

REFERENCE: R-5719

PROJECT: 50473

SEE SHEET 3 FOR PLAN SHEET LAYOUT  
AT TIME OF INVESTIGATION

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5719	1	65

**ROADWAY**  
**SUBSURFACE INVESTIGATION**

COUNTY WAYNE  
PROJECT DESCRIPTION DIVISION 4 - US 117 AND  
SR 1135 (COUNTRY CLUB ROAD) INTERCHANGE

**INVENTORY**

**CONTENTS**

LINE	STATION	PLAN	PROFILE
-L-	10+00 TO 68+00	4 TO 8	11 TO 15
-RAMP A-	10+00 TO 25+12	7, 9	16
-RAMP B-	10+00 TO 29+94	5, 6, 9	17
-RAMP C-	10+00 TO 26+24	5, 6, 10	18
-RAMP D-	10+00 TO 29+55	7, 8, 10	19
-Y I-	10+00 TO 26+35	6, 9, 10	20

**CROSS SECTIONS**

LINE	STATION	SHEETS
-L-	10+00 TO 25+00	21 TO 28
-L-	37+00	29
-L-	38+00	30
-L-	40+00	31
-L-	42+00	32
-L-	57+50 TO 68+00	32 TO 38
-RAMP A-	23+50 TO 24+50	39
-RAMP B-	10+00 TO 14+50	40 TO 43
-RAMP C-	10+00 TO 14+00	44 TO 47
-RAMP C-	23+50 TO 25+50	48 TO 49
-RAMP D-	26+50 TO 29+00	50 TO 52
-Y I-	11+00 TO 14+50	53 TO 55
-Y I-	16+00 TO 19+50	55 TO 58
-Y I-	24+00 TO 26+00	59 TO 60

**APPENDICES**

APPENDIX	TITLE	SHEETS
A	LABORATORY RESULTS	61 TO 62
B	CPT LOGS	63 TO 65

**CAUTION NOTICE**

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

- NOTES:
- 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

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LEE, D. K.  
LEE, S.  
ALEXANDER, M. J.

INVESTIGATED BY TERRACON CONSULTANTS  
DRAWN BY ALEXANDER, M. J.  
CHECKED BY RIGGS, A. F.  
SUBMITTED BY TERRACON CONSULTANTS  
DATE JANUARY 2017



SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

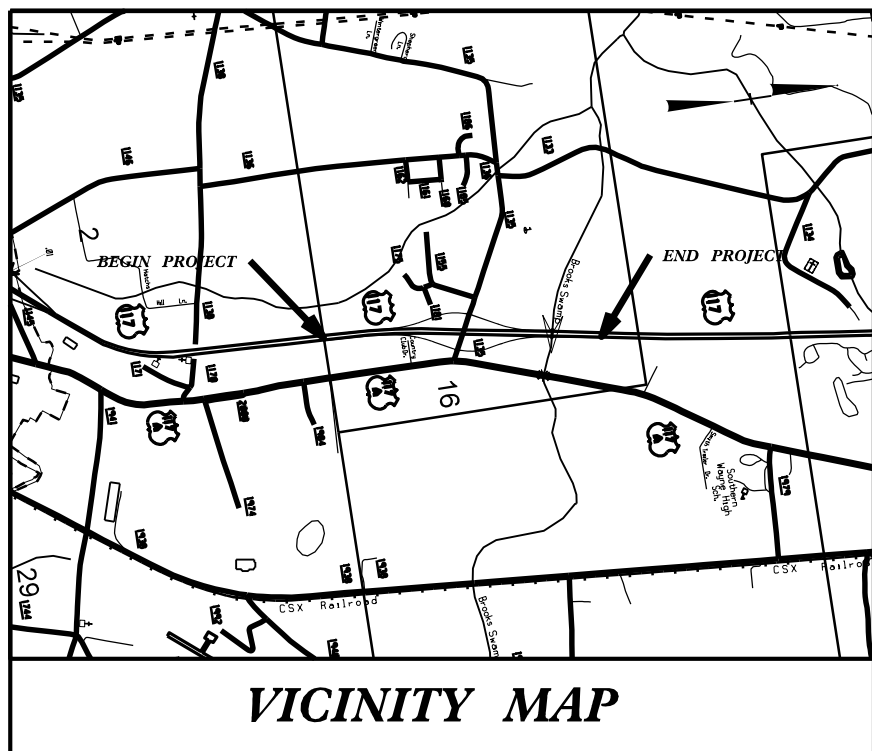
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UNLESS ALL SIGNATURES COMPLETED**

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NC REGISTERED FIRM: F-0869

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

Table with multiple columns: SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, TERMS AND DEFINITIONS, SOIL LEGEND AND AASHTO CLASSIFICATION, MINERALOGICAL COMPOSITION, COMPRESSIBILITY, PERCENTAGE OF MATERIAL, GROUND WATER, MISCELLANEOUS SYMBOLS, RECOMMENDATION SYMBOLS, ABBREVIATIONS, EQUIPMENT USED ON SUBJECT PROJECT, FRACTURE SPACING, BEDDING, INDURATION, PLASTICITY, COLOR.

**TIP PROJECT: R-5719**



**VICINITY MAP**

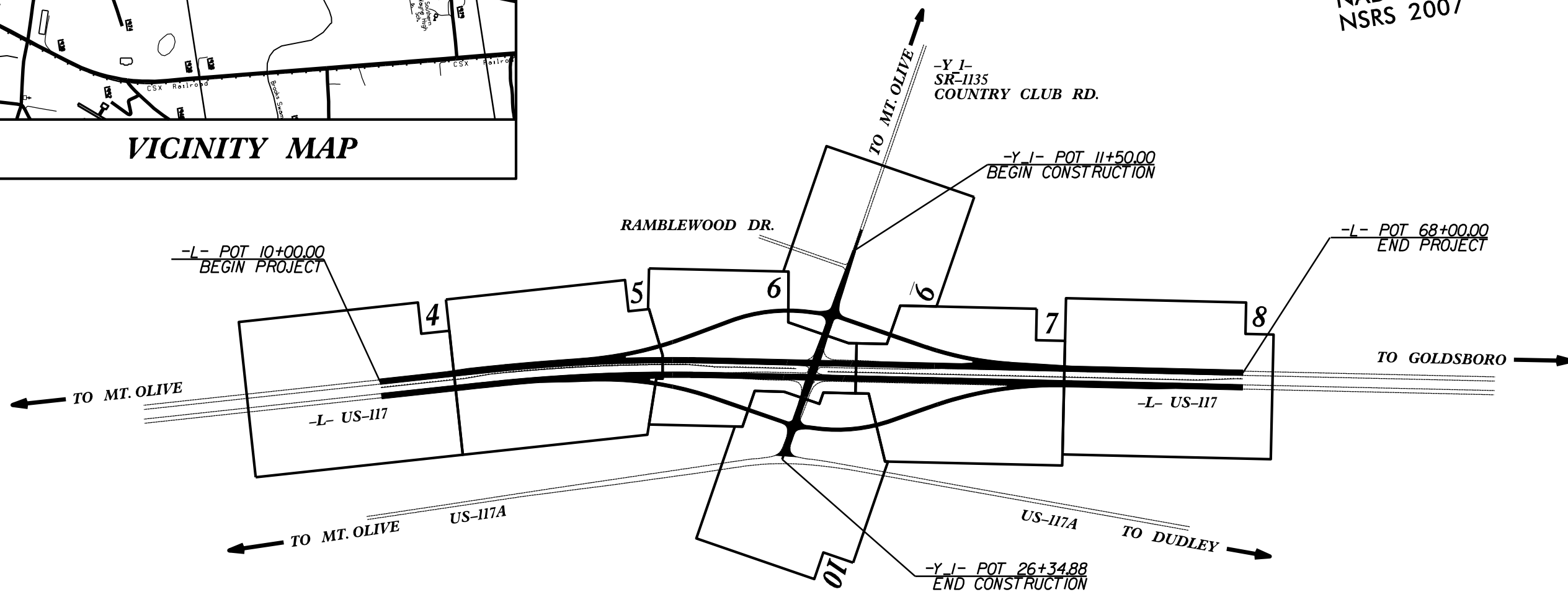
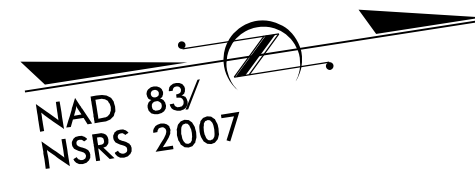
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**WAYNE COUNTY**

**LOCATION: US-117 AND SR-1135 (COUNTRY CLUB RD.) INTERCHANGE**

**TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURE**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5719	3	65
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
50473.1.FD1		PE	



THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES  
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III  
THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

**INCOMPLETE PLANS**  
DO NOT USE FOR R/W ACQUISITION  
**PRELIMINARY PLANS**  
DO NOT USE FOR CONSTRUCTION

**CONTRACT:**

<p><b>GRAPHIC SCALES</b></p> <p>0 50 100 PLANS</p> <p>0 50 100 PROFILE (HORIZONTAL)</p> <p>0 10 20 PROFILE (VERTICAL)</p>	<p><b>DESIGN DATA</b></p> <p>ADT 2015 = 14400 ADT 2040 = 27700 K = 9 % D = 55 % T = 11 % * V = 70 MPH</p> <p>*TTST=8% DUAL=3%</p>	<p><b>PROJECT LENGTH</b></p> <p>LENGTH ROADWAY TIP PROJECT R-5719 = 1.076 MI LENGTH STRUCTURE TIP PROJECT R-5719 = 0.022 MI TOTAL LENGTH TIP PROJECT R-5719 = 1.098 MI</p>	<p>Prepared in the Office of: <b>DIVISION OF HIGHWAYS</b> 1000 Birch Ridge Dr., Raleigh NC, 27610</p> <p>2012 STANDARD SPECIFICATIONS</p> <p>RIGHT OF WAY DATE: AUGUST 2016</p> <p>LETTING DATE: JUNE 2017</p> <p>T.M. LITTLE, PE PROJECT ENGINEER</p> <p>D.R. ETHRIDGE PROJECT DESIGN ENGINEER</p>	<p>HYDRAULICS ENGINEER</p> <p>SIGNATURE: _____ P.E.</p> <p>ROADWAY DESIGN ENGINEER</p> <p>SIGNATURE: _____ P.E.</p>	
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Date: January 2017  
 WBS Number: 50473  
 TIP Number: R-5719  
 County: Wayne  
 Description: US 117 and SR 1135 (Country Club Road) Interchange Improvements

**Subject: Roadway Geotechnical Report - Inventory**

**Project Description**

The project is located along the existing US 117 corridor between Goldsboro and Mt. Olive in Wayne County. On US 117 (-L-), the project begins approximately 0.6 miles south of the existing at-grade intersection of US 117 and SR 1135 (-Y1-) and continues north along US 117 for approximately 1.1 miles. The -L- alignment is proposed to cross over the -Y1- alignment on dual single-span structures. The proposed interchange also includes ramps in all four quadrants of the interchange on new location. On SR 1135 (-Y1-), the project begins approximately 0.2 miles west of the existing intersection and continues east for approximately 0.3 miles. The -Y1- alignment is proposed to remain in the same location and at nearly the same grade. The project corridor is in a rural setting and much of the surrounding land is undeveloped.

The geotechnical subsurface investigation was performed from January through May of 2016. Standard penetration test (SPT) borings were advanced using Diedrich D-50 and Acker Renegade rotary drill rigs equipped with recently calibrated automatic hammers. SPT borings were advanced utilizing wash boring and hollow stem auger drilling techniques to advance the borings to the necessary depths. 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. Two Shelby tube samples were taken near the proposed structures for consolidation testing. Laboratory testing was performed in general accordance with the AASHTO specifications. In addition to the soil test borings performed along the corridor, a Pagani TG73-200 rig was utilized to perform four cone penetrometer (CPT) soundings. Supplemental hand auger borings were performed during October 2016. Excavated soils were visually classified in the field by a trained geologist. Select representative samples were submitted for laboratory analysis by Terracon’s soil testing laboratory.

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

<u>Alignment</u>	<u>Stations</u>
-L-	10+00 to 68+00
-RAMP A-	10+00 to 25+12
-RAMP B-	10+00 to 29+94
-RAMP C-	10+00 to 26+24
-RAMP D-	10+00 to 29+55
-Y 1-	10+00 to 26+35

**Physiography and Geology**

The site is located within the Inner Coastal Plain Physiographic and Geologic Province of North Carolina in Wayne County. The Coastal Plain Province is characterized by subdued topographic features. The existing elevations along the investigated corridor range from approximately 125 feet to 150 feet. In general, the topography at this site is slightly rolling with gentle slopes.

The project is located in the Inner Coastal Plain Physiographic Province with geology consisting of a wedge of unconsolidated sands, silt, and 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 the Cretaceous age Black Creek Formation. However, based on our site visit and subsurface conditions encountered, the near surface soils appear to be recent Coastal Plain deposits of alluvial origin and are consistent with interbedded sands, clayey sands and clays typical of Undivided Coastal Plain soils. This type of deposition has resulted in a highly variable subsurface profile along the project alignments. The Undivided Coastal Plain deposits overlie the denser, darker soils belonging to the Black Creek Formation. The Black Creek Formation soils are described as gray to black lignitic clay with thin beds and laminae of fine-grained micaceous sand and contains thin beds and laminae of fine-grained micaceous sand and thick lenses of cross-bedded sand. Glauconitic, fossiliferous clayey sand lenses are common in the upper part.

**Soil Properties**

Soils encountered during this investigation are separated into three categories based on their origin. The soils encountered consist of roadway embankment fill, Undivided Coastal Plain deposited soils and Formational soils.

Roadway embankment soils were encountered at the following approximate locations:

<u>Alignment</u>	<u>Stations</u>
-L-	10+00 to 16+50
-L-	18+23 to 21+26
-L-	48+79 to 68+00
-RAMP A-	10+00 to 14+40
-RAMP B-	10+00 to 10+30
-RAMP D-	10+00 to 15+79

The roadway embankment soils encountered appear to be derived from the nearby existing cuts along the -L- alignment. The roadway embankment soils predominately consist of medium stiff to very stiff, moist to wet, sandy clay (A-6) and medium stiff, moist, highly plastic silty clay (A-7-6). Some loose, moist, silty sand (A-2-4) was also encountered in the borings advanced through the existing roadway embankments.

Roadway embankment fill consisting of moderately plastic sandy clay (A-6) and moderately to highly plastic silty clay (A-7-6) was encountered along -L- between 10+00 and 16+50, 18+20 and 21+35, and from 57+50 to 68+00. In general, the cohesive roadway embankment soil extends to boring termination depths ranging



from 4 to 10 feet. The plasticity indices of the cohesive roadway embankment soils range from 16 to 31 based on laboratory testing.

A majority of existing US 117 through the project was cut below natural ground. Therefore, Undivided Coastal Plain deposits are present at the surface and beneath the roadway embankment soils and asphalt pavement sections. The Undivided Coastal Plain soils can be generalized as alternating layers of silt, clay, and sand extending to the maximum depths of exploration. The near surface Undivided Coastal Plain deposits along the -L-, -RAMP-, and -Y 1- alignments are generally medium stiff to stiff and consists of moist to wet, sandy silt (A-4), sandy clay (A-6) and moderately to highly plastic silty clay (A-7-6). These cohesive soils were encountered at or near the existing ground surface on a majority of the project. The cohesive soils are interbedded with laterally discontinuous, saturated, very loose to medium dense, silty and clayey sand (A-2-4 and A-2-6, respectively). The Undivided Coastal Plain soils encountered deeper than approximately 10 feet below existing grades were generally very soft to soft cohesive soils and very loose to loose granular soils which extend to the top of the Black Creek Formation.

Undivided Coastal Plain soils consisting of moderately plastic sandy clay (A-6) and moderately to highly plastic silty clay (A-7-6) were encountered at or near the existing ground surface between -L- 16+50 and 24+30. The plasticity indices of the cohesive soils range from 17 to 23 based on laboratory testing. The cohesive soils extend to approximately 10 feet below existing grades and are underlain by saturated, very loose to medium dense silty to clayey sand (A-2-4 and A-2-6, respectively) and fine sand (A-3) based on borings advanced to 15 feet below the existing ground surface.

Undivided Coastal Plain soils consisting of moderately plastic sandy clay (A-6) was encountered near the existing ground surface on -RAMP A- between 23+55 and 25+12 or existing SR 1135. The moderately plastic sandy clay extends to a depth of approximately 2 feet below existing grades and is underlain by moist and loose fine sand (A-3).

The Undivided Coastal Plain soils consisting of moderately plastic sandy clay encountered on the -L- alignment continue along the -RAMP B- and -RAMP C- alignments. Moderately plastic sandy clay was encountered near the existing ground surface between -RAMP B- 10+00 and 14+50 and on -RAMP C- between 10+00 and 14+00. Plasticity indices for these soils ranged from 20 to 23 based on laboratory testing.

Undivided Coastal Plain soils consisting of slightly to moderately plastic sandy clay (A-6) were encountered near proposed grade on -RAMP C- between 23+50 and 25+15. The slightly to moderately plastic sandy clay is underlain by soft to medium stiff, moist to wet, sandy silt (A-4).

Undivided Coastal Plain soils consisting of slightly to moderately plastic sandy clay (A-6) and highly plastic silty clay (A-7-6) were encountered on -RAMP D- between 26+70 and 29+30 near existing SR 1135. The sandy clay was encountered near the surface and transitions to highly plastic silty clay at depths of approximately 3 to 5 feet below existing grades between -RAMP D- 26+66 and 29+30. The plasticity indices of the cohesive soils range from 15 to 35 based on laboratory testing.

Undivided Coastal Plain soils consisting of moderately plastic sandy clay (A-6) was encountered along the -Y 1- alignment between 10+00 and 14+05. The cohesive soils extended to hand auger termination depth of 4 feet below the existing ground surface. Moderately plastic sandy clay (A-6) and highly plastic silty clay (A-7-6) were encountered along -Y 1- between 17+00 and 21+00. The cohesive soils extend to hand auger termination depth of 4 feet along -Y 1- although the borings along -L- encountered very loose to loose, saturated silty sand (A-2-4) approximately 18 feet below the existing ground surface. Moderately plastic sandy clay (A-6) and highly plastic silty clay (A-7-6) were encountered near the existing ground surface between 23+50 and 25+50. Some of this area coincides with the -RAMP C- and -RAMP D- alignments. The cohesive soils extend to boring termination depths ranging from 4 to 10 feet. The moderately plastic sandy clay and highly plastic silty clay are interbedded with sandy silt (A-4).

Formational soils of the Black Creek Formation were encountered in the deep borings along the -L- alignment between Elevation 94 and 60 feet. These soils are characterized by their black to gray color and consist of layers of loose to dense, saturated, silty to clayey sands (A-2-4 and A-2-6).

#### Groundwater

In general, the corridor drains to Brooks Swamp to the north and Lee Branch to the west. Groundwater was encountered during drilling and sampling along the -L- and -RAMP- alignments at depths ranging from 4 to 13 feet below existing grades. Groundwater was not encountered within 6 feet of proposed grades in the borings performed at the site. The depth of groundwater, beneath the ground surface, will fluctuate with seasonal precipitation and may occur a higher levels at other times of the year above less permeable clayey soils.

#### Areas of Special Geotechnical Interest

- 1) Plastic Soils - Moderately to highly plastic soils with plastic indices (PI) of 16 and greater were encountered near proposed subgrade at the following locations:

<u>Alignment</u>	<u>Stations</u>
-L-	10+00 to 24+30
-L-	57+75 to 68+00
-RAMP A-	23+75 to 24+92
-RAMP B-	10+00 to 13+15
-RAMP C-	10+00 to 13+70
-RAMP C-	23+90 to 25+05
-RAMP D-	26+70 to 29+30
-Y 1-	11+50 to 14+00
-Y 1-	17+00 to 21+00
-Y 1-	23+50 to 25+50

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

**UNDISTRUBED SAMPLES**

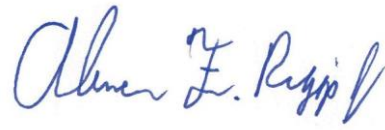
The following "Shelby" tube samples were taken to provide data for the in-situ strength of the soil.

<u>Sample No.</u>	<u>Location</u>	<u>Offset</u>	<u>Depth (ft.)</u>	<u>Test</u>
ST-1	38+83 -L-	68 ft. Left	13.5 - 15.0	Consolidation
ST-2	39+50 -L-	80 ft. Right	15.0 - 17.4	Consolidation


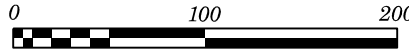
Sincerely,  
Terracon Consultants, Inc.



Matthew J. Alexander, PE  
Project Geotechnical Engineer

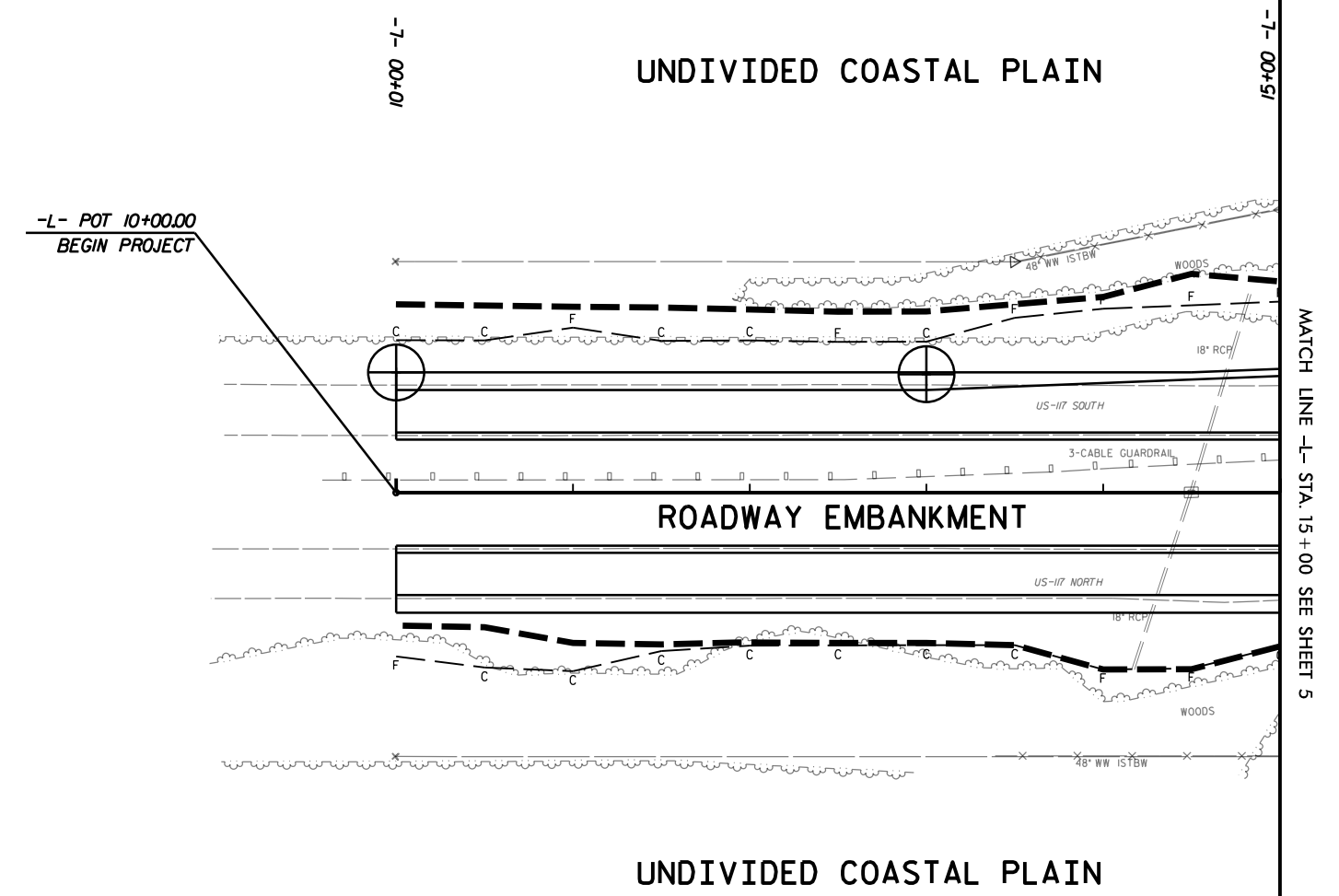


Abner F. Riggs, Jr., PE  
Senior Geotechnical Engineer

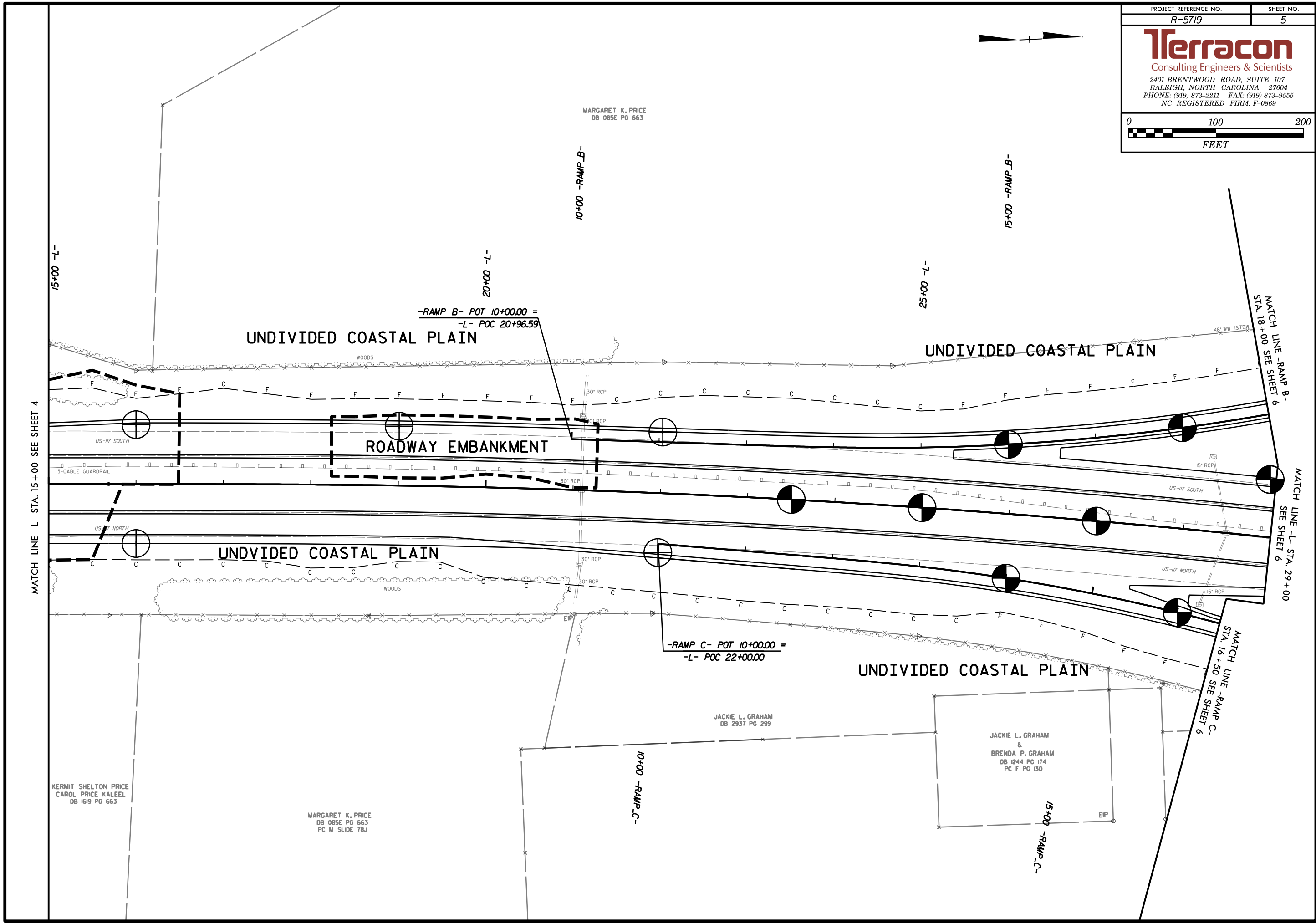
PROJECT REFERENCE NO. <i>R-5719</i>	SHEET NO. <b>4</b>
 <b>Terracon</b> Consulting Engineers & Scientists 2401 BRENTWOOD ROAD, SUITE 107 RALEIGH, NORTH CAROLINA 27604 PHONE: (919) 873-2211 FAX: (919) 873-9555 NC REGISTERED FIRM: F-0869	
 <b>FEET</b>	

KERMIT SHELTON PRICE  
CAROL PRICE KALEEL  
DB 1619 PG 663

**UNDIVIDED COASTAL PLAIN**



KERMIT SHELTON PRICE  
CAROL PRICE KALEEL  
DB 1619 PG 663



MARGARET K. PRICE  
DB 085E PG 663

-RAMP B- POT 10+00.00 =  
-L- POC 20+96.59

-RAMP C- POT 10+00.00 =  
-L- POC 22+00.00

JACKIE L. GRAHAM  
DB 2937 PG 299

JACKIE L. GRAHAM  
&  
BRENDA P. GRAHAM  
DB 1244 PG 174  
PC F PG 130

KERMIT SHELTON PRICE  
CAROL PRICE KALEEL  
DB 1619 PG 663

MARGARET K. PRICE  
DB 085E PG 663  
PC M SLIDE 78J

MATCH LINE -L- STA. 15+00 SEE SHEET 4

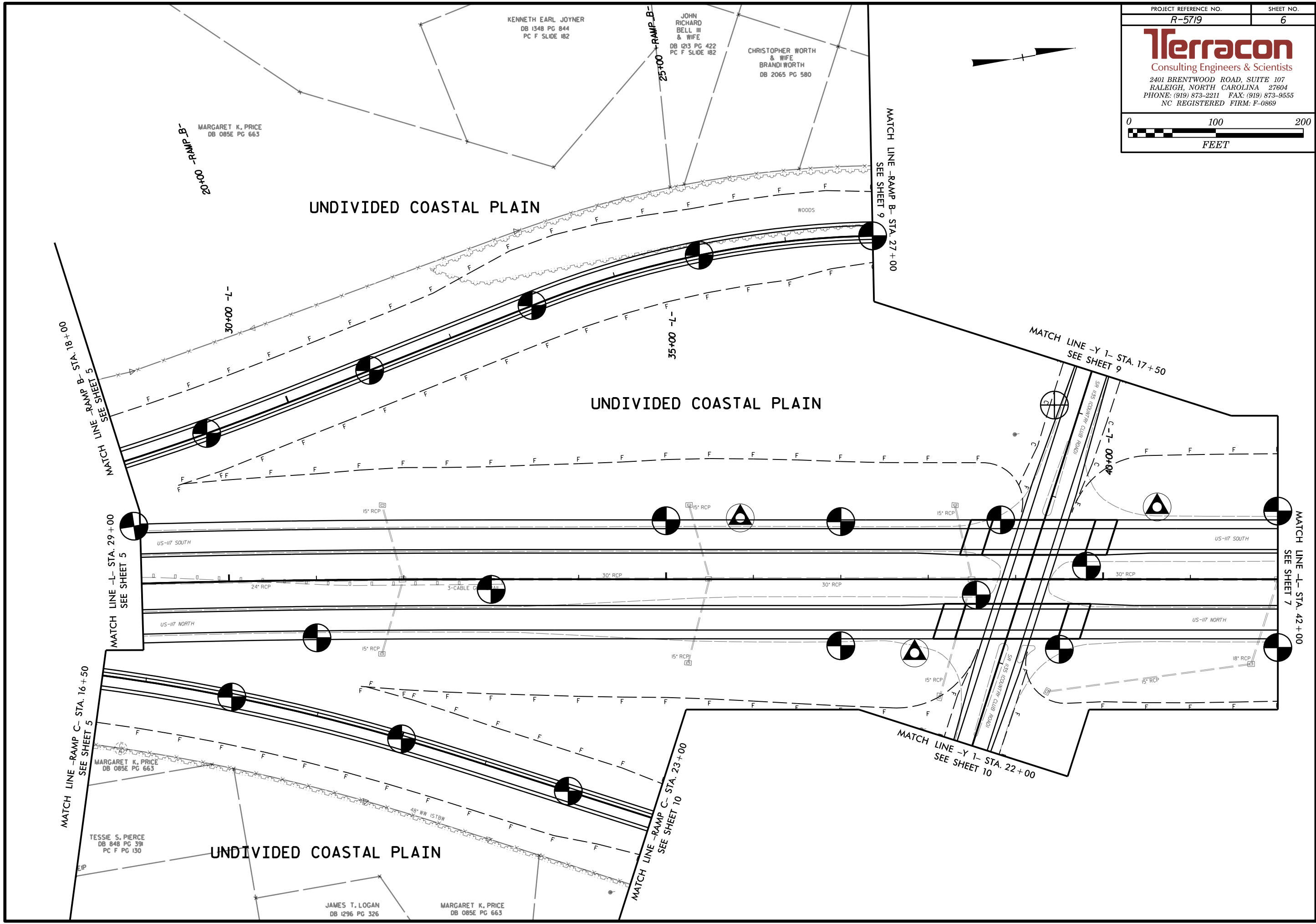
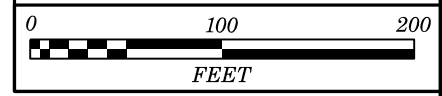
MATCH LINE -RAMP B- STA. 18+00 SEE SHEET 6

