

REFERENCE: R-5752

PROJECT: 53088

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-5752	1	52

ROADWAY SUBSURFACE INVESTIGATION

COUNTY ROBESON
PROJECT DESCRIPTION US 74 FROM SR 2220 TO SR 2225.
UPGRADE THE US 74/SR 2220 INTERSECTION TO AN
INTERCHANGE, AND UPGRADE THE US 74/SR 2225
INTERSECTION TO A DIRECTIONAL CROSSOVER
INVENTORY

CONTENTS

<u>LINE</u>	<u>STATION</u>	<u>PLAN</u>	<u>PROFILE</u>
-L-	26+65 TO 148+24	4-10	11-12
-Y-	22+50 TO 39+50	5	13-14
-Y-	19+35 TO 22+50	8	13
-Y-	39+50 TO 41+76	8	14
-YRPA-	5+00 TO 25+19	5	15
-YRPB-	5+00 TO 20+60	5	16
-YRPC-	5+00 TO 27+58	5	17
-YRPD-	5+00 TO 20+92	5	18

CROSS SECTIONS

<u>LINE</u>	<u>STATION</u>	<u>SHEET NO.</u>
-Y-	35+50 TO 42+00	19-24
-YRPA-	14+00 TO 23+50	25-34
-YRPB-	10+50 TO 14+00	35-38
-YRPC-	14+50 TO 25+50	39-48
-YRPD-	18+50 TO 19+50	49-50

APPENDICES

<u>APPENDIX</u>	<u>TITLE</u>	<u>SHEETS</u>
B	BORELOG B-1	52

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

GEOSYNTEC

CAROLINA DRILLING

INVESTIGATED BY ROHIT WARRIER

DRAWN BY CHUCK TURLINGTON

CHECKED BY NJOROGE WAINAINA

SUBMITTED BY NJOROGE WAINAINA

DATE DECEMBER 2016



DocuSigned by:
Njoroge Wainaina 1/12/2017

AEC0C6E0A2E14F2 SIGNATURE DATE

**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

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

SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS																																																																																																					
<p>SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i></p>										<p>WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.</p>										<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p>										<p>ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOADED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																																																					
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<p>GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>GROUP CLASS.</th> <th>A-1</th> <th>A-3</th> <th>A-2</th> <th>A-4</th> <th>A-5</th> <th>A-6</th> <th>A-7</th> <th>A-1, A-2</th> <th>A-3</th> <th>A-4, A-5</th> <th>A-6, A-7</th> </tr> <tr> <th>SYMBOL</th> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>% PASSING #10 #40 #200</th> <td>50 MX 30 MX 15 MX</td> <td>50 MX 25 MX 10 MN</td> <td>35 MX 35 MX 35 MX</td> <td>35 MX 35 MX 35 MX</td> <td>36 MN 36 MN 36 MN</td> <td>36 MN 36 MN 36 MN</td> <td>36 MN 36 MN 36 MN</td> <td>GRANULAR SOILS</td> <td>SILT-CLAY SOILS</td> <td>MUCK, PEAT</td> <td></td> </tr> </table>										GROUP CLASS.	A-1	A-3	A-2	A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7	SYMBOL												% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX 10 MN	35 MX 35 MX 35 MX	35 MX 35 MX 35 MX	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT		<p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</p>										<p>NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.</p>										<p>FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.</p>																																																																	
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<p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.</p>										<p>SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50</p>										<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>ORGANIC MATERIAL</th> <th>GRANULAR SOILS</th> <th>SILT - CLAY SOILS</th> <th>OTHER MATERIAL</th> </tr> <tr> <td>TRACE OF ORGANIC MATTER</td> <td>2 - 3%</td> <td>3 - 5%</td> <td>TRACE 1 - 10%</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 5%</td> <td>5 - 12%</td> <td>LITTLE 10 - 20%</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>12 - 20%</td> <td>SOME 20 - 35%</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>> 10%</td> <td>> 20%</td> <td>HIGHLY 35% AND ABOVE</td> </tr> </table>										ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE 1 - 10%	LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE 10 - 20%	MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME 20 - 35%	HIGHLY ORGANIC	> 10%	> 20%	HIGHLY 35% AND ABOVE	<p>WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING</p> <p>STATIC WATER LEVEL AFTER 24 HOURS</p> <p>PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA</p> <p>SPRING OR SEEP</p>																																																																																	
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<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>U.S. STD. SIEVE SIZE OPENING (MM)</th> <th>4</th> <th>10</th> <th>40</th> <th>60</th> <th>200</th> <th>270</th> </tr> <tr> <td></td> <td>4.76</td> <td>2.00</td> <td>0.42</td> <td>0.25</td> <td>0.075</td> <td>0.053</td> </tr> </table>										U.S. STD. SIEVE SIZE OPENING (MM)	4	10	40	60	200	270		4.76	2.00	0.42	0.25	0.075	0.053	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>BOULDER (BLDR.)</th> <th>COBBLE (COB.)</th> <th>GRAVEL (GR.)</th> <th>COARSE SAND (CSE. SD.)</th> <th>FINE SAND (F SD.)</th> <th>SILT (SL.)</th> <th>CLAY (CL.)</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>										BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F SD.)	SILT (SL.)	CLAY (CL.)								<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>GRAIN SIZE</th> <th>MM</th> <th>305</th> <th>75</th> <th>2.0</th> <th>0.25</th> <th>0.05</th> <th>0.005</th> </tr> <tr> <td></td> <td>IN.</td> <td>12</td> <td>3</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>										GRAIN SIZE	MM	305	75	2.0	0.25	0.05	0.005		IN.	12	3					<p>SOIL MOISTURE SCALE (ATTERBERG LIMITS)</p> <p>FIELD MOISTURE DESCRIPTION</p> <p>GUIDE FOR FIELD MOISTURE DESCRIPTION</p> <p>LIQUID LIMIT (LL)</p> <p>PLASTIC LIMIT (PL)</p> <p>OPTIMUM MOISTURE SHRINKAGE LIMIT (OM)</p> <p>SL - SHRINKAGE LIMIT</p> <p>- SATURATED - (SAT.)</p> <p>- WET - (W)</p> <p>- MOIST - (M)</p> <p>- DRY - (D)</p> <p>USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE</p> <p>SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE</p> <p>SOLID; AT OR NEAR OPTIMUM MOISTURE</p> <p>REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE</p>										<p>DRILL UNITS:</p> <p>CME-45C</p> <p>CME-55</p> <p>CME-550</p> <p>VANE SHEAR TEST</p> <p>PORTABLE HOIST</p> <p>ADVANCING TOOLS:</p> <p>CLAY BITS</p> <p>6" CONTINUOUS FLIGHT AUGER</p> <p>8" HOLLOW AUGERS</p> <p>HARD FACED FINGER BITS</p> <p>TUNG-CARBIDE INSERTS</p> <p>CASING w/ ADVANCER</p> <p>TRICONE * STEEL TEETH</p> <p>TRICONE * TUNG-CARB.</p> <p>CORE BIT</p> <p>2 7/8 AND 3 7/8 DRAG BIT</p> <p>HAMMER TYPE:</p> <p>AUTOMATIC</p> <p>MANUAL</p> <p>CORE SIZE:</p> <p>B</p> <p>H</p> <p>N</p> <p>HAND TOOLS:</p> <p>POST HOLE DIGGER</p> <p>HAND AUGER</p> <p>SOUNDING ROD</p> <p>VANE SHEAR TEST</p>										<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>SPACING</th> <th>TERM</th> <th>THICKNESS</th> </tr> <tr> <td>VERY WIDE</td> <td>MORE THAN 10 FEET</td> <td>VERY THICKLY BEDDED</td> <td>4 FEET</td> </tr> <tr> <td>WIDE</td> <td>3 TO 10 FEET</td> <td>THICKLY BEDDED</td> <td>1.5 - 4 FEET</td> </tr> <tr> <td>MODERATELY CLOSE</td> <td>1 TO 3 FEET</td> <td>THINLY BEDDED</td> <td>0.16 - 1.5 FEET</td> </tr> <tr> <td>CLOSE</td> <td>0.16 TO 1 FOOT</td> <td>VERY THINLY BEDDED</td> <td>0.03 - 0.16 FEET</td> </tr> <tr> <td>VERY CLOSE</td> <td>LESS THAN 0.16 FEET</td> <td>THINLY LAMINATED</td> <td>0.008 - 0.03 FEET</td> </tr> <tr> <td></td> <td></td> <td>THICKLY LAMINATED</td> <td>< 0.008 FEET</td> </tr> </table>										TERM	SPACING	TERM	THICKNESS	VERY WIDE	MORE THAN 10 FEET	VERY THICKLY BEDDED	4 FEET	WIDE	3 TO 10 FEET	THICKLY BEDDED	1.5 - 4 FEET	MODERATELY CLOSE	1 TO 3 FEET	THINLY BEDDED	0.16 - 1.5 FEET	CLOSE	0.16 TO 1 FOOT	VERY THINLY BEDDED	0.03 - 0.16 FEET	VERY CLOSE	LESS THAN 0.16 FEET	THINLY LAMINATED	0.008 - 0.03 FEET			THICKLY LAMINATED	< 0.008 FEET
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NON PLASTIC	SLIGHTLY PLASTIC	MODERATELY PLASTIC	HIGHLY PLASTIC																																																																																																																																
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<p>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.</p>																																																																																																																																			

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ROBESON COUNTY

LOCATION: US 74 FROM SR 2220 TO SR 2225.

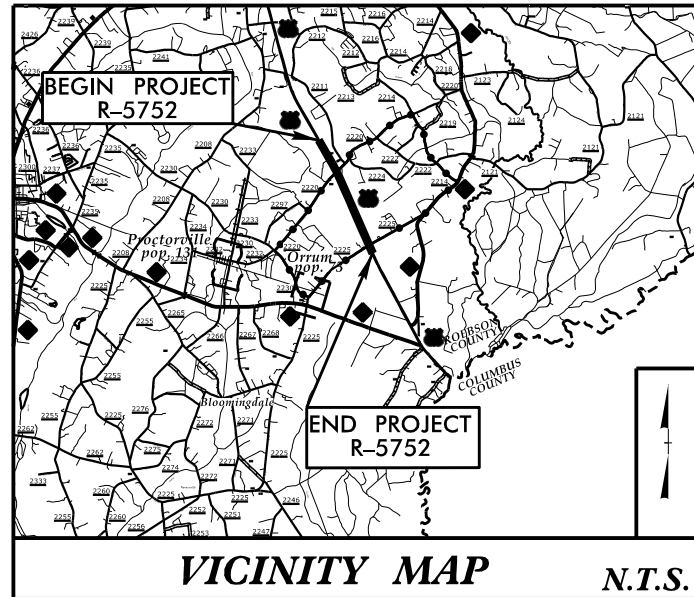
UPGRADE THE US 74/SR 2220 INTERSECTION TO AN INTERCHANGE, AND UPGRADE THE US 74/SR 2225 INTERSECTION TO A DIRECTIONAL CROSSOVER

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURE, AND SIGNING

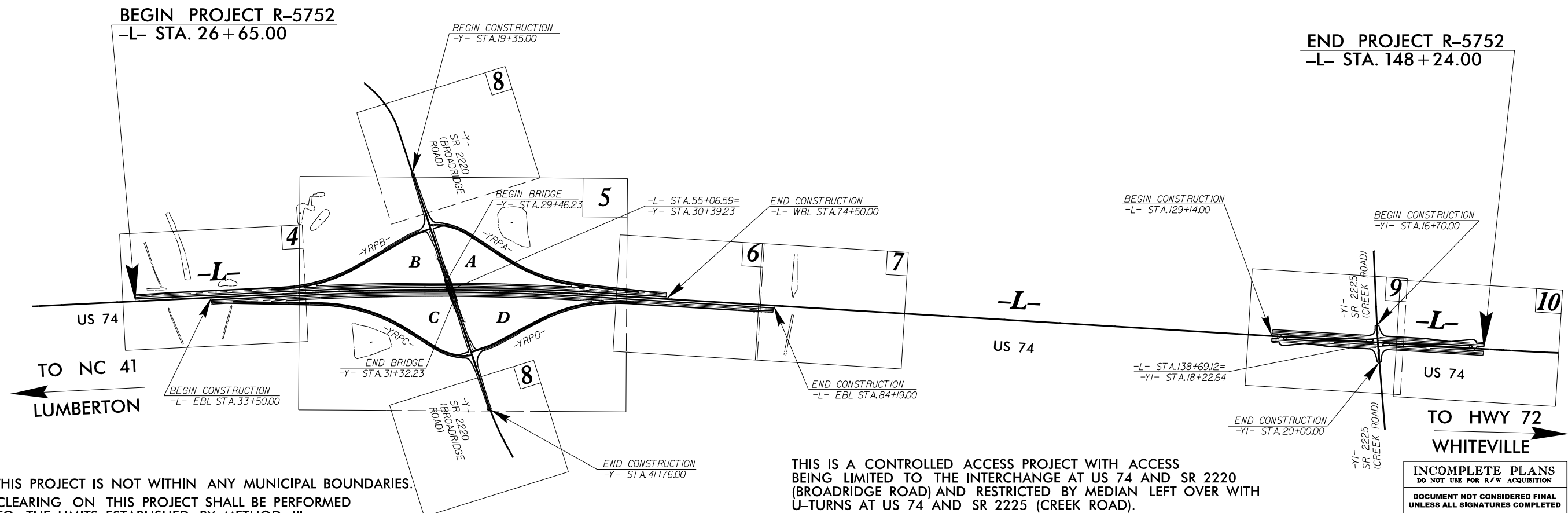
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5752	3	52
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
53088.1.FD1	HSIP-0074 (170)	P.E.	
53088.2.1	HSIP-0074 (170)	RW /UTIL	
53088.3.1	HSIP-0074 (170)	CONST.	

25% PRELIMINARY PLANS

TIP PROJECT: R-5752



OFF-SITE DETOUR ROUTE

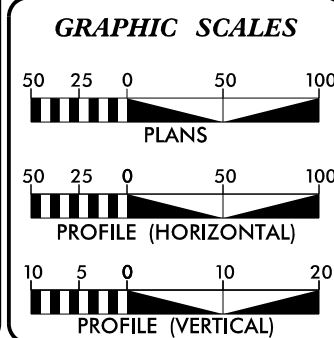


THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO THE INTERCHANGE AT US 74 AND SR 2220 (BROADRIDGE ROAD) AND RESTRICTED BY MEDIAN LEFT OVER WITH U-TURNS AT US 74 AND SR 2225 (CREEK ROAD).

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

CONTRACT:



DESIGN DATA

ADT 2018	=	10,100
ADT 2038	=	16,400
DHV	=	9 %
D	=	55 %
T	=	20 % *
V	=	75 MPH
* TTST = 17 DUAL 3		
FUNC CLASS	=	INTERSTATE
STATEWIDE TIER	=	

PROJECT LENGTH

SECTION 1:		
LENGTH ROADWAY TIP PROJECT R-5752	=	1.090 MILES
SECTION 2:		
LENGTH ROADWAY TIP PROJECT R-5752	=	0.362 MILES
SECTION 1 & 2:		
LENGTH STRUCTURE TIP PROJECT R-5752	=	0.000 MILES
TOTAL LENGTH TIP PROJECT R-5752	=	1.452 MILES

Prepared In the Office of:
CDM Smith
CDM Smith Inc.
5400 Glenwood Avenue
Suite 400
Raleigh, NC 27612-3228
NC CDA No. F-0412

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MARCH 2017

LETTING DATE:
FEBRUARY 2018

DAVID J. CLODGO, P.E.
PROJECT ENGINEER

CURTIS J. TILLMAN, P.E.
PROJECT DESIGN ENGINEER

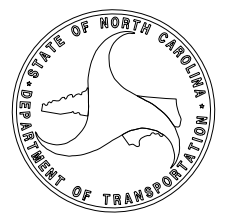
SEAN MATUSZEWSKI
NCDOT CONTACT

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.



1/4/2017 M:\N\NCDOT\R-5752-RDWAY\GEO-RDWAY_modifier\CADD_GEO\TECH\PlanProf\R5752_Rdy_.tsh.dgn User:cturilington

December 20, 2016

WBS NUMBER 53088.1.FD1
TIP NUMBER R-5752
COUNTY: Robeson
DESCRIPTION: US 74 from SR 2220 to SR 2225. Upgrade the US 74/SR 2220 intersection to an interchange, and upgrade the US 74/SR 2225 intersection to a directional crossover.
SUBJECT: Geotechnical Report – Inventory

Geosyntec Consultants has completed a subsurface investigation for this project and presents the following inventory.

Project Description

The project area lies northeast of the town of Proctorville along the existing US 74 beginning just west of Broadridge Road (Station 26+65) and extend eastward 2.3 miles to just east of Creek Road (Station 148+24). The proposed project consist of converting the at-grade intersection at Broadridge Road to an interchange and converting the at-grade intersection at Creek Road to a directional crossover. The roadway construction scope of work consist of construction of ramps, approach embankments along Broadridge Road and widening of US 74 around Creek Road.

The geotechnical investigation was conducted in July of 2016. Borings were advanced with an ATV mounted CME 45C drill machine equipped with an automatic hammer. Standard Penetration tests were performed in all borings. Representative soil samples were collected for visual classification in the field and for laboratory analysis by Falcon Engineering.

The following alignments, totaling 1.8 miles were investigated. This report includes subsurface profiles and selected cross sections of these alignments.

<u>Line</u>	<u>Station</u>
-L-	129+14 to 148+24
-Y-	19+35 to 41+76
-YRPA-	5+00 to 25+19

-YRPB-	5+00 to 20+60
-YRPC-	5+00 to 27+58
-YRPD-	5+00 to 20+92

Physiography and Geology

The project corridor is located within the Coastal Plain Physiographic Province. The topography along the project is relatively flat to gently sloping. The elevation in the majority of the project range from 115± to 130± feet except in the low lying areas where the elevation ranged for 103± to 109± feet. The low lying areas exhibit poor surface drainage with areas of standing water and swampy ground. Surface waters generally drain into the Lumber River.

Surficial soils in this area are generally derived from alluvial deposition and weathering of the Coastal Plain formation materials and primarily consist of fine sands, silty sands and clayey sands. The surficial soils are underlain by the Tertiary marine deposits of the Yorktown Formation. The Yorktown Formation deposits are underlain by Cretaceous marine deposits of the Black Creek Formation.

Soil Properties

Soils encountered on this project have been divided into four categories, 1) roadway embankment 2) alluvial soils, 3) Coastal Plain soils, and 4) artificial fill.

Roadway embankment soils are present along existing US 74 and Broadridge Road. They typically consist of black, brown, red, very loose to medium dense, moist, silty sands and clayey sands (A-2-4 and A-2-6) and stiff to very stiff, moist, sandy silt (A-4).

Alluvial soils were generally encountered in low lying areas on the eastern end of -YRPA- and -YRPD- alignments. These soils typically consist of black, gray, very loose to medium dense, moist to saturated, fine sands, silty sands and clayey sands (A-3, A-2-4 and A-2-6). The alluvial soils range in thickness from 3± to 5± feet.

Coastal Plain soils of the Yorktown and Black Creek Formations were encountered throughout the project site. The thickness of the Yorktown was approximately 20 ± feet and Black Creek Formation soils were encountered from depths of approximately 20± feet to the bottom of the

deepest borings (90 feet). Yorktown Formation soils consist of dark gray, gray, tan, red, brown, very loose to medium dense, moist to saturated, fine sands, silty sands and clayey sands (A-3, A-2-4 and A-2-6); and very soft to stiff, moist to saturated, sandy silts, sandy clays and silty clays (A-4, A-6, A-7-5 and A-7-6). Black Creek Formation soils consist of gray, tan, medium dense, wet to saturated, fine sands and clayey sands (A-3 and A-2-6); and dark gray, gray, very stiff to hard, wet, sandy and silty clays (A-6, A-7-5 and A-7-6).

Artificial fills were encountered along the -YRPA- alignment. Artificial fills consist of black, brown, very loose to medium dense, moist silty sands (A-2-4). There is a small localized area of artificial fill consisting of construction debris (broken up concrete pipes and rip rap) at Station 15+00±.

Ground Water

Ground water data was collected during the month of July 2016 during a time of above normal precipitation. The depths to ground water table ranges from 0 to 9 feet from the existing ground surface. Seasonal fluctuations in groundwater table should be expected.

Ponds: One pond was noted within the construction limit at the following location:

<u>Line</u>	<u>Station</u>	<u>Offsets</u>
-YRPA-	15+75 to 16+00	LT

Drainage Ditches: One drainage ditch (4 feet wide and 3 feet deep at Station 17+50) was noted within the construction limit at the following location:

<u>Line</u>	<u>Station</u>	<u>Offsets</u>
-YRPD-	15+00 to 19+80	LT

Areas of Special Geotechnical Interest

1) High Ground Water: Ground water was encountered within 6 feet of final grade at the following locations:

<u>Line</u>	<u>Station</u>	<u>Offsets</u>
-L-	139+00 to 141+00	LT and RT

-Y-	21+00 to 23+50	LT and RT
-Y-	37+75 to 40+00	LT and RT
-YRPB-	11+00 to 12+50	LT and RT
-YRPC-	8+00 to 14+75	LT and RT
-YRPC-	20+00 to 22+00	LT and RT

2) Artificial Fill: Areas of artificial fill were encountered at the following locations:

<u>Line</u>	<u>Station</u>	<u>Offsets</u>
-YRPA-	14+30 to 23+50	LT and RT

3) Soft Soils: The following areas were found to contain soft clay soils

<u>Line</u>	<u>Station</u>	<u>Offsets</u>
-Y-	37+75 to 41+00	LT and RT
-YRPB-	10+75 to 13+75	LT and RT

4) High Plastic Soils: Clay and Clayey Sandy soils with high plasticity (PI > 15) were encountered either within 3 feet of final grade or above final grade in cut areas at the following locations:

<u>Line</u>	<u>Station</u>	<u>Offsets</u>
-Y-	37+75 to 41+00	RT and LT
-YRPC-	14+75 to 25+00	LT and RT

Prepared by

Njoroge Wainaina
Senior Consultant

APPENDIX A

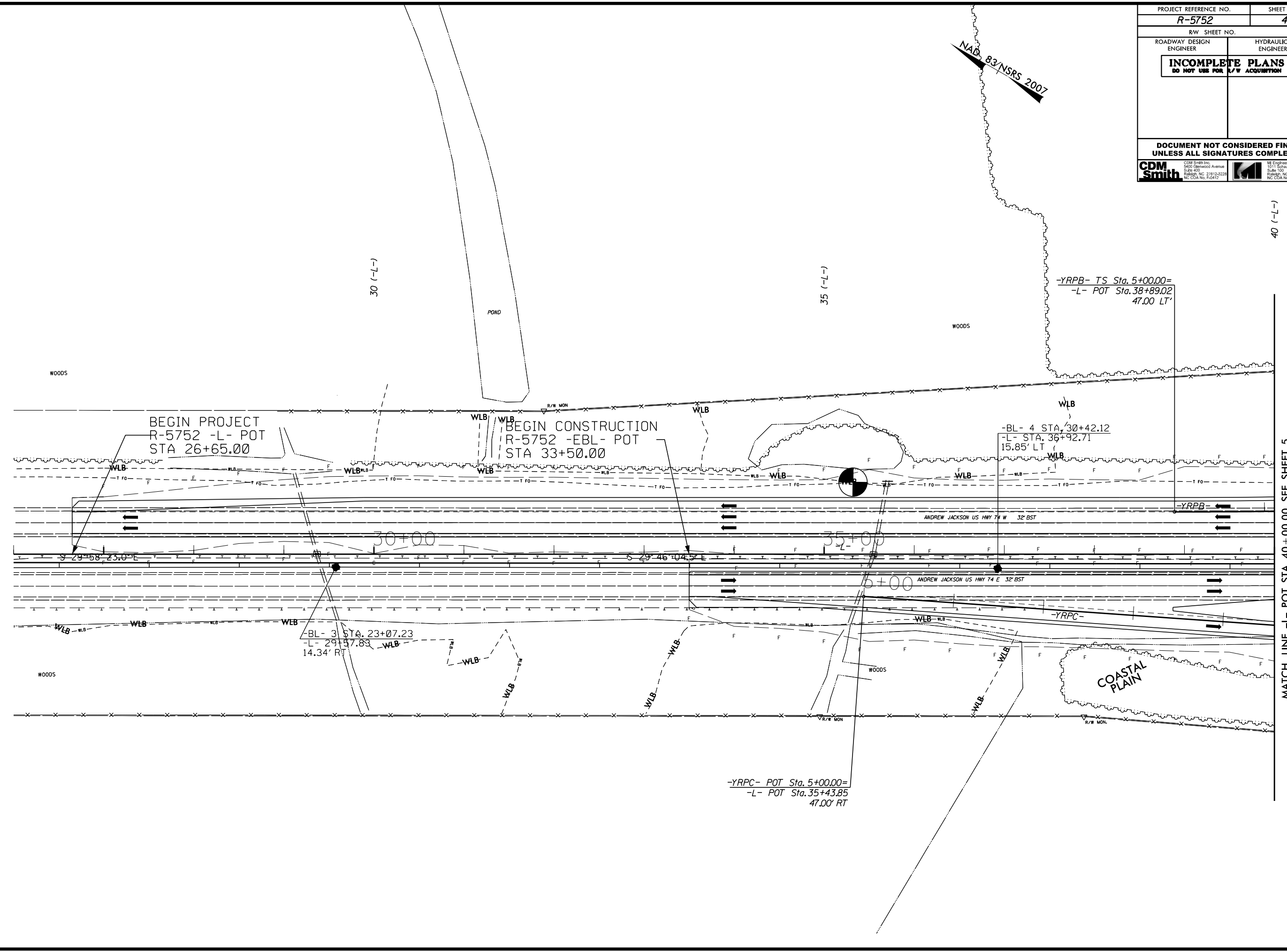
Undisturbed and Bulk Samples

Undisturbed Samples: Undisturbed thin wall Shelby tube samples were collected at the following locations along the -Y- alignment and submitted for testing.

