STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

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GOVERNOR

DIVISION OF HIGHWAYS
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January 6, 1998

STATE PROJECT:	6.499002T (R-2413C)
FEDERAL PROJECT:	N/A
COUNTY:	Guilford and Rockingham
DESCRIPTION:	NC 68 Connector - US 220 from South of Haw River to the Intersection of US 220 and Existing NC 68
SUBJECT:	Geotechnical Report - Inventory

The project is located in northern Guilford and southern Rockingham Counties. US 220 is to be upgraded to a four-lane facility from south of the Haw River to NC 68. The total length of the project is 8.16 kilometers. Construction will include two reinforced concrete box culverts and five structures.

A field reconnaissance and subsurface investigation was conducted from November 1996 to May 1997 utilizing CME-45B, and CME-550 drill machines. Subsurface data was obtained by hand, solid, and hollow stem auger borings, with the use of Standard Penetration Tests at select locations. Soil samples were submitted for laboratory analysis by the Materials and Tests Unit.

Subsurface information is provided for the following alignments.

Line	Station
-LRev1-	13+50 - 19+09
-LRev-	18+20 - 97+10
-SB US 220 Ramp-	8+99 - 19+02
-NB US 220 Ramp-	9+95 - 15+78
-Y20-	10+00 - 28+75
-Y21-	10+00 - 18+69
-Y23-	8+83 - 17+67
-Ramp A- @ US 158	10+00 - 15+36

Line	Station
-Ramp B- @ US 158	10+00 - 14+51
-Ramp C- @ US 158	10+00 - 14+40
-Ramp D- @ US 158	10+00 - 14+33
-Y24-	10+00 - 13+42
-Y25-	10+00 - 14+18
-Ramp A- @ NC 65	10+00 - 14+77
-Ramp B- @ NC 65	10+00 - 14+25
-Ramp C- @ NC 65	10+00 - 14+13
-Ramp D- @ NC 65	10+00 - 14+88

All other alignments were investigated and no subsurface profiles were deemed necessary.

AREAS OF SPECIAL GEOTECHNICAL INTEREST

1) Hard rock
Hard rock is present above or within two meters of proposed grade at the following locations.

Line	Station
-LRev-	31+15 - 32+42
-LRev-	52+52 - 54+25
-SB US 220 Ramp-	16+98 - 17+30
-Ramp B- @ US 158	13+34 - 14+34
-Y20-	14+45 - 15+55

2) Highly Plastic Soils
Highly plastic soils with plastic indices of 35 or greater are present within construction limits at the following locations:

Line	Station
-SB US 220 Ramp-	14+25 - 15+10
-Y20-	27+20 - 28+72
-Ramp B- @ NC 65	11+90 - 14+19

3) Groundwater
Groundwater is present above or within two meters of proposed grade at the following locations.

Line	Station
-LRev-	18+00 - 19+00
-LRev-	32+80 - 35+80

Line	Station
-LRev-	50+00 - 50+80
-Y20-	10+00 - 11+20
-Ramp B- @ US 158	13+00 - 14+40
-Ramp D- @ US 158	13+00 - 14+33
-Y25-	10+00 - 11+00

4) Soft Alluvial Soils
Soft saturated unstable alluvial soils are present within construction limits at the following locations. The ground surface is soft and unstable under heavy equipment and may result in construction problems.

Line	Station
-LRev-	22+80 - 23+90 *
-LRev-	24+70 - 25+30
SB US 220 Ramp	10+18 - 11+30

* Note - This segment includes NB US 220 Ramp 15+27 - 15+78

5) Water Wells
Water wells are present within construction limits and/or proposed right of way at the following locations.

Line	Station	Offset
-LRev1-	15+80	32 m LT
-LRev-	33+36	12 m RT
-LRev-	34+82	15 m LT
-LRev-	35+26	22 m LT
-LRev-	60+76	15 m RT
-LRev-	65+35	11 m RT
-Ramp B- @ NC 65	11+43	6 m LT
-Y10Rev-	10+00	29 m RT
-Y20-	10+76	15 m LT

6) Artificial Fill
Artificial fill soils are present within construction limits at Ramp B at US 158 Station 12+30-13+00. The approximate limits of this material are delineated on the plan and profile sheets.

7) Trash and Debris
Numerous tires are located on the ground surface within proposed right of way along Ramp B at US 158 Station 12+00 to 13+00.

PHYSIOGRAPHY AND GEOLOGY

The topography of the area is gently rolling to hilly, with a maximum relief of 54 meters and a greatest local relief of 53 meters. Drainage along the project is collected into two river basins, the Dan River basin, north of NC 65, which drains to the north-northeast, and the Haw River basin, south of NC 65, which drains to the east-northeast. Drainage along the southern part of the project is relatively poor, causing water to collect in the relatively low and flat Troublesome Creek and Haw River flood plains. Drainage along the northern portion of the project is good. Along the project, drainage is structurally controlled by the northeast strike of the bedrock foliation.

Geologically, the project is underlain by schists and gneisses of the Milton Belt and a granitic intrusion of the Charlotte Belt. Most prominent on the project, is intrusive igneous granitic rock. The bedrock is covered by saprolite and other residuum, and a substantial alluvial deposit in the flood plain of the Haw River.

SOIL PROPERTIES

Residual soils on the project consist predominantly of yellow to brown-gray sandy silt and silt (A-4, A-5), and silty sand (A-2-4). Silty to sandy clay and clay (A-6, A-7), and clayey sand and sand (A-2-6 and A-1-b) are also locally present. Cap or surface clays extend to an average depth of approximately one meter but are absent in some areas. These clays vary in plasticity, with plastic indices from 12 to 41. Subsoils are saprolitic and slightly micaceous. Soil densities for silts and clays range from medium stiff to hard, and for sands, loose to very dense. Natural moisture contents of residual soils vary from 16% to 35%. The majority of soils encountered during construction will have moisture contents slightly greater than the optimum of 20%. Natural moistures of the soils vary with the season, depth of bedrock, and permeability.

Alluvial soils are present along several alignments at the following locations. The approximate lateral alluvial limits are drawn on the plans.

Line	Station
-LRev-	22+75 - 25+30
-LRev-	56+38 - 56+76
-LRev-	76+77 - 77+02
-SB US 220 Ramp-	10+18 - 11+67
-NB US 220 Ramp-	15+27 - 15+78
-Y25-	10+58 - 10+89

The Haw River flood plain is intersected by -LRev-, SB US 220 and NB US 220 Ramps. The flood plain is up to 255 meters wide with alluvial deposits up to 3 to 4 meters in thickness. The alluvial soils consist of interlayered saturated loose sand (A-2-4), soft sandy silt (A-4, A-5) and clay (A-7, A-6). The liquid limits of the cohesive soils range from 37 to 42 indicating these soils are moderately compressible. The ground surface, in

most areas of this flood plain, is soft and unstable under heavy equipment and may result in construction problems. The alluvium overlies very stiff and dense residuum.

Troublesome Creek and other tributaries are intersected by -LRev- and -Y25-. The flood plains are approximately 30 meters wide with alluvial deposits up to 1.5 meters in thickness. The alluvium consists of silty sand (A-2-4) and sandy silt (A-4). These soils are underlain by hard rock (granite).

Alluvium is also present along the tributary of Jacob's Creek north of NC 65. The loose alluvial sand (A-2-4) and soft silt (A-4) is less than 1 meter thick and overlies hard rock (granite).

Roadway embankment soils are present along fill sections of the existing roads and are comprised of material derived from the local residuum. An abandoned road intersects -LRev- Station 22+00, and 26+00, and SB US 220 Ramp Station 10+40 - 12+00. This embankment material consists of soft, non-compacted brown sandy silt (A-4). The soil is "clean", it contains minimal to no debris. Some construction debris (broken asphalt and concrete) and household debris (asphalt shingles, old appliances...) is present at the ground surface along the abandoned road.

Artificial fill is present along Ramp B at US 158, Station 12+30 to 13+00. This soil fill is comprised of medium stiff, red-brown sandy clay (A-7-5, A-6). The soil is very similar to the surrounding residual soils and was likely placed during prior roadway construction activities. This artificial fill material is relatively "clean", it contains minimal to no debris. Numerous tires (household debris) are present at the ground surface within the proposed right of way.

ROCK PROPERTIES

The project traverses two distinct geologic belts. The first two-thirds of the project (-LRev- Station 18+20 - 60+00) is within the Charlotte Belt. This granitic rock of the Charlotte Belt is believed to be associated with the Churchland Pluton. The pluton creates a prominent ridge that is relatively resistant to erosion. The light gray to tan granite is composed of quartz, feldspars and biotite. Rock structure is generally massive and has a medium to coarse grained porphyritic texture.

Soft weathered and hard rock encountered along the project is a tan to gray granite. In the relatively upper-lying areas, the granite is present at depths of 6 to 10 meters. In the relatively low-lying and flood plain areas, the rock is present at shallow depths of 1 to 4 meters. The granite tends to weather to boulders. Numerous boulders, which vary in diameter from 1 to 4 meters, are present at the ground surface and within the residual soils. Hard rock boulders are most prevalent just north of the Haw River (-LRev- Station 29+00 -33+00).

The latter section of the project (-LRev- Station 60+00 - 97+10) is in the Milton Belt. This segment of the project is underlain by metamorphic rock, gneiss and schist. The rocks of the Milton Belt are less resistant to erosion and are overlain by a thicker cover of residuum. For this reason, very little rock was encountered in this segment. This section of the project also contains small local granitic intrusions.

GROUNDWATER

Groundwater was encountered intermittently through out the project. The water table is at shallow depths in all the relatively low-lying and flood plain areas of the project. In the upper-lying cut section at -LRev- Station 53+00, groundwater was encountered at shallow depths just above the hard rock. Very little groundwater was encountered in the latter segment of the project, beyond -LRev- Station 65+00.

GEOTECHNICAL DESCRIPTIVE ANALYSIS

This project will not be divided into segments for detailed descriptive purposes. Specific areas and details have been addressed where conditions necessitate.

Respectfully Submitted,

Robin Russell Held

Robin Russell Held
Project Geologist

STATE PROJECT NO.	SHEET NO.	TOTAL S
6.499002T (R-2413C)	1	82

ID.NO.R-2413C

PROJECT: 6.499002T

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

SUBSURFACE INVESTIGATION

STATE PROJECT 6.499002T ID.No. R-2413C

F.A. PROJECT N/A

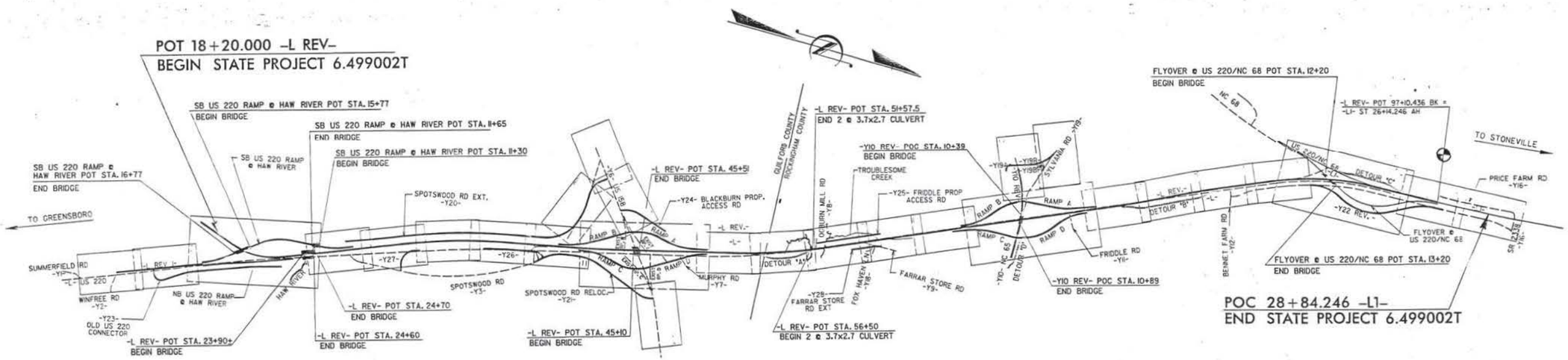
COUNTY GUILFORD & ROCKINGHAM

DESCRIPTION NC 68 CONNECTOR - US 220 FROM SOUTH OF HAW RIVER TO THE INTERSECTION OF US 220 AND EXISTING NC 68.

-INVENTORY-

CONTENTS:

LINE	STATION	SHEET NO.: PLAN	PROFILE	X-SECT.
-LRev1-	13+50 - 19+09	3-5	29	
-LRev-	18+20 - 97+10	3-23	30-41	62-68
-SBUS220RP-	8+99 - 19+02	5-6	42-43	69-72
-NBUS220RP-	9+95 - 15+78	5	44	
-Y20-	10+00 - 28+75	7-10, 25, 28	45-47	75-78
-Y21-	10+00 - 18+69	27	48-49	
-Y23-	8+83 - 17+67	4-5	50-51	
-RPA- @US158	10+00 - 15+36	11-12	52	
-RPB- @US158	10+00 - 14+51	11	53	73-74
-RPC- @US158	10+00 - 14+40	11	54	
-RPD- @US158	10+00 - 14+33	11-12	55	
-Y24-	10+00 - 13+42	26	60	
-Y25-	10+00 - 14+18	14	61	
-RPA- @NC65	10+00 - 14+77	17-18	56	
-RPB- @NC65	10+00 - 14+25	16-17	57	79-82
-RPC- @NC65	10+00 - 14+13	16-17	58	
-RPD- @NC65	10+00 - 14+88	17	59	



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STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
6.499002T (R-2418C)	2	82

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 N-VALUE	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	MEDIUM SAND	FINE SAND	SILT	CLAY

GRAIN SIZE mm: 305, 75, 2, 0.6, 0.425, 0.2, 0.075, 0.002
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 GROUNDWATER TABLE
LL - LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL - PLASTIC LIMIT		
OM - OPTIMUM MOISTURE	- MOIST - (M)	SOLID, AT OR NEAR OPTIMUM MOISTURE
SL - SHRINKAGE LIMIT		
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX	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 INDURATED EARTH 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: NOTE: THIS IS NOT APPLICABLE TO NON-INDURATED COASTAL PLAIN SAND AND CLAY DEPOSITS.

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

*SPT REFUSAL ≤ 25 mm OF PENETRATION PER 50 BLOWS.
**AN INFERRED ROCK LINE INDICATES THE ESTIMATED BOUNDARY OF HARD ROCK AS JUDGED BY THE ENGINEERING GEOLOGIST. A FULL DESCRIPTION OF ROCK IS GIVEN INCLUDING:

CORE RECOVERY (REC.)-TOTAL LENGTH OF ROCK RECOVERED IN THE CORE BARREL DIVIDED

ROCK QUALITY DESIGNATION (RQD)-TOTAL LENGTH OF SOUND ROCK SEGMENTS RECOVERED THAT ARE LONGER THAN OR EQUAL TO 100 mm DIVIDED BY THE TOTAL LENGTH OF THE CORE RUN EXPRESSED AS A PERCENTAGE.

GROUNDWATER

- 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 MAY BE SHOWN WITH SOIL SYMBOL
- INFERRED SOIL BOUNDARIES
- ALLUVIAL/RESIDUAL BOUNDARIES
- 25° DIP DIRECTION AND DIP OF STRUCTURE
- 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
- SOUNDING ROD

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] MOBILE B
- [ ] BK-51
- [x] 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
- [x] TUNG. - CARBIDE INSERTS
- [ ] CLAY BITS

OTHER:

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

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [x] HAND AUGER
- [ ] 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 25 mm.
LAYER - SUBJECT MATERIAL GREATER THAN 25 mm 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 100 mm 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) OF A 140 POUND (63.5 kg) HAMMER FALLING 0.76 m REQUIRED TO PRODUCE A PENETRATION OF 300 mm INTO SOIL WITH A 51mm OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL- PENETRATION RESISTANCE OF LESS THAN 25 mm 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	P.L. - PLASTIC LIMIT
CL. - CLAY	P.I. - PLASTICITY INDEX
COB. - COBBLE	n - POROSITY
CSE. - COARSE	SD. - SAND
EST. - ESTIMATED	SAT. - SATURATED
F. - FINE	SL. - SILT, SILTY
FOSS. - FOSSILIFEROUS	SLI. - SLIGHTLY
FRAC. - FRACTURED	G_s - SPECIFIC GRAVITY
GR. - GRAVEL	qu - UNCONFINED COMPRESSIVE STRENGTH
L.L. - LIQUID LIMIT	γ - UNIT WEIGHT (WET UNIT WEIGHT)
MED. - MEDIUM	γ_d - DRY UNIT WEIGHT
W - MOISTURE CONTENT	γSAT. - SATURATED UNIT WEIGHT
MOT. - MOTTLED	e - VOID RATIO
OM - OPTIMUM MOISTURE	V. - VERY
ORG. - ORGANIC	

CAUTION NOTICE :

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WAS MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. SOME DATA OBTAINED MAY BE OMITTED FROM THIS RELEASE.

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.

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 INCLUDIN TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGI INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE OR OPTIONS OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FC ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

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.

NOTES:

REVISED 1-31-95 (METRIC)

DATUM DESCRIPTION

The Localized Coordinates used on this project are based on the State Plane Coordinates of traverse station "U3413-1" established by NCGS.

The NAD 83 State Plane Coordinates of "U3413-1" are:

Northing: 273,885.6884 (m) Easting: 637,985.5894 (m)

The Combined Grid Factor used on this project (ground to grid) is 0.9999891

The bearing and ground distance from -L- POT Station 10+00.000 to U3413-1 is

N 15-25-20 W 24.013 m

The bearing and ground distance from -L1- POT Station 24+00.000 to U3413-1 is

S 17-25-54 E 9,646.588 m

All distances shown are in horizontal ground meters.

METRIC 5 0 10	PROJECT REFERENCE NO.	SHEET NO.
	R-2413C	3
CONST. REV.	HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R/W REV.		

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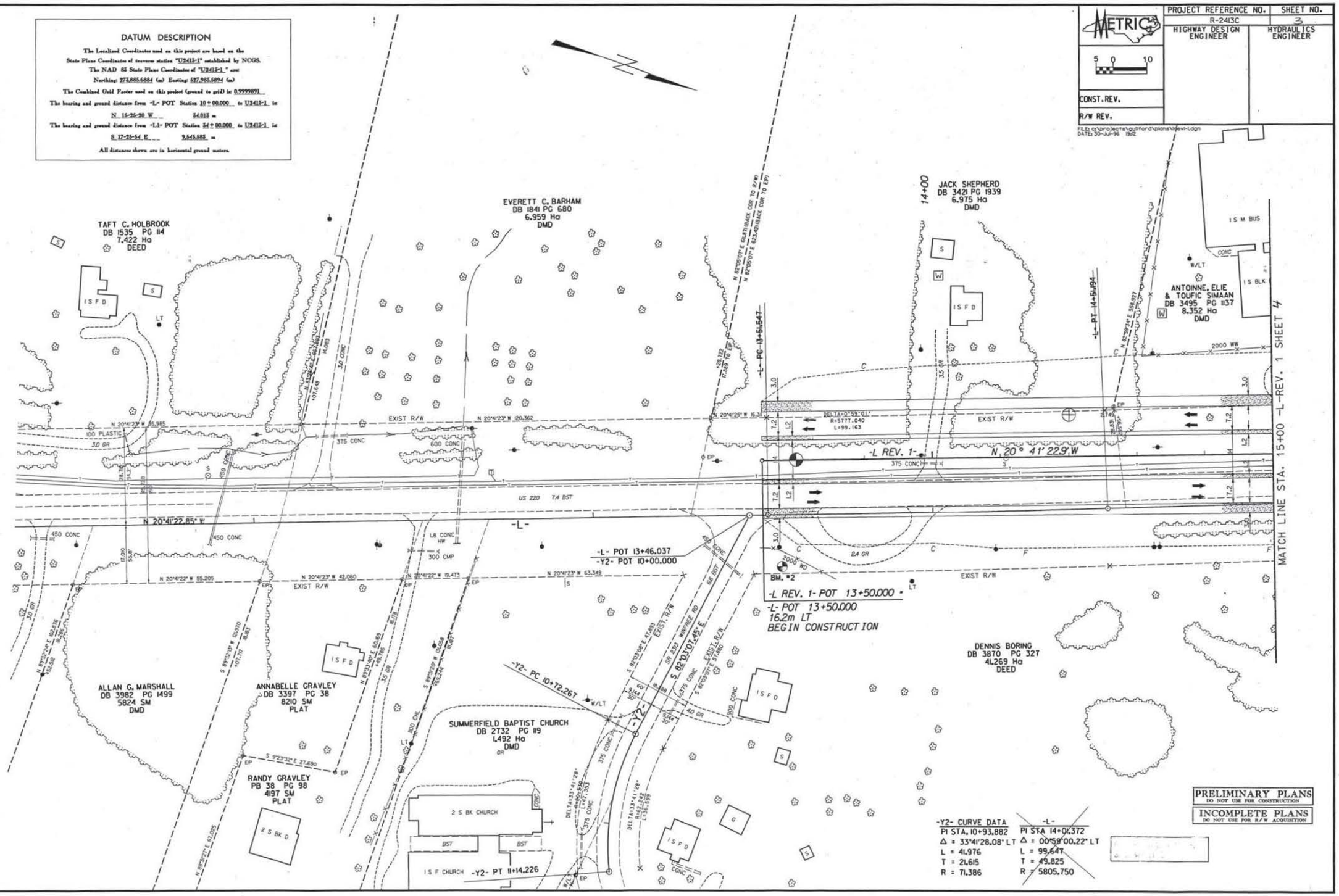
DATE: 30-JUL-96 15:02



-Y2- CURVE DATA	~~-L-~~
PI STA. 10+93.882	~~PI STA 14+01.372~~
Δ = 33°41'28.08" LT	~~Δ = 00°59'00.22" LT~~
L = 41.976	~~L = 99.647~~
T = 21.615	~~T = 49.825~~
R = 71.386	~~R = 5805.750~~

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

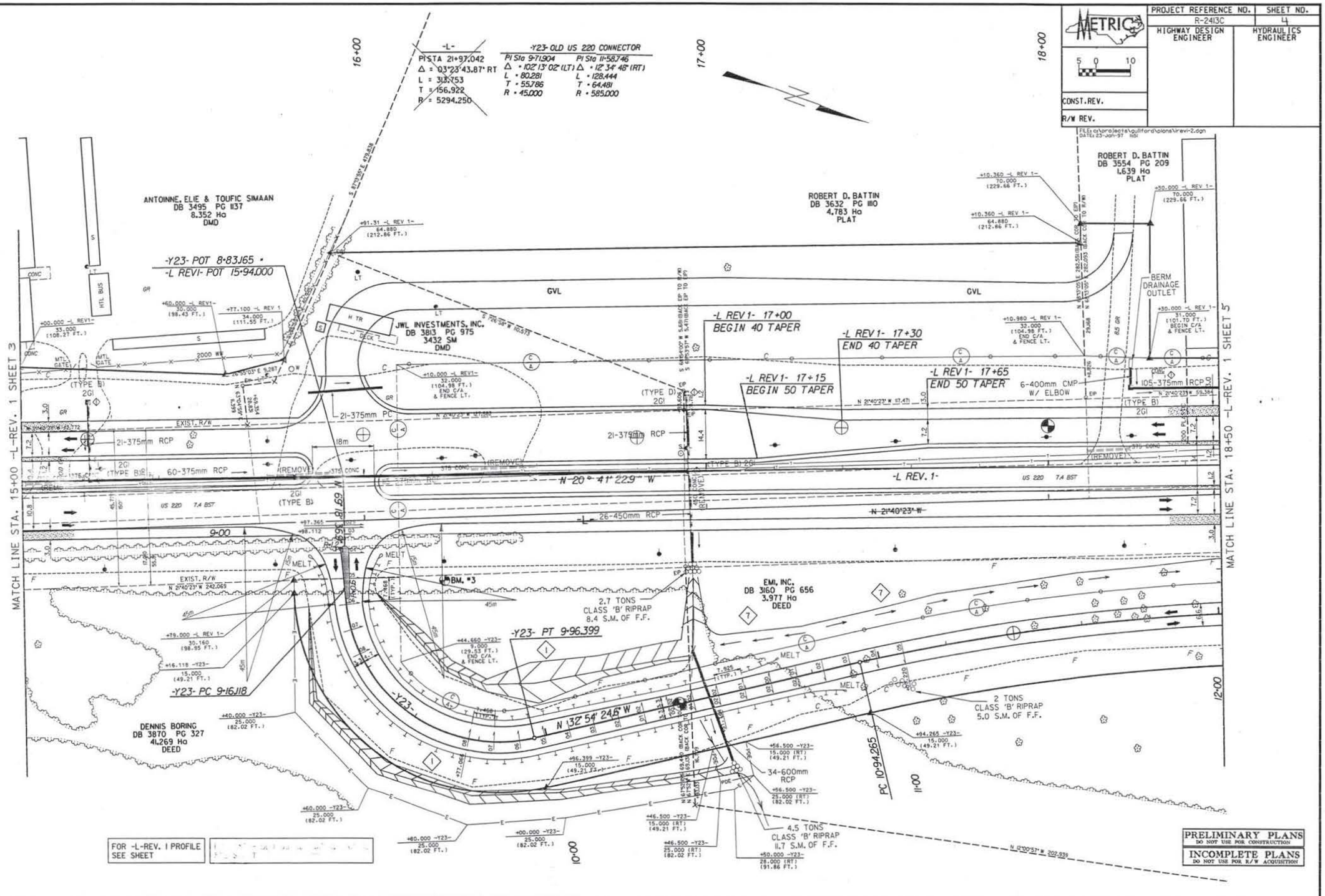
PROJECT REFERENCE NO.	SHEET NO.
R-2413C	4
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

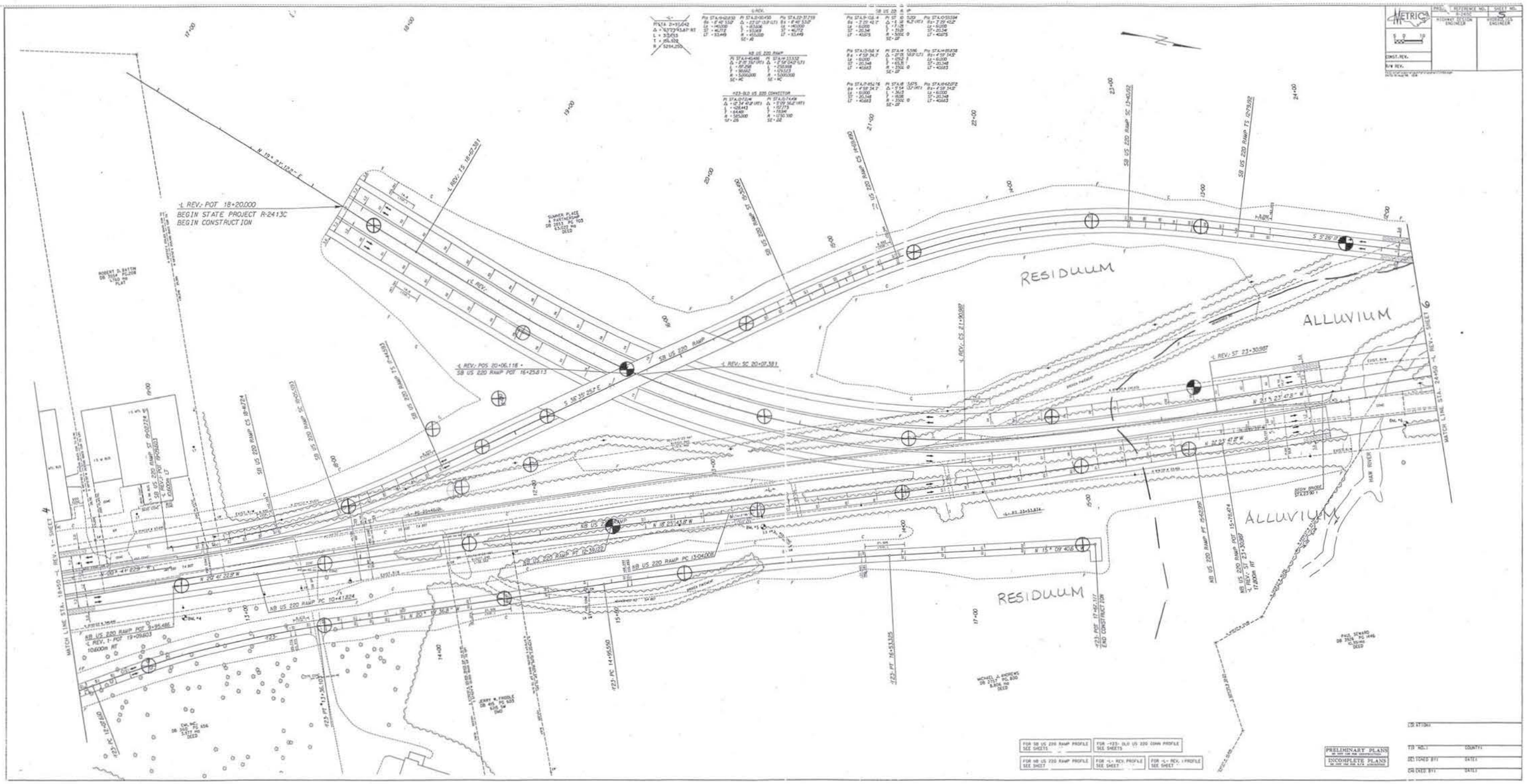
CONST. REV.

R/W REV.



PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION


METRIC
PROJ. REFERENCE NO.
SHEET NO.
R-2413C
HIGHWAY DESIGN ENGINEER
RESIDENTIES ENGINEER
CONST. REV.
R/W REV.
-L REV.- POT 18+20.000
BEGIN STATE PROJECT R-2413C
BEGIN CONSTRUCTION
-L REV.- TS 18+57.381
SB US 220 RAMP
-L REV.- POS 20+06.118 =
SB US 220 RAMP POT 16+25.813
-L REV.- SC 20+07.381
SB US 220 RAMP SC 13+40.192
SB US 220 RAMP TS 12+79.192
-L REV.- CS 21+90.987
-L REV.- ST 23+30.987
RESIDUUM
ALLUVIUM
ALLUVIUM
RESIDUUM
NB US 220 RAMP
NB US 220 RAMP PC 10+41.824
NB US 220 RAMP PC 13+04.008
NB US 220 RAMP POT 9+95.486
-L REV.- POT 19+09.803
10.600m RT
NB US 220 RAMP ST 9+02.274
-L REV.- ST 19+09.803
10.600m RT
NB US 220 RAMP CS 18+41.824
NB US 220 RAMP POT 15+76.474
-L REV.- ST 23+30.987
17.800m RT
MATCH LINE STA. 18+50 -L REV.- 1- SHEET 4
MATCH LINE STA. 24+50 -L REV.- 1- SHEET 6
HAW RIVER
-L REV.- 23+53.874
-123- POT 17+07.117
END CONSTRUCTION
-123- PT 16+53.305
-123- PC 14+06.550
-123- PT 12+39.020
-123- PC 10+41.824
-123- POT 9+95.486
-123- PT 9+02.274
-123- PC 8+60.192
ROBERT H. BATTON
DB 3514, PG 1008
1.150 AC
PLAT
SUMMER PLACE
A PARTNERSHIP
DB 2633, PG 703
6.533 AC
DEED
EMMA NC
DB 3212, PG 456
3.577 AC
DEED
JERRY A. FRIDDLE
DB 405, PG 635
0.34 AC
DEED
MICHAEL A. ANDREWS
DB 2757, PG 800
8.606 AC
DEED
PAUL STEWARD
DB 2626, PG 446
0.30 AC
DEED
FOR SB US 220 RAMP PROFILE SEE SHEETS
FOR -123- DLO US 220 CONN PROFILE SEE SHEETS
FOR NB US 220 RAMP PROFILE SEE SHEET
FOR -L- REV. PROFILE SEE SHEET
FOR -L- REV. 1 PROFILE SEE SHEET
PRELIMINARY PLANS
INCOMPLETE PLANS
CD ATTACH.
TID NO.:
COUNTY:
DESIGNED BY:
DATE:
CHECKED BY:
DATE:

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	6
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CONST. REV.	
R/W REV.	

METRIC

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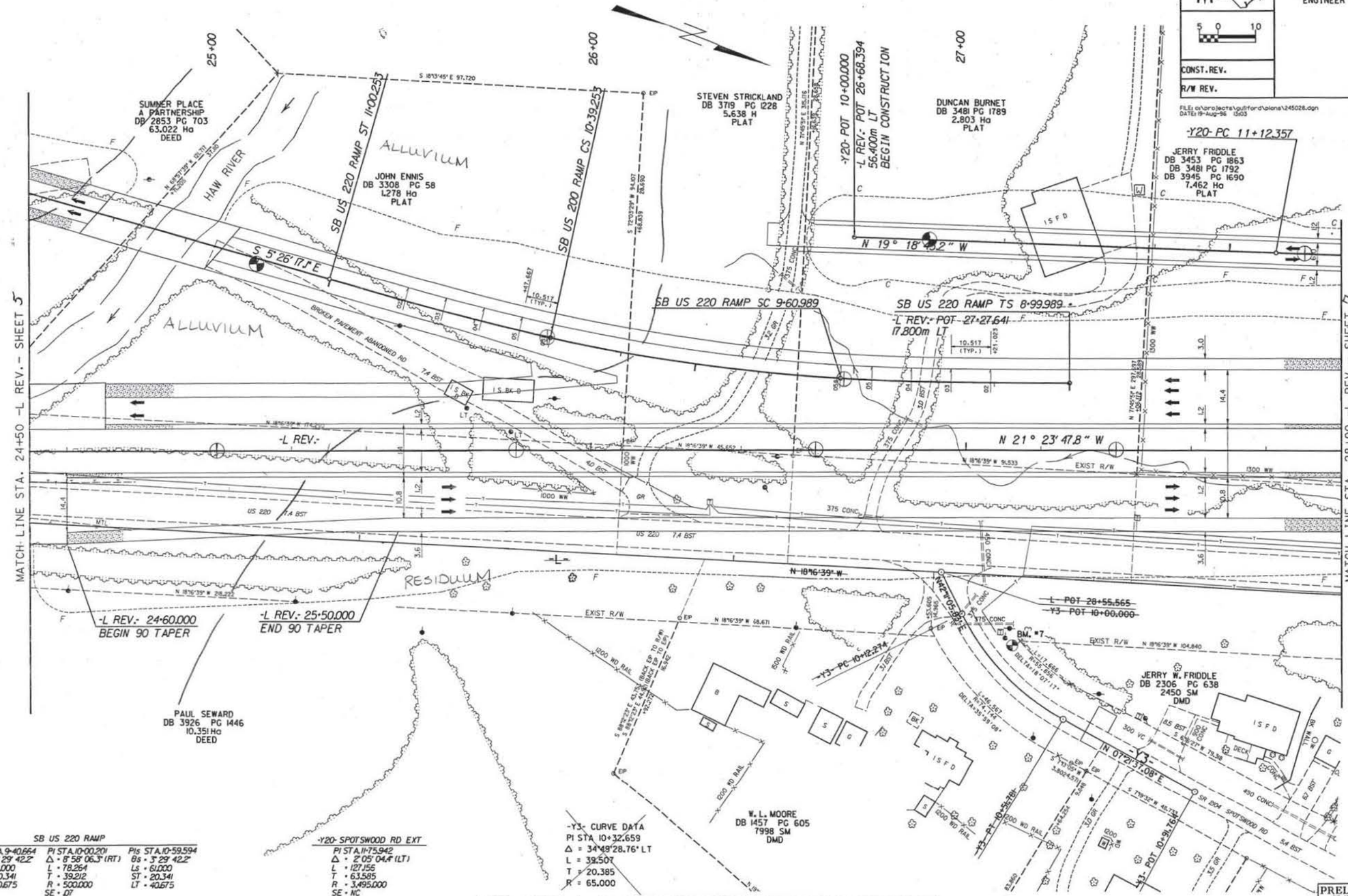
DATE: 19-Aug-96 13:03



SB US 220 RAMP

Pis STA. 9+40.664	PI STA. 10+00.201	Pis STA. 10+59.594
Bs = 3° 29' 42.2"	Δ = 8° 58' 06.3" (RT)	Bs = 3° 29' 42.2"
Ls = 61.000	L = 78.264	Ls = 61.000
ST = 20.341	T = 39.212	ST = 20.341
LT = 40.675	R = 500.000	LT = 40.675
	SE = .07	

-Y20- SPOTSWOOD RD EXT

PI STA. 11+75.942
Δ = 2° 05' 04.4" (LT)
L = 127.156
T = 63.585
R = 3,495.000
SE = NC

-Y3- CURVE DATA

PI STA 10+32.659
Δ = 34° 49' 28.76" LT
L = 39.507
T = 20.385
R = 65.000

FOR -L- REV. PROFILE SEE SHEET

FOR SB US 220 RAMP PROFILE SEE SHEET

FOR -Y20- SPOTSWOOD RD EXT PROFILE SEE SHEET

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	7
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CONST. REV.	
R/W REV.	

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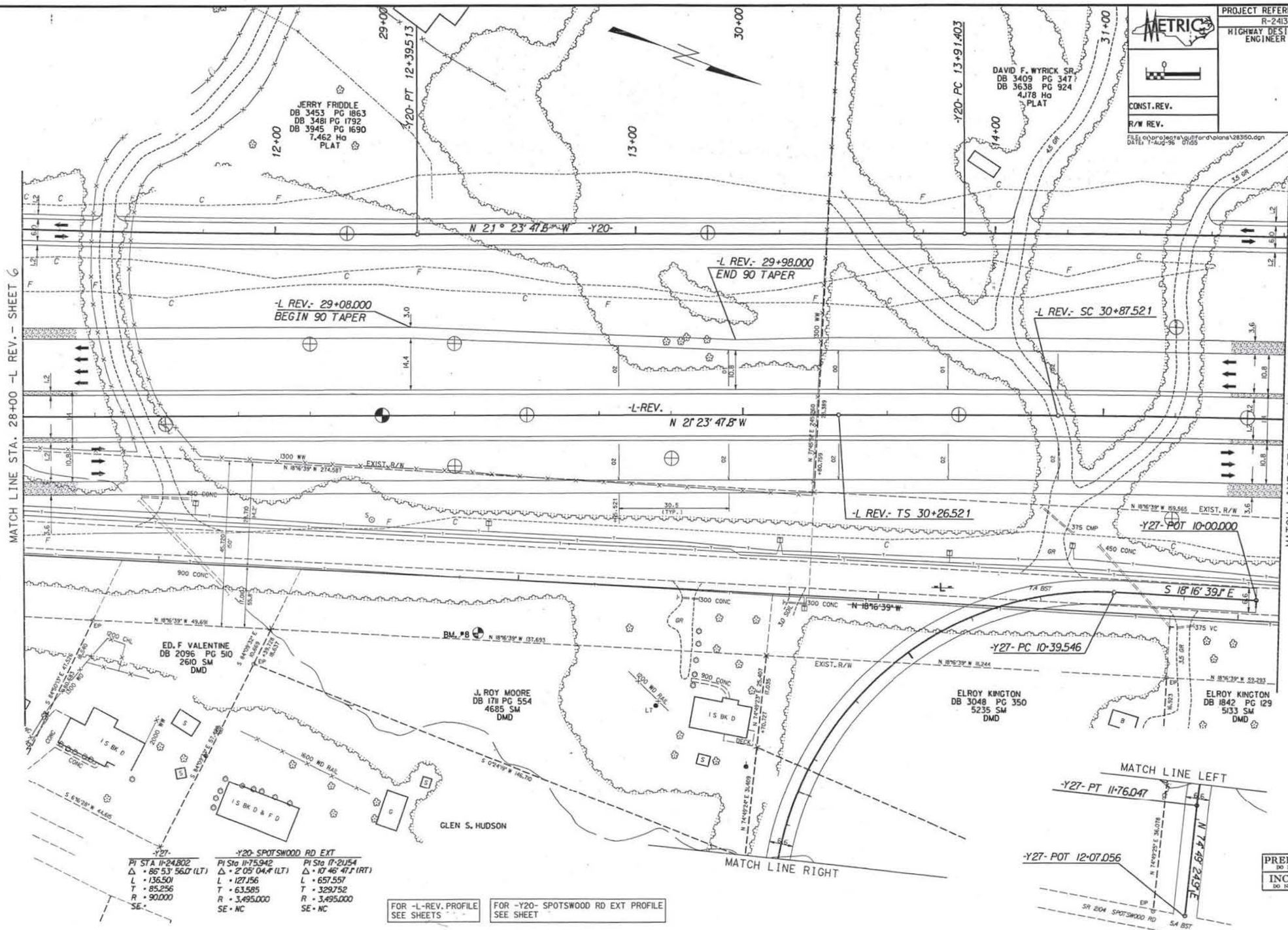


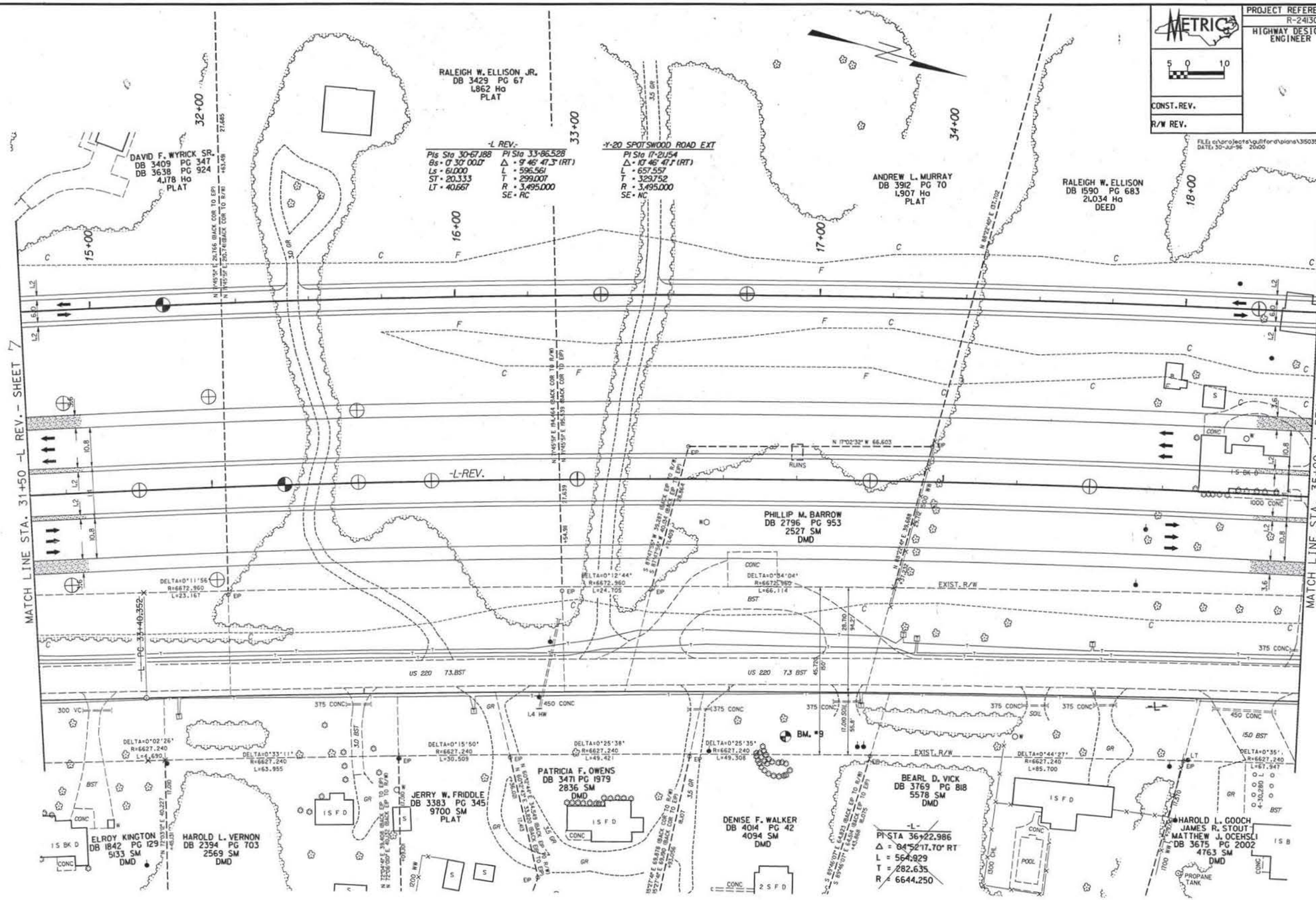
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CONST. REV.

R/W REV.

FILE: c:\projects\guilford\plans\315035.dgn
DATE: 30-Jul-96 20:00



FOR -L-REV. PROFILE SEE SHEET

FOR -Y20- SPOTSWOOD RD EXT PROFILE SEE SHEETS

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	9
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

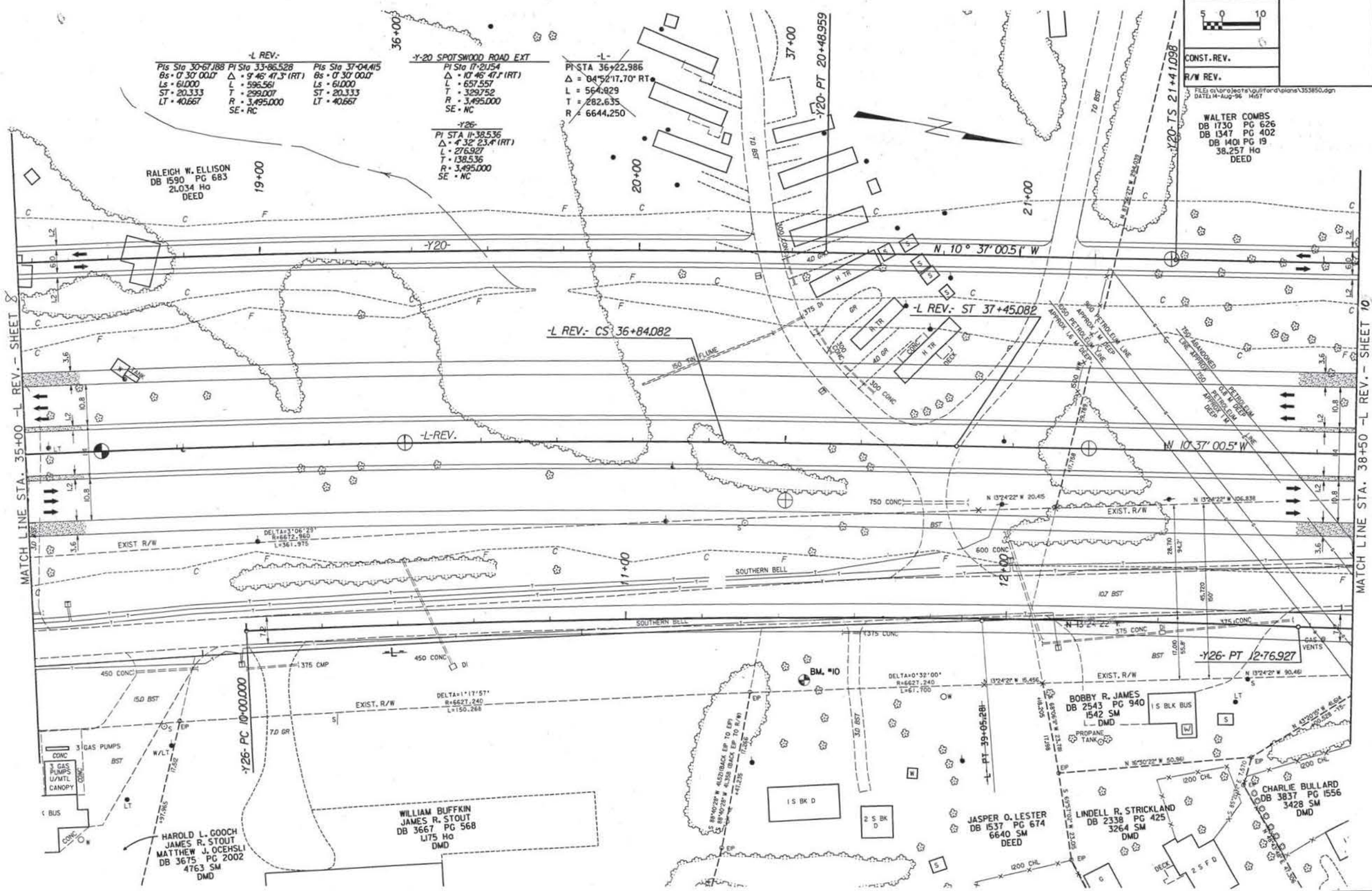
METRIC

5 0 10

CONST. REV.

R/W REV.

FILE: c:\projects\guilford\plans\353850.dgn
DATE: 14-Aug-96 MIST



FOR -L-REV. PROFILE SEE SHEETS

FOR -Y20- SPOTSWOOD RD EXT PROFILE SEE SHEET

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	10
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CONST. REV.	
R/W REV.	

METRIC 5 0 10

FILE: o:\projects\guilford\plans\385042.dgn
DATE: 14-Aug-96 15:01

-Y-20 SPOTSWOOD ROAD EXT

PIs Sta 22+87.979	PI Sta 24+12.321	PIs Sta 25+23.713
θs = 7° 13' 27.3"	Δ = 49° 05' 33.0" (LT)	θs = 7° 13' 27.3"
Ls = 58.000	L = 197.070	Ls = 58.000
ST = 19.363	T = 105.041	ST = 19.363
LT = 38.699	R = 230.000	LT = 38.699
	SE = .08	
	CW = 1.1m	

RAMP B

PIs Sta 10+30.669	PI Sta 11+24.237	PIs Sta 12+16.886
θs = 2° 15' 09.6"	Δ = 15° 14' 05.4" (LT)	θs = 2° 15' 09.6"
Ls = 46.000	L = 155.550	Ls = 46.000
ST = 15.336	T = 78.237	ST = 15.336
LT = 30.669	R = 585.000	LT = 30.669
	SE = .05	

-Y21- SPOTSWOOD RD. REL.

PIs Sta 10+68.830	PI Sta 11+33.884	PIs Sta 11+97.990
θs = 6° 38' 46.7"	Δ = 20° 44' 24.4" (RT)	θs = 6° 38' 46.7"
Ls = 58.000	L = 90.496	Ls = 58.000
ST = 19.358	T = 45.749	ST = 19.358
LT = 38.694	R = 250.000	LT = 38.694
	SE = .08	
	CW = 1.1m	

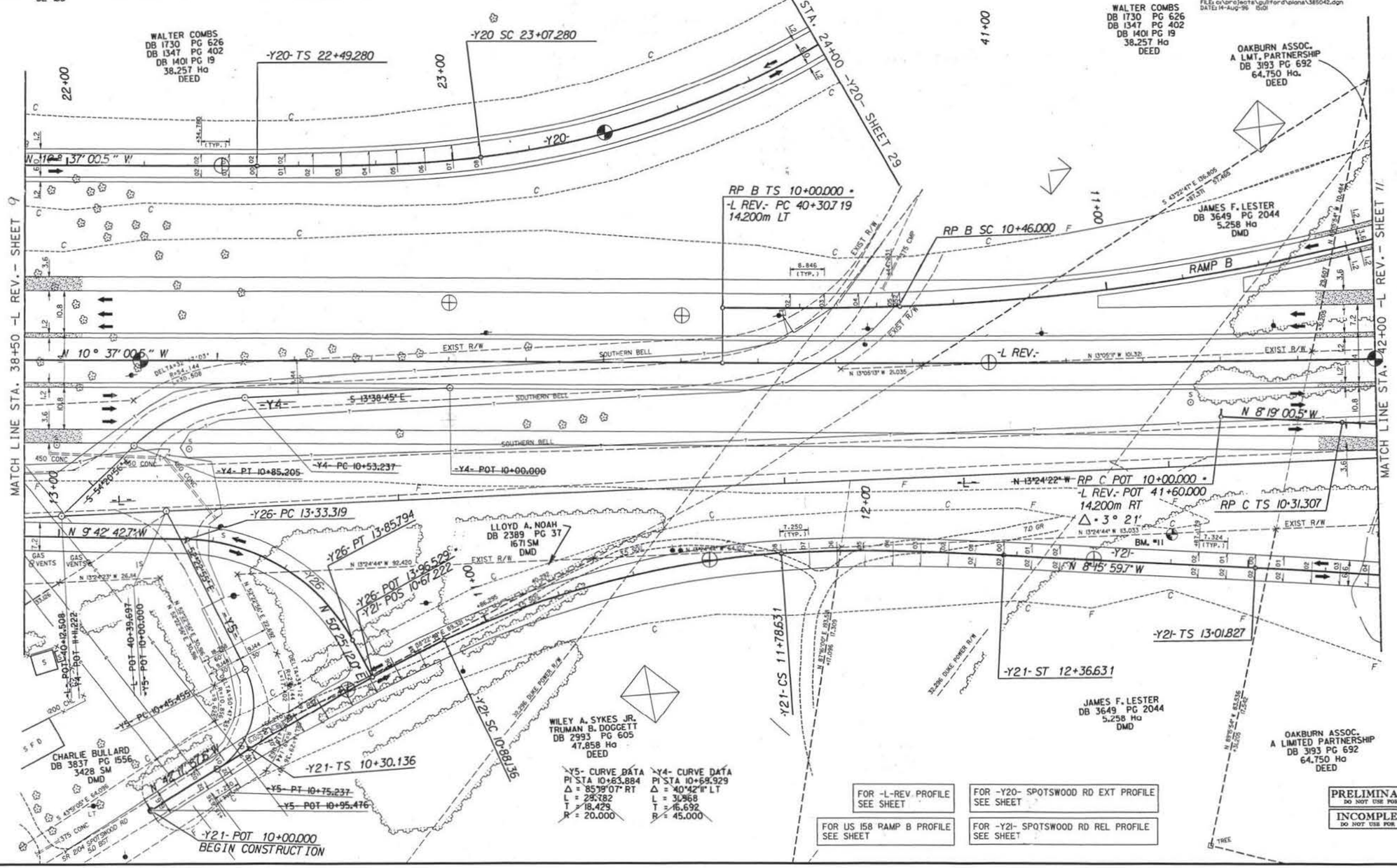
PIs Sta 13+36.504	PI Sta 14+36.057	PIs Sta 15+32.699
θs = 4° 15' 22.5"	Δ = 26° 26' 34.0" (RT)	θs = 4° 15' 22.5"
Ls = 52.000	L = 161.530	Ls = 52.000
ST = 17.342	T = 82.230	ST = 17.342
LT = 34.677	R = 350.000	LT = 34.677
	SE = .07	
	CW = 0.9m	

-L REV.-

PI Sta 42+18.604
Δ = 3° 04' 45.8" (LT)
L = 375.681
T = 187.886
R = 6,990.000
SE = NC

-Y26-

PI STA 13+62.264
Δ = 60° 07' 54.7" (RT)
L = 52.475
T = 28.944
R = 50.000
SE =



-Y5- CURVE DATA

PI STA 10+63.884
Δ = 85°19'07" RT
L = 298.382
T = 18.429
R = 20.000

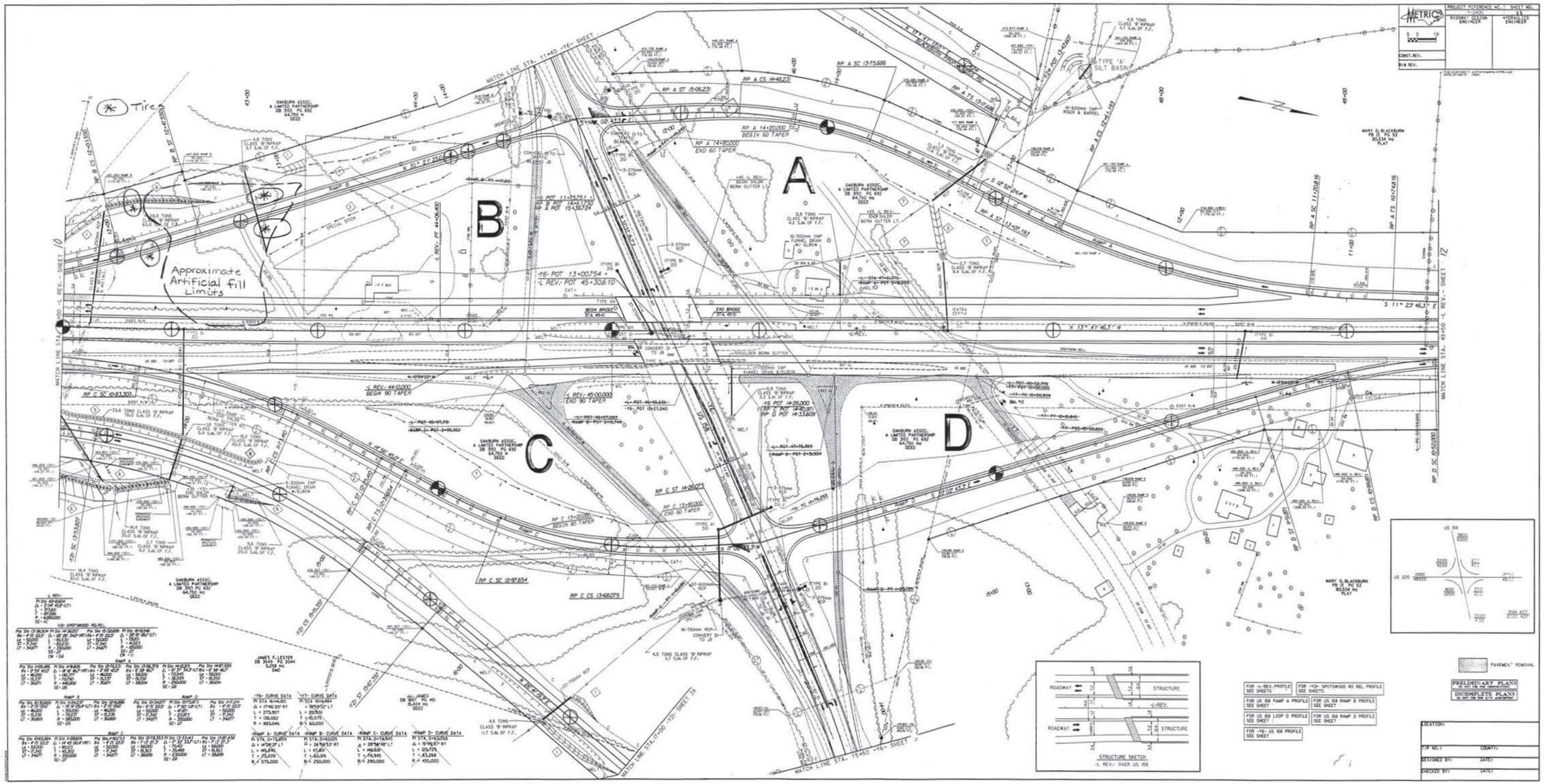
-Y4- CURVE DATA

PI STA 10+69.929
Δ = 40°42'11" LT
L = 30.968
T = 16.692
R = 45.000

FOR -L-REV. PROFILE SEE SHEET	FOR -Y20- SPOTSWOOD RD EXT PROFILE SEE SHEET
FOR US 158 RAMP B PROFILE SEE SHEET	FOR -Y21- SPOTSWOOD RD REL PROFILE SEE SHEET

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION


METRIC
PROJECT REFERENCE NO. / SHEET NO.
RESIDENT ENGINEER
CONSULTING ENGINEERS
CONST. REV.
R/W REV.
MATCH LINE STA. 11+40 -Y6- SHEET 10
MATCH LINE STA. 49+50 -L REV.- SHEET 12
MATCH LINE STA. 15+60 -Y6- SHEET 14
Approximate Artificial fill Limits
A
B
C
D
TYPE 'A' SILT BASIN
BEGIN 60 TAPER
END 60 TAPER
BEGIN 90 TAPER
END 90 TAPER
BEGIN BRIDGE STA. 49+0
END BRIDGE STA. 49+5
-Y6- POT 13+00.754
-L REV.- POT 45+30.610
S 11° 23' 46.3" E
N 13° 41' 46.3" W
ROADWAY
STRUCTURE
-L REV.-
STRUCTURE SKETCH
-L REV.- OVER US 158
FOR -L-REV. PROFILE SEE SHEETS
FOR -Y2- SPOTSWOOD RD REL PROFILE SEE SHEETS
FOR US 158 RAMP A PROFILE SEE SHEET
FOR US 158 RAMP B PROFILE SEE SHEET
FOR US 158 LOOP D PROFILE SEE SHEET
FOR US 158 RAMP D PROFILE SEE SHEET
FOR -Y6- US 158 PROFILE SEE SHEET
PAVEMENT REMOVAL
PRELIMINARY PLANS
INCOMPLETE PLANS
LOCATION:
TIP NO.:
COUNTY:
DESIGNED BY:
DATE:
CHECKED BY:
DATE:

METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	R-2413C	12
	HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CONST. REV.		
R/W REV.		

