

REFERENCE: R-5863

PROJECT: 47516.1

SEE SHEET 3 FOR PLAN SHEET LAYOUT  
AT TIME OF INVESTIGATION

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

ROADWAY  
SUBSURFACE INVESTIGATION

COUNTY CLAY  
PROJECT DESCRIPTION US 64 BUSINESS FROM US 64 TO SR 1307 (MAIN ST)

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	47516.1 R-5863	1	

CAUTION NOTICE

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

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

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

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

PERSONNEL

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INVESTIGATED BY C.D. JOHNSON, P.G.

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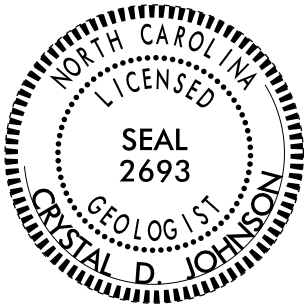
SUBMITTED BY D.C. ELLIOTT, P.G.

DATE

DS  
DCE

DocuSigned by:  
Crystal D. Johnson  
B48DEE97AE58E463  
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

SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, *VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6*

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS ( $\leq 35\%$ PASSING #200)						SILT-CLAY MATERIALS ( $> 35\%$ PASSING #200)						ORGANIC MATERIALS					
GROUP CLASS.	A-1		A-3		A-2		A-4		A-5		A-6		A-7		A-1, A-2		A-4, A-5	
SYMBOL	A-1-a	A-1-b	A-2-4		A-2-5		A-2-6		A-2-7		A-4		A-5		A-6		A-7-5, A-7-6	
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 10 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	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
MATERIAL PASSING #40 LL PI	— 6 MX		— NP		40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER				HIGHLY ORGANIC SOILS	
GROUP INDEX	0		0		0		4 MX		8 MX		12 MX		16 MX		NO MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND		SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS							
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD						FAIR TO POOR						FAIR TO POOR		POOR		UNSUITABLE	

PI OF A-7-5 SUBGROUP IS  $\leq$  LL - 30; PI OF A-7-6 SUBGROUP IS  $>$  LL - 30

GRADATION

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.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LL $<$ 31
MODERATELY COMPRESSIBLE	LL = 31 - 50
HIGHLY COMPRESSIBLE	LL $>$ 50

PERCENTAGE OF MATERIAL

	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME
HIGHLY ORGANIC	$>$ 10%	$>$ 20%	HIGHLY

GROUND WATER

WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING

STATIC WATER LEVEL AFTER 24 HOURS

PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA

SPRING OR SEEP

MISCELLANEOUS SYMBOLS

ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION

SOIL SYMBOL

ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT

INFERRED SOIL BOUNDARY

INFERRED ROCK LINE

ALLUVIAL SOIL BOUNDARY

DIP & DIP DIRECTION OF ROCK STRUCTURES

TEST BORING

AUGER BORING

CORE BORING

MONITORING WELL

PIEZOMETER INSTALLATION

SLOPE INDICATOR INSTALLATION

CONE PENETROMETER TEST

SOUNDING ROD

TEST BORING WITH CORE

SPT N-VALUE

RECOMMENDATION SYMBOLS

UNDERCUT

SHALLOW UNDERCUT

UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE

UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK

UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL

ABBREVIATIONS

AR - AUGER REFUSAL

BT - BORING TERMINATED

CL - CLAY

CPT - CONE PENETRATION TEST

CSE - COARSE

DMT - DILATOMETER TEST

DPT - DYNAMIC PENETRATION TEST

e - VOID RATIO

F - FINE

FOSS. - FOSSILIFEROUS

FRAC. - FRACTURED, FRACTURES

FRAGS. - FRAGMENTS

HL - HIGHLY

MED. - MEDIUM

MICA - MICACEOUS

MOD. - MODERATELY

NP - NON PLASTIC

ORG. - ORGANIC

PMT - PRESSUREMETER TEST

SAP. - SAPROLITIC

SD. - SAND, SANDY

SL. - SILT, SILTY

SLI. - SLIGHTLY

TCR - TRICONE REFUSAL

w - MOISTURE CONTENT

V - VERY

VST - VANE SHEAR TEST

WEA. - WEATHERED

% - UNIT WEIGHT

%g - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS

S - BULK

SS - SPLIT SPOON

ST - SHELBY TUBE

RS - ROCK

RT - RECOMPACTED TRIAXIAL

CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:

☐ CME-45C

☐ CME-55

☒ CME-550

☐ VANE SHEAR TEST

☐ PORTABLE HOIST

☐

☐

ADVANCING TOOLS:

☐ CLAY BITS

☐ 6" CONTINUOUS FLIGHT AUGER

☒ 8" HOLLOW AUGERS

☐ HARD FACED FINGER BITS

☐ TUNG-CARBIDE INSERTS

☐ CASING ☐ W/ ADVANCER

☐ TRICONE \_\_\_\_\_ \* STEEL TEETH

☐ TRICONE \_\_\_\_\_ \* TUNG.-CARB.

☐ CORE BIT

☐

HAMMER TYPE:

☒ AUTOMATIC ☐ MANUAL

CORE SIZE:

☐ -B \_\_\_\_\_

☐ -H \_\_\_\_\_

☐ -N \_\_\_\_\_

HAND TOOLS:

☐ POST HOLE DIGGER

☐ HAND AUGER

☐ SOUNDING ROD

☐ VANE SHEAR TEST

☐

ROCK DESCRIPTION

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:

WEATHERED ROCK (WR)

CRYSTALLINE ROCK (CR)

NON-CRYSTALLINE ROCK (NCR)

COASTAL PLAIN SEDIMENTARY ROCK (CP)

NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES  $>$  100 BLOWS PER FOOT IF TESTED.

FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.

FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.

COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

FRESH

ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.

VERY SLIGHT (V SLI.)

ROCK GENERALLY FRESH, JOINTS STAINED. SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.

SLIGHT (SLI.)

ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.

MODERATE (MOD.)

SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.

MODERATELY SEVERE (MOD. SEV.)

ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *IF TESTED, WOULD YIELD SPT REFUSAL*

SEVERE (SEV.)

ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, WOULD YIELD SPT N VALUES  $>$  100 BPF*

VERY SEVERE (V SEV.)

ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, WOULD YIELD SPT N VALUES  $<$  100 BPF*

COMPLETE

ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

TERMS AND DEFINITIONS

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 DISLOOGED FROM PARENT MATERIAL.

FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.

SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.

SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.

STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.

STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE OPENING (MM)	4	10	40	60	200	270
	4.75	2.00	0.42	0.25	0.075	0.053

	BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F SD.)	SILT (SL.)	CLAY (CL.)
GRAIN SIZE	MM 305 IN. 12	75	2.0	0.25	0.05	0.005	

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)		FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
LL PLASTIC RANGE (PI) PL	LIQUID LIMIT	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
	PLASTIC LIMIT	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
		- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
OM SL	OPTIMUM MOISTURE SHRINKAGE LIMIT	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NON PLASTIC	0-5	VERY LOW
SLIGHTLY PLASTIC	6-15	SLIGHT
MODERATELY PLASTIC	16-25	MEDIUM
HIGHLY PLASTIC	26 OR MORE	HIGH

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FOOT
VERY CLOSE	LESS THAN 0.16 FEET

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 0.16 FEET
THICKLY LAMINATED	0.008 - 0.03 FEET
THINLY LAMINATED	$<$ 0.008 FEET

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

FRIABLE

RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.

MODERATELY INDURATED

GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.

INDURATED

GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.

EXTREMELY INDURATED

SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.

BENCH MARK:

ELEVATION: FEET

NOTES:

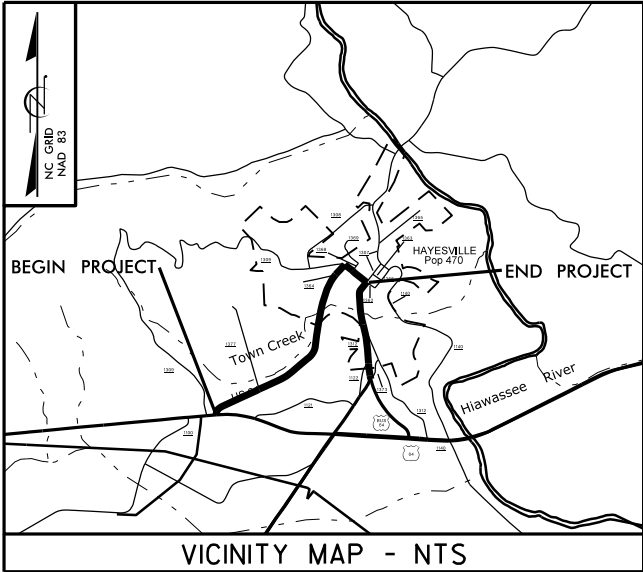
ELEVATION DATA WERE DETERMINED USING .DTM SUPPLIED BY NCDOT LOCATION AND SURVEYS (TIN, TIN) FOUND IN NCDOT SHAREPOINT

DATE: 8-15-14

08/22/13

PROJECT: R-5863

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



RW PLANS

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

CLAY COUNTY

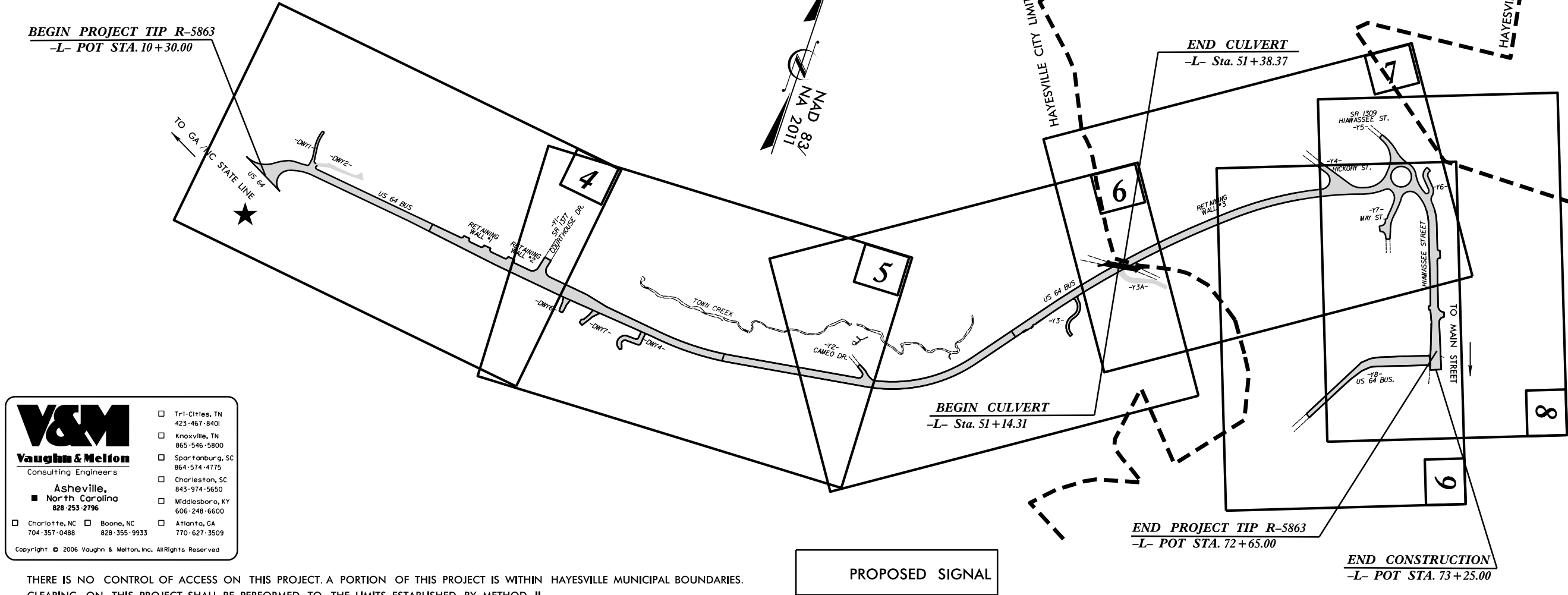
LOCATION: US 64 BUSINESS FROM US 64  
TO SR 1307 (MAIN STREET)

TYPE OF WORK: GRADING, DRAINAGE, PAVING,  
RETAINING WALLS AND CULVERT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5863	3	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
47516.1.1	N/A	PE	
47516.2.1	N/A	RW & UTILITIES	
47516.3.1	N/A	CONST.	

