DGN 0160DEL_P10b2

CONTRACT: ID: P-5206B

NOTE: SEE SHEET 5 FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

CONTENTS

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

RAILROAD SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. *52000.1.STR06T3 (P-5206B)* F.A. PROJ. _____

COUNTY *ROWAN*

PROJECT DESCRIPTION *REID TO NORTH KANNAPOLIS DOUBLE TRACK ON THE NCRR/NORFOLK SOUTHERN RAILROAD*

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	P-5206B	1	27

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
52000.1.STR06T3		P.E.
		R/W & UTIL.

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. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE 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 THIS 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.

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INVESTIGATED BY *S&ME, INC.*

CHECKED BY *S.S. LANEY, P.E.*

SUBMITTED BY *S&ME, INC.*

DATE *APRIL 16, 2013*

NORTH CAROLINA PROFESSIONAL SEAL 031013 ENGINEER STUART S. LANEY 6-14-13

DRAWN BY: *L. CAMPOS*

NOTE – THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

NOTE – 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.

DCN 0160DEL_P10b2

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.
N.C.	P-5206B	2

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 TO BE THE 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 STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. 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 (≤ 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-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL														
% PASSING # 10	50 MX											GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
# 40	30 MX	50 MX	51 MN											
# 200	15 MX	25 MX	10 MX	35 MX	35 MX	35 MX	35 MX	36 MX	36 MN	36 MN	36 MN			
LIQUID LIMIT	6 MX		NP	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
PLASTIC INDEX				10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN			
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 A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT2)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	<4 4 TO 10 10 TO 30 30 TO 50 >50	N/A
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	<2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 >30	<0.25 0.25 TO 0.50 0.5 TO 1.0 1 TO 2 2 TO 4 >4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	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	75	2.0	0.25	0.05	0.005
	IN.	12	3				

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	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.

GRADATION

WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.
UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES 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 WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 31
MODERATELY COMPRESSIBLE	LIQUID LIMIT EQUAL TO 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	1 - 10%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	10 - 20%
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	20 - 35%
HIGHLY ORGANIC	>10%	>20%	HIGHLY	35% AND ABOVE

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING
- STATIC WATER LEVEL AFTER 24 HOURS
- PW - 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
- 25/025 - DIP & DIP DIRECTION OF ROCK STRUCTURES
- SPT / DPT DMT / VST PMT - TEST BORING
- AUGER BORING
- CORE BORING
- MW - MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING W/ CORE
- SPT N-VALUE
- REF - SPT REFUSAL

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. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
w - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_d - 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:
- [ ] MOBILE B-___
- [ ] BK-51
- [ ] CME-45C
- [X] CME-550X
- [ ] 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
- [X] 3-1/4" H.S.A.

HAMMER TYPE:
- [X] AUTOMATIC
- [ ] MANUAL

CORE SIZE:
- [ ] -B_____
- [ ] -N_____
- [ ] -H_____

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [ ] HAND AUGER
- [ ] SOUNDING ROD
- [ ] VANE SHEAR TEST
- [ ] _____

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. 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)	NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
CRYSTALLINE ROCK (CR)	FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
NON-CRYSTALLINE ROCK (NCR)	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 SEDIMENTARY ROCK (CP)	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, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS 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.

ROCK HARDNESS

VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
MEDIUM HARD	CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.
SOFT	CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
VERY SOFT	CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.

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 FEET
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 THE 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.

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

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

BENCH MARK: BENCH MARKS PROVIDED BY STV/RALPH WHITEHEAD ASSOC.

ELEVATION: FT.

NOTES:

REVISED 09/23/09

April 16, 2013

STATE PROJECT: Geotechnical Report - Inventory
F.A. PROJECT: 43217.1.STR05T1B (P-5206B)
COUNTY: Rowan
DESCRIPTION: Reid to North Kannapolis – MP 337.1 to MP 340.9

SUBJECT: Geotechnical Report - Inventory

Project Description

Project information is based on e-mail and telephone communication between Donald Arant, PE of STV / Ralph Whitehead Associates, Inc. (STV) and Stewart Laney, PE of S&ME, Inc. between July 2011 and March 2013. Preliminary Plans prepared by STV, dated January 18, 2012 and electronic CAD files of the cross sections and profiles were provided as attachments to the e-mail correspondence. Additional information regarding final grading has been provided to us in e-mails from Toni Wilson with STV between March 1 and March 12, 2013.

We understand STV is preparing final construction documents for the new double track project from mile post 337.1 to mile post 340.9 in Kannapolis, North Carolina. Based on the plans, construction will include a new main rail line which will be constructed parallel to the existing rail line, new siding and spur tracks as well as new paved access roads and laydown areas. Based on the plans, cuts and fills up to approximately 15 feet will be required to achieve final grades.

In order to explore the general subsurface conditions at the project site S&ME drilled a total of thirteen (13) soil test borings as shown on Sheets 6 through 8 between February 4, 2013 and February 6, 2013. The borings locations were selected by STV and were located in the field by S&ME personnel using existing site features as references.

A CME-550X, All-Terrain Vehicle (ATV) mounted drill rig was used to advance the borings with hollow-stem, continuous flight augers. Standard Penetration Tests (SPT tests) were performed at designated intervals in the soil test borings in general accordance with ASTM D 1586 to provide an index for estimating soil strength and density and to provide samples for soil classification. SPT tests were performed with a hydraulic automatic hammer (Autohammer) rather than the traditional rope, cathead and safety hammer. All boreholes were backfilled with soil cuttings after drilling was completed.

The following alignments were investigated for this project:

Line	Station (+/-)
-M2B-	9080+00 to 9219+00

Areas of Special Geotechnical Interest

Plastic Soils: Based on the laboratory test results, near surface medium to highly plastic A-7-5 and A-7-6 soils (PI of 36 or greater) were encountered at several locations along the project alignment. Some undercutting and replacement or stabilizing of these materials may be required at the following locations.

Line	Station (+/-)
-M2B-	9081+00 to 9086+00
-M2B-	9153+50 to 9158+50
-M2B-	9196+50 to 9201+50
-M2B-	9215+50 to 9218+00

Physiography, Geology and Surface Water

The project site is located from mile post 337.1 to mile post 340.9 in in Rowan County just south of Salisbury. The topography in the area is generally flat to gently rolling. The project area is comprised of wooded areas and some commercial and residential development.

Geologically, the project area is located within the Charlotte Belt of the Piedmont Physiographic Province. The Piedmont Province is predominantly underlain by metamorphic rock (formed by heat, pressure and/or chemical action) and igneous rock (formed directly from molten material), which were initially formed during the Precambrian and Paleozoic eras. The volcanic and sedimentary rocks deposited in the Piedmont Province during the Precambrian eras were the host for the metamorphism and were changed to gneiss and schist. The more recent Paleozoic era had periods of igneous emplacement, with at least several episodes of regional metamorphism resulting in the majority of the rock types seen today. The bedrock under the site consists of Cambrian/Late Proterozoic age felsic to mafic metavolcanic rock.

Surface water is drained from the project corridor by Town Creek which is located to the east of the project alignment.

0160DEL_P10b2

Soil Properties

Generalized subsurface conditions for the project are described below. For more detailed soil descriptions and stratifications at a particular test location, the respective profile and cross section should be reviewed.

Railroad (Borings B-1 through B-13) as indicated by the soil test borings generally consisted of artificial fill or ballast stone underlain by residual soil to the boring termination depths.

Surface Materials: Soil test borings B-4 through B-6 encountered a layer of ballast stone and clay from the ground surface to depths of 3 to 5 feet below existing grades.

Artificial Fill Soils: Beneath the surficial materials or at the ground surface, existing fill soils were encountered in borings B-3 through B-7 and B-13 along the proposed railroad to depths ranging from 1.5 to 12 feet below the existing ground surface. The fill soils generally consisted of dark red brown clays (A-7-6) and (A-6). N-values ranged from 3 to 9 blows per foot (bpf) in the fill soils.

Residual Soils: Beneath the existing fill or at the ground surface, residual soils were encountered in all of the borings. The residual soils generally consisted of sandy silt (A-4), silt (A-5), silty clay (A-7-5) sandy clay (A-6), clay (A-7-6), and silty sand (A-2-4). N-values ranged from 2 to 27 bpf in the residual soils. These residual soil samples selected for laboratory testing exhibit a liquid limit ranging from 75 to 91 and a plasticity index from 46 to 58.

Ground Water

Groundwater level measurements were attempted in the borings at the completion of drilling. Borings B-2, B-3, and B-10 encountered groundwater at a depths ranging from 23 to 27.5 feet below the existing ground surface (elevation 764 to 776.7 feet-MSL). All other borings were dry after drilling.

S&ME, Inc. appreciates the opportunity to provide our services on this project. Please contact us if you have any questions regarding this report or if we may be of further assistance.

Sincerely,

S&ME, Inc.

