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REFERENCE: P-5705B

PROJECT: 44475

SEE SHEET 3 FOR PLAN SHEET LAYOUT
AT TIME OF INVESTIGATION

CONTENTS

<u>LINE</u>	<u>STATION</u>	<u>PLAN</u>	<u>CROSS SECTION</u>
-S1-	10+00 TO 48+00	4 - 9	10 - 58

APPENDICES

<u>APPENDIX</u>	<u>TITLE</u>	<u>SHEETS</u>
A	LABORATORY SUMMARY SHEET	60

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

ROADWAY

SUBSURFACE INVESTIGATION

COUNTY MECKLENBURG
PROJECT DESCRIPTION CHARLOTTE GATEWAY
STATION AND TRACK AND SAFETY
IMPROVEMENTS

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	P-5705B	1	60

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 1919 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

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

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

NOTES:

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

PERSONNEL

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<u>WERITZ, M. A.</u>	<u>McMILLIAN, M. F.</u>
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<u>EKLUND, M. A.</u>	<u>MASHBURN, S. R.</u>
<u>STUDNICKY, R. T.</u>	<u>COGAR, T. E.</u>

INVESTIGATED BY TERRACON CONSULTANTS
DRAWN BY FIELDS, W. D.
CHECKED BY RIGGS, A. F.
SUBMITTED BY TERRACON CONSULTANTS
DATE OCTOBER 2017

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NC REGISTERED FIRM: F-0869



DocuSigned by:

Abner F. Riggs, Jr. 10/26/2017

5228073BB8 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									
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 208, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>										WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.										HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:										ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (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.									
SOIL LEGEND AND AASHTO CLASSIFICATION										ANGULARITY OF GRAINS THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.										WEATHERED ROCK (WR) 										CRYSTALLINE ROCK (CR) 									
MINERALOGICAL COMPOSITION MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.										COMPRESSION SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50										NON-CRYSTALLINE ROCK (NCR) 										COASTAL PLAIN SEDIMENTARY ROCK (CP) 									
PERCENTAGE OF MATERIAL										ORGANIC MATERIAL TRACE OF ORGANIC MATTER 2 - 3% LITTLE ORGANIC MATTER 3 - 5% MODERATELY ORGANIC 5 - 10% HIGHLY ORGANIC > 10%										GRANDULAR SOILS SILT - CLAY SOILS OTHER MATERIAL TRACE 1 - 10% LITTLE 10 - 20% SOME 20 - 35% HIGHLY 35% AND ABOVE										WEATHERING FRESH - ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (IV SL.) - 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 (SL.) - 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. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i> 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. <i>IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF</i> VERY SEVERE (IV 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. <i>IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF</i> 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.									
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 SPT 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																													
CONSISTENCY OR DENSENESS										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 HI. - HIGHLY MED. - MEDIUM MICA - MICACEOUS MOD. - MODERATELY NP - NON PLASTIC ORG. - ORGANIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILTY, SILTY SLI. - SLIGHTLY TCR - TRICONE REFUSAL w - MOISTURE CONTENT V - VERY VST - VANE SHEAR TEST WEA. - WEATHERED UG - UNIT WEIGHT UG - DRY UNIT WEIGHT SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO																			
TEXTURE OR GRAIN SIZE										TEXTURE OR GRAIN SIZE										TEXTURE OR GRAIN SIZE										TEXTURE OR GRAIN SIZE									
SOIL MOISTURE - CORRELATION OF TERMS										SOIL MOISTURE - CORRELATION OF TERMS										SOIL MOISTURE - CORRELATION OF TERMS										SOIL MOISTURE - CORRELATION OF TERMS									
PLASTICITY										PLASTICITY										PLASTICITY										PLASTICITY									
COLOR										COLOR										COLOR										COLOR									
EQUIPMENT USED ON SUBJECT PROJECT										EQUIPMENT USED ON SUBJECT PROJECT										EQUIPMENT USED ON SUBJECT PROJECT										EQUIPMENT USED ON SUBJECT PROJECT									
FRACATURE SPACING										FRACATURE SPACING										FRACATURE SPACING										FRACATURE SPACING									
BEDDING										BEDDING										BEDDING										BEDDING									
INDURATION										INDURATION										INDURATION										INDURATION									
NOTES: FIAD - FILLED IMMEDIATELY AFTER DRILLING PROJECT WAS DRAFTED USING NCDOT PROVIDED TIN FILE FILE: p5705b_Is_tin (DATED: 01/12/2017) BL-5; N: 542,885,1262, E: 1,446,655,7118, ELEV. 706.95 @ STA. 24+97.62 BL-6; N: 543,246,8513, E: 1,446,984,0832, ELEV. 713.51 @ STA. 29+86.19 BL-9; N: 543,315,6877, E: 1,448,007,2578, ELEV. 737.60 @ STA. 44+66.30 BM3; N: 544,105, E: 1,447,804, ELEV. 737.50 @ BL STA. 51+74.00 1' RIGHT CHISELED SQUARE BM4; N: 544,771, E: 1,448,453, ELEV. 738.12 @ BL STA. 51+04.00 2' RIGHT CHISELED SQUARE										NOTES: FIAD - FILLED IMMEDIATELY AFTER DRILLING PROJECT WAS DRAFTED USING NCDOT PROVIDED TIN FILE FILE: p5705b_Is_tin (DATED: 01/12/2017) BL-5; N: 542,885,1262, E: 1,446,655,7118, ELEV. 706.95 @ STA. 24+97.62 BL-6; N: 543,246,8513, E: 1,446,984,0832, ELEV. 713.51 @ STA. 29+86.19 BL-9; N: 543,315,6877, E: 1,448,007,2578, ELEV. 737.60 @ STA. 44+66.30 BM3; N: 544,105, E: 1,447,804, ELEV. 737.50 @ BL STA. 51+74.00 1' RIGHT CHISELED SQUARE BM4; N: 544,771, E: 1,448,453, ELEV. 738.12 @ BL STA. 51+04.00 2' RIGHT CHISELED SQUARE										NOTES: FIAD - FILLED IMMEDIATELY AFTER DRILLING PROJECT WAS DRAFTED USING NCDOT PROVIDED TIN FILE FILE: p5705b_Is_tin (DATED: 01/12/2017) BL-5; N: 542,885,1262, E: 1,446,655,7118, ELEV. 706.95 @ STA. 24+97.62 BL-6; N: 543,246,8513, E: 1,446,984,0832, ELEV. 713.51 @ STA. 29+86.19 BL-9; N: 543,315,6877, E: 1,448,007,2578, ELEV. 737.60 @ STA. 44+66.30 BM3; N: 544,105, E: 1,447,804, ELEV. 737.50 @ BL STA. 51+74.00 1' RIGHT CHISELED SQUARE BM4; N: 544,771, E: 1,448,453, ELEV. 738.12 @ BL STA. 51+04.00 2' RIGHT CHISELED SQUARE										NOTES: FIAD - FILLED IMMEDIATELY AFTER DRILLING PROJECT WAS DRAFTED USING NCDOT PROVIDED TIN FILE FILE: p5705b_Is_tin (DATED: 01/12/2017) BL-5; N: 542,885,1262, E: 1,446,655,7118, ELEV. 706.95 @ STA. 24+97.62 BL-6; N: 543,246,8513, E: 1,446,984,0832, ELEV. 713.51 @ STA. 29+86.19 BL-9; N: 543,315,6877, E: 1,448,007,2578, ELEV. 737.60 @ STA. 44+66.30 BM3; N: 544,105, E: 1,447,804, ELEV. 737.50 @ BL STA. 51+74.00 1' RIGHT CHISELED SQUARE BM4; N: 544,771, E: 1,448,453, ELEV. 738.12 @ BL STA. 51+04.00 2' RIGHT CHISELED SQUARE									

TIP PROJECT: P-5705BA

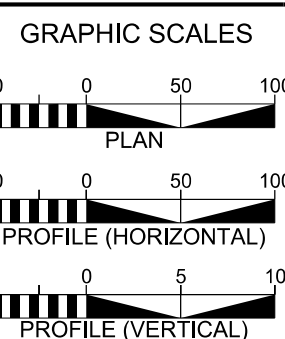
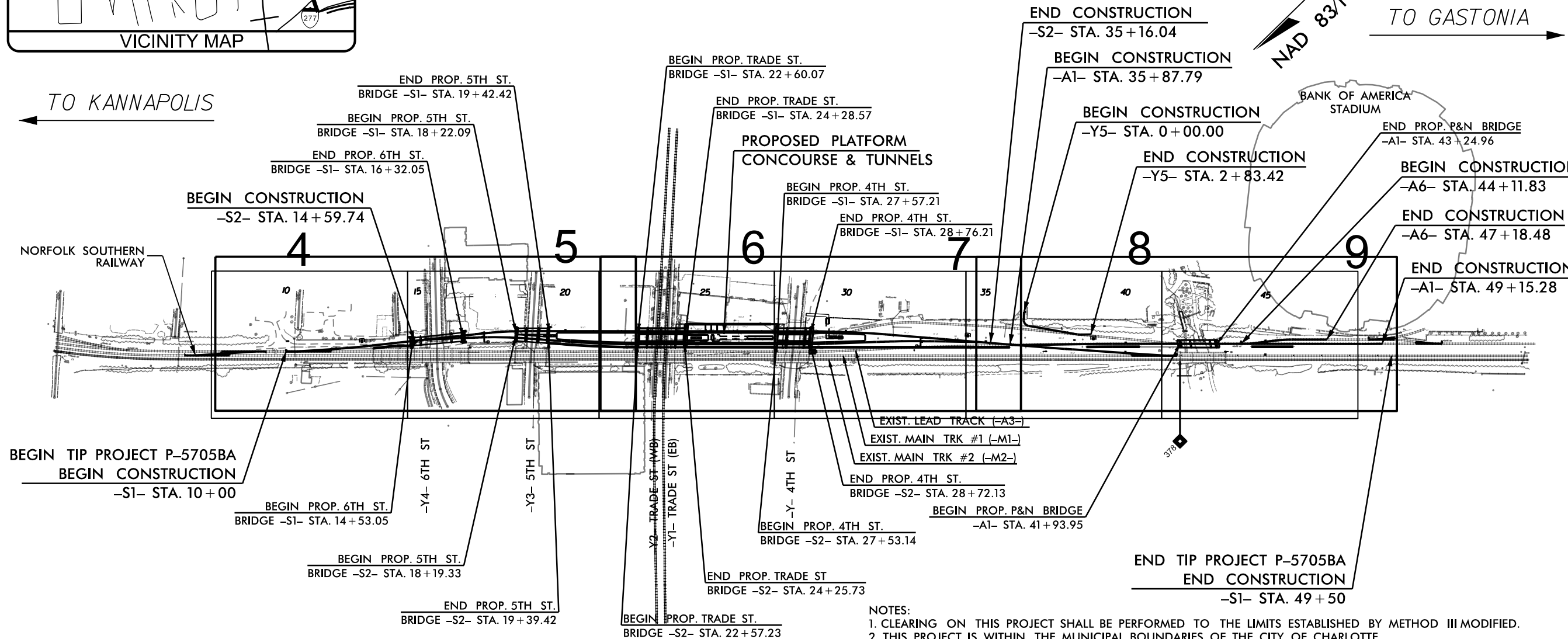
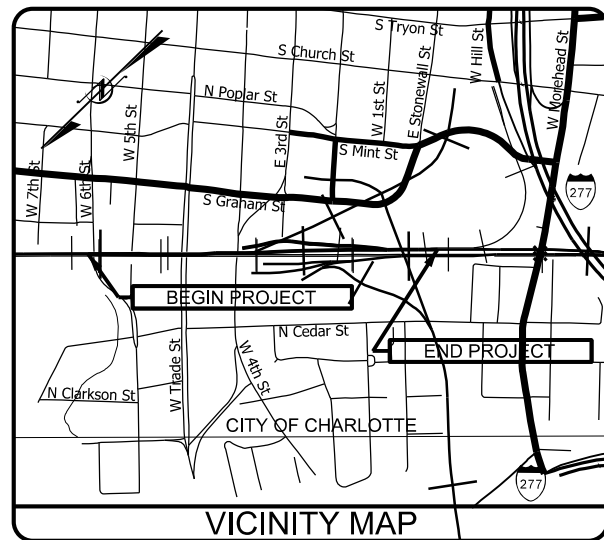
CONTRACT: C204058

STATE OF NORTH CAROLINA
RAIL DIVISION

MECKLENBURG COUNTY

LOCATION: CHARLOTTE GATEWAY STATION - TRACK, STRUCTURE AND SIGNALS
TYPE OF WORK: DRAINAGE, PAVING, GRADING, STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	P-5705BA	3	60
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
44475.1.2		P.E. / UTIL P.E. / ROW	
44475.3.2		CONST./UTIL CONST.	



PROJECT LENGTH	
LENGTH OF RAIL TIP PROJECT	0.612 MILES
LENGTH OF STRUCTURES TIP PROJECT	0.136 MILES
TOTAL LENGTH OF RAIL TIP PROJECT	0.748 MILES
LENGTH MEASURED ALONG -S1-	
NCDOT CONTACT:	MATTHEW SIMMONS, P.E. NCDOT PROJECT MANAGER

HNTB HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: N/A

LETTING DATE: FEBRUARY 20, 2018

COREY VERNIER, P.E.
RAIL PROJECT ENGINEER

DAVID HAWKINS, P.E.
STRUCTURE PROJECT ENGINEER

JAMES BYRD, P.E.
HYDRAULICS PROJECT ENGINEER

ERIC SECKINGER, P.E.
ROADWAY PROJECT ENGINEER

MATTHEW SIMMONS, P.E.
NCDOT PROJECT MANAGER

RAIL ENGINEER HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

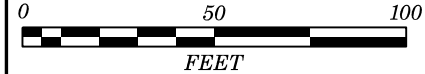
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SUBMITTAL: 90%
DATE: AUGUST 9, 2017

SIGNATURE: _____ P.E. SIGNATURE: _____ P.E.

NC DEPARTMENT OF TRANSPORTATION
RAIL DIVISION
DESIGN AND CONSTRUCTION

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NC REGISTERED FIRM: P-0869



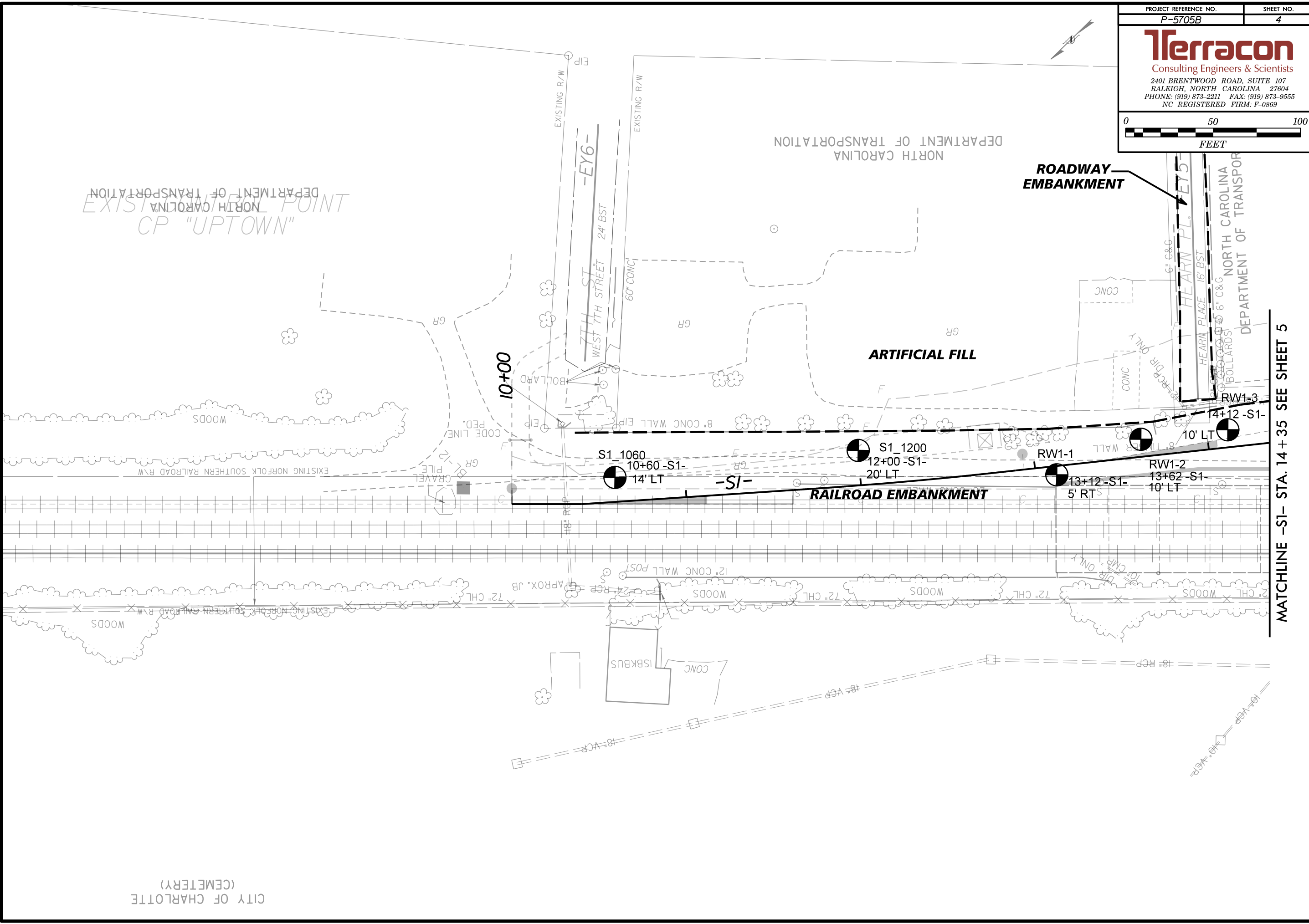
EXISTING POINT
CP "UPTOWN"
DEPARTMENT OF TRANSPORTATION

DEPARTMENT OF TRANSPORTATION
NORTH CAROLINA

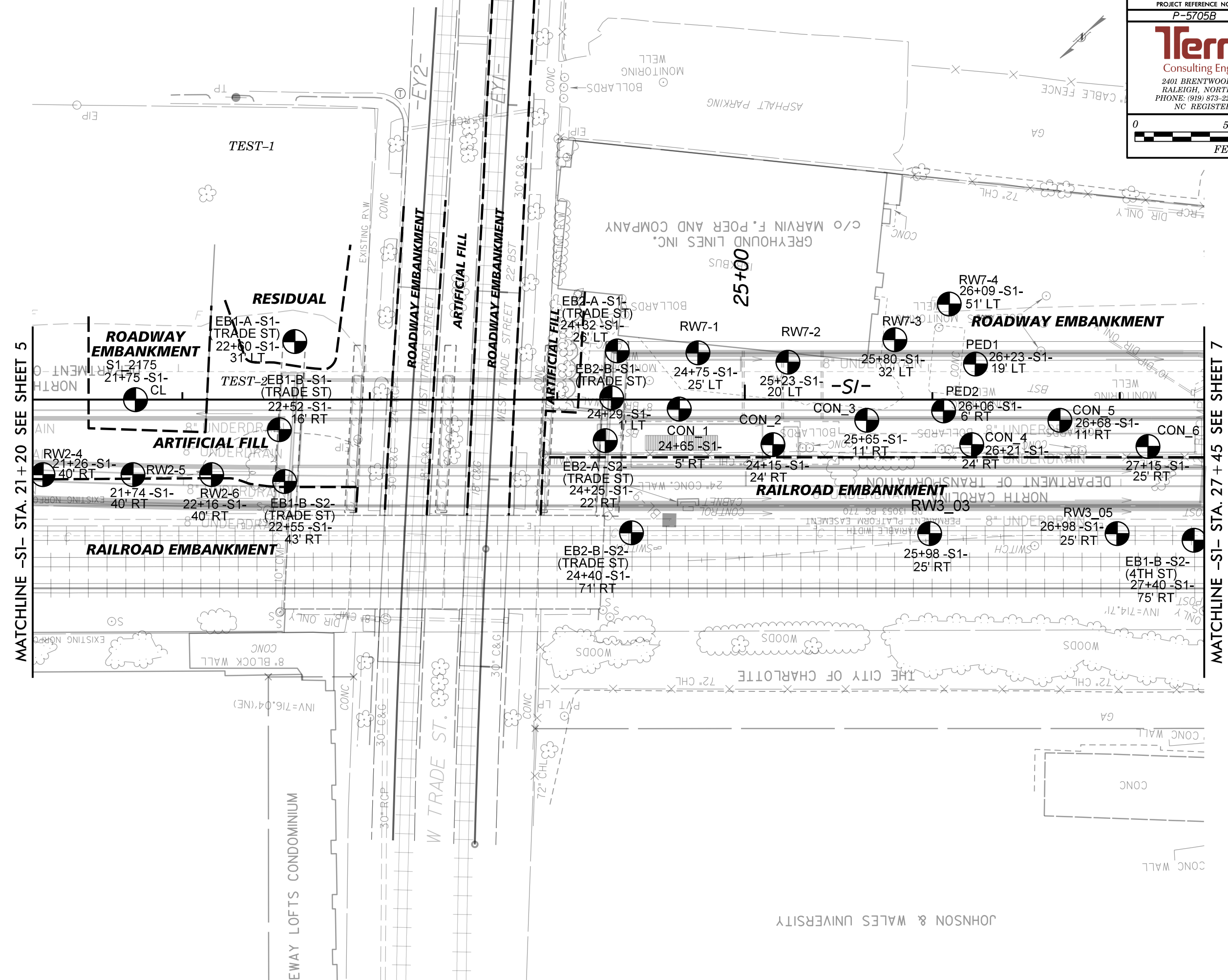
ROADWAY
EMBANKMENT

ARTIFICIAL FILL

MATCHLINE -SI- STA. 14 + 35 SEE SHEET 5



CITY OF CHARLOTTE
(CEMETERY)



MATCHLINE -S1- STA. 21 + 20 SEE SHEET 5

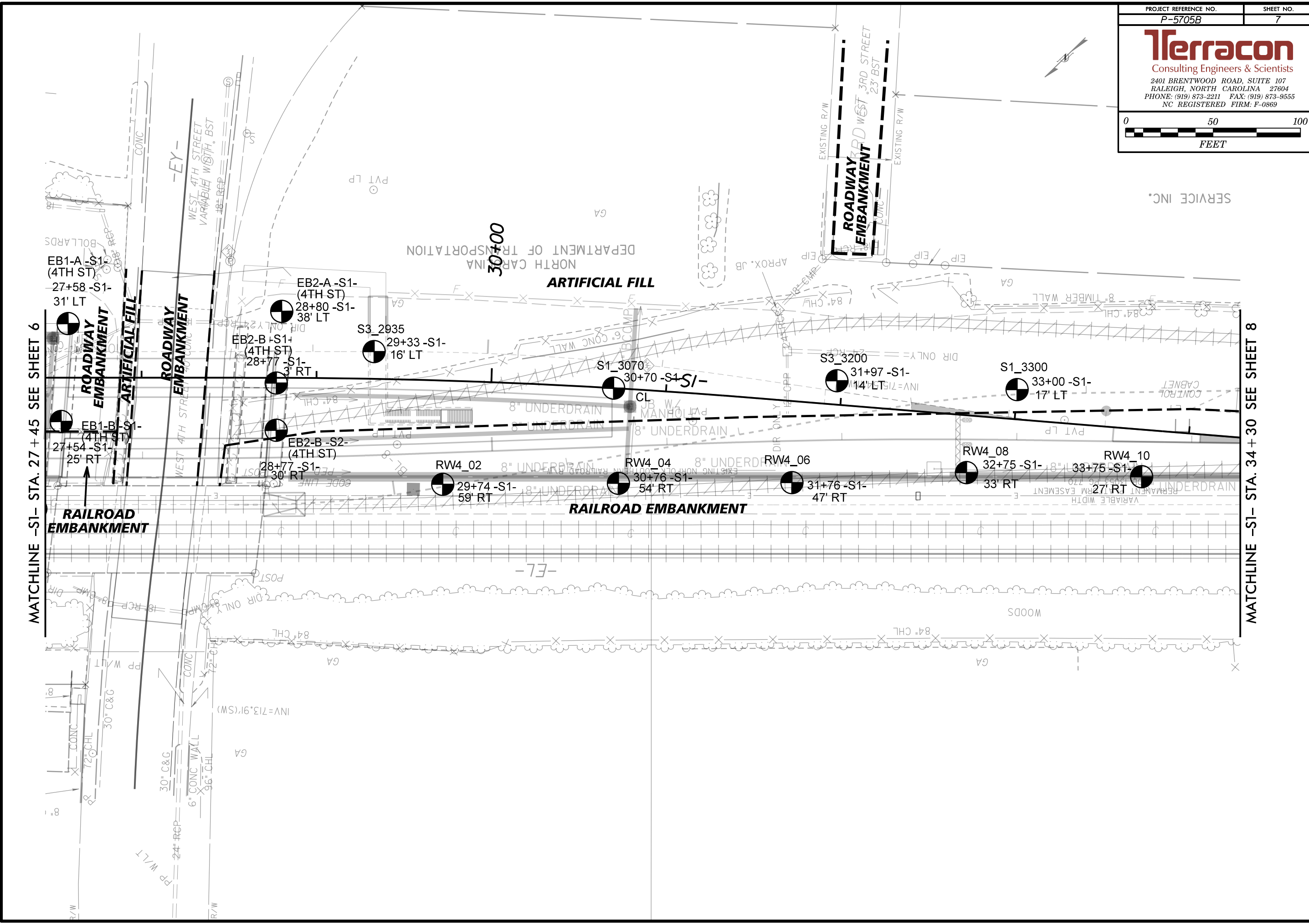
MATCHLINE -S1- STA. 27 + 45 SEE SHEET 7

JOHNSON & WALES UNIVERSITY

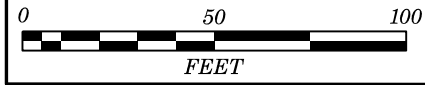
PROJECT REFERENCE NO. P-5705B	SHEET NO. 7
Terracon	
Consulting Engineers & Scientists	
2401 BRENTWOOD ROAD, SUITE 107 RALEIGH, NORTH CAROLINA 27604 PHONE: (919) 873-2211 FAX: (919) 873-9555 NC REGISTERED FIRM: P-0869	
0 50 100 FEET	

MATCHLINE -S1- STA. 27 + 45 SEE SHEET 6

MATCHLINE -S1- STA. 34 + 30 SEE SHEET 8



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PROP. CONTROL POINT
CP "GATEWAY"

