

NOTE: SEE SHEET 2A FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3423	1	20
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34942.1.1	NHF-24(12)	PE	
34942.2.2	NHF-24(12)	RW & UTIL.	
34942.3.2	NHF-0024(40)	CONST.	

CONTENTS

LINE	STATION	PLAN	PROFILE	XSECT
-L-	18+15 to 28+50	4,5	12	
-L-	28+50 to 37+00	5,6	12	16-20
-L-	37+00 to 108+00	6-11	12-15	

ROADWAY  
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34942.1.1(U-3423) F.A. PROJ. NHF-24(12)  
COUNTY CUMBERLAND  
PROJECT DESCRIPTION NC 24-87 (BRAGG BOULEVARD) FROM  
THE US 401 BYPASS TO NORTH OF SR 1437 (SANTE FE DRIVE  
/SHAW ROAD)

INVENTORY

CAUTION NOTICE

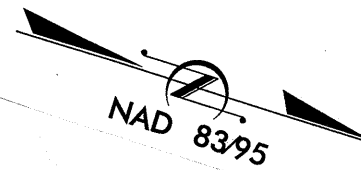
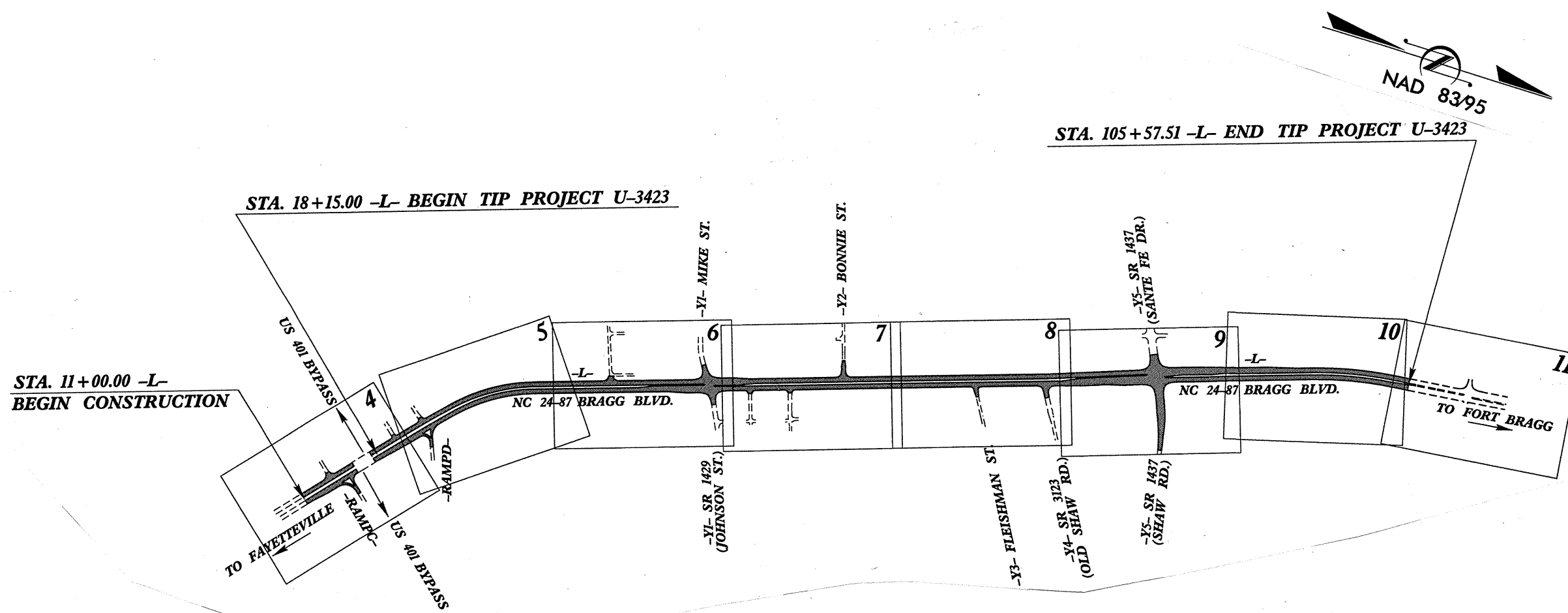
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACED) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION, AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

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

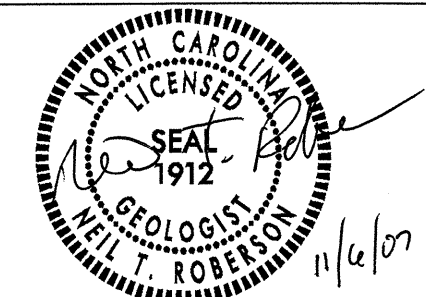
ID: 34924.1.1

CONTRACT: C202435



- PERSONNEL
- O.B. OTI
  - Y. KUNTUKOVA
  - M.L. REEDER
  - J. R. MATULA

INVESTIGATED BY O.B. OTI  
CHECKED BY N.T. ROBERSON  
SUBMITTED BY N.T. ROBERSON  
DATE NOVEMBER 2007



DRAWN BY: T.T. WALKER

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

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
GEOTECHNICAL ENGINEERING UNIT

PROJECT REFERENCE NO.  
34942.1(U-3423)

SHEET NO.  
2

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

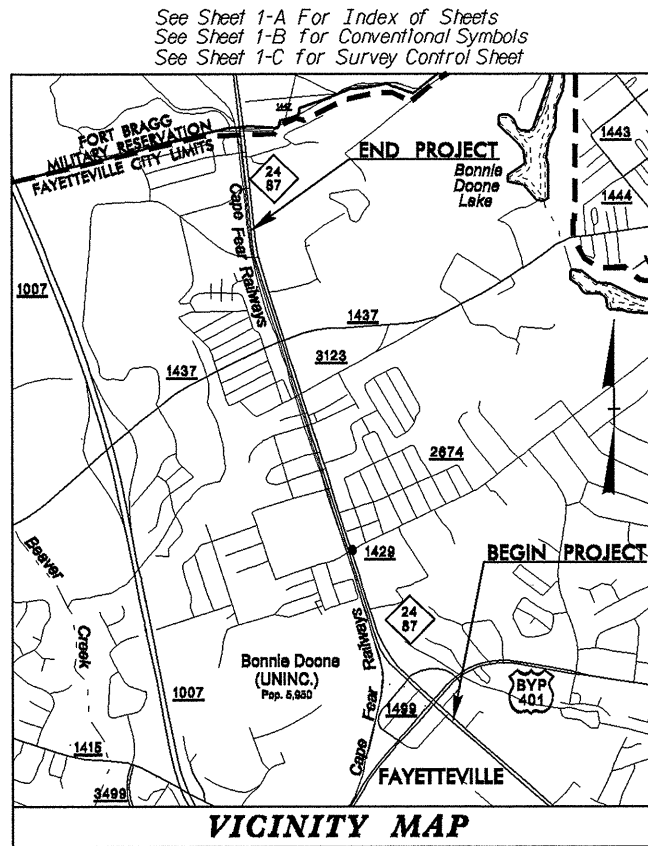
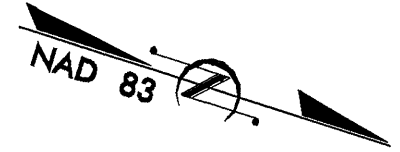
SOIL DESCRIPTION		GRADATION		ROCK DESCRIPTION		TERMS AND DEFINITIONS	
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (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: <i>VERY STIFF, GRAY, SAND, MOST WITH INTERBEDDED FINE SAND LAYERS, HEAVY PLASTIC, A-7-6</i>		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) POORLY GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.  THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.		HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:  WEATHERED ROCK (WR) NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT 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 YIELD 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.		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 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. 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 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.	
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b> GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS		<b>MINERALOGICAL COMPOSITION</b> MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.		<b>WEATHERING</b> 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. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i> 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. <i>IF TESTED, YIELDS SPT N VALUES &gt; 100 BPF</i> 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. <i>IF TESTED, YIELDS SPT N VALUES &lt; 100 BPF</i> 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.		<b>TERMS AND DEFINITIONS</b>	
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b> GROUP CLASS. A-1, A-1-b, A-3, A-2-4, A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7, A-7-5, A-7-6, A-3, A-1, A-2, A-3, A-4, A-5, A-6, A-7		<b>COMPRESSION</b> SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50		<b>WEATHERING</b>			
<b>PERCENTAGE OF MATERIAL</b> ORGANIC MATERIAL GRANULAR SILT-CLAY OTHER MATERIAL TRACE OF ORGANIC MATTER 2-3% 3-5% TRACE 1-10% LITTLE ORGANIC MATTER 3-5% 5-12% LITTLE 10-20% MODERATELY ORGANIC 5-10% 12-20% SOME 20-35% HIGHLY ORGANIC >10% >20% HIGHLY 35% AND ABOVE		<b>GROUND WATER</b> WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP		<b>WEATHERING</b>			
<b>CONSISTENCY OR DENSENESS</b> PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> )		<b>MISCELLANEOUS SYMBOLS</b> ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP & DIP DIRECTION OF ROCK STRUCTURES SOUNDING ROD		<b>ABBREVIATIONS</b> 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 HL - 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 <sub>u</sub> - UNIT WEIGHT γ <sub>d</sub> - DRY UNIT WEIGHT			
<b>TEXTURE OR GRAIN SIZE</b> U.S. STD. SIEVE SIZE OPENING (MM) 4, 10, 40, 60, 200, 270 4.75, 2.00, 0.42, 0.25, 0.075, 0.053		<b>SOIL MOISTURE - CORRELATION OF TERMS</b> SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION LL - LIQUID LIMIT PL - PLASTIC LIMIT OM - OPTIMUM MOISTURE SL - SHRINKAGE LIMIT		<b>ROCK HARDNESS</b> 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 0.25 INCHES 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 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT CAN BE GROOVED 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 FINGER NAIL.			
<b>PLASTICITY</b> NONPLASTIC LOW PLASTICITY MED. PLASTICITY HIGH PLASTICITY		<b>EQUIPMENT USED ON SUBJECT PROJECT</b> DRILL UNITS: MOBILE B-51, BK-51, CME-45C, CME-550, PORTABLE HOIST 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 HAMMER TYPE: AUTOMATIC, MANUAL CORE SIZE: B, N, H HAND TOOLS: POST HOLE DIGGER, HAND AUGER, SOUNDING ROD, VANE SHEAR TEST		<b>FRACTURE SPACING</b> 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 <b>BEDDING</b> 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			
<b>COLOR</b> 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.		<b>INDURATION</b> 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.		<b>INDURATION</b>			
<b>SOIL MOISTURE - CORRELATION OF TERMS</b>		<b>INDURATION</b>		<b>INDURATION</b>			
<b>PLASTICITY</b>		<b>INDURATION</b>		<b>INDURATION</b>			
<b>COLOR</b>		<b>INDURATION</b>		<b>INDURATION</b>			
<b>SOIL MOISTURE - CORRELATION OF TERMS</b>		<b>INDURATION</b>		<b>INDURATION</b>			
<b>PLASTICITY</b>		<b>INDURATION</b>		<b>INDURATION</b>			
<b>COLOR</b>		<b>INDURATION</b>		<b>INDURATION</b>			
<b>SOIL MOISTURE - CORRELATION OF TERMS</b>		<b>INDURATION</b>		<b>INDURATION</b>			
<b>PLASTICITY</b>		<b>INDURATION</b>		<b>INDURATION</b>			
<b>COLOR</b>		<b>INDURATION</b>		<b>INDURATION</b>			
<b>SOIL MOISTURE - CORRELATION OF TERMS</b>		<b>INDURATION</b>		<b>INDURATION</b>			
<b>PLASTICITY</b>		<b>INDURATION</b>		<b>INDURATION</b>			
<b>COLOR</b>		<b>INDURATION</b>		<b>INDURATION</b>			

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3423	2A	20
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34942.1.1	NHF-24(12)	PE	