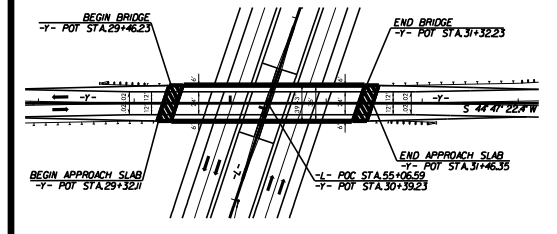
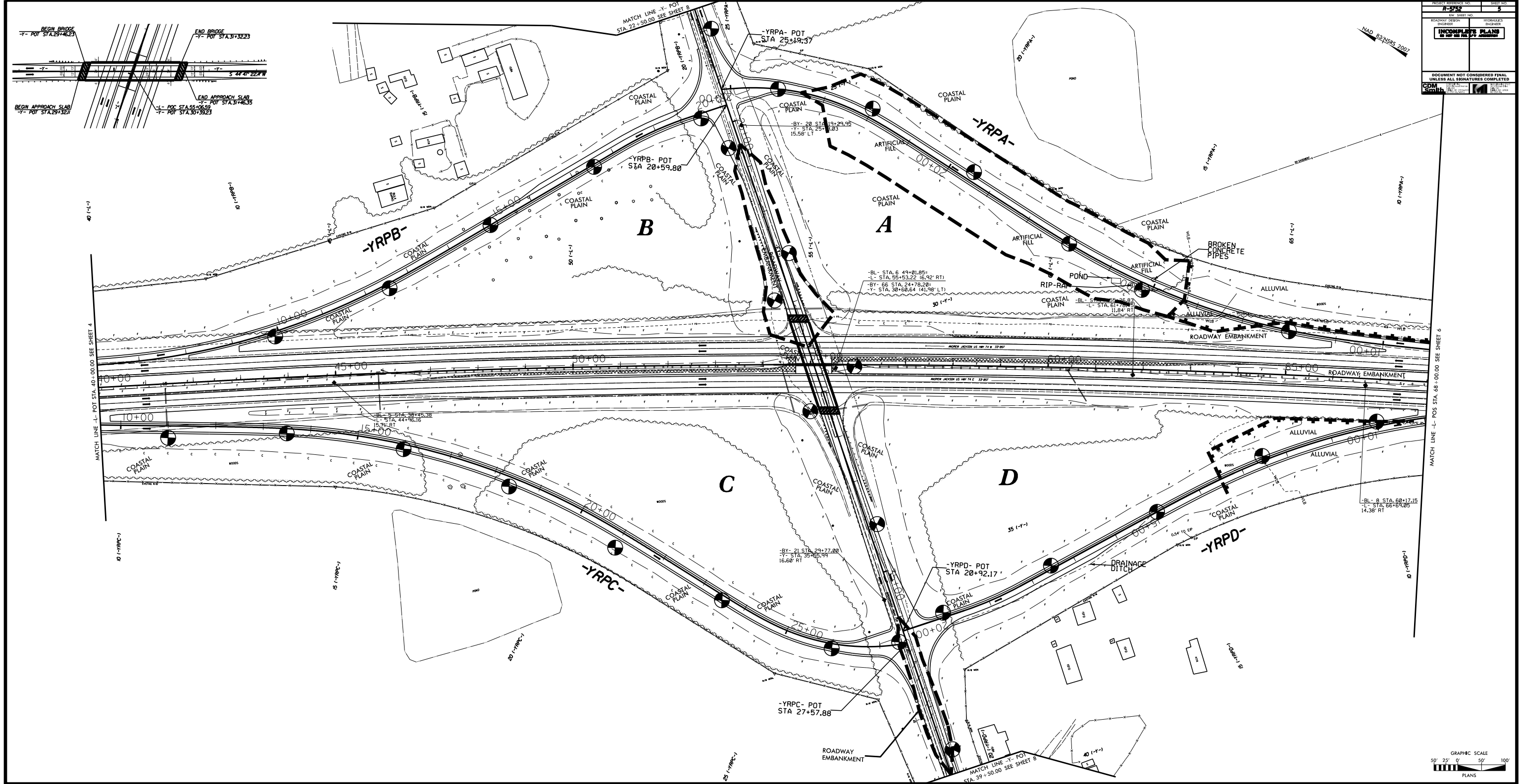
<u>Sample No.</u>	<u>Station</u>	<u>Depth (ft)</u>	<u>Test</u>
ST-1	28+85, 35' RT	17.0-19.0	Consolidation, Triaxial CU
ST-2	31+30, 38' RT	18.0-20.0	Consolidation, Triaxial CU

5/14/99
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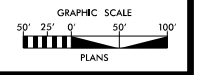
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RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
CDM Smith CDM Smith Inc. 5400 Glenwood Avenue Suite 400 Raleigh, NC 27612-3228 NC COA No. F-0472	ME Engineering, PLLC 3011 Spruce Drive Raleigh, NC 27606 NC COA No.



MATCH LINE -L- POT STA. 40+00.00 SEE SHEET 5



PROJECT NUMBER	2-252	SHEET NO.	5
ROADWAY DESIGN ENGINEER	[Signature]		
INCOMPLETE PLANS			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



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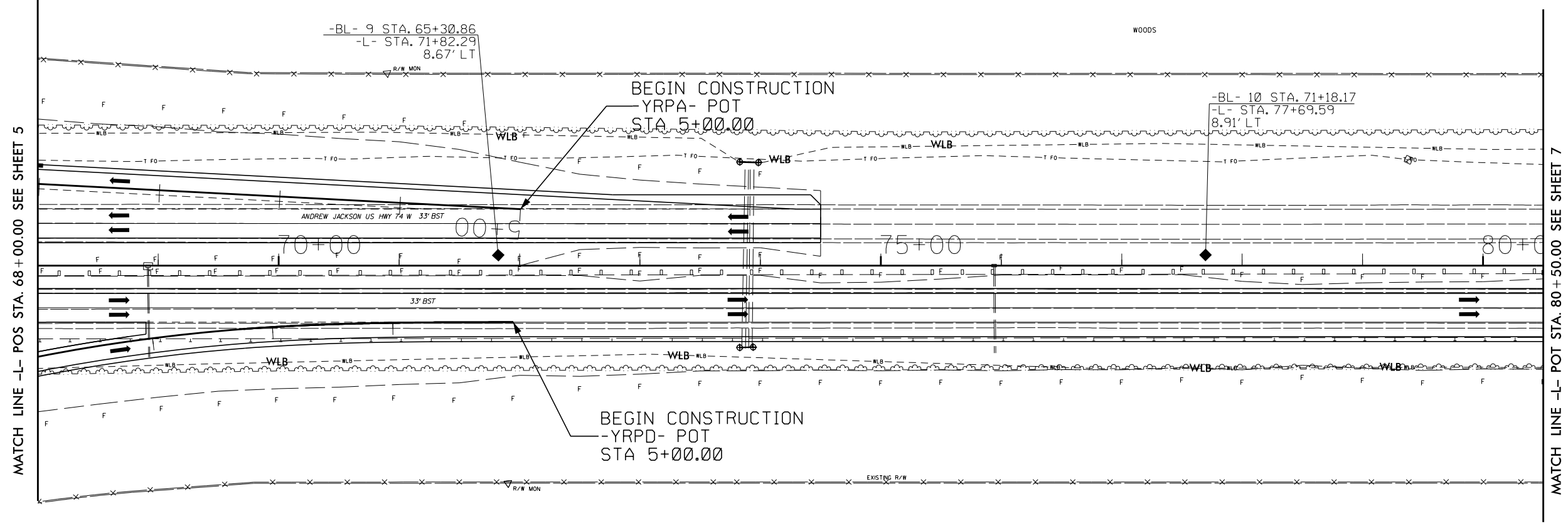
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INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
CDM Smith CDM Smith Inc. 5400 Glenwood Avenue Suite 400 Raleigh, NC 27606 NC COA No. F-0472	ML Engineering, PLLC 1011 Glenwood Drive Suite 100 Raleigh, NC 27606 NC COA No.

NAD 83/NSRS 2007

70 (-L-)

75 (-L-)

80 (-L-)



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5/14/99

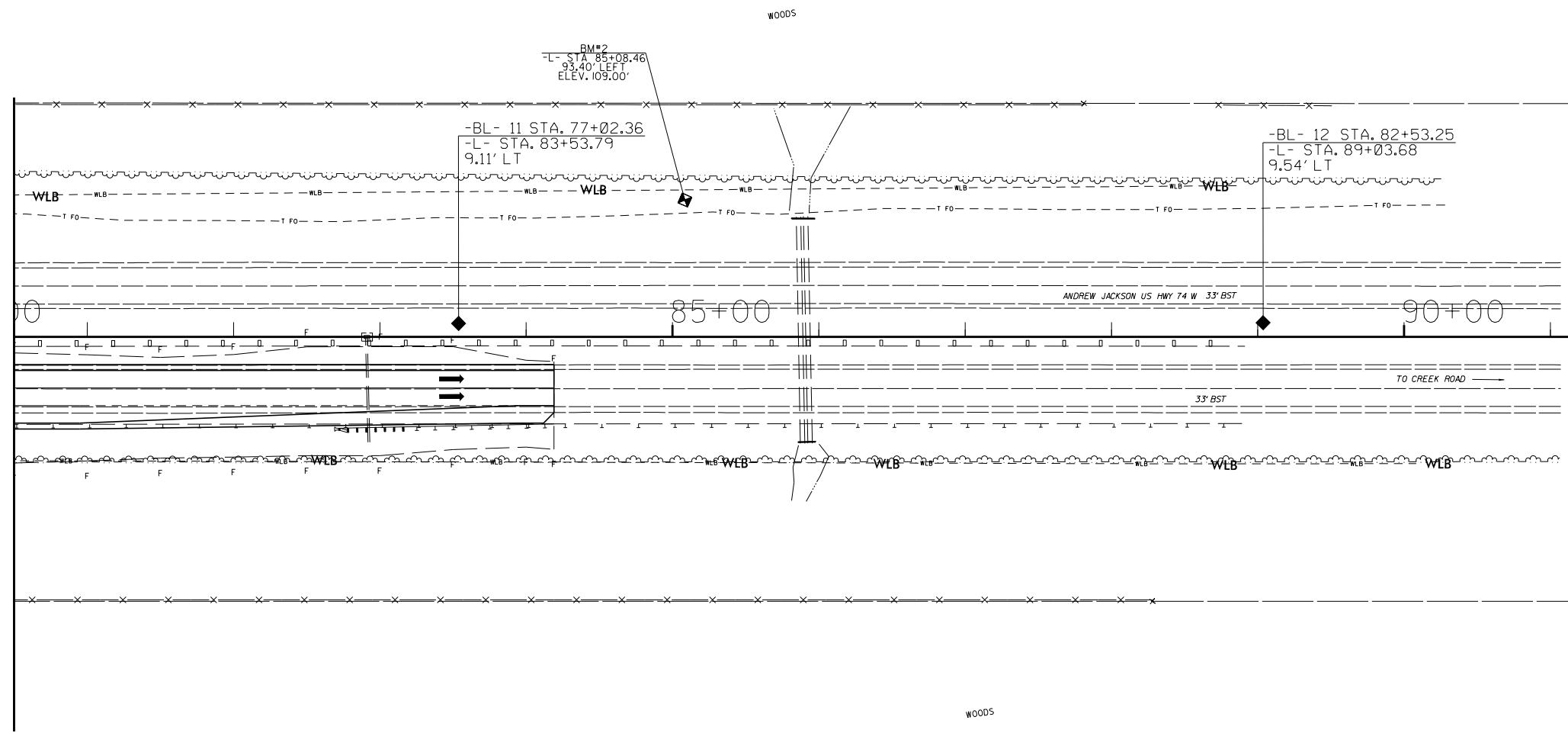
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ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
CDM Smith CDM Smith Inc. 5400 Glenwood Avenue Suite 400 Raleigh, NC 27612-3228 NC COA No. 4-0472	ME Engineering, PLLC 1011 Glenwood Drive Suite 100 Raleigh, NC 27606 NC COA No.

NAD 83/NSRS 2007

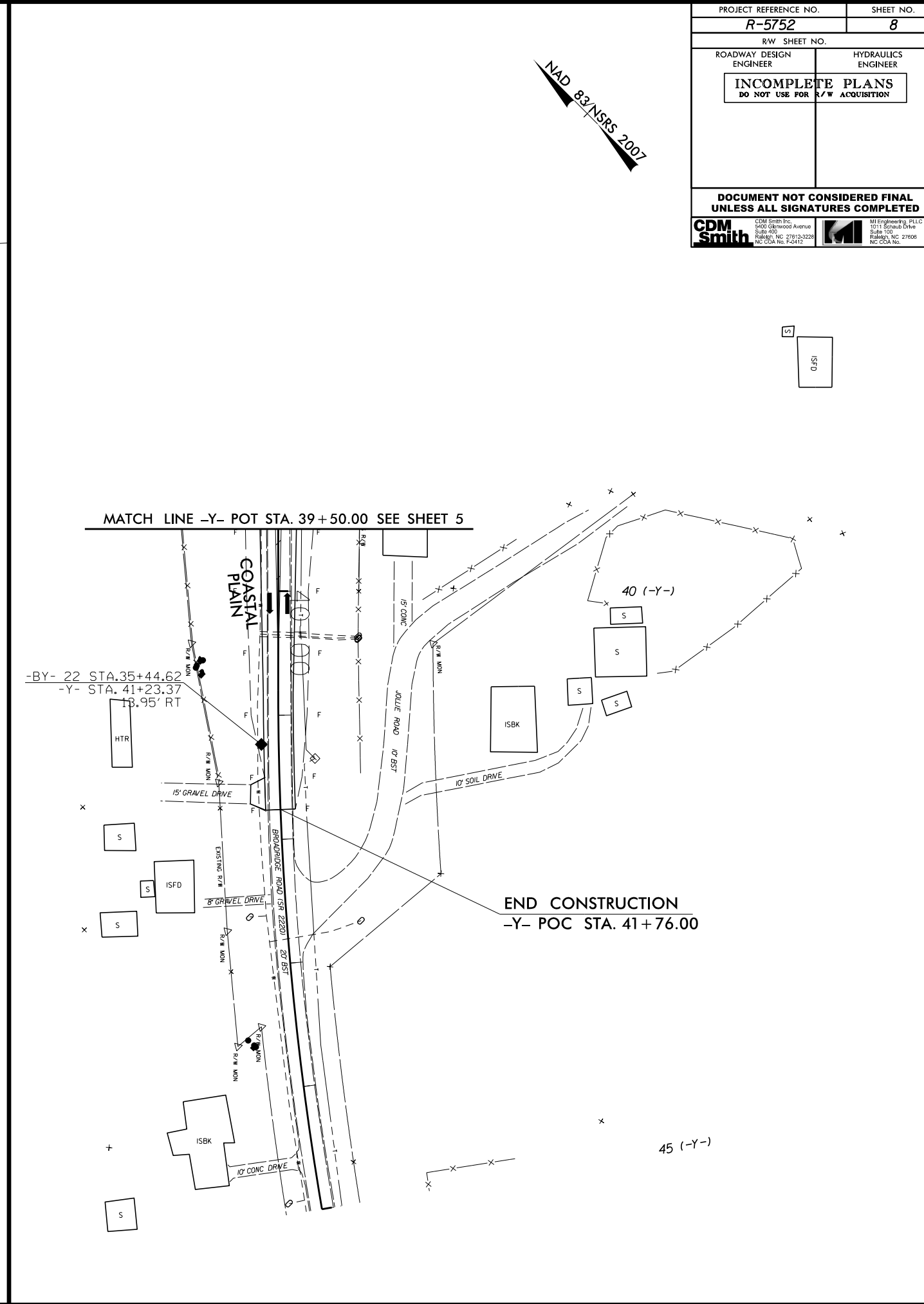
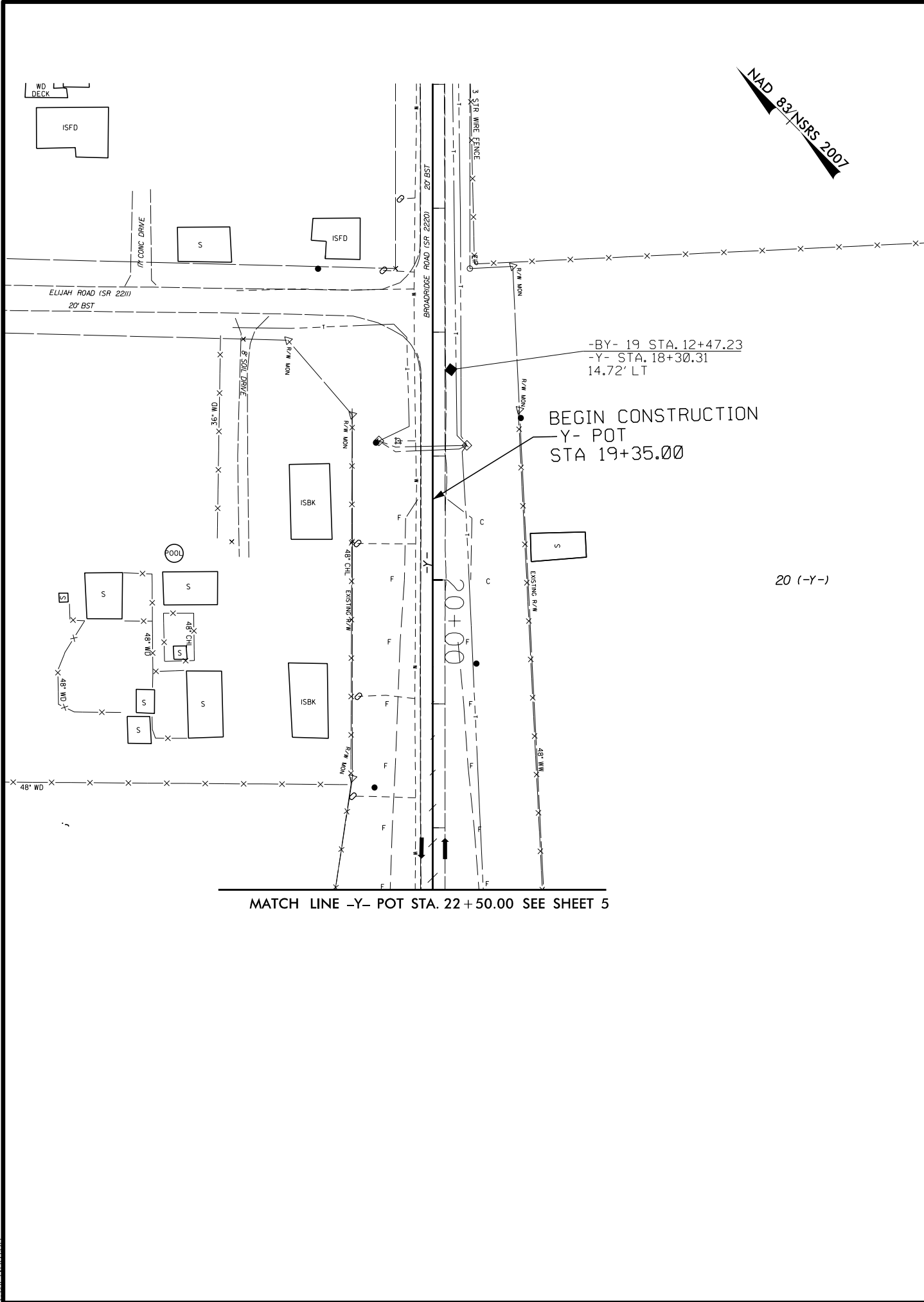
85 (-L-)

90 (-L-)

MATCH LINE -L- POT STA. 80+50.00 SEE SHEET 6



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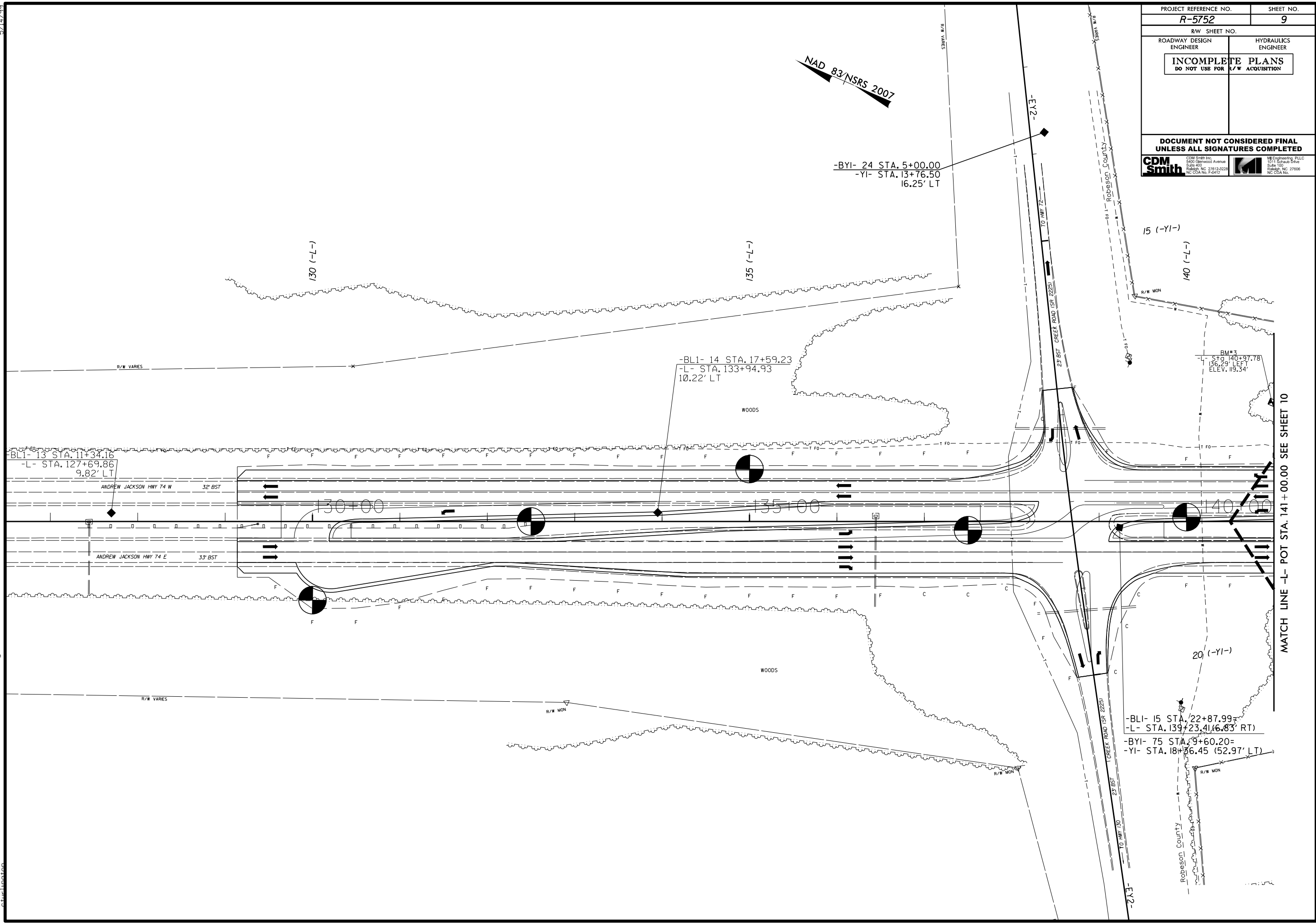


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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
CDM Smith CDM Smith Inc. 5400 Glenwood Avenue Suite 400 Raleigh, NC 27612-2228 NC CDA No. F-0417	M1 Engineering, PLLC 1011 Schaub Drive Suite 103 Raleigh, NC 27608 NC CDA No.

5/14/99

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PROJECT REFERENCE NO.	SHEET NO.
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RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
CDM Smith Civil & Environmental 4400 Glenwood Avenue Suite 400 Raleigh, NC 27606 NC CDA No. F-0412	M Engineering, PLLC 3511 Spruce Drive Raleigh, NC 27606 NC CDA No.

