

NOTE: SEE SHEET 2A FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3812	1	49
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34977.2.1	STP-88(2)	P.E.	
34977.2.2	STP-88(2)	R/W, UTILITIES	
34977.3.1	STP-88(6)	CONSTRUCTION	

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LINE	STATION	PLAN	PROFILE	XSECT	DESCRIPTION	SHEET
-L-	10+00 to 89+00	4-9	-	10-42	SAMPLE RESULTS	49
-Y-	10+00 to 20+50	4	-	43-48		

ROADWAY  
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34977.1.1(U-3812) F.A. PROJ. STP-88(2)  
COUNTY ASHE  
PROJECT DESCRIPTION NC 88 (WEST MAIN STREET) FROM NC 194 TO US 221 BUSINESS

INVENTORY

CAUTION NOTICE

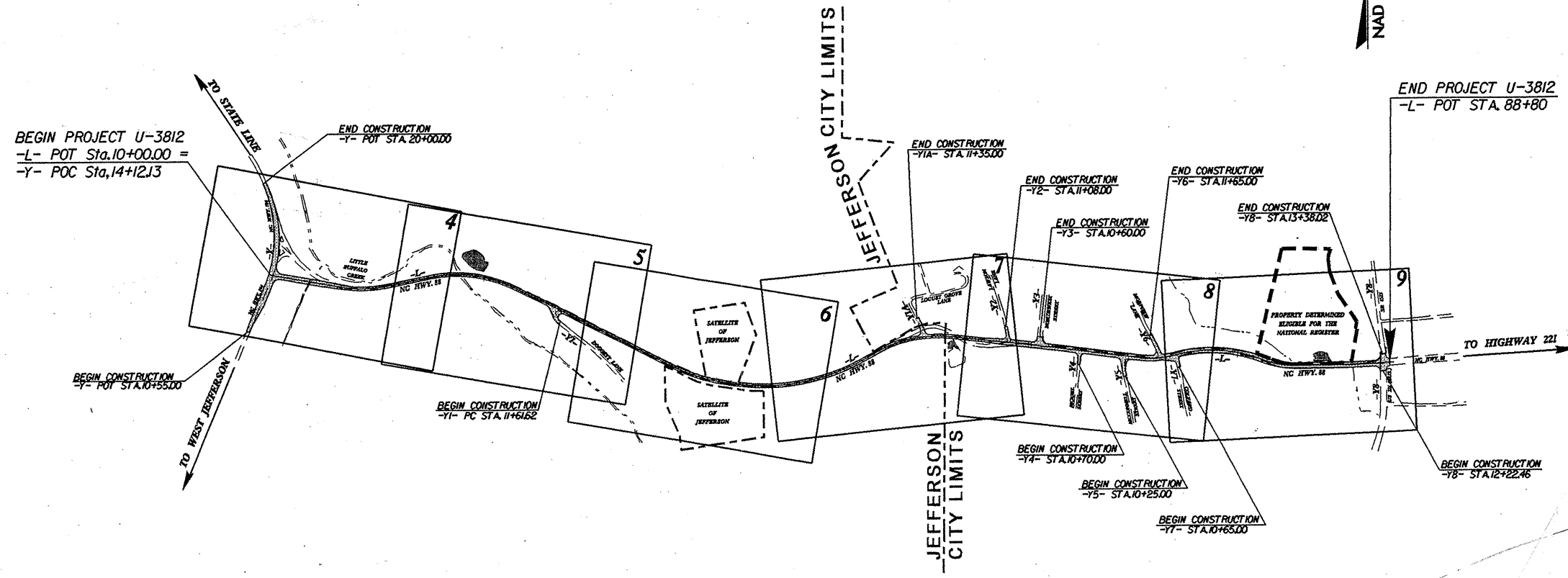
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 919/250-4088. 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.

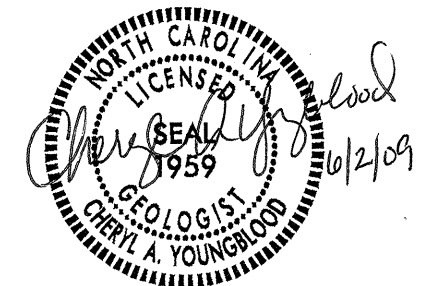
ID: U-3812

CONTRACT: C202744



PERSONNEL  
SUMMIT CONSULTING

INVESTIGATED BY C.A. YOUNGBLOOD  
CHECKED BY K.B. MILLER  
SUBMITTED BY K.B. MILLER  
DATE JUNE, 2009



DRAWN BY: T.T. WALKER, C.A. YOUNGBLOOD

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.

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

PROJECT REFERENCE NO. 34977.1.1(U-3812)	SHEET NO. 2
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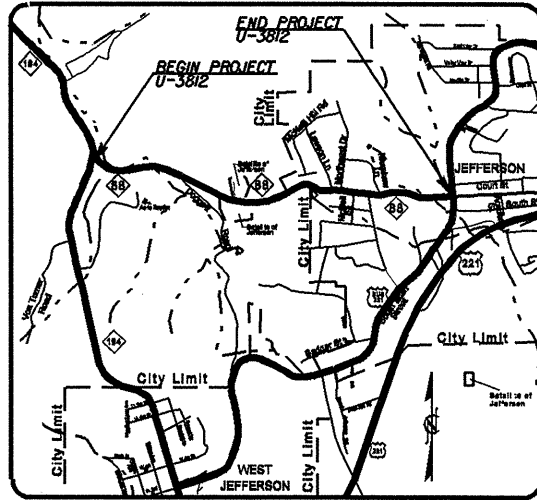
**SUBSURFACE INVESTIGATION**

**SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS**

SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS																																																																																																																																												
<p>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 T208, 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:</p> <p style="text-align: center;"><i>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HEAVY PLASTIC, A-7-6</i></p>	<p><b>WELL GRADED</b> - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.  <b>UNIFORM</b> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)  <b>GAP-GRADED</b> - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</p> <p style="text-align: center;"><b>ANGULARITY OF GRAINS</b></p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: <b>ANGULAR</b>, <b>SUBANGULAR</b>, <b>SUBROUNDED</b>, OR <b>ROUNDED</b>.</p>	<p>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:</p> <p><b>WEATHERED ROCK (WR)</b> - NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES &gt; 100 BLOWS PER FOOT IF TESTED.</p> <p><b>CRYSTALLINE ROCK (CR)</b> - FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.</p> <p><b>NON-CRYSTALLINE ROCK (NCR)</b> - 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.</p> <p><b>COASTAL PLAIN SEDIMENTARY ROCK (CP)</b> - COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.</p>	<p><b>ALLUVIUM (ALLUV.)</b> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.  <b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA.  <b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.  <b>ARGILLACEOUS</b> - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.  <b>ARTESIAN</b> - 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.  <b>CALCAREOUS (CALC.)</b> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.  <b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.  <b>CORE RECOVERY (REC.)</b> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.  <b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.  <b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.  <b>DIP DIRECTION (DIP AZIMUTH)</b> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.  <b>FAULT</b> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.  <b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.  <b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.  <b>FLOOD PLAIN (FP)</b> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.  <b>FORMATION (FM)</b> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.  <b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.  <b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.  <b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.  <b>MOTTLED (MOT.)</b> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.  <b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.  <b>RESIDUAL (RES.) SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.  <b>ROCK QUALITY DESIGNATION (RQD)</b> - 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.  <b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.  <b>SILL</b> - 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.  <b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.  <b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b> - NUMBER OF BLOWS (IN 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.  <b>STRATA CORE RECOVERY (SREC.)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.  <b>STRATA ROCK QUALITY DESIGNATION (SRQD)</b> - 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.  <b>TOPSOIL (TS.)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																																																																																												
<p style="text-align: center;"><b>SOIL LEGEND AND AASHTO CLASSIFICATION</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>GENERAL CLASS.</th> <th colspan="4">GRANULAR MATERIALS (&lt;= 35% PASSING #200)</th> <th colspan="4">SILT-CLAY MATERIALS (&gt; 35% PASSING #200)</th> <th colspan="4">ORGANIC MATERIALS</th> </tr> <tr> <td>GROUP CLASS.</td> <td>A-1</td> <td>A-3</td> <td>A-2</td> <td>A-4</td> <td>A-5</td> <td>A-6</td> <td>A-7</td> <td>A-1, A-2</td> <td>A-3</td> <td>A-4, A-5</td> <td>A-6, A-7</td> <td></td> <td></td> </tr> <tr> <td>SYMBOL</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>% PASSING</td> <td>10 40 200</td> <td>10 40 200</td> <td>10 40 200</td> <td>10 40 200</td> <td>10 40 200</td> <td>10 40 200</td> <td>10 40 200</td> <td>10 40 200</td> <td>10 40 200</td> <td>10 40 200</td> <td>10 40 200</td> <td>10 40 200</td> <td>10 40 200</td> </tr> <tr> <td>LIQUID LIMIT PLASTIC INDEX</td> <td>6 MX</td> <td>NP</td> <td>40 MX 10 MX 11 MN</td> <td>40 MX 10 MX 11 MN</td> <td>40 MX 10 MX 11 MN</td> <td>40 MX 10 MX 11 MN</td> <td>40 MX 10 MX 11 MN</td> <td>40 MX 10 MX 11 MN</td> <td>40 MX 10 MX 11 MN</td> <td>40 MX 10 MX 11 MN</td> <td>40 MX 10 MX 11 MN</td> <td>40 MX 10 MX 11 MN</td> <td>40 MX 10 MX 11 MN</td> </tr> <tr> <td>GROUP INDEX</td> <td>0</td> <td>0</td> <td>0</td> <td>4 MX</td> <td>8 MX</td> <td>12 MX</td> <td>16 MX</td> <td>No MX</td> <td>No MX</td> <td>No MX</td> <td>No MX</td> <td>No MX</td> <td>No MX</td> </tr> <tr> <td>USUAL TYPES OF MAJOR MATERIALS</td> <td>STONE FRAGS, GRAVEL, AND SAND</td> <td>FINE SAND</td> <td>SILTY OR CLAYEY GRAVEL AND SAND</td> <td>SILTY SOILS</td> <td>CLAYEY SOILS</td> <td>CLAYEY SOILS</td> <td>CLAYEY SOILS</td> <td>CLAYEY SOILS</td> <td>CLAYEY SOILS</td> <td>CLAYEY SOILS</td> <td>CLAYEY SOILS</td> <td>CLAYEY SOILS</td> <td>CLAYEY SOILS</td> </tr> <tr> <td>GEN. RATING AS A SUBGRADE</td> <td colspan="3">EXCELLENT TO GOOD</td> <td colspan="3">FAIR TO POOR</td> <td>FAIR TO POOR</td> <td>POOR</td> <td>POOR</td> <td>UNSATURABLE</td> <td></td> <td></td> <td></td> </tr> </table> <p style="text-align: center;">PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS &gt; LL - 30</p>	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			SYMBOL														% PASSING	10 40 200	10 40 200	10 40 200	10 40 200	10 40 200	10 40 200	10 40 200	10 40 200	10 40 200	10 40 200	10 40 200	10 40 200	10 40 200	LIQUID LIMIT PLASTIC INDEX	6 MX	NP	40 MX 10 MX 11 MN	40 MX 10 MX 11 MN	40 MX 10 MX 11 MN	40 MX 10 MX 11 MN	40 MX 10 MX 11 MN	40 MX 10 MX 11 MN	40 MX 10 MX 11 MN	40 MX 10 MX 11 MN	40 MX 10 MX 11 MN	40 MX 10 MX 11 MN	40 MX 10 MX 11 MN	GROUP INDEX	0	0	0	4 MX	8 MX	12 MX	16 MX	No MX	No MX	No MX	No MX	No 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	CLAYEY SOILS	CLAYEY SOILS	CLAYEY SOILS	CLAYEY SOILS	CLAYEY SOILS	CLAYEY SOILS	CLAYEY SOILS	CLAYEY SOILS	GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD			FAIR TO POOR			FAIR TO POOR	POOR	POOR	UNSATURABLE				<p style="text-align: center;"><b>MINERALOGICAL COMPOSITION</b></p> <p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.</p> <p style="text-align: center;"><b>COMPRESSIBILITY</b></p> <p>SLIGHTLY COMPRESSIBLE      LIQUID LIMIT LESS THAN 31          MODERATELY COMPRESSIBLE      LIQUID LIMIT EQUAL TO 31-50          HIGHLY COMPRESSIBLE      LIQUID LIMIT GREATER THAN 50</p> <p style="text-align: center;"><b>PERCENTAGE OF MATERIAL</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th></th> <th>ORGANIC MATERIAL</th> <th>GRANULAR SOILS</th> <th>SILT - CLAY SOILS</th> <th>OTHER MATERIAL</th> </tr> <tr> <td>TRACE OF ORGANIC MATTER</td> <td>2 - 3%</td> <td>3 - 5%</td> <td>3 - 5%</td> <td>TRACE</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 5%</td> <td>5 - 12%</td> <td>5 - 12%</td> <td>LITTLE</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>12 - 20%</td> <td>12 - 20%</td> <td>SOME</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>&gt;10%</td> <td>&gt;20%</td> <td>&gt;20%</td> <td>HIGHLY</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>35% AND ABOVE</td> </tr> </table> <p style="text-align: center;"><b>GROUND WATER</b></p> <p> 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</p>		ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	3 - 5%	TRACE	LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	5 - 12%	LITTLE	MODERATELY ORGANIC	5 - 10%	12 - 20%	12 - 20%	SOME	HIGHLY ORGANIC	>10%	>20%	>20%	HIGHLY					35% AND ABOVE	<p style="text-align: center;"><b>WEATHERING</b></p> <p><b>FRESH</b> - ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.  <b>VERY SLIGHT (V SLI.)</b> - 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.  <b>SLIGHT (SLI.)</b> - 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.  <b>MODERATE (MOD.)</b> - 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.  <b>MODERATELY SEVERE (MOD. SEV.)</b> - 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>  <b>SEVERE (SEV.)</b> - 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, YIELDS SPT N VALUES &gt; 100 BPF</i>  <b>VERY SEVERE (V SEV.)</b> - 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. <i>IF TESTED, YIELDS SPT N VALUES &lt; 100 BPF</i>  <b>COMPLETE</b> - 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.</p> <p style="text-align: center;"><b>ROCK HARDNESS</b></p> <p><b>VERY HARD</b> - CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.  <b>HARD</b> - CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.  <b>MODERATELY HARD</b> - 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.  <b>MEDIUM HARD</b> - CAN BE GROUDED 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.  <b>SOFT</b> - CAN BE GROUDED 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.  <b>VERY SOFT</b> - 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 FINGER NAIL.</p>
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																																																																																																																																				
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09/08/99

See Sheet 1-A For Index of Sheets  
See Sheet 1-B For CONVENTIONAL SYMBOLS



VICINITY MAP

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**ASHE COUNTY**

LOCATION: NC 88 (WEST MAIN ST.) FROM NC 194  
TO US 221 BUSINESS (SOUTH MAIN ST.).

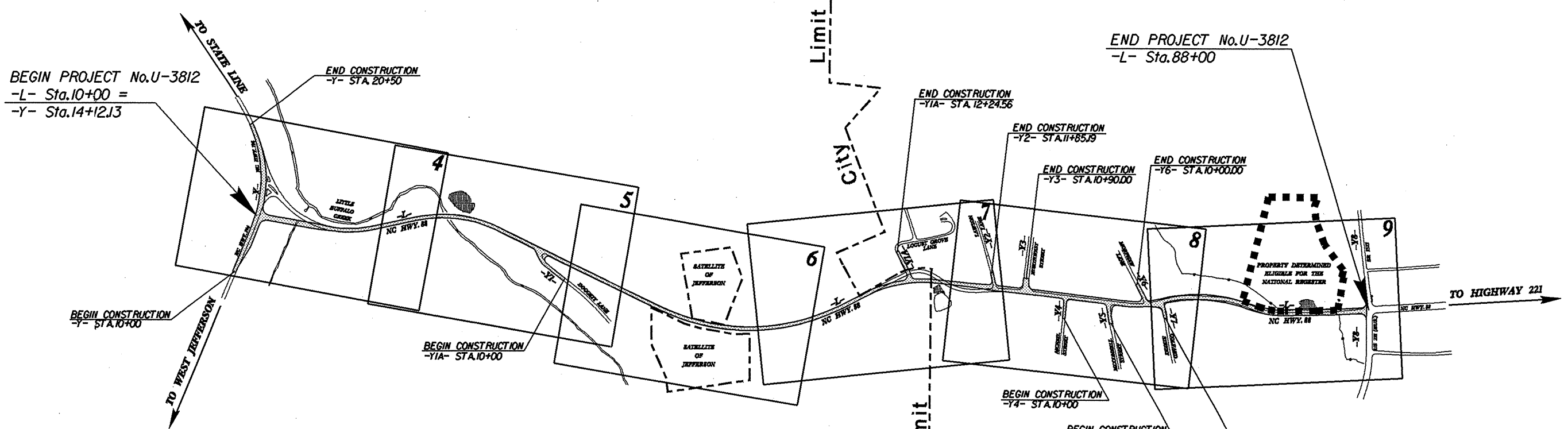
TYPE OF WORK: GRADING, PAVING, RESURFACING,  
WIDENING, DRAINAGE, AND SIDEWALK.

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3812	2A	49
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34977.1.1	STP-88(2)	P.E.	

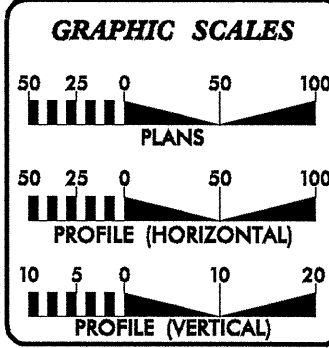


TIP PROJECT: U-3812

CONTRACT: 34977.1.1



CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD \_\_\_\_\_



**DESIGN DATA**

ADT 2006 =	8,400
ADT 2030 =	14,200
DHV =	12 %
D =	60 %
T =	6 % *
V =	50 MPH (Rural)
V =	35 MPH (Urban)
* TTST	1% DUAL 5%

**PROJECT LENGTH**

LENGTH ROADWAY STATE PROJECT No. U-3812 =	1.477 MILES
LENGTH ROADWAY F. A. PROJECT No. STP-88 (2) =	1.477 MILES
TOTAL ROADWAY LENGTH STATE PROJECT No. U-3812 =	1.477 MILES

Prepared in the Office of:  
**DIVISION OF HIGHWAYS**  
1000 Birch Ridge Dr., Raleigh NC, 27610

2006 STANDARD SPECIFICATIONS	
RIGHT OF WAY DATE:	J. S. GOODNIGHT, PE PROJECT ENGINEER
LETTING DATE:	S. D. KENDALL, PE PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.

