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REFERENCE: U-4734

PROJECT: 36600

SEE SHEET 3 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-4734	1	40

ROADWAY SUBSURFACE INVESTIGATION

COUNTY FORSYTH
PROJECT DESCRIPTION SR 2601 (MACY GROVE RD)
EXTENSION FROM NORTH OF SR 1005 (EAST
MOUNTAIN ST) TO NC 150 (NORTH MAIN ST)

INVENTORY

CONTENTS

LINE	STATION	PLAN	PROFILE
-L-	11+75.00 - 102+46.44	4-11	14 - 17
-Y7-	18+00.00 - 20+58.35	4	18
-DR1-	10+00.00 - 12+69.85	5	NA
-DR2-	10+49.50 - 13+50.00	5	20
-DR3-	10+00.00 - 11+15.90	7	NA
-DR4-	10+00.00 - 11+35.00	8	NA
-DR5-	10+00.00 - 11+20.00	8	NA
-GW-	10+00.00 - 14+14.47	6	NA
-Y8-	10+00.00 - 13+00.00	6	NA
-Y9-	10+00.00 - 14+15.05	7	NA
-Y10-	11+23.35 - 14+42.26	9	NA
-Y11-	10+00.00 - 13+28.55	9	NA
-Y12-	10+50.00 - 11+57.73	10	19
-Y13-	10+00.00 - 31+05.69	11-13	NA

CROSS SECTIONS

LINE	STATION	SHEETS
-L-	21+00.00 - 97+00.00	21-34
-Y12-	10+50.00 - 11+57.73	35
-Y13-	15+00.00 - 23+00.00	36

APPENDICES

APPENDIX	TITLE	SHEETS
A	LABORATORY RESULTS	37

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT 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 THE 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.

- NOTES:
1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
 2. 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.

PERSONNEL

Chris Taylor

Mike Morgan

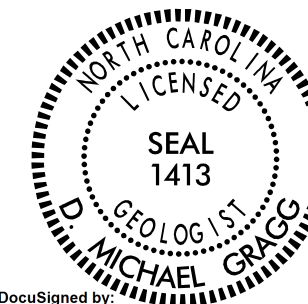
INVESTIGATED BY D. Michael Gragg

DRAWN BY Wesley Shuecraft

CHECKED BY Kenneth Bussey

SUBMITTED BY ICA Engineering

DATE August, 2016



DocuSigned by:
D. Michael Gragg

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8/29/2016

SIGNATURE

DATE



DocuSigned by:
Kenneth R. Bussey, Jr.





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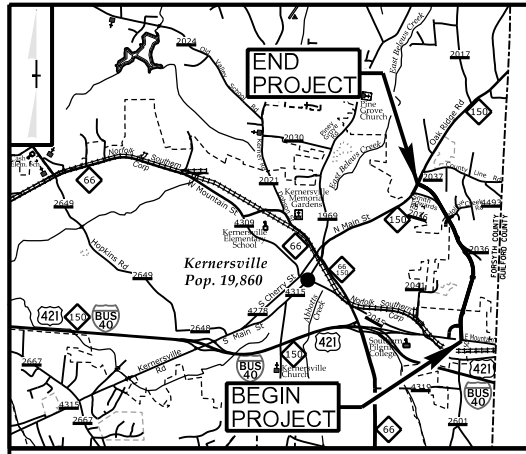
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DATE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS									
SOIL IS CONSIDERED 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 THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>										WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.										HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, 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:										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, SUCH 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 (ROQ) - 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 (SROQ) - 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.									
SOIL LEGEND AND AASHTO CLASSIFICATION										ANGULARITY OF GRAINS THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.										WEATHERED ROCK (WR)  NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.																			
MINERALOGICAL COMPOSITION MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.										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.																													
COMPRESSION SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50										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.																													
PERCENTAGE OF MATERIAL										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.																													
GROUND WATER										WEATHERING																													
U.S. STD. SIEVE SIZE OPENING (MM)										FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.																													
BOULDER (BLDR.) COBBLE (COB.) GRAVEL (GR.) COARSE SAND (CS.E. SD.) FINE SAND (F SD.) SILT (SL.) CLAY (CL.)										VERY SLIGHT (IV 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.																													
GRAIN SIZE (MM)										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.																													
SOIL MOISTURE - CORRELATION OF TERMS										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.																													
SOIL MOISTURE SCALE (ATTERBERG LIMITS)										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>																													
FIELD MOISTURE DESCRIPTION										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, WOULD YIELD SPT N VALUES > 100 BPF</i>																													
GUIDE FOR FIELD MOISTURE DESCRIPTION										VERY SEVERE (IV SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF</i>																													
PLASTICITY										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.																													
PLASTICITY INDEX (PI)										ROCK HARDNESS																													
DRY STRENGTH										VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.																													
COLOR										HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.																													
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.										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 GROUDED 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 GROUDED 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.																													
										FRACTURE SPACING										BEDDING																			
										VERY WIDE MORE THAN 10 FEET										VERY THICKLY BEDDED 4 FEET																			
										WIDE 3 TO 10 FEET										THICKLY BEDDED 1.5 - 4 FEET																			
										MODERATELY CLOSE 1 TO 3 FEET										THINLY BEDDED 0.16 - 1.5 FEET																			
										CLOSE 0.16 TO 1 FOOT										VERY THINLY BEDDED 0.03 - 0.16 FEET																			
										VERY CLOSE LESS THAN 0.16 FEET										THICKLY LAMINATED 0.008 - 0.03 FEET																			
																				THINLY LAMINATED < 0.008 FEET																			
										INDURATION																													
										FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF 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.																													
EQUIPMENT USED ON SUBJECT PROJECT										RECOMMENDATION SYMBOLS										ABBREVIATIONS																			
DRILL UNITS:										UNDERCUT										AR - AUGER REFUSAL																			
<input checked="" type="checkbox"/> CME-45C										<input checked="" type="checkbox"/> UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE										MED. - MEDIUM																			
<input type="checkbox"/> CME-55										<input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK										MICA - MICACEOUS																			
<input type="checkbox"/> CME-550										<input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK										MOD. - MODERATELY																			
<input type="checkbox"/> VANE SHEAR TEST										<input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK										NP - NON PLASTIC																			
<input type="checkbox"/> PORTABLE HOIST										<input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK										CPT - CONE PENETRATION TEST																			
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<input type="checkbox"/>										<input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK										SAP. - SAPROLITIC																			
<input type="checkbox"/>										<input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK										SD. - SAND, SANDY																			
<input type="checkbox"/>										<input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK										SL. - SILT, SILTY																			
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<input type="checkbox"/>										<input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK										TCR - TRICONE REFUSAL																			
<input type="checkbox"/>										<input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK										W - MOISTURE CONTENT																			
<input type="checkbox"/>										<input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK										V - VERY																			
<input type="checkbox"/>										<input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK										SAMPLE ABBREVIATIONS																			
<input type="checkbox"/>										<input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK										S - BULK																			
<input type="checkbox"/>										<input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK										SS - SPLIT SPOON																			
<input type="checkbox"/>										<input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK										ST - SHELBY TUBE																			
<input type="checkbox"/>										<input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK										RS - ROCK																			
<input type="checkbox"/>										<input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK										RT - RECOMPACTED TRIAXIAL																			
<input type="checkbox"/>										<input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK										CBR - CALIFORNIA BEARING RATIO																			
<input type="checkbox"/>										<input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK										FRAC ELEVATION: NA FEET																			
<input type="checkbox"/>										<input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK										NOTES:																			
<input type="checkbox"/>										<input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK										BORING ELEVATIONS OBTAINED USING u4734_ddc.tin.tin DATED 3/28/2016																			
<input type="checkbox"/>										<input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK										ELEVATION: NA FEET																			
<input type="checkbox"/>										<input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK										DATE: 8-15-14																			

