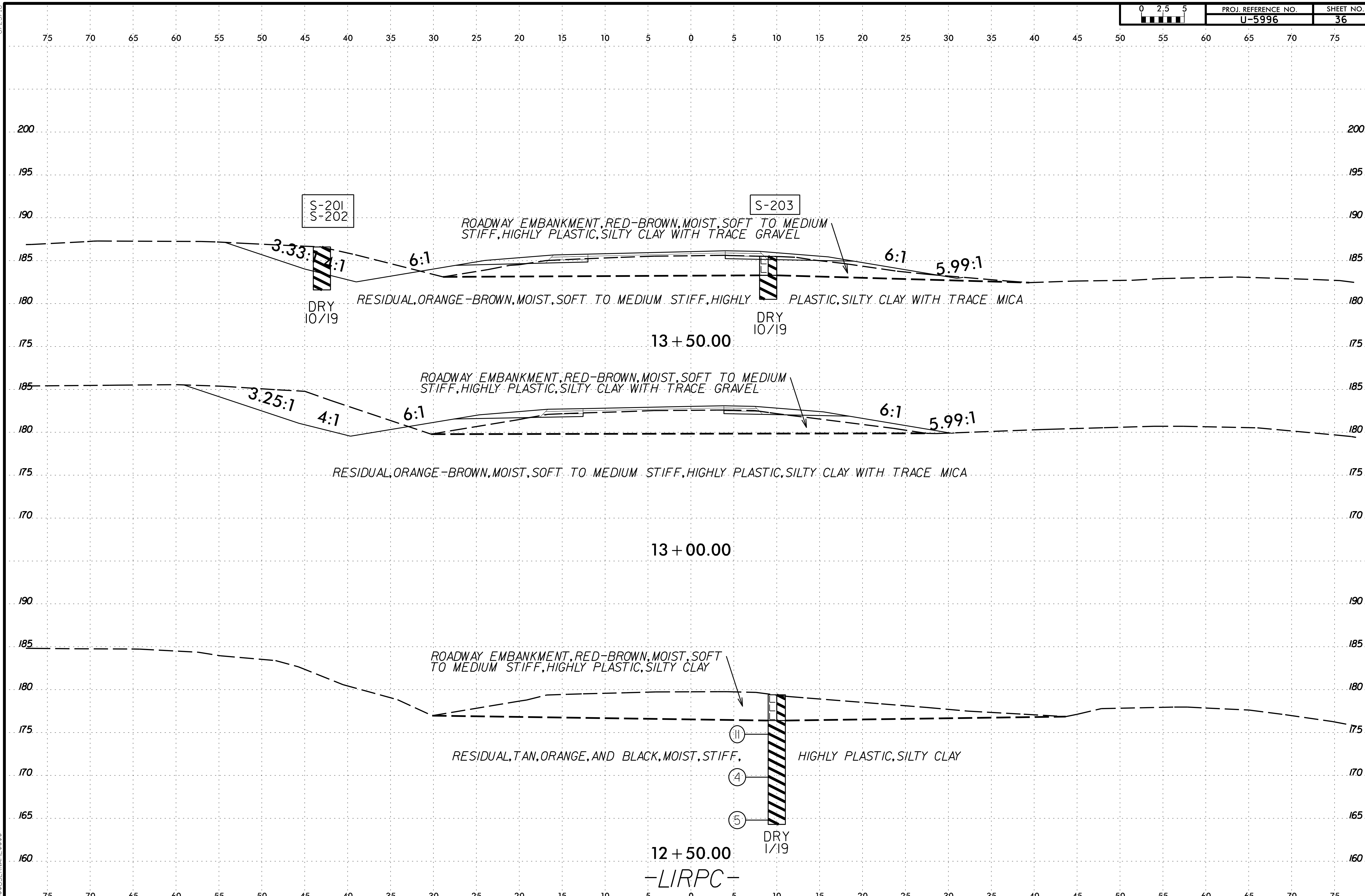

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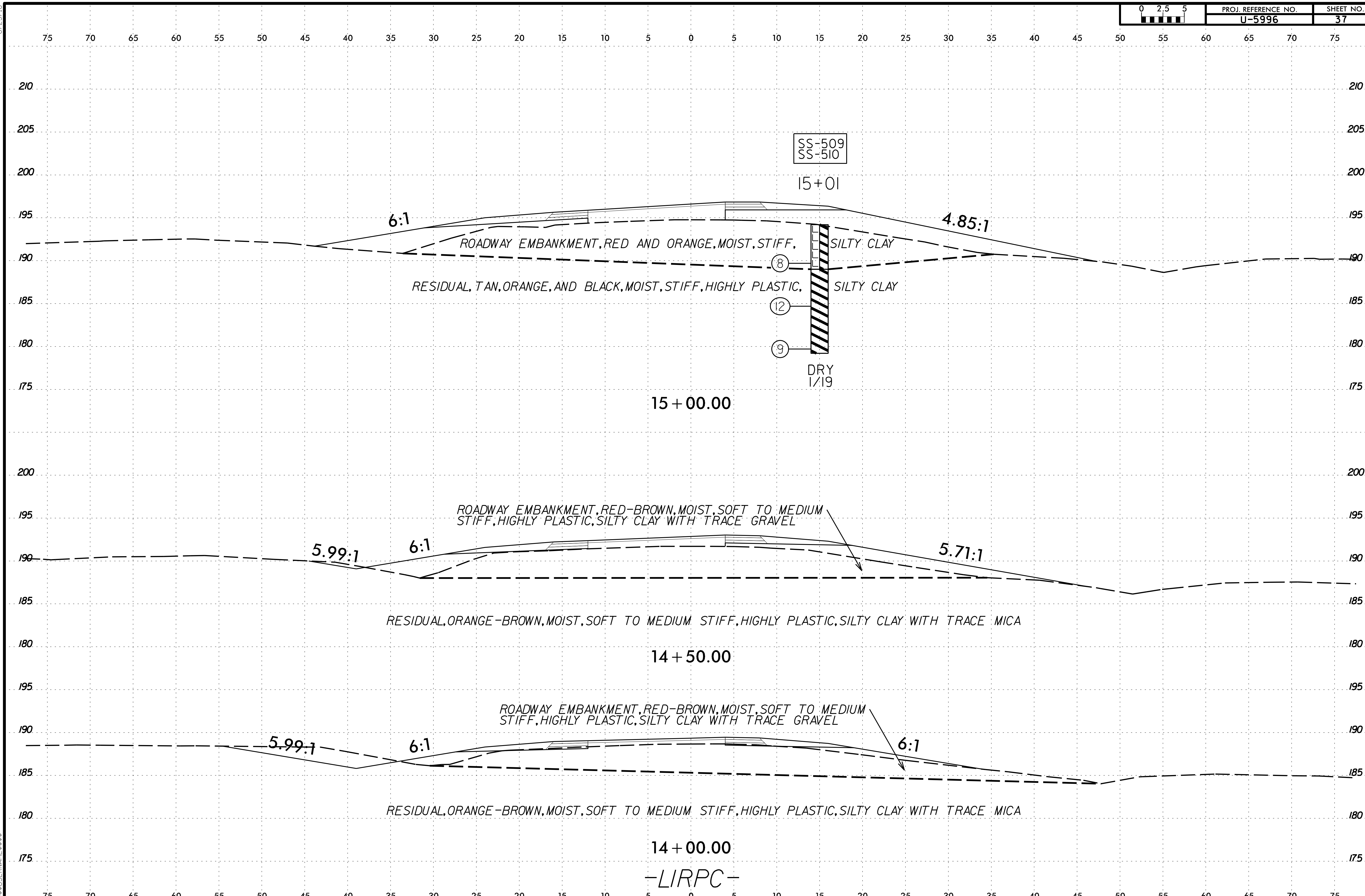