MATCH LINE -L- STA. 29+00 SEE SHEET 6

MATCH LINE -RAMP C- STA. 16+50 SEE SHEET 6



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 NC REGISTERED FIRM: F-0869



KENNETH EARL JOYNER  
 DB 1348 PG 844  
 PC F SLIDE 182

JOHN RICHARD BELL III & WIFE  
 DB 1213 PG 422  
 PC F SLIDE 182

CHRISTOPHER WORTH & WIFE  
 BRANDI WORTH  
 DB 2065 PG 580

MARGARET K. PRICE  
 DB 085E PG 663

MARGARET K. PRICE  
 DB 085E PG 663

TESSIE S. PIERCE  
 DB 848 PG 391  
 PC F PG 130

JAMES T. LOGAN  
 DB 1296 PG 326

MARGARET K. PRICE  
 DB 085E PG 663

MATCH LINE -RAMP B- STA. 18+00  
 SEE SHEET 5

MATCH LINE -L- STA. 29+00  
 SEE SHEET 5

MATCH LINE -RAMP C- STA. 16+50  
 SEE SHEET 5

MATCH LINE -RAMP C- STA. 23+00  
 SEE SHEET 10

MATCH LINE -RAMP B- STA. 27+00  
 SEE SHEET 9

MATCH LINE -Y 1- STA. 17+50  
 SEE SHEET 9

MATCH LINE -L- STA. 42+00  
 SEE SHEET 7

MATCH LINE -Y 1- STA. 22+00  
 SEE SHEET 10

UNDIVIDED COASTAL PLAIN

UNDIVIDED COASTAL PLAIN

UNDIVIDED COASTAL PLAIN

30+00 -L-

35+00 -L-

40+00 -L-

WOODS

US-117 SOUTH

US-117 NORTH

US-117 SOUTH

US-117 NORTH

24" RCP

3-CABLE

30" RCP

30" RCP

30" RCP

15" RCP

15" RCP

15" RCP

15" RCP

18" RCP

48" WW 15TBW

(OPEN BIRD ALIGNMENT) SET 1/8"

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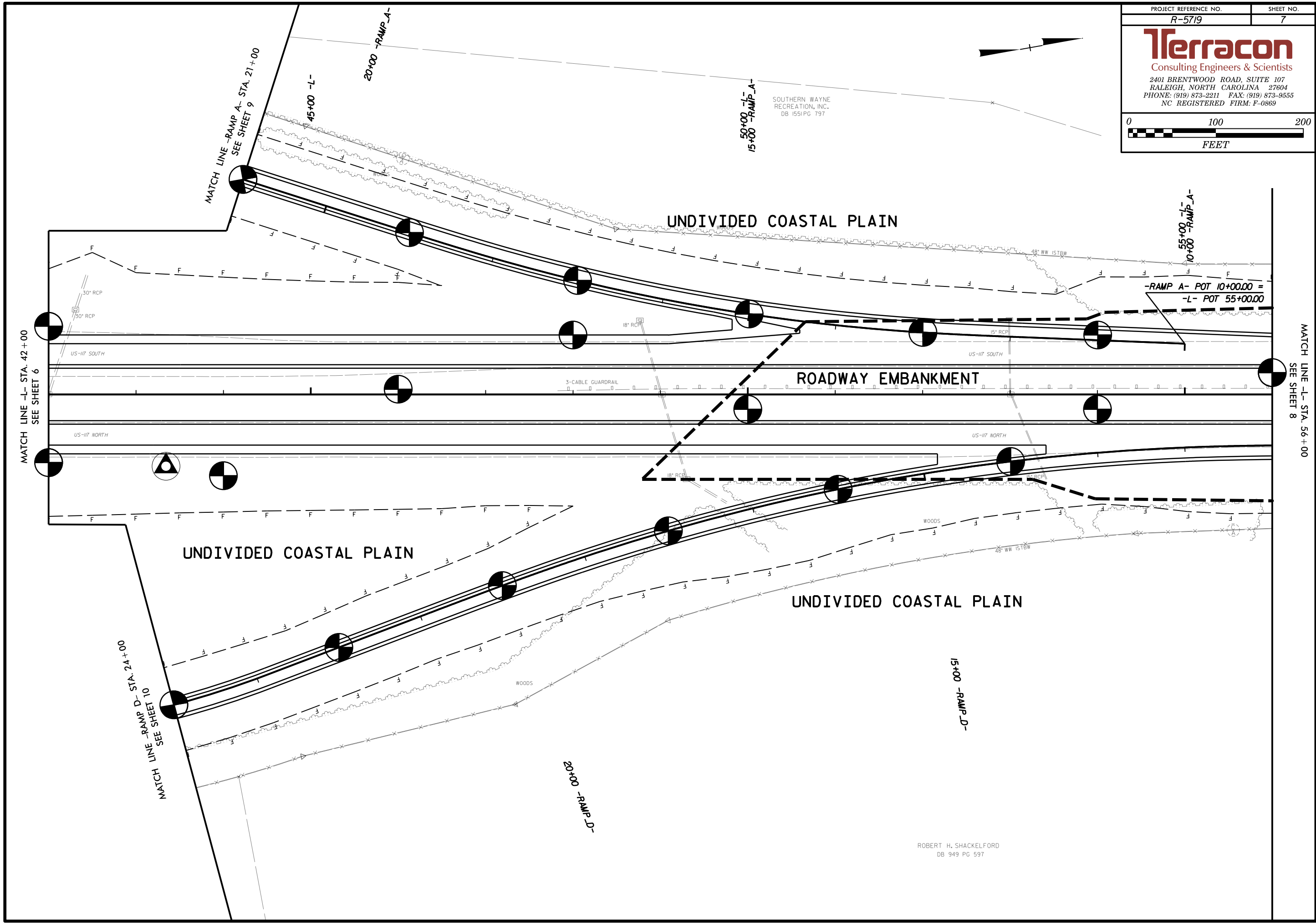
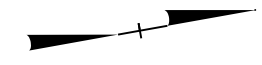
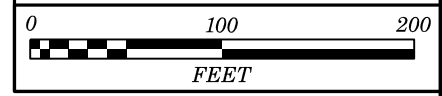
(OPEN BIRD ALIGNMENT) SET 1/8"

(OPEN BIRD ALIGNMENT) SET 1/8"

(OPEN BIRD ALIGNMENT) SET 1/8"

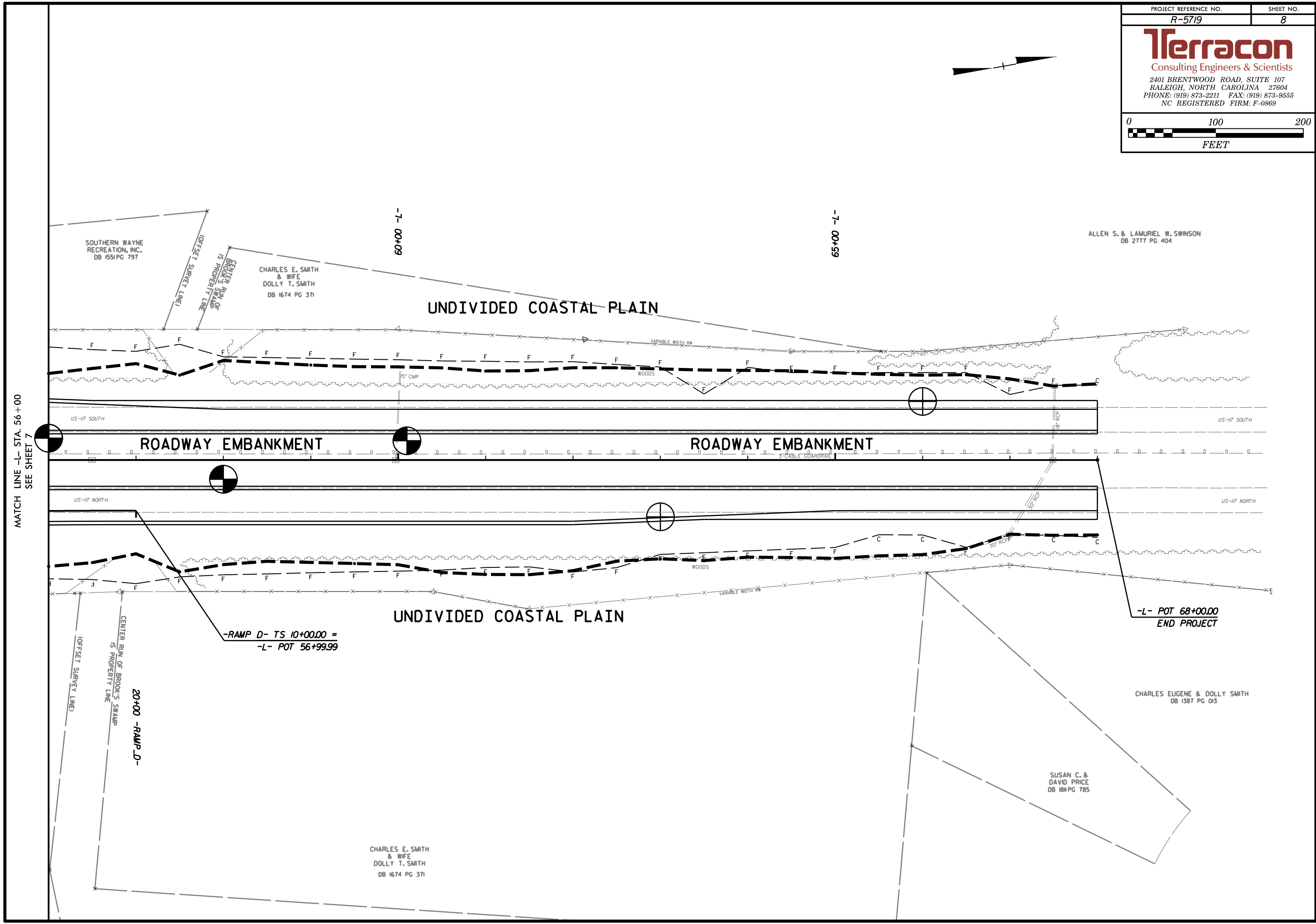
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 NC REGISTERED FIRM: F-0869



SOUTHERN WAYNE  
 RECREATION, INC.  
 DB 1551 PG 797

ROBERT H. SHACKELFORD  
 DB 949 PG 597



MATCH LINE -L- STA. 56+00  
SEE SHEET 7

SOUTHERN WAYNE  
RECREATION, INC.  
DB 1551 PG 797

CHARLES E. SMITH  
& WIFE  
DOLLY T. SMITH  
DB 1674 PG 371

ALLEN S. & LAMURIEL W. SWINSON  
DB 2777 PG 404

ROADWAY EMBANKMENT

ROADWAY EMBANKMENT

US-117 NORTH

US-117 NORTH

US-117 SOUTH

US-117 SOUTH

UNDIVIDED COASTAL PLAIN

-L- POT 68+00.00  
END PROJECT

-RAMP D- TS 10+00.00 =  
-L- POT 56+99.99

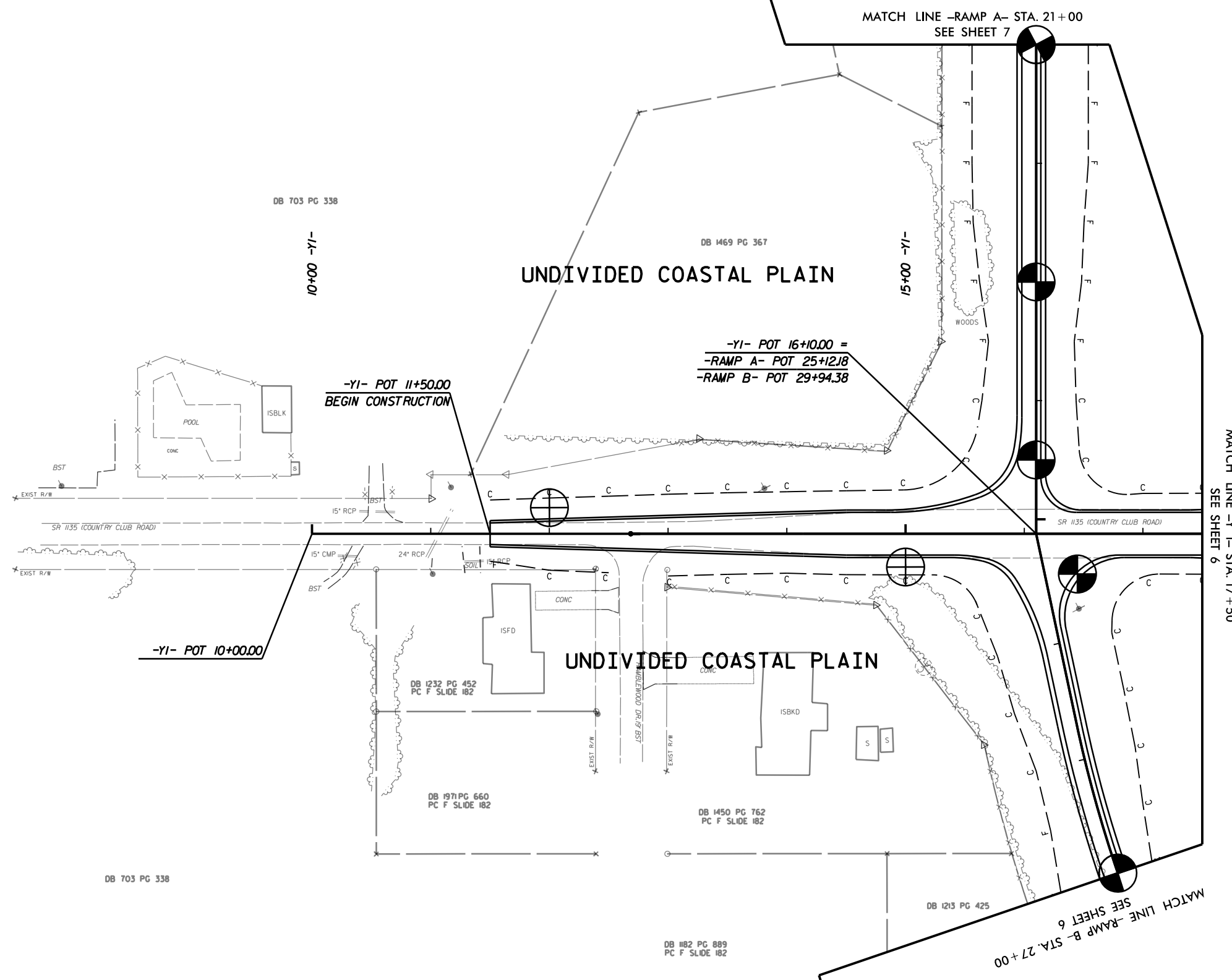
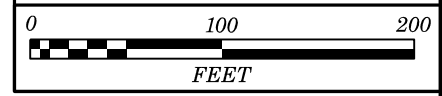
20+00 -RAMP D-

CHARLES EUGENE & DOLLY SMITH  
DB 1387 PG 013

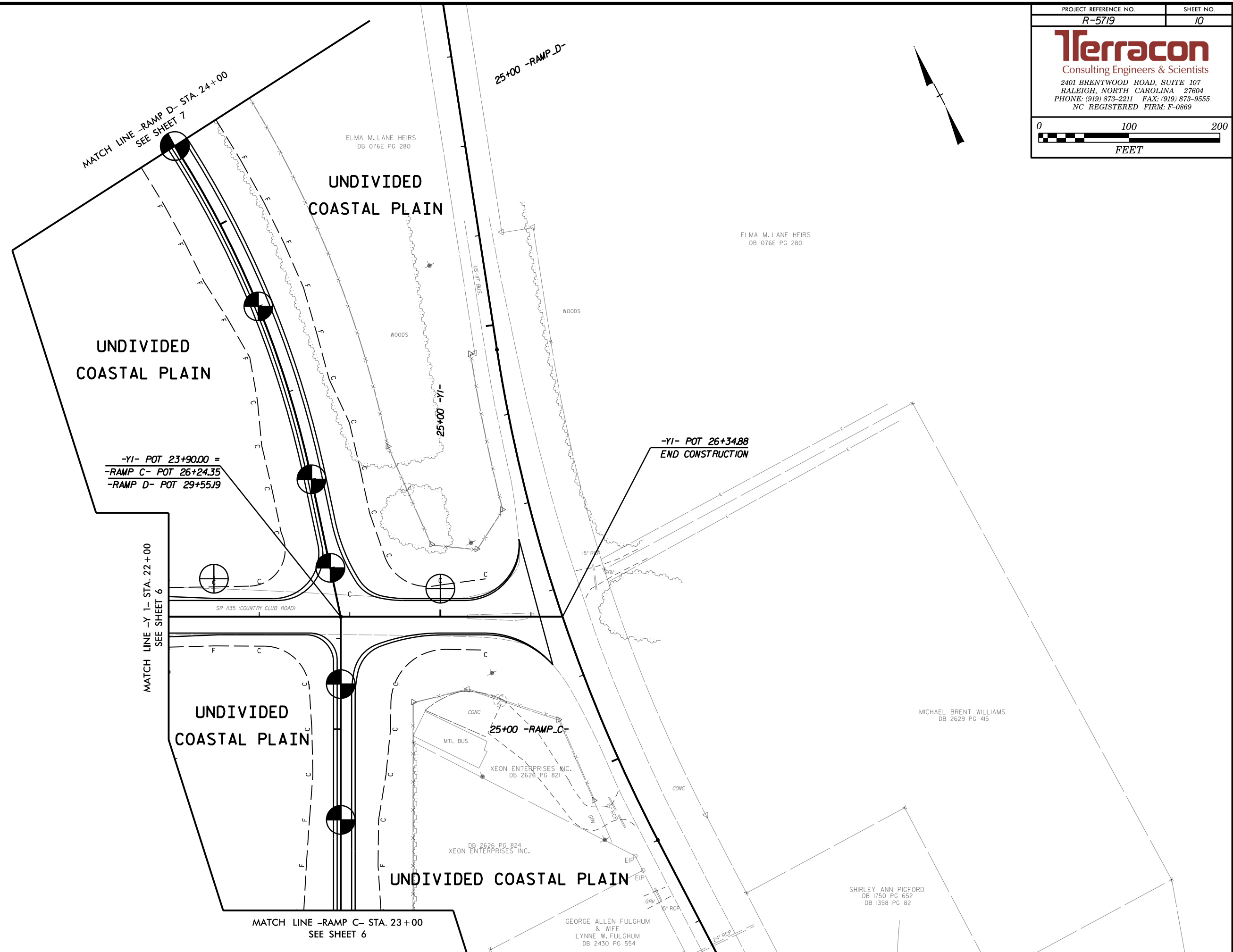
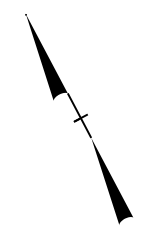
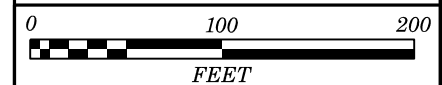
SUSAN C. &  
DAVID PRICE  
DB 1811 PG 785

CHARLES E. SMITH  
& WIFE  
DOLLY T. SMITH  
DB 1674 PG 371

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MATCH LINE -RAMP D- STA. 24+00  
SEE SHEET 7

UNDIVIDED  
COASTAL PLAIN

-YI- POT 23+90.00 =  
-RAMP C- POT 26+24.35  
-RAMP D- POT 29+55.19

MATCH LINE -Y 1- STA. 22+00  
SEE SHEET 6

UNDIVIDED  
COASTAL PLAIN

MATCH LINE -RAMP C- STA. 23+00  
SEE SHEET 6

UNDIVIDED  
COASTAL PLAIN

UNDIVIDED COASTAL PLAIN

25+00 -RAMP\_D-

25+00 -RAMP\_C-

-YI- POT 26+34.88  
END CONSTRUCTION

MICHAEL BRENT WILLIAMS  
DB 2629 PG 415

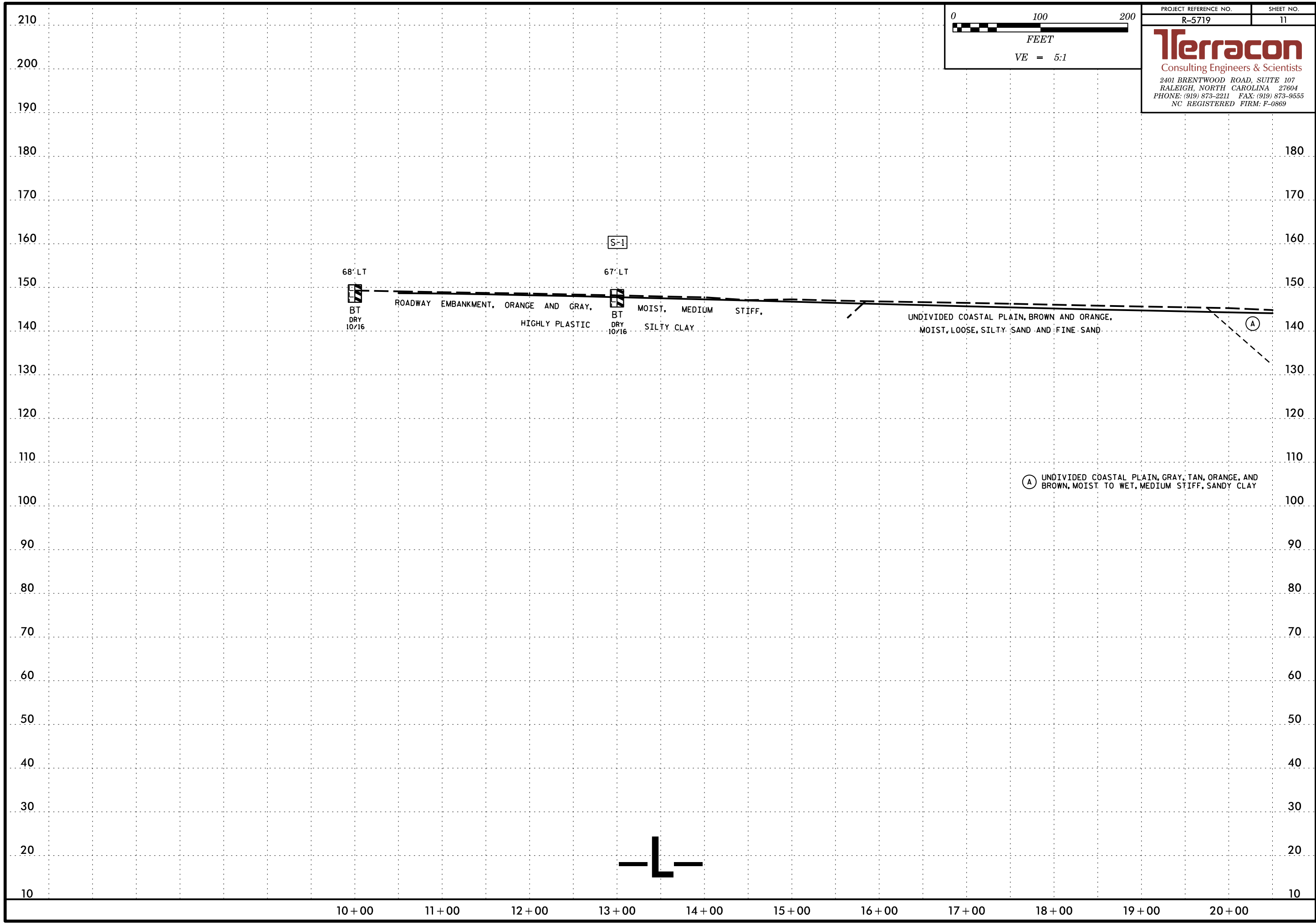
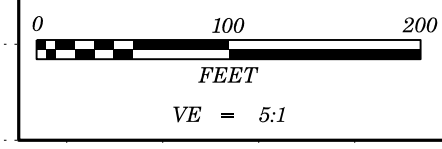
SHIRLEY ANN PIGFORD  
DB 1750 PG 652  
DB 1398 PG 82

GEORGE ALLEN FULGHUM  
& WIFE  
LYNNE W. FULGHUM  
DB 2430 PG 554

ELMA M. LANE HEIRS  
DB 076E PG 280

ELMA M. LANE HEIRS  
DB 076E PG 280

DB 2626 PG 824  
XEON ENTERPRISES INC.



68' LT  
 BT  
 DRY  
 10/16

ROADWAY EMBANKMENT, ORANGE AND GRAY,  
 HIGHLY PLASTIC

S-1

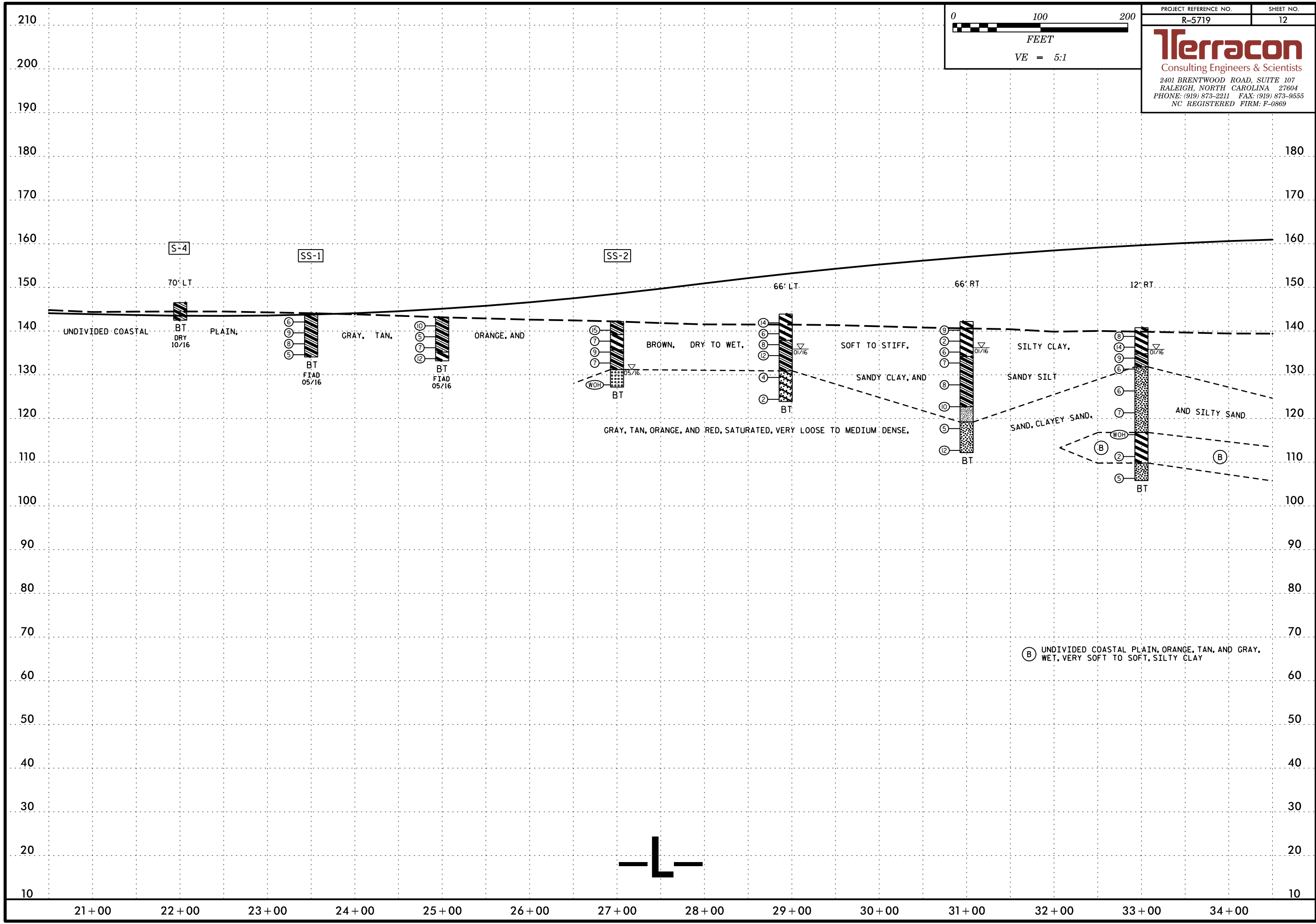
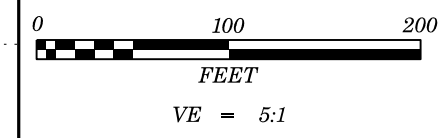
67' LT  
 BT  
 DRY  
 10/16

MOIST, MEDIUM STIFF,  
 SILTY CLAY

UNDIVIDED COASTAL PLAIN, BROWN AND ORANGE,  
 MOIST, LOOSE, SILTY SAND AND FINE SAND

(A) UNDIVIDED COASTAL PLAIN, GRAY, TAN, ORANGE, AND  
 BROWN, MOIST TO WET, MEDIUM STIFF, SANDY CLAY





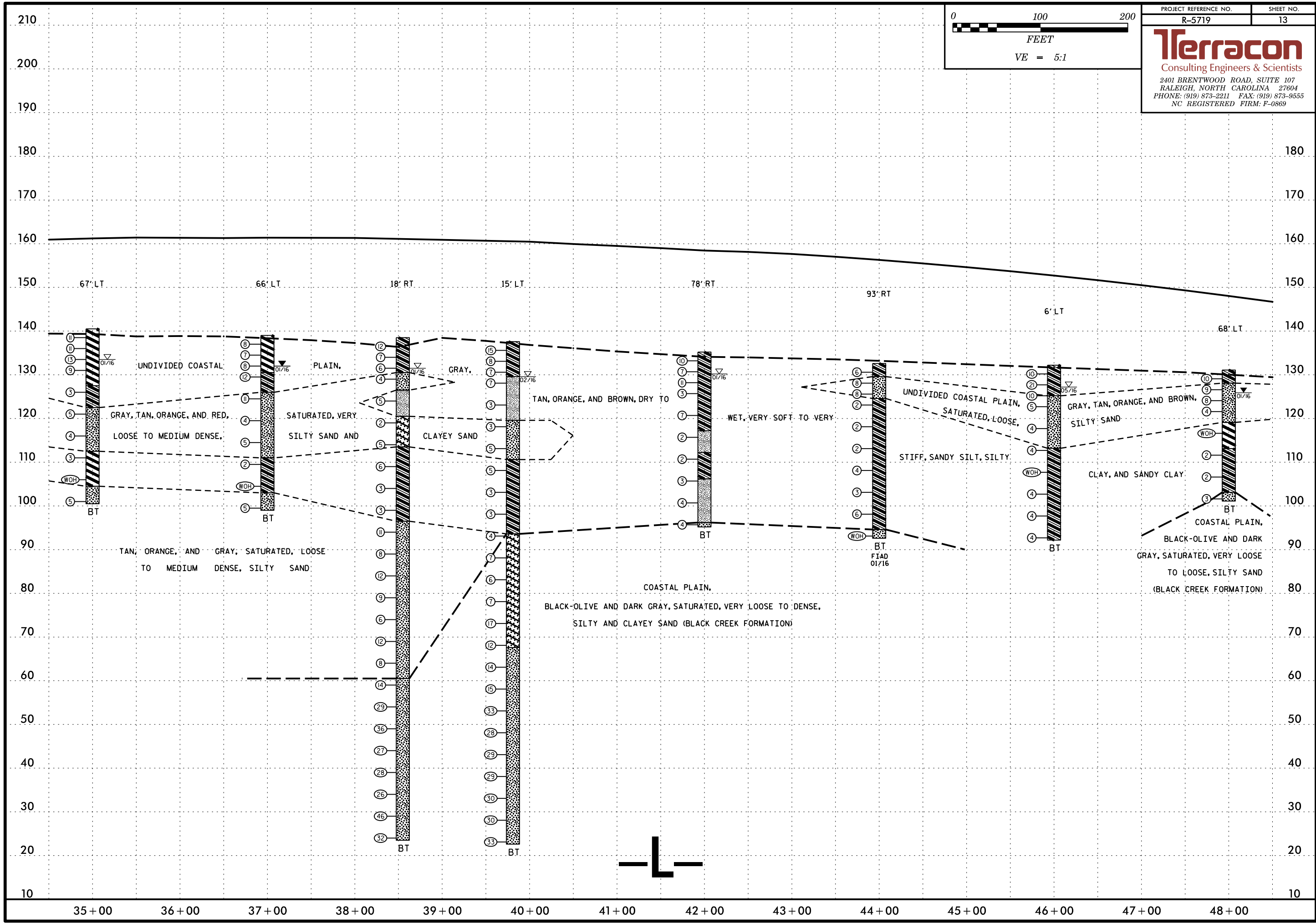
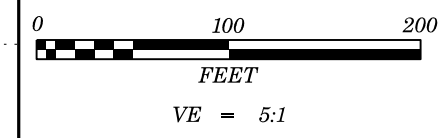
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200  
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10

UNDIVIDED COASTAL PLAIN, GRAY, TAN, ORANGE, AND BROWN, DRY TO WET, SOFT TO STIFF, SANDY CLAY, AND SANDY SILT, SILTY CLAY, SAND, CLAYEY SAND, AND SILTY SAND

BT DRY 10/16  
BT FIAD 05/16  
BT FIAD 05/16  
BT  
BT  
BT  
BT  
BT

70' LT  
SS-1  
SS-2  
66' LT  
66' RT  
12' RT

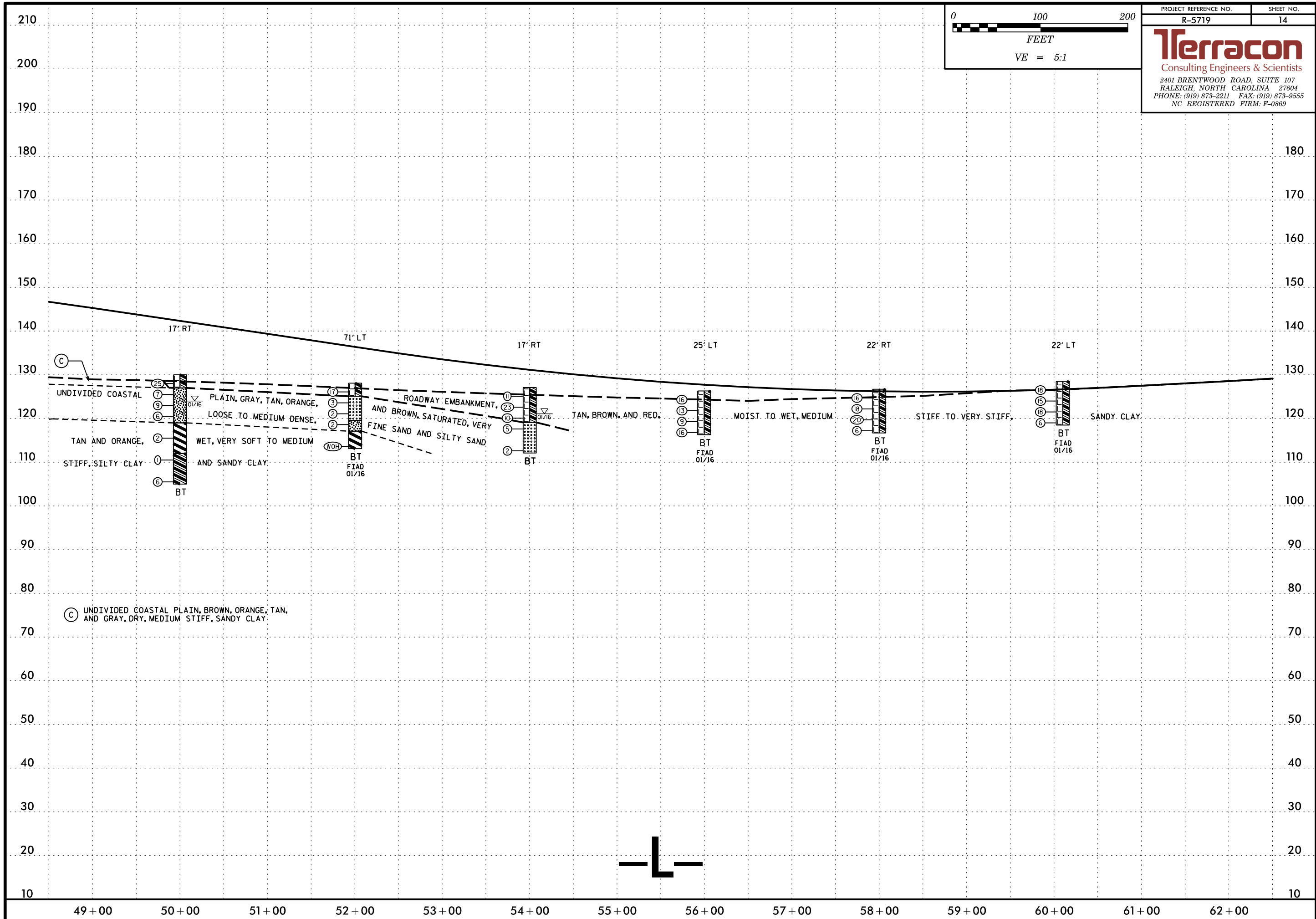
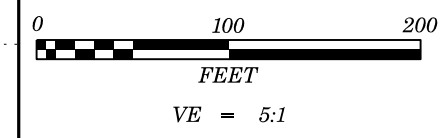
21+00 22+00 23+00 24+00 25+00 26+00 27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00