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
FORSYTH COUNTY

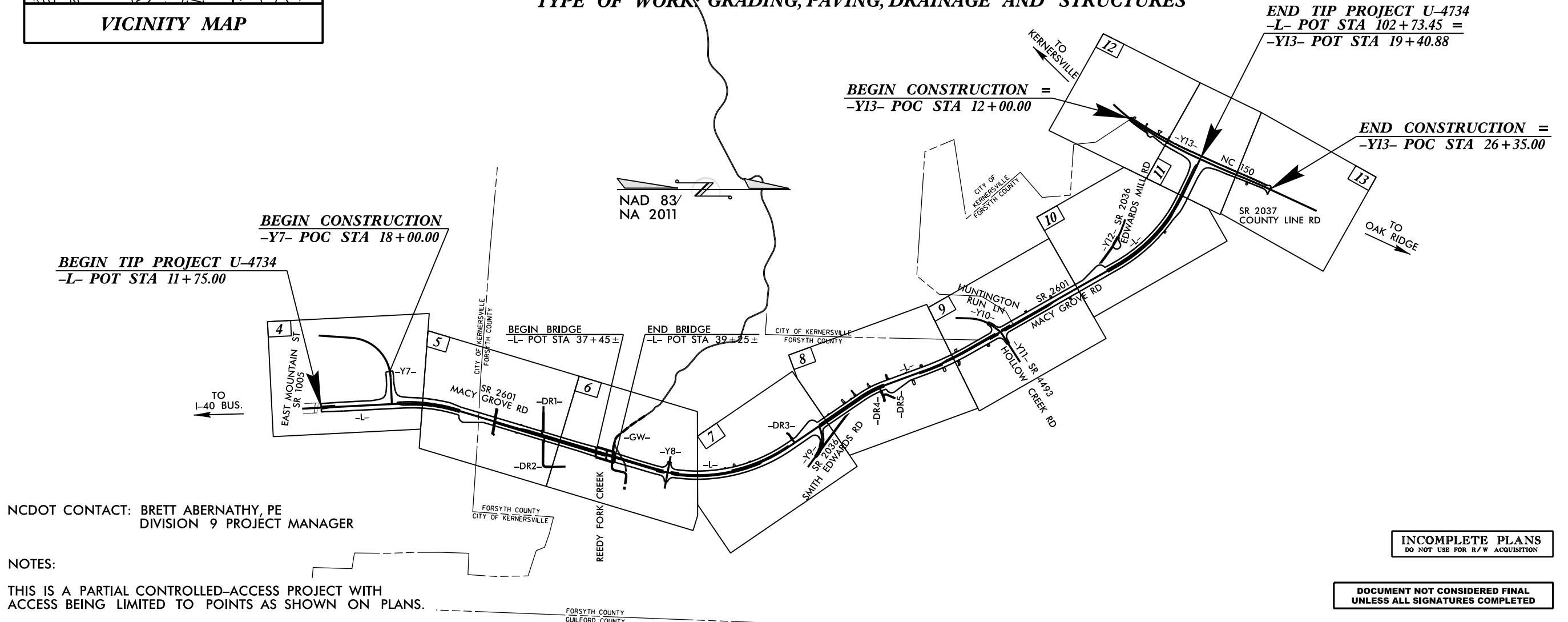
LOCATION: KERNERSVILLE - SR 2601 (MACY GROVE RD) EXTENSION
FROM NORTH OF SR 1005 (EAST MOUNTAIN ST) TO NC 150
(NORTH MAIN ST)

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4734	3	40
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
36600.1.2	STP-2601(3)	P.E.	

TIP PROJECT: U-4734

CONTRACT:



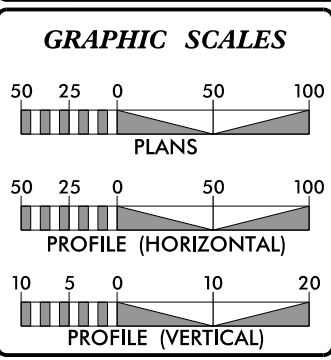
NCDOT CONTACT: BRETT ABERNATHY, PE
DIVISION 9 PROJECT MANAGER

NOTES:
THIS IS A PARTIAL CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON PLANS.

