

# STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

## ROADWAY SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. U-2211B F.A. PROJ. MA-STP-7533(2)

COUNTY CALDWELL

PROJECT DESCRIPTION LENOIR-SR 1001 (CONNELY SPRINGS ROAD)  
FROM US 321A (NORWOOD STREET) TO SR 1712 (STARCROSS  
ROAD) EAST OF US 321

### INVENTORY

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TITLE SHEET	1
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LINE	STATION	PLAN	PROFILE	XSECT
-L-	10+55 - 56+00	4-8		15-23
-LPB-	10+00 - 17+81	6	12	21,24-25
-RPB-	10+00 - 21+81	6,11	13	26-33
-LPC-	10+00 - 21+10	6	13	34-36
-RPC-	10+00 - 25+50	6,11	14	37-44
-Y3-	10+00 - 18+85	5,9		
-Y4-	10+00 - 21+36	5,6,11		
-Y5-NBL	12+47 - 43+00	6,10,11		
-Y5-SBL	12+47 - 43+25	6,10,11		45-54
-Y9-	10+00 - 12+40	7		
-Y10-	10+00 - 10+97	8		
-Y11-	15+68 - 28+35	5,9		
-SRI-	10+20 - 13+35	6		55
-DRI-	10+60 - 11+64	7		
-DR2-	10+50 - 11+65	6		

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2211B	1	5
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34783.1.1	MA-STP-7533(2)	P.E.	
		RW & 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 1911 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.

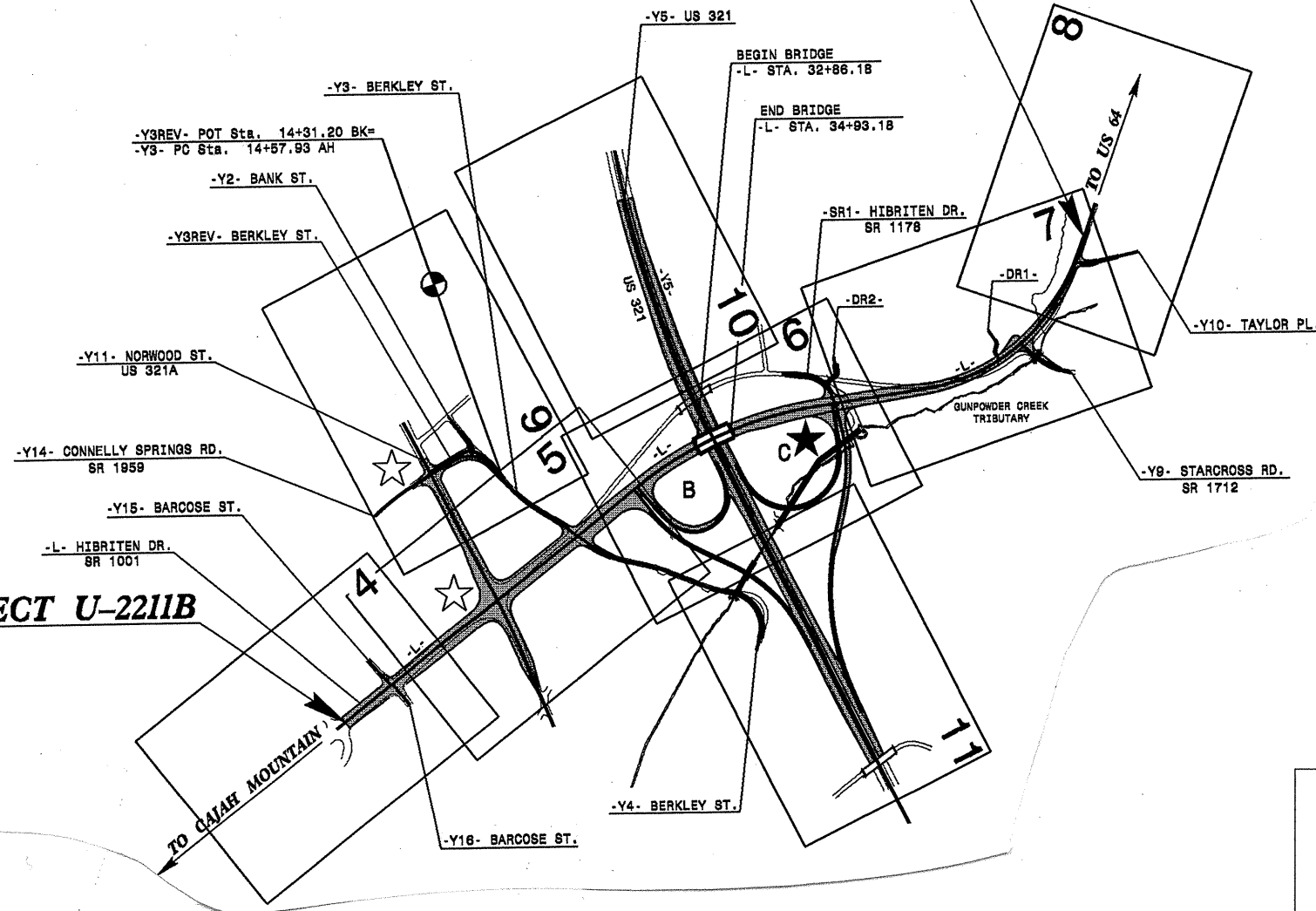
ID: U-2211B

CONTRACT: C202820

**STA. 10+55 -L- BEGIN TIP PROJECT U-2211B**

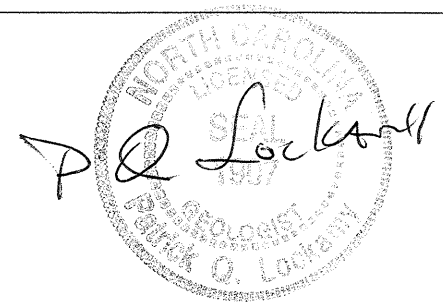
**STA. 56+50 -L- END TIP PROJECT U-2211B**

- ★ PROPOSED SIGNAL
- ☆ SIGNAL UPGRADE



- PERSONNEL
- M.M. HAGAR
  - D.O. CHEEK
  - R.D. CHILDERS
  - G.K. ROSE
  - C.J. COFFEY

INVESTIGATED BY P.Q. LOCKAMY  
 CHECKED BY W.D. FRYE  
 SUBMITTED BY W.D. FRYE  
 DATE 01.28.08



DRAWN BY: J.T. WILLIAMS

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IS IT 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.

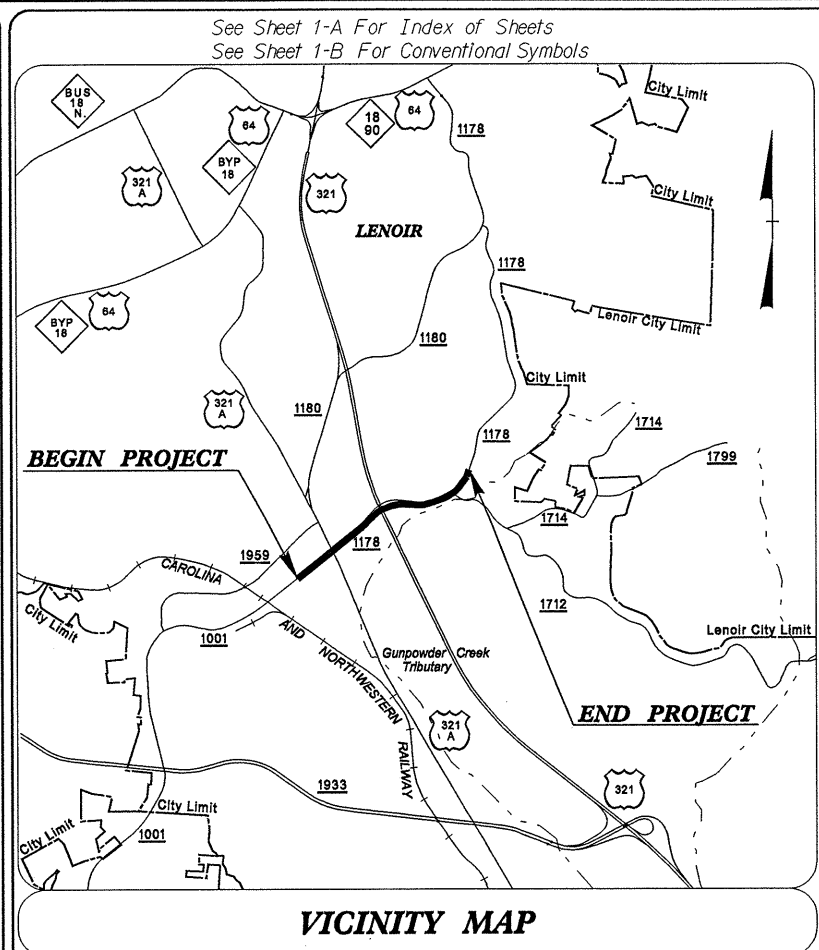
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
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**SUBSURFACE INVESTIGATION**

**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 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:</p> <p style="text-align: center;"><i>VERY STIFF, GRN, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i></p>	<p>WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. 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.</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: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</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>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 (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (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. STRATA CORE RECOVERY (SREC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																																																																																																																																											
<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> <th>GROUP CLASS.</th> <th>A-1</th> <th>A-3</th> <th colspan="2">A-2</th> <th>A-4</th> <th>A-5</th> <th>A-6</th> <th>A-7</th> <th>A-1, A-2</th> <th>A-4, A-5</th> <th colspan="3"></th> </tr> <tr> <th>SYMBOL</th> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>% PASSING</th> <td>50 MX 30 MX 15 MX</td> <td>50 MX 25 MX</td> <td>50 MX 10 MX</td> <td>35 MX 10 MX</td> <td>35 MX 10 MX</td> <td>35 MX 10 MX</td> <td>35 MX 10 MX</td> <td>35 MX 10 MX</td> <td>35 MX 10 MX</td> <td>35 MX 10 MX</td> <td>35 MX 10 MX</td> <td>35 MX 10 MX</td> <td>35 MX 10 MX</td> </tr> <tr> <th>LIQUID LIMIT PLASTIC INDEX</th> <td>6 MX</td> <td>NP</td> <td>40 MX 10 MX</td> <td>41 MN 10 MN</td> <td>40 MX 10 MX</td> <td>41 MN 11 MN</td> <td>40 MX 10 MX</td> <td>41 MN 11 MN</td> <td>40 MX 10 MX</td> <td>41 MN 11 MN</td> <td colspan="3">SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER</td> </tr> <tr> <th>GROUP INDEX</th> <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 colspan="3">HIGHLY ORGANIC SOILS</td> <td colspan="2"></td> </tr> <tr> <th>USUAL TYPES OF MAJOR MATERIALS</th> <td colspan="2">STONE FRAGS, GRAVEL, AND SAND</td> <td colspan="2">FINE SAND</td> <td colspan="2">SILTY OR CLAYEY GRAVEL AND SAND</td> <td colspan="2">SILTY SOILS</td> <td colspan="2">CLAYEY SOILS</td> <td colspan="3"></td> </tr> <tr> <th>GEN. RATING AS A SUBGRADE</th> <td colspan="4">EXCELLENT TO GOOD</td> <td colspan="4">FAIR TO POOR</td> <td>FAIR TO POOR</td> <td>POOR</td> <td colspan="3">UNSATURABLE</td> </tr> <tr> <td colspan="13">PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS &gt; LL - 30</td> <td colspan="2"></td> </tr> </table>	GENERAL CLASS.	GRANULAR MATERIALS (<= 35% PASSING #200)				SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS				GROUP CLASS.	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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</p> <p> STATIC WATER LEVEL AFTER 24 HOURS</p> <p> PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA</p> <p> SPRING OR SEEP</p> <p style="text-align: center;"><b>MISCELLANEOUS SYMBOLS</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION</td> <td></td> <td>SPT TEST BORING</td> </tr> <tr> <td></td> <td>SOIL SYMBOL</td> <td></td> <td>AUGER BORING</td> </tr> <tr> <td></td> <td>ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT</td> <td></td> <td>CORE BORING</td> </tr> <tr> <td></td> <td>INFERRED SOIL BOUNDARY</td> <td></td> <td>MONITORING WELL</td> </tr> <tr> <td></td> <td>INFERRED ROCK LINE</td> <td></td> <td>PIEZOMETER INSTALLATION</td> </tr> <tr> <td></td> <td>ALLUVIAL SOIL BOUNDARY</td> <td></td> <td>SLOPE INDICATOR INSTALLATION</td> </tr> <tr> <td></td> <td>DIP &amp; DIP DIRECTION OF ROCK STRUCTURES</td> <td></td> <td>SPT N-VALUE</td> </tr> <tr> <td></td> <td>SOUNDING ROD</td> <td></td> <td>SPT REFUSAL</td> </tr> </table>		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		ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION		SPT TEST BORING		SOIL SYMBOL		AUGER BORING		ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT		CORE BORING		INFERRED SOIL BOUNDARY		MONITORING WELL		INFERRED ROCK LINE		PIEZOMETER INSTALLATION		ALLUVIAL SOIL BOUNDARY		SLOPE INDICATOR INSTALLATION		DIP & DIP DIRECTION OF ROCK STRUCTURES		SPT N-VALUE		SOUNDING ROD		SPT REFUSAL	<p style="text-align: center;"><b>ROCK HARDNESS</b></p> <p>VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.</p> <p>HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.</p> <p>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.</p> <p>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 PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.</p> <p>SOFT CAN BE GROVED 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.</p> <p>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. 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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.																																																																																																																																																																																													
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																																																																																																																																																																																													

**TIP PROJECT: U-2211B**

**CONTRACT:**



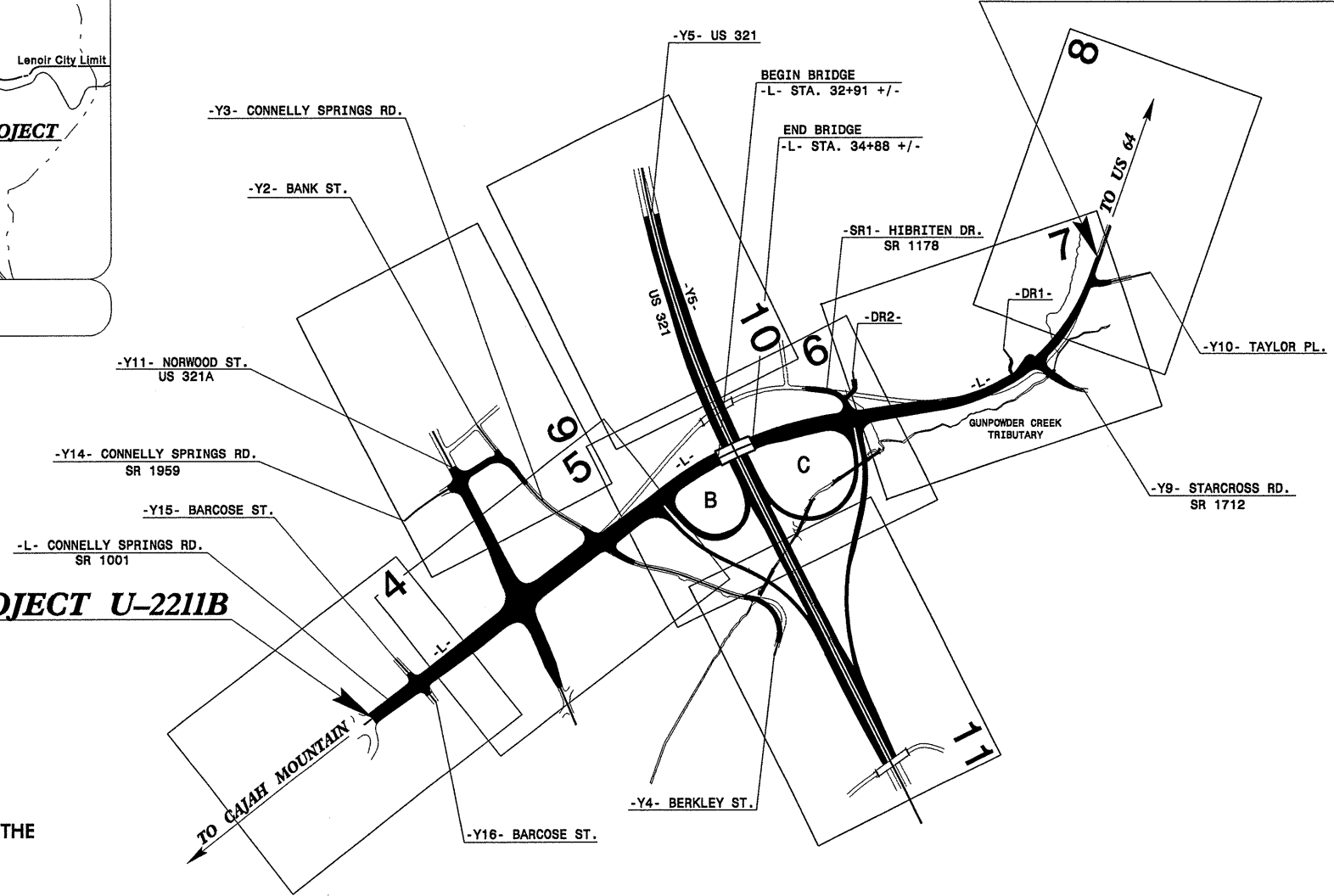
**VICINITY MAP**

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**CALDWELL COUNTY**

**LOCATION:** LENOIR - SR 1001 (CONNELLY SPRINGS ROAD) FROM  
US 321A (NORWOOD STREET) TO SR 1712 (STARCROSS ROAD)  
EAST OF US 321  
**TYPE OF WORK:** GRADING, PAVING, DRAINAGE, AND STRUCTURES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2211B	2A	55
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34783.1.1	MA-STP-7533(2)	P.E.	

**STA. 56+50 -L- END TIP PROJECT U-2211B**

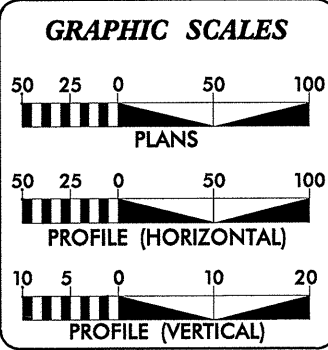


**STA. 10+55 -L- BEGIN TIP PROJECT U-2211B**

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

THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF LENOIR.

INCOMPLETE PLANS  
DO NOT USE FOR R/W ACQUISITION  
PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION



**DESIGN DATA**

ADT 2010	=	8,674
ADT 2030	=	14,600
DHV	=	10 %
D	=	60 %
T	=	4 % *
V	=	50 MPH
FUNC. CLASS.	=	URBAN COLLECTOR
* TTST 1%		DUAL 3%

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT U-2211B	=	0.833 MILES
LENGTH STRUCTURE TIP PROJECT U-2211B	=	0.037 MILES
TOTAL LENGTH OF TIP PROJECT U-2211B	=	0.870 MILES

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

2006 STANDARD SPECIFICATIONS

**RIGHT OF WAY DATE:**  
JULY 18, 2008

**LETTING DATE:**  
JULY 20, 2010

**GARY LOVERING, PE**  
PROJECT ENGINEER

**RON McCOLLUM, 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

09/08/09-  
 \$\$\$ SYSTEM \$\$\$  
 \$\$\$ DGN \$\$\$  
 \$\$\$ PLOT \$\$\$  
 \$\$\$ PERM \$\$\$  
 \$\$\$ NAME \$\$\$



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

January 28, 2008

STATE PROJECT: 34783.1.1 (U-2211B)  
FEDERAL PROJECT: MA-STP-7533 (2)  
COUNTY: Caldwell

DESCRIPTION: Lenoir – SR 1001 (Connelly Springs Road) from US 321A (Norwood Street) to SR 1712 (Starcross Rd) east of US 321

SUBJECT: Geotechnical Report – Inventory

**Project Description**

This project consists of improvements and partial relocation of -L- (Hibriten Street), an interchange on -L- with US 321 (-Y5-) and changes to several other streets in Lenoir.

The subsurface investigation was conducted in the fall of 2007 during a period of drought. A CME-550 ATV mounted drill did most of the work, a hand auger was also used. Standard Penetration Tests were performed at 5-foot intervals using an automatic hammer. Solid auger borings were also made. Soil samples were taken and submitted for quality testing. Vane Shear Tests were made in a swampy area along -RPC-. No rock was cored along this project.

The following alignments were investigated:

<u>Line</u>	<u>Station Interval</u>
-L-	10+55 – 56+00
-LPB-	10+00 – 17+81
-RPB-	10+00 – 21+81
-LPC-	10+00 – 21+10
-RPC-	10+00 – 25+50
-Y3-	10+50 – 18+85
-Y4-	10+00 – 21+36

MAILING ADDRESS:  
NC DEPARTMENT OF TRANSPORTATION  
GEOTECHNICAL UNIT  
1589 MAIL SERVICE CENTER  
RALEIGH NC 27699-1589

TELEPHONE: 919-250-4088  
FAX: 919-250-4237  
WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:  
CENTURY CENTER COMPLEX  
BUILDING B  
1020 BIRCH RIDGE DRIVE  
RALEIGH NC 27610

-Y5NBL-	12+47 – 43+00
-Y5NBL-	12+47 – 43+25
-Y9-	10+00 – 12+40
-Y10-	10+00 – 10+97
-Y11-	15+68 – 28+35
-SR1-	10+20 – 13+35
-DR1-	10+60 – 11+64
-DR2-	10+50 – 11+65

**Areas of Special Geotechnical Interest**

- (1) Floodplain Deposits: Soft ground consisting of silts and clays with some organics which may lead to embankment instability and long term settlement is located in the following areas.

<u>Line</u>	<u>Station Interval</u>
-RPC-	23+00 ± - 25+50
-SR1-	12+00 – 13+35
-L-	39+28 – 42+28±

- (2) Crystalline Rock: Crystalline rock occurs above or within 6 feet of proposed grade at the following locations.

<u>Line</u>	<u>Station Interval</u>
-Y5-	12+47 – 14+75 Lt

- (3) Spring Box: A deteriorated spring box is located in the following area.

<u>Line</u>	<u>Station</u>
-L-	38+75 70 Lt (Approx.)

- (4) Water Well: A residential water well is located within the construction limits at the following location.

<u>Line</u>	<u>Station</u>
-L-	35+90 28 Rt

**Physiography and Geology**

The area is in the foothills, more specifically the Brushy Mountains. It is east of the Brevard Fault so it is in the Inner Piedmont. It is also east of the Brindle Creek Fault, putting it in the Eastern Inner Piedmont. The Brindle Creek Thrust Fault is not visible but is inferred to be between outcrops of migmatitic amphibolite (exposed in excavations at the

new Lowes store) and mafic orthogneiss (dark colored metamorphosed granite) in the existing cut at the beginning of -Y5-.

The project is drained by Gunpowder Creek which flows into the Catawba River at Lake Hickory. The creek has a very low gradient and shallow alluvial soils with patches of subangular quartz gravel. Here, it exhibits a lateral migration to the north with some nascent terrace soils on the south side. A tributary drainage with deep clayey alluvium has created a swampy area with soft ground along -RPC- at -L-.

Rock is nearly absent on this project. The only natural outcrop of crystalline rock is visible for a few feet along the bed of Gunpowder Creek. A manmade outcrop is visible for a few hundred feet along the base of the existing cut left of -Y5-. Bedrock type is indicated mainly by split spoon samples of saprolitic material. Rock types thus observed include sillimanite schist, orthogneiss, paragneiss, amphibolite and vein granite.

Sillimanite schist underlies the highest ground and the largest cut on the project (south half of -RPB-). Thin layers of weathered rock - amphibolite - are present in saprolite of schist. Cobbles of amphibolite are commonly on top of residuum and occasional boulders are found in residual accumulations on concave slopes. Near the creek vein granite is also found in saprolite of schist.

**Soil Properties**

The first 700 feet of -Y5- is underlain by mafic orthogneiss (dark colored gneiss with granitic parents). Sandy residual clay over saprolitic sands is present. Crystalline rock is found fairly close to the surface here.

Continuing along -Y5-, rock type changes to paragneiss (gneiss of sedimentary origin). Deep residuum over considerable accumulations of saprolite is present here. Highly weathered soils with saprolites that are often sandy but can be siltier and moister than other saprolitic soils on the project is present.

From the creek to the end of -Y5-, very deep saprolitic medium to very dense sands are found. These soils almost uniformly test as sands but look and feel like fine sandy silt with trace to little mica. They are very well drained and tend to have a thin, acidic residuum.

The most interesting and challenging soils on this project are alluvial soils. These soils tend to be soft and clayey with patches of intermittent basal sands and gravel underlain by very loose saprolitic sand which in places has been gleyed (the pores are plugged with clay and its color turned to a grey).

A problem area of swampy alluvial silts and clays exists on the north side of the creek. The drill rig pumped the ground there and wooden blocks under the drill jacks sank easily into the ground. Up to 30 feet of embankment is proposed over this alluvium. Two conditions have made this ground very soft. The first is a recent meander filled with very soft alluvium with some organic material. The second is a small soggy tributary drainage

with very little surface flow. The drainage has accumulated clays and has gleyed the underlying soils.

Embankment along -Y5- over floodplain soils of Gunpowder creek is slightly steeper than 2:1 (H:V) and is in excellent shape.

Vane Shear Results

A Geonor Vane Tester H-60 with a 1/2-inch vane was used - no adjustment for this vane.

<u>Station</u>	<u>Offset</u>	<u>Depth</u>	<u>Reading (Kpa)</u>
39+50 -L-	38 Rt	6.0	17
		7.0	20
		7.5	12
		8.0	34
40+50 -L-	CL	1.0	27
		1.5	22
		2.0	44
		2.5	32
		3.0	34
		3.5	26
		4.0	80

Groundwater

Significant drought has occurred before and during this investigation. Many borings, some quite deep, were dry at 24 hours. Groundwater is present along -L- at the west side of the proposed bridge over -Y5- at elevation 1263 feet. Groundwater elevation along nearby Gunpowder Creek varied from 1262 (upstream) to 1247 feet (downstream).

Respectfully Submitted,

P. Q. Lockamy, LG

Attachment A

Bag Samples: A bag sample was taken from the largest cut on the project at -Y5- Station 38+00, 165 Lt. at a depth of 2 to 19 feet. BS-1 is being tested for triaxial CU, recompact density and permeability.

STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE				
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. +15%		ROCK	SUITABLE	UNSUIT.	TOTAL	
-Y4- LT. 16+68.00	17+25.00	36				36	1		1				35		35	
-Y4- RT. 16+68.00	17+25.00	14				14							14		14	
-Y4- FULL 17+25.00	20+50.00	54				54	2,265		2,265	2,605	2,551					
-Y4- LT. 20+50.00	21+36.21	1				1	40		40	46	45					
-Y4- RT. 20+50.00	21+36.21	5				5	61		61	70	65					
-Y3REV- FULL 10+30.08	11+50.00	198				198	73		73	84			114		114	
-Y3REV- RT. 11+50.00	14+31.20	114				114	88		88	101			13		13	
-Y3REV- LT. 11+50.00	14+31.20	60				60	70		70	81	21					
-Y11- LT. 15+68.54	23+05.78	641				641	62		62	71			570		570	
-Y11- LT. 23+97.10	28+35.00	254				254	124		124	143			111		111	
-Y11- RT. 15+68.54	23+12.68	155				155							155		155	
-Y11- RT. 24+01.37	28+35.00	116				116	86		86	99			17		17	
-L- RT. 20+65.03	23+25.00	235				235	335		335	385	150					
-L- FULL 23+25.00	32+86.18 (BEG. BG.)	1,465				1,465	28,485		28,485	32,758	31,293					
L- FULL 34+93.18 (END BG)	43+25.00	515		4,666		515	47,507		47,507	54,633	54,118			4,666	4,666	
-L- RT. 43+25.00	47+75.00	50				50	4,246		4,246	4,883	4,833					
-L- LT. 43+25.00	47+75.00	3,178				3,178	214		214	246			2,932		2,932	
-DR3- 10+60.61	11+45.25	3				3	599		599	689	686					
-LPB- FULL 10+00.00	17+81.18	624				624	7,503		7,503	8,628	8,004					
-RPB- FULL 10+00.00	21+81.84	690				690	53,114		53,114	61,081	60,391					
-LPC- FULL 10+00.00	20+10.60	432		2,220		432	59,390		59,390	68,299	67,867			2,220	2,220	
-RPC- FULL 10+00.00	25+50.31	148,833		1,335		148,833	28,001		28,001	32,201			116,632	1,335	117,967	
-Y5- MED. 12+47.56	43+25.00	3,172				3,172	2		2	2			3,170		3,170	
-Y5- LT. 12+47.56	26+86.63	19,338	1,555			17,783	28		28	32		1,555	17,751		19,306	
-Y5- LT. 29+00.00	36+00.00	3,350				3,350	4,869		4,869	5,599	2,249					
-Y5- LT. 40+79.00	43+00.00	3,173				3,173	10		10	12			3,161		3,161	
-Y5- RT. 12+47.56	26+35.10	3,713				3,713	300		300	345			3,368		3,368	
-Y5- RT. 28+50.00	33+50.00	242				242	4,385		4,385	5,043	4,801					
-Y5- RT. 36+75.00	43+25.00	6,328				6,328	2		2	2			6,326		6,326	
-Y4- FULL 10+52.54	11+00.00	130				130	59		59	68			62		62	
-Y4- LT. 11+00.00	11+98.04	260				260	39		39	45			215		215	
-Y4- RT. 11+00.00	11+98.04	5				5	30		30	35	30					
<b>PHASE I SUBTOTAL</b>		197,384	1,555	8,221		195,829	241,988		241,988	278,286	237,103		1,555	154,645	8,221	164,421
ROCK WASTE TO REPLACE BORROW								1,555	-1,555		-1,555		-1,555			-1,555
ADJUST FOR ROCK SWELL									-389	-389	-389					
ADJUST SHRINKAGE FOR ROCK MATERIAL										-292	-292					
USE SUITABLE WASTE IN LIEU OF BORROW											-154,368		-154,368		-154,368	
<b>PHASE I TOTAL</b>		197,384	1,555	8,221		195,829	241,988	1,555	240,044	277,606	80,500		277	8,221	8,498	

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.

STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. +15%		ROCK	SUITABLE	UNSUIT.	TOTAL
-L- FULL 47+75.00	53+75.00	5,870				5,870	1,112		1,112	1,279			4,591		4,591
-L- LT. 53+75.00	56+50.00	45				45	153		153	176	131				
-L- RT. 53+75.00	56+50.00	127				127	38		38	44			83		83
-DR1- 10+60.50	11+39.36	627				627							627		627
-Y10- 10+12.06	10+97.52	119				119							119		119
-Y9- FULL 10+20.85	12+40.41	251				251	755		755	868	617				
-SR1- FULL 10+20.00	13+01.20	163		410		163	7,640		7,640	8,786	8,623			410	410
-DR2- FULL 10+50.00	11+53.90						1,307		1,307	1,503	1,503				
-L- LT. 20+65.03	23+25.00	746				746	52		52	60			686		686
-Y3- LT. 17+80.00	18+85.03	16				16	8		8	9			7		7
-Y3- RT. 17+80.00	18+85.03	9				9	35		35	40	31				
<b>PHASE II SUBTOTAL</b>		7,973		410		7,973	11,100		11,100	12,765	10,905		6,113	410	6,523
USE SUITABLE WASTE IN LIEU OF BORROW											-6,113		-6,113		-6,113
<b>PHASE II TOTAL</b>		7,973		410		7,973	11,100		11,100	12,765	4,792			410	410

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.



STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. +15%		ROCK	SUITABLE	UNSUIT.	TOTAL
PHASE I TOTAL FROM SHEET 1		197,384	1,555	8,221		195,829	241,988	1,555	240,044	277,606	80,500		277	8,221	8,498
PHASE II TOTAL FROM SHEET 2		7,973		410		7,973	11,100		11,100	12,765	4,792			410	410
<b>PROJECT SUBTOTAL</b>		<b>205,357</b>	<b>1,555</b>	<b>8,631</b>		<b>203,802</b>	<b>253,088</b>	<b>1,555</b>	<b>251,144</b>	<b>290,371</b>	<b>85,292</b>		<b>277</b>	<b>8,631</b>	<b>8,908</b>
MATERIAL FOR SHOULDER CONSTRUCTION							4,800		4,800	5,520	5,520				
LOSS DUE TO CLEARING & GRUBBING		-4,500				-4,500					4,500				
ADDITIONAL UNDERCUT - EMBKMT. STABILITY				1,000			1,000		1,000	1,150	1,150			1,000	1,000
ADDITIONAL UNDERCUT - GRADE POINTS				650			650		650	748	748			650	650
SELECT GRANULAR MATERIAL IN LIEU OF BORROW										-7,000	-7,000				
<b>PROJECT SUBTOTAL</b>		<b>200,857</b>	<b>1,555</b>	<b>10,281</b>		<b>199,302</b>	<b>259,538</b>	<b>1,555</b>	<b>257,594</b>	<b>290,788</b>	<b>90,209</b>		<b>277</b>	<b>10,281</b>	<b>10,558</b>
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT											4,510				
<b>GRAND TOTAL</b>		<b>200,857</b>	<b>1,555</b>	<b>10,281</b>		<b>199,302</b>	<b>259,538</b>	<b>1,555</b>	<b>257,594</b>	<b>290,788</b>	<b>94,719</b>		<b>277</b>	<b>10,281</b>	<b>10,558</b>
<b>SAY</b>		<b>201,000</b>		<b>10,300</b>							<b>94,800</b>				
SHALLOW UNDERCUT CONTINGENCY				2,000											

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.

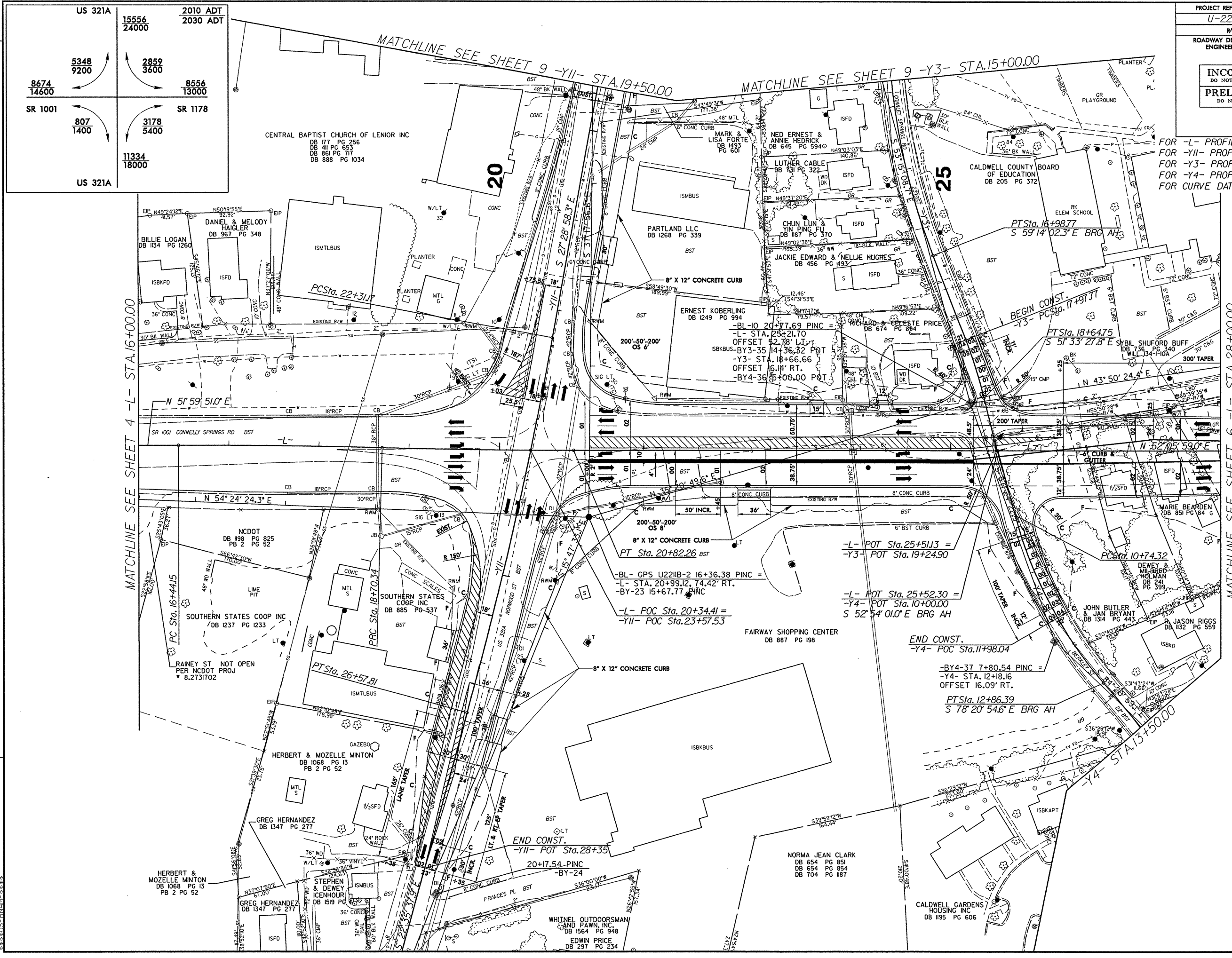
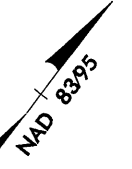


8/17/99

US 321A 15556 24000	2010 ADT 2030 ADT
5348 9200	2859 3600
8674 14600	8556 13000
SR 1001 807 1400	SR 1178 3178 5400
US 321A	11334 18000

PROJECT REFERENCE NO. U-2211B	SHEET NO. 5/55
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

FOR -L- PROFILE SEE SHEET 12  
 FOR -YII- PROFILE SEE SHEETS 21 & 22  
 FOR -Y3- PROFILE SEE SHEET 17  
 FOR -Y4- PROFILE SEE SHEET 17  
 FOR CURVE DATA SEE SHEET 2-1



REVISIONS

\*\*\*\*\*  
 SYSTEMS \*\*\*\*\*  
 DONSON \*\*\*\*\*  
 USER \*\*\*\*\*

MATCHLINE SEE SHEET 4 -L- STA. 16+00.00

MATCHLINE SEE SHEET 6 -L- STA. 28+00.00

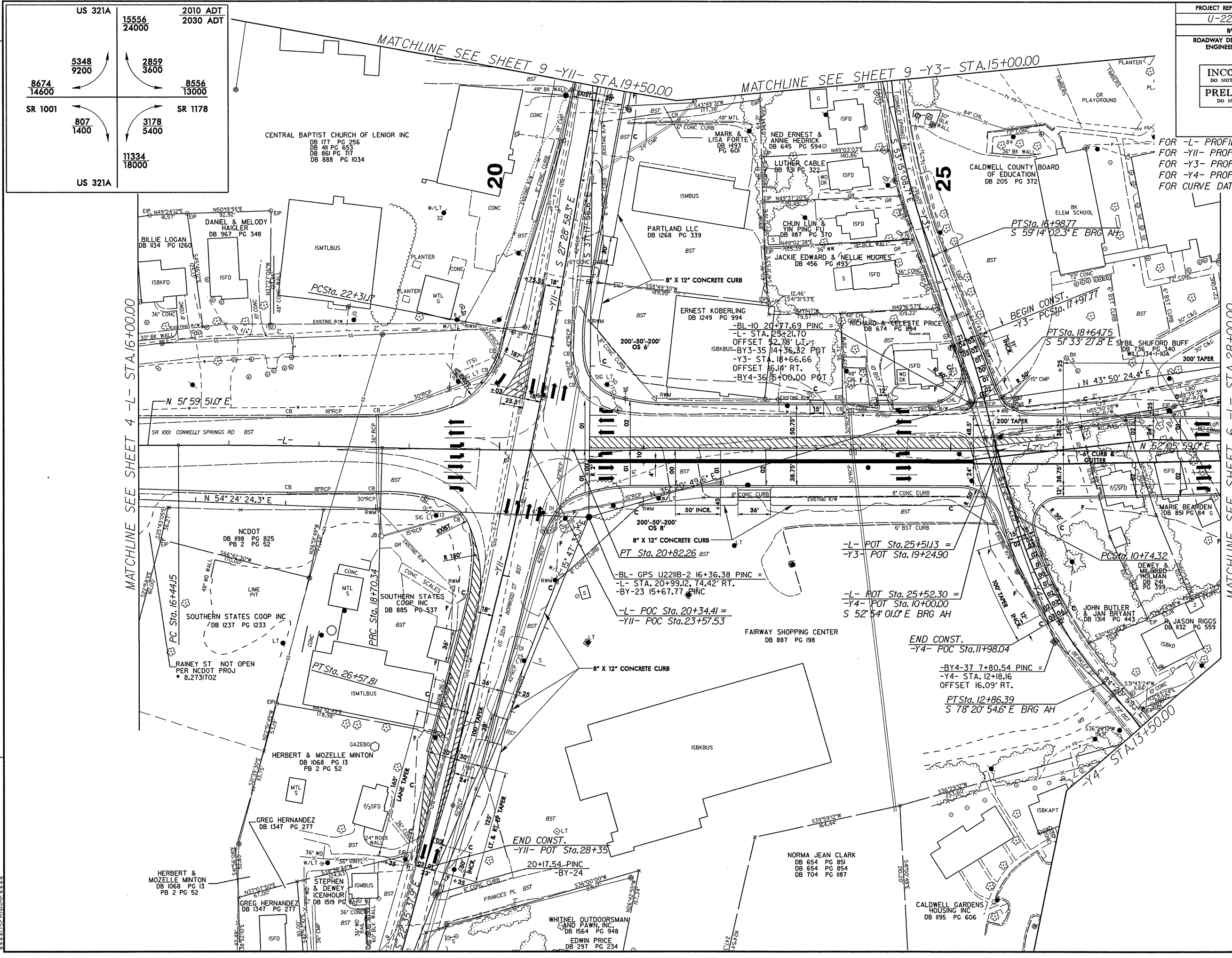
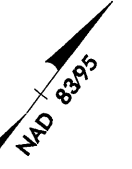
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MATCHLINE SEE SHEET 9 -Y3- STA. 15+00.00

-Y4- STA. 13+50.00

US 321A 15556 24000	2010 ADT 2030 ADT
5348 9200	2859 3600
8674 14600	8556 13000
SR 1001 807 1400	SR 1178 3178 5400
US 321A	11334 18000

FOR -L- PROFILE SEE SHEET 12  
 FOR -YII- PROFILE SEE SHEETS 21 & 22  
 FOR -Y3- PROFILE SEE SHEET 17  
 FOR -Y4- PROFILE SEE SHEET 17  
 FOR CURVE DATA SEE SHEET 2-1



REVISIONS

\*\*\*\*\*  
 SYSTEMS \*\*\*\*\*  
 DONSON \*\*\*\*\*  
 USER \*\*\*\*\*

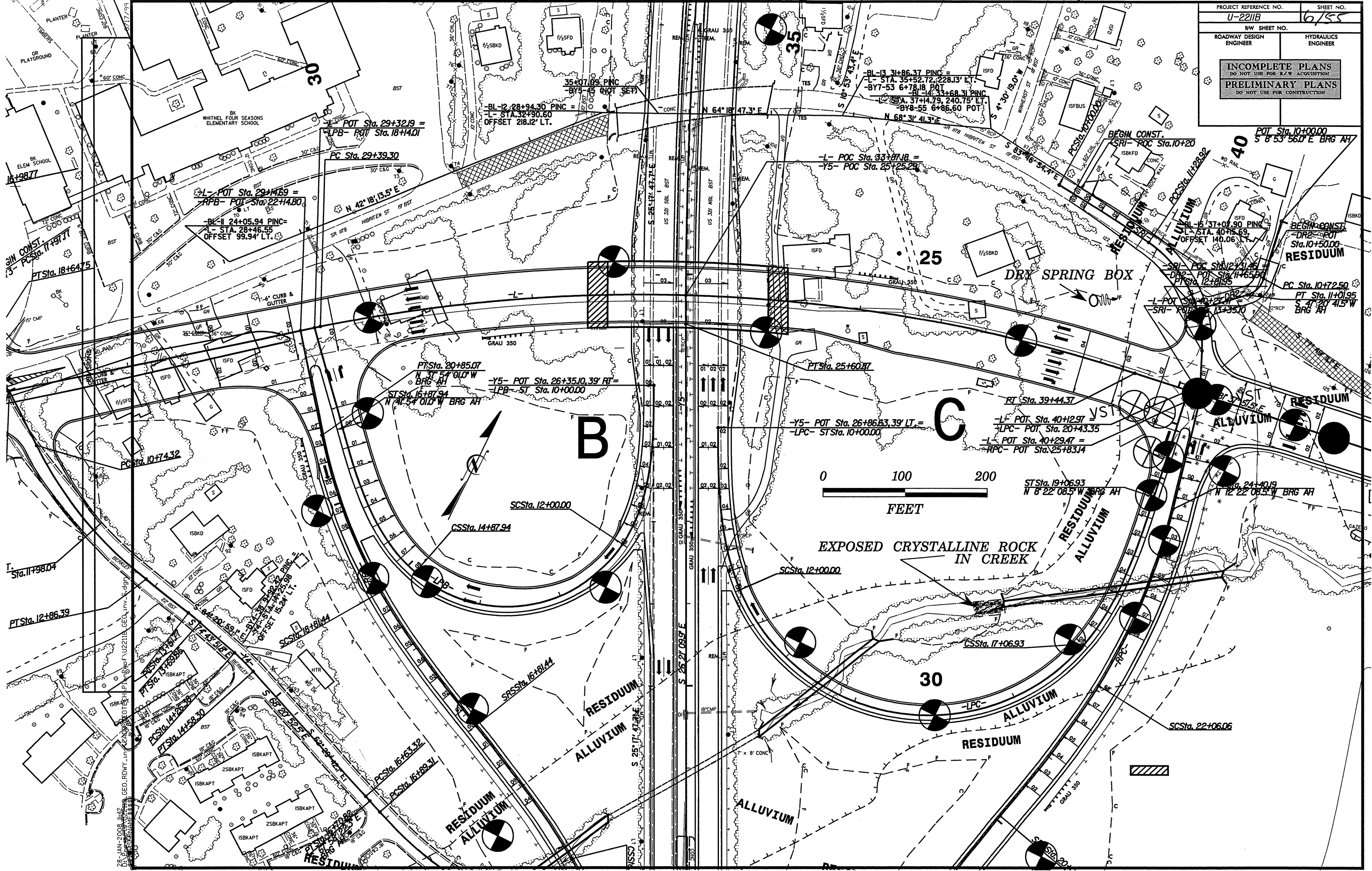
MATCHLINE SEE SHEET 4 -L- STA. 16+00.00

MATCHLINE SEE SHEET 6 -L- STA. 28+00.00

MATCHLINE SEE SHEET 9 -YII- STA. 19+50.00

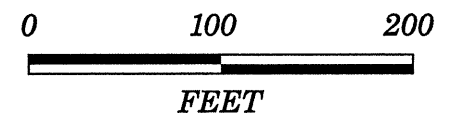
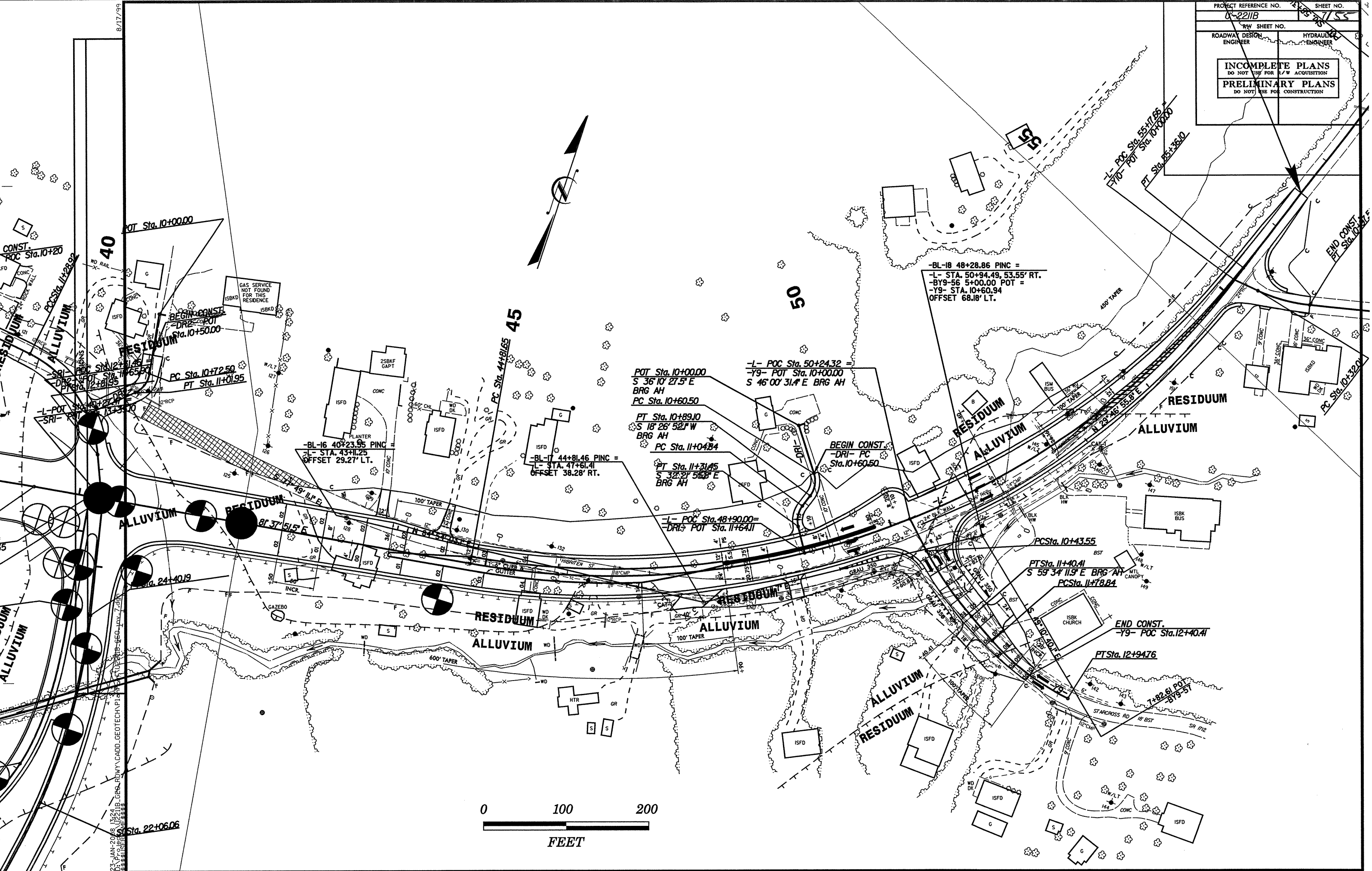
MATCHLINE SEE SHEET 9 -Y3- STA. 15+00.00

-Y4- STA. 13+50.00



28 JAN 2008 11:42 AM  
 GEO. RDMY. IN CHARGE  
 2515 HILLVIEW RD.  
 01553

8/17/99



23 JAN 2006 13:24  
C:\GEO\RDW\YACADD\_GEO\TECH\PLANS\0-2211B\7-55.DWG  
DESIGNED BY: JAC





REVISIONS



OLD CONNELLY SPRINGS RD.		704 1000	2010 ADT 2030 ADT
252 400	452 600		
18519 28000	16260 25000		
US 321A	US 321A		
4570 6200	2111 3000		
SR 1959	6681 9200		

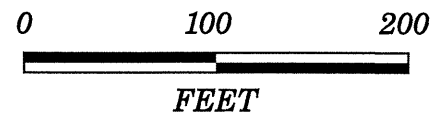
**BEGIN CONST.**  
 -Y11- POT Sta.15+68.54  
 -Y11- POT Sta.16+39.82 =  
 -Y3- POT Sta.10+00.00  
 -Y11- POT Sta.16+50.56 =  
 -Y14- POT Sta.10+00.00

**END CONST.**  
 -Y14- POT Sta.10+64

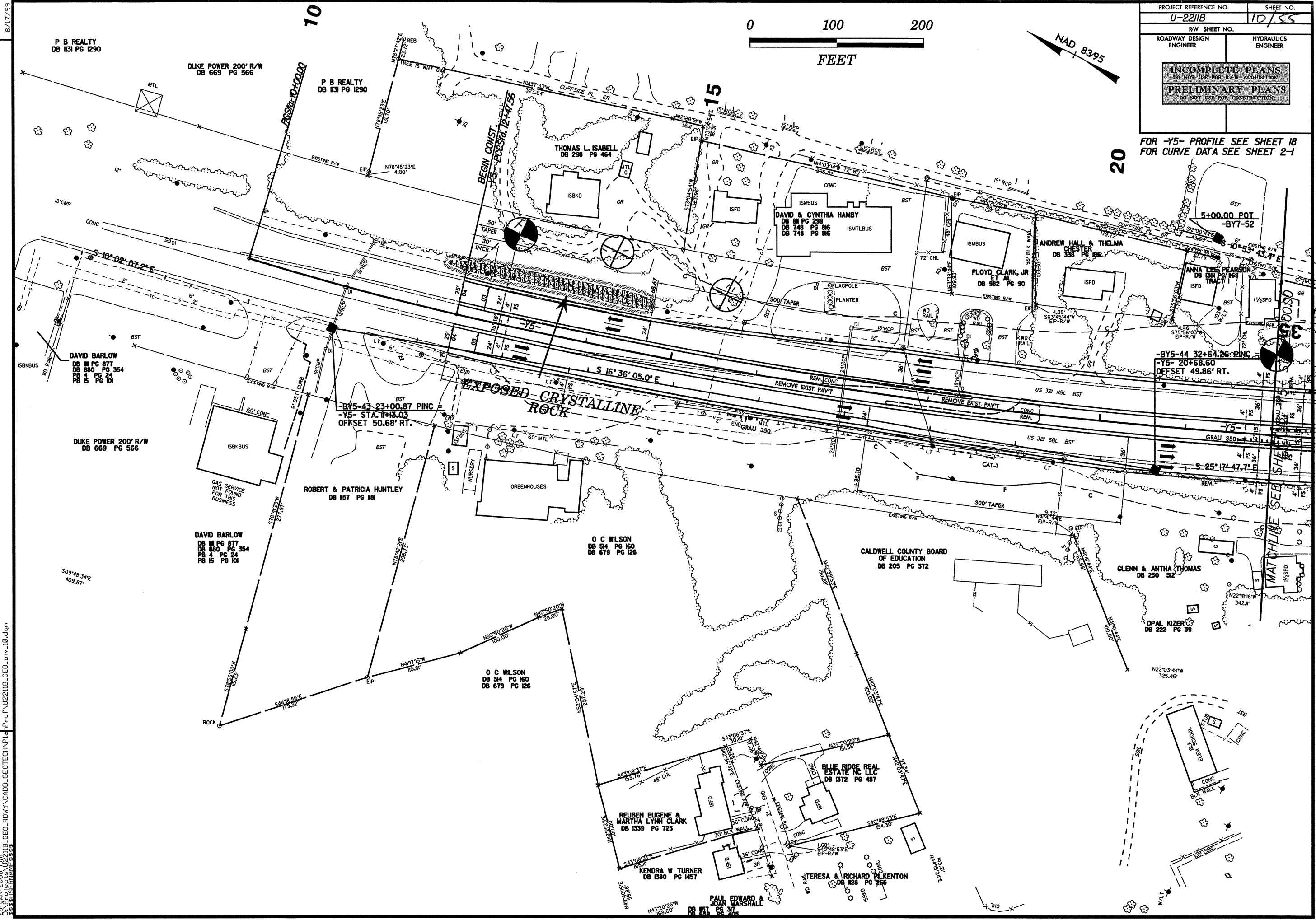
25

MATCHLINE SEE SHEET 9/5000

MATCHLINE SEE SHEET 9/5000



FOR -Y5- PROFILE SEE SHEET 18  
 FOR CURVE DATA SEE SHEET 2-1

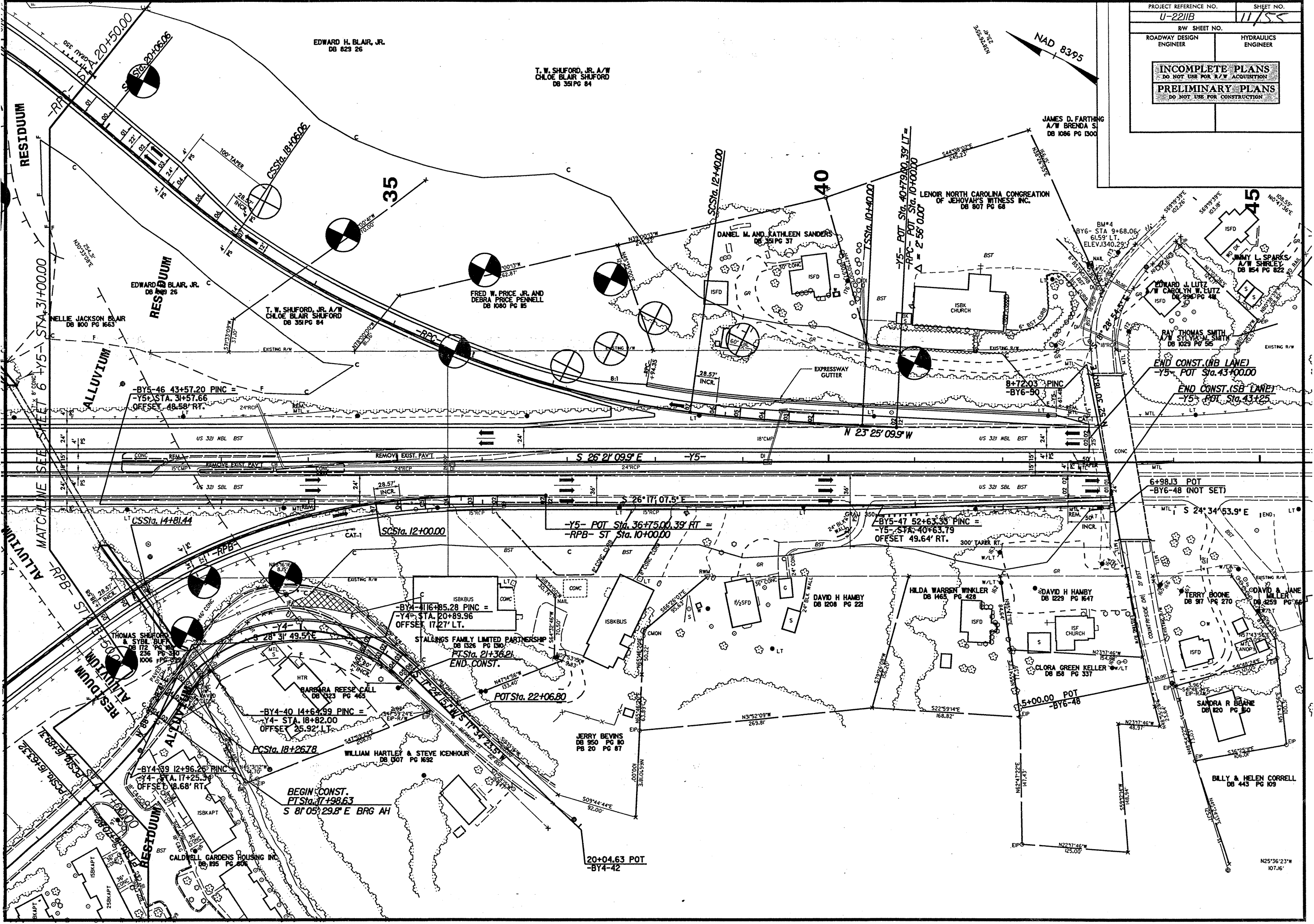


REVISIONS

8/17/99  
 28-JAN-2008 15:11:18 GEO.RDWAY.CADD.GEOTECH.P14-Prof\U2211B\_GEO.rvw\_10.dgn  
 11/11/2008 10:56:41