**ROADWAY DESIGN ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.

**DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA**

STATE HIGHWAY DESIGN ENGINEER P.E.

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STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE  
GOVERNOR

EUGENE A. CONTI, JR.  
SECRETARY

June 2, 2009

STATE PROJECT: 34977.1.1, U-3812  
FEDERAL PROJECT: STP-88(2)  
COUNTY: Ashe  
DESCRIPTION: NC 88 (West Main Street) from NC 194 to US 221 Business  
SUBJECT: Geotechnical Report –Inventory

**Project Description**

The project consists of the improvement of NC 88 (West Main Street) from NC 194 to US 221 Business that includes widening and resurfacing. The project begins at NC 194 and extends east for 1.48 miles to US 221 Business.

A geotechnical investigation was conducted in December 2008. Borings were advanced utilizing an ATV mounted CME-550 drill machine with manual hammer and a hand auger. Standard Penetration Tests were performed at selected locations and additional borings were advanced using continuous flight augers. Representative soil samples were collected for visual classification in the field and selected samples were submitted for laboratory analysis by the Materials and Tests Unit. The following alignments were investigated

<u>Line</u>	<u>Station(±)</u>
-L-	10+00 to 88+27.35
-Y-	10+55 to 20+00

**Areas of Special Geotechnical Interest**

- 1) Highly Plastic Clays: Highly plastic ( $PI \geq 26$ ) clays were encountered on the project at the following interval.

<u>Line</u>	<u>Station (±)</u>
-L-	78+25 to 79+00

- 2) Organic Soils: The following areas on the project contained organic soils.

<u>Line</u>	<u>Station (±)</u>
-L-	58+35 to 59+20 Rt.
-L-	83+25 to 84+75 Lt.

- 3) Artificial Fill: Artificial fill was encountered at the following locations.

<u>Line</u>	<u>Station (±)</u>
-L-	10+25 to 12+60
-L-	77+52 to 81+48 Rt.
-L-	86+29 to 87+85 Rt.

- 4) Crystalline Rock: Rock Outcrops were observed or crystalline Rock was encountered within 6 feet of proposed grade at the following locations.

<u>Line</u>	<u>Station (±)</u>
-L-	14+25 to 21+40 Rt
-L-	28+27 to 36+25 Lt.
-L-	54+60 to 55+80 Lt.
-Y-	10+55 to 11+25

- 5) Groundwater: The following areas exhibit a high water table, seasonal high ground water or the potential for groundwater related construction problems

<u>Line</u>	<u>Station (±)</u>
-L-	58+35 to 59+20
-L-	83+25 to 84+75

-Y-

10+55 to 11+25

- 6) Water Wells: Water wells within or in close proximity of the right of way or construction easement are noted at the following locations.

Line

Station (±)

-L-

11+57 3' Rt.

Other wells may be present along the project corridor that were not detected

### Physiography and Geology

The project is located in the mountainous terrain of the Eastern Blue Ridge Physiographic Province. Land use along the project corridor consists of homes, commercial businesses and woods. Geologically, the project is located within the Late Proterozoic Ashe Metamorphic Suite which is composed of metasedimentary and mafic metavolcanic rocks that lie nonconformably on granitic basement. The muscovite-biotite gneiss (Zatm) was encountered at the project site. Little Buffalo Creek and a few ditches all within the New River Basin drain the project.

### Soil Properties

Soils encountered at the project site include roadway embankment, artificial fill, alluvial, residual, weathered rock and crystalline rock of the Ashe Metamorphic Suite.

Roadway Embankment soils are present along the existing NC 88 and NC 198. These soils consist of brown, medium dense, silty sand, brown, stiff, sandy silt with gravel and orange, stiff, sandy clay (A-2-4, A-4, A-6).

Artificial Fill soils were encountered from -L- 10+25 to 12+60 where a property owner attempted to develop that land for a commercial business and consist of brown-tan, medium stiff, sandy silt with trace gravel and cobbles (A-4). The artificial fill is underlain by residual soils. Artificial fill soils were also encountered along utility easements and consist of orange, medium stiff, sandy silt (A-4) and brown, medium stiff, sandy and silty clay with trace organic, little mica and trace gravel (A-6, A-7-5, A-7-6).

Alluvial deposits are located within the floodplains of Little Buffalo Creek, ditches and wetland areas that traverse the project. These soils are primarily gray, very soft, highly organic sandy silt (A-4), tan, dark brown and dark gray, very loose to loose, clayey or silty sand (A-2-4, A-2-5) and dark brown and tan, very soft, silt clay with organic matter (A-7-5).

Residual soils were encountered throughout the project. These soils consist of tan to brown, medium stiff to hard, sandy silt with trace mica (A-4), red and orange, soft to medium stiff to stiff clayey silt (A-5), gray, medium dense silty sand with trace gravel (A-2-4) and orange, stiff, sandy clay (A-6, A-7-5)

### Rock Properties

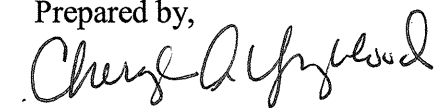
Weathered rock was encountered during the roadway investigation. It originates from the underlying muscovite-biotite gneiss.

Crystalline rock was encountered during the roadway investigation and consists of muscovite-biotite gneiss. Refer to the "Areas of Geotechnical Interest" for areas of rock outcrops or rock encountered within 6 feet of proposed grade.

### Ground Water

Groundwater was encountered in multiple borings and ranges in elevation from 2644.8 to 3027.7 feet. Groundwater may fluctuate with seasonal precipitation.

Prepared by,



Cheryl A. Youngblood, L.G.

Senior Project Geological Engineer

STATION	STATION	EXCAVATION				EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH		EMBANK. +15%	ROCK	SUITABLE	UNSUIT.
<b>SUMMARY No. 1 (Area 1, Phase 1)</b>														
L 10+15.28	13+00.00 (LT/RT)	10				10				4,691				
L 13+00.00	15+50.00 (RT)	101	2			99	2	550	635	534				
Y 10+55.00	16+00.00	306	1			305	1	699	805	499				
<b>SUBTOTAL SUMMARY No. 1 (Area 1, Phase 1)</b>		417	3			414	3	5,337	6,141	5,724				
<b>SUMMARY No. 2 (Area 2, Phase 1)</b>														
L 49+50	63+00	11,133	167	125		10,966		2,740	3,318			7,815	125	7,940
Y1A 10+12.35	10+40	3				3		111	128	125				
Y2 10+19	11+25.00	213				213		77	89			124		124
<b>SUBTOTAL SUMMARY No. 2 (Area 2, Phase 1)</b>		11,349	167	125		11,182		2,928	3,535	125		7,939	125	8,064
<b>SUMMARY No. 3 (Area 2, Phase 1)</b>														
L 63+00.00	88+10.21 (LT)	1,231		100		1,231		3,721	4,279	3,048			100	100
Y6 10+20.91	11+65.00	520				520		8	9			511		511
<b>SUBTOTAL SUMMARY No 3 (Area 2,Phase 1)</b>		1,751		100		1,751		3,729	4,288	3,048		511	100	611
<b>SUMMARY 1-3 SUBTOTAL(PHASE 1)</b>		<b>13,517</b>	<b>170</b>	<b>225</b>		<b>13,347</b>	<b>170</b>	<b>11,994</b>	<b>13,964</b>	<b>8,897</b>		<b>8,450</b>	<b>225</b>	<b>8,675</b>
<b>SUMMARY No. 4 (Area 1, Phase 2)</b>														
L 13+00.00	15+50.00 (LT)	6				6		145	167	161				
Y 16+00.00	20+00.00	2,583				2,583		260	299			2,284		2,284
<b>SUBTOTAL SUMMARY No. 4 (Area 1 Phase 2)</b>		<b>2,589</b>				<b>2,589</b>		<b>405</b>	<b>466</b>	<b>161</b>		<b>2,284</b>		<b>2,284</b>
<b>SUMMARY No 5 (Area 1, Phase 2)</b>														
L 61+67.00	88+10.21 (RT)	2,381				2,381		1,217	1,400			981		981
Y1A 10+40.00	11+35.00	1				1		59	68	67				
Y5 10+25	11+46.90							227	261	261				
<b>SUMMARY No. 5 (Area 1, Phase 2)</b>		<b>2,382</b>				<b>2,382</b>		<b>1,503</b>	<b>1,729</b>	<b>328</b>		<b>981</b>		<b>981</b>
<b>SUMMARY'S 4-5 SUBTOTAL (PHASE 2)</b>		<b>4,971</b>				<b>4,971</b>		<b>1,908</b>	<b>2,195</b>	<b>489</b>		<b>3,265</b>		<b>3,265</b>
<b>TOTAL</b>		<b>18,488</b>	<b>170</b>	<b>225</b>		<b>18,318</b>	<b>170</b>	<b>14,072</b>	<b>16,159</b>	<b>9,386</b>		<b>11,715</b>	<b>225</b>	<b>11,940</b>
SHOULDER MATERIAL								1,305	1,501	1,501				
LOSS DUE TO CLEARING & GRUBBING		-1,100				-1,100				1,100				
WASTE IN LIEU OF BORROW										-11,715		-11,715		-11,715
<b>PROJECT TOTAL</b>		<b>17,388</b>	<b>170</b>	<b>225</b>		<b>17,218</b>	<b>170</b>	<b>15,377</b>	<b>17,660</b>	<b>272</b>		<b>0</b>	<b>225</b>	<b>225</b>
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT										14				
ADDITIONAL UNDERCUT				1,200									1,200	1,200
<b>GRAND TOTAL</b>		<b>17,388</b>	<b>170</b>	<b>1,425</b>		<b>17,218</b>	<b>170</b>	<b>15,377</b>	<b>17,660</b>	<b>286</b>			<b>1,425</b>	<b>1,425</b>
<b>SAY</b>		<b>17,500</b>		<b>1,425</b>						<b>300</b>		<b>0</b>		

NOTE: EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.

NOTE; APPROXIMATE QUANTITIES ONLY. BORROW EXCAVATION, FINE GRADING, CLEARING & GRUBBING, REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE LUMP SUM PRICE FOR "GRADING".

EST. DDE = 410 CUBIC YARDS

EST. SHALLOW UNDERCUT 1,000CY PER LETTER FROM GEOTECH AT JUNE 2,2009

CLASS IV SUBGRADE STABILIZATION 1,900 TONS



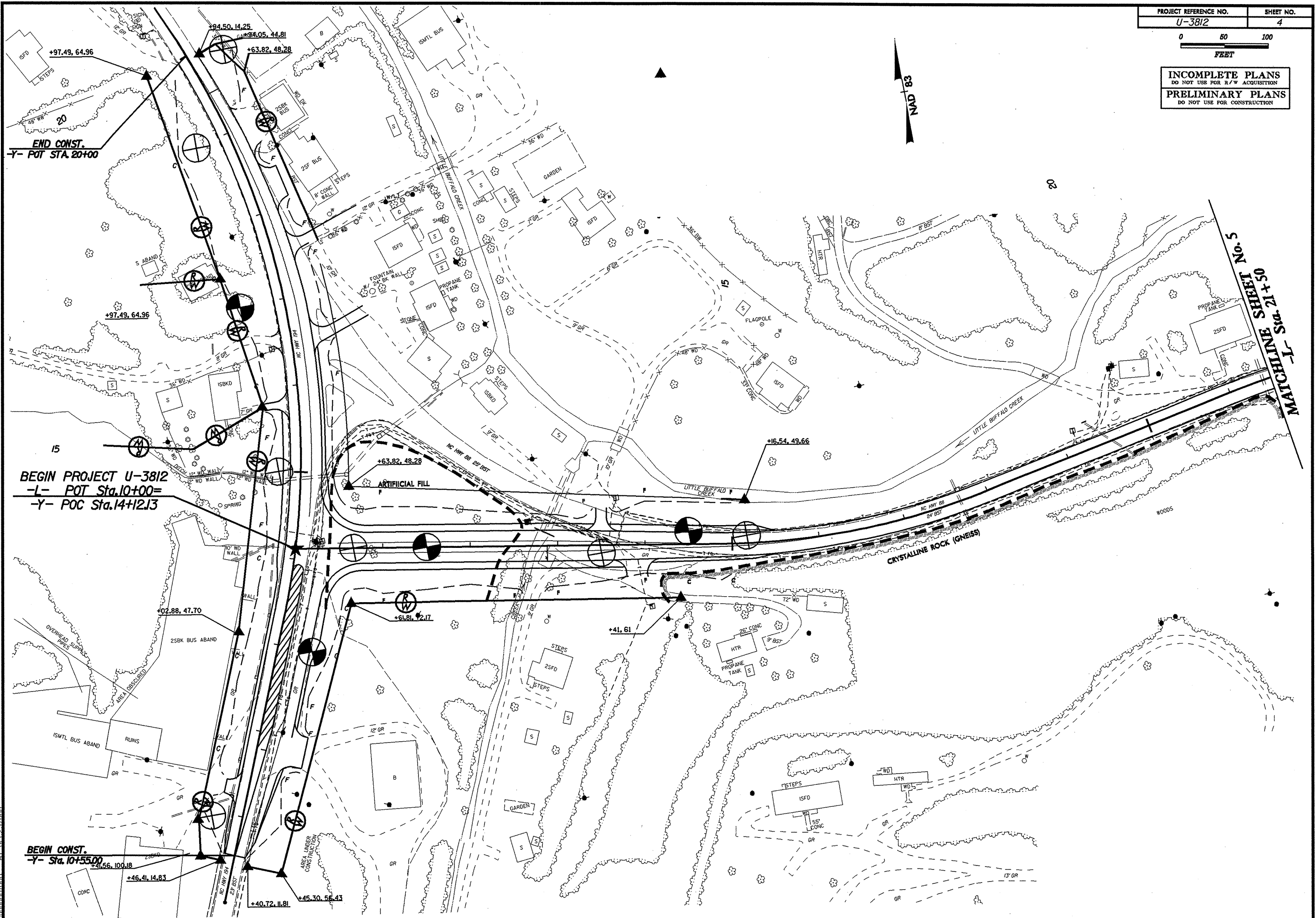


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**PRELIMINARY PLANS**  
DO NOT USE FOR CONSTRUCTION



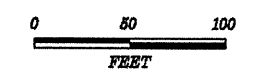
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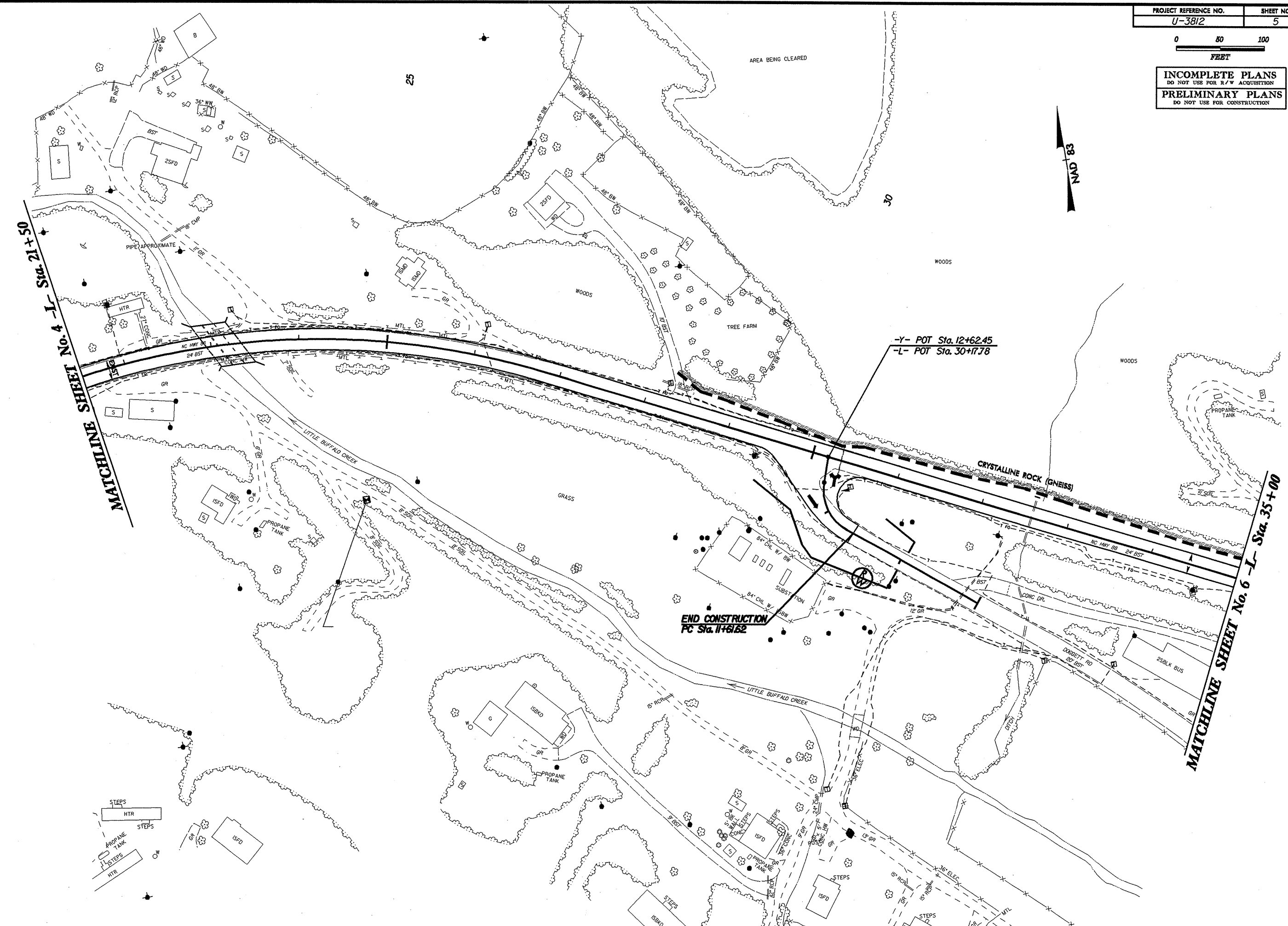


**Matchline Sheet No. 5**  
**Matchline Sta. 21+50**

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U-3812	5



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-Y- POT Sta. 12+62.45  
-L- POT Sta. 30+17.78

