ID. R-2707B

PROJECT: C203201

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2707B	1	44

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34497.1.2	NHF-0074(14)	P.E.
34497.2.8	NHF-0074(107)	ROW/UTIL
34497.3.5	NHF-0074(107)	CON.

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL UNIT

SUBSURFACE INVESTIGATION

STATE PROJECT 8.1801001 I.D. NO. R-2707B

F.A. PROJECT NHF - 74(14)

COUNTY CLEVELAND

DESCRIPTION US 74 - SHELBY BYPASS FROM WEST OF ARTEE RD. (SR 1314) TO WEST OF NC 226.

CONTENTS:

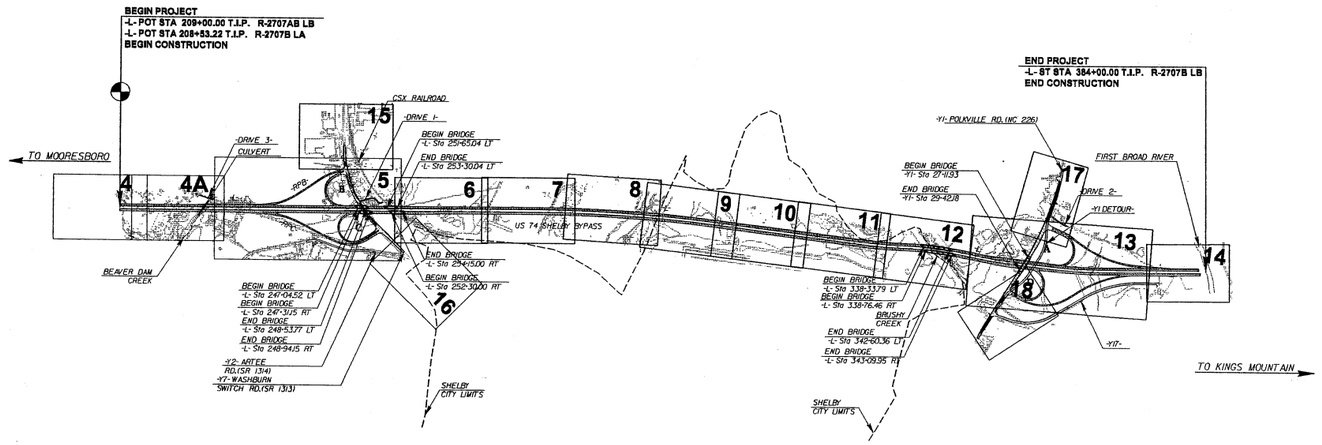
CAUTION NOTICE

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

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

INVENTORY



INVESTIGATED BY JP ROGERS PERSONNEL JP ROGERS

CHECKED BY CB LITTLE RW TODD

SUBMITTED BY CB LITTLE RS HINSON

DATE 03/04 ML SMITH

JA VANDERBURG

DRAWN BY: JP ROGERS / TA MECHUM

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

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

NORTH CAROLINA LICENSED SEAL 1104 GEOLOGIST CLINTON B. LITTLE

SEAL 3-15-04

SIGNATURE

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
R-2707B	8.1801001	2	44

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

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

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

SOIL LEGEND AND AASHTO CLASSIFICATION

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

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

CONSISTENCY OR DENSENESS

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

TEXTURE OR GRAIN SIZE

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

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

GRAIN SIZE	MM	305	75	2.0	0.25	0.05	0.005
	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)	- 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 (PI)	DRY STRENGTH
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	26 OR MORE	HIGH

COLOR

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

GRADATION

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

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

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

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

GROUND WATER

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

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS
- INFERRED SOIL BOUNDARIES
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 — DIP/DIP DIRECTION OF ROCK STRUCTURES
- ● - SOUNDING ROD
- SPT, CPT, DPT, DMT, PMT, VST — TEST BORING
- AUGER BORING
- CORE BORING
- MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- SPT N-VALUE
- REF — SPT REFUSAL

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

ABBREVIATIONS

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

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- ☐ MOBILE B-___
- ☐ BK-51
- ☐ CME-45
- ☒ CME-550
- ☐ PORTABLE HOIST
- ☐ OTHER _____
- ☐ OTHER _____

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

HAMMER TYPE:
- ☒ AUTOMATIC ☐ MANUAL

CORE SIZE:
- ☐ -B_____
- ☐ -N_____
- ☐ -H_____

HAND TOOLS:
- ☐ POST HOLE DIGGER
- ☐ HAND AUGER
- ☐ SOUNDING ROD
- ☒ VANE SHEAR TEST
- ☐ OTHER _____

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WHEN TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.
ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLOWS:

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

WEATHERING

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

ROCK HARDNESS

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

FRACTURE SPACING

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

BEDDING

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

INDURATION

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

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

TERMS AND DEFINITIONS

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

AQUIFER - A WATER BEARING FORMATION OR STRATA.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

ROCK QUALITY DESIGNATION (R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

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

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

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

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR B.P.F.) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS LESS THAN 0.1 FOOT PENETRATION WITH 60 BLOWS.

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

STRATA ROCK QUALITY DESIGNATION (S.R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 10 CENTIMETERS DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

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

BENCH MARK:

ELEVATION:

NOTES:

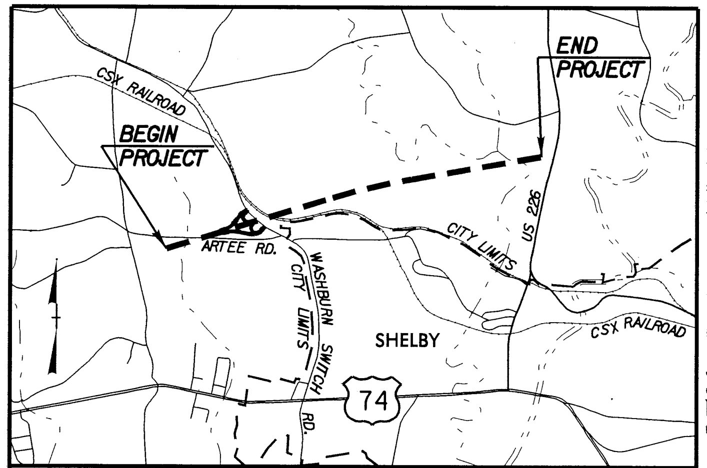
REVISED 09/15/00

R-2707B

PROJECT: 8.1801001

09/08/99

See Sheet 1-A For Index of Sheets



VICINITY MAP

25% SUBMITTAL

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

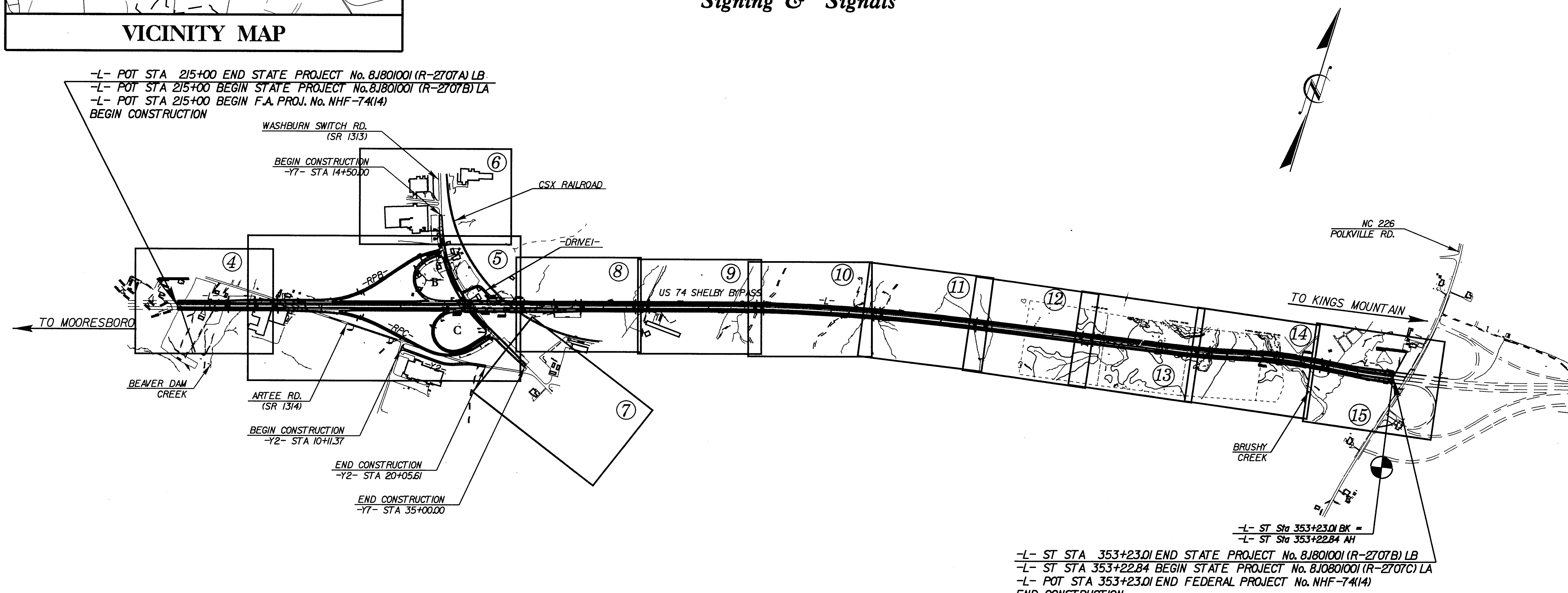
CLEVELAND COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2707B	2A	44

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
8.1801001	NHF-74(14)	P.E.

***LOCATION:* US 74 – Shelby Bypass from West of Artee Rd. (SR 1314) to West of NC 226**

***TYPE OF WORK:* Grading, Drainage, Paving, Structures, Guardrail, Signing & Signals**



INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NCDOT Contact: S. D. Blevins, PE – Project Engineer – Design Services

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

GRAPHIC SCALES

50 25 0 50 100 — PLANS

50 25 0 50 100 — PROFILE (HORIZONTAL)

10 5 0 10 20

DESIGN DATA

ADT 2002 = 12,600
ADT 2022 = 19,400
DHV = 10%
D = 60%
T = 11%
V = 70 MPH

PROJECT LENGTH

LENGTH OF ROADWAY F.A. PROJECT NHF-74(14) =	2.49 mi.
LENGTH OF STRUCTURES F.A. PROJECT NHF-74(14) =	0.13 mi.
TOTAL LENGTH OF STATE PROJECT 8.1801001 =	2.62 mi.

Prepared In the Office of:

HNTB

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: AUGUST 15, 2003 (PROD)

LETTING DATE: OCTOBER 18, 2005 (TIP)

ENRICO A. ROQUE, PE — PROJECT ENGINEER

BETH E. EMERSON, PE — PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER P.E.

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

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

LYNDO TIPPETT
SECRETARY

March 12, 2004

STATE PROJECT: 8.1801001 (R-2707B)
FEDERAL PROJECT: NHF-74-(14)
COUNTY: Cleveland
DESCRIPTION: US 74 – Shelby Bypass from West of Artee Rd. (SR 1314) to West of NC 226.

SUBJECT: Geotechnical Report – Inventory

This project is located in southern Cleveland County near the city of Shelby. Total length of lines investigated for this project is 4.47 miles. –L- line typical sections call for a four-lane median divided facility with paved shoulders and a major interchange at Washburn Switch Road (-Y7-). 2 dual bridges (-Y7- and CSX railroad) will also be included in the scope of this project.

The Geotechnical field investigation was conducted primarily during the months of July – September 2003. Field data was collected using an all-terrain CME 550-power auger machine equipped with an automatic hammer for Standard Penetration tests.

Geologically, the project corridor is underlain predominantly by biotite gneiss and mica schist rocks of the Inner Piedmont Geological Belt. Mica can be readily observed in the soil samples obtained from the residual silts and sands. Topography consists of gently rolling hills with relief of about 135.0' between the upland and lowland portions of the project. Brushy Creek and its tributaries are the primary drainage outlets for this section of the Bypass.

The following baselines were investigated either by actual soil testing or visual reconnaissance:

Line	Stations
-L-	215+00 to 353+23
-Loop B-	10+00 to 20+19
-Ramp B-	10+00 to 26+83
-Loop C-	10+00 to 23+47
-Ramp C-	10+00 to 32+20
-DRIVE 1-	10+21 to 14+66
-Y2-	10+11 to 20+05
-Y7-	14+50 to 35+00

Items of Special Geotechnical Interest

1. Groundwater

The following project intervals contain groundwater within six feet of proposed grade:

Line	Stations
-L-	215+00 to 218+00
-L-	271+50 to 277+00
-L-	284+00 to 289+50
-L-	308+00 to 311+00

2. Hard Rock

Hard rock was encountered above or within ten feet of proposed grade at the following locations:

Line	Station
-L-	300+60 to 301+40
"	303+50 to 306+25

The cross-sections for these areas can be found at the back of the attached inventory plans and profiles beginning on page 28.

3. Pond

The pond located at Station 320+00 –L- has been filled in with approximately six to 14.0' of silt. This siltation most likely occurred during the construction of the embankment fill for the adjacent Wal-Mart Distribution Center. This fill covers approximately two-thirds of the pond's original area. It is also possible that this pond was drained and then filled to accommodate the Wal-Mart embankment fill. Plan view representation of the fill slope and pond are on pages 12-13 of the attached inventory plans. The cross-sections for these areas can be found on pages 38-43. The slope lines shown for the embankment fill on the cross-sections is an approximation.

4. Alluvial Deposits

Alluvial soils were encountered throughout the project corridor around ponds, ephemeral streams, and creeks. The largest concentrations of alluvium were encountered at the following locations:

(a) 293+05 to 294+35 –L-. Alluvial soils found in this interval consist of loose to dense silty sand (A-2-4, A-1-a) in thickness' of up to 7.0 feet. Some gravel and boulders were encountered in the alluvium in the boring performed at 294+20-L-. Four feet of artificial fill (medium stiff silty clay) was encountered in this boring as well. Groundwater levels were within six feet of the ground surface in this area. Proposed Fill heights in this segment range from 37.0' to 40.0'.

(b) 320+10 to 339+00 –L-. Alluvial soils encountered in this segment consist of very soft to medium stiff, sandy and silty clay (A-7, A-6); very soft, sandy silt (A-4); and very loose to medium dense, silty and clayey sand (A-2-4, A-2-5, A-1-b) with gravel. These soils ranged in thickness from four to 18.0'. In the borings performed in this area, groundwater was encountered anywhere from the ground surface to six feet below the ground surface (elevation 735.00' and 744.00'). Maximum proposed fill heights through this area are 30.0'. Four Shelby Tubes (ST-3 through ST-6) were obtained from this floodplain between Stas. 327+00 to 332+00 –L-. In conjunction with the Shelby Tubes, several vane shear tests were performed at the locations shown on planview pages 13 –14.

The Wal-Mart distribution center located adjacent to the proposed Bypass is partially built on this same floodplain. Please refer to planview pages 13 - 14. In the fall of 2003, Wal-Mart spent 2-3 months pumping grout under the main warehouse floor to stop settlement. The Distribution Center had been open approximately one year at the time.

(c) 339+00 to 341+60 –L-. Alluvial soils in this segment are associated with Brushy Creek. No borings were obtained in this interval due to a proposed bridge spanning the entire floodplain.

(d) 347+40 to 348+74 –L-. Seven to 14.0' of alluvium was encountered in this interval. These soils consist of very loose to loose, coarse, silty and clayey sand (A-1-b, A-2-4, A-2-5, A-3) with some gravel. Groundwater levels were encountered four to five feet below the existing ground surface (elevation 733.00"and 734.00'). The proposed maximum fill height in this area is approximately 45.0'.

5. Artificial Fill

309+75 to 317+90 –L-. The artificial fill contained in this segment is two to eight feet thick. These soils were most likely placed in the area during the construction of the adjacent Wal-Mart distribution center. Fill soils encountered contain soft to stiff, sandy clay (A-7, A-6) and stiff, sandy silt (A-4). Groundwater, where encountered, was 24.0' to 38.0' below existing ground surface (elevations 790.00' and 800.00'). Organic debris (stumps, logs, etc.) was not encountered in the borings performed in this area. However, boulders were encountered in the boring performed left of Station 318+00 –L-. Plan view representation of the area can be found on page 12 of the attached inventory plans. Cross-sections are on pages 33-38.

6. Water Wells

Three domestic water wells fall within the construction limits at the following locations:

Location	Offset
13+80 Loop B	5.0' LT.
16+50 "	12.0' RT.
228+00 –L-	100.0' LT.

7. Culvert Survey

A double-barreled 10' x 10' box culvert has been proposed at Station 222+20.43 –L- with a skew of 125 degrees to line –L-. Alluvial soils in the area are four to seven feet thick and consist of loose, wet, silty sand (A-2-4). Residual soils beneath the culvert floor (elev. 806.9' – 809.00') consist of loose to very dense, silty sand (A-2-4, A-1-b). Alternating layers of weathered rock were encountered in the residual soil in the boring performed at Station 223+00 –L-, 120.0' left. Hard rock, where encountered, is at approximate elevation 794.00'.

Soils Properties

Residual soils, derived from the weathering of parent rock materials, occur in the uplands as cut materials, in the flanks of hillsides as foundation soils for proposed fills, and underneath alluvial deposits in floodplains. Red and brown clays (A-6, A-7-5, and A-7-6) cap most of the hills and are approximately three to 37' in thickness. In addition to these clays, a variety of saprolite soils are present. These include sandy silts (A-4, A-5) and silty sands (A-2-4, A-2-5, and A-1-b), plus some weathered rock and hard rock.

If we can furnish any further information on this project please advise.

Respectfully submitted,

J. P. Rogers
Project Geologist - Geotechnical Unit
Matthews Field Office

cc: Michael Holder, PE
Division 12 Engineer

List of Specialized Samples

Sample Number	Location	Test
ST-1	316+00 –L-	Triaxial CD
ST-2	319+10 –L-	Triaxial CD
ST-3	328+00 –L-	Consolidation
ST-4	328+00 –L-	Triaxial Cu
ST-5	331+50 –L-	Consolidation
ST-6	331+50 –L-	Triaxial Cu

3c

EARTHWORK BALANCE SHEET

Volumes in Cubic Yards

PROJECT **TIP #** **R-2707B** COUNTY Cleveland DATE 2/18/2014 SHEET 1 OF 2 SHEETS

LINE	STATION	STATION	TOTAL EXCAV. (UNCL.)	ROCK EXCAV.	UNDERCUT EXCAV.	UNSUIT. EXCAV.	SUITABLE EXCAV.	TOTAL EMB.	ROCK EMB.	EARTH EMB.	EMBANK. 15%/25%	BORROW	ROCK WASTE	SUITABLE WASTE	UNSUIT. WASTE	TOTAL WASTE
-L-	209+00.00	215+00.00	93,538				93,538	47		47	54	0		93,484		93,484
5" ADJ. MATERIAL FOR GRADING								2,784		2,784	3,202	3,202				
		SUBTOTAL	93,538				93,538	2,831		2,831	3,256	3,202		93,484		93,484
-L-	215+00	252+00.00	40,788				40,788	561,593		561,593	645,832	605,044		0		0
-RPB-	15+50.00	26+50.00	809				809	50,532		50,532	58,112	57,303		0		0
-LPB-	13+00.00	17+50.00	953				953	14,577		14,577	16,764	15,811		0		0
-RPC-	15+00.00	32+00.00	540				540	55,356		55,356	63,659	63,119		0		0
-LPC-	12+50.00	18+00.00	17				17	19,006		19,006	21,857	21,840		0		0
-Y2-	10+11.37	20+05.61	904				904	1,001		1,001	1,151	247		0		0
-Y7-	14+50.00	35+00.00	2,851				2,851	10,955		10,955	12,598	9,747		0		0
-DRIVE1-	10+50.00	14+50.00	484				484	26		26	30	0		454		454
-DRIVE3-	10+50.00	14+50.00	93				93	223		223	256	163		0		0
5" ADJ. MATERIAL FOR GRADING								13,759		13,759	15,823	15,823				
		SUBTOTAL	47,439				47,439	727,028		727,028	836,082	789,097		454		454
-L-	253+00.00	283+00.00	93,185				93,185	301,992		301,992	347,291	254,106		0		0
5" ADJ. MATERIAL FOR GRADING								10,396		10,396	11,955	11,955				
		SUBTOTAL	93,185				93,185	312,388		312,388	359,246	266,061		0		0
-L-	283+00.00	313+00.00	507,237	6,250			500,987	68,220	6,250	60,408	75,719	0		431,518		431,518
5" ADJ. MATERIAL FOR GRADING								10,686		10,686	12,289	12,289				
		SUBTOTAL	507,237	6,250			500,987	78,906	6,250	71,094	88,008	12,289		431,518		431,518
-L-	313+00.00	338+50.00	146,160		1,750		146,160	161,806		161,806	186,077	39,917		0	1,750	1,750
5" ADJ. MATERIAL FOR GRADING								11,194		11,194	12,873	12,873				
		SUBTOTAL	146,160		1,750		146,160	173,000		173,000	198,950	52,790		0	1,750	1,750
-L-	342+50.00	353+00.00	9,316				9,316	141,972		141,972	163,268	153,952		0		0
5" ADJ. MATERIAL FOR GRADING								3,557		3,557	4,091	4,091				
		SUBTOTAL	9,316				9,316	145,529		145,529	167,358	158,042		0		0
-L-	353+00.00	384+00.00	367,359	12,035			355,324	97,151	12,035	82,107	106,458	0		260,901		260,901
-DRIVE2-	10+50.00	14+50.00	199				199	71		71	82	0		117		117
-Y1-	11+90.00	27+00.00	2,589				2,589	7,043		7,043	8,099	5,510		0		0
-Y1-	29+52.00	42+40.00	2,163				2,163	2,385		2,385	2,743	580		0		0
-Y1DET-	10+00.00	29+50.00	1,468				1,468	12,051		12,051	13,859	12,391		0		0
-RPA1-	0+00.00	20+50.00	57,196	307			56,889	2,395	307	2,011	2,620	0		54,576		54,576
-RPD1-	0+00.00	23+50.00	1,939				1,939	149,338		149,338	171,739	169,800		0		0
-LPA1-	2+10.00	6+33.80	58,933	2,582			56,351	0		0	0	0	2,582	56,351		58,933
-LPD1-	2+41.00	7+65.75	16,941	353			16,588	19,659	353	19,218	22,453	5,512		0		0
-Y17-	10+20.00	21+00.00	2,396				2,396	75,419		75,419	86,732	84,336		0		0
-L- (BASIN)	364+00	365+50	2,050				2,050	0			0	0		2,050		2,050
-L- (BASIN)	379+90	381+90	5,250				5,250	0			0	0		5,250		5,250
5" ADJ. MATERIAL FOR GRADING								8,797		8,797	10,117	10,117				
		SUBTOTAL	518,483	15,277			503,206	374,309	12,695	358,440	424,901	288,245	2,582	379,245	0	381,827

LINE	STATION	STATION	TOTAL EXCAV. (UNCL.)	ROCK EXCAV.	UNDERCUT EXCAV.	UNSUIT. EXCAV.	SUITABLE EXCAV.	TOTAL EMB.	ROCK EMB.	EARTH EMB.	EMBANK. 15%/25%	BORROW	ROCK WASTE	SUITABLE WASTE	UNSUIT. WASTE	TOTAL WASTE
																0
PROJECT SUBTOTAL			1,415,358	21,527	1,750		1,393,831	1,813,991	18,945	1,790,310	2,077,801	1,569,727	2,582	904,702	1,750	909,034
ADDITIONAL UNDERCUT PER GEOTECHNICAL					6,000			6,000		6,000	6,900	6,900			6,000	6,000
**EST. 5% LOSS DUE TO CLEARING & GRUBBING			-24,000				-24,000					24,000				
ROCK WASTE TO REPLACE BORROW									2,582	-2,582		-2,582	-2,582			-2,582
ESTIMATED SHOULDER MATERIAL								3,600		3,600	4,140	4,140				
DETOUR REMOVAL			12,391				12,391							12,391		12,391
WASTE TO REPLACE BORROW												-904,702		-904,702		-904,702
ADJUST FOR ROCK SWELL										-646	-646	-646			7,750	
ELIMINATE EARTH SHRINK. FACTOR											-484	-484				
PROJECT TOTAL			1,403,749	21,527	7,750	0	1,369,831	1,823,591	21,527	1,796,682	2,087,711	696,353	0	12,391	15,500	20,141
EST. 5% FOR REPLACING TOPSOIL												34,818				
GRAND TOTAL			1,403,749									731,171				0
SAY			1,404,000									732,000				

EST. DDE = 15,000 CY
EST. 4,500 CY OF SELECT GRANULAR MATERIAL PER GEOTECHNICAL RECOMMENDATION

*** THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEER.**
**** ESTIMATE ONLY, QUANTITY TO BE PROVIDED BY GEOTECHNICAL ENGINEER.**