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# CUMBERLAND COUNTY

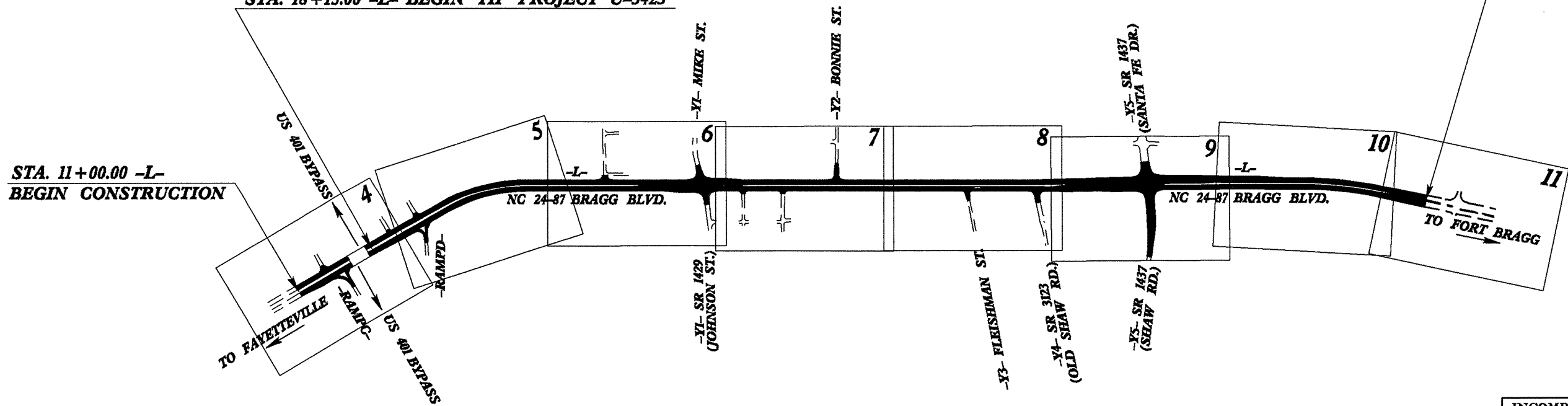
**LOCATION: NC 24 - 87 (BRAGG BOULEVARD)**  
**FROM THE US 401 BYPASS TO NORTH OF**  
**SR 1437 (SANTE FE DRIVE /SHAW ROAD)**  
**TYPE OF WORK: GRADING, DRAINAGE, PAVING, WIDENING,**  
**CURB & GUTTER, SIGNALS, AND**  
**OVERHEAD SIGNING**



VICINITY MAP

STA. 18+15.00 -L- BEGIN TIP PROJECT U-3423

STA. 108+00.00 -L- END TIP PROJECT U-3423

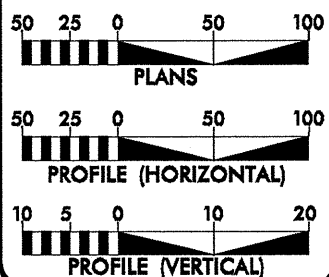


STA. 11+00.00 -L-  
BEGIN CONSTRUCTION

NOTE: THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF FAYETTEVILLE.  
 NOTE: CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD \_\_\_\_\_.

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

**GRAPHIC SCALES**



**DESIGN DATA**

ADT 2010 = 43,200  
 ADT 2030 = 49,700  
 DHV = 9 %  
 D = 50 %  
 T = 11 % \*  
 V = 50 MPH  
 \* TTST 4% + DUAL 7%  
 FUNC CLASS = ARTERIAL

**PROJECT LENGTH**

LENGTH OF ROADWAY TIP PROJECT U-3423 = 1.702 MILES  
 TOTAL LENGTH OF TIP PROJECT U-3423 = 1.702 MILES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:  
JUNE 20, 2008

LETTING DATE:  
JUNE 15, 2010

BRENDA MOORE, P.E.  
PROJECT ENGINEER

ROGER KLUCKMAN, P.E.  
PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.  
ROADWAY DESIGN ENGINEER

SIGNATURE: \_\_\_\_\_ P.E.  
STATE HIGHWAY DESIGN ENGINEER

**DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA**



STATE HIGHWAY DESIGN ENGINEER P.E.

TIP PROJECT: U-3423

CONTRACT:

23-OCT-2007 09:11 I:\proj\raleigh\_investigation\tip\3423\_geo\_r.dwg\cadd\_geotech\planproj\3423\_geo\_rsh.dgn TTWALKER AT 06J22425

09/05/99



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

Michael F. Easley  
GOVERNOR

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

Lyndo Tippett  
SECRETARY

November 2, 2007

STATE PROJECT: 34942.1.1 (U-3423)  
FEDERAL PROJECT: NHF-24 (12)  
COUNTY: Cumberland

DESCRIPTION: NC 24-87 (Bragg Boulevard) from the US 401 Bypass to North of SR 1437  
(Sante Fe Drive/Shaw Road)

SUBJECT: Geotechnical Report - Inventory

**Project Description**

This project consists of the grading and widening of NC 24-87 in Fayetteville from US 401 bypass to north of SR 1437. The total length of this project is 1.702 miles. A geotechnical investigation was conducted during June - July of 2007. Hand augers were performed at selected locations along -L-. 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.

<u>Line</u>	<u>Station</u>
-L-	11+00 to 108+00

**Areas of Special Geotechnical Interest**

1) Highly Plastic Clay Soils: Area containing highly plastic clay soils is noted below.

<u>Alignment</u>	<u>Station</u>
-L-	28+25 to 36+75

**Physiography and Geology**

The project is located in the Coastal Plain Physiographic Province on relatively flat terrain. The project corridor is well drained due to its urban location with homes and businesses. Geologically, the site is located within the Middendorf Formation and is underlain by the Cape Fear Formation.

**Soil Properties**

Soils encountered during this investigation consist of roadway embankment and Coastal Plain soils.

Roadway Embankment soils were encountered in small amounts associated with several existing roadways on the project. These soils are similar to and derived from the Coastal Plain soils encountered elsewhere on the project.

Coastal Plain deposits were encountered through out the project corridor. This embodied Middendorf Formation. The Coastal Plain soils typically consist of orange-brown to tan-orange, tan and gray, moist, very loose to dense, silty sands and soft to stiff sandy silt (AASHTO CLASSIFICATION A-2-4 and A-4). Red-brown to tan-brown and gray, moist, soft to very stiff, highly plastic, sandy and silty clay (A-4, A-6, and A-7) are also present.

Prepared by,

Onuoha B. Oti.  
Project Engineering Geologist

## EARTHWORK BALANCE SHEET

Volumes in Cubic Yards

PROJECT: U-3423

COUNTY: Cumberland

DATE: February 22, 2010

COMPILED BY: CP

SHEET <sup>3A</sup> OF <sup>20</sup> SHEETS

STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. +25%		ROCK	SUITABLE	UNSUIT.	TOTAL
-L- 11+00	15+50	188				188	111		111	139			49		49
-L- 18+00	48+00	797			121	676	7,118		7,118	8,898	8,222			121	121
-L- 48+00	78+00	2,156				2,156	4,409		4,409	5,511	3,355				
-L- 78+00	105+50	3,005				3,005	5,580		5,580	6,975	3,970				
<b>SUBTOTAL</b>		6,146			121	6,025	17,218		17,218	21,523	15,547			49	170
-Y1 12+75	15+75	59				59	43		43	54			5		5
-Y2- 10+00	12+08.32	141				141	33		33	41			100		100
-Y4- 10+49.11	11+50	18				18	24		24	31	13				
-Y5- 13+86.36	23+25	656				656	185		185	231			425		425
<b>SUBTOTAL</b>		874				874	285		285	357	13			530	530
RAMP C 10+75	12+00	121				121	35		35	44			77		77
RAMP D 10+75	12+00	93				93	63		63	79			14		14
<b>SUBTOTAL</b>		214				214	98		98	123			92		92
<b>TOTAL</b>		7,234			121	7,113	17,601		17,601	22,002	15,560			671	792
MATERIAL FOR SHOULDER CONSTRUCTION LOSS DUE TO CLEARING & GRUBBING		-3,250				-3,250					3,250				
ADDITIONAL UNDERCUT															
ROCK WASTE TO REPLACE BORROW															
ADJUST FOR ROCK WASTE															
WASTE IN LIEU OF BORROW											-671		-671		-671
SHOULDER MATERIAL							150		150	188	188				
<b>PROJECT TOTAL</b>		3,984			121	3,863	17,751		17,751	22,190	18,327			121	121
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT											916				
<b>GRAND TOTAL</b>		3,984			121	3,863	17,751		17,751	22,190	19,244			121	121
<b>SAY</b>		4,000									19,300				
EST. UNDERCUT CONTINGENCY				350 CY											
EST. SHALLOW UNDERCUT BY STATIONS				1466 CY											
EST. SHALLOW UNDERCUT CONTINGENCY				500 CY											
TOTAL SHALLOW UNDERCUT				1966 CY											
CLASS IV SUBGRADE STABILIZATION				4760 TONS											
SELECT GRANULAR MATERIAL				600 CY											

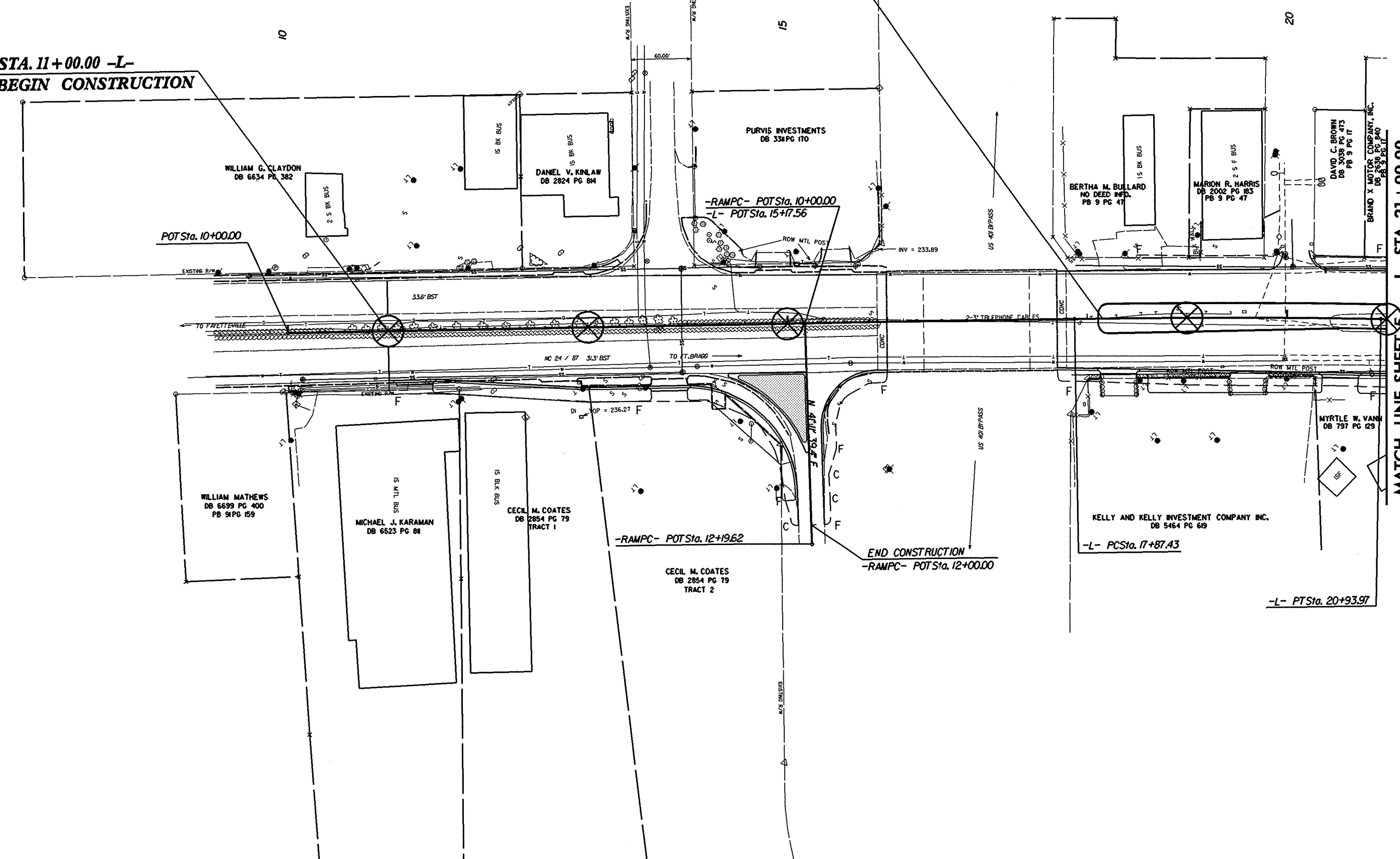
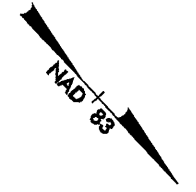
NOTE: EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.



