

REFERENCE: BR-0086

PROJECT: 67086

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 JOHNSTON PROJECT DESCRIPTION APPROACHES TO BR. NO. 70 ON US 301 (BRIGHTLEAF BLVD.) OVER NEUSE RIVER

INVENTORY

CONTENTS

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CROSS SECTIONS

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Table with columns: STATE, STATE PROJECT REFERENCE NO., SHEET NO., TOTAL SHEETS. Values: N.C., BR-0086, 1, 33

CAUTION NOTICE

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

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

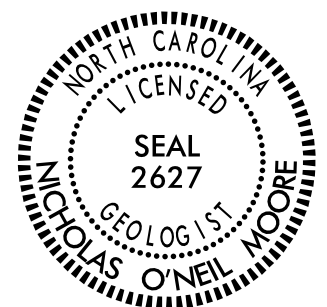
THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT...

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.

PERSONNEL

- N.O. MOORE
A.N. JONES
C.M. WALKER
R.E. SMITH

INVESTIGATED BY N.O. MOORE
DRAWN BY N.O. MOORE
CHECKED BY N.T. ROBERSON
SUBMITTED BY N.O. MOORE
DATE MAY 2024



DocuSigned by: Nick Moore 06/06/2024
8636AEA78511411... SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS									
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS 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										WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.										HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:										ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.									
SOIL LEGEND AND AASHTO CLASSIFICATION										ANGULARITY OF GRAINS										WEATHERED ROCK (WR)										CRYSTALLINE ROCK (CR)									
GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS										THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.										NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.										FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.									
MINERALOGICAL COMPOSITION										COMPRESSION										NON-CRYSTALLINE ROCK (NCR)										COASTAL PLAIN SEDIMENTARY ROCK (CP)									
MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.										SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50										FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.										COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.									
COMPRESSIBILITY										PERCENTAGE OF MATERIAL										WEATHERING										GROUND WATER									
GROUP CLASS. A-1, A-1-b, A-2, A-2-4, A-2-5, A-2-6, A-2-7, A-3, A-4, A-5, A-6, A-7										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										FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (V SL.) ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE. SLIGHT (SL.) ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. MODERATE (MOD.) SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK. MODERATELY SEVERE (MOD. SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. IF TESTED, WOULD YIELD SPT REFUSAL. SEVERE (SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF. VERY SEVERE (V SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF. COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.										WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP									
GROUP INDEX 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10										FAIR TO POOR, POOR, UNSUITABLE										ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY										DIP & DIP DIRECTION OF ROCK STRUCTURES SPT DMT TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION CONE PENETROMETER TEST SOUNDING ROD TEST BORING WITH CORE SPT N-VALUE									
TEXTURE OR GRAIN SIZE										MISCELLANEOUS SYMBOLS										ROCK HARDNESS										RECOMMENDATION SYMBOLS									
U.S. STD. SIEVE SIZE OPENING (MM) 4, 10, 40, 60, 200, 270 4.75, 2.00, 0.42, 0.25, 0.075, 0.053										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										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 GROUDED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT CAN BE GROUDED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE. 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 FINGER NAIL.										AR - AUGER REFUSAL, BT - BORING TERMINATED, CL - CLAY, CPT - CONE PENETRATION TEST, CSE - COARSE, DMT - DILATOMETER TEST, DPT - DYNAMIC PENETRATION TEST, e - VOID RATIO, F - FINE, FOSS. - FOSSILIFEROUS, FRAC. - FRACTURED, FRACTURES, FRAGS. - FRAGMENTS, HI. - HIGHLY, MED. - MEDIUM, MICA - MICACEOUS, MOD. - MODERATELY, NP - NON PLASTIC, ORG. - ORGANIC, PMT - PRESSUREMETER TEST, SAP. - SAPROLITIC, SD. - SAND, SANDY, SL. - SILTY, SILTY, SLI. - SLIGHTLY, TCR - TRICONE REFUSAL, w - MOISTURE CONTENT, V - VERY, VST - VANE SHEAR TEST, WEA. - WEATHERED, % - UNIT WEIGHT, %g - DRY UNIT WEIGHT, S - BULK, SS - SPLIT SPOON, ST - SHELBY TUBE, RS - ROCK, RT - RECOMPACTED TRIAXIAL, CBR - CALIFORNIA BEARING RATIO									
SOIL MOISTURE - CORRELATION OF TERMS										ABBREVIATIONS										FRACTURE SPACING										BEDDING									
SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION										DRILL UNITS: CME-45C, CME-55, CME-550, VANE SHEAR TEST, PORTABLE HOIST										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										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, THINLY LAMINATED 0.008 - 0.03 FEET, THINLY LAMINATED < 0.008 FEET									
LL - LIQUID LIMIT, PL - PLASTIC LIMIT, OM - OPTIMUM MOISTURE SHRINKAGE LIMIT										ADVANCING TOOLS: CLAY BITS, 6" CONTINUOUS FLIGHT AUGER, 8" HOLLOW AUGERS, HARD FACED FINGER BITS, TUNG-CARBIDE INSERTS, CASING w/ ADVANCER, TRICONE * STEEL TEETH, TRICONE * TUNG-CARB., CORE BIT										HAMMER TYPE: AUTOMATIC, MANUAL, CORE SIZE: B, H, N, HAND TOOLS: POST HOLE DIGGER, HAND AUGER, SOUNDING ROD, VANE SHEAR TEST										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.									
PLASTICITY										EQUIPMENT USED ON SUBJECT PROJECT										INDURATION										NOTES:									
NON PLASTIC, SLIGHTLY PLASTIC, MODERATELY PLASTIC, HIGHLY PLASTIC										INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.										ROADWAY BORING ELEVATIONS WERE TAKEN FROM TIN FILE br-0086.is.tin.tin DATED 6/7/2023																			
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.										BENCH MARK: ELEVATION: FEET																			

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0086	3	33
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
67086.1.1	N/A	PE	

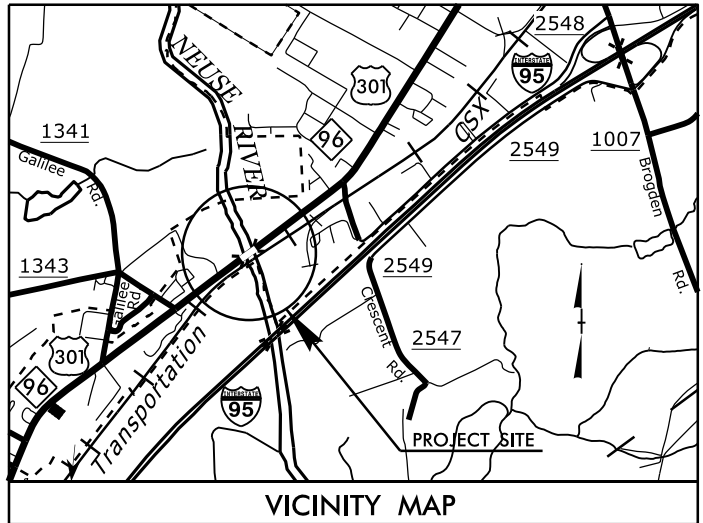
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

JOHNSTON COUNTY

LOCATION: REPLACE BRIDGE No. 500070 ON US 301
OVER NEUSE RIVER

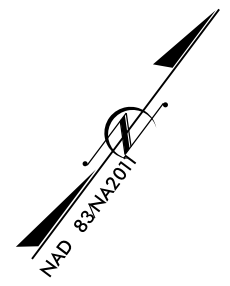
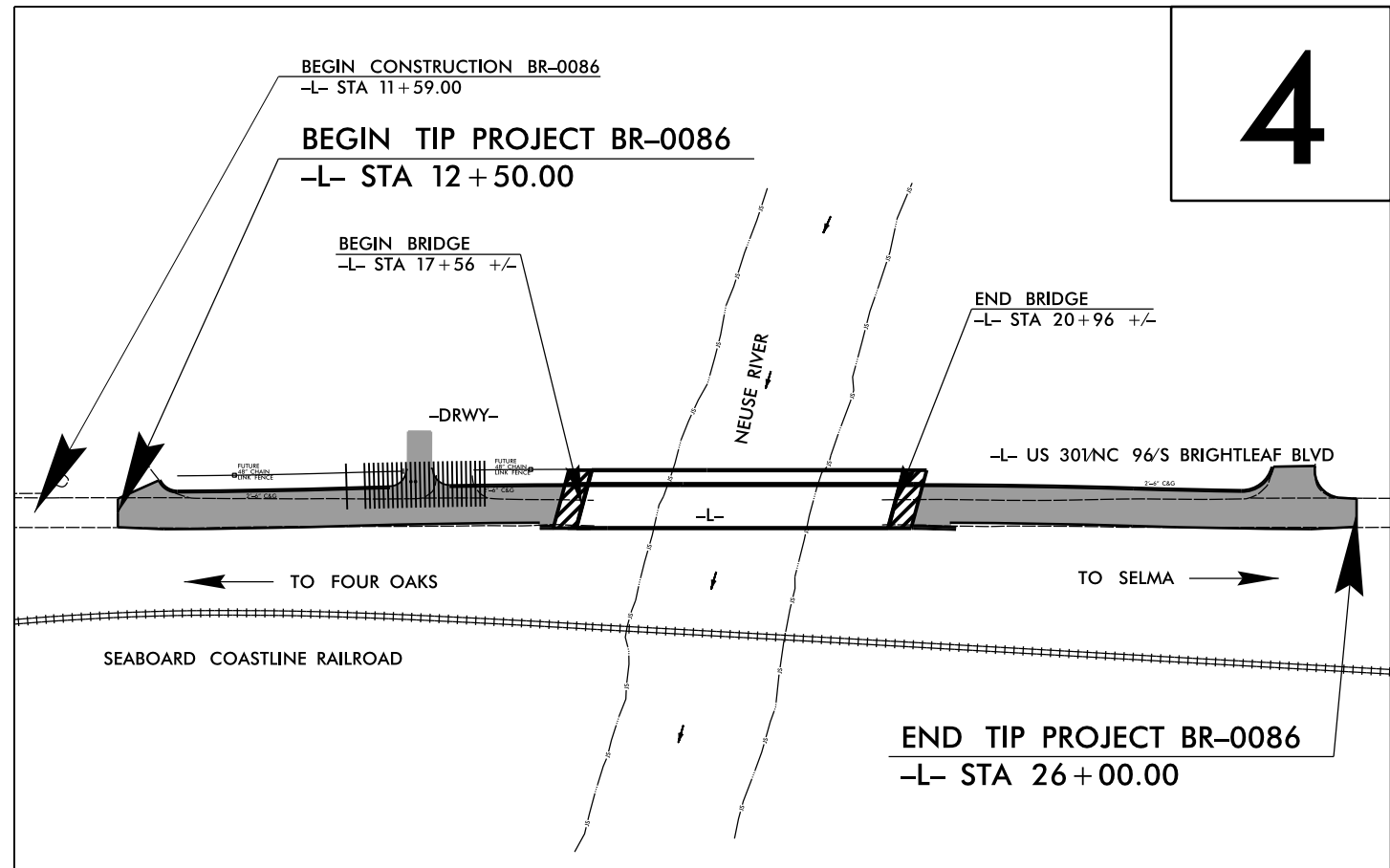
TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE

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



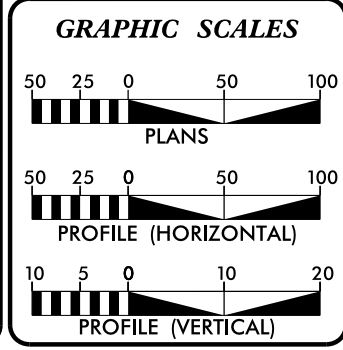
COMBINED FIELD
INSPECTION PLAN SET

CONTRACT: TIP PROJECT: BR-0086



THIS PROJECT HAS NO CONTROLLED ACCESS
THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE TOWN OF SMITHFIELD
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ?.

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



DESIGN DATA

ADT 2023 =	12540
ADT 2043 =	15240
K =	9 %
D =	65 %
T =	4 % *
V =	50 MPH
* TTST =	2% DUAL = 2%
FUNC CLASS =	MINOR ARTERIAL
	REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT BR-0086 =	0.192 MI.
LENGTH STRUCTURE TIP PROJECT BR-0086 =	0.064 MI.
TOTAL LENGTH TIP PROJECT BR-0086 =	0.256 MI.

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

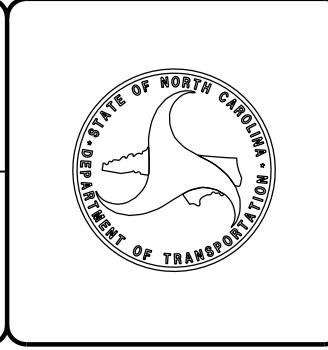
2018 STANDARD SPECIFICATIONS	RUSSELL BROADWELL, PE PROJECT MANAGER
RIGHT OF WAY DATE: June 19, 2023	JORDAN A. WOODARD, PE PROJECT ENGINEER
LETTING DATE: July 16, 2024	DOUGLAS KRETCHMAN, PE PROJECT TEAM LEAD

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

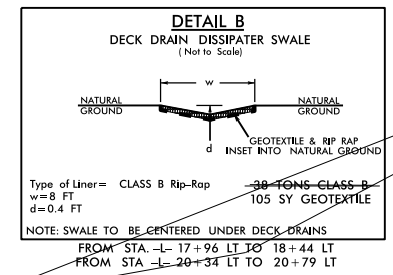
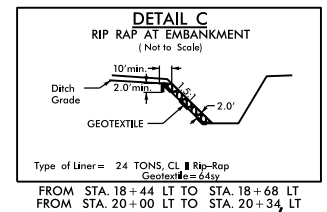
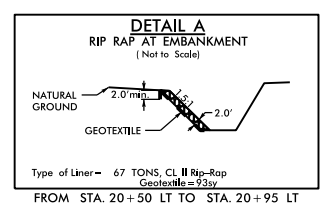
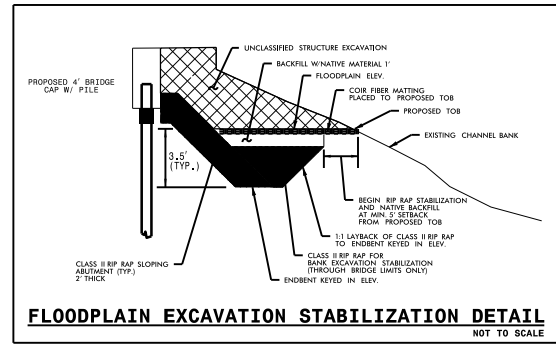
ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.