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

BEGIN PROJECT TIP R-5863  
-L- POT STA. 10+30.00



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- Atlanta, GA 770-627-3509

THERE IS NO CONTROL OF ACCESS ON THIS PROJECT. A PORTION OF THIS PROJECT IS WITHIN HAYESVILLE MUNICIPAL BOUNDARIES.  
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II

GRAPHIC SCALES



DESIGN DATA

ADT 2018 = 2400  
ADT 2040 = 2448  
T = 6%  
V = 40 MPH  
\*TTST = 5% DUAL = 1%  
FUNCT. CLASS =  
MAJOR COLLECTOR  
DESIGN SPEED 40 MPH (RURAL)  
DESIGN SPEED 20 MPH (URBAN)  
SUBREGIONAL CLASSIFICATION

PROJECT LENGTH

LENGTH ROADWAY PROJECT R-5863 = 1.176 MI  
LENGTH OF STRUCTURE PROJECT R-5863 = 0.005 MI  
TOTAL LENGTH OF PROJECT R-5863 = 1.181 MI

NCDOT CONTACT: JOSHUA DEYTON, PE  
DIVISION 14

PROPOSED SIGNAL

Prepared In the Office of:  
**VAUGHN & MELTON**

1318-F PATTON AVE.  
ASHEVILLE NC, 28806  
FOR THE NORTH CAROLINA DIVISION OF HIGHWAYS

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:  
MAY 16, 2019

LETTING DATE:  
SEPTEMBER 17, 2024

BRETT ABERNATHY, PE, PLS  
PROJECT ENGINEER

JOHN LANSFORD, PE  
PROJECT DESIGN ENGINEER

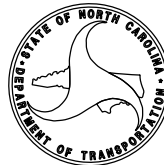
HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN  
ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA



CONTRACT:

V&M PROJECT #31333-01  
TRANSPORTATION\31333-01\RD\PROJECT\BUNC222TISH.DGN



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

ROY COOPER  
GOVERNOR

J. ERIC BOYETTE  
SECRETARY

September 19, 2023

STATE PROJECT: 47516.1.1 (R-5863)  
FEDERAL PROJECT: N/A  
COUNTY: CLAY  
DESCRIPTION: US-64 Business from US-64 to SR-1307 (Main St.)

SUBJECT: Geotechnical Report – Roadway Inventory

The Geotechnical Engineering Unit (GEU) has completed a reconnaissance and subsurface investigation for the above roadway project and presents the following roadway inventory. Plans and cross-sections are included in this report.

**Project Description**

The project corridor is located in Clay County along US-64 Business from US-64 to SR-1307 (Main St.) in downtown Hayesville, NC. Minor widening, grading, drainage, paving, retaining walls, and culvert are proposed for this site. The mainline (-L-) starts at the southeast end of the project at the US-64 intersection and continues for approximately 1.18 miles to the northeast. The culvert and retaining wall investigations were not performed by the GEU, and as such, those subsurface findings are not available in this report. They are available under separate covers on the NCDOT R-5863 CONNECT/SHAREPOINT site.

The geotechnical field investigation was conducted by GEU during the period of July 2023. One drill crew was used to drill and sample all the borings, and a GEU staff field Geologist was used to log all the borings in this report. GEU used a CME-550X drill rig equipped with an automatic hammer and hollow-stem augers to drill borings. Standard Penetration Tests were performed at all borehole locations along the project. Two representative soil samples were collected in the field and submitted for laboratory analysis by the NCDOT Asheville Regional M&T soils lab.

The -L- alignment, totaling 1.18 miles, was investigated. Subsurface cross-sections of this alignment are included in this report.

<u>Line</u>	<u>Station</u>
-L-	10+30 to 73+25

**Physiography and Geology**

The project is within the Blue Ridge Mountain physiographic province of Western North Carolina near the North Carolina/Georgia state line in Hayesville, NC. A mixture of rural, single-family homes, pasture/farmland, wooded areas and some development lies within the project corridor. The topography along the corridor consists of gentle to steeply rolling hills. Elevations range from 1830± to 1940± feet above sea level.

Geologically, the project area is located within the Great Smokey Group and Ocoee Supergroup, bounded by the Dean Formation to the northwest and the Wehuttu Formation to the southeast. This area is characterized by metasandstones, metagraywackes and metasiltstones with minor amounts of mica schist and calcsilicate rock.

**Soil and Rock Properties**

Soils encountered during this investigation have been divided into three categories based on origin: roadway embankment, residual soils and residual soils containing saprolitic structure.

Roadway embankment soils were encountered near station 47+00 where the existing ground was manipulated into a ~2:1 slope and in the proposed roundabout near the end of the project located in the existing right-of-way. Residual soils are derived from the weathering of the underlying metamorphic bedrock. Residual soils exhibiting relic structure of the bedrock they were derived from are considered saprolitic and are slightly stiffer than residual soils with no (relic) structure. Saprolitic soils in this project often contained fragments of weathered rock and/or weathered rock seams. Residual soils and stiffer saprolitic soils were encountered in all other areas of the project.

Weathered rock and crystalline rock encountered on this project were identified by SPT sampling, auger/SPT refusal. The depth to crystalline rock, where encountered in the borings, ranged from 8.1 to 18.1 feet and the elevation for the top of crystalline rock ranged from approximately 1842 feet to 1889 feet. Crystalline rock and weathered rock found at these sites were Metagraywackes. Weathered rock (WR) and crystalline rock (CR) were noted at the following stations:

<u>Line</u>	<u>Station</u>	<u>Type</u>	<u>Depth</u>
-L-	21+61 58' RT	WR	24.7'
-L-	27+54 42' RT	WR/CR	8.1' - 10.7'
-L-	35+00 37' RT	WR seams	13.9' - 15.3'
-L-	48+00 61' RT	WR/CR	16.5' - 18.1'

**Soil Samples**

Two soil samples were taken at Sta 30+60 and Sta 64+29. Both samples were determined to be sandy-silt (A-4) and Non-Plastic with an acceptable Liquid Limit. No other soil samples were taken by the GEU. All soils within the project corridor were determined to be predominantly (A-4) sandy-silts and (A-2-4, A-2-5) silty-sands with some trace occurrences of low-plasticity (A-6 to A-7) sandy-to-silty clays, all with a trace-to-a little of Mica. These findings were further substantiated by GEU review of the aforementioned culvert and

retaining wall investigations by others & the available lab-tests. A preponderance of all samples had some traces of manganese oxide seams.

**Groundwater**

Groundwater was encountered in only one boring (B-10) at 9 feet; all other borings were dry at the 24-hr measurement. Groundwater is not expected to cause any significant impact on construction.

Prepared By,

DocuSigned by:

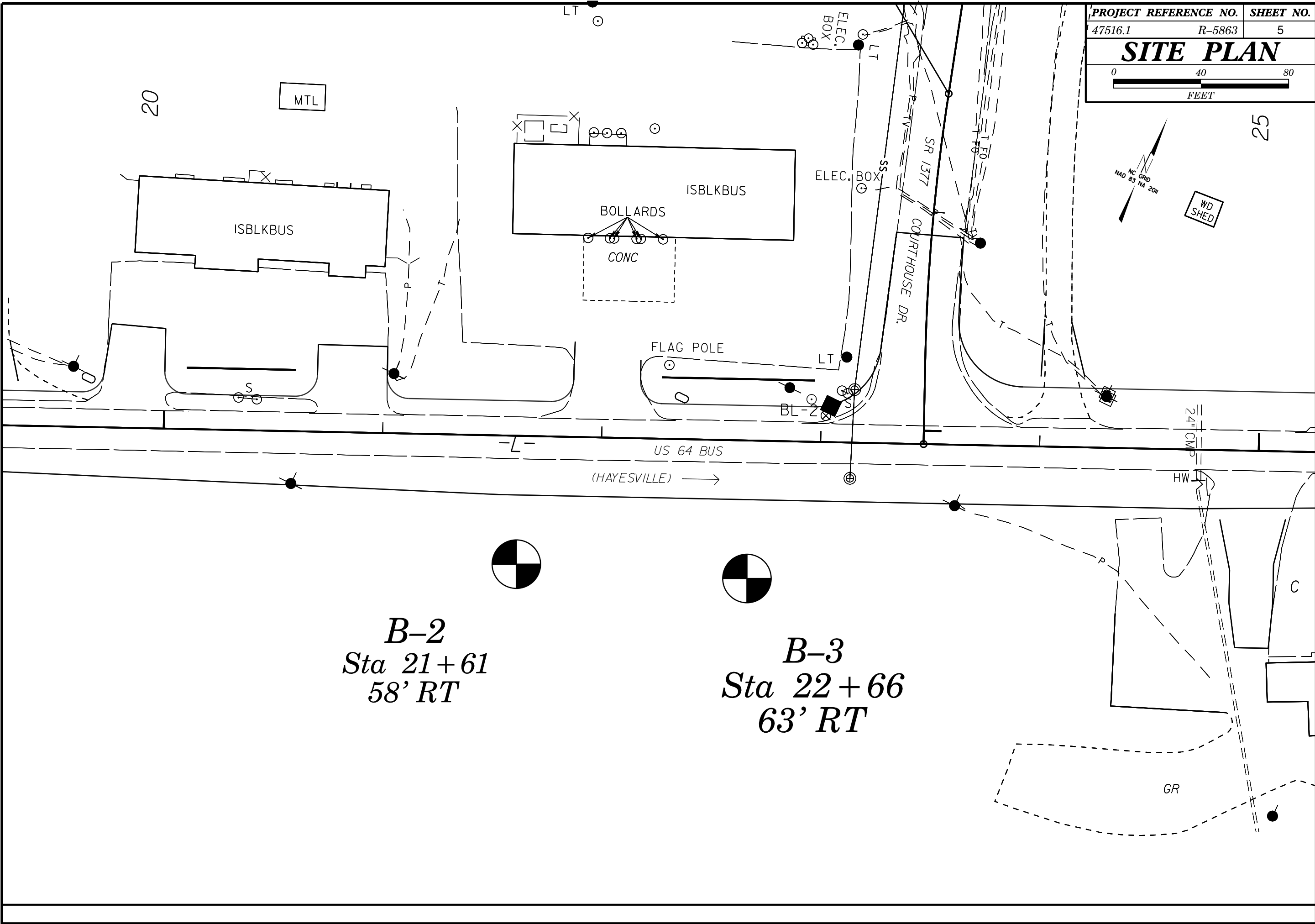
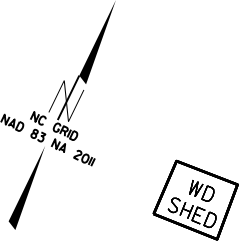
*Crystal D. Johnson*