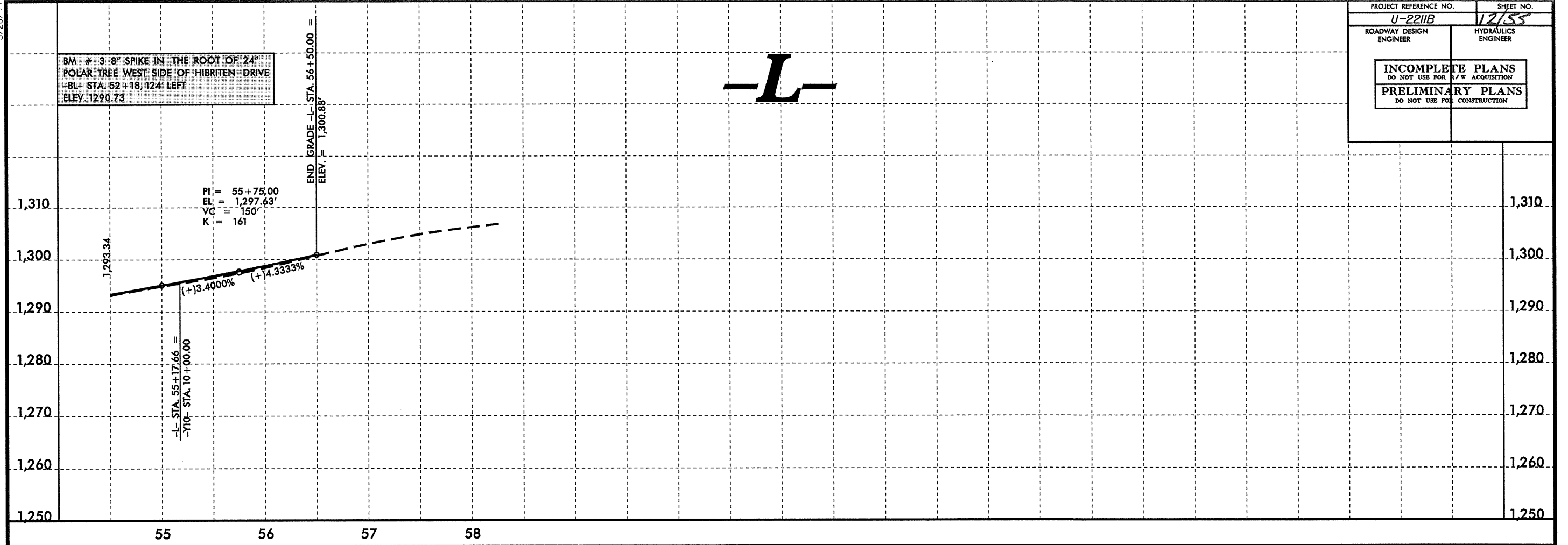


PROJECT REFERENCE NO.	SHEET NO.
U-2211B	11/55
BW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	



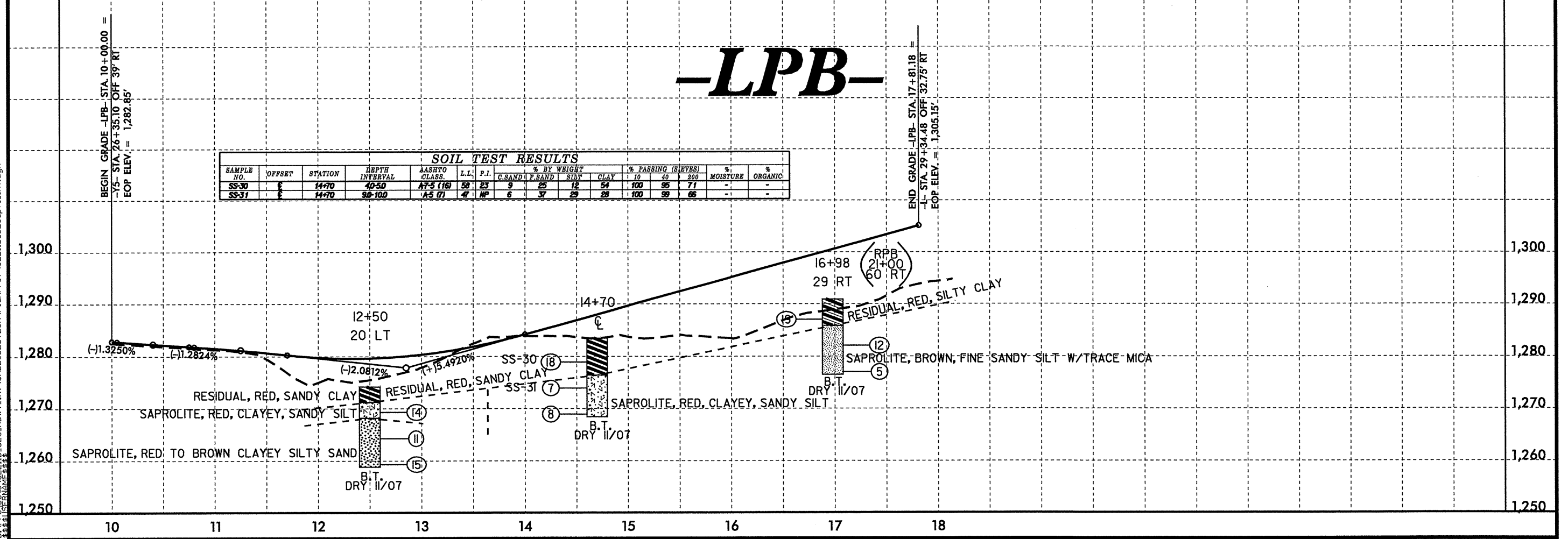
BM # 3 8" SPIKE IN THE ROOT OF 24" POLAR TREE WEST SIDE OF HIBRITEN DRIVE  
 -BL- STA. 52+18, 124' LEFT  
 ELEV. 1290.73

-L-



-LPB-

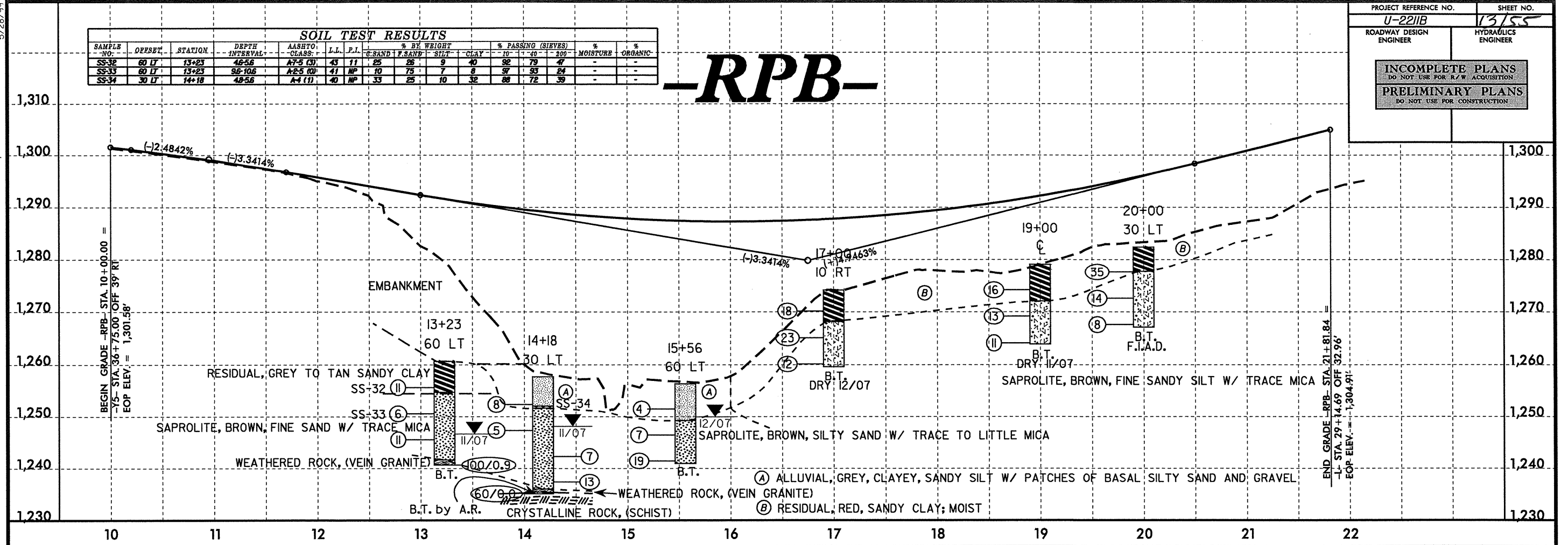
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-30	0	14+70	40-50	A7-5 (16)	58	23	9	25	12	54	100	95	71	-	-
SS-31	0	14+70	90-100	A5 (7)	47	NP	6	37	29	28	100	99	66	-	-



0-FEB-2008 10:50  
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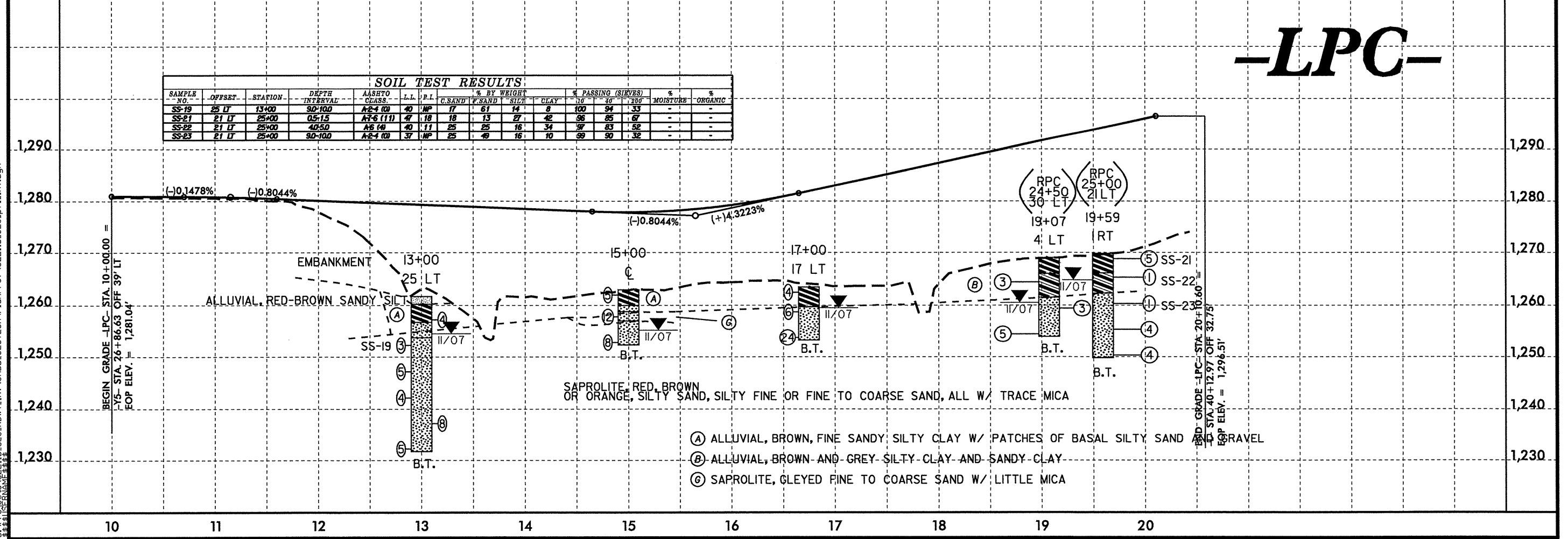
# -RPB-

SOIL TEST RESULTS														
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)		% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	200		
SS-32	60 LT	13+23	48-56	A-7-5 (3)	43	11	25	25	9	40	92	79	47	-
SS-33	60 LT	13+23	96-106	A-2-5 (0)	41	NP	10	75	7	8	97	93	24	-
SS-34	30 LT	14+18	48-56	A-4 (1)	40	NP	33	25	10	32	88	72	39	-

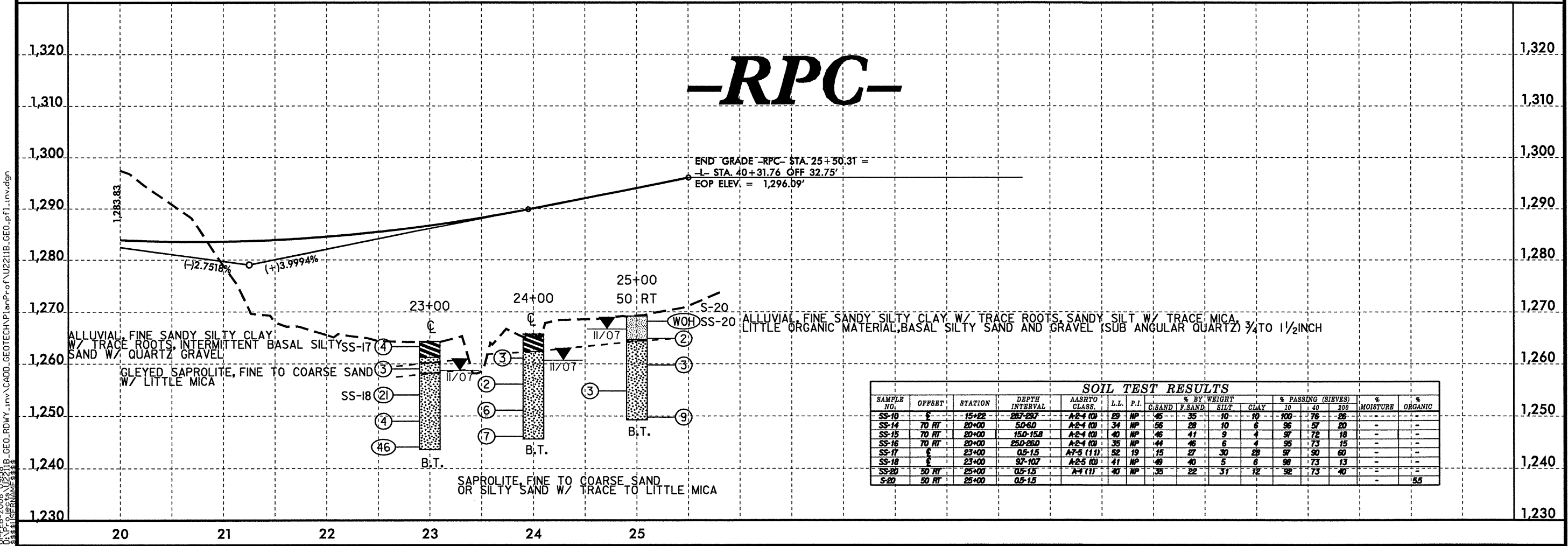
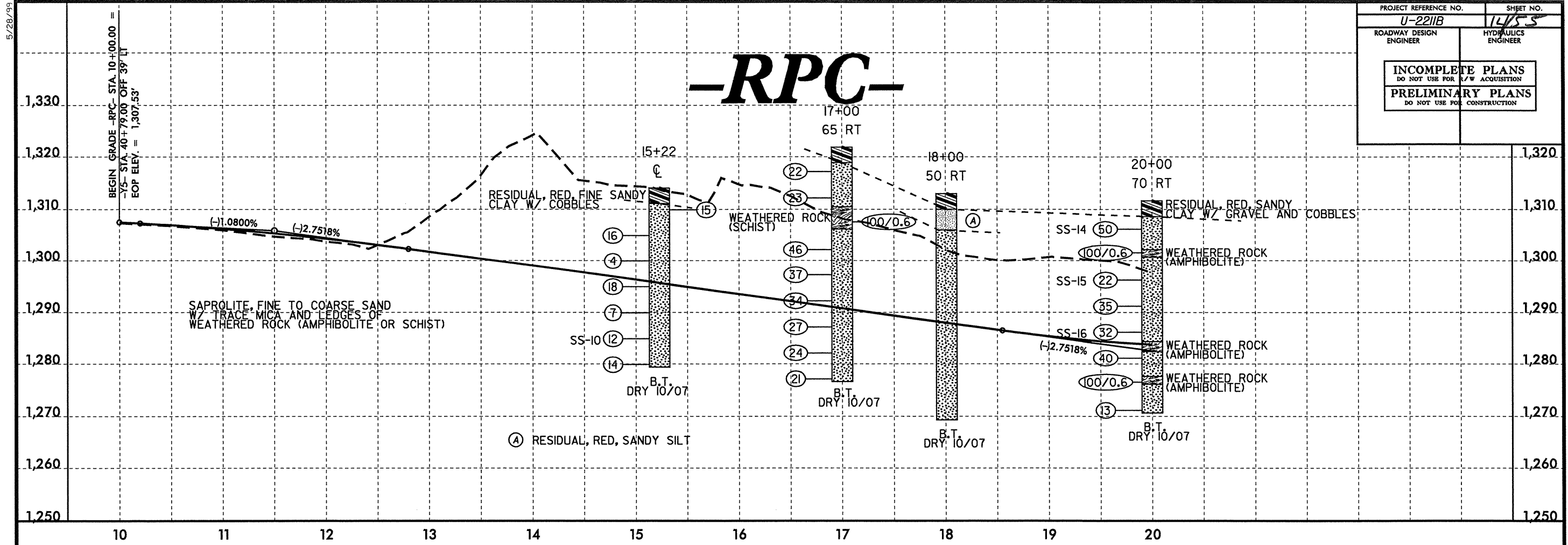


# -LPC-

SOIL TEST RESULTS														
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)		% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	200		
SS-19	25 LT	13+00	90-100	A-2-4 (0)	40	NP	17	61	14	8	100	94	33	-
SS-21	21 LT	25+00	05-15	A-7-6 (11)	47	18	18	13	27	42	96	85	67	-
SS-22	21 LT	25+00	40-50	A-6 (4)	40	11	25	25	16	34	97	83	52	-
SS-23	21 LT	25+00	90-100	A-2-4 (0)	37	NP	25	49	16	10	99	90	32	-

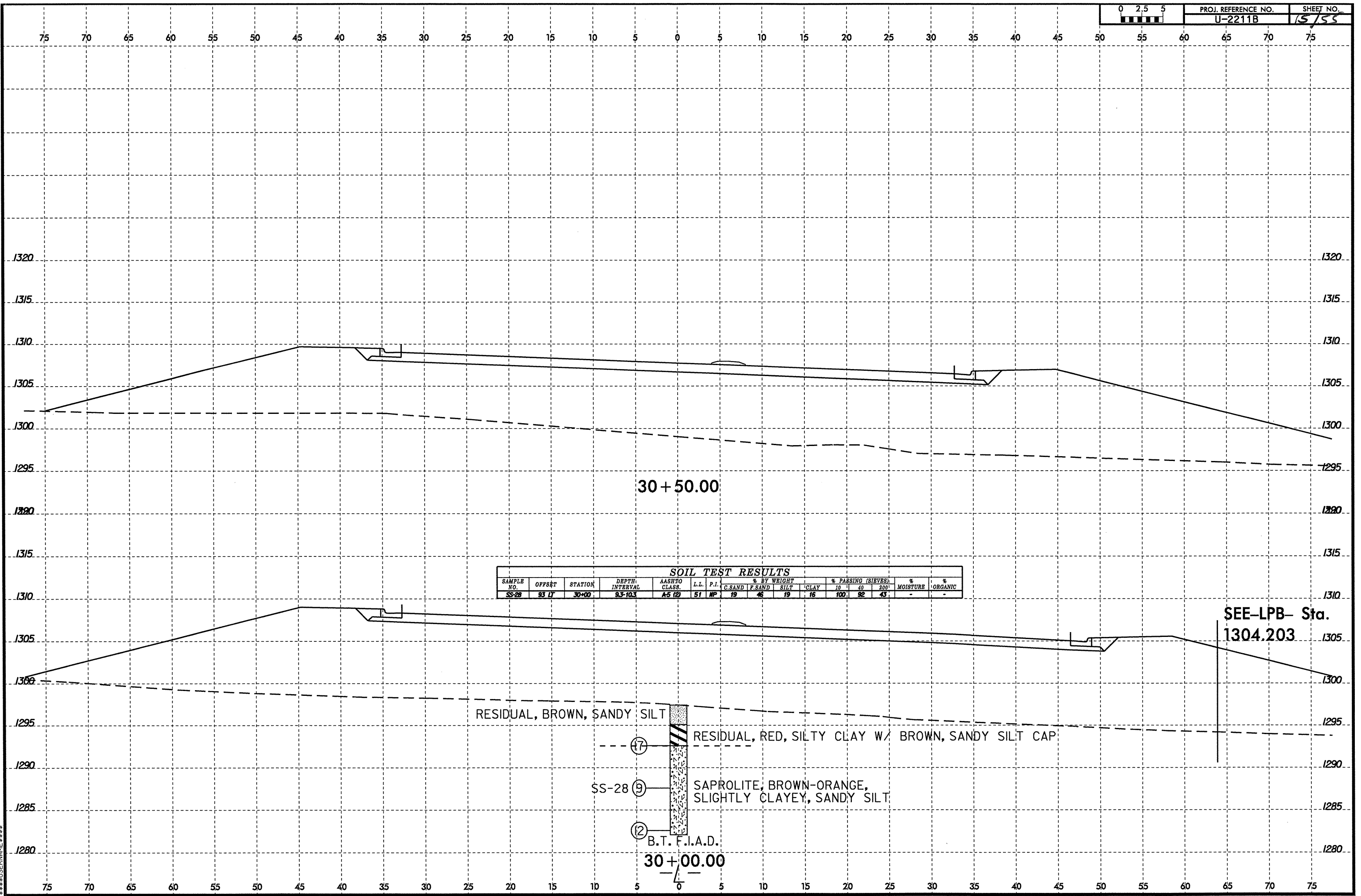


5/28/99  
 0-FEB-2008 10:50  
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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-10	0	15+22	287-297	A-2-4 (U)	29	NP	45	35	10	10	100	76	26	-	-
SS-14	70 RT	20+00	5.0-6.0	A-2-4 (U)	34	NP	56	28	10	6	96	57	20	-	-
SS-15	70 RT	20+00	15.0-15.8	A-2-4 (U)	40	NP	46	41	9	4	97	72	18	-	-
SS-16	70 RT	20+00	25.0-26.0	A-2-4 (U)	35	NP	44	46	6	4	95	73	15	-	-
SS-17	0	23+00	0.5-1.5	A-7-5 (11)	52	19	15	27	30	28	97	90	60	-	-
SS-18	0	23+00	97-107	A-2-5 (U)	41	NP	49	40	5	6	98	73	13	-	-
SS-20	50 RT	25+00	0.5-1.5	A-4 (1)	40	NP	35	22	31	12	92	73	40	-	-
S-20	50 RT	25+00	0.5-1.5												55

5/28/99  
 01-FEB-2008 09:58:18 GEO\_RDWY...inv\CADD\_GEO\TECH\Plan\Pro\U2211B\_GEO.p1...inv.dgn  
 14/55



30 + 50.00

SEE-LPB- Sta.  
1304.203

SOIL TEST RESULTS																
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							C.SAND	F.SAND	SILT	CLAY	10'	40'	200'			
SS-28	93	LT	30+00	9.3-10.3	A-5 (2)	51	NP	19	46	19	16	100	92	43	-	-

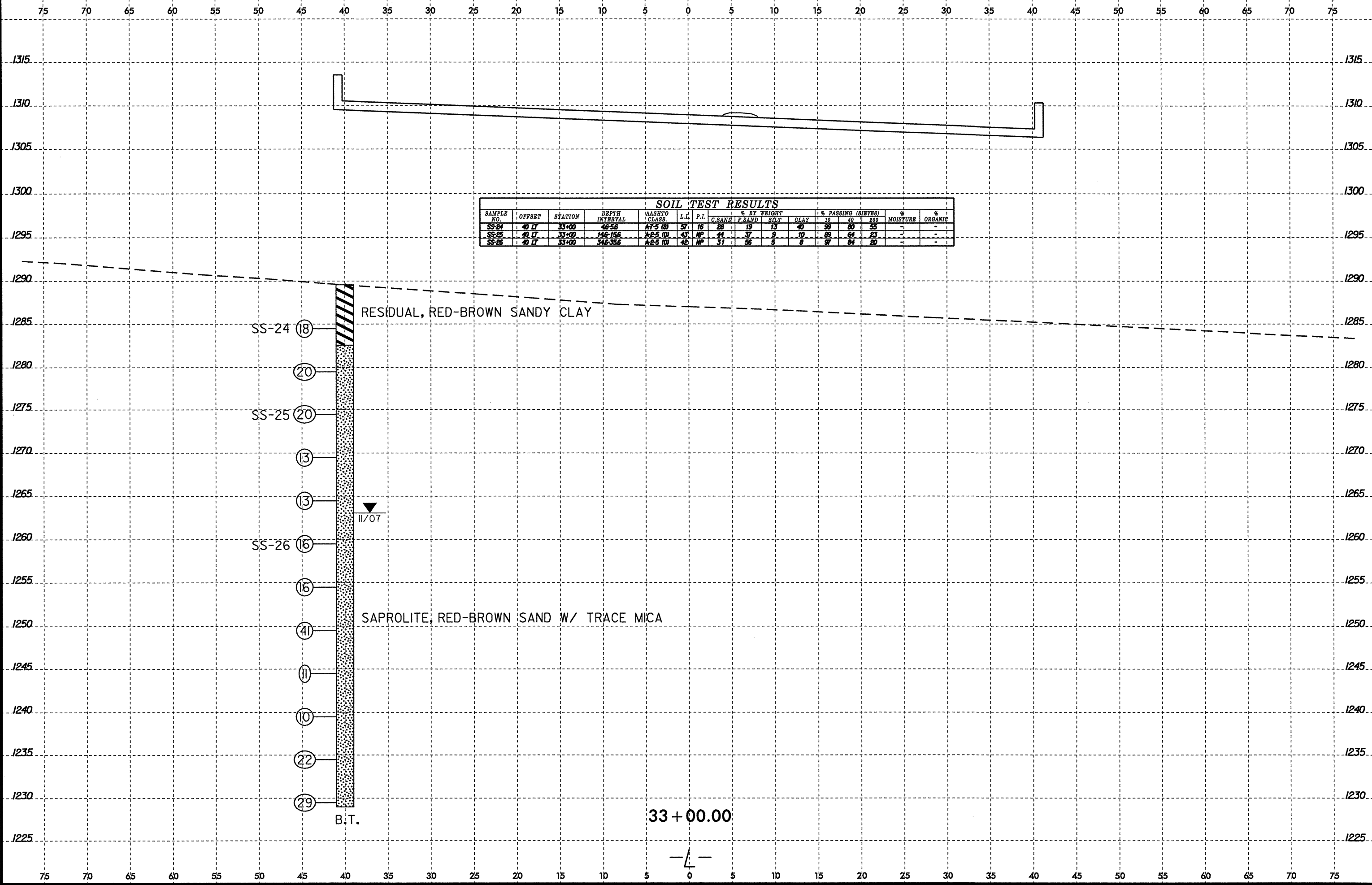
RESIDUAL, BROWN, SANDY SILT

RESIDUAL, RED, SILTY CLAY W/ BROWN, SANDY SILT CAP

SS-28 (9) SAPROLITE, BROWN-ORANGE, SLIGHTLY CLAYEY, SANDY SILT

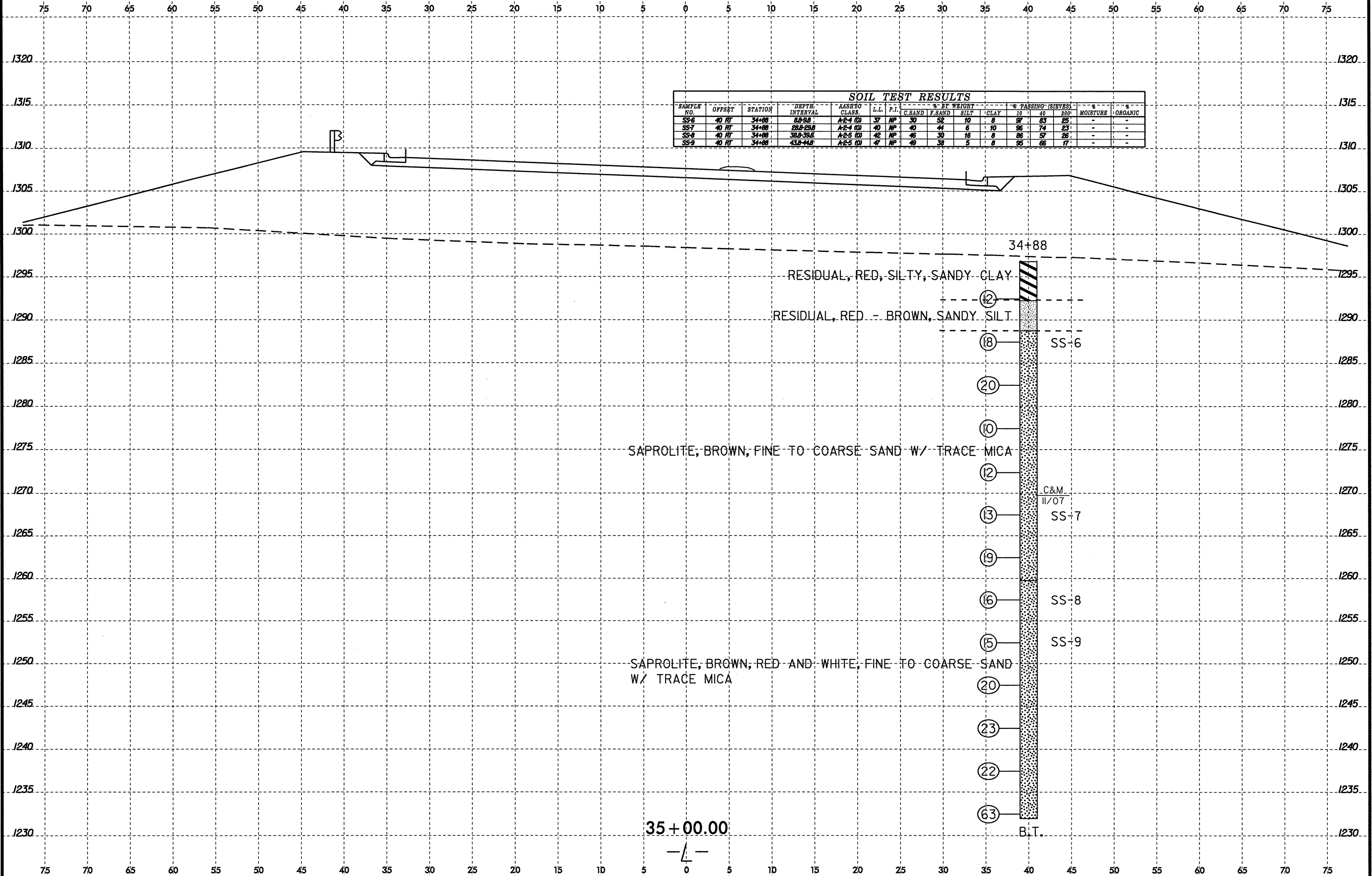
(2) B.T. F.I.A.D.