**END CONSTRUCTION**  
PC Sta. 11+61.62

**MATCHLINE SHEET No. 4 -L- Sta. 21+50**

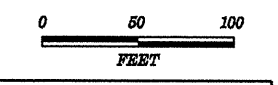
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**INCOMPLETE PLANS**  
DO NOT USE FOR R/W ACQUISITION  
**PRELIMINARY PLANS**  
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**MATCHLINE SHEET No. 6 -T- Sta. 48+00**



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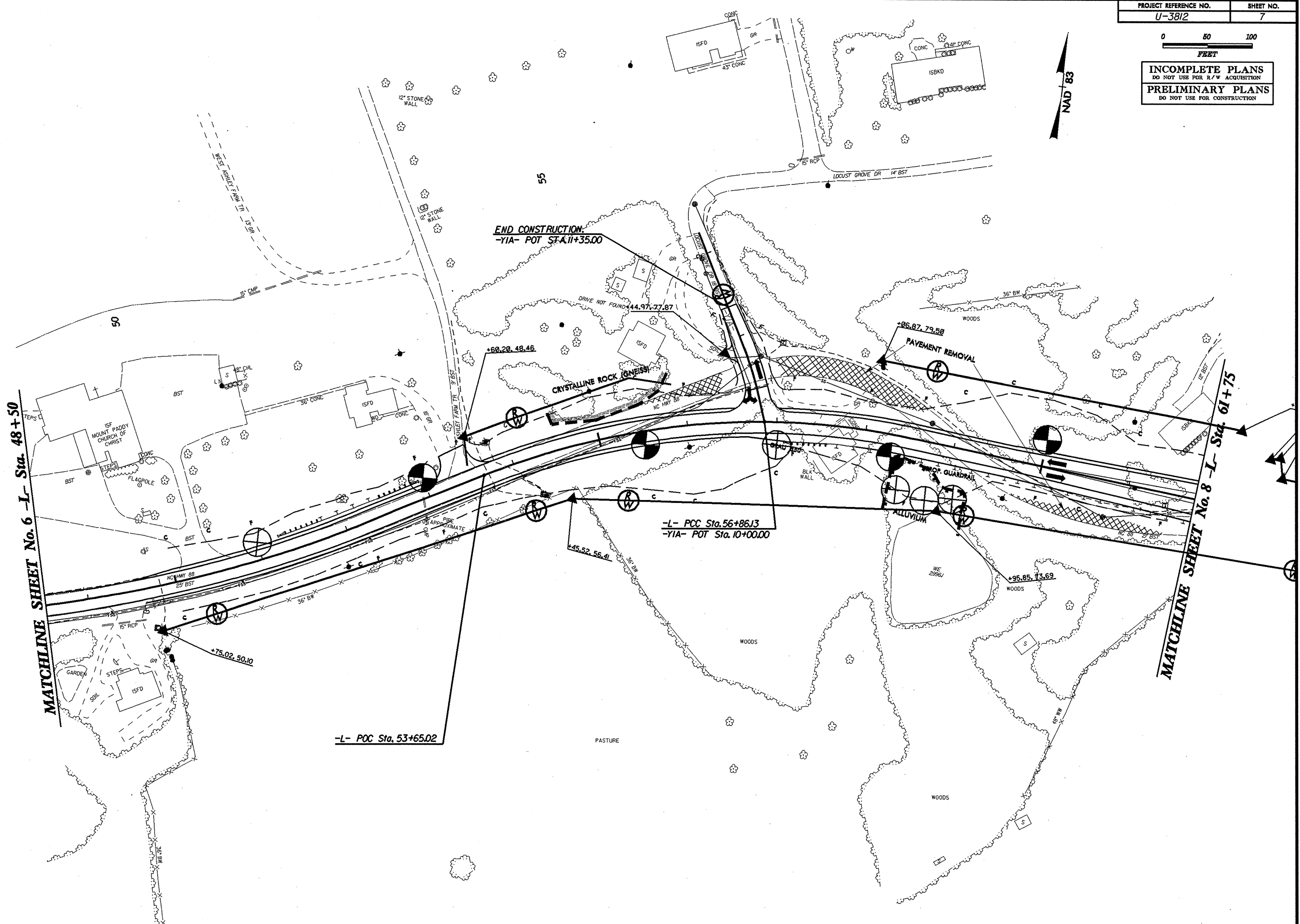


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**MATCHLINE SHEET No. 6 -L- Sta. 48+50**

**MATCHLINE SHEET No. 8 -L- Sta. 61+75**



**END CONSTRUCTION**  
-YIA- POT Sta. 11+35.00

-L- POC Sta. 56+86J3  
-YIA- POT Sta. 10+00.00

-L- POC Sta. 53+65.02

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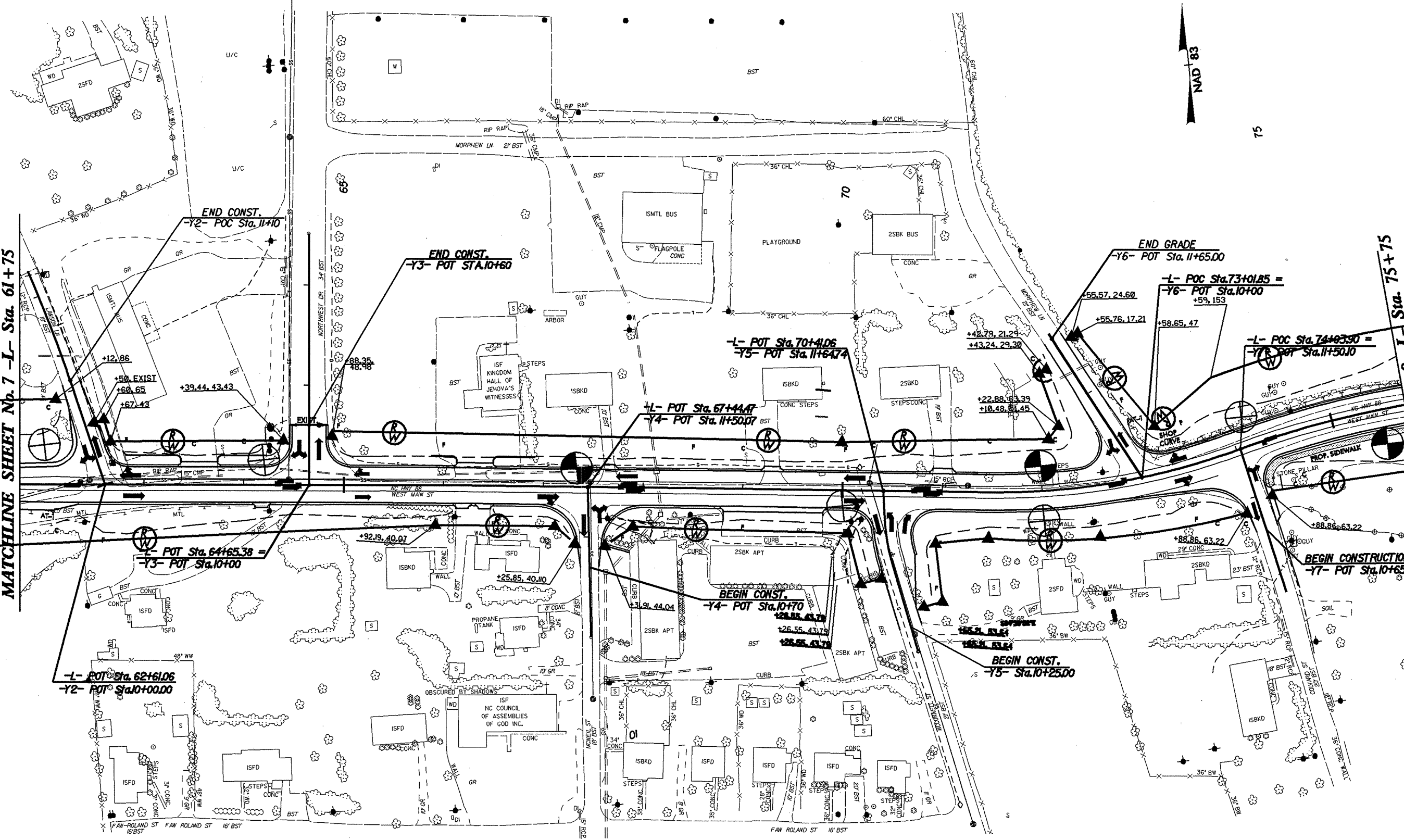
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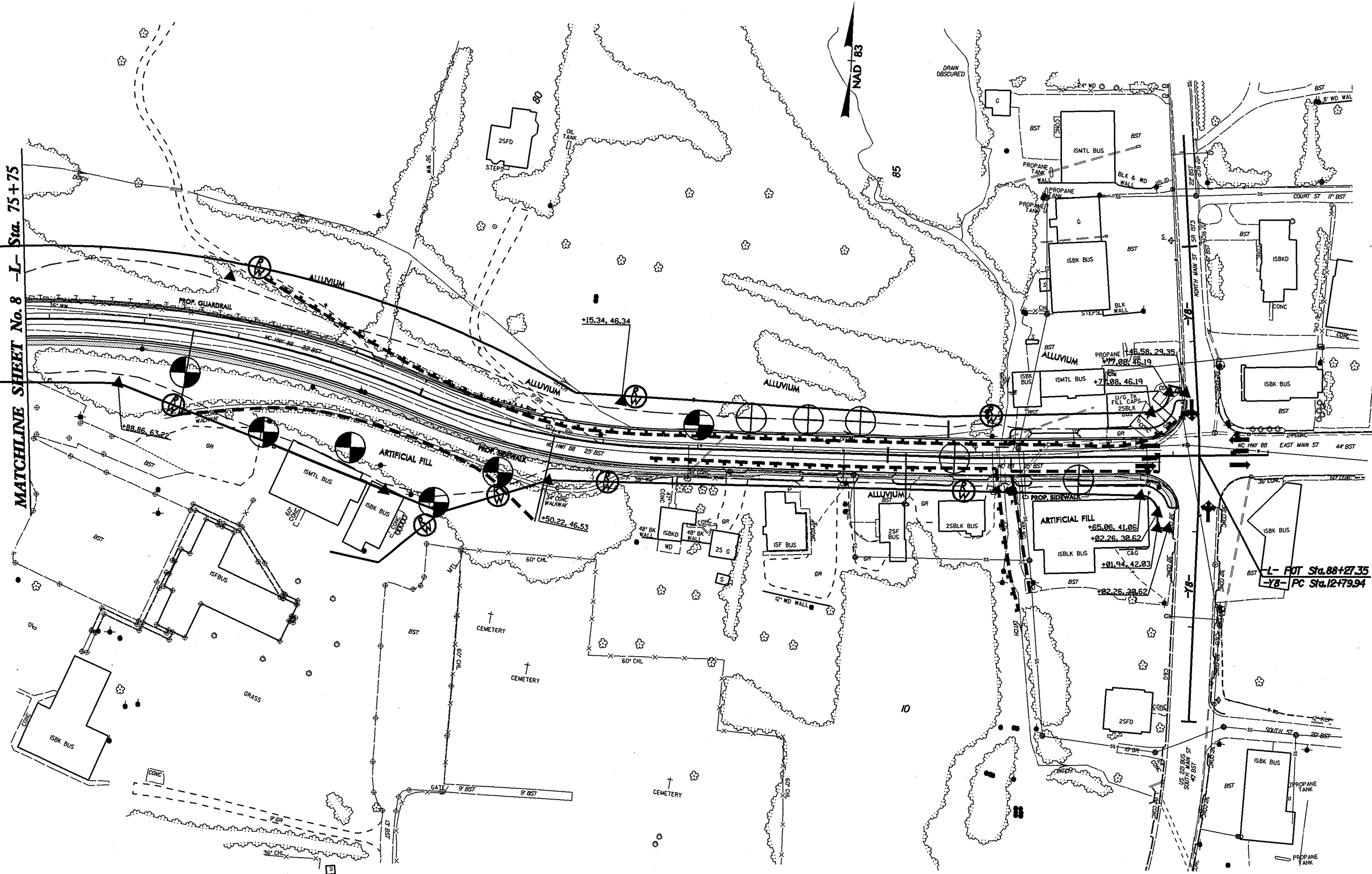
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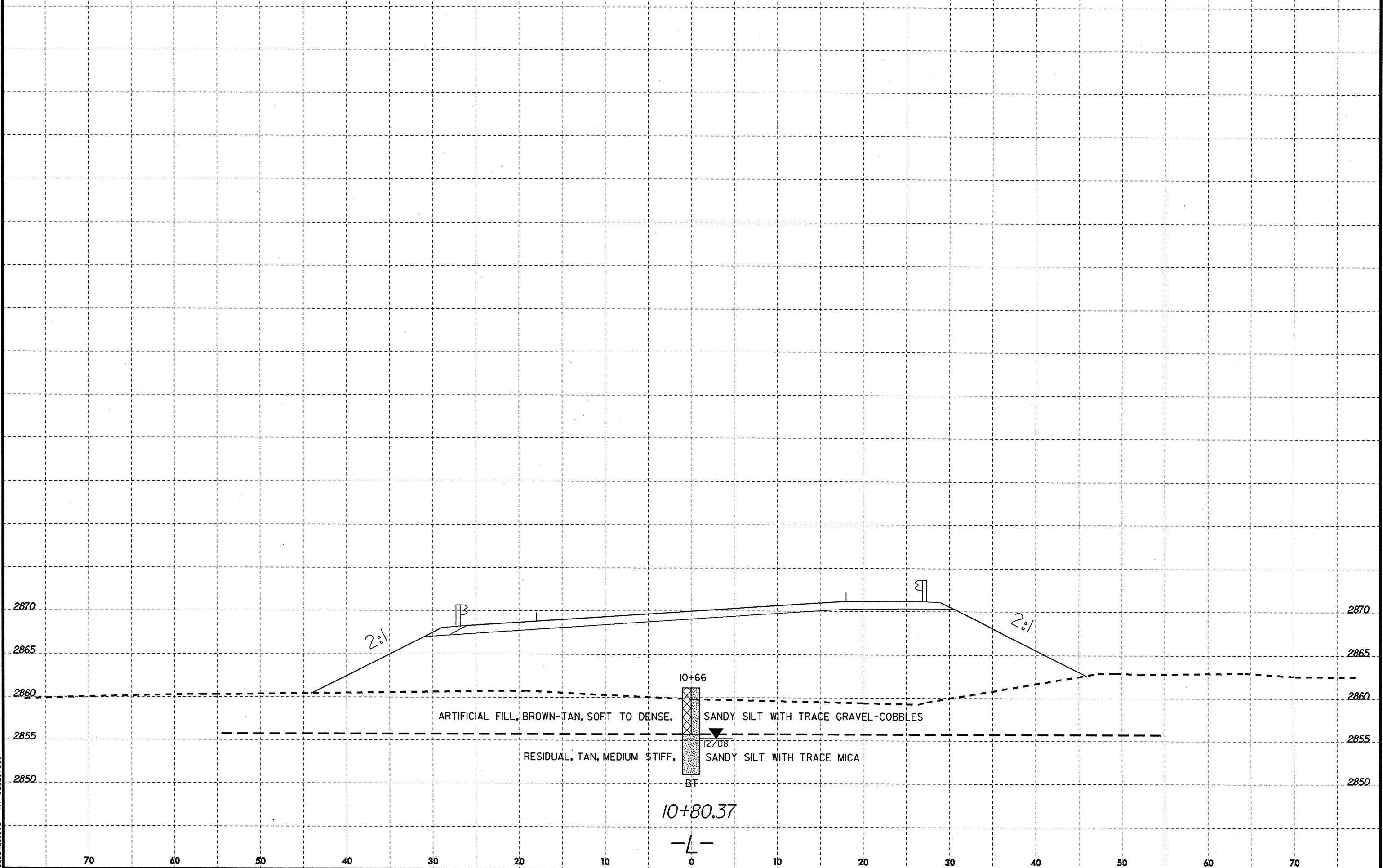


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-YB- PC Sta. 12+79.94

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2870  
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10+66