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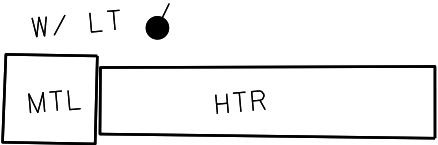
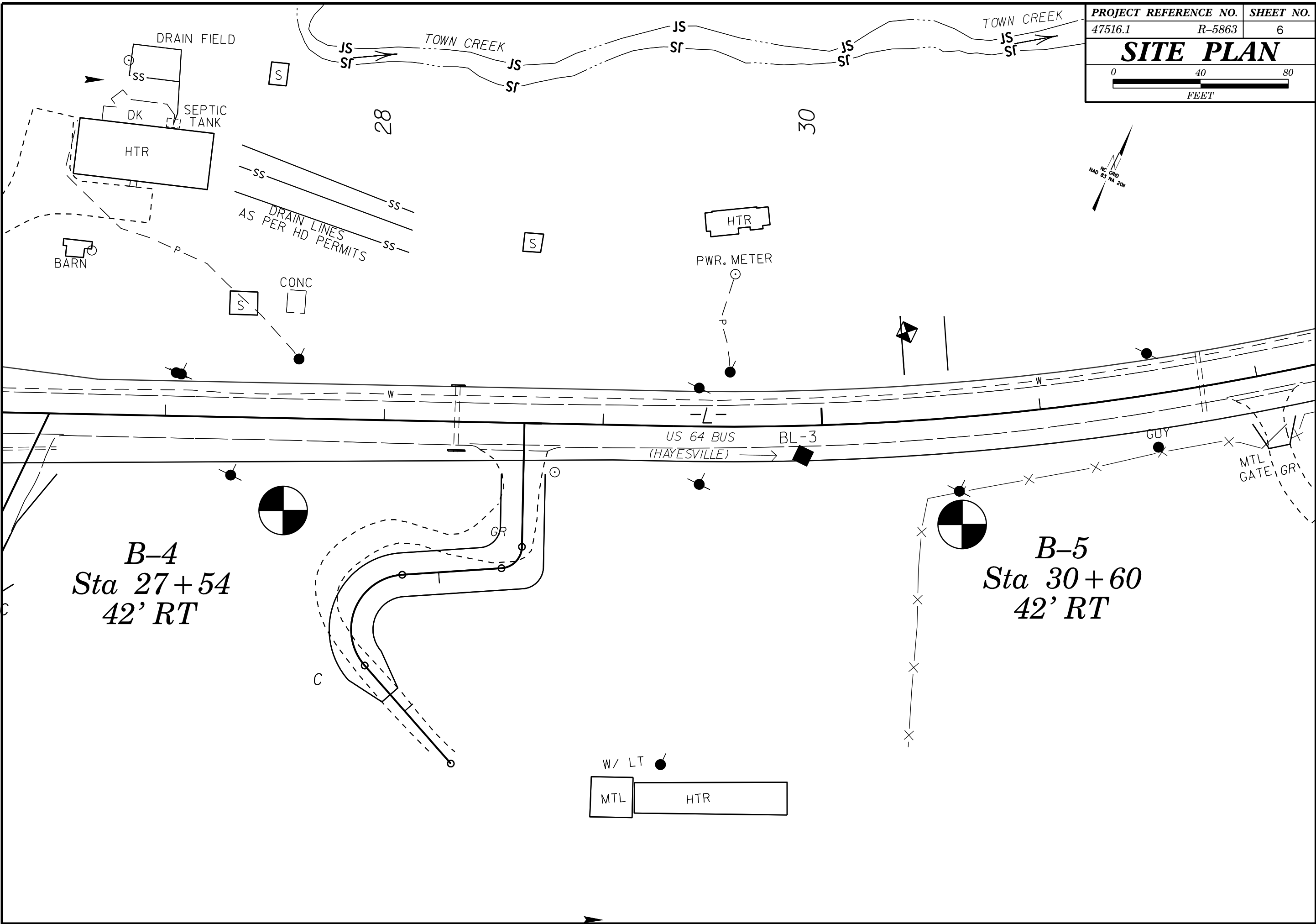
Crystal D. Johnson, P.G.  
Project Geological Engineer



PROJECT REFERENCE NO.	SHEET NO.	
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<b>SITE PLAN</b>		
0 40 80 FEET		

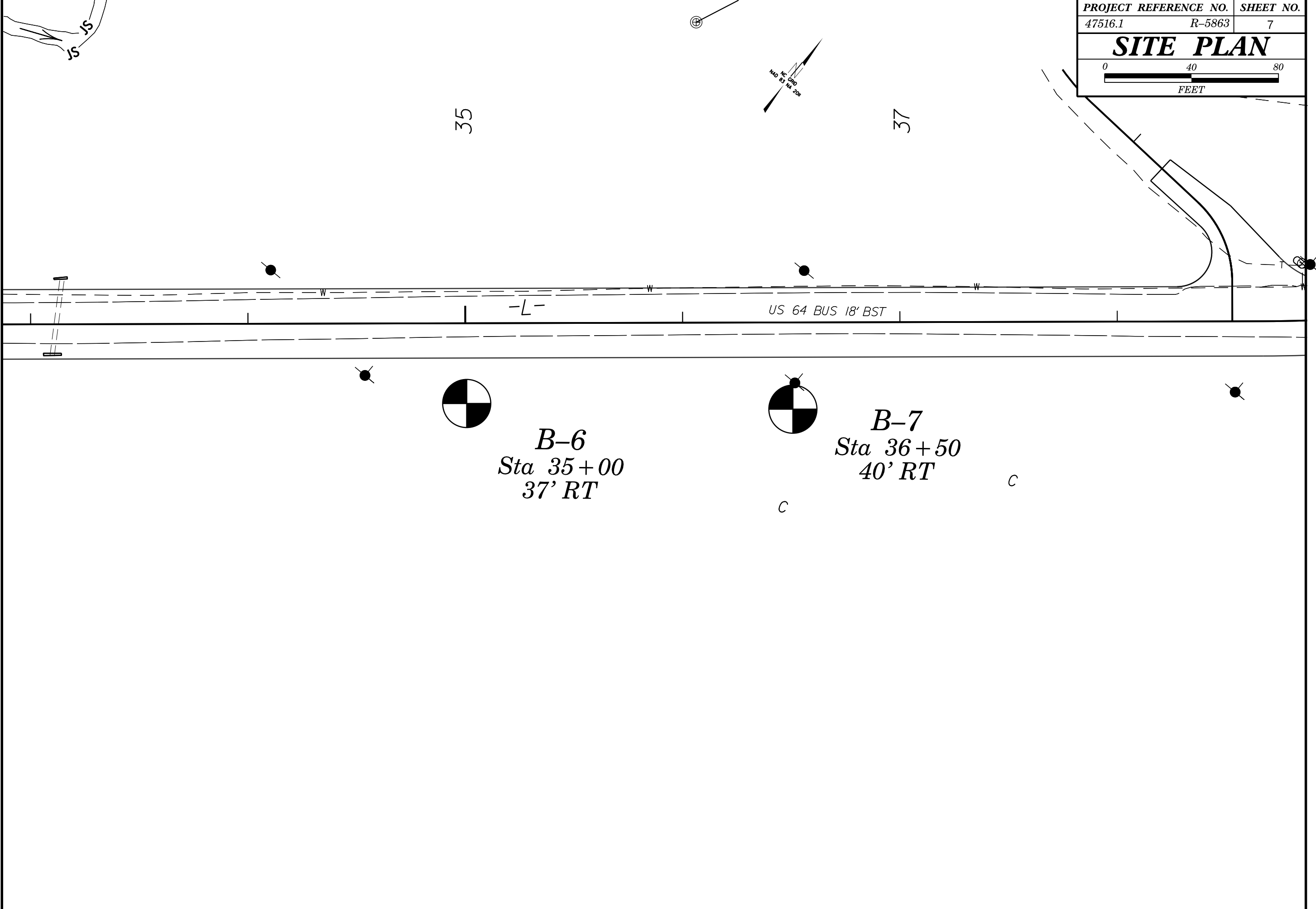


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47516.1	R-5863
6	
<b>SITE PLAN</b>	
0 40 80 FEET	