Stewart S. Laney, P.E.
Project Engineer

Kristen H. Hill, P.E., P.G.
Senior Geotechnical Engineer

SSL/KHH/cps

S/1351/Project/2011/11-043

0160DEL_P10b2

PROJECT REFERENCE NO.	SHEET NO.
P-5206B	4

SHEET___ OF__ SHEETS

PROJECT: **P-5206B** COUNTY: **Rowan** DATE: **6/26/13** COMPILED BY: **STV**

Volumes in Cubic Yards

STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. +20%		ROCK	SUITABLE	UNSUIT.	TOTAL
-M2- (Prop. Main Track #2)															
-M2- 9011+00.00	-M2- 9041+00.00	14,234				14,234	1,076		1,076	1,291			12,943		12,943
	SUBTOTAL	14,234				14,234	1,076		1,076	1,291			12,943		12,943
-M2- (Prop. Main Track #2)															
-M2- 9041+00.00	-M2- 9071+00.0	6,842				6,842	5,844		5,844	7,013	171				
	SUBTOTAL	6,842				6,842	5,844		5,844	7,013	171				
-M2- (Prop. Main Track #2)															
-M2- 9071+00.00	-M2- 9101+00.00	11,218				11,218	6,425		6,425	7,710			3,508		3,508
	SUBTOTAL	11,218				11,218	6,425		6,425	7,710			3,508		3,508
-M2- (Prop. Main Track #2)															
-M2- 9101+00.00	-M2- 9131+00.00	4,145				4,145	2,340		2,340	2,808			1,337		1,337
	SUBTOTAL	4,145				4,145	2,340		2,340	2,808			1,337		1,337
-M2- (Prop. Main Track #2)															
-M2- 9131+00.00	-M2- 9161+00.0	10,730				10,730	974		974	1,169			9,561		9,561
	SUBTOTAL	10,730				10,730	974		974	1,169			9,561		9,561
-M2- (Prop. Main Track #2)															
-M2- 9161+00.00	-M2- 9169+50.00	11,342				11,342	65		65	78			11,264		11,264
-Y4- 10+28.78	-Y4- 12+50.00	23				23	325		325	390	367				
-Y4- 12+50.00	-Y4- 15+60.00	164				164	353		353	424	260				
	SUBTOTAL	11,529				11,529	743		743	892	627		11,264		11,264
-M2- (Prop. Main Track #2)															
-M2- 9170+50.00	-M2- 9200+50.00	14,280				14,280	7,745		7,745	9,294			4,986		4,986
	SUBTOTAL	14,280				14,280	7,745		7,745	9,294			4,986		4,986
-M2- (Prop. Main Track #2)															
-M2- 9200+50.00	-M2- 9218+00.00	1,379				1,379	6,062		6,062	7,274	5,895				
	SUBTOTAL	1,379				1,379	6,062		6,062	7,274	5,895				
	TOTAL	74,357				74,357	31,209		31,209	37,451	6,693		43,599		43,599
REDUCTION OF UNCLASSIFIED EXCAVATION		1,200			1,200		1,200		1,200	1,440	1,440			1,200	1,200
LOSS DUE TO CLEARING & GRUBBING		-612				-612							-612		-612
WASTE IN LIEU OF BORROW											-8,133		-8,133		-8,133
PROJECT TOTAL		74,945			1,200	73,745	32,409		32,409	38,891			34,854	1,200	36,054
GRAND TOTAL		74,945			1,200	73,745	32,409		32,409	38,891			34,854	1,200	36,054
SAY		75,000		5,500											

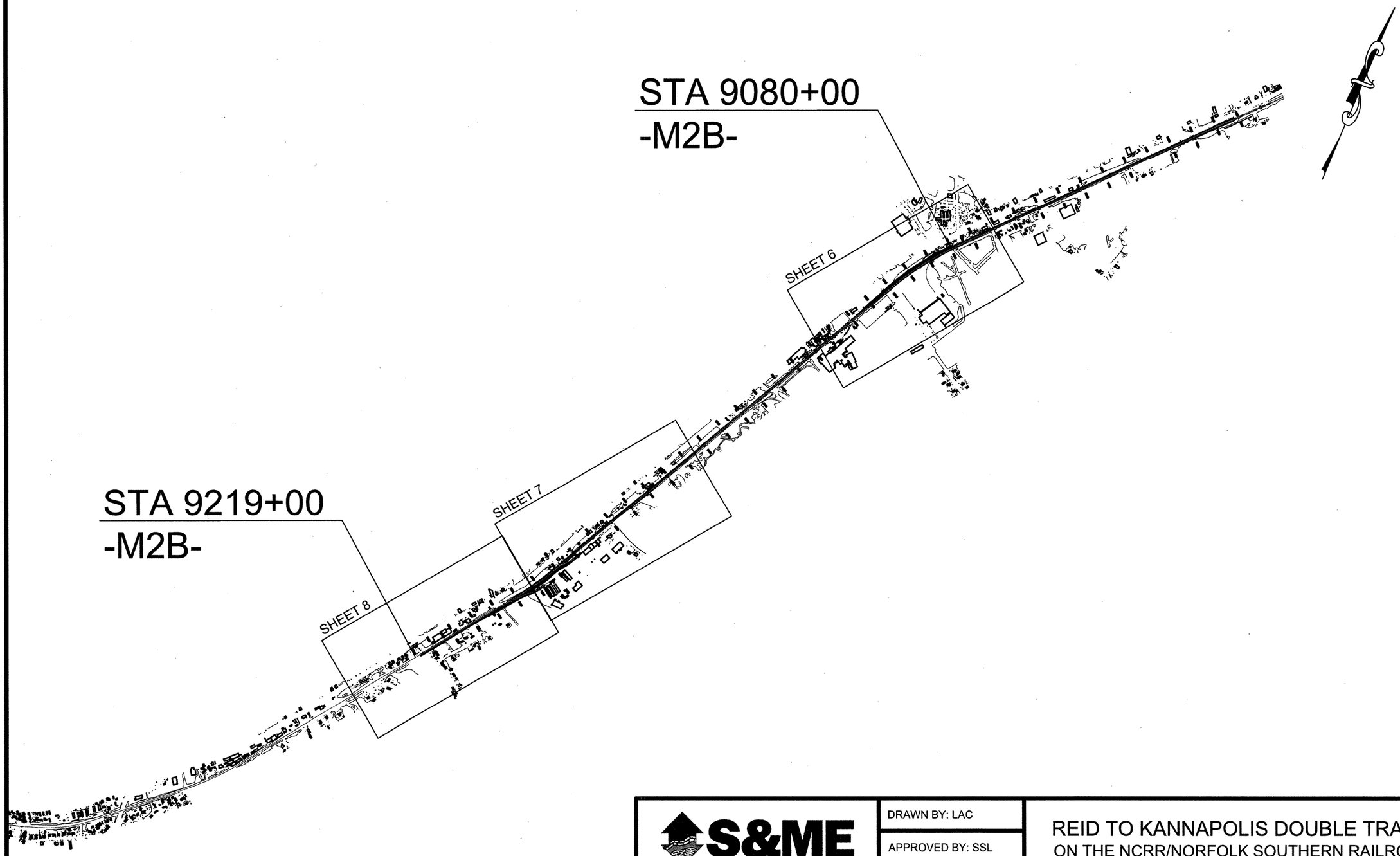
DWN 0160DEL_P10b2

PROJECT REFERENCE NO.	SHEET
P-5206B	5

PLAN SHEET LAYOUT

0 1000 2000 4000

FEET



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DRAWN BY: LAC

APPROVED BY: SSL

DATE: APRIL 16, 2013

REID TO KANNAPOLIS DOUBLE TRACK
ON THE NCRR/NORFOLK SOUTHERN RAILROAD
ROWAN COUNTY, NORTH CAROLINA

DGN 0160DEL_P10b2

PROJECT REFERENCE NO.	SHEET
P-5206B	6

SITE PLAN

0 150 300 600
FEET

-M2B-

BM#4
BL– STA. 105+30.87
225.60' LT
ELEV. 799.90'

B–1
B–2
B–3

9070 9075 9080 9085 9090 9095 9100 9105 9110

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	APPROVED BY: SSL
	DATE: APRIL 16, 2013

REID TO KANNAPOLIS DOUBLE TRACK
ON THE NCRR/NORFOLK SOUTHERN RAILROAD
ROWAN COUNTY, NORTH CAROLINA

DWN 0160DEL_P10b2

PROJECT REFERENCE NO.	SHEET
P-5206B	7

SITE PLAN

0 150 300 600

FEET

-M2B-

BM#6
STA. 180+33.69
182.18' RT
ELEV. 797.53'

BM#24
STA. 164+56.76
168.36' RT
ELEV. 808.11'