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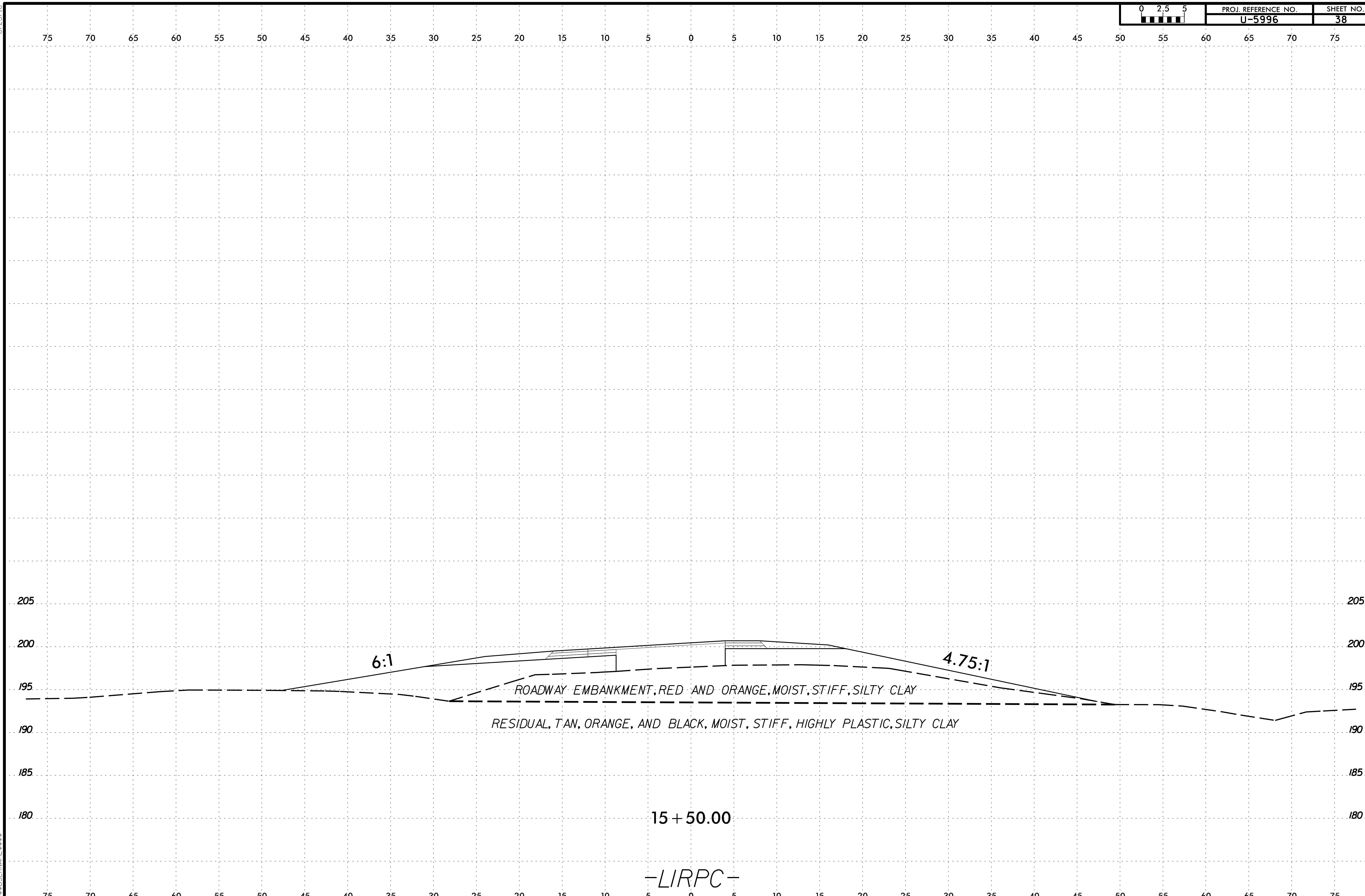