8/17/99

HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609

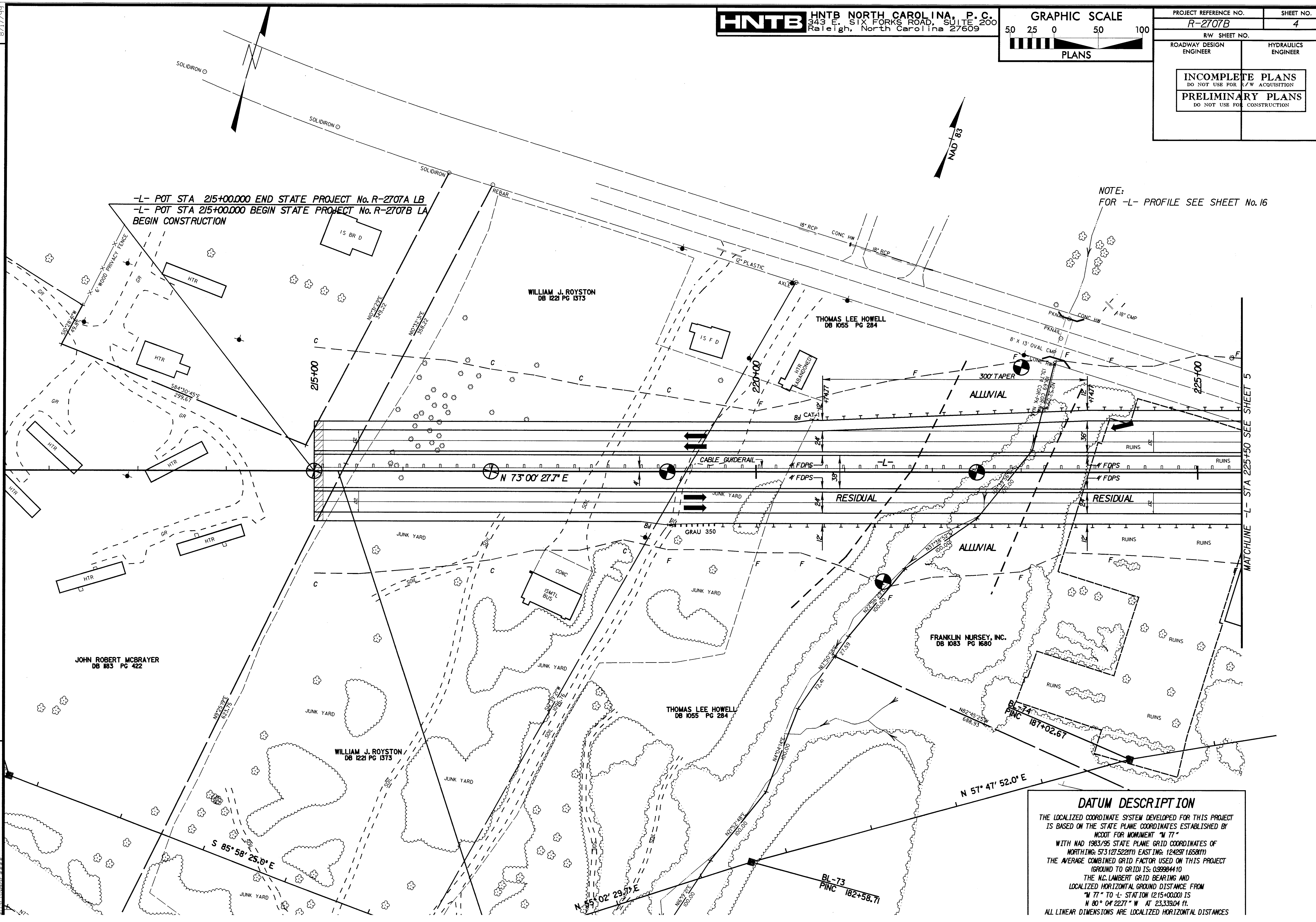
PROJECT REFERENCE NO.	SHEET NO.
R-2707B	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

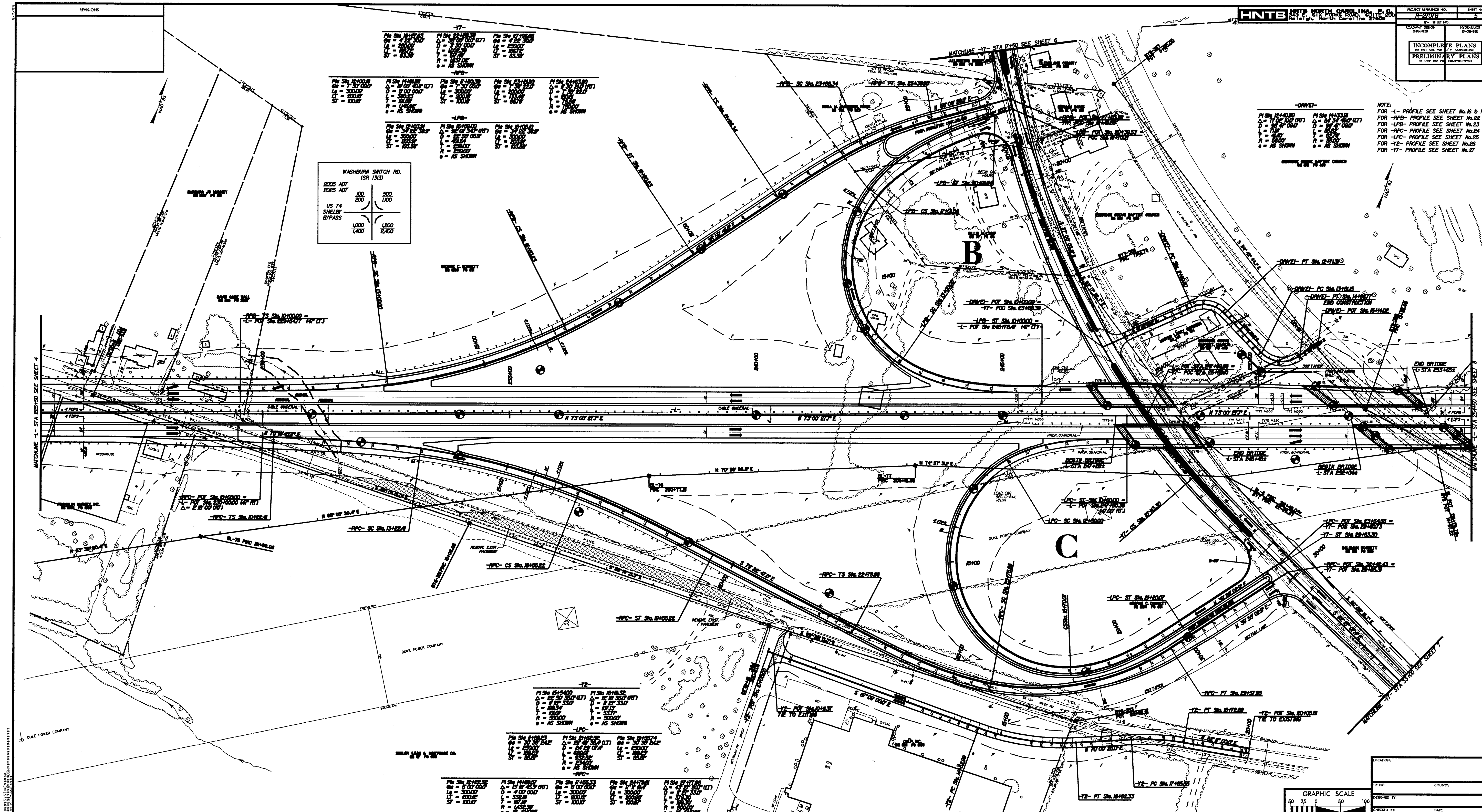
GRAPHIC SCALE
50 25 0 50 100
PLANS

REVISIONS



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "M 77"
WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 573127.522(ft) EASTING: 1242971.658(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99984410
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "M 77" TO -L- STATION (215+00.00) IS N 80° 04' 22.77" W AT 23,339.04 ft.
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES


HNTB
HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609
PROJECT REFERENCE NO.
R-2707B
SHEET NO.
5
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
REVISIONS
NOTE:
FOR -L- PROFILE SEE SHEET No. 16 & 17
FOR -RPB- PROFILE SEE SHEET No. 22
FOR -LPB- PROFILE SEE SHEET No. 23
FOR -RPC- PROFILE SEE SHEET No. 24
FOR -LPC- PROFILE SEE SHEET No. 25
FOR -Y2- PROFILE SEE SHEET No. 26
FOR -Y7- PROFILE SEE SHEET No. 27
WASHBURN SWITCH RD.
(SR 1313)
2005 ADT
2025 ADT
US 74
SHELBY
BYPASS
100
200
500
1,100
1,000
1,400
1,200
2,400
-Y7-
-RPB-
-LPB-
-DRIVE1-
-Y2-
-LPC-
-RPC-
B
C
MATCHLINE -Y7- STA 17+50 SEE SHEET 6
MATCHLINE -L- STA 225+50 SEE SHEET 4
MATCHLINE -L- STA 254+50 SEE SHEET 8
MATCHLINE -Y7- STA 33+00 SEE SHEET 7
NAD 83
N 73°00'27.7" E
CABLE GUIDERAIL
PROP. GUARDRAIL
BEGIN BRIDGE -L- STA 247+28±
END BRIDGE -L- STA 249+48±
BEGIN BRIDGE -L- STA 252+04±
END BRIDGE -L- STA 253+65±
-DRIVE1- PT Sta. 12+71.31
-DRIVE1- PC Sta. 13+61.15
END CONSTRUCTION
-DRIVE1- POT Sta. 15+14.02
-RPB- TS Sta. 10+00.00 =
-L- POT Sta. 225+54.07 (41' LT)
-RPC- POT Sta. 10+00.00 =
-L- POT Sta. 230+00.00 (41' RT)
Δ= 2°18'00" (RT)
-RPC- TS Sta. 10+22.41
-RPC- SC Sta. 13+22.41
-RPC- CS Sta. 16+55.22
-RPC- ST Sta. 19+55.22
-RPC- TS Sta. 22+78.86
-RPC- PT Sta. 29+57.95
REMOVE EXIST. PAVEMENT
DUKE POWER COMPANY
GREENHOUSE
-Y2- POT Sta. 10+11.37
TIE TO EXISTING
-Y2- PT Sta. 16+52.33
-Y2- PC Sta. 17+65.55
-Y2- PT Sta. 19+72.80
-Y2- POT Sta. 20+05.81
TIE TO EXISTING
GRAPHIC SCALE
50 25 0 50 100
PLANS
LOCATION:
TIP NO.:
COUNTY:
DESIGNED BY:
CHECKED BY:
DATE:

8/17/99

REVISIONS

HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609

GRAPHIC SCALE
50 25 0 50 100
PLANS

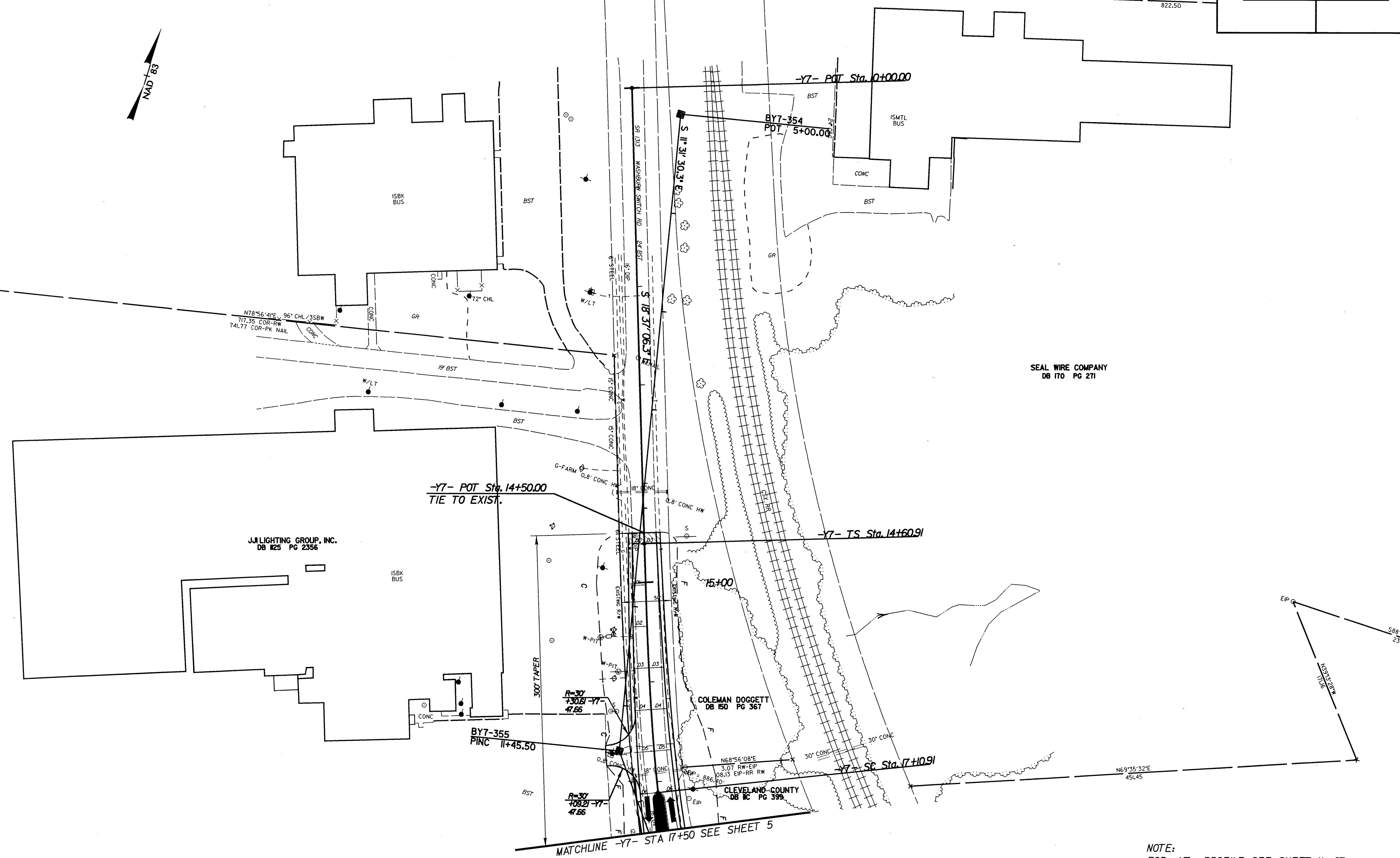
PROJECT REFERENCE NO.	SHEET NO.
R-2707B	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

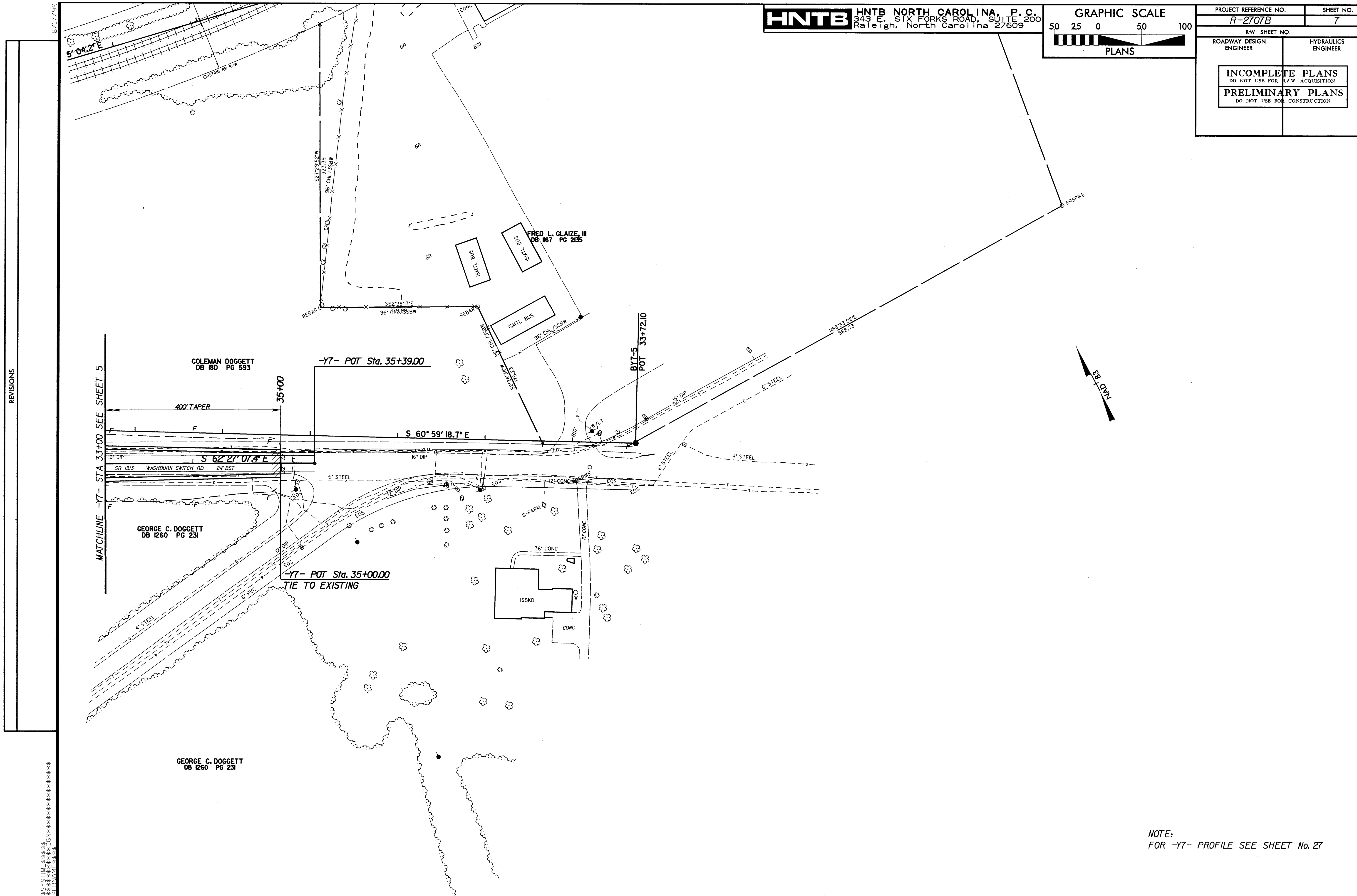
-Y7-

PIs Sta 16+27.63	PI Sta 22+28.38
Θs = 4° 22′ 30.0″	Δ = 35° 05′ 01.0″ (LT)
Ls = 250.00′	D = 3° 30′ 00.0″
LT = 166.72′	L = 1,002.39
ST = 83.38′	T = 517.46′
	R = 1,637.02′



NOTE:
FOR -Y7- PROFILE SEE SHEET No. 27

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



HNTB
HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609
GRAPHIC SCALE
50 25 0 50 100
PLANS
PROJECT REFERENCE NO.
SHEET NO.
R-2707B
7
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
8/17/99
REVISIONS
EXISTING RR R/W
S27°29'52"W
323.39
96" CHL/3SBW
GR
FRED L. GLAIZE, III
DB 1167 PG 2135
ISMTL BUS
ISMTL BUS
ISMTL BUS
REBAR
S62°38'17"E
179.99
96" CHL/3SBW
S2°24'34"W
175.23
BY7-5
POT 33+72.10
N88°33'08"E
568.73
RRSPIKE
NAD 83
COLEMAN DOGGETT
DB 18D PG 593
-Y7- POT Sta. 35+39.00
35+00
400' TAPER
MATCHLINE -Y7- STA 33+00 SEE SHEET 5
S 60° 59' 18.7" E
S 62° 27' 07.4" E
16" DIP
SR 1313 WASHBURN SWITCH RD 24' BST
6" STEEL
4" STEEL
12" DIP
EOS
W/LT
BST
12" CONC
G-FARM
10' CONC
36" CONC
ISBKD
CONC
6" PVC
GEORGE C. DOGGETT
DB 1260 PG 231
-Y7- POT Sta. 35+00.00
TIE TO EXISTING
GEORGE C. DOGGETT
DB 1260 PG 231
NOTE:
FOR -Y7- PROFILE SEE SHEET No. 27
$$$$SYSTIME$$$$
$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$
$$USERNAME$$$$

8/17/99

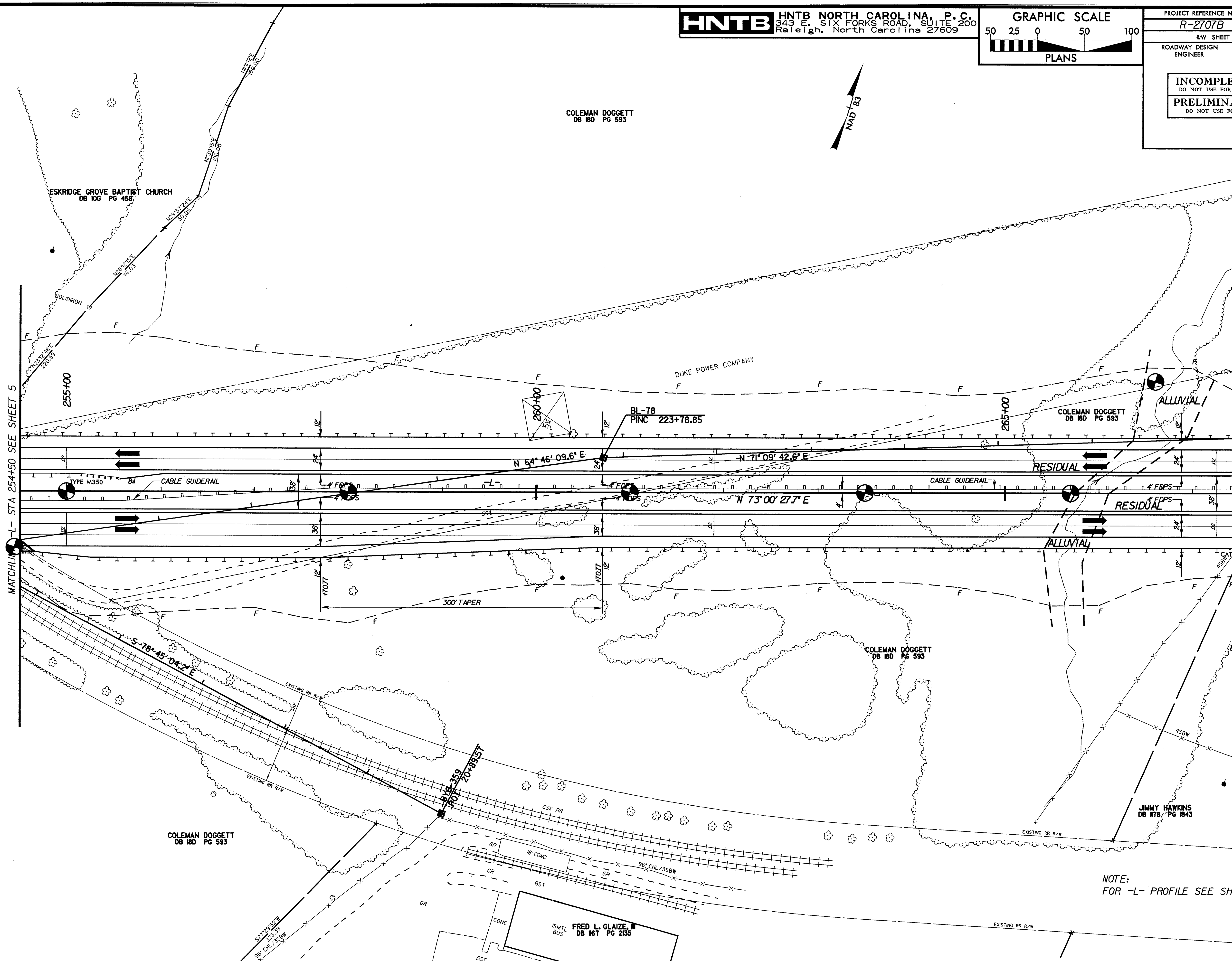
REVISIONS

HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609

GRAPHIC SCALE
50 25 0 50 100
PLANS

PROJECT REFERENCE NO.	SHEET NO.
R-2707B	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



NOTE:
FOR -L- PROFILE SEE SHEET No. 17 & 18

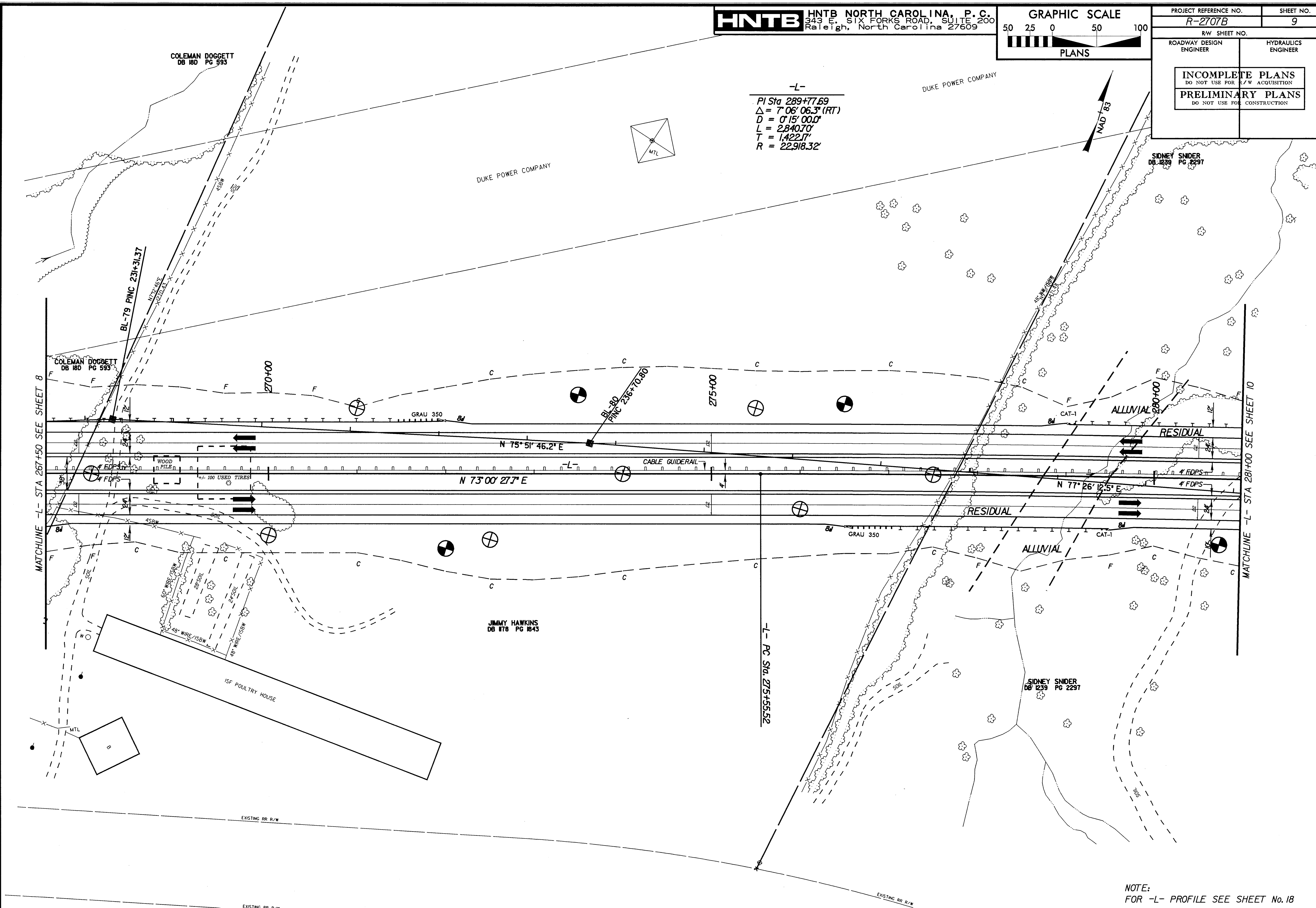
$$$$$$SYSTIME$$$$$$
$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$
USERNAME$$$$

HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609

PROJECT REFERENCE NO.	SHEET NO.
R-2707B	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



