CONTRACT: C201225 ID: R-0609IB

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-0609IB	1	34

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34345.1.1	MAF-F-119-(1)	PE
34345.2.8	NHF-119-1(12)	R/W, UTIL.

METRIC

ALL DIMENSIONS IN THESE PLANS ARE IN METERS

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL UNIT

SUBSURFACE INVESTIGATION

STATE PROJECT 34345.2.8 I.D. NO. R-0609IB

F.A. PROJECT MAF-F-119-(1)

COUNTY GUILFORD /RANDOLPH

DESCRIPTION US 311 HIGH POINT EAST BELT FROM I-85 TO SOUTH OF SR 1920 NORTH OF ARCHDALE

CONTENTS:

LINE	STATION	SHEET NUMBERS PLAN	PROFILE	X-SECTS.
-L-	60+59.109 - 90+29.616	4-12	17-21	25-33
-Y8-	10+84.66 - 18+88.934	5,13,14	22-23	
-Y9-	10+00 - 17+54.76	10,15,16	23-24	

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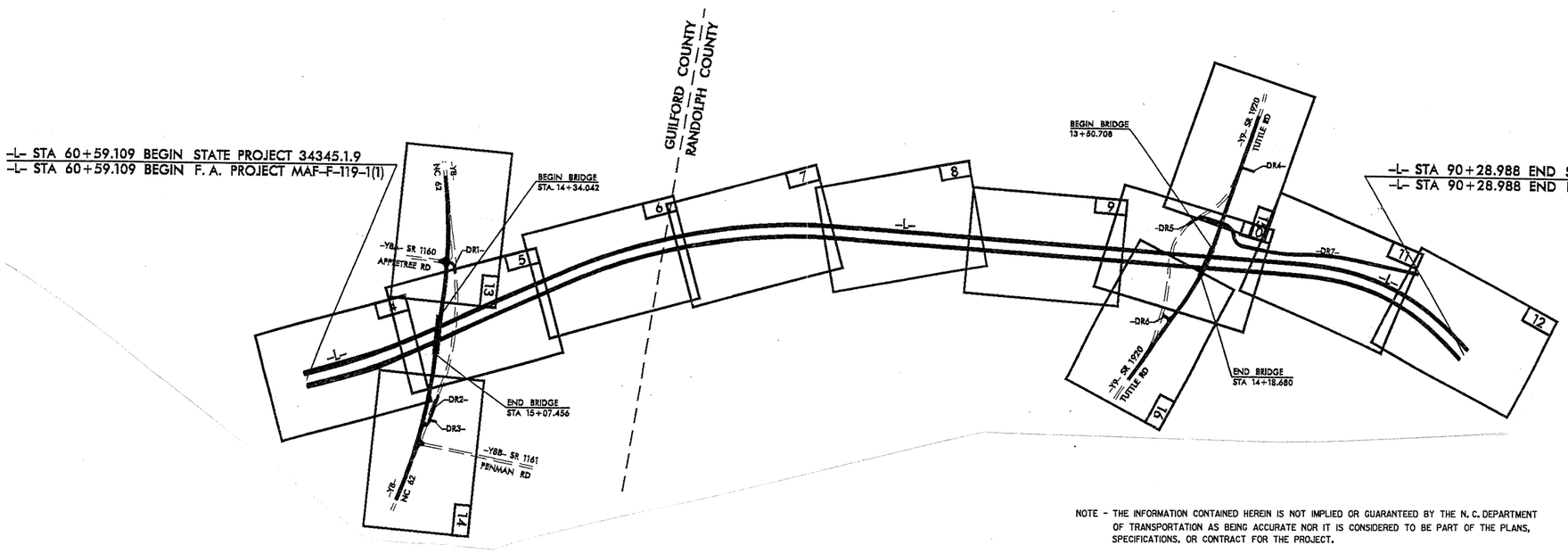
INVENTORY



INVESTIGATED BY J.E. BEVERLY PERSONNEL J.K. STICKNEY

CHECKED BY C.B. LITTLE C.E. BURRIS

SUBMITTED BY C.B. LITTLE C.L. SMITH

DATE OCTOBER 2003

DRAWN BY: J.E. BEVERLY

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NORTH CAROLINA LICENSED SEAL 1104 GEOLOGIST CLINTON B. LITTLE

SEAL

11-5-03

SIGNATURE

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
R-0609IB	8.1570601	2	34

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED OR WEATHERED EARTH MATERIALS WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS ACCORDING TO STANDARD PENETRATION TEST (ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION AND OTHER PERTINENT FACTORS, SUCH AS, MINERALOGICAL COMPOSITION, ANGULARITY STRUCTURE, PLASTICITY, ETC. EXAMPLE: *VERY STIFF, GRAY SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6.*

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-A	A-1-B		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL														
% PASSING #10	50 MX											GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
#40	30 MX	50 MX	51 MN											
#200	15 MX	25 MX	10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN			
LIQUID LIMIT	6 MX		N.P.	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
PLASTIC INDEX				10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN			
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	NO MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

P.I. OF A-7-5 ≤ L.L. - 30 ; P.I. OF A-7-5 > L.L. - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (BLOWS)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (kN/m^2)
GENERALLY GRANULAR MATERIAL	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	<4 4 TO 10 10 TO 30 30 TO 50 >50	N/A
GENERALLY SILT-CLAY MATERIAL	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	<2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 >30	<25 25 TO 50 50 TO 100 100 TO 200 200 TO 400 >400

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.0	0.42	0.25	0.075	0.053

BOULDER	COBBLE	GRAVEL	COARSE SAND	FINE SAND	SILT	CLAY

GRAIN SIZE MM: 305 | 75 | 2.0 | 0.25 | 0.05 | 0.005
GRAIN SIZE IN.: 12" | 3"

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

	PLASTICITY INDEX	DRY STRENGTH
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	26 OR MORE	HIGH

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN, BLUE-GRAY) MODIFIERS SUCH AS LIGHT, DARK, MOTTLED, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

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

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS; ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 30
MODERATELY COMPRESSIBLE	LIQUID LIMIT 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 50

ROCK DESCRIPTION

IN THE BROADEST MEANING, HARD ROCK IS CONSIDERED THAT MATERIAL WHICH CANNOT BE SAMPLED BY CONVENTIONAL SOIL SAMPLING TOOLS OR TECHNIQUES. THE BOUNDARY BETWEEN SOIL AND ROCK IS ARBITRARY. TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF 'WEATHERED ROCK'. FOR THE PURPOSE OF THIS INVESTIGATION, THESE MATERIALS ARE DIVIDED AS FOLLOWS:

WEATHERED ROCK (SWR) (HWR)		SOFT WEATHERED ROCK	MATERIAL THAT CAN BE PENETRATED WITH SOME DIFFICULTY USING POWER AUGERS AND YIELDS SPT VALUES > 100 BLOWS BUT < SPT REFUSAL
		HARD WEATHERED ROCK	MATERIAL THAT CAN BE PENETRATED WITH GREAT DIFFICULTY USING POWER AUGERS AND YIELDS SPT REFUSAL.*
HARD ROCK (HR)	CORED ROCK	INFERRED ROCK LINE**	MATERIAL THAT CANNOT BE PENETRATED BY POWER AUGERS, EXCEPT IN THIN LEDGES, AND REQUIRES ROCK CORING TOOLS FOR OBTAINING A SAMPLE.

*SPT REFUSAL ≤2.5cm OF PENETRATION PER 50 BLOWS.

**AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH AUGERS COULD NO LONGER PENETRATE. THE HARD ROCK SYMBOL IS SHOWN WHEN ROCK IS CORED AND ONLY TO THAT DEPTH CORED. A DESCRIPTION OF ROCK IS GIVEN INCLUDING:

CORE RECOVERY (REC.)- TOTAL LENGTH OF ROCK RECOVERED IN THE CORE BARREL DIVIDED BY THE TOTAL LENGTH OF THE CORE RUN TIMES 100%.

ROCK QUALITY DESIGNATION (RQD)- TOTAL LENGTH OF SOUND ROCK SEGMENTS RECOVERED THAT ARE LONGER THAN OR EQUAL TO 0.1m DIVIDED BY THE TOTAL LENGTH OF THE CORE RUN TIMES 100%.

GROUND WATER

WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING.
STATIC WATER LEVEL AFTER 24 HOURS.
PERCHED WATER, SATURATED ZONE OR WATER BEARING STRATA
SPRING OR SEEPAGE

MISCELLANEOUS SYMBOLS AND ABBREVIATIONS

ROADWAY EMBANKMENT WITH SOIL DESCRIPTION
SOIL SYMBOL
ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS
INFERRED SOIL BOUNDARIES
ALLUVIAL/RESIDUAL BOUNDARIES
25° DIP DIRECTION AND DIP OF STRUCTURES
APPARENT DIP (NORMAL TO_____)

SPT, DPT, VST TEST BORING
AUGER BORING
CORE BORING
MW MONITORING WELL
PIEZOMETER INSTALLATION
SLOPE INDICATOR INSTALLATION
SPT N-COUNT

SAMPLE DESIGNATIONS
S- BULK SAMPLE
SS- SPLIT SPOON SAMPLE
ST- SHELBY TUBE SAMPLE
RS- ROCK SAMPLE
● - SOUNDING ROD

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] MOBILE B
- [ ] BK-51
- [ ] CME-45
- [x] CME-550
- [ ] PORTABLE HOIST
- [ ] OTHER _____
- [ ] OTHER _____

AUGER TOOLS:
- [x] 6" (152 mm) CONTINUOUS FLIGHT
- [x] 8" (203 mm) HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG. - CARBIDE INSERTS
- [ ] CLAY BITS

OTHER:

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

CORE BORING TOOLS:
- [ ] -AX
- [ ] -BX
- [ ] -NX

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

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS WHICH HAVE BEEN TRANSPORTED BY WATER.
APPARENT DIP - THE DIP OF ROCK STRATA NOT PERPENDICULAR TO STRIKE.
AQUIFER - A WATER BEARING FORMATION OR STRATA.
AUGER REFUSAL (A.R.) - POINT AT WHICH POWER AUGERS WILL NOT PENETRATE.
BEDDED - SOIL OR ROCK LYING IN A POSITION ESSENTIALLY PARALLEL.
BEDROCK - ROCK OF RELATIVELY GREAT THICKNESS AND EXTENT IN ITS ORIGINAL LOCATION.
CALCAREOUS (CALC.) - SOILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
COHESIVE SOIL - A SOIL THAT WHEN UNCONFINED HAS CONSIDERABLE DRY STRENGTH AND SIGNIFICANT COHESION WHEN SUBMERGED.
COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
CORE RECOVERY (% REC.) - TOTAL LENGTH OF ALL ROCK DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
COQUINA - A ROCK TYPE COMPOSED ESSENTIALLY OF MARINE SHELLS CEMENTED BY CALCIUM CARBONATE.
DIKE - IGNEOUS ROCK INTRUSION WHICH IS NARROW COMPARED WITH ITS OTHER DIMENSIONS.
DIP - THE ANGLE BETWEEN A BEDDING PLANE, JOINT PLANE OR FAULT PLANE AND THE HORIZONTAL, MEASURED PERPENDICULAR TO THE STRIKE.
DUMPS - UNCOVERED DEPOSITS OF WASTE MATERIAL SUCH AS WOOD, MASONRY DEBRIS OR GARBAGE.
FAULT - A BREAK IN THE CONTINUITY OF A BODY OF ROCK, ATTENDED BY A MOVEMENT ON EITHER OR BOTH SIDES OF THE BREAK.
FINES - PORTIONS OF A SOIL FINER THAN NO. 200 U.S. STANDARD SIEVE.
FISSILITY OR FISSILE - A PROPERTY OF SPLITTING EASILY ALONG CLOSELY SPACED PARALLEL PLANES.
FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.
FLOODPLAIN - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
FORMATION - A MAPPABLE UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
FRACTURE - A CRACK LARGE ENOUGH TO BE VISIBLE TO THE UNAIDED EYE.
FRIABLE - EASY TO BREAK OR CRUMBLE.
GRANULAR MATERIAL - SOIL THAT WHEN UNCONFINED HAS LITTLE OR NO DRY STRENGTH AND HAS LITTLE OR NO COHESION WHEN SUBMERGED.
GROUNDWATER (G.W.) - WATER THAT IS FREE TO MOVE THROUGH SOIL MASS UNDER THE INFLUENCE OF GRAVITY.
GROUNDWATER LEVEL - LEVEL OF WATER WITH RESPECT TO EXISTING GROUND SURFACE.
HARDPAN - A GENERAL TERM USED TO DESCRIBE A HARD CEMENTED SOIL LAYER WHICH DOES NOT SOFTEN WHEN WET.
INDURATED - EARTH MATERIAL HARDENED BY HEAT, PRESSURE OR CEMENTATION.
INTERBEDDED - ALTERNATING LENSES OR LAYERS OF SOIL AND/OR ROCK MATERIALS.
JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
LAMINATED - VERY THIN ALTERNATING LAYERS LESS THAN 1INCH.
LAYER - SUBJECT MATERIAL GREATER THAN 1INCH IN THICKNESS.
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.
MARL - A NON-INDURATED, CALCAREOUS DEPOSIT OF CLAYS, SILTS AND SANDS, OFTEN CONTAINING SHELLS.
MICACEOUS SOIL (MIC.) - A SOIL OR ROCK TYPE CONTAINING AN APPRECIABLE AMOUNT OF MICA.
MUCK (MK.) - A HIGHLY ORGANIC SOIL OF VERY SOFT CONSISTENCY, GENERALLY FOUND ON TIDAL FLATS, LAKE OR STREAM FLOODPLAINS.
PEAT (PT) - A FIBROUS MASS OF ORGANIC MATTER IN VARIOUS STAGES OF DECOMPOSITION.
PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
RESIDUAL SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
ROCK - SEE LEGEND
ROCK QUALITY DESIGNATION (R.Q.D.) - 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 EXPRESSED AS A PERCENTAGE.
SANITARY LANDFILLS - COMPACTED AND/OR COVERED LAYERS OF SOIL AND WASTE PRODUCTS.
SAPROLITE (SAP.) - RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLAIN.
SILL - AN IGNEOUS SHEET OF INTRUSIVE ROCK WHOSE THICKNESS IS SLIGHT COMPARED TO ITS LATERAL EXTENT.
SOME - PRESENCE OF 5% TO 30% OF SUBJECT MATERIAL.
STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR B.P.F.) 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 PENETRATION RESISTANCE OF LESS THAN 1INCH WITH 50 BLOWS.
STRIKE - THE DIRECTION OR BEARING OF A HORIZONTAL LINE IN THE PLANE OF AN INCLINED STRATUM, JOINT, FAULT OR OTHER STRUCTURAL PLANE.
SUBGRADE - THE SOIL PREPARED TO SUPPORT A STRUCTURE OR A PAVEMENT SYSTEM.
TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
TRACE - PRESENCE OF LESS THAN 5% OF SUBJECT MATERIAL.

ABBREVIATIONS

BLDR. - BOULDER
CL. - CLAY
COB. - COBBLE
CSE. - COARSE
EST. - ESTIMATED
F. - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED
GR. - GRAVEL
LL - LIQUID LIMIT
MED. - MEDIUM
W - MOISTURE CONTENT
MOT. - MOTTLED
OM - OPTIMUM MOISTURE
ORG. - ORGANIC
PL - PLASTIC LIMIT
PI - PLASTICITY INDEX
n - POROSITY
SD. - SAND
SAT. - SATURATED
SL. - SILT, SILTY
SLI. - SLIGHTLY
G_s - SPECIFIC GRAVITY
qu - UNCONFINED COMPRESSIVE STRENGTH
γ - UNIT WEIGHT (WET UNIT WEIGHT)
γ_d - DRY UNIT WEIGHT
γ_{SAT} - SATURATED UNIT WEIGHT
e - VOID RATIO
V. - VERY

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ADDITIONAL INFORMATION MAY BE AVAILABLE, INCLUDING, BUT NOT LIMITED TO THE FOLLOWING:

FIELD BORING LOGS
ROCK CORES
SOIL & ROCK TEST DATA
SUBSURFACE REPORT

THIS INFORMATION MAY BE VIEWED BY APPOINTMENT BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL UNIT @ (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA IS PART OF THE CONTRACT.

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NOTES:

REVISED AUGUST 10, 1998

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

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

LYNDO TIPPETT
SECRETARY

October 22, 2003

STATE PROJECT:	8.1570601 (R-0609IB)
F.A. PROJECT:	MAF-F-119-(1)
COUNTY:	Guilford / Randolph
DESCRIPTION:	US 311 High Point East Beltway from I-85 to South of SR 1920 North of Archdale
SUBJECT:	Geotechnical Report - Inventory

This report presents the findings of the Geotechnical Investigation for section IB of the proposed US 311 High Point Beltway. Stations encompassed on this project are from -L- 60+59 to 90+29. The project generally proceeds in a southern direction from beginning to end.

The geotechnical field investigation for this project was originally conducted in August of 2001. Due to an alignment shift from the beginning of the project to approximate -L- station 75+42, a portion of the project was re-drilled in May of 2003. An ATV mounted CME 550 drill machine was utilized each time to perform this investigation.

The following survey lines were investigated:

Line	Station
-L-	60+59.109 – 90+29.616
-Y8-	10+84.66 – 18+88.934
-Y9-	10+00 – 17+54.76

Areas of Special Geotechnical Interest:

1. *Groundwater:*

Groundwater was encountered in many instances throughout the project corridor. The following two station intervals indicate known areas where groundwater was encountered at or above proposed grade.

Line	Station Range
-L-	65+20 to 67+40 (see sections and profile)
-L-	71+00 to 74+30 (see sections and profile)

2. *Rock:*

Hard rock was encountered at many locations throughout the proposed project corridor. Hard rock was only encountered at or above proposed grade in the station range between -L- 71+40 – 73+10. Rock within this range is best represented on the attached geotechnical cross section sheets.

3. *High PI Soils:* (PI's Greater than 26)

A. The area between -L- station 61+10 to 62+20 contains a very stiff red-tan sandy clay with a plasticity index of 48. The clay layer extends from the ground surface to approximately 2.0 meters in depth.

B. The area between -L- stations 79+80 to 81+20 contains a stiff tan-gray sandy silty clay (A-7-6) with a Plasticity Index of 38. The clay layer extends from the ground surface to approximately 3.0 meters in depth.

C. The area between -L- stations 84+70 to 86+00 contains a stiff to very stiff tan-brown silty sandy clay (A-7-6) with a Plasticity Index of 27. The clay layer extends from the ground surface to 2.5 meters in depth.

4. *Alluvial Soils / Wet Areas:*

There are many areas containing alluvial soils throughout the project corridor. Most of these areas are the result of adjacent streams and tributaries. Additionally there are several ponds within the project corridor. Many alluvial areas are comprised of soft to medium stiff silt and clay soils or very loose to loose silty sand soils that should be of no special interest. The following is a list of areas that are known to contain, or in the case of ponds and their tributaries are likely to contain, very soft to soft alluvial soils that may be of concern.

Line	Station Range
-L-	60+65 – 61+25 (recently dug manmade pond)
-L-	62+80 – 63+40 (pond extending left and right of -L-)
-L-	64+60 – 65+30 (Floodplain)
-L-	76+80 – 77+20 (Creek)
-L-	79+30 – 79+50 (Pond sediments)
-L-	81+50 – 81+85 (Creek at -L- with pond RT of -L-)
-Y8-	15+20 – 15+60 (Creek floodplain)
-Y9-	12+10 – 12+60 (Creek floodplain)

Physiography/Geology:

The project area is located in Guilford and Randolph Counties in the northern-central piedmont region of North Carolina. The topography ranges from flat to gently rolling with gently sloping interstream

areas. The proposed project corridor is generally well drained and is bisected by several stream and wet weather drainage features. The project is surrounded by a combination of densely wooded areas, urban areas and open fields. Elevations within the project area range from approximately 210 to 260 meters.

Geologically this site is part of the Carolina Slate Belt and is underlain by granitic and meta-granitic rock types.

Soil Properties:

1. *Residual Soils:*

These soils are derived from in place weathering of parent materials. They occur in a variety of consistencies, classifications, and stratigraphic sequences. Residual soils are further subdivided into clays, silts, and sands.

Clays are found consistently throughout the project corridor as both near surface soils and subsoils. They consist primarily of medium stiff to hard red-brown and tan silty sandy clay (A-6, A-7-5, A-7-6) up to 7.0 meters in thickness. These soils are typically well drained and possess Atterburg Limits in the intermediate range. Soil test results for these soils indicate a plasticity index range of 12 to 48 and a liquid limit range of 30 to 78.

Silts encountered on the project were of the A-4 AASHTO Classifications and occur as both near surface soils and subsoils. They generally consist of stiff to hard red-tan and gray clayey sandy silt with depths up to 4 meters.

Sands encountered on the project were of the A-1-b, A-2-4, A-2-6, and, A-3 AASHTO Classification and occur as both near surface soils and subsoils. The sandy soil generally consists of medium dense to very dense tan-brown silty sand with depths ranging up to 7 meters.

2. *Alluvial Soils:*

Alluvial soils originate from water transportation and deposition in a floodplain environment. These deposits are usually shallow, but range up to 2 meters in thickness. Alluvial soils consist of soft to medium stiff clayey sandy silt (A-4), and very loose to loose silty sand (A-2-4).

3. *Fill Soils:*

Only one instances of uncompacted fill material were encountered during the course of this investigation. The earthen dam between -L- stations 78+90 and 79+25 supports a pond to the west of proposed -L- centerline. The height of the dam is approximately 3 meters from base to crest. Soil type would presumably be impermeable clay as with most man made dam structures.

Roadway fill soils were encountered at the existing locations of -Y8- (NC 62) and -Y9- (Tuttle Rd.). No borings were performed in existing roadway fill materials at either location. Both of these roads appear in good condition.

Rock Properties:

Rock is defined as that material which refuses penetration of power augers and / or achieves SPT refusal. Large quantities of hard rock were encountered throughout the project corridor. The majority of rock encountered is below proposed grade.

Wells:

During the course of this investigation only one well was noted within the proposed construction boundary. This well is located 6.5 meters left of -Y9- station 15+49. The project corridor traverses mostly open fields and wooded areas, however there are several rural homes located along intersecting interchanges at -Y8- and -Y9-. Thus, there is the possibility for additional wells which remain undetected at this time.

Respectfully Submitted,

J.E. Beverly, Project Geologist

J E Beverly

9/09/99

R-0609IB

PROJECT: 8.1570601

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD – RANDOLPH

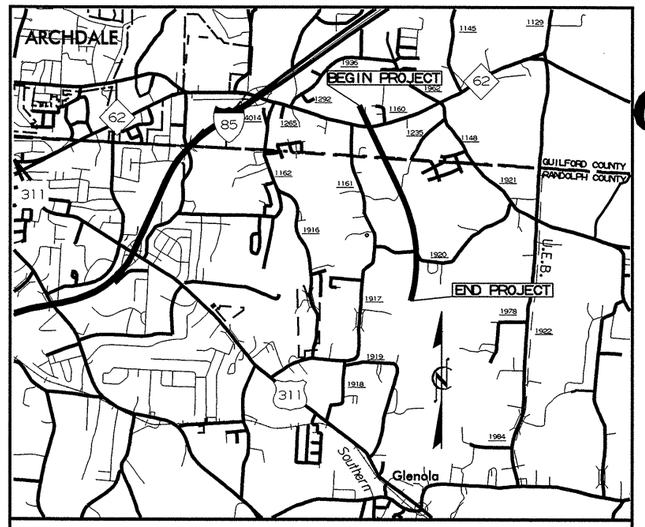
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-0609IB	2A	34

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
8.1570601	MAF-F-119-(1)	PE

METRIC

ALL DIMENSIONS IN THESE PLANS ARE IN METERS

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols



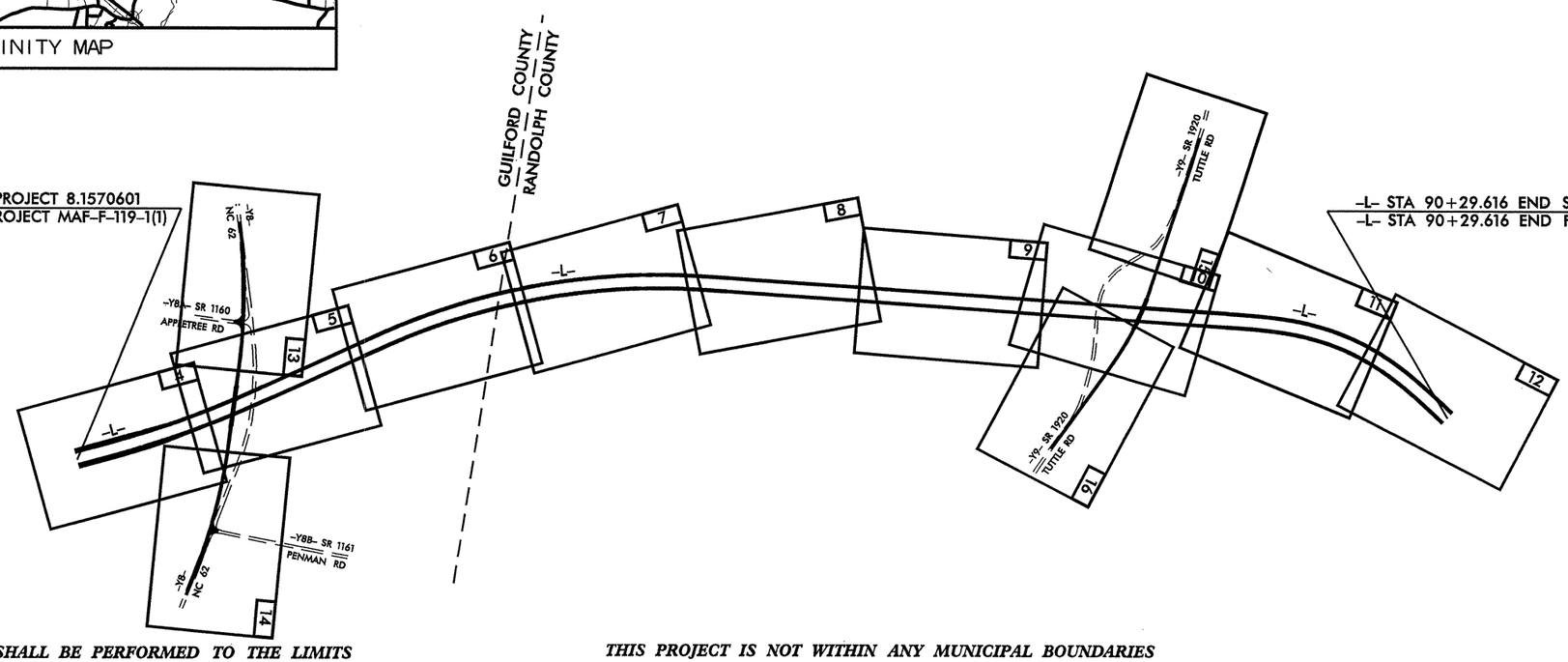
VICINITY MAP

LOCATION: *US 311 HIGH POINT EAST BELT FROM I-85 TO SOUTH OF SR 1920 NORTH OF ARCHDALE*

TYPE OF WORK: *GRADING, DRAINAGE, PAVING, SIGNING, AND STRUCTURES*

-L- STA 60+59.109 BEGIN STATE PROJECT 8.1570601
-L- STA 60+59.109 BEGIN F. A. PROJECT MAF-F-119-1(1)

-L- STA 90+29.616 END STATE PROJECT 8.1570601
-L- STA 90+29.616 END F. A. PROJECT MAF-F-119-1(1)



CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD___

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES

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

GRAPHIC SCALES

PLANS: 5 0 10
PROFILE (HORIZONTAL): 5 0 10
PROFILE (VERTICAL): 1 0 2

DESIGN DATA

ADT 2000 = 18,000
ADT 2025 = 29,000
DHV = 10 %
D = 60 %
T = 13 % *
V = 110 km/h

* TTST 7% DUAL 6%

PROJECT LENGTH

TOTAL LENGTH STATE PROJECT 8.1570601 = 2.971Km

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

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:

LETTING DATE:
MARCH, 2003

J. S. GOODNIGHT, PE
PROJECT ENGINEER

LEON OLIVER
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER
SIGNATURE: *P.E.*

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA
P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION
APPROVED
DIVISION ADMINISTRATOR *DATE*

$$$$$SYSTIME$$$$
$$$$$USERNAME$$$$ $$$$$DGN$$$$

3-B

EARTHWORK SUMMARIES

Volumes in Cubic Meters

PROJECT R-0609IB COUNTY GUILORD/ RANDOLPH DATE 04/2006 SHEET 1 OF 2 SHEETS

RD10S01C

LINE	STATION	STATION	TOTAL EXCAV. (UNCL.)	ROCK EXCAV.	UNDERCUT	UNSUIT. EXCAV.	SUITABLE EXCAV.	TOTAL EMB.	ROCK EMB.	EARTH EMB.	EMBANK. 20%	BORROW	SUITABLE WASTE	UNSUIT. WASTE	TOTAL WASTE
SUMMARY	#1														
-L-	60+59.109	70+60.00	52102		3670		52102	56654		56654	67985	15883		3670	3670
-Y8-	10+84.660	14+34.042	1054				1054	10630		10630	12756	11702			
-Y8-	15+07.456	18+82.197	847				847	45648		45648	54778	53931			
-DR1-	10+03.620	10+40.000	4				4	203		203	244	240			
-DR2-	10+03.600	10+90.000	4				4	351		351	421	417			
-DR3	10+02.400	10+17.035	4				4	4		4	5	1			
SUMMARY	#2														
-L-	70+60.000	80+60.000	96174	3775	400		92399	156030	3775	152255	186481	90307		400	400
SUMMARY	#3														
-L-	80+60.000	90+28.988	64321		380		64321	77456		77456	92947	28626		380	380
-Y9-	10+00.000	13+50.708	735				735	70138		70138	84166	83431			
-Y9-	14+18.680	17+20.000	879				879	7688		7688	9226	8347			
-DR4-	10+03.6000	10+35.000						422		422	506	506			
-DR5-	10+03.6000	10+90.000	2				2	11301		11301	13561	13559			
-DR6-	10+03.6000	10+23.187	28				28	21		21	25		3		3
-DR7-	10+03.6000	15+23.485	126				126	36540		36540	43848	43722			
TOTAL	**# 1-3**		**216280**	**3775**	**4450**		**212505**	**473086**	**3775**	**469311**	**566949**	**350672**	**3**	4450	**4453**
LOSS TO	**CLEARING**	**AND**	-10814				-10814					10,814			
GRUBBING															
UNDERCU	**FOR**	**GRADE**			3100			3100		3100	3720	3720	3100		3100
POINTS															
UNDERCUT	**GEOTECH**	**Contengency)**			4300			4300		4300	5160	5160		4300	4300
USE	**SUITABLE**	**WASTE IN**										**-3103**	**-3103**		**-3103**
LIEU	**OF**	**BORROW**													
SHEET TOTALS:			**205466**	**3775**	**11850**		**201691**	**480486**	**3775**	**476711**	**575829**	**367263**		**8750**	**8750**

3-C

EARTHWORK SUMMARIES

Volumes in Cubic Meters

PROJECT: R-0609IB | COUNTY GUILFORD / RANDOLPH | SHEET 2 OF 2 SHEETS

RD10S01C

LINE	STATION	STATION	TOTAL EXCAV. (UNCL.)	ROCK EXCAV.	UNDERCUT	UNSUIT. EXCAV.	SUITABLE EXCAV.	TOTAL EMB.	ROCK EMB.	EARTH EMB.	EMBANK. +20%	BORROW	SUITABLE WASTE	UNSUIT. WASTE	TOTAL WASTE
SHOULDE	MATERIAL							12500		12500	15000	15000			
PROJECT TOTALS :			205,466	3,775	11,850		201,691	492,986	3,775	489,211	590,829	382,263		8,750	8,750
+5% TO	REPLACE	TOPSOIL										19,113			
IN	BORROW	PIT													
CHIPPED	TIRES											-8,995			
GRAND	TOTALS:		205,466									392,381			
SAY			205,600									393,250			
SELECT	GRANULAR	MATERIAL	PER	GEOTECH	CLASS	II OR III		4,000 cm							
SELECT	GRANULAR	MATERIAL	PER	GEOTECH	CLASS	IV		500 mtons							
DRAIN.	DITCH	EXCAV.						5,750 cm							
-L-	PAVE.	STRUCT.	VOLUME					22,723 cm							

EARTHWORK TOTALS FOR ALTERNATE PAVEMENT DESIGN

SUMMARIES TOTALS			216,280	3,775	4,450		212,505	473,086	3,775	469,311	566,949	350,672	3	4,450	4,453
ADJ. FOR ALT. PAV'T DESIGN			-3,350				-3,350	8,271		8,271	9,925	13,275			
ADDITIONAL UNDERCUT					7,400			7,400		7,400	8,880	8,880	3,100	4,300	7,400
LOSS DUE TO C & G			-10,814				-10,814					10,814			
SUITABLE WASTE IN												-3,103	-3,100		-3,103
LIEU OF BORROW															
SHOLDER MATERIAL								9,375		9,375	11,250	11,250			
PROJECT TOTALS			202,116	3,775	11,850		198,341	498,132	3,775	494,357	597,004	391,788		8,750	8,750
5% TO REPLACE TOPSOIL												19,590			
IN BORROW PITS															
CHIPPED TIRES												-8,995			
GRAND TOTALS			202,116		11,850							402,383			8,750
SAY			202,300									402,500			
-L-	PAVE.	STRUCT.	VOLUME					21587							

REVISIONS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "HOLLAND" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 243098.3720(m) EASTING: 525132.3280(m)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999908360
THE N.C. LAMBERT GRID BEARING LOCALIZED HORIZONTAL GROUND DISTANCE FROM "HOLLAND" TO -L- STATION 60+59.109 IS
S 40° 12' 26.25" E 2,232.7059m
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

METRIC

5 0 10

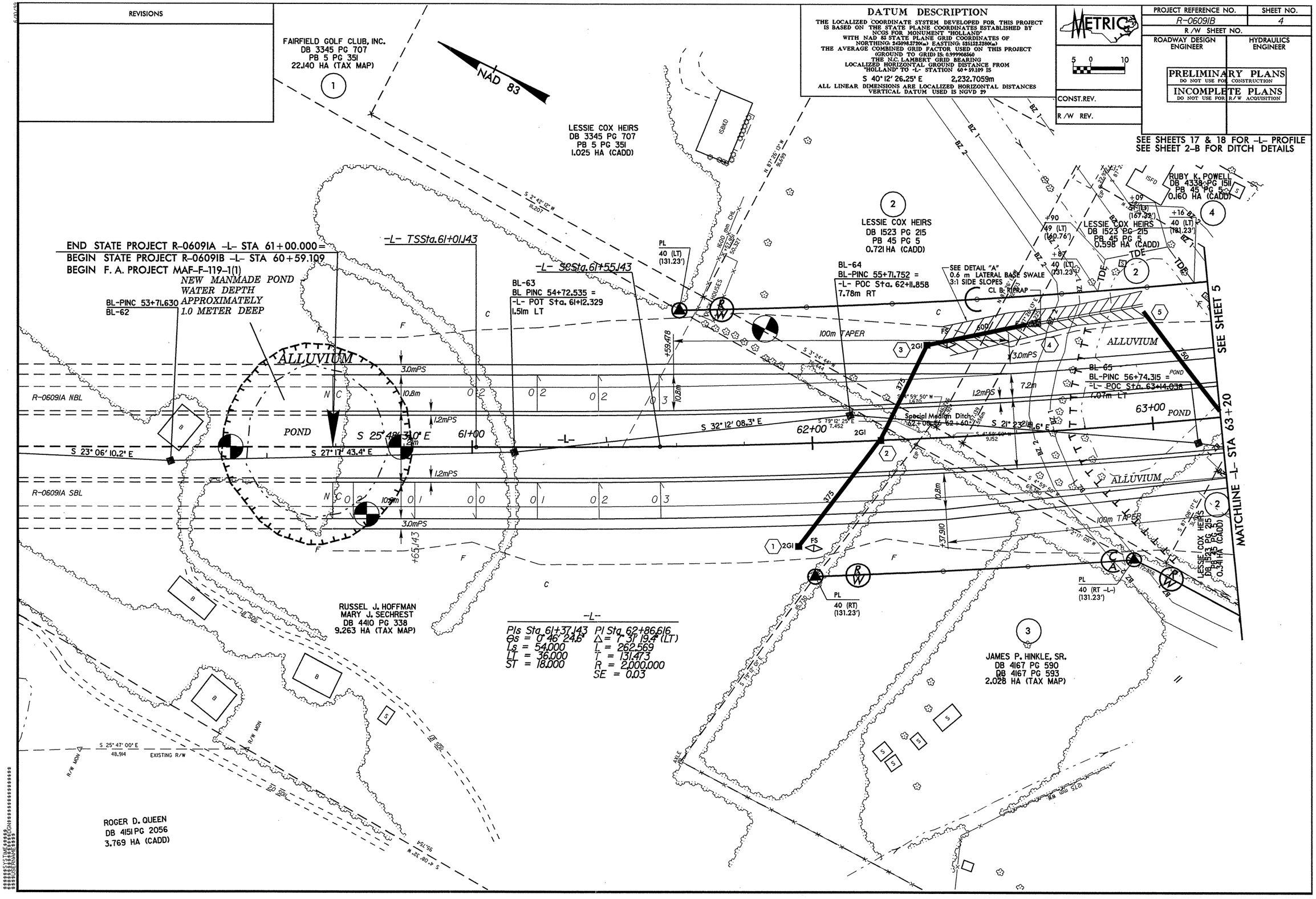
CONST.REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

SEE SHEETS 17 & 18 FOR -L- PROFILE
SEE SHEET 2-B FOR DITCH DETAILS



PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

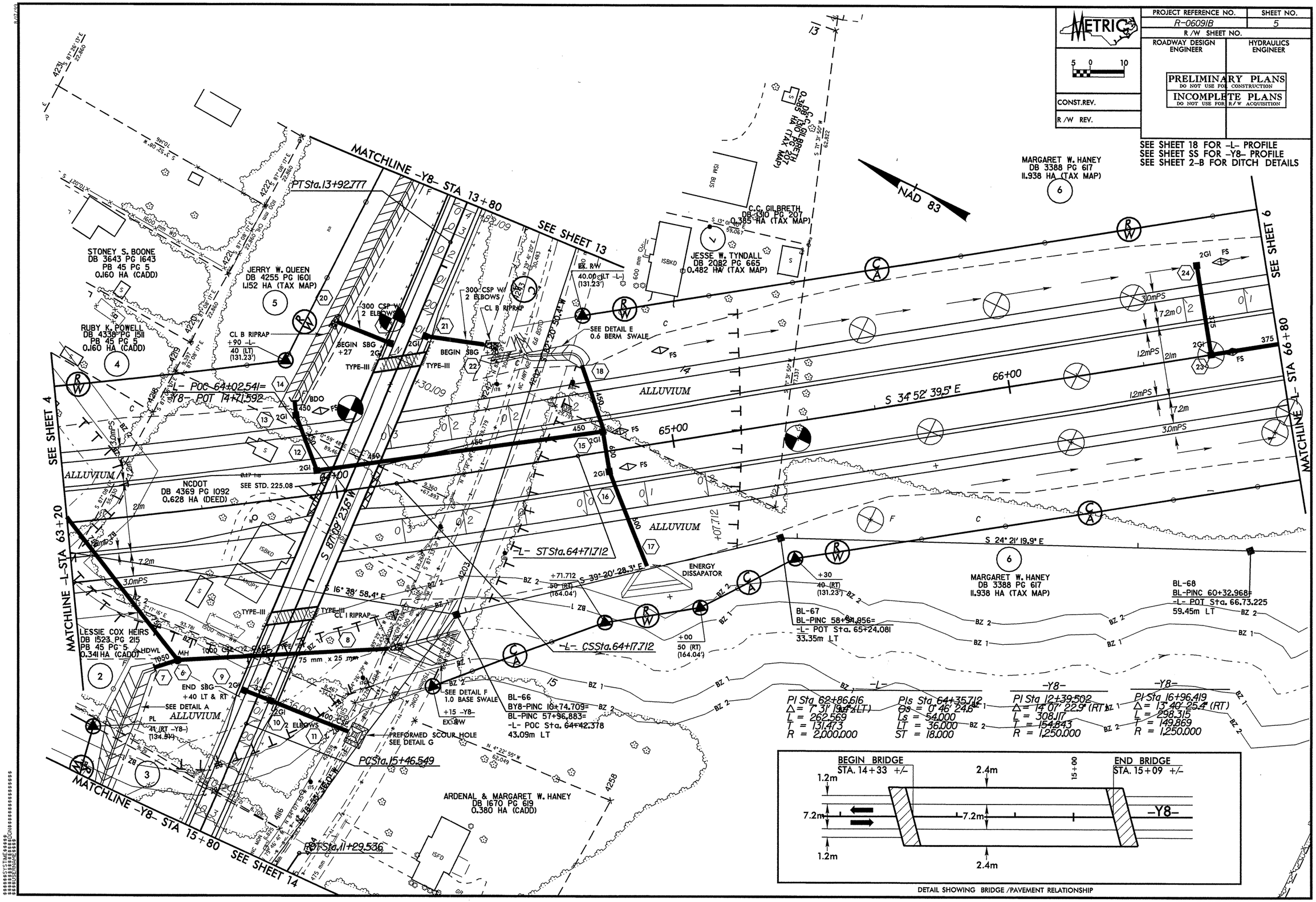
CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

SEE SHEET 18 FOR -L- PROFILE
SEE SHEET SS FOR -Y8- PROFILE
SEE SHEET 2-B FOR DITCH DETAILS



DETAIL SHOWING BRIDGE /PAVEMENT RELATIONSHIP

PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

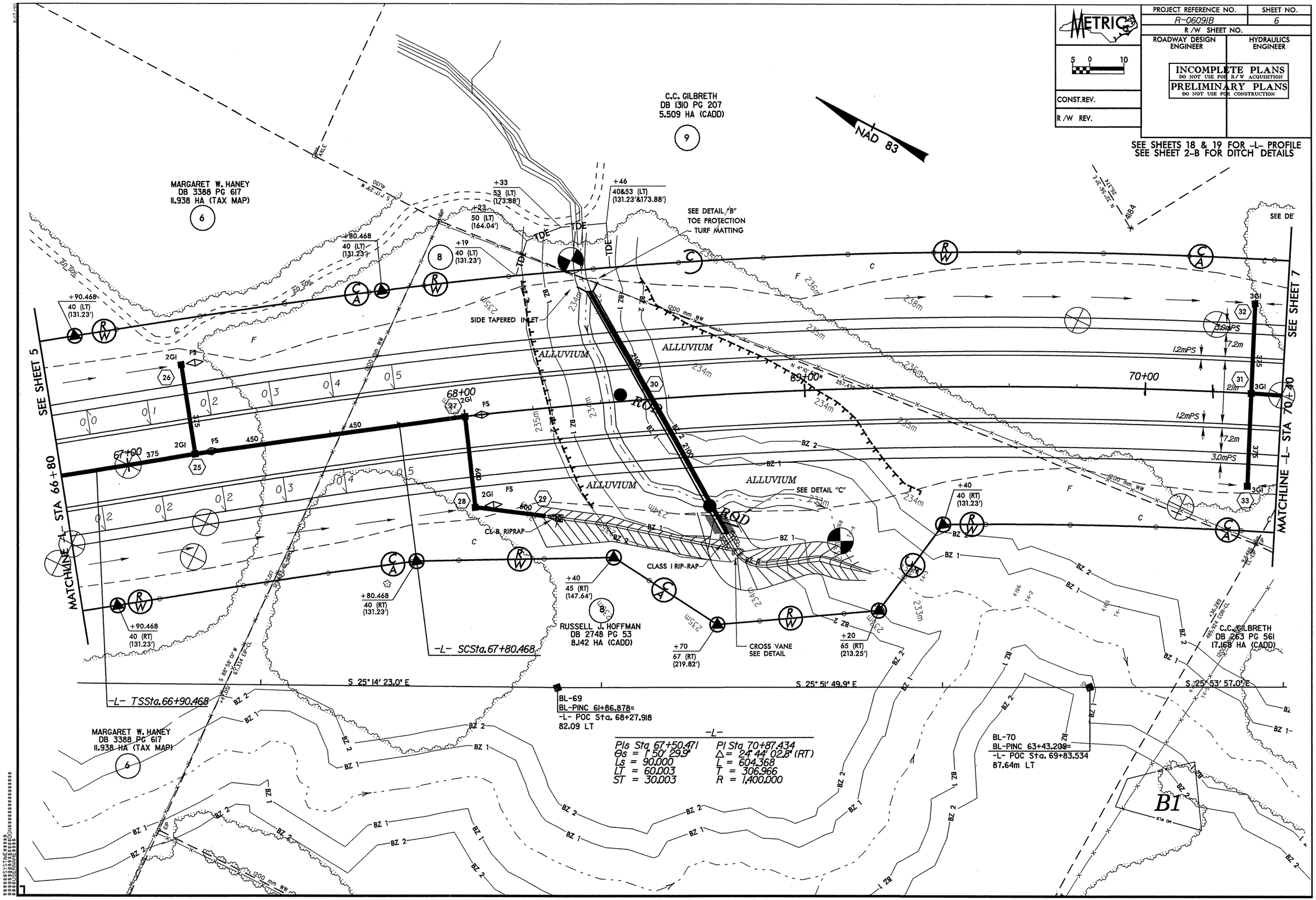
5 0 10

CONST.REV.

R/W REV.

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

SEE SHEETS 18 & 19 FOR -L- PROFILE
SEE SHEET 2-B FOR DITCH DETAILS



PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	7
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

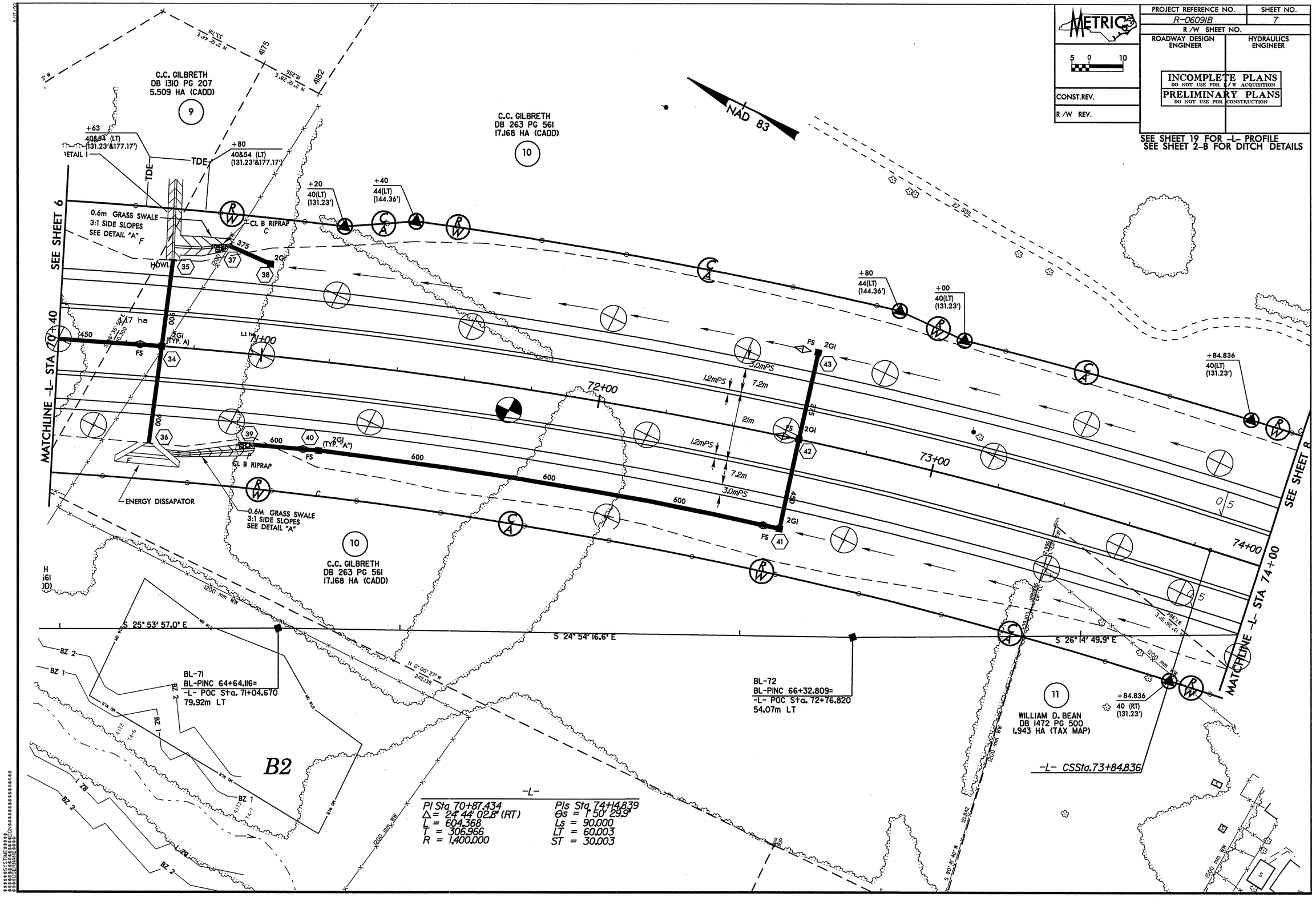
5 0 10

CONST.REV.

R /W REV.

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

SEE SHEET 19 FOR -L- PROFILE
SEE SHEET 2-B FOR DITCH DETAILS



-L-

PI Sta 70+87.434	PIs Sta 74+14.839
Δ = 24° 44' 02.8" (RT)	θs = 1° 50' 29.9"
L = 604.368	Ls = 90.000
T = 306.966	LT = 60.003
R = 1,400.000	ST = 30.003

PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

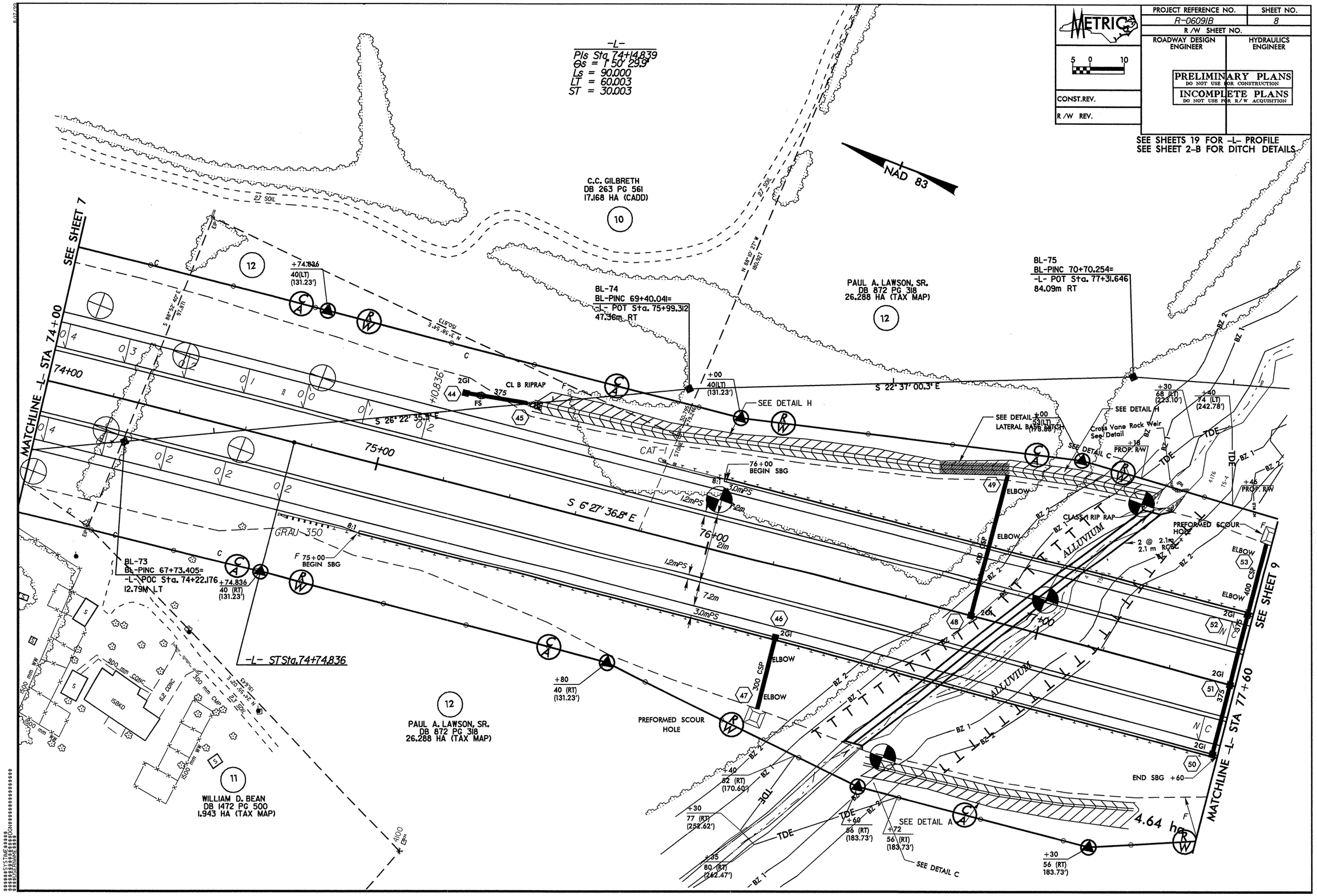
CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

SEE SHEETS 19 FOR -L- PROFILE
SEE SHEET 2-B FOR DITCH DETAILS



REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

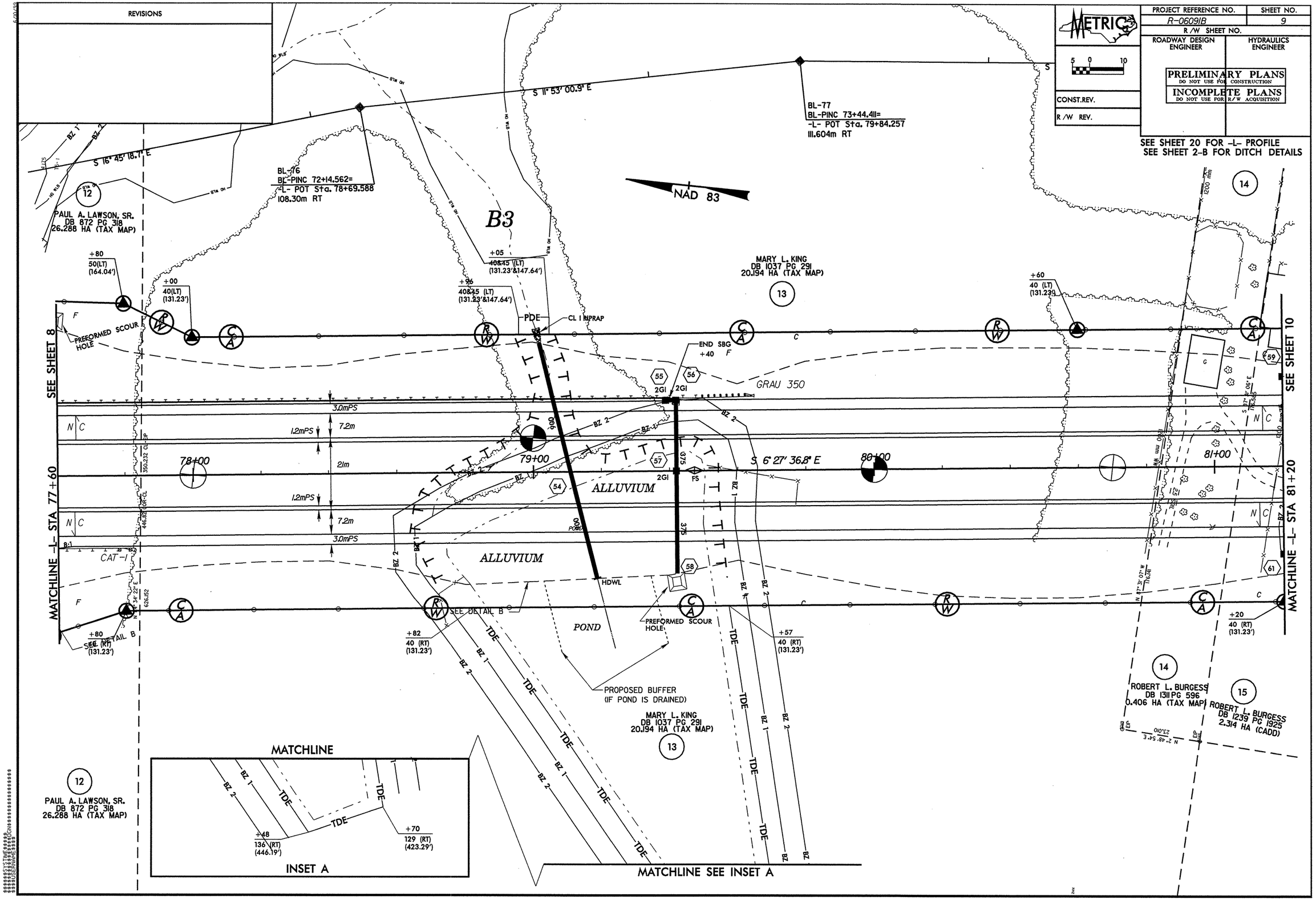
CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

SEE SHEET 20 FOR -L- PROFILE
SEE SHEET 2-B FOR DITCH DETAILS



REVISIONS

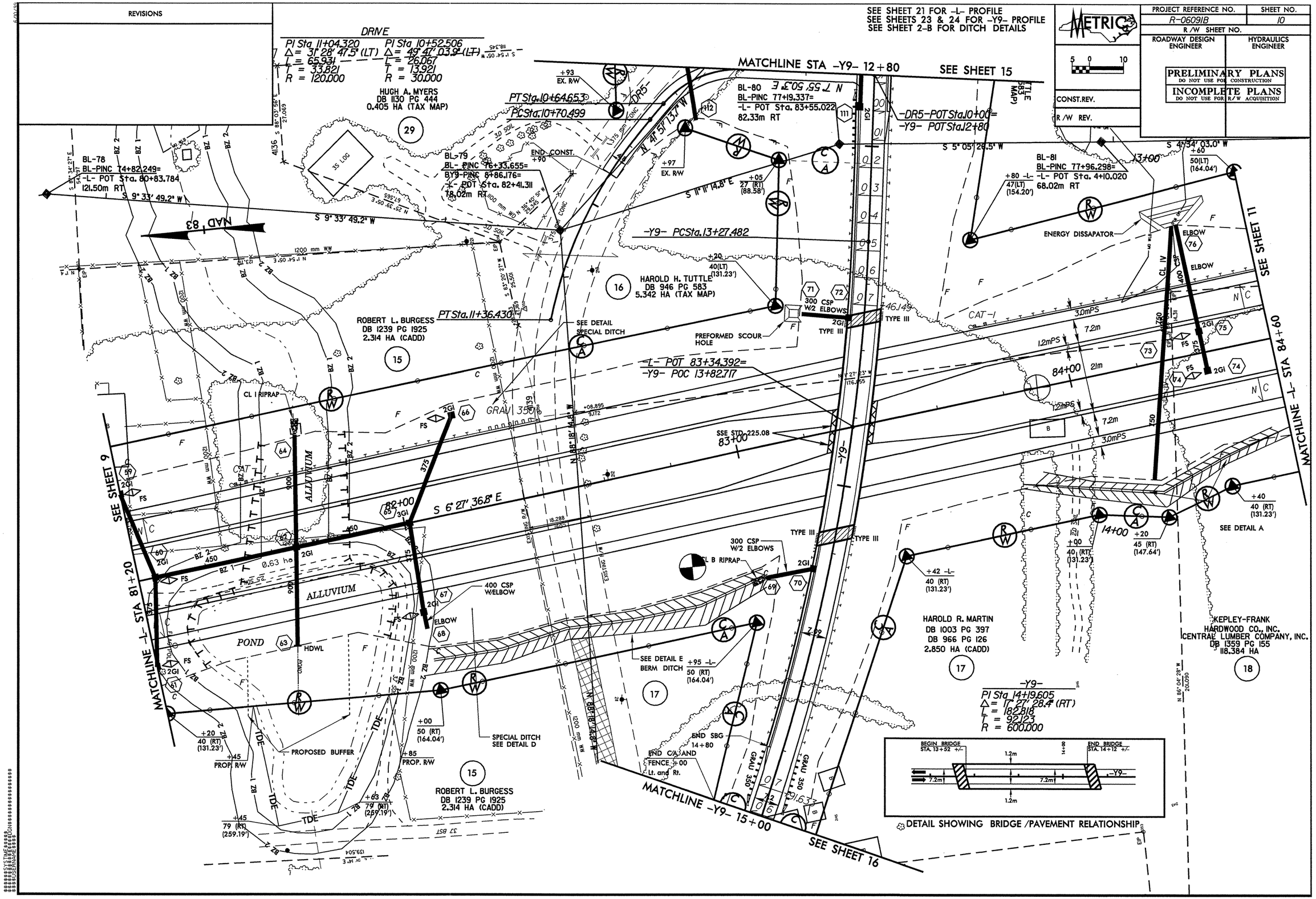
SEE SHEET 21 FOR -L- PROFILE
SEE SHEETS 23 & 24 FOR -Y9- PROFILE
SEE SHEET 2-B FOR DITCH DETAILS

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-0609B	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

CONST.REV.
R/W REV.



REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

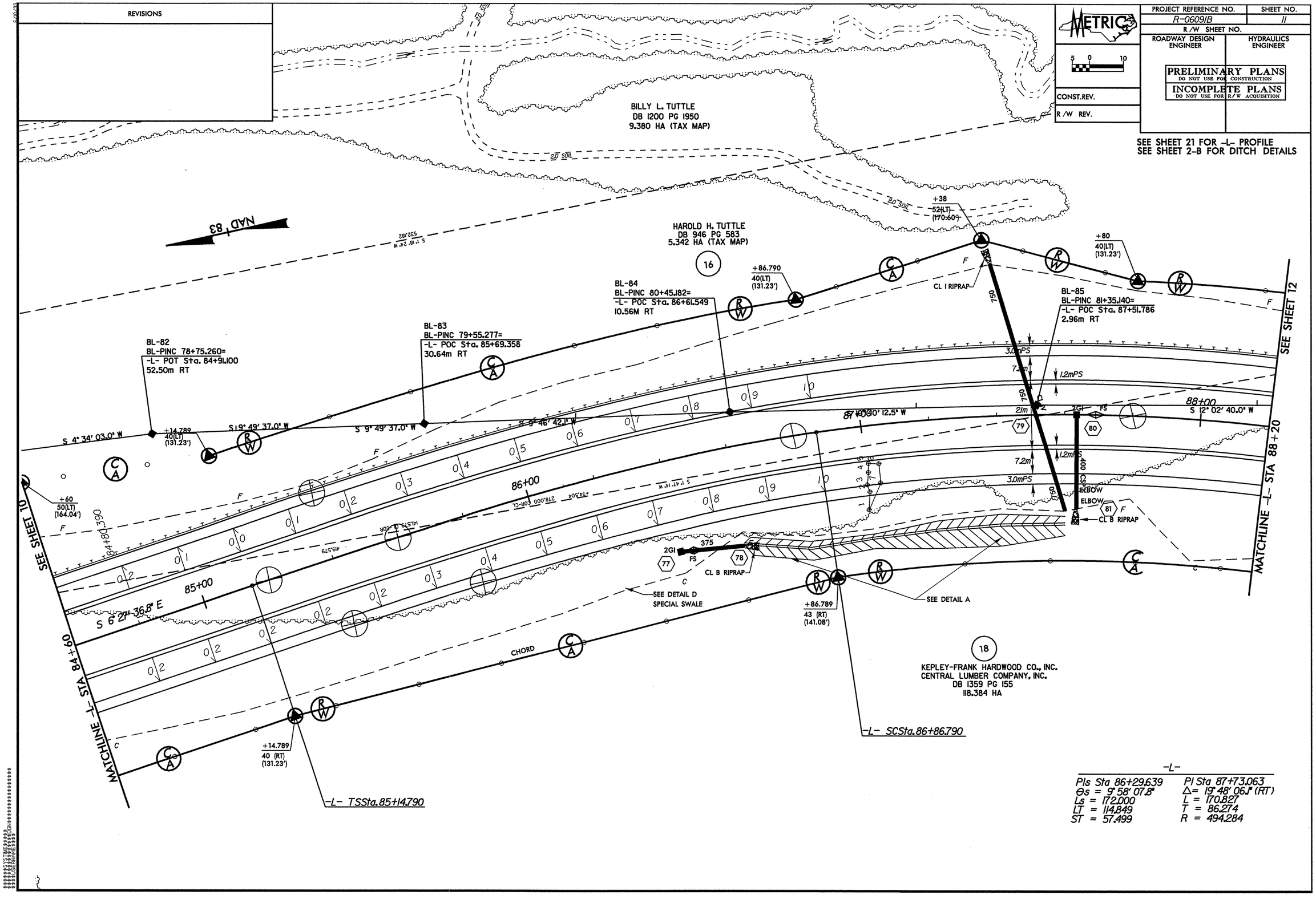
CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

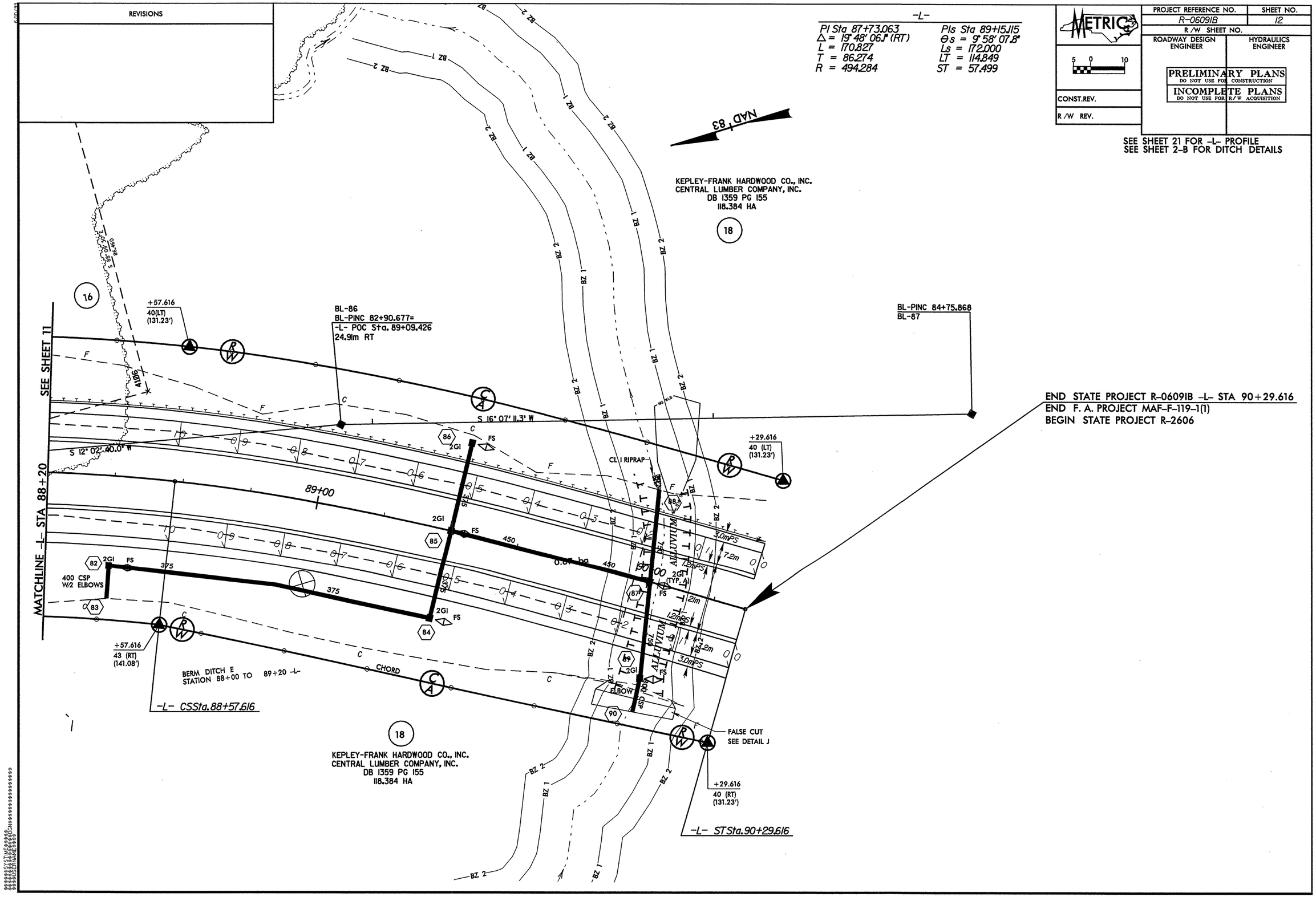
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

SEE SHEET 21 FOR -L- PROFILE
SEE SHEET 2-B FOR DITCH DETAILS



-L-

PIs Sta 86+29.639	PI Sta 87+73.063
Θs = 9° 58' 07.8"	Δ= 19° 48' 06.1" (RT)
Ls = 172.000	L = 170.827
LT = 114.849	T = 86.274
ST = 57.499	R = 494.284



REVISIONS
-L-
PI Sta 87+73.063
Δ = 19° 48' 06.1" (RT)
L = 170.827
T = 86.274
R = 494.284
PIs Sta 89+15.115
Θs = 9° 58' 07.8"
Ls = 172.000
LT = 114.849
ST = 57.499
METRIC
PROJECT REFERENCE NO.
R-0609IB
SHEET NO.
12
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
CONST.REV.
R/W REV.
SEE SHEET 21 FOR -L- PROFILE
SEE SHEET 2-B FOR DITCH DETAILS
NAD 83
KEPLEY-FRANK HARDWOOD CO., INC.
CENTRAL LUMBER COMPANY, INC.
DB 1359 PG 155
118.384 HA
18
16
+57.616
40(LT)
(131.23')
BL-86
BL-PINC 82+90.677=
-L- POC Sta. 89+09.426
24.91m RT
BL-PINC 84+75.868
BL-87
END STATE PROJECT R-0609IB -L- STA 90+29.616
END F. A. PROJECT MAF-F-119-1(1)
BEGIN STATE PROJECT R-2606
SEE SHEET 11
MATCHLINE -L- STA 88+20
S 16° 07' 11.3" W
S 12° 02' 40.0" W
89+00
CL I RIPRAP
+29.616
40 (LT)
(131.23')
400 CSP
W/2 ELBOWS
+57.616
43 (RT)
(141.08')
BERM DITCH E
STATION 88+00 TO 89+20 -L-
CHORD
-L- CSSta.88+57.616
ALLUVIUM
ELBOW
FALSE CUT
SEE DETAIL J
+29.616
40 (RT)
(131.23')
-L- STSta.90+29.616

REVISIONS

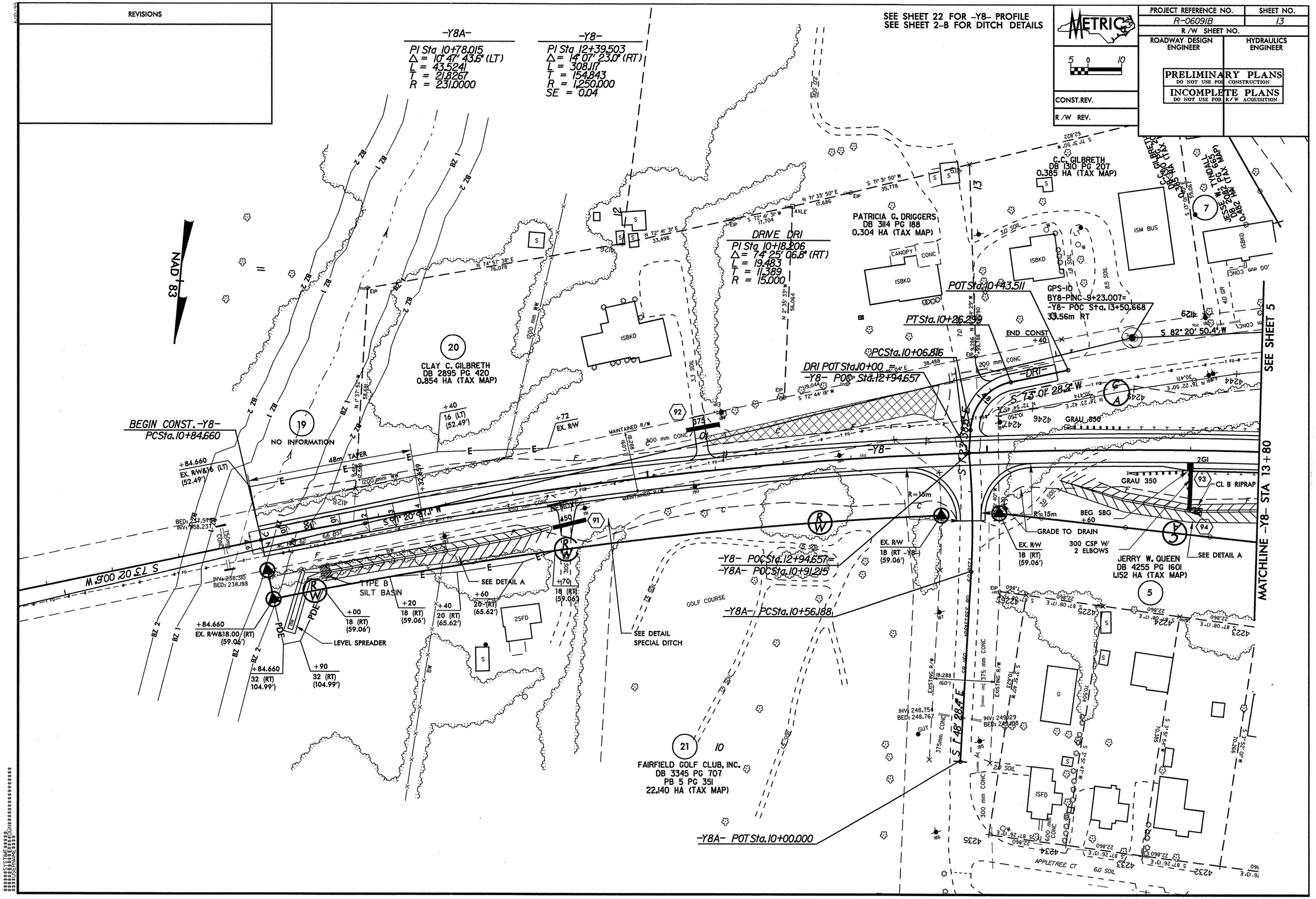
SEE SHEET 22 FOR -Y8- PROFILE
SEE SHEET 2-B FOR DITCH DETAILS

METRIC 5 0 10

PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

CONST. REV.
R/W REV.



PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

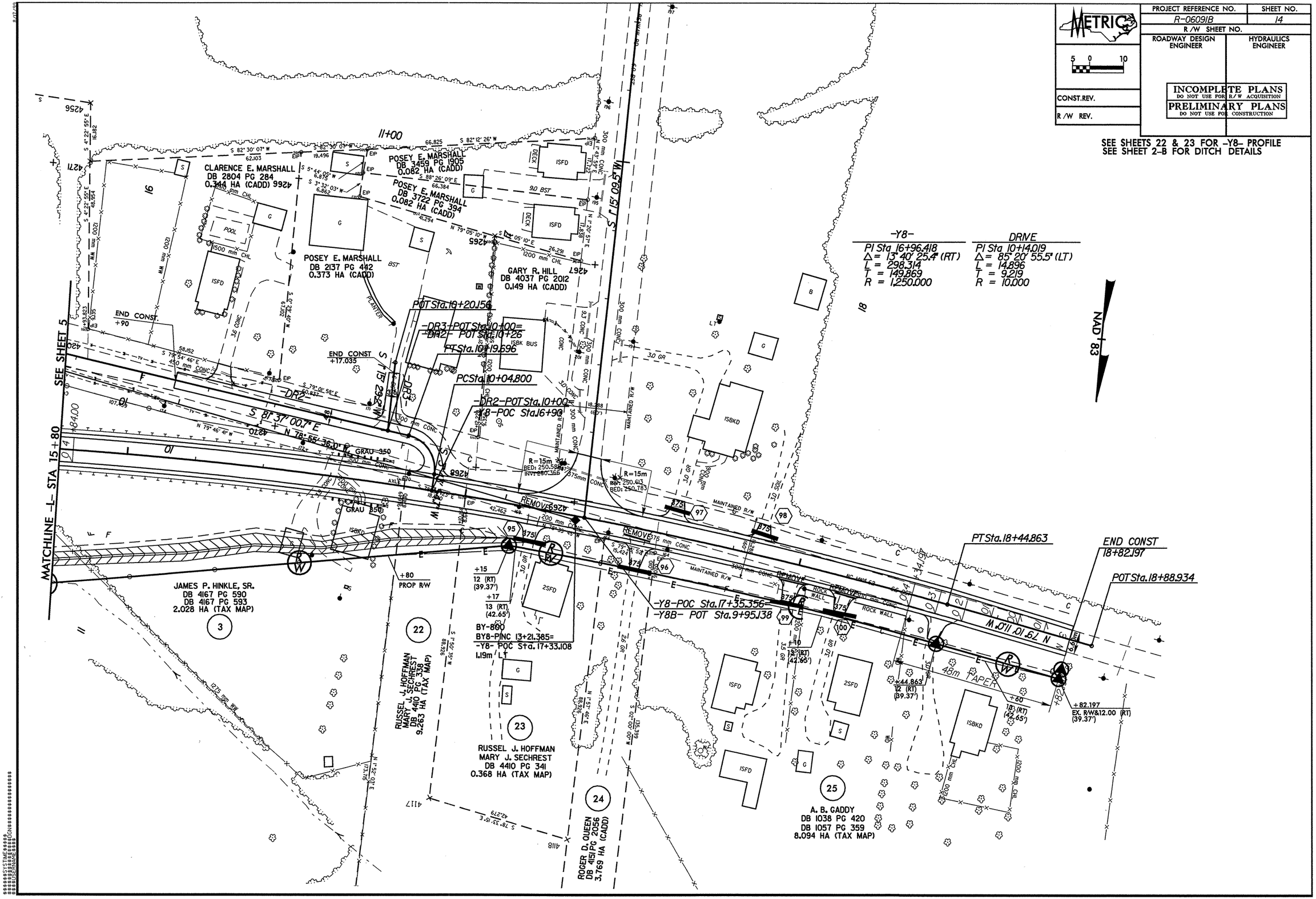
5 0 10

CONST.REV.

R/W REV.

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

SEE SHEETS 22 & 23 FOR -Y8- PROFILE
SEE SHEET 2-B FOR DITCH DETAILS



REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

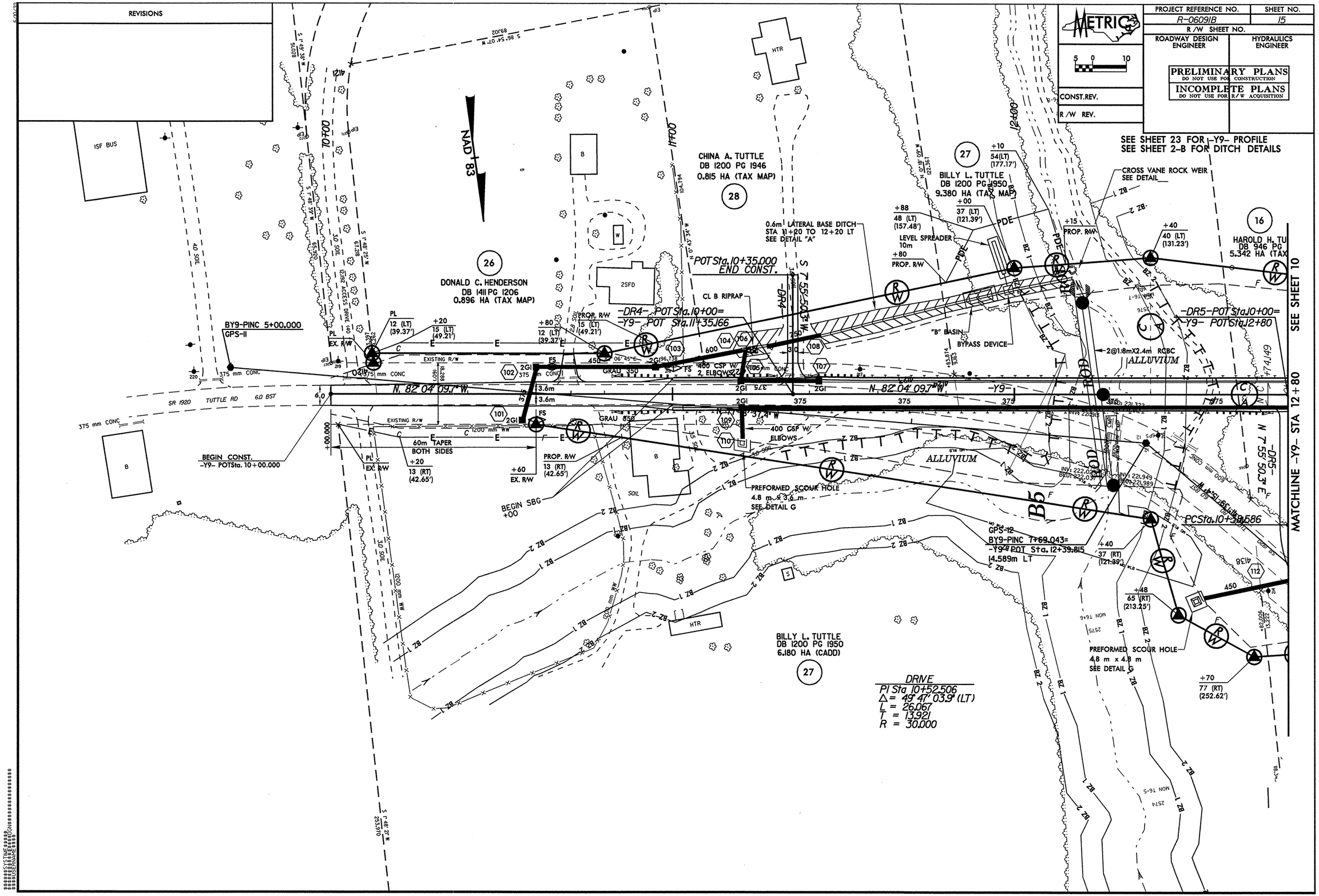
5 0 10

CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

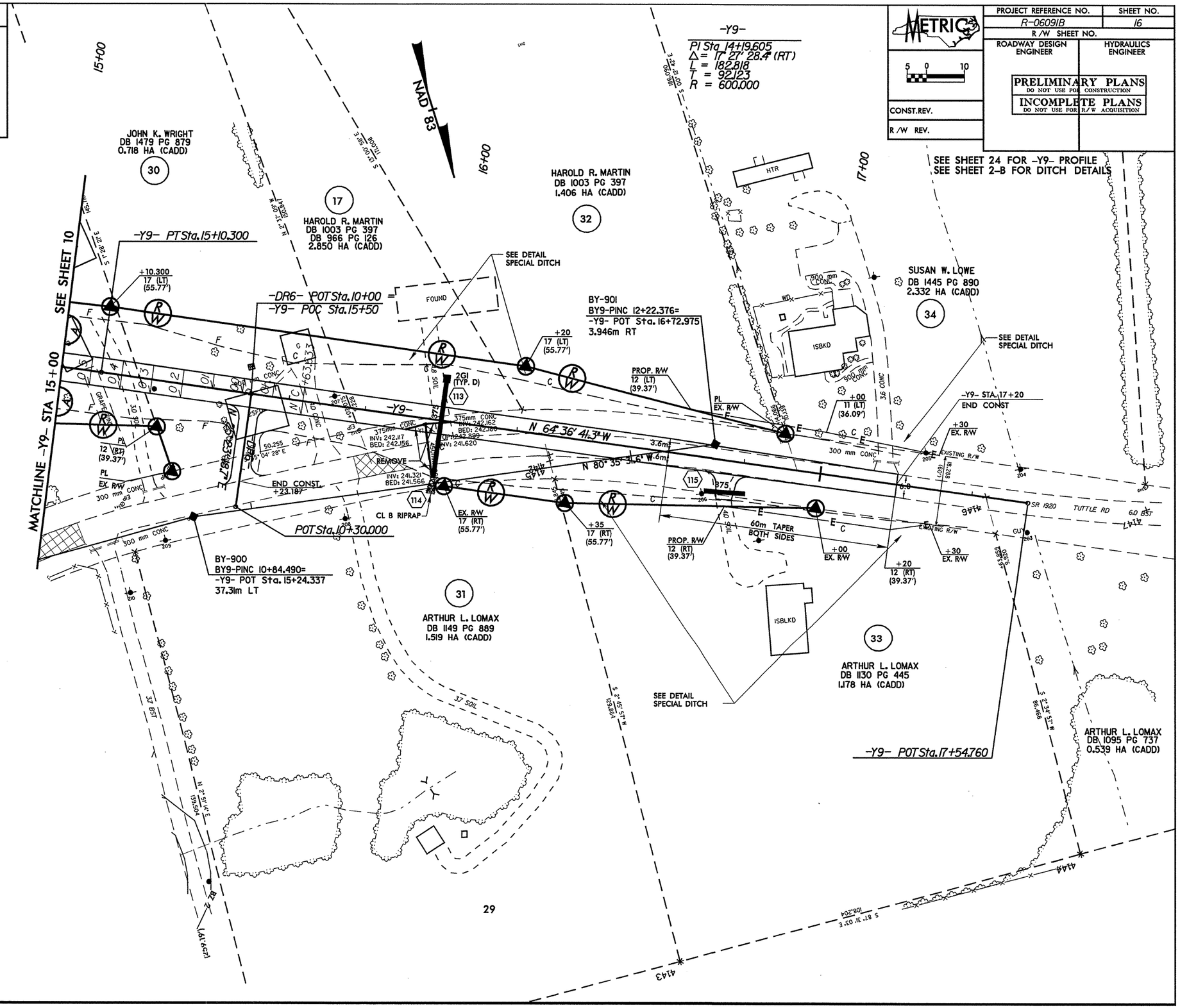
5 0 10

CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	17

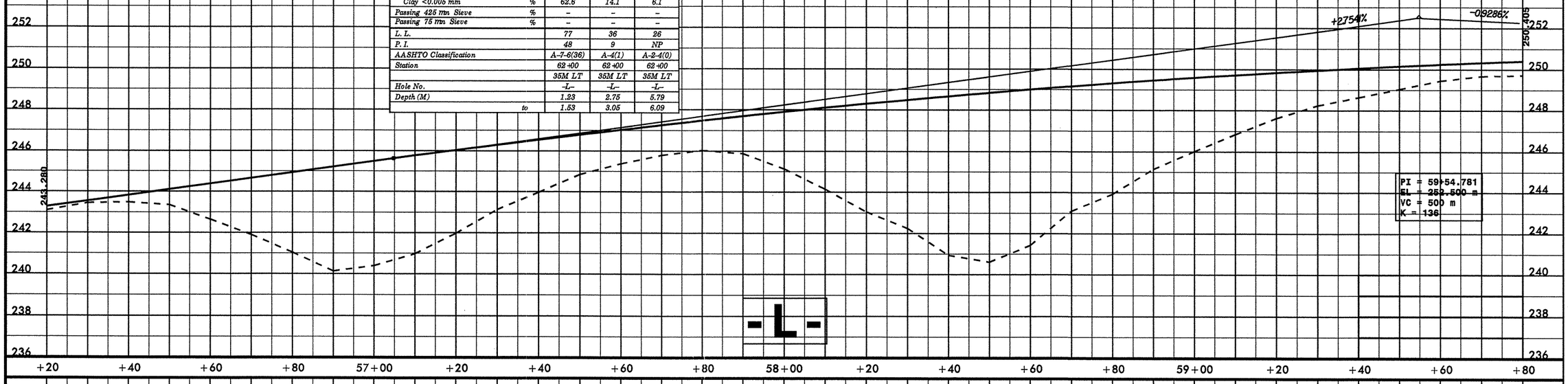
ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

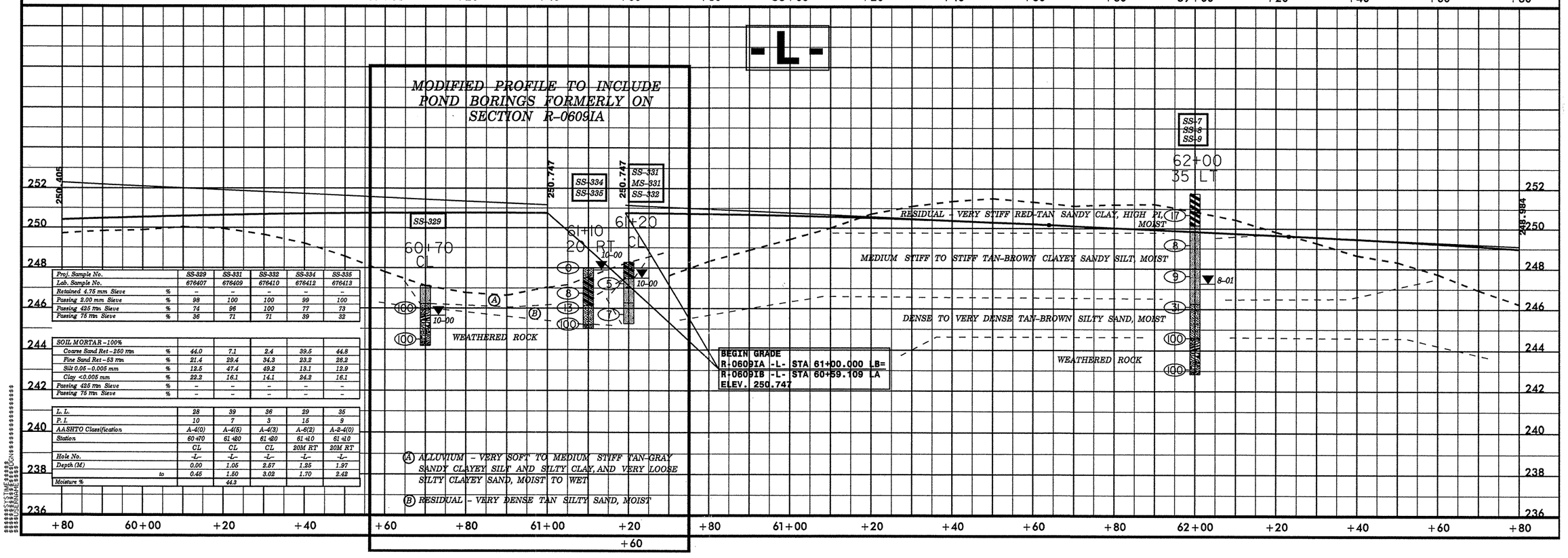
CONST.REV.

R/W REV.

BM 6 RR SPIKE IN BASE OF 470mm POPLAR 67m LT OF BASELINE STA 49+62 ELEV. 236.930

Proj. Sample No.		SS-7	SS-8	SS-9
Lab. Sample No.		688288	688289	688290
Retained 4.75 mm Sieve	%	TEST RESULTS		–
Passing 2.00 mm Sieve	%	100	100	100
Passing 425 mm Sieve	%	88	80	72
Passing 75 mm Sieve	%	72	42	24
		MINUS 2.00 mm FRACTION		
SOIL MORTAR – 100%				
Coarse Sand Ret – 250 mm	%	20.8	33.9	49.0
Fine Sand Ret – 53 mm	%	8.7	29.7	30.9
Silt 0.05 – 0.005 mm	%	7.9	22.2	14.0
Clay <0.005 mm	%	62.6	14.1	6.1
Passing 425 mm Sieve	%	–	–	–
Passing 75 mm Sieve	%	–	–	–
L. L.		77	36	26
P. I.		48	9	NP
AASHTO Classification		A-7-6(36)	A-4(1)	A-2-4(0)
Station		62+00	62+00	62+00
		35M LT	35M LT	35M LT
Hole No.		-L-	-L-	-L-
Depth (M)		1.23	2.75	5.79
	to	1.53	3.05	6.09





Proj. Sample No.		SS-329	SS-331	SS-332	SS-334	SS-335
Lab. Sample No.		676407	676409	676410	676412	676413
Retained 4.75 mm Sieve	%	–	–	–	–	–
Passing 2.00 mm Sieve	%	98	100	100	99	100
Passing 425 mm Sieve	%	74	96	100	77	73
Passing 75 mm Sieve	%	36	71	71	39	32
SOIL MORTAR – 100%						
Coarse Sand Ret – 250 mm	%	44.0	7.1	2.4	39.5	44.8
Fine Sand Ret – 53 mm	%	21.4	29.4	34.3	23.2	26.2
Silt 0.05 – 0.005 mm	%	12.5	47.4	49.2	13.1	12.9
Clay <0.005 mm	%	22.2	16.1	14.1	24.2	16.1
Passing 425 mm Sieve	%	–	–	–	–	–
Passing 75 mm Sieve	%	–	–	–	–	–
L. L.		28	39	36	29	35
P. I.		10	7	3	15	9
AASHTO Classification		A-4(0)	A-4(6)	A-4(3)	A-6(2)	A-2-4(0)
Station		60+70	61+20	61+20	61+10	61+10
		CL	CL	CL	20M RT	20M RT
Hole No.		-L-	-L-	-L-	-L-	-L-
Depth (M)		0.00	1.05	2.57	1.25	1.97
	to	0.45	1.50	3.02	1.70	2.42
Moisture %			44.3			

(A) ALLUVIUM - VERY SOFT TO MEDIUM STIFF TAN-GRAY SANDY CLAYEY SILT AND SILTY CLAY, AND VERY LOOSE SILTY CLAYEY SAND, MOIST TO WET

(B) RESIDUAL - VERY DENSE TAN SILTY SAND, MOIST

PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

CONST.REV.

R/W REV.

BM 7 RR SPIKE IN BASE OF 320mm HICKORY 90m LT OF BASELINE STA 57+97 ELEV. 247.15'

PI = 63+23.110
EL = 248.700 m
VC = 200 m
K = 139

248.984

-0.9286%

-2.3719%

-Y8-

SHALLOW POND

ALLUVIUM

RESIDUAL - DENSE TO VERY DENSE TAN-BROWN SILTY SAND, MOIST

750mm

SS-12

65+36
5 RT

65+75
9 RT

66+20
CL

ALLUVIUM - SOFT TO MEDIUM STIFF GRAY CLAYEY SANDY SILT, MOIST TO WET

RESIDUAL - HARD TAN SILTY SANDY CLAY, MOIST

WEATHERED ROCK

RESIDUAL - VERY DENSE TAN SILTY SAND, MOIST

RESIDUAL - STIFF TAN-BROWN SILTY SANDY CLAY, MOIST

WEATHERED ROCK

HARD ROCK

HARD ROCK

8-01

231.184

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO. 5

DRAINAGE AREA	=	40 HA
DESIGN FREQUENCY	=	50 YRS
DESIGN DISCHARGE	=	0.67 CMS
DESIGN HW ELEVATION	=	245.73M
100 YEAR DISCHARGE	=	0.77 CMS
100 YEAR HW ELEVATION	=	245.8 M
OVERTOPPING FREQUENCY	=	500 YRS
OVERTOPPING DISCHARGE	=	N/A CMS
OVERTOPPING ELEVATION	=	246.8 M

Proj. Sample No.		S-3	SS-12
Passing 2.00 mm Sieve	%	92	100
Passing 425 mm Sieve	%	61	72
Passing 75 mm Sieve	%	22	19
Coarse Sand Ret - 250 mm	%	53.0	52.4
Fine Sand Ret - 53 mm	%	27.9	33.0
Silt 0.05 - 0.005 mm	%	11.0	9.5
Clay <0.005 mm	%	8.1	5.1
L. L.		21	22
P. I.		NP	NP
AASHTO Classification		A-2-4(0)	A-2-4(0)
Station		66+60	65+86
		CL	5 RT
Hole No.		-L-	-L-
Depth (M)		0.00	1.17
	to	2.00	1.47

-L-

+80 63+00 +20 +40 +60 +80 64+00 +20 +40 +60 +80 65+00 +20 +40 +60 +80 66+00 +20 +40

-L-

S-3

66+60
CL

67+00
CL

241.184

RESIDUAL - STIFF TO HARD TAN-BROWN SILTY SANDY CLAY, MOIST

RESIDUAL - VERY DENSE TAN SILTY SAND, MOIST

WEATHERED ROCK

HARD ROCK

RESIDUAL - VERY DENSE TAN SILTY SAND, MOIST

ROD SOUNDING
68+46
2 LT

ALLUVIUM - VERY LOOSE BROWN-TAN SILTY COARSE SAND, WET

RESIDUAL - VERY DENSE TAN SILTY SAND, MOIST

HARD ROCK

RESIDUAL - VERY DENSE TAN SILTY SAND, MOIST

-2.3719%

+1.3035%

WEATHERED ROCK

HARD ROCK

PI = 69+50.000
EL = 233.831 m
VC = 560 m
K = 52

236.219

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	=	7.67 CMS
DESIGN FREQUENCY	=	50 YRS
DESIGN HW ELEVATION	=	237.95M
BASE DISCHARGE	=	9.01 CMS
BASE FREQUENCY	=	100 YRS
BASE HW ELEVATION	=	238.29M
OVERTOPPING DISCHARGE	=	N/A CMS
OVERTOPPING FREQUENCY	=	500 YRS
OVERTOPPING ELEVATION	=	236.42M

+40 +60 +80 67+00 +20 +40 +60 +80 68+00 +20 +40 +60 +80 69+00 +20 +40 +60 +80 70+00

$$SYSTIME$$
$$SYSDRIVE$$
$$SYSDIR$$
$$SYSNAME$$

Proj. Sample No.		SS-20	SS-21	S-26	S-27	S-28	SS-29	SS-30
Passing 2.00 mm Sieve	%	100	100	91	100	100	100	100
Passing 425 mm Sieve	%	93	97	67	98	99	82	80
Passing 75 mm Sieve	%	57	65	30	76	84	45	37
Coarse Sand Ret - 250 mm	%	18.0	6.3	42.9	7.1	3.2	32.9	35.4
Fine Sand Ret - 53 mm	%	32.7	34.5	28.1	22.8	20.8	26.5	32.9
Silt 0.05 - 0.005 mm	%	39.2	47.1	12.8	41.8	53.7	18.4	19.6
Clay <0.005 mm	%	10.1	12.1	16.2	28.3	22.2	22.2	12.1
L. L.		27	27	18	46	36	39	36
P. I.		6	6	5	21	13	17	9
AASHTO Classification		A-4(1)	A-4(2)	A-2-4(0)	A-7-6(16)	A-6(11)	A-6(4)	A-4(0)
Station		71+74	71+74	74+20	74+20	74+20	76+00	76+00
		7 M LT	7 M LT	10 RT	10 RT	10 RT	15M LT	15M LT
Hole No.		-L-	-L-	-L-	-L-	-L-	-L-	-L-
Depth (M)		1.28	2.80	0.00	3.20	6.00	1.32	2.84
	to	1.68	3.10	3.20	6.00	7.15	1.62	3.14

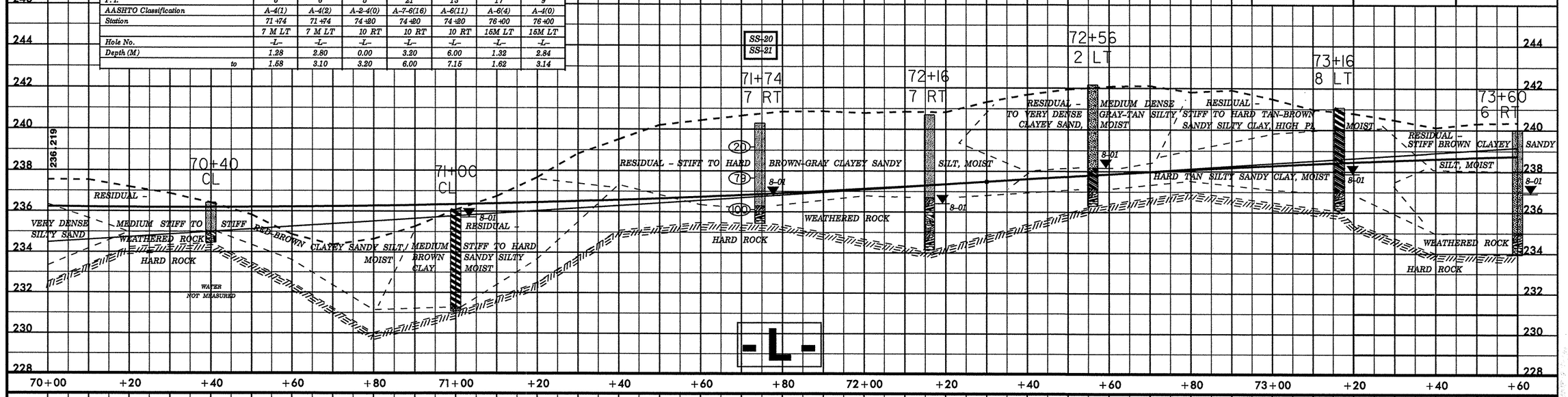
BM 8 RR SPIKE IN BASE OF 600mm GUM 86m RT OF BASELINE STA 65+00 ELEV. 231.001

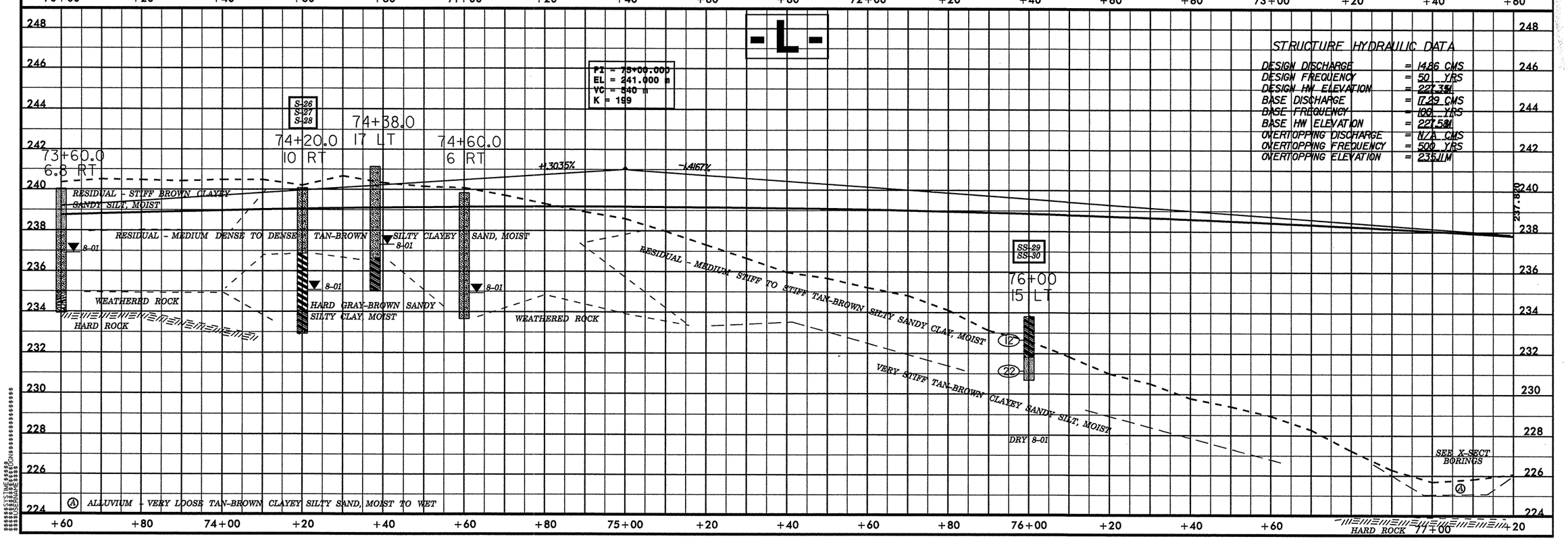
METRIC 5 0 10

PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CONST.REV.

R /W REV.





STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	=	1486 CMS
DESIGN FREQUENCY	=	50 YRS
DESIGN HW ELEVATION	=	227.3M
BASE DISCHARGE	=	1729 CMS
BASE FREQUENCY	=	100 YRS
BASE HW ELEVATION	=	227.5M
OVERTOPPING DISCHARGE	=	N/A CMS
OVERTOPPING FREQUENCY	=	500 YRS
OVERTOPPING ELEVATION	=	235.1M

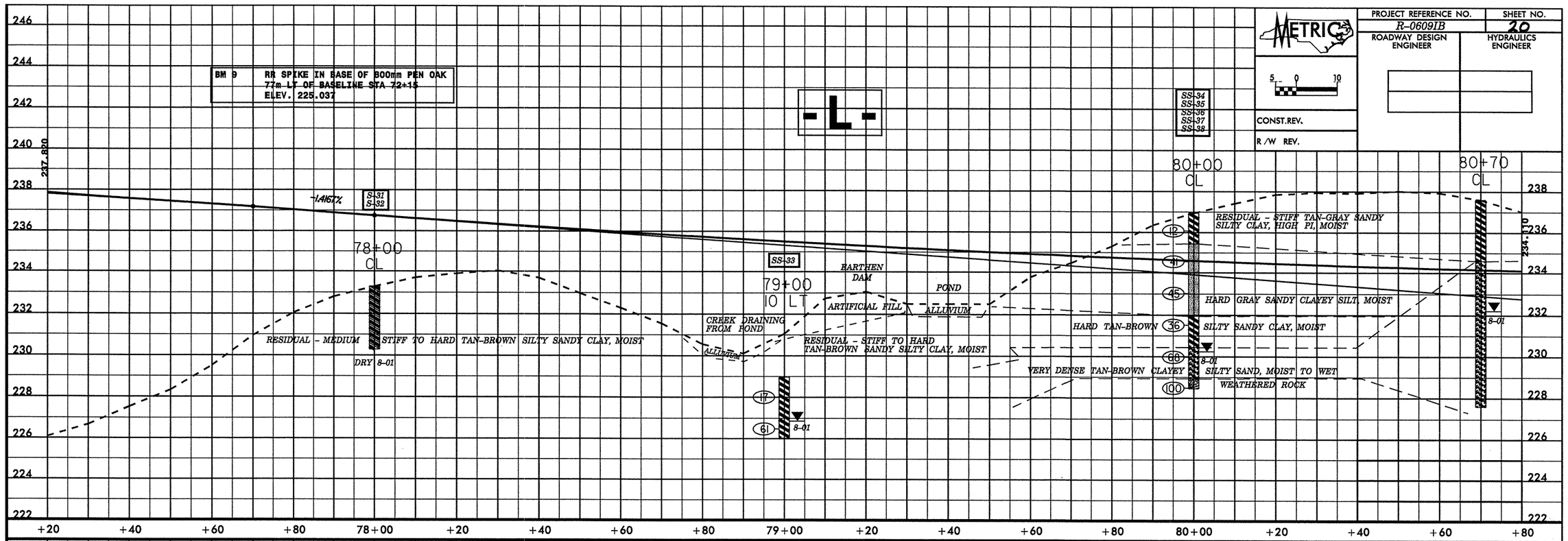
SYSTIME$$$$ SYSTIME$$$$ DGN$$$$ USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	20
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

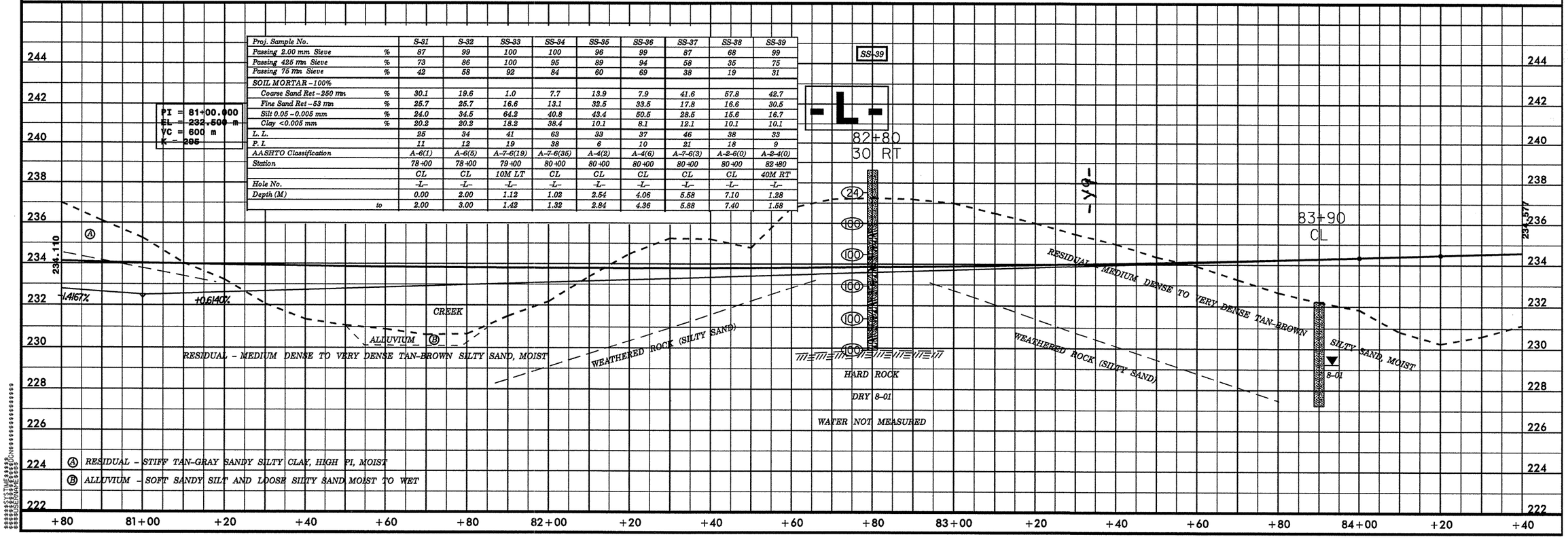
METRIC 5 0 10

CONST.REV.

R/W REV.



Proj. Sample No.		S-31	S-32	SS-33	SS-34	SS-35	SS-36	SS-37	SS-38	SS-39
Passing 2.00 mm Sieve	%	87	99	100	100	96	99	87	68	99
Passing 425 mm Sieve	%	73	86	100	95	89	94	58	35	75
Passing 75 mm Sieve	%	42	58	92	84	60	69	38	19	31
SOIL MORTAR -100%										
Coarse Sand Ret - 250 mm	%	30.1	19.6	1.0	7.7	13.9	7.9	41.6	57.8	42.7
Fine Sand Ret - 53 mm	%	25.7	25.7	16.6	13.1	32.5	33.5	17.8	16.6	30.5
Silt 0.05 - 0.005 mm	%	24.0	34.5	64.2	40.8	43.4	50.5	28.5	15.6	16.7
Clay <0.005 mm	%	20.2	20.2	18.2	38.4	10.1	8.1	12.1	10.1	10.1
L. L.		25	34	41	63	33	37	46	38	33
P. I.		11	12	19	38	6	10	21	18	9
AASHTO Classification		A-6(1)	A-6(5)	A-7-6(19)	A-7-6(35)	A-4(2)	A-4(6)	A-7-6(3)	A-2-6(0)	A-2-4(0)
Station		78+00	78+00	79+00	80+00	80+00	80+00	80+00	80+00	82+80
		CL	CL	10M LT	CL	CL	CL	CL	CL	40M RT
Hole No.		-L-	-L-	-L-	-L-	-L-	-L-	-L-	-L-	-L-
Depth (M)		0.00	2.00	1.12	1.02	2.54	4.06	5.58	7.10	1.28
	to	2.00	3.00	1.42	1.32	2.84	4.36	5.88	7.40	1.58



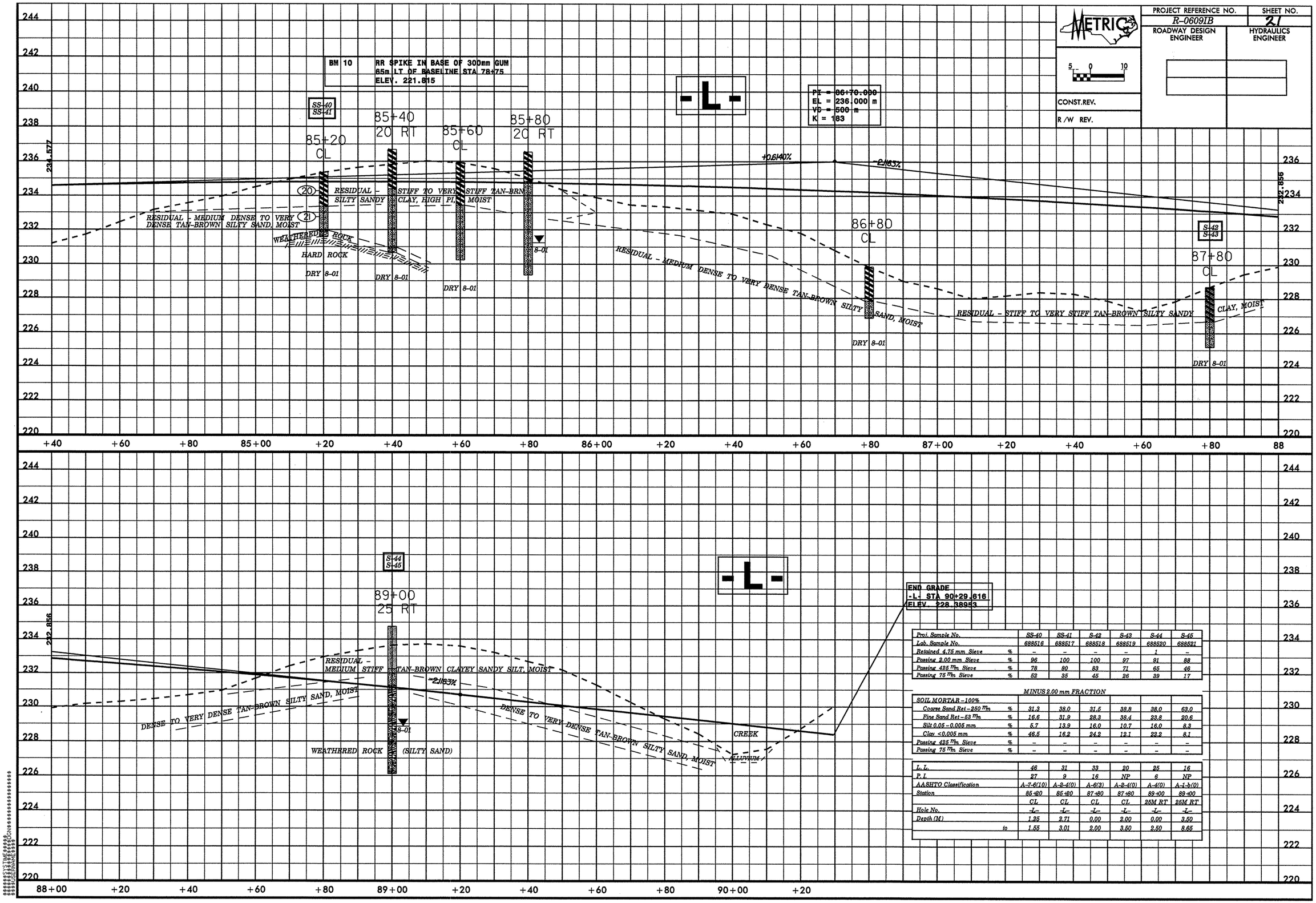
PROJECT REFERENCE NO.	SHEET NO.
R-0609B	21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

CONST.REV.

R/W REV.



END GRADE
-L- STA 90+29.616
ELEV. 228.38953

Proj. Sample No.		SS-40	SS-41	S-42	S-43	S-44	S-45
Lab. Sample No.		688516	688517	688518	688519	688520	688521
Retained 4.75 mm Sieve	%	–	–	–	–	1	–
Passing 2.00 mm Sieve	%	96	100	100	97	91	88
Passing 426 ᵐᵐ Sieve	%	78	80	83	71	65	46
Passing 75 ᵐᵐ Sieve	%	52	35	45	26	39	17
MINUS 2.00 mm FRACTION							
SOIL MORTAR – 100%							
Coarse Sand Ret – 250 ᵐᵐ	%	31.3	38.0	31.5	38.8	38.0	63.0
Fine Sand Ret – 53 ᵐᵐ	%	16.6	31.9	28.3	38.4	23.8	20.6
Silt 0.05 – 0.005 mm	%	5.7	13.9	16.0	10.7	16.0	8.3
Clay <0.005 mm	%	46.5	16.2	24.2	12.1	22.2	8.1
Passing 425 ᵐᵐ Sieve	%	–	–	–	–	–	–
Passing 75 ᵐᵐ Sieve	%	–	–	–	–	–	–
L.L.		46	31	33	20	25	16
P.I.		27	9	16	NP	6	NP
AASHTO Classification		A-7-6(10)	A-2-4(0)	A-6(3)	A-2-4(0)	A-4(0)	A-1-b(0)
Station		85+20	85+20	87+80	87+80	89+00	89+00
		CL	CL	CL	CL	25M RT	25M RT
Hole No.		-L-	-L-	-L-	-L-	-L-	-L-
Depth (M)		1.25	2.71	0.00	2.00	0.00	3.50
	to	1.55	3.01	2.00	3.50	2.50	8.65

SYSTIME#### SYSCON#### USERNAME#### SNELL

PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	22
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

CONST.REV.

R/W REV.

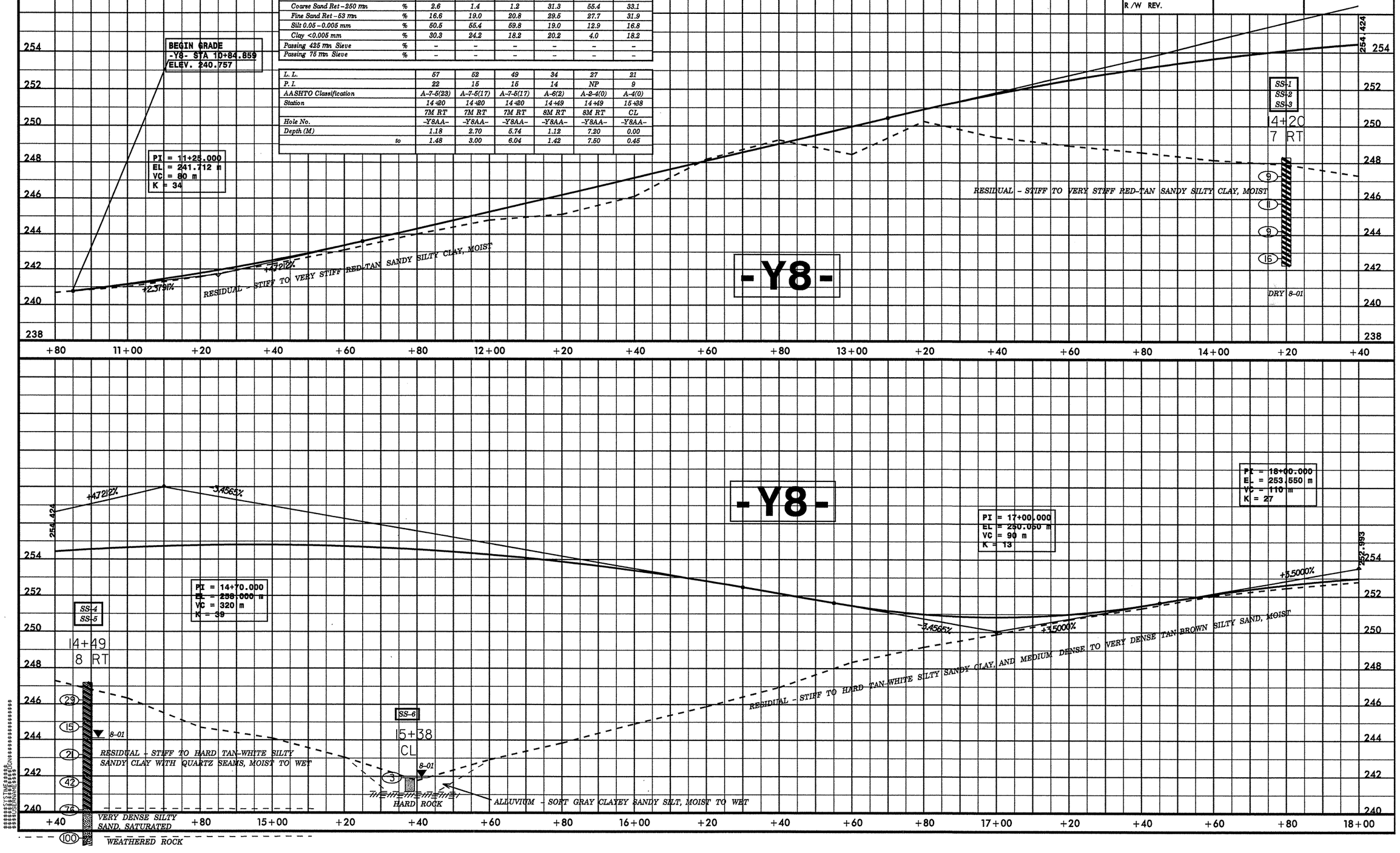
TEST RESULTS

Proj. Sample No.		SS-1	SS-2	SS-3	SS-4	SS-5	SS-6
Lab. Sample No.		688282	688283	688284	688285	688286	688287
Retained 4.75 mm Sieve	%	–	–	–	–	–	–
Passing 2.00 mm Sieve	%	100	100	100	98	89	100
Passing 425 mm Sieve	%	99	99	99	83	57	80
Passing 75 mm Sieve	%	87	88	88	43	18	38

MINUS 2.00 mm FRACTION

SOIL MORTAR – 100%							
Coarse Sand Ret – 250 mm	%	2.6	1.4	1.2	31.3	55.4	33.1
Fine Sand Ret – 53 mm	%	16.6	19.0	20.8	29.5	27.7	31.9
Silt 0.05 – 0.005 mm	%	50.5	55.4	59.8	19.0	12.9	16.8
Clay <0.005 mm	%	30.3	24.2	18.2	20.2	4.0	18.2
Passing 425 mm Sieve	%	–	–	–	–	–	–
Passing 75 mm Sieve	%	–	–	–	–	–	–

L. L.	57	52	49	34	27	21
P. I.	22	15	15	14	NP	9
AASHTO Classification	A-7-5(23)	A-7-5(17)	A-7-5(17)	A-6(2)	A-2-4(0)	A-4(0)
Station	14+20	14+20	14+20	14+49	14+49	15+38
	7M RT	7M RT	7M RT	8M RT	8M RT	CL
Hole No.	-Y8AA-	-Y8AA-	-Y8AA-	-Y8AA-	-Y8AA-	-Y8AA-
Depth (M)	1.18	2.70	5.74	1.12	7.20	0.00
to	1.48	3.00	6.04	1.42	7.50	0.45



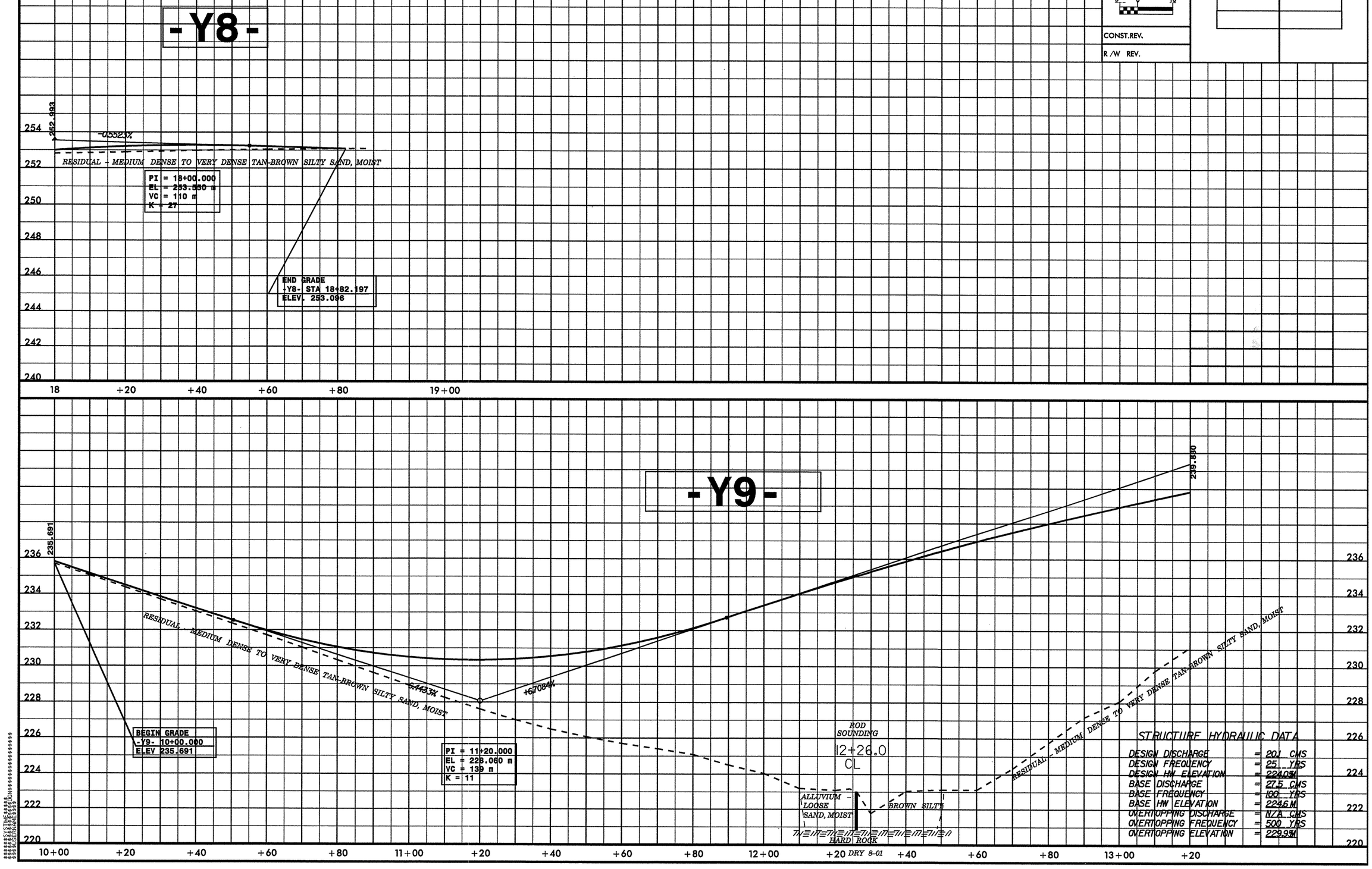
PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

CONST.REV.

R/W REV.



STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	=	20.1 CMS
DESIGN FREQUENCY	=	25 YRS
DESIGN HW ELEVATION	=	224.0M
BASE DISCHARGE	=	27.5 CMS
BASE FREQUENCY	=	100 YRS
BASE HW ELEVATION	=	224.6M
OVERTOPPING DISCHARGE	=	N/A CMS
OVERTOPPING FREQUENCY	=	500 YRS
OVERTOPPING ELEVATION	=	229.9M

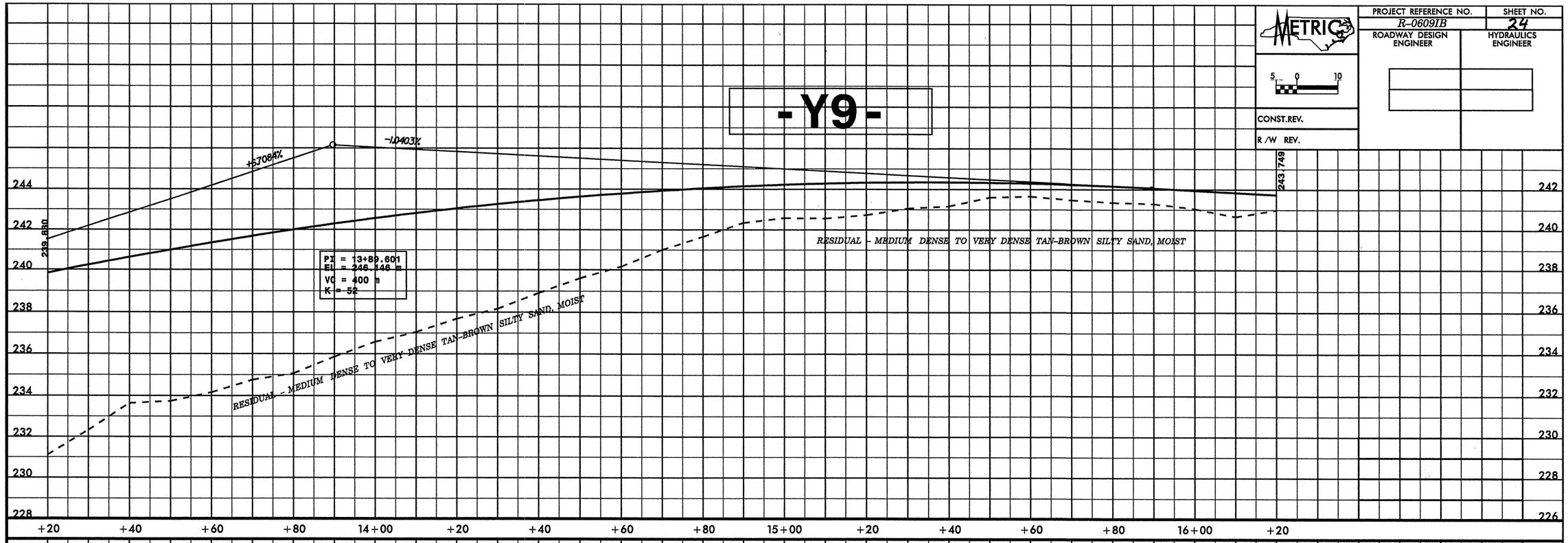
PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	24
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

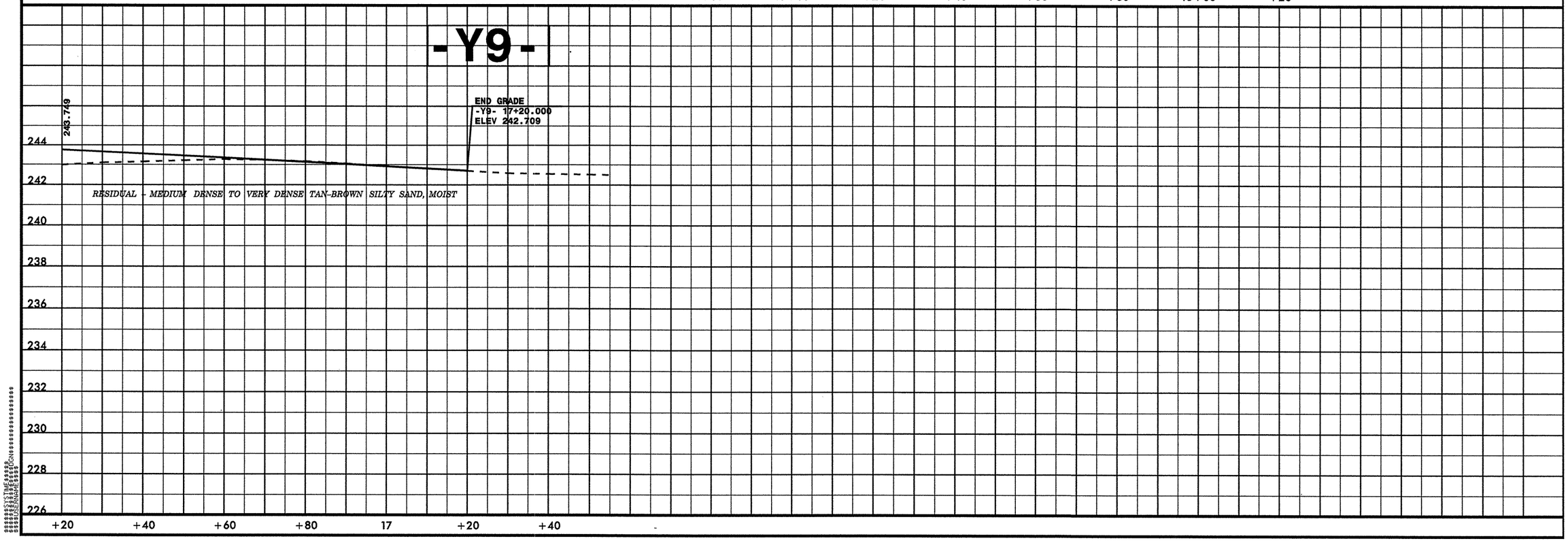
METRIC

5 0 10

CONST.REV.

