

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.	R-2612A	1	36
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33483.1.1	NHF-421(11)	P.E.	
34483.2.2	CMNHS-0421(43)	RW & UTIL.	
34483.3.1	CMNHS-0421(51)	CONST.	

CONTENTS

LINE	STATION	PLAN	PROFILE	XSECT
-L-	80+50 TO 84+50	8,9		24-26
-L-	87+00	9		27
-L-	90+00	9		27
-Y-	10+00 TO 54+00	8, 10-12	14,15	
-Y1-	14+37 TO 82+35	4-8	16-18	
-Y2-	10+05 TO 23+50	12,13	19	
-Y3-	12+00 TO 15+84	8	19	
-LPB-	10+00 TO 15+50	8	20	
-LPB-	15+50 TO 17+31	8,11	20	28-30
-LPB-	17+31 TO 20+69		20	
-RPB-	10+00 TO 22+00	7,8	21	
-RPB-	22+00 TO 25+00	8,11	21	
-RPB-	25+00 TO 28+39	11	21	
-RPC-	10+00 TO 29+98	7,8	22	
-RPD-	10+00 TO 10+38		23	
-RPD-	10+36 TO 20+50	8,9	23	24-26, 31-36
-RPD-	20+50 TO 22+87	8	23	

ROADWAY
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33483.1.1(R-2612A) F.A. PROJ. NHF-421(11)
COUNTY GUILFORD
PROJECT DESCRIPTION US 421 AT SR 3389 (WOODY MILL ROAD)
SOUTH OF GREENSBORO

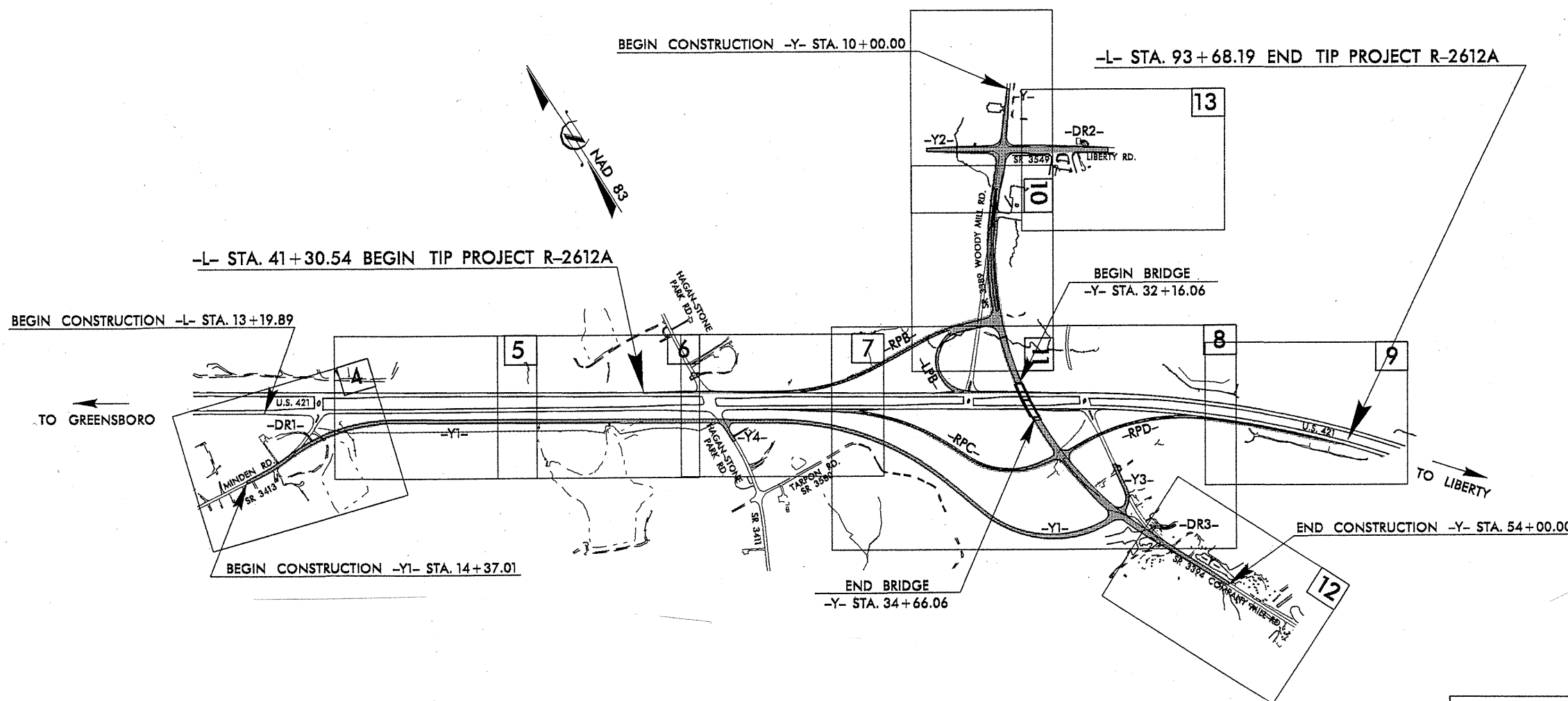
INVENTORY

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.

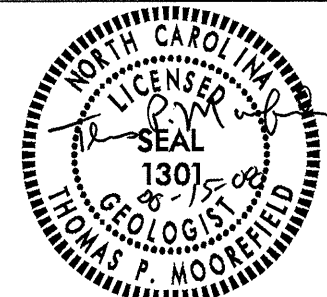
GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND 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.



PERSONNEL
K. KUNTUKOVA
H.R. CONLEY
D.W. DIXON
G.D. CZAJKA

INVESTIGATED BY **T.P. MOOREFIELD**
CHECKED BY **N.T. ROBERSON**
SUBMITTED BY **N.T. ROBERSON**
DATE **AUGUST 2008**



DRAWN BY: **T.T. WALKER, T.P. MOOREFIELD**

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.

CONTRACT: C202440 ID: R-2612A

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

PROJECT REFERENCE NO. 33483.1(KR-2612A)	SHEET NO. 2
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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>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</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)</p> <p>GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</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.</p> <p>AQUIFER - A WATER BEARING FORMATION OR STRATA.</p> <p>ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.</p> <p>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.</p> <p>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.</p> <p>CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.</p> <p>COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.</p> <p>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.</p> <p>DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.</p> <p>DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.</p> <p>DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.</p> <p>FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.</p> <p>FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.</p> <p>FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.</p> <p>FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.</p> <p>FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.</p> <p>JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.</p> <p>LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.</p> <p>LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.</p> <p>MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.</p> <p>PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.</p> <p>RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.</p> <p>ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.</p> <p>SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.</p> <p>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 INTRODUCED ROCKS.</p> <p>SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.</p> <p>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.</p> <p>STRATA CORE RECOVERY (SCRC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.</p> <p>STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.</p> <p>TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																																									
<p>SOIL LEGEND AND AASHTO CLASSIFICATION</p> <table border="1"> <tr> <th>GENERAL CLASS.</th> <th colspan="2">GRANULAR MATERIALS (<= 35% PASSING #200)</th> <th colspan="2">SILT-CLAY MATERIALS (> 35% PASSING #200)</th> <th colspan="2">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> </tr> <tr> <td>SYMBOL</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> </tr> <tr> <td>LIQUID LIMIT PLASTIC INDEX</td> <td>6 MX</td> <td>NP</td> <td>40 MX 41 MN 10 MX 11 MN 11 MN 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN 11 MN 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN 11 MN 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN 11 MN 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> </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>SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER</td> </tr> <tr> <td>GEN. RATING AS A SUBGRADE</td> <td colspan="2">EXCELLENT TO GOOD</td> <td colspan="2">FAIR TO POOR</td> <td>FAIR TO POOR</td> <td>POOR</td> </tr> </table>		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	SYMBOL							% PASSING	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 41 MN 10 MX 11 MN 11 MN 11 MN	40 MX 41 MN 10 MX 11 MN 11 MN 11 MN	40 MX 41 MN 10 MX 11 MN 11 MN 11 MN	40 MX 41 MN 10 MX 11 MN 11 MN 11 MN	GROUP INDEX	0	0	0	4 MX	8 MX	12 MX	USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS, GRAVEL, AND SAND	FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND	SILTY SOILS	CLAYEY SOILS	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER	GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD		FAIR TO POOR		FAIR TO POOR	POOR	<p>ANGULARITY OF GRAINS</p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</p>		<p>MINERALOGICAL COMPOSITION</p> <p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.</p>		<p>WEATHERED ROCK (WR)</p> <p>CRYSTALLINE ROCK (CR)</p> <p>NON-CRYSTALLINE ROCK (NCR)</p> <p>COASTAL PLAIN SEDIMENTARY ROCK (CP)</p>		<p>COMPRESSION</p> <p>SLIGHTLY COMPRESSIBLE</p> <p>MODERATELY COMPRESSIBLE</p> <p>HIGHLY COMPRESSIBLE</p>		<p>COMPRESSIBILITY</p> <p>LIQUID LIMIT LESS THAN 31</p> <p>LIQUID LIMIT EQUAL TO 31-50</p> <p>LIQUID LIMIT GREATER THAN 50</p>		<p>PERCENTAGE OF MATERIAL</p> <table border="1"> <tr> <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>TRACE</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 5%</td> <td>5 - 12%</td> <td>LITTLE</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>12 - 20%</td> <td>SOME</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>>10%</td> <td>>20%</td> <td>HIGHLY</td> </tr> </table>		ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	HIGHLY ORGANIC	>10%	>20%	HIGHLY	<p>WEATHERING</p> <p>FRESH</p> <p>VERY SLIGHT (V SL.)</p> <p>SLIGHT (SL.)</p> <p>MODERATE (MOD.)</p> <p>SEVERE (SEV.)</p> <p>VERY SEVERE (V SEV.)</p> <p>COMPLETE</p>		<p>GROUND WATER</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>MISCELLANEOUS SYMBOLS</p> <p>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION</p> <p>SOIL SYMBOL</p> <p>ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT</p> <p>INFERRED SOIL BOUNDARY</p> <p>INFERRED ROCK LINE</p> <p>ALLUVIAL SOIL BOUNDARY</p> <p>DIP & DIP DIRECTION OF ROCK STRUCTURES</p> <p>SOUNDING ROD</p> <p>SPT TEST BORING</p> <p>AUGER BORING</p> <p>CORE BORING</p> <p>MONITORING WELL</p> <p>PIEZOMETER INSTALLATION</p> <p>SLOPE INDICATOR INSTALLATION</p> <p>SPT N-VALUE</p> <p>SPT REFUSAL</p> <p>BULK SAMPLE</p> <p>SPLIT SPOON SAMPLE</p> <p>SHELL TUBE SAMPLE</p> <p>ROCK SAMPLE</p> <p>RECOMPACTED TRIAXIAL SAMPLE</p> <p>CALIFORNIA BEARING RATIO SAMPLE</p>	
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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2612A	2A	36
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33483.1.1	NHF-421(11)	P.E.	

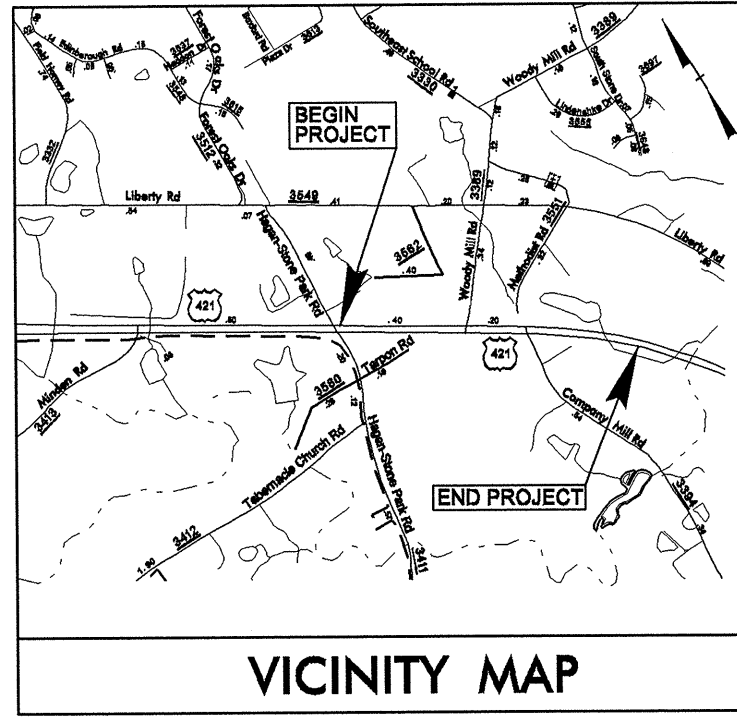
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

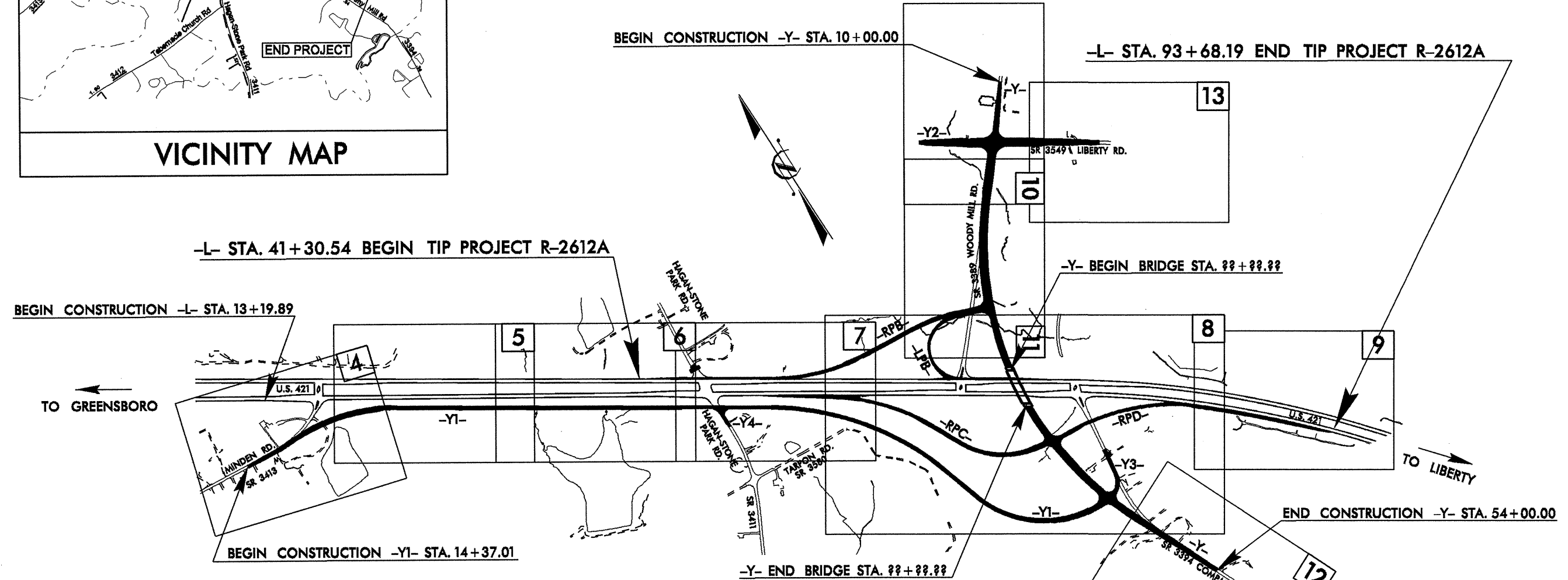
LOCATION: US 421 AT SR 3389 (WOODY MILL ROAD)
SOUTH OF GREENSBORO

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURES

See Sheet 1-A For Index of Sheets



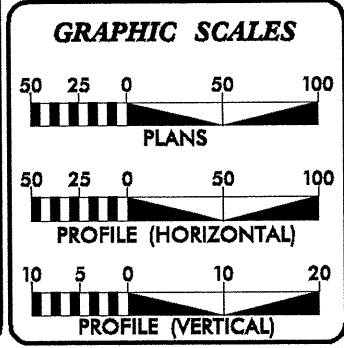
VICINITY MAP



THIS PROJECT HAS FULL AND PARTIAL CONTROLLED ACCESS.
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD _____.

TIP PROJECT: R-2612A

CONTRACT:



DESIGN DATA

ADT 2010 =	25,900
ADT 2030 =	41,200
DHV =	11 %
D =	70 %
T =	14 % *
V =	55 MPH
* (TTST 9% + DUAL 5%)	
FUNCTIONAL CLASS =	FREEWAY

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2612A =	0.925 MI
TOTAL LENGTH TIP PROJECT R-2612A =	0.925 MI

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: OCTOBER 17, 2008	GLENN W. MUMFORD, PE PROJECT ENGINEER
LETTING DATE: MAY 18, 2010	SUSAN C. LANCASTER, 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.

12-AUG-2008 09:04 k:\erc\Falseth\investigation\tip\2612a\geo_r.dwg\cadd-geotech\planprof\2612a-geo-tsh.dgn ttwalker AT GE221425



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

Michael F. Easley
GOVERNOR

P.O. BOX 25201, RALEIGH, N.C. 27611-5201

Lyndo Tippet
SECRETARY

August 15, 2008

STATE PROJECT: 33483.1.1 (R-2612A)
FEDERAL PROJECT: NHF-421(11)
COUNTY: Guilford
DESCRIPTION: US 421 at SR 3389 (Woody Mill Road) South of Greensboro
SUBJECT: Geotechnical Report – Inventory

Project Description

This project consists of a new interchange on US 421, approximately 10 miles south of Greensboro. Woody Mill Road (SR 3389) and Company Mill Road (SR 3394) will be realigned to form a single roadway (-Y-) passing over US 421. Access to and from US 421 will be provided by -LPB-, -RPB-, -RPC-, and -RPD-. A service road (-Y1-), to be constructed parallel to US 421 from Minden Road (SR 3413, Plan Sheet No. 4) to Company Mill Road (-Y-, see Plan Sheet No. 8), will provide access to the interchange. A portion of Company Mill Road, designated as -Y3- is being realigned to provide access to several homes along the original Company Mill Road. Access to US 421 from Hagan Stone Park Road (SR 3411) is being blocked from the north (see Plan Sheet No. 7). From the south, Hagan Stone Park Road (-Y4) will intersect with the new service road -Y1-. Improvements are being made at the intersection of Woody Mill Road (-Y-) and Liberty Road (-Y2-, SR 3549) to accommodate an anticipated increase in traffic flow (see Plan Sheet Nos. 10 and 13).