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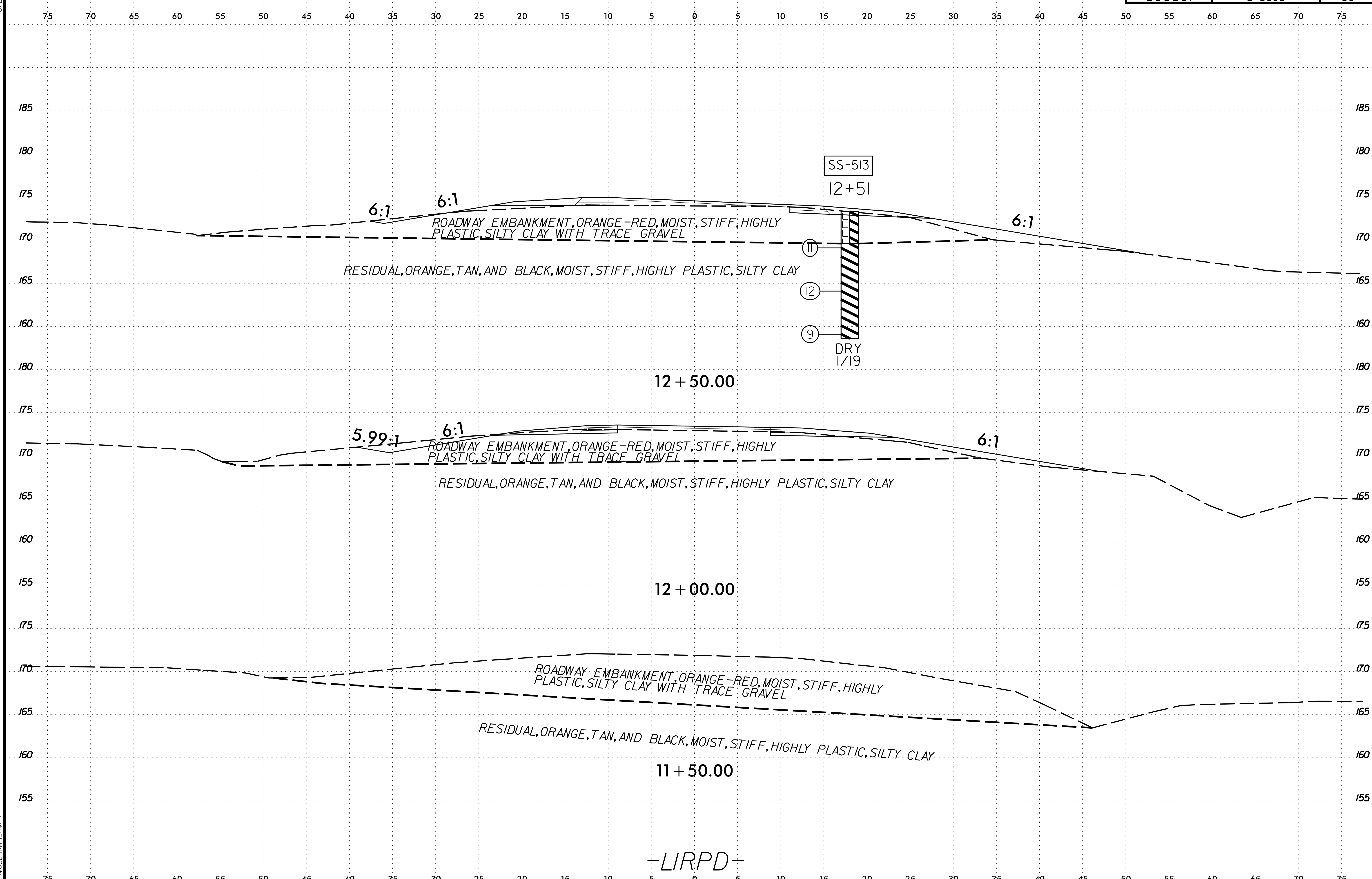