REVISIONS

NOTE:
FOR -L- PROFILE SEE SHEET No. 18

8/17/99

REVISIONS

HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609

GRAPHIC SCALE
50 25 0 50 100
PLANS

PROJECT REFERENCE NO.	SHEET NO.
R-2707B	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

DUKE POWER COMPANY

-L-
PI Sta 289+77.69
Δ = 7° 06' 06.3" (RT)
D = 0° 15' 00.0"
L = 2,840.70'
T = 1,422.17'
R = 22,918.32'

SIDNEY SNIDER
DB 1239 PG 2297

285+00

290+00

MATCHLINE -L- STA 281+00 SEE SHEET 9

MATCHLINE -L- STA 294+50 SEE SHEET 11

GRAU 350

CABLE GUIDERAIL

-L-

4' FDPS

4' FDPS

N 78° 09' 00.2" E

BL-81
PINC
250+32.95

SOIL

ALLUVIAL

RESIDUAL

16" RED OAK
W/POINTRS

SHELBY LOAN &
MORTGAGE CO.
DB 15A PG 306

NOTE:
FOR -L- PROFILE SEE SHEET No 18

HNTB
HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609

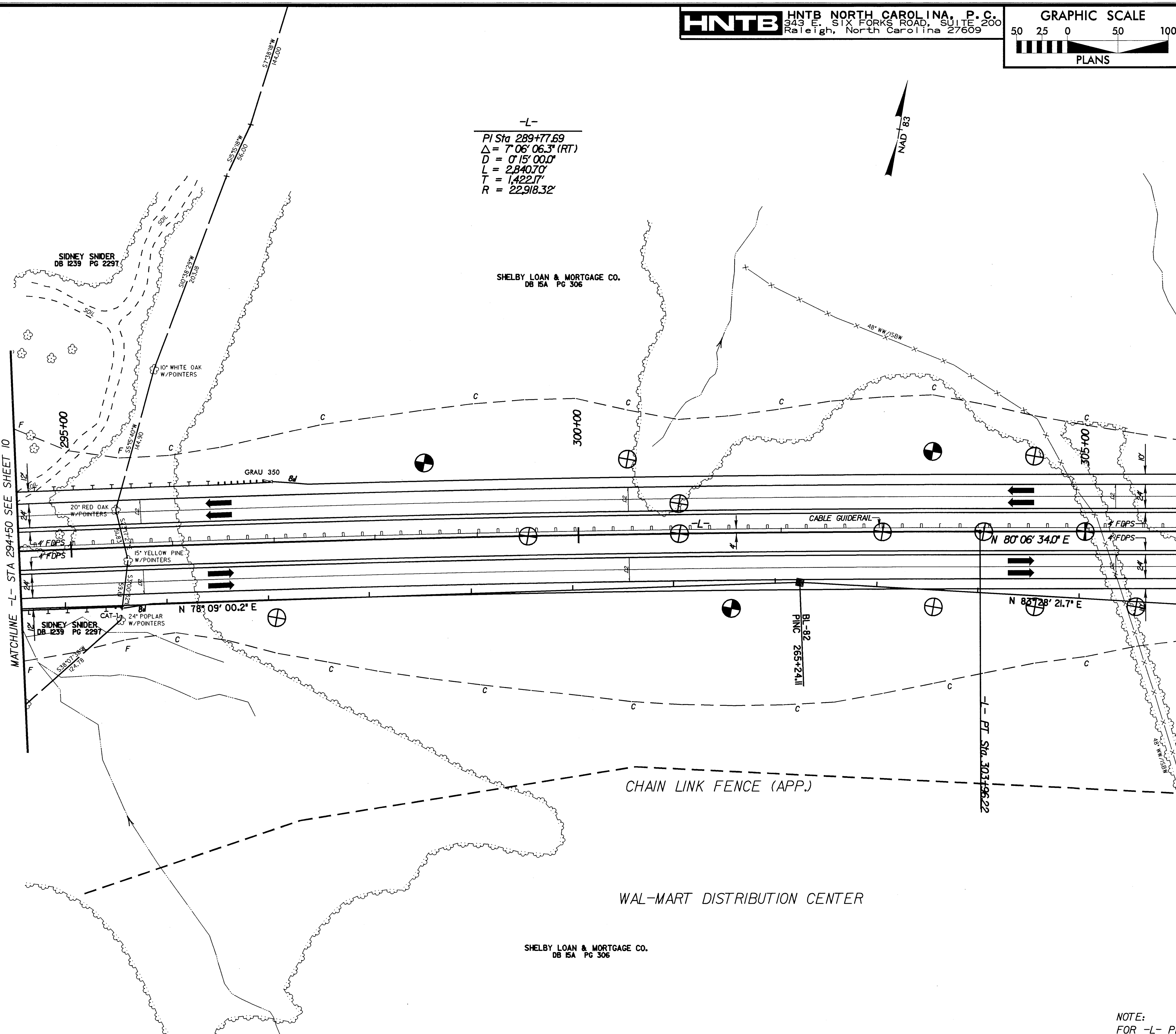
GRAPHIC SCALE
50 25 0 50 100
PLANS

PROJECT REFERENCE NO.	SHEET NO.
R-2707B	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

8/17/99

REVISIONS



NOTE:
FOR -L- PROFILE SEE SHEET No. 18 & 19

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

8/17/99

REVISIONS

HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609

GRAPHIC SCALE
50 25 0 50 100
PLANS

PROJECT REFERENCE NO.	SHEET NO.
R-2707B	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

RUINS

SHELBY LOAN & MORTGAGE CO.
DB 15A PG 306

ARTIFICIAL FILL

310+00

315+00

BOULDERS

MATCHLINE -L- STA 306+00 SEE SHEET 11

MATCHLINE -L- STA 318+50 SEE SHEET 13

-L-

4" FDPS

CABLE GUIDERAIL

N 80° 06' 34.0" E

GRAN 350

N 83° 28' 21.7" E

BL-83 PINC 276+06.01

N 78° 24' 57.6" E

ARTIFICIAL FILL

WAL-MART FILL

CHAIN LINK FENCE (APP.)

WAL-MART DISTRIBUTION CENTER

SHELBY LOAN & MORTGAGE CO.
DB 15A PG 306

SOIL

MOSI/MM.SP.

NOTE:
FOR -L- PROFILE SEE SHEET No 19

$$$$CYCTIME$$$$
$$$$USERNAME$$$$ $$$$DGN$$$$$$$$$$$$$$$$$$$$

HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609

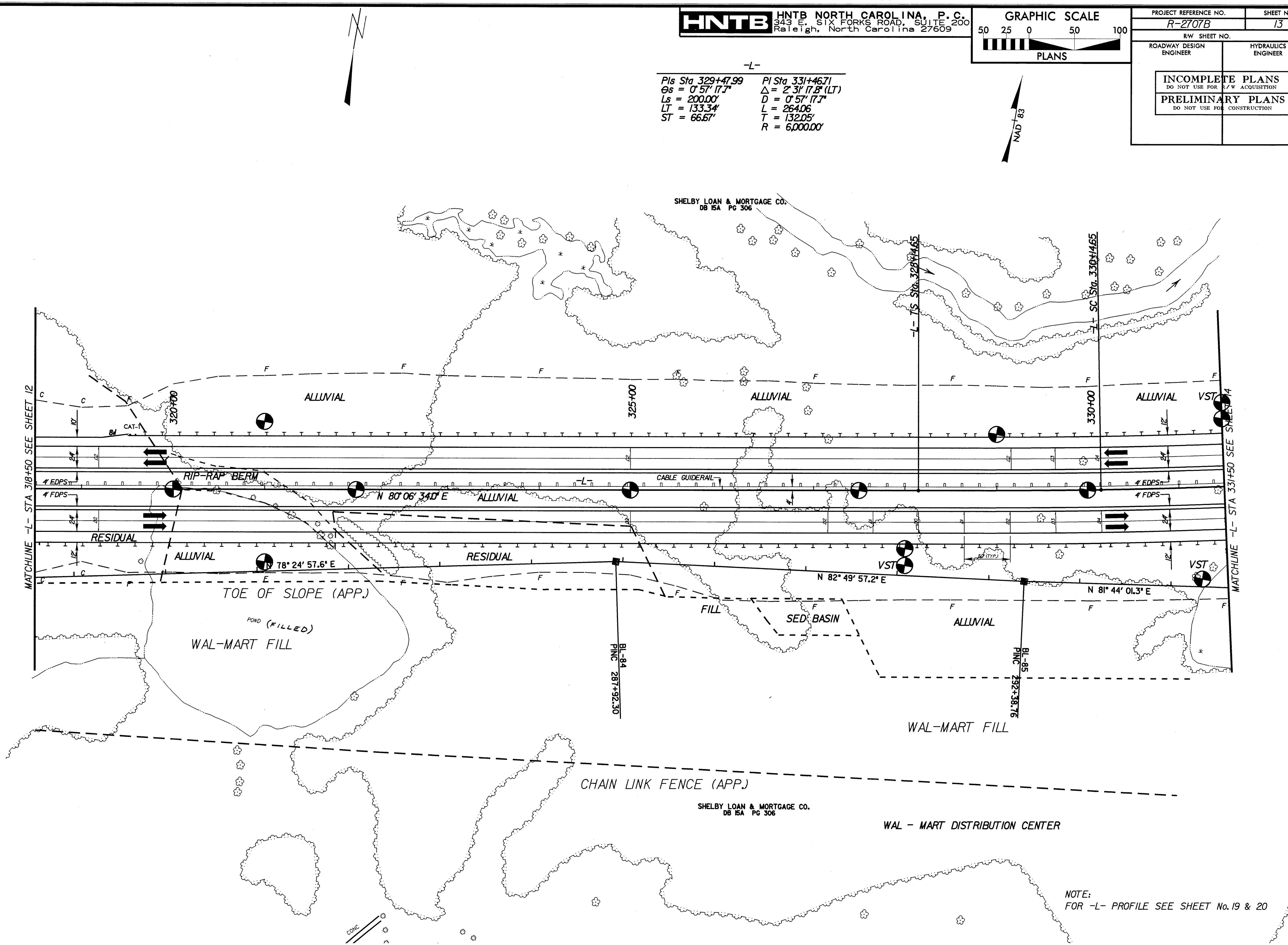
GRAPHIC SCALE
50 25 0 50 100
PLANS

PROJECT REFERENCE NO.	SHEET NO.
R-2707B	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

REVISIONS

8/17/99



NOTE:
FOR -L- PROFILE SEE SHEET No. 19 & 20

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

8/17/99

HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609

GRAPHIC SCALE
50 25 0 50 100
PLANS

PROJECT REFERENCE NO.	SHEET NO.
R-2707B	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

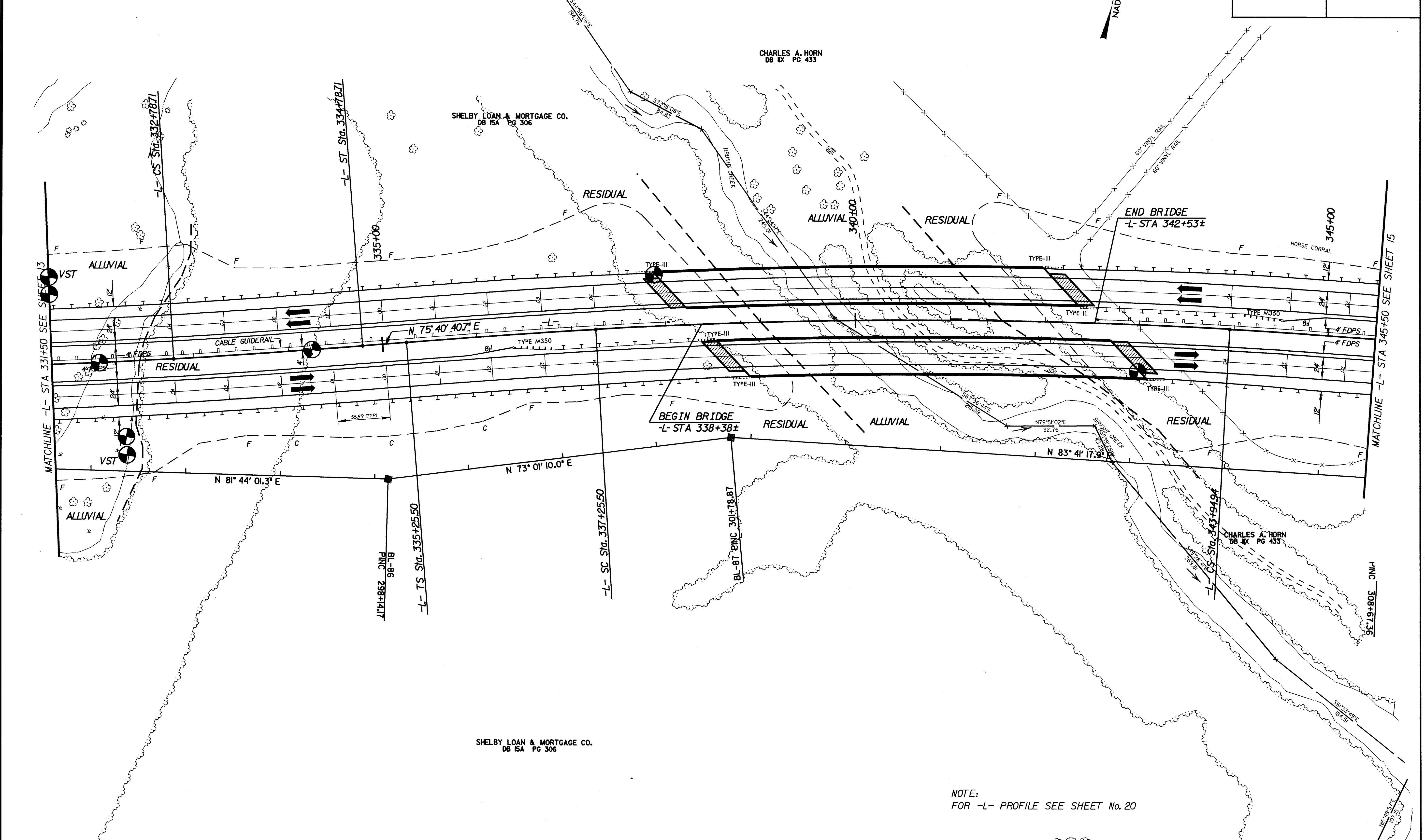
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

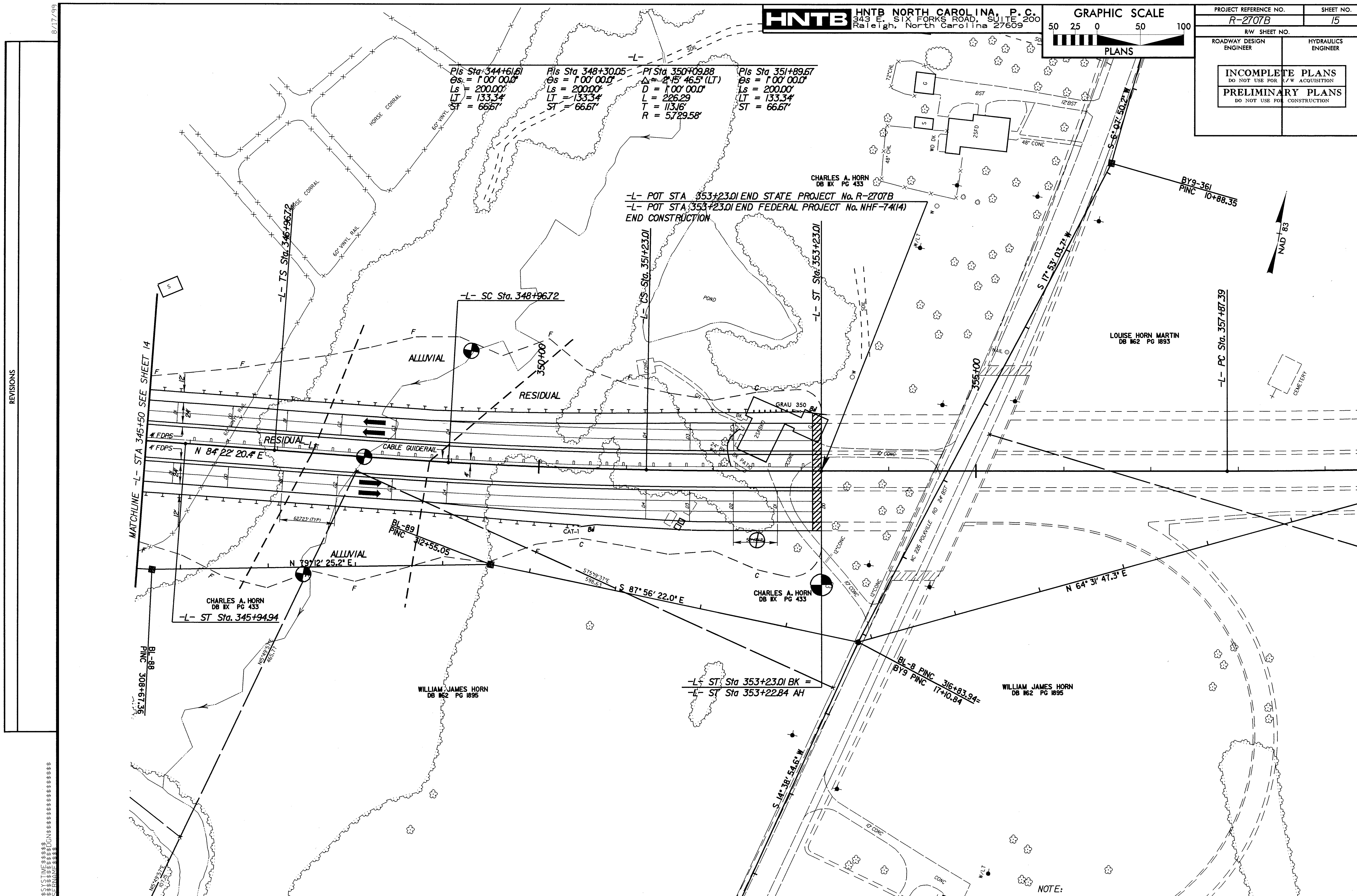
-L-

PI Sta 331+46.71	PIs Sta 333+45.39	PIs Sta 336+58.84	PI Sta 340+60.60	PIs Sta 344+61.61
△ = 2° 31' 17.8" (LT)	Θs = 0° 57' 17.7"	Θs = 1° 00' 00.0"	△ = 6° 41' 39.7" (RT)	Θs = 1° 00' 00.0"
D = 0° 57' 17.7"	Ls = 200.00'	Ls = 200.00'	D = 1° 00' 00.0"	Ls = 200.00'
L = 264.06	LT = 133.34'	LT = 133.34'	L = 669.44	LT = 133.34'
T = 132.05'	ST = 66.67'	ST = 66.67'	T = 335.10'	ST = 66.67'
R = 6,000.00'			R = 5,729.58'	



NOTE:
FOR -L- PROFILE SEE SHEET No. 20

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



8/17/99
REVISIONS
HNTB
HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609
GRAPHIC SCALE
50 25 0 50 100
PLANS
PROJECT REFERENCE NO.
R-2707B
SHEET NO.
15
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
-L-
PIs Sta 344+61.61
θs = 1° 00' 00.0"
Ls = 200.00'
LT = 133.34'
ST = 66.67'
PIs Sta 348+30.05
θs = 1° 00' 00.0"
Ls = 200.00'
LT = 133.34'
ST = 66.67'
PI Sta 350+09.88
Δ = 2° 15' 46.5" (LT)
D = 1° 00' 00.0"
L = 226.29
T = 113.16'
R = 5,729.58'
PIs Sta 351+89.67
θs = 1° 00' 00.0"
Ls = 200.00'
LT = 133.34'
ST = 66.67'
HORSE CORRAL
HORSE CORRAL
60" VINYL RAIL
60" VINYL RAIL
SOIL
72"CHL
48" CHL
BST
12' BST
2SFD
WD DK
48" CONC
CHARLES A. HORN
DB IIX PG 433
-L- POT STA 353+23.01 END STATE PROJECT No. R-2707B
-L- POT STA 353+23.01 END FEDERAL PROJECT No. NHF-74(14)
END CONSTRUCTION
-L- TS Sta. 346+96.72
-L- SC Sta. 348+96.72
-L- CS Sta. 351+23.01
-L- ST Sta. 353+23.01
POND
BY9-361
PINC 10+88.35
NAD 83
S 6° 07' 50.2" W
S 17° 53' 03.7" W
LOUISE HORN MARTIN
DB 1162 PG 1893
-L- PC Sta. 357+87.39
CEMETERY
NAIL
ALLUVIAL
RESIDUAL
350+00
355+00
GRAU 350
2SFBKD
BK
24" BK WALL
BK PATIO
CONC
10' CONC
12' CONC
MATCHLINE -L- STA 345+50 SEE SHEET 14
4' FDPS
4' FDPS
N 84° 22' 20.4" E
CABLE GUIDERAIL
CAT-1
62.723' (TYP)
BL-89
PINC 312+55.05
ALLUVIAL
N 79° 12' 25.2" E
S75°19'37"E
598.63
S 87° 56' 22.0" E
CHARLES A. HORN
DB IIX PG 433
-L- ST Sta. 345+94.94
CHARLES A. HORN
DB IIX PG 433
NC 226 POLKVILLE RD 24' BST
N 64° 31' 47.3" E
BL-88
PINC 308+67.36
N15°49'57"E
465.77
WILLIAM JAMES HORN
DB 1162 PG 1895
-L- ST Sta 353+23.01 BK =
-L- ST Sta 353+22.84 AH
BL-8 PINC 316+83.94=
BY9 PINC 17+10.84
WILLIAM JAMES HORN
DB 1162 PG 1895
S 14° 38' 54.6" W
N15°49'57"E
107.15
W/LT
NOTE:
FOR -L- PROFILE SEE SHEET No. 20 & 21
$$$$SYSTIME$$$$
$$$$$$$$$$DGN$$$$$$$$$$$$$$$$
$$USERNAME$$$$

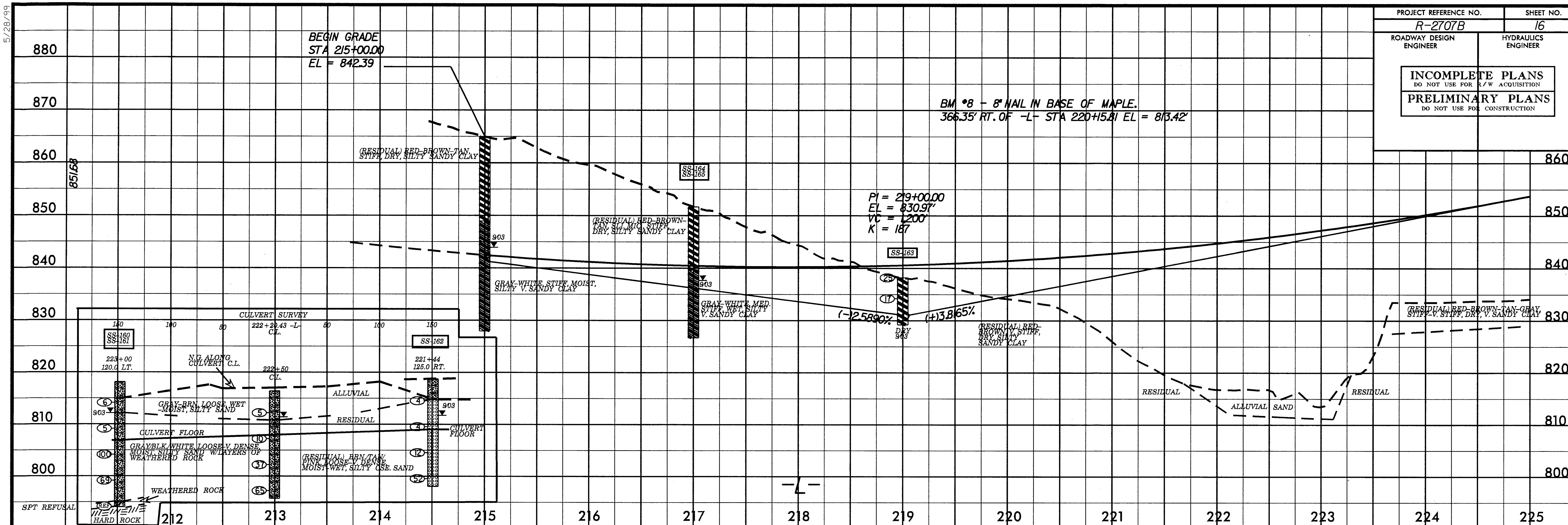
PROJECT REFERENCE NO.	SHEET NO.
R-2707B	16