The geotechnical field investigation was conducted during May and June of 2008. The project was drilled by the NCDOT Geotechnical Engineering Unit crew. An ATV-mounted CME-550 drill machine was used during the field investigation. Standard Penetration Tests were performed in selected borings and additional borings were advanced using continuous flight augers. Rod soundings were taken at two locations. Representative soil samples were collected for visual classification in the field and submitted for laboratory analysis by NCDOT's Materials and Tests Unit.

The following alignments, totaling 3.8 miles, were investigated. Subsurface soil profiles, or cross-sections, of these alignments are included in this report:

<u>Line</u>	<u>Station</u>		
-L-	80+50	to	90+00
-Y-	10+00	to	54+00
-Y1-	14+37	to	82+53

-Y2-	10+05	to	23+50
-Y3-	12+00	to	15+84
-LPB-	10+00	to	20+69
-RPB-	10+00	to	28+39
-RPC-	10+00	to	29+98
-RPD-	10+00	to	22+87

Areas of Special Geotechnical Interest

1) **Highly Plastic Clay Soils:** Occurrences of highly plastic clay soil (Plasticity Index greater than 25) are noted below:

<u>Alignment</u>	<u>Station</u>	<u>Offset</u>
-Y-	44+00	CL
-Y-	46+50	20 RT
-Y1-	16+50	30 LT
-Y1-	26+00	25 RT
-Y1-	30+00	20 LT
-Y1-	59+00	CL
-Y2-	10+85	30 LT
-Y3-	13+50	10 RT
-RPC-	11+00	10 RT

2) **Crystalline Rock:** Crystalline rock was encountered in the following borings:

<u>Alignment</u>	<u>Station</u>	<u>Offset</u>
-Y1-	26+00	25 RT
-Y1-	28+00	30 RT
-Y1-	32+50	CL
-Y1-	36+20	60 RT
-Y1-	49+00	25 LT
-RPB-	24+00	20 LT
-RPB-	26+50	CL
-RPC-	28+50	CL
-RPD-	15+50	70 LT
-RPD-	16+15	40 LT
-RPD-	16+65	60 LT
-RPD-	17+50	20 LT
-RPD-	17+50	40 RT
-RPD-	17+50	70 RT
-RPD-	18+00	25 RT
-RPD-	18+00	30 LT
-RPD-	20+00	CL

- 3) Artificial Fill: Artificial fill soil occurs in the pond dam at the following intervals:

<u>Alignment</u>	<u>Station</u>
-LPB-	15+54 to 16+27
-RPB-	23+04 to 24+98

- 4) Soft Foundation Soils: The following area contains unconsolidated, soft alluvial soils:

<u>Alignment</u>	<u>Station</u>
-RPB-	22+33 to 24+20

- 5) Shallow Groundwater: Shallow groundwater, which may cause problems during construction, was encountered in the following interval:

<u>Alignment</u>	<u>Station</u>
-RPB-	22+33 to 24+20

- 6) Water wells: One water well was found within the proposed right of way at the following location:

<u>Alignment</u>	<u>Station/Offset</u>
-Y-	26+15/15 LT

Physiography and Geology

The project is located in the central Piedmont Physiographic Province. The terrain is moderately rolling. A mixture of woods, pastures, and single-family homes occur within the project area. Geologically, the project is located within the Carolina Slate Belt. Soils within the project are mainly derived from the underlying metamorphosed granite.

Soil Properties

Soils encountered at the project site include artificial fill, roadway embankment, residual, and alluvial soils.

Roadway embankment soil occurs in places beneath the existing US 421, as well as the Woody Mill Road portion of the -Y- alignment. Along the -Y- alignment, the embankment soil ranges from two to fifteen feet in thickness, and consists of gray, moist, medium dense, silty sand (AASHTO classification of A-2-4). The roadway embankment soil on -L- from 87+00 to 90+00 consists of two to six feet of tan, moist, stiff sandy clay (A-6).

Artificial fill soil occurs in an earthen pond dam along the -RPB- and -LPB- alignments. The fill soil consists of eleven feet of brown, moist, medium stiff to stiff, sandy clay (A-6). The fill soil overlies alluvial and residual soil (see discussion below for details). Fill soil also occurs over the gas pipelines that cross -Y- at 46+90 (see Plan Sheet Nos. 8 and 12, and Profile Sheet No. 15). The depth and width of the fill soil is estimated.

Alluvial soils occur in several areas and have several depositional origins. The most recently deposited alluvial soils occur in active streams, wet-weather runs, and at the entrance to several ponds and lakes. These recent sediments include wet to saturated, loose, silty sand (A-2-4) and pebbles (see

boring at -Y- 28+75), as well as tan and gray, medium stiff, moist, sandy silt (A-4) and sandy clay (A-6) at -Y1- 42+00.

Older alluvial soils were encountered in four areas. The most significant area is made up of approximately two feet of gray, wet to saturated, soft, silty, alluvial clay (A-7-5) deposited in the former pond at -RPB- 23+04 to 24+98 (see Plan Sheet Nos. 8 and 11, Profile Sheet No. 21, and Cross-section Sheet Nos. 28 through 30). These sediments were deposited prior to the dam being breached and are denoted as "Alluvial (Pond Sediments)". These pond sediments overlie alluvial floodplain sediments which were deposited within the original stream channel prior to the construction of the dam. Based on the boring through the dam (-RPB- 24+00/10 LT), the original floodplain sediments range up to nine feet in thickness and consist of gray, moist to wet, soft to medium stiff, sandy silt (A-4). These sediments occur beneath the pond sediments and extend downstream to the Woody Mill Road embankment. South of the embankment, the floodplain sediments appear to have been removed, or eroded away. This same stream channel flows southward, parallel to US 421, with several tributaries emptying into it before it flows beneath US 421 at -L- 85+00. Additional alluvial soil was encountered beneath the roadway embankment at -L- 87+00 and 90+00. The alluvial soils at this location consist of gray, moist to wet, medium stiff, sandy silt (A-4) and sandy clay (A-6).

The fourth area of older alluvial soil was encountered in a boring 50 feet left of -Y- 38+00 (see Plan Sheet No. 8 and Profile Sheet Nos. 15, 22, and 23). Approximately twelve feet of alluvial soil occurs at this location in a former drainage area estimated to be forty to sixty feet in width. Six feet of gray, moist, medium stiff to stiff, sandy silt and sandy clay overlies six feet of gray, wet, medium dense, silty sand (A-2-4). The alluvial sand overlies weathered rock. This drainage area may have been a more active stream prior to the construction of US 421, flowing from southwest to northeast across the US 421 alignment. Currently, it is a wet-weather run.

Residual soils are derived from the in-place weathering of the underlying metamorphosed granitic bedrock. Tan, dry to moist, stiff to hard, sandy silt (A-4) is the most common soil in the project area. Tan, stiff to hard, sandy clay (A-6) and silty clay (A-7-5 and A-7-6) are also present. Residual, plastic "cap" clays occur at, or near, the ground surface over several areas of the project. These clays exhibit moderate to high plastic indices ranging from 26 to 38. Residual soils grade into weathered rock that retains the relict characteristics of the metamorphosed granite intrusions.

Rock Properties

Weathered rock and crystalline rock occur throughout the project. The weathered rock is derived from the underlying metamorphosed granite intrusions and ranges in depth from 0.5 to 17 feet. Crystalline rock occurs in the areas noted above in the "Areas of Special Geotechnical Interest". The crystalline bedrock consists mostly of metamorphosed granite.

Groundwater

Groundwater was encountered in 11 of the 81 borings completed on this project. Groundwater, when encountered in residual soil or weathered rock, was variable across the project, ranging from 1.0 feet to 14.5 feet below the ground surface. The water depth in the

alluvial area located at the intersection of -RPC-, -RPD-, and -Y- alignments was at 6.8 feet. Groundwater in the alluvial pond sediments, located at -RPB- 23+04 to 24+98 occurs 0.2 feet from the surface. The shallow groundwater in this alluvial area may cause problems during construction.

Artificial Fill Soil in Breached Earthen Pond Dam

Artificial fill soil occurs in an earthen dam on the -RPB- and -LPB- alignments (see Plan Sheet Nos. 8 and 11, Profile Sheet Nos. 20 and 21, and Cross-section Sheet Nos. 28 through 30). The dam is estimated to be up to 80 feet wide. The base of the dam overlies alluvial floodplain sediments across the former floodplain and residual sandy clay (A-6) on its flanks. The western edge of the dam has been breached to a depth of approximately eleven feet, exposing residual soil in the bottom of the steep-sided gully.

Prepared by,



Thomas P. Moorefield, LG
Project Geological Engineer

EARTHWORK BALANCE SHEET

Volumes in Cubic Yards

PROJECT R-2612A

COUNTY: GUILFORD

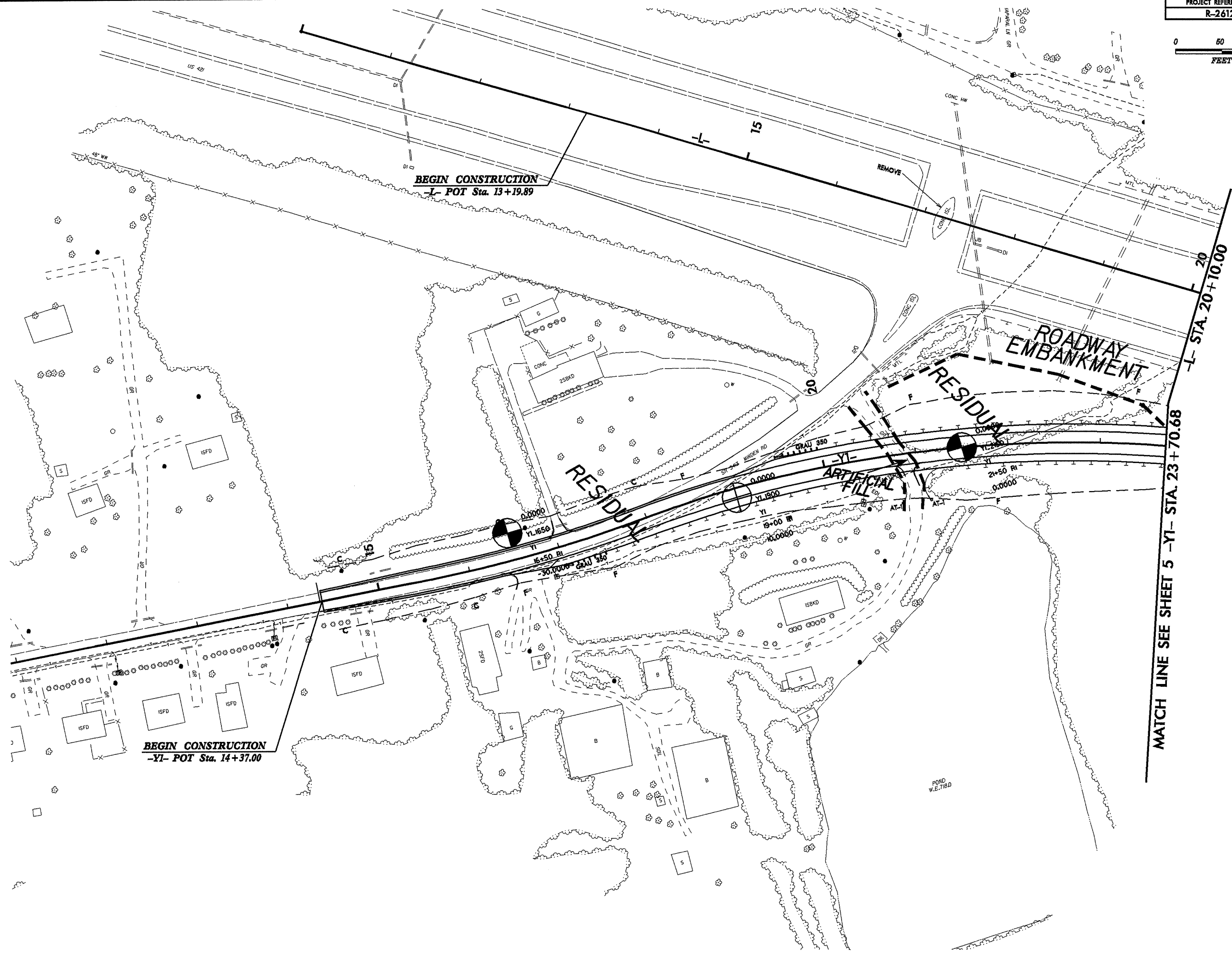
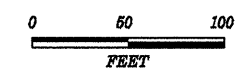
COMPILED BY: EMS 8-2-10

CHECKED BY: SCL 9-2-2010

ALIGN	STATION	STATION	EXCAVATION					EMBANKMENT					WASTE			
			TOTAL	ROCK	UNDERCUT	UNSUIT.	SUITABLE	TOTAL	ROCK	EARTH	EMBANK.	BORROW	ROCK	SUITABLE	UNSUIT.	TOTAL
			UNCLASS.			UNCLASS.	UNCLASS.				(+ 20% Earth (+ 25% Rock)					
-L- (LT)	41+30.54	53+10.17	1307				1307	1161		1161	1393	86		0		0
-L- (LT)	62+72.74	72+18.43	932				932	1600		1600	1920	988		0		0
-LPB-	12+38.47	15+50.00	2440				2440	4597		4597	5516	3076		0		0
-RPB-	13+00.00	28+39.27	1803		4430		1803	125703		125703	150844	149041		0	4430	4430
	SUB TOTAL		6482		4430		6482	133061		133061	159673	153191		0	4430	4430
-L- (RT)	50+18.24	57+87.22	1403				1403	197		197	236	0		1167		1167
-L- (RT)	80+50.00	93+68.19	7643				7643	72		72	86	0		7557		7557
-RPC-	14+67.47	29+97.68	12222				12222	51024		51024	61229	49007		0		0
-RPD-	14+35.89	22+87.47	32824	8800			24024	16182	8800	5182	15018	0		17806		17806
	SUB TOTAL		54092	8800			45292	67475	8800	56475	76569	49007		26530		26530
-Y-	10+00	32+16.06 (BEGIN BRIDGE)	392				392	114379		114379	137255	136863		0		0
-Y2-	10+05	15+34.85	233				233	6907		6907	8288	8055		0		0
-Y2-	15+88.72	23+50	3921				3921	49		49	59	0		3862		3862
-DR2-	10+00.00	10+85.60	0				0	70		70	84	84		0		0
	SUB TOTAL		4546				4546	121405		121405	145686	145002		3862		3862
-Y-	34+66.06 (END BRIDGE)	54+00	1828				1828	59473		59473	71368	69540		0		0
-Y3-	12+00	15+84.26	613				613	150		150	180	0		433		433
-DR3-	10+00.00	12+07.86	18				18	2048		2048	2458	2440		0		0
	SUB TOTAL		2459				2459	61671		61671	74006	71980		433		433
-Y1-	14+37.00	37+50.00	8567				8567	31157		31157	37388	28821		0		0
-DR1-	10+00.00	10+84.61	0				0	73		73	88	88		0		0
-DR4-	10+12.00	11+35.00	4				4	955		955	1146	1142		0		0
	SUB TOTAL		8571				8571	32185		32185	38622	30051		0		0
-Y1-	37+50.00	56+50.00	5734				5734	25377		25377	30452	24718		0		0
-Y1-	56+50.00	82+52.97	3135				3135	28827		28827	34592	31457		0		0
-Y4-	10+14.21	11+75.00	146				146	106		106	127	0		19		19
	SUB TOTAL		9015				9015	54310		54310	65171	56175		19		19
	TOTAL		85165	8800	4430		76365	470107	8800	459107	559727	505406		30844	4430	35274
	Loss due to clear. & grub.		-6750				-6750					6750				
	Earth Waste to repl. Borrow											-30844		-30844		-30844
	Additional Undercut				2000			2000		2000	2400	2400			2000	2000
	Estimated Shoulder Material							12100		12100	14520	14520				
	PROJECT TOTAL		78415	8800	6430		69615	484207	8800	473207	576647	498232		0	6430	6430
	Est. to replace topsoil on borrow pits											24912				
	GRAND TOTAL		78415	8800	6430		69615	484207		473207	576647	523144		0	6430	6430
	SAY		81000									539000				

DDE=2640 yd³

Note: Earthwork quantities are calculated by the Roadway Design Unit. These quantities are based in part on subsurface data provided by The Geotechnical Engineering Unit.