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

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



DESIGN DATA

ADT (2018) =	7,400
ADT (2038) =	10,300
K =	11 %
D =	55 %
T =	6 % *
V =	50 MPH
* TTST =	2% DUAL 4%
FUNC CLASS =	COLLECTOR REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-4734 =	1.689 MILES
LENGTH STRUCTURES TIP PROJECT U-4734 =	0.034 MILES
TOTAL LENGTH TIP PROJECT U-4734 =	1.723 MILES

Prepared for the North Carolina Department of Transportation in the office of:

ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: F-0258

2012 STANDARD SPECIFICATIONS	
RIGHT OF WAY DATE: DEC 2, 2016	DAVID C. WALLER, PE PROJECT ENGINEER
LETTING DATE: JUNE 19, 2018	DENA SNEAD, PE PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

DIVISION OF HIGHWAYS

STATE OF NORTH CAROLINA

DATE: \$\$\$\$\$\$
USER: \$\$\$\$\$\$



August 15, 2016

WBS NUMBER: 36600.1.2
TIP NUMBER: U-4734
F.A. NUMBER: STP-2601(3)
COUNTY: Forsyth
DESCRIPTION: SR 2601 (Macy Grove Road) Extension from North of SR 1005 to NC 150

SUBJECT: Geotechnical Report – Inventory

PROJECT DESCRIPTION

The project is located in east-central Forsyth County, North Carolina. This project consists of new alignment for the SR 2601 (Macy Grove Road) extension, the improvement of existing Smith Edward Road, and realignment and improvement of additional roadways/driveways impacted by the new alignment.

A CME 45 drill rig with an automatic hammer was used for the majority of the geotechnical investigation during May and June 2016. Additionally, a hand auger was utilized to advance two (2) borings within a difficult access tract. At selected boring locations, standard penetration tests (SPT) and/or Shelby tube tests were performed with samples extracted for laboratory analysis by HDR|ICA Engineering.

The following alignments, totaling 2.07 miles of roadway, were investigated. Profiles and cross sections of the appropriate alignments are included with this report.

<u>LINE</u>	<u>STATIONS</u>
-L-	11+75.00 to 102+73.45
-Y7-	18+00.00 to 20+99.35
-Y12-	10+50.00 to 11+57.73
-Y13-	12+00.00 to 26+35.00

AREAS OF SPECIAL GEOTECHNICAL INTEREST

Weathered Rock: Material identified by SPT drive reaction as Weathered Rock (WR) was encountered within advanced borings but not at or above proposed grade.

Crystalline Rock: Outcropping rock or crystalline rock (CR) was not identified above proposed grade during field operations:

High Plasticity Soils: Soils exhibiting plasticity indices of or in excess of 25 were encountered during the subsurface investigation at the following locations:

<u>LINE</u>	<u>STATIONS</u>	<u>OFFSETS</u>
-L-	79+50.00 to 82+00.00	LT to RT
-Y12-	10+50.00 to 11+57.73	LT to RT

Wet or Saturated Soils: Soils with natural moisture contents in excess of the liquid limit or excessively high moisture contents were encountered at the following locations:

<u>LINE</u>	<u>STATIONS</u>	<u>OFFSETS</u>
-L-	27+50.00 to 29+00.00	LT to RT
-L-	36+25.00 to 39+50.00	LT to RT
-L-	48+20.00 to 49+10.00	LT to CL

Alluvial Soils / Ponds: The following locations were interpreted to have alluvial soil deposits and/or intervals where proposed alignments and slopes extending into existing ponds:

<u>LINE</u>	<u>STATIONS</u>	<u>OFFSETS</u>
-L-	27+50.00 to 29+00.00	LT to RT
-L-	36+25.00 to 39+50.00	LT to RT
-L-	48+20.00 to 49+10.00	LT to RT
-L-	52+50.00 to 54+30.00	CL to RT

Soft or loose soils: Soils at or immediately beneath grade and identified as very soft to soft or very loose by SPT drives, Shelby tube testing or visual observation were encountered at the following locations:

<u>LINE</u>	<u>STATIONS</u>	<u>OFFSETS</u>
-L-	27+50.00 to 29+00.00	LT to RT
-L-	53+70.00 to 54+40.00	CL to RT
-L-	78+50.00 to 79+60.00	LT to RT
-L-	91+75.00 to 95+40.00	LT to RT
-Y13-	12+00.00 to 15+60.00	LT to RT
-Y13-	21+00.00 to 25+50.00	LT to RT

Groundwater Wells: Groundwater wells were located within or immediately adjacent to proposed alignment construction limits at the following locations:

<u>LINE</u>	<u>STATIONS</u>	<u>OFFSETS</u>
-L-	68+00.00	70' LT
-L-	78+50.00	80' RT

Sanitary Sewer/Septic Tanks: Septic Tanks and/or drain fields – infiltration areas are indicated within or immediately adjacent to the proposed alignment construction limits at the following locations:

<u>LINE</u>	<u>STATIONS</u>	<u>OFFSETS</u>
-L-	96+00.00 to 96+20	75' LT
-L-	96+50.00 to 97+50	30' LT to CL

PHYSIOGRAPHY AND GEOLOGY

The project alignment is located within the Piedmont Physiographic Province. The project corridor is comprised of rural to subdivision settings immediately east of Kernersville. The general topography of the alignment consists of broad ridge crests with moderately to gently sloping hillsides and drainage courses flowing to the south and east away from the proposed -L- alignment.

Geologically, the project is located within the northeastern extension of the Charlotte Litho-Tectonic Belt - approximately 2 miles east of the boundary with the Milton Belt (*Geologic Map of North Carolina, 1985 & Geologic*

Map of the East Half of the Winston-Salem Quadrangle, North Carolina-Virginia - Espenshade, Rankin, Shaw and Neuman, 1975). Underlying granitic rock is considered Pennsylvanian to Permian. The overlying residual soils are a product of the physical and chemical weathering of the underlying crystalline rock comprising the intrusive bodies.

SOIL PROPERTIES

Soils encountered during this investigation are separated into six (6) categories based on origin. The origins consist of roadway embankment, artificial fill, alluvial soils, residual soils, weathered rock and crystalline rock.

1) Roadway Embankment

Materials interpreted as roadway embankment were observed at the proposed extension beginning with existing Macy Grove Road, proposed extension and Huntington Run Lane/Hollow Creek Road intersection, proposed extension and NC 150 (Oak Ridge Road) intersection, -Y13- (NC-150 improvement section) beginning to Station 21+00, and the -Y12- cul-de-sac improvement. Materials were not sampled but varied in thickness from 1.5 feet to 2.7 feet.