67' LT      66' LT      18' RT      15' LT      78' RT      93' RT      6' LT      68' LT

35+00    36+00    37+00    38+00    39+00    40+00    41+00    42+00    43+00    44+00    45+00    46+00    47+00    48+00

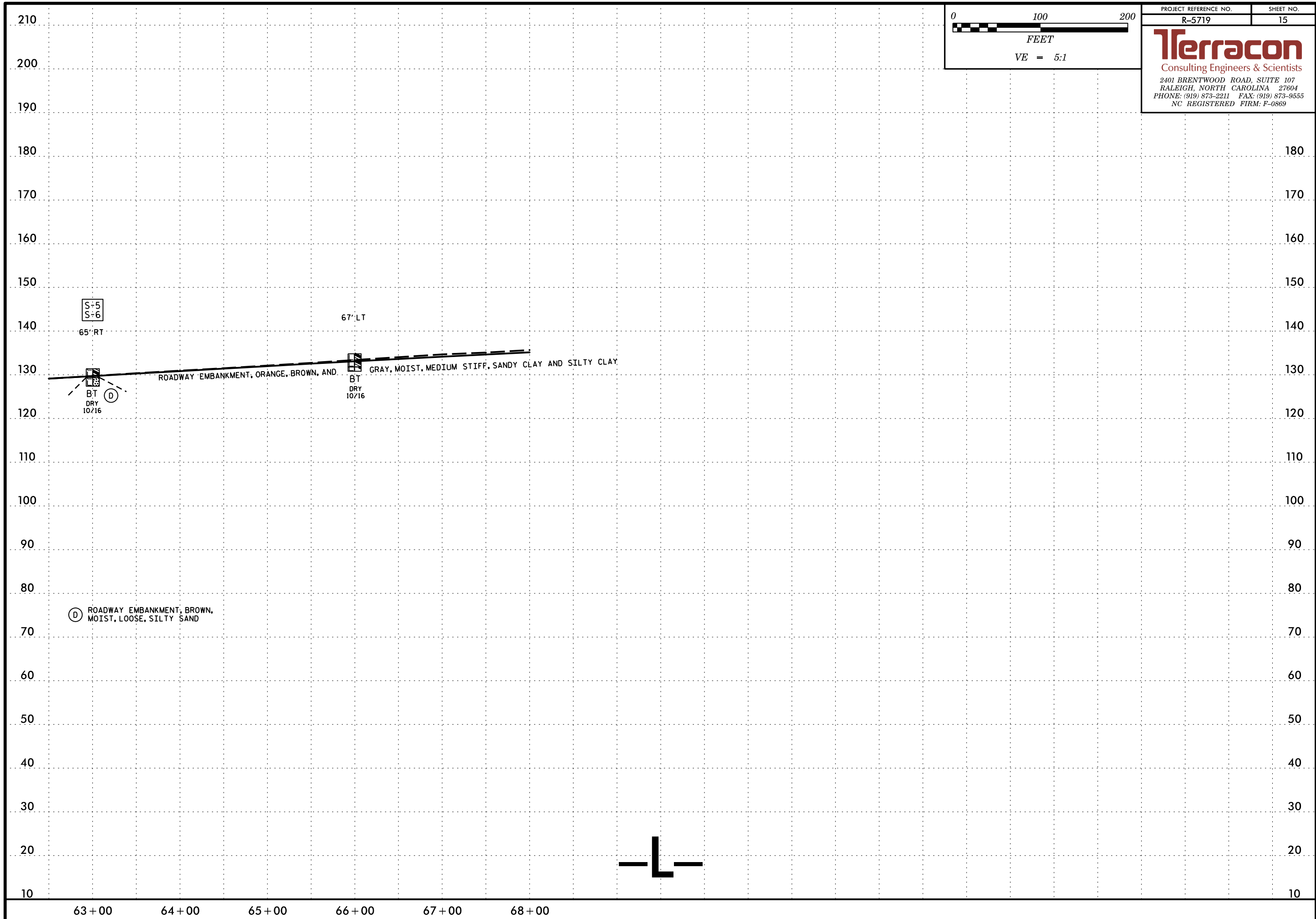
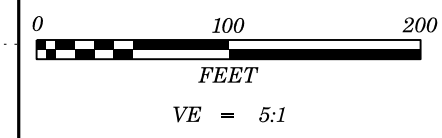




210  
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49+00 50+00 51+00 52+00 53+00 54+00 55+00 56+00 57+00 58+00 59+00 60+00 61+00 62+00



S-5  
S-6

65+RT

BT  
DRY  
10/16

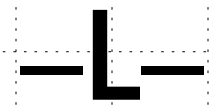
Ⓧ ROADWAY EMBANKMENT, BROWN,  
MOIST, LOOSE, SILTY SAND

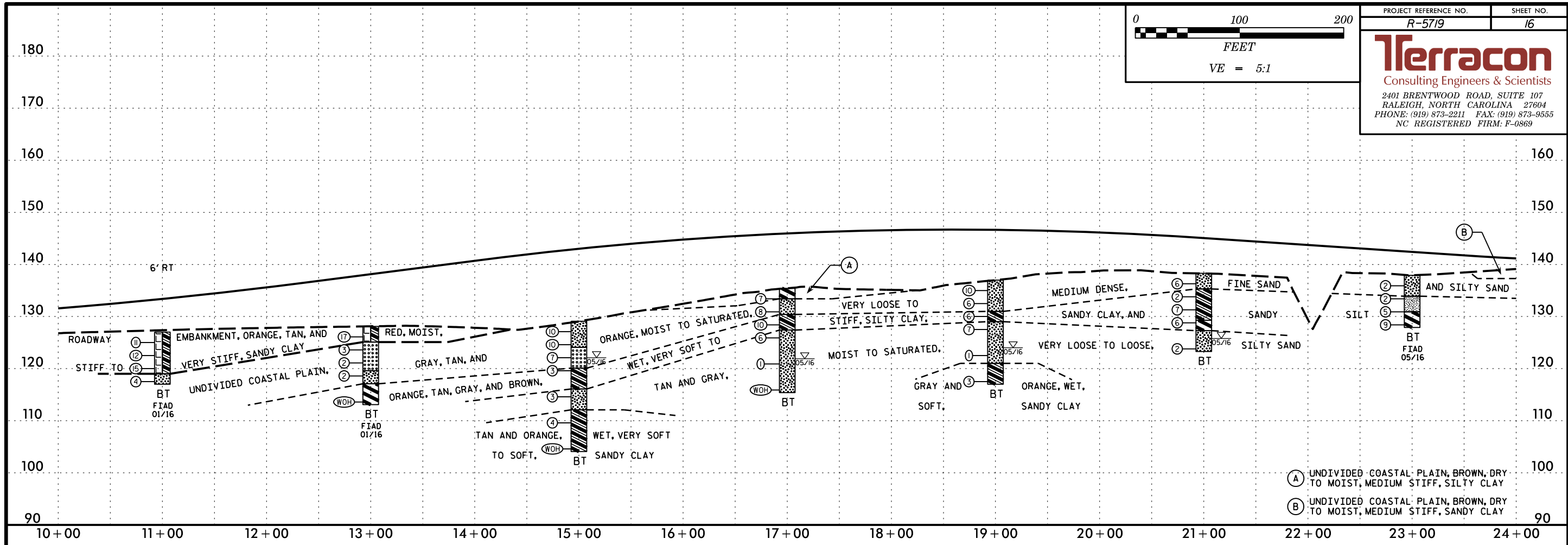
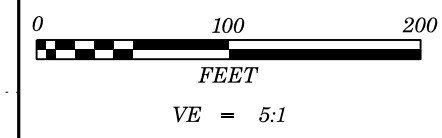
67+LT

BT  
DRY  
10/16

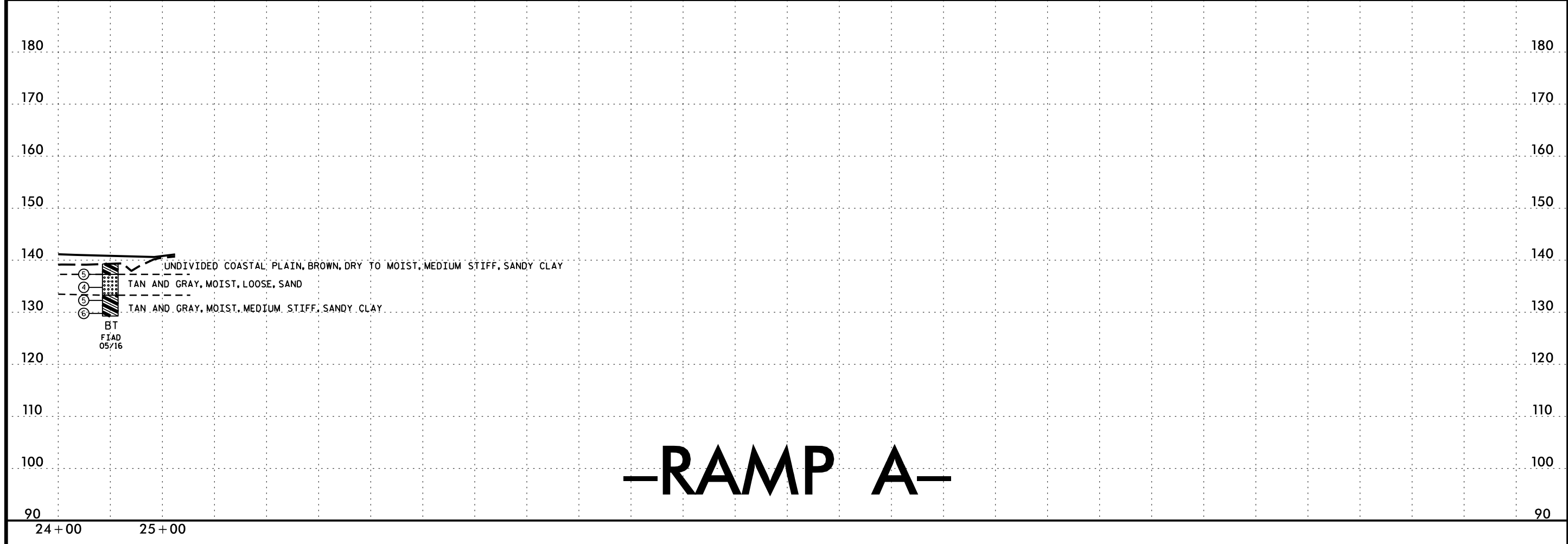
ROADWAY EMBANKMENT, ORANGE, BROWN, AND  
GRAY, MOIST, MEDIUM STIFF, SANDY CLAY AND SILTY CLAY

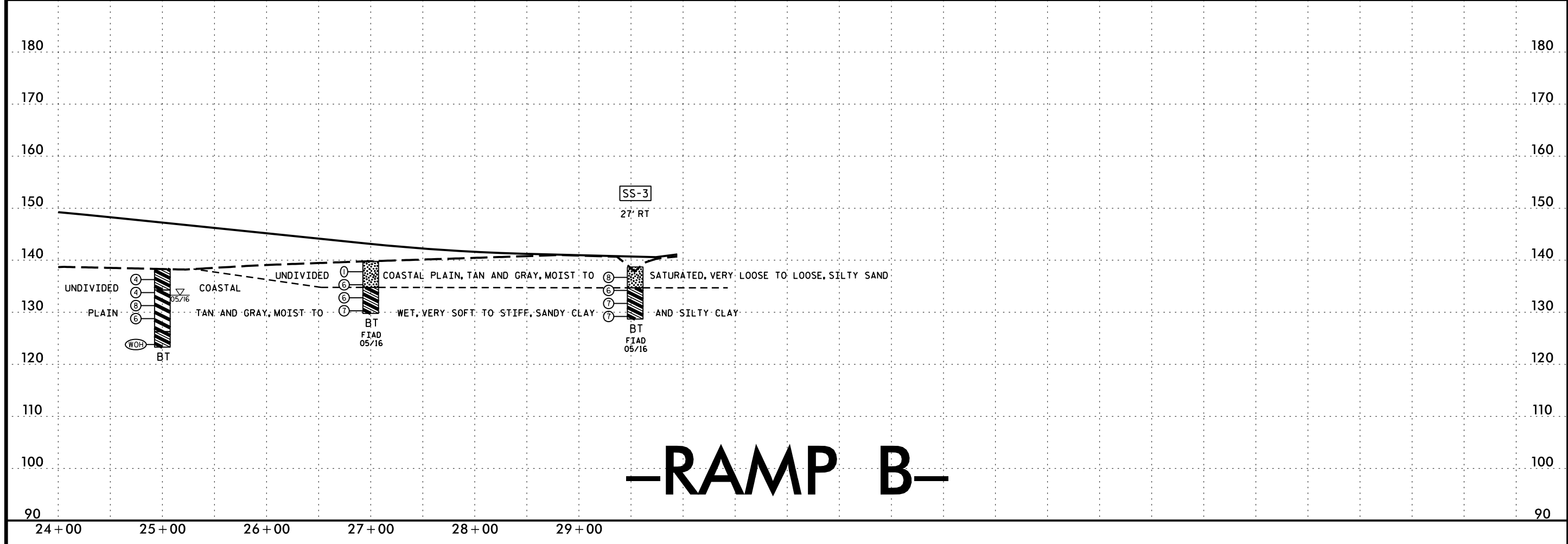
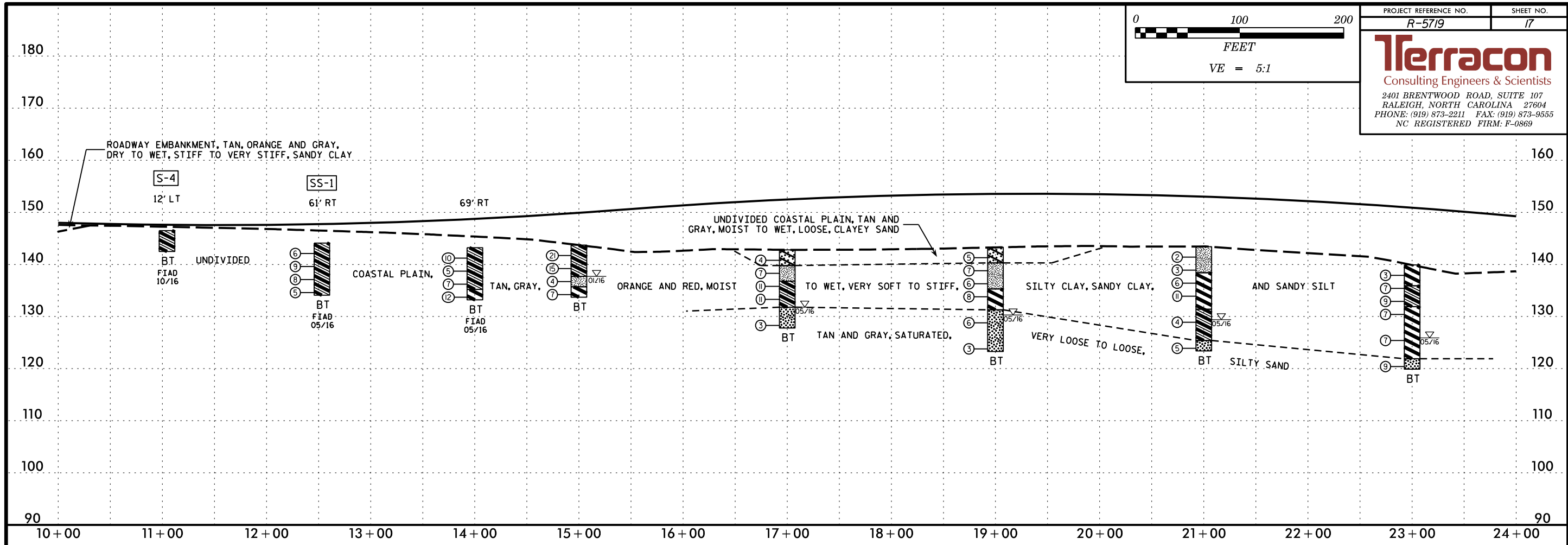
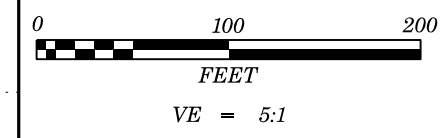
63+00    64+00    65+00    66+00    67+00    68+00



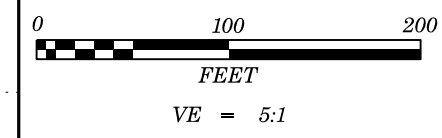


- Ⓐ UNDIVIDED COASTAL PLAIN, BROWN, DRY TO MOIST, MEDIUM STIFF, SILTY CLAY
- Ⓑ UNDIVIDED COASTAL PLAIN, BROWN, DRY TO MOIST, MEDIUM STIFF, SANDY CLAY



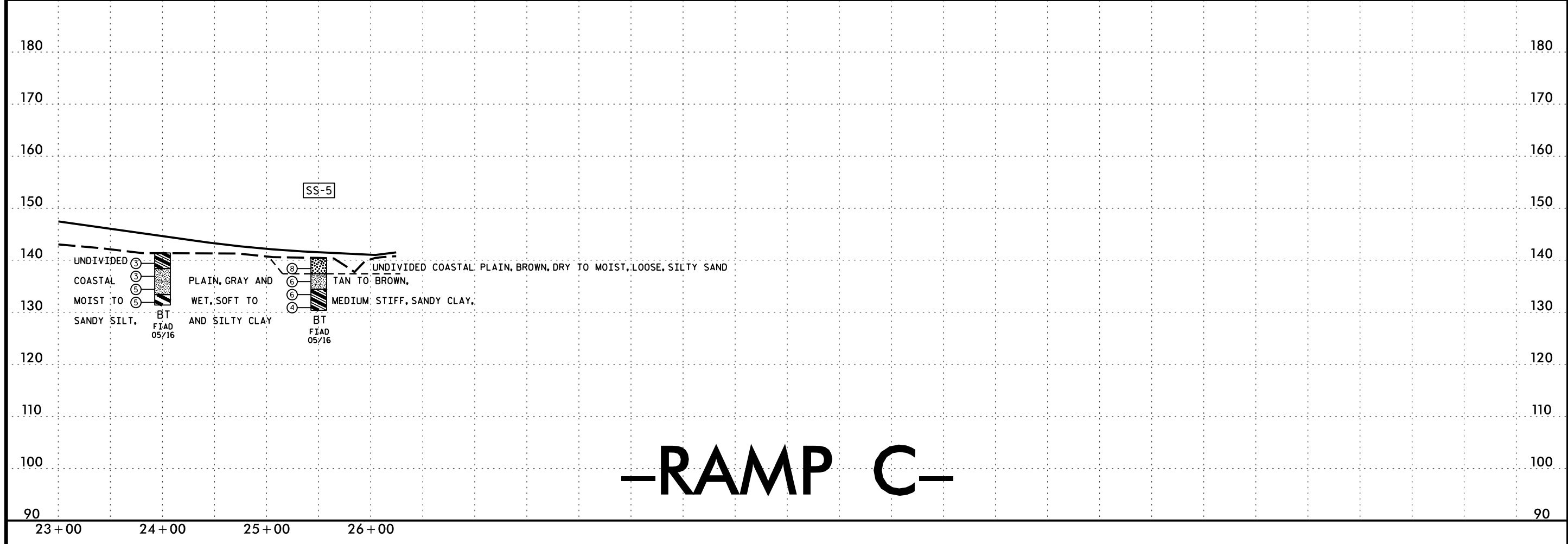
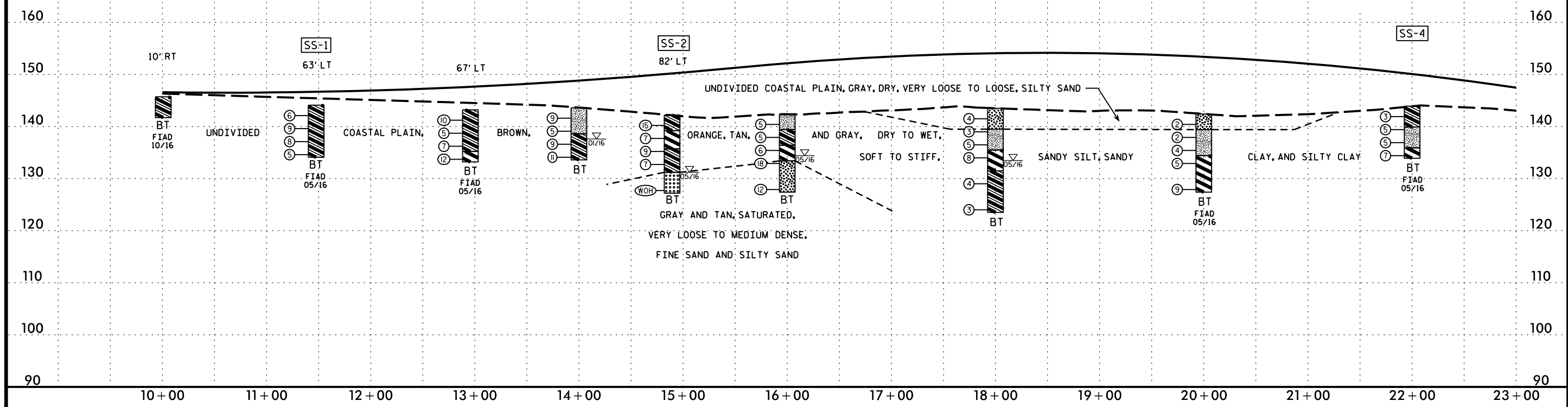


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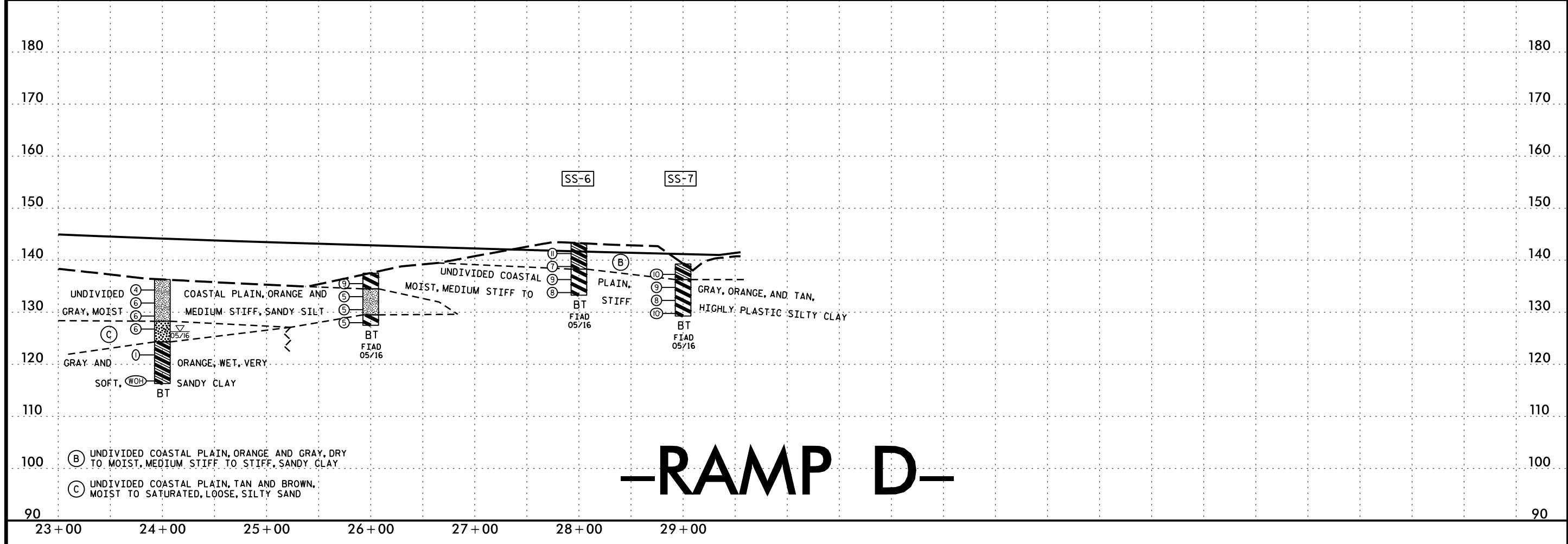
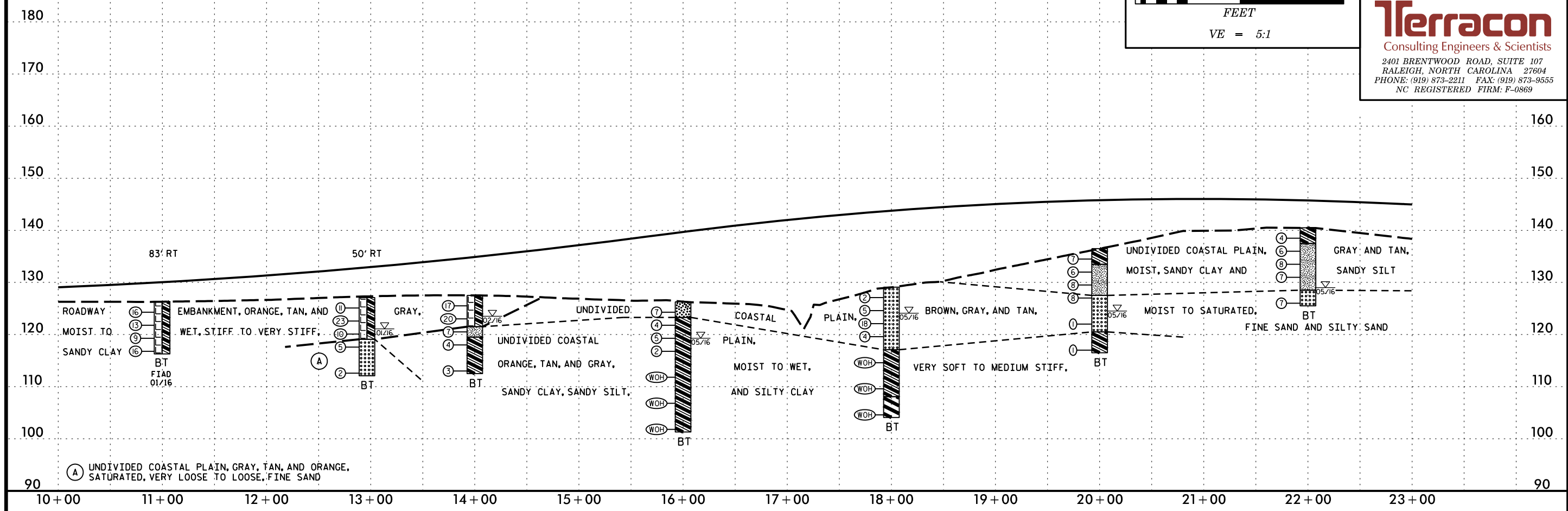
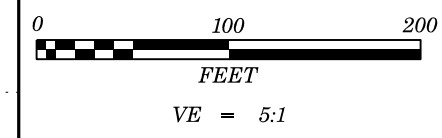


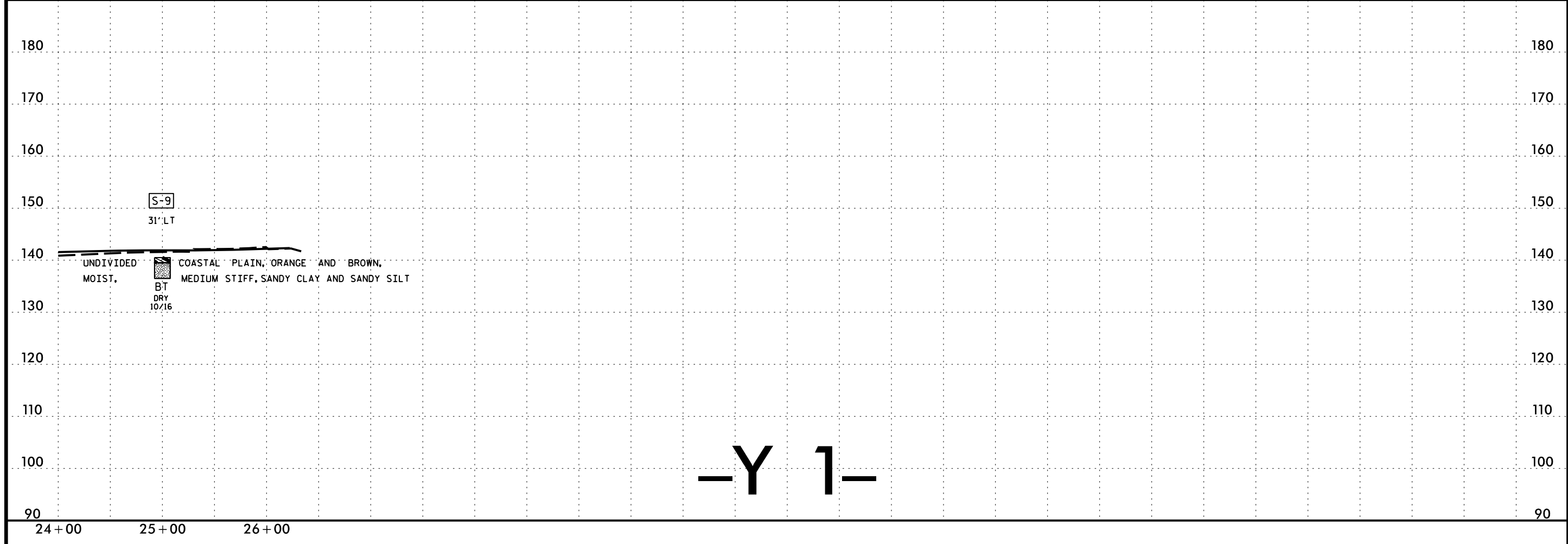
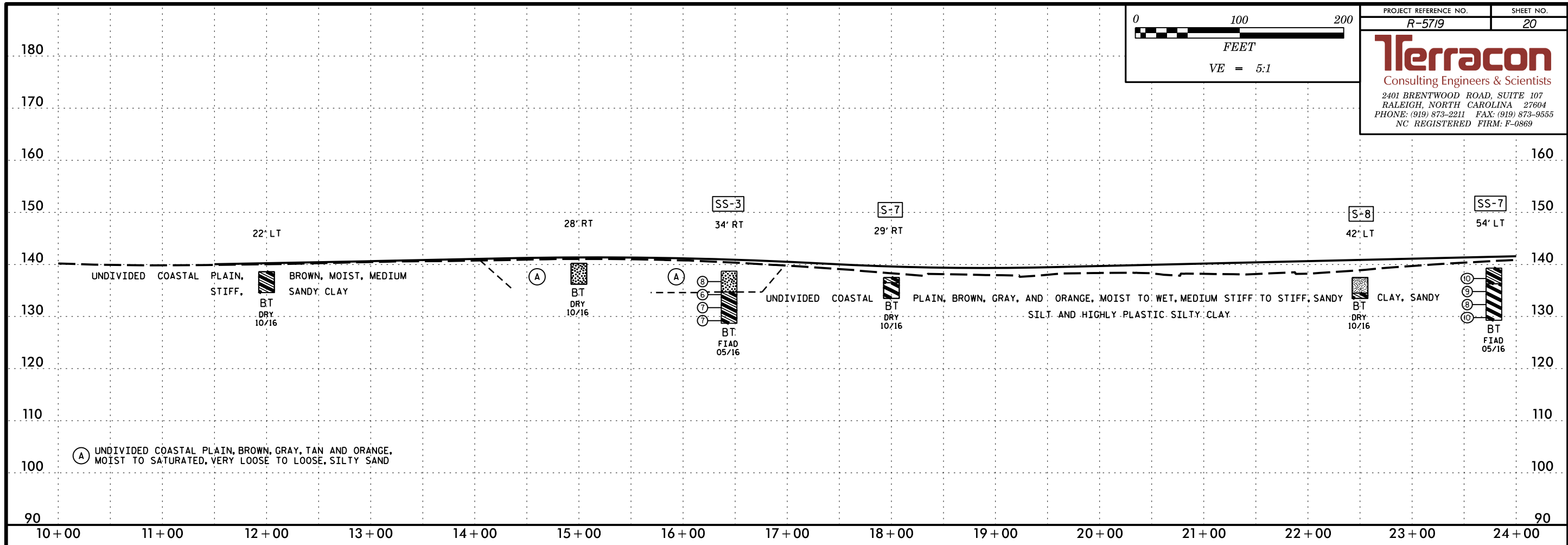
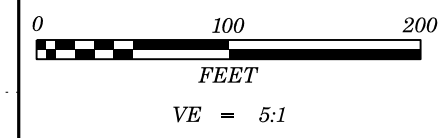
PROJECT REFERENCE NO. R-5719	SHEET NO. 18
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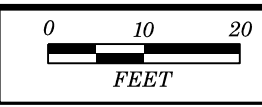