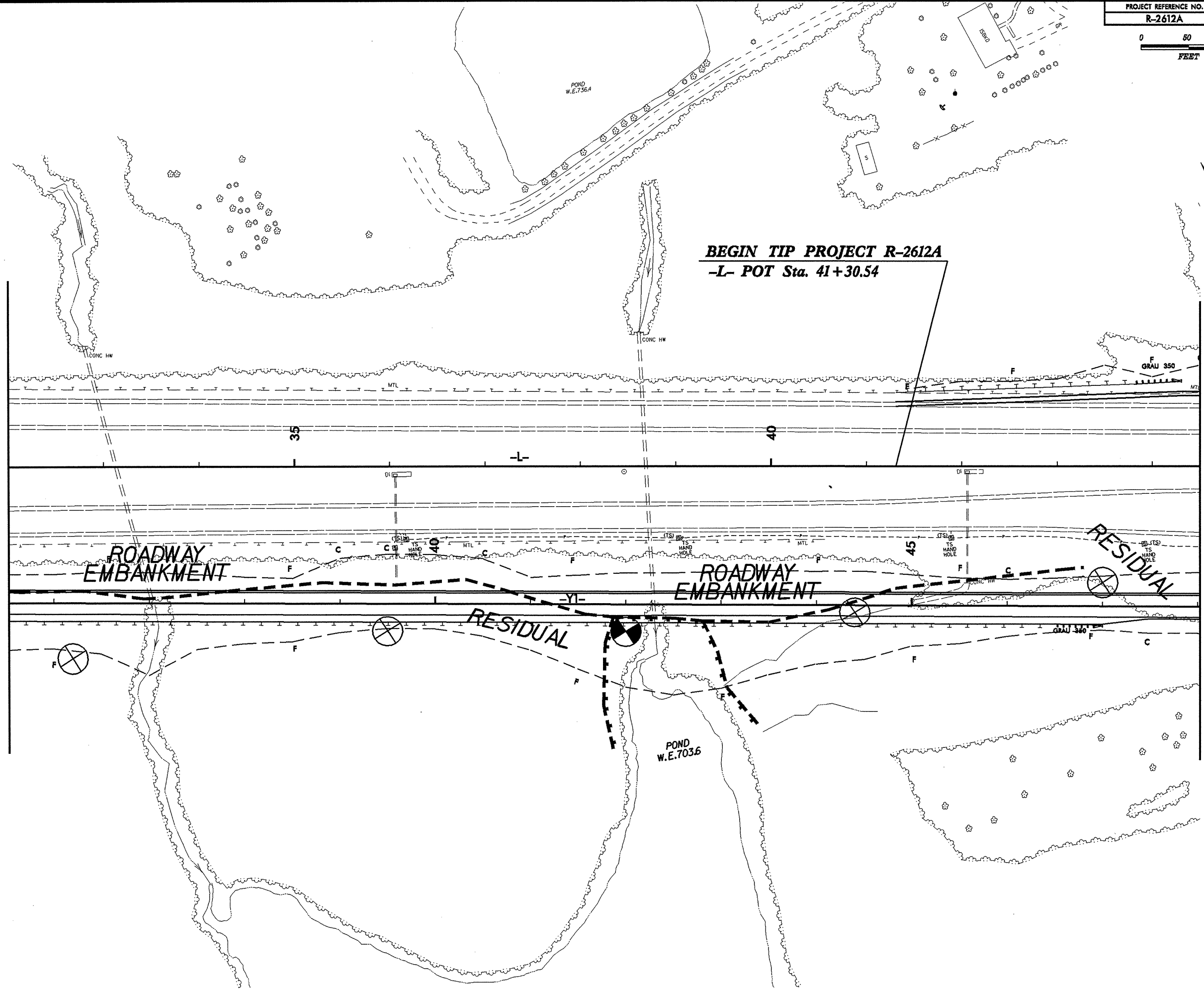
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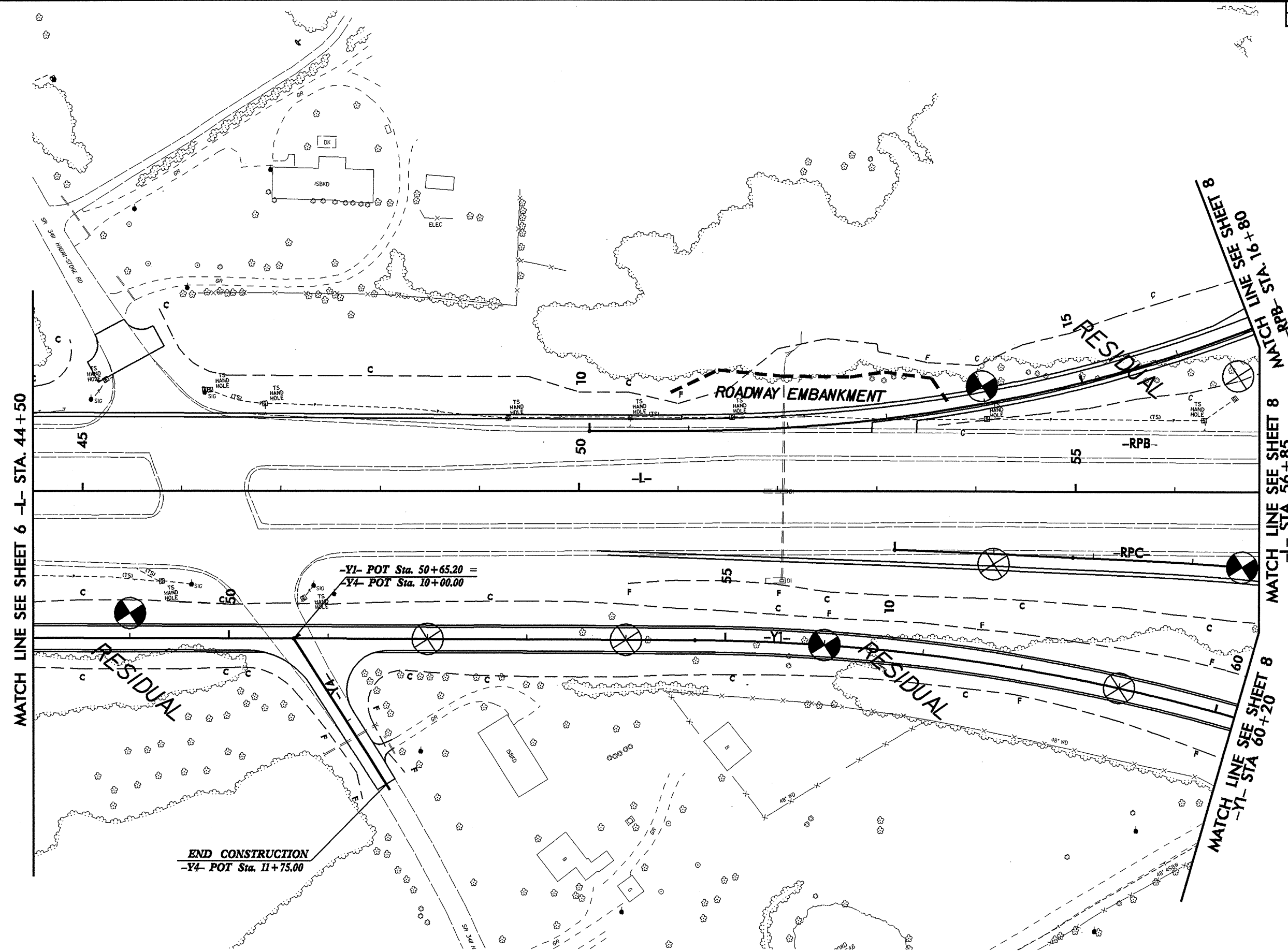
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-L- POT Sta. 41+30.54

MATCH LINE SEE SHEET 5 -L- STA. 32+00.00

MATCH LINE SEE SHEET 7 -L- STA. 44+50.00



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MATCH LINE SEE SHEET 6 -L- STA. 44+50

MATCH LINE SEE SHEET 8 -R- STA. 19+08

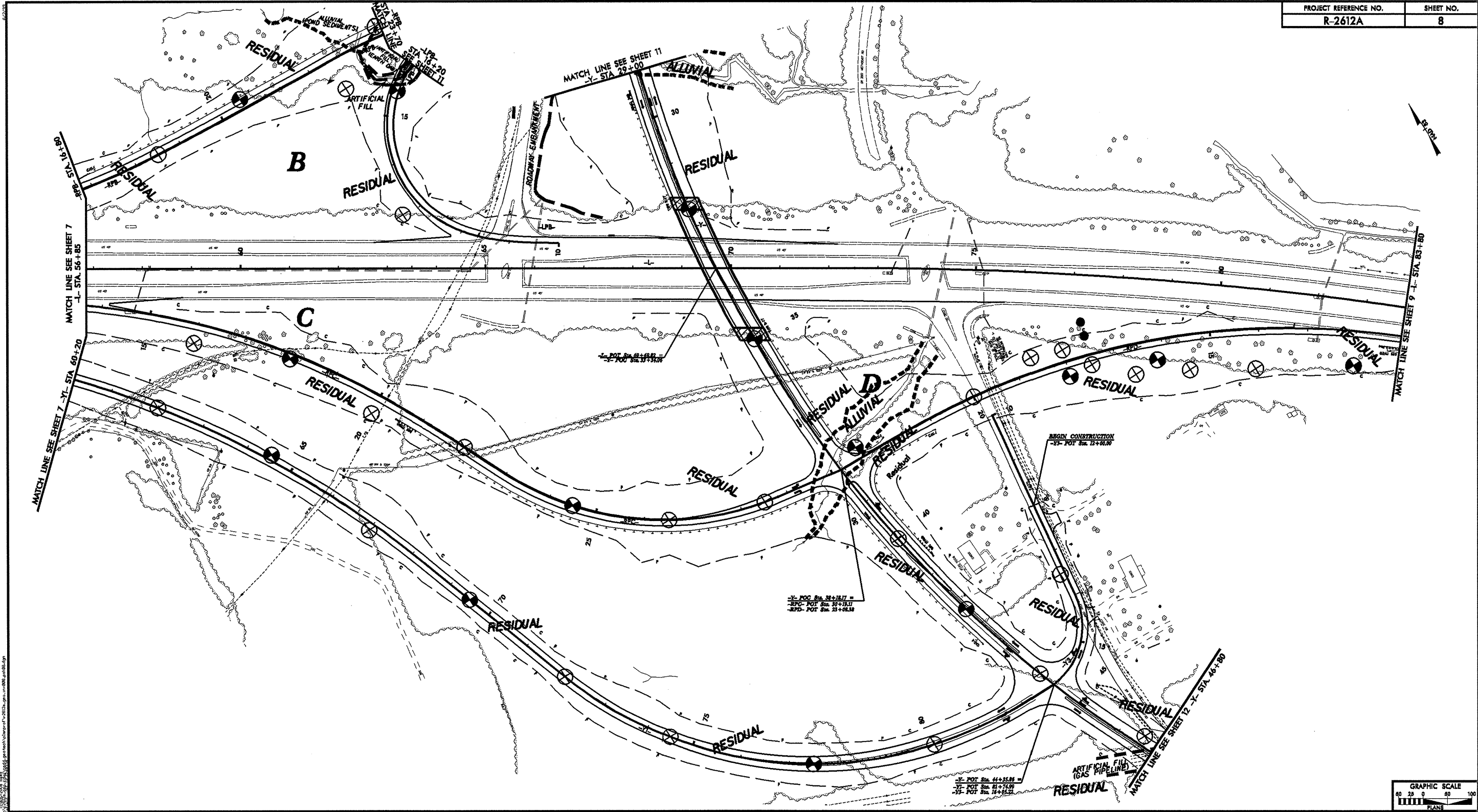
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MATCH LINE SEE SHEET 8 -Y1- STA. 60+20

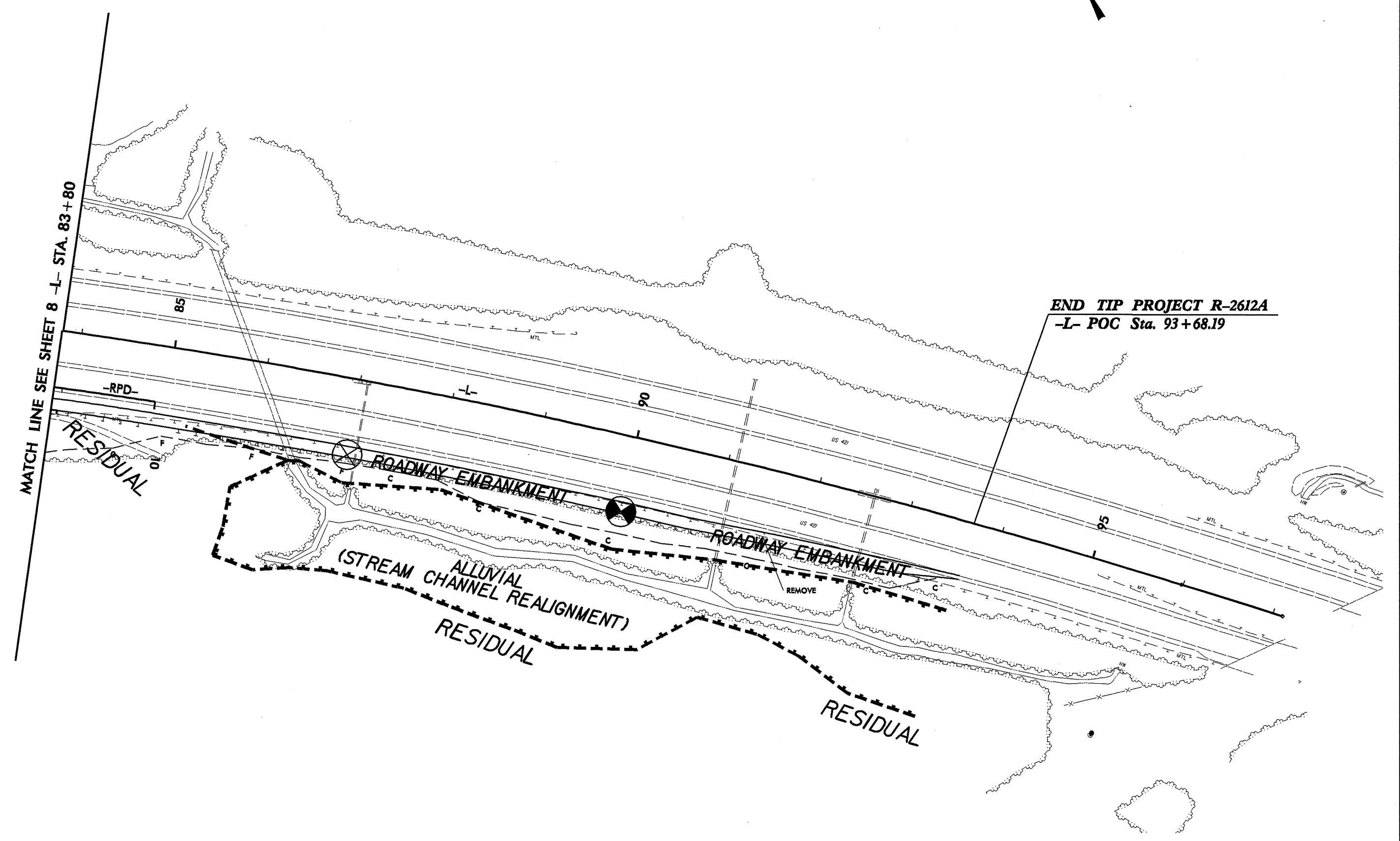
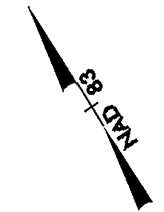
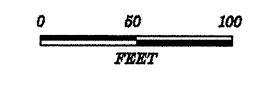
END CONSTRUCTION
-Y4- POT Sta. 11+75.00

-Y1- POT Sta. 50+65.20 =
-Y4- POT Sta. 10+00.00

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ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED EXCEPT WHERE SHOWN OTHERWISE BY A CONTROLLED UNCLASSIFICATION GUIDE



END TIP PROJECT R-2612A
-L- POC Sta. 93+68.19

MATCH LINE SEE SHEET 8 -L- STA. 83+80

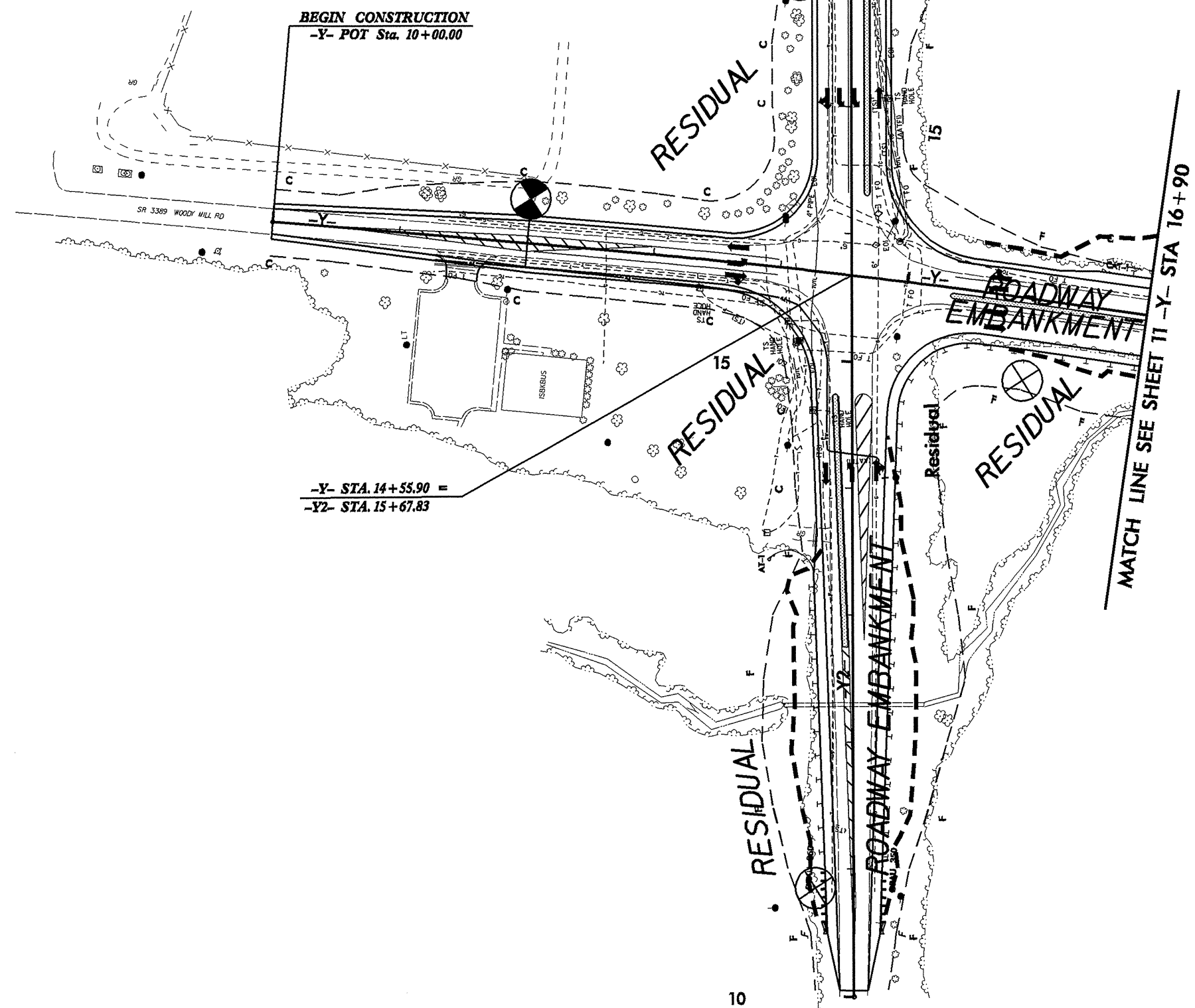
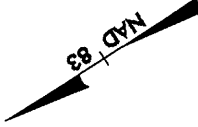
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MATCH LINE SEE SHEET 13 -Y2- STA 18+00

