

REFERENCE: U-5789B

PROJECT: 44369

SEE SHEET 3 FOR PLAN SHEET LAYOUT
AT TIME OF INVESTIGATION

CONTENTS

<u>LINE</u>	<u>STATION</u>	<u>PLAN</u>
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CROSS SECTIONS

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APPENDICES

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

ROADWAY
SUBSURFACE INVESTIGATION

COUNTY HOKE/CUMBERLAND
PROJECT DESCRIPTION WIDEN TO MULTI- LANES SR 1102 (GILLIS HILL ROAD) FROM SOUTH OF CELTIC DRIVE TO NORTH OF SR 1112 (STONEY POINT RD.)

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5798B	1	

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 PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

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

PERSONNEL

MARPLES, Z. J.

TURNAGE, J. R.

OXENDINE, J.

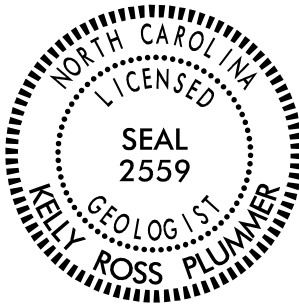
INVESTIGATED BY MARPLES, Z. J.

DRAWN BY ALMULLA, H.

CHECKED BY RIGGS JR., A. F.

SUBMITTED BY PLUMMER, K. R.

DATE DECEMBER 2023



DocuSigned by:
Kelly Plummer
51340CC5FA2E414
SIGNATURE

2/26/2025
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

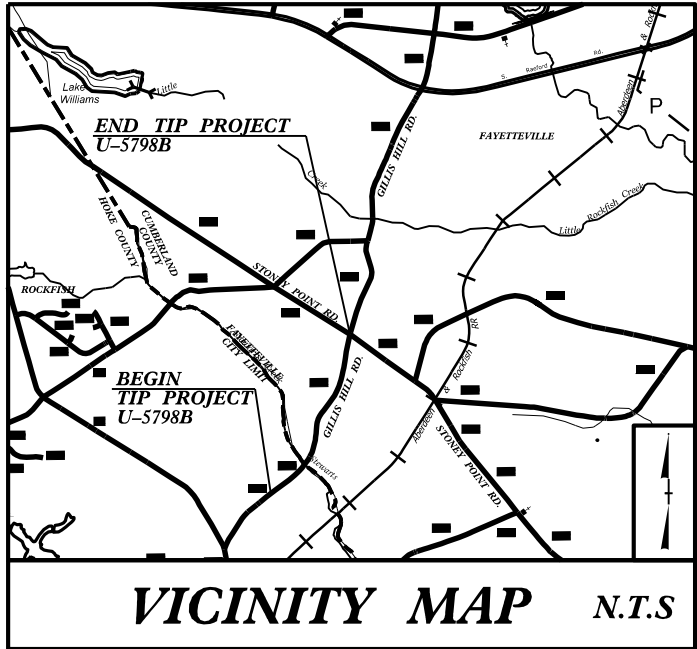
SOIL DESCRIPTION												GRADATION												ROCK DESCRIPTION												TERMS AND DEFINITIONS													
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS 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												WEATHERED ROCK (WR)												CRYSTALLINE ROCK (CR)													
GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)					SILT-CLAY MATERIALS (> 35% PASSING #200)					MINERALOGICAL COMPOSITION												NON-CRYSTALLINE ROCK (NCR)												COASTAL PLAIN SEDIMENTARY ROCK (CP)														
GROUP CLASS.	A-1	A-3	A-2	A-2-4	A-2-5	A-2-6	A-2-7	A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7	COMPRESSIBILITY												SLIGHTLY COMPRESSIBLE																					
SYMBOL	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7	A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7	PERCENTAGE OF MATERIAL												ORGANIC MATERIAL																						
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX 10 MX	51 MN 35 MX 10 MX	35 MX 35 MX 35 MX	35 MX 35 MX 35 MX	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	GROUND WATER												TRACE OF ORGANIC MATTER																				
MATERIAL PASSING #40 LL PI	— 6 MX	— NP	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING												2 - 3%																				
GROUP INDEX	0	0	0	0	4 MX	8 MX	12 MX	16 MX	NO MX	STATIC WATER LEVEL AFTER 24 HOURS												MODERATELY COMPRESSIBLE												5 - 10%															
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. OF GRAVEL, AND SAND	FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND			SILTY SOILS			CLAYEY SOILS			PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA												HIGHLY COMPRESSIBLE												LITTLE ORGANIC MATTER													
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												TRACE OF ORGANIC MATTER											
CONSISTENCY OR DENSENESS												MISCELLANEOUS SYMBOLS												FRESH												VERY SLIGHT (V SL.)													
PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY			RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)			RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)			SLIGHT (SL.)												MODERATE (MOD.)												MODERATELY SEVERE (MOD. SEV.)															
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE			< 4 4 TO 10 10 TO 30 30 TO 50 > 50			N/A			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												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								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.							
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD			< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30			< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4			VERY												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												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.															
TEXTURE OR GRAIN SIZE												RECOMMENDATION SYMBOLS												VERY HARD												HARD													
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	UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE	UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL	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.																					
BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F SD.)	SILT (SL.)	CLAY (CL.)	ABBREVIATIONS																MEDIUM HARD												SOFT														
GRAIN SIZE	MM IN.	305 12	75 3	2.0	0.25	0.05	0.005	AR - AUGER REFUSAL	MED. - MEDIUM	VST - VANE SHEAR TEST	BT - BORING TERMINATED	MICA - MICACEOUS	WEA. - WEATHERED	BT - BORING TERMINATED	MICA - MICACEOUS	WEA. - WEATHERED	VERY SOFT												FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.																				
SOIL MOISTURE - CORRELATION OF TERMS												SAMPLE ABBREVIATIONS												VERY HARD												HARD													
SOIL MOISTURE SCALE (ATTERBERG LIMITS)					FIELD MOISTURE DESCRIPTION					S - BULK	CSE. - COARSE	PMT - PRESSUREMETER TEST	SAP. - SAPROLITIC	SAND, SANDY	SL. - SILT, SILTY	SLI. - SLIGHTLY	TCR - TRICONE REFUSAL	WT - MOISTURE CONTENT	V - VERY	W - VOID RATIO	F - FINE	FOSS. - FOSSILIFEROUS	FRAC. - FRACTURED, FRACTURES	FRAGS. - FRAGMENTS	HL - HIGHLY	W - VOID RATIO	F - FINE	FOSS. - FOSSILIFEROUS	FRAC. - FRACTURED, FRACTURES	FRAGS. - FRAGMENTS	HL - HIGHLY	W - VOID RATIO	F - FINE	FOSS. - FOSSILIFEROUS	FRAC. - FRACTURED, FRACTURES	FRAGS. - FRAGMENTS	HL - HIGHLY												
SOIL MOISTURE SCALE (ATTERBERG LIMITS)					FIELD MOISTURE DESCRIPTION					W - VOID RATIO	F - FINE	FOSS. - FOSSILIFEROUS	FRAC. - FRACTURED, FRACTURES	FRAGS. - FRAG																																			

05/08/24

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hainulid AT WXE-70045194

TIP PROJECT: U-5798B

CONTRACT:



RIGHT OF WAY PLAN SET

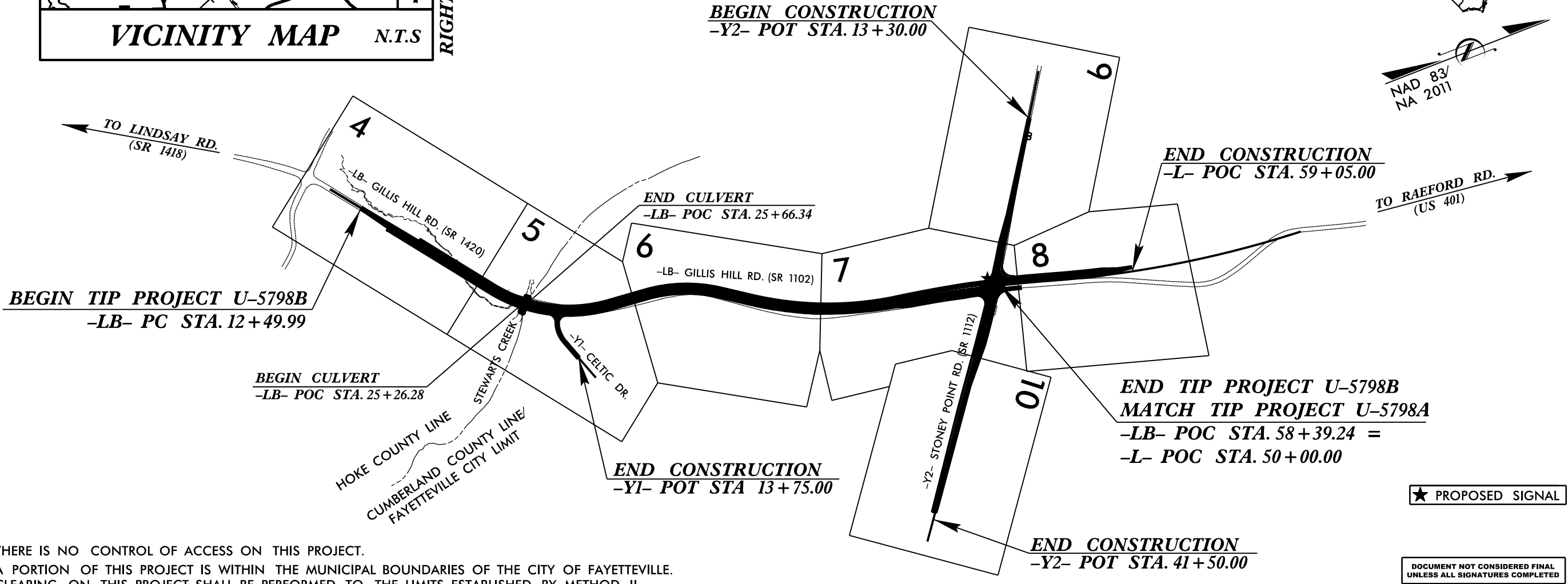
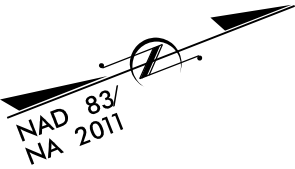
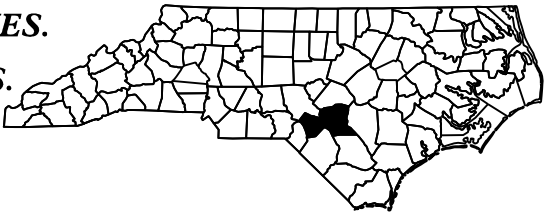
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

**HOKE AND CUMBERLAND
COUNTIES**

**LOCATION: SR 1102 (GILLIS HILL ROAD) FROM SOUTH OF CELTIC DRIVE TO
NORTH OF SR 1112 (STONEY POINT ROAD). WIDEN TO MULTI-LANES.**

TYPE OF WORK: PAVING, GRADING, DRAINAGE, CULVERT, WALLS, AND SIGNALS.

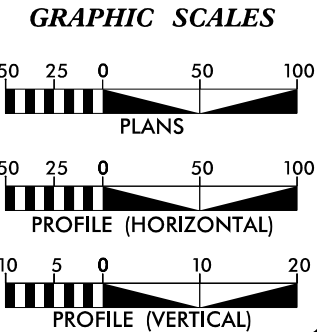
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5798B	3	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
44369.1.3	N/A	PE	
44369.2.3	N/A	ROW	
44369.2.4	N/A	UTL.	



THERE IS NO CONTROL OF ACCESS ON THIS PROJECT.

A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF FAYETTEVILLE.

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.



DESIGN DATA

ADT 2025 = 10,800
ADT 2045 = 17,500

K = 7 %
D = 55 %
T = 3 % *
V = 50 MPH

*(TTST=1 + DUAL=2)

FUNC CLASS =
MINOR COLLECTOR
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-5798B = 0.861 MILES

LENGTH CULVERT TIP PROJECT U-5798B = 0.008 MILES

TOTAL LENGTH TIP PROJECT U-5798B = 0.869 MILES

PREPARED IN THE OFFICE OF:

RS&H

8521 SIX FORKS ROAD, SUITE 400
RALEIGH, NC 27615
NC FIRM LICENSE No: F-0493

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JUNE 13, 2023

LETTING DATE:
FEBRUARY 18, 2025

SEAN KORTOVICH, PE
PROJECT ENGINEER

DANA M. PACZEK, PE
PROJECT DESIGN ENGINEER

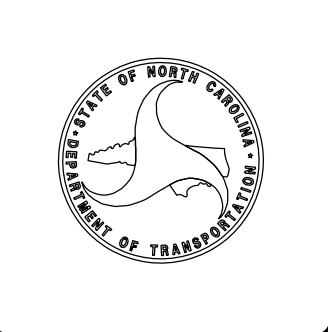
KHALED A. ALAKHDAR
NCDOT CONTACT

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.





PROJECT REFERENCE NO.	SHEET NO.
U-5798B	3A

Date: October 20, 2023

WBS Number: 44369.1.3

TIP Number: U-5798B

County: Hoke and Cumberland

Description: Widen to Multi-Lanes SR 1102 (Gillis Hill Road) from South of Celtic Drive to North of SR 1112 (Stoney Point Road)

Subject: Roadway Geotechnical Report - Inventory

Project Description

The project is located in Hoke and Cumberland Counties, North Carolina on Gillis Hill Road between Steeple Run Drive and Stoney Point Road (SR 1112). The project will consist of widening approximately 0.86 miles of Gillis Hill Road. The existing facility is two lanes. The proposed project predominately consists of constructing a four-lane median divided section with sidewalk on both shoulders. Stoney Point Road will be improved near the intersection with Gillis Hill Road to include turn lanes and 4-feet wide paved shoulders.

The project also includes replacing the existing 92-inch metal pipe culvert with a triple 12’ X 8’ reinforced concrete box culvert at Stewart Creek (25+46 -LB-). One retaining wall is proposed to limit impacts on adjacent residential properties. The type of retaining wall has not been determined at this time, however it is located in cuts with maximum heights of approximately 8 feet. The proposed retaining wall is located between Stations 20+50 and 22+90 -LB- on the left side of the project and is approximately 240 feet long. Slopes steeper than 3:1 (H:V) and up to 2.01 (H:V) are proposed on fill slopes along the left side of the project between approximately Stations 18+00 and 19+00 -LB- to reduce impacts to a jurisdictional stream that crosses beneath Gillis Hill Road.

The geotechnical subsurface investigation was performed in July 2023 to August 2023. The site was investigated with fourteen (14) hand auger borings and twenty-eight (28) standard penetration test (SPT) borings. The hand auger borings were advanced to depths of 6 to 10 feet beneath the ground surface. The SPT borings were advanced using a track mounted Diedrich D-50 rotary drill rig equipped with a recently calibrated automatic hammer. The SPT borings were advanced using hollow stem augers and mud rotary drilling techniques to depths of 9.9 to 44.4 feet beneath the ground surface.

Representative soil samples were collected in the field for visual classification and selected samples were submitted for laboratory analysis by Terracon’s soil testing laboratory. All laboratory testing was performed in a NCDOT materials and testing certified laboratory in accordance with the AASHTO Soil Classification System.

The following alignments were investigated by soil testing and visual reconnaissance:

Alignment	Stations (±)
-LB-	12+49.99 to 58+39.24
-Y1-	10+00 to 13+75
-Y2-	13+00 to 41+50

Physiography and Geology

The site is located within the Inner Coastal Plain Physiographic and Geologic Province of North Carolina in Hoke and Cumberland Counties. The Coastal Plain Province is typically characterized by marine and eolian sediments that were deposited during periods of fluctuating sea levels and moving shorelines. The existing elevations along the investigated corridor range from approximately 202 feet at the south end of the project to a low of 170 feet near the center of the project at the crossing of Stewart Creek and then rising again to about 225 at the north end of the project site. In general, the topography at this site is generally rolling with some gentle slopes.

The Inner Coastal Plain Physiographic Province consists of a wedge of unconsolidated sands, silt, marl, and other clays interbedded with occasional limestone strata, which rests atop crystalline basement rocks.

Based on previous mapping (N.C. Geologic Map 1985) and our knowledge of the local geology, the site falls within Middendorf Formation. Based on our site visit and subsurface conditions encountered, the near surface soils appear to be Coastal Plain deposits of sands, silts, and clays, typical of Coastal Plain formations. The Coastal Plain deposits underlie the clays and sands that make up the roadway embankment materials and alluvial soils.

The Cretaceous Age Middendorf Formation consists of beds of sands and clays of alluvial origin. The lithology of the materials and mica content indicates that these sediments are derived from weathered crystalline granitic and metamorphosed gneiss rocks of the Piedmont. The sands consist of angular grains that are fine to course in texture and the clays are arenaceous. Iron- cemented concretions are common. Crossbedding is common, and beds are laterally discontinuous.

Soil Properties

Soils encountered during this investigation are separated into four categories based on their origin. The soils encountered consist of roadway embankment fill, artificial fill, alluvial deposits, and Coastal Plain formational soils.

The roadway embankment soils encountered appear to be derived from the on-site soils along the alignments. Roadway embankment fill was encountered up to a maximum depth of about 12.5 feet along the -LB- alignment. The roadway embankment soils predominately consist of loose to medium dense, moist to wet, silty fine sand (A-2-4) and clayey fine sand (A-2-6). Additionally, very soft to soft, moist to wet, sandy silts (A-4) were also encountered in the roadway embankment.



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Artificial fill soils were encountered at the following approximate location:

<u>Alignment</u>	<u>Stations (±)</u>
-LB-	27+04 to 27+77

Artificial fill soils encountered consist of loose, moist silty fine to coarse sands (A-2-4).

Alluvial soils were encountered at the following approximate locations:

<u>Alignment</u>	<u>Stations (±)</u>	<u>Offset</u>
-LB-	12+50 to 21+00	LT
-LB-	20+50 to 27+00	RT
-LB-	24+90 to 27+50	LT
-Y1-	10+50 to 12+00	RT

Alluvial soils are present at the surface and beneath the roadway embankments extending to depths of 8.5 to 22 feet (elevations 158.6 to 180.4 feet) beneath the surface The alluvial soils along the -LB- alignment range from 5.5 to 12.5 feet thick and consist of very loose to loose, moist to saturated, silty and clayey fine to course sands (A-2-4, A-2-6) with trace organics and wood fragments and very soft to medium stiff, moist to saturated, fine sandy silts (A-4) and moderately plastic sandy clays (A-6) with trace to little organics. The plasticity index of the sandy silts, sandy clays, and silty clays in the alluvial soils tested, range from 11 to 16 percent. The percent fines passing the #200 sieve in these soils range from 29 to 87 percent. The natural moisture contents range from 24.6 to 79.5 percent, with organic contents of 2.7 to 6.3 percent based on laboratory testing.

Coastal Plain deposits are present at the surface along the shoulders, beneath the roadway embankment and alluvial soils. The Coastal Plain Formation encountered, Middendorf Formation, contain soils that can be generalized as alternating layers of sand, silt, and clay.

The Middendorf Formation consists of very loose to very dense, dry to saturated, silty and clayey fine to coarse sands (A-2-4, A-2-6 and A-2-7). Some of the clayey sands were slightly to moderately plastic and exhibited plasticity indices of 12 to 25 percent with 23 to 35 percent passing the #200 sieve. The cohesive soils consist of very soft to hard, moist to saturated, slightly plastic fine sandy silt (A-4), slightly to moderately plastic fine sandy clay (A-6) and moderately plastic to highly plastic silty clay (A-7-5, A-7-6). The plasticity indices of the cohesive soils range from 7 to 50 percent with 36 to 90 percent passing the #200 sieve and natural moisture contents of 10 to 31 percent, based on laboratory testing. The moderately to highly plastic Coastal Plain soils are indicated on the attached cross section graphics.

Groundwater

Groundwater was encountered at depths of about 1 to 15.3 feet (elevations 172.8 to 191.6 feet) along the project. Drainage flows from both the north and south to Stewart Creek. The depth of groundwater, beneath the ground surface, will fluctuate with seasonal precipitation and may occur at higher levels at other times of the year above less permeable clayey soils.

Areas of Special Geotechnical Interest

1) Plastic Soils – Moderately plastic soils with plastic indices (PI) of 16 and greater were encountered at the following locations:

<u>Alignment</u>	<u>Stations (±)</u>
-LB-	12+50 to 23+25
-LB-	24+75 to 25+50
-LB-	26+25 to 27+50
-LB-	28+25 to 29+75
-LB-	38+75 to 42+75
-LB-	44+50 to 58+39
-Y2-	16+50 to 18+50
-Y2-	22+75 to 32+00
-Y2-	34+25 to 41+50

A discussion of these plastic soils is located above in the section titled “Soil Properties”.

2) Soft/Wet Soils- Soft wet near surface soils which have the potential to cause embankment stability/settlement problems occur through the following sections:

<u>Alignment</u>	<u>Station (±)</u>
-LB-	17+75 to 22+75
-LB-	23+75 to 27+25

A discussion of these soft wet near surface soils is located above in the section titled “Soil Properties”.

3) Organic Soils- Soils with little organic content were encountered at the following locations.

<u>Alignment</u>	<u>Station (±)</u>
-LB-	12+25 to 15+25
-LB-	17+75 to 20+25

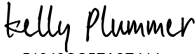
PROJECT REFERENCE NO.	SHEET NO.
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4) Groundwater- High water tables, seasonal high ground water, as well as potential perched groundwater were encountered within six feet of existing grade at the following locations.

<u>Alignment</u>	<u>Station (±)</u>
-LB-	12+50 to 27+75
-Y1-	10+00 to 12+00

Sincerely,
Terracon Consultants, Inc.

DocuSigned by:


51340CC5FA2E414...

Kelly R. Plummer, PG
Project Manager

DocuSigned by:


C2F6ACA84D274B1...

Abner F. Riggs, Jr., PE
Senior Geotechnical Engineer

8/17/99

PROJECT REFERENCE NO.

U-5798B

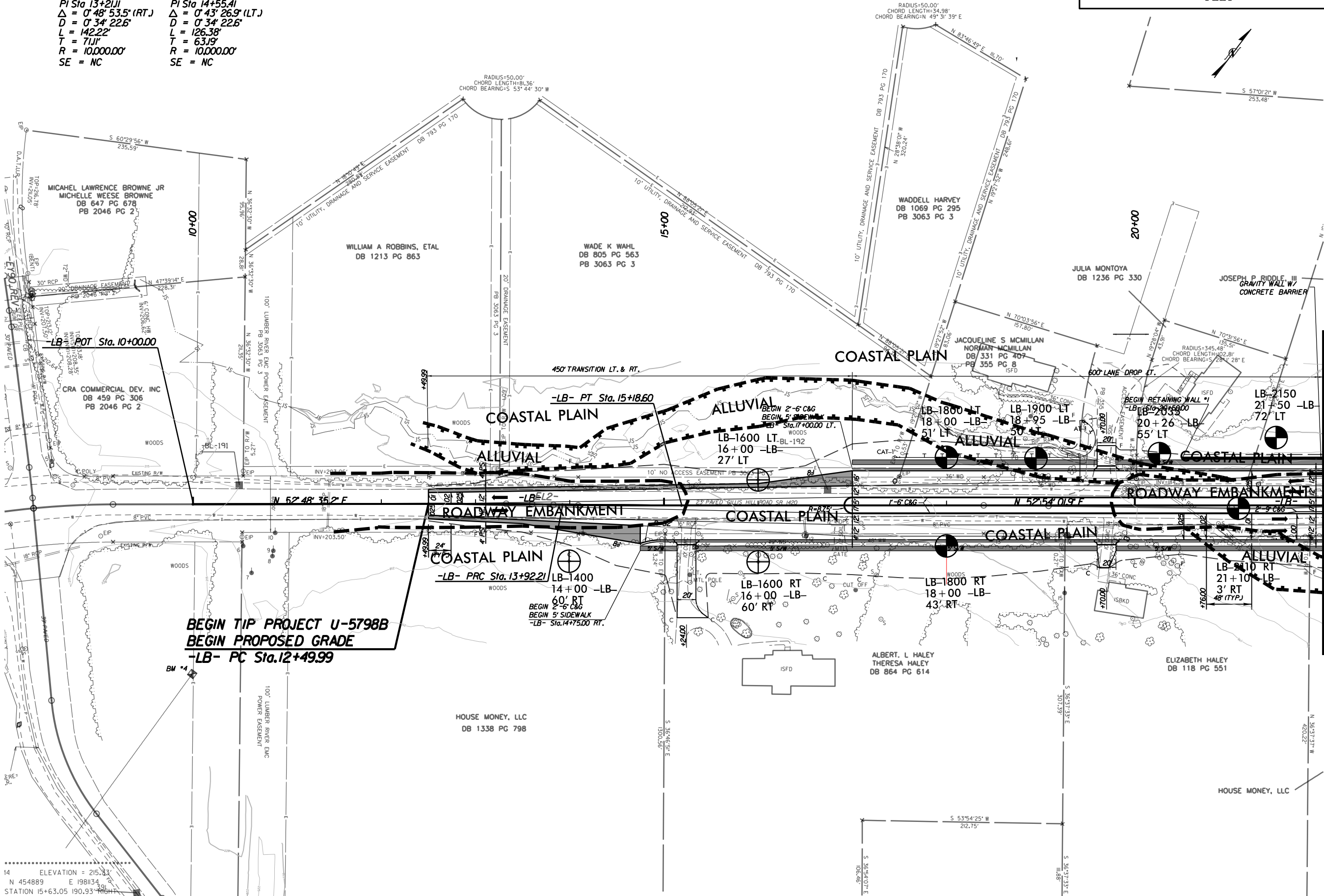
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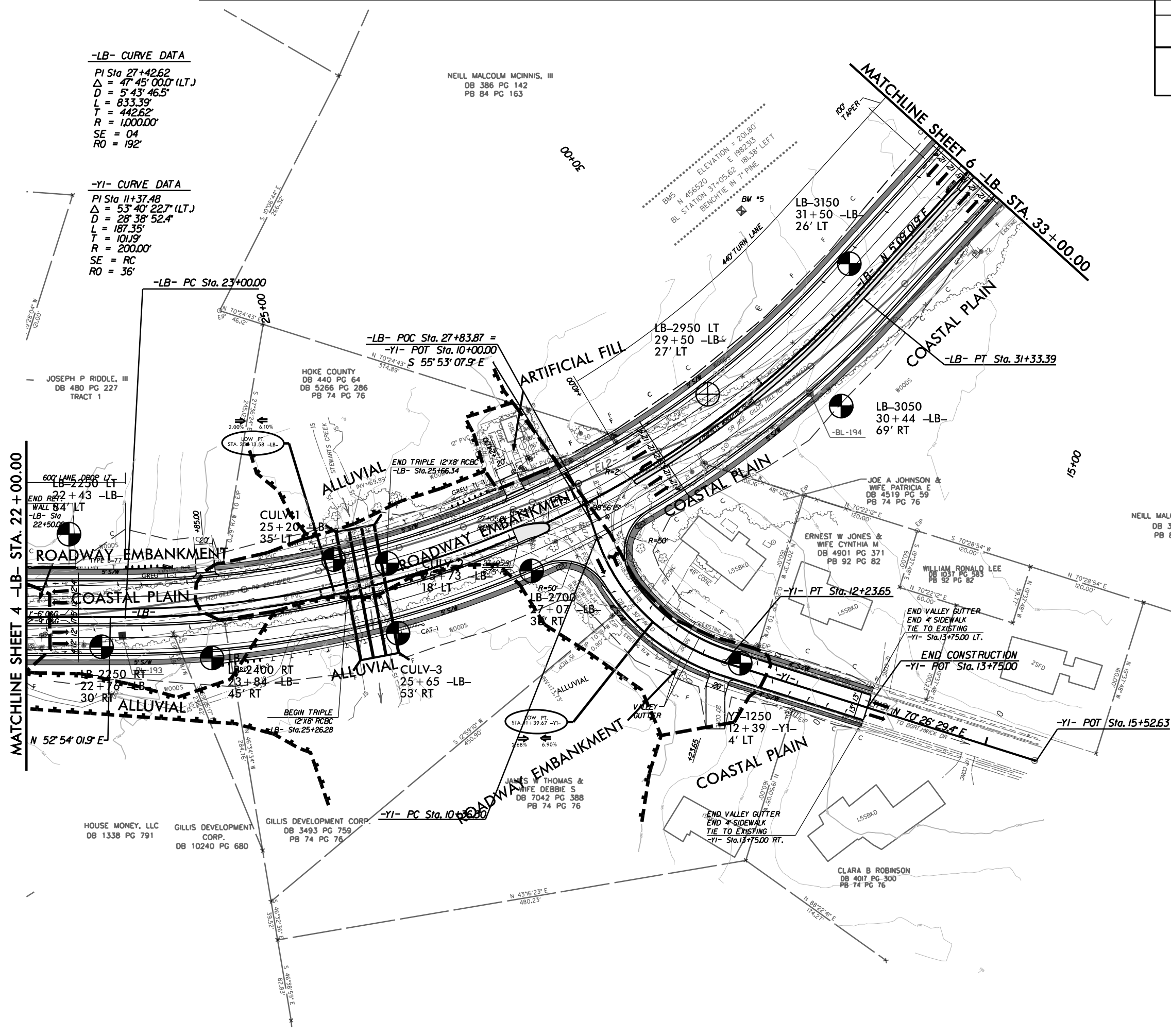
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FEET