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

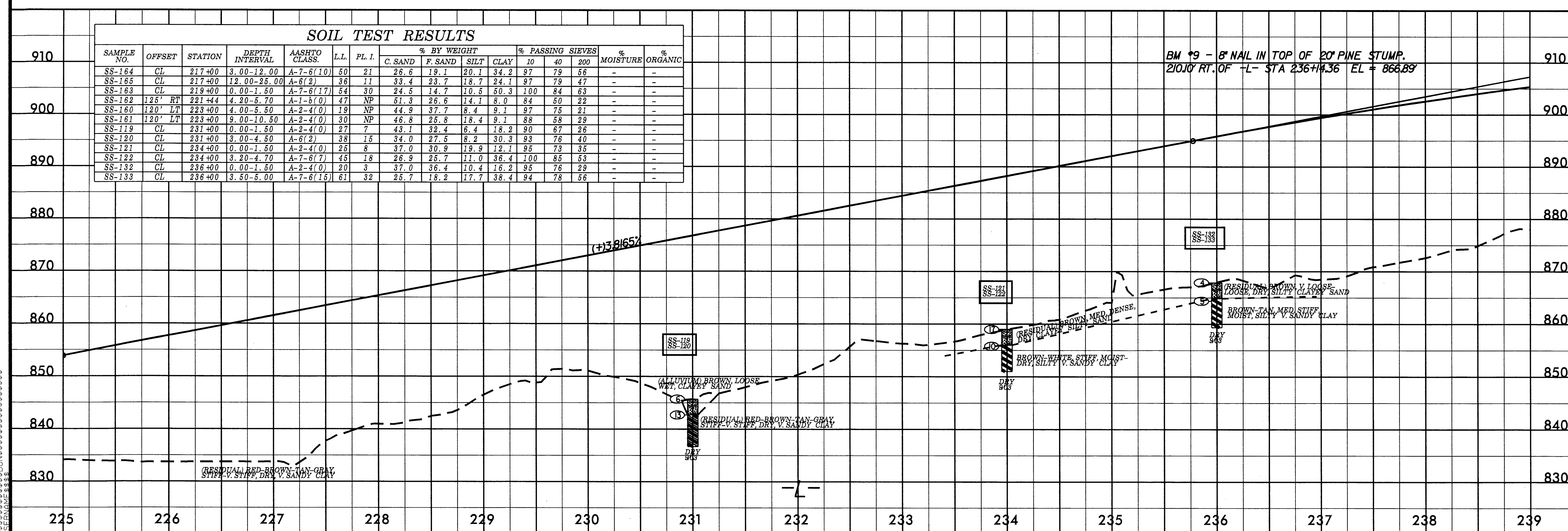
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-164	CL	217+00	3.00-12.00	A-7-6(10)	50	21	26.6	19.1	20.1	34.2	97	79	56	-	-
SS-165	CL	217+00	12.00-25.00	A-6(2)	36	11	33.4	23.7	18.7	24.1	97	79	47	-	-
SS-163	CL	219+00	0.00-1.50	A-7-6(17)	54	30	24.5	14.7	10.5	50.3	100	84	63	-	-
SS-162	125' RT	221+44	4.20-5.70	A-1-b(0)	47	NP	51.3	26.6	14.1	8.0	84	50	22	-	-
SS-160	120' LT	223+00	4.00-5.50	A-2-4(0)	19	NP	44.9	37.7	8.4	9.1	97	75	21	-	-
SS-161	120' LT	223+00	9.00-10.50	A-2-4(0)	30	NP	46.8	25.8	18.4	9.1	88	58	29	-	-
SS-119	CL	231+00	0.00-1.50	A-2-4(0)	27	7	43.1	32.4	6.4	18.2	90	67	26	-	-
SS-120	CL	231+00	3.00-4.50	A-6(2)	38	15	34.0	27.5	8.2	30.3	93	76	40	-	-
SS-121	CL	234+00	0.00-1.50	A-2-4(0)	25	8	37.0	30.9	19.9	12.1	95	73	35	-	-
SS-122	CL	234+00	3.20-4.70	A-7-6(7)	45	18	26.9	25.7	11.0	36.4	100	85	53	-	-
SS-132	CL	236+00	0.00-1.50	A-2-4(0)	20	3	37.0	36.4	10.4	16.2	95	76	29	-	-
SS-133	CL	236+00	3.50-5.00	A-7-6(15)	61	32	25.7	18.2	17.7	38.4	94	78	56	-	-



5/28/99

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

PROJECT REFERENCE NO.	SHEET NO.
R-2707B	17
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PI = 245+00.00
EL = 930.20'
VC = 1845'
K = 272
(+)3.8165%
(-)12.9755%

BM #10 - 8" NAIL IN ROOT OF 18" WHITE PINE.
91.16' LT. OF -L- STA 249+98.11 EL = 881.23'

-L- STA 247+90.86=
-Y7- STA 25+55.10

RED-BROWN, MIC., STIFF-V. STIFF, MOIST, SANDY CLAY

RED-BROWN, MIC., STIFF-V. STIFF, MOIST, SANDY CLAY

RED-BROWN, MIC., MED. STIFF-V. STIFF, MOIST-DRY, SANDY CLAY

RED-BROWN, MIC., STIFF, SLIGHTLY SOFT, MOIST, CLAYEY V. SANDY SILT

GRAY-TAN-WHITE, V. STIFF, WET-MOIST, CLAYEY V. SANDY SILT

GRAY-BRN-TAN, LOOSE TO DENSE, MOIST TO WET, SILTY SAND

GRAY-TAN-WHITE, V. STIFF, MOIST, CLAYEY V. SANDY SILT

BRN-TAN, V. STIFF-HARD, MOIST, SANDY SILT

(WEATHERED ROCK)

PI = 257+80.00
EL = 892.11'
VC = 715'
K = 698
(-)12.9755%
(-)14.0000%

BM #11 - 8" NAIL SET IN BASE OF DOUBLE POPLAR.
82.16' RT. OF -L- STA 266+07.25 EL = 830.29'

(-)14.0000%

BRN./TAN, V. STIFF-HARD, MOIST, SANDY SILT

RED/BRN, STIFF MOIST SANDY CLAY

TAN-BLACK-WHITE, MIC., LOOSE TO DENSE, MOIST, SILTY SAND

BROWN, MIC., STIFF, MOIST, SANDY CLAY

TAN-BLACK-WHITE, MIC., DENSE, SILTY SAND

RED-BROWN, MIC., MED. DENSE, DRY, SILTY SAND

TAN-BLACK-WHITE, DENSE, DRY, SILTY SAND

BROWN-TAN, V. STIFF, DRY

BROWN-GRAY, LOOSE, MOIST, SAND (ALLUVIAL)

RESIDUAL

TAN-BLACK-WHITE, V. LOOSE-LOOSE, SAT., SILTY SAND

TAN-BLACK-WHITE, V. LOOSE-MED. DENSE, SAT., MOIST, SILTY SAND

WEATHERED ROCK

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING SIEVES 10	% PASSING SIEVES 40	% PASSING SIEVES 200	% MOISTURE	% ORGANIC
SS-130	CL	240+00	0.00-1.50	A-7-6(11)	50	26	24.7	21.8	9.0	44.5	97	84	64	-	-
SS-131	CL	240+00	3.70-5.20	A-7-5(27)	69	31	11.1	17.0	17.3	54.6	99	95	76	-	-
SS-183	120' LT	249+84	0.00-1.50	A-7-6(18)	56	28	20.0	16.3	13.3	48.4	100	86	67	-	-
SS-184	120' LT	249+84	4.20-5.70	A-2-4(0)	31	NP	32.5	37.3	18.1	12.1	98	78	35	-	-
SS-185	120' LT	249+84	11.70-13.20	A-2-4(0)	36	NP	37.3	32.1	20.6	10.1	94	71	35	-	-
SS-191	90' LT	250+24	0.00-1.50	A-2-4(0)	36	NP	39.3	35.9	18.8	6.0	97	72	32	-	-
SS-192	90' LT	250+24	13.90-15.40	A-2-5(0)	44	NP	38.9	38.3	18.8	4.0	98	71	30	-	-
SS-156	52' LT	253+00	4.00-5.50	A-7-6(15)	57	30	21.1	24.1	12.6	42.3	98	86	58	-	-
SS-157	52' LT	253+00	9.00-10.50	A-4(0)	35	8	28.8	39.0	22.1	10.1	93	77	39	-	-
SS-186	23' LT	253+41	4.30-5.80	A-7-6(13)	52	31	26.2	21.6	11.9	40.3	98	82	54	-	-
SS-187	23' LT	253+41	9.30-10.80	A-2-4(0)	32	NP	36.9	34.7	18.3	10.1	90	69	32	-	-
SS-188	23' LT	253+41	19.30-20.80	A-2-4(0)	26	NP	39.1	32.7	20.2	8.1	80	58	28	-	-
SS-158	CL	255+00	0.00-1.50	A-7-6(17)	59	30	25.2	17.1	15.6	42.3	100	83	61	-	-
SS-153	CL	258+00	0.00-1.50	A-6(2)	32	16	36.4	29.2	17.3	18.1	88	69	37	-	-
SS-154	CL	258+00	4.20-5.70	A-2-4(0)	33	7	46.3	27.6	17.1	10.1	93	62	30	-	-
SS-161	120' LT	266+60	4.20-5.70	A-2-4(0)	19	NP	25.4	57.3	9.3	8.0	98	86	24	-	-
SS-162	120' LT	266+60	9.20-10.70	A-2-4(0)	28	NP	37.0	33.4	19.5	10.1	100	77	35	-	-

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2707B	18

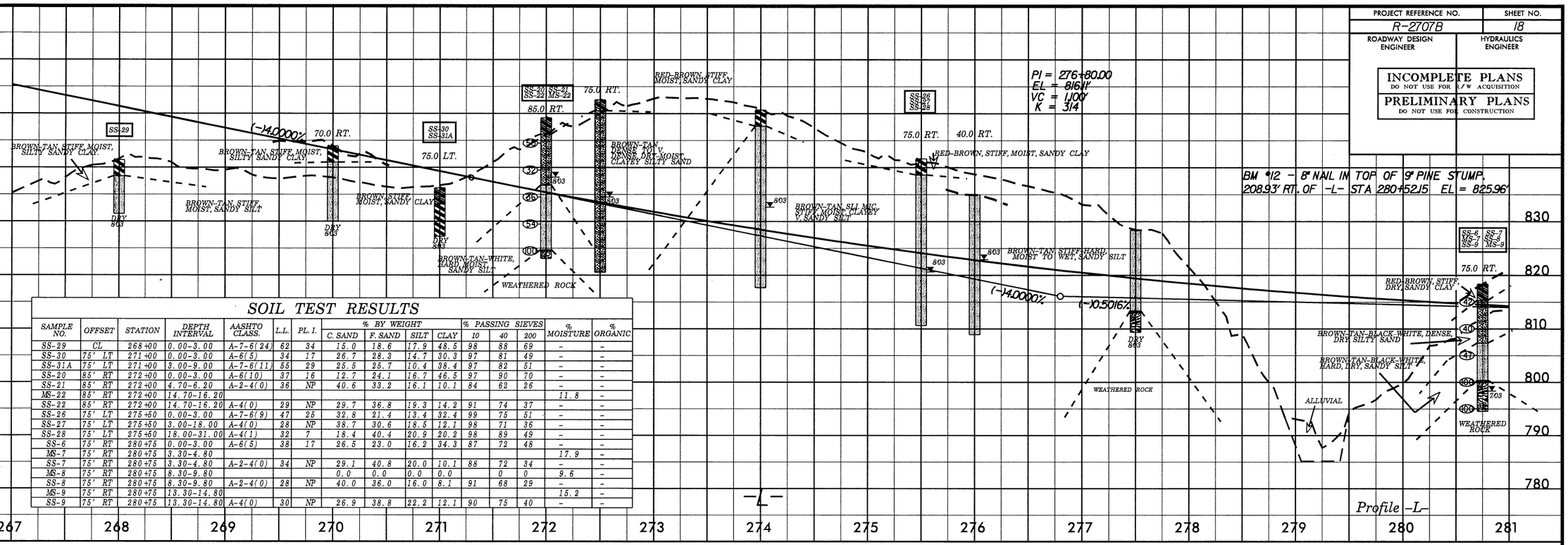
ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

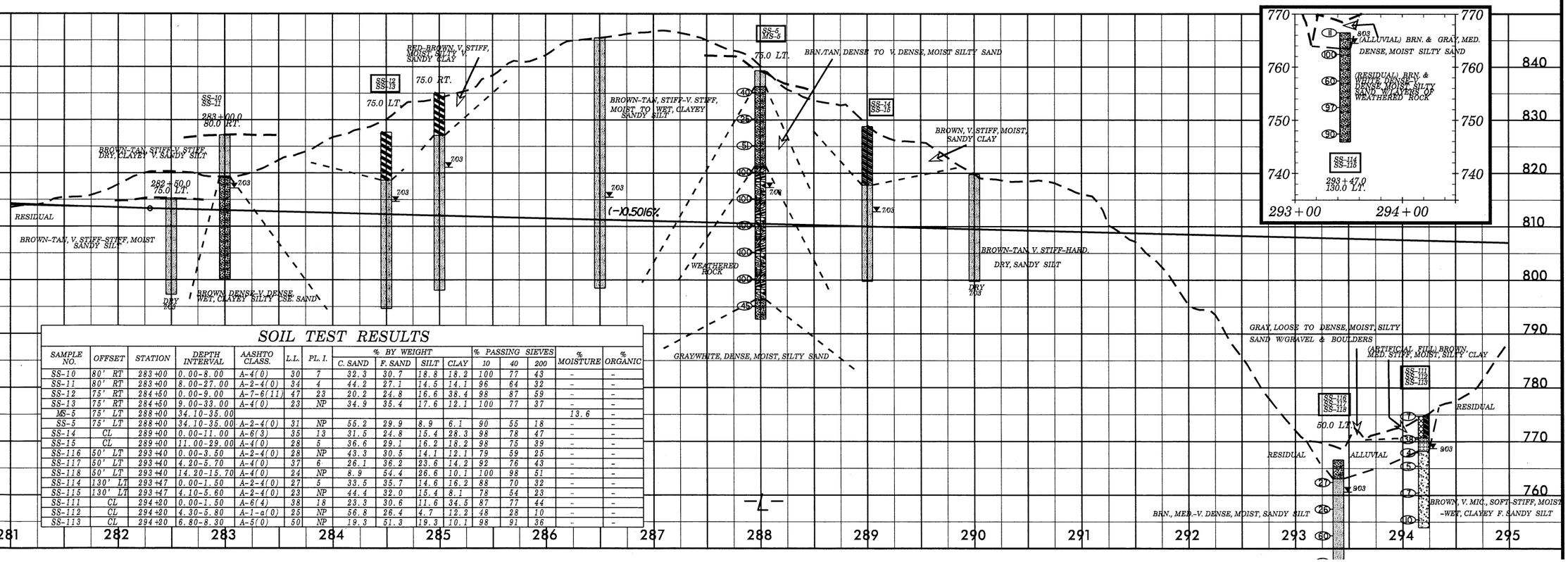
PI = 276+80.00
EL = 816.11'
VC = 1,100'
K = 314

BM #12 - 8" NAIL IN TOP OF 9" PINE STUMP, 208.93' RT. OF -L- STA 280+52.15 EL = 825.96'



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-29	CL	268+00	0.00-3.00	A-7-6(24)	62	34	15.0	18.6	17.9	48.5	98	88	69	-	-
SS-30	75' LT	271+00	0.00-3.00	A-6(5)	34	17	26.7	28.3	14.7	30.3	97	81	49	-	-
SS-31A	75' LT	271+00	3.00-9.00	A-7-6(11)	55	29	25.5	25.7	10.4	38.4	97	82	51	-	-
SS-20	85' RT	272+00	0.00-3.00	A-6(10)	37	16	12.7	24.1	16.7	46.5	97	90	70	-	-
SS-21	85' RT	272+00	4.70-6.20	A-2-4(0)	36	NP	40.6	33.2	16.1	10.1	84	62	26	-	-
MS-22	85' RT	272+00	14.70-16.20											11.8	-
SS-22	85' RT	272+00	14.70-16.20	A-4(0)	29	NP	29.7	36.8	19.3	14.2	91	74	37	-	-
SS-26	75' LT	275+50	0.00-3.00	A-7-6(9)	47	25	32.8	21.4	13.4	32.4	99	75	51	-	-
SS-27	75' LT	275+50	3.00-18.00	A-4(0)	28	NP	38.7	30.6	18.5	12.1	98	71	36	-	-
SS-28	75' LT	275+50	18.00-31.00	A-4(1)	32	7	18.4	40.4	20.9	20.2	98	89	49	-	-
SS-6	75' RT	280+75	0.00-3.00	A-6(5)	38	17	26.5	23.0	16.2	34.3	87	72	48	-	-
MS-7	75' RT	280+75	3.30-4.80											17.9	-
SS-7	75' RT	280+75	3.30-4.80	A-2-4(0)	34	NP	29.1	40.8	20.0	10.1	88	72	34	-	-
MS-8	75' RT	280+75	8.30-9.80				0.0	0.0	0.0	0.0		0	0	9.6	-
SS-8	75' RT	280+75	8.30-9.80	A-2-4(0)	28	NP	40.0	36.0	16.0	8.1	91	68	29	-	-
MS-9	75' RT	280+75	13.30-14.80											15.2	-
SS-9	75' RT	280+75	13.30-14.80	A-4(0)	30	NP	26.9	38.8	22.2	12.1	90	75	40	-	-



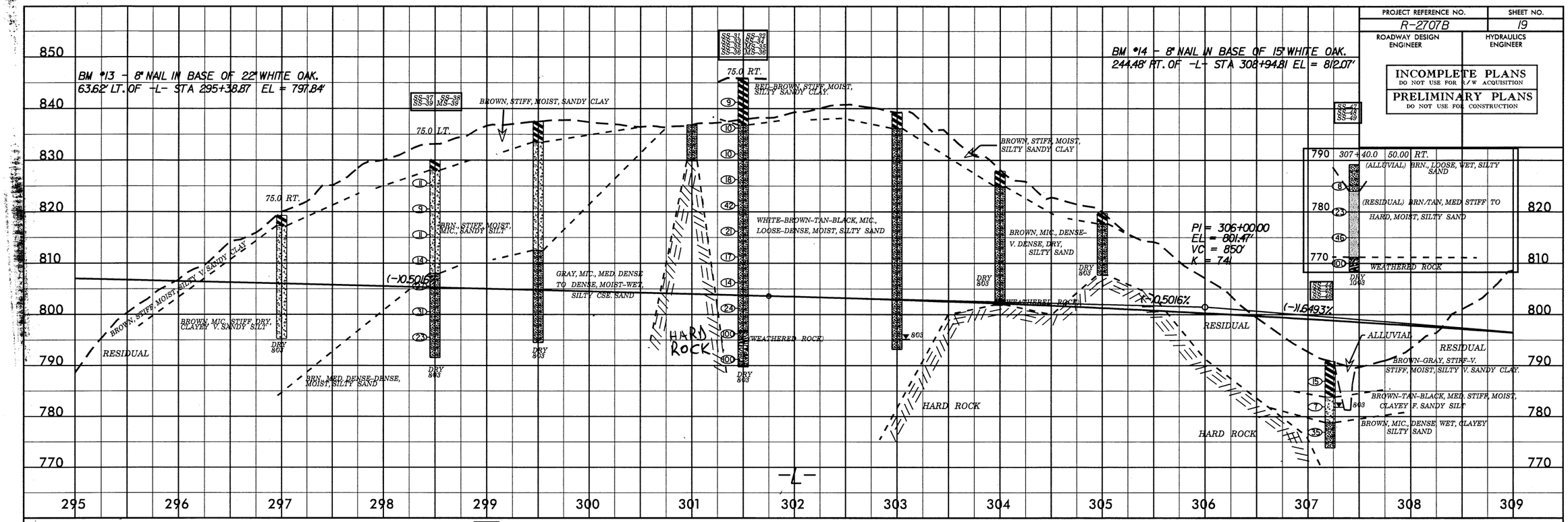
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-10	80' RT	283+00	0.00-8.00	A-4(0)	30	7	32.3	30.7	18.8	18.2	100	77	43	-	-
SS-11	80' RT	283+00	8.00-27.00	A-2-4(0)	34	4	44.2	27.1	14.5	14.1	96	64	32	-	-
SS-12	75' RT	284+50	0.00-9.00	A-7-6(11)	47	23	20.2	24.8	16.6	38.4	98	87	59	-	-
SS-13	75' RT	284+50	9.00-33.00	A-4(0)	23	NP	34.9	35.4	17.6	12.1	100	77	37	-	-
MS-5	75' LT	288+00	34.10-35.00											13.6	-
SS-5	75' LT	288+00	34.10-35.00	A-2-4(0)	31	NP	55.2	29.9	8.9	6.1	90	55	18	-	-
SS-14	CL	289+00	0.00-11.00	A-6(3)	35	13	31.5	24.8	15.4	28.3	98	78	47	-	-
SS-15	CL	289+00	11.00-29.00	A-4(0)	28	5	36.6	29.1	16.2	18.2	98	75	39	-	-
SS-116	50' LT	293+40	0.00-3.50	A-2-4(0)	28	NP	43.3	30.5	14.1	12.1	79	59	25	-	-
SS-117	50' LT	293+40	4.20-5.70	A-4(0)	37	6	26.1	36.2	23.6	14.2	92	76	43	-	-
SS-118	50' LT	293+40	14.20-15.70	A-4(0)	24	NP	8.9	54.4	26.6	10.1	100	98	51	-	-
SS-114	130' LT	293+47	0.00-1.50	A-2-4(0)	27	5	33.5	35.7	14.6	16.2	88	70	32	-	-
SS-115	130' LT	293+47	4.10-5.60	A-2-4(0)	23	NP	44.4	32.0	15.4	8.1	78	54	23	-	-
SS-111	CL	294+20	0.00-1.50	A-6(4)	38	18	23.3	30.6	11.6	34.5	87	77	44	-	-
SS-112	CL	294+20	4.30-5.80	A-1-a(0)	25	NP	56.8	26.4	4.7	12.2	48	28	10	-	-
SS-113	CL	294+20	6.80-8.30	A-5(0)	50	NP	19.3	51.3	19.3	10.1	98	91	36	-	-

PROJECT REFERENCE NO.	SHEET NO.
R-2707B	19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-37	75LT	298+50	0.00-2.00	A-7-6(9)	48	21	17.0	34.8	11.7	36.4	100	95	54	-	-
SS-38	75LT	298+50	4.50-6.00	A-6(0)	43	NP	18.6	48.0	13.2	20.2	100	92	41	-	-
MS-39	75 LT	298+50	24.50-26.00											17.1	-
SS-39	75LT	298+50	24.50-26.00	A-2-5(0)	42	NP	23.9	53.6	14.4	8.1	68	60	22	-	-
SS-31	75' RT	301+50	0.00-3.00	A-7-6(19)	52	27	11.9	19.4	18.0	50.6	96	88	71	-	-
SS-32	75' RT	301+50	4.60-6.10	A-7-6(4)	53	34	46.8	14.2	14.8	24.3	89	54	38	-	-
SS-33	75' RT	301+50	9.60-11.10	A-2-4(0)	38	NP	44.7	24.7	18.4	12.1	95	63	33	-	-
SS-34	75' RT	301+50	19.60-21.10	A-2-5(0)	42	NP	40.5	28.3	17.0	14.2	94	67	35	-	-
MS-35	75 RT	301+50	29.60-31.10											26.2	-
SS-35	75' RT	301+50	29.60-31.10	A-2-5(0)	47	NP	23.9	47.6	16.4	12.1	98	87	34	-	-
MS-36	75 RT	301+50	44.60-46.10											32.6	-
SS-36	75' RT	301+50	44.60-46.10	A-2-4(0)	40	NP	24.3	56.9	10.7	8.1	100	94	28	-	-
SS-44	CL	307+25	3.90-5.40	A-7-6(7)	49	27	31.1	27.7	10.9	30.3	95	80	43	-	-
SS-45	CL	307+25	8.90-10.40	A-5(0)	61	NP	22.0	43.8	18.0	16.2	96	83	42	-	-
SS-46	CL	307+25	13.90-15.40	A-2-5(0)	46	NP	23.0	44.6	20.2	12.1	77	69	31	-	-
SS-47	50' RT	307+40	4.20-5.20	A-2-4(0)	38	NP	44.6	32.5	8.7	14.1	74	53	20	-	-
SS-48	50' RT	307+40	9.20-10.70	A-4(0)	36	NP	23.0	40.6	26.3	10.1	91	80	41	-	-
SS-49	50' RT	307+40	14.20-15.70	A-4(0)	38	NP	29.1	40.6	18.2	12.1	95	78	36	-	-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC	UNIT WT.(lb)	VOID RATIO
SS-69	CL	313+00	0.00-2.00	A-6(4)	38	17	23.0	33.6	13.1	30.3	90	79	43	-	-		
SS-60	CL	317+00	0.00-5.00	A-6(4)	36	17	27.0	30.9	6.4	40.7	89	80	46	-	-		
SS-67	CL	320+00	0.00-1.50	A-7-5(9)	63	31	17.6	28.6	17.3	36.6	92	63	64	-	-		
SS-68	CL	320+00	4.50-6.00	A-4(4)	38	10	31.7	46.7	21.3	28.4	100	99	59	-	-		
SS-69	CL	320+00	9.50-11.00	A-1-b(0)	36	NP	44.4	23.7	17.6	14.3	68	46	25	-	-		
SS-74	CL	322+00	4.50-6.00	A-7-5(14)	63	28	20.1	23.0	8.0	48.8	98	87	66	-	-		
SS-75	CL	322+00	9.50-11.00	A-7-6(31)	48	22	36.4	25.8	9.3	28.5	90	68	37	-	-		
SS-73	CL	322+00	14.50-16.00	A-6(6)	33	18	17.3	36.6	13.4	32.5	98	91	59	-	-		

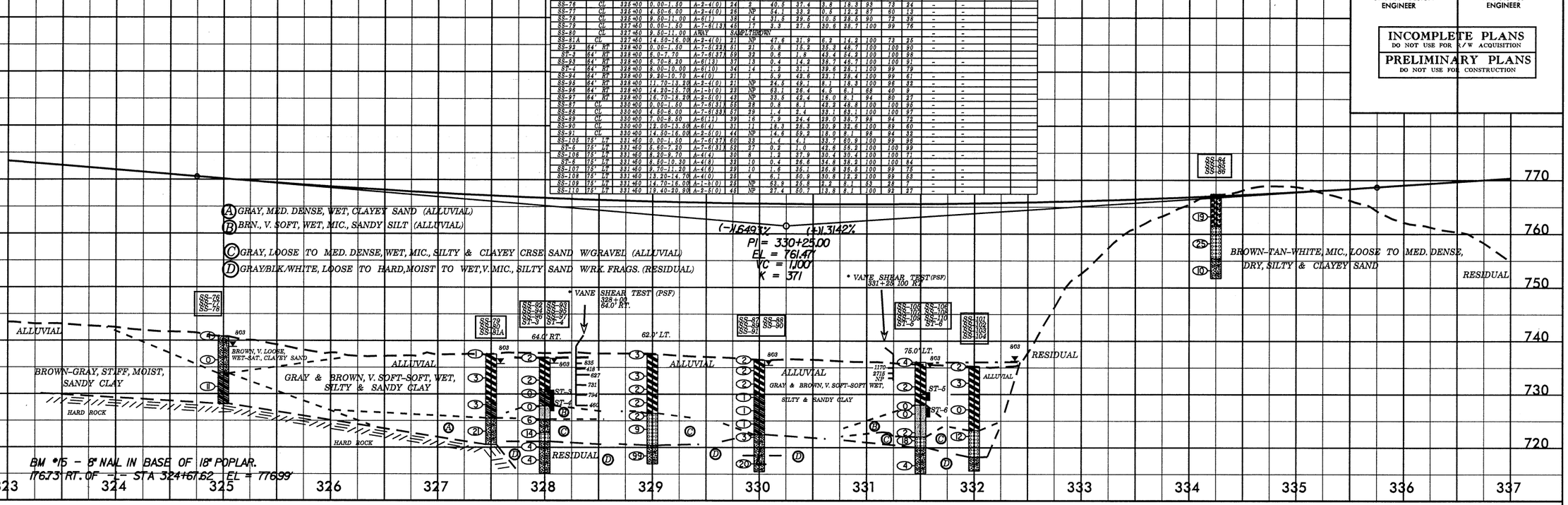
PROJECT REFERENCE NO.	SHEET NO.
R-2707B	20
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