ARTIFICIAL FILL, BROWN-TAN, SOFT TO DENSE,

SANDY SILT WITH TRACE GRAVEL-COBBLIES

RESIDUAL, TAN, MEDIUM STIFF,

SANDY SILT WITH TRACE MICA

BT

10+80.37

-L-

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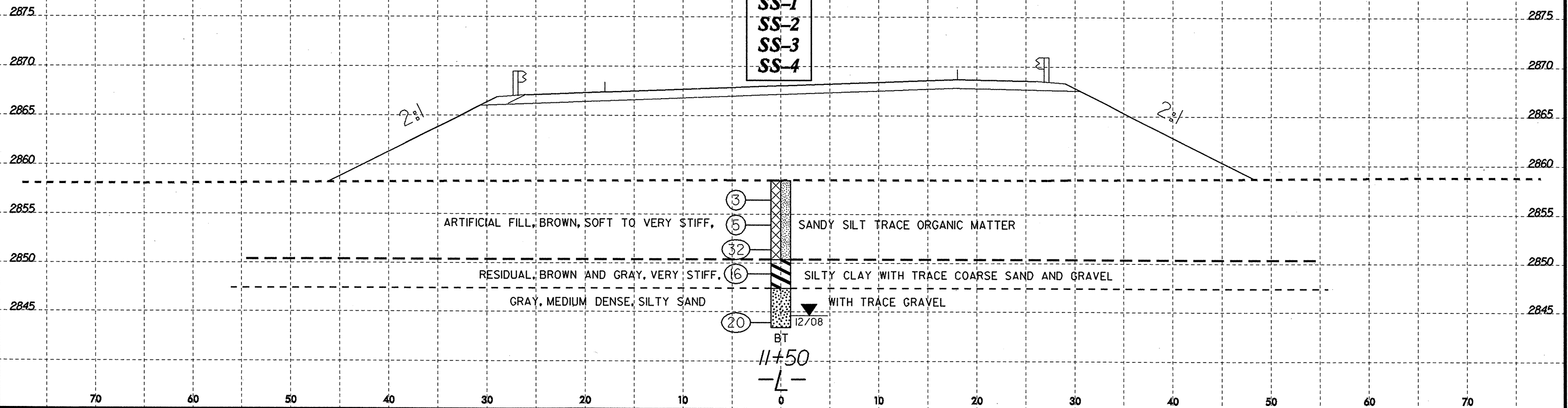
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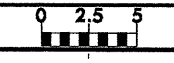
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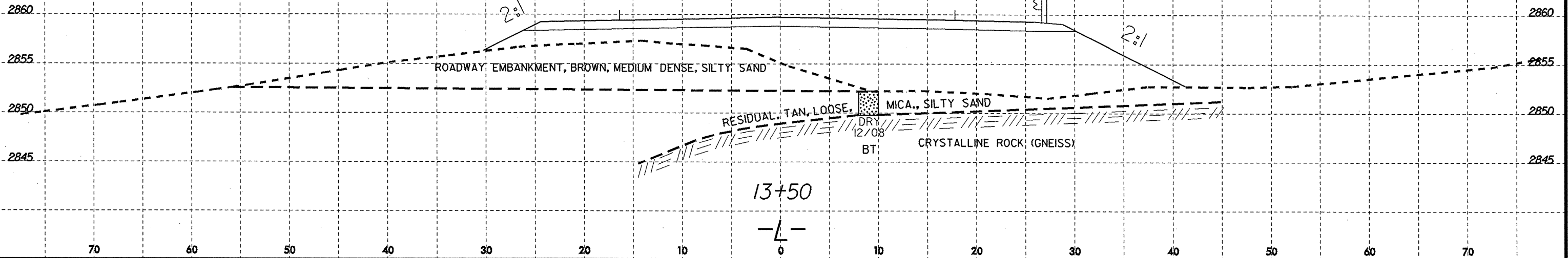
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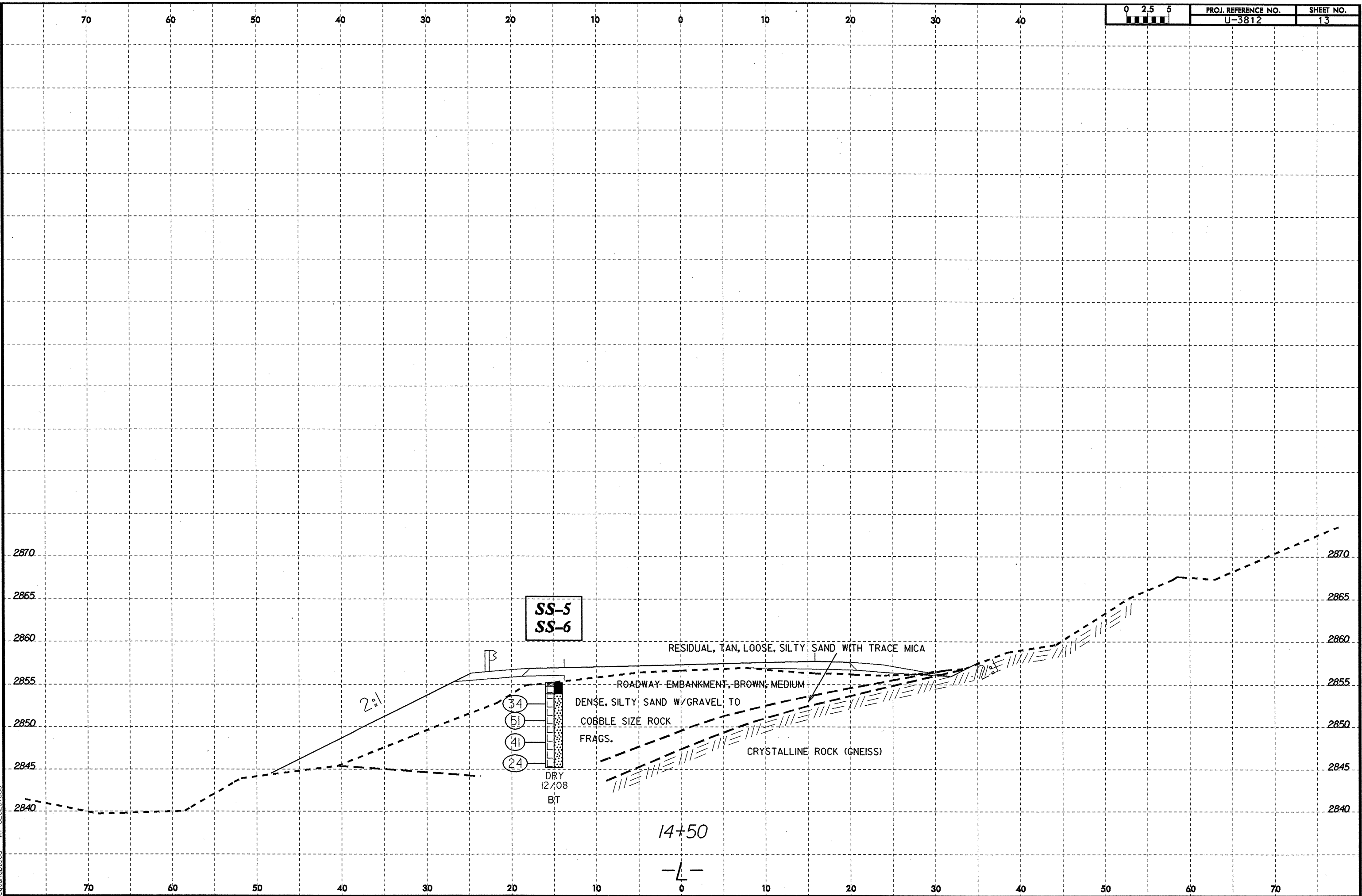


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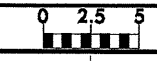
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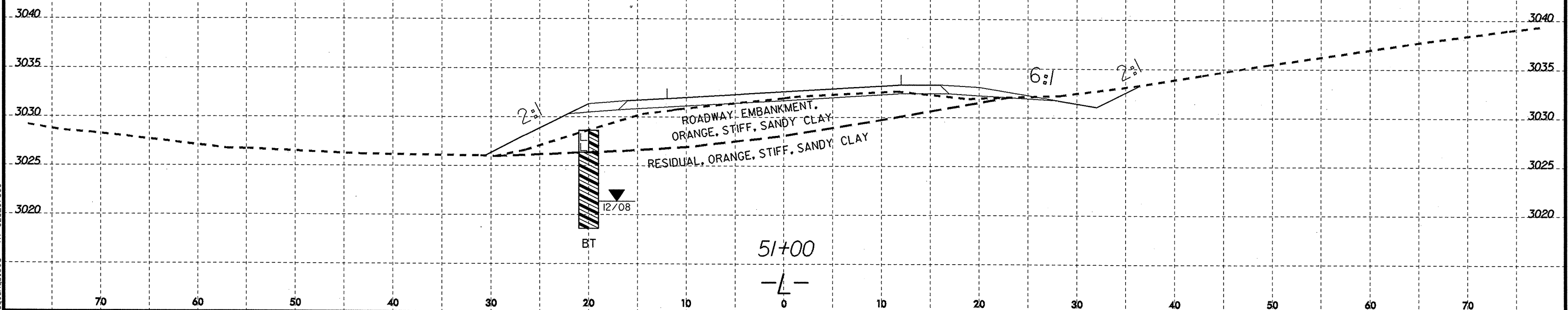
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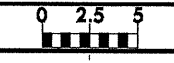
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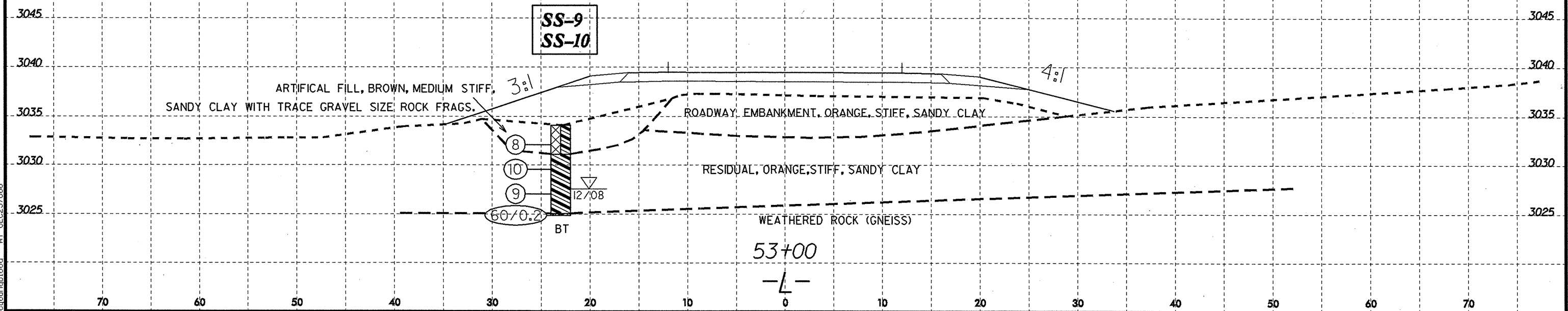
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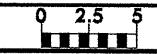
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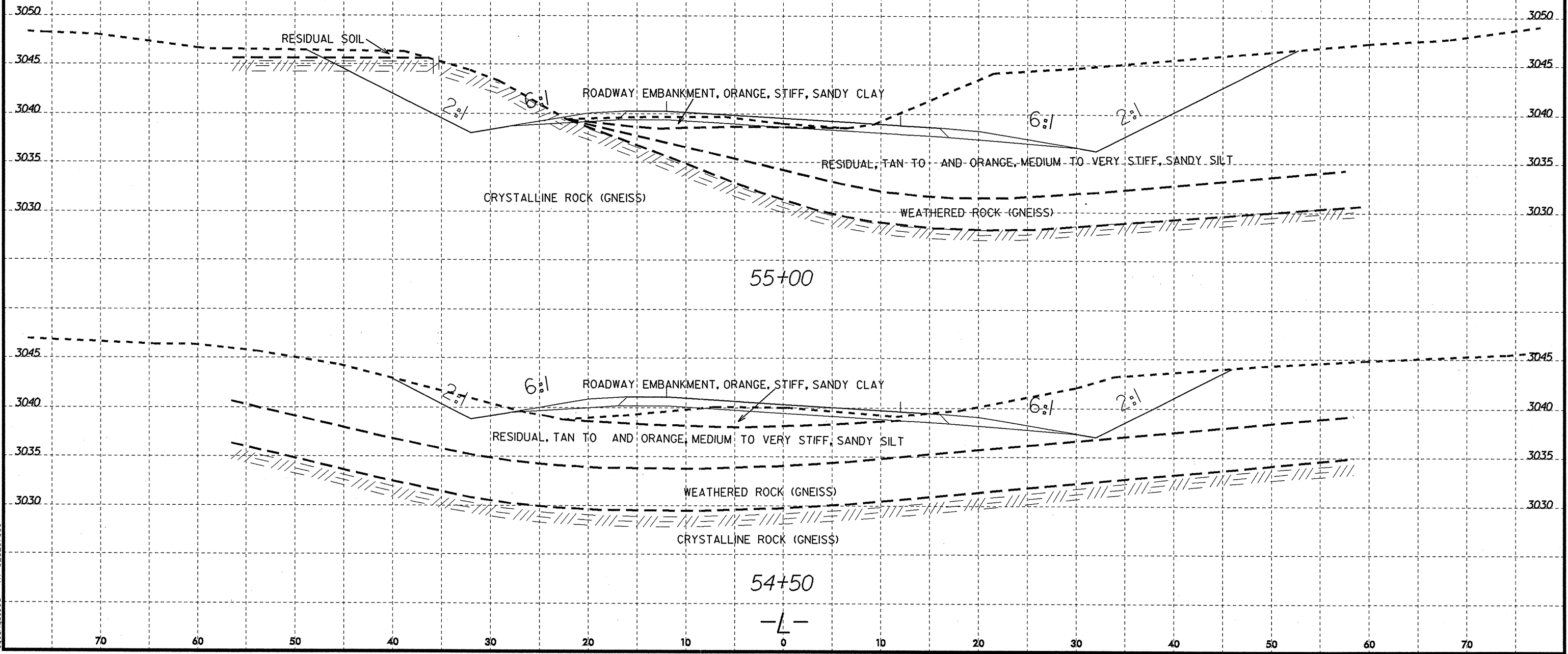
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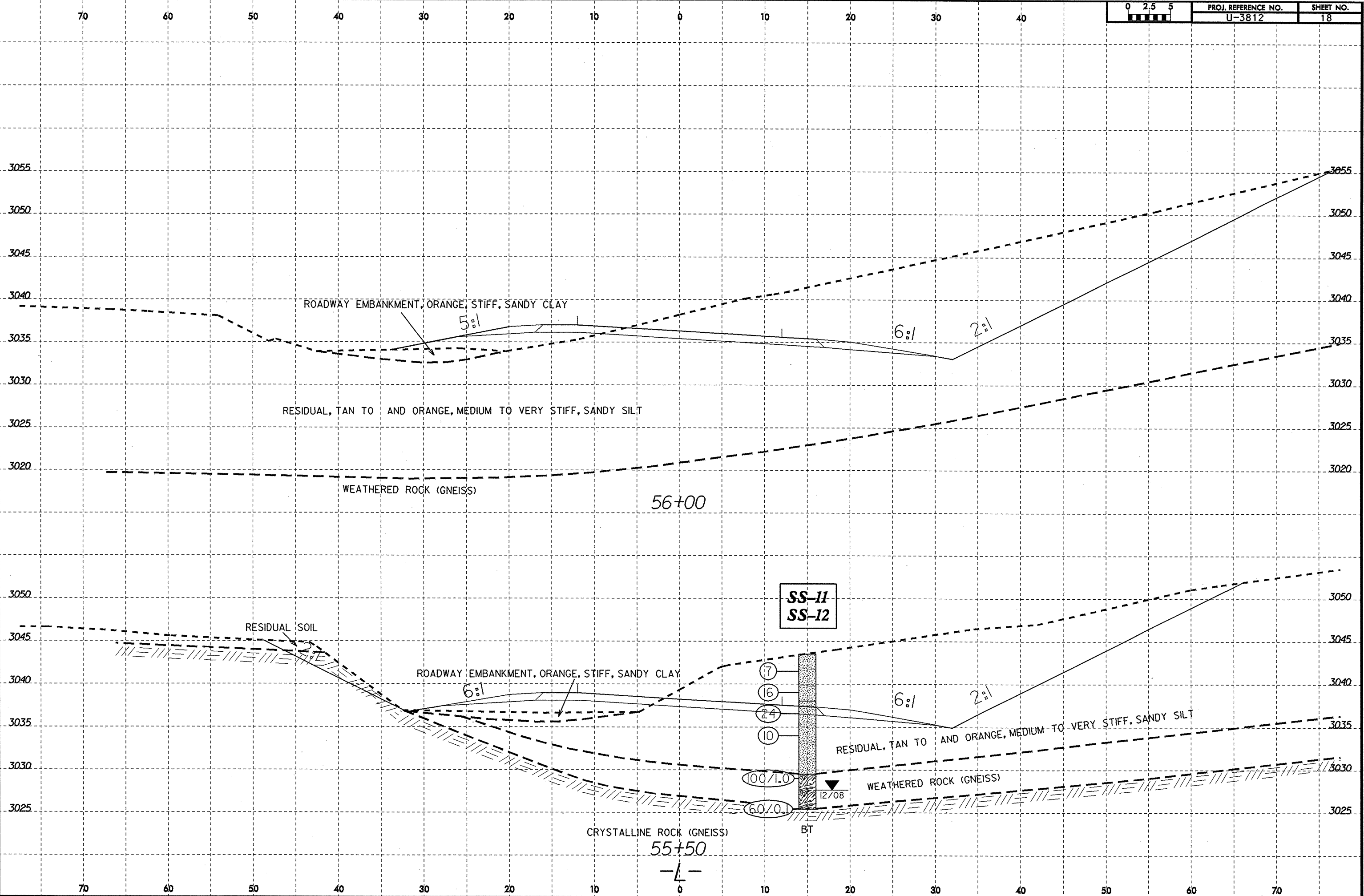


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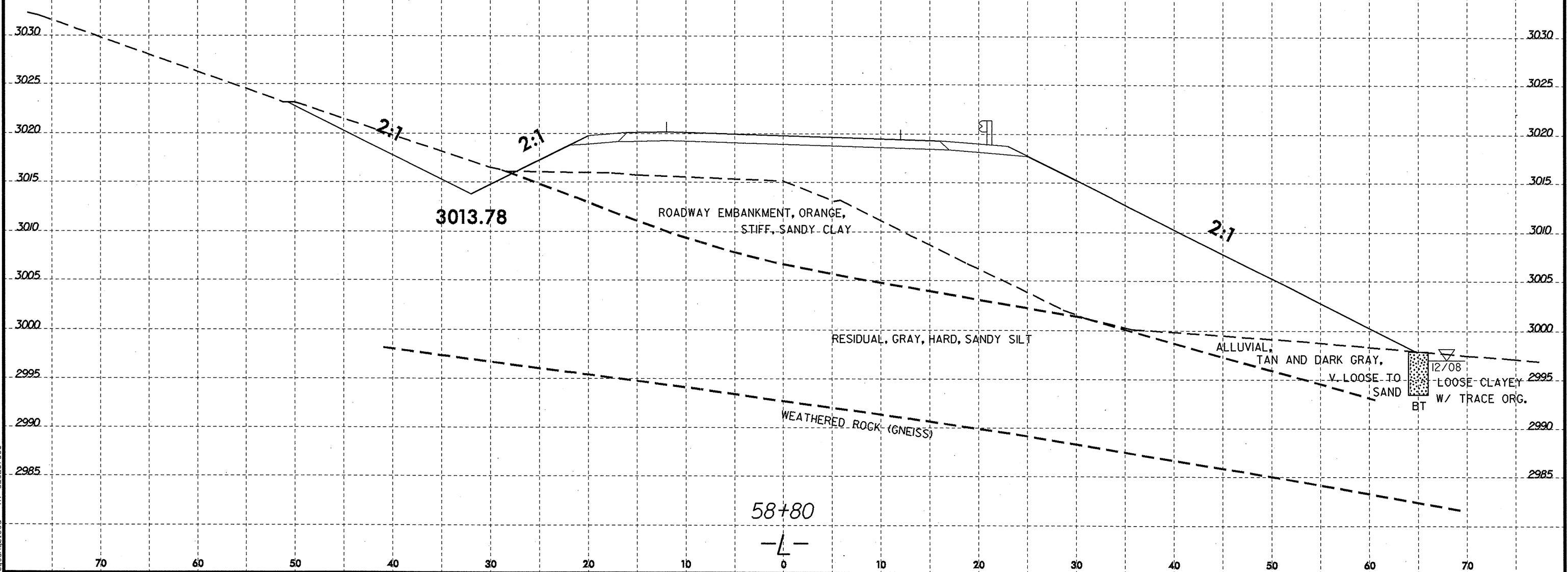




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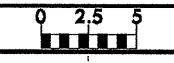