-LB- CURVE DATA	
PI Sta 13+21.11	PI Sta 14+55.41
Δ = 0° 48' 53.5" (RT.)	Δ = 0° 43' 26.9" (LT.)
D = 0° 34' 22.6"	D = 0° 34' 22.6"
L = 142.22'	L = 126.38'
T = 71.11'	T = 63.19'
R = 10,000.00'	R = 10,000.00'
SE = NC	SE = NC



14 ELEVATION = 215.33'
N 454889 E 1981134
STATION 15+63.05 190.93 RIGHT

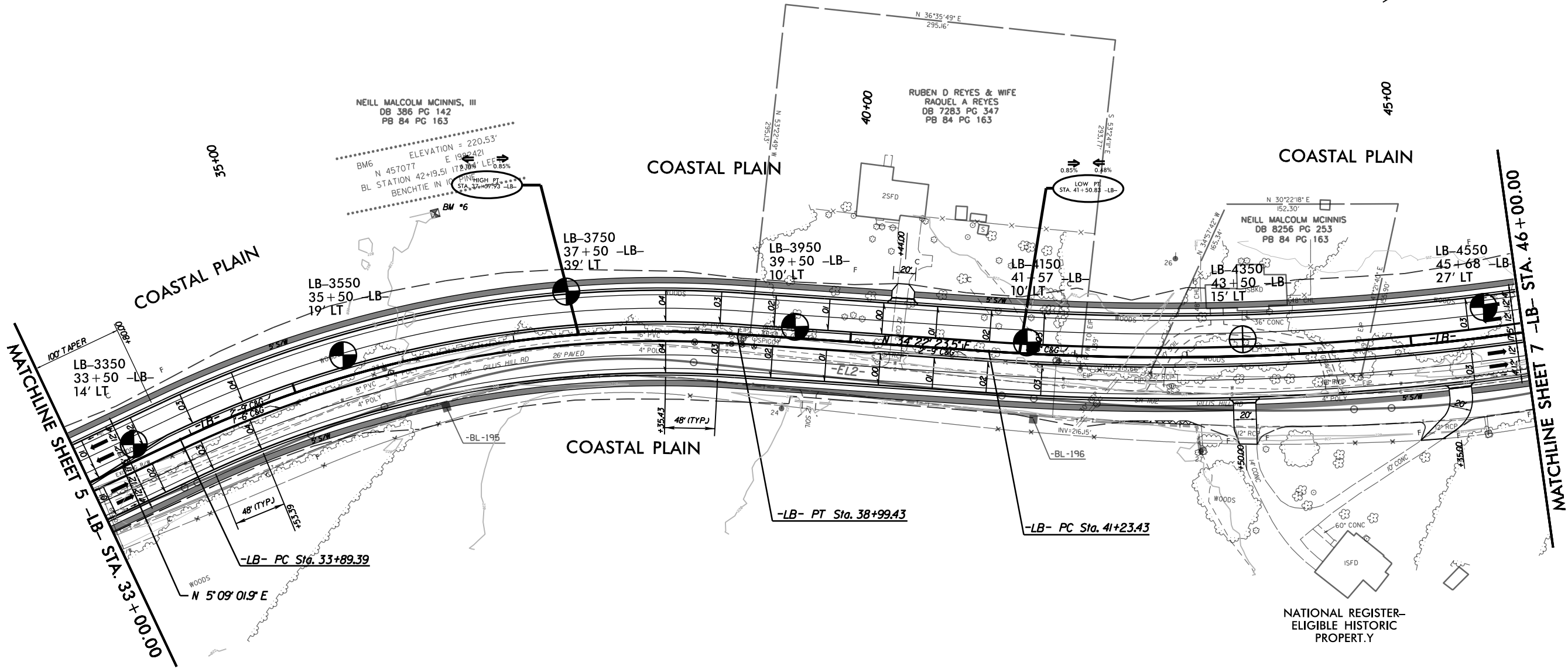


8/17/99

-LB- CURVE DATA	
PI Sta 36+50.09	PI Sta 46+22.93
$\Delta = 29^{\circ}13'21.6"$ (RT.)	$\Delta = 24^{\circ}30'21.9"$ (LT.)
D = 5'43"46.5"	D = 2'29"28.0"
L = 510.03'	L = 983.74'
T = 260.69'	T = 499.51'
R = 1,000.00'	R = 2,300.00'
SE = 04	SE = 03
RO = 192'	RO = 144'

PROJECT REFERENCE NO.	SHEET NO.
U-5798B	6
0 100 200 FEET	

REVISIONS

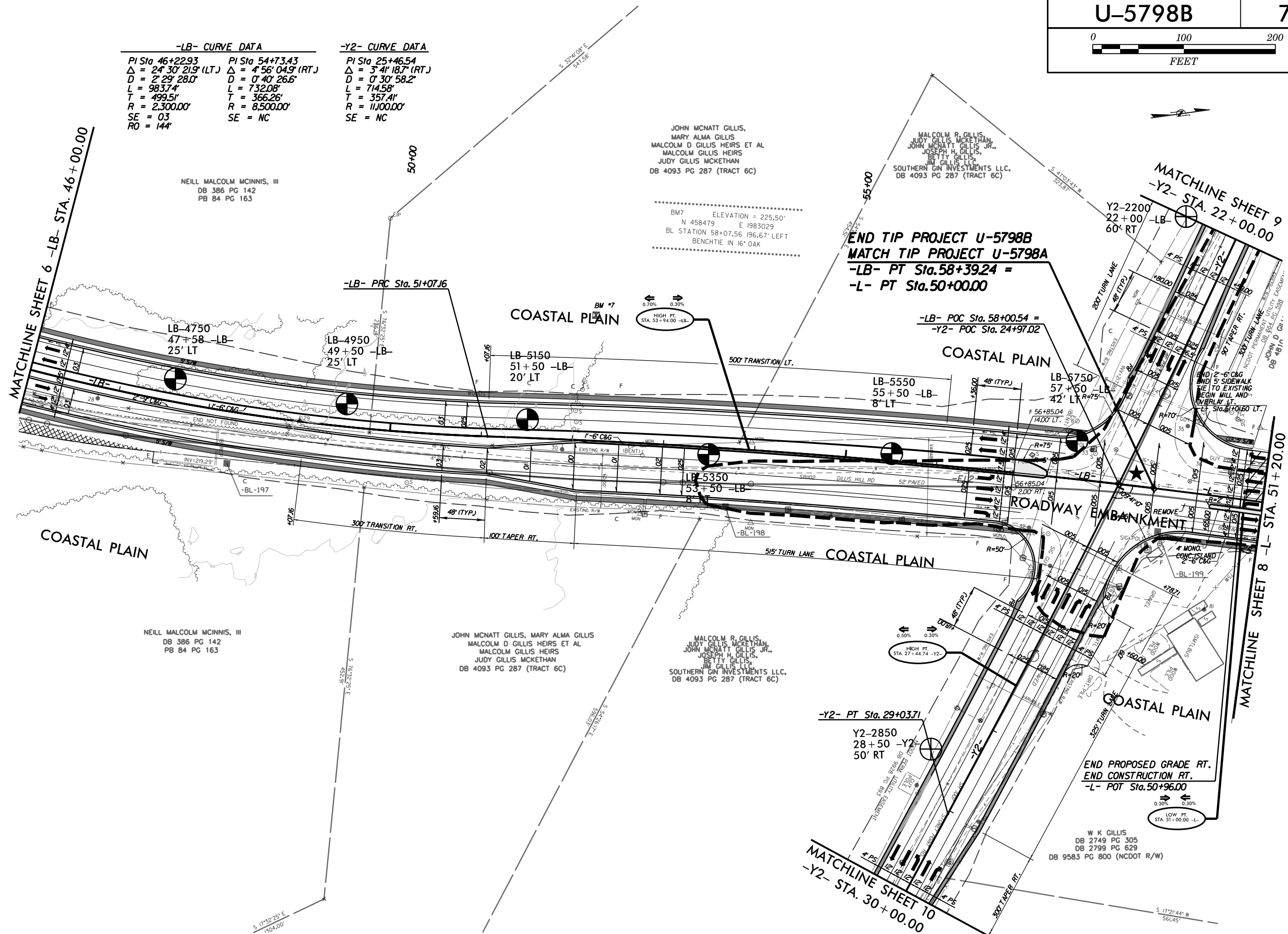


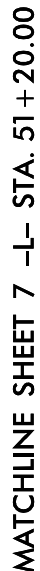
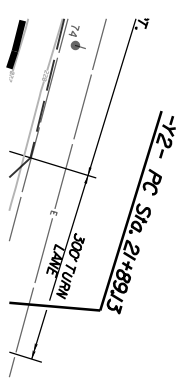
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DB 386 PG 142
PB 84 PG 163

NATIONAL REGISTER-ELIGIBLE
HISTORIC PROPERTY BOUNDARY

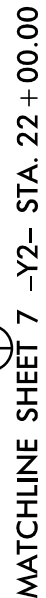
MCINNIS, III
142
53

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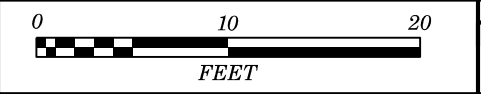




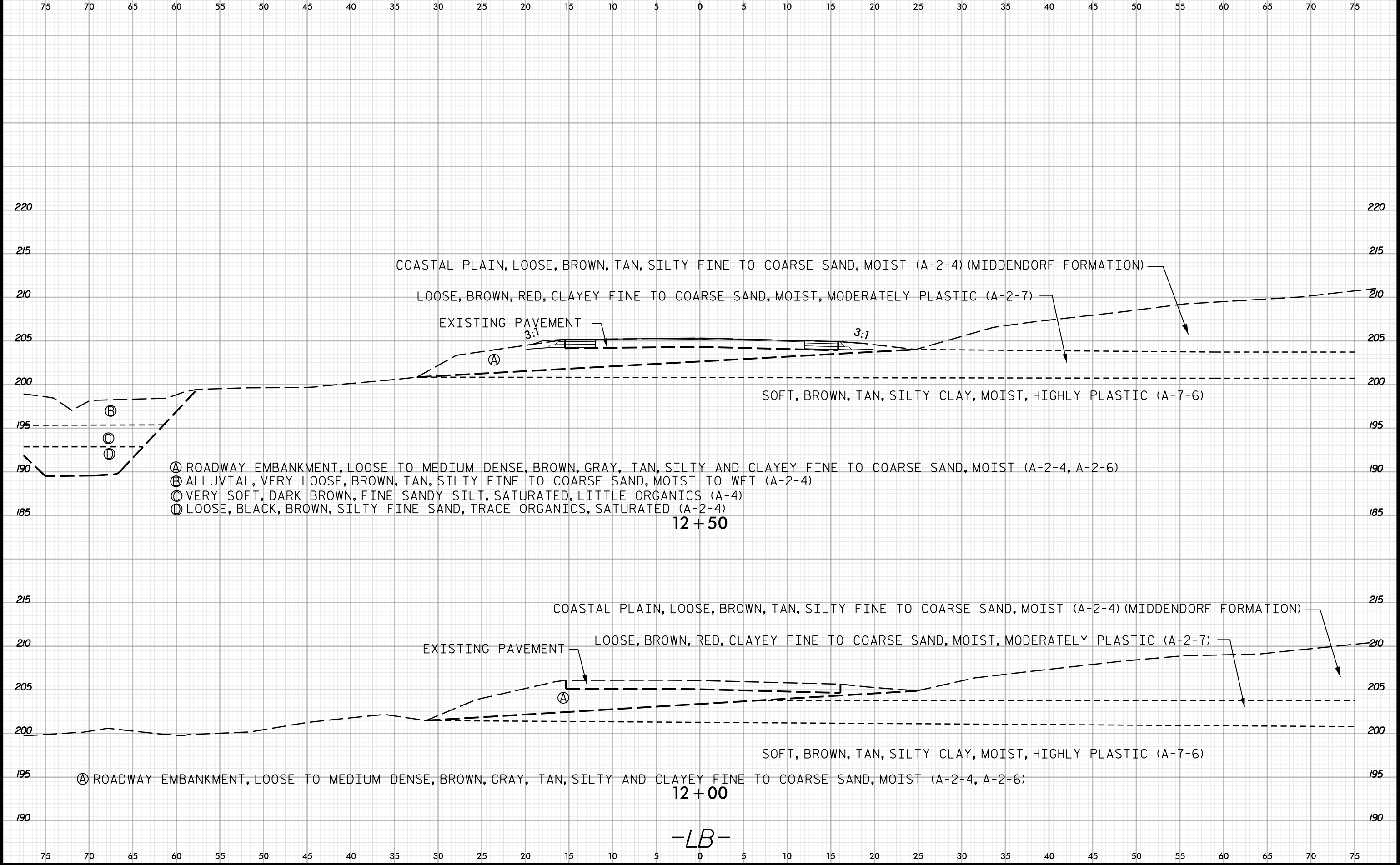
JOHN D GILLIS
PG 586
DB 4810

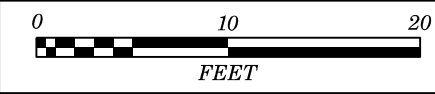




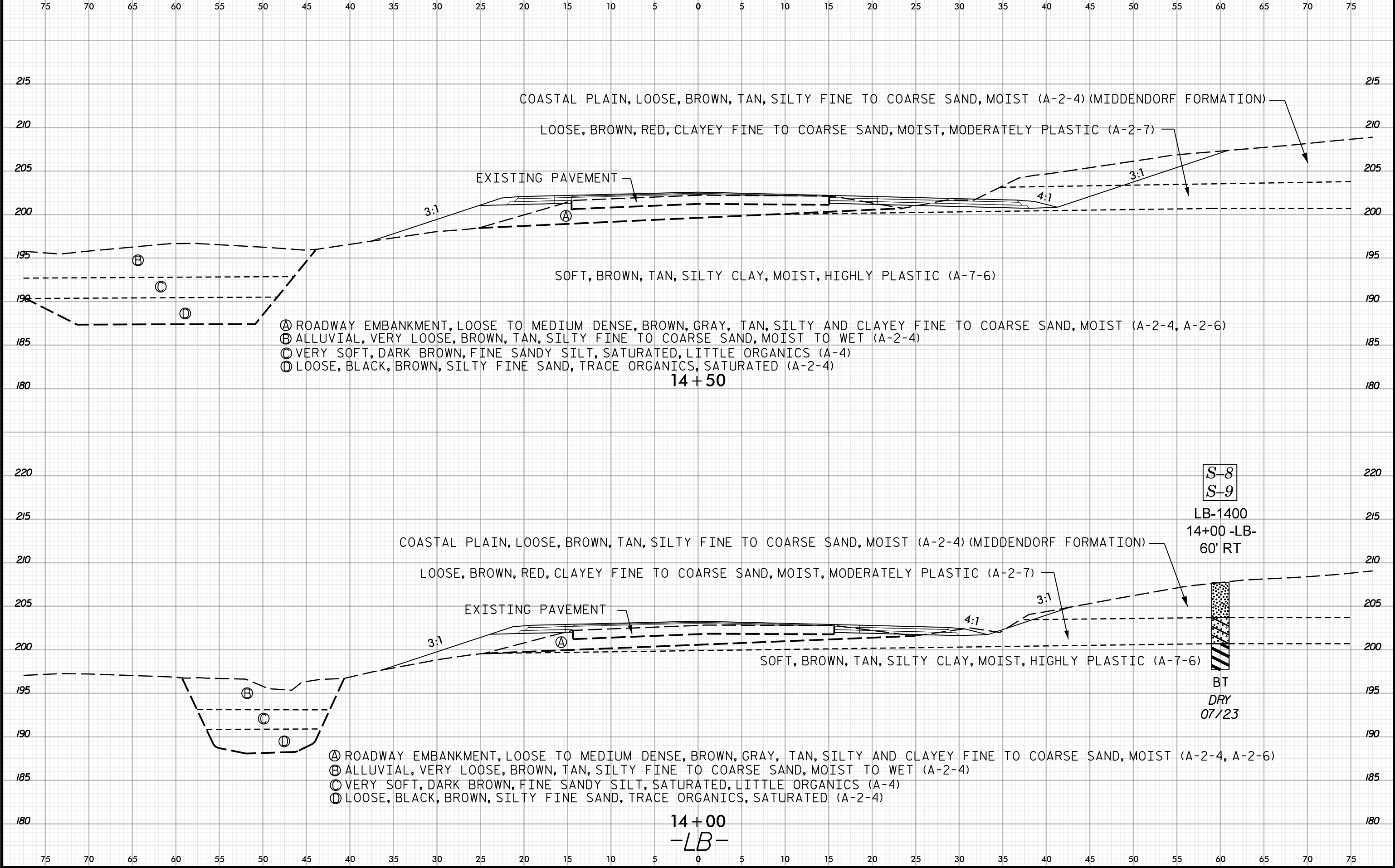


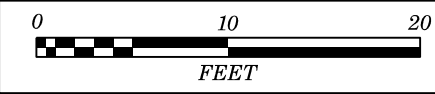
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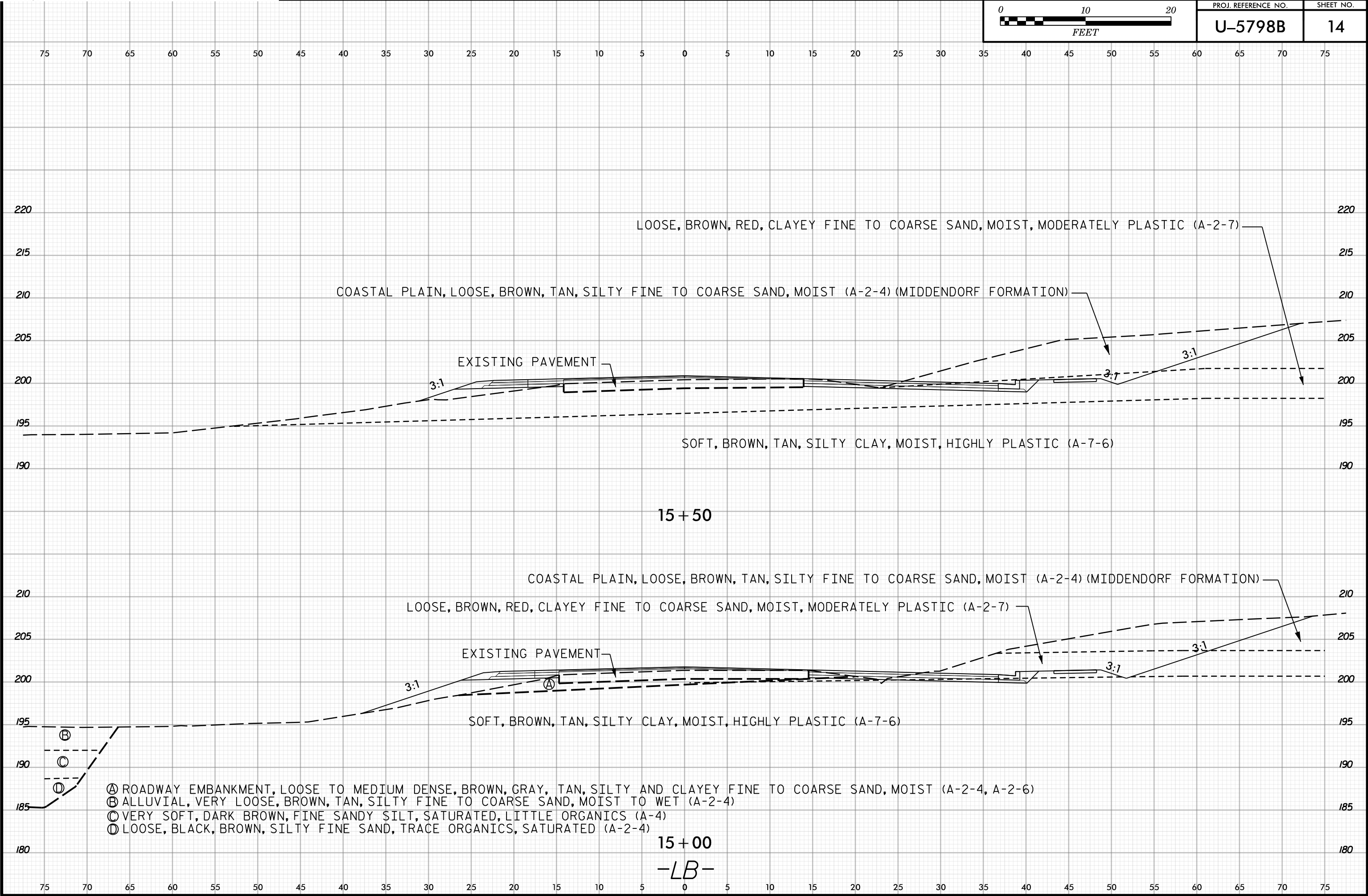


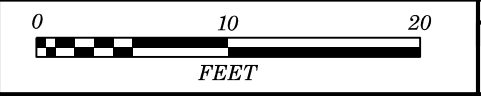
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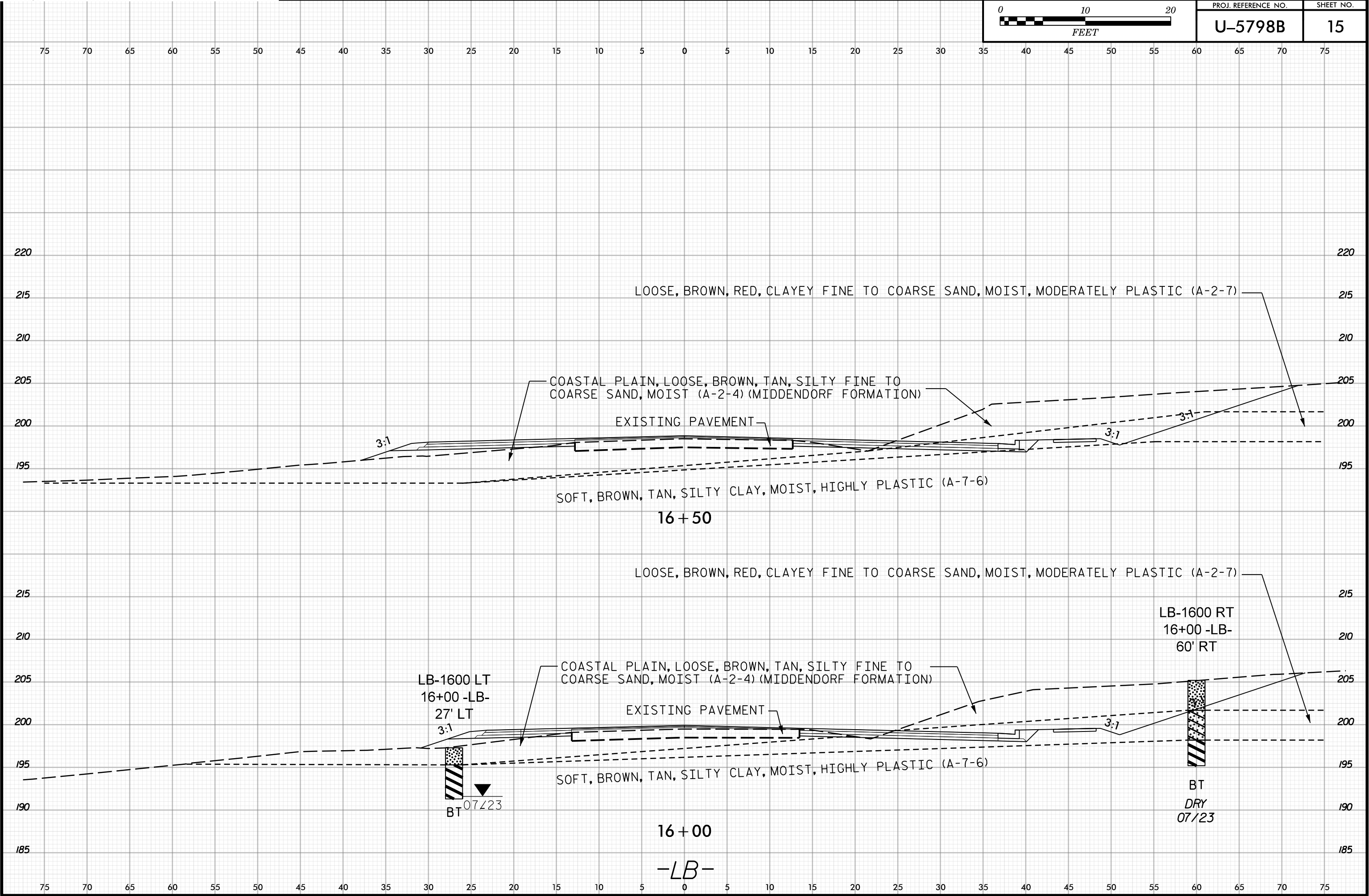


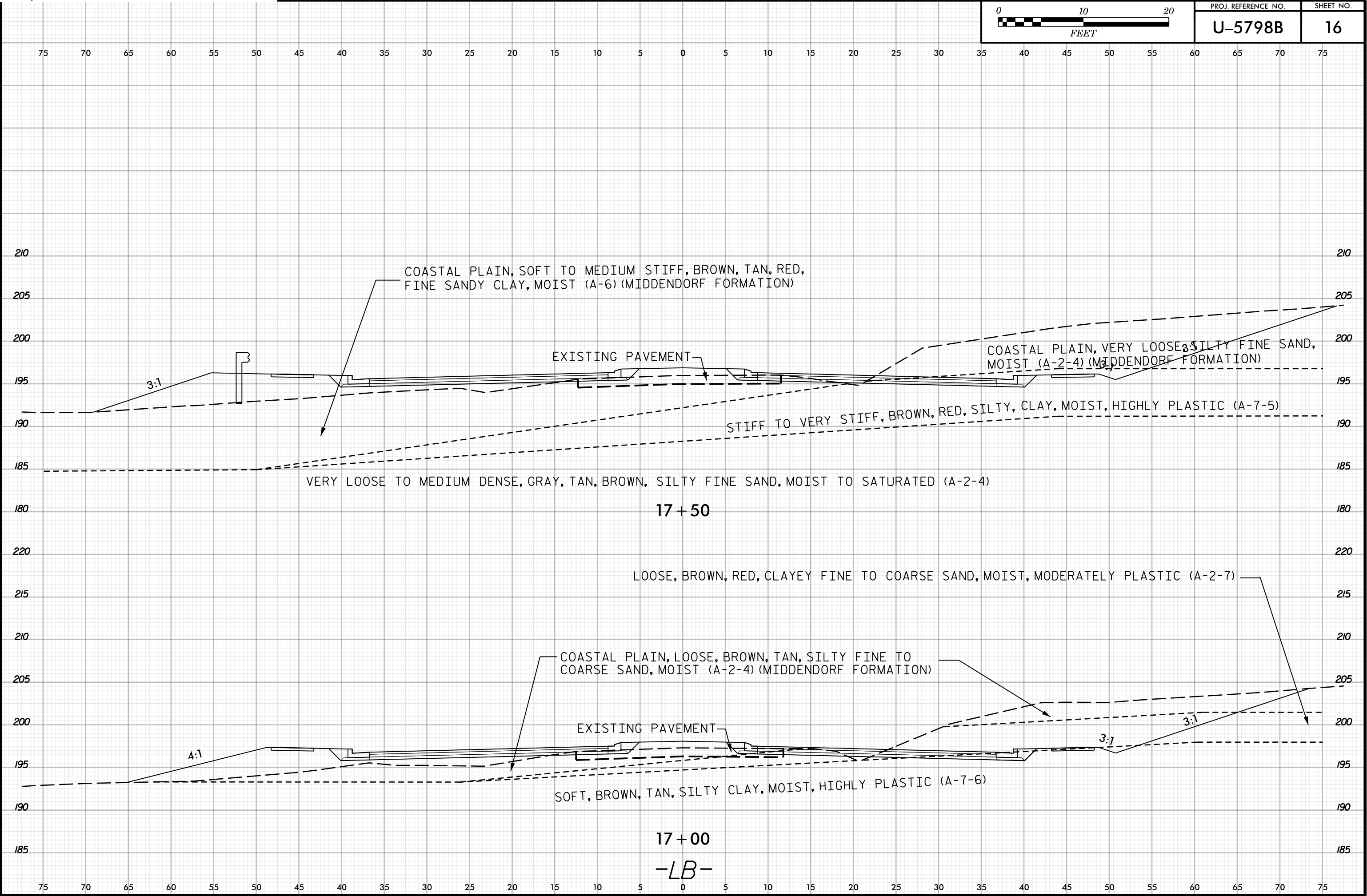
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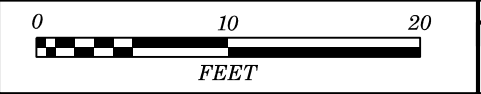