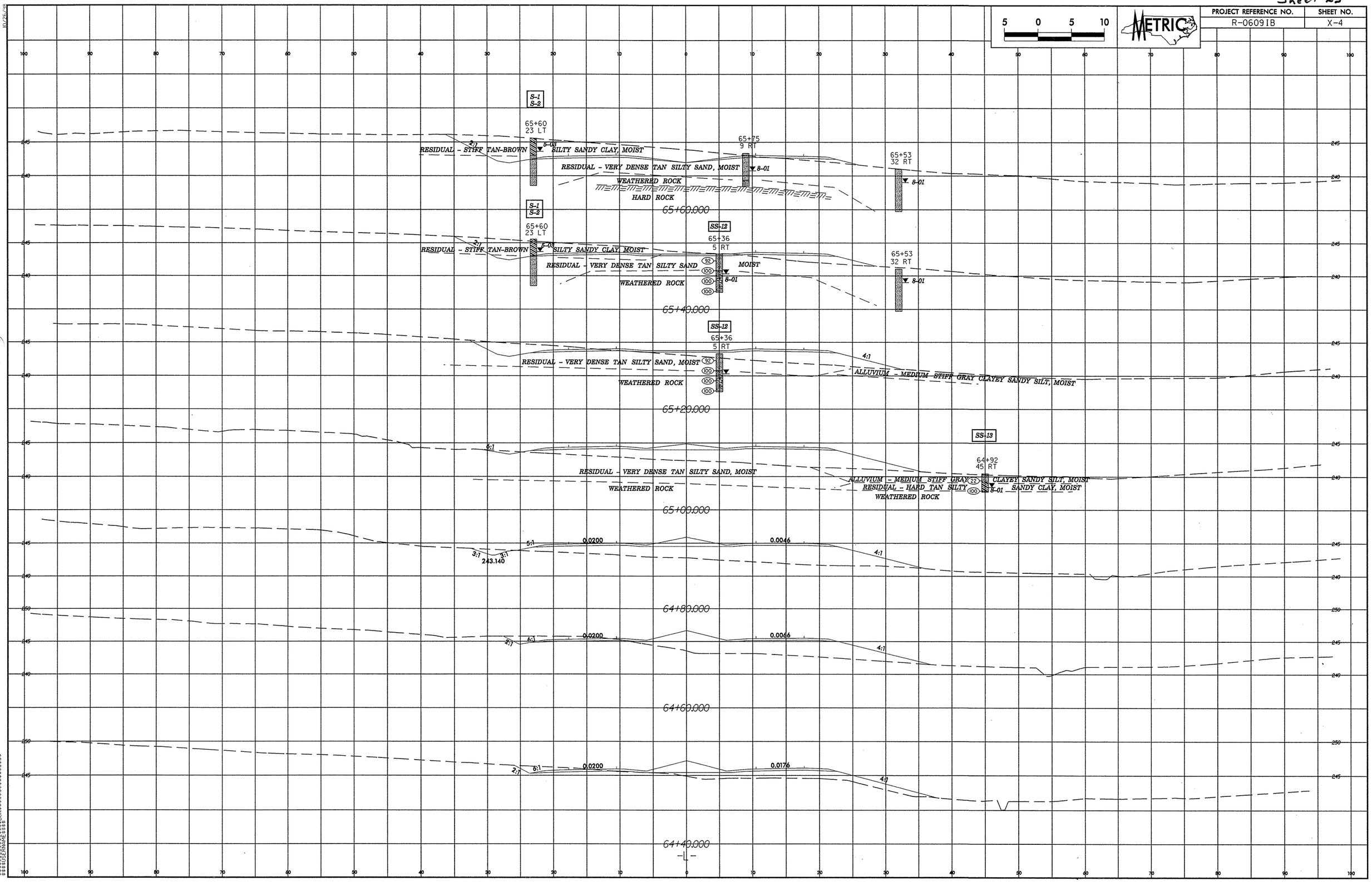
R /W REV.





Sheet 25

PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	X-4

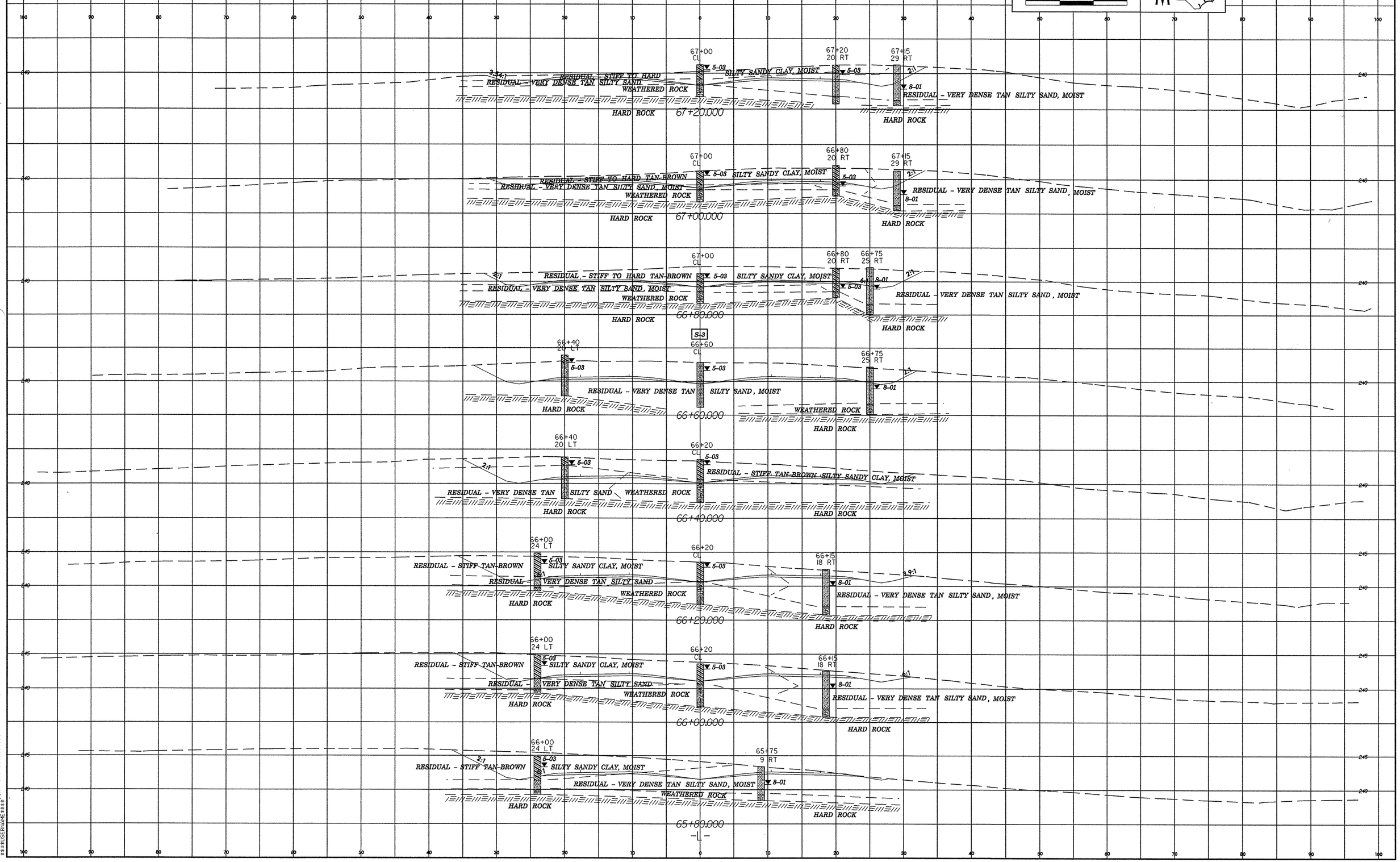


Sheet 26

PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	X-5

5 0 5 10

METRIC



sheet 27

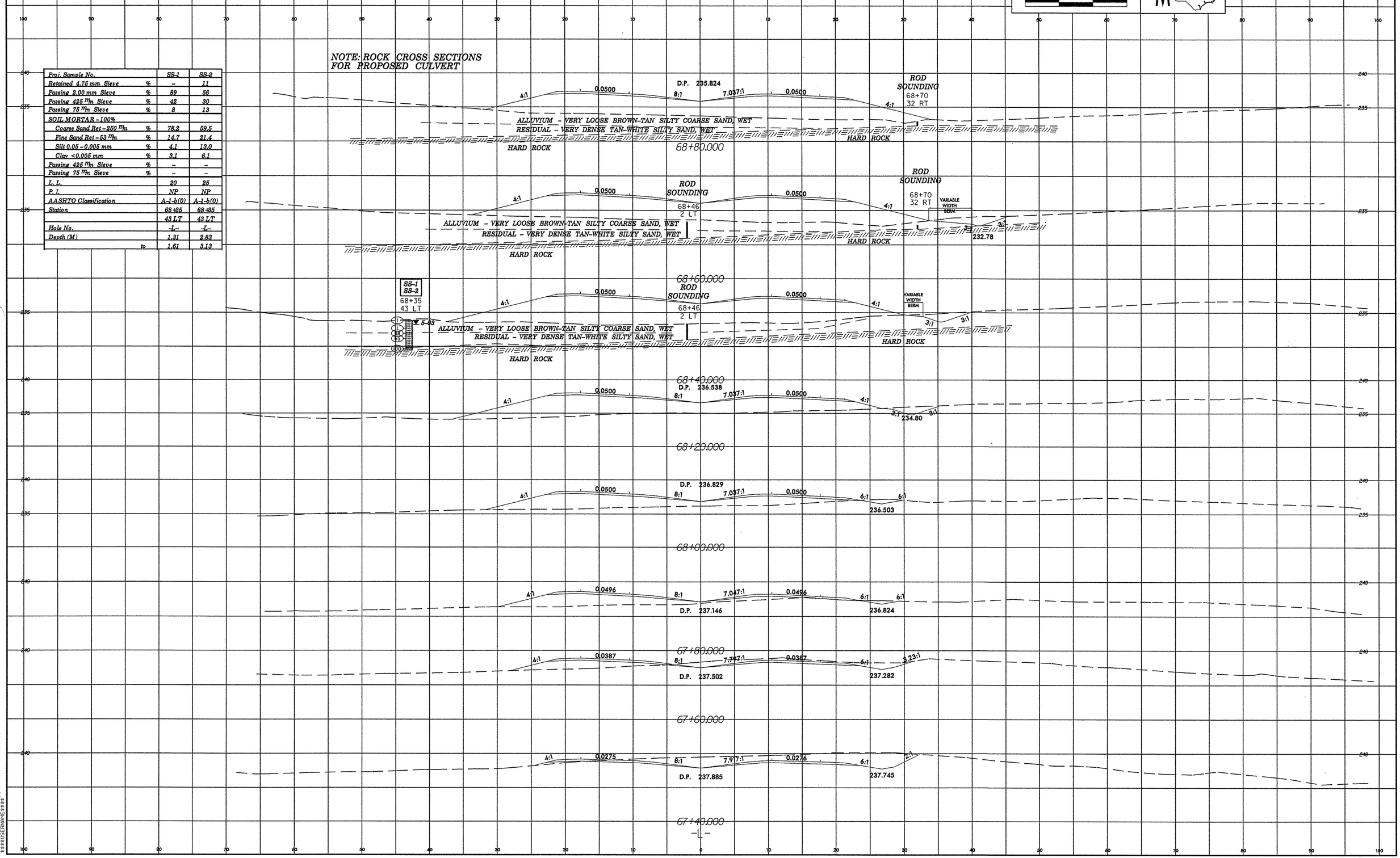
PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	X-6

5 0 5 10

METRIC

NOTE: ROCK CROSS SECTIONS FOR PROPOSED CULVERT

Proj. Sample No.		SS-1	SS-2
Retained 4.75 mm Sieve	%	–	11
Passing 2.00 mm Sieve	%	89	56
Passing 425 mm Sieve	%	42	30
Passing 75 mm Sieve	%	8	13
SOIL MORTAR – 100%			
Coarse Sand Ret – 250 mm	%	78.2	59.5
Fine Sand Ret – 53 mm	%	14.7	21.4
Silt 0.05 – 0.005 mm	%	4.1	13.0
Clay <0.005 mm	%	3.1	6.1
Passing 425 mm Sieve	%	–	–
Passing 75 mm Sieve	%	–	–
L. L.		20	25
P. I.		NP	NP
AASHTO Classification		A-1-b(0)	A-1-b(0)
Station		68+35	68+35
		43 LT	43 LT
Hole No.		-L-	-L-
Depth (M)		1.31	2.83
	to	1.61	3.13

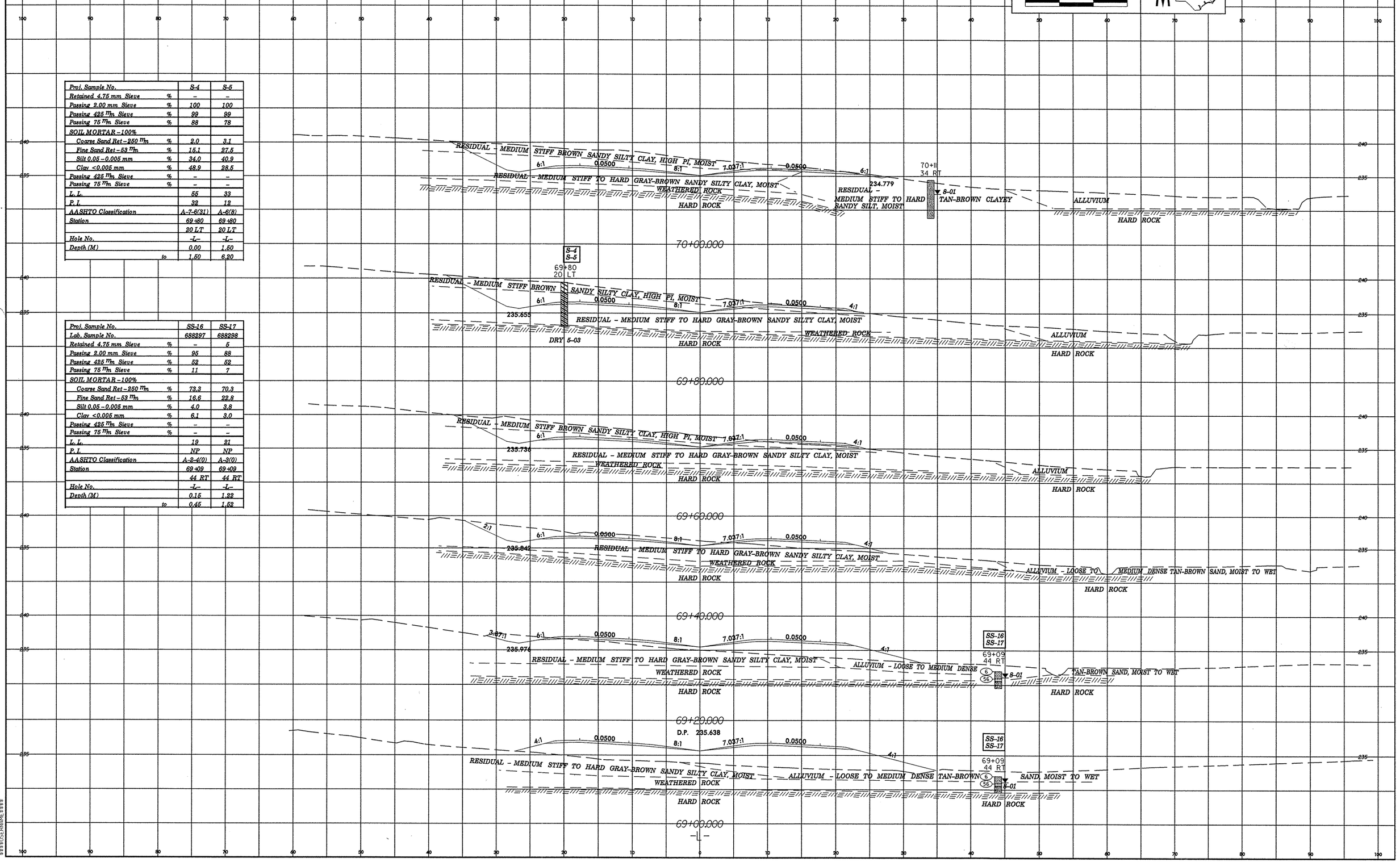


Sheet 28

PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	X-7

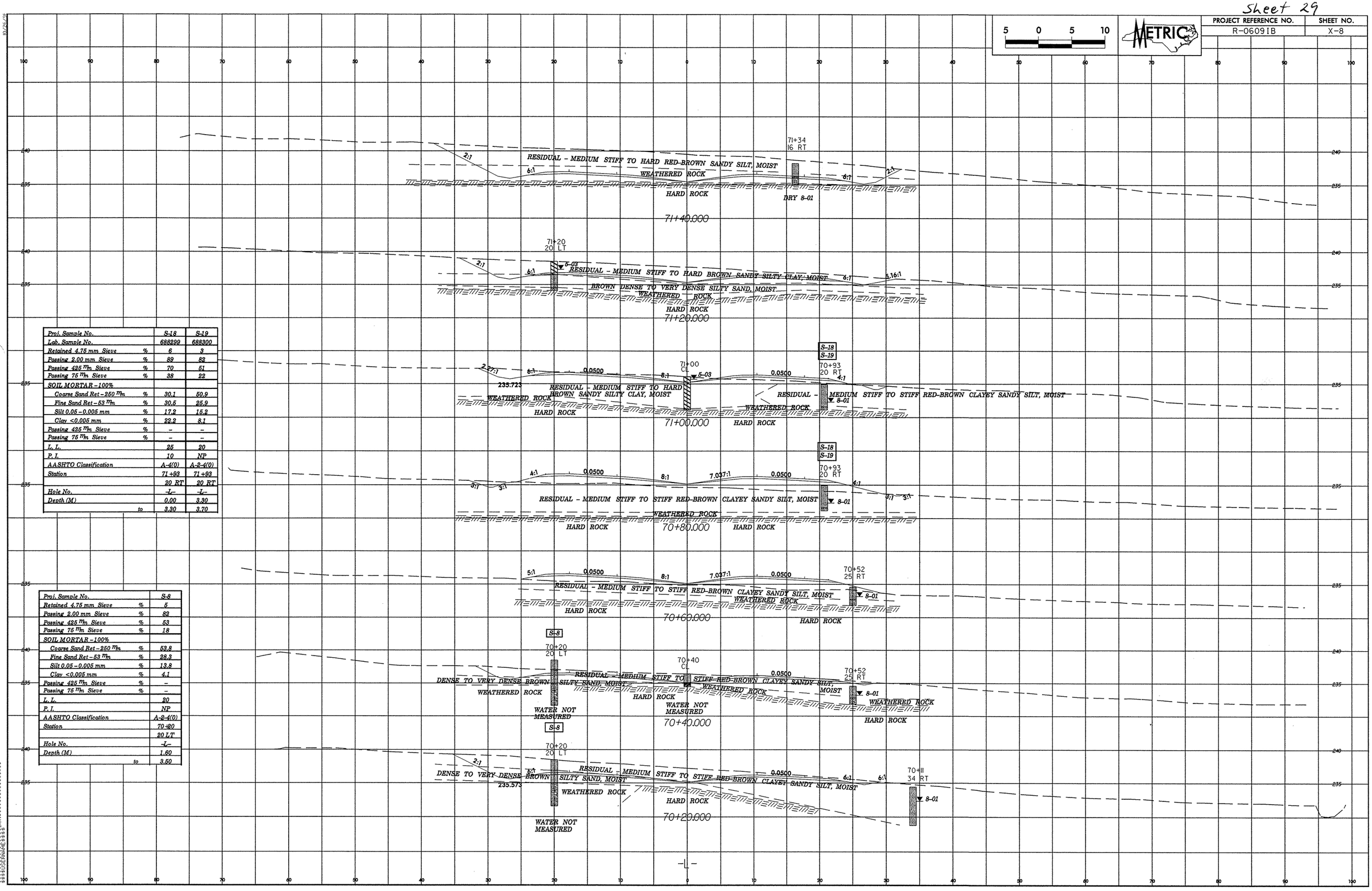
Proj. Sample No.		S-4	S-5
Retained 4.75 mm Sieve	%	–	–
Passing 2.00 mm Sieve	%	100	100
Passing 425 µm Sieve	%	99	99
Passing 75 µm Sieve	%	88	78
SOIL MORTAR – 100%			
Coarse Sand Ret – 250 µm	%	2.0	3.1
Fine Sand Ret – 53 µm	%	15.1	27.5
Silt 0.05 – 0.005 mm	%	34.0	40.9
Clay <0.005 mm	%	48.9	28.5
Passing 425 µm Sieve	%	–	–
Passing 75 µm Sieve	%	–	–
L. L.		55	33
P. I.		32	12
AASHTO Classification		A-7-6(31)	A-6(8)
Station		69+80	69+80
		20 LT	20 LT
Hole No.		-L-	-L-
Depth (M)		0.00	1.50
	to	1.50	6.20

Proj. Sample No.		SS-16	SS-17
Lab. Sample No.		688297	688298
Retained 4.75 mm Sieve	%	–	5
Passing 2.00 mm Sieve	%	95	88
Passing 425 µm Sieve	%	52	52
Passing 75 µm Sieve	%	11	7
SOIL MORTAR – 100%			
Coarse Sand Ret – 250 µm	%	73.3	70.3
Fine Sand Ret – 53 µm	%	16.6	22.8
Silt 0.05 – 0.005 mm	%	4.0	3.8
Clay <0.005 mm	%	6.1	3.0
Passing 425 µm Sieve	%	–	–
Passing 75 µm Sieve	%	–	–
L. L.		19	21
P. I.		NP	NP
AASHTO Classification		A-2-4(0)	A-3(0)
Station		69+09	69+09
		44 RT	44 RT
Hole No.		-L-	-L-
Depth (M)		0.15	1.32
	to	0.45	1.62



Sheet 29

PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	X-8

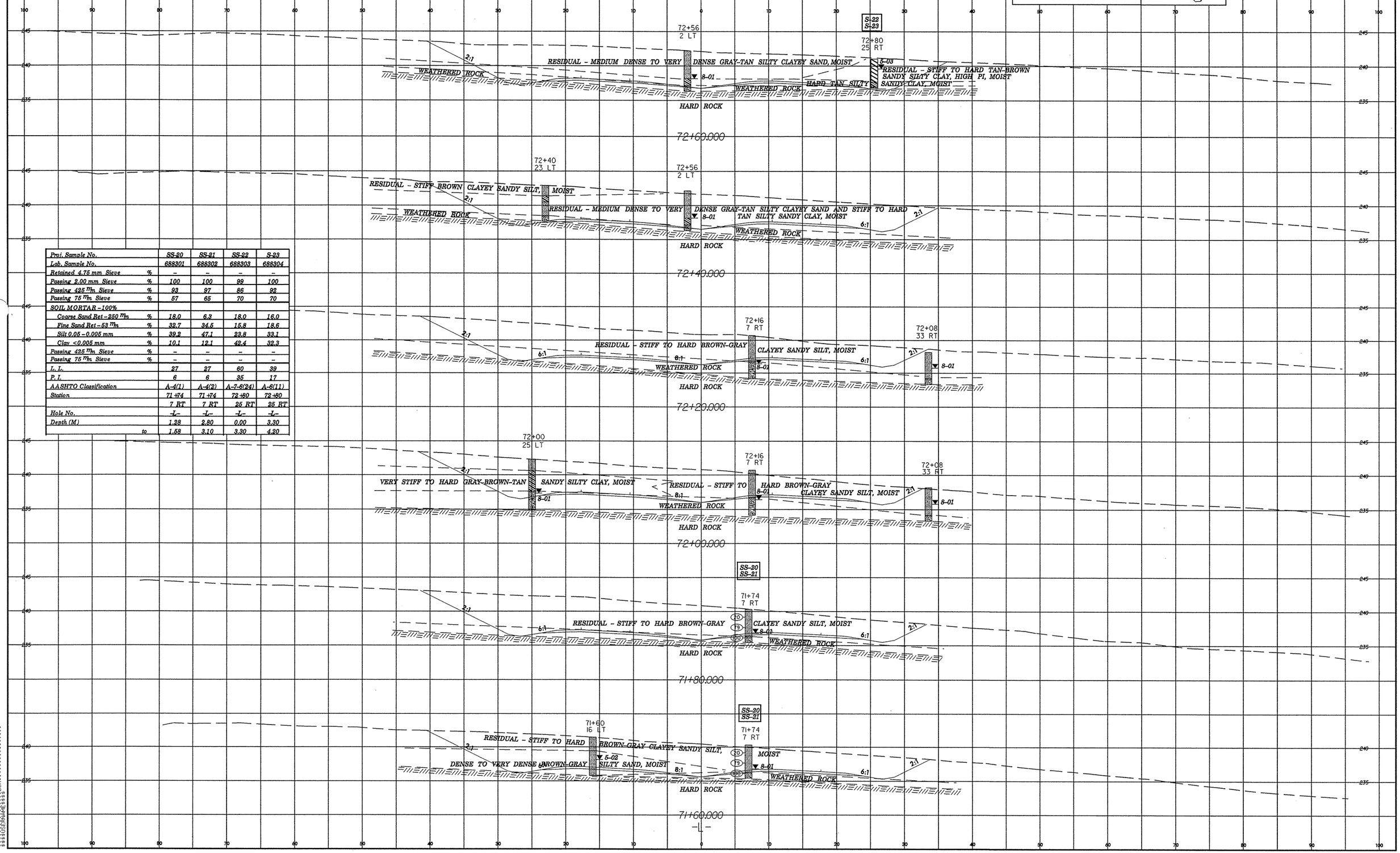


Proj. Sample No.		S-18	S-19
Lab. Sample No.		688299	688300
Retained 4.75 mm Sieve	%	6	3
Passing 2.00 mm Sieve	%	89	82
Passing 425 µm Sieve	%	70	51
Passing 75 µm Sieve	%	38	22
SOIL MORTAR - 100%			
Coarse Sand Ret - 250 µm	%	30.1	50.9
Fine Sand Ret - 53 µm	%	30.5	25.9
Silt 0.05 - 0.005 mm	%	17.2	16.2
Clay <0.005 mm	%	22.2	8.1
Passing 425 µm Sieve	%	–	–
Passing 75 µm Sieve	%	–	–
L. L.		25	20
P. I.		10	NP
AASHTO Classification		A-4(0)	A-2-4(0)
Station		71+93	71+93
		20 RT	20 RT
Hole No.		-L-	-L-
Depth (M)		0.00	3.30
	to	3.30	3.70

Proj. Sample No.		S-8
Retained 4.75 mm Sieve	%	5
Passing 2.00 mm Sieve	%	82
Passing 425 µm Sieve	%	53
Passing 75 µm Sieve	%	18
SOIL MORTAR - 100%		
Coarse Sand Ret - 250 µm	%	53.8
Fine Sand Ret - 53 µm	%	28.3
Silt 0.05 - 0.005 mm	%	13.8
Clay <0.005 mm	%	4.1
Passing 425 µm Sieve	%	–
Passing 75 µm Sieve	%	–
L. L.		20
P. I.		NP
AASHTO Classification		A-2-4(0)
Station		70+20
		20 LT
Hole No.		-L-
Depth (M)		1.60
	to	3.50

Sheet 30

PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	X-9



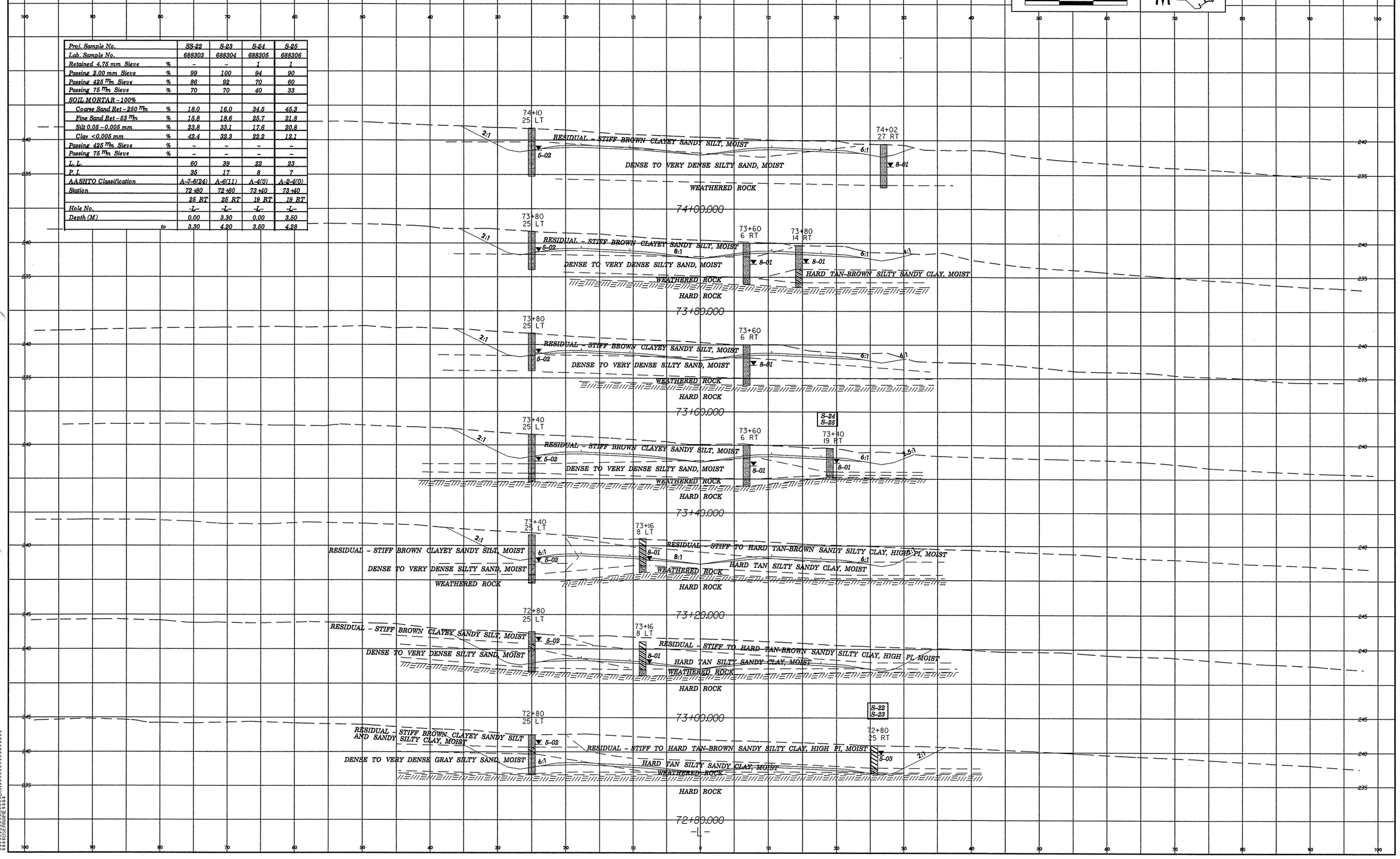
Proj. Sample No.		SS-20	SS-21	SS-22	S-23
Lab. Sample No.		688301	688302	688303	688304
Retained 4.75 mm Sieve	%	–	–	–	–
Passing 2.00 mm Sieve	%	100	100	99	100
Passing 425 mm Sieve	%	93	97	86	92
Passing 75 mm Sieve	%	57	65	70	70
SOIL MORTAR - 100%					
Coarse Sand Ret - 250 mm	%	18.0	6.3	18.0	16.0
Fine Sand Ret - 53 mm	%	32.7	34.5	15.8	18.6
Silt 0.05 - 0.005 mm	%	39.2	47.1	23.8	33.1
Clay <0.005 mm	%	10.1	12.1	42.4	32.3
Passing 425 mm Sieve	%	–	–	–	–
Passing 75 mm Sieve	%	–	–	–	–
L. L.		27	27	60	39
P. I.		6	6	35	17
AASHTO Classification		A-4(1)	A-4(2)	A-7-6(24)	A-6(11)
Station		71+74	71+74	72+80	72+80
		7 RT	7 RT	25 RT	25 RT
Hole No.		-L-	-L-	-L-	-L-
Depth (M)		1.28	2.80	0.00	3.30
	to	1.58	3.10	3.30	4.20

Sheet 31

PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	X-10

METRIC

Proj. Sample No.		SS-22	S-23	S-24	S-25
Lab. Sample No.		688303	688304	688305	688306
Retained 4.75 mm Sieve	%	–	–	1	1
Passing 2.00 mm Sieve	%	99	100	94	90
Passing 425 mm Sieve	%	86	92	70	60
Passing 75 mm Sieve	%	70	70	40	33
SOIL MORTAR – 100%					
Coarse Sand Ret – 250 mm	%	18.0	16.0	34.5	45.3
Fine Sand Ret – 53 mm	%	15.8	18.6	25.7	21.8
Silt 0.05 – 0.005 mm	%	23.8	33.1	17.6	20.8
Clay <0.005 mm	%	42.4	32.3	22.2	12.1
Passing 425 mm Sieve	%	–	–	–	–
Passing 75 mm Sieve	%	–	–	–	–
L. L.		60	39	22	23
P. I.		35	17	8	7
AASHTO Classification		A-7-6(24)	A-6(11)	A-4(0)	A-2-4(0)
Station		72+80	72+80	73+40	73+40
		25 RT	25 RT	19 RT	19 RT
Hole No.		-L-	-L-	-L-	-L-
Depth (M)		0.00	3.30	0.00	3.50
	to	3.30	4.20	3.50	4.28



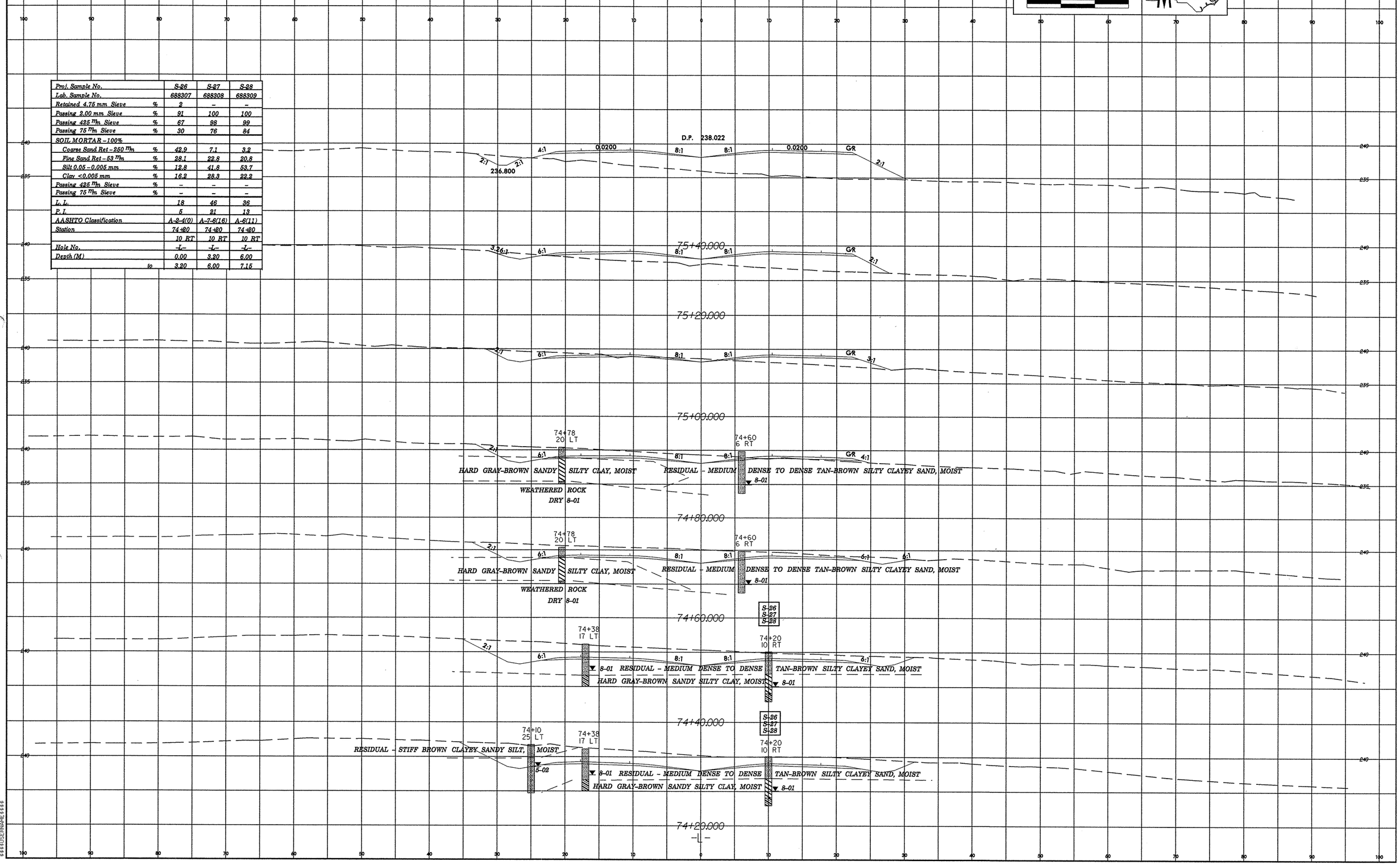
Sheet 32

PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	X-11

5 0 5 10

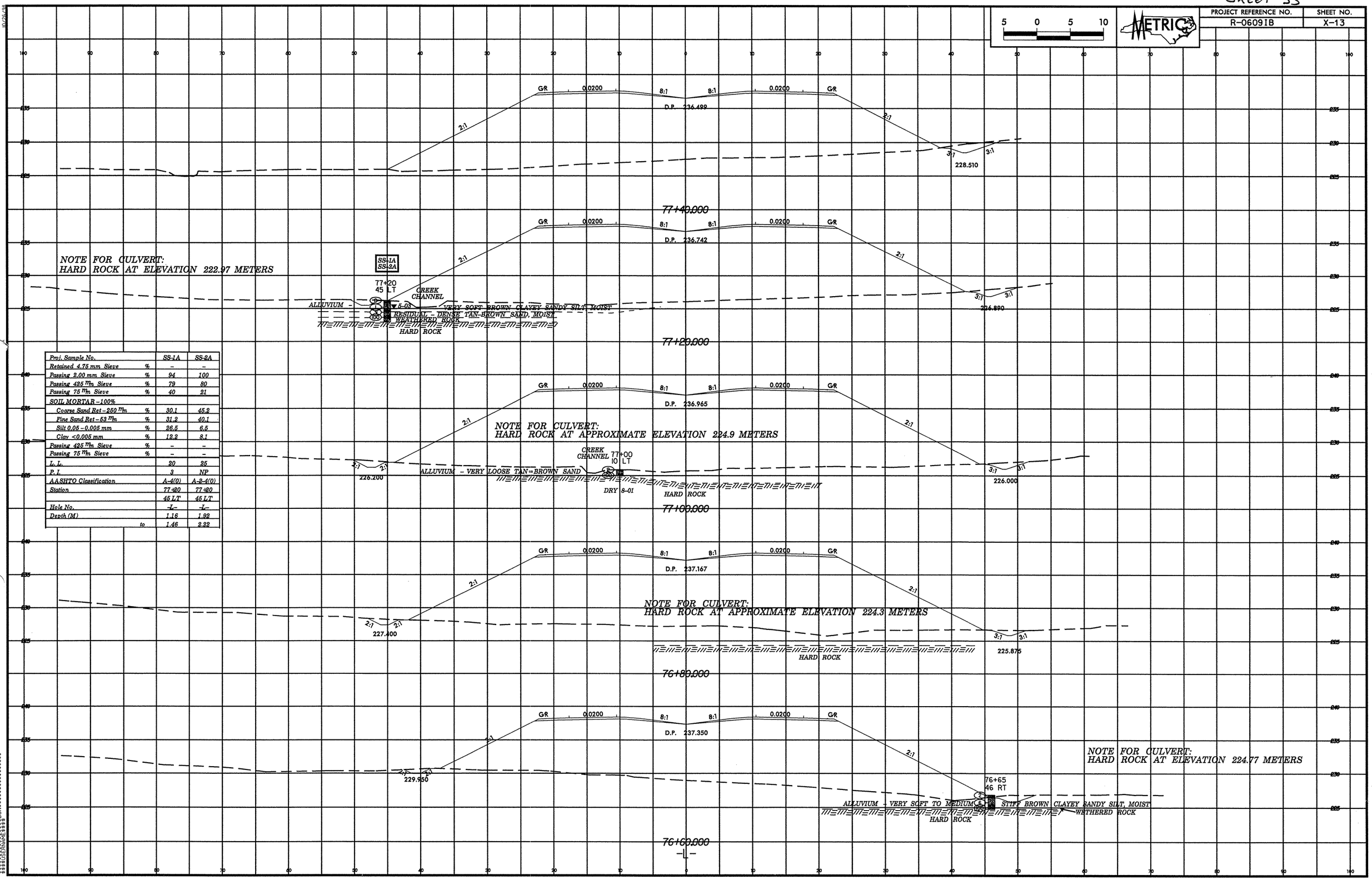
METRIC

Proj. Sample No.		S-26	S-27	S-28
Lab. Sample No.		688307	688308	688309
Retained 4.75 mm Sieve	%	2	–	–
Passing 2.00 mm Sieve	%	91	100	100
Passing 425 ᵐᵐ Sieve	%	67	98	99
Passing 75 ᵐᵐ Sieve	%	30	76	84
SOIL MORTAR – 100%				
Coarse Sand Ret – 250 ᵐᵐ	%	42.9	7.1	3.2
Fine Sand Ret – 53 ᵐᵐ	%	28.1	22.8	20.8
Silt 0.05 – 0.005 mm	%	12.8	41.8	53.7
Clay <0.005 mm	%	16.2	28.3	22.2
Passing 425 ᵐᵐ Sieve	%	–	–	–
Passing 75 ᵐᵐ Sieve	%	–	–	–
L. L.		18	46	36
P. I.		5	21	13
AASHTO Classification		A-2-4(0)	A-7-6(16)	A-6(11)
Station		74+20	74+20	74+20
		10 RT	10 RT	10 RT
Hole No.		-L-	-L-	-L-
Depth (M)		0.00	3.20	6.00
	to	3.20	6.00	7.15



Sheet 33

PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	X-13



Proj. Sample No.		SS-1A	SS-2A
Retained 4.75 mm Sieve	%	–	–
Passing 2.00 mm Sieve	%	94	100
Passing 425 µm Sieve	%	79	80
Passing 75 µm Sieve	%	40	21
SOIL MORTAR – 100%			
Coarse Sand Ret – 250 µm	%	30.1	45.2
Fine Sand Ret – 53 µm	%	31.2	40.1
Silt 0.05 – 0.005 mm	%	26.5	6.5
Clay <0.005 mm	%	12.2	8.1
Passing 425 µm Sieve	%	–	–
Passing 75 µm Sieve	%	–	–
L. L.		20	25
P. I.		3	NP
AASHTO Classification		A-4(0)	A-2-4(0)
Station		77+20	77+20
		45 LT	45 LT
Hole No.		-L-	-L-
Depth (M)		1.16	1.92
	to	1.46	2.22

10/26/95

SYSTIME$$$$$$$$
USERNAME$$$$$$$$

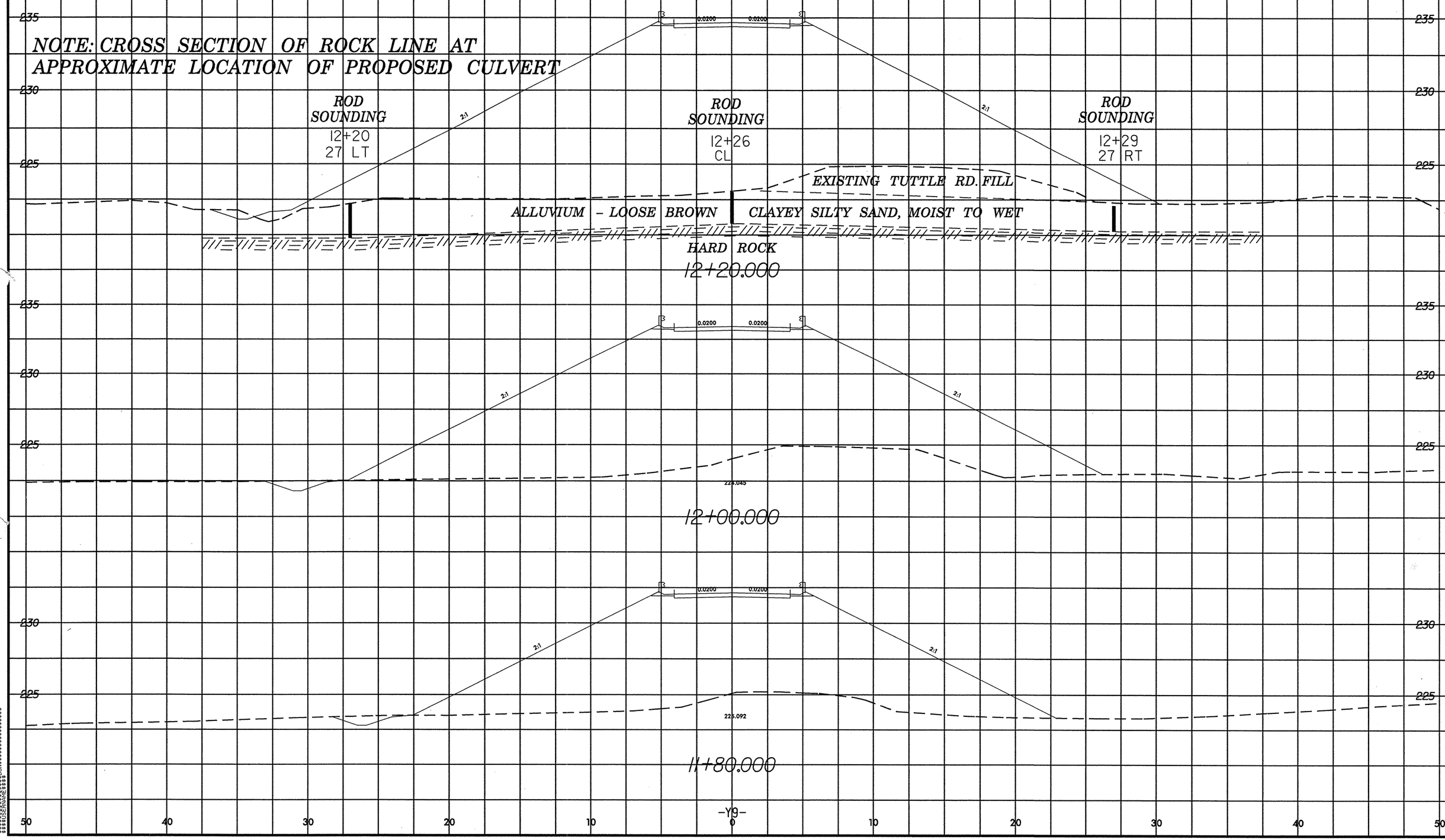
Sheet 34

PROJECT REFERENCE NO.	SHEET NO.
R-0609IB	X-38

2.5 0 2.5 5

METRIC

NOTE: CROSS SECTION OF ROCK LINE AT APPROXIMATE LOCATION OF PROPOSED CULVERT



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2606A	1	67

W.B.S. NO.	F.A. PROJ. NO.	DESCRIPTION
34480.1.1	STP-NHF-311(3)	PE
34480.2.2	NHF-311(17)	R/W, UTIL.
34480.3.2	NHF-311(18)	CONSTRUCTION

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL UNIT

SUBSURFACE INVESTIGATION

INVENTORY

STATE PROJECT 34480.3.2 I.D. NO. R-2606A

F.A. PROJECT STP-NHF-311(3)

COUNTY RANDOLPH

DESCRIPTION US 311 FROM SOUTH OF SR 1920 TO NORTH OF SR 1929

CONTENTS: See Pg 2A for As Investigated Index

LINE	STATION	SHEET NUMBERS PLAN	PROFILE	X-SECTS.
-L-	10+00.00 to 132+00.00	4-12	16-20	
-Y-	10+00.00 to 18+10.00	6	26	
-SR-	10+00.00 to 81+96.59	7-11	24-26	
-Y1-	10+00.00 to 46+00.00	14,11,15	27,28	
-RAMP A-	0+00.00 to 17+83.01	12,11	21,22	
-RAMP C-	0+00.00 to 16+10.08	10,11	22	
-RAMP D-	0+00.00 to 17+60.15	11	23	
-LOOP A-	0+00.00 to 10+16.77	11	21	
	CULVERTS			
-L-	46+00	7	29	
-L-	63+00	8	29	
-RAMP A-	14+72	11	29	
	ROCK SECTIONS			LEFT
-L-	10+00.00 to 21+50.00			X1-X6
	27+00.00 to 44+00.00			X9-X17
	52+00.00 to 57+00.00			X21-X23
	72+00.00 to 77+00.00			X32-X33
				RIGHT
-L-	10+00.00 to 22+00.00			X62-X68
	27+00.00 to 43+00.00			X71-X78
	52+00.00 to 58+00.00			X83-X85

CAUTION NOTICE

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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.

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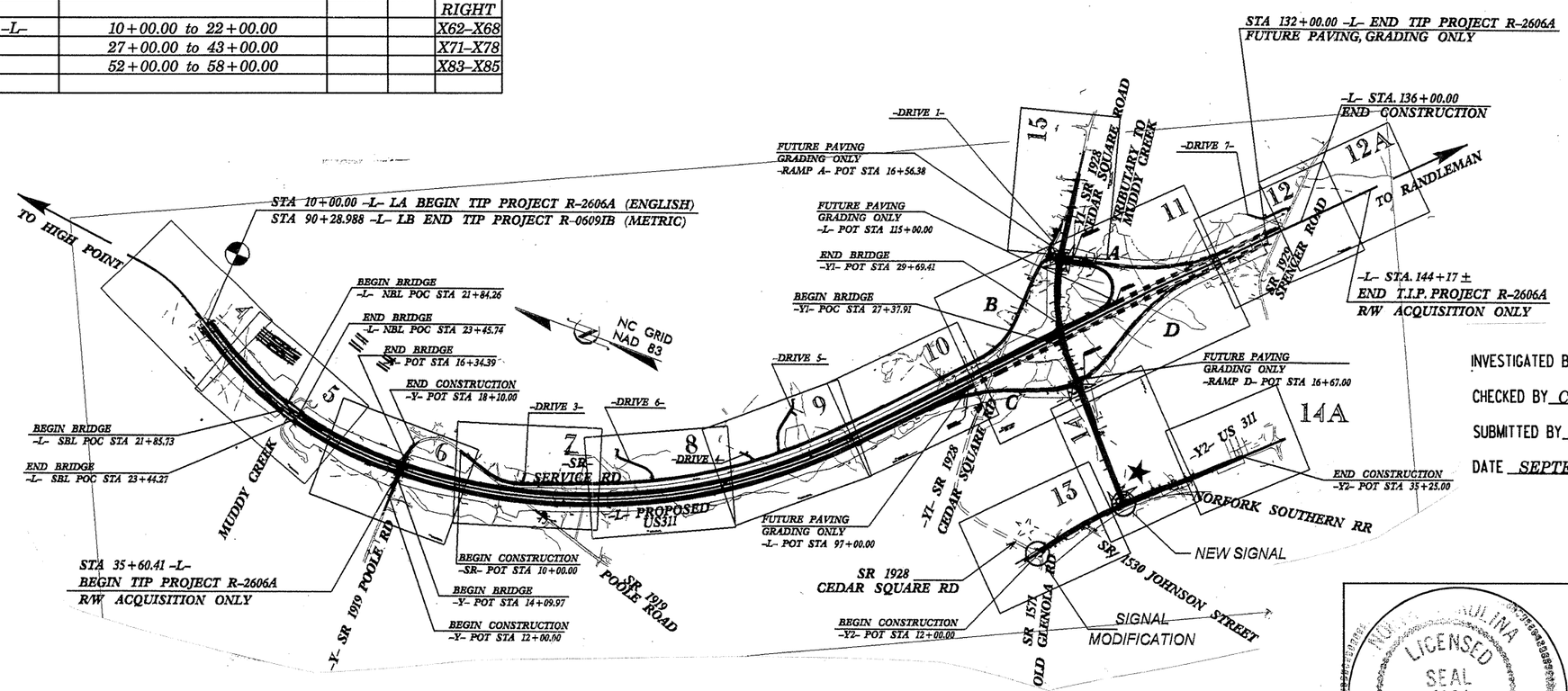


INVESTIGATED BY C.C. MURRAY PERSONNEL R.S. HINSON

CHECKED BY C.B. LITTLE C.E. BURRIS

SUBMITTED BY C.B. LITTLE

DATE SEPTEMBER 2001

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

NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

NORTH CAROLINA LICENSED SEAL 1104 GEOLOGIST CLINTON B. LITTLE

SEAL

SIGNATURE

DRAWN BY: J.K. McCLURE

CONTRACT: C201225

ID. R-2606A

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
R-2606A	8.1571501	2	67

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED OR WEATHERED EARTH MATERIALS WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:

VERY STIFF, GRAY SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤35% PASSING #200)							SILT-CLAY MATERIALS (>35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL														
% PASSING # 10	50 MX											GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
# 40	30 MX	50 MX	51 MN											
# 200	15 MX	25 MX	10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN			
LIQUID LIMIT	6 MX		N.P.	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
PLASTIC INDEX				10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN			
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	No MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

P.I. OF A-7-5 ≤ L.L. - 30 : P.I. OF A-7-6 > L.L. - 30

CONSISTENCY OR DENSENESS

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

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.0	0.42	0.25	0.075	0.053

BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F. SD.)	SILT (SL.)	CLAY (CL.)

GRAIN SIZE MM: 305 | 75 | 2.0 | 0.25 | 0.05 | 0.005
GRAIN SIZE IN.: 12" | 3"

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	26 OR MORE	HIGH

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN, BLUE-GRAY) MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

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

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS; ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 30
MODERATELY COMPRESSIBLE	LIQUID LIMIT 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT- CLAY SOILS
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%
MODERATELY ORGANIC	5 - 10%	12 - 20%
HIGHLY ORGANIC	>10%	>20%

OTHER MATERIAL	
TRACE	1 - 10%
LITTLE	10 - 20%
SOME	20 - 35%
HIGHLY	35% AND ABOVE

GROUND WATER

WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING.
STATIC WATER LEVEL AFTER 24 HOURS.
PW PERCHED WATER, SATURATED ZONE OR WATER BEARING STRATA
SPRING OR SEEPAGE

MISCELLANEOUS SYMBOLS

ROADWAY EMBANKMENT WITH SOIL DESCRIPTION
SOIL SYMBOL
ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS
INFERRED SOIL BOUNDARIES
INFERRED ROCK LINE
ALLUVIAL SOIL BOUNDARY
25/025 DIP/DIP DIRECTION OF ROCK STRUCTURES
● - SOUNDING ROD

SPT CPT DPT DMT VST PMT TEST BORING
AUGER BORING
CORE BORING
MW MONITORING WELL
PIEZOMETER INSTALLATION
SLOPE INDICATOR INSTALLATION
SPT N-VALUE
REF SPT REFUSAL

SAMPLE DESIGNATIONS
S- BULK SAMPLE
SS- SPLIT SPOON SAMPLE
ST- SHELBY TUBE SAMPLE
RS- ROCK SAMPLE
RT- RECOMPACTED TRIAXIAL SAMPLE
CBR - CBR SAMPLE

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F. - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED
FRAGS. - FRAGMENTS
MED. - MEDIUM
PMT - PRESSUREMETER TEST
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT
W - MOISTURE CONTENT
V. - VERY
VST - VANE SHEAR TEST

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] MOBILE B-___
- [ ] BK-51
- [ ] CME-45
- [X] CME-550
- [ ] PORTABLE HOIST
- [ ] OTHER _____
- [ ] OTHER _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [X] 6" CONTINUOUS FLIGHT AUGER
- [X] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [X] TUNG.-CARBIDE INSERTS
- [ ] CASING [ ] W/ ADVANCER
- [ ] TRICONE ____" STEEL TEETH
- [ ] TRICONE ____" TUNG.-CARB.
- [ ] CORE BIT
- [ ] OTHER _____

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

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

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

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WHEN 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 FOLOWS:

WEATHERED ROCK (WR)	NON-COASTAL PLAIN MATERIAL THAT YIELDS SPT N VALUES > 100 BLOWS PER FOOT.
CRYSTALLINE ROCK (CR)	FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
NON-CRYSTALLINE ROCK (NCR)	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
COASTAL PLAIN SEDIMENTARY ROCK (CP)	COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V. SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *IF TESTED, WOULD YIELD SPT REFUSAL*
SEVERE (SEV.)	ALL ROCKS EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS SPT N VALUES < 100 BPF*
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

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

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FEET
VERY CLOSE	LESS THAN 0.16 FEET

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	> 4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 0.16 FEET
THICKLY LAMINATED	0.008 - 0.03 FEET
THINLY LAMINATED	< 0.008 FEET

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.
INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.
EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS WHICH 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 IS IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS WHICH 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 (F.P.) - 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 SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (R.Q.D.) - 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 WHICH 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, WHICH HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS

SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR B.P.F.) 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 LESS THAN 0.1 FOOT PENETRATION WITH 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 (S.R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 10 CENTIMETERS DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK:

ELEVATION:

NOTES:

R-2606A

PROJECT: 8.1571501

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2606A	2A	67

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
8.1571501	STP-NHF-311(3)	PE, UTIL, ROW

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

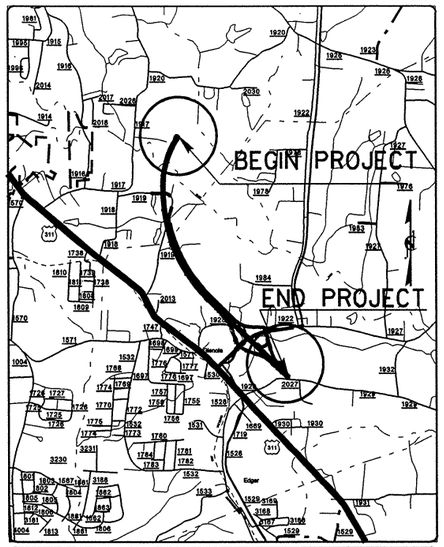
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PLAN AND PROFILE OF PROPOSED STATE HIGHWAY

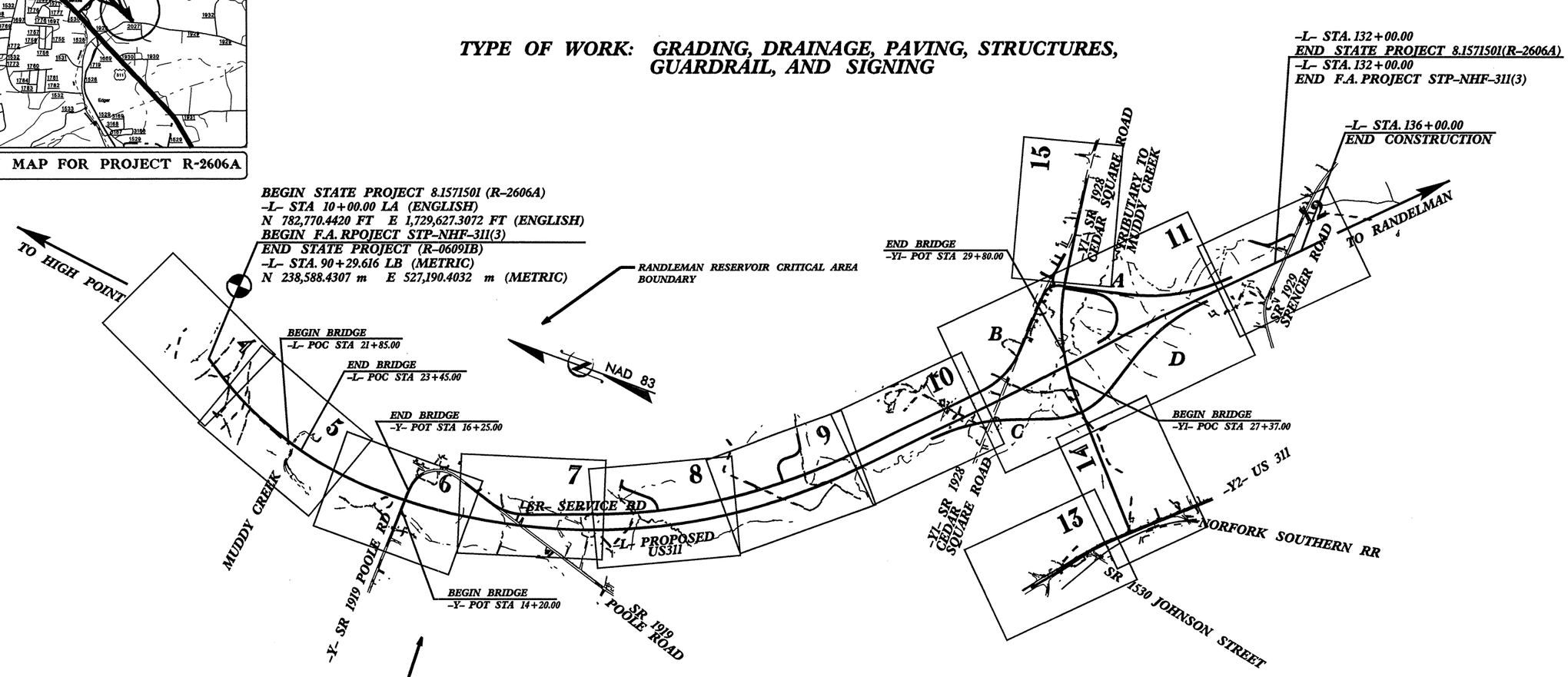
RANDOLPH COUNTY

LOCATION: US 311 FROM SOUTH OF SR 1920 TO NORTH OF SR 1929

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, GUARDRAIL, AND SIGNING



VICINITY MAP FOR PROJECT R-2606A



See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols

HAZARDOUS SPILL BASIN BOUNDARY (1/2 MILE FROM RANDLEMAN RESERVOIR CRITICAL AREA BOUNDARY)

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III, EXCEPT IN WETLANDS.
THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

NCDOT CONTACT : SCOTT D. BLEVINS, P.E., PROJECT ENGINEER, DESIGN SERVICES

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2000 = 8,667
ADT 2025 = 15,000
DHV = 10%
D = 60%
T = 9%
TTST 4% DUAL 5%
V = 70 mph

PROJECT LENGTH

LENGTH ROADWAY F.A. PROJECT STP-NHF-311(3) = 2.281 MILES
LENGTH STRUCTURES F.A. PROJECT STP-NHF-311(3) = 0.030 MILES
TOTAL LENGTH STATE PROJECT 8.1571501 = 2.311 MILES

1998 STANDARD SPECIFICATIONS
R/W : (Pred.) September 21, 2001
LETTING DATE : (Pred.) October 21, 2003

TOM SHEARIN, P.E.
EARTH TECH PROJECT MANAGER

Prepared in the Office of:
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JOHN NICHOLS, P.E.
SIGNATURE:
ROADWAY DESIGN ENGINEER
G. T. SHEARIN, P.E.
SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
DEBBIE BARBOUR, P.E.
STATE DESIGN ENGINEER
DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED
DIVISION ADMINISTRATOR DATE

7/01/99

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

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

LYNDO TIPPETT
SECRETARY

September 28, 2001

STATE PROJECT:	8.1571501 R-2606A
F. A. PROJECT:	STP-NHF-311(3)
COUNTY:	Randolph
DESCRIPTION:	US 311 relocation from south of SR 1920 to north of SR 1929
SUBJECT:	Geotechnical Report- Inventory

Project Description

This project involves the relocation of US 311 towards the northeast of the old US 311, which is the major road between High Point and Asheboro. New construction includes a controlled access, four-lane divided highway with a grass median and necessitates the realignments of several intersecting roads. The highway comes out of southeastern High Point and will temporarily end slightly north of Glenola.