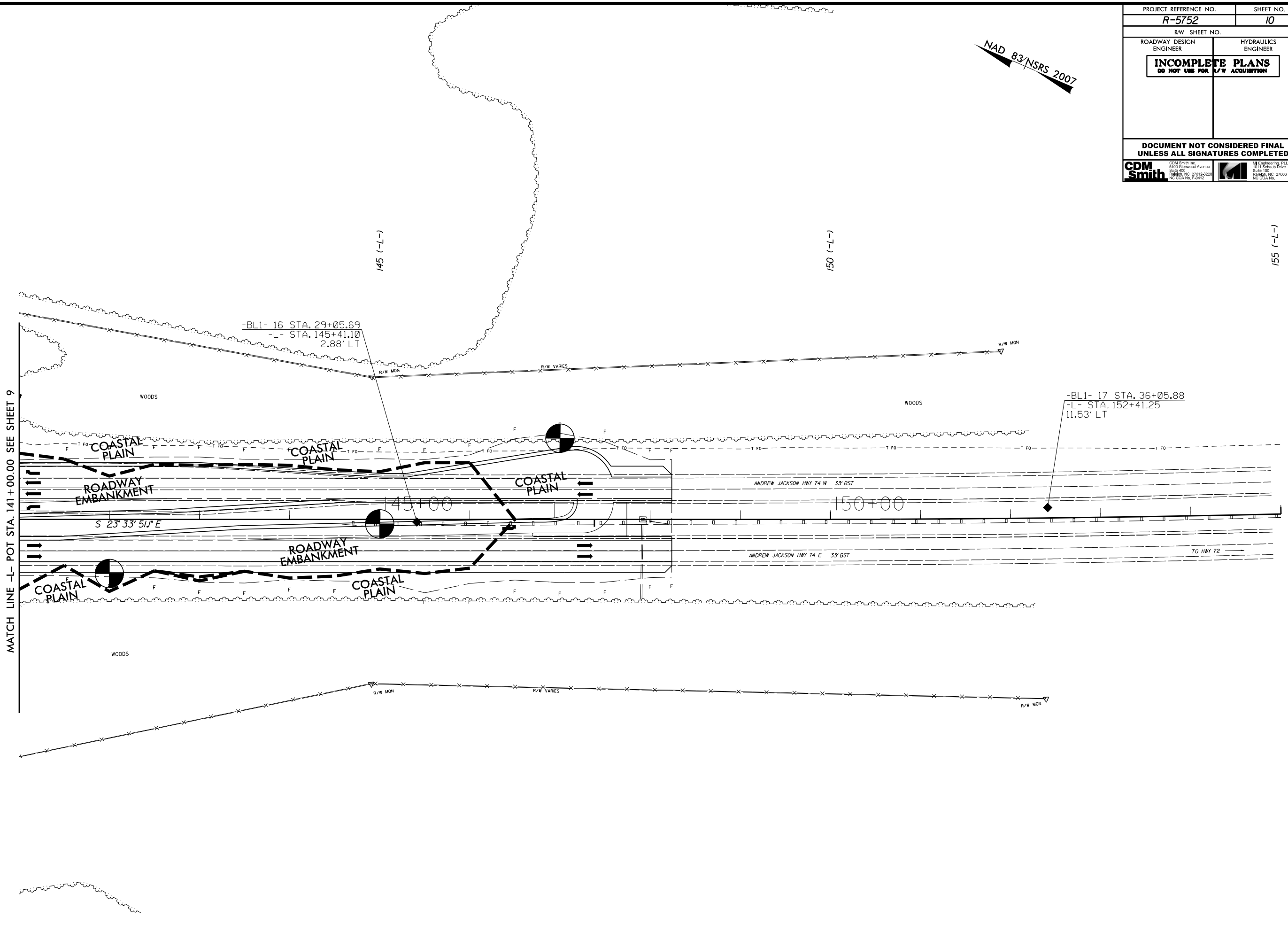


MATCH LINE -L- POT STA. 141+00.00 SEE SHEET 10

5/14/99

PROJECT REFERENCE NO. R-5752	SHEET NO. 10
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
CDM Smith CDM Smith Inc. 5400 Glenwood Avenue Suite 400 Raleigh, NC 27612-3228 NC COA No. F-0412	M Engineering, PLLC 3011 Spruce Drive Suite 100 Raleigh, NC 27606 NC COA No.

NAD 83/NSRS 2007

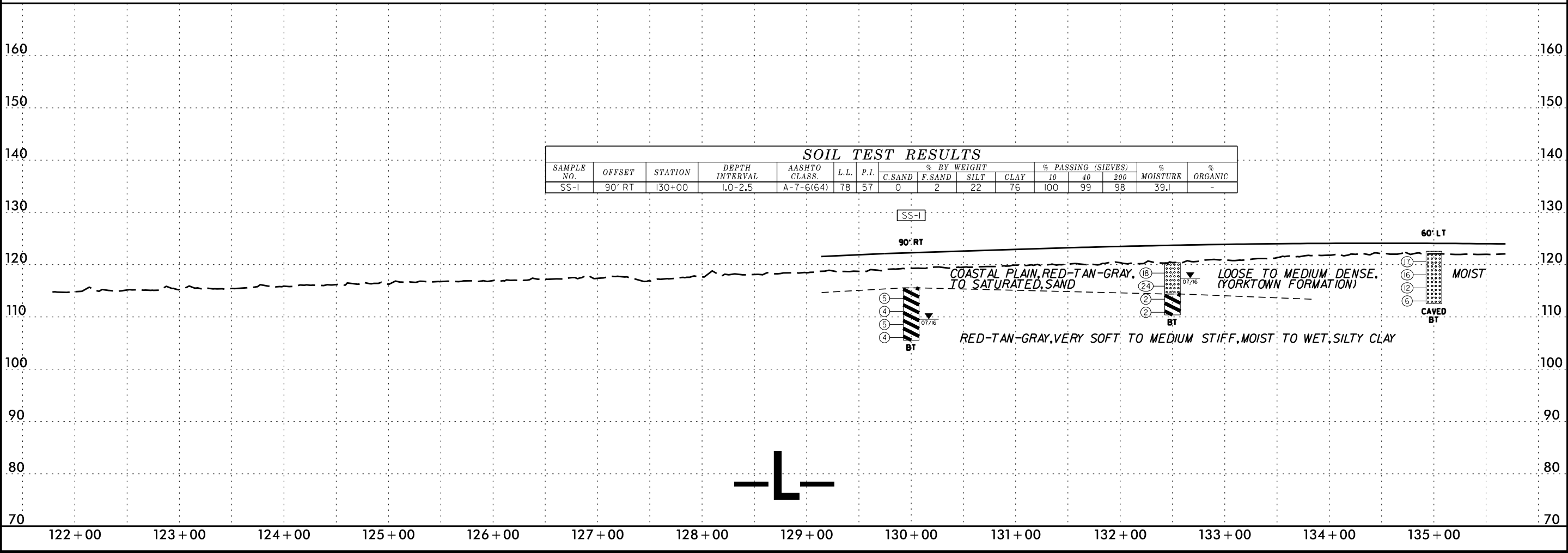
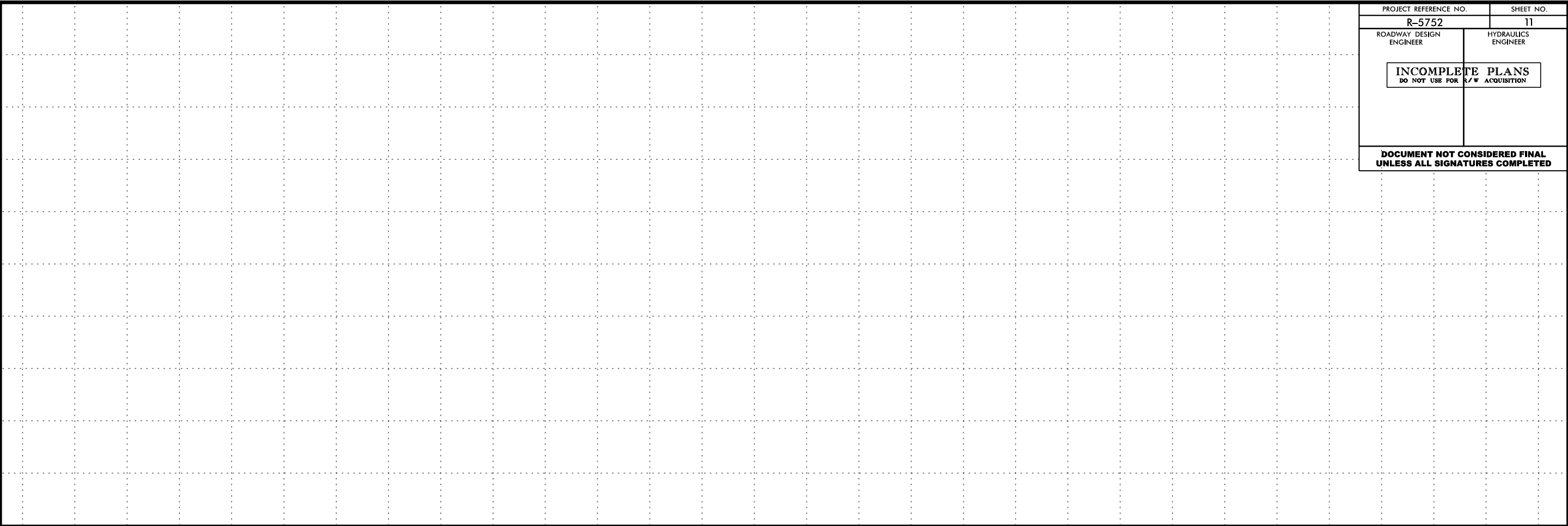


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5/28/99

PROJECT REFERENCE NO. R-5752	SHEET NO. 11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

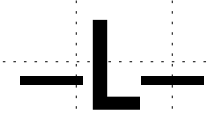
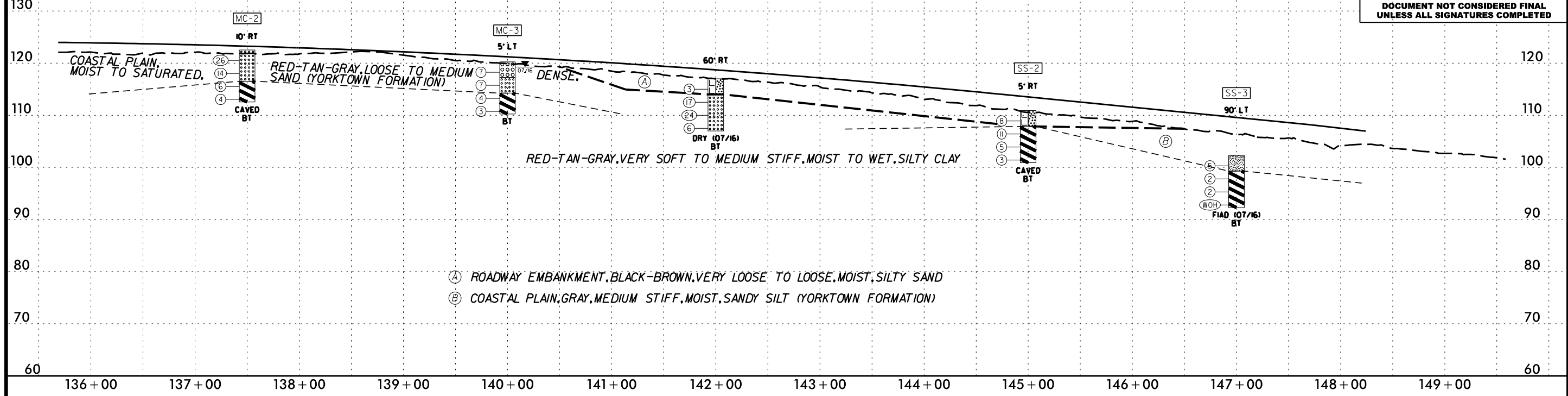
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5/28/99

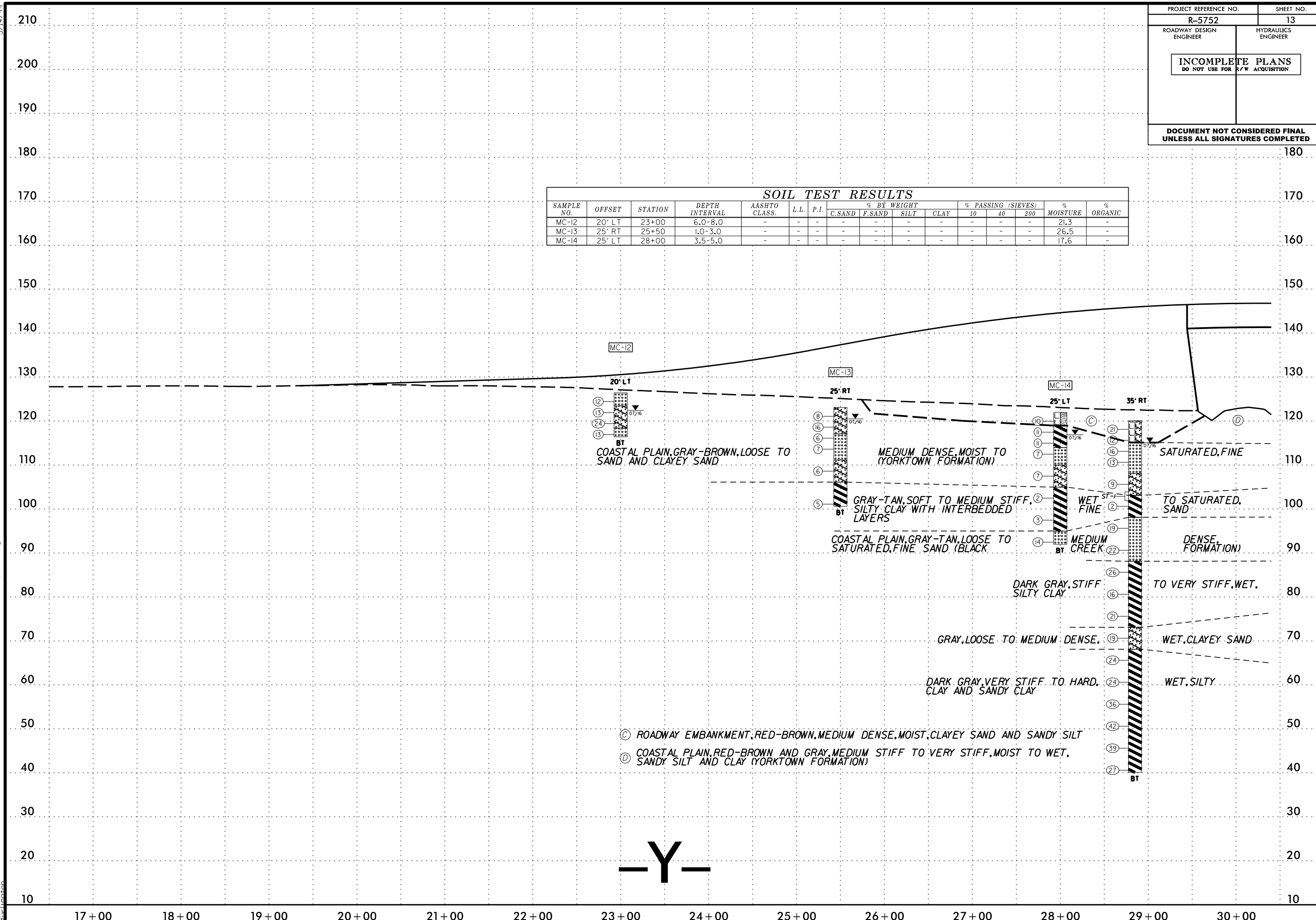
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ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
MC-2	10' RT	137+50	6.0-7.5	-	-	-	-	-	-	-	-	-	46.0	-	
MC-3	5' LT	140+00	6.0-7.5	-	-	-	-	-	-	-	-	-	44.3	-	
SS-2	5' RT	145+00	3.5-5.0	A-7-6(8)	41	25	9	43	10	38	100	99	49	20.3	
SS-3	90' LT	147+00	3.5-5.0	A-7-6(40)	77	55	1	29	13	57	100	99	72	-	



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 RDWY

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
MC-12	20' LT	23+00	6.0-8.0	-	-	-	-	-	-	-	-	-	-	21.3	-
MC-13	25' RT	25+50	1.0-3.0	-	-	-	-	-	-	-	-	-	-	26.5	-
MC-14	25' LT	28+00	3.5-5.0	-	-	-	-	-	-	-	-	-	-	17.6	-

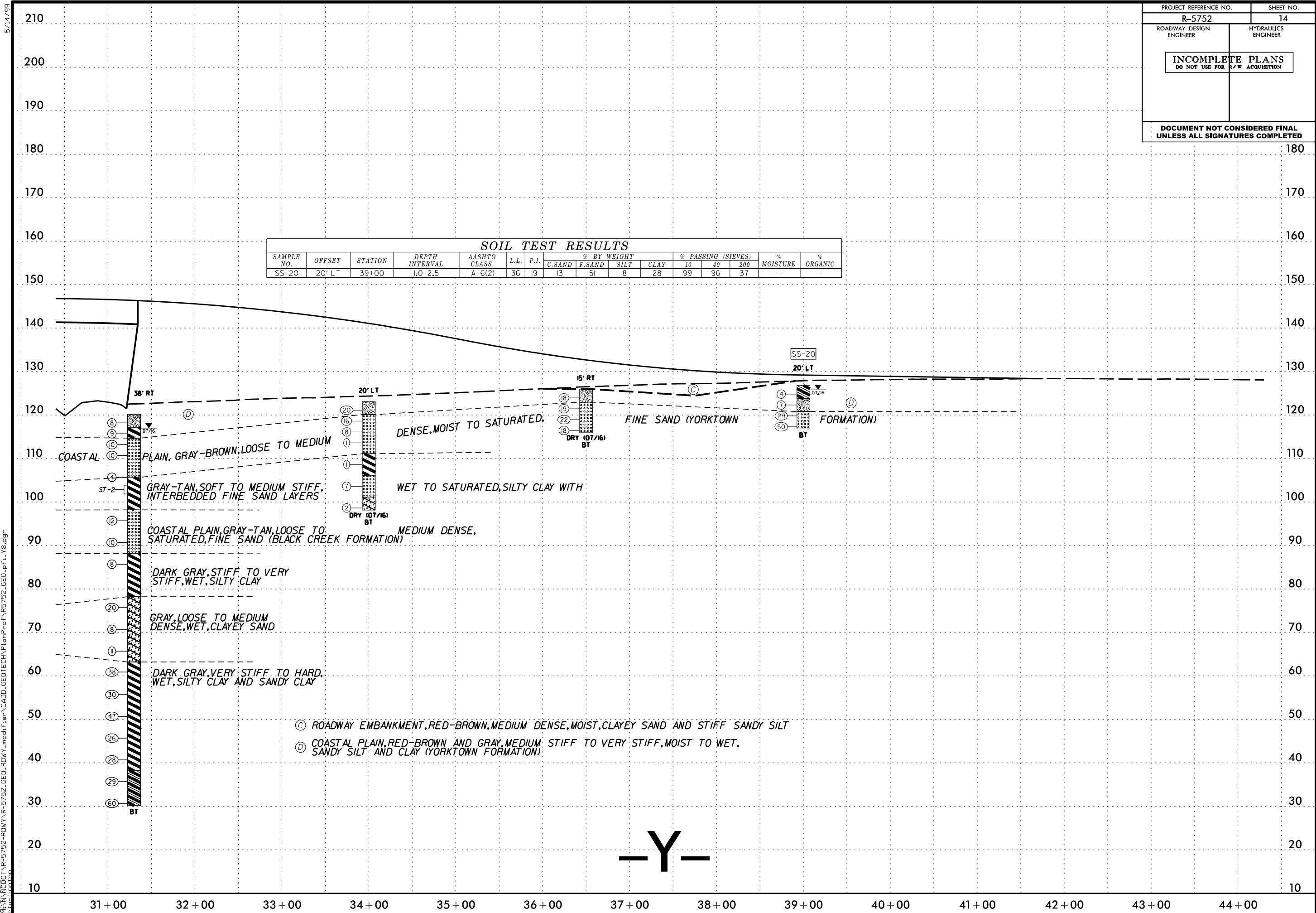


(C) ROADWAY EMBANKMENT, RED-BROWN, MEDIUM DENSE, MOIST, CLAYEY SAND AND SANDY SILT
 (D) COASTAL PLAIN, RED-BROWN AND GRAY, MEDIUM STIFF TO VERY STIFF, MOIST TO WET, SANDY SILT AND CLAY (YORKTOWN FORMATION)

-Y-

5/14/99
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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-20	20' LT	39+00	L0-2.5	A-6(2)	36	19	13	51	8	28	99	96	37	-	-

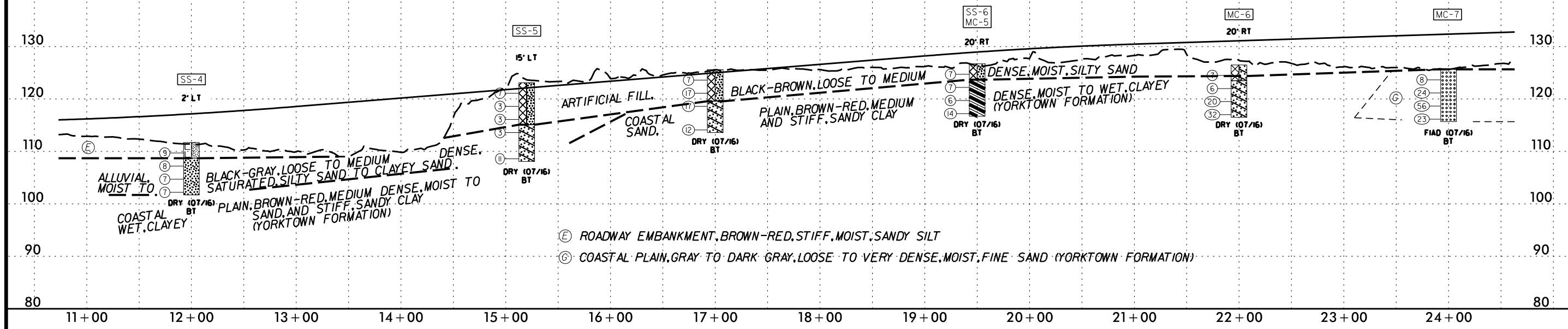


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5/28/99

PROJECT REFERENCE NO.		SHEET NO.	
R-5752		15	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-4	2' LT	12+00	1.0-2.5	A-4(0)	28	4	16	45	11	28	99	96	39	-	-
SS-5	15' LT	15+20	3.5-5.0	A-2-4(0)	15	4	21	51	11	17	99	93	29	-	-
SS-6	20' RT	19+50	1.0-2.5	A-2-4(0)	16	2	18	57	10	15	96	88	26	-	-
MC-5	20' RT	19+50	3.5-5.0	-	-	-	-	-	-	-	-	-	-	65.6	-
MC-6	20' RT	22+00	3.5-5.0	-	-	-	-	-	-	-	-	-	-	12.5	-
MC-7	CL	24+00	8.5-10.0	-	-	-	-	-	-	-	-	-	-	16.7	-



- (E) ROADWAY EMBANKMENT, BROWN-RED, STIFF, MOIST, SANDY SILT
- (G) COASTAL PLAIN, GRAY TO DARK GRAY, LOOSE TO VERY DENSE, MOIST, FINE SAND (YORKTOWN FORMATION)

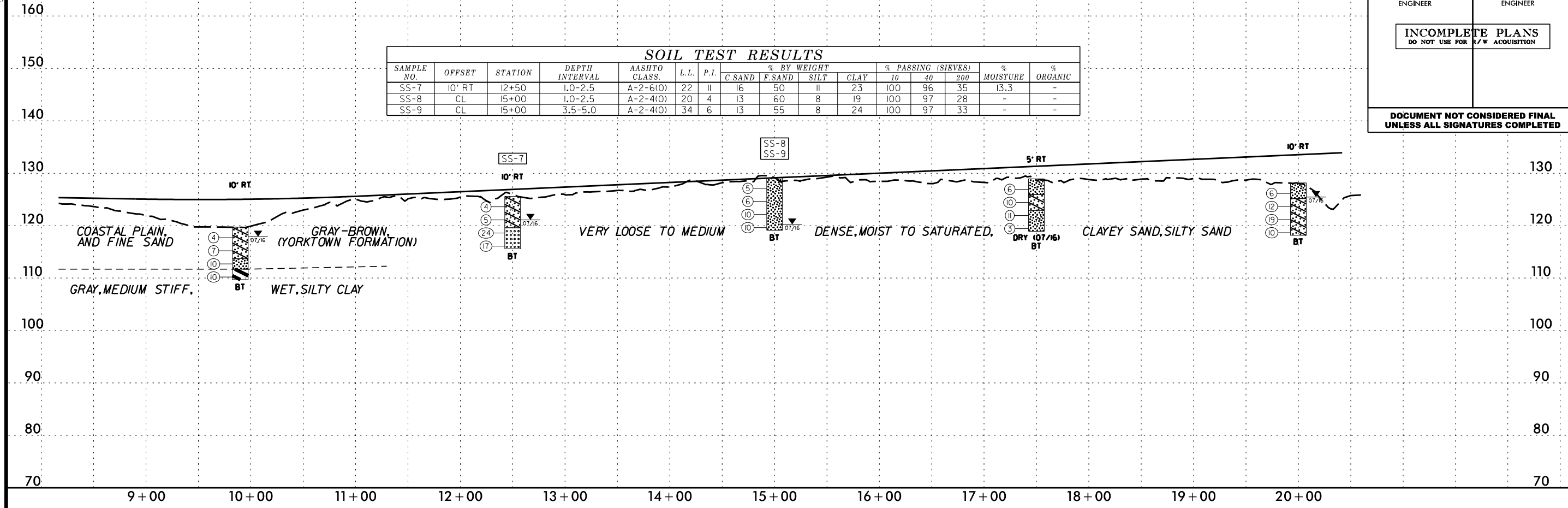
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5/28/99

PROJECT REFERENCE NO. R-5752		SHEET NO. 16	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-7	10' RT	12+50	1.0-2.5	A-2-6(O)	22	11	16	50	11	23	100	96	35	13.3	-
SS-8	CL	15+00	1.0-2.5	A-2-4(O)	20	4	13	60	8	19	100	97	28	-	-
SS-9	CL	15+00	3.5-5.0	A-2-4(O)	34	6	13	55	8	24	100	97	33	-	-