31-MAY-2024 10:52 S:\VFP01\raleigh_investigation\TIP\BR0086_GEO_RDWY\CADD_GEO\TECH\Plan\Prof\BR0086_GEO_RDWY_tsh_65%.dgn

PROJECT REFERENCE NO.	SHEET NO.
BR-0086	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

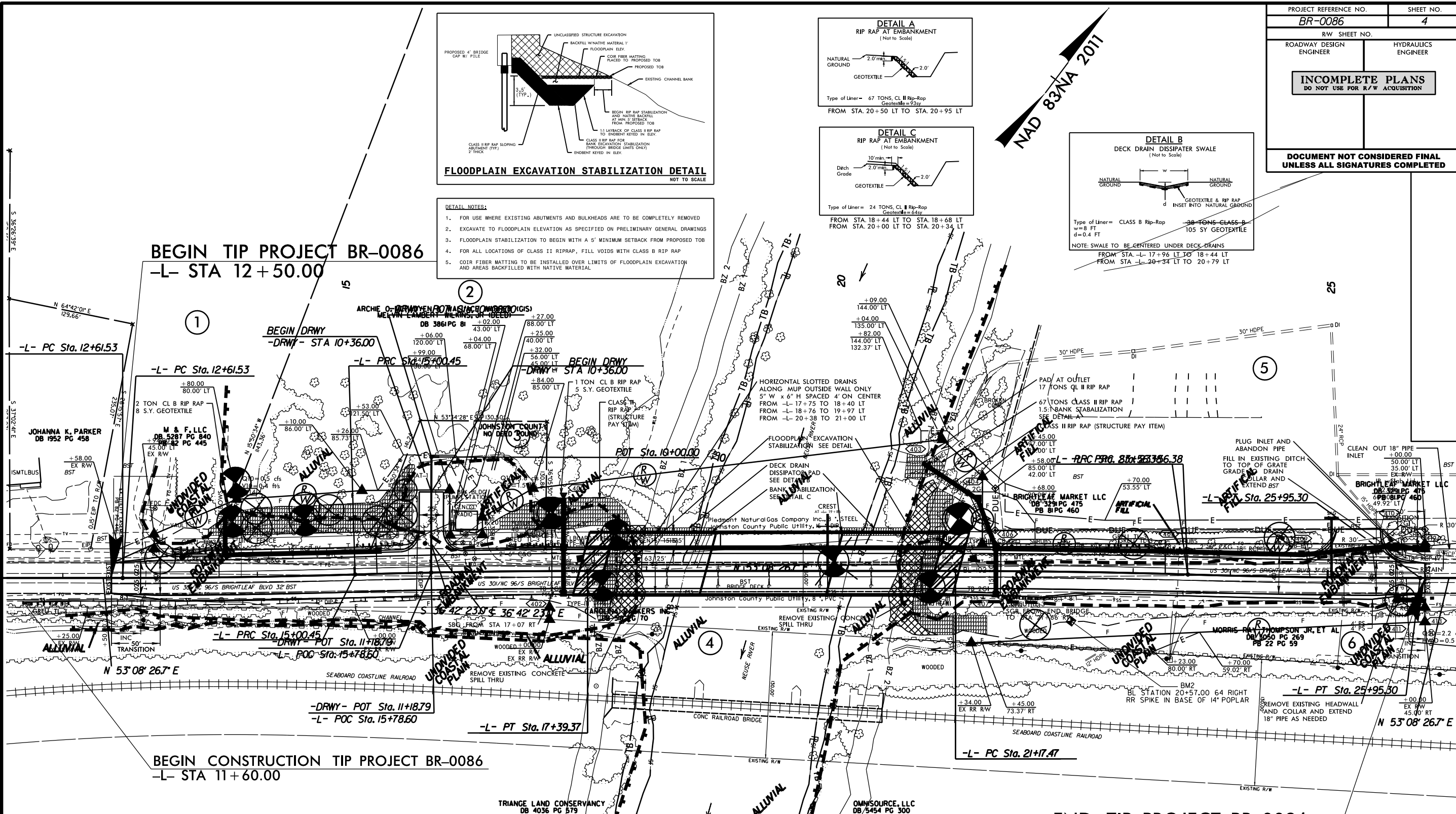


- DETAIL NOTES:**
- FOR USE WHERE EXISTING ABUTMENTS AND BULKHEADS ARE TO BE COMPLETELY REMOVED
 - EXCAVATE TO FLOODPLAIN ELEVATION AS SPECIFIED ON PRELIMINARY GENERAL DRAWINGS
 - FLOODPLAIN STABILIZATION TO BEGIN WITH A 5' MINIMUM SETBACK FROM PROPOSED TOB
 - FOR ALL LOCATIONS OF CLASS II RIPRAP, FILL VOIDS WITH CLASS B RIP RAP
 - CORR FIBER MATTING TO BE INSTALLED OVER LIMITS OF FLOODPLAIN EXCAVATION AND AREAS BACKFILLED WITH NATIVE MATERIAL

BEGIN TIP PROJECT BR-0086
-L- STA 12+50.00

BEGIN CONSTRUCTION TIP PROJECT BR-0086
-L- STA 11+60.00

END TIP PROJECT BR-0086
-L- STA 26+00.00

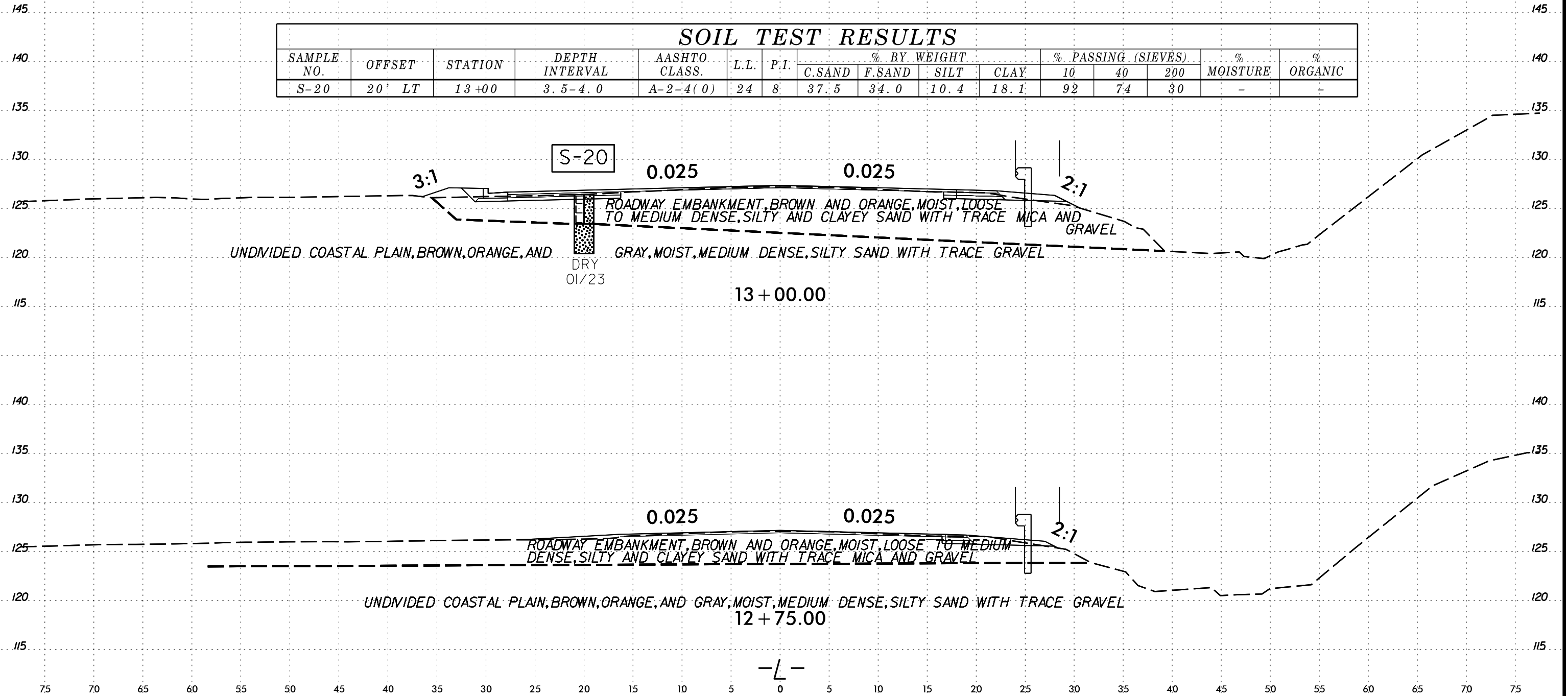


PI Sta 13+81.00 Δ = 1°43' 58.1 (LT) D = 0°43' 30.9" L = 238.92' T = 119.47' R = 7,900.00' SE = NC 2.5%	PI Sta 16+19.92 Δ = 1°43' 58.1 (RT) D = 0°43' 30.9" L = 238.92' T = 119.47' R = 7,900.00' SE = NC 2.5%	PI Sta 22+36.94 Δ = 1°43' 57.9 (RT) D = 0°43' 30.9" L = 238.91' T = 119.47' R = 7,900.00' SE = NC 2.5%	PI Sta 24+75.85 Δ = 1°43' 57.9 (LT) D = 0°43' 30.9" L = 238.91' T = 119.47' R = 7,900.00' SE = NC 2.5%
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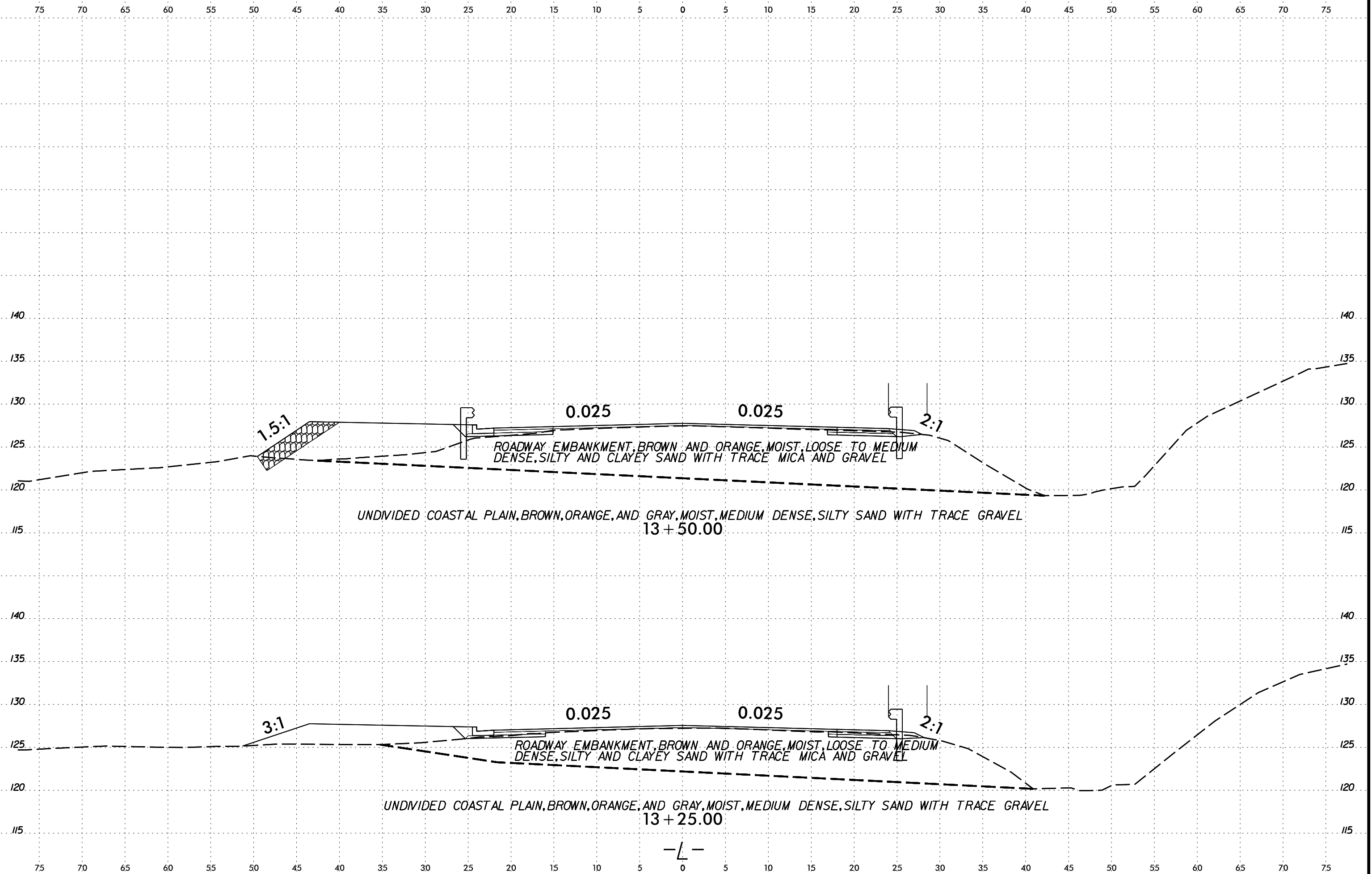
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-20	20' LT	13+00	3.5-4.0	A-2-4(0)	24	8	37.5	34.0	10.4	18.1	92	74	30	-	-



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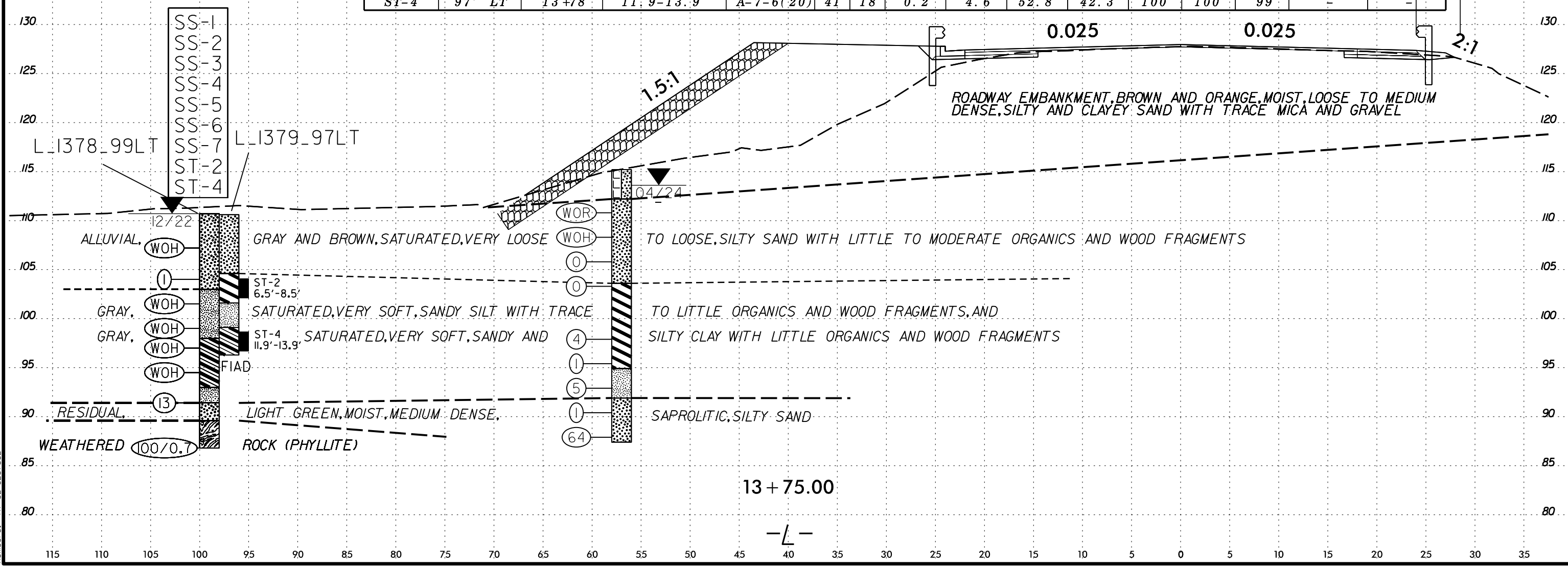
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SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-1	99' LT	13+79	3.2-3.5	A-2-4(0)		NP	44.6	34.3	15.0	6.1	96	73	23	-	5
SS-2	99' LT	13+79	5.7-6.7	A-2-4(0)		NP	41.8	27.9	20.3	10.1	97	74	32	53	6
SS-3	99' LT	13+79	8.2-9.2		-	-	32.1	22.2	23.5	22.2	99	81	48	60	1
SS-4	99' LT	13+79	10.7-11.2		-	-	21.6	14.5	41.7	22.2	100	88	66	-	11
SS-5	99' LT	13+79	13.2-13.7		-	-	10.3	9.7	41.7	38.3	99	93	83	-	9
SS-6	99' LT	13+79	15.7-16.2		-	-	11.7	9.7	40.3	38.3	98	91	80	-	9
SS-7	99' LT	13+79	18.2-19.3	A-4(0)		NP	24.8	38.5	24.5	12.1	99	87	42	-	8
ST-2	97' LT	13+78	6.5-8.5	A-7-5(19)	74	19	18.2	11.7	37.8	32.3	100	90	72	-	22.6
ST-4	97' LT	13+78	11.9-13.9	A-7-6(20)	41	18	0.2	4.6	52.8	42.3	100	100	99	-	-