B-4 B-5 B-6 B-7 B-8

9150 9155 9160 9165 9170 9175 9180 9185 9190

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APPROVED BY: SSL

DATE: APRIL 16, 2013

REID TO KANNAPOLIS DOUBLE TRACK
ON THE NCRR/NORFOLK SOUTHERN RAILROAD
ROWAN COUNTY, NORTH CAROLINA

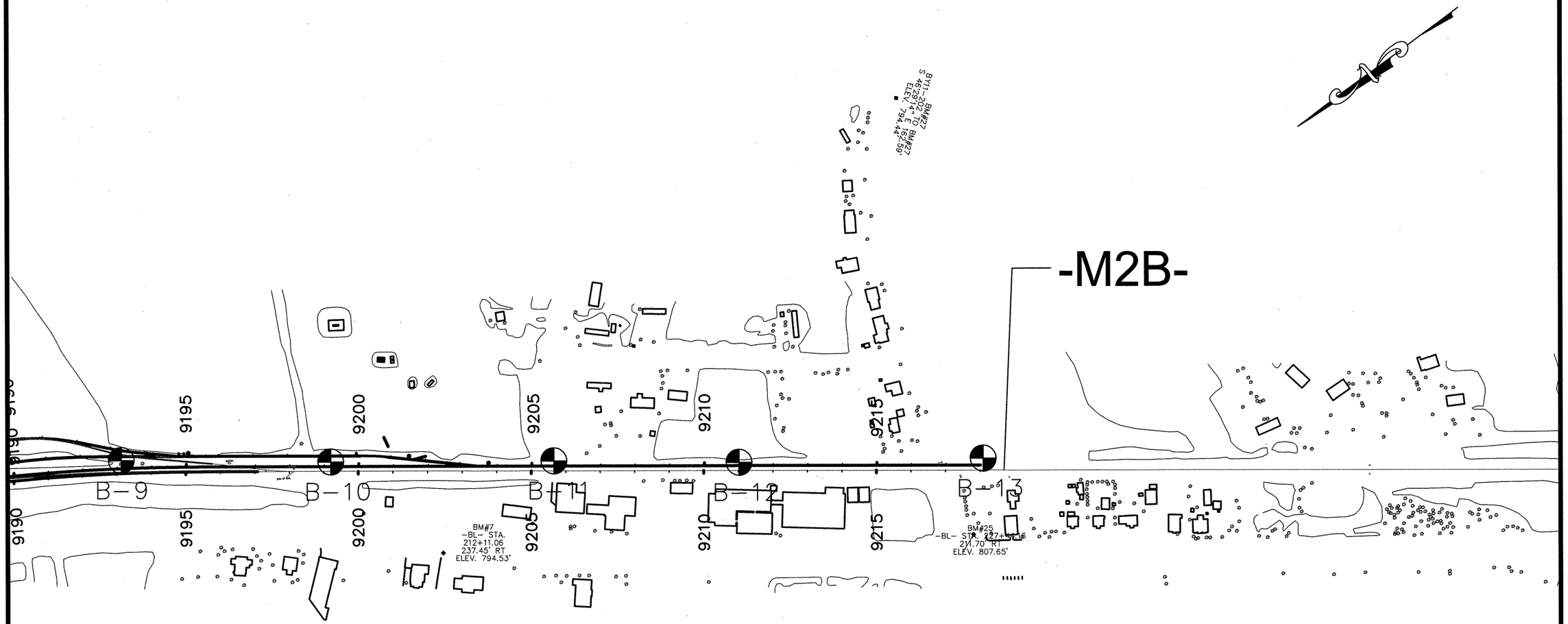
DGN 0160DEL_P10b2

PROJECT REFERENCE NO.	SHEET
P-5206B	8

SITE PLAN

0 150 300 600

FEET



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DRAWN BY: LAC

APPROVED BY: SSL

DATE: APRIL 16, 2013

REID TO KANNAPOLIS DOUBLE TRACK
ON THE NCRR/NORFOLK SOUTHERN RAILROAD
ROWAN COUNTY, NORTH CAROLINA

DCN 0160DEL_P10b2

PROJ. REFERENCE NO.	SHEET
P-5206B	9

T/RAIL EXIST.
MAIN TRACK #1

T/RAIL PROP
MAIN TRACK #2

PEELER
ROAD

B-1
9083+37
45 ft RT

B-2
9091+09
33 ft RT

B-3
9096+98
9 ft RT

(+)0.4439%

SS-1

9 7 14 12 24 10

DRY

RESIDUAL: *TAN RED BROWN, MEDIUM STIFF TO STIFF, WET TO MOIST, HIGHLY PLASTIC SANDY CLAY AND SILTY CLAY*

EXIST. GROUND ALONG
PROP MAIN TRACK #2

RESIDUAL: *GRAY, MEDIUM DENSE TO LOOSE, MOIST, SILTY FINE SAND*

ARTIFICIAL FILL: *RED BROWN BLACK, MEDIUM STIFF, MOIST, HIGHLY PLASTIC CLAY*

7 5 5 5 5 7 7

2/6/13

7 6 10 10 5 4 2 7

2/6/13

RESIDUAL: *TAN ORANGE BROWN, VERY SOFT TO MEDIUM STIFF, MOIST TO WET, SANDY SILT AND SILT*

825 820 815 810 805 800 795 790 785 780 775 770 765 760 755 750 745 740 735

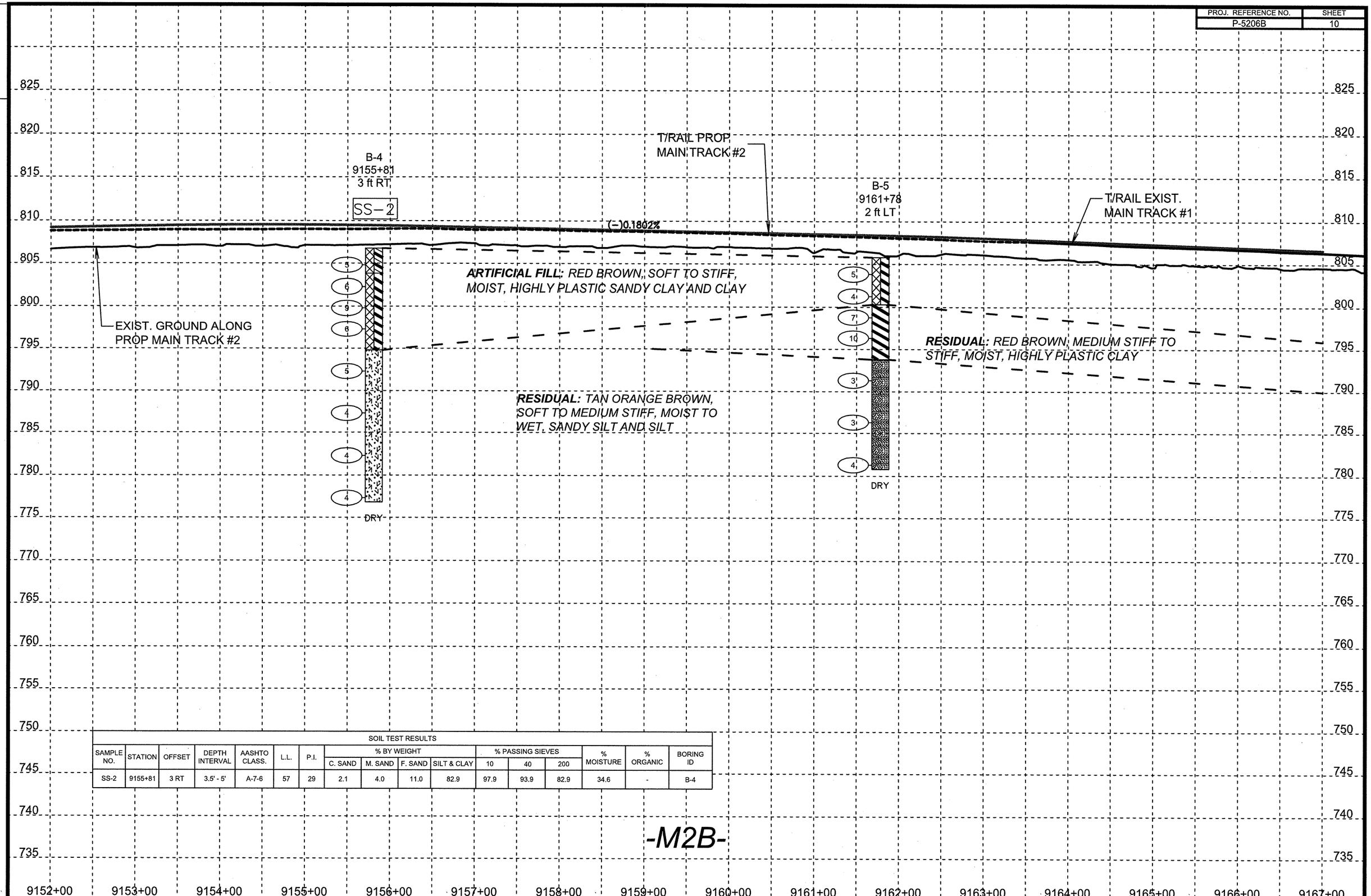
9083+00 9084+00 9085+00 9086+00 9087+00 9088+00 9089+00 9090+00 9091+00 9092+00 9093+00 9094+00 9095+00 9096+00 9097+00

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC	BORING ID
							C. SAND	M. SAND	F. SAND	SILT & CLAY	10	40	200			
SS-1	9083+37	45 RT	1' - 2.5'	A-7-5	91	58	0.0	0.7	5.3	94	100	99.3	94.0	43.0	-	B-1

-M2B-

PROJ. REFERENCE NO.	SHEET
P-5206B	10



SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC	BORING ID
							C. SAND	M. SAND	F. SAND	SILT & CLAY	10	40	200			
SS-2	9155+81	3 RT	3.5' - 5'	A-7-6	57	29	2.1	4.0	11.0	82.9	97.9	93.9	82.9	34.6	-	B-4

-M2B-

0160DEL_P10b2

PROJ. REFERENCE NO.	SHEET
P-5206B	11

WEBB ROAD

T/RAIL EXIST. MAIN TRACK #1

(–)0.3608%

T/RAIL PROP MAIN TRACK #2

EXIST. GROUND ALONG PROP MAIN TRACK #2

(–)0.3608%

B-6
9175+12
3 ft RT

B-7
9180+95
54 ft LT

ARTIFICIAL FILL: *RED BROWN, MEDIUM STIFF, DRY TO MOIST, HIGHLY PLASTIC CLAY AND BALLAST STONE*

RESIDUAL: *GRAY RED BROWN, STIFF, MOIST, HIGHLY PLASTIC SANDY CLAY AND SILTY CLAY*

RESIDUAL: *ORANGE BROWN, MEDIUM DENSE, MOIST, SILTY SAND*

RESIDUAL: *RED BROWN, MEDIUM STIFF, MOIST, SANDY SILT AND SILT*

B-6: 7, 5, 5, 5, 9, 15 — DRY

B-7: 8, 9, 10, 7, 7, 7, 8 — DRY

825 820 815 810 805 800 795 790 785 780 775 770 765 760 755 750 745 740 735

9167+00 9168+00 9169+00 9170+00 9171+00 9172+00 9173+00 9174+00 9175+00 9176+00 9177+00 9178+00 9179+00 9180+00 9181+00 9182+00