-YRPB-

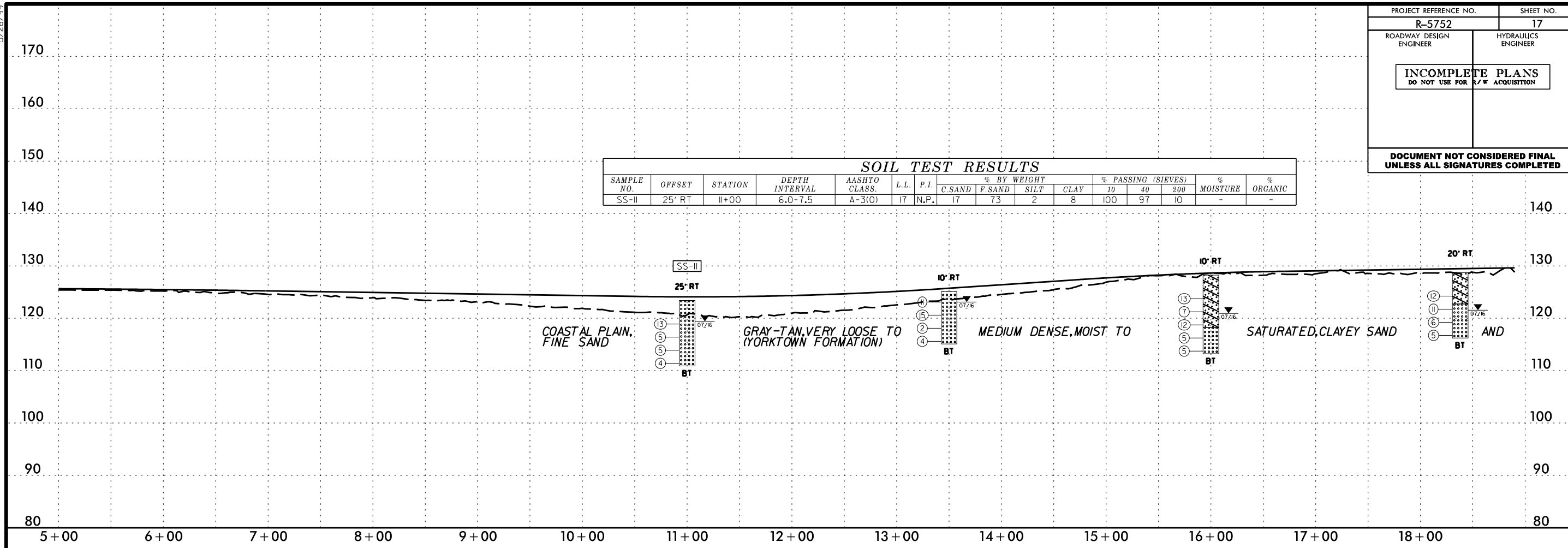
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PROJECT REFERENCE NO. R-5752	SHEET NO. 17
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

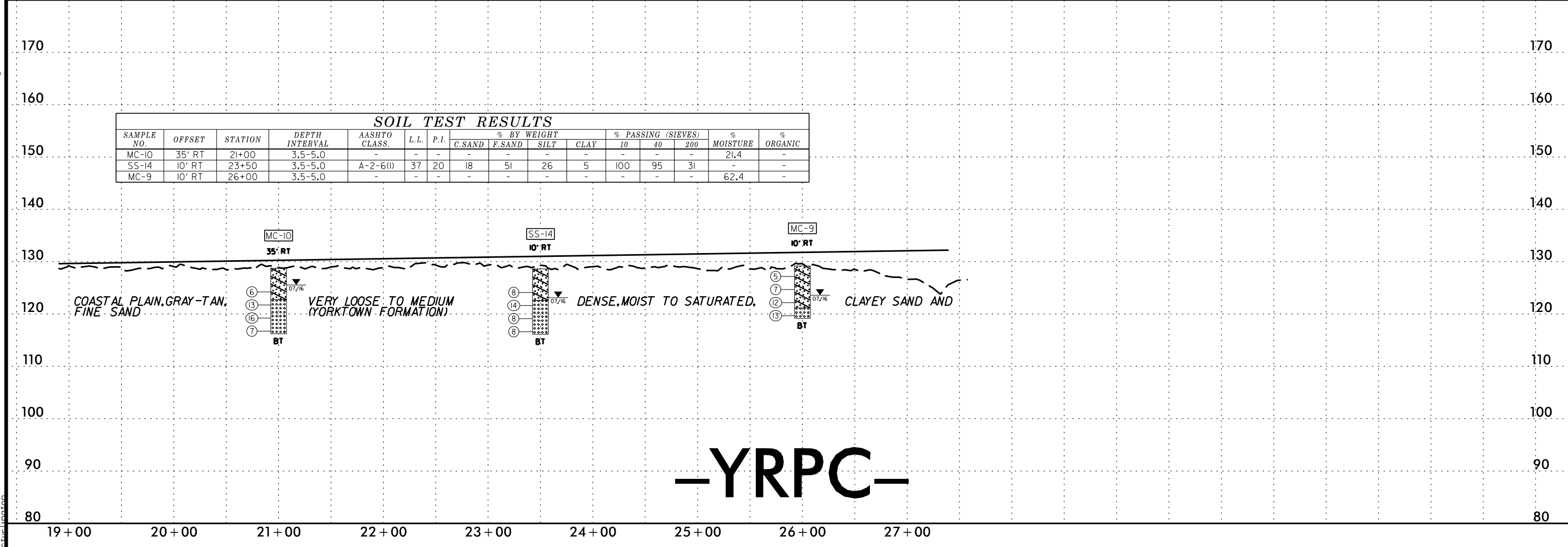
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-11	25' RT	11+00	6.0-7.5	A-3(O)	17	N.P.	17	73	2	8	100	97	10	-	-



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
MC-10	35' RT	21+00	3.5-5.0	-	-	-	-	-	-	-	-	-	-	21.4	-
SS-14	10' RT	23+50	3.5-5.0	A-2-6(1)	37	20	18	51	26	5	100	95	31	-	-
MC-9	10' RT	26+00	3.5-5.0	-	-	-	-	-	-	-	-	-	62.4	-	



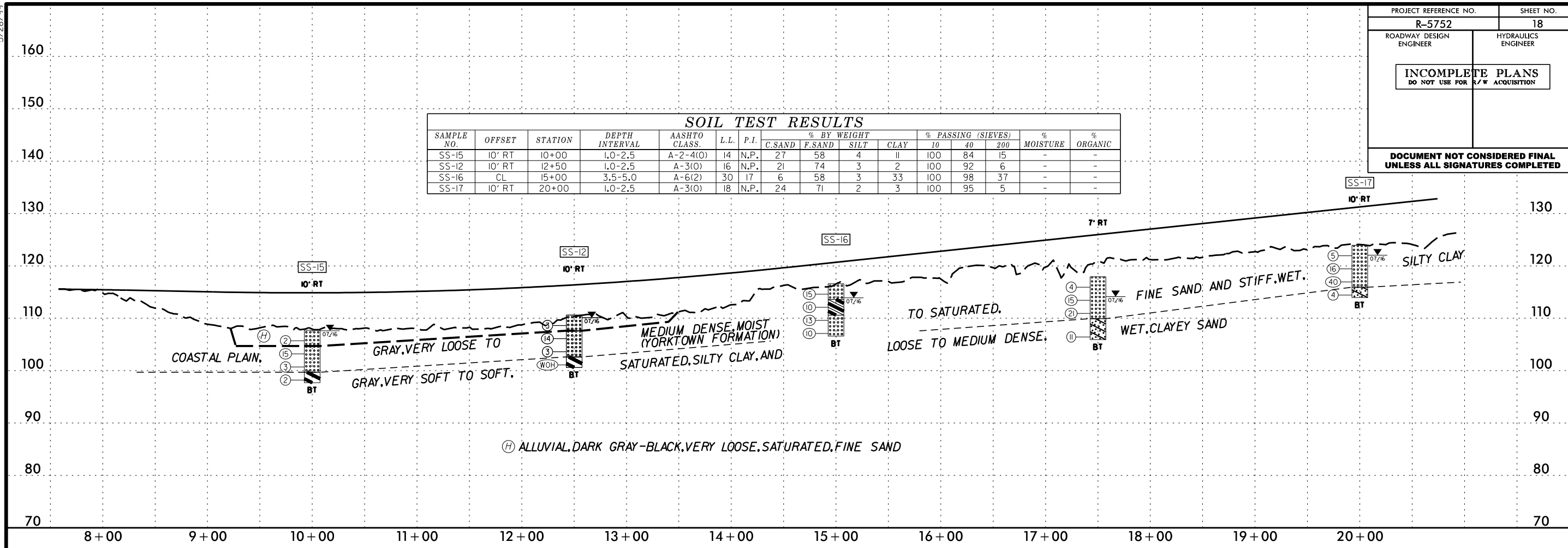
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PROJECT REFERENCE NO. R-5752	SHEET NO. 18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-15	10' RT	10+00	1.0-2.5	A-2-4(0)	14	N.P.	27	58	4	11	100	84	15	-	-
SS-12	10' RT	12+50	1.0-2.5	A-3(0)	16	N.P.	21	74	3	2	100	92	6	-	
SS-16	CL	15+00	3.5-5.0	A-6(2)	30	17	6	58	3	33	100	98	37	-	
SS-17	10' RT	20+00	1.0-2.5	A-3(0)	18	N.P.	24	71	2	3	100	95	5	-	

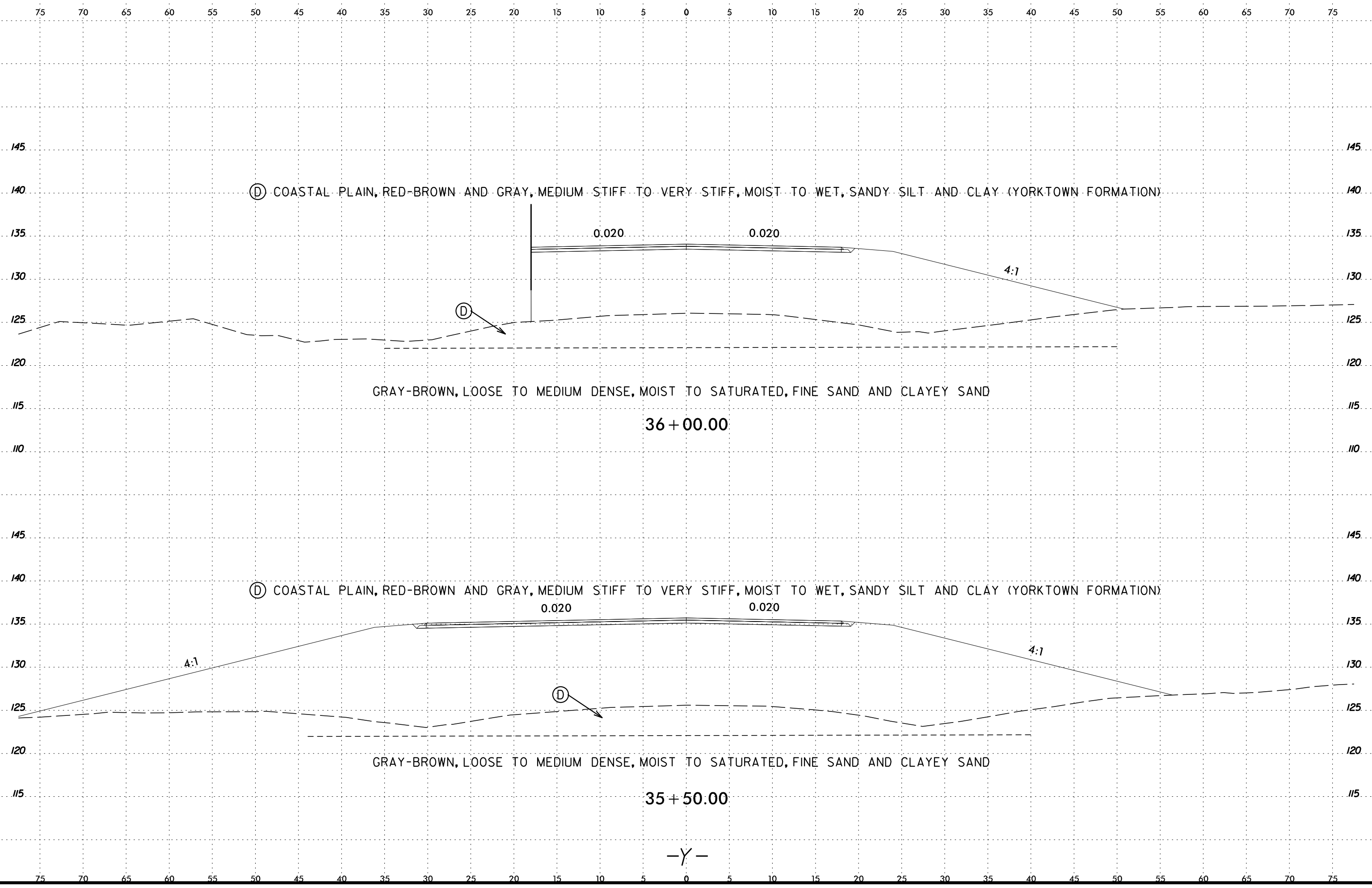


(H) ALLUVIAL, DARK GRAY-BLACK, VERY LOOSE, SATURATED, FINE SAND

-YRPD-

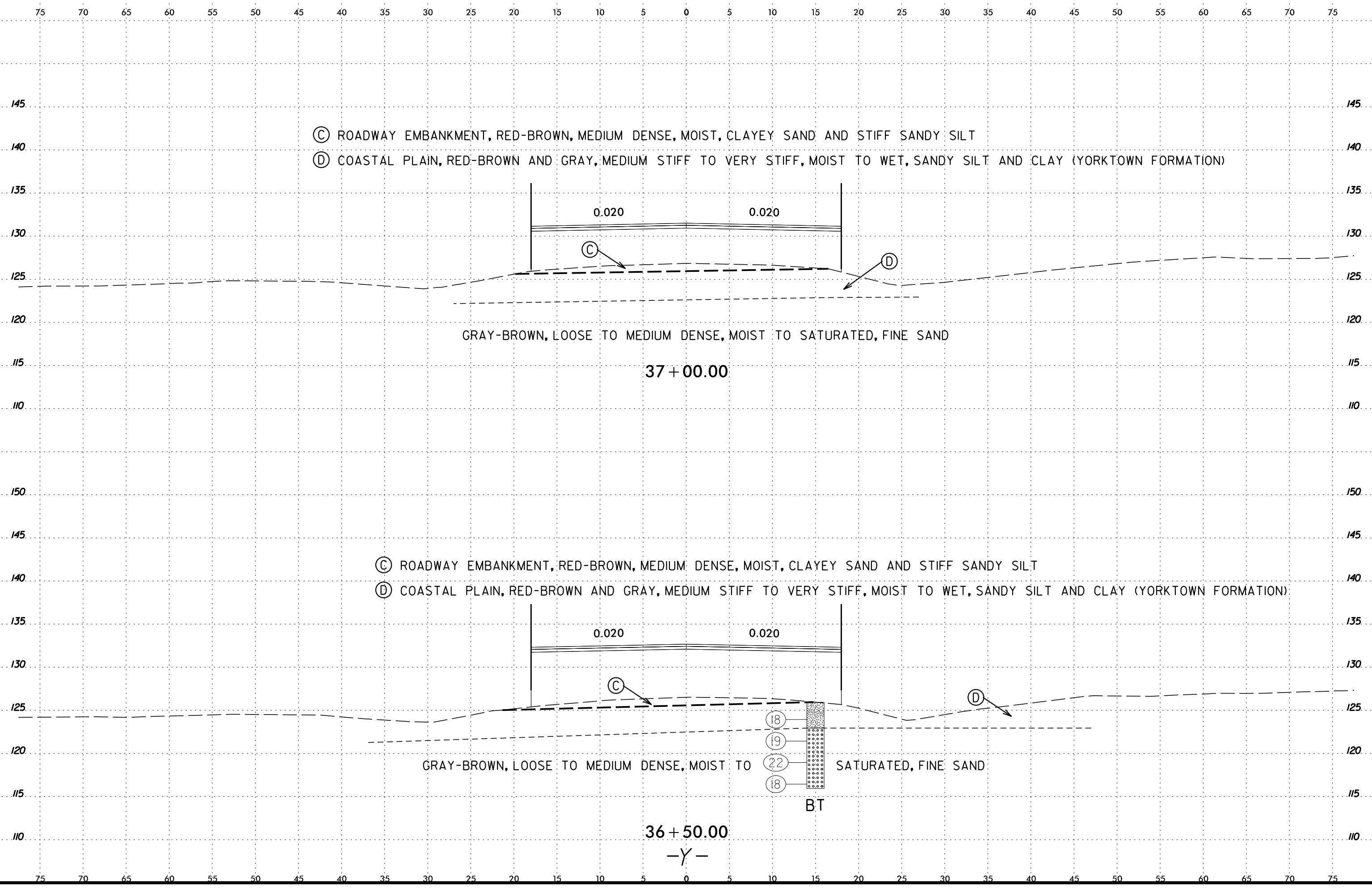
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-Y-



- Ⓒ ROADWAY EMBANKMENT, RED-BROWN, MEDIUM DENSE, MOIST, CLAYEY SAND AND STIFF SANDY SILT
- Ⓓ COASTAL PLAIN, RED-BROWN AND GRAY, MEDIUM STIFF TO VERY STIFF, MOIST TO WET, SANDY SILT AND CLAY (YORKTOWN FORMATION)

GRAY-BROWN, LOOSE TO MEDIUM DENSE, MOIST TO SATURATED, FINE SAND

37 + 00.00

- Ⓒ ROADWAY EMBANKMENT, RED-BROWN, MEDIUM DENSE, MOIST, CLAYEY SAND AND STIFF SANDY SILT
- Ⓓ COASTAL PLAIN, RED-BROWN AND GRAY, MEDIUM STIFF TO VERY STIFF, MOIST TO WET, SANDY SILT AND CLAY (YORKTOWN FORMATION)

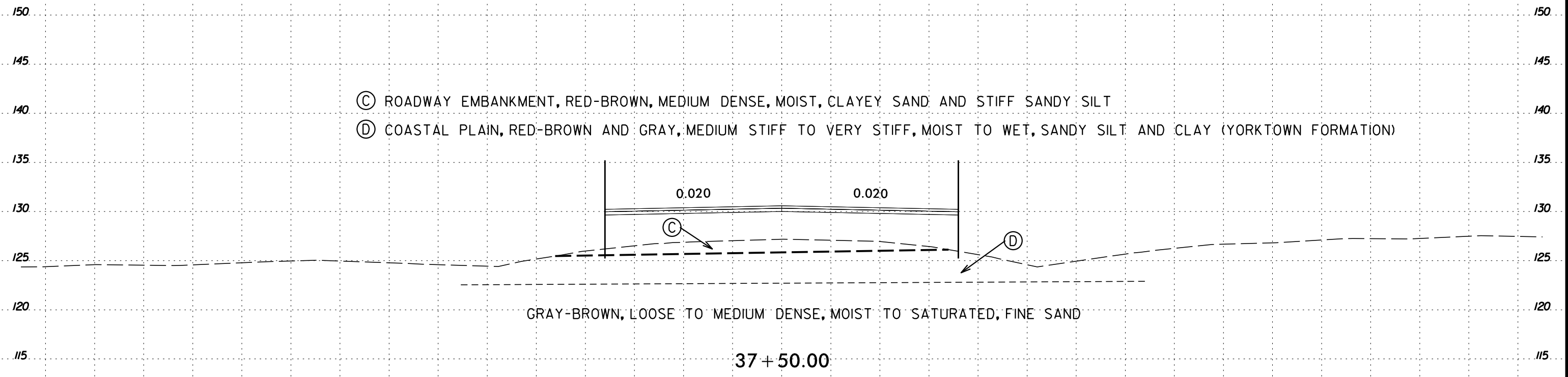
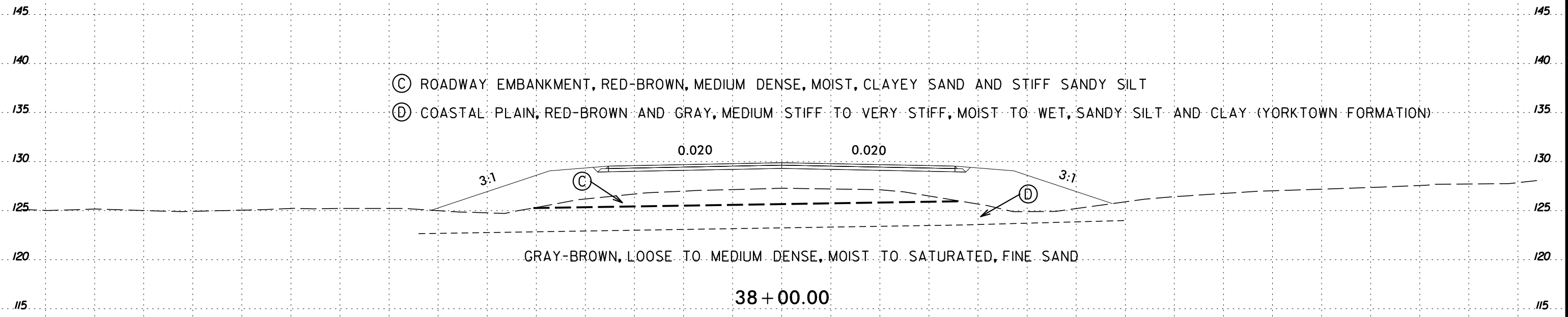
GRAY-BROWN, LOOSE TO MEDIUM DENSE, MOIST TO SATURATED, FINE SAND

36 + 50.00

BT

-Y-

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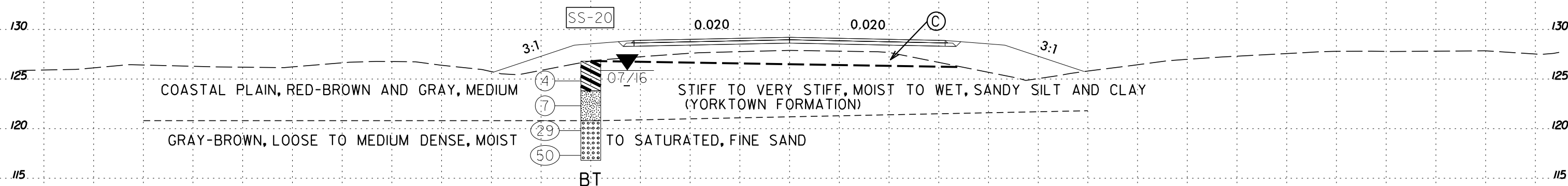
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75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

Ⓢ ROADWAY EMBANKMENT, RED-BROWN, MEDIUM DENSE, MOIST, CLAYEY SAND AND SANDY SILT

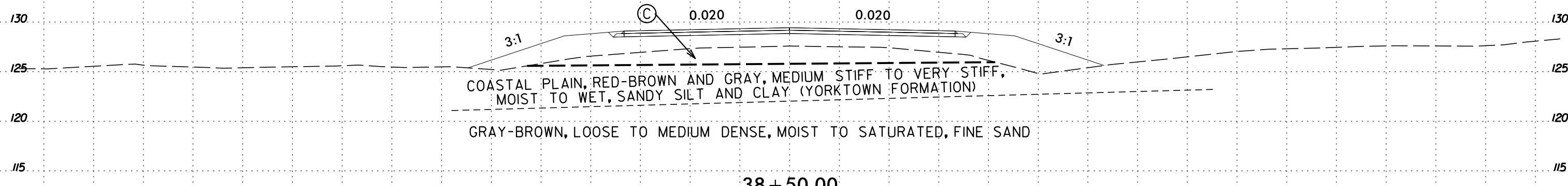
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-20	20' LT	39+00	1.0-2.5	A-6(2)	36	19	13	51	8	28	99	96	37	-	-