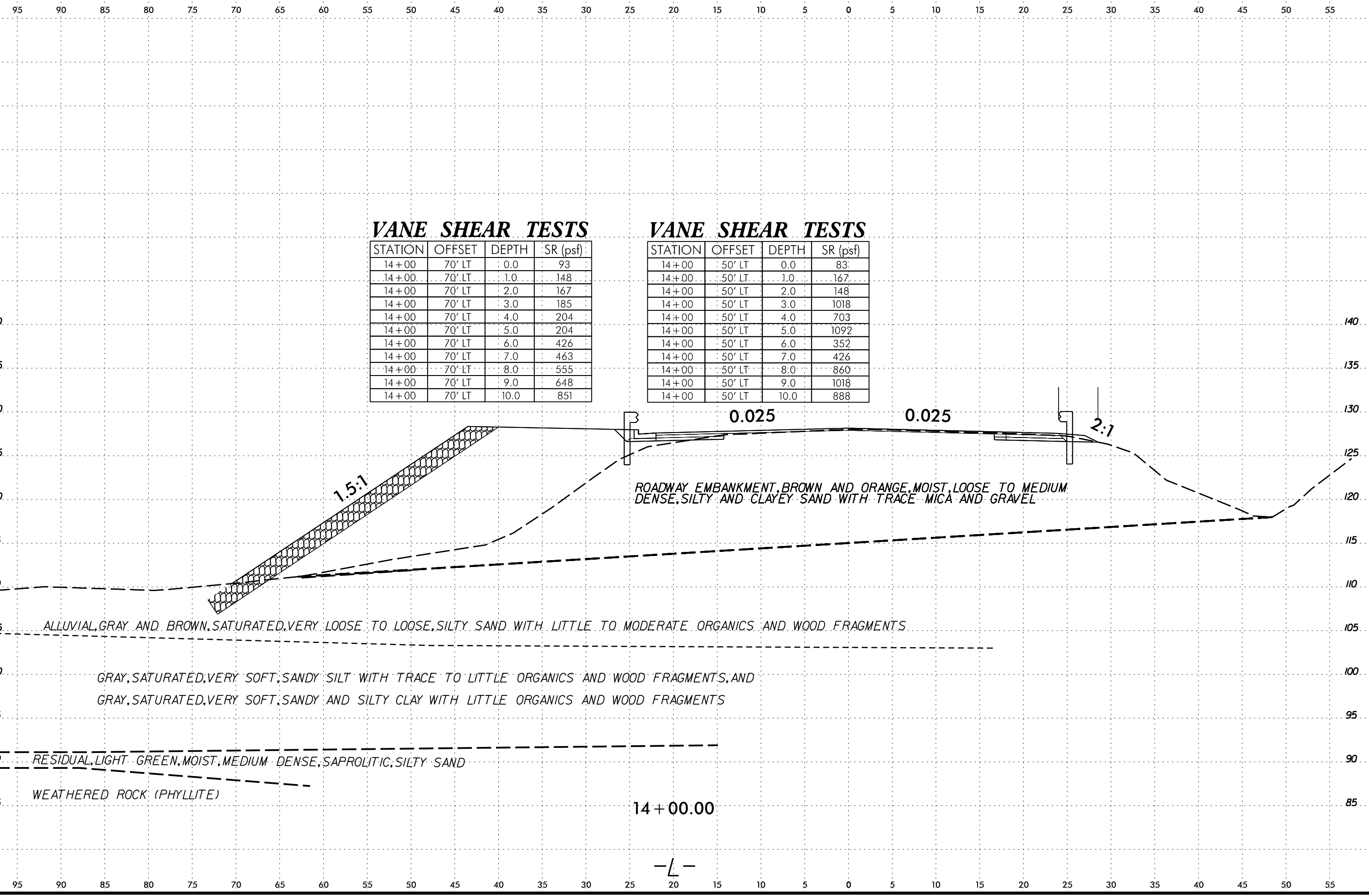
VANE SHEAR TESTS

STATION	OFFSET	DEPTH	SR (psf)
13+78	99' LT	0.0	278
13+78	99' LT	3.0	74
13+78	99' LT	5.0	833



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VANE SHEAR TESTS

STATION	OFFSET	DEPTH	SR (psf)
14+00	70' LT	0.0	93
14+00	70' LT	1.0	148
14+00	70' LT	2.0	167
14+00	70' LT	3.0	185
14+00	70' LT	4.0	204
14+00	70' LT	5.0	204
14+00	70' LT	6.0	426
14+00	70' LT	7.0	463
14+00	70' LT	8.0	555
14+00	70' LT	9.0	648
14+00	70' LT	10.0	851

VANE SHEAR TESTS

STATION	OFFSET	DEPTH	SR (psf)
14+00	50' LT	0.0	83
14+00	50' LT	1.0	167
14+00	50' LT	2.0	148
14+00	50' LT	3.0	1018
14+00	50' LT	4.0	703
14+00	50' LT	5.0	1092
14+00	50' LT	6.0	352
14+00	50' LT	7.0	426
14+00	50' LT	8.0	860
14+00	50' LT	9.0	1018
14+00	50' LT	10.0	888

1.5:1

0.025

0.025

2:1

ROADWAY EMBANKMENT, BROWN AND ORANGE, MOIST, LOOSE TO MEDIUM DENSE, SILTY AND CLAYEY SAND WITH TRACE MICA AND GRAVEL

ALLUVIAL, GRAY AND BROWN, SATURATED, VERY LOOSE TO LOOSE, SILTY SAND WITH LITTLE TO MODERATE ORGANICS AND WOOD FRAGMENTS

GRAY, SATURATED, VERY SOFT, SANDY SILT WITH TRACE TO LITTLE ORGANICS AND WOOD FRAGMENTS, AND
 GRAY, SATURATED, VERY SOFT, SANDY AND SILTY CLAY WITH LITTLE ORGANICS AND WOOD FRAGMENTS

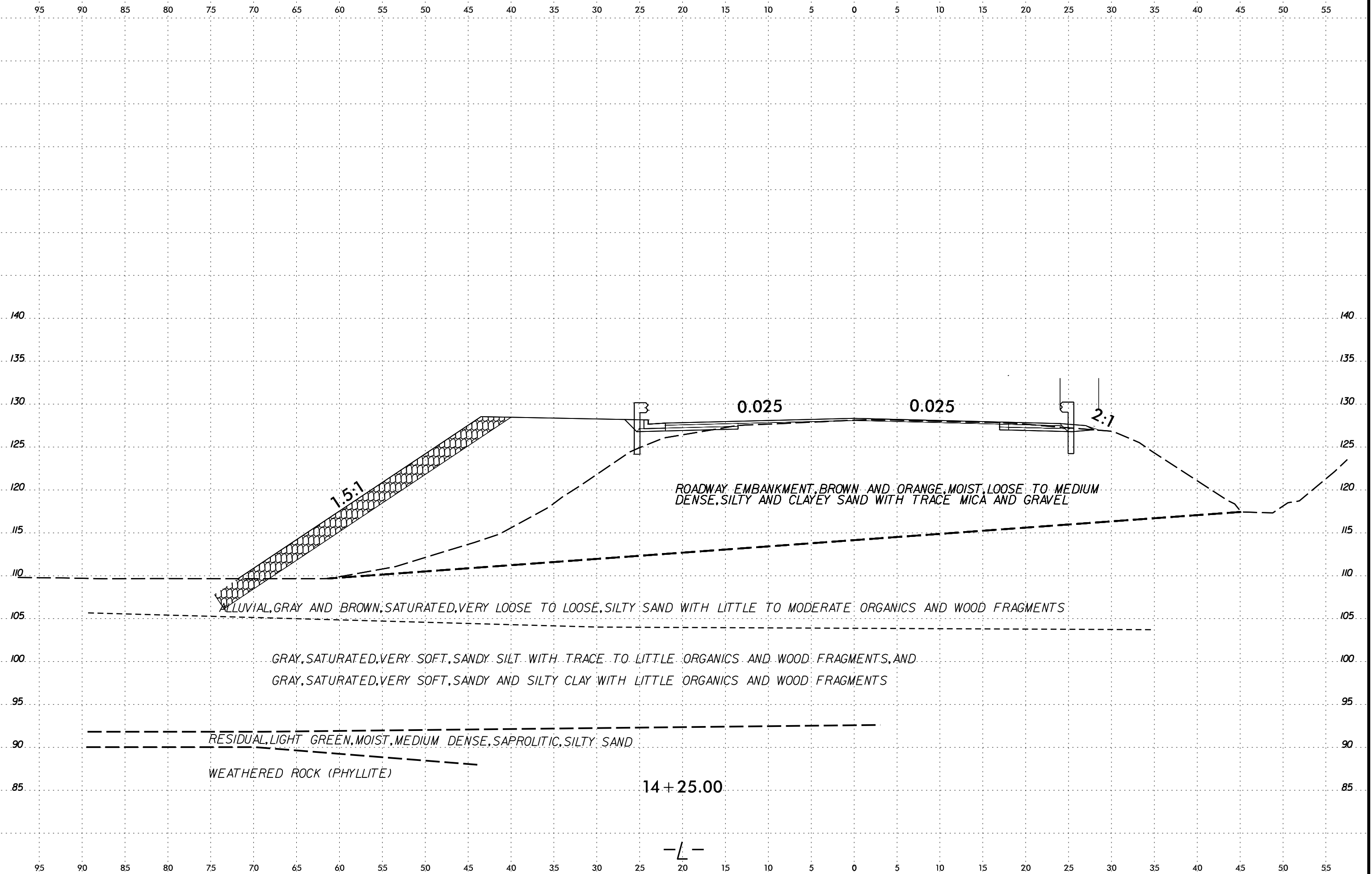
RESIDUAL, LIGHT GREEN, MOIST, MEDIUM DENSE, SAPROLITIC, SILTY SAND

WEATHERED ROCK (PHYLLITE)

14+00.00

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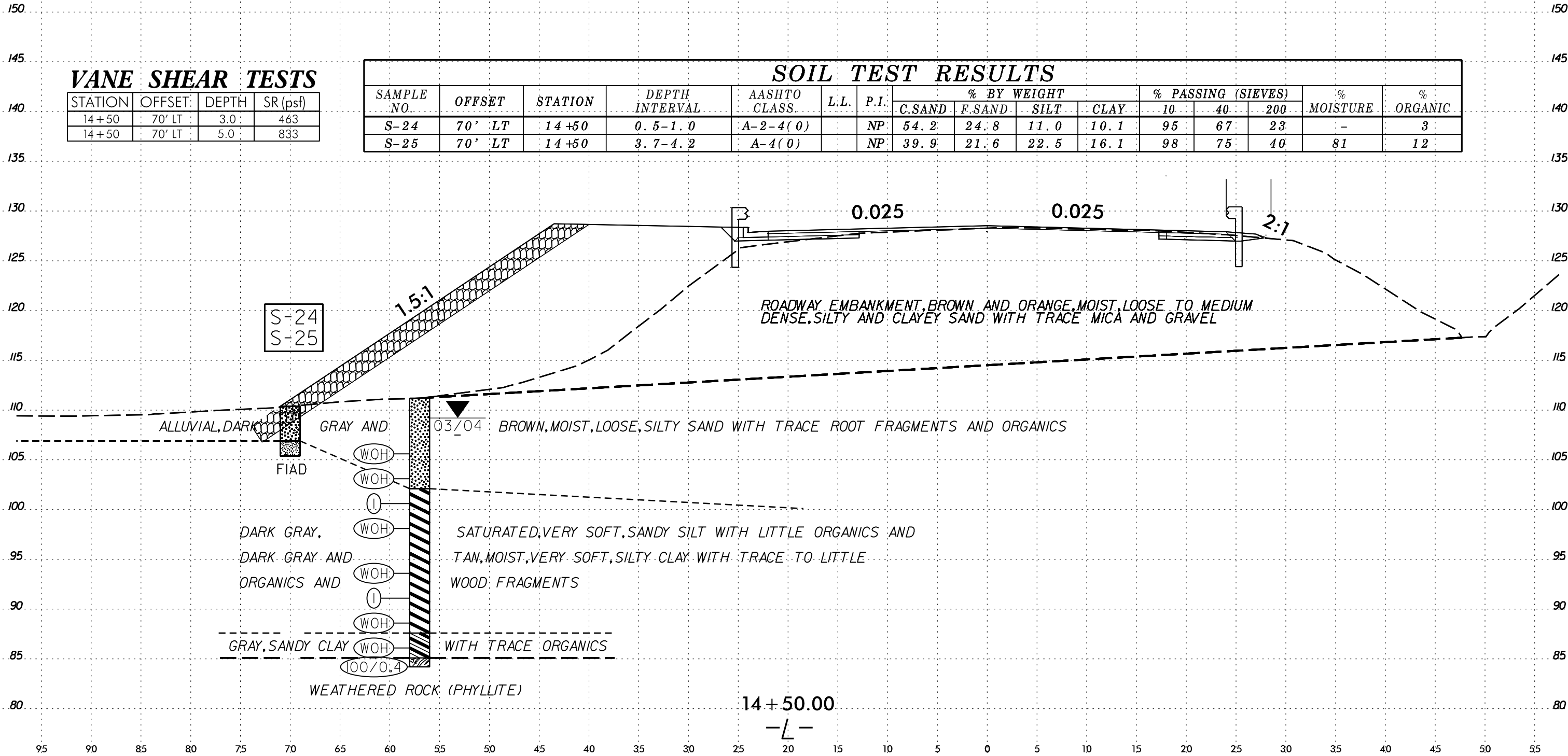
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VANE SHEAR TESTS

STATION	OFFSET	DEPTH	SR (psf)
14+50	70' LT	3.0	463
14+50	70' LT	5.0	833

SOIL TEST RESULTS

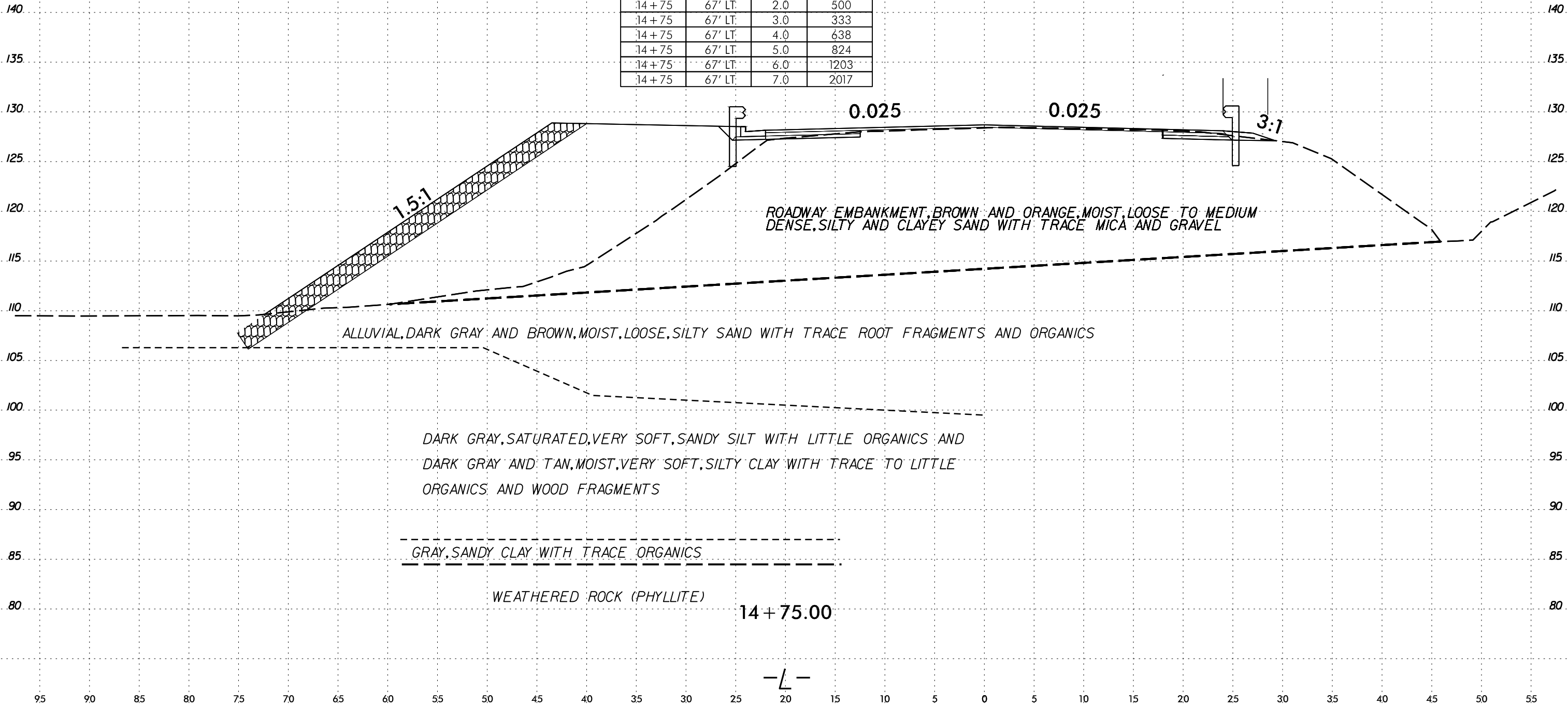
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-24	70' LT	14+50	0.5-1.0	A-2-4(0)		NP	54.2	24.8	11.0	10.1	95	67	23	-	3
S-25	70' LT	14+50	3.7-4.2	A-4(0)		NP	39.9	21.6	22.5	16.1	98	75	40	81	12