DUKE POWER COMPANY

WEST PARKING

35+00

ARTIFICIAL FILL

ROADWAY EMBANKMENT
KING J.R. BLVD

EXISTING R/W

EXISTING R/W

ASPHALT PARKING

DUKE POWER COMPANY

ARTIFICIAL FILL

40+00

ASPHALT PARKING

ALLUVIAL

MATCHLINE -S1- STA. 34 + 30 SEE SHEET 7

S1_3450
34+50 -S1-
29' LT

S1_3600
36+00 -S1-
43' LT

A1_3752
37+49 -S1-
39' LT

A1_3920
39+16 -S1-
61' LT

A1_4065
40+62 -S1-
64' LT

RW4_12
34+75 -S1-
14' RT

RW4_14
35+72 -S1-
3' RT

RAILROAD EMBANKMENT

S1_3700
37+00 -S1-
4' LT

S1_3800
38+00 -S1-
5' LT

RW5_01
38+59 -S1-
20' LT

RW5_02
38+97 -S1-
23' LT

RW5_03
39+35 -S1-
25' LT

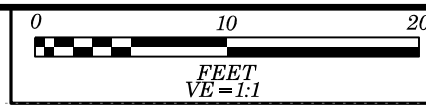
RW5_04
39+73 -S1-
35' LT

RW5_05
40+11 -S1-
30' LT

RW5_06
40+49 -S1-
34' LT

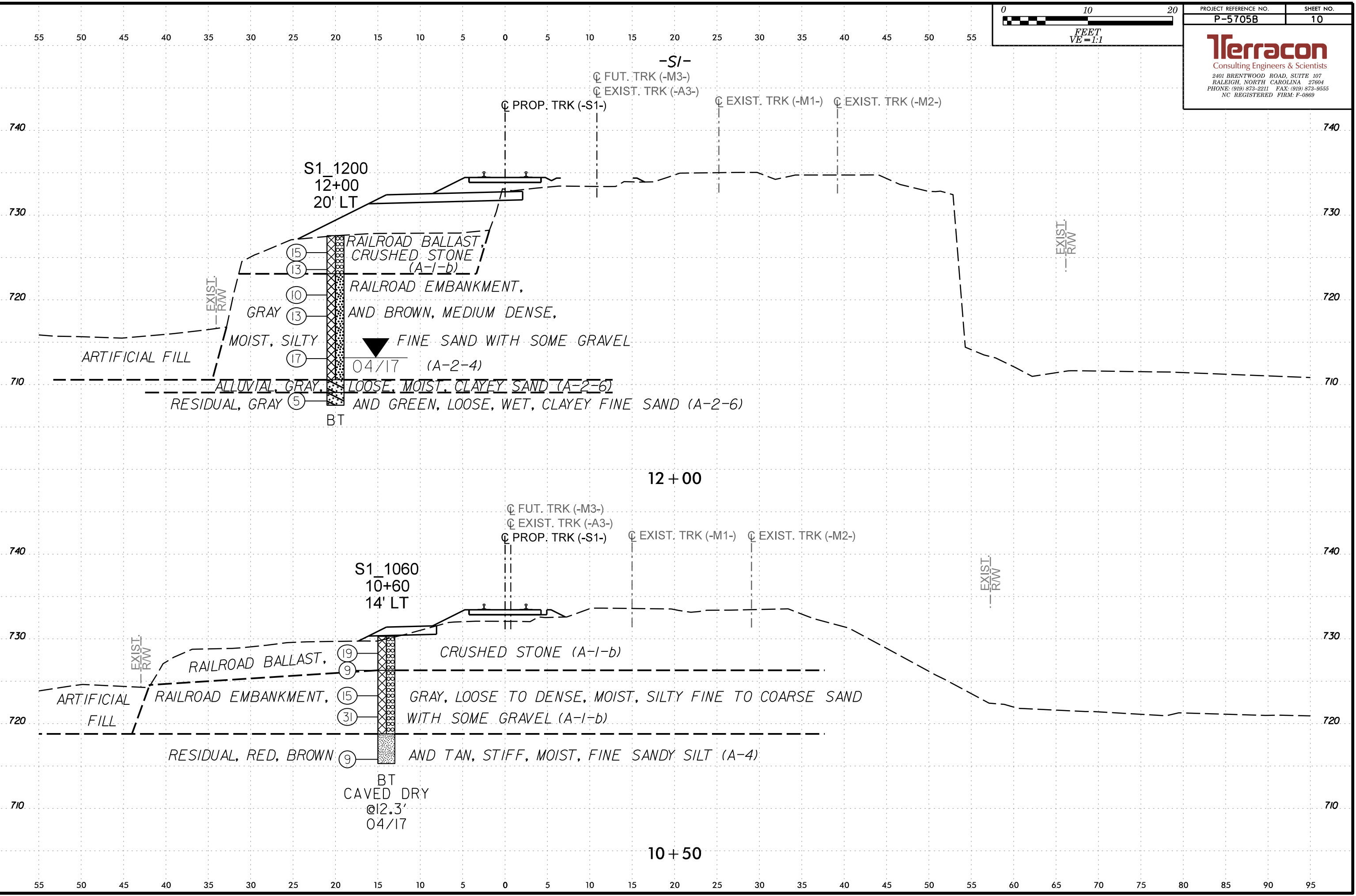
MATCHLINE -S1- STA. 41 + 30 SEE SHEET 9

ELEVATION = 706.15
E 1446742
ION 26+70.00 40 LEFT
RIVER

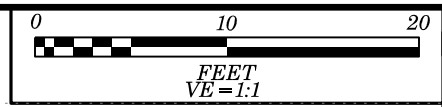


PROJECT REFERENCE NO. P-5705B	SHEET NO. 10
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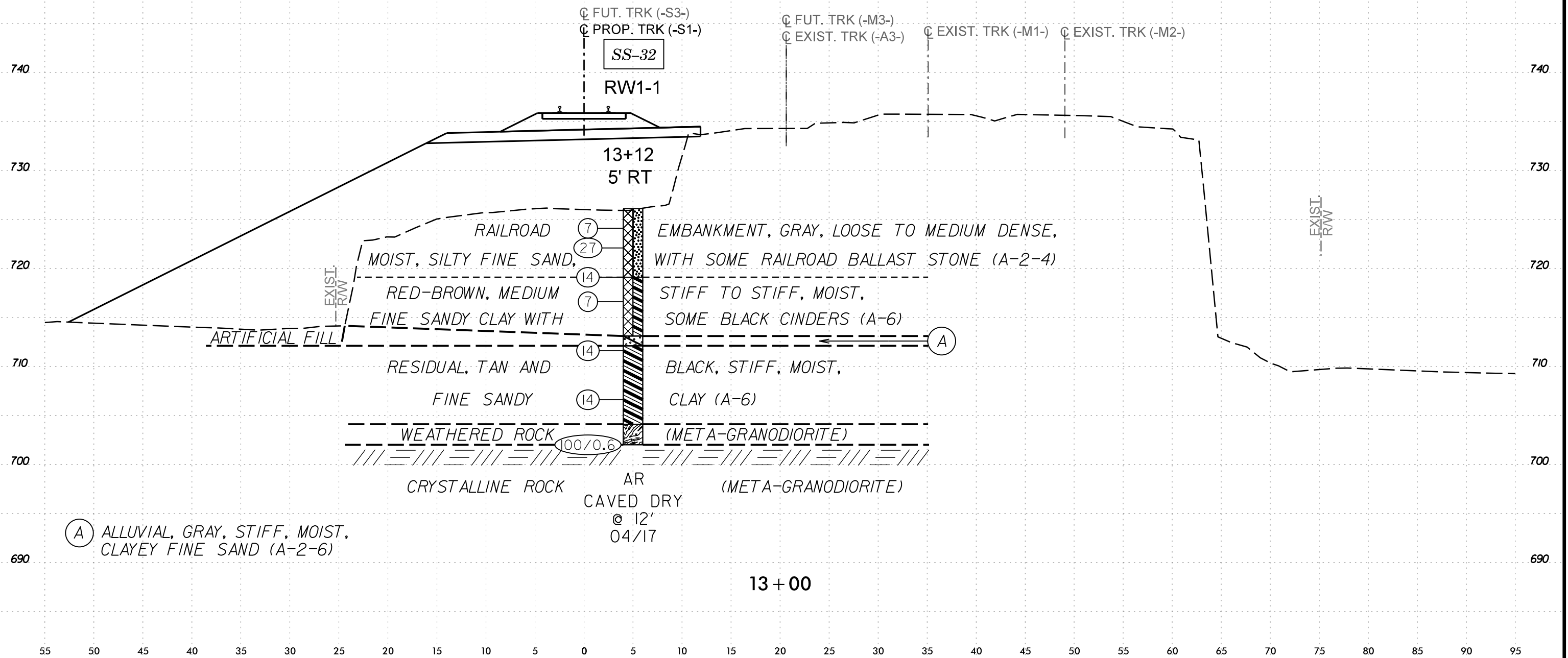
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PROJECT REFERENCE NO. P-5705B	SHEET NO. 11
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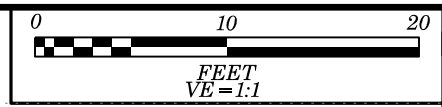
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-S1-



0012DEL_P28

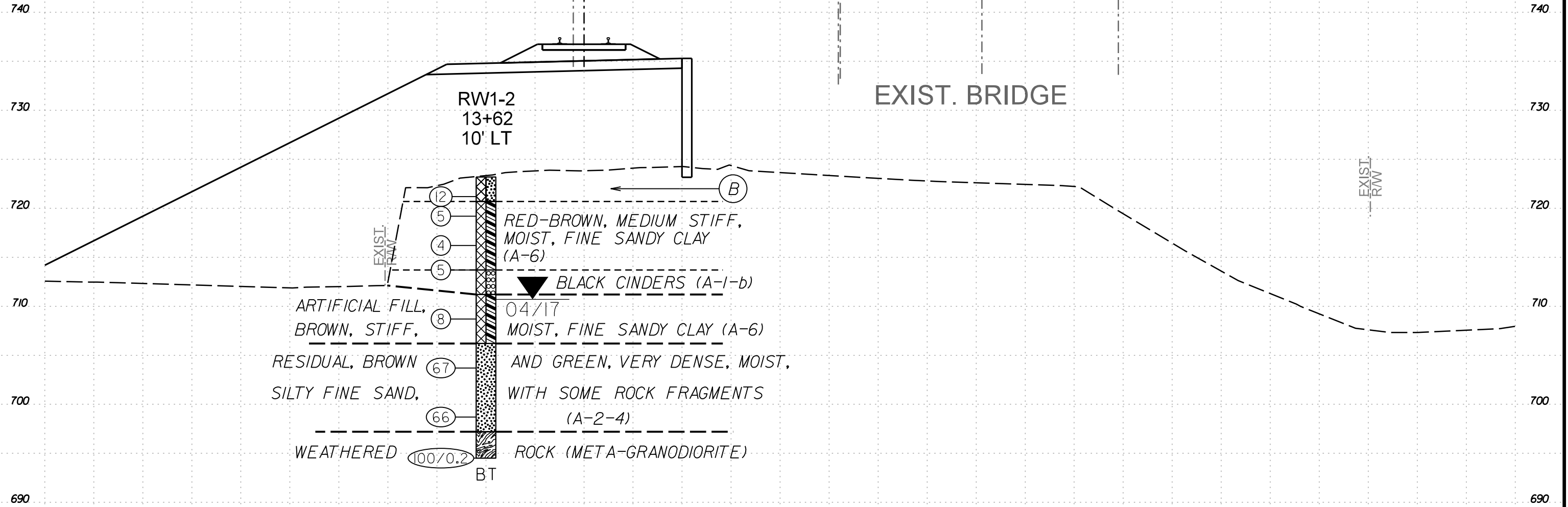
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PROJECT REFERENCE NO. P-5705B	SHEET NO. 12
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-S1-



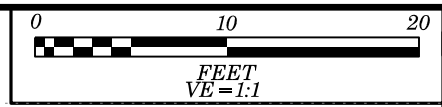
13 + 50

(B) RAILROAD EMBANKMENT, BROWN-GRAY, MEDIUM DENSE, MOIST, SILTY FINE SAND WITH SOME RAILROAD BALLAST STONE (A-2-4)

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 80 85 90 95

0012DEL_P28

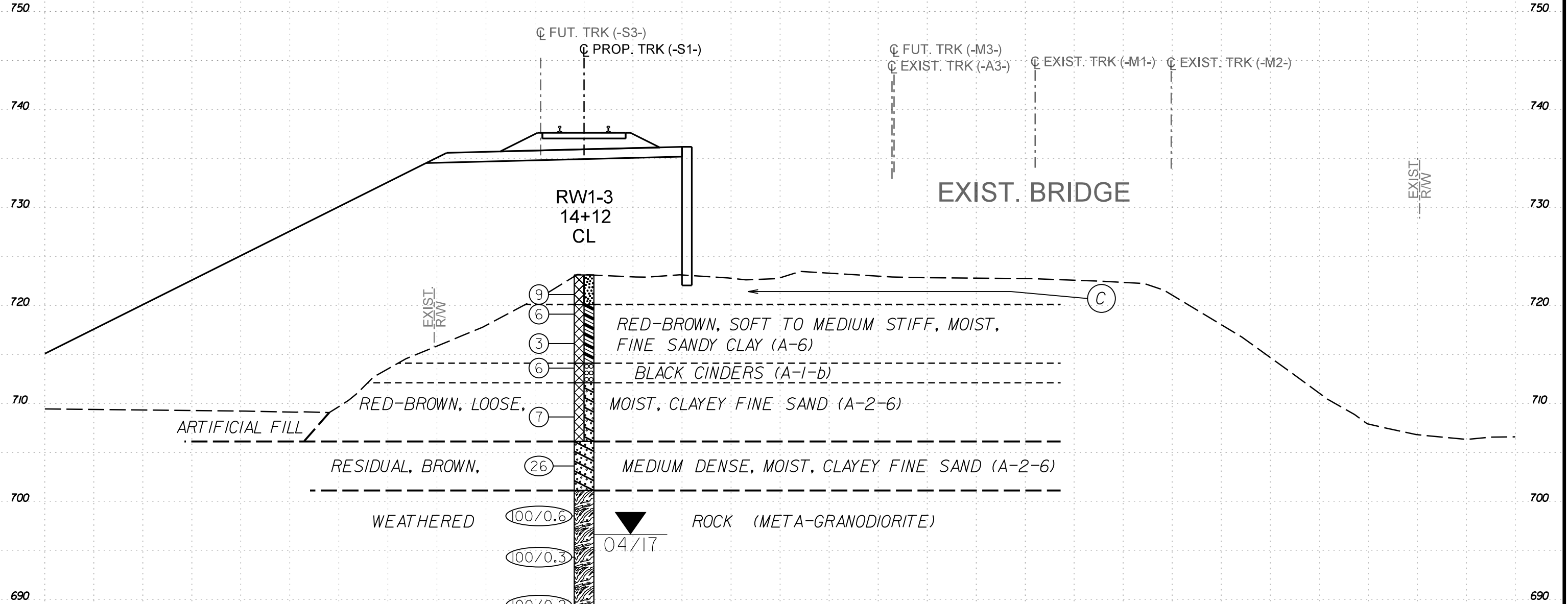
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PROJECT REFERENCE NO. P-5705B	SHEET NO. 13
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-S1-

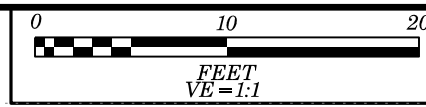


14+00

Ⓒ RAILROAD EMBANKMENT, BROWN-GRAY, LOOSE, MOIST, SILTY FINE SAND WITH SOME RAILROAD BALLAST (A-2-4)

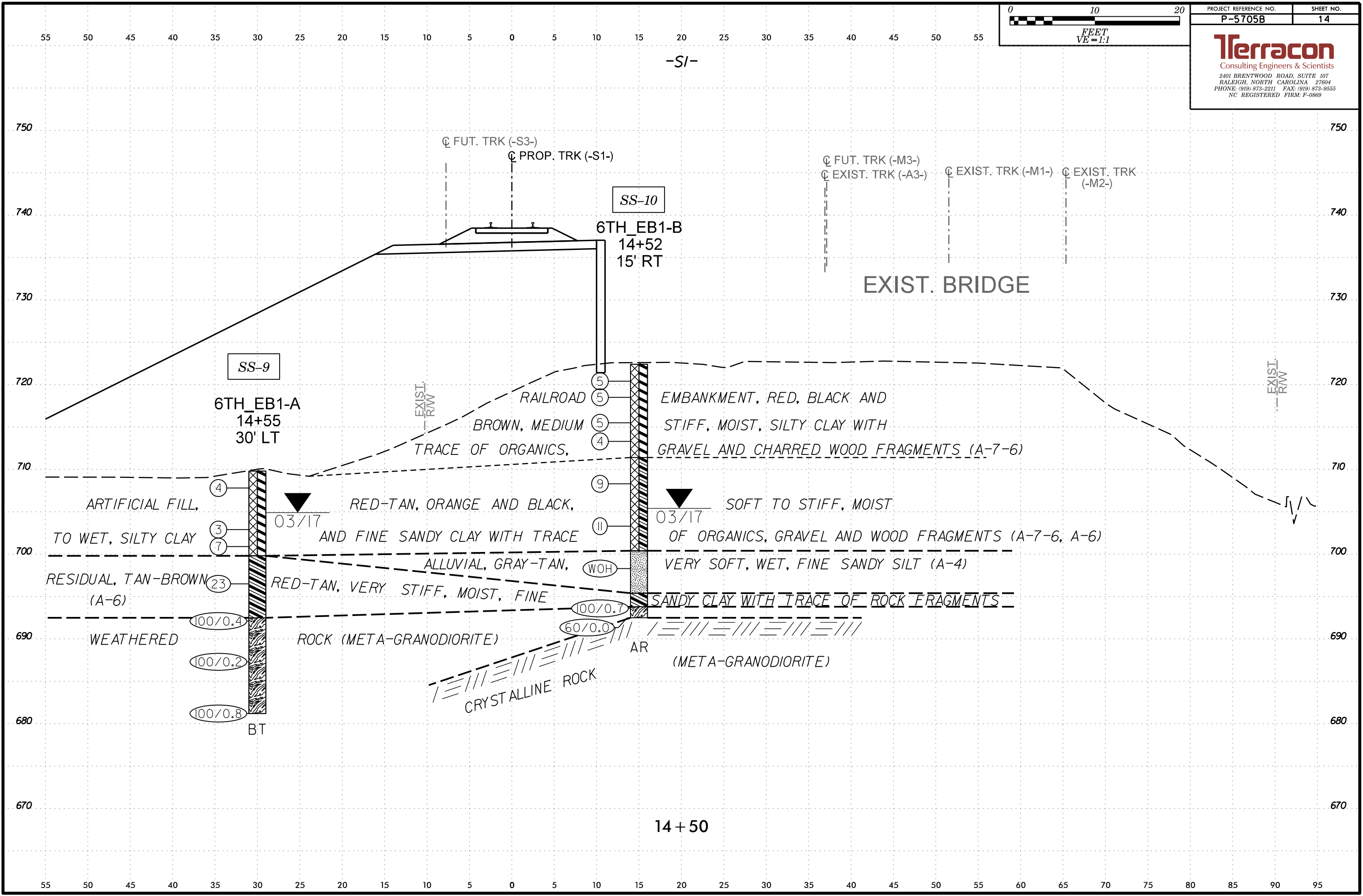
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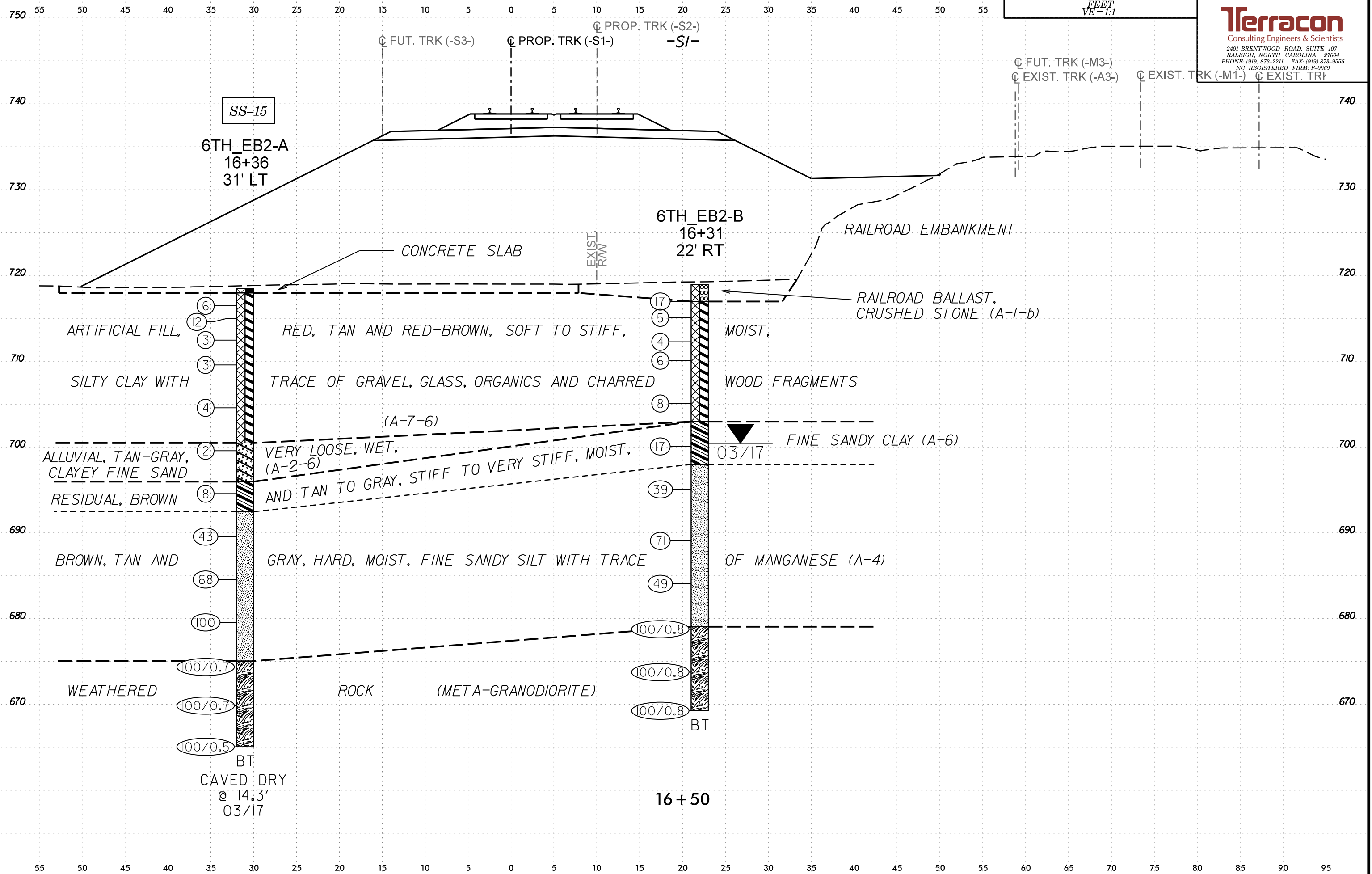
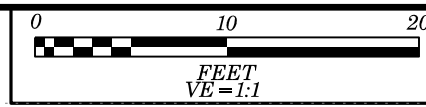
0012DEL_P28



PROJECT REFERENCE NO. P-5705B	SHEET NO. 14
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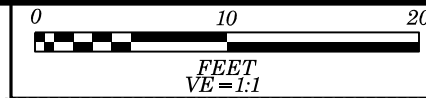
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0012DEL_P28

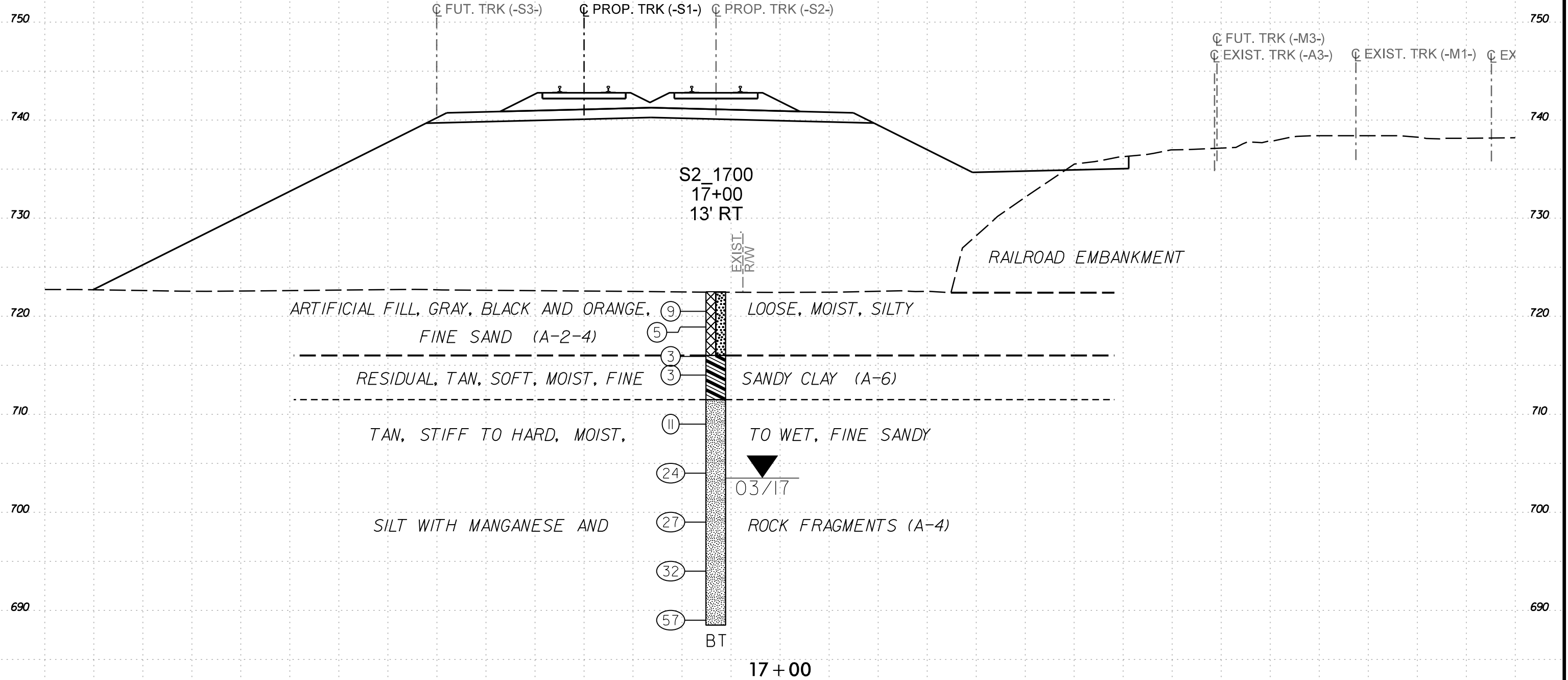
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PROJECT REFERENCE NO. P-5705B	SHEET NO. 16
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-S1-



S2_1700
17+00
13' RT

EXIST. R/W

RAILROAD EMBANKMENT

ARTIFICIAL FILL, GRAY, BLACK AND ORANGE,
FINE SAND (A-2-4)

9
5

LOOSE, MOIST, SILTY

RESIDUAL, TAN, SOFT, MOIST, FINE

3
3

SANDY CLAY (A-6)

TAN, STIFF TO HARD, MOIST,

11

TO WET, FINE SANDY

SILT WITH MANGANESE AND

24

03/17

27

ROCK FRAGMENTS (A-4)