30 + 00.00



SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	HAASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-24	40 LT	33+00	46-56	A-7.5 (B)	57	16	28	19	13	40	99	80	55	-	-
SS-25	40 LT	33+00	146-156	A-2.5 (U)	43	MP	44	37	9	10	89	64	23	-	-
SS-26	40 LT	33+00	346-356	A-2.5 (U)	42	MP	31	56	5	8	97	84	20	-	-

8/23/95



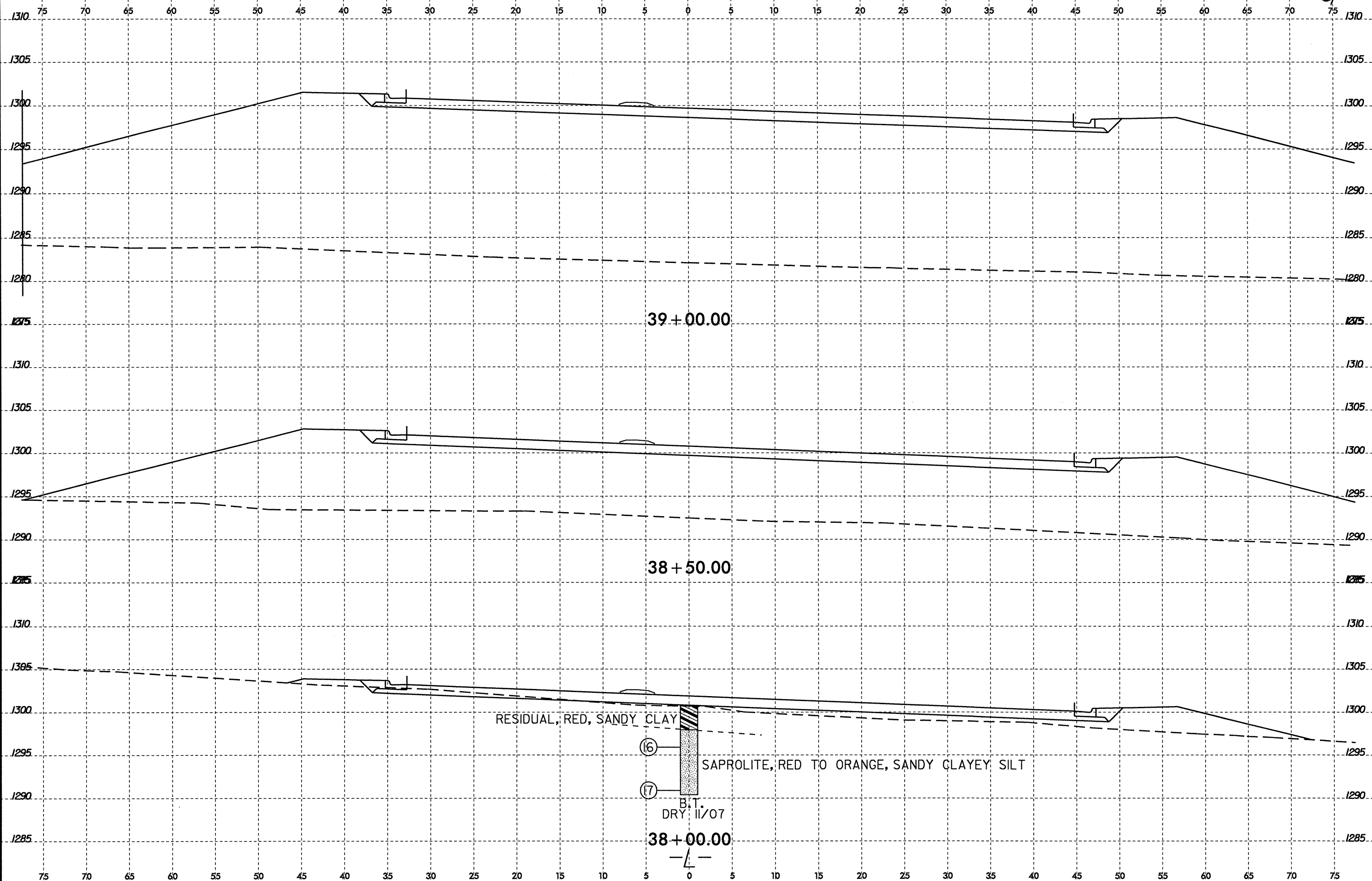
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT			% PASSING (SIEVES)			% MOISTURE	% ORGANIC	
							C.SAND	F.SAND	SILT	CLAY	10	40			200
SS-6	40 FT	34+88	8.0-9.8	A-2-4 (U)	37	NP	30	52	10	8	57	63	25	-	-
SS-7	40 FT	34+88	28.0-29.6	A-2-4 (U)	40	NP	40	44	6	10	96	74	23	-	-
SS-8	40 FT	34+88	38.0-39.6	A-2-5 (U)	42	NP	46	30	16	8	86	57	26	-	-
SS-9	40 FT	34+88	43.0-44.6	A-2-5 (U)	47	NP	49	32	5	8	95	66	17	-	-

23-JAN-2008 10:33  
 D:\PROJETS\U2211B\_GEO\RDWY\CADD\_GEO\TECH\XSEC\U2211B\_GEO\_XS1.1.dgn  
 \$\$\$USERNAME\$\$\$

35 + 00.00

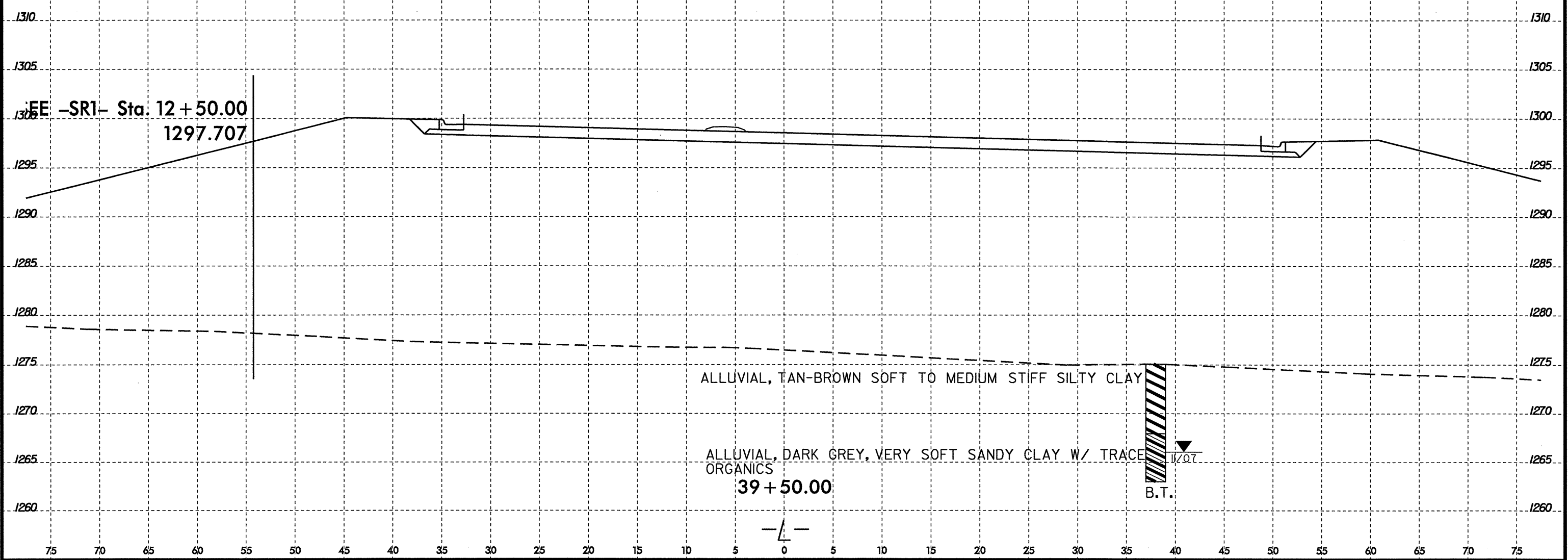
34+88

B.T.



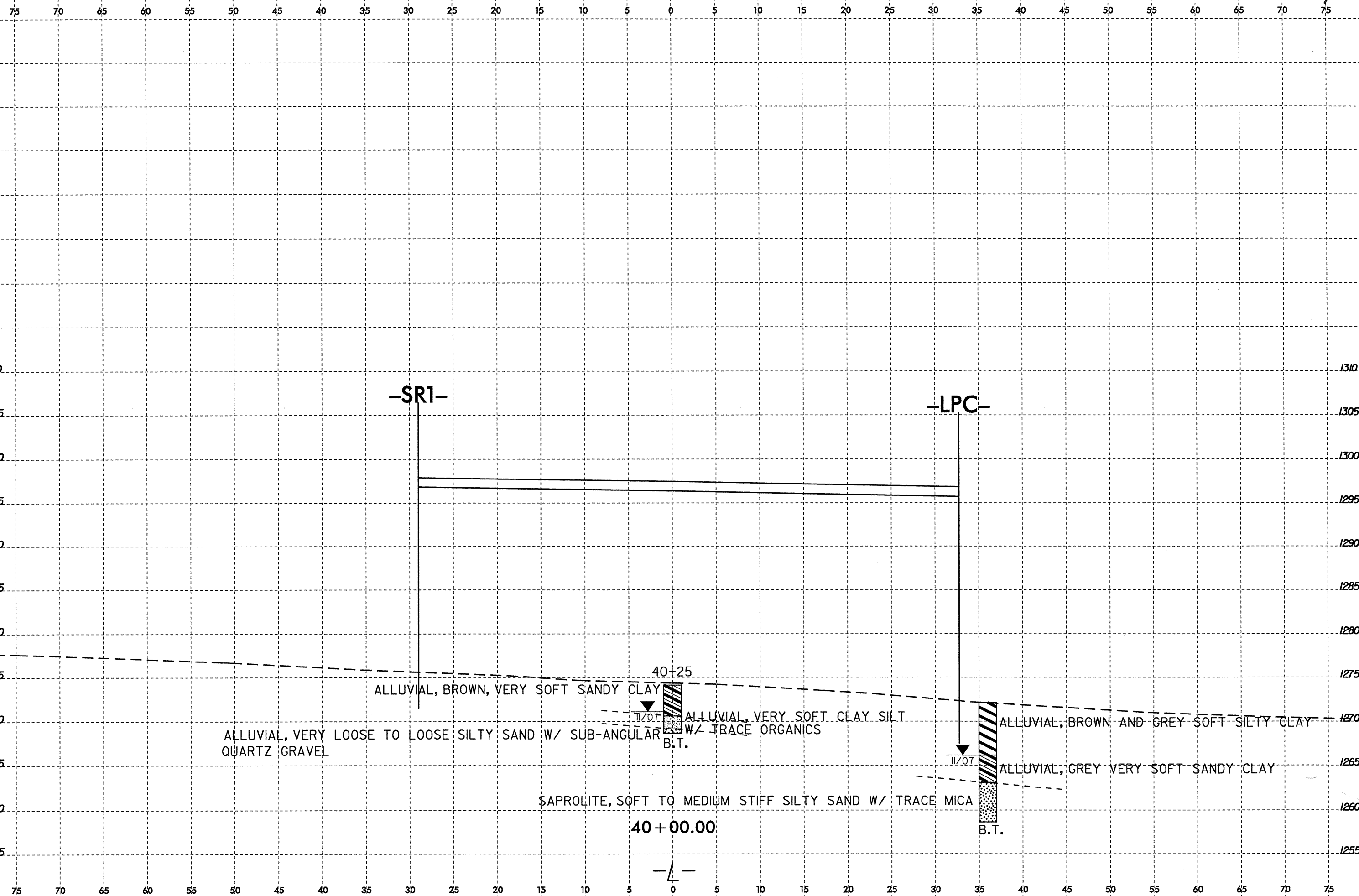
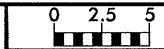


75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

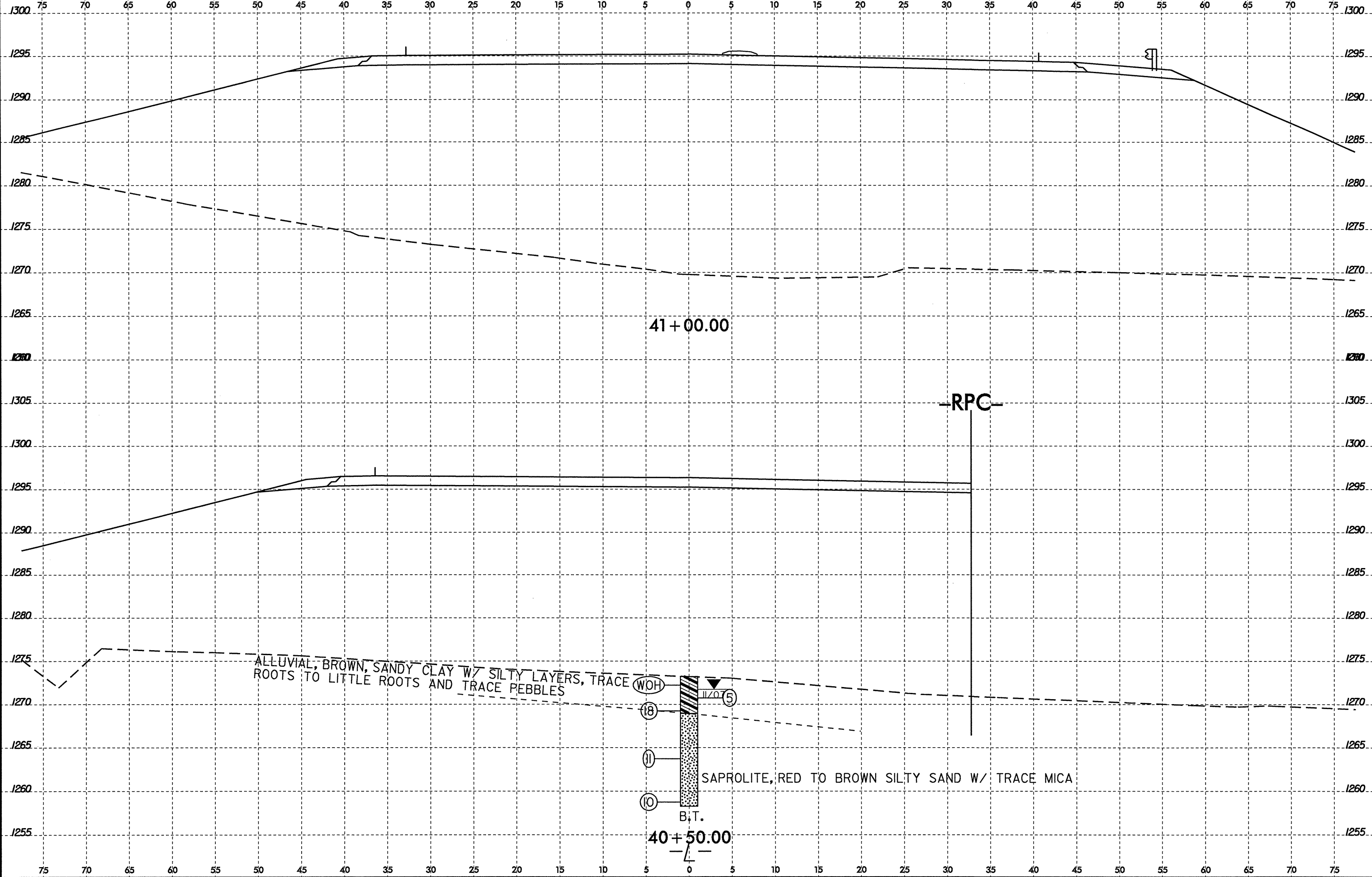


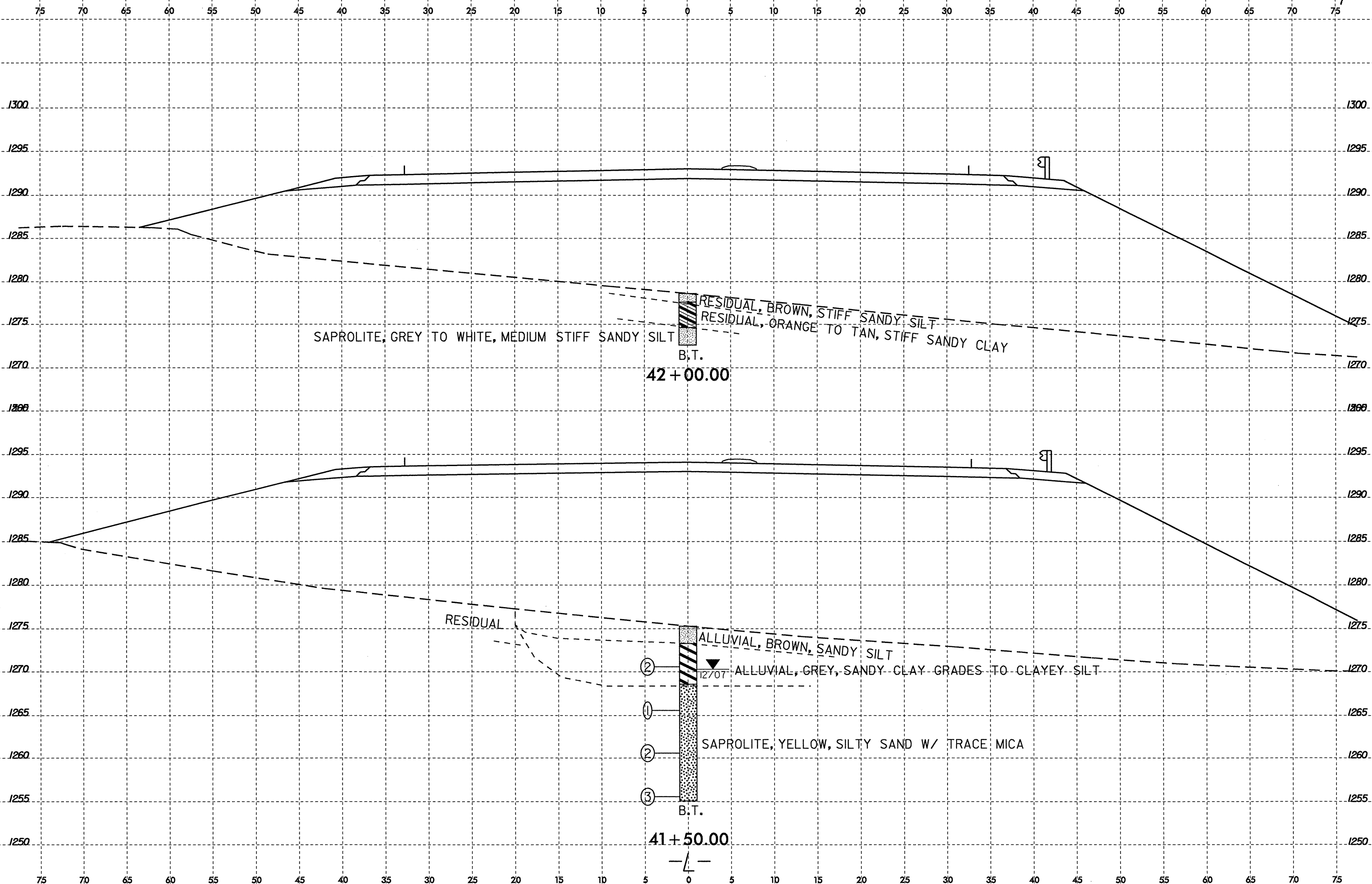
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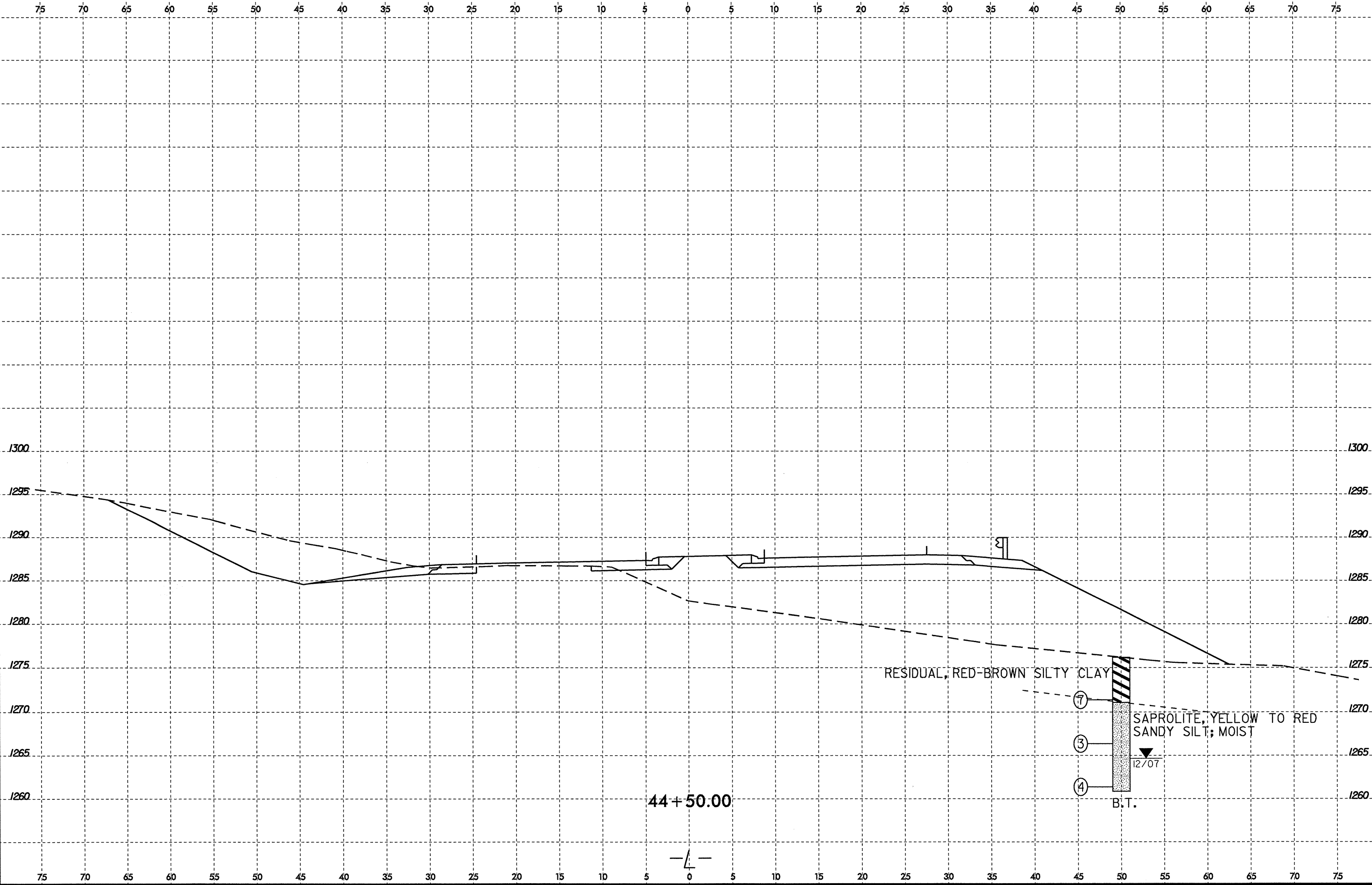
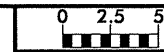
8/23/09



23-JAN-2008 10:40  
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18-JAN-2008 09:21  
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44 + 50.00

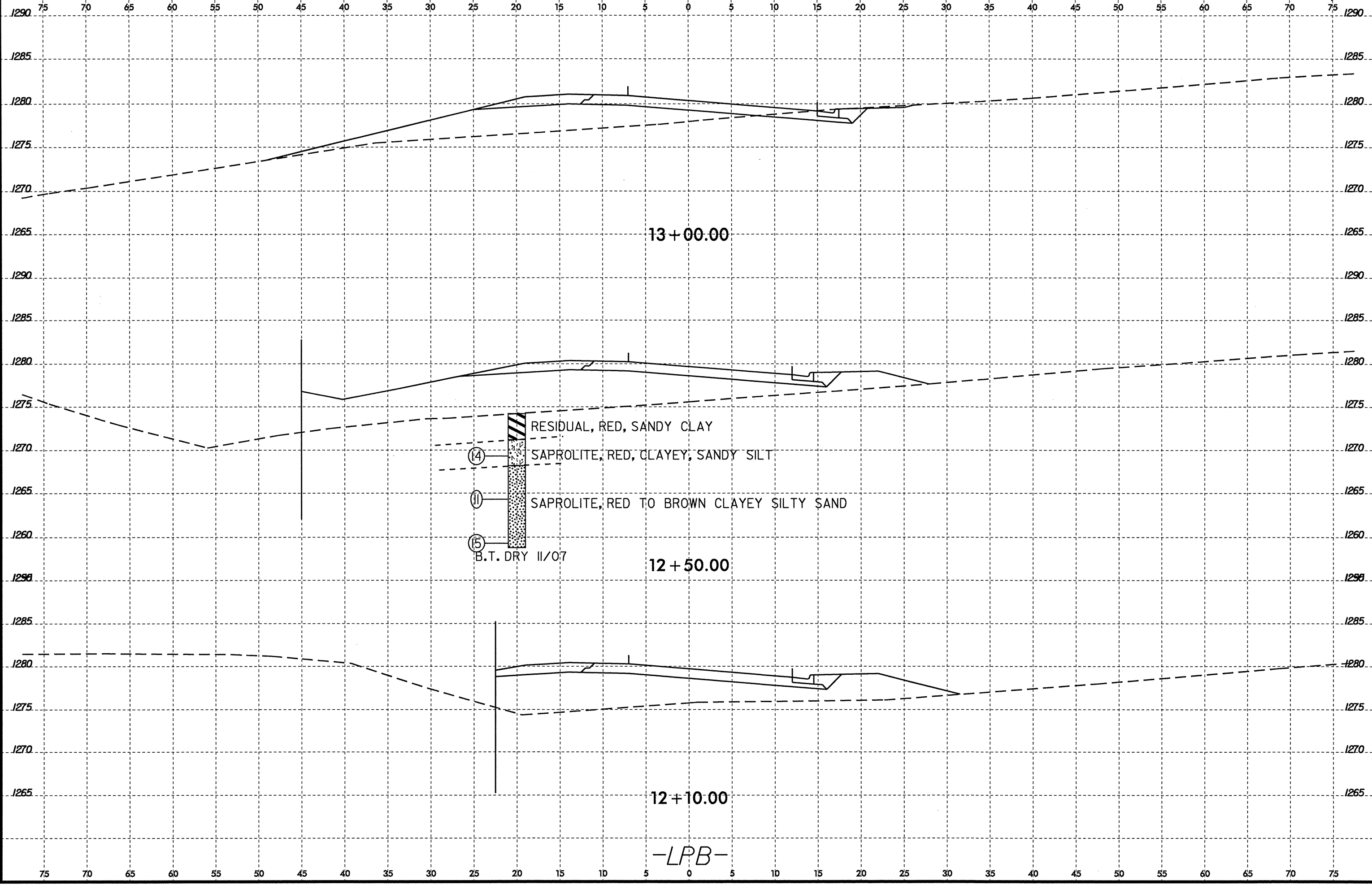


RESIDUAL, RED-BROWN SILTY CLAY

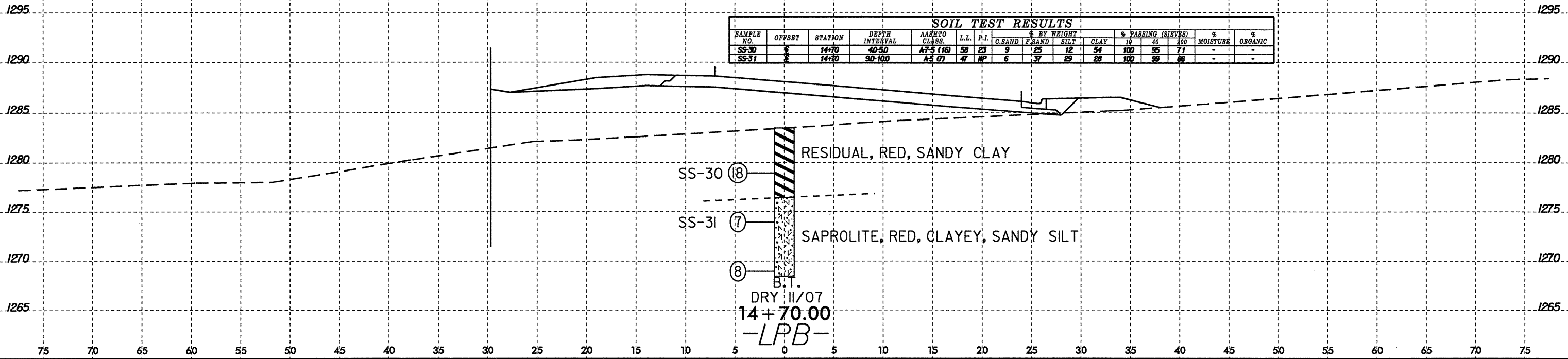
SAPROLITE, YELLOW TO RED SANDY SILT; MOIST

1270.7

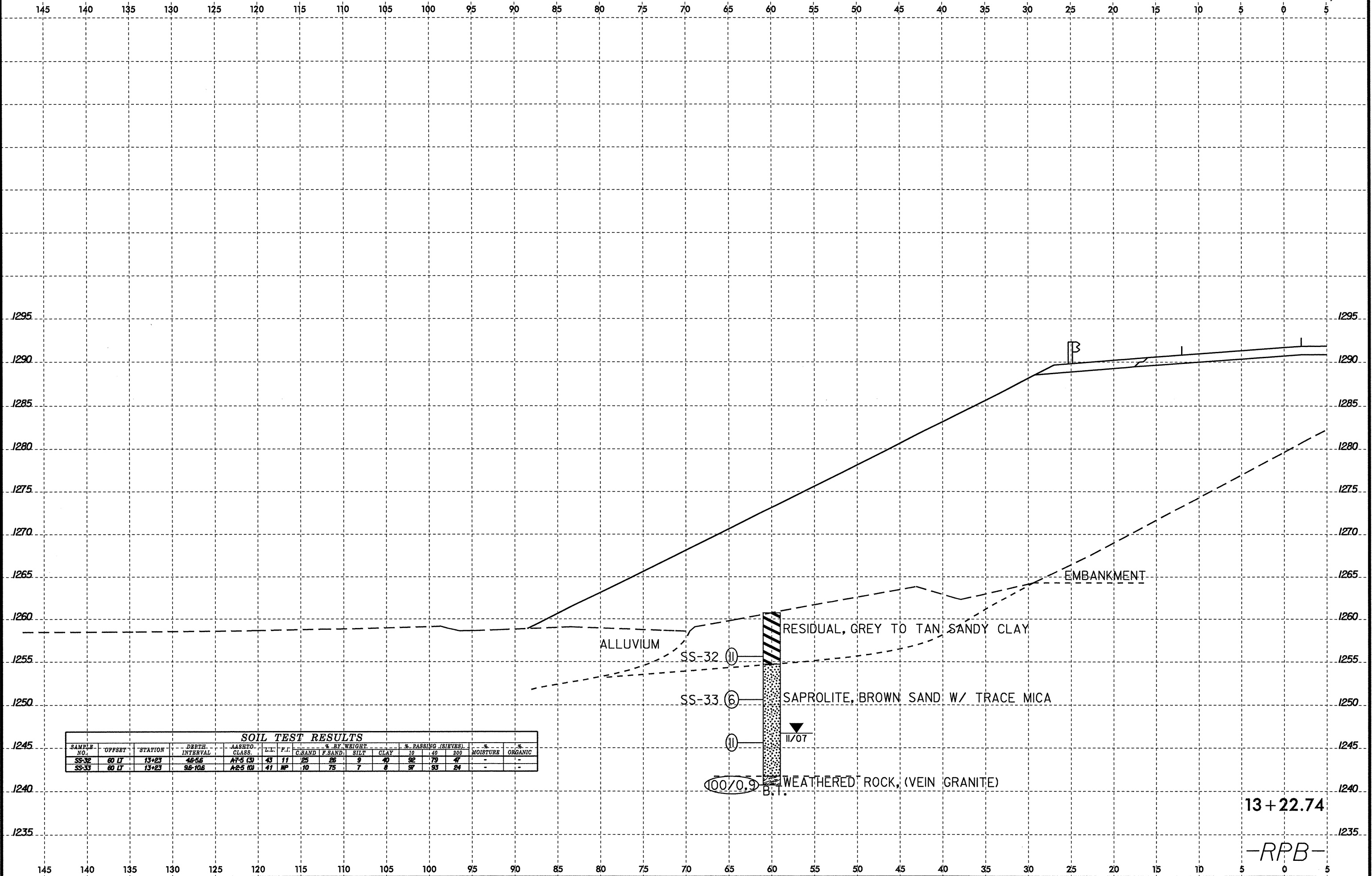
B.T.