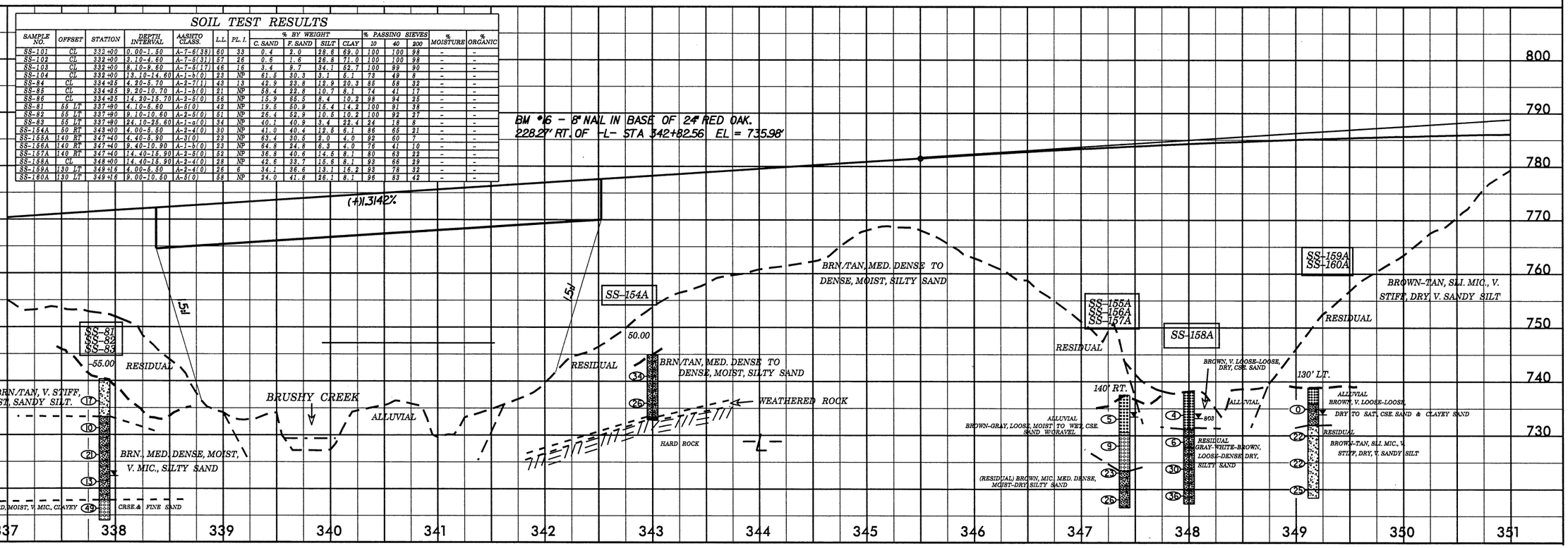
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC	UNIT WT.(g)	VOID RATIO
SS-76	CL	325+00	0.00-1.50	A-2-4(0)	24	2	40.5	37.4	3.8	18.3	93	73	24	-	-		
SS-77	CL	325+00	4.50-6.00	A-2-4(0)	26	NP	54.1	33.2	0.6	12.2	87	60	13	-	-		
SS-78	CL	325+00	9.50-11.00	A-6(1)	38	14	31.6	29.5	10.5	28.5	90	72	38	-	-		
SS-79	CL	327+50	0.00-1.50	A-7-6(13)	45	17	3.3	27.5	30.6	38.7	100	99	76	-	-		
SS-80	CL	327+50	9.50-11.00	AWAY		SAMPLE THROWN								-	-		
SS-81A	CL	327+50	14.50-16.00	A-2-4(0)	21	NP	47.6	31.9	6.2	14.3	100	73	25	-	-		
SS-82	64' RT	328+00	0.00-1.50	A-7-5(23)	61	21	0.8	15.2	35.3	48.7	100	100	90	-	-		
ST-3	64' RT	328+00	6.0-7.70	A-7-6(37)	59	32	0.6	1.8	43.4	54.2	100	100	98				
SS-83	64' RT	328+00	6.70-8.20	A-6(13)	37	13	0.4	14.2	39.7	45.7	100	100	91	-	-		
ST-4	64' RT	328+00	18.00-10.00	A-6(10)	34	14	1.2	19.9	31.1	39.8	28.1	100	99	79			
SS-84	64' RT	328+00	9.30-10.70	A-4(0)	21	1	6.9	42.6	23.1	28.4	100	99	61	-	-		
SS-85	64' RT	328+00	11.70-13.20	A-2-4(0)	21	NP	24.5	49.1	8.1	18.3	100	96	32	-	-		
SS-86	64' RT	328+00	14.20-15.70	A-1-b(0)	23	NP	63.1	26.4	4.5	6.1	68	40	9	-	-		
SS-87	64' RT	328+00	16.70-18.20	A-2-5(0)	43	NP	33.6	42.4	16.0	8.1	94	80	27	-	-		
SS-87	CL	330+00	0.00-1.50	A-7-6(31)	55	28	0.8	8.1	42.2	48.8	100	100	96	-	-		
SS-88	CL	330+00	4.50-6.00	A-7-6(33)	57	29	1.4	2.4	33.1	63.1	100	100	97	-	-		
SS-89	CL	330+00	7.00-8.50	A-6(11)	39	16	7.9	24.4	29.9	38.5	98	94	72	-	-		
SS-90	CL	330+00	12.00-13.50	A-6(4)	31	11	18.3	28.3	20.8	32.6	100	89	60	-	-		
SS-91	CL	330+00	14.50-16.00	A-2-5(0)	44	NP	14.6	59.2	18.0	8.1	98	94	32	-	-		
SS-105	75' LT	331+60	0.00-1.50	A-7-6(37)	60	33	1.4	4.1	33.7	60.9	100	99	95	-	-		
ST-5	75' LT	331+60	6.50-7.20	A-7-6(31)	52	27	0.2	1.0	42.8	56.0	100	100	99				
SS-106	75' LT	331+60	8.30-9.70	A-4(4)	30	8	1.2	37.9	30.4	30.4	100	100	71	-	-		
ST-6	75' LT	331+60	8.50-10.30	A-4(8)	33	10	0.4	26.6	34.8	38.2	100	100	84				
SS-107	75' LT	331+60	9.70-11.20	A-4(6)	29	10	1.6	36.1	26.8	35.5	100	99	76	-	-		
SS-108	75' LT	331+60	13.20-14.70	A-4(0)	28	4	6.1	60.9	30.8	12.2	100	99	53	-	-		
SS-109	75' LT	331+60	14.70-16.00	A-1-b(0)	26	NP	63.9	25.8	9.2	8.1	53	28	7	-	-		
SS-110	75' LT	331+60	19.40-20.90	A-2-5(0)	45	NP	27.4	50.7	13.8	8.1	100	92	27	-	-		



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-101	CL	332+00	0.00-1.50	A-7-6(38)	60	33	0.4	2.0	28.6	69.0	100	100	98	-	-
SS-102	CL	332+00	3.10-4.60	A-7-6(31)	57	26	0.6	1.6	26.8	71.0	100	100	98	-	-
SS-103	CL	332+00	8.10-9.60	A-7-5(17)	46	16	3.4	9.7	34.1	52.7	100	99	90	-	-
SS-104	CL	332+00	13.10-14.60	A-1-b(0)	23	NP	61.5	30.3	3.1	5.1	73	49	8	-	-
SS-84	CL	334+25	4.20-5.70	A-2-7(1)	43	13	42.9	23.8	12.9	20.3	86	58	32	-	-
SS-85	CL	334+25	9.20-10.70	A-1-b(0)	21	NP	58.4	22.8	10.7	8.1	74	41	17	-	-
SS-86	CL	334+25	14.20-15.70	A-2-5(0)	56	NP	15.9	65.5	8.4	10.2	98	94	25	-	-
SS-81	55 LT	337+90	4.10-5.60	A-5(0)	42	NP	19.5	60.9	15.4	14.2	100	91	38	-	-
SS-82	55 LT	337+90	9.10-10.60	A-2-5(0)	51	NP	26.4	52.9	10.5	10.2	100	92	27	-	-
SS-83	55 LT	337+90	24.10-25.60	A-1-a(0)	34	NP	40.1	40.9	3.4	22.4	24	18	8	-	-
SS-154A	50 RT	343+00	4.00-5.50	A-2-4(0)	30	NP	41.0	40.4	12.6	6.1	86	65	21	-	-
SS-155A	140 RT	347+40	4.40-5.90	A-3(0)	23	NP	63.4	30.5	2.0	4.0	92	60	7	-	-
SS-156A	140 RT	347+40	9.40-10.90	A-1-b(0)	23	NP	64.8	24.8	6.3	4.0	76	41	10	-	-
SS-157A	140 RT	347+40	14.40-15.90	A-2-5(0)	52	NP	36.8	40.6	14.6	8.1	80	63	22	-	-
SS-158A	CL	348+00	14.40-15.90	A-2-4(0)	28	NP	42.6	33.7	15.6	8.1	93	66	29	-	-
SS-159A	130 LT	349+16	4.00-5.50	A-2-4(0)	26	6	34.1	36.6	13.1	16.2	93	78	32	-	-
SS-160A	130 LT	349+16	9.00-10.60	A-5(0)	56	NP	24.0	41.8	26.1	8.1	96	83	42	-	-



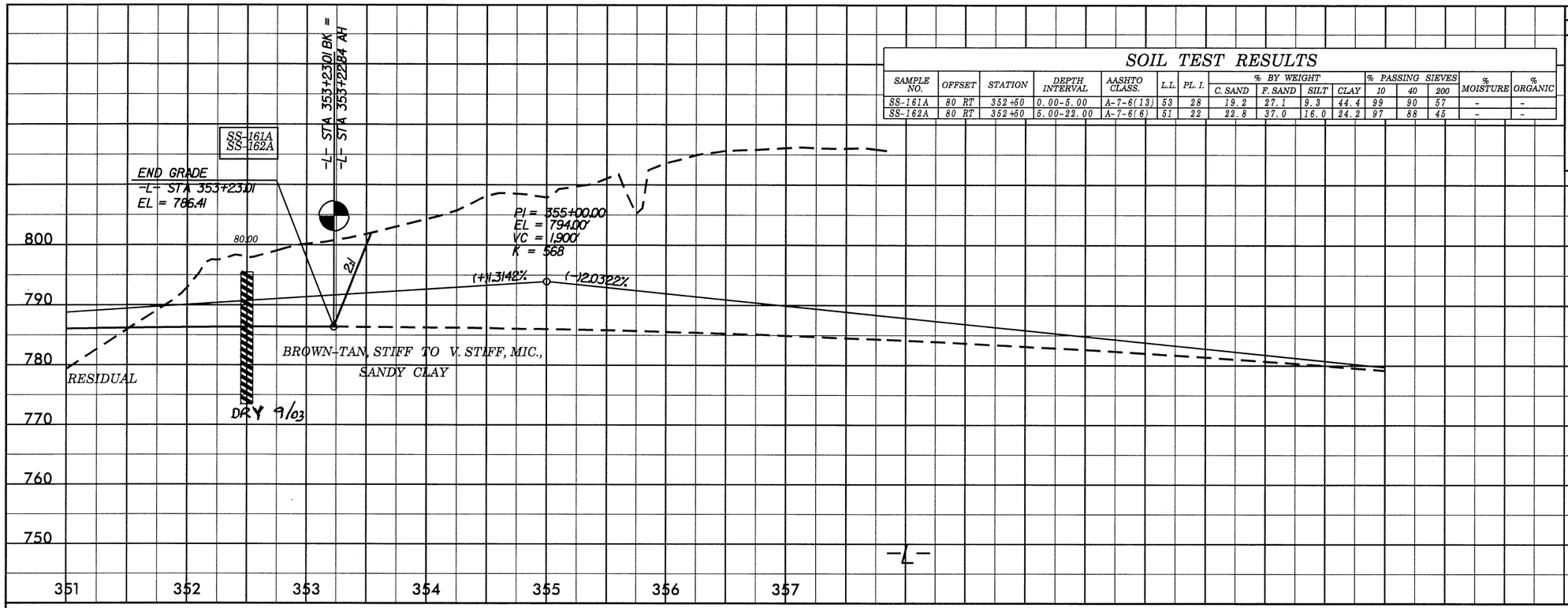
PROJECT REFERENCE NO.	SHEET NO.
R-2707B	21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-161A	80 RT	352+50	0.00-5.00	A-7-6(13)	53	28	19.2	27.1	9.3	44.4	99	90	57	-	-
SS-162A	80 RT	352+50	5.00-22.00	A-7-6(6)	51	22	22.8	37.0	16.0	24.2	97	88	45	-	-



PROJECT REFERENCE NO.	SHEET NO.
R-2707B	22
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-119	CL	231+00	0.00-1.50	A-2-4(0)	27	7	43.1	32.4	6.4	18.2	90	67	26	–	–
SS-120	CL	231+00	3.00-4.50	A-6(2)	38	15	34.0	27.5	8.2	30.3	93	76	40	–	–
SS-121	CL	234+00	0.00-1.50	A-2-4(0)	25	8	37.0	30.9	19.9	12.1	95	73	35	–	–
SS-122	CL	234+00	3.20-4.70	A-7-6(7)	45	18	26.9	25.7	11.0	36.4	100	85	53	–	–
SS-123	50' RT	16+00	0.00-1.50	A-6(5)	37	17	27.9	23.3	12.4	36.4	98	81	51	–	–
SS-124	50' RT	16+00	3.40-4.90	A-6(3)	36	14	32.8	24.5	14.5	28.3	98	77	46	–	–
SS-125	CL	18+00	4.10-5.60	A-7-6(6)	48	22	34.4	22.9	6.4	36.4	99	81	46	–	–
SS-126	CL	20+00	3.70-5.20	A-7-5(11)	52	17	11.5	29.9	34.3	24.3	96	90	65	–	–
SS-127	CL	22+00	0.00-1.50	A-7-5(27)	67	35	17.0	12.7	11.6	58.6	99	88	73	–	–

PI = 19+75.00
EL = 907.48'
VC = 750'
K = 132

(+)3.7638%

(-)1.9019%

BEGIN GRADE
STA. 10+00
EL=870.79

(ALLUVIUM) BROWN, LOOSE, WET, CLAYEY SAND

SS-119
SS-120

11+43.77 -RPB- 48.46 RT. = 231+00 CL -L-

RESIDUAL

RESIDUAL

RED-BROWN-TAN-GRAY, STIFF-V. STIFF, DRY, V. SANDY CLAY

DRY 903

BROWN, MED. DENSE, DRY, CLAYEY SILTY SAND

SS-121
SS-122

14+27.35 -RPB- 86.18 RT. = 234+00 CL -L-

DRY 903

SS-123
SS-124

DRY 903

RED/BRN., STIFF TO V. STIFF, MOIST, SANDY CLAY

SS-125

DRY 903

SS-126

RED/BRN., STIFF TO V. STIFF, MOIST, SANDY CLAY

DRY 903

SS-127

DRY 903

-RPB-

PI = 26+83.83
EL = 894.00'

END GRADE
STA. 26+83.83
EL=894.00

(-)1.9019%

(-)6.0599%

89279

RED/BRN., STIFF TO V. STIFF, MOIST, SANDY CLAY

-RPB-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-128	CL	14+00	0.00-1.50	A-7-6(21)	57	32	15.6	17.6	10.2	56.6	96	88	67	-	-
SS-129	CL	15+00	3.70-5.20	A-7-5(17)	74	30	22.6	14.8	20.1	42.5	89	75	58	-	-

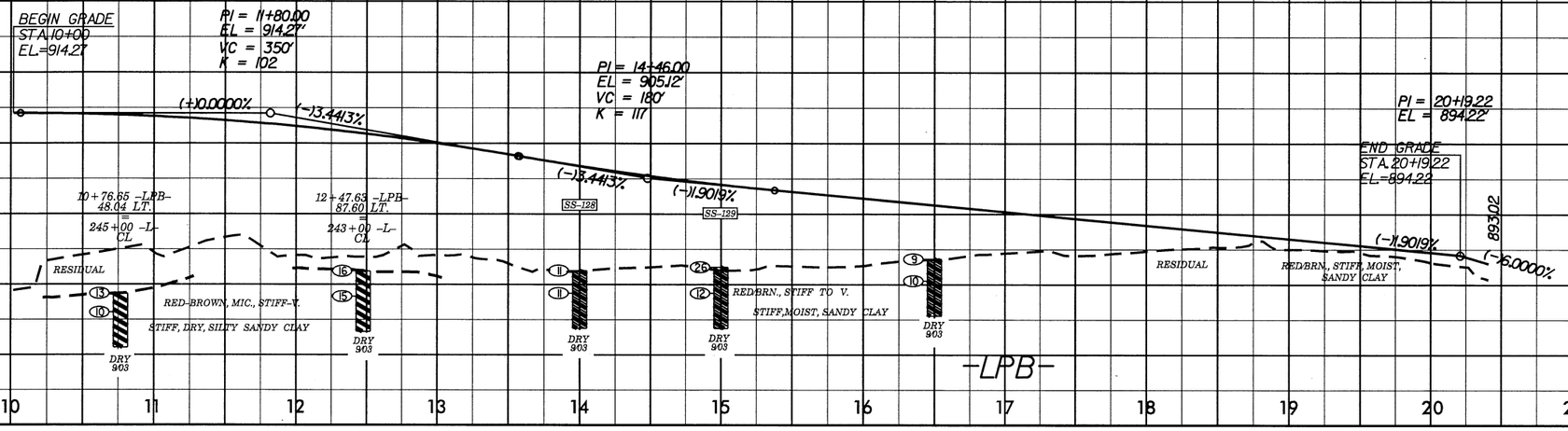
PROJECT REFERENCE NO.	SHEET NO.
R-2707B	23

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

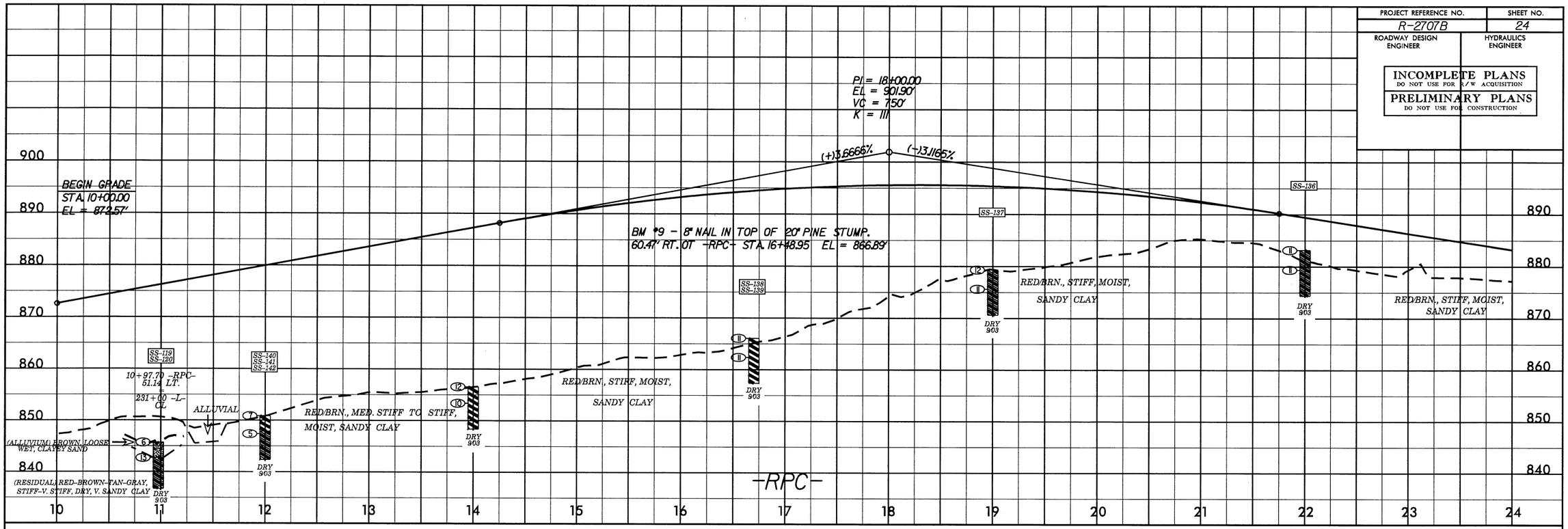
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

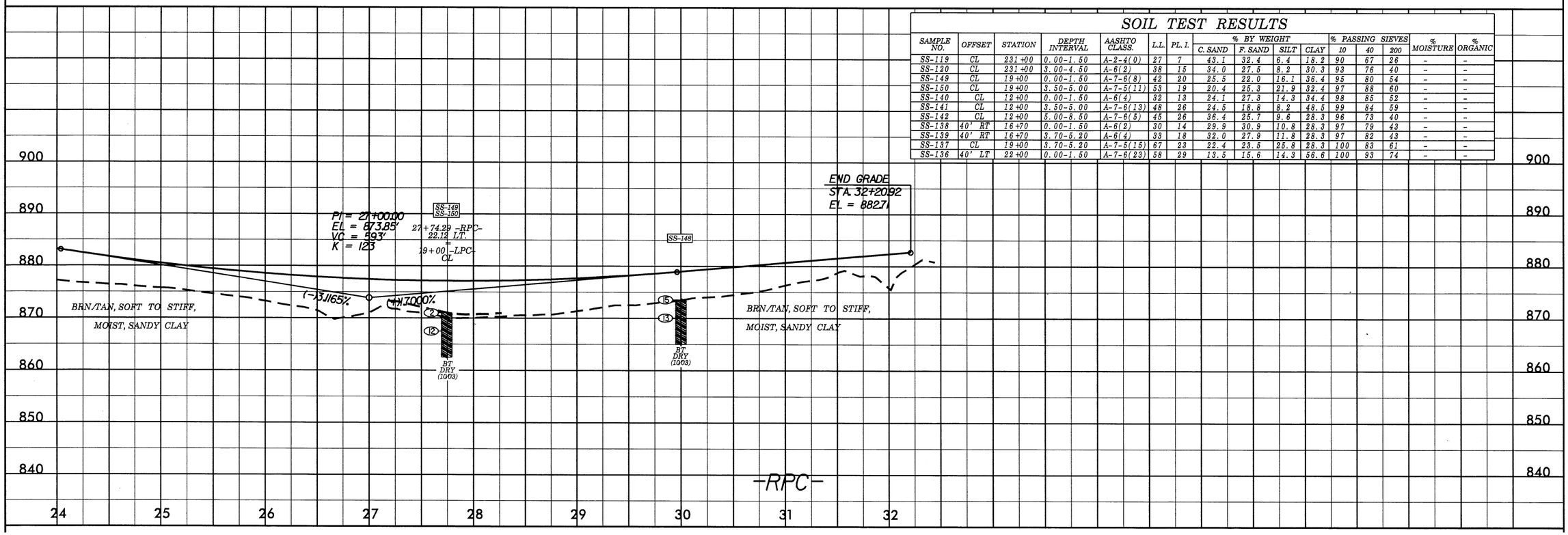


PROJECT REFERENCE NO.	SHEET NO.
R-2707B	24
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION





SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-119	CL	231+00	0.00-1.50	A-2-4(0)	27	7	43.1	32.4	6.4	18.2	90	67	26	-	-
SS-120	CL	231+00	3.00-4.50	A-6(2)	38	15	34.0	27.5	8.2	30.3	93	76	40	-	-
SS-149	CL	19+00	0.00-1.50	A-7-6(8)	42	20	25.5	22.0	16.1	36.4	95	80	54	-	-
SS-150	CL	19+00	3.50-6.00	A-7-5(11)	53	19	20.4	25.3	21.9	32.4	97	88	60	-	-
SS-140	CL	12+00	0.00-1.50	A-6(4)	32	13	24.1	27.3	14.3	34.4	98	85	52	-	-
SS-141	CL	12+00	3.50-5.00	A-7-6(13)	48	26	24.5	18.8	8.2	48.5	99	84	59	-	-
SS-142	CL	12+00	5.00-8.50	A-7-6(5)	45	26	36.4	25.7	9.6	28.3	96	73	40	-	-
SS-138	40' RT	16+70	0.00-1.50	A-6(2)	30	14	29.9	30.9	10.8	28.3	97	79	43	-	-
SS-139	40' RT	16+70	3.70-6.20	A-6(4)	33	18	32.0	27.9	11.8	28.3	97	82	43	-	-
SS-137	CL	19+00	3.70-5.20	A-7-5(15)	67	23	22.4	23.5	25.8	28.3	100	83	61	-	-
SS-136	40' LT	22+00	0.00-1.50	A-7-6(23)	58	29	13.5	15.6	14.3	56.6	100	93	74	-	-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-134	CL	13+40	0.00-1.50	A-7-5(23)	62	31	15.4	16.6	11.4	56.6	100	92	71	-	-
SS-135	CL	13+40	3.50-5.00	A-7-6(18)	58	22	13.5	19.0	18.9	48.5	100	96	72	-	-
SS-149	CL	19+00	0.00-1.50	A-7-6(8)	42	20	25.5	22.0	16.1	36.4	95	80	54	-	-
SS-150	CL	19+00	3.50-5.00	A-7-6(11)	53	19	20.4	25.3	21.9	32.4	97	88	60	-	-
SS-148	CL	30+00	0.00-1.50	A-7-6(14)	52	29	22.2	24.9	10.4	42.5	98	86	57	-	-