The Geotechnical Unit field investigation was conducted in March and April 2001. The –L– line was investigated from Sta. 10+00 to 132+00. A CME-550 all-terrain-drilling machine with an automatic hammer was used to gather the subsurface information including standard penetration tests (SPT) and standard auger borings.

The deepest cut on the project is projected to be 36' at –L– Sta. 14+00/CL and will be in very dense silty sand, with A-2 (AASHTO classifications). The highest fill is 38' at –L– Sta. 47+00/CL and will lie on alluvial soft to medium stiff clayey A-7-5 soils or A-2 sands. There are 4 water crossings that have discernable alluvial soils associated with them that will be discussed within.

The following intervals were investigated:

Line	Station	To	Station	Total Length (in ft)
-L-	10+00	To	132+00	12200.00
-Y-	12+00	To	18+10	610.00
-SR-	10+00	To	81+96.59	7196.59
-Rp C-	0+00	To	15+98.93	1598.93
-Y1-	10+00	To	46+00.00	3600.00
-Rp-A	0+00	To	17+83.01	1738.01
-Lp-A-	0+00	To	10+48.67	1048.67
-Rp-D-	0+00	To	17+60.15	1760.15
-Y2-	10+00	To	28+50.00	1850.00

Total length of lines investigated was 31647.35' or 5.99 miles.

Physiography and Geology

The project is located in the heart of the Piedmont region of North Carolina near the center of the Carolina Slate Belt. The terrain begins in gently rolling thinly clay capped hills underlain by a dense sandy intrusive light colored granitic and or gneissic appearing rock type mixed with an olive green metavolcanic rock of gabbro or diorite in composition. Near the end at Glenola the terrain is almost flat with much deeper clayey soils which are derived from mafic to felsic volcanic fine to medium grained tuff.

Residual Soils

Residual soils on the project are derived from two distinct geologic rock types, and will be discussed separately.

The soils from the beginning to about 110+00 are derived from medium to large grained granitic and/or gneissic rock types. Large volumes of gabbro or diorite cut across the granite. Any occurrence of rock on the project will be in the granite or the gabbro. Generally the gabbro is present in large dikes or sills and near the surface it weathers into a green colored soil type that produces the thicker clayey soils with higher plasticity. From 110+00 to the end, another rock type is introduced, but the granitic rock is still present. This is defined as a mafic metavolcanic rock according to the Geologic Map of North Carolina. At Glenola the parent rock is more felsic (lighter in color) and is extrusive in composition. No rock outcrop or hand sample was obtained because this rock type weathers deeply, but the observed saprolite has crystals that can be seen with the naked eye.

Alluvial Soils

There are 4 areas of alluvial soils that need to be addressed.

The first at –L– 22+50 a bridge is proposed. There are no alluvial soils under End Bent 1 and the only alluvial soil is sand (A-2) under End Bent 2.

The next 3 alluvial areas: –L–46+20±, –L–63+00 ±, and at –Ramp A– 15+00± will require a channel change with a proposed bottomless Reinforced Concrete Box Culvert (RCBC) at these locations.

Of these, the creeks at: –L–46+20±, –L–63+00 ± lie on hard rock or have at most (6 feet) of alluvial soils containing layers of sand, silt and/or clay, on top of hard rock.

The proposed bottomless RCBC at –Ramp A– 15+00± will lie on deep soft residual soils. These are the felsic volcanic soil types that are deeply weathered and have become soft (4 B/F) saturated clay.

Rock

Rock (SPT refusal) was encountered above grade in the following areas:

Line	Offset	Station	to	Station
-L-	Left	11+50	to	19+00
-L-	CL	11+50	to	19+00
-L-	Right	16+00	to	20+00
-L-	Left	28+50	to	30+50
-L-	CL	28+50	to	30+00
-L-	Right	28+50	to	31+00
-L-	Left	35+00	to	42+00
-L-	CL	38+50	to	42+00
-L-	Right	39+00	to	41+50

Rock was encountered within 10' of grade in the following areas:

Line	Offset	Station	to	Station
-L-	CL	10+50	to	20+00
-L-	CL	26+50	to	31+50
-L-	CL	38+00	to	42+00
-L-	CL	53+00	to	55+00
-L-	CL	73+00	to	75+00
-SR-	CL	21+50	to	25+50
-SR-	CL	41+50	to	45+50

Groundwater

Ground water was encountered within 6 feet of grade in the following borings:

Location -L-	Depth to Grade in ft	Depth to Water in ft
10+50/100Lt	12	3
10+75/CL	18	1
11+50/50Lt	23	5
11+50/100Rt	23	10
12+25/50Rt	28	17
12+50/100Lt	30	5.5
13+00/CL	34	11
13+50/100Lt	32	4
14+00/50Rt	36	26
14+50/100Lt	35	17
15+50100Lt	33	15
16+00/120Rt	32	12
16+50/100Lt	29	15
16+50/50Rt	29	0
17+50/100Rt	25	17
15+50/100Lt	23	7
18+50/100Lt	21	2
18+50/100Rt	21	13
19+50/80Lt	13	0
19+500/100Rt	13	8
20+50/100Rt	5	11
26+75/25Rt	2	2
27+25/40Lt	3	3
27+75/25Rt	12	12
28+25/40Lt	17	2
29+25/50Lt	22	2
29+75/100Rt	22	2
30+00/25Rt	23	2
30+75/50Rt	20	0
31+00/120Rt	18	2
31+50/CL	16	2
32+00/50Rt	16	2
32+75/100Rt	22	4
33+50/25Rt	26	15
34+50/50Rt	26	16
36+50/100Lt	23	6
36+50/100Rt	23	14
37+00/CL	24	15
37+50/100Lt	25	15
37+50/100Rt	25	11
38+50/100Lt	26	6
38+50/75Rt	26	10
39+50/100Lt	24	5
40+50/80Lt	19	0
42+00/CL	9	7
90+00/50Lt	-2	6
101+25/CL	11	8
102+50/50Rt	5	10
104+75/Rt	-1	1
SR 40+00/CL	10	10

<u>Area of Special Geotechnical Interest</u>

Residual Plastic Soils

The following areas of residual clay soils have a high Plastic Index (greater than 26) and are within 10ft of grade:

Location -L-	Sample No.	Depth to Grade	Sample Depth	P.I.	Moisture %
17+50/100Lt	S-64	26	8.0-12.0	26	
27+75 /25Rt	S-35	8	0-3.7	33	17.4
51+75 /CL	S-99	5	0-4.2	31	25.2
70+00/100Lt	S-118	-4	0-5.0	36	
90+50/50Lt	S-130	-2	0-3.4	28	
102+50/50Rt	SS-150	7	4.40-5.90	26	16.7
126+00/CL	S-189	4	0-4.5	44	34.9
126+00/CL	SS-190	4	4.50-6.00	34	35.3
128+50/CL	S-196	0	0-4.40	36	25.5
-SR-					
57+50/20Rt	S-127	-2	0-3.6	33	
60+00CL	S-133	2	0-3.4	30	
60+00CL	SS-134	2	3.4-3.90	36	53.6
70+00/CL	S-140	-1	0-3.5	38	
70+00/CL	SS-141	-1	3.5-5.00	36	
70+00/CL	SS-142	-1	8.50-10.00	26	
-Y1-					
15+50/50Lt	S-206	9	0-4.6	27	
15+50/50Lt	S-207	9	4.60-6.10	37	20.5
-RP-A-					
0+00/CL	S-193	-1	0-4.70	41	34.0
0+00/CL	SS-194	0	4.70-6.20	31	33.1
-RP-D-					
0+00/CL	S-186	0	0-3.5	51	33.9
0+00/CL	S-187	0	3.50	5.0	

The following areas of residual clay soils have a high P.I. and are not within 10ft of grade but may be considered as possible borrow material:

Location	Sample No.	Depth to Grade	Sample Depth	P.I.	Moisture %
-L-					
11+50/100Rt	S-78	24	0-8.00	27	
12+25 /50Rt	S-80	30	0-17.0	40	40.9
14+50 /130Rt	S-87	35	0-10.0	30	
15+50/100Lt	SS-67	35	4-5.50	49	22.4
16+50/50Rt	S-51	32	0-5.0	38	
16+50/50Rt	S-52	32	5.0-12.0	32	31.5
30+50/140Rt	S-43	20	0-2.0	29	
32+75/100Rt	S-44	26	0-4.0	45	
36+50/100Rt	S-47	23	11.0-15.0	35	27.4
40+00/CL	S-124	23	4-9.0	27	28.4
-RP-C-					
0+00/CL	S-199	17	3.0-7.0	26	

Residential Water Wells

Wells within the construction limits:

Line	Station	Offset
-L-	52+85	40Rt
-L-	79+49	33Lt*
-L-	95+20	53Lt
-L-	96+59	78Rt
-L-	97+95	114Rt
-SR-	20+00	15Lt **
-SR-	64+04	50Rt
–Y1–	24+78	06Lt
–Y1–	34+25	67Lt
–Y2–	28+08	36Rt

* (Abandoned)
** (Not on existing plans.)

Wells less than 30' from construction limits:

Line	Station	Offset
-L-	14+69	265Rt* **
-L-	56+52	135Rt
-SR-	16+38	57Lt
-SR-	19+62	58Lt **
-SR-	63+32	43Lt
-Y1-	39+55	150Lt
-Y2-	28+10	57Lt
–Y2–	29+34	49Lt

* (Abandoned)
** (Not on existing plans.)

Springs

Four springs were noted during this investigation.

Line	Station	Offset
-L-	58+55	40Rt
-L-	58+73	125Rt
-L-	79+44	41Lt*
-L-	93+87	148Rt

* (Existing spring box, but not on plans.)

Septic Field

A large septic field, force main fed, for a trailer park is at –L- 39+50/120Rt± to 41+50/120Rt±. This is within construction limits of a large cut. (Reported by the owner of the trailer park.)

Fill Area

There is a large fill area between -SR-23+00/20Lt± and 26+00/50Lt± and may be under the proposed highway near -SR-24+00. The material was hauled in by private contractors for the NCDOT and contains broken concrete slabs and asphalt, and associated roadway debris. This was reported by a nearby property owner and roadway material was confirmed in one test boring.

Between stations 23+00 to 24+00 at centerline there will be about 3'of the artifical fill, but this will be totally undercut if the proposed grade is maintained. The fill deepens to about 20' to the left of the -SR- (beyond construction limits) but the fill area does not go the right of the centerline.

Underground Storage Tanks

One home heating oil UST was noted at –Y1– Sta. 25+70/35Lt.

Respectfully Submitted,

Clay C. Murray

Clay C. Murray
Project Geologist

Volumes in Cubic Yards

ENGLISH 3C

PROJECT: R-2606A **COUNTY: RANDOLPH** DATE: 6/27/2006 COMP BY: CHK. BY: SHEET: 1 of 1

1		2		3	4	5	6	7	8	9	10	11	12	13	14	15	16
				EXCAVATION					EMBANKMENT				BORROW	WASTE			
LINE	*STATION*	*TO*	*STATION*	*TOTAL UNCLASSIFIED EXCAVATION*	*ROCK EXCAVATION*	*UNDERCUT EXCAVATION*	*UNSUITABLE UNCLASSIFIED*	*SUITABLE UNCLASSIFIED*	*TOTAL EMBANKMENT*	*ROCK EMBANKMENT*	*EARTH EMBANKMENT*	*EMBANKMENT +20%*		*ROCK*	*SUITABLE WASTE*	*UNSUITABLE WASTE*	*TOTAL WASTE*
-L-	10+00.00	TO	21+85.73 (BRIDGE)	263,800	38,606			225,194	3,003	3,003	0	3,003		35,603	225,194	0	260,797
SUBTOTAL SUMMARY 1				263,800	38,606	0	0	225,194	3,003	3,003	0	3,003	0	35,603	225,194	0	260,797
-L-	23+44.27 (BRIDGE)	TO	46+00.00	279,966	31,199			248,767	54,576	31,199	23,377	59,251		0	220,715		220,715
-Y-	12+00.00	TO	14+09.97	324				324	248		248	298			26		26
-Y-	16+34.39 (BRIDGE)	TO	18+00.00	164				164	458		458	550	386				
SR	10+00.00	TO	13+67.04	1,449				1,449	4,291		4,291	5,149	3,700				
SUBTOTAL SUMMARY 2				281,903	31,199	0	0	250,704	59,573	31,199	28,374	65,248	4,086	0	220,741	0	220,741
-L-	46+00.00	TO	63+00.00	31,910	7,739			24,171	154,066	7,739	146,327	183,331	151,421	0			0
DRIVE 3	10+13.60	TO	10+75.00	1				1	216		216	259	258				
SUBTOTAL SUMMARY 3				31,911	7,739	0	0	24,172	154,282	7,739	146,543	183,591	151,680	0	0	0	0
-L-	63+00.00	TO	84+50.00	93,277	93			93,184	107,290	93	107,197	128,729	35,452	0			0
DRIVE 6	10+20.00	TO	15+35.00	1,152				1,152	564		564	677			475		475
DRIVE 4	10+20.00	TO	11+50.00	2,000				2,000	0		0	0			2,000		2,000
DRIVE 5	10+20.00	TO	15+45.00	12,841				12,841	112		112	134			12,707		12,707
SUBTOTAL SUMMARY 4				109,270	93	0	0	109,177	107,966	93	107,873	129,541	35,452	0	15,182	0	15,182
-L-	84+50.00	TO	113+50.00	165,403				165,403	102,152		102,152	122,582			42,821		42,821
SR	69+00.00	TO	81+96.59	1,581				1,581	6,029		6,029	7,235	5,654				
DRIVE 1	10+20.00	TO	13+10.00	172				172	2,387		2,387	2,864	2,692				
-Y1-	29+69.41	TO	46+00.00	1,744				1,744	112,162		112,162	134,594	132,850				
RAMP C	4+72.78	TO	10+14.12	30,185				30,185	1,489		1,489	1,787			28,398		28,398
RAMP A	14+50.00	TO	17+83.01	0				0	17,961		17,961	21,553	21,553				
SUBTOTAL SUMMARY 5				199,085	0	0	0	199,085	242,180	0	242,180	290,616	162,750	0	71,219	0	71,219
-L-	113+50.00	TO	132+00.00	17,500				17,500	77,556		77,556	93,067	75,567				
-Y1-	11+00.00	TO	27+37.91	13,774				13,774	72,566		72,566	87,079	73,305				
RAMP A	0+00.00	TO	14+50.00	759				759	49,838		49,838	59,806	59,047				
LOOP A	0+00.00	TO	7+60.00	883				883	11,248		11,248	13,498	12,615				
RAMP D	4+88.57	TO	16+50.00	0				0	51,348		51,348	61,618	61,618				
RAMP C	10+14.12	TO	15+00.00	25				25	17,143		17,143	20,572	20,547				
-Y2-	12+00.00	TO	29+00.00	4,771				4,771	658		658	790			3,981		3,981
DRIVE 7	11+00.00	TO	14+69.67	972				972	0		0	0			972		972
SUBTOTAL SUMMARY 6				38,684	0	0	0	38,684	280,357	0	280,357	336,428	302,698	0	4,953	0	4,953
GRAND TOTALS				**924,653**	**77,637**	**0**	**0**	**847,016**	**847,361**	**42,034**	**805,327**	**1,008,426**	**656,665**	**35,603**	**537,289**	**0**	**572,892**
ADJUSTMENTS DUE TO:																	
Est. Loss Due To Clearing And Grubbing				-20,700				-20,700					20,700				
Rock Waste to Replace Borrow										35,603	-35,603		-35,603	-35,603			-35,603
Adjustment for Rock Waste												-7,121	-7,121				
Earth Waste to Replace Borrow													-537,289		-537,289		-537,289
Est. Shoulder Material									32,300		32,300	38,760	38,760				
Additional Undercut						6,600			6,600		6,600	7,920	7,920			6,600	6,600
PROJECT TOTALS				**903,953**	**77,637**	**6,600**	**0**	**826,316**	**886,261**	**77,637**	**808,624**	**1,047,985**	**144,032**	**0**	**0**	**6,600**	**6,600**
Est. 5% to Replace Topsoil on Borrow Pits													7,202				
GRAND TOTAL				**903,953**									**151,234**				**6,600**
SAY				**910,000**									**154,000**				**6,600**

PAVEMENT STRUCTURE VOLUME = 62,000 CU. YARDS

3D

EARTHWORK BALANCE CARD

Volumes in Cubic Yards

ENGLISH (ALT)

PROJECT: R-2606A **COUNTY: RANDOLPH** DATE: 6/27/2006 COMP BY: CHK. BY: SHEET: 1 of 1

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		EXCAVATION					EMBANKMENT				BORROW	WASTE			
LINE	STATION TO STATION	TOTAL UNCLASSIFIED EXCAVATION	ROCK EXCAVATION	UNDERCUT EXCAVATION	UNSUITABLE UNCLASSIFIED	SUITABLE UNCLASSIFIED	TOTAL EMBANKMENT	ROCK EMBANKMENT	EARTH EMBANKMENT	EMBANKMENT +20%		ROCK	SUITABLE WASTE	UNSUITABLE WASTE	TOTAL WASTE
GRAND TOTALS		**924,653**	**77,637**	**0**	**0**	**847,016**	**847,361**	**42,034**	**805,327**	**1,008,426**	**656,665**	**35,603**	**537,289**	**0**	**572,892**
ADJUSTMENTS DUE TO:															
Adjustment for Alternate Pavement Design		-15,135				-15,135	12,515		12,515	15,018	15,018		-15,135		-15,135
Est. Loss Due To Clearing And Grubbing		-20,700				-20,700					20,700				
Rock Waste to Replace Borrow								35,603	-35,603		-35,603	-35,603			-35,603
Adjustment for Rock Waste										-7,121	-7,121				
Earth Waste to Replace Borrow											-522,154		-522,154		-522,154
Est. Shoulder Material							32,300		32,300	38,760	38,760				
Additional Undercut				6,600			6,600		6,600	7,920	7,920			6,600	6,600
PROJECT TOTALS		**888,818**	**77,637**	**6,600**	**0**	**811,181**	**898,776**	**77,637**	**821,139**	**1,063,003**	**174,185**	**0**	**0**	**6,600**	**6,600**
Est. 5% to Replace Topsoil on Borrow Pits											8,709				
GRAND TOTAL		**888,818**									**182,894**				**6,600**
SAY		**895,000**									**185,000**				**6,600**

PAVEMENT STRUCTURE VOLUME = 58,700 CU. YARDS

PROJECT REFERENCE NO.	SHEET NO.
R-2606A	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

Prepared in the Office of:
EARTH TECH
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

GRAPHIC SCALE
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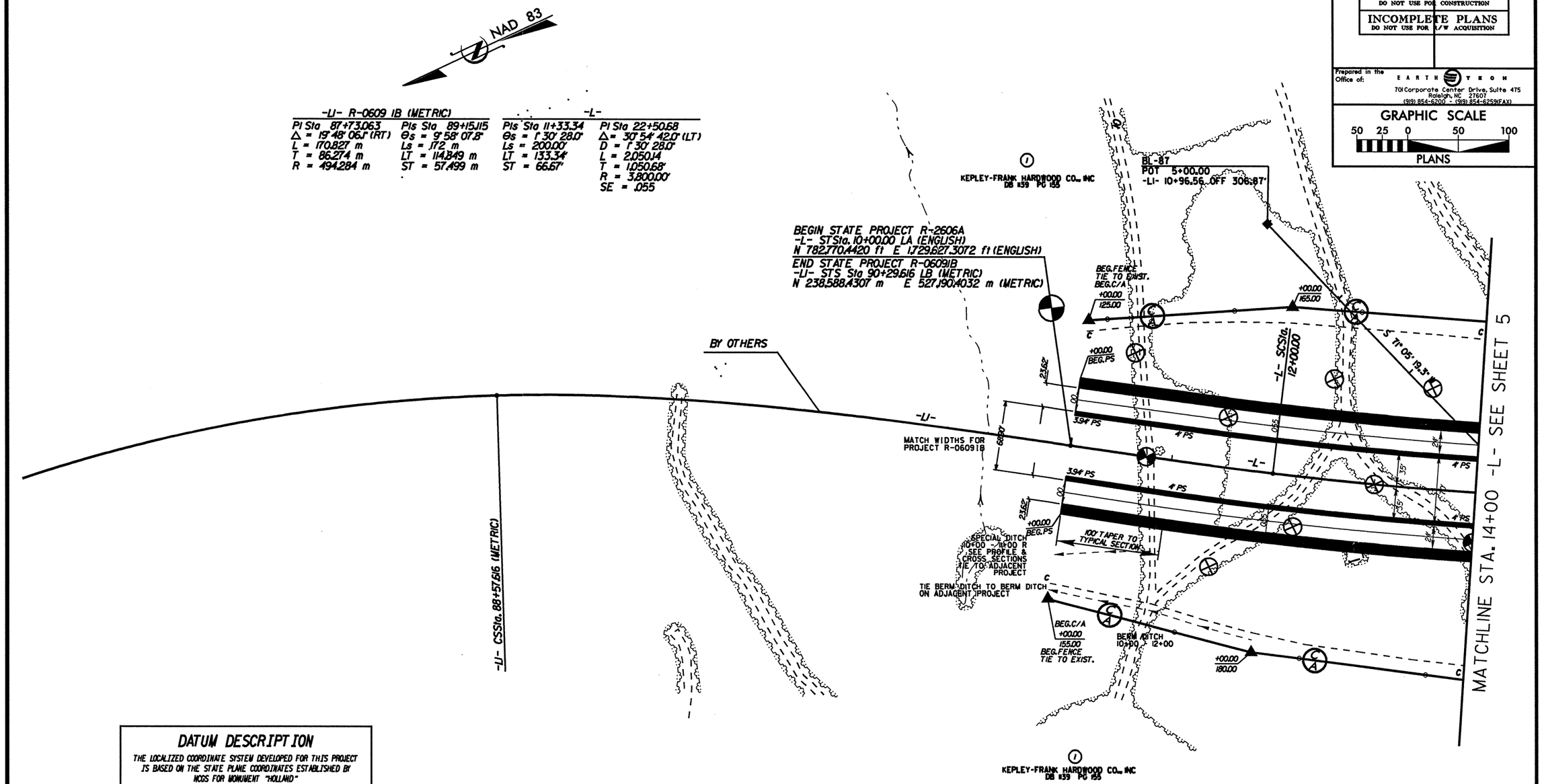
PLANS



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "HOLLAND"
WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 797565.242(ft) EASTING: 1722871.646(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99990836
THE N.C. LAMBERT GRID BEARING
LOCALIZED HORIZONTAL GROUND DISTANCE FROM "HOLLAND" TO -L- STATION 10+00.00 IS 16,264.23' S 24° 32' 33.3" E
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

FOR -L- PROFILE SEE SHEET 16

DATE: $$DATE$$
TIME: $$TIME$$
USER: $$USER$$
DGN: $$DGN$$
PRF: $$PRF$$

PROJECT REFERENCE NO.	SHEET NO.
R-2606A	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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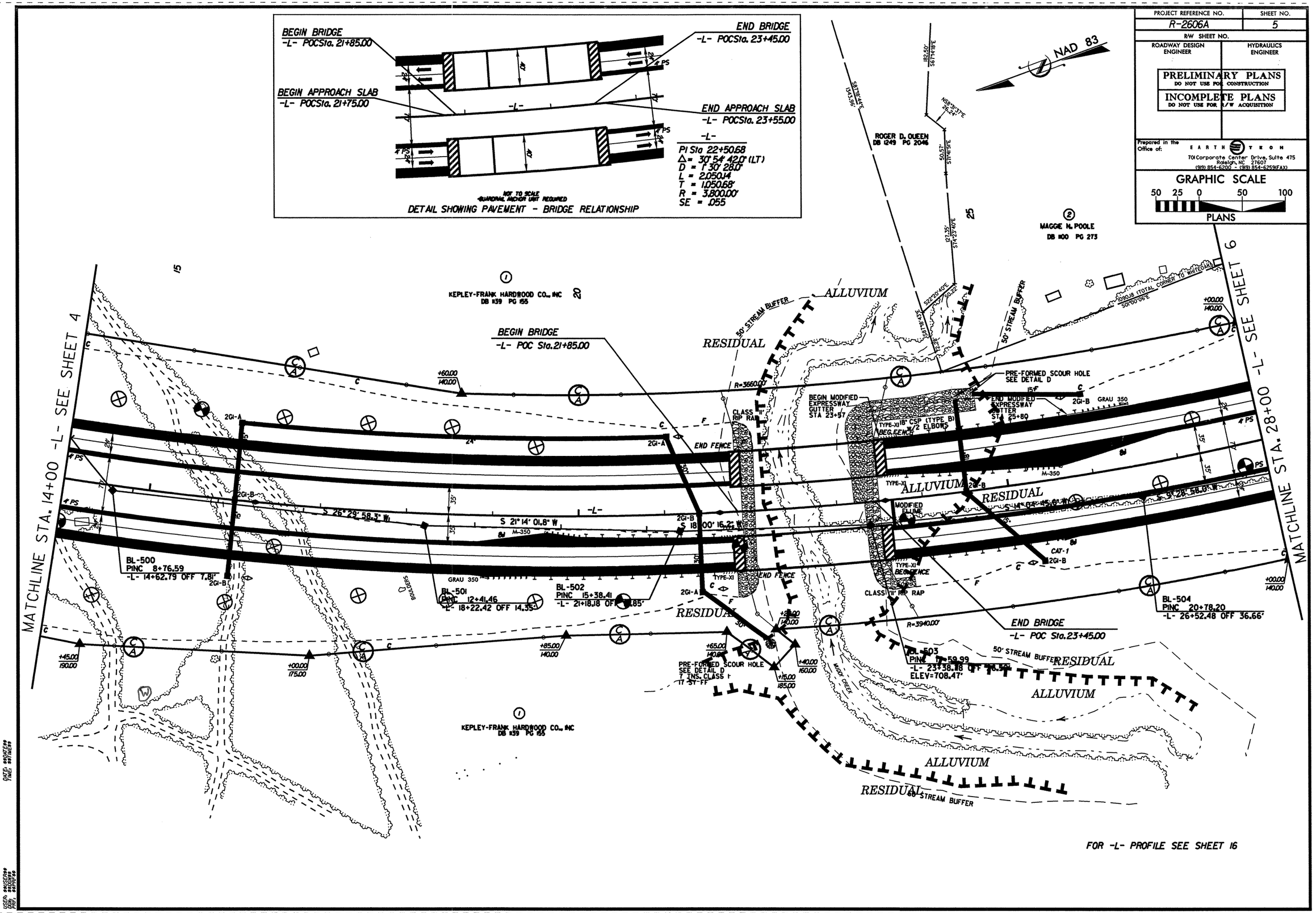

PROJECT REFERENCE NO.	SHEET NO.
R-2606A	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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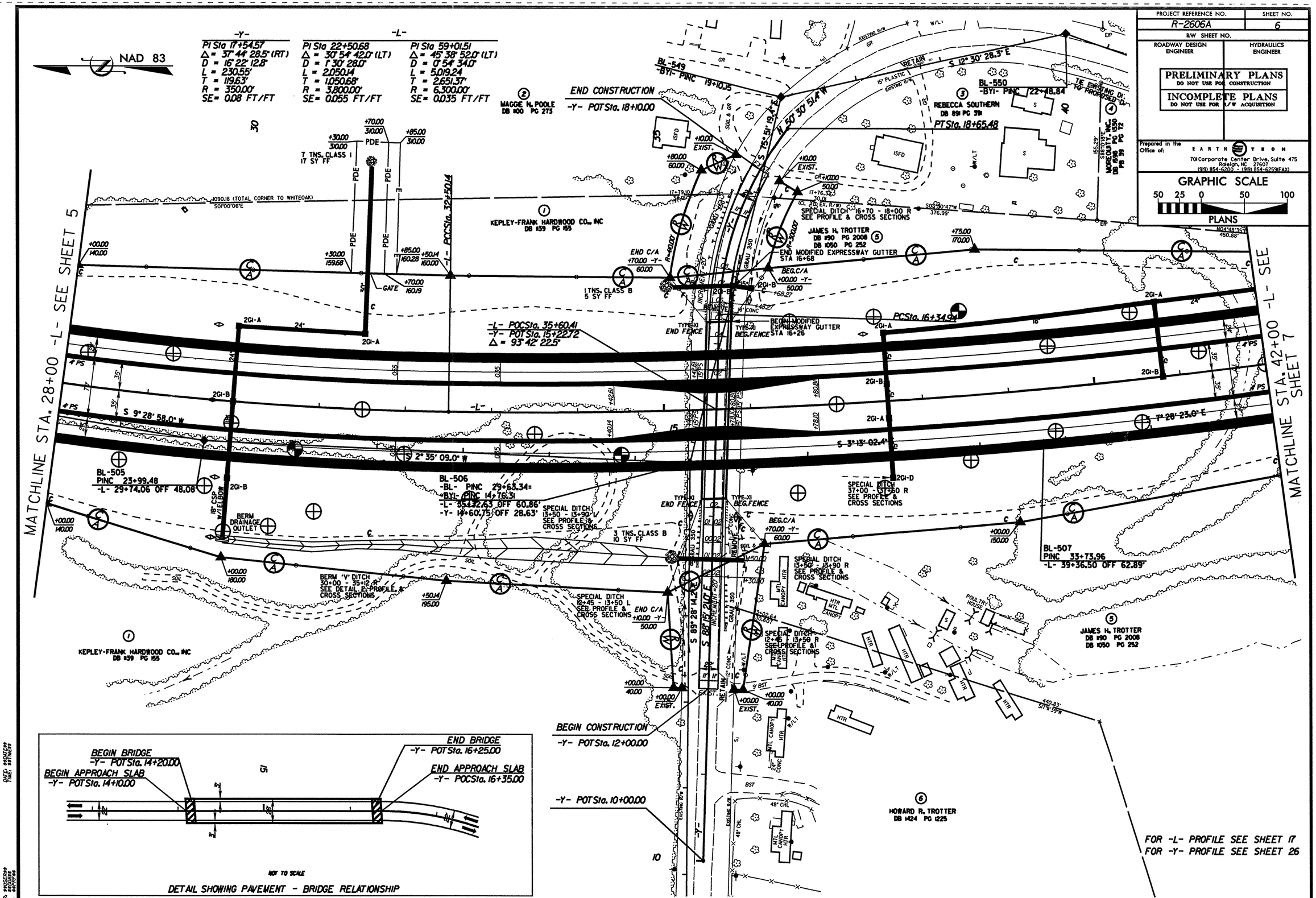
PLANS

NAD 83

-Y-	-L-	
PI Sta 17+54.57	PI Sta 22+50.68	PI Sta 59+01.51
Δ = 37° 44' 28.5" (RT)	Δ = 30° 54' 42.0" (LT)	Δ = 45° 38' 52.0" (LT)
D = 16° 22' 12.8"	D = 1° 30' 28.0"	D = 0° 54' 34.0"
L = 230.55'	L = 2,050.14	L = 5,019.24
T = 119.63'	T = 1,050.68'	T = 2,651.37'
R = 350.00'	R = 3,800.00'	R = 6,300.00'
SE = 0.08 FT/FT	SE = 0.055 FT/FT	SE = 0.035 FT/FT



PROJECT REFERENCE NO.	SHEET NO.
R-2606A	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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GRAPHIC SCALE
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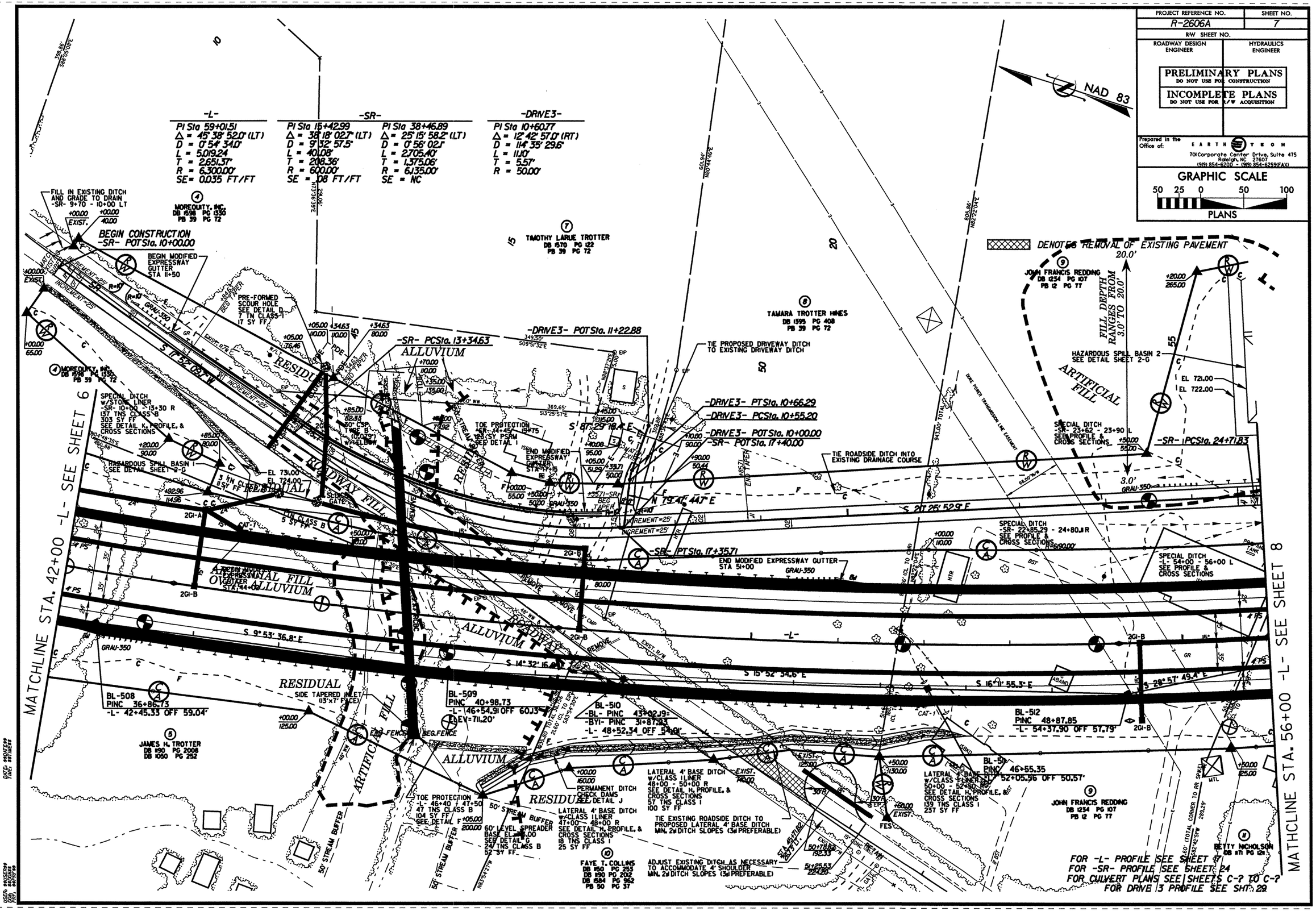
PLANS



PROJECT REFERENCE NO.	SHEET NO.
R-2606A	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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GRAPHIC SCALE
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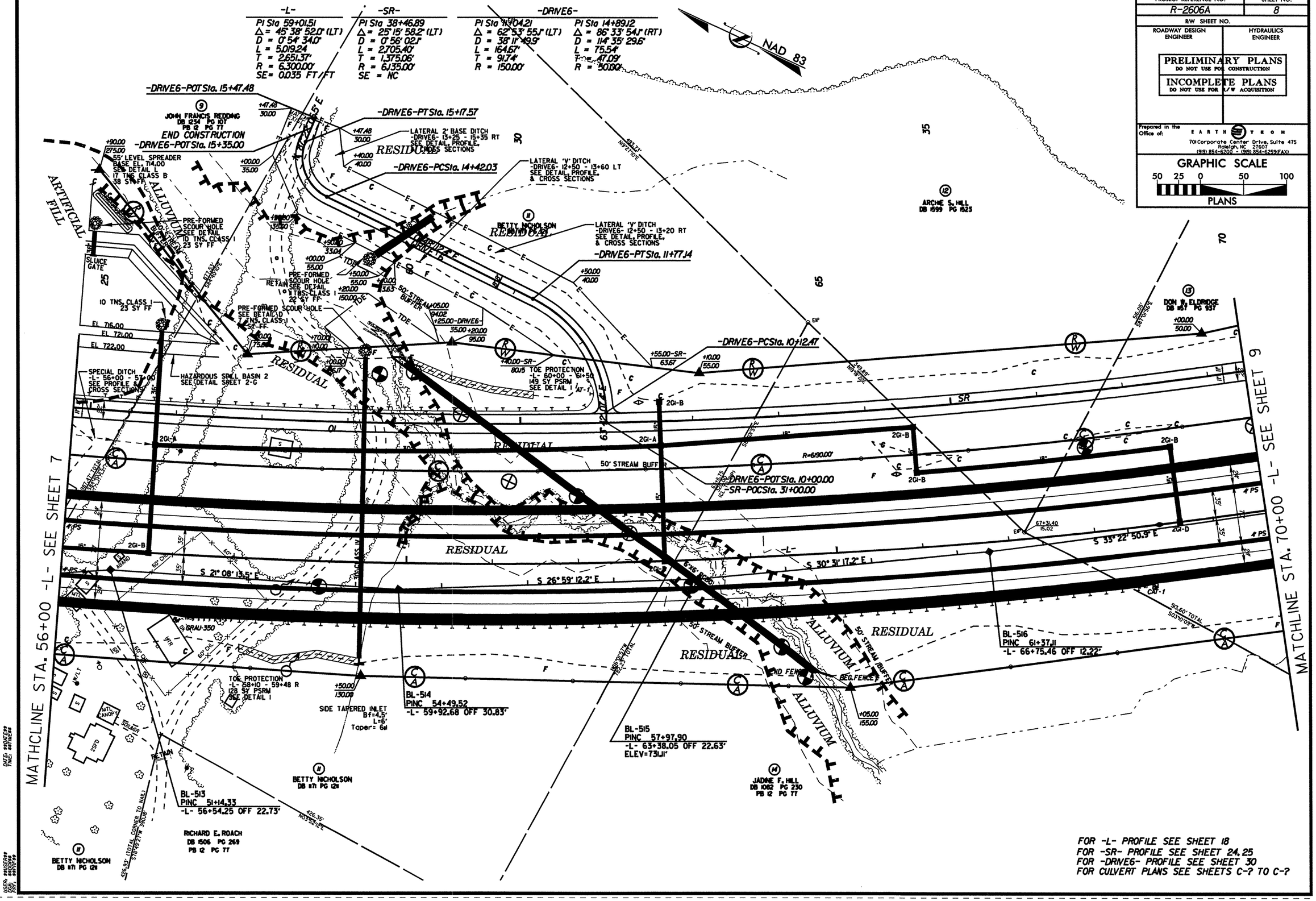
PLANS



PROJECT REFERENCE NO.	SHEET NO.
R-2606A	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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INCOMPLETE PLANS
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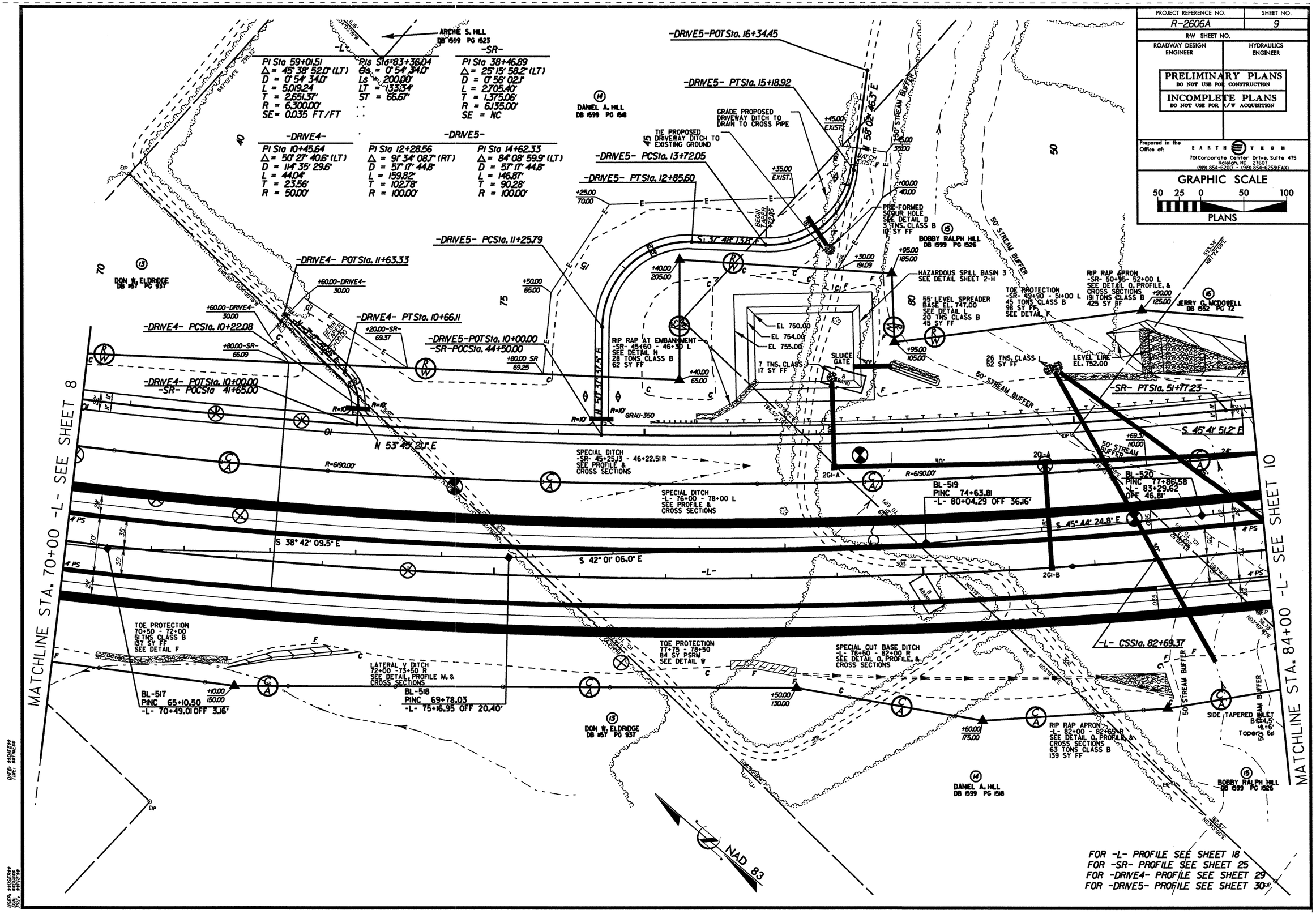
PLANS



PROJECT REFERENCE NO.	SHEET NO.
R-2606A	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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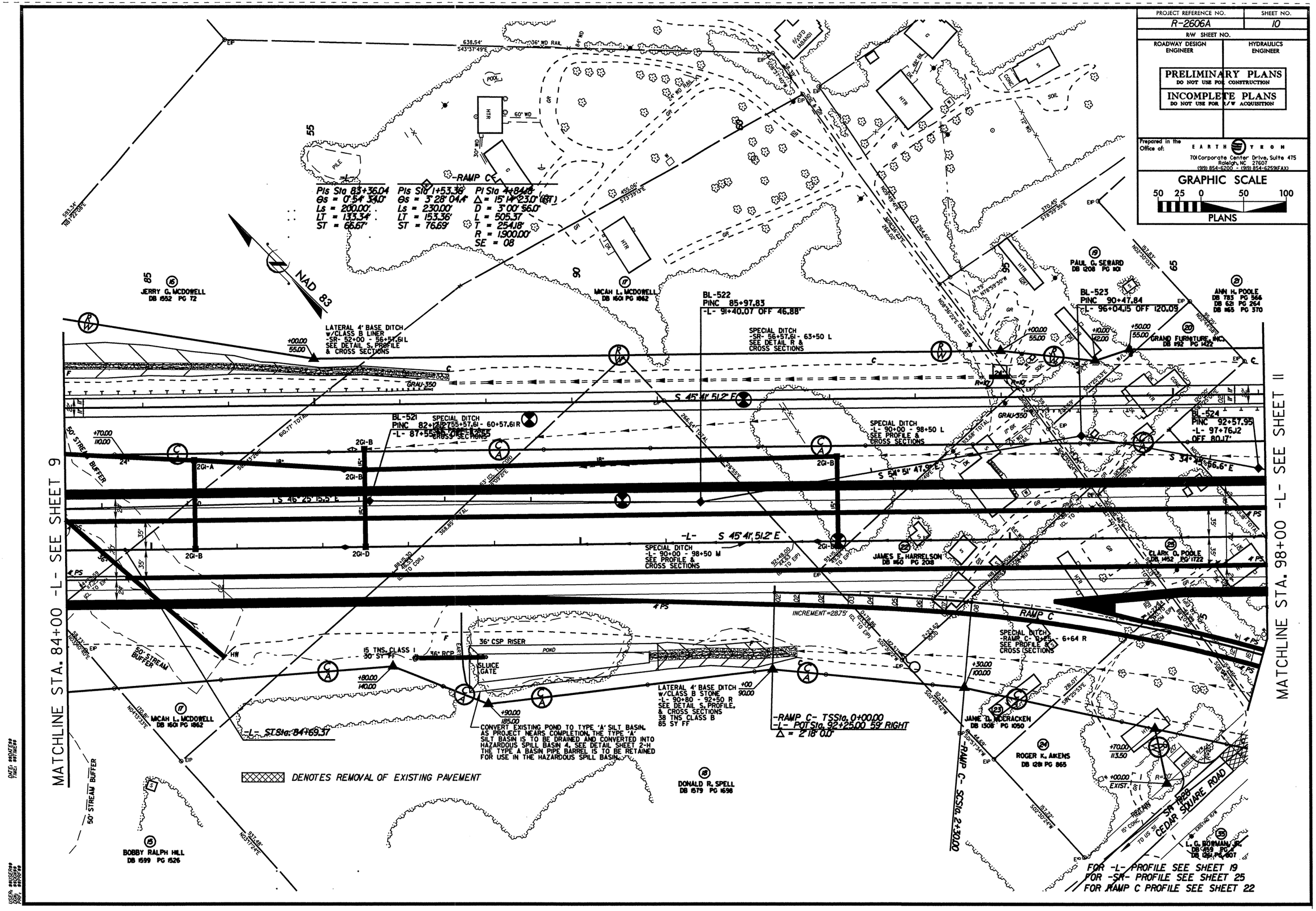
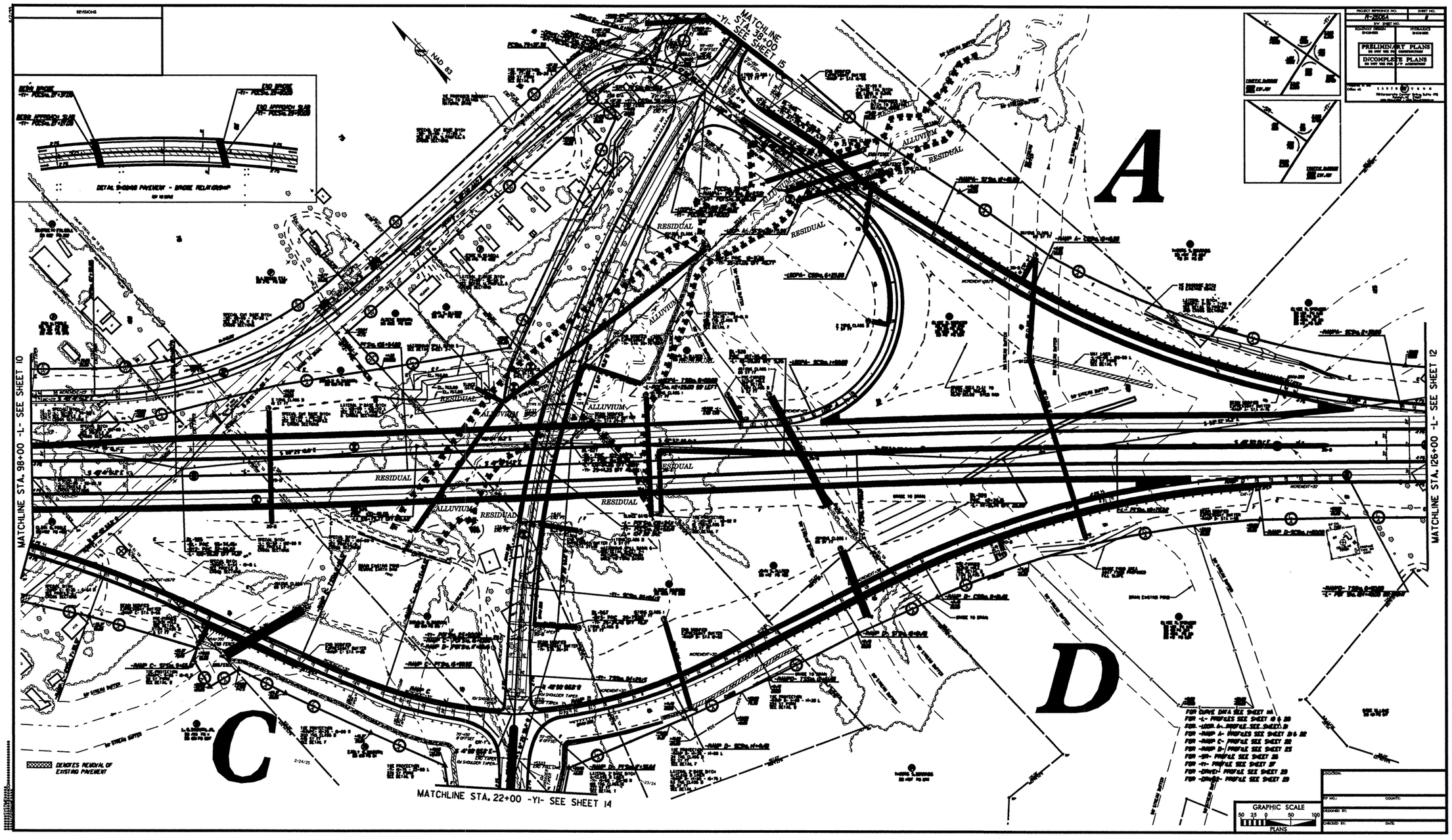
GRAPHIC SCALE
50 25 0 50 100
PLANS





MATCHLINE STA. 38+00 -Y1- SEE SHEET 15
MATCHLINE STA. 98+00 -L- SEE SHEET 10
MATCHLINE STA. 126+00 -L- SEE SHEET 12
MATCHLINE STA. 22+00 -Y1- SEE SHEET 14
NAD 83
A
C
D
RESIDUAL
ALLUVIUM
DETAIL SHOWING PAVEMENT - BRIDGE RELATIONSHIP
DENOTES REMOVAL OF EXISTING PAVEMENT
PRELIMINARY PLANS
INCOMPLETE PLANS
GRAPHIC SCALE
50 25 0 50 100
PLANS

PROJECT REFERENCE NO.	SHEET NO.
R-2606A	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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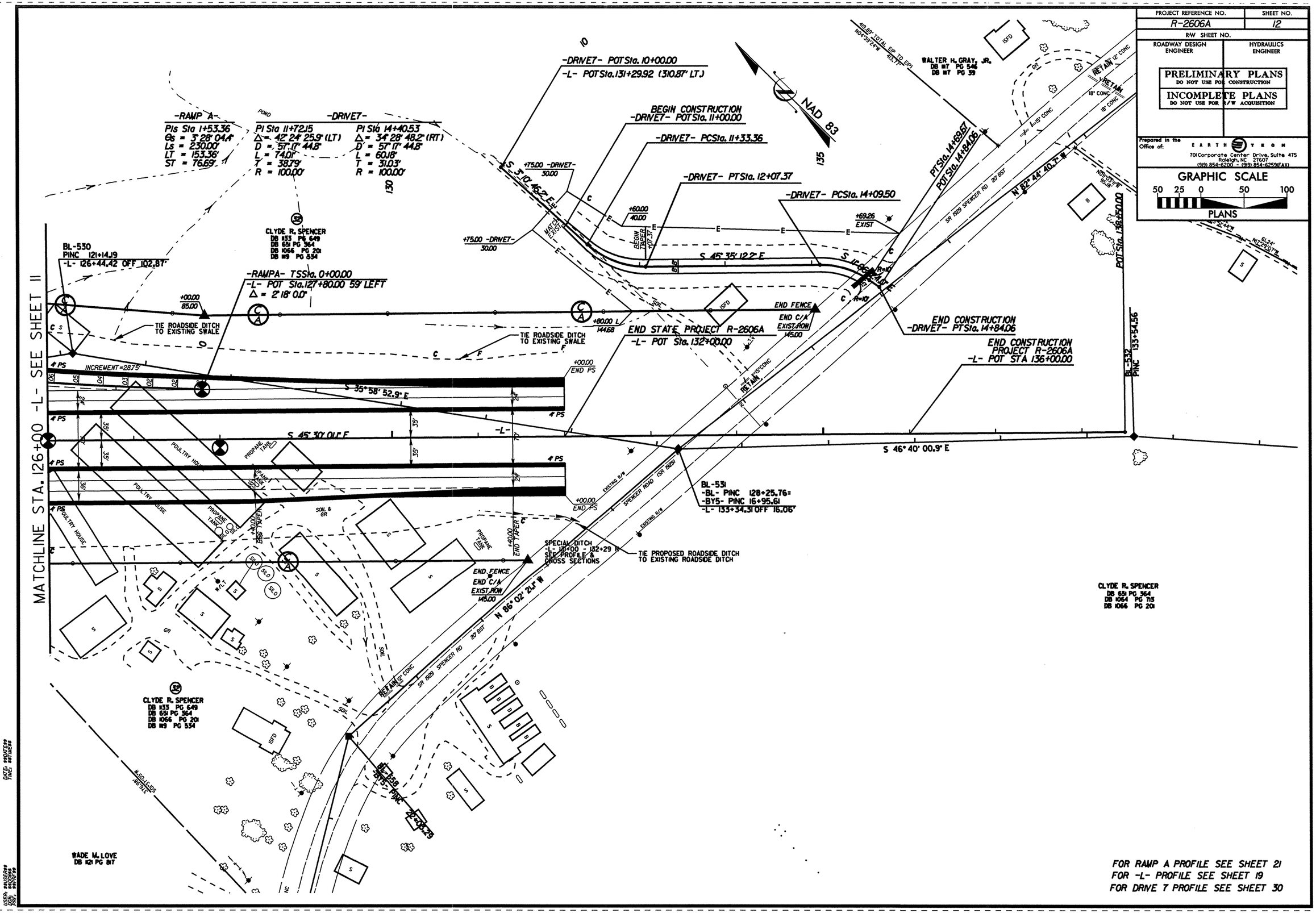
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259 (FAX)

GRAPHIC SCALE
50 25 0 50 100
PLANS



FOR RAMP A PROFILE SEE SHEET 21
FOR -L- PROFILE SEE SHEET 19
FOR DRIVE 7 PROFILE SEE SHEET 30

PROJECT REFERENCE NO.	SHEET NO.
R-2606A	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

Prepared in the Office of:
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GRAPHIC SCALE
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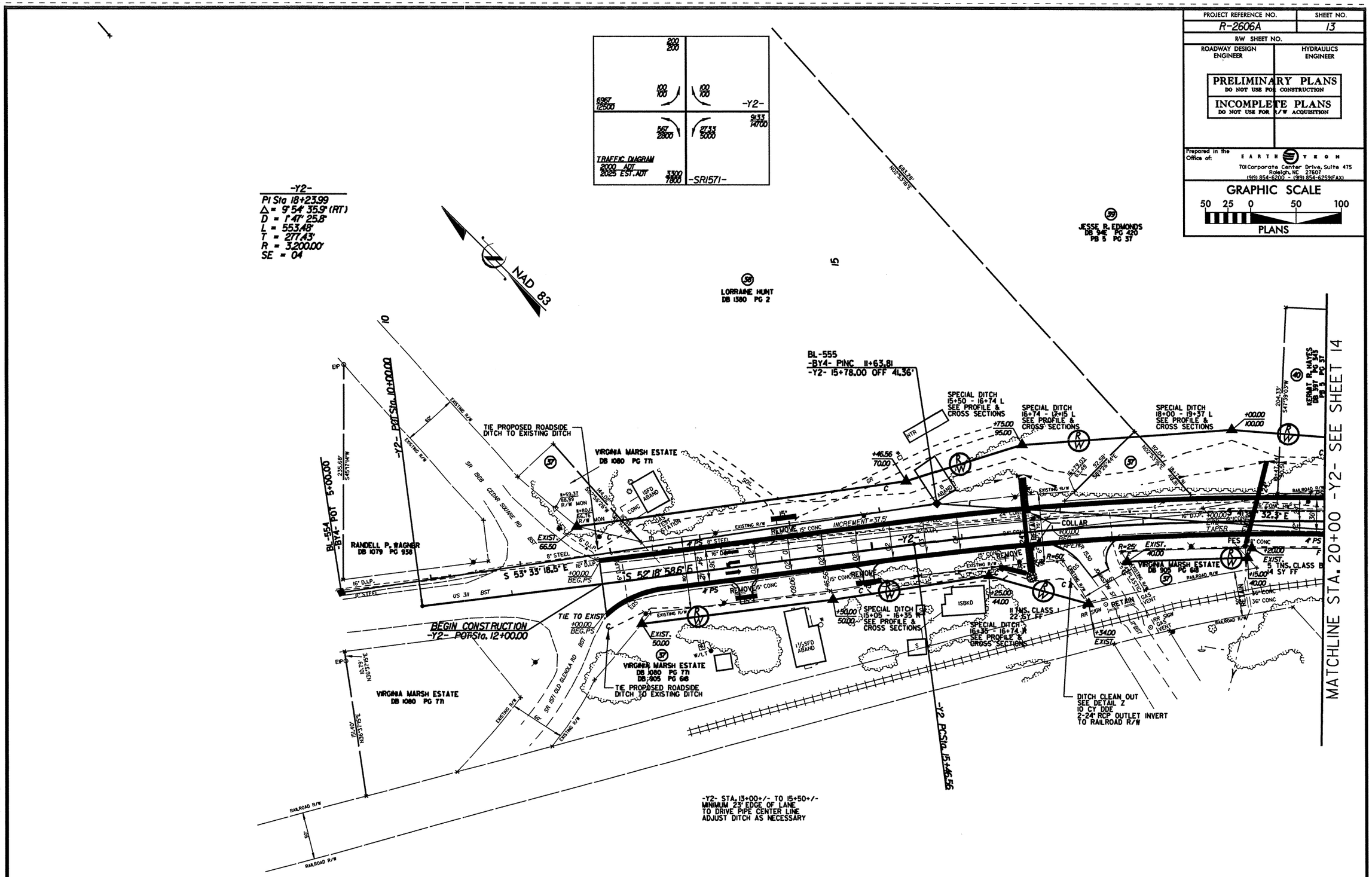
PLANS



FOR -Y2- PROFILE SEE SHEET 28

PROJECT REFERENCE NO.	SHEET NO.
R-2606A	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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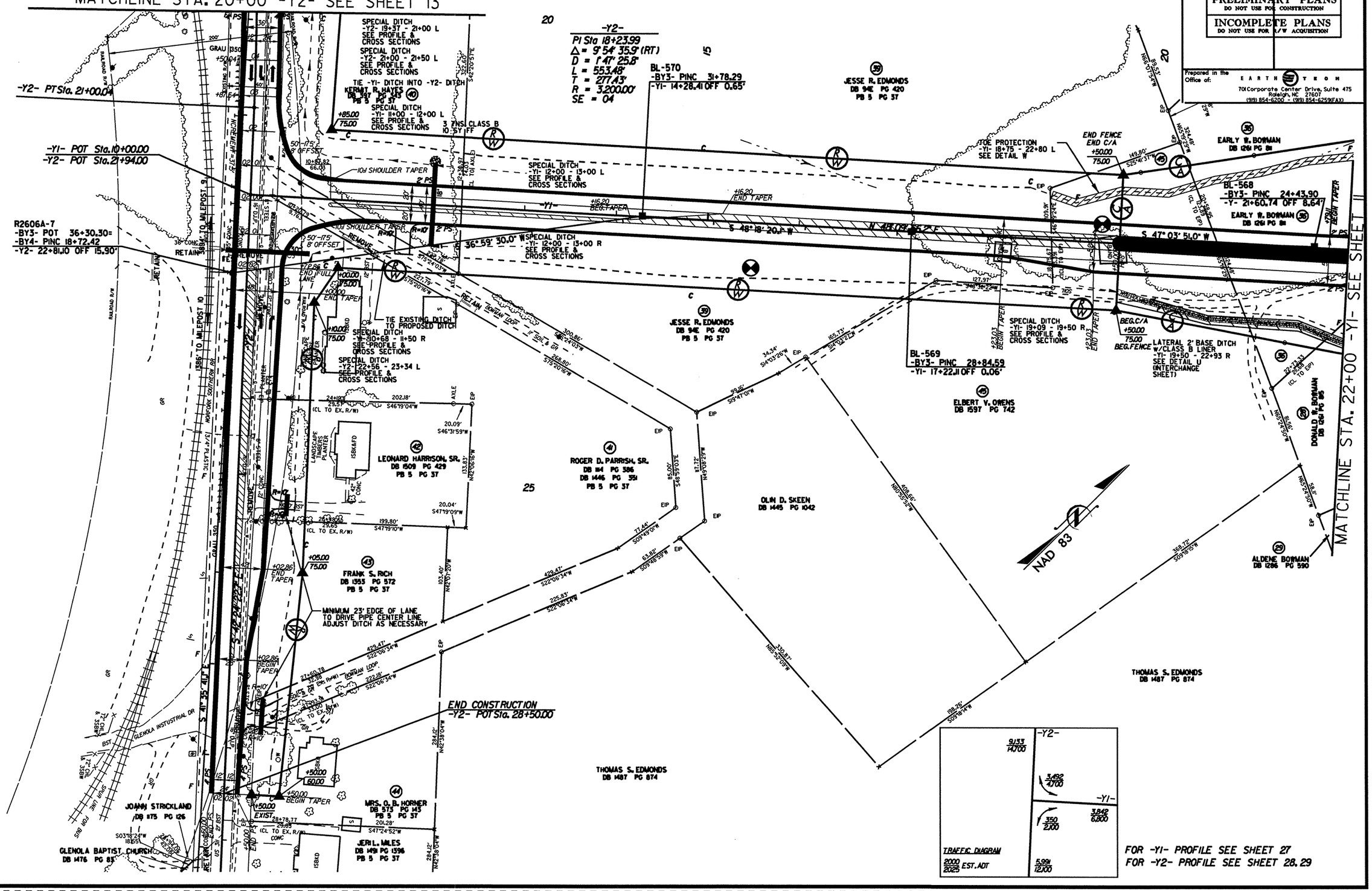
GRAPHIC SCALE
50 25 0 50 100
PLANS



FOR -Y1- PROFILE SEE SHEET 27
FOR -Y2- PROFILE SEE SHEET 28, 29

PROJECT REFERENCE NO.	SHEET NO.
R-2606A	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

Prepared in the Office of:
EARTH TECH
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 (919) 854-6259(FAX)