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



8/23/99  
 28-JAN-2008 10:10  
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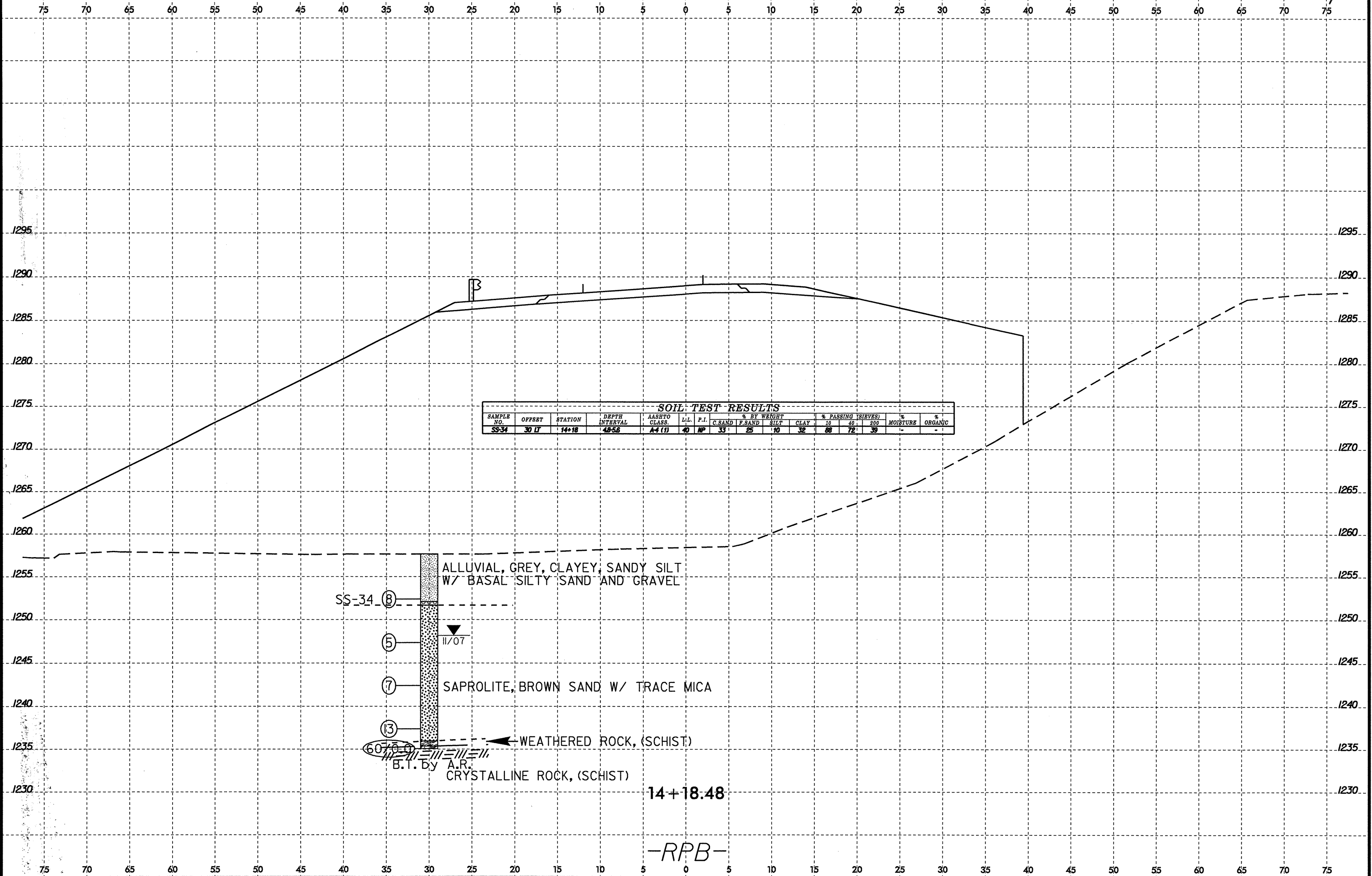


SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-32	60 LT	13+23	46-56	A7-5 (S)	43	11	25	26	9	4	92	79	47	-	-
SS-33	60 LT	13+23	96-106	A2-5 (U)	41	NP	10	75	7	8	97	93	24	-	-

13 + 22.74  
 -RPB-



8/23/99



**SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-34	30 FT	14+18	48-56	A-4 (1)	40	10	33	25	10	32	88	72	39	-	-

SS-34 (8) ALLUVIAL, GREY, CLAYEY, SANDY SILT W/ BASAL SILTY SAND AND GRAVEL

(5) 11/07

(7) SAPROLITE, BROWN SAND W/ TRACE MICA

(13) WEATHERED ROCK, (SCHIST)

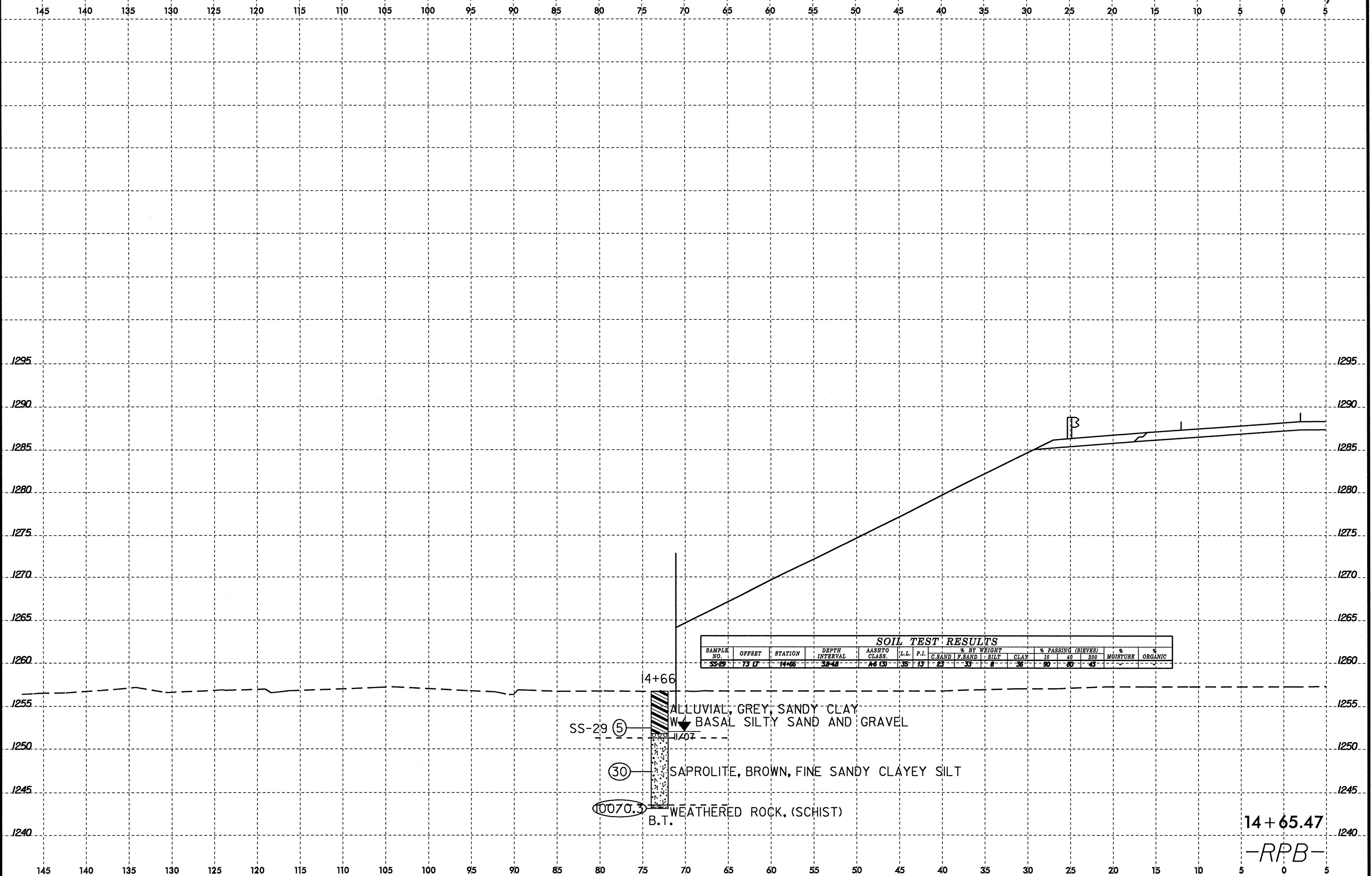
6079-0 B.T. by A.R. CRYSTALLINE ROCK, (SCHIST)

14+18.48

-RPB-

23-JAN-2008 15:19 D:\P\0\1\2211B\_GEO\RDW\CADD\_GEO\TECH\XSC\U2211B\_GEO.XSL-rpb.dgn

24-JAN-2008 10:56  
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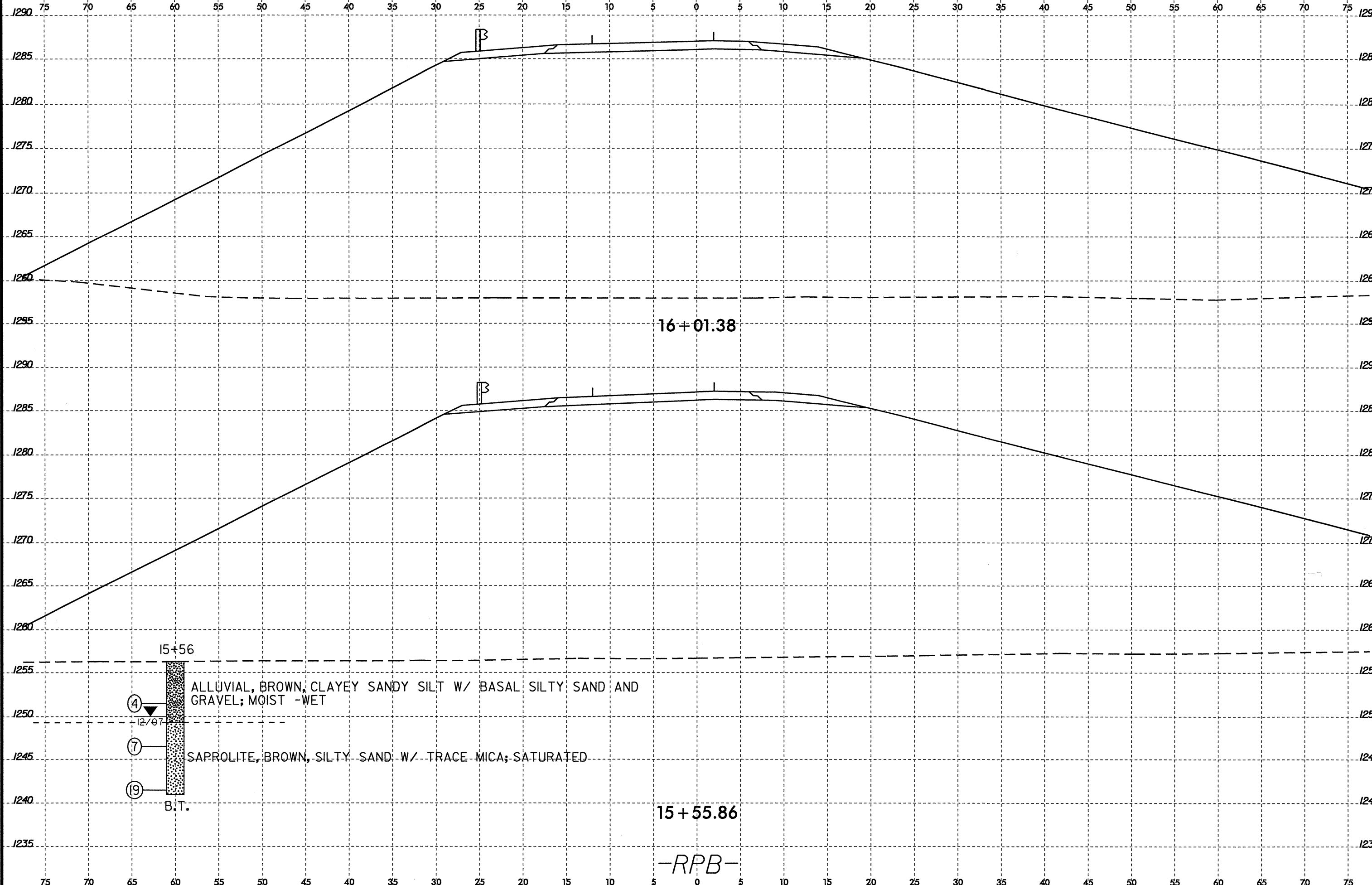
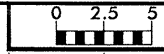
**SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-29	73 FT	14+66	38-48	A6 (3)	35	13	23	33	8	36	90	80	43		

4+66  
 SS-29 (5)  
 (30)  
 (10070.3)  
 B.T.

ALLUVIAL, GREY, SANDY CLAY  
 W  
 BASAL SILTY SAND AND GRAVEL  
 SAPROLITE, BROWN, FINE SANDY CLAYEY SILT  
 WEATHERED ROCK, (SCHIST)

14 + 65.47  
 -RPB-



15+56

4



12/07

7

19

B.T.

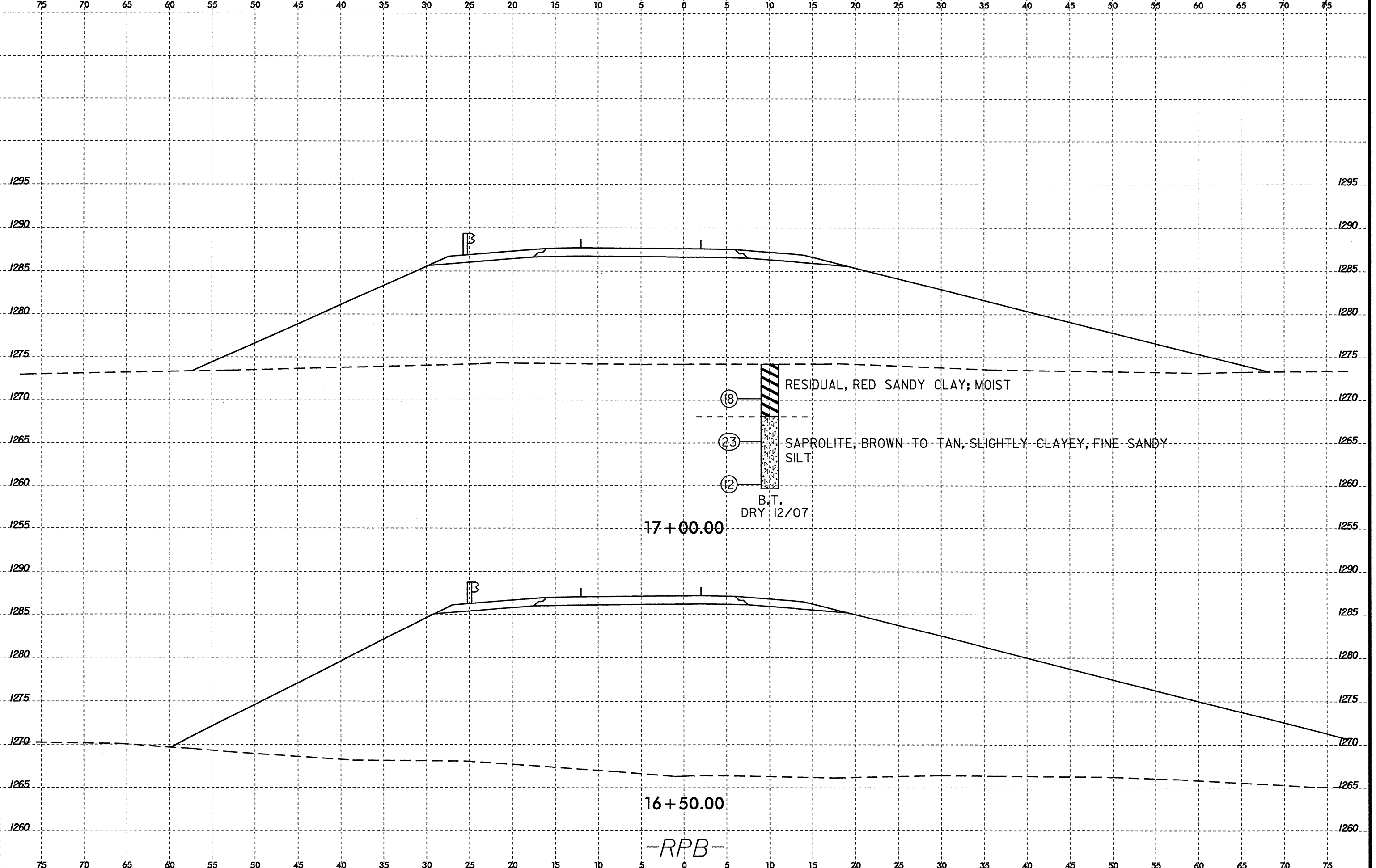
ALLUVIAL, BROWN, CLAYEY SANDY SILT W/ BASAL SILTY SAND AND GRAVEL; MOIST - WET

SAPROLITE, BROWN, SILTY SAND W/ TRACE MICA; SATURATED

15 + 55.86

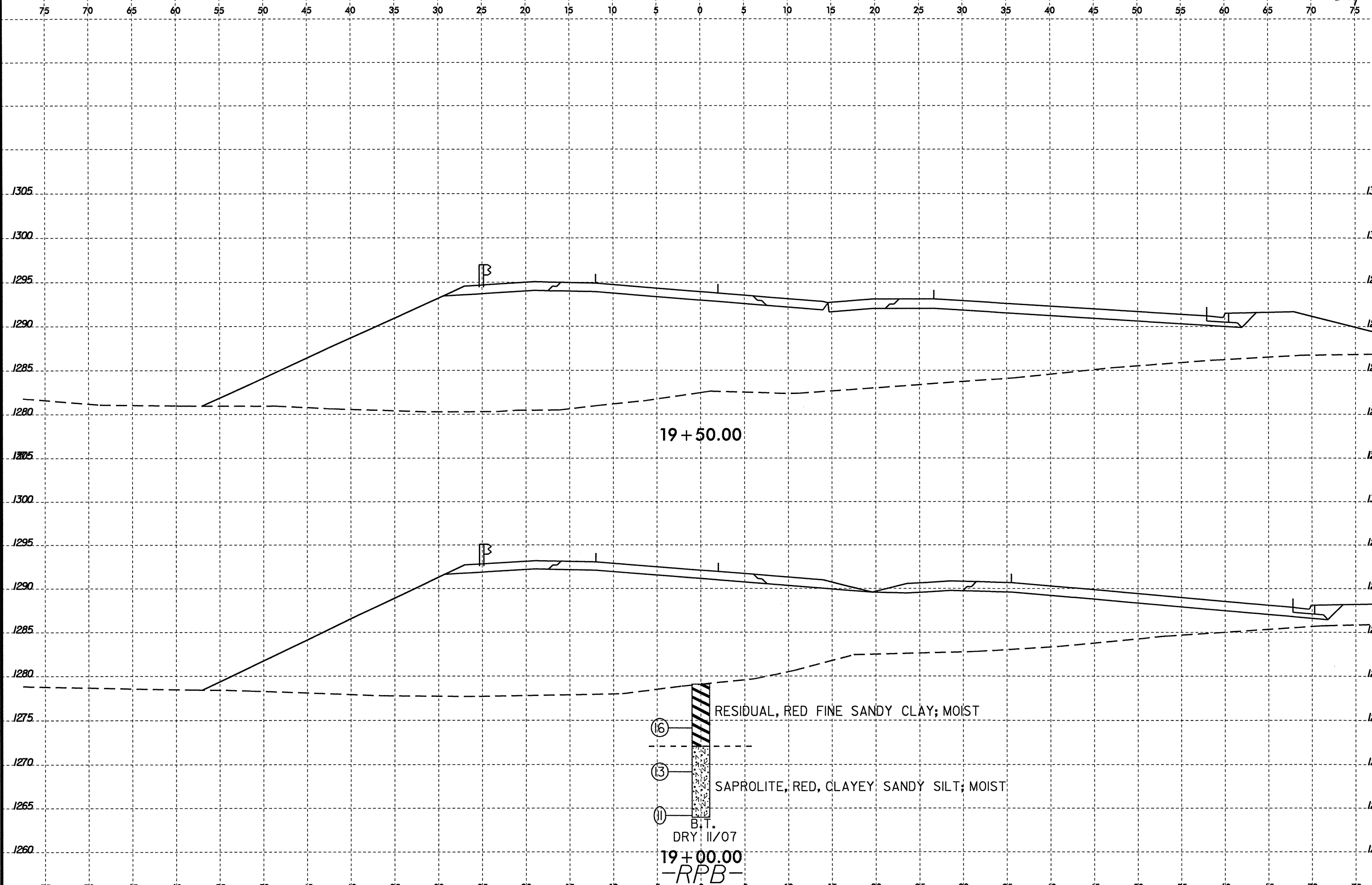
-RPB-

8/23/99

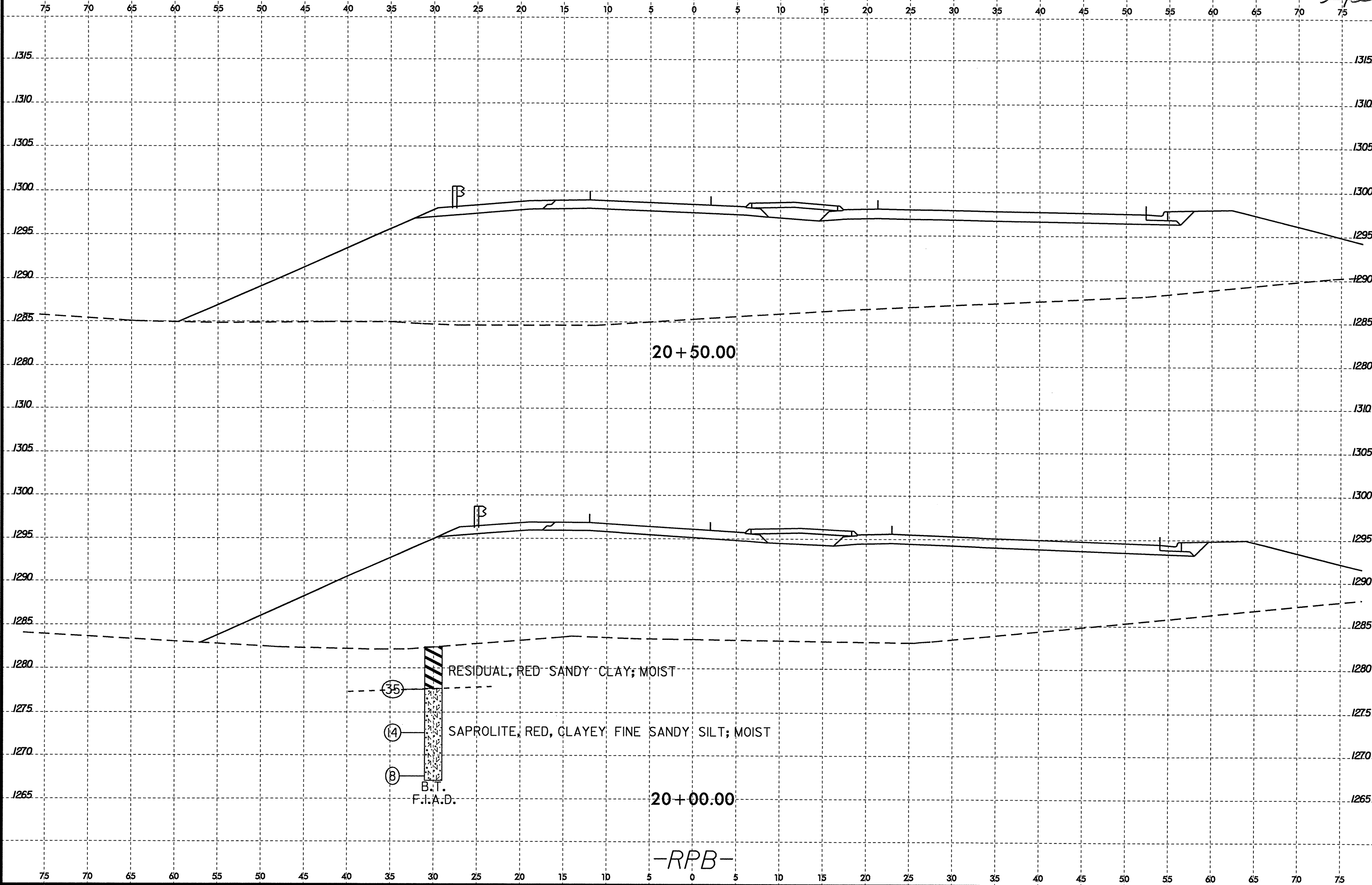


18-JAN-2008 15:33  
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-RPB-

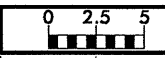


24-JAN-2008 14:2  
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\$\$\$\$\$USERNAME\$\$\$\$\$