**-RAMP C-**



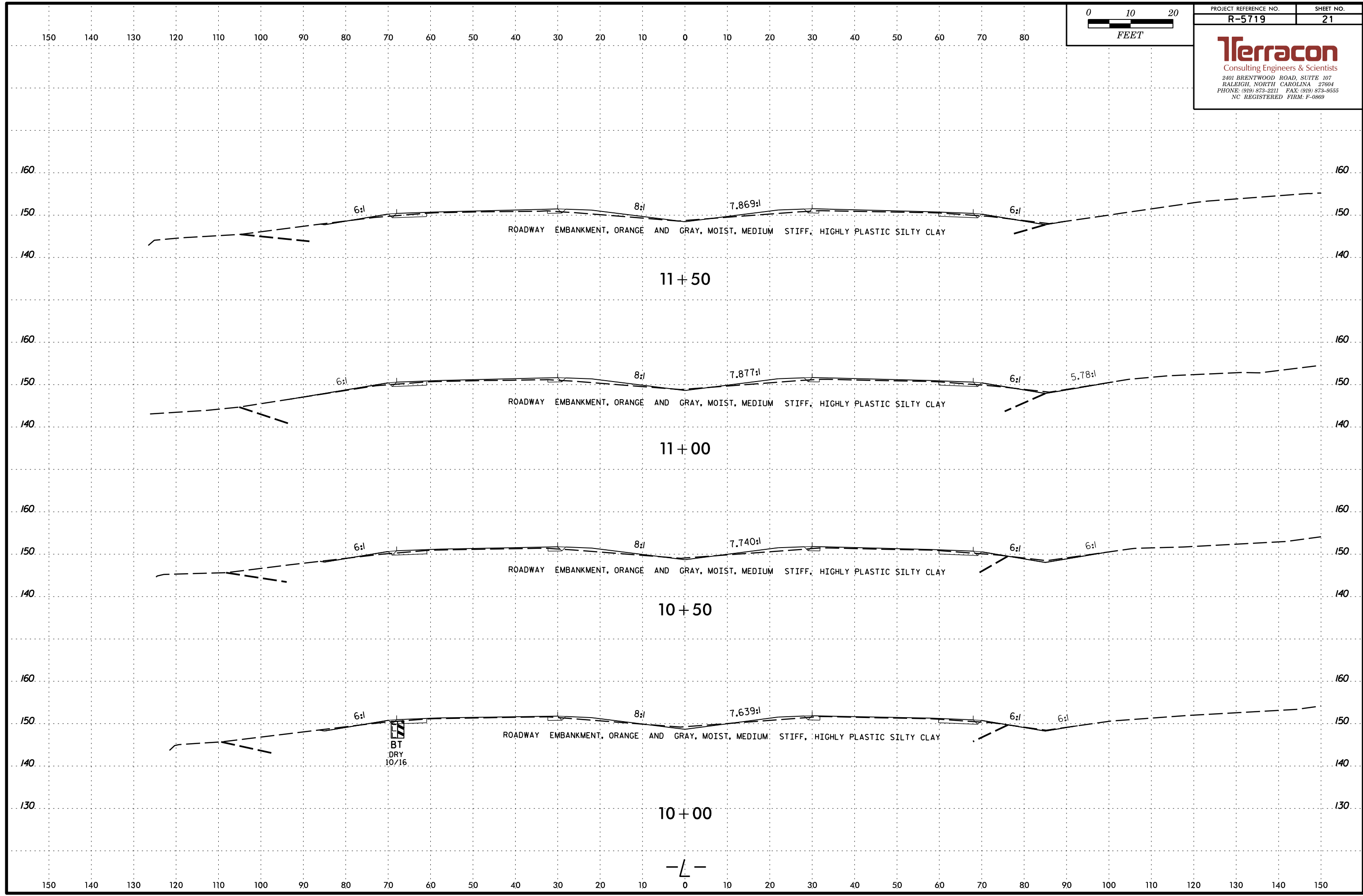


-Y 1-

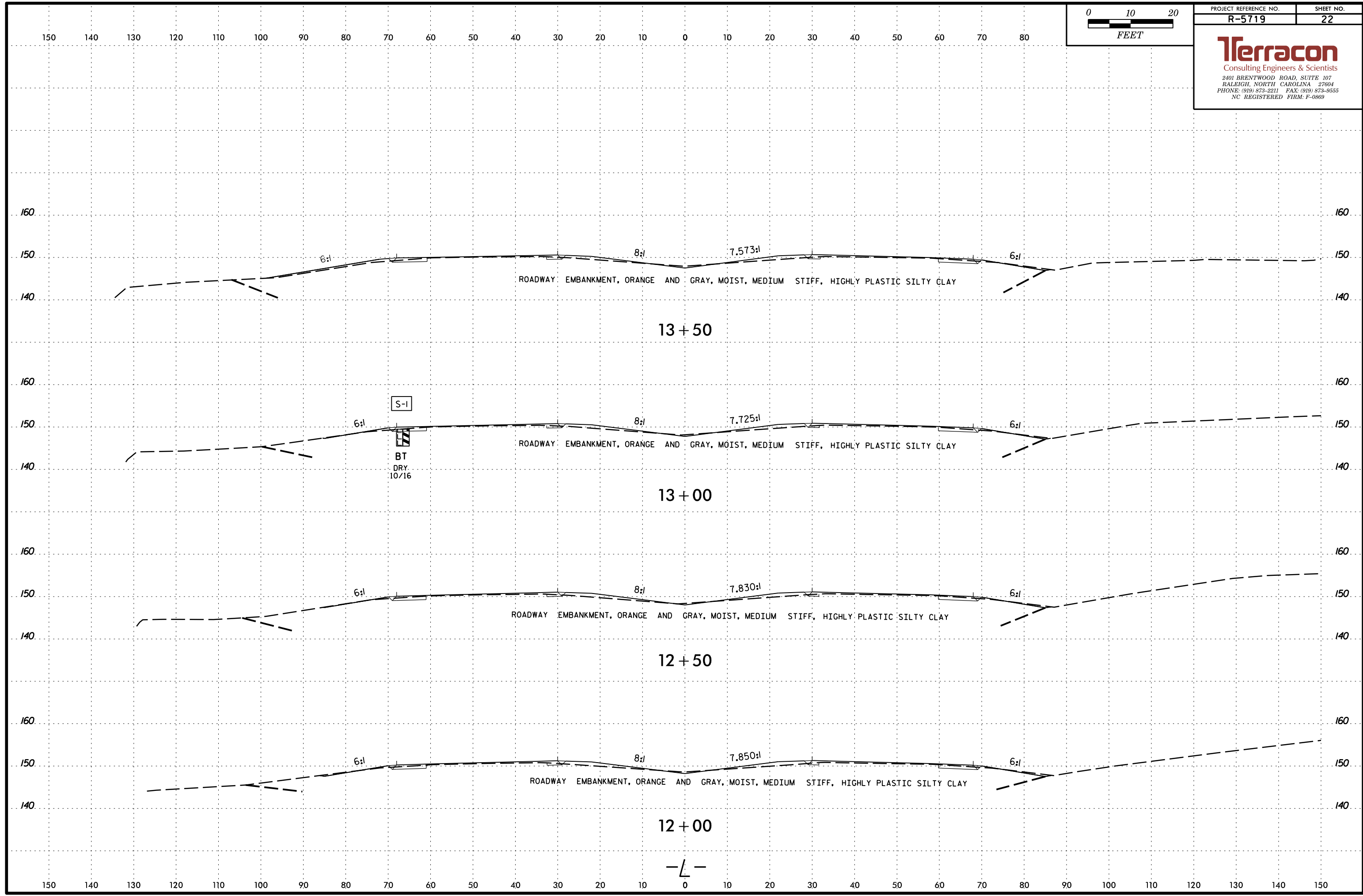
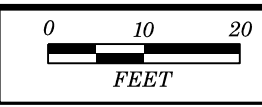


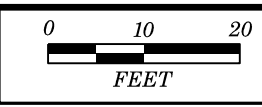
PROJECT REFERENCE NO. R-5719	SHEET NO. 21
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NC REGISTERED FIRM: F-0889



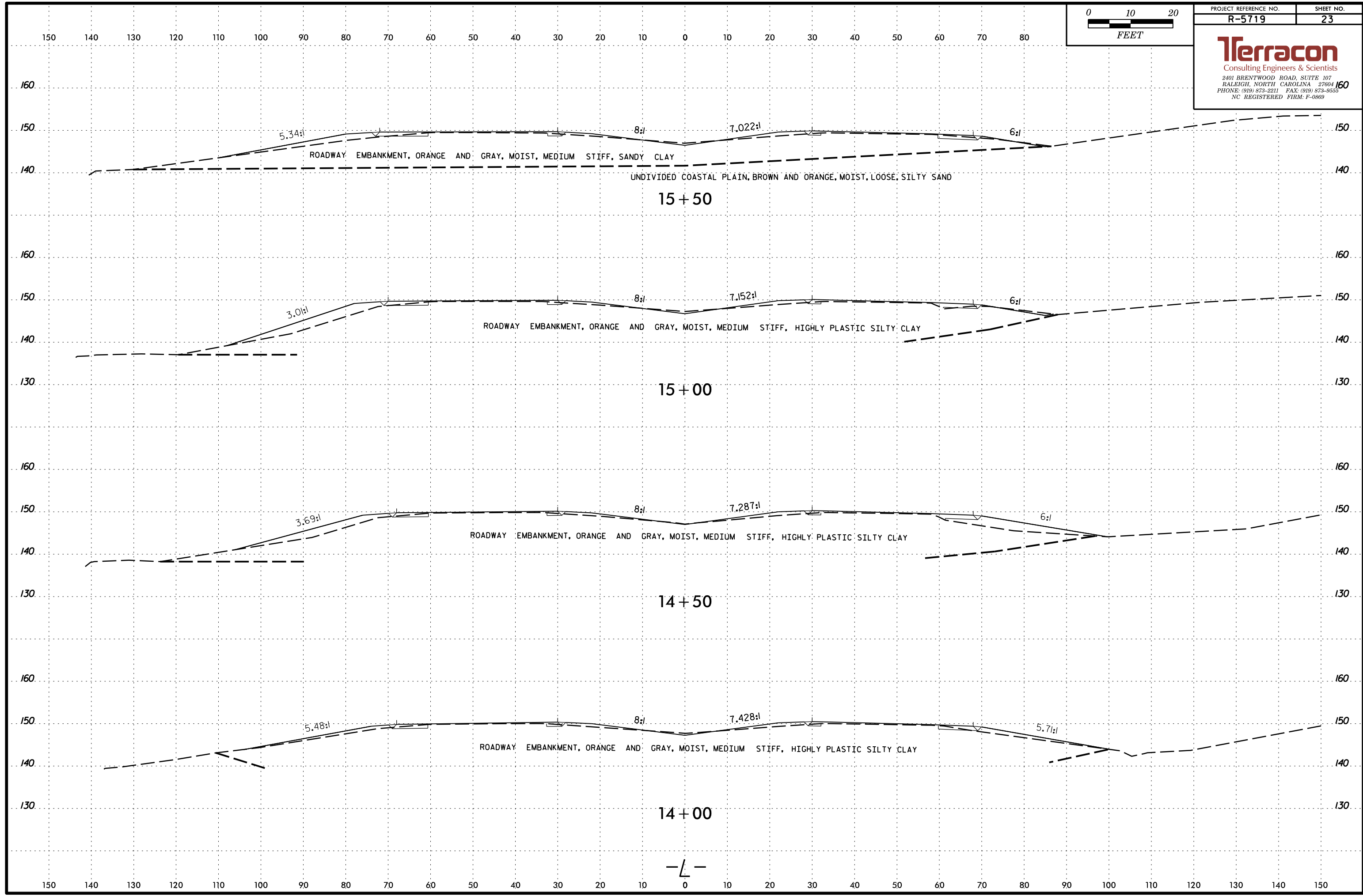


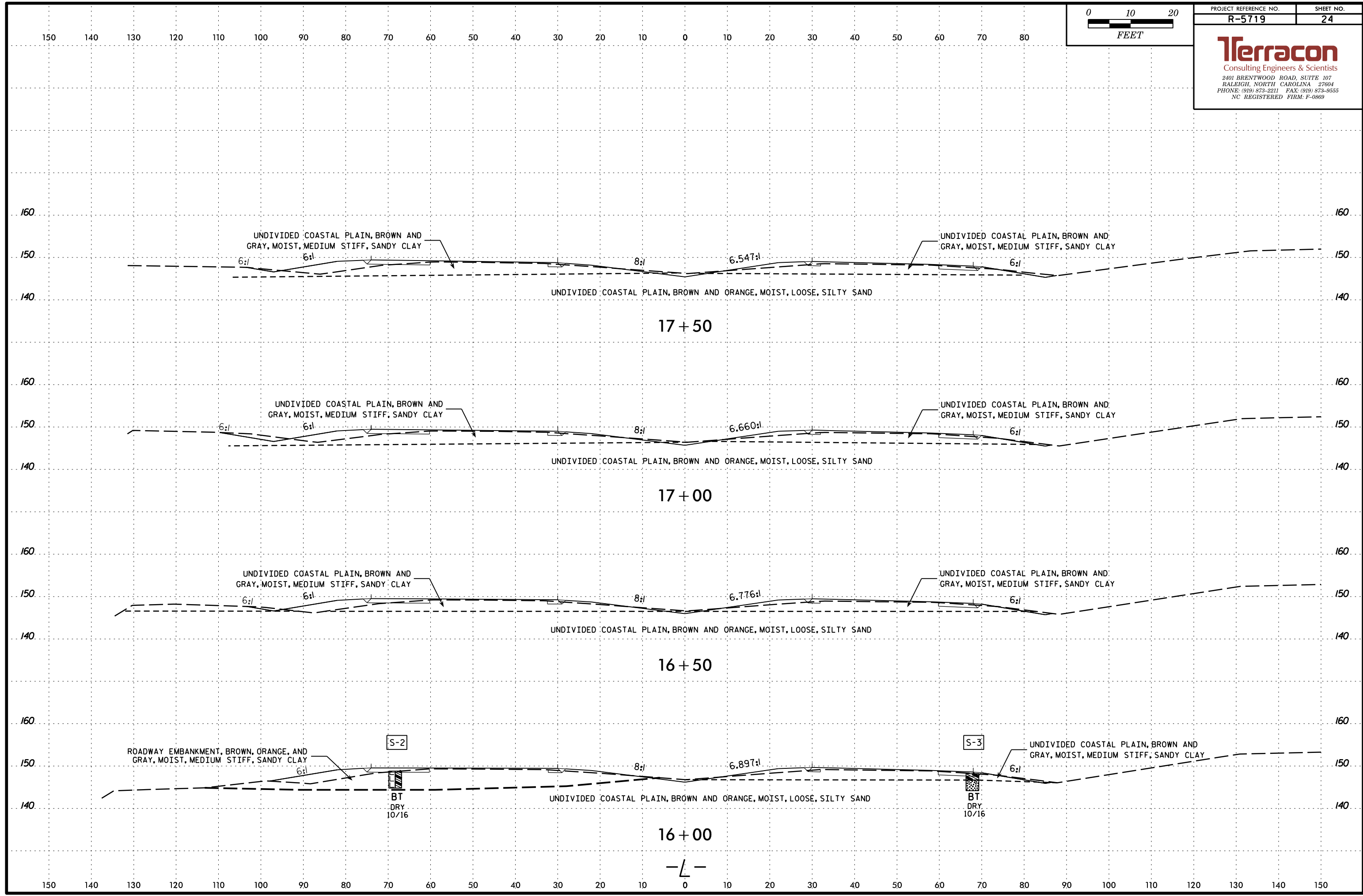
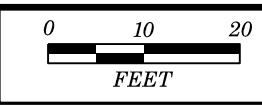


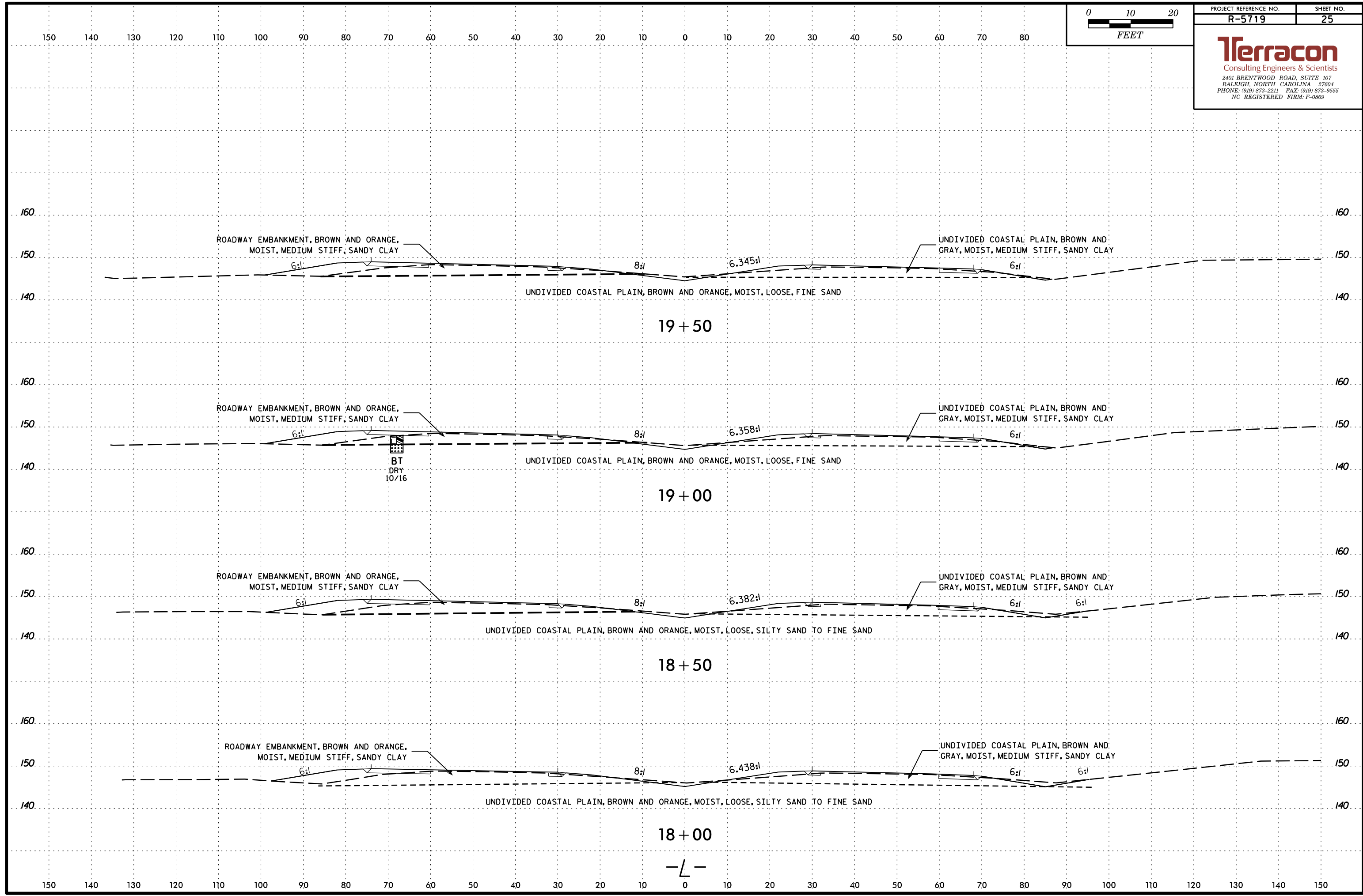
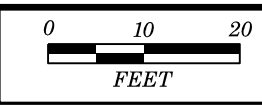


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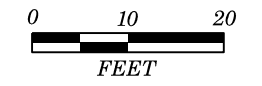
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RALEIGH, NORTH CAROLINA 27604 160  
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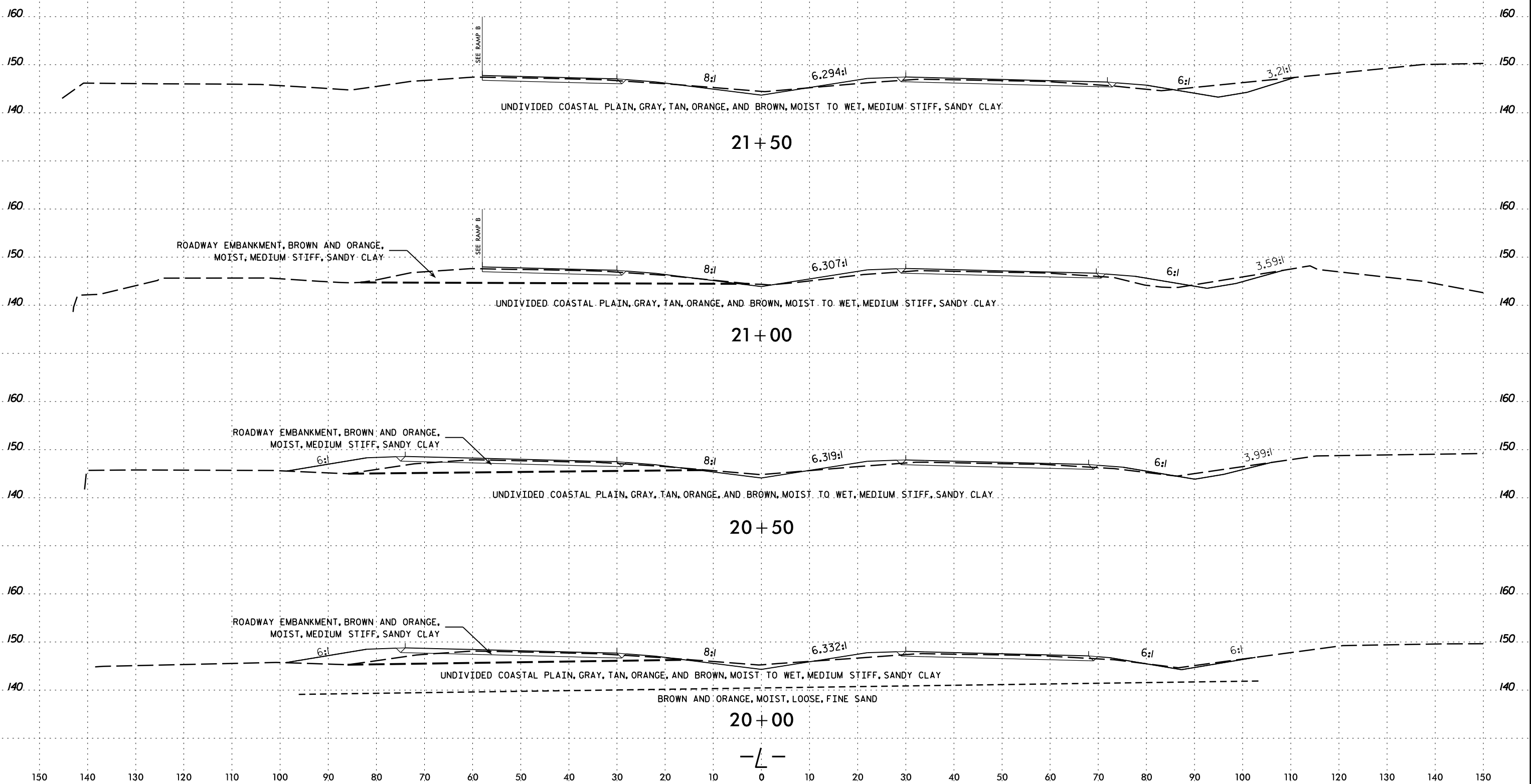


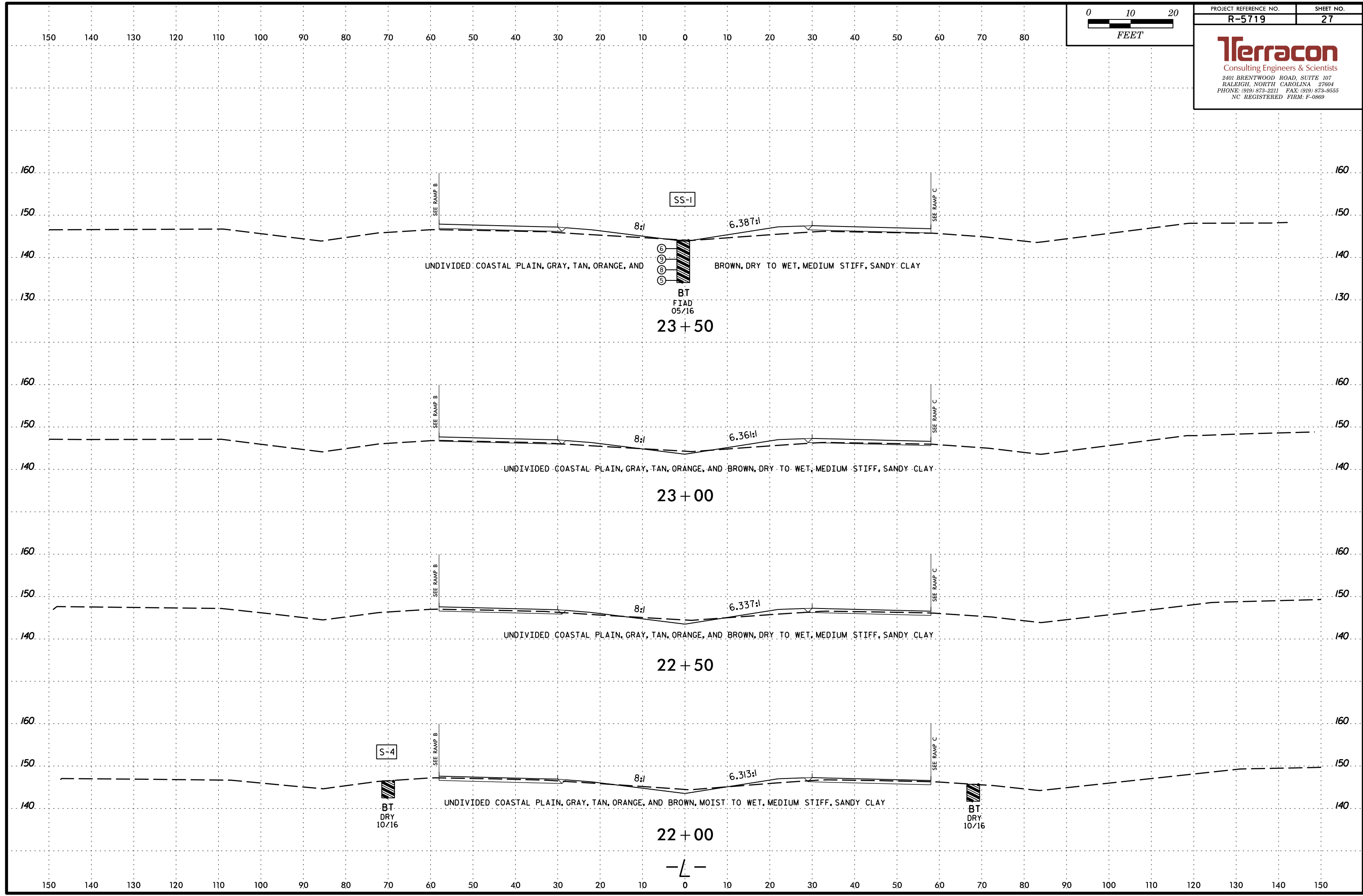
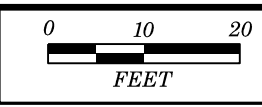
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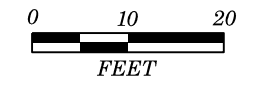
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R-5719	26

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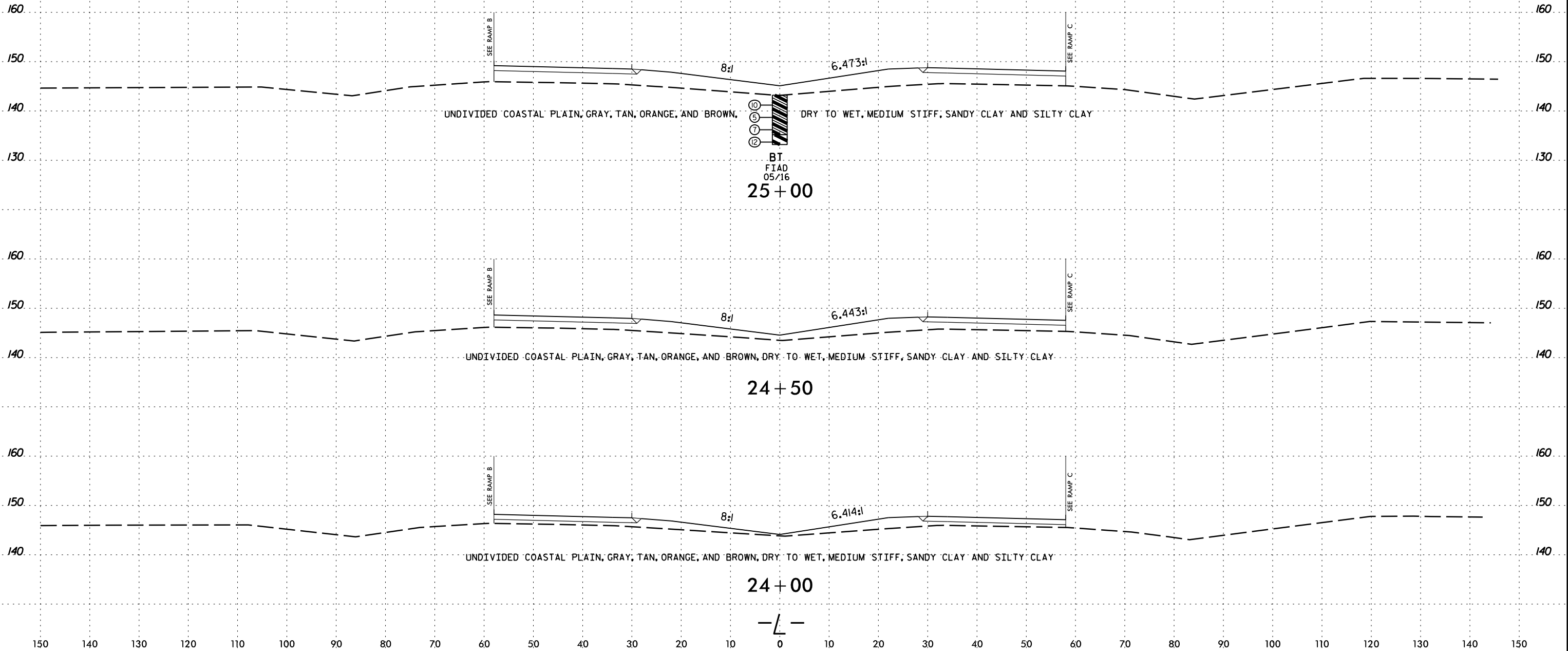


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PROJECT REFERENCE NO. R-5719 SHEET NO. 28

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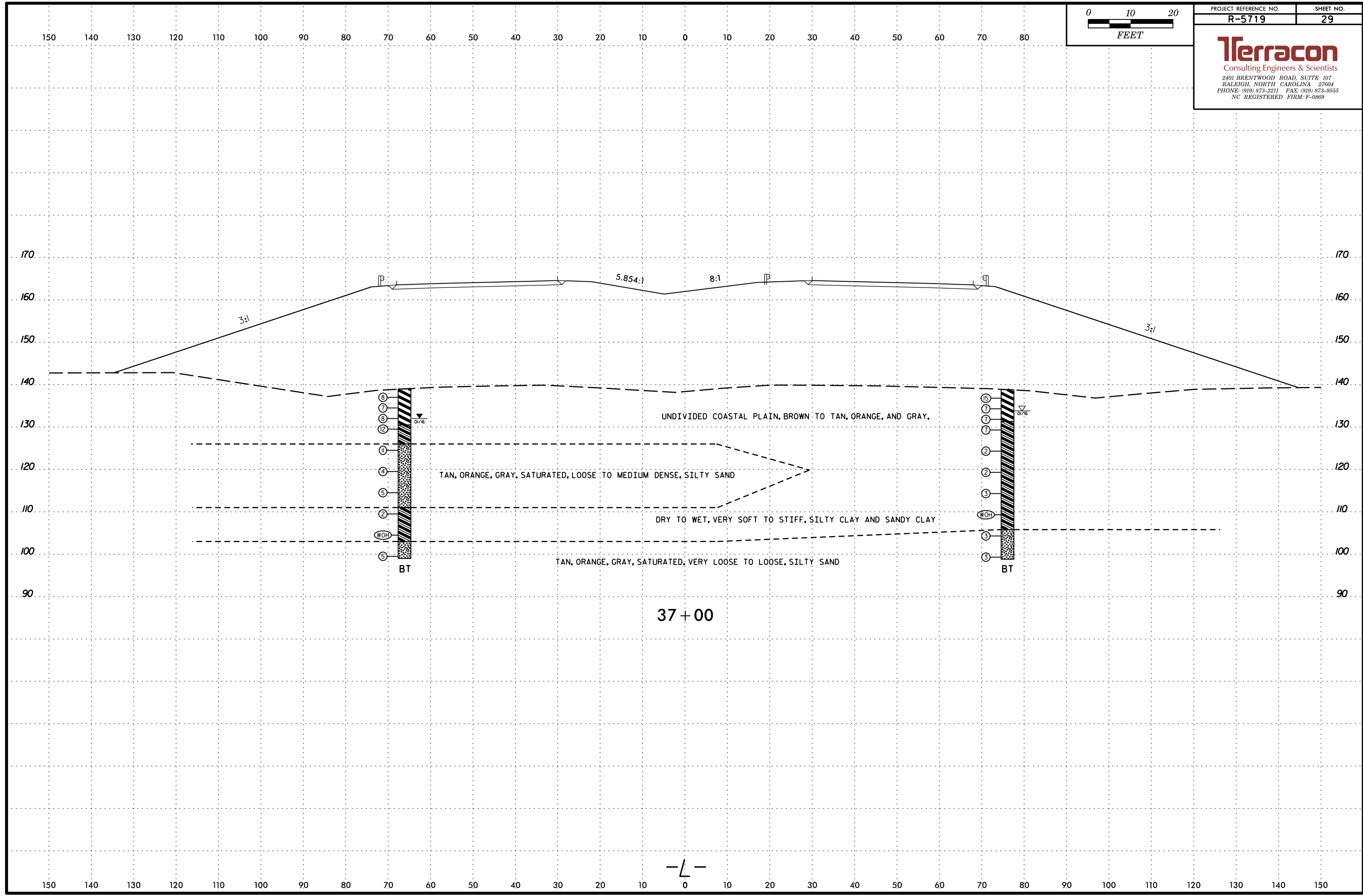
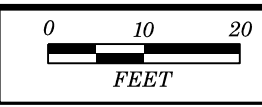