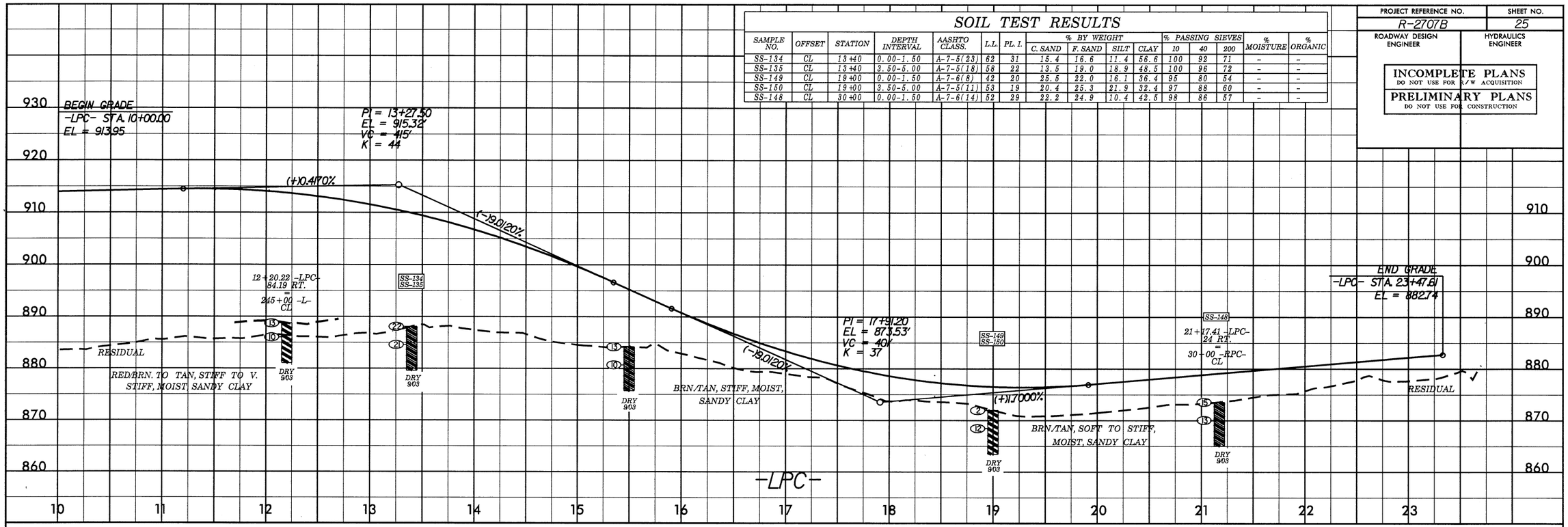
PROJECT REFERENCE NO.	SHEET NO.
R-2707B	25

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

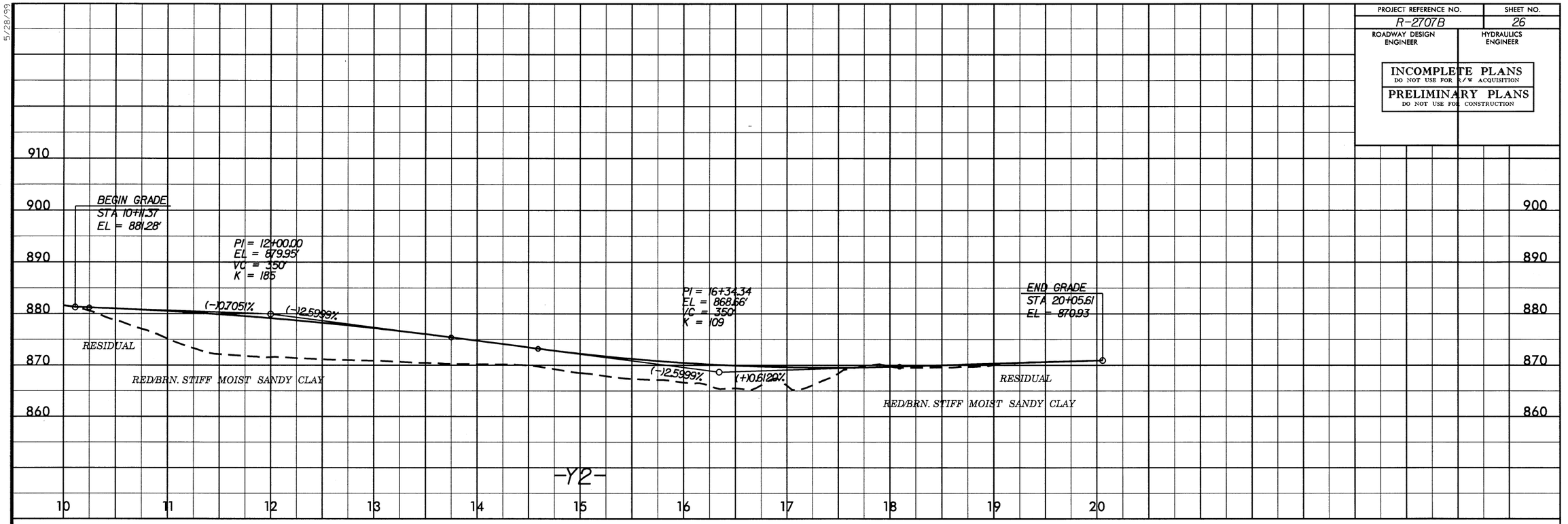


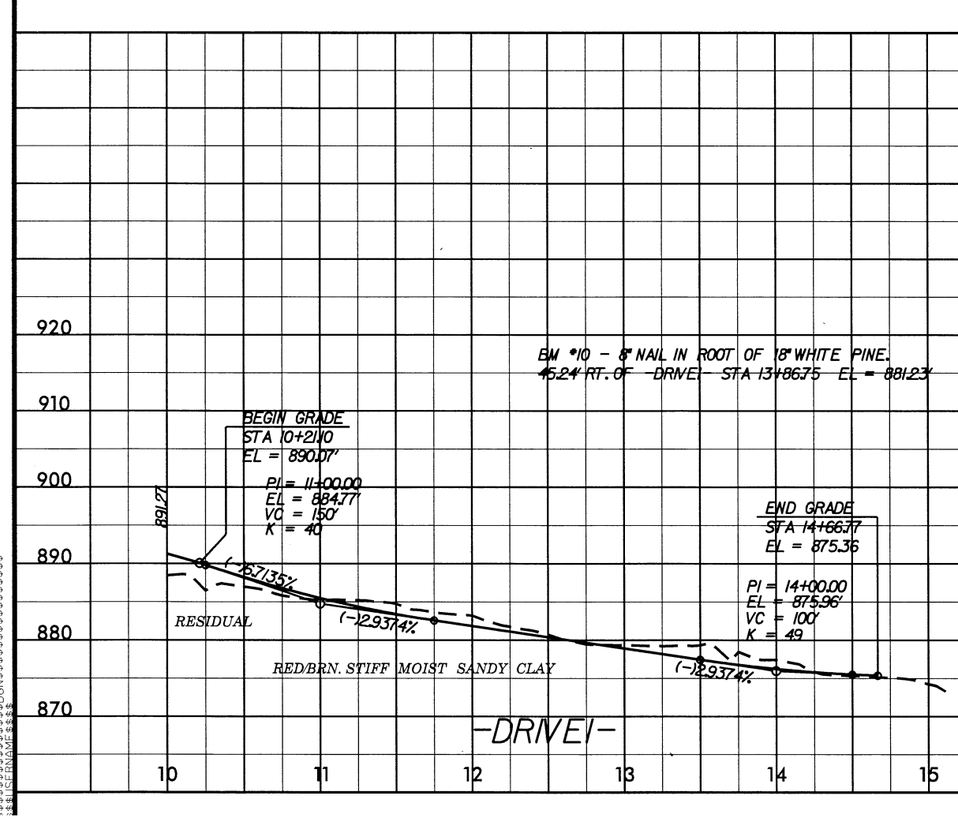
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2707B	26
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION





PROJECT REFERENCE NO.	SHEET NO.
R-2707B	27
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-199	60' LT	246+81	4.10-5.60	A-7-5(9)	53	21	33.6	17.3	22.9	26.2	100	75	53	-	-
SS-200	60' LT	246+81	9.10-10.60	A-7-5(6)	53	17	26.2	32.2	27.5	14.1	100	84	50	-	-
SS-201	60' LT	246+81	19.10-20.60	A-5(0)	42	6	38.9	28.8	24.3	8.1	98	68	38	-	-
SS-201A	60' LT	246+81	29.10-30.60	A-4(0)	38	4	39.3	30.0	20.6	10.1	99	72	37	-	-
SS-202	21' LT	247+10	9.10-10.60	A-7-5(3)	46	15	43.3	17.7	24.9	14.1	99	65	41	-	-
SS-203	21' LT	247+10	44.10-45.60	A-5(0)	42	NP	15.9	45.5	30.5	8.1	100	92	51	-	-
SS-145	60' RT	247+68	4.40-5.90	A-7-6(4)	41	12	28.2	24.5	21.1	26.2	97	81	51	-	-
SS-146	60' RT	247+68	14.40-15.90	A-5(3)	45	9	21.8	32.2	23.8	22.2	95	85	52	-	-
SS-147	60' RT	247+68	29.40-30.90	A-4(0)	32	NP	29.5	40.2	18.1	12.1	100	85	39	-	-
SS-194	22' RT	248+90	4.50-6.00	A-5(0)	50	NP	19.7	41.9	30.3	8.1	99	88	49	-	-
SS-195	22' RT	248+90	39.50-41.00	A-2-4(0)	35	NP	35.2	37.9	20.8	6.0	98	76	34	-	-
SS-196	22' RT	248+90	54.50-56.00	A-7-5(13)	62	19	7.0	38.7	36.2	18.1	100	98	64	-	-
SS-197	55' RT	249+20	4.10-5.60	A-6(4)	39	14	22.4	36.1	33.5	8.1	97	84	49	-	-
SS-198	55' RT	249+20	19.10-20.60	A-4(2)	37	9	20.5	42.7	28.7	8.1	97	87	47	-	-

BEGIN GRADE
-Y7- STA. 14+50.00
EL = 890.84

PI = 16+85.00
EL = 890.90'
VC = 300'
K = 267

PI = 19+65.00
EL = 894.12'
VC = 260'
K = 158

PI = 24+30.00
EL = 891.80'
VC = 500'
K = 296

(+)0.0260% (+)1.1500% (+)1.1500% (-)0.5000% (-)0.5000%

RESIDUAL

RED/BRN. MED. STIFF TO HARD MOIST SANDY CLAY

BM #10 - 8" NAIL IN ROOT OF 18" WHITE PINE.
221.02' LT. OF -Y7- STA 26+08.79 EL = 881.23'.

-Y7-

-L- STA. 247+90.66 =
-Y7- STA. 25+55.10

25+40 -Y7- 50.0 RT. = 247+40 -L- 20.0 RT.

25+89.61 -Y7- 53.70 RT. = 247+68 -L- 60 RT.

SS-145 SS-146 SS-147
SS-199 SS-200 SS-201 SS-201A
SS-202 SS-203
SS-194 SS-195 SS-196
SS-197 SS-198

24920 249+20.0 55.00

24390 248+90.0 22.00

-60.00 -21.00

(-)12.1898%

903 DRY

Ⓐ RED/BRN. MED. STIFF TO HARD MOIST SANDY CLAY
Ⓑ BRN./TAN TO GRAY/WHITE MED. STIFF TO HARD SANDY SILT
Ⓒ GRAY/BRN. MED. DENSE MOIST SILTY SAND
Ⓓ WEATHERED ROCK

PI = 28+80.00
EL = 881.94'
VC = 350'
K = 128

END GRADE
-Y7- STA 35+00.00
EL = 885.35

(-)12.1898% (+)0.5496%

RESIDUAL

RED/BRN. MED. STIFF TO HARD MOIST SANDY CLAY

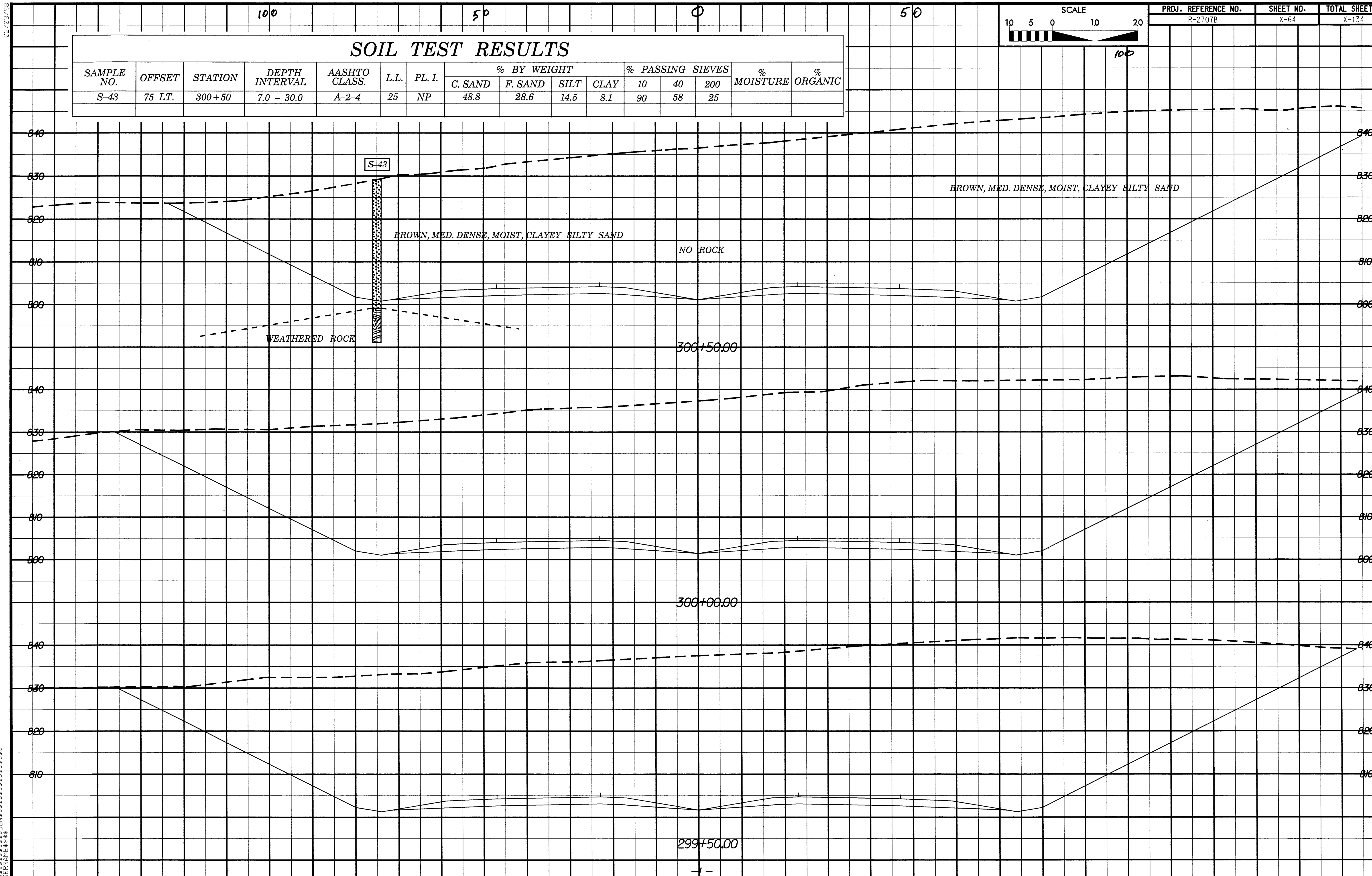
-Y7-

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-2707B	X-64	X-134

SCALE 10 5 0 10 20

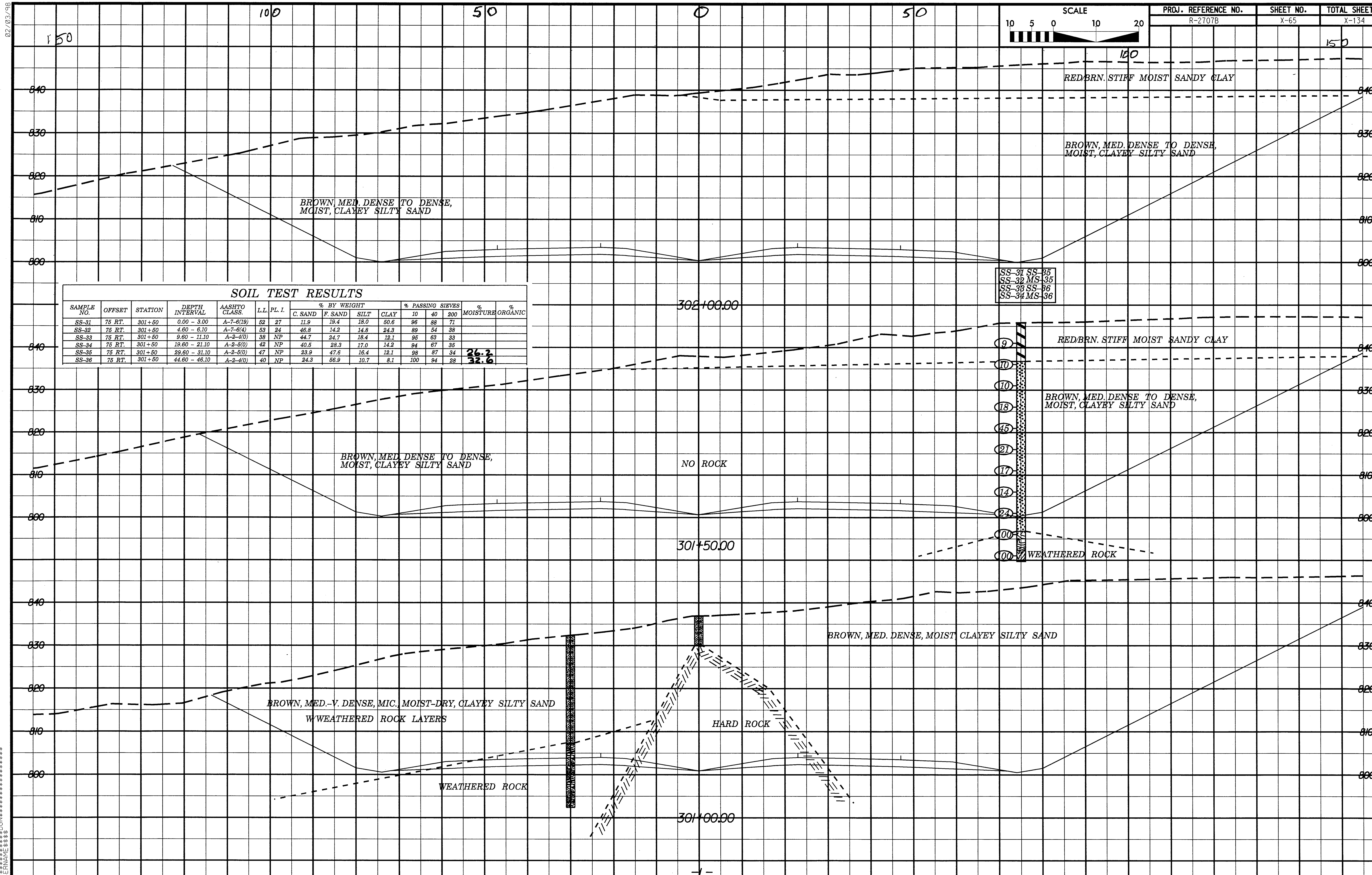
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-43	75 LT.	300+50	7.0 - 30.0	A-2-4	25	NP	48.8	28.6	14.5	8.1	90	58	25		



29/44

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-2707B	X-65	X-134



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-31	75 RT.	301+50	0.00 - 3.00	A-7-6(19)	52	27	11.9	19.4	18.0	50.6	96	88	71		
SS-32	75 RT.	301+50	4.60 - 6.10	A-7-6(4)	53	24	46.8	14.2	14.8	24.3	89	54	38		
SS-33	75 RT.	301+50	9.60 - 11.10	A-2-4(0)	38	NP	44.7	24.7	18.4	12.1	95	63	33		
SS-34	75 RT.	301+50	19.60 - 21.10	A-2-5(0)	42	NP	40.5	28.3	17.0	14.2	94	67	35		
SS-35	75 RT.	301+50	29.60 - 31.10	A-2-5(0)	47	NP	23.9	47.6	16.4	12.1	98	87	34	26.2	
SS-36	75 RT.	301+50	44.60 - 46.10	A-2-4(0)	40	NP	24.3	56.9	10.7	8.1	100	94	28	32.6	

02/03/98

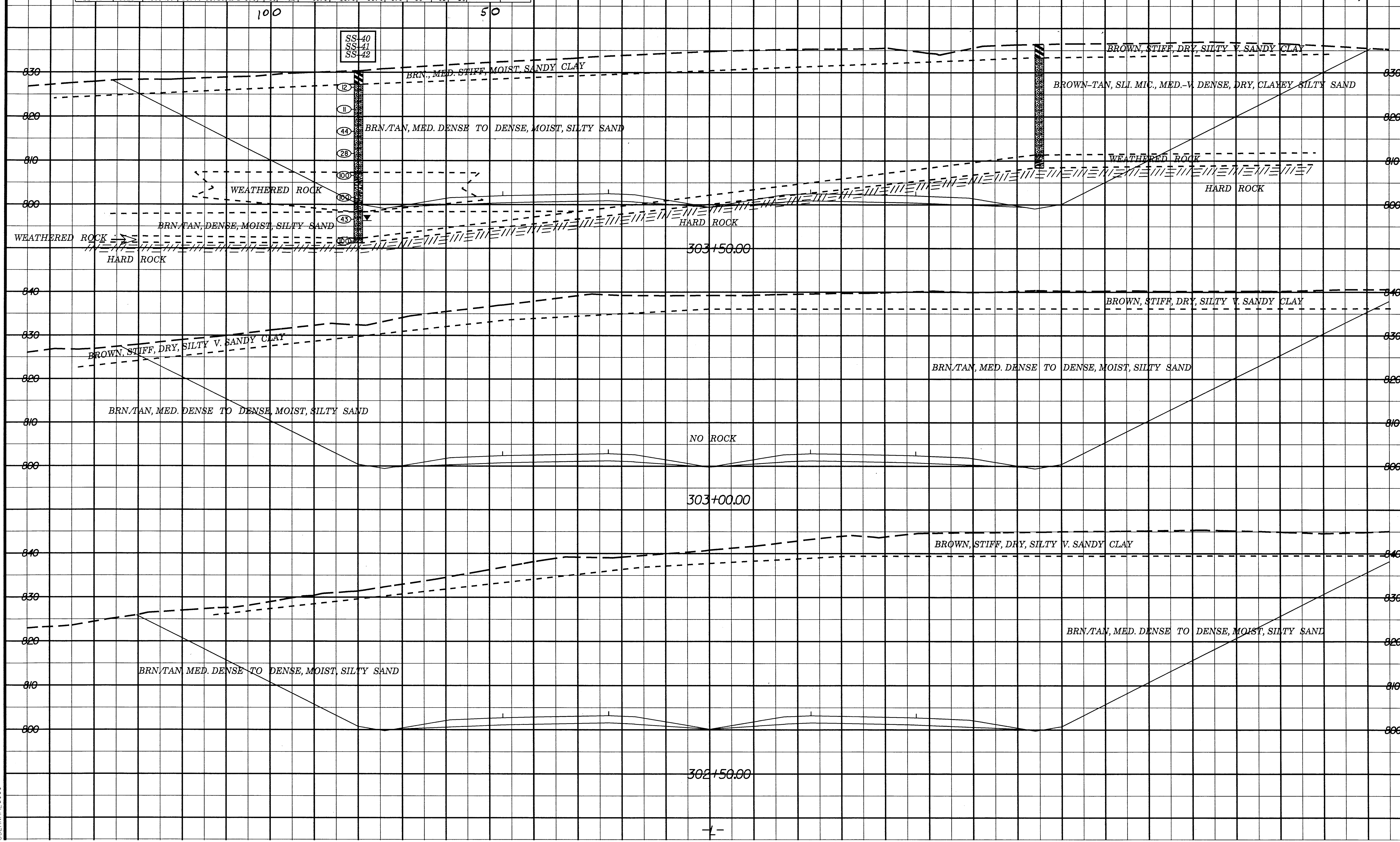
$$$SYSTIME$$$$
$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$
USERNAME$$$$

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-2707B	X-66	X-134

SCALE 10 5 0 10 20

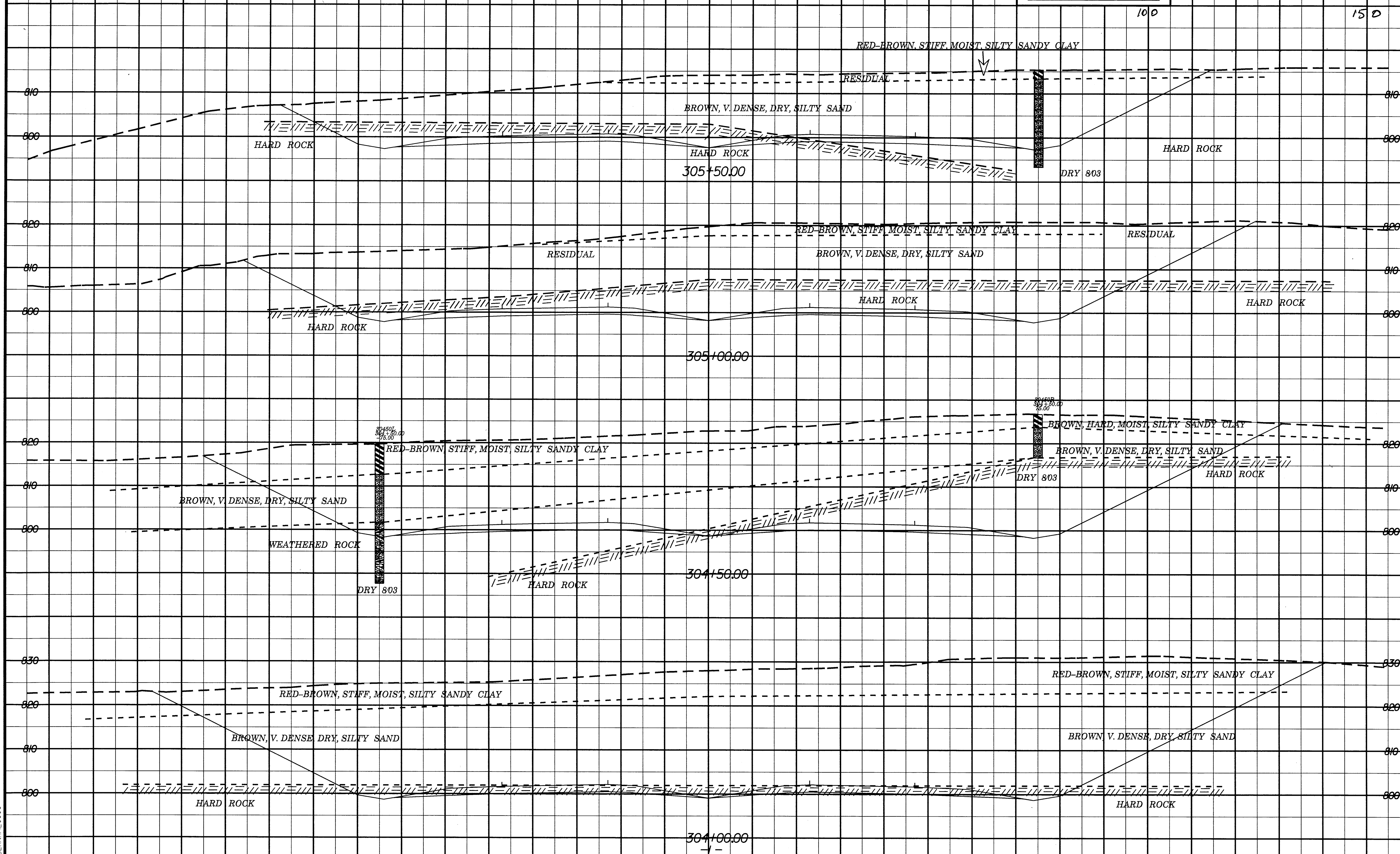
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-40	80LT	303+50	0.00-2.00	A-7-5(11)	57	25	16.8	31.4	19.4	32.4	94	89	54	-	-
SS-41	80LT	303+50	3.70-5.20	A-2-5(0)	44	NP	18.6	53.2	11.9	16.2	98	92	35	-	-
SS-42	80LT	303+50	13.70-15.20	A-2-5(0)	46	NP	40.9	35.6	15.4	8.1	86	62	26	-	-