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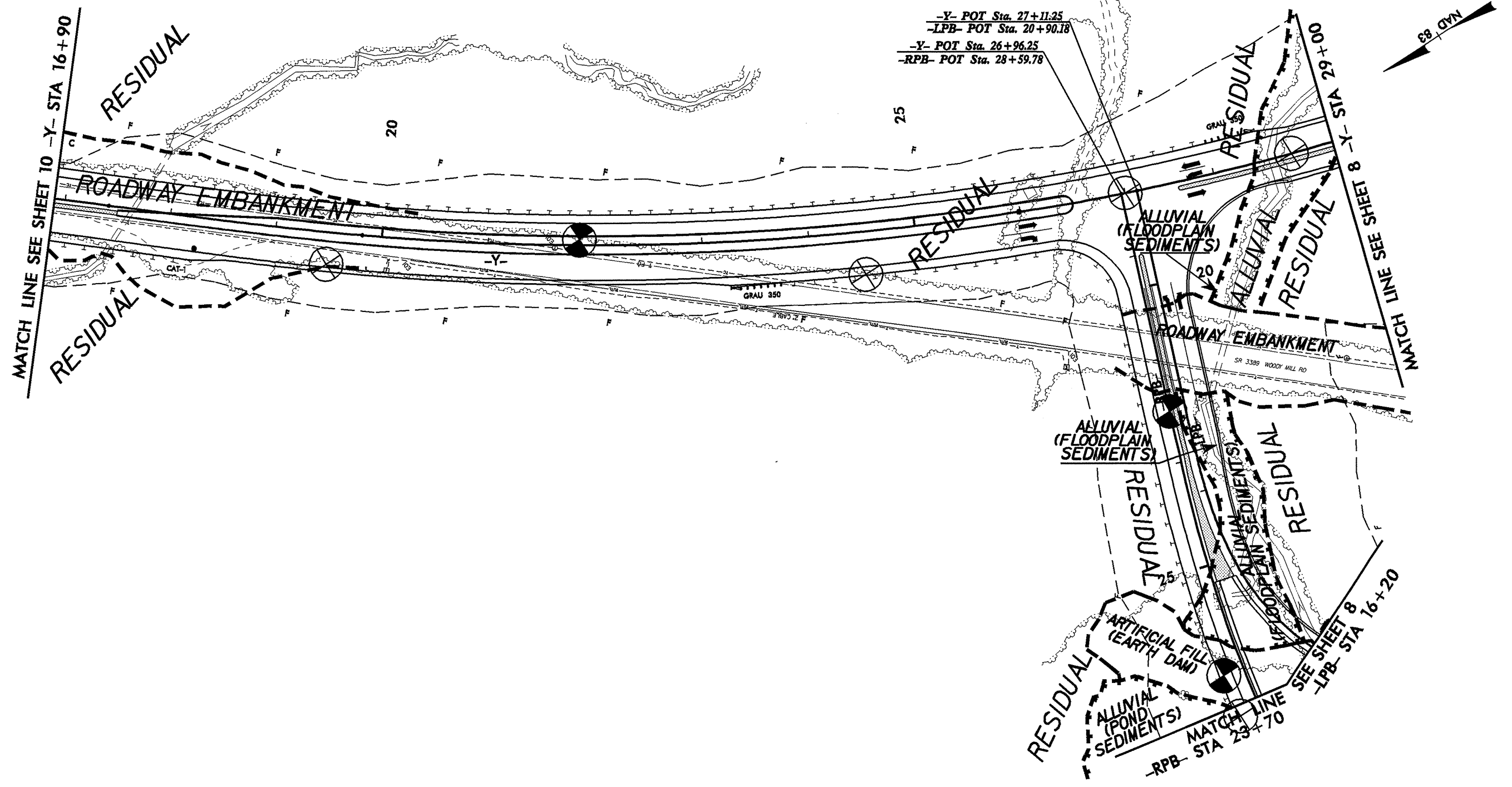
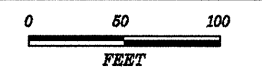


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PROJECT REFERENCE NO.	SHEET NO.
R-2612A	11



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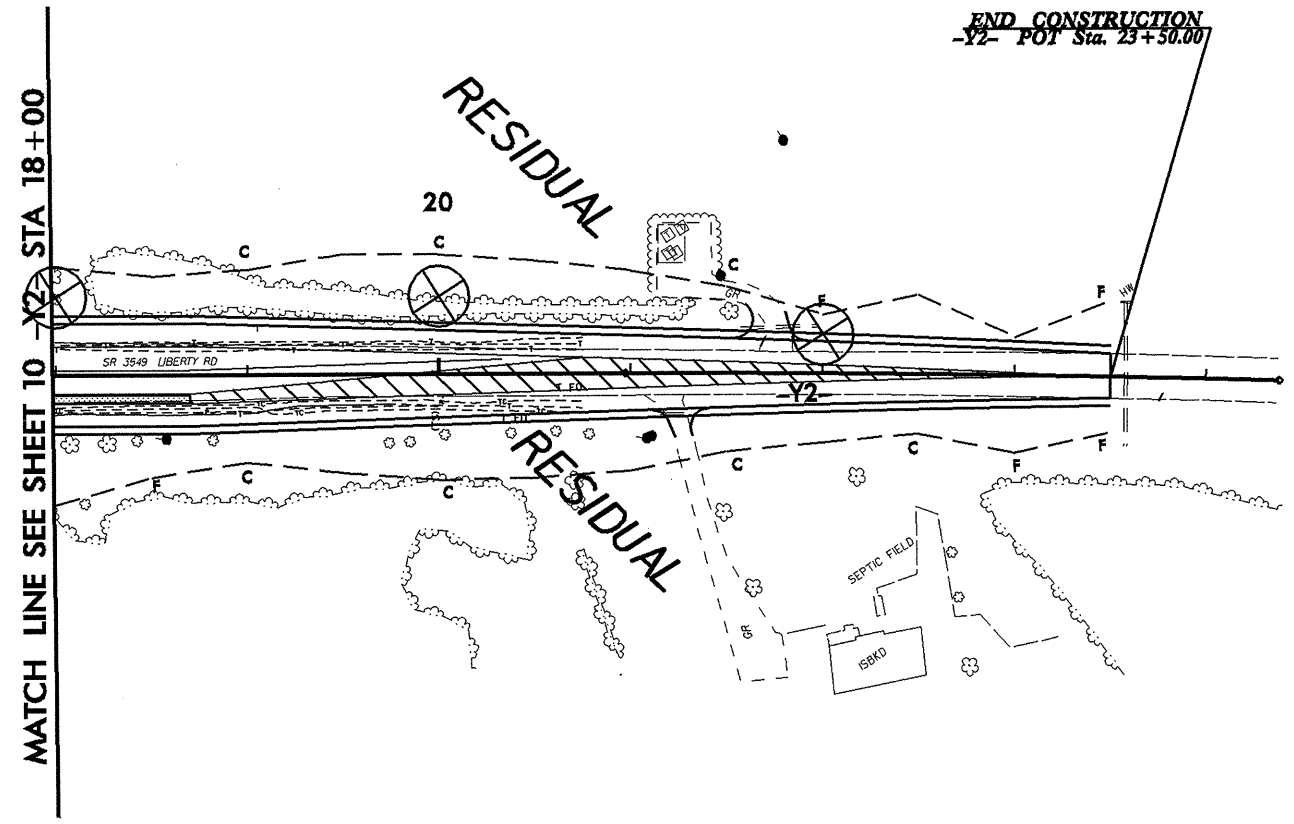
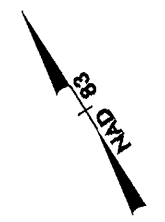
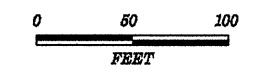
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MATCH LINE SEE SHEET 8 -Y- STA. 46+80



TOP = 105.1562
 ANY ACCESSIBLE
 MANHOLE BOLTED SHUT



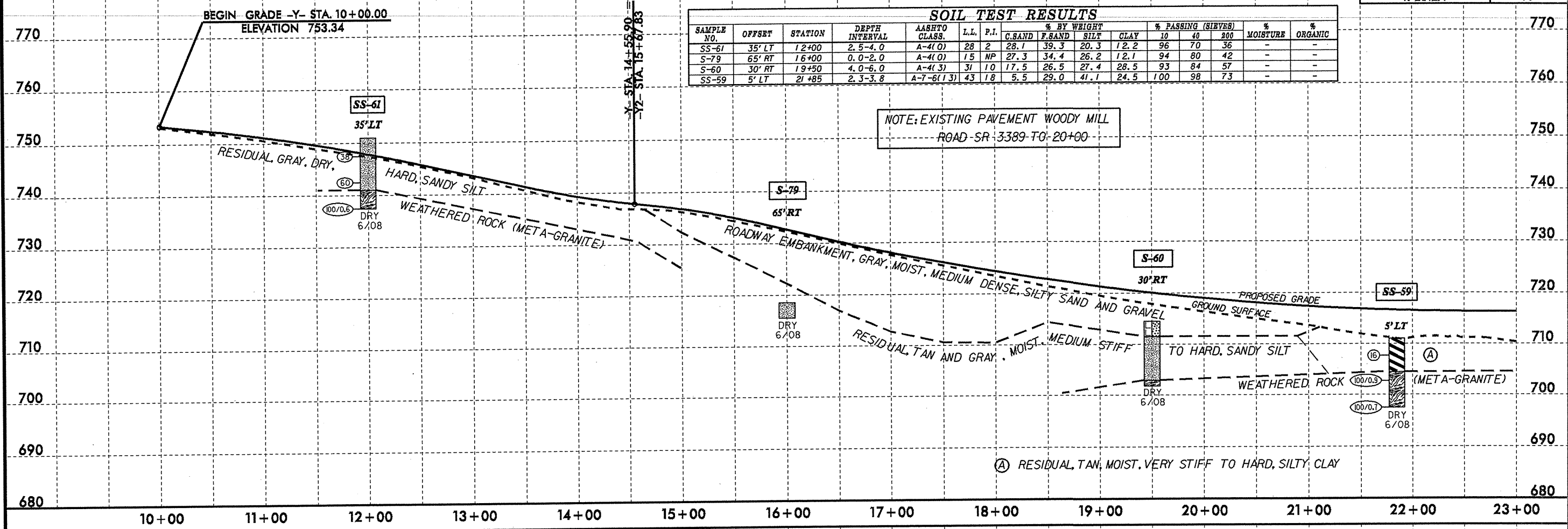
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SOIL TEST RESULTS

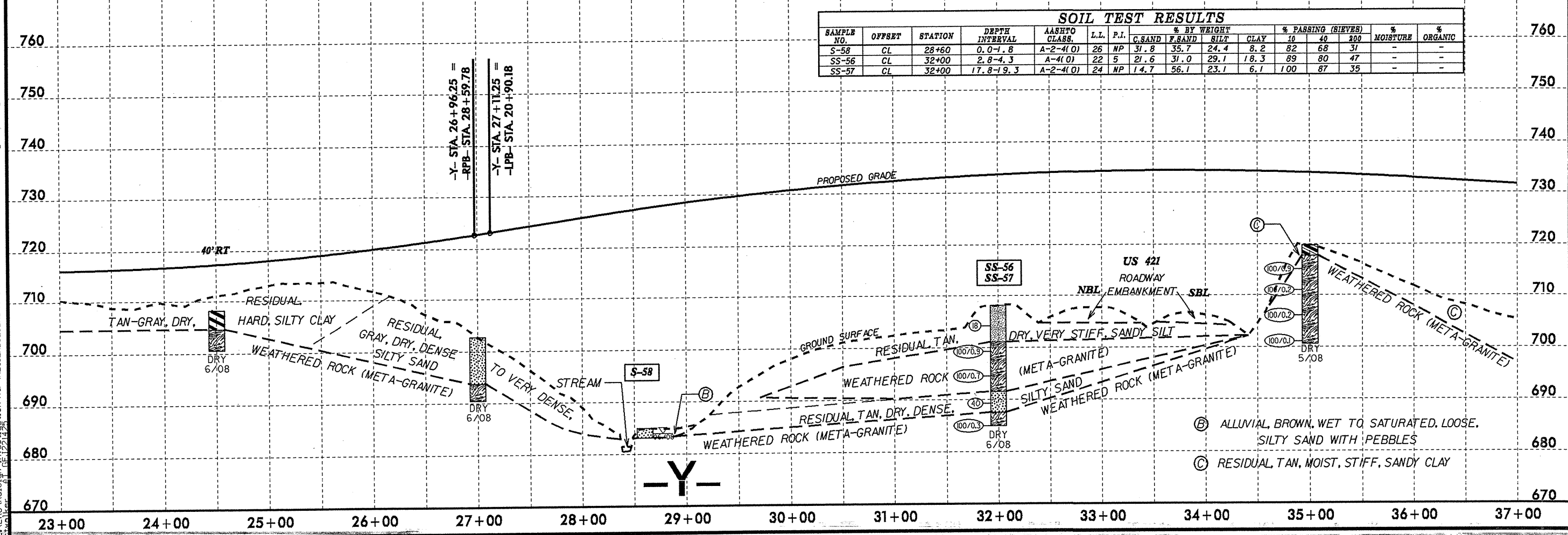
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-61	35' LT	12+00	2.5-4.0	A-4(0)	28	2	28.1	39.3	20.3	12.2	96	70	36	-	-
S-79	65' RT	16+00	0.0-2.0	A-4(0)	15	NP	27.3	34.4	26.2	12.1	94	80	42	-	-
S-60	30' RT	19+50	4.0-6.0	A-4(3)	31	10	17.5	26.5	27.4	28.5	93	84	57	-	-
SS-59	5' LT	21+85	2.3-3.8	A-7-6(1.3)	43	18	5.5	29.0	41.1	24.5	100	98	73	-	-

NOTE: EXISTING PAVEMENT WOODY MILL ROAD SR 3389 TO 20+00



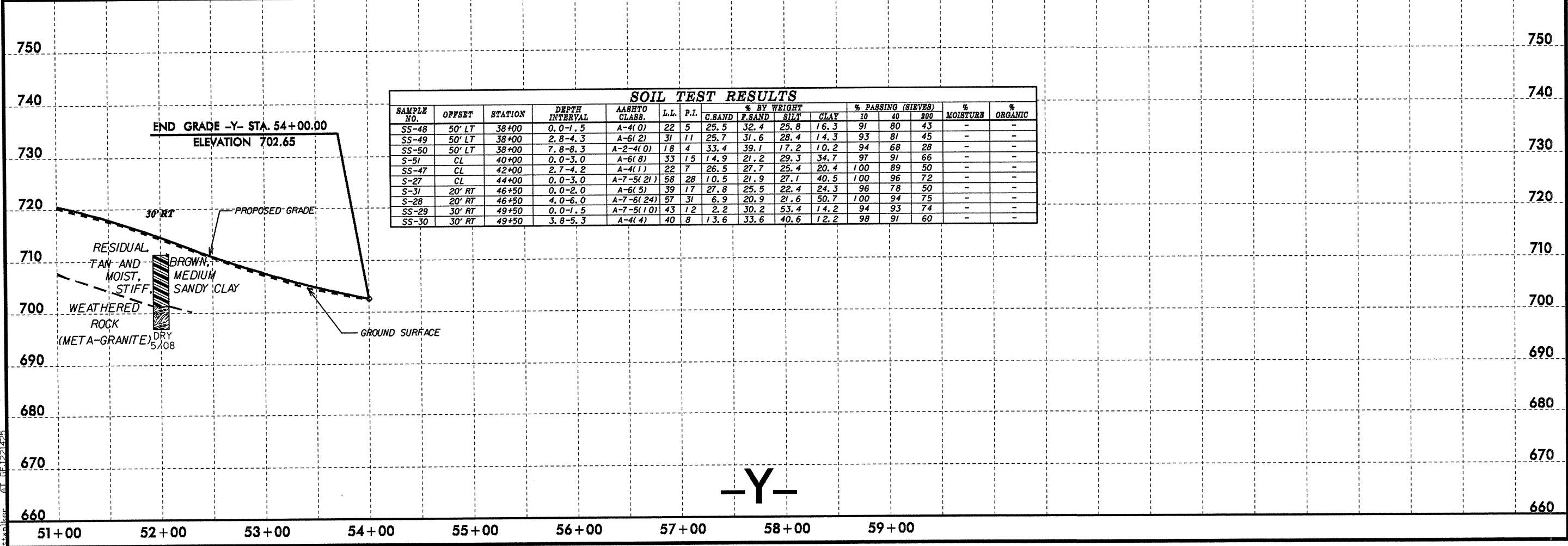
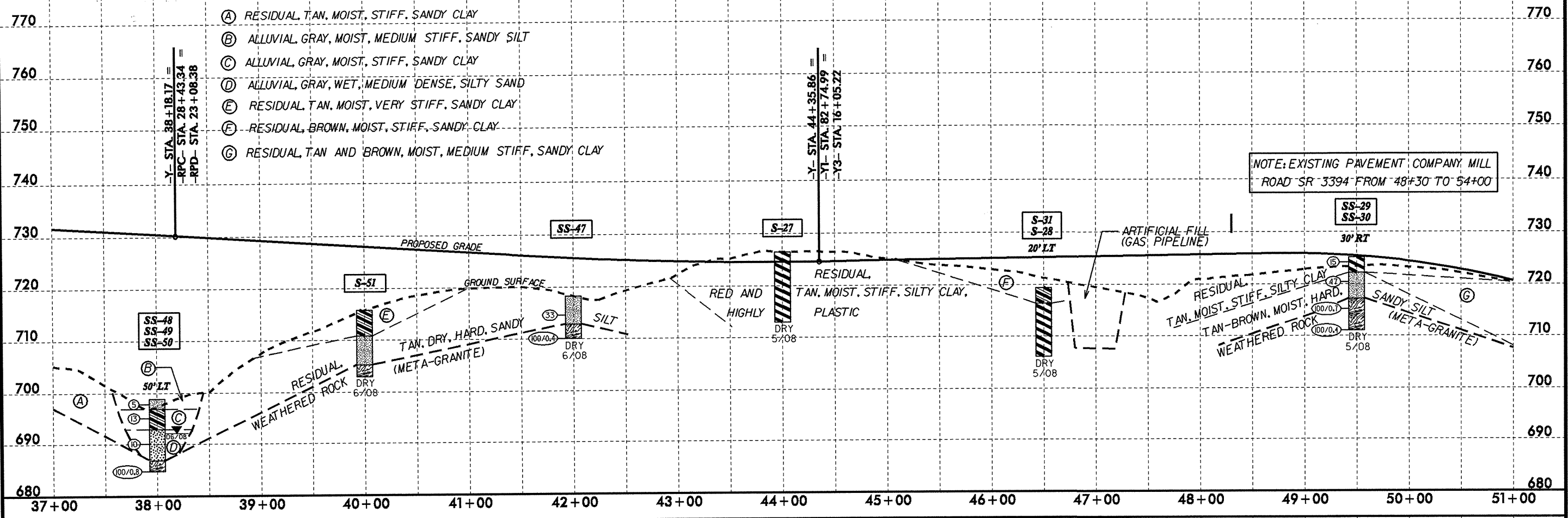
SOIL TEST RESULTS