FILE: o:\projects\guilford\plans\495053.dgn
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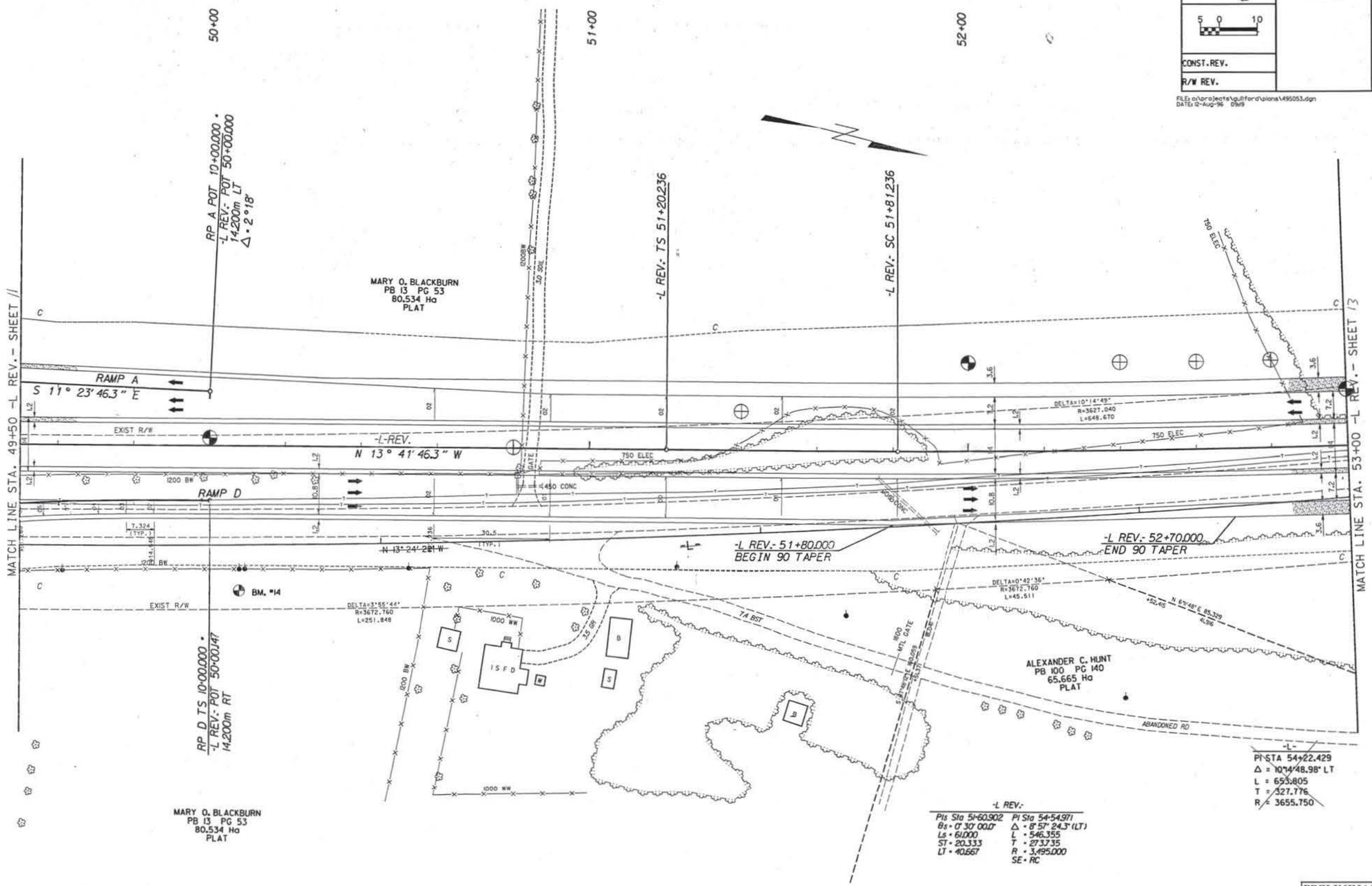


FOR -L-REV. PROFILE SEE SHEETS 37, 38

FOR US 158 RAMP A PROFILE SEE SHEET 58

FOR US 158 RAMP D PROFILE SEE SHEET 60

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	13
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

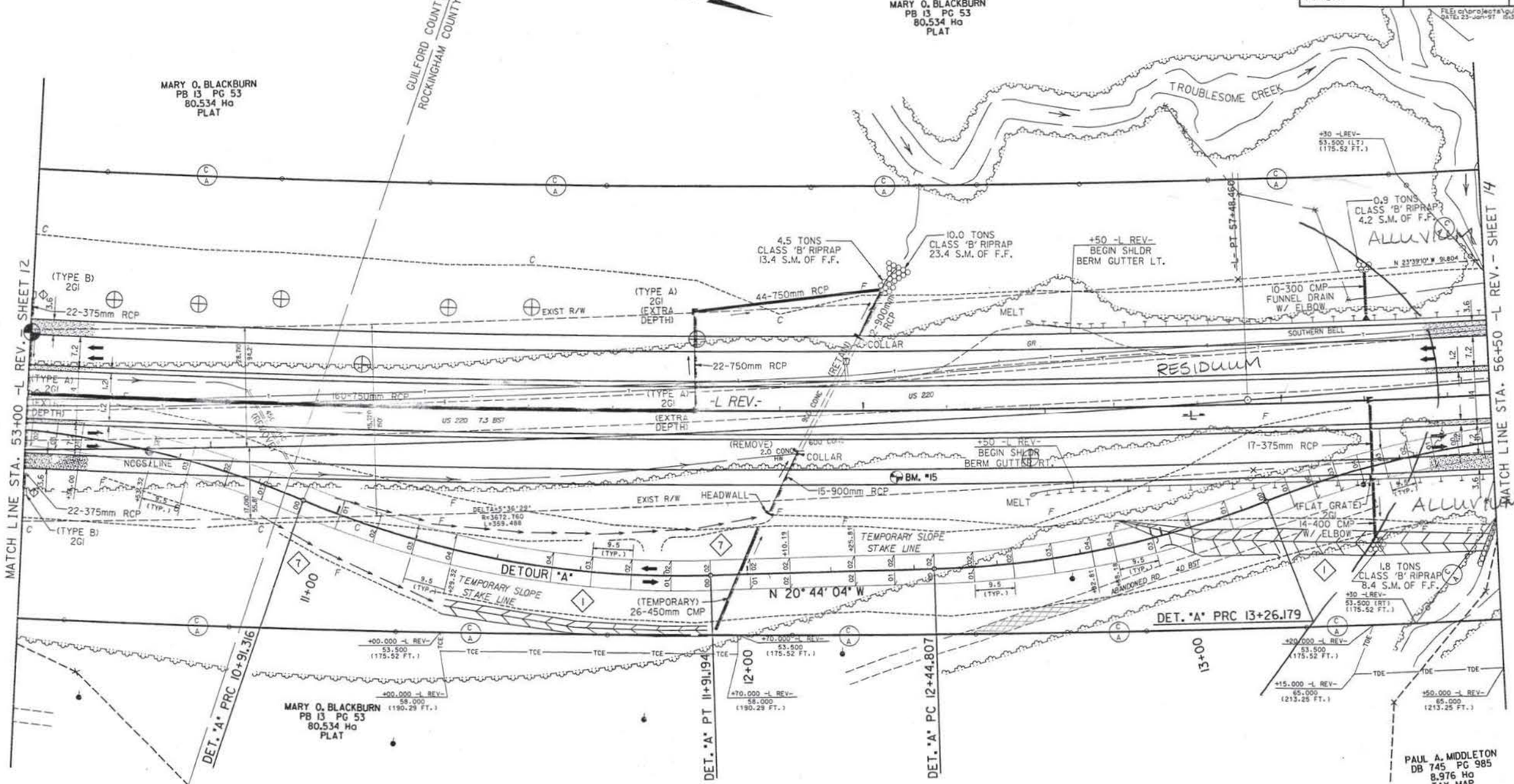
METRIC

5 0 10

CONST. REV.

R/W REV.

FILE: c:\projects\guilford\plans\535650.dgn
DATE: 23-Jan-97 15:36



DETOUR "A"

PI Sta 10+46.241	PI Sta 11+42.020	PI Sta 12+85.904	PI Sta 13+64.196
Δ = 22° 15' 50" (RT)	Δ = 24° 21' 05" (LT)	Δ = 19° 50' 22" (LT)	Δ = 18° 22' 45" (RT)
L = 91.316	L = 99.878	L = 81.372	L = 75.382
T = 46.241	T = 50.705	T = 41.097	T = 38.018
R = 235.000	R = 235.000	R = 235.000	R = 235.000
SE = .04	SE = .04	SE = .04	SE = .04

~~-L-~~

~~PI STA 54+22.429~~
~~Δ = 10°14'48.98" LT~~
~~L = 653.805~~
~~T = 327.776~~
~~R = 3655.750~~

-L REV.-

Pis Sta 51+60.902	Pi Sta 54+54.971	Pis Sta 57+47.924
θs = 0° 30' 00.0"	Δ = 8° 57' 24.3" (LT)	θs = 0° 30' 00.0"
Ls = 61.000	L = 546.355	Ls = 61.000
ST = 20.333	T = 273.735	ST = 20.333
LT = 40.667	R = 3,495.000	LT = 40.667
	SE = RC	

FOR DETOUR "A" PROFILE SEE SHEET

FOR -L-REV. PROFILE SEE SHEET

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	14
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC 5 0 10

CONST. REV.

R/W REV.

FILE: a:\projects\guilford\plans\565060.dgn
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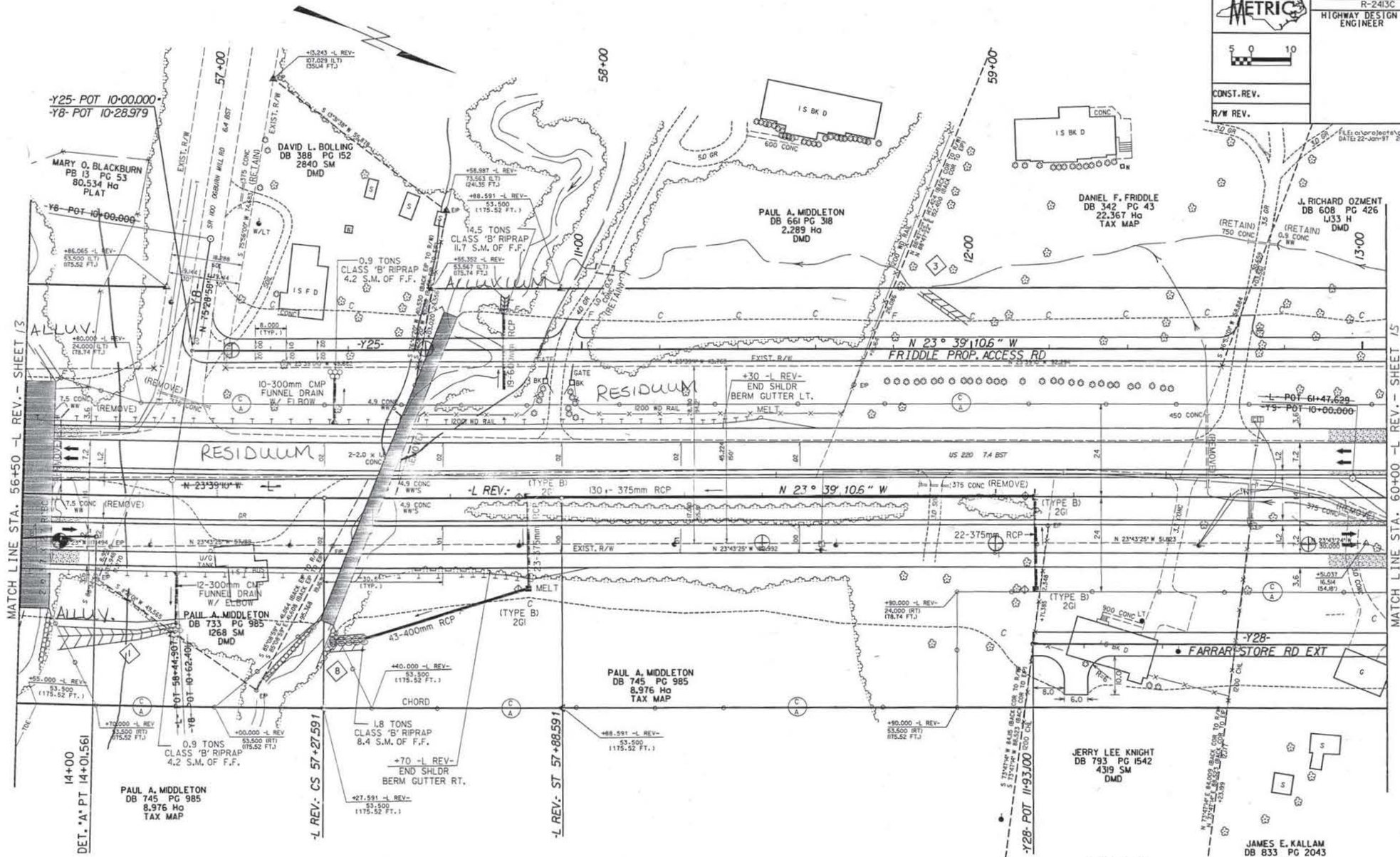


-Y8- CURVE DATA
PI STA 10+25.276
Δ = 08°41'15" LT
L = 20.469
T = 10.254
R = 135.000

-L REV.-
PI Sta 54+54.971
Δ = 8° 57' 24.3" (LT)
L = 546.355
T = 273.735
R = 3,495.000
SE = RC
PIs Sta 57+47.924
Θs = 0° 30' 00.0"
Ls = 61.000
ST = 20.333
LT = 40.667

DETOUR "A"
PI Sta 13+64.196
Δ = 18° 22' 44.8" (RT)
L = 75.382
T = 38.018
R = 235.000
SE = .07

FOR DETOUR "A" PROFILE SEE SHEET

FOR -L-REV. PROFILE SEE SHEETS .

FOR -Y28- FARRAR STORE RD EXT PROFILE SEE SHEET

FOR -Y25- FRIDDLE PROP. ACCESS RD PROFILE SEE SHEET

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

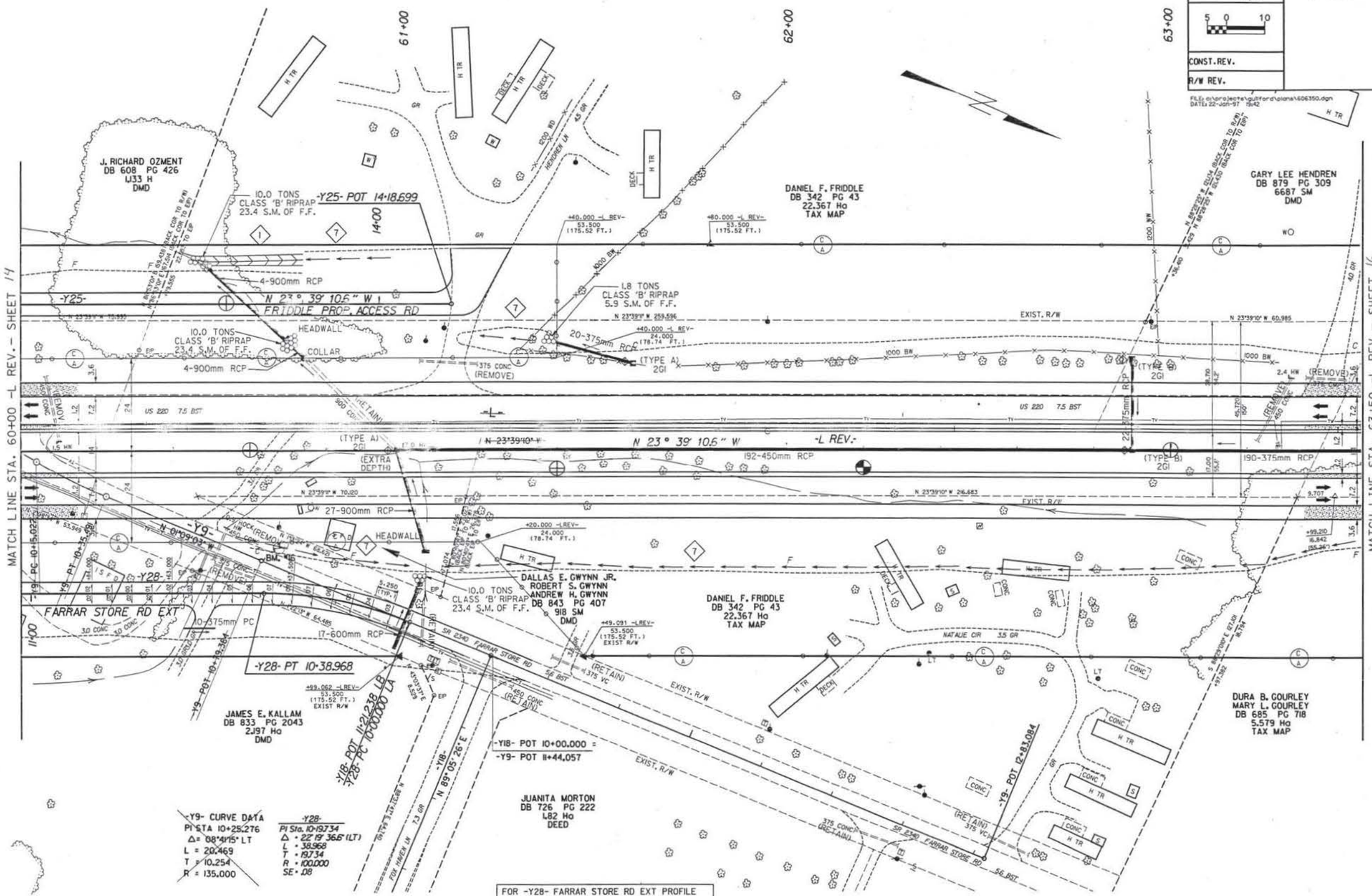
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	15
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CONST. REV.

R/W REV.

FILE: c:\projects\guilford\plans\606350.dgn
DATE: 22-Jan-97 15:42



FOR -Y28- FARRAR STORE RD EXT PROFILE SEE SHEET

FOR -L-REV. PROFILE SEE SHEET

FOR -Y25- FRIDDLE PROP ACCESS RD PROFILE SEE SHEET

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	16
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

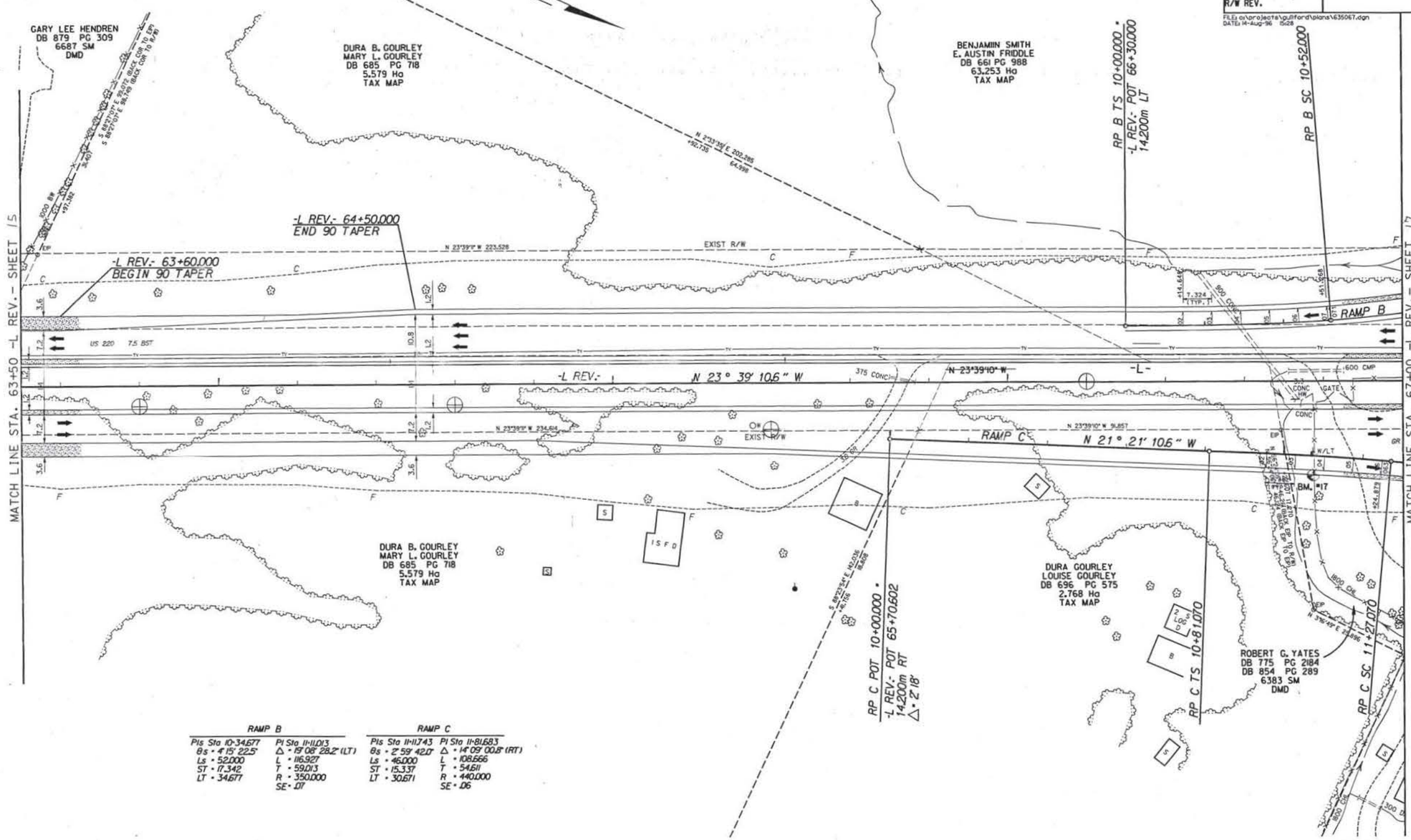
METRIC

5 0 10

CONST. REV.

R/W REV.

FILE: o:\projects\guilford\plans\635067.dgn
DATE: 14-Aug-96 15:28



RAMP B	
PIs Sta 10-34.677	PI Sta 11-11.013
θs = 4°15' 22.5"	Δ = 19°08' 28.2" (LT)
Ls = 52.000	L = 116.927
ST = 17.342	T = 59.013
LT = 34.677	R = 350.000
	SE = .07

RAMP C	
PIs Sta 11-11.743	PI Sta 11-81.683
θs = 2°59' 42.0"	Δ = 14°09' 00.8" (RT)
Ls = 46.000	L = 108.666
ST = 15.337	T = 54.611
LT = 30.671	R = 440.000
	SE = .06

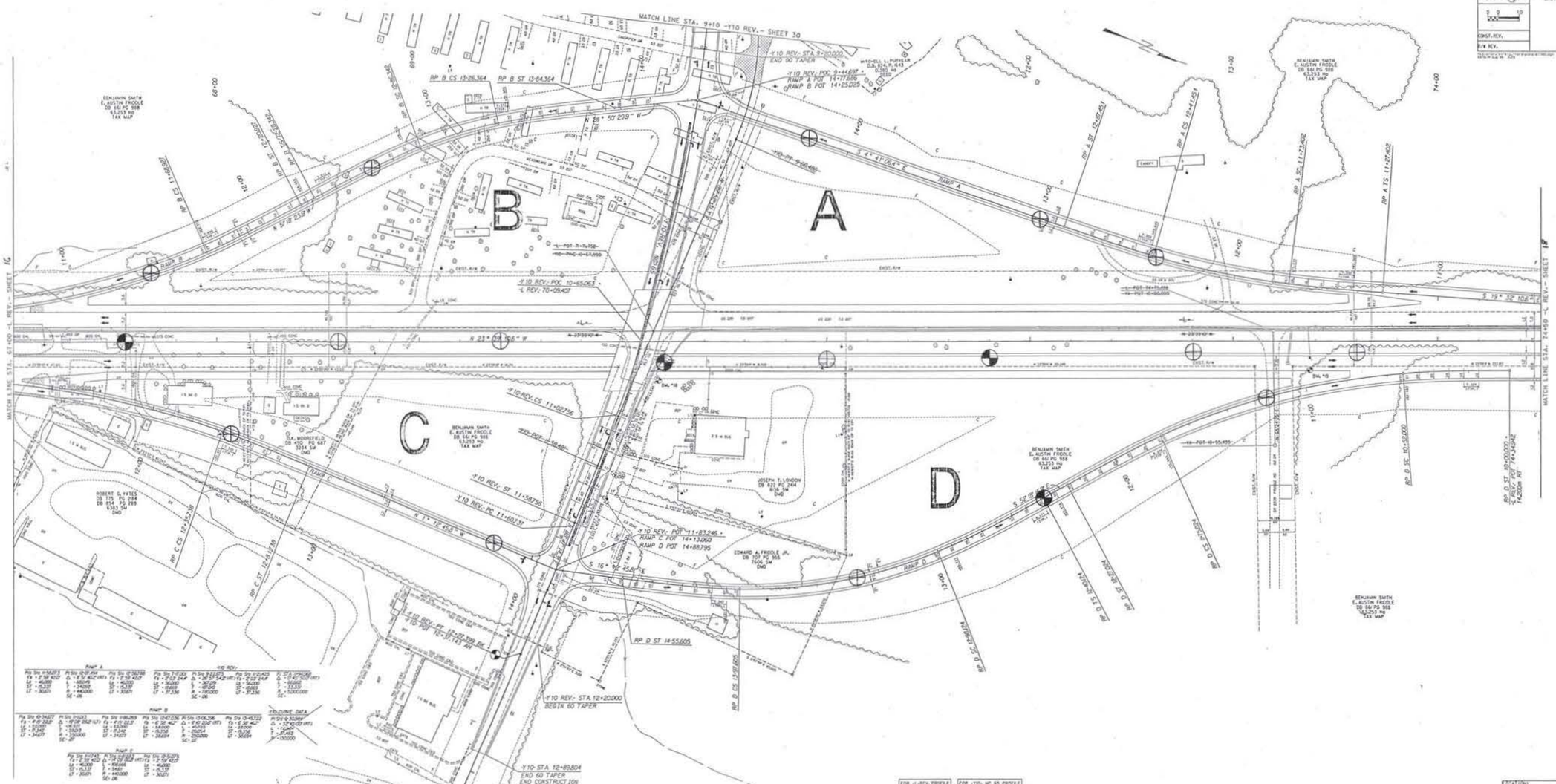
FOR -L-REV. PROFILE SEE SHEETS ,

FOR NC 65 RAMP B PROFILE SEE SHEET

FOR NC 65 RAMP C PROFILE SEE SHEET

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION


MATCH LINE STA. 9+10 -Y10 REV.- SHEET 30
A
B
C
D
RAMP A
RAMP B
RAMP C
RAMP D
BEGIN 60 TAPER
END 60 TAPER
END CONSTRUCTION
PAVEMENT REMOVAL
PRELIMINARY PLANS
INCOMPLETE PLANS

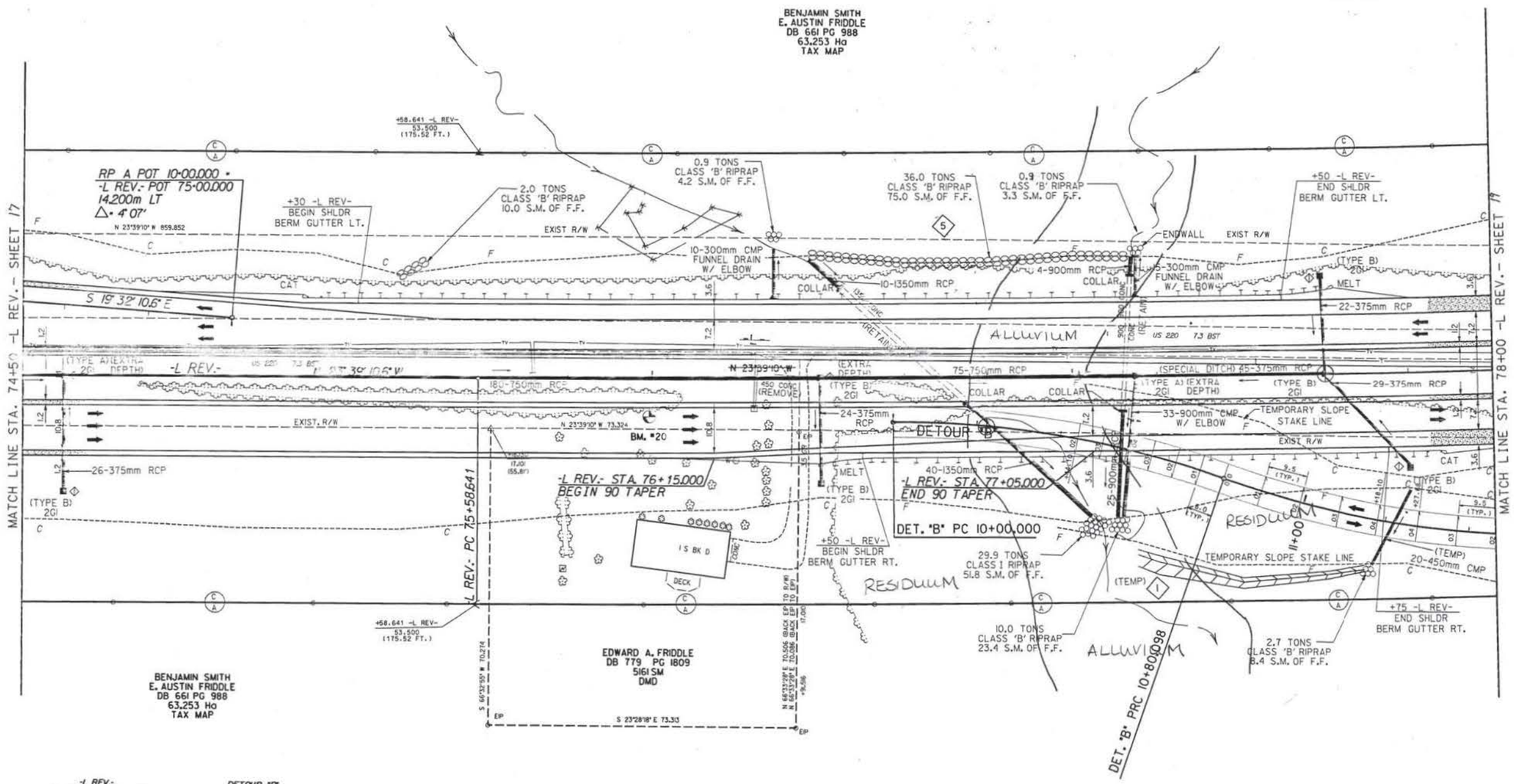
PROJECT REFERENCE NO.	SHEET NO.
R-2413C	18
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC 5 0 10

CONST. REV.

R/W REV.

FILE: c:\projects\guilford\plans\T45078.dgn
DATE: 23-Jan-97 15:49



-L REV.-	DETOUR "B"	
PI Sta 77+51.191	PI Sta 10+40.441	PI Sta 11+23.367
Δ = 3° 09' 20.9" (LT)	Δ = 19° 31' 44" (RT)	Δ = 20° 51' 55" (LT)
L = 385.004	L = 80.098	L = 85.579
T = 192.550	T = 40.441	T = 43.269
R = 6,990.000	R = 235.000	R = 235.000
SE = NC	SE = .04	SE = .04

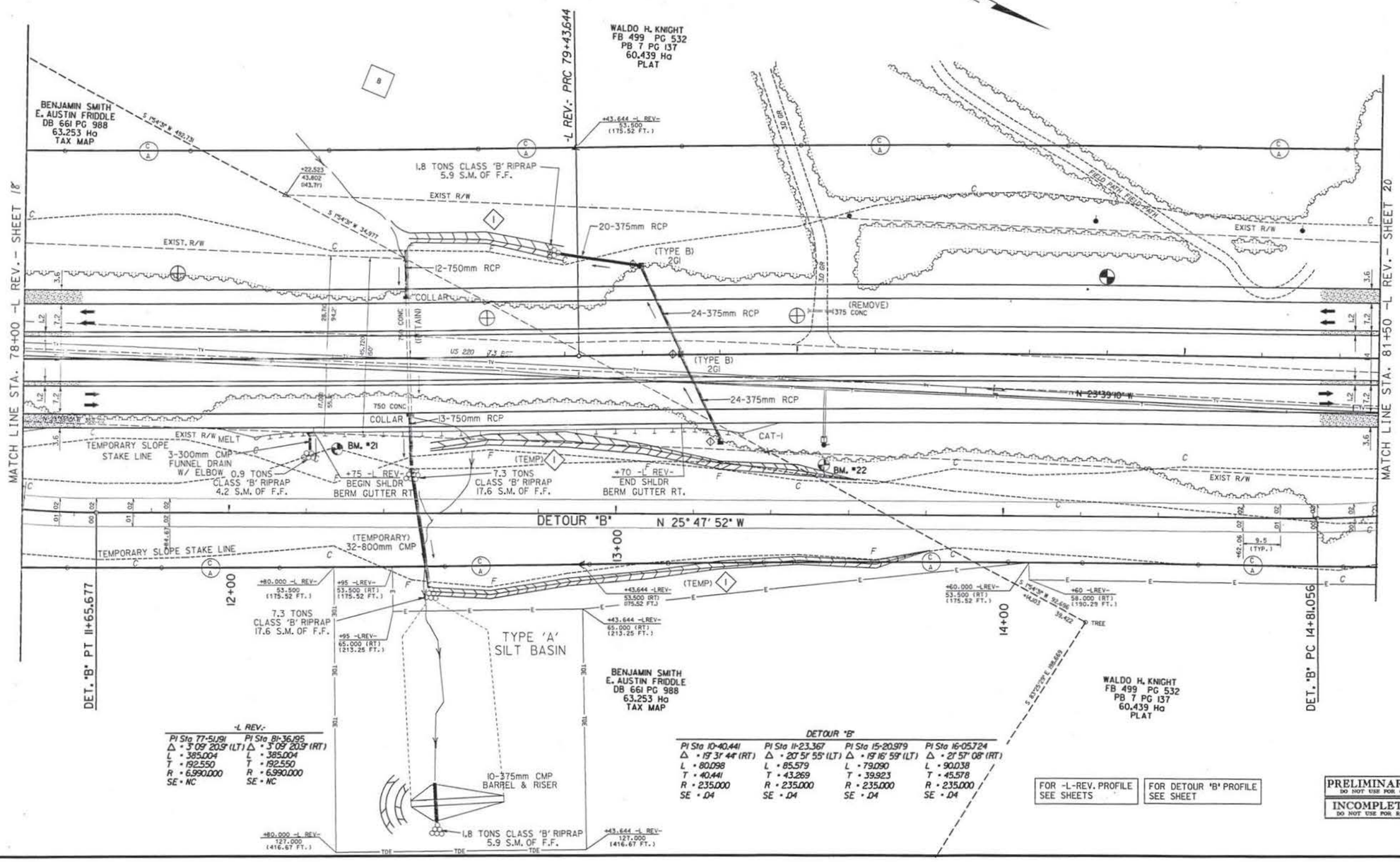
FOR -L-REV. PROFILE SEE SHEET	FOR NC 65 RAMP A PROFILE SEE SHEET	FOR DETOUR "B" PROFILE SEE SHEET

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	R-2413C	19
CONST. REV.	HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R/W REV.		

FILE: c:\projects\guilford\plans\188150.dgn
DATE: 23-Jan-97 16:03



-L REV.-

PI Sta 77-5.191	PI Sta 81-36.195
Δ = 3° 09' 20.3" (LT)	Δ = 3° 09' 20.3" (RT)
L = 385.004	L = 385.004
T = 192.550	T = 192.550
R = 6,990.000	R = 6,990.000
SE = NC	SE = NC

DETOUR "B"

PI Sta 10-40.441	PI Sta 11-23.367	PI Sta 15-20.979	PI Sta 16-05.724
Δ = 19° 31' 44" (RT)	Δ = 20° 51' 55" (LT)	Δ = 19° 16' 59" (LT)	Δ = 21° 57' 08" (RT)
L = 80.098	L = 85.579	L = 79.090	L = 90.038
T = 40.441	T = 43.269	T = 39.923	T = 45.578
R = 235.000	R = 235.000	R = 235.000	R = 235.000
SE = .04	SE = .04	SE = .04	SE = .04

FOR -L-REV. PROFILE SEE SHEETS

FOR DETOUR "B" PROFILE SEE SHEET

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

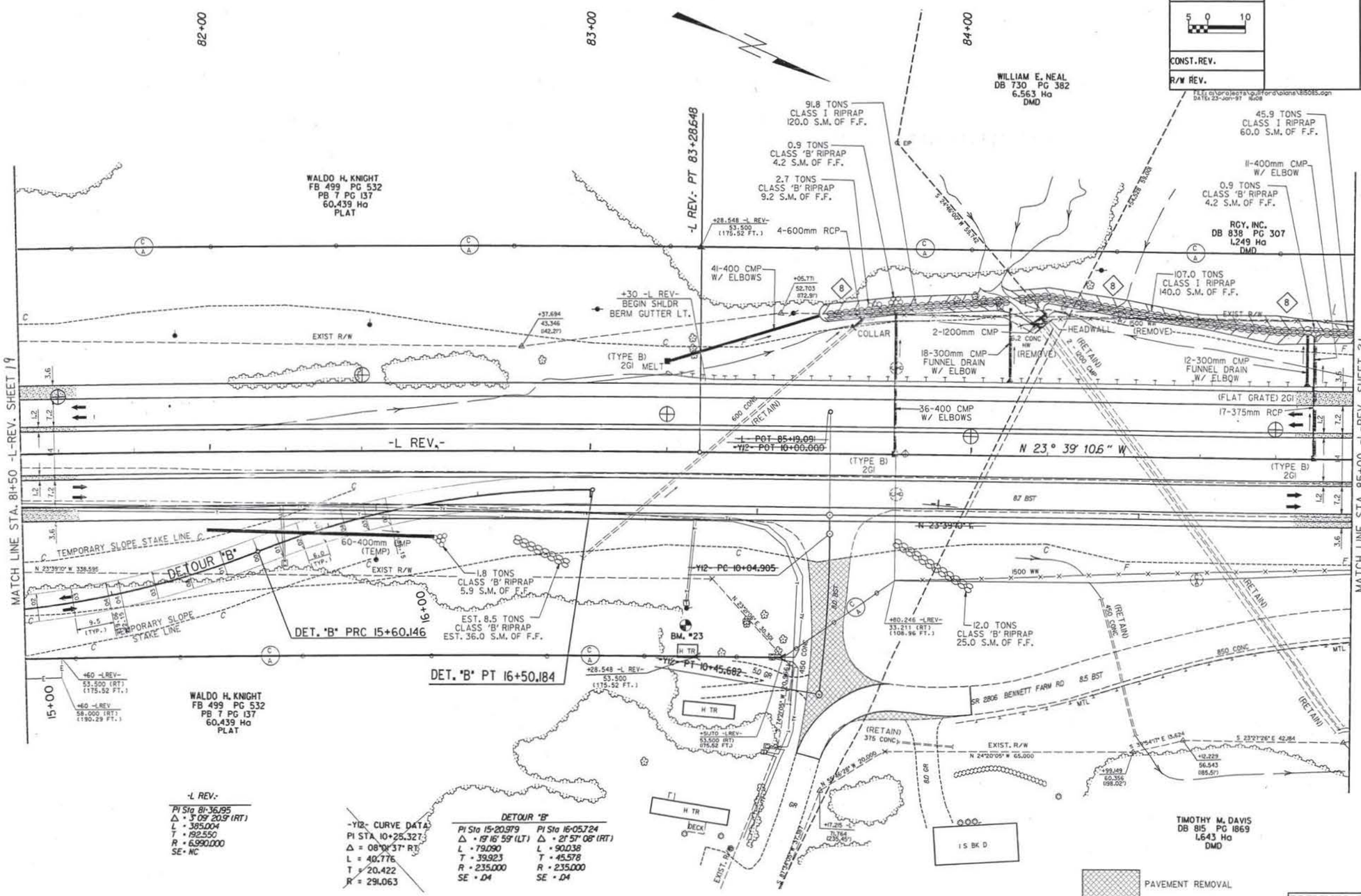
PROJECT REFERENCE NO.	SHEET NO.
R-2413C	20
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC 5 0 10

CONST. REV.

R/W REV.

FILE: o:\projects\guilford\plans\815085.dgn
DATE: 23-Jan-97 16:08



-L REV.-
PI Sta 81+36.195
Δ = 3°09'20.9" (RT)
L = 385.004
T = 192.550
R = 6,990.000
SE = NC

-Y12- CURVE DATA
PI STA 10+25.327
Δ = 08°01'37" RT
L = 40.776
T = 20.422
R = 291.063

DETOUR "B"

PI Sta 15+20.979	PI Sta 16+05.724
Δ = 19°16'59" (LT)	Δ = 20°57'08" (RT)
L = 79.090	L = 90.038
T = 39.923	T = 45.578
R = 235.000	R = 235.000
SE = .04	SE = .04

FOR -L-REV. PROFILE SEE SHEET

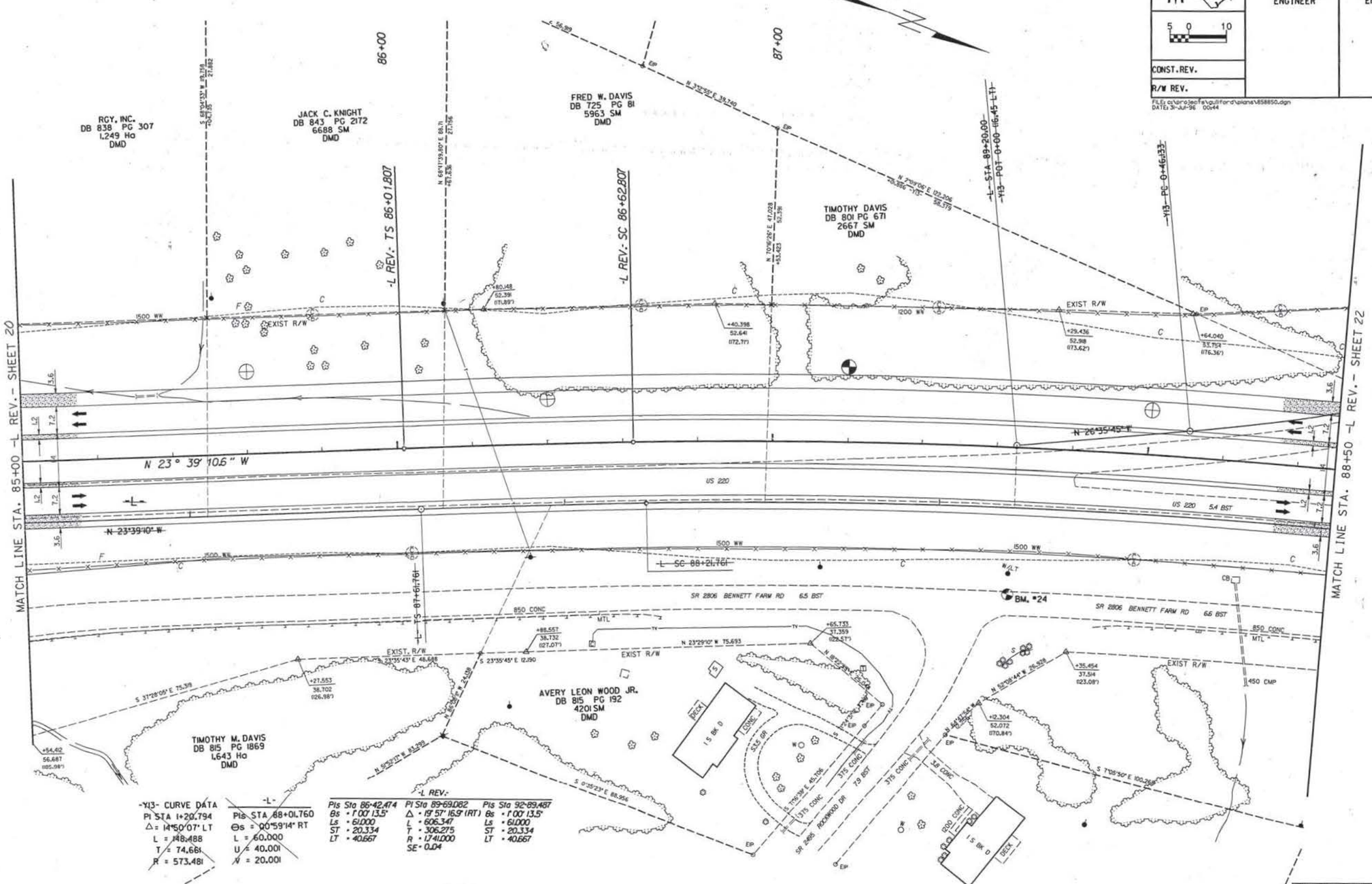
FOR DETOUR "B" PROFILE SEE SHEET

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	R-2413C	2
CONST. REV.	HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R/W REV.		