BT  
FIAD  
05/16  
25+00

24+50

24+00

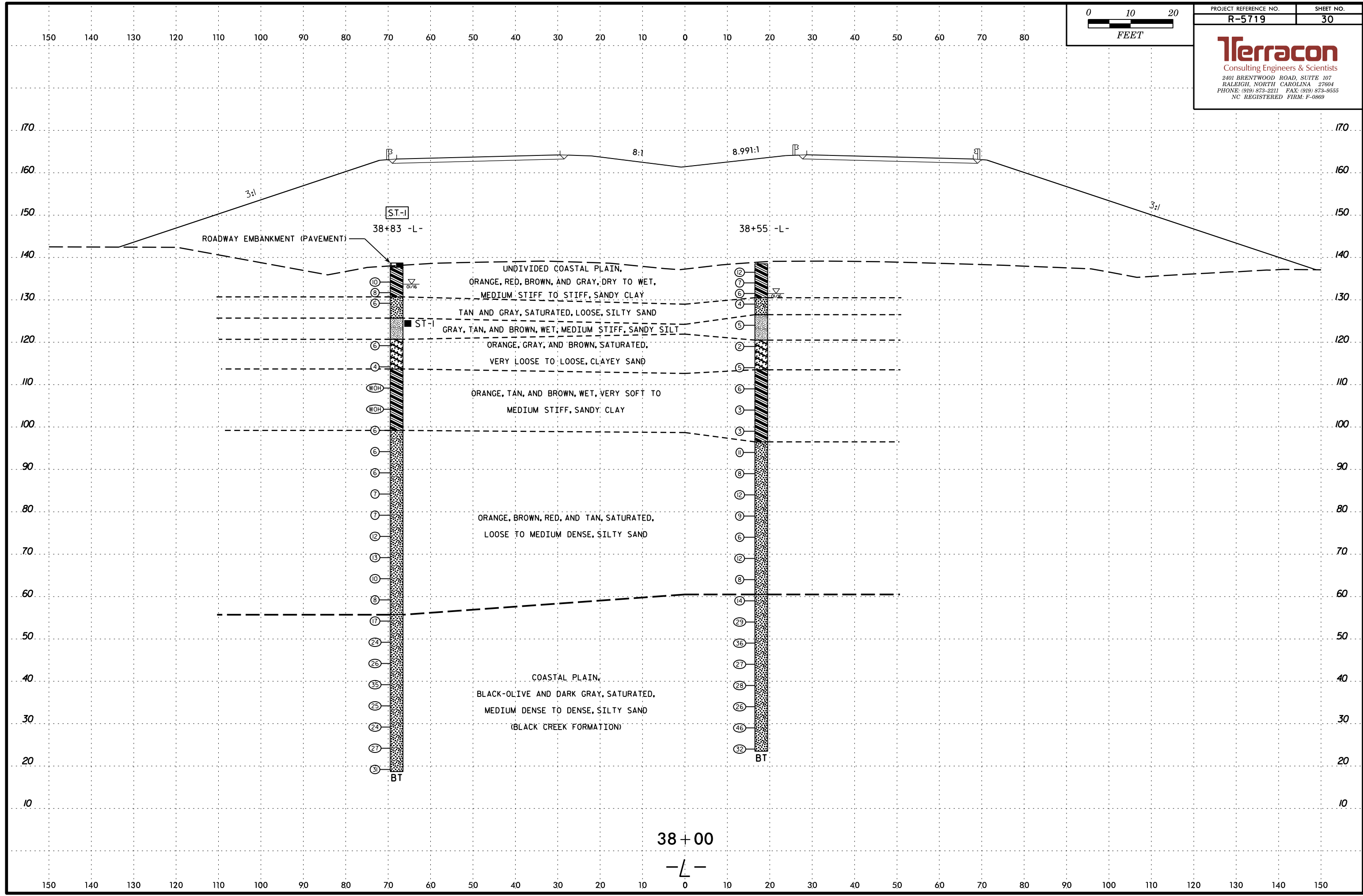
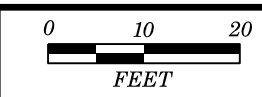
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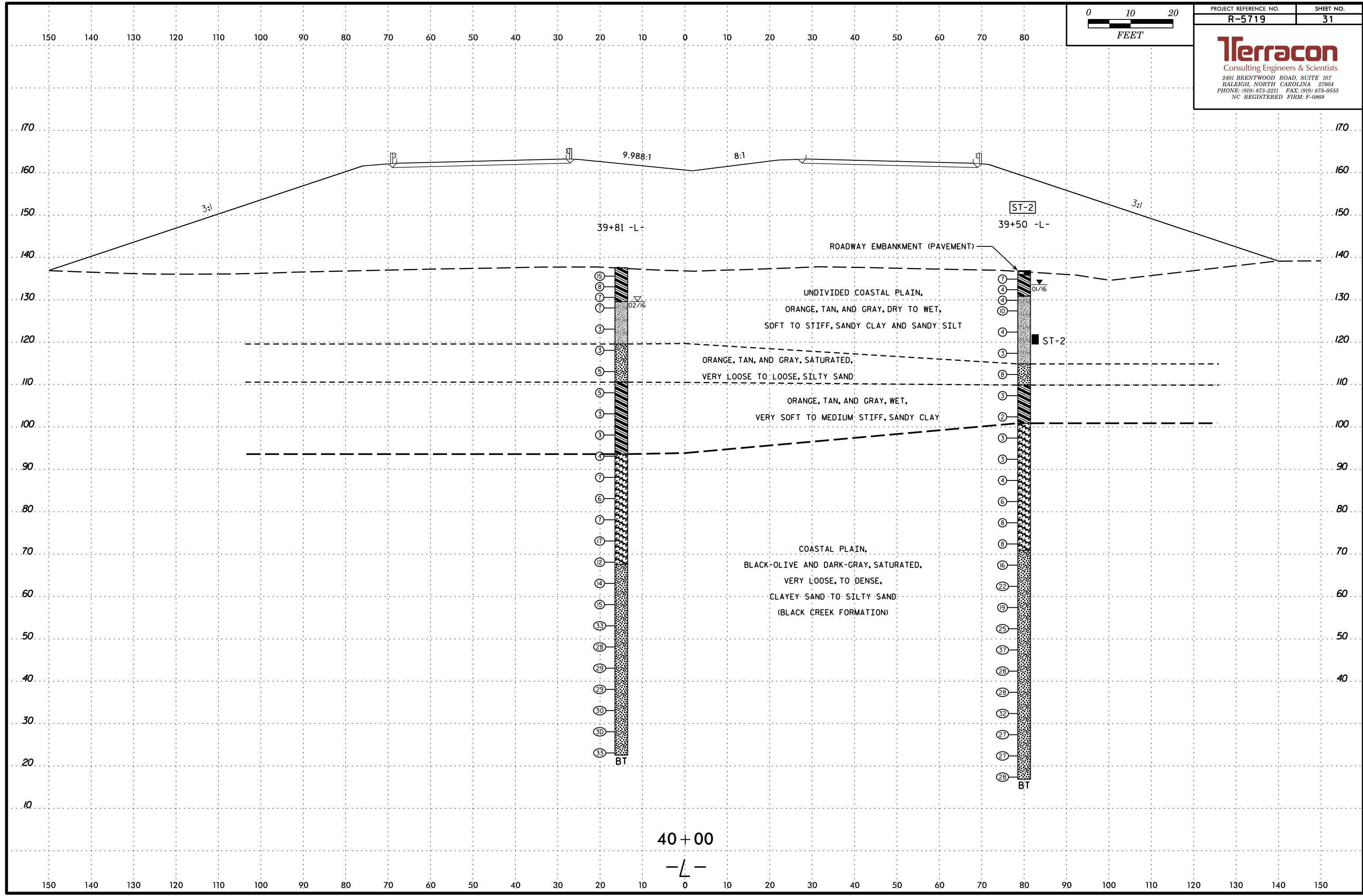
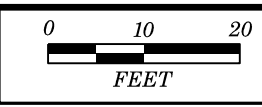


37+00

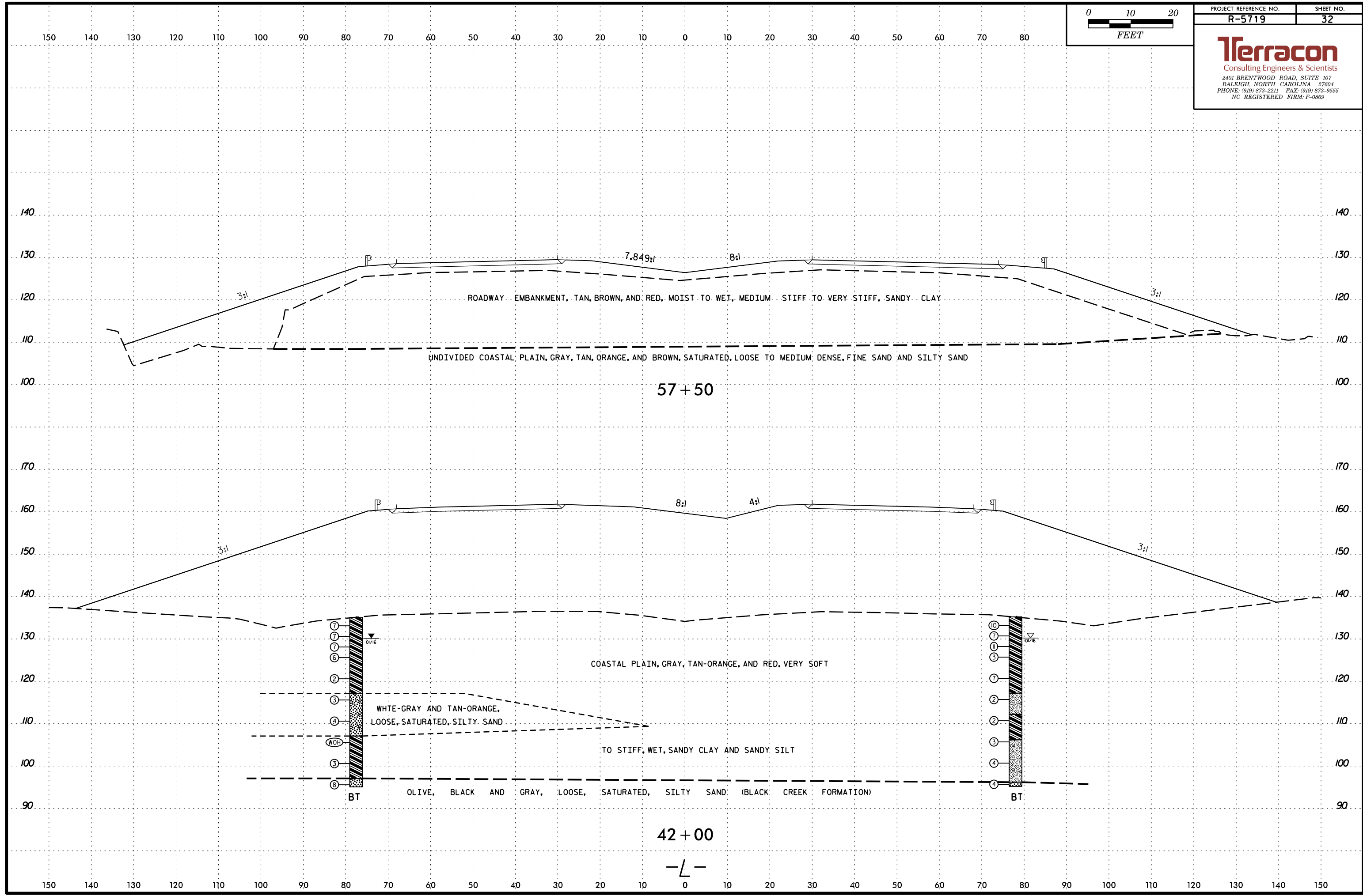
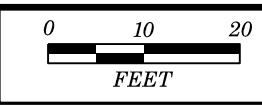
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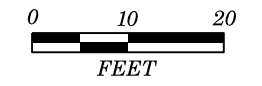




40+00  
 -L-

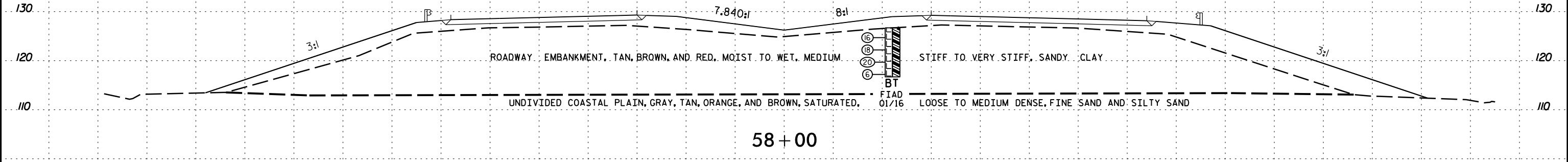
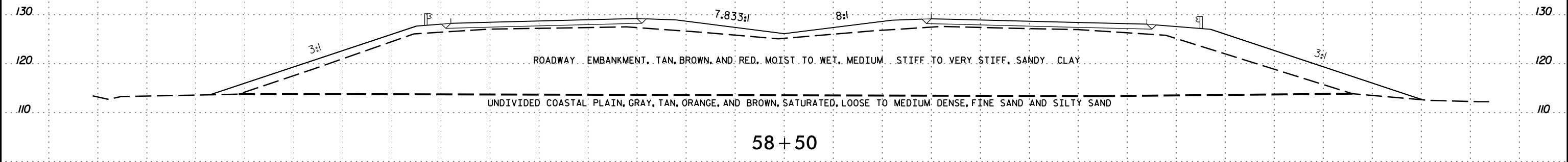
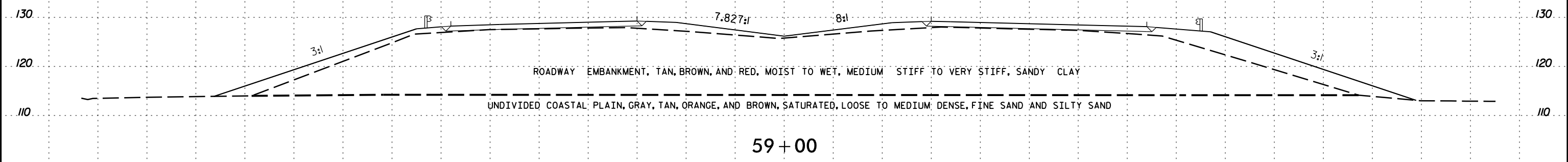


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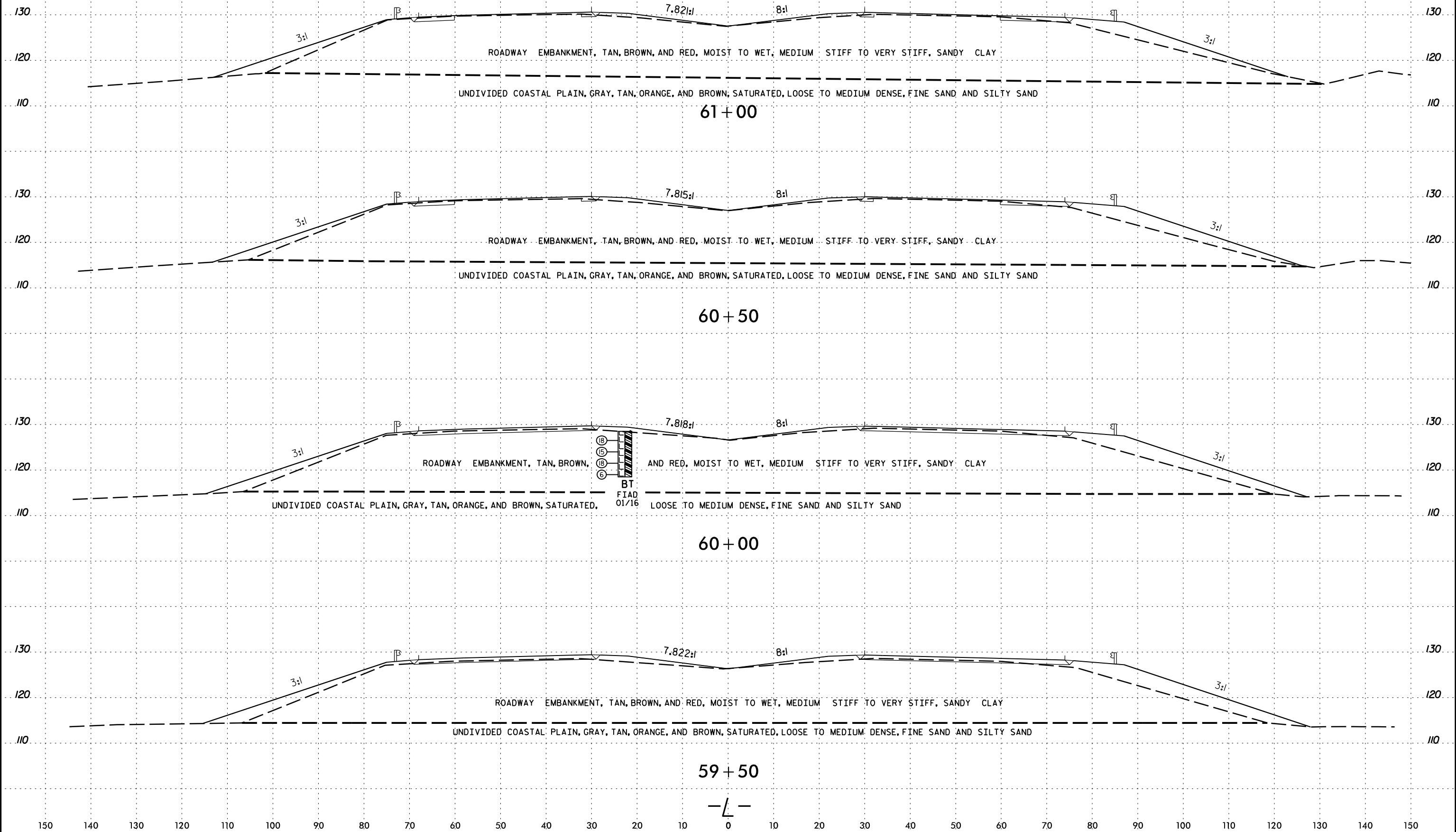
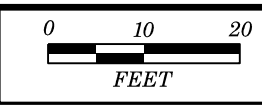


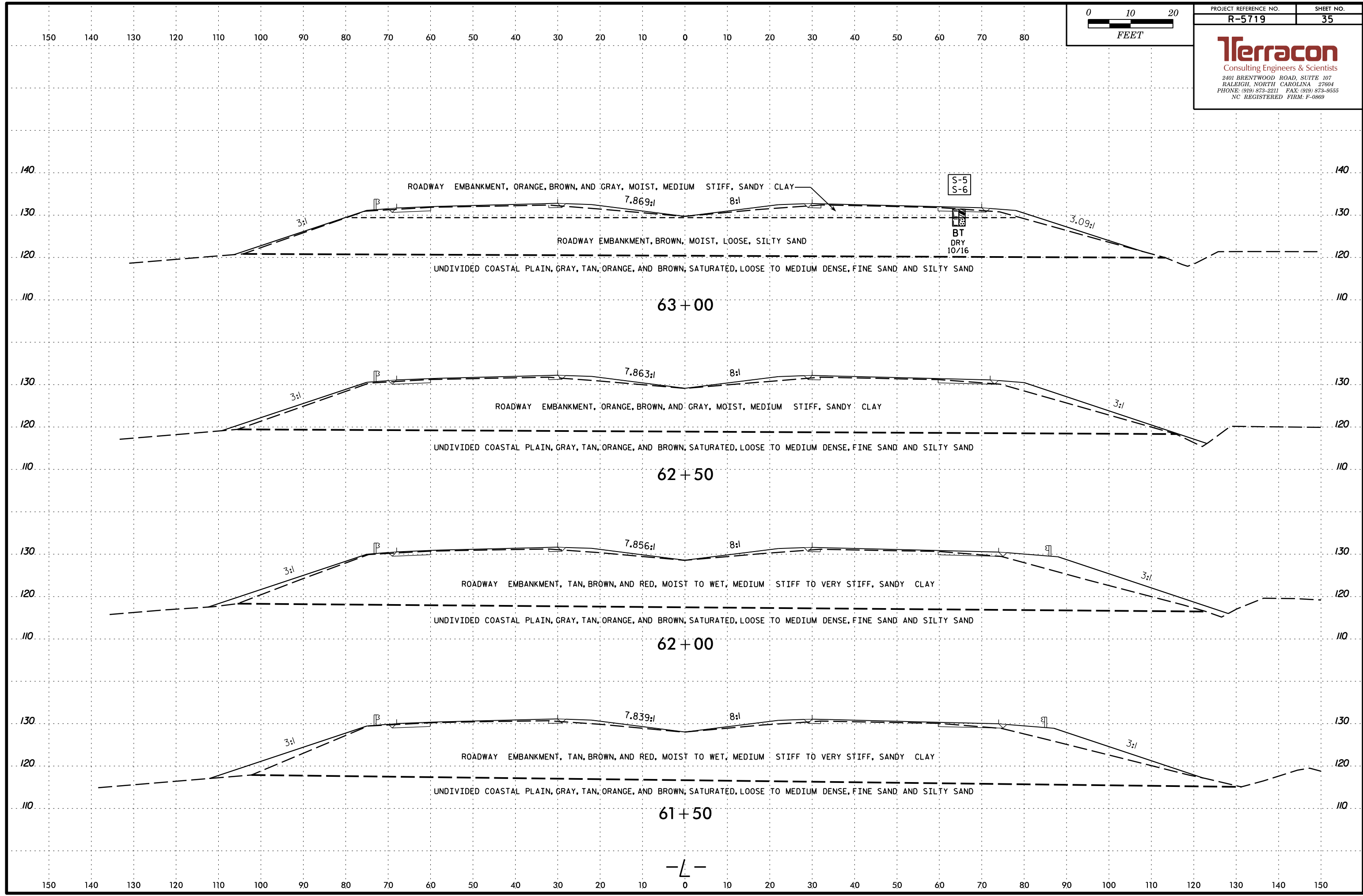
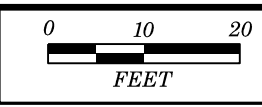
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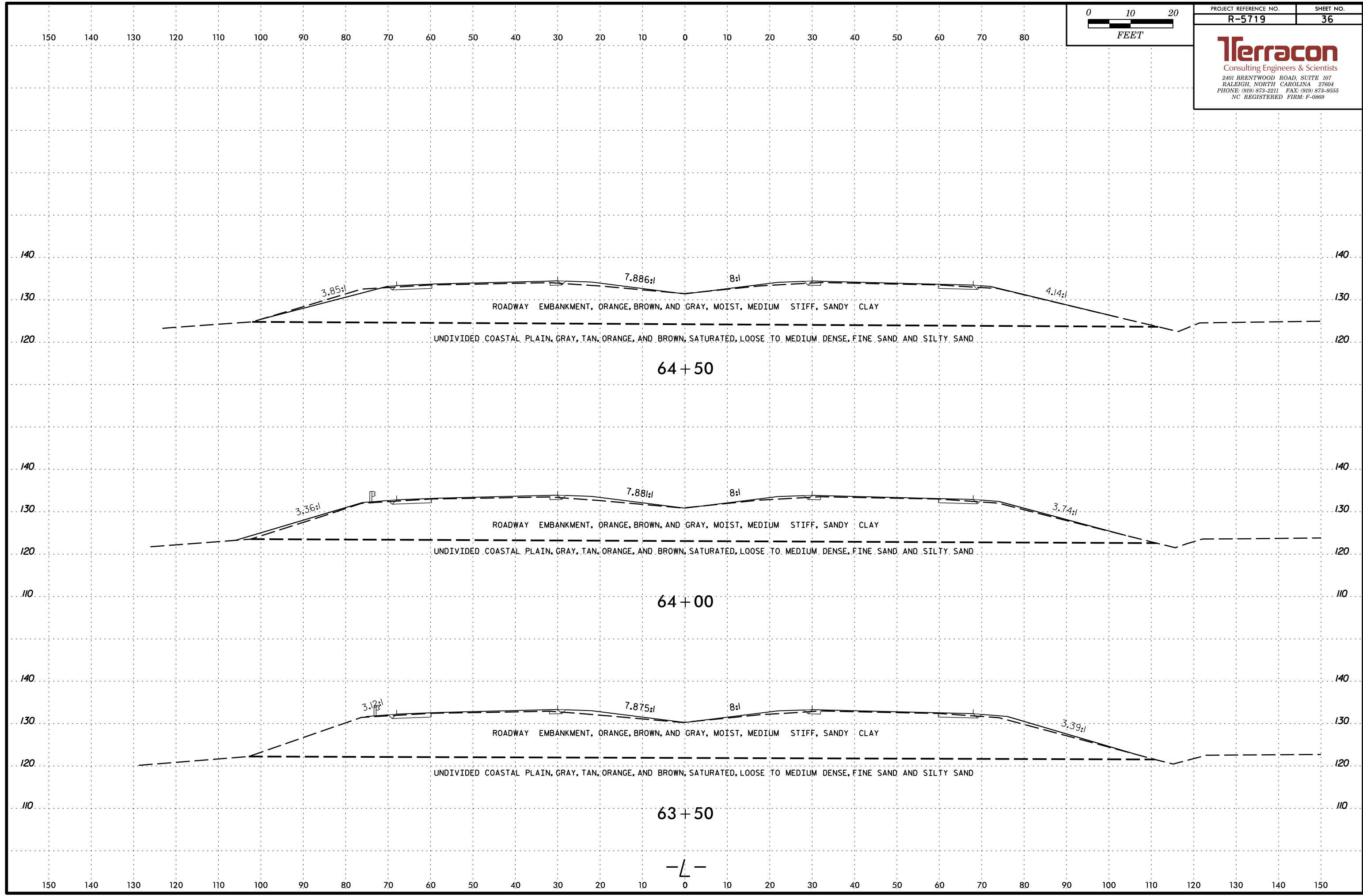
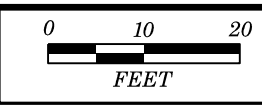
**Terracon**  
Consulting Engineers & Scientists  
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PHONE: (919) 873-2211 FAX: (919) 873-9555  
NC REGISTERED FIRM: F-0869

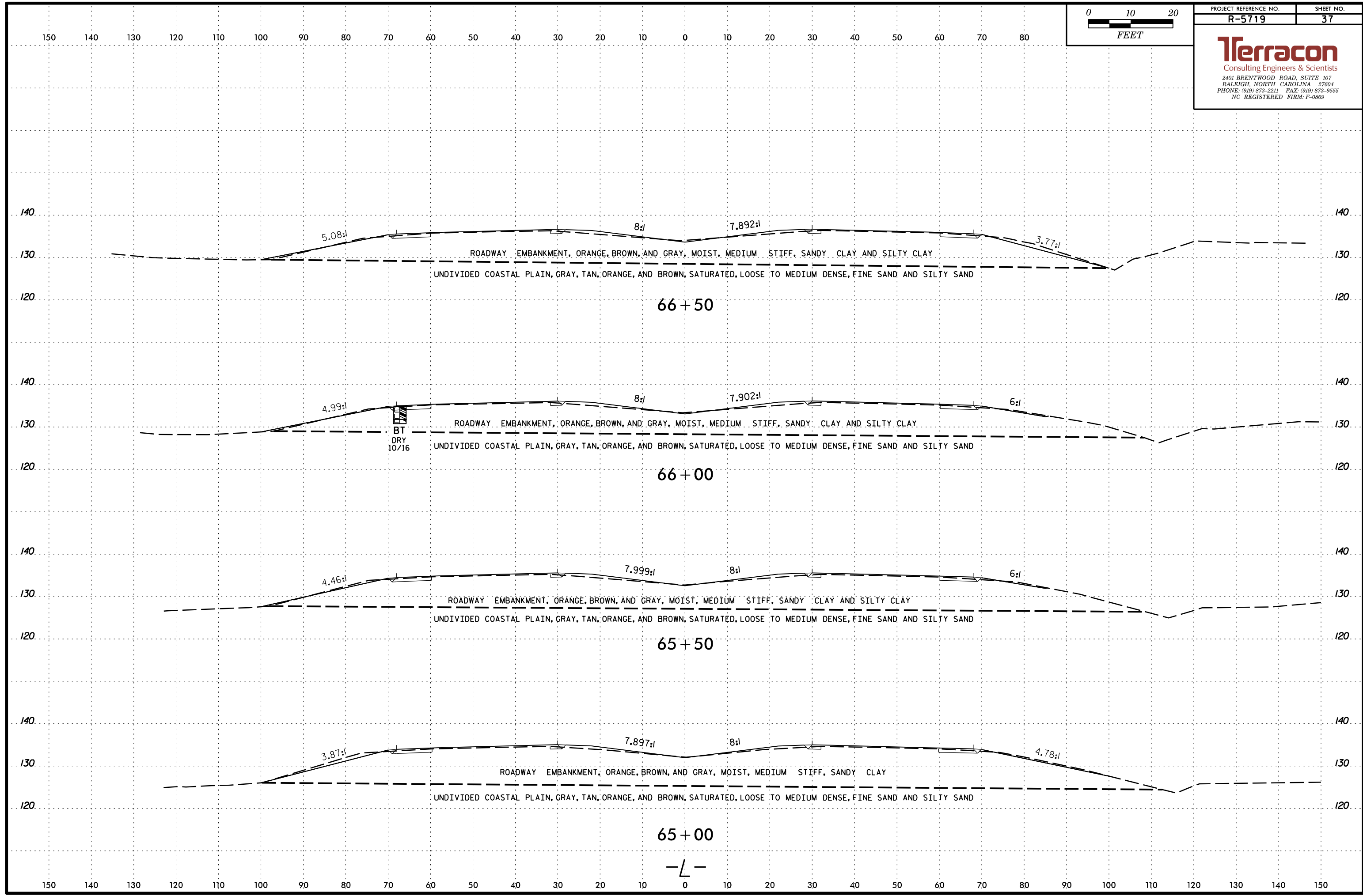
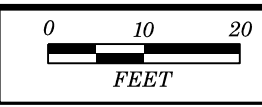


