

REFERENCE: U-5789B

PROJECT: 44369

SEE SHEET 3 FOR PLAN SHEET LAYOUT  
AT TIME OF INVESTIGATION

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CROSS SECTIONS

| <u>LINE</u> | <u>STATION</u> | <u>SHEETS</u> |
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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.

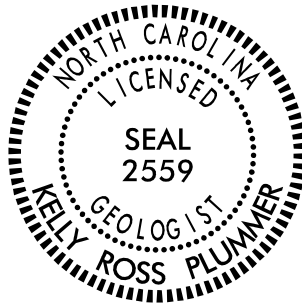
INVESTIGATED BY MARPLES, Z. J.

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

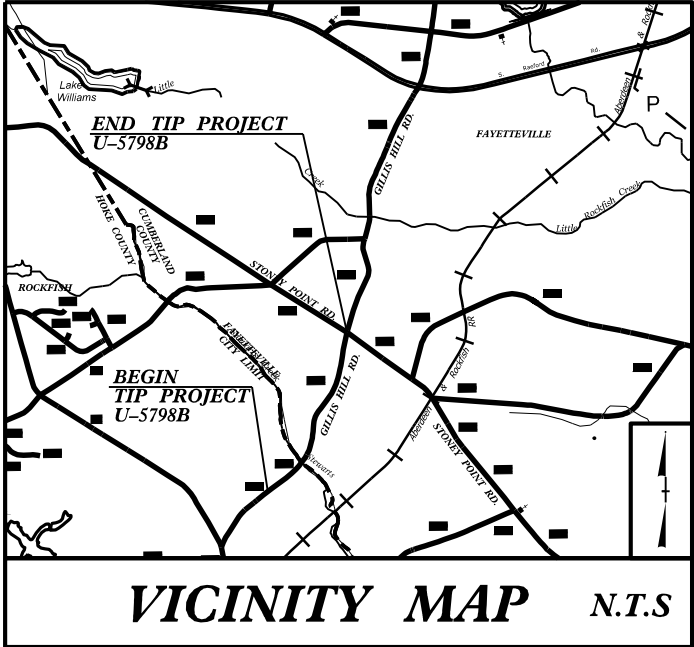
DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

| SOIL DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |  | GRADATION                                                                                                                                                                                                                                                         |  |  |  |  |  | ROCK DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |  | TERMS AND DEFINITIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      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| 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, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6 |  |  |  |  |  | WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.<br>UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE.<br>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 60 BLOWS 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.<br>AQUIFER - A WATER BEARING FORMATION OR STRATA.<br>ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.<br>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.<br>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.<br>CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.<br>COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.<br>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.<br>DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.<br>DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.<br>DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.<br>FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.<br>FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.<br>FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL.<br>FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.<br>FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.<br>JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.<br>LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.<br>LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.<br>MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.<br>PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.<br>RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.<br>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.<br>SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.<br>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 INTRODUCED ROCKS.<br>SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.<br>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 60.1 FOOT PER 60 BLOWS.<br>STRATA CORE RECOVERY (SCRC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.<br>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.<br>TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER. |  |  |  |  |  |
| GENERAL CLASS.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |  |  |  | MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.                                                                                                                               |  |  |  |  |  | CRYSTALLINE ROCK (CR)                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |  |  |  |  |
| GROUP CLASS.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |  |  |  |  | MINORALOGICAL COMPOSITION                                                                                                                                                                                                                                         |  |  |  |  |  | NON-CRYSTALLINE ROCK (NCR)                                                       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| SYMBOL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |  |  |  | COMPRESSIBILITY                                                                                                                                                                                                                                                   |  |  |  |  |  | COASTAL PLAIN SEDIMENTARY ROCK (CP)                                              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| % PASSING<br>#10<br>#40<br>#200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |  | PERCENTAGE OF MATERIAL                                                                                                                                                                                                                                            |  |  |  |  |  | WEATHERING                                                                       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| MATERIAL PASSING #40 LL PI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  | GROUND WATER                                                                                                                                                                                                                                                      |  |  |  |  |  | VERY SLIGHT (IV SL)                                                              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| GROUP INDEX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |  |  |  | MISCELLANEOUS SYMBOLS                                                                                                                                                                                                                                             |  |  |  |  |  | MODERATE (MOD.)                                                                  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| USUAL TYPES OF MAJOR MATERIALS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |  |  |  |                                                                                                                                                                                                                                                                   |  |  |  |  |  | MODERATELY SEVERE (MOD. SEV.)                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |  |  |  |  |
| GEN. RATING AS SUBGRADE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |  |  |  |  |                                                                                                                                                                                                                                                                   |  |  |  |  |  | SEVERE (SEV.)                                                                           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| CONSISTENCY OR DENSENESS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |  |  |  |                                                                                                                                                                                                                                                                   |  |  |  |  |  | COMPLETE                                                                         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| PRIMARY SOIL TYPE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |  |  |  |  |                                                                                                                                                                                                                                                                   |  |  |  |  |  |                                                                                  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| GENERAL GRANULAR MATERIAL (NON-COHESIVE)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |  |  |  |                                                                                                                                                                                                                                                                   |  |  |  |  |  |                                                                                  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| GENERALLY SILT-CLAY MATERIAL (COHESIVE)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |  |  |  |  |                                                                                                                                                                                                                                                                   |  |  |  |  |  |                                                                                  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| TEXTURE OR GRAIN SIZE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |  |  |  |  |                                                                                                                                                                                                                                                                   |  |  |  |  |  |                                                                                  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| U.S. STD. SIEVE SIZE OPENING (MM)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |  |  |  |  |                                                                                                                                                                                                                                                                   |  |  |  |  |  |                                                                                              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| BOULDER (BLDR.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |                                                                                                                                                                                                                                                                   |  |  |  |  |  |                                                                                  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| GRAIN SIZE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |                                                                                                                                                                                                                                                                   |  |  |  |  |  |                                                                                  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| SOIL MOISTURE - CORRELATION OF TERMS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |  |                                                                                                                                                                                                                                                                   |  |  |  |  |  |                                                                                  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| SOIL MOISTURE SCALE (ATTERBERG LIMITS)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |  |  |  |                                                                                                                                                                                                                                                                   |  |  |  |  |  |                                                                                  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| LL LIQUID LIMIT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |                                                                                                                                                                                                                                                                   |  |  |  |  |  |                                                                                  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| PL PLASTIC LIMIT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |  |                                                                                                                                                                                                                                                                   |  |  |  |  |  |                                                                                  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| OM OPTIMUM MOISTURE SHrinkage LIMIT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |  |  |  |                                                                                                                                                                                                                                                                   |  |  |  |  |  |                                                                                  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| PLASTICITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |                                                                                                                                                                                                                                                                   |  |  |  |  |  |                                                                                  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| NON PLASTIC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |  |  |  |                                                                                                                                                                                                                                                                   |  |  |  |  |  |                                                                                  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| SLIGHTLY PLASTIC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |  |                                                                                                                                                                                                                                                                   |  |  |  |  |  |                                                                                  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| MODERATELY PLASTIC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |  |                                                                                                                                                                                                                                                                   |  |  |  |  |  |                                                                                  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| HIGHLY PLASTIC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |  |  |  |                                                                                                                                                                                                                                                                   |  |  |  |  |  |                                                                                  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| COLOR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |  |  |  |  |                                                                                                                                                                                                                                                                   |  |  |  |  |  |                                                                                  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                                                                                               |  |  |  |  |  |
| 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |  |  |  |                                                                                                                                                                                                                                                                   |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |  |  |  |  |

TIP PROJECT:U-5798B

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hainulid AT WXE-70045194

CONTRACT:



VICINITY MAP

N.T.S.

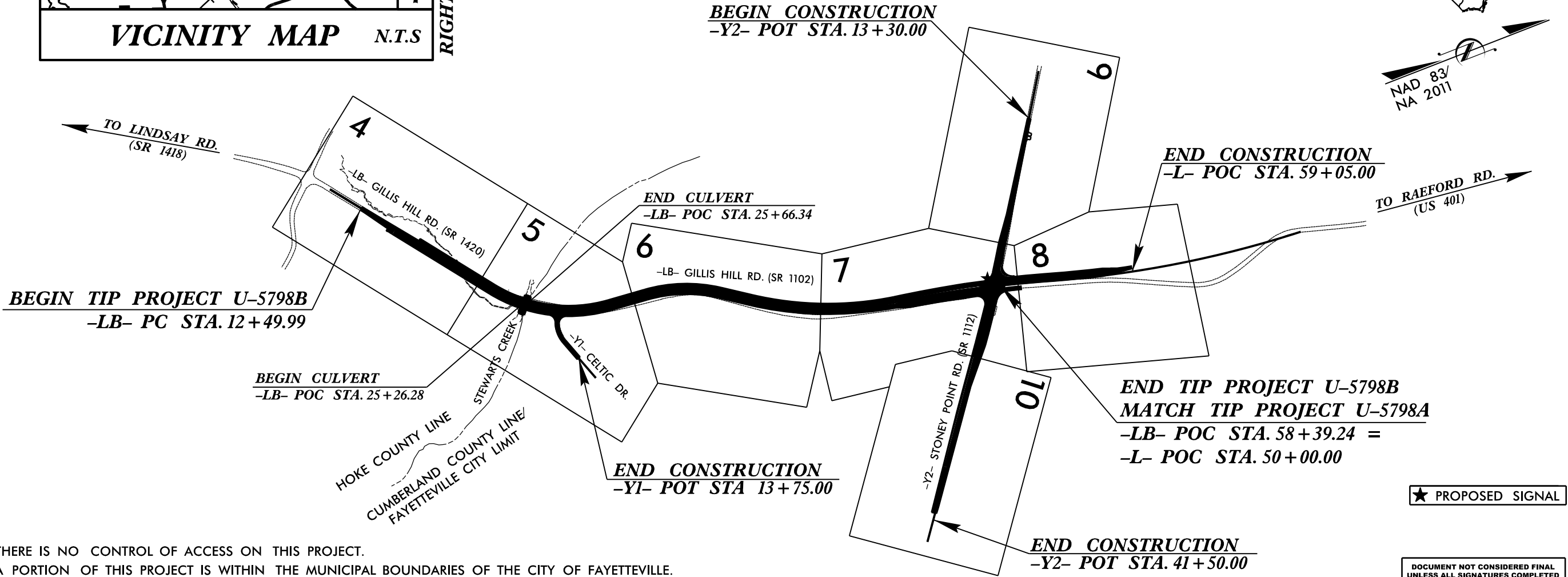
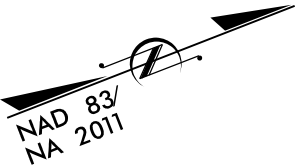
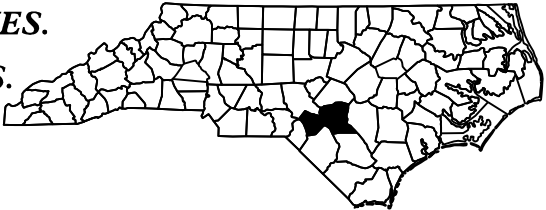
RIGHT OF WAY PLAN SET

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.

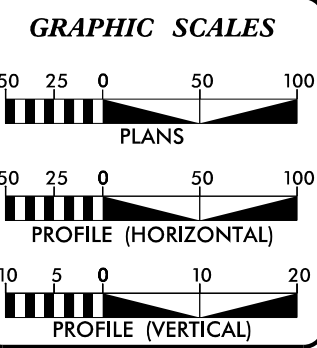
| STATE           | STATE PROJECT REFERENCE NO. | SHEET NO.   | TOTAL SHEETS |
|-----------------|-----------------------------|-------------|--------------|
| N.C.            | U-5798B                     | 3           |              |
| STATE PROJ. NO. | F.A. PROJ. NO.              | DESCRIPTION |              |
| 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.

★ PROPOSED SIGNAL

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



| 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.



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

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     |



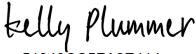
| PROJECT REFERENCE NO. | SHEET NO. |
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| U-5798B               | 3C        |

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

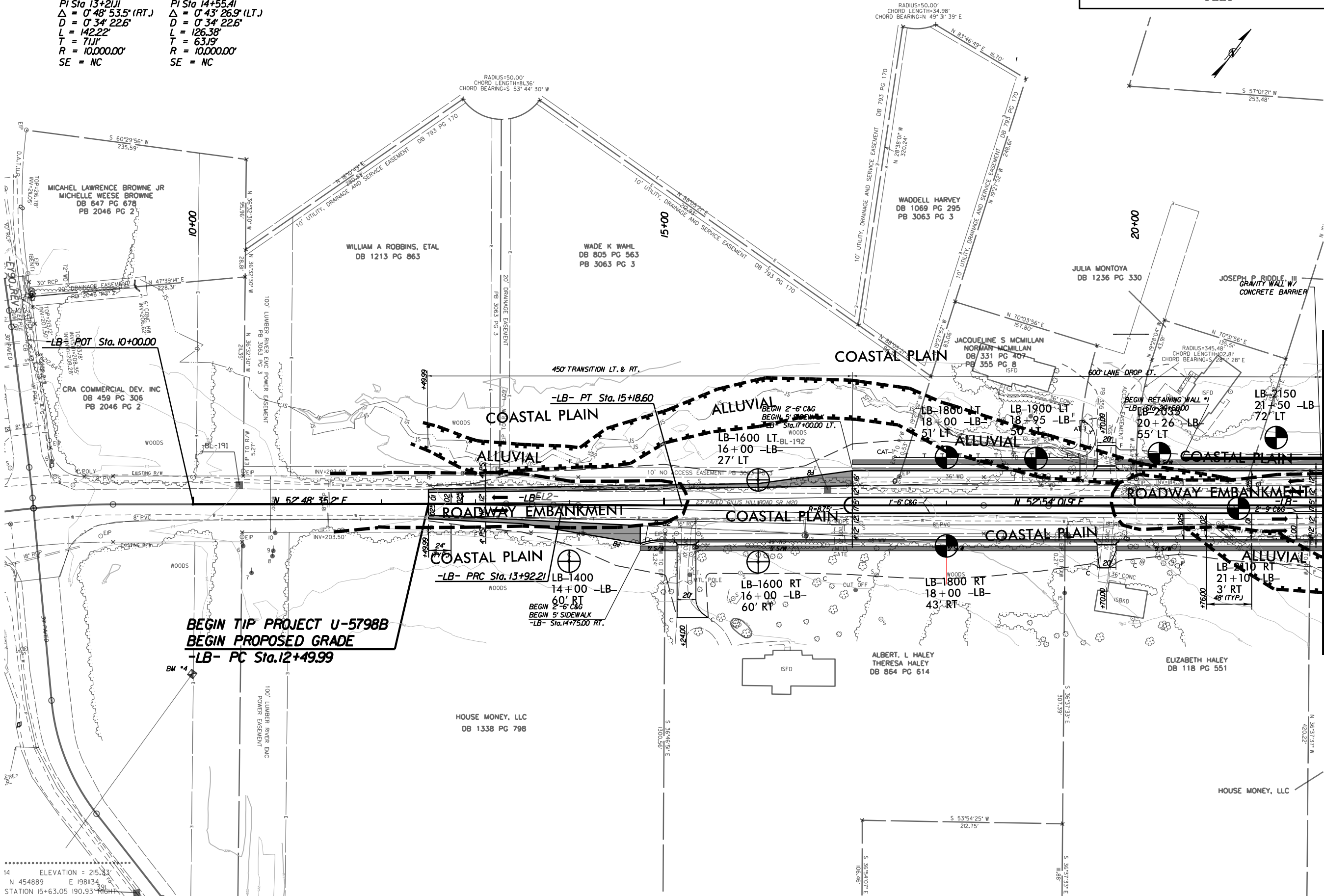
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4

0100200

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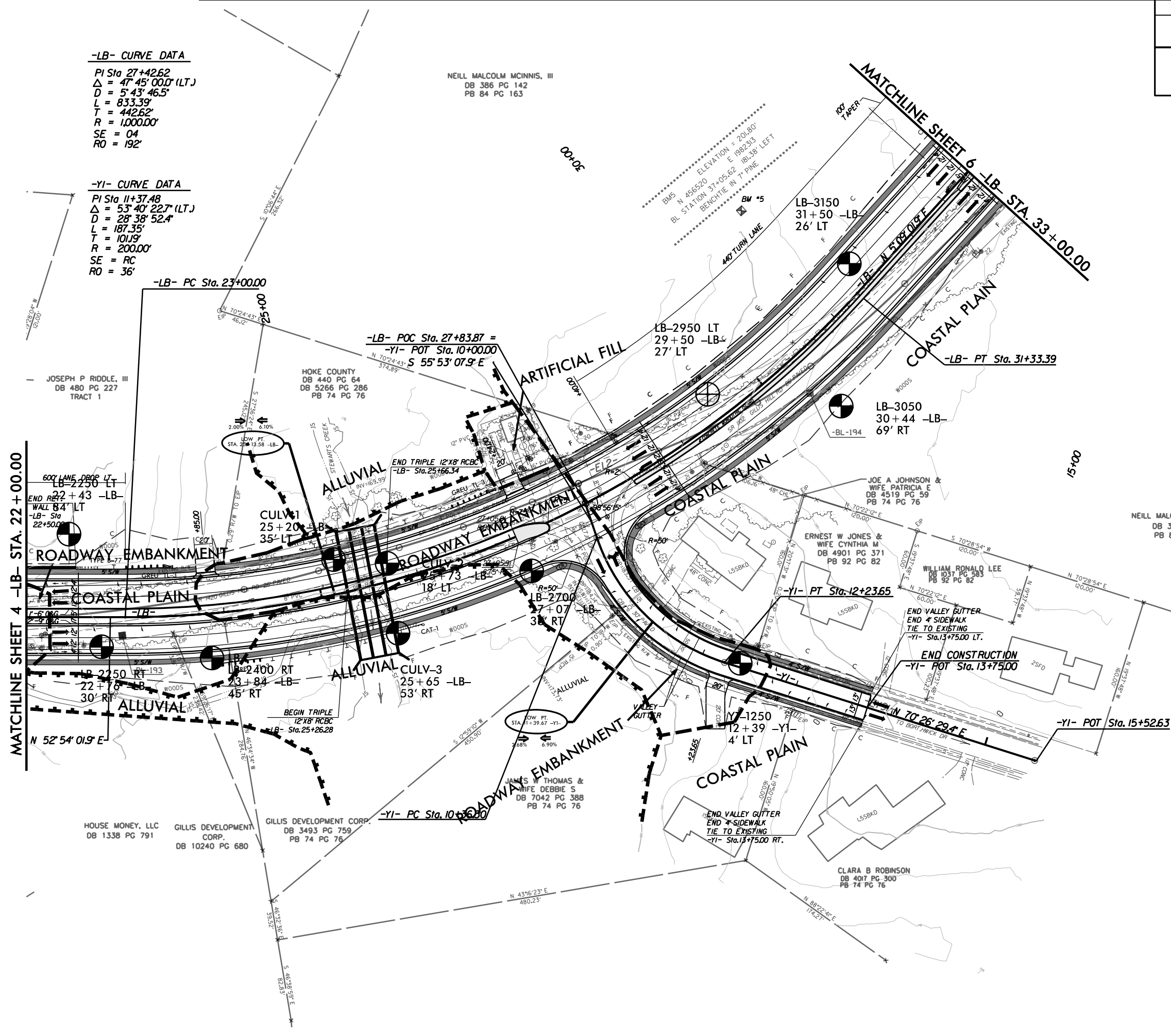
| -LB- CURVE DATA        |                        |
|------------------------|------------------------|
| PI Sta 13+21.11        | PI Sta 14+55.41        |
| Δ = 0° 48' 53.5" (RT.) | Δ = 0° 43' 26.9" (LT.) |
| D = 0° 34' 22.6"       | D = 0° 34' 22.6"       |
| L = 142.22'            | L = 126.38'  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



REVISIONS

MATCHLINE SHEET 5 -LB- STA. 22 + 00.00

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



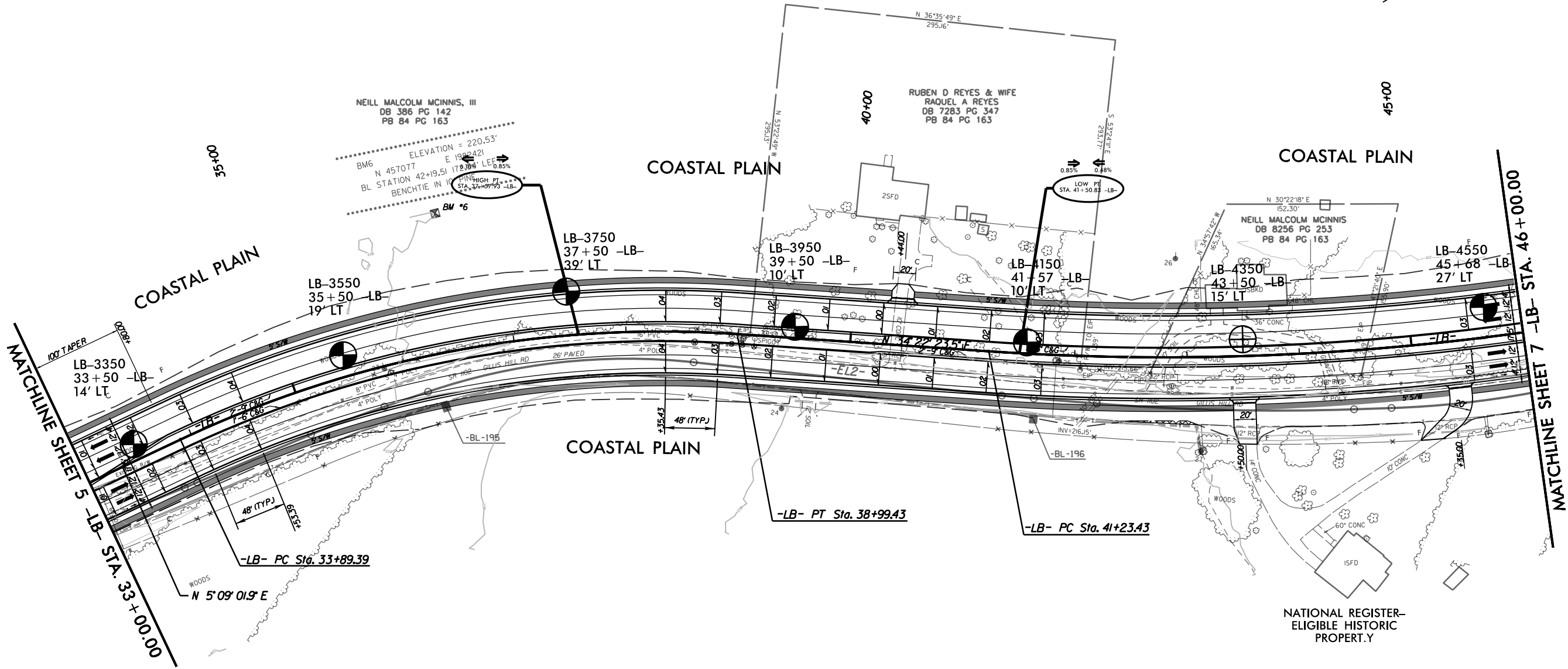


8/17/99

REVISIONS

| -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.) |
| $D = 5^{\circ}43'46.5"$             | $D = 2^{\circ}29'28.0"$             |
| $L = 510.03'$                       | $L = 983.74'$                       |
| $T = 260.69'$                       | $T = 499.51'$                       |
| $R = 1,000.00'$                     | $R = 2,300.00'$                     |
| $SE = 04$                           | $SE = 03$                           |
| $RO = 192'$                         | $RO = 144'$                         |

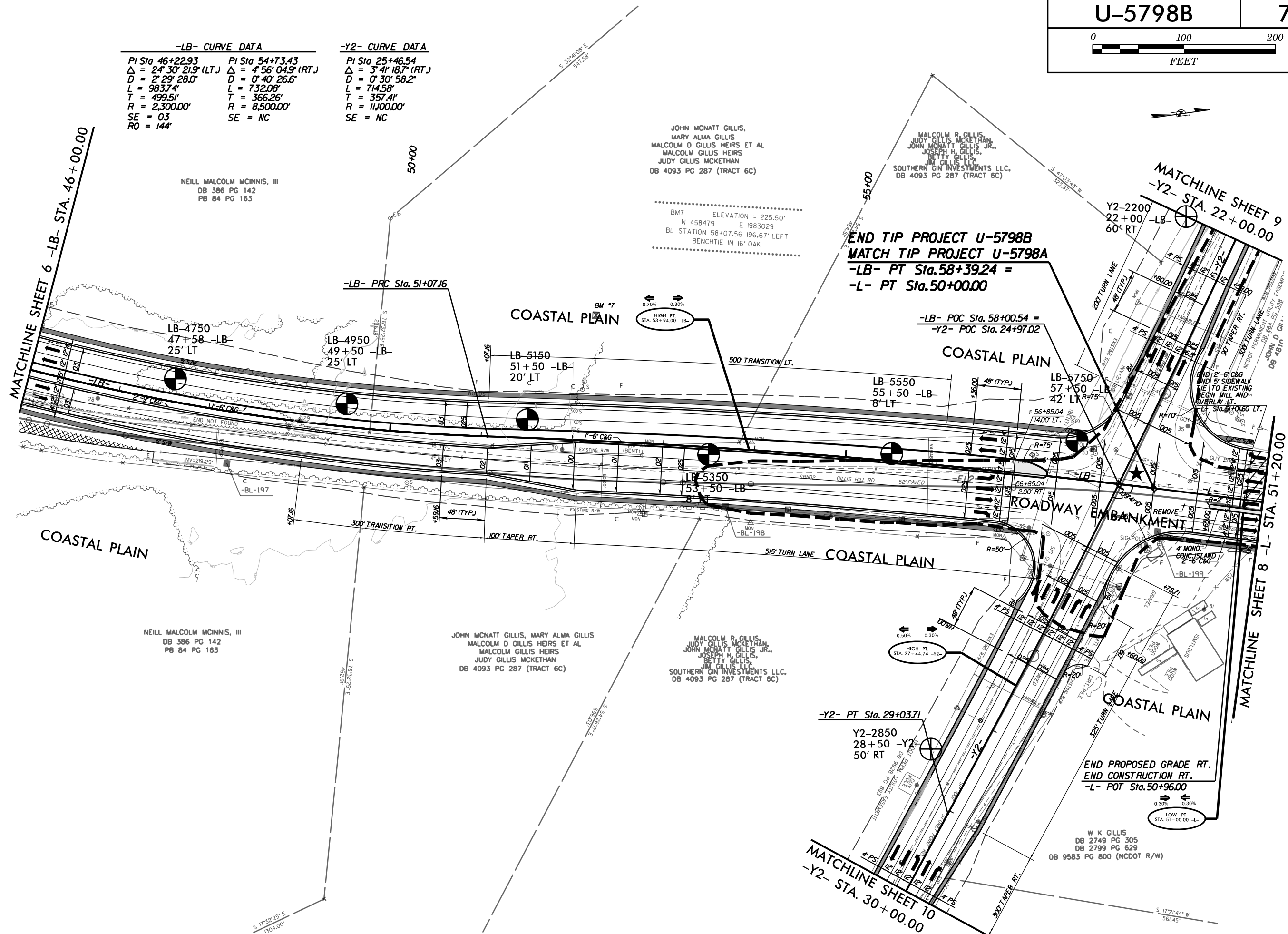
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| PROJECT REFERENCE NO.                                               | SHEET NO. |
| U-5798B                                                             | 6         |
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NEILL MALCOLM MCINNIS, III  
DB 386 PG 142  
PB 84 PG 163