32

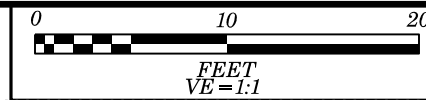
57

BT

17+00

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 80 85 90 95

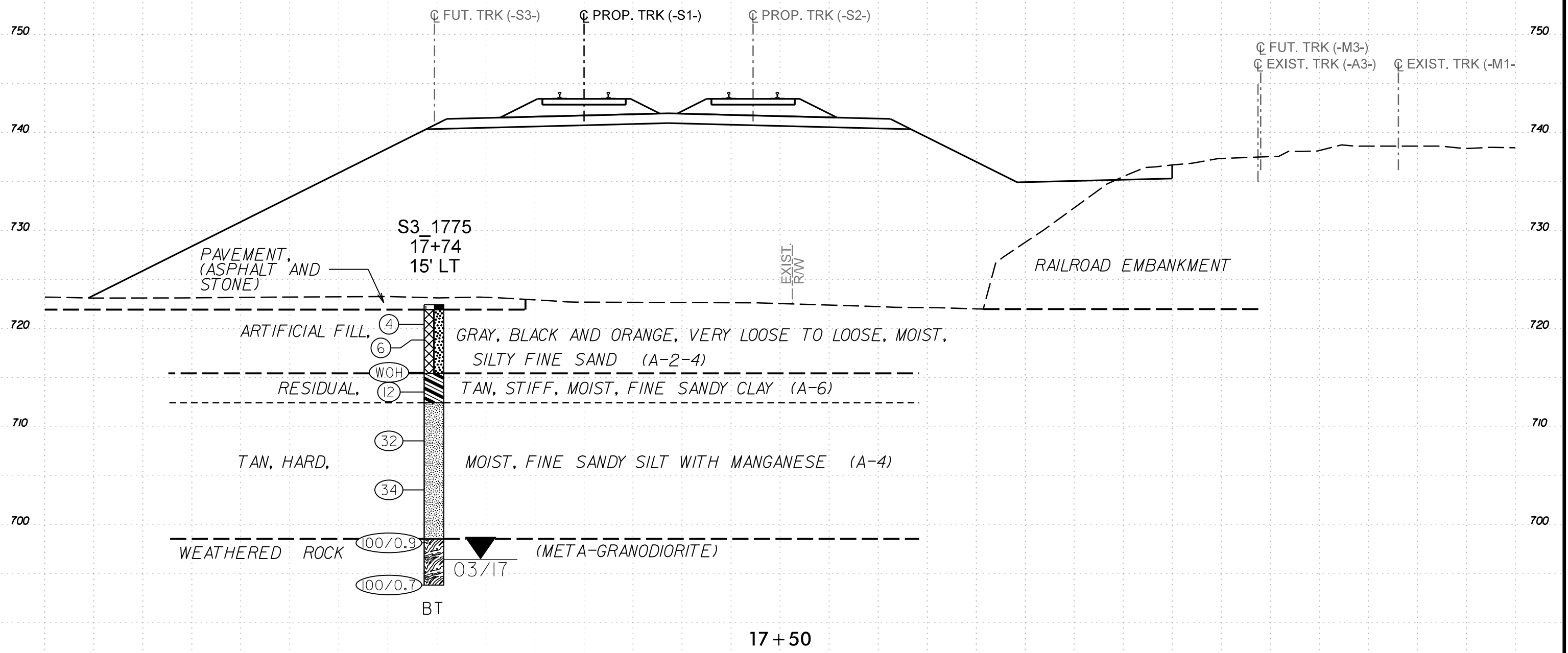
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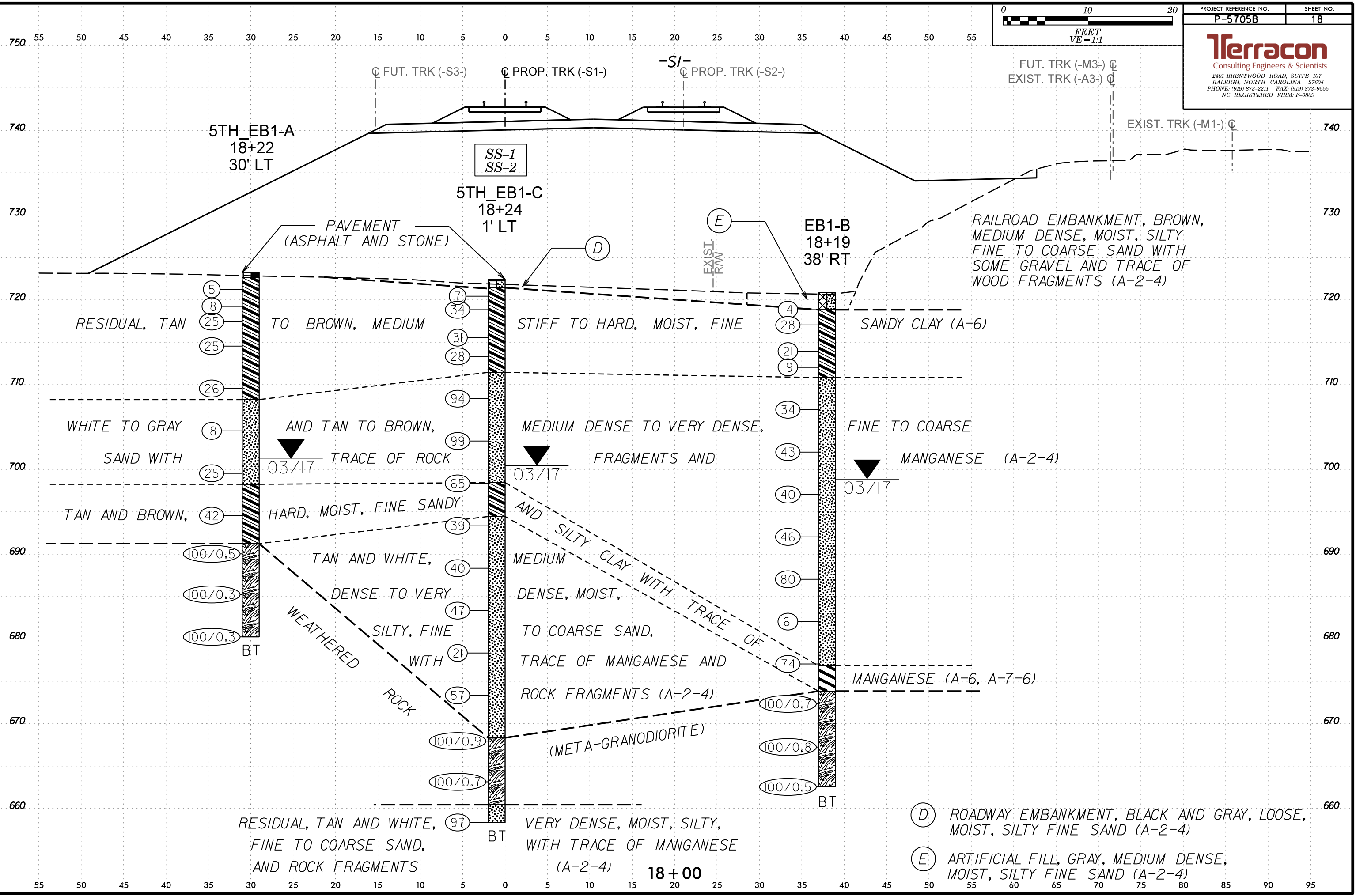
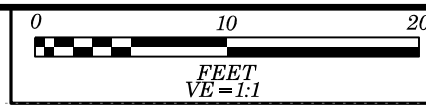


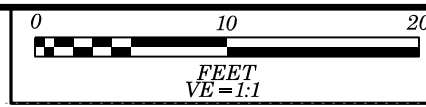
PROJECT REFERENCE NO. P-5705B	SHEET NO. 17
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-S1-

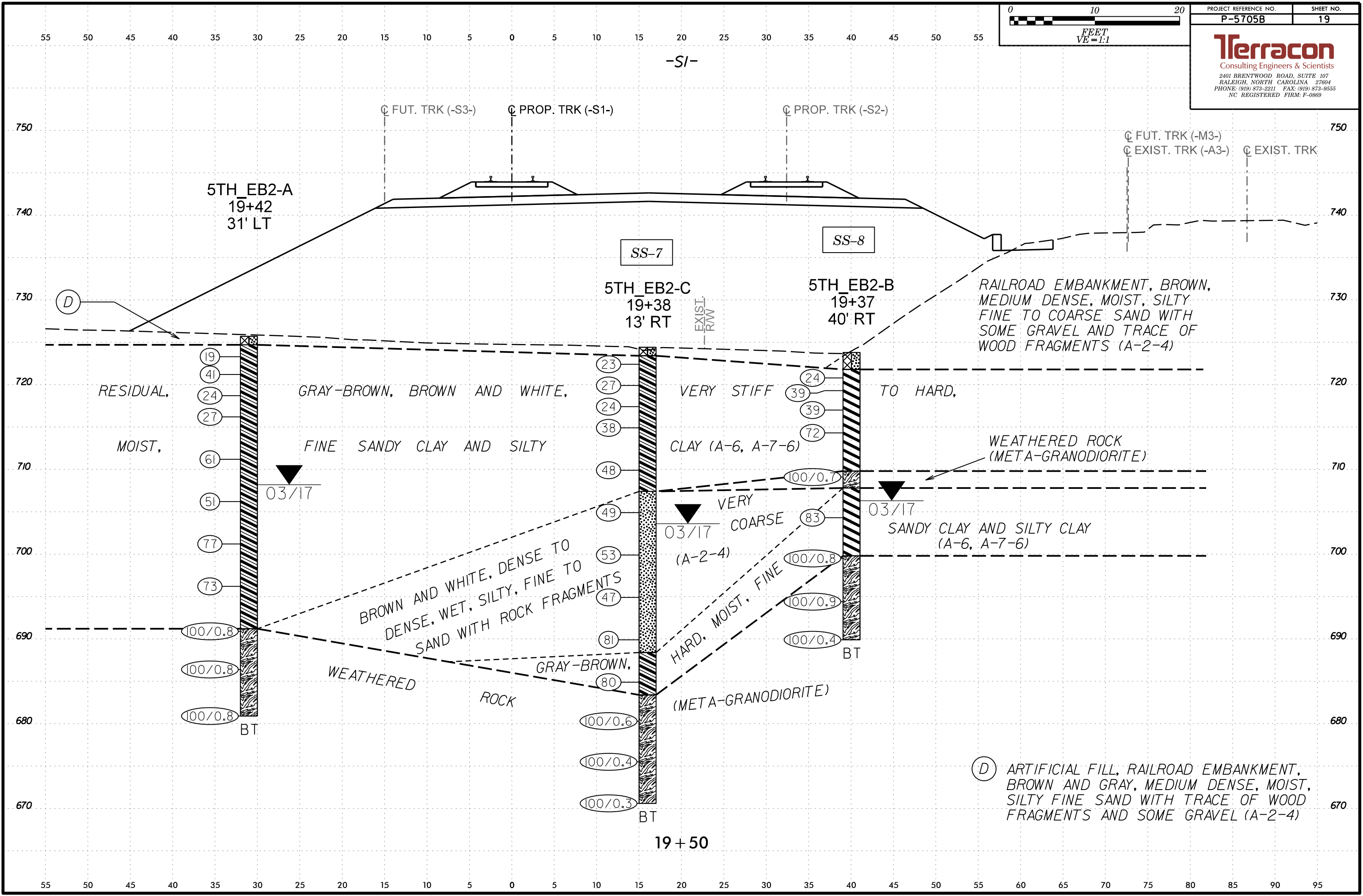






PROJECT REFERENCE NO. P-5705B	SHEET NO. 19
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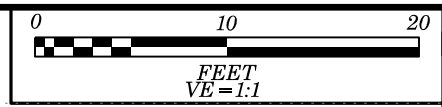
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(D) ARTIFICIAL FILL, RAILROAD EMBANKMENT, BROWN AND GRAY, MEDIUM DENSE, MOIST, SILTY FINE SAND WITH TRACE OF WOOD FRAGMENTS AND SOME GRAVEL (A-2-4)

0012DEL_P28

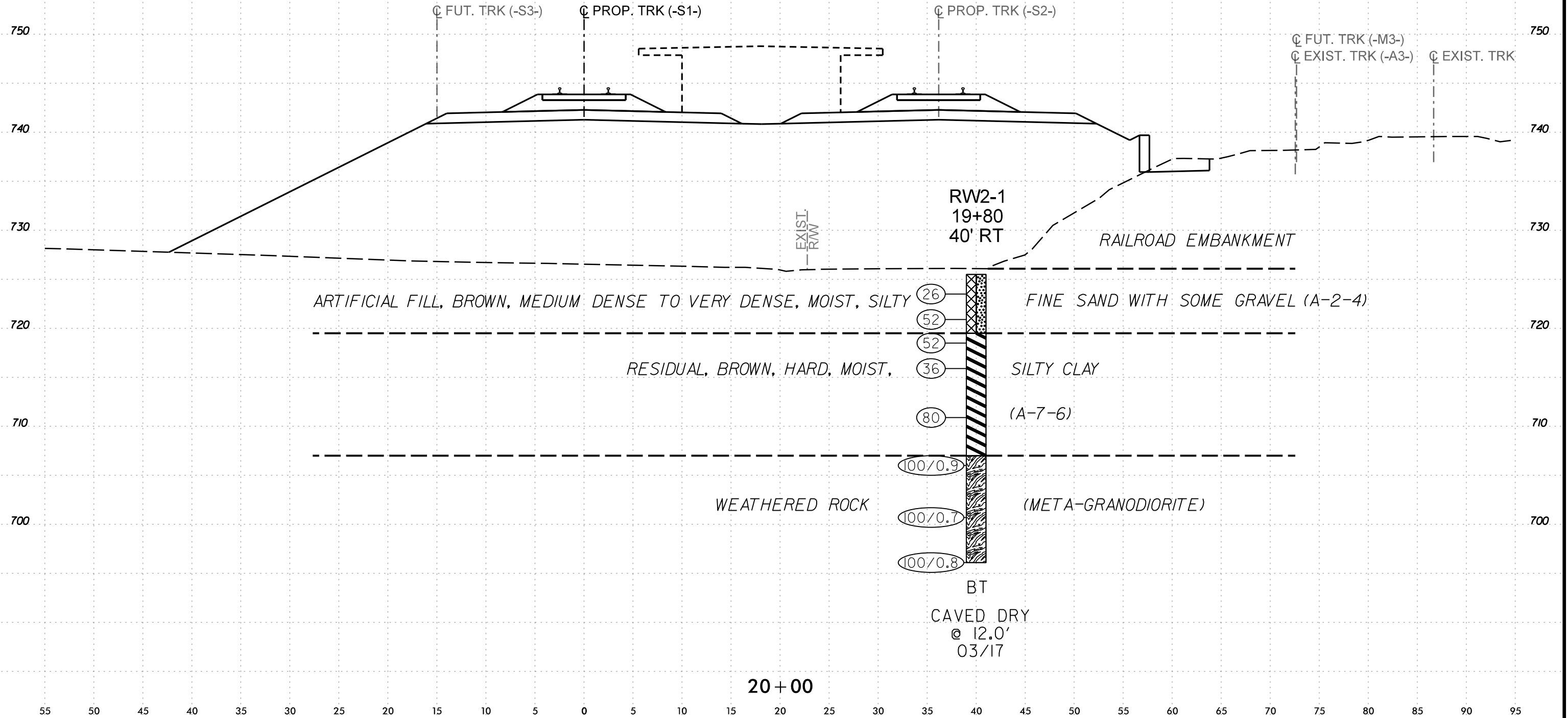
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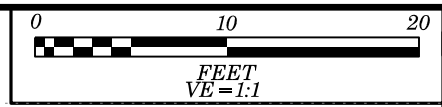
PROJECT REFERENCE NO. P-5705B	SHEET NO. 20
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-S1-



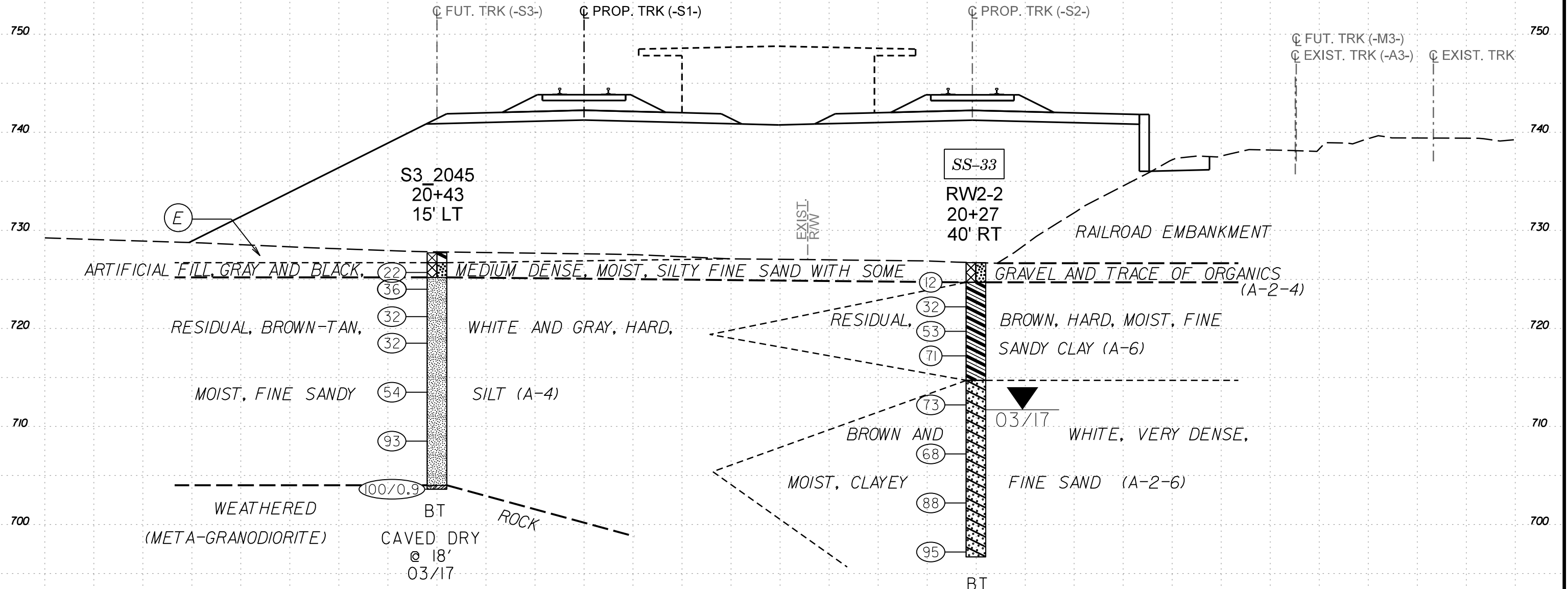
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PROJECT REFERENCE NO. P-5705B	SHEET NO. 21
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-S1-



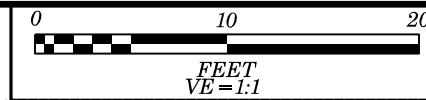
20 + 50

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 80 85 90 95

0012DEL_P28

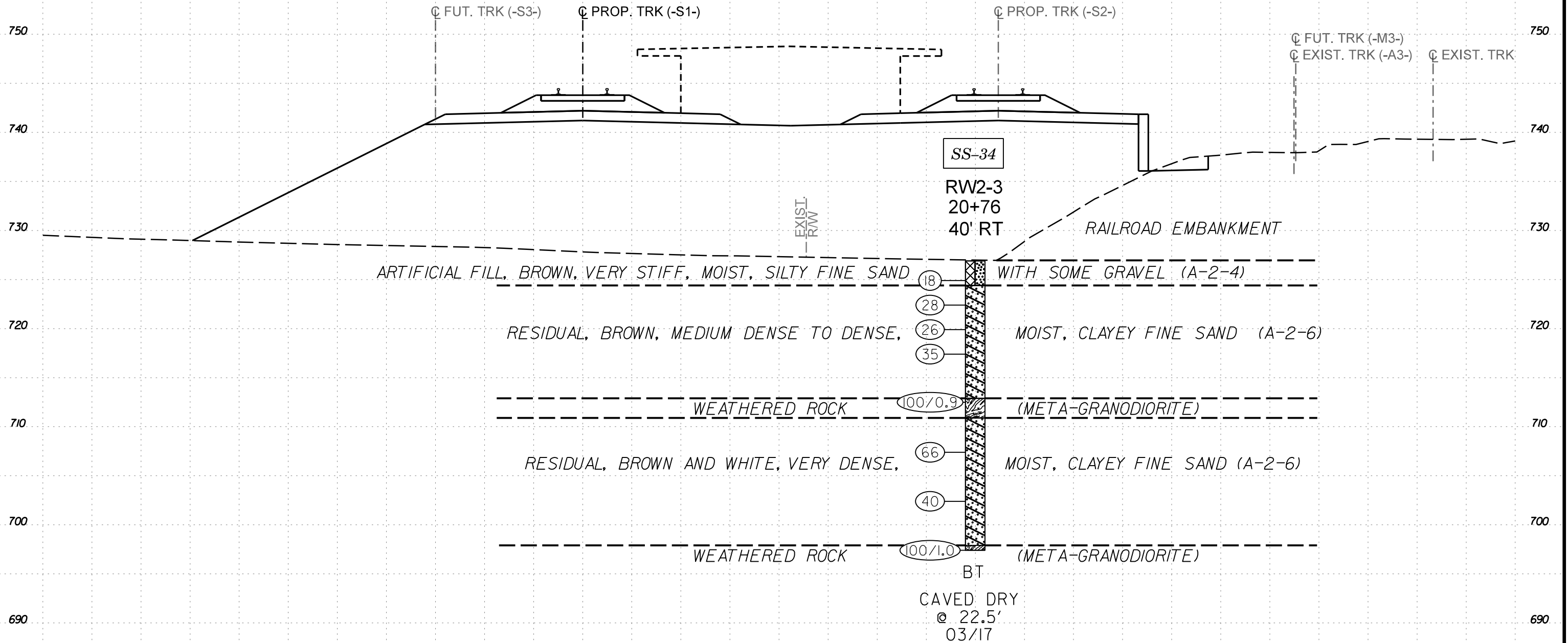
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-S1-



PROJECT REFERENCE NO. P-5705B	SHEET NO. 22
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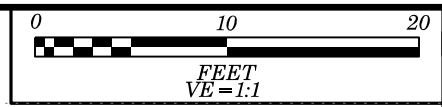
Terracon
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21 + 00

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 80 85 90 95

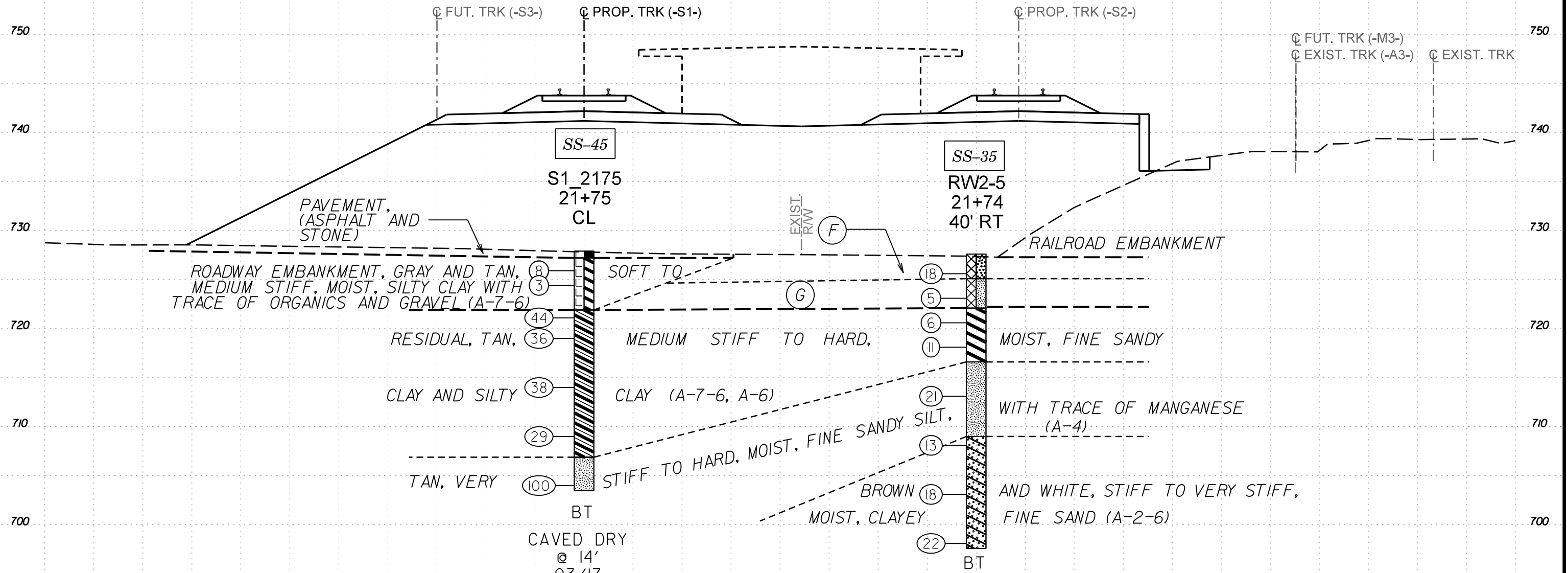
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PROJECT REFERENCE NO. P-5705B	SHEET NO. 23
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-S1-



- (F) ARTIFICIAL FILL, GRAY, MEDIUM DENSE, MOIST, SILTY FINE SAND WITH SOME GRAVEL (A-2-4)
- (G) ARTIFICIAL FILL, DARK BROWN, LOOSE, MOIST, FINE SANDY SILT (A-4)

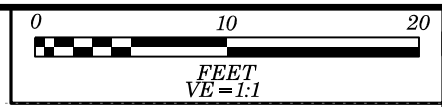
21+50

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 80 85 90 95

0012DEL_P28

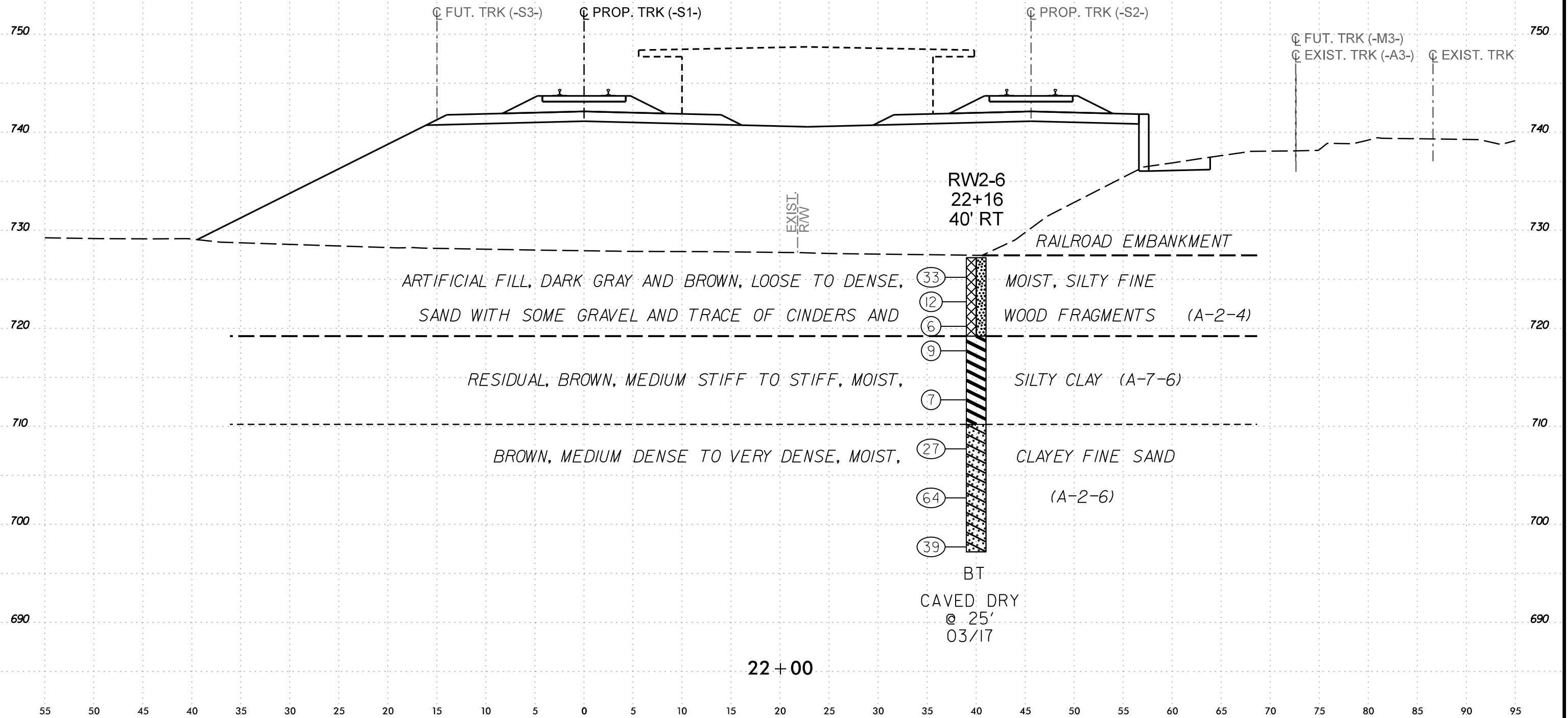
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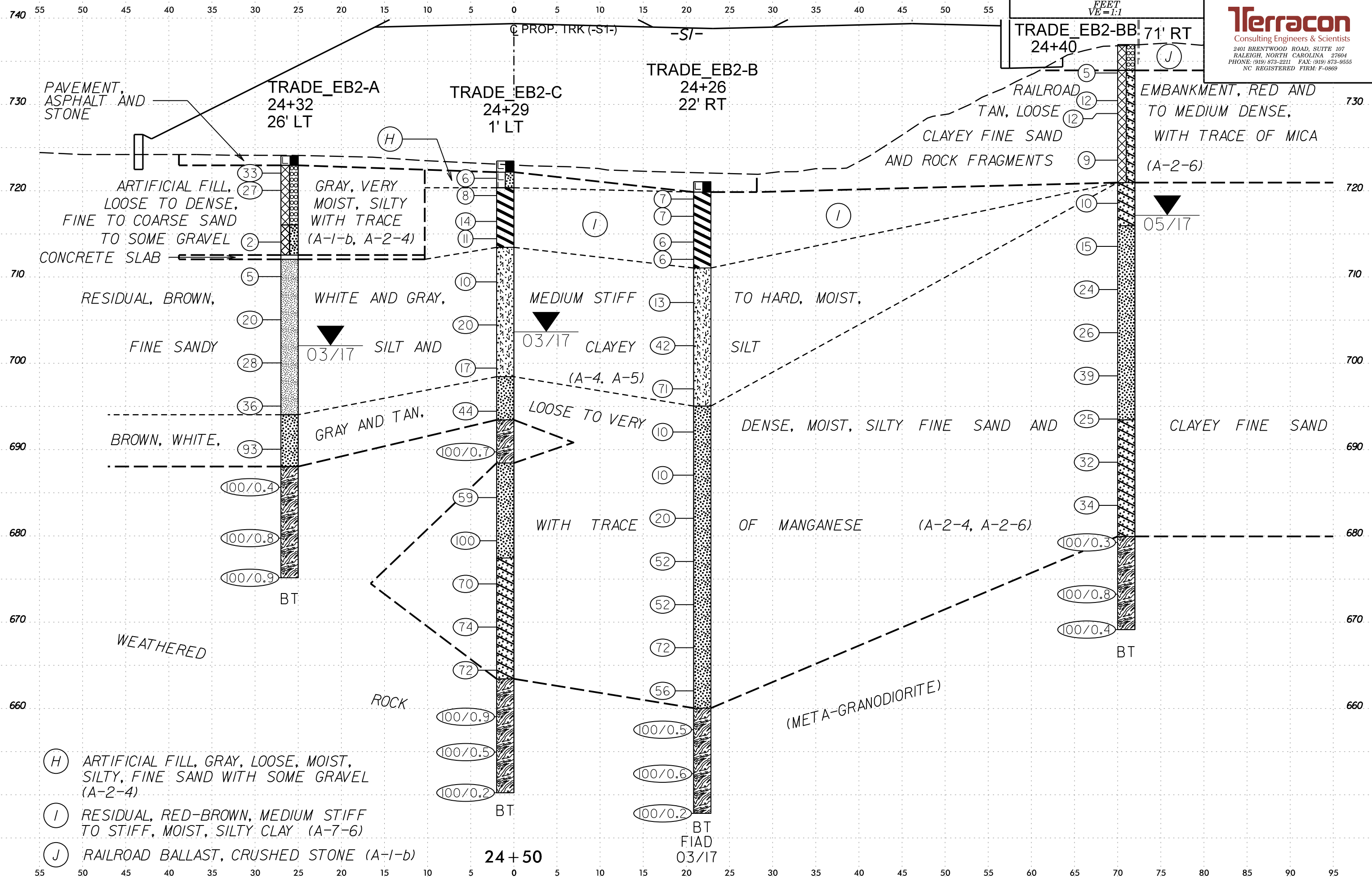
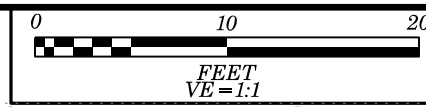
-S1-