2) Artificial Fill

Materials interpreted as artificial fill, typically isolated and small in mass, were observed associated with ponds (levees) at approximate Station 53+00. Materials were not sampled.

3) Alluvial Soils

Alluvial soils were encountered along -L- at two (2) Reedy Fork tributaries and Reedy Fork Creek. At Reedy Fork Creek, ponds are present, constructed within alluvial deposits. Additionally, one (1) pond is constructed within residual soils but included within alluvial soils due to similar soils and moisture conditions. Alluvial soils were composed of moist to wet, medium stiff clays with sub-equal fine to coarse grain sand (A-7-6), medium dense, coarse grain, silty sand (A-2-4), and very soft, slightly sandy clayey silt (A-4). Intercepted thickness ranged from 5.9 feet to 10.0 feet. Sediments exhibited non-plastic to medium plasticity characteristics.

4) Residual Soils

Residual soils are present throughout the proposed -L-, -Y7-, -Y12-, and -Y13- alignments and are derived from the weathering of the underlying crystalline rock. Typically, with exceptions for roadway embankment or alluvium, residual soils were recognized at the surface and penetrated to boring termination or infrequently interception of weathered rock or rarely interception of crystalline rock. Residual soils were differentiated into the following six (6) classifications:

- 1) moist, medium stiff, medium to occasionally high plasticity, sandy clay (A-7-5);
- 2) moist, medium stiff, medium plasticity clay with sub-equal fractions of sand (A-7-6);
- 3) moist, medium stiff, low plasticity, sandy silt (A-5);
- 4) moist, medium stiff to stiff, low plasticity silt with sub-equal to minor sand and traces rock fragments(A-4);
- 5) moist, loose to medium dense, low plasticity, fine to coarse grain silty sand (A-2-5); and
- 6) dry to moist, predominately coarse grain silty sand occasionally with rock fragments (A-2-4).

Field visual classifications of moist, loose to medium dense, coarse grain, silty clayey sand with quartz fragments in parts (A-2-6) and moist medium stiff to stiff silty clay with scattered traces of rock fragments (A-6) were also reported. Penetrated residual soil thickness varies within the project corridor from 7.2 feet to a maximum of 50.8 feet prior to termination, interception of weathered rock or interception of crystalline rock.

5) Weathered Rock

Weathered rock, determined by SPT drive, was encountered underlying the major hills (cuts) along the proposed -L- alignment and near the -L- alignment and US 150 (-Y13) intersection. No samples were

recovered however published mapping indicates underlying granitic rock. Weathered rock thickness appears to range from not present to 15.5 feet. Elevation at the top of weathered rock varies widely depending upon location from 977.5 (MSL) near the -L-/-Y13-(NC150) intersection to 878.7 (MSL) beneath the southerly most Reedy Fork tributary.

6) Crystalline Rock

Crystalline rock, determined by SPT refusal, was intercepted beneath residual soils or weathered rock, depending upon location, along the proposed alignments. No samples were recovered however published mapping indicates granitic rock underlying the proposed alignments. Crystalline rock was intercepted near the beginning of -L-, underlying the southerly most tributary of Reedy Fork and near the -L-/-Y13-(NC150) intersection. Elevation at the top of crystalline rock varies from 974.8 (MSL) to 868.0 (MSL) at these sites.

GROUNDWATER

Groundwater was encountered during drilling operations (immediate) within seven (7) roadway borings along the various proposed alignments at elevations of 973.8 to 880.5 (MSL). The remaining advanced borings were reported as dry. Static or 24 hour measurements were recorded within four (4) roadway borings at elevations of 975.8 to 880.5 (MSL).

1) Wells

Two (2) groundwater wells were recognized within proposed construction limits at the following locations:

<u>LINE</u>	<u>STATIONS</u>	<u>OFFSETS</u>
-L-	68+00.00	70' LT
-L-	78+50.00	80' RT

Additional groundwater wells were recognized outside of construction limits but within the proposed alignment corridor. The potential exists for groundwater wells not located during the investigation phase to be encountered during construction.

Similarly, septic tank locations with drain fields, within construction limits, were recognized. The potential exists for additional sites to be encountered during construction.

Prepared by,

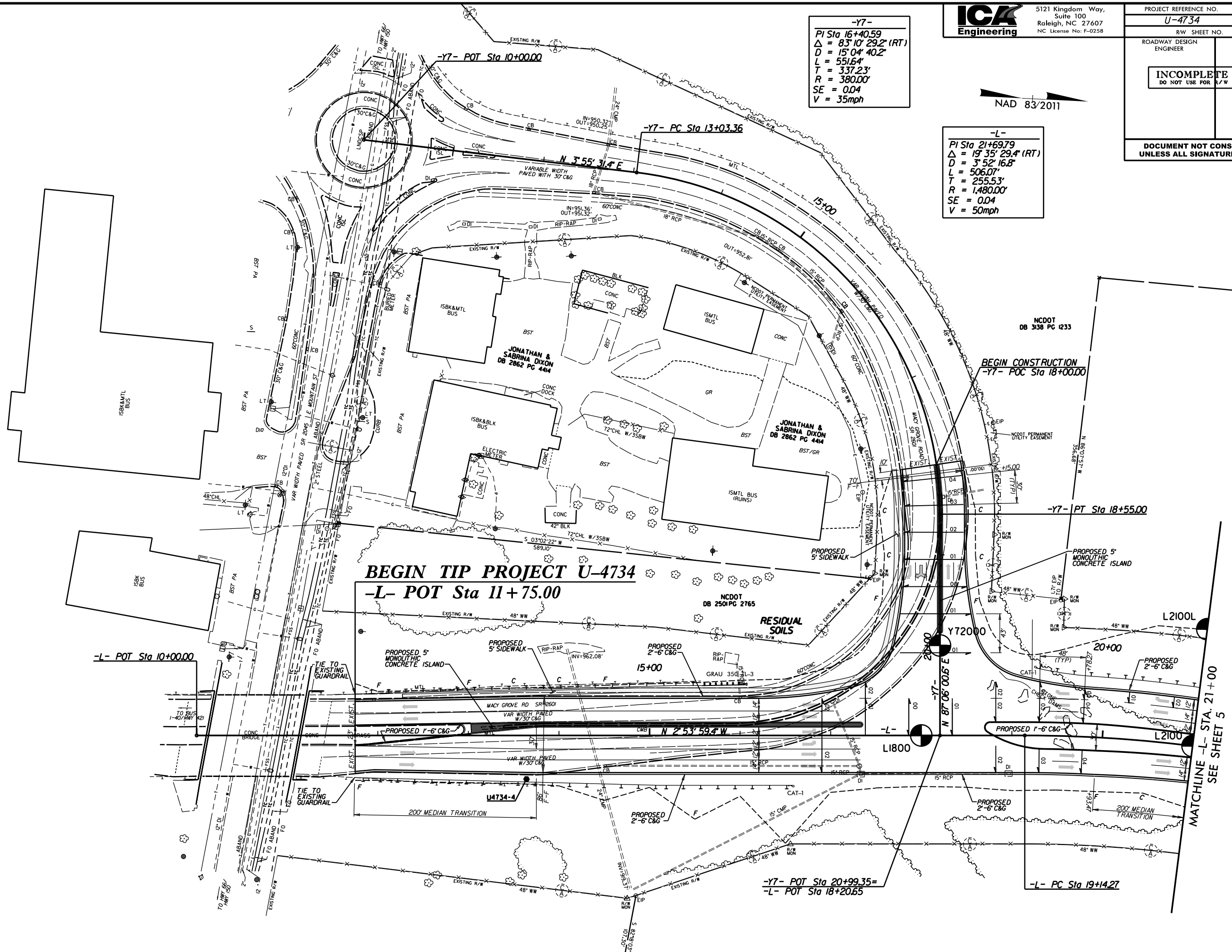
Kenneth R. Bussey, Jr., PE
Project Engineer