GRAPHIC SCALE
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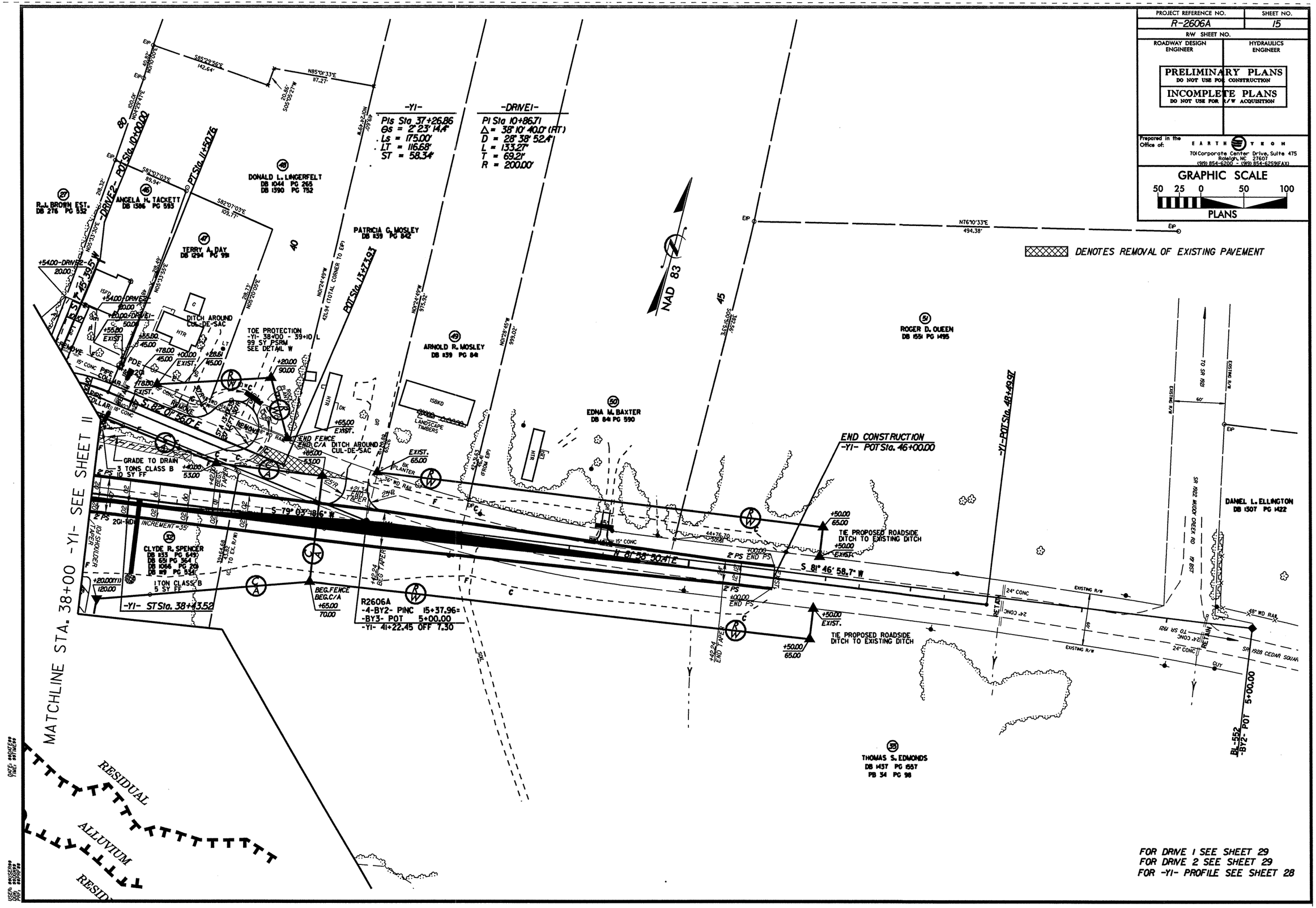
PLANS



PROJECT REFERENCE NO.	SHEET NO.
R2606A	16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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INCOMPLETE PLANS
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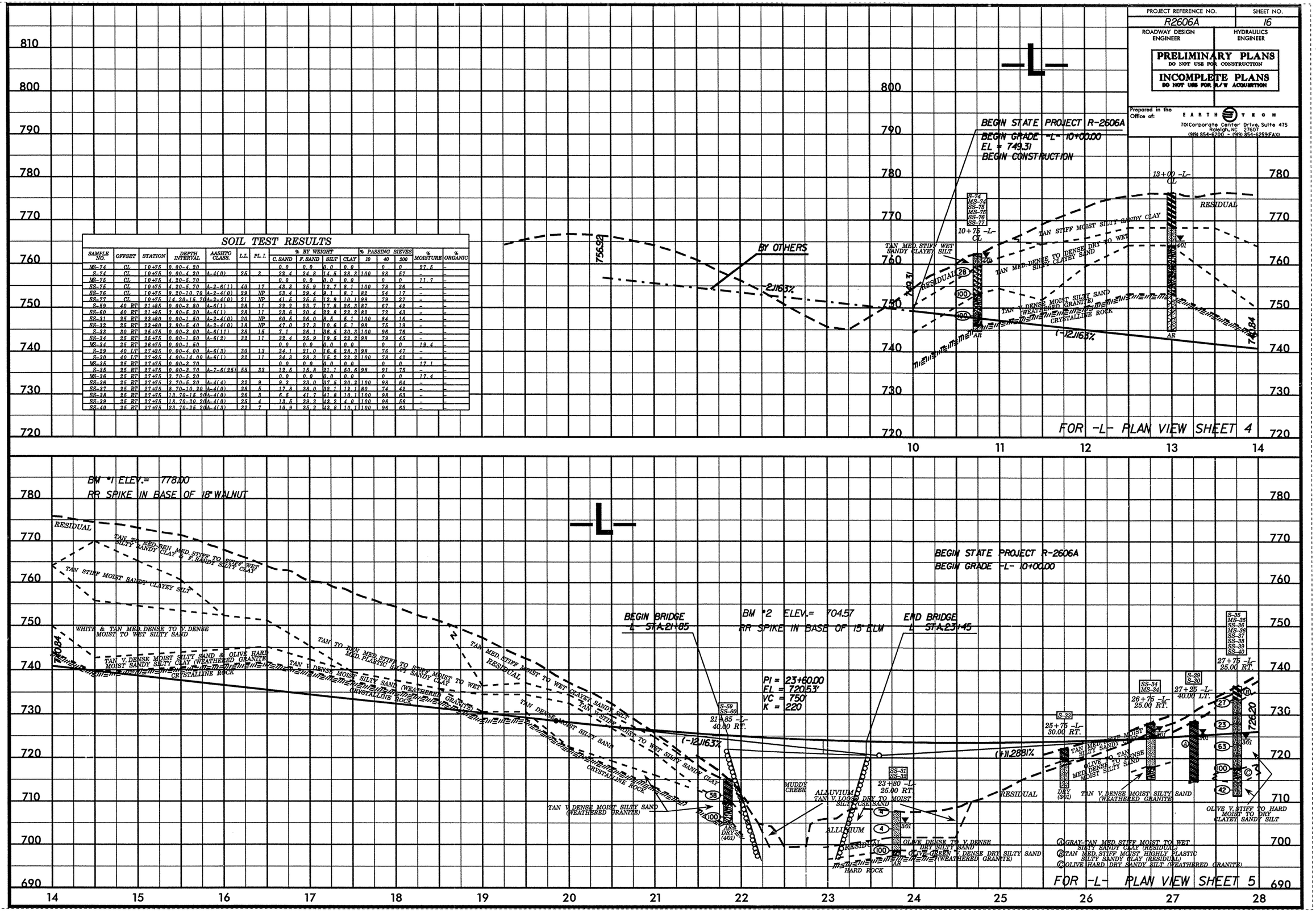
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
MS-74	CL	10+75	0.00-4.20				0.0	0.0	0.0	0.0		0	0	27.5	-
S-74	CL	10+75	0.00-4.20	A-4(0)	25	3	22.4	24.8	14.5	38.3	100	88	57	-	-
MS-75	CL	10+75	4.20-5.70				0.0	0.0	0.0	0.0		0	0	11.7	-
SS-75	CL	10+75	4.20-5.70	A-2-6(1)	40	17	43.3	35.9	12.7	8.1	100	78	36	-	-
SS-76	CL	10+75	9.20-10.70	A-2-4(0)	29	NP	53.4	29.4	9.1	8.1	82	54	17	-	-
SS-77	CL	10+75	14.20-15.70	A-2-4(0)	21	NP	41.5	35.5	12.9	10.1	99	79	27	-	-
S-59	40 RT	21+85	0.00-3.80	A-6(1)	28	11	32.2	23.7	17.8	26.3	87	67	42	-	-
SS-60	40 RT	21+85	3.80-5.30	A-6(1)	28	11	23.6	30.4	23.8	22.2	82	72	43	-	-
SS-31	25 RT	23+80	0.00-1.50	A-2-4(0)	20	NP	60.5	26.0	6.5	6.1	100	84	16	-	-
SS-32	25 RT	23+80	3.20-5.40	A-2-4(0)	18	NP	47.0	37.3	10.6	5.1	98	75	19	-	-
S-33	30 RT	25+75	0.00-3.00	A-6(11)	38	15	7.1	26.1	36.5	30.3	100	96	76	-	-
SS-34	25 RT	25+75	0.00-1.50	A-6(2)	32	11	32.4	25.9	19.5	22.2	98	79	45	-	-
MS-34	25 RT	26+75	0.00-1.50				0.0	0.0	0.0	0.0		0	0	19.4	-
S-29	40 LT	27+25	0.00-4.00	A-6(3)	30	13	34.1	21.0	16.6	28.3	98	76	47	-	-
S-30	40 LT	27+25	4.00-14.00	A-6(1)	32	11	34.3	28.3	15.2	22.2	100	78	42	-	-
MS-35	25 RT	27+75	0.00-3.70				0.0	0.0	0.0	0.0		0	0	17.1	-
S-35	25 RT	27+75	0.00-3.70	A-7-6(26)	55	33	12.5	15.8	21.1	50.6	98	91	75	-	-
MS-36	25 RT	27+75	3.70-5.20				0.0	0.0	0.0	0.0		0	0	17.4	-
SS-36	25 RT	27+75	3.70-5.20	A-4(4)	32	9	9.3	33.0	37.5	20.2	100	98	64	-	-
SS-37	25 RT	27+75	8.70-10.20	A-4(0)	28	5	17.8	38.0	32.1	12.1	80	74	42	-	-
SS-38	25 RT	27+75	13.70-15.20	A-4(0)	26	3	6.5	41.7	41.8	10.1	100	98	63	-	-
SS-39	25 RT	27+75	18.70-20.20	A-4(0)	25	4	13.5	39.2	43.2	4.0	100	96	56	-	-
SS-40	25 RT	27+75	23.70-25.20	A-4(2)	32	7	10.9	35.2	43.8	10.1	100	96	63	-	-



PROJECT REFERENCE NO.	SHEET NO.
R2606A	17
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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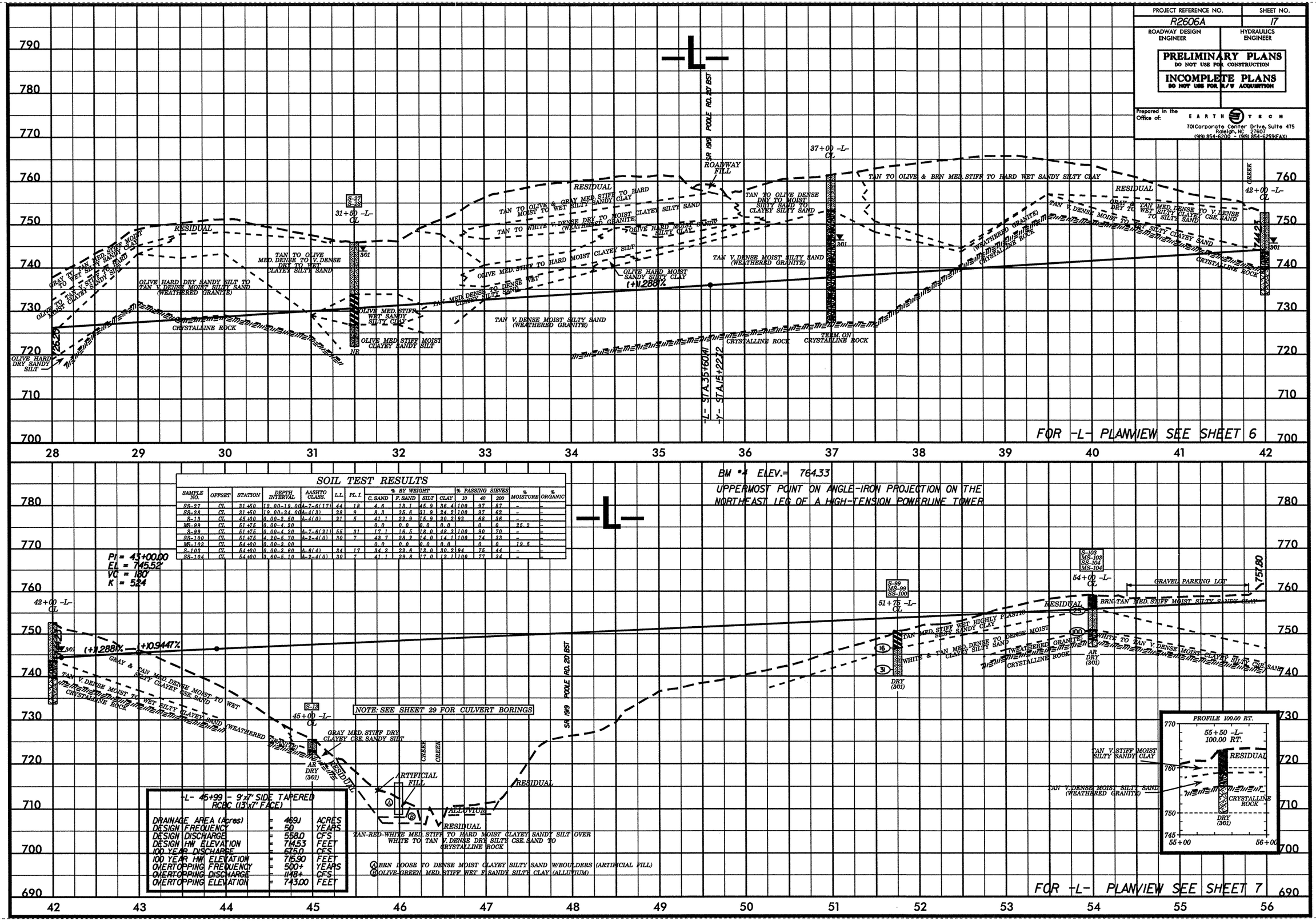

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PI. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-27	CL	31+50	19.00-19.00	A-7-6(17)	44	18	4.6	18.1	45.9	36.4	100	97	87	-	-
SS-28	CL	31+50	19.00-24.00	A-4(8)	28	9	8.3	35.6	31.9	24.2	100	97	62	-	-
S-13	CL	45+00	0.00-2.50	A-4(0)	21	5	41.1	22.9	15.9	20.2	92	68	36	-	-
MS-99	CL	51+75	0.00-4.20				0.0	0.0	0.0	0.0		0	0	25.2	-
S-99	CL	51+75	0.00-4.20	A-7-6(21)	55	31	17.1	16.5	18.0	48.3	100	90	70	-	-
SS-100	CL	51+75	4.20-6.70	A-2-4(0)	30	7	43.7	28.2	14.0	14.1	100	74	33	-	-
MS-103	CL	54+00	0.00-3.00				0.0	0.0	0.0	0.0		0	0	19.5	-
S-103	CL	54+00	0.00-3.60	A-6(4)	34	17	34.2	22.6	13.0	30.2	94	75	44	-	-
SS-104	CL	54+00	3.60-5.10	A-2-4(0)	30	7	41.1	29.8	17.0	12.1	100	77	34	-	-

-L- 45+99 - 9'x7' SIDE TAPERED RCBC (13'x7' FACE)

DRAINAGE AREA (Acres)	=	469.1	ACRES
DESIGN FREQUENCY	=	50	YEARS
DESIGN DISCHARGE	=	558.0	CFS
DESIGN HW ELEVATION	=	714.53	FEET
100 YEAR DISCHARGE	=	675.0	CFS
100 YEAR HW ELEVATION	=	715.90	FEET
OVERTOPPING FREQUENCY	=	500+	YEARS
OVERTOPPING DISCHARGE	=	1148+	CFS
OVERTOPPING ELEVATION	=	743.00	FEET

PROJECT REFERENCE NO.	SHEET NO.
R2606A	18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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INCOMPLETE PLANS
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BM #5 ELEV.= 746.09
RR SPIKE IN BASE OF 8" OAK

-L- 59+48 - 30" RCP

DRAINAGE AREA (Acres)	=	7.8	ACRES
DESIGN FREQUENCY	=	50	YEARS
DESIGN DISCHARGE	=	35.5	CFS
DESIGN HW ELEVATION	=	742.88	FEET
100 YEAR DISCHARGE	=	38.1	CFS
100 YEAR HW ELEVATION	=	743.05	FEET
OVERTOPPING FREQUENCY	=	500+	YEARS
OVERTOPPING DISCHARGE	=	64.8+	CFS
OVERTOPPING ELEVATION	=	760.00	FEET

(+10.94%)

-L- 63+02 - 6'x6' RCBC

DRAINAGE AREA (Acres)	=	129.1	ACRES
DESIGN FREQUENCY	=	50	YEARS
DESIGN DISCHARGE	=	205.0	CFS
DESIGN HW ELEVATION	=	733.27	FEET
100 YEAR DISCHARGE	=	248.0	CFS
100 YEAR HW ELEVATION	=	734.01	FEET
OVERTOPPING FREQUENCY	=	500+	YEARS
OVERTOPPING DISCHARGE	=	957	CFS
OVERTOPPING ELEVATION	=	760.00	FEET

NOTE: SEE SHEET 29 FOR CULVERT BORINGS

S-115 SS-116 SS-117 — 68+00 -L- 100.00 LT.
S-118 S-119 — 70+00 -L- 100.00 LT.
S-119 — 70+00 -L- 100.00 LT.
S-112 SS-113 SS-114 — 59+00 -L- 30.00 RT.
62+60 -L- 32.00 LT.
63+30 -L- 30.00 RT.

TAN MED. STIFF WET HIGHLY PLASTIC SILTY SANDY CLAY TO TAN HARD WET SILTY SANDY CLAY
TAN MED. STIFF DRY SILTY SANDY CLAY
TAN V. DENSE DRY SILTY CLAYEY SAND TO CLAYEY SILTY SAND
TAN TO WHITE & MOIST SILTY TAN MED. STIFF SANDY CLAY
TAN V. DENSE WET CSE. SAND
ALLUVIUM TAN SOFT WET SANDY SILT OVER RESIDUAL TAN MED. DENSE WET SILTY SAND
ALLUVIUM GRAY LOOSE WET SILTY SAND OVER RESIDUAL TAN LOOSE TO MED. DENSE CLAYEY SAND
CRYSTALLINE ROCK
RESIDUAL
ALLUVIUM
SOIL & GRAVEL
CREEK
DRY (401)
AR

FOR -L- PLANVIEW SEE SHEET 8

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING SIEVES 10	% PASSING SIEVES 40	% PASSING SIEVES 200	% MOISTURE	% ORGANIC
S-112	30 RT	59+00	0.00-3.50	A-6(4)	36	15	32.3	21.6	16.0	30.2	97	78	48	-	-
SS-113	30 RT	59+00	3.50-5.00	A-7-6(7)	45	25	32.8	25.0	12.0	30.2	100	82	45	-	-
SS-114	30 RT	59+00	8.50-10.00	A-1-b(0)	23	NP	57.2	25.4	9.4	8.1	71	45	16	-	-
S-115	100 LT	68+00	0.00-4.30	A-6(3)	33	17	37.8	19.6	16.0	26.6	91	65	42	-	-
SS-116	100 LT	68+00	4.30-5.80	A-2-4(0)	25	8	55.3	19.8	12.7	12.3	71	41	19	-	-
SS-117	100 LT	68+00	9.30-10.80	A-2-6(0)	27	11	55.0	17.6	13.1	14.3	66	37	20	-	-
S-118	100 LT	70+00	0.00-5.00	A-7-6(14)	56	36	32.5	14.7	13.9	38.9	93	72	51	-	-
S-119	100 LT	70+00	5.00-9.00	A-7-6(24)	51	24	2.2	15.5	39.3	42.9	100	99	88	-	-
S-120	CL	74+00	0.00-3.00	A-6(5)	39	18	35.4	16.6	11.2	36.8	97	74	48	-	-
S-121	100 LT	74+50	0.00-3.10	A-6(5)	33	20	29.2	22.6	18.0	30.2	93	74	48	-	-
SS-122	100 LT	74+50	3.10-4.60	A-2-4(0)	19	NP	39.9	31.8	16.2	12.1	97	76	32	-	-

BM #6 ELEV.= 758.67
RR SPIKE IN BASE OF 10" POPLAR

PI = 75+50.00
EL = 776.22'
K = 538
VC = 960'

-L- 82+74 - 30" RCP

DRAINAGE AREA (Acres)	=	24.6	ACRES
DESIGN FREQUENCY	=	50	YEARS
DESIGN DISCHARGE	=	41.3	CFS
DESIGN HW ELEVATION	=	756.83	FEET
100 YEAR DISCHARGE	=	50.0	CFS
100 YEAR HW ELEVATION	=	757.47	FEET
OVERTOPPING FREQUENCY	=	500+	YEARS
OVERTOPPING DISCHARGE	=	85.0+	CFS
OVERTOPPING ELEVATION	=	768.56	FEET

BM #7 ELEV.= 751.03
RR SPIKE IN BASE OF 15" OAK

S-118 S-119 — 70+00 -L- 100.00 LT.
71+00 -L- 60.00 LT.
72+00 -L- 50.00 LT.
S-120 — 74+00 -L- CL
S-121 SS-122 — 74+50 -L- 100.00 LT.
76+50 -L- 100.00 RT.
81+50 -L- 120.00 LT.
82+50 -L- 50.00 LT.

(-10.83%)
(+10.94%)

TAN MED. STIFF WET HIGHLY PLASTIC SILTY SANDY CLAY TO TAN HARD WET SILTY SANDY CLAY
TAN MED. STIFF MOIST SILTY SANDY CLAY
TAN DENSE TO V. DENSE DRY SILTY SAND
TAN V. DENSE MOIST SILTY SAND (WEATHERED GRANITE)
TAN V. DENSE MOIST SILTY SAND
TAN MED. STIFF MOIST CLAYEY SILTY SAND
TAN V. STIFF MOIST SILTY SANDY CLAY
WHITE & TAN V. DENSE MOIST CLAYEY SILTY SAND (WEATHERED GRANITE)
WHITE & TAN V. DENSE MOIST CLAYEY SILTY SAND W/CRYSTALLINE ROCK LAYERS
CRYSTALLINE ROCK
TAN MED. STIFF MOIST SILTY SANDY CLAY
TAN V. DENSE MOIST SILTY SAND (WEATHERED GRANITE)
TAN MED. STIFF MOIST SILTY SANDY CLAY
TAN MED. STIFF TO HARD MOIST CLAYEY SANDY SILT
TAN MED. STIFF MOIST SILTY SANDY CLAY
TAN V. DENSE DRY SILTY SAND
DRY CRYSTALLINE ROCK
RESIDUAL
SOIL RD.
CREEK
DRY (401)
AR

FOR -L- PLANVIEW SEE SHEET 9

PROJECT REFERENCE NO.	SHEET NO.
R2606A	19

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
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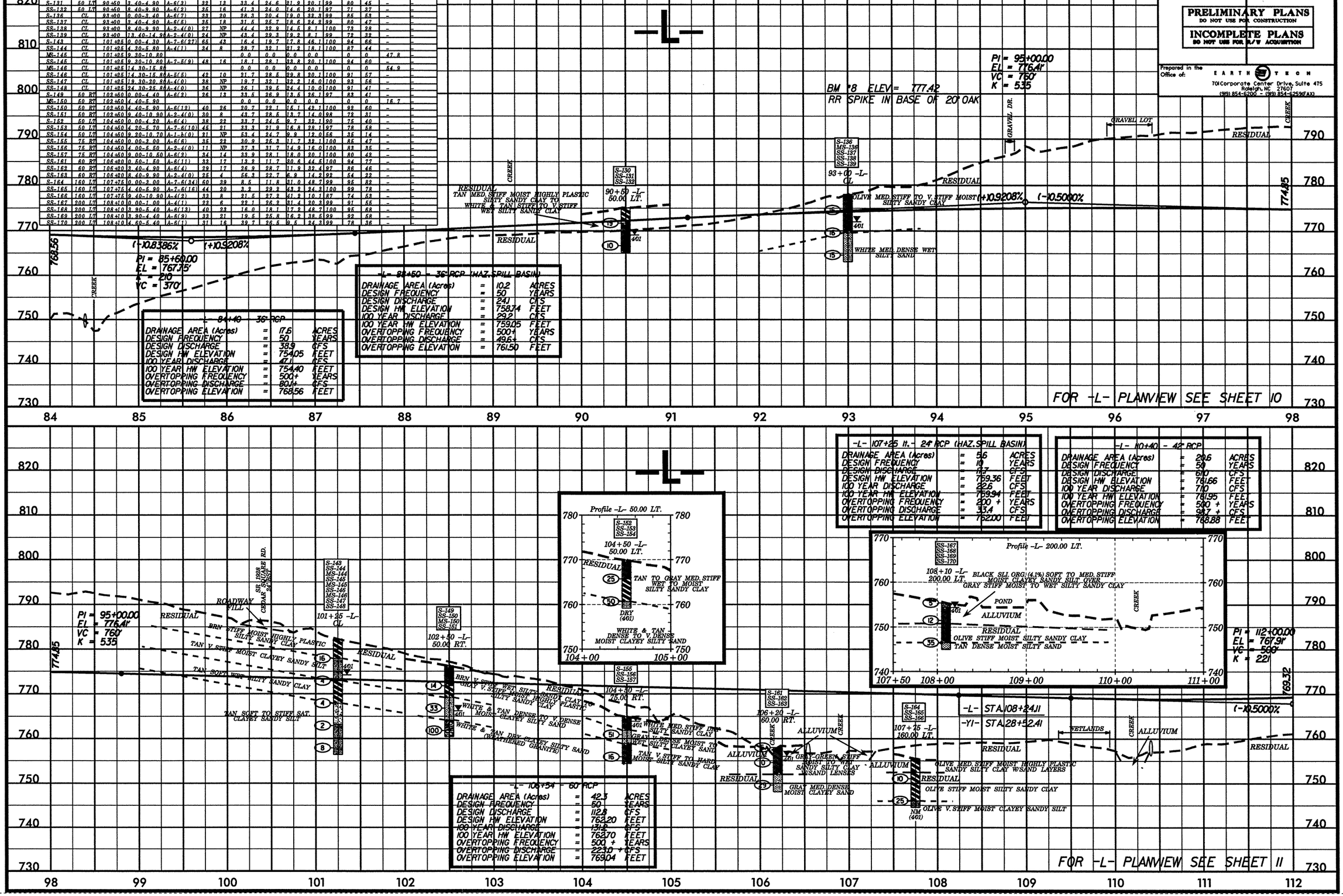
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-130	50 LT	90+50	0.00-3.40	A-7-6(13)	42	28	25.2	17.1	25.5	32.2	99	84	60	-	-
S-131	50 LT	90+50	3.40-4.90	A-6(3)	32	13	33.4	24.6	21.9	20.1	99	80	45	-	-
SS-132	50 LT	90+50	8.40-9.90	A-6(2)	35	16	41.3	24.0	14.6	20.1	97	71	37	-	-
S-136	CL	93+00	0.00-3.40	A-6(7)	33	20	28.3	20.4	19.0	32.3	99	85	53	-	-
SS-137	CL	93+00	3.40-4.90	A-6(6)	35	18	31.5	25.7	18.5	24.3	99	80	47	-	-
SS-138	CL	93+00	8.40-9.90	A-2-4(0)	27	NP	44.4	33.9	14.5	8.1	100	73	28	-	-
SS-139	CL	93+00	13.40-14.90	A-2-4(0)	24	NP	43.4	29.3	19.2	8.1	99	72	32	-	-
S-143	CL	101+25	0.00-4.30	A-7-6(27)	65	43	16.4	19.7	17.8	46.1	100	94	66	-	-
SS-144	CL	101+25	4.30-5.80	A-4(1)	34	8	28.7	32.1	21.2	18.1	100	87	44	-	-
MS-145	CL	101+25	9.30-10.80				0.0	0.0	0.0	0.0		0	0	47.8	-
SS-145	CL	101+25	9.30-10.80	A-7-5(9)	48	16	18.1	28.1	33.8	20.1	100	94	60	-	-
MS-146	CL	101+25	14.30-15.80				0.0	0.0	0.0	0.0		0	0	54.9	-
SS-146	CL	101+25	14.30-15.80	A-5(5)	42	10	21.7	28.5	29.8	20.1	100	91	57	-	-
SS-147	CL	101+25	19.30-20.80	A-4(0)	38	NP	19.7	32.1	32.2	16.0	100	93	56	-	-
SS-148	CL	101+25	24.30-25.80	A-4(0)	36	NP	26.1	39.5	24.4	10.0	100	91	47	-	-
S-149	50 RT	102+50	0.00-4.40	A-6(2)	26	13	33.5	26.9	13.5	26.1	97	83	41	-	-
MS-150	50 RT	102+50	4.40-5.90				0.0	0.0	0.0	0.0		0	0	16.7	-
SS-150	50 RT	102+50	4.40-5.90	A-6(12)	40	26	20.7	22.1	15.1	42.1	100	92	60	-	-
SS-151	50 RT	102+50	9.40-10.90	A-2-4(0)	30	8	43.7	28.5	13.7	14.0	98	72	31	-	-
S-152	50 LT	104+50	0.00-4.20	A-6(4)	38	22	33.7	24.5	9.7	32.1	90	76	40	-	-
SS-153	50 LT	104+50	4.20-5.70	A-7-6(10)	46	21	33.3	21.9	16.8	28.1	97	78	58	-	-
SS-154	50 LT	104+50	9.20-10.70	A-1-b(0)	21	NP	53.4	24.7	9.9	12.0	56	35	14	-	-
SS-155	75 RT	104+50	0.00-3.00	A-6(6)	35	22	30.9	26.3	11.7	32.1	100	85	47	-	-
SS-156	75 RT	104+50	4.00-5.50	A-2-4(0)	11	NP	37.3	31.7	14.9	16.0	100	83	35	-	-
SS-157	75 RT	104+50	9.00-10.50	A-6(2)	34	14	33.9	28.1	18.0	20.1	100	80	42	-	-
SS-161	60 RT	106+20	0.50-1.50	A-6(11)	38	17	13.3	11.7	30.6	44.4	100	94	77	-	-
SS-162	60 RT	106+20	3.40-4.90	A-6(4)	29	17	26.9	28.7	11.9	32.4	97	86	46	-	-
SS-163	60 RT	106+20	8.40-9.90	A-2-4(0)	25	4	56.3	22.7	6.9	14.2	92	54	22	-	-
S-164	160 LT	107+75	0.00-3.00	A-7-6(34)	60	39	8.5	11.8	31.0	48.7	99	95	82	-	-
SS-165	160 LT	107+75	4.40-5.90	A-7-6(16)	44	20	3.2	29.2	43.2	24.3	100	99	78	-	-
SS-166	160 LT	107+75	9.40-10.90	A-4(2)	33	8	21.5	27.2	41.2	10.1	87	74	53	-	-
SS-167	200 LT	108+10	0.00-1.00	A-4(1)	23	6	29.1	26.2	31.4	20.3	99	91	55	-	-
SS-168	200 LT	108+10	3.90-5.40	A-6(13)	40	23	16.0	18.1	17.2	48.7	100	95	68	-	-
SS-169	200 LT	108+10	8.90-4.40	A-6(9)	33	21	19.5	25.8	16.2	38.5	99	92	58	-	-
SS-170	200 LT	108+10	4.60-5.40	A-6(1)	31	16	39.7	26.5	9.5	24.3	99	78	36	-	-



PROJECT REFERENCE NO.	SHEET NO.
R2606A	20
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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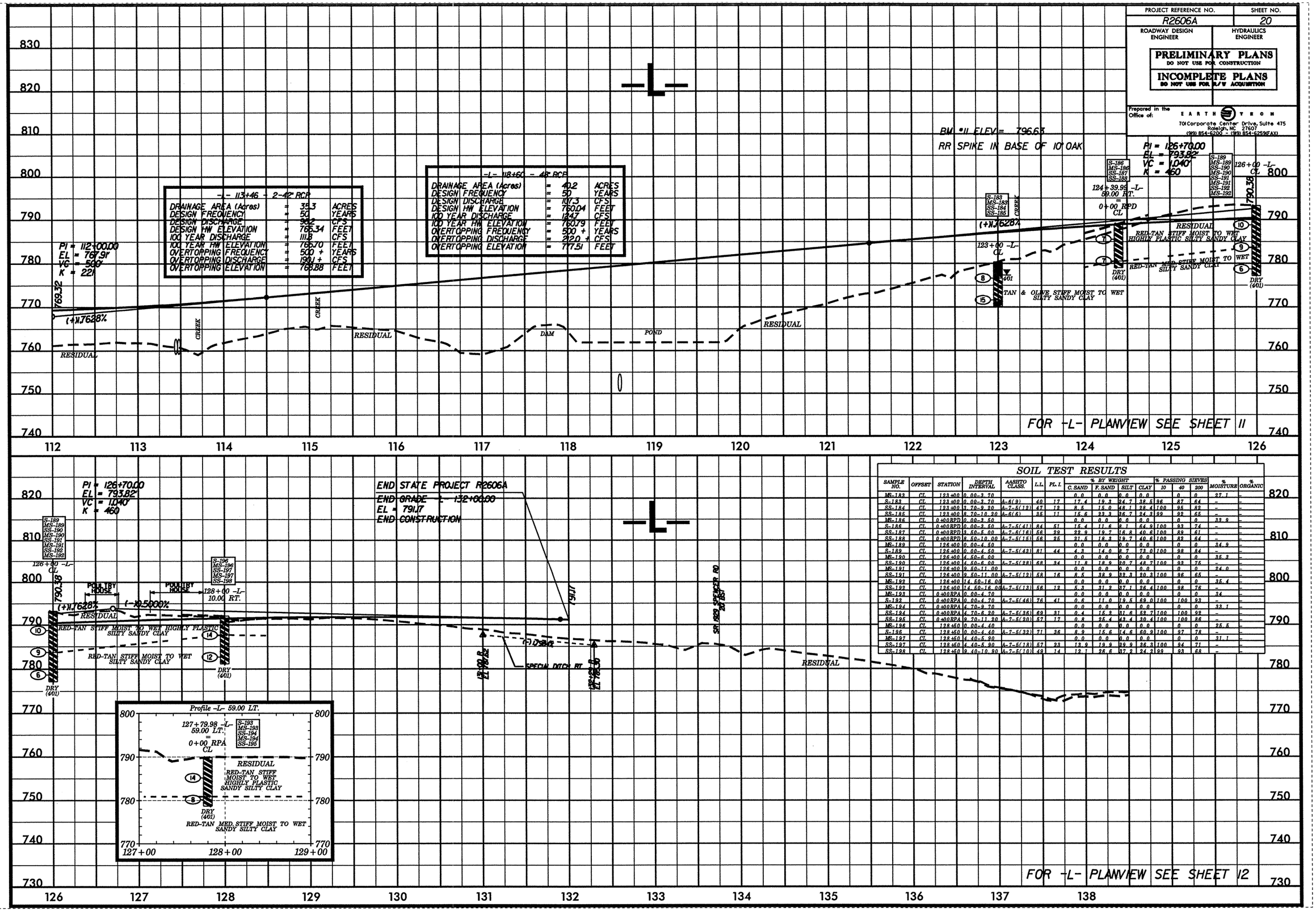


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
MS-183	CL	123+00	0.00-3.70				0.0	0.0	0.0	0.0		0	0	27.1	-
S-183	CL	123+00	0.00-3.70	A-6(9)	40	17	17.4	19.3	24.7	38.5	96	87	64	-	-
SS-184	CL	123+00	3.70-9.20	A-7-5(12)	47	12	8.5	15.0	48.1	28.4	100	95	82	-	-
SS-185	CL	123+00	8.70-10.20	A-6(6)	35	11	15.6	23.3	36.7	24.3	99	92	65	-	-
MS-186	CL	0+00RPD	0.00-3.50				0.0	0.0	0.0	0.0		0	0	33.9	-
S-186	CL	0+00RPD	0.00-3.50	A-7-5(41)	84	51	15.4	11.6	8.1	64.9	100	93	74	-	-
SS-187	CL	0+00RPD	3.50-5.00	A-7-6(16)	56	29	22.9	19.7	16.8	40.6	100	89	61	-	-
SS-188	CL	0+00RPD	8.50-10.00	A-7-6(16)	56	25	21.5	18.3	19.7	40.6	100	83	64	-	-
MS-189	CL	126+00	0.00-4.50				0.0	0.0	0.0	0.0		0	0	34.9	-
S-189	CL	126+00	0.00-4.50	A-7-5(43)	81	44	4.3	14.0	8.7	73.0	100	98	84	-	-
MS-190	CL	126+00	4.50-6.00				0.0	0.0	0.0	0.0		0	0	35.3	-
SS-190	CL	126+00	4.50-6.00	A-7-6(28)	68	34	11.8	18.9	20.7	48.7	100	93	75	-	-
MS-191	CL	126+00	9.50-11.00				0.0	0.0	0.0	0.0		0	0	24.0	-
SS-191	CL	126+00	9.50-11.00	A-7-5(12)	58	16	8.5	38.9	32.3	20.3	100	96	65	-	-
MS-192	CL	126+00	14.50-16.00				0.0	0.0	0.0	0.0		0	0	35.4	-
SS-192	CL	126+00	14.50-16.00	A-7-5(13)	56	12	5.3	31.2	37.1	26.4	100	98	76	-	-
MS-193	CL	0+00RPA	0.00-4.70				0.0	0.0	0.0	0.0		0	0	34	-
S-193	CL	0+00RPA	0.00-4.70	A-7-5(46)	76	41	0.6	11.0	19.5	69.0	100	100	93	-	-
MS-194	CL	0+00RPA	4.70-9.70				0.0	0.0	0.0	0.0		0	0	33.1	-
SS-194	CL	0+00RPA	4.70-6.20	A-7-5(36)	69	31	0.4	15.2	31.6	52.7	100	100	92	-	-
SS-195	CL	0+00RPA	9.70-11.20	A-7-5(20)	57	17	0.8	25.4	43.4	30.4	100	100	86	-	-
MS-196	CL	128+50	0.00-4.40				0.0	0.0	0.0	0.0		0	0	25.5	-
S-196	CL	128+50	0.00-4.40	A-7-5(32)	71	36	8.9	15.6	14.6	60.9	100	97	78	-	-
MS-197	CL	128+50	4.40-5.90				0.0	0.0	0.0	0.0		0	0	31.1	-
SS-197	CL	128+50	4.40-5.90	A-7-5(18)	57	23	13.9	19.9	29.9	36.3	100	94	71	-	-
SS-198	CL	128+50	9.40-10.90	A-7-5(10)	49	14	12.7	26.6	37.2	24.2	99	93	68	-	-

PROJECT REFERENCE NO.	SHEET NO.
R2606A	21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

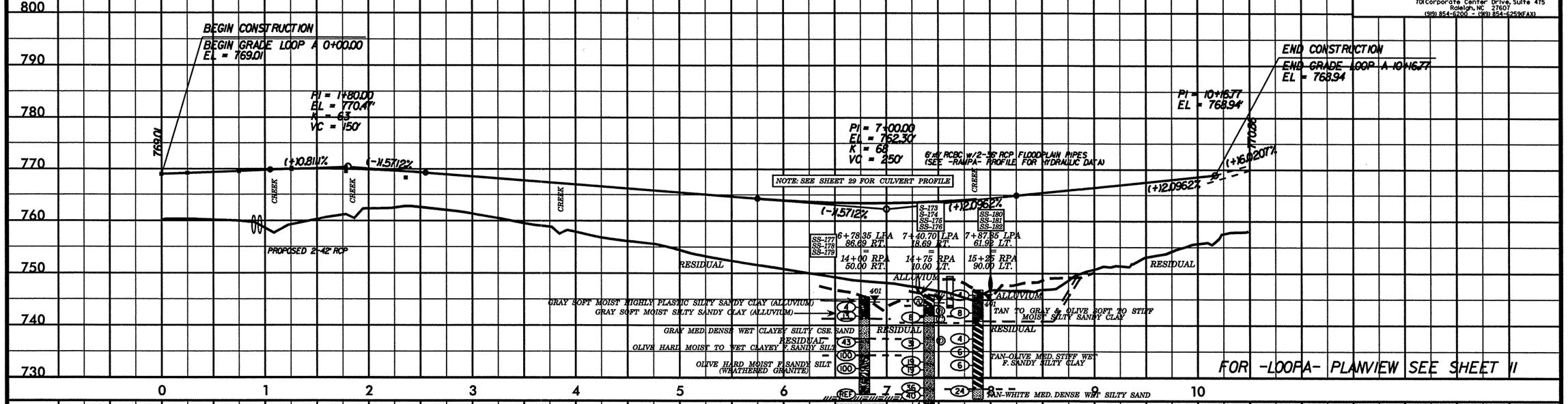
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

Prepared in the Office of:
EARTH TECH
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

-LOOPA-

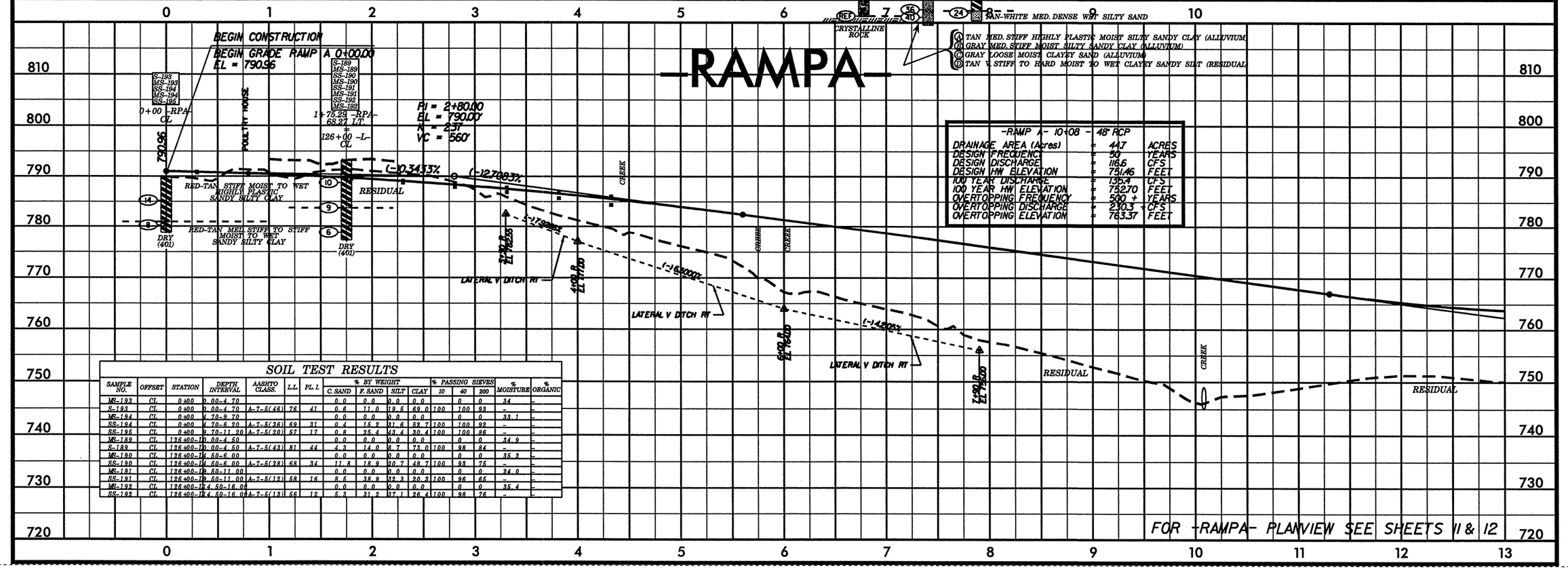
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-180	90 LT	15+25 RPA	4.40-5.90	A-6(8)	30	16	17.6	30.0	17.8	34.6	98	92	56	-	-
SS-181	90 LT	15+25 RPA	9.40-10.90	A-7-5(23)	57	19	0.8	16.2	58.6	24.3	100	100	91	-	-
SS-182	90 LT	15+25 RPA	14.40-15.90	A-7-5(14)	48	15	3.0	23.7	57.0	16.2	97	95	81	-	-
S-173	10 LT	14+75 RPA	0.00-2.00	A-7-6(26)	60	35	15.6	10.9	12.8	60.7	99	91	74	-	-
S-174	10 LT	14+75 RPA	2.00-4.00	A-6(12)	40	24	20.0	21.3	10.1	48.6	100	94	61	-	-
SS-175	10 LT	14+75 RPA	4.30-5.80	A-2-4(0)	18	NP	37.1	36.7	7.9	18.3	94	81	27	-	-
SS-176	10 LT	14+75 RPA	14.30-15.80	A-4(0)	28	NP	28.8	36.9	24.1	10.1	100	87	40	-	-
SS-177	50 RT	14+00 RPA	2.00-3.50	A-6(9)	36	21	20.3	24.5	12.6	42.6	100	93	58	-	-
SS-178	50 RT	14+00 RPA	4.20-5.20	A-2-4(0)	25	8	42.6	24.3	16.8	16.2	93	70	33	-	-
SS-179	50 RT	14+00 RPA	8.70-10.20	A-4(0)	22	NP	11.6	40.4	37.9	10.1	100	95	59	-	-



FOR -LOOPA- PLANVIEW SEE SHEET 11

-RAMPA-



-RAMP A- 10+08 - 48" RCP

DRAINAGE AREA (Acres)	=	44.7	ACRES
DESIGN FREQUENCY	=	50	YEARS
DESIGN DISCHARGE	=	118.6	CFS
DESIGN HW ELEVATION	=	751.46	FEET
100 YEAR DISCHARGE	=	135.4	CFS
100 YEAR HW ELEVATION	=	752.70	FEET
OVERTOPPING FREQUENCY	=	500 +	YEARS
OVERTOPPING DISCHARGE	=	230.3	CFS
OVERTOPPING ELEVATION	=	763.37	FEET

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
MS-193	CL	0+00	0.00-4.70				0.0	0.0	0.0	0.0		0	0	34	-
S-193	CL	0+00	0.00-4.70	A-7-5(46)	76	41	0.6	11.0	19.5	69.0	100	100	93	-	-
MS-194	CL	0+00	4.70-9.70				0.0	0.0	0.0	0.0		0	0	33.1	-
SS-194	CL	0+00	4.70-8.20	A-7-5(36)	69	31	0.4	15.2	31.6	52.7	100	100	92	-	-
SS-195	CL	0+00	9.70-11.20	A-7-5(20)	57	17	0.8	25.4	43.4	30.4	100	100	86	-	-
MS-189	CL	126+00-L-	0.00-4.50				0.0	0.0	0.0	0.0		0	0	34.9	-
S-189	CL	126+00-L-	0.00-4.50	A-7-5(43)	81	44	4.3	14.0	8.7	73.0	100	98	84	-	-
MS-190	CL	126+00-L-	4.50-6.00				0.0	0.0	0.0	0.0		0	0	35.3	-
SS-190	CL	126+00-L-	4.50-6.00	A-7-5(28)	68	34	11.8	18.9	20.7	48.7	100	93	75	-	-
MS-191	CL	126+00-L-	6.50-11.00				0.0	0.0	0.0	0.0		0	0	24.0	-
SS-191	CL	126+00-L-	6.50-11.00	A-7-5(12)	58	16	8.5	38.9	32.3	20.3	100	96	65	-	-
MS-192	CL	126+00-L-	14.50-16.00				0.0	0.0	0.0	0.0		0	0	35.4	-
SS-192	CL	126+00-L-	14.50-16.00	A-7-5(13)	56	12	5.3	31.2	37.1	26.4	100	98	76	-	-

FOR -RAMPA- PLANVIEW SEE SHEETS 11 & 12

PROJECT REFERENCE NO.	SHEET NO.
R2606A	22

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

Prepared in the Office of:
EARTH TECH
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-180	90 LT	15+25	4.40-5.90	A-6(6)	30	16	17.8	30.0	17.8	34.6	98	92	56	-	-
SS-181	90 LT	15+25	9.40-10.90	A-7-5(23)	57	19	0.8	16.3	58.6	24.3	100	100	91	-	-
SS-182	90 LT	15+25	14.40-15.90	A-7-5(14)	48	15	3.0	23.7	57.0	16.2	97	95	81	-	-
S-173	10 LT	14+75	0.00-2.00	A-7-6(26)	60	35	15.6	10.9	12.8	60.7	99	91	74	-	-
S-174	10 LT	14+75	2.00-4.00	A-6(12)	40	24	20.0	21.3	10.1	48.6	100	94	61	-	-
SS-175	10 LT	14+75	4.30-5.80	A-2-4(0)	18	NP	37.1	36.2	7.9	18.3	94	81	27	-	-
SS-176	10 LT	14+75	14.30-15.80	A-4(0)	28	NP	28.8	36.9	24.1	10.1	100	87	40	-	-
SS-177	50 RT	14+00	2.00-3.50	A-6(9)	36	21	20.3	24.5	12.6	42.6	100	93	58	-	-
SS-178	50 LT	14+00	4.20-5.20	A-2-4(0)	25	8	42.6	24.3	16.8	16.2	93	70	33	-	-
SS-179	50 LT	14+00	8.70-10.20	A-4(0)	22	NP	11.6	40.4	37.9	10.1	100	95	59	-	-

-RAMPA-

-RAMP A- 14+72 - 6'X6' RCBC W/72-36" FLOODPLAIN PIPES @ 14+40 & 15+12

DRAINAGE AREA (Acres)	=	115.8	ACRES
DESIGN FREQUENCY	=	50	YEARS
DESIGN DISCHARGE	=	283.0	CFS
DESIGN HW ELEVATION	=	749.57	FEET
100 YEAR DISCHARGE	=	330.0	CFS
100 YEAR HW ELEVATION	=	750.06	FEET
OVERTOPPING FREQUENCY	=	500 +	YEARS
OVERTOPPING DISCHARGE	=	561.0 +	CFS
OVERTOPPING ELEVATION	=	763.96	FEET

END CONSTRUCTION
END GRADE RAMP A 17+50.98
EL = 769.02

PI = 14+00.00
EL = 759.67'
K = 100
VC = 540

(A) TAN MED. STIFF HIGHLY PLASTIC MOIST SILTY SANDY CLAY (ALLUVIUM)
(B) GRAY MED. STIFF MOIST SILTY SANDY CLAY (ALLUVIUM)
(C) GRAY LOOSE MOIST CLAYEY SAND (ALLUVIUM)
(D) TAN V. STIFF TO HARD MOIST TO WET CLAYEY SANDY SILT (RESIDUAL)

(+)2.6649% (+)14.5519% (-)12.7083% (+)2.6649%

NOTE: SEE SHEET 29 FOR CULVERT PROFILE

CREEK

GRAY SOFT MOIST HIGHLY PLASTIC SILTY SANDY CLAY (ALLUVIUM) — SS-177, SS-178, SS-179 — 14+00 RPA 50.00 RT.

S-173, S-174, SS-175, SS-176 — 14+75 RPA 10.00 LT.

SS-180, SS-181, SS-182 — 15+25 RPA 90.0 LT.

RESIDUAL

ALLUVIUM

GRAY SOFT MOIST SILTY SANDY CLAY

RESIDUAL

GRAY MED. DENSE WET CLAYEY SILTY CSE. SAND

OLIVE HARD MOIST TO WET CLAYEY F. SANDY SILT

OLIVE HARD MOIST F. SANDY SILT (WEATHERED GRANITE)

CRYSTALLINE ROCK

TAN OLIVE MED. STIFF WET F. SANDY SILTY CLAY

TAN-WHITE MED. DENSE WET SILTY SAND

FOR -RAMPA- PLANVIEW SEE SHEET 11

-RAMPC-

BEGIN CONSTRUCTION
BEGIN GRADE RAMP C 0+00.00
EL = 773.29

S-136, MS-136, SS-137, SS-138, SS-139

0+72.28 -RPC- 62.11 LT.

93+00 -L- CL

PI = 2+30.00
EL = 774.95'
VC = 460'
K = 302

(+)1.7200% (-)0.8024% (+)0.3000%

OLIVE MED. STIFF TO V. STIFF MOIST SILTY SANDY CLAY

WHITE MED. DENSE WET SILTY SAND

SPECIAL DITCH RIGHT

GRAVEL RD.

SR 1529 CEDAR SQUARE RD 24 DEC

771.88

FOR -RAMPC- PLANVIEW SEE SHEETS 10 & 11

-RAMPC-

END CONSTRUCTION
END GRADE RAMP C 15+89.52
EL = 796.08'

PI = 8+00.00
EL = 770.37'
VC = 450'
K = 111

(+)3.2568% (+)12.0231%

S-199, S-200 — 7+50 -RPC- 50.00 LT.

BRN STIFF MOIST TO WET HIGHLY PLASTIC SILTY SANDY CLAY

RESIDUAL

S-201, MS-201, S-202 — 9+00 -RPC- CL

BRN LOOSE WET CLAYEY SILTY SAND

(-)1.8024% (+)3.2568% (-)10.299%

LIGHT BRN-TAN MED. STIFF TO V. STIFF MOIST CLAYEY SANDY SILT

LIGHT BRN HARD MOIST CLAYEY SANDY SILT (WEATHERED GRANITE)

SPECIAL DITCH LEFT

CREEK

SOIL RD.

771.88

-RAMP C- 10+57 - 3-36" RCP

DRAINAGE AREA (Acres)	=	36.3	ACRES
DESIGN FREQUENCY	=	50	YEARS
DESIGN DISCHARGE	=	96.0	CFS
DESIGN HW ELEVATION	=	767.80	FEET
100 YEAR DISCHARGE	=	114.0	CFS
100 YEAR HW ELEVATION	=	768.11	FEET
OVERTOPPING FREQUENCY	=	500+	YEARS
OVERTOPPING DISCHARGE	=	193.7+	CFS
OVERTOPPING ELEVATION	=	771.22	FEET

FOR -RAMPC- PLANVIEW SEE SHEET 11

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-136	CL	93+00-L-	0.00-3.40	A-6(7)	33	20	28.3	20.4	19.0	32.3	99	86	53	-	-
SS-137	CL	93+00-L-	3.40-4.90	A-6(5)	35	18	31.6	25.7	18.6	24.2	99	80	47	-	-
SS-138	CL	93+00-L-	8.40-9.90	A-2-4(0)	27	NP	44.4	32.9	14.5	8.1	100	73	28	-	-
SS-139	CL	93+00-L-	13.40-14.90	A-2-4(0)	24	NP	43.4	29.3	19.2	8.1	99	72	32	-	-
S-199	50 LT	7+60	3.00-7.00	A-7-6(13)	48	26	22.6	16.5	18.6	42.3	93	81	59	-	-
S-200	50 LT	7+60	7.00-17.00	A-4(3)	29	10	23.8	23.8	30.3	22.2	98	85	55	-	-
MS-201	CL	9+00	0.00-7.00				0.0	0.0	0.0	0.0		0	0	14.6	-
S-201	CL	9+00	0.00-7.00	A-2-4(0)	16	3	37.3	31.2	19.4	12.1	99	82	35	-	-
S-202	CL	9+00	7.00-9.00	A-4(0)	18	2	26.2	25.6	32.1	16.1	100	87	52	-	-

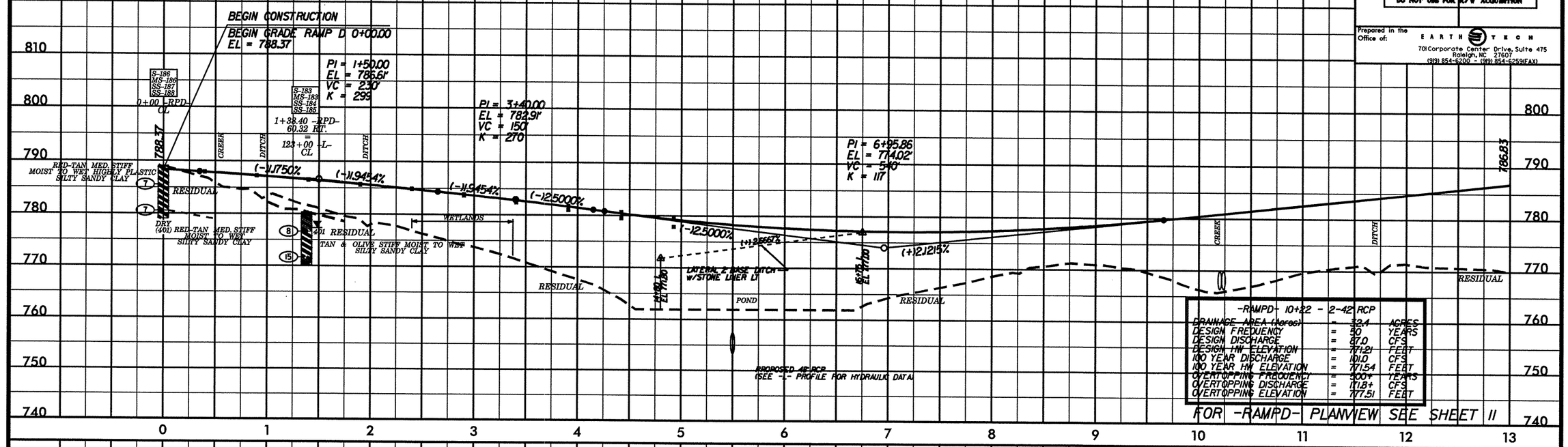
PROJECT REFERENCE NO.	SHEET NO.
R2606A	23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

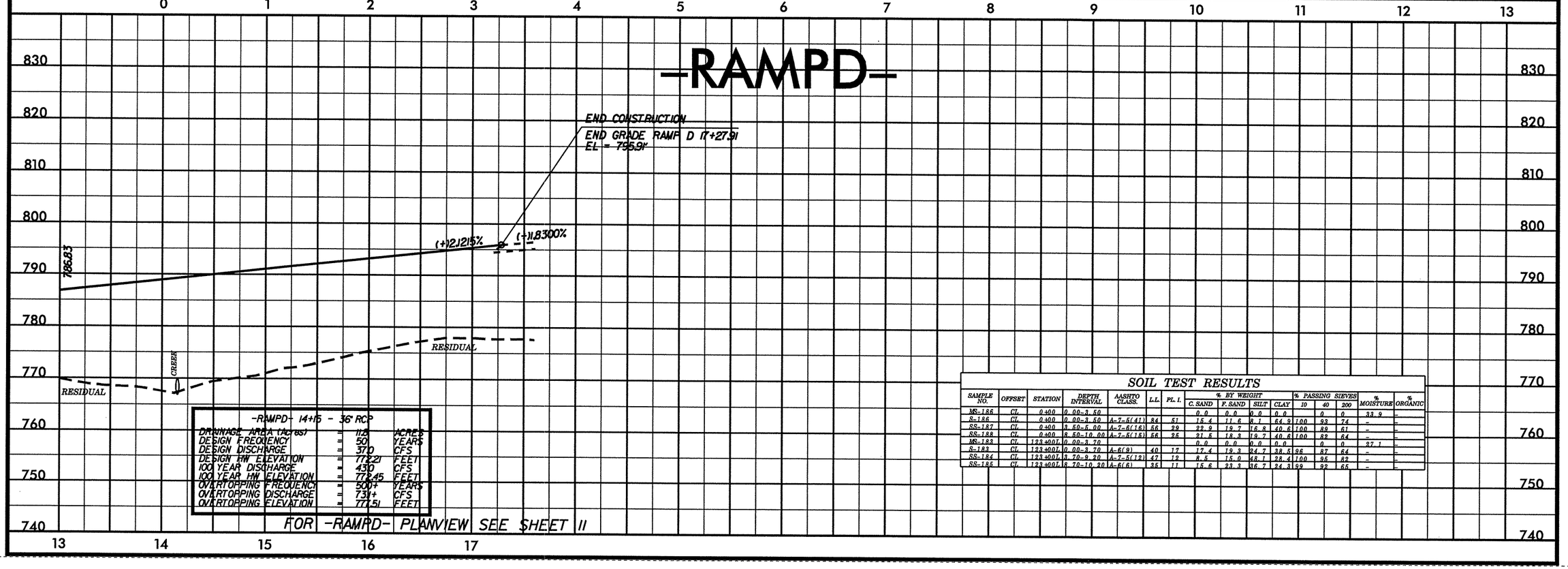
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

Prepared in the Office of: EARTH TECH
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

-RAMPD-



-RAMPD-



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PI. I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING SIEVES 10	% PASSING SIEVES 40	% PASSING SIEVES 200	% MOISTURE	% ORGANIC
MS-186	CL	0+00	0.00-3.50				0.0	0.0	0.0	0.0		0	0	33.9	-
S-186	CL	0+00	0.00-3.50	A-7-5(41)	84	51	15.4	11.6	8.1	64.9	100	93	74	-	-
SS-187	CL	0+00	0.50-5.00	A-7-6(16)	56	29	22.9	19.7	16.8	40.6	100	89	61	-	-
SS-188	CL	0+00	8.50-10.00	A-7-5(18)	58	26	21.5	18.3	19.7	40.6	100	83	64	-	-
MS-183	CL	123+00 L	0.00-3.70				0.0	0.0	0.0	0.0		0	0	37.1	-
S-183	CL	123+00 L	0.00-3.70	A-6(9)	40	17	17.4	19.3	24.7	38.5	96	87	64	-	-
SS-184	CL	123+00 L	9.70-9.20	A-7-5(12)	47	12	8.5	15.0	48.1	28.4	100	95	82	-	-
SS-185	CL	123+00 L	9.70-10.20	A-6(6)	35	11	15.6	23.3	36.7	24.3	99	92	65	-	-

PROJECT REFERENCE NO.	SHEET NO.
R2606A	24
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

Prepared in the Office of:
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Raleigh, NC 27607
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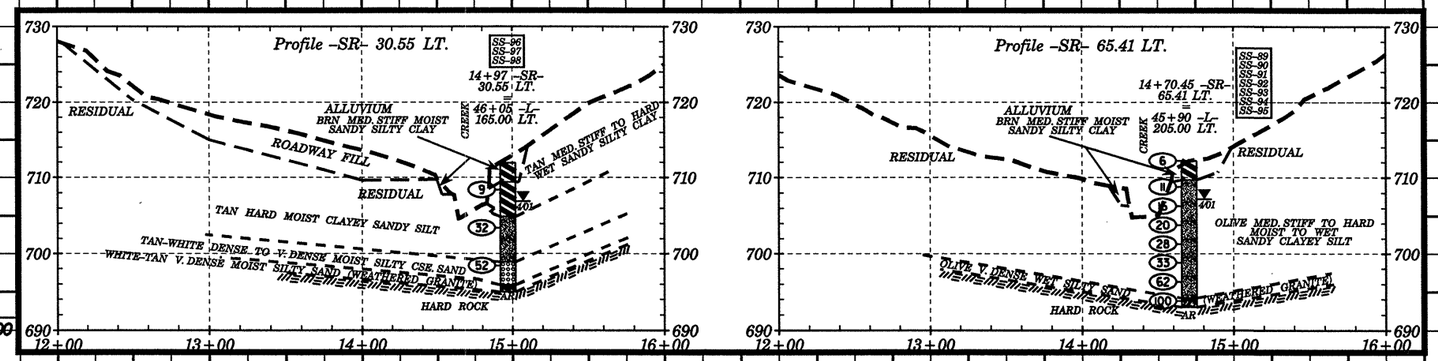
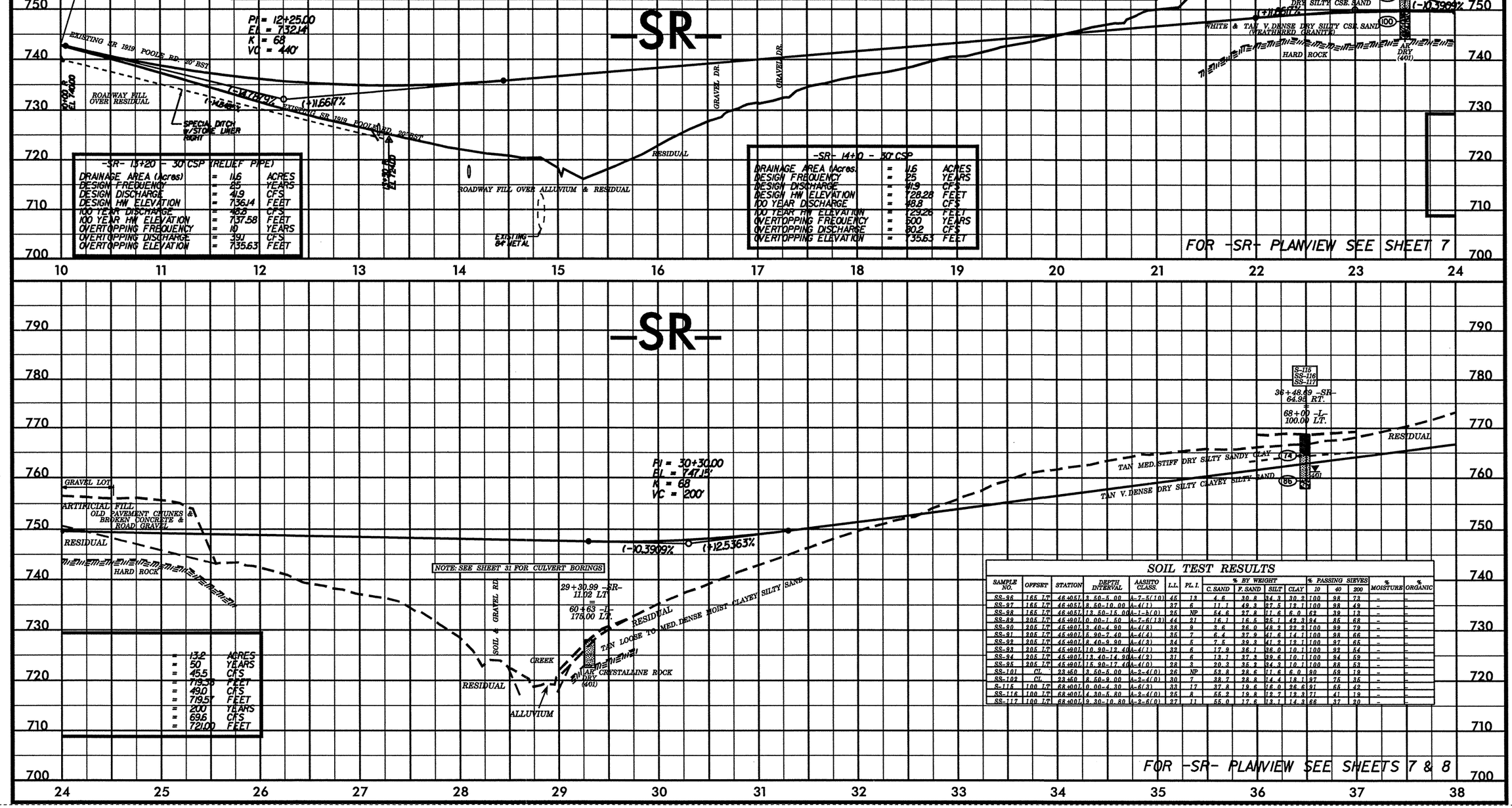




SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-96	16.5 LT	46+05L	3.50-5.00	A-7-5(10)	45	13	4.6	30.8	34.3	30.3	100	98	73	-	-
SS-97	16.5 LT	46+05L	8.50-10.00	A-4(1)	37	6	11.1	49.3	27.5	12.1	100	98	49	-	-
SS-98	16.5 LT	46+05L	13.50-15.00	A-1-b(0)	25	NP	54.6	37.8	11.6	6.0	62	38	13	-	-
SS-89	20.5 LT	45+90L	0.00-1.50	A-7-6(13)	44	21	16.1	16.5	25.1	42.3	94	86	68	-	-
SS-90	20.5 LT	45+90L	3.40-4.90	A-4(8)	38	9	3.6	26.0	48.2	22.2	100	99	79	-	-
SS-91	20.5 LT	45+90L	5.90-7.40	A-4(4)	35	7	6.4	37.9	41.6	14.1	100	98	66	-	-
SS-92	20.5 LT	45+90L	8.40-9.90	A-4(8)	34	5	7.5	39.3	41.2	12.1	100	97	65	-	-
SS-93	20.5 LT	45+90L	10.90-12.40	A-4(1)	32	6	17.9	36.1	36.0	10.1	100	92	54	-	-
SS-94	20.5 LT	45+90L	13.40-14.90	A-4(2)	31	6	13.1	37.3	39.6	10.1	100	94	59	-	-
SS-95	20.5 LT	45+90L	15.90-17.40	A-4(0)	28	3	20.3	36.2	34.3	10.1	100	88	53	-	-
SS-101	CL	23+50	3.50-5.00	A-2-4(0)	26	NP	53.8	28.6	11.6	6.0	80	59	19	-	-
SS-102	CL	23+50	8.50-9.00	A-2-4(0)	30	7	38.7	28.8	14.4	18.1	97	76	36	-	-
S-115	100 LT	68+00L	0.00-4.30	A-6(3)	32	17	37.8	19.6	16.0	26.6	91	66	42	-	-
SS-116	100 LT	68+00L	4.30-5.80	A-2-4(0)	25	8	55.2	19.8	12.7	12.3	71	41	19	-	-
SS-117	100 LT	68+00L	9.30-10.80	A-2-6(0)	27	11	55.0	17.6	13.1	14.3	66	37	20	-	-

PROJECT REFERENCE NO.	SHEET NO.
R2606A	25
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

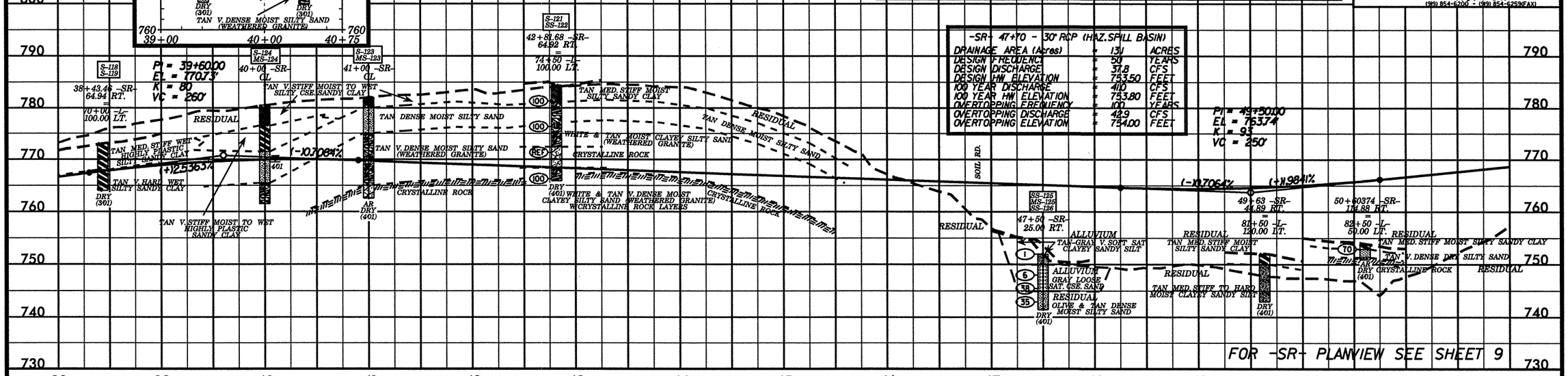
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

Prepared in the Office of:
EARTH TECH
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PI. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-118	100 LT	70+00L	0.00-5.00	A-7-6(14)	56	36	33.5	14.7	13.9	38.9	93	73	51	-	-
S-119	100 LT	70+00L	5.00-9.00	A-7-6(24)	51	24	9.9	15.5	39.3	45.9	100	99	88	-	-
MS-124	CL	40+00	4.00-9.00				0.0	0.0	0.0	0.0		0	0	23.3	-
S-124	CL	40+00	4.00-9.00	A-7-6(25)	51	27	7.0	13.7	38.4	40.9	100	96	85	-	-
MS-123	CL	41+00	0.00-2.00				0.0	0.0	0.0	0.0		0	0	15.3	-
S-123	CL	41+00	0.00-2.00	A-6(2)	31	17	43.3	17.9	10.6	28.2	95	66	39	-	-
S-131	100 LT	74+50L	0.00-3.10	A-6(5)	33	20	39.3	23.6	18.0	20.2	93	74	48	-	-
SS-132	100 LT	74+50L	3.10-4.60	A-2-4(0)	19	NP	39.9	31.8	16.2	12.1	97	76	32	-	-
MS-125	25 RT	47+50	0.00-1.50				0.0	0.0	0.0	0.0		0	0	28.4	-
SS-125	25 RT	47+50	0.00-1.50	A-4(0)	24	4	24.1	21.5	40.1	14.3	97	82	58	-	-
SS-126	25 RT	47+50	4.00-5.50	A-1-b(0)	20	NP	65.5	23.8	7.6	4.1	82	47	11	-	-

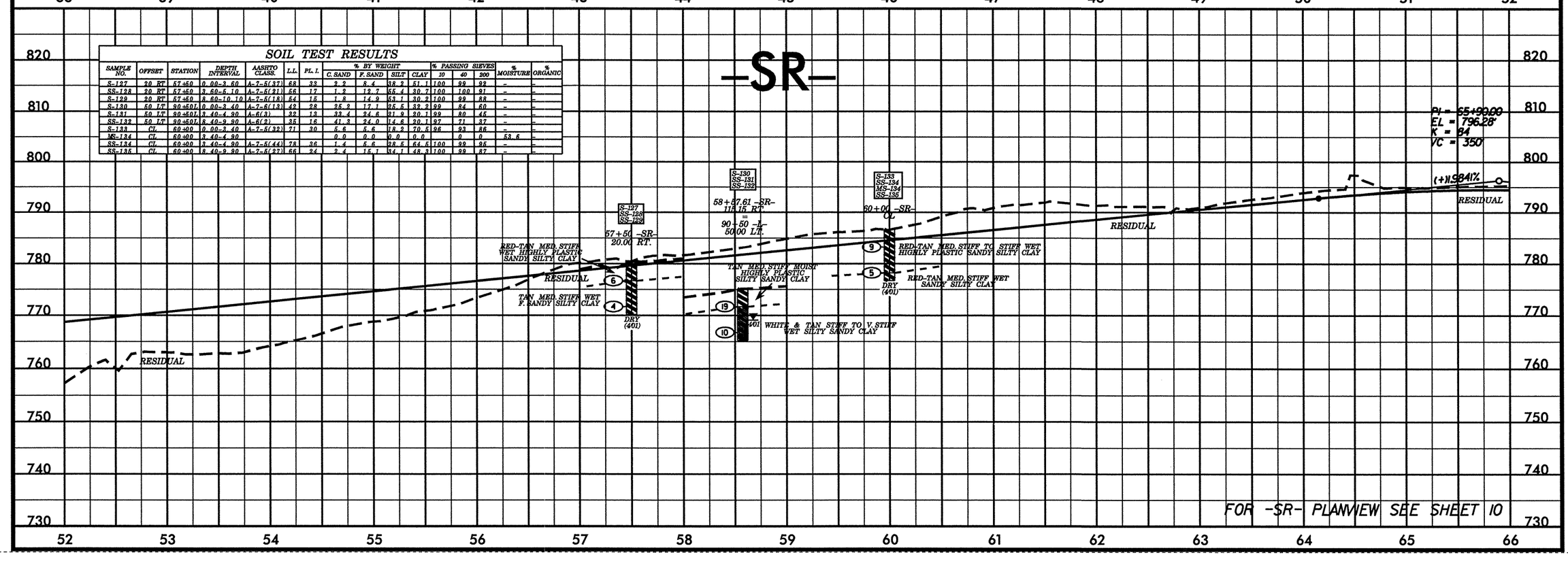


-SR- 47+70 - 30" RCP (HAZ. SPILL BASIN)

DRAINAGE AREA (Acres)	=	131	ACRES
DESIGN FREQUENCY	=	50	YEARS
DESIGN DISCHARGE	=	37.8	CFS
DESIGN HW ELEVATION	=	753.50	FEET
100 YEAR DISCHARGE	=	410	CFS
100 YEAR HW ELEVATION	=	753.80	FEET
OVERTOPPING FREQUENCY	=	100	YEARS
OVERTOPPING DISCHARGE	=	42.9	CFS
OVERTOPPING ELEVATION	=	754.00	FEET

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PI. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-197	20 RT	57+60	0.00-3.60	A-7-5(37)	68	33	3.2	8.4	38.2	51.1	100	99	92	-	-
SS-128	20 RT	57+60	3.60-6.10	A-7-5(31)	56	17	1.2	13.7	65.4	30.2	100	100	91	-	-
S-129	20 RT	57+60	8.60-10.10	A-7-5(18)	54	15	1.8	14.9	63.1	30.2	100	99	88	-	-
S-130	50 LT	90+50L	0.00-3.40	A-7-6(13)	42	28	25.2	17.1	25.5	32.2	99	84	60	-	-
S-131	50 LT	90+50L	3.40-4.90	A-6(3)	32	13	33.4	24.6	21.9	20.1	99	80	45	-	-
SS-132	50 LT	90+50L	8.40-9.90	A-6(2)	35	16	41.3	24.0	14.6	20.1	97	71	37	-	-
S-133	CL	60+00	0.00-3.40	A-7-5(32)	71	30	5.6	5.6	18.2	70.6	96	93	86	-	-
MS-134	CL	60+00	3.40-4.90				0.0	0.0	0.0	0.0		0	0	53.6	-
SS-134	CL	60+00	3.40-4.90	A-7-5(44)	78	36	1.4	5.6	28.5	64.5	100	99	95	-	-
SS-135	CL	60+00	8.40-9.90	A-7-6(27)	66	24	2.4	15.1	34.1	48.3	100	99	87	-	-



PROJECT REFERENCE NO.	SHEET NO.
R2606A	26
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

Prepared in the Office of: EARTH TECH
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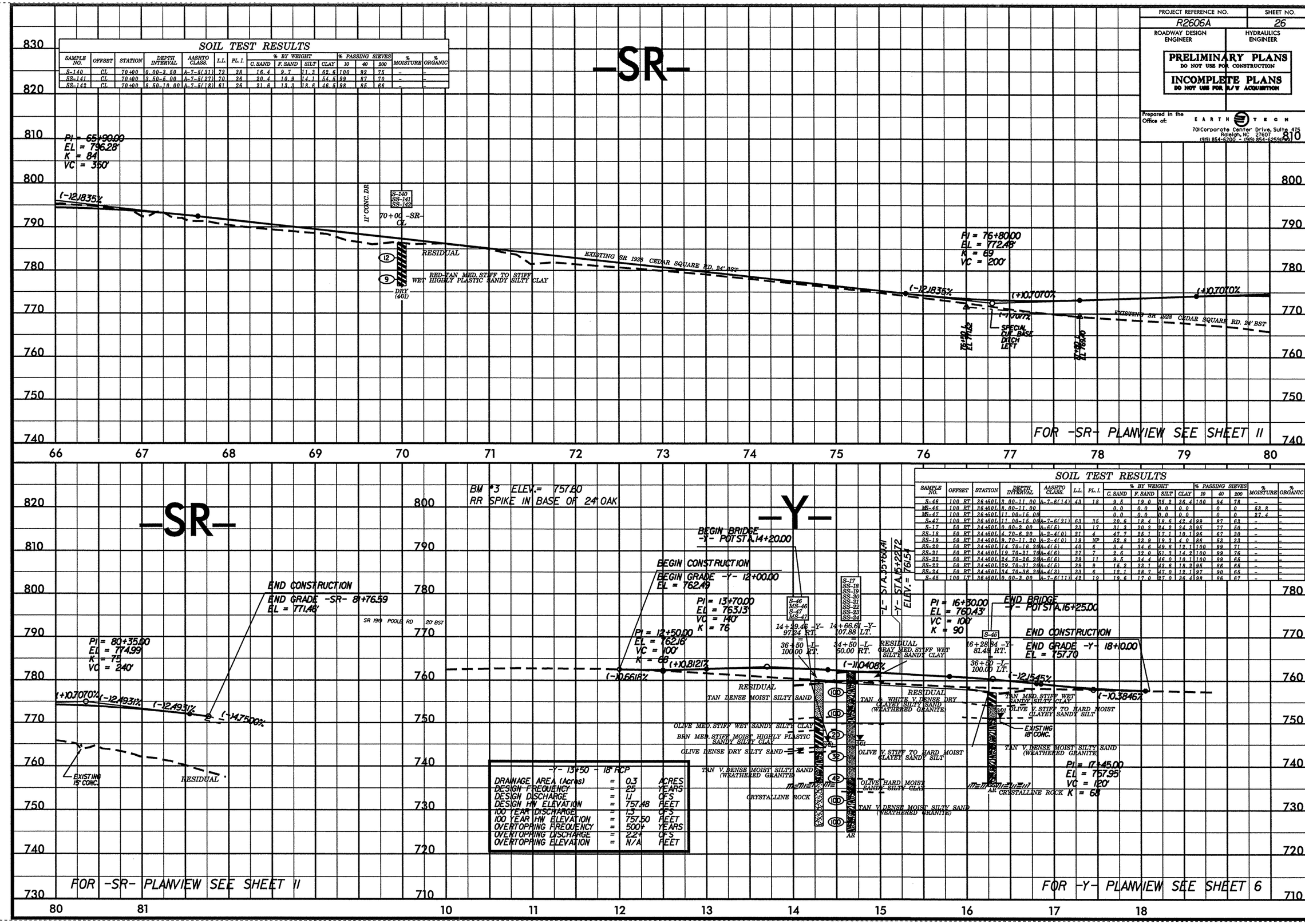
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259 (Fax)

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-140	CL	70+00	0.00-3.50	A-7-5(31)	72	38	16.4	9.7	11.3	62.6	100	92	75	-	-
SS-141	CL	70+00	3.50-5.00	A-7-5(27)	70	36	20.4	10.9	14.1	54.6	99	87	70	-	-
SS-142	CL	70+00	8.50-10.00	A-7-5(18)	61	25	21.6	13.3	18.5	46.6	98	85	66	-	-



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-46	100 RT	36+50 L	3.00-11.00	A-7-6(14)	43	18	9.5	19.0	35.2	36.4	100	94	78	-	-
MS-46	100 RT	36+50 L	8.00-11.00				0.0	0.0	0.0	0.0		0	0	53.8	-
MS-47	100 RT	36+50 L	11.00-15.00				0.0	0.0	0.0	0.0		0	0	27.4	-
S-47	100 RT	36+50 L	11.00-15.00	A-7-6(21)	63	35	20.6	18.4	18.6	42.4	99	87	63	-	-
S-17	50 RT	34+50 L	0.00-2.00	A-6(5)	33	12	31.3	20.2	24.2	24.3	95	77	50	-	-
SS-18	50 RT	34+50 L	4.70-6.20	A-2-4(0)	21	4	47.7	25.1	17.1	10.1	96	67	30	-	-
SS-19	50 RT	34+50 L	9.70-11.20	A-2-4(0)	19	NP	52.8	23.9	19.9	4.0	86	53	23	-	-
SS-20	50 RT	34+50 L	14.70-16.20	A-4(5)	40	6	3.4	34.6	49.8	12.1	100	99	71	-	-
SS-21	50 RT	34+50 L	19.70-21.70	A-4(8)	37	7	2.6	32.0	51.3	14.2	100	99	76	-	-
SS-22	50 RT	34+50 L	24.70-26.20	A-6(6)	39	11	9.5	34.4	46.0	10.1	100	99	65	-	-
SS-23	50 RT	34+50 L	29.70-31.20	A-4(5)	39	9	15.2	23.1	43.6	18.2	95	86	65	-	-
SS-24	50 RT	34+50 L	34.70-36.20	A-4(3)	33	6	12.1	28.7	47.0	12.1	97	90	65	-	-
S-45	100 LT	36+50 L	0.00-3.00	A-7-6(11)	42	19	19.6	17.0	27.0	36.4	98	86	67	-	-

PROJECT REFERENCE NO.	SHEET NO.
R2606A	27
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

Prepared in the Office of:
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Raleigh, NC 27607
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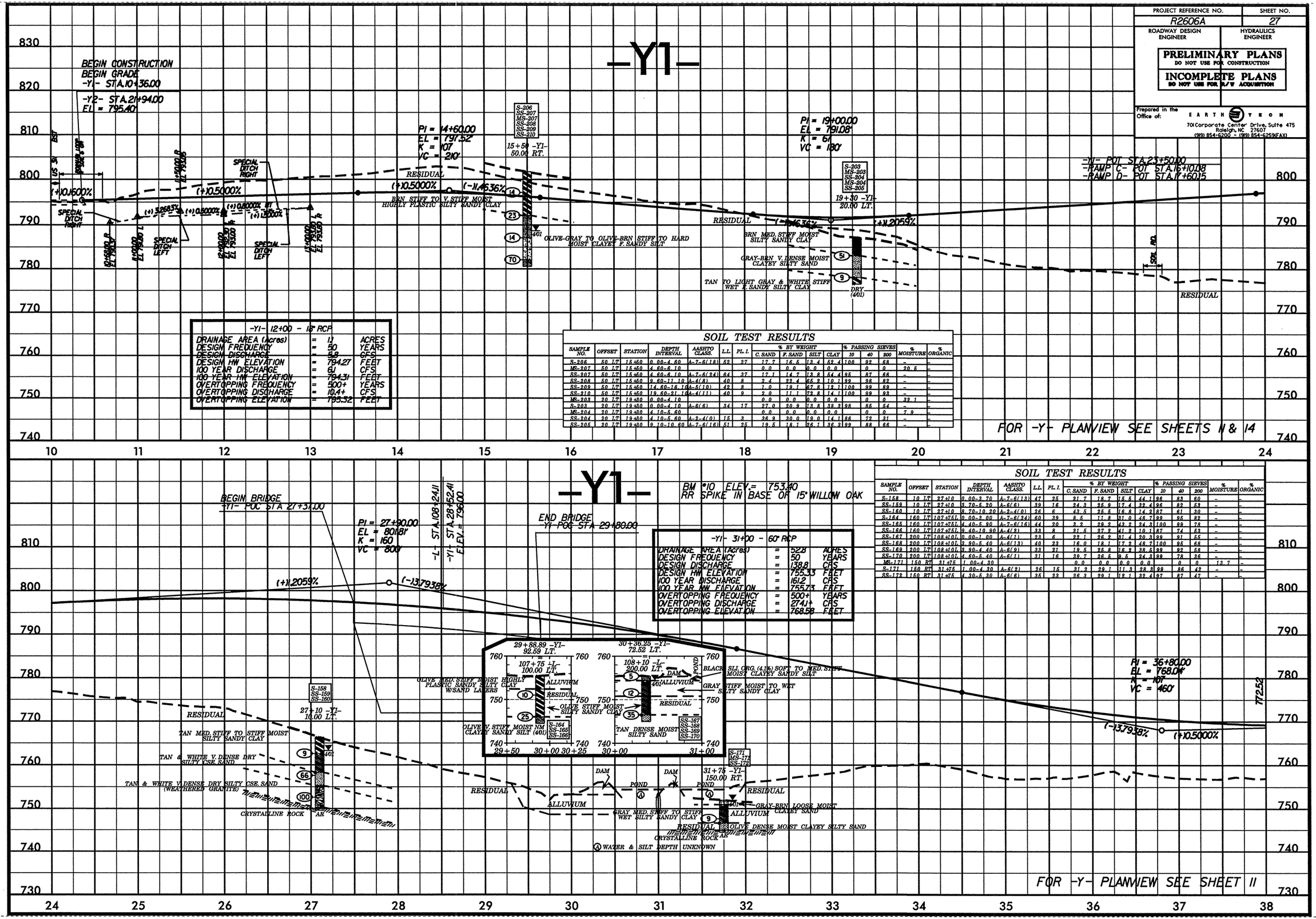

-Y1- 12+00 - 18" RCP			
DRAINAGE AREA (acres)	=	11	ACRES
DESIGN FREQUENCY	=	50	YEARS
DESIGN DISCHARGE	=	58	CFS
DESIGN HW ELEVATION	=	794.27	FEET
100 YEAR DISCHARGE	=	61	CFS
100 YEAR HW ELEVATION	=	794.31	FEET
OVERTOPPING FREQUENCY	=	500+	YEARS
OVERTOPPING DISCHARGE	=	10.4+	CFS
OVERTOPPING ELEVATION	=	795.52	FEET

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-206	50 LT	15+50	0.00-4.60	A-7-6(18)	52	27	17.7	16.5	13.4	52.4	100	92	68	-	-
MS-207	50 LT	15+50	4.60-6.10				0.0	0.0	0.0	0.0		0	0	20.5	-
SS-207	50 LT	15+50	4.60-6.10	A-7-6(24)	64	37	17.1	14.7	13.8	54.4	95	87	66	-	-
SS-208	50 LT	15+50	9.60-11.10	A-4(8)	40	8	2.4	22.4	65.2	10.1	99	98	82	-	-
SS-209	50 LT	15+50	14.60-16.10	A-5(10)	42	8	1.0	19.1	67.8	12.1	100	99	89	-	-
SS-210	50 LT	15+50	19.60-21.10	A-4(11)	40	9	2.0	11.1	73.8	14.1	100	99	93	-	-
MS-203	20 LT	19+30	0.00-4.10				0.0	0.0	0.0	0.0		0	0	32.1	-
S-203	20 LT	19+30	0.00-4.10	A-6(6)	34	17	27.0	20.9	13.8	38.3	98	85	64	-	-
MS-204	20 LT	19+30	4.10-5.60				0.0	0.0	0.0	0.0		0	0	7.9	-
SS-204	20 LT	19+30	4.10-5.60	A-2-4(0)	15	3	36.9	30.0	19.0	14.1	86	72	31	-	-
SS-205	20 LT	19+30	9.10-10.60	A-7-6(16)	51	25	19.5	18.1	26.1	36.3	99	88	66	-	-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-158	10 LT	27+10	0.00-3.70	A-7-6(13)	47	25	21.7	18.7	15.5	44.1	96	83	60	-	-
SS-159	10 LT	27+10	3.70-5.20	A-6(6)	39	16	24.3	25.9	17.4	32.4	96	82	53	-	-
SS-160	10 LT	27+10	8.70-10.20	A-2-4(0)	26	6	43.5	25.6	16.8	14.2	87	61	30	-	-
S-164	160 LT	107+75L	0.00-3.00	A-7-6(34)	60	39	8.5	11.8	31.0	48.7	99	95	82	-	-
SS-165	160 LT	107+75L	4.40-5.90	A-7-6(16)	44	20	3.2	29.2	43.2	24.3	100	99	78	-	-
SS-166	160 LT	107+75L	9.40-10.90	A-4(2)	33	8	21.5	27.2	41.2	10.1	87	74	53	-	-
SS-167	200 LT	108+10L	0.00-1.00	A-4(1)	23	6	22.1	26.2	31.4	20.3	99	91	55	-	-
SS-168	200 LT	108+10L	3.90-5.40	A-6(13)	40	23	16.0	18.1	17.2	48.7	100	95	68	-	-
SS-169	200 LT	108+10L	3.90-4.40	A-6(9)	33	21	19.5	25.8	16.2	38.5	99	92	58	-	-
SS-170	200 LT	108+10L	4.60-5.40	A-6(1)	31	16	39.7	26.6	9.5	24.3	99	78	36	-	-
MS-171	150 RT	31+75	1.00-4.30				0.0	0.0	0.0	0.0		0	0	13.7	-
S-171	150 RT	31+75	1.00-4.30	A-6(2)	26	15	31.2	29.7	11.3	28.8	99	86	42	-	-
SS-172	150 RT	31+75	4.30-5.30	A-6(6)	35	23	26.3	29.1	12.1	32.4	97	87	47	-	-

-Y1- 31+00 - 60" RCP			
DRAINAGE AREA (acres)	=	528	ACRES
DESIGN FREQUENCY	=	50	YEARS
DESIGN DISCHARGE	=	138.8	CFS
DESIGN HW ELEVATION	=	755.33	FEET
100 YEAR DISCHARGE	=	161.2	CFS
100 YEAR HW ELEVATION	=	755.73	FEET
OVERTOPPING FREQUENCY	=	500+	YEARS
OVERTOPPING DISCHARGE	=	274.1+	CFS
OVERTOPPING ELEVATION	=	768.58	FEET

PROJECT REFERENCE NO.	SHEET NO.
R2606A	28
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

Prepared in the Office of:
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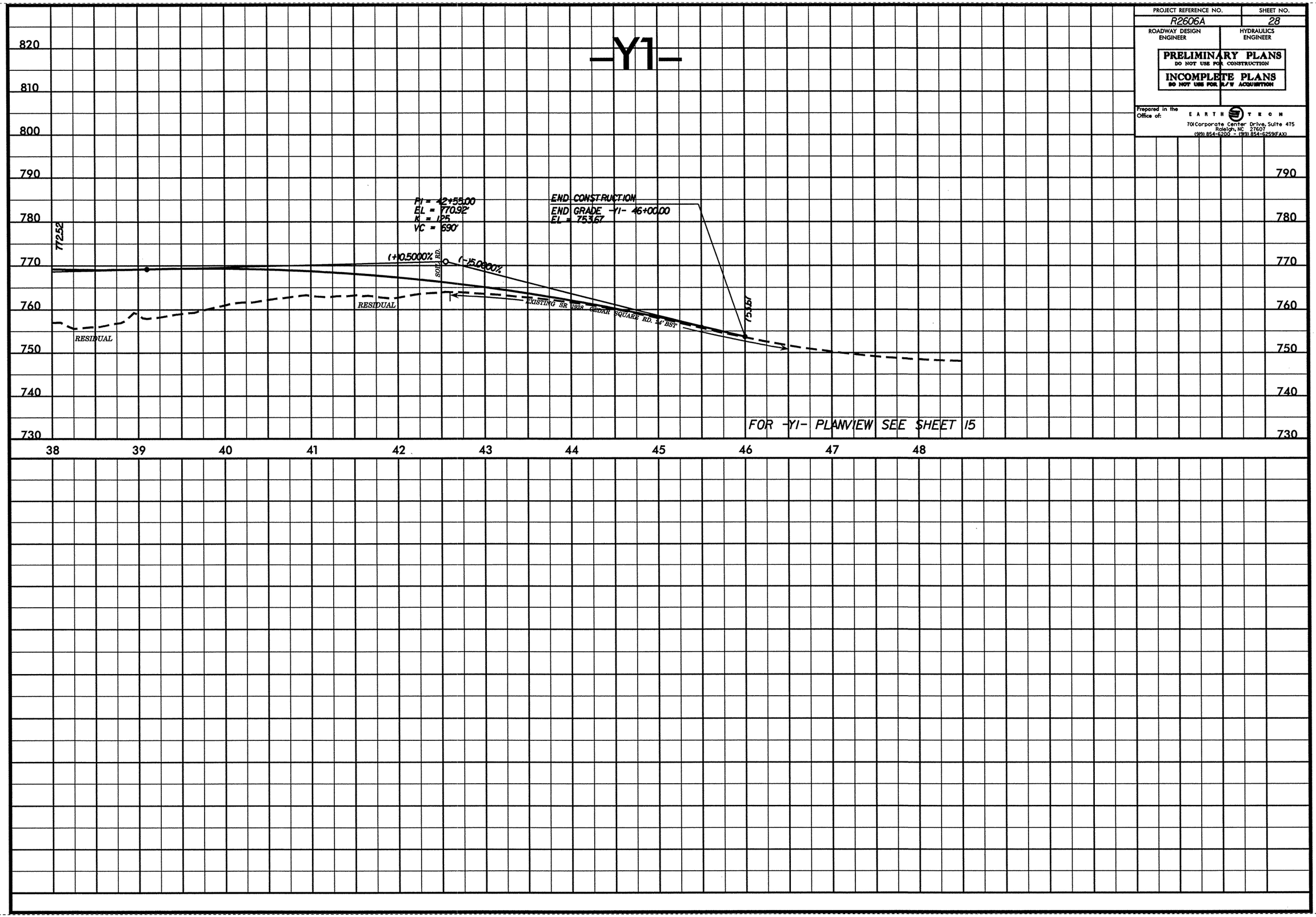
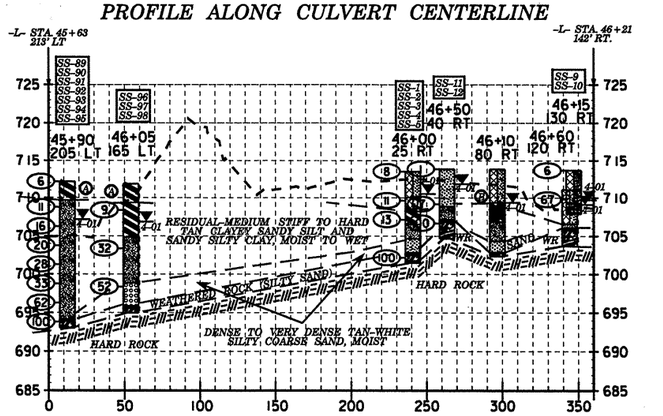


PROJECT REF. NO.	SHEET NO.	TOTAL SHEETS
R-2606A	29	

CULVERT AT -L- STA. 46+00

PROFILE ALONG CULVERT CENTERLINE



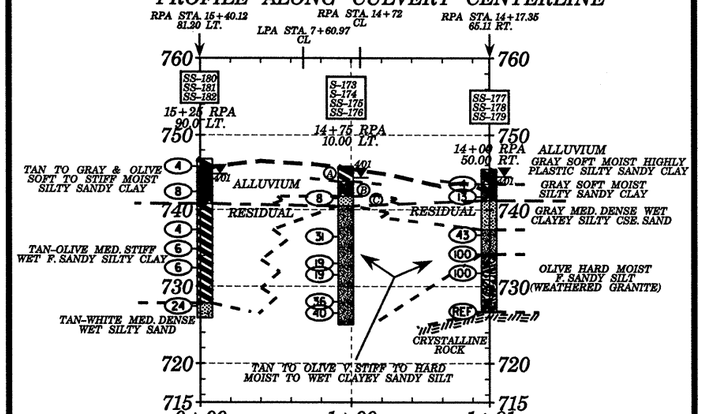
Ⓐ ALLUVIUM - MEDIUM STIFF BROWN SANDY SILTY CLAY, MOIST
Ⓑ ARTIFICIAL FILL - LOOSE TO DENSE BROWN CLAYEY SILTY SAND WITH SOME BOULDERS, MOIST

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-89	205 LT	45+90	0.00-1.50	A-7-6(13)	44	21	16.1	16.5	25.1	42.3	94	85	68	-	-
SS-90	205 LT	45+90	3.40-4.90	A-4(8)	38	9	3.6	26.0	48.2	22.2	100	99	79	-	-
SS-91	205 LT	45+90	5.90-7.40	A-4(4)	35	7	6.4	37.9	41.6	14.1	100	98	66	-	-
SS-92	205 LT	45+90	8.40-9.90	A-4(3)	34	5	7.5	39.3	41.2	12.1	100	97	65	-	-
SS-93	205 LT	45+90	10.90-12.40	A-4(1)	32	6	17.9	36.1	36.0	10.1	100	92	54	-	-
SS-94	205 LT	45+90	13.40-14.90	A-4(2)	31	6	18.1	37.3	39.6	10.1	100	94	59	-	-
SS-95	205 LT	45+90	15.90-17.40	A-4(0)	28	3	20.3	35.2	34.3	10.1	100	88	53	-	-
SS-1	25 RT	46+00	0.00-1.50	A-2-4(0)	28	7	36.7	25.0	30.3	8.1	64	51	37	-	-
SS-2	25 RT	46+00	3.90-5.40	A-2-7(2)	42	18	27.4	16.5	21.9	34.2	57	48	34	-	-
SS-3	25 RT	46+00	5.40-6.90	A-7-6(18)	47	25	10.9	13.5	45.4	30.2	93	87	74	-	-
SS-4	25 RT	46+00	7.40-7.90	A-4(2)	33	8	29.8	25.0	42.2	10.1	86	76	49	-	-
SS-5	25 RT	46+00	8.90-10.40	A-2-4(0)	22	NP	42.2	26.4	27.4	4.0	72	52	26	-	-
SS-96	165 LT	46+05	3.50-5.00	A-7-5(10)	45	13	4.6	30.8	34.3	30.2	100	98	73	-	-
SS-97	165 LT	46+05	8.50-10.00	A-4(1)	37	6	11.1	49.3	27.5	12.1	100	98	49	-	-
SS-98	165 LT	46+05	13.50-15.00	A-1-b(0)	25	NP	54.6	27.8	11.6	6.0	62	39	13	-	-
SS-6	80 RT	46+10	4.50-6.00	A-6(6)	38	19	39.2	19.7	23.9	24.2	91	74	50	-	-
SS-7	80 RT	46+10	7.00-8.50	A-4(1)	27	10	31.8	24.9	29.9	14.1	82	67	40	-	-
SS-8	80 RT	46+10	9.50-11.00	A-2-4(0)	30	5	47.1	12.9	28.0	9.0	76	52	31	-	-
SS-9	130 RT	46+15	0.00-1.50	A-4(0)	17	2	32.6	31.4	23.9	12.1	97	80	40	-	-
SS-10	130 RT	46+15	4.40-5.50	A-4(0)	23	5	31.8	32.2	23.9	12.1	86	72	36	-	-
SS-11	40 RT	46+50	0.00-1.50	A-2-4(0)	15	NP	38.8	36.2	16.9	8.1	100	86	29	-	-
SS-12	40 RT	46+50	5.20-6.70	A-4(2)	33	5	14.4	37.0	40.5	8.1	100	94	59	-	-

CULVERT AT RPA STA. 14+72

PROFILE ALONG CULVERT CENTERLINE



Ⓐ TAN MED. STIFF HIGHLY PLASTIC MOIST SILTY SANDY CLAY (ALLUVIUM)
Ⓑ GRAY MED. STIFF MOIST SILTY SANDY CLAY (ALLUVIUM)
Ⓒ GRAY LOOSE MOIST CLAYEY SAND (ALLUVIUM)

SOIL TEST RESULTS

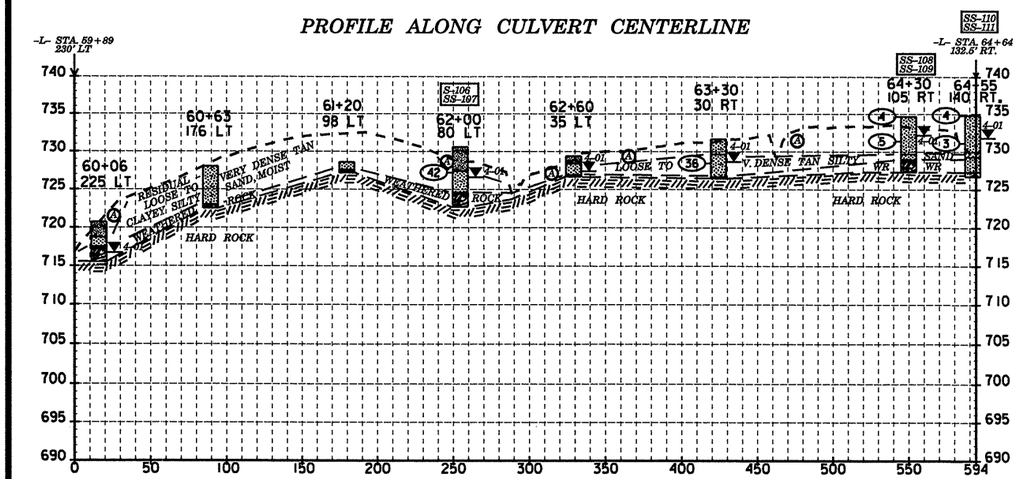
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-173	101 LT	14+75	0.00-2.00	A-7-6(26)	60	35	15.6	10.9	12.8	60.7	99	91	74	-	-
S-174	101 LT	14+75	2.00-4.00	A-6(12)	40	24	20.0	21.3	10.1	48.6	100	94	61	-	-
SS-175	101 LT	14+75	4.30-5.80	A-2-4(0)	18	NP	37.1	36.7	7.9	18.3	94	81	37	-	-
SS-176	101 LT	14+75	14.30-15.80	A-4(0)	28	NP	28.8	36.9	24.1	10.1	100	87	40	-	-
SS-180	90 LT	15+25	14.40-5.90	A-6(6)	30	16	17.6	30.0	17.8	34.5	98	92	66	-	-
SS-181	90 LT	15+25	9.40-10.90	A-7-5(23)	57	19	0.8	16.2	53.6	24.3	100	100	81	-	-
SS-182	90 LT	15+25	14.40-15.90	A-7-5(14)	48	15	3.0	23.7	57.0	16.2	97	95	81	-	-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-106	80 LT	62+00	0.00-3.40	A-4(1)	27	9	33.4	26.4	17.0	24.2	95	77	45	-	-
SS-107	80 LT	62+00	3.40-4.90	A-2-4(0)	22	NP	58.0	24.8	7.2	10.1	95	56	19	-	-
SS-108	105 RT	64+30	0.00-1.50	A-2-4(0)	16	NP	40.7	27.8	17.4	14.1	96	75	34	-	-
SS-109	105 RT	64+30	3.30-4.80	A-2-4(0)	22	6	39.1	30.2	12.6	18.1	96	77	33	-	-
SS-110	140 RT	64+55	0.00-1.50	A-4(0)	19	4	26.2	30.0	25.7	18.1	91	79	44	-	-
SS-111	140 RT	64+55	3.70-5.20	A-2-4(0)	23	8	34.2	33.4	16.2	16.1	92	76	33	-	-

CULVERT AT -L- STA. 63+00

PROFILE ALONG CULVERT CENTERLINE



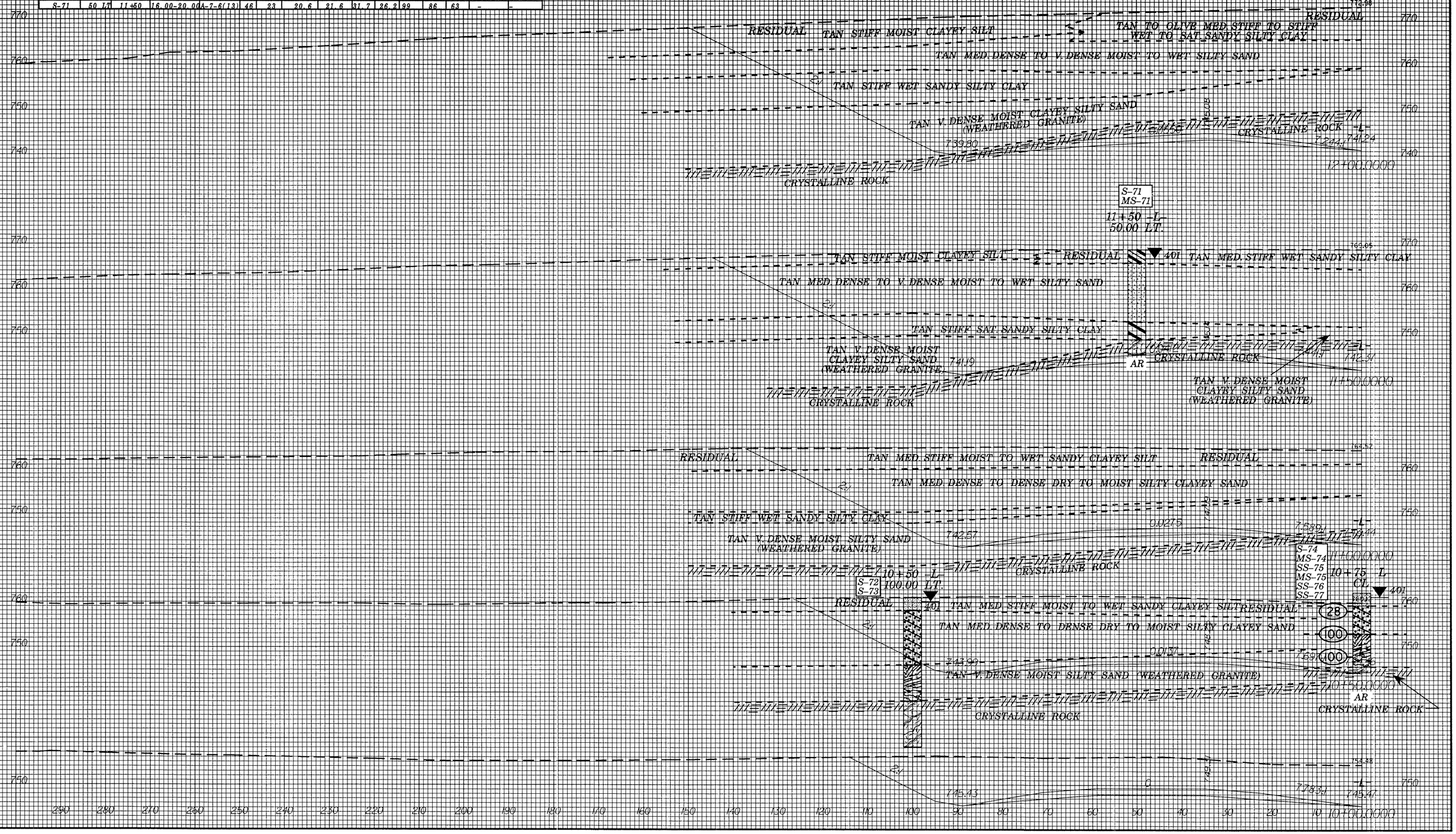
Ⓐ ALLUVIUM - SOFT TO MEDIUM STIFF GRAY-TAN SANDY SILT AND LOOSE TO TAN SILTY SAND, MOIST TO WET

PROJ. REFERENCE NO.	SHEET NO.
R-2606A	X-1
-L- LEFT OF CENTERLINE	

0 10

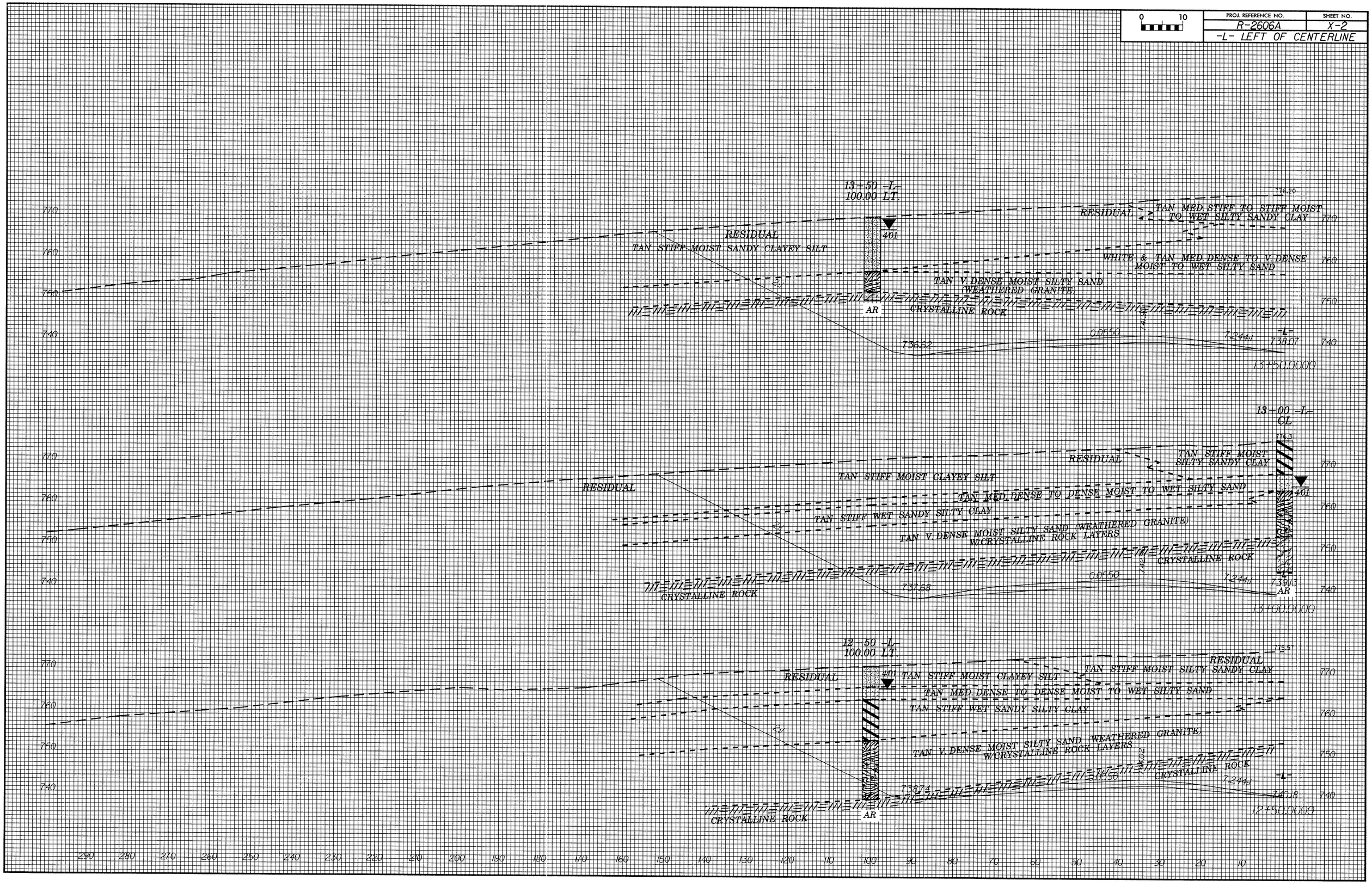
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-72	100 LT	10+50	0.00-3.00	A-4(4)	34	10	24.6	21.6	13.5	40.3	99	84	57	-	-
S-73	100 LT	10+50	3.00-15.00	A-2-7(1)	42	19	45.2	30.2	14.5	10.1	99	72	29	-	-
MS-74	CL	10+75	0.00-4.20				0.0	0.0	0.0	0.0		0	0	27.5	-
S-74	CL	10+75	0.00-4.20	A-4(0)	25	3	22.4	24.8	14.5	38.3	100	88	57	-	-
MS-75	CL	10+75	4.20-5.70				0.0	0.0	0.0	0.0		0	0	11.7	-
SS-75	CL	10+75	4.20-5.70	A-2-6(1)	40	17	43.3	35.9	12.7	8.1	100	78	26	-	-
SS-76	CL	10+75	9.20-10.70	A-2-4(0)	29	NP	53.4	29.4	9.1	8.1	82	54	17	-	-
SS-77	CL	10+75	14.20-15.70	A-2-4(0)	21	NP	41.5	35.5	12.9	10.1	99	79	27	-	-
MS-71	50 LT	11+50	16.00-20.00				0.0	0.0	0.0	0.0		0	0	24.8	-
S-71	50 LT	11+50	16.00-20.00	A-7-6(13)	46	23	20.6	21.6	31.7	26.2	99	86	63	-	-



PROJ. REFERENCE NO.	SHEET NO.
R-2606A	X-2
-L- LEFT OF CENTERLINE	

0 10

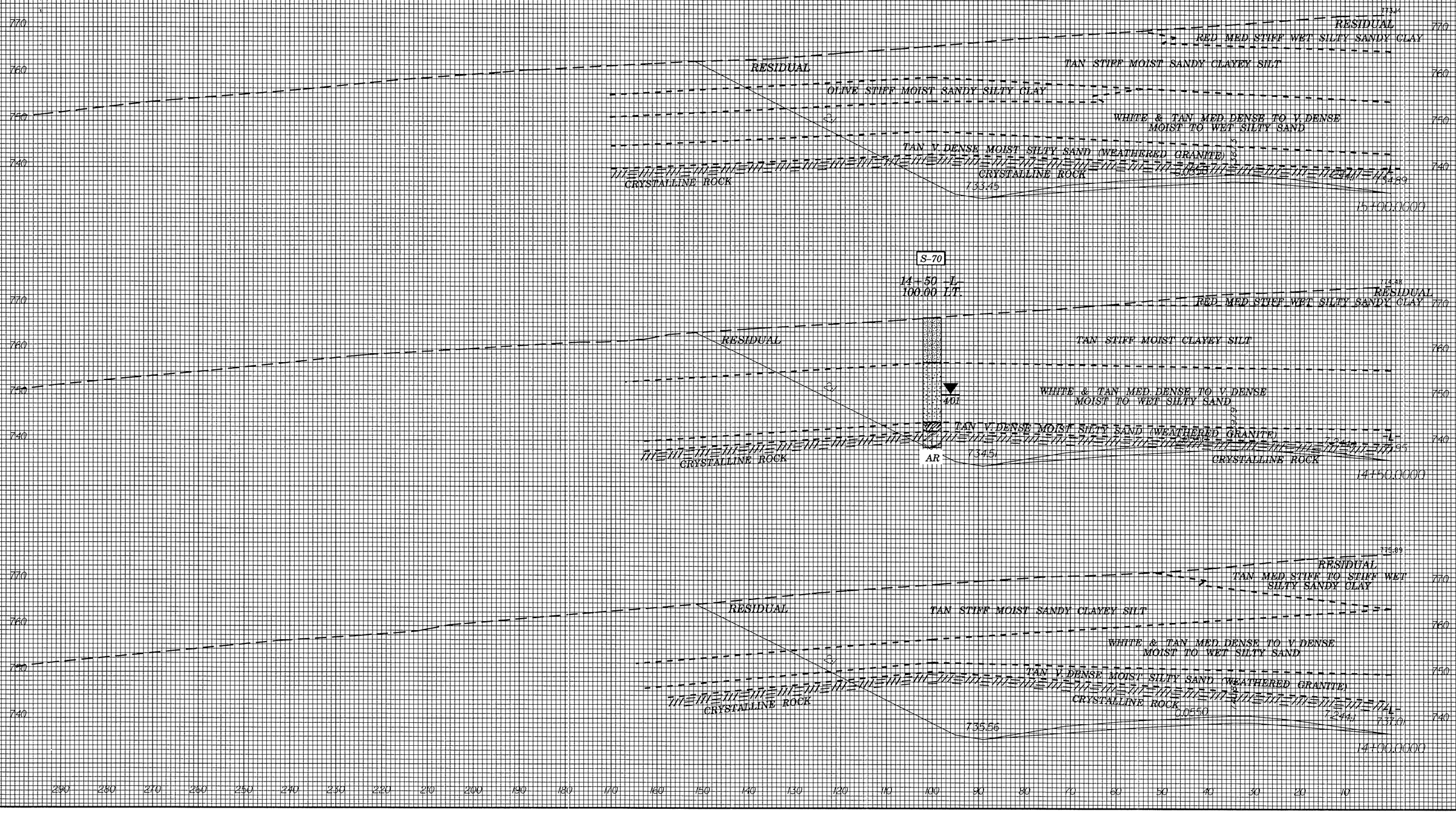


PROJ. REFERENCE NO.	SHEET NO.
R-2606A	X-3
-L- LEFT OF CENTERLINE	

0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-70	100 LT	14+50	3.00-10.00	A-4(1)	32	7	28.8	22.2	14.7	34.3	99	82	51	-	-

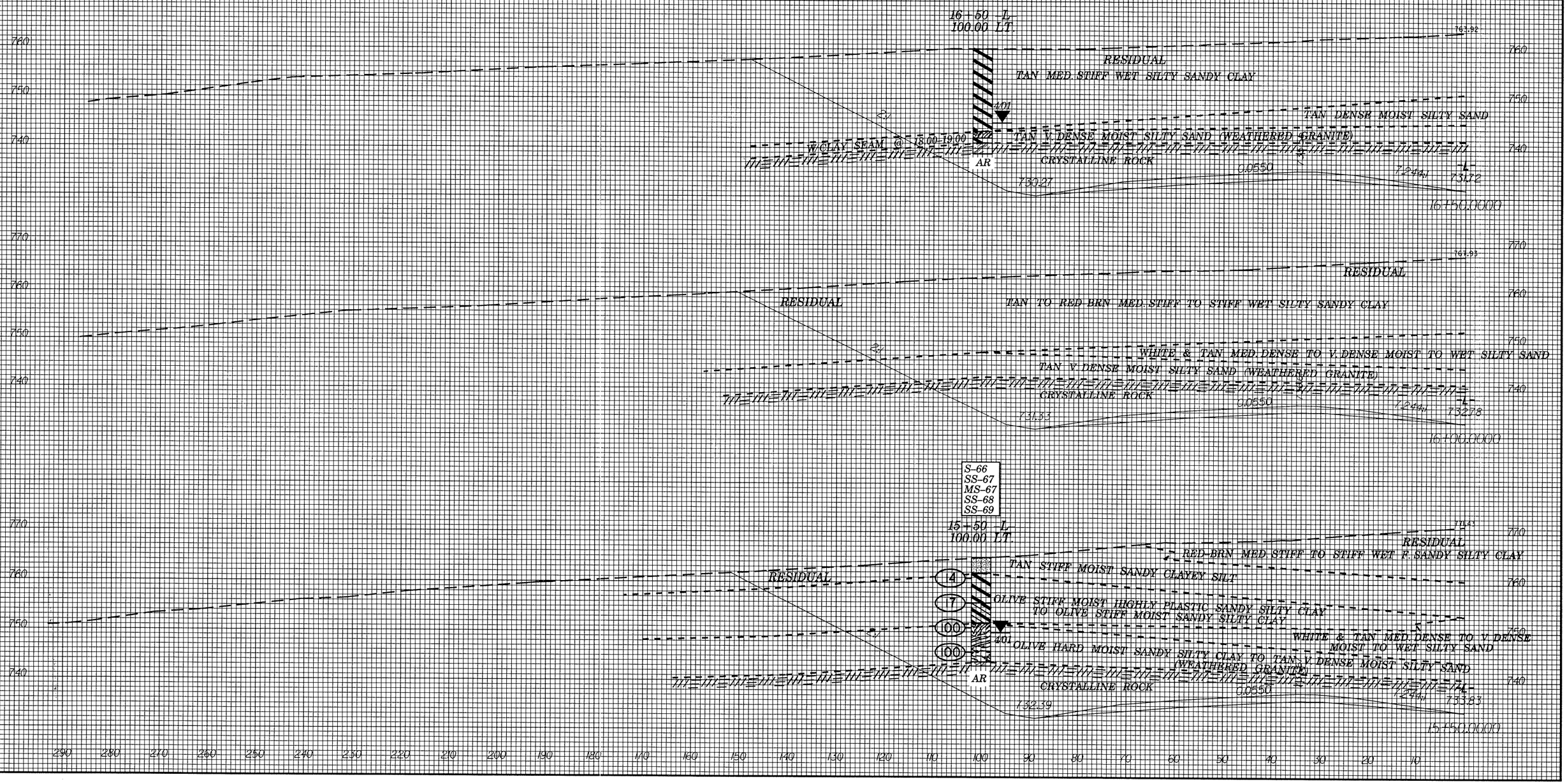


PROJ. REFERENCE NO.	SHEET NO.
R-2606A	X-4
-L- LEFT OF CENTERLINE	

0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-66	100 LT	15+50	0.00-3.00	A-4(6)	32	8	9.1	7.5	14.9	68.5	99	94	84	-	-
MS-67	100 LT	15+50	4.00-5.50				0.0	0.0	0.0	0.0		0	0	22.4	-
SS-67	100 LT	15+50	4.00-5.50	A-7-5(43)	81	49	3.8	22.6	47.4	26.2	100	99	79	-	-
MS-68	100 LT	15+50	9.00-10.50				0.0	0.0	0.0	0.0		0	0	31.4	-
SS-68	100 LT	15+50	9.00-10.50	A-6(9)	38	12	4.2	24.8	50.8	20.2	100	99	78	-	-
SS-69	100 LT	15+50	14.00-15.50	A-6(9)	39	12	2.0	33.3	54.6	10.1	100	100	74	-	-

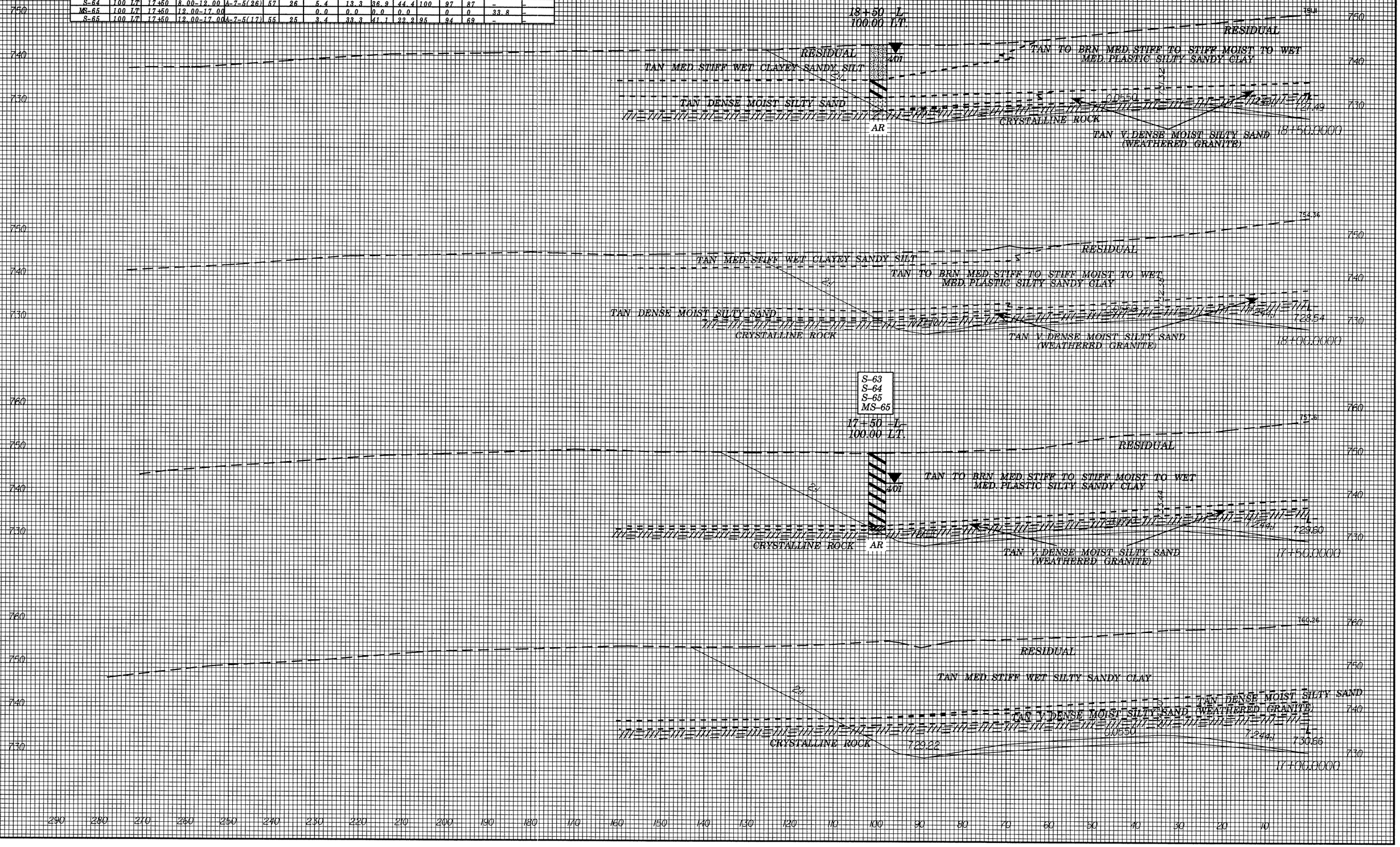


PROJ. REFERENCE NO.	SHEET NO.
R-2606A	X-5
-L- LEFT OF CENTERLINE	

0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-63	100 LT	17+50	0.00-8.00	A-7-6(11)	41	19	20.4	12.9	20.4	46.4	96	83	66	-	-
S-64	100 LT	17+50	8.00-12.00	A-7-5(26)	57	26	5.4	13.3	36.9	44.4	100	97	87	-	-
MS-65	100 LT	17+50	12.00-17.00				0.0	0.0	0.0	0.0		0	0	33.8	-
S-65	100 LT	17+50	12.00-17.00	A-7-5(17)	55	25	3.4	33.3	41.1	22.2	95	94	69	-	-