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-L-



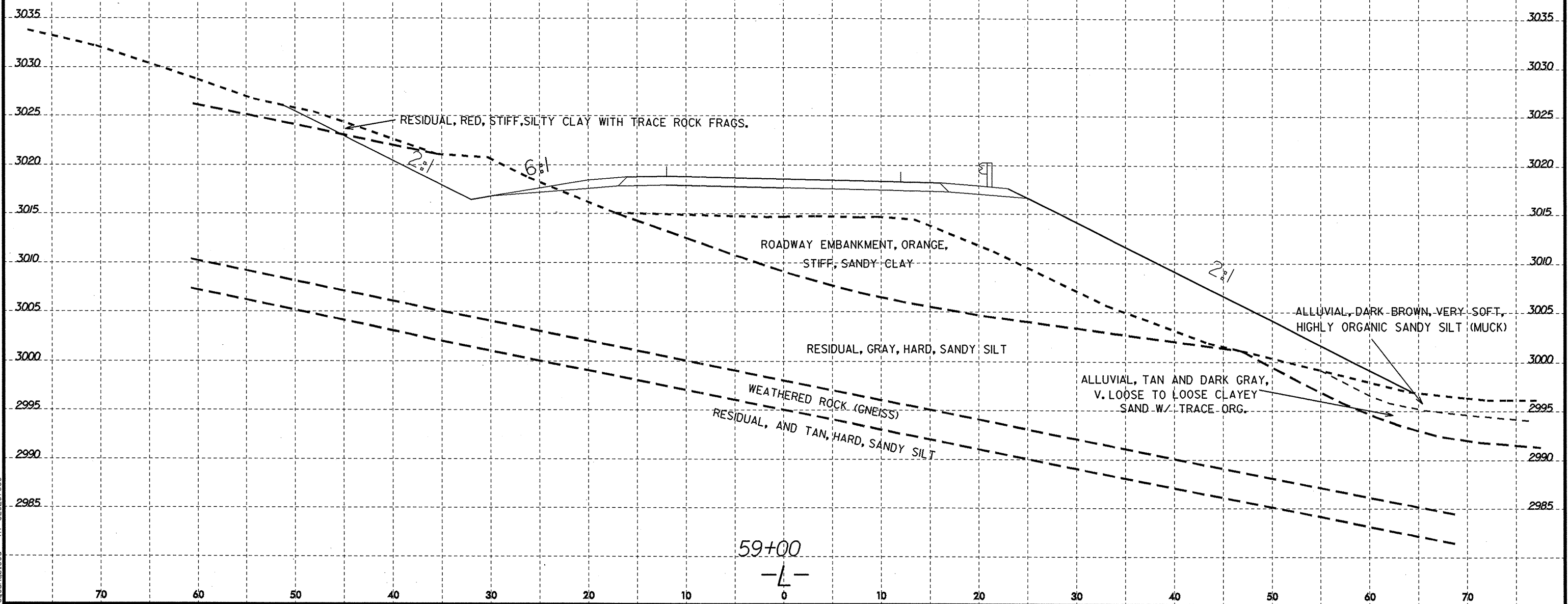
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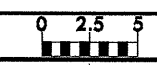
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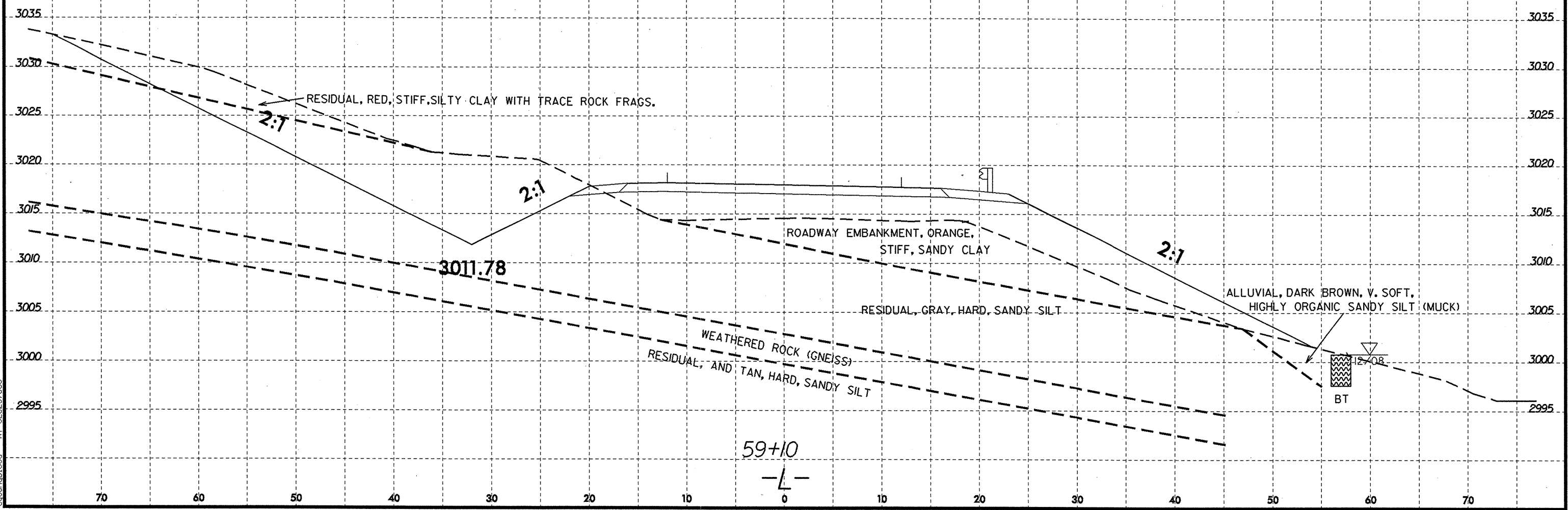
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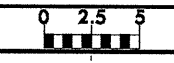


PROJ. REFERENCE NO.	SHEET NO.
U-3812	25



8/23/99

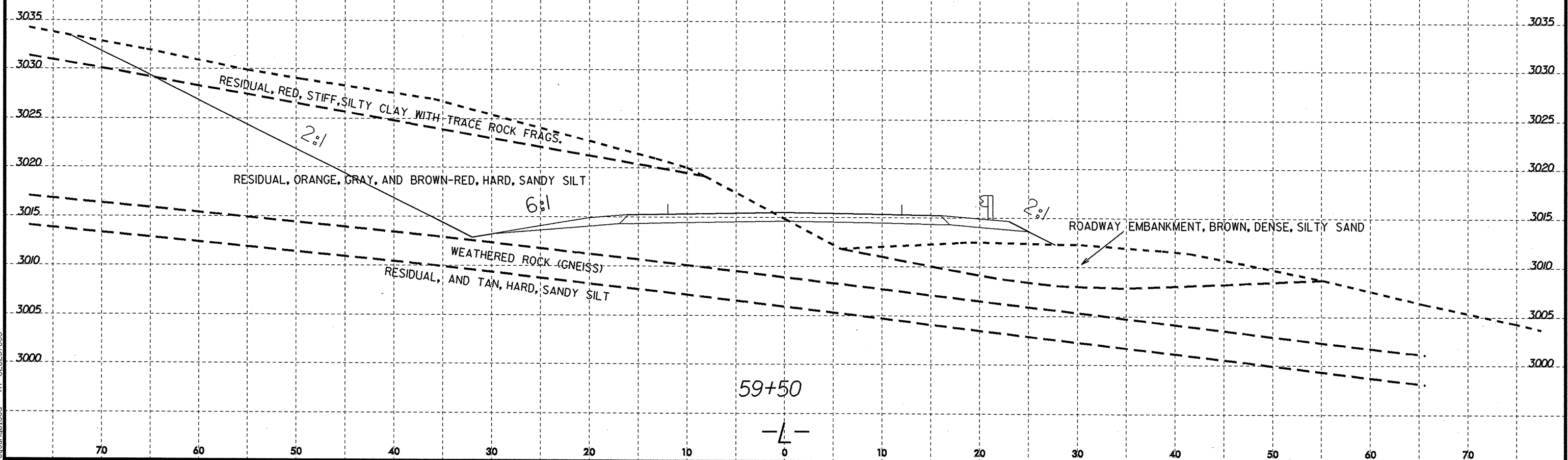
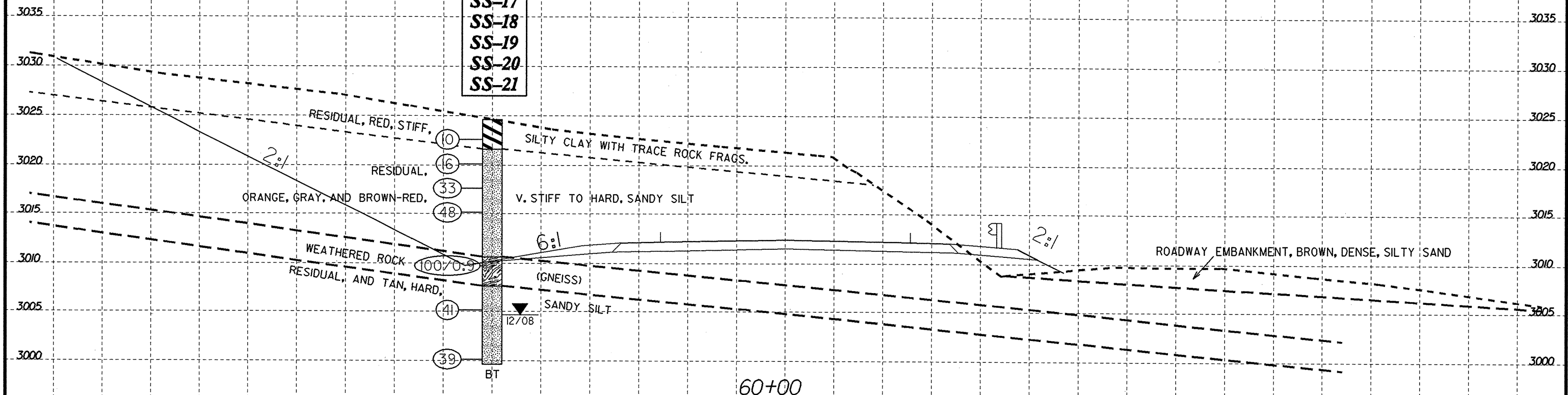
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PROJ. REFERENCE NO. U-3812

SHEET NO. 26

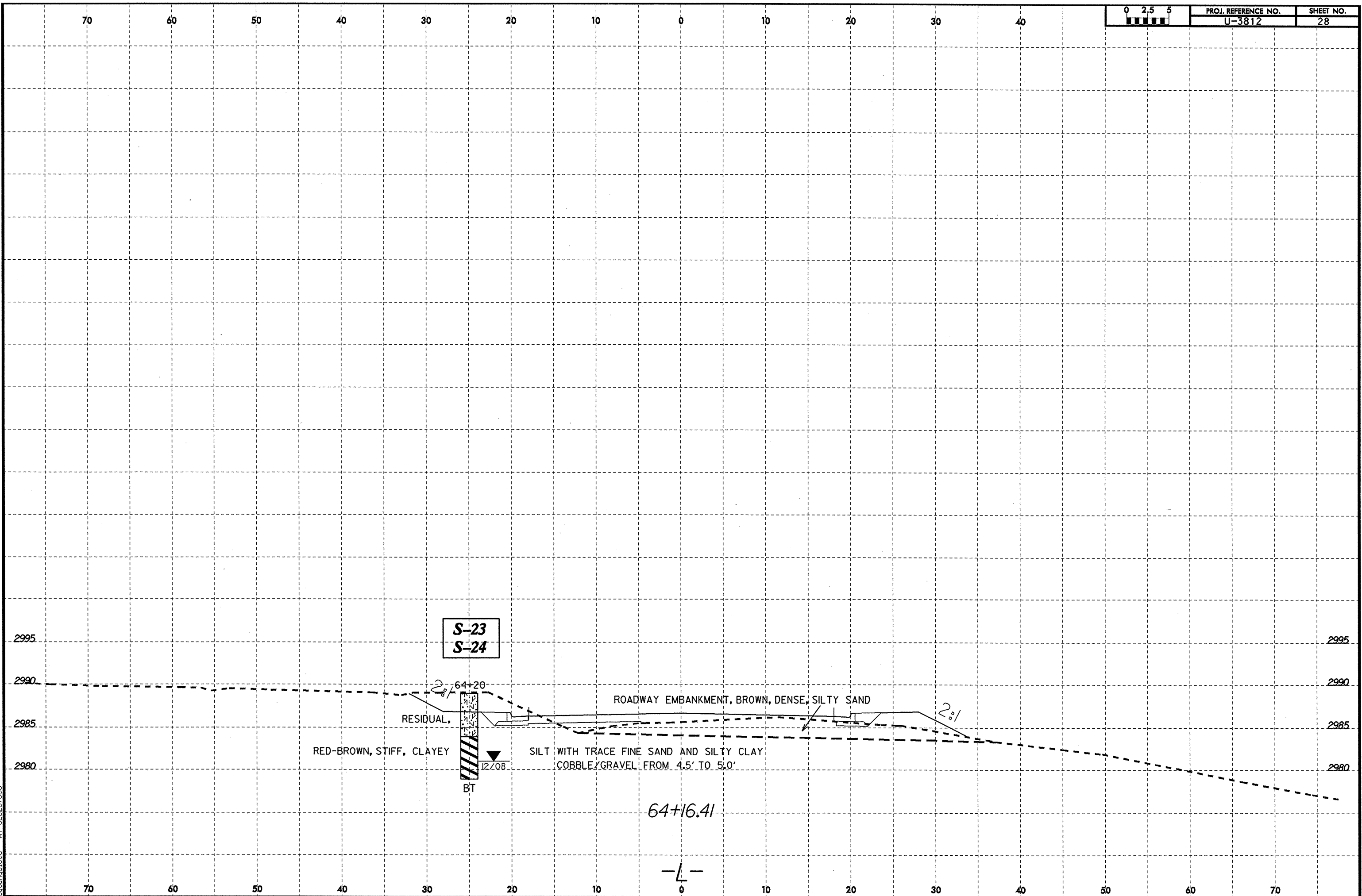
SS-17  
SS-18  
SS-19  
SS-20  
SS-21



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AT 06/23/99

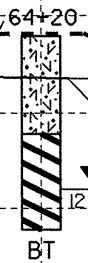


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8/23/99



S-23  
S-24

RESIDUAL,  
RED-BROWN, STIFF, CLAYEY



ROADWAY EMBANKMENT, BROWN, DENSE, SILTY SAND

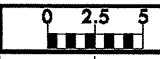
SILT WITH TRACE FINE SAND AND SILTY CLAY  
COBBLE/GRAVEL FROM 4.5' TO 5.0'

64+16.41

-L-

8/23/99

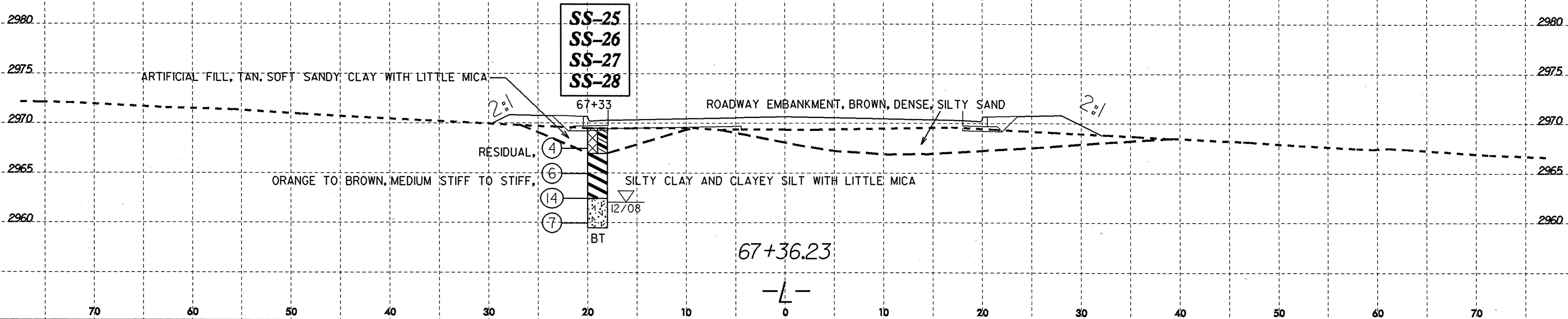
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PROJ. REFERENCE NO.  
U-3812

SHEET NO.  
29

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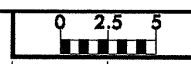