39 + 00.00

Ⓢ ROADWAY EMBANKMENT, RED-BROWN, MEDIUM DENSE, MOIST, CLAYEY SAND AND STIFF SANDY SILT

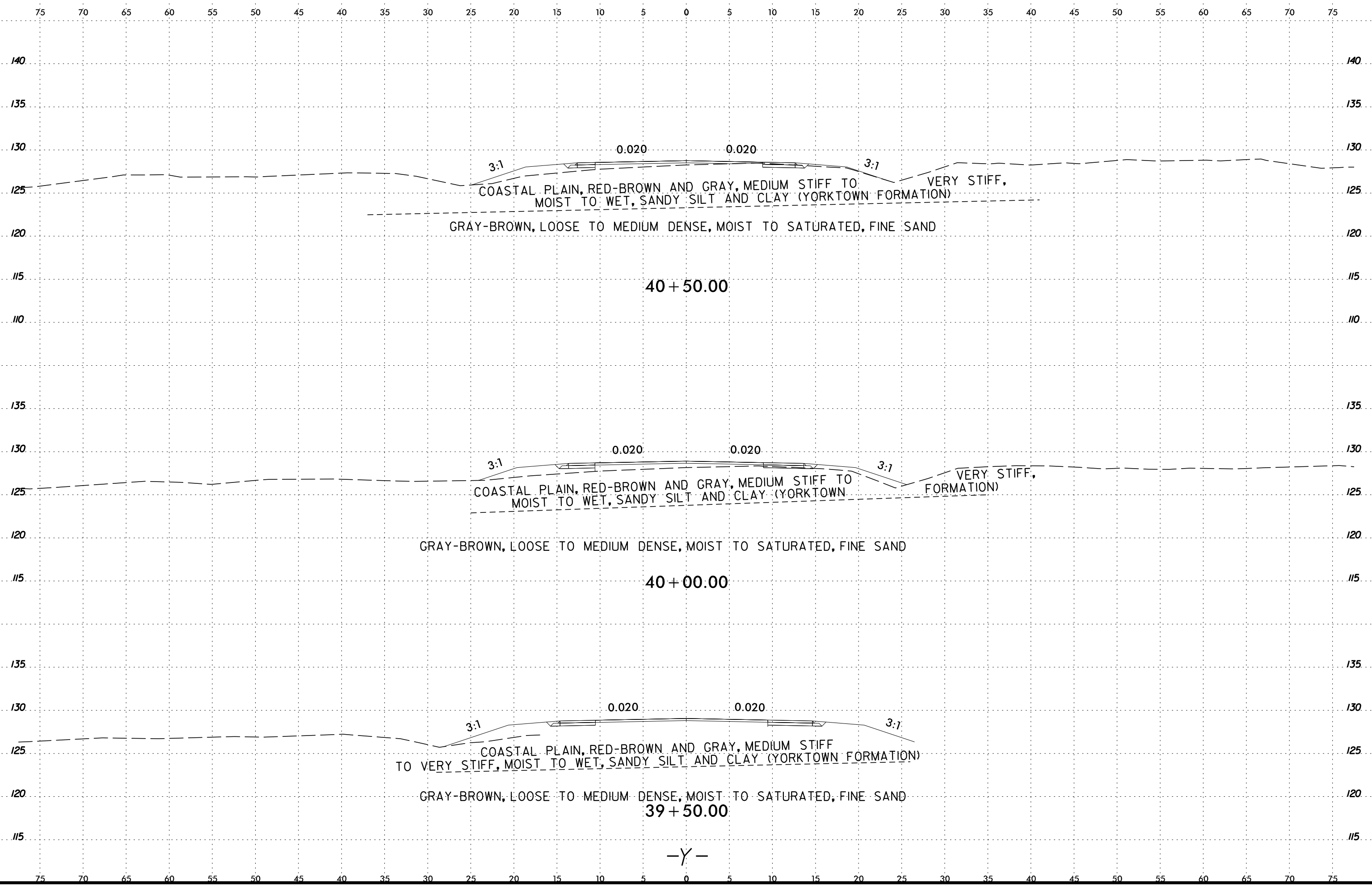


38 + 50.00

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6/23/16



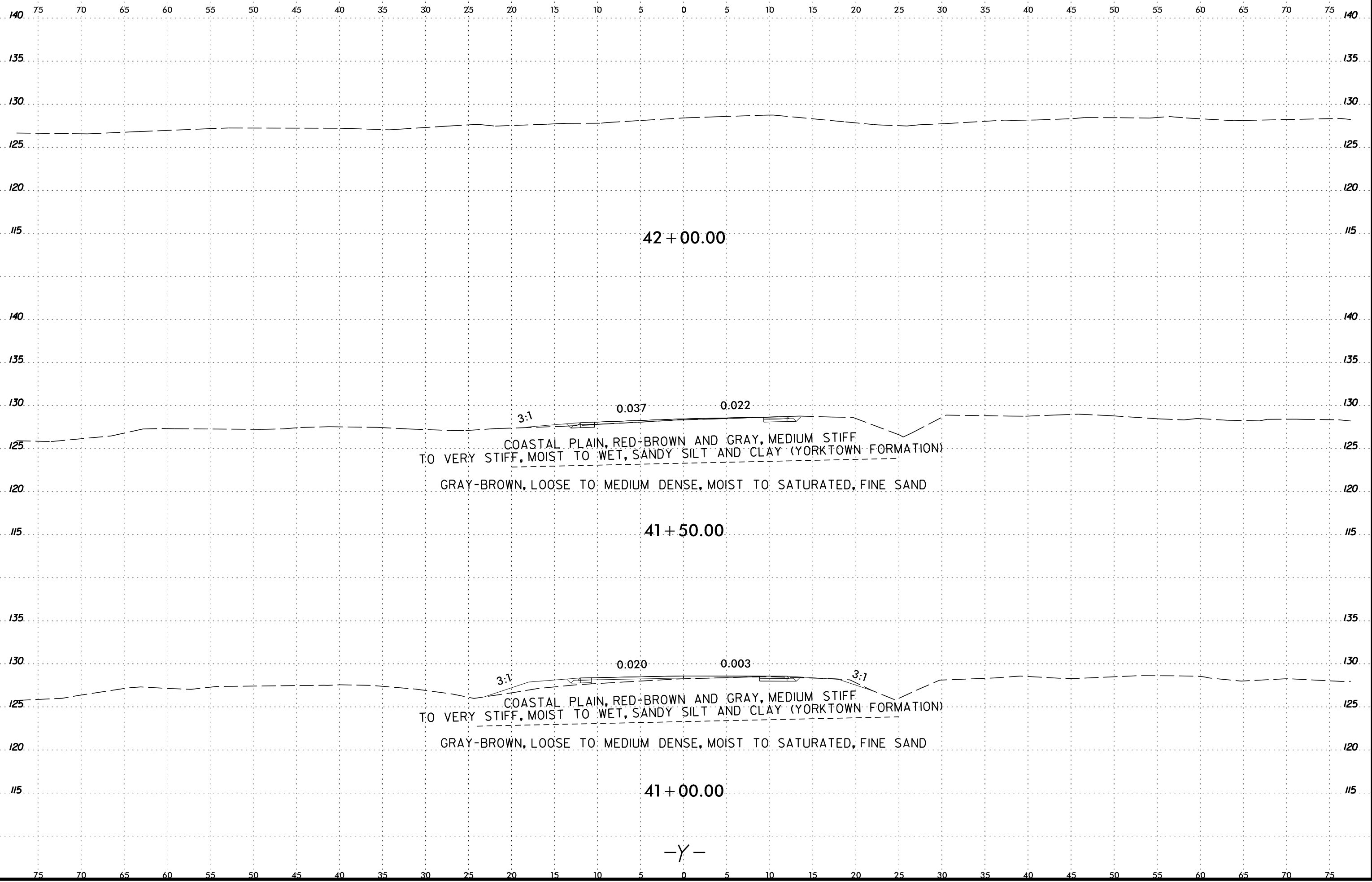
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6/23/16



PROJ. REFERENCE NO.
R-5752

SHEET NO.
24



42 + 00.00

3:1 0.037 0.022
COASTAL PLAIN, RED-BROWN AND GRAY, MEDIUM STIFF
TO VERY STIFF, MOIST TO WET, SANDY SILT AND CLAY (YORKTOWN FORMATION)
GRAY-BROWN, LOOSE TO MEDIUM DENSE, MOIST TO SATURATED, FINE SAND

41 + 50.00

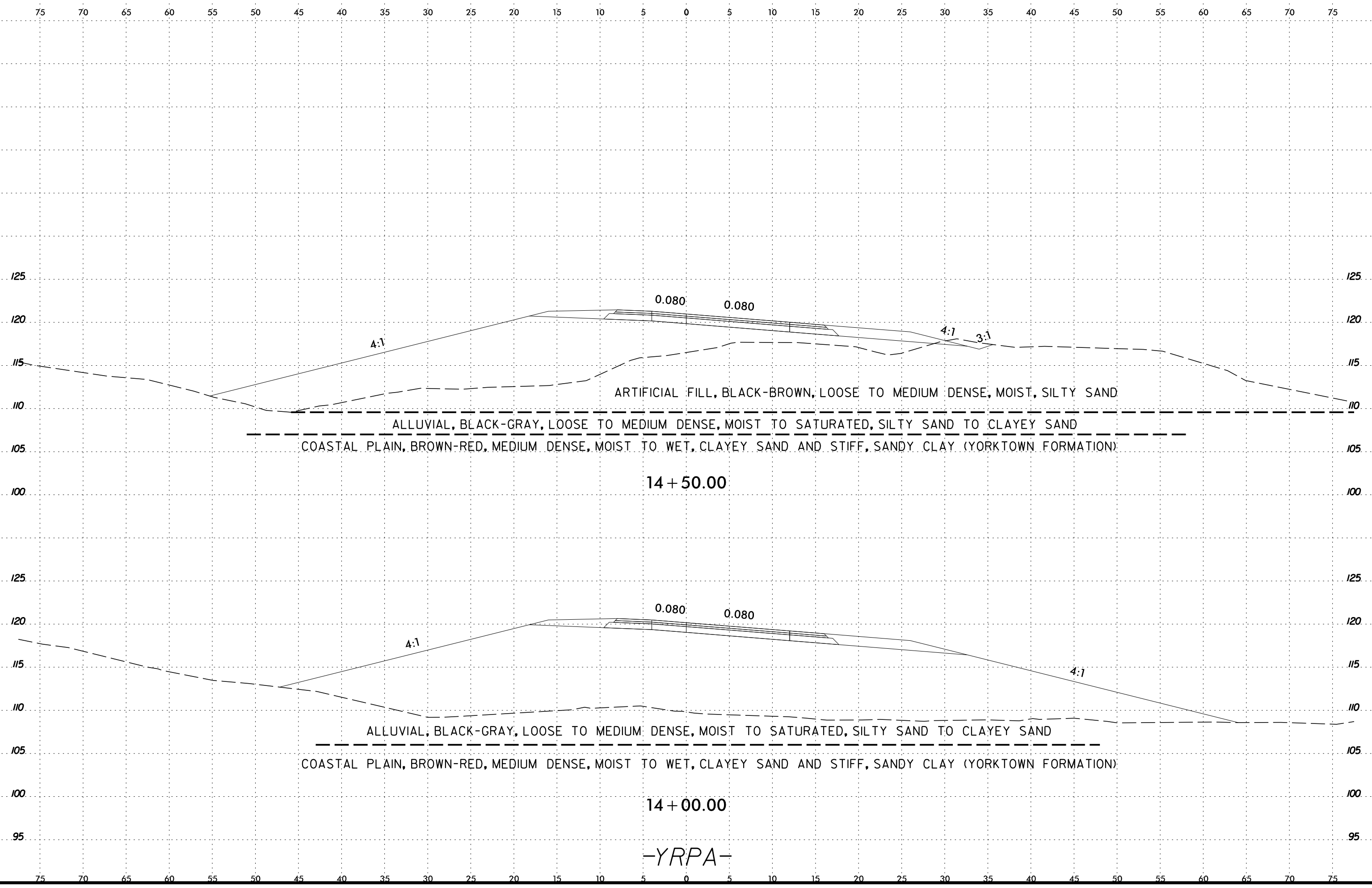
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COASTAL PLAIN, RED-BROWN AND GRAY, MEDIUM STIFF
TO VERY STIFF, MOIST TO WET, SANDY SILT AND CLAY (YORKTOWN FORMATION)
GRAY-BROWN, LOOSE TO MEDIUM DENSE, MOIST TO SATURATED, FINE SAND

41 + 00.00

-Y-

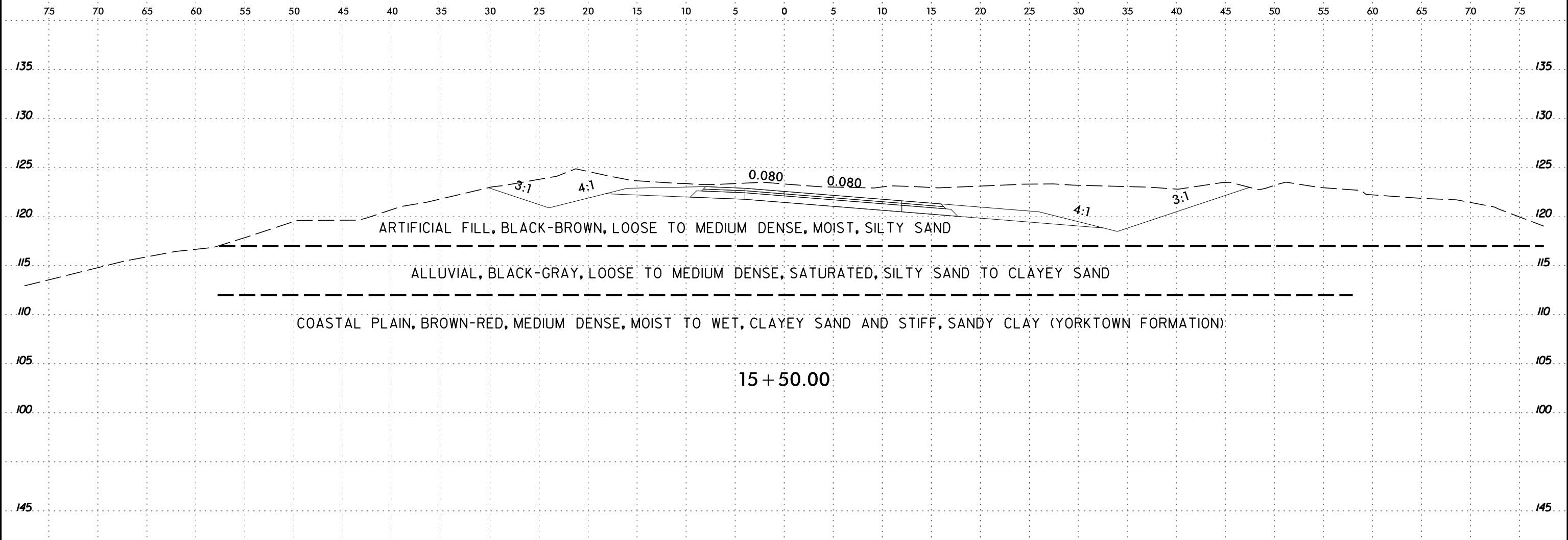
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6/23/16



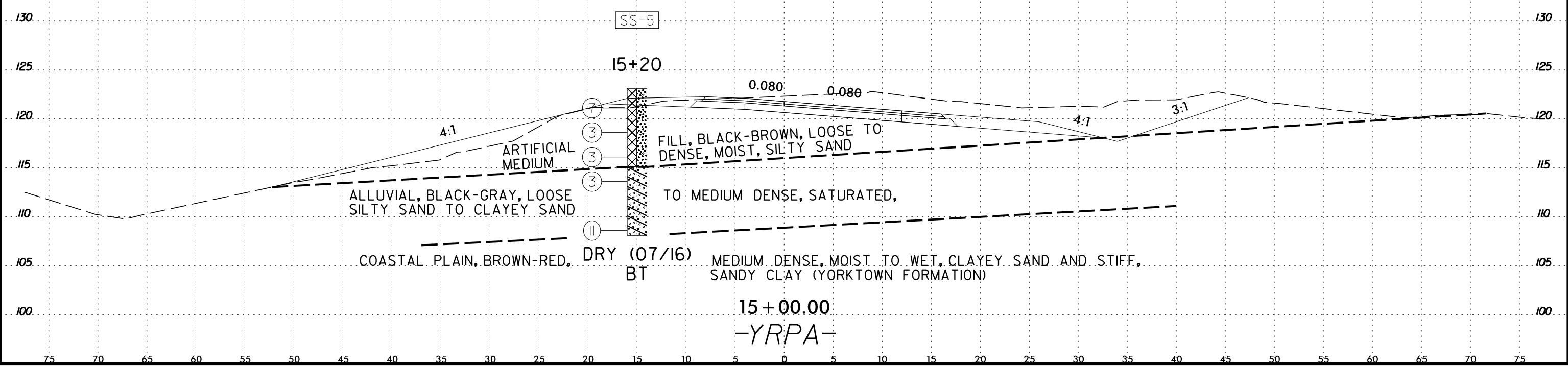
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-YRPA-

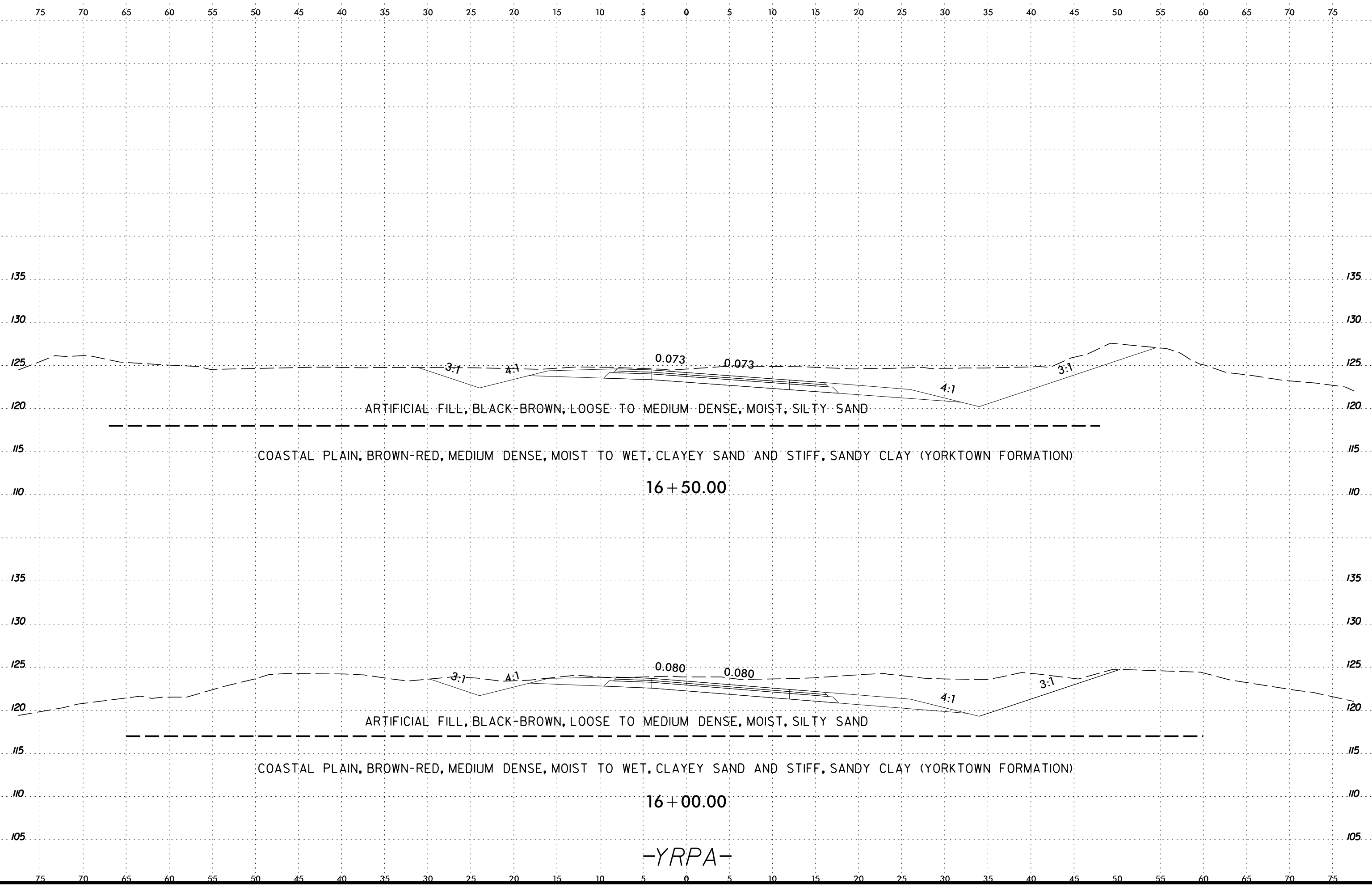


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-5	15' LT	15+20	3.5-5.0	A-2-4(0)	15	4	21	51	11	17	99	93	29	-	-