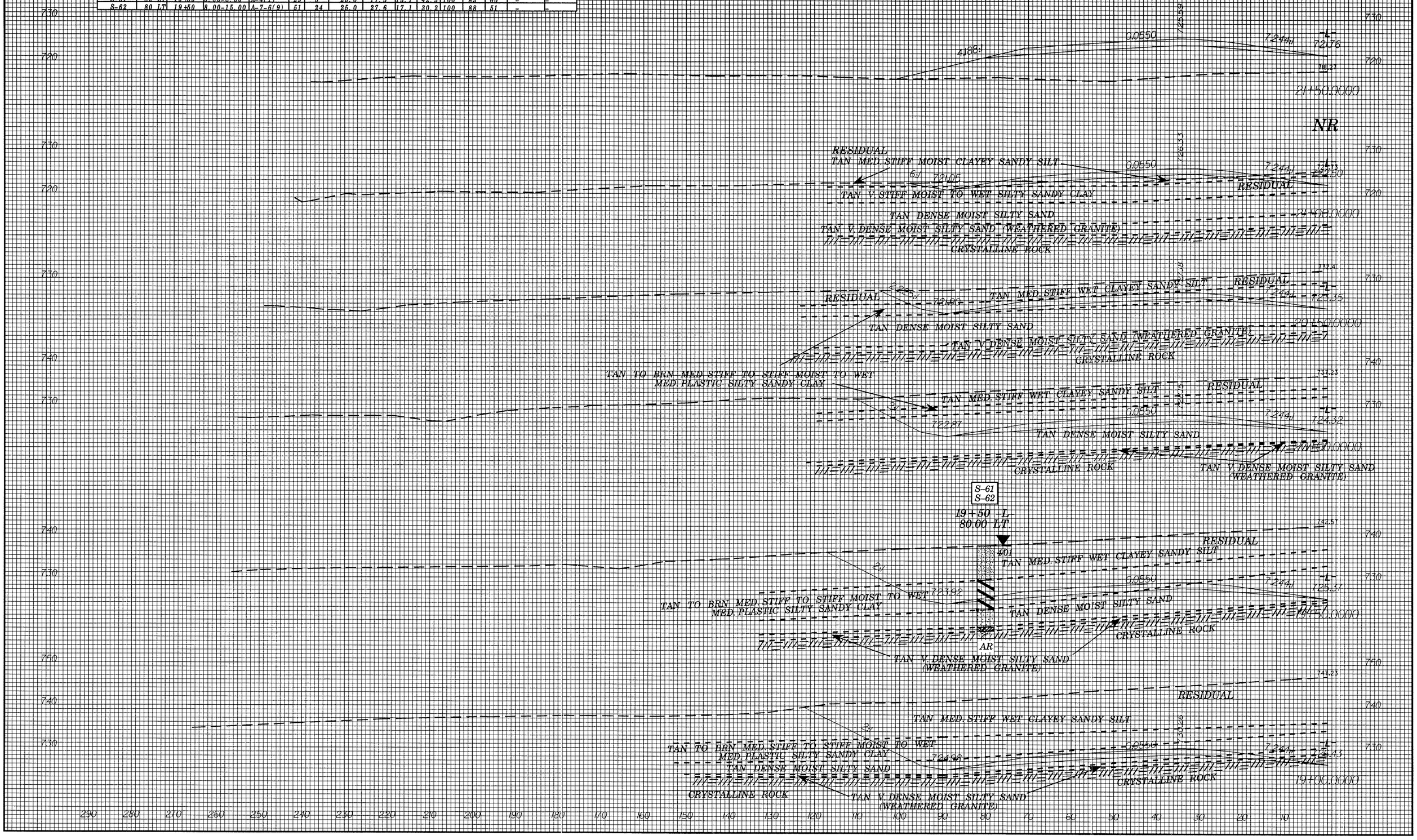


PROJ. REFERENCE NO.	SHEET NO.
R-2606A	X-6
-L- LEFT OF CENTERLINE	

0 10

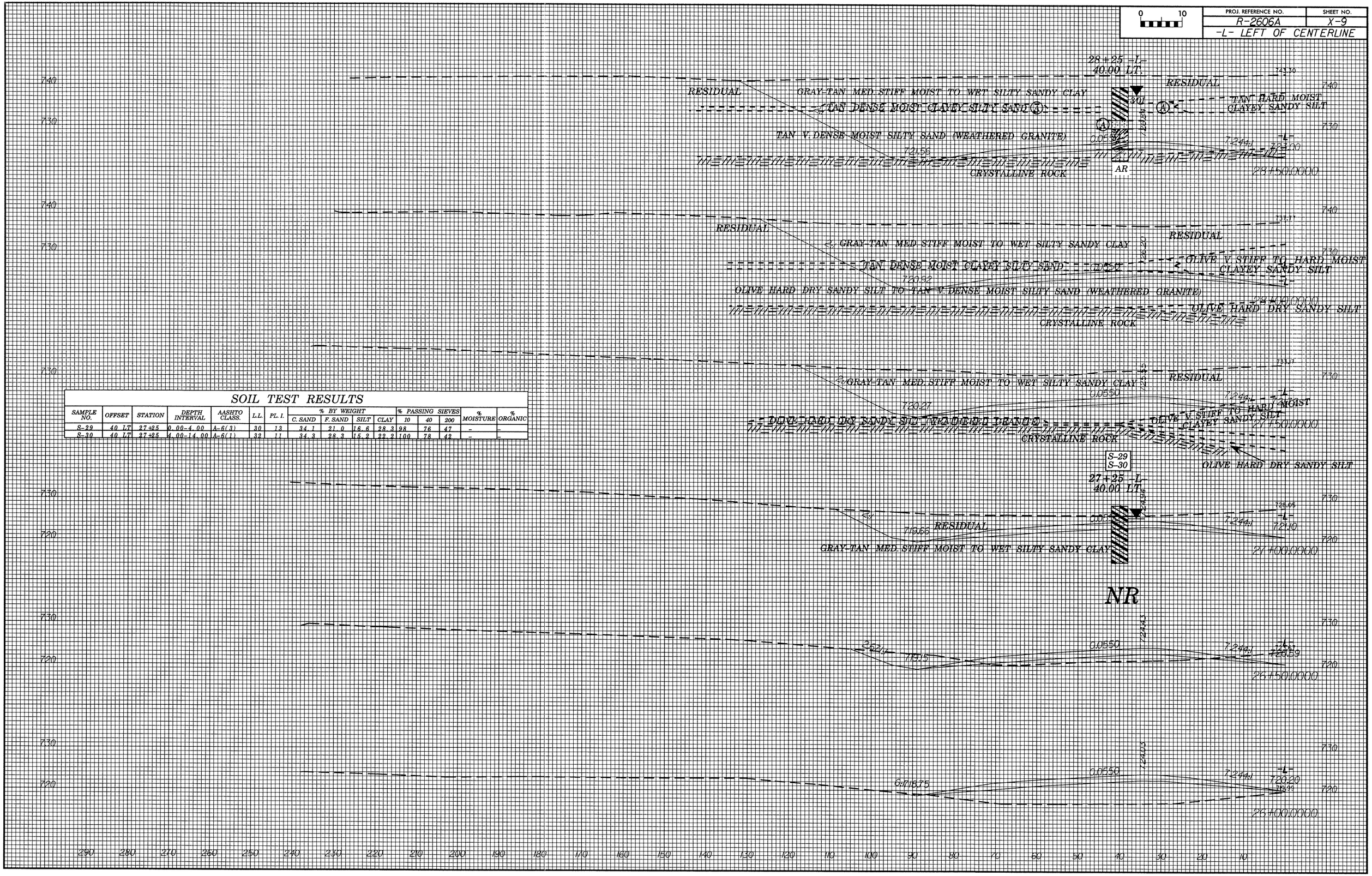
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-61	80 LT	19+50	0.00-8.00	A-4(1)	29	5	25.0	17.5	15.1	42.3	100	83	60	-	-
S-62	80 LT	19+50	8.00-15.00	A-7-6(9)	51	24	25.0	27.6	17.1	30.2	100	88	51	-	-



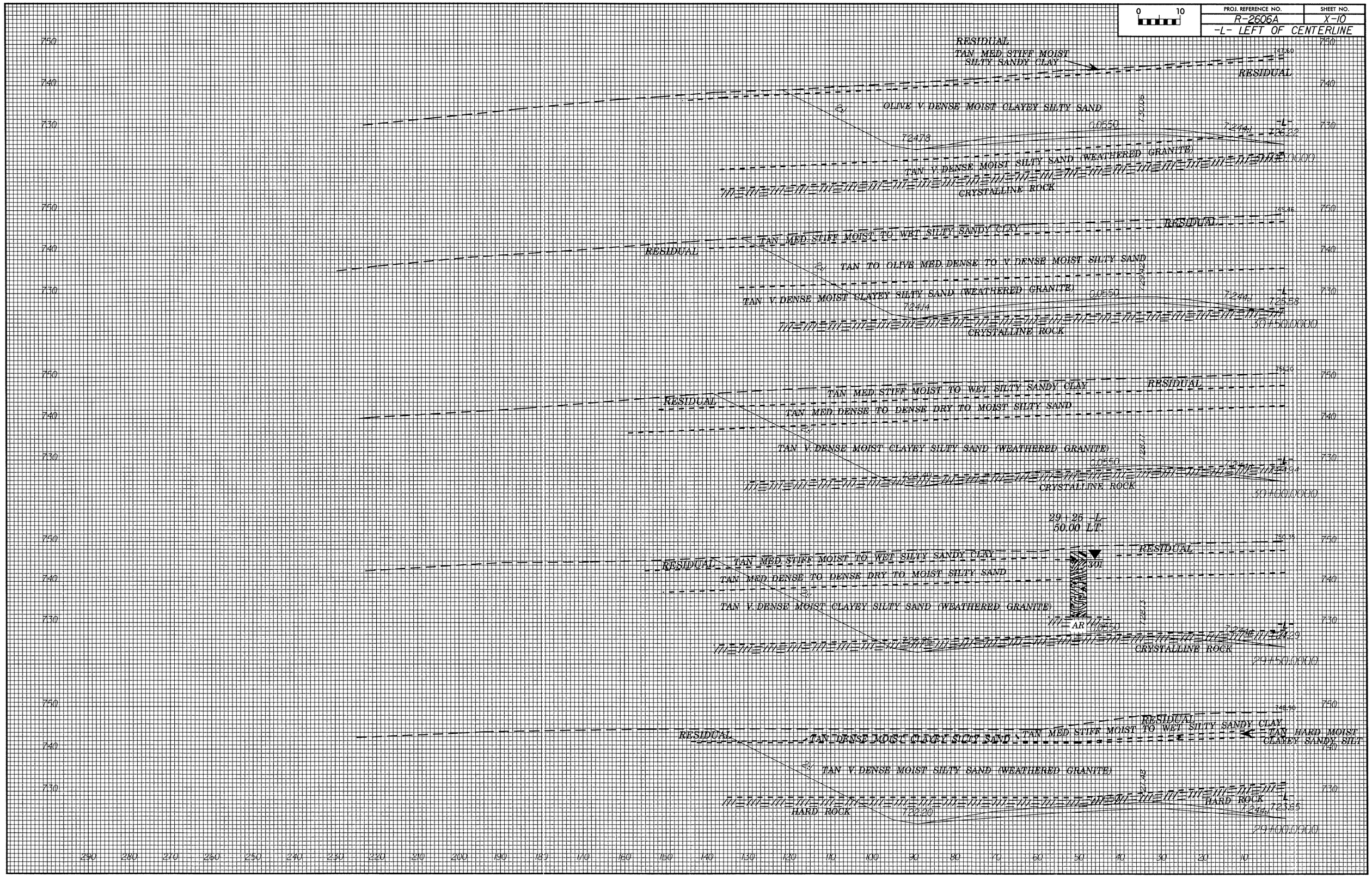
PROJ. REFERENCE NO.	SHEET NO.
R-2606A	X-9
-L- LEFT OF CENTERLINE	

0 10



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-29	40 LT	27+25	0.00-4.00	A-6(3)	30	13	34.1	21.0	16.6	28.3	98	76	47	-	-
S-30	40 LT	27+25	4.00-14.00	A-6(1)	32	11	34.3	28.3	15.2	22.2	100	78	42	-	-


0 10
PROJ. REFERENCE NO.
R-2606A
SHEET NO.
X-10
-L- LEFT OF CENTERLINE
RESIDUAL
TAN MED STIFF MOIST SILTY SANDY CLAY
OLIVE V. DENSE MOIST CLAYEY SILTY SAND
TAN V. DENSE MOIST SILTY SAND (WEATHERED GRANITE)
CRYSTALLINE ROCK
TAN MED STIFF MOIST TO WET SILTY SANDY CLAY
TAN TO OLIVE MED. DENSE TO V. DENSE MOIST SILTY SAND
TAN V. DENSE MOIST CLAYEY SILTY SAND (WEATHERED GRANITE)
TAN MED DENSE TO DENSE DRY TO MOIST SILTY SAND
29 + 25 -L-
50.00 LT.
AR
TAN DENSE MOIST CLAYEY SILTY SAND
TAN HARD MOIST CLAYEY SANDY SILT
HARD ROCK

0 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2606A	X-11
	-L- LEFT OF CENTERLINE	

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-27	CL	31+50	12.00-19.00	A-7-6(17)	44	18	4.6	13.1	45.9	36.4	100	97	87	-	-
SS-28	CL	31+50	19.00-24.00	A-4(3)	28	9	8.3	35.6	31.9	24.2	100	97	62	-	-

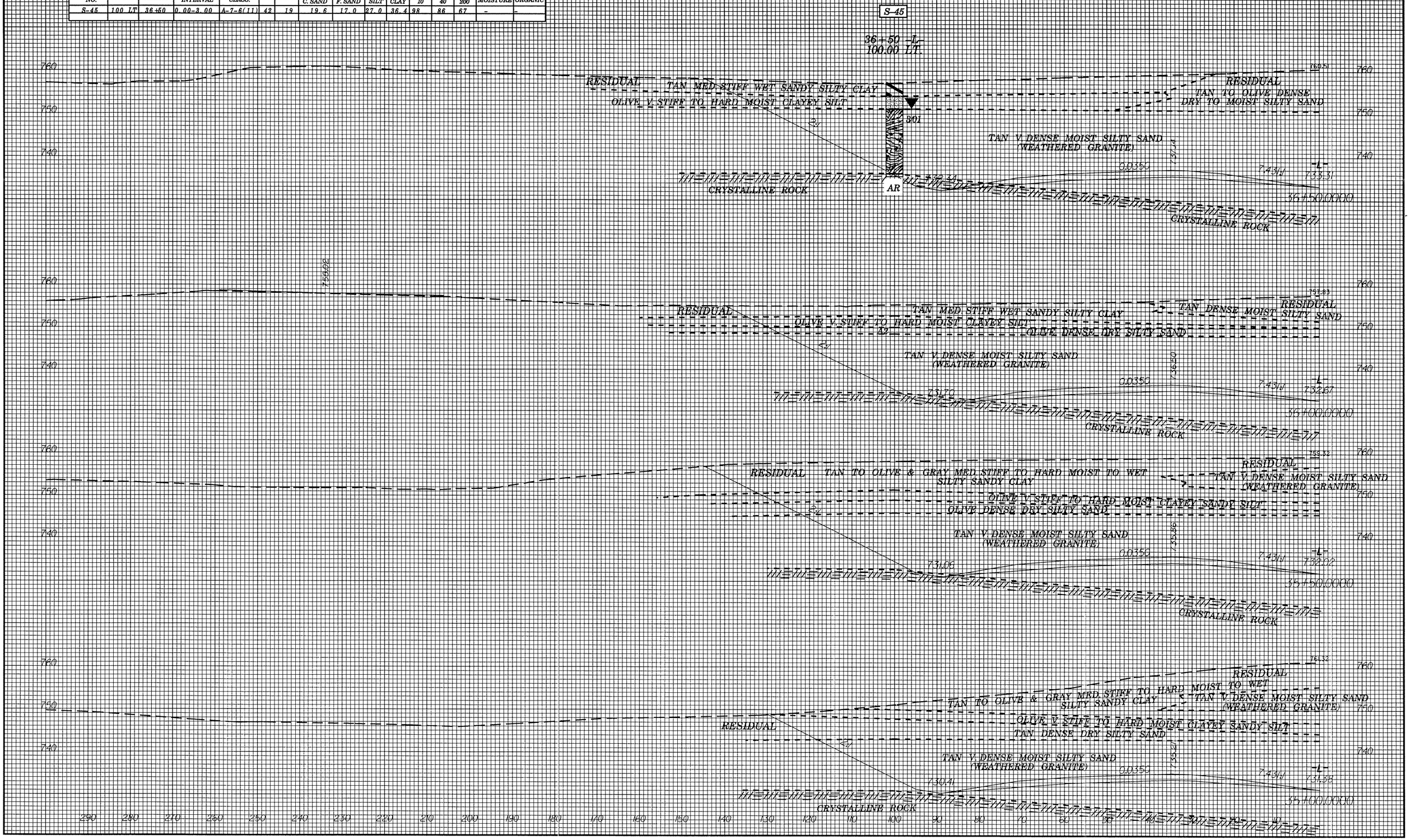
0 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2606A	X-12
	-L- LEFT OF CENTERLINE	

PROJ. REFERENCE NO.	SHEET NO.
R-2606A	X-13
-L- LEFT OF CENTERLINE	

0 10

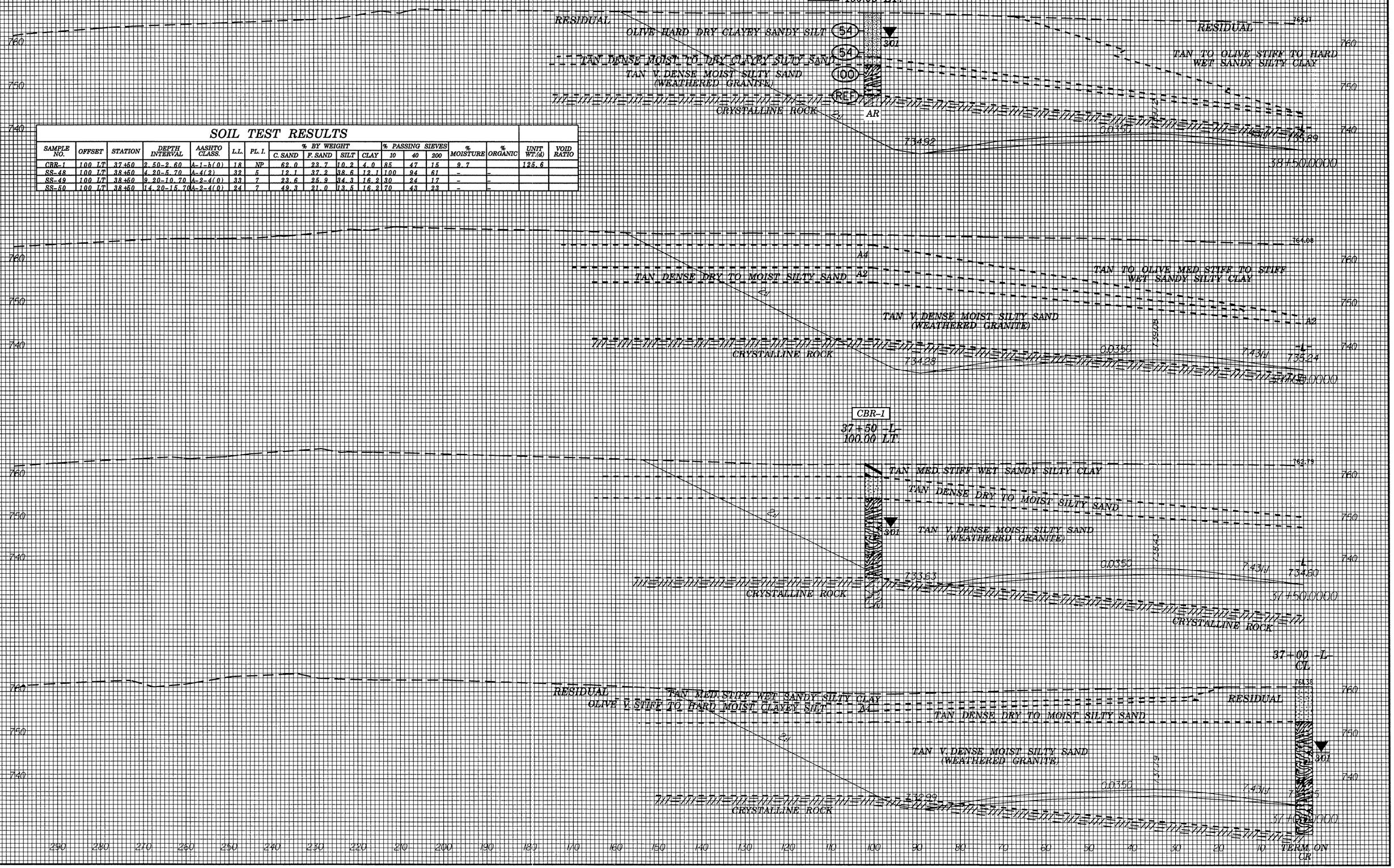
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-45	100 LT	36+50	0.00-3.00	A-7-6(11)	42	19	19.6	17.0	27.0	36.4	98	86	67	-	-



PROJ. REFERENCE NO.	SHEET NO.
R-2606A	X-14
-L- LEFT OF CENTERLINE	

0 10

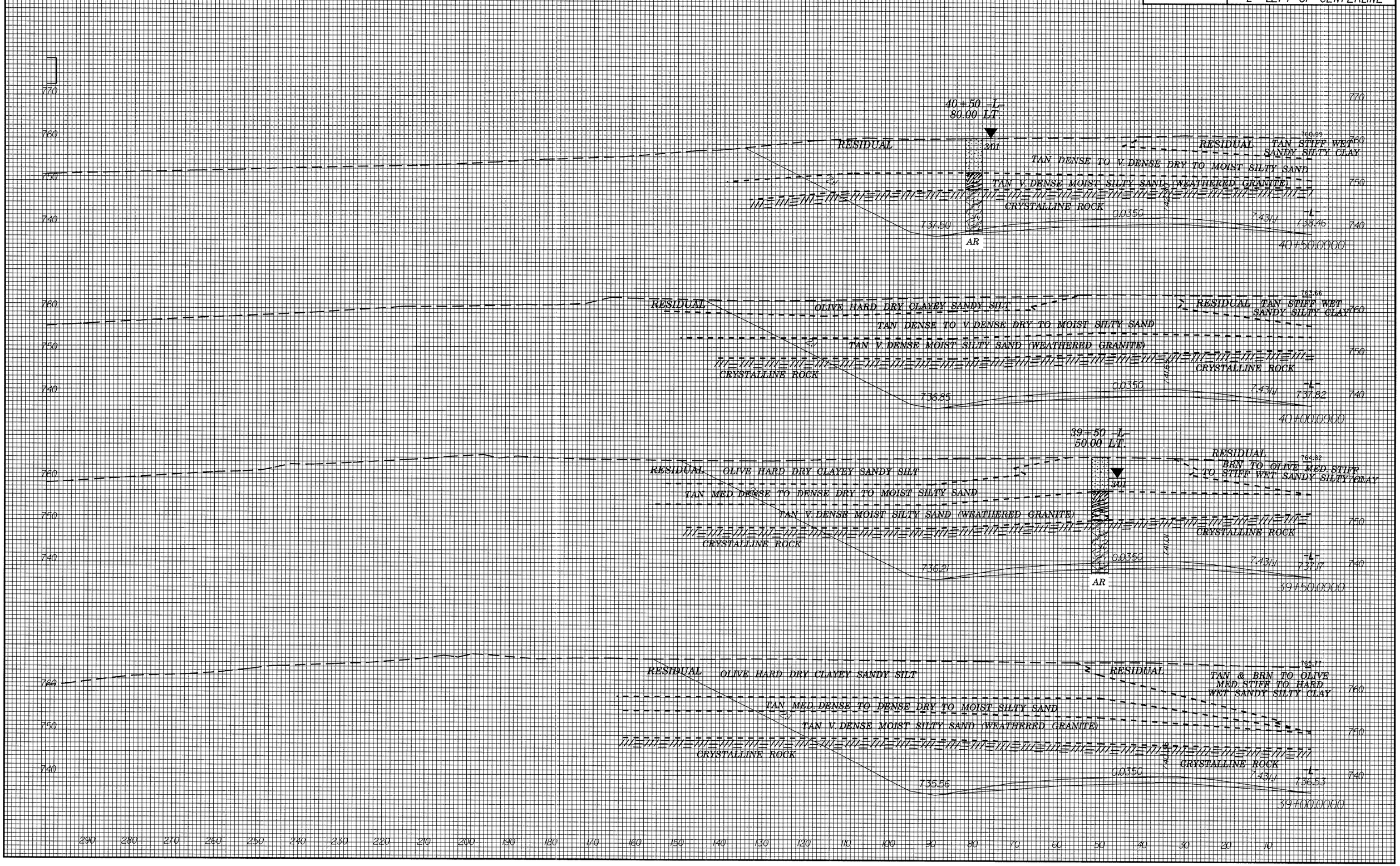


SOIL TEST RESULTS

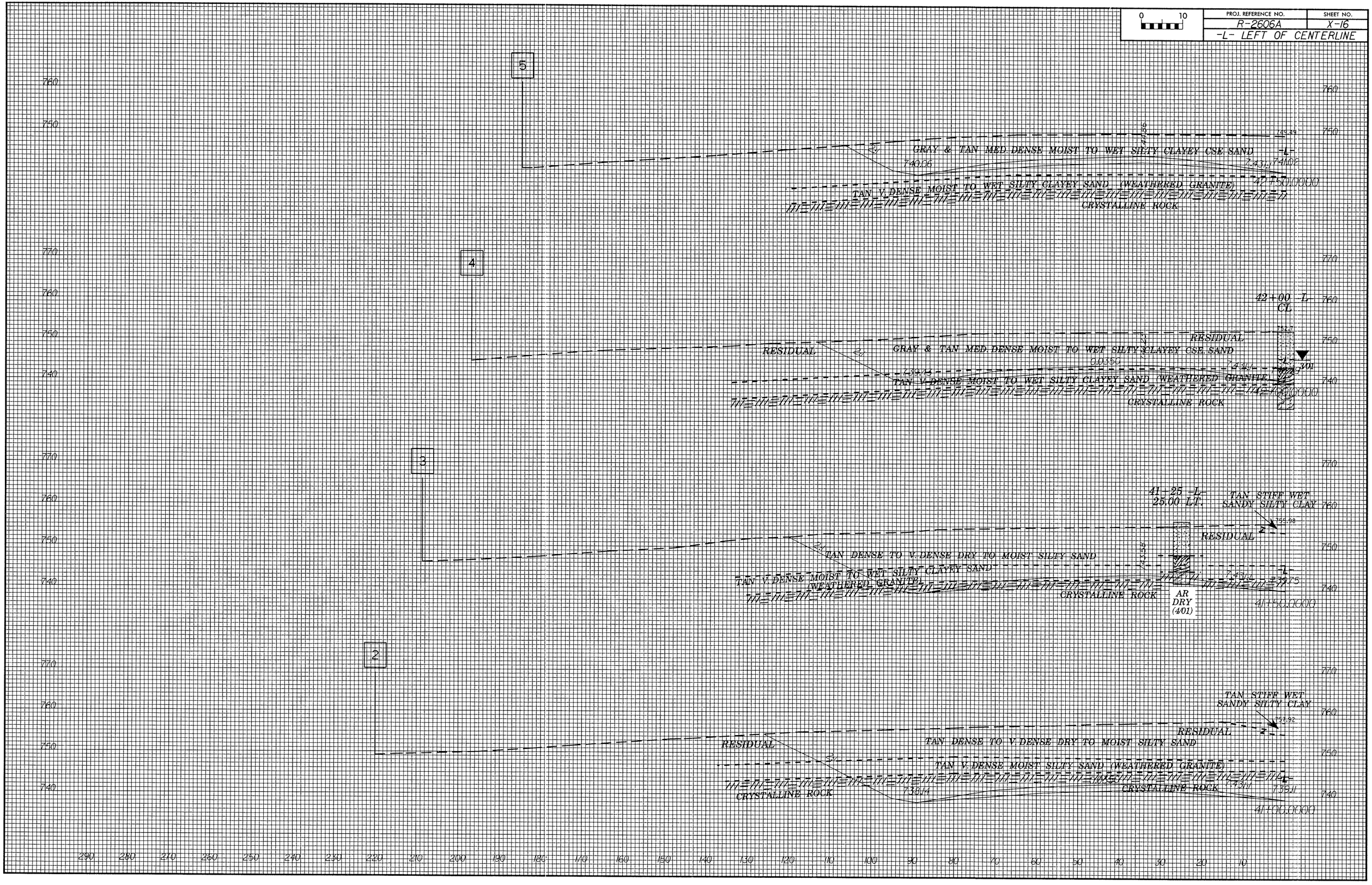
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC	UNIT WT.(d)	VOID RATIO
CBR-1	100 LT	37+50	2.50-2.60	A-1-b(0)	18	NP	62.0	23.7	10.2	4.0	85	47	15	9.7		125.6	
SS-48	100 LT	38+50	4.20-5.70	A-4(2)	32	5	12.1	37.2	38.6	12.1	100	94	61	-	-		
SS-49	100 LT	38+50	9.20-10.70	A-2-4(0)	33	7	23.6	25.9	34.3	16.2	30	24	17	-	-		
SS-50	100 LT	38+50	14.20-15.70	A-2-4(0)	24	7	49.3	21.0	13.5	16.2	70	43	23	-	-		

PROJ. REFERENCE NO.	SHEET NO.
R-2606A	X-15
-L- LEFT OF CENTERLINE	

0 10



0 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2606A	X-16
	-L- LEFT OF CENTERLINE	



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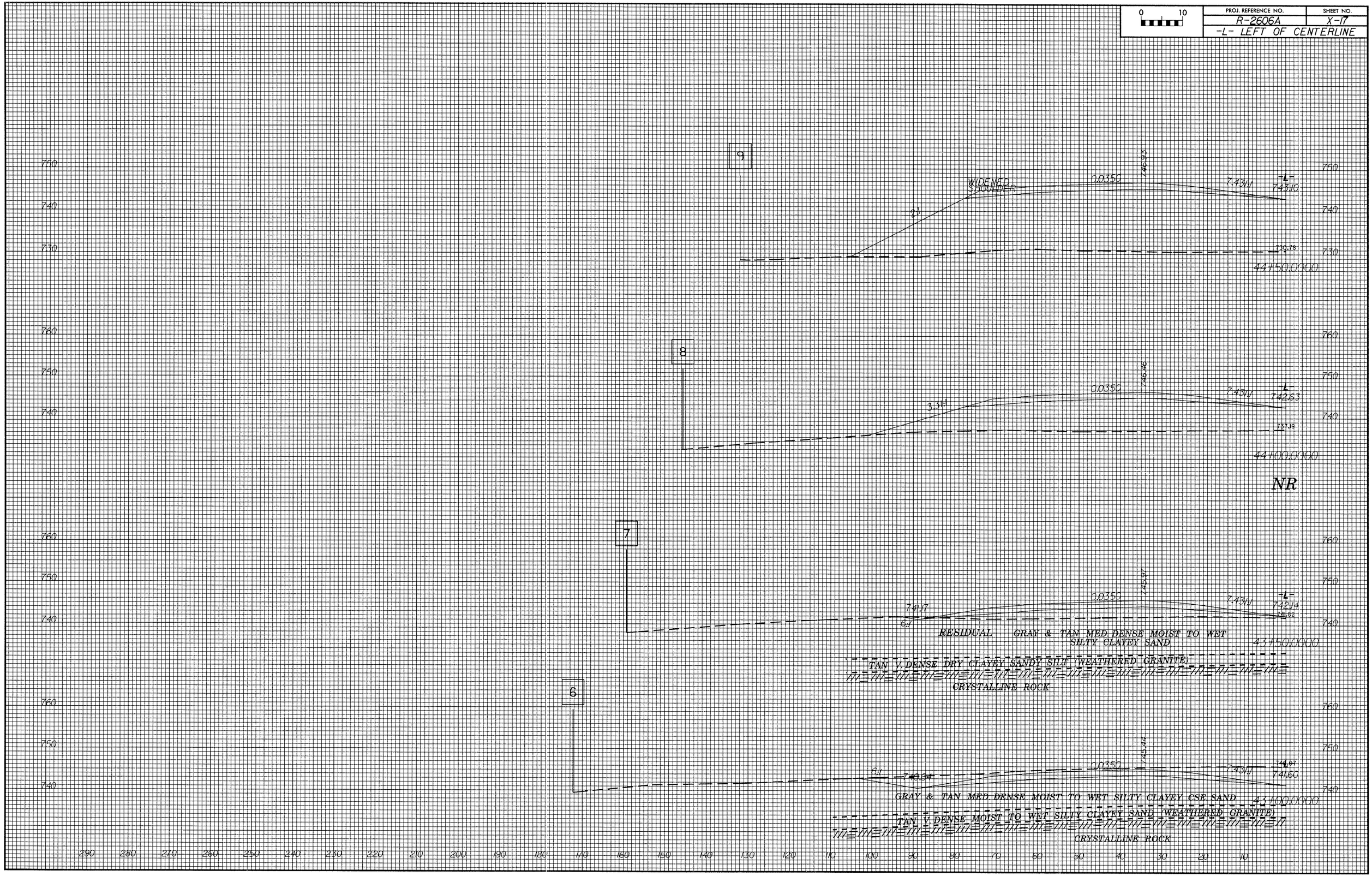
	R-2606A	X-17
	-L- LEFT OF CENTERLINE	

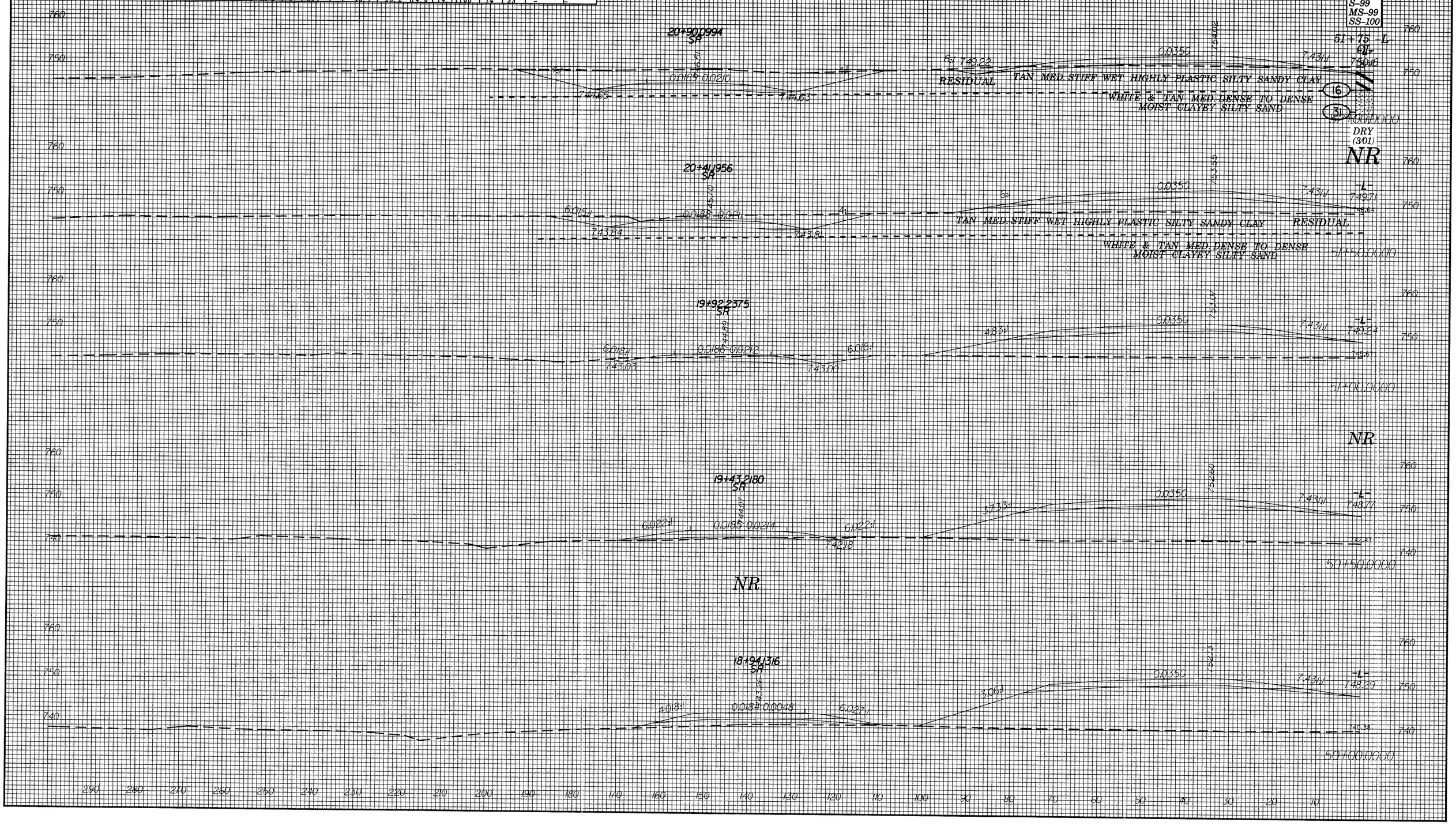


PROJ. REFERENCE NO.	SHEET NO.
R-2606A	X-21
-L- LEFT OF CENTERLINE	

0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
MS-99	CL	51+75	0.00-4.20				0.0	0.0	0.0	0.0		0	0	25.2	-
S-99	CL	51+75	0.00-4.20	A-7-6(21)	55	31	17.1	16.5	18.0	48.3	100	90	70	-	-
SS-100	CL	51+75	4.20-5.70	A-2-4(0)	30	7	43.7	28.2	14.0	14.1	100	74	33	-	-

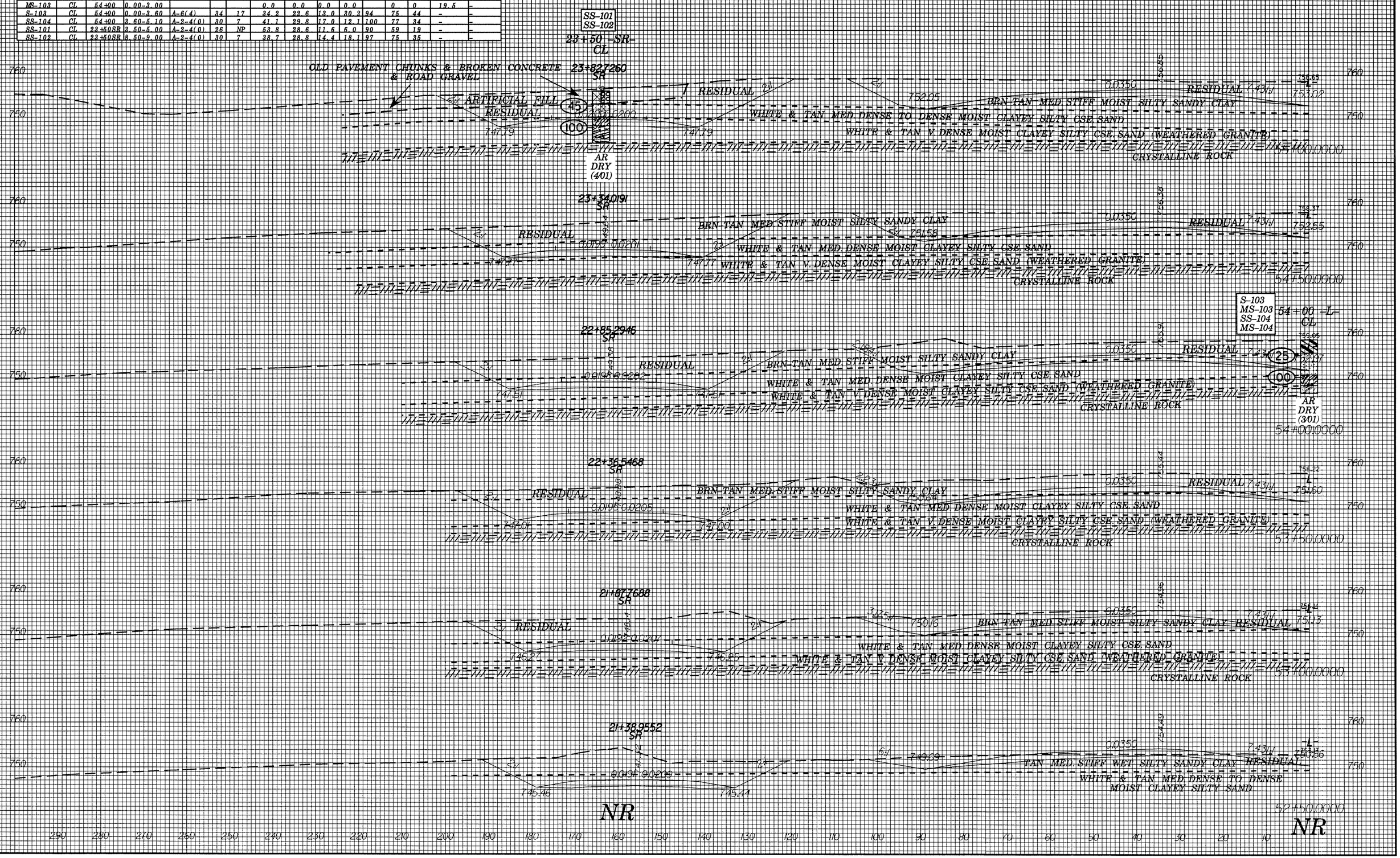


PROJ. REFERENCE NO.	SHEET NO.
R-2606A	X-22
-L- LEFT OF CENTERLINE	

0 10

SOIL TEST RESULTS

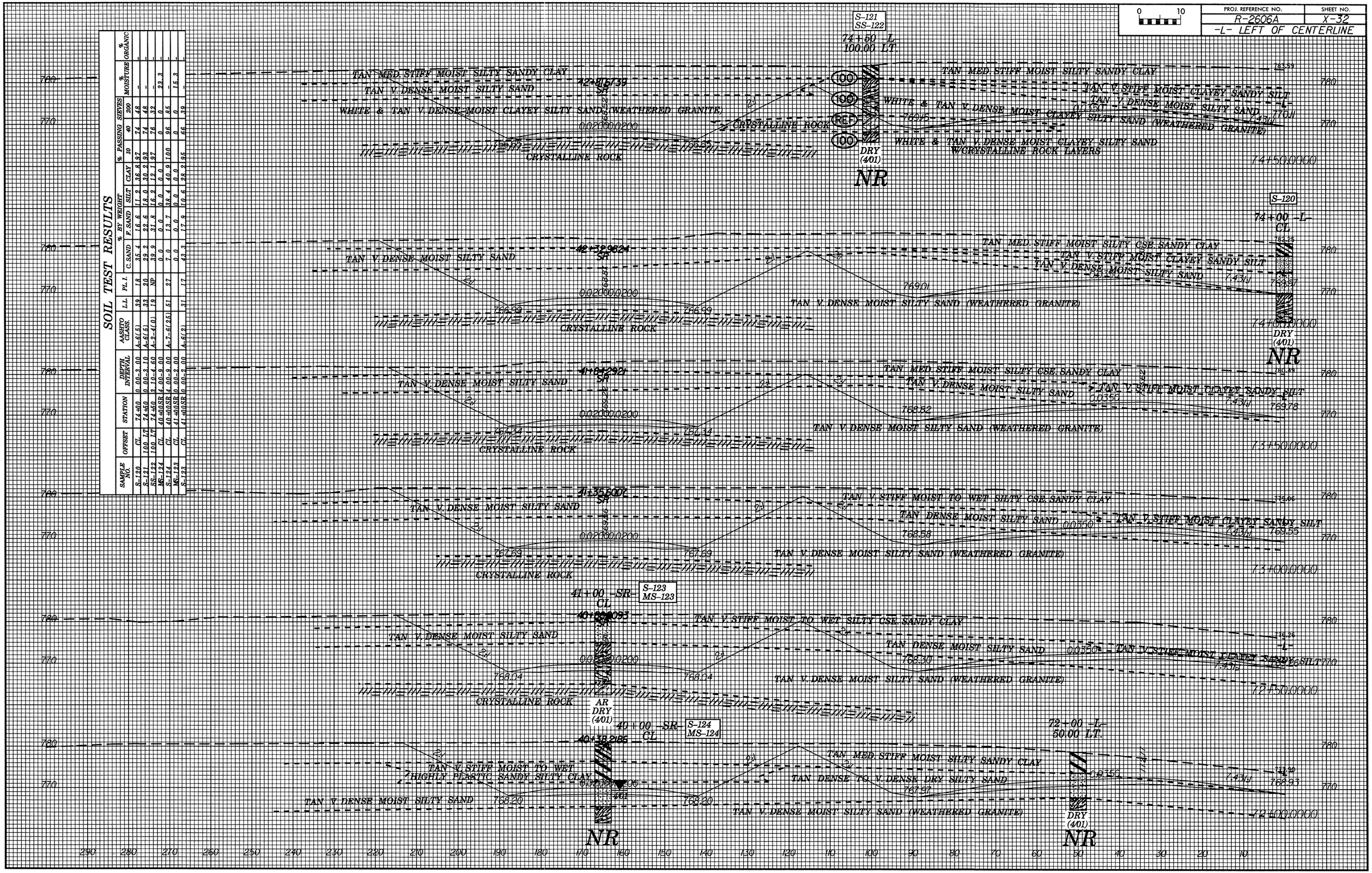
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
MS-103	CL	54+00	0.00-3.00				0.0	0.0	0.0	0.0		0	0	19.5	-
S-103	CL	54+00	0.00-3.60	A-6(4)	34	17	34.2	22.6	13.0	30.2	94	75	44	-	-
SS-104	CL	54+00	3.60-5.10	A-2-4(0)	30	7	41.1	29.8	17.0	12.1	100	77	34	-	-
SS-101	CL	23+50SR	3.50-5.00	A-2-4(0)	26	NP	53.8	28.6	11.6	6.0	90	59	19	-	-
SS-102	CL	23+50SR	8.50-9.00	A-2-4(0)	30	7	38.7	28.8	14.4	18.1	97	75	35	-	-



0 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2606A	X-23
	-L- LEFT OF CENTERLINE	

PROJ. REFERENCE NO.	SHEET NO.
R-2606A	X-32

-L- LEFT OF CENTERLINE



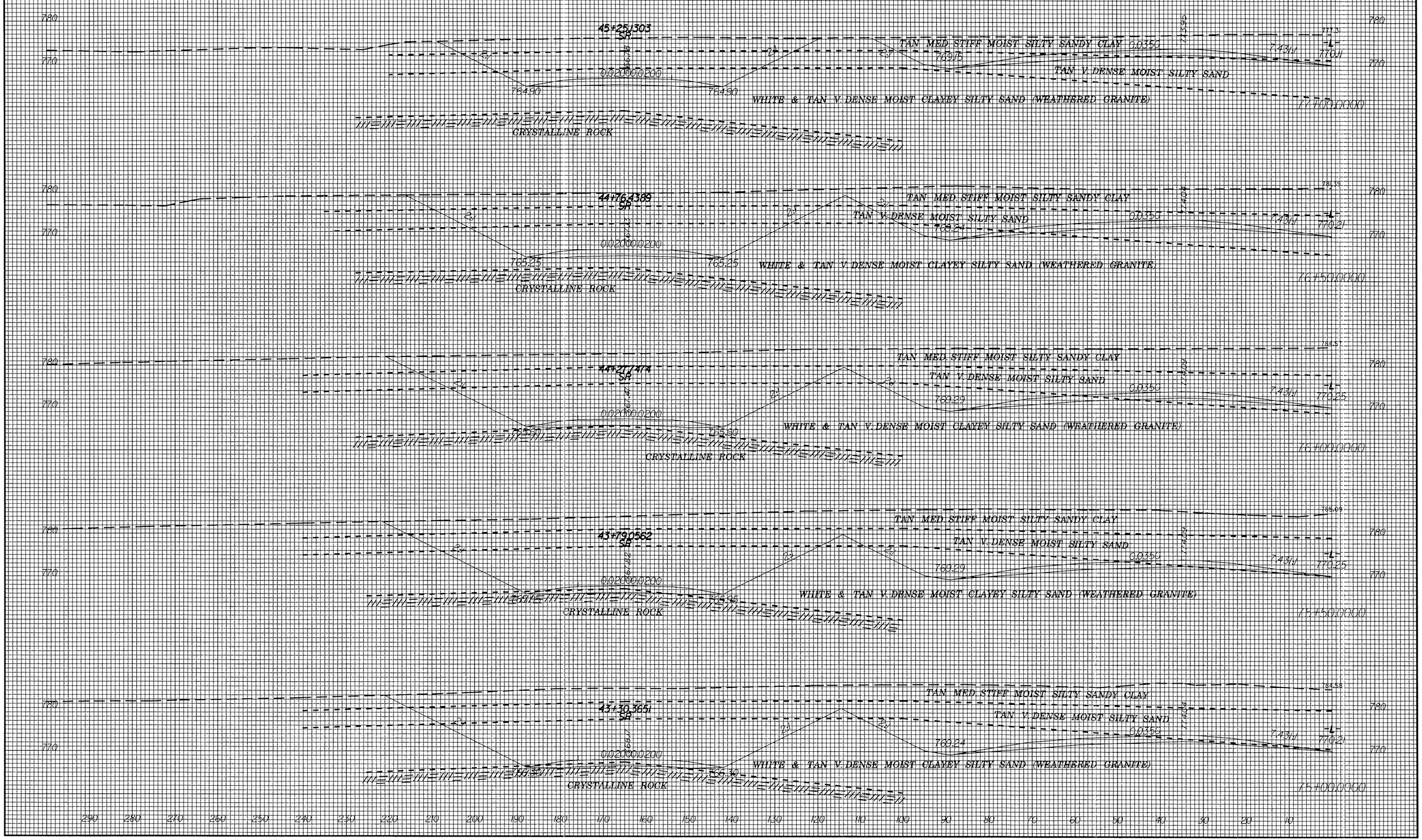
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-120	CL	74+00	0.00-3.00	A-6(5)	39	18	35.4	16.6	11.2	36.8	97	74	48	-	-
S-121	100 LT	74+50	0.00-3.10	A-6(5)	33	20	29.2	22.6	18.0	30.2	93	74	48	-	-
SS-122	100 LT	74+50	3.10-4.60	A-2-4(0)	19	NP	39.9	31.8	16.2	12.1	97	76	32	-	-
MS-124	CL	40+00SR	4.00-9.00				0.0	0.0	0.0	0.0		0	0	23.3	-
S-124	CL	40+00SR	4.00-9.00	A-7-6(25)	51	27	7.0	13.7	38.4	40.9	100	96	85	-	-
MS-123	CL	41+00SR	0.00-2.00				0.0	0.0	0.0	0.0		0	0	15.3	-
S-123	CL	41+00SR	0.00-2.00	A-6(2)	31	17	43.3	17.9	10.6	28.2	95	66	39	-	-

PROJ. REFERENCE NO.	SHEET NO.
R-2606A	X-33
-L- LEFT OF CENTERLINE	

0 10

NR

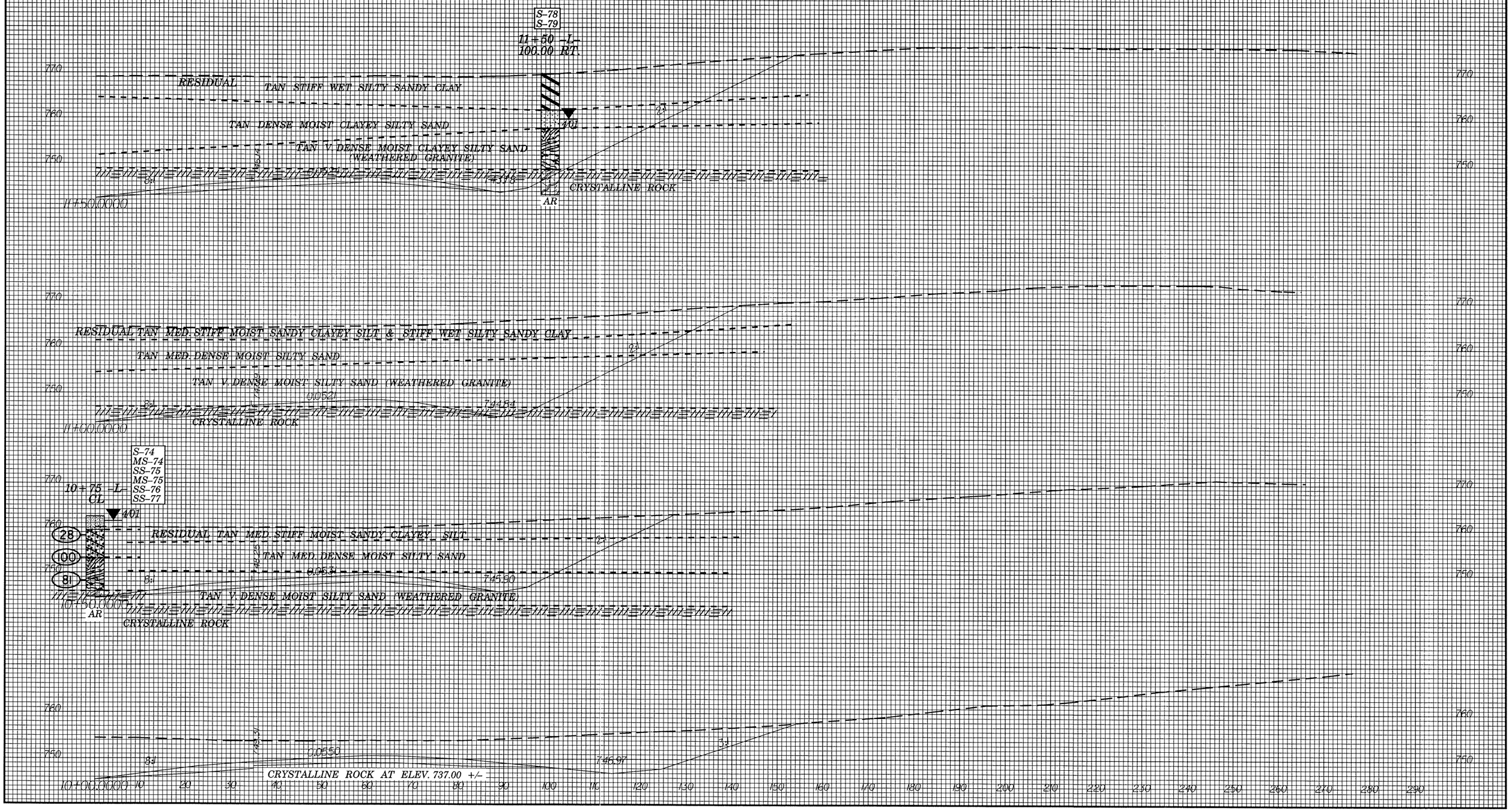


PROJ. REFERENCE NO.	SHEET NO.
R-2606A	X-62
-L- RIGHT OF CENTERLINE	

0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
MS-74	CL	10+75	0.00-4.20				0.0	0.0	0.0	0.0		0	0	27.5	-
S-74	CL	10+75	0.00-4.20	A-4(0)	25	3	22.4	24.8	14.5	38.3	100	88	57	-	-
MS-75	CL	10+75	4.20-5.70				0.0	0.0	0.0	0.0		0	0	11.7	-
SS-75	CL	10+75	4.20-5.70	A-2-6(1)	40	17	43.3	35.9	12.7	8.1	100	78	26	-	-
SS-76	CL	10+75	9.20-10.70	A-2-4(0)	29	NP	53.4	29.4	9.1	8.1	82	54	17	-	-
SS-77	CL	10+75	14.20-15.70	A-2-4(0)	21	NP	41.5	35.5	12.9	10.1	99	79	27	-	-
S-78	100 RT	11+50	0.00-8.00	A-7-6(10)	49	27	29.7	21.5	10.0	38.9	98	81	50	-	-
S-79	100 RT	11+50	8.00-12.00	A-2-4(0)	29	8	38.2	33.3	18.2	10.2	100	81	34	-	-

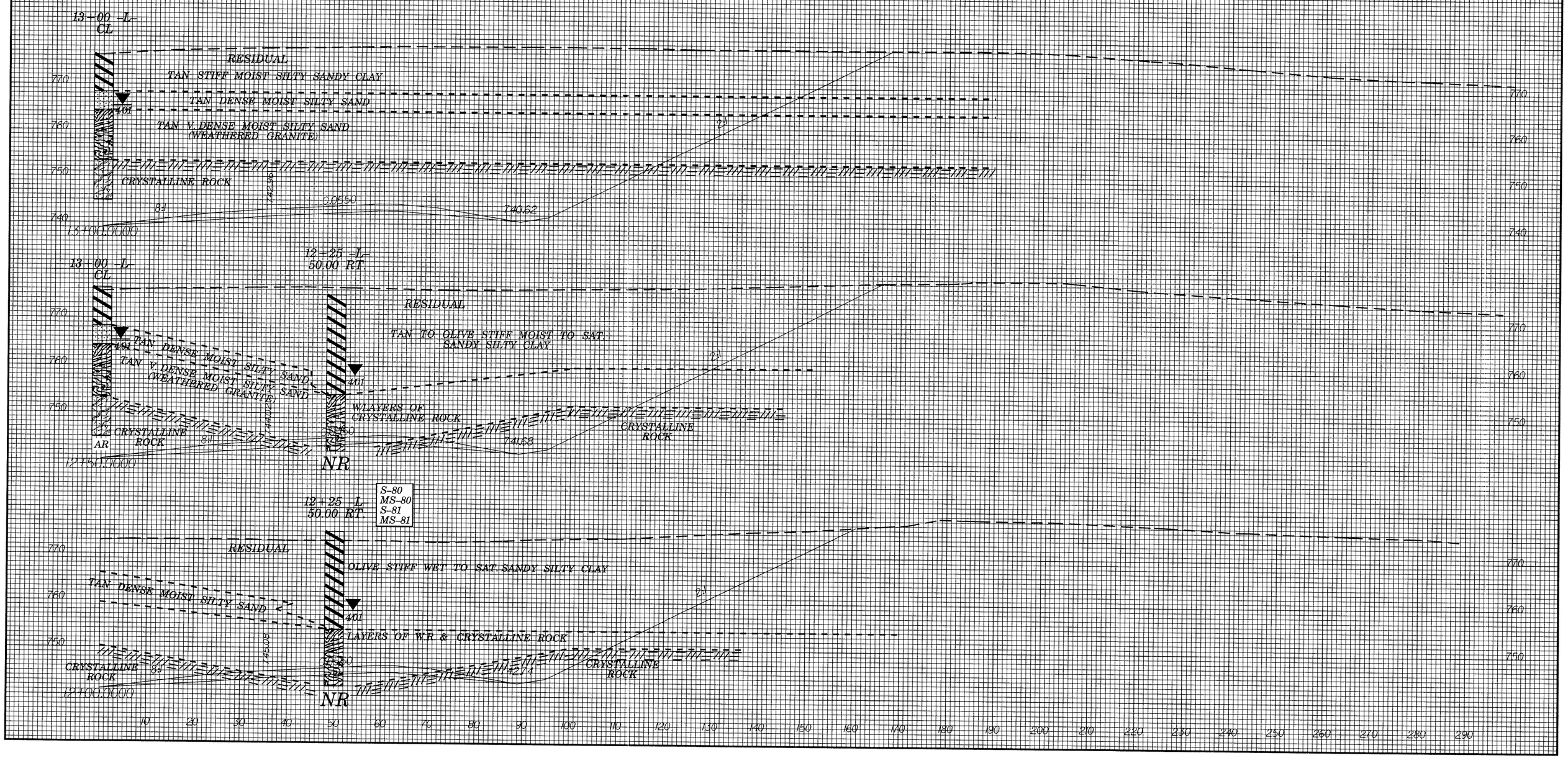


PROJ. REFERENCE NO.	SHEET NO.
R-2606A	X-63
-L- RIGHT OF CENTERLINE	

0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
MS-80	50 RT	12+25	0.00-17.00				0.0	0.0	0.0	0.0		0	0	40.9	-
S-80	50 RT	12+25	0.00-17.00	A-7-6(45)	69	40	0.8	7.6	40.5	51.1	100	100	95	-	-
MS-81	50 RT	12+25	17.00-21.00				0.0	0.0	0.0	0.0		0	0	44.4	-
S-81	50 RT	12+25	17.00-21.00	A-7-5(23)	55	23	2.7	17.0	45.6	34.8	100	99	86	-	-

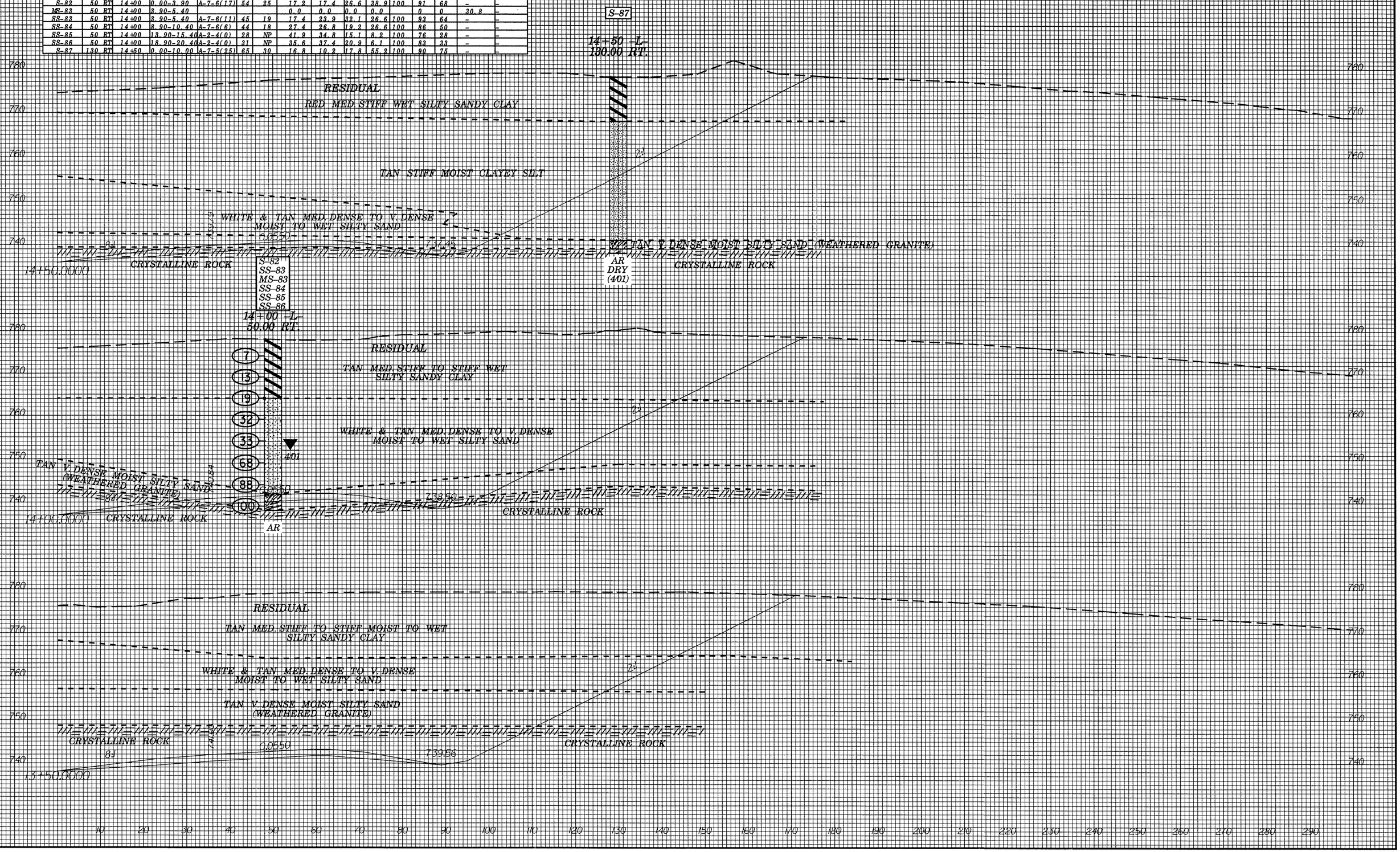


PROJ. REFERENCE NO.	SHEET NO.
R-2606A	X-64
-L- RIGHT OF CENTERLINE	

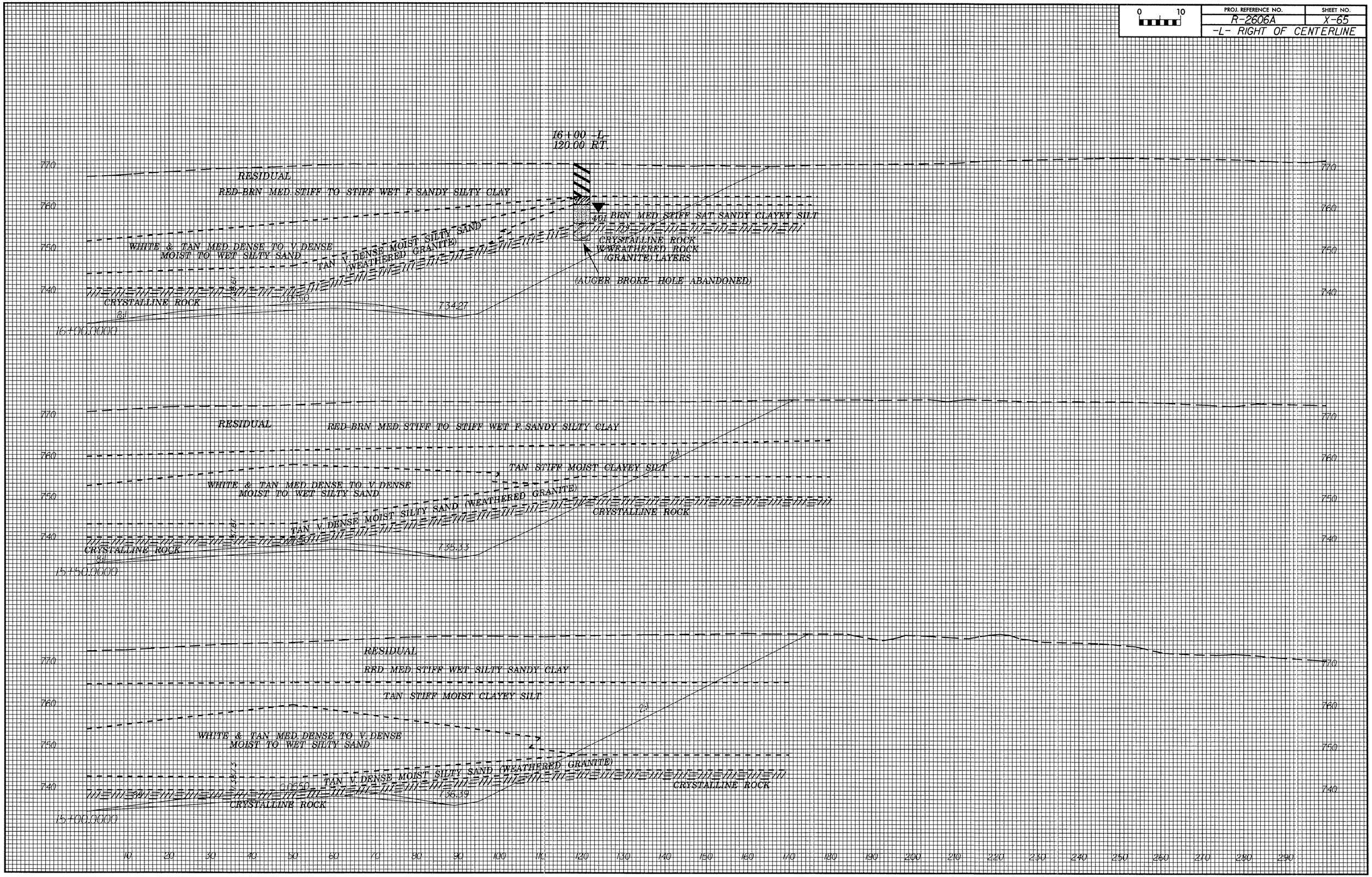
0 10

SOIL TEST RESULTS

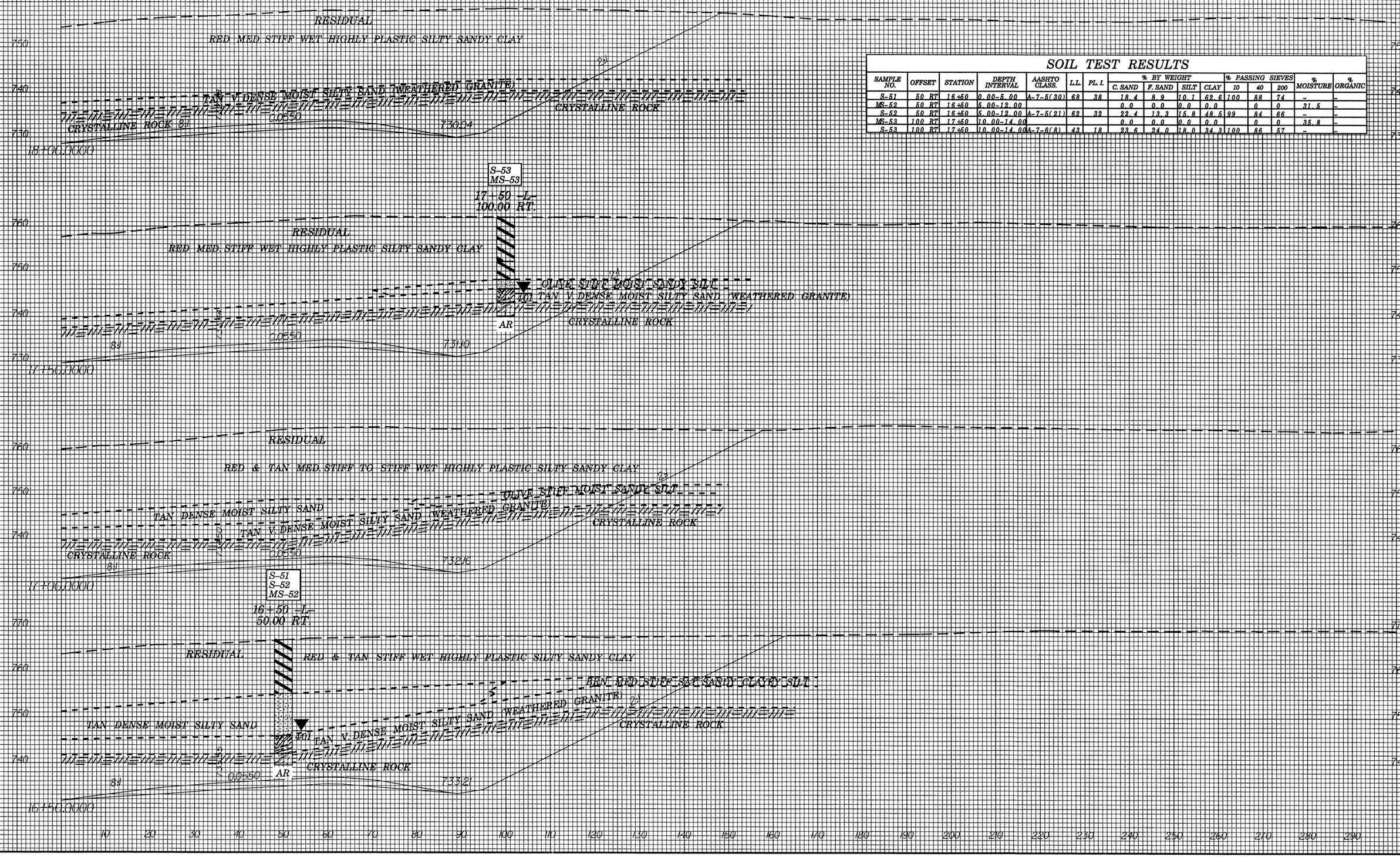
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING SIEVES 10	% PASSING SIEVES 40	% PASSING SIEVES 200	% MOISTURE	% ORGANIC
S-82	50 RT	14+00	0.00-3.90	A-7-6(17)	54	25	17.2	17.4	26.6	38.9	100	91	68	-	-
MS-83	50 RT	14+00	3.90-5.40				0.0	0.0	0.0	0.0		0	0	30.8	-
SS-83	50 RT	14+00	3.90-5.40	A-7-6(11)	45	19	17.4	23.9	32.1	26.6	100	93	64	-	-
SS-84	50 RT	14+00	8.90-10.40	A-7-6(6)	44	18	27.4	26.8	19.2	26.6	100	86	50	-	-
SS-85	50 RT	14+00	13.90-15.40	A-2-4(0)	28	NP	41.9	34.8	15.1	8.2	100	76	28	-	-
SS-86	50 RT	14+00	18.90-20.40	A-2-4(0)	31	NP	35.6	37.4	20.9	6.1	100	83	33	-	-
S-87	130 RT	14+50	0.00-10.00	A-7-5(25)	65	30	16.8	10.2	17.8	55.2	100	90	75	-	-