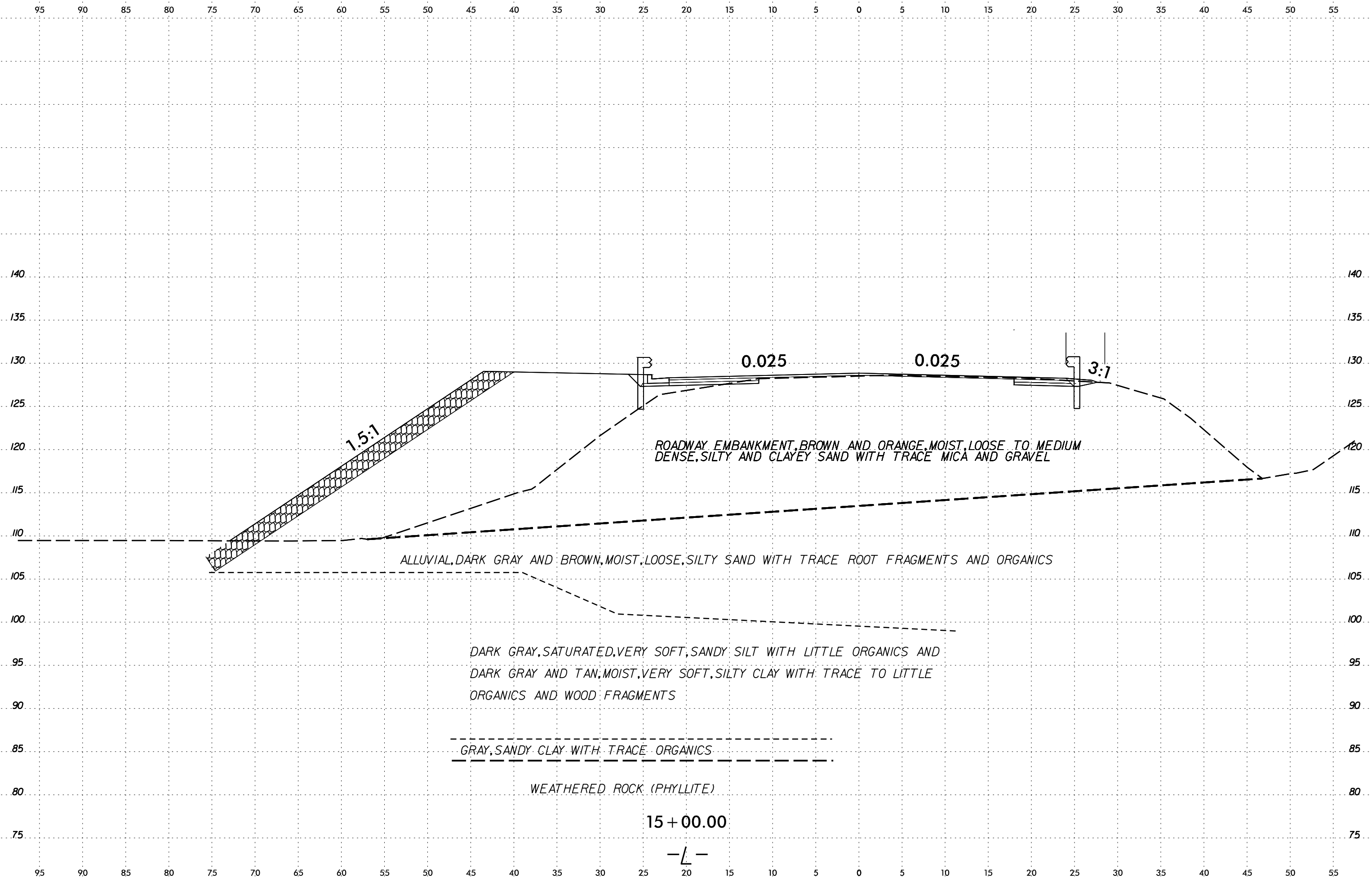


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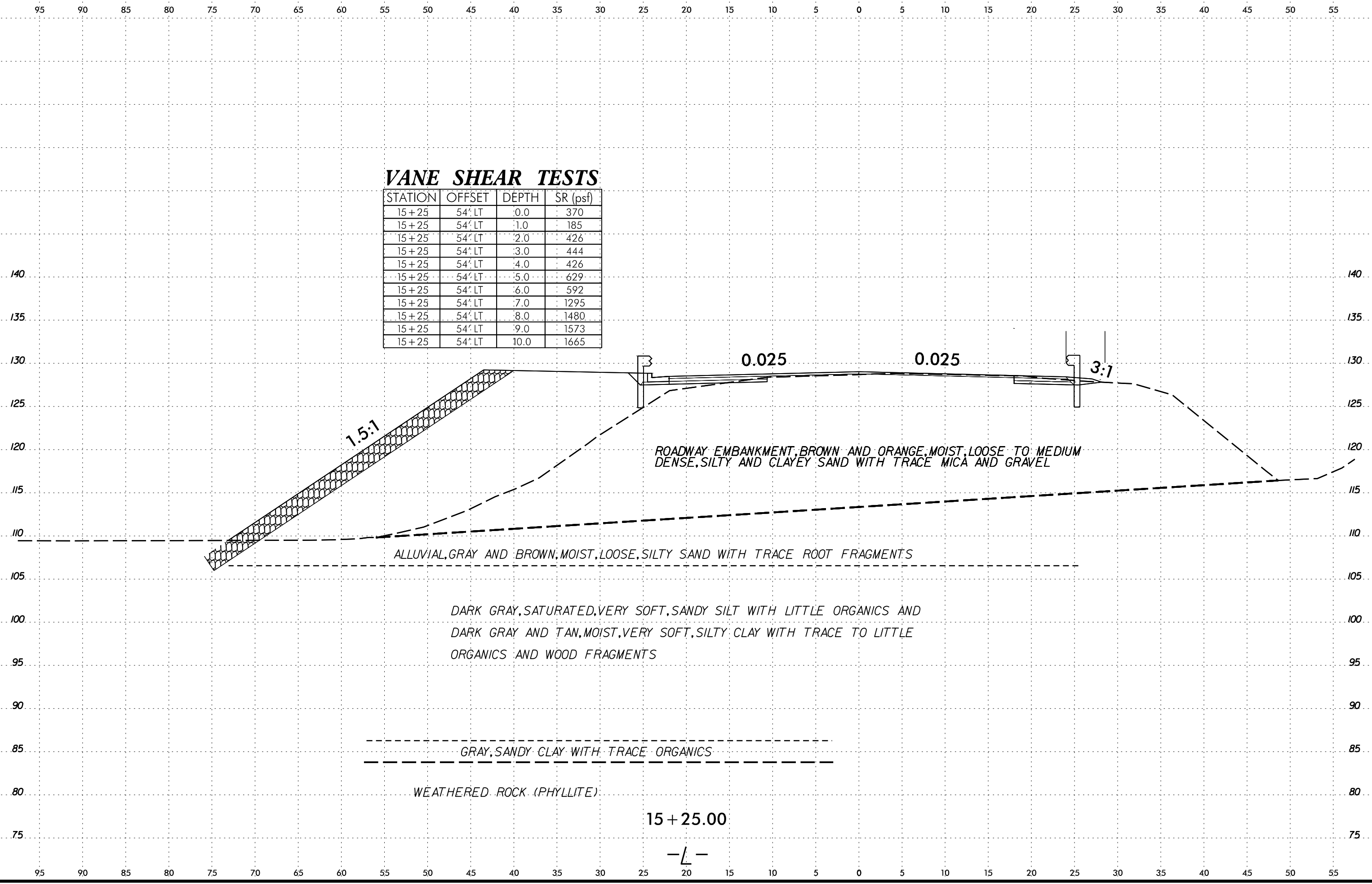
VANE SHEAR TESTS

STATION	OFFSET	DEPTH	SR (psf)
14+75	67' LT.	0.0	426
14+75	67' LT.	1.0	426
14+75	67' LT.	2.0	500
14+75	67' LT.	3.0	333
14+75	67' LT.	4.0	638
14+75	67' LT.	5.0	824
14+75	67' LT.	6.0	1203
14+75	67' LT.	7.0	2017





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VANE SHEAR TESTS

STATION	OFFSET	DEPTH	SR (psf)
15+25	54' LT	0.0	370
15+25	54' LT	1.0	185
15+25	54' LT	2.0	426
15+25	54' LT	3.0	444
15+25	54' LT	4.0	426
15+25	54' LT	5.0	629
15+25	54' LT	6.0	592
15+25	54' LT	7.0	1295
15+25	54' LT	8.0	1480
15+25	54' LT	9.0	1573
15+25	54' LT	10.0	1665

1.5:1

0.025

0.025

3:1

ROADWAY EMBANKMENT, BROWN AND ORANGE, MOIST, LOOSE TO MEDIUM DENSE, SILTY AND CLAYEY SAND WITH TRACE MICA AND GRAVEL

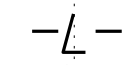
ALLUVIAL, GRAY AND BROWN, MOIST, LOOSE, SILTY SAND WITH TRACE ROOT FRAGMENTS

DARK GRAY, SATURATED, VERY SOFT, SANDY SILT WITH LITTLE ORGANICS AND DARK GRAY AND TAN, MOIST, VERY SOFT, SILTY CLAY WITH TRACE TO LITTLE ORGANICS AND WOOD FRAGMENTS

GRAY, SANDY CLAY WITH TRACE ORGANICS

WEATHERED ROCK (PHYLLITE)

15 + 25.00



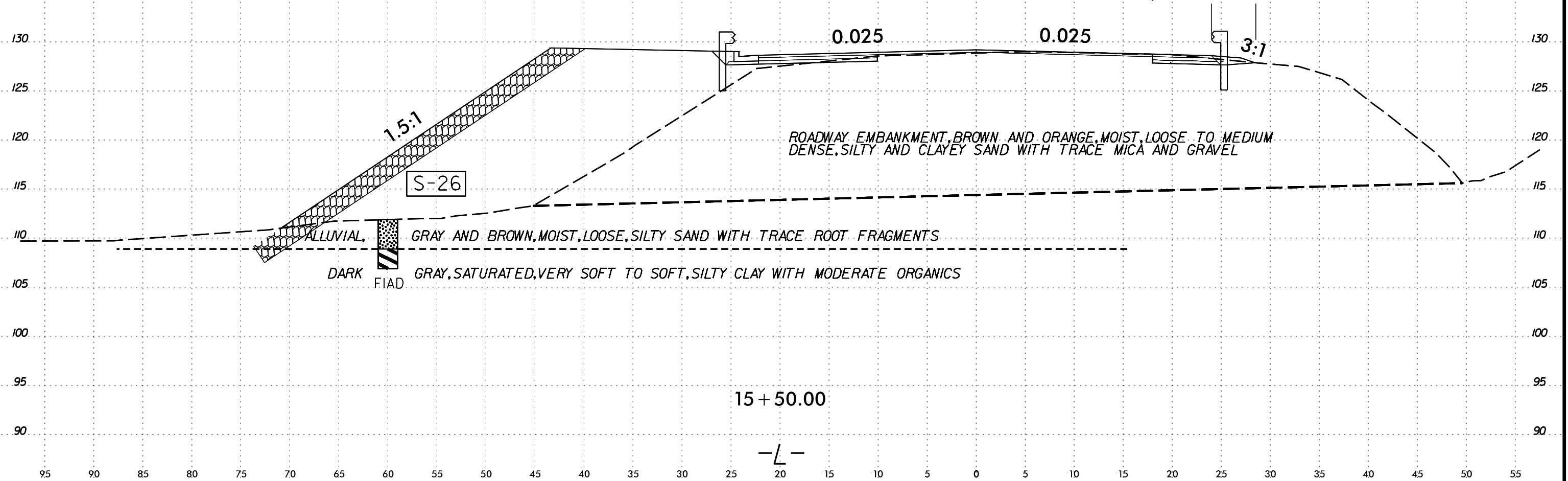
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VANE SHEAR TESTS

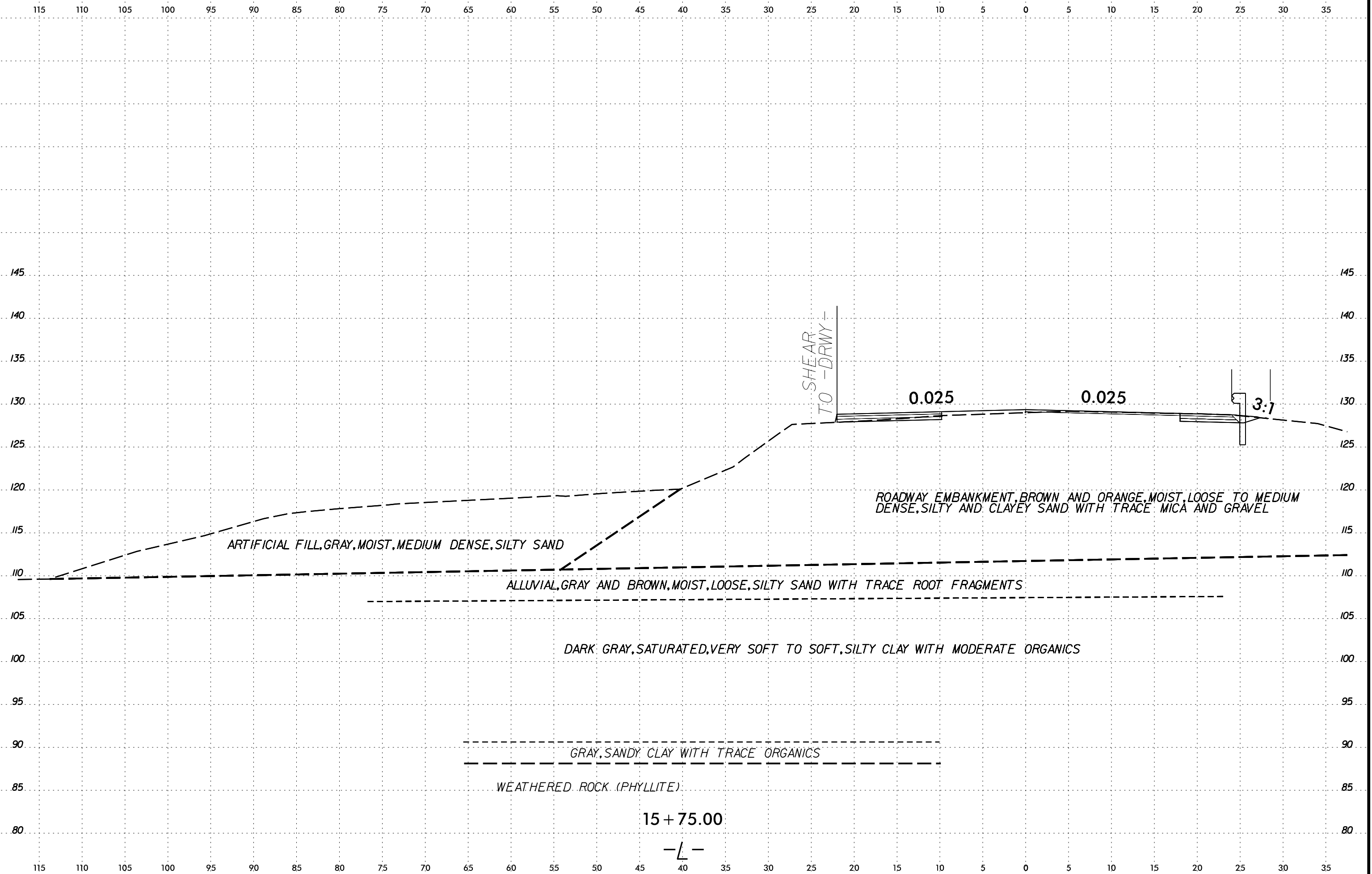
STATION	OFFSET	DEPTH	SR.(psf)
15+50	60' LT	3.0	537
15+50	60' LT	5.0	1129