PROJECT REFERENCE NO. P-5705B	SHEET NO. 24
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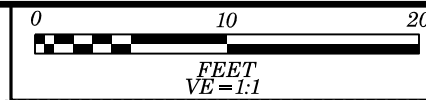
- (H) ARTIFICIAL FILL, GRAY, LOOSE, MOIST, SILTY, FINE SAND WITH SOME GRAVEL (A-2-4)
- (I) RESIDUAL, RED-BROWN, MEDIUM STIFF TO STIFF, MOIST, SILTY CLAY (A-7-6)
- (J) RAILROAD BALLAST, CRUSHED STONE (A-1-b)

24 + 50

BT
FIAD
03/17

0012DEL_P28

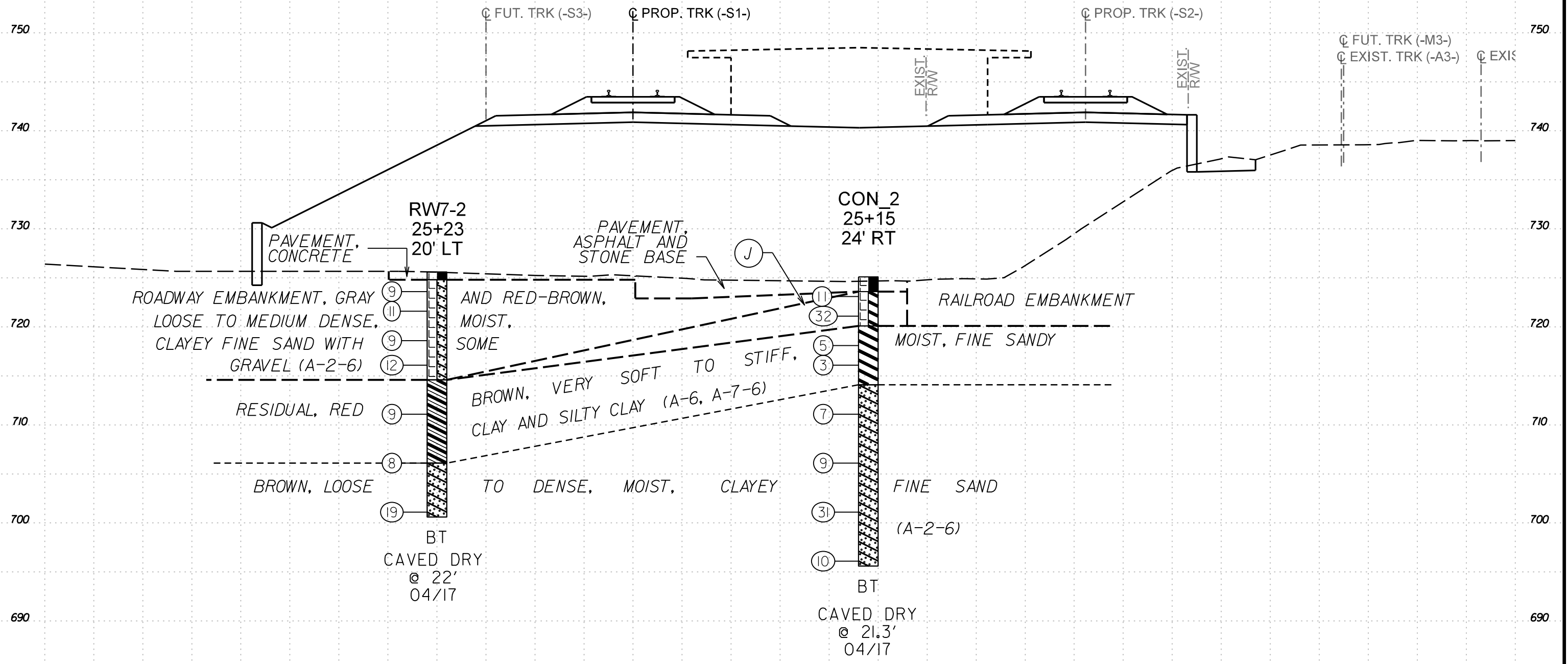
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PROJECT REFERENCE NO. P-5705B	SHEET NO. 27
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-S1-



25+00

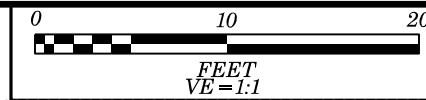
(J) ROADWAY EMBANKMENT, RED BROWN, STIFF TO HARD, MOIST, SILTY CLAY WITH SOME GRAVEL (A-7-6)

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 80 85 90

0012DEL_P28

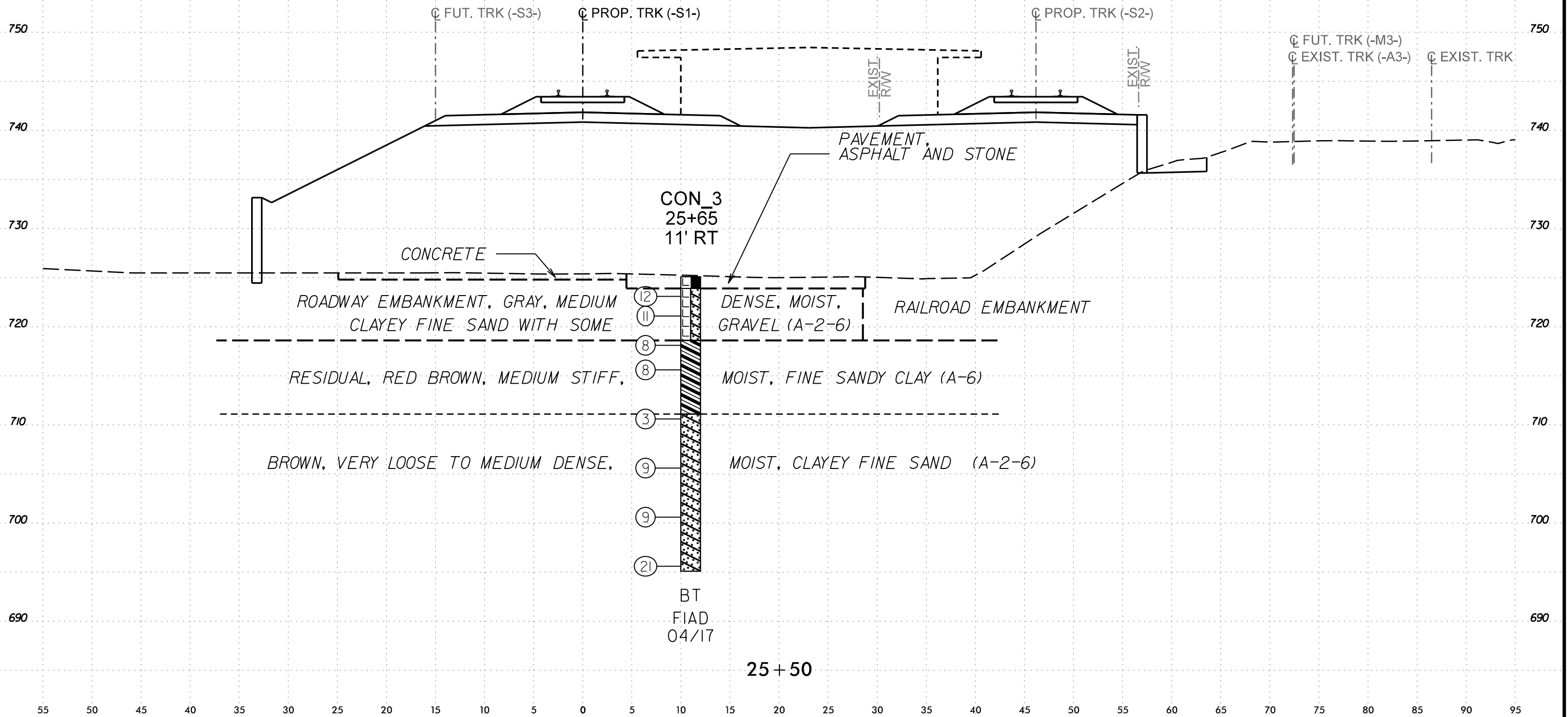
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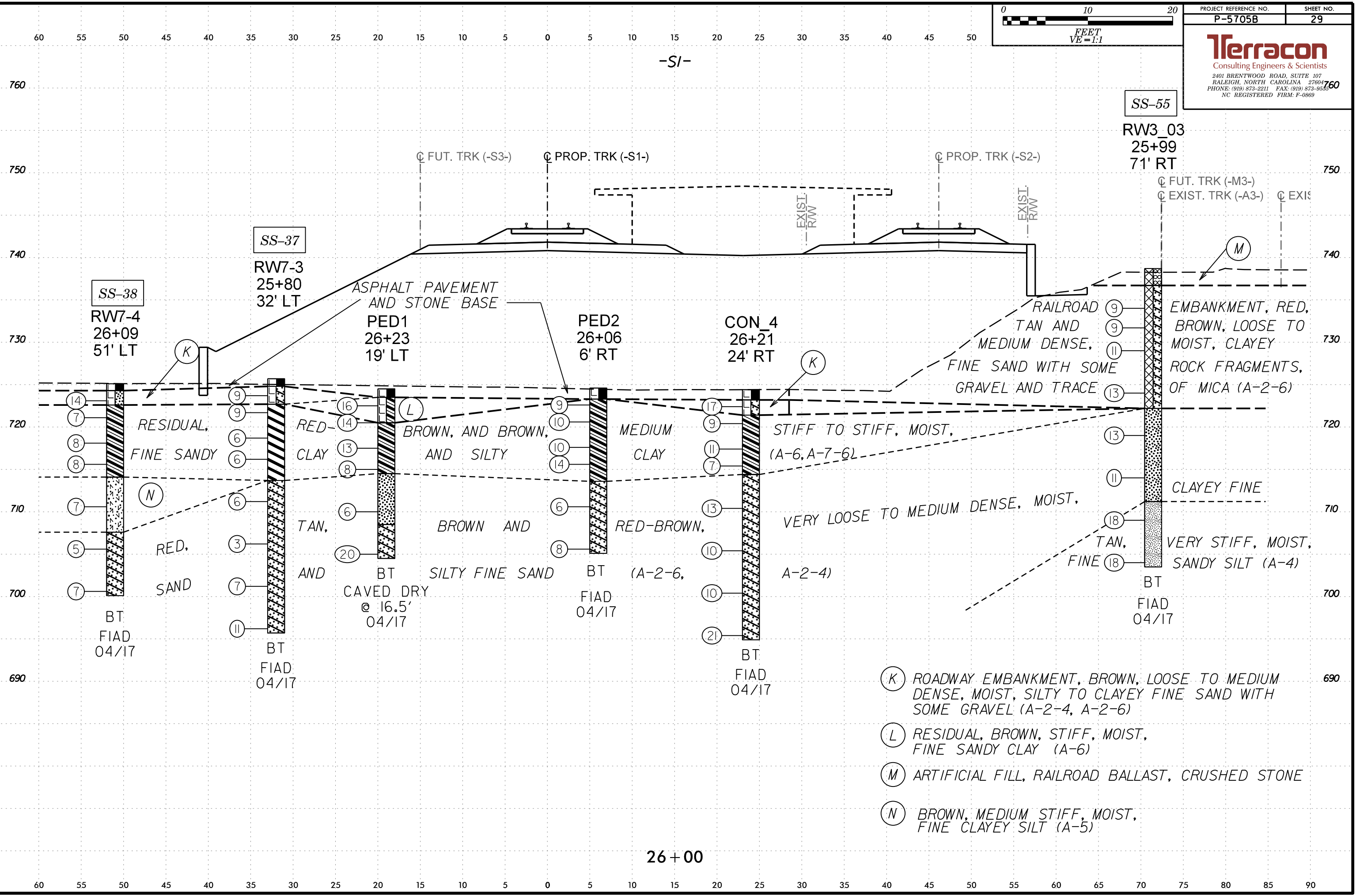
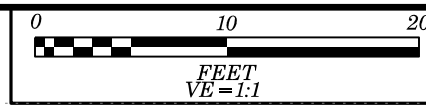
-S1-



PROJECT REFERENCE NO. P-5705B	SHEET NO. 28
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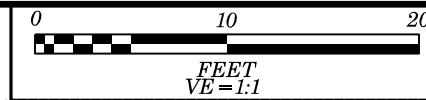
- (K) ROADWAY EMBANKMENT, BROWN, LOOSE TO MEDIUM DENSE, MOIST, SILTY TO CLAYEY FINE SAND WITH SOME GRAVEL (A-2-4, A-2-6)
- (L) RESIDUAL, BROWN, STIFF, MOIST, FINE SANDY CLAY (A-6)
- (M) ARTIFICIAL FILL, RAILROAD BALLAST, CRUSHED STONE
- (N) BROWN, MEDIUM STIFF, MOIST, FINE CLAYEY SILT (A-5)

26 + 00

0012DEL_P28

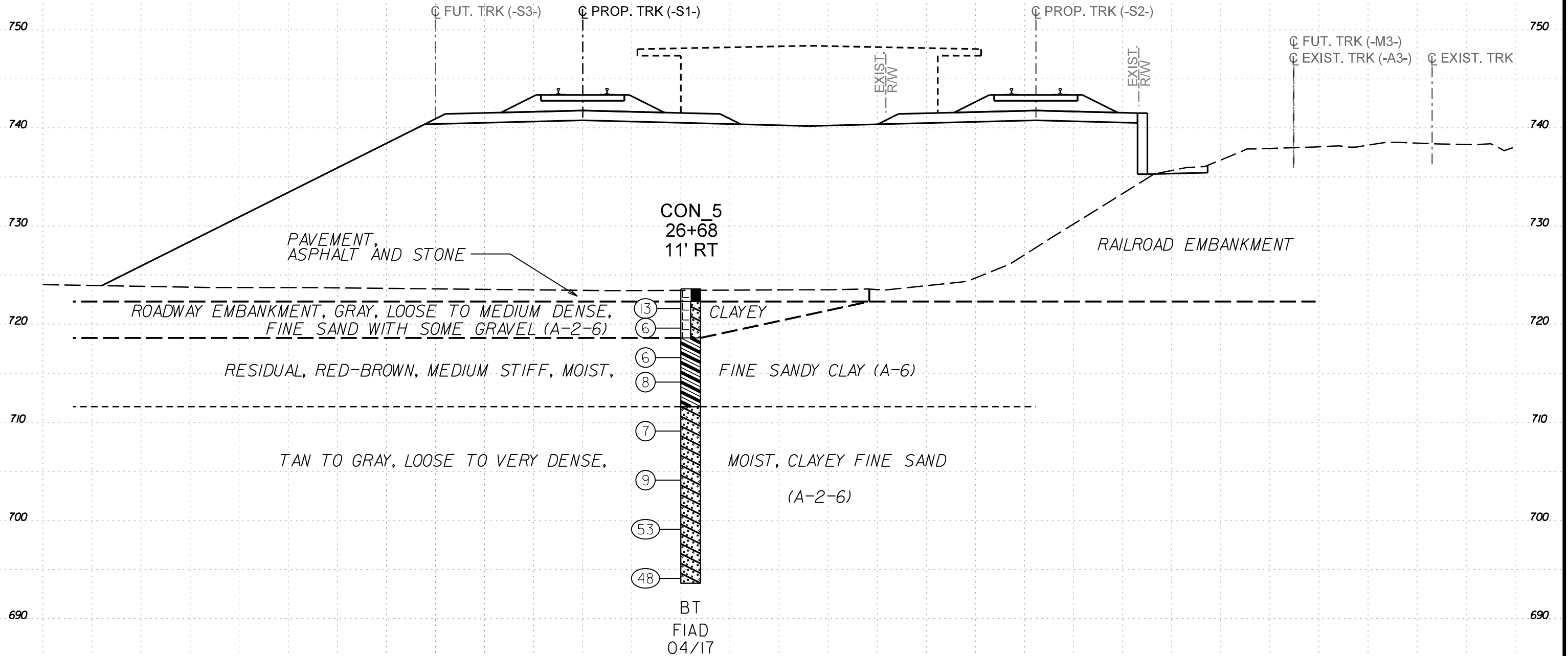
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-S/-



PROJECT REFERENCE NO. P-5705B	SHEET NO. 30
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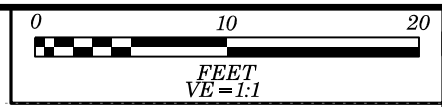
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55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

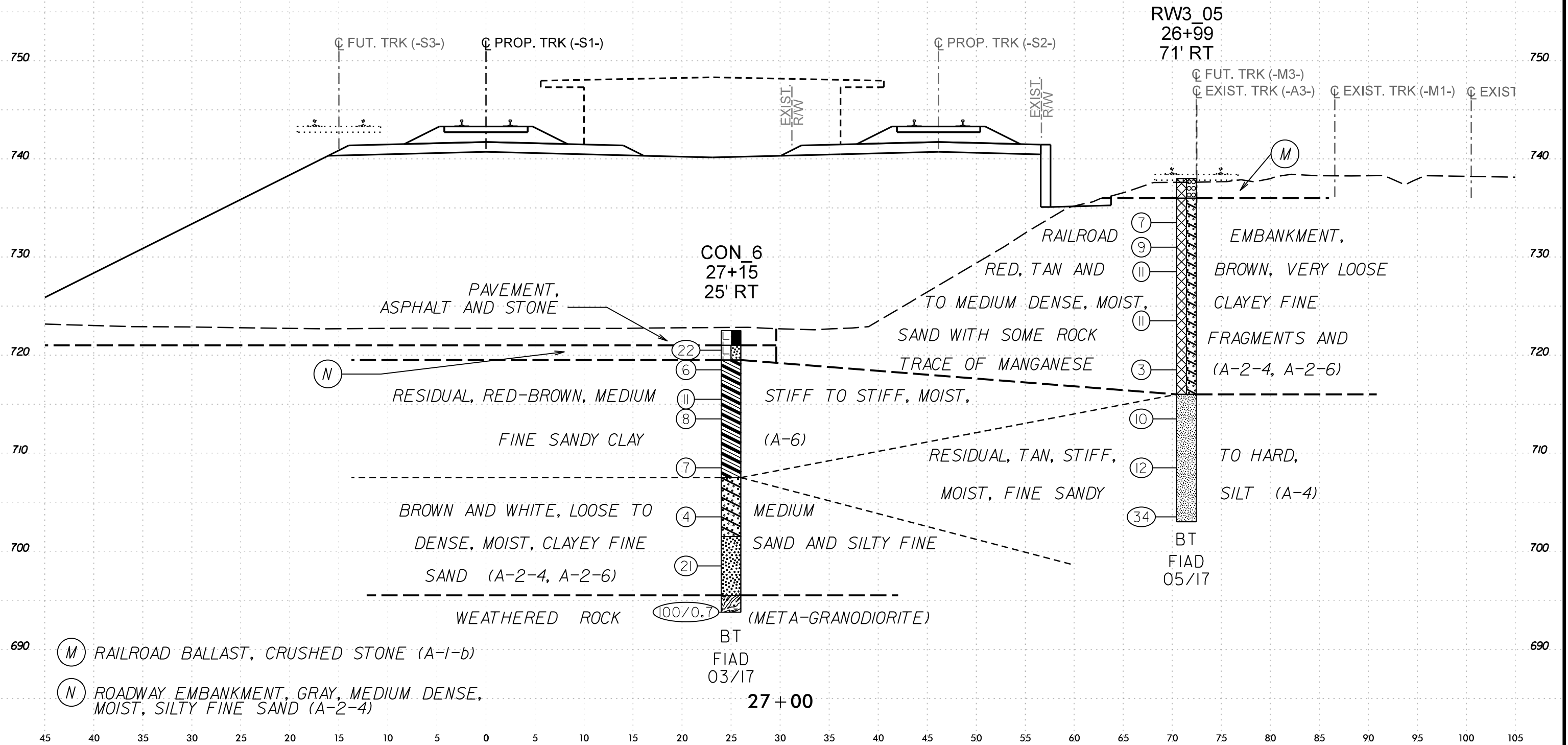
45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65

-S1-



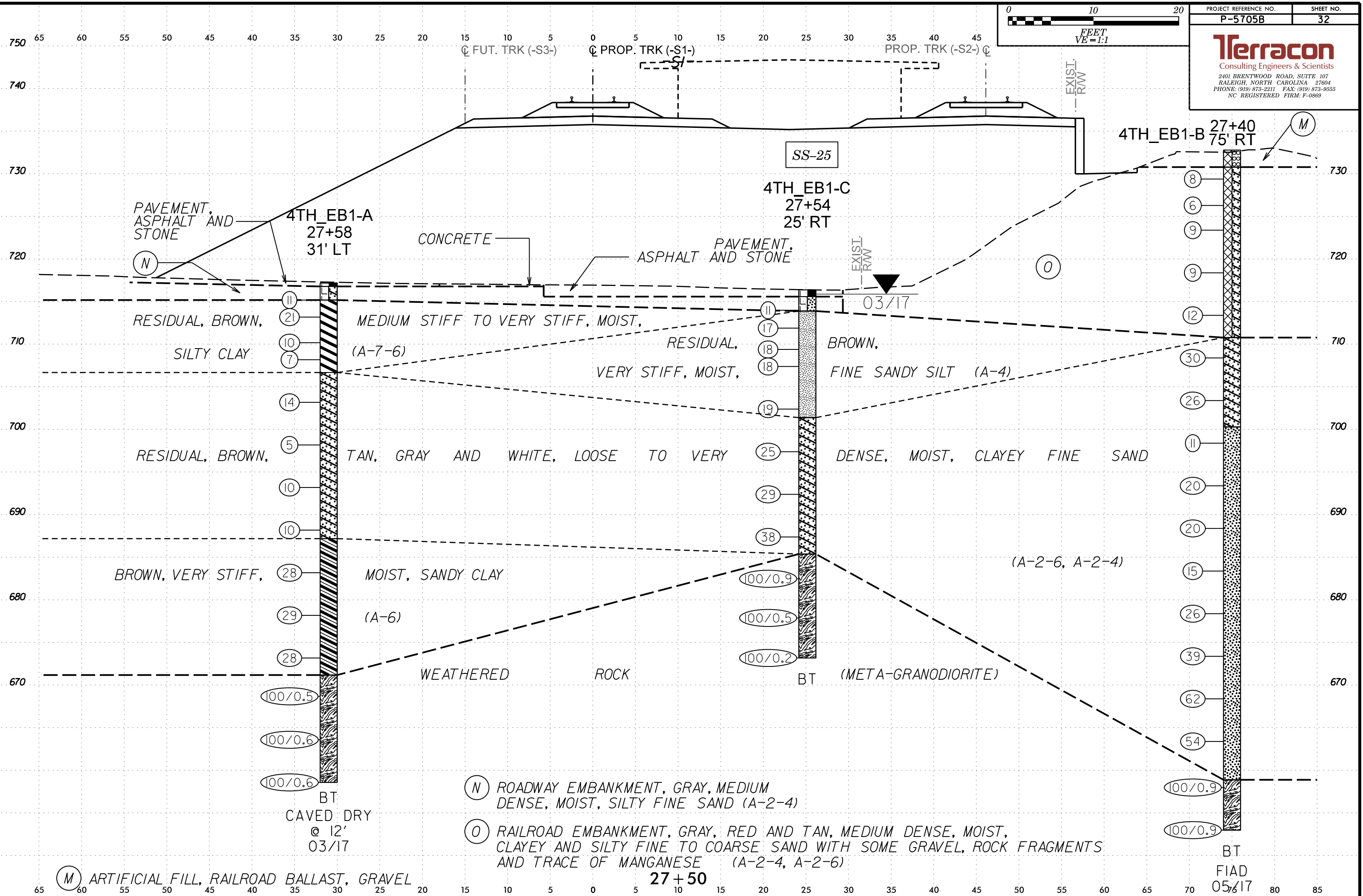
PROJECT REFERENCE NO. P-5705B	SHEET NO. 31
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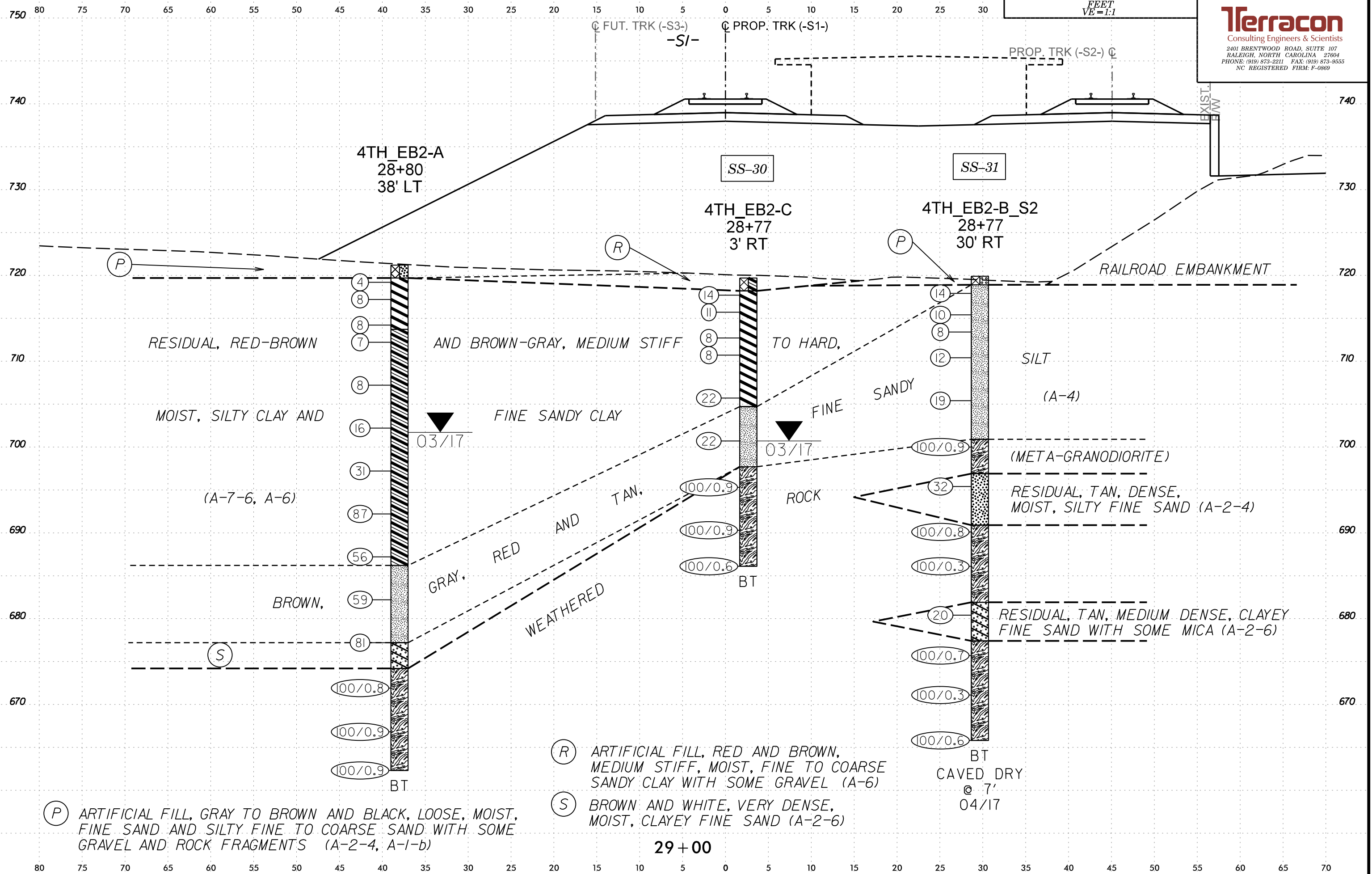
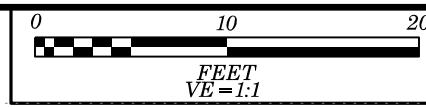
- (M) RAILROAD BALLAST, CRUSHED STONE (A-1-b)
- (N) ROADWAY EMBANKMENT, GRAY, MEDIUM DENSE, MOIST, SILTY FINE SAND (A-2-4)