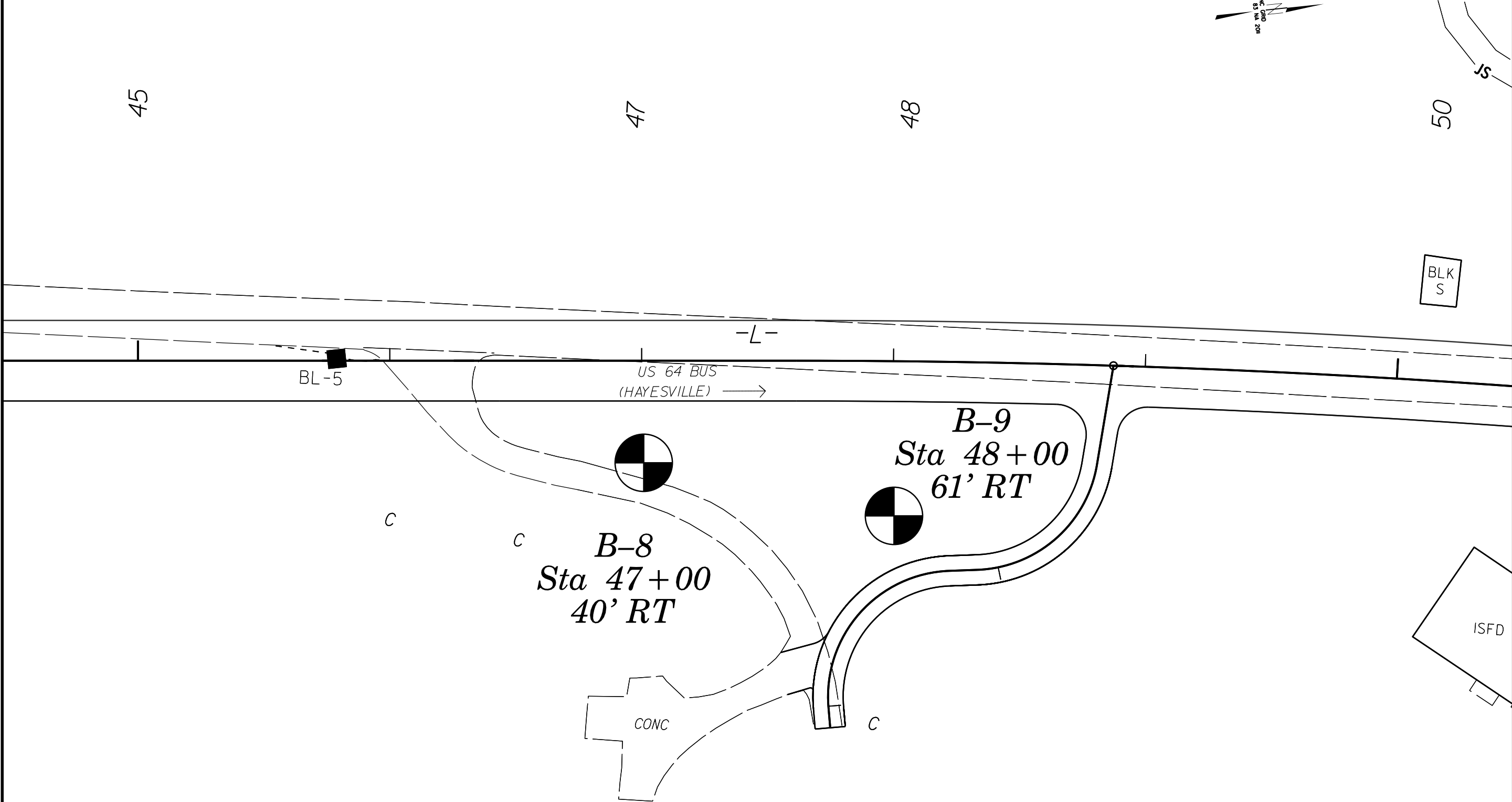




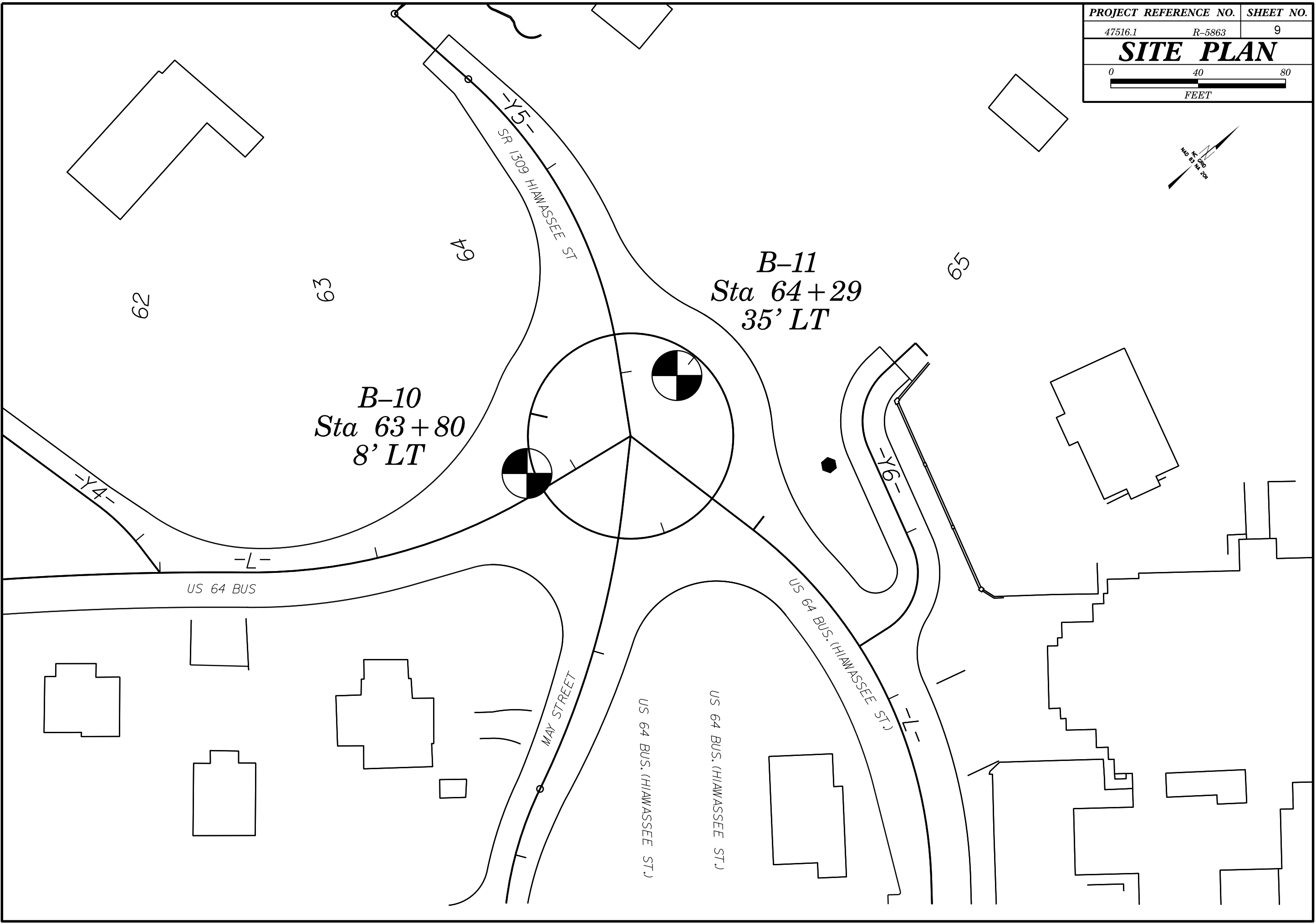
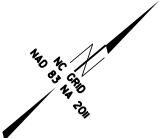
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47516.1	7
R-5863	
SITE PLAN	
0 40 80 FEET	



PROJECT REFERENCE NO.	SHEET NO.
47516.1	8
SITE PLAN	
<div><div>04080</div><div>FEET</div></div>	



PROJECT REFERENCE NO.	SHEET NO.
47516.1	R-5863
9	
SITE PLAN	
0 40 80	
FEET	

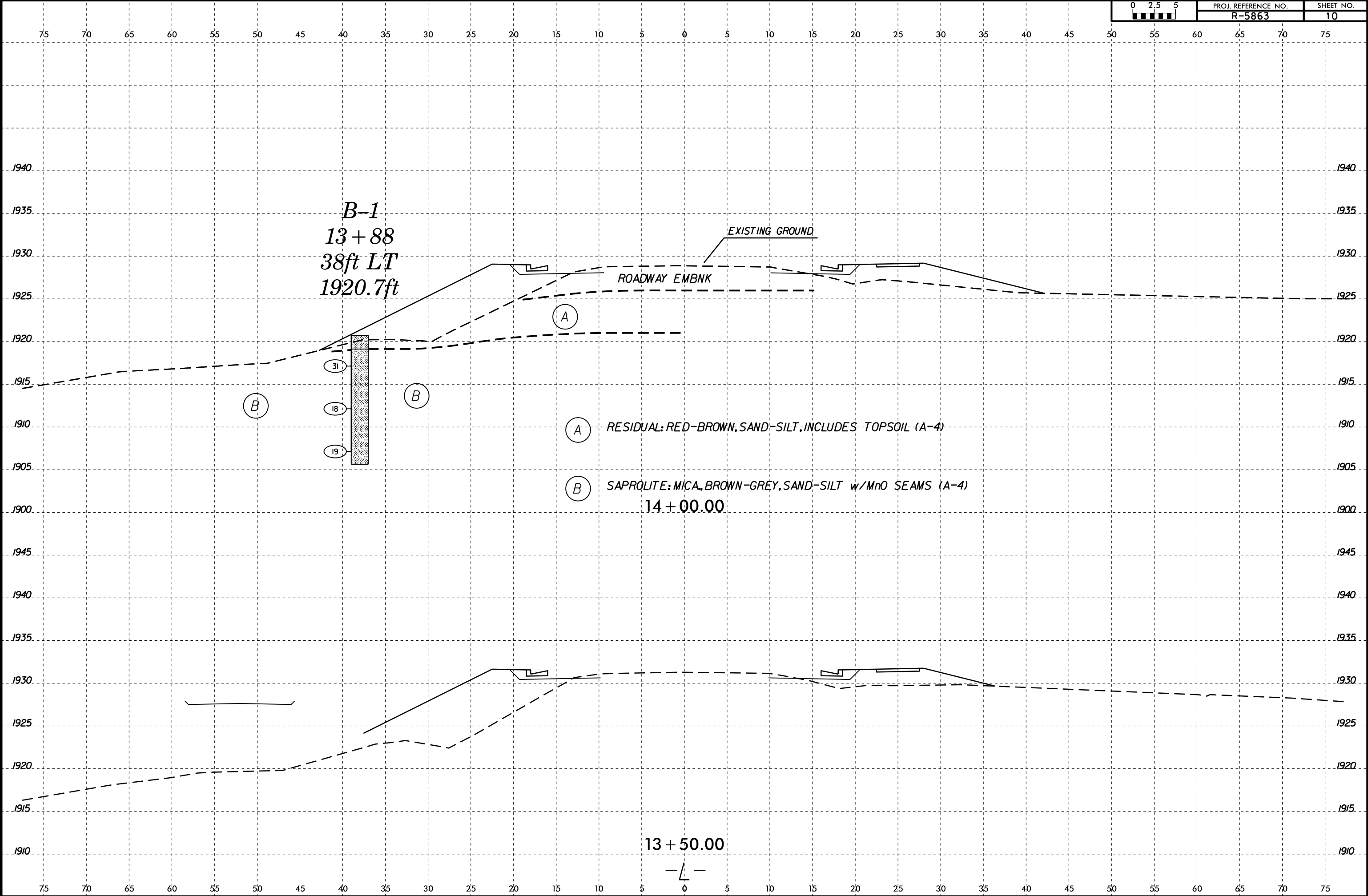


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PROJ. REFERENCE NO.  
R-5863

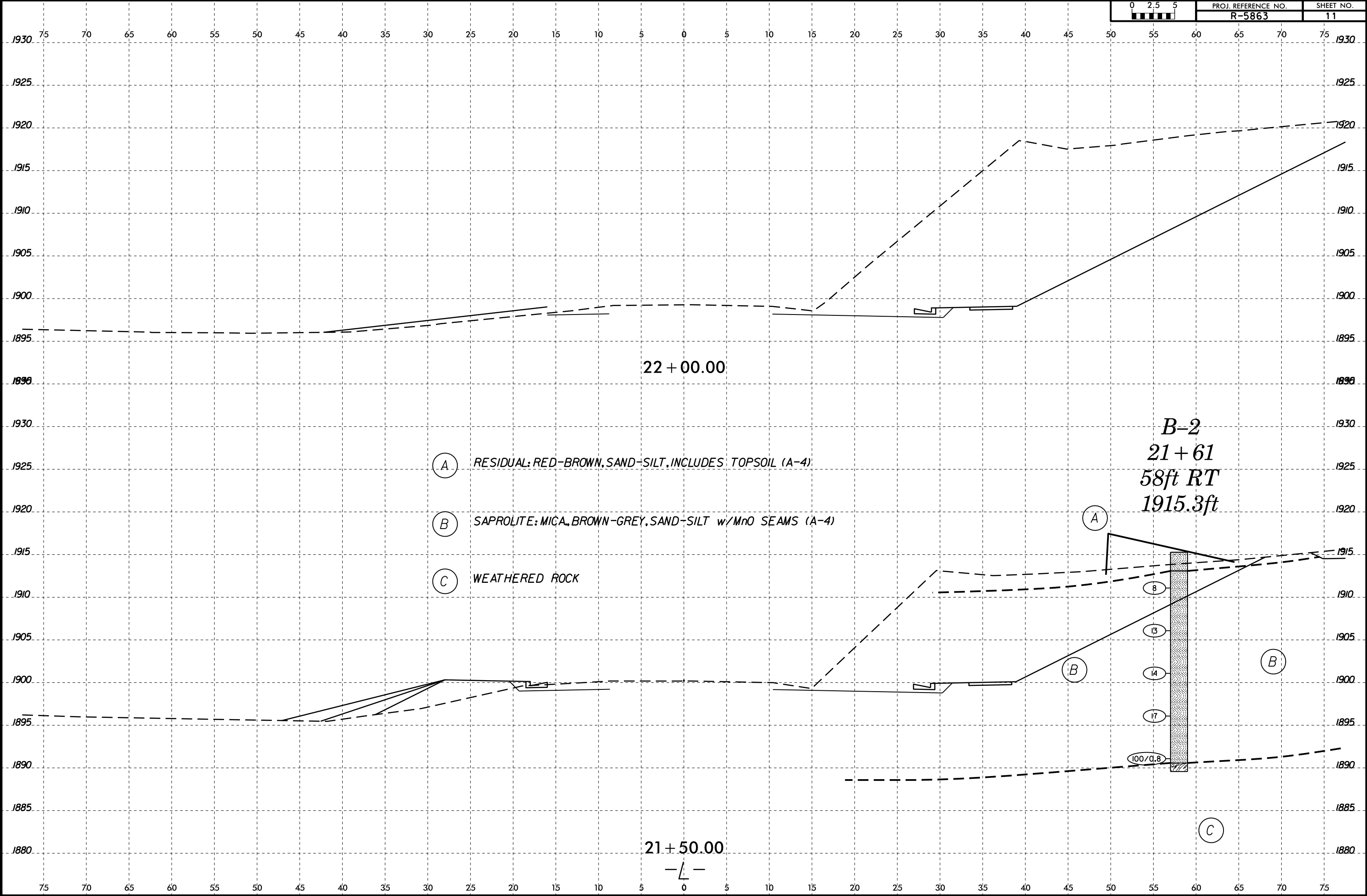
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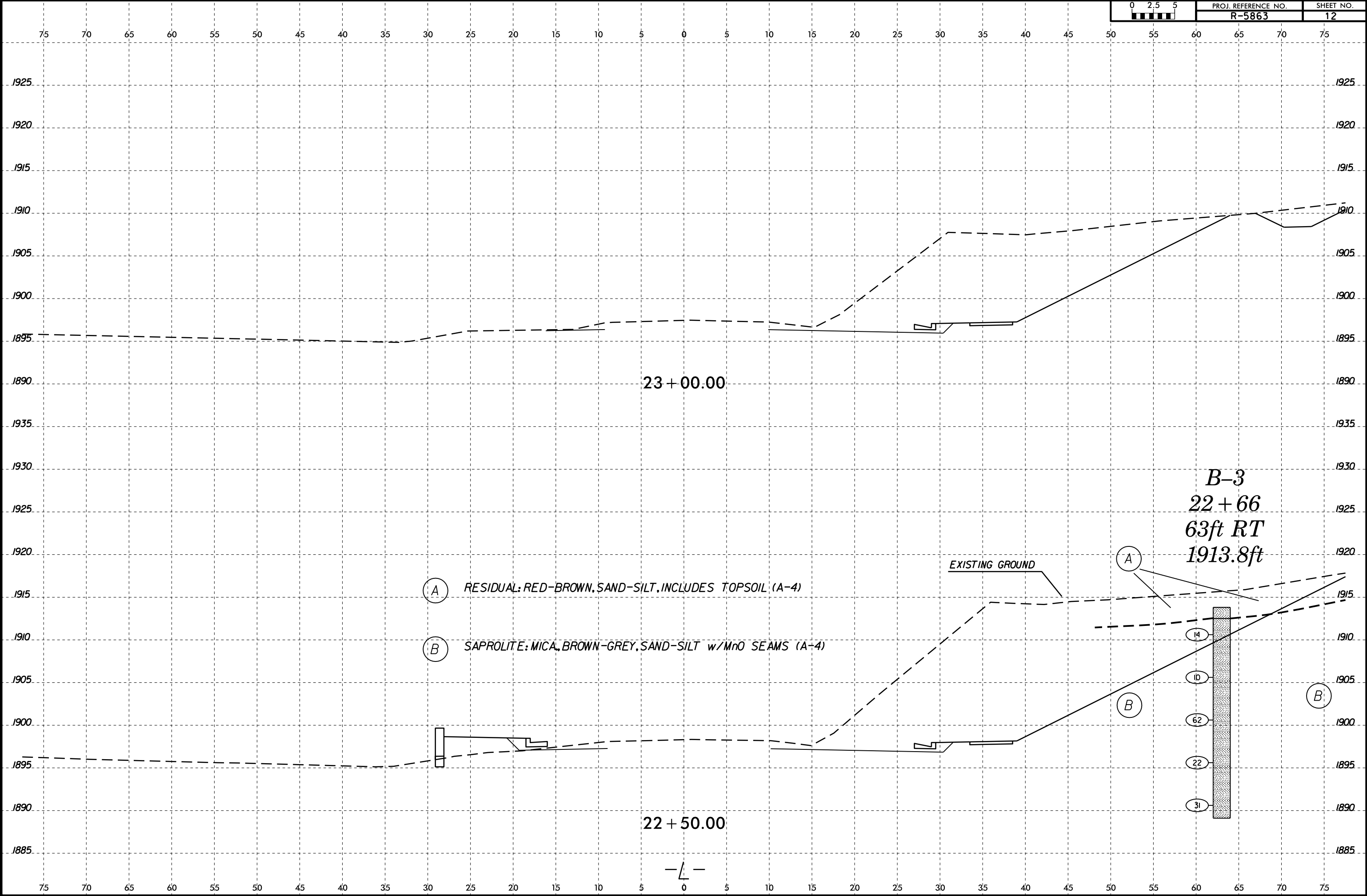