-M2B-

DCV 0160DEL_P10b2

PROJ. REFERENCE NO.	SHEET
P-5206B	12

T/RAIL PROP.
MAIN TRACK #2

T/RAIL PROP.
MAIN TRACK #2

(–)0.1639%

(+)0.5529%

(+)0.5529%

B-8
9186+78
43 ft LT

B-9
9193+14
37 ft LT

SS–3

7
12
12
11

5
7

DRY

11
14
12
7
6
6
4
8

DRY

T/RAIL EXIST.
MAIN TRACK #1

EXIST. GROUND ALONG
PROP MAIN TRACK #2

RESIDUAL: *RED ORANGE BROWN, STIFF TO MEDIUM STIFF, MOIST, HIGHLY PLASTIC SILTY CLAY AND CLAY*

RESIDUAL: *TAN ORANGE, SOFT TO STIFF, MOIST TO WET, SANDY SILT AND SILT*

RESIDUAL: *TAN WHITE, LOOSE, WET, SILTY SAND*

825 820 815 810 805 800 795 790 785 780 775 770 765 760 755 750 745 740 735

9182+00 9183+00 9184+00 9185+00 9186+00 9187+00 9188+00 9189+00 9190+00 9191+00 9192+00 9193+00 9194+00 9195+00 9196+00 9197+00

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC	BORING ID
							C. SAND	M. SAND	F. SAND	SILT & CLAY	10	40	200			
SS-3	9186+78	43 LT	1' - 2.5'	A-7-6	75	46	0.7	3.4	12.8	58.0	74.3	70.8	58.0	19.2	-	B-8

-M2B-

DCN 0160DEL_P10b2

PROJ. REFERENCE NO.	SHEET
P-5206B	13

EXIST. GROUND ALONG
EXIST. MAIN TRACK #1

T/RAIL EXIST.
MAIN TRACK #1

EXIST. GROUND ALONG
EXIST. MAIN TRACK #1
PROP MAIN TRACK #2

B-10
9199+20
27 ft LT

(+)0.6867%

11
9
6
5
7
7
6
13
2/5/13

B-11
9205+65
28 ft LT

8
12
11
10
8
9
DRY

RESIDUAL: *TAN RED BROWN, MEDIUM STIFF TO STIFF, MOIST, SANDY SILT AND SILT*

B-12
9211+02
23 ft LT

RESIDUAL: *RED ORANGE BROWN, STIFF, MOIST, HIGHLY PLASTIC SANDY CLAY AND CLAY*

9
11
14
9
5
27
DRY

RESIDUAL: *WHITE ORANGE BROWN, MEDIUM DENSE, MOIST, SILTY SAND*

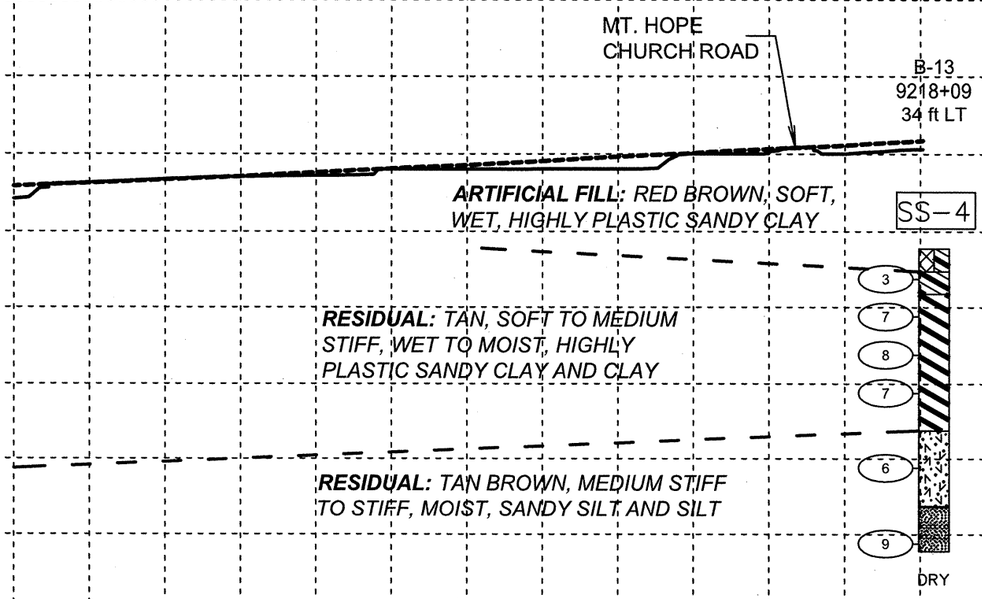
825 820 815 810 805 800 795 790 785 780 775 770 765 760 755 750 745 740 735

9197+00 9198+00 9199+00 9200+00 9201+00 9202+00 9203+00 9204+00 9205+00 9206+00 9207+00 9208+00 9209+00 9210+00 9211+00 9212+00

-M2B-

DCN 0160DEL_P10b2

PROJ. REFERENCE NO.	SHEET
P-5206B	14



825 820 815 810 805 800 795 790 785 780 775 770 765 760 755 750 745 740 735

9212+00 9213+00 9214+00 9215+00 9216+00 9217+00 9218+00 9219+00 9220+00 9221+00 9222+00 9223+00 9224+00 9225+00 9226+00 9227+00

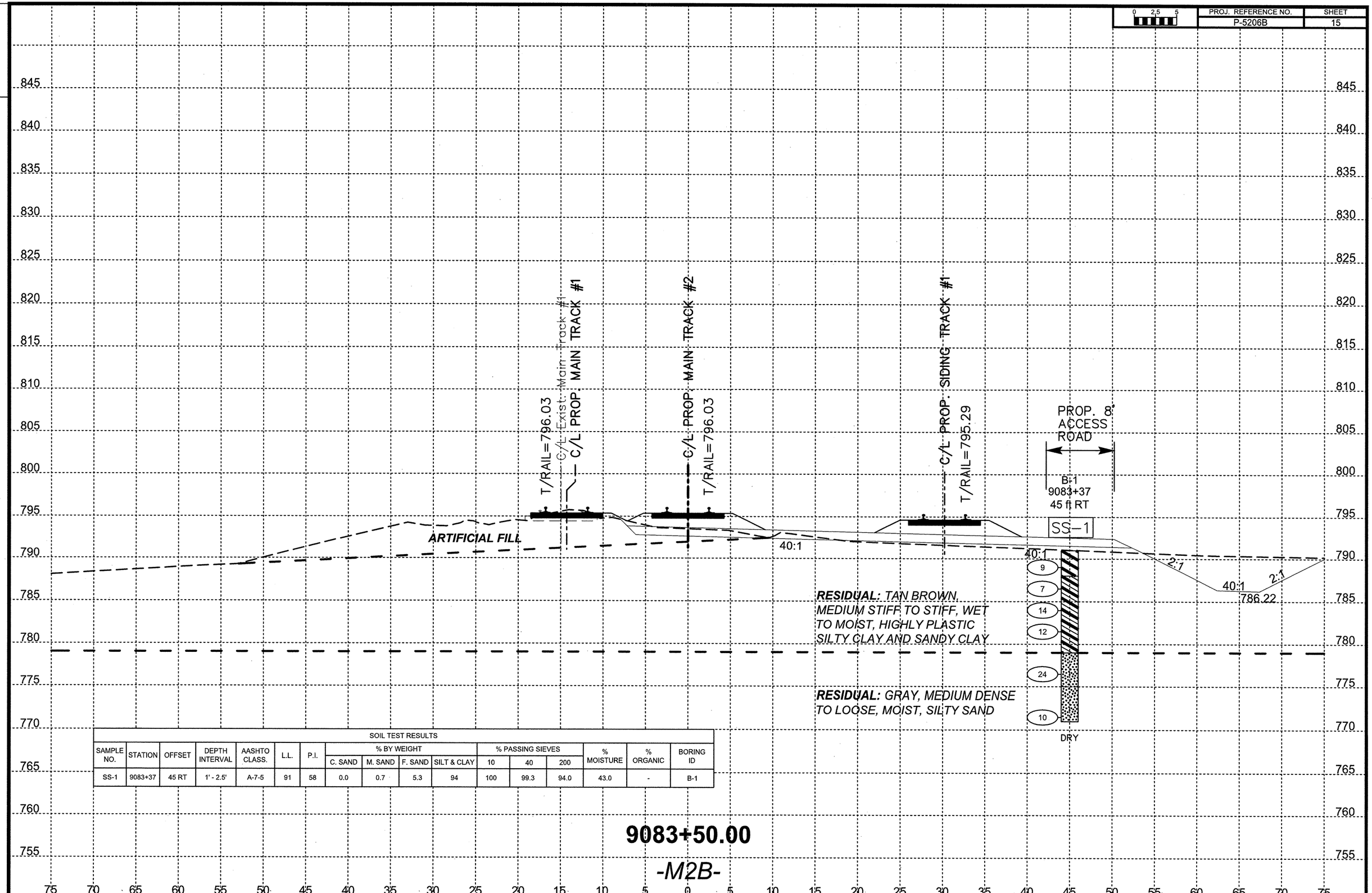
SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC	BORING ID
							C. SAND	M. SAND	F. SAND	SILT & CLAY	10	40	200			
SS-4	9218+09	34 LT	1' - 2.5'	A-6	24	11	0.7	9.5	41.7	47.9	99.1	89.6	47.9	14.7	-	B-13