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 80 85 90 95 100 105



- (N) ROADWAY EMBANKMENT, GRAY, MEDIUM DENSE, MOIST, SILTY FINE SAND (A-2-4)
- (O) RAILROAD EMBANKMENT, GRAY, RED AND TAN, MEDIUM DENSE, MOIST, CLAYEY AND SILTY FINE TO COARSE SAND WITH SOME GRAVEL, ROCK FRAGMENTS AND TRACE OF MANGANESE (A-2-4, A-2-6)

(M) ARTIFICIAL FILL, RAILROAD BALLAST, GRAVEL
 27+50



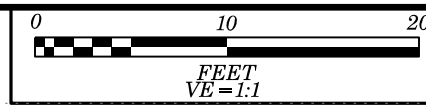
(P) ARTIFICIAL FILL, GRAY TO BROWN AND BLACK, LOOSE, MOIST, FINE SAND AND SILTY FINE TO COARSE SAND WITH SOME GRAVEL AND ROCK FRAGMENTS (A-2-4, A-1-b)

(R) ARTIFICIAL FILL, RED AND BROWN, MEDIUM STIFF, MOIST, FINE TO COARSE SANDY CLAY WITH SOME GRAVEL (A-6)

(S) BROWN AND WHITE, VERY DENSE, MOIST, CLAYEY FINE SAND (A-2-6)

29+00

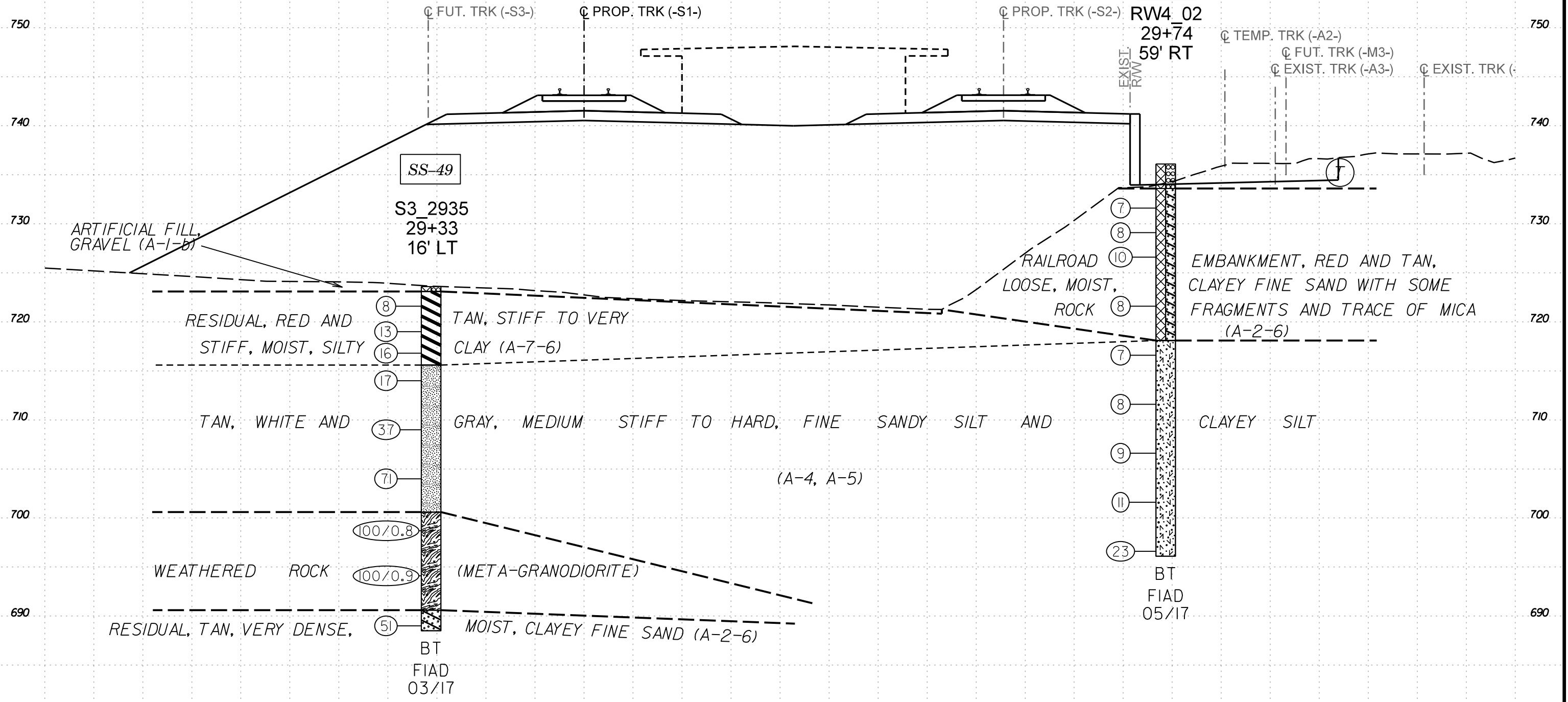
55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55



PROJECT REFERENCE NO. P-5705B	SHEET NO. 34
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Terracon
Consulting Engineers & Scientists
2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: P-0869

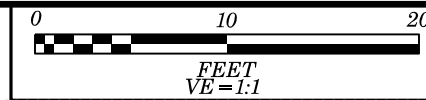
-S/-



29 + 50

(T) RAILROAD BALLAST, CRUSHED STONE (A-1-b)

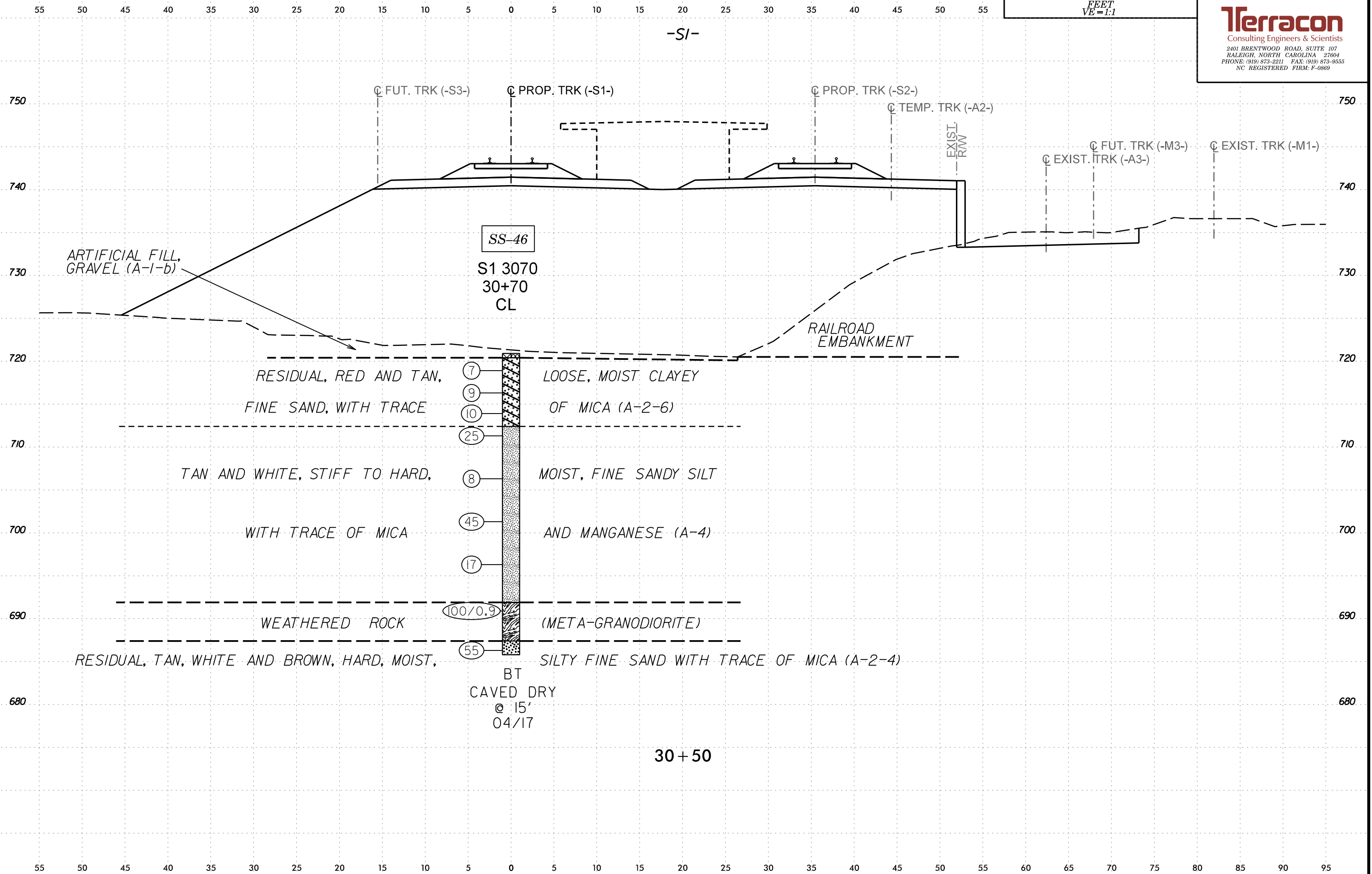
55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95



PROJECT REFERENCE NO. P-5705B	SHEET NO. 35
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Consulting Engineers & Scientists
2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: P-0869

-S/-



SS-46

S1 3070
30+70
CL

- 7
- 9
- 10
- 25
- 8
- 45
- 17
- 100/0.9
- 55

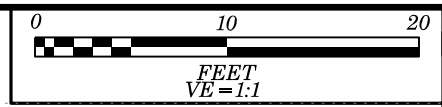
BT
CAVED DRY
@ 15'
04/17

30 + 50

0012DEL_P28

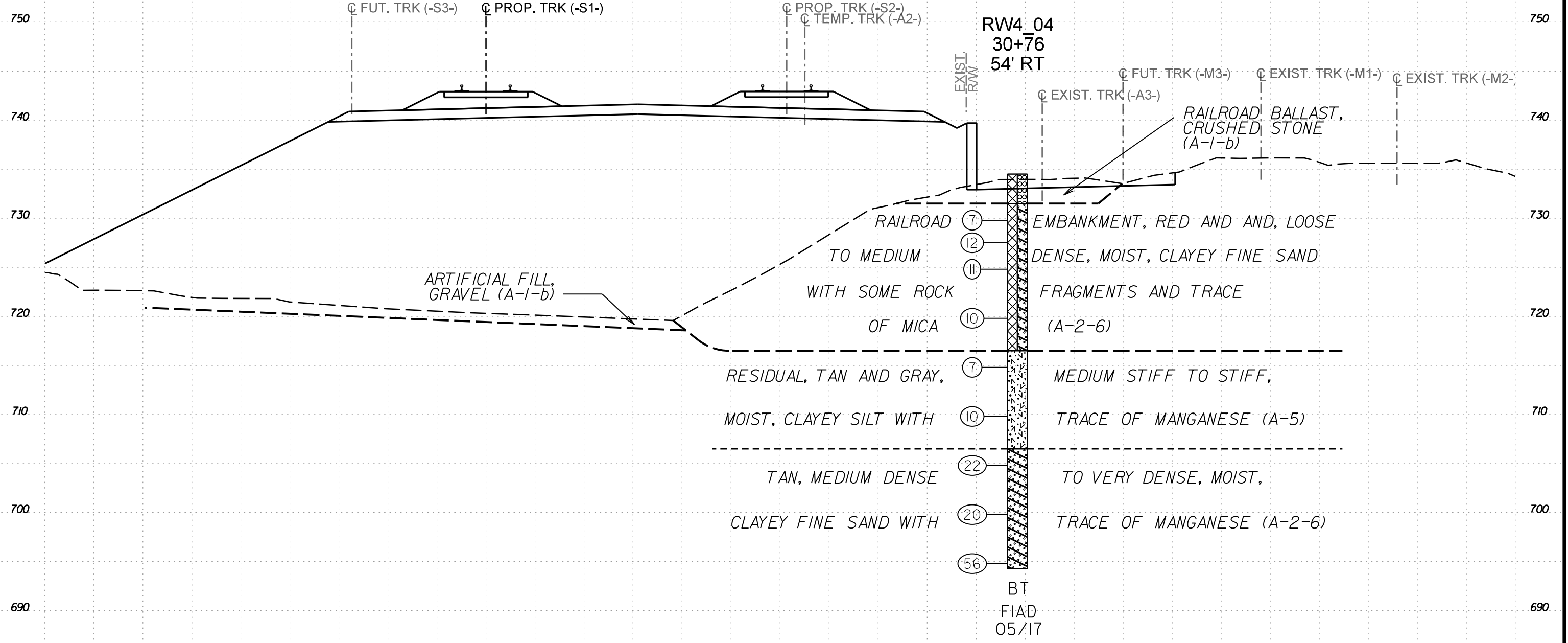
45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65

-S1-



PROJECT REFERENCE NO. P-5705B	SHEET NO. 36
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RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: P-0869

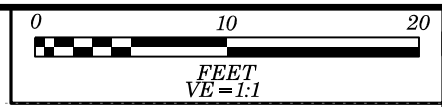


31+00

0012DEL_P28

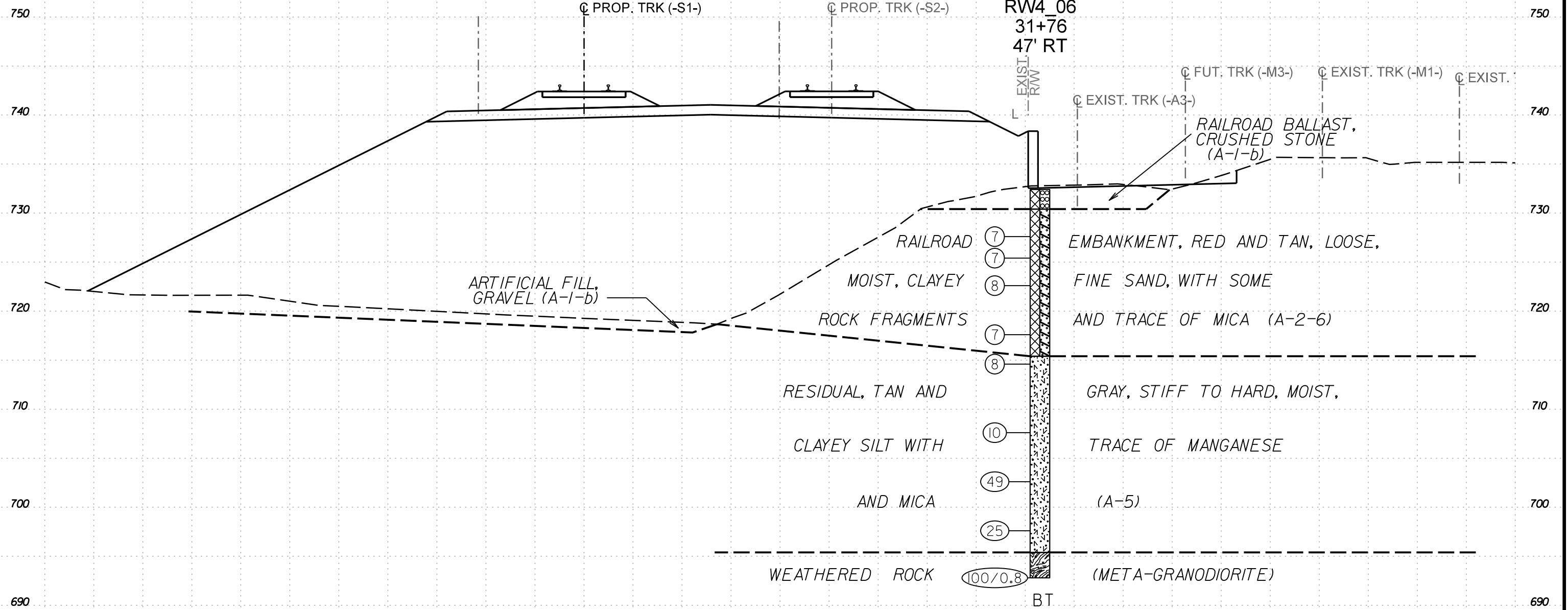
55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55

-S/-



PROJECT REFERENCE NO. P-5705B	SHEET NO. 37
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Consulting Engineers & Scientists
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RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: P-0869



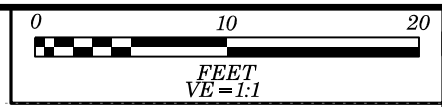
SS-57
RW4_06
31+76
47' RT

31 + 50

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 80 85 90 95

0012DEL_P28

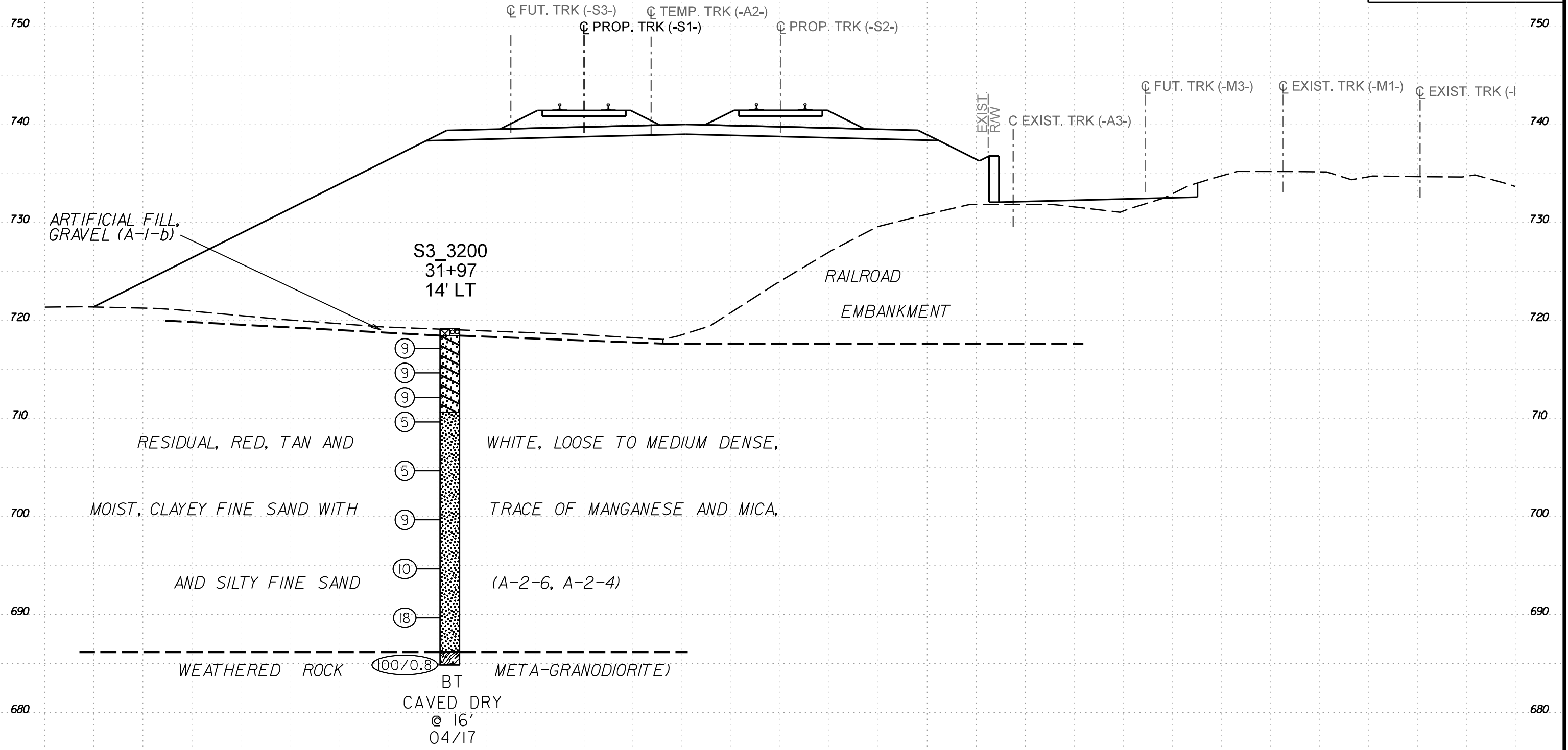
55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55



PROJECT REFERENCE NO. P-5705B	SHEET NO. 38
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Terracon
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RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: P-0869

-S/-

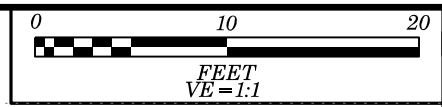


32 + 00

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 80 85 90 95

0012DEL_P28

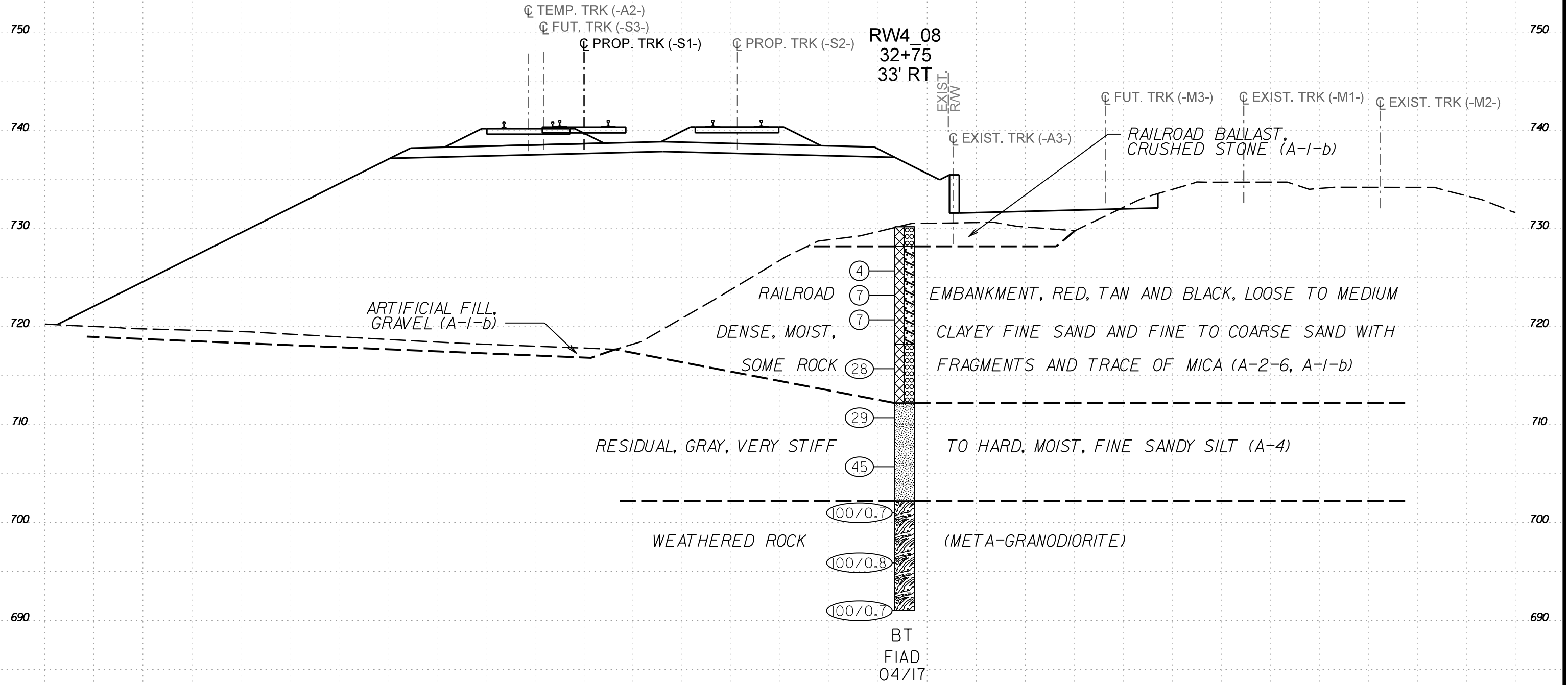
55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55



PROJECT REFERENCE NO. P-5705B	SHEET NO. 39
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Consulting Engineers & Scientists
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RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: P-0869