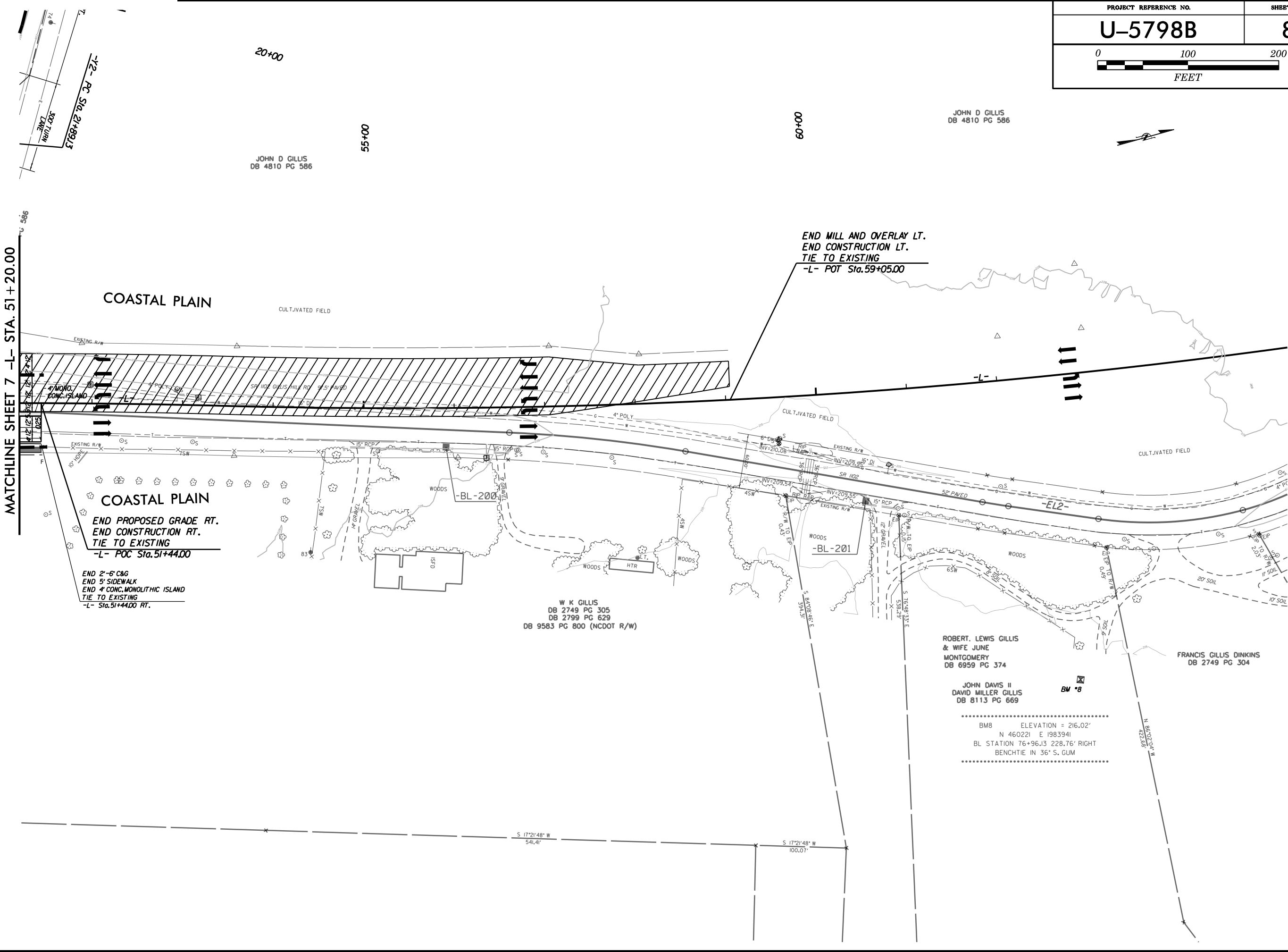
NATIONAL REGISTER-ELIGIBLE  
HISTORIC PROPERTY BOUNDARY

MCINNIS, III  
142  
53

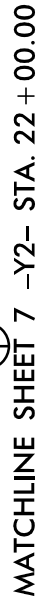


8/17/99

| PROJECT REFERENCE NO.                                   | SHEET NO. |
|---------------------------------------------------------|-----------|
| U-5798B                                                 | 8         |
| <div><div></div><div>0100200</div><div>FEET</div></div> |           |



JOHN D GILLIS  
PG 586  
DB 4810







01020

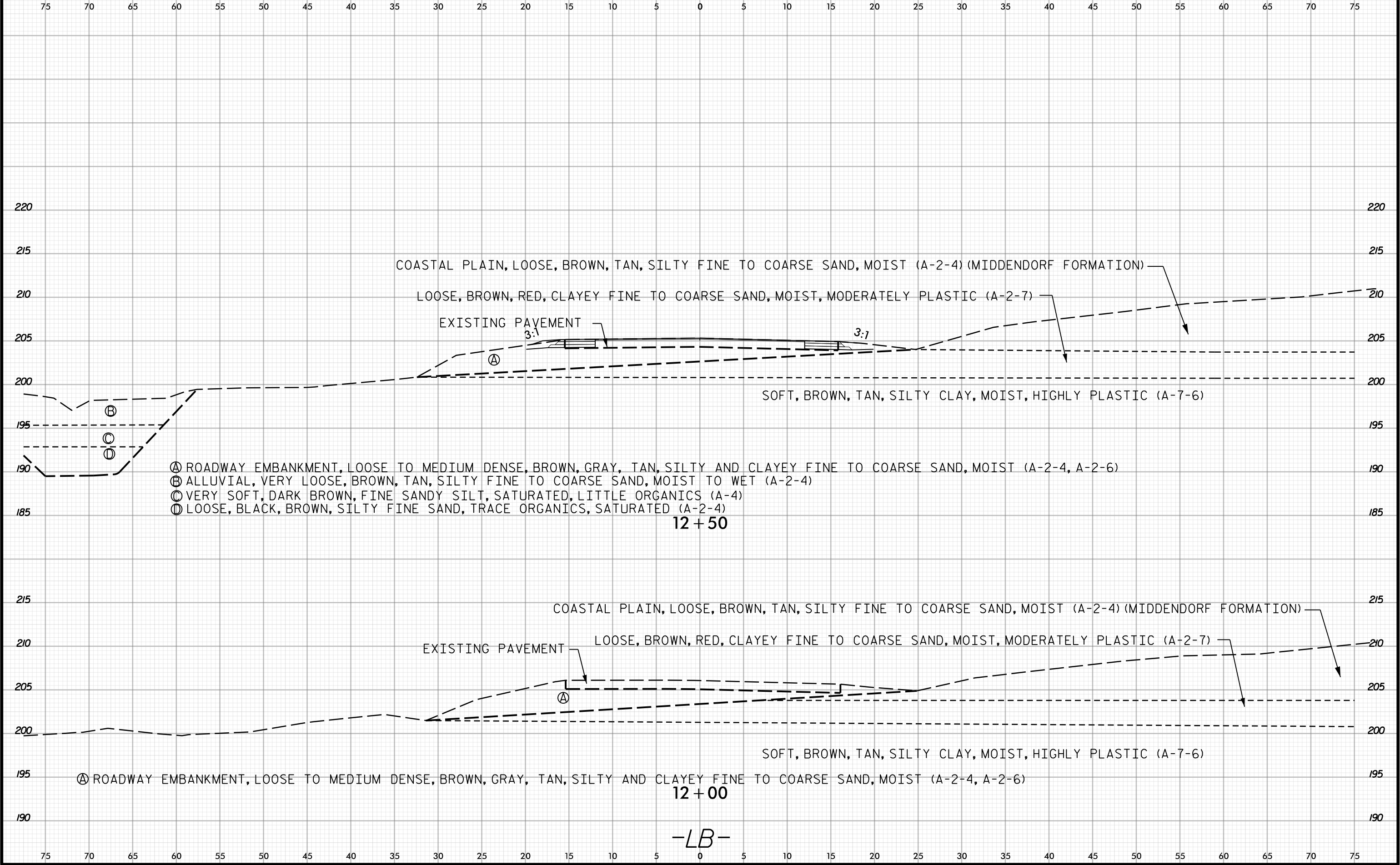
FEET

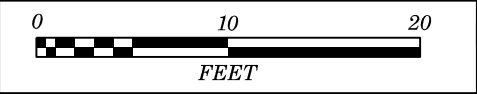
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U-5798B

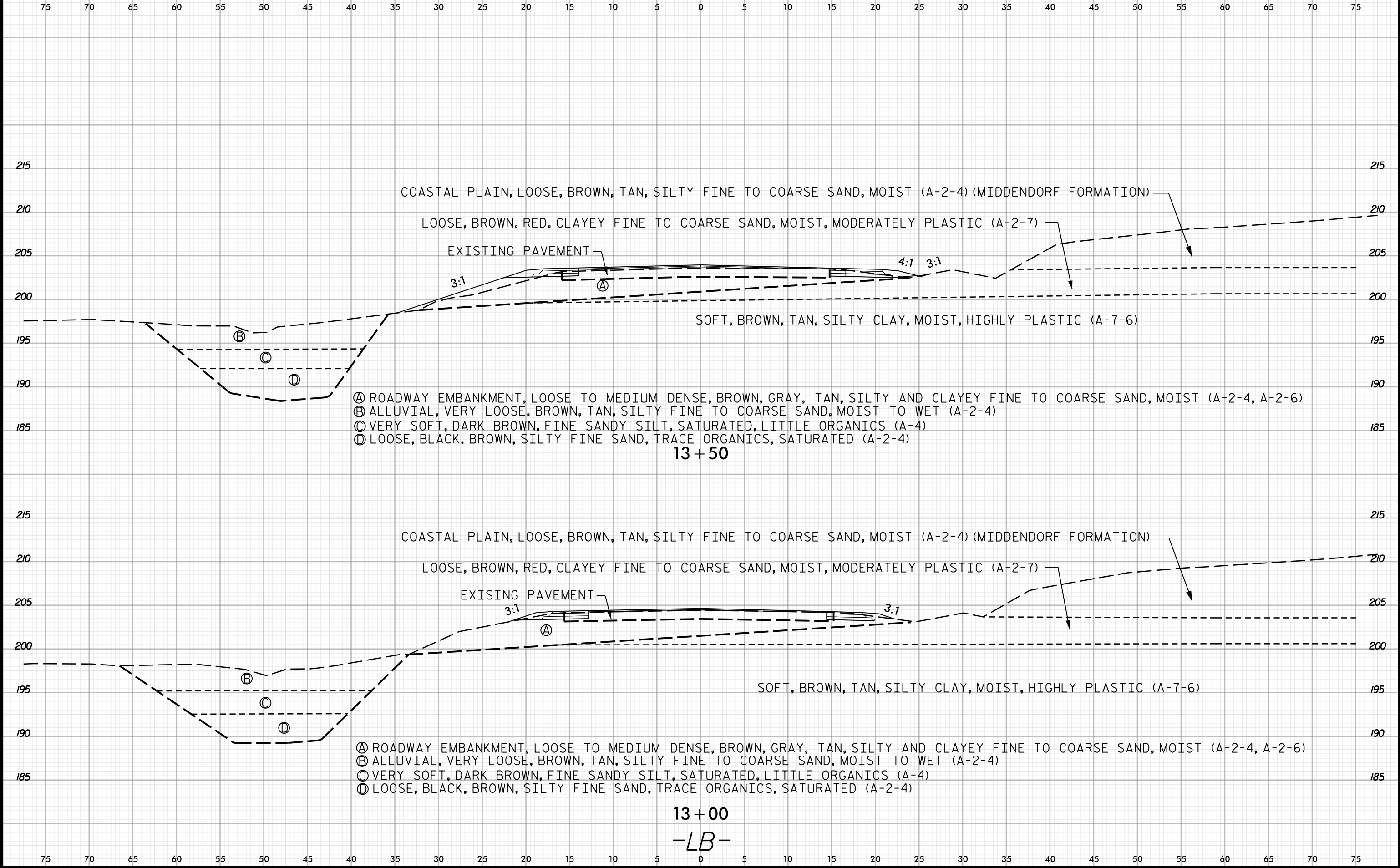
SHEET NO.

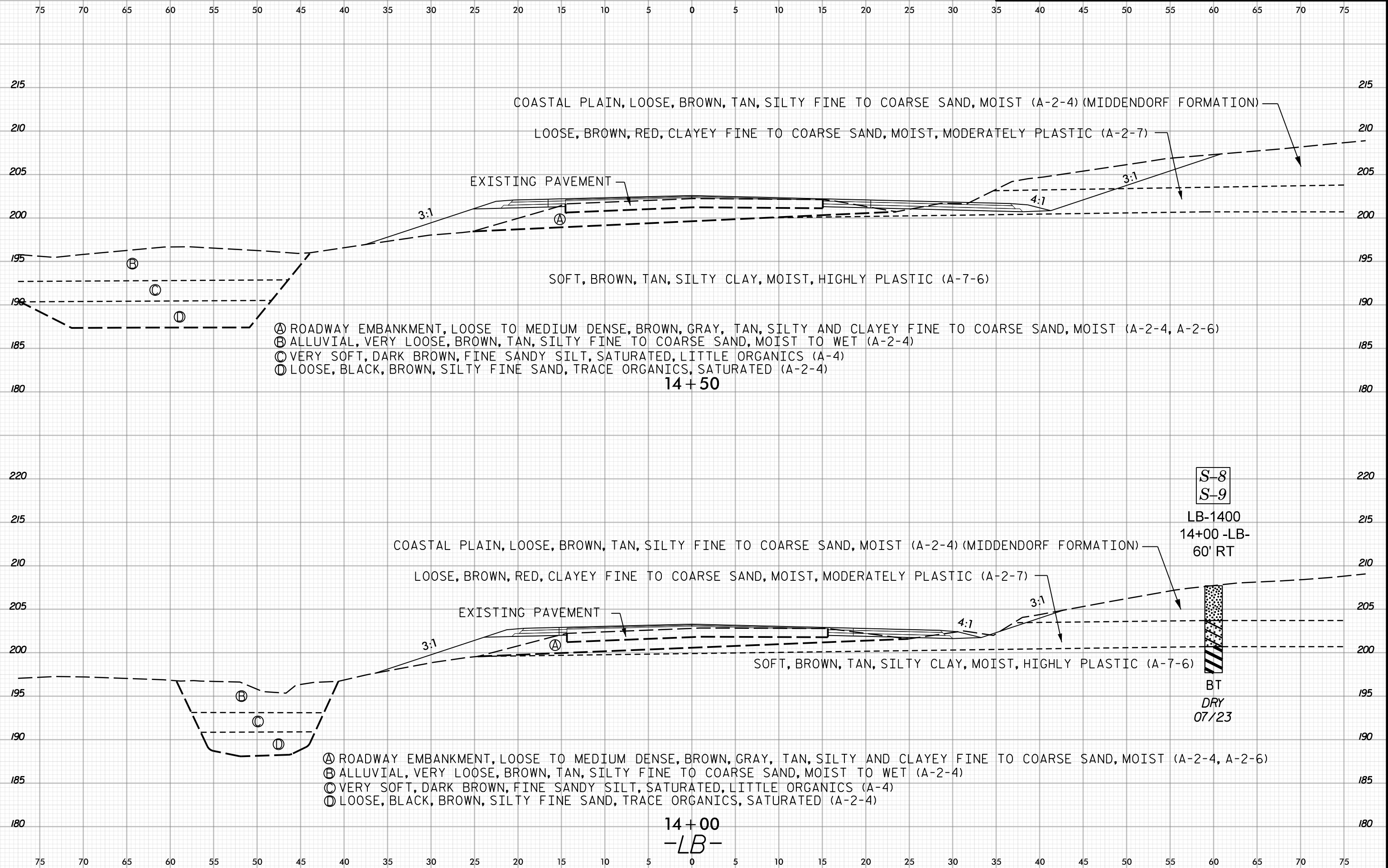
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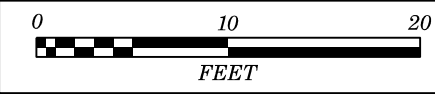




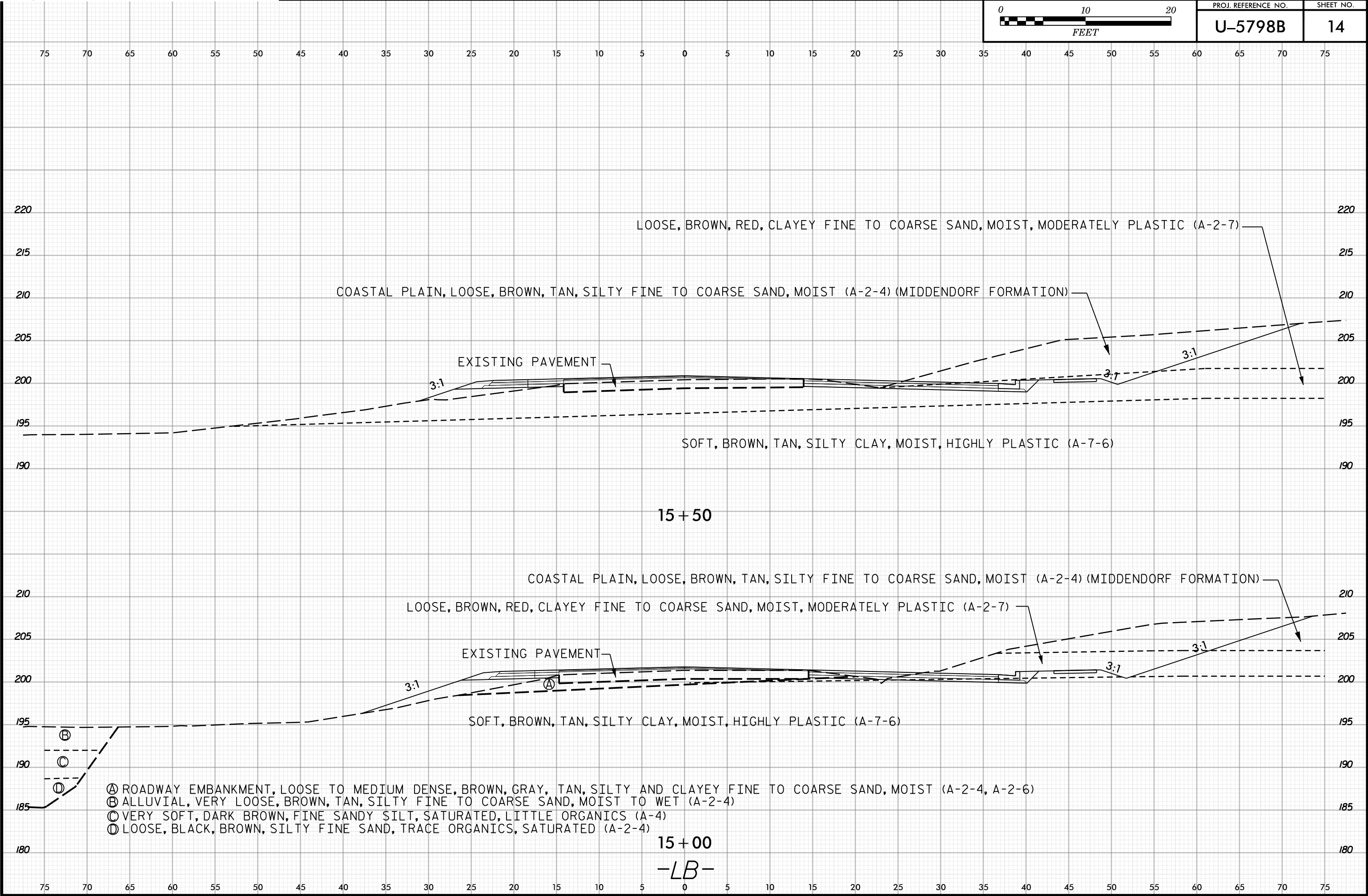
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| U-5798B             | 12        |

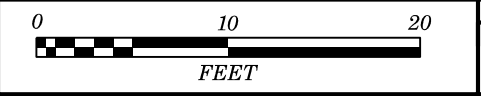




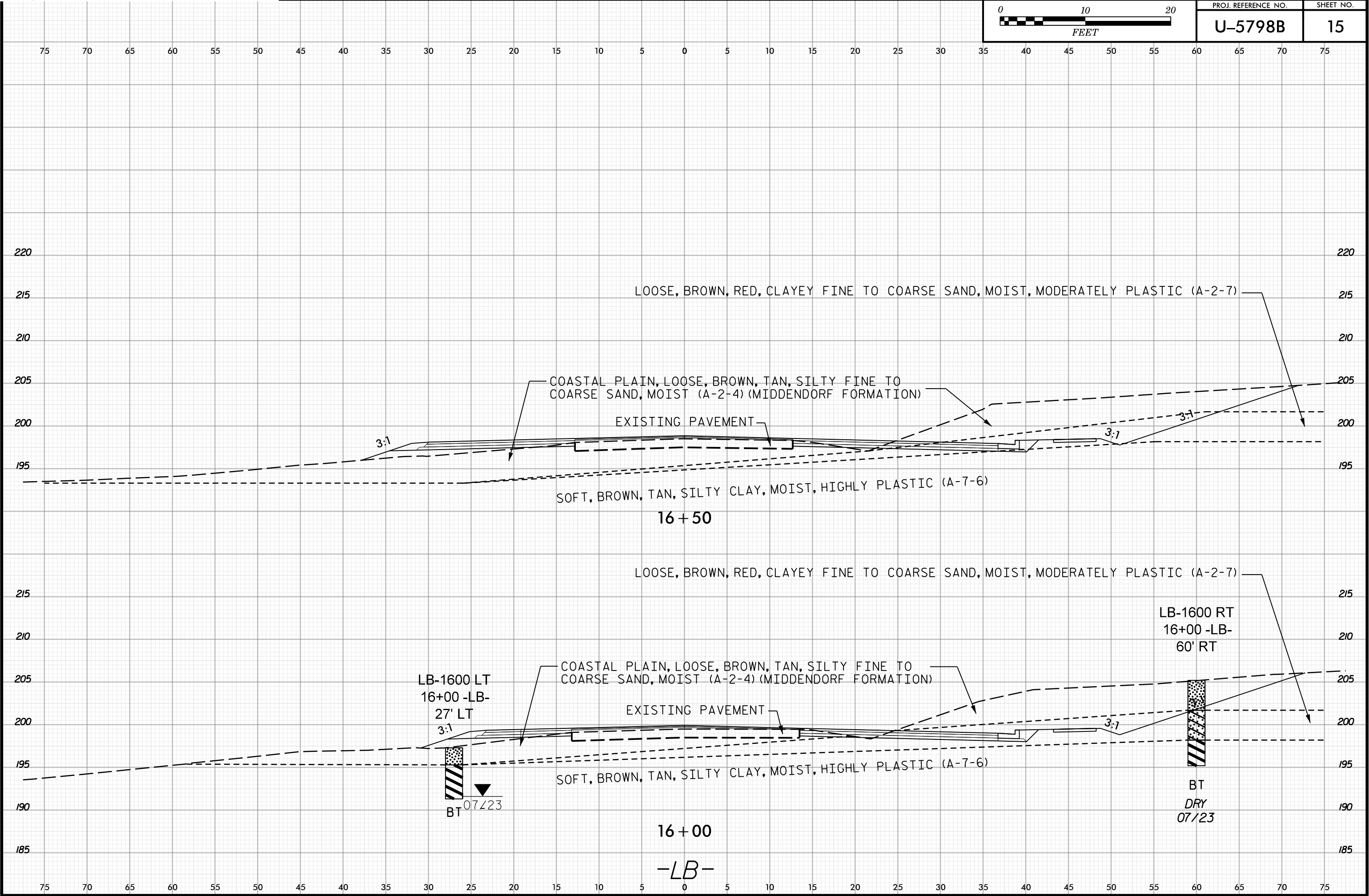


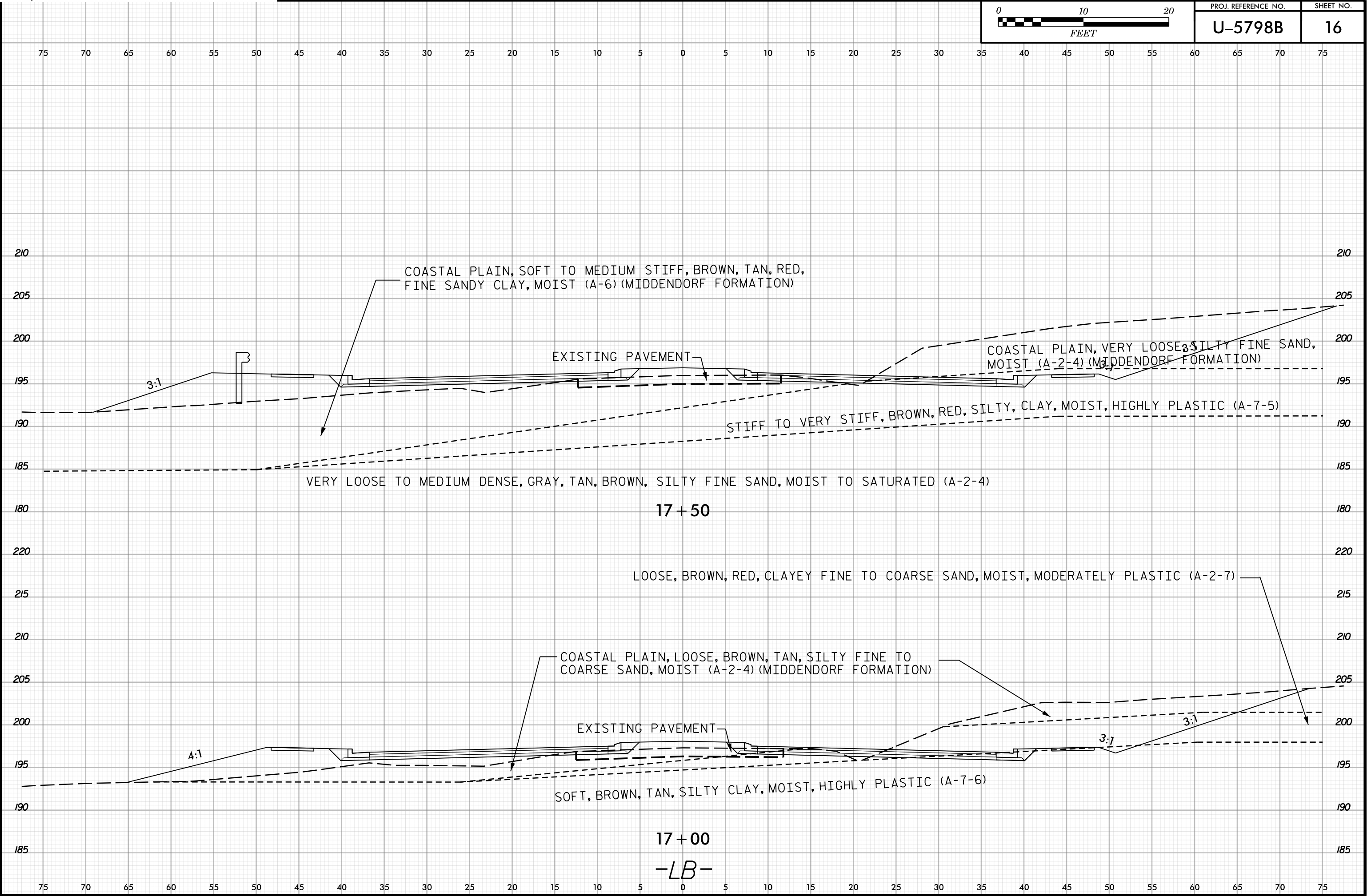
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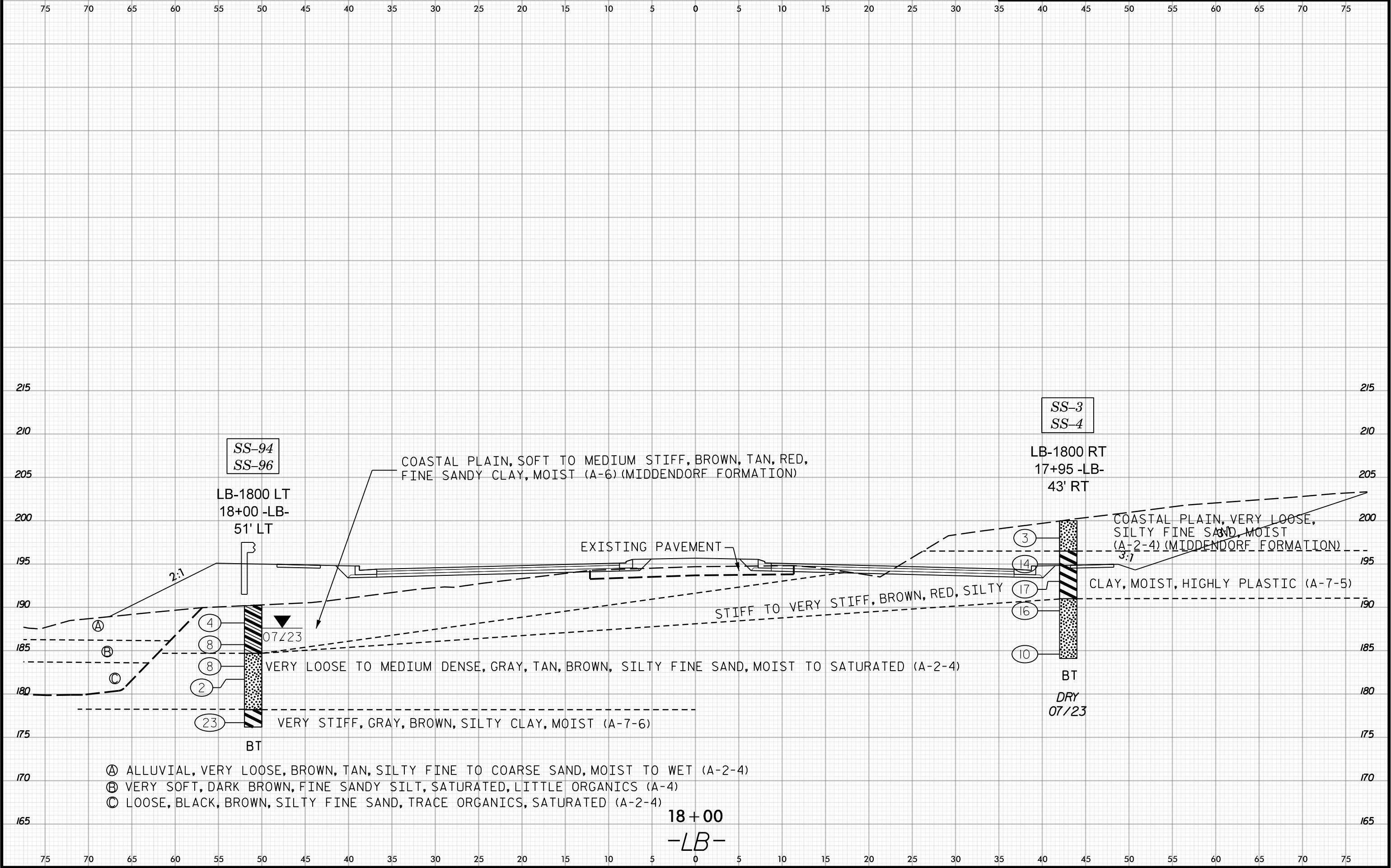