-M2B-

DGN 0160DEL_P10b2

0 2.5 5	PROJ. REFERENCE NO.	SHEET
	P-5206B	15



SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC	BORING ID
							C. SAND	M. SAND	F. SAND	SILT & CLAY	10	40	200			
SS-1	9083+37	45 RT	1' - 2.5'	A-7-5	91	58	0.0	0.7	5.3	94	100	99.3	94.0	43.0	-	B-1

9083+50.00

-M2B-

DGN 0160DEL_P10b2

0 2.5 5	PROJ. REFERENCE NO.	SHEET
	P-5206B	16

T/RAIL=799.34
C/L Exist. Main Track #1
C/L PROP. MAIN TRACK #1

C/L PROP. MAIN TRACK #2
T/RAIL=799.35

C/L PROP. SIDING TRACK #1
T/RAIL=798.62

PROP. 8' ACCESS ROAD

ARTIFICIAL FILL

40:1

B-2
9091+09
33 ft RT

40:1

2:1

40:1
787.70

RESIDUAL: *RED BROWN, MEDIUM STIFF, MOIST, HIGHLY PLASTIC CLAY*

RESIDUAL: *TAN BROWN, MEDIUM STIFF, MOIST TO WET, SILT AND SANDY SILT*

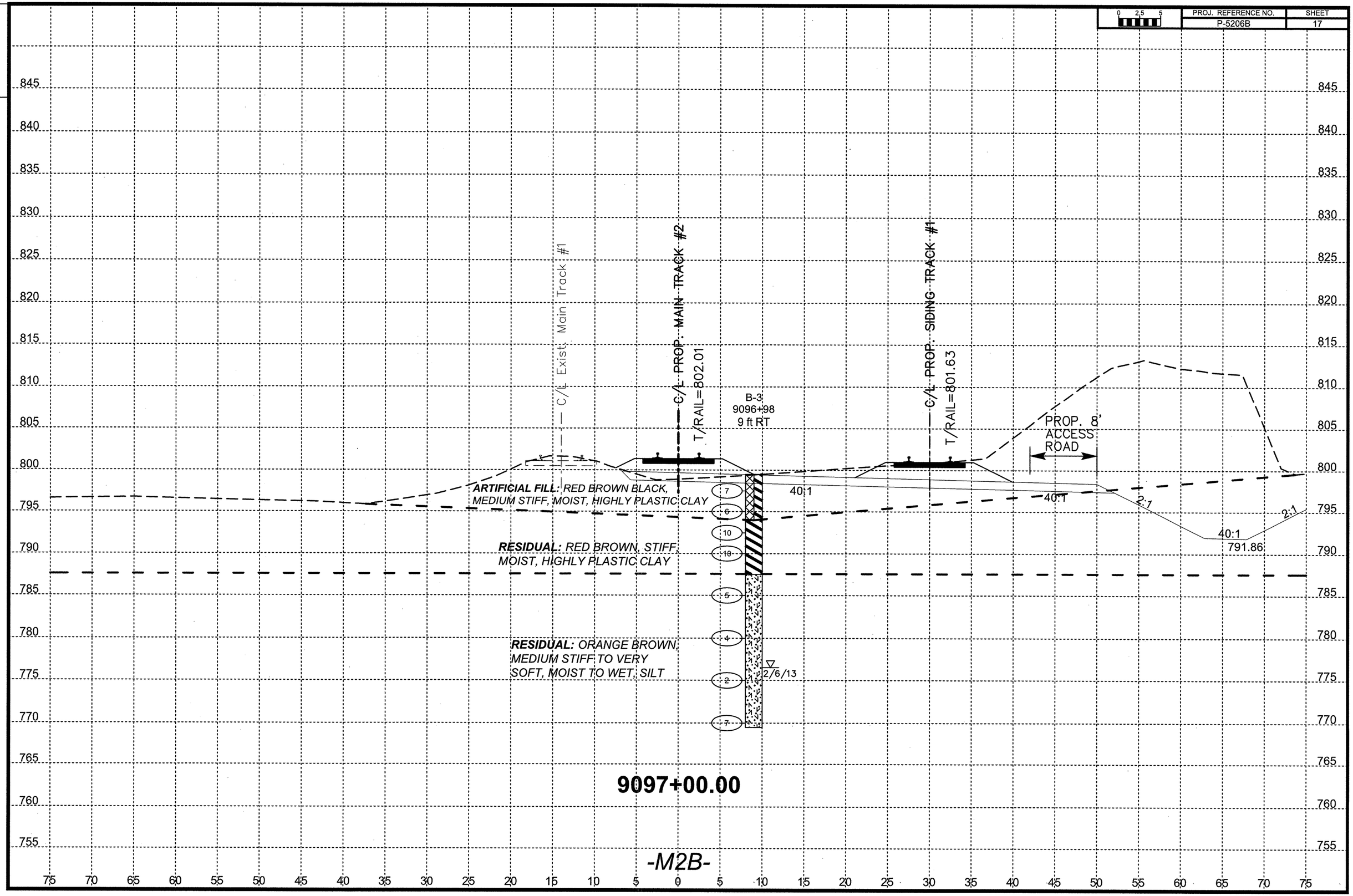
2/6/13

9091+00.00

-M2B-

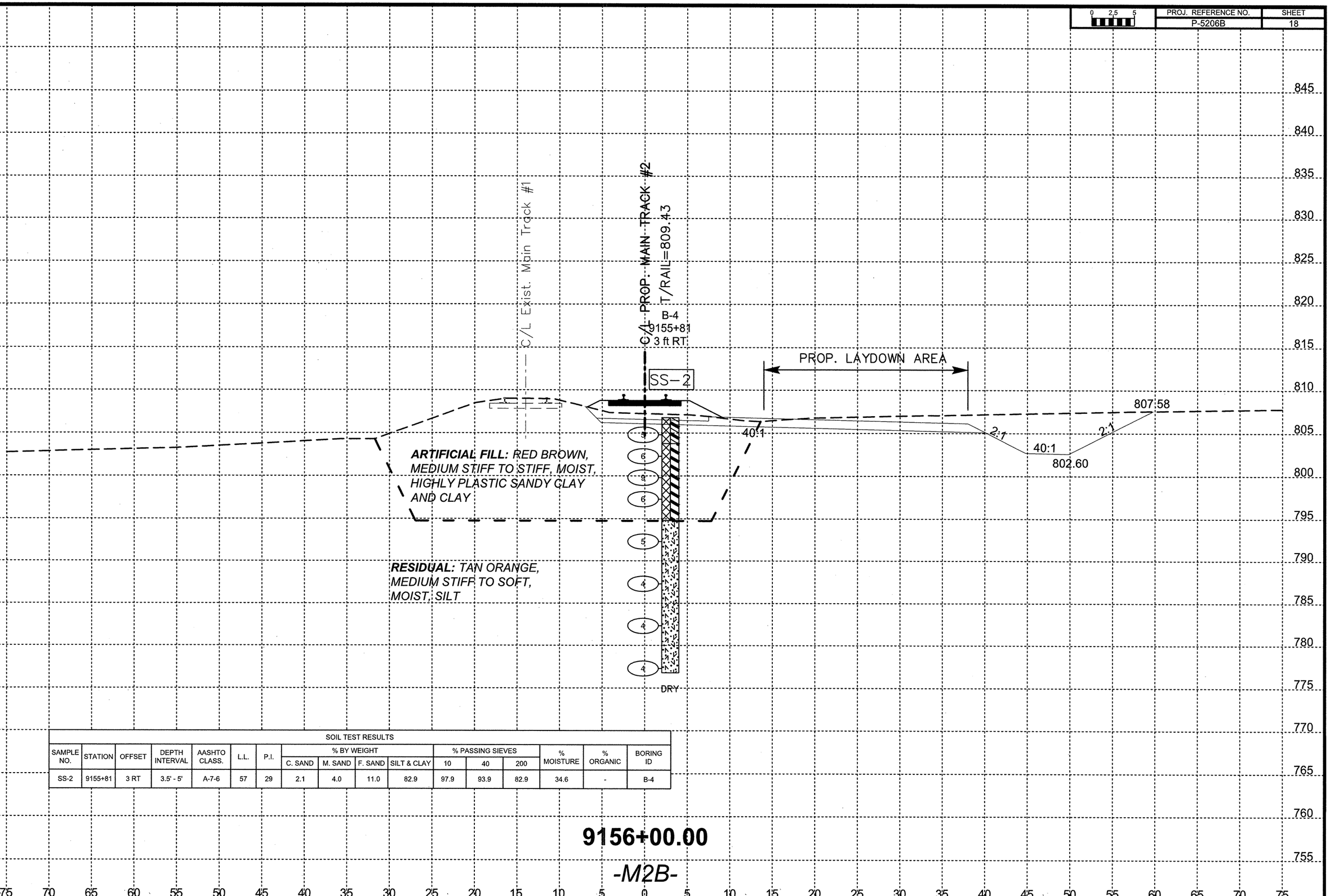
pcv
0160DEL_P10b2

0 2.5 5	PROJ. REFERENCE NO.	SHEET
	P-5206B	17



DCN 0160DEL_P10b2

0 2.5 5	PROJ. REFERENCE NO.	SHEET
	P-5206B	18



SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC	BORING ID
							C. SAND	M. SAND	F. SAND	SILT & CLAY	10	40	200			
SS-2	9155+81	3 RT	3.5' - 5'	A-7-6	57	29	2.1	4.0	11.0	82.9	97.9	93.9	82.9	34.6	-	B-4