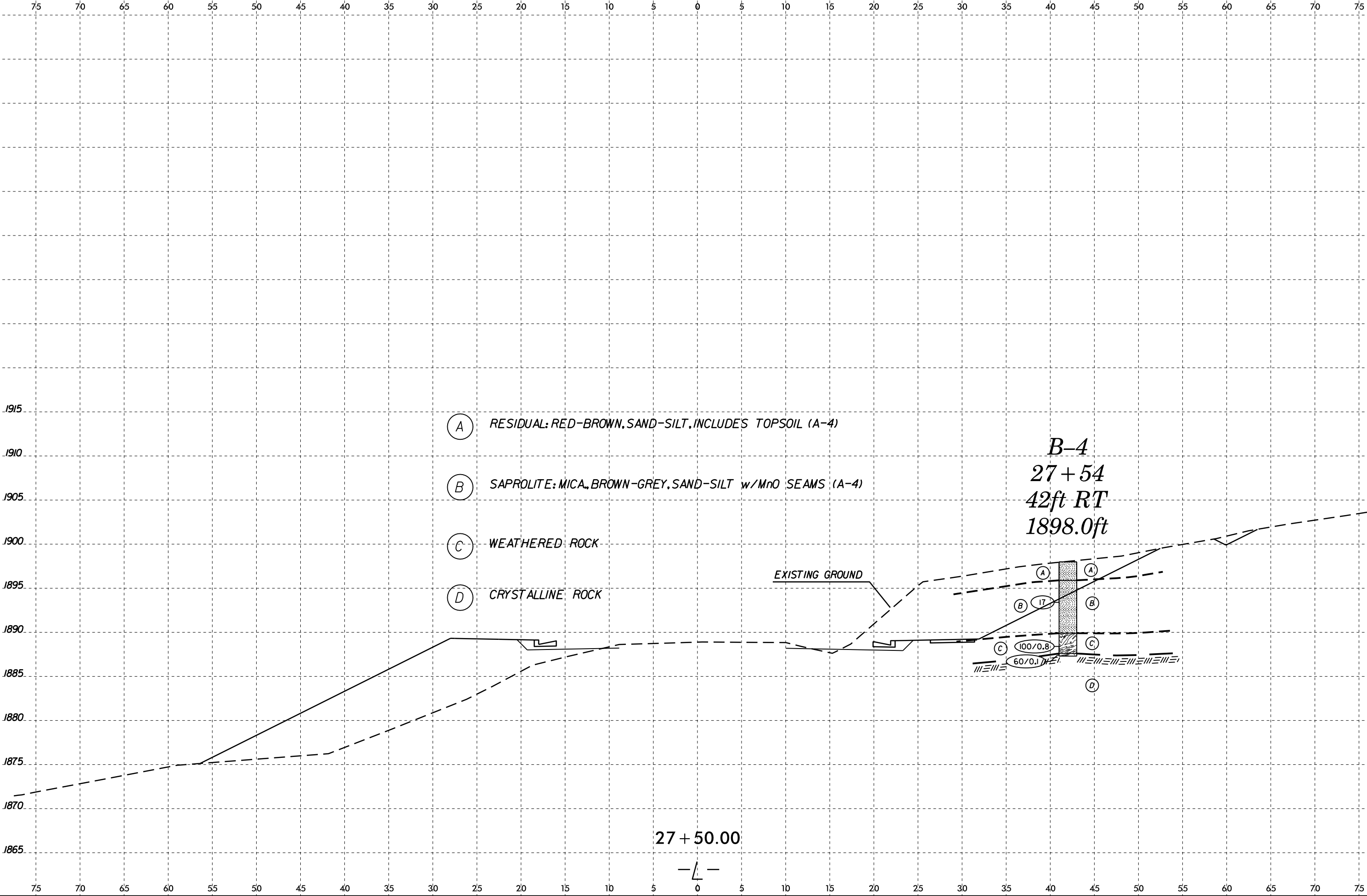
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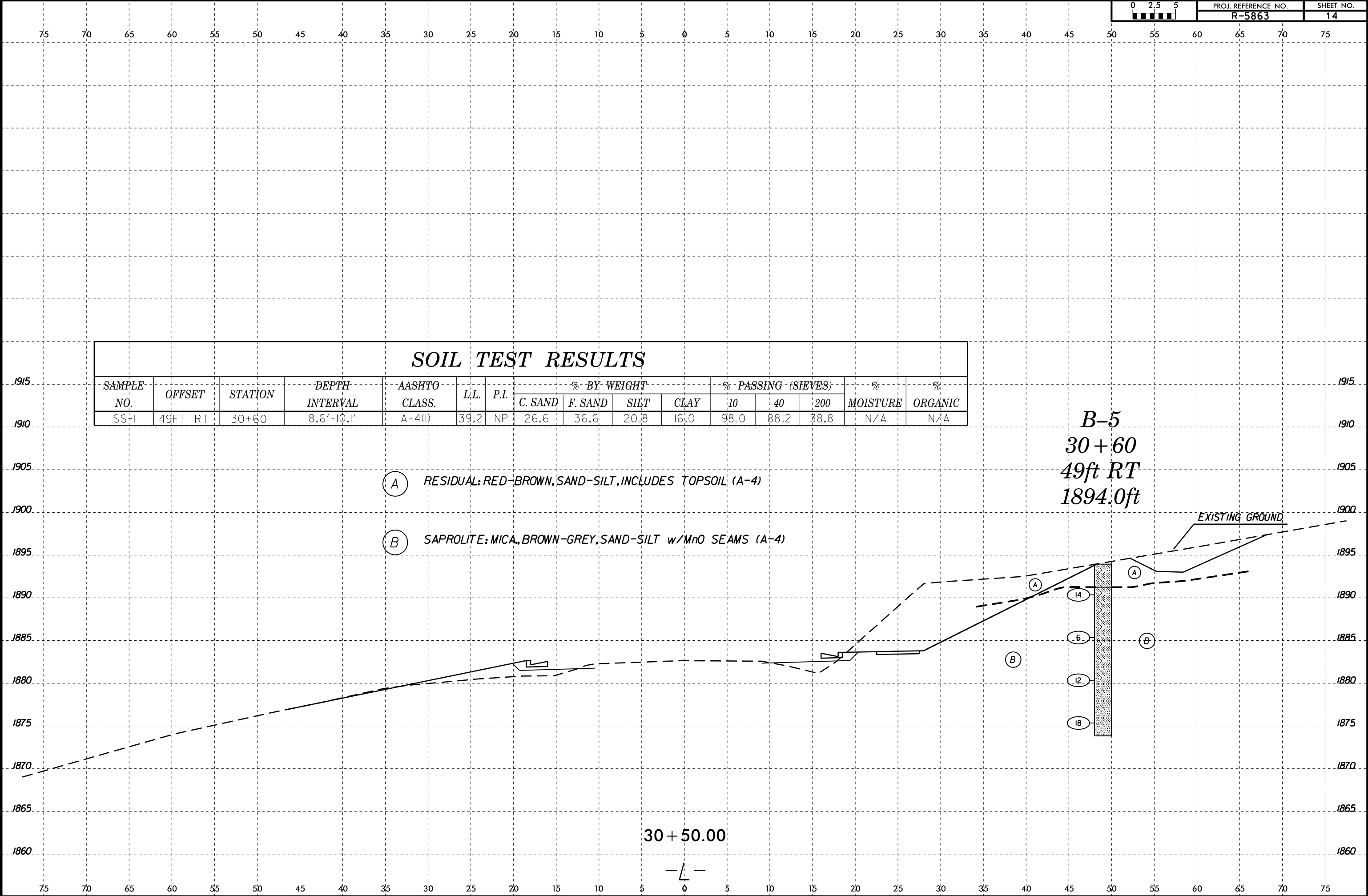