150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



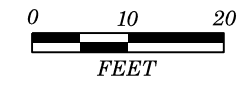






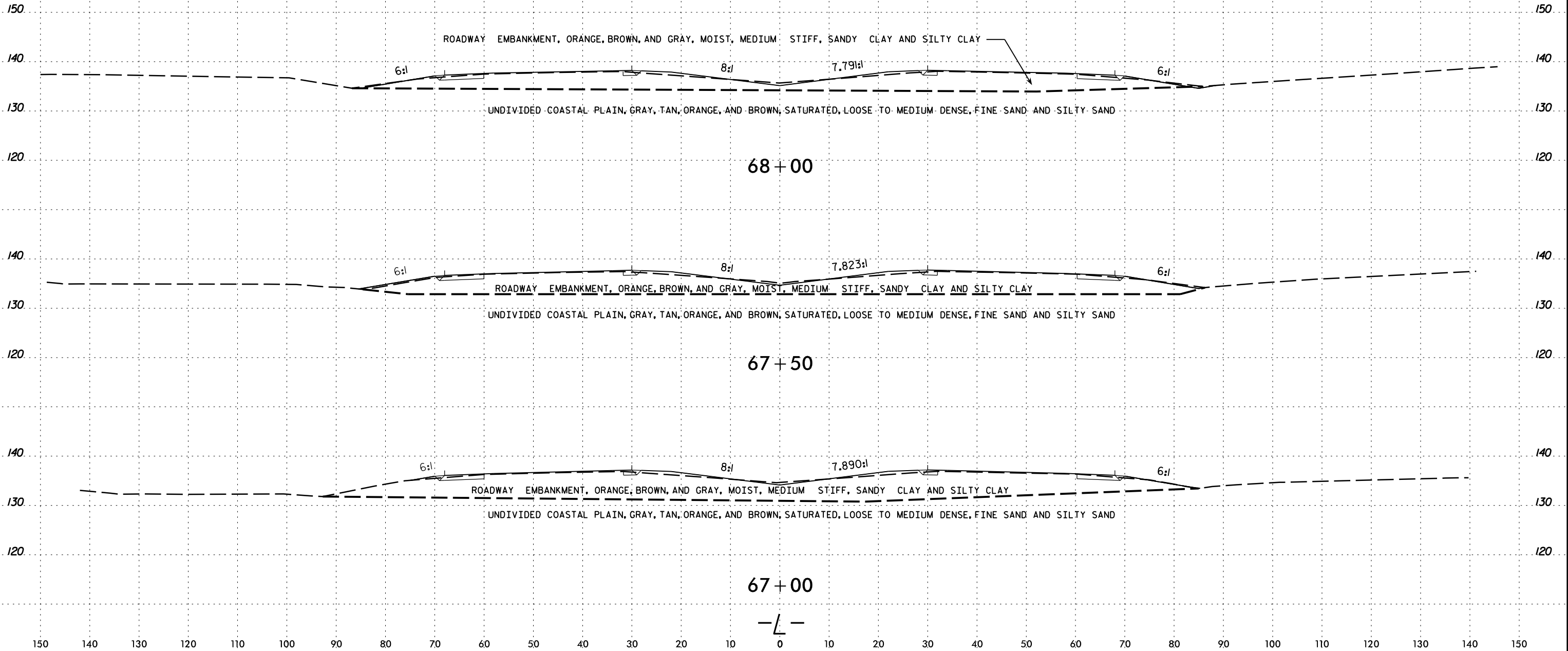


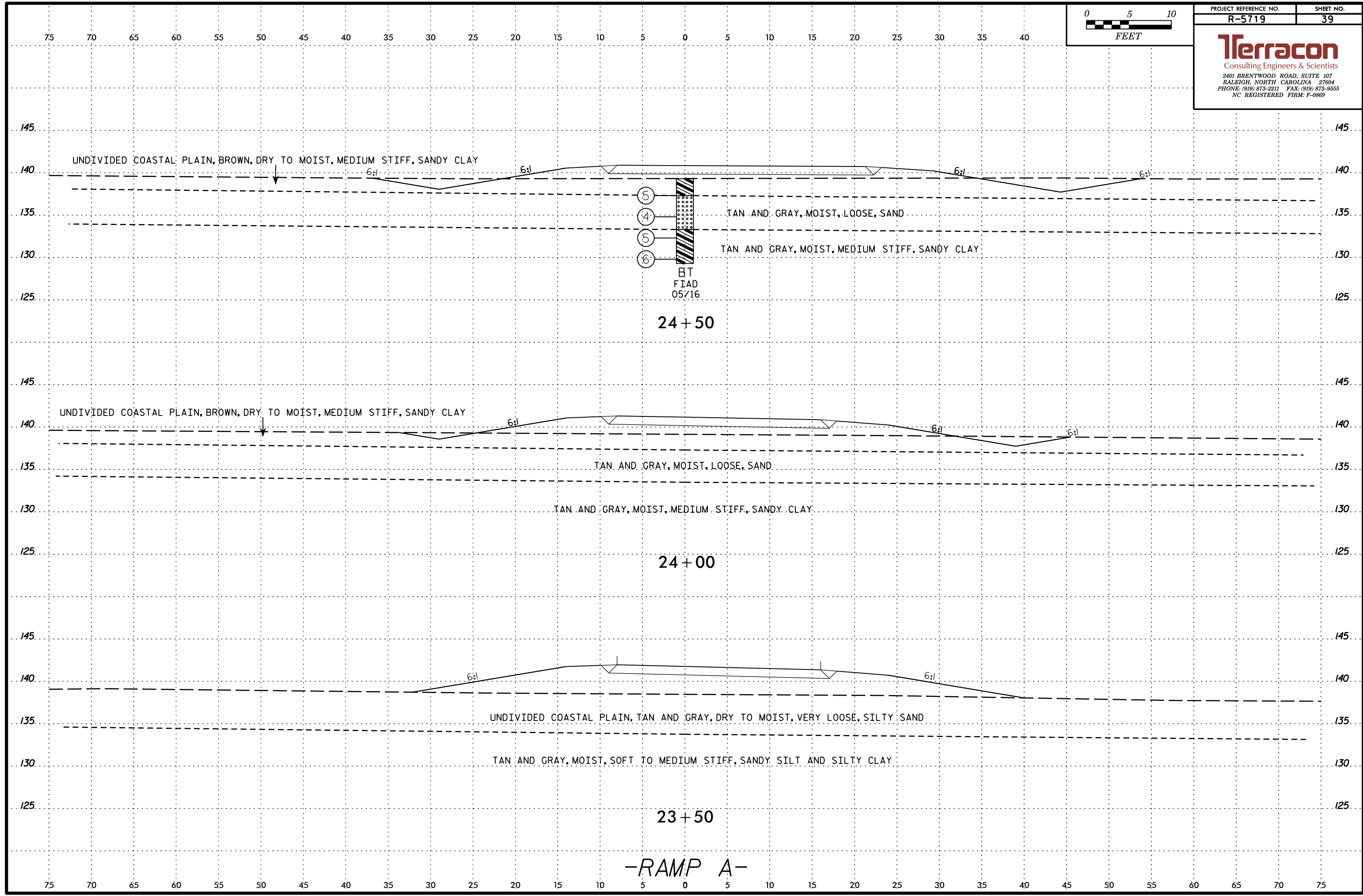
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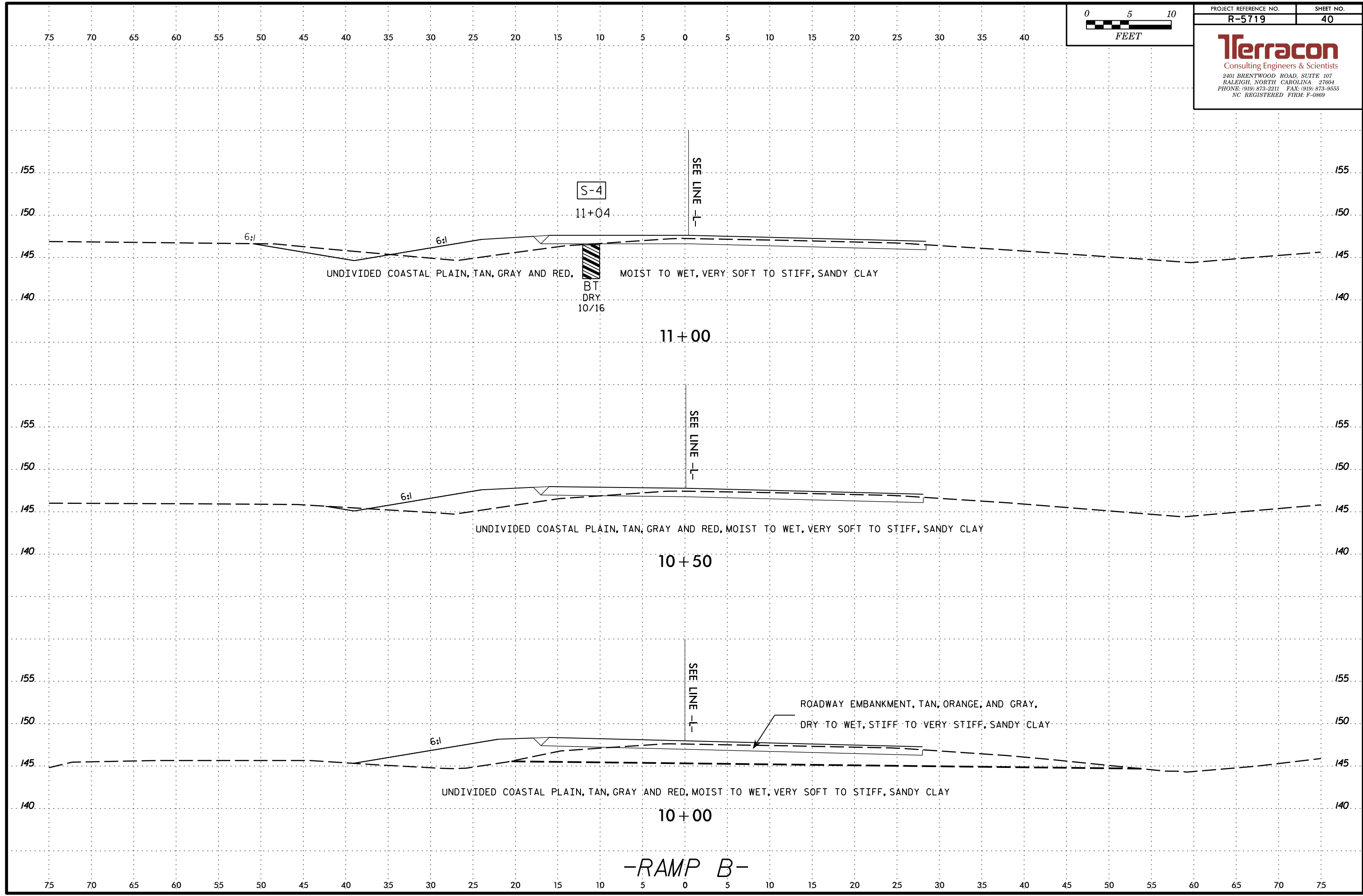


PROJECT REFERENCE NO.	SHEET NO.
R-5719	38

**Terracon**  
 Consulting Engineers & Scientists  
 2401 BRENTWOOD ROAD, SUITE 107  
 RALEIGH, NORTH CAROLINA 27604  
 PHONE: (919) 873-2211 FAX: (919) 873-9555  
 NC REGISTERED FIRM: F-0869







S-4

11+04

BT  
 DRY  
 10/16

11+00

10+50

10+00

-RAMP B-

UNDIVIDED COASTAL PLAIN, TAN, GRAY AND RED, MOIST TO WET, VERY SOFT TO STIFF, SANDY CLAY

UNDIVIDED COASTAL PLAIN, TAN, GRAY AND RED, MOIST TO WET, VERY SOFT TO STIFF, SANDY CLAY

ROADWAY EMBANKMENT, TAN, ORANGE, AND GRAY,  
 DRY TO WET, STIFF TO VERY STIFF, SANDY CLAY

UNDIVIDED COASTAL PLAIN, TAN, GRAY AND RED, MOIST TO WET, VERY SOFT TO STIFF, SANDY CLAY

SEE LINE -L-

SEE LINE -L-

SEE LINE -L-

6:1

6:1

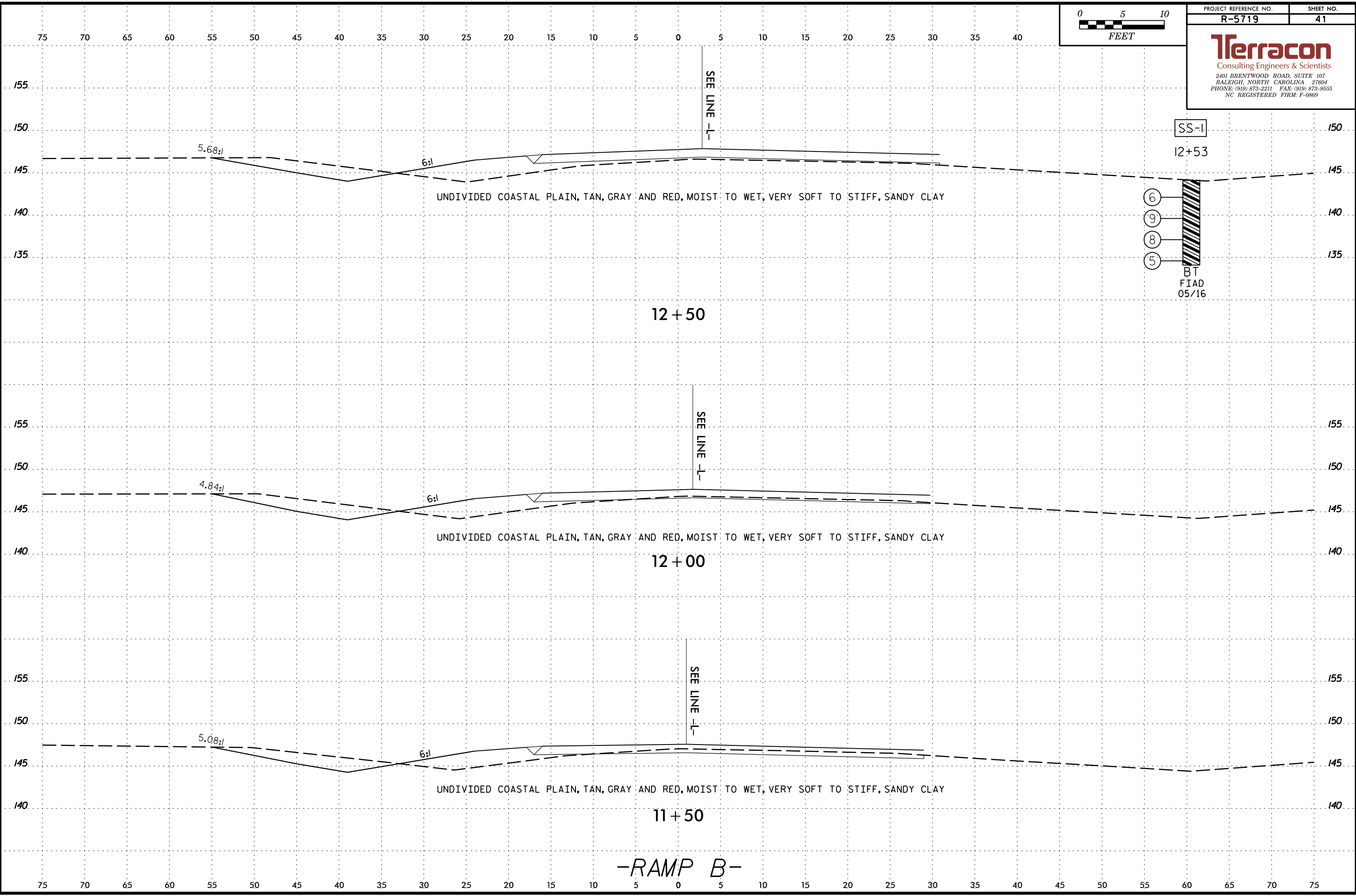
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6:1



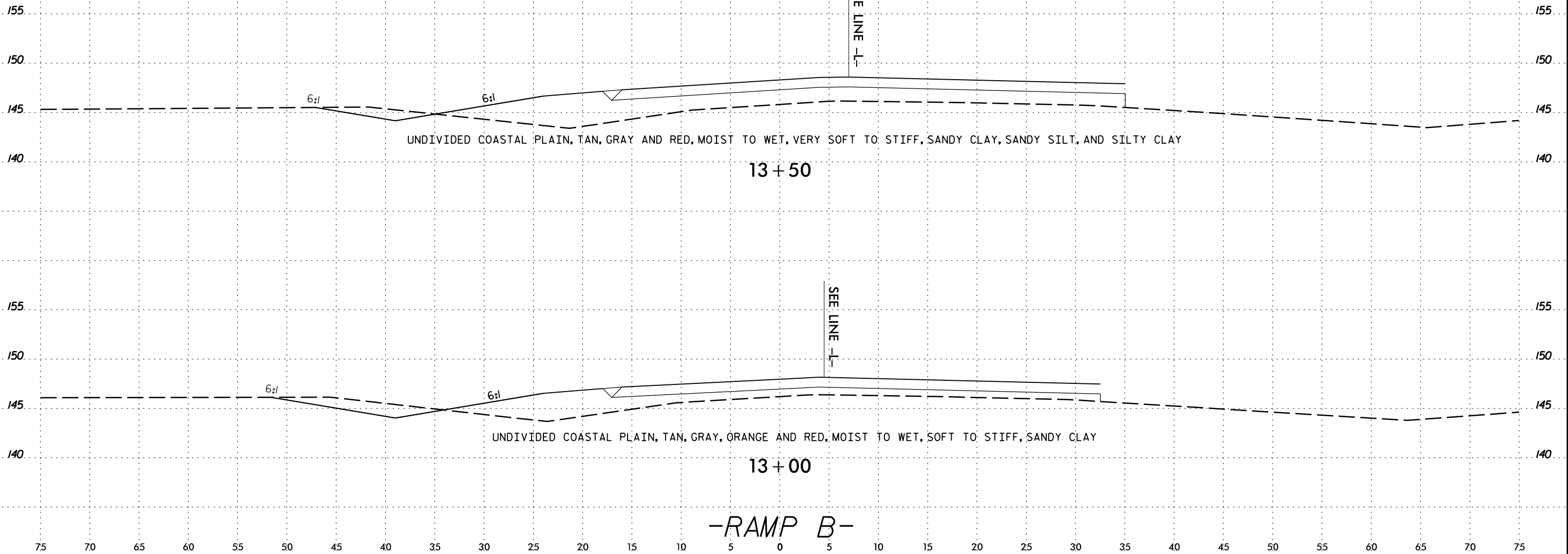
PROJECT REFERENCE NO.	SHEET NO.
R-5719	41

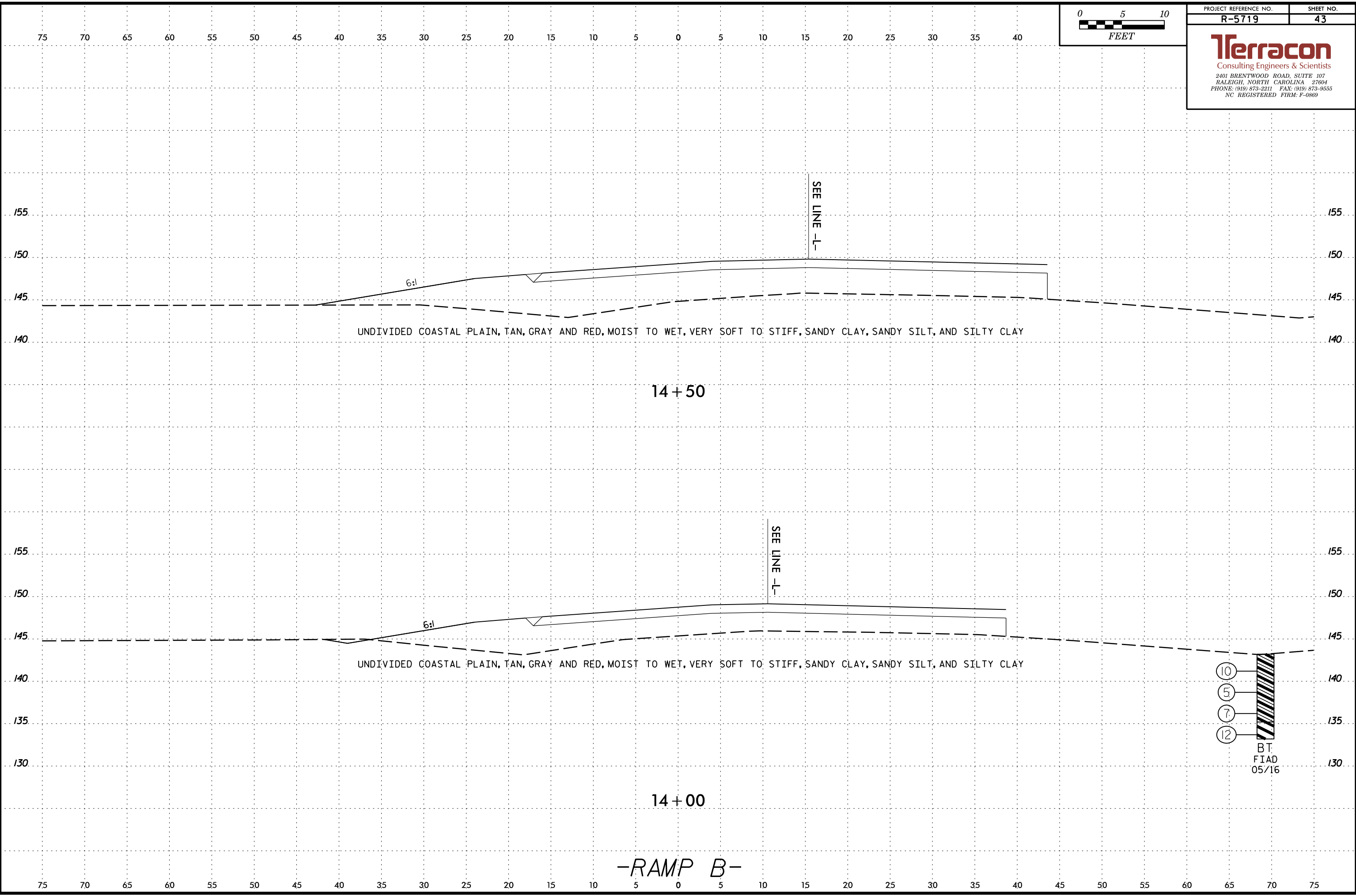
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 NC REGISTERED FIRM: F-0869

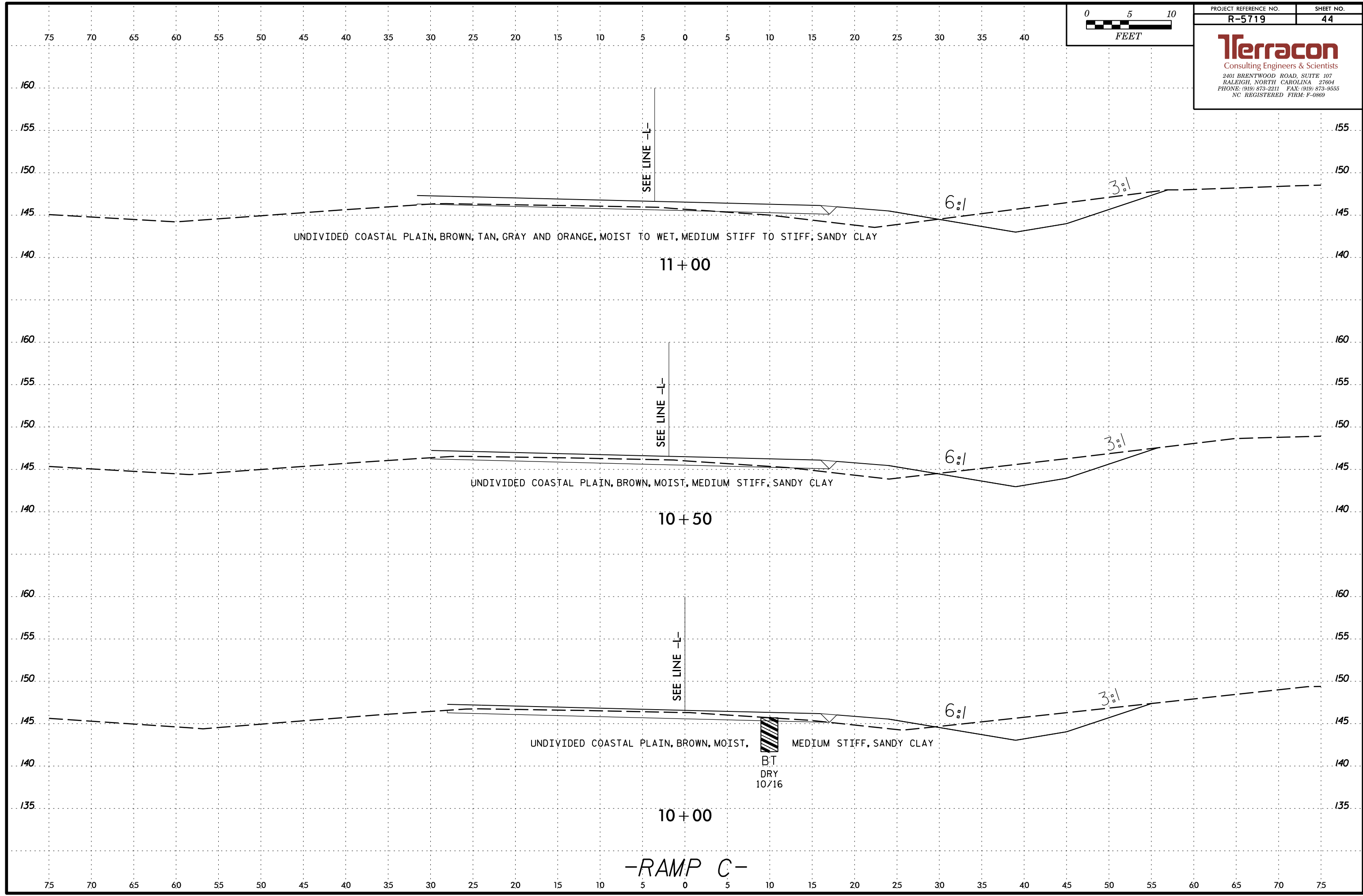




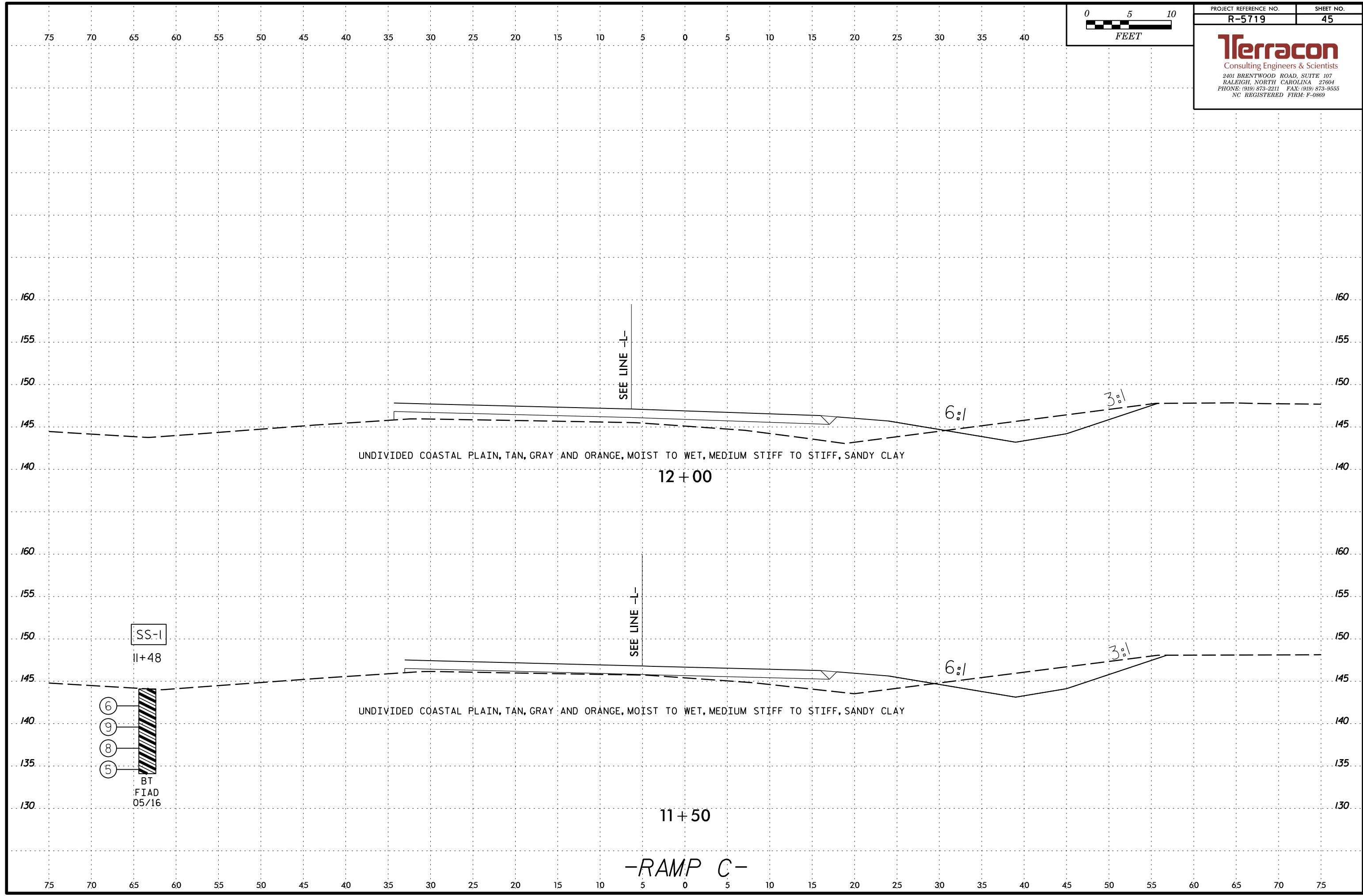
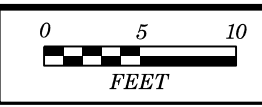
75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40







-RAMP C-



SEE LINE -L-

SEE LINE -L-

UNDIVIDED COASTAL PLAIN, TAN, GRAY AND ORANGE, MOIST TO WET, MEDIUM STIFF TO STIFF, SANDY CLAY

UNDIVIDED COASTAL PLAIN, TAN, GRAY AND ORANGE, MOIST TO WET, MEDIUM STIFF TO STIFF, SANDY CLAY

12+00

11+50

-RAMP C-

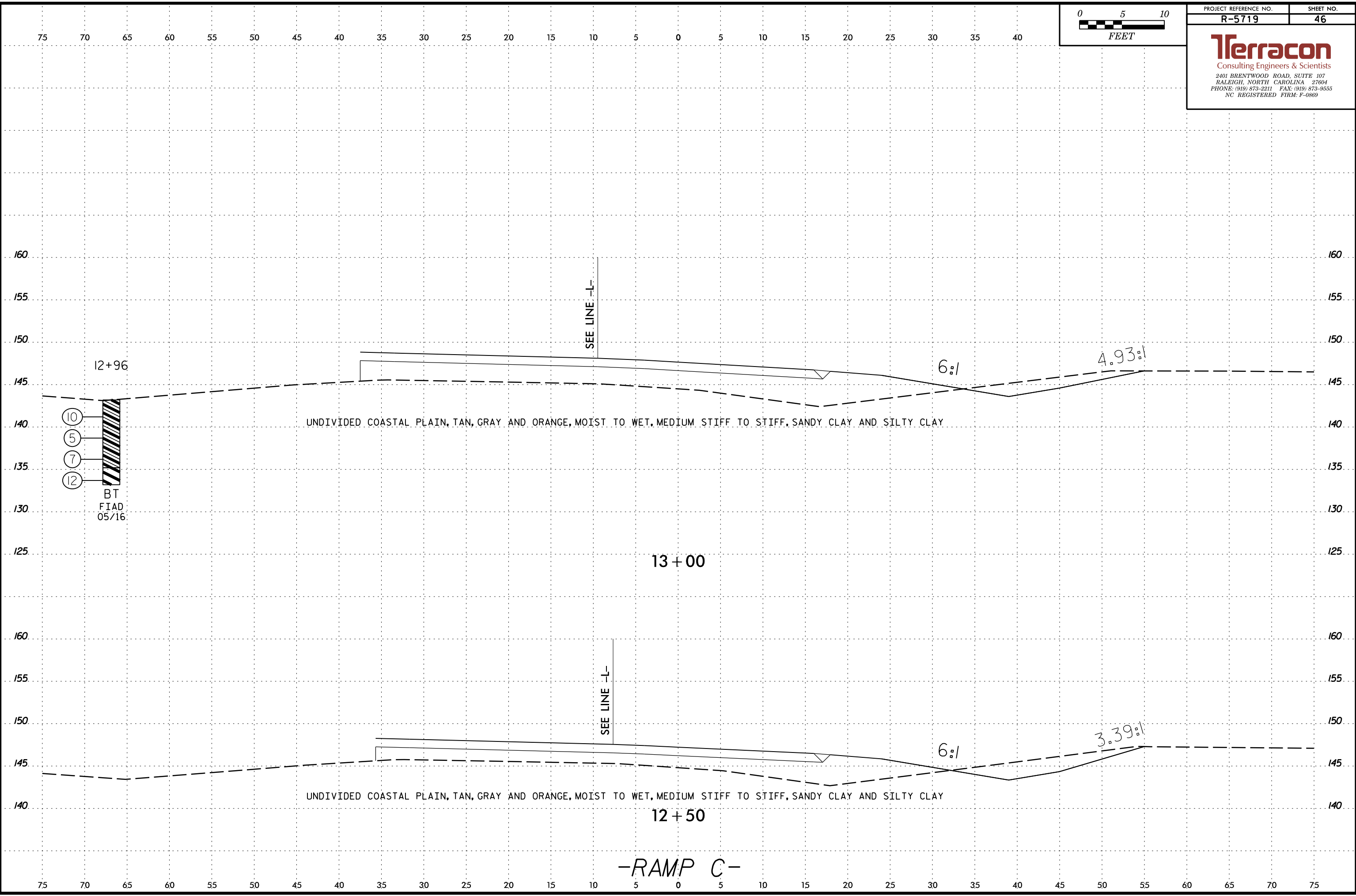
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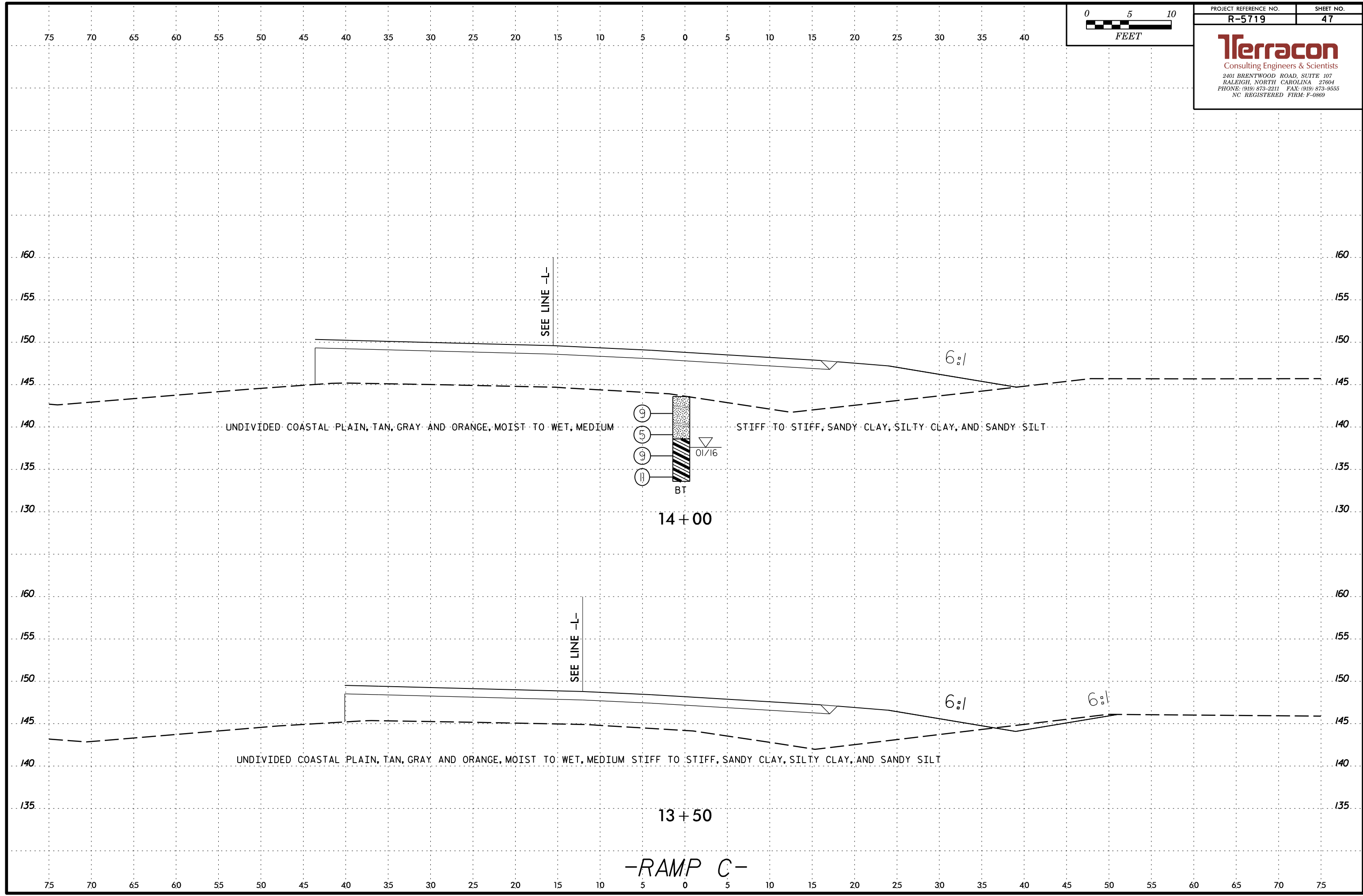
11+48