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		
S-58	CL	28+60	0.0-1.8	A-2-4(0)	26	NP	31.8	35.7	24.4	8.2	82	68	31	-	-
SS-56	CL	32+00	2.8-4.3	A-4(0)	22	5	21.6	31.0	29.1	18.3	89	80	47	-	-
SS-57	CL	32+00	17.8-19.3	A-2-4(0)	24	NP	14.7	56.1	23.1	6.1	100	87	35	-	-



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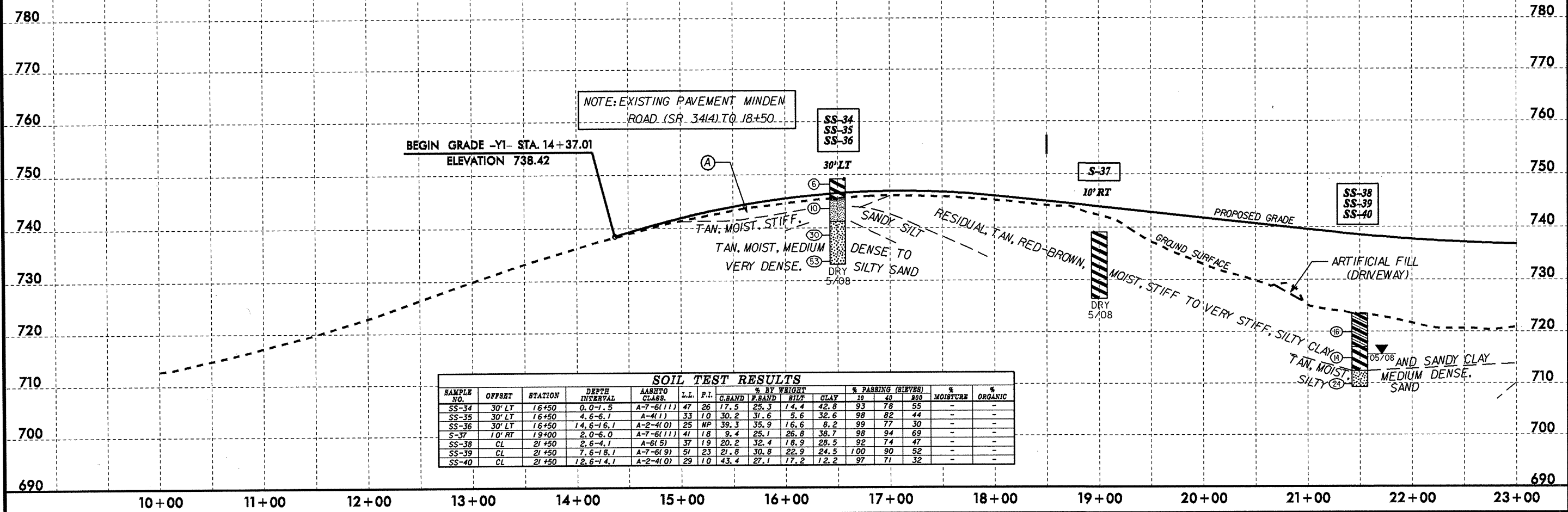


SOIL TEST RESULTS

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-48	50' LT	38+00	0.0-1.5	A-4(0)	22	5	25.5	32.4	25.8	16.3	91	80	43	-	-
SS-49	50' LT	38+00	2.8-4.3	A-6(2)	31	11	25.7	31.6	28.4	14.3	93	81	45	-	-
SS-50	50' LT	38+00	7.8-8.3	A-2-4(0)	18	4	33.4	39.1	17.2	10.2	94	68	28	-	-
S-51	CL	40+00	0.0-3.0	A-6(8)	33	15	14.9	21.2	29.3	34.7	97	91	66	-	-
SS-47	CL	42+00	2.7-4.2	A-4(1)	22	7	26.5	27.7	25.4	20.4	100	89	50	-	-
S-27	CL	44+00	0.0-3.0	A-7-5(21)	58	28	10.5	21.9	27.1	40.5	100	96	72	-	-
S-31	20' RT	46+50	0.0-2.0	A-6(5)	39	17	27.8	25.5	22.4	24.3	96	78	50	-	-
S-28	20' RT	46+50	4.0-6.0	A-7-6(24)	57	31	6.9	20.9	21.6	50.7	100	94	75	-	-
SS-29	30' RT	49+50	0.0-1.5	A-7-5(10)	43	12	2.2	30.2	53.4	14.2	94	93	74	-	-
SS-30	30' RT	49+50	3.8-5.3	A-4(4)	40	8	13.6	33.6	40.6	12.2	98	91	60	-	-

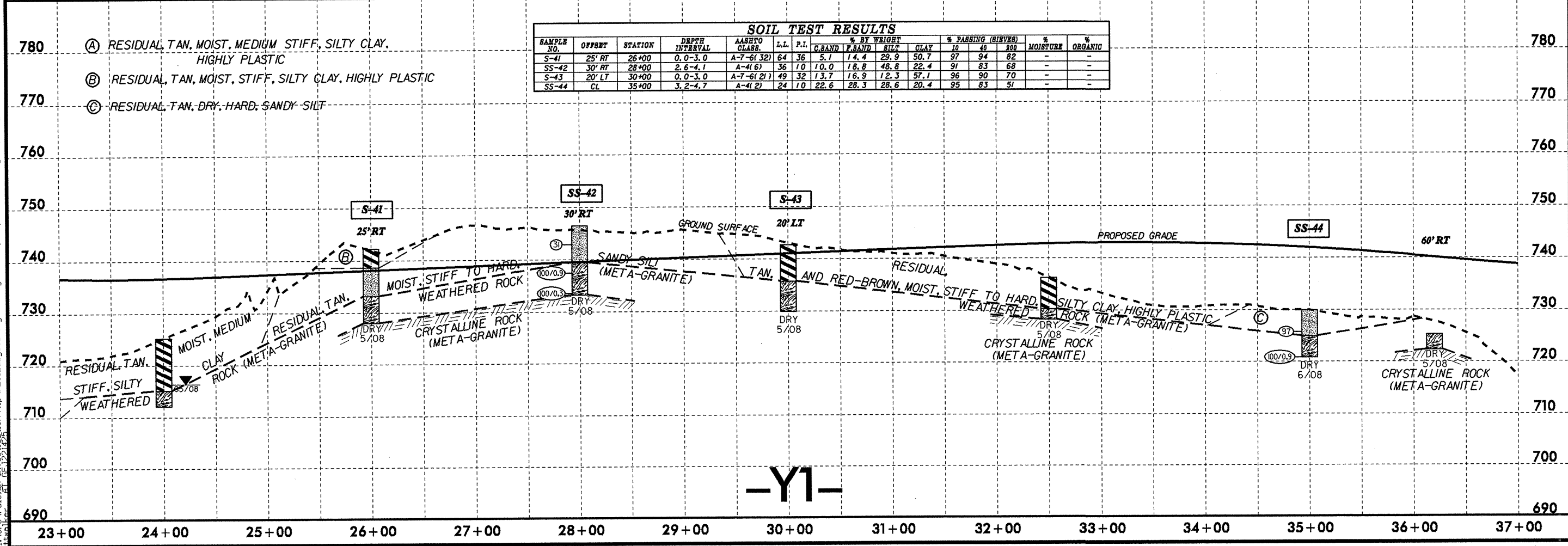
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SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT			% PASSING (SIEVES)			% MOISTURE	% ORGANIC	
							G.BAND	F.BAND	SILT	10	40	200			
SS-34	30' LT	16+50	0.0-1.5	A-7-6(11)	47	26	17.5	25.3	14.4	42.8	93	78	55	-	-
SS-35	30' LT	16+50	4.6-6.1	A-4(1)	33	10	30.2	37.6	5.6	32.6	98	82	44	-	-
SS-36	30' LT	16+50	14.6-16.1	A-2-4(0)	25	MP	39.3	35.9	16.6	8.2	99	77	30	-	-
S-37	10' RT	19+00	2.0-6.0	A-7-6(11)	41	18	9.4	25.1	26.8	38.7	98	94	69	-	-
SS-38	CL	21+50	2.6-4.1	A-6(5)	37	19	20.2	32.4	18.9	28.5	92	74	47	-	-
SS-39	CL	21+50	7.6-18.1	A-7-6(9)	51	23	21.8	30.8	22.9	24.5	100	90	52	-	-
SS-40	CL	21+50	12.6-14.1	A-2-4(0)	29	10	43.4	27.1	17.2	12.2	97	71	32	-	-



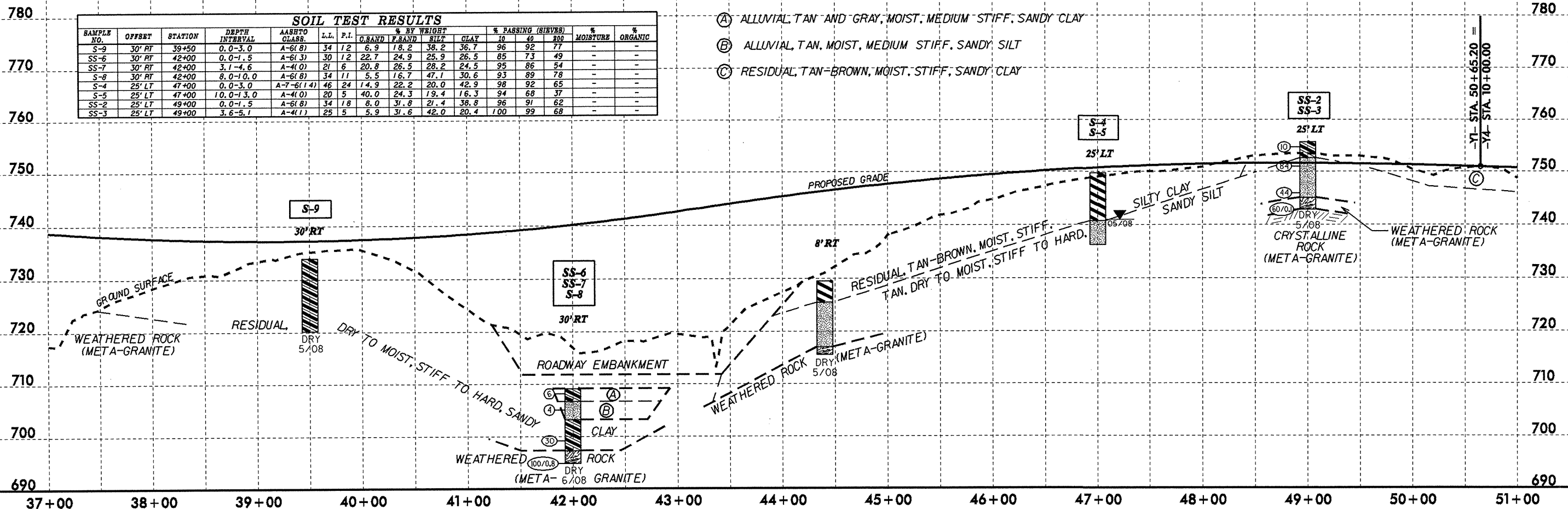
SOIL TEST RESULTS

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							G.BAND	F.BAND	SILT	10	40	200			
S-41	25' RT	26+00	0.0-3.0	A-7-6(32)	64	36	5.1	14.4	29.9	50.7	97	94	82	-	-
SS-42	30' RT	28+00	2.6-4.1	A-4(6)	36	10	10.0	18.8	48.8	22.4	91	83	68	-	-
S-43	20' LT	30+00	0.0-3.0	A-7-6(21)	49	32	13.7	16.9	12.3	57.1	96	90	70	-	-
SS-44	CL	35+00	3.2-4.7	A-4(2)	24	10	22.6	28.3	28.6	20.4	95	83	51	-	-

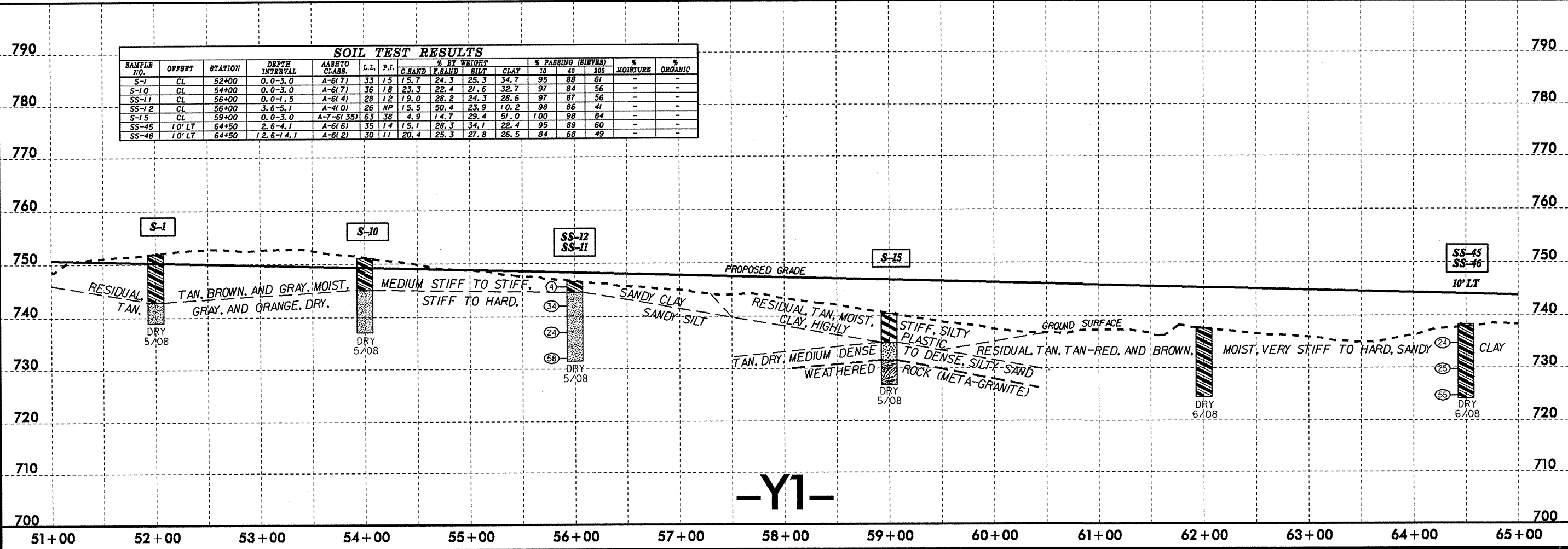
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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	ASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							G.BAND	F.BAND	SILT	CLAY	10	40	200		
S-9	30' RT	39+50	0.0-3.0	A-6(8)	34	12	6.9	18.2	38.2	36.7	96	92	77	-	-
SS-6	30' RT	42+00	0.0-1.5	A-6(3)	30	12	22.7	24.9	25.9	26.5	85	73	49	-	-
SS-7	30' RT	42+00	3.1-4.6	A-4(0)	21	6	20.8	26.5	28.2	24.5	95	86	54	-	-
S-8	30' RT	42+00	8.0-10.0	A-6(8)	34	11	5.5	16.7	47.1	30.6	93	89	78	-	-
S-4	25' LT	47+00	0.0-3.0	A-7-6(14)	46	24	14.9	22.2	20.0	42.9	98	92	65	-	-
S-5	25' LT	47+00	10.0-13.0	A-4(0)	20	5	40.0	24.3	19.4	16.3	94	68	37	-	-
SS-2	25' LT	49+00	0.0-1.5	A-6(8)	34	18	8.0	31.8	21.4	38.8	96	91	62	-	-
SS-3	25' LT	49+00	3.6-5.1	A-4(1)	25	5	5.9	31.6	42.0	20.4	100	99	68	-	-

- (A) ALLUVIAL, TAN AND GRAY, MOIST, MEDIUM STIFF, SANDY CLAY
- (B) ALLUVIAL, TAN, MOIST, MEDIUM STIFF, SANDY SILT
- (C) RESIDUAL, TAN-BROWN, MOIST, STIFF, SANDY CLAY

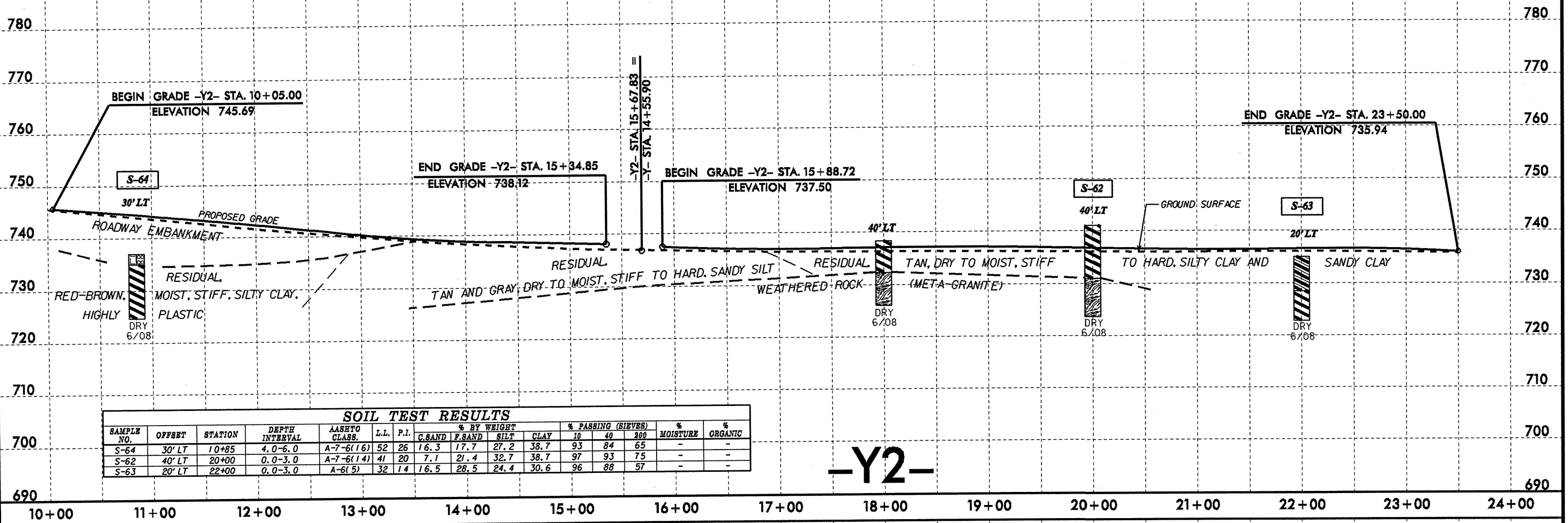


SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	ASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							G.BAND	F.BAND	SILT	CLAY	10	40	200		
S-1	CL	52+00	0.0-3.0	A-6(7)	33	15	15.7	24.3	25.3	34.7	95	88	61	-	-
S-10	CL	54+00	0.0-3.0	A-6(7)	36	18	23.3	22.4	21.6	32.7	97	84	56	-	-
SS-11	CL	56+00	0.0-1.5	A-6(4)	28	12	19.0	28.2	24.3	28.6	97	87	56	-	-
SS-12	CL	56+00	3.6-5.1	A-4(0)	26	NP	15.5	50.4	23.9	10.2	98	86	41	-	-
S-15	CL	59+00	0.0-3.0	A-7-6(35)	63	38	4.9	14.7	29.4	51.0	100	98	84	-	-
SS-45	10' LT	64+50	2.6-4.1	A-6(6)	35	14	15.1	28.3	34.1	22.4	95	89	60	-	-
SS-46	10' LT	64+50	12.6-14.1	A-6(2)	30	11	20.4	25.3	27.8	26.5	84	68	49	-	-