31/44

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-2707B	X-67	X-134



02/03/98
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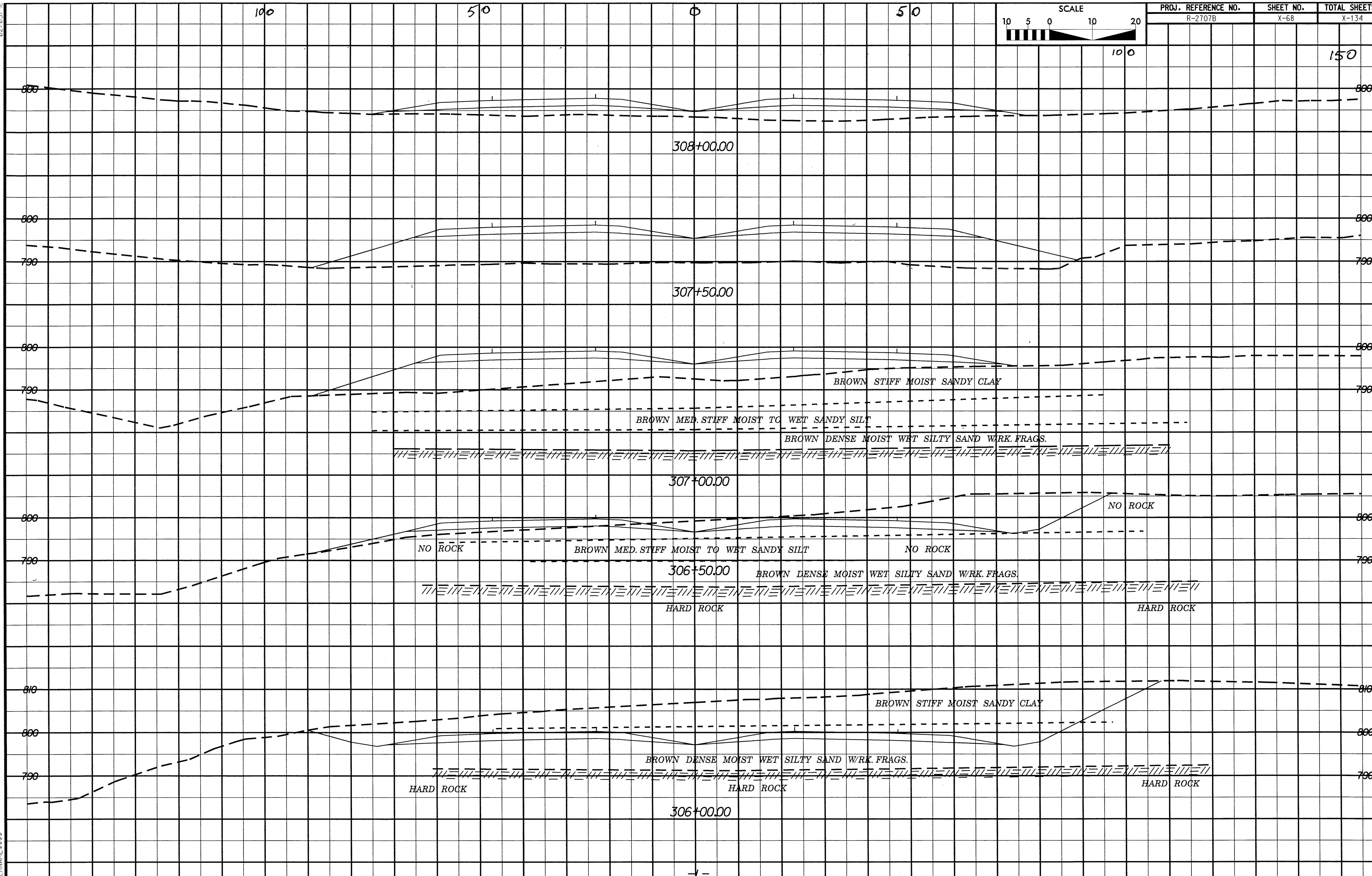
$USERNAME$$$$

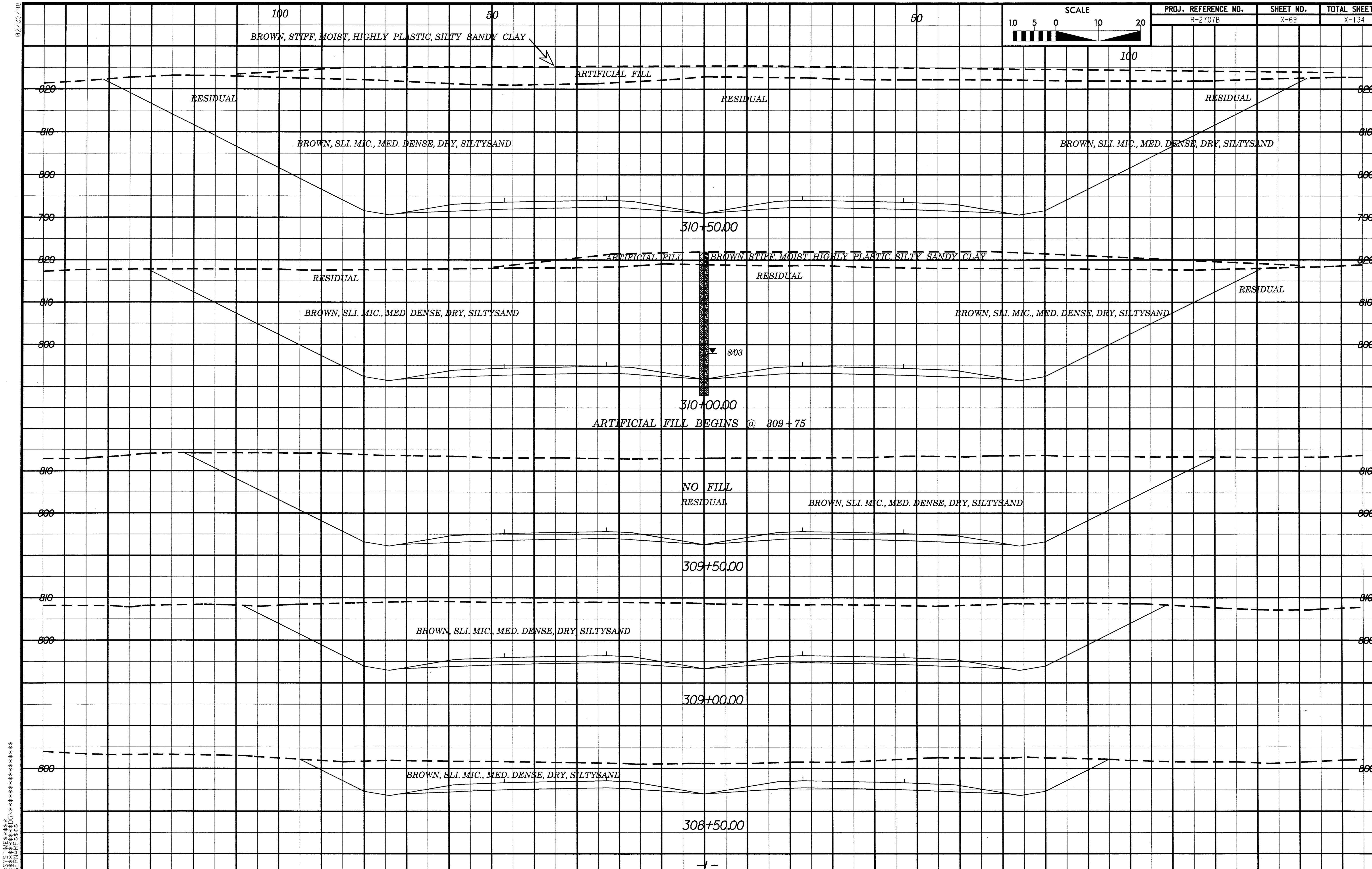
32/44



SCALE
10 5 0 10 20
PROJ. REFERENCE NO. R-2707B
SHEET NO. X-68
TOTAL SHEETS X-134
100
50
0
50
100
150
800
790
810
308+00.00
307+50.00
307+00.00
306+50.00
306+00.00
BROWN STIFF MOIST SANDY CLAY
BROWN MED. STIFF MOIST TO WET SANDY SILT
BROWN DENSE MOIST WET SILTY SAND W/RK. FRAGS.
NO ROCK
HARD ROCK

-1-

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-2707B	X-69	X-134



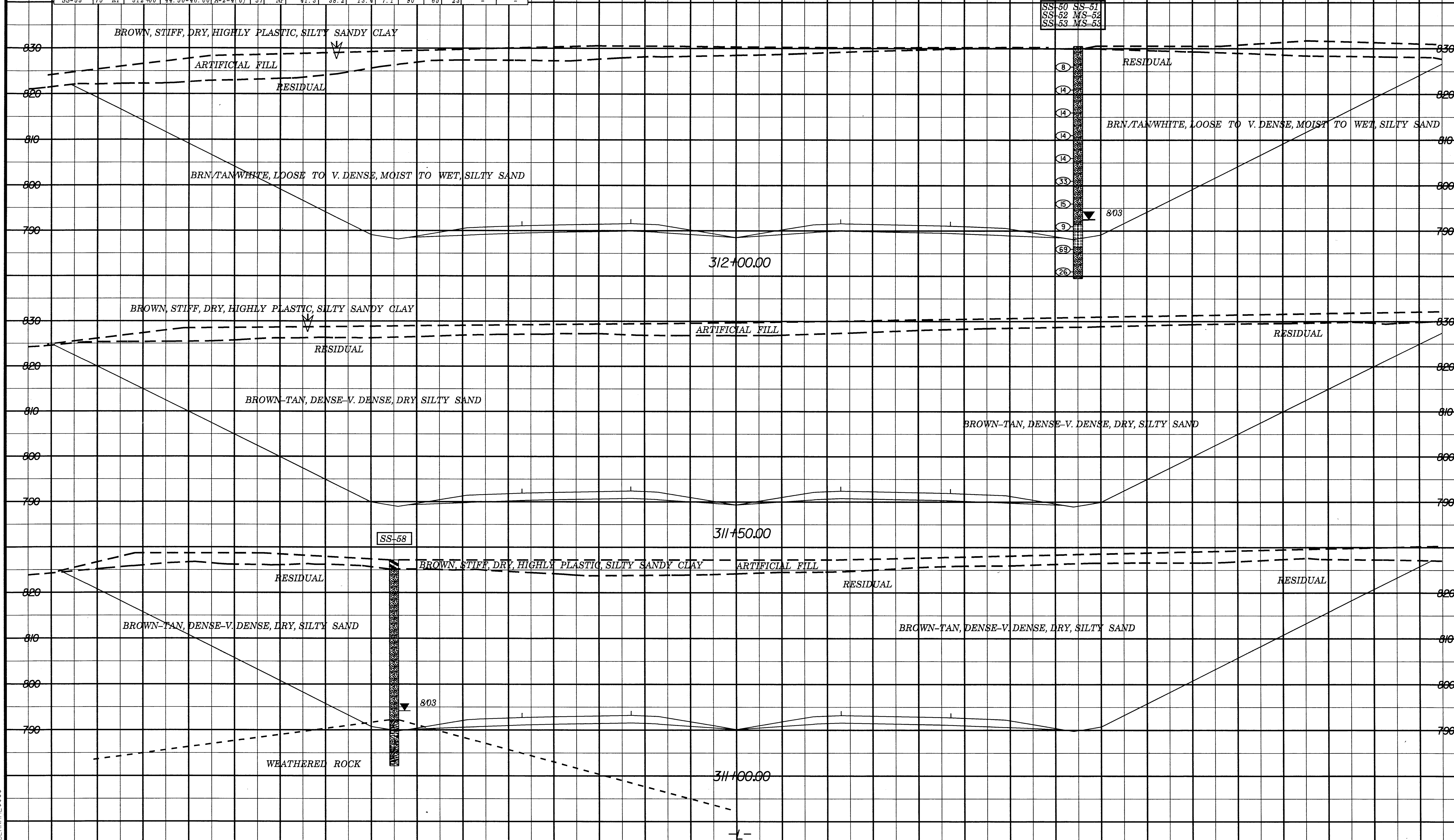
02/03/98

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-58	75' LT	311+00	0.00-2.00	A-7-6(29)	68	43	14.3	18.2	14.9	52.5	98	90	69	-	-
SS-50	75' RT	312+00	4.50-6.00	A-2-5(0)	46	NP	20.2	55.4	16.4	8.1	100	94	34	-	-
SS-51	75' RT	312+00	29.50-31.00	A-2-4(0)	33	NP	46.7	33.3	12.9	7.1	95	66	24	-	-
MS-52	75 RT	312+00	39.50-41.00											29.6	-
SS-52	75' RT	312+00	39.50-41.00	A-1-b(0)	48	NP	20.2	64.4	7.3	8.1	99	49	21	-	-
MS-53	75 RT	312+00	44.50-46.00											20.4	-
SS-53	75' RT	312+00	44.50-46.00	A-2-4(0)	37	NP	41.3	38.2	13.4	7.1	90	65	23	-	-

SCALE 10 5 0 10 20

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-2707B	X-70	X-134



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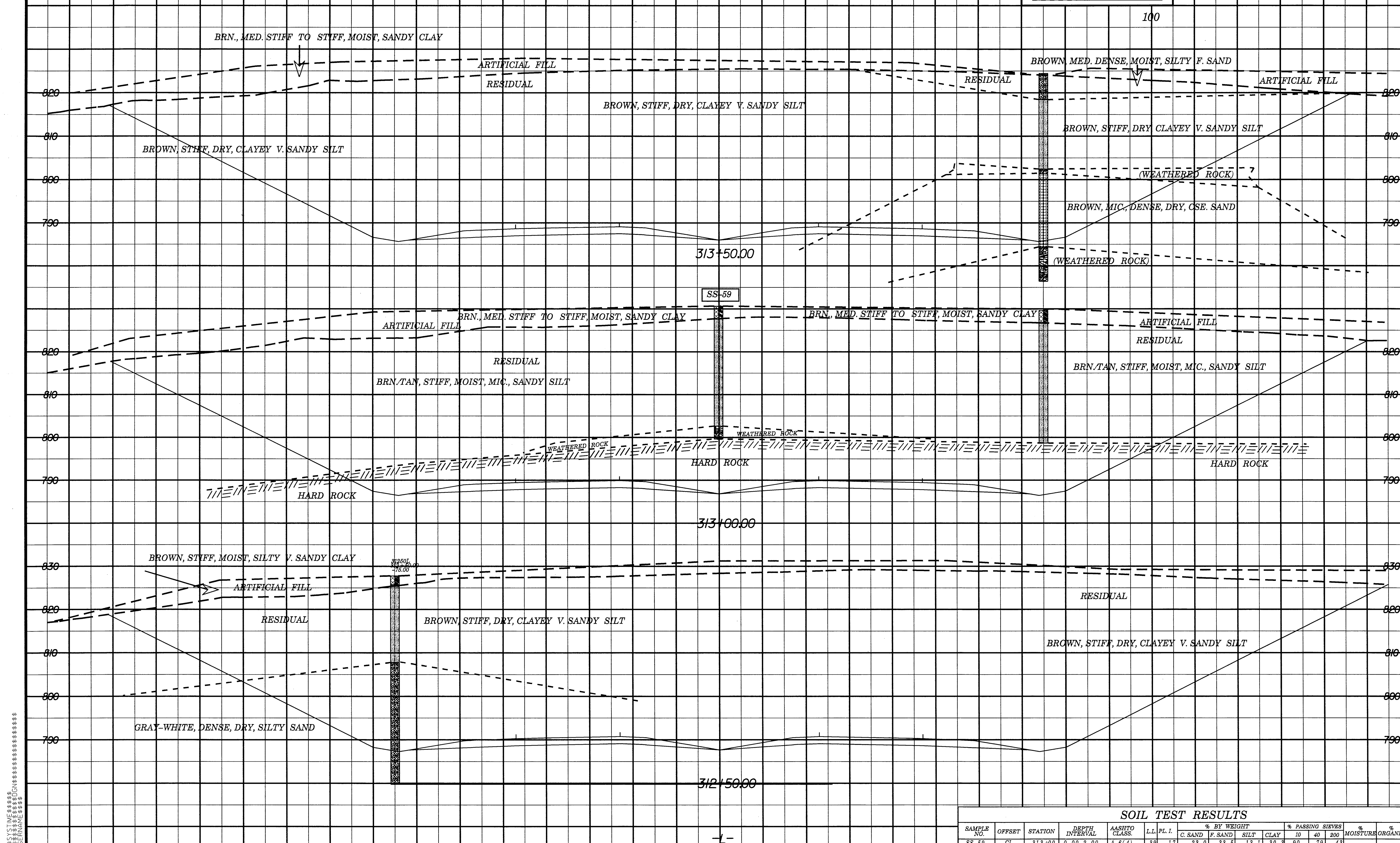
$$$USERNAME$$$$

35/44

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-2707B	X-71	X-134



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-59	CL	313+00	0.00-2.00	A-6(4)	39	17	23.0	33.5	13.1	30.3	90	79	43	-	-

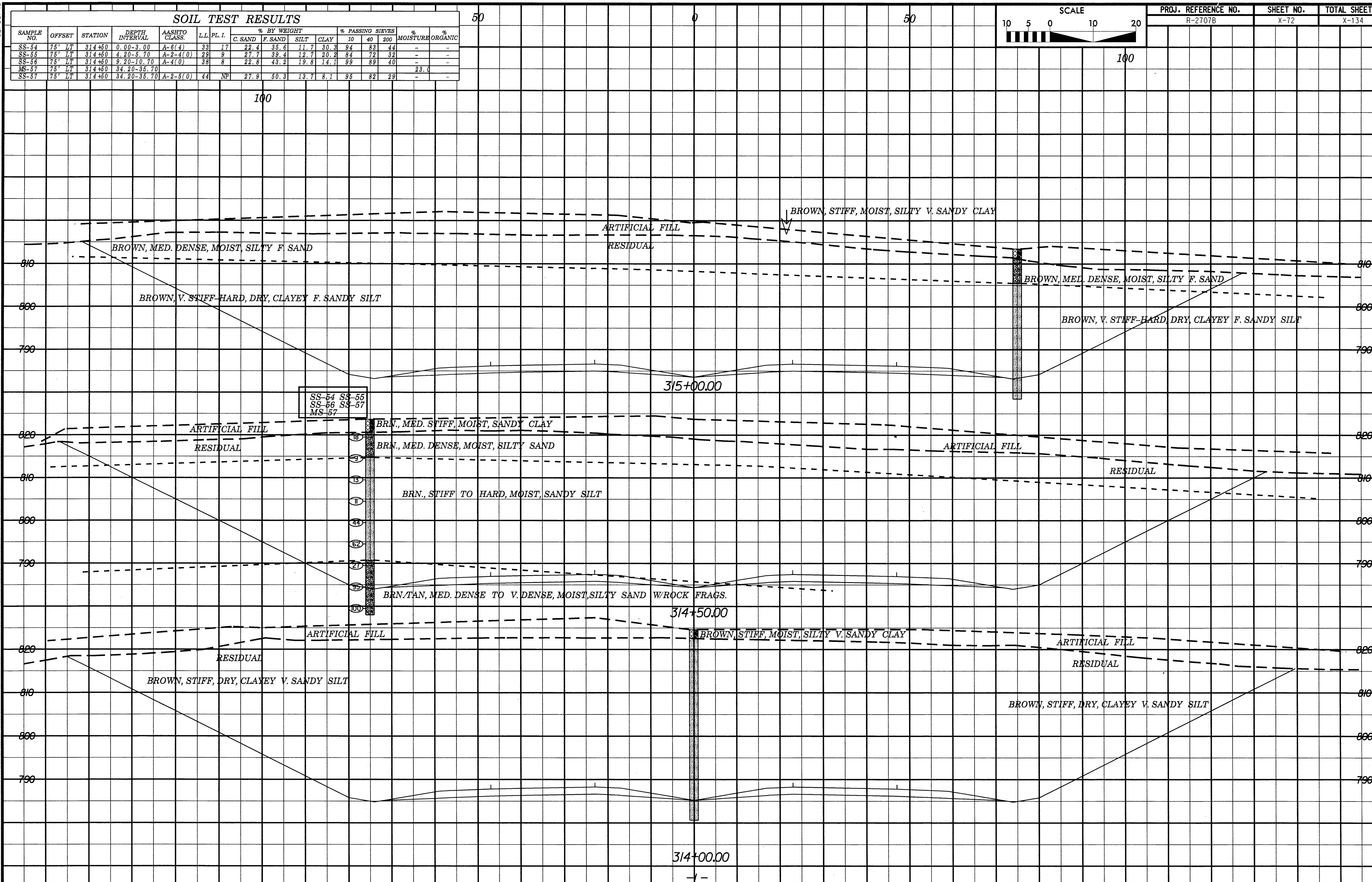
02/03/98

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-2707B	X-72	X-134

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT: C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES: 10	40	200	% MOISTURE	% ORGANIC
SS-54	75' LT	314+50	0.00-3.00	A-6(4)	33	17	22.4	35.6	11.7	30.3	94	83	44	-	-
SS-55	75' LT	314+50	4.20-5.70	A-2-4(0)	29	9	27.7	39.4	12.7	20.2	84	72	32	-	-
SS-56	75' LT	314+50	9.20-10.70	A-4(0)	38	8	22.8	43.2	19.8	14.1	99	89	40	-	-
MS-57	75' LT	314+50	34.20-35.70											23.0	
SS-57	75' LT	314+50	34.20-35.70	A-2-5(0)	44	NP	27.9	50.3	13.7	8.1	95	82	29	-	-

SCALE 10 5 0 10 20

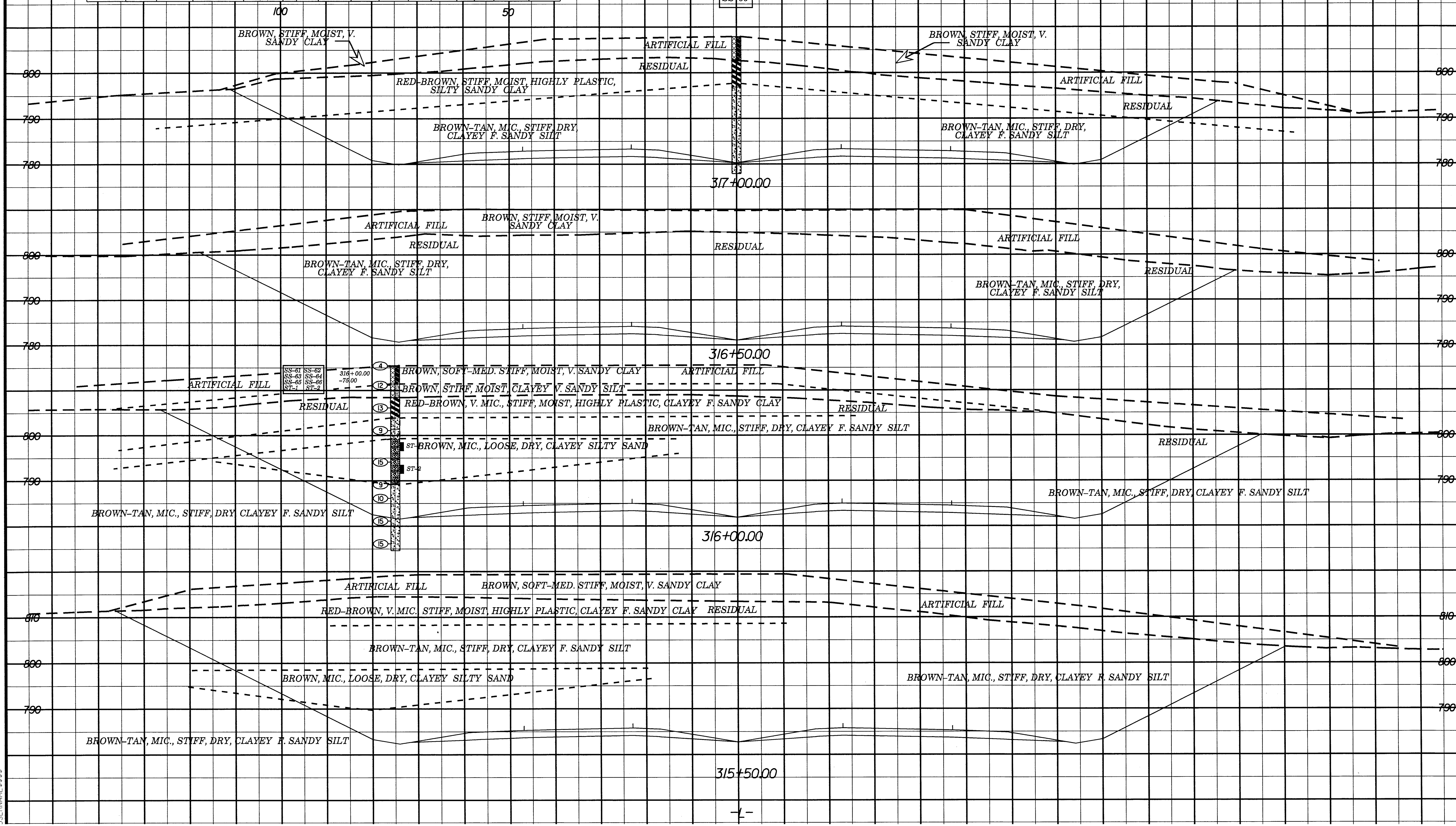


PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-2707B	X-73	X-134

SCALE 10 5 0 10 20

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-61	75' LT	316+00	0.00-1.50	A-6(4)	38	15	22.5	30.6	8.3	38.5	91	82	47	-	-
SS-62	75' LT	316+00	4.30-5.80	A-4(1)	28	10	23.7	31.6	14.2	30.4	86	74	43	-	-
SS-63	75' LT	316+00	9.30-10.80	A-7-6(12)	53	29	16.6	27.8	11.0	44.6	89	81	53	-	-
SS-64	75' LT	316+00	14.30-15.80	A-5(2)	63	NP	5.1	49.9	26.8	18.3	100	100	52	-	-
ST-1	75' LT	316+00	19.30-21.30	A-2-5(0)	41	NP	39.5	33.1	19.4	8.1	95	66	32		
SS-65	75' LT	316+00	21.30-22.80	A-2-5(0)	41	NP	32.3	39.1	16.4	12.2	94	77	33	-	-
ST-2	75' LT	316+00	24.30-26.30	A-2-5(0)	55	NP	10.0	67.5	16.5	6.0	100	97	35		
SS-66	75' LT	316+00	26.30-27.80	A-5(0)	53	NP	12.0	60.9	17.0	10.1	100	97	37	-	-
SS-60	CL	317+00	0.00-5.00	A-6(4)	35	17	22.0	30.9	6.4	40.7	89	80	46	-	-