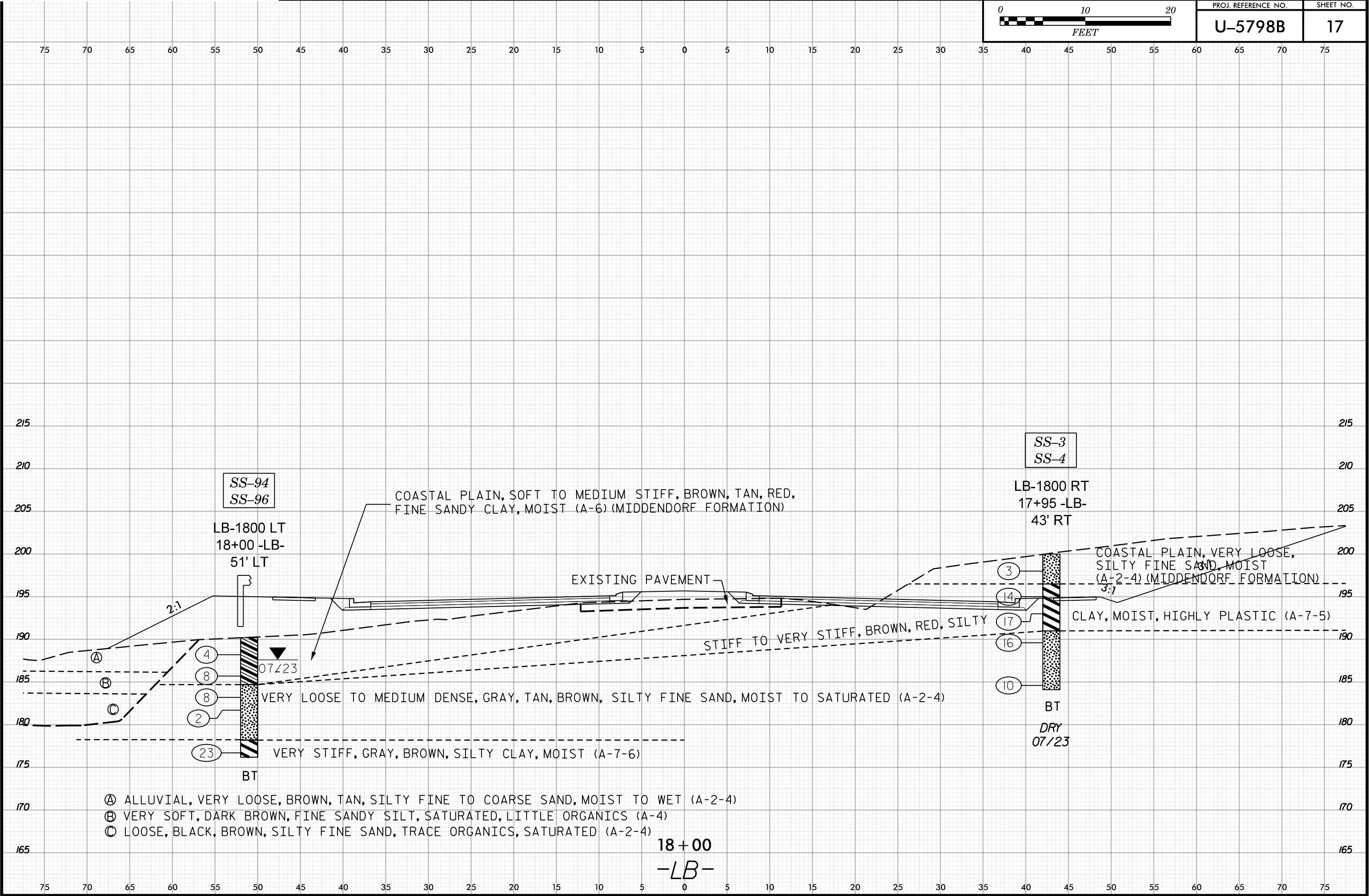
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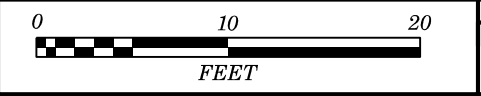




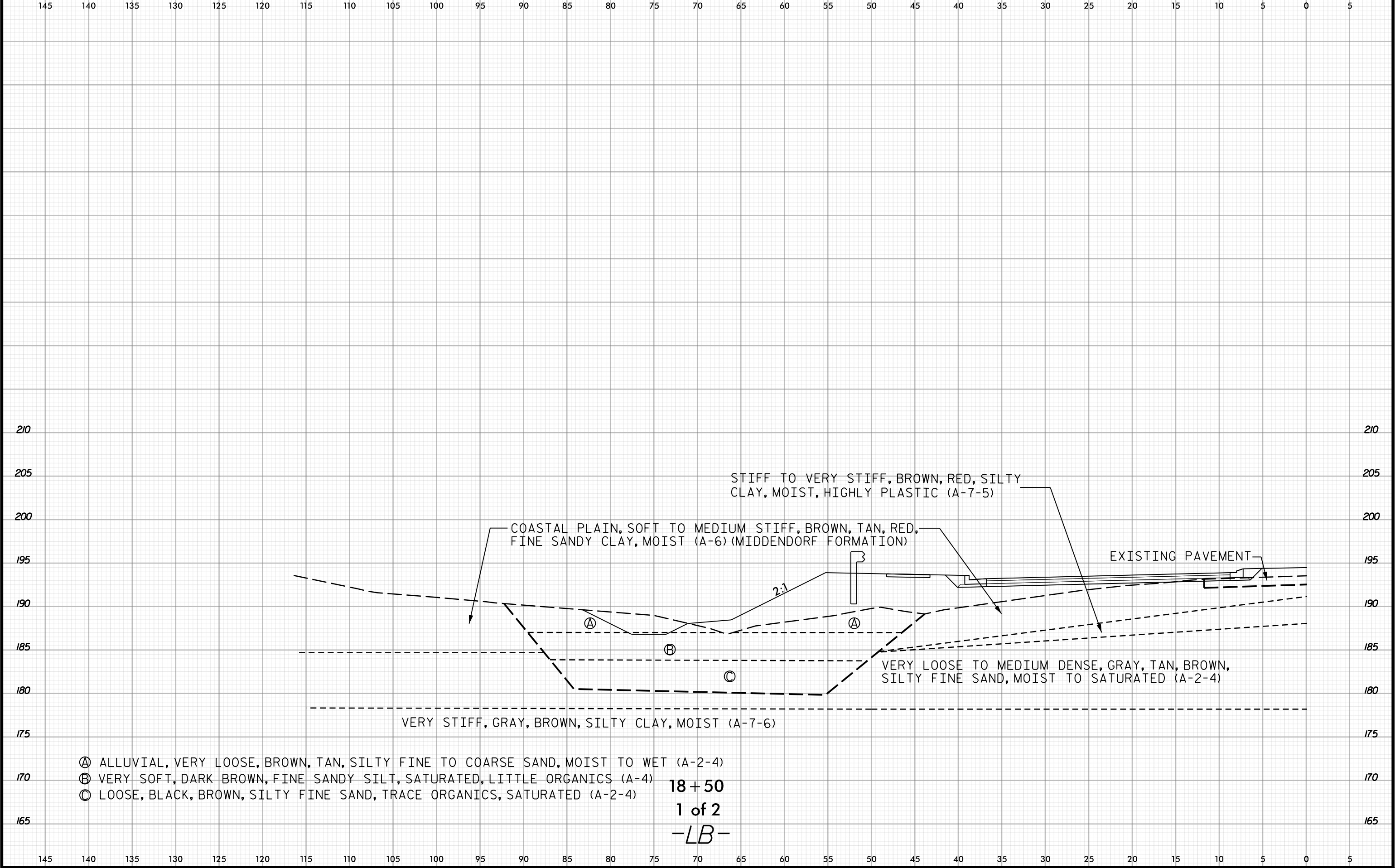


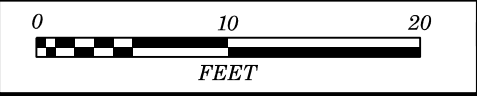
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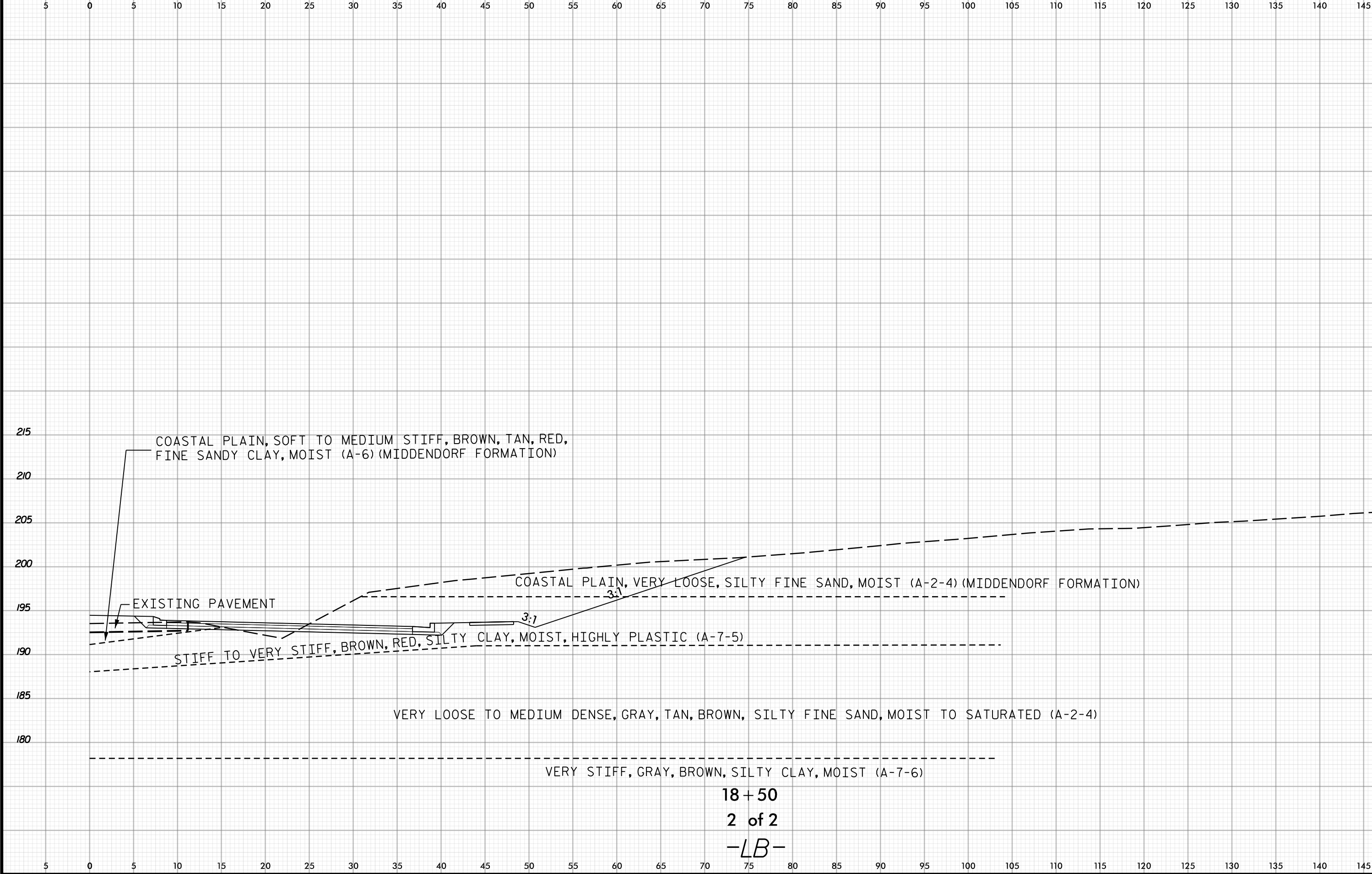


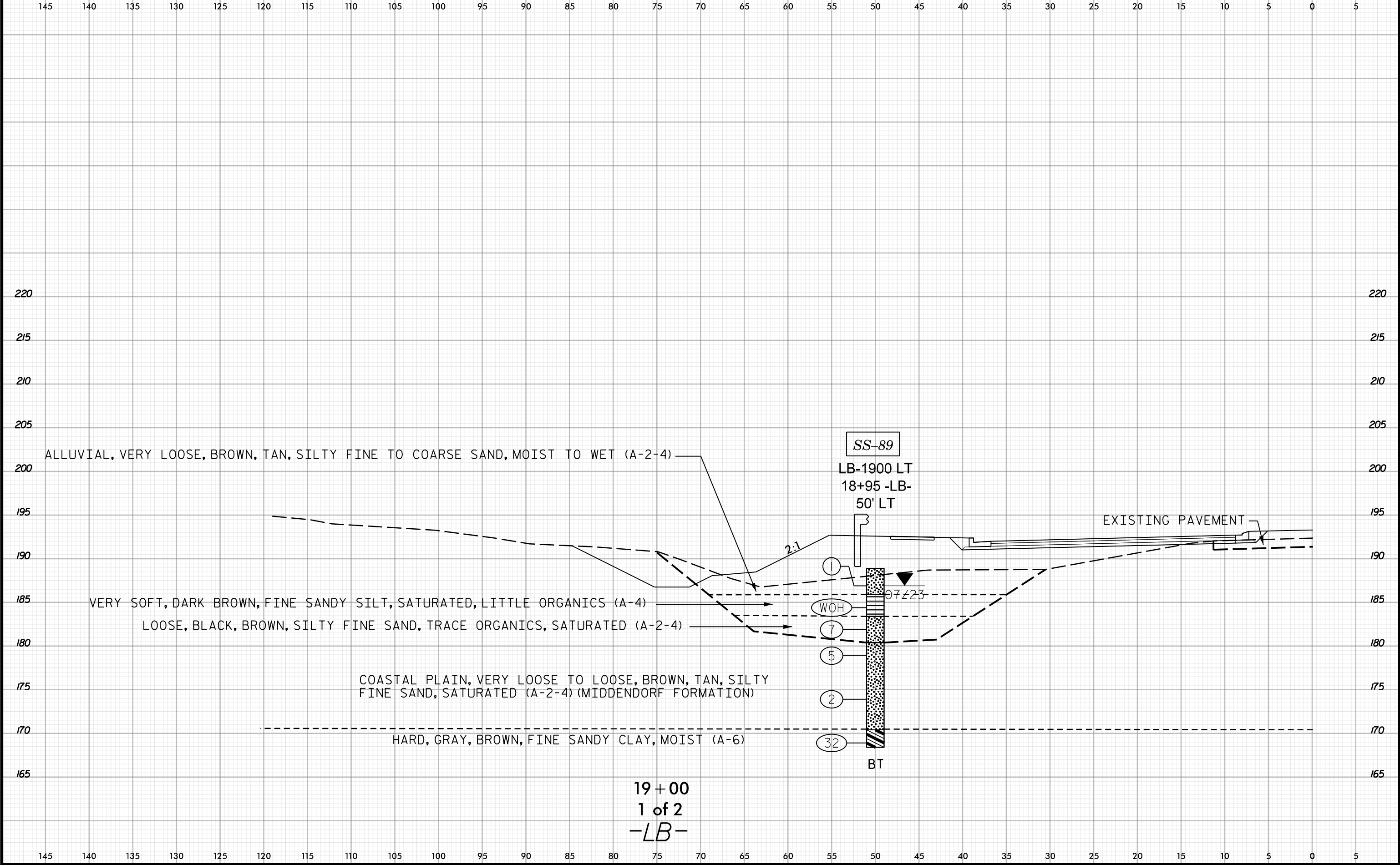
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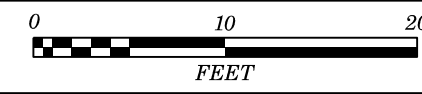




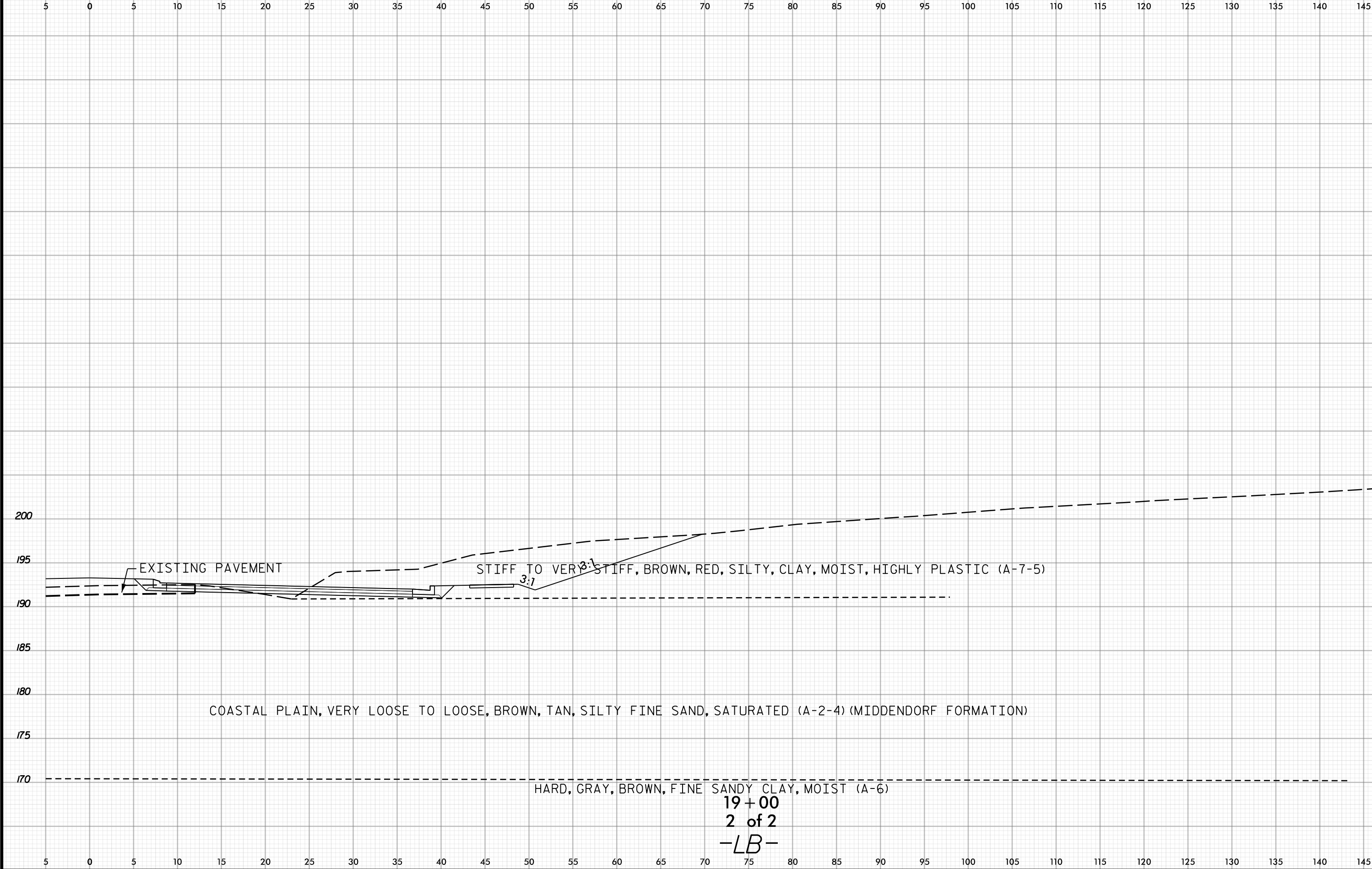
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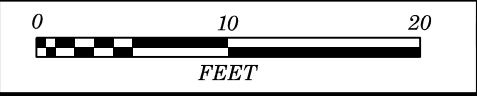




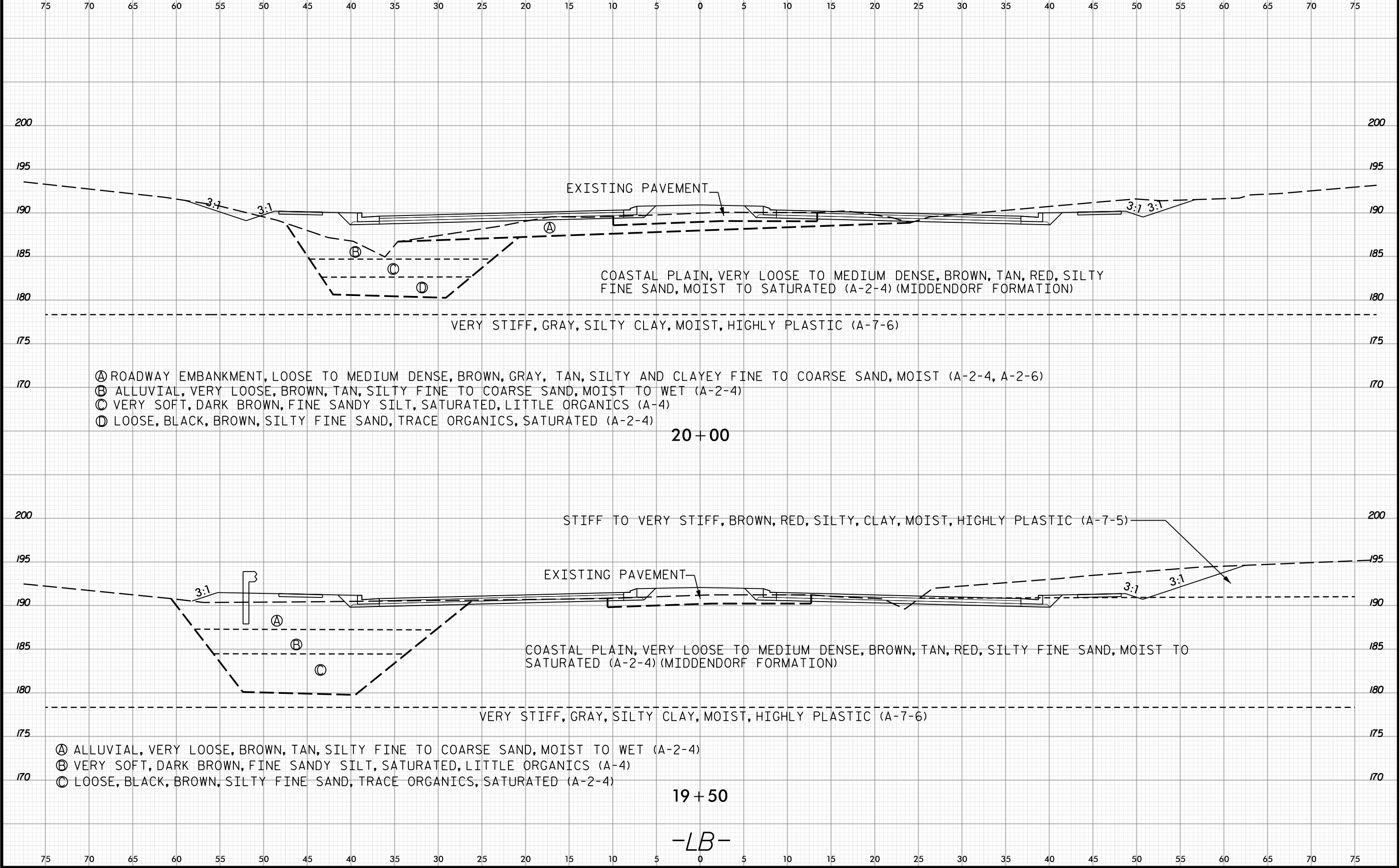


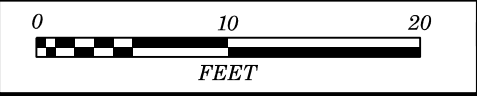
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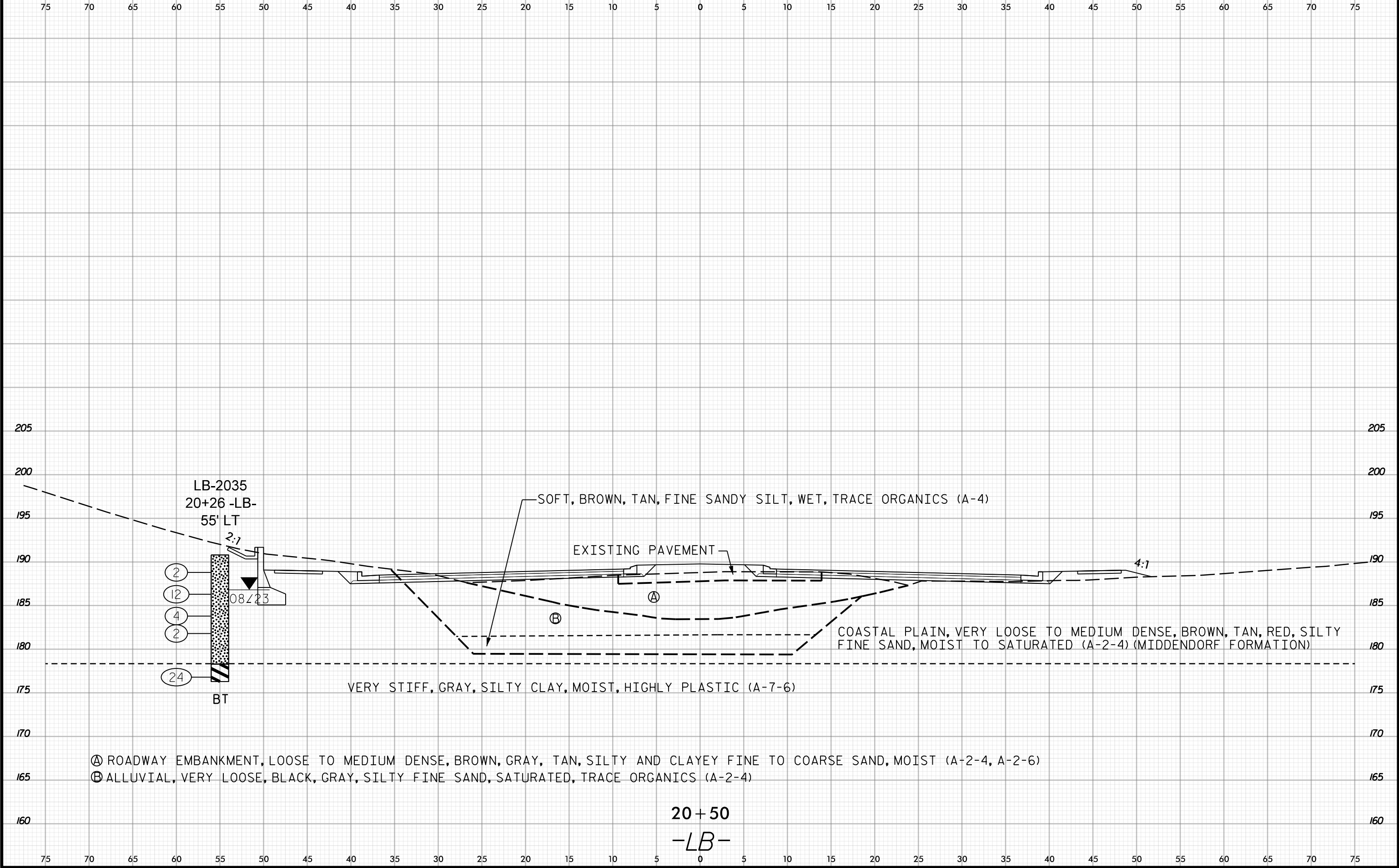