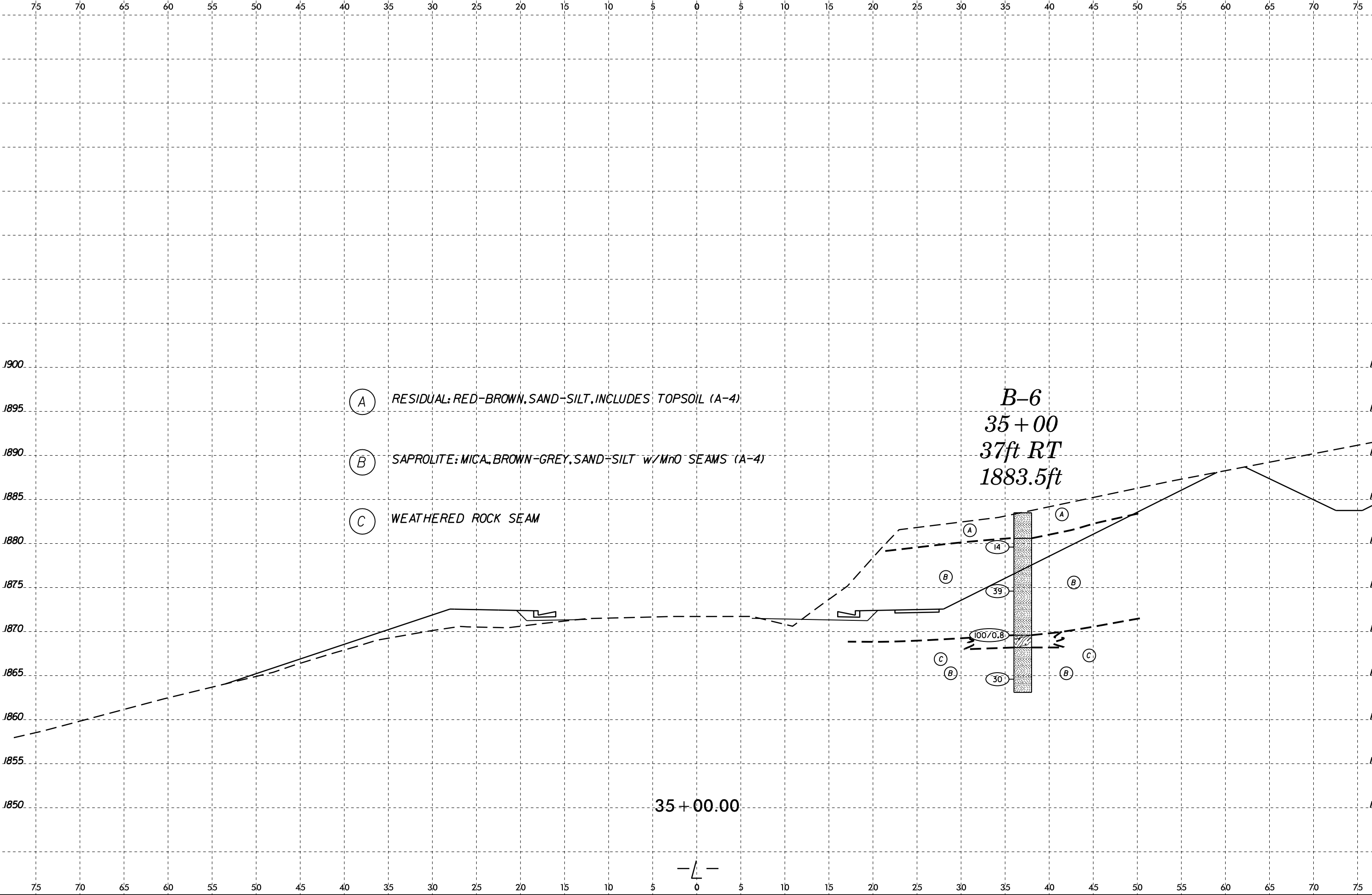


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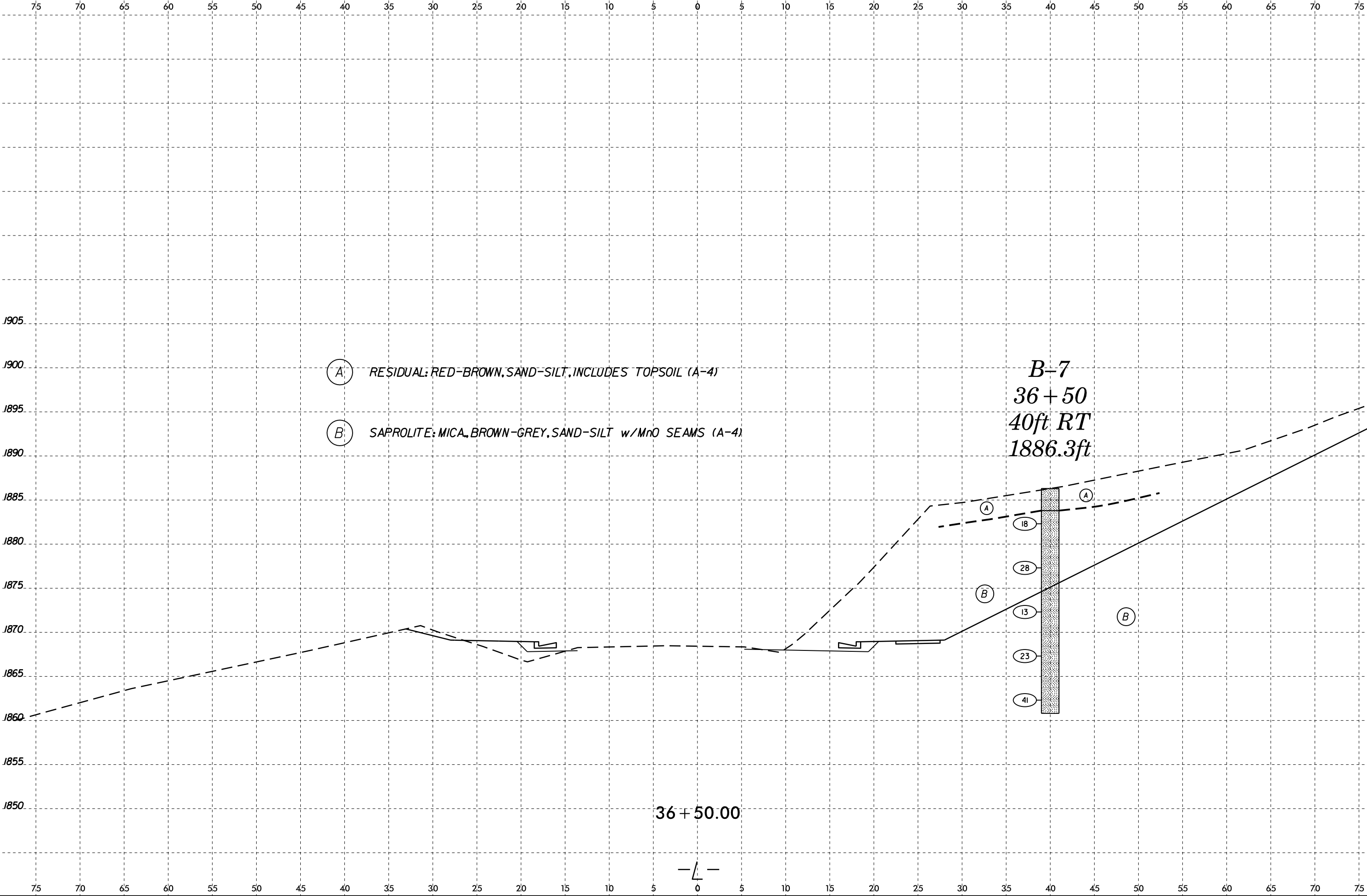




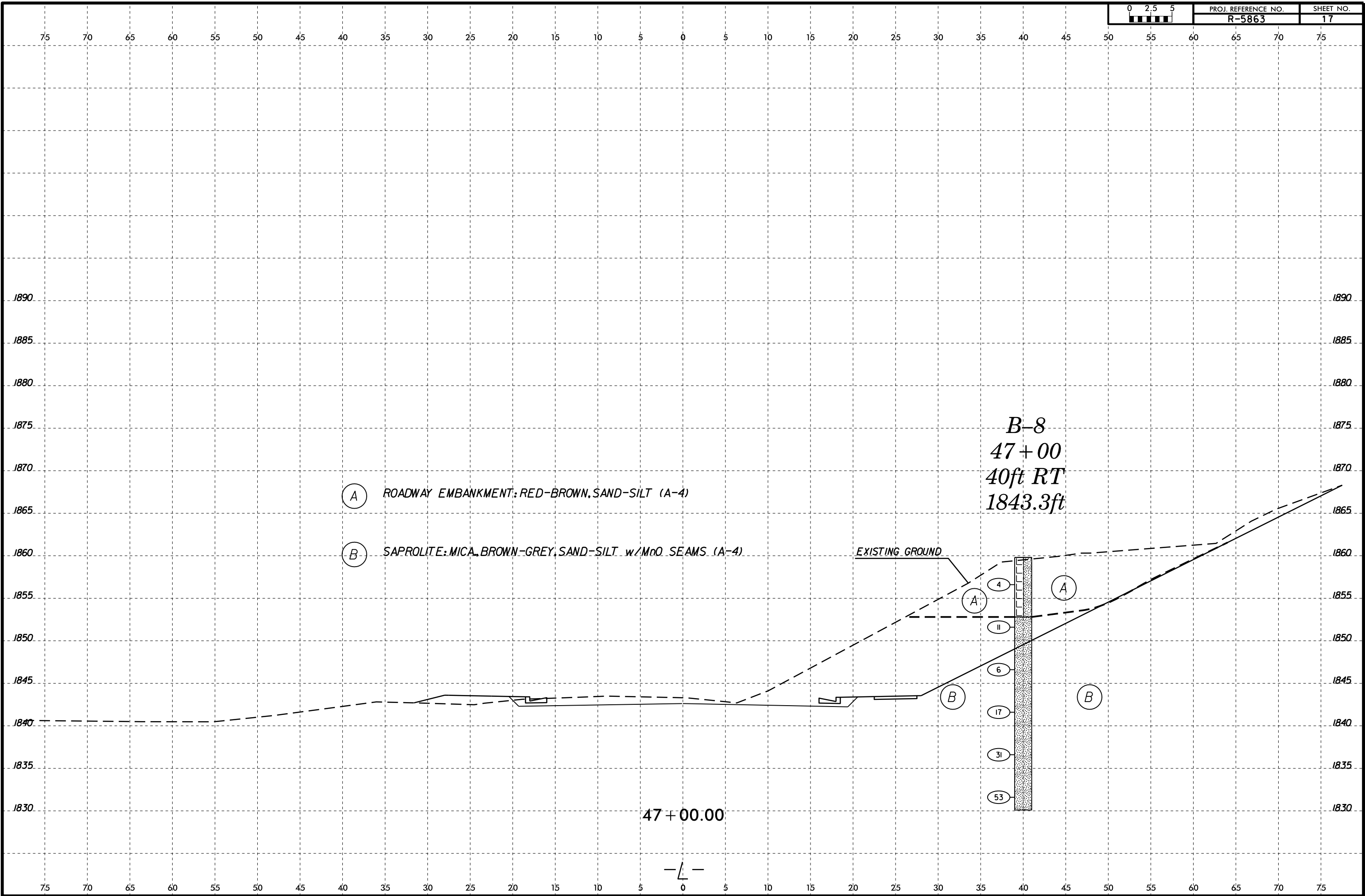
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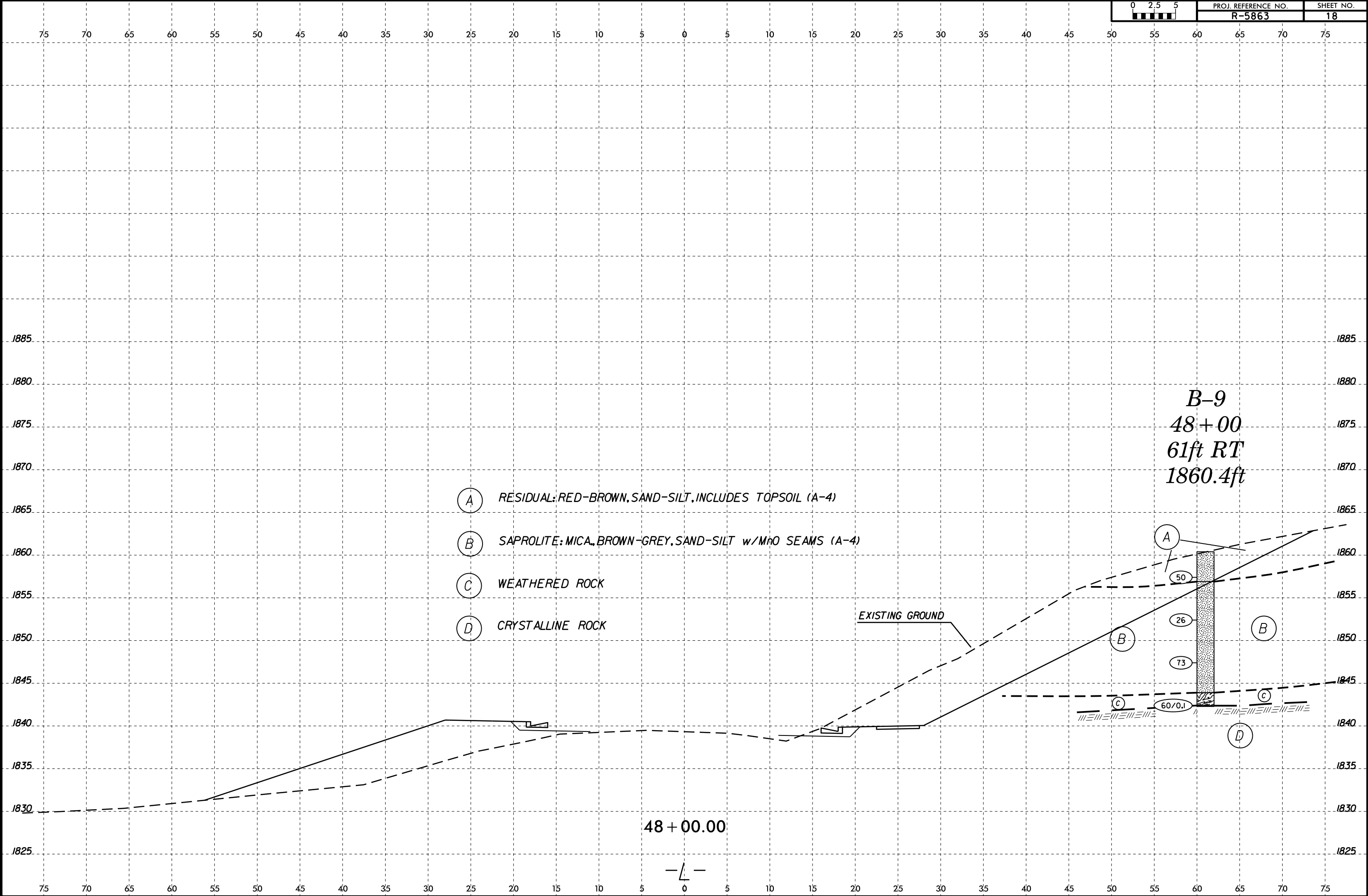