FILE: c:\projects\guilford\plans\R2413C.dgn
DATE: 31-JUL-96 00:44



-Y13- CURVE DATA
PI STA 1+20.794
Δ = 14°50'07" LT
L = 148.488
T = 74.661
R = 573.481

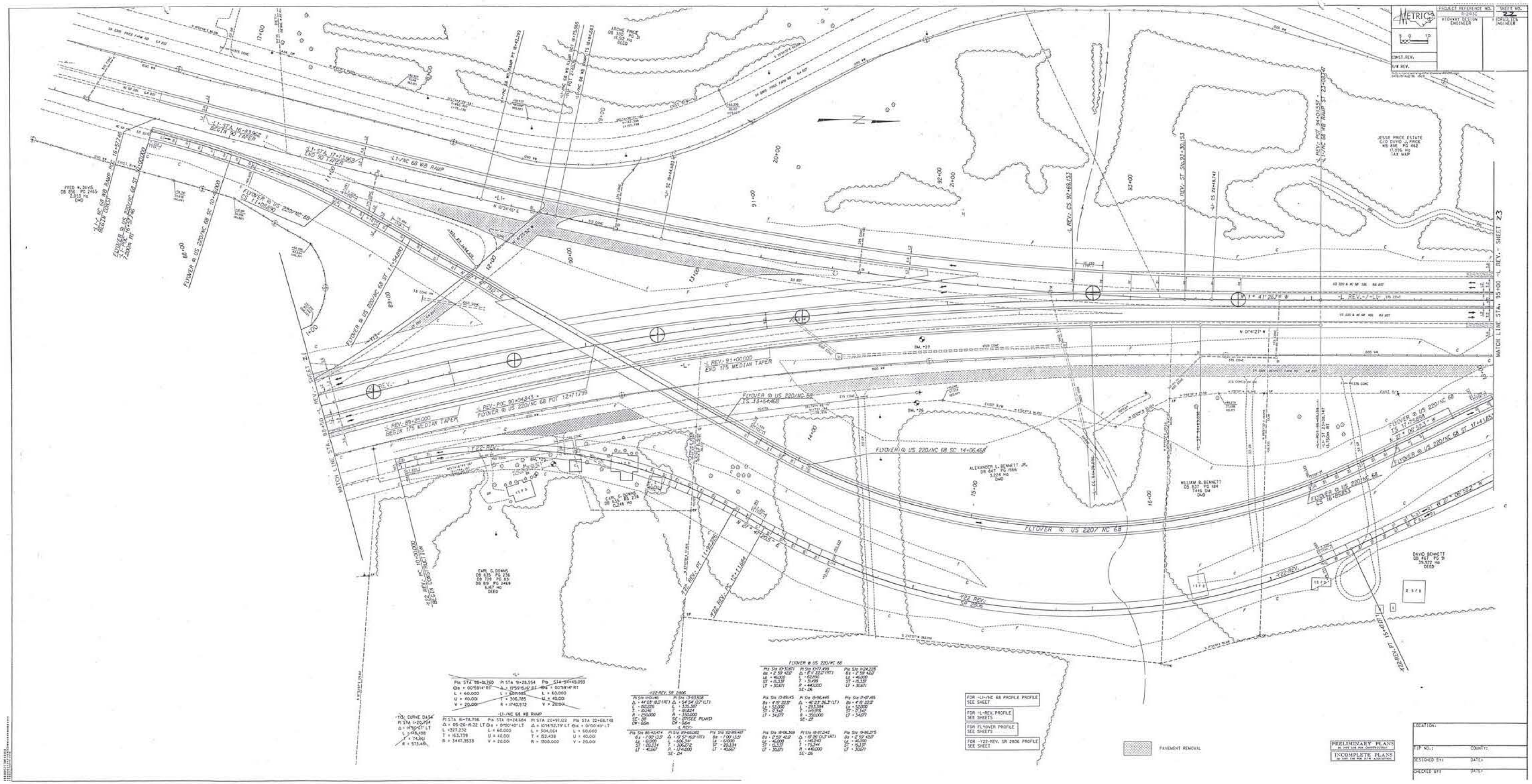
-L-
PIs STA 88+01.760
Θs = 00°59'14" RT
L = 60.000
U = 40.001
V = 20.001

-L REV.-

PIs Sta 86+42.474	PI Sta 89+69.082	PIs Sta 92+89.487
Bs = 1°00'13.5"	Δ = 19°57'16.9" (RT)	Bs = 1°00'13.5"
Ls = 61.000	L = 606.347	Ls = 61.000
ST = 20.334	T = 306.275	ST = 20.334
LT = 40.667	R = 1741.000	LT = 40.667
	SE = 0.04	

FOR -L-REV. PROFILE
SEE SHEETS ,

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


METRIC
PROJECT REFERENCE NO. R-2413C
SHEET NO. 22
HIGHWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST. REV.
R/W REV.
-L1- STA. 16+83.962 BEGIN 90 TAPER
-L1- STA. 17+73.962 END 90 TAPER
-L1-/NC 68 WB RAMP
-L1-/NC 68 WB RAMP POC 16+57.746 BEGIN CONST.
FLYOVER @ US 220/NC 68 ST 10+00.000
FLYOVER @ US 220/NC 68 SC 10+46.000
FLYOVER @ US 220/NC 68 CS 11+09.890
FLYOVER @ US 220/NC 68 ST 11+54.890
FRED W. DAVIS DB 856 PG 2465 2.053 Ha DWD
ARCHIE PRICE DB 300 PG 31 17.512 Ha DEED
-L1-/NC 68 WB RAMP PT 18+42.289
-L1- SC 19+44.683
-L REV.- 91+00.000 END 175 MEDIAN TAPER
-L REV.- 89+25.000 BEGIN 175 MEDIAN TAPER
-L REV.- POC 90+04.843 = FLYOVER @ US 220/NC 68 POT 12+71.799
FLYOVER @ US 220/NC 68 TS 13+54.468
FLYOVER @ US 220/NC 68 SC 14+06.468
-L REV.- CS 92+69.153
-L REV.- ST 93+30.153
-L1- CS 22+48.747
-L REV.- POT 94+04.557 = -L1-/NC 68 WB RAMP ST 23+08.747
JESSIE PRICE ESTATE C/O DAVID J. PRICE WB 88E PG 462 17.996 Ha TAX MAP
-L REV.-/-L1-
MATCH LINE STA. 95+00 -L REV.- SHEET 23
MATCH LINE STA. 88+50 -L REV.- SHEET 21
BM. #27
BM. #26
-Y22-REV.-
-Y22- REV.- PC 10+00.000 BEGIN CONSTRUCTION
-Y22- REV.- PT 11+92.226
-Y22- REV.- PC 12+11.684
-Y22- REV.- PT 15+47.071
-Y22 REV.- SR 2806
CARL G. DOWNS DB 635 PG 236 DB 709 PG 831 DB 819 PG 2469 6.167 Ha DEED
CARL G. DOWNS DB 635 PG 238 0.246 Ha
ALEXANDER L. BENNETT JR. DB 847 PG 1966 3.224 Ha DWD
WILLIAM B. BENNETT DB 837 PG 184 7446 SM DWD
DAVID BENNETT DB 467 PG 91 39.922 Ha DEED
FLYOVER @ US 220/NC 68
FLYOVER @ US 220/NC 68 CS 16+89.853
FLYOVER @ US 220/NC 68 TS 17+75.898
FLYOVER @ US 220/NC 68 ST 17+41.853
N 27° 06' 52.3" W
N 27° 06' 52.2" W
N 1° 41' 26.7" W
-L-
PIs STA 89+01.760 ΘS = 00°59'14" RT L = 60.000 U = 40.001 V = 20.001
PI STA 91+26.554 Δ = 19°59'15.6" RT L = 607.535 T = 306.785 R = 1740.972
PIs STA 94+49.093 ΘS = 00°59'14" RT L = 60.000 U = 40.001 V = 20.001
-L1-/NC 68 WB RAMP
PI STA 16+78.796 Δ = 05-26-19.22 LT L = 327.232 T = 163.739 R = 3447.3533
PIs STA 19+24.684 ΘS = 0°00'40" LT L = 60.000 U = 40.001 V = 20.001
PI STA 20+97.122 Δ = 10°14'52.79" LT L = 304.064 T = 152.439 R = 1700.000
PIs STA 22+68.748 ΘS = 0°00'40" LT L = 60.000 U = 40.001 V = 20.001
-Y13- CURVE DATA PI STA 1+20.754 Δ = 14°50'07" LT L = 148.488 T = 74.661 R = 573.48
-Y22-REV. SR 2806
PI Sta 11+01.146 Δ = 44°03' 18.0" (RT) L = 192.226 T = 101.146 R = 250.000 SE = .08 CW = 0.6m
PI Sta 13+93.508 Δ = 54°54' 12.2" (LT) L = 335.387 T = 181.824 R = 350.000 SE = .07(SEE PLANS) CW = 0.6m
-L REV.-
PIs Sta 86+42.474 θs = 1°00' 13.5" Ls = 61.000 ST = 20.334 LT = 40.667
PI Sta 89+69.082 Δ = 19°57' 16.9" (RT) L = 606.341 T = 306.272 R = 1741.000 SE = .04
PIs Sta 92+89.487 θs = 1°00' 13.5" Ls = 61.000 ST = 20.334 LT = 40.667
FLYOVER @ US 220/NC 68
PIs Sta 10+30.671 θs = 2°59' 42.0" Ls = 46.000 ST = 15.337 LT = 30.671
PI Sta 10+77.499 Δ = 8°11' 22.0" (RT) L = 62.890 T = 31.499 R = 440.000 SE = .06
PIs Sta 11+24.228 θs = 2°59' 42.0" Ls = 46.000 ST = 15.337 LT = 30.671
PIs Sta 13+89.145 θs = 4°15' 22.5" Ls = 52.000 ST = 17.342 LT = 34.677
PI Sta 15+56.445 Δ = 46°23' 26.3" (LT) L = 283.384 T = 149.976 R = 350.000 SE = .07
PIs Sta 17+07.195 θs = 4°15' 22.5" Ls = 52.000 ST = 17.342 LT = 34.677
PIs Sta 18+06.368 θs = 2°59' 42.0" Ls = 46.000 ST = 15.337 LT = 30.671
PI Sta 18+97.048 Δ = 19°25' 01.3" (RT) L = 149.240 T = 75.344 R = 440.000 SE = .06
PIs Sta 19+86.275 θs = 2°59' 42.0" Ls = 46.000 ST = 15.337 LT = 30.671
FOR -L1-/NC 68 PROFILE PROFILE SEE SHEET
FOR -L-REV. PROFILE SEE SHEETS
FOR FLYOVER PROFILE SEE SHEETS
FOR -Y22-REV. SR 2806 PROFILE SEE SHEET
PAVEMENT REMOVAL
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION
LOCATION:
TIP NO.:
COUNTY:
DESIGNED BY:
DATE:
CHECKED BY:
DATE:

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	23
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

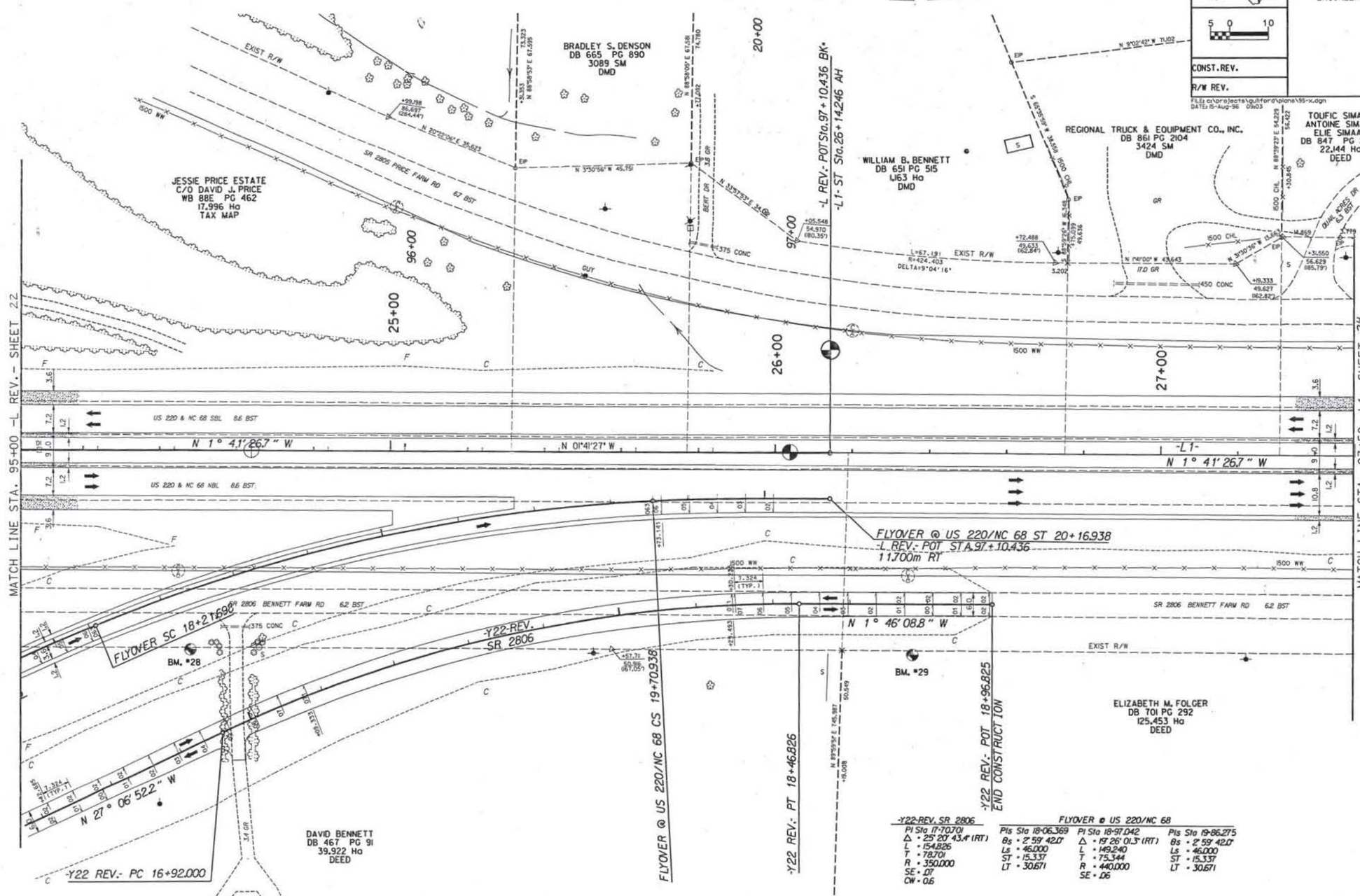
METRIC

5 0 10

CONST.REV.

R/W REV.

FILE: a:\projects\guilford\plans\95-x.dgn
DATE: 15-Aug-96 09:03



FOR -L-REV. PROFILE SEE SHEET	FOR FLYOVER PROFILE SEE SHEET	FOR -Y22 REV- SR 2806 PROFILE SEE SHEETS ,	FOR -L1- PROFILE SEE SHEET

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	25
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

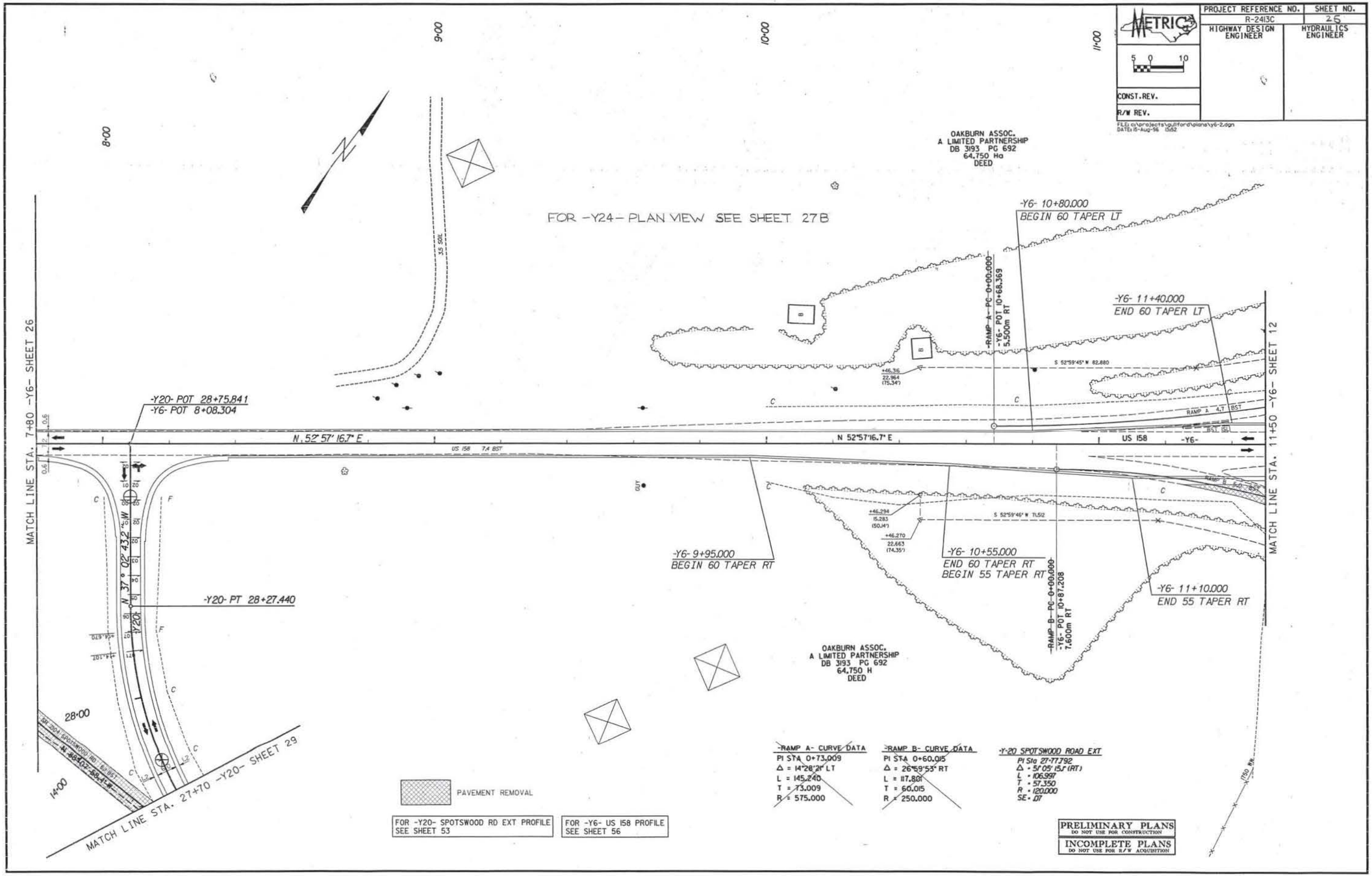
METRIC

5 0 10

CONST. REV.

R/W REV.

FILE: c:\projects\guilford\plans\y6-2.dgn
DATE: 15-Aug-96 13:52



PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	26
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

CONST. REV.

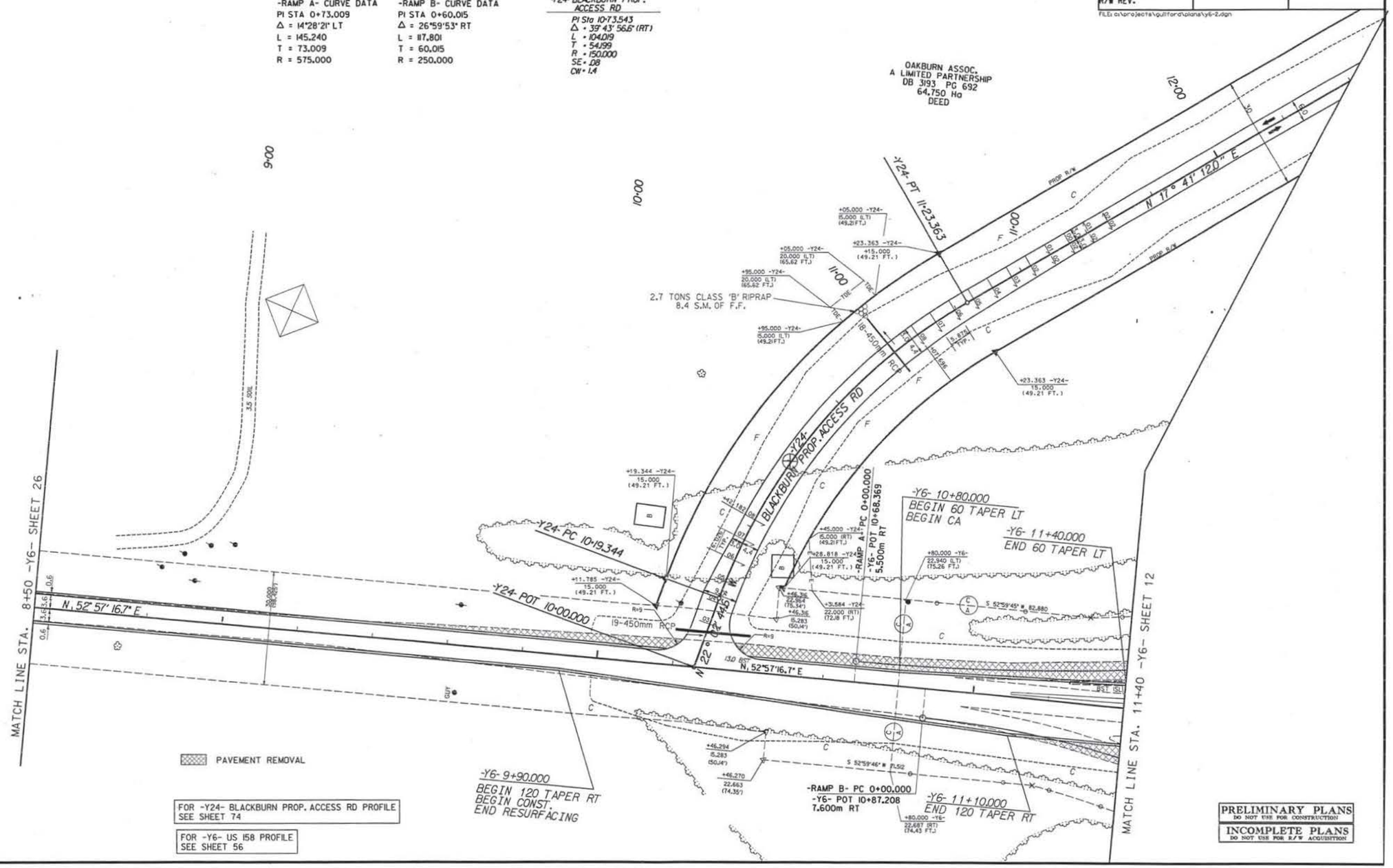
R/W REV.

FILE: c:\projects\guilford\plans\y6-2.dgn

-RAMP A- CURVE DATA
PI STA 0+73.009
Δ = 14°28'21" LT
L = 145.240
T = 73.009
R = 575.000

-RAMP B- CURVE DATA
PI STA 0+60.015
Δ = 26°59'53" RT
L = 117.801
T = 60.015
R = 250.000

-Y24- BLACKBURN PROP. ACCESS RD
PI Sta 10+73.543
Δ = 39°43'56.6" (RT)
L = 104.019
T = 54.199
R = 150.000
SE = .08
CW = 1.4



FOR -Y24- BLACKBURN PROP. ACCESS RD PROFILE
SEE SHEET 74

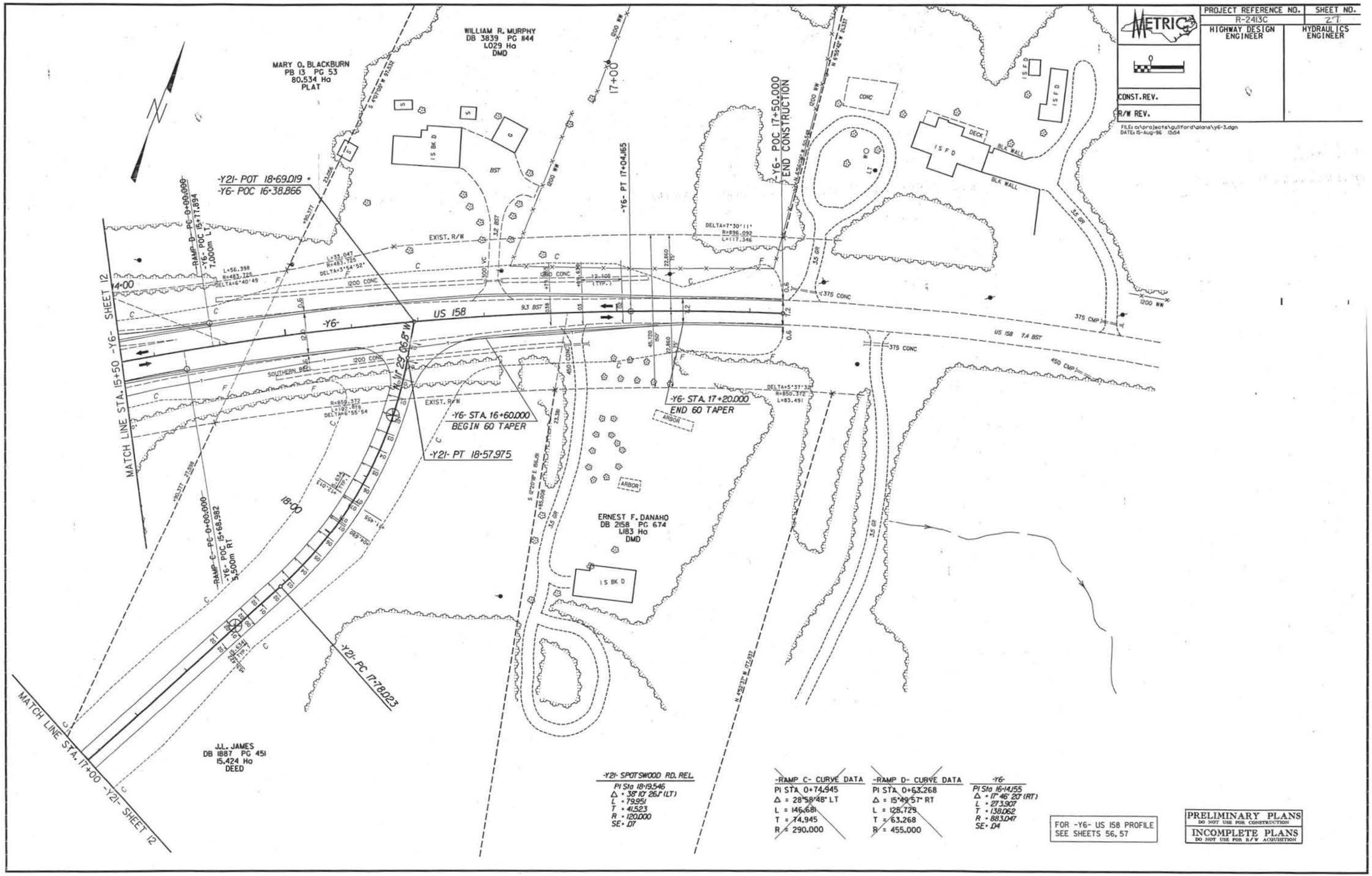
FOR -Y6- US 158 PROFILE
SEE SHEET 56

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	27
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CONST. REV.	
R/W REV.	

FILE: c:\projects\guilford\plans\y6-3.dgn
DATE: 15-Aug-96 13:54



-Y21- SPOTSWOOD RD. REL.
PI Sta 18+19.546
Δ = 38° 10' 26.1" (LT)
L = 79.951
T = 41.523
R = 120.000
SE = .07

~~-RAMP C- CURVE DATA~~
~~PI STA 0+74.945~~
~~Δ = 28° 58' 48" LT~~
~~L = 146.681~~
~~T = 74.945~~
~~R = 290.000~~

~~-RAMP D- CURVE DATA~~
~~PI STA 0+63.268~~
~~Δ = 15° 49' 57" RT~~
~~L = 125.729~~
~~T = 63.268~~
~~R = 455.000~~

-Y6-
PI Sta 16+14.55
Δ = 17° 46' 20" (RT)
L = 273.907
T = 138.062
R = 883.047
SE = .04

FOR -Y6- US 158 PROFILE
SEE SHEETS 56, 57

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

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	28
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

CONST. REV.

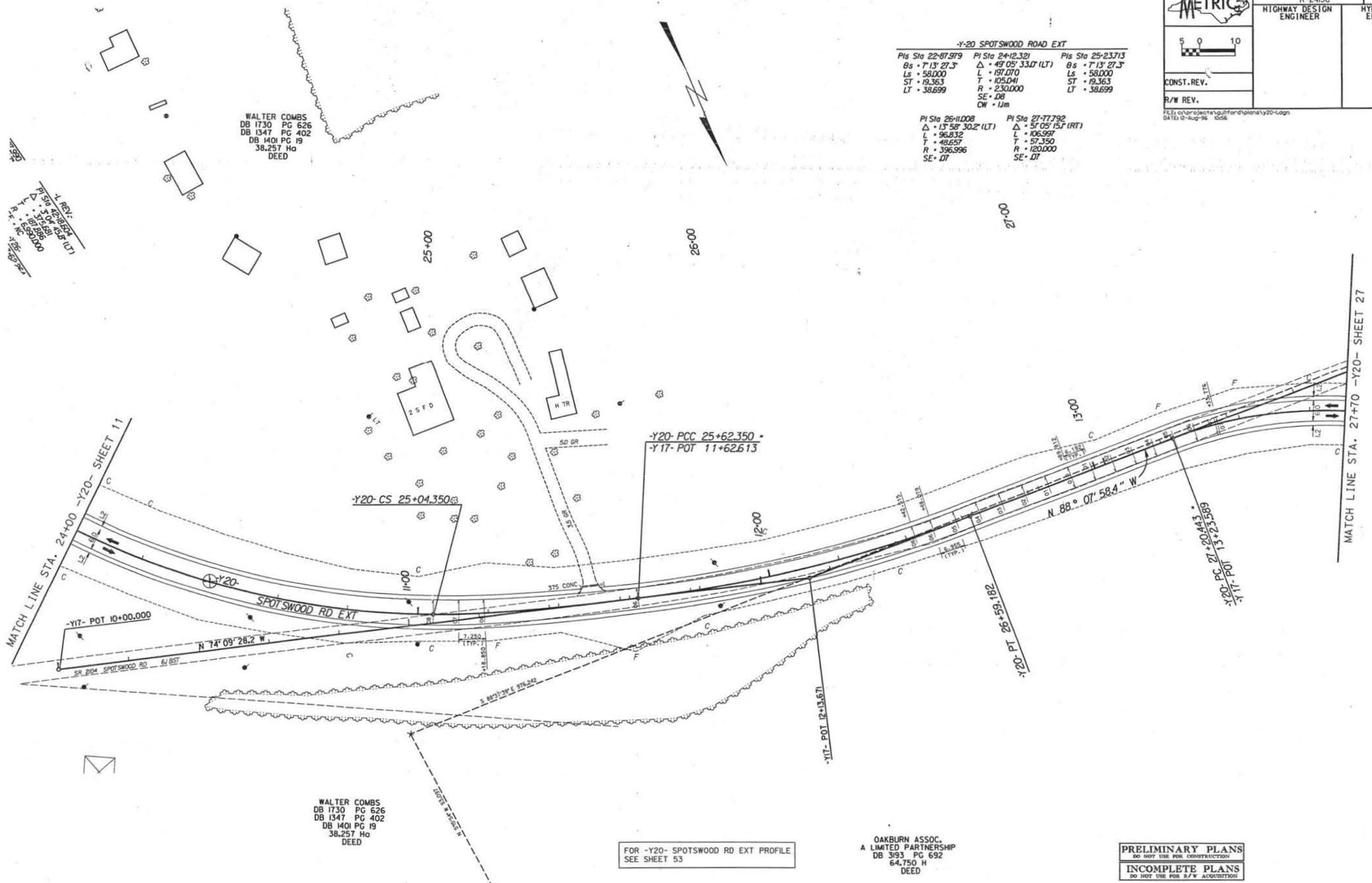
R/W REV.

FILE: c:\projects\guilford\plans\y20-ldgn
DATE: 12-Aug-96 10:56

-Y-20 SPOTSWOOD ROAD EXT

Pls Sta 22+87.979	Pi Sta 24+12.321	Pls Sta 25+23.713
Bs = 7° 13' 27.3"	Δ = 49° 05' 33.0" (LT)	Bs = 7° 13' 27.3"
Ls = 58.000	L = 197.070	Ls = 58.000
ST = 19.363	T = 105.041	ST = 19.363
LT = 38.699	R = 230.000	LT = 38.699
	SE = .08	
	CW = 1.1m	

Pi Sta 26+11.008	Pi Sta 27+77.792
Δ = 13° 58' 30.2" (LT)	Δ = 51° 05' 15.1" (RT)
L = 96.832	L = 106.997
T = 48.657	T = 57.350
R = 396.996	R = 120.000
SE = .07	SE = .07



FOR -Y20- SPOTSWOOD RD EXT PROFILE
SEE SHEET 53

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

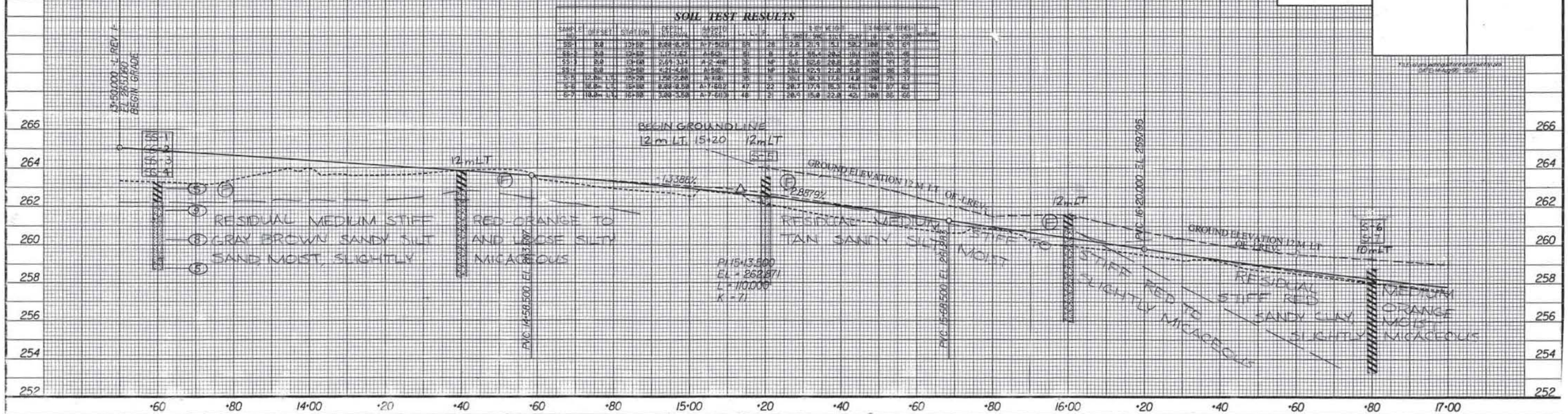
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	29

(F) RESIDUAL MEDIUM STIFF RED-ORANGE SANDY CLAY, MOIST, SLIGHTLY MICACEOUS, HIGHLY PLASTIC

SOIL TEST RESULTS

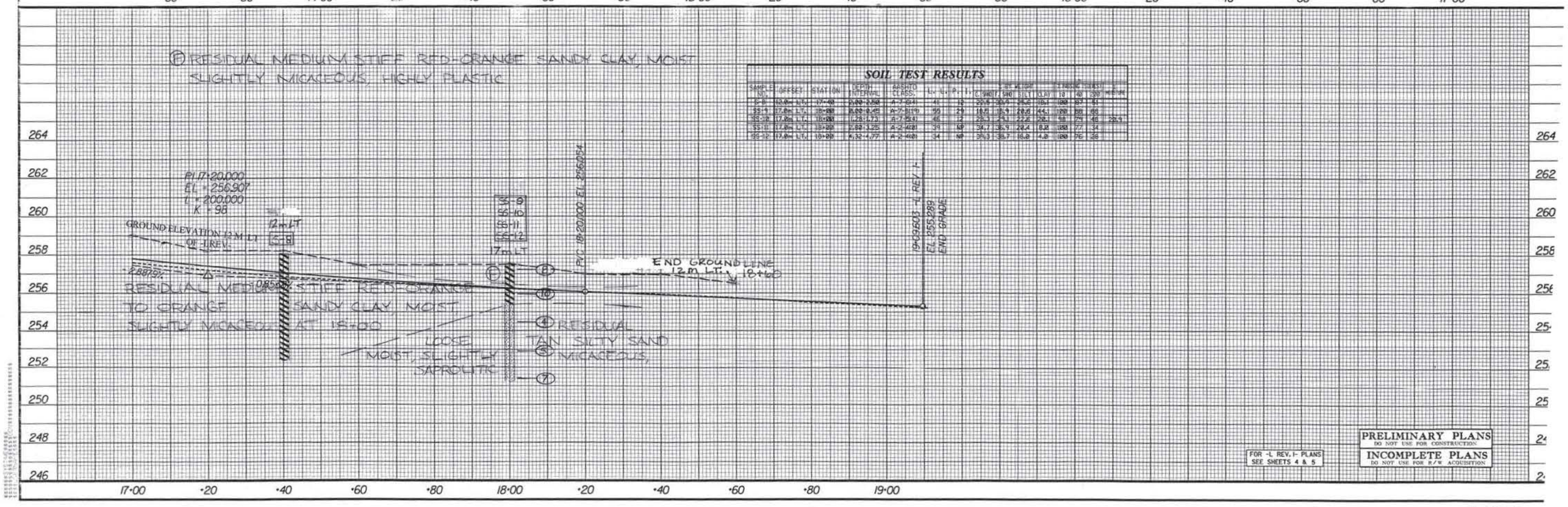
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING #10	#40	#200	% PASSING 0.05	0.02	0.005	0.002	% MOISTURE	CLASS.
SS-1	8.0	13+00	0.00-0.45	A-7-5(2)	58	28	2.8	2.3	5.1	50.2	100	50	29		
SS-2	8.0	13+00	1.37-1.82	A-6(2)	41	19	6.2	86.4	98.2	19.1	100	96	28		
SS-3	8.0	13+00	2.69-3.14	A-2-4(0)	36	NP	0.8	82.6	28.8	6.8	100	94	25		
SS-4	8.0	13+00	4.21-4.66	A-2(0)	41	NP	20.1	92.9	21.8	6.8	100	86	26		
S-5	12.8m LT	15+20	1.50-2.00	A-4(8)	35	5	30.1	98.3	77.8	14.8	100	75	37		
S-6	10.8m LT	15+00	0.00-0.50	A-7-6(12)	47	22	28.7	77.4	16.3	45.1	98	87	42		
S-7	10.8m LT	16+00	3.00-3.50	A-7-6(13)	48	21	28.5	15.0	22.8	42.1	100	86	66		



(F) RESIDUAL MEDIUM STIFF RED-ORANGE SANDY CLAY, MOIST SLIGHTLY MICACEOUS, HIGHLY PLASTIC

SOIL TEST RESULTS

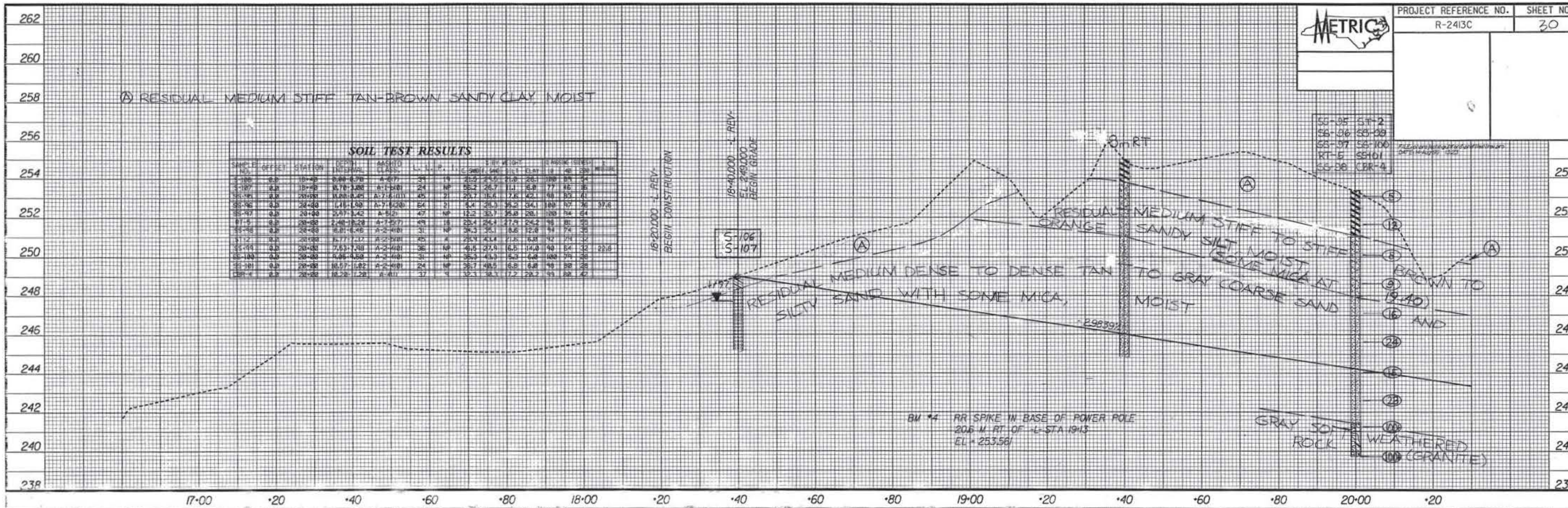
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING #10	#40	#200	% PASSING 0.05	0.02	0.005	0.002	% MOISTURE	CLASS.
S-9	13.0m LT.	17+00	0.00-0.50	A-7-5(4)	41	13	25.6	96.4	99.8	18.1	100	87	41		
SS-9	17.0m LT.	18+00	0.00-0.45	A-7-5(19)	59	29	18.0	18.9	20.8	44.1	100	88	66		
SS-10	17.0m LT.	18+00	1.28-1.73	A-7-5(8)	45	12	28.1	94.1	22.2	28.1	98	79	48	28.4	
SS-11	17.0m LT.	18+00	2.80-3.25	A-2-4(0)	34	NP	34.7	35.9	20.4	8.2	100	77	34		
SS-12	17.0m LT.	18+00	4.32-4.77	A-2-4(0)	34	NP	34.3	35.7	16.0	4.8	100	76	28		



FOR -L REV. I- PLANS SEE SHEETS 4 & 5

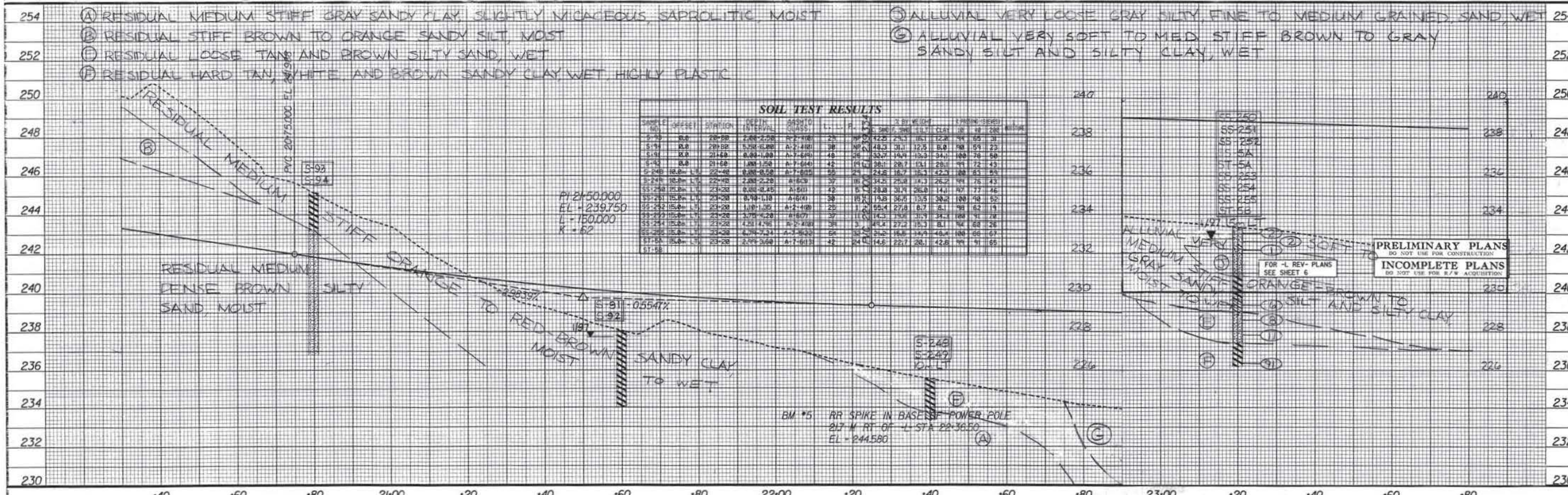
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

METRIC



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L. L.	P. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE
S-106	0.0	18+40	0.00-0.70	A-6(7)	39	19	21.5	29.5	21.0	28.1	100	89	54	
S-107	0.0	18+40	0.70-3.00	A-1-b(0)	24	NP	56.2	26.7	11.1	6.0	77	46	16	
SS-95	0.0	20+00	0.00-0.45	A-7-6(11)	45	21	23.7	16.6	17.6	42.1	98	83	61	
SS-96	0.0	20+00	1.45-1.90	A-7-5(20)	64	21	5.4	25.3	35.2	34.1	100	97	76	37.6
SS-97	0.0	20+00	2.97-3.42	A-5(2)	47	NP	12.2	32.7	35.0	20.1	100	94	64	
RT-5	0.0	20+00	2.40-10.20	A-7-5(7)	49	15	23.4	24.4	27.9	24.2	98	81	55	
SS-98	0.0	20+00	6.01-6.46	A-2-4(0)	31	NP	34.3	35.1	18.6	12.0	94	74	35	
ST-2	0.0	20+00	6.77-7.37	A-2-5(0)	45	4	28.9	43.4	21.6	6.0	92	79	32	
SS-99	0.0	20+00	7.63-7.98	A-2-4(0)	36	NP	46.6	27.9	16.5	14.0	90	64	32	22.6
SS-100	0.0	20+00	9.05-9.50	A-2-4(0)	31	NP	35.3	43.3	15.3	6.0	100	79	28	
SS-101	0.0	20+00	10.57-11.02	A-2-4(0)	24	NP	36.7	48.5	16.8	6.0	98	80	28	
CBR-4	0.0	20+00	10.20-11.20	A-4(1)	37	9	32.3	38.3	17.2	22.2	99	80	42	



SOIL TEST RESULTS

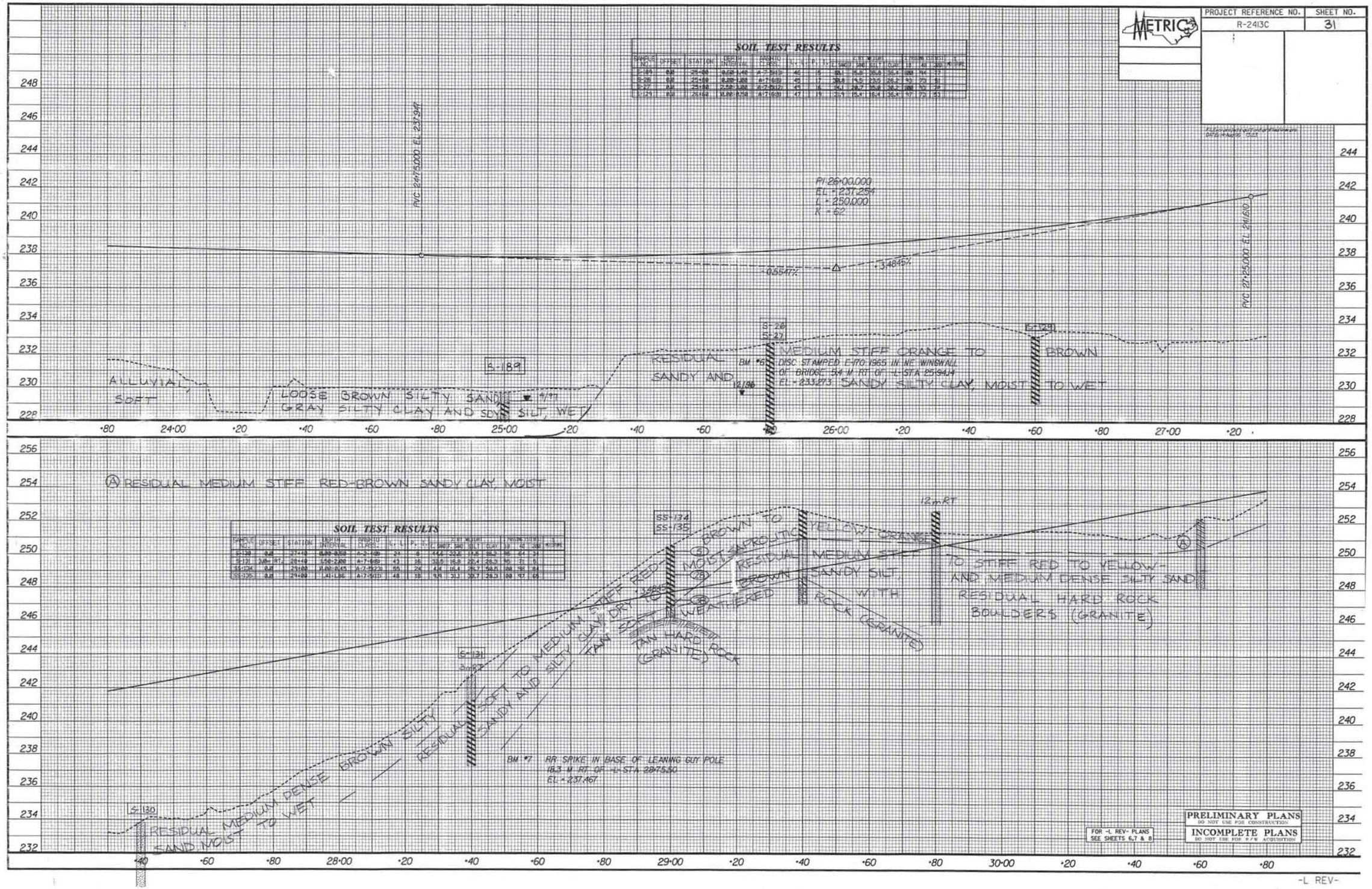
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L. L.	P. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE
S-93	0.0	20+80	2.00-2.50	A-2-4(0)	25	NP	42.5	29.3	16.1	12.0	99	65	31	
S-94	0.0	20+80	5.50-6.00	A-2-4(0)	30	NP	48.3	31.1	12.5	8.0	90	59	23	
S-91	0.0	21+60	0.00-1.00	A-7-6(9)	48	26	32.7	19.9	13.3	34.1	100	78	50	
S-92	0.0	21+60	1.00-1.50	A-7-6(4)	42	19	38.1	20.7	13.1	28.1	99	72	43	
S-248	10.0m LT	22+40	0.00-0.50	A-7-6(15)	55	29	24.6	16.7	16.3	42.3	100	83	59	
S-249	10.0m LT	22+40	2.00-2.20	A-6(3)	37	16	34.5	25.0	14.3	26.2	99	76	43	
SS-250	15.0m LT	23+20	0.00-0.45	A-5(1)	42	6	28.0	31.9	26.0	14.1	97	77	46	
SS-251	15.0m LT	23+20	0.90-1.10	A-6(4)	30	15	19.8	36.5	13.5	30.2	100	90	52	
SS-252	15.0m LT	23+20	1.10-1.35	A-2-4(0)	25	1	55.4	27.8	8.7	8.1	98	62	19	
SS-253	15.0m LT	23+20	3.75-4.20	A-6(7)	37	11	14.3	19.6	31.9	34.3	100	91	70	
SS-254	15.0m LT	23+20	4.51-4.96	A-2-4(0)	39	3	49.4	27.2	15.3	8.1	94	60	26	
SS-255	15.0m LT	23+20	6.79-7.24	A-7-5(22)	64	32	24.2	16.6	14.9	40.4	100	86	67	
ST-5A	15.0m LT	23+20	2.99-3.60	A-7-6(13)	42	24	14.6	22.7	20.1	42.6	99	91	65	
ST-5B														

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-L REV-

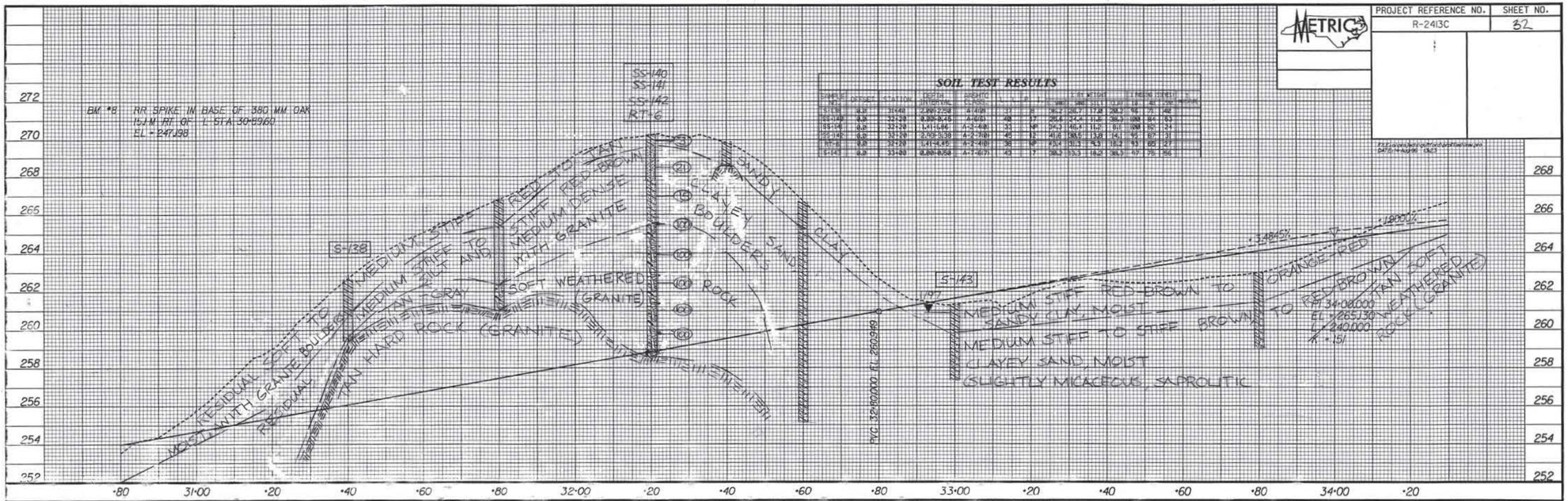
PROJECT REFERENCE NO.	SHEET NO.
R-2413C	31

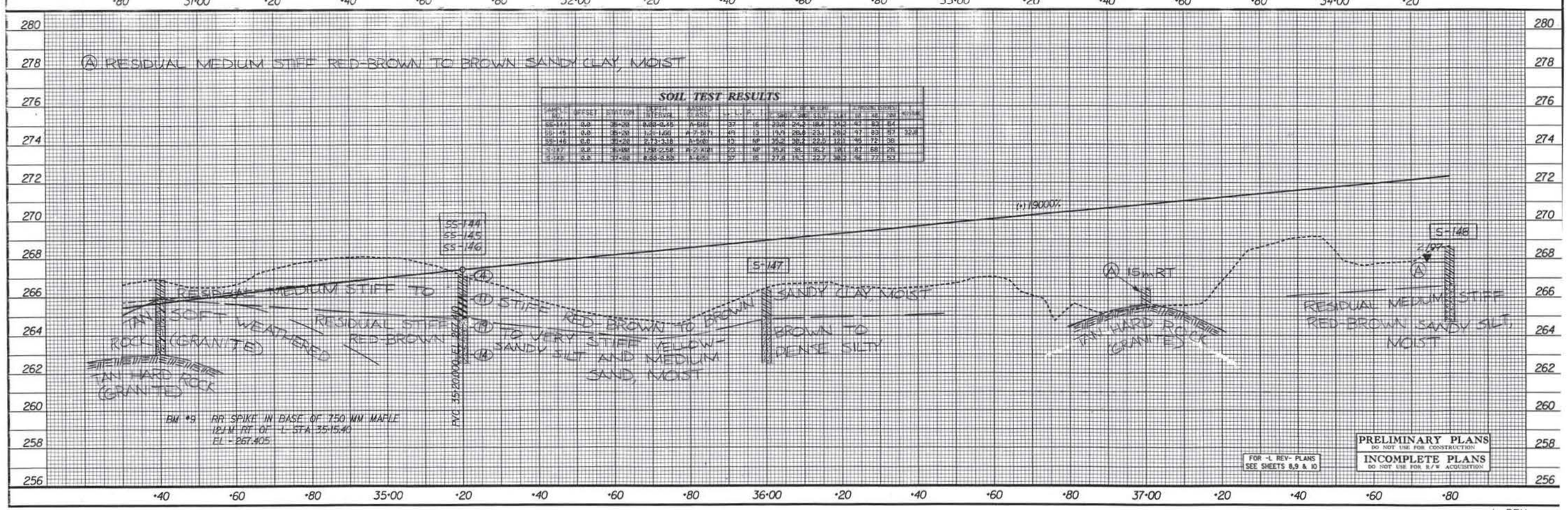


-L REV-

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	32

METRIC





SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH IN FEET	AASHTO CLASS.	L.L.	P.I.	% PASSING 10	40	200	LIQUID LIMIT	PLASTIC LIMIT	% PASSING 10	40	200	NOTES
SS-139	0.0	31+00	2.00-2.58	A-4(8)	31	8	96.2	86.7	72.8	26.3	18.4	75	72	48	
SS-140	0.0	32+20	0.33-0.75	A-4(8)	48	17	98.6	94.4	71.5	36.5	19.0	84	79	63	
SS-141	0.0	32+20	1.41-1.96	A-3(0)	33	NP	94.3	86.1	11.2	61	NP	90	34		
SS-142	0.0	32+20	2.42-3.00	A-2-7(0)	42	9	41.8	38.5	13.8	41.1	19	87	31		
RT-6	0.0	32+20	1.41-1.95	A-2-4(0)	36	8	29.4	13.3	5.3	18.3	11	89	27		
S-143	0.0	33+00	0.80-0.58	A-7-6(7)	42	7	98.2	93.3	18.2	36.5	17	75	56		

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH IN FEET	AASHTO CLASS.	L.L.	P.I.	% PASSING 10	40	200	LIQUID LIMIT	PLASTIC LIMIT	% PASSING 10	40	200	NOTES
SS-143	0.0	34+20	0.00-0.45	A-6(6)	37	16	99.8	94.3	68.4	34.2	17	82	64		
SS-145	0.0	35+20	1.21-1.66	A-7-5(7)	49	13	99.9	98.0	93.1	28.2	17	88	87	32.8	
SS-146	0.0	35+20	2.73-3.18	A-6(8)	35	NP	98.8	98.2	82.0	12.1	15	72	38		
S-147	0.0	36+00	1.00-2.58	A-2-4(0)	23	NP	35.8	38	16.2	19.1	17	68	28		
S-148	0.0	37+00	0.00-0.58	A-6(6)	37	16	27.8	16.3	22.7	30.2	16	77	53		

FOR -L REV- PLANS SEE SHEETS 8,9 & 10

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-L REV-

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	33

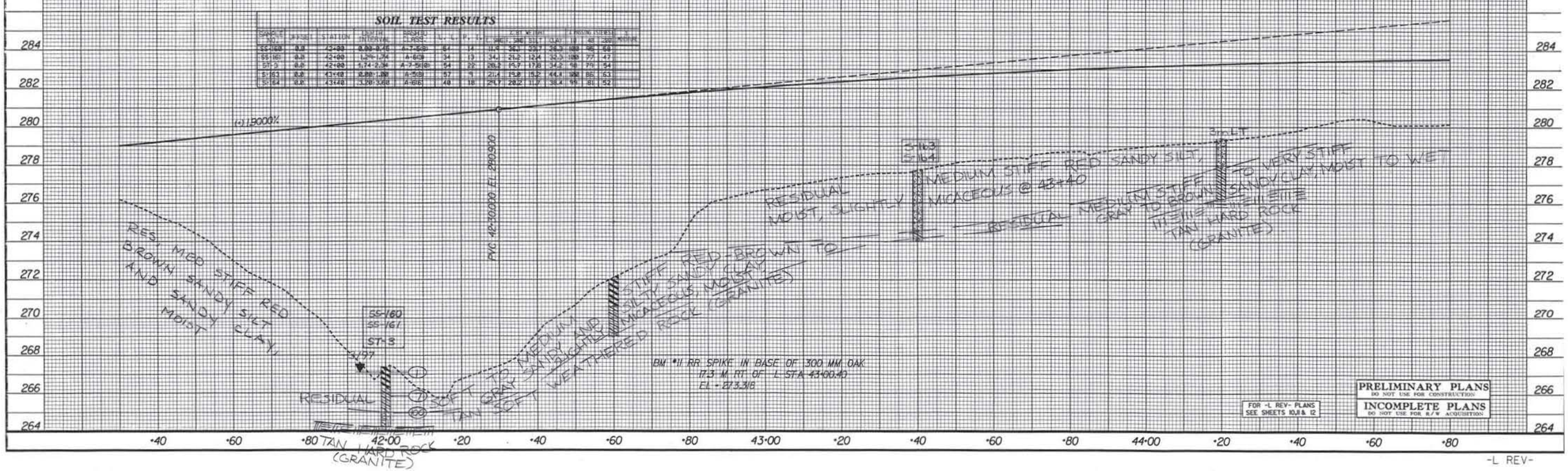
Ⓐ RESIDUAL MEDIUM STIFF RED-BROWN SANDY CLAY, MOIST

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH (INTERVAL)	AASHTO CLASS.	L.L.	P.I.	A-2 SIEVE	A-2 SIEVE	A-2 SIEVE	A-2 SIEVE	PASSING SIEVES			NOTES
							#40	#60	#80	#200	10	40	200	
S-148	0.0	37+00	0.00-0.50	A-6(8)	37	15	27.8	14.3	32.7	26.2	46	77	53	
SS-149	0.0	38+00	0.00-0.45	A-7-5(8)	42	17	24.0	20.1	13.5	35.3	48	77	49	
SS-157	0.0	38+00	1.50-1.51	A-2(0)	44	18	30.1	30.1	25.3	15.2	48	78	36	
SS-158	0.0	38+00	4.38-4.75	A-2-4(0)	37	NP	18.4	12.9	14.6	12.0	47	78	21	
S-159	0.0	41+00	0.00-0.50	A-6(8)	33	10	26.8	27.3	17.4	22.2	100	97	48	