DGN 0160DEL_P10b2

0 2.5 5	PROJ. REFERENCE NO.	SHEET
	P-5206B	19

PROP. LAYDOWN AREA

T/RAIL=808.36
C/L PROP. MAIN TRACK #1
C/L Exist. Main Track #1
C/L PROP. CROSSOVER TRACK

B-5
9161+78
2 ft LT

C/L PROP. MAIN TRACK #2
T/RAIL=808.36

PROP. LAYDOWN AREA

806.48
2:1
40:1
801.20
2:1
40:1
2:1
808.41
2:1
40:1
800.20

ARTIFICIAL FILL: *RED BROWN, MEDIUM STIFF TO SOFT, MOIST, HIGHLY PLASTIC CLAY*

5
4
7
10

RESIDUAL: *RED BROWN, MEDIUM STIFF TO STIFF, MOIST, HIGHLY PLASTIC CLAY*

3
3
4

RESIDUAL: *ORANGE BROWN, SOFT, WET, SANDY SILT*

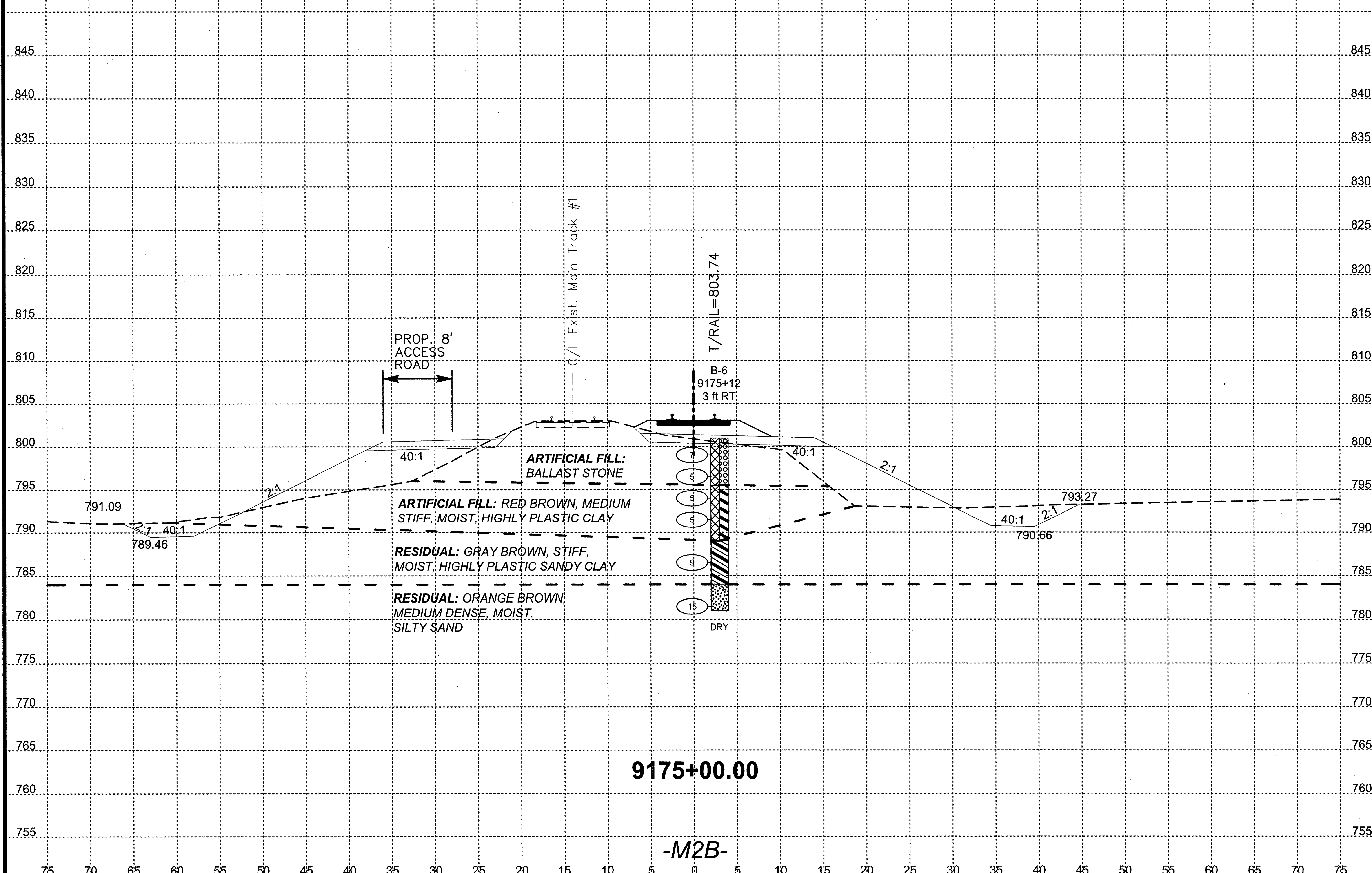
DRY

9162+00.00

-M2B-

845 840 835 830 825 820 815 810 805 800 795 790 785 780 775 770 765 760 755

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


PROP. 8' ACCESS ROAD
C/L Exst. Main Track #1
T/RAIL=803.74
B-6
9175+12
3 ft RT
40:1
2:1
791.09
789.46
40:1
793.27
790.66
ARTIFICIAL FILL: BALLAST STONE
ARTIFICIAL FILL: RED BROWN, MEDIUM STIFF, MOIST, HIGHLY PLASTIC CLAY
RESIDUAL: GRAY BROWN, STIFF, MOIST, HIGHLY PLASTIC SANDY CLAY
RESIDUAL: ORANGE BROWN, MEDIUM DENSE, MOIST, SILTY SAND
DRY
9175+00.00
-M2B-