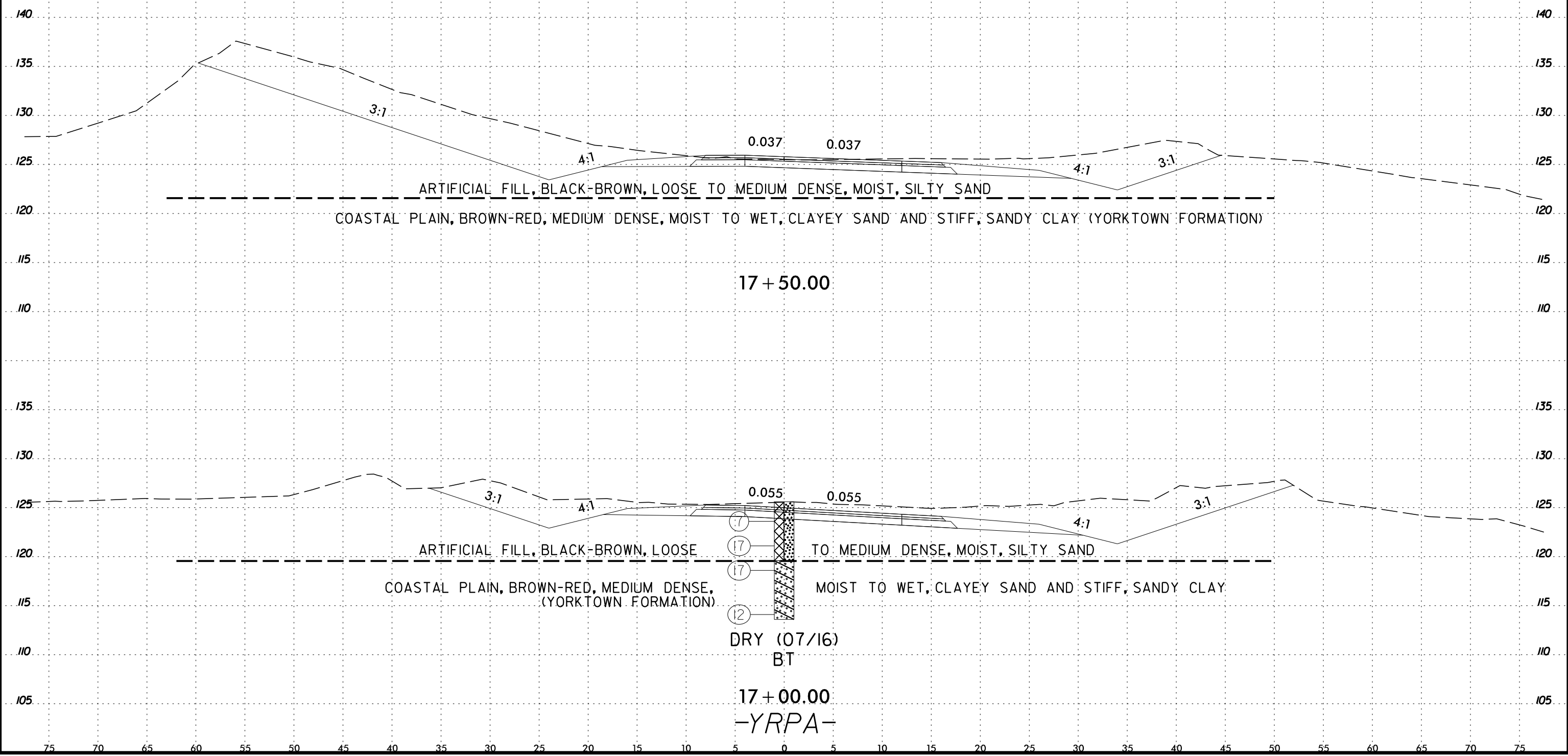


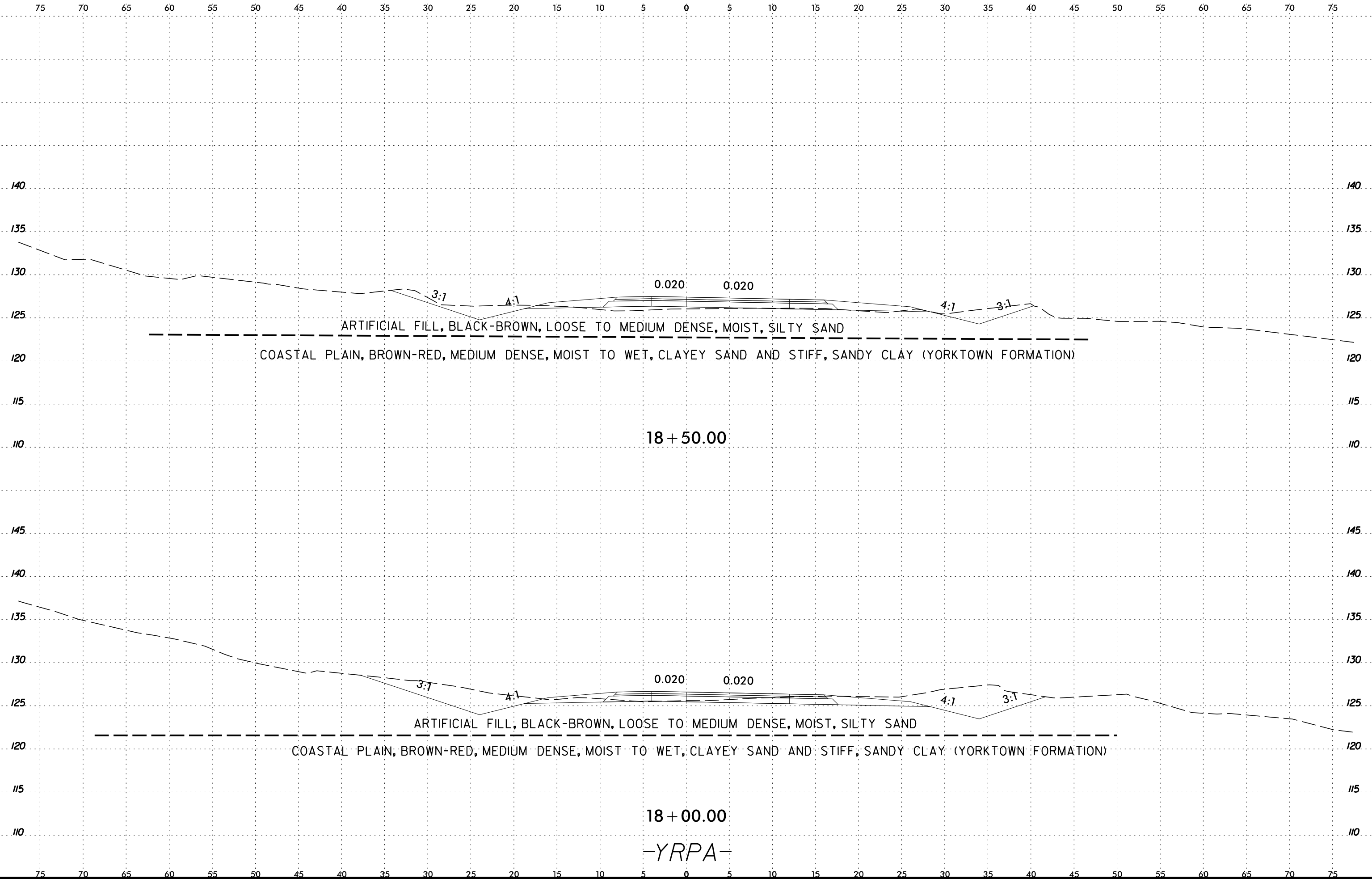
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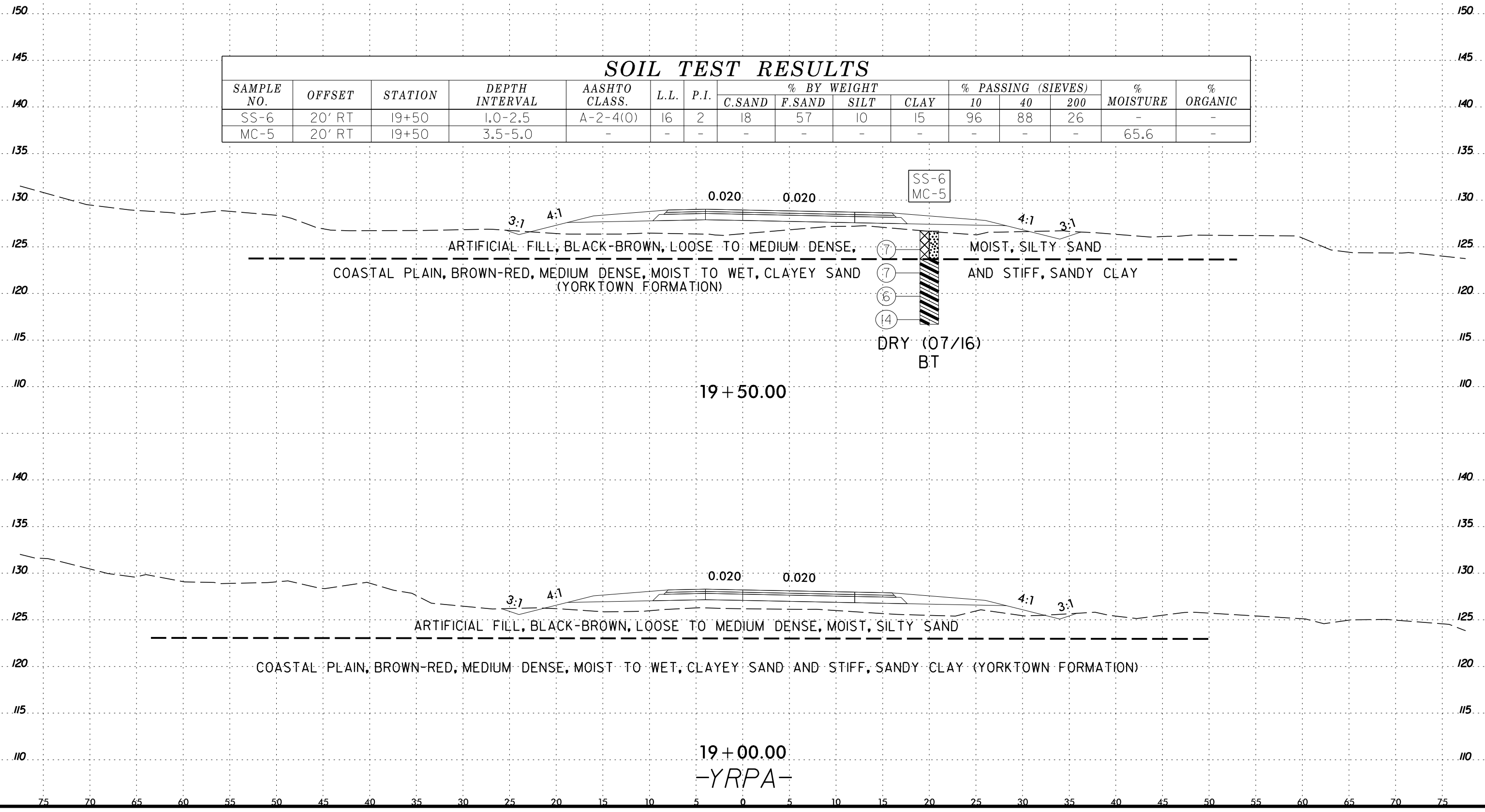




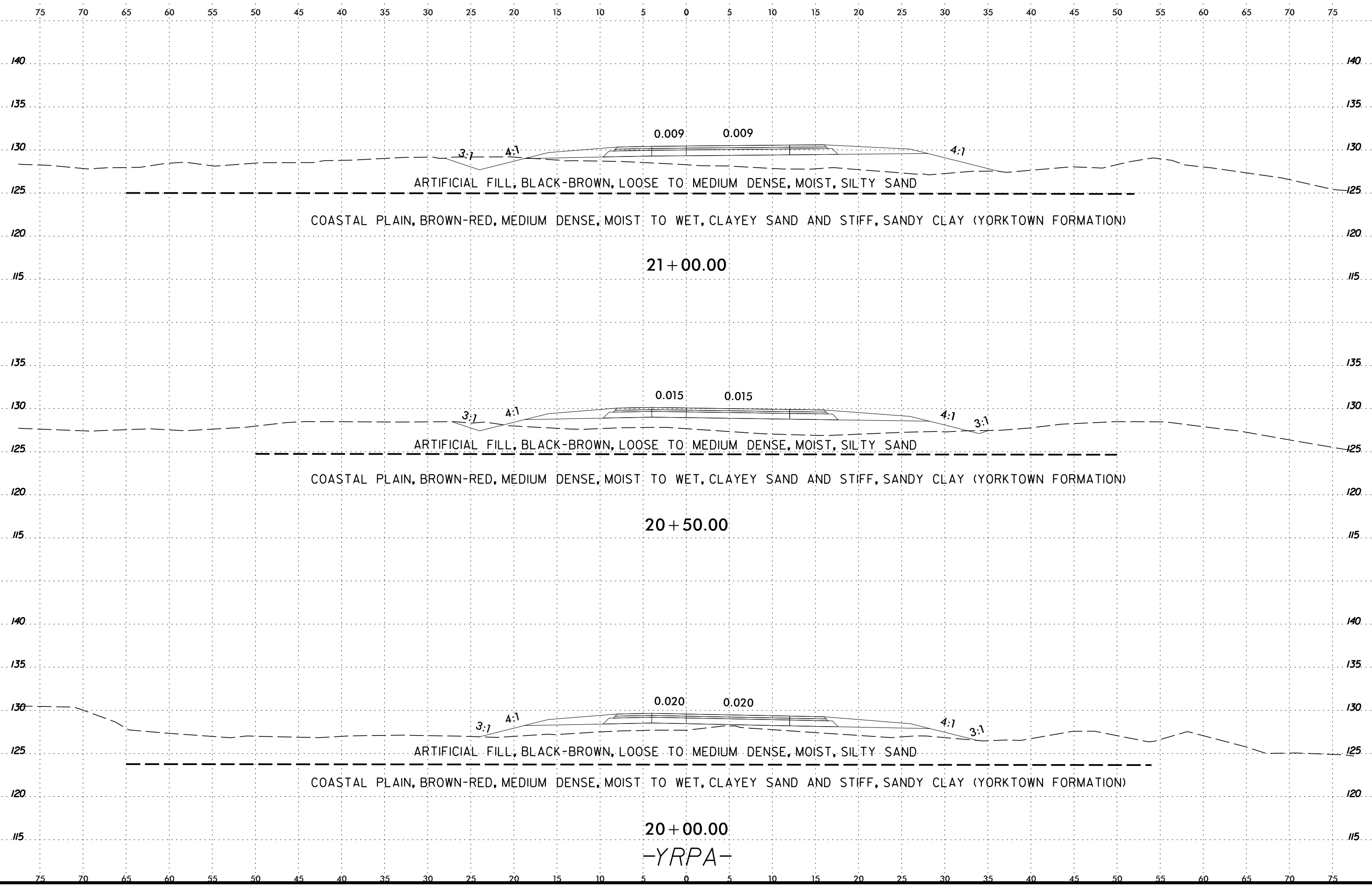
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SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-6	20' RT	19+50	1.0-2.5	A-2-4(0)	16	2	18	57	10	15	96	88	26	-	-
MC-5	20' RT	19+50	3.5-5.0	-	-	-	-	-	-	-	-	-	-	65.6	-



6/23/16



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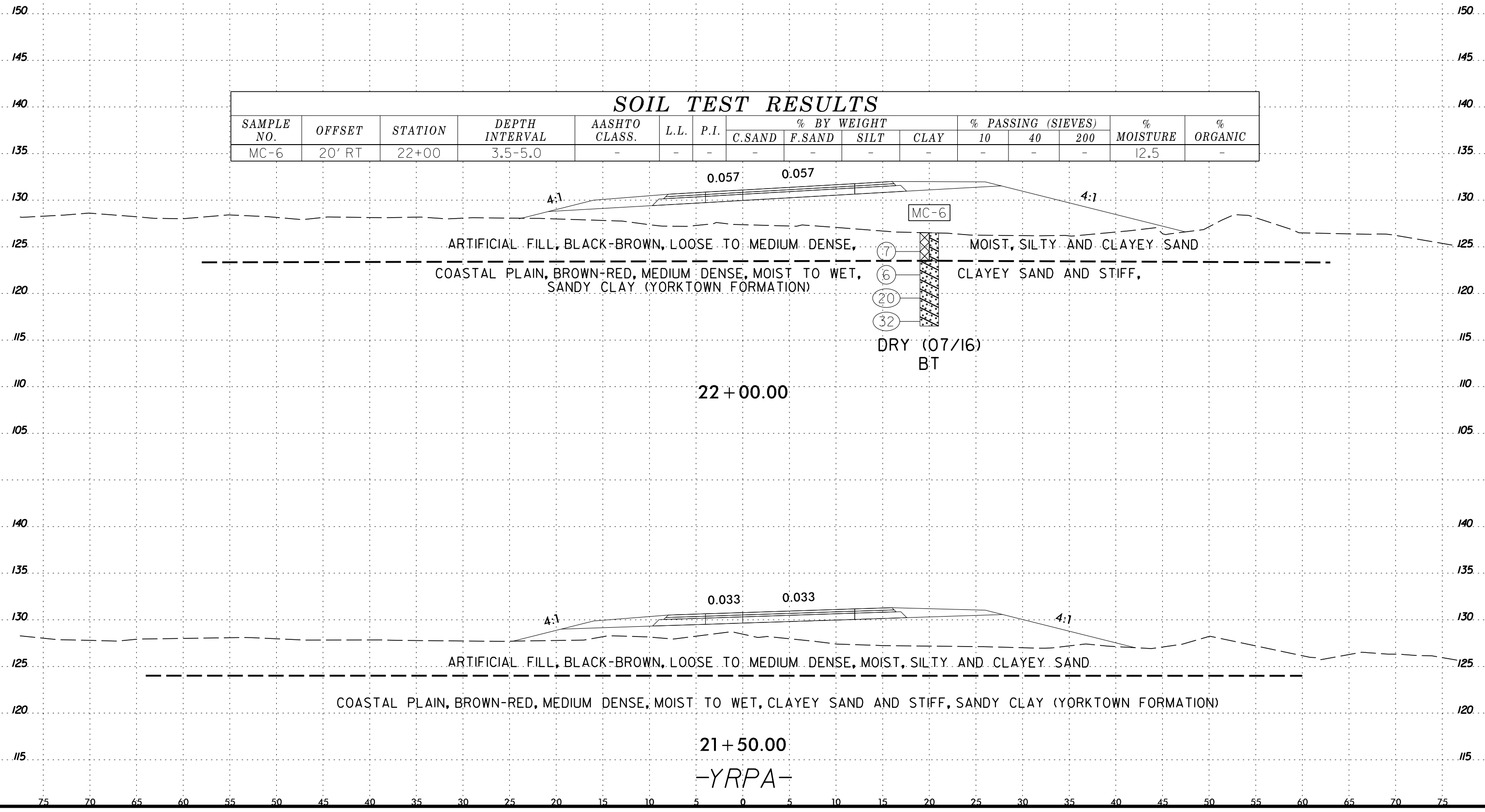
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6/23/16

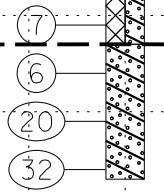
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SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
MC-6	20' RT	22+00	3.5-5.0	-	-	-	-	-	-	-	-	-	-	12.5	-



ARTIFICIAL FILL, BLACK-BROWN, LOOSE TO MEDIUM DENSE, MOIST, SILTY AND CLAYEY SAND
 COASTAL PLAIN, BROWN-RED, MEDIUM DENSE, MOIST TO WET, SANDY CLAY (YORKTOWN FORMATION)



DRY (07/16)
BT

22 + 00.00

ARTIFICIAL FILL, BLACK-BROWN, LOOSE TO MEDIUM DENSE, MOIST, SILTY AND CLAYEY SAND
 COASTAL PLAIN, BROWN-RED, MEDIUM DENSE, MOIST TO WET, CLAYEY SAND AND STIFF, SANDY CLAY (YORKTOWN FORMATION)

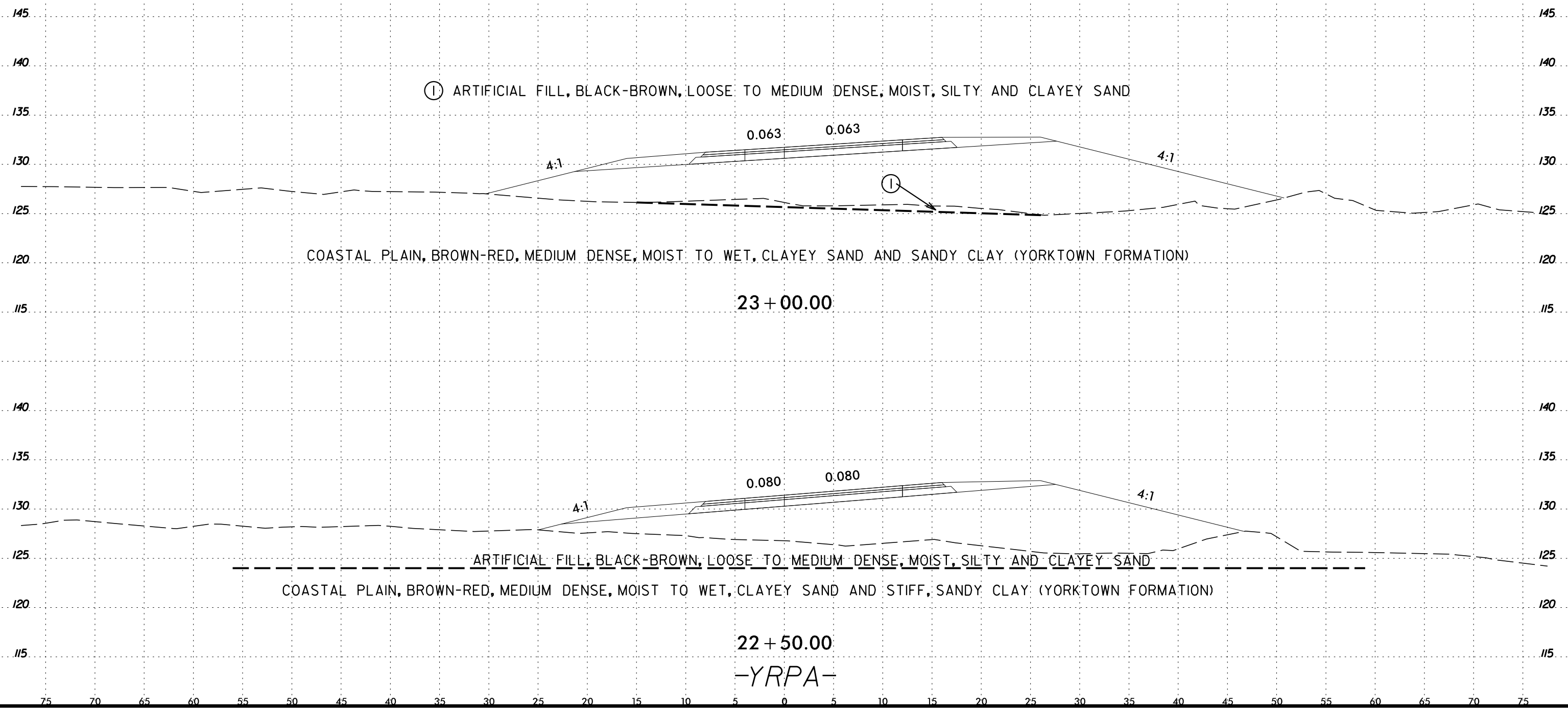
21 + 50.00

-YRPA-

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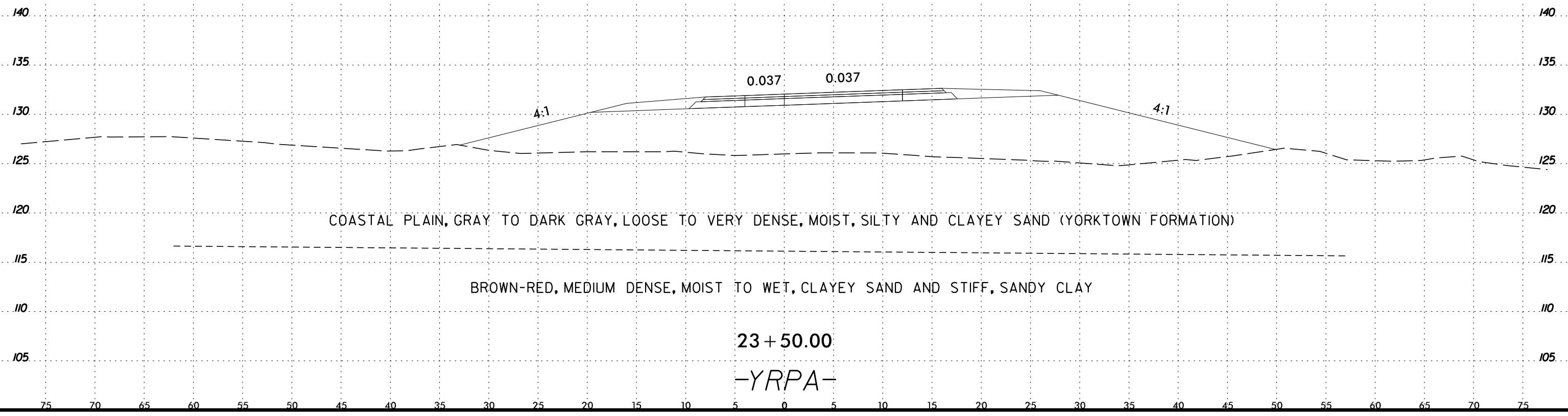
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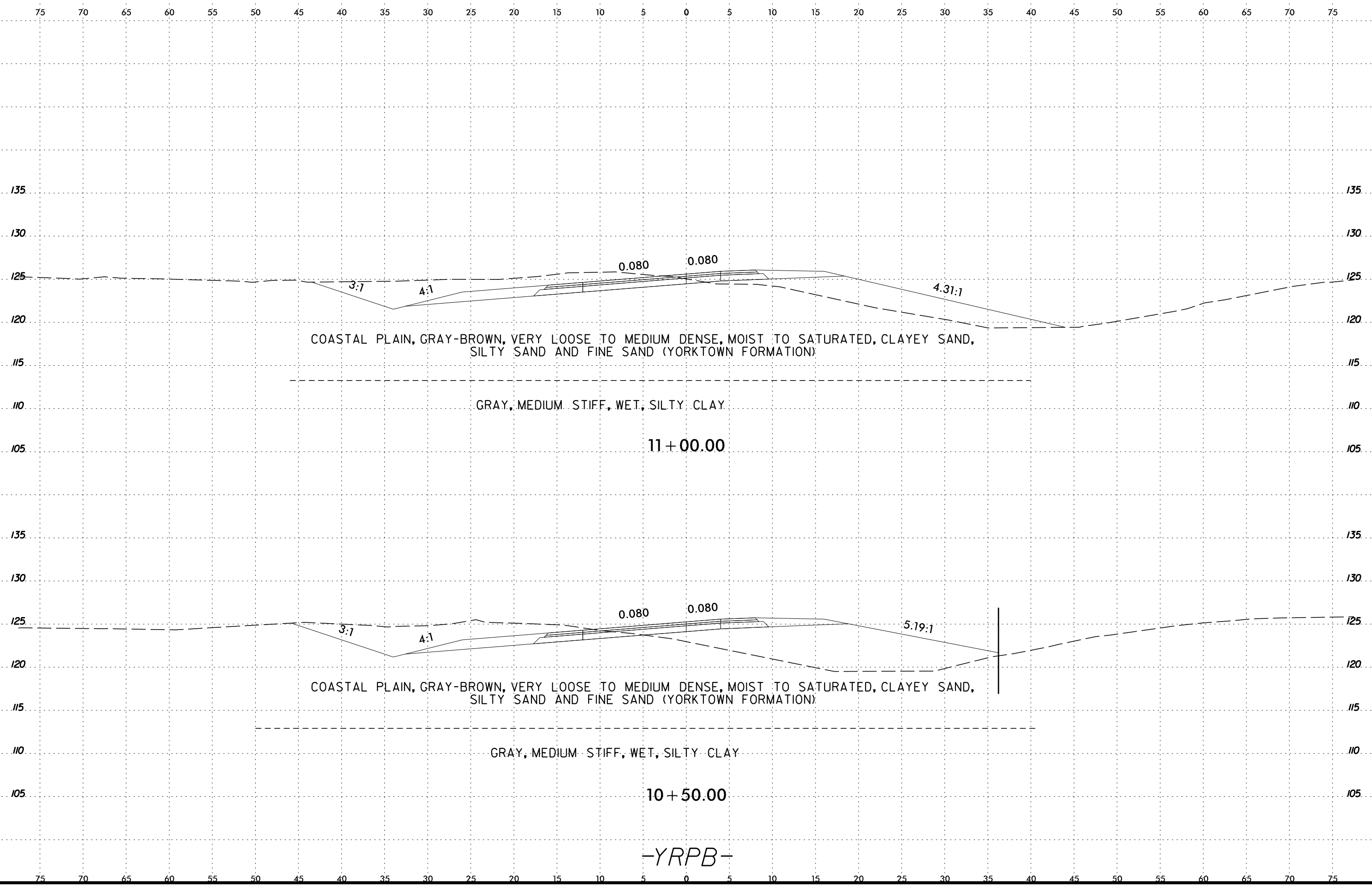
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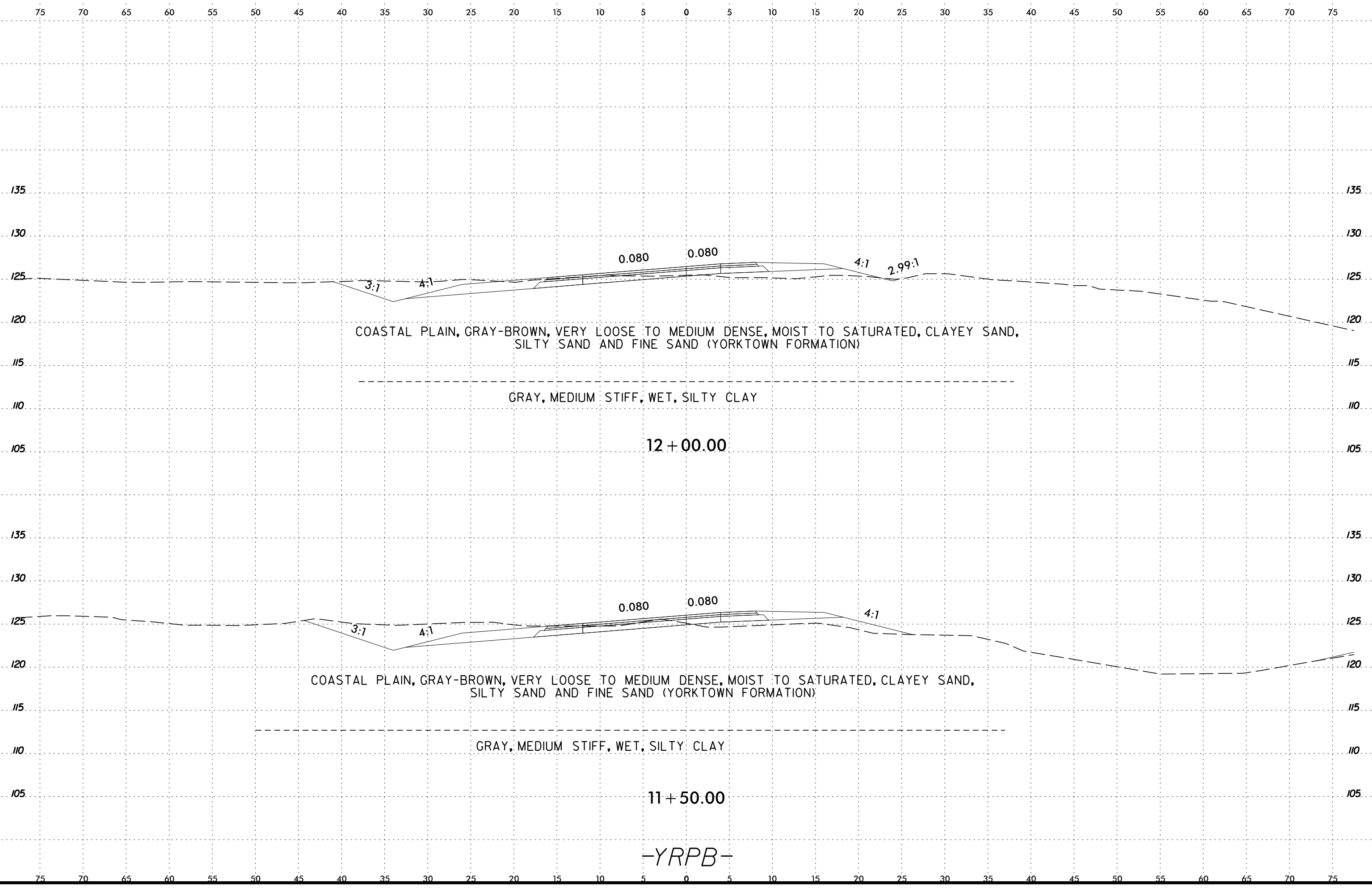
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 ctur\mgton