D. Michael Gragg, LG
Senior Project Geologist

-Y7-
 PI Sta 16+40.59
 $\Delta = 83^{\circ}10'29.2''$ (RT)
 $D = 15^{\circ}04'40.2''$
 $L = 551.64'$
 $T = 337.23'$
 $R = 380.00'$
 $SE = 0.04$
 $V = 35\text{mph}$

-L-
 PI Sta 21+69.79
 $\Delta = 19^{\circ}35'29.4''$ (RT)
 $D = 3^{\circ}52'16.8''$
 $L = 506.07'$
 $T = 255.53'$
 $R = 1,480.00'$
 $SE = 0.04$
 $V = 50\text{mph}$

NAD 83/2011



BEGIN TIP PROJECT U-4734
-L- POT Sta 11+75.00

BEGIN CONSTRUCTION
-Y7- POC Sta 18+00.00

-Y7- PT Sta 18+55.00

-L- POT Sta 10+00.00

-Y7- POT Sta 20+99.35 =
-L- POT Sta 18+20.65

-L- PC Sta 19+14.27

MATCHLINE -L- STA. 21+00
SEE SHEET 5

DATE\$\$\$\$\$
 USER\$\$\$\$\$

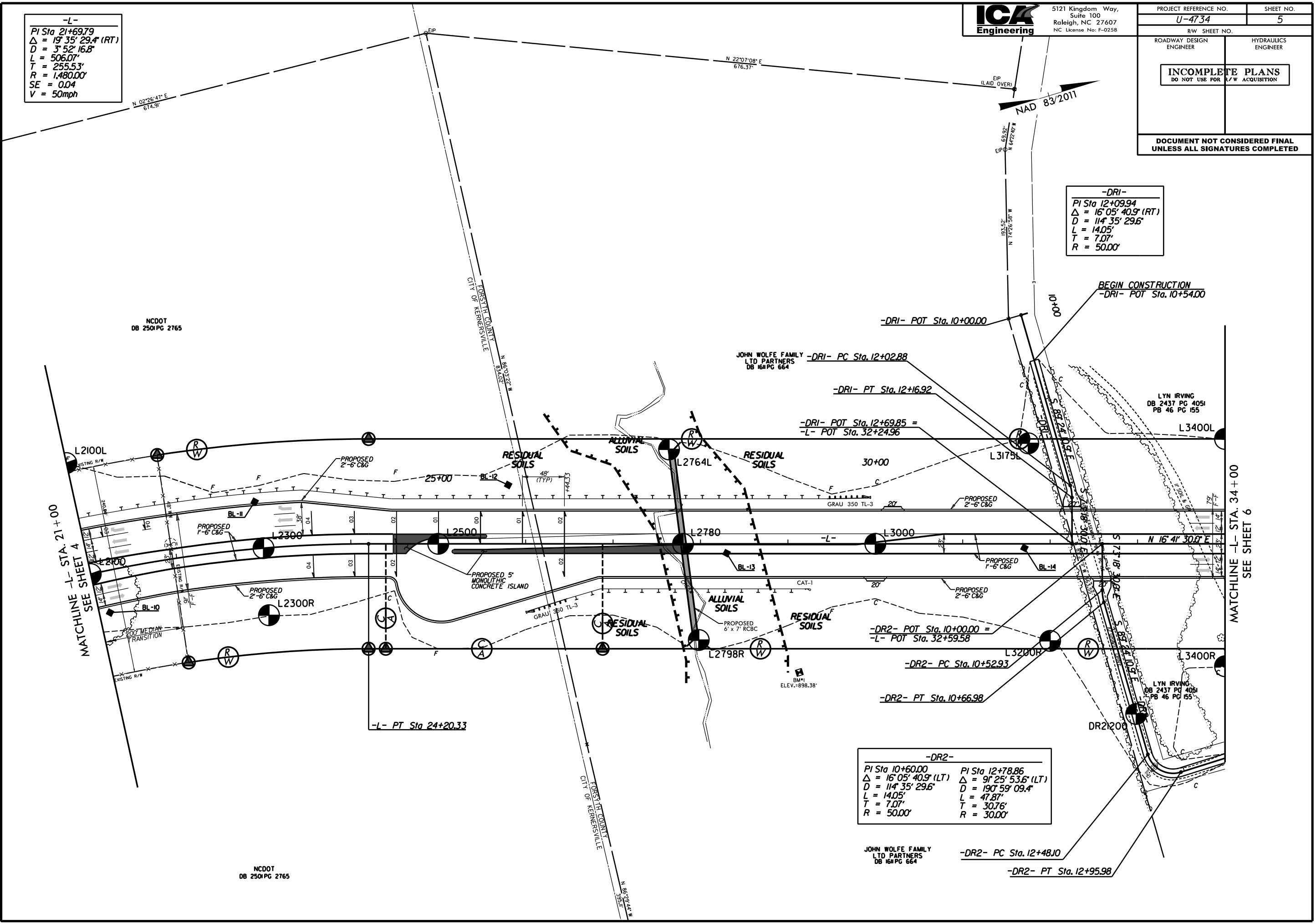
-L-
 PI Sta 21+69.79
 $\Delta = 19' 35'' 29.4'' (RT)$
 $D = 3' 52'' 16.8''$
 $L = 506.07'$
 $T = 255.53'$
 $R = 1,480.00'$
 $SE = 0.04$
 $V = 50\text{mph}$