8/17/99  
01-NOV-2007 09:50  
I:\proj\p1\proj\station\tp\03423-geo-rdwy\cadd\geotech\planprof\03423-geo.rwy.psh4.dgn

**STA. 11+00.00 -L-  
BEGIN CONSTRUCTION**

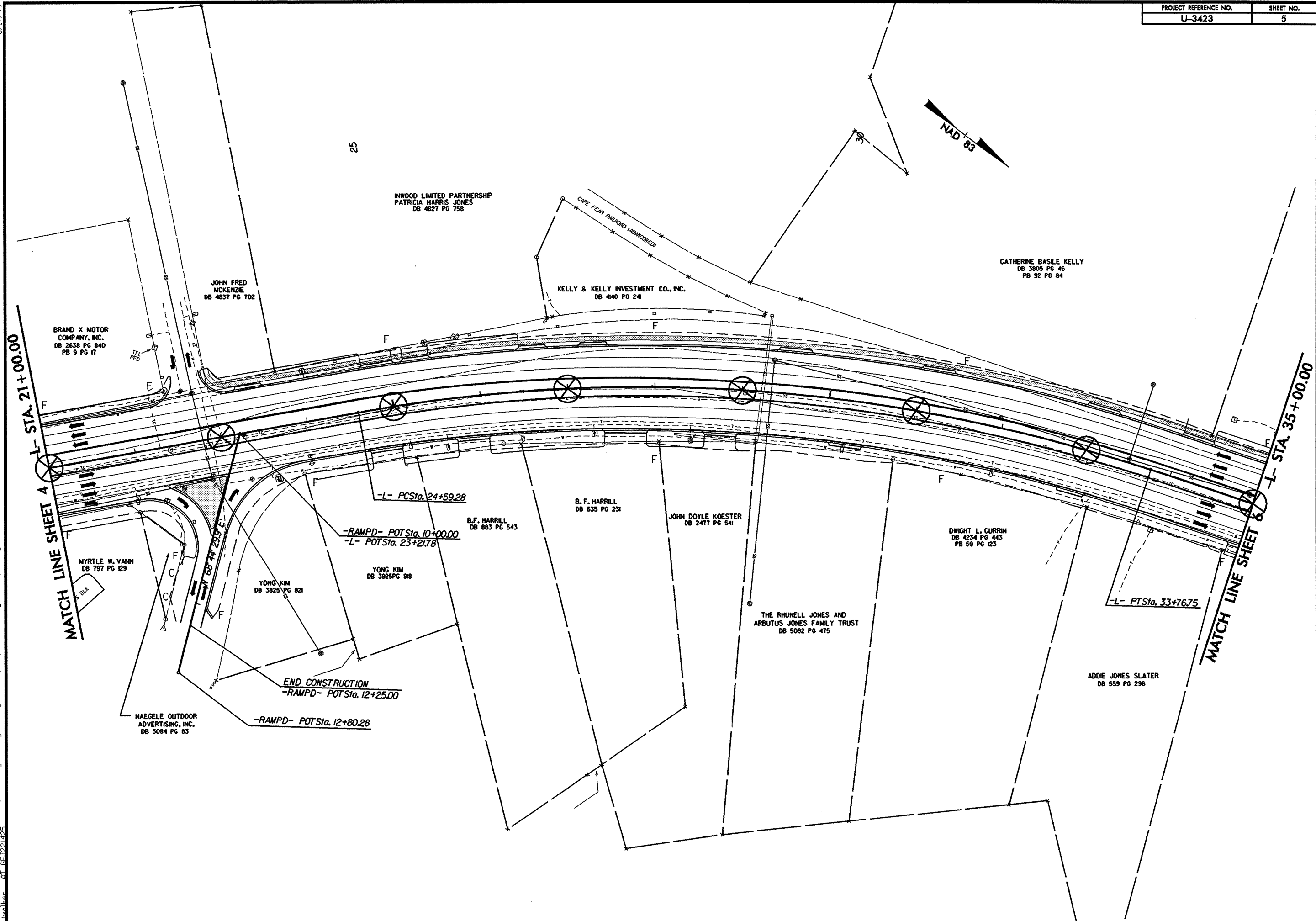
**STA. 18+15.00 -L- BEGIN TIP PROJECT U-3423**



**MATCH LINE SHEET 5 -L- STA. 21+00.00**

06-NOV-2007 11:35  
 I:\ep\water\ep\proj\3423\geo\_rdw\cadd\geotech\planprof\3423-geo\_rnv\_psh5.dgn  
 8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-3423	5

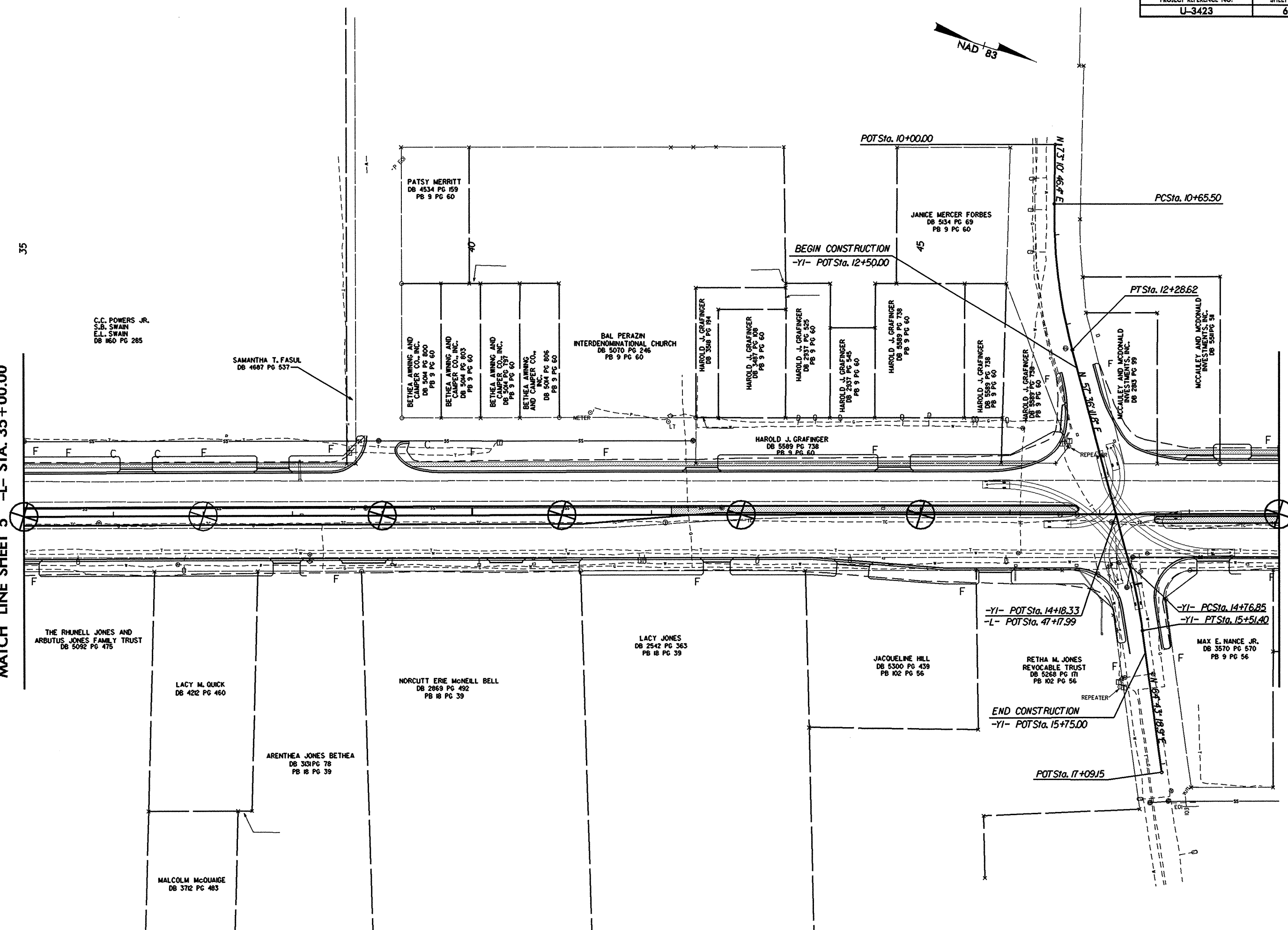


06-NOV-2007 11:36  
vsstgstation\tp\U3423.geo\_rdw\cadd\_geotech\planprof\U3423.geo\_inv.psh6.dgn  
8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-3423	6