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH (INTERVAL)	AASHTO CLASS.	L.L.	P.I.	A-2 SIEVE #40	A-2 SIEVE #60	A-2 SIEVE #80	A-2 SIEVE #200	PASSING SIEVES 10	40	200	NOTES
SS-160	0.0	42+00	0.00-0.45	A-7-6(8)	64	14	31.4	34.2	29.7	36.3	100	98	68	
SS-161	0.0	42+00	1.24-1.74	A-6(8)	34	13	34.1	21.5	12.4	32.5	100	97	47	
ST-3	0.0	42+00	1.74-2.34	A-7-5(8)	54	22	28.2	15.7	17.8	34.2	98	79	54	
S-163	0.0	43+40	0.00-1.00	A-6(8)	37	9	20.4	19.8	19.6	44.8	100	88	63	
S-164	0.0	43+40	1.00-3.00	A-6(6)	40	18	24.7	28.2	31.7	38.4	99	86	52	



FOR -L REV- PLANS SEE SHEETS 10,11 & 12

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

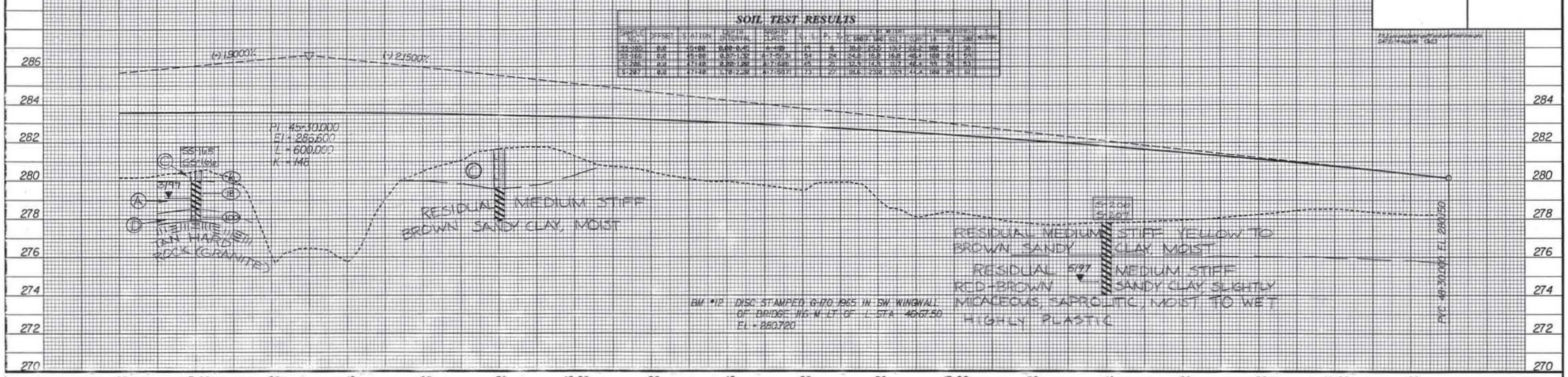
-L REV-

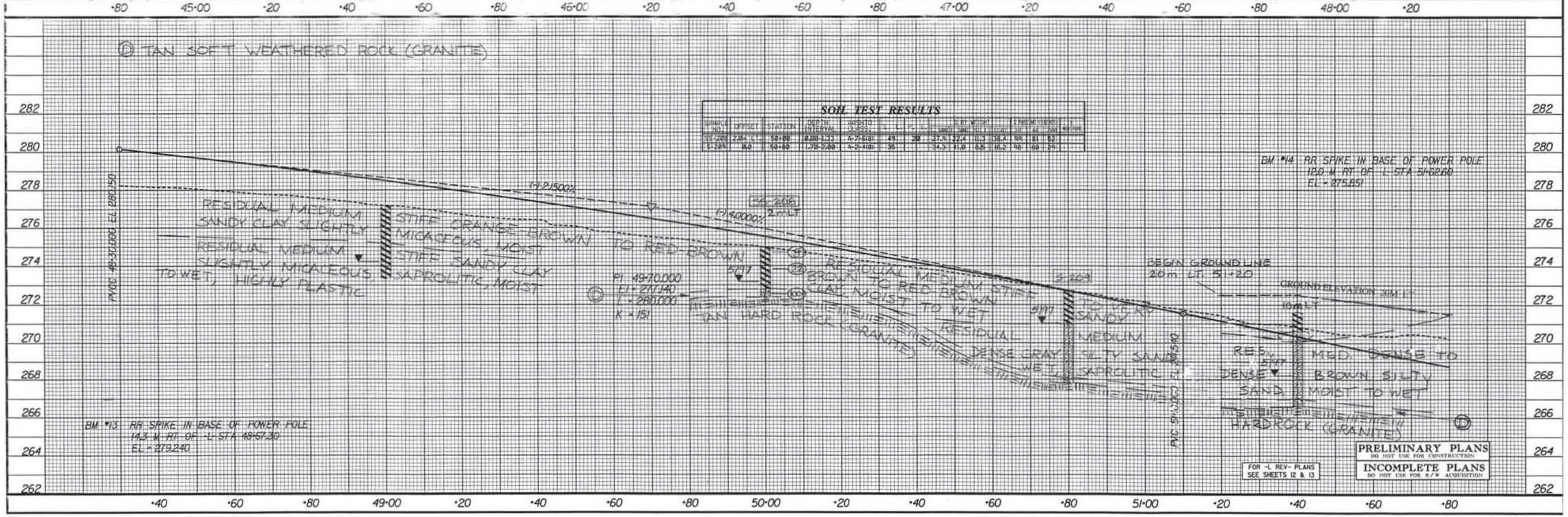
PROJECT REFERENCE NO.	SHEET NO.
R-2413C	34

Ⓐ RESIDUAL VERY STIFF RED SANDY CLAY SLIGHTLY MICACEOUS MOIST TO WET
Ⓑ ROADWAY EMBANKMENT MEDIUM STIFF TAN TO RED-BROWN SANDY SILT, MOIST
Ⓒ TAN SOFT WEATHERED ROCK (GRANITE)

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING 10	% PASSING 40	% PASSING 200	% MOISTURE
SS-205	0.0	47+00	0.00-0.45	A-4(8)	15	6	38.8	25.6	13.7	22.3
SS-206	0.0	47+00	0.87-1.30	A-7-6(13)	51	24	34.4	16.8	16.8	46.4
S-206	0.0	47+00	0.90-1.30	A-7(8)	45	21	32.5	12.5	11.7	46.4
S-207	0.0	47+00	1.78-2.20	A-7(10)	73	27	36.6	23.8	13.3	42.4





SOIL TEST RESULTS

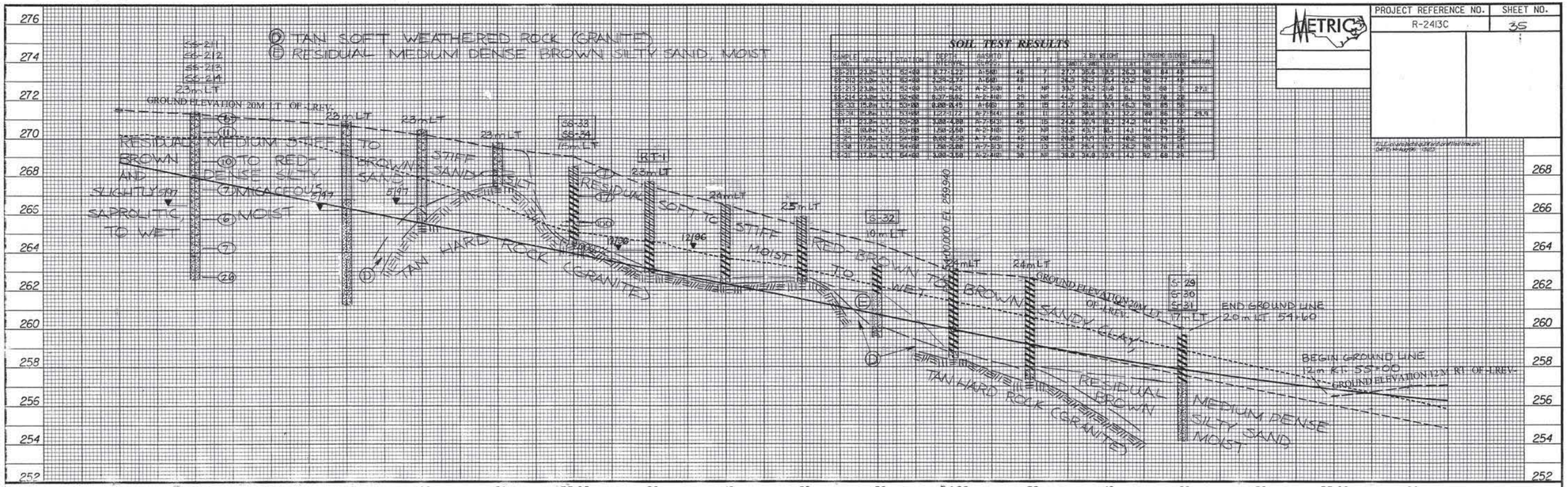
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING 10	% PASSING 40	% PASSING 200	% MOISTURE
SS-208	2.3m LT	50+80	0.88-1.33	A-7-5(8)	49	28	27.8	22.4	11.3	38.4
S-208	0.0	50+80	1.78-2.00	A-2-4(0)	36		34.3	31.0	8.5	16.2

FOR -L REV- PLANS SEE SHEETS 12 & 13

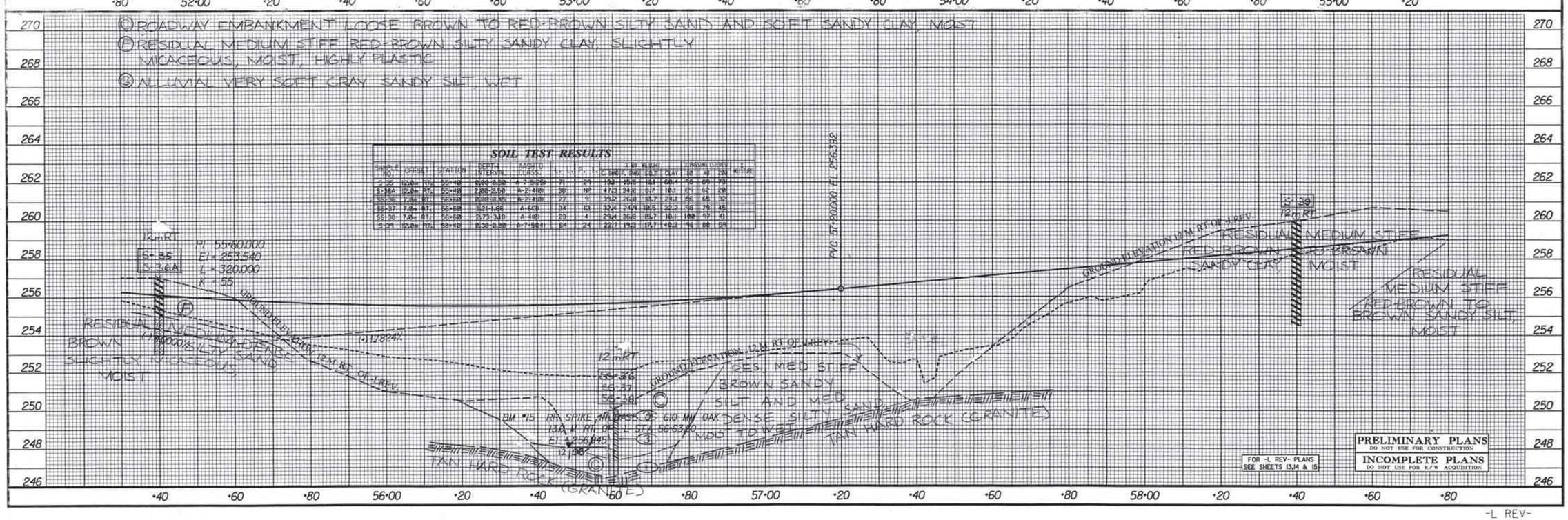
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-L REV-

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	35



SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	ASSTO CLASS.	L.L.	P.L.	P.I.	% SOIL MORT.	% SAND	% SILT	% CLAY	PASSING SIEVE 10	40	200	REMARKS
SS-211	23.0m LT	52+00	0.77-1.22	A-6(8)	46	7	39	27.7	35.6	18.5	36.3	88	84	49	
SS-212	23.0m LT	52+00	2.28-2.77	A-6(8)	48	7	41	34.0	38.3	15.4	32.2	92	77	49	
SS-213	23.0m LT	52+00	3.81-4.26	A-2-5(0)	41	NP	10	33.7	39.2	21.0	6.1	98	60	31	27.11
SS-214	23.0m LT	52+00	5.37-5.82	A-2-4(0)	29	NP	11	41.2	38.2	12.5	8.1	92	70	28	
SS-33	19.0m LT	53+00	0.00-0.45	A-6(8)	36	18	18	21.7	23.1	18.3	36.9	98	85	56	
SS-34	19.0m LT	53+00	1.27-1.72	A-7-5(4)	48	16	32	21.5	30.8	16.3	32.2	100	86	56	29.91
RT-1	23.0m LT	53+00	3.00-4.00	A-7-5(3)	45	15	30	21.8	30.4	18.3	34.2	94	82	49	
S-32	18.0m LT	53+80	1.50-2.50	A-2-4(0)	27	NP	11	33.2	43.7	10.1	14.3	94	79	28	
S-29	17.0m LT	54+80	0.00-0.50	A-7-6(0)	46	28	18	24.8	19.5	13.1	40.2	98	93	56	
S-30	17.0m LT	54+80	1.50-2.00	A-7-6(3)	42	15	27	33.0	25.4	18.7	26.2	98	76	48	
S-31	17.0m LT	54+80	3.00-3.50	A-2-4(0)	38	NP	11	34.0	34.0	17.4	14.3	92	68	28	



SOIL TEST RESULTS

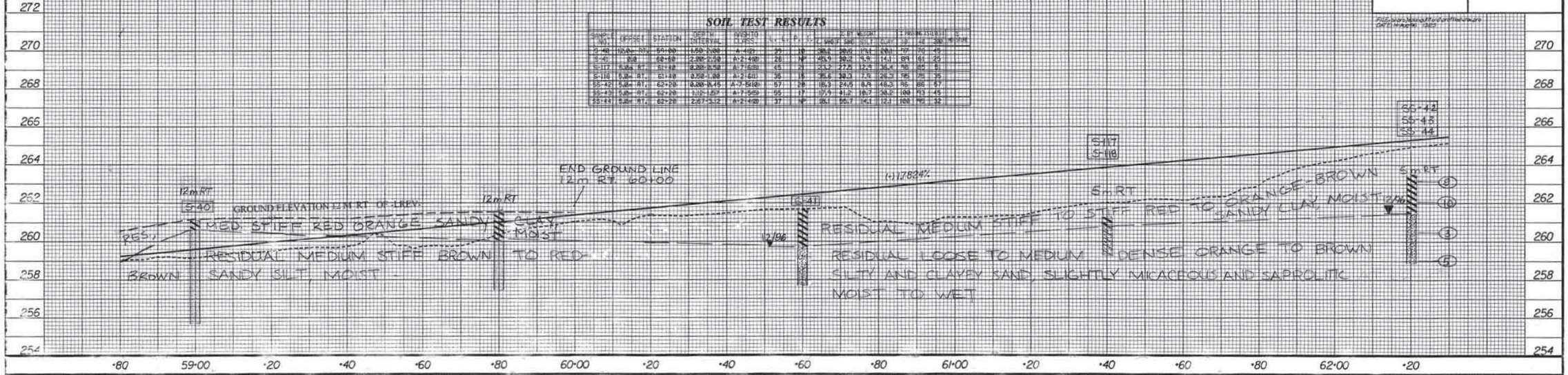
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	ASSTO CLASS.	L.L.	P.L.	P.I.	% SOIL MORT.	% SAND	% SILT	% CLAY	PASSING SIEVE 10	40	200	REMARKS
S-35	12.0m RT	55+40	0.00-0.50	A-7-5(5)	71	23	48	19.5	15.5	16.1	68.4	98	89	79	
S-36A	12.0m RT	55+40	2.00-2.50	A-2-4(0)	38	NP	11	47.3	34.8	8.7	10.1	89	62	28	
SS-36	7.0m RT	56+60	0.00-0.45	A-2-4(0)	27	9	18	19.2	26.8	18.7	26.1	86	65	32	
SS-37	7.0m RT	56+60	1.21-1.66	A-6(9)	34	13	21	32.6	24.9	18.5	32.2	98	79	45	
SS-38	7.0m RT	56+60	2.73-3.18	A-4(0)	23	4	19	29.4	36.8	15.7	18.1	100	97	41	
S-39	12.0m RT	58+40	0.30-0.80	A-7-5(4)	84	24	60	22.7	15.3	17.7	44.2	98	88	58	

-L REV-

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	36

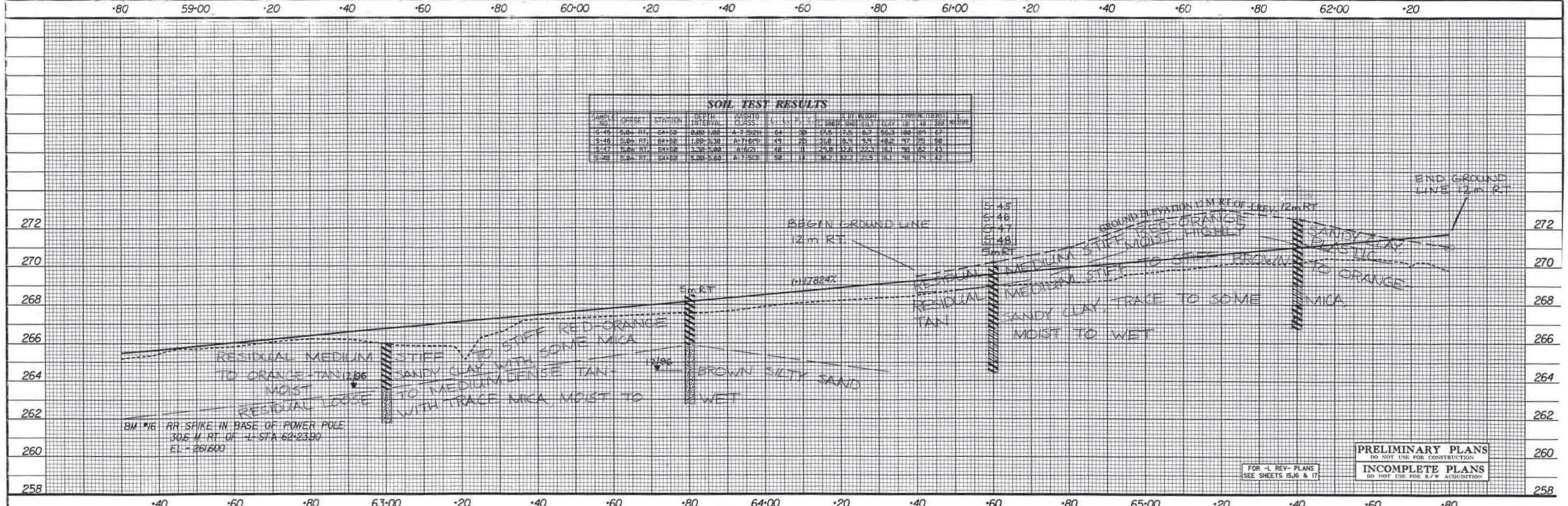
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% PASSING SIEVE								
							GRAVEL	SAND	SILT	CLAY	10	40	200	4.75mm	
S-40	12.0m RT	59+00	1.50-2.00	A-4(0)	32	10	38.2	38.0	19.1	24.7	70	56	45		
S-41	0.0	60+60	2.00-2.50	A-2-4(0)	28	NP	45.9	38.2	3.9	14.1	89	61	20		
S-117	5.0m RT	61+40	0.00-0.50	A-7(6)	45	21	23.2	27.5	12.5	36.4	98	85	61		
S-116	5.0m RT	61+40	0.50-1.00	A-2(6)	36	15	25.6	32.3	7.5	34.3	98	75	42		
SS-42	5.0m RT	62+00	0.00-0.45	A-7-5(10)	67	28	16.9	24.0	8.9	48.3	98	86	67		
SS-43	5.0m RT	62+00	0.90-1.07	A-7-5(9)	55	17	17.9	41.2	18.7	36.2	100	93	48		
SS-44	5.0m RT	62+00	2.67-3.12	A-2-4(0)	37	NP	18.1	55.7	16.1	12.1	100	95	32		



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% PASSING SIEVE								
							GRAVEL	SAND	SILT	CLAY	10	40	200	4.75mm	
S-45	5.0m RT	63+50	0.00-1.00	A-7-5(9)	64	32	0.5	13.5	8.7	56.3	100	99	67		
S-46	5.0m RT	64+00	1.00-3.38	A-7(6)	45	20	3.8	8.1	13.1	48.2	97	95	58		
S-47	5.0m RT	64+00	1.38-5.62	A-6(2)	48	11	23.8	22.6	22.3	31.3	98	82	43		
S-48	5.0m RT	64+00	5.20-5.68	A-7-5(8)	58	19	8.2	22.2	21.5	48.1	98	75	42		



FOR -L REV- PLANS SEE SHEETS 15,16 & 17

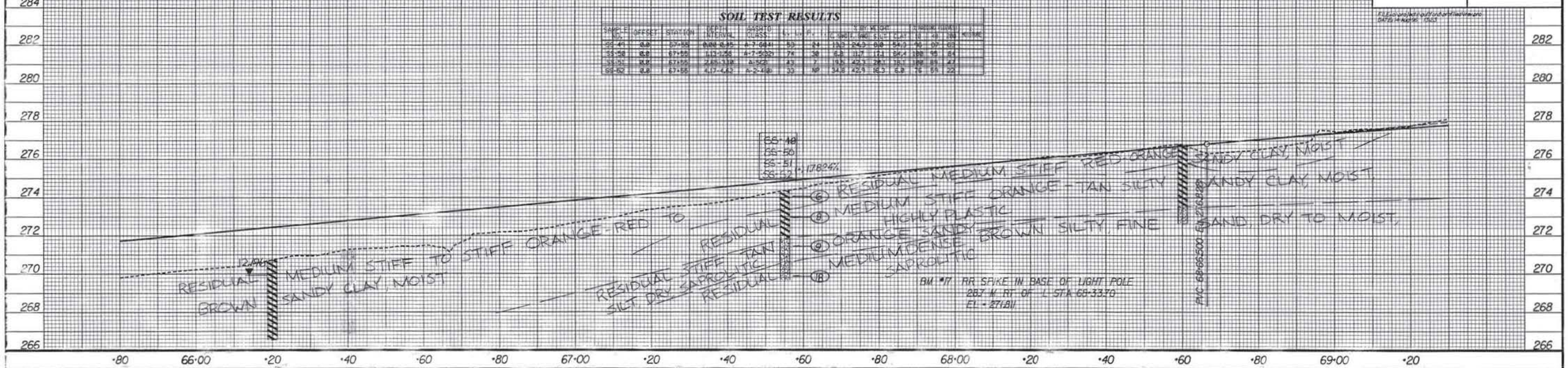
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-L REV-

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	37

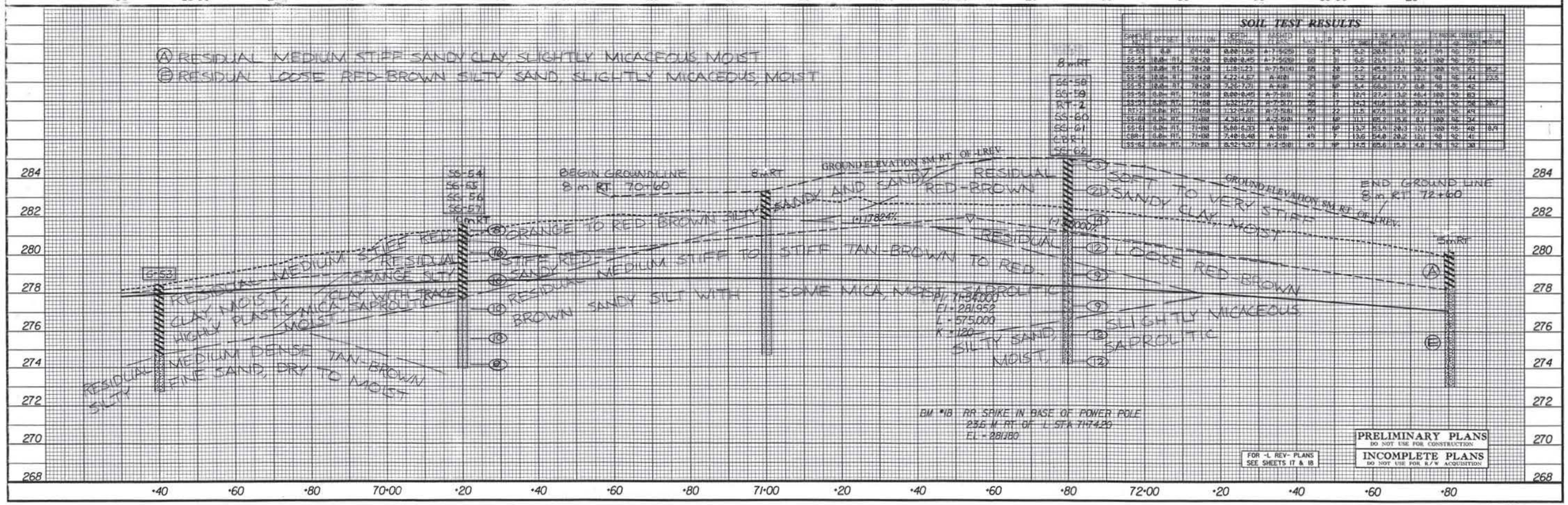
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	ASSHTO CLASS.	L.L.	P.I.	% PASSING 10	40	200	% MOISTURE	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	10	40	200	% MOISTURE
SS-49	0.0	67+55	0.00-0.45	A-7-6(4)	50	30	100	84.5	60	34.0	30	17	60				
SS-50	0.0	67+55	0.12-1.06	A-7-5(22)	74	38	6.8	11.7	71	36.4	100	19	81				
SS-51	0.0	67+55	2.65-3.18	A-5(2)	43	7	15	42.3	34	18.7	100	31	47				
SS-52	0.0	67+55	4.17-4.63	A-2-4(0)	33	NP	34.8	42.9	15.2	6.8	76	51	22				



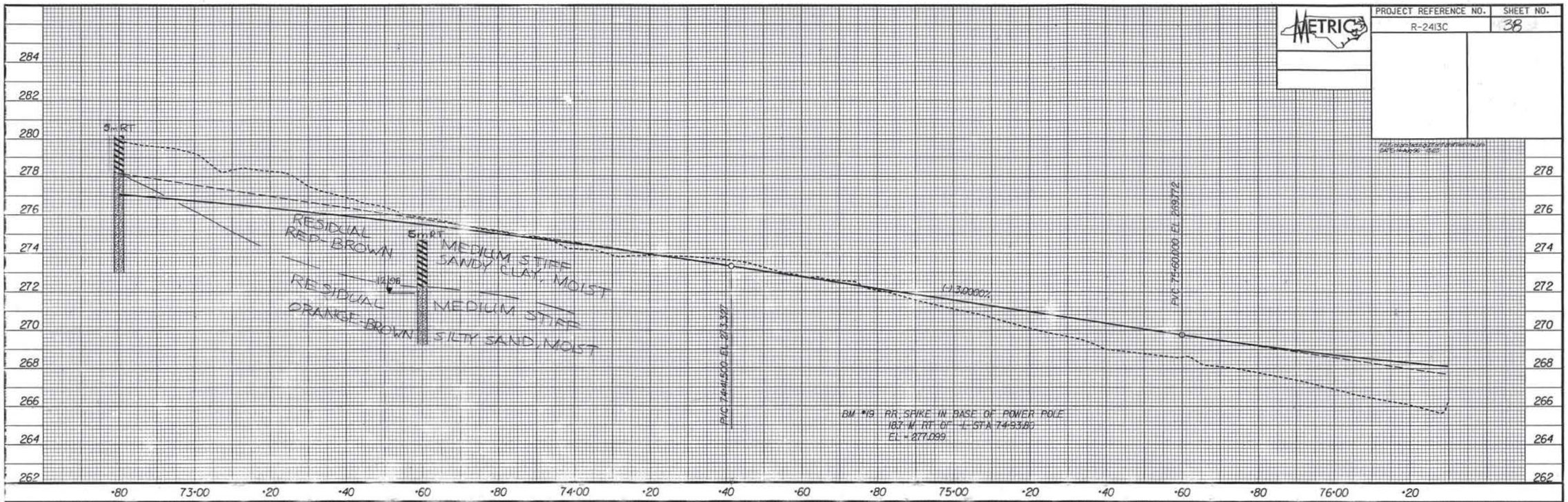
SOIL TEST RESULTS

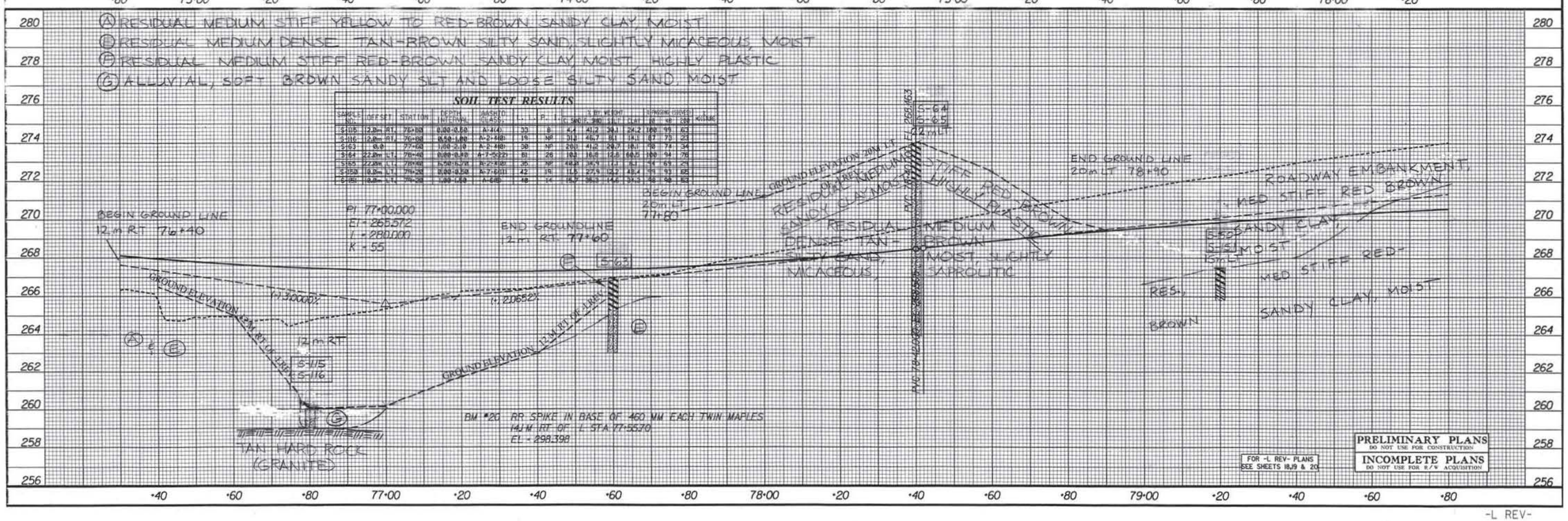
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	ASSHTO CLASS.	L.L.	P.I.	% PASSING 10	40	200	% MOISTURE	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	10	40	200	% MOISTURE
SS-53	0.0	69+40	0.00-1.50	A-7-5(20)	63	29	15.2	28.5	15.9	20.4	99	56	37				
SS-54	10.0 Rt	70+20	0.00-0.45	A-7-5(20)	68	31	6.5	26.9	13.1	20.4	100	56	35				
SS-55	10.0 Rt	70+20	1.16-1.23	A-7-5(14)	66	28	2.2	45.5	22.1	30.2	100	55	61	35.2			
SS-56	10.0 Rt	70+20	2.22-2.67	A-4(8)	34	NP	5.2	64.8	17.9	12.1	98	56	44	23.5			
SS-57	10.0 Rt	70+20	3.65-3.91	A-4(8)	31	NP	8.4	60.8	17.7	8.8	98	56	42				
SS-58	0.0 Rt	71+00	0.00-0.45	A-7-5(11)	42	21	12.6	37.4	13.8	18.4	100	55	33				
SS-59	0.0 Rt	71+00	1.32-1.77	A-7-5(7)	50	21	12.4	41.8	13.8	20.3	99	55	36	30.7			
RT-2	0.0 Rt	71+00	1.32-5.88	A-7-5(8)	56	22	11.5	47.5	15.8	22.2	100	55	49				
SS-60	0.0 Rt	71+00	4.36-4.81	A-2-5(0)	67	NP	11.1	65.2	15.6	8.1	100	55	24				
SS-61	0.0 Rt	71+00	5.88-6.33	A-3(0)	49	NP	13.7	53.6	20.3	12.1	100	55	48	8.9			
CBR-1	0.0 Rt	71+00	7.40-8.48	A-5(1)	49	7	13.6	54.0	20.2	12.1	100	52	41				
SS-62	0.0 Rt	71+00	8.92-9.37	A-2-5(0)	45	NP	14.5	65.6	15.5	6.0	98	52	30				



-L REV-

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	38





SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% MOIST.	% DIST. GRAVEL	% DIST. SAND	% DIST. SILT	% DIST. CLAY	% PASSING #10	% PASSING #40	% PASSING #200	A-4 SUBGRADE
S-115	12.0m	RT	76+80	0.00-0.60	A-4(4)	33	8	4.4	41.2	30.1	24.2	100	99	82	
S-116	12.0m	RT	76+80	0.50-1.00	A-2-4(0)	19	NP	3.3	46.7	31	19.1	87	75	23	
S-63	6.0	RT	77+60	1.00-2.10	A-2-4(0)	30	NP	20.0	41.2	20.7	18.1	98	74	34	
S-64	22.0m	LT	78+40	0.00-0.80	A-7-5(22)	81	26	10.3	16.6	12.8	60.2	100	94	76	
S-65	22.0m	LT	78+90	0.50-1.70	A-2-4(0)	30	NP	18.8	30.1	31	18.1	97	65	23	
S-115	12.0m	LT	76+20	0.00-0.50	A-7-6(11)	42	16	11.4	22.5	19.2	46.4	91	93	88	
S-116	12.0m	LT	76+20	1.00-1.60	A-6(8)	40	12	15.7	36.3	24.2	33.3	98	89	82	

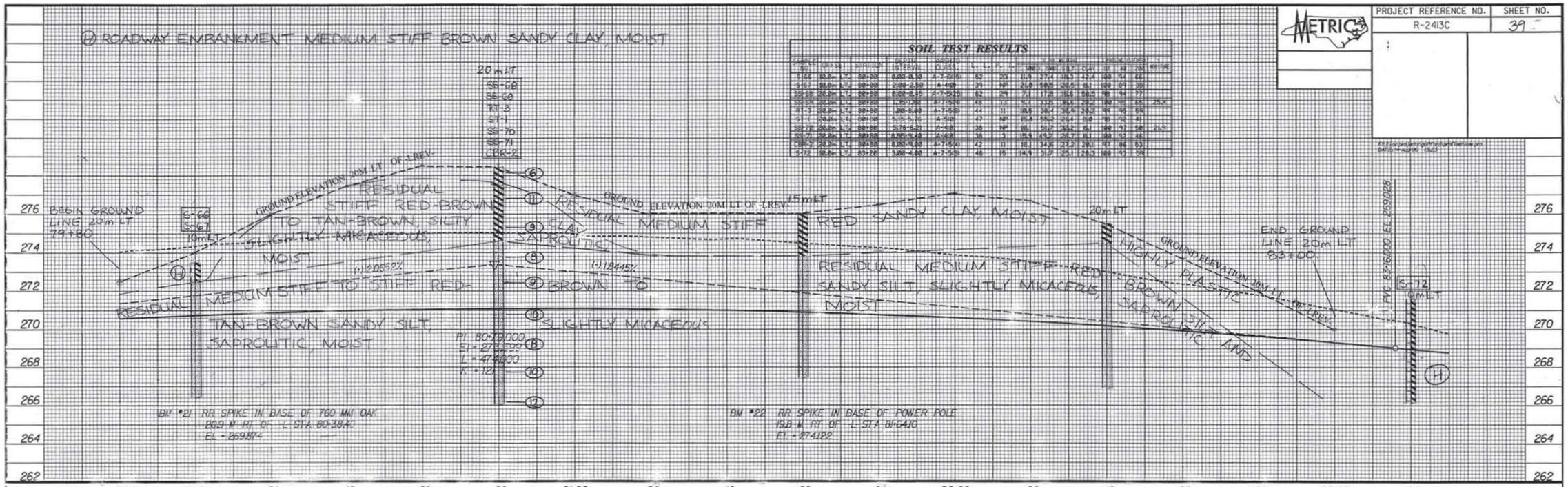
FOR -L REV- PLANS SEE SHEETS 18,19 & 20

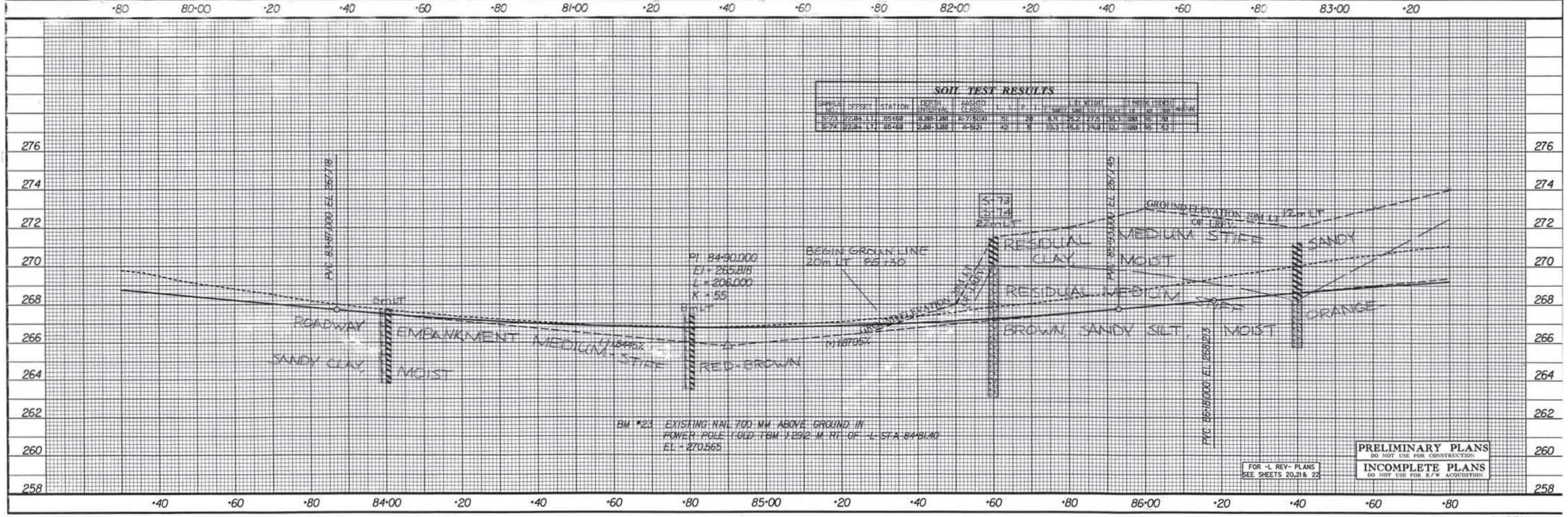
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-L REV-

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	39

METRIC





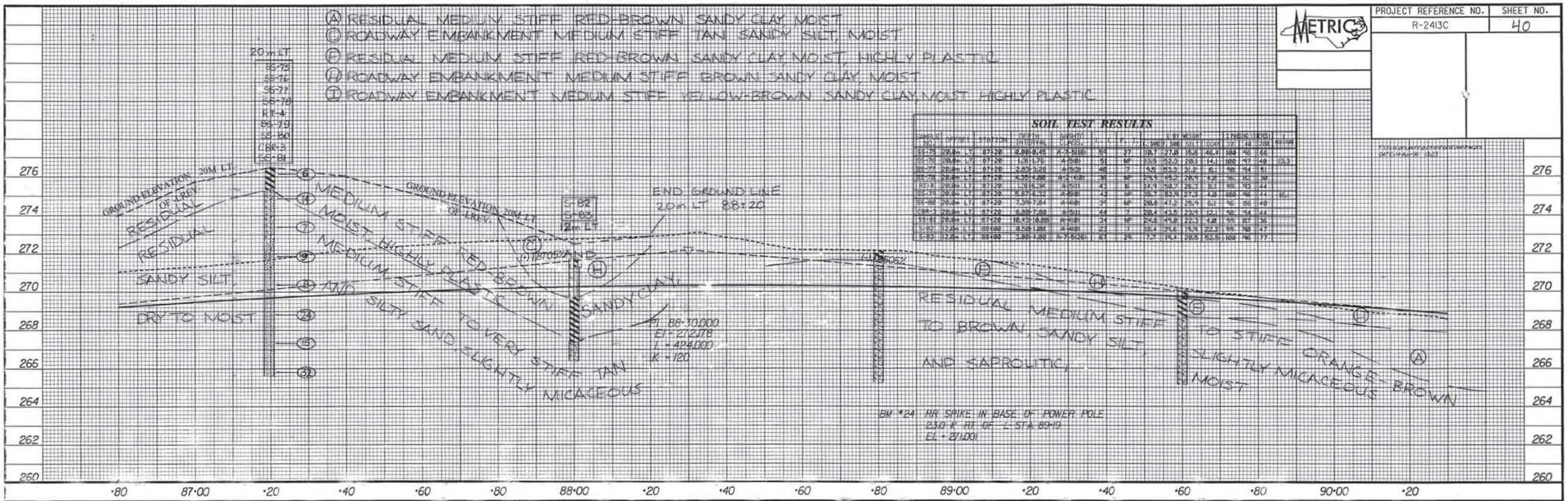
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-L REV-

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	40

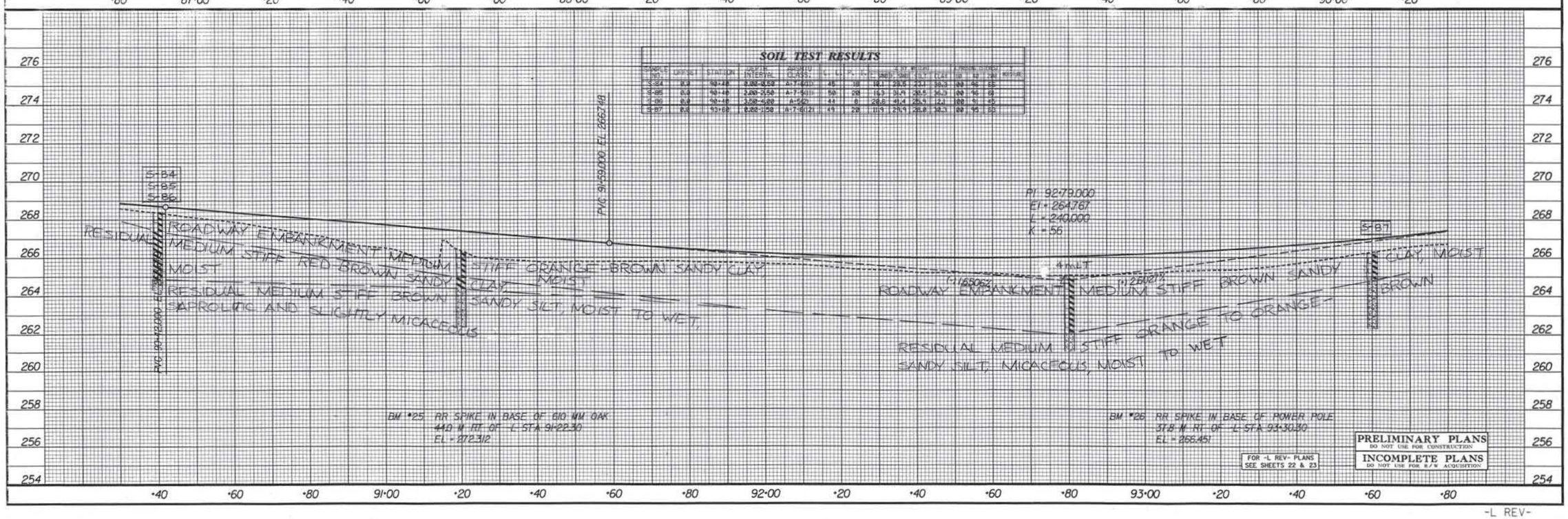
METRIC

Ⓐ RESIDUAL MEDIUM STIFF RED-BROWN SANDY CLAY MOIST
Ⓑ ROADWAY EMBANKMENT MEDIUM STIFF TAN SANDY SILT, MOIST
Ⓒ RESIDUAL MEDIUM STIFF RED-BROWN SANDY CLAY MOIST, HIGHLY PLASTIC
Ⓓ ROADWAY EMBANKMENT MEDIUM STIFF BROWN SANDY CLAY MOIST
Ⓔ ROADWAY EMBANKMENT MEDIUM STIFF YELLOW-BROWN SANDY CLAY, MOIST HIGHLY PLASTIC



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH (FT) INTERVAL	DESCRIPTION AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT PASS #10	PASS #40	PASS #200	PASS #270	LANDING CLASS. CLAY	SILT	SAND	GRAVEL	MOISTURE
SS-75	20.0m LT	87+20	0.00-0.45	A-7-5(18)	59	37	18.7	27.8	15.8	46.4	100	96	66		
SS-76	20.0m LT	87+20	1.31-1.76	A-5(0)	51	NP	13.5	52.3	28.1	14.1	100	97	48	13.2	
SS-77	20.0m LT	87+20	2.83-3.28	A-5(0)	46	7	9.5	53.3	31.2	6.1	98	94	51		
SS-78	20.0m LT	87+20	4.35-4.80	A-4(0)	36	NP	24.9	45.2	26.9	4.8	95	82	38		
RT-4	20.0m LT	87+20	5.16-5.36	A-5(0)	43	6	24.9	50.7	26.3	8.1	98	93	44		
SS-79	20.0m LT	87+20	6.87-7.32	A-5(0)	43	NP	36.1	53.6	27.4	4.8	100	98	44		16.1
SS-80	20.0m LT	87+20	7.39-7.84	A-4(0)	39	NP	28.8	47.2	25.9	6.1	95	86	40		
CBR-3	20.0m LT	87+20	8.00-7.80	A-5(0)	44	7	28.4	43.5	23.3	12.1	98	94	44		
SC-81	20.0m LT	87+20	10.43-10.88	A-4(0)	34	NP	25.6	45.8	22.3	4.8	98	87	36		
C-82	12.0m LT	88+00	0.50-1.00	A-4(0)	23	7	18.4	31.6	19.9	22.2	98	98	47		
C-83	12.0m LT	88+00	3.00-4.00	A-7-6(26)	83	28	7.7	19.4	20.5	52.6	100	96	77		



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH (FT) INTERVAL	DESCRIPTION AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT PASS #10	PASS #40	PASS #200	PASS #270	LANDING CLASS. CLAY	SILT	SAND	GRAVEL	MOISTURE
S-84	0.0	90+40	0.00-0.50	A-7-6(11)	45	18	18.1	28.6	24.1	38.3	90	96	65		
S-85	0.0	90+40	2.00-2.50	A-7-5(11)	50	20	14.3	31.9	28.5	36.3	90	96	63		
S-86	0.0	90+40	3.50-4.00	A-5(0)	44	8	28.6	41.4	26.9	2.1	100	91	45		
S-87	0.0	93+60	0.00-1.50	A-7-6(21)	49	22	11.9	29.9	28.0	30.3	90	95	53		

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

FOR -L REV- PLANS SEE SHEETS 22 & 23

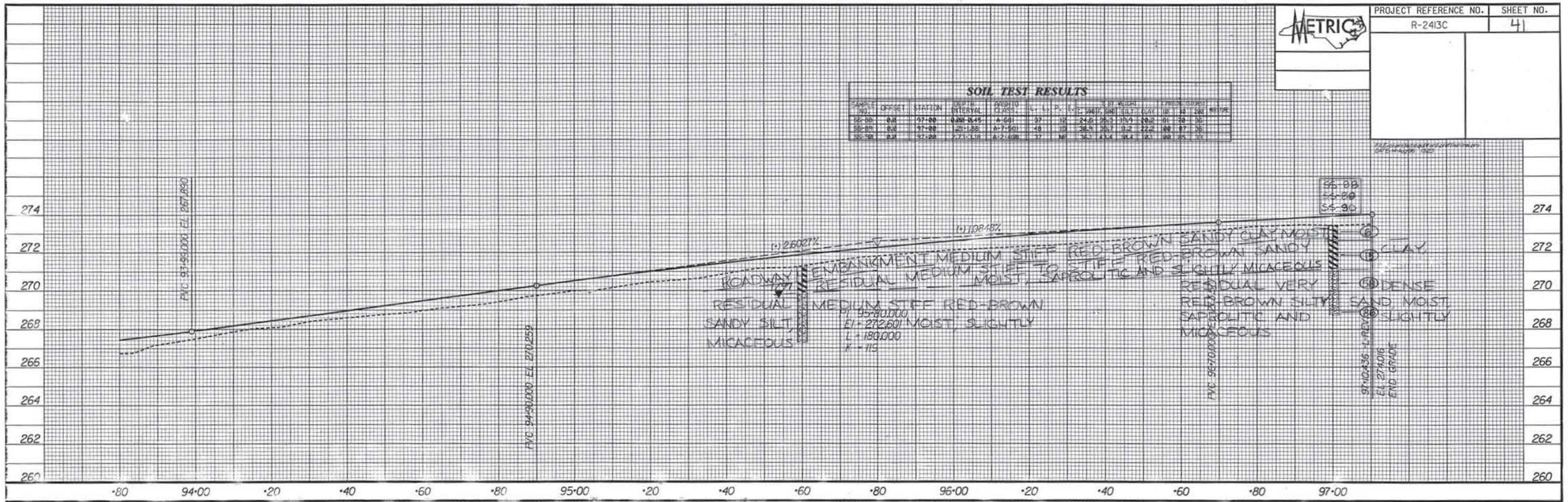
-L REV-

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	41

METRIC

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% PASSING #10	% PASSING #40	% PASSING #200	% MOISTURE	% LIMESTONE	% GRAVEL	% SAND	% SILT	% CLAY	LL	PI	CBR	MOISTURE
SS-98	8LT	97+00	0.00-0.45	A-6(6)	37	12	24.6	35.3	75.7	20.2	61	7.0	3.0						
SS-99	8LT	97+00	2.0-3.5	A-7-6(1)	49	19	38.9	50.7	8.2	22.2	88	2.1	3.8						
SS-96	8LT	97+00	7.7-9.15	A-2-4(0)	37	NP	30	43.4	99.4	21	88	9.5	2.5						



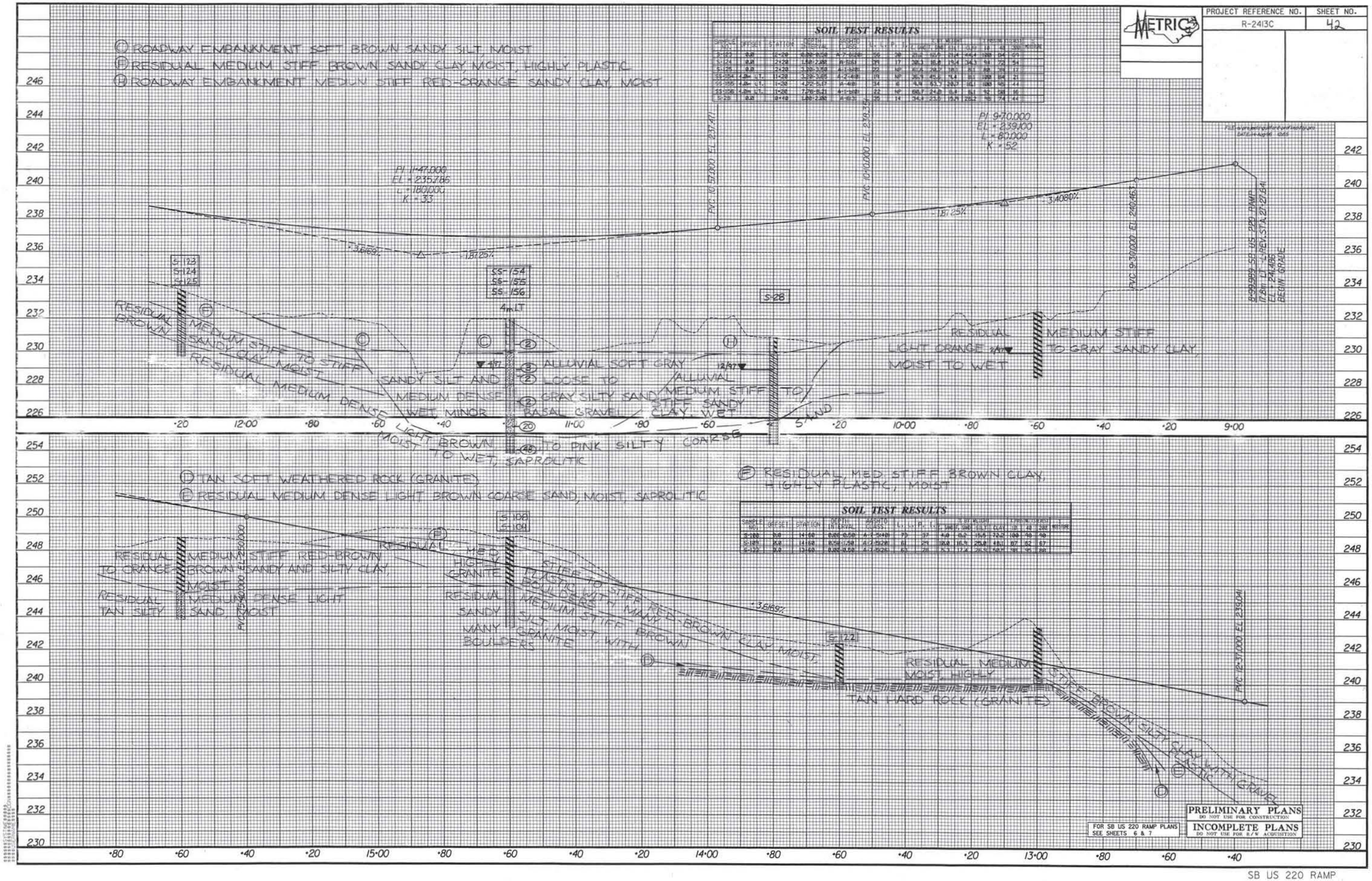
FOR -L REV- PLANS SEE SHEETS 23 & 24

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

-L REV-

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	42

METRIC



SOIL TEST RESULTS

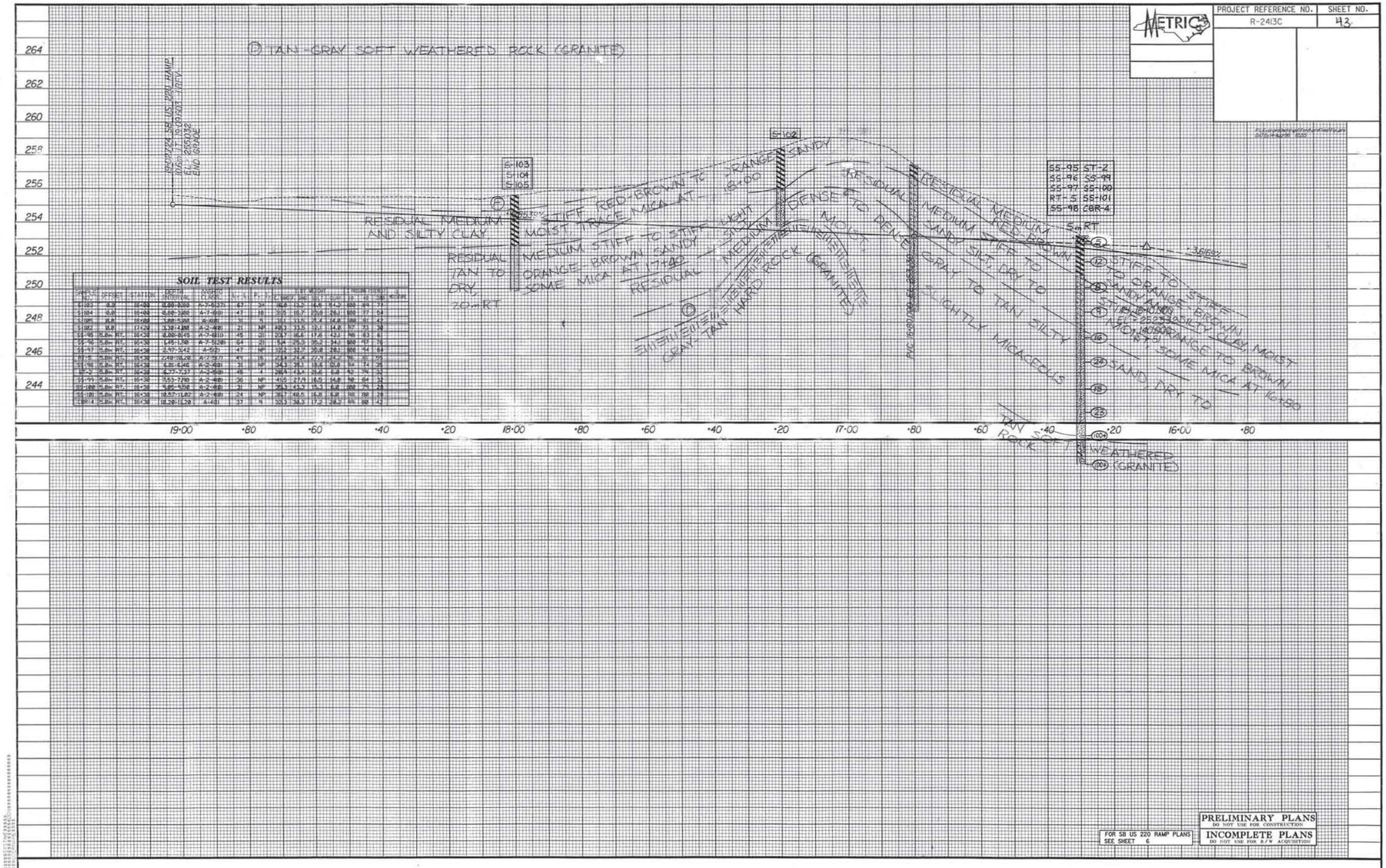
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	ASSTO CLASS.	LL	PI	W.C.	% BY WEIGHT GRAVEL	SAND	SILT	CLAY	PENETROMETER TSF	1.0	2.0	4.0	MOISTURE
S-23	0.0	9+50	0.00-0.50	A-4 (SAND)	35	10	21.6	0.0	42.7	44.4	12.9	1.00	0.4	0.1		
S-24	0.0	9+50	1.00-1.50	A-7-6 (26)	56	30	21.6	0.0	21.4	44.1	34.5	1.0	0.5	0.4		
S-25	0.0	9+50	3.00-3.50	A-1-b (0)	32	17	20.3	16.8	19.4	34.1	29.7	2.0	1.0	0.5		
SS-154	3.4	11+28	1.50-3.00	A-7-6 (18)	54	30	31.4	0.0	24.7	38.1	37.2	0.5	0.5	0.5		
SS-155	4.8	11+28	4.72-6.17	A-4 (0)	34	6	13.4	0.0	63.7	28.0	8.3	4.0	2.0	1.0		
SS-156	4.8	11+28	7.76-9.21	A-1-b (0)	23	NP	10.7	24.8	0.0	51.1	24.1	4.0	2.0	1.0		
S-28	0.0	9+50	1.00-2.00	A-6 (2)	39	11	24.1	2.3	19.9	28.2	49.6	1.0	0.5	0.5		