DCN 0160DEL_P10b2

0 2.5 5	PROJ. REFERENCE NO.	SHEET
	P-5206B	21

T/RAIL=795.23

C/L PROP. SPUR TRACK #1

C/L Exist. Spur Track #1

B-7
9180+95
54 ft LT

PROP. 8'
ACCESS
ROAD

C/L PROP. SIDING TRACK #2

C/L Exist. Main Track #1

T/RAIL=801.78

C/L PROP. MAIN TRACK #2

T/RAIL=802.07

40:1 791.50

2:1

40:1

40:1

791.25

2:1

2:1

40:1

2:1

40:1

799.46

40:1

2:1

40:1

2:1

794.40

8
9
10
7
7
8

DRY

ARTIFICIAL FILL: *RED BROWN, MEDIUM STIFF, MOIST, HIGHLY PLASTIC CLAY*

RESIDUAL: *RED BROWN, STIFF, MOIST, HIGHLY PLASTIC SILTY CLAY*

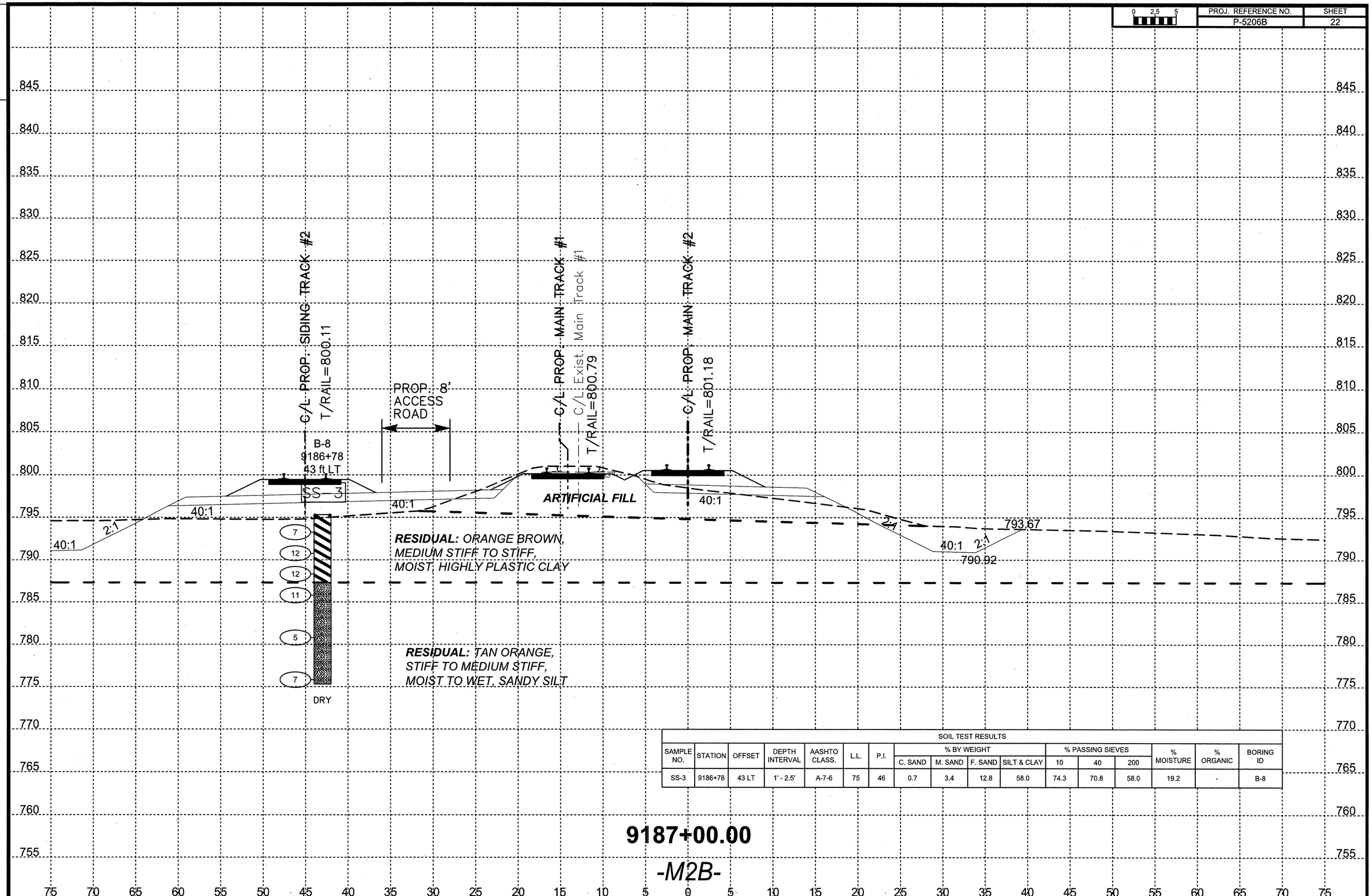
RESIDUAL: *RED BROWN, MEDIUM STIFF, MOIST, SILT AND SANDY SILT*

9181+00.00

-M2B-

DCN 0160DEL_P10b2

0 2.5 5	PROJ. REFERENCE NO.	SHEET
	P-5206B	22



SOIL TEST RESULTS

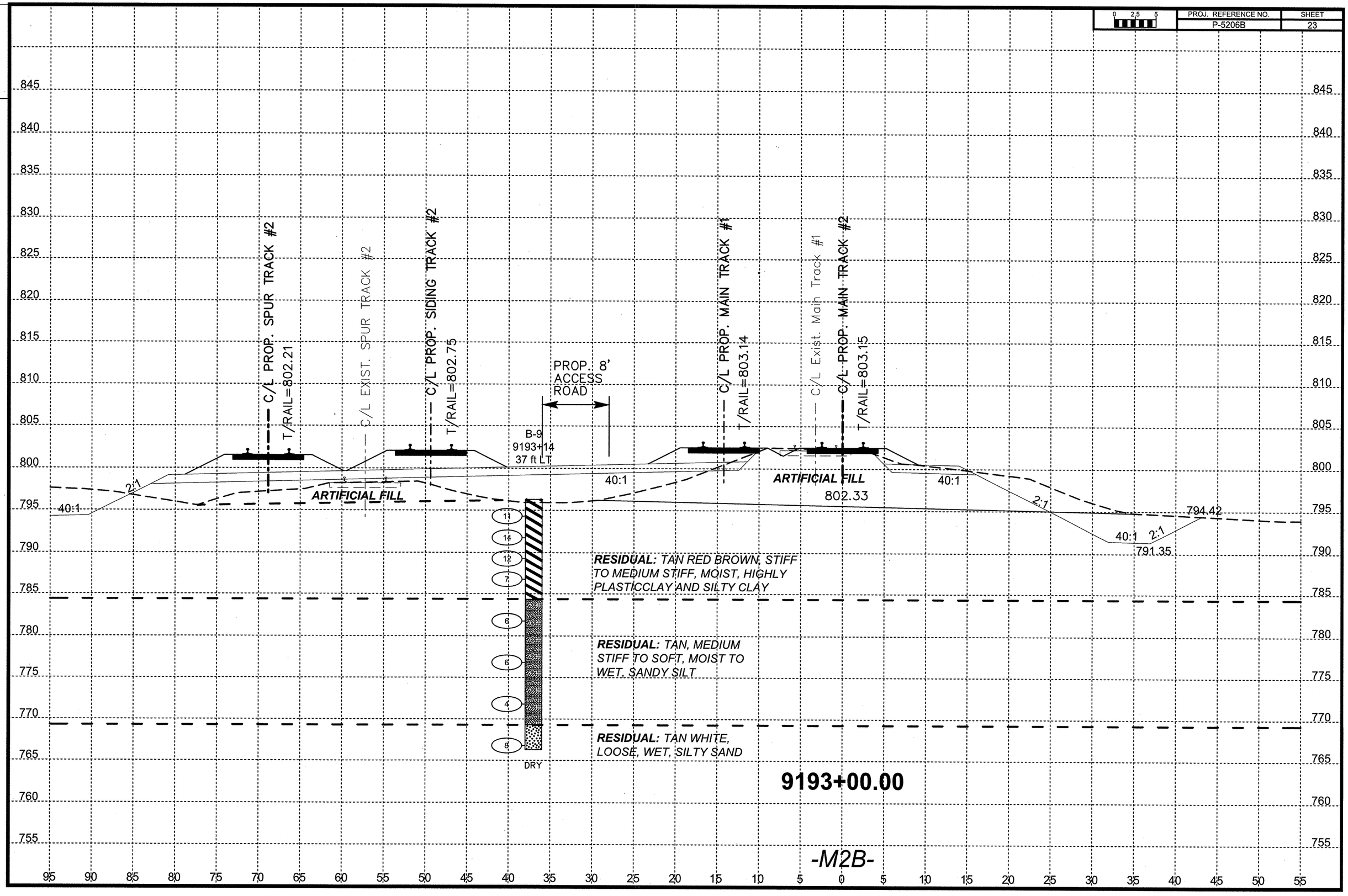
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC	BORING ID
							C. SAND	M. SAND	F. SAND	SILT & CLAY	10	40	200			
SS-3	9186+78	43 LT	1' - 2.5'	A-7-6	75	46	0.7	3.4	12.8	58.0	74.3	70.8	58.0	19.2	-	B-8