MATCH LINE SHEET 5 -L- STA. 35+00.00

MATCH LINE SHEET 7 -L- STA. 49+00.00

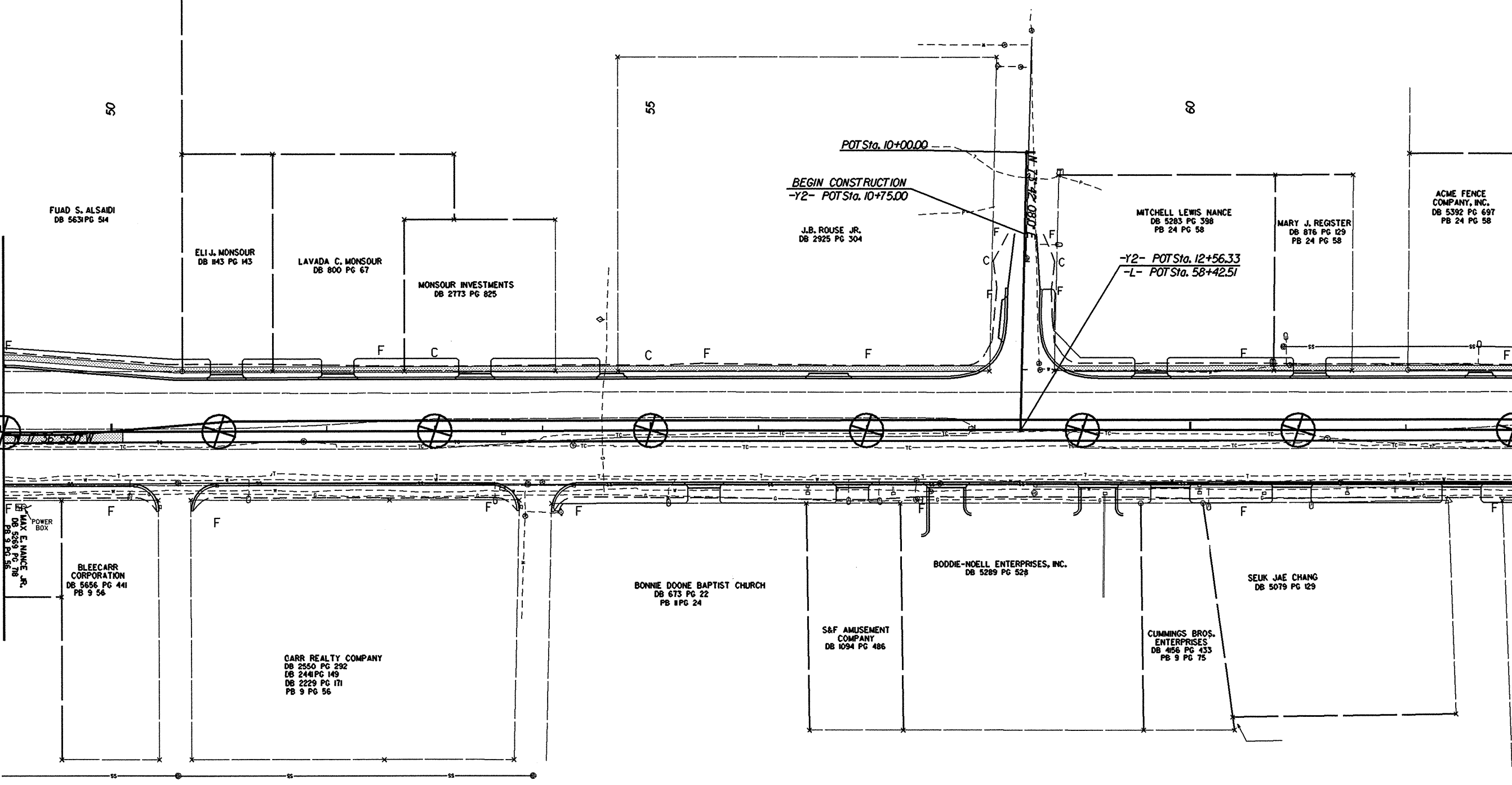






MATCH LINE SHEET 6 -L- STA. 49+00.00

MATCH LINE SHEET 8 -L- STA. 63+00.00



FUAD S. ALSAIDI  
DB 5631 PG 514

ELI J. MONSOUR  
DB 1143 PG 143

LAVADA C. MONSOUR  
DB 800 PG 67

MONSOUR INVESTMENTS  
DB 2173 PG 825

BEGIN CONSTRUCTION  
-Y2- POT Sta. 10+75.00

J.B. ROUSE JR.  
DB 2925 PG 304

MITCHELL LEWIS NANCE  
DB 5283 PG 398  
PB 24 PG 58

MARY J. REGISTER  
DB 876 PG 129  
PB 24 PG 58

ACME FENCE  
COMPANY, INC.  
DB 5392 PG 697  
PB 24 PG 58

-Y2- POT Sta. 12+56.33  
-L- POT Sta. 58+42.51

MAX E. NANCE JR.  
DB 5288 PG 718  
PB 9 PG 56

BLEECARR  
CORPORATION  
DB 5656 PG 441  
PB 9 PG 56

CARR REALTY COMPANY  
DB 2550 PG 292  
DB 2441 PG 149  
DB 2229 PG 171  
PB 9 PG 56

BONNIE DOONE BAPTIST CHURCH  
DB 673 PG 22  
PB 1 PG 24

S&F AMUSEMENT  
COMPANY  
DB 1094 PG 486

BODDIE-NOELL ENTERPRISES, INC.  
DB 5289 PG 528

CUMMINGS BROS.  
ENTERPRISES  
DB 456 PG 433  
PB 9 PG 75

SEUK JAE CHANG  
DB 5079 PG 129

8/17/99

23-OCT-2007 08:54  
I:\projects\2007\2007-08-17\3423-geo\_rdv\cadd\geotech\planprof\3423-geo\_rdv-ph7.dgn



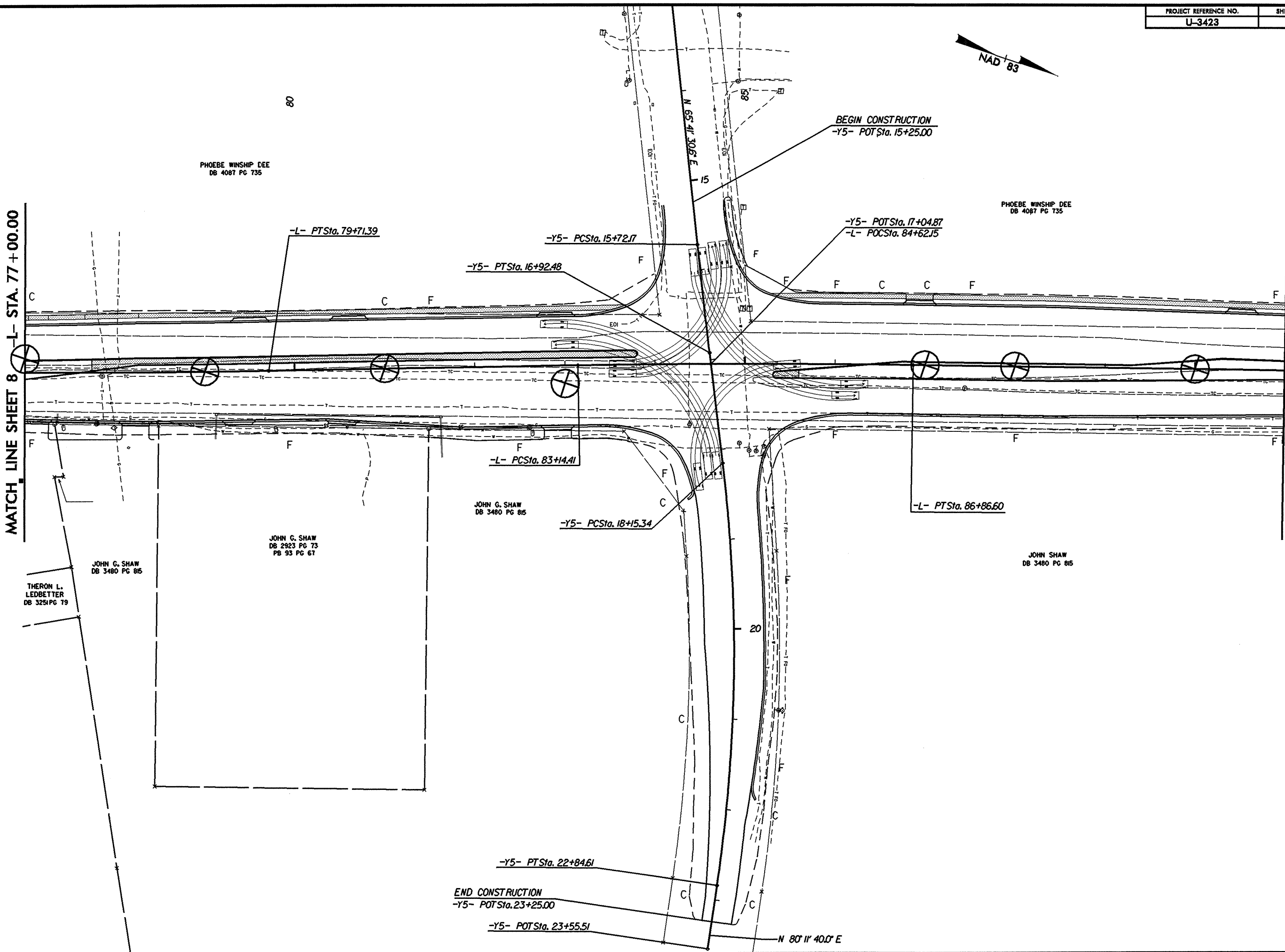
23-OCT-2007 08:55  
\\p01\eng\inv\proj\3423\geo\rdwy\cadd\geotech\planproj\3423\geo\inv\ph9.dgn  
8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-3423	9



MATCH LINE SHEET 8 -L- STA. 77+00.00

MATCH LINE SHEET 10 -L- STA. 91+00.00



23-OCT-2007 08:59  
I:\ero\aleigh\_rives\ggs\on\p\3423\_geo\_rdw\cadd\geotech\planprof\3423\_geo\_rv\_psh10.dgn  
TWA:KER AT 11/22/07

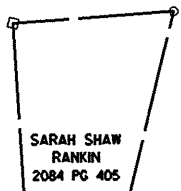
8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-3423	10



MATCH LINE SHEET 9 -L- STA. 91+00.00

MATCH LINE SHEET 11 -L- STA. 105+00.00



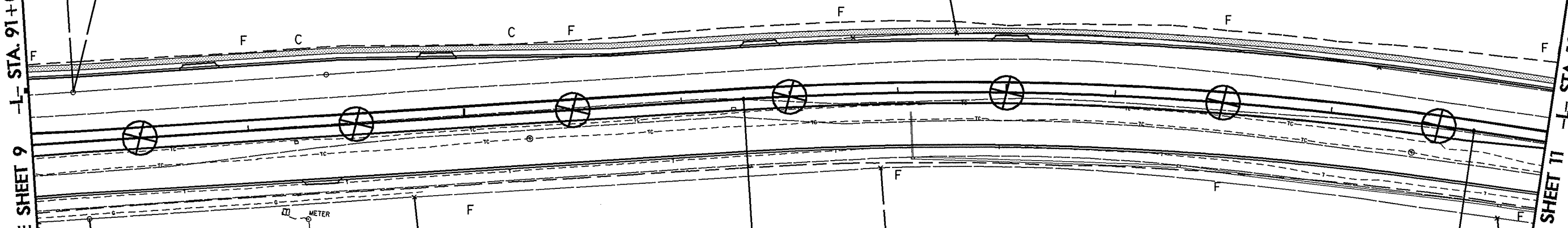
SARAH SHAW  
RANKIN  
2084 PG 405

95

100

PHOEBE WINSHIP DEE  
DB 4087 PG 735

NANCY W. BROADWELL  
DB 4481 PG 99



ALEXANDER M. SHAW  
DB 4089 PG 272

MARIE SHAW DEE  
DB 2795 PG 231

FRANK SHAW  
DB 2524 PG 10

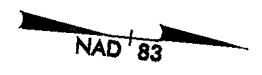
-L- PCSta. 97+57.56

-L- PTSta. 104+32.66

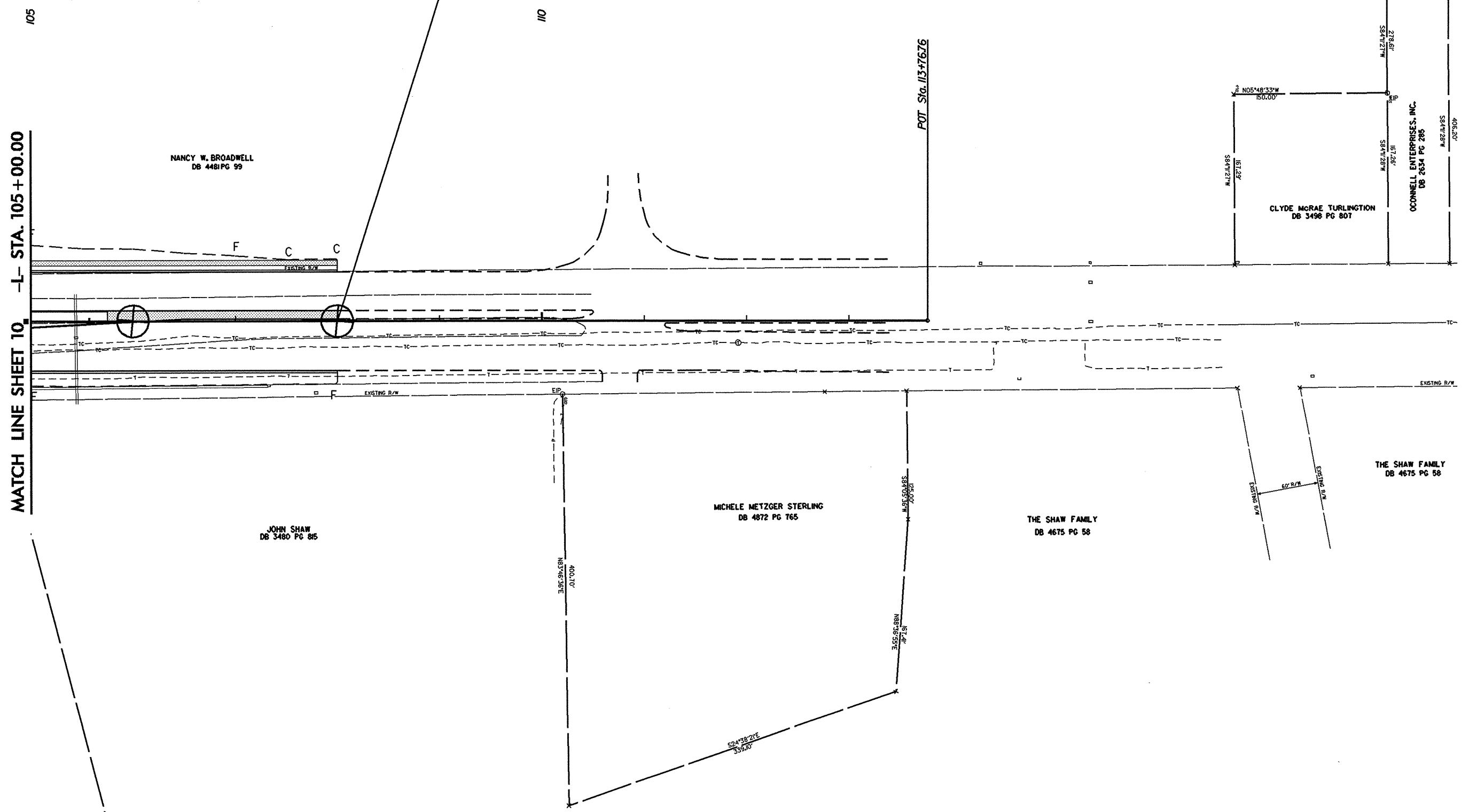
METER

8/17/99  
23-OCT-2007 08:56  
I:\ero\aleigh\_rives\gis\station\tp\3423\_geo\_rdky\cadd\geotech\planprof\3423\_geo\_rnv\_psh11.dgn  
TITWALTER AT THE TIP