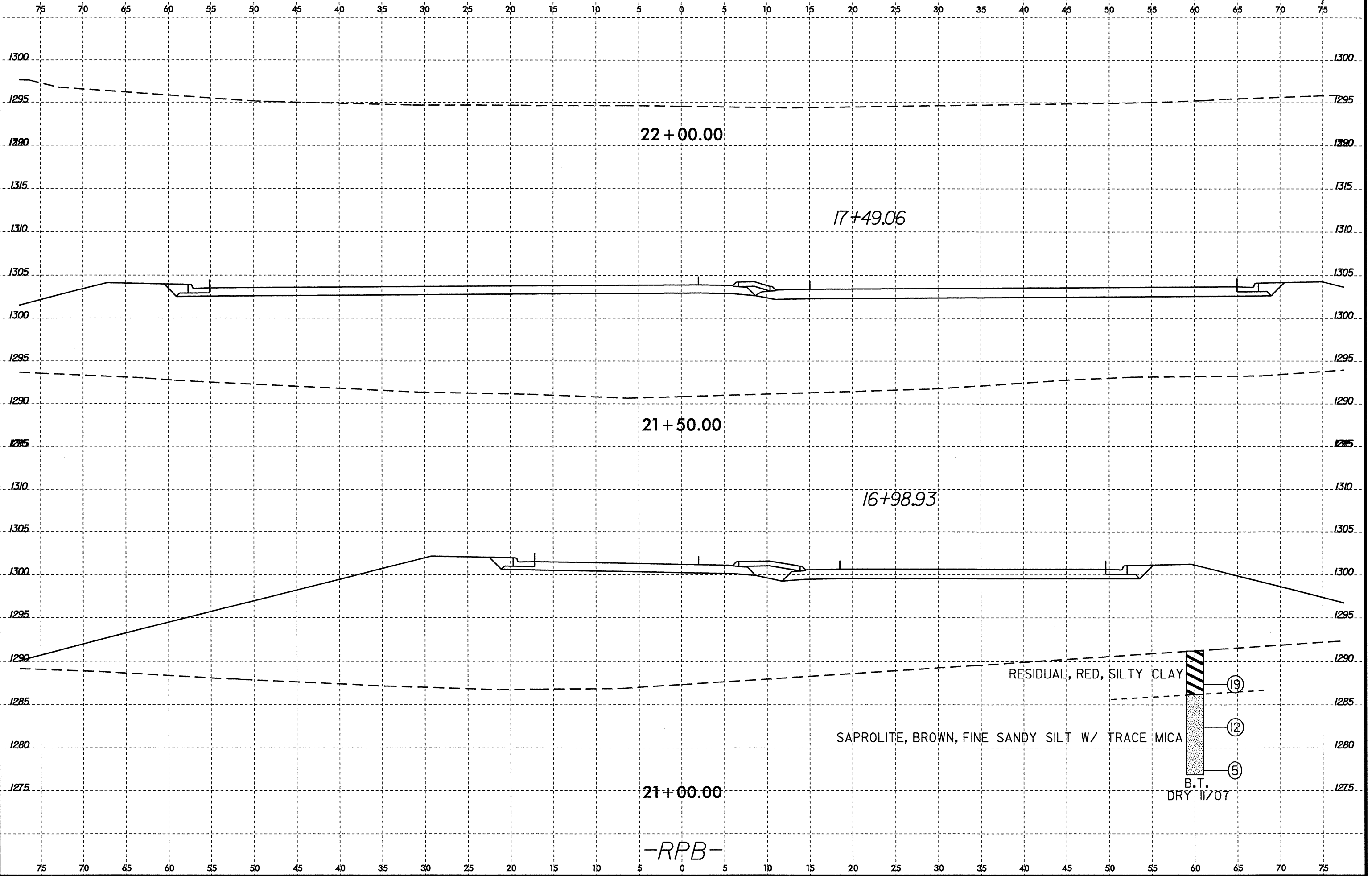


23-JAN-2008 10:19  
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8/23/99



PROJ. REFERENCE NO. U-2211B SHEET NO. 33/55



RESIDUAL, RED, SILTY CLAY

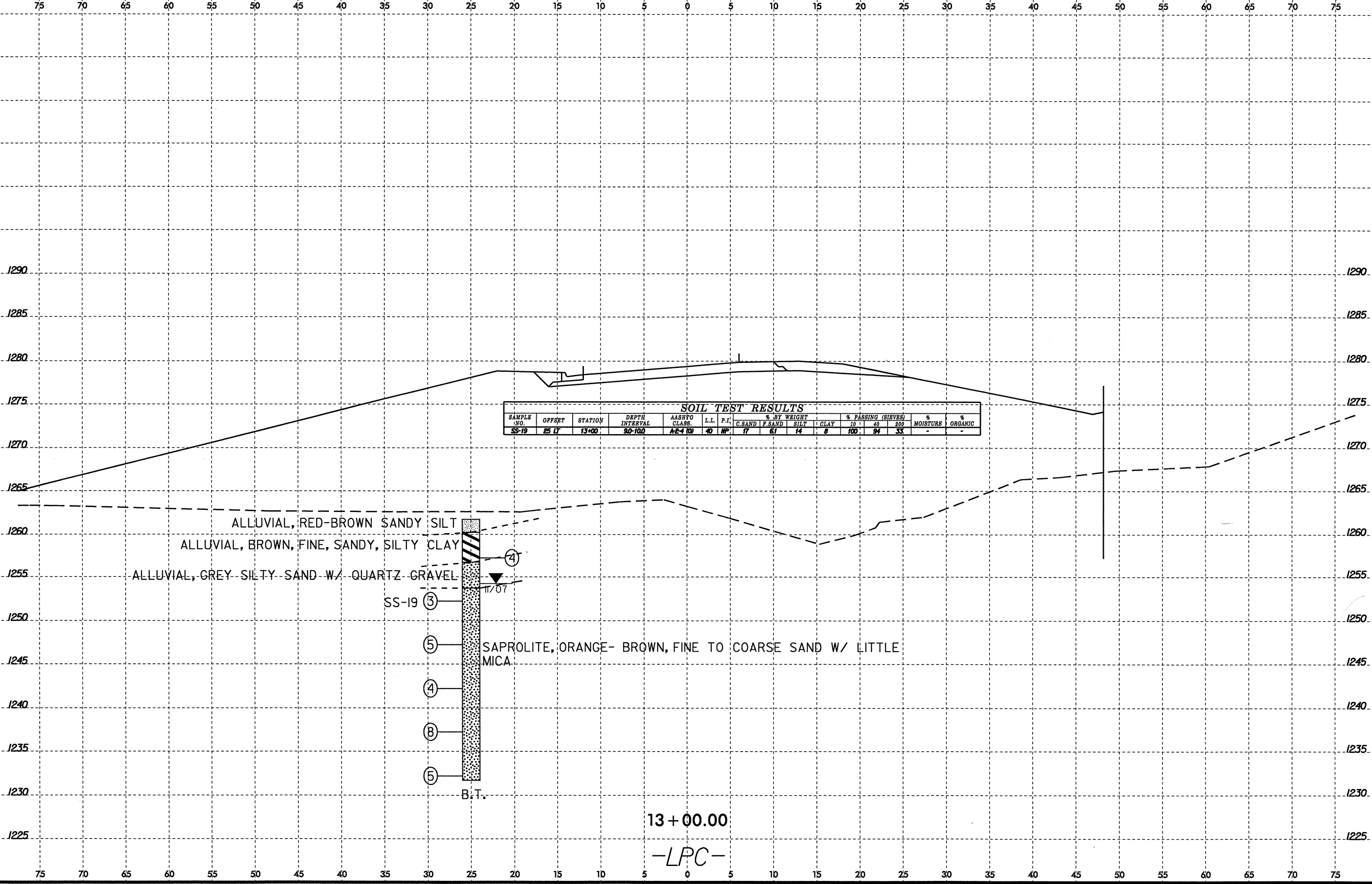
SAPROLITE, BROWN, FINE SANDY SILT W/ TRACE MICA



B.T. DRY 11/07

-RPB-

23-JAN-2008 10:12:43 \\S:\GEOTECH\U2211B\CADD\GEO\RDW\CADD\_GEO\RDW\U2211B\_GEO\_xsl\_rpb.dgn



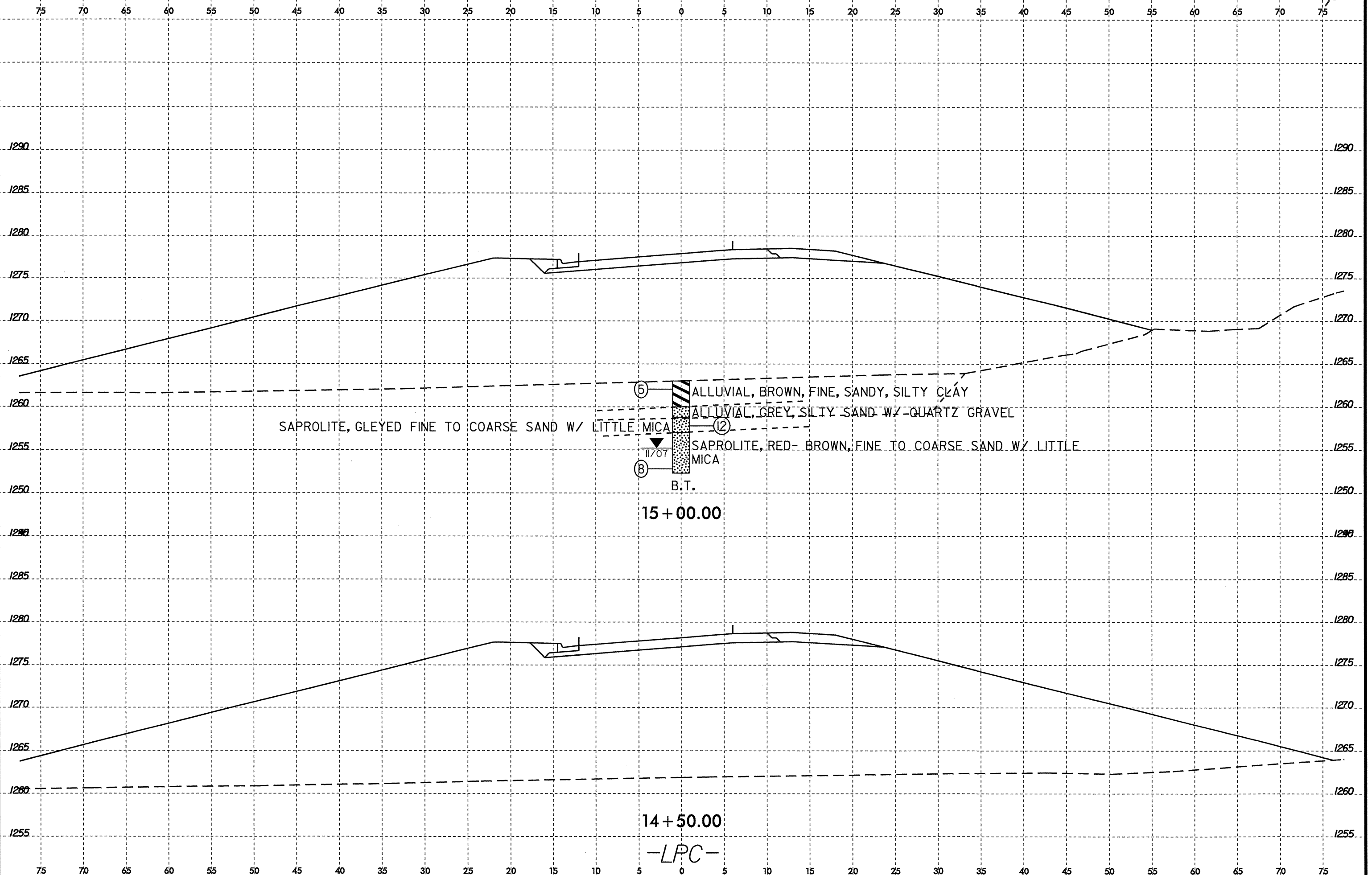
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-19	25 FT	13+00	90-100	A-2-4	40	10	17	61	14	8	100	94	33	-	-

ALLUVIAL, RED-BROWN SANDY SILT  
 ALLUVIAL, BROWN, FINE, SANDY, SILTY CLAY  
 ALLUVIAL, GREY SILTY SAND W/ QUARTZ GRAVEL

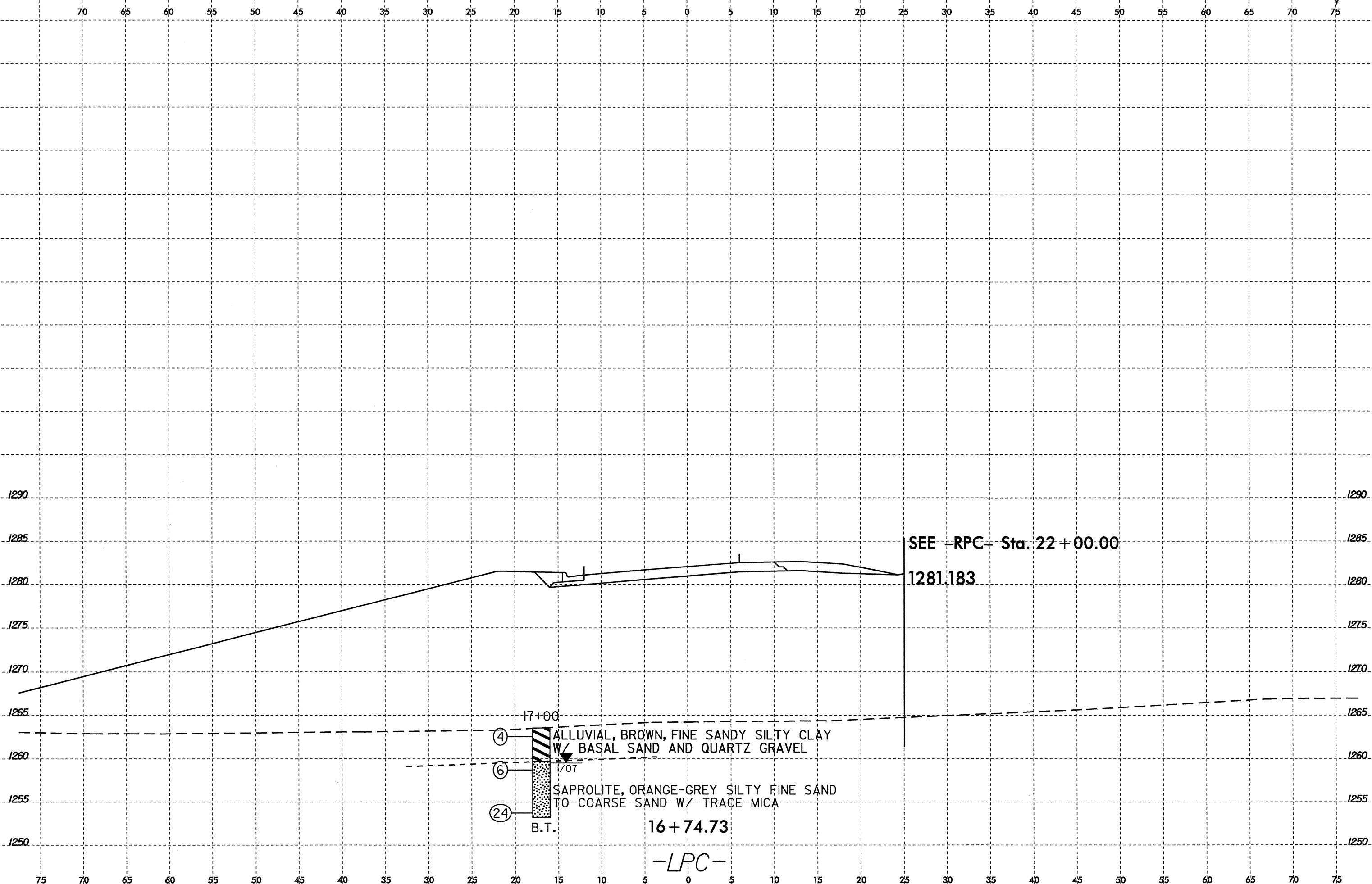
SAPROLITE, ORANGE-BROWN, FINE TO COARSE SAND W/ LITTLE MICA

13+00.00  
 -LPC-





8/23/99



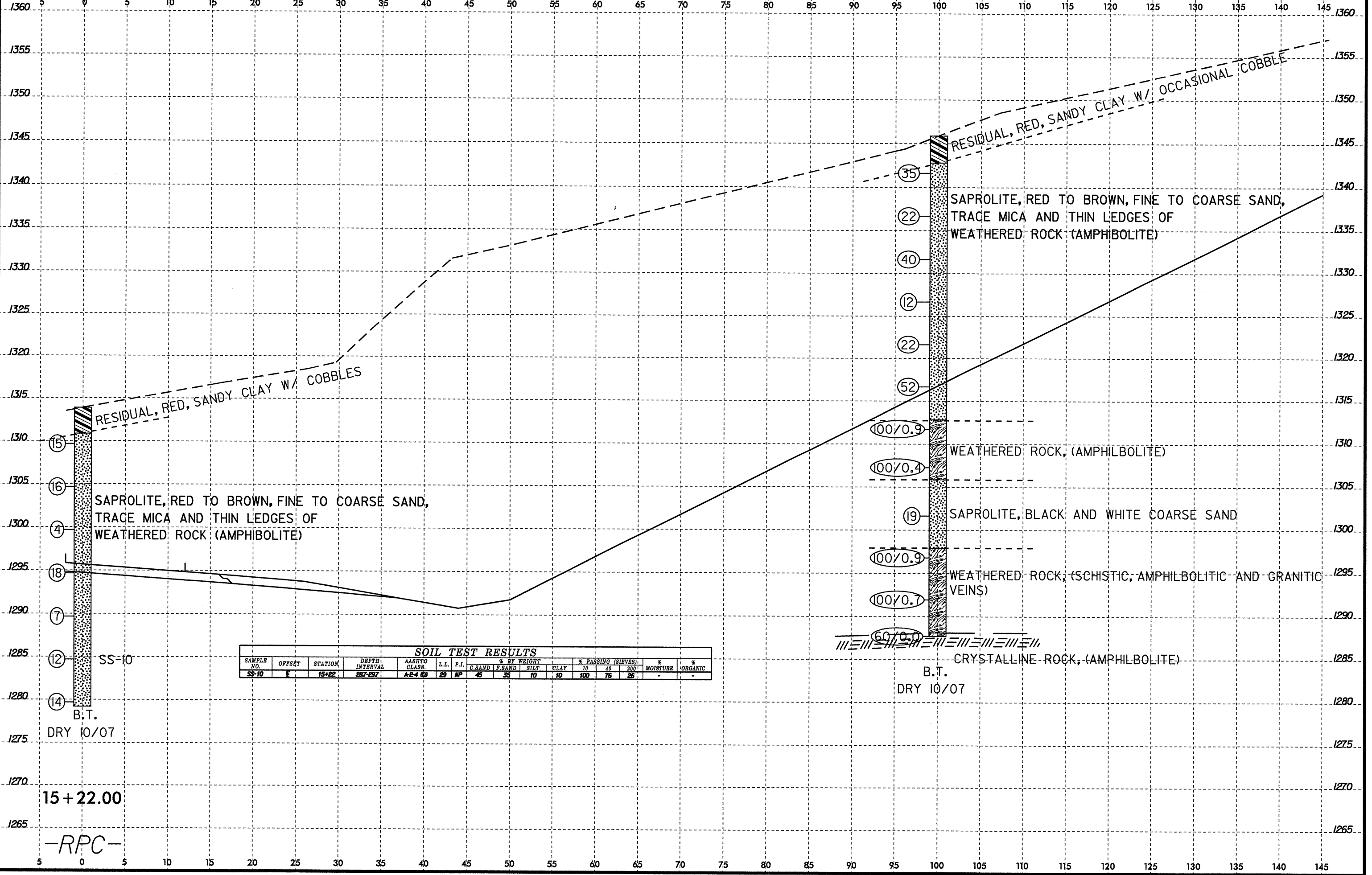
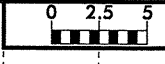
17+00  
 ④ ALLUVIAL, BROWN, FINE SANDY SILTY CLAY  
 W/ BASAL SAND AND QUARTZ GRAVEL  
 ⑥  
 ②④ SAPROLITE, ORANGE-GREY SILTY FINE SAND  
 TO COARSE SAND W/ TRACE MICA  
 B.T.  
 16+74.73

SEE RPC Sta. 22+00.00  
 1281.183

-LPC-

23 JAN-2008 14:51  
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 \$\$\$\$  
 \$\$\$\$

8/23/99



SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-10	0	15+22	287-297	A-2-4 (U)	29	NP	45	35	10	10	100	76	25	-	-

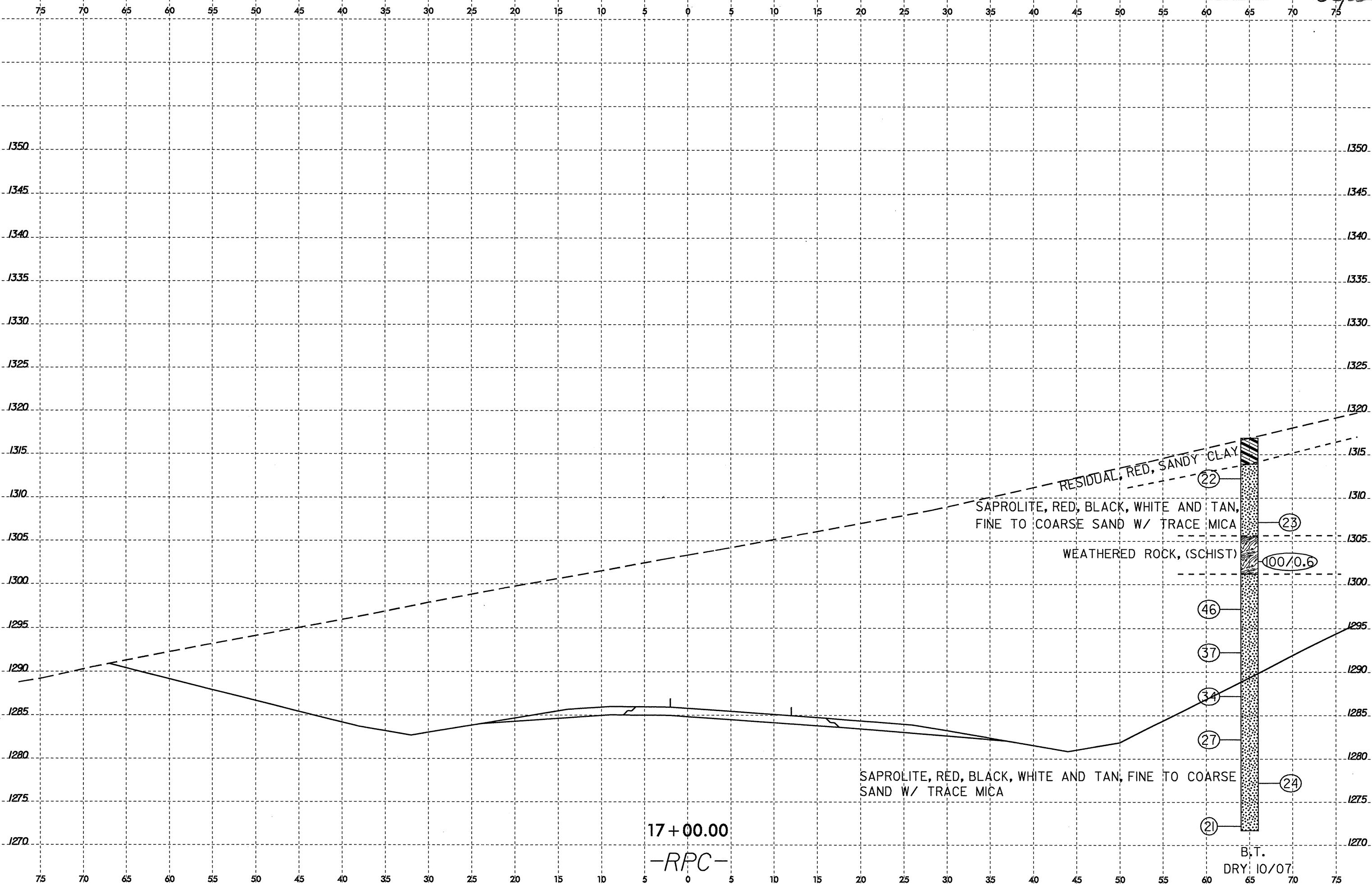
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15+22.00

-RPC-

B.T.  
DRY 10/07

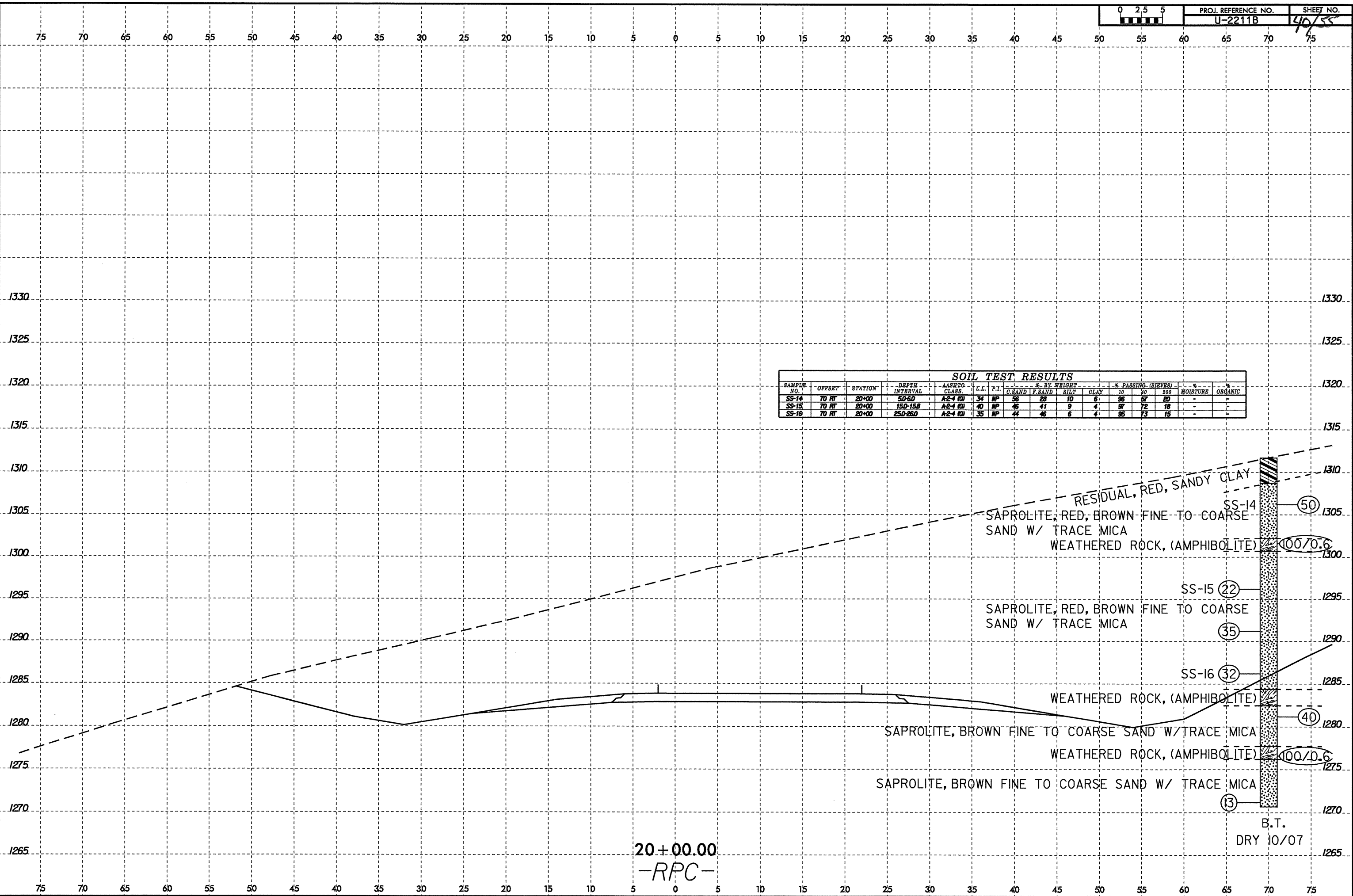
8/23/99



18-JAN-2008 10:52:18 GEO. RDWY\CADD.GEOTECH\sc\U2211B\_GEO\_xst\_rpc.dgn



8/23/99

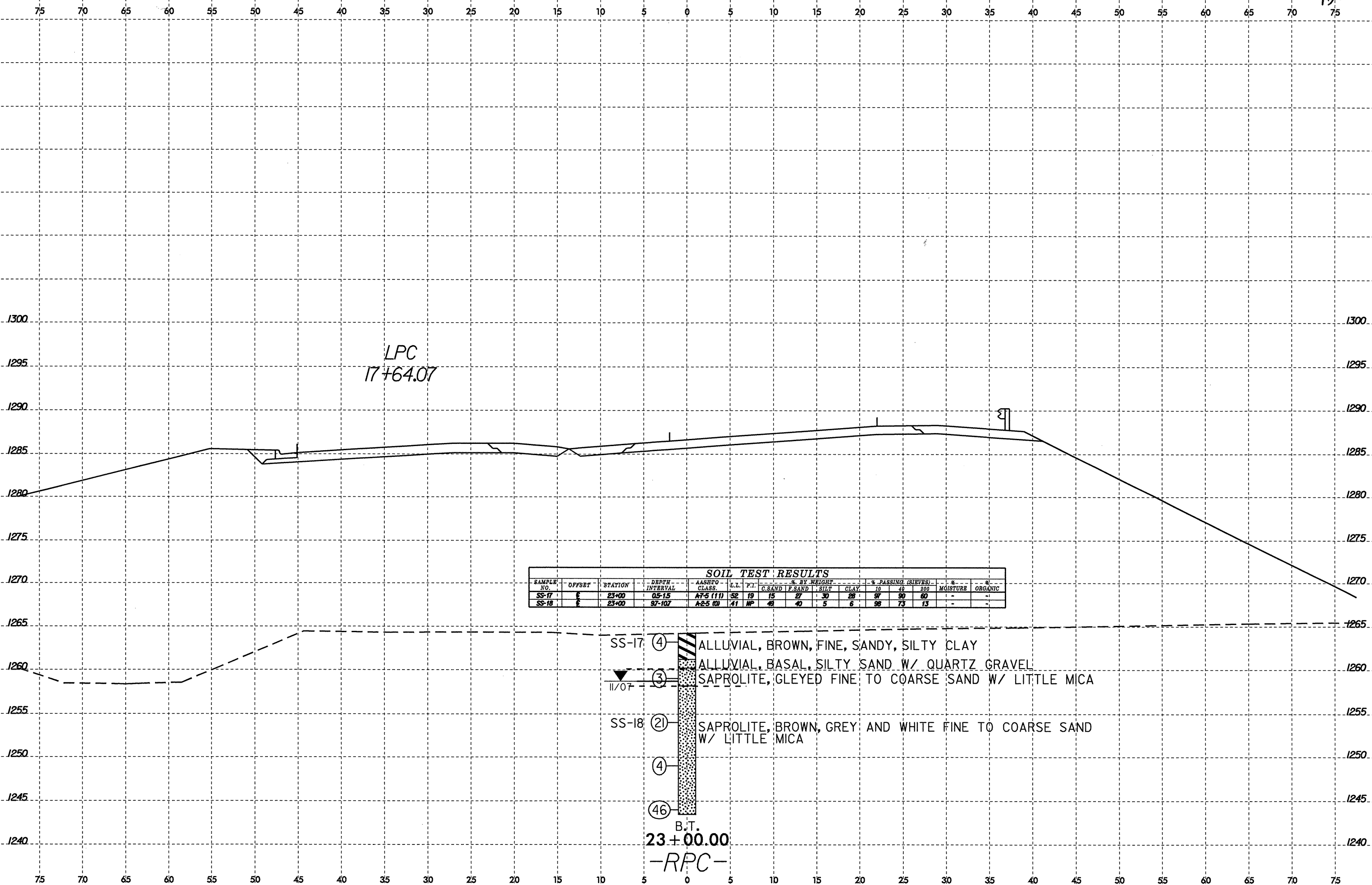


SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-14	70 RT	20+00	50-60	A-2-4 (U)	34	NP	56	28	10	6	96	57	20	-	-
SS-15	70 RT	20+00	150-158	A-2-4 (U)	40	NP	46	41	9	4	97	72	18	-	-
SS-16	70 RT	20+00	250-260	A-2-4 (U)	35	NP	44	46	6	4	95	73	15	-	-