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R-5863	16



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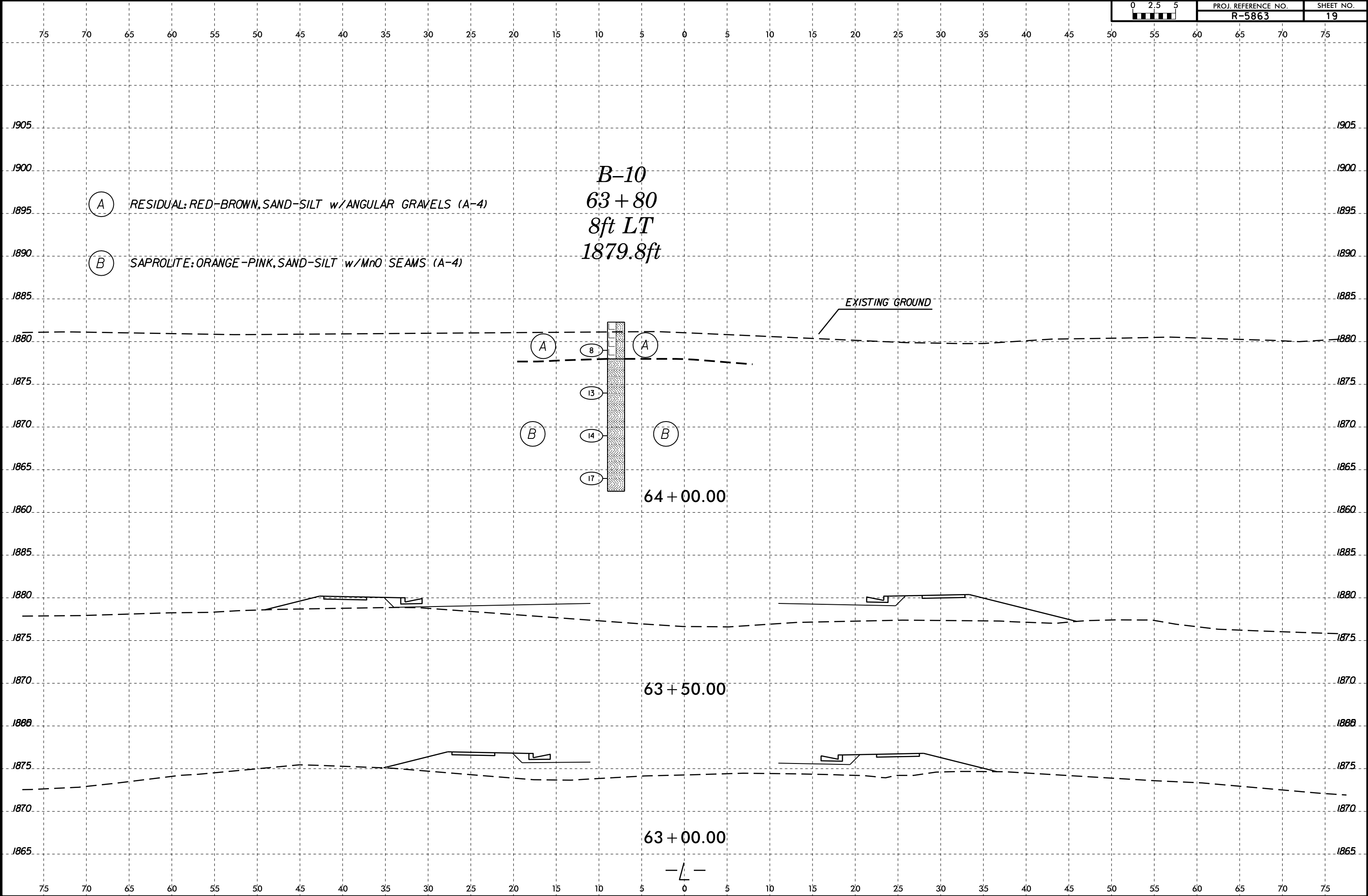




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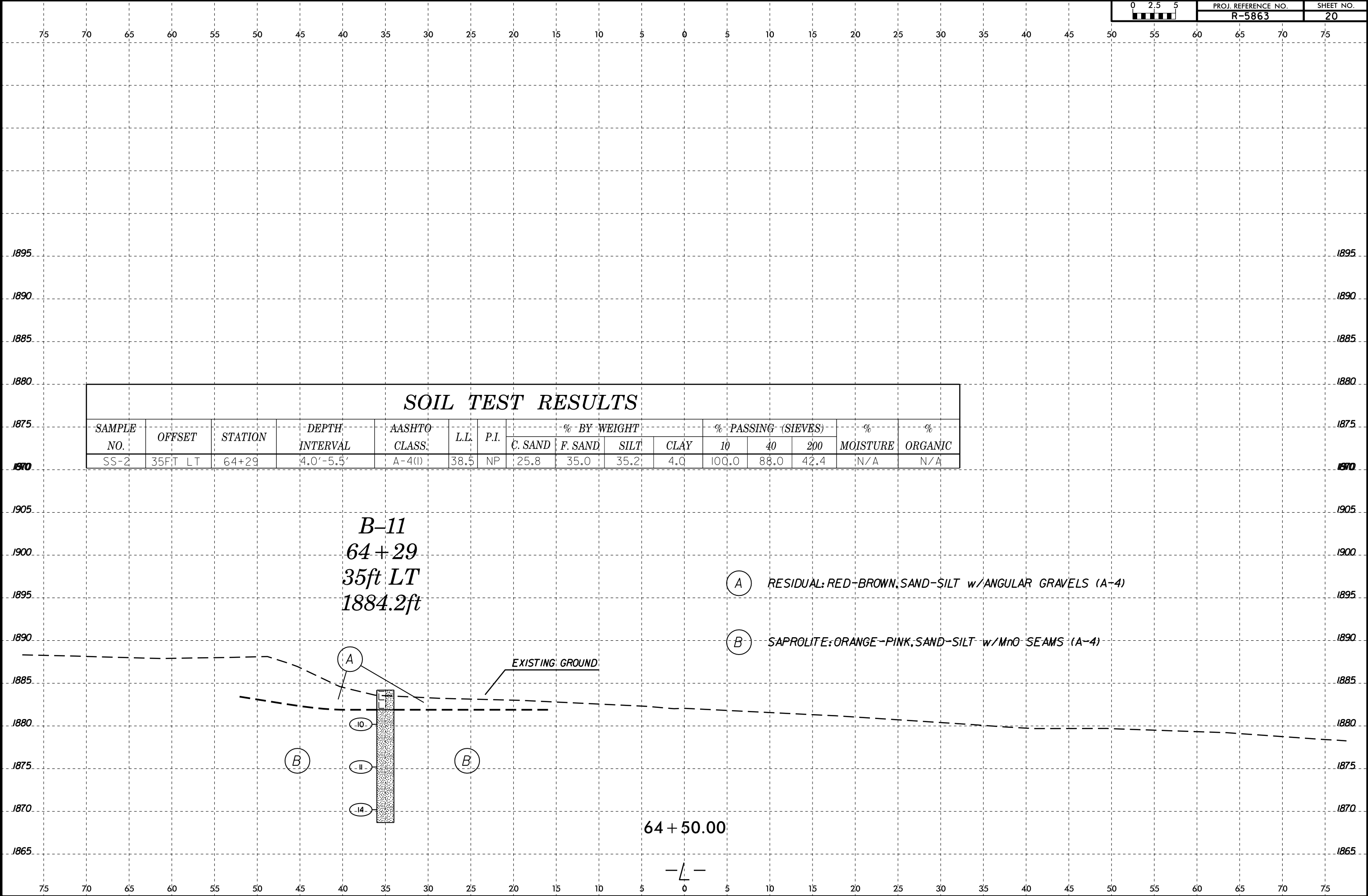


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R-5863	19



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NCDOT BORE DOUBLE R5863 GEO\_RDWY\_US64 CLAY\_BH.GPJ NC\_DOT.GDT 9/7/23

WBS 47516.1.1			TIP R-5863			COUNTY CLAY			GEOLOGIST Stewman, C. E.						
SITE DESCRIPTION US-64 BUSINESS FROM US-64 TO SR-1307 (MAIN STREET)									GROUND WTR (ft)						
BORING NO. B-2			STATION 21+61			OFFSET 58 ft RT			ALIGNMENT -L-			0 HR. Dry			
COLLAR ELEV. 1,915.3 ft			TOTAL DEPTH 25.7 ft			NORTHING 503,607			EASTING 555,467			24 HR. Dry			
DRILL RIG/HAMMER EFF/DATE AFO8963 CME-550X 83% 04/11/2022						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic						
DRILLER Coffey, Jr., C.			START DATE 07/11/23			COMP. DATE 07/11/23			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					
1920															
1915														1,915.3 GROUND SURFACE 0.0	
1910	1,911.1	4.2	2	4	10									1,913.1 RED, BROWN SAND-SILT TOP SOIL (A-4) 2.2	
1905	1,906.1	9.2	6	10	13									SAPROLITE	
1900	1,901.1	14.2	7	14	18									MICACEOUS BROWN, GRAY SAND-SILT w/ MnO SEAMS (A-4)	
1895	1,896.1	19.2	11	12	12										
1890	1,891.1	24.2	23	60	40/0.3									1,890.6 24.7	
														1,889.6 25.7	
														WEATHERED ROCK	
														BROWN WEATHERED ROCK w/ MnO SEAMS	
														Boring Terminated at Elevation 1,889.6 ft IN WEATHERED ROCK	