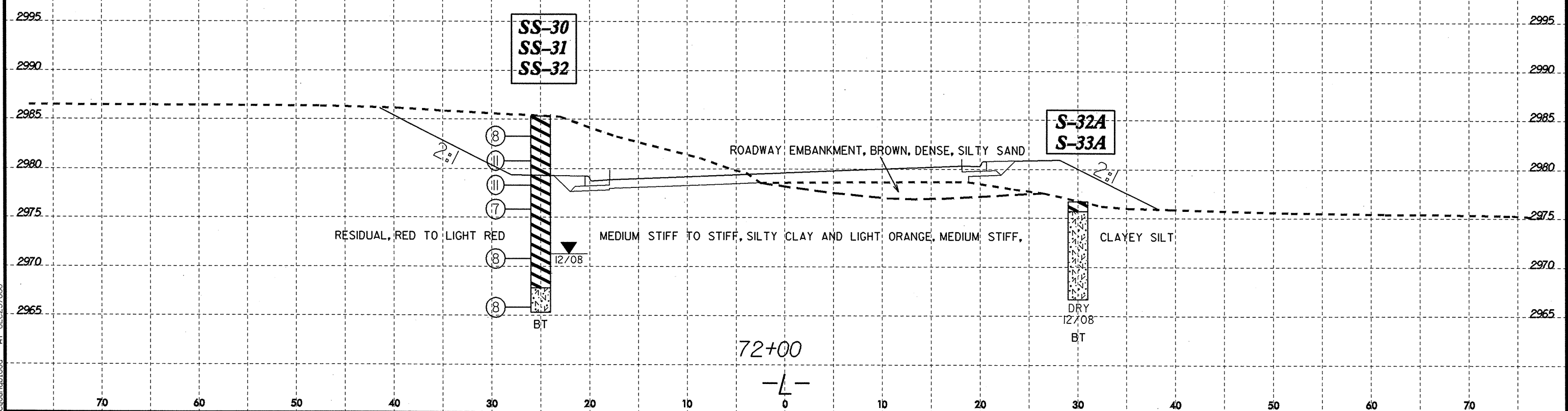


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3/23/99  
3/23/99

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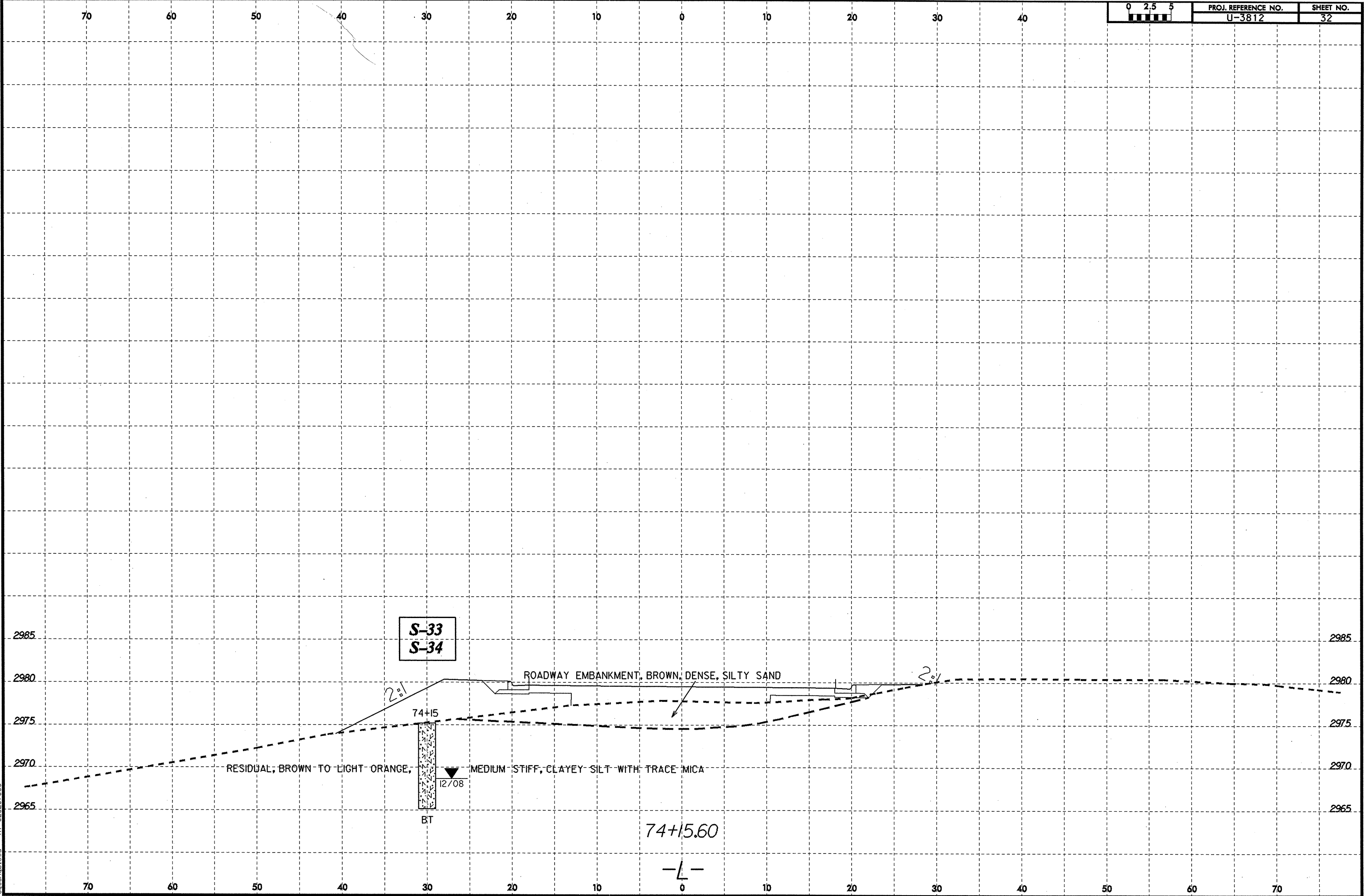
PROJ. REFERENCE NO.	SHEET NO.
U-3812	31



8/23/99

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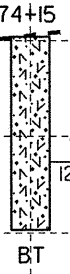
0 2.5 5	PROJ. REFERENCE NO. U-3812	SHEET NO. 32
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S-33  
S-34

ROADWAY EMBANKMENT, BROWN, DENSE, SILTY SAND

RESIDUAL, BROWN TO LIGHT ORANGE, MEDIUM STIFF, CLAYEY SILT WITH TRACE MICA



74+15

12/08

BT

74+15.60

-L-

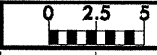
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70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

2985 2985  
2980 2980  
2975 2975  
2970 2970  
2965 2965

8/23/99

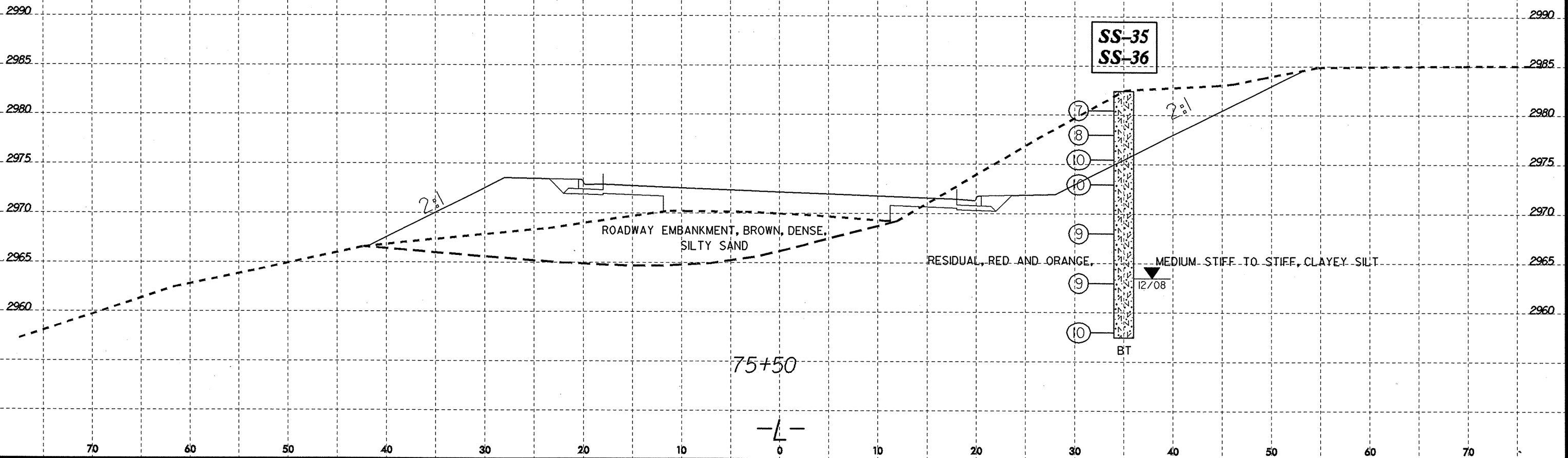
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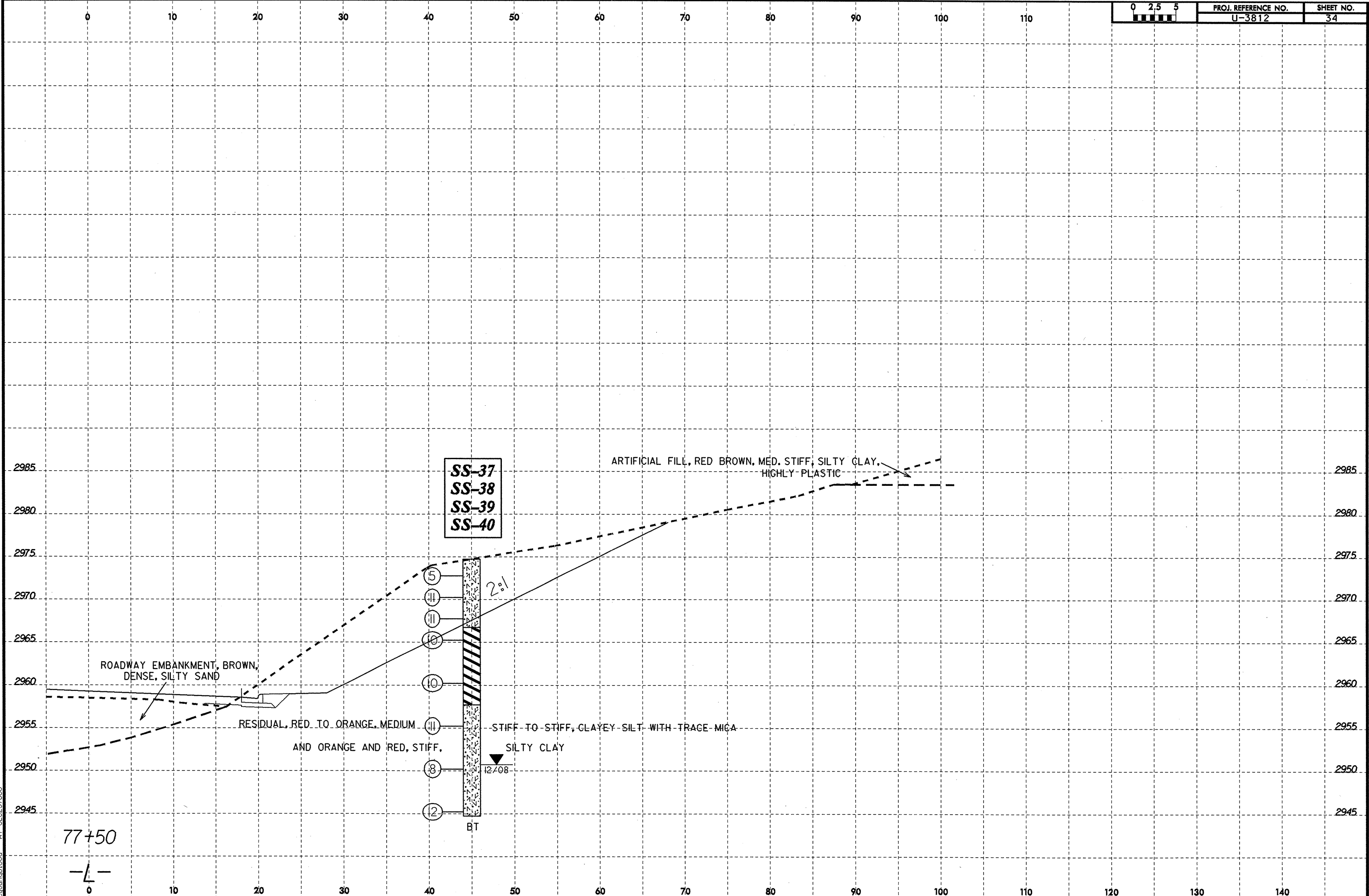
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U-3812