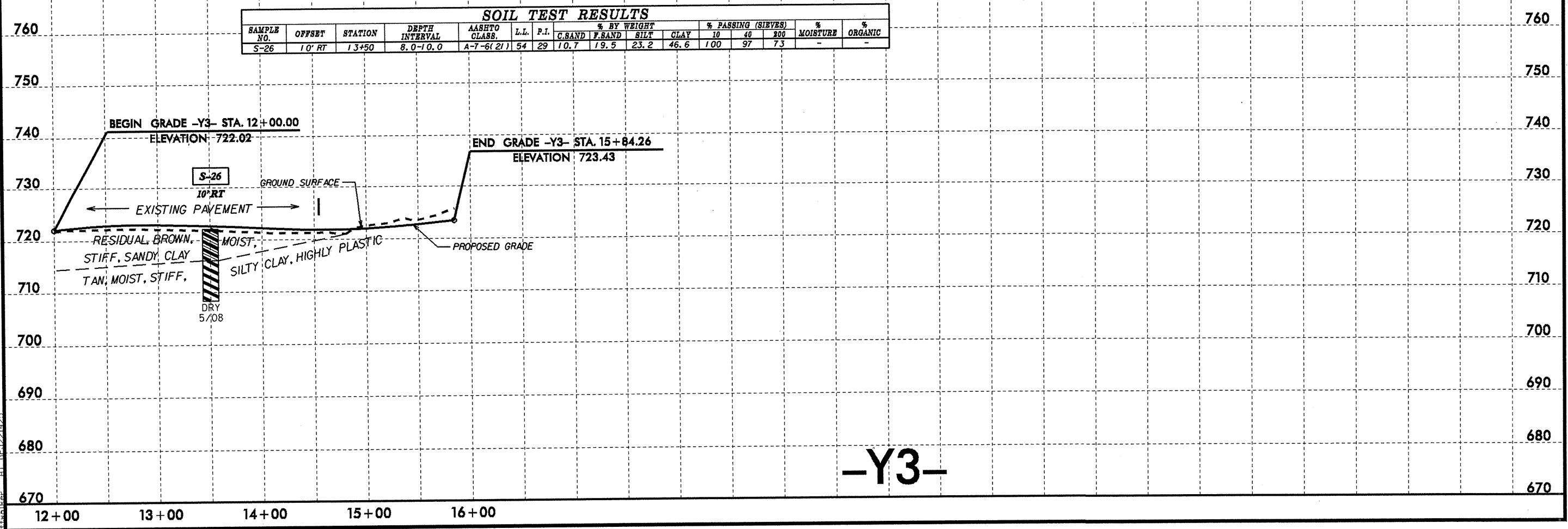
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-Y2-

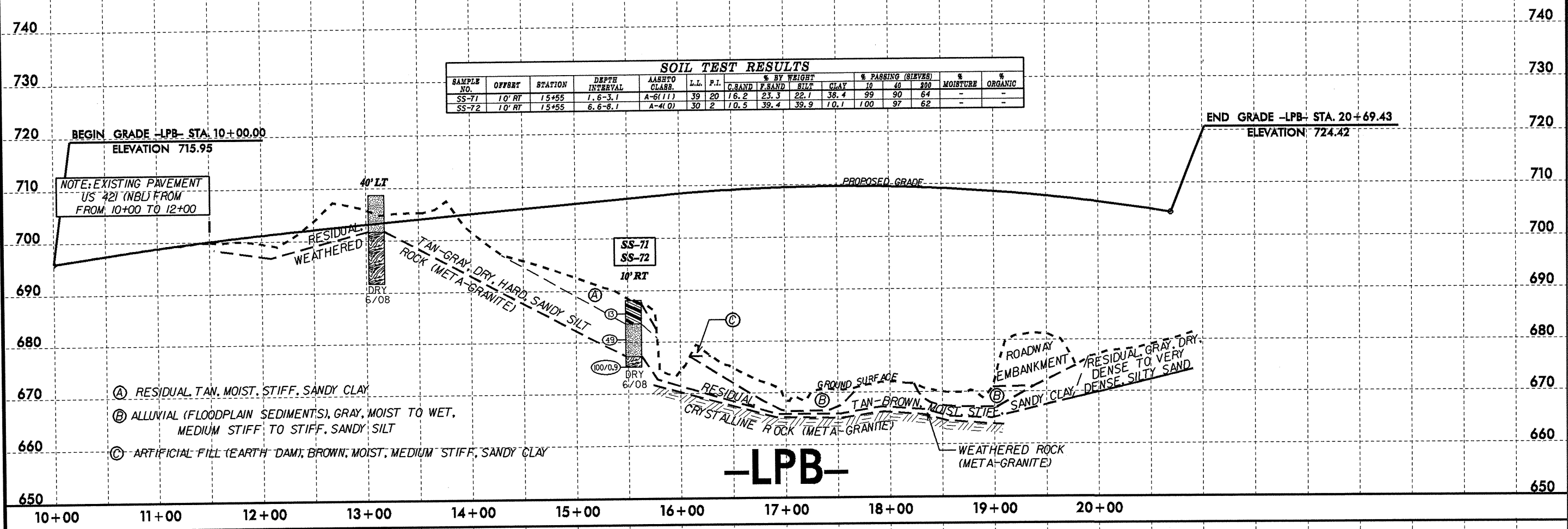
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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							G.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-71	10' RT	15+55	1.6-3.1	A-6(11)	39	20	16.2	23.3	22.1	38.4	99	90	64	-	-
SS-72	10' RT	15+55	6.6-8.1	A-4(O)	30	2	10.5	39.4	39.9	10.1	100	97	62	-	-



BEGIN GRADE -LPB- STA. 10+00.00
ELEVATION 715.95

NOTE: EXISTING PAVEMENT
US 421 (NBL) FROM
FROM: 10+00 TO 12+00

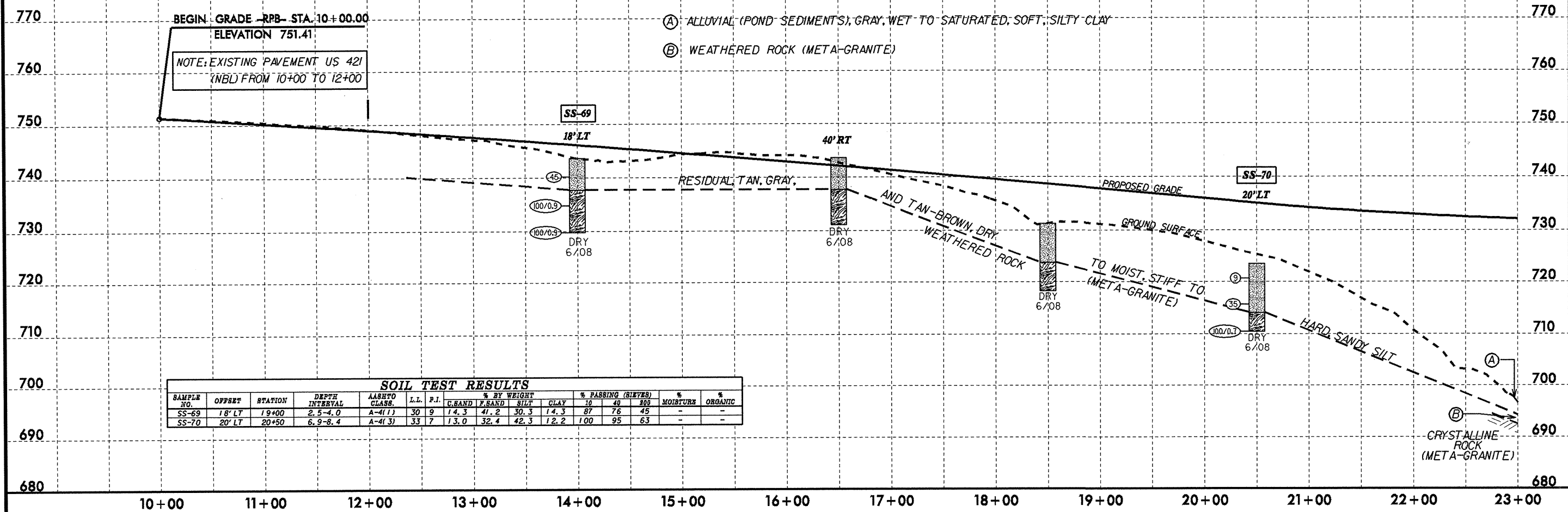
END GRADE -LPB- STA. 20+69.43
ELEVATION 724.42

- Ⓐ RESIDUAL, TAN, MOIST, STIFF, SANDY CLAY
- Ⓑ ALLUVIAL (FLOODPLAIN SEDIMENTS), GRAY, MOIST TO WET, MEDIUM STIFF TO STIFF, SANDY SILT
- Ⓒ ARTIFICIAL FILL (EARTH DAM), BROWN, MOIST, MEDIUM STIFF, SANDY CLAY

-LPB-

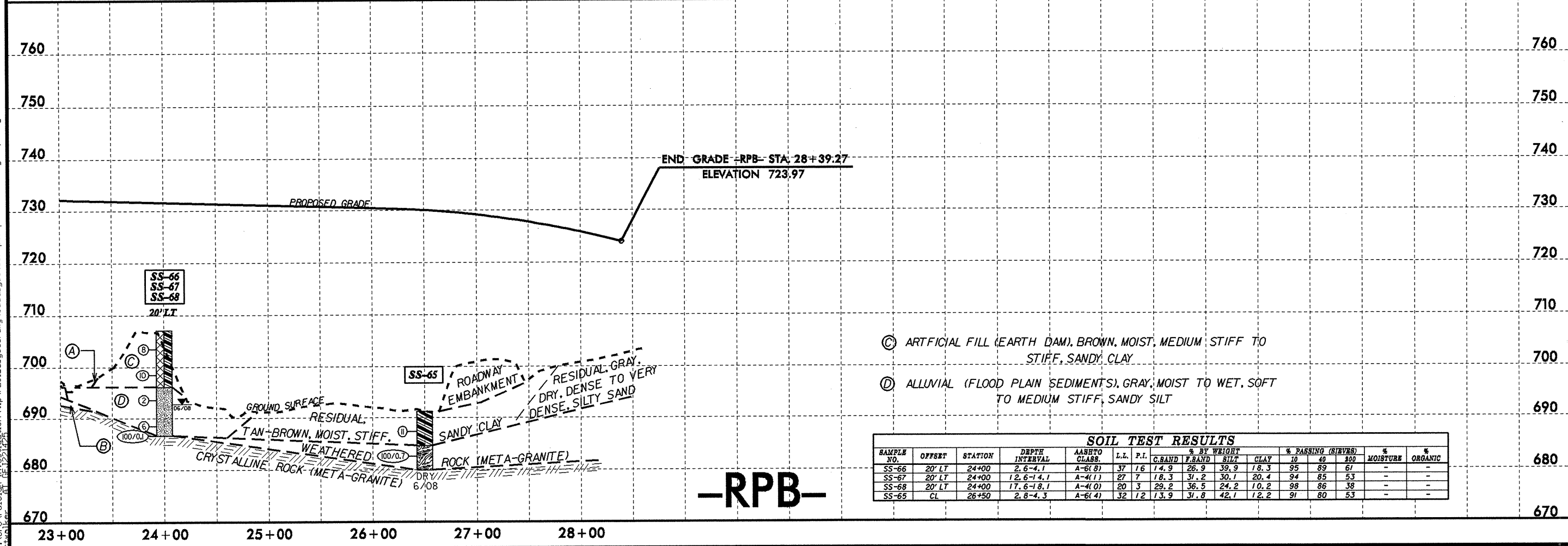
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SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.BAND	F.BAND	SILT	CLAY	10	40	200		
SS-69	18' LT	19+00	2.5-4.0	A-4(1)	30	9	14.3	41.2	30.3	14.3	87	76	45	-	-
SS-70	20' LT	20+50	6.9-8.4	A-4(3)	33	7	13.0	32.4	42.3	12.2	100	95	63	-	-

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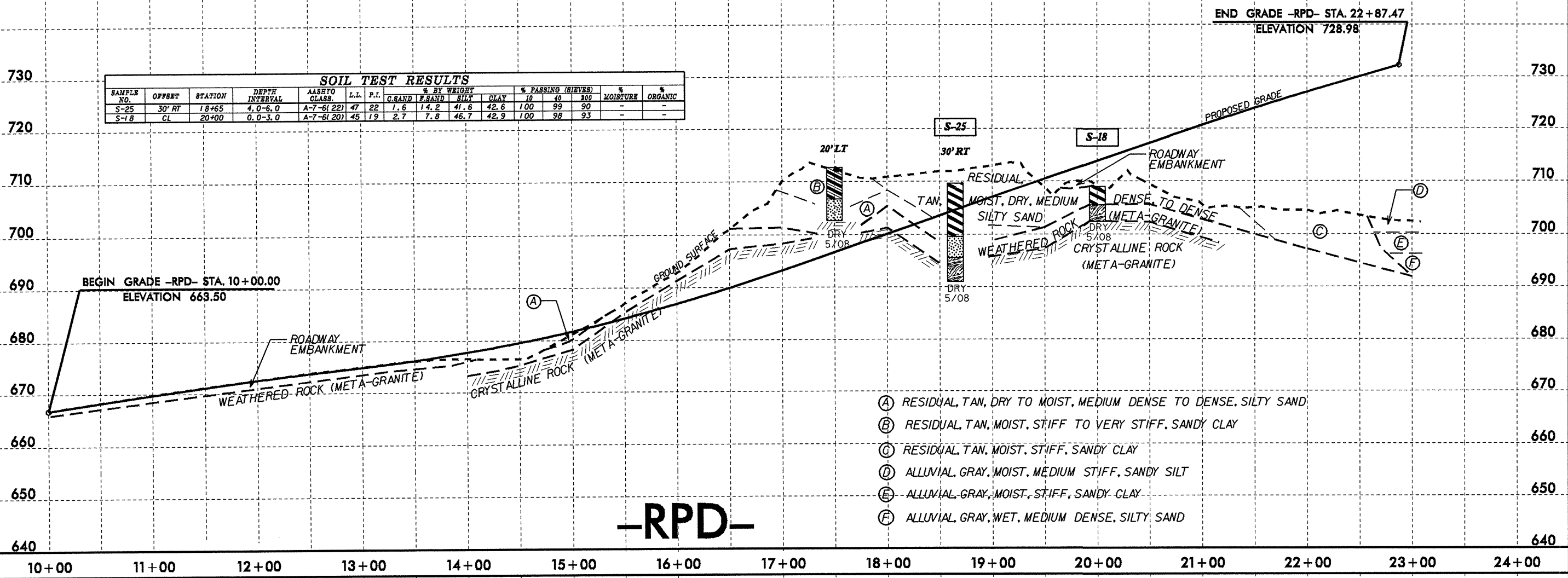


- © ARTIFICIAL FILL (EARTH DAM), BROWN, MOIST, MEDIUM STIFF TO STIFF, SANDY CLAY
- © ALLUVIAL (FLOOD PLAIN SEDIMENTS), GRAY, MOIST TO WET, SOFT TO MEDIUM STIFF, SANDY SILT

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.BAND	F.BAND	SILT	CLAY	10	40	200		
SS-66	20' LT	24+00	2.6-4.1	A-6(8)	37	16	14.9	26.9	39.9	18.3	95	89	61	-	-
SS-67	20' LT	24+00	12.6-14.1	A-4(1)	27	7	18.3	31.2	30.1	20.4	94	85	53	-	-
SS-68	20' LT	24+00	17.6-18.1	A-4(0)	20	3	29.2	36.5	24.2	10.2	98	86	38	-	-
SS-65	CL	26+50	2.8-4.3	A-6(4)	32	12	13.9	31.8	42.1	12.2	91	80	53	-	-

-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	40	200		
S-25	30' RT	18+65	4.0-6.0	A-7-6(22)	47	22	1.6	14.2	41.6	42.6	100	99	90	-	-
S-18	CL	20+00	0.0-3.0	A-7-6(20)	45	19	2.7	7.8	46.7	42.9	100	98	93	-	-