PROJECT REFERENCE NO. U-3423	SHEET NO. 11
---------------------------------	-----------------

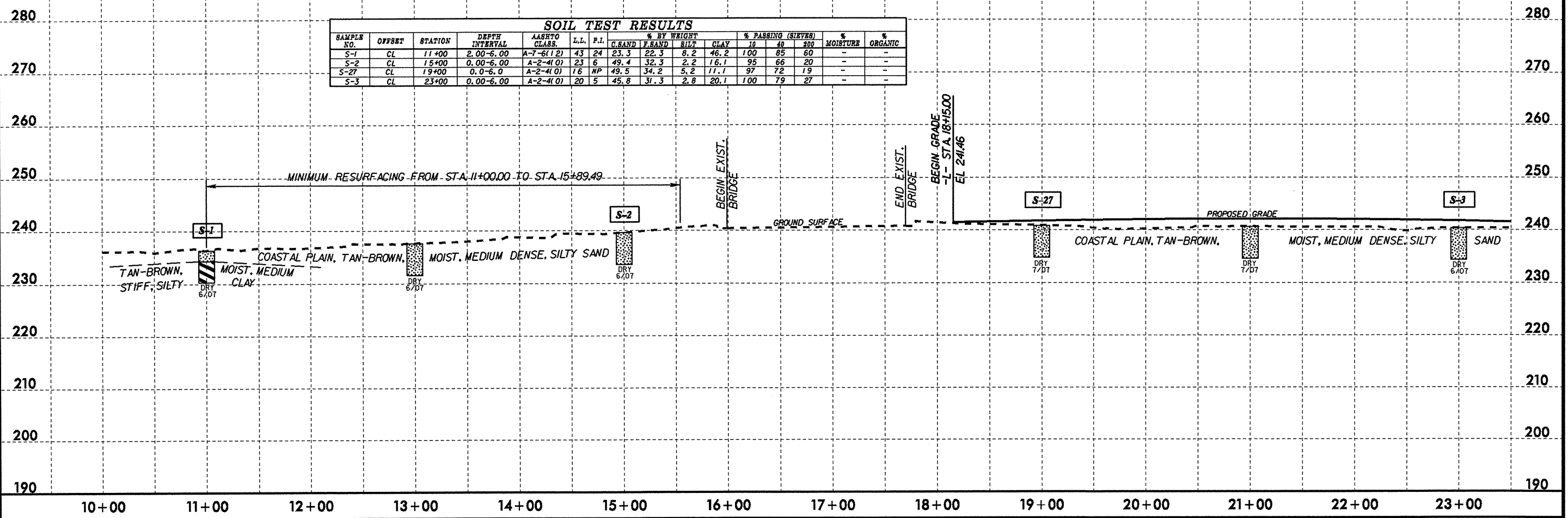


**STA. 108+00.00 -L- END TIP PROJECT U-3423**

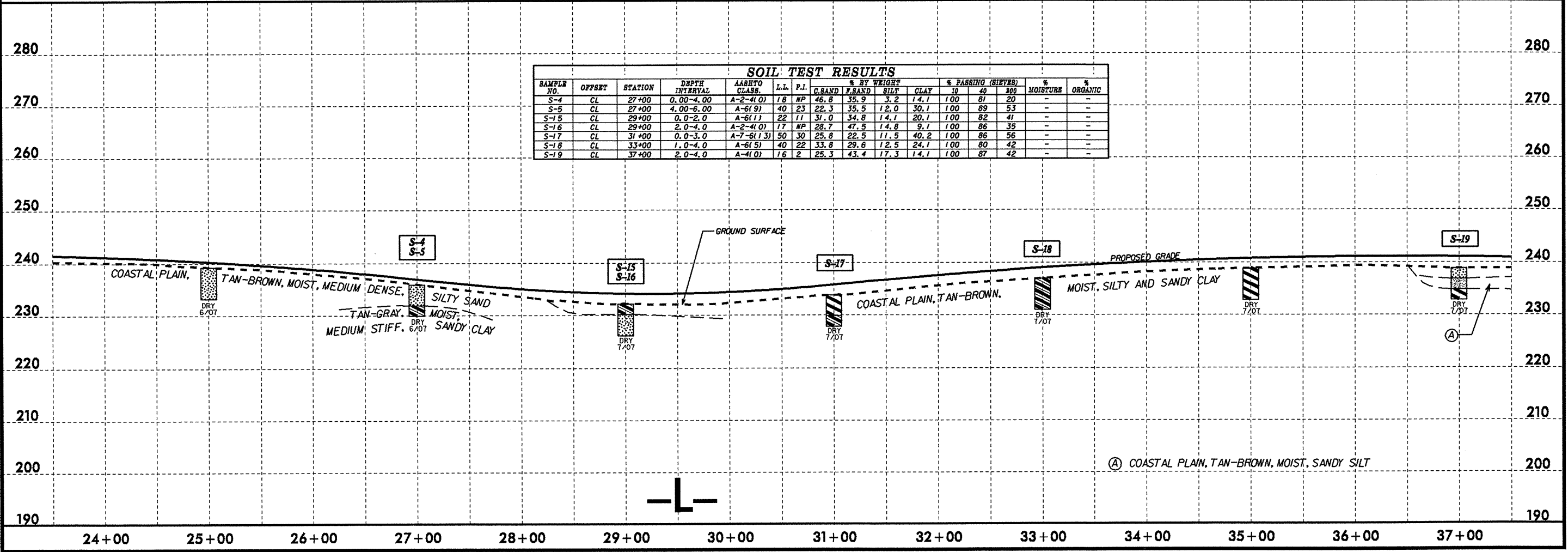


5/28/99

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT			% PASSING (SIEVES)			% MOISTURE	% ORGANIC	
							G.SAND	F.SAND	SILT	CLAY	10	40			200
S-1	CL	11+00	2.00-6.00	A-7-6(12)	43	24	23.3	22.3	8.2	46.2	100	85	60	-	-
S-2	CL	15+00	0.00-6.00	A-2-4(0)	23	6	49.4	32.3	2.2	16.1	95	66	20	-	-
S-27	CL	19+00	0.0-6.0	A-2-4(0)	16	NP	49.5	34.2	5.2	11.1	97	72	19	-	-
S-3	CL	23+00	0.00-6.00	A-2-4(0)	20	5	45.8	31.3	2.8	20.1	100	79	27	-	-



SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT			% PASSING (SIEVES)			% MOISTURE	% ORGANIC	
							G.SAND	F.SAND	SILT	CLAY	10	40			200
S-4	CL	27+00	0.00-4.00	A-2-4(0)	18	NP	46.8	35.9	3.2	14.1	100	81	20	-	-
S-5	CL	27+00	4.00-6.00	A-6(9)	40	23	22.3	35.5	12.0	30.1	100	89	53	-	-
S-15	CL	29+00	0.0-2.0	A-6(1)	22	11	31.0	34.8	14.1	20.1	100	82	41	-	-
S-16	CL	29+00	2.0-4.0	A-2-4(0)	17	NP	28.7	47.5	14.8	9.1	100	86	35	-	-
S-17	CL	31+00	0.0-3.0	A-7-6(13)	50	30	25.8	22.5	11.5	40.2	100	86	56	-	-
S-18	CL	33+00	1.0-4.0	A-6(5)	40	22	33.8	29.6	12.5	24.1	100	80	42	-	-
S-19	CL	37+00	2.0-4.0	A-4(0)	16	2	25.3	43.4	17.3	14.1	100	87	42	-	-

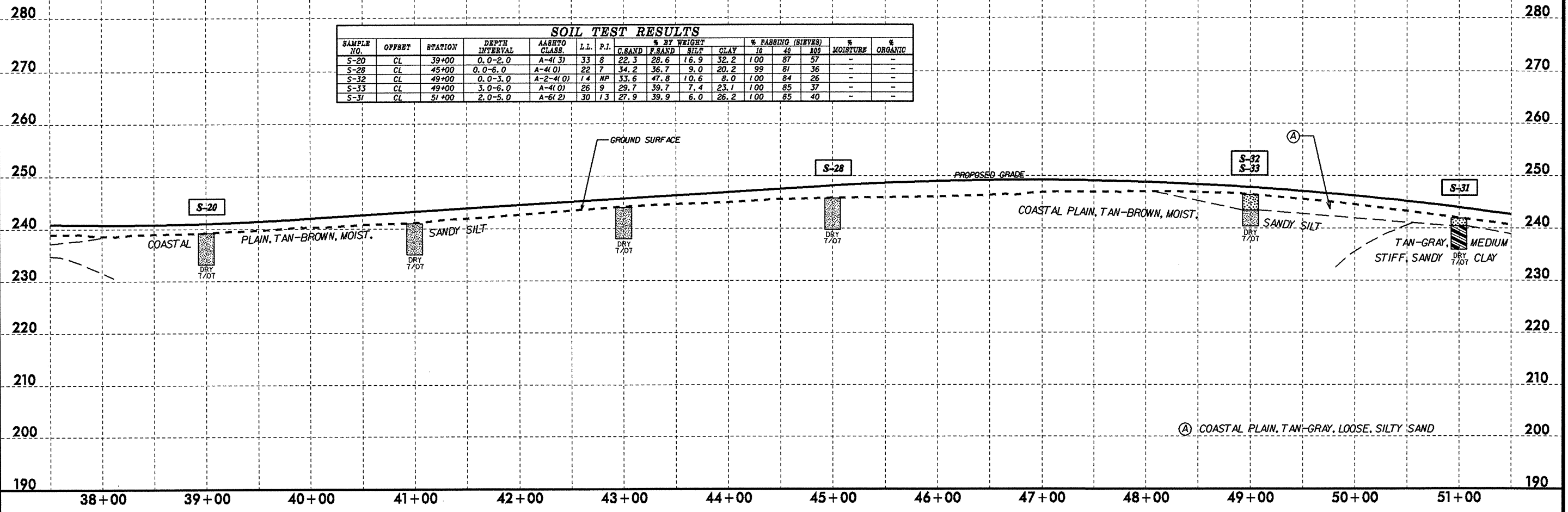


01-NOV-2007 14:39  
 I:\env\p\at\p\investigation\p\03423-geo\_rdw\geotech\PlanProf\U3423\_GEO\_pf\_1.dgn  
 title: U3423-geo\_rdw\geotech\PlanProf\U3423\_GEO\_pf\_1.dgn