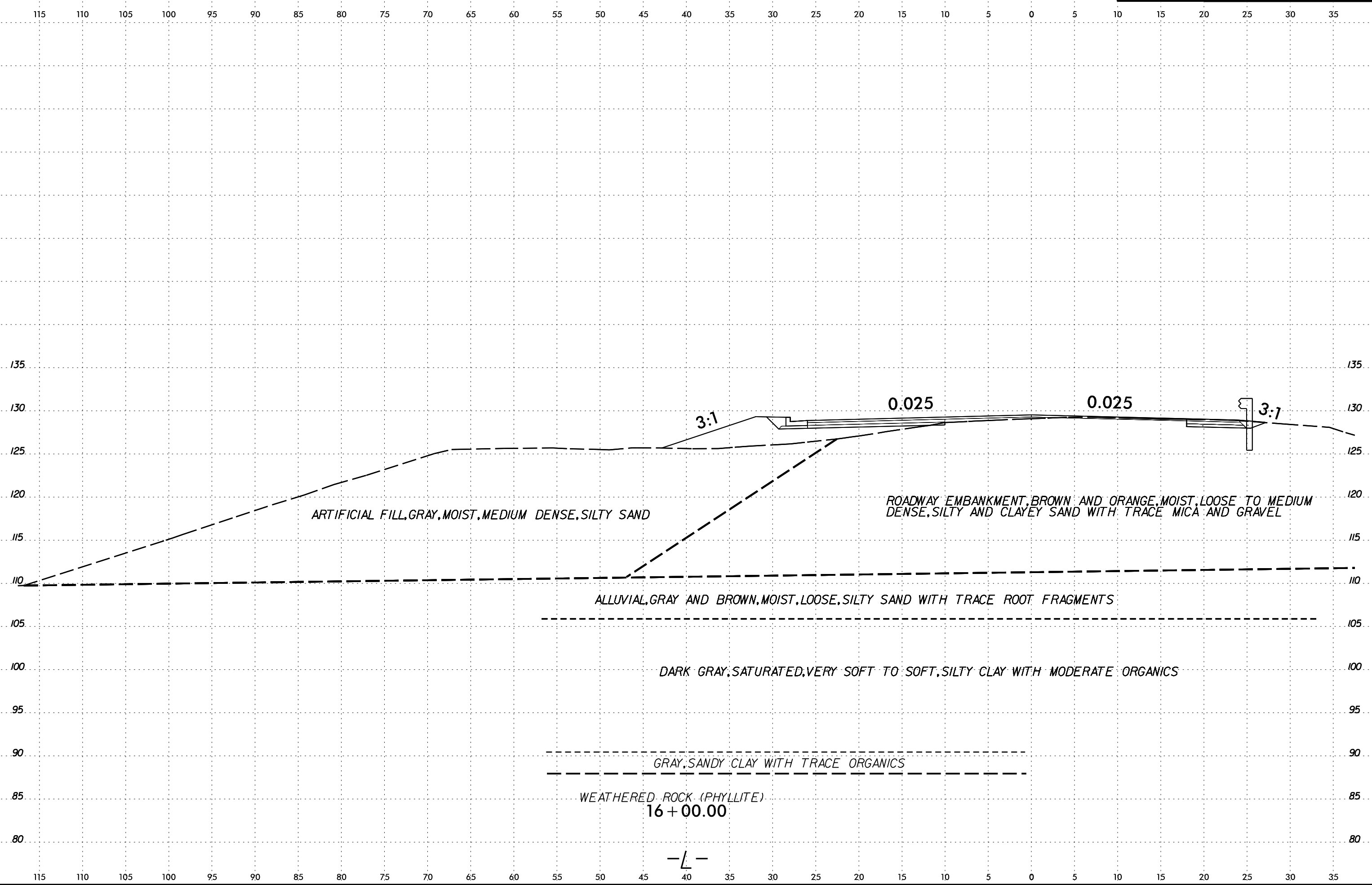
SOIL TEST RESULTS

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-26	60' LT	15+50	3.5-4.0	A-7-5(15)	66	22	20.1	10.5	27.1	42.3	91	80	64	92	19

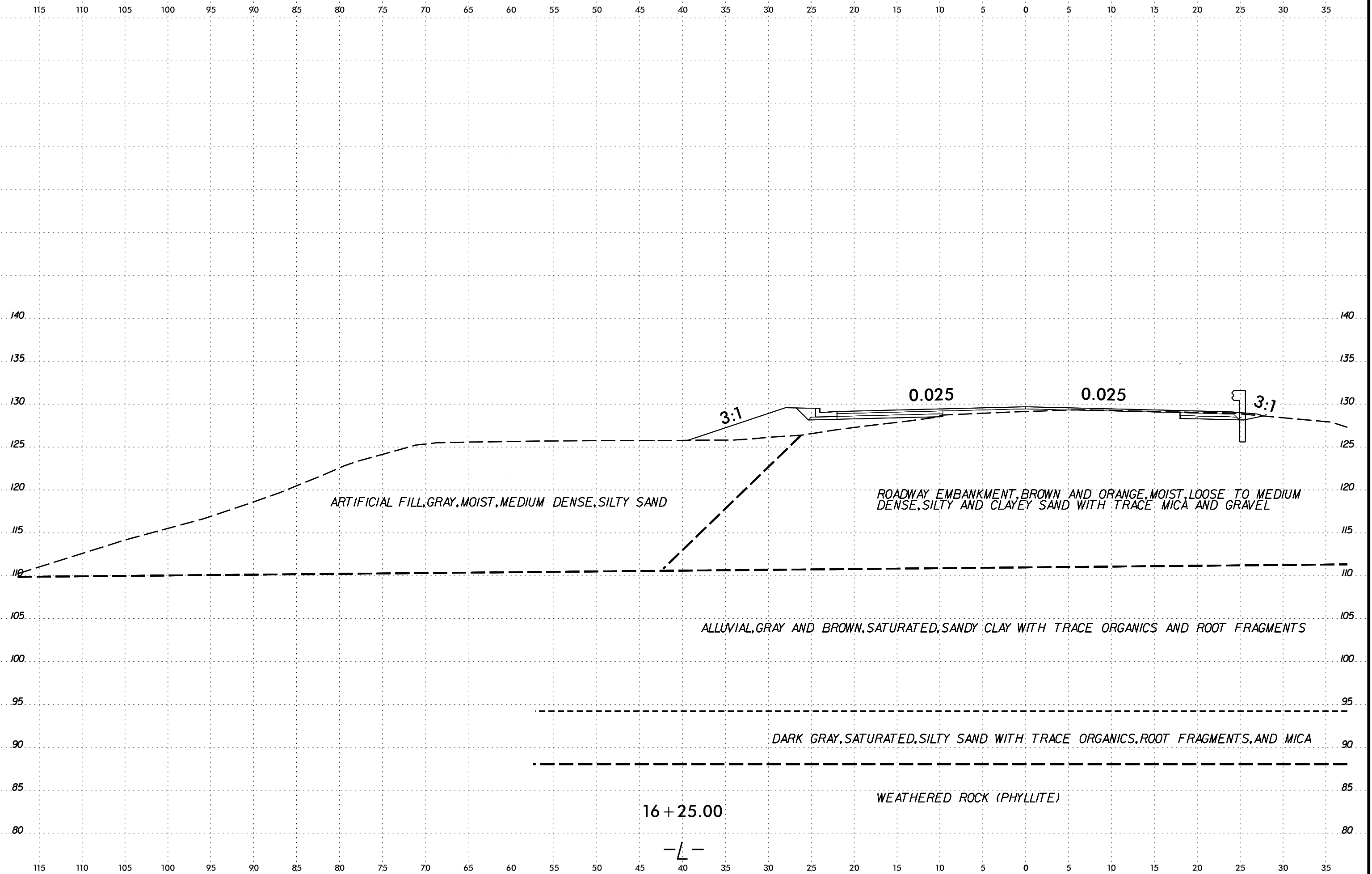


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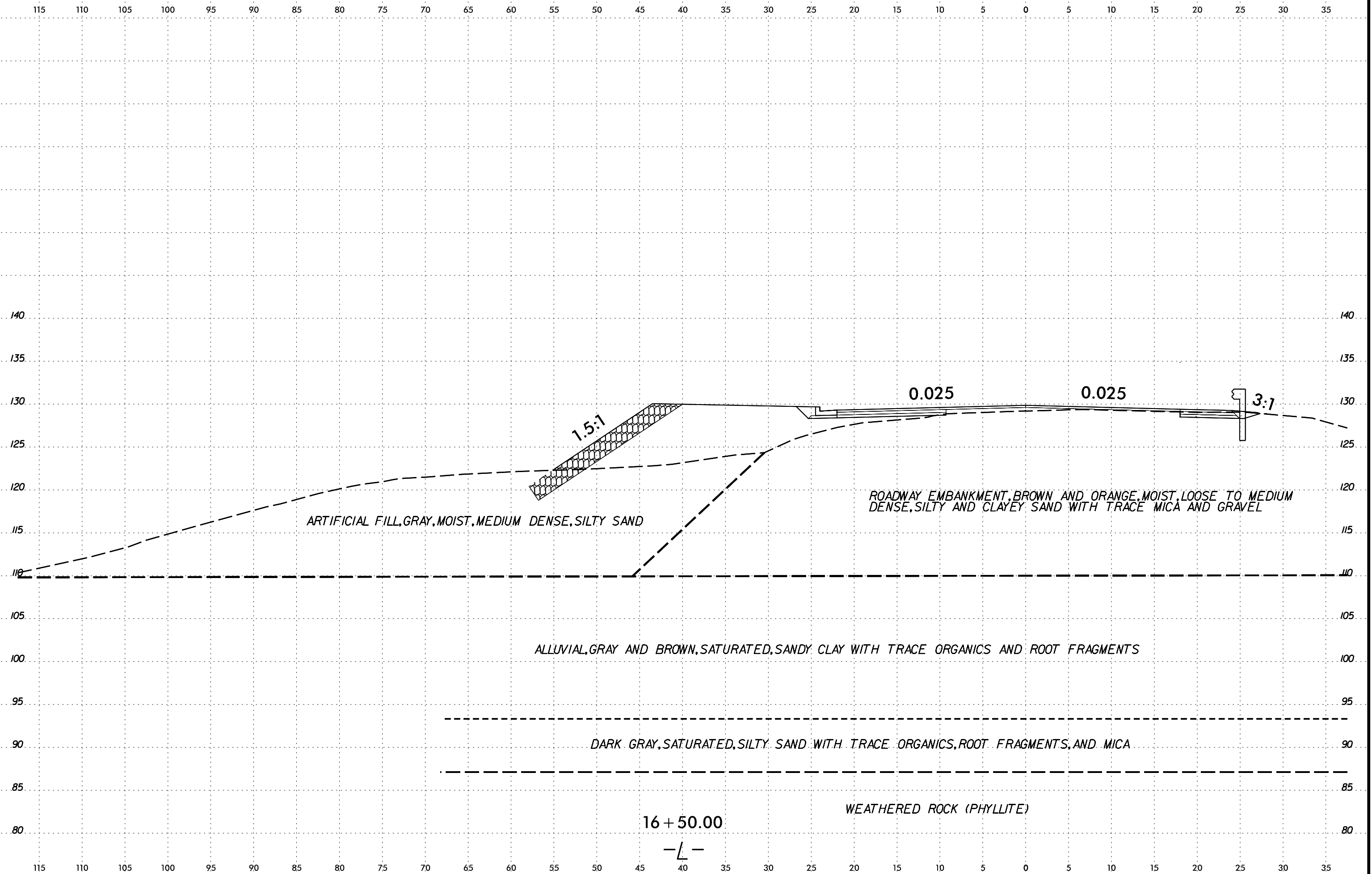




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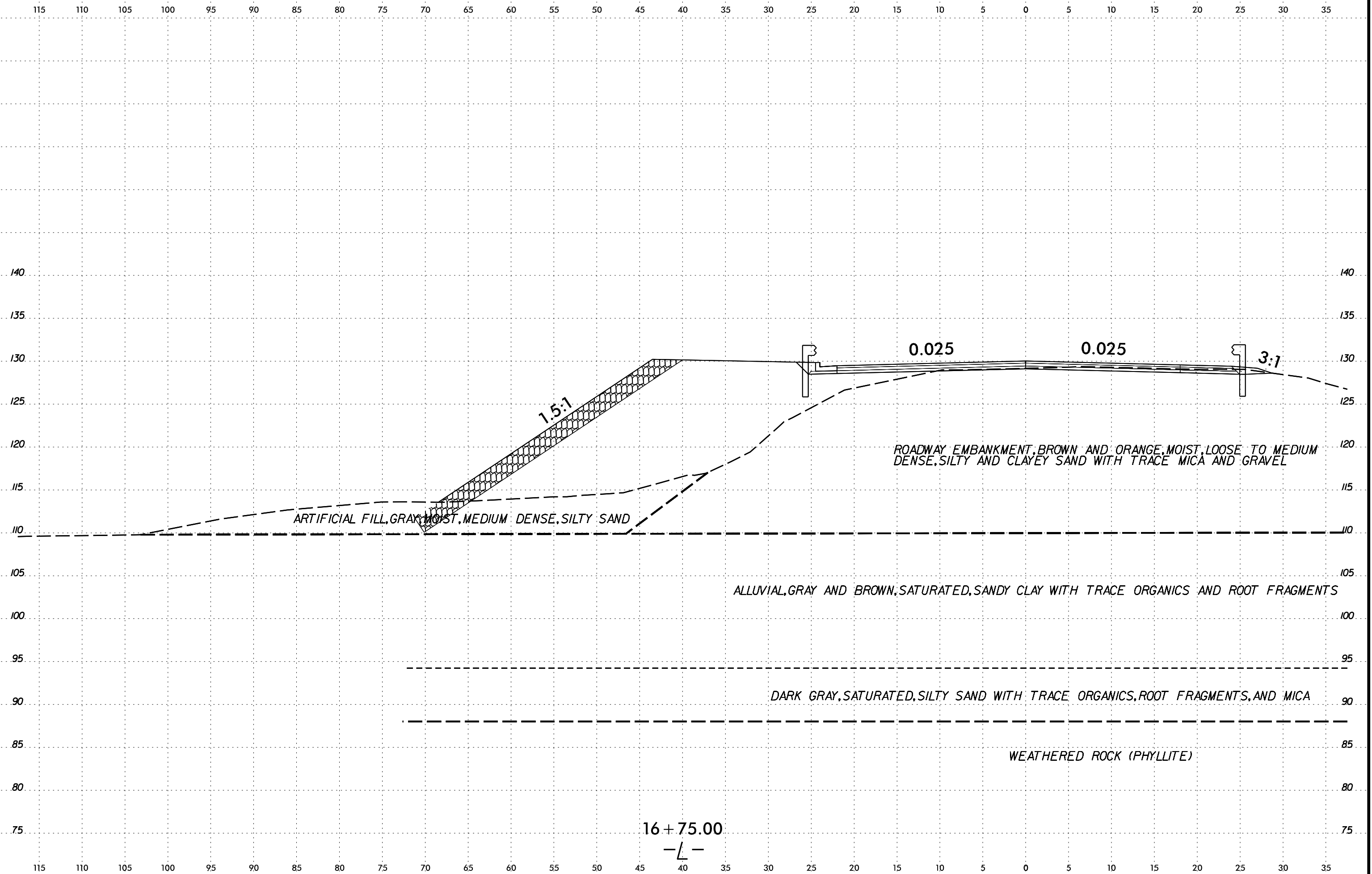