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	ASSTO CLASS.	LL	PI	W.C.	% BY WEIGHT GRAVEL	SAND	SILT	CLAY	PENETROMETER TSF	1.0	2.0	4.0	MOISTURE
S-108	0.0	14+60	0.00-0.50	A-7 (148)	72	37	4.0	0.0	19.5	73.0	100	90	90			
S-109	0.0	14+60	0.50-1.50	A-7 (128)	81	29	10.0	16.3	25.0	48.0	87	62	67			
S-122	0.0	13+60	0.00-0.50	A-7 (126)	61	28	5.1	17.4	26.0	56.7	98	95	88			

SB US 220 RAMP

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	43



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	M-4	PI	NAT. MOIST.	LIQUID LIMIT	PLASTIC LIMIT	% PASSING 10	40	200	% MOISTURE
S-103	0.0	18+00	0.00-0.88	A-7-6(27)	67	34	16.0	42.0	14.8	94.5	88	71	
S-104	0.0	18+00	0.88-3.00	A-7-6(8)	47	18	31.5	31.7	23.0	24.3	100	77	64
S-105	0.0	18+00	3.00-5.00	A-4(8)	31	5	18.1	21.5	21.4	14.8	100	81	42
S-102	0.0	17+20	3.38-4.88	A-2-4(0)	21	NP	18.5	23.5	19.4	14.8	97	71	38
SS-95	5.0m	RT.	16+38	0.00-0.45	A-7-6(10)	49	21	20.7	46.6	17.6	93.1	98	83	61
SS-96	5.0m	RT.	16+38	1.45-1.90	A-7-5(20)	64	21	5.4	25.3	35.2	34.1	100	97	76
SS-97	5.0m	RT.	16+38	2.97-3.42	A-5(2)	47	NP	17.2	32.7	35.8	28.1	100	94	69
RT-5	5.0m	RT.	16+38	2.48-16.20	A-7-5(7)	41	16	24.4	24.4	27.9	24.7	98	81	55
SS-98	5.0m	RT.	16+38	6.01-6.46	A-2-4(0)	31	NP	24.3	36.1	18.6	10.0	94	74	38
BR-2	5.0m	RT.	16+38	6.77-7.37	A-2-4(0)	46	4	28.4	43.4	21.6	6.0	93	74	32
SS-99	5.0m	RT.	16+38	7.53-7.98	A-2-4(0)	36	NP	41.5	27.9	16.5	14.8	98	84	32
SS-100	5.0m	RT.	16+38	9.05-9.50	A-2-4(0)	31	NP	29.5	43.5	15.3	8.8	100	79	28
SS-101	5.0m	RT.	16+38	10.57-11.02	A-2-4(0)	24	NP	28.7	48.5	16.8	8.8	96	78	28
CBR-4	5.0m	RT.	16+38	12.28-12.28	A-4(1)	37	9	30.1	34.3	17.2	24.2	96	88	42

FOR SB US 220 RAMP PLANS SEE SHEET 6

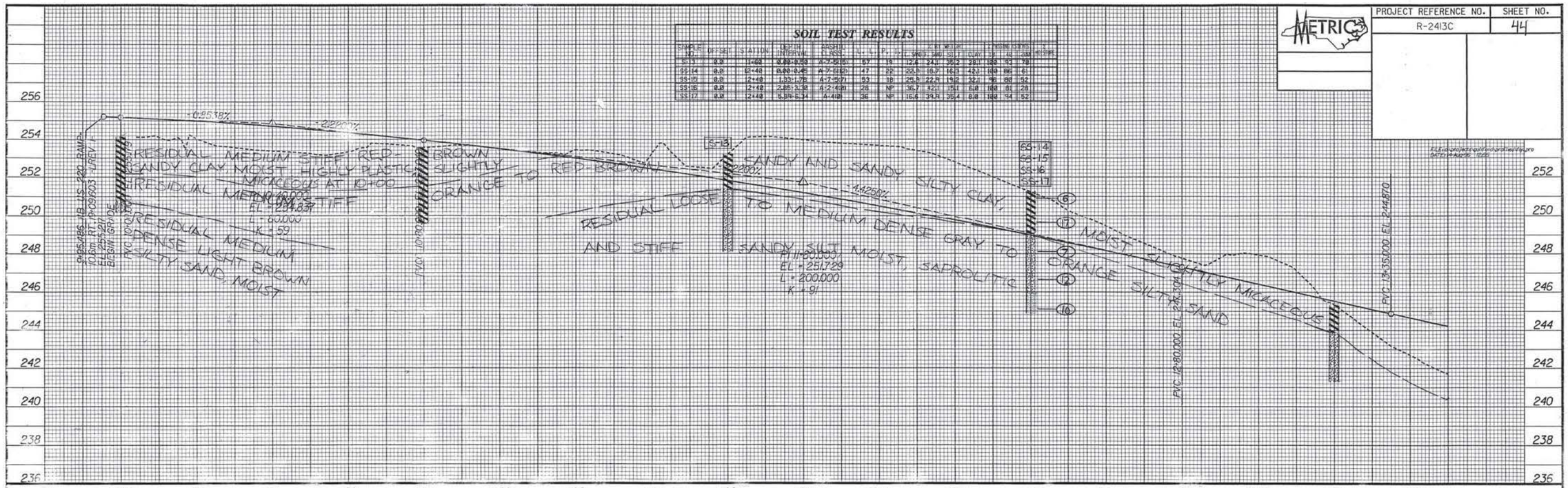
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	44

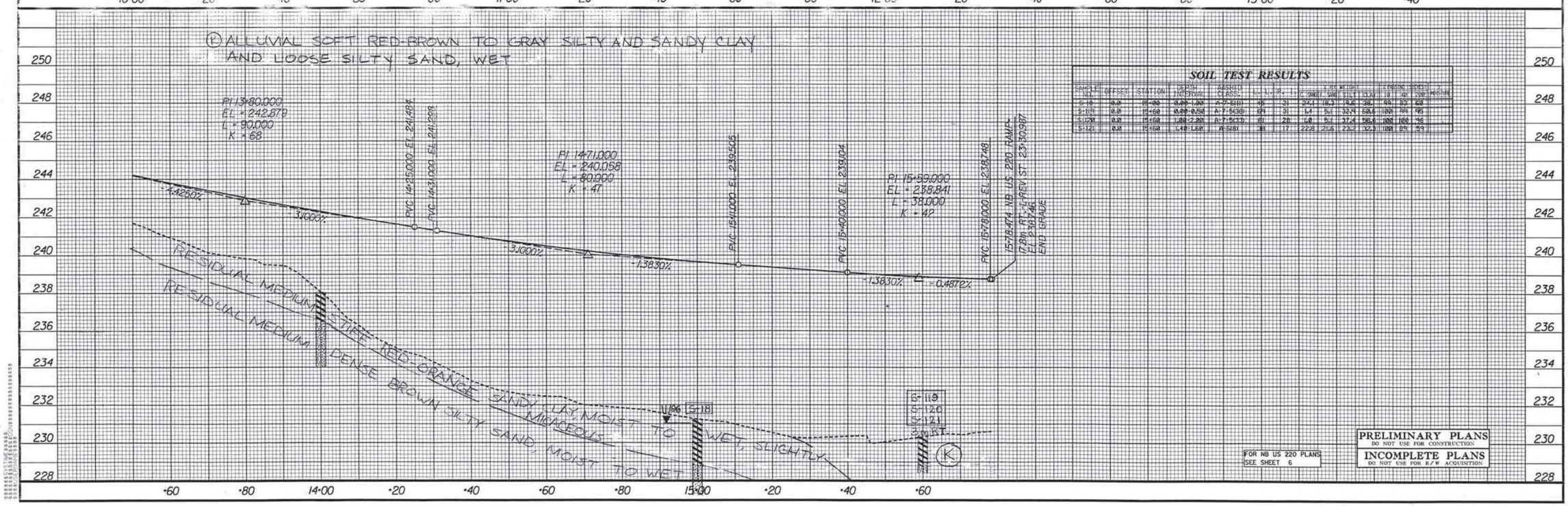
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	ASSHTO CLASS.	LL	PI	% BY WEIGHT GRAVEL	COARSE SAND	FINE SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	HORIZ
S-13	0.0	12+60	0.00-0.35	A-7-6(8)	57	18	12.4	24.1	30.2	29.1	100	94	79	
SS-14	0.0	12+40	0.00-0.45	A-7-6(8)	47	22	22.8	18.7	16.3	42.1	100	86	61	
SS-15	0.0	12+40	1.33-1.75	A-7-6(7)	53	18	25.9	22.4	19.2	32.1	98	80	52	
SS-16	0.0	12+40	2.85-3.30	A-2-4(0)	28	NP	36.7	32.1	15.1	16.1	100	81	28	
SS-17	0.0	12+40	5.95-6.34	A-4(8)	36	NP	16.4	34.8	35.4	8.8	100	94	52	



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	ASSHTO CLASS.	LL	PI	% BY WEIGHT GRAVEL	COARSE SAND	FINE SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	HORIZ
S-118	0.0	15+80	0.00-1.00	A-2-6(11)	48	31	24.1	18.3	19.6	38.1	99	92	69	
S-119	0.0	15+60	0.00-0.50	A-7-5(39)	69	31	1.4	5.1	32.9	59.6	100	99	95	
S-120	0.0	15+60	1.00-2.00	A-7-5(33)	61	28	1.0	5.1	37.4	56.5	100	100	96	
S-121	0.0	15+60	1.40-1.60	A-6(8)	38	17	22.6	21.6	23.2	32.6	100	89	59	

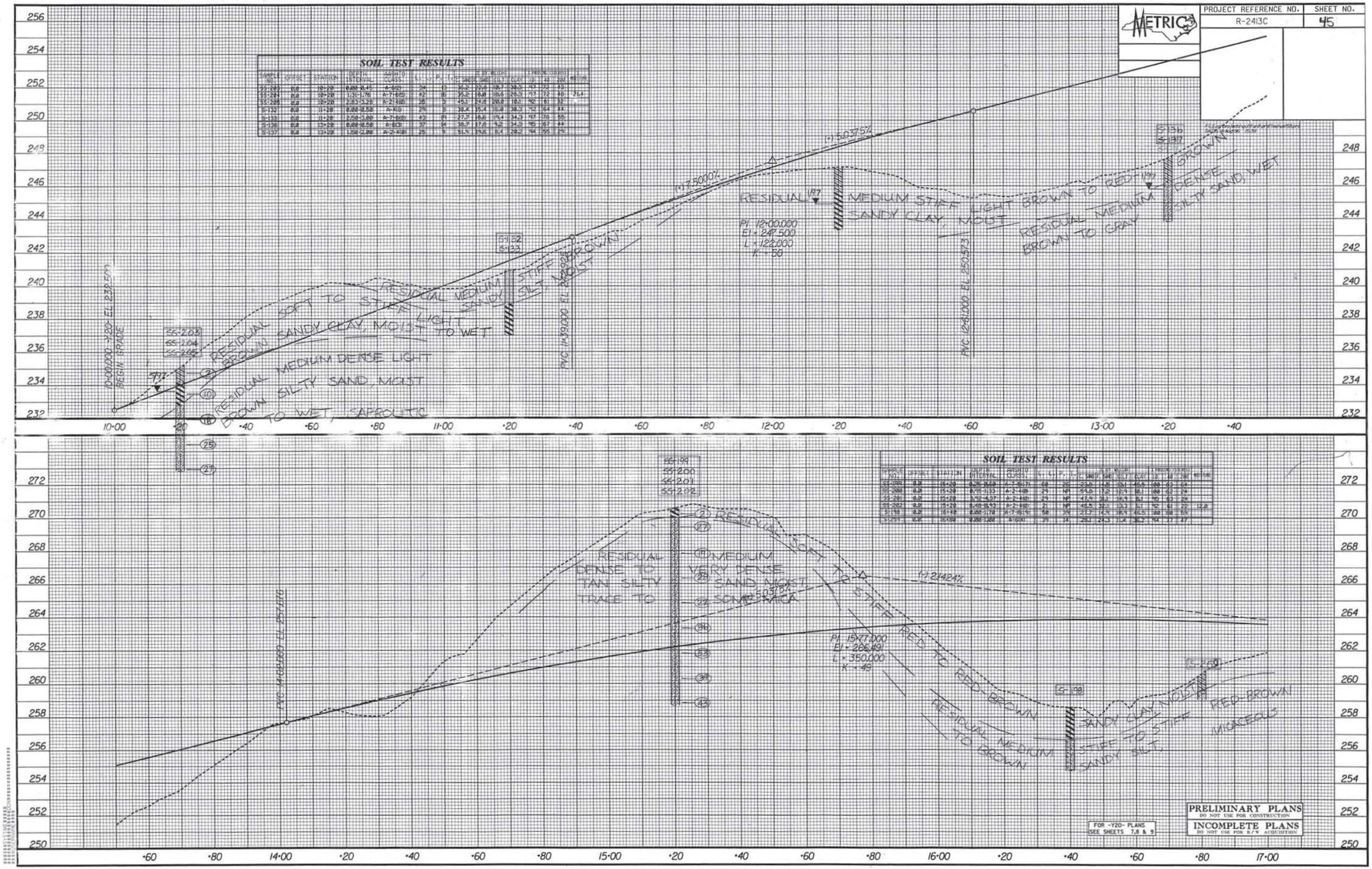


FOR NB US 220 PLANS SEE SHEET 6

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

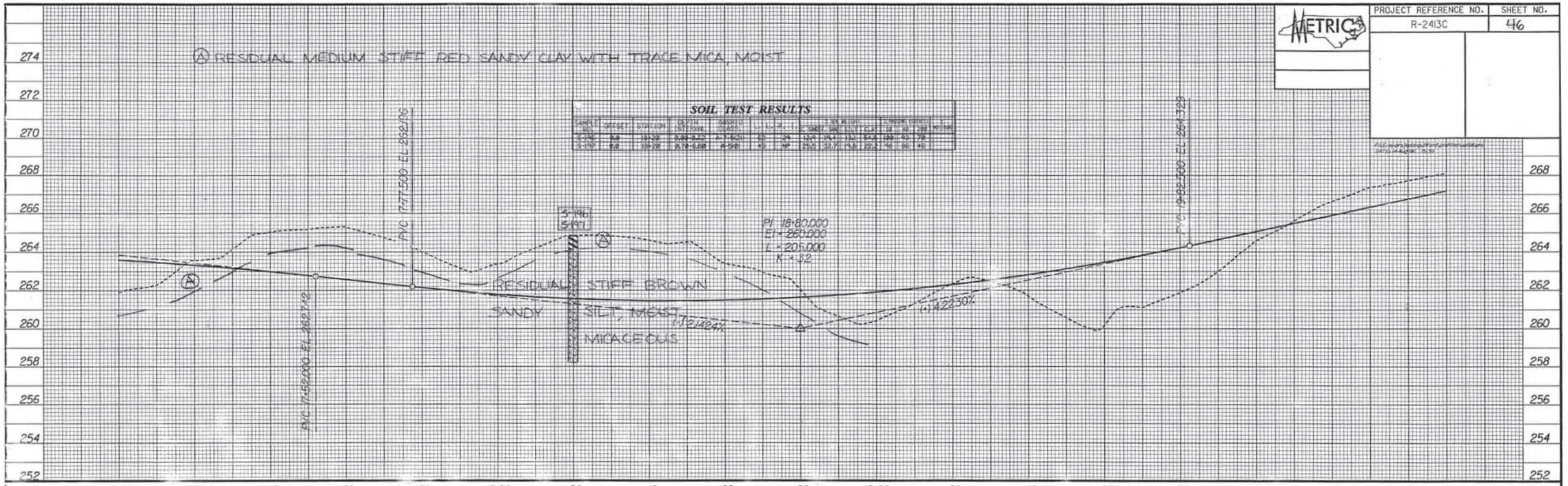
PROJECT REFERENCE NO.	SHEET NO.
R-2413C	45

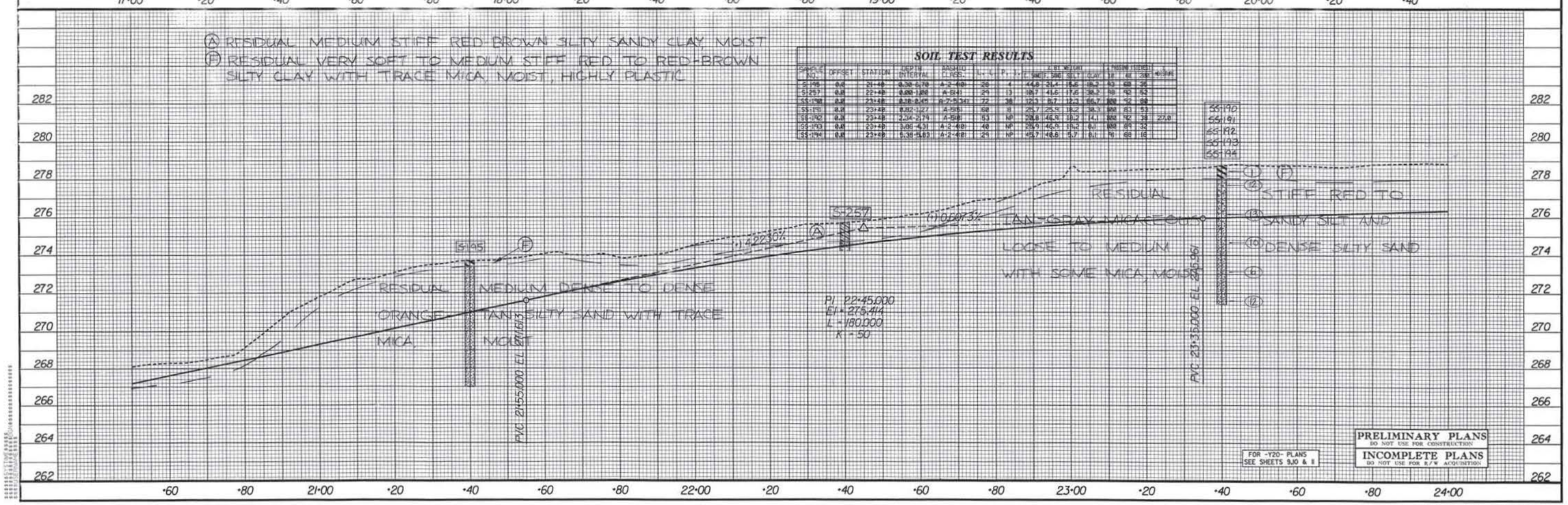
METRIC



-Y20- SPOTSWOOD ROAD EXT.

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	46

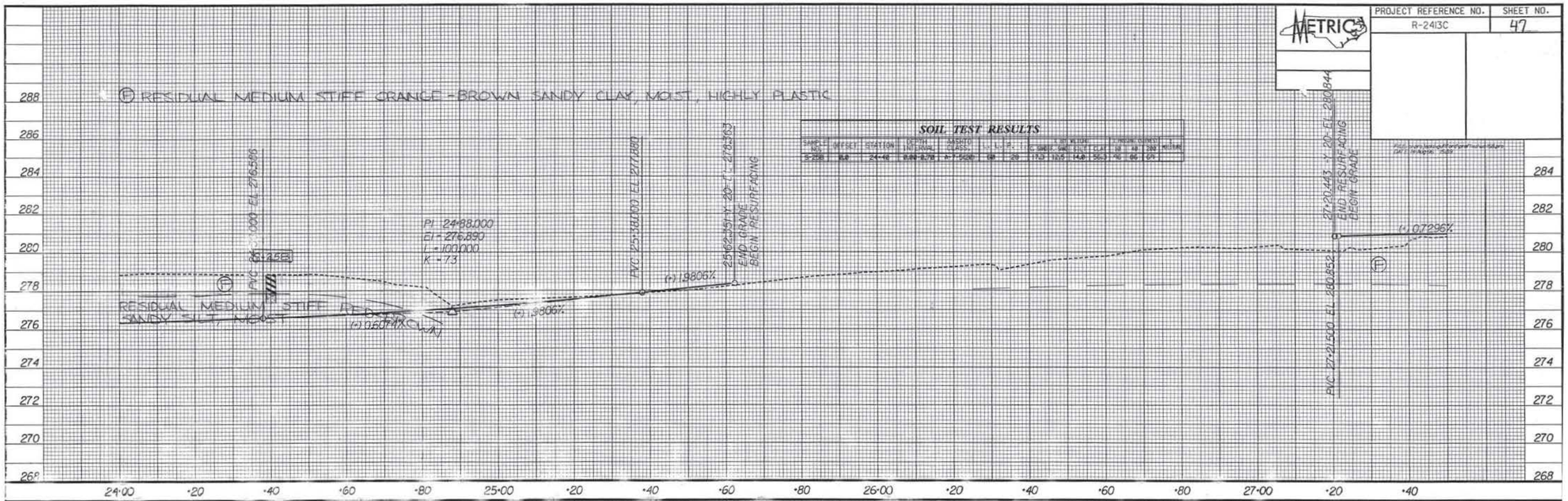




FOR -Y20- PLANS SEE SHEETS 9,10 & 11

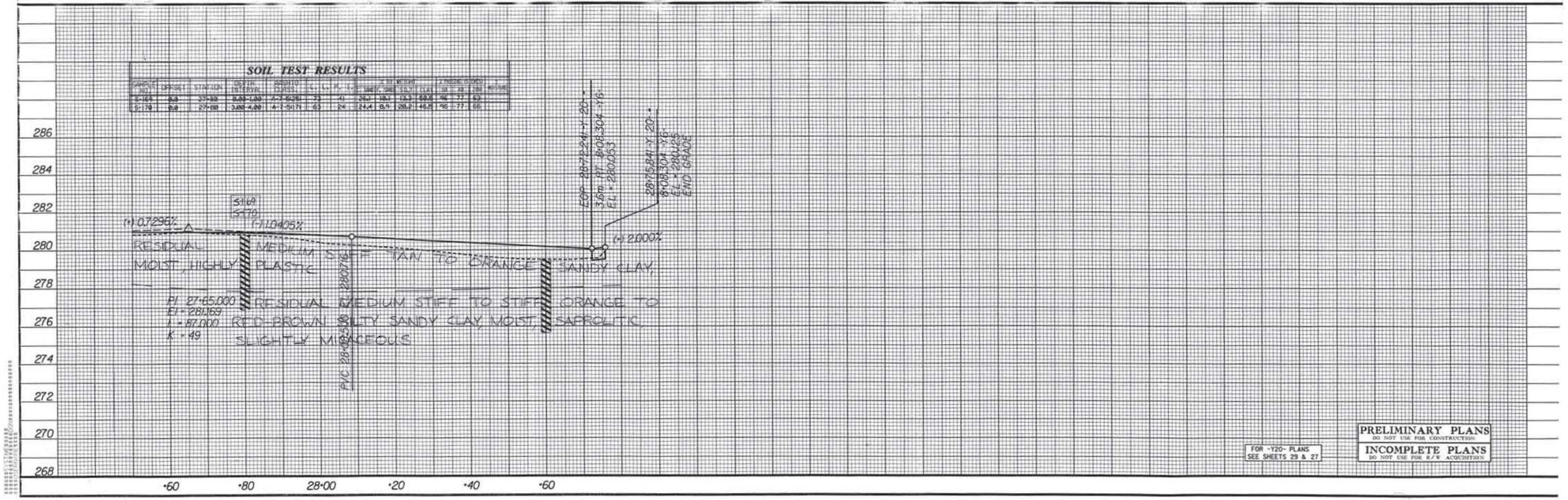
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	47



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	ASSHTO CLASS.	L.L.	P.I.	% SOIL MOISTURE GRAVEL	SAND	SILT	CLAY	% PASSING SIEVE 10	40	200	MOISTURE
S-168	8.0	24+48	0.00-0.78	A-7-5(20)	69	26	17.3	10.5	14.8	56.7	76	66	57	



SOIL TEST RESULTS

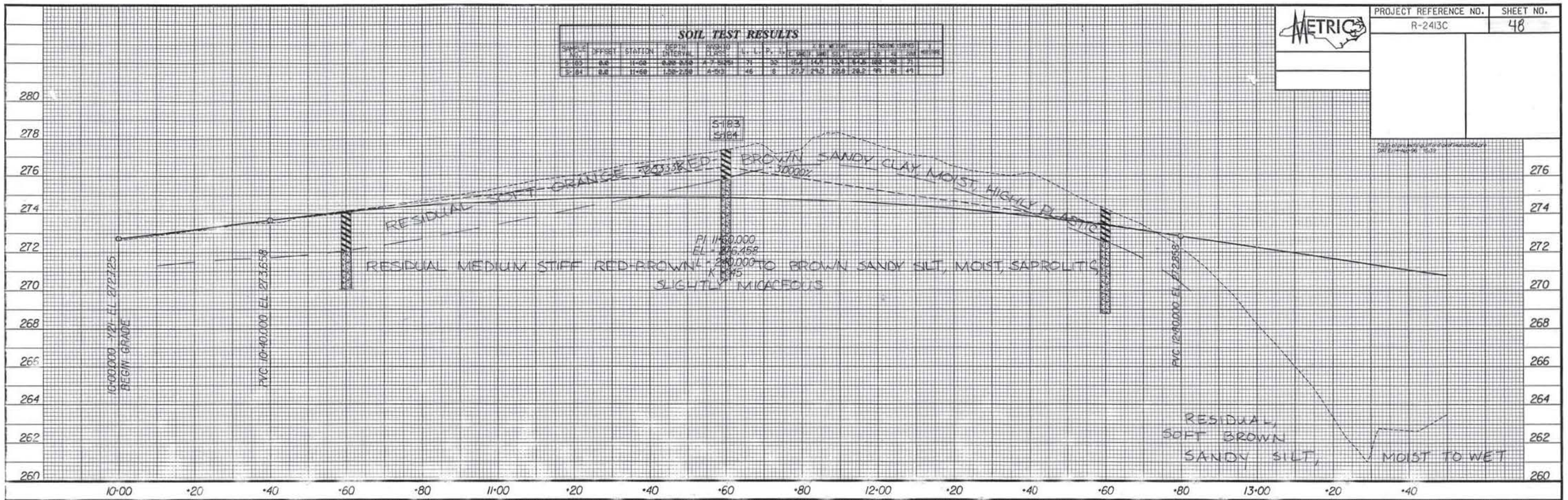
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	ASSHTO CLASS.	L.L.	P.I.	% SOIL MOISTURE GRAVEL	SAND	SILT	CLAY	% PASSING SIEVE 10	40	200	MOISTURE
S-169	8.0	27+88	0.00-1.00	A-7-6(20)	73	41	26.1	18.1	13.3	60.6	96	77	62	
S-170	8.0	27+88	3.00-4.00	A-7-5(17)	63	24	24.4	8.9	20.2	46.5	96	77	66	

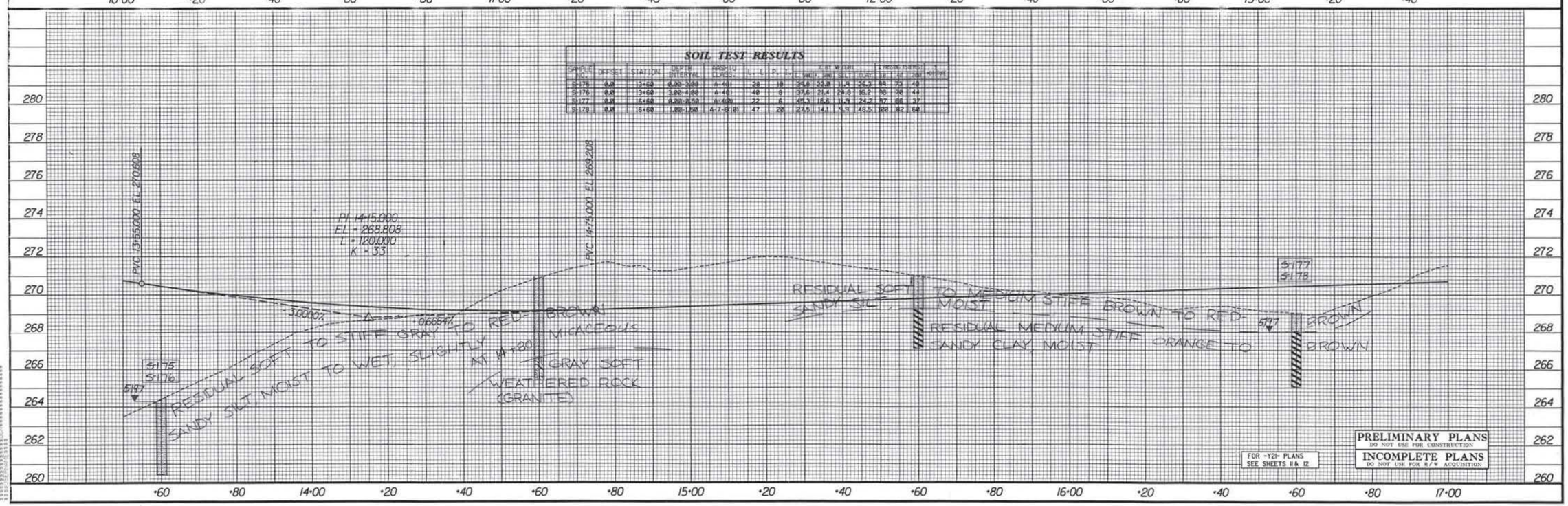
FOR -Y20- PLANS
SEE SHEETS 29 & 27

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

-Y20- SPOTSWOOD ROAD EXT.

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	48



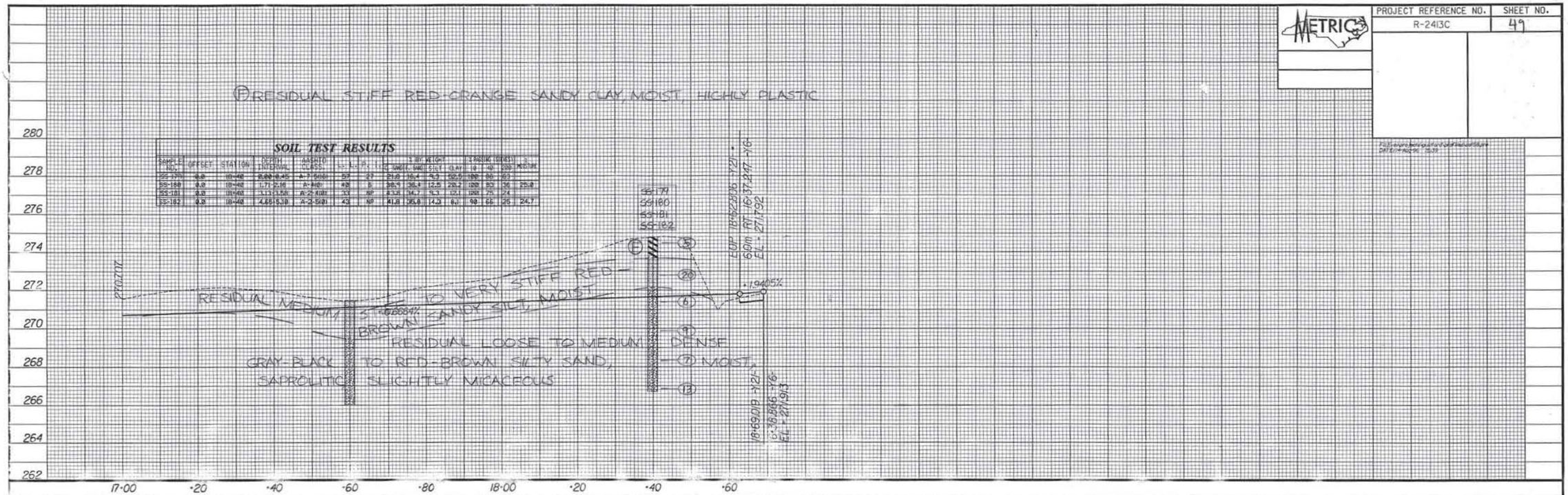


FOR -Y2I- PLANS
SEE SHEETS 11 & 12

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

-Y2I- SPOTSWOOD RD. RELOC.

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	49



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	PL	LL	PI	% GRAVEL	% SAND	% SILT	% CLAY	% PASSING 10	% PASSING 40	% PASSING 200	% MOISTURE
SS-179	0.0	18+40	0.00-0.45	A-7-5(18)	53	97	44	21.0	18.4	4.9	55.7	100	99	93	
SS-180	0.0	18+40	1.71-2.16	A-4(0)	NP	5	NP	38.5	36.9	12.5	20.2	100	80	36	25.8
SS-181	0.0	18+40	3.17-3.66	A-2-4(0)	33	NP	5	33.8	34.7	9.3	22.1	100	75	24	
SS-182	0.0	18+40	4.66-5.10	A-2-5(0)	43	NP	7	41.8	35.8	14.3	8.1	98	66	26	24.7

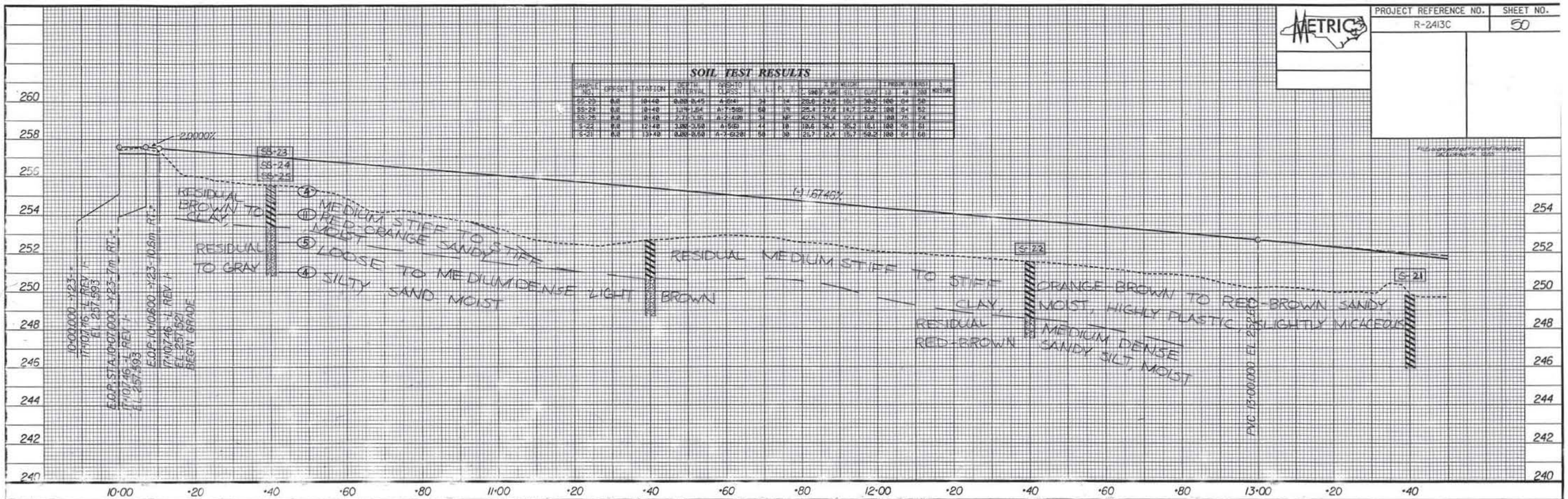
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

FOR -Y21- PLANS SEE SHEET 28

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	50

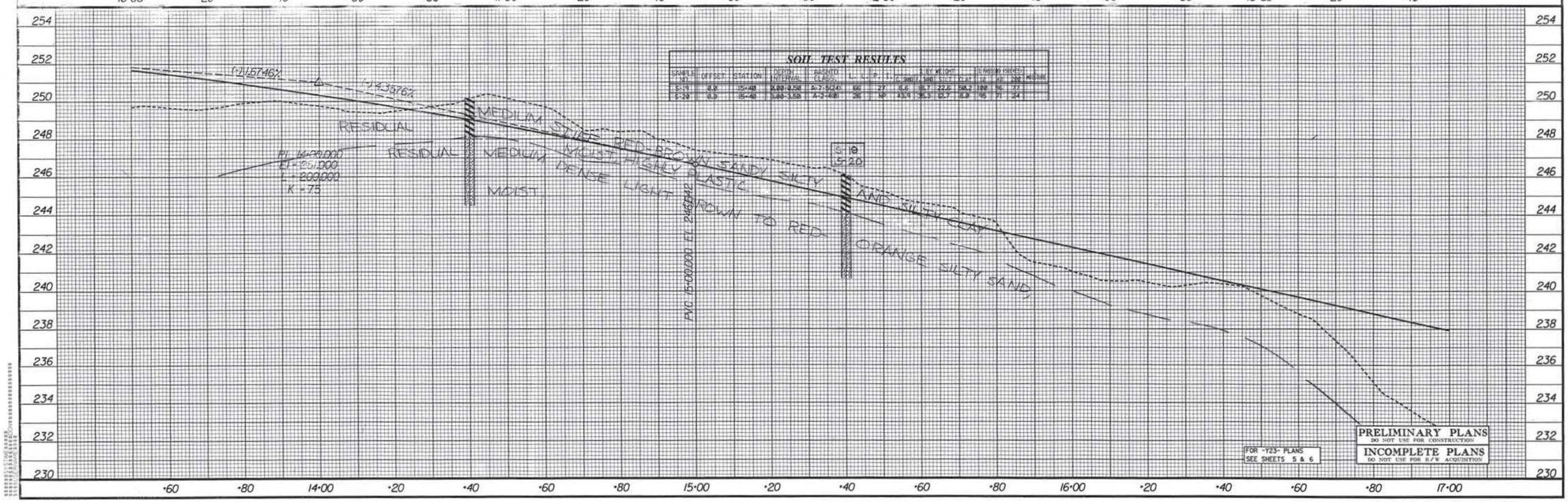
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT GRAVEL	COARSE SAND	FINE SAND	SILT	CLAY	PASSING SIEVE # 10	40	200	MOISTURE
SS-23	8.0	10+40	0.00-0.45	A-2-4	21	4	25.8	24.0	18.1	30.2		100	64	50	
SS-24	8.0	10+40	1.07-1.64	A-7-5(8)	68	18	25.4	27.8	14.7	32.2		100	84	62	
SS-25	8.0	10+40	2.75-3.16	A-2-4(0)	31	NP	42.5	39.4	12.1	6.0		100	75	24	
S-22	8.0	12+40	3.00-3.50	A-5(5)	44	10	19.6	36.3	35.2	18.1		100	95	61	
S-21	8.0	13+40	0.00-0.50	A-3-6(20)	56	30	21.7	12.4	15.7	50.2		100	84	68	



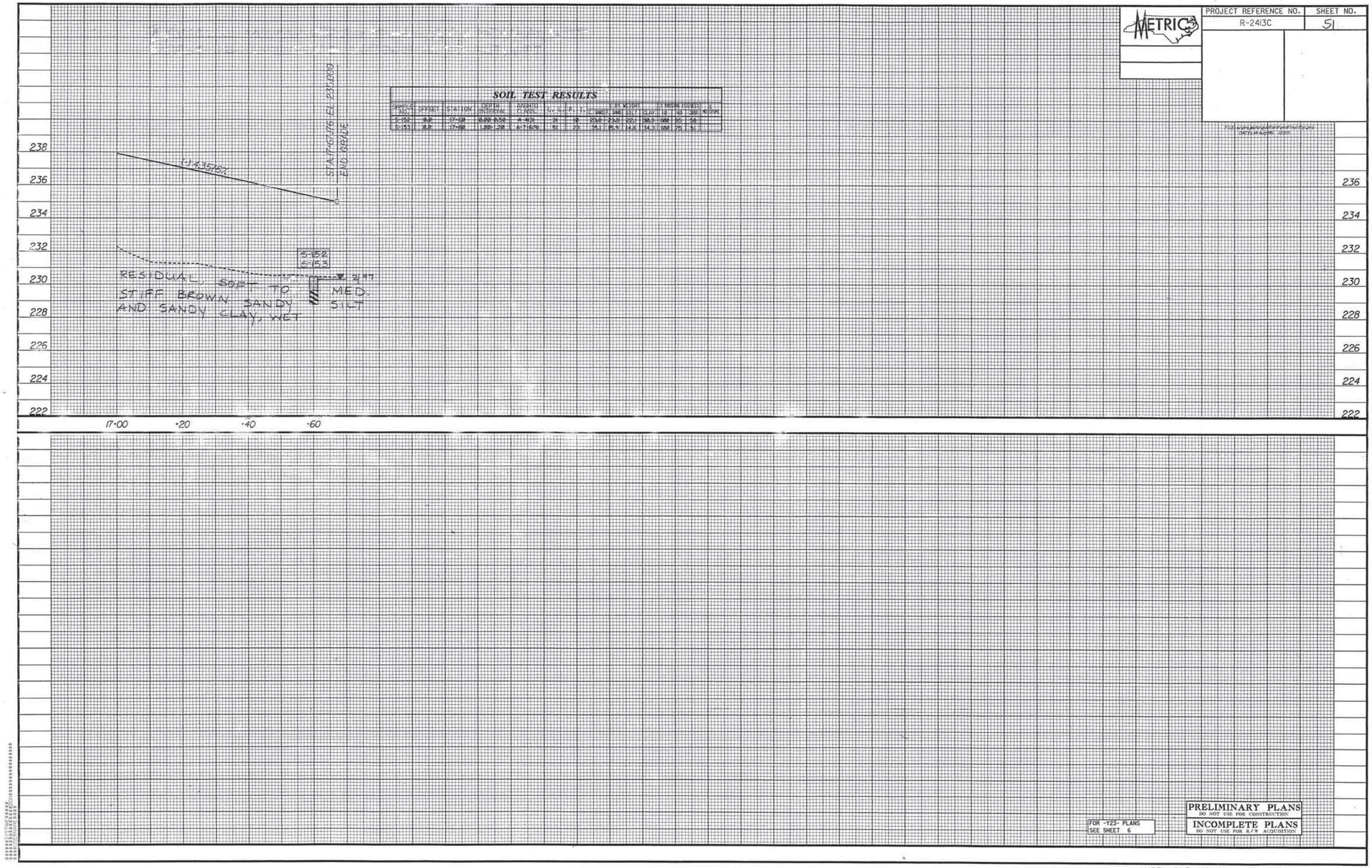
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT GRAVEL	COARSE SAND	FINE SAND	SILT	CLAY	PASSING SIEVE # 10	40	200	MOISTURE
S-19	8.0	15+40	0.00-0.58	A-7-5(24)	66	27	6.6	18.7	22.6	58.2		100	96	77	
S-20	8.0	15+40	3.00-3.58	A-2-4(0)	36	NP	43.4	35.3	15.7	6.8		96	71	24	



-Y23- OLD US 220 CONNECTOR

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	51



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	%	% BY WEIGHT GRAV.	SAND	SILT	CLAY	% PASSING SIEVE# 10	40	200	% MOIST.
S-152	0.0	17+00	0.00-0.50	A-4(8)	31	10	23.0	23.0	22.1	30.9	100	85	56		
S-153	0.0	17+00	1.00-1.28	A-7-6(10)	51	25	15.1	21.9	14.6	34.3	100	75	51		

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DATE: 10/12/2010 12:55

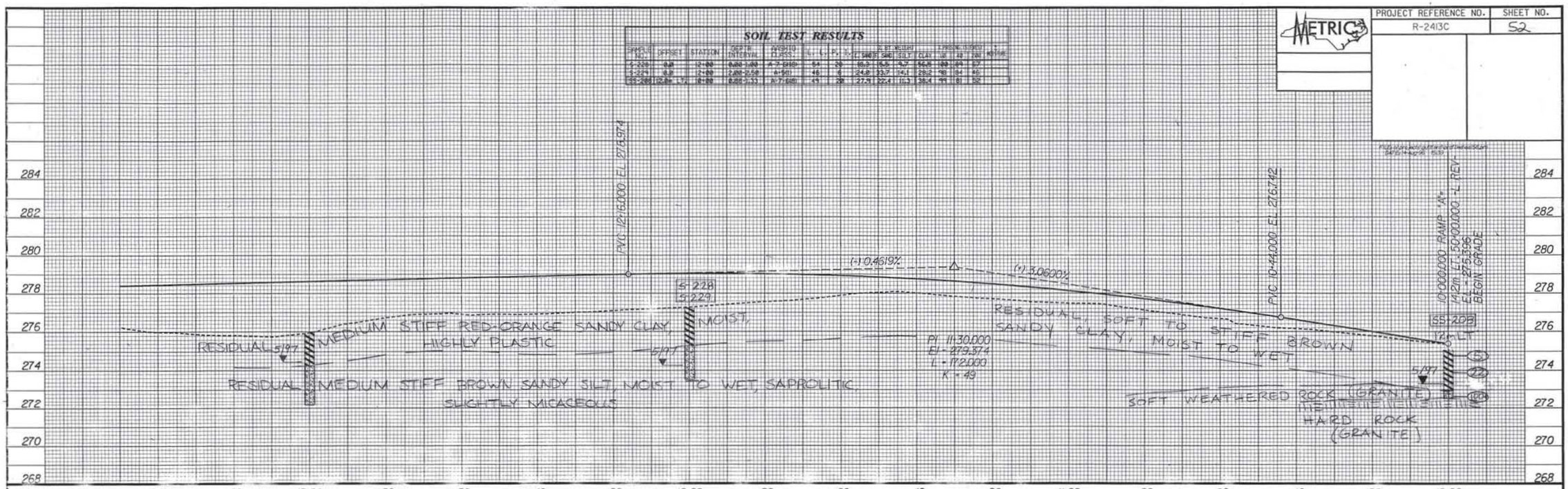
FOR -Y23- PLANS SEE SHEET 6

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

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	52

SOIL TEST RESULTS

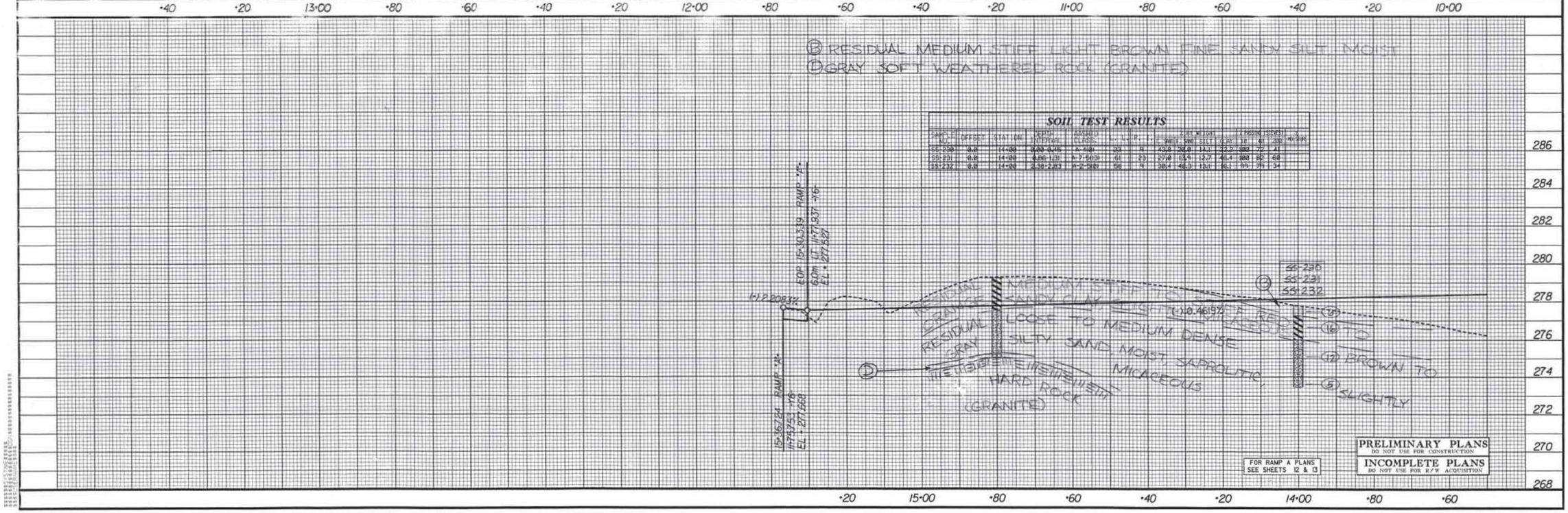
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	ASSHTO CLASS.	L.L.	P.I.	% BY WEIGHT GRAVEL	SAND	SILT	CLAY	% PASSING SIEVE 10	40	140	200	MOISTURE
SS-228	0.0	12+00	0.00-1.00	A-7-6(15)	51	30	15.5	3.5	4.7	56.3	100	94	87		
SS-229	0.0	12+00	2.00-3.00	A-6(9)	46	16	24.8	33.7	14.1	28.2	98	84	46		
SS-230	12.0 LT	11+00	0.00-1.33	A-7-6(8)	49	28	27.3	22.4	13.3	36.4	99	81	52		



Ⓑ RESIDUAL MEDIUM STIFF LIGHT BROWN FINE SANDY SILT MOIST
Ⓓ GRAY SOFT WEATHERED ROCK (GRANITE)

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	ASSHTO CLASS.	L.L.	P.I.	% BY WEIGHT GRAVEL	SAND	SILT	CLAY	% PASSING SIEVE 10	40	140	200	MOISTURE
SS-230	0.0	14+00	0.00-0.46	A-4(0)	23	9	40.0	26.0	13.1	22.2	100	72	41		
SS-231	0.0	14+00	0.66-1.31	A-7-5(10)	61	23	27.0	13.9	12.7	46.4	100	82	60		
SS-232	0.0	14+00	2.38-2.83	A-2-5(0)	56	9	30.4	46.9	13.0	6.1	99	71	34		

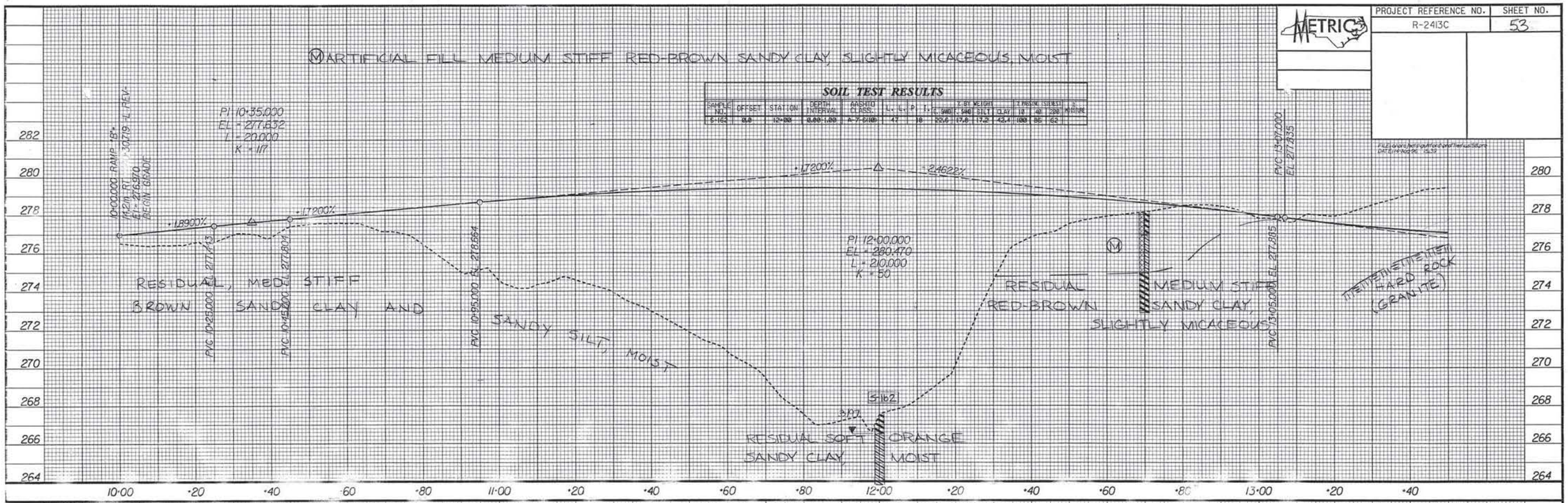


FOR RAMP A PLANS SEE SHEETS 12 & 13

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

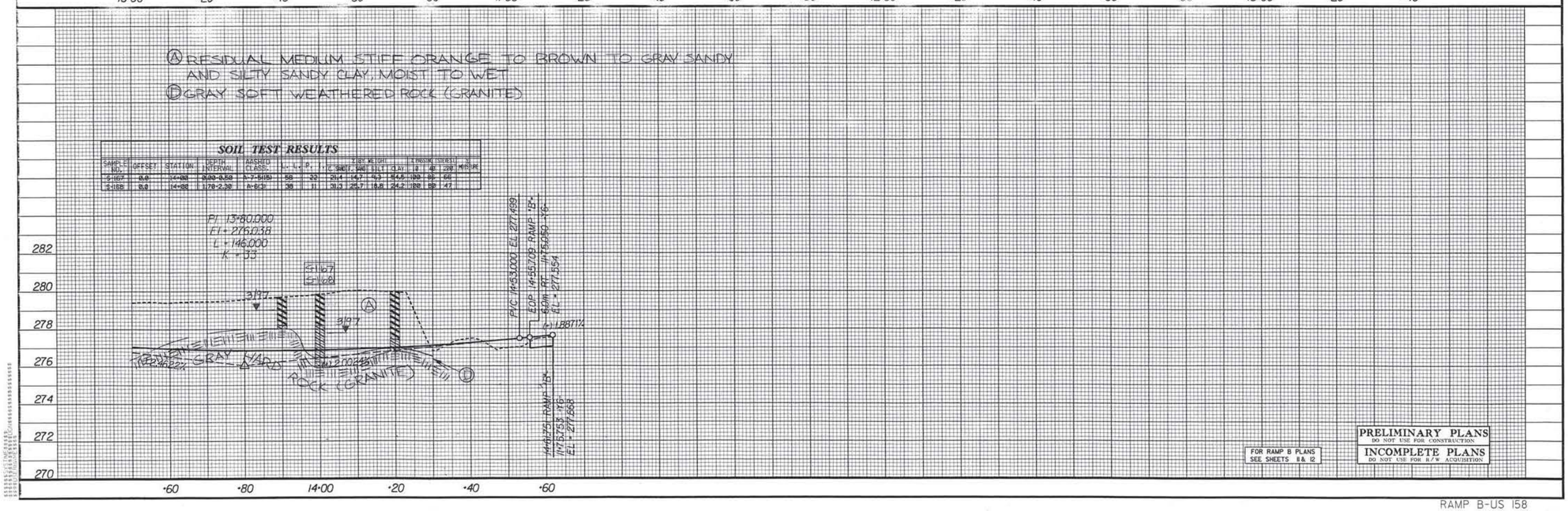
PROJECT REFERENCE NO.	SHEET NO.
R-2413C	53

METRIC



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT GRAVEL	COARSE SAND	FINE SAND	SILT	CLAY	% PASSING 10	40	200	% MOISTURE
S-162	8.0	12+00	0.00-1.00	A-7-6(10)	47	18	22.6	17.8	17.2	42.4	100	96	62		



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT GRAVEL	COARSE SAND	FINE SAND	SILT	CLAY	% PASSING 10	40	200	% MOISTURE
S-167	8.0	14+00	0.00-0.50	A-7-6(15)	58	32	21.4	14.7	9.3	54.6	100	98	66		
S-168	8.0	14+00	1.70-2.30	A-6(3)	38	11	31.3	25.7	18.8	24.2	100	89	47		

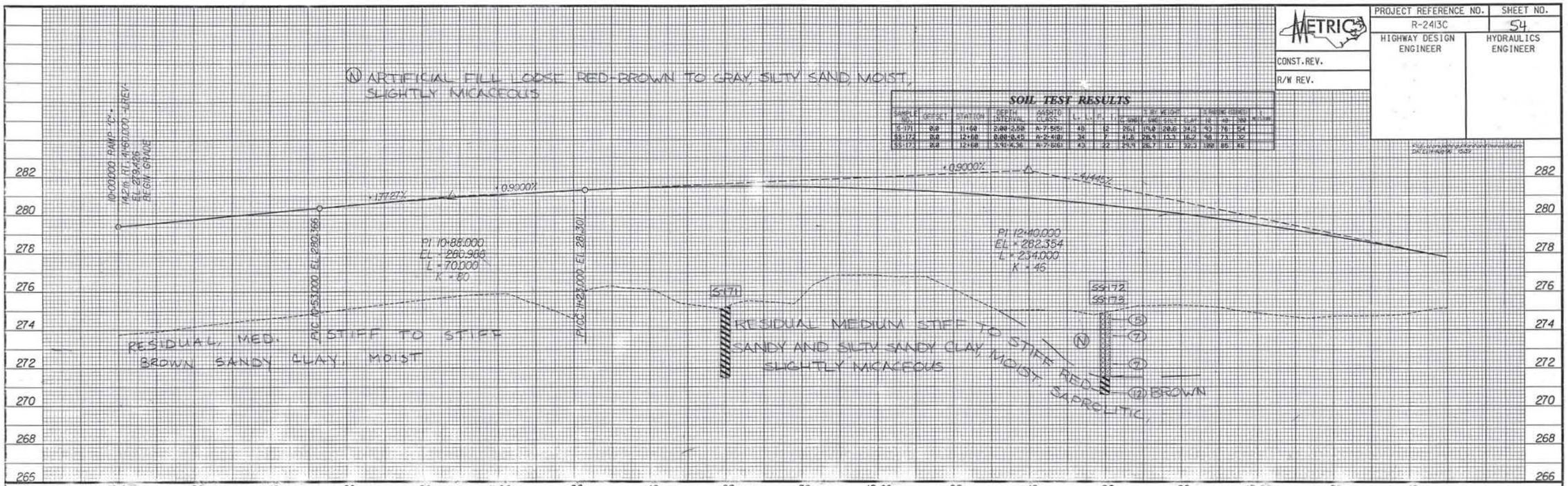
FOR RAMP B PLANS
SEE SHEETS 8A & 12

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

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	54
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

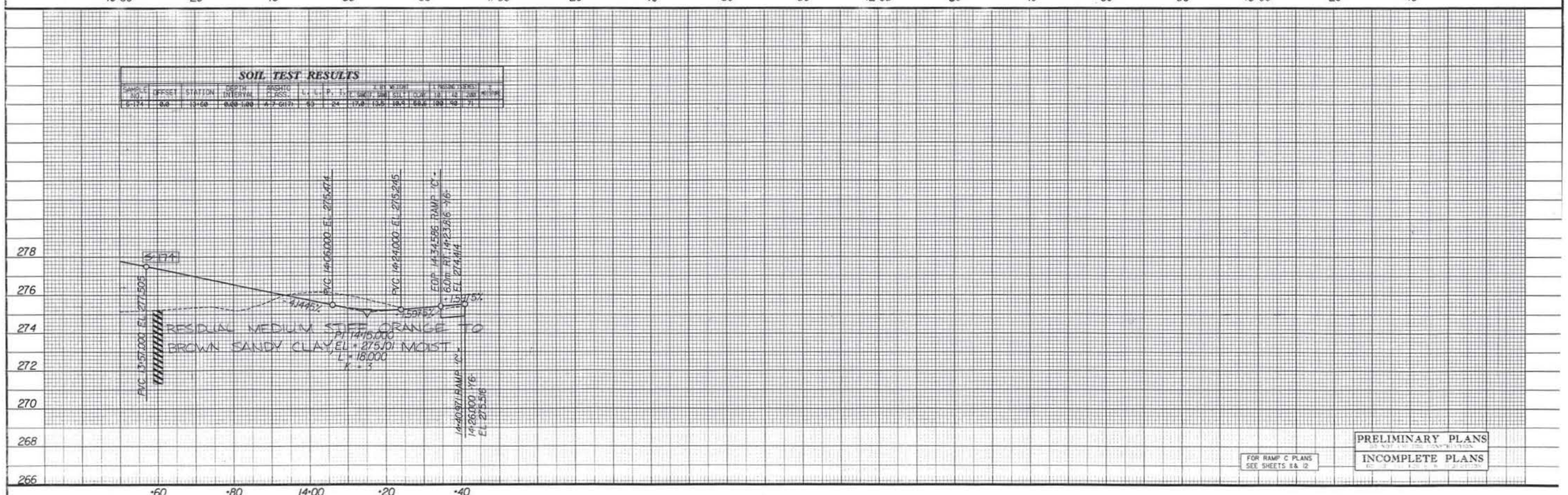
CONST. REV.