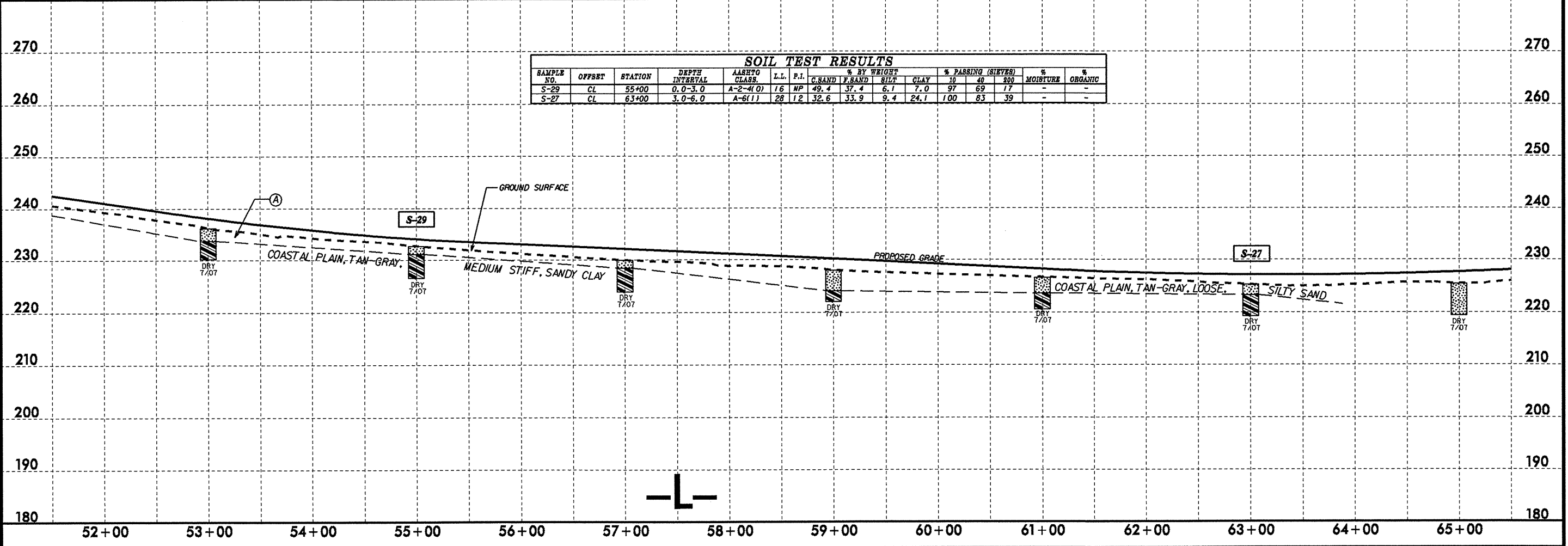


5/28/99

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-20	CL	39+00	0.0-2.0	A-4(3)	33	8	22.3	28.6	16.9	32.2	100	87	57	-	-
S-28	CL	45+00	0.0-6.0	A-4(0)	22	7	34.2	36.7	9.0	20.2	99	81	36	-	-
S-32	CL	49+00	0.0-3.0	A-2-4(0)	14	NP	33.6	47.8	10.6	8.0	100	84	26	-	-
S-33	CL	49+00	3.0-6.0	A-4(0)	26	9	29.7	39.7	7.4	23.1	100	85	37	-	-
S-37	CL	51+00	2.0-5.0	A-6(2)	30	13	27.9	39.9	6.0	26.2	100	85	40	-	-



SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-29	CL	55+00	0.0-3.0	A-2-4(0)	16	NP	49.4	37.4	6.1	7.0	97	69	17	-	-
S-27	CL	63+00	3.0-6.0	A-6(1)	28	12	32.6	33.9	9.4	24.1	100	83	39	-	-

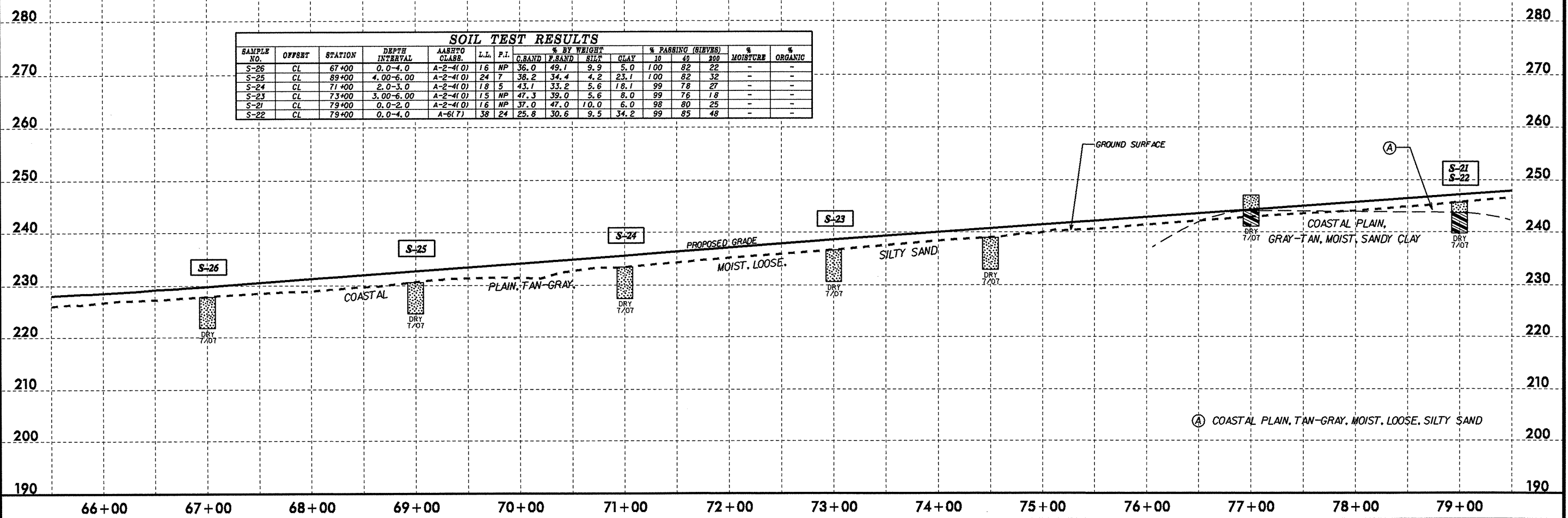


01-NOV-2007 13:56  
 I:\env\ralph\investigation\tp\3423-geo\_rdwj\cadd\geotech\PlanPrf\U3423\_GEO\_pf1.Lrdgn  
 11/1/07

5/28/99

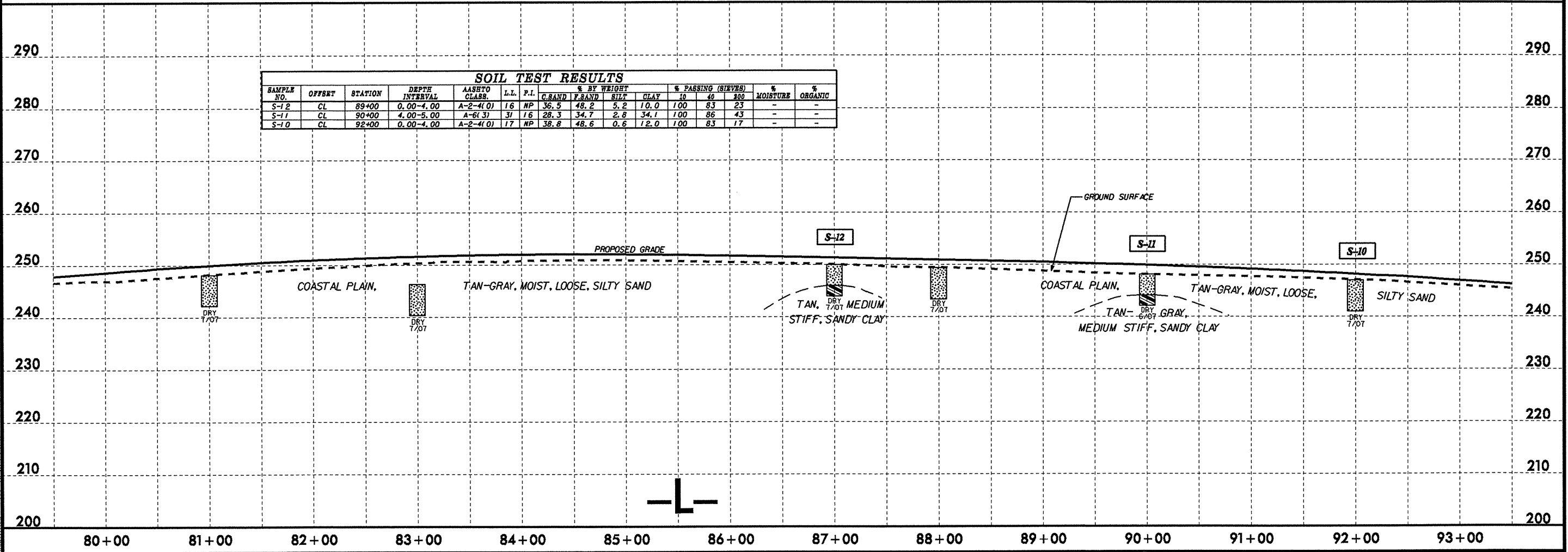
**SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-26	CL	67+00	0.0-4.0	A-2-4(0)	16	NP	36.0	49.1	9.9	5.0	100	82	22	-	-
S-25	CL	89+00	4.00-6.00	A-2-4(0)	24	7	38.2	34.4	4.2	23.1	100	82	32	-	-
S-24	CL	71+00	2.0-3.0	A-2-4(0)	18	5	43.1	33.2	5.6	18.1	99	78	27	-	-
S-23	CL	73+00	3.00-6.00	A-2-4(0)	15	NP	47.3	39.0	5.6	8.0	99	76	18	-	-
S-21	CL	79+00	0.0-2.0	A-2-4(0)	16	NP	37.0	47.0	10.0	6.0	98	80	25	-	-
S-22	CL	79+00	0.0-4.0	A-6(7)	38	24	25.8	30.6	9.5	34.2	99	85	48	-	-



**SOIL TEST RESULTS**

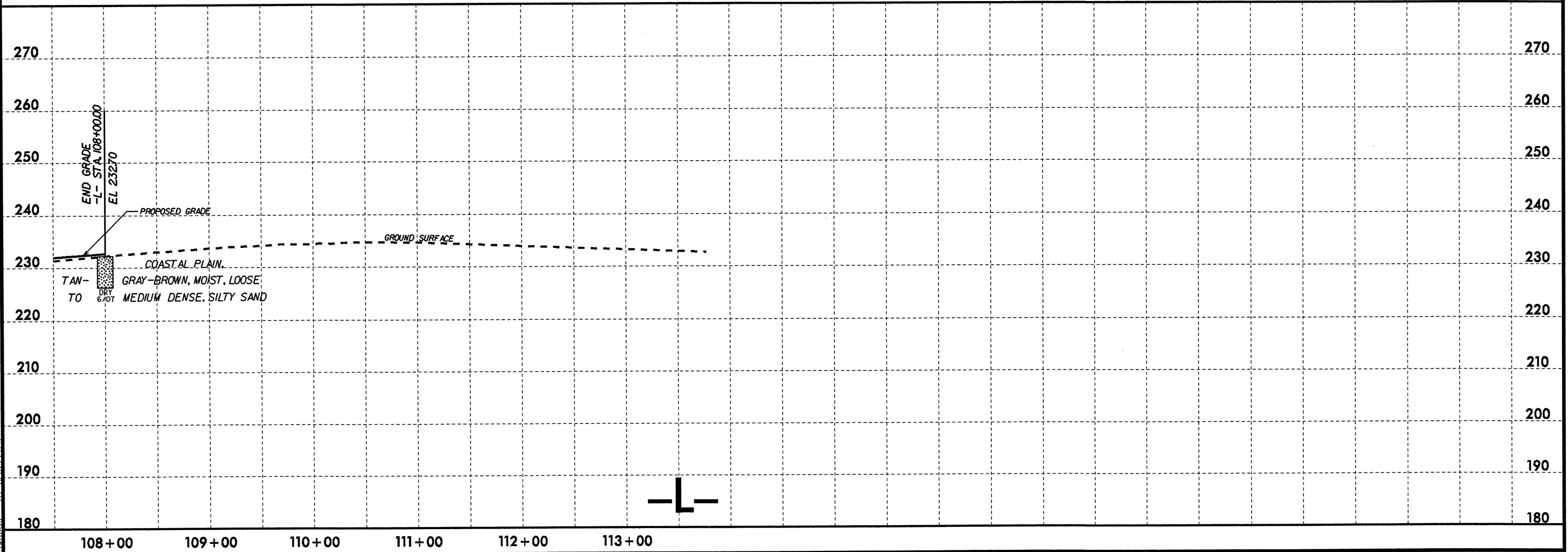
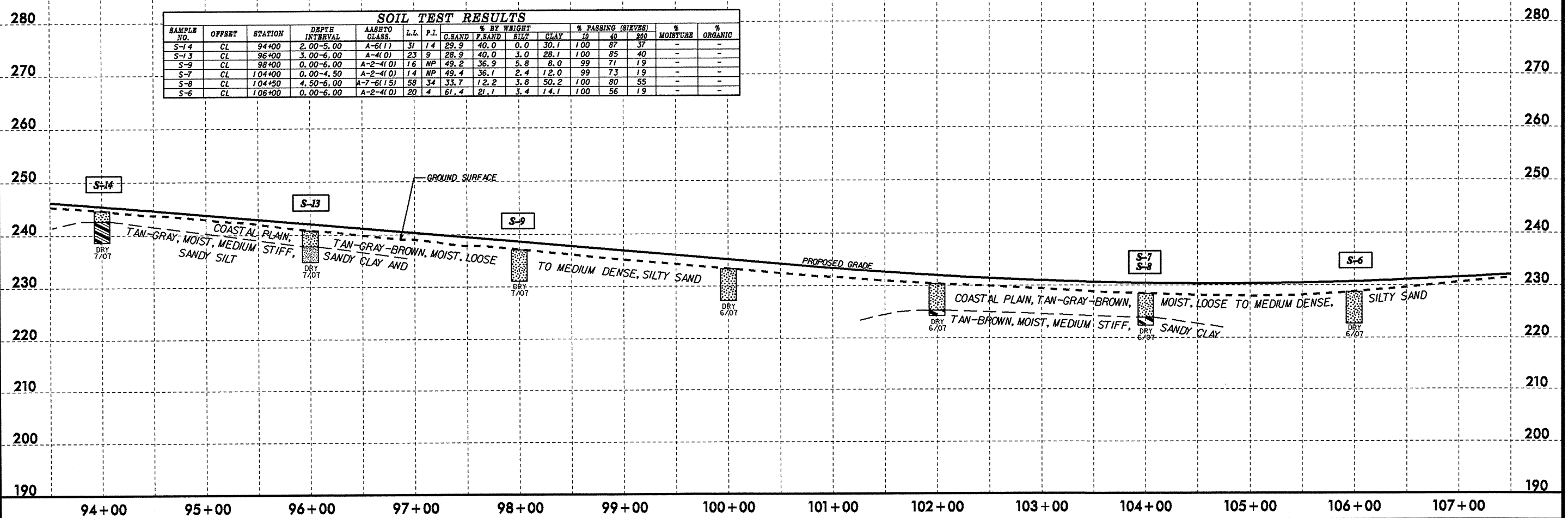
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-12	CL	89+00	0.00-4.00	A-2-4(0)	16	NP	36.5	48.2	5.2	10.0	100	83	23	-	-
S-11	CL	90+00	4.00-5.00	A-6(3)	37	16	28.3	34.7	2.8	34.1	100	86	43	-	-
S-10	CL	92+00	0.00-4.00	A-2-4(0)	17	NP	38.8	48.6	0.6	12.0	100	83	17	-	-