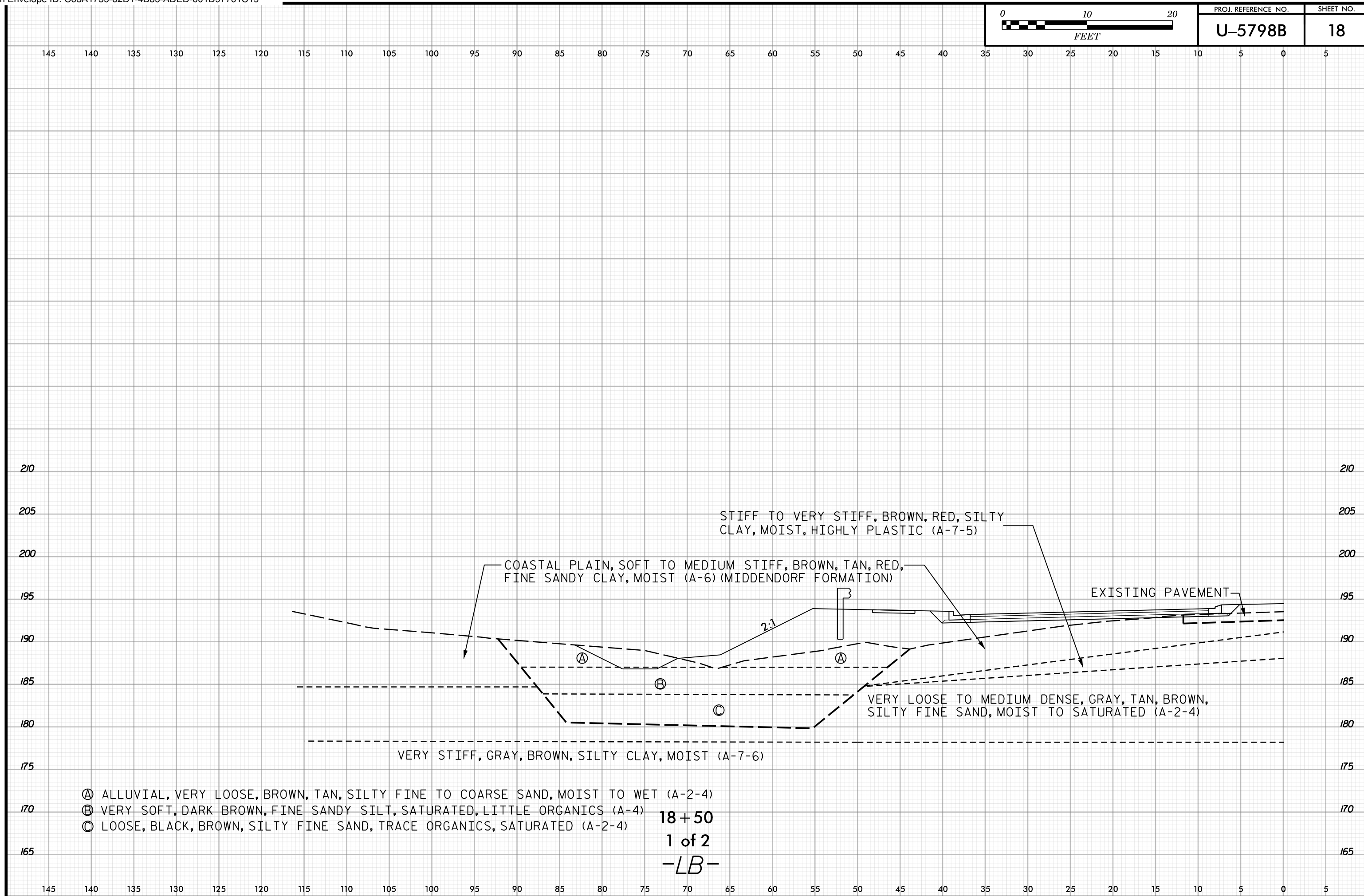
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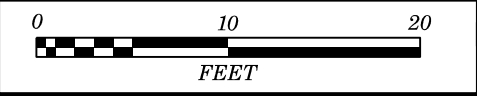




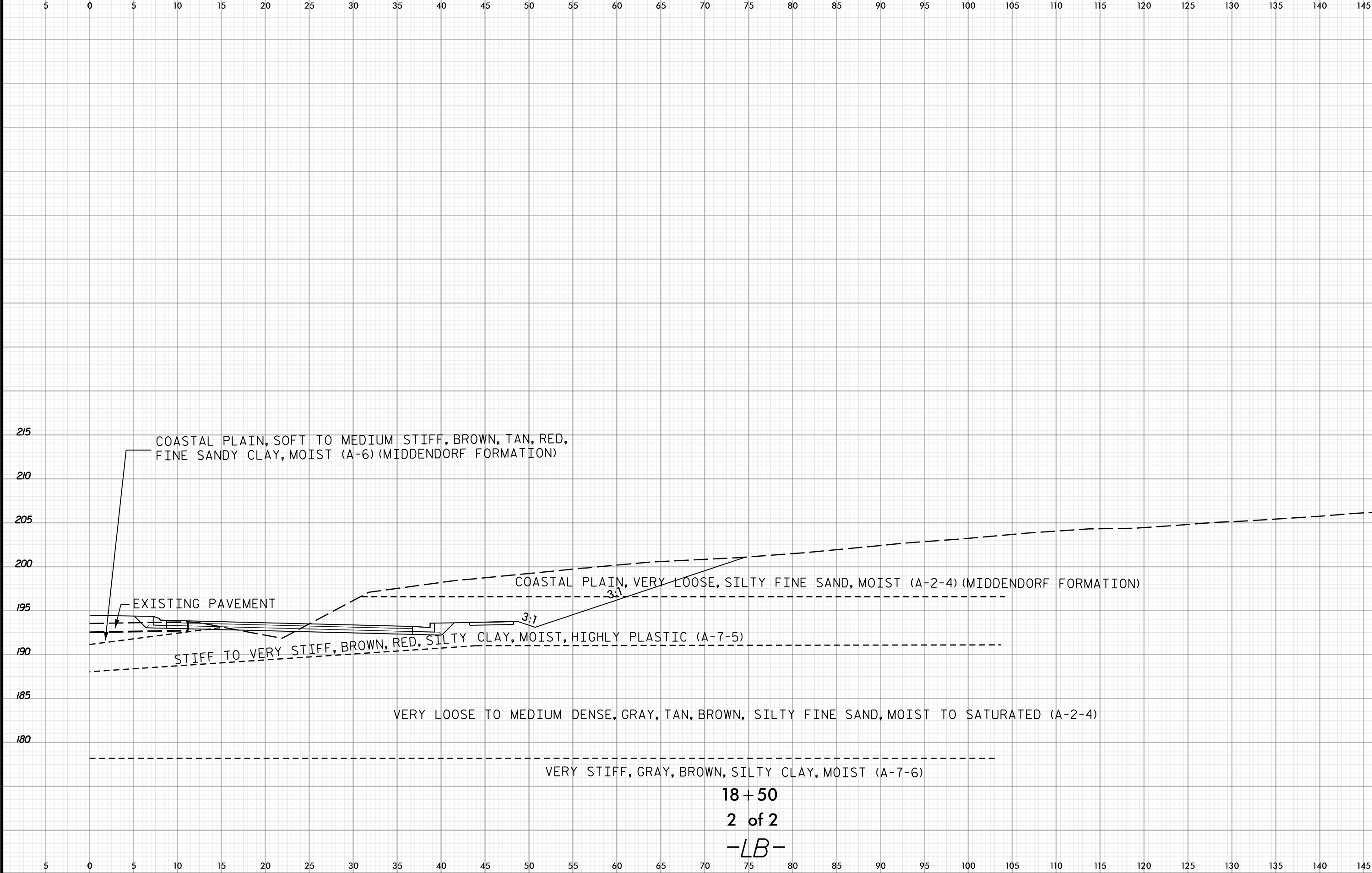








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01020

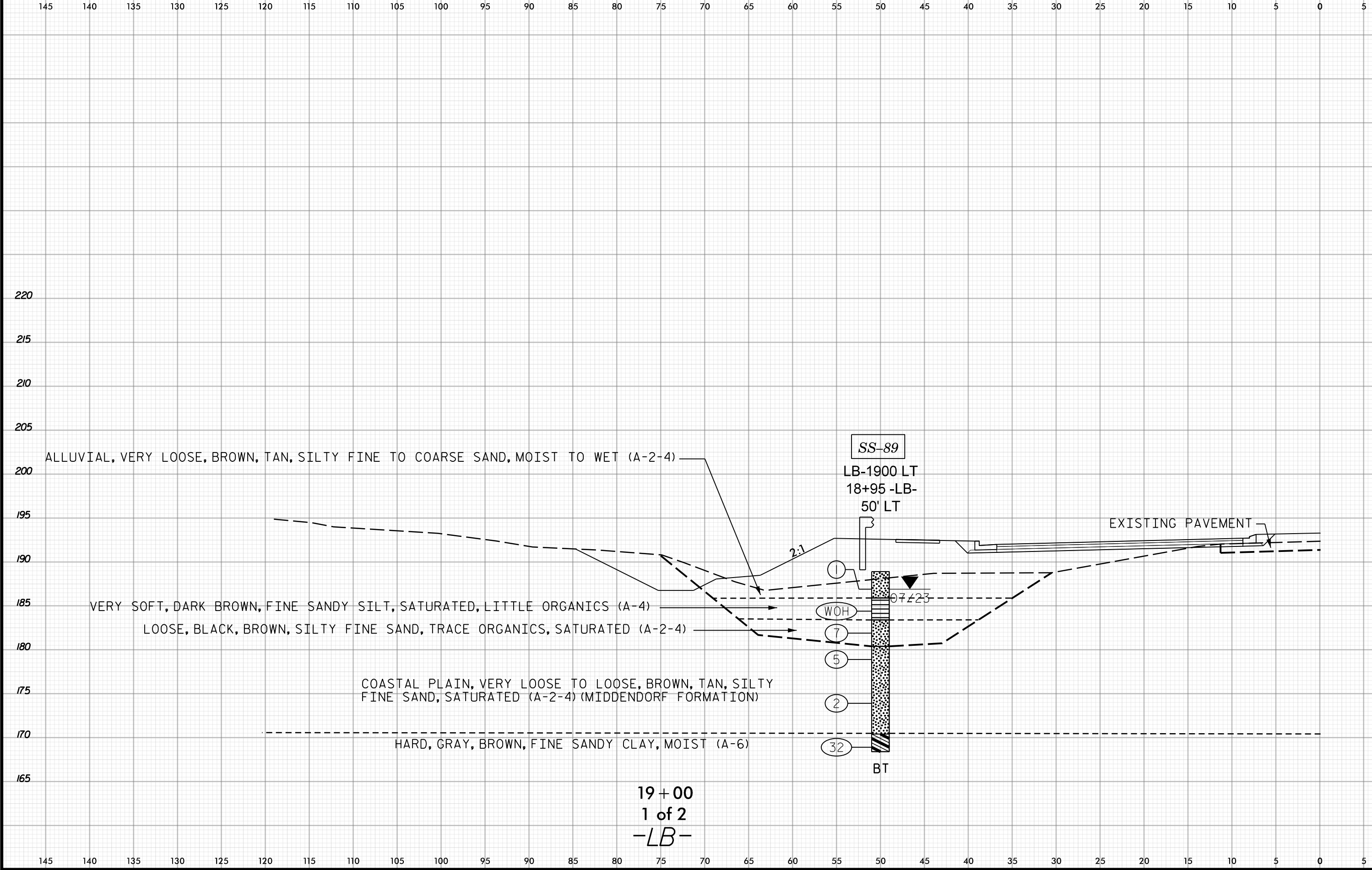
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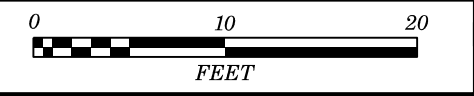
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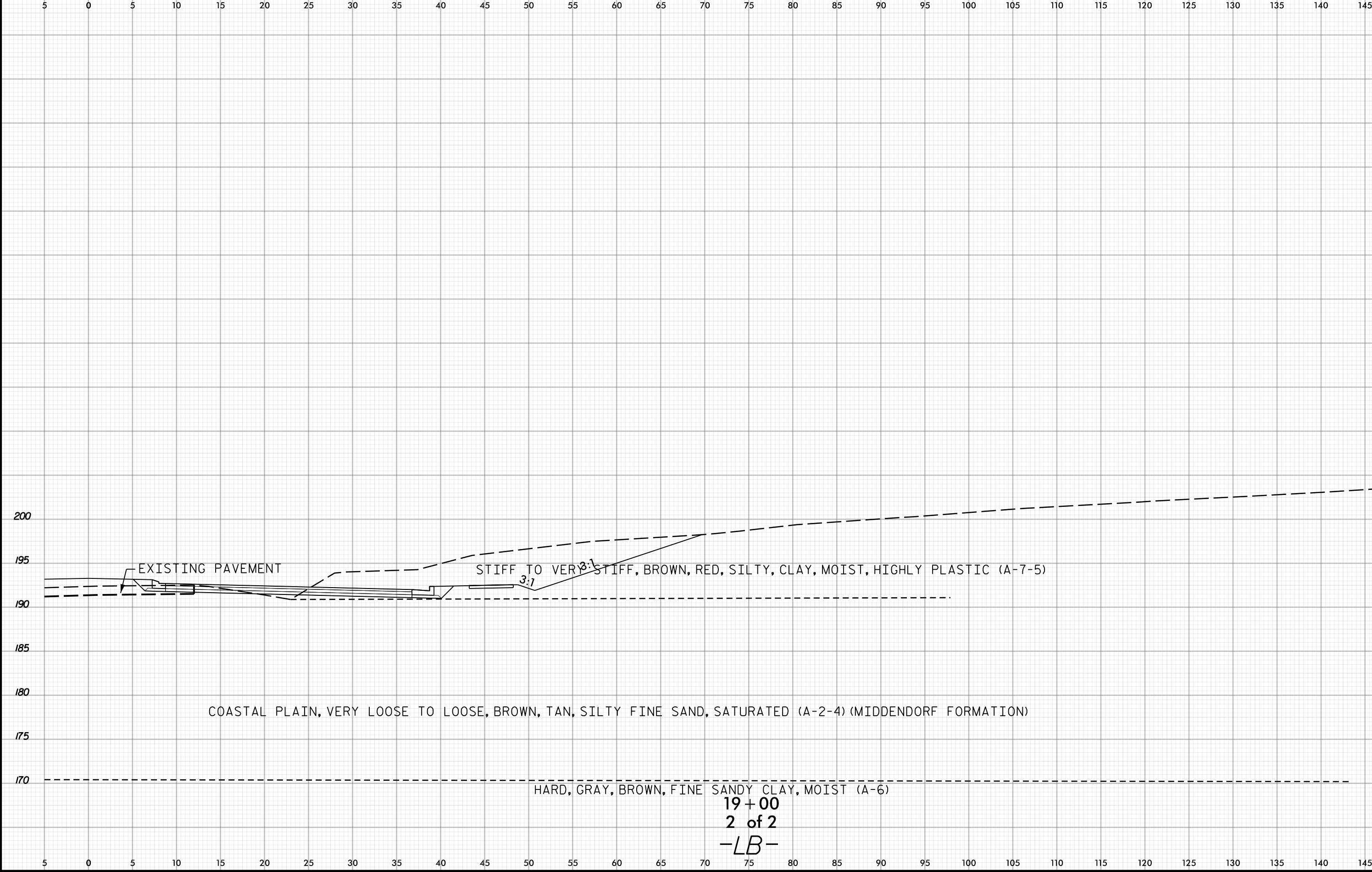
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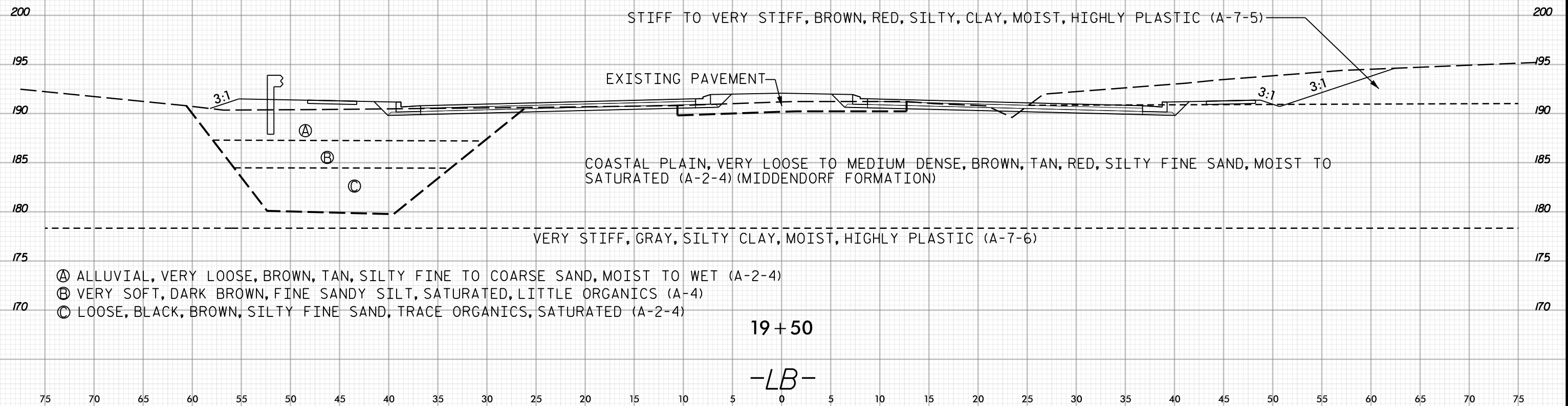
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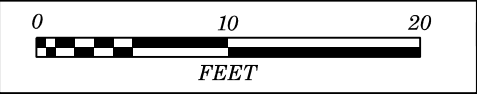


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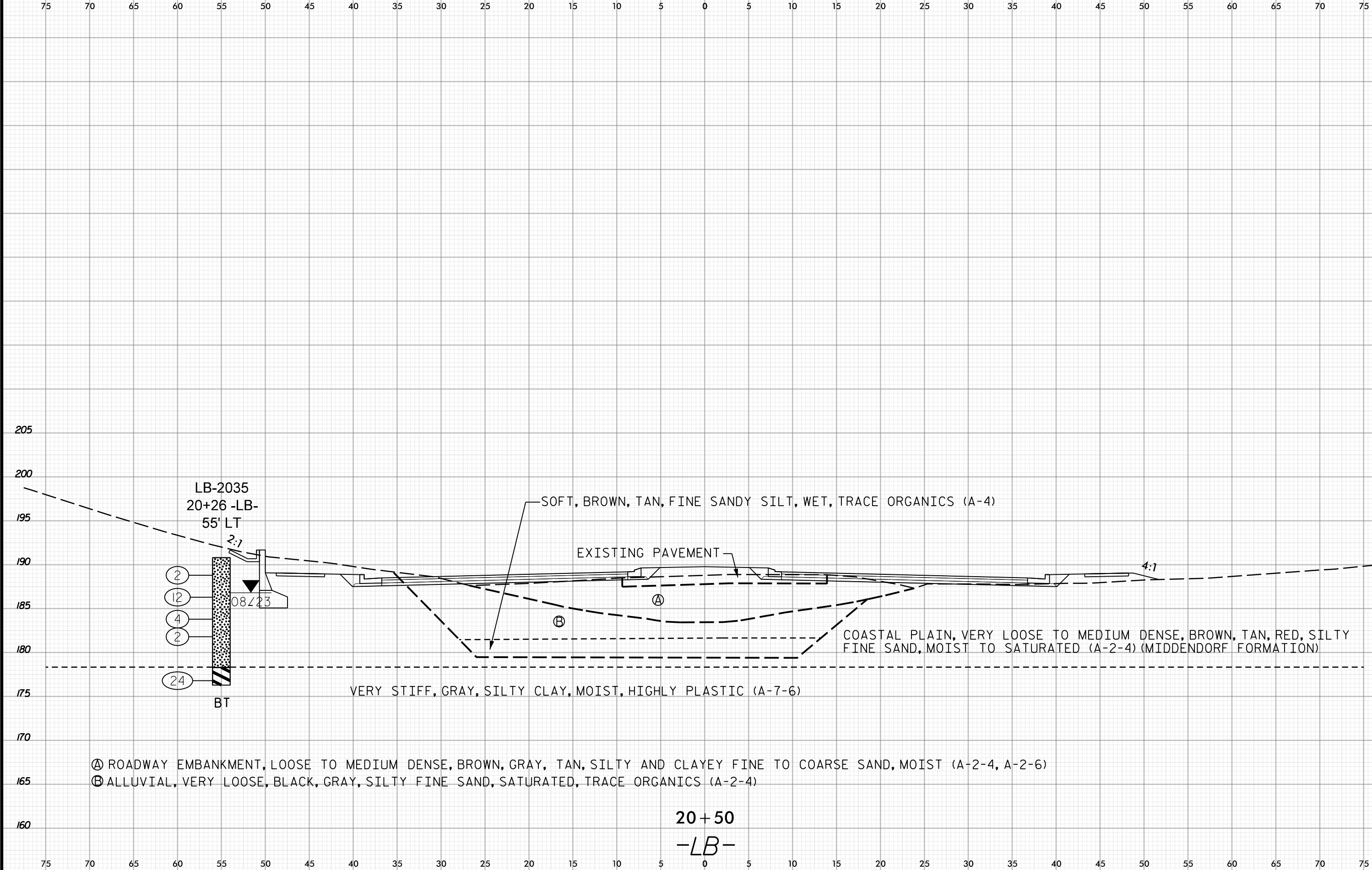