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PROJECT REFERENCE NO.	SHEET NO.
U-4734	5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

-DRI-
 PI Sta 12+09.94
 $\Delta = 16' 05'' 40.9'' (RT)$
 $D = 11' 35'' 29.6''$
 $L = 14.05'$
 $T = 7.07'$
 $R = 50.00'$

-DR2-
 PI Sta 10+60.00 PI Sta 12+78.86
 $\Delta = 16' 05'' 40.9'' (LT)$ $\Delta = 9' 25'' 53.6'' (LT)$
 $D = 11' 35'' 29.6''$ $D = 19' 59'' 09.4''$
 $L = 14.05'$ $L = 47.87'$
 $T = 7.07'$ $T = 30.76'$
 $R = 50.00'$ $R = 30.00'$



NCDOT
 DB 2501 PG 2765

NCDOT
 DB 2501 PG 2765

MATCHLINE -L- STA. 21+00
SEE SHEET 4

MATCHLINE -L- STA. 34+00
SEE SHEET 6

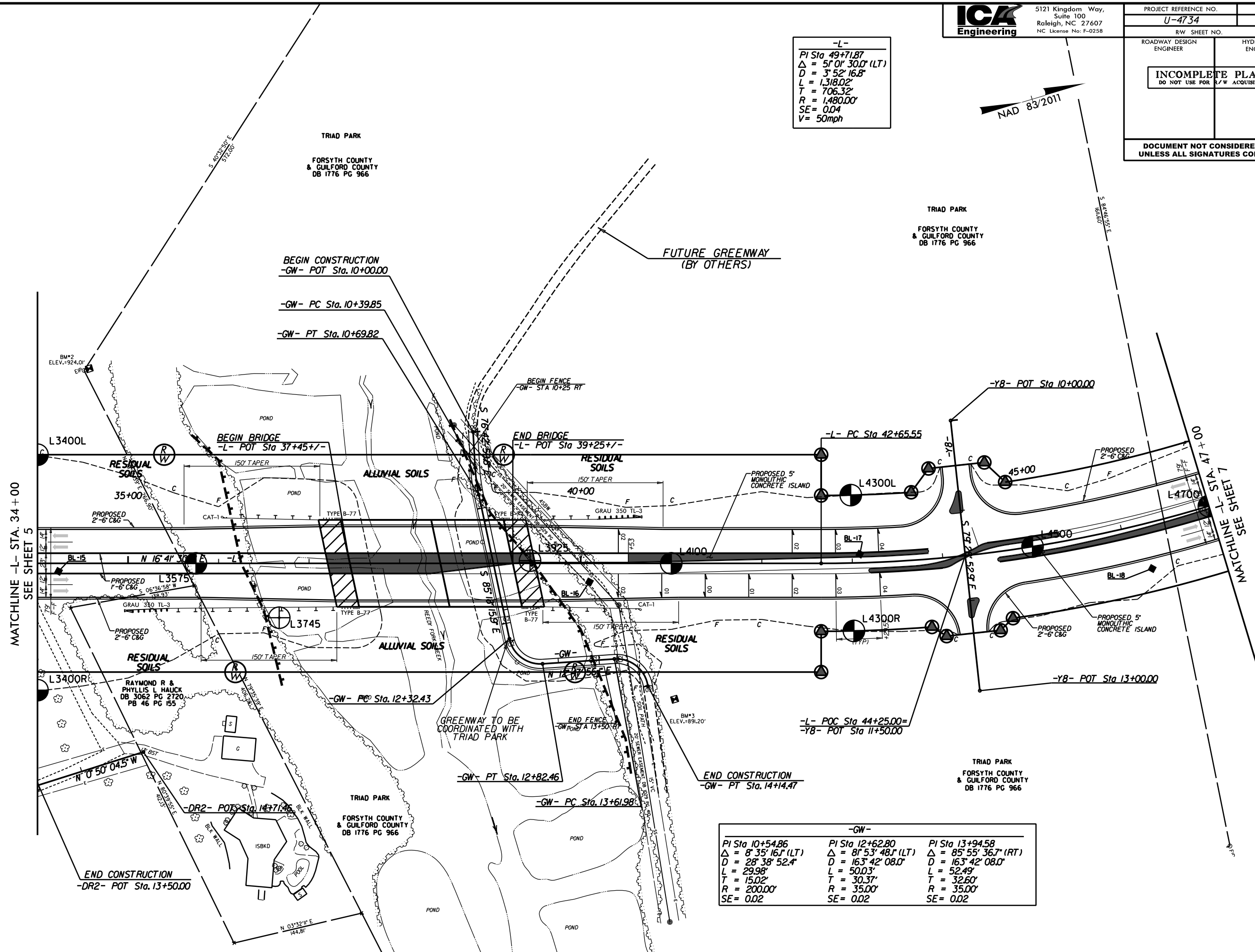
DATE: \$
 \$\$\$\$USERNAME\$\$\$\$

FORESTH COUNTY
 CITY OF KERNERSVILLE

JOHN WOLFE FAMILY
 LTD PARTNERS
 DB 161 PG 664

LYN IRVING
 DB 2437 PG 4051
 PB 46 PG 155

-L-
 PI Sta 49+71.87
 $\Delta = 51^{\circ} 01' 30.0''$ (LT)
 $D = 3^{\circ} 52' 16.8''$
 $L = 1,318.02'$
 $T = 706.32'$
 $R = 1,480.00'$
 $SE = 0.04$
 $V = 50\text{mph}$