01-NOV-2007 13:57 I:\proj\alldat\project\station\tip\3423-geo\_rdw\cadd\geotech\PIanProf\U3423\_GEO\_pf\_L.dgn

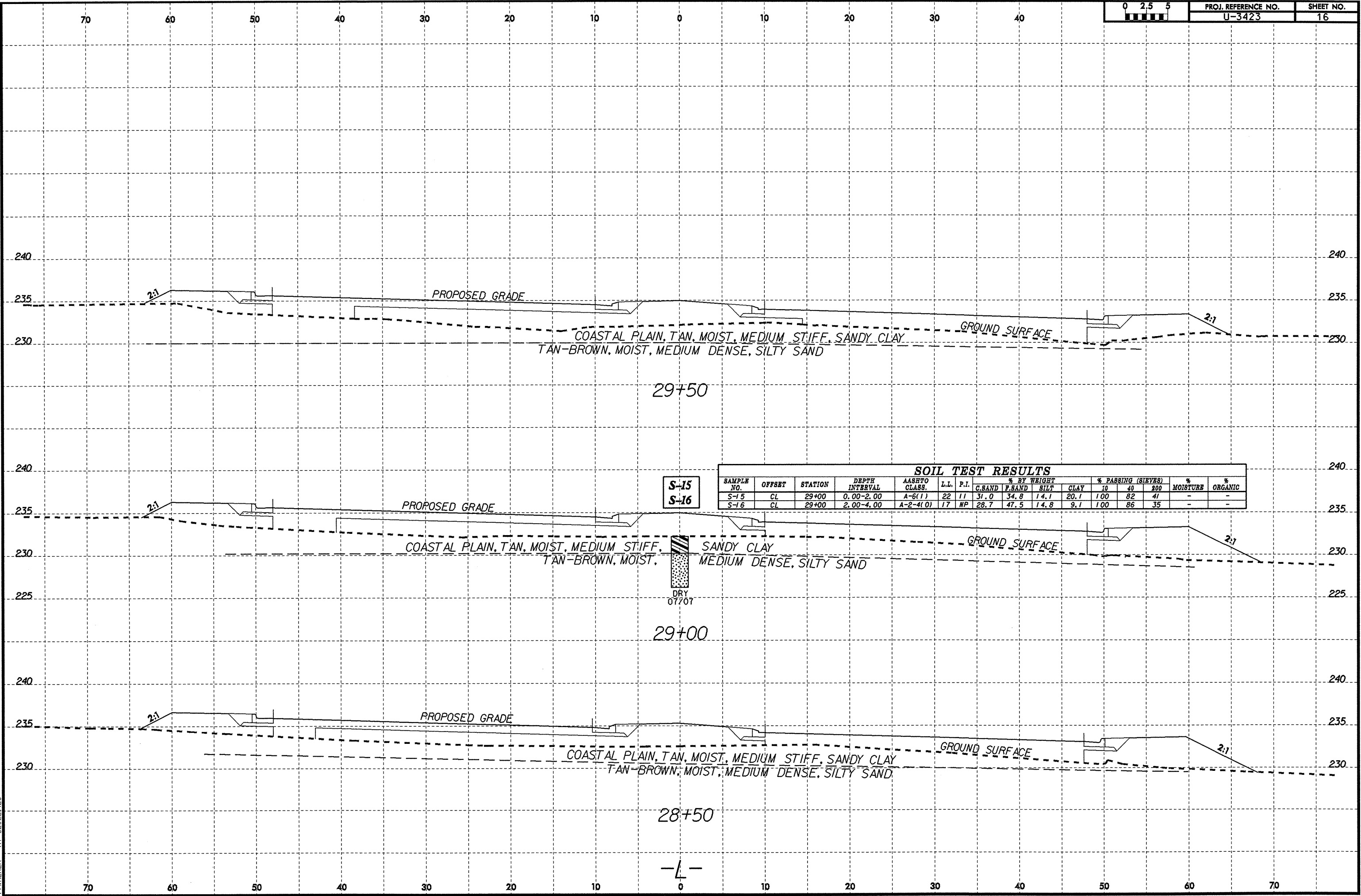
5/28/99

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	ASTM CLASS.	L.L.	P.I.	% BY WEIGHT			% PASSING (SIZES)			% MOISTURE	% ORGANIC	
							C SAND	F SAND	SILT	CLAY	10	40			200
S-14	CL	94+00	2.00-5.00	A-6(1)	31	14	29.9	40.0	0.0	30.1	100	87	37	-	-
S-13	CL	96+00	3.00-6.00	A-4(1)	23	9	28.9	40.0	3.0	28.1	100	85	40	-	-
S-9	CL	98+00	0.00-6.00	A-2-4(1)	16	NP	49.2	36.9	5.8	8.0	99	71	19	-	-
S-7	CL	104+00	0.00-4.50	A-2-4(1)	14	NP	49.4	36.1	2.4	12.0	99	73	19	-	-
S-8	CL	104+50	4.50-6.00	A-7-6(1.5)	58	34	33.7	12.2	3.8	50.2	100	80	55	-	-
S-6	CL	106+00	0.00-6.00	A-2-4(1)	20	4	61.4	21.1	3.4	14.1	100	56	19	-	-



I:\proj\071357\investigation\vip\U3423\geo\_r\dwy\cadd\geotech\PlanProf\U3423\_050.pfi\_L.dgn  
 01-NOV-2007 13:57  
 dwg: 12/21/07

8/23/99  
 23-OCT-2007 08:31  
 C:\FRENCH\PROJECTS\TIP\U3423.GEO\ROW\Y\CADD\GEO\TECH\SEC\U3423.GEO\_XSI.DGN  
 T. WALKER



29+50

29+00

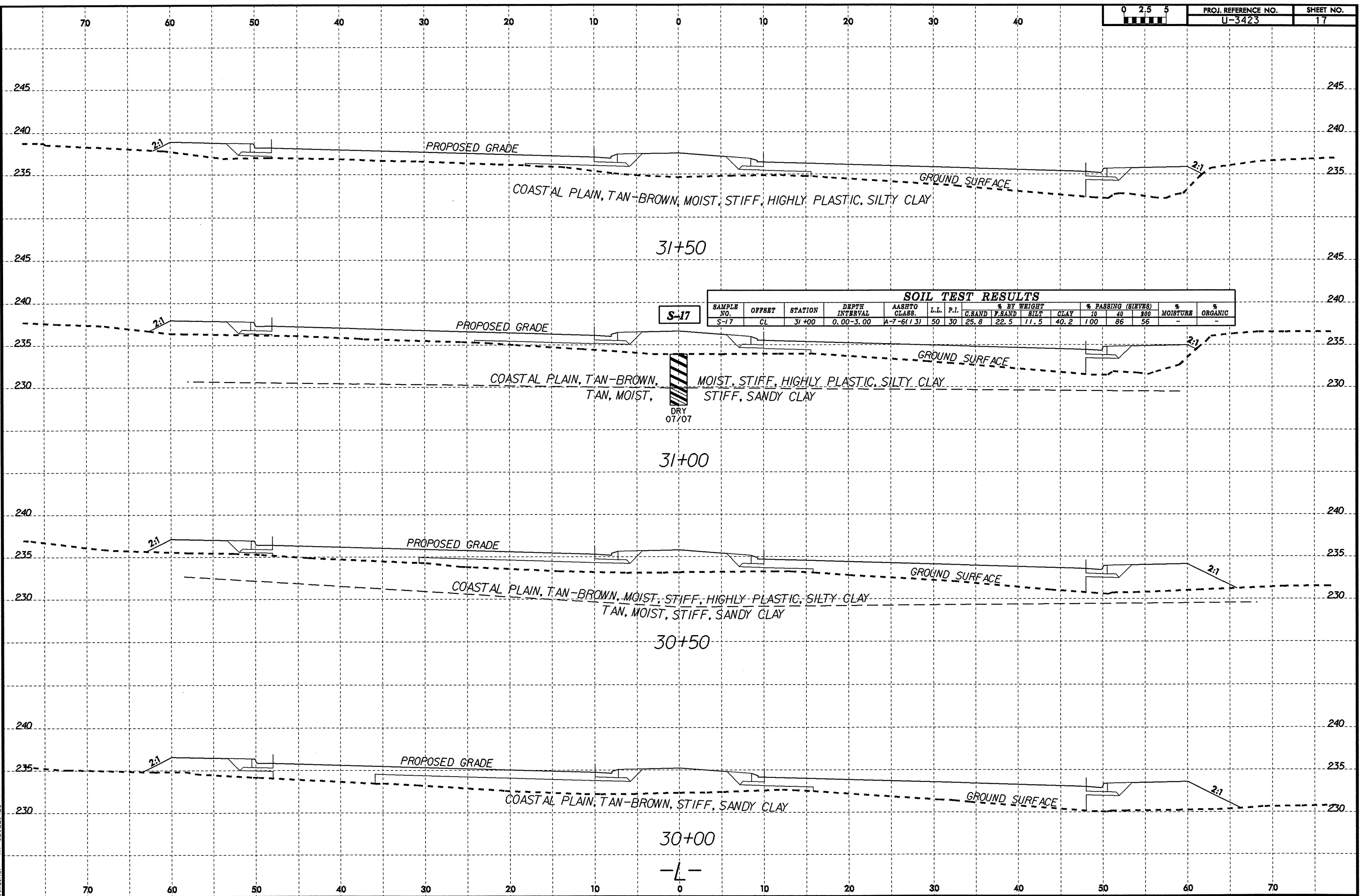
28+50

S-15  
S-16

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-15	CL	29+00	0.00-2.00	A-6(1)	22	11	31.0	34.8	14.1	20.1	100	82	47	-	-
S-16	CL	29+00	2.00-4.00	A-2-4(0)	17	NP	28.7	47.5	14.8	9.1	100	86	35	-	-

-L-

06-NOV-2007 11:38  
 I:\projects\investigation\top\3423\geo\_rdw\cadd\geotech\3423-geo\_xs.dgn  
 At GEJ22125  
 twalker