6/23/16



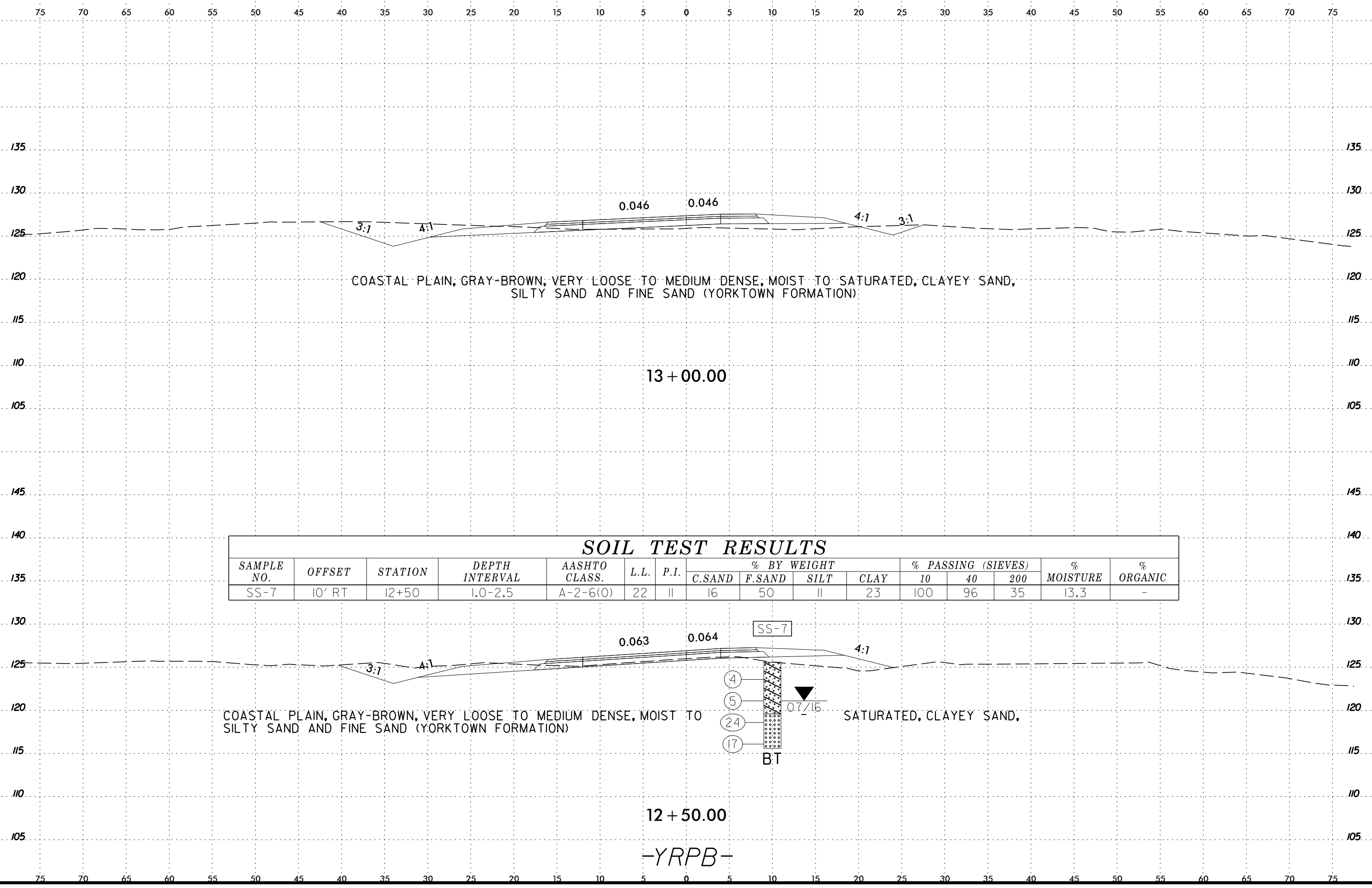
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-YRPB-



COASTAL PLAIN, GRAY-BROWN, VERY LOOSE TO MEDIUM DENSE, MOIST TO SATURATED, CLAYEY SAND, SILTY SAND AND FINE SAND (YORKTOWN FORMATION)

13 + 00.00

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-7	10' RT	12+50	1.0-2.5	A-2-6(0)	22	11	16	50	11	23	100	96	35	13.3	-

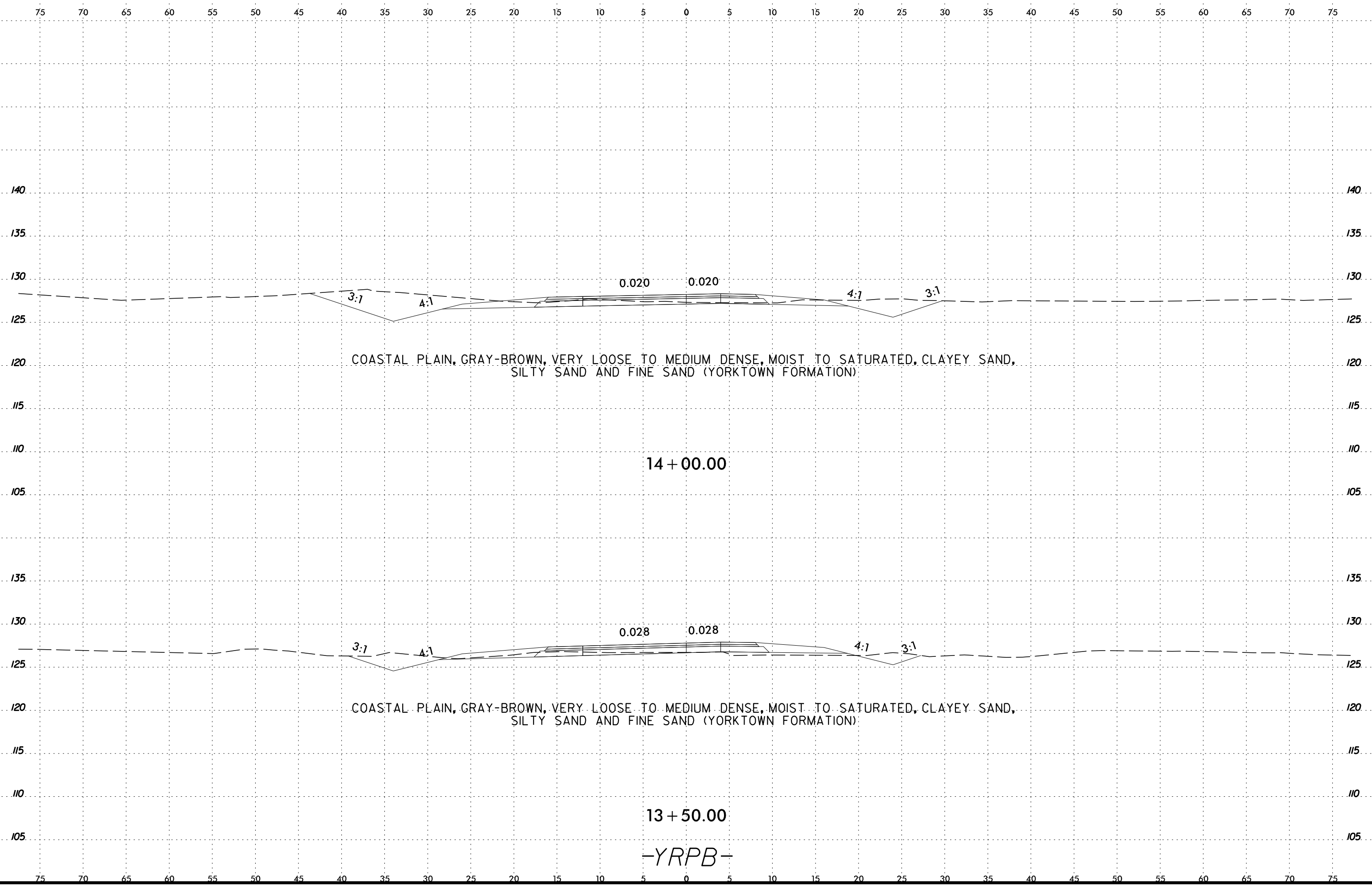
COASTAL PLAIN, GRAY-BROWN, VERY LOOSE TO MEDIUM DENSE, MOIST TO SILTY SAND AND FINE SAND (YORKTOWN FORMATION)

SATURATED, CLAYEY SAND,

12 + 50.00

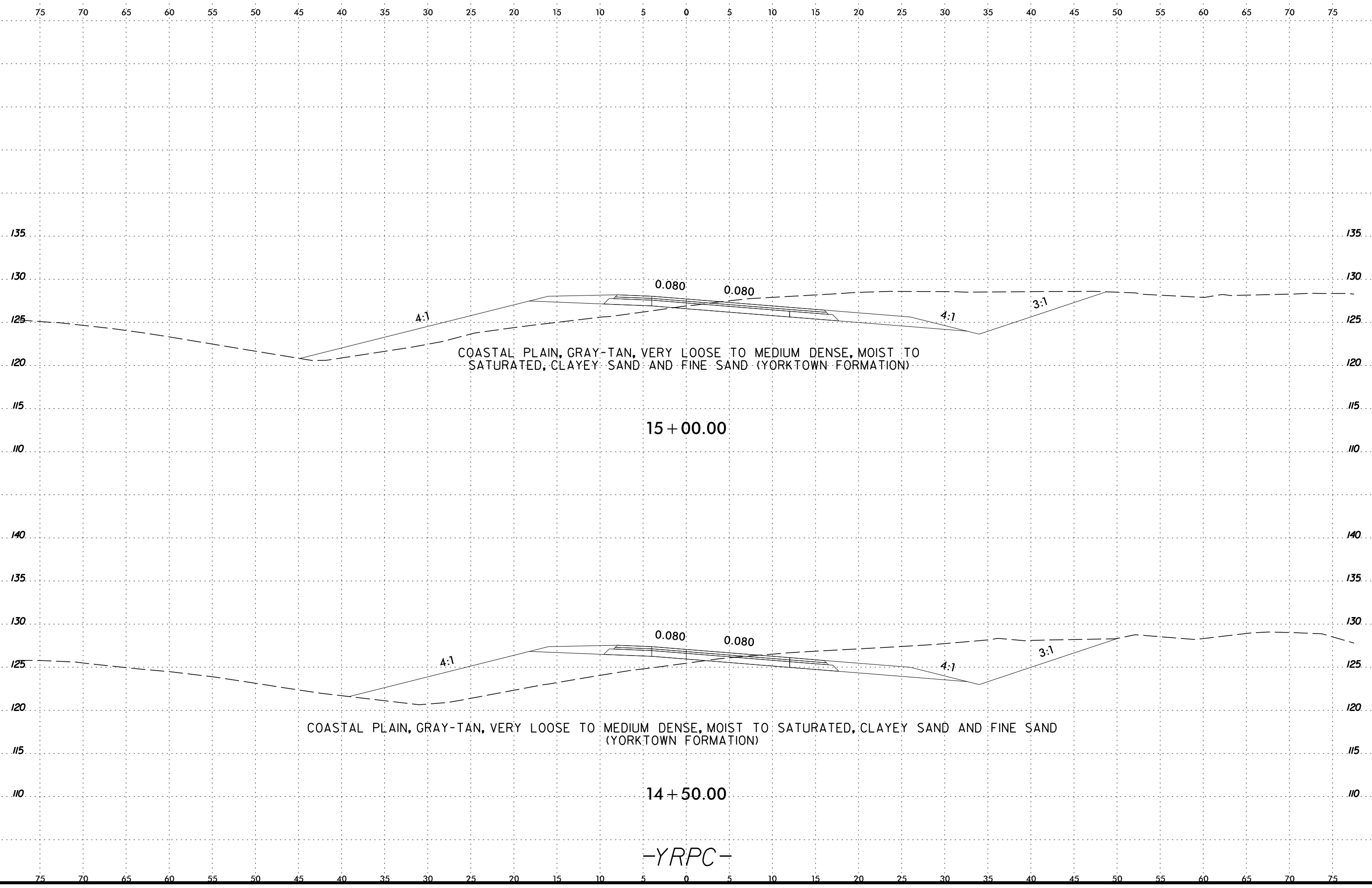
-YRPB-

6/23/16



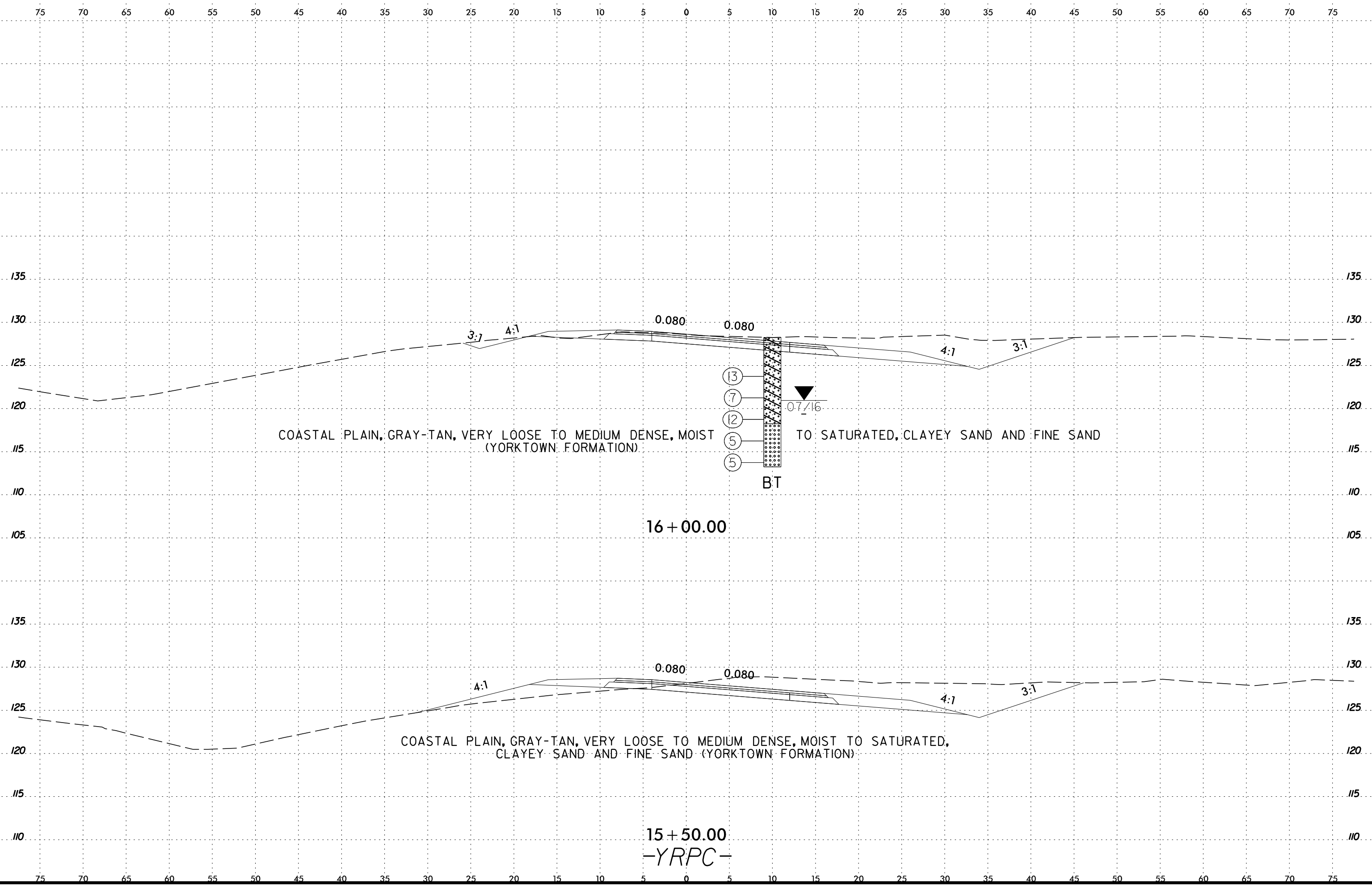
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6/23/16



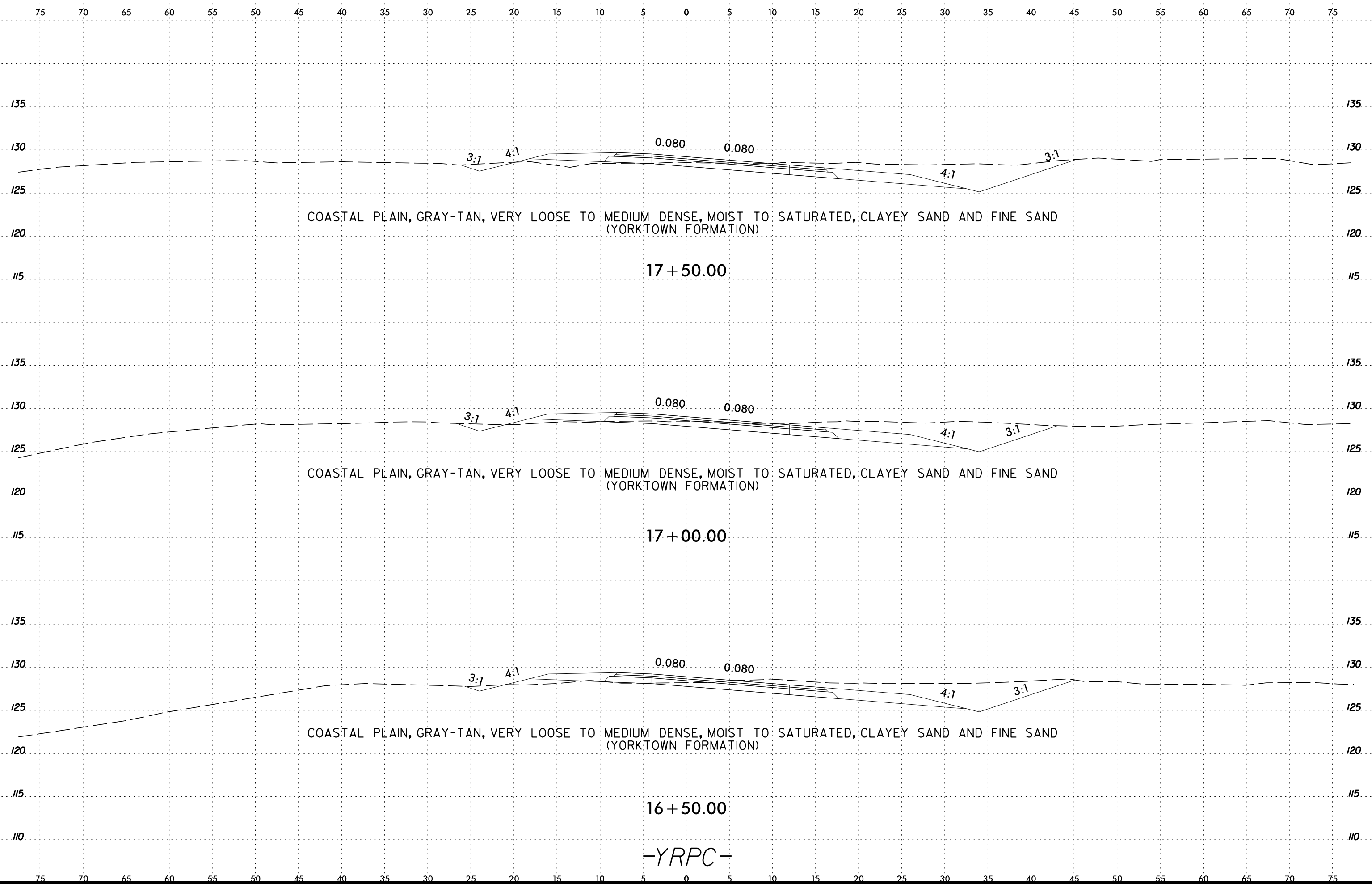
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6/23/16



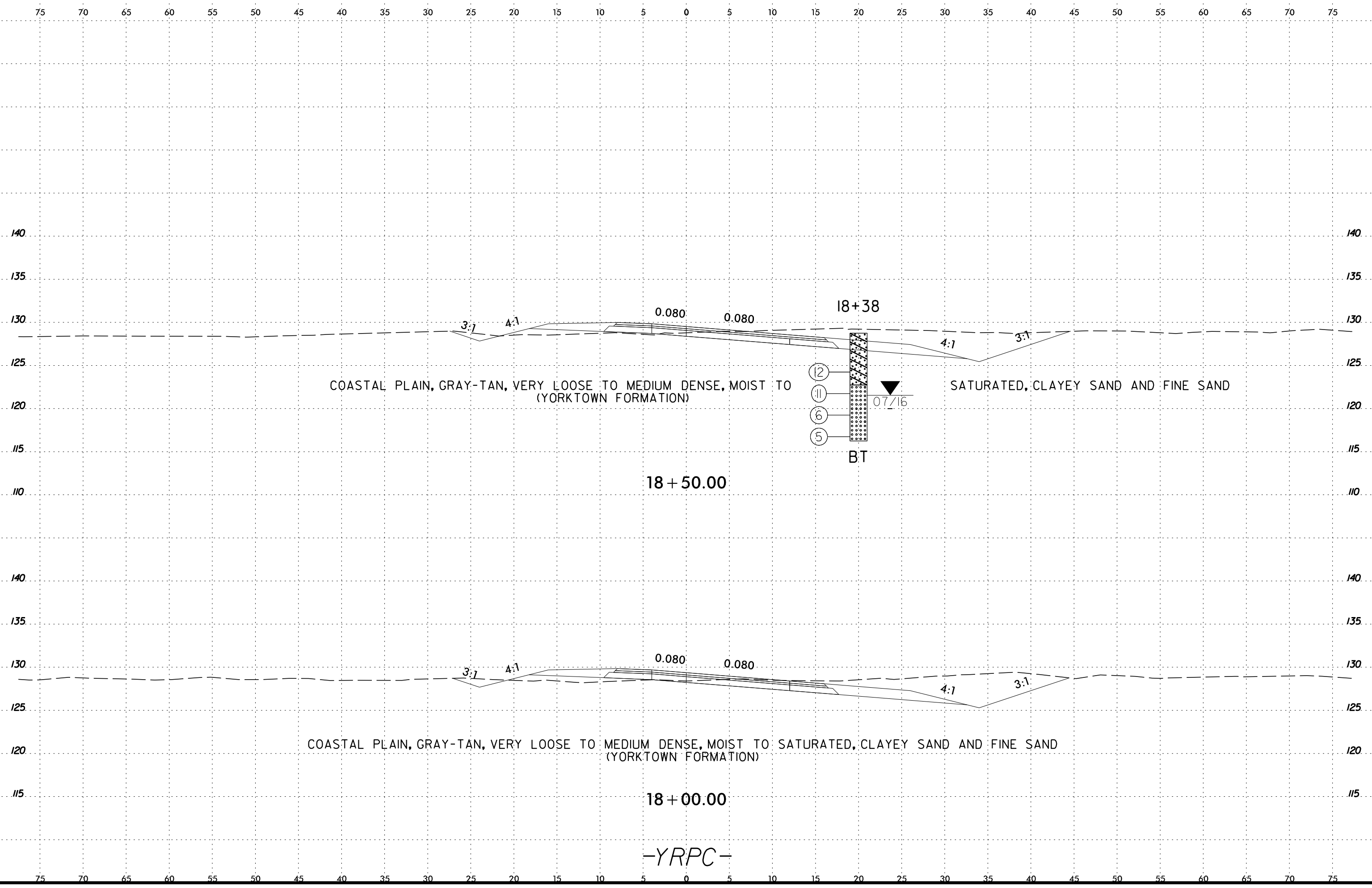
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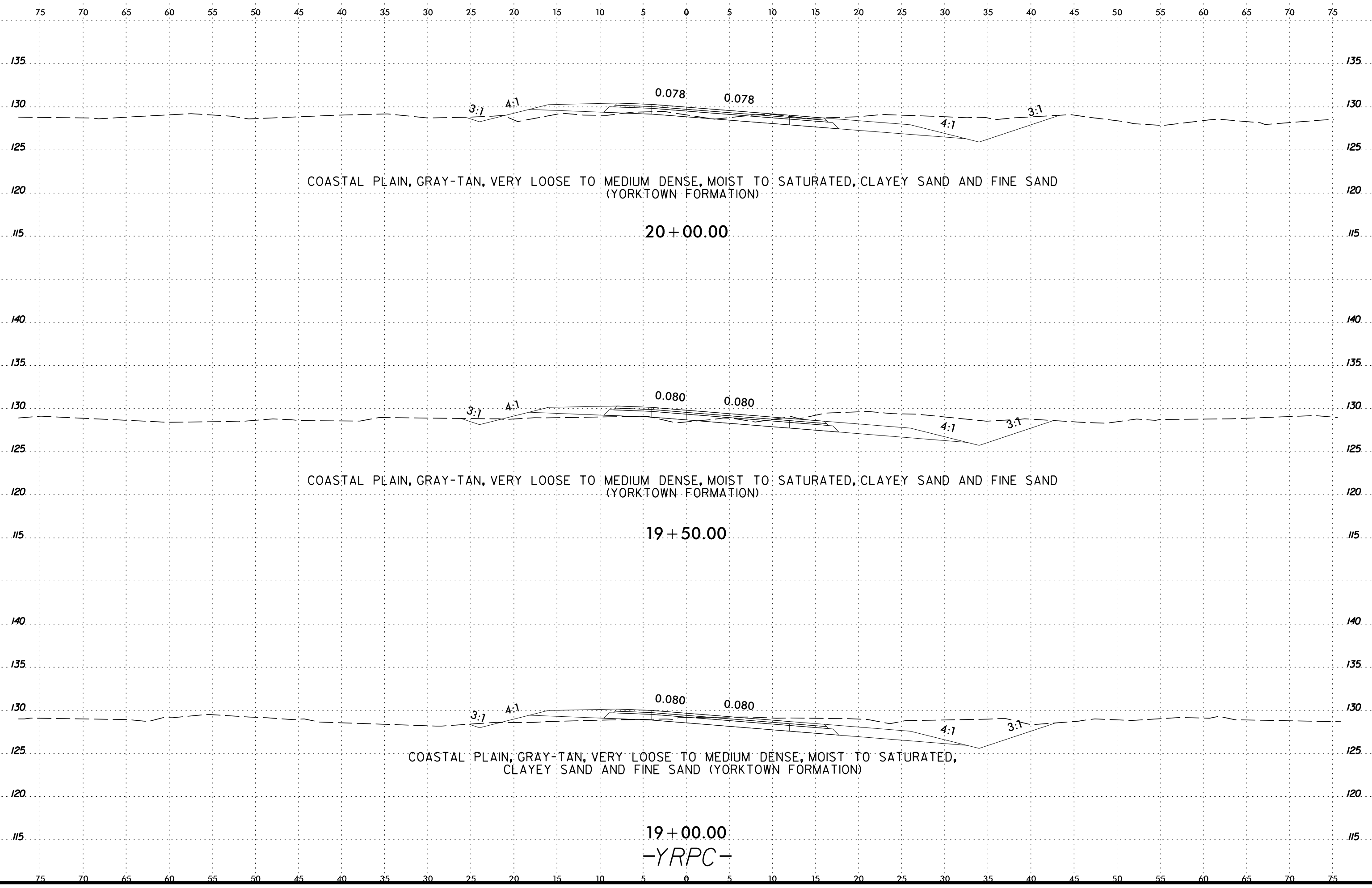
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6/23/16