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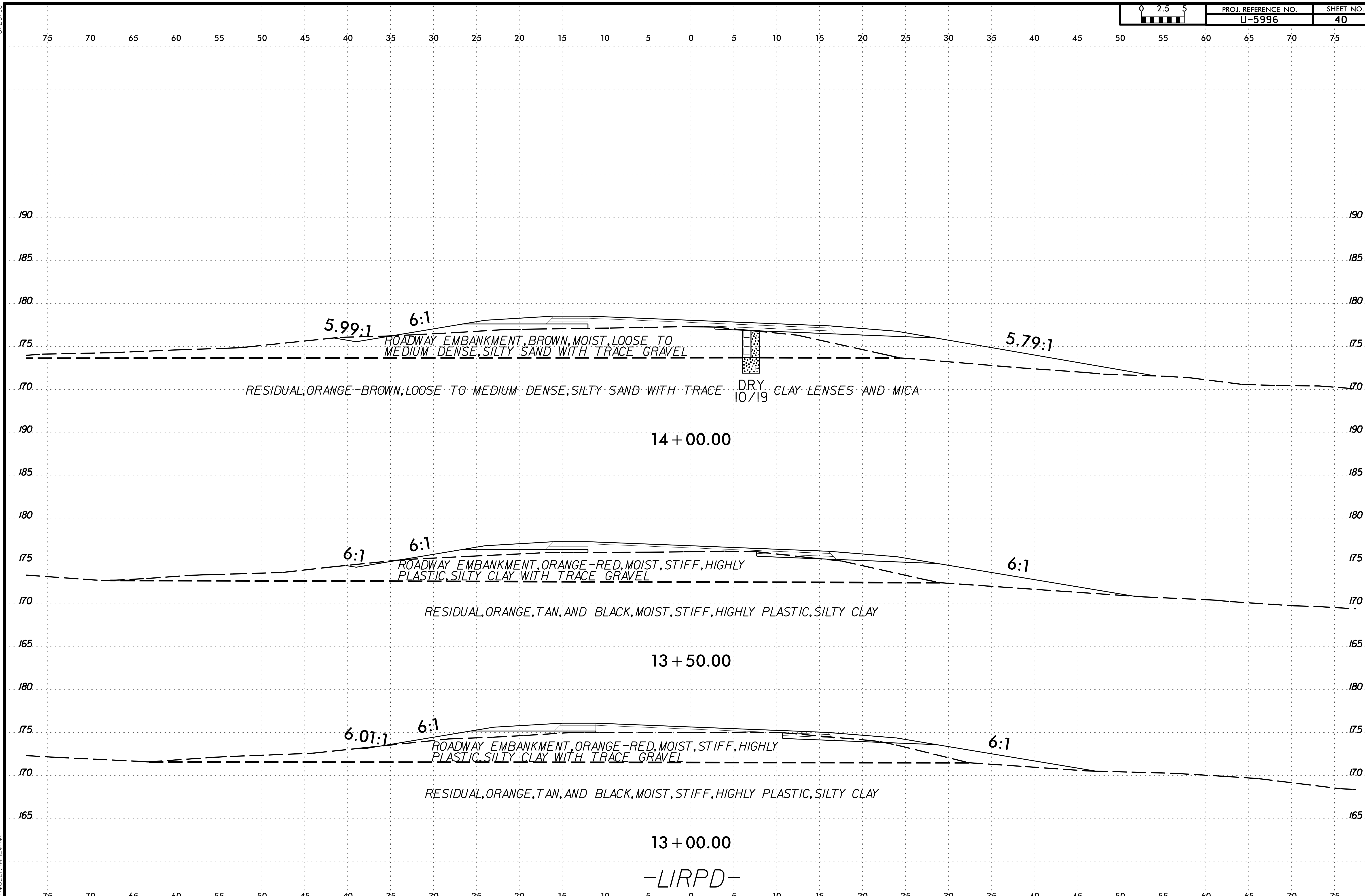
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5.79:1
RESIDUAL, ORANGE-BROWN, LOOSE TO MEDIUM DENSE, SILTY SAND WITH TRACE CLAY LENSES AND MICA
DRY 10/19
14+00.00
6:1
6:1
ROADWAY EMBANKMENT, ORANGE-RED, MOIST, STIFF, HIGHLY PLASTIC, SILTY CLAY WITH TRACE GRAVEL
6:1