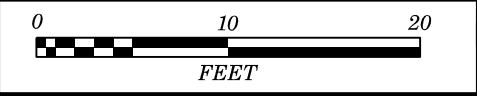
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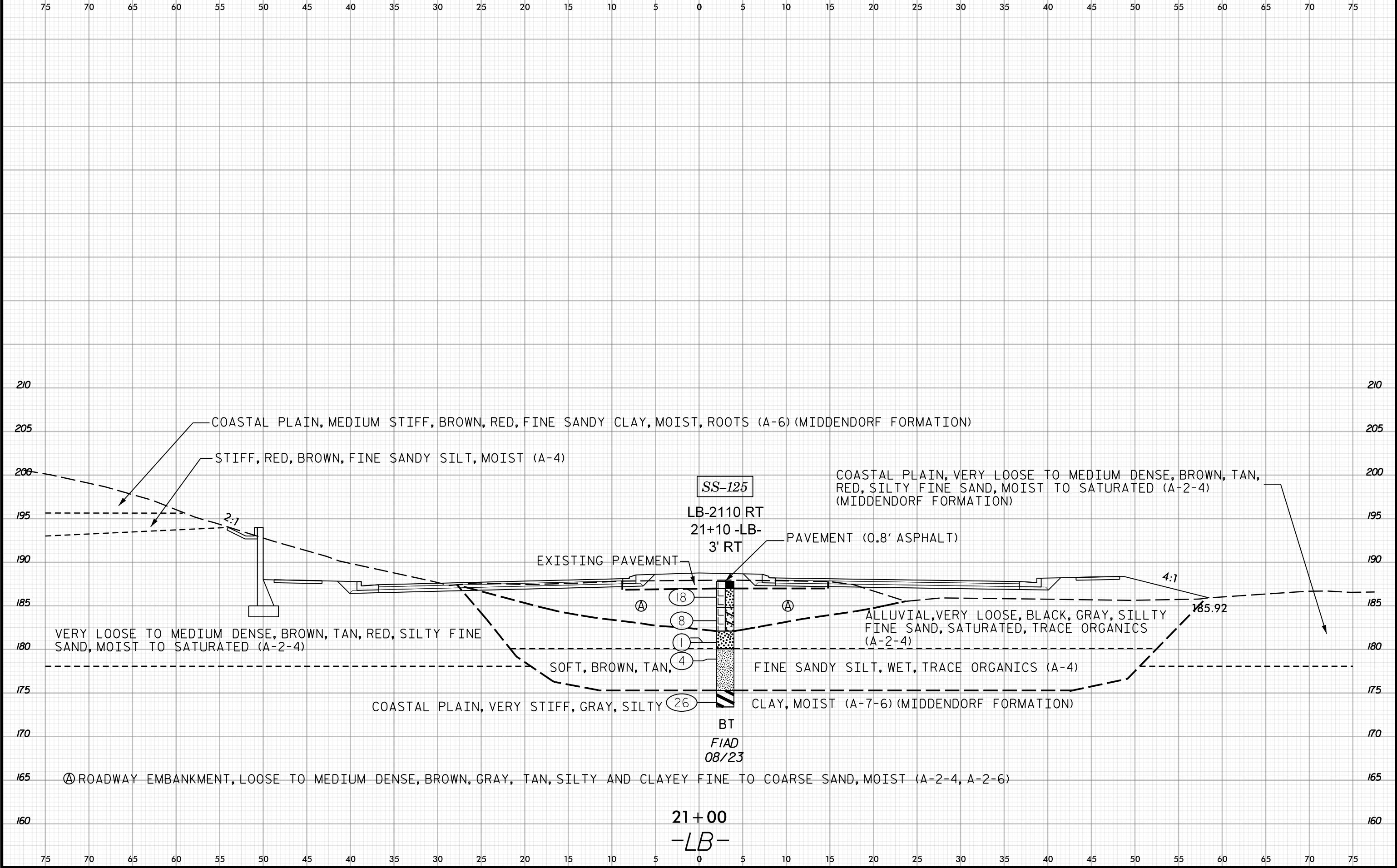


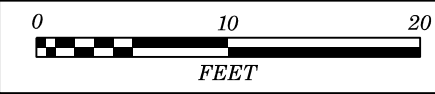
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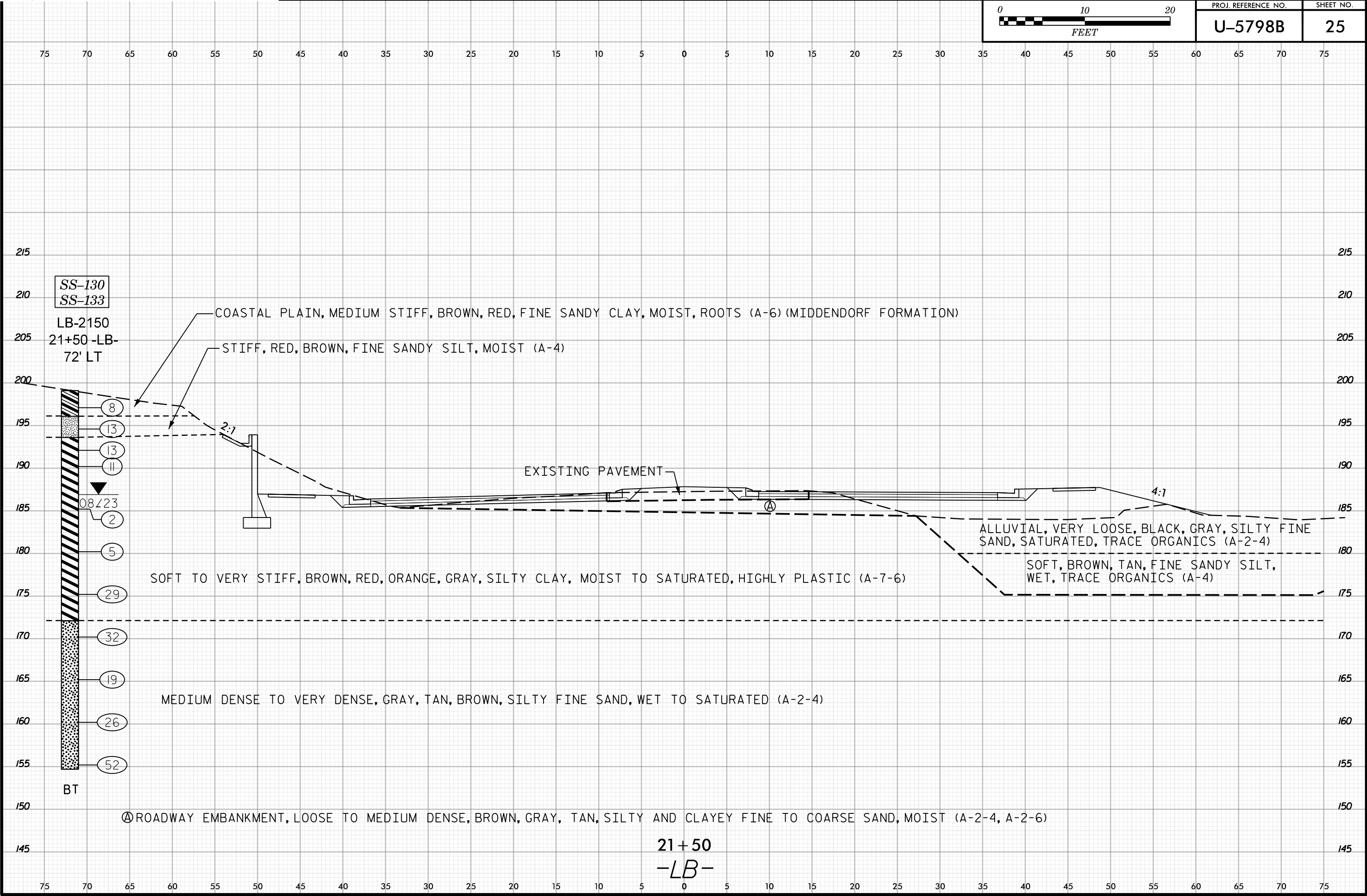


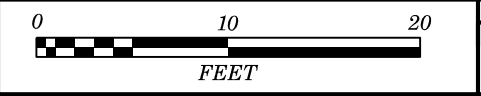
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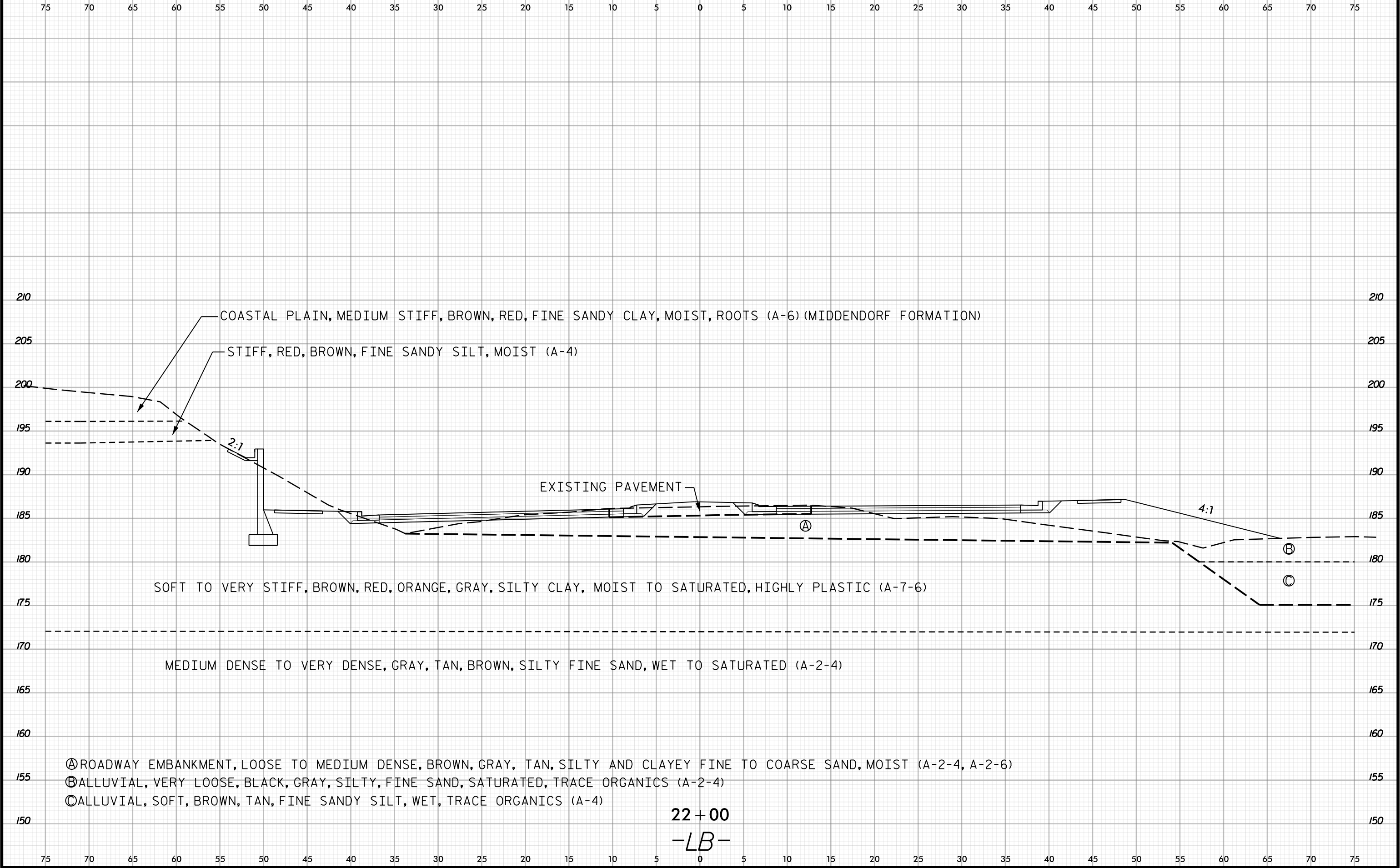


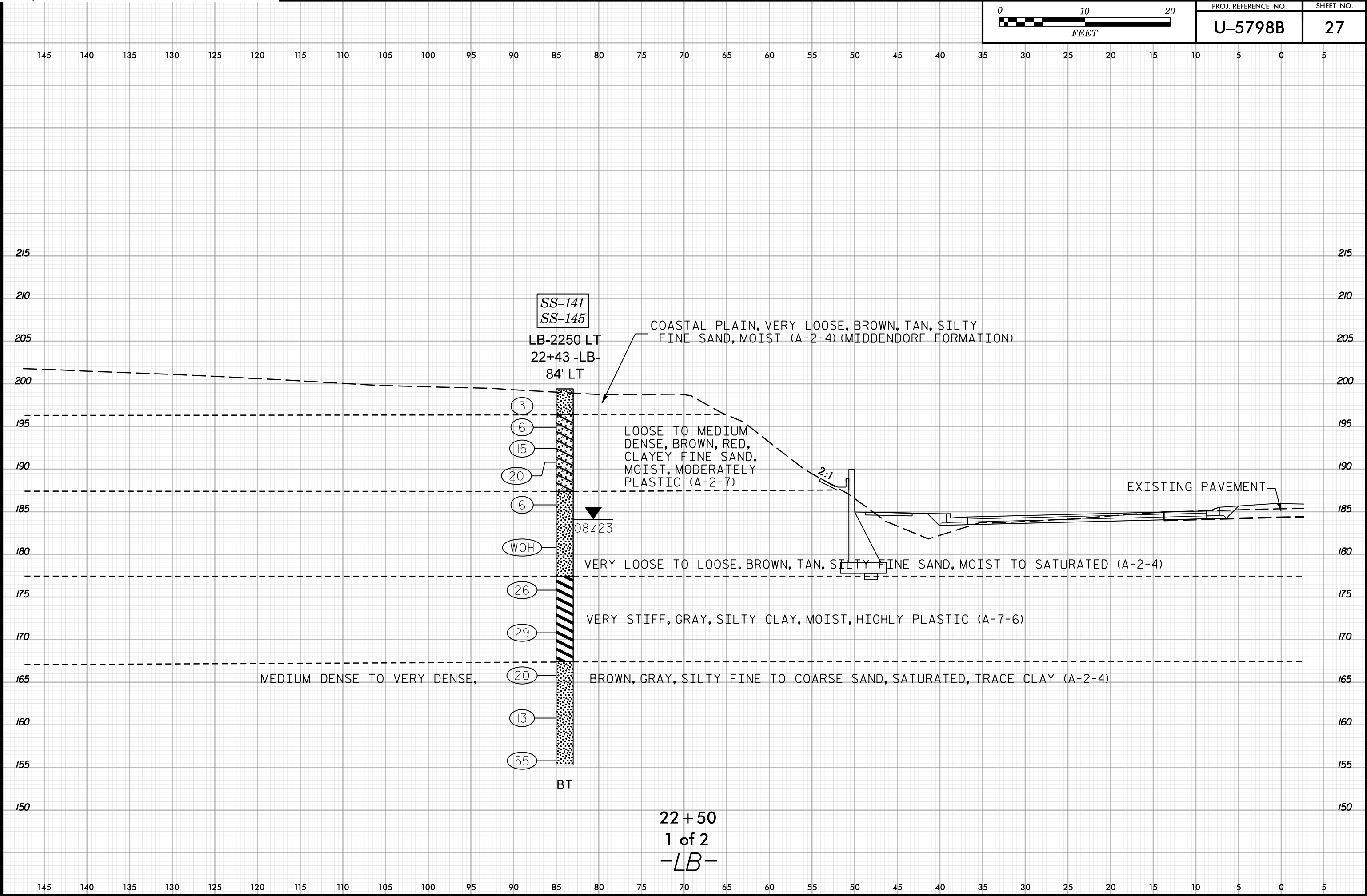
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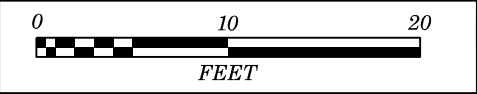




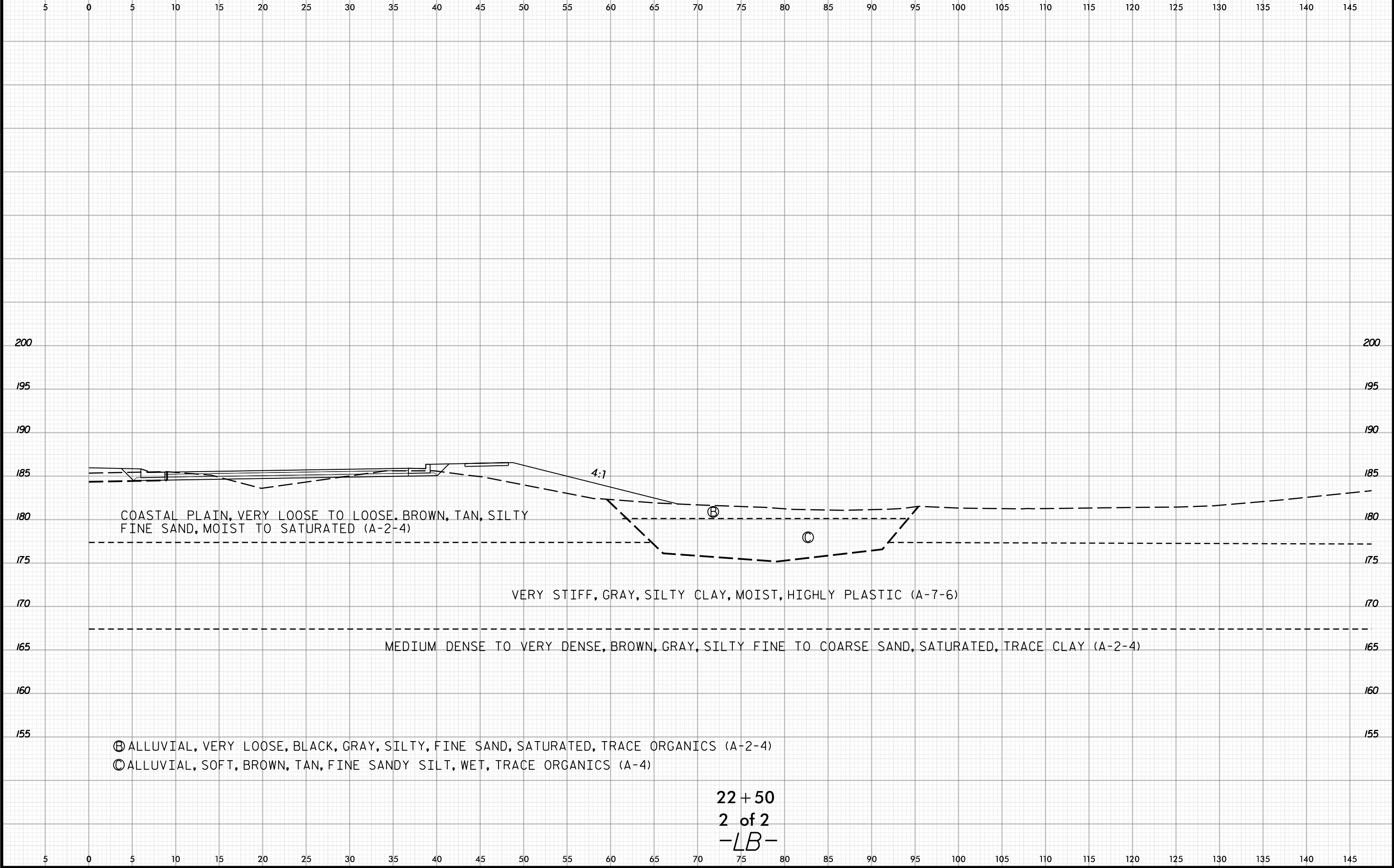
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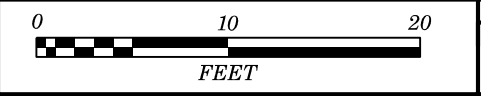




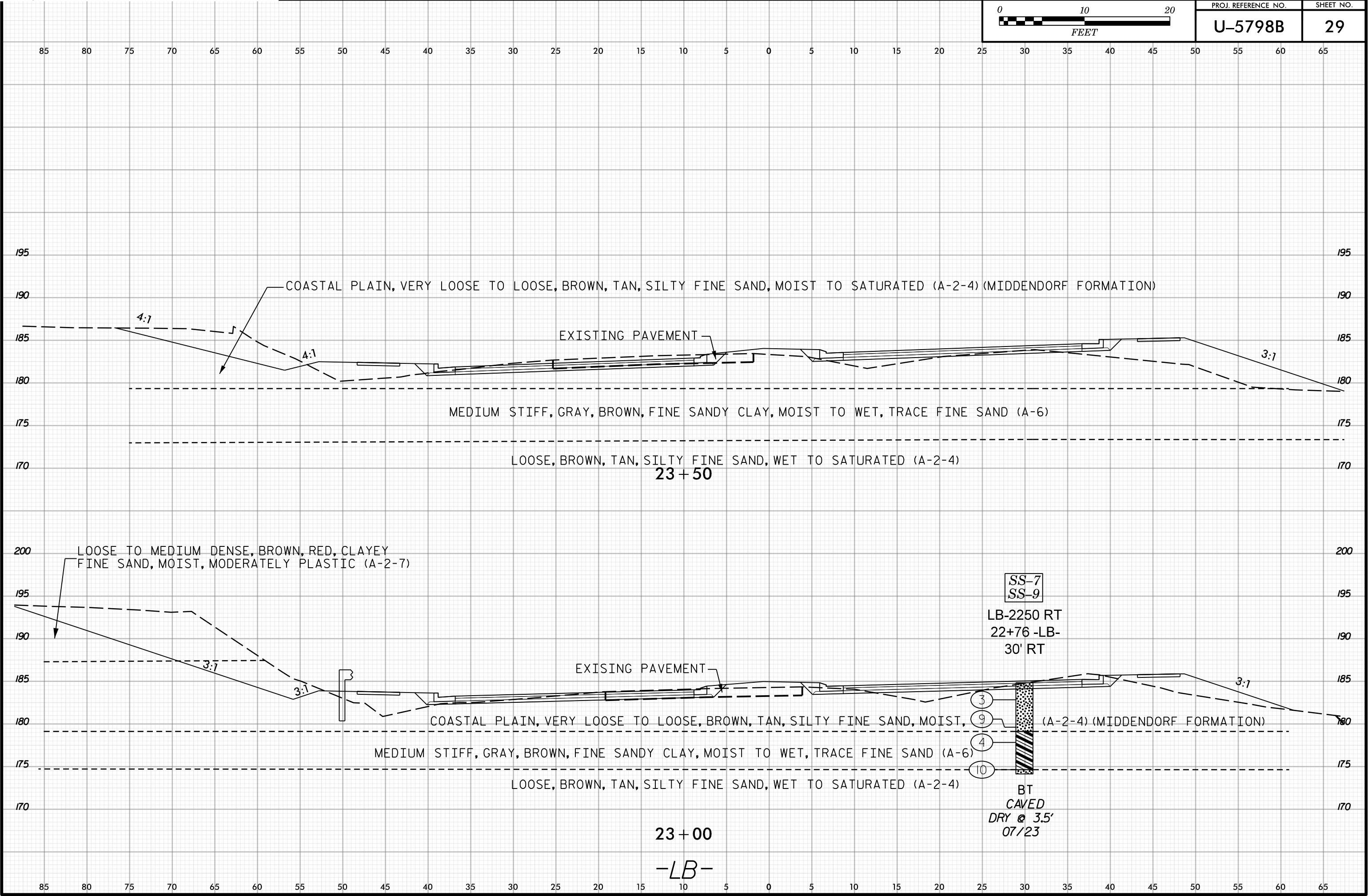


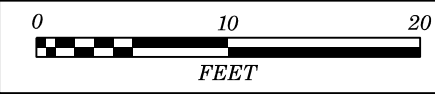
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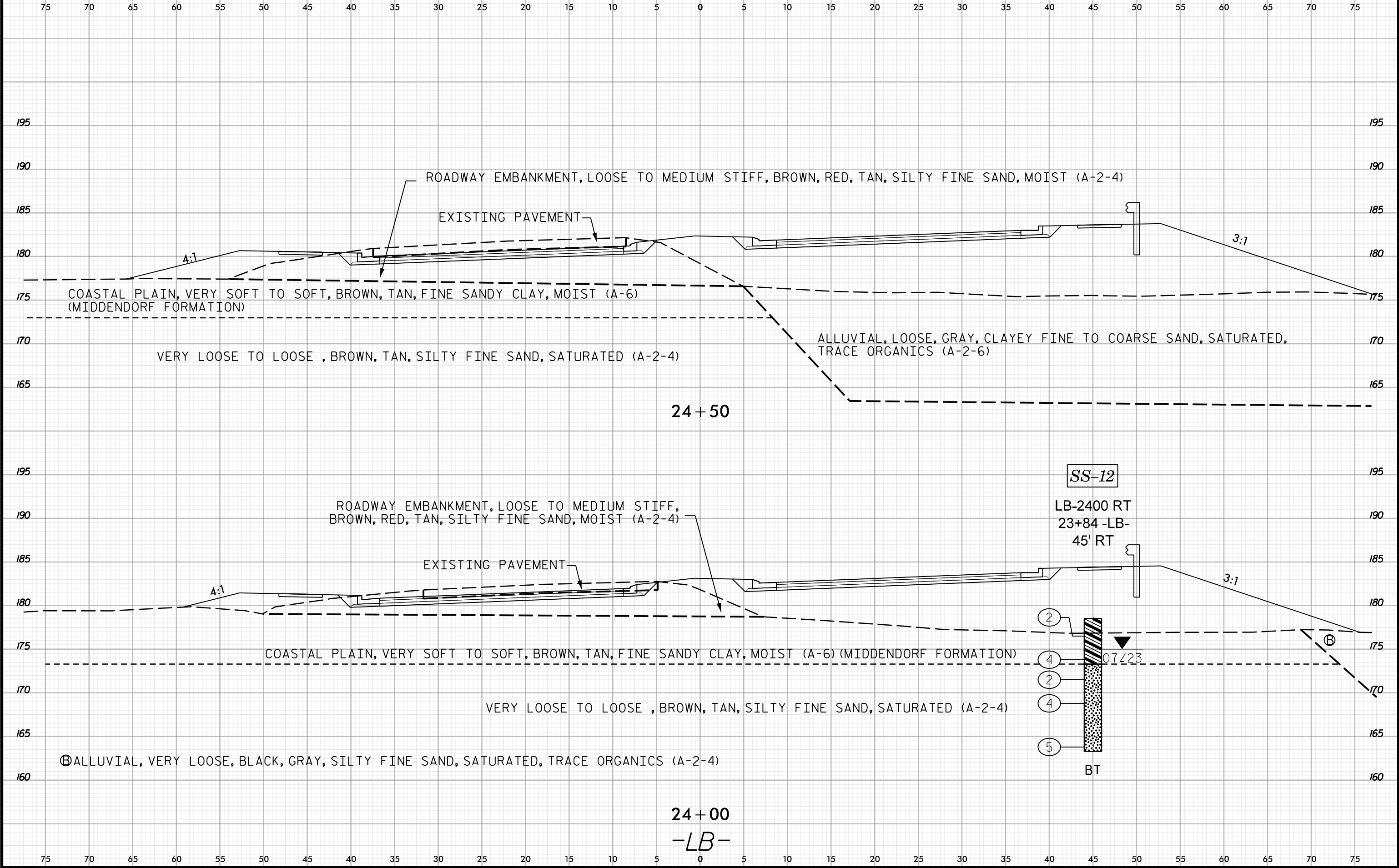


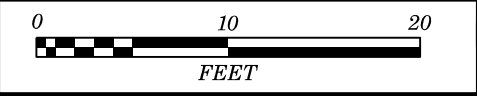
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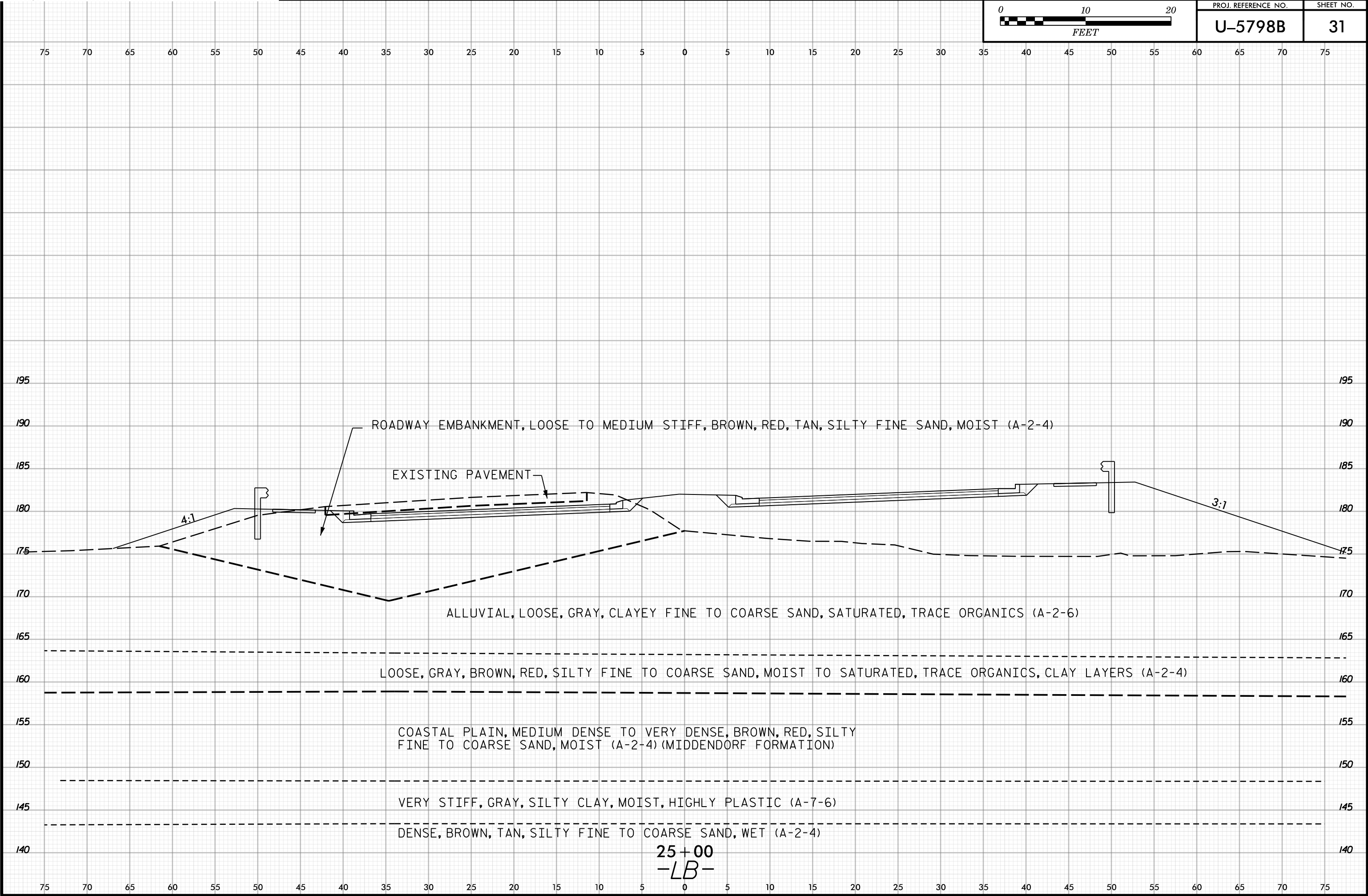