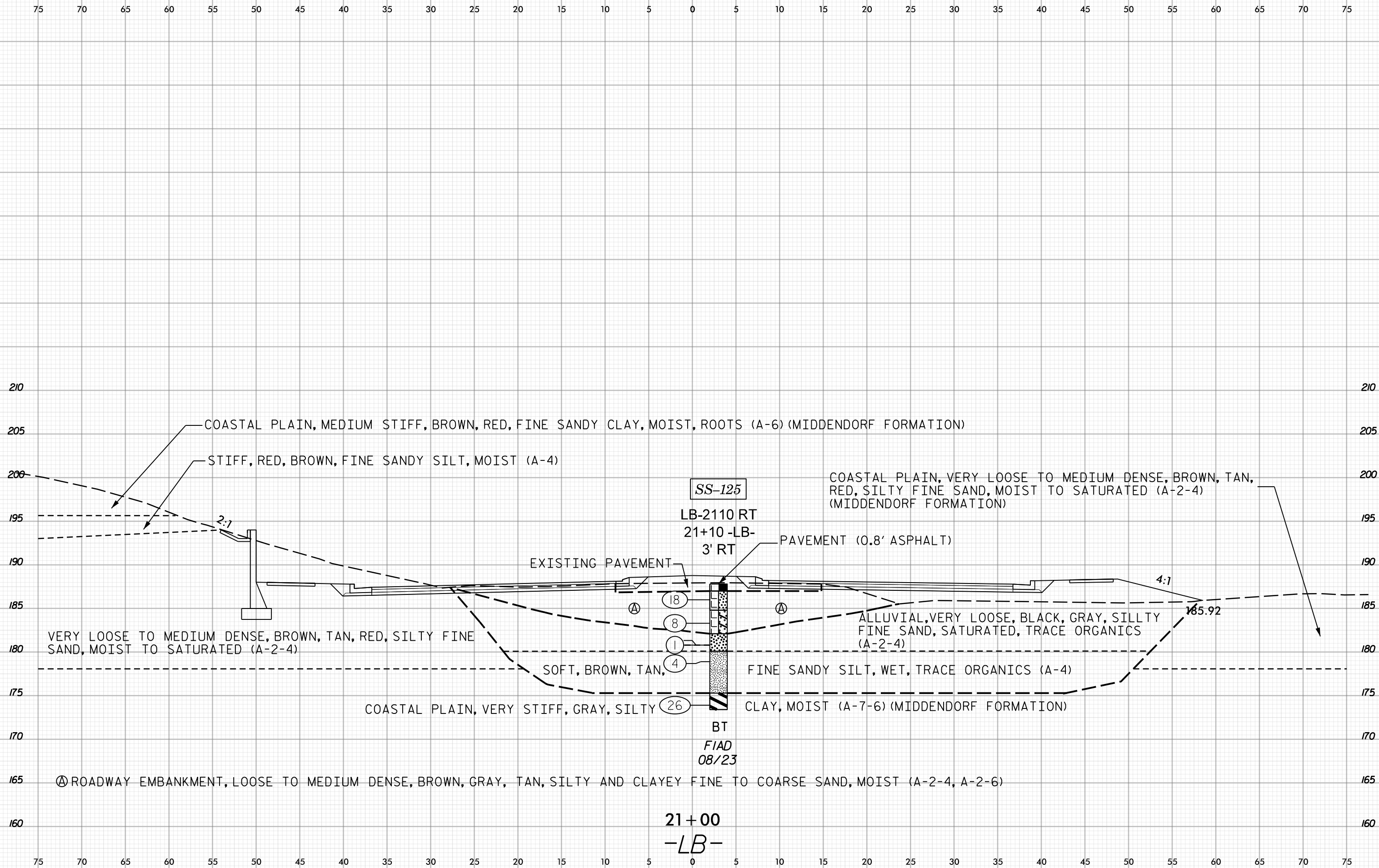


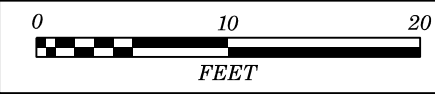


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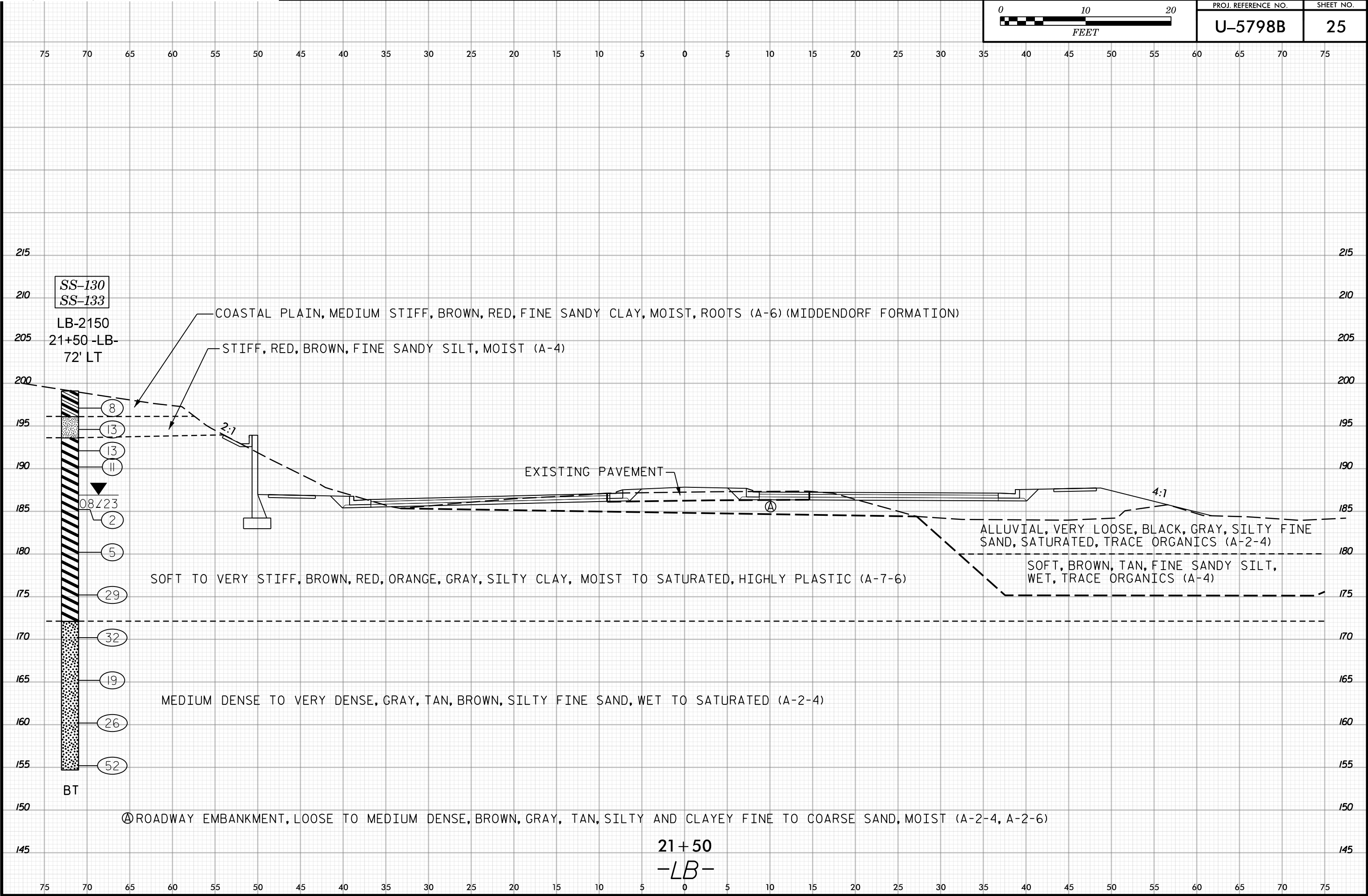


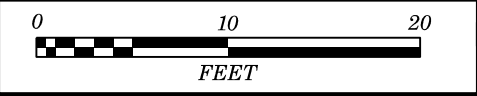




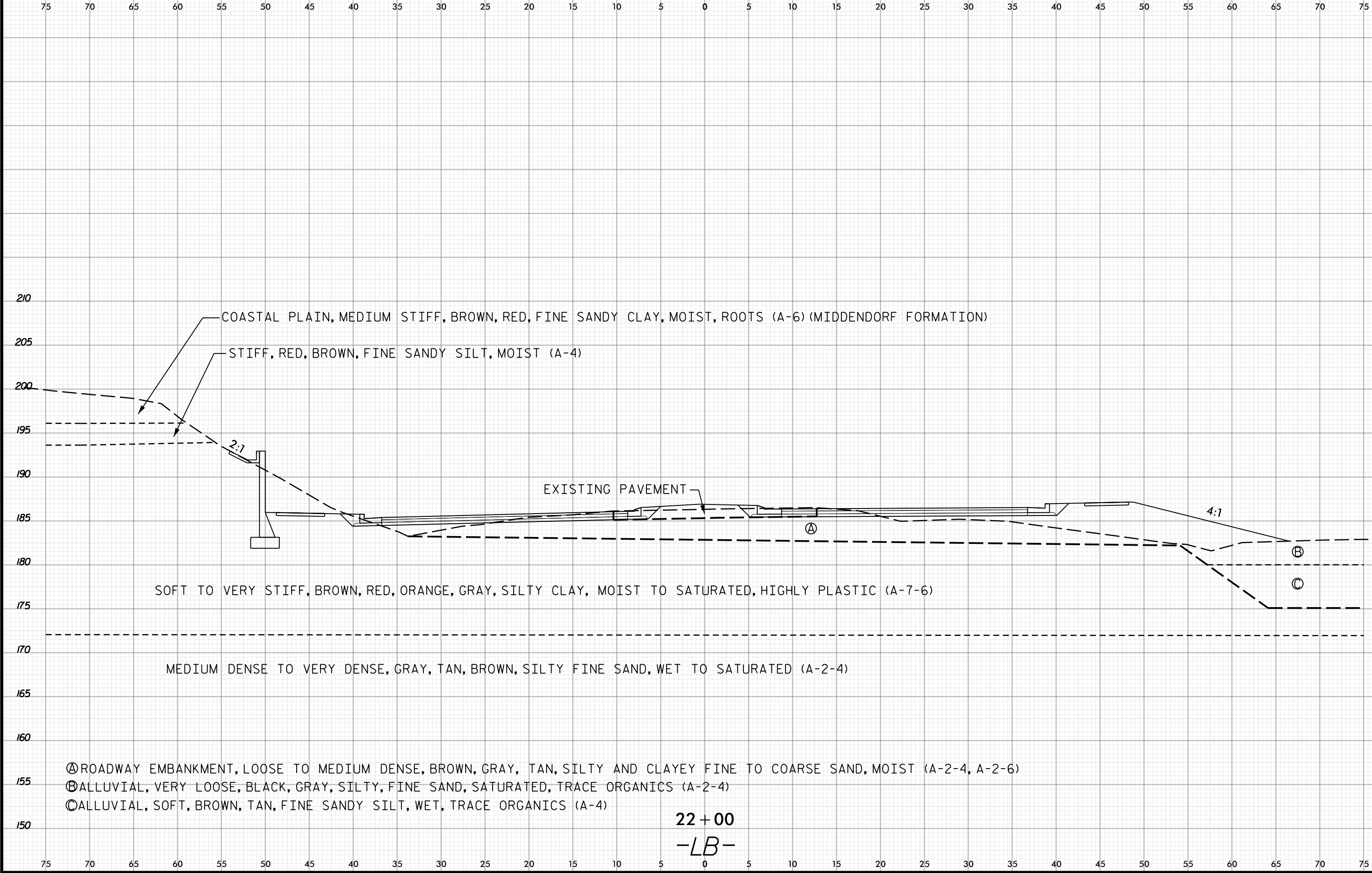


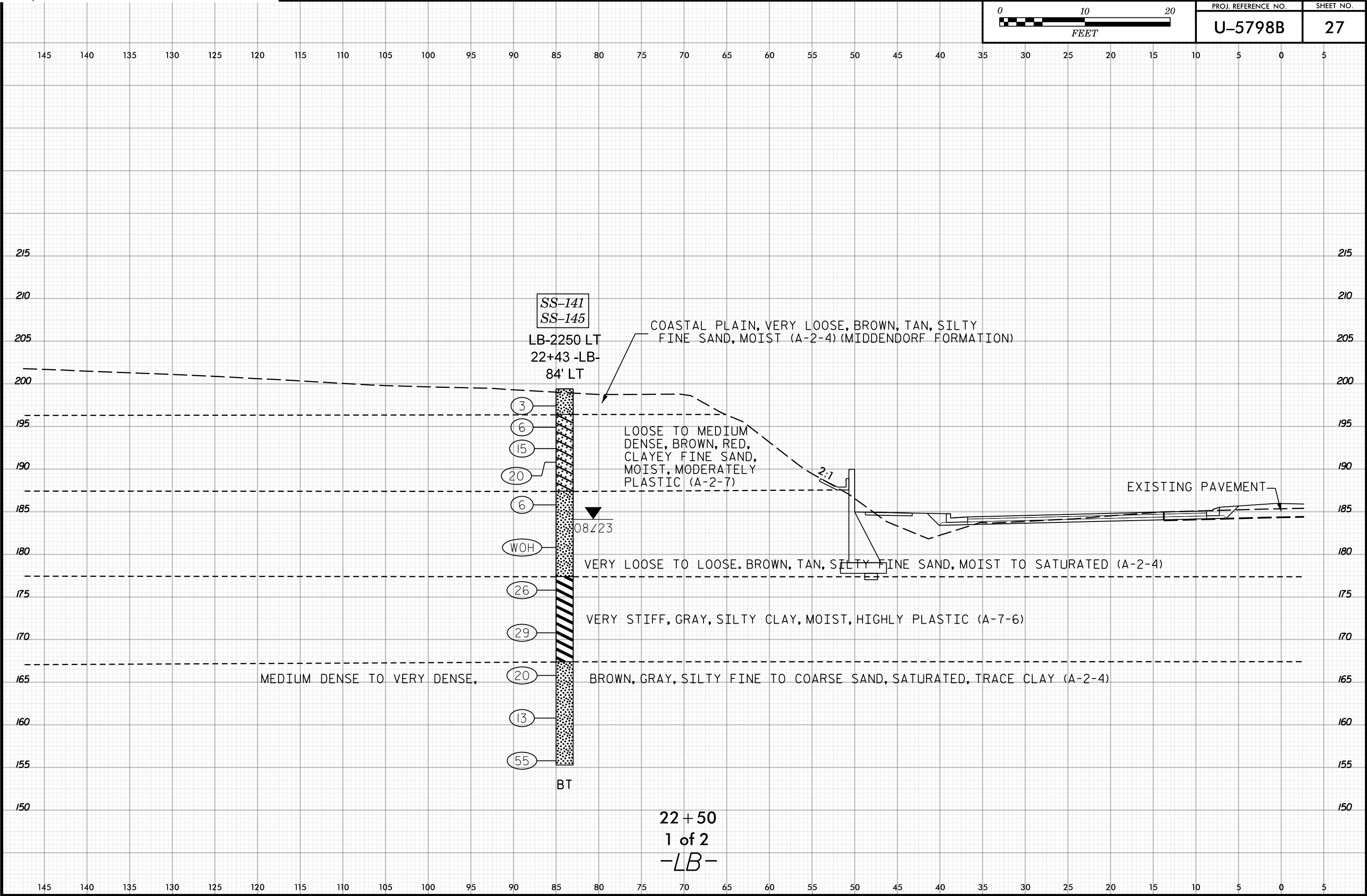
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| U-5798B             | 25        |

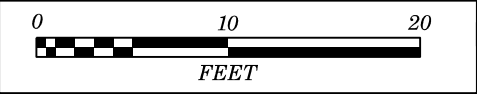




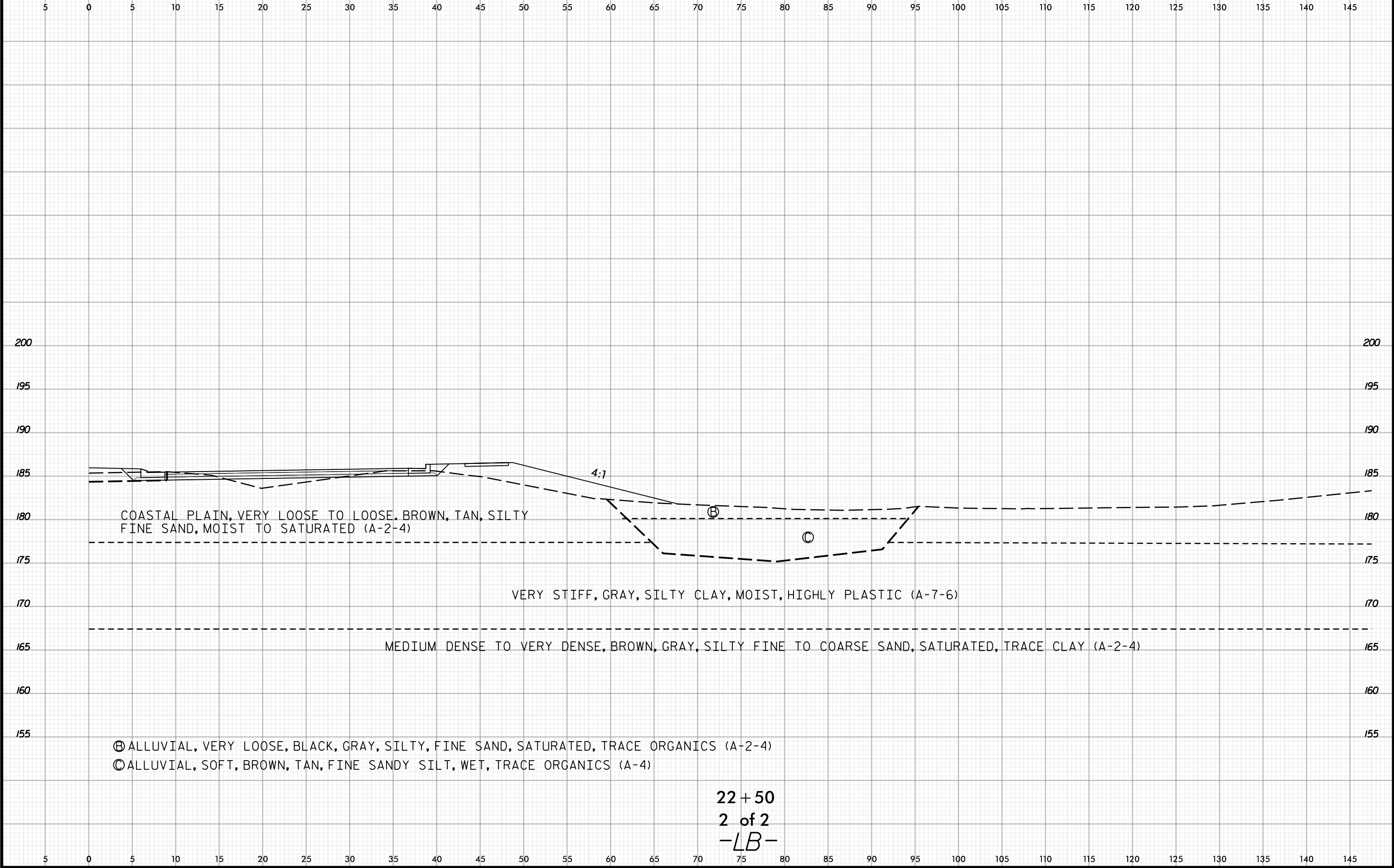
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| U-5798B             | 26        |

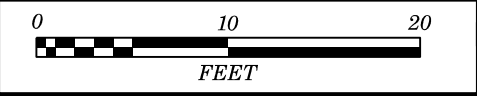




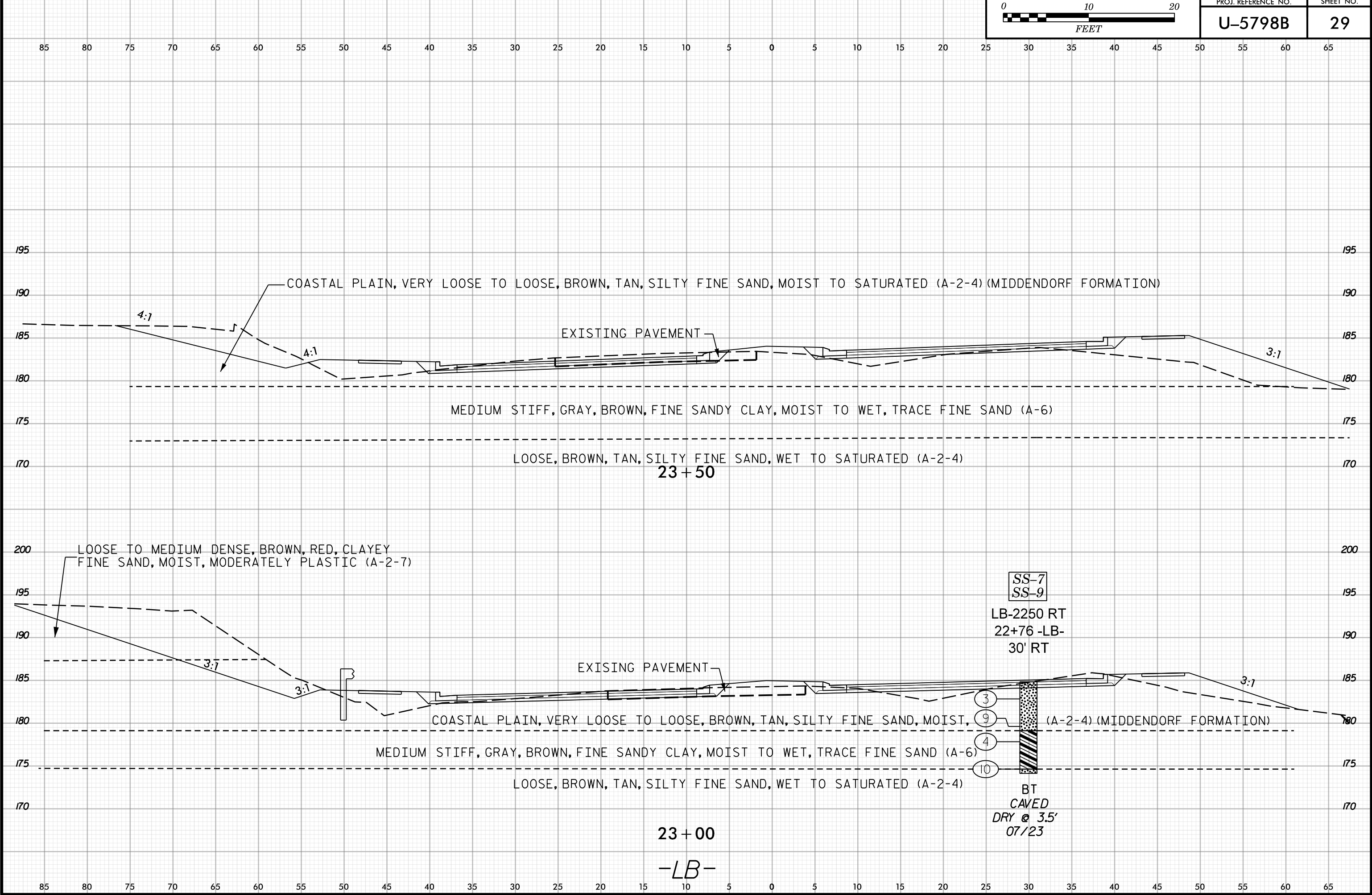


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| U-5798B             | 28        |

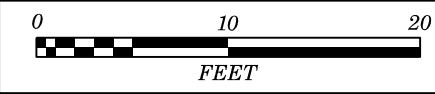




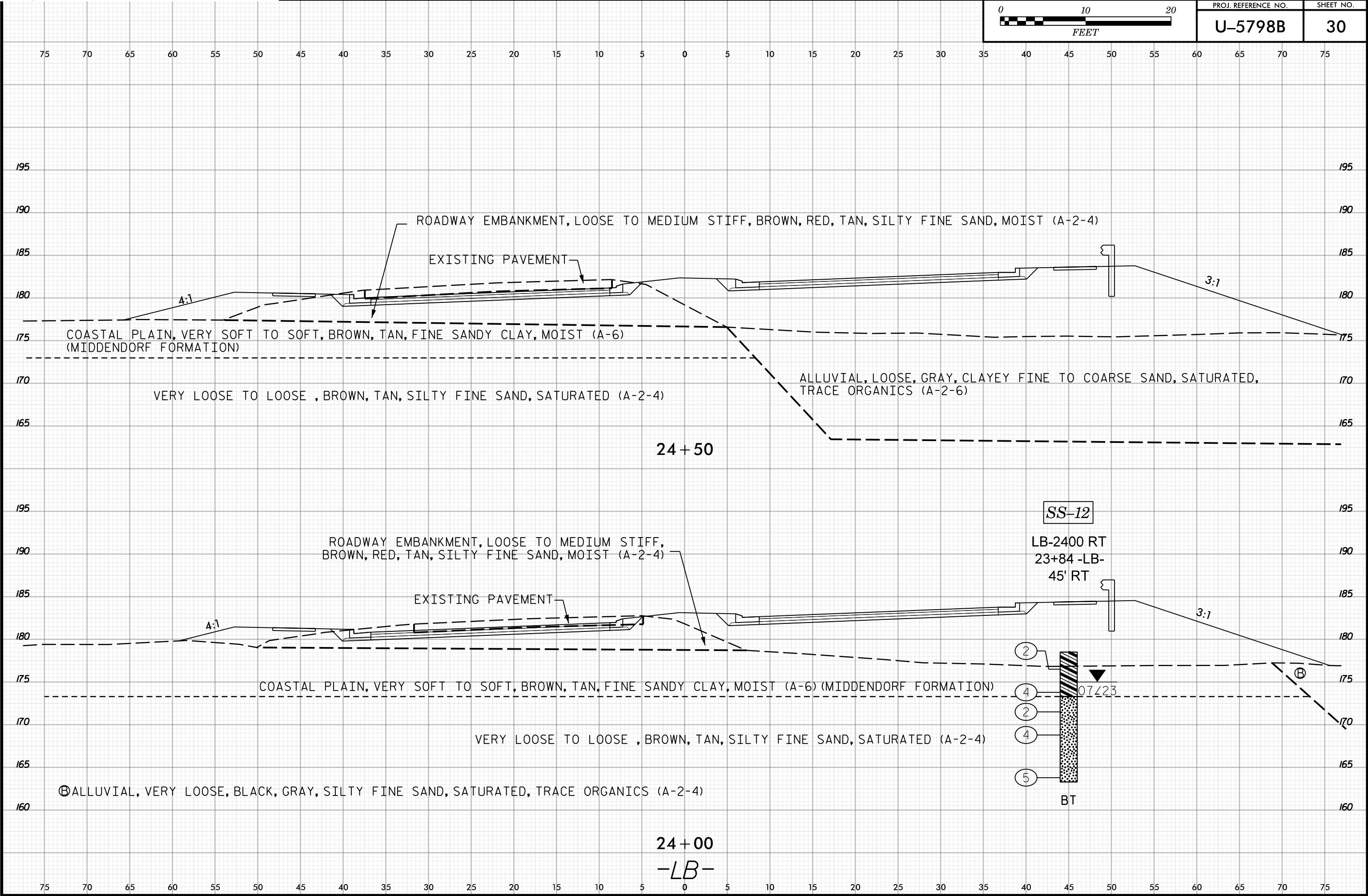
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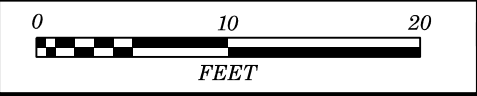




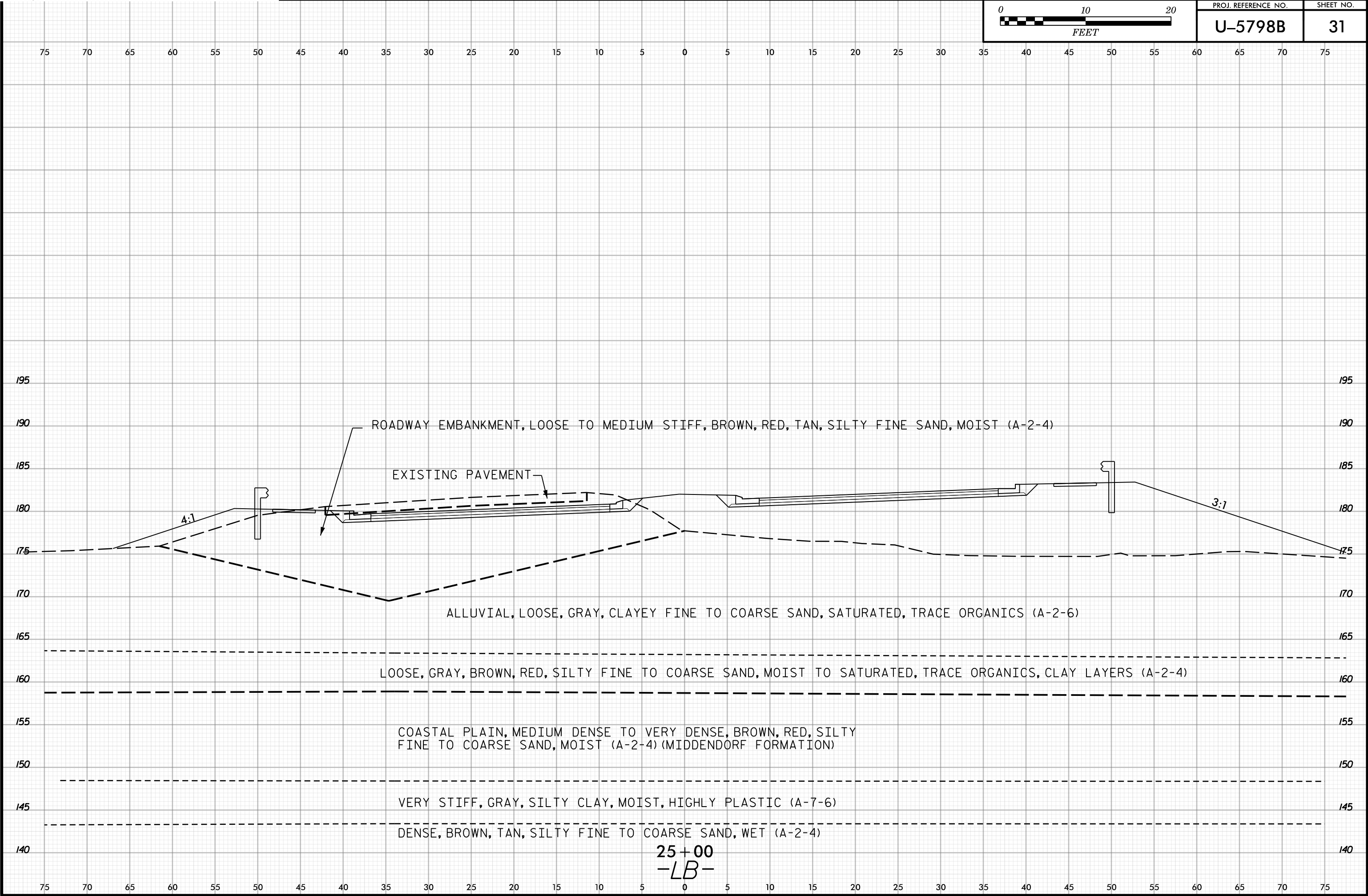


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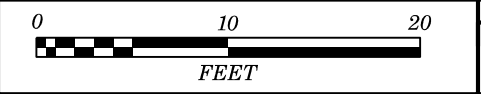