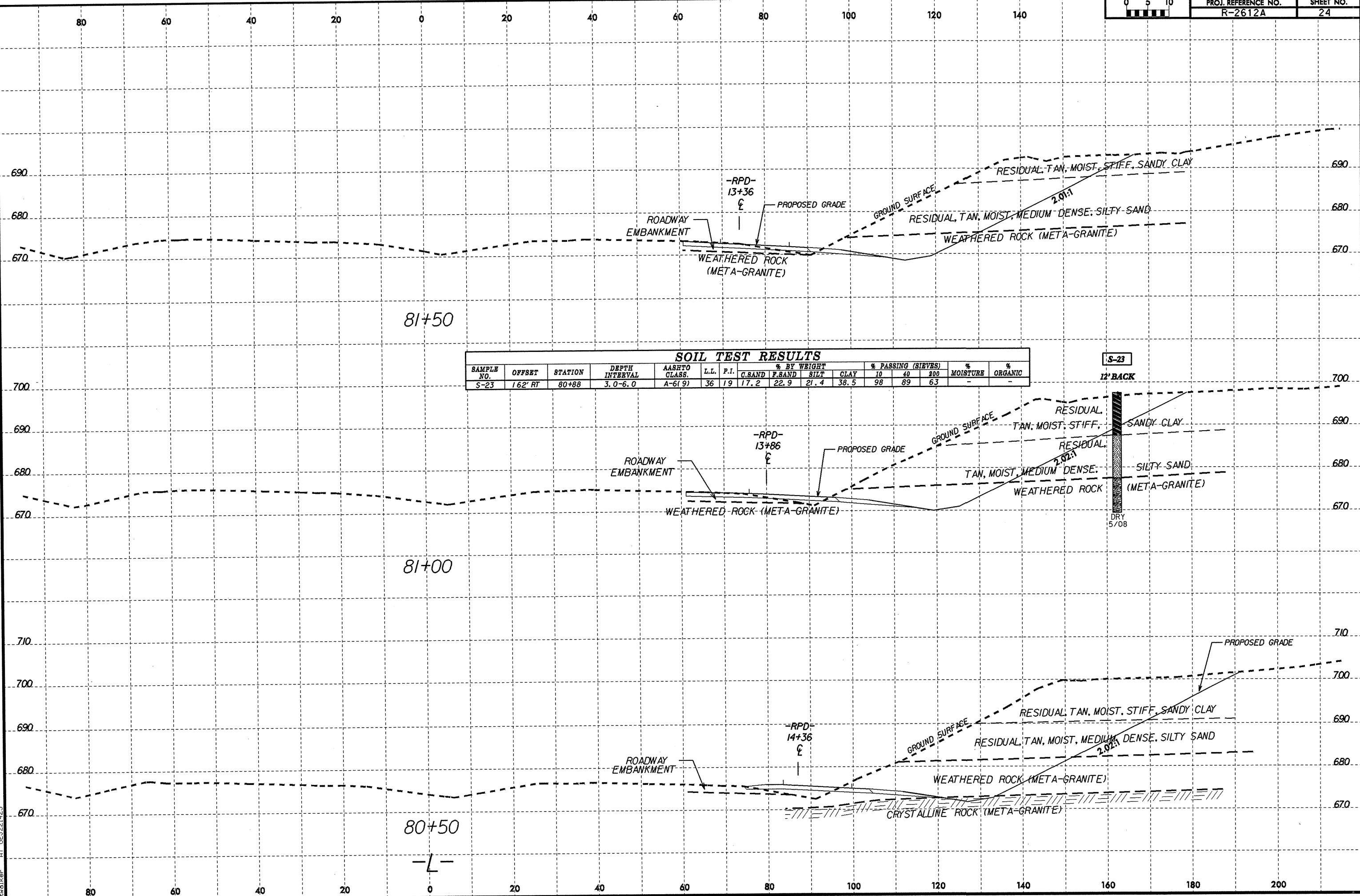


- (A) RESIDUAL, TAN, DRY TO MOIST, MEDIUM DENSE TO DENSE, SILTY SAND
- (B) RESIDUAL, TAN, MOIST, STIFF TO VERY STIFF, SANDY CLAY
- (C) RESIDUAL, TAN, MOIST, STIFF, SANDY CLAY
- (D) ALLUVIAL, GRAY, MOIST, MEDIUM STIFF, SANDY SILT
- (E) ALLUVIAL, GRAY, MOIST, STIFF, SANDY CLAY
- (F) ALLUVIAL, GRAY, WET, MEDIUM DENSE, SILTY SAND

-RPD-

5/28/99

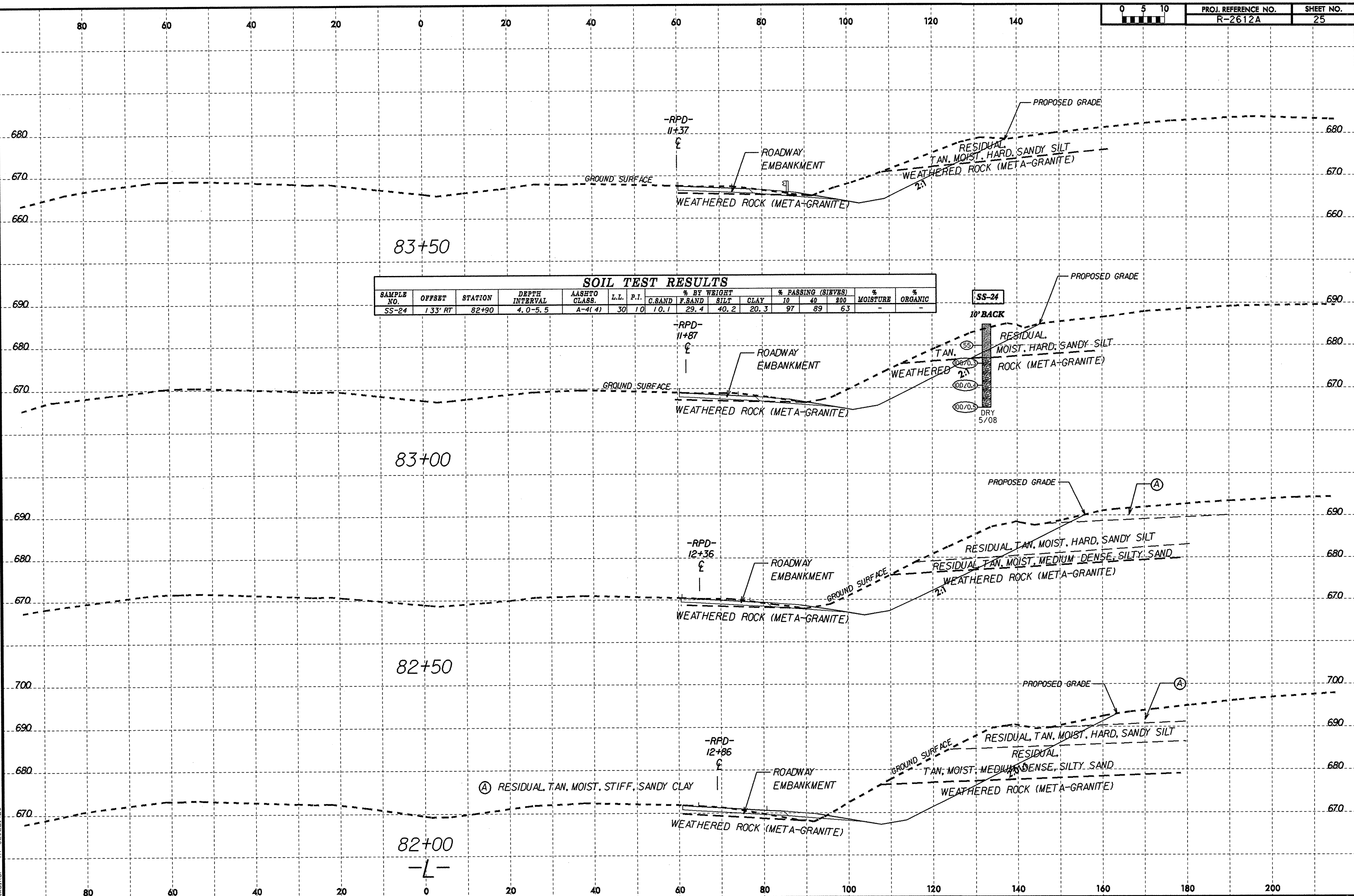
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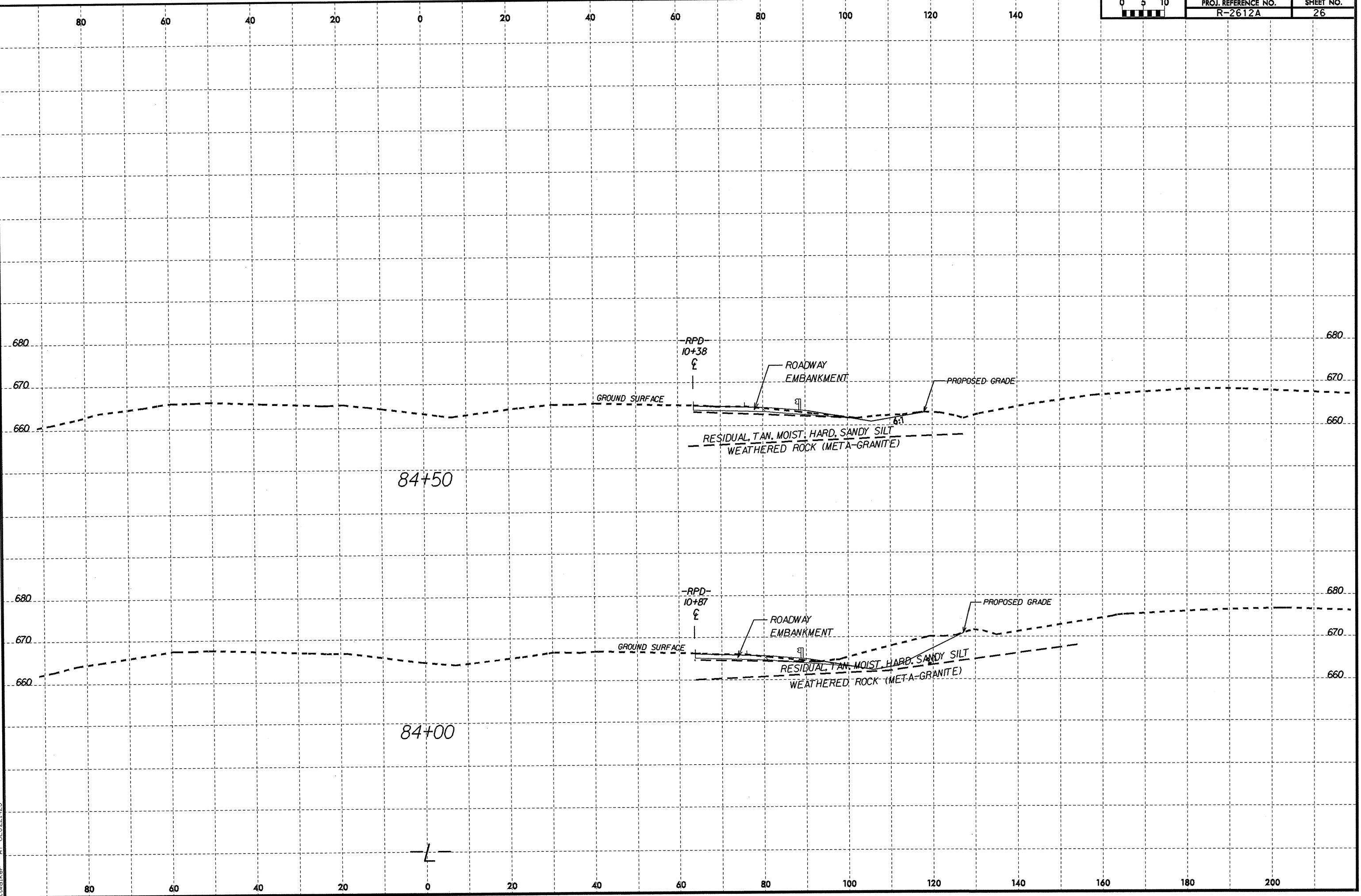
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							G.SAND	F.SAND	SILT	CLAY	10	40	200		
S-23	162' RT	80+88	3.0-6.0	A-6(9)	36	19	17.2	22.9	21.4	38.5	98	89	63	-	-

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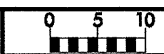


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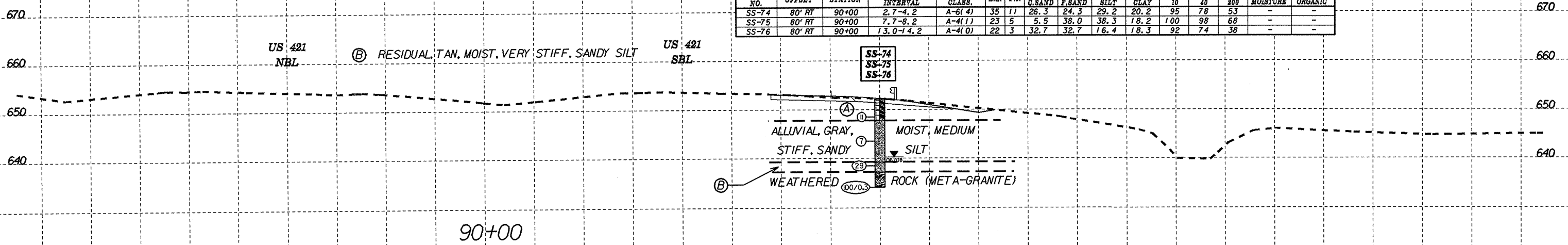


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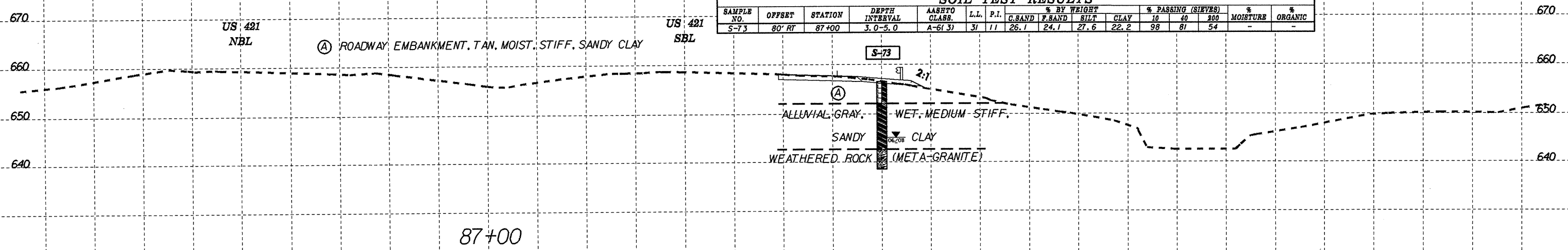
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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							G.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-74	80' RT	90+00	2.7-4.2	A-6(4)	35	11	26.3	24.3	29.2	20.2	95	78	53	-	-
SS-75	80' RT	90+00	7.7-8.2	A-4(1)	23	5	5.5	38.0	38.3	18.2	100	98	68	-	-
SS-76	80' RT	90+00	13.0-14.2	A-4(0)	22	3	32.7	32.7	16.4	18.3	92	74	38	-	-

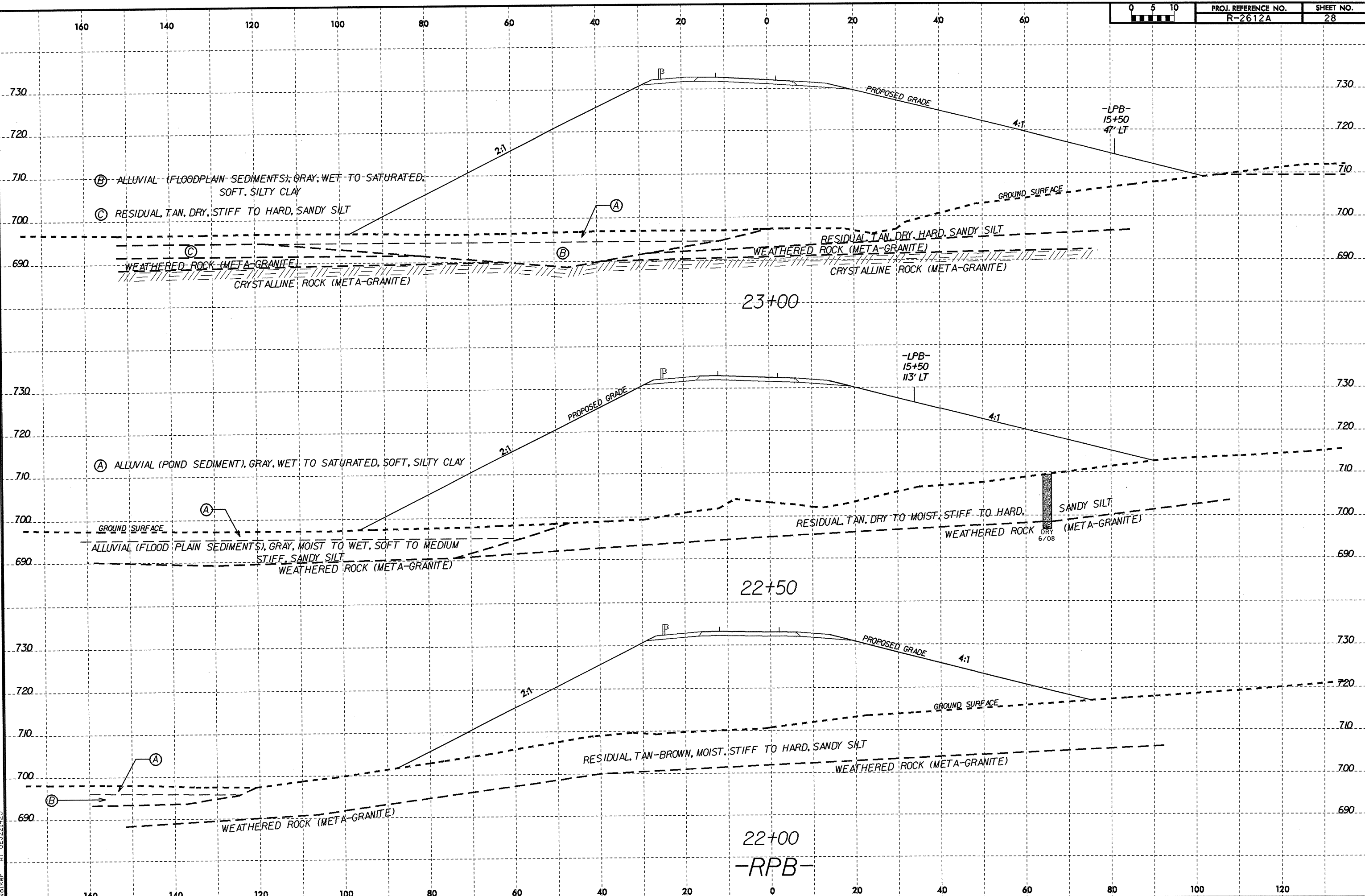


SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							G.SAND	F.SAND	SILT	CLAY	10	40	200		
S-73	80' RT	87+00	3.0-5.0	A-6(3)	31	11	26.1	24.1	27.6	22.2	98	81	54	-	-