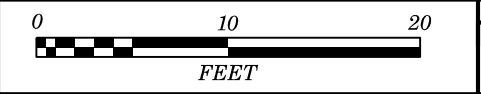
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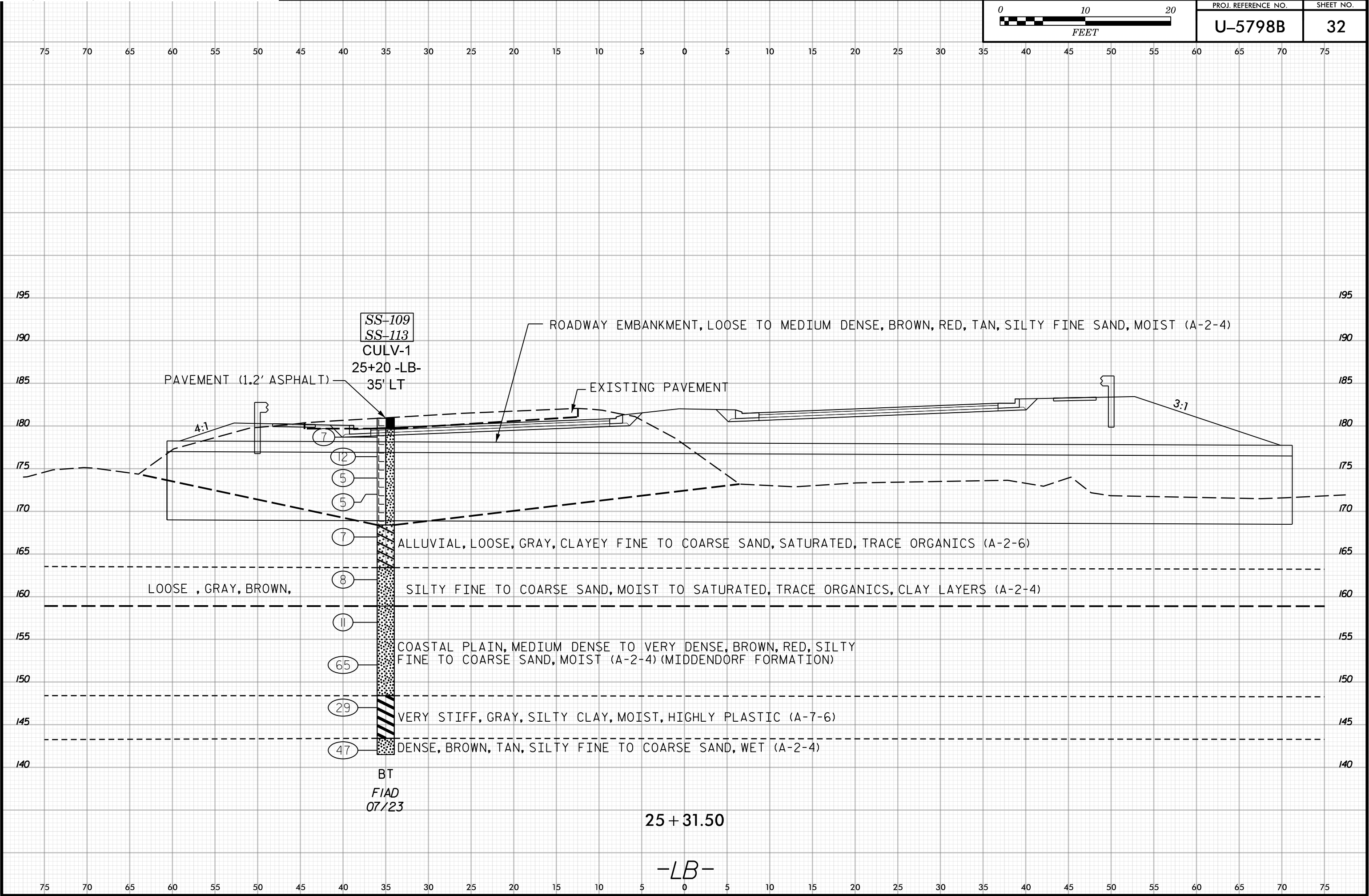


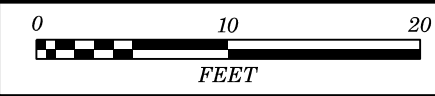
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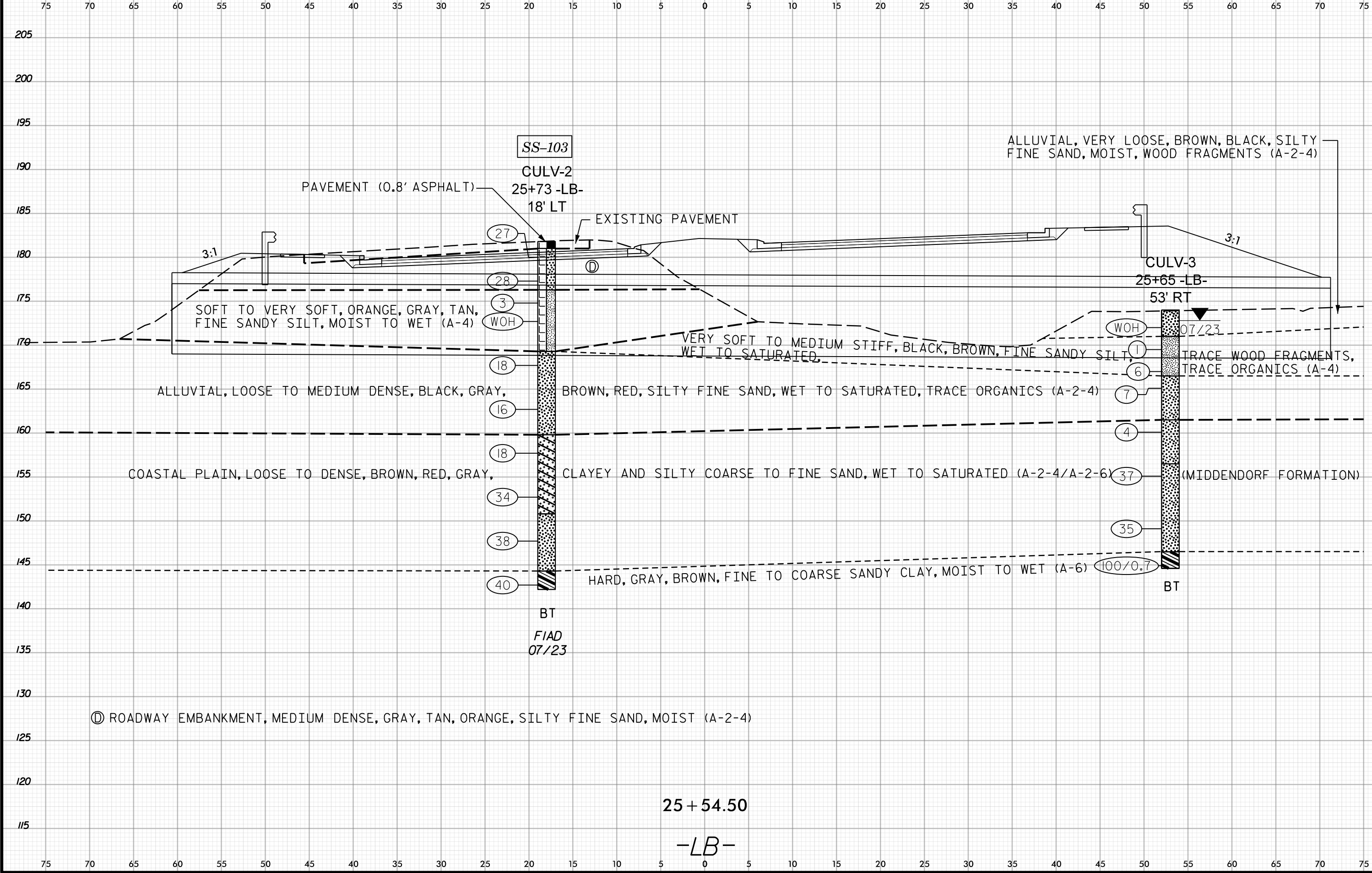


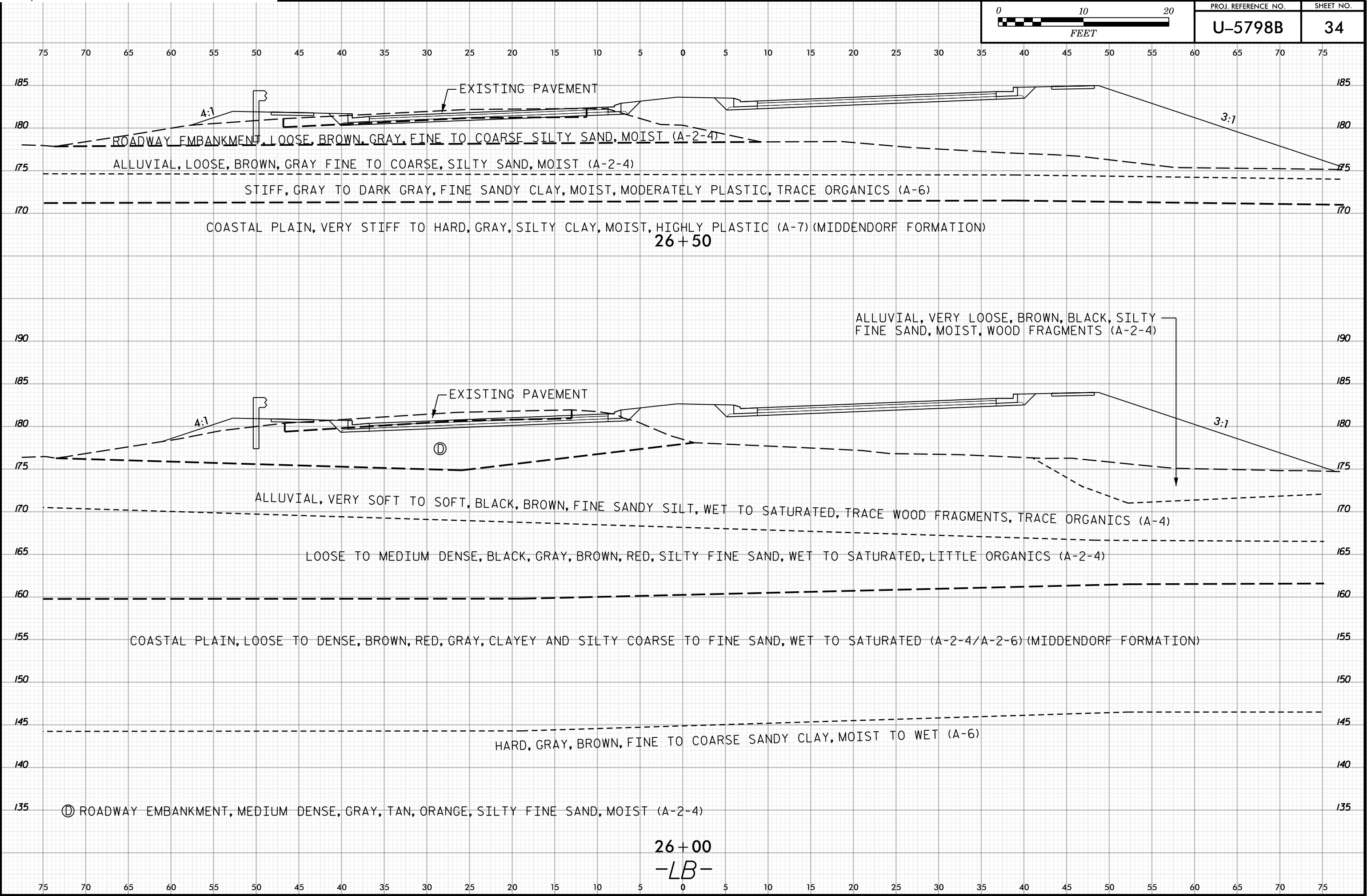
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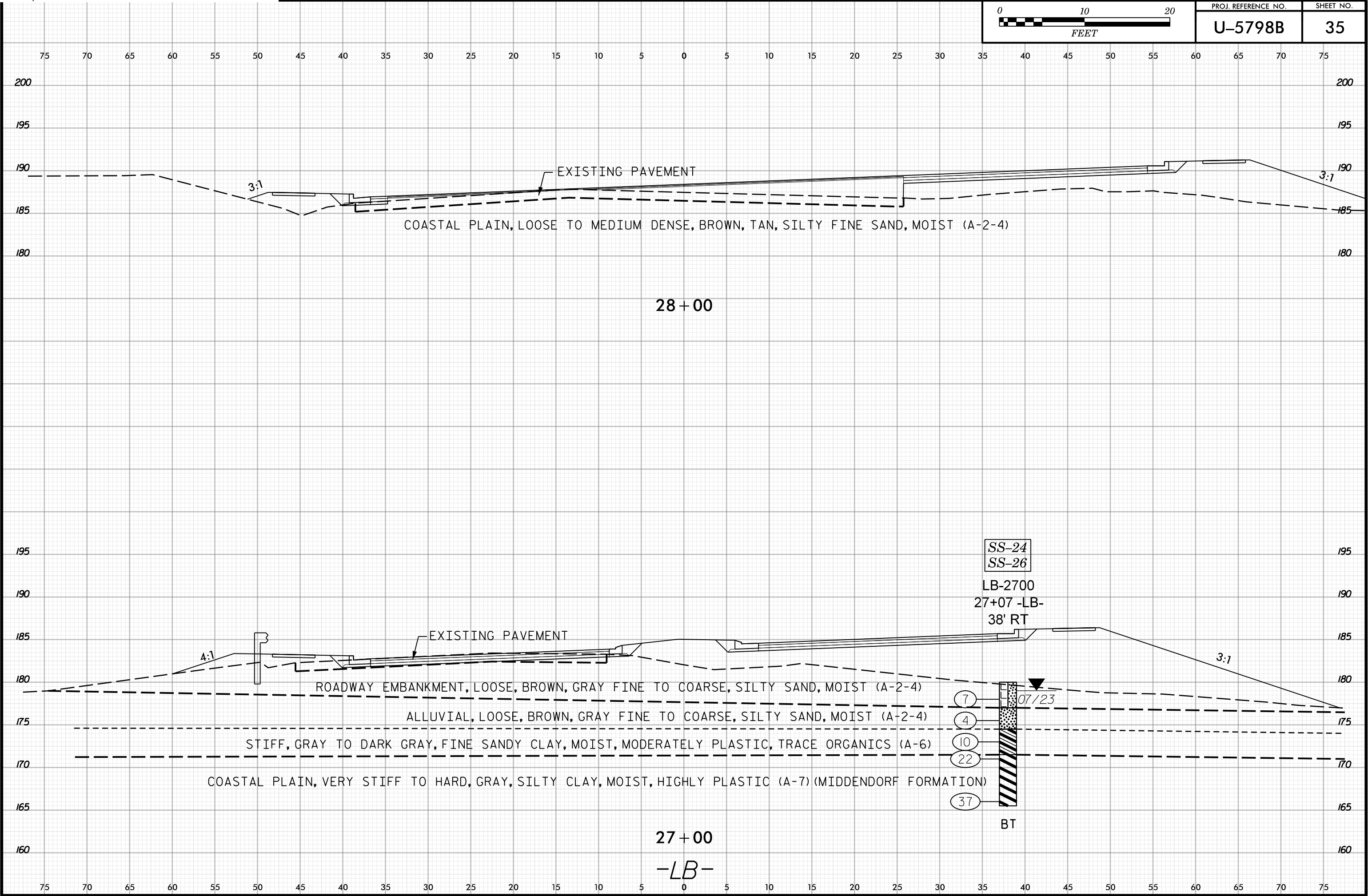


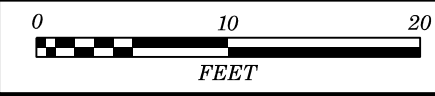


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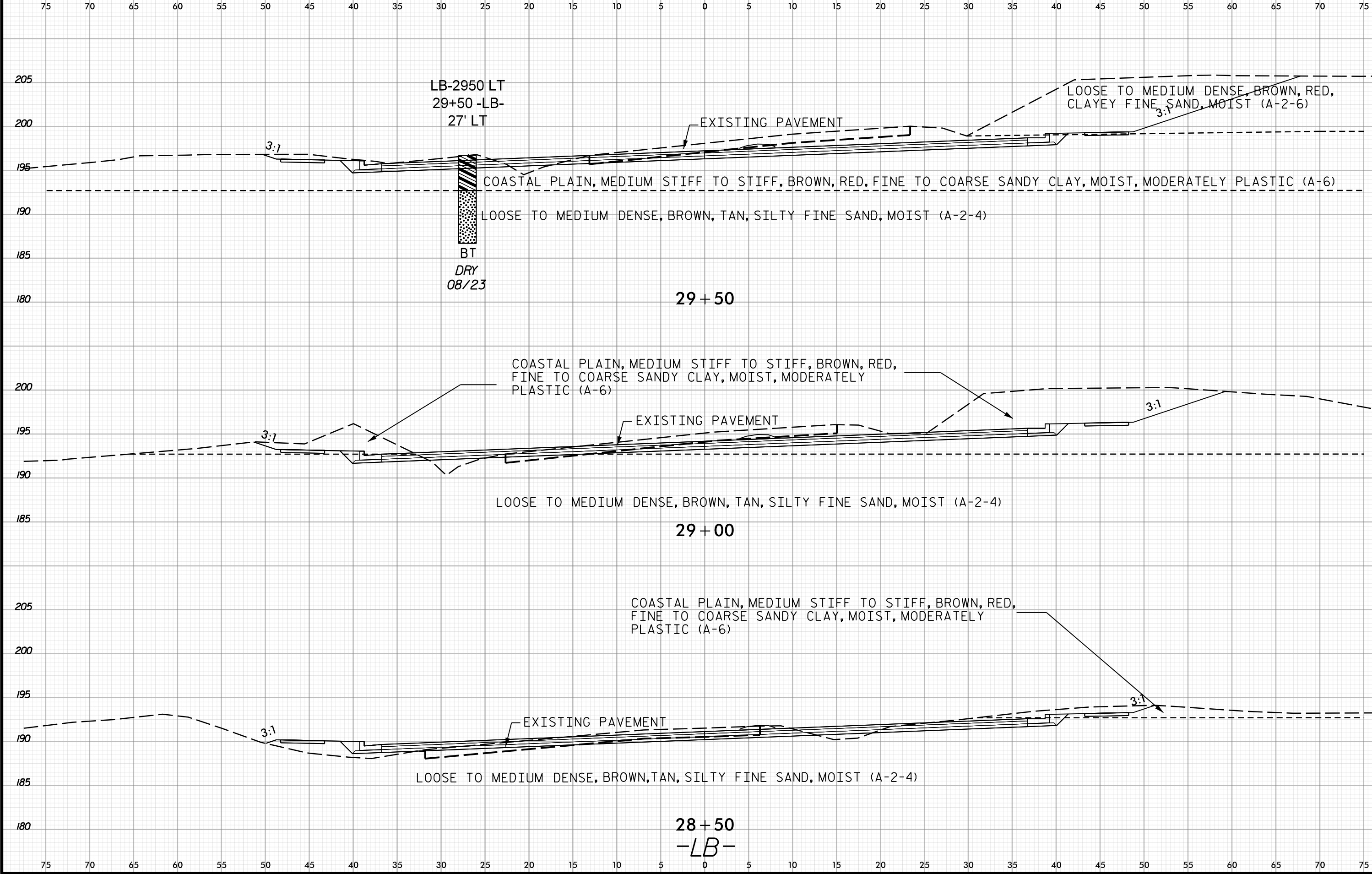


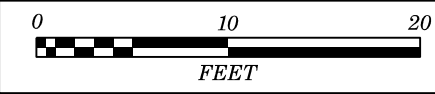




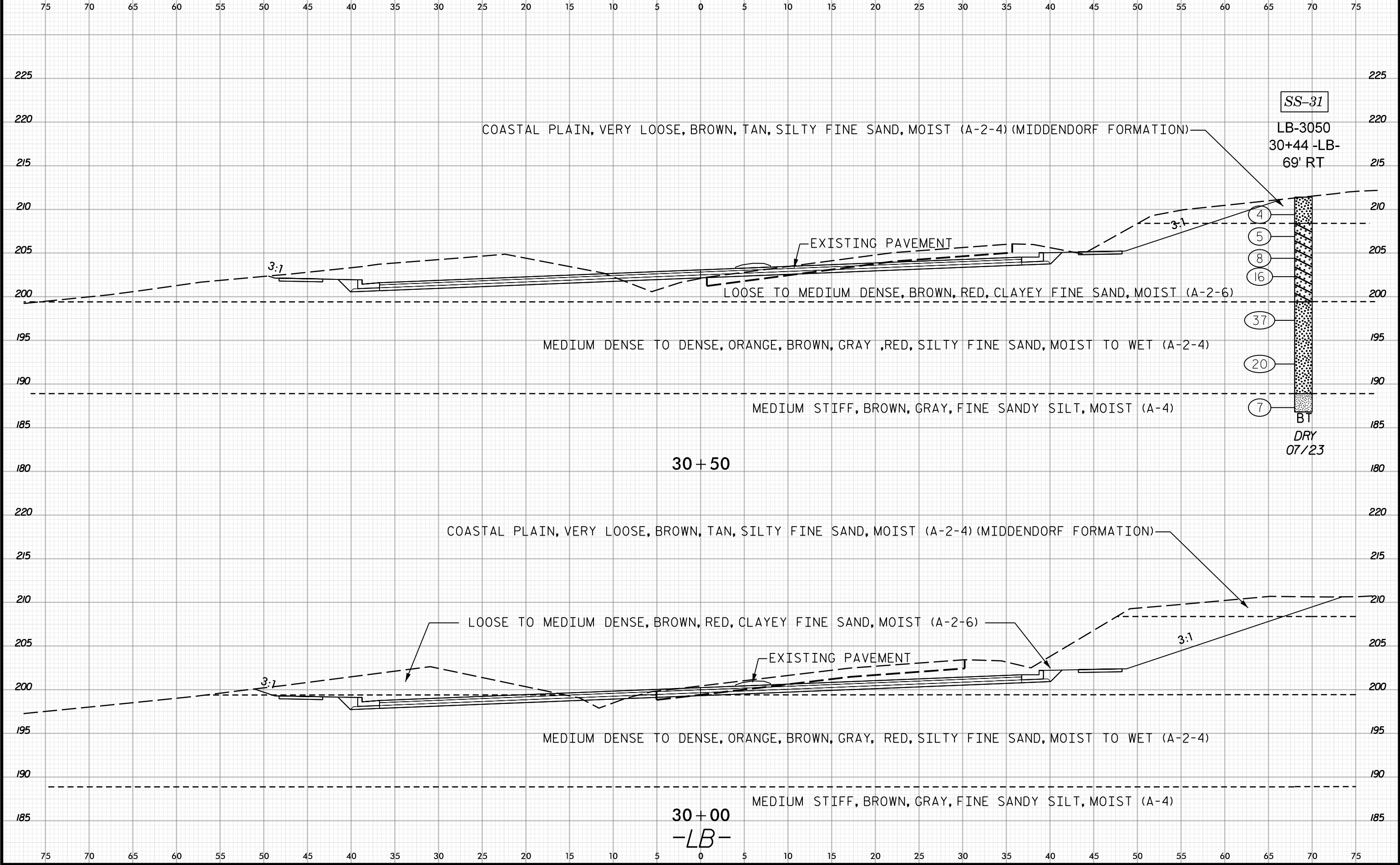


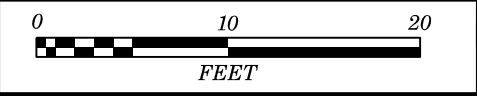
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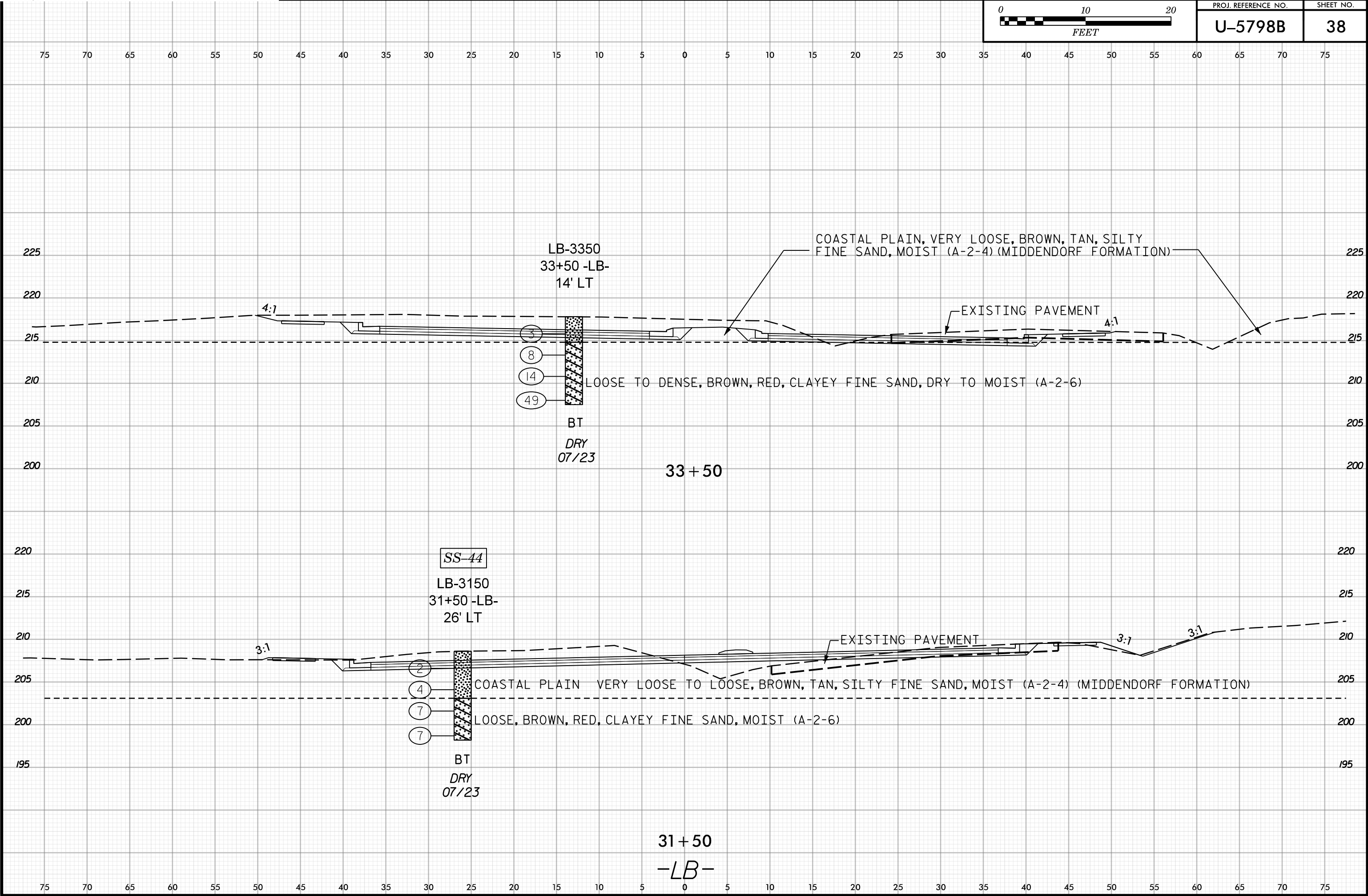