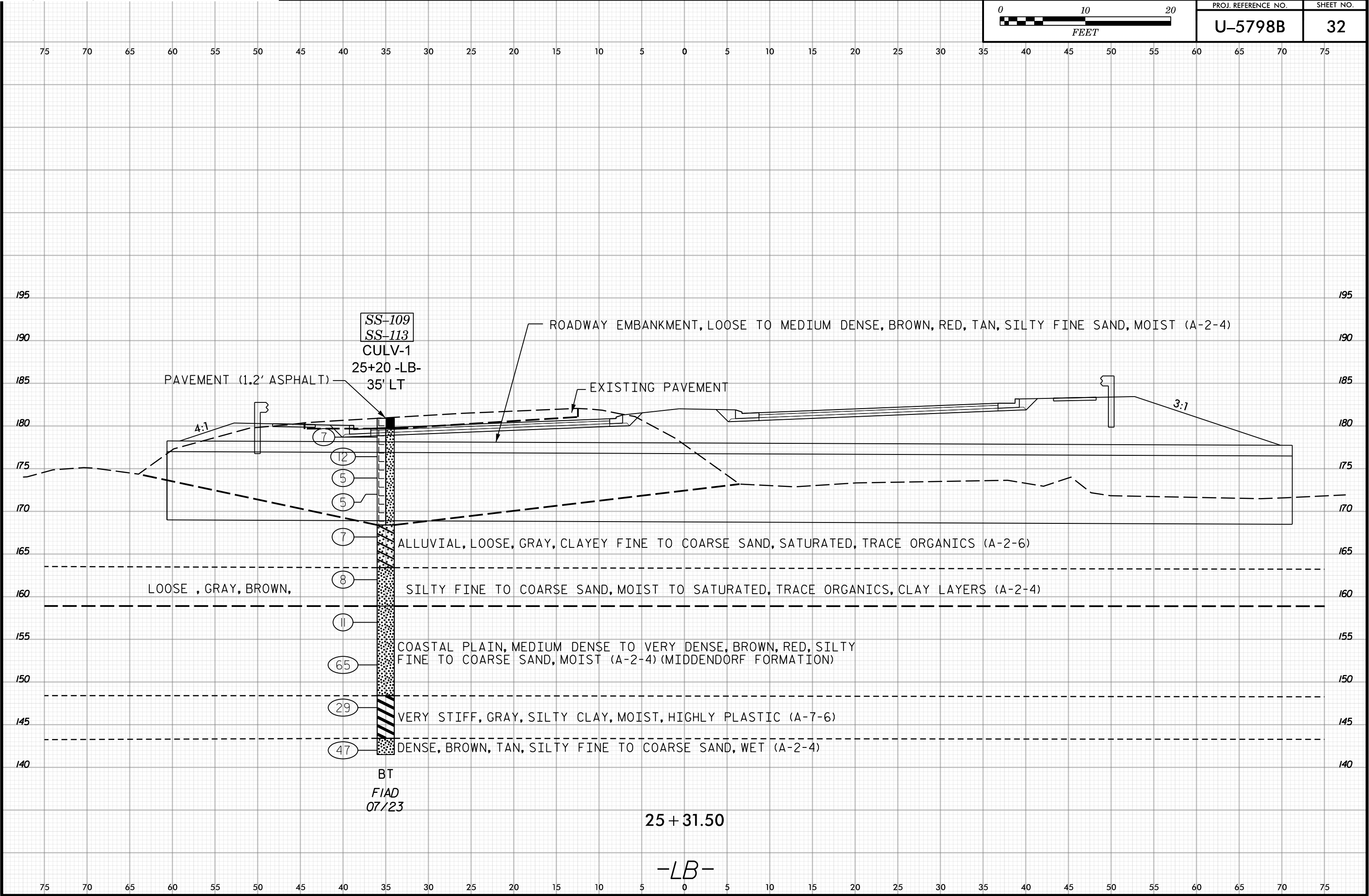
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| U-5798B             | 31        |

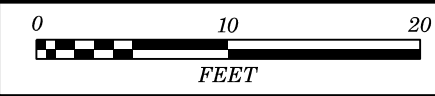




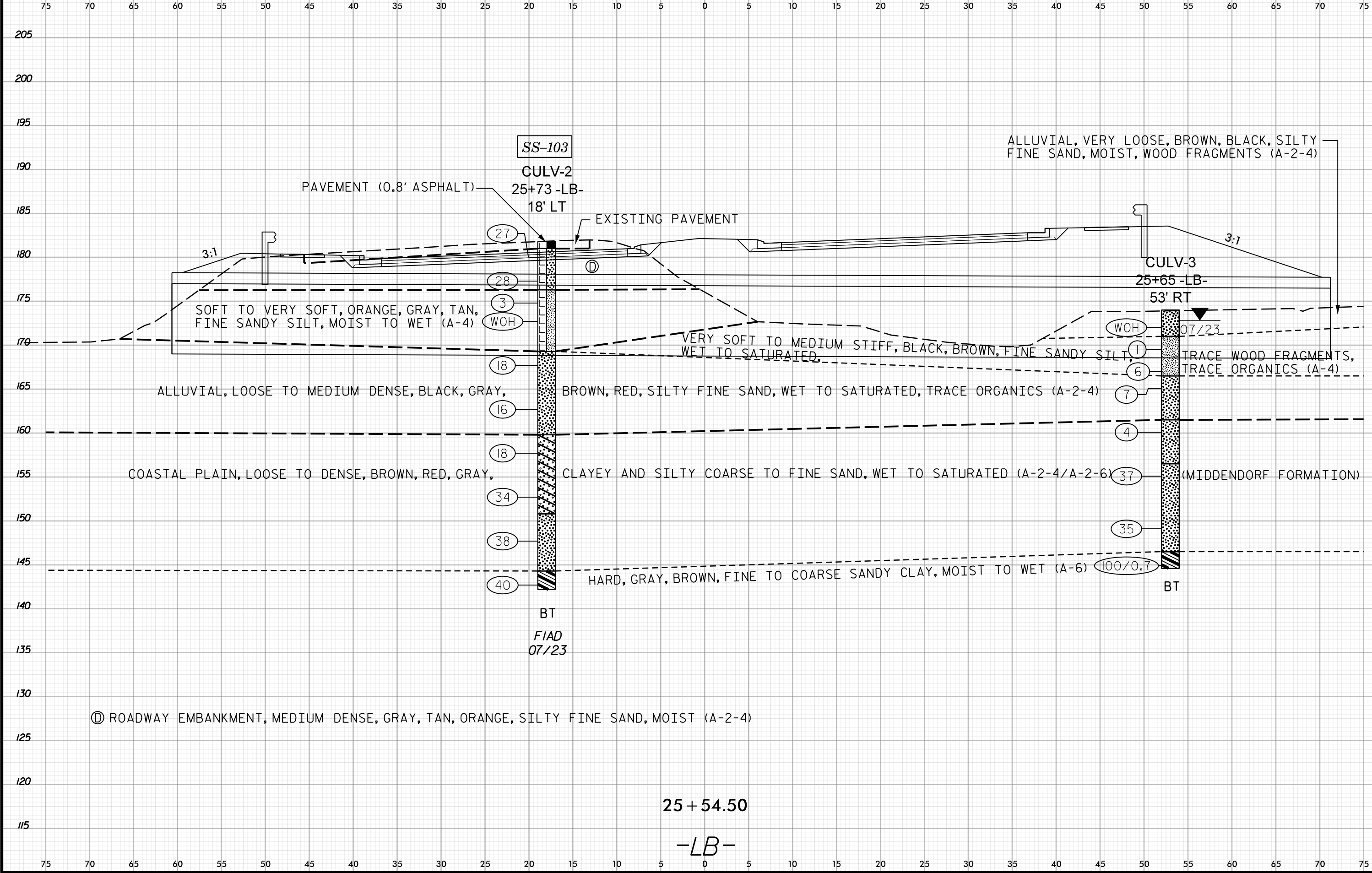


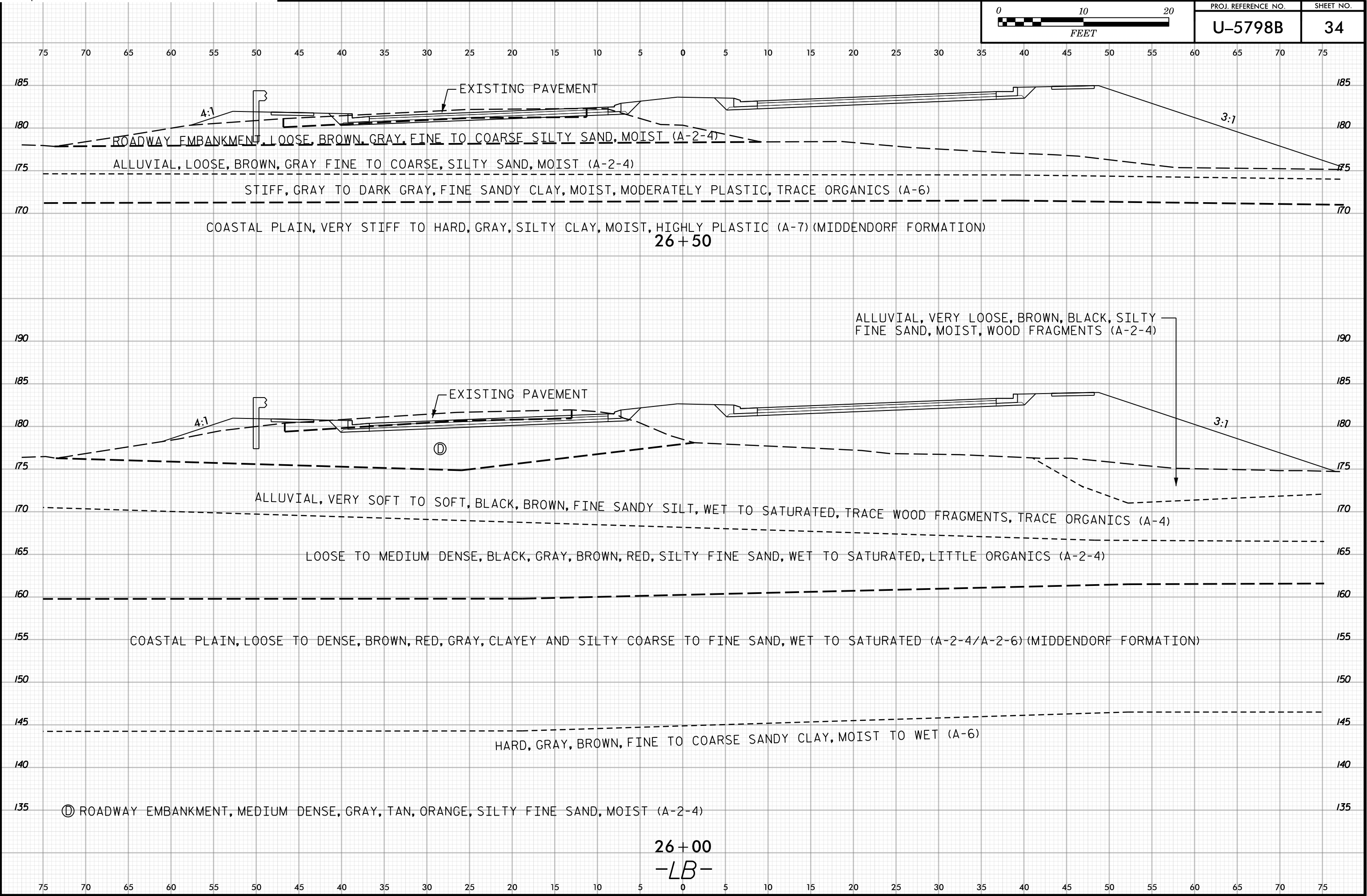
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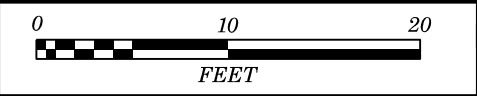




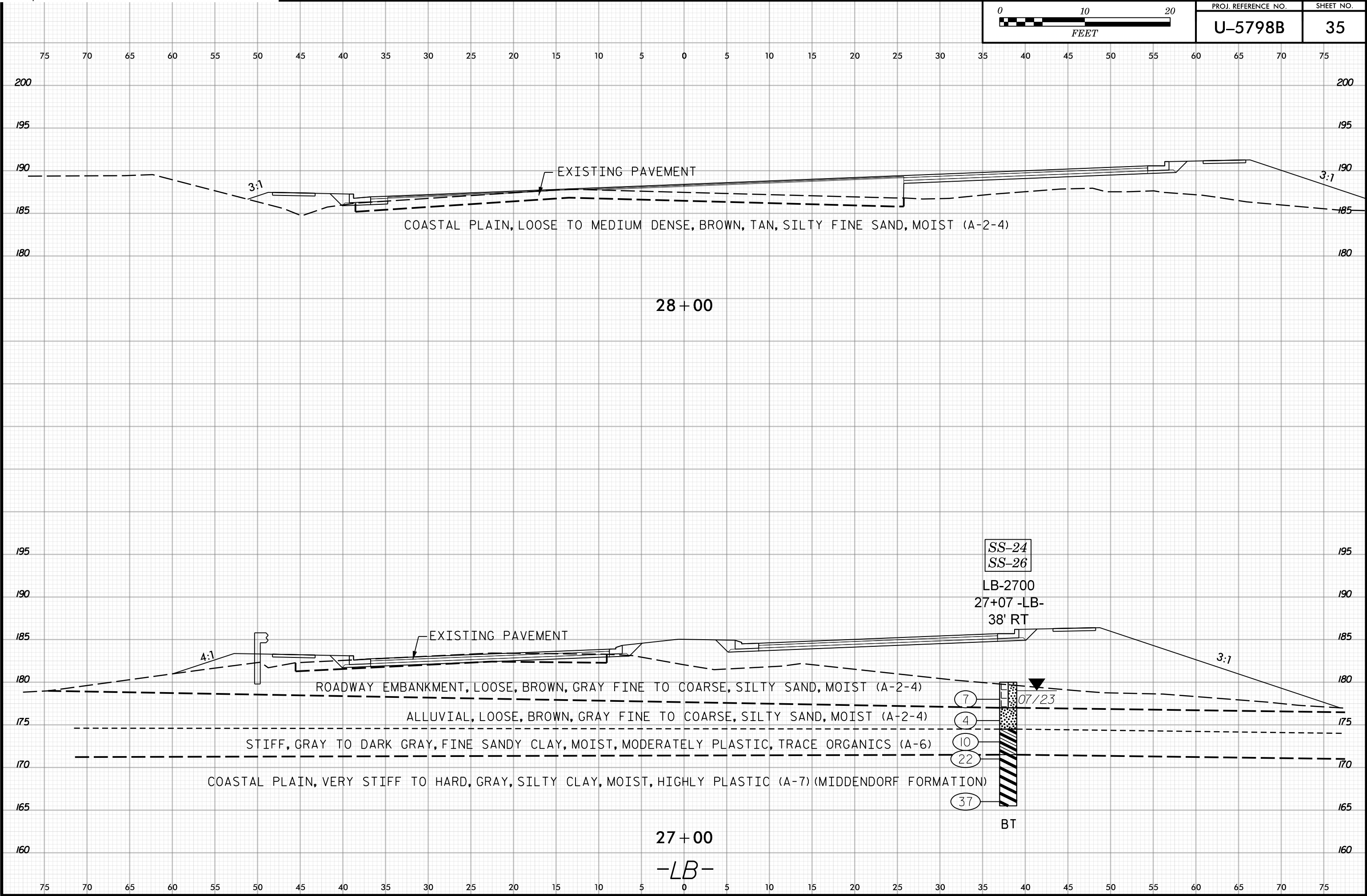
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| U-5798B             | 33        |

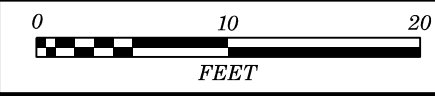




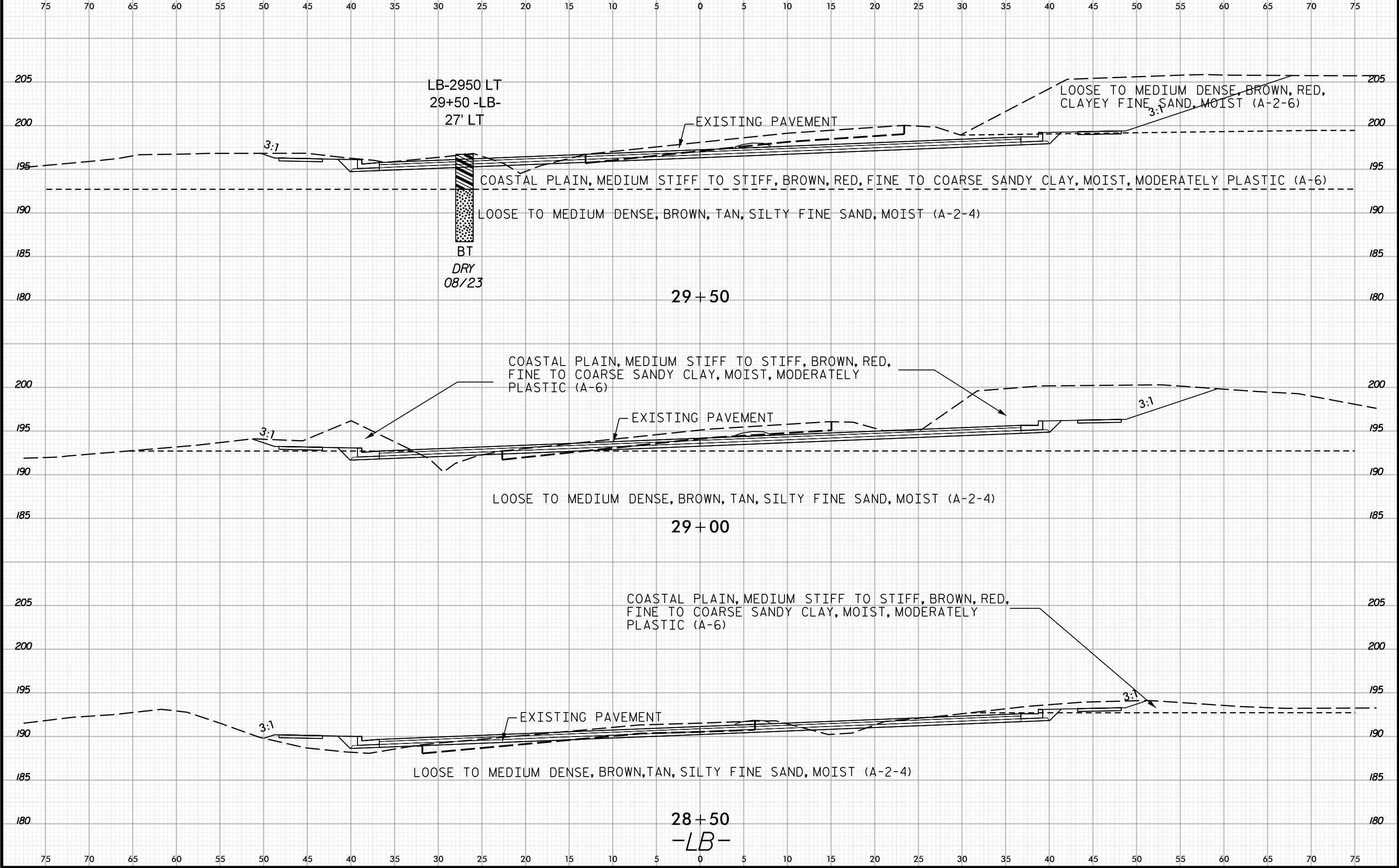


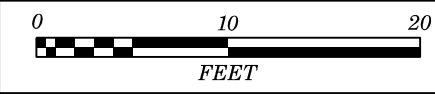
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| U-5798B             | 35        |



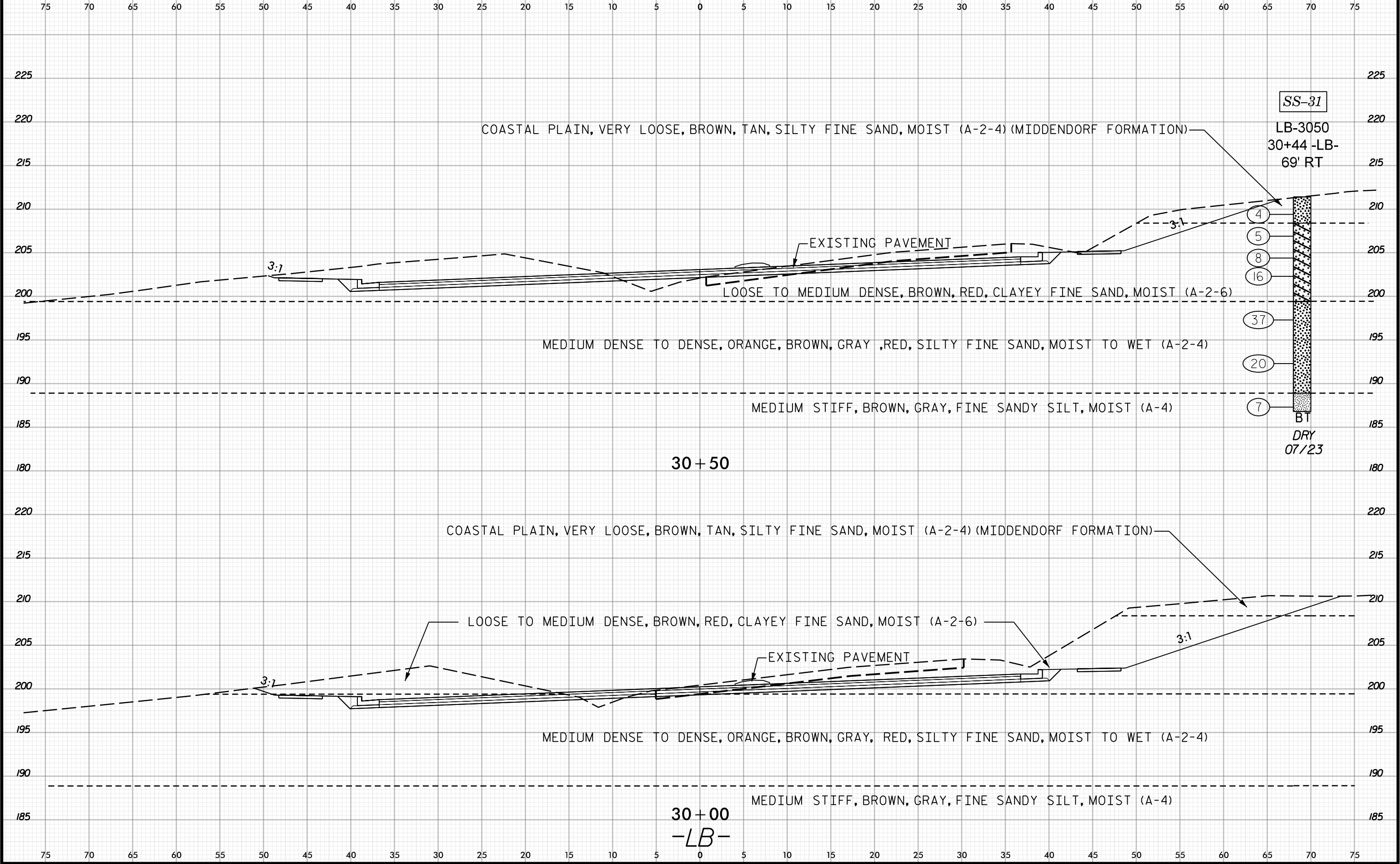


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| U-5798B             | 36        |

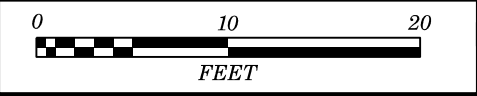




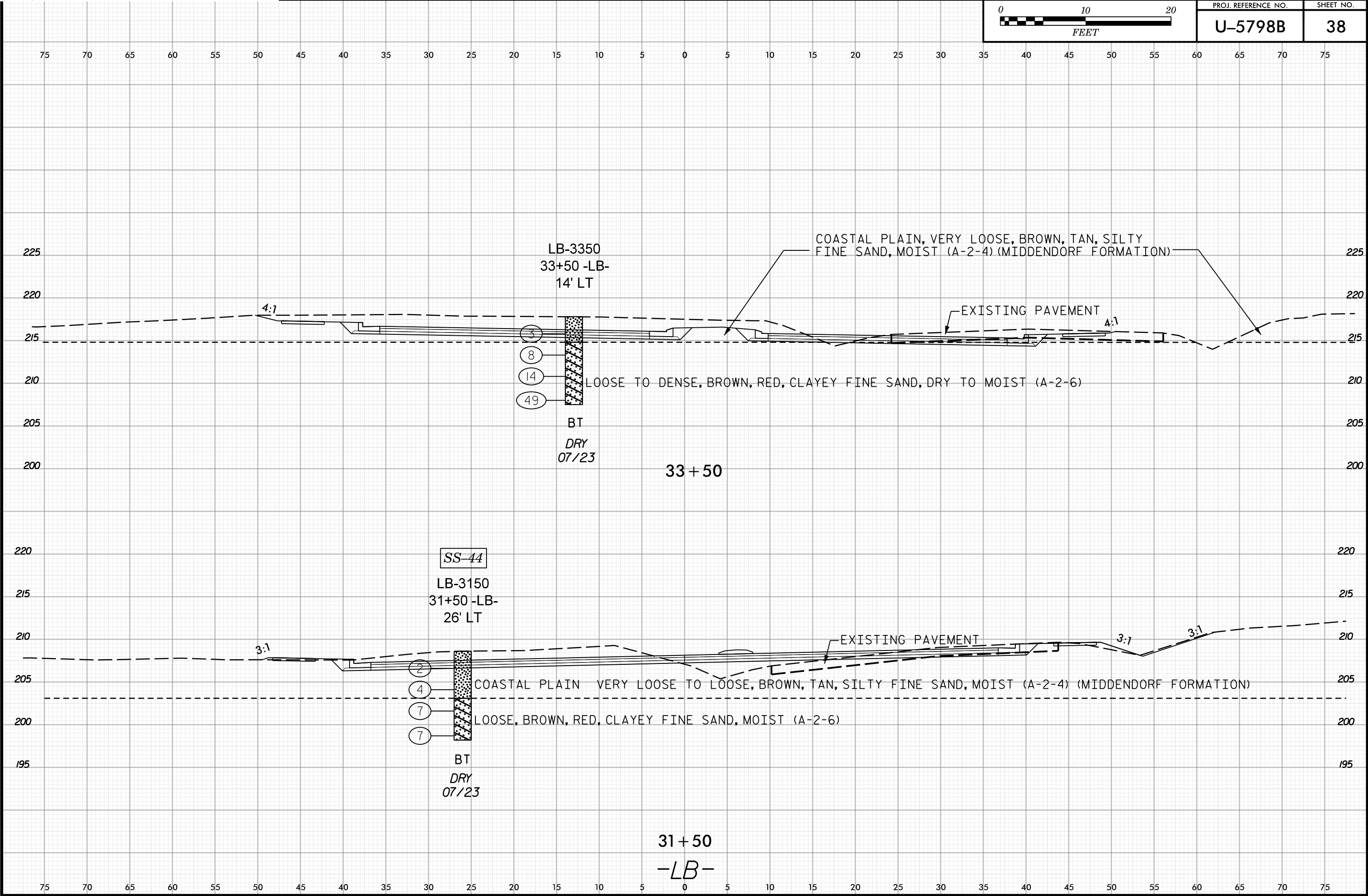
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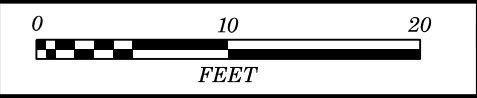