20+00.00  
-RPC-

B.T.  
DRY 10/07

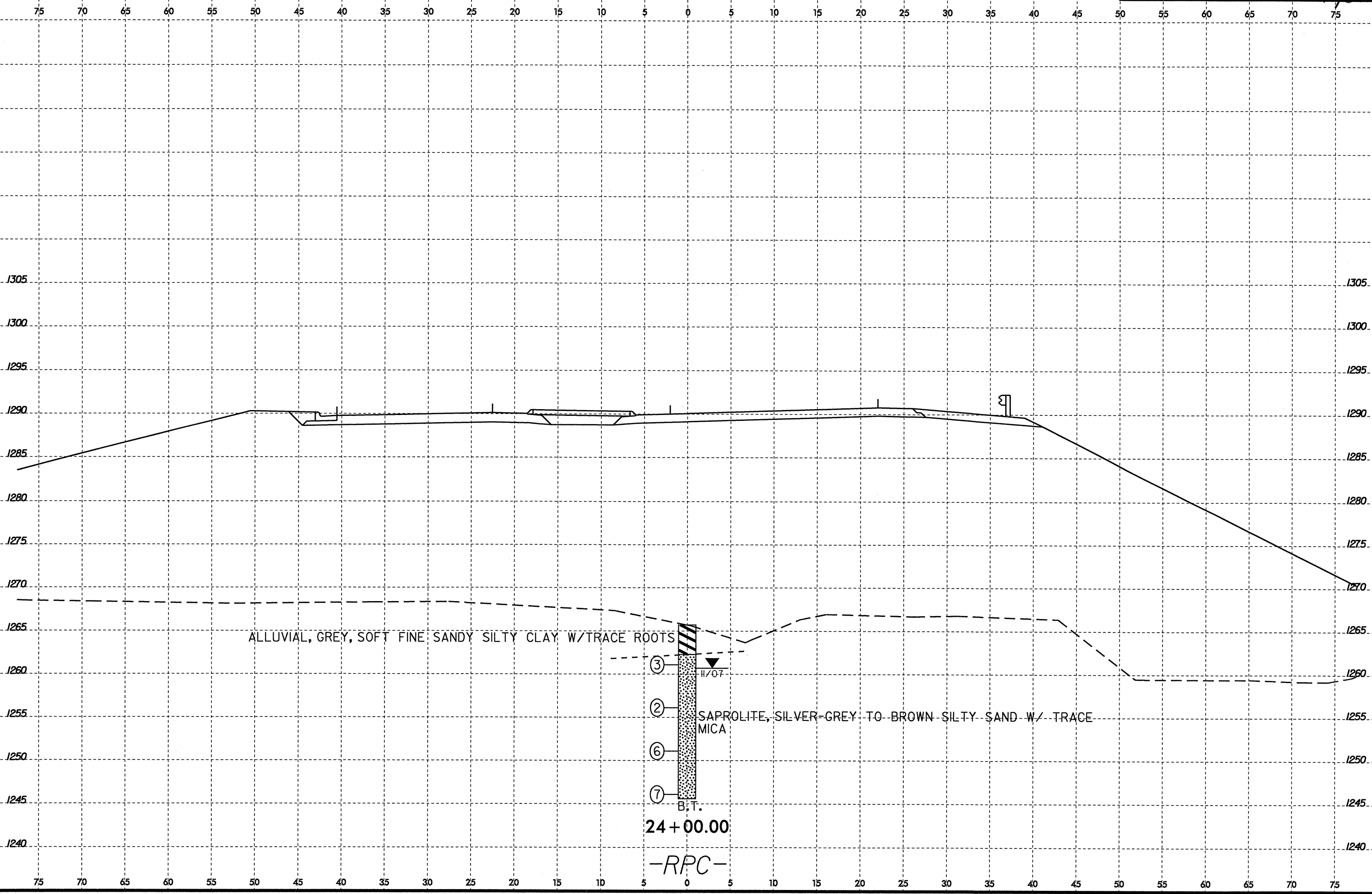
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LPC  
17+64.07

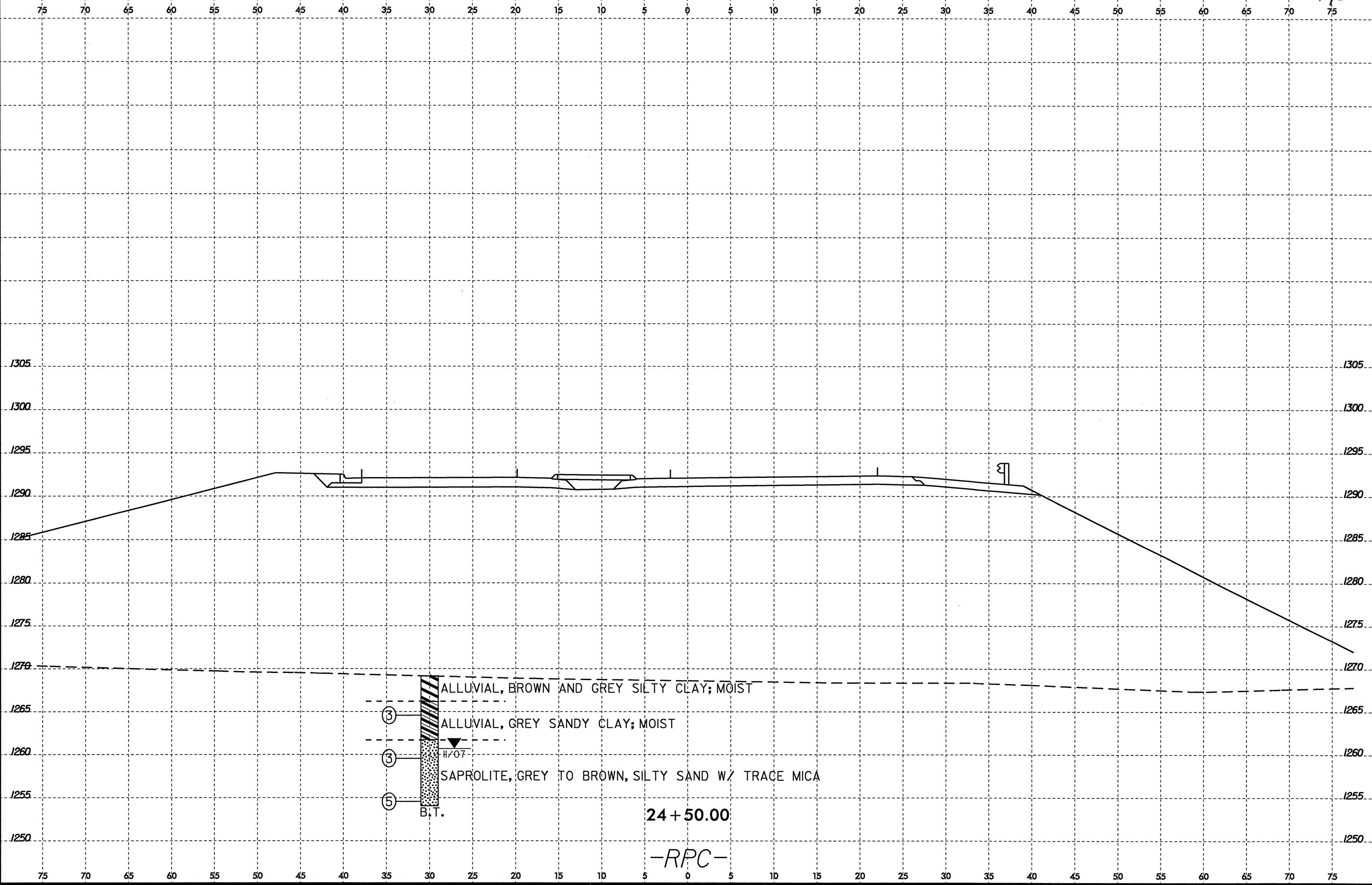
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	V.L.	P.T.	% BY WEIGHT				% PASSING (SIEVES)			MOISTURE	ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-17	0	23+00	05-15	A-7-5 (11)	62	19	15	27	30	28	97	90	60	-	-
SS-18	0	23+00	97-107	A-2-5 (10)	41	NP	48	40	5	6	98	75	15	-	-

SS-17 (4) ALLUVIAL, BROWN, FINE, SANDY, SILTY CLAY  
 (3) ALLUVIAL, BASAL, SILTY SAND W/ QUARTZ GRAVEL  
 11/07 (3) SAPROLITE, GLEYED FINE TO COARSE SAND W/ LITTLE MICA  
 SS-18 (2) SAPROLITE, BROWN, GREY AND WHITE FINE TO COARSE SAND W/ LITTLE MICA  
 (4)  
 (46)  
 B.T.  
 23+00.00  
 -RPC-

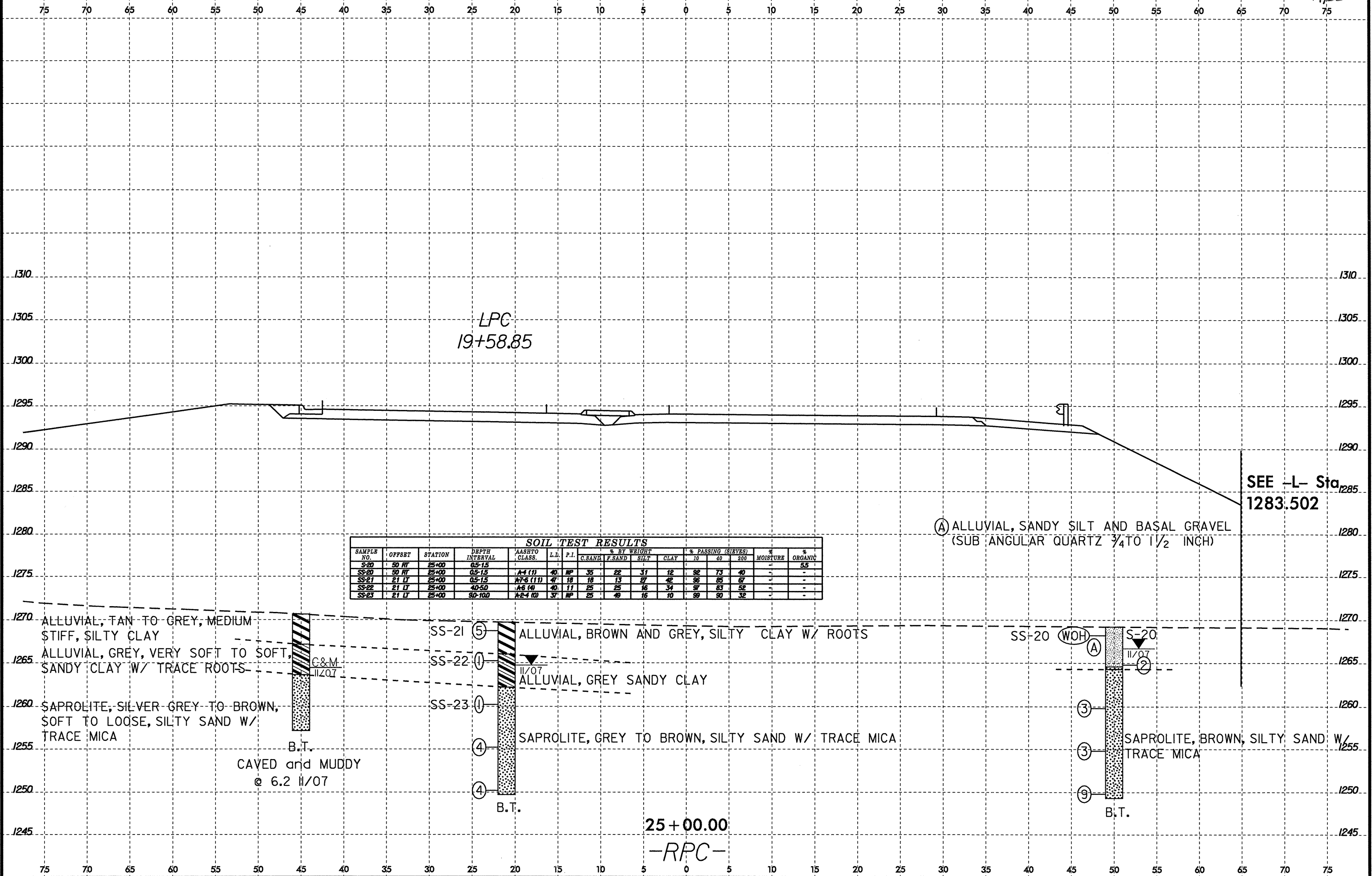


28-JAN-2008 14:36  
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 \$\$\$USERNAME\$\$\$





8/23/09



LPC  
19+58.85

SEE -L- Sta  
1283.502

(A) ALLUVIAL, SANDY SILT AND BASAL GRAVEL  
(SUB ANGULAR QUARTZ 3/4 TO 1/2 INCH)

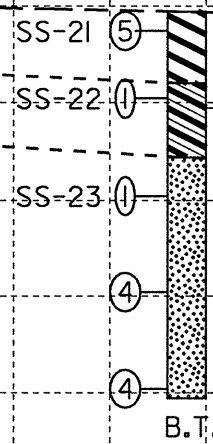
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-20	50 RT	25+00	0.5-1.5	A-4 (1)	40	NP	35	22	31	12	92	73	40	-	5.5
SS-20	50 RT	25+00	0.5-1.5	A-4 (1)	40	NP	35	22	31	12	92	73	40	-	5.5
SS-21	21 LT	25+00	0.5-1.5	A-7-6 (11)	47	18	18	13	27	42	96	85	67	-	-
SS-22	21 LT	25+00	40-50	A-6 (4)	40	11	25	25	16	34	97	83	52	-	-
SS-23	21 LT	25+00	90-100	A-2-4 (0)	37	NP	25	49	16	10	99	90	32	-	-

1270 ALLUVIAL, TAN TO GREY, MEDIUM STIFF, SILTY CLAY  
 1265 ALLUVIAL, GREY, VERY SOFT TO SOFT, SANDY CLAY W/ TRACE ROOTS  
 1260 SAPROLITE, SILVER GREY TO BROWN, SOFT TO LOOSE, SILTY SAND W/ TRACE MICA



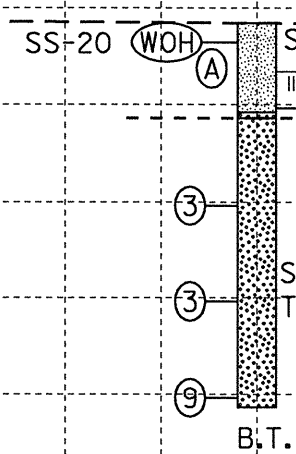
B.T.  
CAVED and MUDDY  
@ 6.2 11/07

SS-21 (5) ALLUVIAL, BROWN AND GREY, SILTY CLAY W/ ROOTS  
 SS-22 (1) ALLUVIAL, GREY SANDY CLAY  
 SS-23 (1) SAPROLITE, GREY TO BROWN, SILTY SAND W/ TRACE MICA

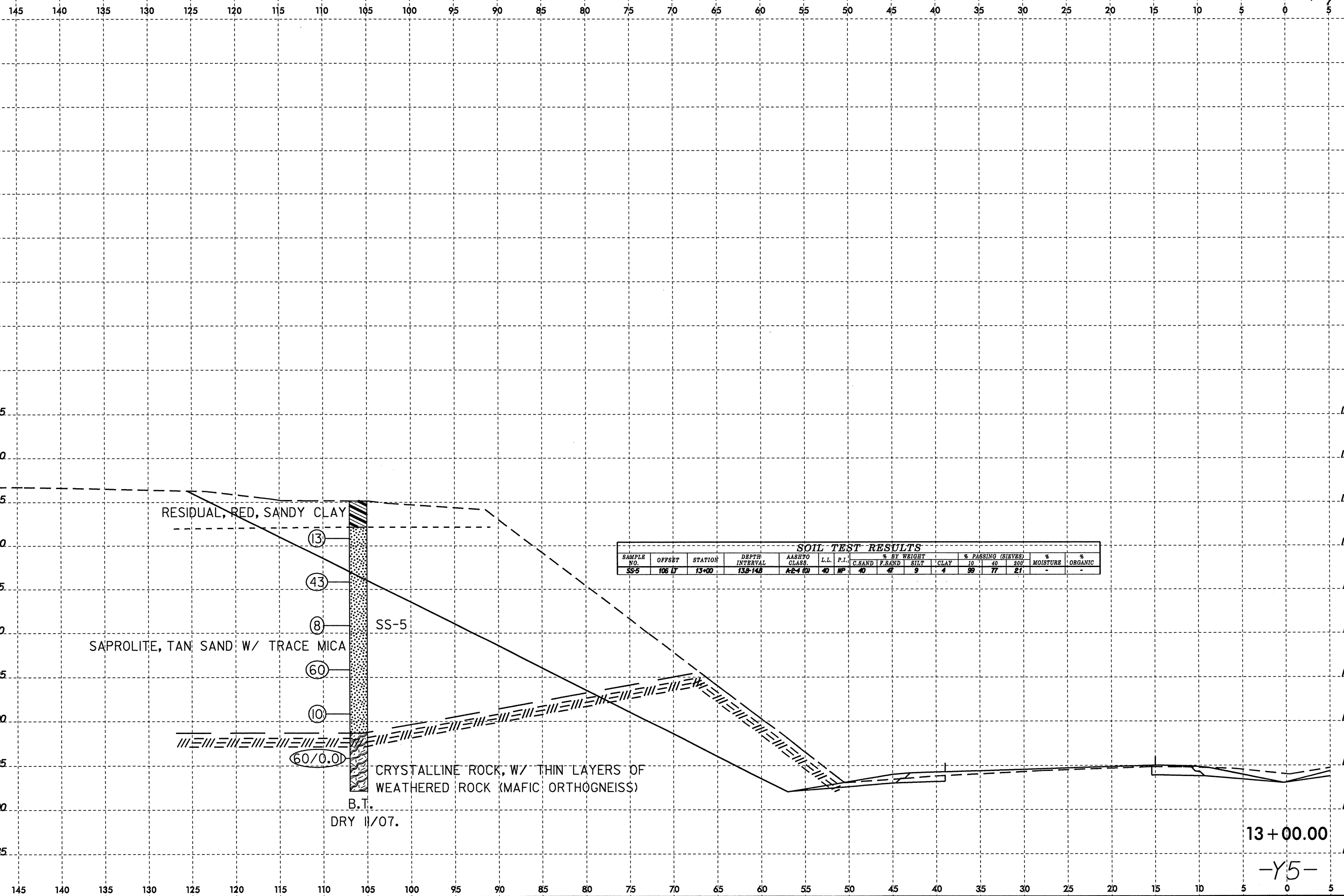


25 + 00.00  
-RPC-

SS-20 (WOH) (A) ALLUVIAL, SANDY SILT AND BASAL GRAVEL (SUB ANGULAR QUARTZ 3/4 TO 1/2 INCH)  
 S-20 (11/07) (2)  
 (3) SAPROLITE, BROWN, SILTY SAND W/ TRACE MICA

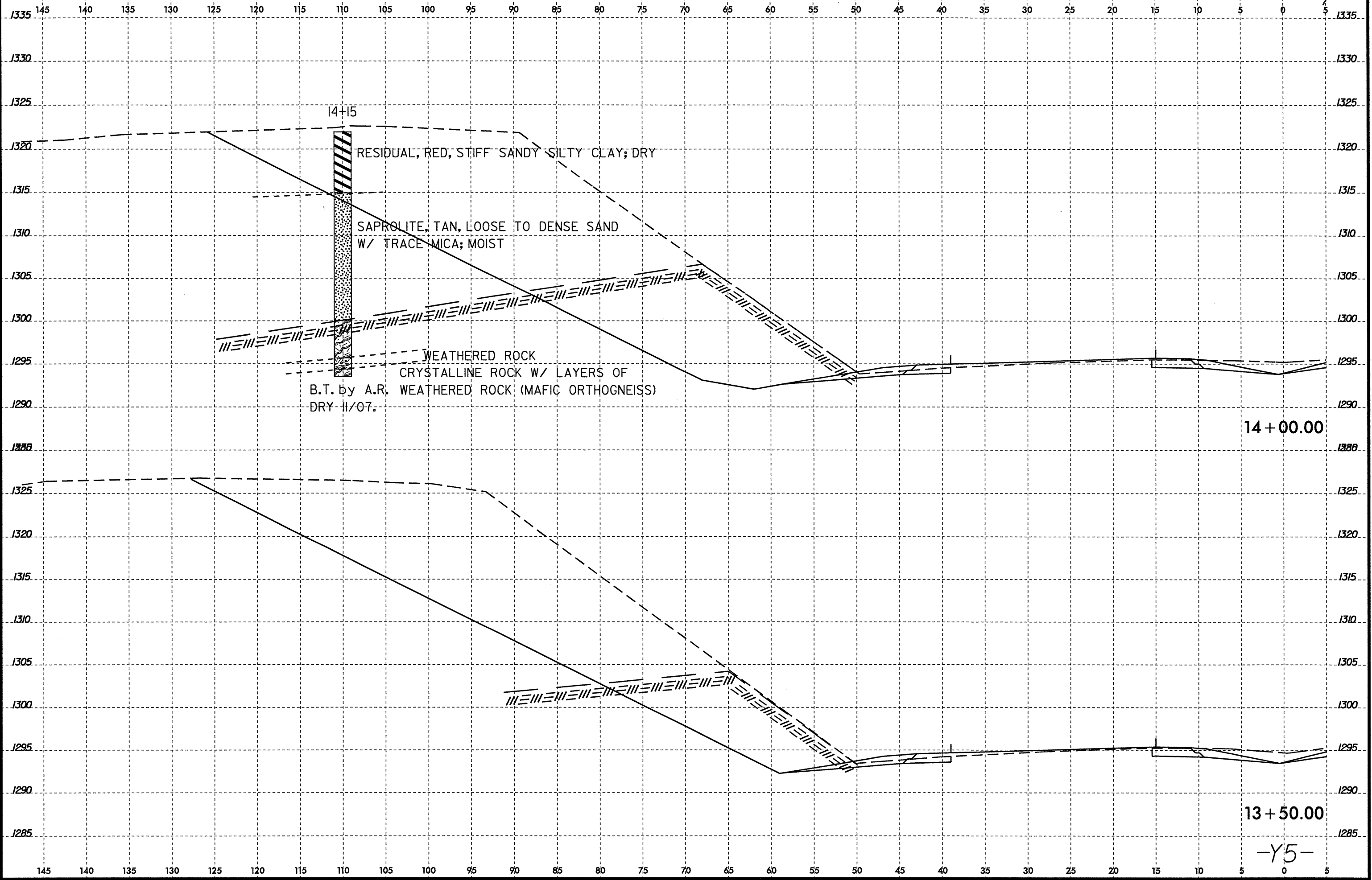


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 \$\$\$USERNAME\$\$\$



**SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-5	106 LT	13+00	13.8-14.8	A-24 (D)	40	NP	40	4	9	4	99	77	21	-	-



RESIDUAL, RED, STIFF SANDY SILTY CLAY; DRY

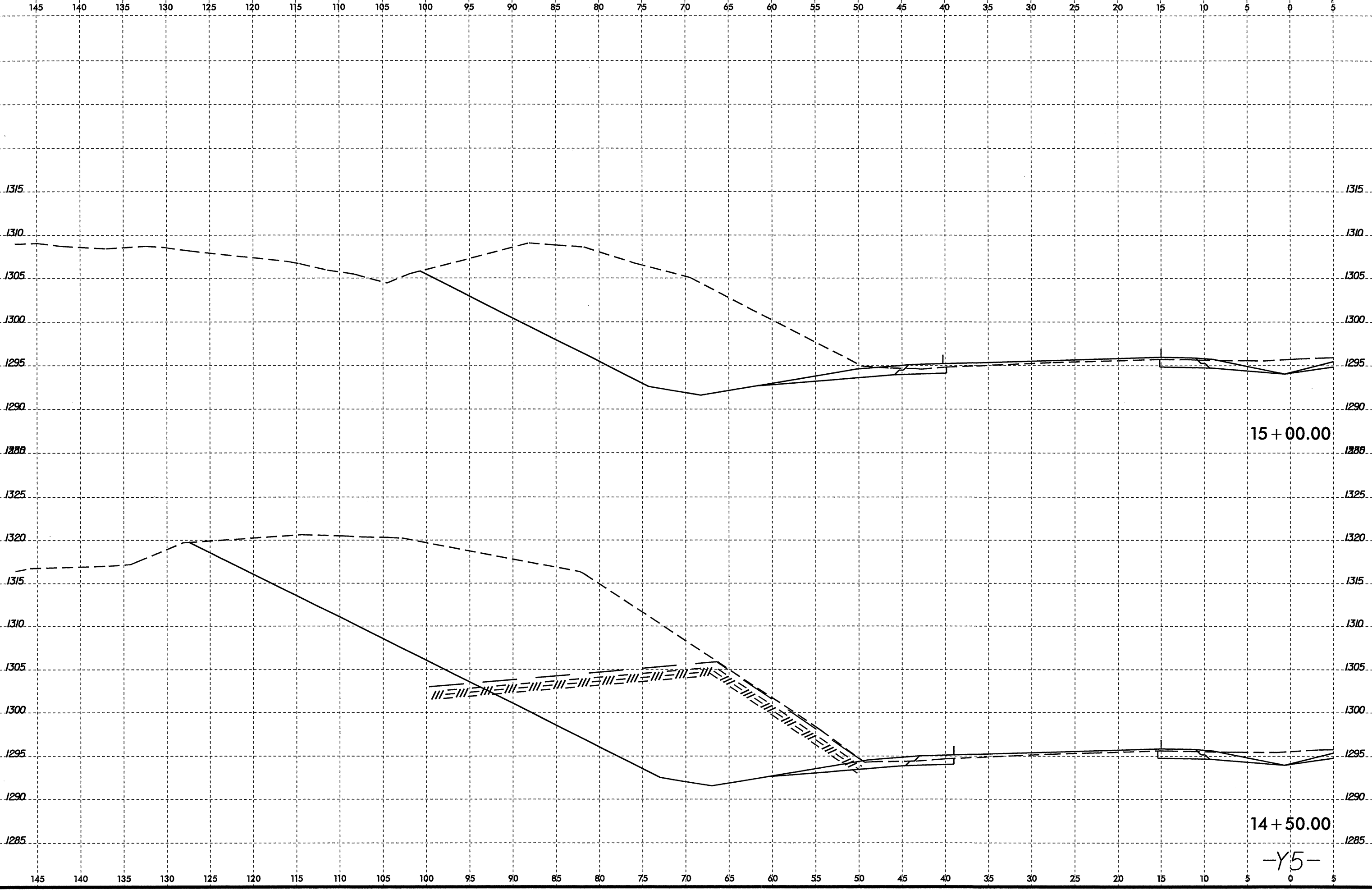
SAPROLITE, TAN, LOOSE TO DENSE SAND  
W/ TRACE MICA; MOIST

WEATHERED ROCK  
CRYSTALLINE ROCK W/ LAYERS OF  
B.T. by A.R. WEATHERED ROCK (MAFIC ORTHOGNEISS)  
DRY 11/07.