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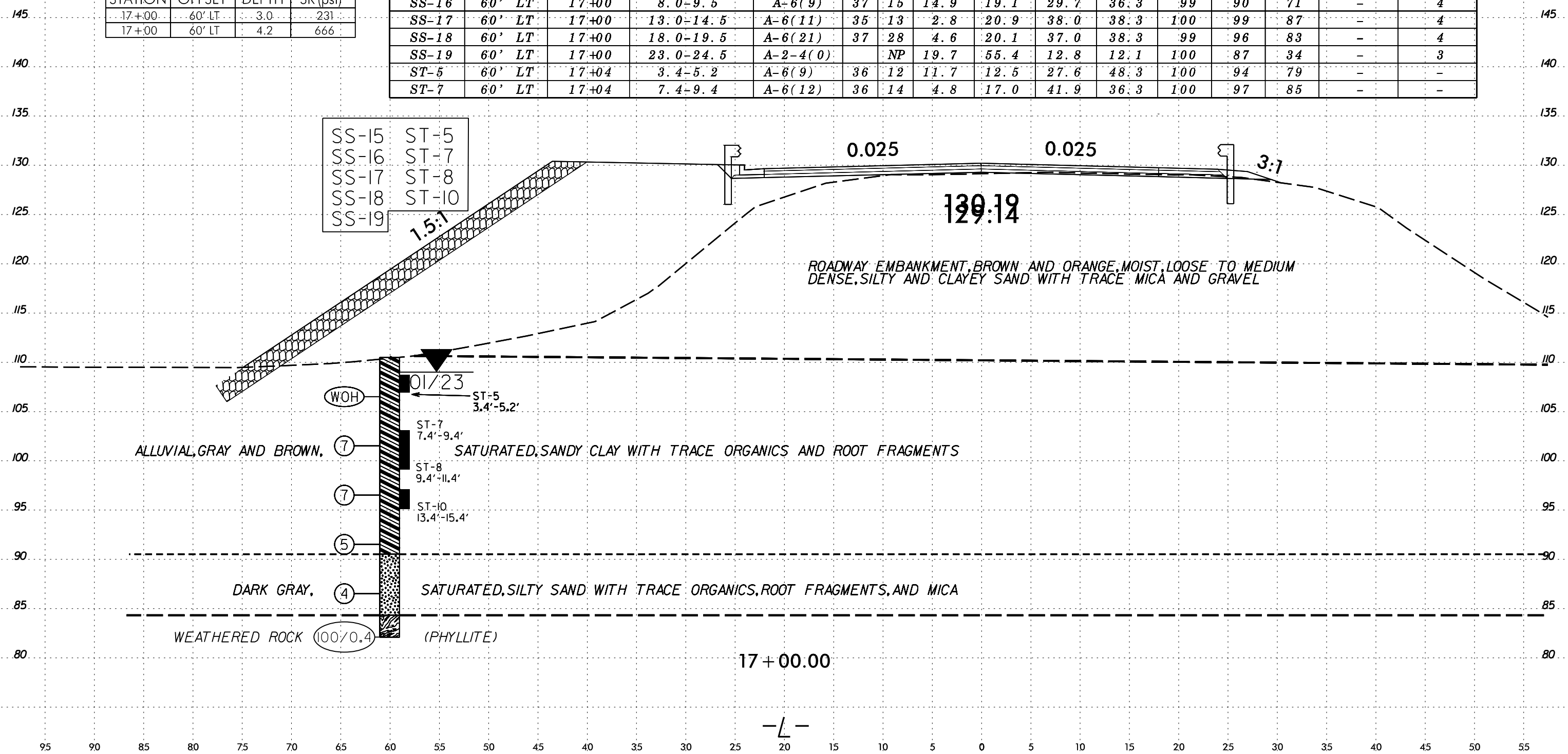


VANE SHEAR TESTS

STATION	OFFSET	DEPTH	SR (psf)
17+00	60' LT	3.0	231
17+00	60' LT	4.2	666

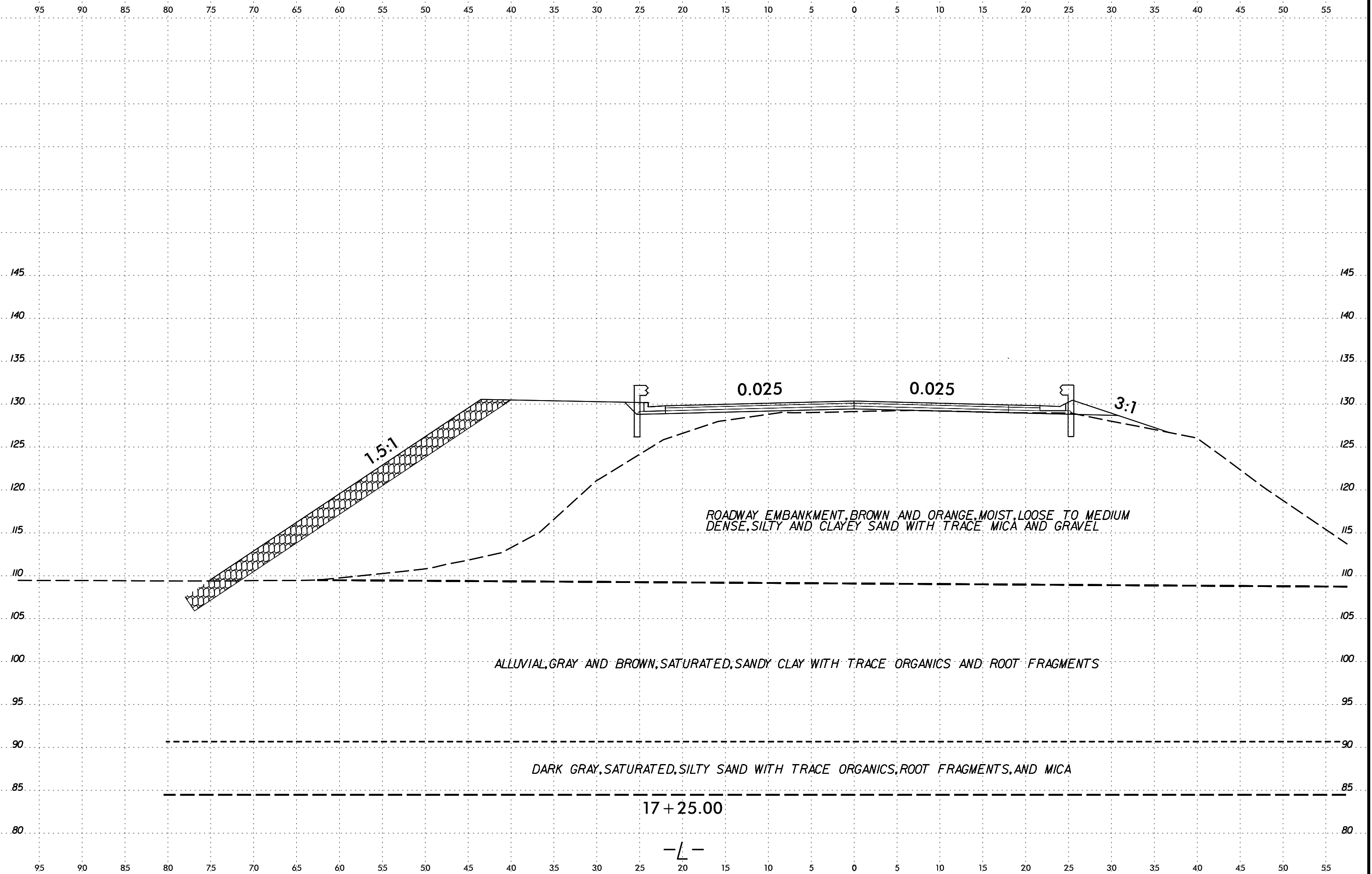
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-15	60' LT	17+00	3.0-4.5	A-6(5)	32	12	26.0	15.5	20.2	38.3	95	79	58	-	4
SS-16	60' LT	17+00	8.0-9.5	A-6(9)	37	15	14.9	19.1	29.7	36.3	99	90	71	-	4
SS-17	60' LT	17+00	13.0-14.5	A-6(11)	35	13	2.8	20.9	38.0	38.3	100	99	87	-	4
SS-18	60' LT	17+00	18.0-19.5	A-6(21)	37	28	4.6	20.1	37.0	38.3	99	96	83	-	4
SS-19	60' LT	17+00	23.0-24.5	A-2-4(0)		NP	19.7	55.4	12.8	12.1	100	87	34	-	3
ST-5	60' LT	17+04	3.4-5.2	A-6(9)	36	12	11.7	12.5	27.6	48.3	100	94	79	-	-
ST-7	60' LT	17+04	7.4-9.4	A-6(12)	36	14	4.8	17.0	41.9	36.3	100	97	85	-	-