02/03/98

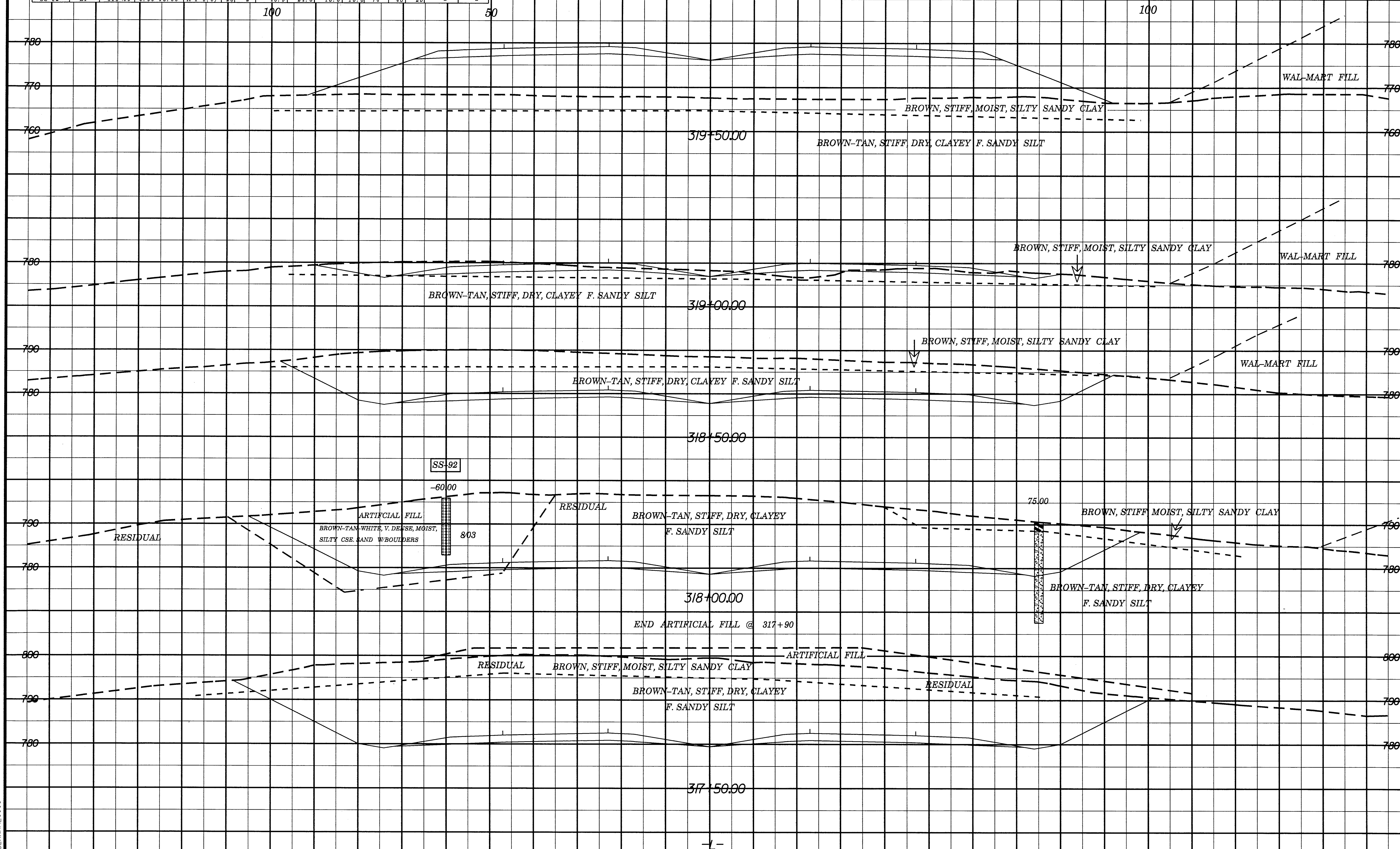
$$$SYSTIME$$$$ $$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$ USERNAME$$$$

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-2707B	X-74	X-134

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING SIEVES 10	% PASSING SIEVES 40	% PASSING SIEVES 200	% MOISTURE	% ORGANIC
SS-92	LT	318+00	0.00-13.00	A-1-b(0)	23	2	46.9	24.3	13.5	15.3	74	48	25	-	-

SCALE 10 5 0 10 20



02/03/98

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

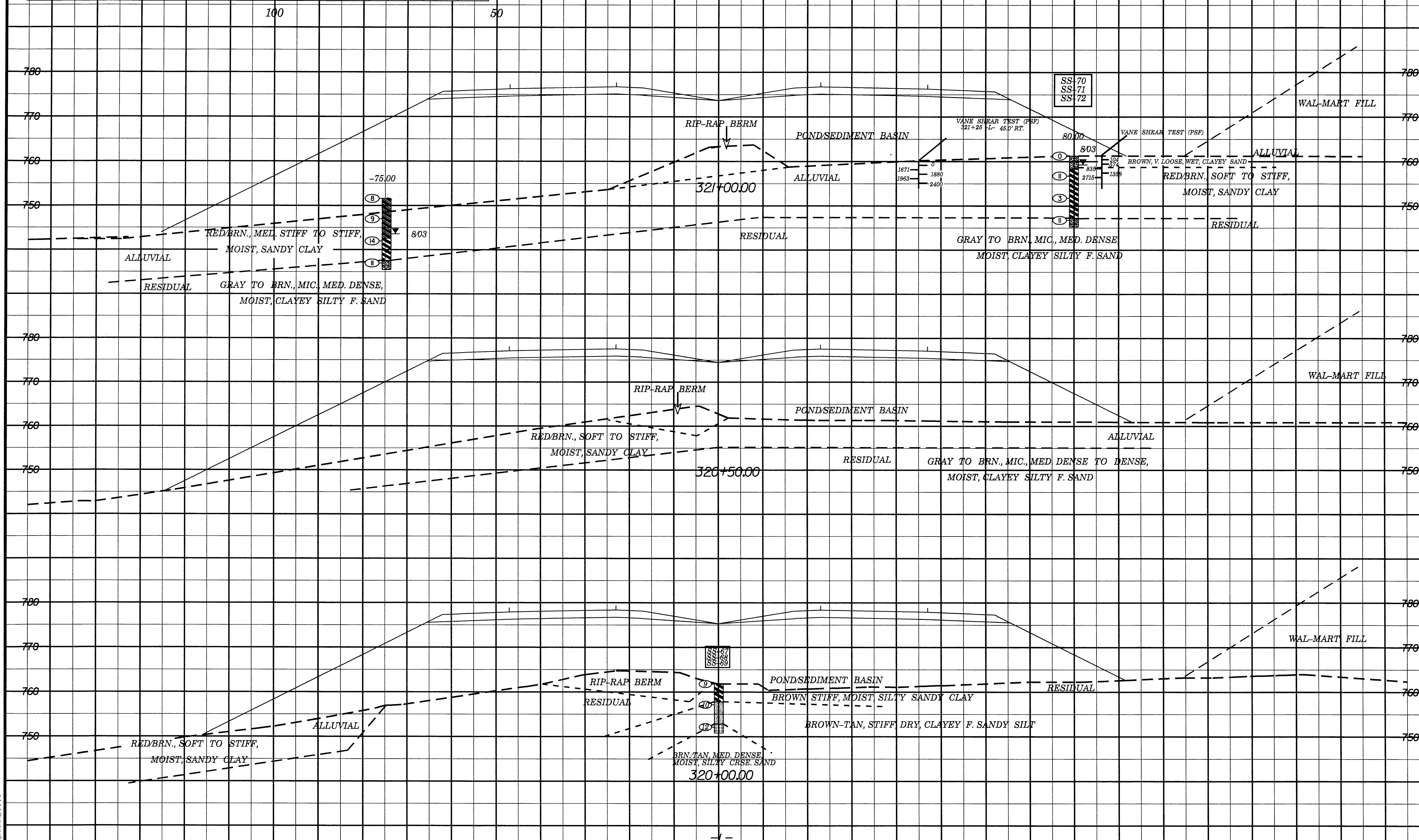
02/03/98

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-2707B	X-75	X-134

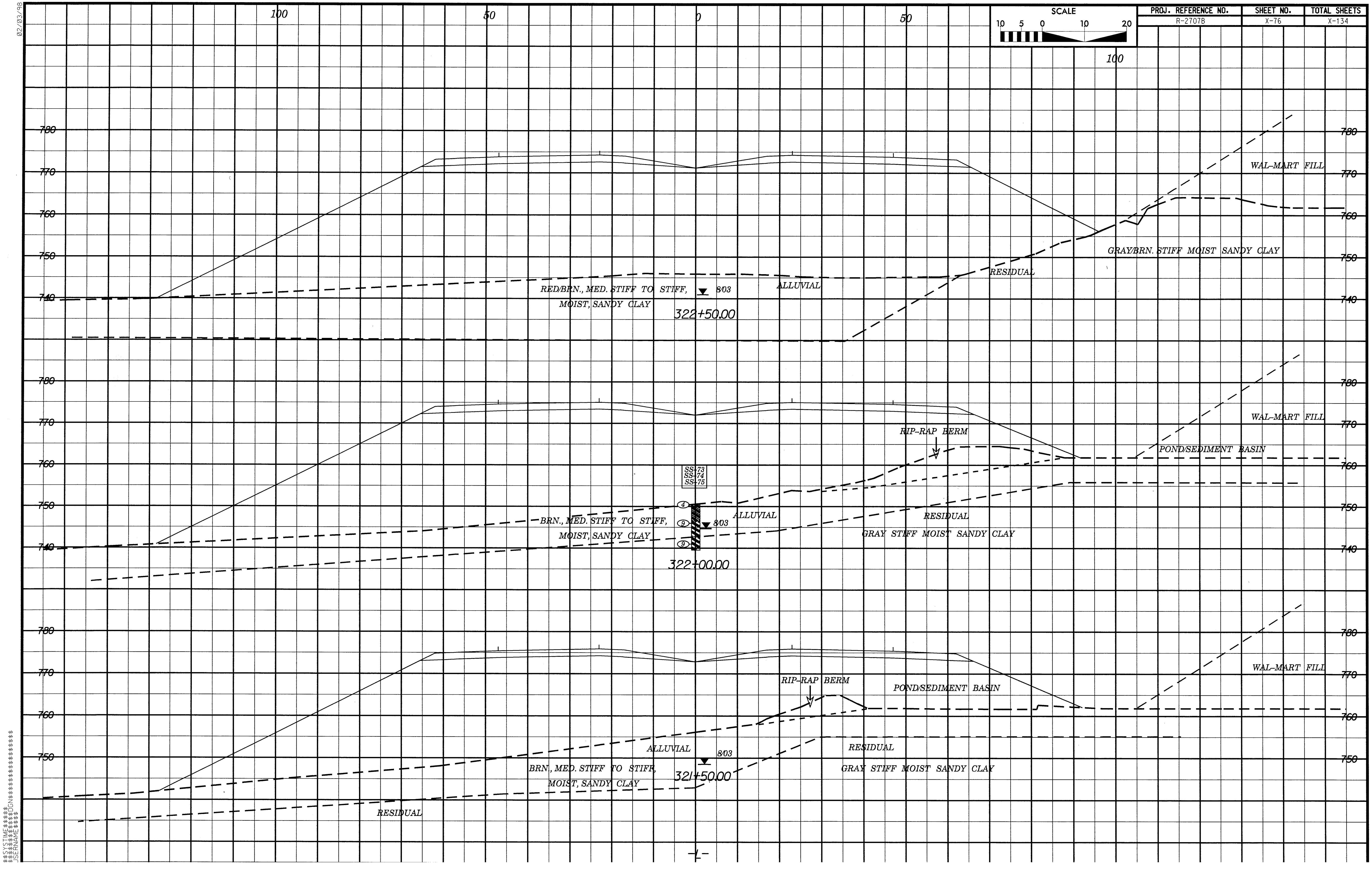
SCALE 10 5 0 10 20

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
SS-70	80RT	321+00	0.00-1.50	A-2-4(0)	39	7	36.8	34.4	8.4	20.3	89	68	31	-	-
SS-71	80RT	321+00	4.50-6.00	A-7-5(5)	46	16	20.1	32.6	10.7	36.6	94	84	49	-	-
SS-72	80RT	321+00	14.50-16.00	A-2-5(0)	55	NP	13.6	59.4	14.8	12.2	94	89	35	-	-

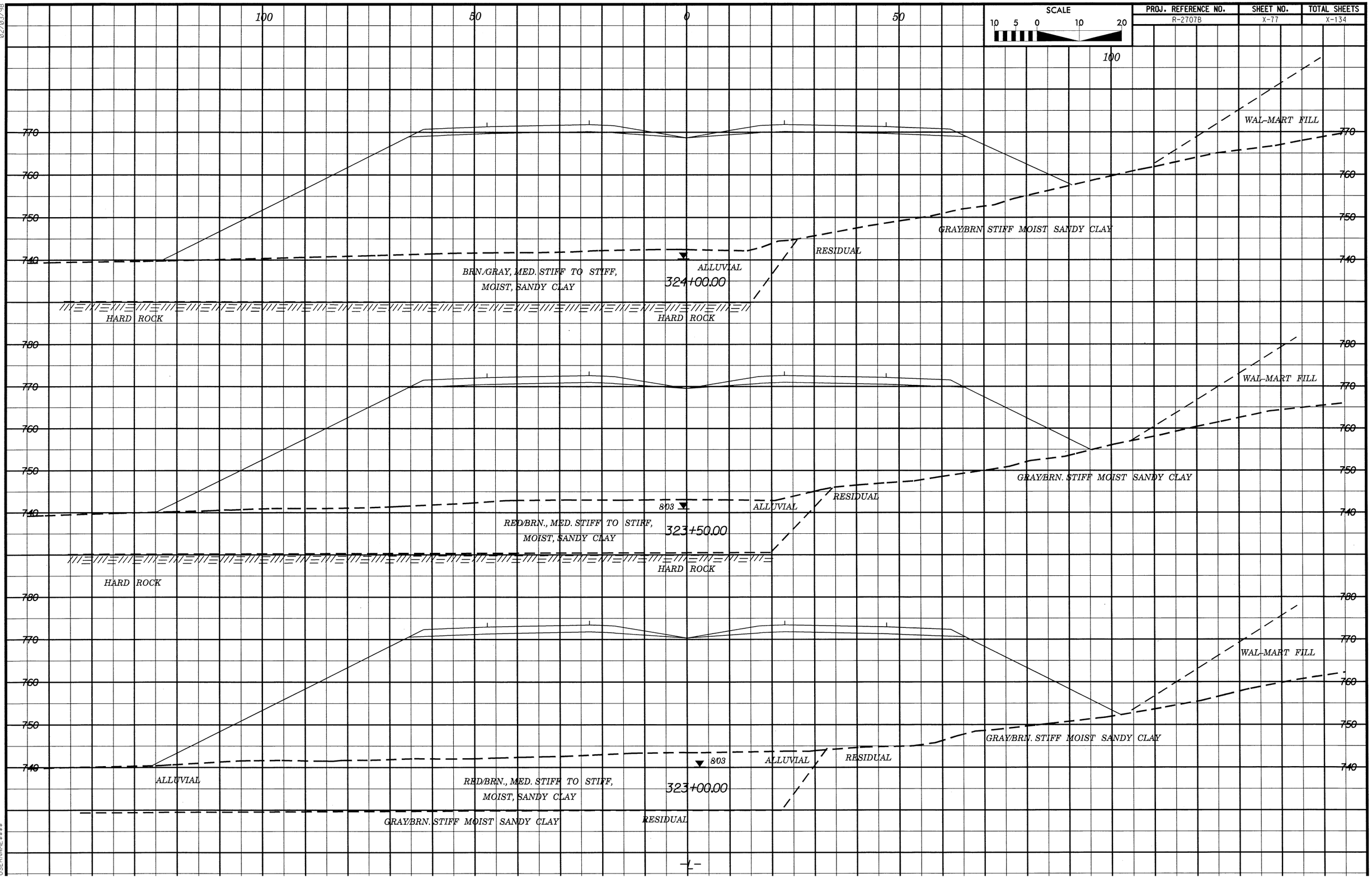


$$SYSTIME$$$$
$$$$$$$$DGN$$$$$$$$$$$$$$$$$$
USERNAME$$$$


02/03/98
SCALE
10 5 0 10 20
PROJ. REFERENCE NO.
R-2707B
SHEET NO.
X-76
TOTAL SHEETS
X-134
100
50
0
50
100
780
770
760
750
740
WAL-MART FILL
GRAY/BRN. STIFF MOIST SANDY CLAY
RESIDUAL
ALLUVIAL
RED/BRN., MED. STIFF TO STIFF,
MOIST, SANDY CLAY
8/03
322+50.00
RIP-RAP BERM
POND/SEDIMENT BASIN
SS-73
SS-74
SS-75
4
9
9
BRN., MED. STIFF TO STIFF,
MOIST, SANDY CLAY
GRAY STIFF MOIST SANDY CLAY
322+00.00
BRN., MED. STIFF TO STIFF,
MOIST, SANDY CLAY
321+50.00
$$$$SYSTIME$$$$
$$$$DGN$$$$
$$$USERNAME$$$

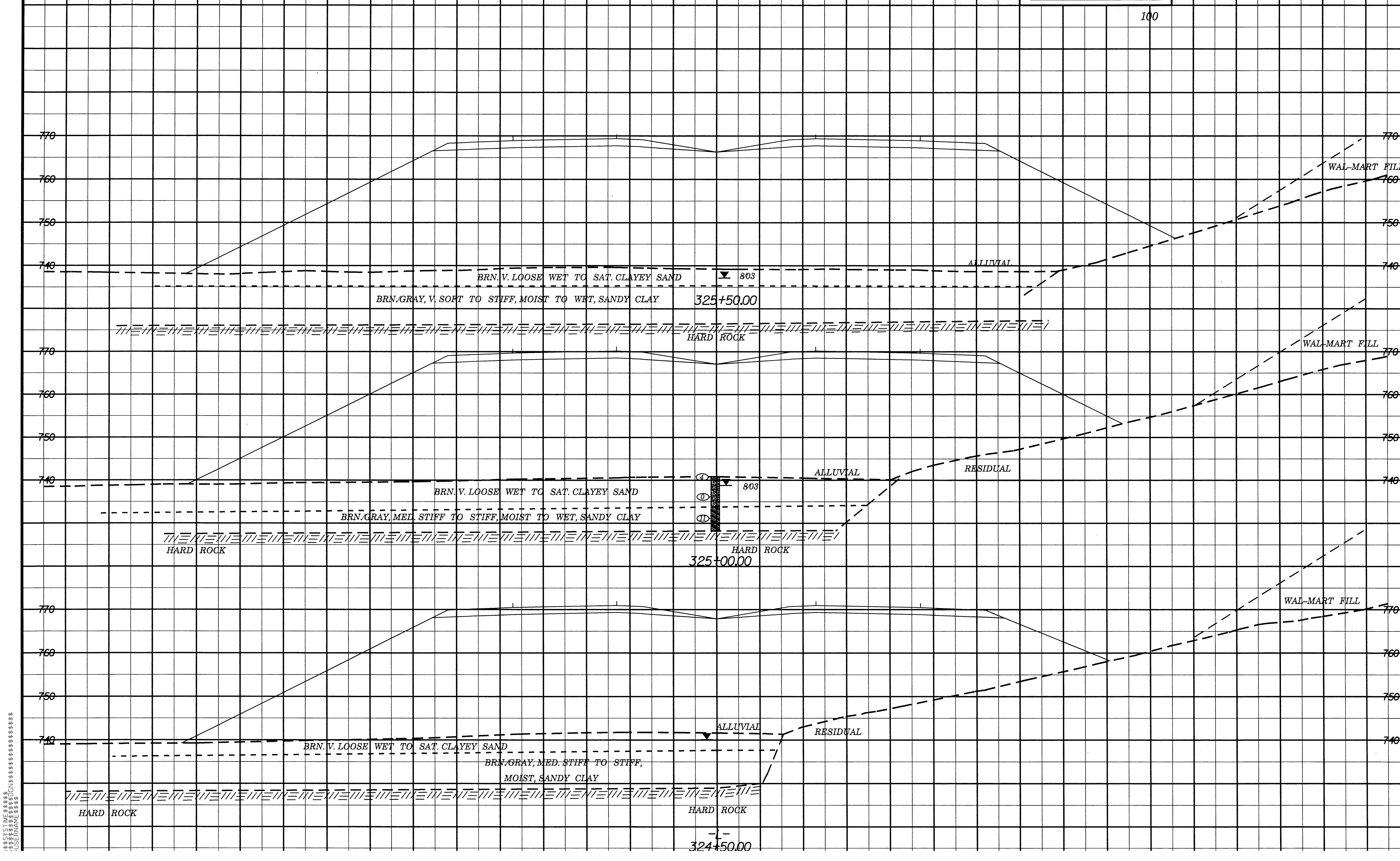
02/03/98

SCALE	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
10 5 0 10 20	R-2707B	X-77	X-134

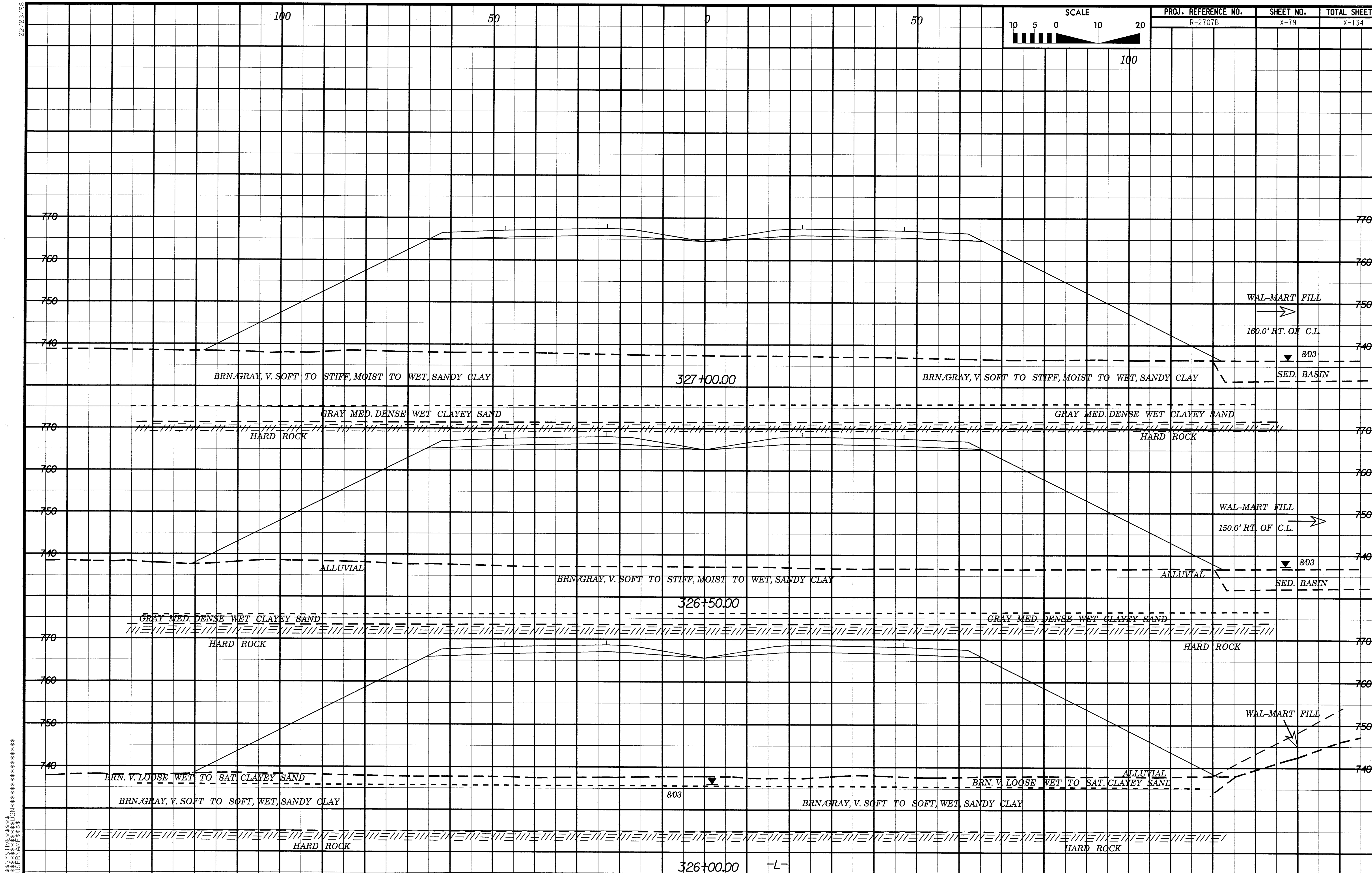


$$$$SYSTIME$$$$
$$$$USERNAME$$$$

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-2707B	X-78	X-134



PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-2707B	X-79	X-134



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PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-2707B	X-83	X-134

SCALE: 10 5 0 10 20

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-98	80' RT	332+25	0.00-1.50	A-7-5(30)	58	25	1.2	2.4	19.3	77.1	100	99	97	-	-
SS-99	80' RT	332+25	8.20-9.70	A-7-6(5)	41	14	24.9	23.5	13.0	38.5	95	82	52	-	-
SS-100	80' RT	332+25	13.20-14.70	A-1-b(0)	21	NP	65.5	22.5	3.9	8.1	86	50	12	-	-