RESIDUAL, ORANGE, TAN, AND BLACK, MOIST, STIFF, HIGHLY PLASTIC, SILTY CLAY
13+50.00
6.01:1
6:1
ROADWAY EMBANKMENT, ORANGE-RED, MOIST, STIFF, HIGHLY PLASTIC, SILTY CLAY WITH TRACE GRAVEL
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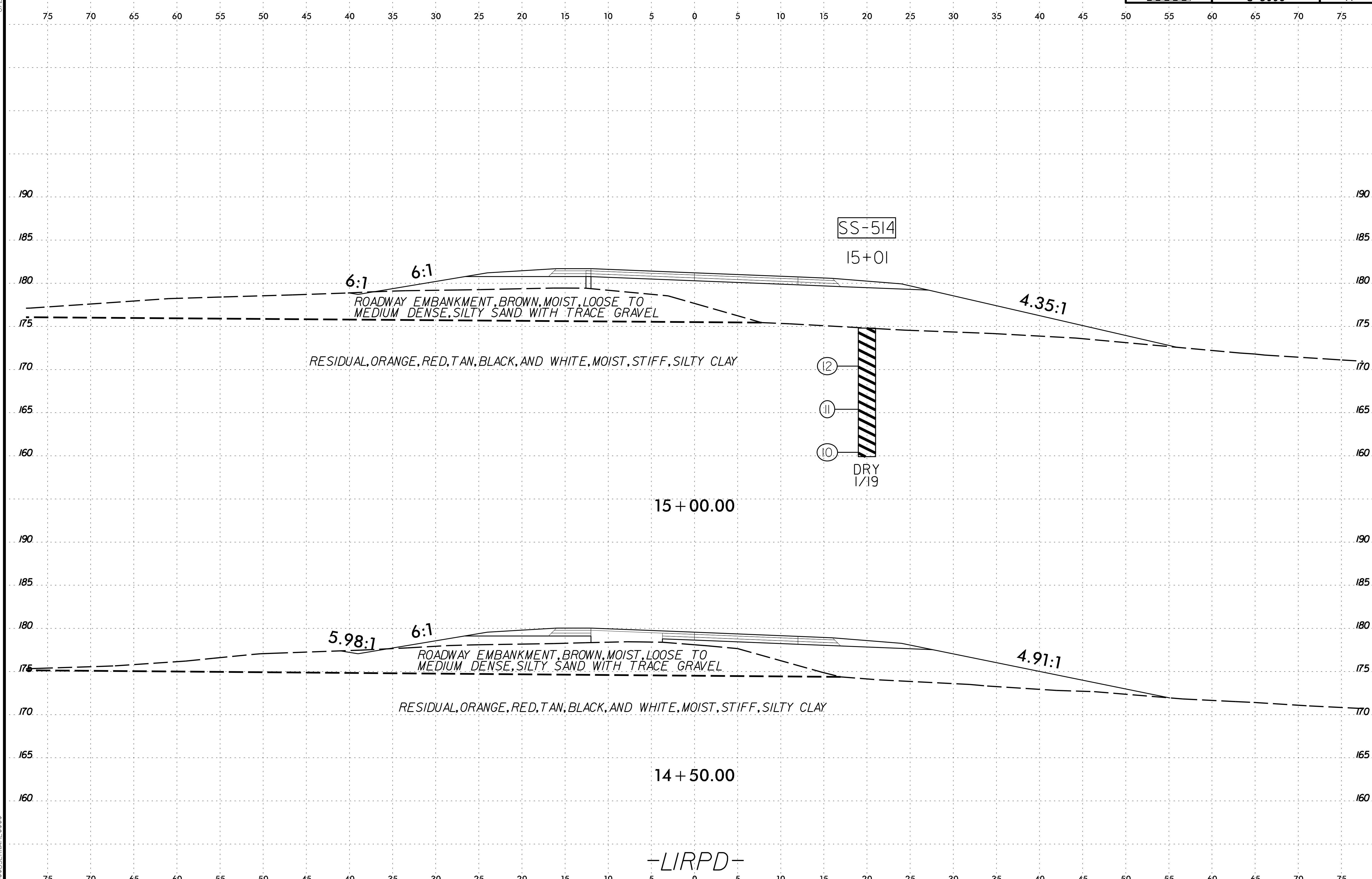
RESIDUAL, ORANGE, TAN, AND BLACK, MOIST, STIFF, HIGHLY PLASTIC, SILTY CLAY
13+00.00