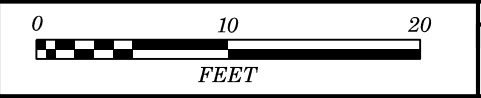
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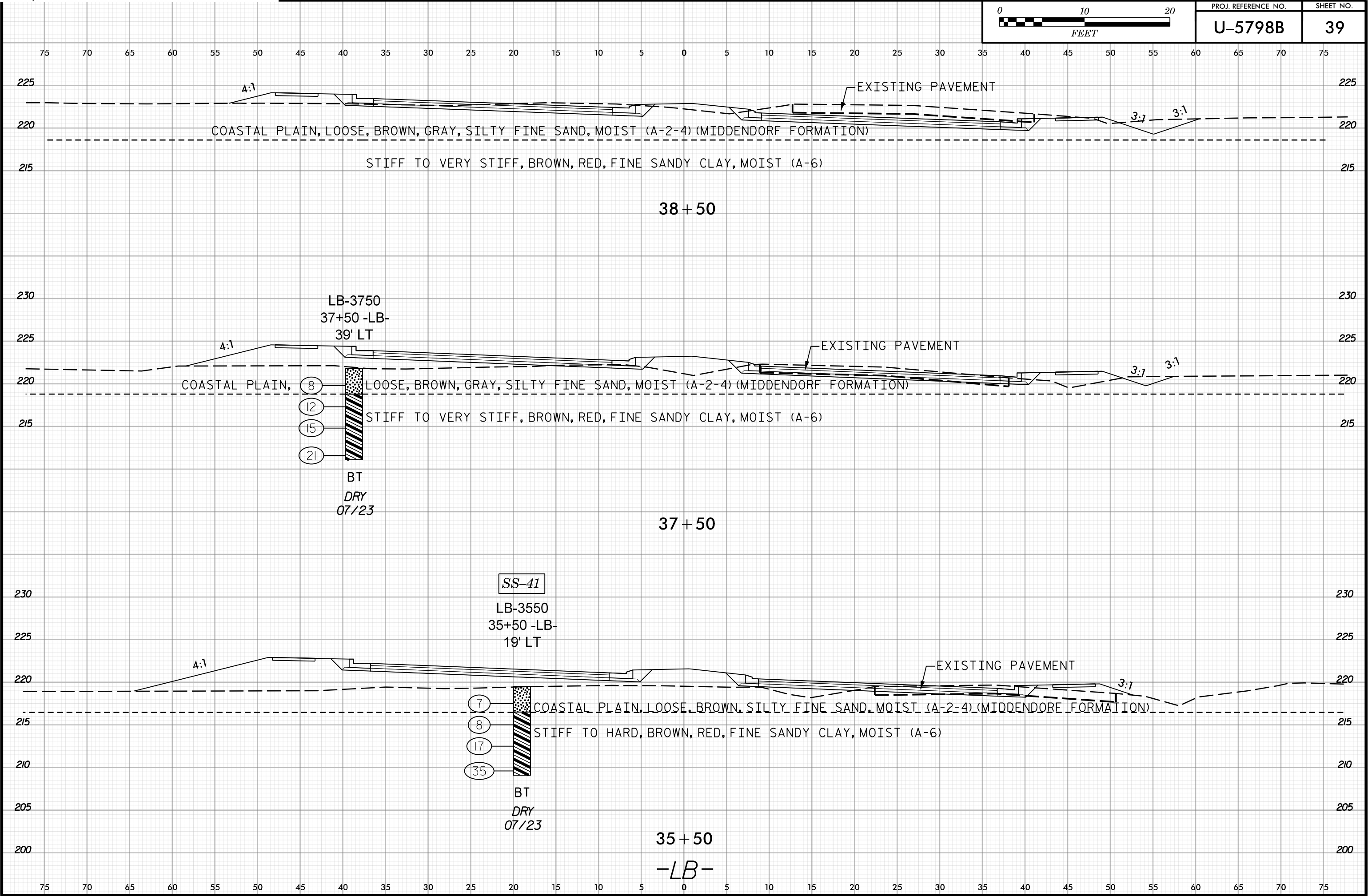


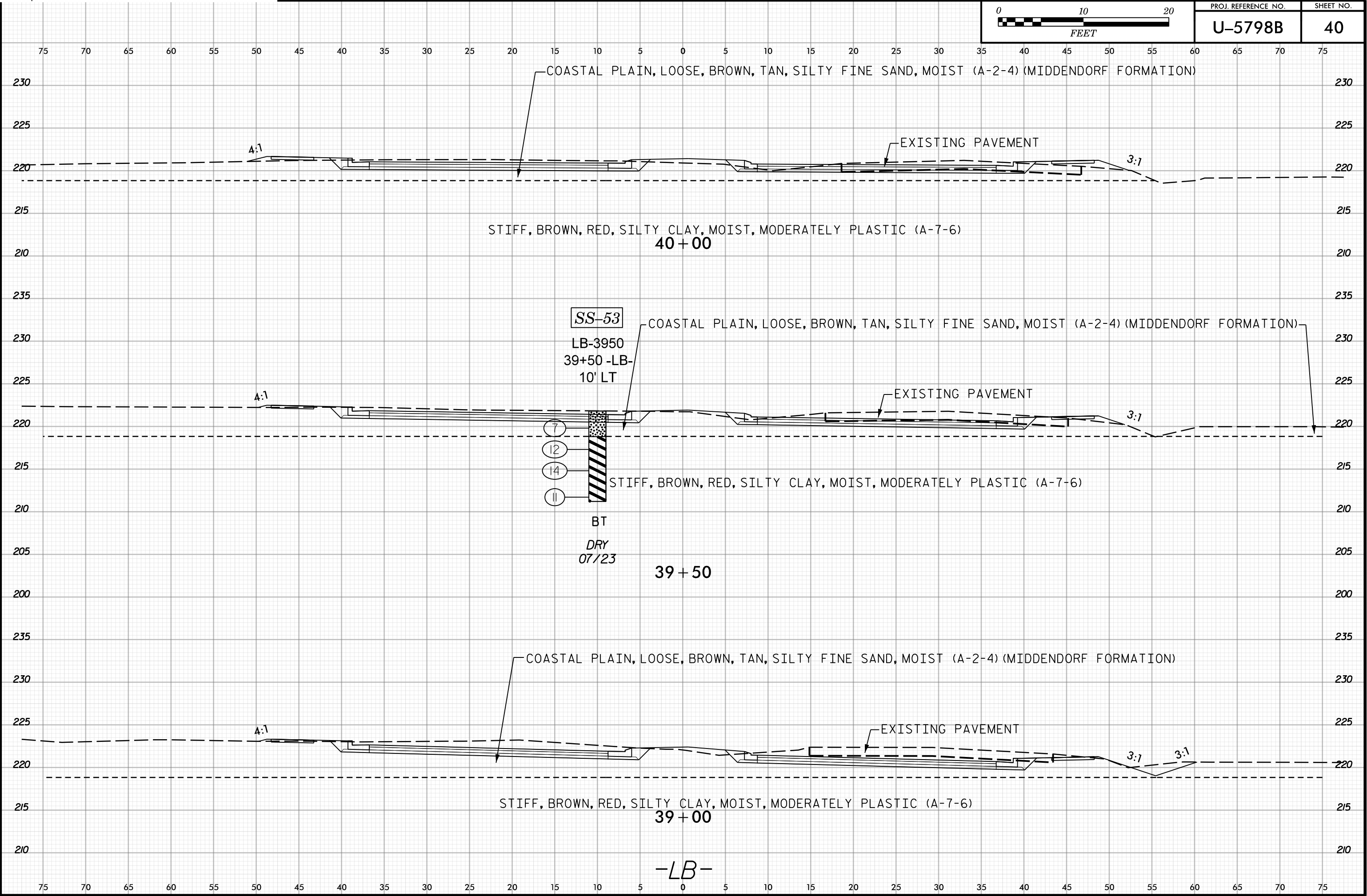
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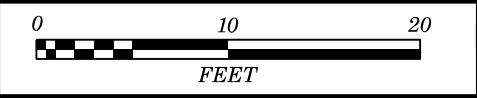




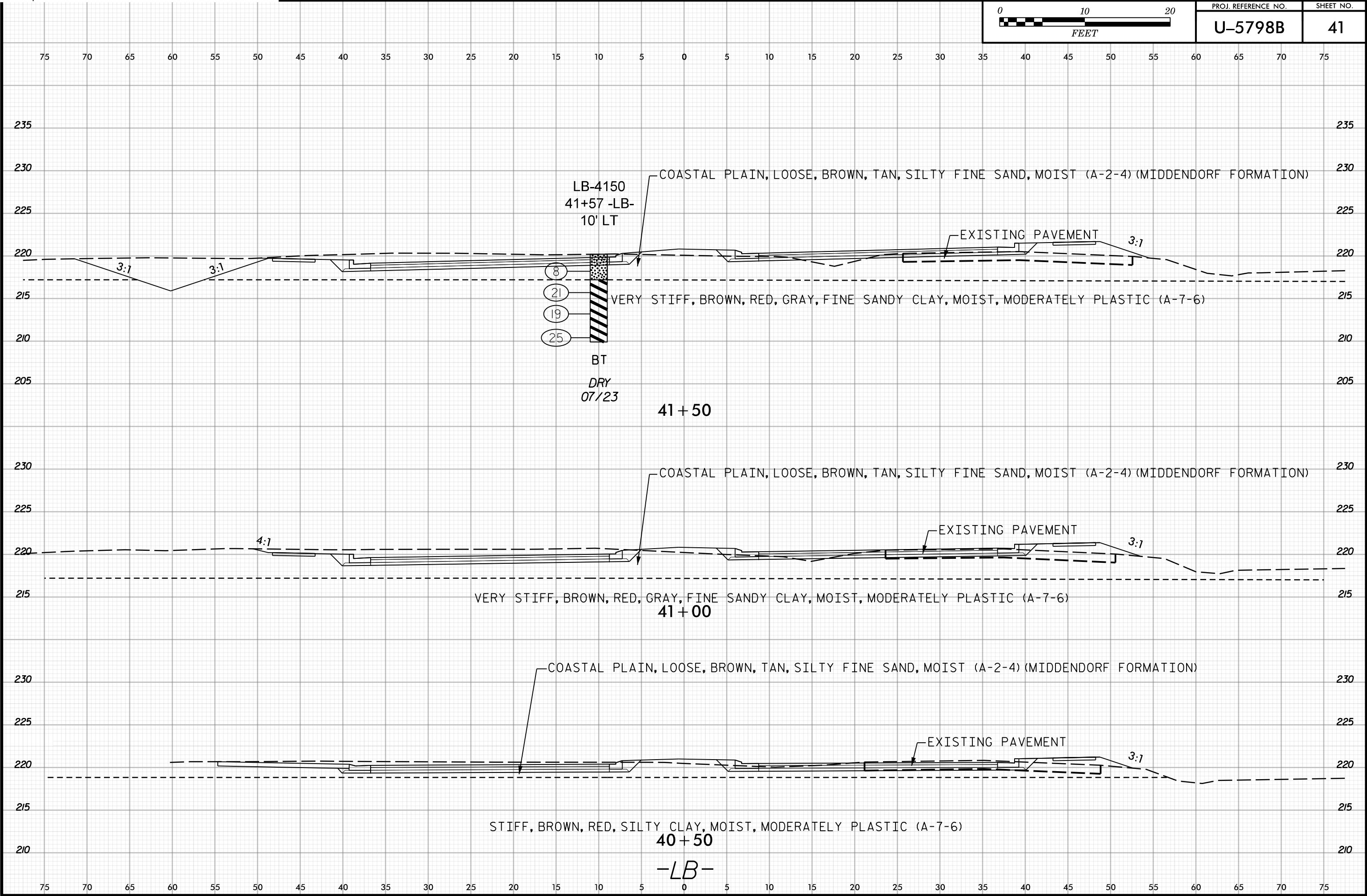
PROJ. REFERENCE NO.	SHEET NO.
U-5798B	39

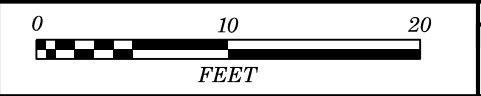




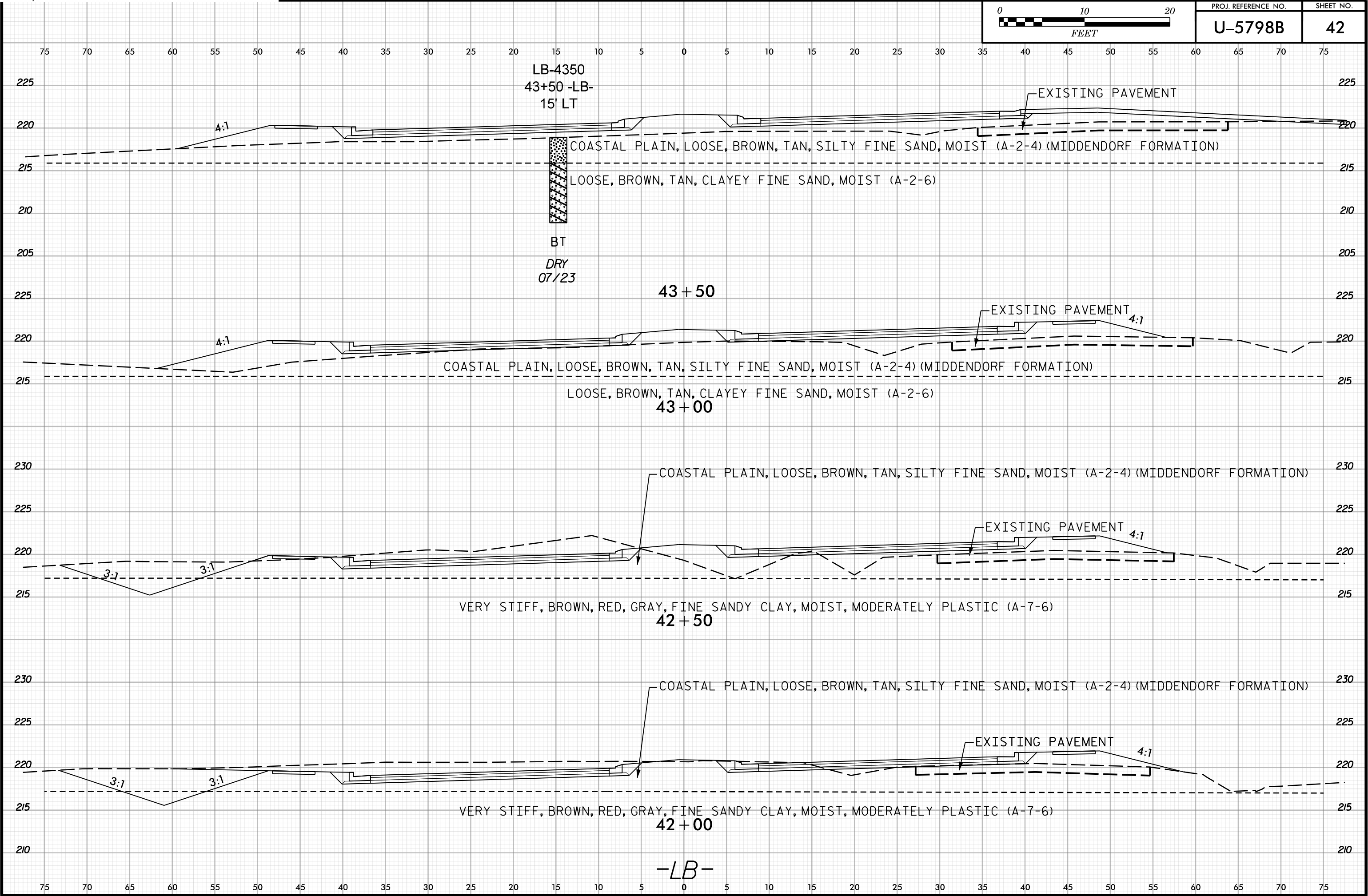


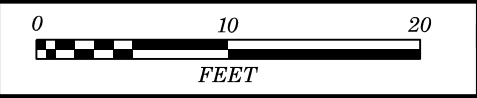
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U-5798B	41



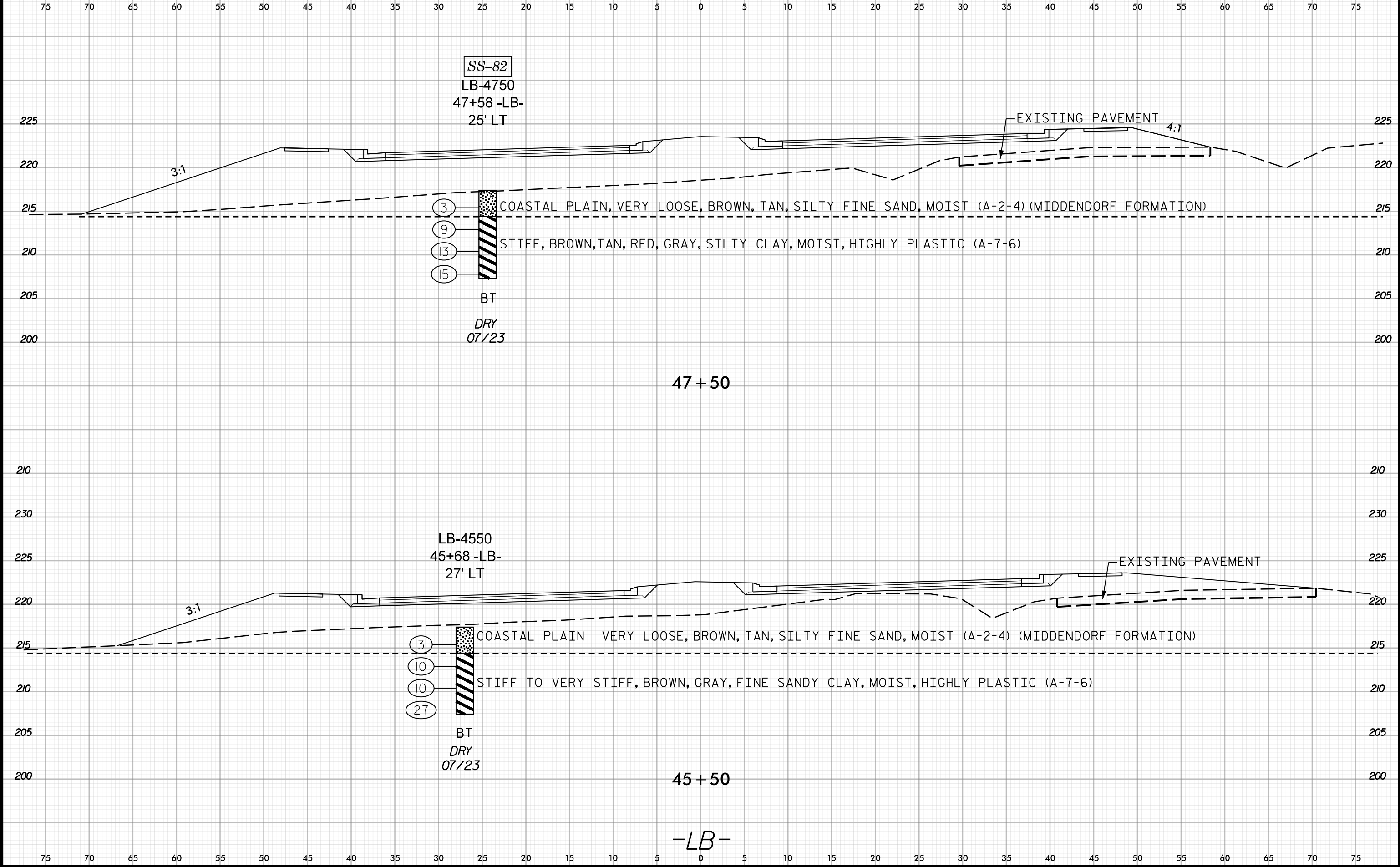


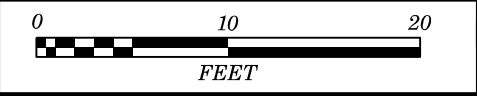
PROJ. REFERENCE NO.	SHEET NO.
U-5798B	42



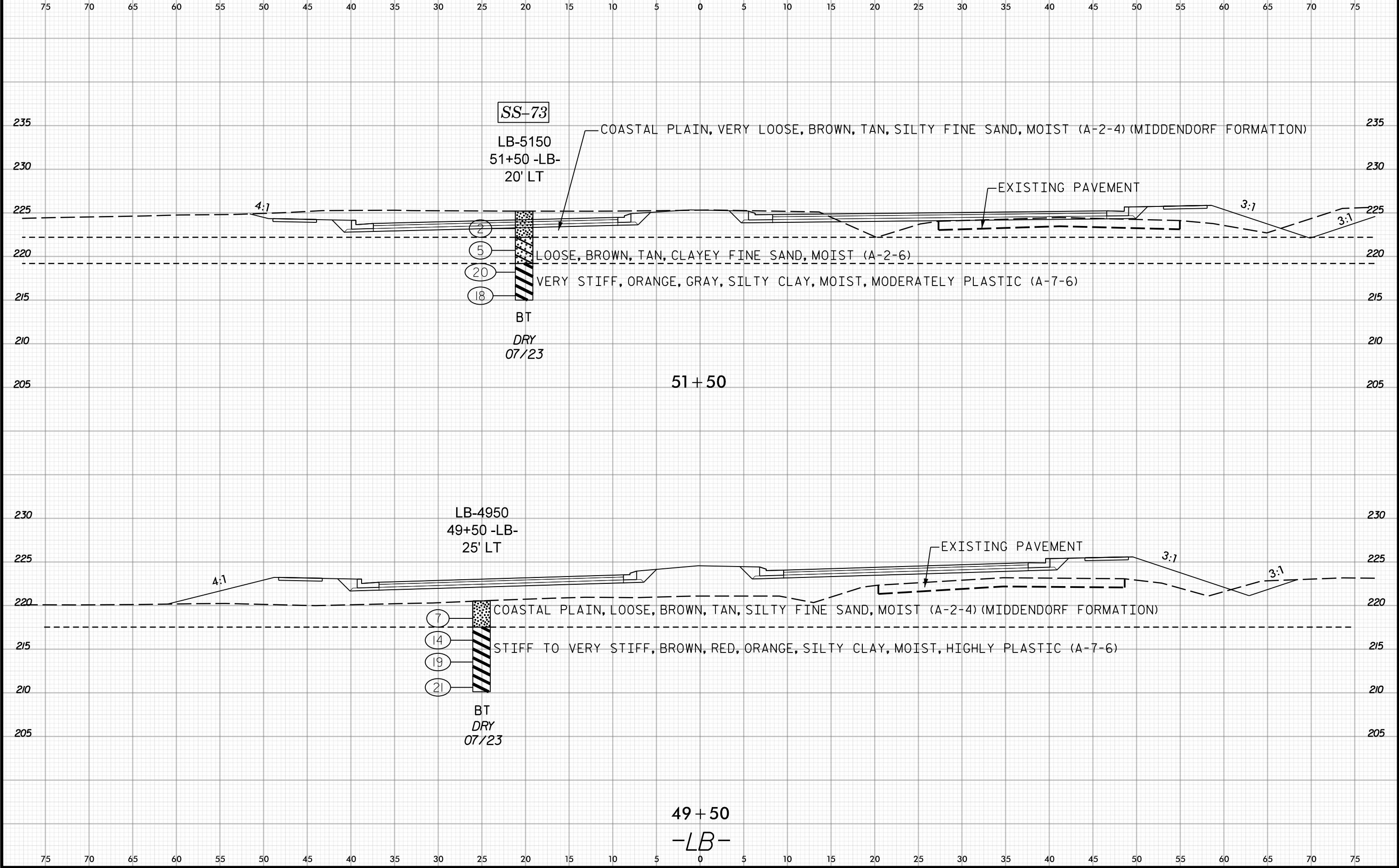


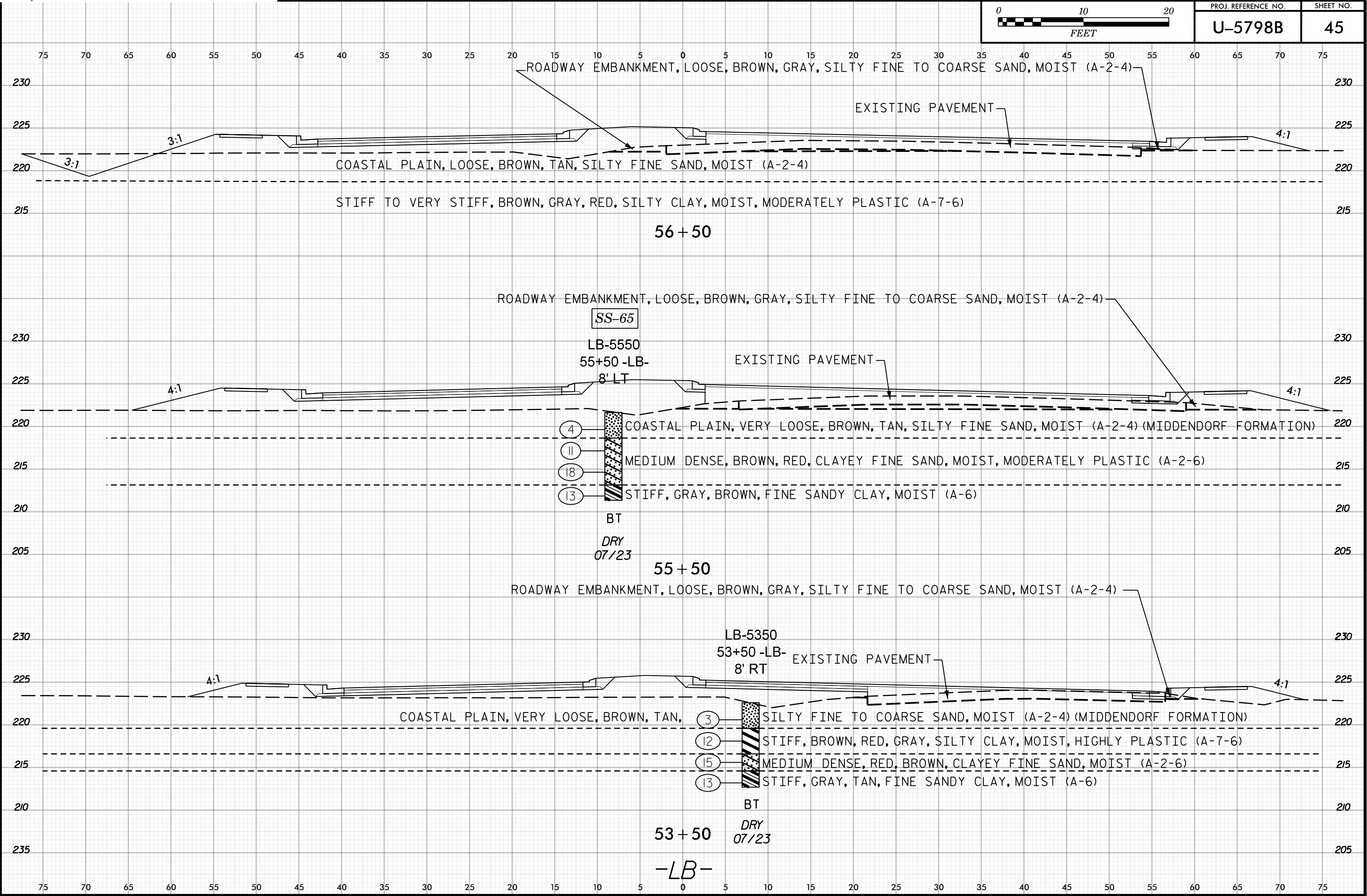
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U-5798B	43