BEGIN CONSTRUCTION
 -GW- POT Sta. 10+00.00
 -GW- PC Sta. 10+39.85
 -GW- PT Sta. 10+69.82

FUTURE GREENWAY
 (BY OTHERS)

BEGIN BRIDGE
 -L- POT Sta 37+45+/-

END BRIDGE
 -L- POT Sta 39+25+/-

-L- PC Sta 42+65.55

-YB- POT Sta 10+00.00

MATCHLINE -L- STA. 34+00
SEE SHEET 5

MATCHLINE -L- STA. 47+00
SEE SHEET 7

-GW- PC Sta. 12+32.43

-GW- PT Sta. 12+82.46

-GW- PC Sta. 13+61.98

-L- POC Sta 44+25.00=
 -YB- POT Sta 11+50.00

-YB- POT Sta 13+00.00

END CONSTRUCTION
 -GW- PT Sta. 14+14.47

END CONSTRUCTION
 -DR2- POT Sta. 13+50.00

-GW-		
PI Sta 10+54.86	PI Sta 12+62.80	PI Sta 13+94.58
$\Delta = 8^{\circ} 35' 16.1''$ (LT)	$\Delta = 81^{\circ} 53' 48.1''$ (LT)	$\Delta = 85^{\circ} 55' 36.7''$ (RT)
$D = 28^{\circ} 38' 52.4''$	$D = 163^{\circ} 42' 08.0''$	$D = 163^{\circ} 42' 08.0''$
$L = 29.98'$	$L = 50.03'$	$L = 52.49'$
$T = 15.02'$	$T = 30.37'$	$T = 32.60'$
$R = 200.00'$	$R = 35.00'$	$R = 35.00'$
$SE = 0.02$	$SE = 0.02$	$SE = 0.02$

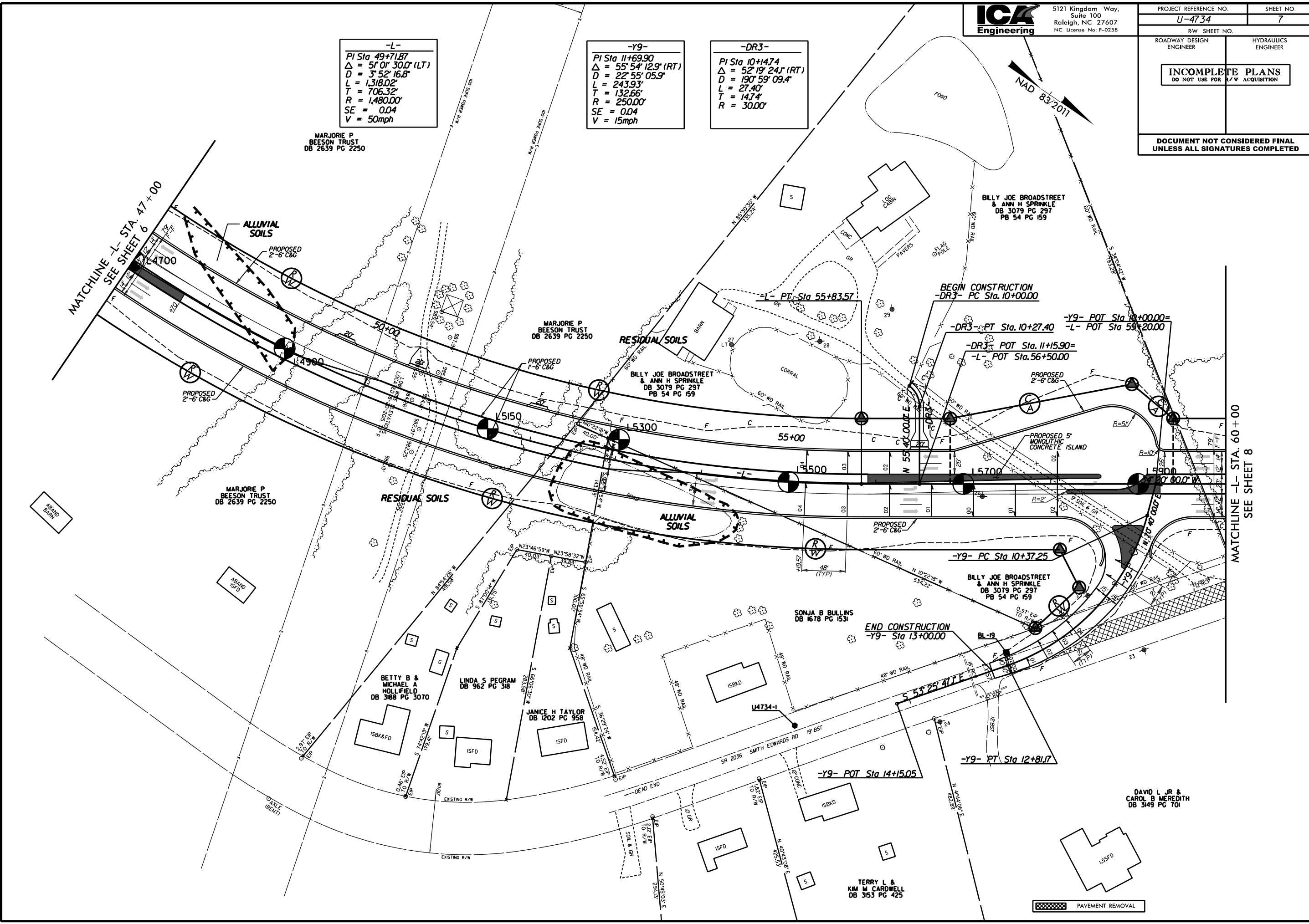
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 USER: \$
 USER: \$

PROJECT REFERENCE NO.	SHEET NO.
U-4734	7
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