R/W REV.



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% SHRINK	% WEIGHT GRAV.	SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	MOISTURE
S-70	0.0	11+00	2.00-2.50	A-7-5(5)	49	12	25.1	17.0	20.6	34.3	43	76	54		
SS-72	0.0	12+00	0.00-0.45	A-2-4(0)	26	7	41.5	28.9	13.3	16.2	98	73	32		
SS-73	0.0	12+00	3.91-4.36	A-7-6(6)	43	22	25.9	26.7	11.1	32.3	100	86	46		



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% SHRINK	% WEIGHT GRAV.	SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	MOISTURE
S-74	0.0	13+60	0.00-1.00	A-7-6(17)	53	24	19.0	13.5	10.4	66.6	100	92	71		

FOR RAMP C PLANS SEE SHEETS 8 & 12

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	55
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

CONST. REV.

R/W REV.

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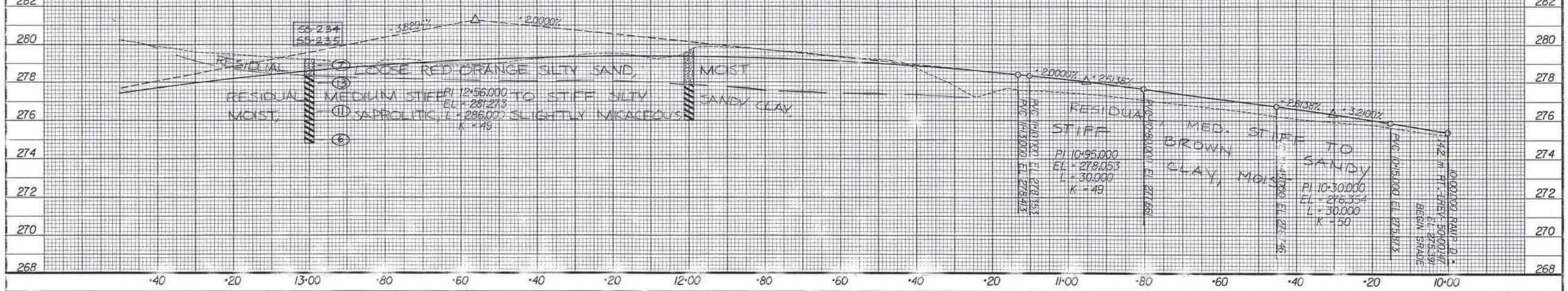
DATE: 9/18/2006 - 08:07

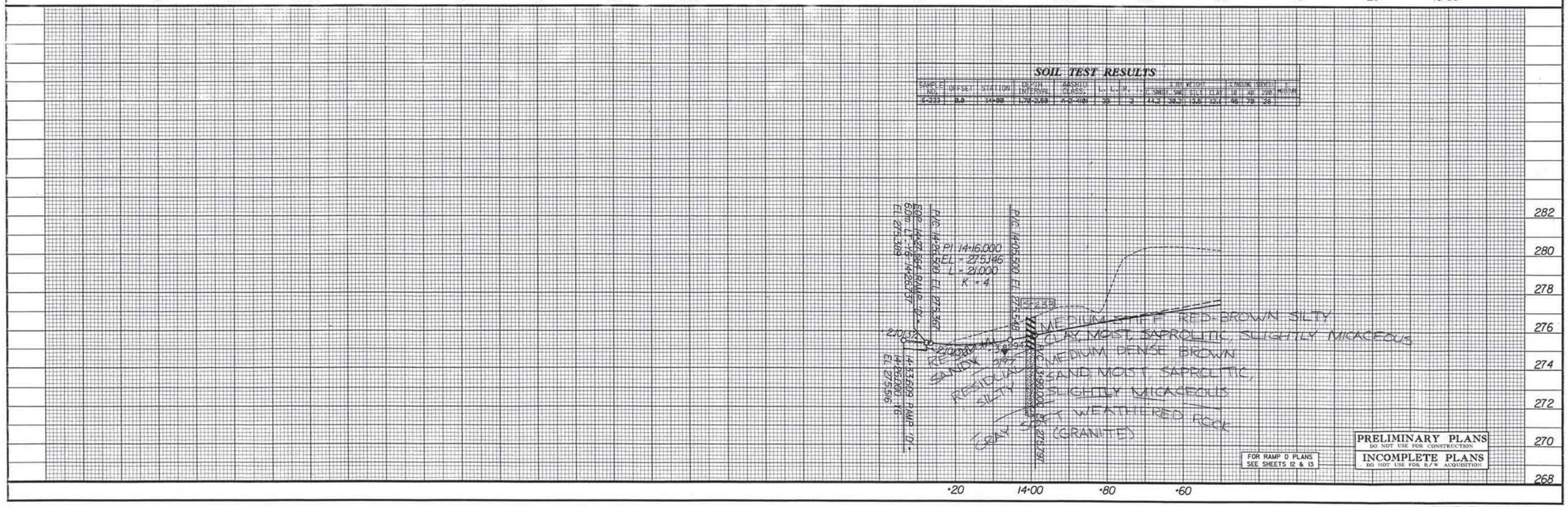
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT GRAVEL	COARSE SAND	FINE SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE
SS-234	0.0	13+00	0.00-0.46	A-2-4(0)	32	1	47.2	28.2	16.5	8.1	4.2	61	31	20	
SS-235	0.0	13+00	0.98-1.43	A-7-5(4)	62	15	21.8	26.4	21.6	30.2	9.9	86	57	25.7	



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT GRAVEL	COARSE SAND	FINE SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE
S-233	0.0	14+00	1.74-2.58	A-2-4(0)	32	3	44.2	38.2	13.5	12.1		46	28	28	



FOR RAMP D PLANS
SEE SHEETS 12 & 13

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

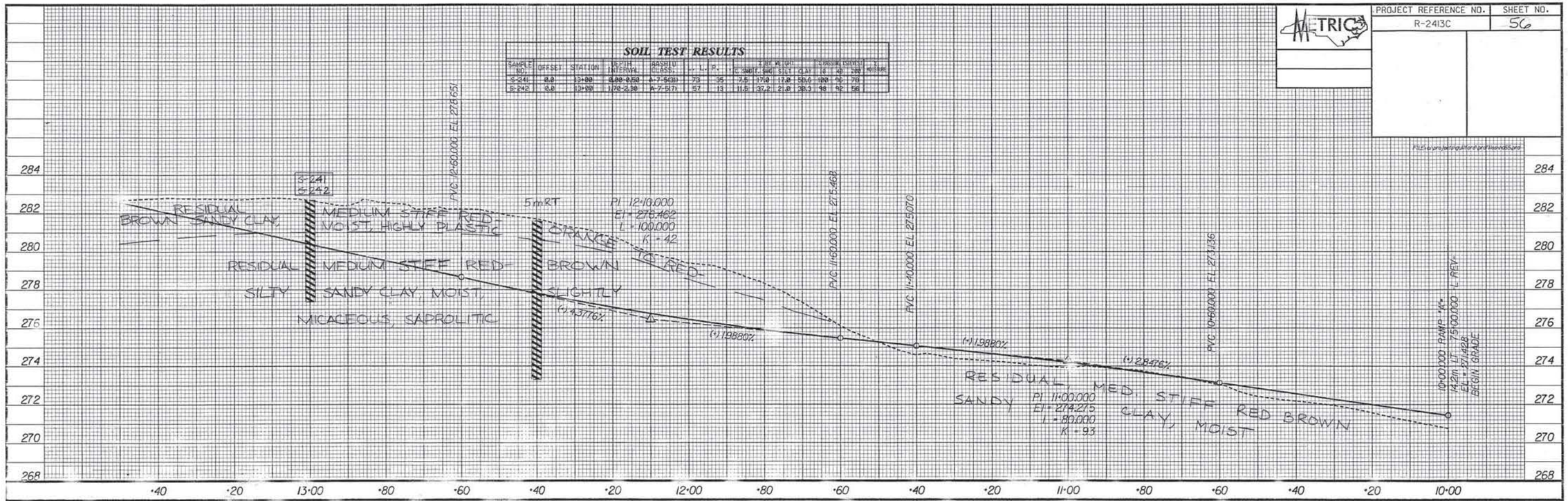
RAMP D - US 158

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	56

METRIC

SOIL TEST RESULTS

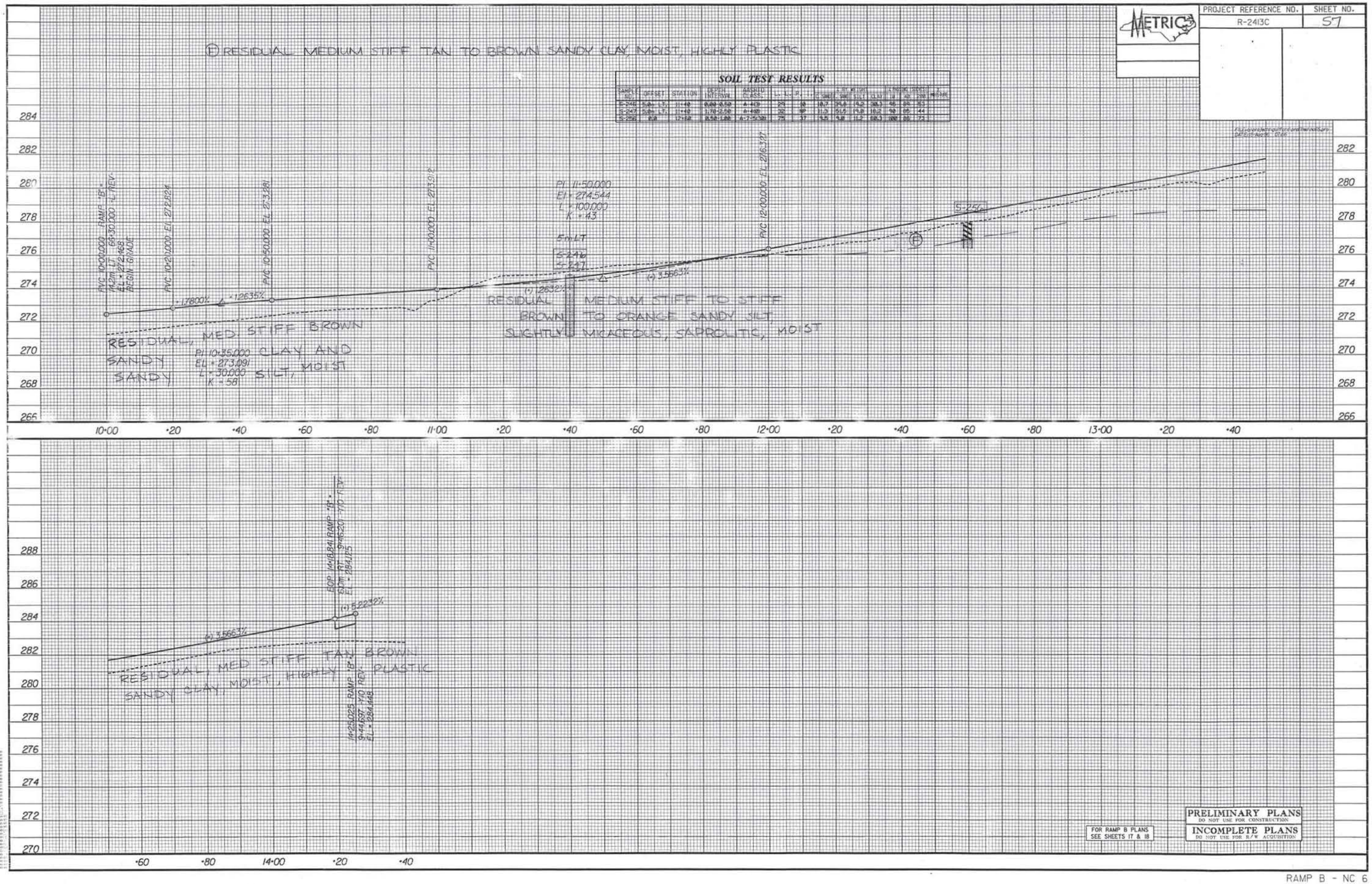
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	ASSHTO CLASS.	L.L.	P.I.	PERCENT WEIGHT C SAND	F SAND	SILT	CLAY	PASSING SIEVE 10	40	200	MISC.
S-241	8.0	13+00	0.00-0.50	A-7-5(8)	73	35	7.5	17.0	17.0	55.6	100	95	78	
S-242	8.0	13+00	1.70-2.30	A-7-5(7)	57	13	11.5	37.2	21.0	28.3	98	92	56	



FOR RAMP A PLANS SEE SHEETS 19 & 18

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

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	57



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT GRAVEL	SAND	SILT	CLAY	% PASSING SIEVES #10	#40	#200	MOISTURE
S-246	5.0 - LT	11+00	0.00-0.50	A-4(8)	29	10	10.7	24.0	42.2	23.1	96	86	53	
S-247	5.0 - LT	11+00	1.75-2.50	A-4(8)	32	10	11.3	31.5	41.0	16.2	90	85	44	
S-250	0.0	12+00	0.50-1.00	A-7-5(20)	75	37	3.5	9.8	11.2	69.3	100	88	73	

FOR RAMP B PLANS
SEE SHEETS 17 & 18

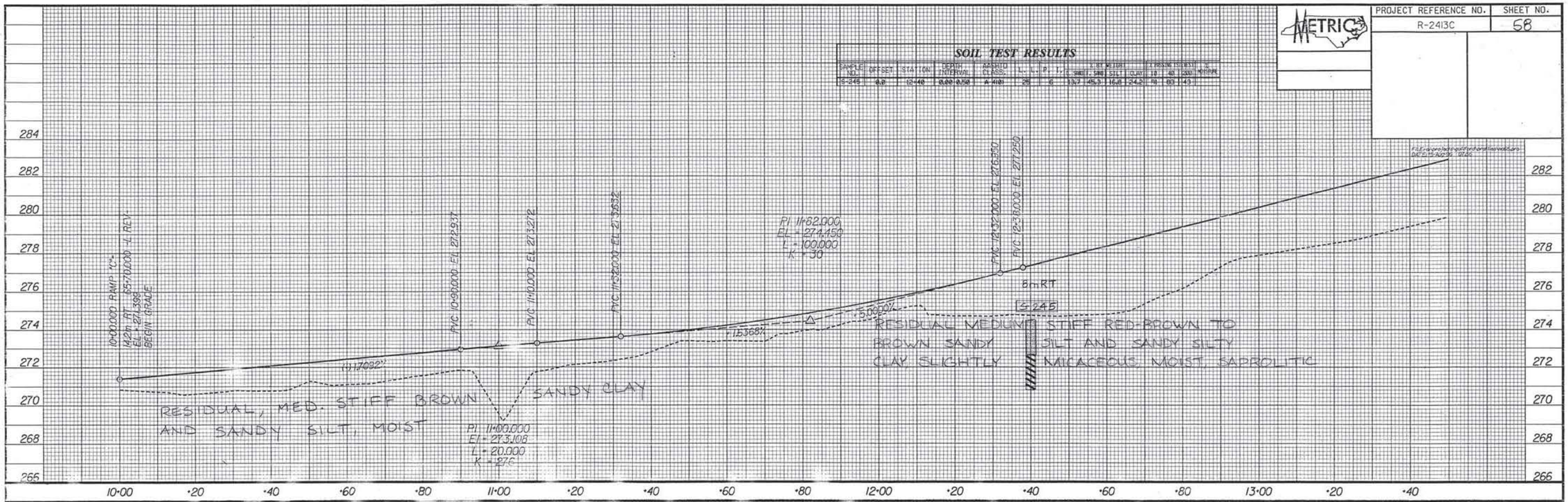
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	58

METRIC

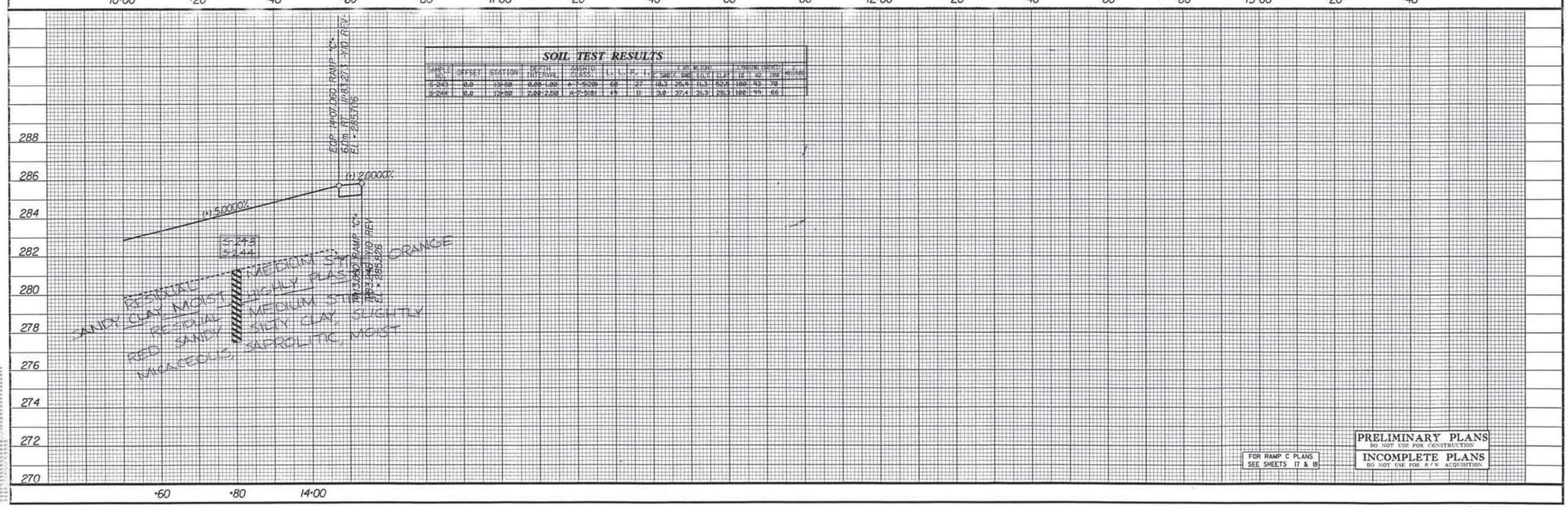
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% SOIL WEIGHT SAND	SILT	CLAY	% PASSING SIEVE 10	40	200	MOISTURE
S-245	0.0	12+40	0.00-0.50	A-4(8)	28	6	39.7	45.3	16.8	24.2	91	83	43



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% SOIL WEIGHT SAND	SILT	CLAY	% PASSING SIEVE 10	40	200	MOISTURE
S-243	0.0	10+80	0.00-1.00	A-7-5(20)	60	27	18.3	26.9	41.3	55.8	100	93	70
S-244	0.0	10+80	2.00-2.50	A-7-5(8)	49	11	3.0	37.4	31.3	28.3	100	99	66



FOR RAMP C PLANS SEE SHEETS 17 & 18

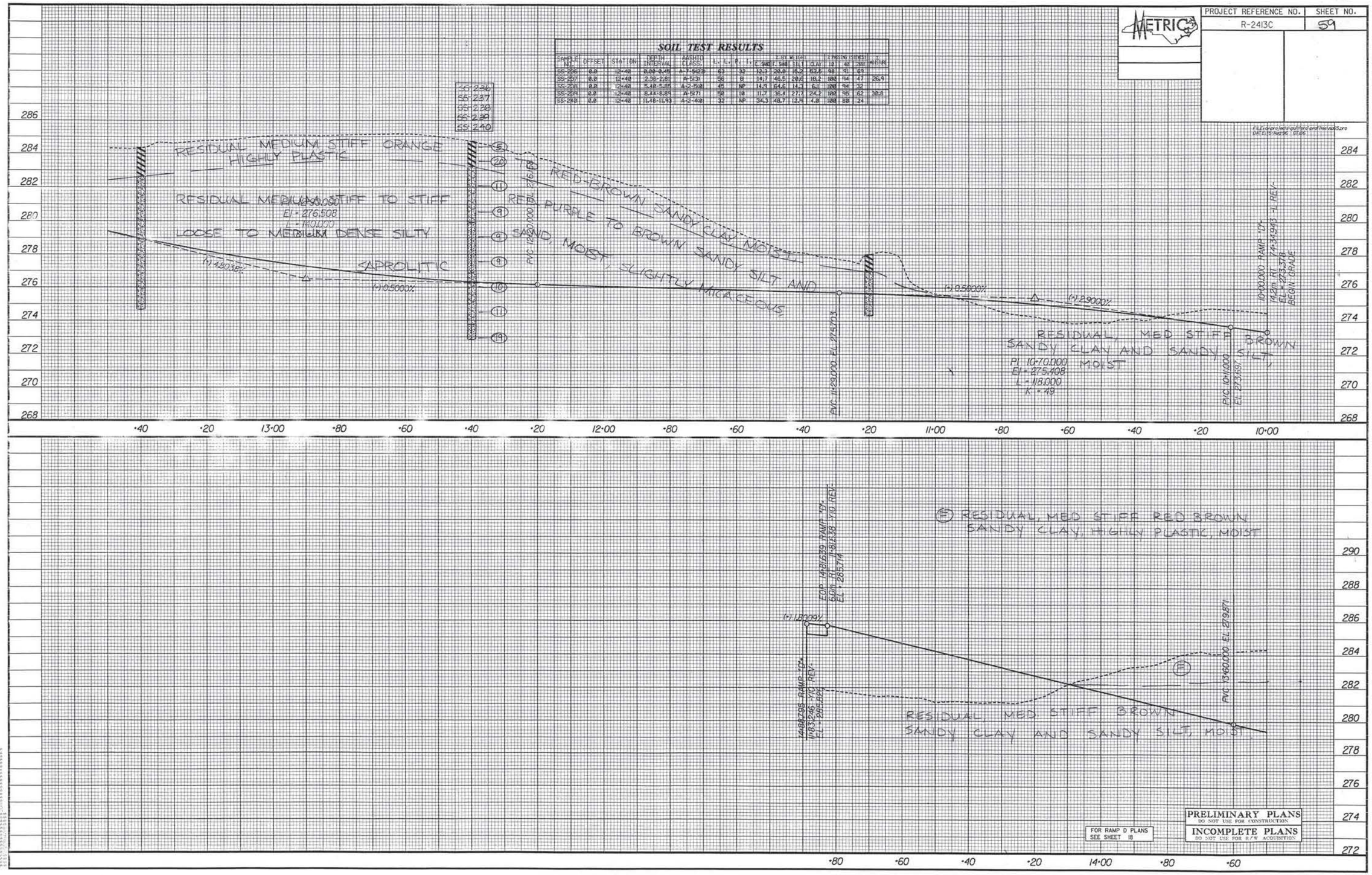
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	59

SOIL TEST RESULTS

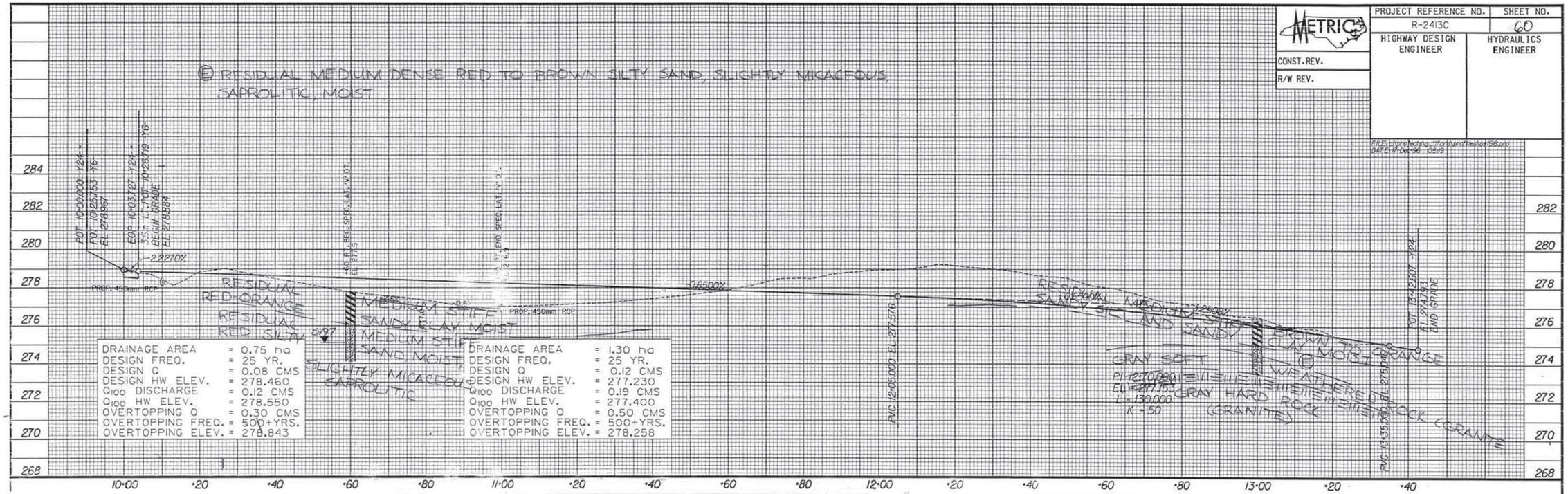
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% PASSING #10	% PASSING #40	% PASSING #200	% PASSING SILT	% PASSING CLAY	% PASSING #10	% PASSING #40	% PASSING #200	% MOISTURE
SS-206	0.0	12+40	0.00-0.48	A-7-5(23)	63	32	12.3	20.0	16.2	30.6	33.2	98	91	69	
SS-207	0.0	12+40	2.38-2.81	A-5(3)	56	8	14.7	46.5	20.6	18.2	100	94	47		26.9
SS-208	0.0	12+40	3.48-3.85	A-2-5(0)	45	NP	14.9	64.6	14.3	6.1	100	94	32		
SS-209	0.0	12+40	8.44-8.89	A-5(7)	50	10	11.7	36.4	27.7	24.2	100	95	62		30.8
SS-210	0.0	12+40	11.48-11.93	A-2-4(0)	32	NP	34.3	48.7	12.4	4.6	100	88	24		



PROJECT REFERENCE NO.	SHEET NO.
R-2413C	60
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CONST. REV.

R/W REV.

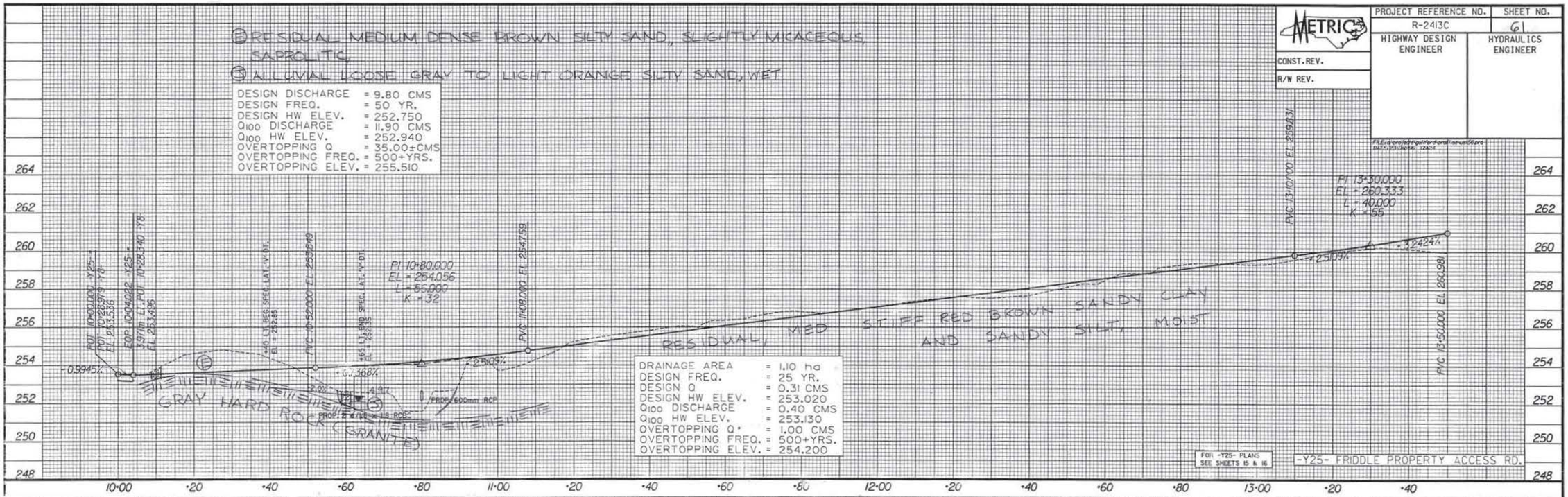


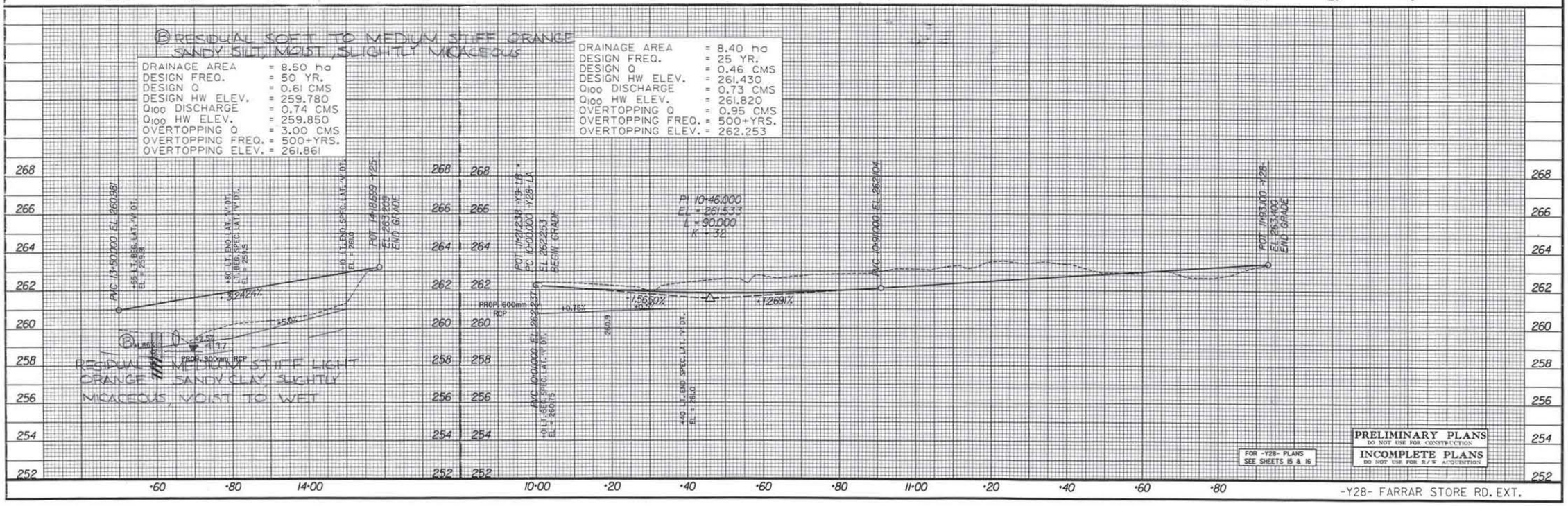
FOR -Y24- PLANS SEE SHEETS 12 & 27

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

-Y24- BLACKBURN PROP. ACCESS RD.

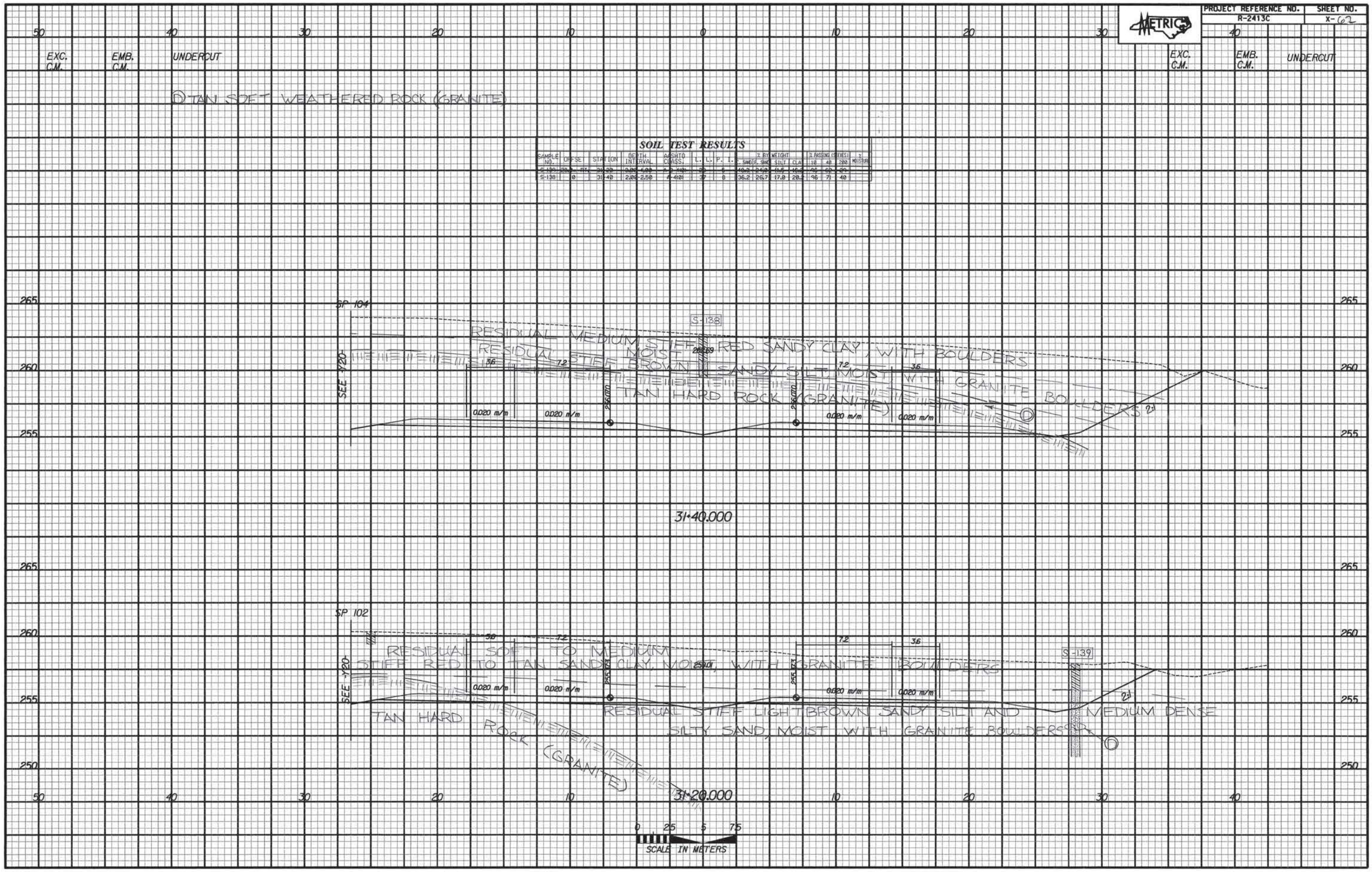
PROJECT REFERENCE NO.	SHEET NO.
R-2413C	61
HIGHWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CONST. REV.	
R/W REV.	





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

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	X-62

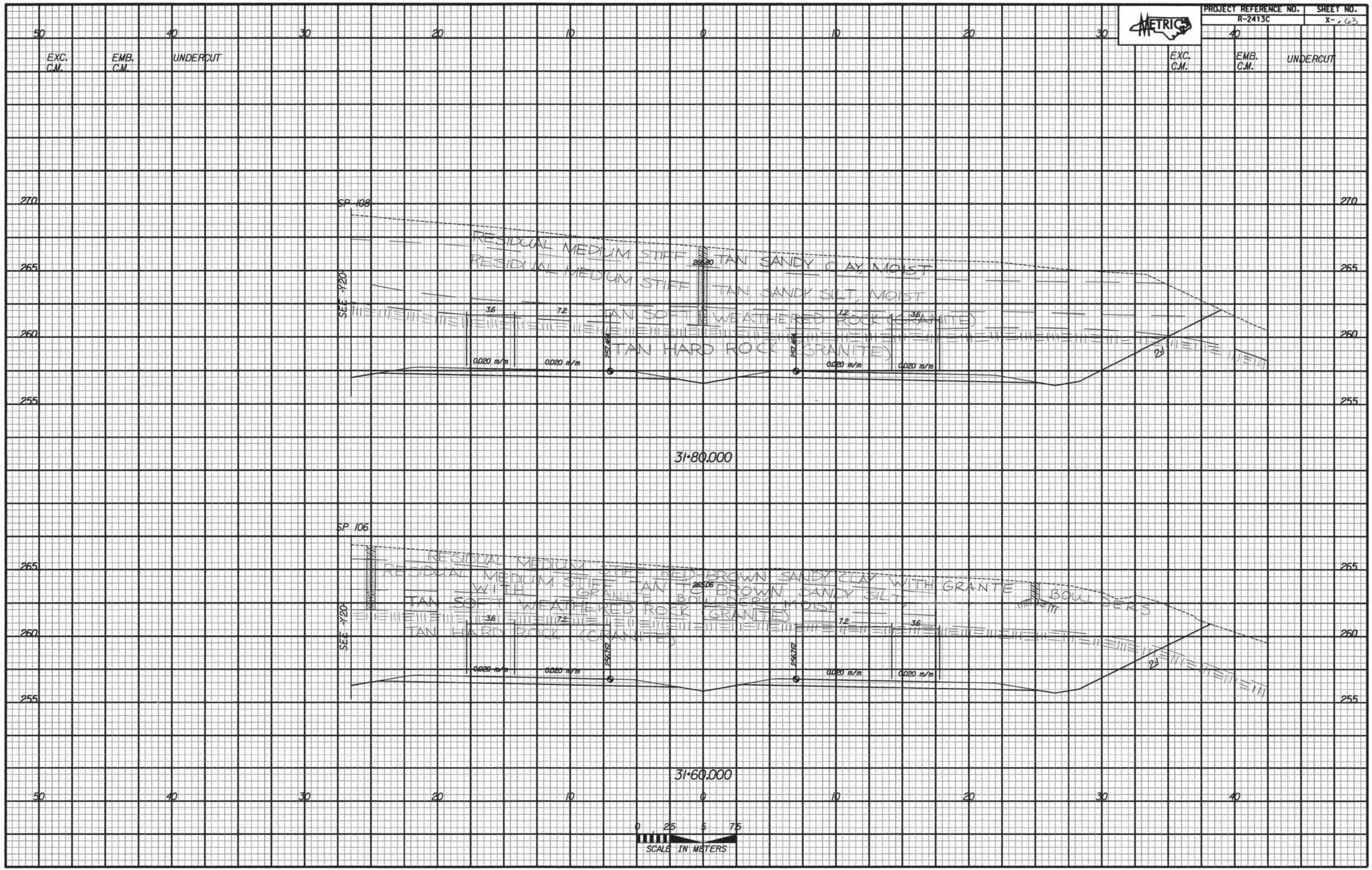


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE
S-139	30.5 RT.	31+20	0.80-1.00	A-2-4(0)	30	5	40.3	24.0	16.5	19.2	96	82	39	
S-138	0	31+40	2.00-2.50	A-4(0)	37	8	36.2	26.7	17.0	20.2	96	71	40	

-L-REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	X-4B3



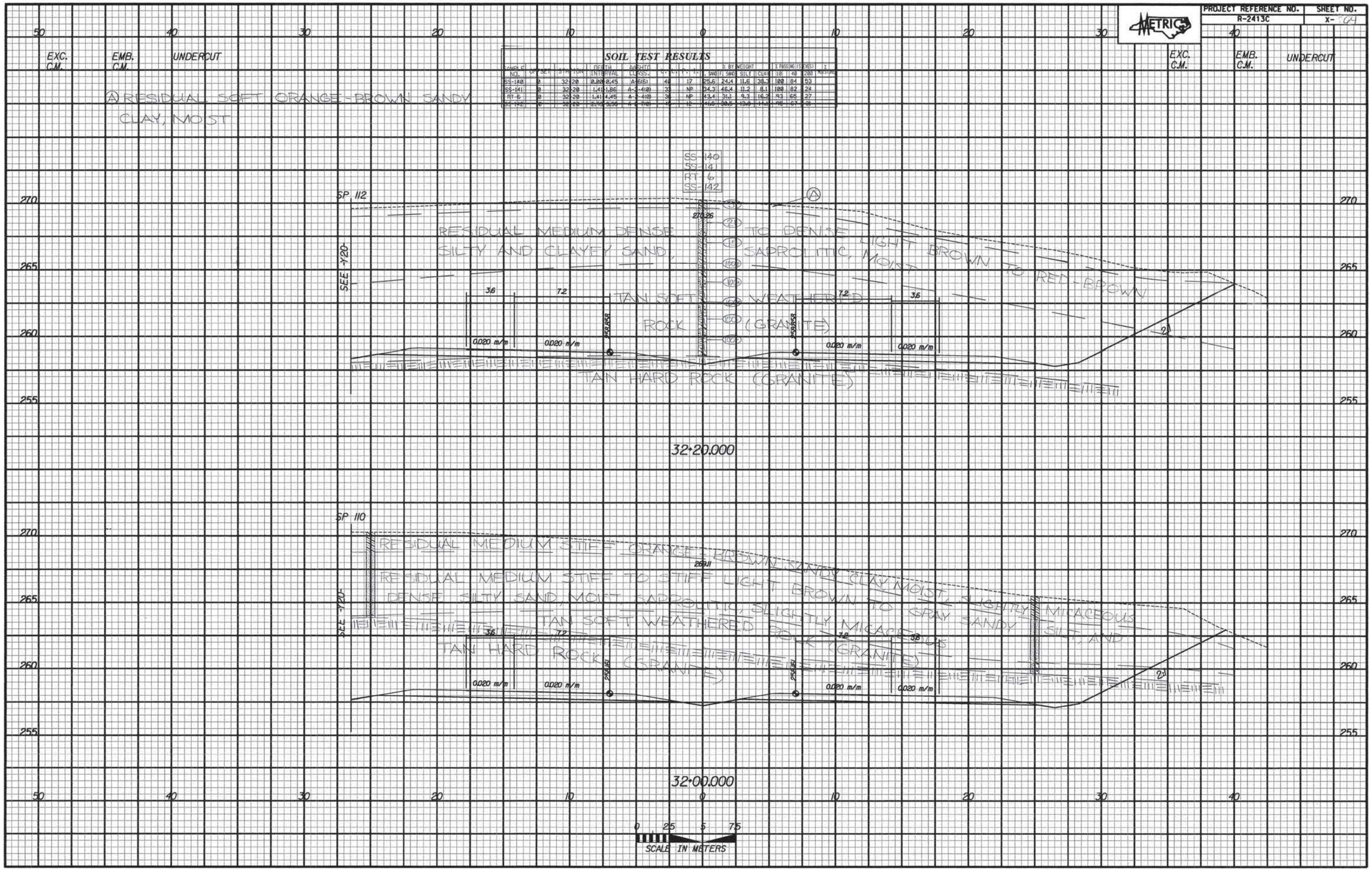
-L-REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	X-64

METRIC

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT GRAVEL	SAND	SILT	CLAY	% PASS #10	#40	#200	% MOISTURE
SS-140	0	32+20	0.00-0.45	A-6(6)	46	17	25.6	24.4	11.6	38.3	100	84	53	
SS-141	0	32+20	1.41-1.86	A-3-4(0)	31	NP	34.3	46.4	11.2	8.1	100	82	24	
RT-6	0	32+20	1.41-1.45	A-3-4(0)	36	NP	43.4	31.1	9.3	16.2	93	65	27	
SS-142	0	32+20	2.95-3.36	A-3-4(0)	42	15	15.6	30.5	13.0	41.0	96	67	28	



-L-REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	X-[illegible]

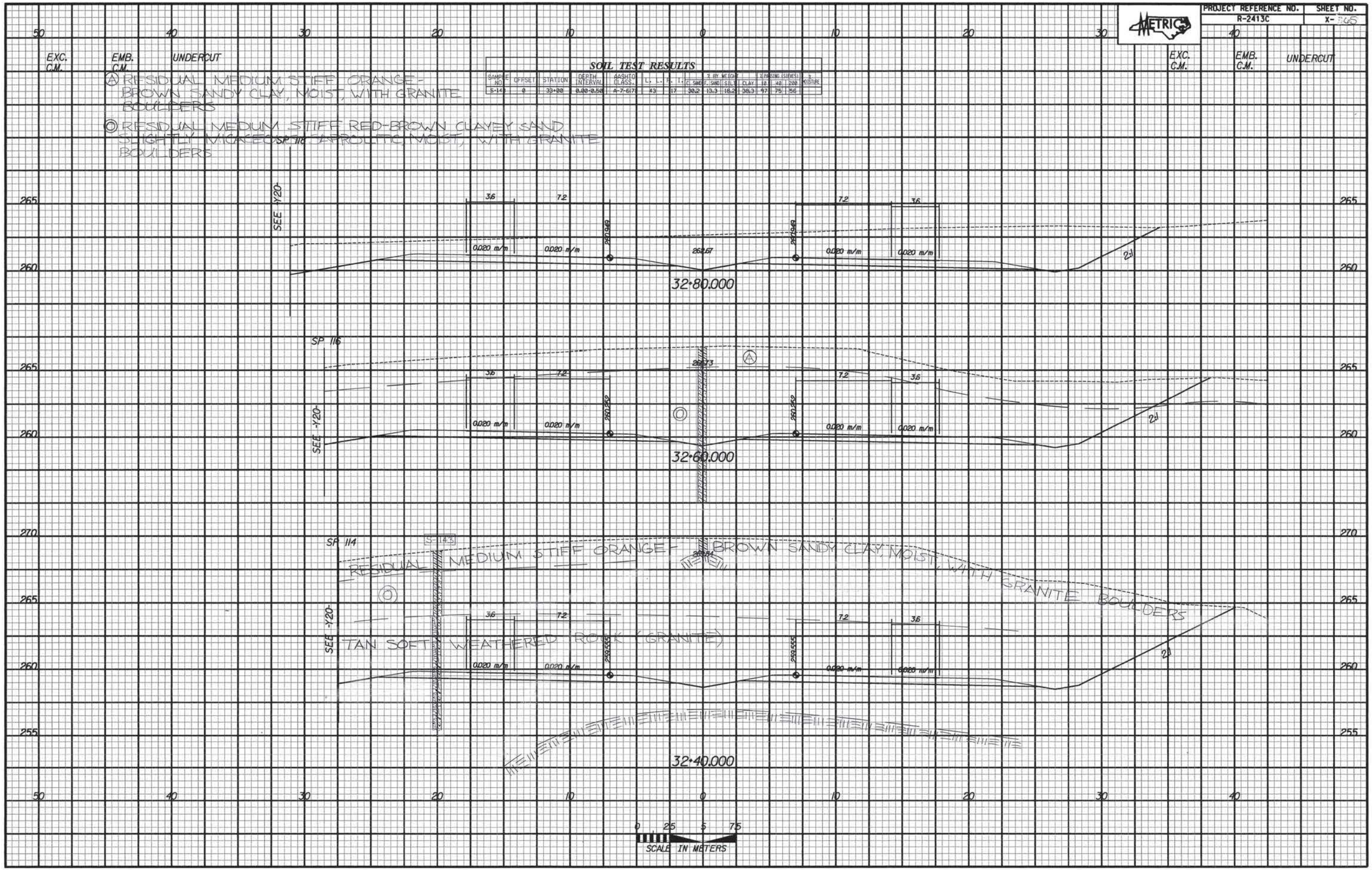
EXC. C.M. | EMB. C.M. | UNDERCUT

Ⓐ RESIDUAL MEDIUM STIFF ORANGE-BROWN SANDY CLAY, MOIST, WITH GRANITE BOULDERS

Ⓞ RESIDUAL MEDUM STIFF RED-BROWN CLAYEY SAND SLIGHTLY MICACEOUS, SAPROLITIC, MOIST, WITH GRANITE BOULDERS

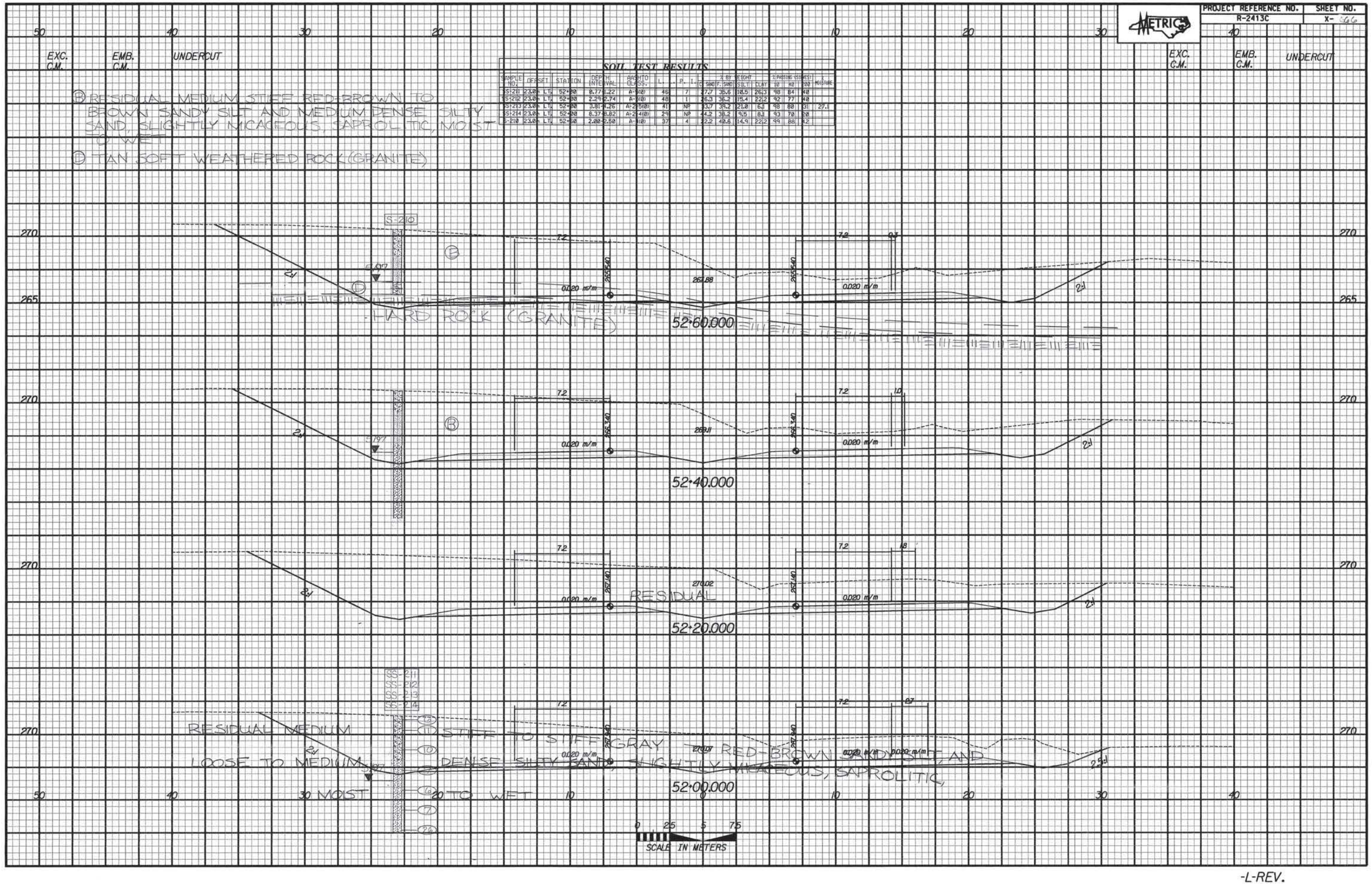
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C SND	F. SND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE
S-14	0	33+00	0.00-0.50	A-7-6(7)	43	17	30.2	13.3	18.2	38.3	97	75	56	