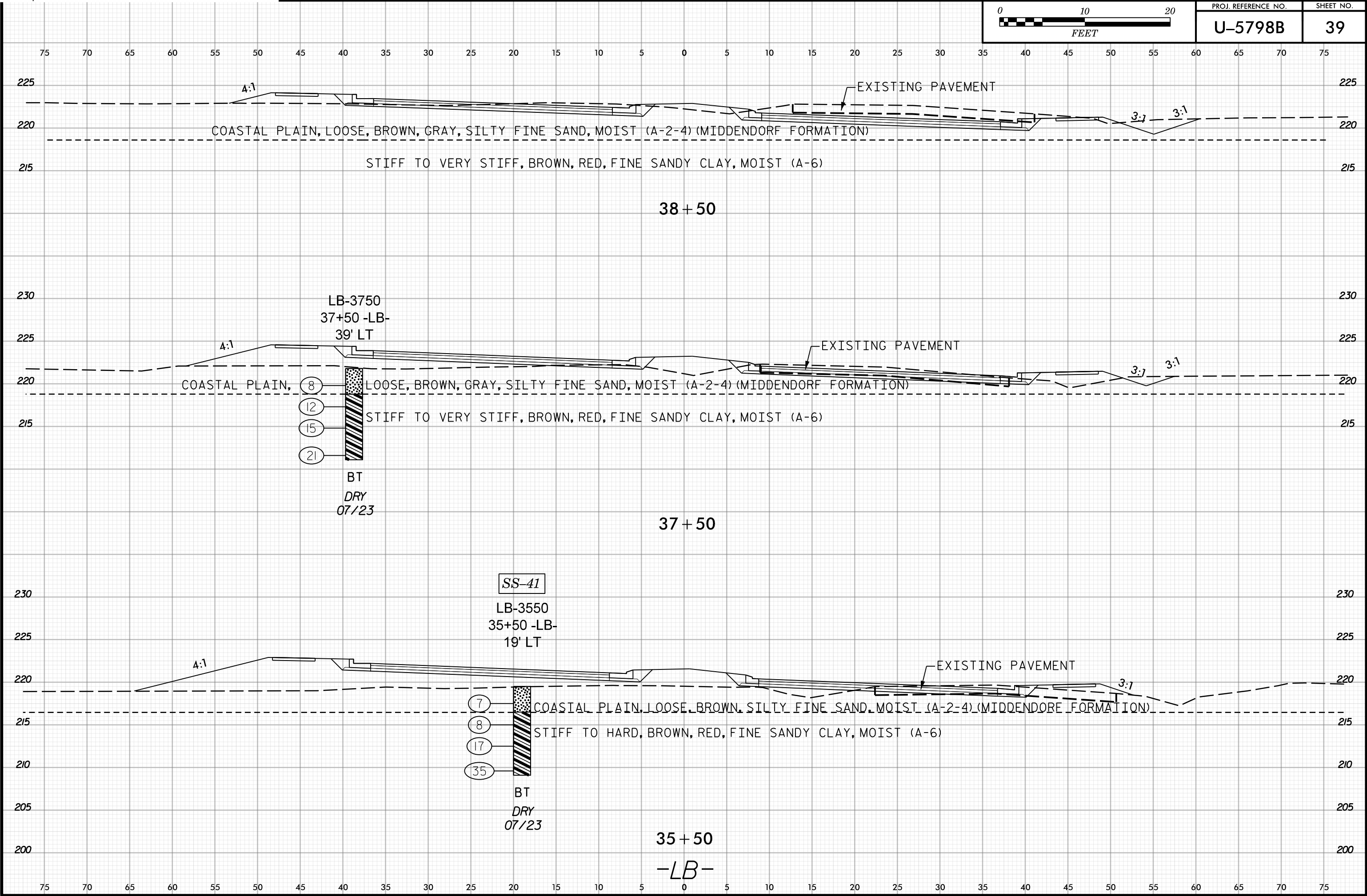


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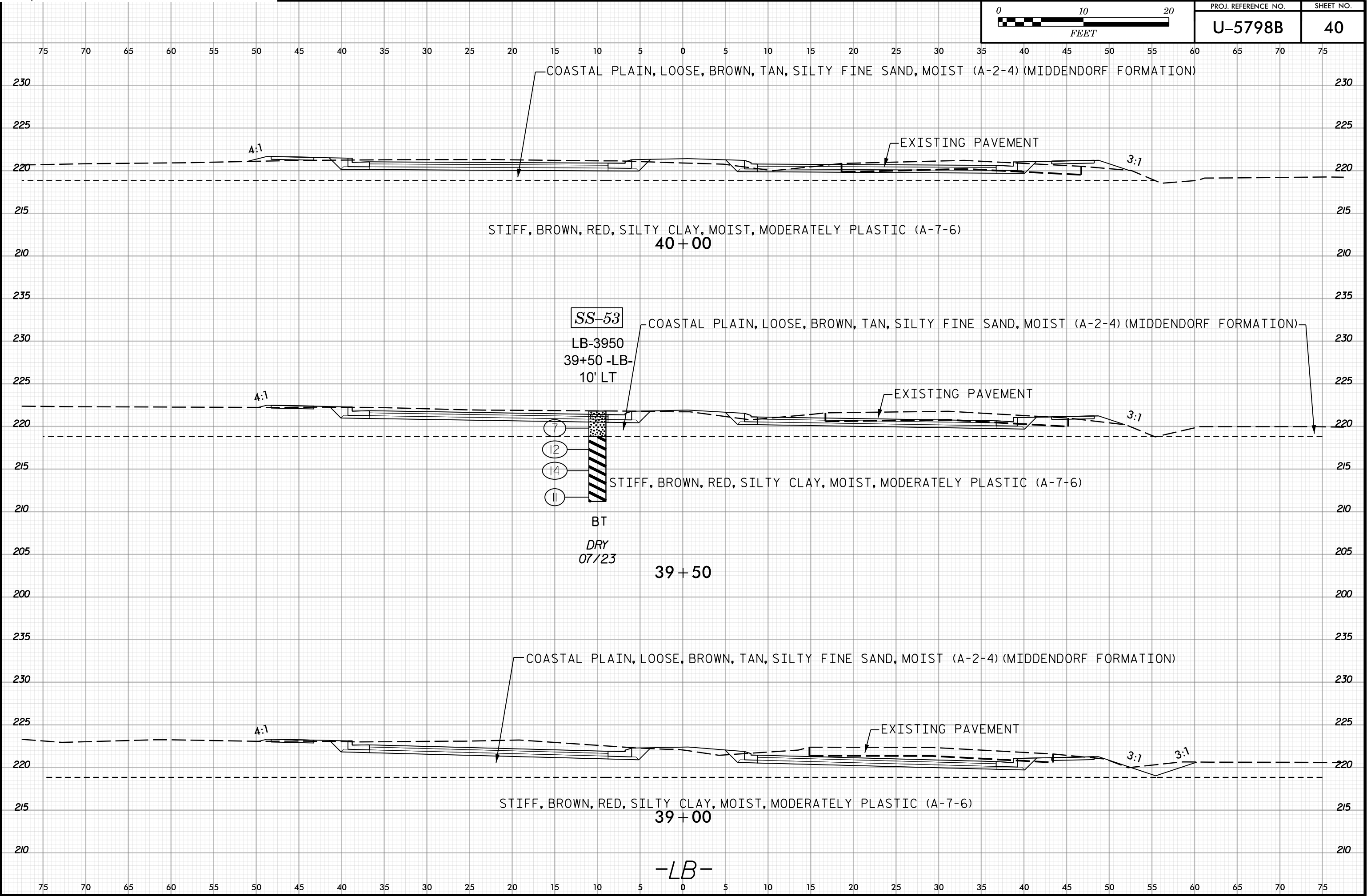


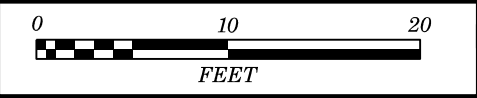


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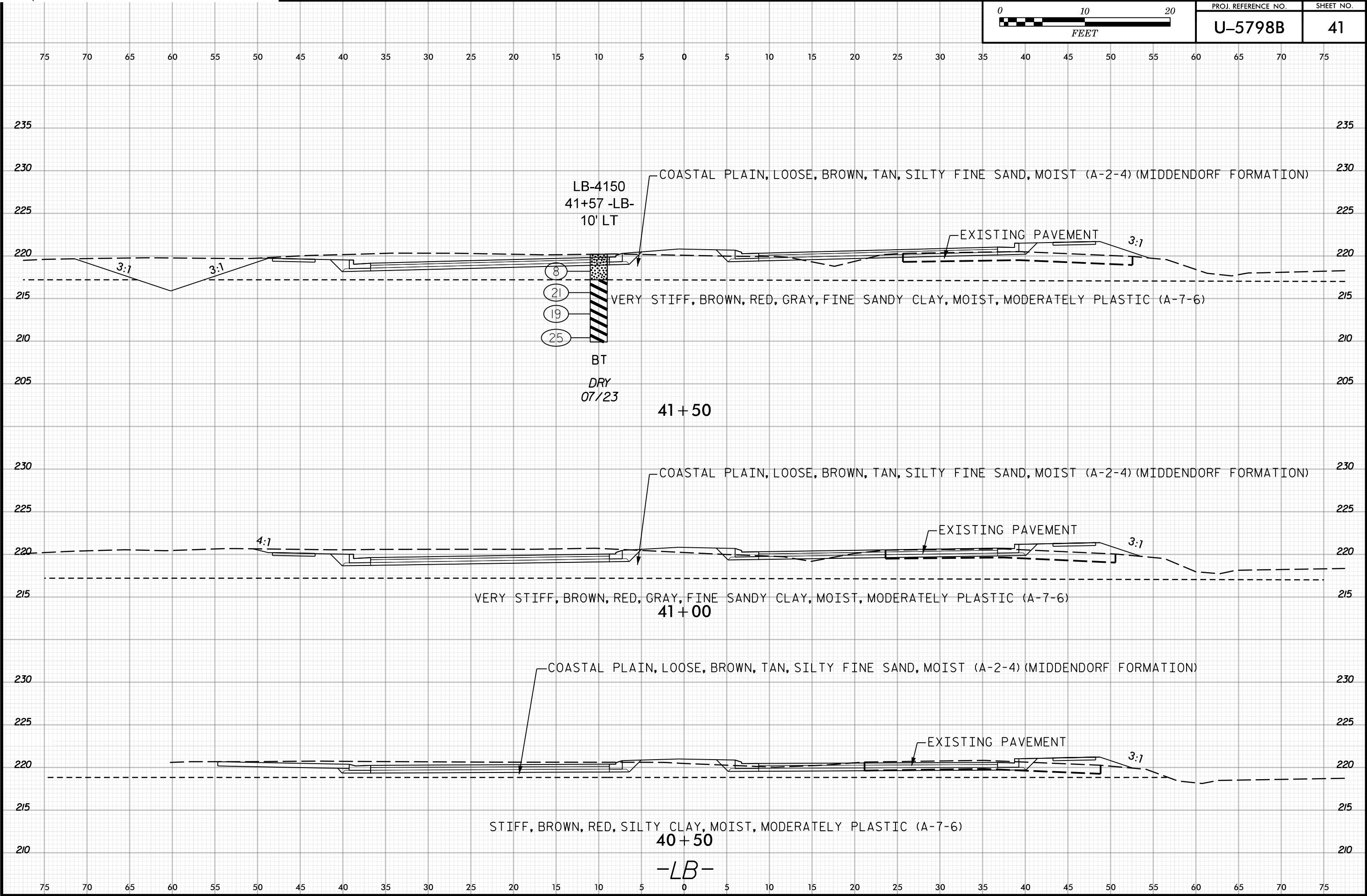


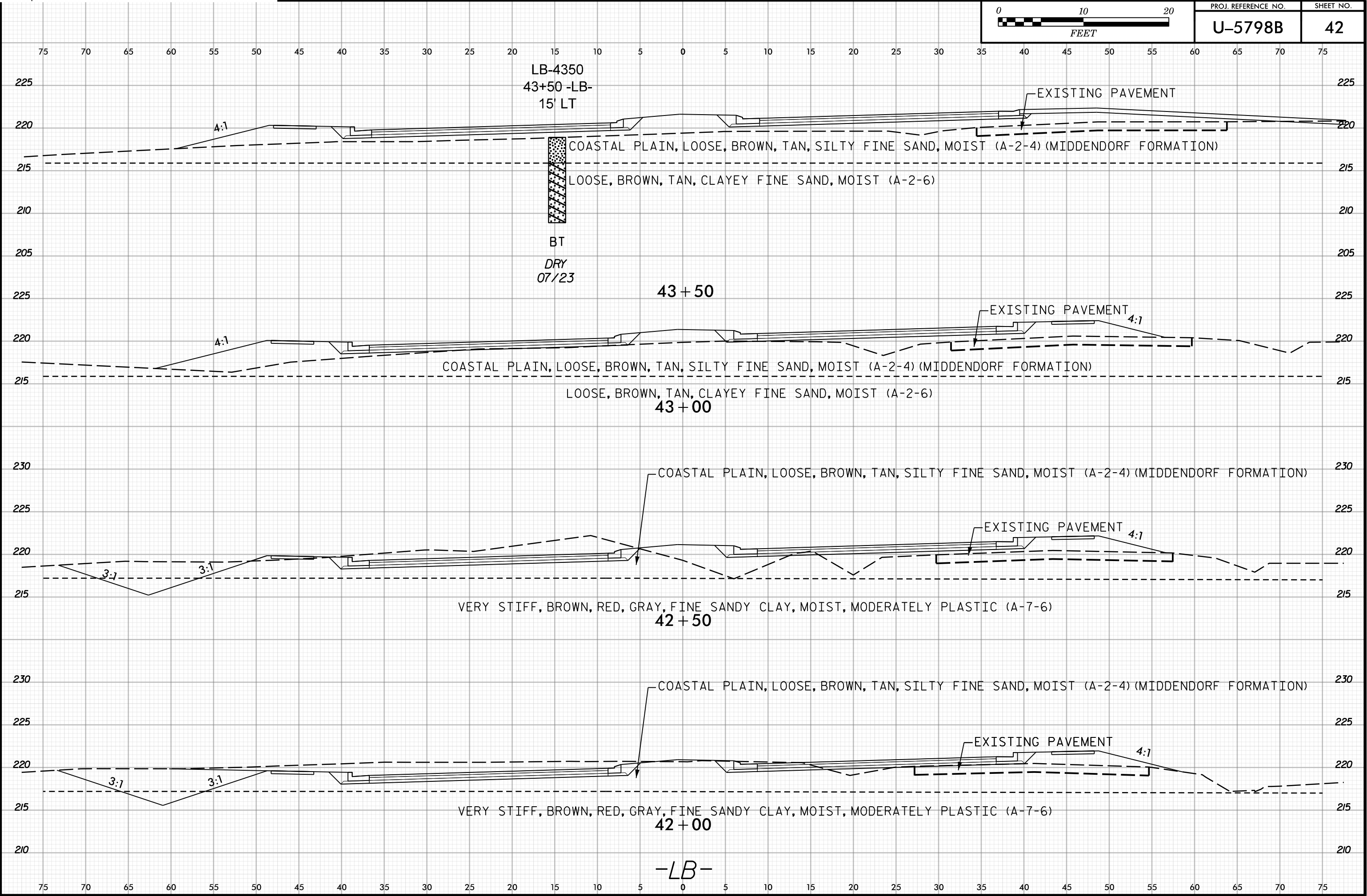


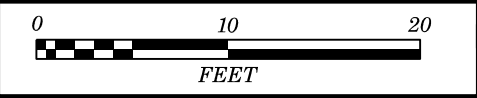




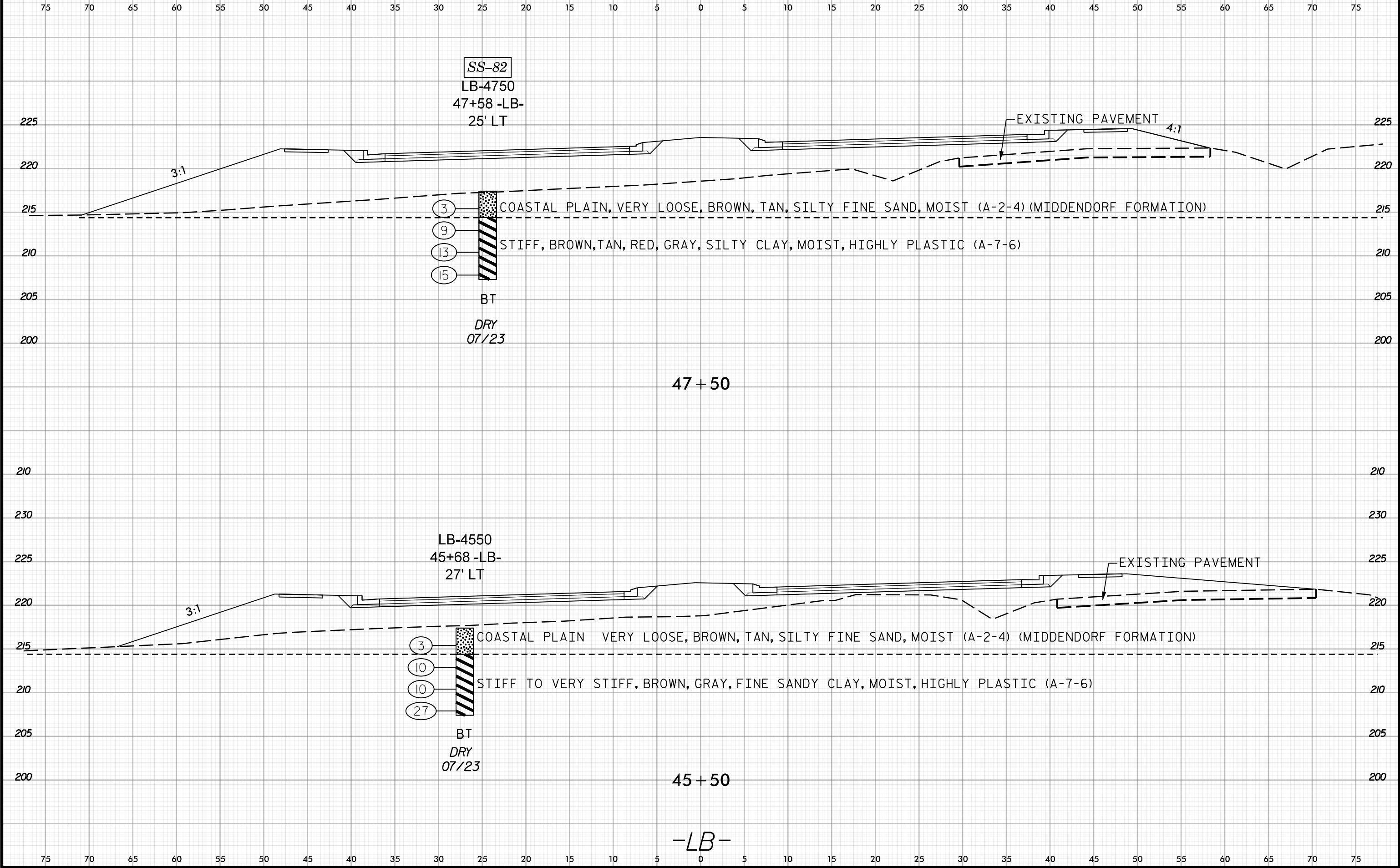
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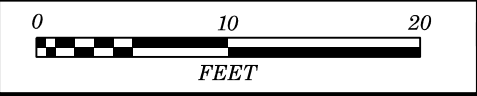




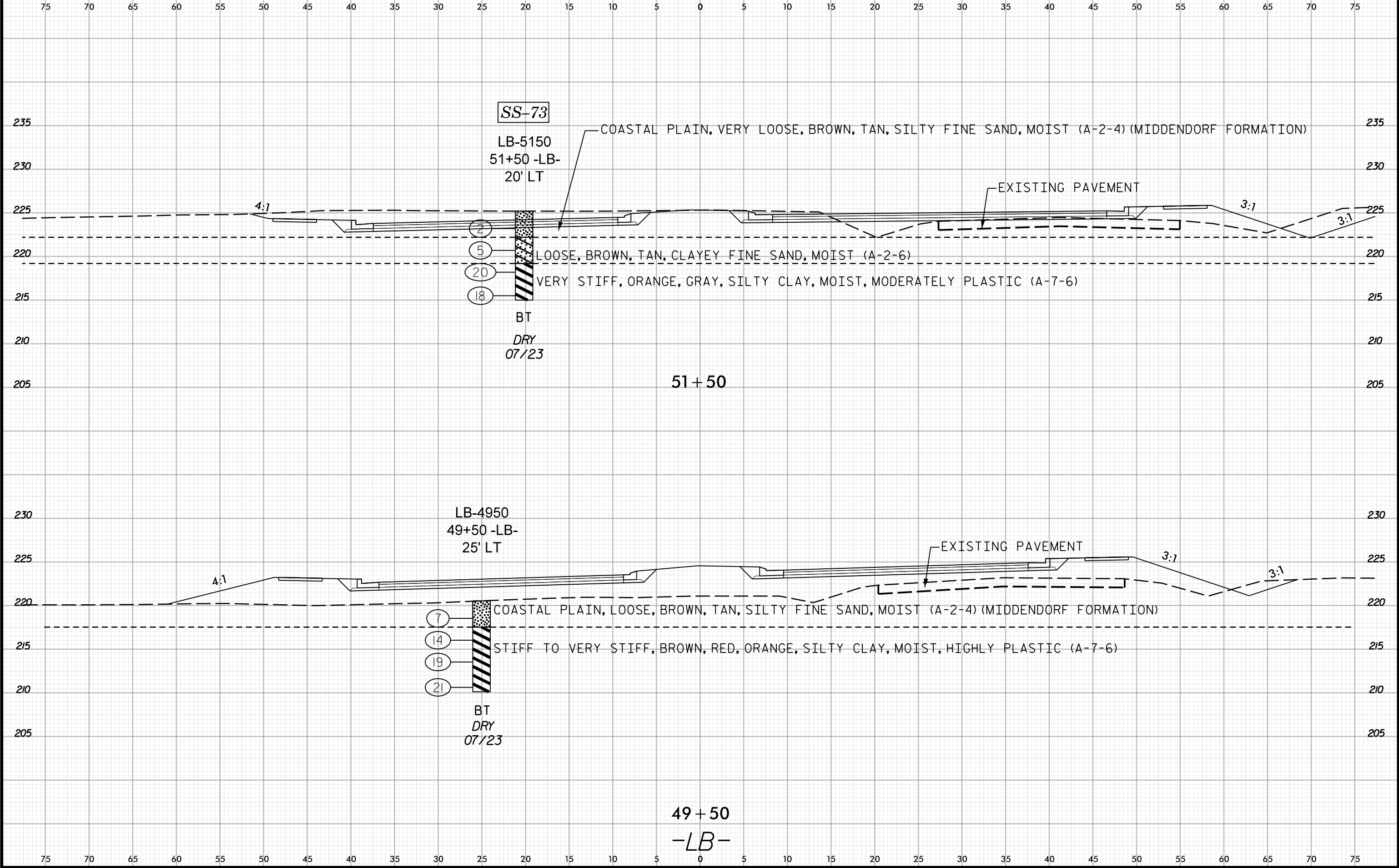


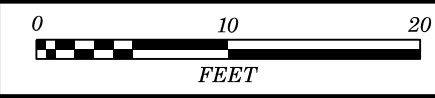
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| U-5798B             | 43        |



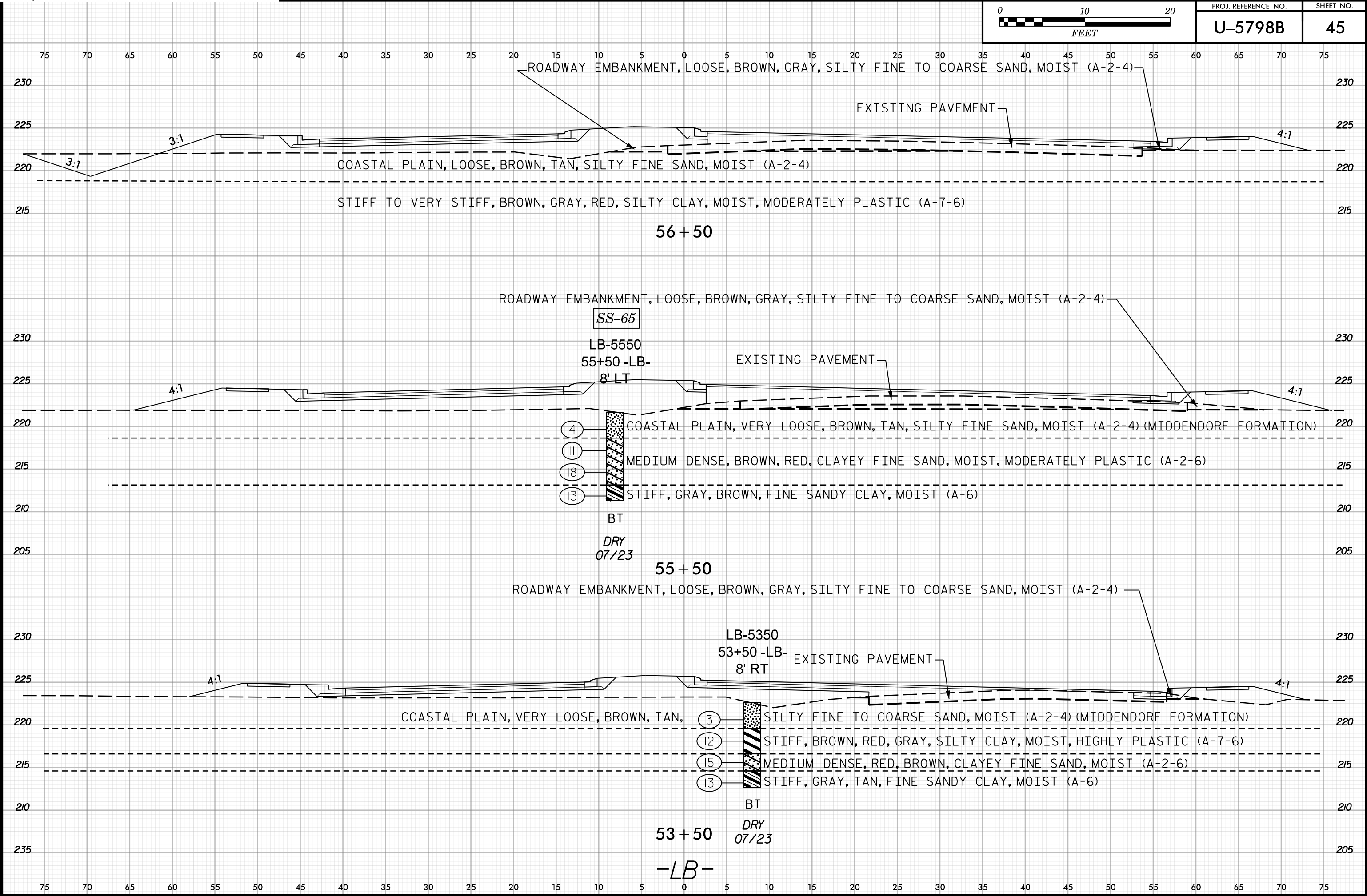


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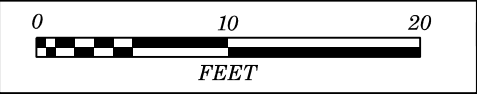