-S/-

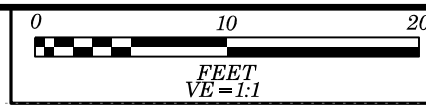


RW4_08
32+75
33' RT

32 + 50

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 80 85 90 95

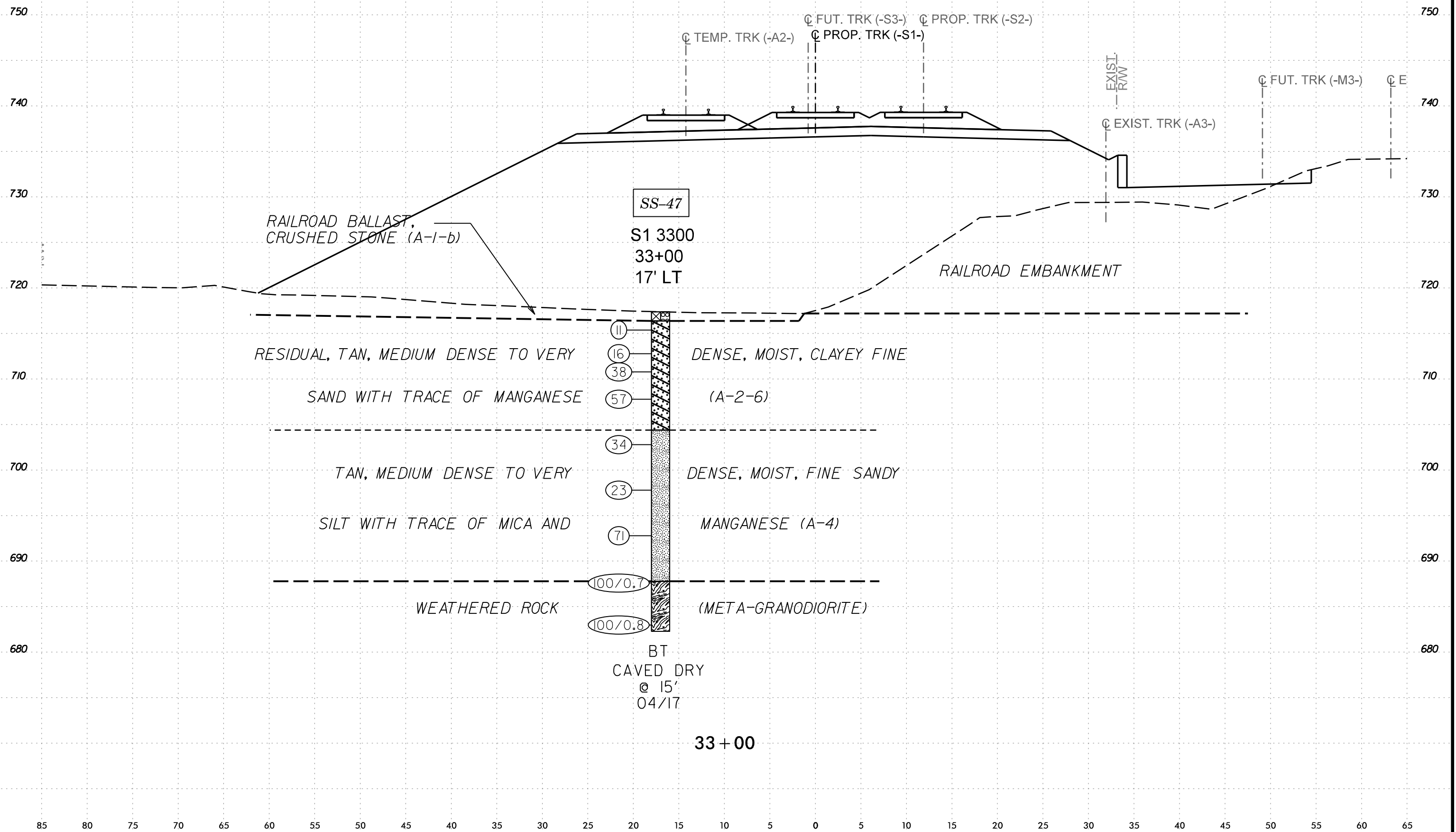
85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25



PROJECT REFERENCE NO. P-5705B	SHEET NO. 40
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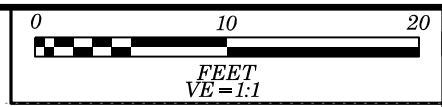
Terracon
Consulting Engineers & Scientists
2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: P-0869

-S/-



85 80 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

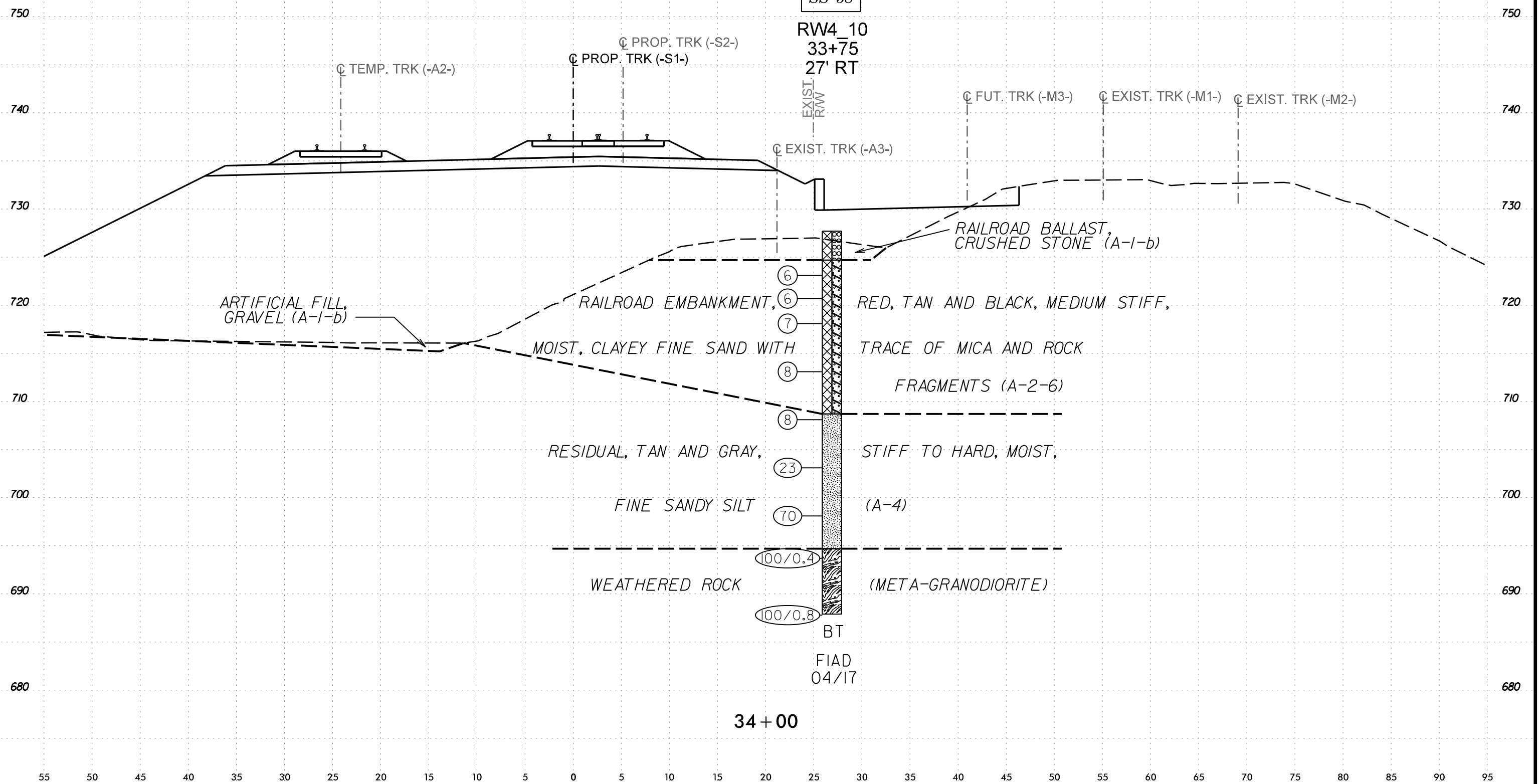
55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55



PROJECT REFERENCE NO. P-5705B	SHEET NO. 41
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RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: P-0869

-S1-



SS-58

RW4 10
33+75
27' RT

EXIST. RAW

EXIST. TRK (-A3-)

FUT. TRK (-M3-)

EXIST. TRK (-M1-)

EXIST. TRK (-M2-)

RAILROAD BALLAST,
CRUSHED STONE (A-1-b)

ARTIFICIAL FILL,
GRAVEL (A-1-b)

RAILROAD EMBANKMENT,

RED, TAN AND BLACK, MEDIUM STIFF,

MOIST, CLAYEY FINE SAND WITH

TRACE OF MICA AND ROCK

FRAGMENTS (A-2-6)

RESIDUAL, TAN AND GRAY,

STIFF TO HARD, MOIST,

FINE SANDY SILT

(A-4)

WEATHERED ROCK

(META-GRANODIORITE)

BT

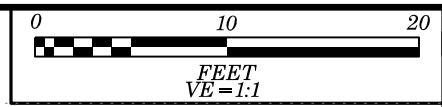
FIAD
04/17

34+00

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 80 85 90 95

0012DEL_P28

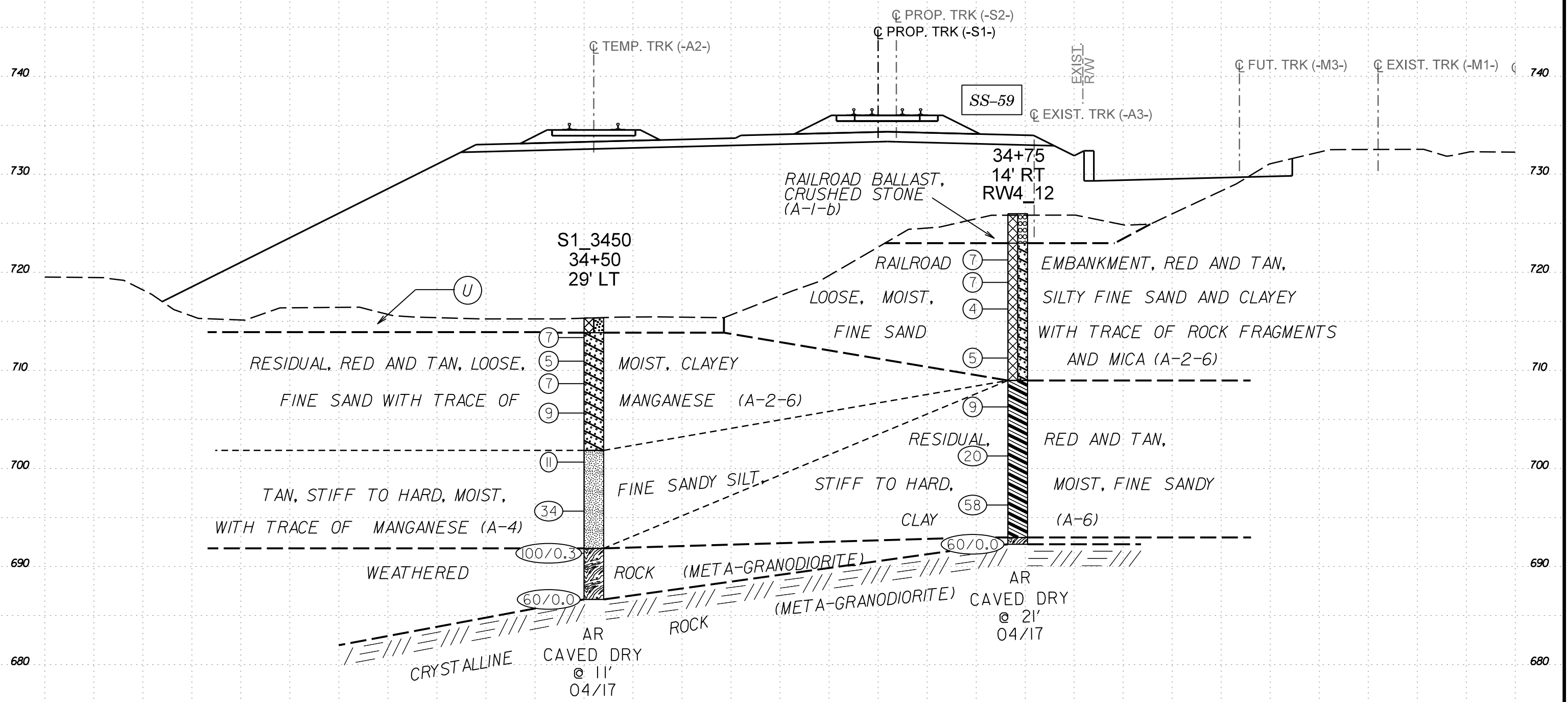
85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25



PROJECT REFERENCE NO. P-5705B	SHEET NO. 42
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RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: P-0869

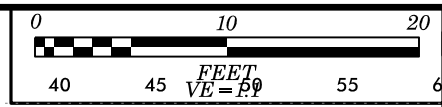
-S/-



(U) ARTIFICIAL FILL, BLACK, LOOSE, MOIST, SILTY FINE SAND WITH TRACE OF ROCK FRAGMENTS (A-2-4)

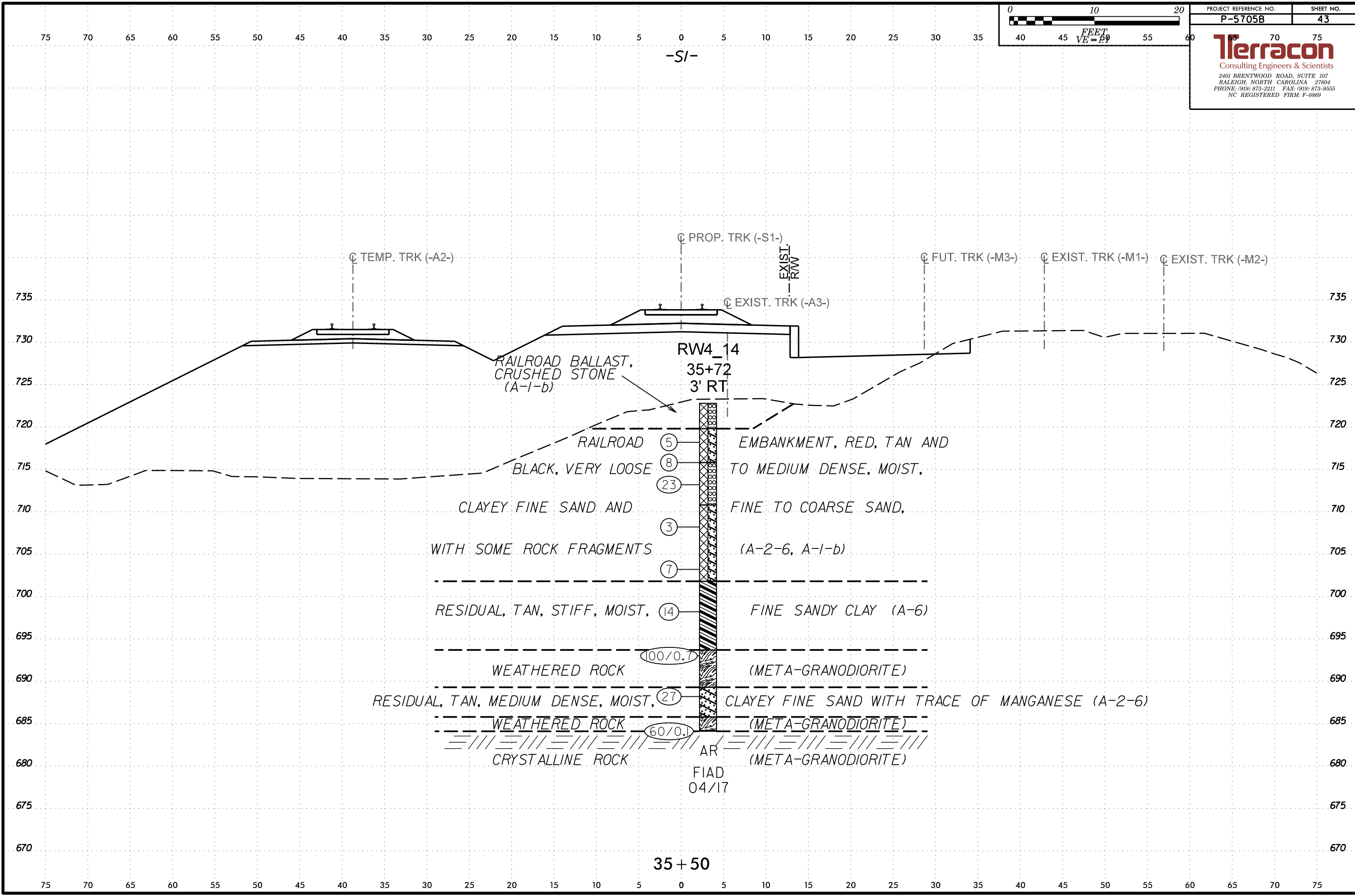
34 + 50

85 80 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



PROJECT REFERENCE NO. P-5705B	SHEET NO. 43
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RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: P-0869



35 + 50

FIAD
04/17

100/0.7

7

3

23

8

5

RW4_14
35+72
3' RT

EXIST.
RW

-S1-

TEMP. TRK (-A2-)

PROP. TRK (-S1-)

EXIST. TRK (-A3-)

FUT. TRK (-M3-)

EXIST. TRK (-M1-)

EXIST. TRK (-M2-)

RAILROAD BALLAST,
CRUSHED STONE
(A-1-b)

RAILROAD
BLACK, VERY LOOSE

EMBANKMENT, RED, TAN AND
TO MEDIUM DENSE, MOIST,

CLAYEY FINE SAND AND
WITH SOME ROCK FRAGMENTS

FINE TO COARSE SAND,
(A-2-6, A-1-b)

RESIDUAL, TAN, STIFF, MOIST,

FINE SANDY CLAY (A-6)

WEATHERED ROCK

(META-GRANODIORITE)

RESIDUAL, TAN, MEDIUM DENSE, MOIST,

CLAYEY FINE SAND WITH TRACE OF MANGANESE (A-2-6)

WEATHERED ROCK

(META-GRANODIORITE)

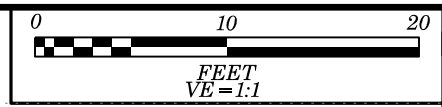
CRYSTALLINE ROCK

(META-GRANODIORITE)

AR

0012DEL_P28

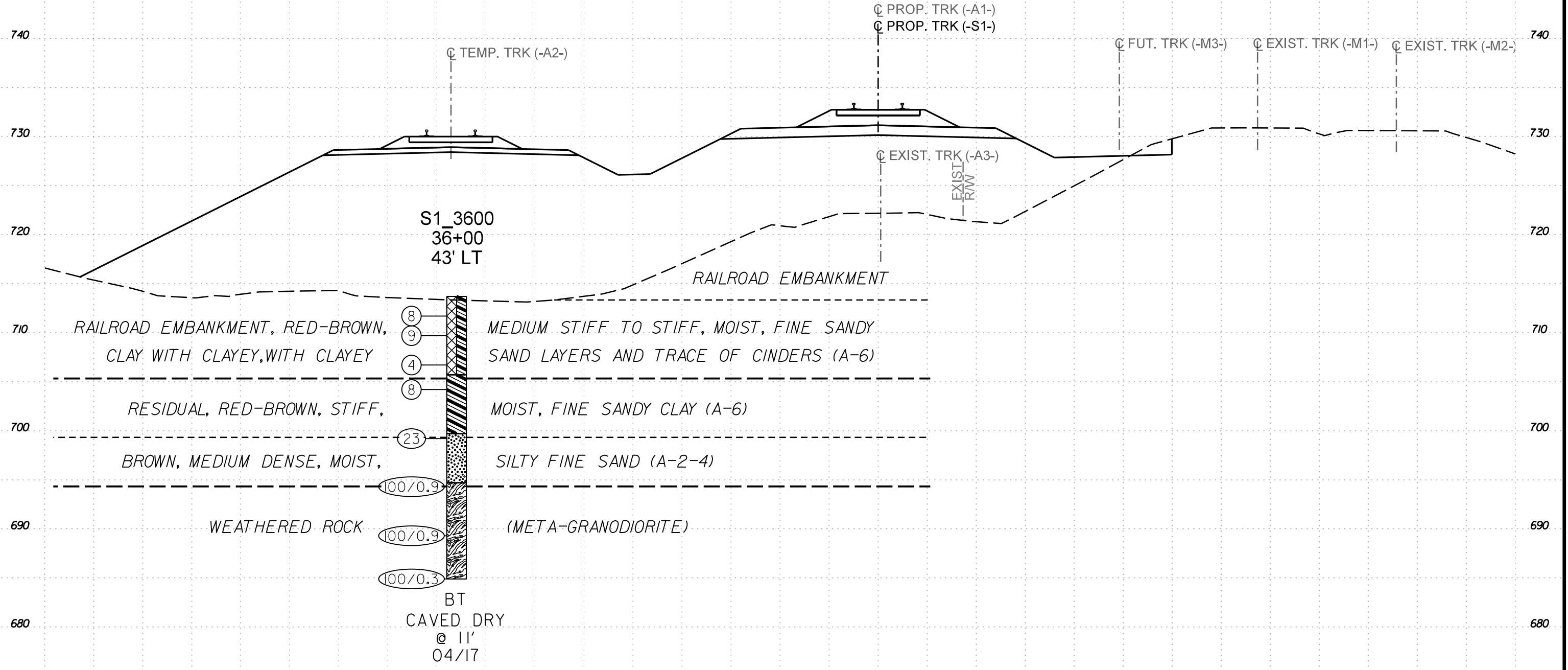
85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25



PROJECT REFERENCE NO. P-5705B	SHEET NO. 44
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PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: P-0869

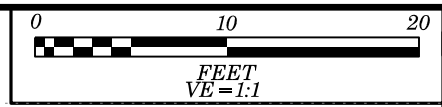
-S1-



36 + 00

85 80 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

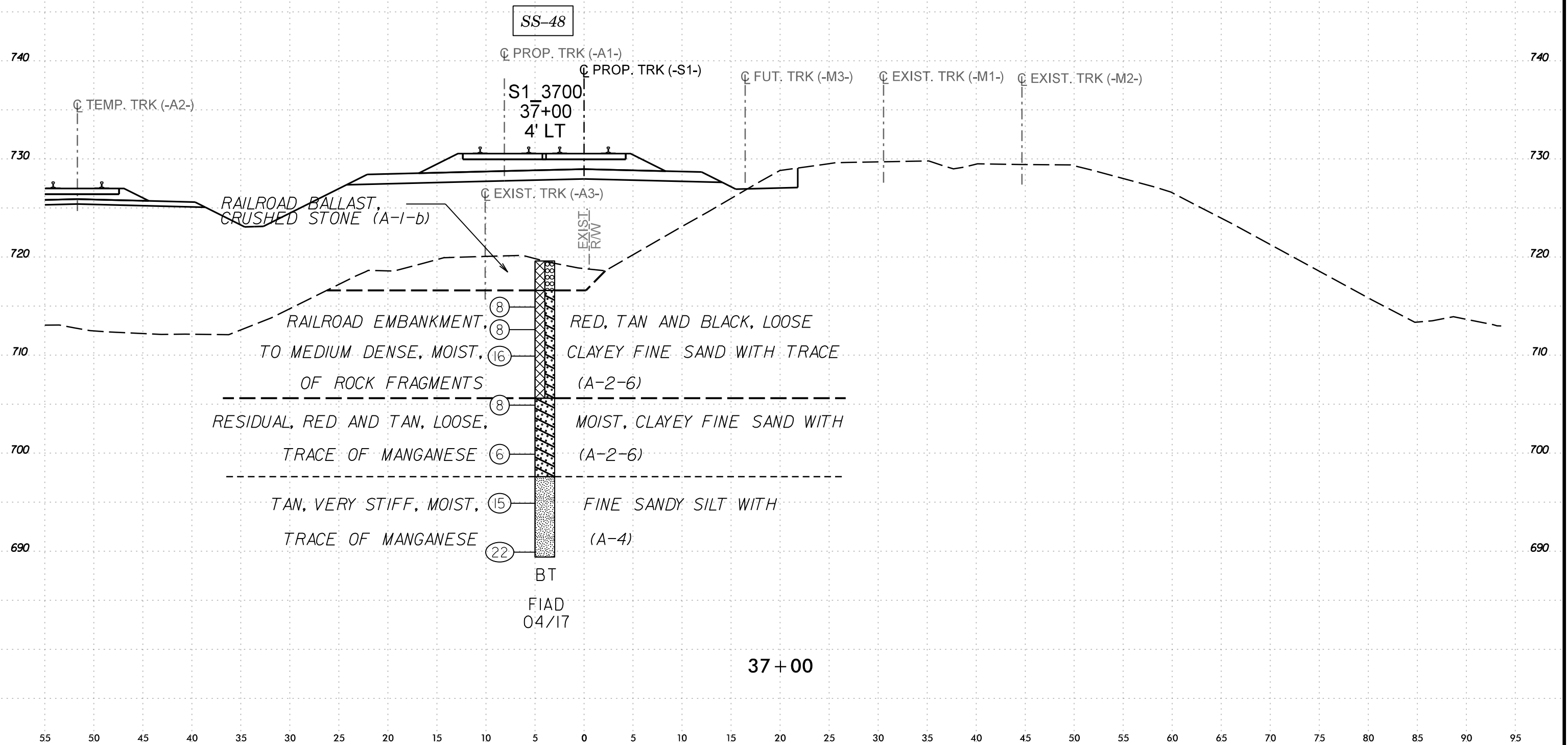
55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55



PROJECT REFERENCE NO. P-5705B	SHEET NO. 45
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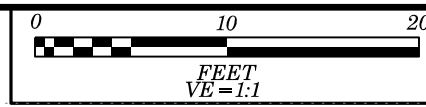
Terracon
Consulting Engineers & Scientists
2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: P-0869

-S1-



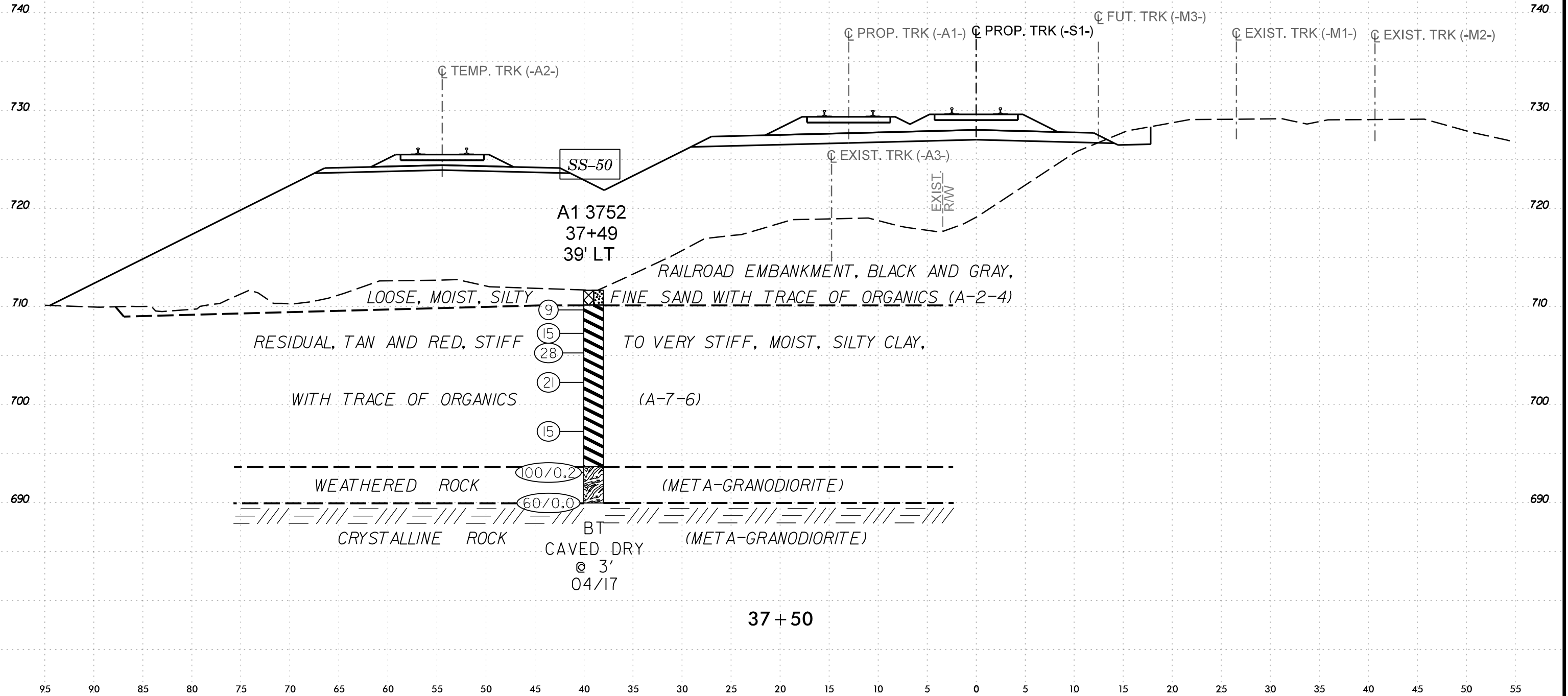
0012DEL_P28

95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15



PROJECT REFERENCE NO. P-5705B	SHEET NO. 46
Consulting Engineers & Scientists 2401 BRENTWOOD ROAD, SUITE 107 RALEIGH, NORTH CAROLINA 27604 PHONE: (919) 873-2211 FAX: (919) 873-9555 NC REGISTERED FIRM: P-0869	