-LIRPD-



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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

APPENDIX A:
SOIL TEST RESULTS

LABORATORY TESTING SUMMARY

PROJECT NUMBER: 47133.1.1 **TIP:** U-5996 **COUNTY:** Nash

DESCRIPTION: Eastern Ave. Widening

Sample No.	Alignment	Station	Offset (feet)	Depth Interval (feet)	AASHTO Class.	L.L.	P.I.	% by Weight				% Retained #4 Sieve	% Passing (sieves)			% Moisture	% Organic
								Coarse Sand	Fine Sand	Silt	Clay		#10	#40	#200		
S-165	-L1-	32+50	20 RT	2.0 - 6.0	A-2-6 (2)	39	25	42.3	23.1	2.8	31.8	7	92	76	33	18.9	--
S-167A	-L1-	37+50	5 RT	0.0 - 6.0	A-6 (5)	38	23	34.4	24.1	4.8	36.7	0	100	87	43	18.7	--
S-168A	-L1-	40+00	5 RT	0.0 - 4.8	A-2-6 (0)	34	16	50.7	25.7	0.5	23.1	0	100	82	25	15.7	--
S-169A	-L1-	40+00	5 RT	4.8 - 6.0	A-2-6 (1)	40	18	47.9	20.8	0.7	30.6	0	100	82	32	17.7	--
S-174	-L1-	45+00	5 RT	0.0 - 5.0	A-2-4 (0)	15	NP	49.5	32.2	2.6	15.7	1	98	77	20	10.5	--
S-175	-L1-	49+99	15 LT	3.1 - 6.0	A-7-5 (18)	52	17	2.9	20.4	39.0	37.7	0	100	99	84	34.6	--
SS-529	-L1-	54+01	26 LT	8.8 - 10.3	A-7-5 (16)	56	25	17.4	21.3	12.8	48.5	0	100	92	64	25.7	--
SS-530	-L1-	54+01	26 LT	18.8 - 20.3	A-7-5 (7)	55	11	13.1	37.0	28.0	21.9	0	100	96	57	45.6	--
SS-526	-L1-	54+28	97 LT	17.9 - 19.4	A-7-5 (20)	68	19	1.6	32.1	37.9	28.4	0	100	100	78	42.9	--
SS-527	-L1-	55+57	20 LT	3.3 - 4.8	A-5 (2)	45	6	19.2	40.4	26.5	13.9	0	100	94	48	40.2	--
SS-528	-L1-	55+57	20 LT	38.3 - 39.8	A-4 (0)	16	NP	32.2	38.7	21.2	7.9	0	100	82	37	25.4	--
SS-519	-L1-	56+54	16 LT	3.4 - 4.9	A-7-5 (25)	75	43	20.8	20.8	10.6	47.8	1	98	88	61	23.5	--
SS-520	-L1-	56+54	16 LT	18.4 - 19.9	A-7-5 (8)	56	15	17.4	32.4	29.1	21.1	0	100	90	57	38.3	--
SS-521	-L1-	56+54	16 LT	28.4 - 29.9	A-2-5 (0)	46	9	37.8	28.8	21.9	11.5	0	100	84	35	37.2	--
SS-522	-L1-	56+73	91 LT	3.6 - 4.6	A-4 (1)	37	9	36.9	28.0	10.0	25.1	0	98	74	39	22.9	--
SS-523	-L1-	56+73	91 LT	18.1 - 19.6	A-4 (0)	36	NP	21.9	41.5	22.4	14.2	0	100	91	44	26.8	--
SS-524	-L1-	56+73	91 LT	28.1 - 29.6	A-2-4 (0)	31	NP	30.7	41.7	19.8	7.8	0	99	85	35	24.1	--
SS-525	-L1-	56+73	91 LT	58.1 - 59.6	A-6 (2)	38	8	12.9	47.3	26.5	13.3	0	100	95	51	18.4	--
SS-515	-L1-	57+59	27 LT	3.0 - 4.5	A-7-6 (18)	55	29	17.4	20.6	16.5	45.5	1	97	88	65	25.2	--
SS-516	-L1-	57+59	27 LT	8.0 - 9.5	A-7-5 (17)	60	18	5.4	26.7	29.8	38.1	0	100	98	75	32.7	--
SS-531	-L1-	64+17	15 LT	8.5 - 10.0	A-7-6 (10)	47	23	22.0	28.0	17.8	32.2	0	99	86	55	29.3	--
S-1	-L1-	67+46	52 LT	0.0 - 1.0	A-2-4 (0)	17	NP	40.1	38.2	9.1	12.6	0	98	79	25	15.0	--
S-2	-L1-	67+46	52 LT	1.0 - 3.5	A-7-6 (18)	57	29	18.8	18.8	14.3	48.1	0	99	90	65	24.8	--
S-3	-L1-	67+46	52 LT	3.5 - 5.0	A-7-6 (16)	50	26	18.5	16.7	16.7	48.1	0	98	89	67	31.4	--
S-4	-L1-	67+46	52 LT	5.0 - 6.0	A-2-6 (2)	34	19	41.7	25.5	7.1	25.7	0	98	75	35	24.9	--
S-5	-L1-	69+90	37 LT	0.0 - 2.0	A-2-4 (0)	18	4	32.2	36.9	17.2	13.7	1	95	79	35	12.3	--
S-6	-L1-	69+90	37 LT	2.0 - 3.5	A-6 (4)	37	20	29.8	28.5	10.7	31.0	0	95	80	43	16.5	--
S-7	-L1-	69+90	37 LT	3.5 - 6.0	A-7-6 (13)	57	34	26.1	26.8	9.1	38.0	0	99	88	50	21.9	--
S-9	-L1-	72+32	63 LT	0.0 - 2.0	A-6 (1)	32	13	31.0	32.7	14.0	22.3	1	95	80	38	20.4	--
S-10	-L1-	72+32	63 LT	2.0 - 3.5	A-6 (4)	32	17	20.4	38.8	10.0	30.8	0	100	91	46	21.6	--
S-11	-L1-	72+32	63 LT	3.5 - 6.0	A-7-5 (39)	77	41	4.0	20.0	21.0	55.0	0	100	97	82	57.1	--
S-12	-L1-	74+46	67 LT	0.0 - 5.5	A-4 (1)	26	10	32.2	31.8	15.1	20.9	1	97	79	40	16.1	--