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6/23/16

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

150 150

145 145

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
MC-10	35' RT	21+00	3.5-5.0	-	-	-	-	-	-	-	-	-	-	21.4	-

135 135

130 130

125 125

120 120

115 115

110 110

140 140

135 135

130 130

125 125

120 120

115 115

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

SOIL TEST RESULTS

COASTAL PLAIN, GRAY-TAN, VERY LOOSE TO MEDIUM DENSE, MOIST TO SATURATED, (YORKTOWN FORMATION)

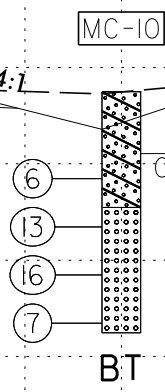
CLAYEY SAND AND FINE SAND

21 + 00.00

COASTAL PLAIN, GRAY-TAN, VERY LOOSE TO MEDIUM DENSE, MOIST TO SATURATED, CLAYEY SAND AND FINE SAND (YORKTOWN FORMATION)

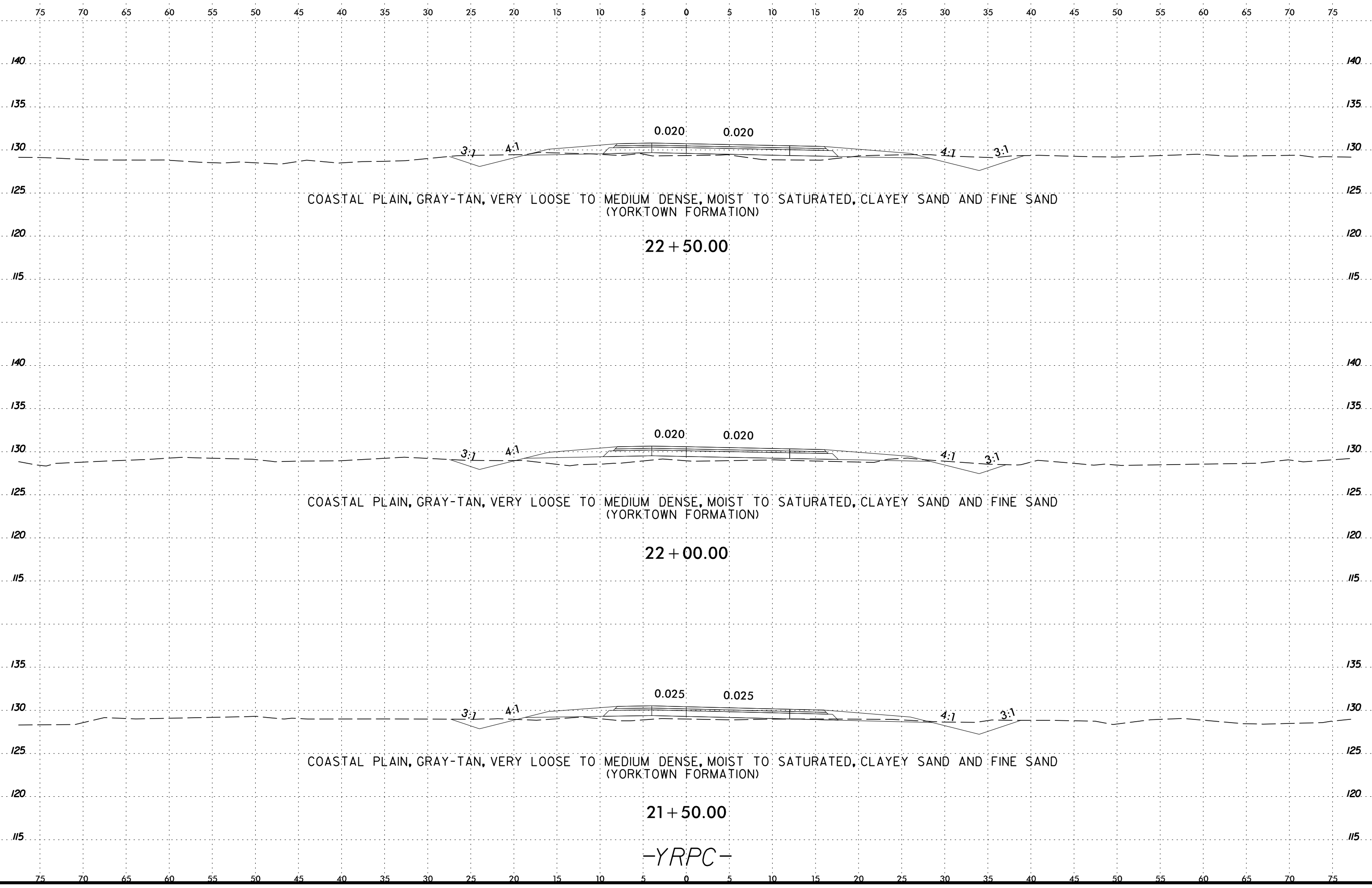
20 + 50.00

-YRPC-



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155 155

150 150

145 145

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-14	10' RT	23+50	3.5-5.0	A-2-6(I)	37	20	18	51	26	5	100	95	31	-	-

140 140

135 135

130 130

125 125

120 120

115 115

110 110

140 140

135 135

130 130

125 125

120 120

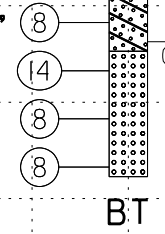
115 115

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COASTAL PLAIN, GRAY-TAN, VERY LOOSE TO MEDIUM DENSE, (YORKTOWN FORMATION)

MOIST TO SATURATED, CLAYEY SAND AND FINE SAND



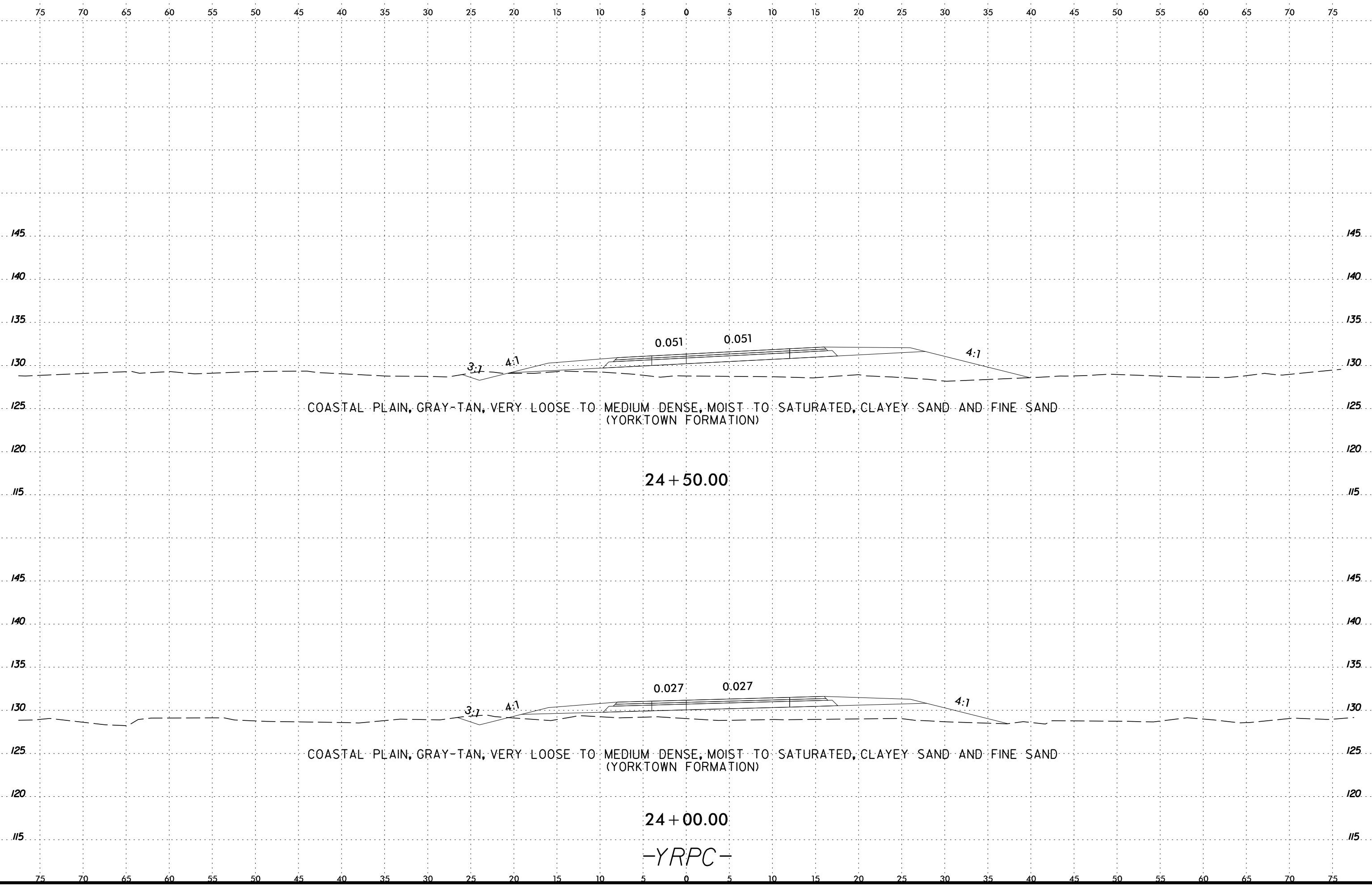
23 + 50.00

COASTAL PLAIN, GRAY-TAN, VERY LOOSE TO MEDIUM DENSE, MOIST TO SATURATED, CLAYEY SAND AND FINE SAND (YORKTOWN FORMATION)

23 + 00.00

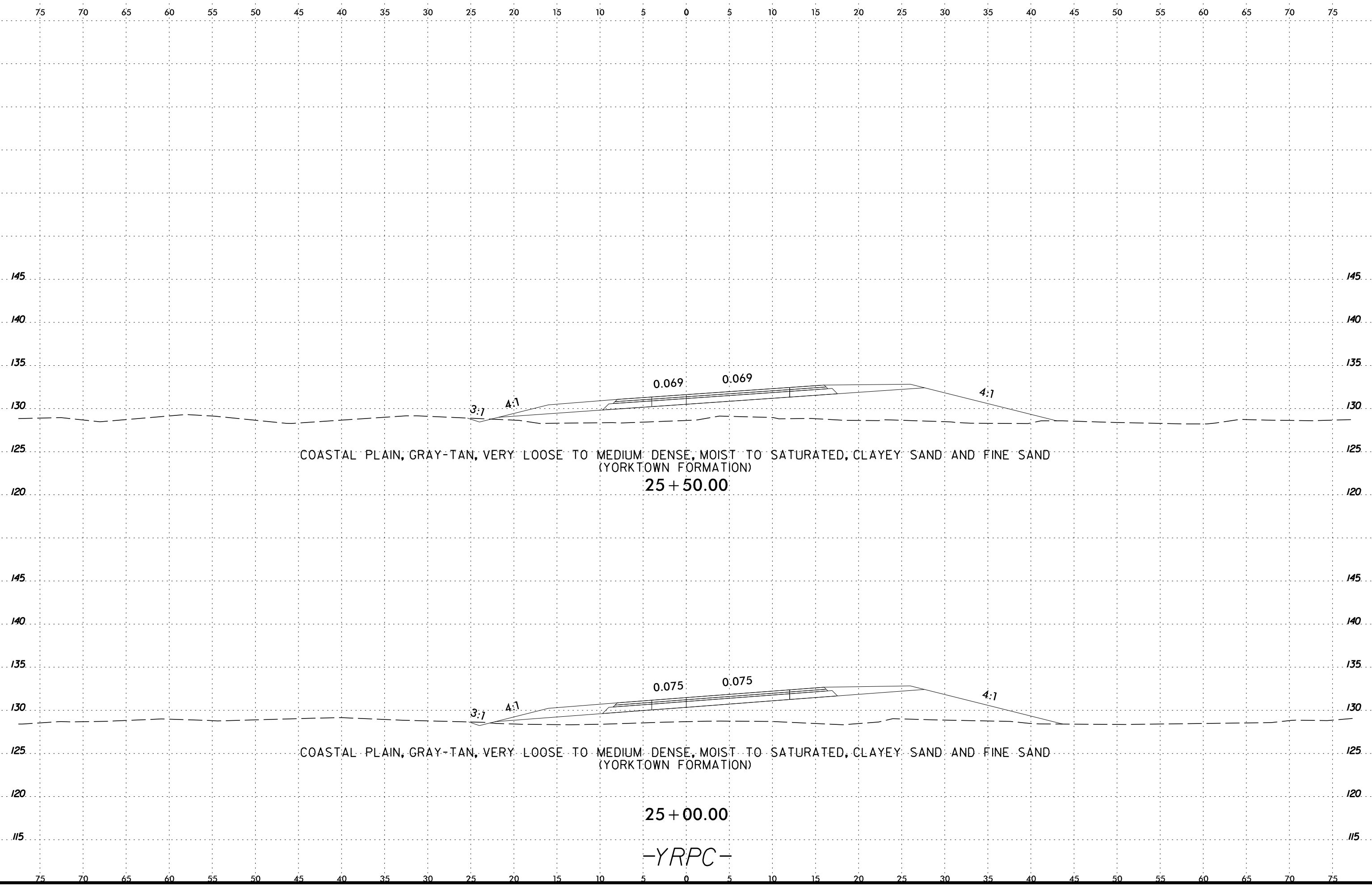
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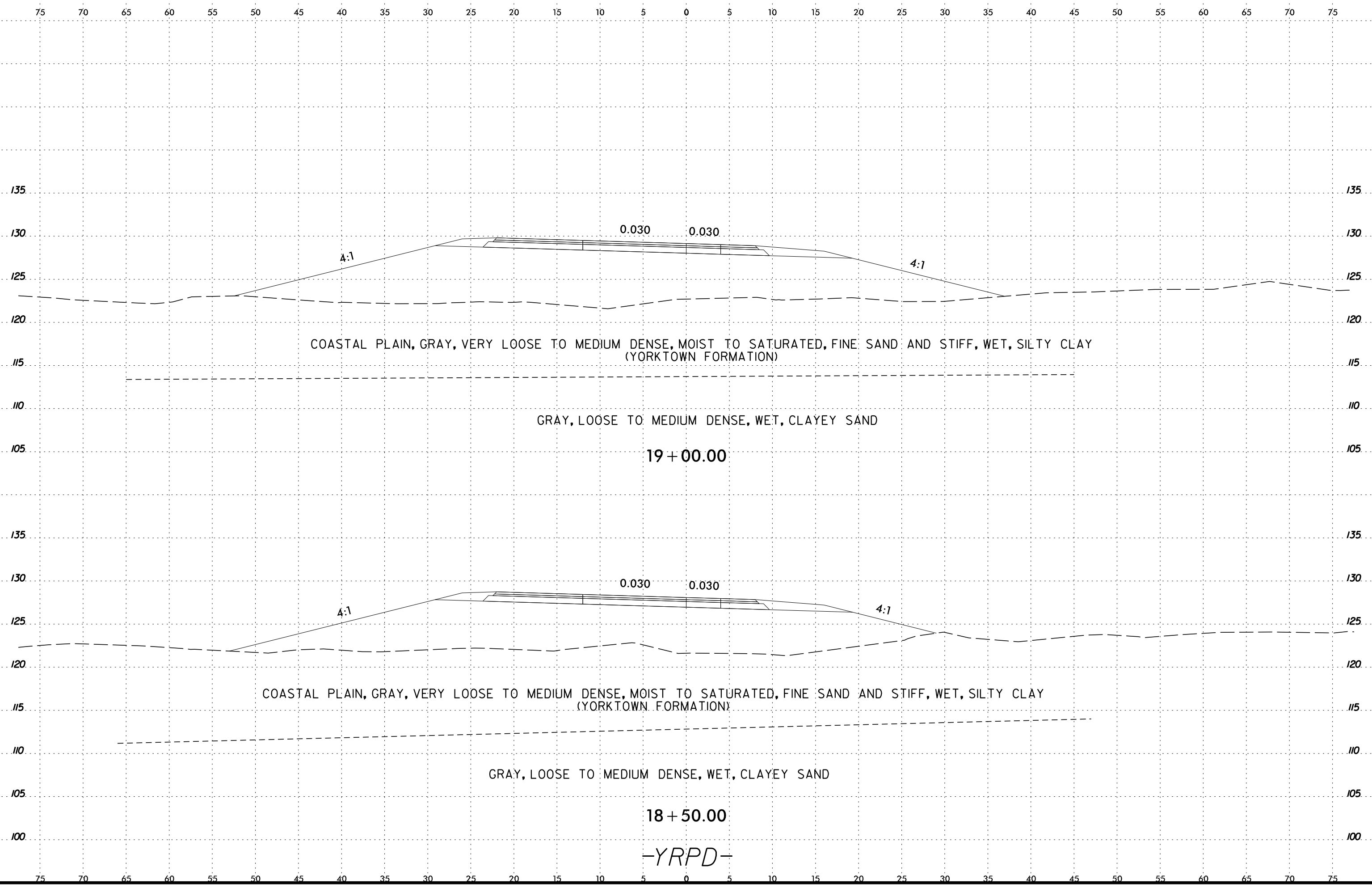
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COASTAL PLAIN, GRAY-TAN, VERY LOOSE TO MEDIUM DENSE, MOIST TO SATURATED, CLAYEY SAND AND FINE SAND
(YORKTOWN FORMATION)
25 + 50.00

COASTAL PLAIN, GRAY-TAN, VERY LOOSE TO MEDIUM DENSE, MOIST TO SATURATED, CLAYEY SAND AND FINE SAND
(YORKTOWN FORMATION)
25 + 00.00

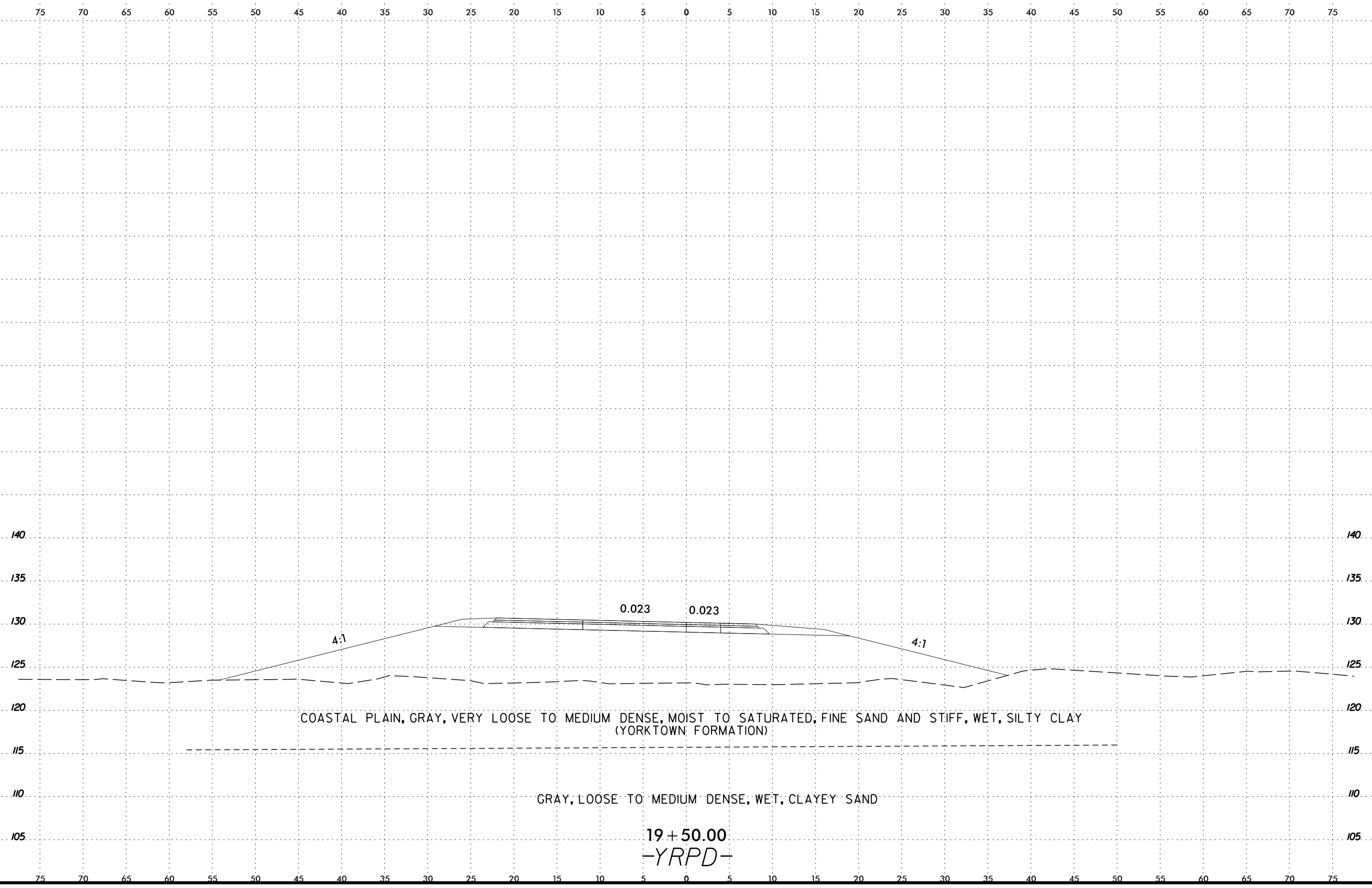
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*NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT*

SUBSURFACE INVESTIGATION

***APPENDIX B
BORELOG***

REFERENCE: R-5752

PROJECT: 53088

GEOTECHNICAL BORING REPORT BORE LOG

WBS 53088.1.FD1	TIP R-5752	COUNTY ROBESON	GEOLOGIST Rohit Warrier
SITE DESCRIPTION Upgrade US74/SR2220 intersection to an interchange and US74/SR2225 intersection to a directional crossover			GROUND WTR (ft)
BORING NO. B-1	STATION 35+32	OFFSET 80 ft LT	ALIGNMENT -L-
COLLAR ELEV. 121.5 ft	TOTAL DEPTH 10.0 ft	NORTHING 275,400	EASTING 1,999,352
DRILL RIG/HAMMER EFF./DATE BRI8284 45 Track 89% 02/26/2016		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER J. ANDERSON	START DATE 07/22/16	COMP. DATE 07/22/16	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)	
125																
120	120.5	1.0	2	4	1	5							M		121.5	GROUND SURFACE
	118.0	3.5	2	1	2	3							M			ALLUVIAL BLACK, SILT
115	115.5	6.0	7	14	11	25							M		115.5	COASTAL PLAIN GRAY, SILTY SAND (YORKTOWN FORMATION)
	113.0	8.5	3	3	6	9							M		113.5	COASTAL PLAIN GRAY, SILTY CLAY
															111.5	Boring Terminated at Elevation 111.5 ft IN COASTAL PLAIN (SILTY CLAY)

NCDOT BORE DOUBLE R5752_GEO_RDWY_BH.GPJ NC_DOT.GDT 1/4/17