-S1-



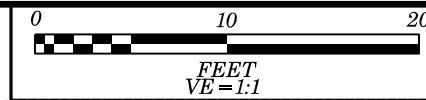
37+50

95 90 85 80 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

0012DEL_P28

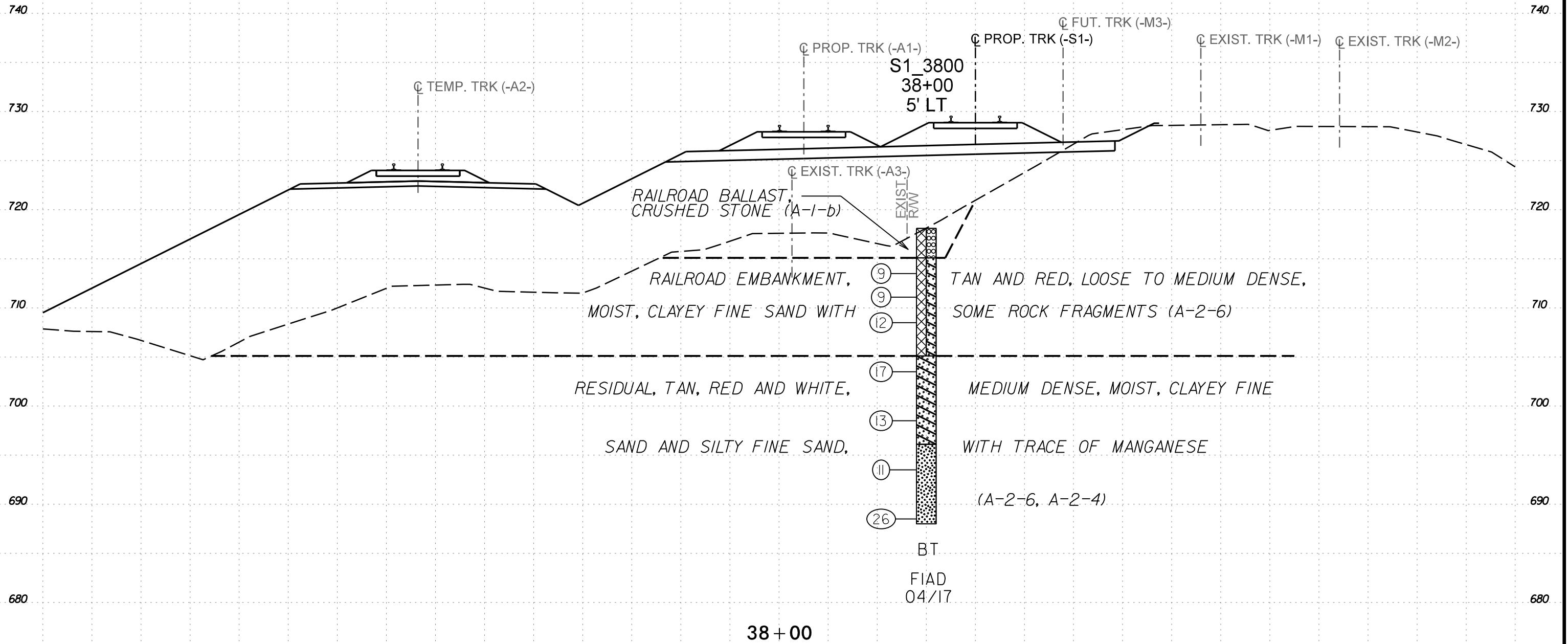
95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15

-S1-



PROJECT REFERENCE NO. P-5705B	SHEET NO. 47
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RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: P-0869



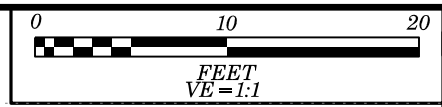
740 730 720 710 700 690 680

95 90 85 80 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

38+00

0012DEL_P28

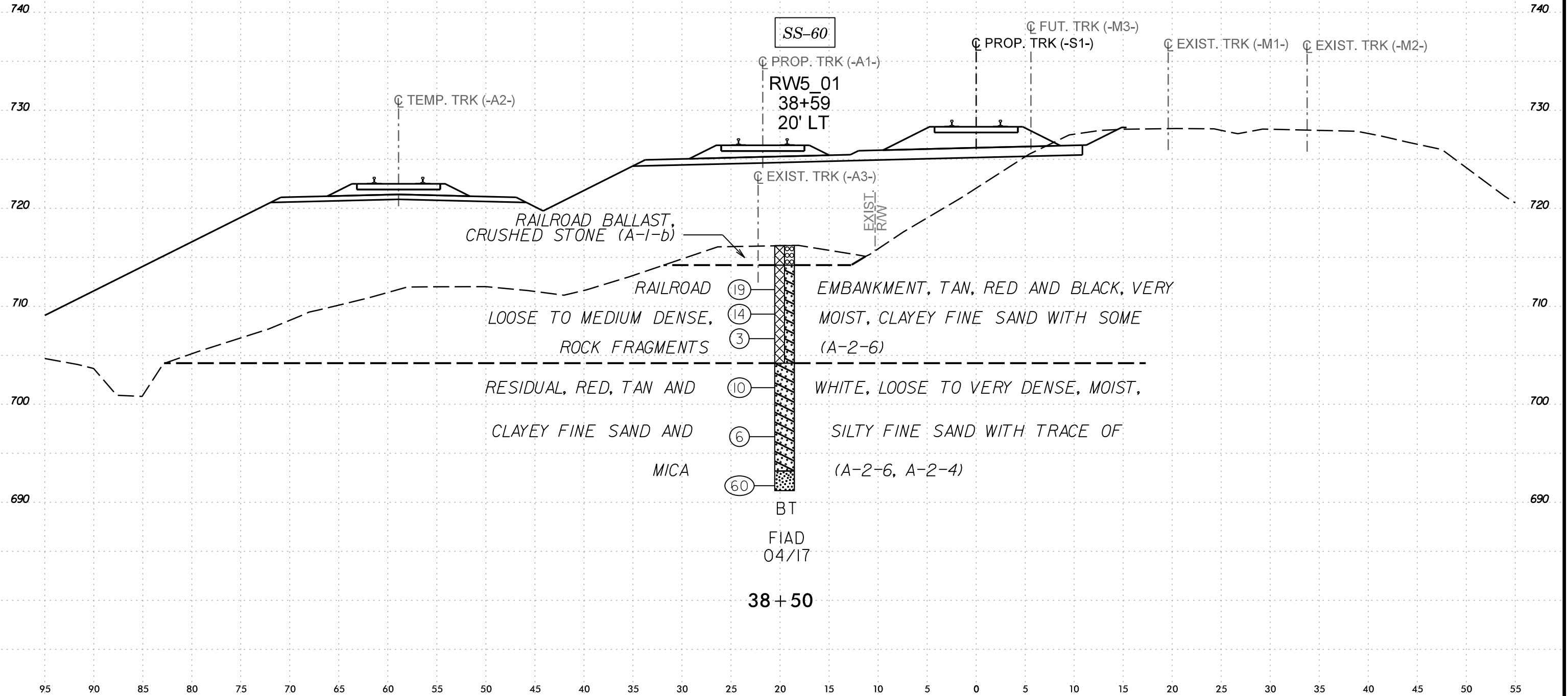
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PROJECT REFERENCE NO. P-5705B	SHEET NO. 48
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RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: P-0869

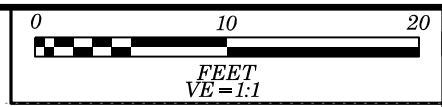
-S1-



38 + 50

0012DEL_P28

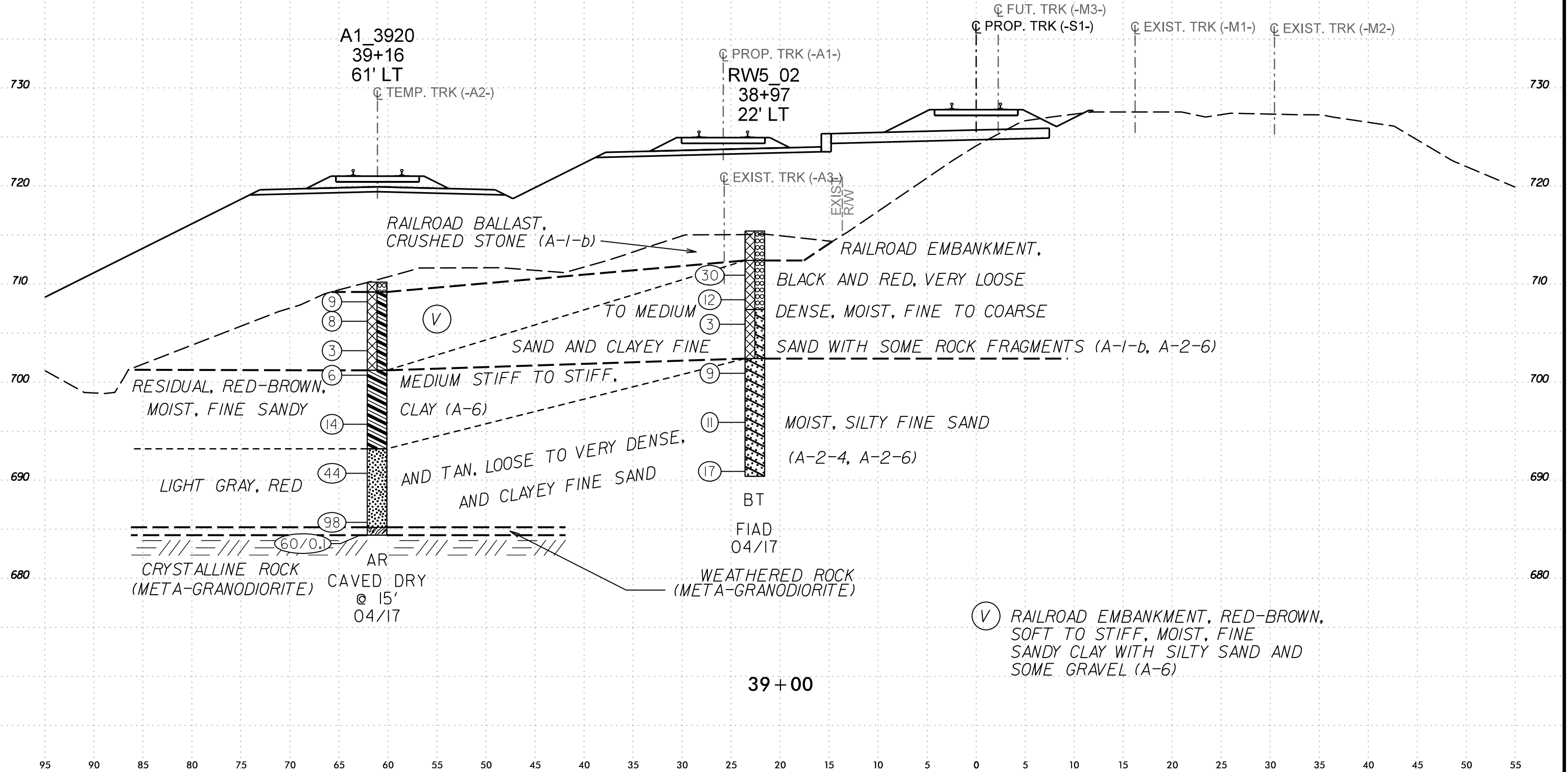
95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15



PROJECT REFERENCE NO. P-5705B	SHEET NO. 49
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RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: P-0869

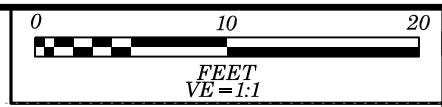
-S1-



95 90 85 80 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

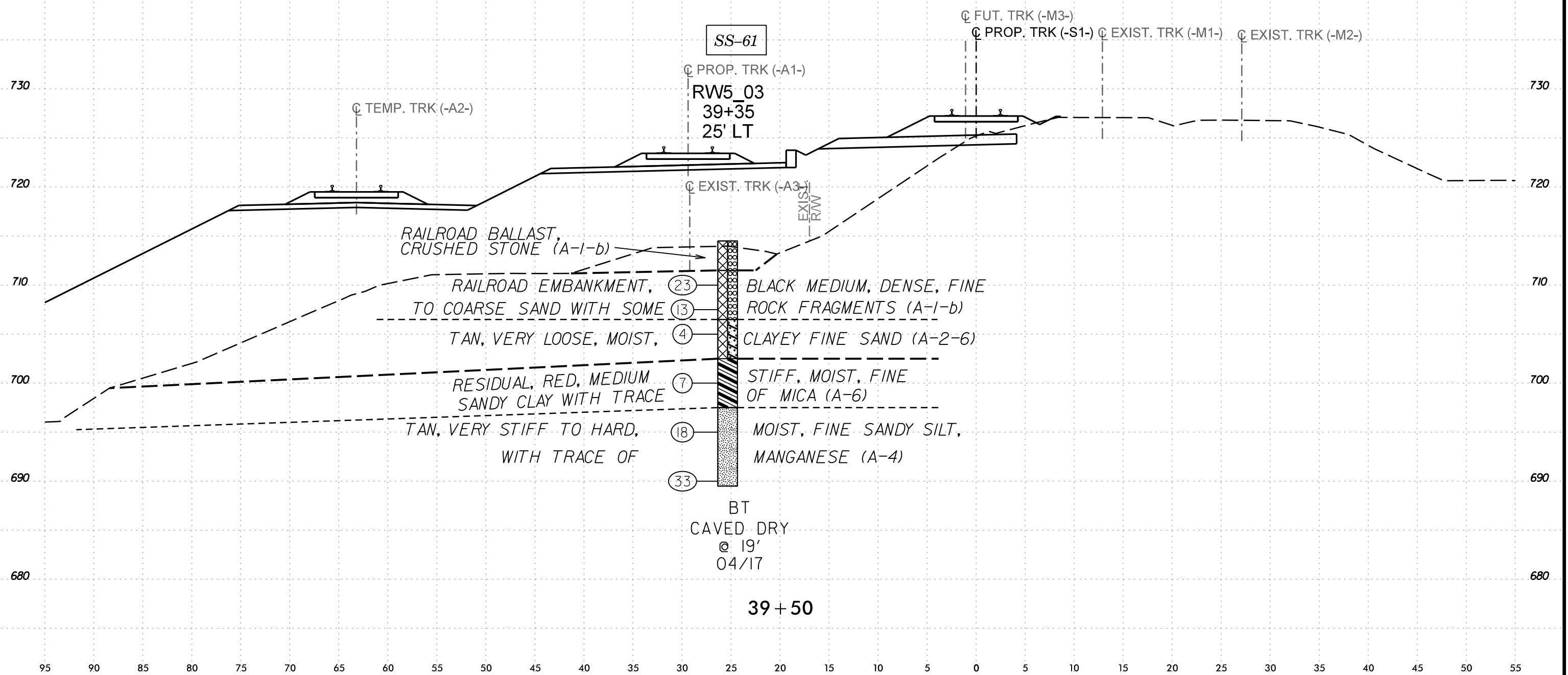
95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15

-S1-



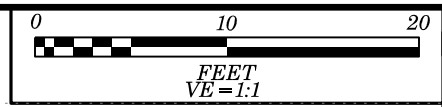
PROJECT REFERENCE NO. P-5705B	SHEET NO. 50
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Terracon
Consulting Engineers & Scientists
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RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: P-0869



39 + 50

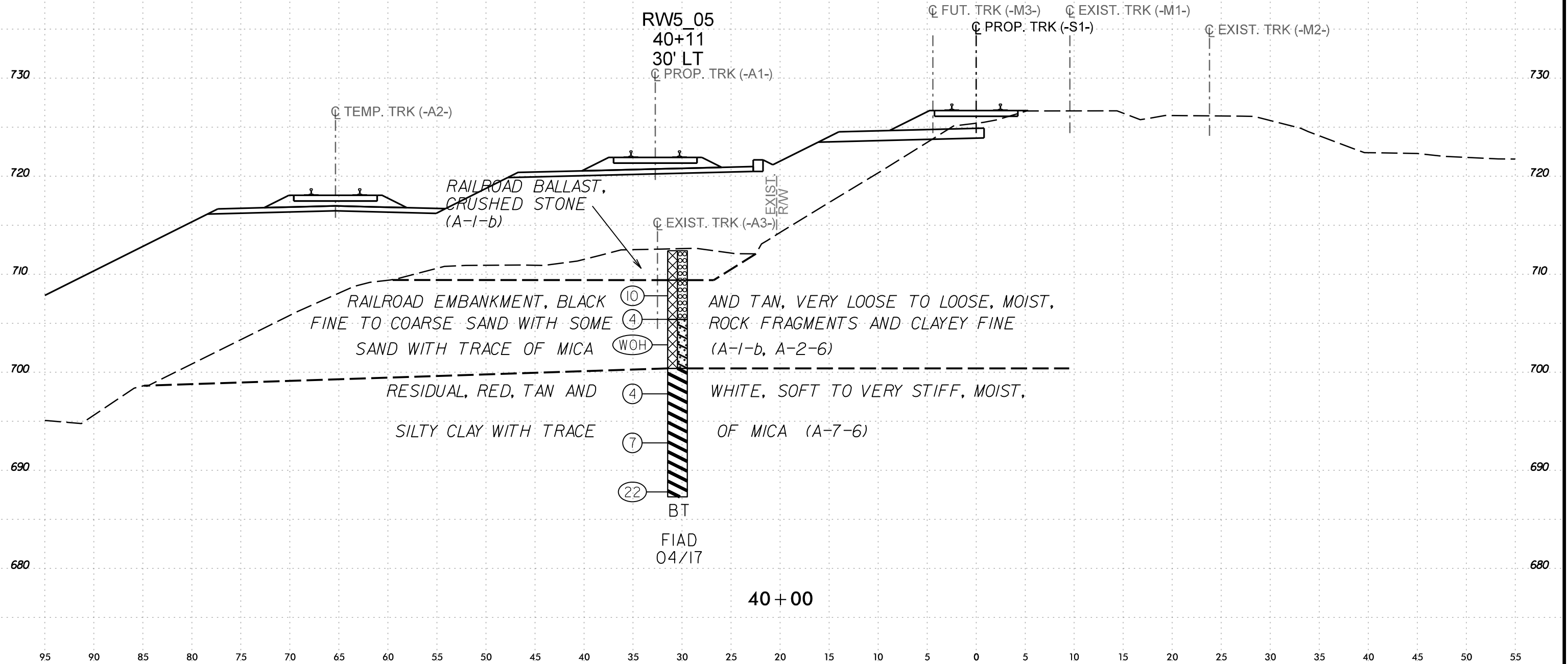
95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15



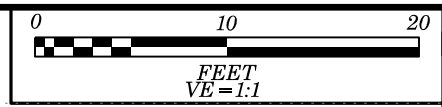
PROJECT REFERENCE NO. P-5705B	SHEET NO. 51
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Terracon
Consulting Engineers & Scientists
2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: P-0869

-S1-



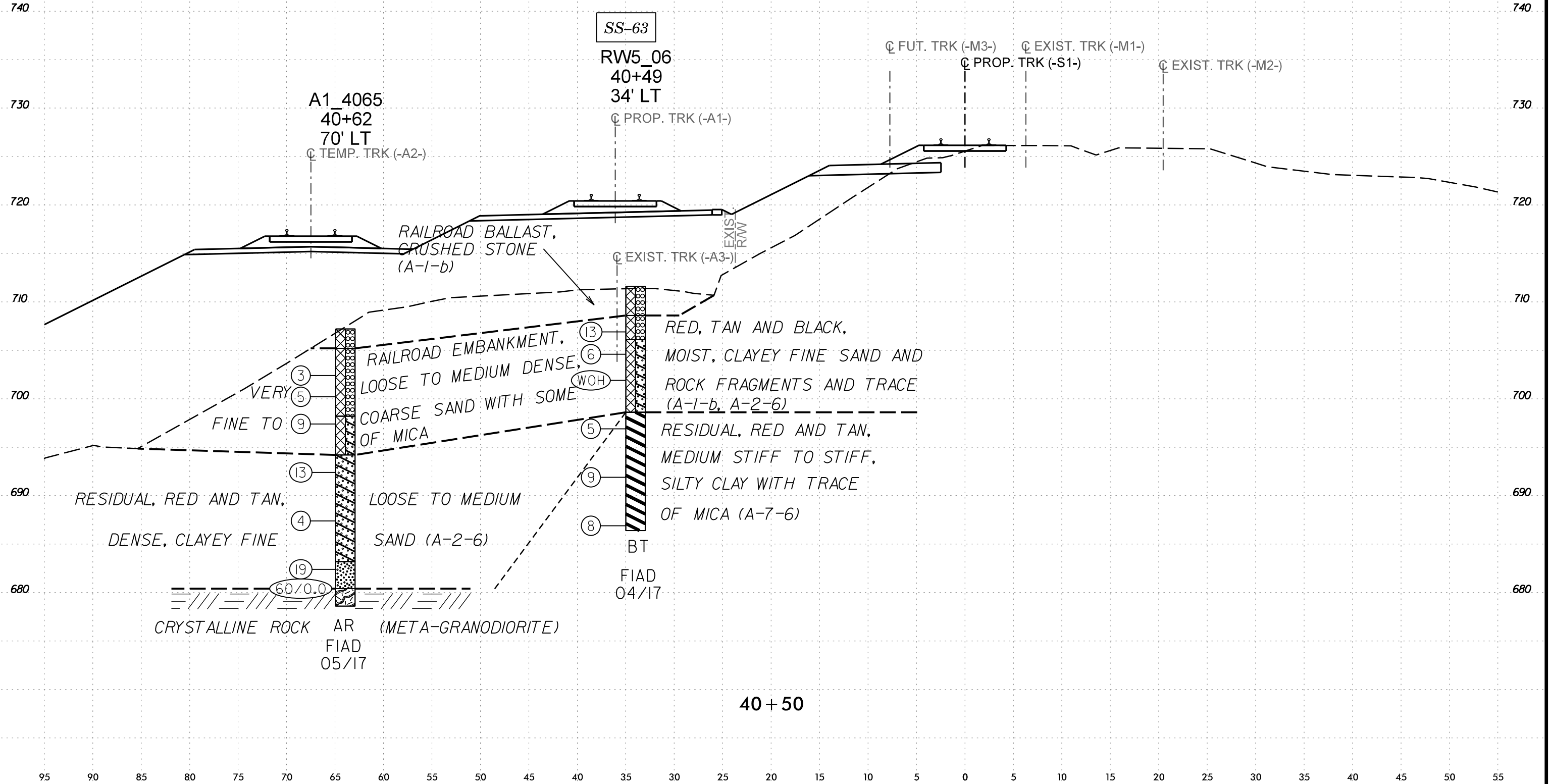
95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15



PROJECT REFERENCE NO. P-5705B	SHEET NO. 52
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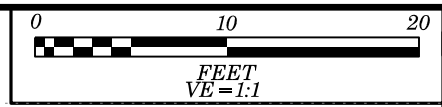
Terracon
Consulting Engineers & Scientists
2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: P-0869

-S1-



0012DEL_P28

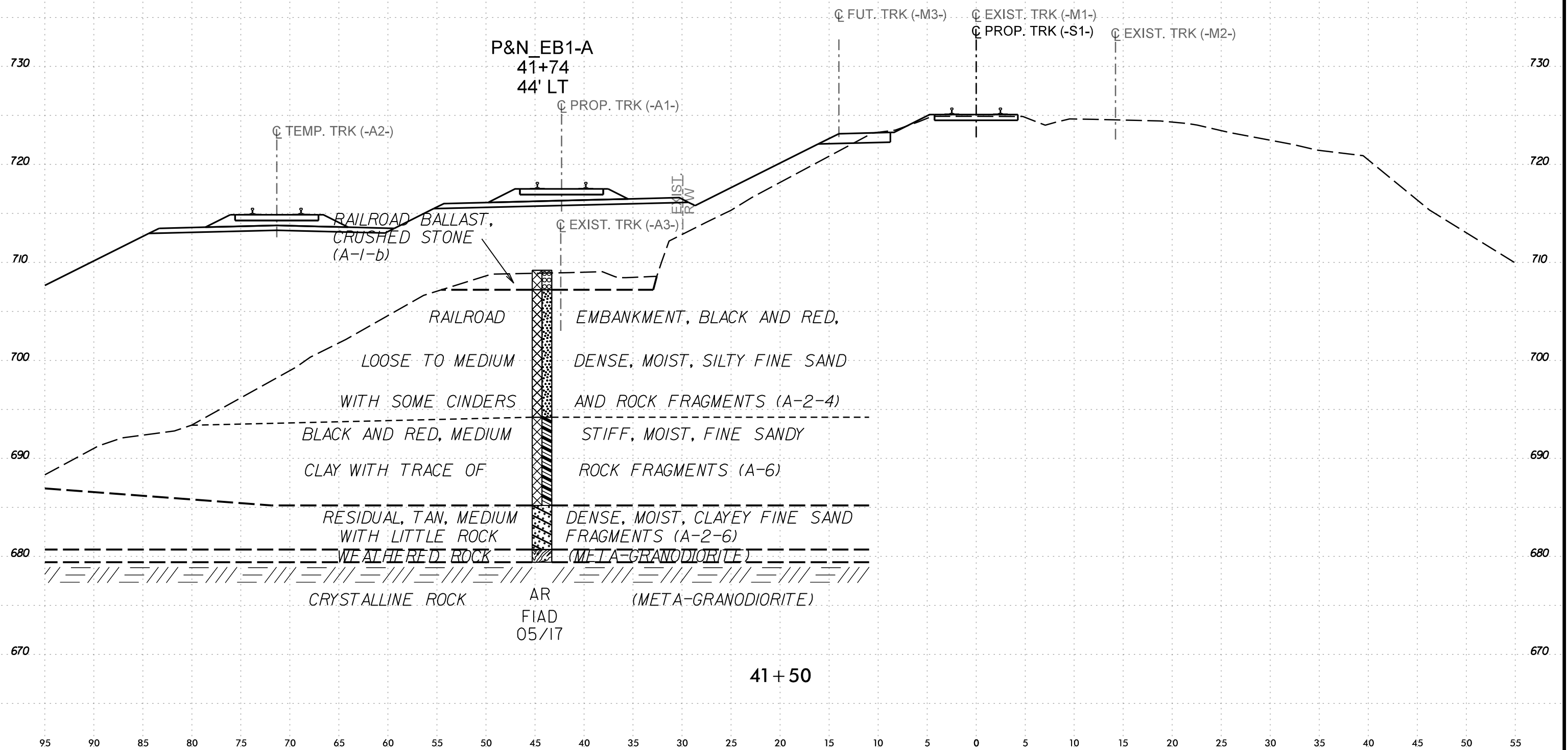
95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15



PROJECT REFERENCE NO. P-5705B	SHEET NO. 53
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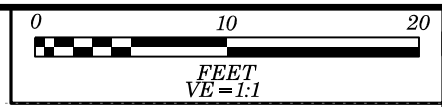
Terracon
Consulting Engineers & Scientists
2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: P-0869

-S1-



95 90 85 80 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

95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15



PROJECT REFERENCE NO. P-5705B	SHEET NO. 54
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2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: P-0869