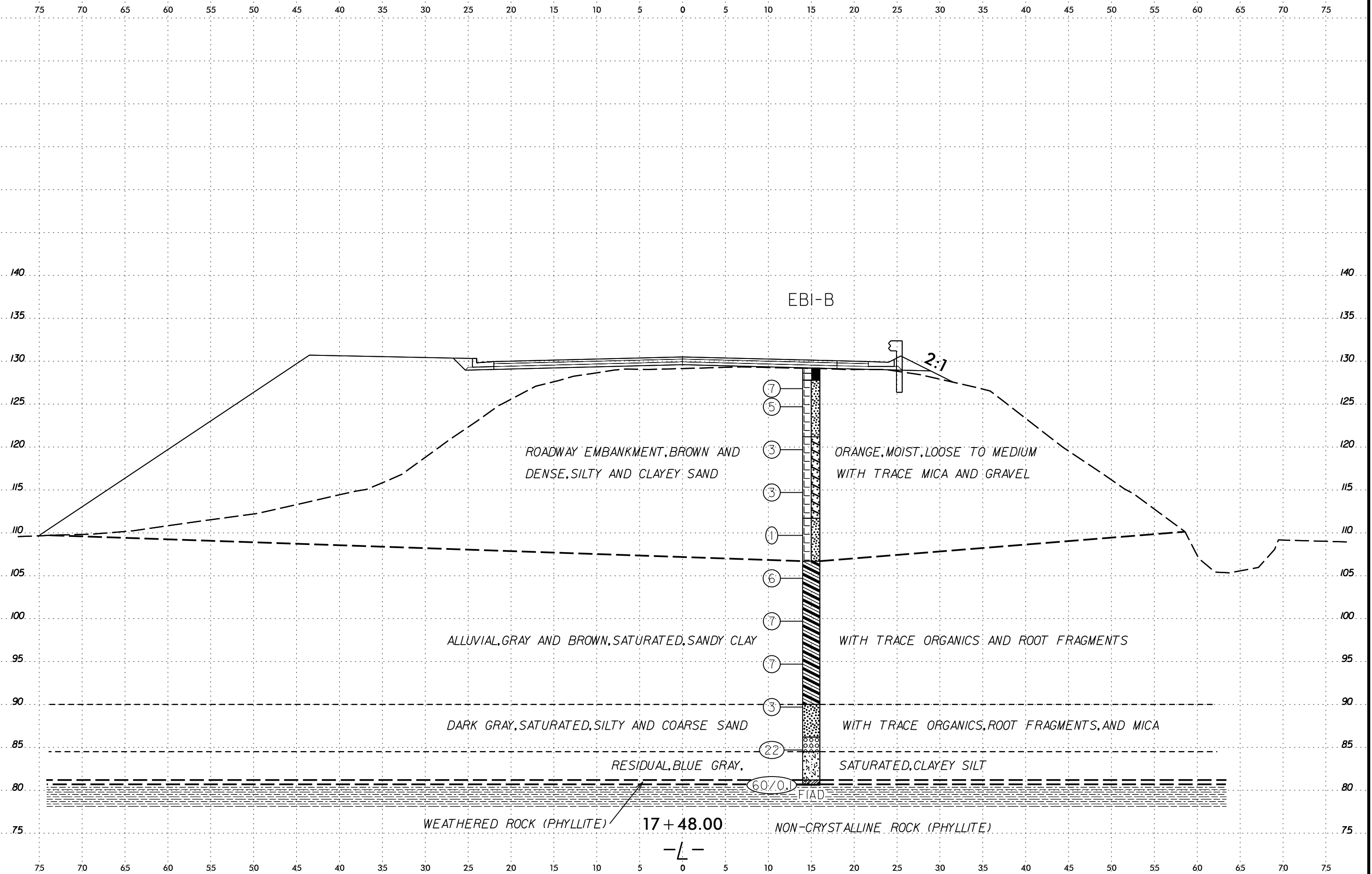


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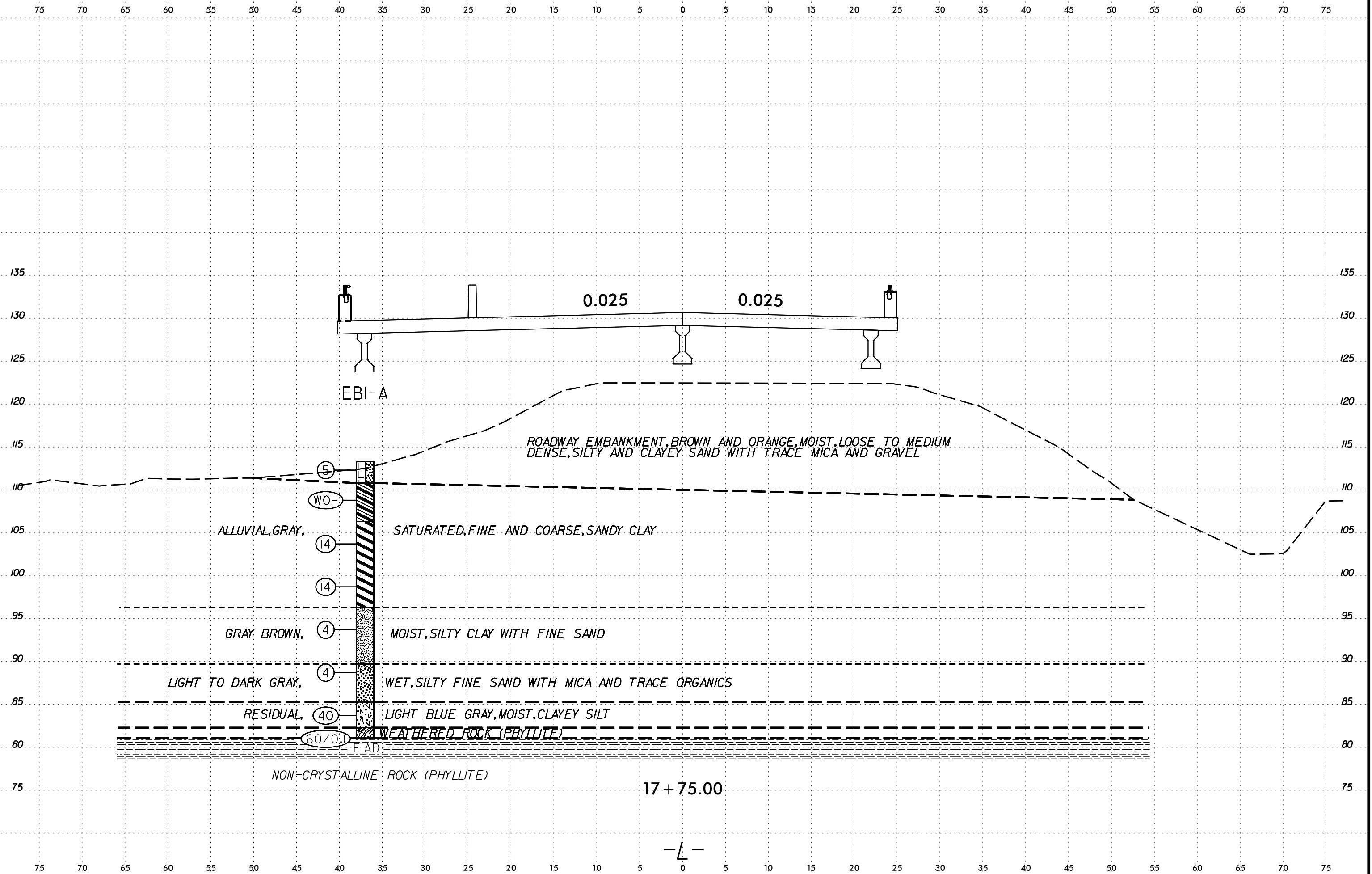
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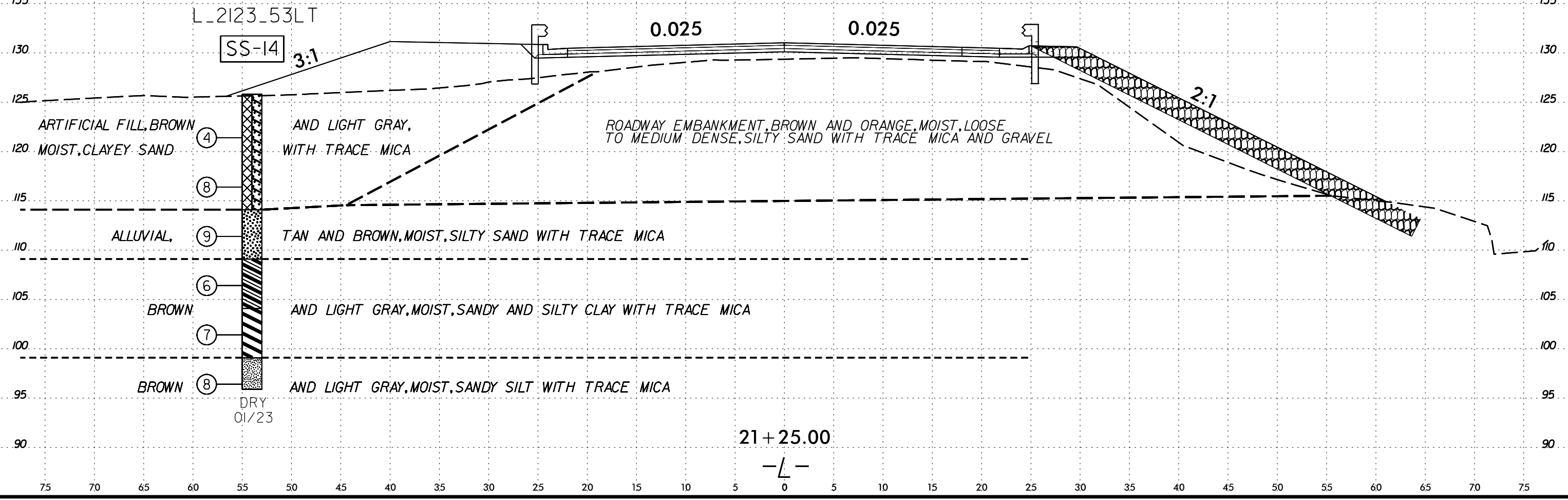
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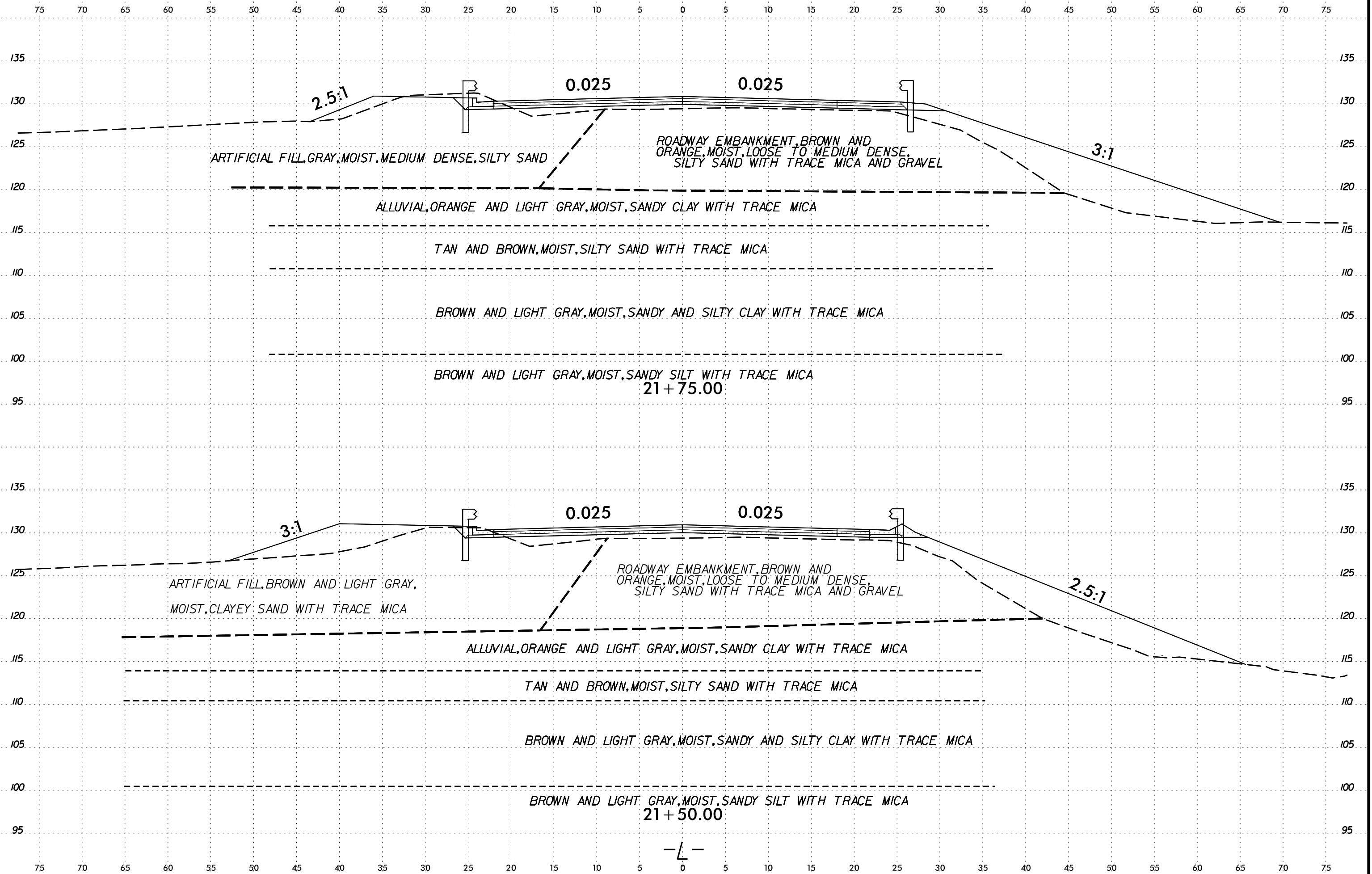
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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-14	54' LT	21+23	28.4-29.9	A-4(0)		NP	12.9	49.1	21.9	16.1	100	97	48	-	-



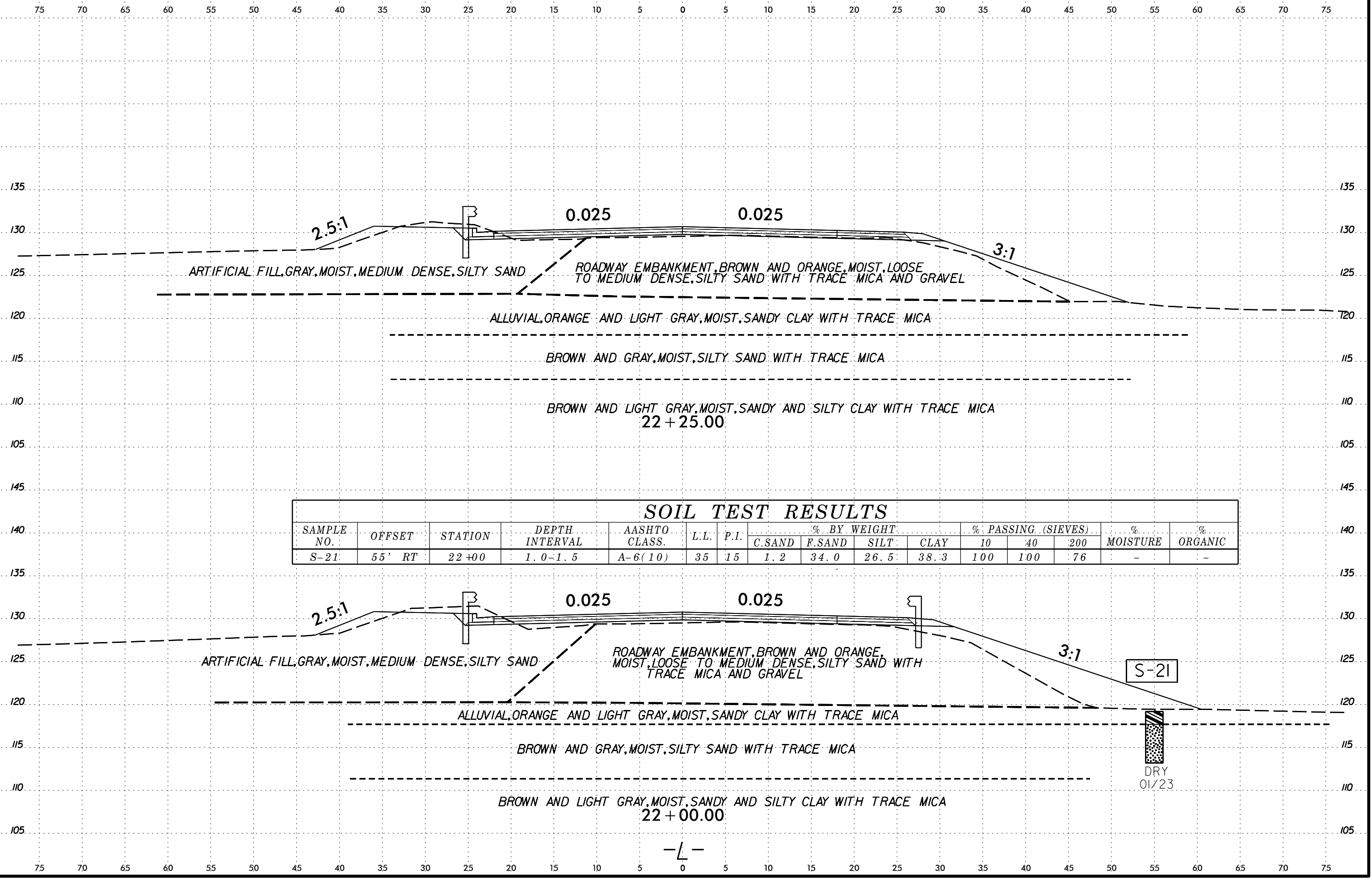
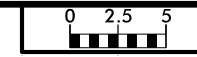
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ARTIFICIAL FILL, GRAY, MOIST, MEDIUM DENSE, SILTY SAND

ROADWAY EMBANKMENT, BROWN AND ORANGE, MOIST, LOOSE TO MEDIUM DENSE, SILTY SAND WITH TRACE MICA AND GRAVEL

ALLUVIAL, ORANGE AND LIGHT GRAY, MOIST, SANDY CLAY WITH TRACE MICA

BROWN AND GRAY, MOIST, SILTY SAND WITH TRACE MICA

BROWN AND LIGHT GRAY, MOIST, SANDY AND SILTY CLAY WITH TRACE MICA
22 + 25.00

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-21	55' RT	22 + 00	1.0-1.5	A-6(10)	35	15	1.2	34.0	26.5	38.3	100	100	76	-	-