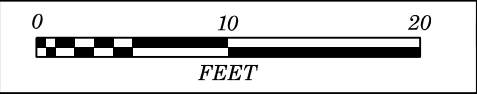




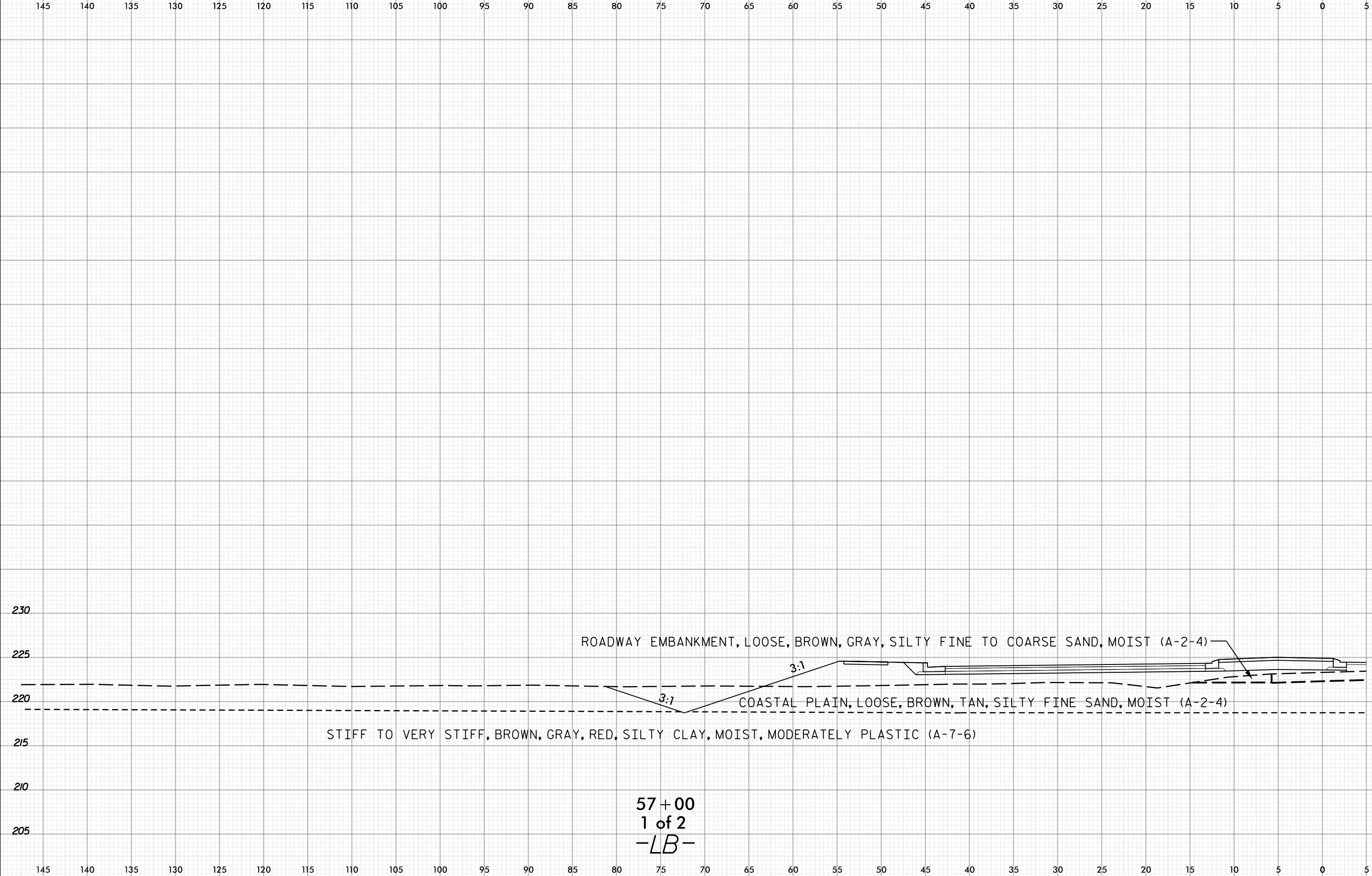
PROJ. REFERENCE NO.	SHEET NO.
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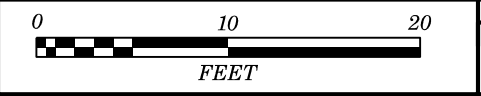




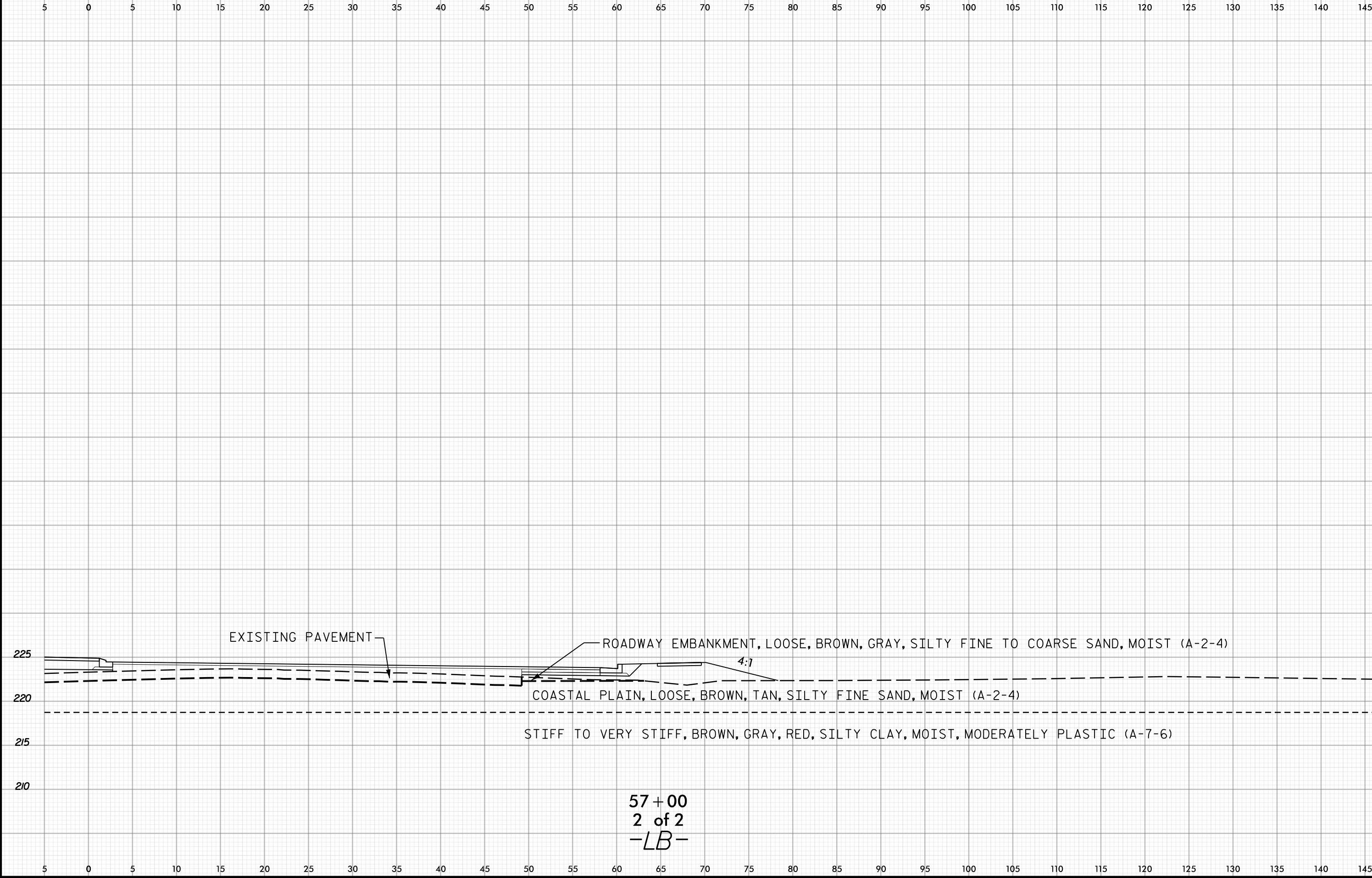


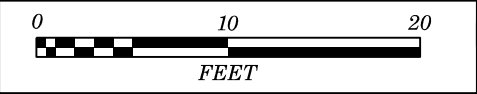
PROJ. REFERENCE NO.	SHEET NO.
U-5798B	46



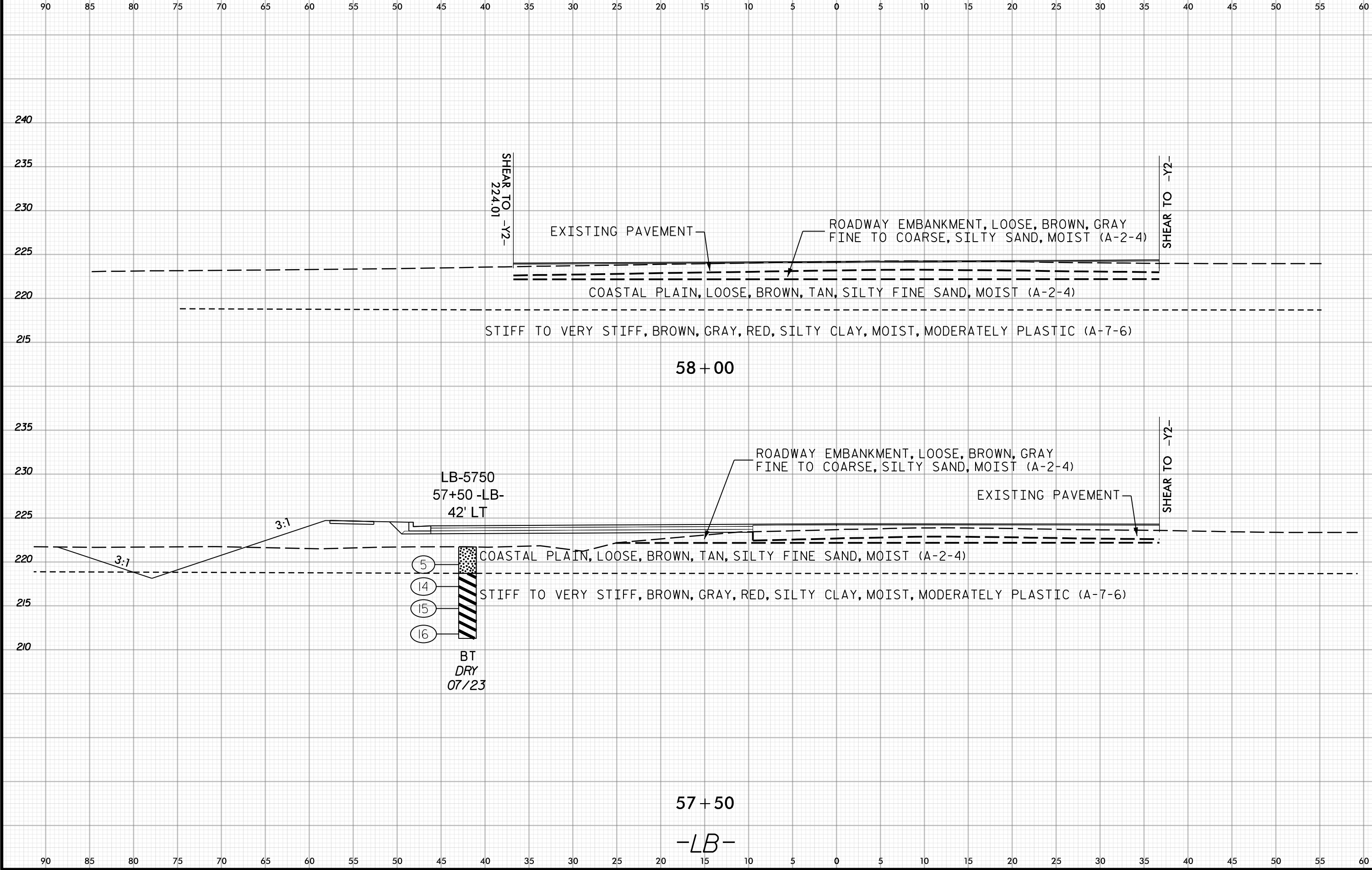


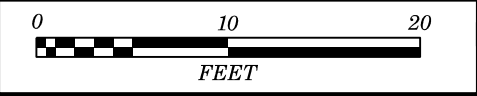
PROJ. REFERENCE NO.	SHEET NO.
U-5798B	47



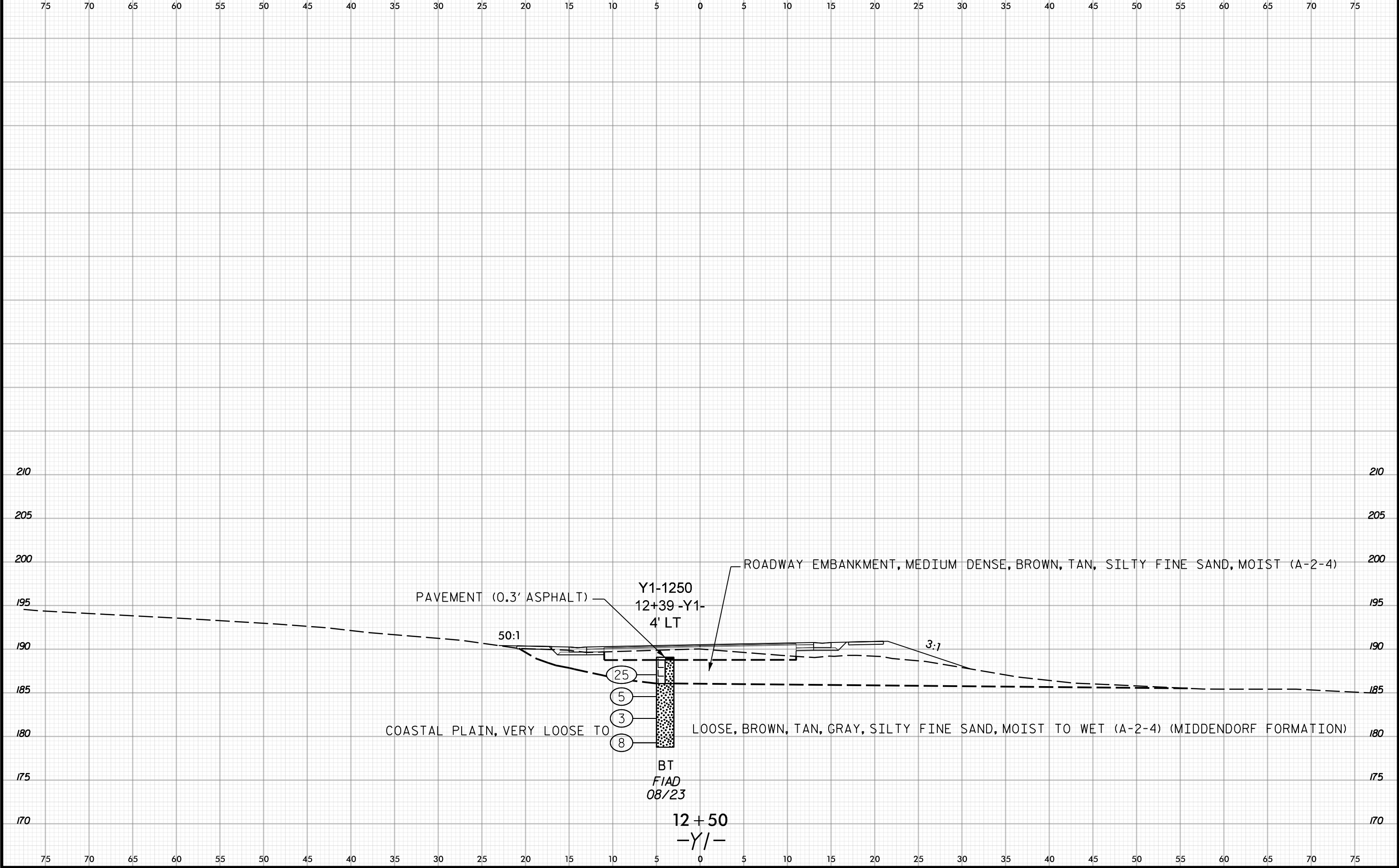


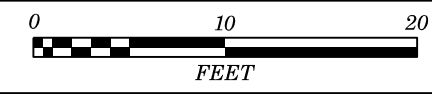
PROJ. REFERENCE NO.	SHEET NO.
U-5798B	48



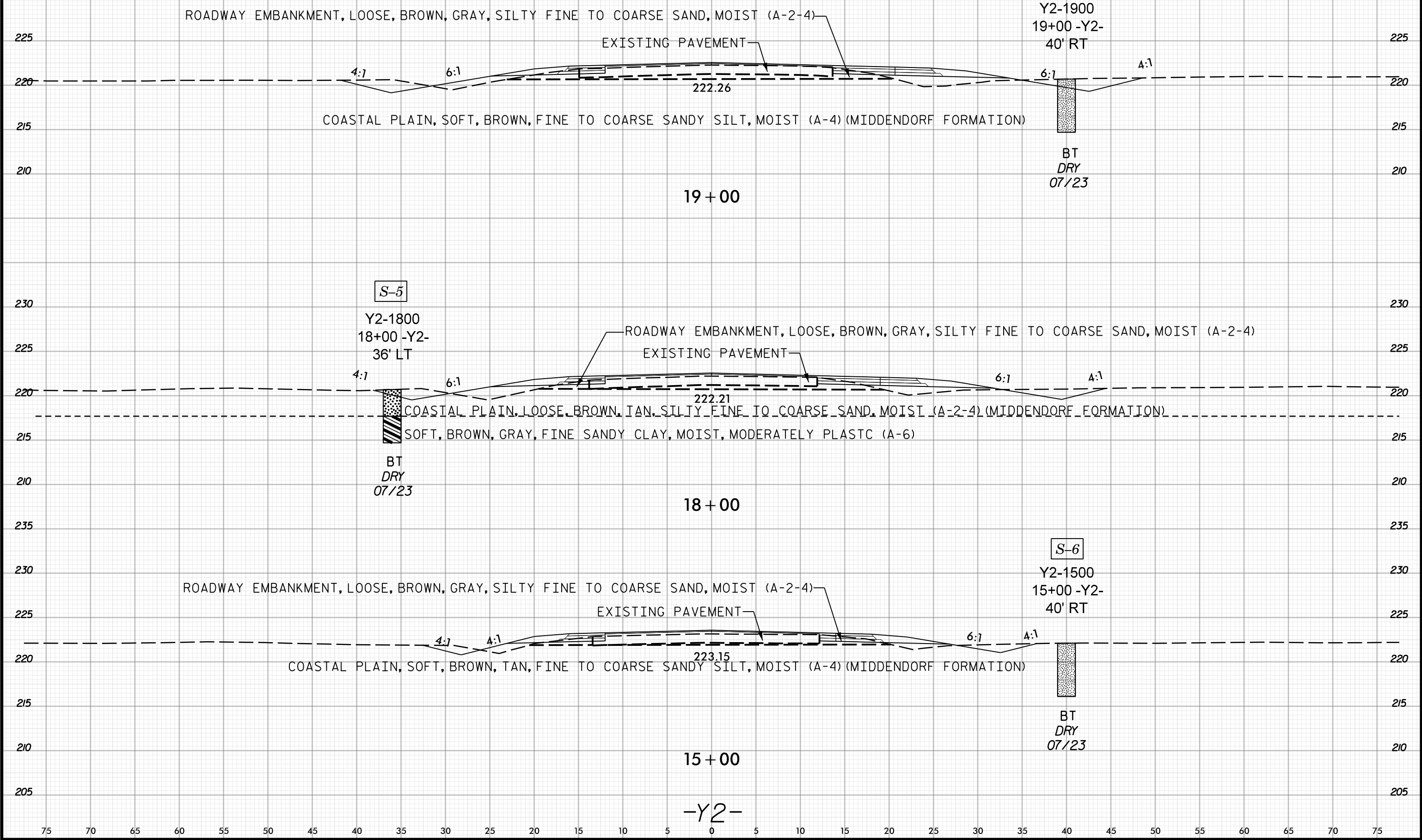


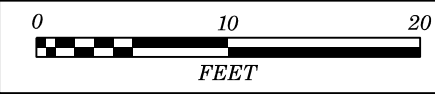
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U-5798B	49



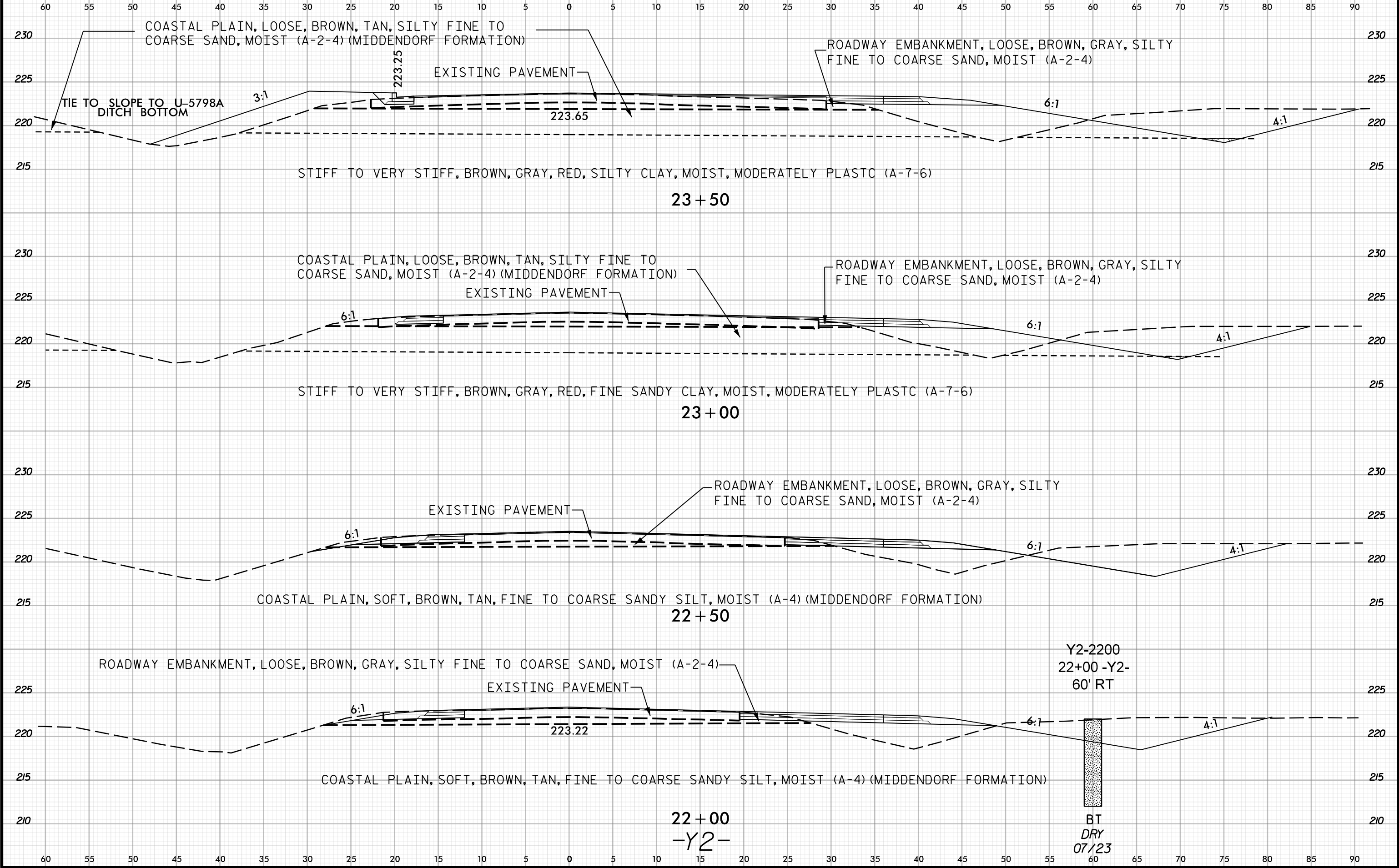


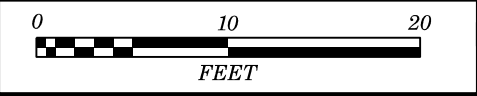
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U-5798B	50