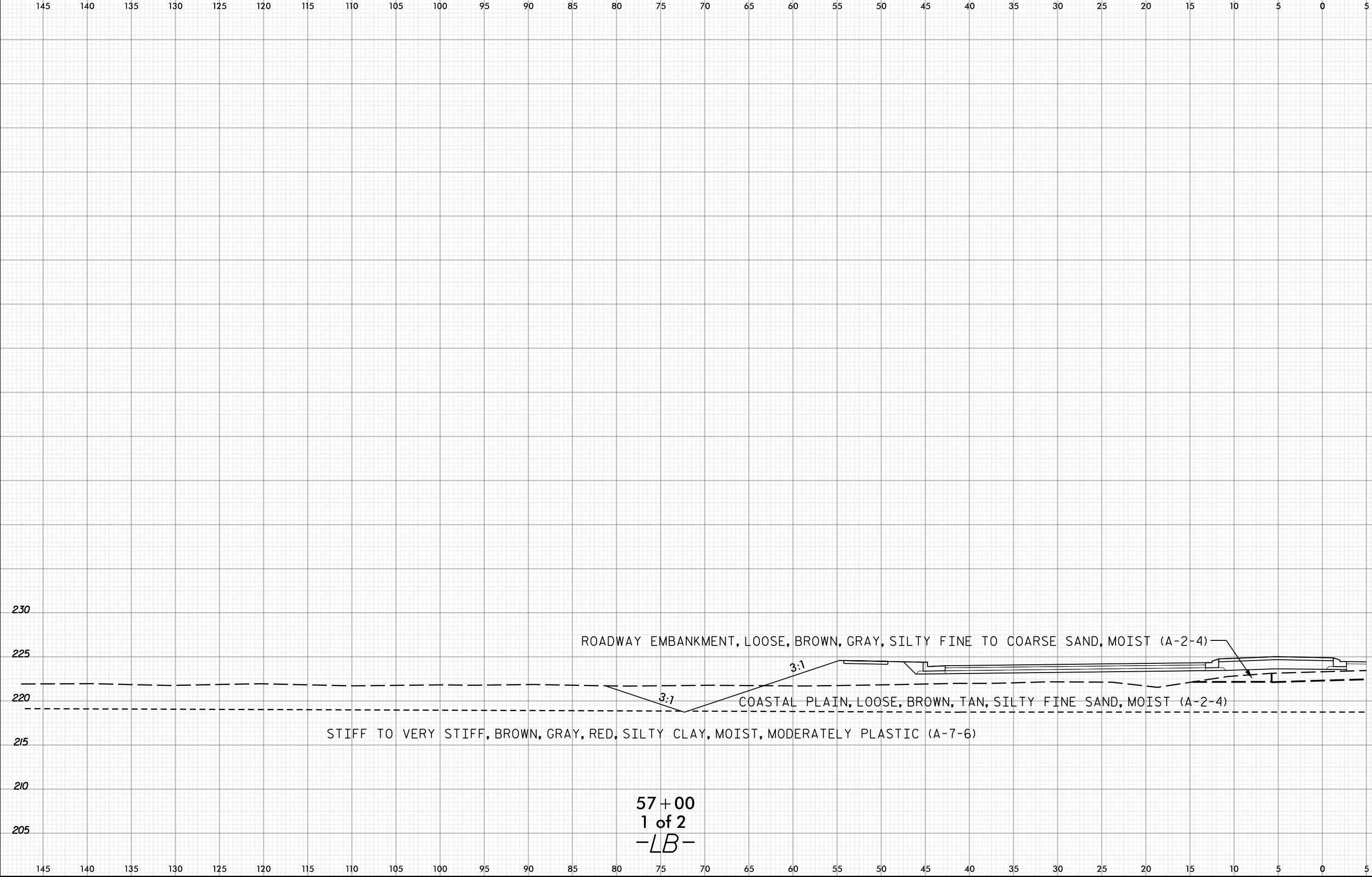
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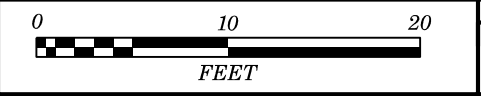




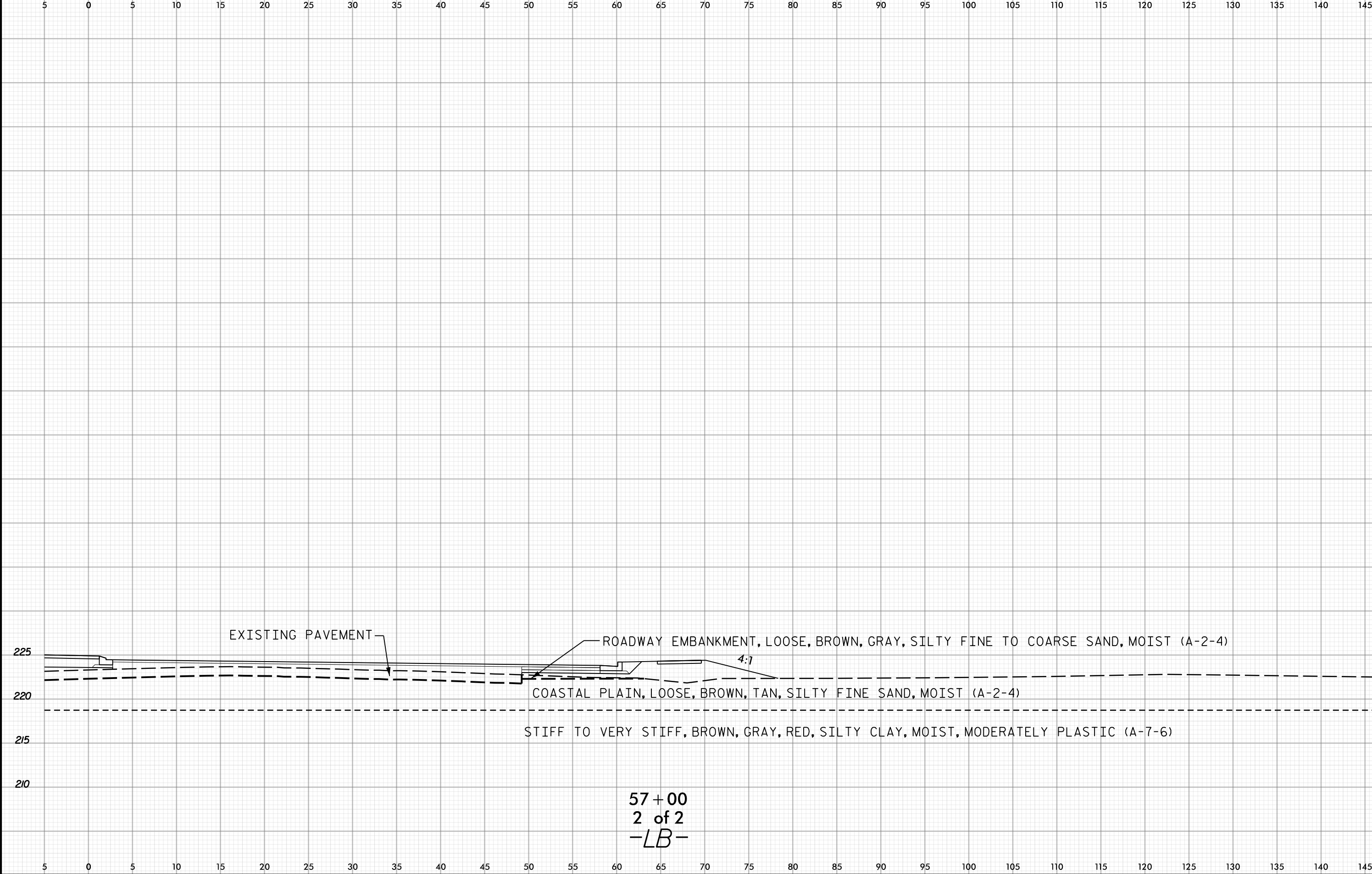


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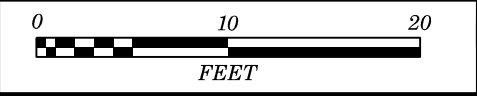




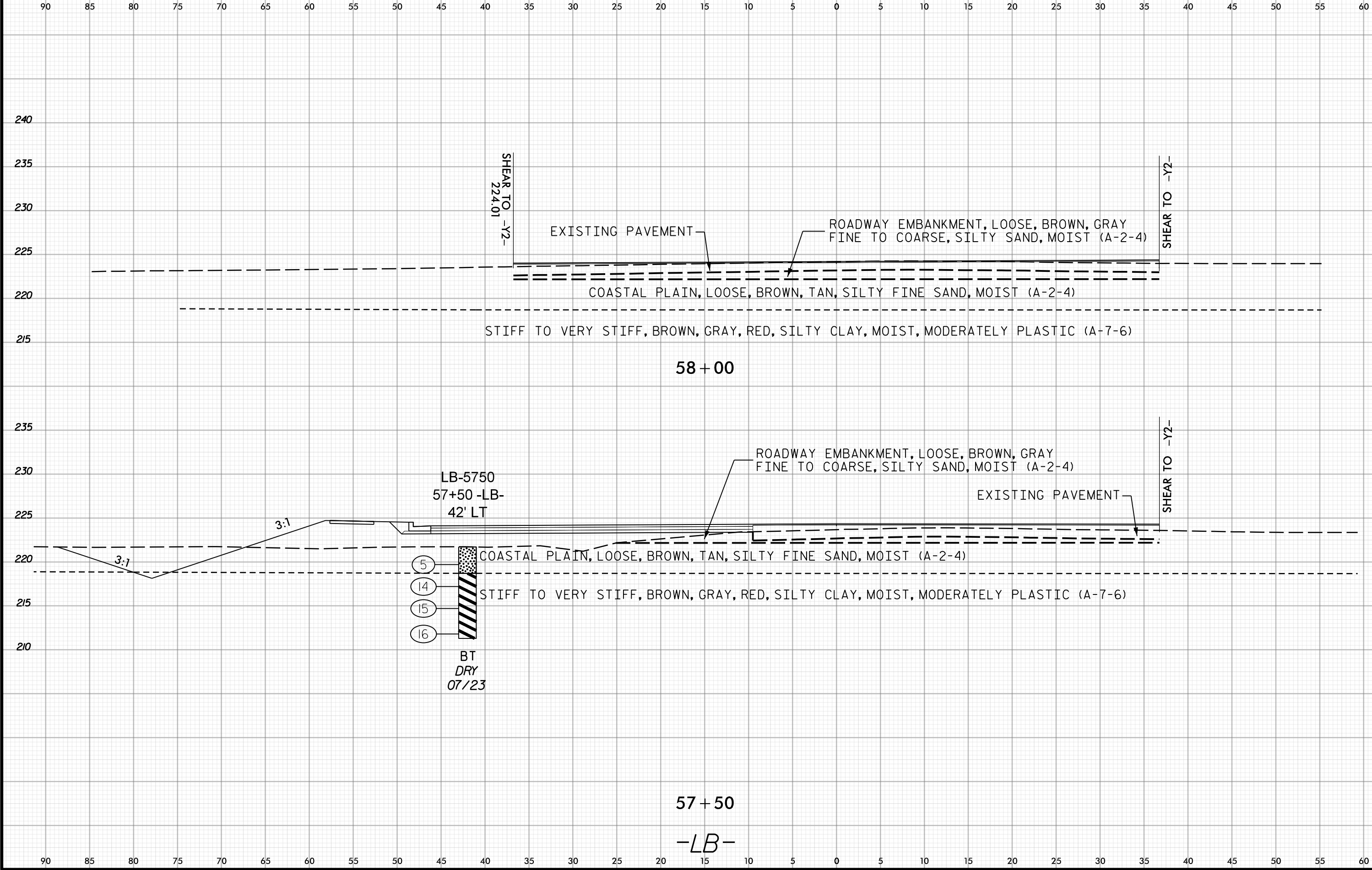
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| U-5798B             | 47        |

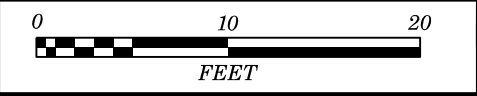




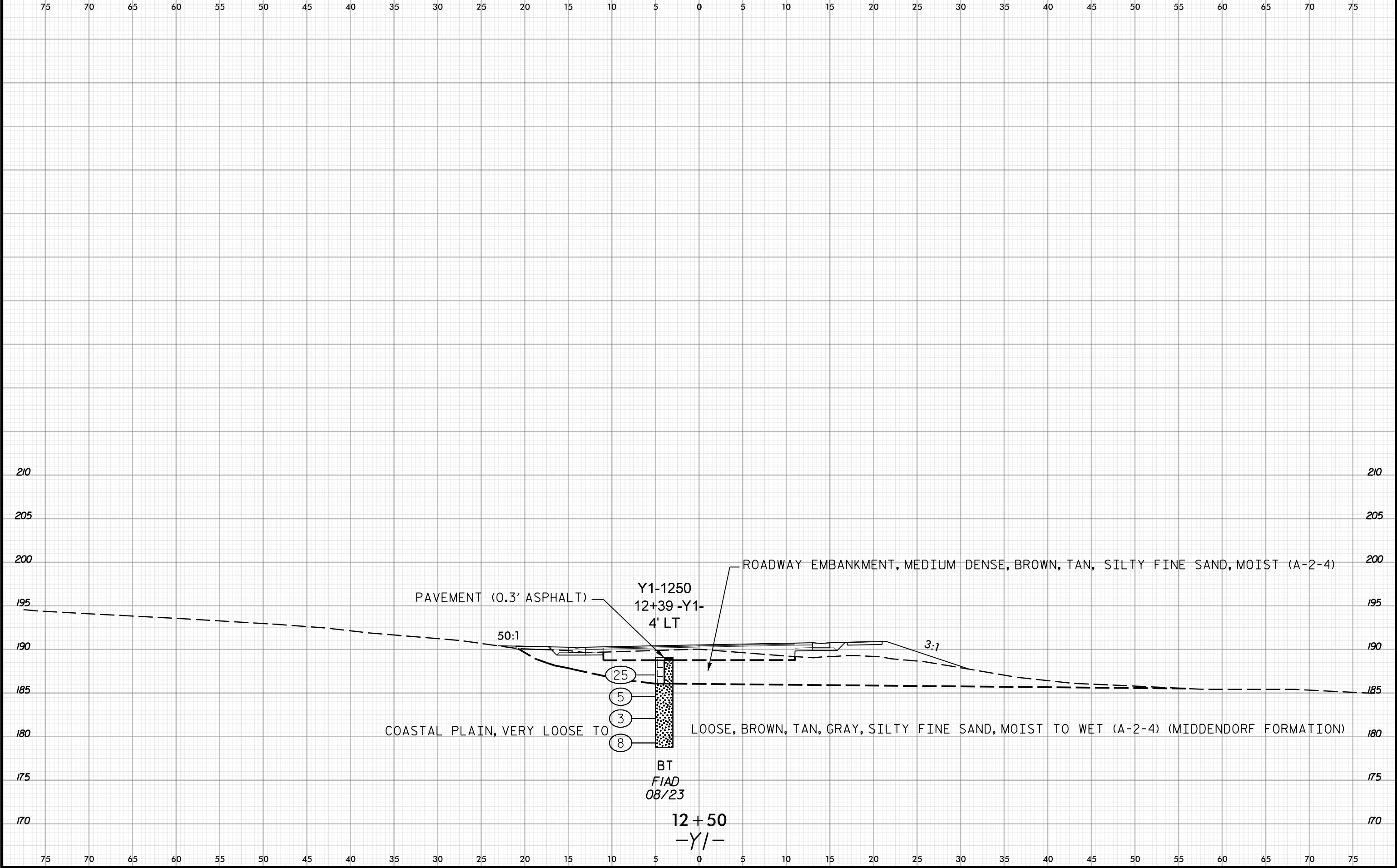


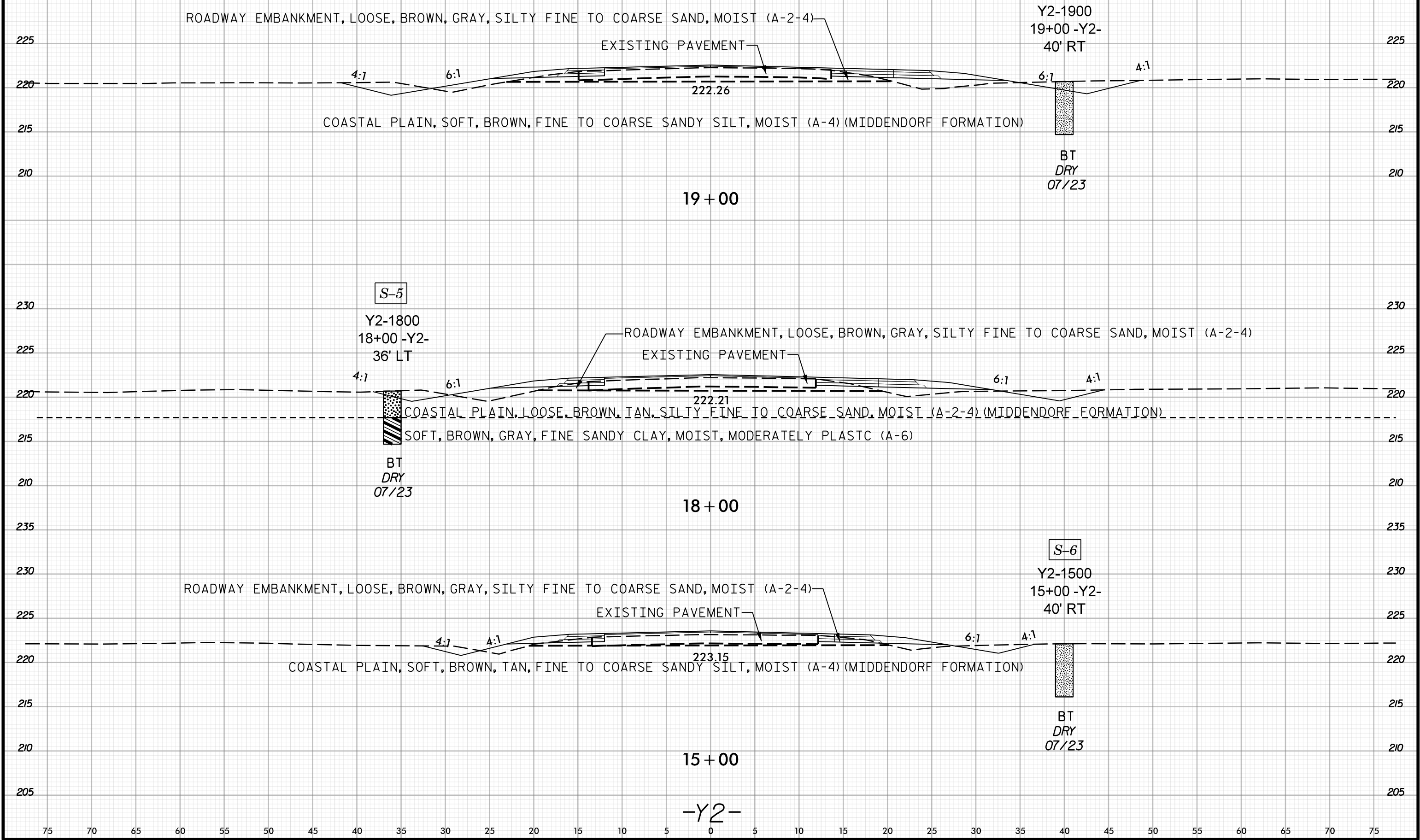
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| U-5798B             | 48        |

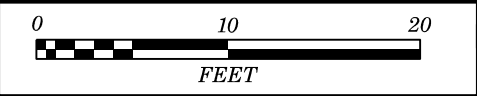




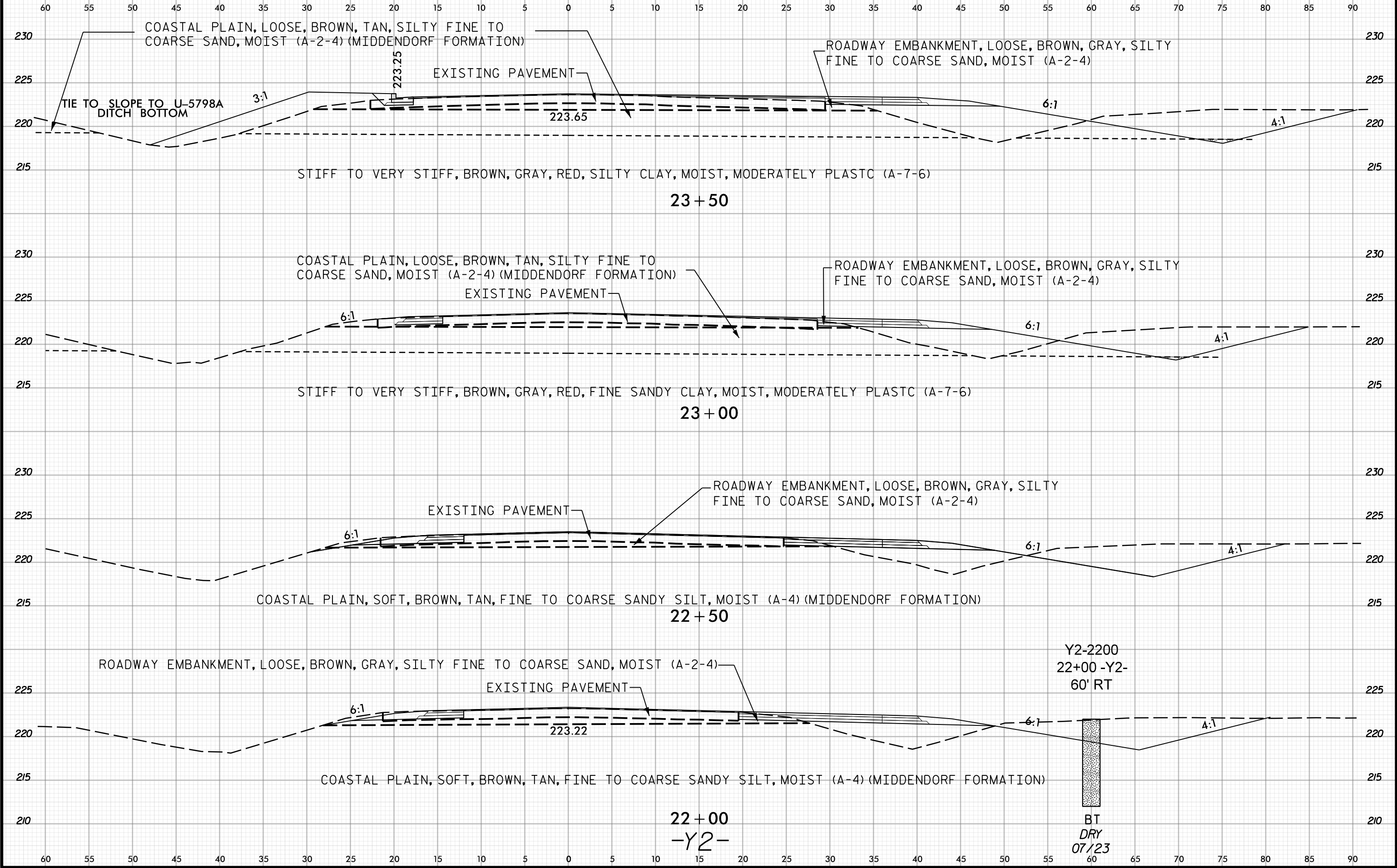
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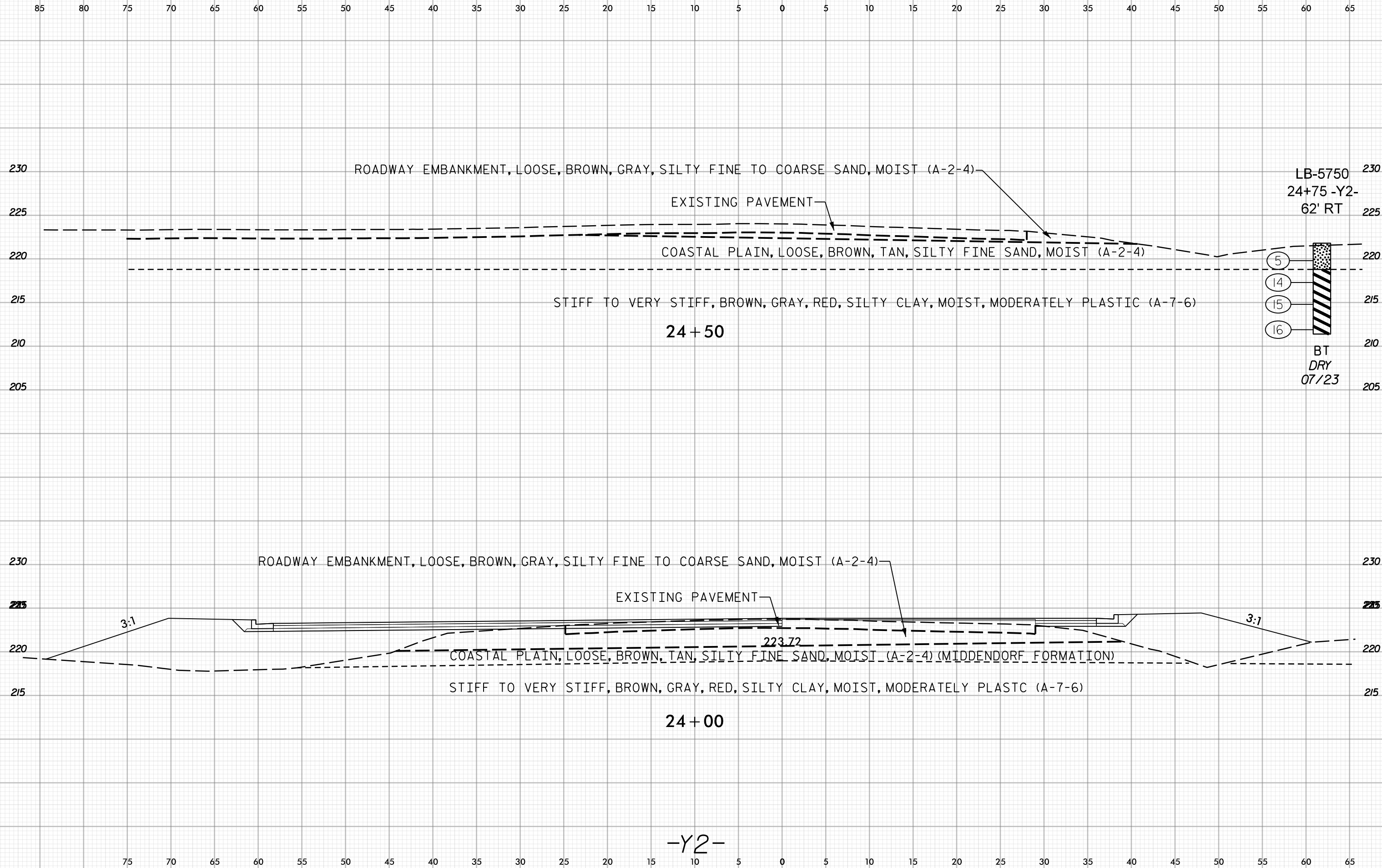