-L-

8/23/99

70

60

50

40

30

20

10

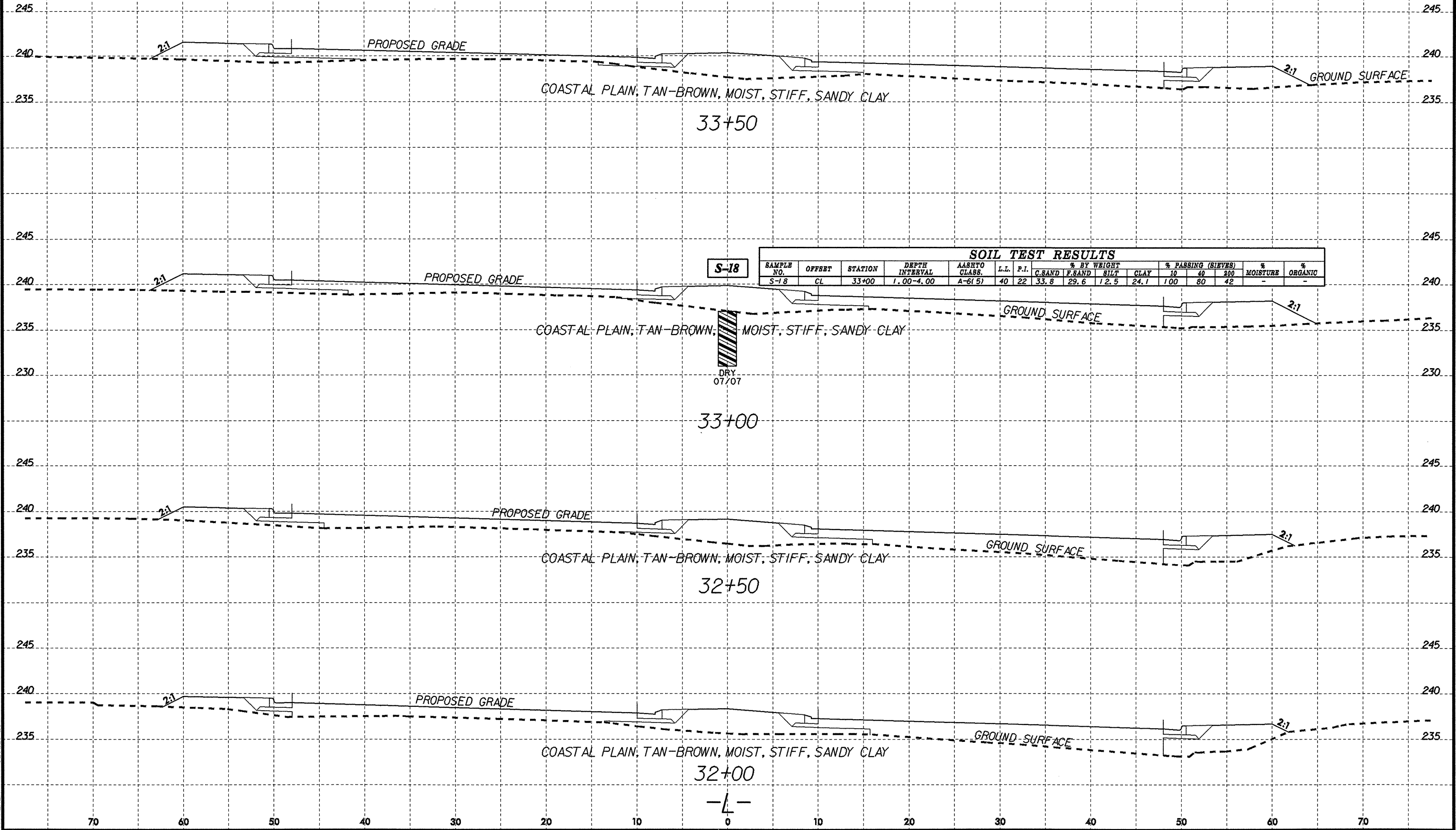
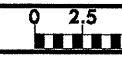
0

10

20

30

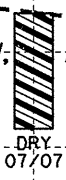
40



**SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-18	CL	33+00	1.00-4.00	A-6(5)	40	22	33.8	29.6	12.5	24.1	100	80	42	-	-

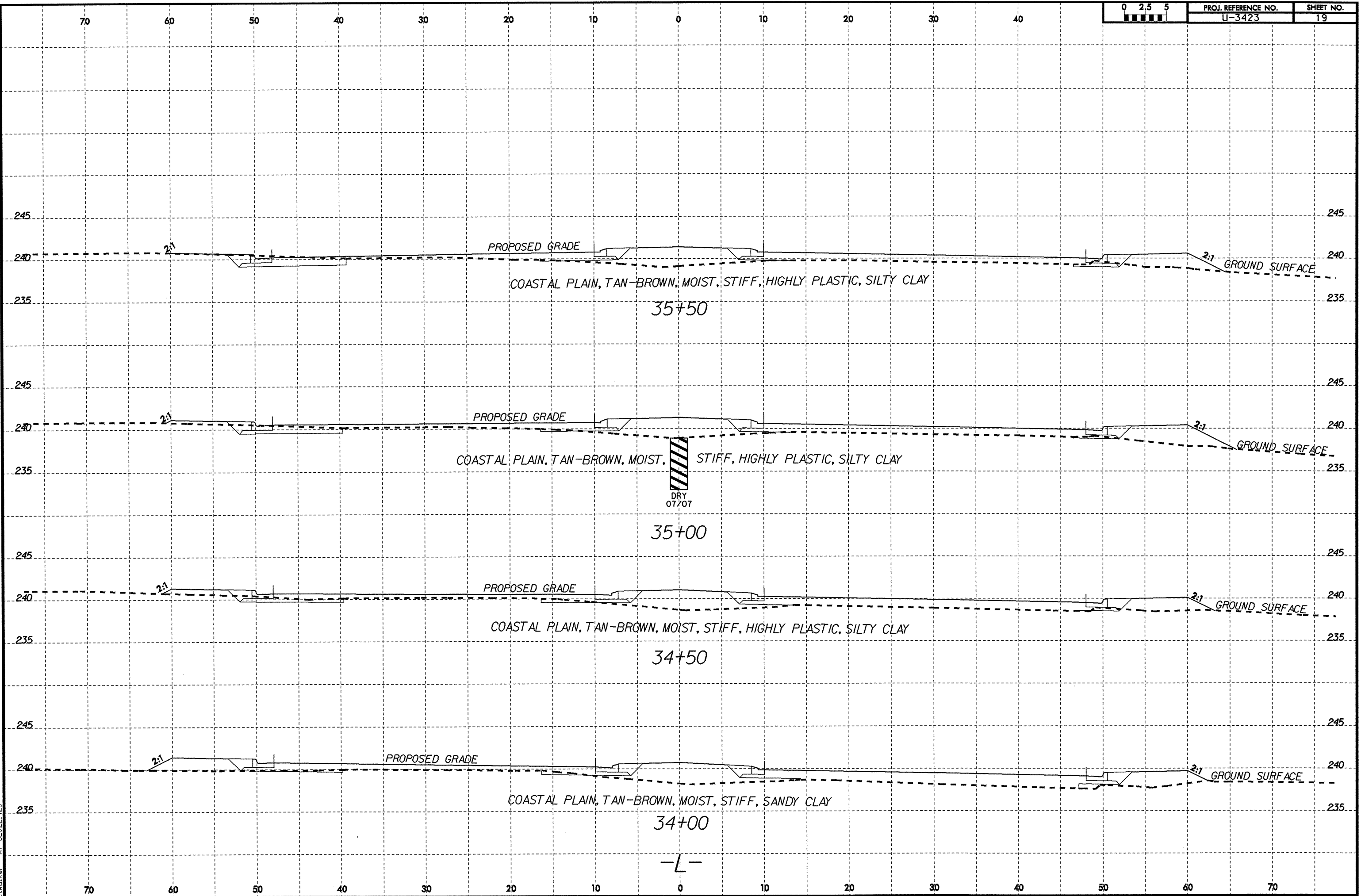
S-18



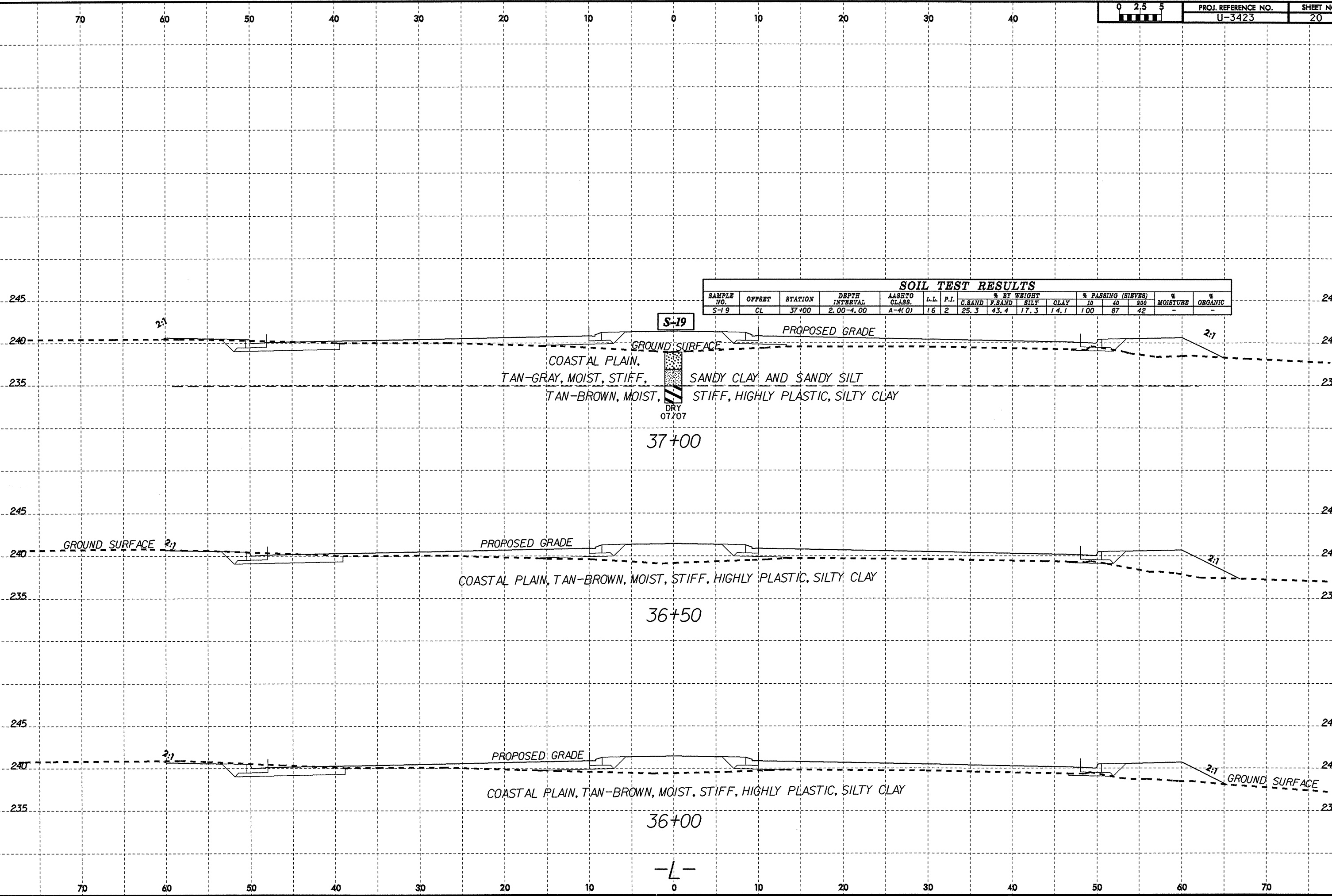
23-06T-2007 08:31 \\server\cadd\user\jst\proj\U3423\GEO\RDWY\CADD\_GEO\TECH\asc\U3423\_groc\_xst.dgn



8/23/99  
0:\NOV-2007\1107\investigation\up\3423.gpo\_rdkj\cadd\geotech\sec\3423.gpo\_xa.dgn  
11/22/07  
11/22/07



8/23/99  
 0:\NOV-2007\B17\avast\station\tp\3423-geo-rdwy\cadd\geotech\wsc\3423-geo-xxs.dgn  
 11/05/2007 09:21:25  
 11/05/2007 09:21:25



SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-19	CL	37+00	2.00-4.00	A-4(0)	16	2	25.3	43.4	17.3	14.1	100	87	42	-	-

S-19

37+00

36+50

36+00

-L-