NCDOT BORE DOUBLE R5863 GEO\_RDWY\_US64 CLAY\_BH.GPJ NC\_DOT.GDT 9/7/23

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NCDOT BORE DOUBLE R5863 GEO RDWY US64 CLAY BH.GPJ NC DOT.GDT 9/7/23

WBS 47516.1.1			TIP R-5863			COUNTY CLAY			GEOLOGIST Stewman, C. E.					
SITE DESCRIPTION US-64 BUSINESS FROM US-64 TO SR-1307 (MAIN STREET)									GROUND WTR (ft)					
BORING NO. B-6			STATION 35+00			OFFSET 37 ft RT			ALIGNMENT -L-					
COLLAR ELEV. 1,883.5 ft			TOTAL DEPTH 20.4 ft			NORTHING 504,283			EASTING 556,627					
DRILL RIG/HAMMER EFF/DATE AFO8963 CME-550X 83% 04/11/2022						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic					
DRILLER Coffey, Jr., C.			START DATE 07/11/23			COMP. DATE 07/11/23			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				
1885														
1880	1,879.6	3.9	2	7	7									1,883.5 GROUND SURFACE 0.0
1875	1,874.6	8.9	10	20	19									1,880.6 RED, BROWN SILT-SAND TOP SOIL w/ ORGX (A-4) 2.9
1870	1,869.6	13.9	15	45	55/0.3									SAPROLITE BROWN SAND-SILT w/ MnO SEAMS (A-4)
1865	1,864.6	18.9	4	15	15									***IN/OUT WEATHERED ROCK SEAMS @ 10.8'
														1,869.6 13.9
														1,868.2 15.3
														WEATHERED ROCK GRAY WEATHERED ROCK SEAM
														SAPROLITE BROWN SAND-SILT w/ TR. MnO (A-4)
														1,863.1 20.4
														Boring Terminated at Elevation 1,863.1 ft IN SAPROLITE (A-4)

GEOTECHNICAL BORING REPORT  
BORE LOG

WBS 47516.1.1			TIP R-5863			COUNTY CLAY			GEOLOGIST Stewman, C. E.						
SITE DESCRIPTION US-64 BUSINESS FROM US-64 TO SR-1307 (MAIN STREET)										GROUND WTR (ft)					
BORING NO. B-7			STATION 36+50			OFFSET 40 ft RT			ALIGNMENT -L-		0 HR. Dry				
COLLAR ELEV. 1,886.3 ft			TOTAL DEPTH 25.5 ft			NORTHING 504,337			EASTING 556,744		24 HR. Dry				
DRILL RIG/HAMMER EFF./DATE AFO8963 CME-550X 83% 04/11/2022						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic						
DRILLER Coffey, Jr., C.			START DATE 07/10/23			COMP. DATE 07/10/23			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)
1890															
1885														1,886.3	GROUND SURFACE 0.0
1880	1,882.3	4.0	3	4	14									1,883.8	RESIDUAL RED, BROWN SAND-SILT TOPSOIL (A-4) 2.5
	1,877.3	9.0	4	10	18										
1875	1,872.3	14.0	2	4	9										
	1,867.3	19.0	8	11	12										
1865	1,862.3	24.0	9	17	24										

WBS 47516.1.1				TIP R-5863				COUNTY CLAY				GEOLOGIST Stewman, C. E.					
SITE DESCRIPTION US-64 BUSINESS FROM US-64 TO SR-1307 (MAIN STREET)												GROUND WTR (ft)					
BORING NO. B-8				STATION 47+00				OFFSET 40 ft RT				ALIGNMENT -L-				0 HR. Dry	
COLLAR ELEV. 1,859.8 ft				TOTAL DEPTH 29.7 ft				NORTHING 505,306				EASTING 557,186				24 HR. Dry	
DRILL RIG/HAMMER EFF./DATE AFO8963 CME-550X 83% 04/11/2022								DRILL METHOD H.S. Augers				HAMMER TYPE Automatic					
DRILLER Coffey, Jr., C.				START DATE 07/10/23				COMP. DATE 07/10/23				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							
1860														1,859.8 GROUND SURFACE 0.0			
1855	1,856.6	3.2												ROADWAY EMBANKMENT RED SAND-SILT w/ ORGX (A-4)			
			3	2	2										**BOULDER AT 5.6'		
1850	1,851.6	8.2												1,852.8 7.0			
			4	5	6										SAPROLITE		
1845	1,846.6	13.2												SL. MICACEOUS BROWN SAND-SILT w/ MnO SEAMS (A-4)			
			1	3	3												
1840	1,841.6	18.2															
			6	7	10												
1835	1,836.6	23.2															
			7	14	17												
	1,831.6	28.2												1,830.1 29.7			
			5	26	27										Boring Terminated at Elevation 1,830.1 ft IN SAPROLITE (A-4)		

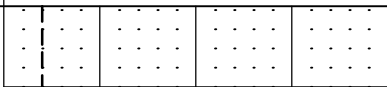
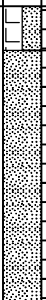
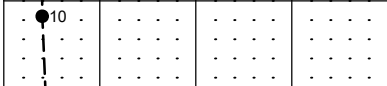
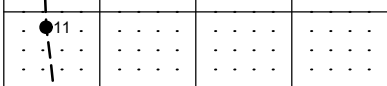
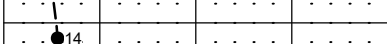
NCDOT BORE DOUBLE R5863\_GEO\_RDWY\_US64\_CLAY\_BH.GPJ NC\_DOT.GDT 9/7/23

NCDOT BORE DOUBLE R5863 GEO\_RDWY\_US64\_CLAY\_BH.GPJ NC\_DOT.GDT 9/7/23

WBS 47516.1.1			TIP R-5863			COUNTY CLAY			GEOLOGIST Stewman, C. E.				
SITE DESCRIPTION US-64 BUSINESS FROM US-64 TO SR-1307 (MAIN STREET)									GROUND WTR (ft)				
BORING NO. B-10			STATION 63+80			OFFSET 8 ft LT			ALIGNMENT -L-			0 HR. Dry	
COLLAR ELEV. 1,879.8 ft			TOTAL DEPTH 19.8 ft			NORTHING 506,876			EASTING 557,675			24 HR. 9.0	
DRILL RIG/HAMMER EFF./DATE AFO8963 CME-550X 83% 04/11/2022						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic				
DRILLER Coffey, Jr., C.			START DATE 07/10/23			COMP. DATE 07/10/23			SURFACE WATER DEPTH N/A				
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100	MOI		
1880													1,879.8 GROUND SURFACE 0.0
1875	1,876.5	3.3	1	2	6						M		ROADWAY EMBANKMENT RED SAND-SILT EMBANKMENT w/ ANGULAR GRAVELS (A-4) 4.3
1870	1,871.5	8.3	6	5	8						M		SAPROLITE ORANGE, PINK SAND-SILT w/ MnO SEAMS (A-4)
1865	1,866.5	13.3	3	6	8						M		
1860	1,861.5	18.3	4	7	10						M		
													1,860.0 19.8
Boring Terminated at Elevation 1,860.0 ft IN SAPROLITE (A-4)													

## **GEOTECHNICAL BORING REPORT**

### **BORE LOG**

WBS 47516.1.1			TIP R-5863			COUNTY CLAY			GEOLOGIST Stewman, C. E.							
SITE DESCRIPTION US-64 BUSINESS FROM US-64 TO SR-1307 (MAIN STREET)									GROUND WTR (ft)							
BORING NO. B-11			STATION 64+29			OFFSET 35 ft LT			ALIGNMENT -L-			0 HR. Dry				
COLLAR ELEV. 1,884.2 ft			TOTAL DEPTH 15.5 ft			NORTHING 506,957			EASTING 557,685			24 HR. Dry				
DRILL RIG/HAMMER EFF./DATE AFO8963 CME-550X 83% 04/11/2022						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic							
DRILLER Coffey, Jr., C.			START DATE 07/10/23			COMP. DATE 07/10/23			SURFACE WATER DEPTH N/A							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	L O G	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)	
1885														1,884.2	0.0	GROUND SURFACE
														1,881.9	2.3	ROADWAY EMBANKMENT SL. MICACEOUS RED SILT-SAND w/ ANGULAR GRAVEL (A-4)
1880	1,880.2	4.0	2	4	6						SS-2	M				SAPROLITE SL. MICACEOUS PINK SAND-SILT w/ TR. MnO (A-4)
1875	1,875.2	9.0	2	4	7							M				
1870	1,870.2	14.0	3	6	8							M				
												M			1,868.7	15.5

NC DOT BORE DOUBLE R5863 GEO RDWY US64 CLAY BH.GPJ NC DOT.GDT 9/7/23

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS-MATERIALS AND TESTS UNIT  
SOILS TEST REPORT-SOILS LABORATORY**

<b>T.I.P. ID #:</b>	47516.1
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<b>REPORT ON SAMPLES OF:</b>	Soils for Quality
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<b>PROJECT:</b>	R-5863	<b>COUNTY:</b>	CLAY	<b>Owner:</b>	NCDOT
<b>DATE SAMPLED:</b>	7.10 & 7.11	<b>DATE RECEIVED:</b>	7.12.23	<b>DATE REPORTED:</b>	7.18.23
<b>SAMPLED FROM:</b>	Split Spoon	<b>SAMPLED BY:</b>	C. Johnson		
<b>SUBMITTED BY:</b>	Asheville Geotechnical	2018		<b>STANDARD SPECIFICATION</b>	
<b>LABORATORY:</b>	Asheville Regional				

**TEST RESULTS**

<b>Project Sample No.</b>	SS-1	SS-2						
<b>Lab Sample No.</b>	A-225002	A-225003						
<b>HiCAMS Sample #</b>	N/A	N/A						
<b>Retained #4 Sieve %</b>	0.0	0.0						
<b>Passing #10 Sieve %</b>	98.0	100.0						
<b>Passing #40 Sieve %</b>	88.2	88.0						
<b>Passing #200 Sieve %</b>	38.8	42.4						

**MINUS #10 FRACTION**

<b>Soil Mortar - 100%</b>								
<b>Coarse Sand -Ret. #60</b>	26.6	25.8						
<b>Fine Sand - Ret. #270</b>	36.6	35.0						
<b>Silt 0.05-0.005 mm %</b>	20.8	35.2						
<b>Clay &lt; 0.005 mm %</b>	16.0	4.0						
<b>Passing # 40 Sieve %</b>	90.0	88.0						
<b>Passing # 200 Sieve %</b>	39.6	42.4						

<b>Liquid Limit</b>	39.2	38.5						
<b>Plastic Index</b>	NP	NP						
<b>AASHTO Classification</b>	A-4 (1)	A-4 (1)						
<b>Quantity</b>								
<b>Texture</b>								
<b>Station</b>								
<b>Hole No.</b>								
<b>Depth (ft) From:</b>	8.6'	4.0'						
<b>To:</b>	10.1'	5.5'						
	OK	OK						

**Remarks:**

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**CC:**

Asheville Geotechnical Unit	
Asheville Regional Laboratory	

<b>SOILS ENGINEER:</b>	
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