-S1-

SS-44

P&N_EB2-A 43+45 42' LT
P&N_EB2-B 43+55 29' LT

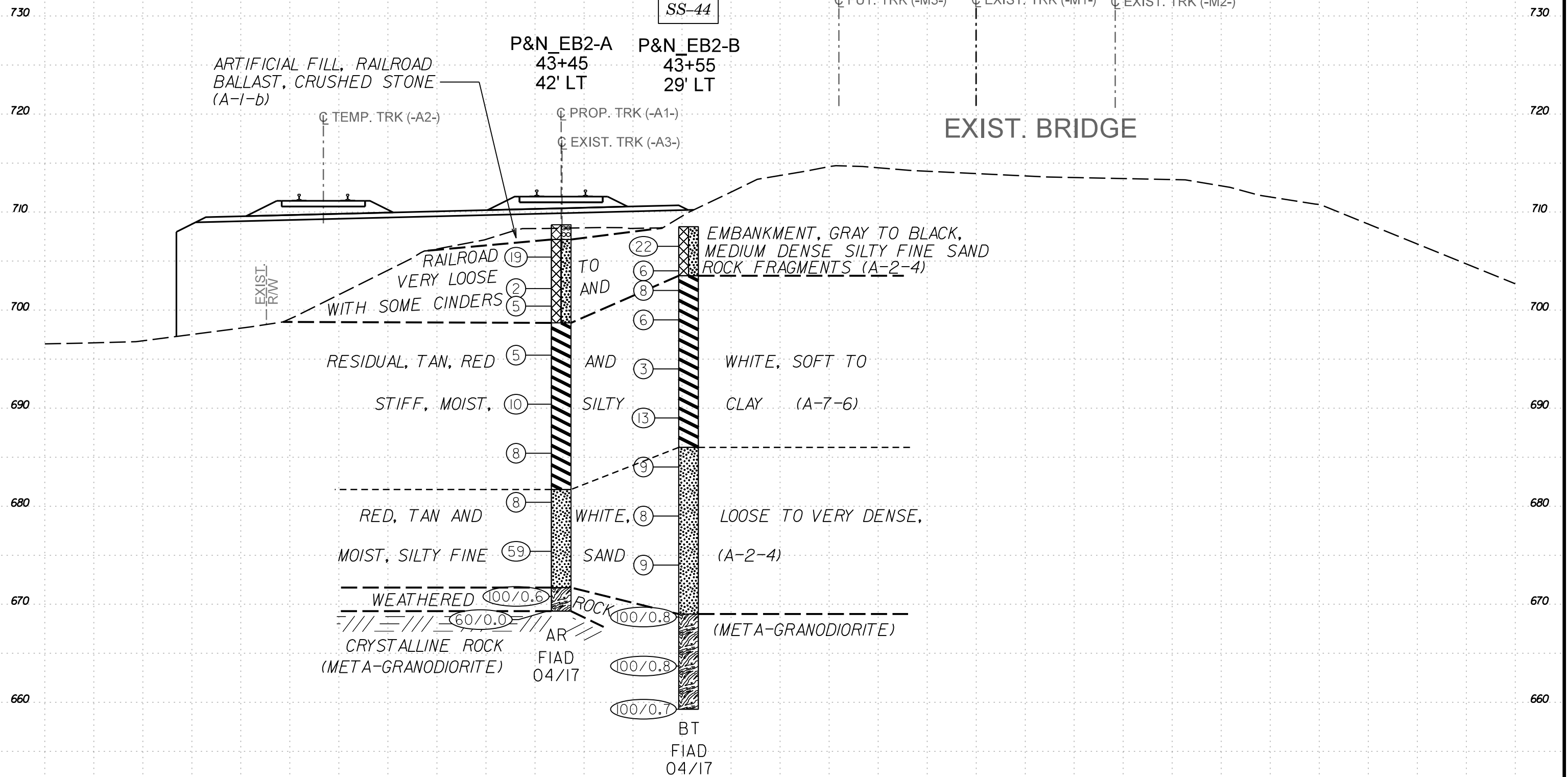
☉ FUT. TRK (-M3-)
☉ PROP. TRK (-S1-)
☉ EXIST. TRK (-M1-)
☉ EXIST. TRK (-M2-)

ARTIFICIAL FILL, RAILROAD BALLAST, CRUSHED STONE (A-1-b)

☉ TEMP. TRK (-A2-)

☉ PROP. TRK (-A1-)
☉ EXIST. TRK (-A3-)

EXIST. BRIDGE



RAILROAD VERY LOOSE WITH SOME CINDERS

EMBANKMENT, GRAY TO BLACK, MEDIUM DENSE SILTY FINE SAND ROCK FRAGMENTS (A-2-4)

RESIDUAL, TAN, RED STIFF, MOIST,

WHITE, SOFT TO CLAY (A-7-6)

RED, TAN AND MOIST, SILTY FINE

WHITE, SAND LOOSE TO VERY DENSE, (A-2-4)

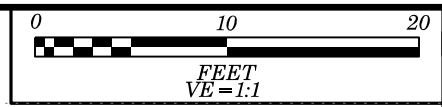
WEATHERED CRYSTALLINE ROCK (META-GRANODIORITE)

ROCK (META-GRANODIORITE)

BT FIAD 04/17

43 + 50

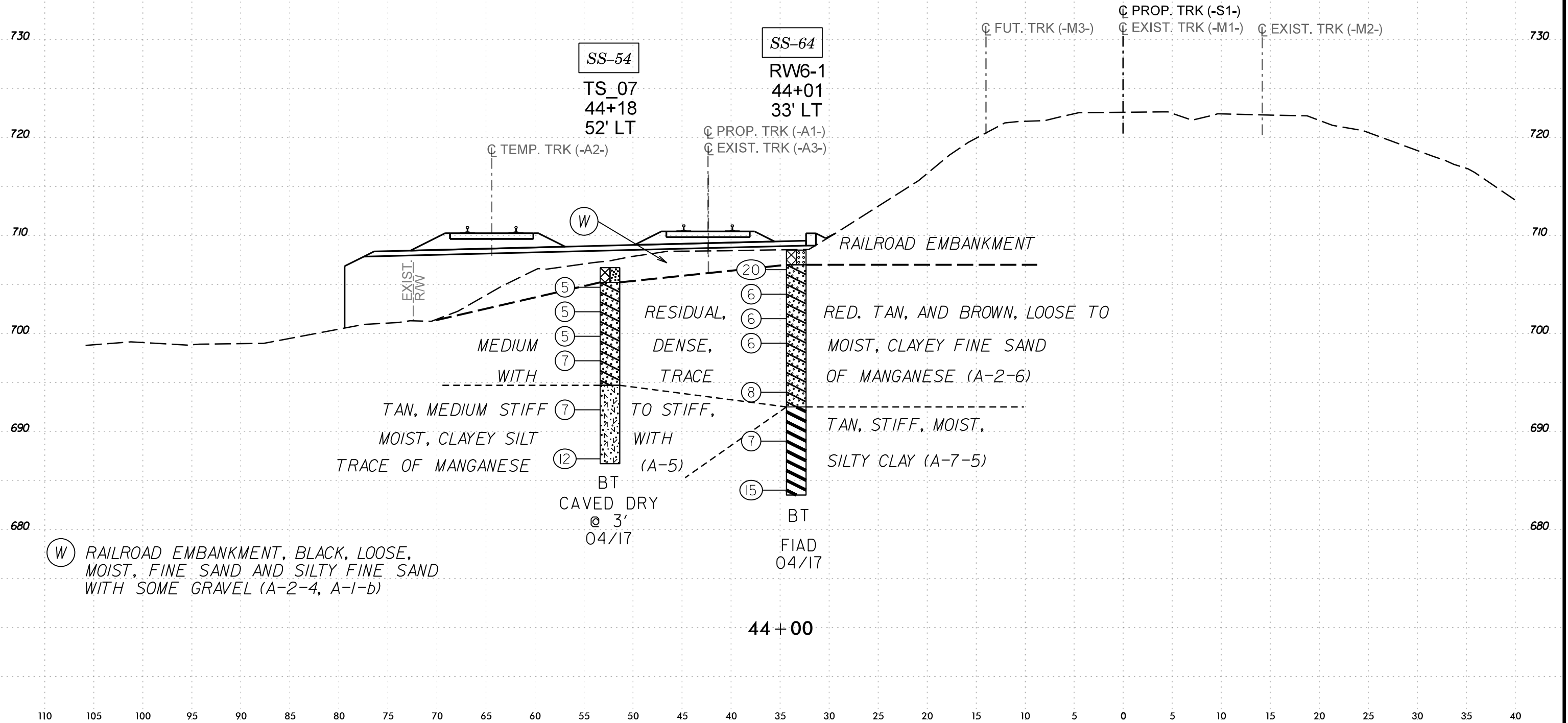
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PROJECT REFERENCE NO. P-5705B	SHEET NO. 55
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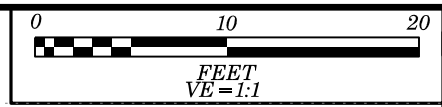
Terracon
Consulting Engineers & Scientists
2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NORTH CAROLINA 27604
PHONE: (919) 873-2211 FAX: (919) 873-9555
NC REGISTERED FIRM: P-0869

-S1-



(W) RAILROAD EMBANKMENT, BLACK, LOOSE, MOIST, FINE SAND AND SILTY FINE SAND WITH SOME GRAVEL (A-2-4, A-1-b)

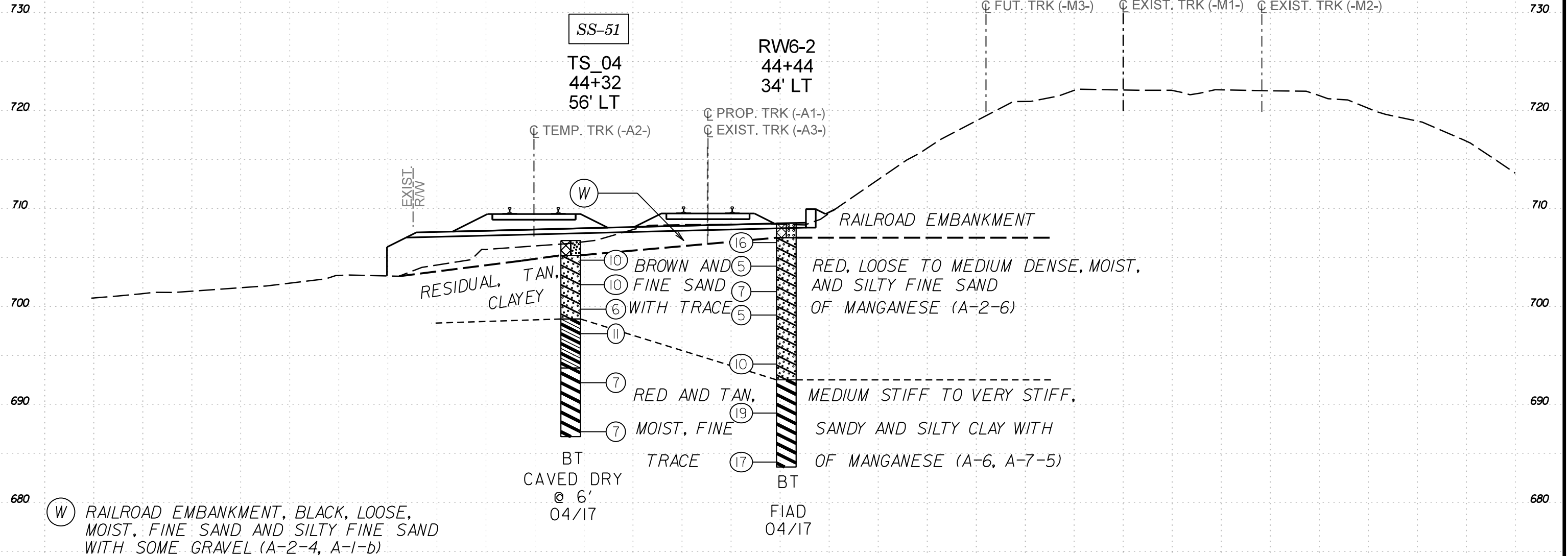
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PROJECT REFERENCE NO. P-5705B	SHEET NO. 56
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NC REGISTERED FIRM: P-0869

-S1-



SS-51

TS_04
44+32
56' LT

RW6-2
44+44
34' LT

TEMP. TRK (-A2-)

PROP. TRK (-A1-)
EXIST. TRK (-A3-)

FUT. TRK (-M3-)

PROP. TRK (-S1-)
EXIST. TRK (-M1-)

EXIST. TRK (-M2-)

EXIST. R/W

W

RAILROAD EMBANKMENT

RESIDUAL, TAN. CLAYEY

10 BROWN AND
10 FINE SAND
6 WITH TRACE

RED, LOOSE TO MEDIUM DENSE, MOIST, AND SILTY FINE SAND OF MANGANESE (A-2-6)

7 RED AND TAN,
7 MOIST, FINE

MEDIUM STIFF TO VERY STIFF, SANDY AND SILTY CLAY WITH OF MANGANESE (A-6, A-7-5)

BT
CAVED DRY
@ 6'
04/17

BT
FIAD
04/17

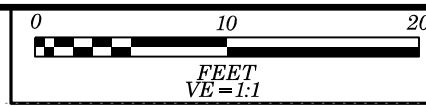
W RAILROAD EMBANKMENT, BLACK, LOOSE, MOIST, FINE SAND AND SILTY FINE SAND WITH SOME GRAVEL (A-2-4, A-1-b)

44 + 50

110 105 100 95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40

0012DEL_P28

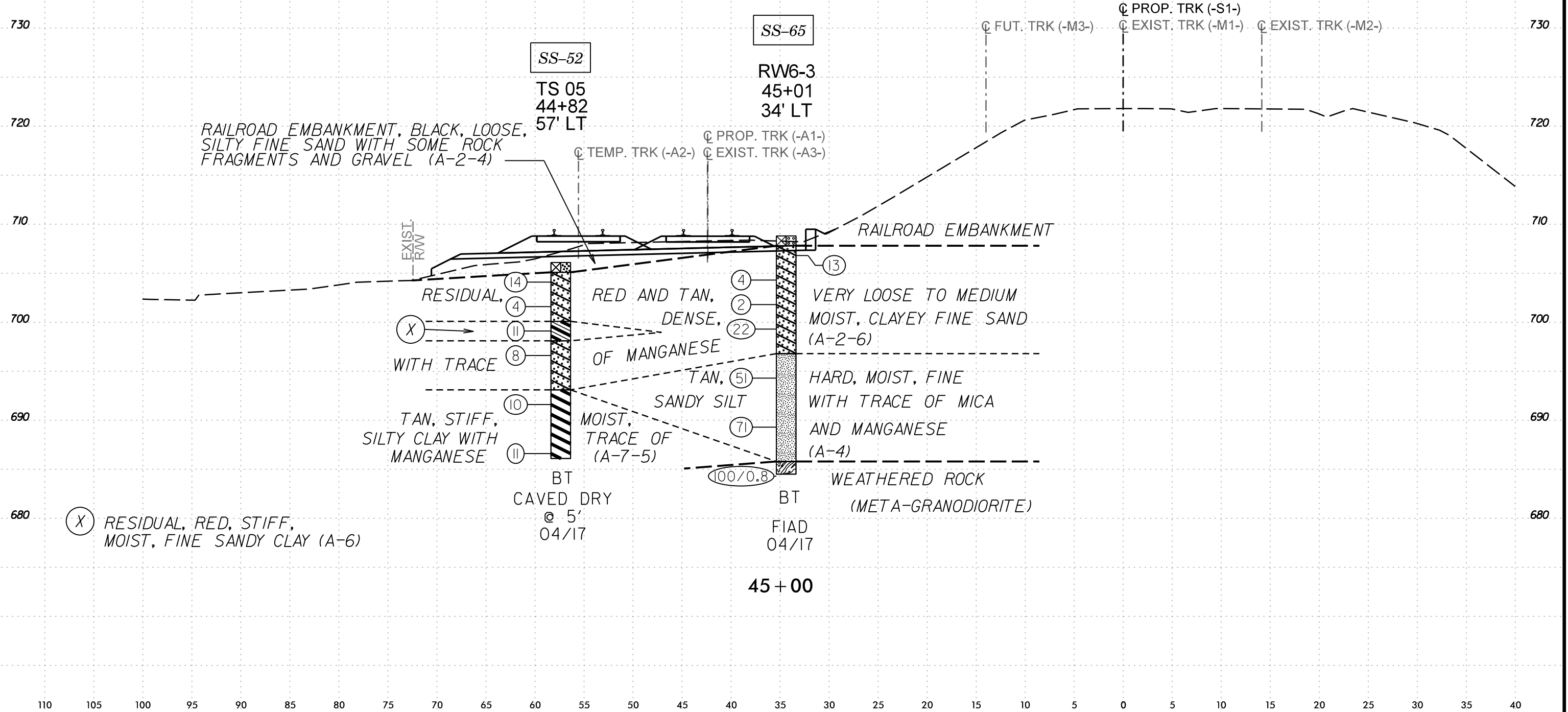
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PROJECT REFERENCE NO. P-5705B	SHEET NO. 57
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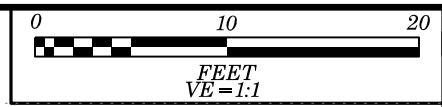
Terracon
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NC REGISTERED FIRM: P-0869

-S1-



0012DEL_P28

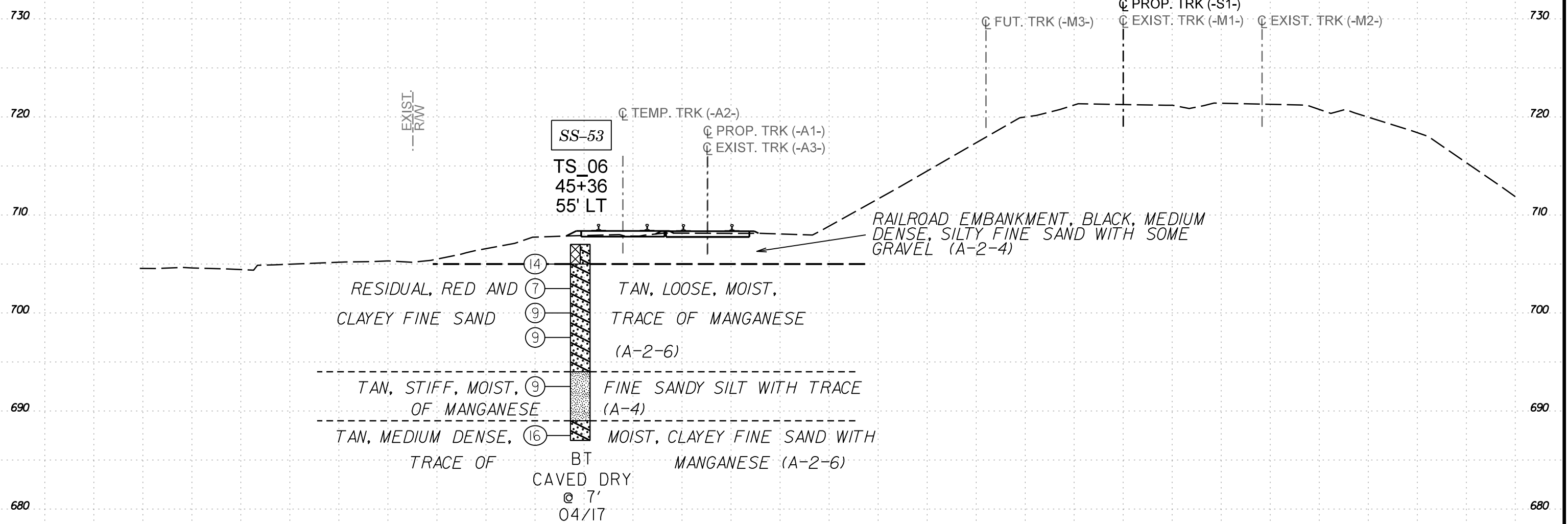
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PROJECT REFERENCE NO. P-5705B	SHEET NO. 58
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NC REGISTERED FIRM: P-0869

-S1-



45 + 50

110 105 100 95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40

PROJECT: 44475.1.2

REFERENCE: P-5705B

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	P-2705B	59	60

APPENDIX A

LABORATORY TESTING SUMMARY

PROJECT NUMBER: 44475.1.2

TIP: P-5705B

COUNTY: MECKLENBURG

DESCRIPTION: Charlotte Gateway Station and Track and Safety Improvements

Sample No.	Alignment	Station	Offset (feet)	Depth Interval (feet)	AASHTO Class.	L.L.	P.I.	% by Weight				% Retained #4 Sieve	% Passing (sieves)			% Moisture	% Organic	Ave. Wet Unit Wt. (pcf)	Shear Strength Values			
								Coarse Sand	Fine Sand	Silt	Clay		#10	#40	#200				Total Cohesion (psf)	Total Friction (φ)	Effective Cohesion (psf)	Effective Friction (φ')
SS-32	-S1-	13+12	5' RT	18.5 - 20.0'	A-6 (2)	28	13	34.7	22.2	12.9	30.2	3	96	77	45	17.2	N/D	N/D	N/D	N/D	N/D	N/D
SS-9	-S1-	14+55	30' LT	12.3-13.8	A-6 (3)	37	18	28.8	35.2	21.2	14.8	0	100	87	42	44.8	N/D	N/D	N/D	N/D	N/D	N/D
SS-10	-S1-	14+52	15' RT	23.1-24.6	A-4 (0)	16	NP	33.3	25.5	29.2	12.0	0	99	77	47	19.9	N/D	N/D	N/D	N/D	N/D	N/D
SS-15	-S1-	16+36	31' LT	27.9-29.4	A-4 (0)	27	6	36.5	29.8	23.4	10.3	0	100	80	39	18.9	N/D	N/D	N/D	N/D	N/D	N/D
SS-1	-S1-	18+24	1' LT	5.9-7.4	A-6 (8)	39	14	14.8	26.7	41.7	16.8	0	100	92	67	17.6	N/D	N/D	N/D	N/D	N/D	N/D
SS-2	-S1-	18+24	1' LT	13.1-14.6	A-2-4 (0)	19	NP	58.7	19.6	13.4	8.3	1	94	52	24	N/D	N/D	N/D	N/D	N/D	N/D	N/D
SS-7	-S1-	19+38	13' RT	33.5-35.0	A-2-4 (0)	28	9	57.8	20.1	14.2	7.9	12	68	36	18	N/D	N/D	N/D	N/D	N/D	N/D	N/D
SS-8	-S1-	19+37	40' RT	3.5-5.0	A-7-6 (10)	41	14	11.4	21.0	46.9	20.7	1	98	91	73	21.1	N/D	N/D	N/D	N/D	N/D	N/D
SS-33	-S1-	20+27	40' RT	8.5 - 10.0'	A-6 (8)	39	14	16.6	24.7	44.1	14.6	0	100	92	66	13.4	N/D	N/D	N/D	N/D	N/D	N/D
SS-34	-S1-	20+76	40' RT	3.5 - 5.0'	A-2-6 (0)	31	12	45.1	22.4	20.9	11.6	0	90	60	34	N/D	N/D	N/D	N/D	N/D	N/D	N/D
SS-45	-S1-	21+75	CL	12.9-14.4	A-6 (10)	36	13	5.6	22.5	55.7	16.2	0	100	97.6	79.6	11.6	N/D	N/D	N/D	N/D	N/D	N/D
SS-35	-S1-	21+74	40' RT	8.5 - 10.0'	A-7-6 (17)	41	20	2.5	16.2	51.9	29.4	5	94	93	83	20.4	N/D	N/D	N/D	N/D	N/D	N/D
SS-16	-S1-	22+52	16' RT	18.6-20.1	A-5 (1)	42	9	38.7	23.1	25.8	12.4	0	95	67	42	40.6	N/D	N/D	N/D	N/D	N/D	N/D
SS-37	-S1-	25+80	32' LT	3.0 - 4.5'	A-7-6 (38)	69	40	10.5	6.3	25.8	57.4	1	99	91	84	32.1	N/D	N/D	N/D	N/D	N/D	N/D
SS-38	-S1-	26+09	51' LT	13.5 - 15.0'	A-5 (8)	44	8	1.6	31.8	57.9	8.7	0	100	99	79	24.2	N/D	N/D	N/D	N/D	N/D	N/D
SS-55	-S1-	25+99	71' RT	28.7-30.2	A-4 (4)	35	4	2.6	24.9	62.1	10.4	0	100	99	84	23.7	N/D	N/D	N/D	N/D	N/D	N/D
SS-25	-S1-	27+54	25' RT	8.0-9.5	A-4 (5)	38	9	10.3	37.1	39.6	13.0	0	100	95	64	22.6	N/D	N/D	N/D	N/D	N/D	N/D
SS-30	-S1-	28+77	3' RT	18.0-19.5	A-4 (0)	29	NP	2.8	39.4	45.8	12.0	0	100	99	71	21.3	N/D	N/D	N/D	N/D	N/D	N/D
SS-31	-S1-	28+77	30' RT	13.5-15.0	A-4 (0)	30	NP	0.4	38.1	48.3	13.2	0	100	100	76	25.6	N/D	N/D	N/D	N/D	N/D	N/D
SS-49	-S1-	29+33	16' LT	13.6-15.1	A-4 (2)	30	4	5.6	41.0	45.1	8.3	0	100	98	66.5	11.9	N/D	N/D	N/D	N/D	N/D	N/D
SS-56	-S1-	29+74	59' RT	23.5-25.0	A-5 (10)	43	9	2.0	22.6	60.8	14.6	0	100	98	85	33.3	N/D	N/D	N/D	N/D	N/D	N/D
SS-46	-S1-	30+70	CL	8.6-10.1	A-4 (4)	38	10	19.4	35.3	35.1	10.2	0	100	89	55.1	21.0	N/D	N/D	N/D	N/D	N/D	N/D
SS-57	-S1-	31+76	47' RT	23.8-25.3	A-5 (8)	44	9	2.4	39.2	49.9	8.5	0	100	99	72	31.7	N/D	N/D	N/D	N/D	N/D	N/D
SS-47	-S1-	33+00	17' LT	13.6-15.1	A-4 (3)	33	8	24.5	26.6	38.0	10.9	27.4	93.2	79.2	52.2	13.8	N/D	N/D	N/D	N/D	N/D	N/D
SS-58	-S1-	33+75	27' RT	23.6-25.1	A-4 (1)	36	NP	15.2	9.3	60.1	15.4	0	100	89	78	21.3	N/D	N/D	N/D	N/D	N/D	N/D
SS-59	-S1-	34+75	14' RT	23.7-25.2	A-6 (4)	32	11	12.5	39.0	25.2	23.3	0	100	98	55	17.9	N/D	N/D	N/D	N/D	N/D	N/D
SS-48	-S1-	37+00	4' LT	23.7-28.2	A-4 (0)	28	NP	25.9	34.8	29.4	9.9	0	100	93	45.2	24.8	N/D	N/D	N/D	N/D	N/D	N/D
SS-50	-S1-	37+49	39' LT	3.4-4.9	A-7-6 (9)	42	23	20.9	18.7	20.3	40.1	48.5	86.7	75.9	54.9	21.1	N/D	N/D	N/D	N/D	N/D	N/D
SS-60	-S1-	38+59	20' LT	23.5-25.0	A-2-4 (0)	21	NP	39.8	33.5	18.7	8.0	3	97	75	30	N/D	N/D	N/D	N/D	N/D	N/D	N/D
SS-61	-S1-	39+35	25' LT	18.5-20.0	A-4 (1)	36	NP	4.9	28.7	54.2	12.2	0	100	97	77	24.5	N/D	N/D	N/D	N/D	N/D	N/D
SS-63	-S1-	40+49	34' LT	23.7-25.2	A-7-6 (12)	49	23	27.3	17.7	28.3	26.7	0	100	79	60	29.3	N/D	N/D	N/D	N/D	N/D	N/D
SS-44	-S1-	43+55	29' LT	13.5-15.0	A-7-6 (32)	61	36	5.4	15.9	26.6	52.1	0	100	97	83	34.1	N/D	N/D	N/D	N/D	N/D	N/D
SS-64	-S1-	44+01	33' LT	18.5-20.0	A-7-5 (6)	48	17	34.9	19.8	26.1	19.2	0	99	73	50	27.6	N/D	N/D	N/D	N/D	N/D	N/D
SS-54	-S1-	44+18	52' LT	18.5-20.0	A-5 (8)	46	8	4.7	32.3	53.0	10.0	0	100	98.1	76.3	38.1	N/D	N/D	N/D	N/D	N/D	N/D
SS-51	-S1-	44+32	56' LT	13.5-15.0	A-7-5 (6)	46	13	29.6	18.7	31.6	20.1	0	99.9	79.8	56.1	27.2	N/D	N/D	N/D	N/D	N/D	N/D
SS-52	-S1-	44+82	57' LT	18.5-20.0	A-7-5 (6)	47	15	32.3	22.5	29.2	16.0	0	99.4	75.5	50.6	24.5	N/D	N/D	N/D	N/D	N/D	N/D
SS-65	-S1-	45+01	34' LT	18.5-20.0	A-4 (1)	30	7	30.1	31.7	28.8	9.4	0	100	82	45	10.1	N/D	N/D	N/D	N/D	N/D	N/D
SS-53	-S1-	45+36	55' LT	13.5-15.0	A-4 (4)	40	7	28.0	18.2	38.9	14.9	0	99.8	78.4	59.5	25.4	N/D	N/D	N/D	N/D	N/D	N/D

Stephanie H. Huffman

114-01-1203
Certification Number