SHEET NO.  
33

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8/23/99



77+50

-L-

SS-37  
SS-38  
SS-39  
SS-40

5  
4  
11  
10  
10  
11  
8  
12

BT

2:1

12.708

STIFF TO STIFF, CLAYEY SILT WITH TRACE MICA  
SILTY CLAY

ARTIFICIAL FILL, RED BROWN, MED. STIFF, SILTY CLAY,  
HIGHLY PLASTIC

ROADWAY EMBANKMENT, BROWN,  
DENSE, SILTY SAND

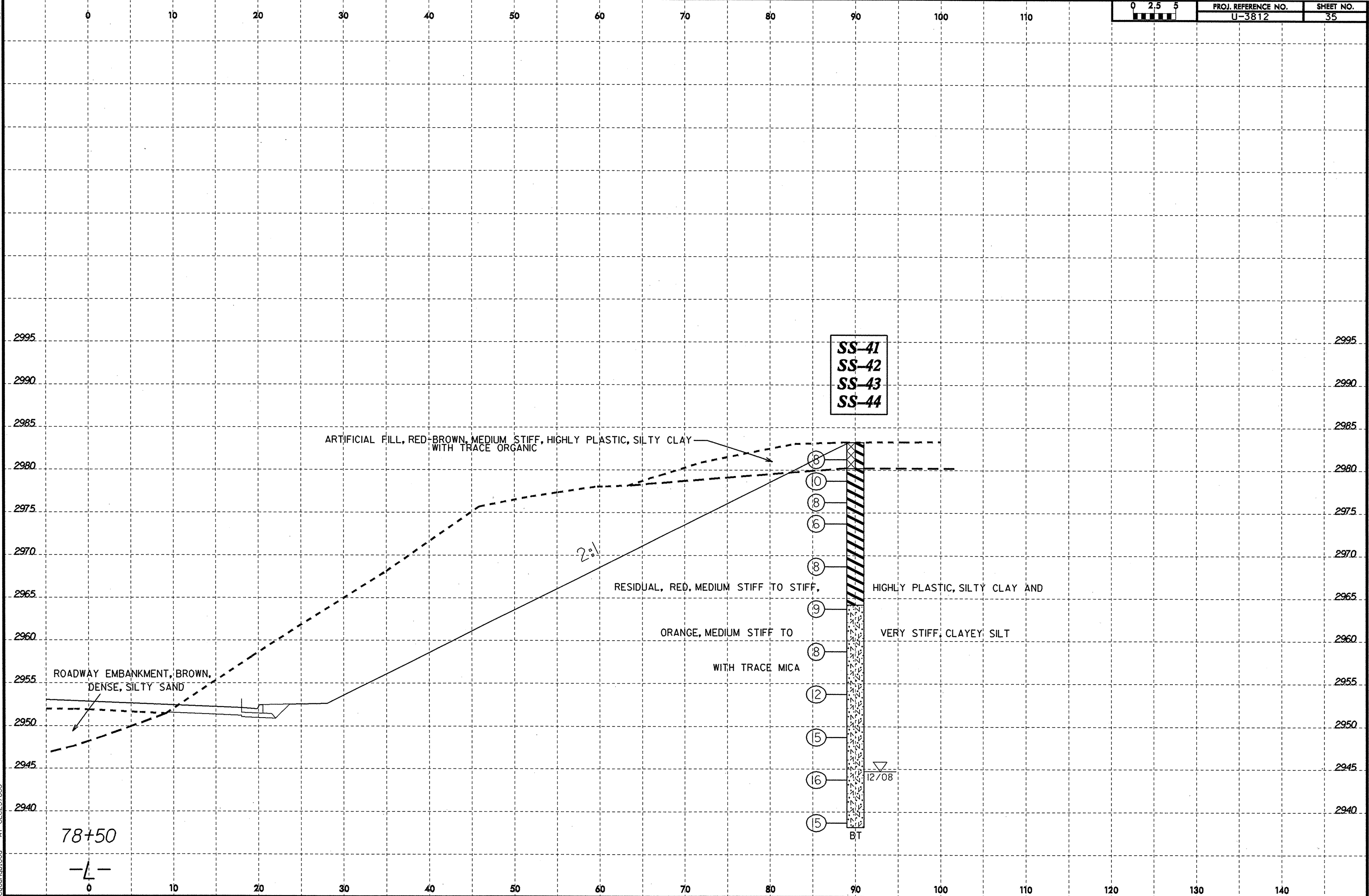
RESIDUAL, RED TO ORANGE, MEDIUM  
AND ORANGE AND RED, STIFF,  
SILTY CLAY

8/23/99



PROJ. REFERENCE NO.  
U-3812

SHEET NO.  
35



ARTIFICIAL FILL, RED-BROWN, MEDIUM STIFF, HIGHLY PLASTIC, SILTY CLAY WITH TRACE ORGANIC

2:1

RESIDUAL, RED, MEDIUM STIFF TO STIFF,

ORANGE, MEDIUM STIFF TO

WITH TRACE MICA

HIGHLY PLASTIC, SILTY CLAY AND

VERY STIFF, CLAYEY SILT

ROADWAY EMBANKMENT, BROWN, DENSE, SILTY SAND

SS-41  
SS-42  
SS-43  
SS-44

- 8
- 10
- 8
- 6
- 8
- 9
- 8
- 12
- 15
- 16
- 15

12/08

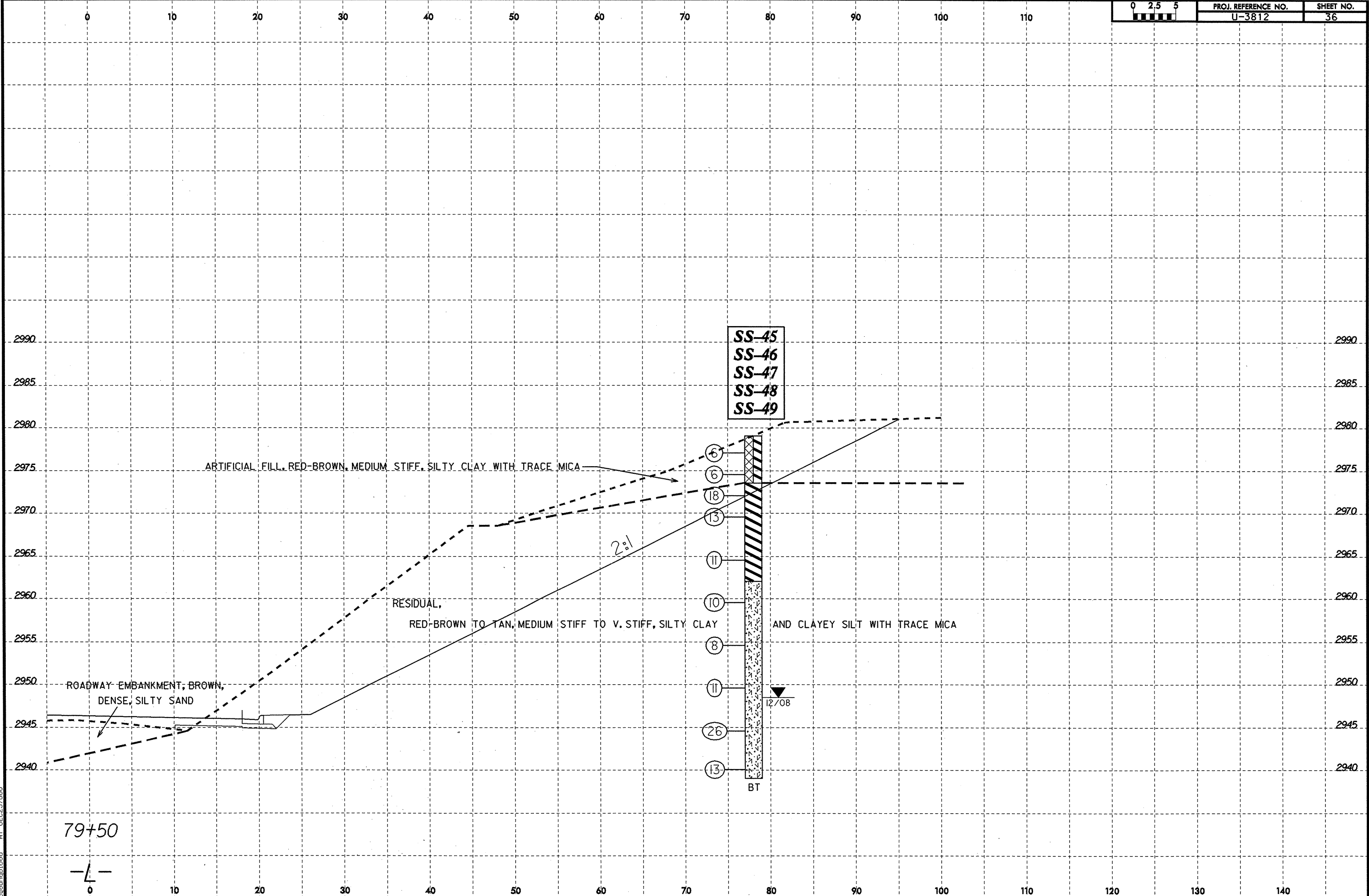
B/T

78+50

-L-

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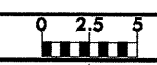
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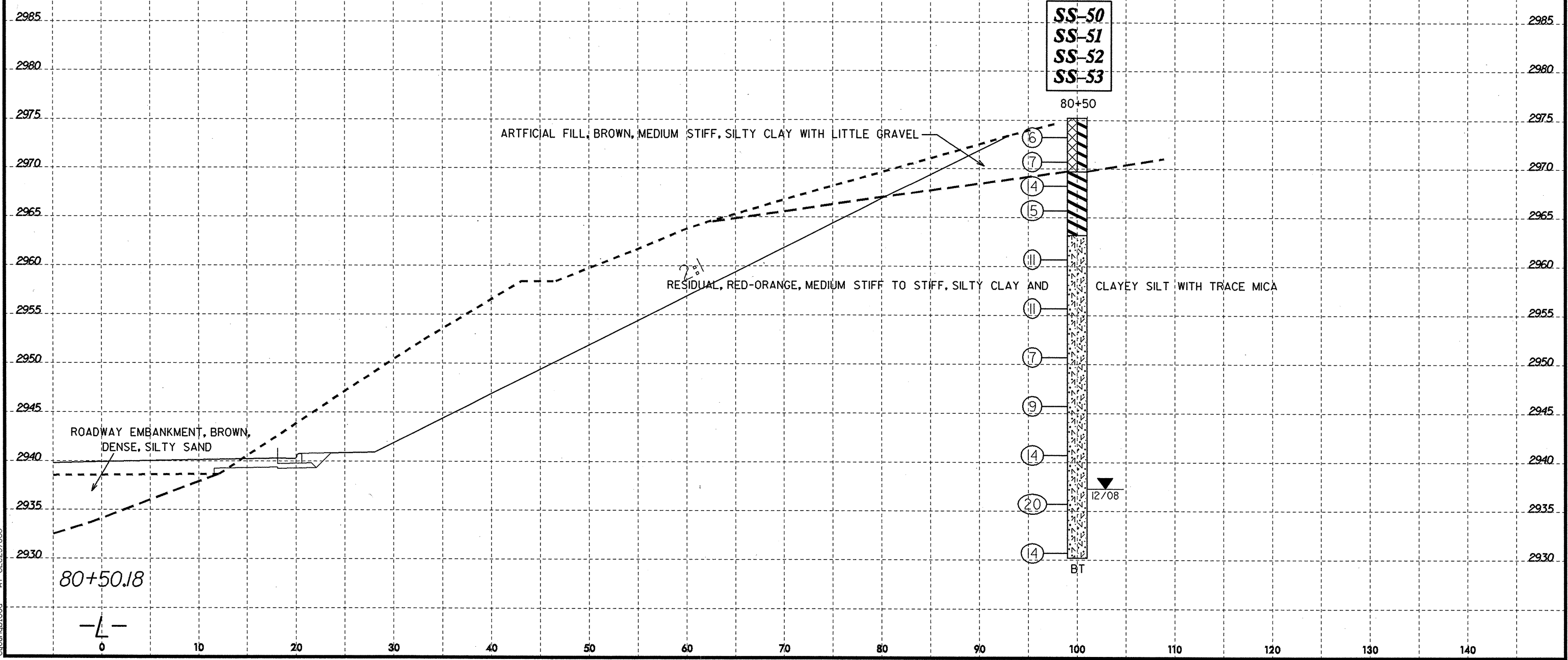


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11/20/08

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PROJ. REFERENCE NO.	SHEET NO.
U-3812	37



SS-50  
SS-51  
SS-52  
SS-53

80+50

ARTIFICIAL FILL, BROWN, MEDIUM STIFF, SILTY CLAY WITH LITTLE GRAVEL

2:1  
RESIDUAL, RED-ORANGE, MEDIUM STIFF TO STIFF, SILTY CLAY AND

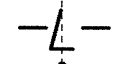
CLAYEY SILT WITH TRACE MICA

ROADWAY EMBANKMENT, BROWN,  
DENSE, SILTY SAND

12/08

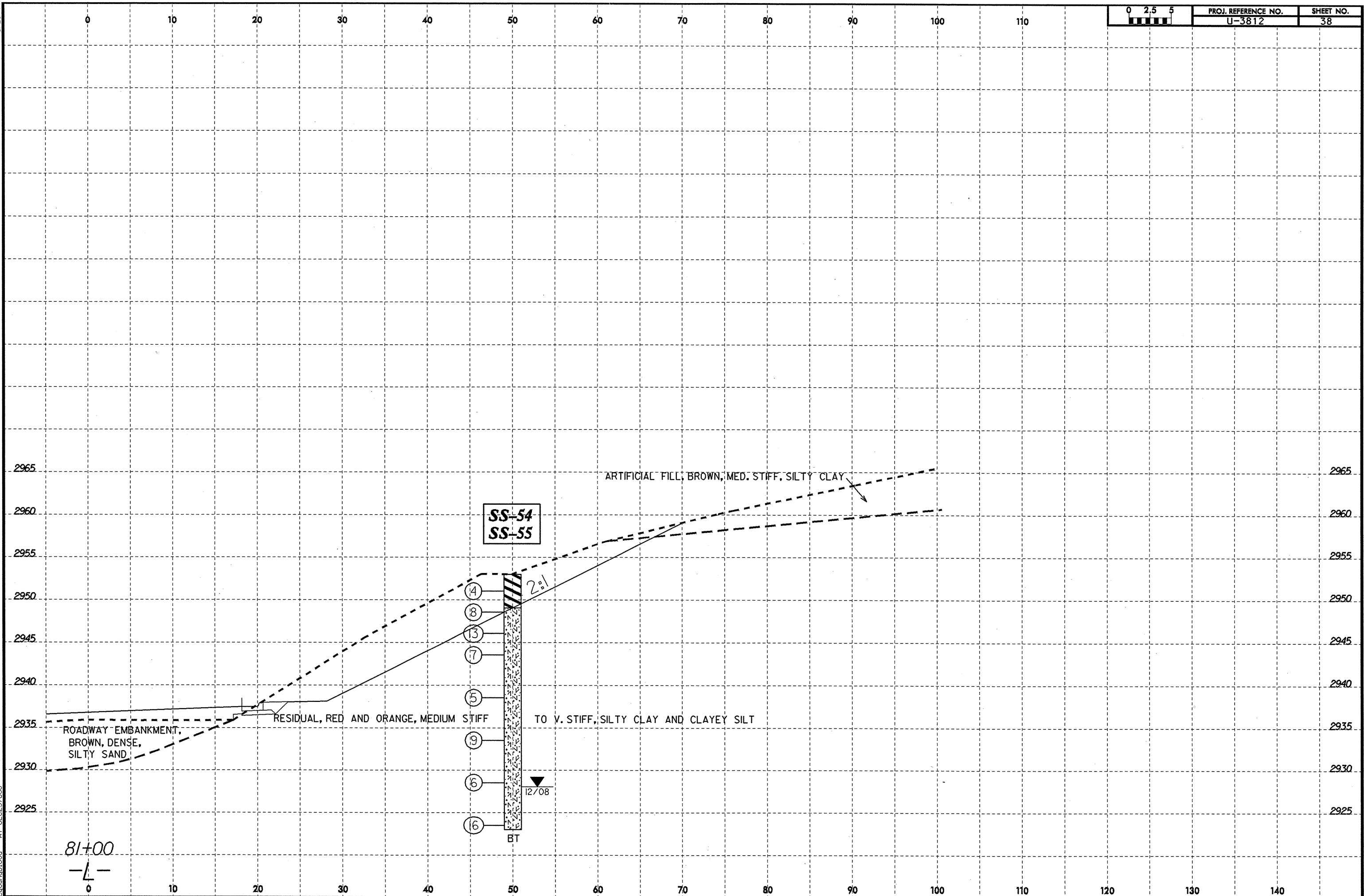
BT

80+50.18



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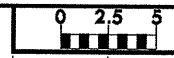
8/23/09



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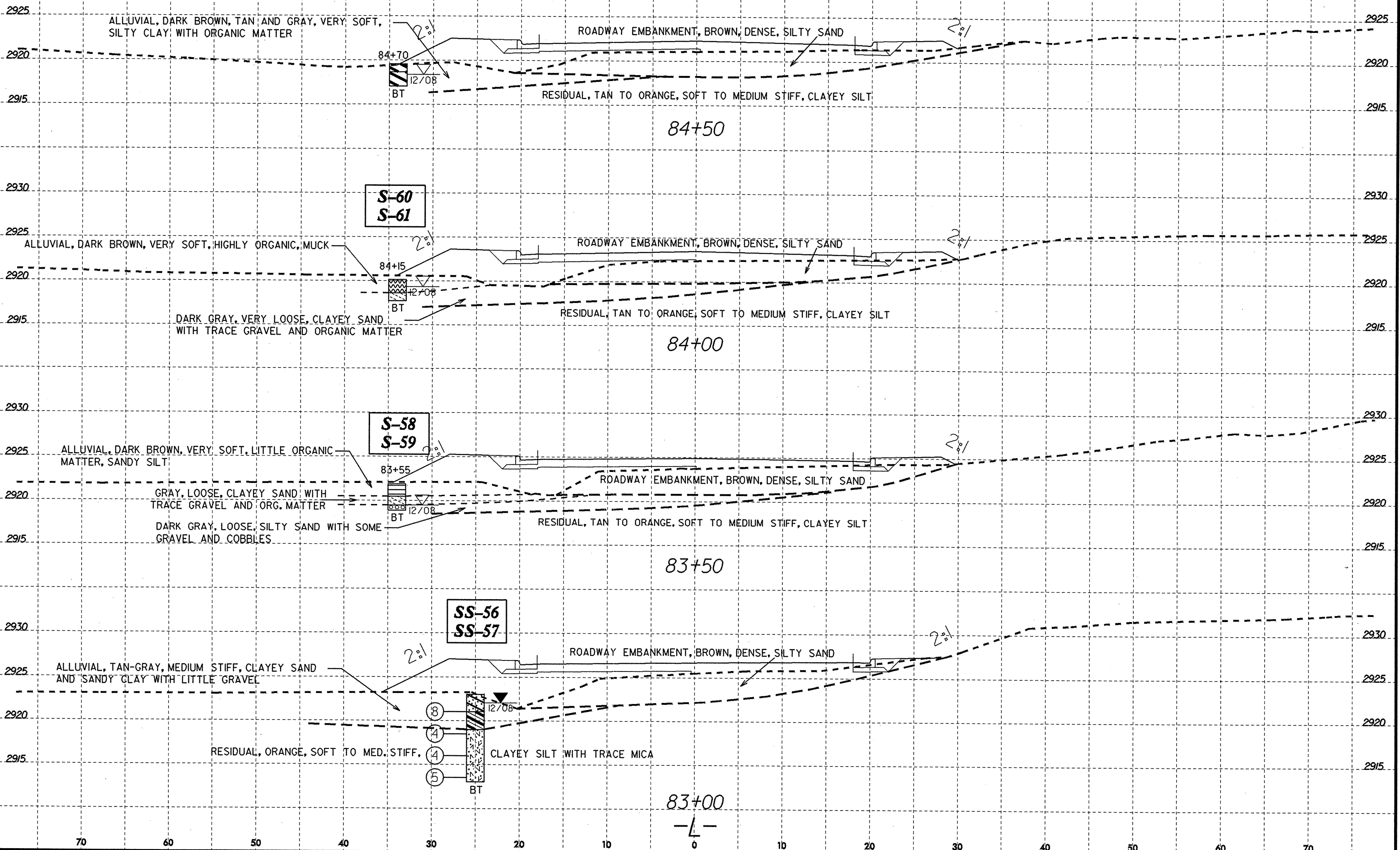
81+00  
-L-

8/23/99



PROJ. REFERENCE NO. U-3812

SHEET NO. 39



S-60  
S-61

S-58  
S-59

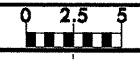
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SS-57

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23/08/06

83+00  
-L-

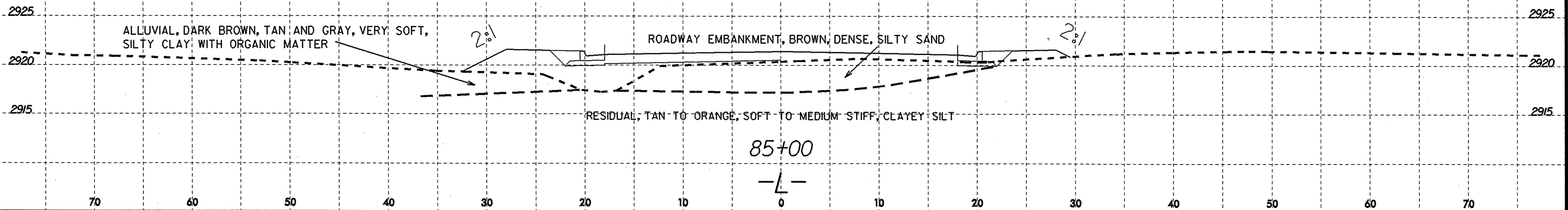
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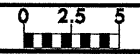
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U-3812

SHEET NO.  
40



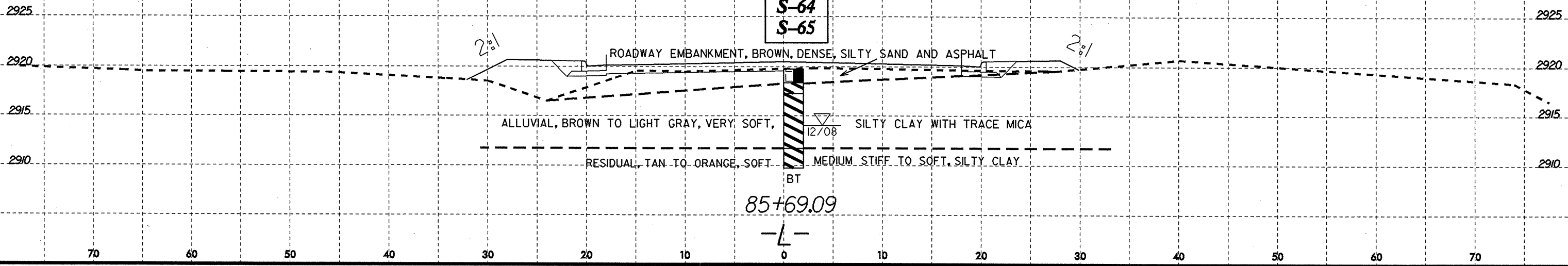
8/23/09

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PROJ. REFERENCE NO.	SHEET NO.
U-3812	41

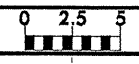
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12/08





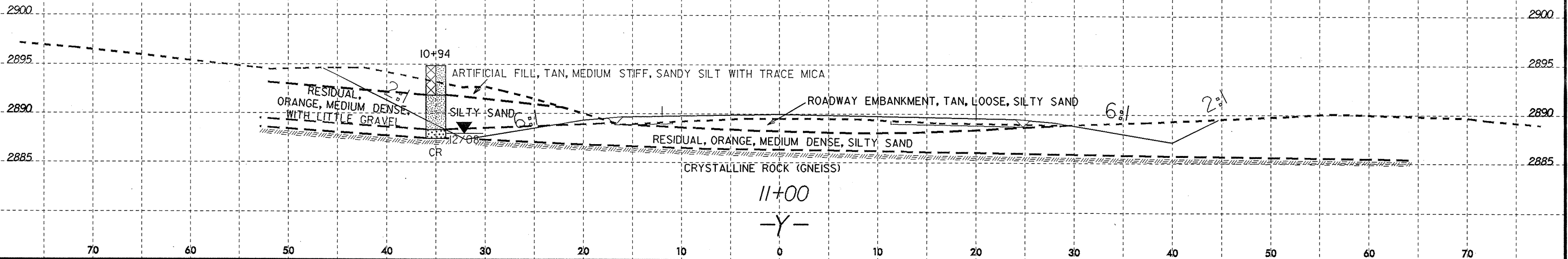
8/23/99

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PROJ. REFERENCE NO. U-3812 SHEET NO. 43

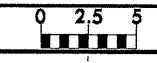
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3812





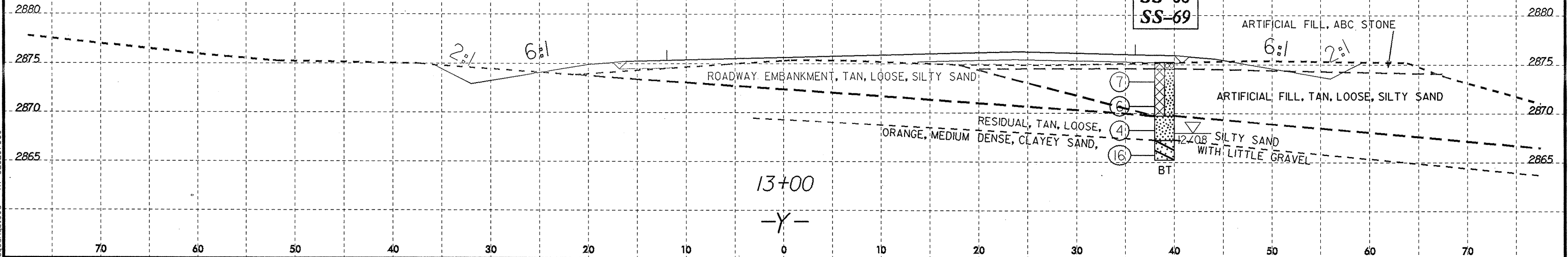
8/23/99

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PROJ. REFERENCE NO.  
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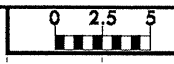
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8/23/99