ARTIFICIAL FILL, GRAY, MOIST, MEDIUM DENSE, SILTY SAND

ROADWAY EMBANKMENT, BROWN AND ORANGE, MOIST, LOOSE TO MEDIUM DENSE, SILTY SAND WITH TRACE MICA AND GRAVEL

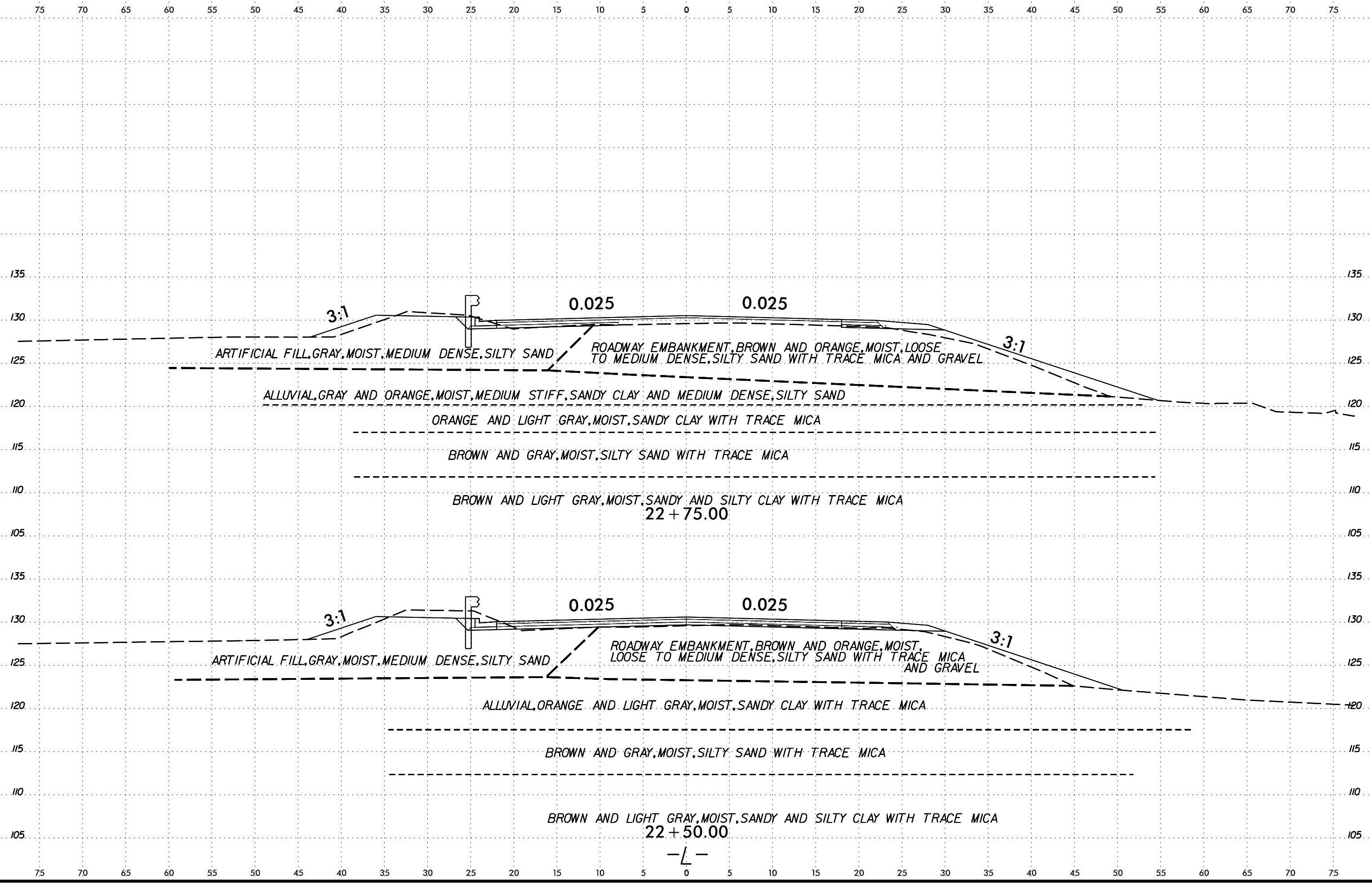
ALLUVIAL, ORANGE AND LIGHT GRAY, MOIST, SANDY CLAY WITH TRACE MICA

BROWN AND GRAY, MOIST, SILTY SAND WITH TRACE MICA

BROWN AND LIGHT GRAY, MOIST, SANDY AND SILTY CLAY WITH TRACE MICA
22 + 00.00

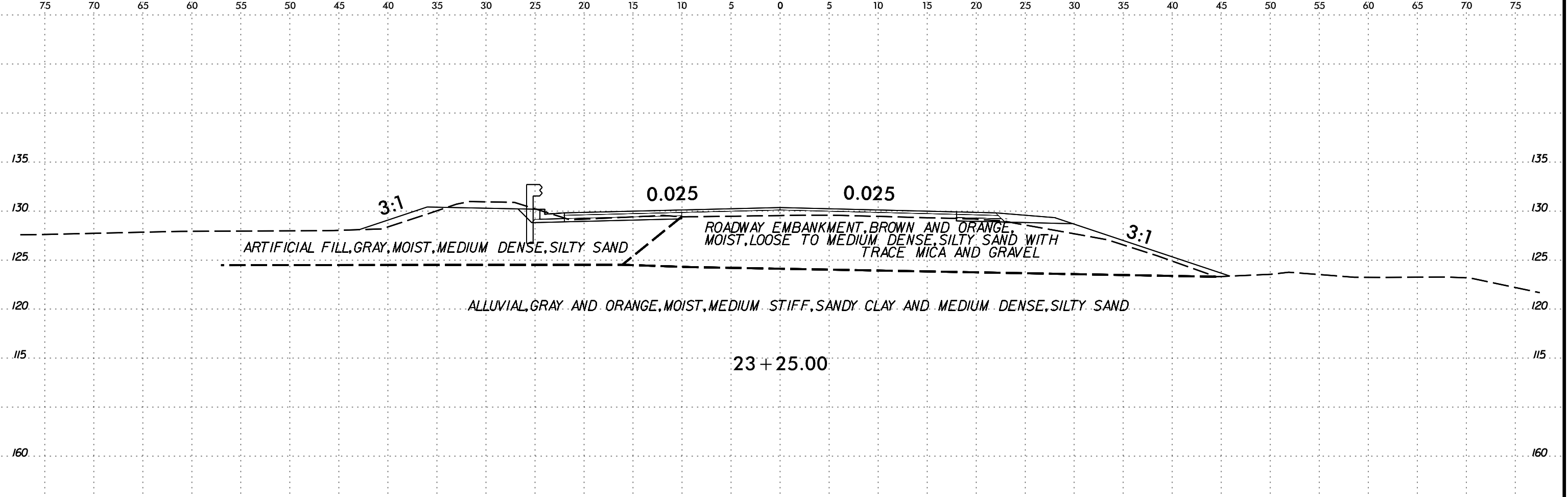
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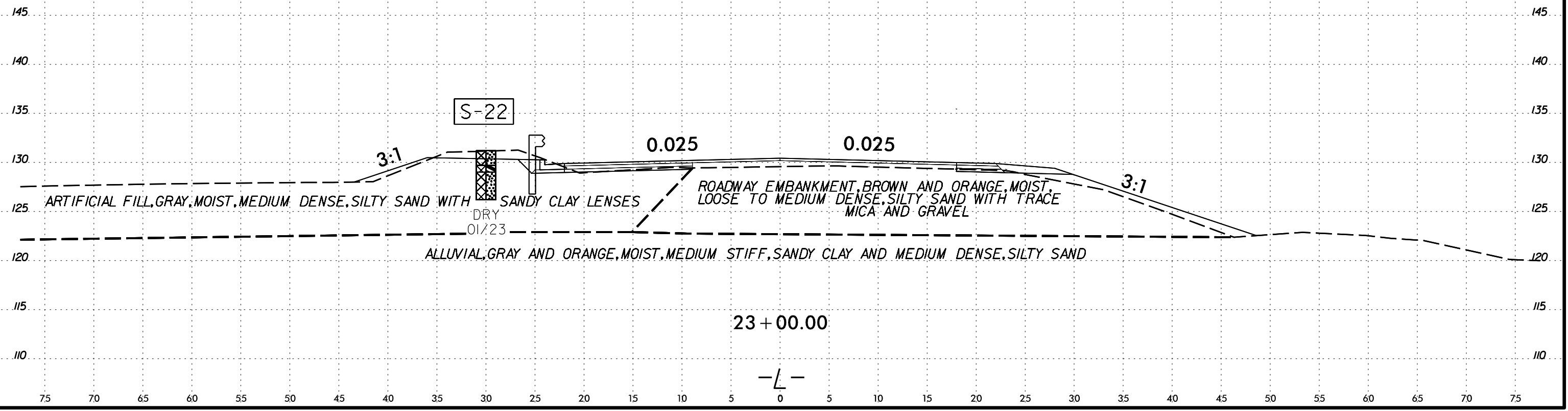
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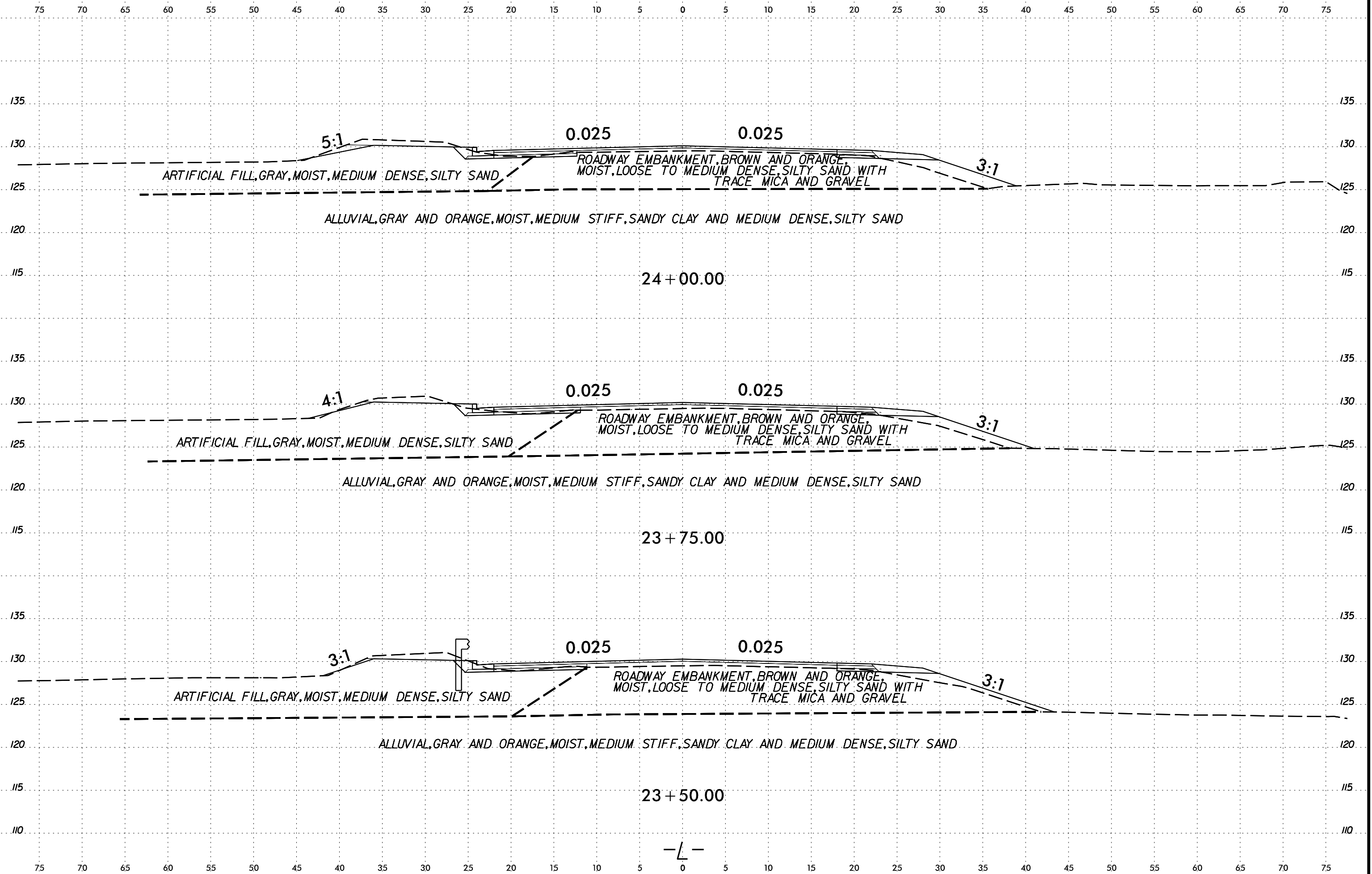
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-22	30' LT	23+00	1.5-2.0	A-6(8)	36	17	15.3	28.2	28.3	28.2	96	87	61	-	-



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75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

160 160

155 155

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-23	40' LT	24+50	2.0-2.5	A-4(2)	25	7	7.3	34.6	33.9	24.2	100	98	66	-	-

150 150

145 145

140 140

135 135

130 130

125 125

120 120

115 115

135 135

130 130

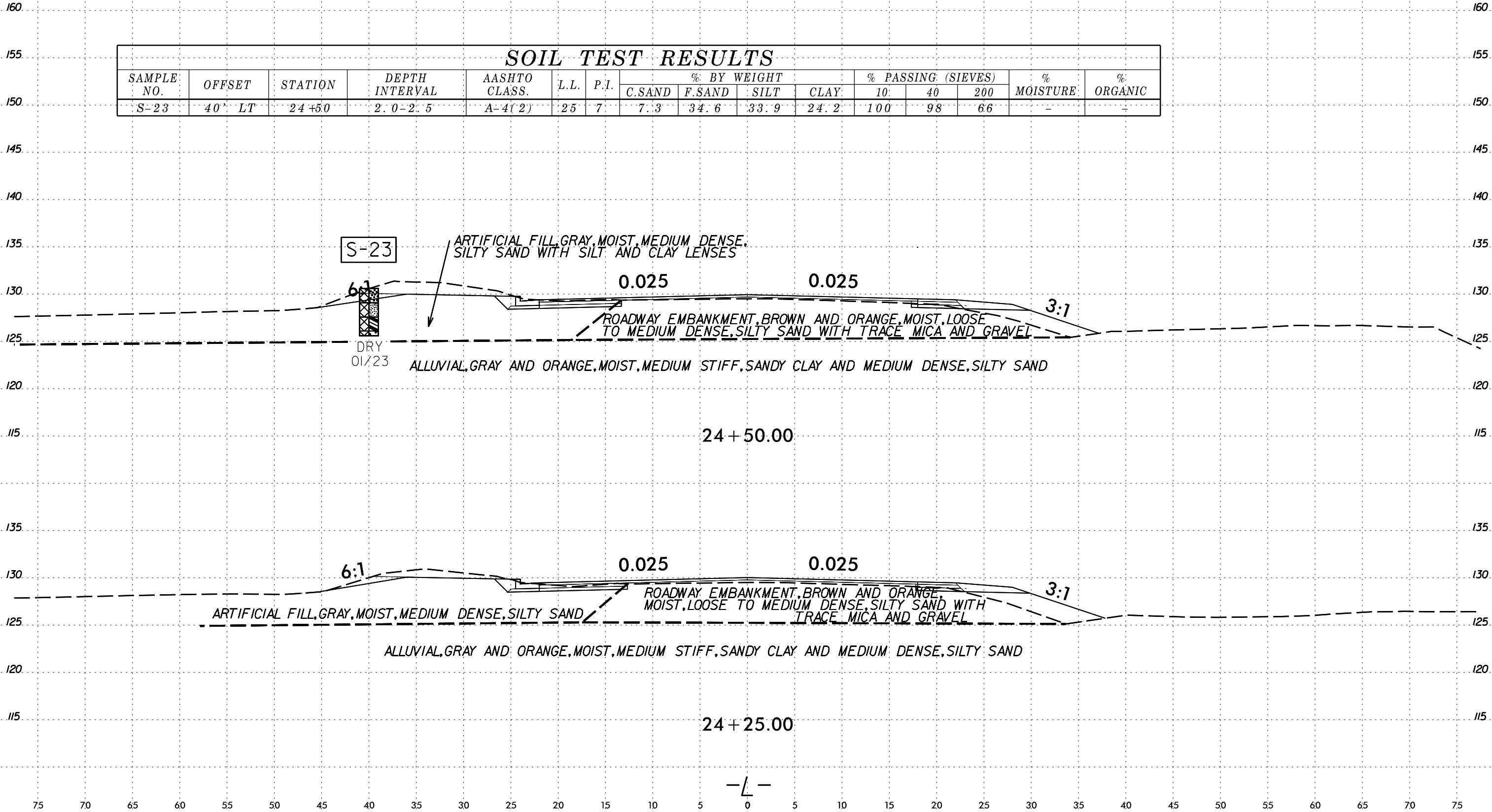
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120 120

115 115

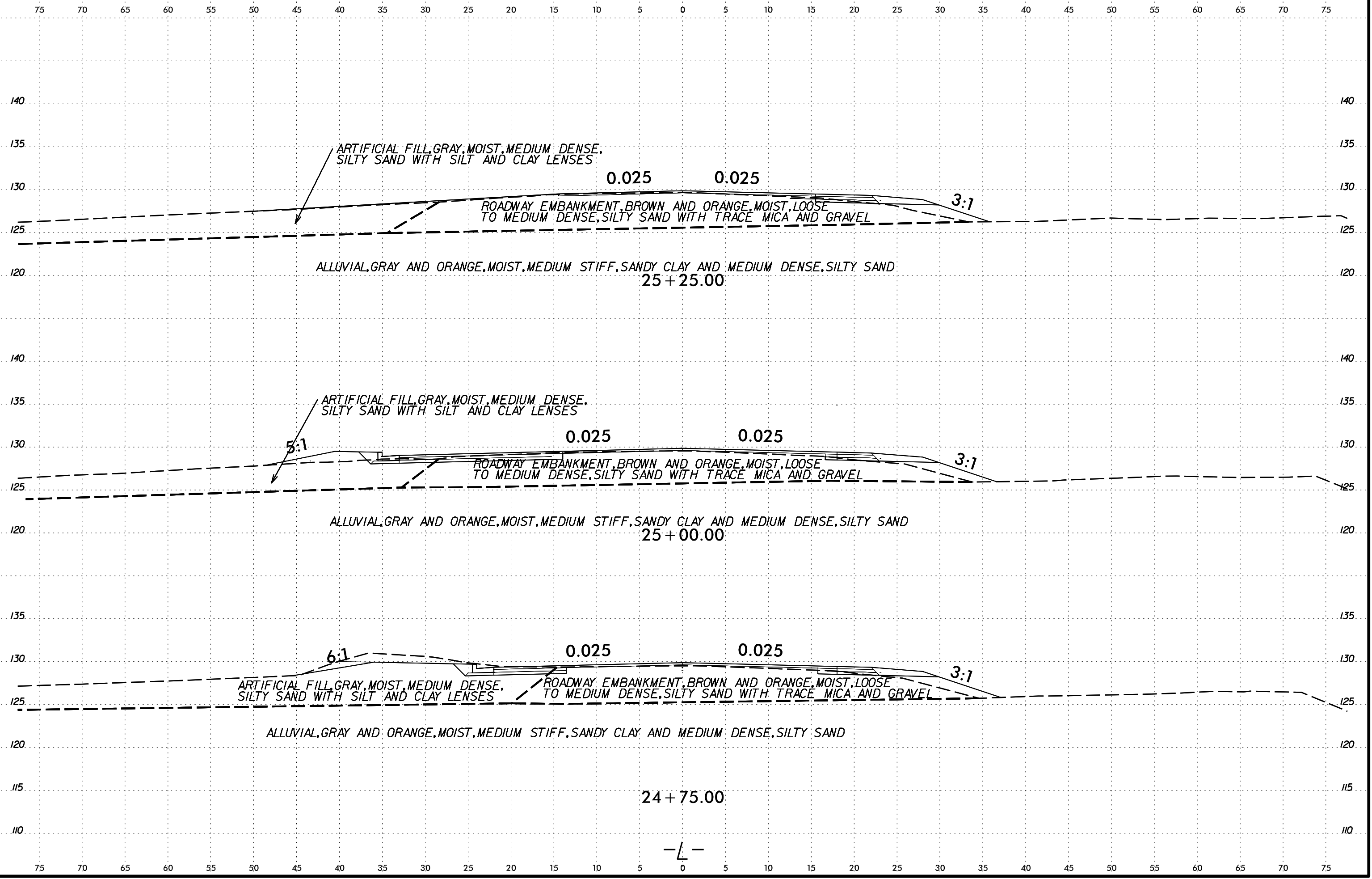
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