0 — 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2606A	X-65
	-L- RIGHT OF CENTERLINE	



0 — 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2606A	X-66
	-L- RIGHT OF CENTERLINE	



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-51	50 RT	16+50	0.00-5.00	A-7-5(30)	68	38	18.4	8.9	10.1	62.6	100	88	74	-	-
MS-52	50 RT	16+50	5.00-12.00				0.0	0.0	0.0	0.0		0	0	31.5	-
S-52	50 RT	16+50	5.00-12.00	A-7-5(21)	62	32	22.4	13.3	15.8	48.5	99	84	66	-	-
MS-53	100 RT	17+50	10.00-14.00				0.0	0.0	0.0	0.0		0	0	35.8	-
S-53	100 RT	17+50	10.00-14.00	A-7-6(8)	43	18	23.6	24.0	18.0	34.3	100	86	57	-	-

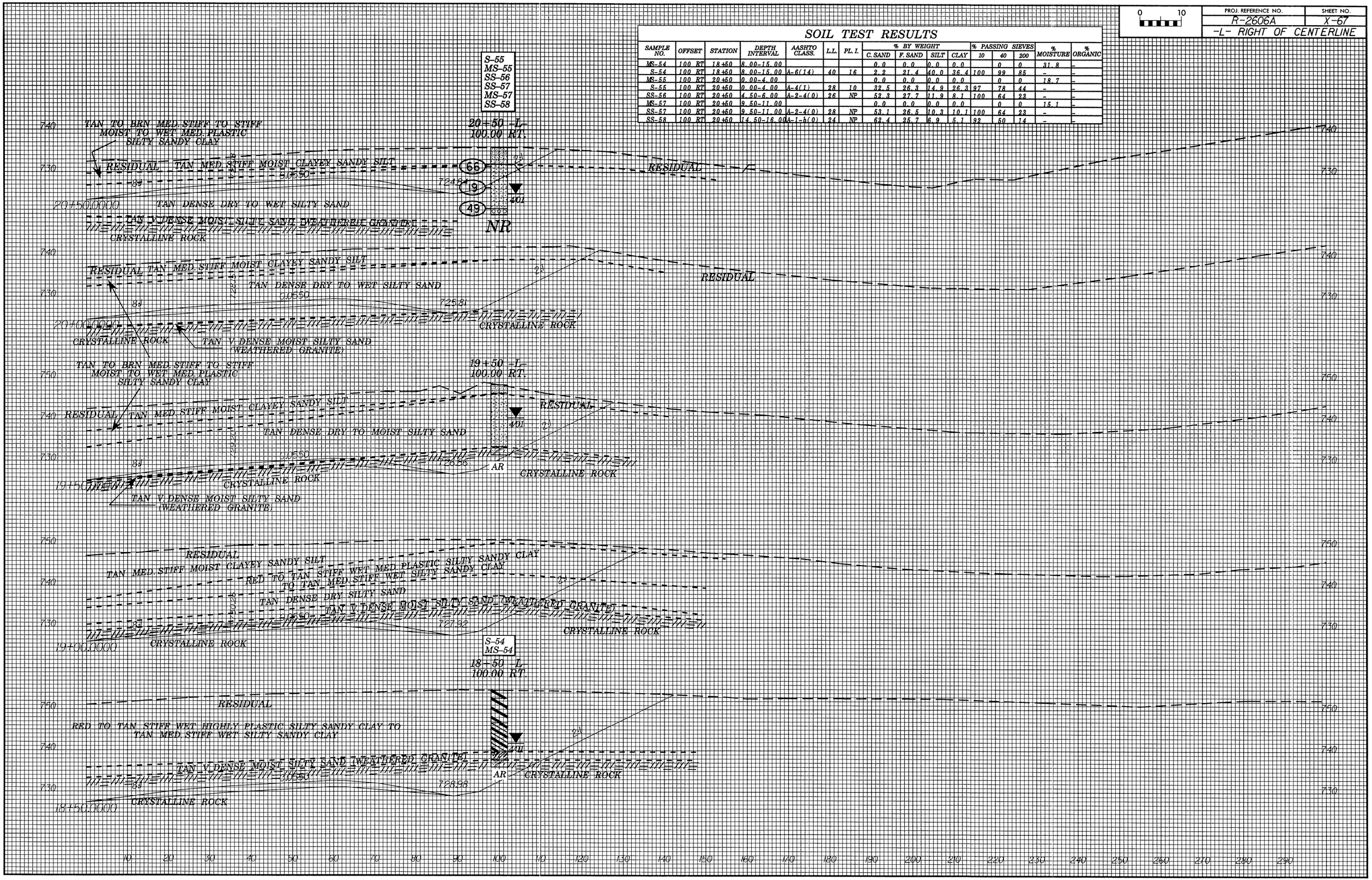
PROJ. REFERENCE NO.	SHEET NO.
R-2606A	X-67

-L- RIGHT OF CENTERLINE

0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
MS-54	100 RT	18+50	8.00-15.00				0.0	0.0	0.0	0.0		0	0	31.8	-
S-54	100 RT	18+50	8.00-15.00	A-6(14)	40	16	2.2	21.4	40.0	36.4	100	99	85	-	-
MS-55	100 RT	20+50	0.00-4.00				0.0	0.0	0.0	0.0		0	0	18.7	-
S-55	100 RT	20+50	0.00-4.00	A-4(1)	28	10	32.5	26.3	14.9	26.3	97	78	44	-	-
SS-56	100 RT	20+50	4.50-6.00	A-2-4(0)	26	NP	52.3	27.7	11.9	8.1	100	64	23	-	-
MS-57	100 RT	20+50	9.50-11.00				0.0	0.0	0.0	0.0		0	0	15.1	-
SS-57	100 RT	20+50	9.50-11.00	A-2-4(0)	28	NP	53.1	26.5	10.3	10.1	100	64	23	-	-
SS-58	100 RT	20+50	14.50-16.00	A-1-b(0)	24	NP	62.4	25.7	6.9	5.1	92	50	14	-	-

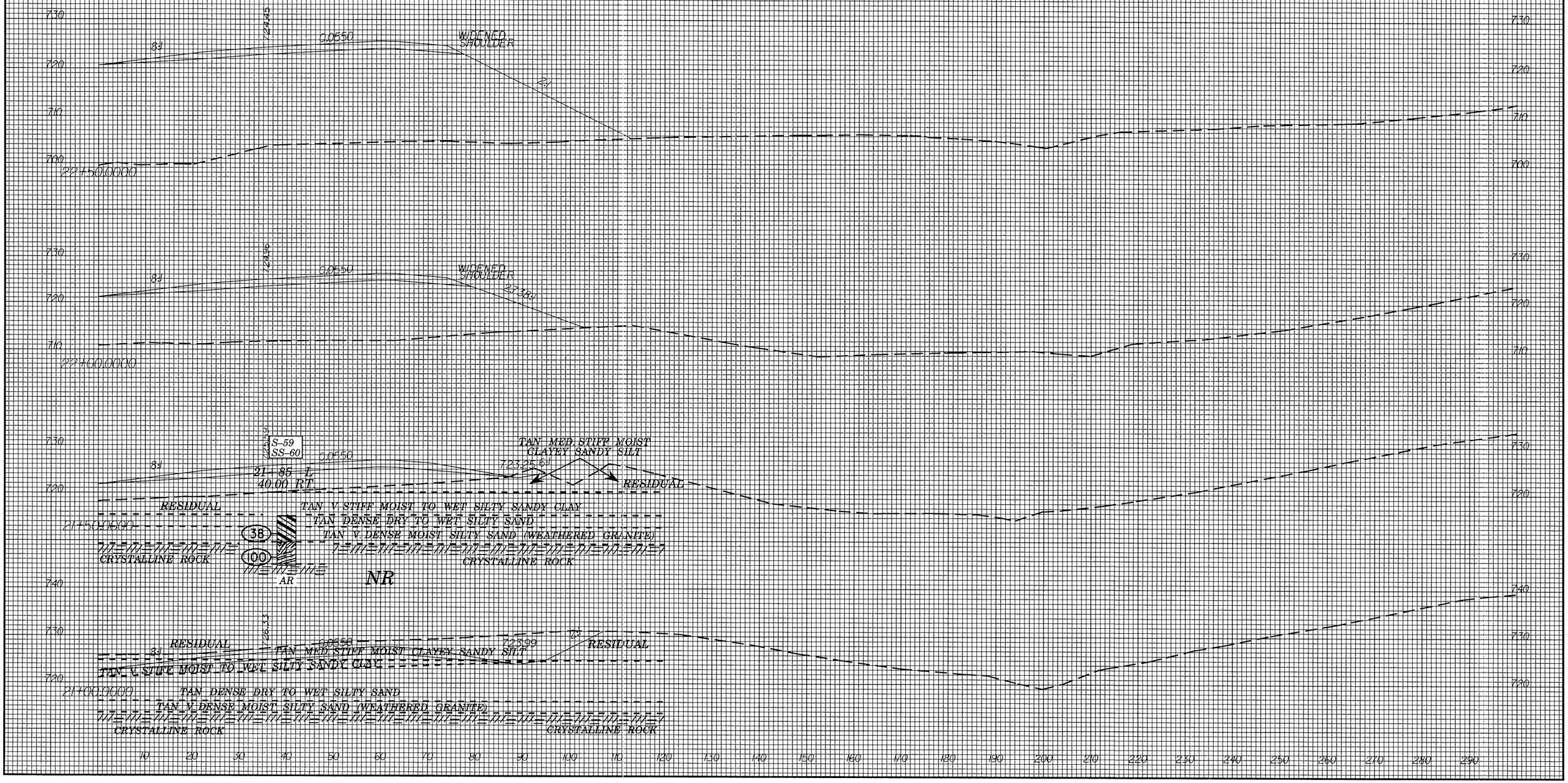


PROJ. REFERENCE NO.	SHEET NO.
R-2606A	X-68
-L- RIGHT OF CENTERLINE	

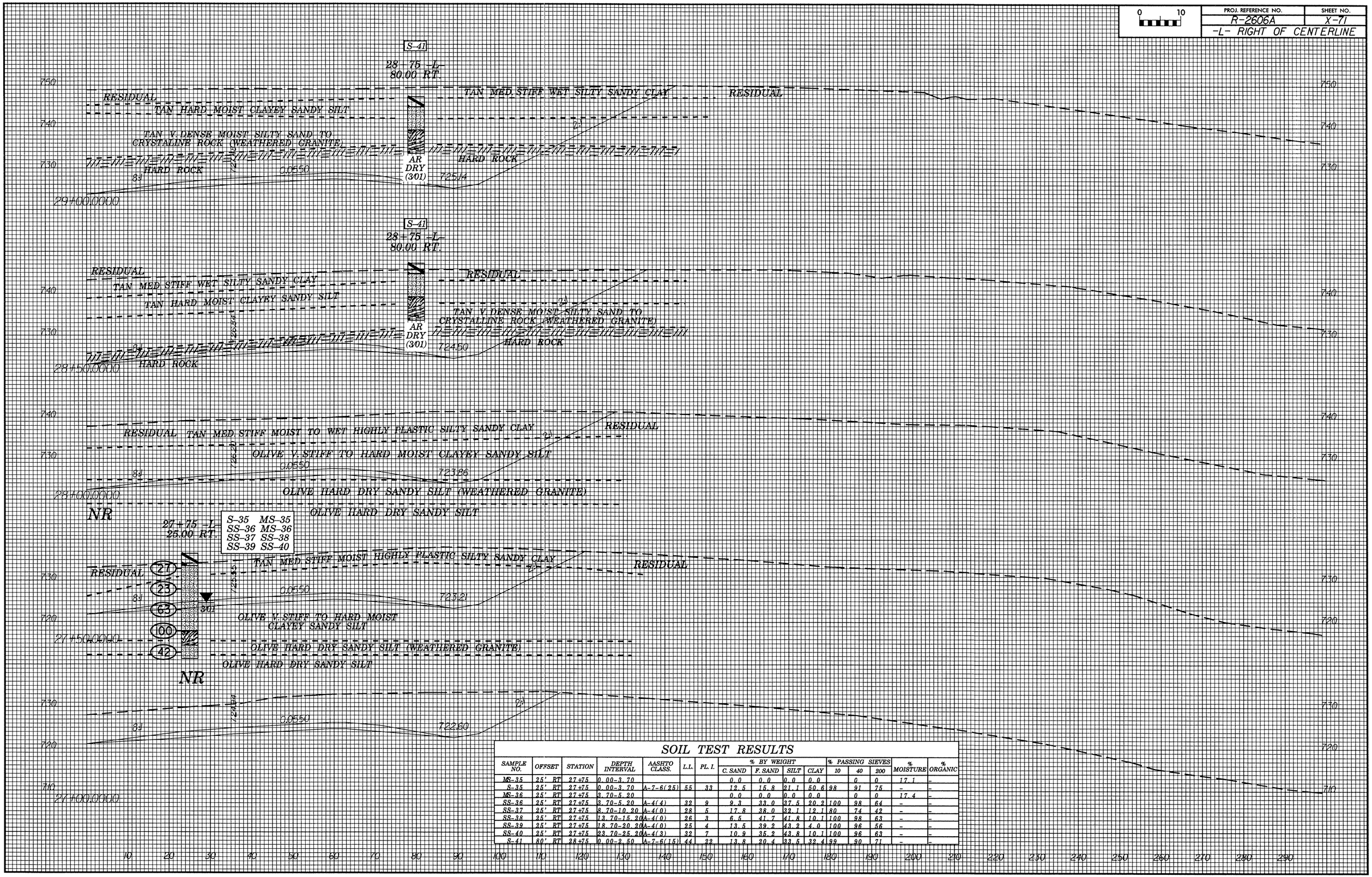
0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-59	40 RT	21+85	0.00-3.80	A-6(1)	28	11	32.2	23.7	17.8	26.3	87	67	42	-	-
SS-60	40 RT	21+85	3.80-5.30	A-6(1)	28	11	23.6	30.4	23.8	22.2	82	72	43	-	-



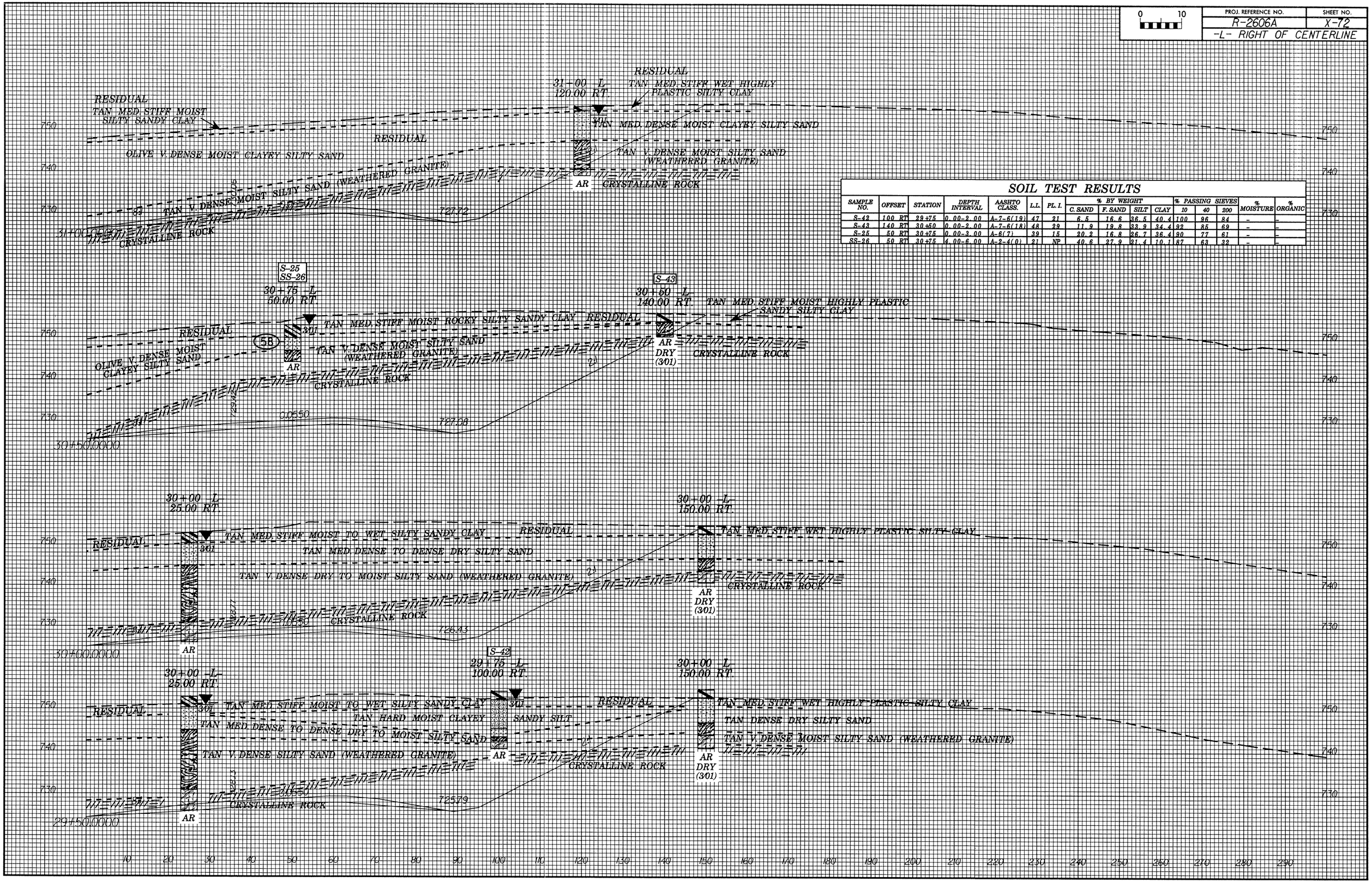
PROJ. REFERENCE NO.	SHEET NO.
R-2606A	X-71
-L- RIGHT OF CENTERLINE	



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
MS-35	25' RT	27+75	0.00-3.70				0.0	0.0	0.0	0.0		0	0	17.1	-
S-35	25' RT	27+75	0.00-3.70	A-7-6(25)	55	33	12.5	15.8	21.1	50.6	98	91	75	-	-
MS-36	25' RT	27+75	3.70-5.20				0.0	0.0	0.0	0.0		0	0	17.4	-
SS-36	25' RT	27+75	3.70-5.20	A-4(4)	32	9	9.3	33.0	37.5	20.2	100	98	64	-	-
SS-37	25' RT	27+75	8.70-10.20	A-4(0)	28	5	17.8	38.0	32.1	12.1	80	74	42	-	-
SS-38	25' RT	27+75	13.70-15.20	A-4(0)	26	3	6.5	41.7	41.8	10.1	100	98	63	-	-
SS-39	25' RT	27+75	18.70-20.20	A-4(0)	25	4	13.5	39.2	43.2	4.0	100	96	56	-	-
SS-40	25' RT	27+75	23.70-25.20	A-4(3)	32	7	10.9	35.2	43.8	10.1	100	96	63	-	-
S-41	80' RT	28+75	0.00-2.50	A-7-6(15)	44	22	13.8	20.4	33.5	32.4	99	90	71	-	-

0 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2606A	X-72
	-L- RIGHT OF CENTERLINE	



SOIL TEST RESULTS

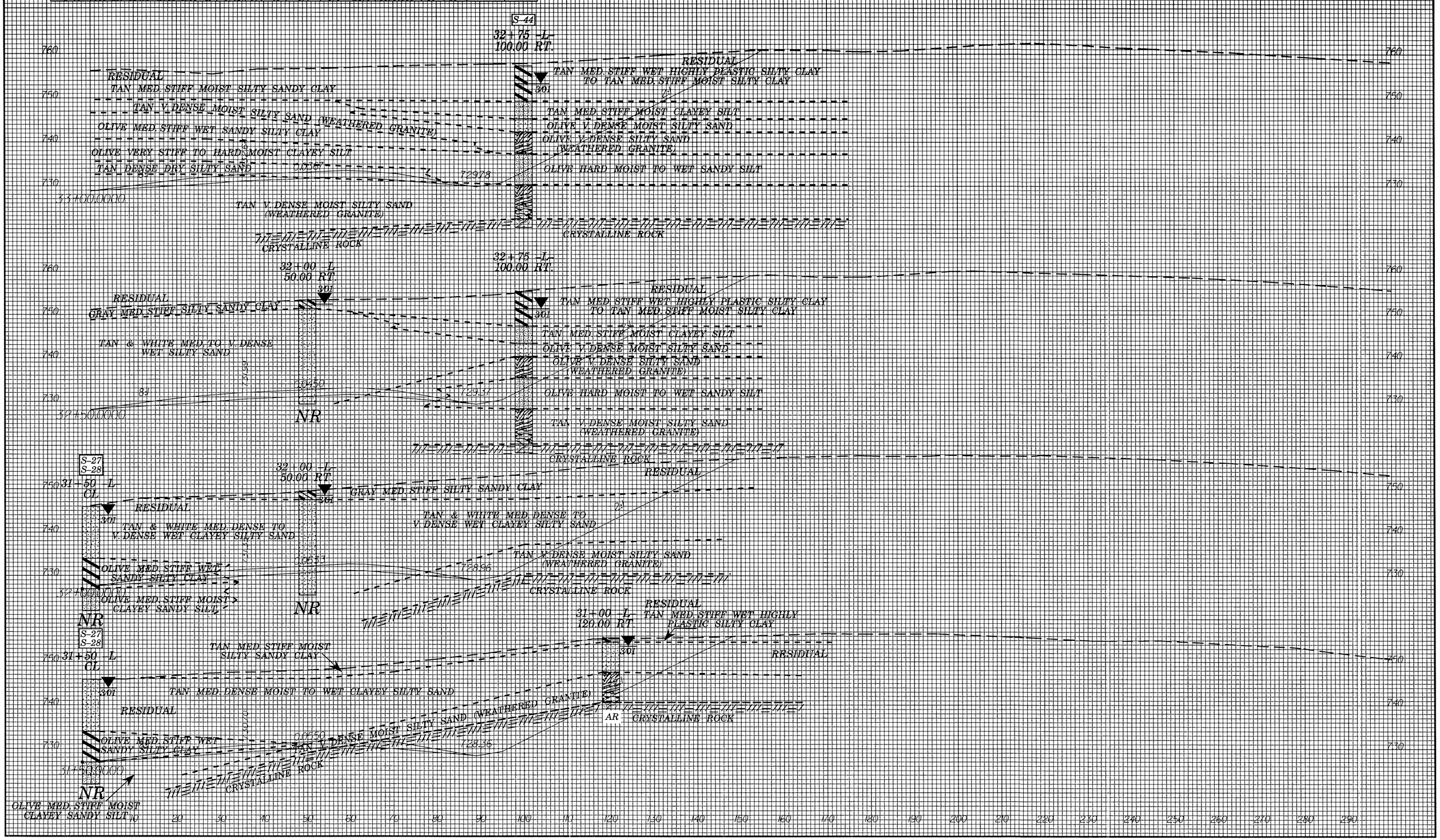
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-42	100 RT	29+75	0.00-2.00	A-7-6(19)	47	21	6.5	16.6	36.5	40.4	100	96	84	-	-
S-43	140 RT	30+50	0.00-2.00	A-7-6(18)	48	29	11.9	19.8	33.9	34.4	92	85	69	-	-
S-25	50 RT	30+75	0.00-3.00	A-6(7)	39	15	20.2	16.8	26.7	36.4	90	77	61	-	-
SS-26	50 RT	30+75	4.00-6.00	A-2-4(0)	21	NP	40.6	27.9	21.4	10.1	87	63	32	-	-

PROJ. REFERENCE NO.	SHEET NO.
R-2606A	X-73
-L- RIGHT OF CENTERLINE	

0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-27	CL	31+50	12.00-19.00	A-7-6(17)	44	18	4.6	13.1	45.9	36.4	100	97	87	-	-
SS-28	CL	31+50	19.00-24.00	A-4(3)	28	9	8.3	35.6	31.9	24.2	100	97	62	-	-
S-44	100 RT	32+75	0.00-4.00	A-7-6(42)	67	45	6.7	9.9	32.9	50.6	100	96	86	-	-

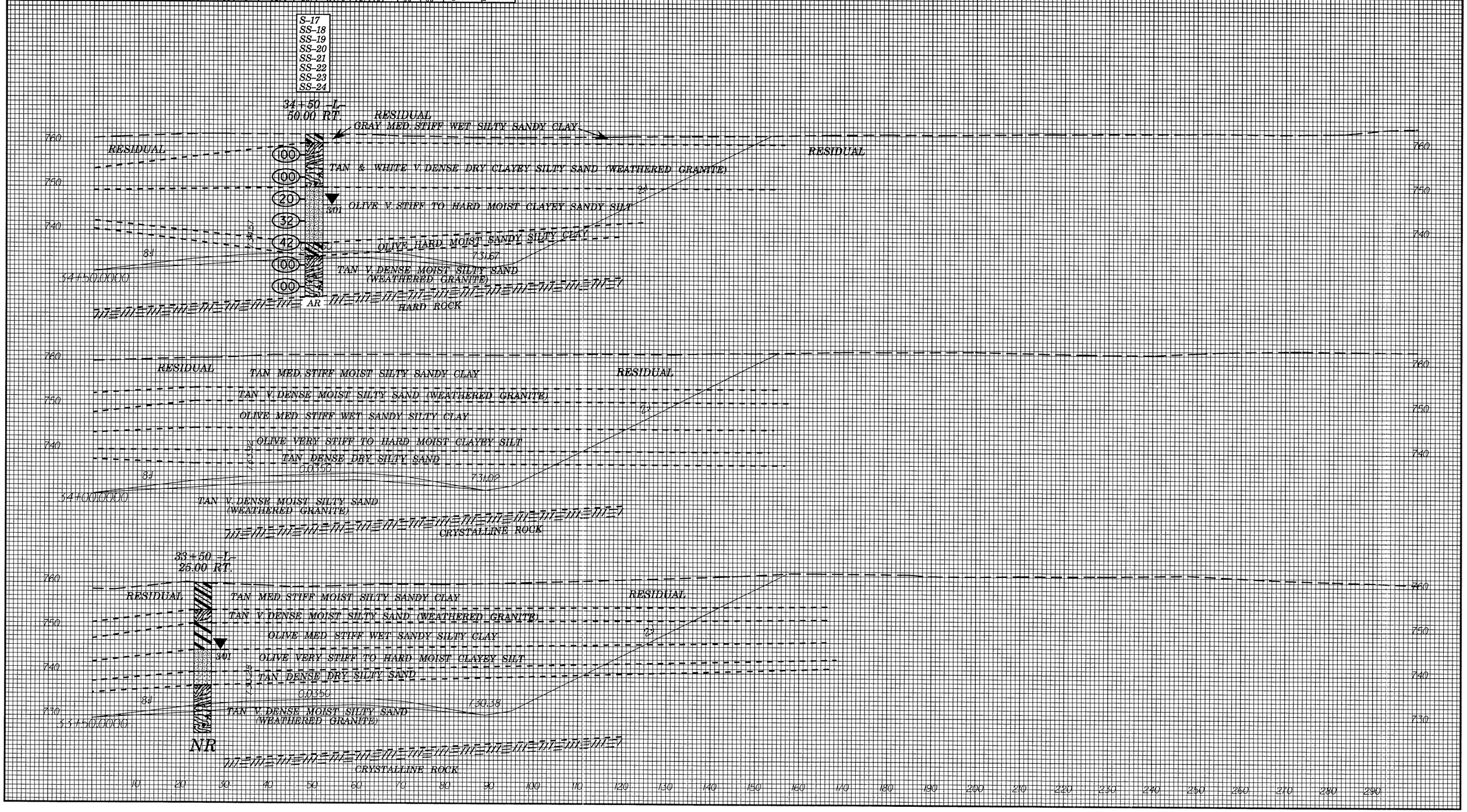


PROJ. REFERENCE NO.	SHEET NO.
R-2606A	X-74
-L- RIGHT OF CENTERLINE	

0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-17	50 RT	34+50	0.00-2.00	A-6(5)	33	17	31.3	20.2	24.2	24.3	95	77	50	-	-
SS-18	50 RT	34+50	4.70-6.20	A-2-4(0)	21	4	47.7	25.1	17.1	10.1	96	67	30	-	-
SS-19	50 RT	34+50	9.70-11.20	A-2-4(0)	19	NP	52.8	23.9	19.3	4.0	86	53	23	-	-
SS-20	50 RT	34+50	14.70-16.20	A-4(5)	40	6	3.4	34.6	49.8	12.1	100	99	71	-	-
SS-21	50 RT	34+50	19.70-21.70	A-4(6)	37	7	2.6	32.0	51.3	14.2	100	99	76	-	-
SS-22	50 RT	34+50	24.70-26.20	A-6(6)	39	11	9.5	34.4	46.0	10.1	100	99	65	-	-
SS-23	50 RT	34+50	29.70-31.20	A-4(5)	39	9	15.2	23.1	43.6	18.2	95	86	65	-	-
SS-24	50 RT	34+50	34.70-36.20	A-4(3)	33	6	12.1	28.7	47.0	12.1	97	90	65	-	-

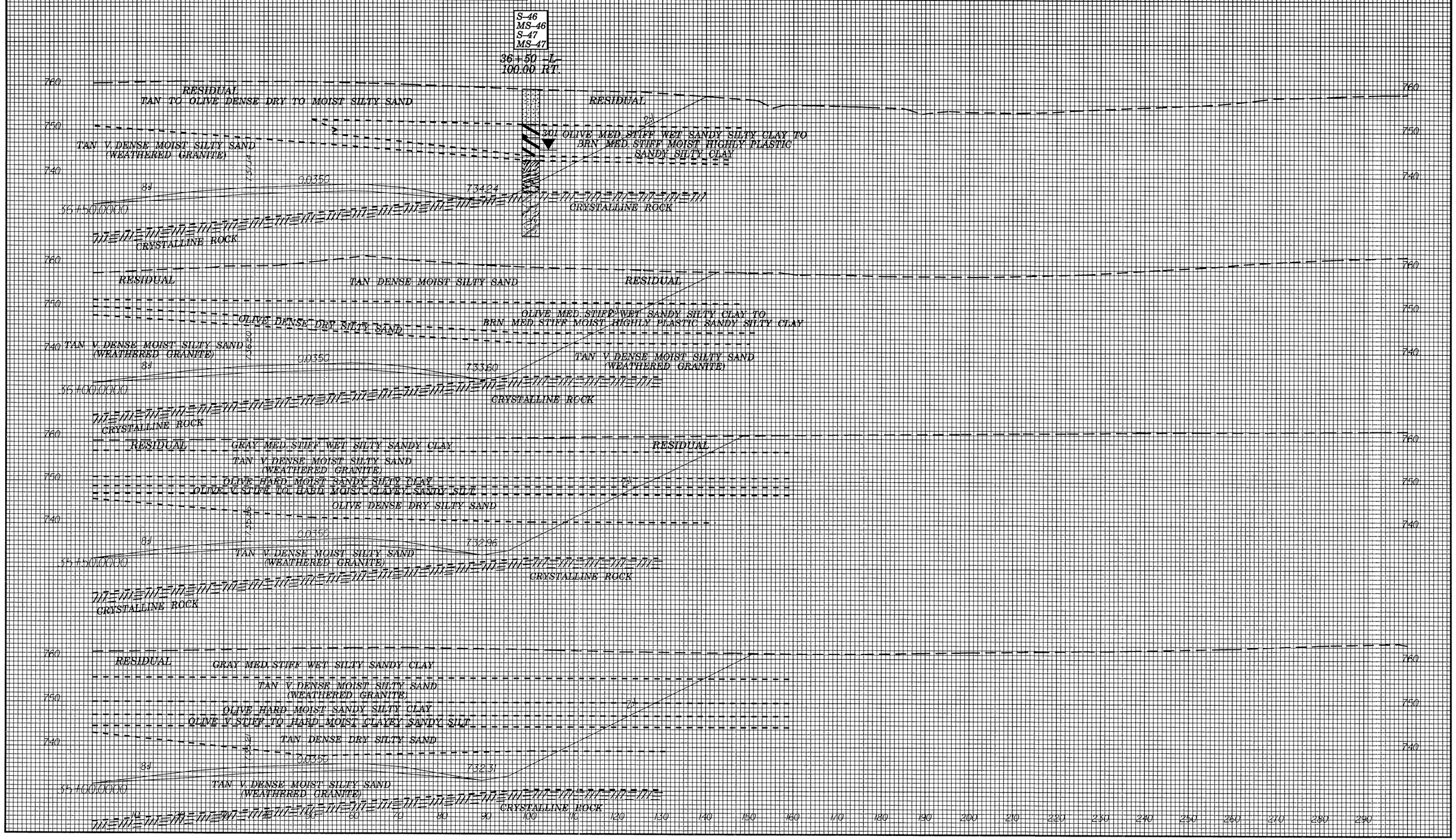


PROJ. REFERENCE NO.	SHEET NO.
R-2606A	X-75
-L- RIGHT OF CENTERLINE	

0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-46	100 RT	36+50	3.00-11.00	A-7-6(14)	43	18	9.5	19.0	35.2	36.4	100	94	78	-	-
MS-46	100 RT	36+50	8.00-11.00				0.0	0.0	0.0	0.0		0	0	53.8	-
MS-47	100 RT	36+50	11.00-15.00				0.0	0.0	0.0	0.0		0	0	27.4	-
S-47	100 RT	36+50	11.00-15.00	A-7-6(21)	63	35	20.6	18.4	18.6	42.4	99	87	63	-	-

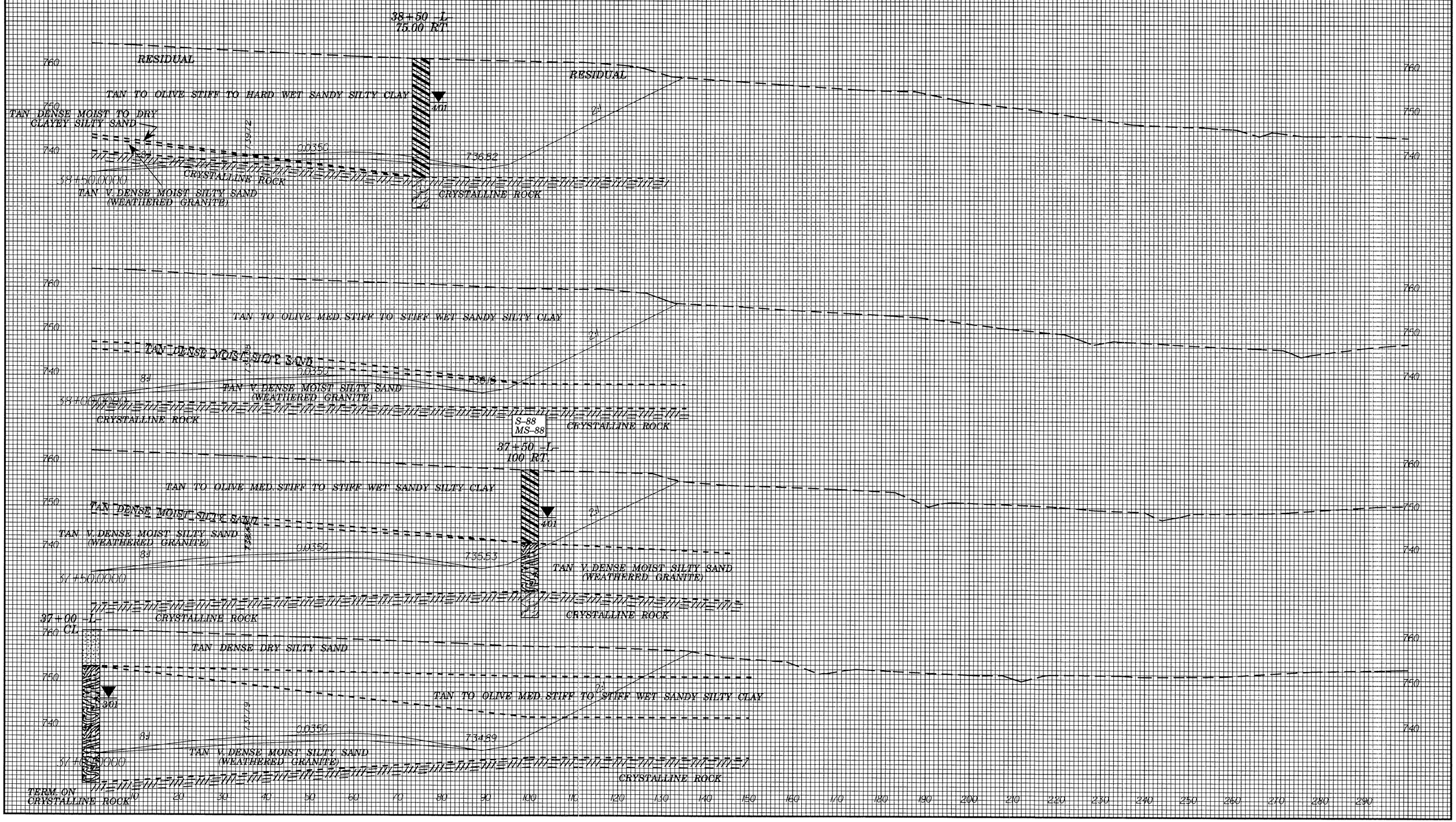


PROJ. REFERENCE NO.	SHEET NO.
R-2606A	X-76
-L- RIGHT OF CENTERLINE	

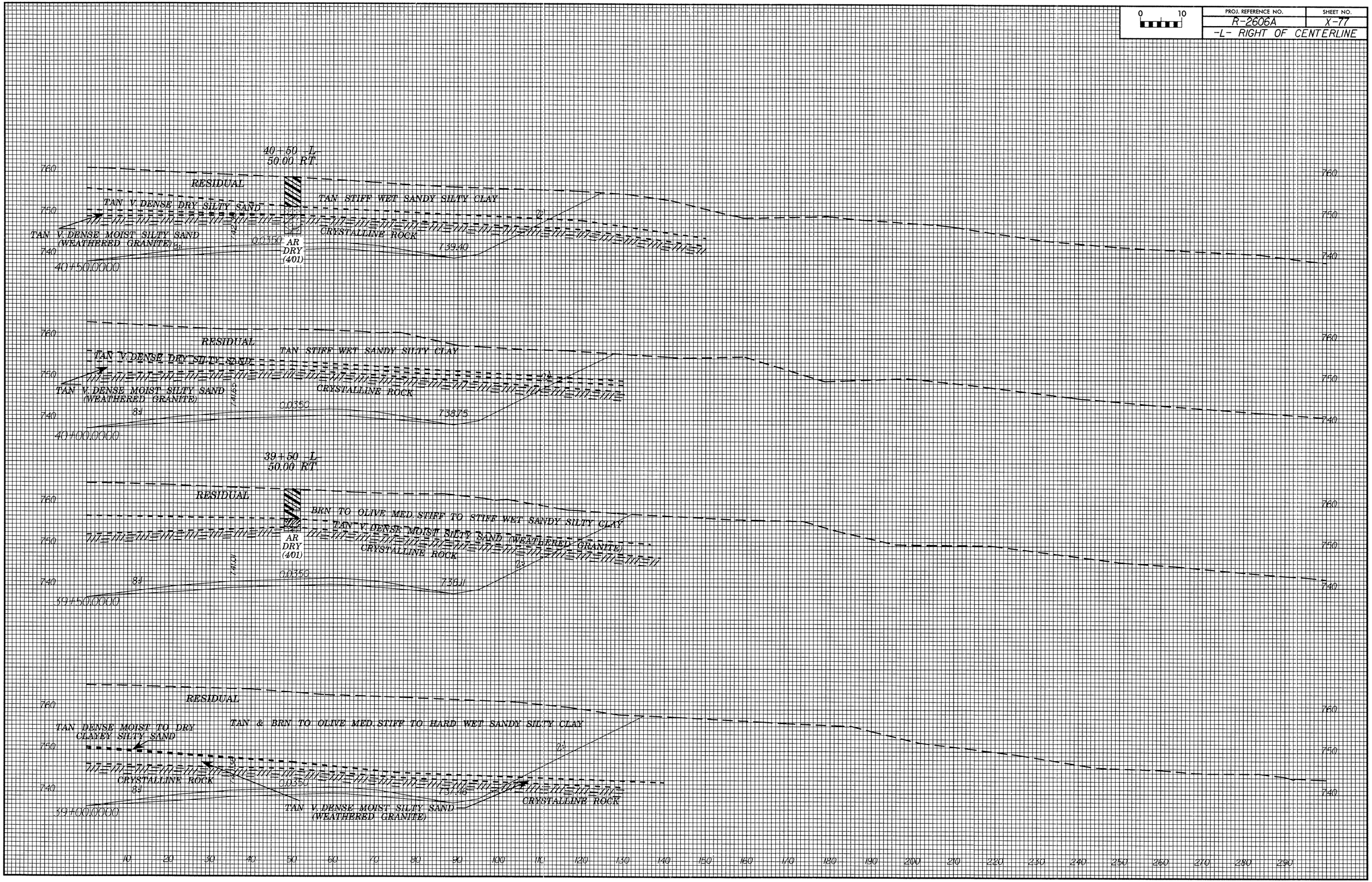
0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
MS-88	100 RT	37+50	4.00-13.00				0.0	0.0	0.0	0.0		0	0	28.2	-
S-88	100 RT	37+50	4.00-13.00	A-6(9)	40	14	12.7	24.8	34.3	28.2	100	95	68	-	-



0 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2606A	X-77
	-L- RIGHT OF CENTERLINE	

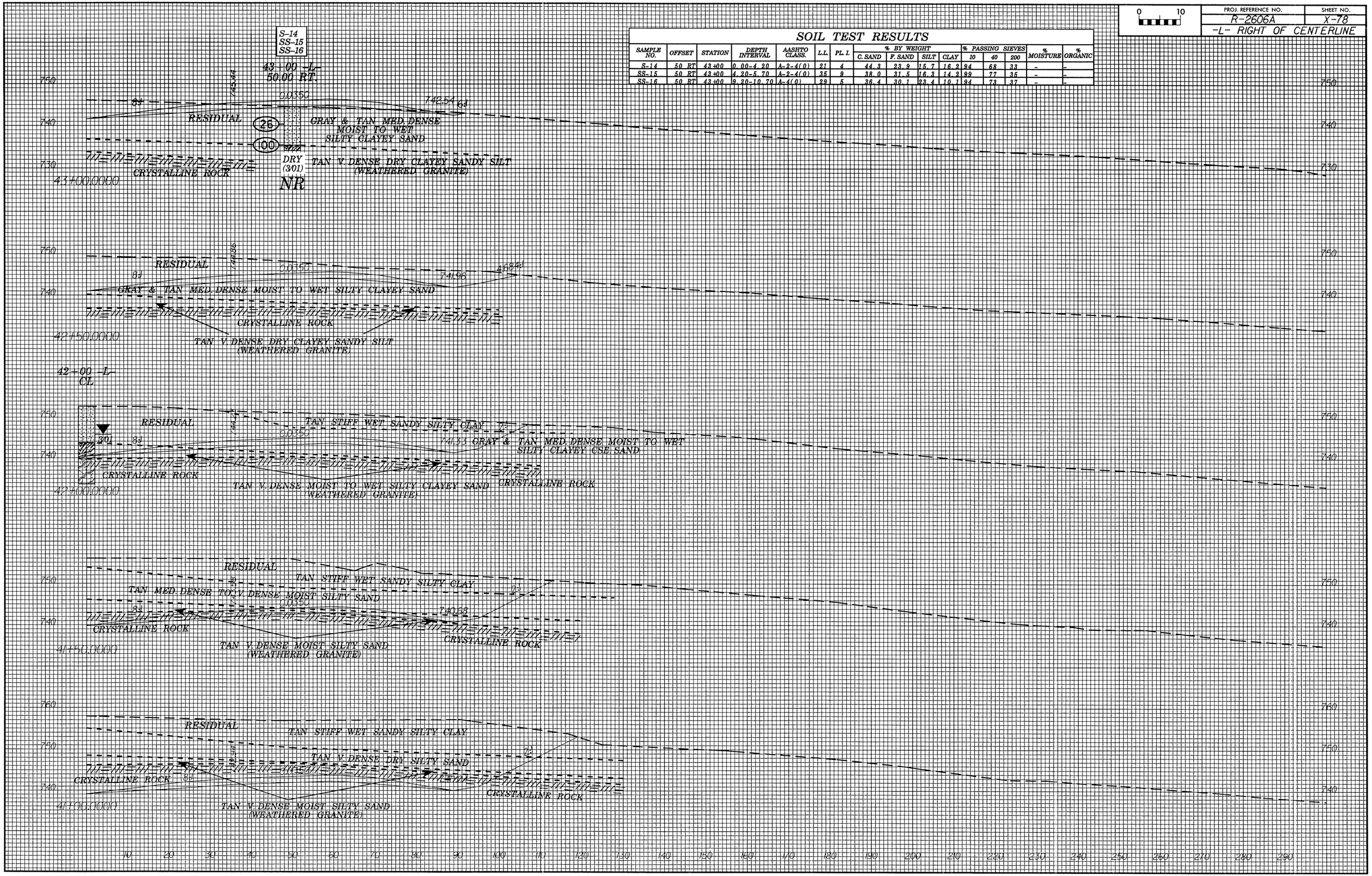


PROJ. REFERENCE NO.	SHEET NO.
R-2606A	X-78
-L- RIGHT OF CENTERLINE	

0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
S-14	50 RT	43+00	0.00-4.20	A-2-4(0)	21	4	44.3	23.9	15.7	16.2	94	68	33	-	-
SS-15	50 RT	43+00	4.20-5.70	A-2-4(0)	35	9	38.0	31.5	16.3	14.2	99	77	35	-	-
SS-16	50 RT	43+00	9.20-10.70	A-4(0)	29	5	36.4	30.1	23.4	10.1	94	73	37	-	-

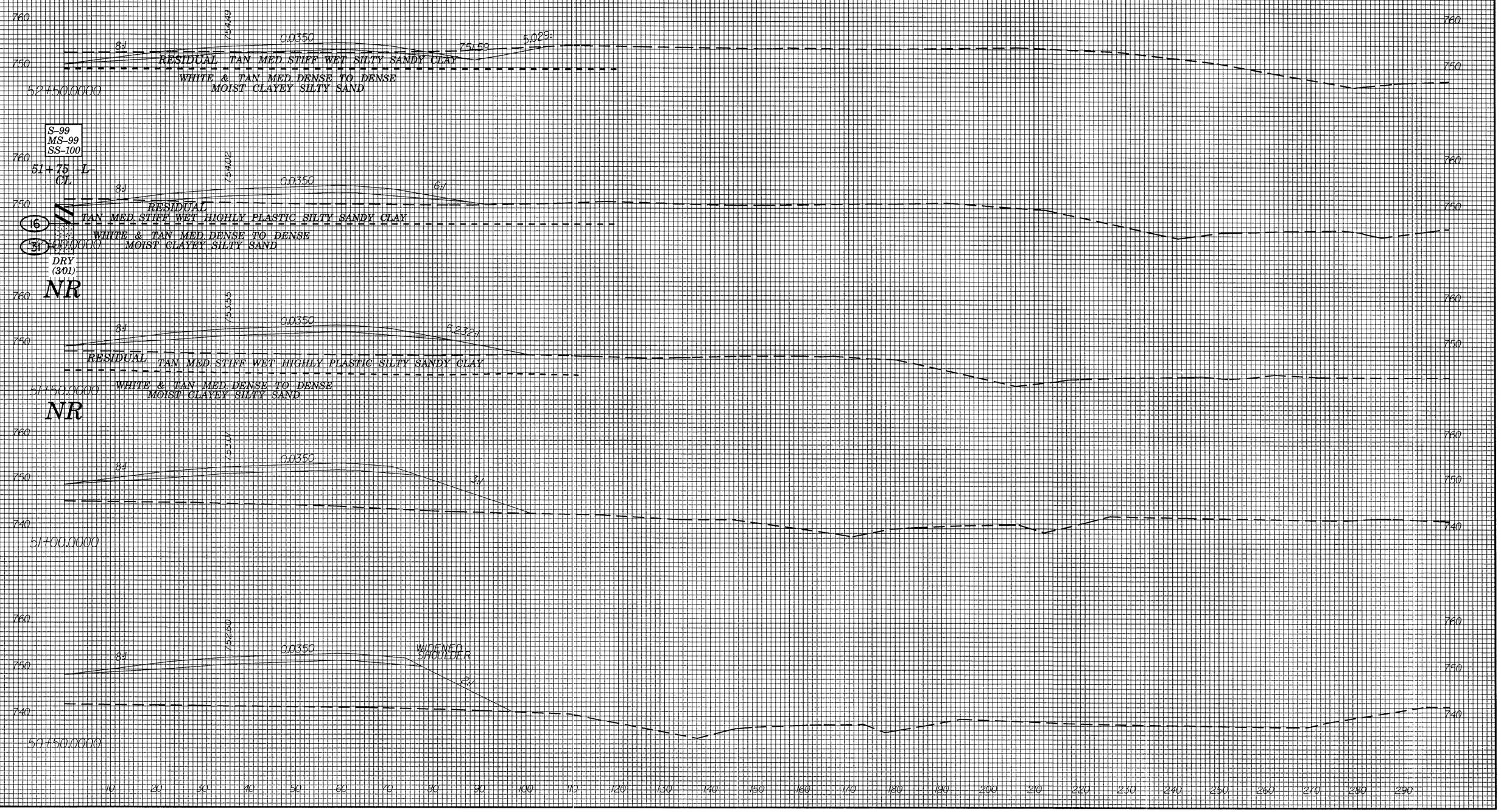


PROJ. REFERENCE NO.	SHEET NO.
R-2606A	X-83
-L- RIGHT OF CENTERLINE	

0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
MS-99	CL	51+75	0.00-4.20				0.0	0.0	0.0	0.0		0	0	25.2	-
S-99	CL	51+75	0.00-4.20	A-7-6(21)	55	31	17.1	16.5	18.0	48.3	100	90	70	-	-
SS-100	CL	51+75	4.20-5.70	A-2-4(0)	30	7	43.7	28.2	14.0	14.1	100	74	33	-	-

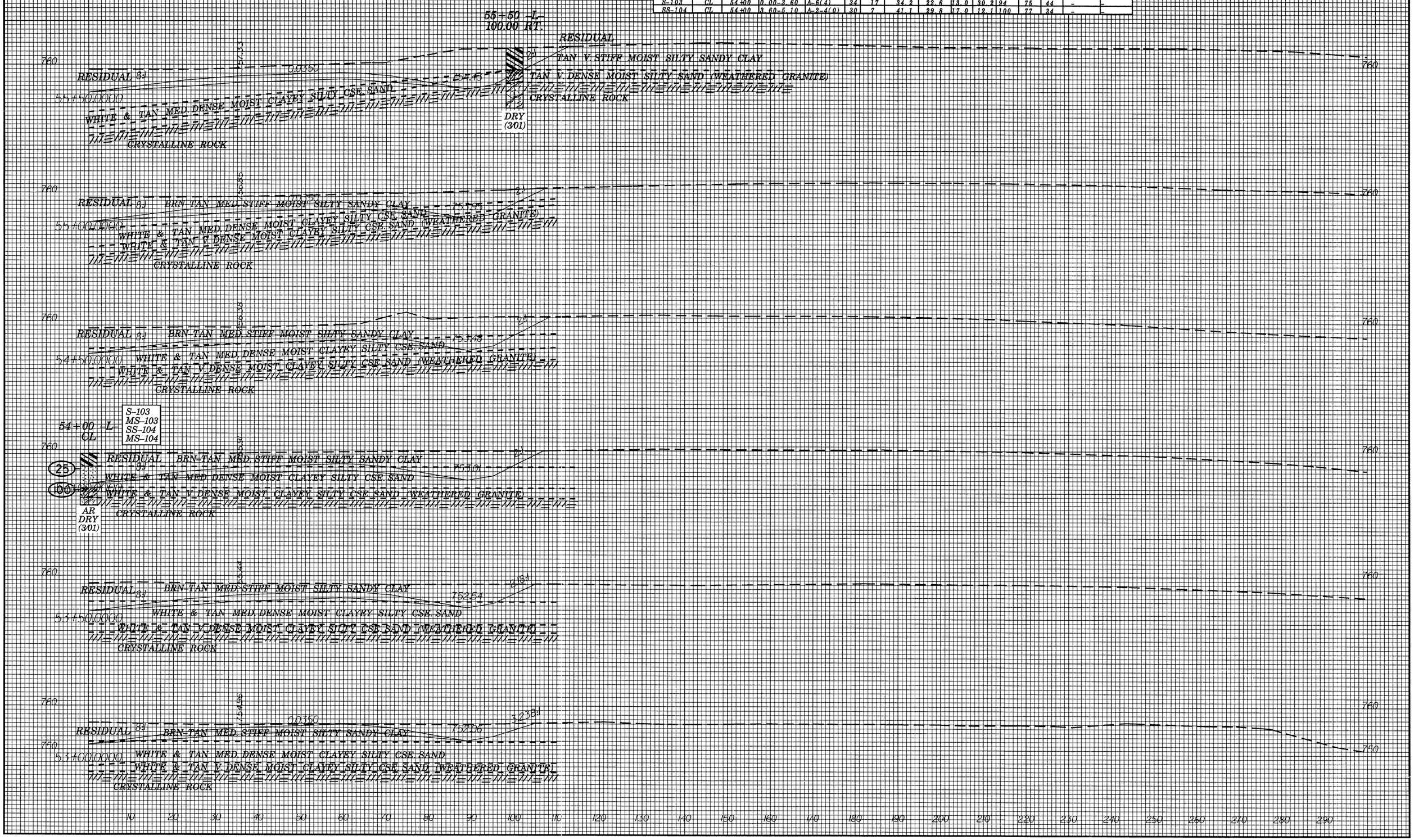


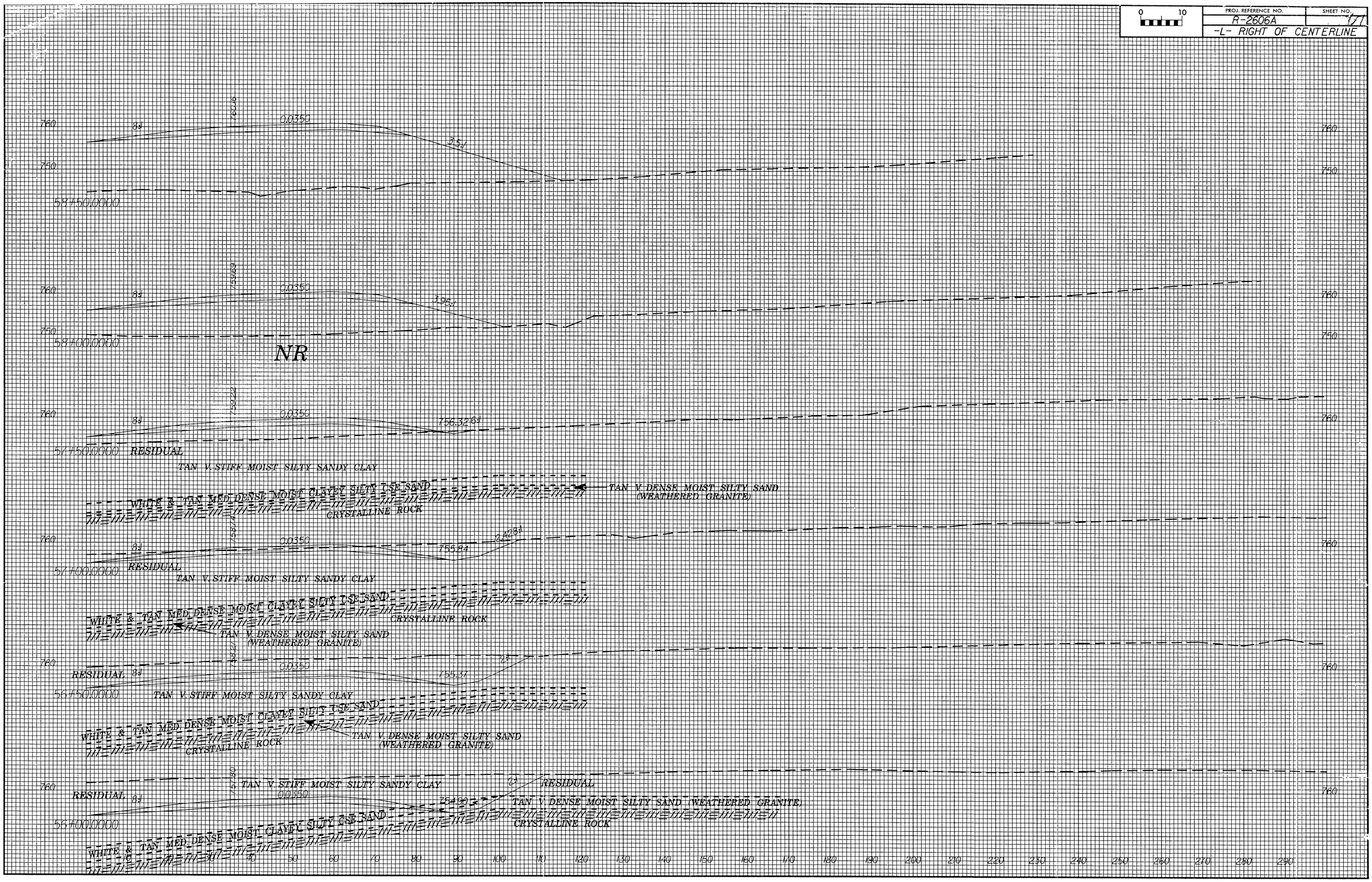
PROJ. REFERENCE NO.	SHEET NO.
R-2606A	X-84
-L- RIGHT OF CENTERLINE	

0 10

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING SIEVES 10	% PASSING SIEVES 40	% PASSING SIEVES 200	% MOISTURE	% ORGANIC
MS-103	CL	54+00	0.00-3.00				0.0	0.0	0.0	0.0		0	0	19.5	-
S-103	CL	54+00	0.00-3.60	A-6(4)	34	17	34.2	22.6	13.0	30.2	94	75	44	-	-
SS-104	CL	54+00	3.60-5.10	A-2-4(0)	30	7	41.1	29.8	17.0	12.1	100	77	34	-	-





0 10
PROJ. REFERENCE NO.
R-2606A
SHEET NO.
-L- RIGHT OF CENTERLINE
760
750
58+50.0000
8:1
760.16
0.0350
3.5:1
58+00.0000
759.69
3.95:1
NR
57+50.0000
759.22
756.32
6:1
RESIDUAL
TAN V. STIFF MOIST SILTY SANDY CLAY
WHITE & TAN MED DENSE MOIST CLAYEY SILTY CSE SAND
TAN V. DENSE MOIST SILTY SAND (WEATHERED GRANITE)
CRYSTALLINE ROCK
57+00.0000
758.74
755.84
2.428:1
56+50.0000
758.27
755.37
2:1
56+00.0000
757.80
754.90
2:1
10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290