NP - NON-PLASTIC

Stephanie H. Huffman

Certified Lab Technician Signature

114-01-1203

Certification Number

LABORATORY TESTING SUMMARY

PROJECT NUMBER: 47133.1.1 **TIP:** U-5996 **COUNTY:** Nash

DESCRIPTION: Eastern Ave. Widening

Sample No.	Alignment	Station	Offset (feet)	Depth Interval (feet)	AASHTO Class.	L.L.	P.I.	% by Weight				% Retained #4 Sieve	% Passing (sieves)			% Moisture	% Organic
								Coarse Sand	Fine Sand	Silt	Clay		#10	#40	#200		
S-13	-L1-	74+46	67 LT	5.5 - 6.0	A-6 (3)	35	19	33.8	28.0	13.9	24.3	2	92	75	38	22.9	--
S-14	-L1-	77+17	8 LT	0.0 - 1.5	A-7-6 (11)	54	35	33.5	21.5	11.0	34.0	0	99	79	47	26.2	--
S-15	-L1-	77+17	8 LT	1.5 - 3.5	A-6 (7)	39	22	21.2	32.7	14.8	31.3	0	100	89	50	26.7	--
S-16	-L1-	77+17	8 LT	3.5 - 5.0	A-6 (7)	37	24	17.8	39.3	13.2	29.7	0	98	89	48	20.9	--
S-17	-L1-	77+17	8 LT	5.0 - 6.0	A-4 (0)	28	8	13.2	54.0	14.8	18.0	0	99	95	38	21.1	--
S-18	-L1-	79+61	2 LT	0.0 - 1.0	A-6 (5)	37	18	19.3	34.7	11.2	34.8	3	96	87	48	16.3	--
S-19	-L1-	79+61	2 LT	1.0 - 3.0	A-4 (1)	22	6	13.0	28.9	35.7	22.4	0	98	91	63	17.9	--
S-20	-L1-	79+61	2 LT	3.0 - 6.0	A-7-6 (28)	54	31	2.6	15.0	32.4	50.0	0	98	97	85	37.4	--
S-20A	-L1-	82+08	14 RT	0.0 - 3.0	A-1-b (0)	16	NP	86.1	8.1	1.6	4.2	6	85	29	6	5.2	--
S-21	-L1-	82+08	14 RT	3.0 - 4.5	A-2-6 (1)	30	17	26.7	42.1	11.3	19.9	0	100	97	34	21.4	--
S-22	-L1-	82+08	14 RT	4.5 - 6.0	A-2-6 (0)	33	13	79.0	8.0	2.2	10.8	1	91	33	12	23.5	--
S-23	-L1-	84+60	15 LT	0.0 - 2.0	A-1-b (0)	15	NP	68.6	19.1	5.0	7.3	10	84	47	12	10.9	--
S-24	-L1-	84+60	15 LT	2.0 - 4.0	A-7-5 (21)	65	33	15.5	22.3	16.2	46.0	2	97	90	64	28.6	--
S-25	-L1-	84+60	15 LT	4.0 - 4.5	A-3 (0)	16	NP	75.6	15.8	1.5	7.1	0	97	53	9	10.0	--
S-26	-L1-	84+60	15 LT	4.5 - 6.0	A-7-6 (15)	43	21	6.8	27.6	28.0	37.6	0	100	97	73	25.1	--
SS-517	-L1RPA-	10+00	11 RT	13.4 - 14.9	A-7-5 (25)	72	28	9.4	21.3	27.4	41.9	0	99	94	75	62.2	--
SS-518	-L1RPA-	12+50	10 RT	14.2 - 14.8	A-7-6 (30)	86	62	28.9	15.9	5.4	49.8	0	98	81	56	25.7	--
SS-500	-L1RPB-	10+00	19 RT	3.2 - 4.7	A-7-6 (46)	79	50	4.2	18.7	25.3	51.8	0	99	97	83	44.3	--
SS-501	-L1RPB-	10+00	19 RT	8.2 -9.7	A-7-5 (10)	52	19	20.4	27.9	19.4	32.3	0	100	91	57	50.5	--
SS-502	-L1RPB-	10+00	19 RT	13.2 - 14.7	A-7-5 (16)	53	23	7.6	32.8	31.0	28.6	0	100	96	68	50.8	--
SS-503	-L1RPB-	15+00	24 RT	3.3 - 4.8	A-2-6 (0)	25	12	72.2	11.5	0.8	15.5	1	93	41	16	11.3	--
SS-504	-L1RPB-	15+00	24 RT	8.3 - 9.8	A-7-6 (6)	49	26	26.5	35.5	11.7	26.3	1	97	82	42	33.2	--
SS-505	-L1RPB-	15+00	24 RT	13.6 - 14.8	A-7-5 (5)	81	28	18.9	34.8	20.1	26.2	1	73	68	38	40.3	--
SS-509	-L1RPC-	15+01	15 RT	8.5 - 10.0	A-7-5 (37)	73	40	7.6	14.3	22.0	56.1	0	99	94	82	33.6	--
SS-510	-L1RPC-	15+01	15 RT	13.5 - 15.0	A-7-5 (26)	67	26	2.8	22.8	32.9	41.5	0	100	98	81	42.6	--
SS-511	-L1RPD-	10+00	17 RT	3.2 - 4.7	A-7-5 (19)	61	27	11.2	19.7	26.7	42.4	6	93	86	68	40.7	--
SS-512	-L1RPD-	10+00	17 RT	8.2 - 9.7	A-7-5 (14)	66	17	11.0	29.5	29.4	30.1	0	100	96	66	48.0	--
SS-513	-L1RPD-	12+51	17 RT	8.2 - 9.7	A-7-5 (27)	68	36	13.2	20.6	18.0	48.2	0	100	92	72	34.9	--
SS-514	-L1RPD-	15+01	5 LT	8.4 - 9.9	A-7-6 (2)	48	20	29.1	29.6	16.8	24.5	15	77	62	36	23.7	--
S-166	-RAB8-	12+87	18 LT	0.5 - 6.0	A-2-6 (0)	31	13	38.0	29.7	0.8	31.5	0	99	85	34	15.4	--
SS-507	-RAB9-	11+12	23 LT	3.4 - 4.9	A-7-5 (35)	73	40	11.4	11.3	16.3	61.0	0	100	95	79	29.2	--
SS-508	-RAB9-	11+12	23 LT	8.4 - 9.9	A-7-5 (19)	63	21	8.5	18.9	21.5	51.1	1	98	95	75	34.7	--