-L-REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	X- 366

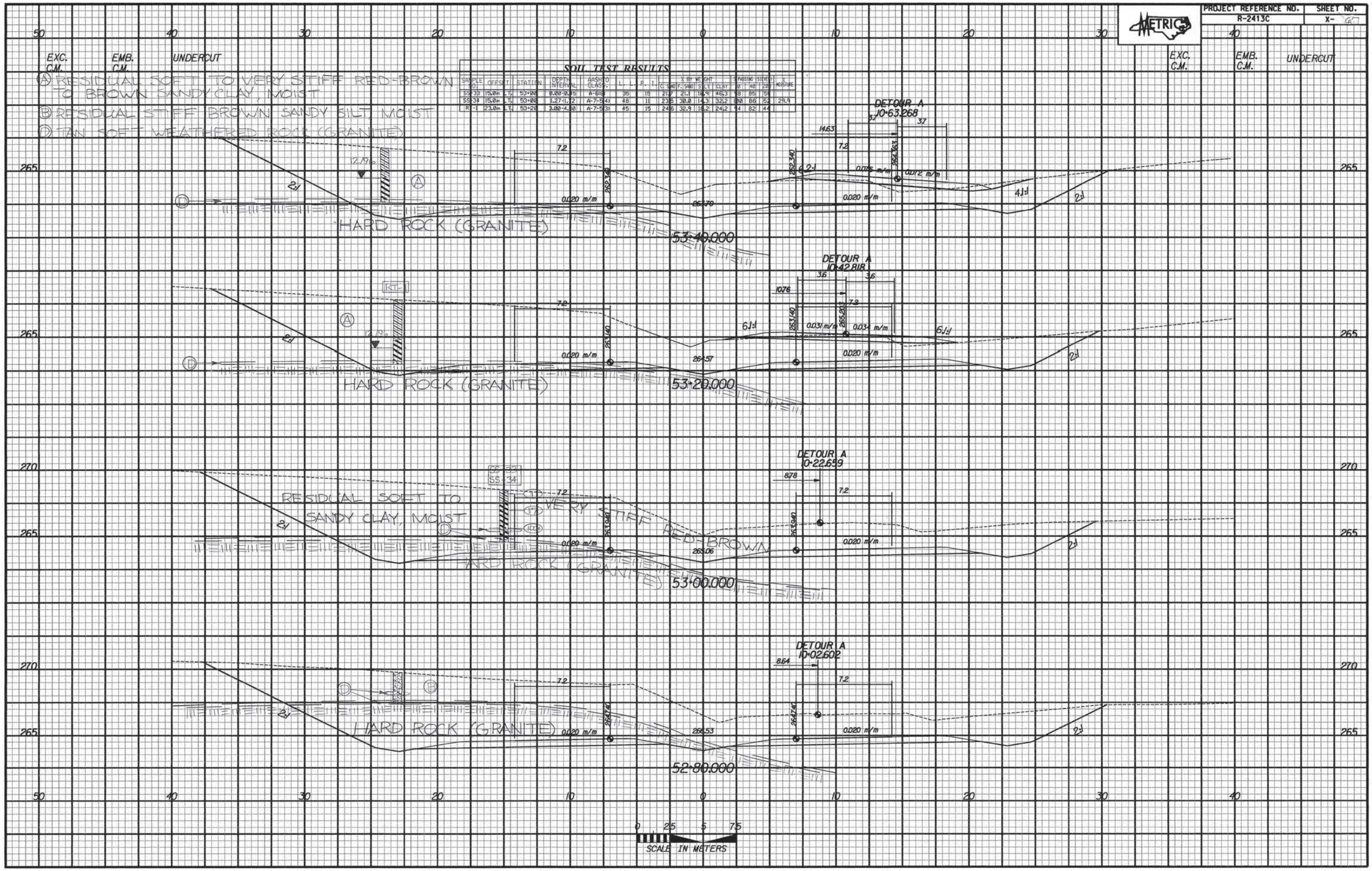


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT GRAVEL	SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	MOISTURE
S-211	23.0 m LT	52+00	0.77-1.22	A-4(0)	46	7	27.7	35.5	18.5	26.3	98	84	40	
S-212	23.0 m LT	52+00	2.29-2.74	A-4(0)	48	11	26.3	36.2	15.4	22.2	92	77	40	
S-213	23.0 m LT	52+00	3.81-4.26	A-2-5(0)	41	NP	3.7	34.2	21.0	61	98	80	31	27.1
S-214	23.0 m LT	52+00	8.37-8.82	A-2-4(0)	29	NP	14.2	38.2	9.5	8.1	93	70	20	
S-210	23.0 m LT	52+50	2.00-2.50	A-4(0)	37	4	22.2	40.6	14.9	22.2	99	88	42	

-L-REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	X- 6

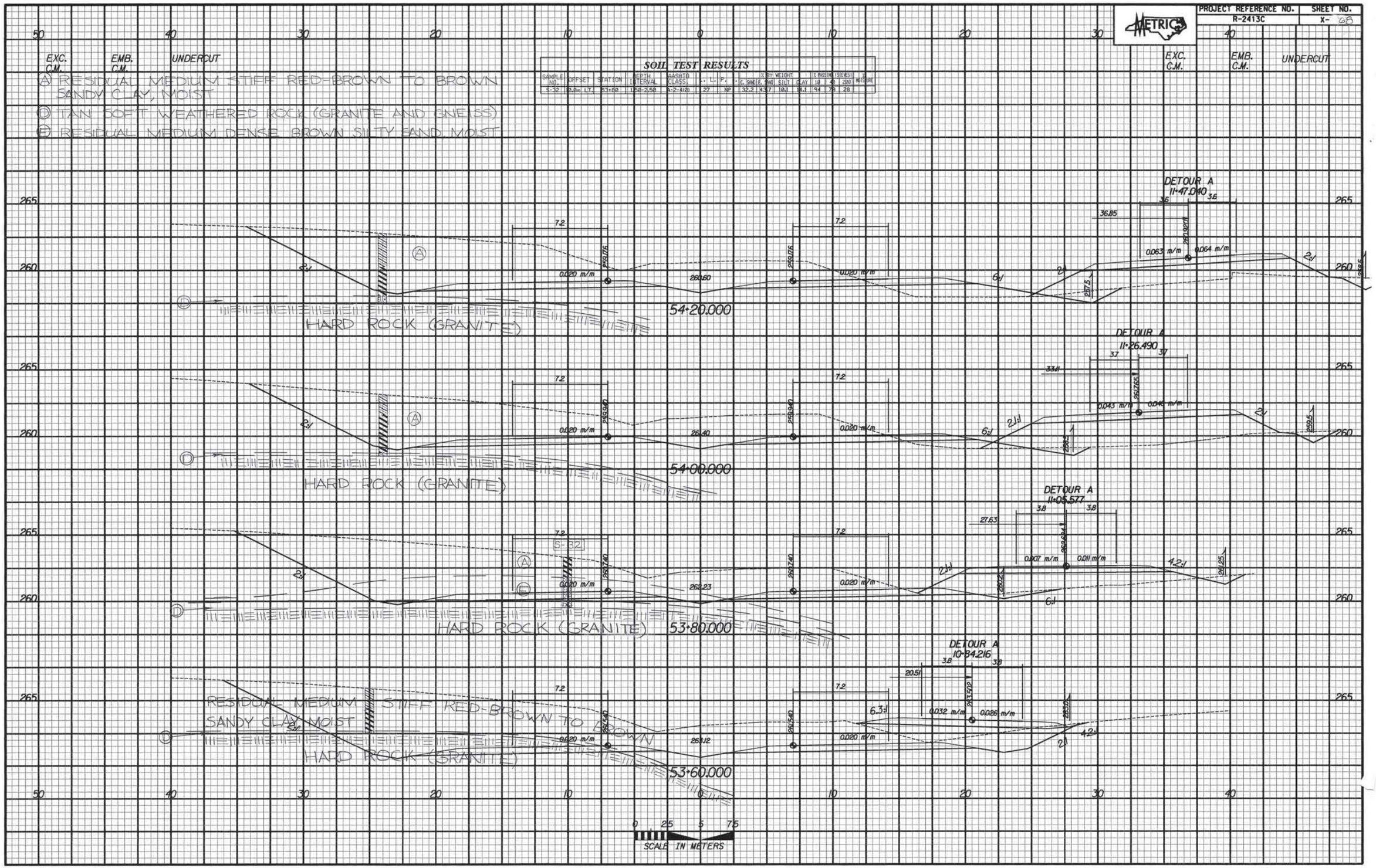


SOIL TEST RESULTS

SAMPLE NO.	DEPTH	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT G	S	M	C	% PASSING SIEVE 10	40	200	REMARKS
SS 33	15.0m	LT	53+00	A-6(8)	35	15	21.7	21.1	18.9	45.3	98	85	59	
SS 34	15.0m	LT	53+00	A-7-5(4)	48	11	23.5	30.0	14.3	32.2	100	86	52	28.9
TR-1	23.0m	LT	53+20	A-7-5(3)	45	15	24.6	32.9	18.2	24.2	94	82	44	

-L-REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	X- 68



SOIL TEST RESULTS

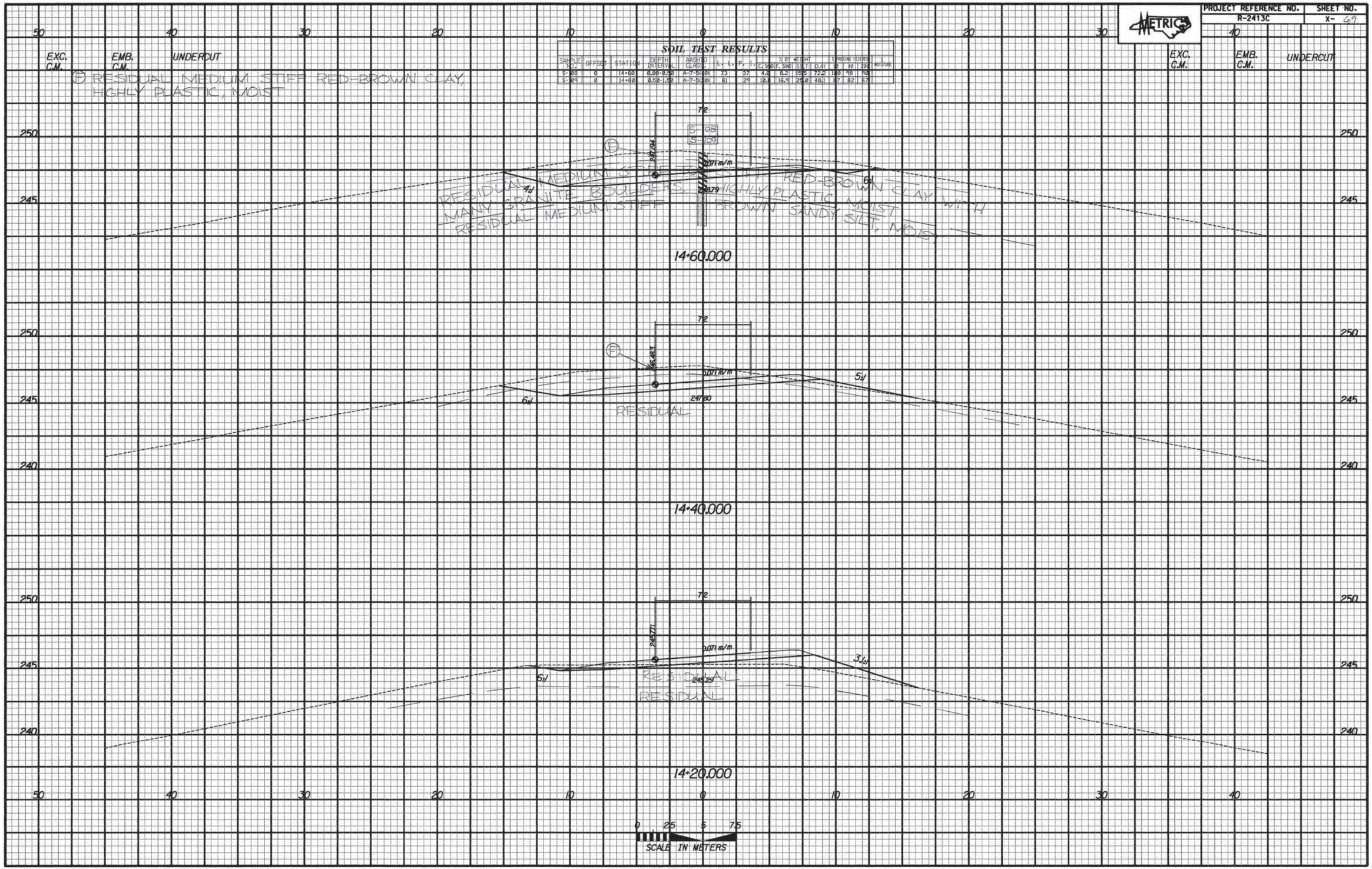
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE
S-32	8.0m LT.	53+80	1.50-2.50	A-2-4(0)	27	NP	32.2	43.7	10.1	14.1	94	79	28	

-L-REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	X- 69

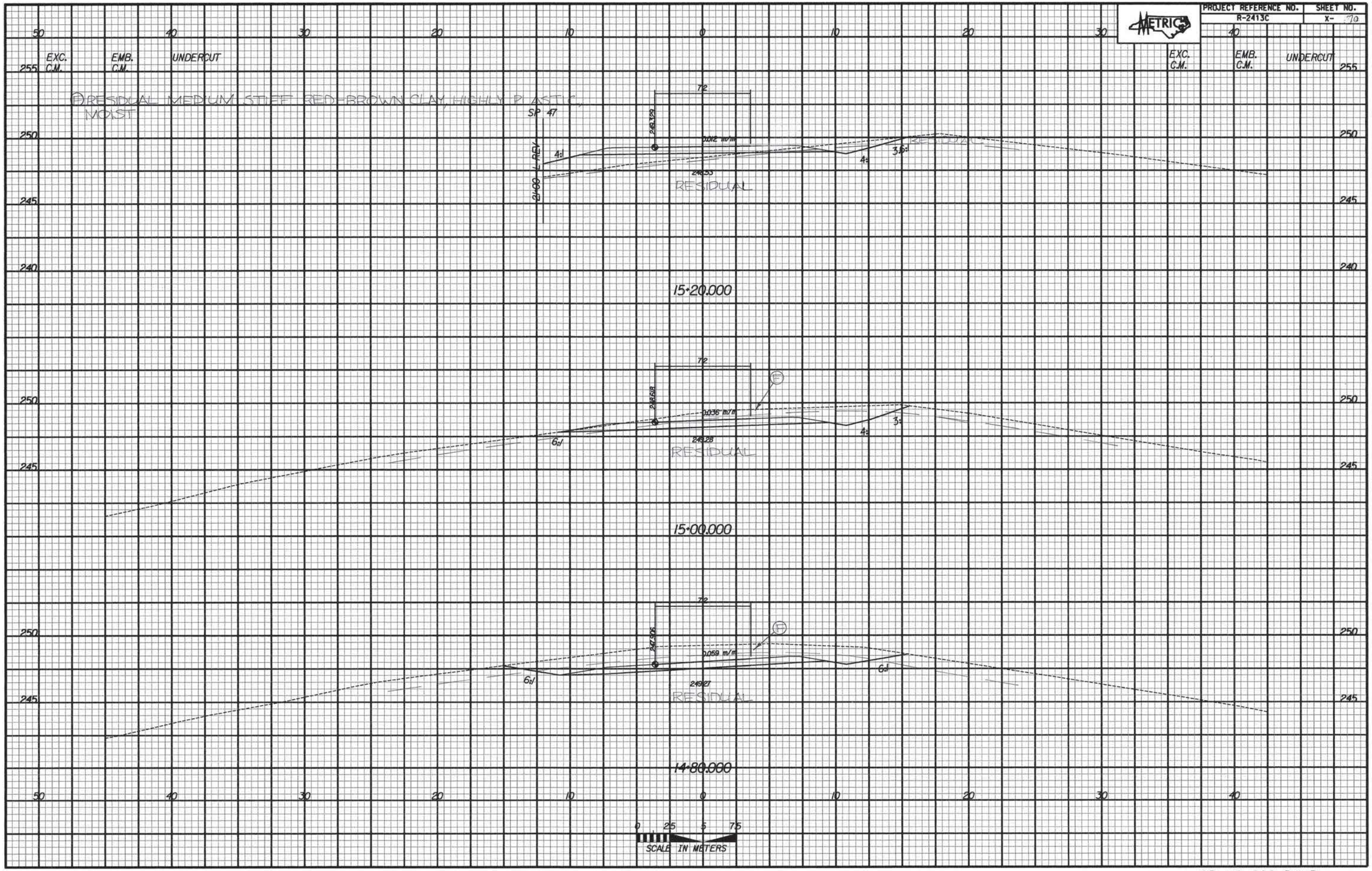
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L. L.	P. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVE) 10	40	200	% MOISTURE
S-108	0	14+60	0.00-0.50	A-7-5(10)	73	37	4.8	8.2	15.5	72.2	100	98	98	
S-109	0	14+60	0.50-1.50	A-7-5(20)	61	29	12.4	16.9	25.0	48.1	87	82	57	



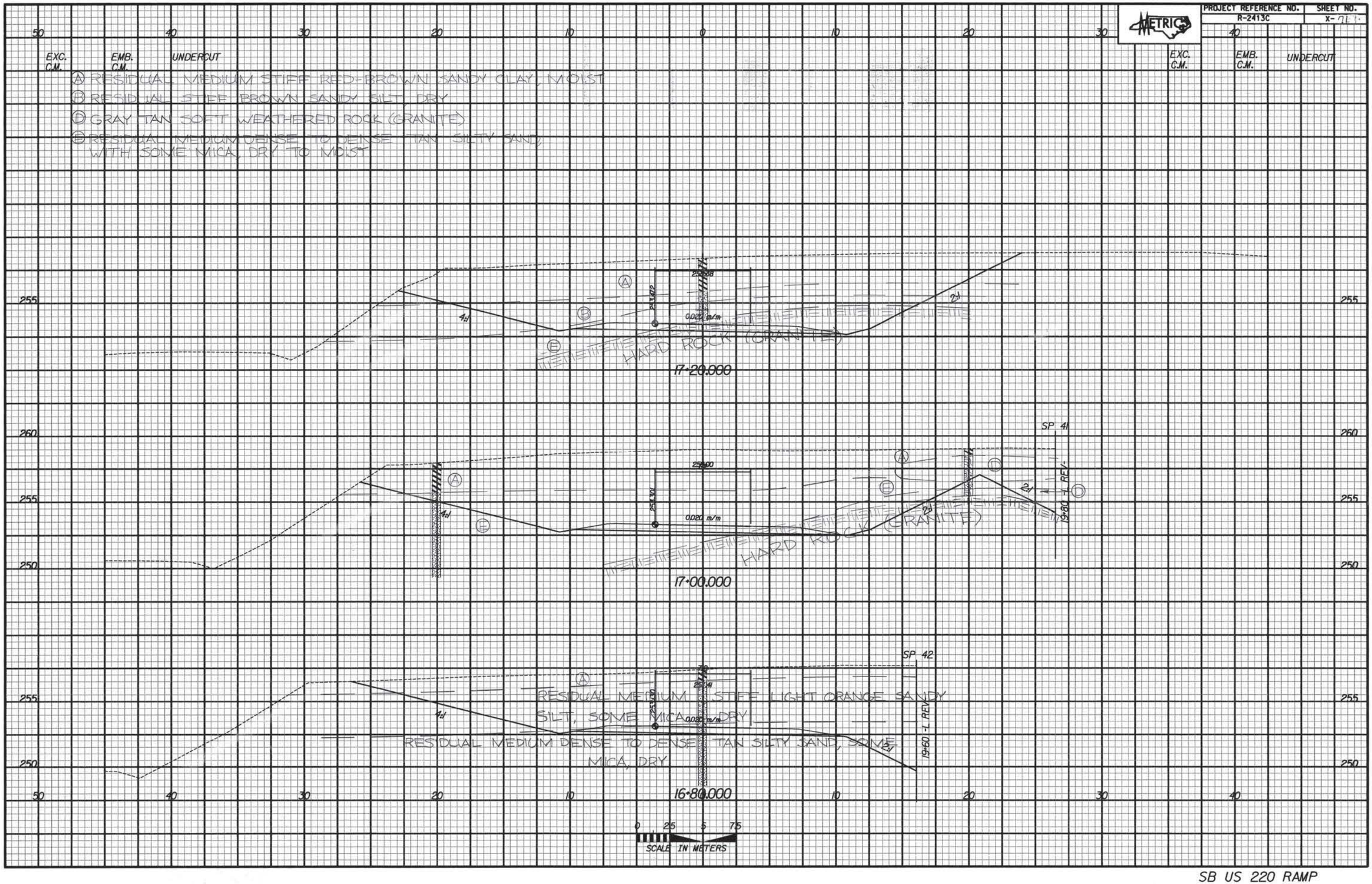
SB US 220 RAMP

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	X- 70



SB US 220 RAMP

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	X-7L1



SB US 220 RAMP

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	X- 72

METRIC

EXC. C.M. | EMB. C.M. | UNDERCUT

Ⓐ RESIDUAL MEDIUM STIFF RED-BROWN SANDY CLAY MOIST

Ⓑ RESIDUAL MEDIUM STIFF TO STIFF TAN TO ORANGE-BROWN SANDY SILT, WITH SOME MICA, DRY TO MOIST

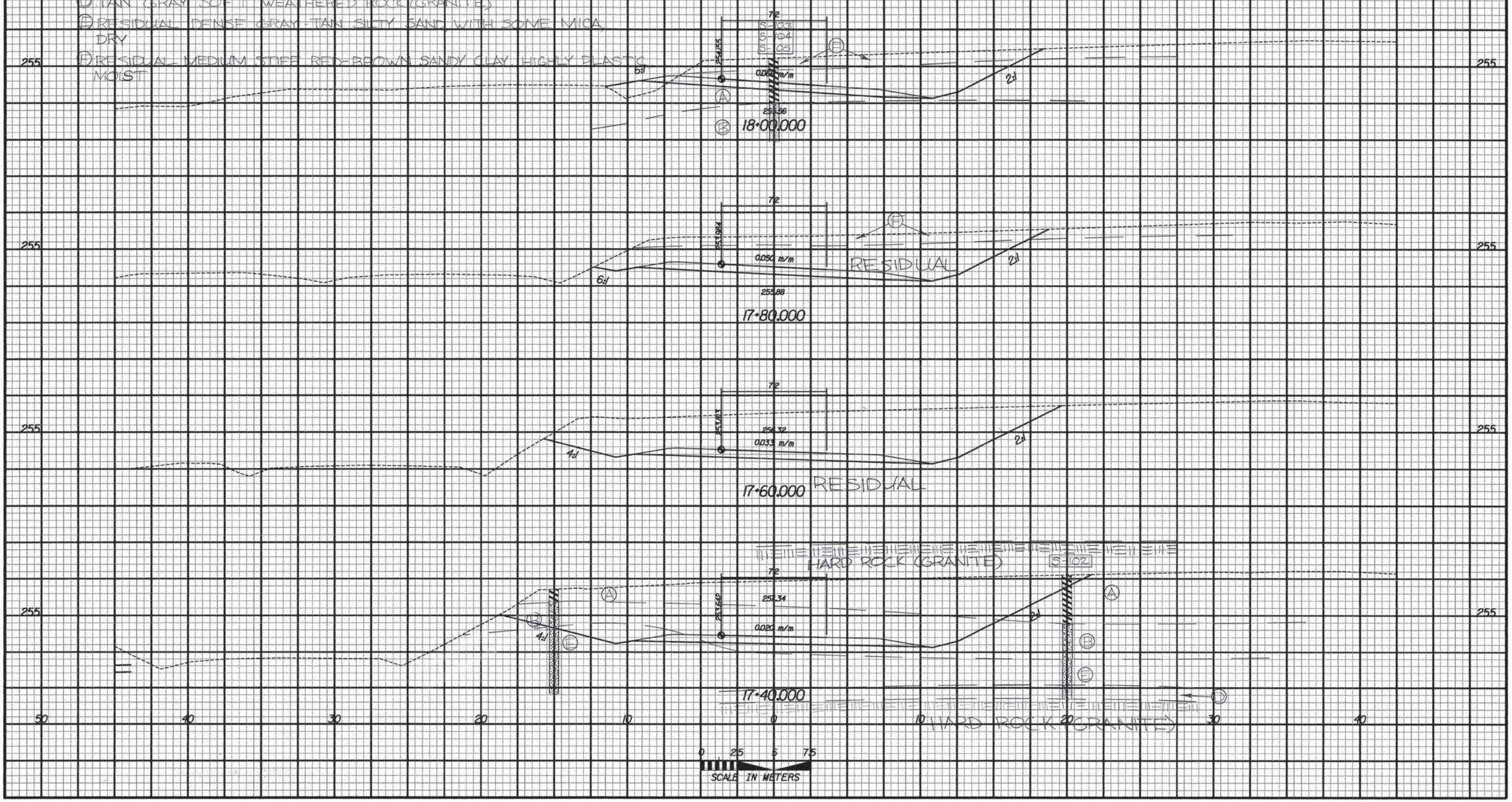
Ⓒ TAN GRAY SOFT WEATHERED ROCK (GRANITE)

Ⓓ RESIDUAL DENSE GRAY-TAN SILTY SAND WITH SOME MICA, DRY

Ⓔ RESIDUAL MEDIUM STIFF RED-BROWN SANDY CLAY, HIGHLY PLASTIC MOIST

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	M	% BY WEIGHT GRAVEL	COARSE SAND	FINE SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE
S-102	0	17+20	3.30-4.00	A-2-4(0)	21	NP	40.0	33.5	12.1	14.0	47	73	38	
S-103	0	18+00	0.00-0.00	A-7-5(7)	57	24	15.8	13.2	16.5	54.2	100	84	74	
S-104	0	18+00	0.50-1.00	A-7-6(8)	47	18	31.5	18.7	23.5	26.1	100	77	54	
S-105	0	18+00	3.00-5.00	A-4(0)	31	5	31.0	33.5	21.4	14.0	100	81	42	



SB US 220 RAMP

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	X-13

METRIC

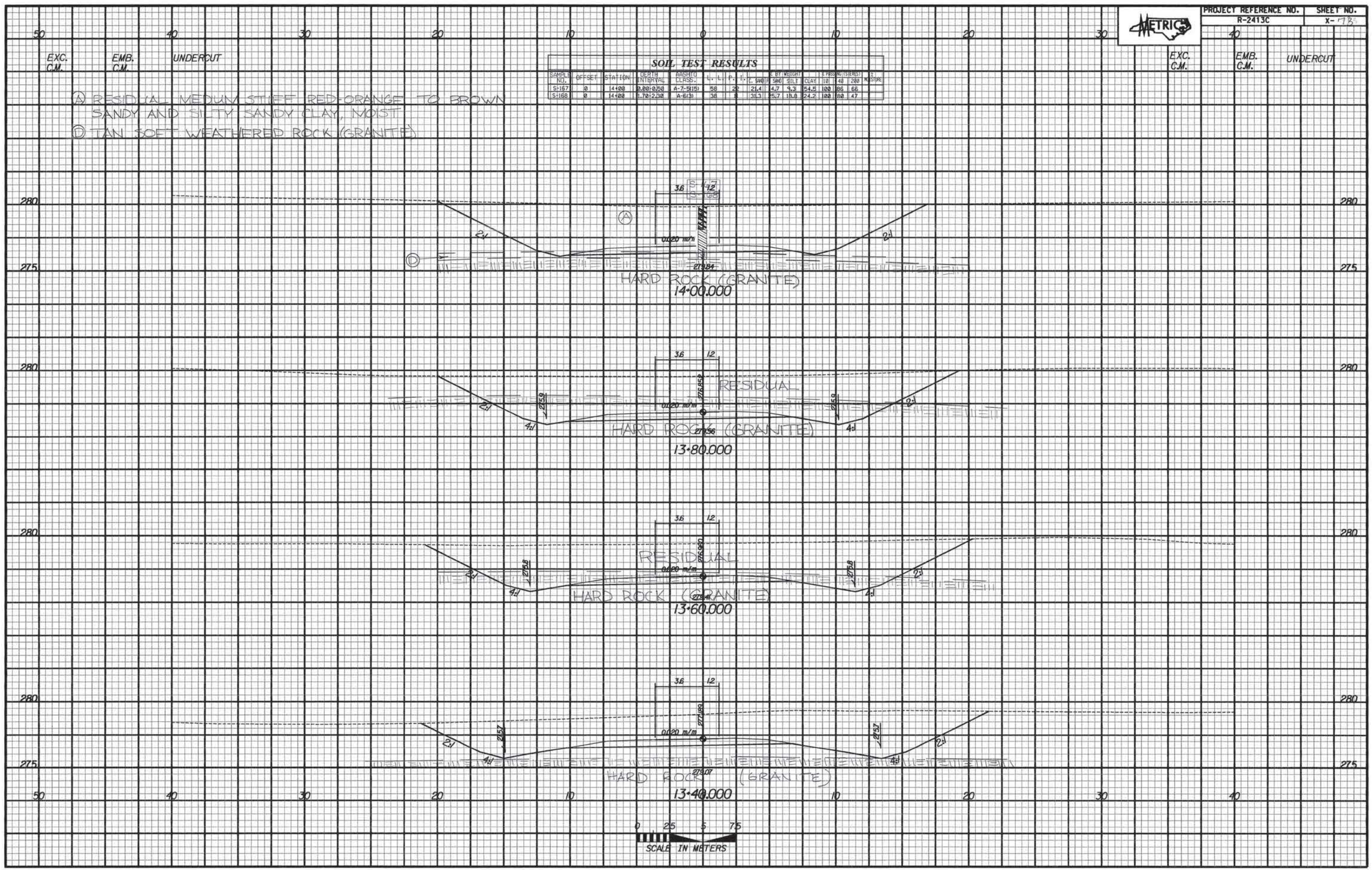
EXC. C.M. | EMB. C.M. | UNDERCUT

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L. L.	P. I.	I. C.	% BY WEIGHT GRAVEL	SAND	SILT	CLAY	% PASSING SIEVE 10	40	200	% MOISTURE
S-167	0	14+00	0.00-0.50	A-7-5(15)	58	22	21.4	4.7	9.3	54.5	100	86	66		
S-168	0	14+00	1.70-2.30	A-6(3)	38	8	31.3	25.7	18.8	24.2	100	80	47		

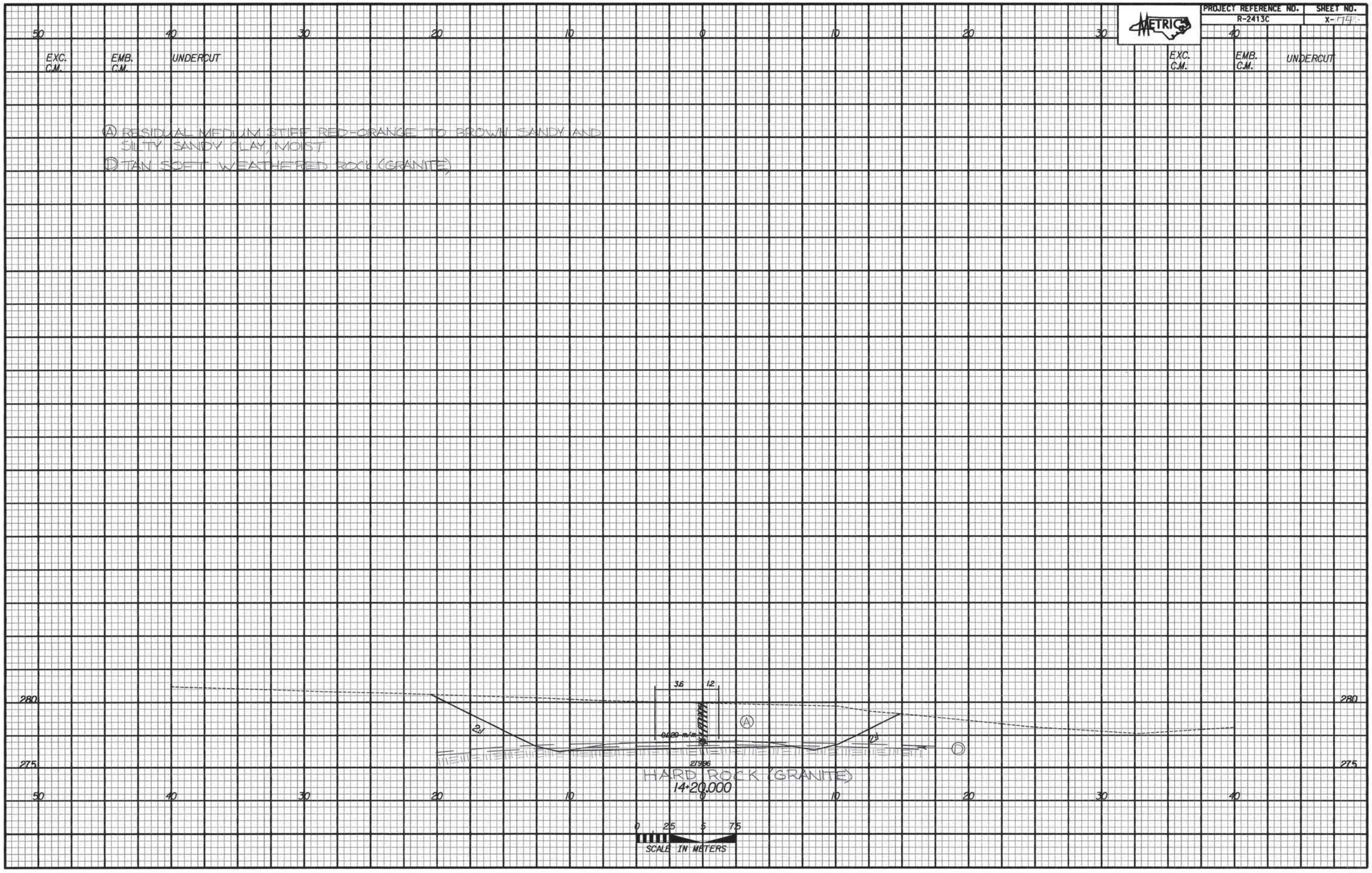
(A) RESIDUAL MEDIUM STIFF RED-ORANGE TO BROWN SANDY AND SILTY SANDY CLAY, MOIST

(D) TAN SOFT WEATHERED ROCK (GRANITE)

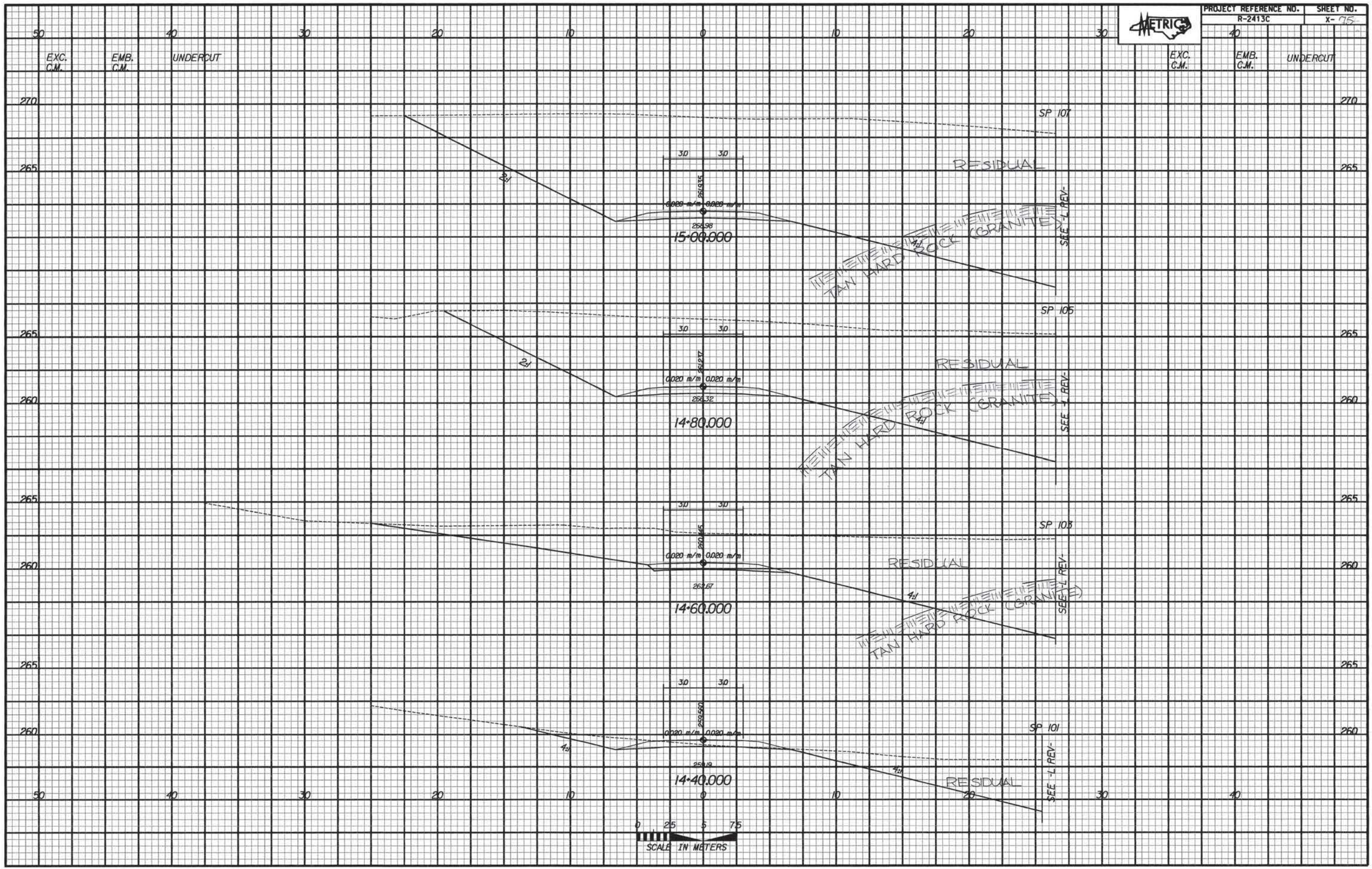


RAMP B @ US 158

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	X-114



RAMP B @ US 158

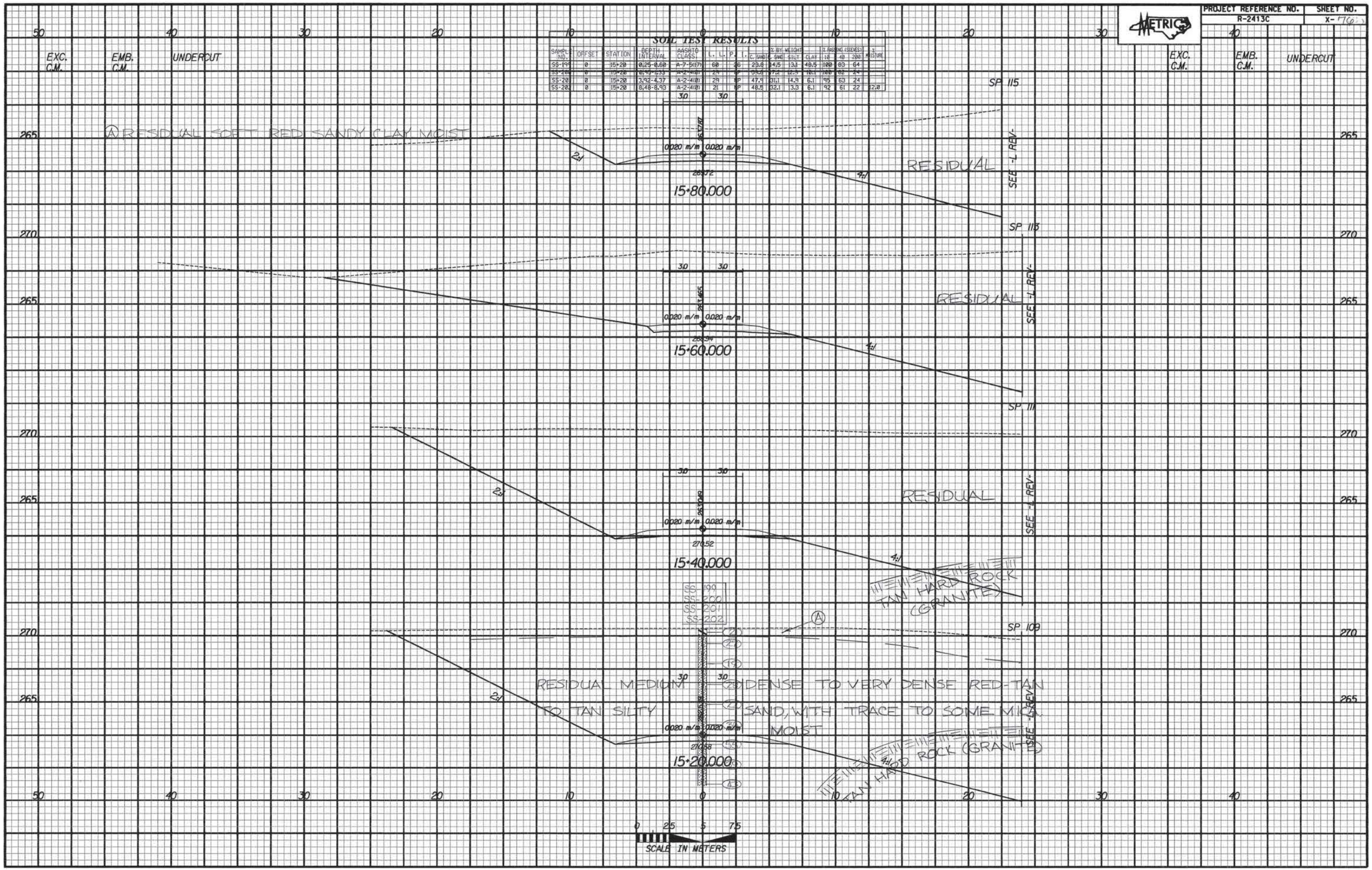


-Y20- SPOTSWOOD RD.EXT.

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	X-7(6)

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SND	F. SND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE
SS-199	0	15+20	0.25-0.60	A-7-5(17)	60	26	23.8	14.5	13.1	48.5	100	83	64	
SS-200	0	15+20	0.92-1.33	A-2-4(0)	24	NP	51.8	17.2	12.9	18.1	100	82	24	
SS-201	0	15+20	3.92-4.37	A-2-4(0)	29	NP	47.9	31.1	14.9	6.1	95	63	24	
SS-202	0	15+20	8.48-8.93	A-2-4(0)	21	NP	48.5	32.1	13.3	6.1	92	61	22	12.0



-Y20- SPOTSWOOD RD.EXT.

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	X-[illegible]

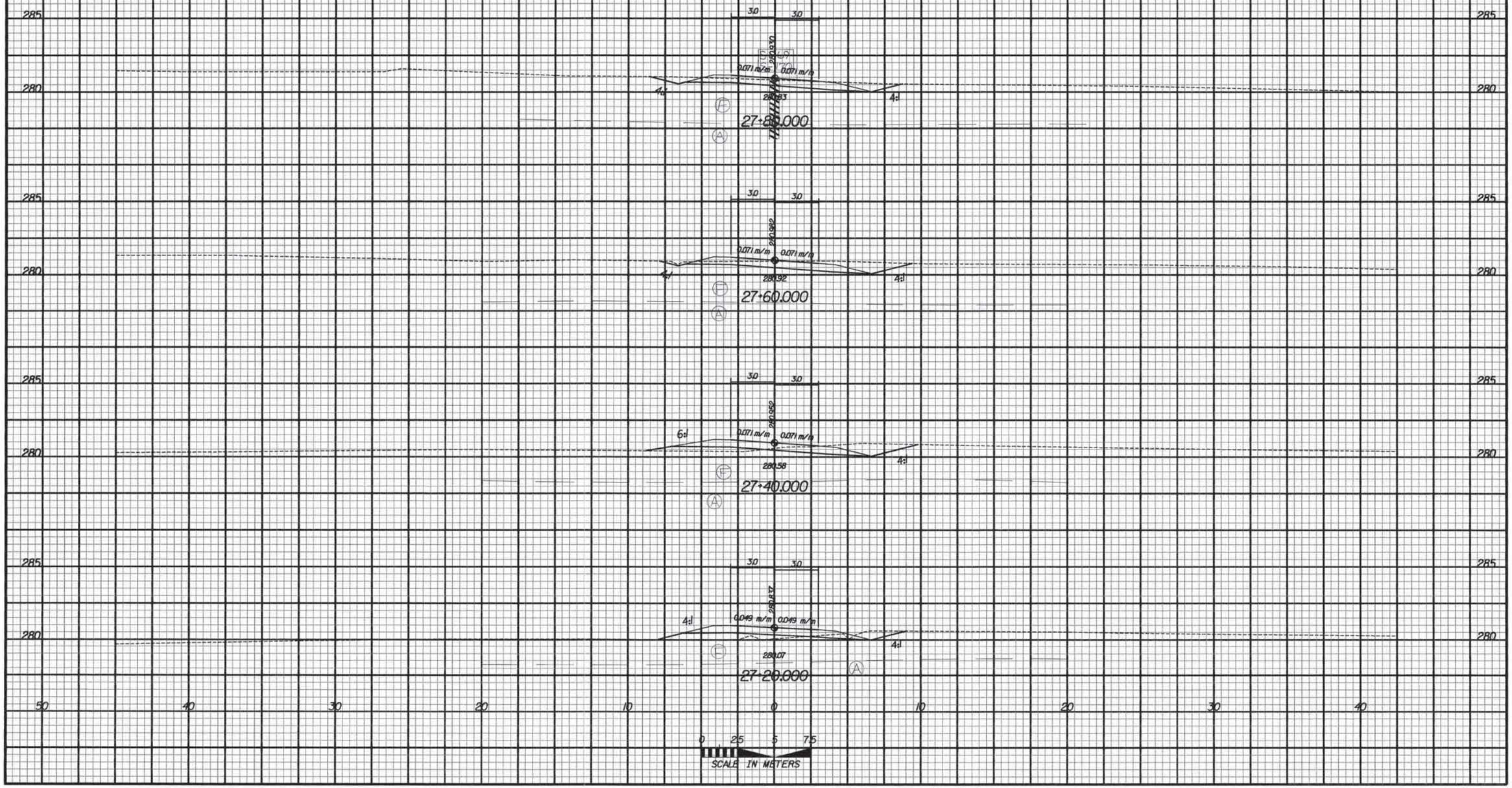
EXC. C.M. | EMB. C.M. | UNDERCUT

Ⓐ RESIDUAL MEDIUM STIFF ORANGE SILTY SANDY CLAY, MOIST

Ⓕ RESIDUAL MEDIUM STIFF TAN TO ORANGE SANDY CLAY, HIGHLY PLASTIC, MOIST

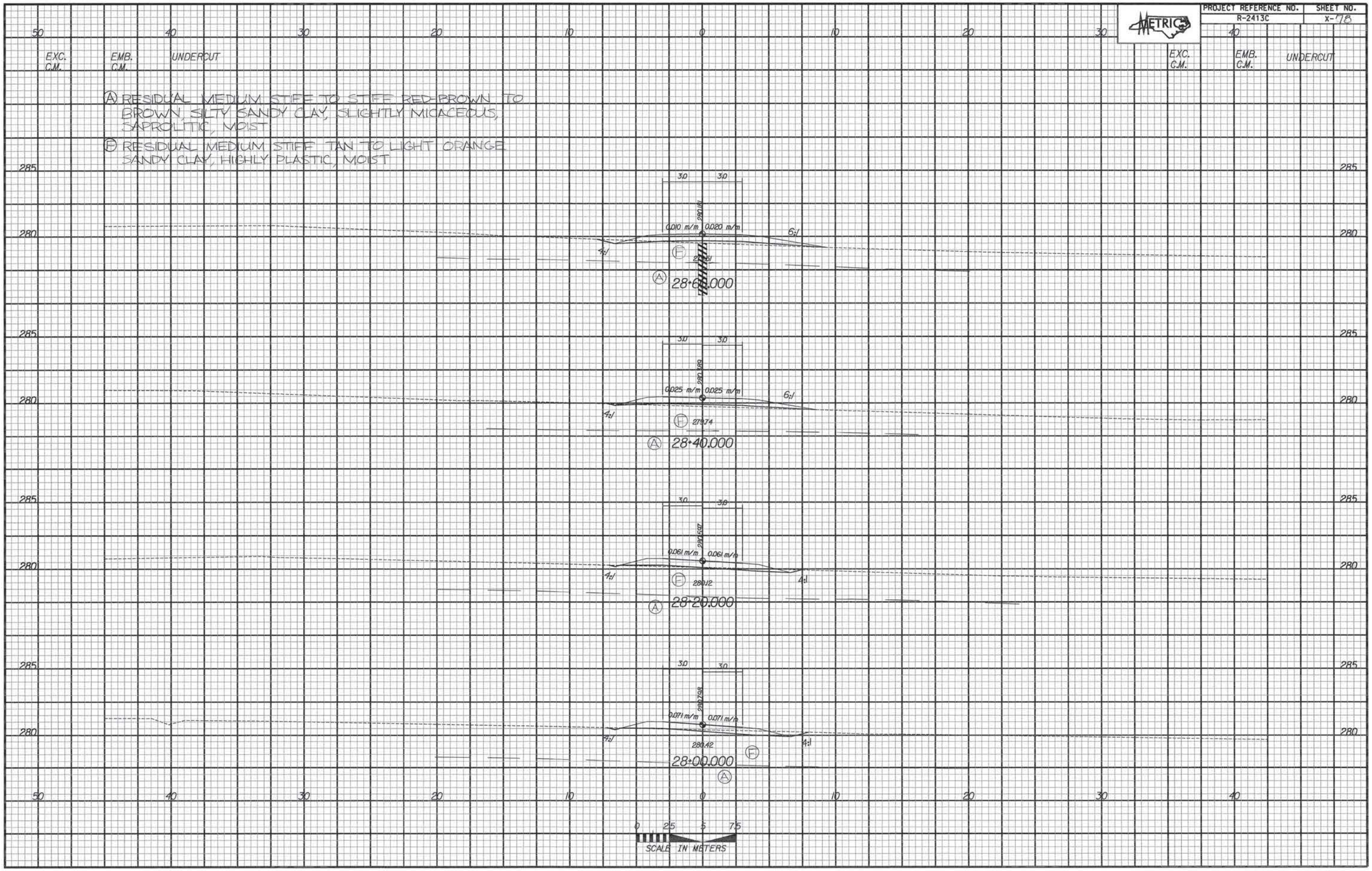
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE
S-169	0	27+80	0.00-1.00	A-5(8)	73	41	26.1	10.1	13.9	49.5	96	77	63	
S-170	0	27+80	3.00-4.00	A-7-5(17)	63	24	24.4	8.9	20.2	46.5	96	77	66	



-Y20- SPOTSWOOD RD.EXT.

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	X-78



-Y20- SPOTSWOOD RD.EXT.