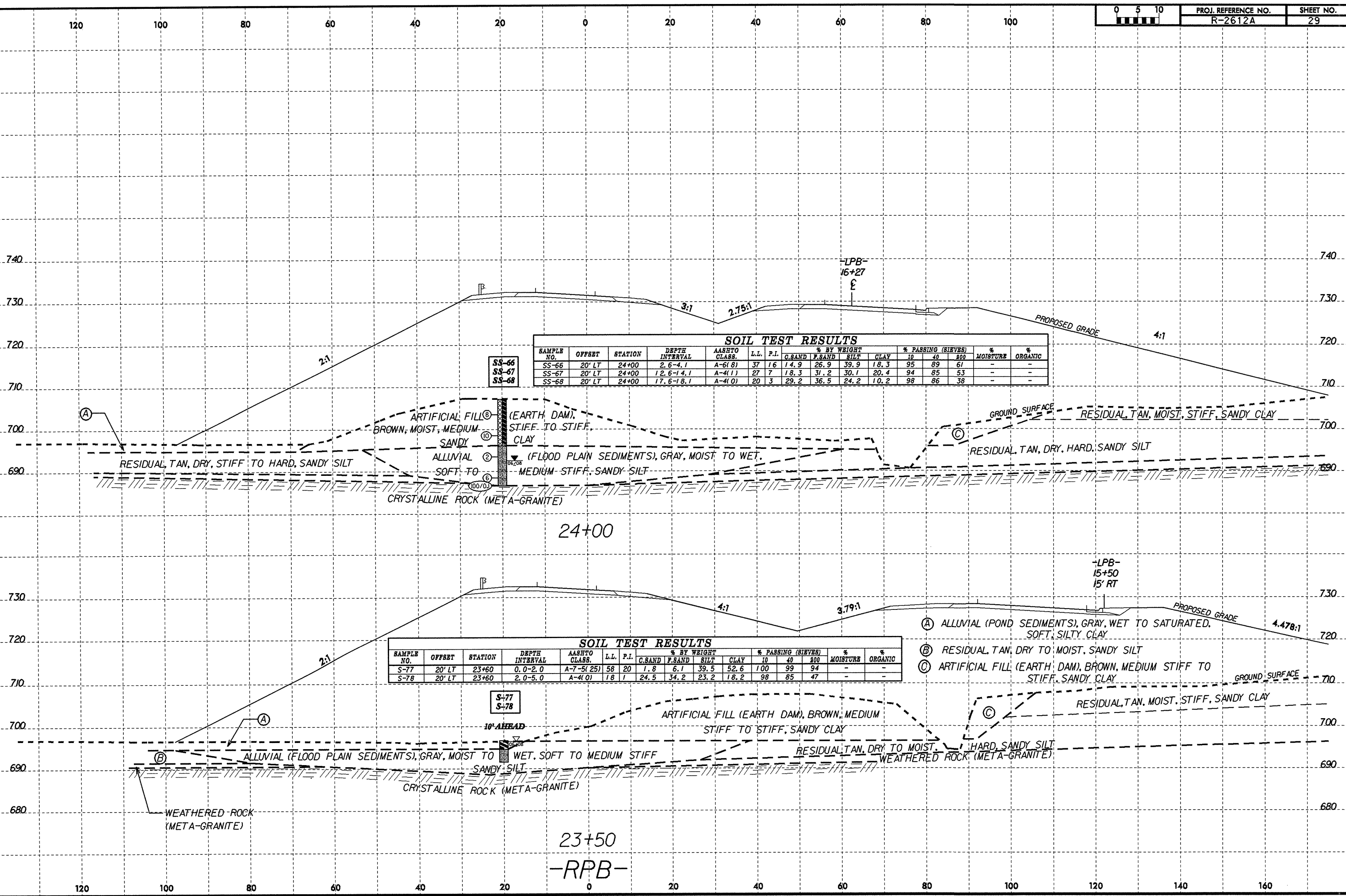
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SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT			% PASSING (SIEVES)			% MOISTURE	% ORGANIC	
							C.BAND	F.SAND	SILT	CLAY	10	40			200
SS-66	20' LT	24+00	2.6-4.1	A-6(8)	37	16	14.9	26.9	39.9	18.3	95	89	61	-	-
SS-67	20' LT	24+00	12.6-14.1	A-4(1)	27	7	18.3	31.2	30.1	20.4	94	85	53	-	-
SS-68	20' LT	24+00	17.6-18.1	A-4(0)	20	3	29.2	36.5	24.2	10.2	98	86	38	-	-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT			% PASSING (SIEVES)			% MOISTURE	% ORGANIC	
							C.BAND	F.SAND	SILT	CLAY	10	40			200
S-77	20' LT	23+60	0.0-2.0	A-7-5(25)	58	20	1.8	6.1	39.5	52.6	100	99	94	-	-
S-78	20' LT	23+60	2.0-5.0	A-4(0)	18	1	24.5	34.2	23.2	18.2	98	85	47	-	-

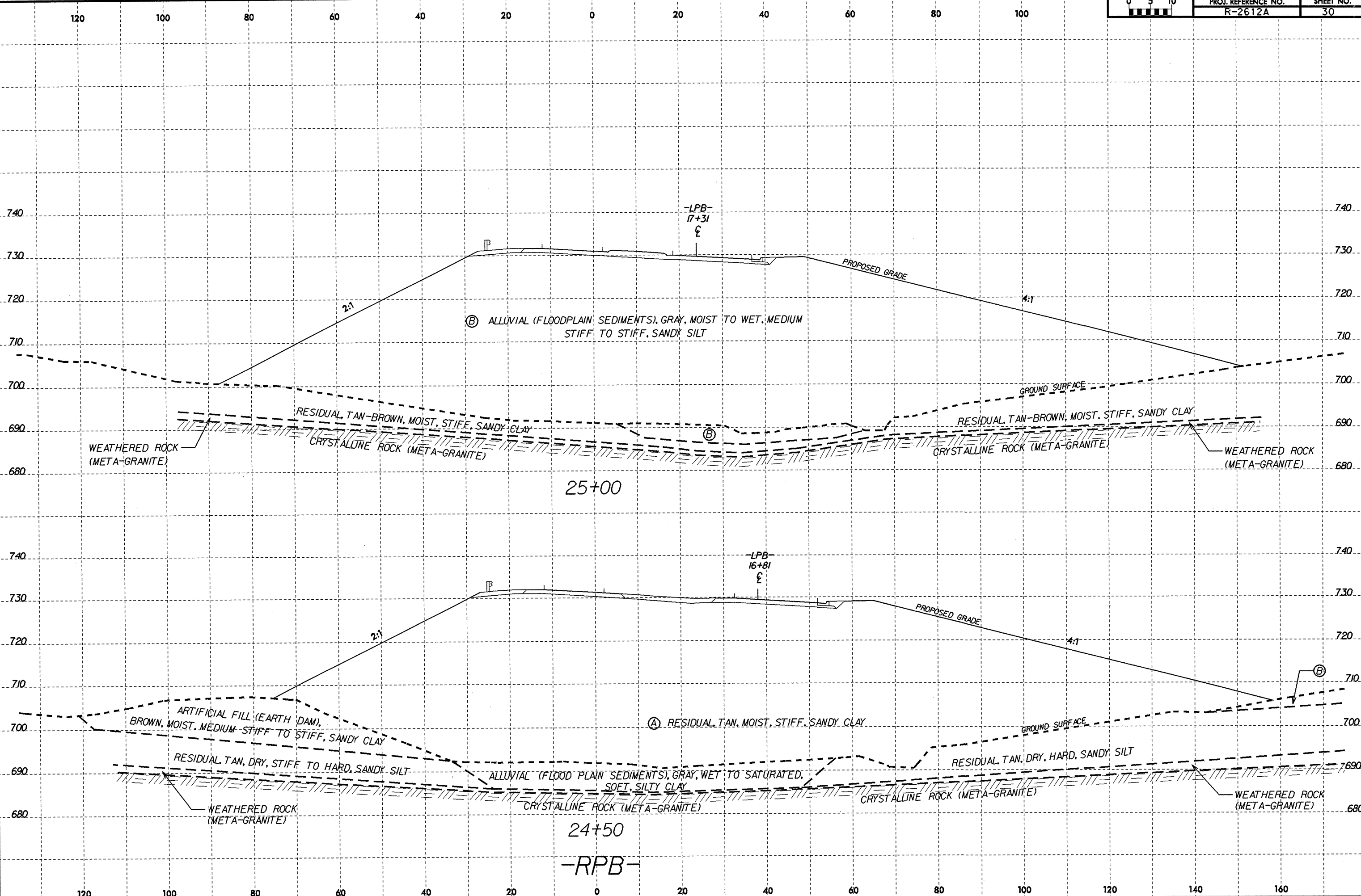
- (A) ALLUVIAL (POND SEDIMENTS), GRAY, WET TO SATURATED, SOFT, SILTY CLAY
- (B) RESIDUAL TAN, DRY TO MOIST, SANDY SILT
- (C) ARTIFICIAL FILL (EARTH DAM), BROWN, MEDIUM STIFF TO STIFF, SANDY CLAY

23+50
 -RPB-

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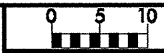


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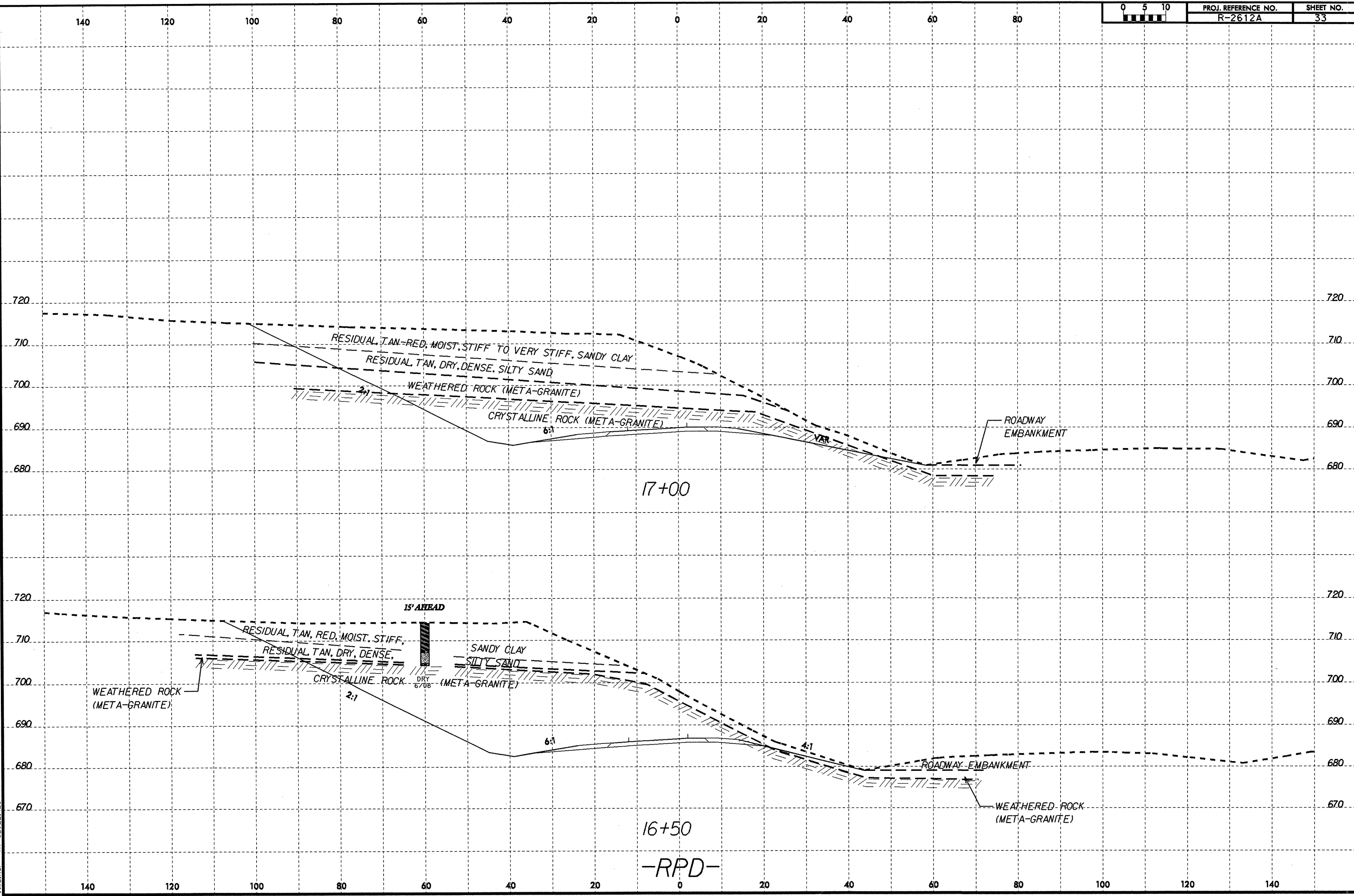


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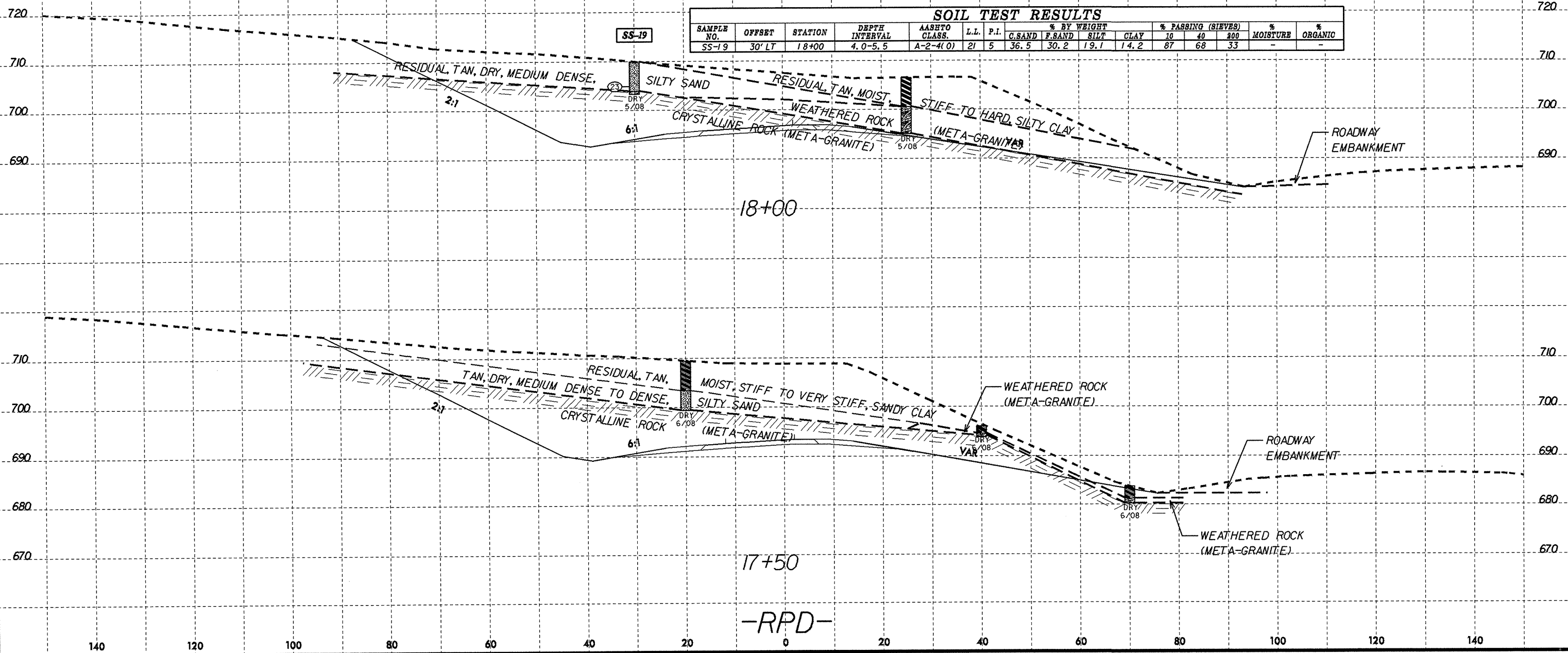
ROADWAY EMBANKMENT

ROADWAY EMBANKMENT

WEATHERED ROCK (META-GRANITE)

WEATHERED ROCK (META-GRANITE)

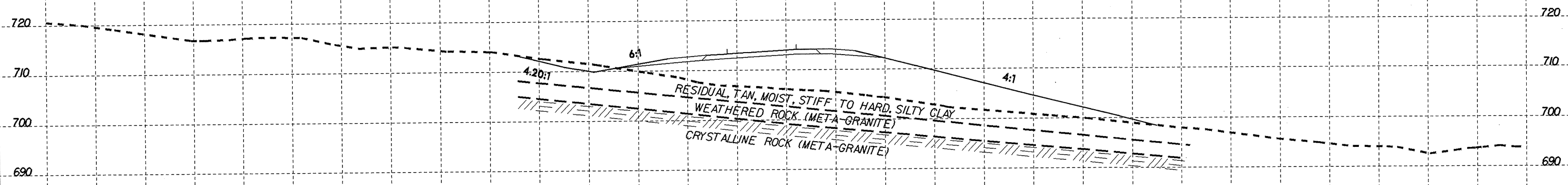
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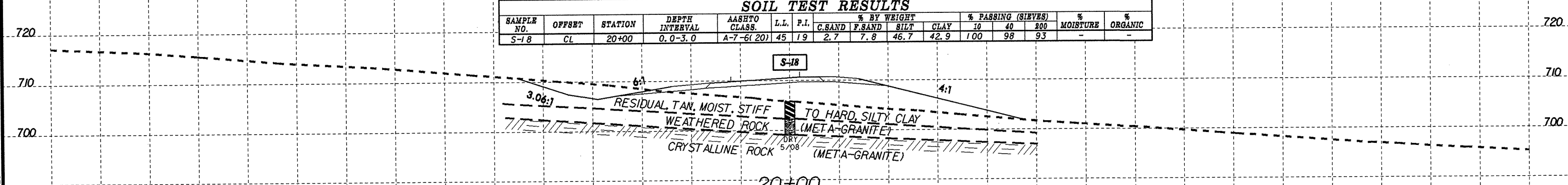


20+50

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		
S-18	CL	20+00	0.0-3.0	A-7-6(20)	45	19	2.7	7.8	46.7	42.9	100	98	93	-	-

S-18



20+00

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