- 6
- 9
- 8
- 5

BT  
 FIAD  
 05/16





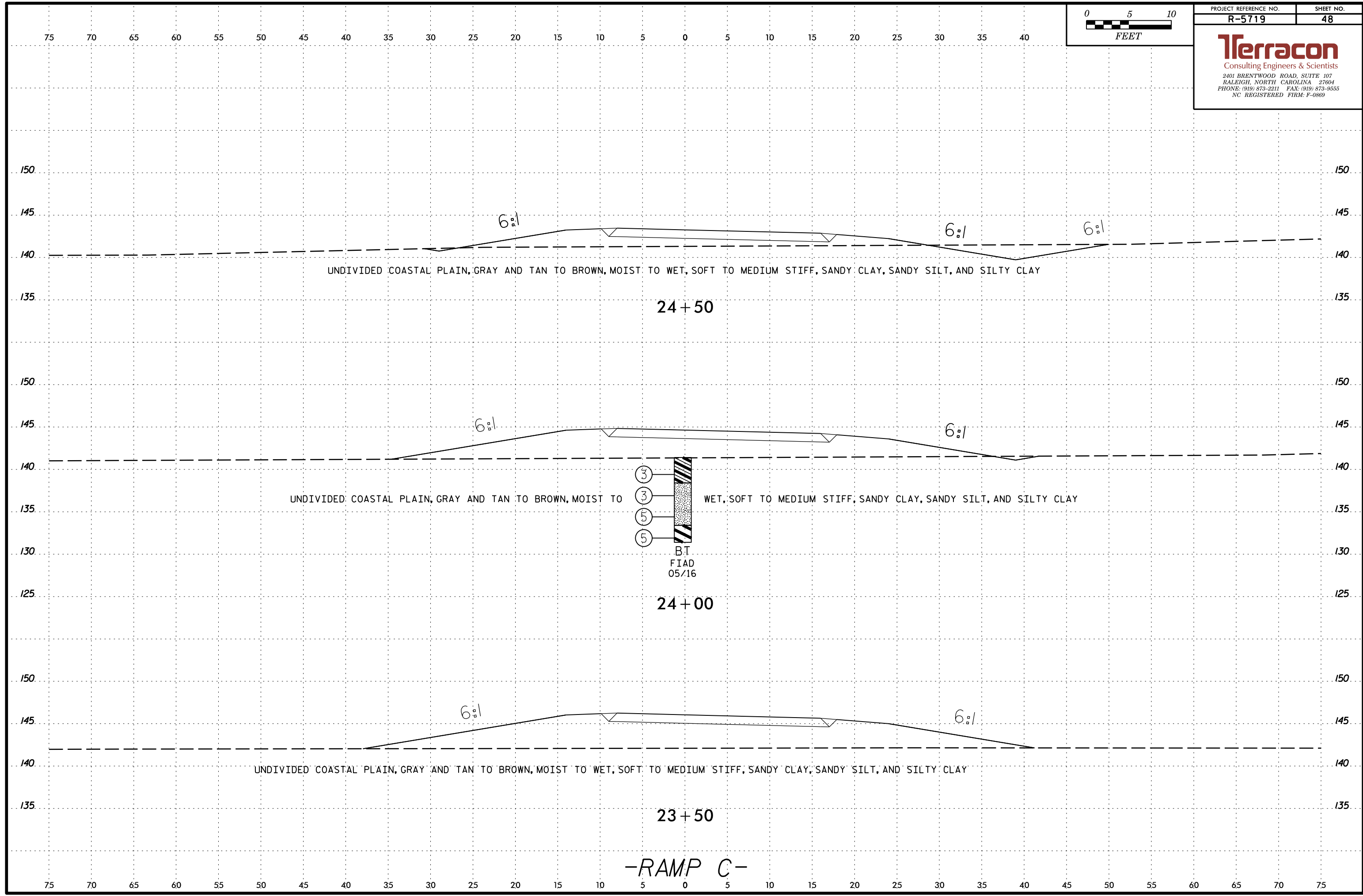


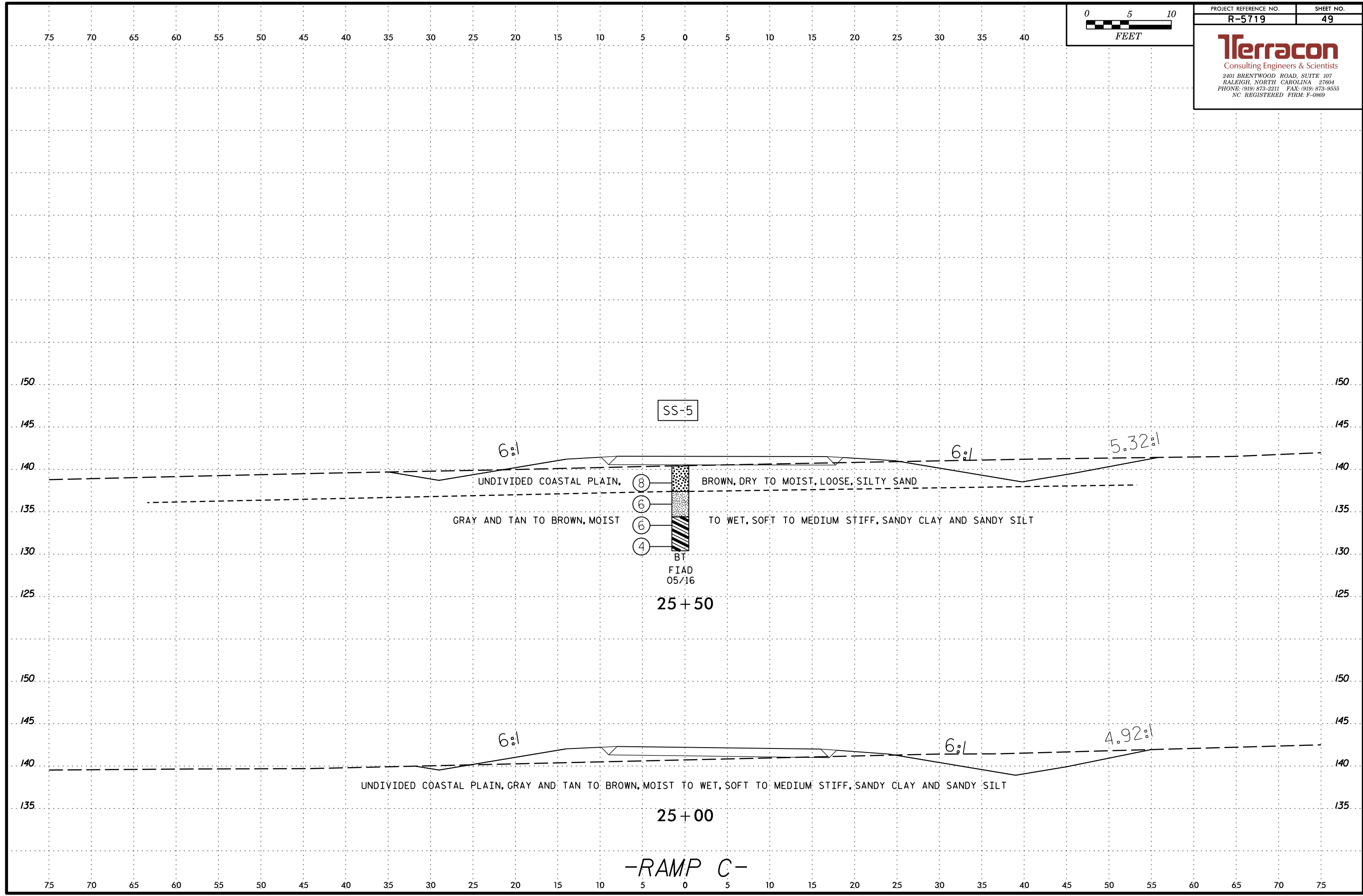
-RAMP C-



PROJECT REFERENCE NO.	SHEET NO.
R-5719	48

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 NC REGISTERED FIRM: F-0869

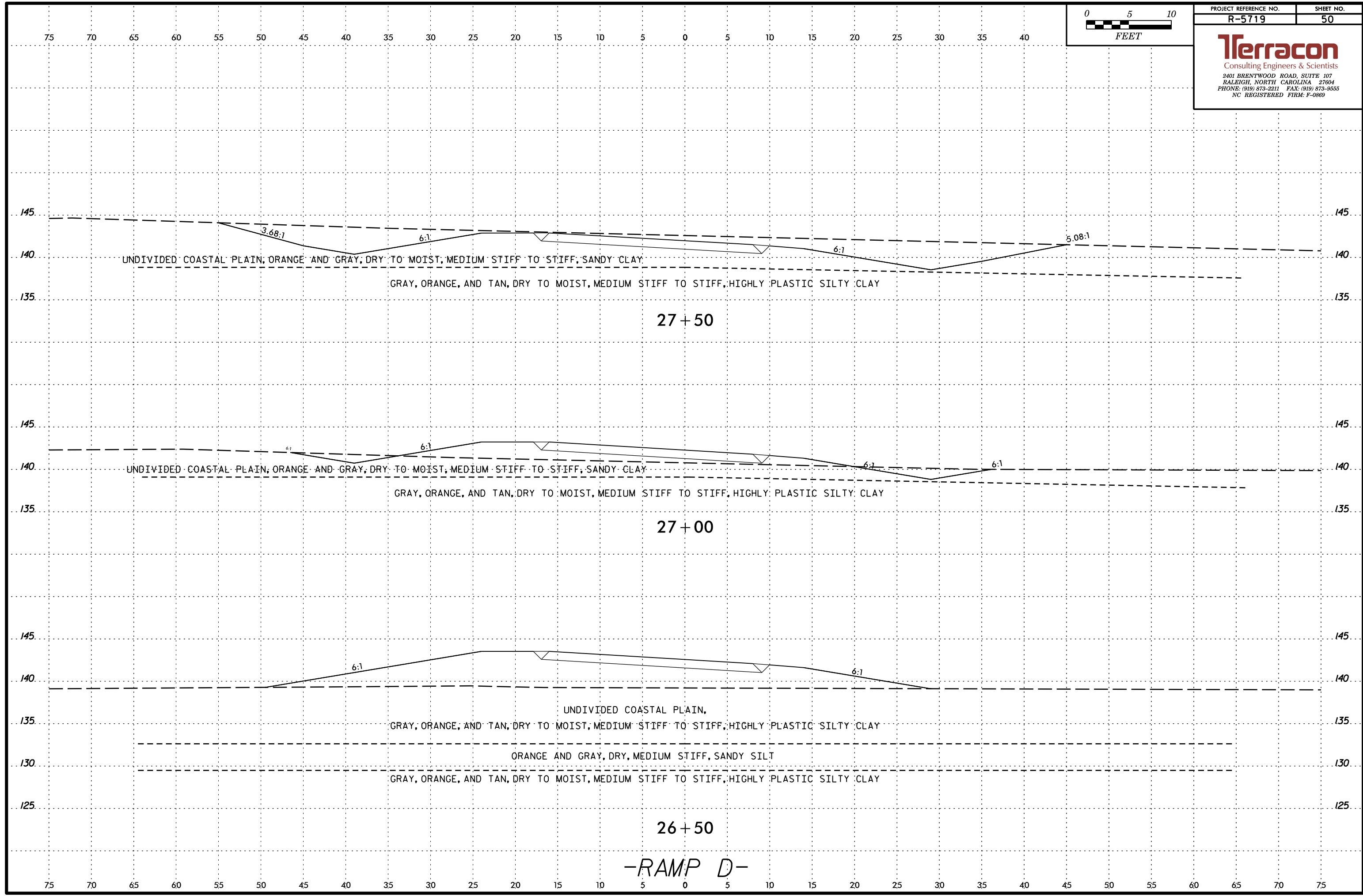






PROJECT REFERENCE NO.	SHEET NO.
R-5719	50

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 RALEIGH, NORTH CAROLINA 27604  
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 NC REGISTERED FIRM: F-0869

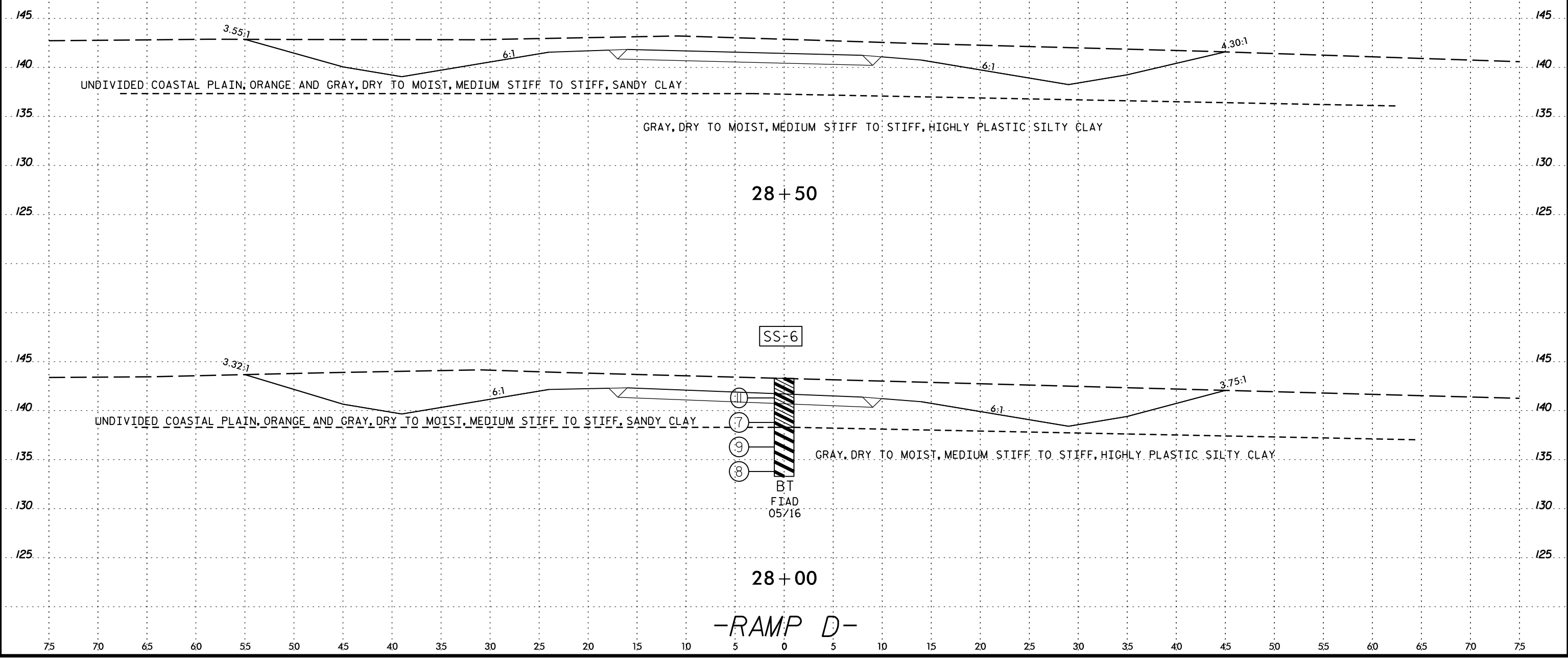


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PROJECT REFERENCE NO.	SHEET NO.
R-5719	51

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 RALEIGH, NORTH CAROLINA 27604  
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 NC REGISTERED FIRM: F-0869



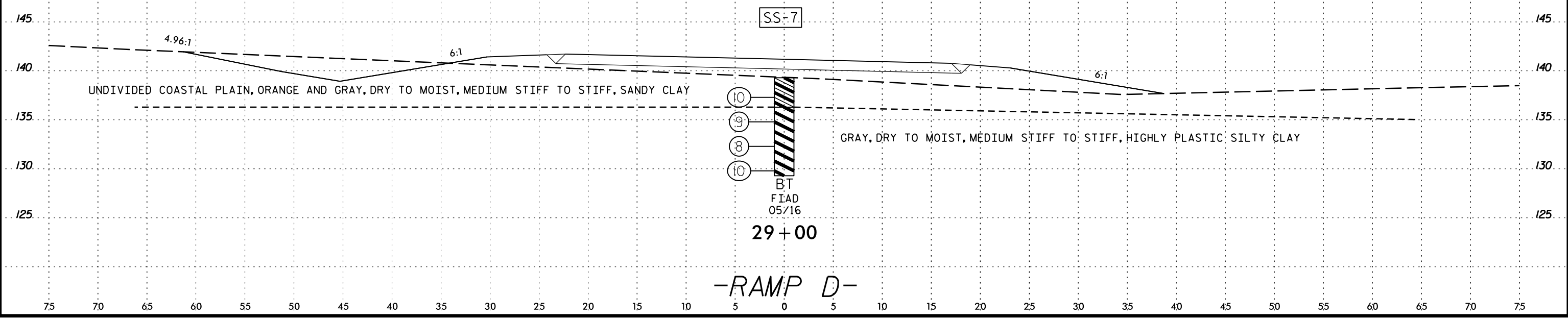
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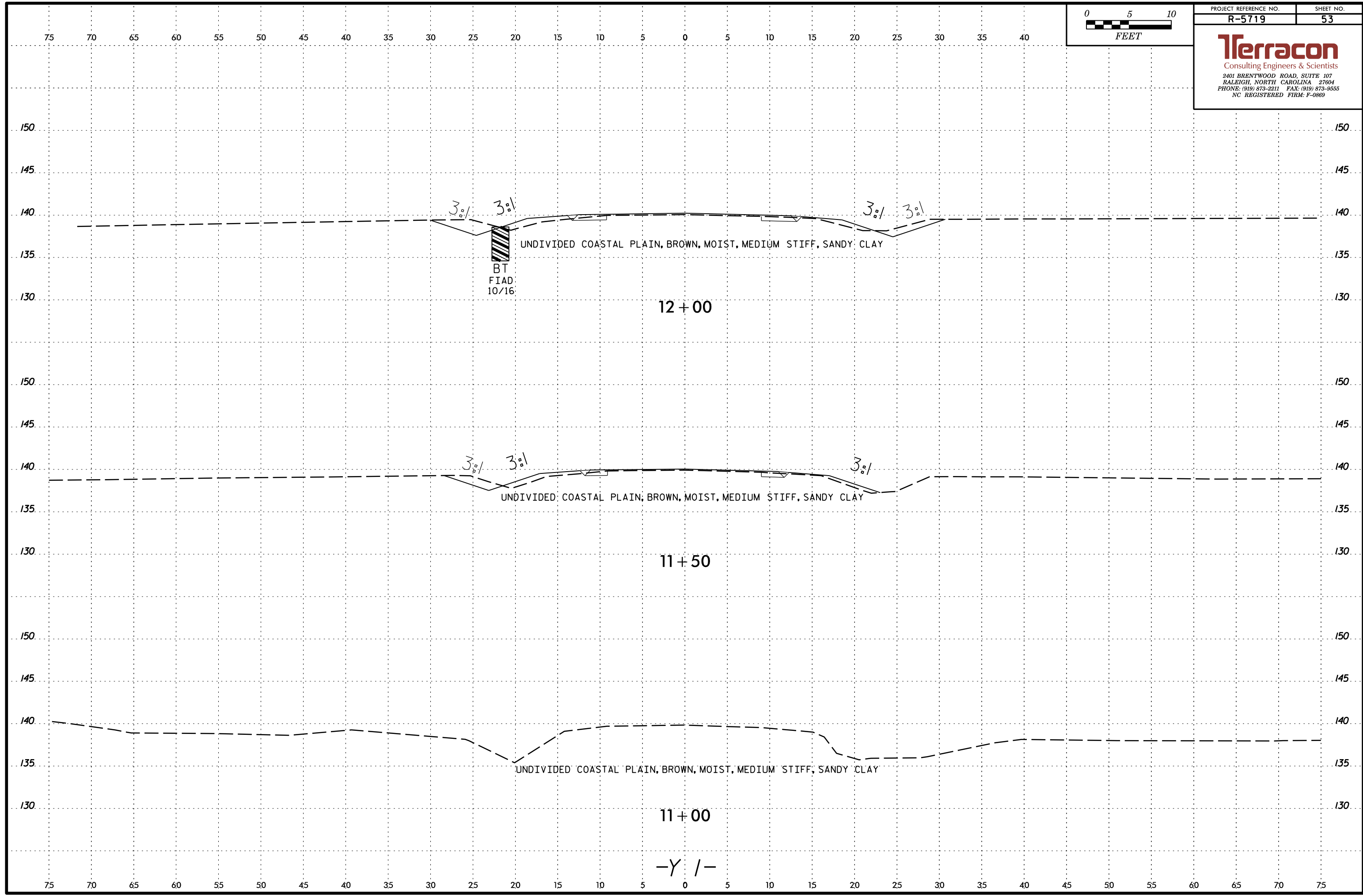
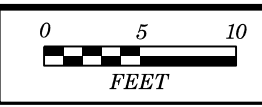
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PROJECT REFERENCE NO.	SHEET NO.
R-5719	52

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 NC REGISTERED FIRM: F-0869





3:1

3:1

3:1

3:1

3:1

3:1

3:1

12 + 00

11 + 50

11 + 00

-Y / -

UNDIVIDED COASTAL PLAIN, BROWN, MOIST, MEDIUM STIFF, SANDY CLAY  
BT  
FIAD  
10/16

UNDIVIDED COASTAL PLAIN, BROWN, MOIST, MEDIUM STIFF, SANDY CLAY

UNDIVIDED COASTAL PLAIN, BROWN, MOIST, MEDIUM STIFF, SANDY CLAY

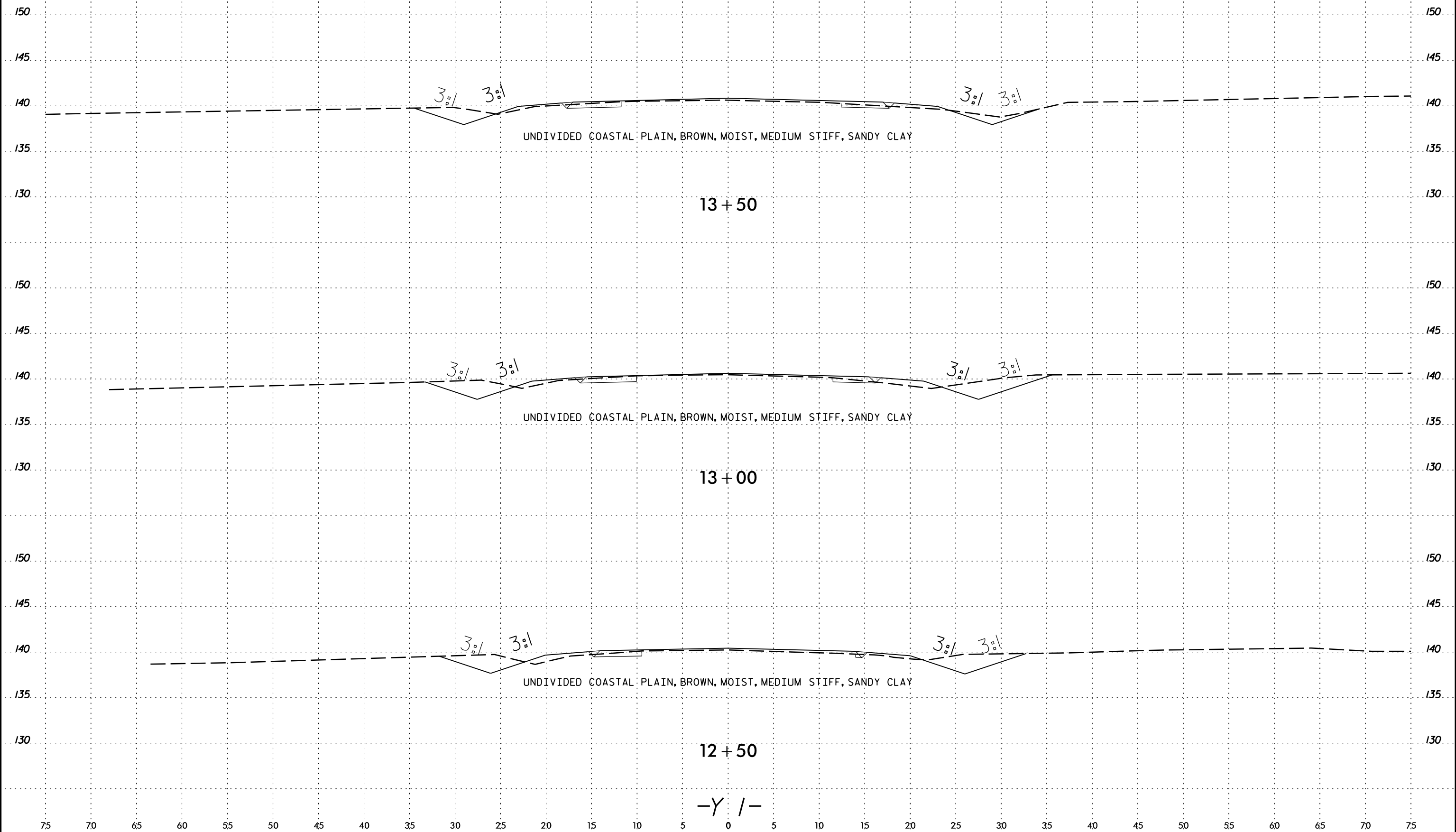


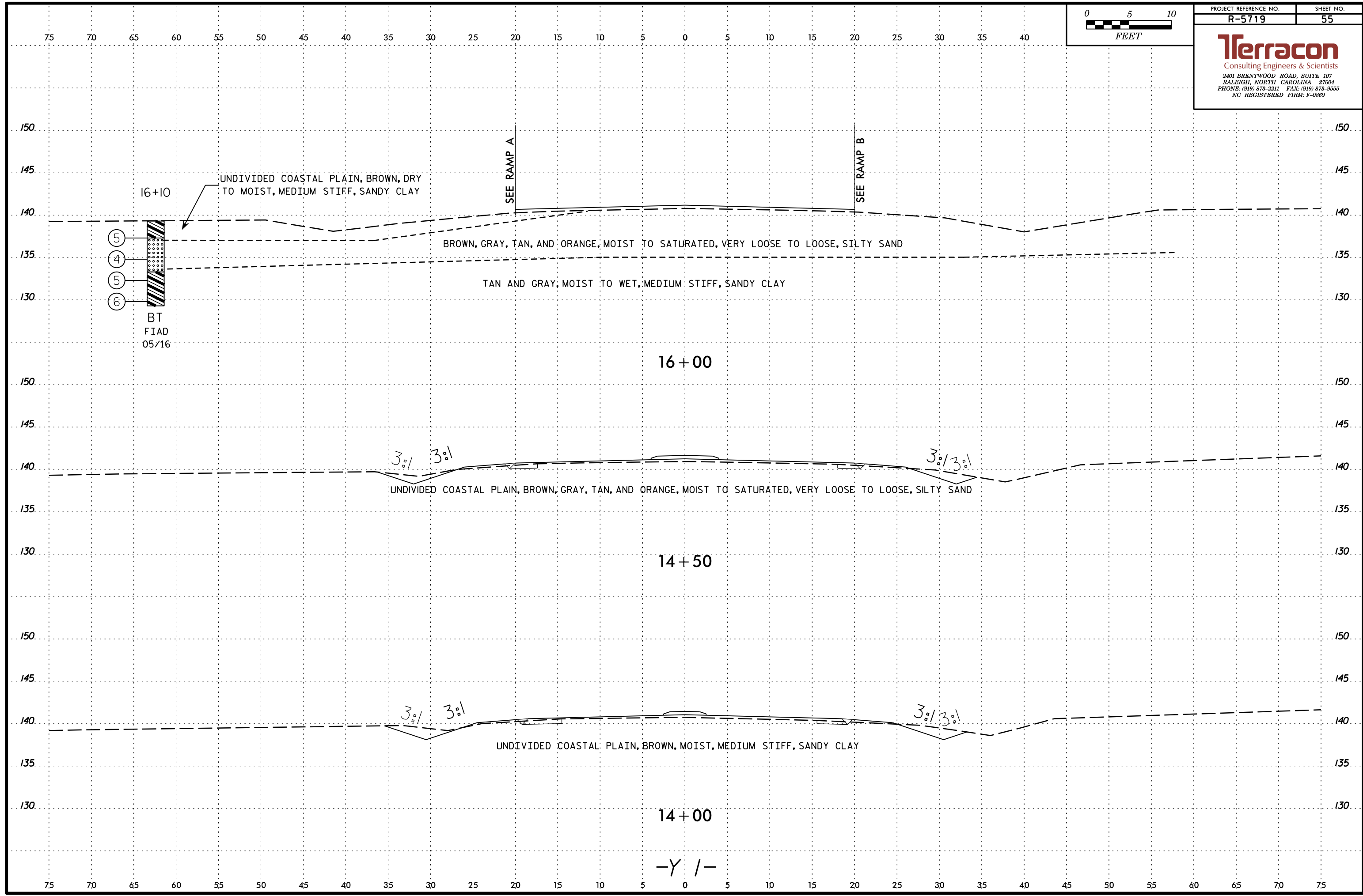
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PROJECT REFERENCE NO.	SHEET NO.
R-5719	54

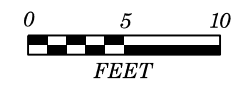
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 RALEIGH, NORTH CAROLINA 27604  
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 NC REGISTERED FIRM: F-0869





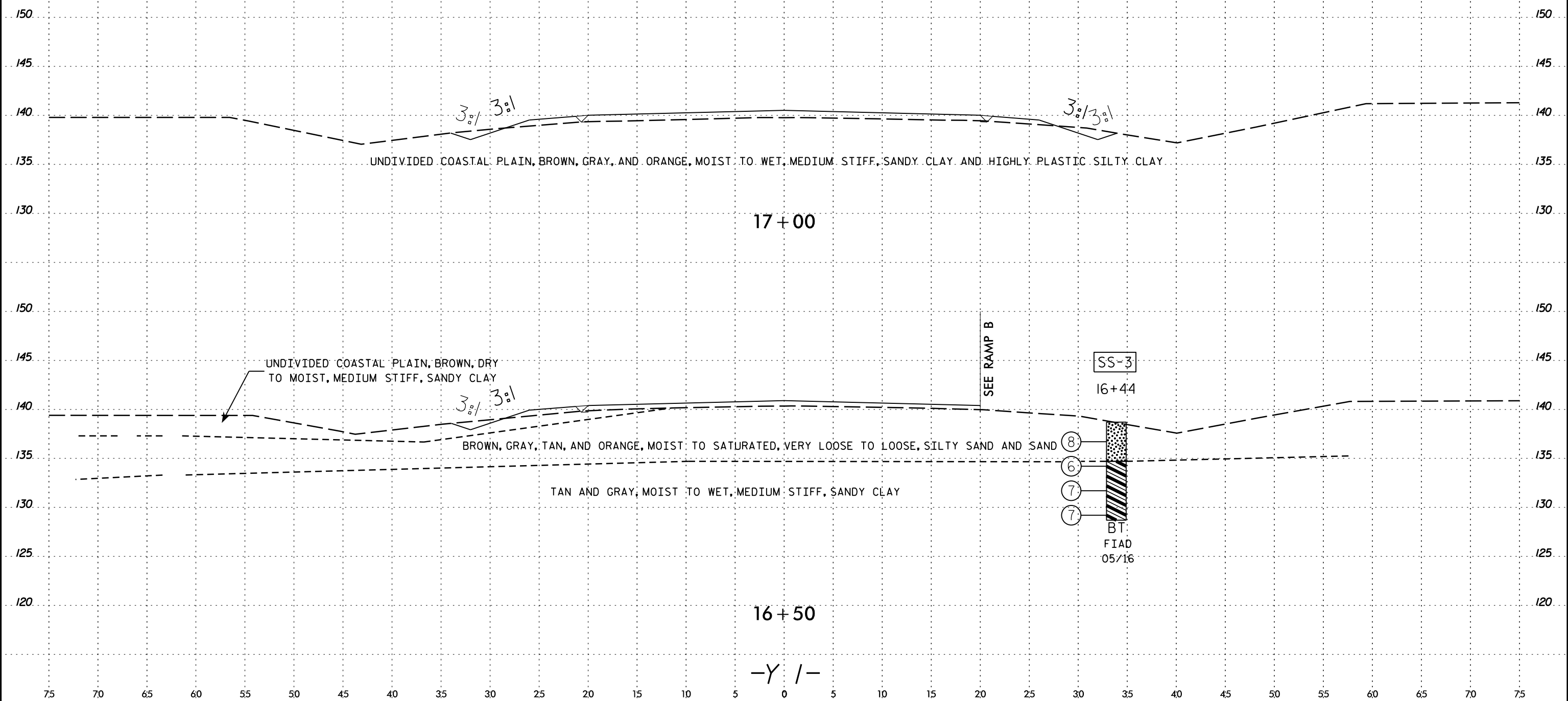
-Y /-

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PROJECT REFERENCE NO.	SHEET NO.
R-5719	56