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	X- 79

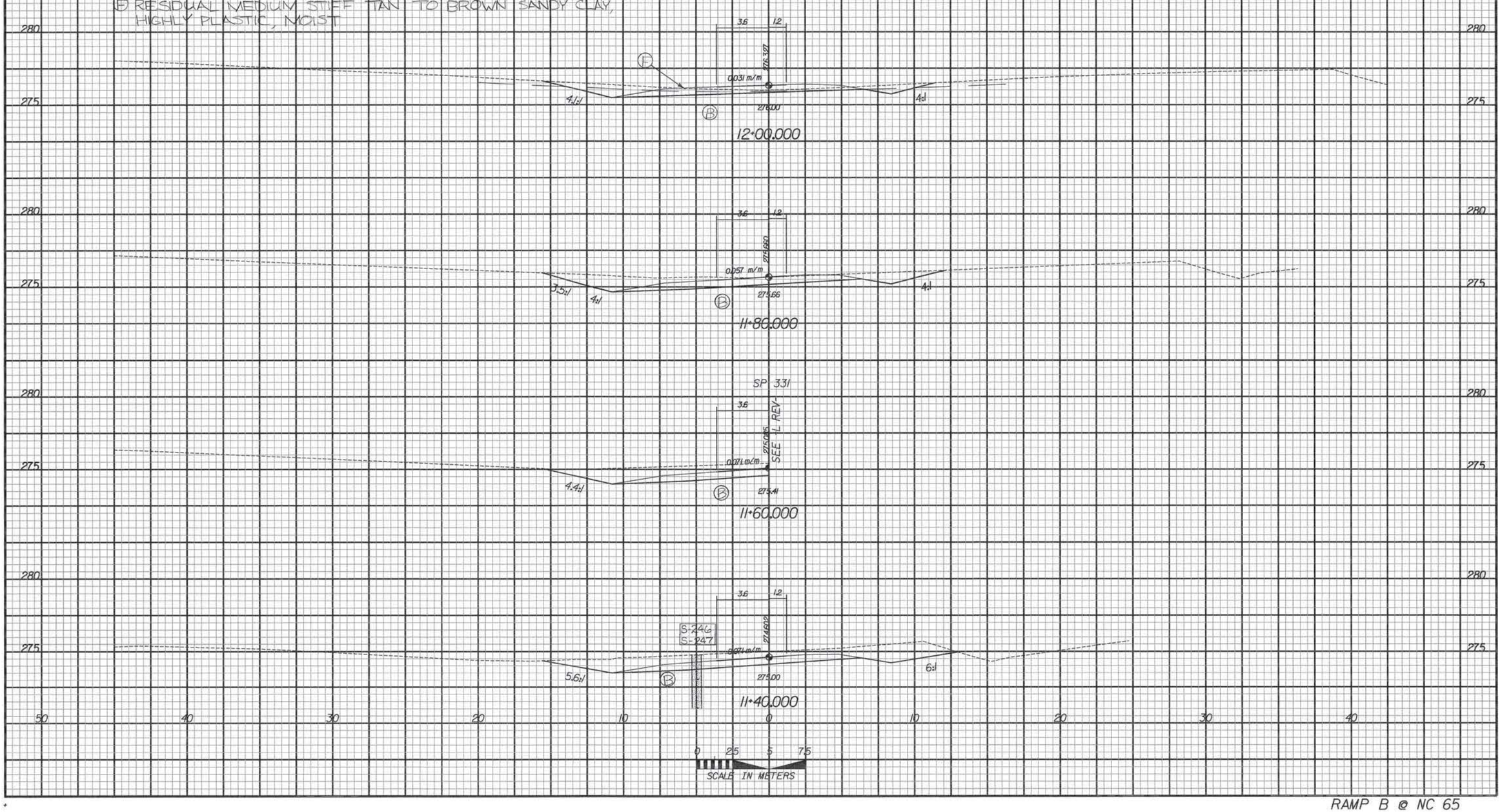
EXC. C.M. | EMB. C.M. | UNDERCUT

Ⓑ RESIDUAL MEDIUM STIFF TO STIFF BROWN TO ORANGE SANDY SILT, SLIGHTLY MICACEOUS, SAPROLITIC, MOIST

Ⓔ RESIDUAL MEDIUM STIFF TAN TO BROWN SANDY CLAY, HIGHLY PLASTIC, MOIST

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L. L.	P. I.	% BY WEIGHT C. SAND	SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE
S-246	5.8m LT.	11+40	0.82-0.50	A-4(3)	29	9	18.7	39.8	19.3	30.3	95	89	53	
S-247	5.8m LT.	11+40	1.78-2.50	A-4(0)	32	NP	11.3	51.5	19.0	18.2	98	85	44	



RAMP B @ NC 65

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	X- 80

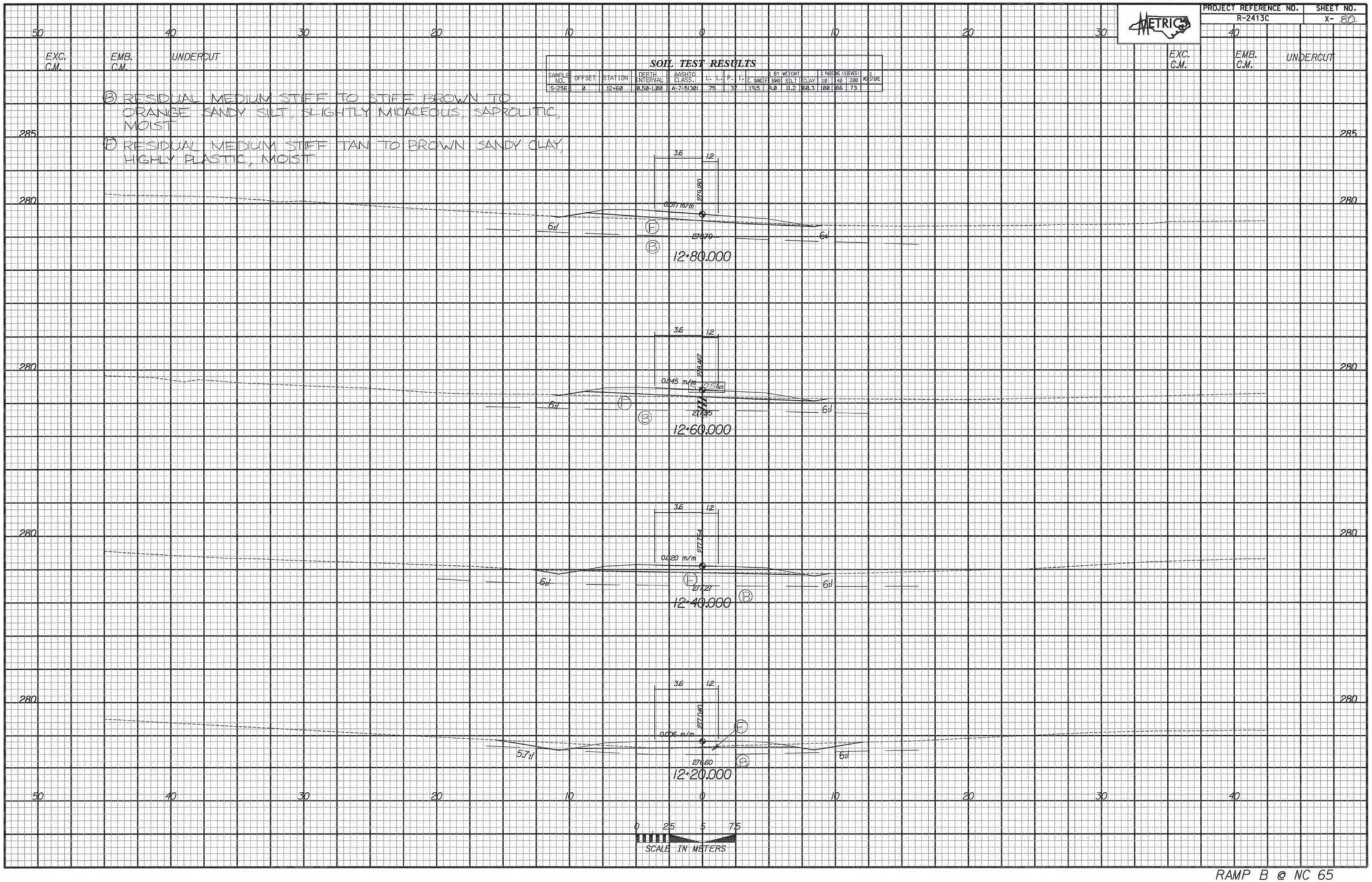
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L. L.	P. I.	% BY WEIGHT C. SAND	F SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE
S-256	0	12+60	0.50-1.00	A-7-5(30)	75	37	19.5	8.0	11.2	60.3	100	86	73	

EXC. C.M. | EMB. C.M. | UNDERCUT

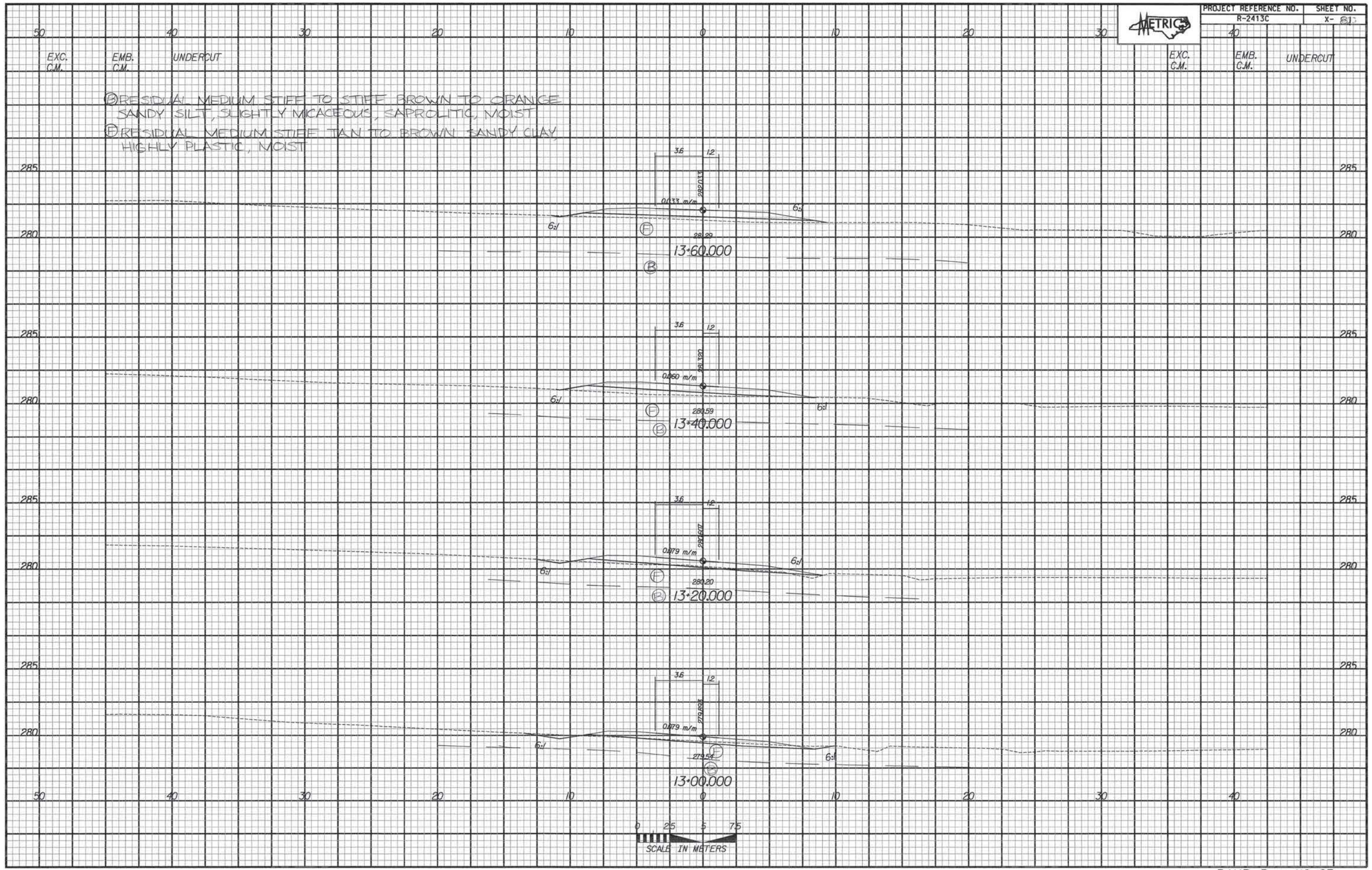
Ⓑ RESIDUAL MEDIUM STIFF TO STIFF BROWN TO ORANGE SANDY SILT, SLIGHTLY MICACEOUS, SAPROLITIC, MOIST

Ⓕ RESIDUAL MEDIUM STIFF TAN TO BROWN SANDY CLAY, HIGHLY PLASTIC, MOIST



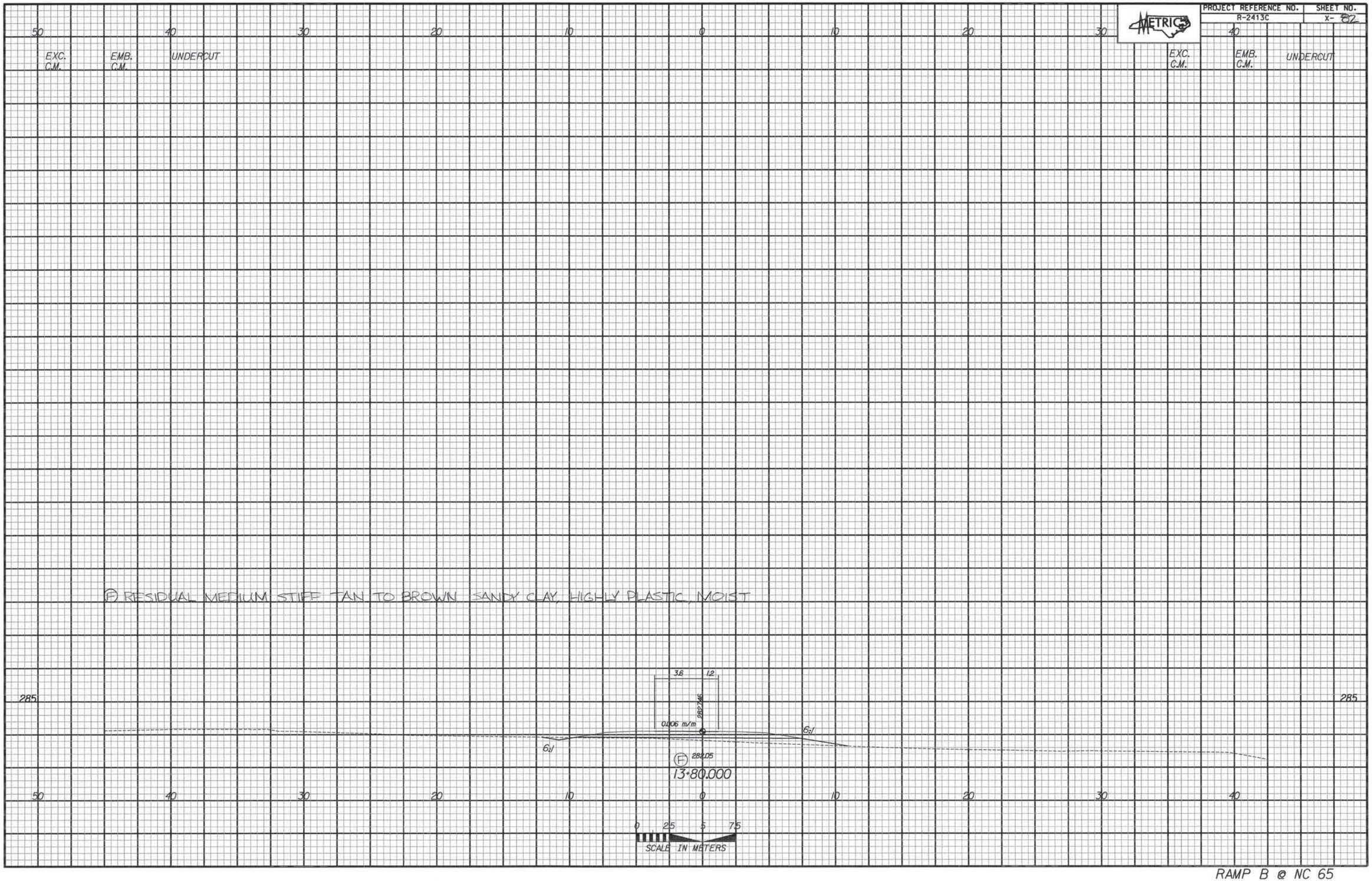
RAMP B @ NC 65

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	X- 8B



RAMP B @ NC 65

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	X- 82



RAMP B @ NC 65

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	34429.1.1 (R-2413C)	1	11

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

METRIC

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

ROADWAY SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34429.1.1 (R-2413C) F.A. PROJ. N/A

COUNTY GUILFORD

PROJECT DESCRIPTION US 220 FROM SOUTH OF HAW RIVER TO THE INTERSECTION OF US 220 AND EXISTING NC 68

INVENTORY ADDENDUM

CONTENTS

LINE	STATION	PLAN	PROFILE	XSECT
-LREV_SB-	86+18.6 TO 98+72.8	4-7	10	-
-NC68_SB-	10+00.0 TO 15+79.1	5	11	-

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

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CHECKED BY N. T. ROBERSON

SUBMITTED BY N. T. ROBERSON

DATE JULY 2014

NORTH CAROLINA LICENSED SEAL 2157 GEOLOGIST JAIME LOVE PEDRO

PROJECT: 34429.1.1

ID: R-2413C

DRAWN BY: J. L. PEDRO, T. T. WALKER

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.

PROJECT REFERENCE NO.	SHEET NO.
34429.1.1 (R-2413C)	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER 30 CM ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:

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

SOIL LEGEND AND AASHTO CLASSIFICATION

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

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

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (kN/m^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	<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	2.00	0.42	0.25	0.075	0.053

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

GRAIN SIZE MM: 305 | 75 | 2.0 | 0.25 | 0.05 | 0.005

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, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

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

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS
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 SEEP

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
- INFERRED SOIL BOUNDARY
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 DIP & DIP DIRECTION OF ROCK STRUCTURES
- SPT DPT DMT VST PMT TEST BORING
- AUGER BORING
- CORE BORING
- MW MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING W/ CORE
- SPT N-VALUE
- REF SPT REFUSAL

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED, FRACTURES
FRAGS. - FRAGMENTS
HI. - HIGHLY
MED. - MEDIUM
MICA. - MICACEOUS
MOD. - MODERATELY
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
w - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS

S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

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

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 152mm CONTINUOUS FLIGHT AUGER
- [X] 203mm HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [X] TUNG.-CARBIDE INSERTS
- [ ] CASING [ ] W/ ADVANCER
- [ ] TRICONE ____mm STEEL TEETH
- [ ] TRICONE ____mm TUNG.-CARB.
- [ ] CORE BIT
- [ ] _____

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

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

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

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 3 CM PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.
ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:

WEATHERED ROCK (WR)	NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER 30 CM IF TESTED.
CRYSTALLINE ROCK (CR)	FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
NON-CRYSTALLINE ROCK (NCR)	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD 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 ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, YIELDS SPT N VALUES > 100 BLOWS PER 30 CM*
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 BLOWS PER 30 CM*
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 6 MM DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
MEDIUM HARD	CAN BE GROOVED OR GOUGED 13 MM DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 25 MM MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S 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 25 MM OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 3 M
WIDE	3 TO 10 M
MODERATELY CLOSE	30 TO 100 CM
CLOSE	5 TO 30 CM
VERY CLOSE	LESS THAN 5 CM

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	> 1 M
THICKLY BEDDED	0.5 - 1 M
THINLY BEDDED	0.05 - 0.5 M
VERY THINLY BEDDED	10 - 50 MM
THICKLY LAMINATED	2.5 - 10 MM
THINLY LAMINATED	< 2.5 MM

INDURATION

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

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

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 10 CM DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.

SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.

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

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N) OF A 63.5 KG HAMMER FALLING 0.76 M REQUIRED TO PRODUCE A PENETRATION OF 30 CM INTO SOIL WITH A 5 CM OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 3 CM PER 60 BLOWS.

STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.

STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 10 CM DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

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

BENCH MARK:

ELEVATION: M

NOTES:

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAT MCCRORY
GOVERNOR

ANTHONY J. TATA
SECRETARY

June 26, 2014

STATE PROJECT: 34429.1.1 (R-2413C)
FEDERAL PROJECT: N/A
COUNTY: Rockingham
DESCRIPTION: US 220 from South of Haw River to the intersection of US 220 and existing NC 68

SUBJECT: Geotechnical Report – Inventory Addendum

Project Description

This project has been revised in the vicinity of the intersection of US 220 and existing NC 68. The revision consists of replacing the at-grade intersection and signal at US 220 and NC 68 with a grade-separated, free flow design. Also, full access movements at the intersection of US 220 and SR 2805 (Price Farm Rd.)/SR 2338 (Newman Rd.) were limited to right in and right out using directional crossovers.

A geotechnical investigation was conducted during April and May of 2014, using a CME-550 drill machine with an automatic hammer. Standard Penetration Tests were performed at selected locations. Representative soil samples were collected for visual classification in the field and selected samples were submitted for laboratory analysis by the Materials and Tests Unit.

The following alignments were investigated. Subsurface plans, profiles and/or cross sections of these alignments are included in this report.

Line	Stations
-LREV_SB-	86+18.6 to 98+72.8
-NC68_SB-	10+00.0 to 15+79.1

Physiography and Geology

The project is located in the northern Piedmont Physiographic Province. The terrain is irregular with gently rolling hills interspersed with steep-sided drainages. There is a mixture of single family dwellings and scattered woods along the project corridor. Geologically, the project is located within the Milton Belt. Soils within the Milton Belt are derived from the underlying biotite gneiss and schist with some granitic intrusions.

Soils Properties

Soils encountered during this investigation are residual. These soils primarily consist of tan, orange, red, brown, and white, medium stiff to very stiff, moist to wet, silty clay (A-7-6), sandy and clayey silt (A-4, and A-5) with trace to abundant mica. Smaller amounts of tan, brown, orange, white, and red, loose to very

dense, moist to wet, silty sand (A-2-4) are also present. The surficial, residual, silty clays exhibit moderate to high plastic indices from 26 to 31. Residual soils grade into weathered rock with depth and retain the relict characteristics of the biotite gneiss and schist.

Rock Properties

Weathered rock and crystalline rock occur in a few areas of the project. Weathered rock in the Milton Belt is derived from the underlying biotite gneiss and schist and ranges in depth from 5.00 to 20.00 meters from the ground surface.

Ground Water

Ground water measurements were taken in April and May 2014 during average rainfall conditions. Ground water is estimated to be about 10.00 meters from the surface except in low lying areas, where it is closer to the surface.

Respectfully submitted,

NORTH CAROLINA LICENSED SEAL 2157 GEOLOGIST JAIME LOVE PEDRO

Jaime Love Pedro, L.G.
Project Geological Engineer

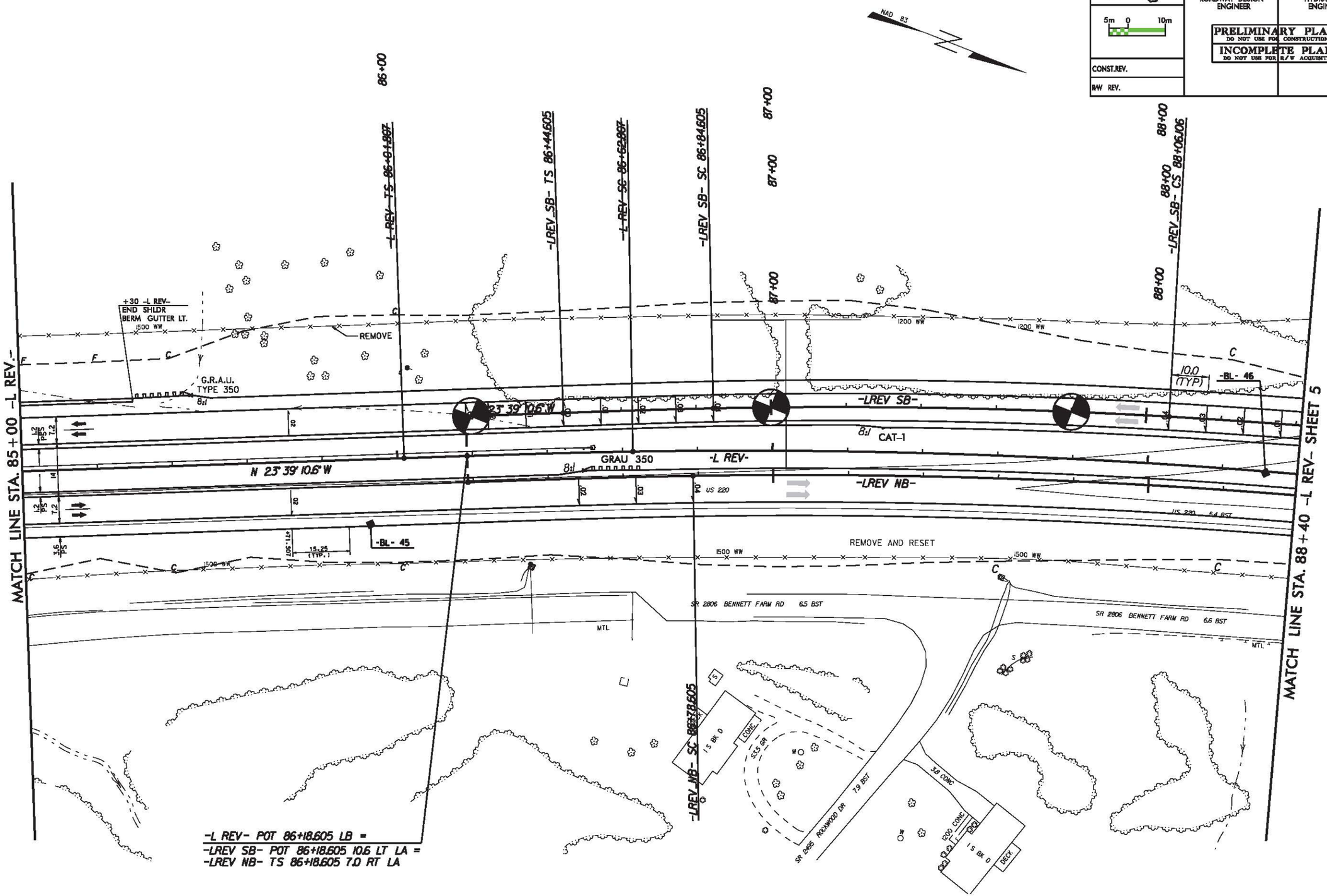
JLP/JRB/NTR/jlp

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	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

CONST.REV.

R/W REV.



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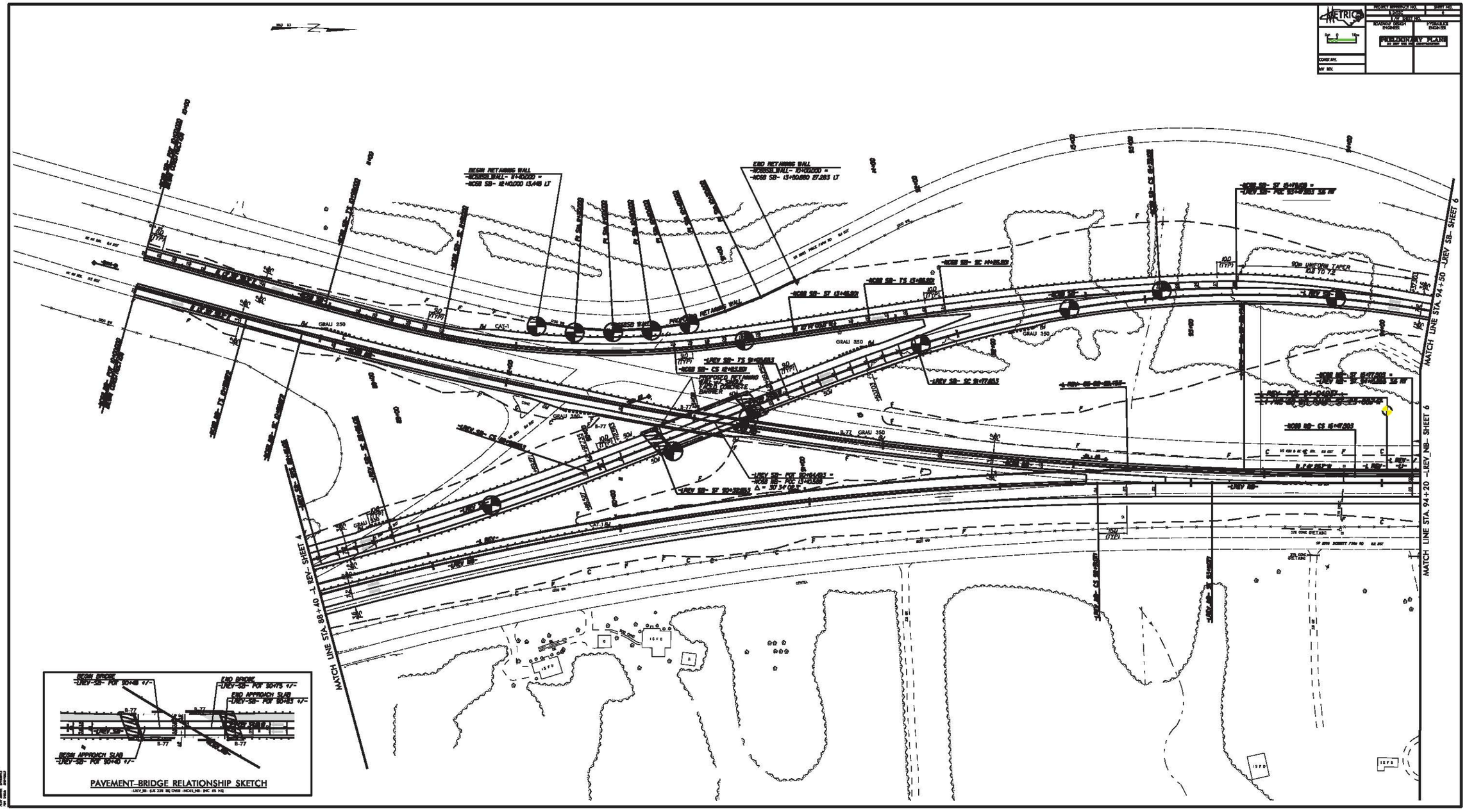
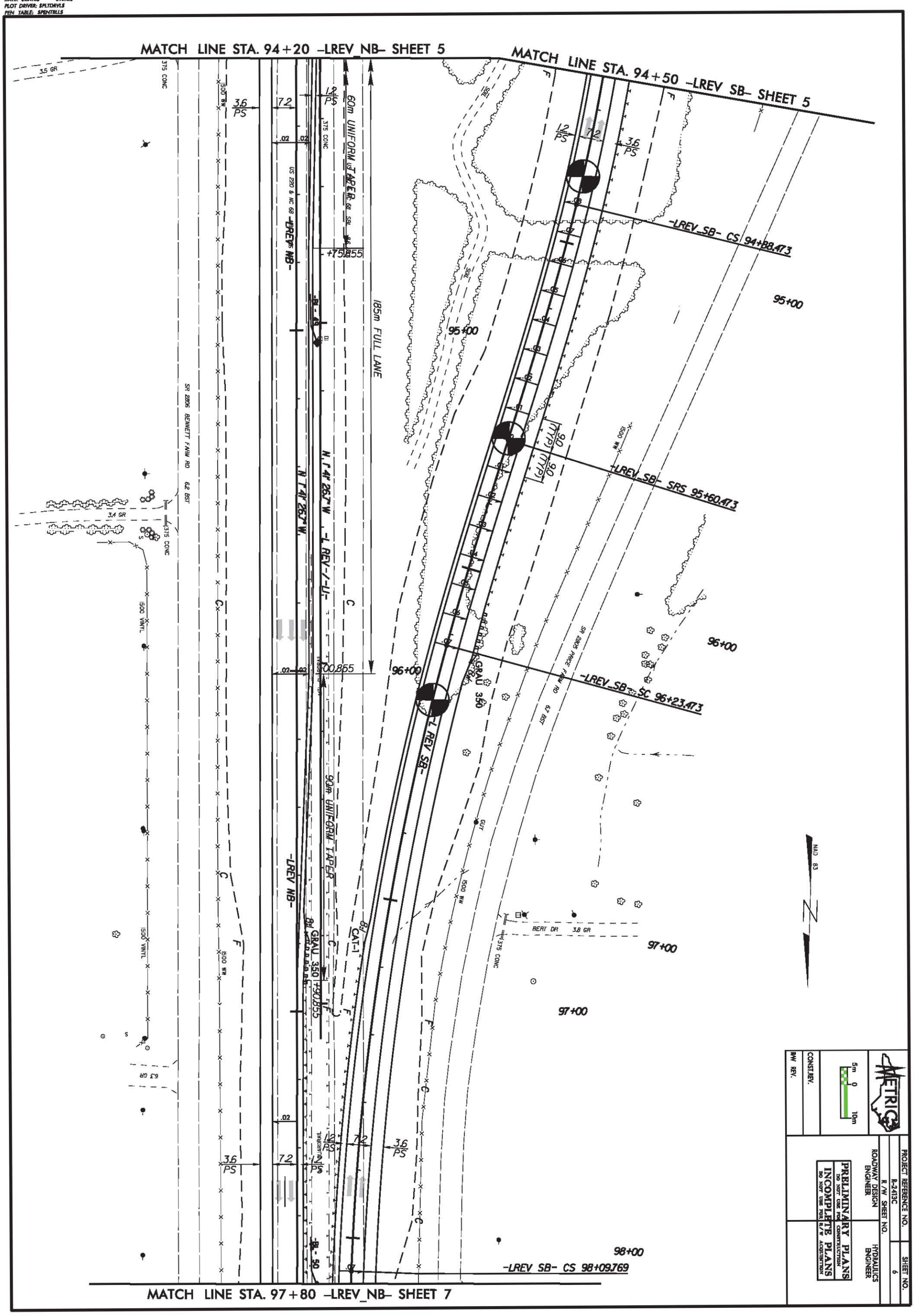
DATE: 8/10/2015 STAMP
PLOT DRIVER: BRITDRV12
PEN TABLE: SPENTBLS


METRIC
PRELIMINARY PLANS
BEGIN RETAINING WALL
END RETAINING WALL
90m UNIFORM TAPER
MATCH LINE STA. 94+50 -LREV SB- SHEET 6
MATCH LINE STA. 94+20 -LREV_NB- SHEET 6
MATCH LINE STA. 88+40 -LREV- SHEET 4
GRAU 350
PAVEMENT-BRIDGE RELATIONSHIP SKETCH

FILE: $FILE1$
DATE: $DATE$ $TIME$
PLOT DRIVER: $PLTDRV1$
PEN TABLE: $PENTBL1$



PROJECT REFERENCE NO.	SHEET NO.
R-2413C	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

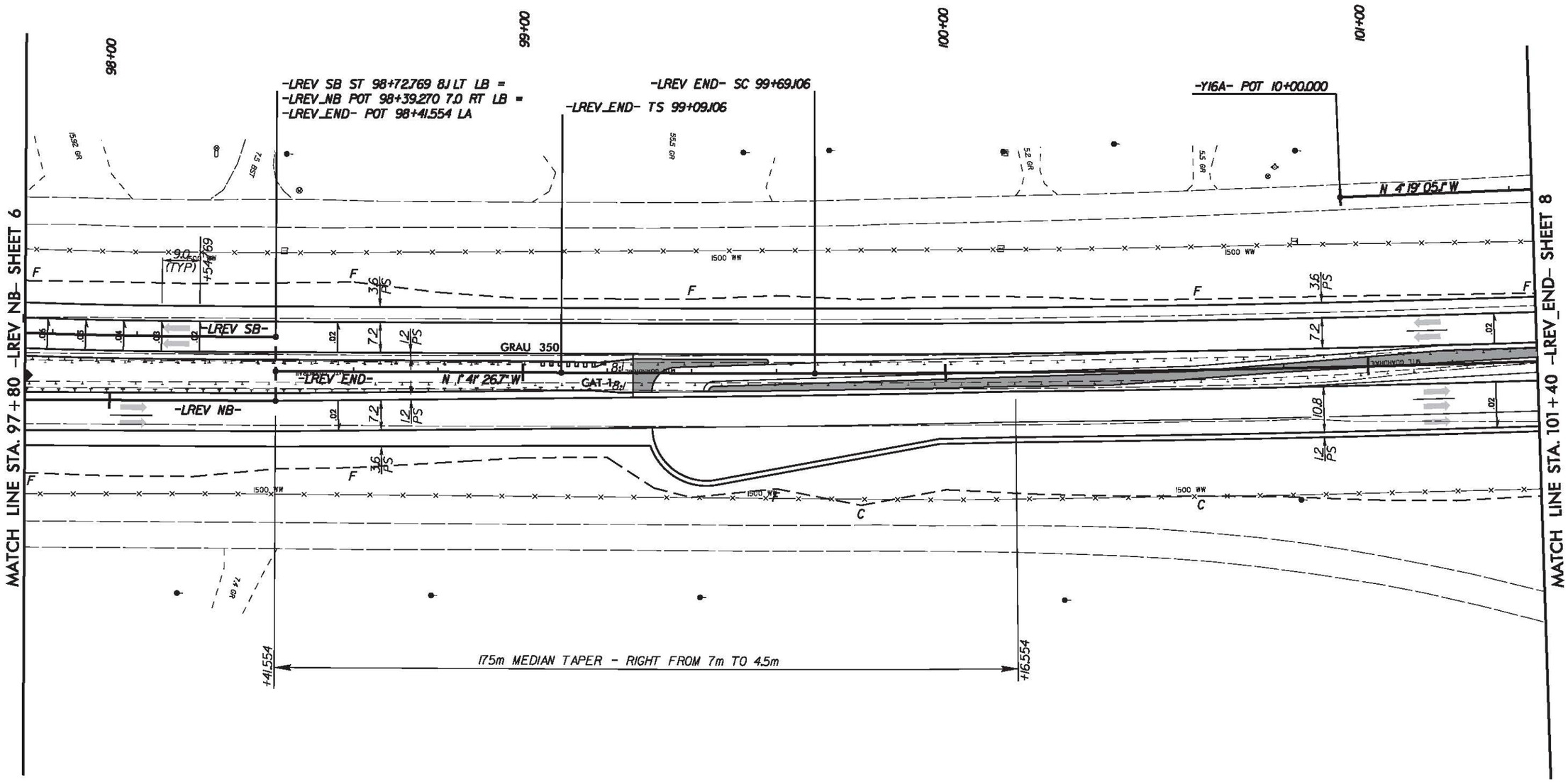
5m 0 10m

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONST.REV.

RAW REV.

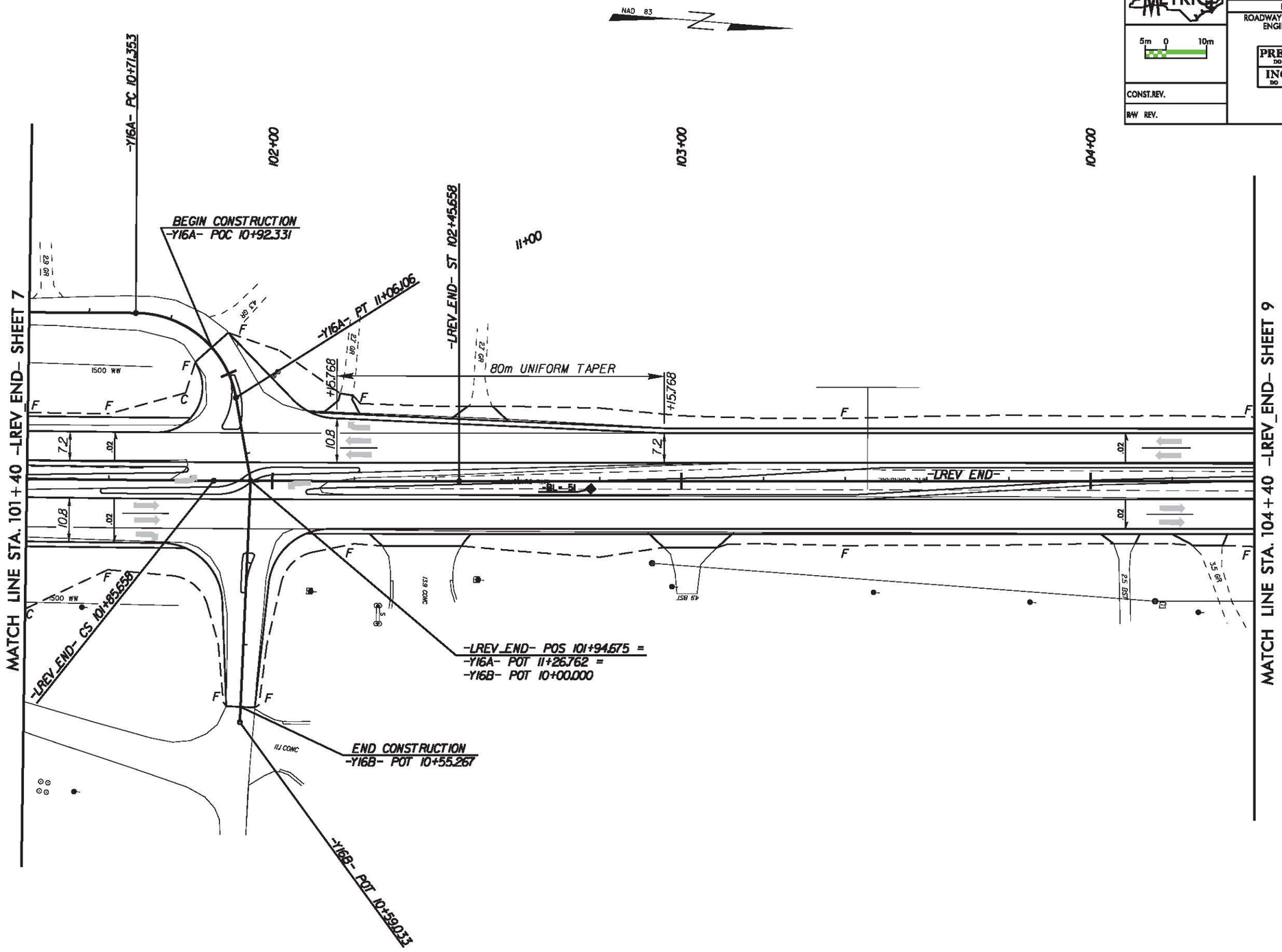


PROJECT REFERENCE NO.	SHEET NO.
R-2413C	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

CONST.REV.

R/W REV.



FILE: STYLES
DATE: STYLES STAMS
PLOT DRIVER: SPLTDRVS
PEN TABLE: SPENTBLS

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	9
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

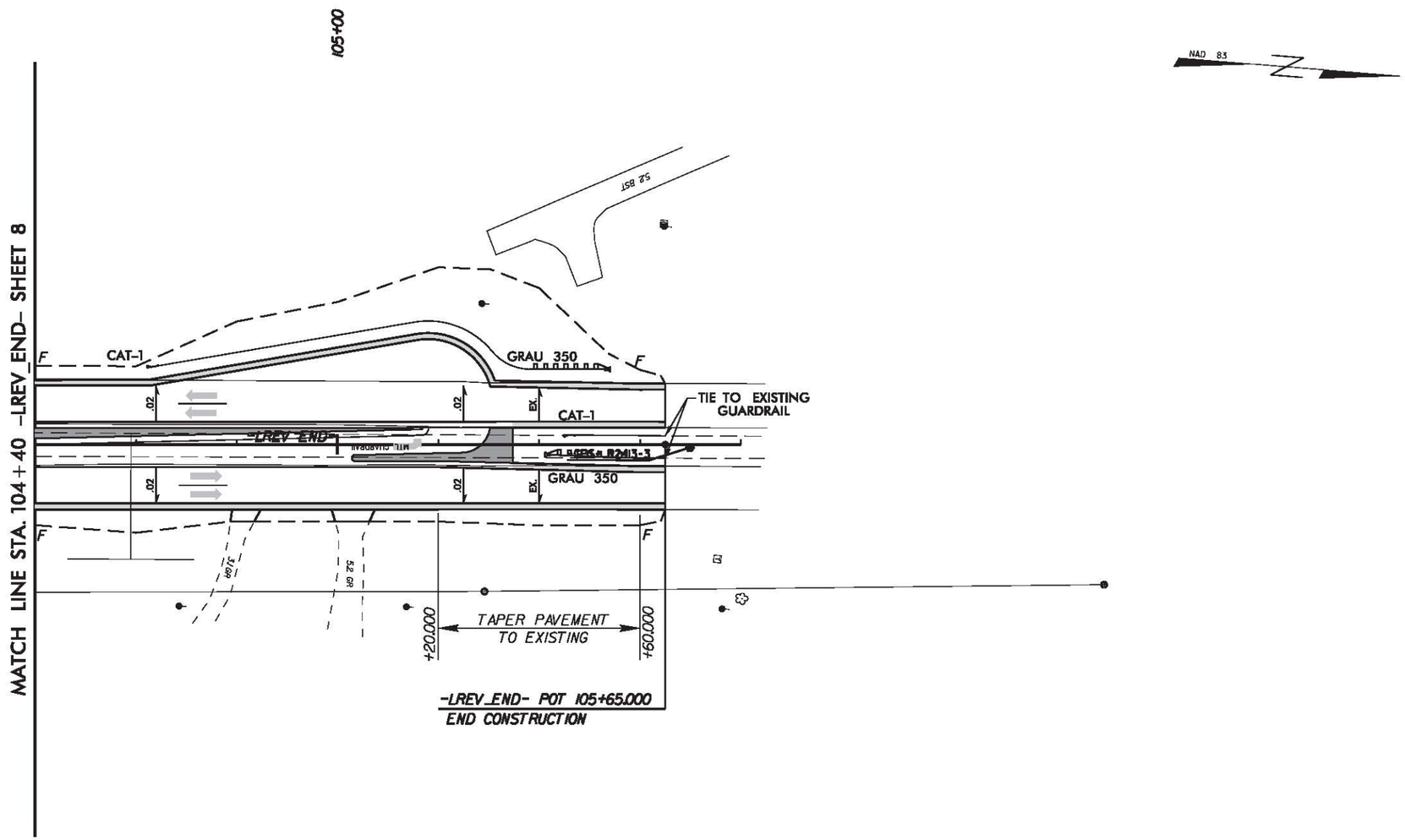
5m 0 10m

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

CONST.REV.

R/W REV.



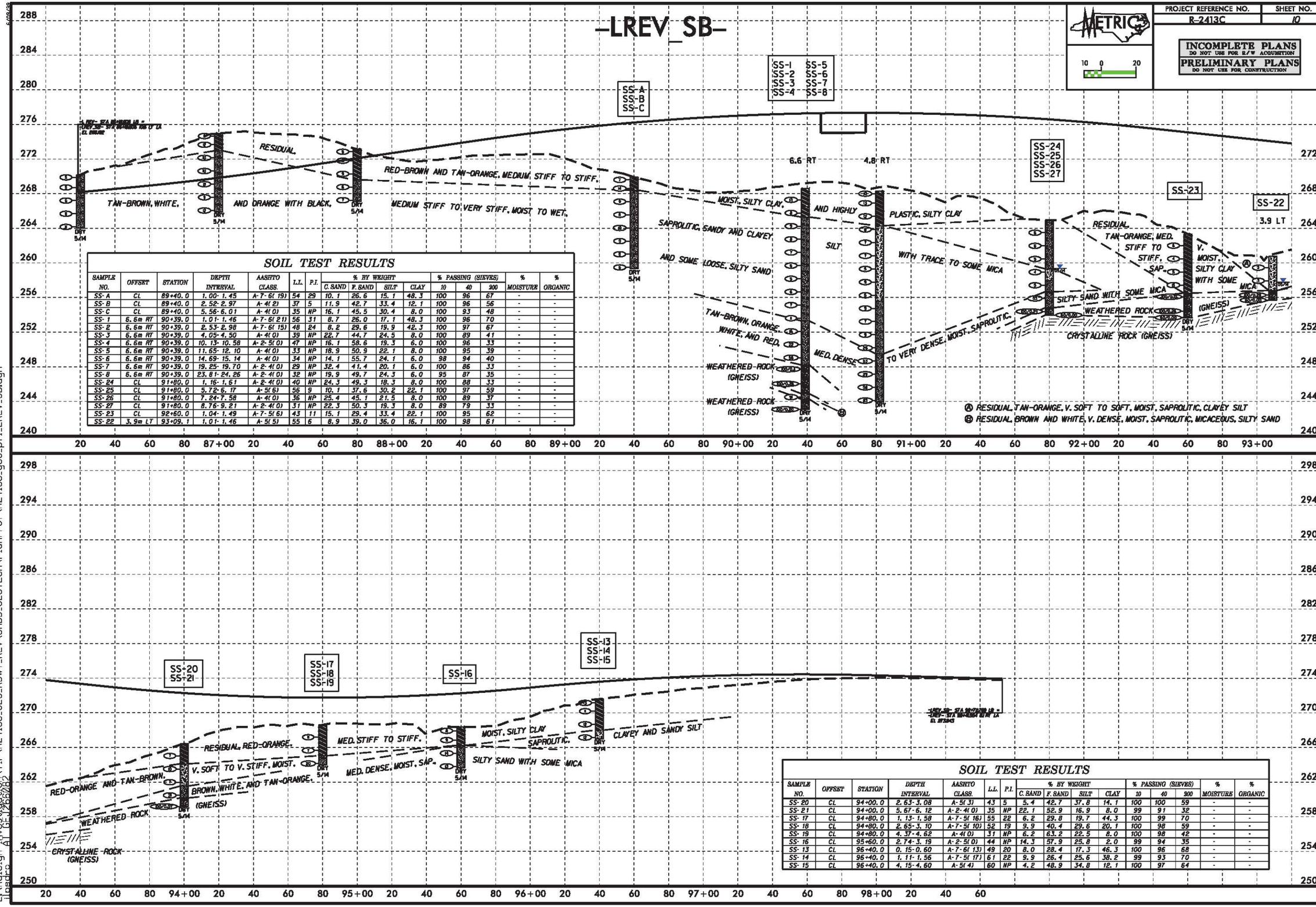
FILE: SPULES
DATE: 8/1/2018 STIMES
PLOT DRIVER: SPLTDRV15
PEN TABLE: SPENTBL15

PROJECT REFERENCE NO.	SHEET NO.
R-2413C	10

METRIC 10 0 20

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

-LREV_SB-



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-A	CL	89+40.0	1.00-1.45	A-7-6(19)	54	29	10.1	26.6	15.1	48.3	100	96	67	-	-
SS-B	CL	89+40.0	2.52-2.97	A-4(2)	37	5	11.9	42.7	33.4	12.1	100	96	56	-	-
SS-C	CL	89+40.0	5.56-6.01	A-4(0)	35	NP	16.1	45.5	30.4	8.0	100	93	48	-	-
SS-1	6.6m RT	90+39.0	1.01-1.46	A-7-6(21)	56	31	8.7	26.0	17.1	48.3	100	96	70	-	-
SS-2	6.6m RT	90+39.0	2.53-2.98	A-7-6(15)	48	24	8.2	29.6	19.9	42.3	100	97	67	-	-
SS-3	6.6m RT	90+39.0	4.05-4.50	A-4(0)	39	NP	22.7	44.7	24.5	8.0	100	89	41	-	-
SS-4	6.6m RT	90+39.0	10.13-10.58	A-2-5(0)	47	NP	16.1	58.6	19.3	6.0	100	96	33	-	-
SS-5	6.6m RT	90+39.0	11.65-12.10	A-4(0)	33	NP	18.9	50.9	22.1	8.0	100	95	39	-	-
SS-6	6.6m RT	90+39.0	14.69-15.14	A-4(0)	34	NP	14.1	55.7	24.1	6.0	98	94	40	-	-
SS-7	6.6m RT	90+39.0	19.25-19.70	A-2-4(0)	29	NP	32.4	41.4	20.1	6.0	100	86	33	-	-
SS-8	6.6m RT	90+39.0	23.81-24.26	A-2-4(0)	32	NP	19.9	49.7	24.3	6.0	95	87	35	-	-
SS-24	CL	91+80.0	1.16-1.61	A-2-4(0)	40	NP	24.3	49.3	18.3	8.0	100	88	33	-	-
SS-25	CL	91+80.0	5.72-6.17	A-5(6)	56	9	10.1	37.6	30.2	22.1	100	97	59	-	-
SS-26	CL	91+80.0	7.24-7.58	A-4(0)	36	NP	25.4	45.1	21.5	8.0	100	89	37	-	-
SS-27	CL	91+80.0	8.76-9.21	A-2-4(0)	31	NP	22.3	50.3	19.3	8.0	89	79	33	-	-
SS-23	CL	92+60.0	1.04-1.49	A-7-5(6)	43	11	15.1	29.4	33.4	22.1	100	95	62	-	-
SS-22	3.9m LT	93+09.1	1.01-1.46	A-5(5)	55	6	8.9	39.0	36.0	16.1	100	98	61	-	-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-20	CL	94+00.0	2.63-3.08	A-5(3)	43	5	5.4	42.7	37.8	14.1	100	100	59	-	-
SS-21	CL	94+00.0	5.67-6.12	A-2-4(0)	35	NP	22.1	52.9	16.9	8.0	99	91	32	-	-
SS-17	CL	94+80.0	1.13-1.58	A-7-5(16)	55	22	6.2	29.8	19.7	44.3	100	99	70	-	-
SS-18	CL	94+80.0	2.65-3.10	A-7-5(10)	52	19	9.9	40.4	29.6	20.1	100	98	59	-	-
SS-19	CL	94+80.0	4.37-4.62	A-4(0)	31	NP	6.2	63.2	22.5	8.0	100	98	42	-	-
SS-16	CL	95+60.0	2.74-3.19	A-2-5(0)	44	NP	14.3	57.9	25.8	2.0	99	94	35	-	-
SS-13	CL	96+40.0	0.15-0.60	A-7-6(13)	49	20	8.0	28.4	17.3	46.3	100	96	68	-	-
SS-14	CL	96+40.0	1.11-1.56	A-7-5(17)	61	22	9.9	26.4	25.6	38.2	99	93	70	-	-
SS-15	CL	96+40.0	4.15-4.60	A-5(4)	60	NP	4.2	48.9	34.8	12.1	100	97	64	-	-

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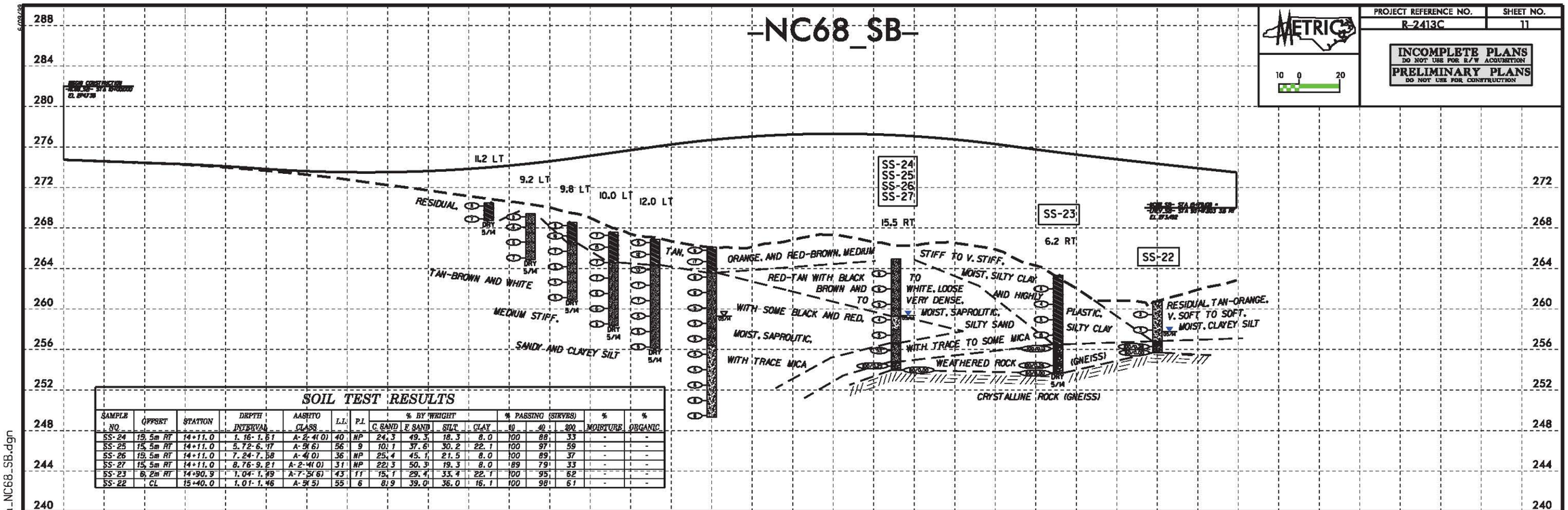
PROJECT REFERENCE NO.	SHEET NO.
R-2413C	11

METRIC

10 0 20

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

-NC68_SB-



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	L.L.	P.I.	% BY WEIGHT C. SAND	F SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-24	15.5m RT	14+11.0	1.16-1.61	A-2-4(0)	40	NP	24.3	49.3	18.3	8.0	100	88	33	-	-
SS-25	15.5m RT	14+11.0	5.72-6.17	A-5(6)	56	9	10.1	37.6	30.2	22.1	100	97	59	-	-
SS-26	15.5m RT	14+11.0	7.24-7.58	A-4(0)	36	NP	25.4	45.1	21.5	8.0	100	89	37	-	-
SS-27	15.5m RT	14+11.0	8.76-9.21	A-2-4(0)	31	NP	22.3	50.3	19.3	8.0	89	79	33	-	-
SS-23	6.2m RT	14+90.9	1.04-1.49	A-7-5(6)	43	11	15.1	29.4	33.4	22.1	100	95	62	-	-
SS-22	CL	15+40.0	1.01-1.46	A-5(5)	55	6	8.9	39.0	36.0	16.1	100	98	61	-	-

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