14 + 00.00

13 + 50.00

-Y5-



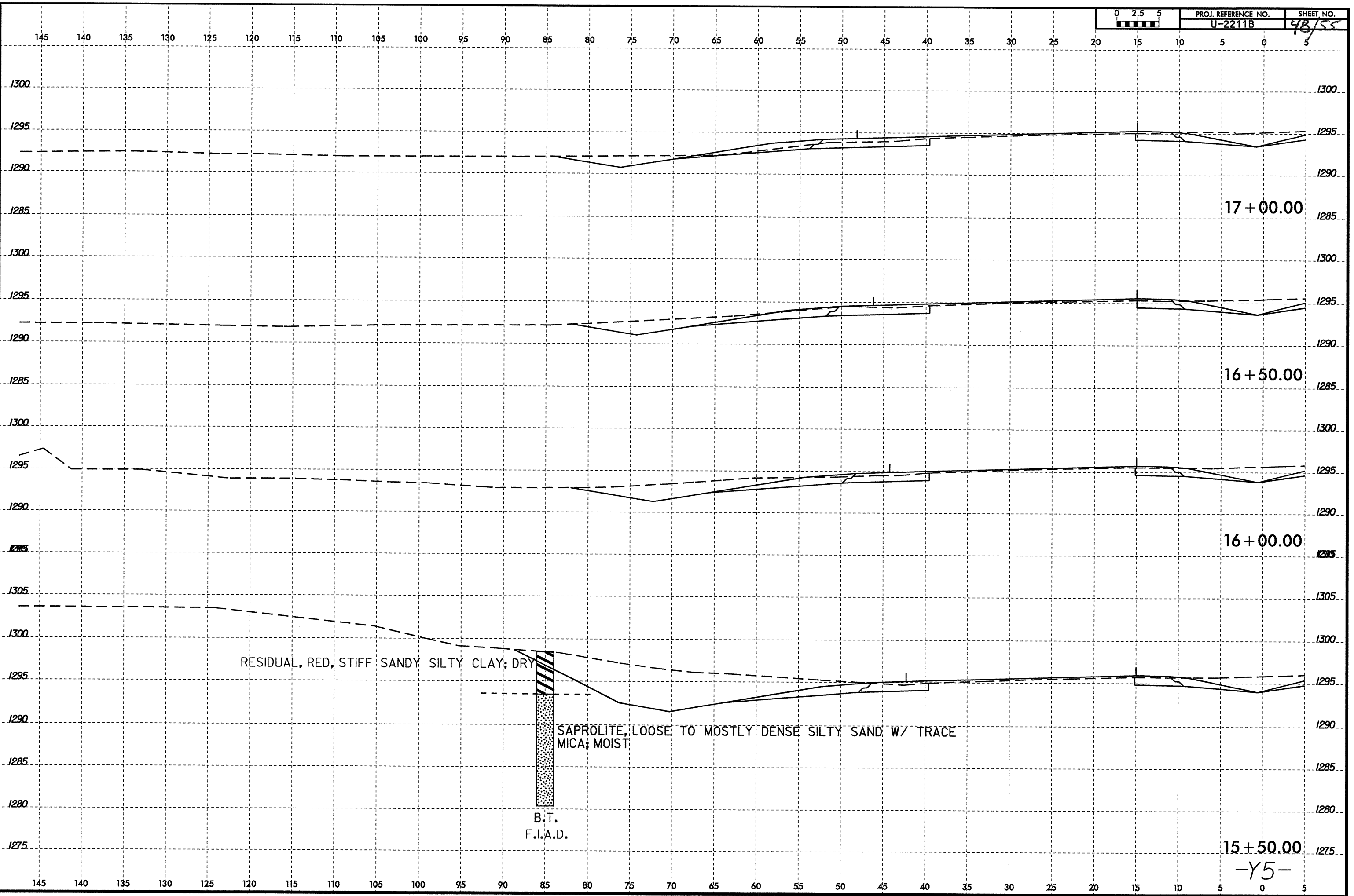
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15+00.00

14+50.00

-Y5-

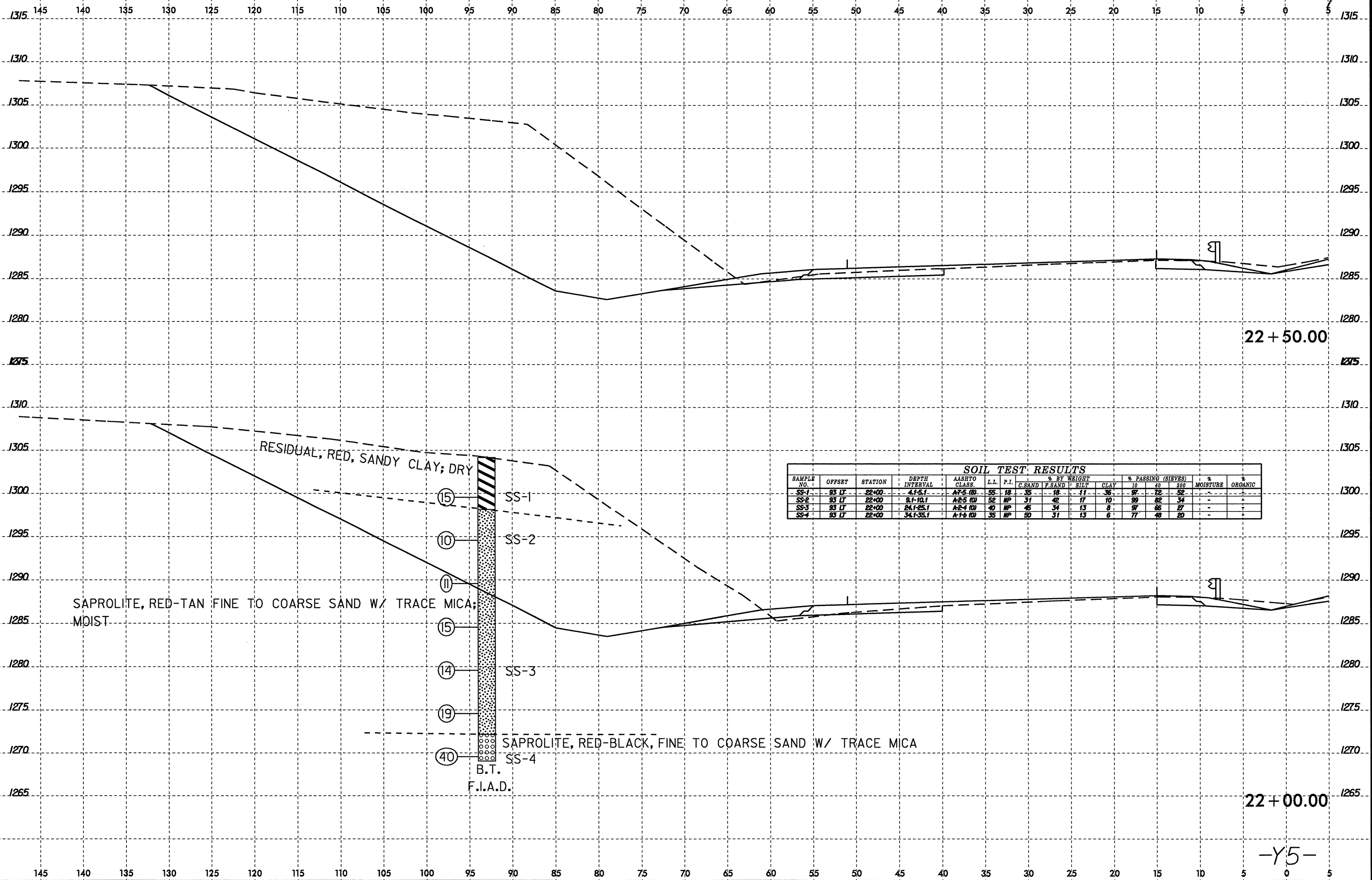
8/23/99



16-JAN-2008 10:55:18 -GEO-RDWAY\CADD\GEO\GEO\U2211B\_GEO\_xst-15.dgn

-Y5-

8/23/99



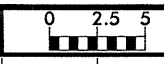
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-1	83 LT	22+00	4.1-5.7	A-7-5 (U)	55	18	35	18	11	36	97	72	52	-	-
SS-2	83 LT	22+00	9.1-10.1	A-2-5 (U)	52	NP	31	42	17	10	99	82	34	-	-
SS-3	83 LT	22+00	24.1-25.1	A-2-4 (U)	40	NP	45	34	13	8	97	66	27	-	-
SS-4	83 LT	22+00	34.1-35.1	A-1-3 (U)	35	NP	50	31	13	6	77	48	20	-	-

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-Y5-

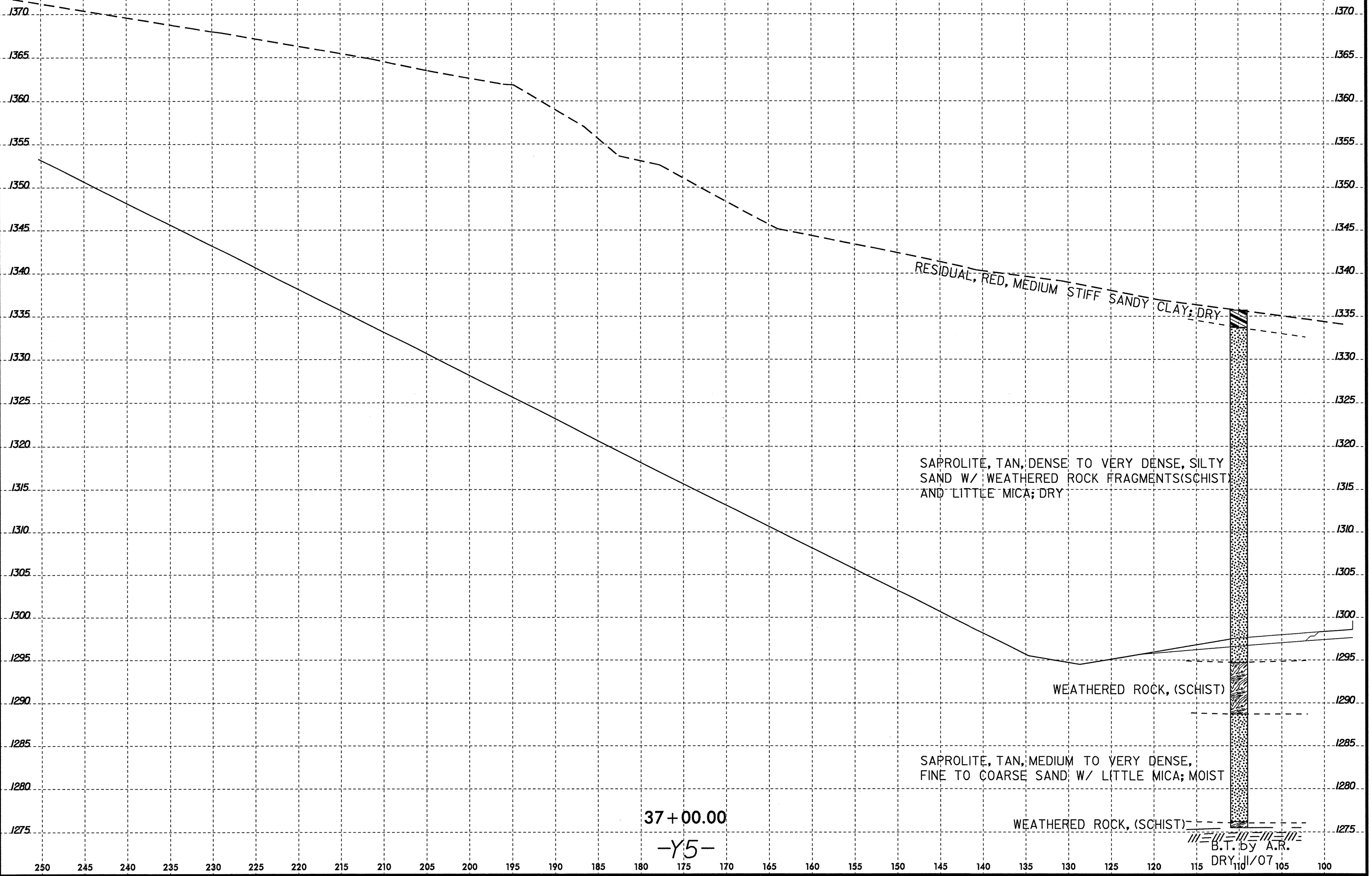
8/23/95

250 245 240 235 230 225 220 215 210 205 200 195 190 185 180 175 170 165 160 155 150 145 140 135 130



PROJ. REFERENCE NO. U-2211B

SHEET NO. 50/55



RESIDUAL, RED, MEDIUM STIFF SANDY CLAY; DRY

SAPROLITE, TAN, DENSE TO VERY DENSE, SILTY SAND W/ WEATHERED ROCK FRAGMENTS (SCHIST) AND LITTLE MICA; DRY

WEATHERED ROCK, (SCHIST)

SAPROLITE, TAN, MEDIUM TO VERY DENSE, FINE TO COARSE SAND W/ LITTLE MICA; MOIST

WEATHERED ROCK, (SCHIST)

37+00.00  
-Y5-

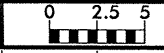
B.T. by A.R.  
DRY 11/07

23-JAN-2008 09:52  
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[User Name]

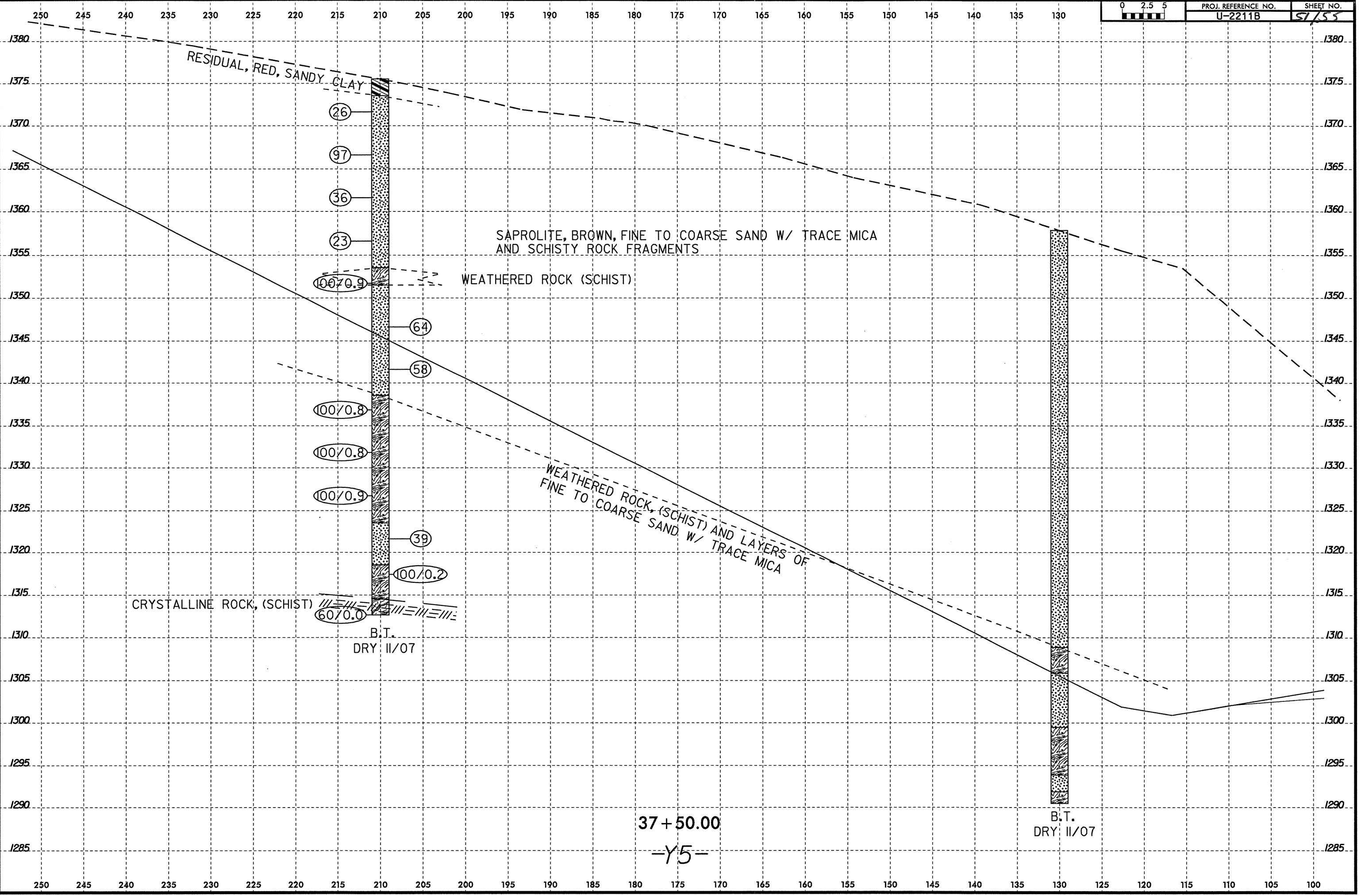


8/23/93

16-JAN-2008 09:47  
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William



PROJ. REFERENCE NO.	SHEET NO.
U-2211B	57/55



(26)

(97)

(36)

(23)

(100/0.9)

(64)

(58)

(100/0.8)

(100/0.8)

(100/0.9)

(39)

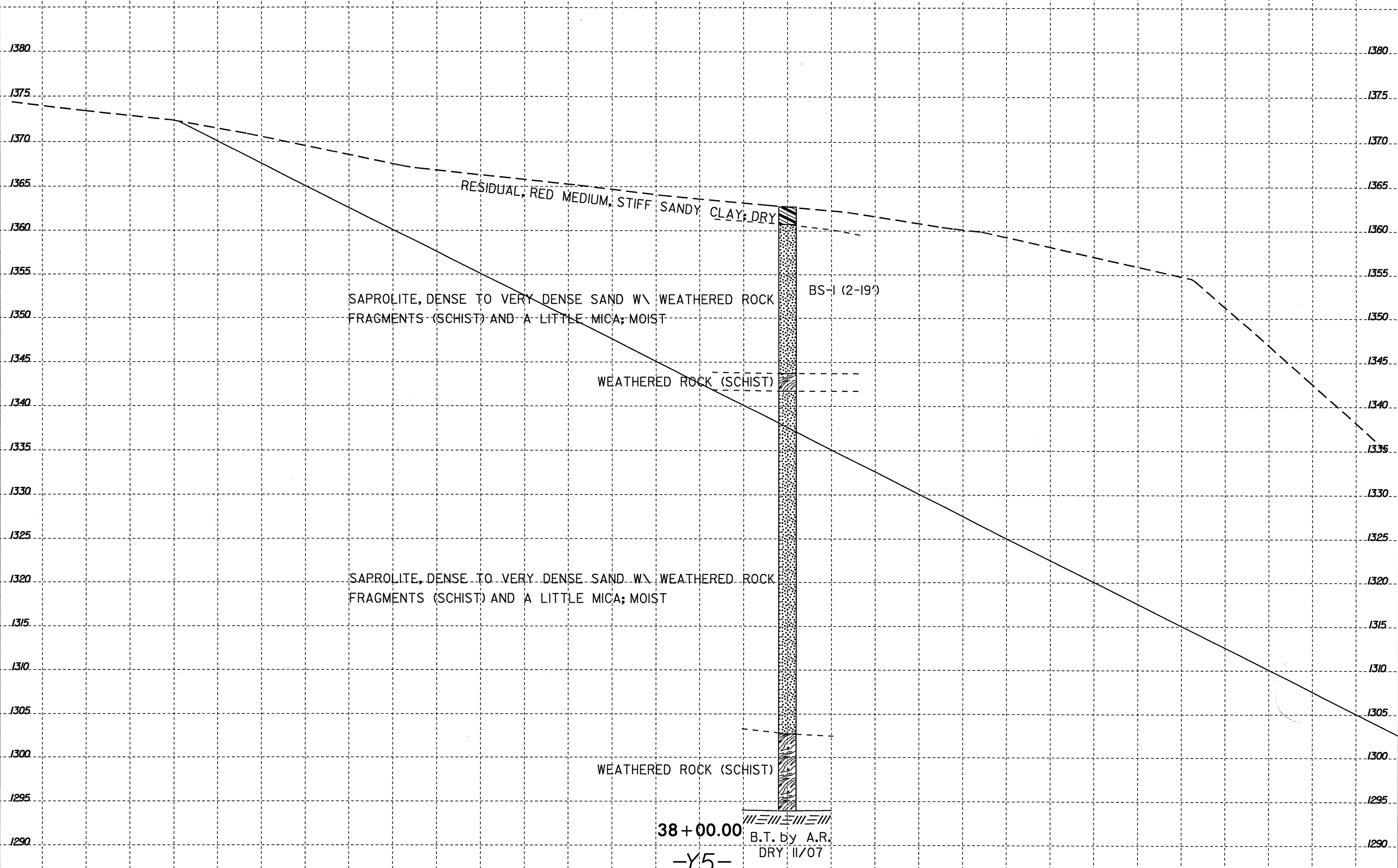
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(60/0.0)

8/23/99

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0 2.5 5  
PROJ. REFERENCE NO.  
U-2211B  
SHEET NO.  
52/55



RESIDUAL, RED MEDIUM, STIFF SANDY CLAY; DRY

SAPROLITE, DENSE TO VERY DENSE SAND W\ WEATHERED ROCK FRAGMENTS (SCHIST) AND A LITTLE MICA; MOIST

WEATHERED ROCK (SCHIST)

SAPROLITE, DENSE TO VERY DENSE SAND W\ WEATHERED ROCK FRAGMENTS (SCHIST) AND A LITTLE MICA; MOIST

WEATHERED ROCK (SCHIST)

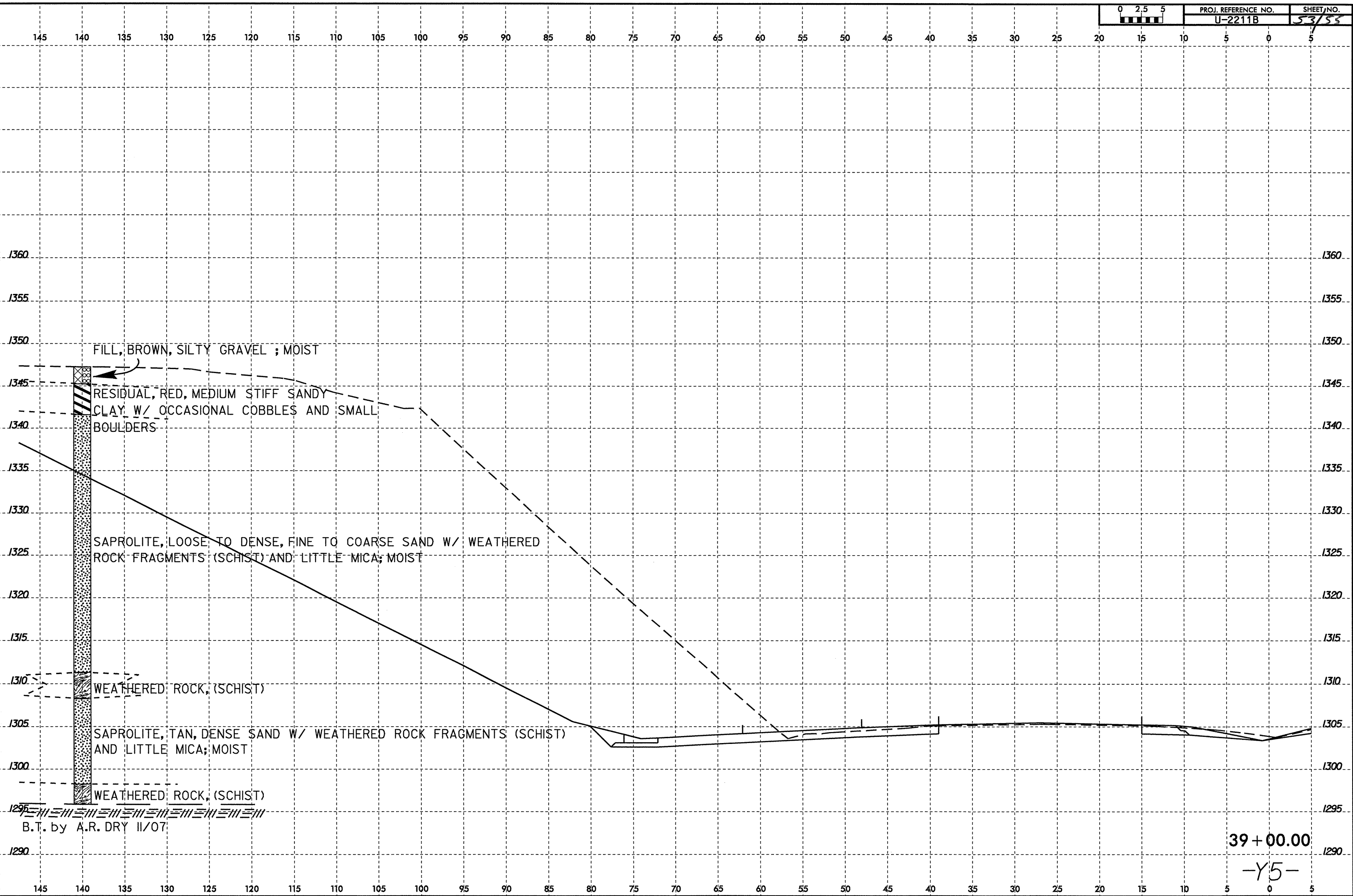
BS-1 (2-19')

38 + 00.00 B.T. by A.R.  
-Y5- DRY 11/07

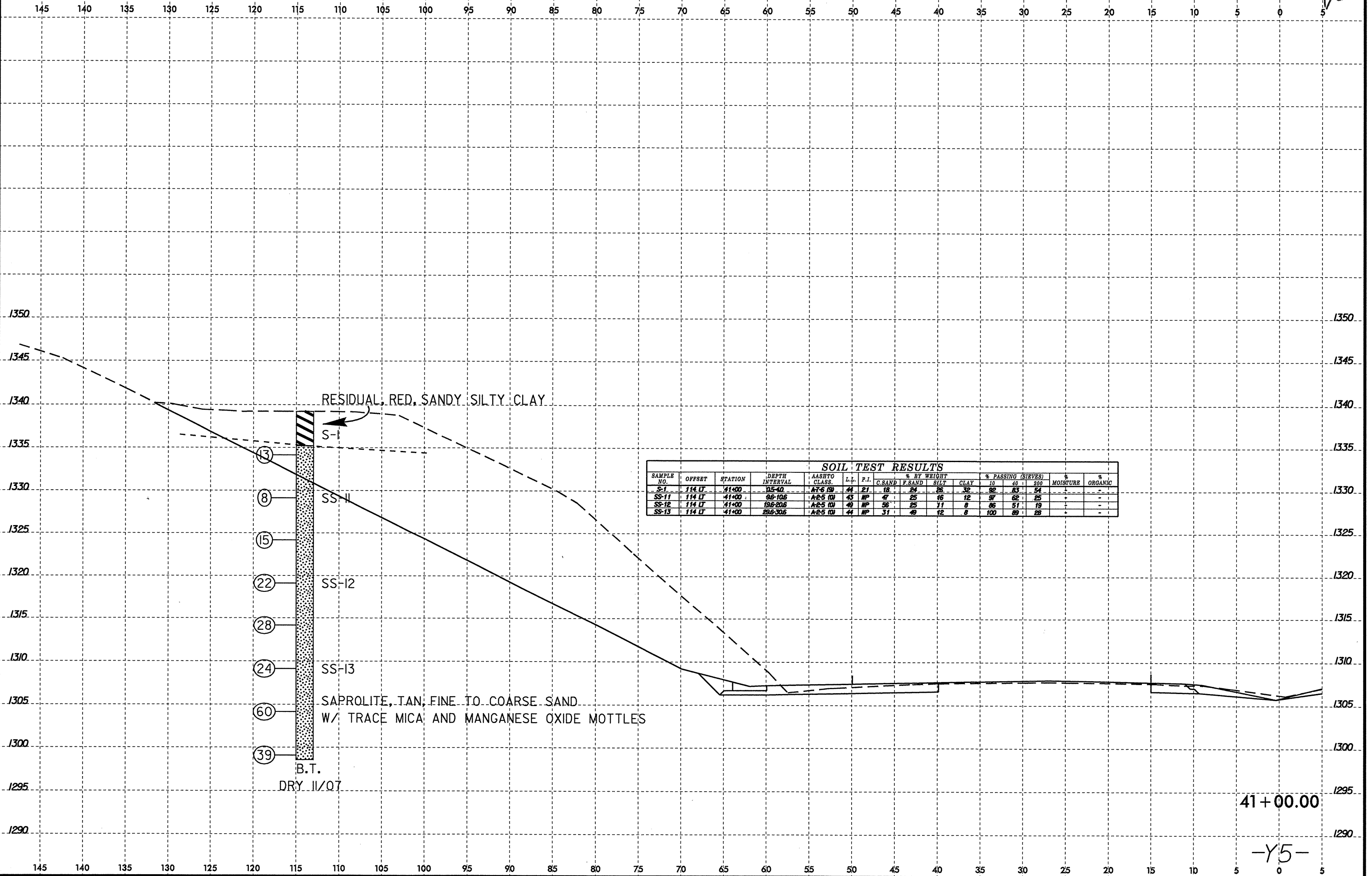
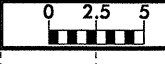
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William

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8/23/99



RESIDUAL, RED, SANDY SILTY CLAY

S-1

SS-1

SS-12

SS-13

SAPROLITE, TAN, FINE TO COARSE SAND  
W/ TRACE MICA AND MANGANESE OXIDE MOTTLES

B.T.  
DRY 11/07

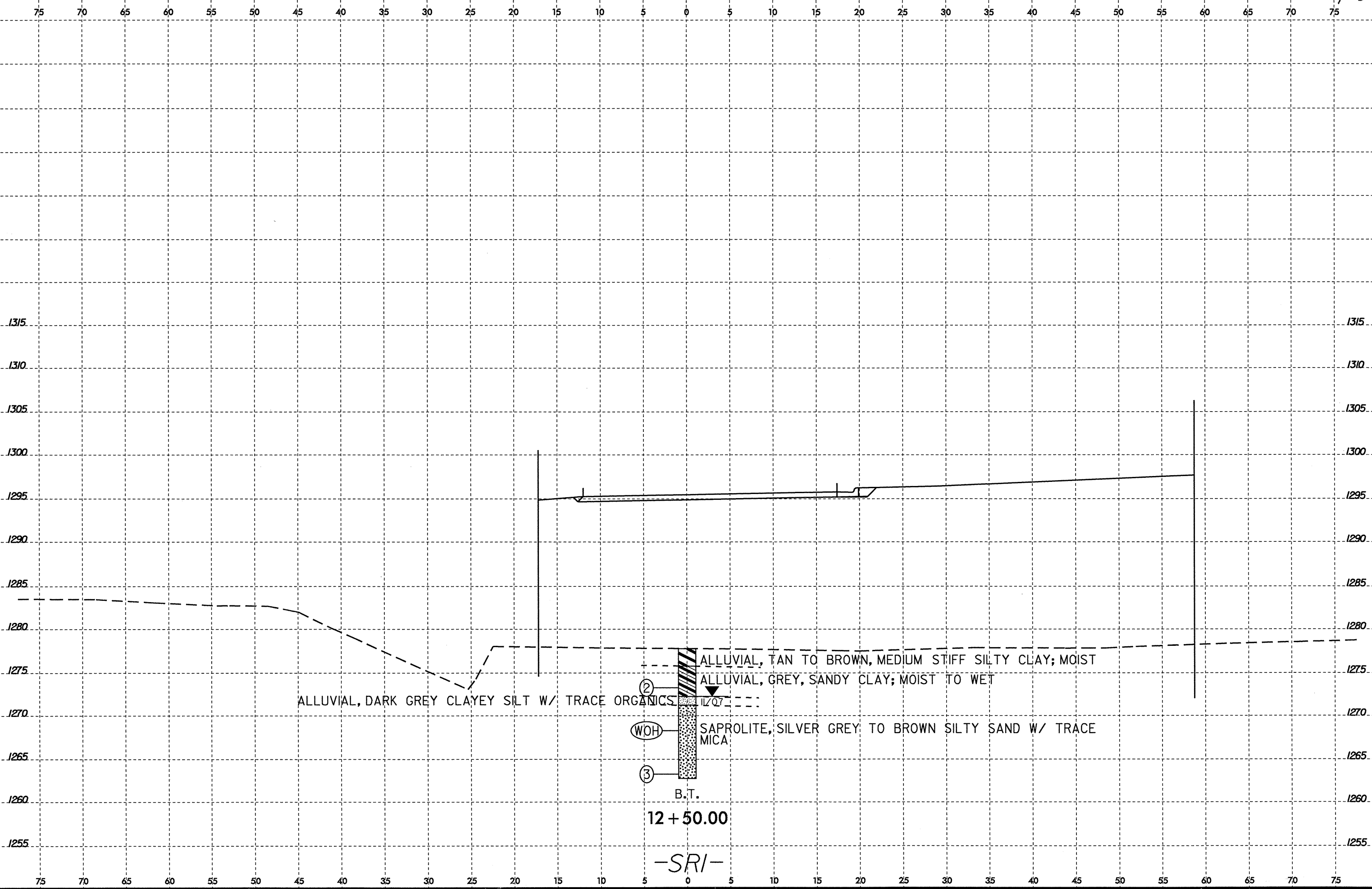
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-1	114 LT	41+00	05-40	A-7-6 (S)	44	21	18	24	26	32	92	83	54	-	-
SS-11	114 LT	41+00	96-106	A-2-5 (S)	43	NP	47	25	16	12	97	62	25	-	-
SS-12	114 LT	41+00	196-206	A-2-5 (S)	49	NP	56	25	11	8	86	51	19	-	-
SS-13	114 LT	41+00	296-306	A-2-5 (S)	44	NP	31	49	12	8	100	89	28	-	-

41+00.00

-Y5-

8-JAN-2008 10:00:11B-GEO-RDWAY-CADD.GEOTECH\asc\U2211B\_GEO\_xst\_15.dgn

8/23/99



ALLUVIAL, DARK GREY CLAYEY SILT W/ TRACE ORGANICS

- ① ALLUVIAL, TAN TO BROWN, MEDIUM STIFF SILTY CLAY; MOIST
- ② ALLUVIAL, GREY, SANDY CLAY; MOIST TO WET
- ③ SAPROLITE, SILVER GREY TO BROWN SILTY SAND W/ TRACE MICA

B.T.

12 + 50.00

-SRI-

U:\JAN-2008\1500\15001B\_GEO.PDW\CADD\_GEO\U2211B\_GEO\_xs1.sr1.dgn