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 NC REGISTERED FIRM: F-0869



UNDIVIDED COASTAL PLAIN, BROWN, GRAY, AND ORANGE, MOIST TO WET, MEDIUM STIFF, SANDY CLAY AND HIGHLY PLASTIC SILTY CLAY

17+00

UNDIVIDED COASTAL PLAIN, BROWN, DRY TO MOIST, MEDIUM STIFF, SANDY CLAY

BROWN, GRAY, TAN, AND ORANGE, MOIST TO SATURATED, VERY LOOSE TO LOOSE, SILTY SAND AND SAND

TAN AND GRAY, MOIST TO WET, MEDIUM STIFF, SANDY CLAY

SS-3

16+44

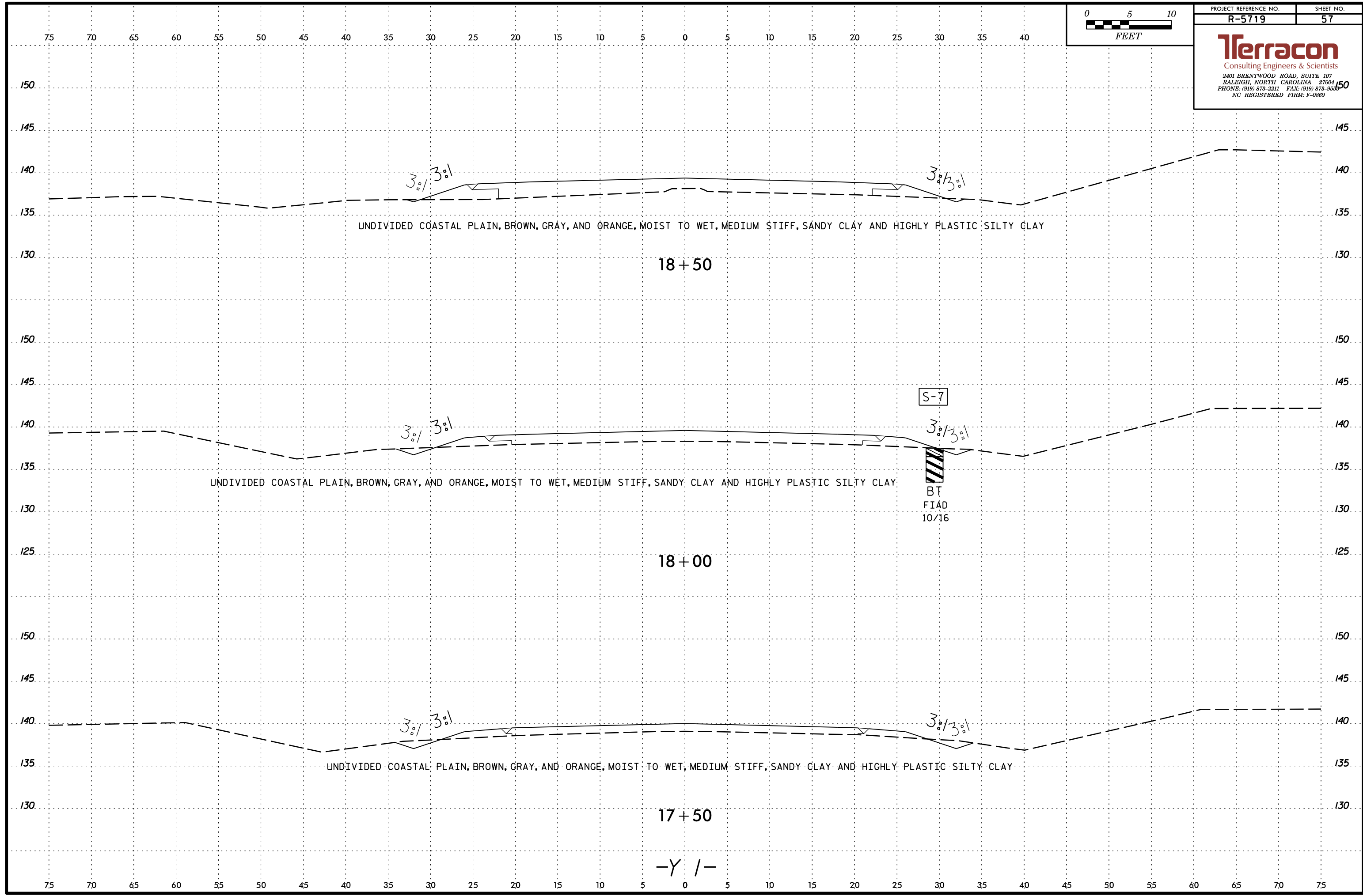
- 8
- 6
- 7
- 7

BT  
FIAD  
05/16

16+50

-Y /-

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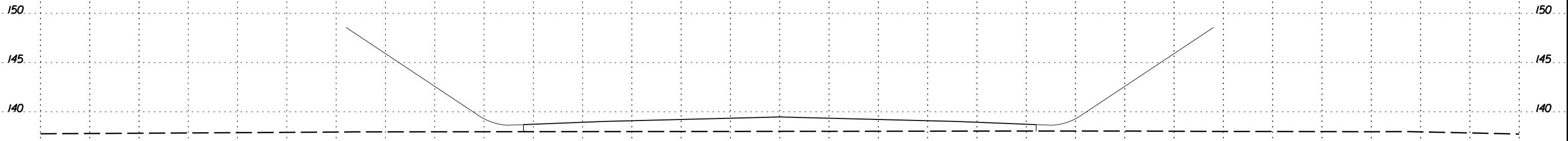


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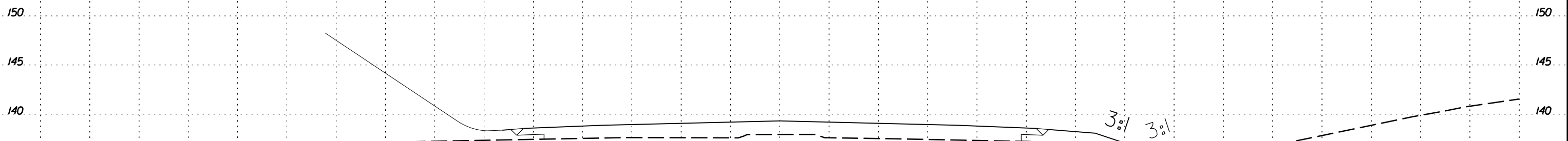
PROJECT REFERENCE NO. R-5719 SHEET NO. 58

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NC REGISTERED FIRM: F-0869



UNDIVIDED COASTAL PLAIN, BROWN, GRAY, AND ORANGE, MOIST TO WET, MEDIUM STIFF TO STIFF, SANDY CLAY AND HIGHLY PLASTIC SILTY CLAY

19+50

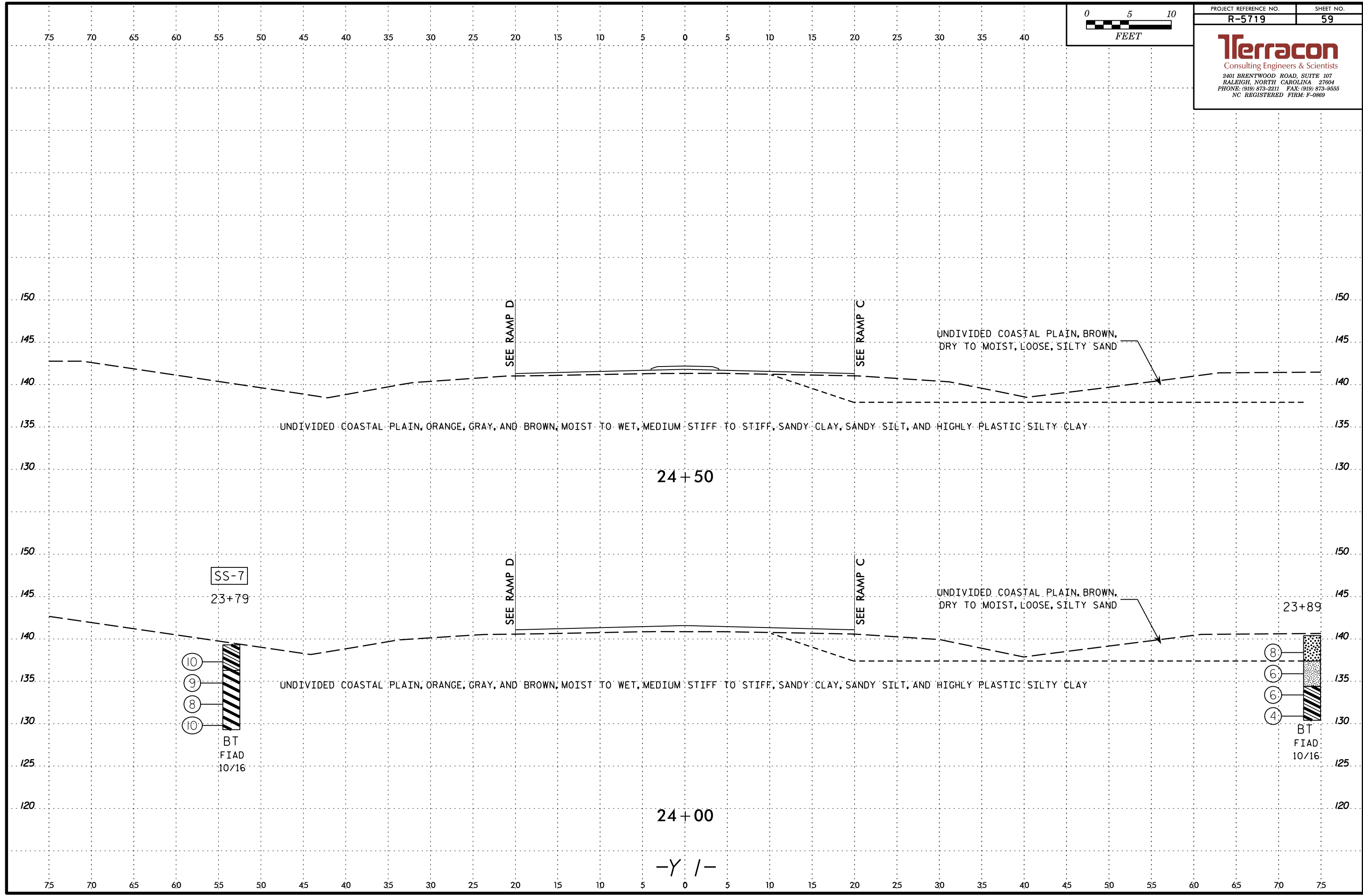


UNDIVIDED COASTAL PLAIN, BROWN, GRAY, AND ORANGE, MOIST TO WET, MEDIUM STIFF TO STIFF, SANDY CLAY AND HIGHLY PLASTIC SILTY CLAY

19+00

-Y /-

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



SS-7

- 10
- 9
- 8
- 10

BT  
FIAD  
10/16

- 8
- 6
- 6
- 4

BT  
FIAD  
10/16

24+50

24+00

-Y /-

UNDIVIDED COASTAL PLAIN, ORANGE, GRAY, AND BROWN, MOIST TO WET, MEDIUM STIFF TO STIFF, SANDY CLAY, SANDY SILT, AND HIGHLY PLASTIC SILTY CLAY

UNDIVIDED COASTAL PLAIN, BROWN, DRY TO MOIST, LOOSE, SILTY SAND

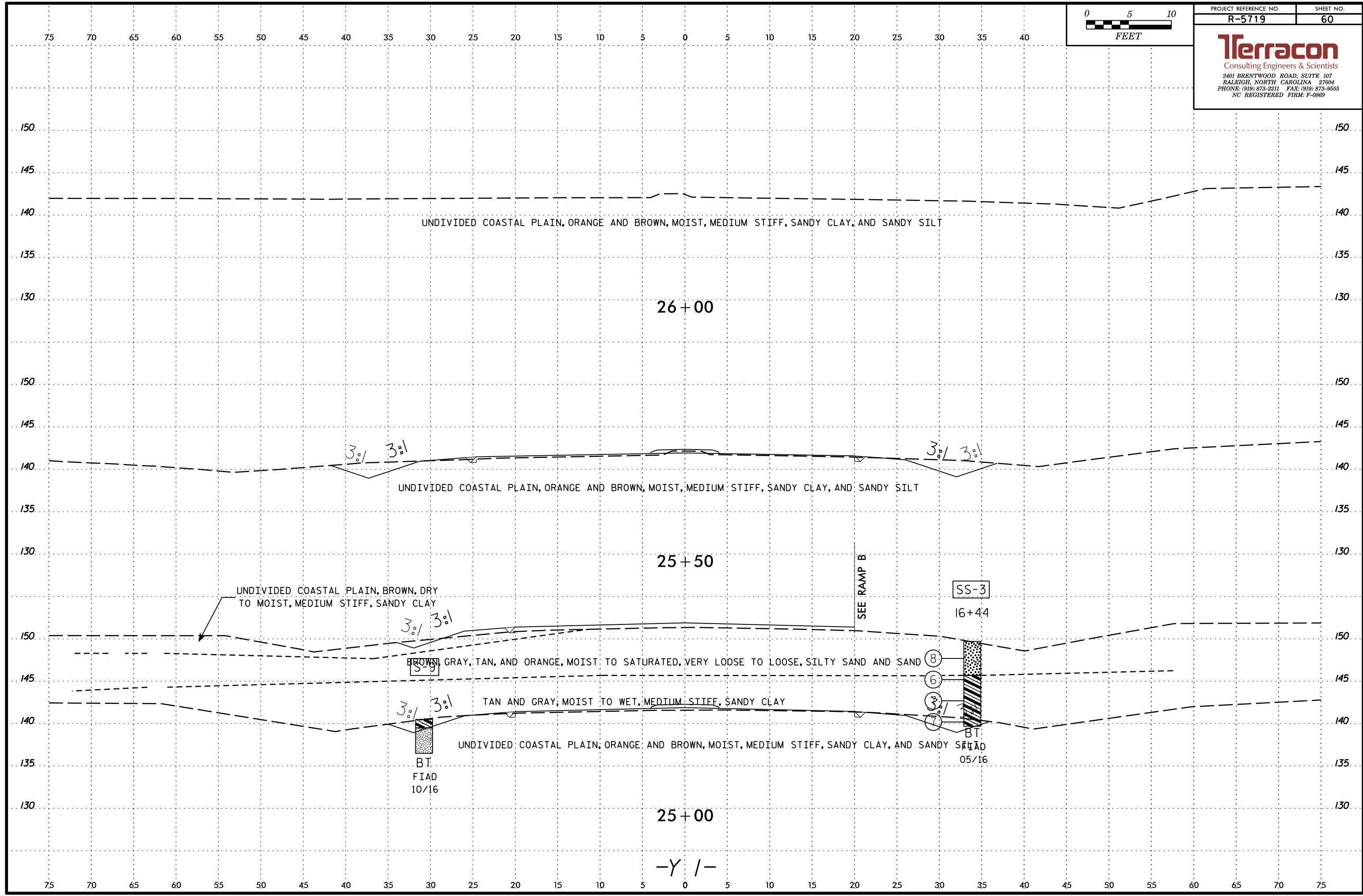
UNDIVIDED COASTAL PLAIN, BROWN, DRY TO MOIST, LOOSE, SILTY SAND

SEE RAMP D

SEE RAMP C

SEE RAMP D

SEE RAMP C



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
GEOTECHNICAL ENGINEERING UNIT  
SUBSURFACE INVESTIGATION  
APPENDIX A  
LABORATORY RESULTS

REFERENCE: R-5719

PROJECT: 50473

**Terracon**  
Consulting Engineers & Scientists  
2401 BRENTWOOD ROAD, SUITE 107  
RALEIGH, NORTH CAROLINA 27604  
PHONE: (919) 873-2211 FAX: (919) 873-9555  
NC REGISTERED FIRM: F-0869

INITIALS

DATE



**LABORATORY TESTING SUMMARY**

PROJECT NUMBER: 50473

TIP: R-5719

COUNTY: WAYNE

DESCRIPTION: US 117 AND SR 1135 (COUNTRY CLUB ROAD) INTERCHANGE

Sample No.	Alignment	Station	Offset (feet)	Depth Interval (feet)	AASHTO Class.	L.L.	P.I.	% by Weight				% Retained #4 Sieve	% Passing (sieves)			% Moisture	% Organic
								Coarse Sand	Fine Sand	Silt	Clay		#10	#40	#200		
SS-1	-L-	23+50	CL	1.0 - 2.5	A-6 (8)	36	20	8.6	44.7	19.3	27.4	0	100	97	58	19.1	ND
SS-2	-L-	27+00	CL	1.0 - 2.5	A-6 (2)	26	11	9.3	50.7	16.7	23.3	0	100	97	49	12.0	ND
SS-3	-RAMP B-	29+50	27 RT	6.0 - 7.5	A-6 (11)	40	25	5.4	45.9	18.8	29.9	0	100	98	59	22.9	ND
SS-4	-RAMP C-	22+00	CL	1.0 - 2.5	A-6 (4)	26	14	8.0	50.8	15.8	25.4	0	100	97	53	18.2	ND
SS-5	-RAMP C-	25+50	CL	3.5 - 5.0	A-4 (0)	19	5	7.7	56.2	16.7	19.4	0	100	98	48	13.2	ND
SS-6	-RAMP D-	28+00	CL	3.5 - 5.0	A-6 (3)	31	15	8.7	56.3	10.9	24.1	1	98	95	44	16.1	ND
SS-7	-RAMP D-	29+00	CL	3.5 - 5.0	A-7-6 (18)	53	35	6.8	40.6	14.6	38.0	0	100	98	61	20.1	ND
ST-1	-L-	38+83	68 LT	13.5 - 15.0	A-4 (0)	25	NP	0.4	66.4	20.8	12.4	0	100	100	51	31.4	ND
ST-2	-L-	39+50	80 RT	15.0 - 17.4	A-4 (0)	24	6	21.5	52.3	12.1	14.1	0	100	91	38	19.2	ND
S-1	-L-	13+00	67 LT	0 - 4.0	A-7-6 (11)	45	31	4.3	49.9	10.9	34.9	0	100	100	50	21.1	ND
S-2	-L-	16+00	68 LT	0 - 4.0	A-6 (4)	33	17	4.9	55.6	17.1	22.4	0	100	98	48	15.4	ND
S-3	-L-	16+00	68 RT	1.5 - 4.0	A-2-4 (0)	30	10	26.7	52.8	1.6	18.9	0	97	85	22	ND	ND
S-4	-L-	22+00	70 LT	0 - 4.0	A-6 (5)	38	23	26.3	36.6	4.5	32.6	0	100	90	41	13.7	ND
S-5	-L-	63+00	65 RT	0 - 2.0	A-6 (5)	28	16	7.8	50.3	12.6	29.3	0	100	97	52	13.7	ND
S-6	-L-	63+00	65 RT	2.0 - 4.0	A-2-4 (0)	26	9	15.8	58.2	6.4	19.6	0	100	94	31	ND	ND
S-7	-Y1-	18+00	29 RT	1.0 - 3.0	A-7-6 (30)	59	43	5.1	31.0	16.4	47.5	0	100	99	72	23.0	ND
S-8	-Y1-	22+50	42 LT	3.0 - 4.0	A-6 (4)	28	16	8.6	50.6	12.7	28.1	0	100	97	50	15.2	ND
S-9	-Y1-	25+00	31 LT	1.0 - 4.0	A-4 (1)	26	9	5.8	61.4	12.4	20.4	0	100	99	45	14.1	ND

NP - NONPLASTIC  
 ND - NOT DETERMINED  
 LABORATORY TESTING OF SHELBY TUBE SAMPLES, ST-1 AND ST-2, WAS PERFORMED BY GEOTECHNICS.

*Stephanie H. Huffman*  
 \_\_\_\_\_  
 Certified Lab Technician Signature

114-01-1203  
 \_\_\_\_\_  
 Certification Number

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
GEOTECHNICAL ENGINEERING UNIT  
SUBSURFACE INVESTIGATION  
APPENDIX B  
CPT LOGS

REFERENCE: R-5719

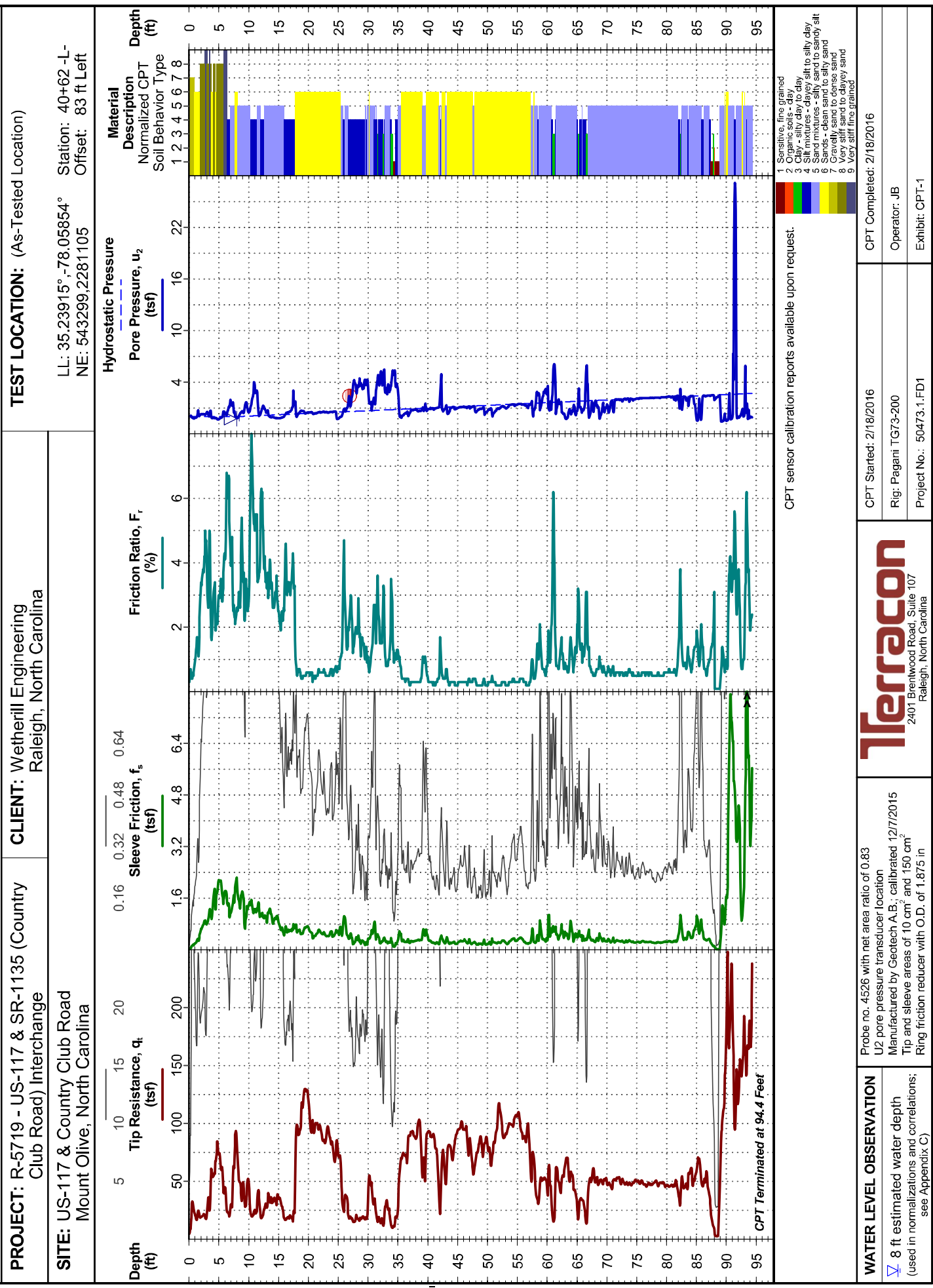
PROJECT: 50473

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RALEIGH, NORTH CAROLINA 27604  
PHONE: (919) 873-2211 FAX: (919) 873-9555  
NC REGISTERED FIRM: F-0869

INITIALS

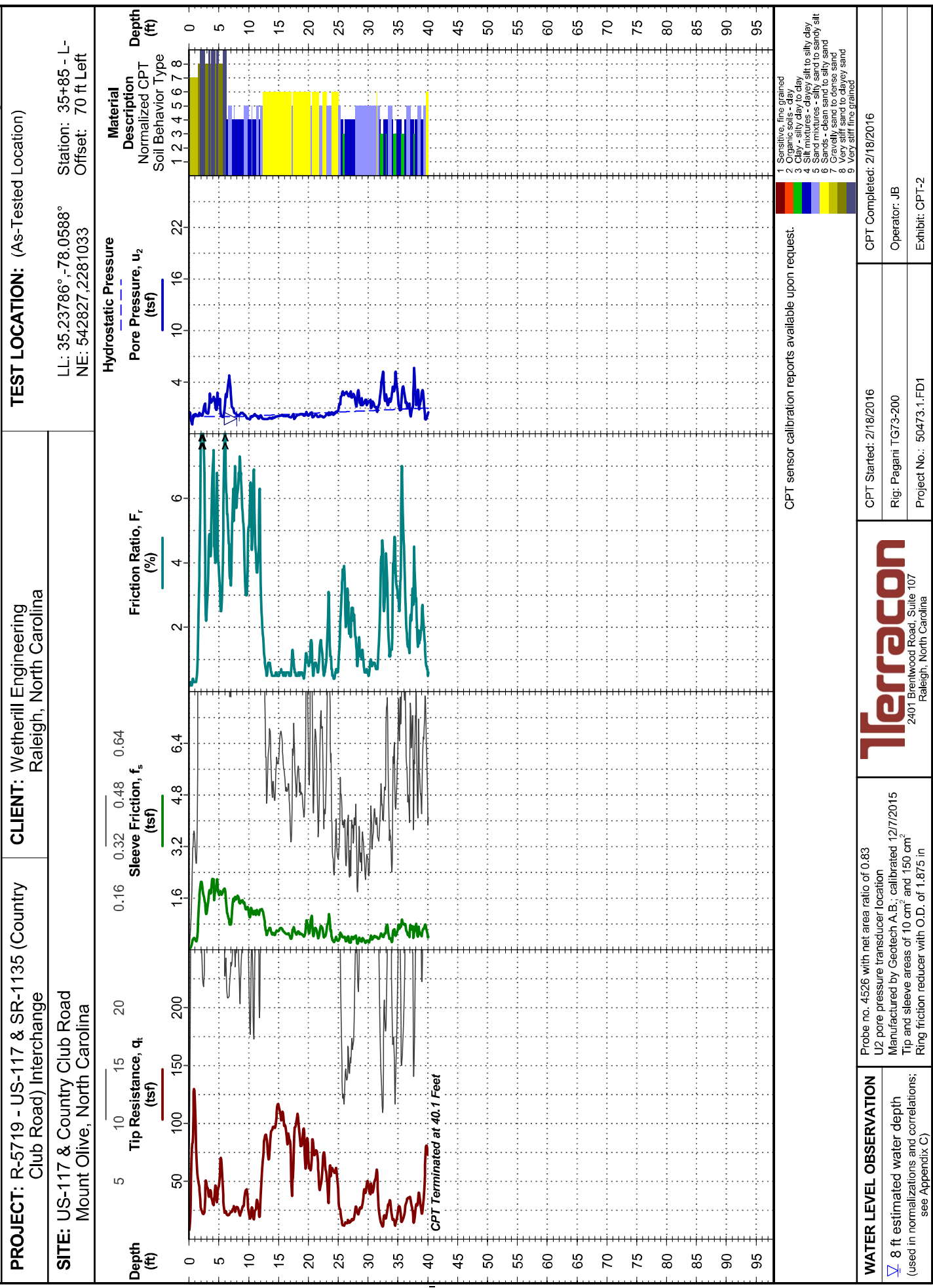
DATE

# CPT LOG NO. C1



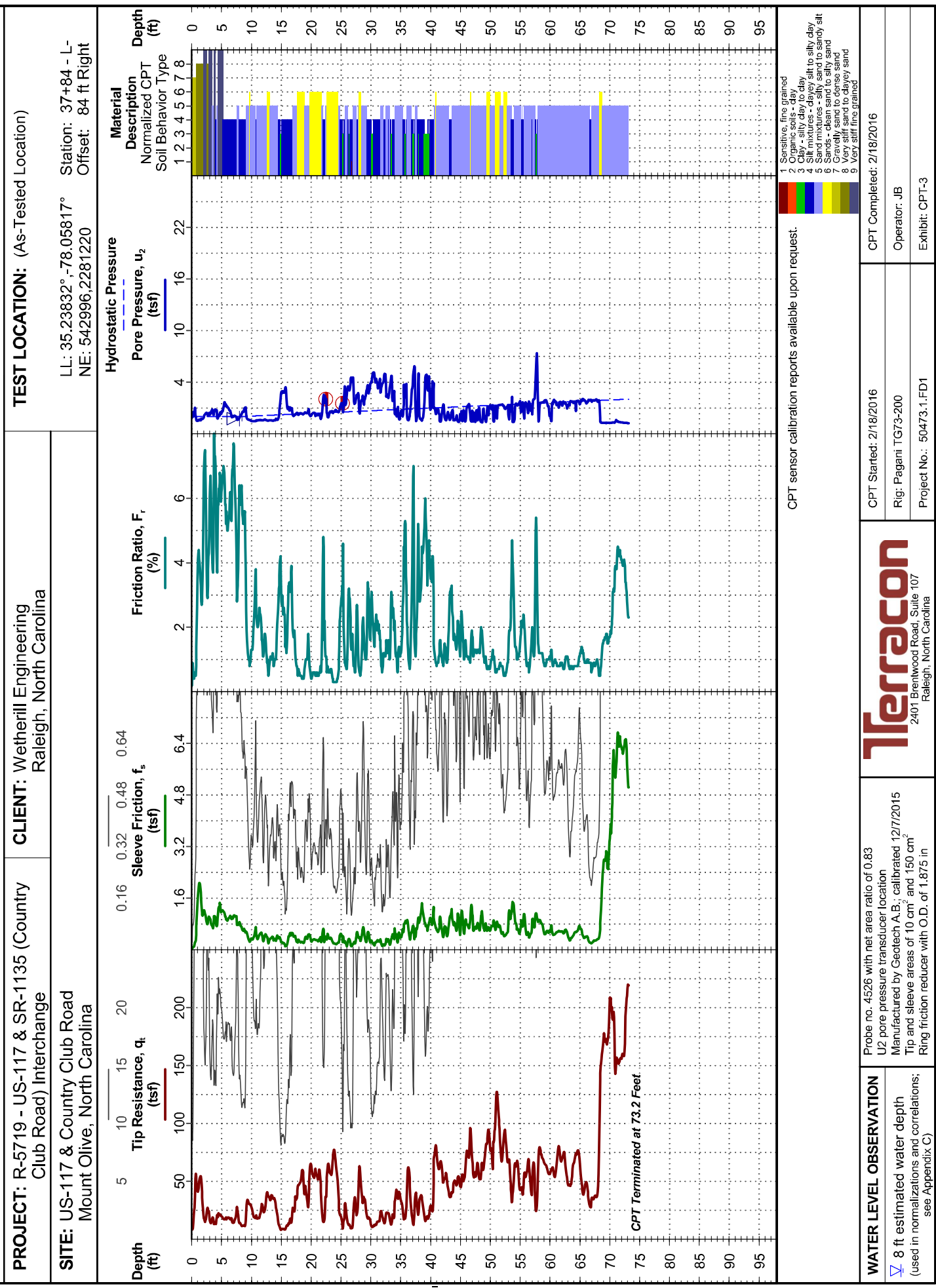
THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. CPT REPORT R5719.CPT.GPJ TERRACON2015.GDT 3/1/16

# CPT LOG NO. C2



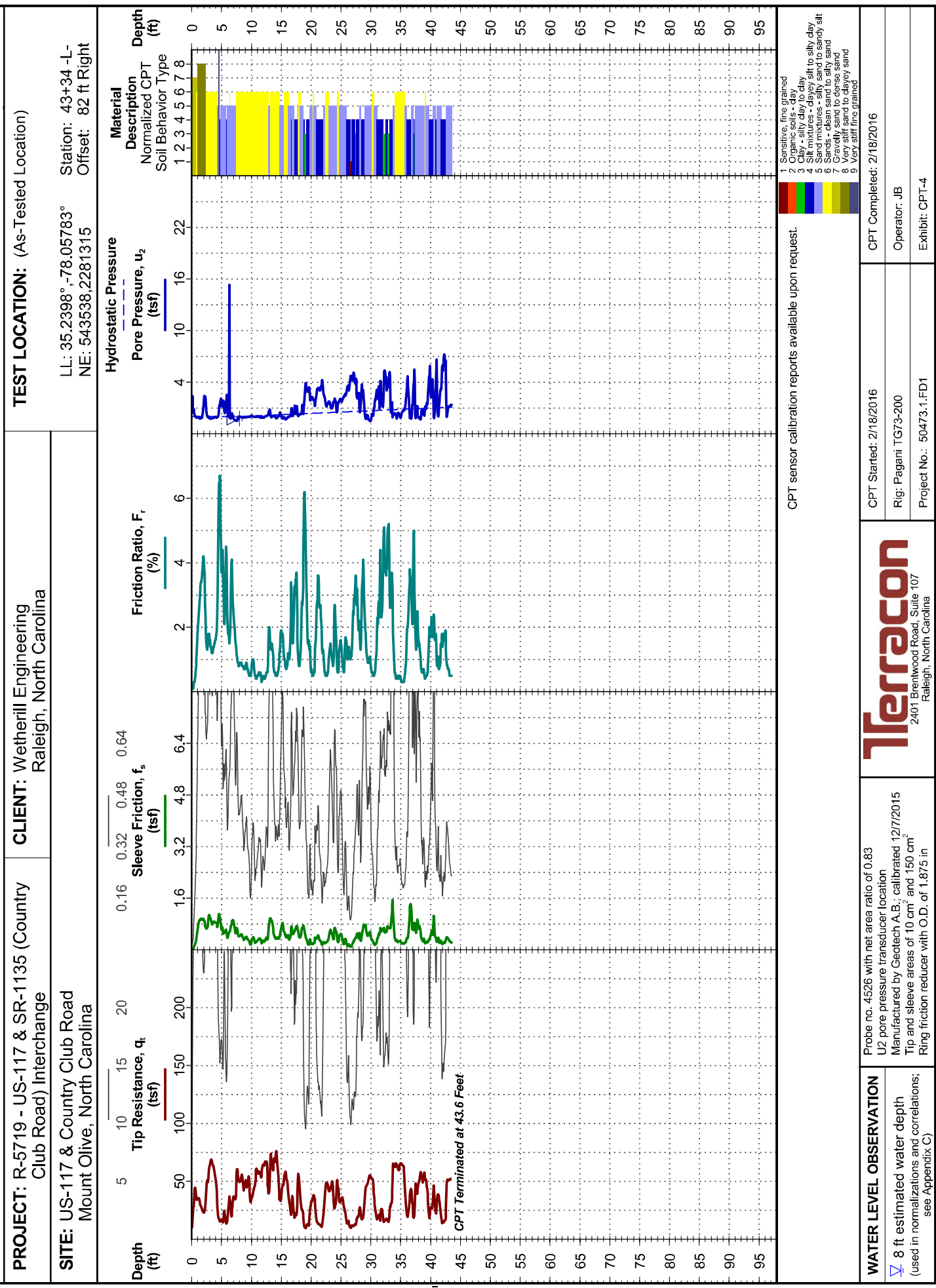
THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. CPT REPORT R5719.CPT.GPJ TERRACON2015.GDT 3/1/16

### CPT LOG NO. C3



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### CPT LOG NO. C4



THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. CPT REPORT R5719\_CPT.GPJ TERRACON2015.GDT 3/1/16