9187+00.00

-M2B-

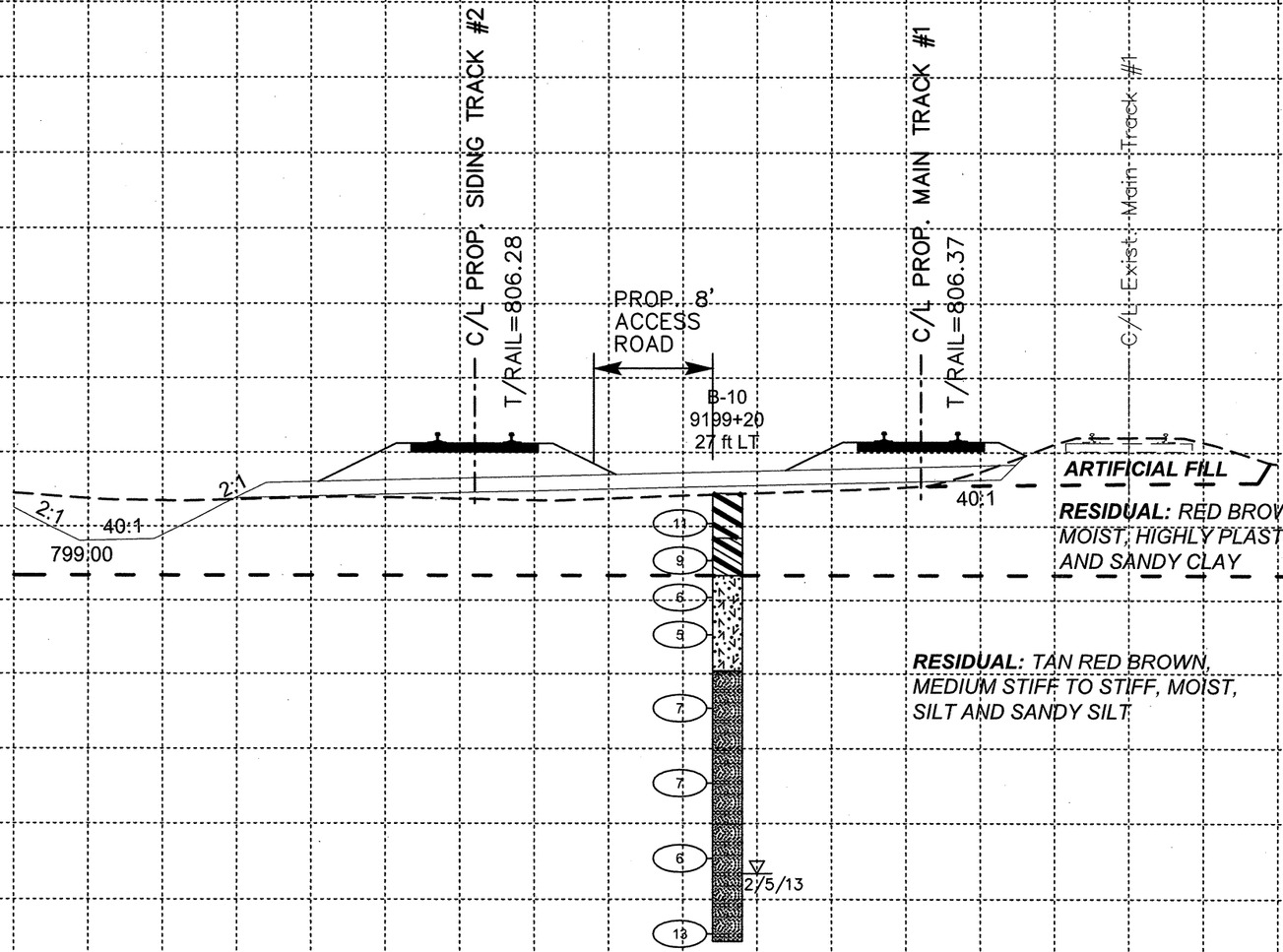
DGN 0160DEL_P10b2

0 2.5 5	PROJ. REFERENCE NO.	SHEET
	P-5206B	23



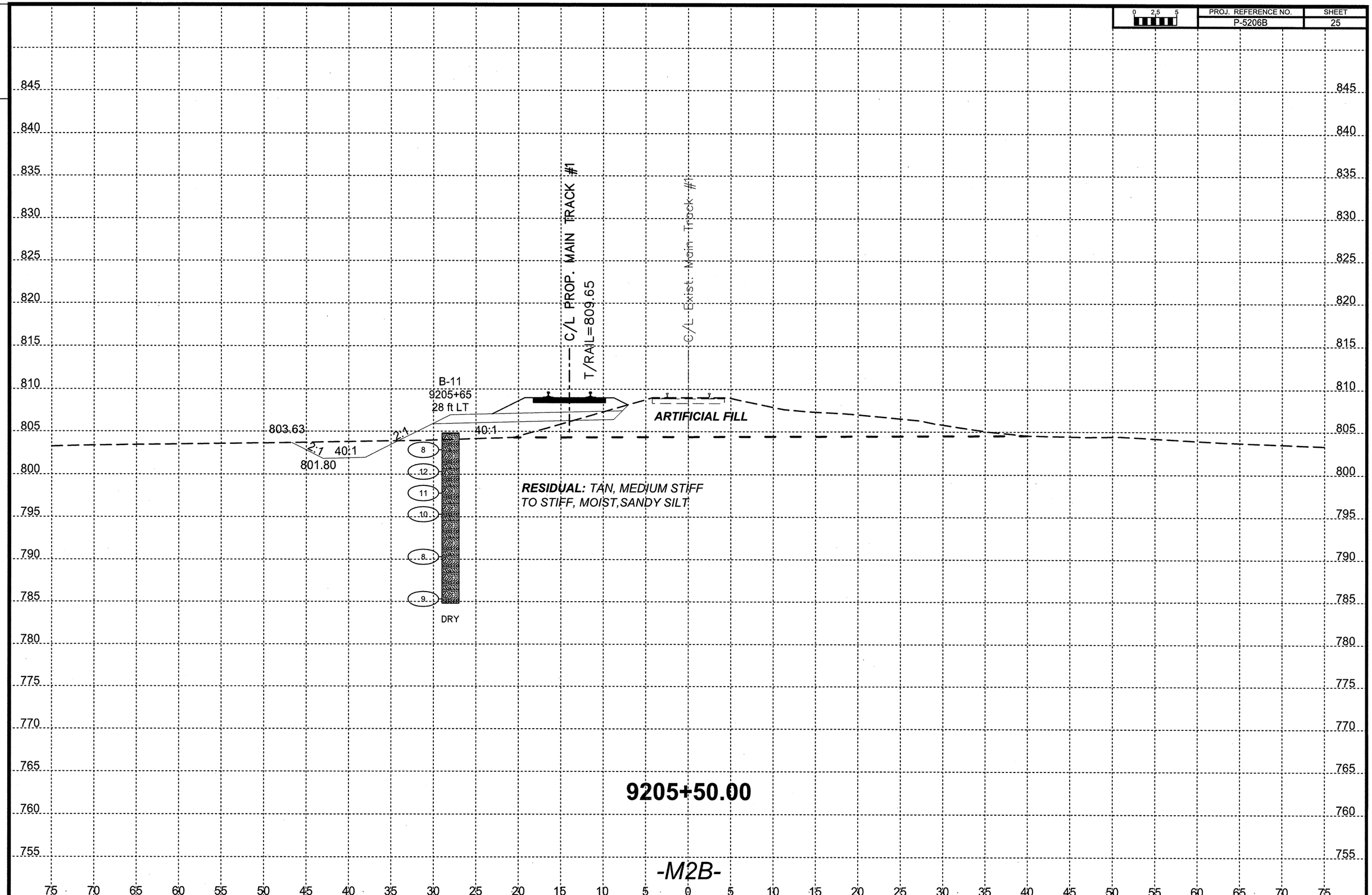
DGN 0160DEL_P10b2

0 2.5 5	PROJ. REFERENCE NO.	SHEET
	P-5206B	24



DCN 0160DEL_P10b2

0 2.5 5	PROJ. REFERENCE NO.	SHEET
	P-5206B	25



DCN 0160DEL_P10b2

PROJ. REFERENCE NO.	SHEET
P-5206B	26

0 2.5 5

C/L PROP. MAIN TRACK #1
T/RAIL=812.42

C/L Exist. Main Track #1

EXIST. BUILDING

B-12
9211+02
23 ft LT

9
11
14
9
5
27
DRY

2:1
40:1
804.52

809.75
ARTIFICIAL FILL
807.21
40:1
804.60

RESIDUAL: *ORANGE BROWN, STIFF, MOIST, HIGHLY PLASTIC CLAY AND SILTY CLAY*

RESIDUAL: *TAN, MEDIUM STIFF, MOIST, SANDY SILT*

RESIDUAL: *WHITE ORANGE BROWN, MEDIUM DENSE, MOIST, SILTY SAND*

9211+00.00

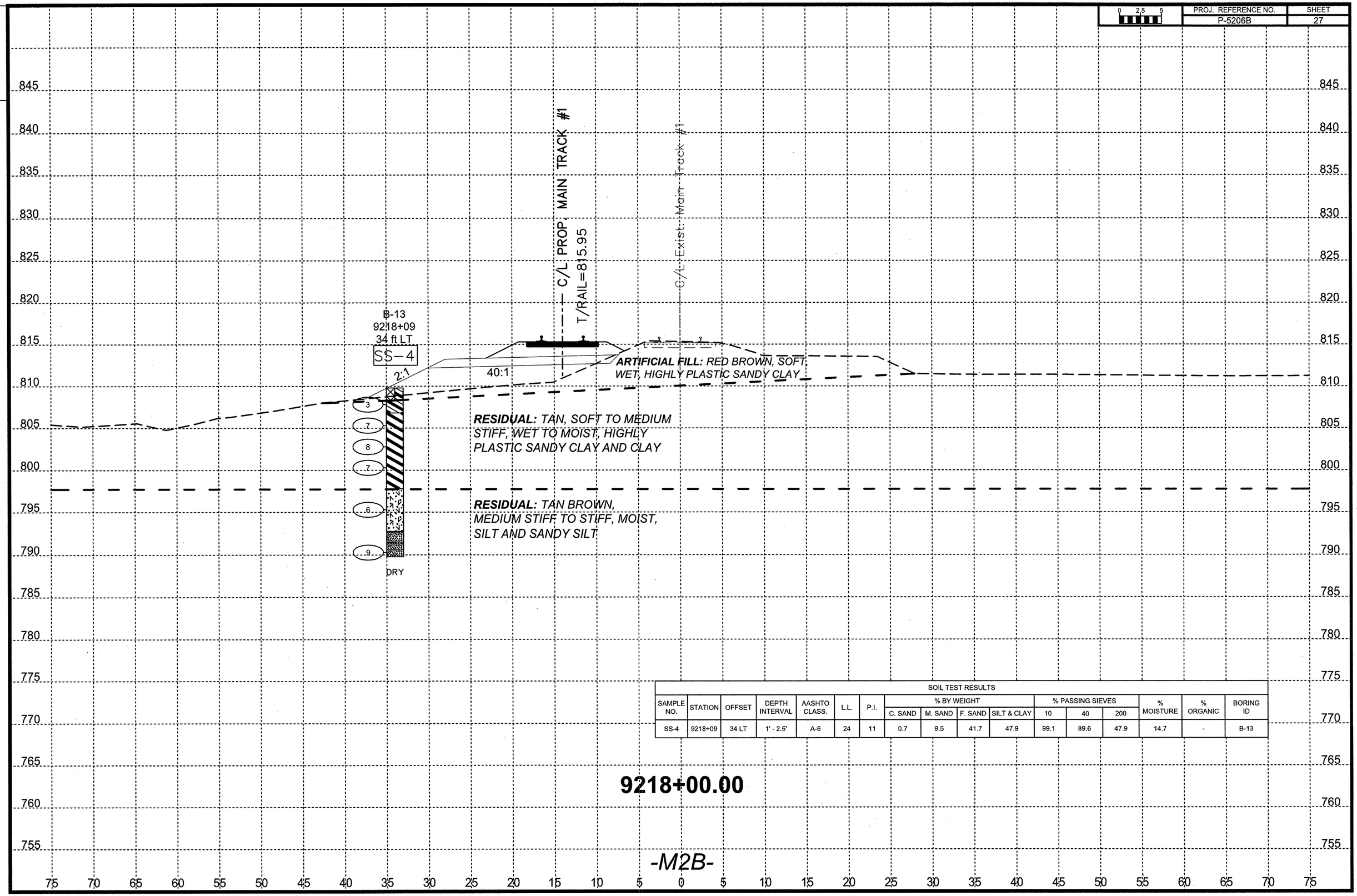
-M2B-

845 840 835 830 825 820 815 810 805 800 795 790 785 780 775 770 765 760 755

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

DCN 0160DEL_P10b2

0 2.5 5	PROJ. REFERENCE NO.	SHEET
	P-5206B	27



SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC	BORING ID
							C. SAND	M. SAND	F. SAND	SILT & CLAY	10	40	200			
SS-4	9218+09	34 LT	1' - 2.5'	A-6	24	11	0.7	9.5	41.7	47.9	99.1	89.6	47.9	14.7	-	B-13

9218+00.00

-M2B-