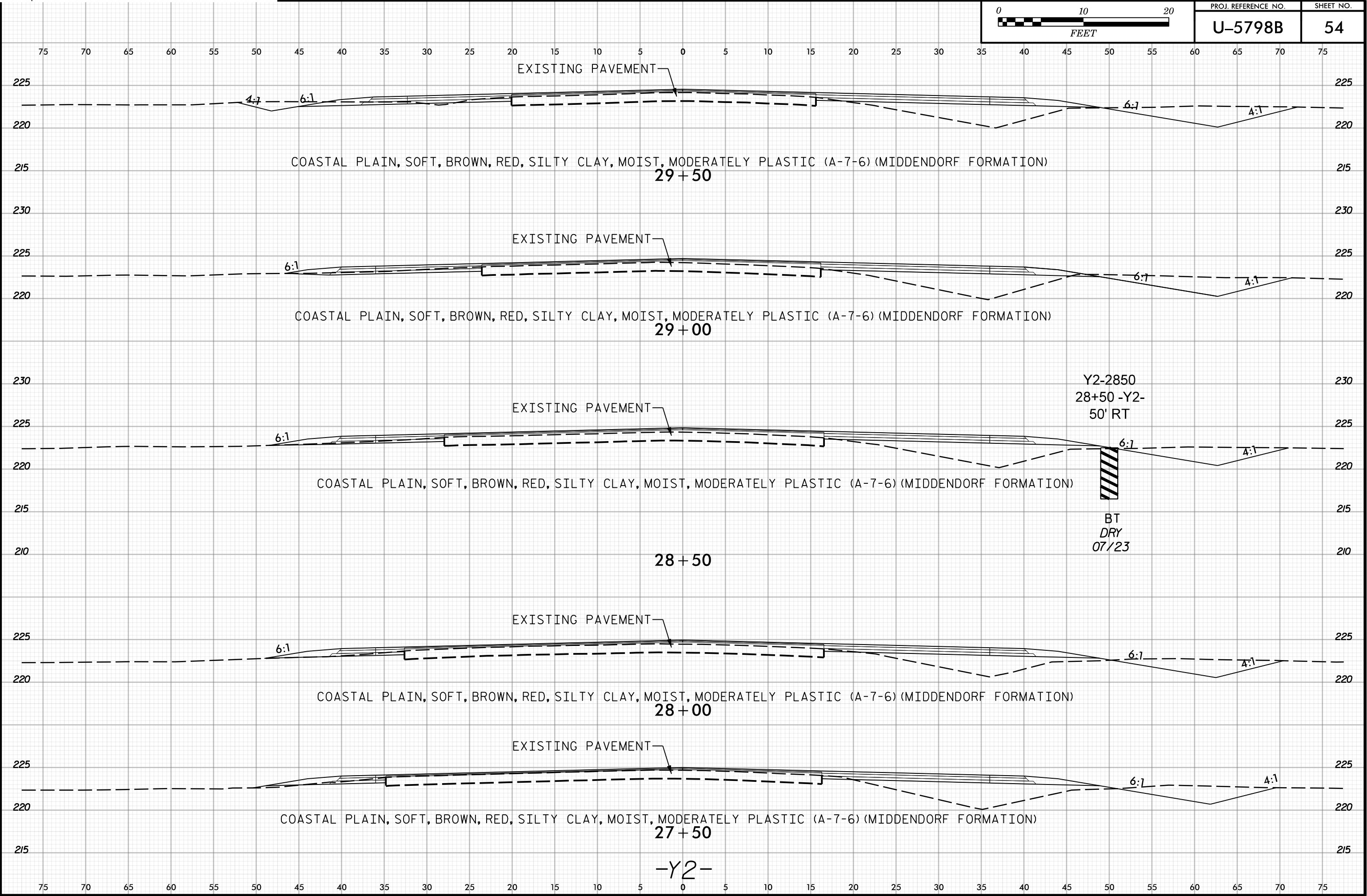
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| U-5798B             | 51        |

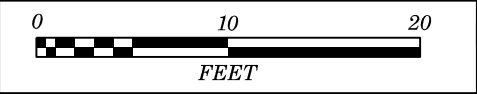




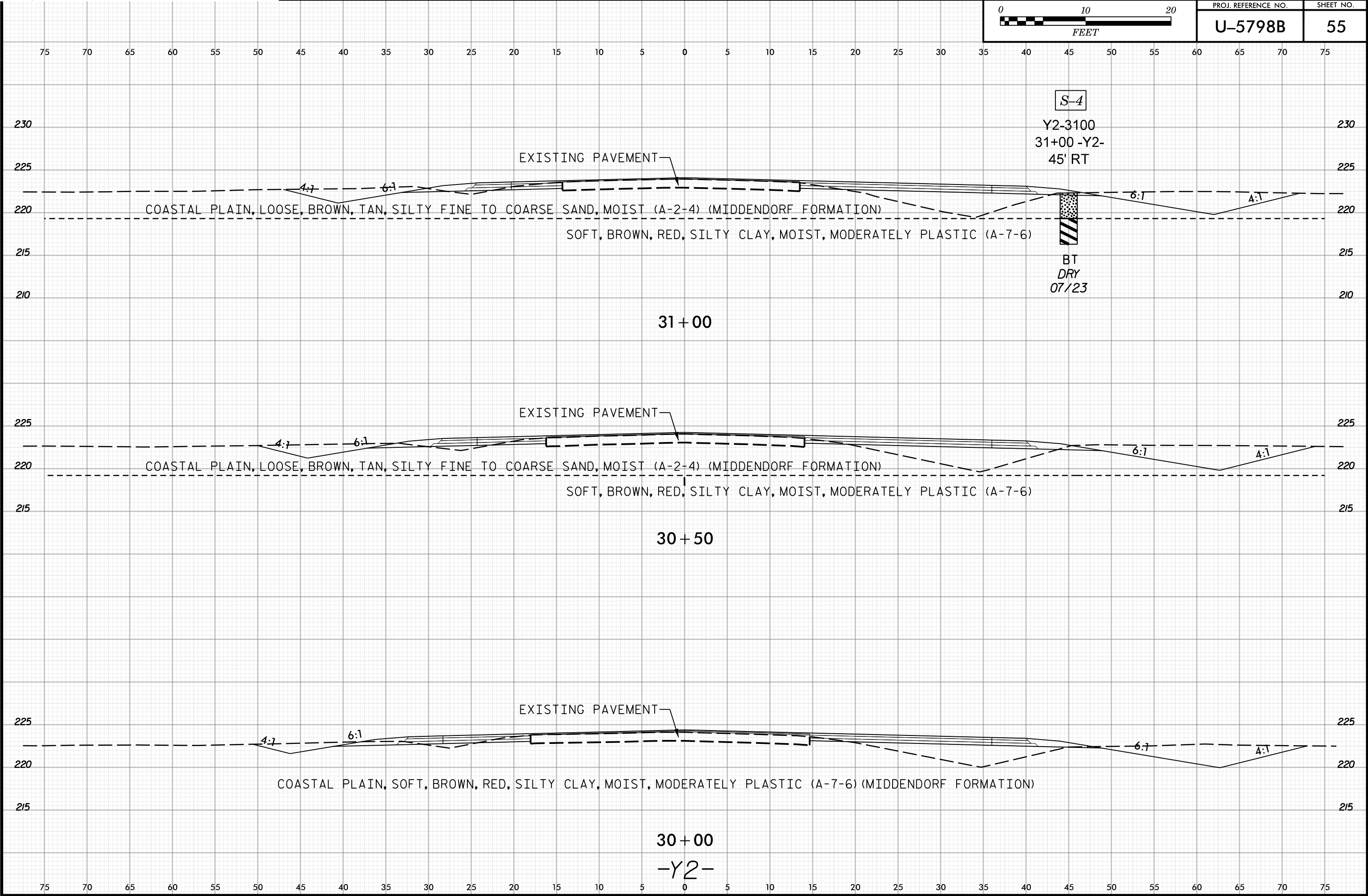




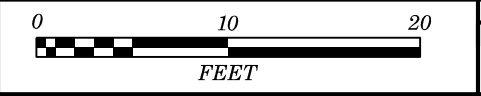




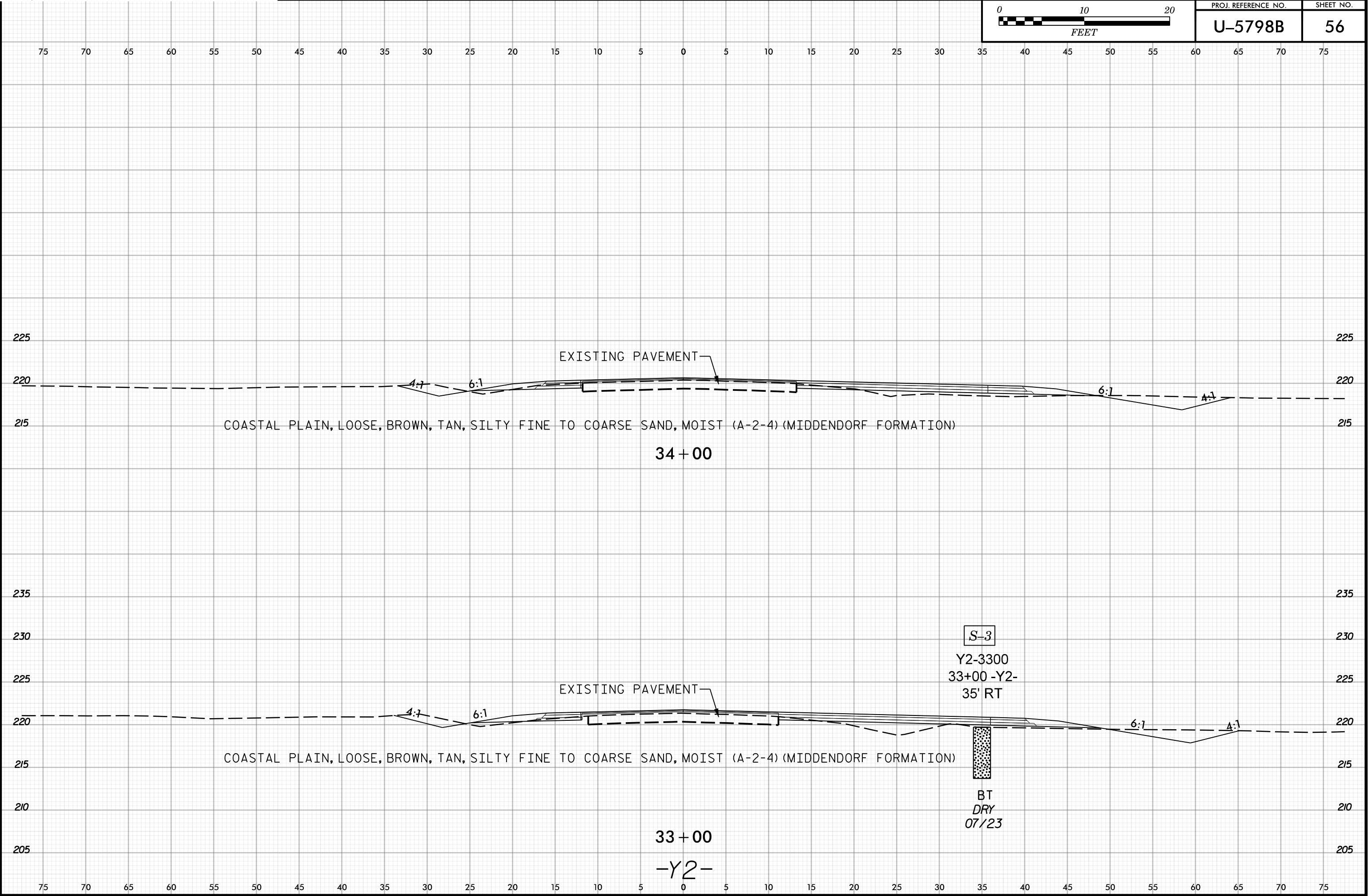
| PROJ. REFERENCE NO. | SHEET NO. |
|---------------------|-----------|
| U-5798B             | 55        |

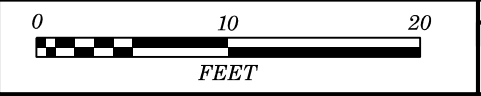




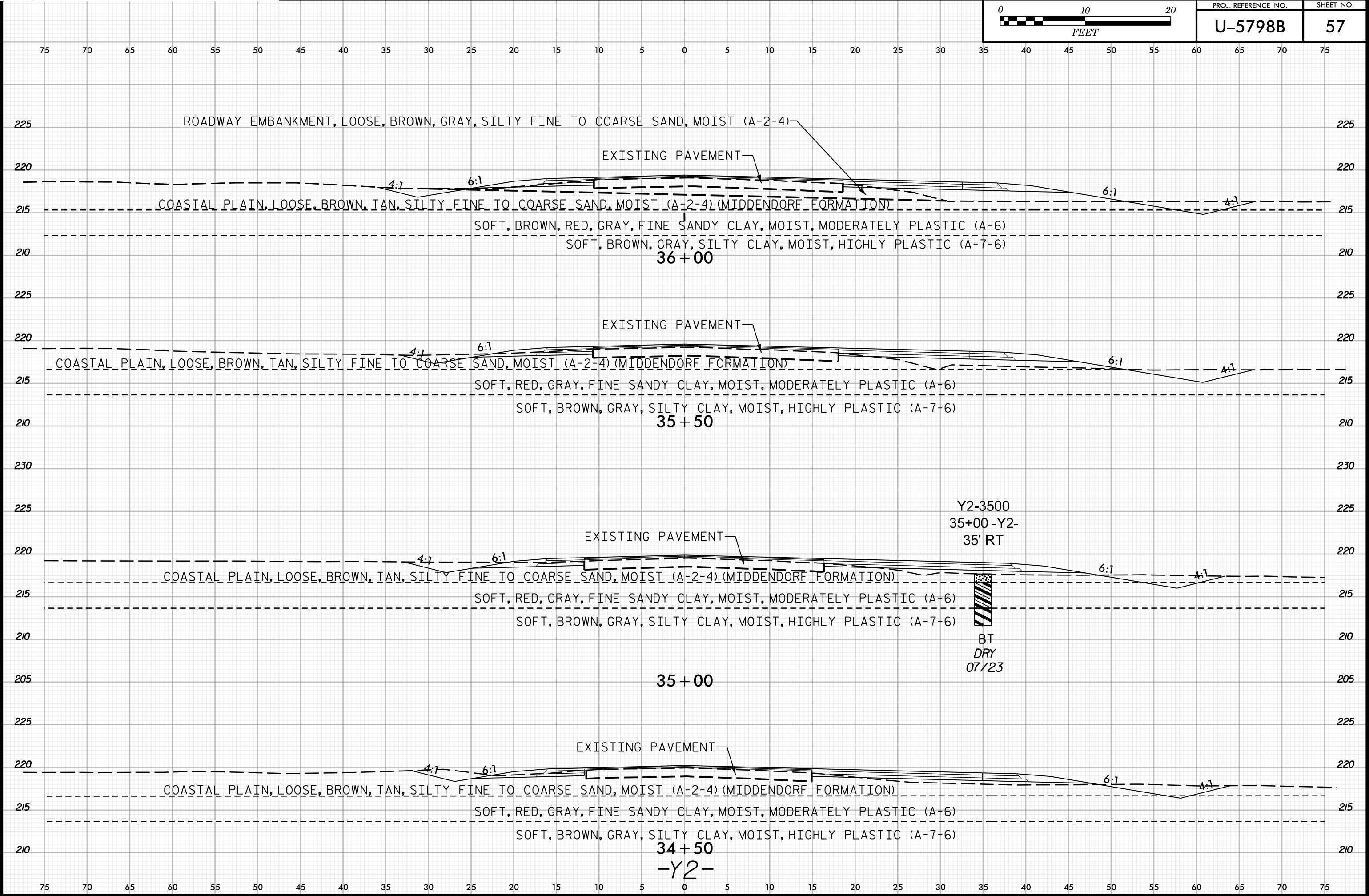


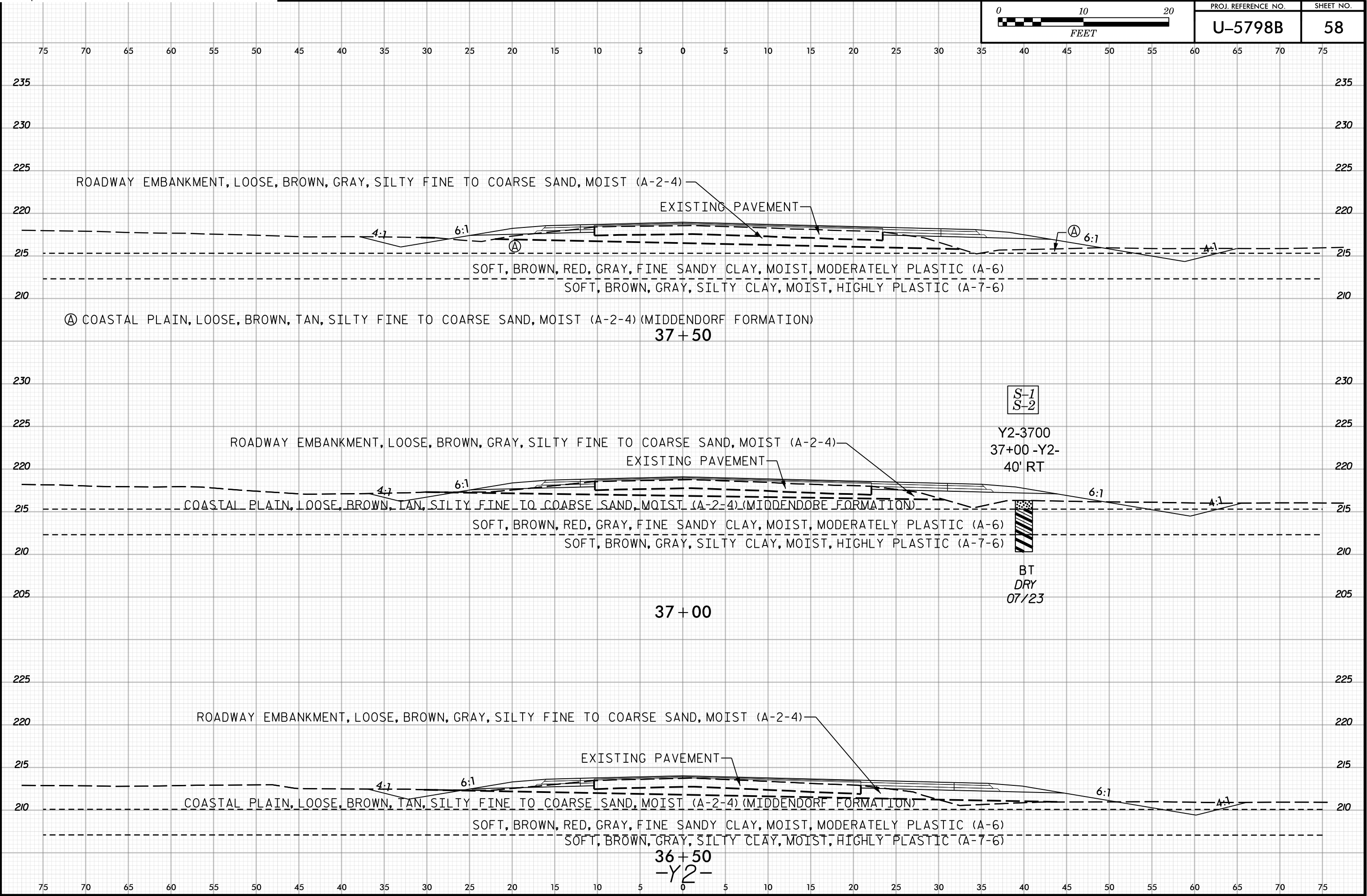
| PROJ. REFERENCE NO. | SHEET NO. |
|---------------------|-----------|
| U-5798B             | 56        |



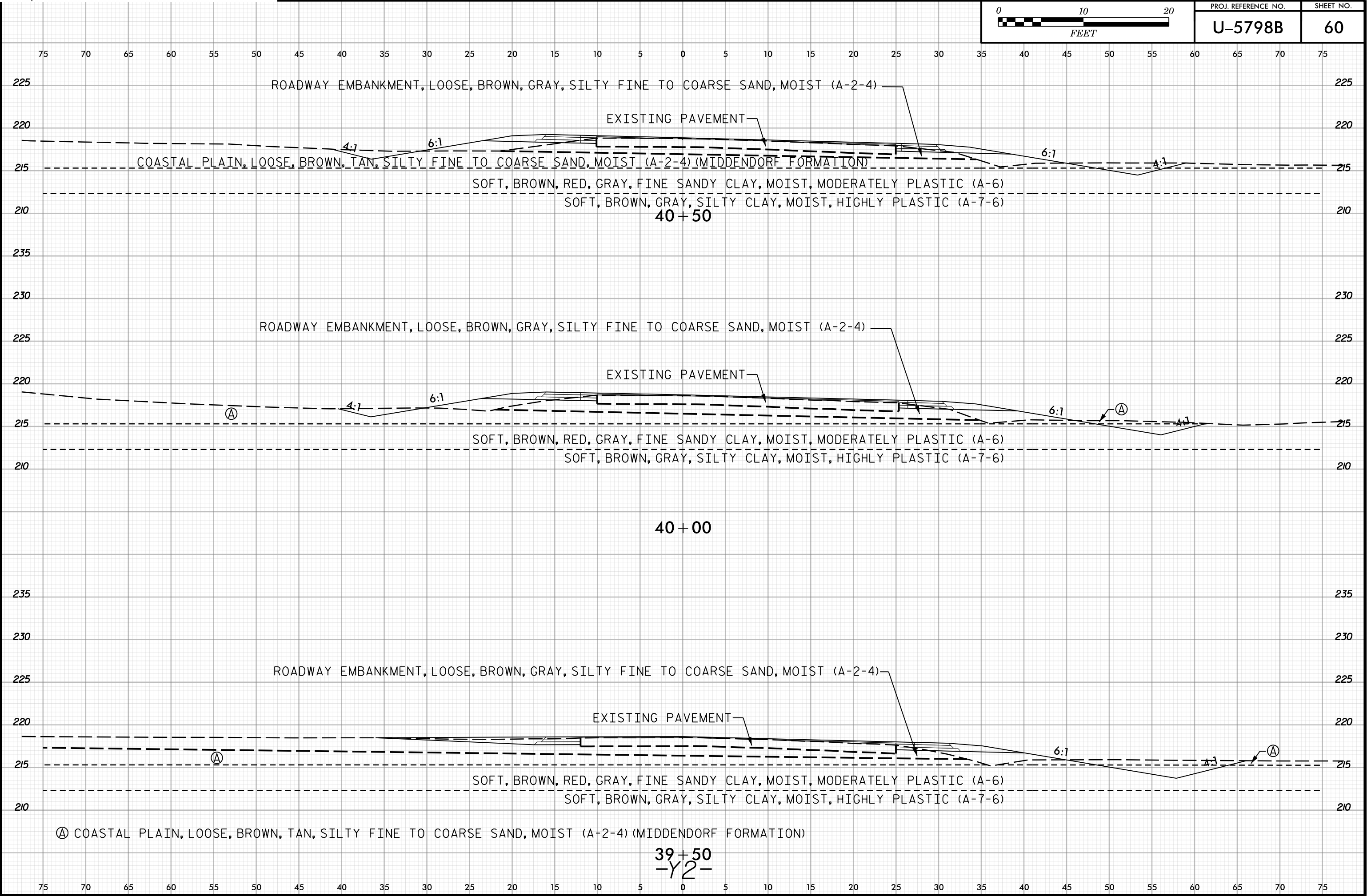


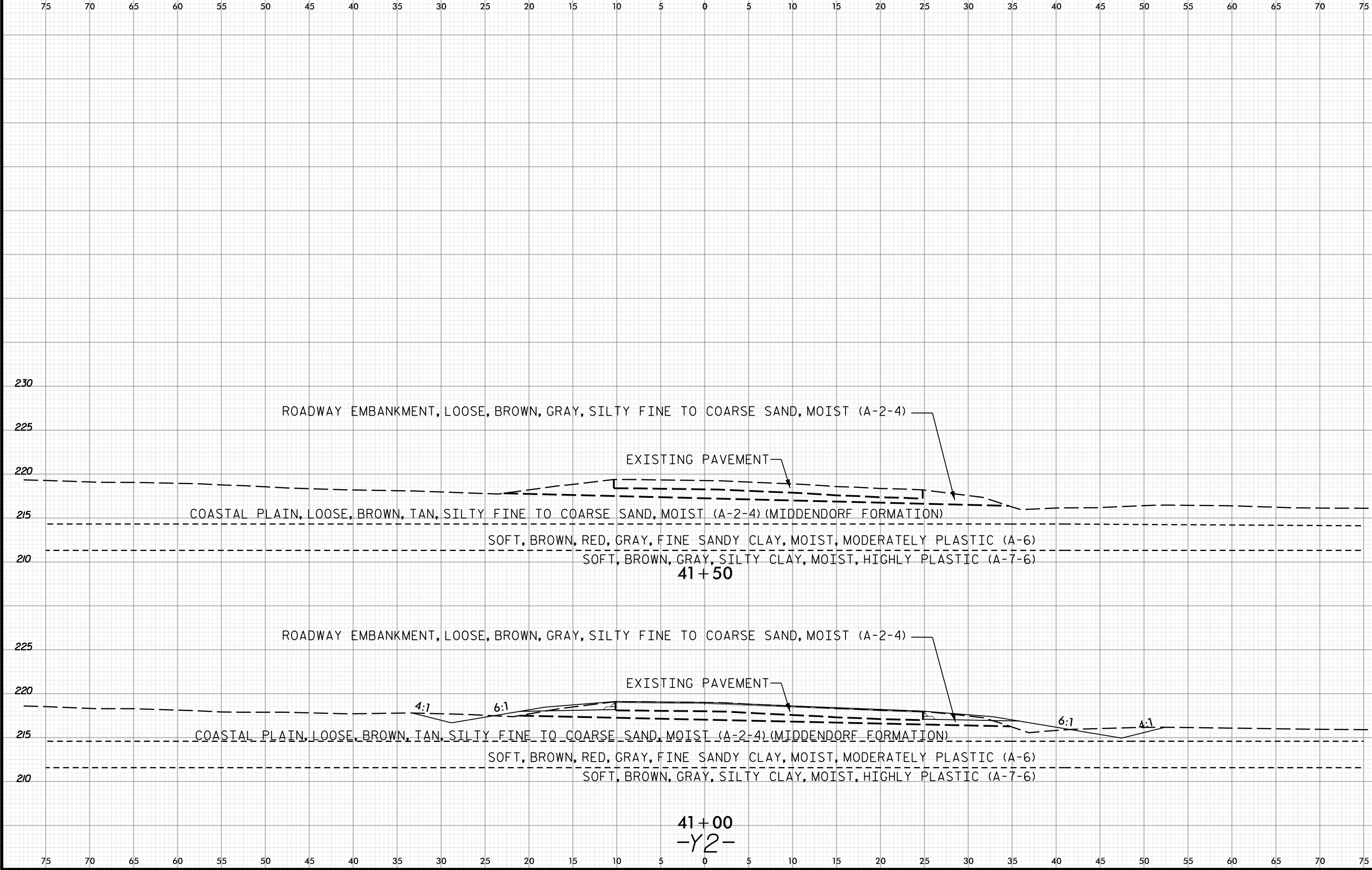
| PROJ. REFERENCE NO. | SHEET NO. |
|---------------------|-----------|
| U-5798B             | 57        |













REFERENCE: U-5798B

PROJECT: 44369

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

APPENDIX A  
LABORATORY TESTING SUMMARY

**PROJECT NUMBER:** 44369.1.3 **TIP:** U-5798B **COUNTY:** Cumberland/ Hoke

|                     |                                                                                                                  |
|---------------------|------------------------------------------------------------------------------------------------------------------|
| <b>DESCRIPTION:</b> | 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