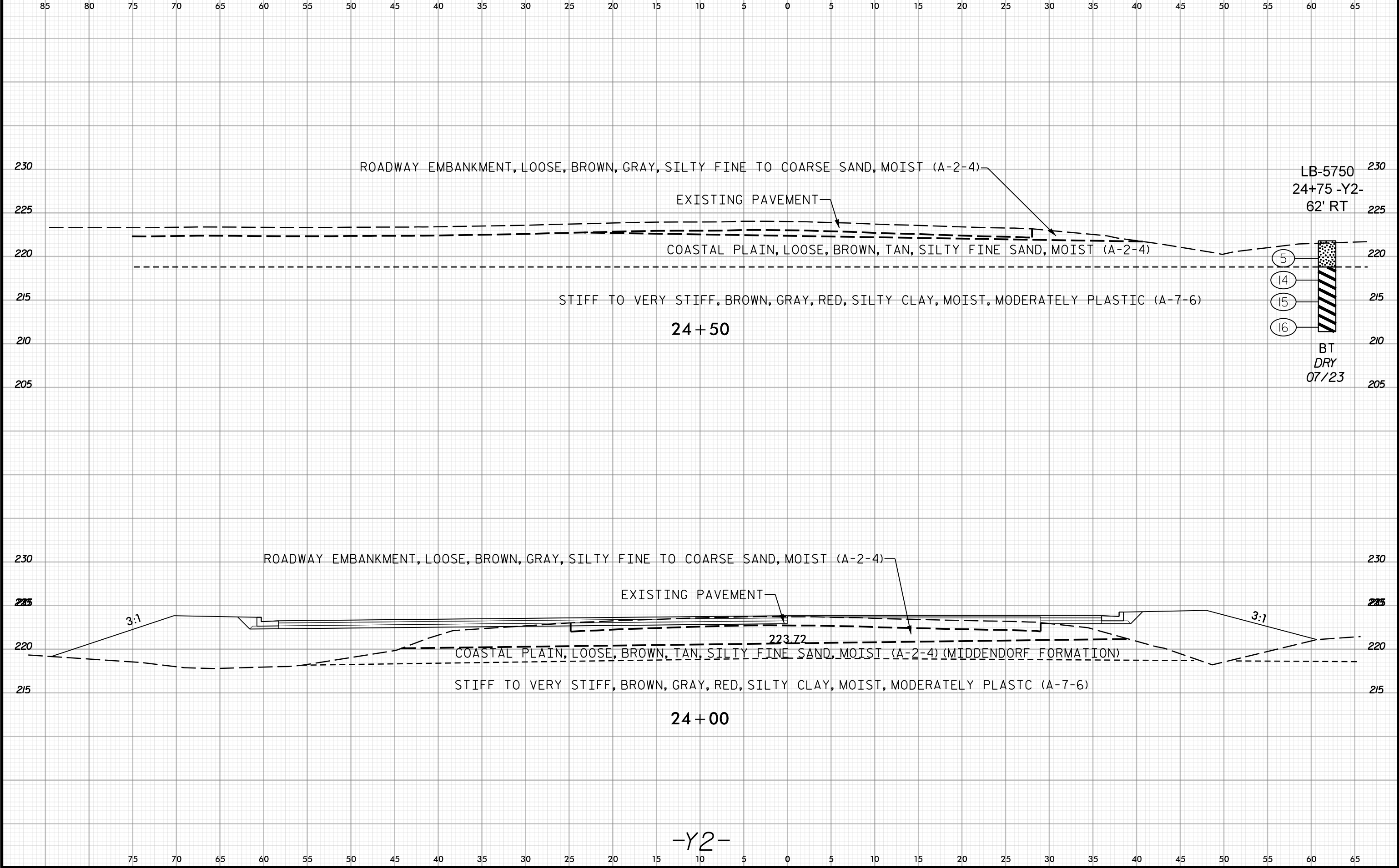


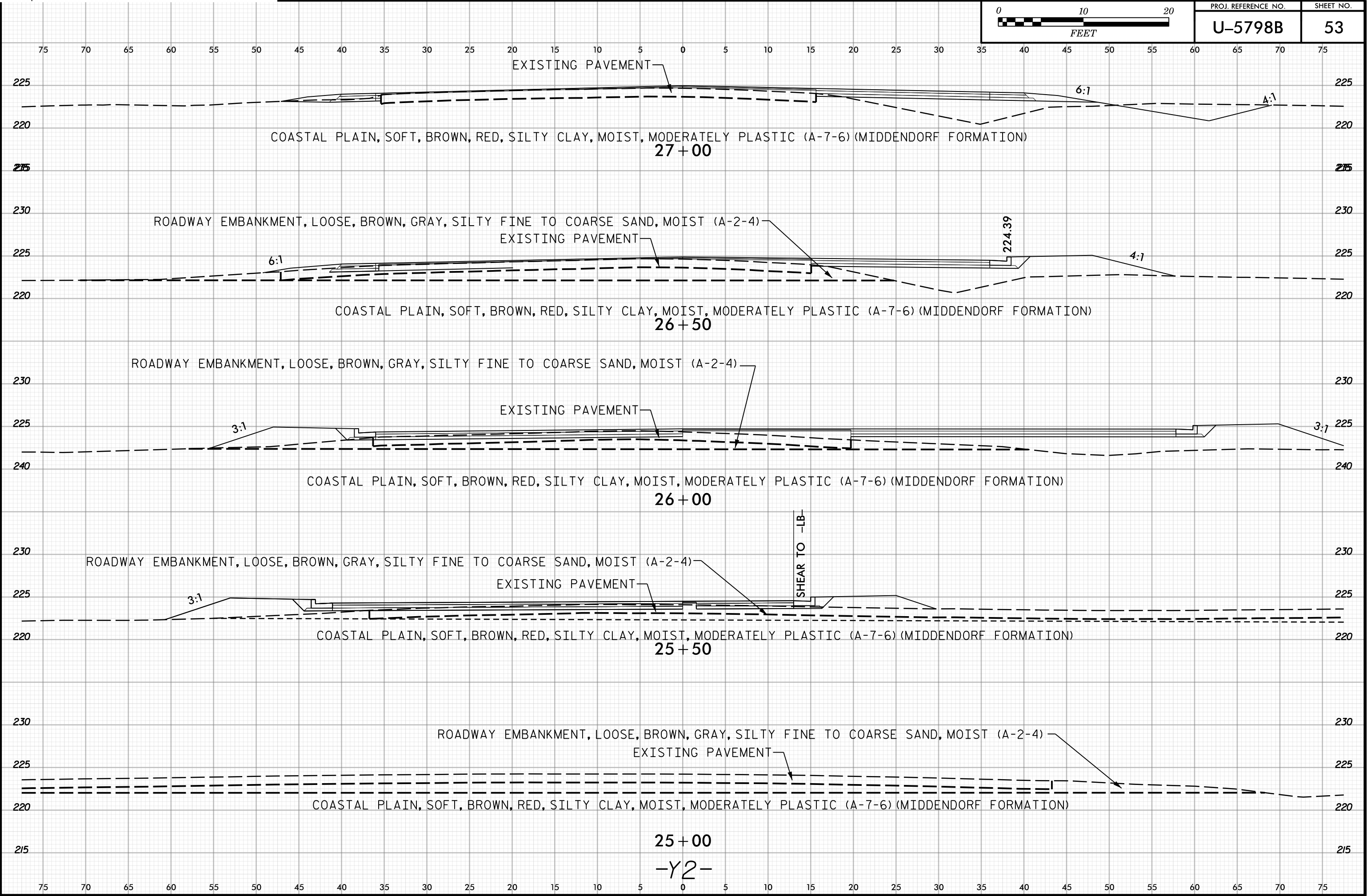
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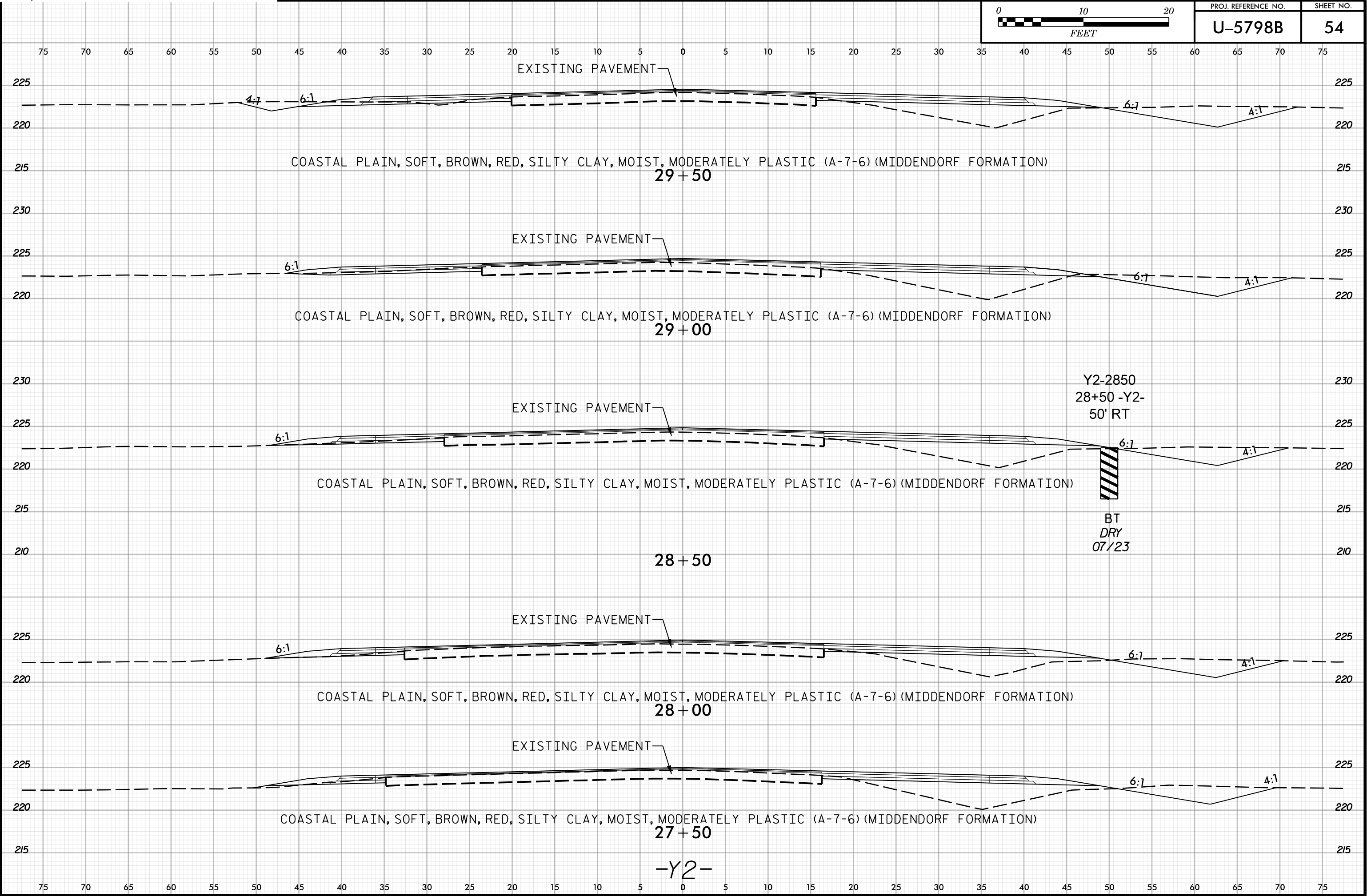


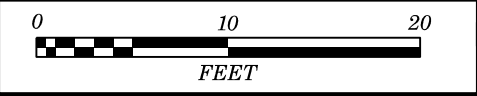


PROJ. REFERENCE NO.	SHEET NO.
U-5798B	52

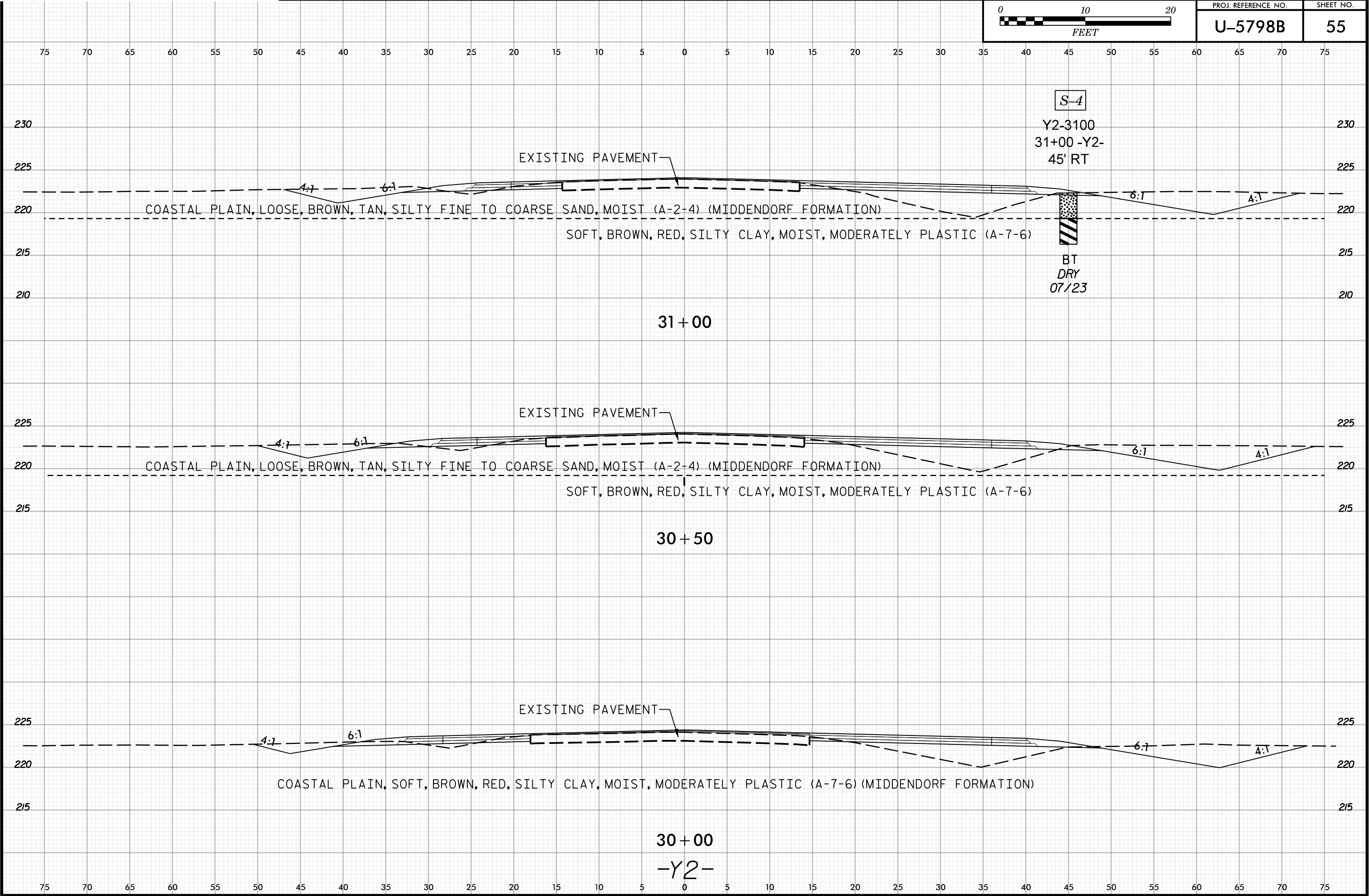


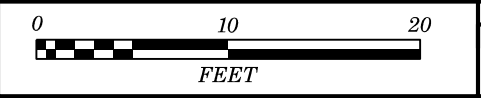




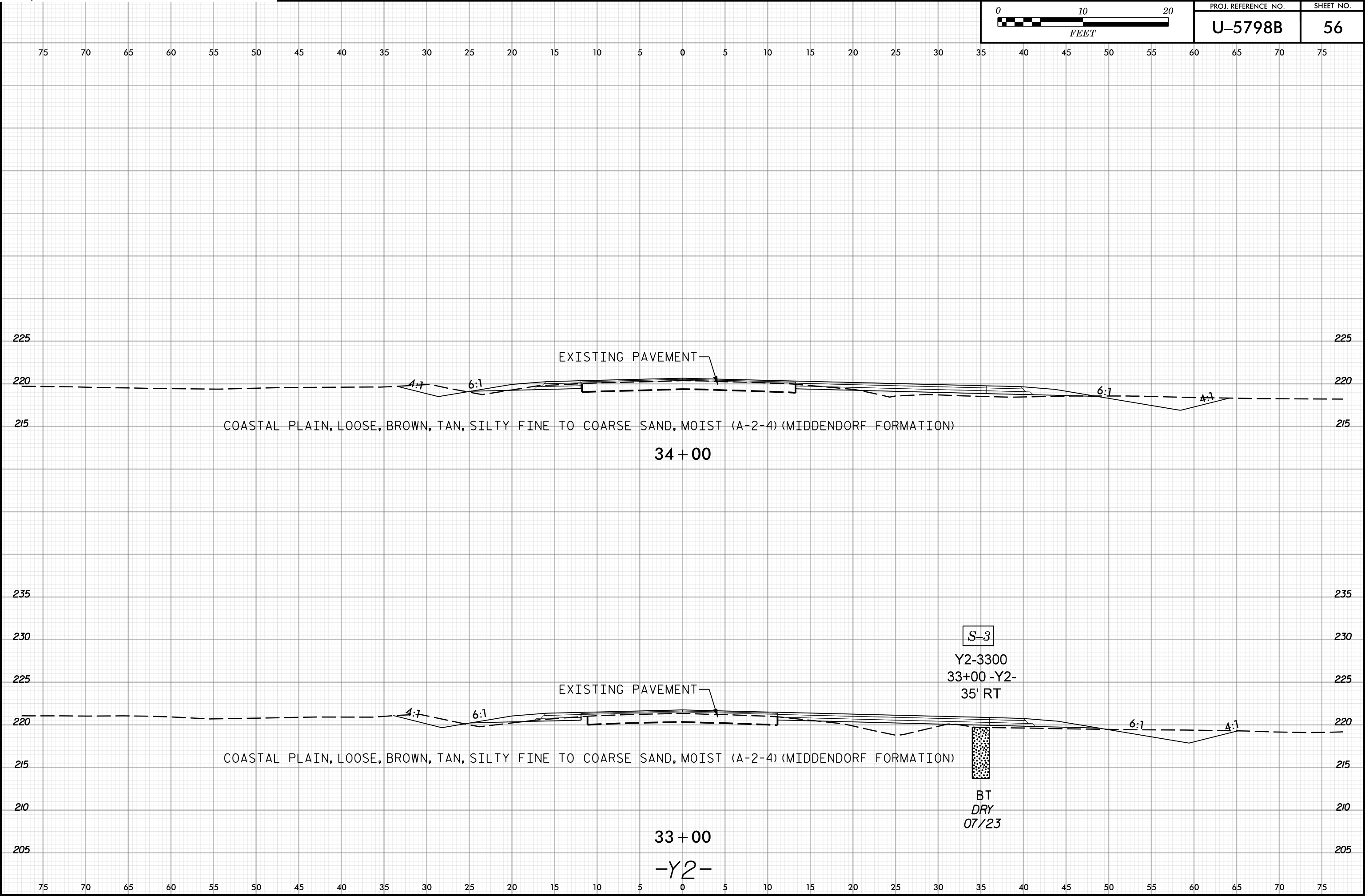


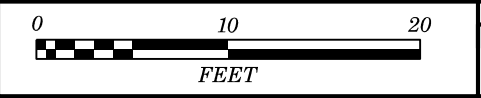
PROJ. REFERENCE NO.	SHEET NO.
U-5798B	55



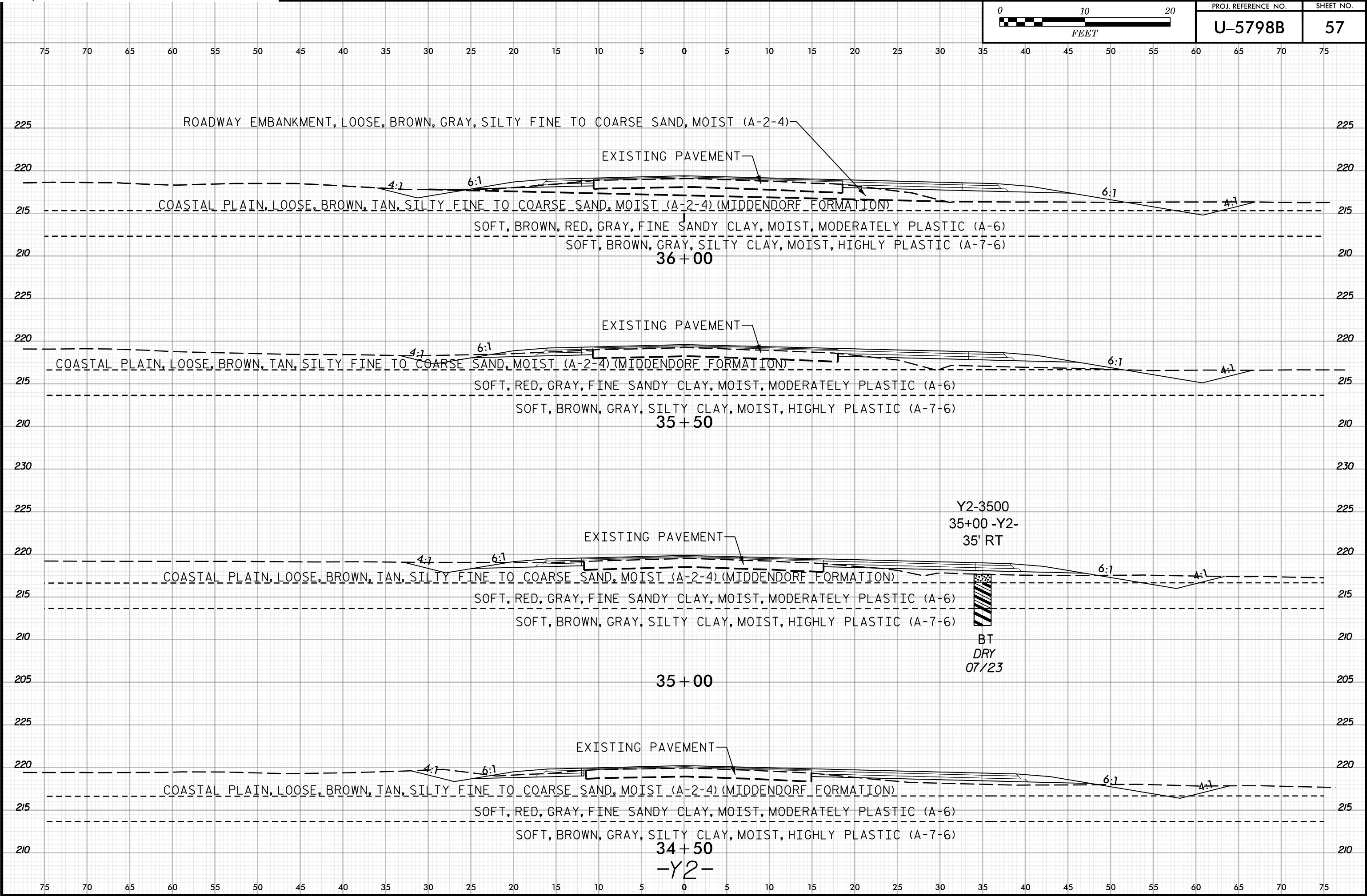


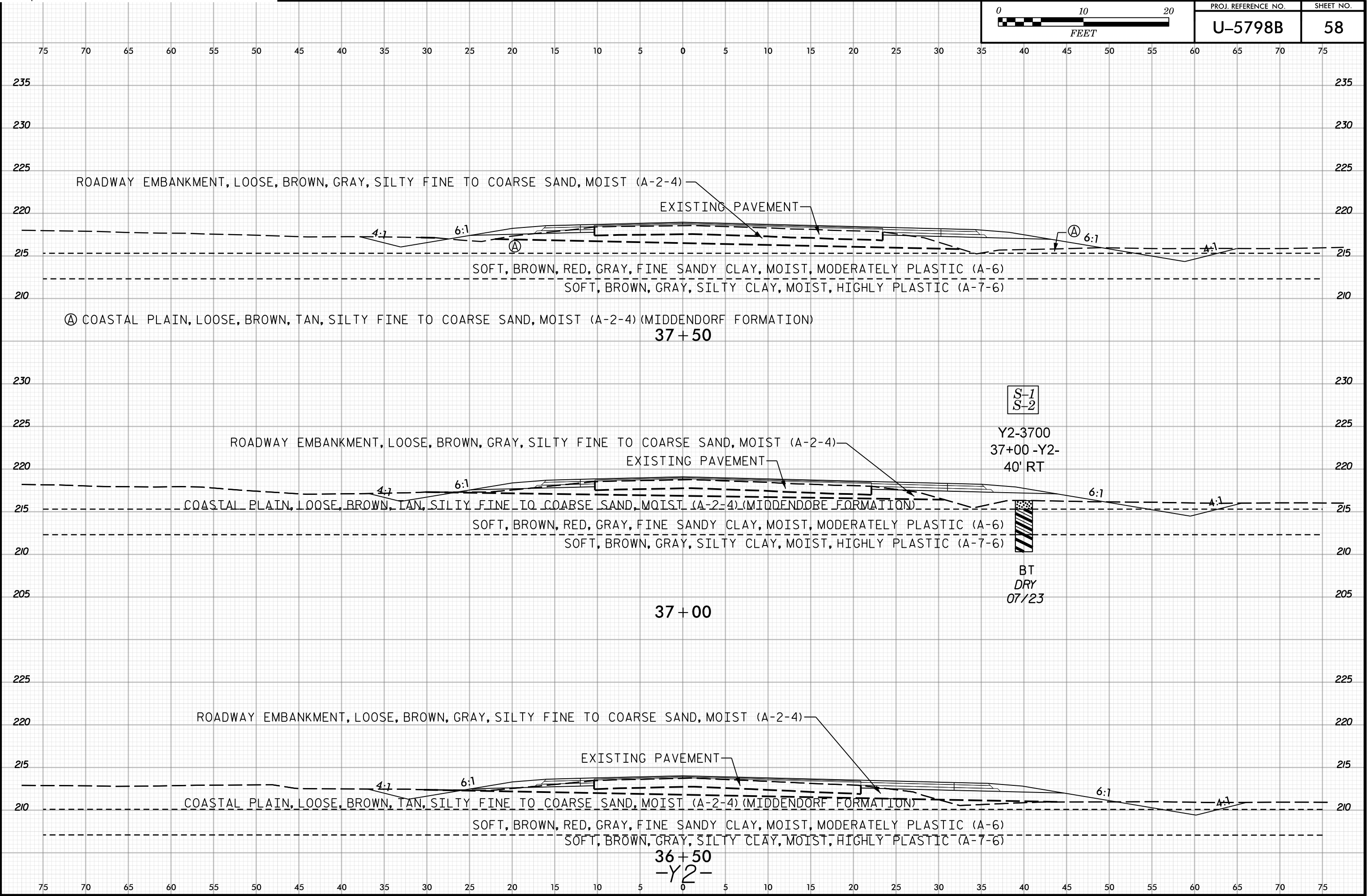
PROJ. REFERENCE NO.	SHEET NO.
U-5798B	56

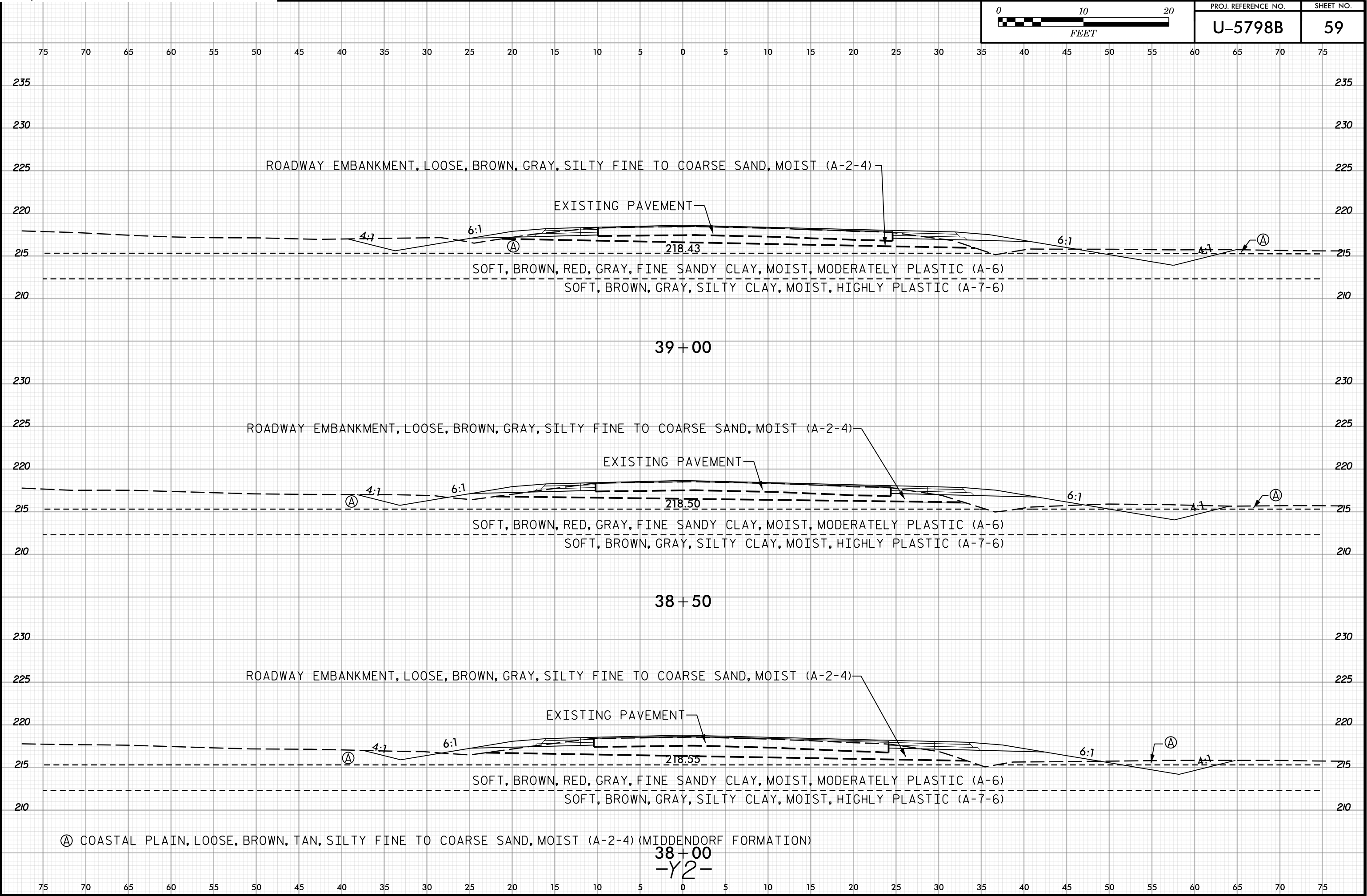


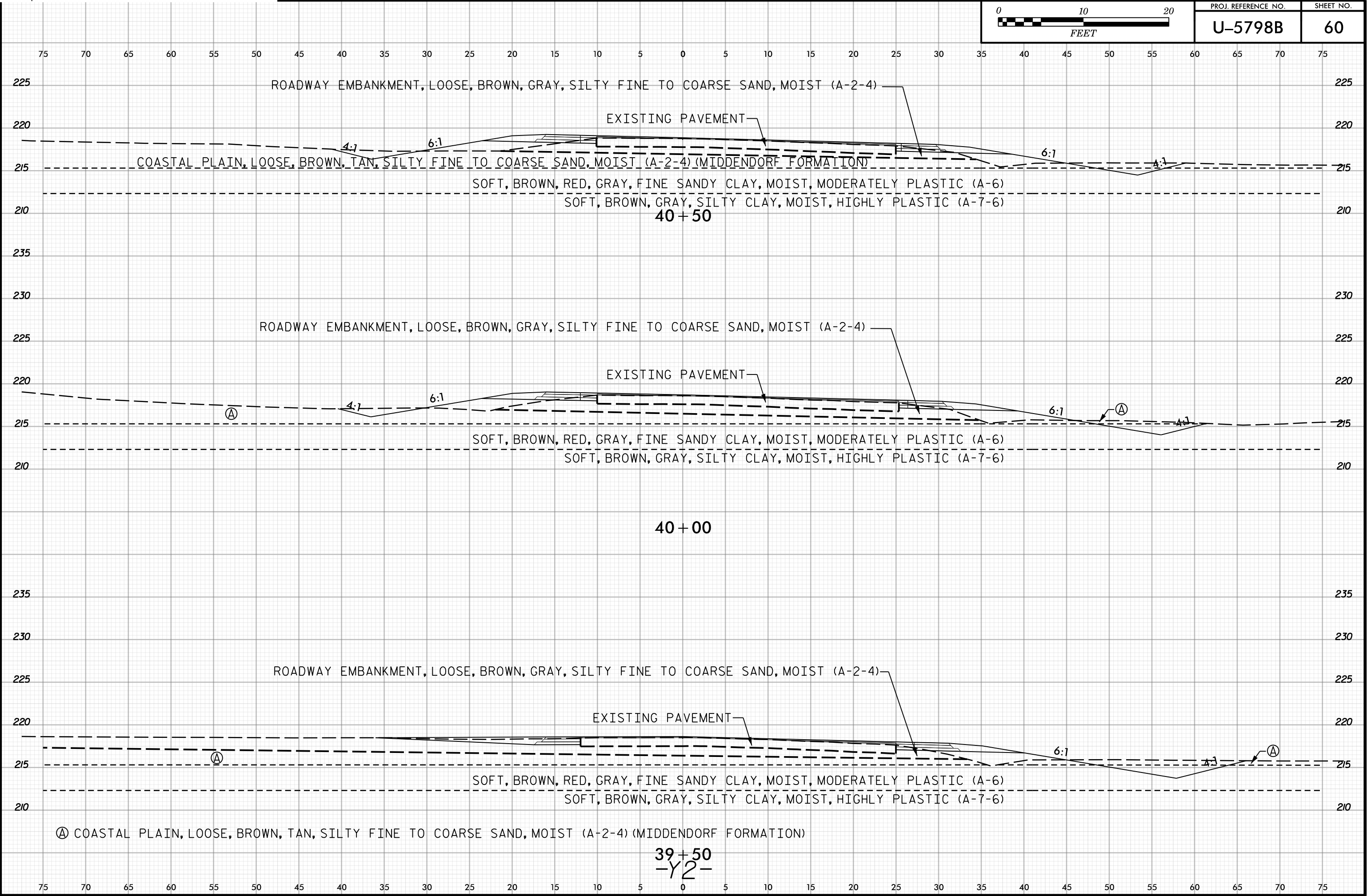


PROJ. REFERENCE NO.	SHEET NO.
U-5798B	57









REFERENCE: U-5798B

PROJECT: 44369

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5798B	62	

APPENDIX A

LABORATORY TESTING SUMMARY

DESCRIPTION: Widen to Multi-Lanes SR 1102 (Gillis Hill Rd.) From South of Celtic Drive to North of SR 1112 (Stoney Point Rd.)

NP - NON-PLASTIC

114-01-1203

Certification Number

LABORATORY TESTING SUMMARY

PROJECT NUMBER: 44369.1.3

TIP: U-5798B

COUNTY: Cumberland/ Hoke

DESCRIPTION: Widen to Multi-Lanes SR 1102 (Gillis Hill Rd.) From South of Celtic Drive to North of SR 1112 (Stoney Point Rd.)

[illegible]

NP - NON-PLASTIC

Stephanie H. Huffman
Certified Lab Technician Signature

114-01-1203
Certification Number