NP - NON-PLASTIC

Stephanie H. Huffman
Certified Lab Technician Signature

114-01-1203
Certification Number

LABORATORY TESTING SUMMARY

PROJECT NUMBER: 47133.1.1 **TIP:** U-5996 **COUNTY:** Nash

DESCRIPTION: Eastern Ave. Widening

Sample No.	Alignment	Station	Offset (feet)	Depth Interval (feet)	AASHTO Class.	L.L.	P.I.	% by Weight				% Retained #4 Sieve	% Passing (sieves)			% Moisture	% Organic
								Coarse Sand	Fine Sand	Silt	Clay		#10	#40	#200		
SS-506	-RAB9-	13+55	2 RT	3.5 - 5.0	A-2-6 (1)	35	24	42.2	29.7	0.7	27.4	0	100	84	29	12.0	--
S-56	-RAB11-	14+64	7 RT	0.0 - 2.3	A-1-b (0)	18	2	60.7	22.7	8.8	7.8	7	85	50	16	11.0	--
S-57	-RAB11-	14+64	7 RT	2.3 - 6.0	A-7-6 (6)	42	20	32.0	21.0	13.5	33.5	1	98	78	49	19.9	--
S-168B	-Y19-	10+75	25 RT	1.0 - 2.4	A-2-4 (0)	11	NP	44.1	35.7	9.1	11.1	6	92	77	21	6.4	--
S-169B	-Y19-	10+75	25 RT	2.4 - 6.0	A-6 (4)	36	22	35.8	24.9	4.5	34.8	1	99	85	40	15.8	--
S-170	-Y20-	10+50	17 RT	0.0 - 2.7	A-2-4 (0)	22	10	26.0	43.0	4.9	26.1	7	91	80	35	14.6	--
S-171	-Y20-	10+50	17 RT	3.6 - 4.8	A-7-6 (9)	50	21	27.8	18.2	3.0	51.0	3	95	83	53	24.3	--
S-172	-Y20-	10+50	17 RT	4.8 - 6.0	A-7-5 (3)	45	15	41.4	18.7	2.7	37.2	0	100	77	41	19.7	--
S-173	-Y21-	12+00	15 RT	4.8 - 6.0	A-2-6 (2)	35	18	43.4	22.6	2.3	31.7	1	99	82	35	20.5	--
S-58	-Y24-	12+50	24 LT	0.0 - 5.0	A-7-6 (27)	62	35	8.9	19.3	25.4	46.4	2	96	91	74	32.1	--
S-59	-Y24-	12+50	24 LT	5.0 - 6.0	A-2-6 (0)	31	13	42.9	26.6	15.5	15.0	3	92	72	31	28.6	--
S-60	-Y25-	11+00	25 LT	0.0 - 6.0	A-7-6 (12)	44	19	12.8	23.1	23.6	40.5	0	100	93	69	28.0	--

NP - NON-PLASTIC

Stephanie H. Huffman

Certified Lab Technician Signature

114-01-1203

Certification Number

PROJ. NO. - 47133.1.1
ID NO. - U-5996
COUNTY - NASH

L1RPC 1350 LT

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-201	43' LT	13+50	1.0-1.5	A-7-5(35)	67	35	5.6	12.5	21.5	60.4	100	98	86	-	-
S-202	43' LT	13+50	3.5-4.0	A-7-5(21)	58	21	2.2	21.3	36.2	40.2	100	99	83	-	-

L1RPC 1350 RT

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-203	9' RT	13+50	1.0-1.5	A-7-5(34)	67	33	5.4	10.7	23.5	60.4	100	97	87	-	-

L1 7650 LT

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-204	10' LT	76+50	1.0-1.5	A-7-6(16)	57	29	23.7	17.5	10.5	48.3	100	88	61	-	-

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

APPENDIX B:
BORELOGS

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 47133.1.1	**TIP** U-5996	**COUNTY** NASH	**GEOLOGIST** Kintner, A. N.
SITE DESCRIPTION SR 1603 (OLD CARRIAGE RD.) FROM SR 1770 (EASTERN AVE./SUNSET AVE.) TO SR 1601/SR 1609			**GROUND WTR (ft)**
BORING NO. L1RPC_1000	**STATION** 10+00	**OFFSET** 10 ft RT	**ALIGNMENT** -L1RPC- / **0 HR.** Dry
COLLAR ELEV. 169.0 ft	**TOTAL DEPTH** 15.0 ft	**NORTHING** 814,021	**EASTING** 2,326,965 / **24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 86% 11/17/2017	**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Pinter, D. G.	**START DATE** 01/28/19	**COMP. DATE** 01/28/19	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT	SAMP. NO.	MOI	SOIL AND ROCK DESCRIPTION
170									
									169.0 GROUND SURFACE 0.0
									RESIDUAL Tan, Orange, and Black, Highly Plastic, Silty Clay
165	165.5	3.5	2	4	6	10		M	
160	160.5	8.5	2	3	4	7		M	
155	155.5	13.5	3	3	3	6		M	154.0 15.0
									Boring Terminated at Elevation 154.0 ft IN RESIDUAL (SILTY CLAY)

WBS 47133.1.1	**TIP** U-5996	**COUNTY** NASH	**GEOLOGIST** Kintner, A. N.
SITE DESCRIPTION SR 1603 (OLD CARRIAGE RD.) FROM SR 1770 (EASTERN AVE./SUNSET AVE.) TO SR 1601/SR 1609			**GROUND WTR (ft)**
BORING NO. L1RPD_1000	**STATION** 10+00	**OFFSET** 17 ft RT	**ALIGNMENT** -L1RPD- / **0 HR.** Dry
COLLAR ELEV. 168.7 ft	**TOTAL DEPTH** 14.7 ft	**NORTHING** 814,179	**EASTING** 2,326,726 / **24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 86% 11/17/2017	**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Pinter, D. G.	**START DATE** 01/29/19	**COMP. DATE** 01/29/19	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT	SAMP. NO.	MOI	SOIL AND ROCK DESCRIPTION
170									
									168.7 GROUND SURFACE 0.0
									ROADWAY EMBANKMENT ORANGE-RED, HIGHLY PLASTIC, SILTY CLAY WITH TRACE GRAVEL AND ORGANICS
165	165.5	3.2	3	4	4	8	SS-511	41%	163.7 5.0
									RESIDUAL ORANGE, TAN, AND BLACK, SILTY CLAY
160	160.5	8.2	2	2	4	6	SS-512	48%	
155	155.5	13.2	2	3	3	6		M	154.0 14.7
									Boring Terminated at Elevation 154.0 ft IN RESIDUAL (SILTY CLAY)