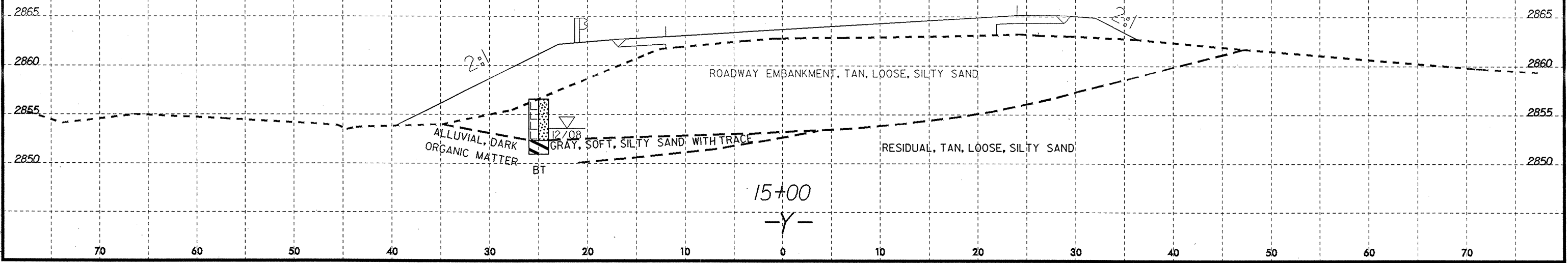
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U-3812

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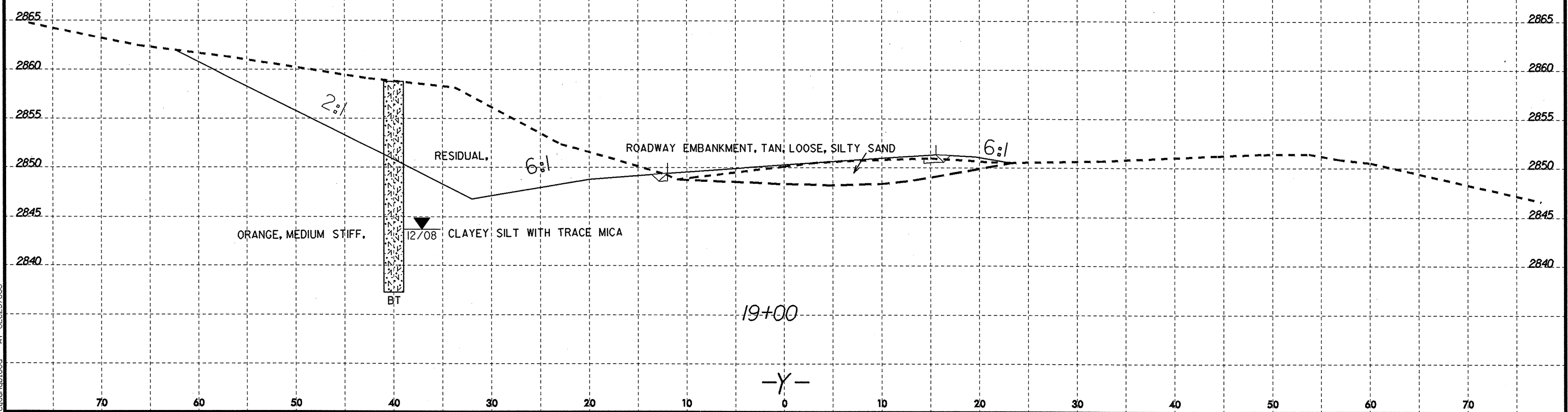




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0 2.5 5	PROJ. REFERENCE NO. U-3812	SHEET NO. 47
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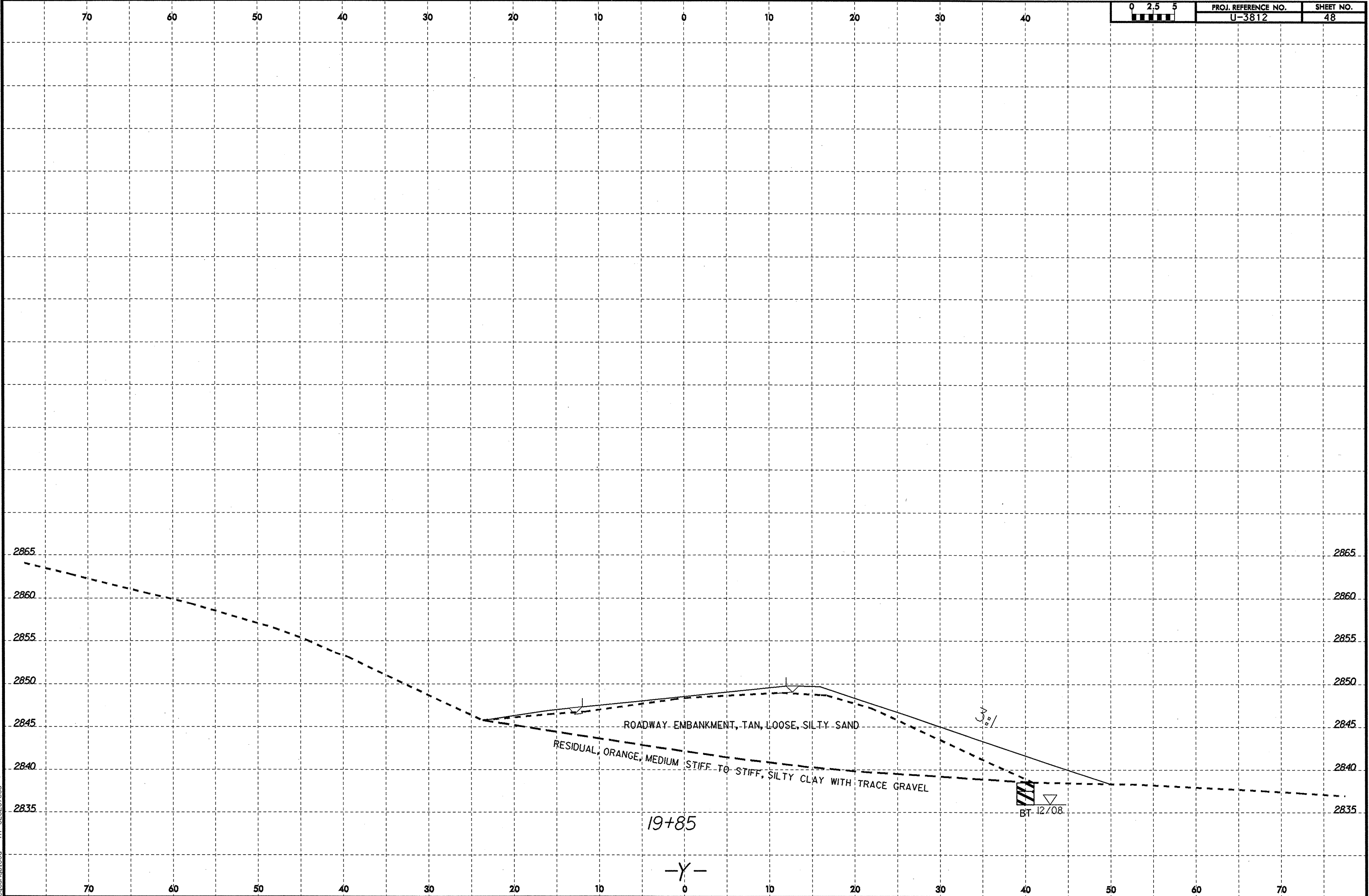


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PROJ. REFERENCE NO.  
 U-3812

SHEET NO.  
 48



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70

60

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40

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50

60

70

19+85

-Y-

BT 12/08

ROADWAY EMBANKMENT, TAN, LOOSE, SILTY SAND

RESIDUAL, ORANGE, MEDIUM STIFF TO STIFF, SILTY CLAY WITH TRACE GRAVEL

BT

**SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-1	CL	17+50	1.0-2.5	A-4(0)	31	4	17.8	45.5	24.6	12.1	98	92	44	-	-
SS-2	CL	11+50	6.0-7.5	A-4(0)	32	6	14.1	42.6	31.1	12.1	72	66	39	-	-
SS-3	CL	11+50	8.5-10.0	A-7-6(7)	46	18	10.7	41.8	25.3	22.2	93	88	53	-	-
SS-4	CL	11+50	13.5-15.0	A-2-4(0)	21	NP	24.8	54.9	16.2	4.0	66	57	20	-	-
SS-5	15' LT	14+50	1.5-3.0	A-2-4(0)	27	4	22.4	45.1	20.4	12.1	84	75	34	-	-
SS-6	15' LT	14+50	8.5-10.0	A-2-4(0)	30	NP	27.9	45.3	18.8	8.1	77	66	27	-	-
S-7	9' LT	15+17	5.0-7.0	A-4(0)	29	7	18.0	39.2	24.6	18.2	88	80	44	-	-
S-8	9' LT	15+17	7.0-9.0	A-4(0)	28	4	21.6	42.8	19.4	16.2	89	80	38	-	-
SS-9	23' LT	53+00	1.0-2.5	A-6(3)	40	12	19.4	31.5	32.9	16.2	78	68	45	-	-
SS-10	23' LT	53+00	3.5-5.0	A-6(10)	39	18	8.9	31.7	29.1	30.3	100	96	67	-	-
SS-11	15' RT	55+50	1.0-2.5	A-4(0)	34	4	15.4	50.3	22.2	12.1	100	95	44	-	-
SS-12	15' RT	55+50	6.0-7.5	A-4(0)	26	NP	19.2	49.5	23.2	8.1	100	93	41	-	-
S-13	60' RT	58+45	0.0-1.5	A-4(3)	37	7	9.7	44.6	33.5	12.1	100	96	56	-	-
SS-14	25' RT	58+32	1.0-2.5	A-7-5(13)	48	17	8.7	26.1	26.9	38.4	100	95	72	-	-
SS-15	25' RT	58+32	8.5-10.0	A-6(8)	39	12	10.1	26.5	29.1	34.3	100	94	70	-	-
SS-16	25' RT	58+32	13.5-15.0	A-4(2)	36	9	12.5	34.5	38.8	14.1	80	75	48	-	-
SS-17	30' LT	60+00	1.0-2.5	A-7-5(8)	47	14	14.7	32.5	26.5	26.3	100	91	62	-	-
SS-18	30' LT	60+00	3.5-5.0	A-4(0)	33	NP	22.6	47.5	23.8	6.1	100	91	40	-	-
SS-19	30' LT	60+00	6.0-7.5	A-4(0)	28	NP	8.3	55.4	28.3	8.1	100	99	49	-	-
SS-20	30' LT	60+00	18.5-20.0	A-4(0)	23	NP	13.9	58.6	17.4	10.1	100	98	38	-	-
SS-21	30' LT	60+00	23.5-25.0	A-4(0)	27	NP	24.0	49.1	18.8	8.1	100	89	36	-	-
S-22	40' LT	62+00	3.0-5.0	A-7-5(15)	58	19	9.5	13.9	18.0	58.6	86	81	69	-	-
S-23	25' LT	64+20	1.0-5.0	A-5(6)	41	10	9.5	33.5	26.7	30.3	100	95	66	-	-
S-24	25' LT	64+20	7.5-9.0	A-7-5(12)	59	18	13.5	19.8	18.2	48.5	87	79	62	-	-
SS-25	19' LT	67+33	1.0-2.5	A-6(4)	38	11	19.8	31.7	20.2	28.3	96	86	52	-	-
SS-26	19' LT	67+33	3.5-5.0	A-7-5(15)	68	20	8.9	32.3	18.2	40.6	100	98	65	-	-
SS-27	19' LT	67+33	6.0-7.5	A-7-5(6)	58	11	12.4	42.4	24.9	20.3	100	97	55	-	-
SS-28	19' LT	67+33	8.5-10.0	A-5(0)	45	5	14.8	61.3	17.8	6.1	100	95	36	-	-
S-29	16' RT	70+00	6.0-7.5	A-7-5(12)	49	17	10.2	21.7	21.4	46.7	93	87	69	-	-
SS-30	25' LT	72+00	1.0-2.5	A-7-5(25)	70	16	0.8	11.0	23.2	65.0	100	100	93	-	-
SS-31	25' LT	72+00	8.5-10.0	A-7-5(19)	69	13	1.6	23.4	38.5	36.5	100	100	84	-	-
SS-32	25' LT	72+00	18.5-20.0	A-5(10)	60	7	5.9	31.3	38.5	24.4	100	98	73	-	-
S-32A	30' RT	72+00	0.0-1.0	A-7-5(27)	63	25	2.0	18.3	26.9	52.8	100	99	86	-	-
S-33	30' RT	74+15	1.0-5.0	A-5(11)	60	10	6.9	28.8	27.7	36.5	100	98	71	-	-
S-33A	30 RT	72+00	4.0-5.0	A-5(16)	64	10	1.6	22.3	37.5	38.6	100	100	85	-	-
S-34	30' LT	74+15	7.0-10.0	A-5(7)	45	10	9.9	32.1	25.5	32.5	100	96	66	-	-
SS-35	35' RT	75+50	3.5-5.0	A-5(10)	60	8	7.9	28.0	23.5	40.6	100	99	71	-	-
SS-36	35' RT	75+50	18.5-20.0	A-5(6)	52	9	12.4	39.6	29.7	18.3	100	94	58	-	-
SS-37	45' RT	75+50	3.5-5.0	A-5(16)	64	10	3.7	17.3	20.2	58.9	100	98	85	-	-
SS-38	45' RT	77+50	6.0-7.5	A-5(15)	59	10	2.0	20.1	27.1	50.8	100	99	85	-	-
SS-39	45' RT	77+50	8.5-10.0	A-7-5(9)	57	12	9.9	34.9	24.7	30.5	100	97	63	-	-
SS-40	45' RT	77+50	18.5-20.0	A-5(4)	52	3	4.5	40.2	33.0	22.3	100	99	65	-	-
SS-41	90' RT	78+50	1.0-2.5	A-7-6(14)	59	31	10.6	14.6	18.0	56.9	71	66	55	-	-
SS-42	90' RT	78+50	3.5-5.0	A-7-5(34)	76	30	2.8	10.2	15.9	71.1	95	93	86	-	-
SS-43	90' RT	78+50	13.5-15.0	A-7-5(19)	65	17	1.6	27.2	30.6	40.6	100	100	79	-	-
SS-44	90' RT	78+50	18.5-20.0	A-5(6)	49	6	6.7	34.3	32.6	26.4	100	99	68	-	-
SS-45	78' RT	79+50	1.0-2.5	A-7-6(14)	45	22	7.5	14.8	16.8	60.9	87	83	70	-	-
SS-46	78' RT	79+50	6.0-7.5	A-7-5(23)	73	14	0.4	15.4	21.2	62.9	100	100	89	-	-
SS-47	78' RT	79+50	18.5-20.0	A-5(12)	70	9	5.7	32.3	33.6	28.4	100	100	70	-	-
SS-48	78' RT	79+50	23.5-25.0	A-5(9)	65	9	5.7	40.4	33.6	20.3	100	100	65	-	-
SS-49	78' RT	79+50	33.5-35.0	A-5(4)	57	6	9.9	48.5	25.3	16.2	100	98	53	-	-

**SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-50	100' RT	80+50	6.0-7.5	A-7-5(31)	66	25	1.4	6.9	16.5	75.1	100	99	94	-	-
SS-51	100' RT	80+50	13.5-15.0	A-5(11)	61	9	4.5	30.3	28.7	36.5	100	99	74	-	-
SS-52	100' RT	80+50	18.5-20.0	A-5(4)	54	5	13.6	35.9	24.1	26.4	100	96	57	-	-
SS-53	100' RT	80+50	38.5-40.0	A-5(0)	53	NP	20.1	45.7	26.1	8.1	100	95	43	-	-
SS-54	50' RT	81+00	3.5-5.0	A-5(8)	52	6	1.6	33.9	27.9	36.5	100	100	75	-	-
SS-55	50' RT	81+00	8.5-10.0	A-5(6)	56	3	4.3	36.3	33.0	26.4	100	99	69	-	-
SS-56	25' LT	83+00	1.0-2.5	A-2-6(0)	37	11	27.2	34.9	15.5	22.3	51	43	22	-	-
SS-57	25' LT	83+00	6.0-7.5	A-5(0)	47	NP	8.5	56.2	25.1	10.2	100	98	49	-	-
S-58	34' LT	83+55	0.0-1.0	A-4(2)	38	8	11.9	45.7	24.3	18.1	92	86	49	-	7.3
S-59	34' LT	83+55	2.5-3.0	A-1-b(0)	33	NP	30.4	53.2	12.4	4.0	46	38	11	-	3.9
S-60	34' LT	84+15	0.0-1.0	A-5(4)	55	9	15.3	38.5	32.1	14.1	91	83	49	-	10.5
S-61	34' LT	84+15	1.5-2.0	A-2-5(0)	41	NP	26.4	53.2	16.4	4.0	85	73	23	-	6.8
S-62	34' LT	84+70	0.0-0.9	A-7-5(5)	43	13	11.1	31.2	27.5	30.2	82	77	53	-	-
S-63	34' LT	84+70	1.0-2.5	A-7-6(5)	47	18	12.5	29.4	21.9	36.3	70	65	45	-	-
S-64	1' RT	85+70	2.0-3.0	A-7-5(6)	48	14	8.1	24.8	26.9	40.3	73	70	54	-	-
S-65	1' RT	85+70	6.0-7.5	A-7-5(11)	59	12	5.0	33.2	37.6	24.2	99	98	69	-	-
S-66	24' RT	87+00	1.0-2.0	A-4(3)	35	7	7.0	43.9	24.9	24.2	100	98	59	-	-
S-67	24' RT	87+00	6.0-8.0	A-2-4(0)	32	7	20.5	47.1	18.2	14.1	83	74	34	-	5.1
SS-68	39' RT	13+00	1.0-2.5	A-2-4(0)	33	NP	25.0	51.2	15.8	8.1	98	89	32	-	-
SS-69	39' RT	13+00	8.5-10.0	A-2-7(1)	44	19	17.1	33.2	19.4	30.2	50	45	29	-	-
SS-70	51' LT	17+00	1.0-51.0	A-5(0)	54	NP	25.4	44.1	18.4	12.1	100	92	36	-	-
SS-71	51' LT	17+00	0.0-0.0	A-2-4(0)	37	NP	33.6	46.9	15.4	4.0	100	86	27	-	-