-L-
 PI Sta 49+71.87
 $\Delta = 51^{\circ} 01' 30.0''$ (LT)
 $D = 3^{\circ} 52' 16.8''$
 $L = 1,318.02'$
 $T = 706.32'$
 $R = 1,480.00'$
 $SE = 0.04$
 $V = 50\text{mph}$

-Y9-
 PI Sta 11+69.90
 $\Delta = 55^{\circ} 54' 12.9''$ (RT)
 $D = 22^{\circ} 55' 05.9''$
 $L = 243.93'$
 $T = 132.66'$
 $R = 250.00'$
 $SE = 0.04$
 $V = 15\text{mph}$

-DR3-
 PI Sta 10+14.74
 $\Delta = 52^{\circ} 19' 24.1''$ (RT)
 $D = 190^{\circ} 59' 09.4''$
 $L = 27.40'$
 $T = 14.74'$
 $R = 30.00'$



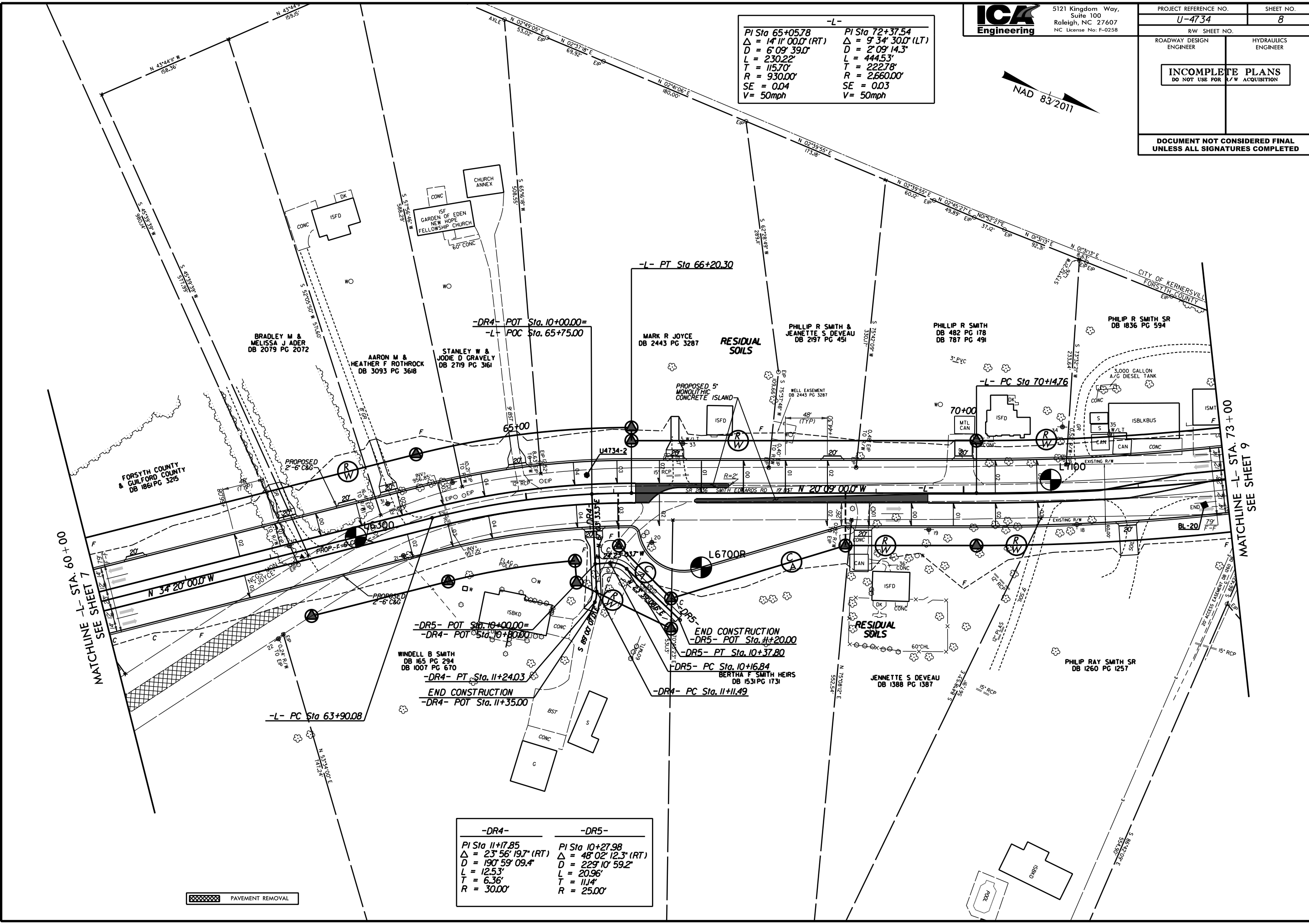
MATCHLINE -L- STA. 47+00
 SEE SHEET 6

MATCHLINE -L- STA. 60+00
 SEE SHEET 8

DATE: \$\$\$\$
 USER: \$\$\$\$
 USER: \$\$\$\$

PAVEMENT REMOVAL

-L-	
PI Sta 65+05.78	PI Sta 72+37.54
$\Delta = 14^{\circ} 11' 00.0" (RT)$	$\Delta = 9^{\circ} 34' 30.0" (LT)$
D = 6'09' 39.0"	D = 2'09' 14.3"
L = 230.22'	L = 444.53'
T = 115.70'	T = 222.78'
R = 930.00'	R = 2,660.00'
SE = 0.04	SE = 0.03
V = 50mph	V = 50mph



-DR4-	-DR5-
PI Sta 11+17.85	PI Sta 10+27.98
$\Delta = 23^{\circ} 56' 19.7" (RT)$	$\Delta = 48^{\circ} 02' 12.3" (RT)$
D = 190' 59' 09.4"	D = 229' 10' 59.2"
L = 125.3'	L = 20.96'
T = 6.36'	T = 11.4'
R = 30.00'	R = 25.00'

PAVEMENT REMOVAL

MATCHLINE -L- STA. 60+00
SEE SHEET 7

MATCHLINE -L- STA. 73+00
SEE SHEET 9

DATE: \$\$\$\$
 USER: \$\$\$\$
 USERNAME: \$\$\$\$



5121 Kingdom Way,
Suite 100
Raleigh, NC 27607
NC License No: F-0258

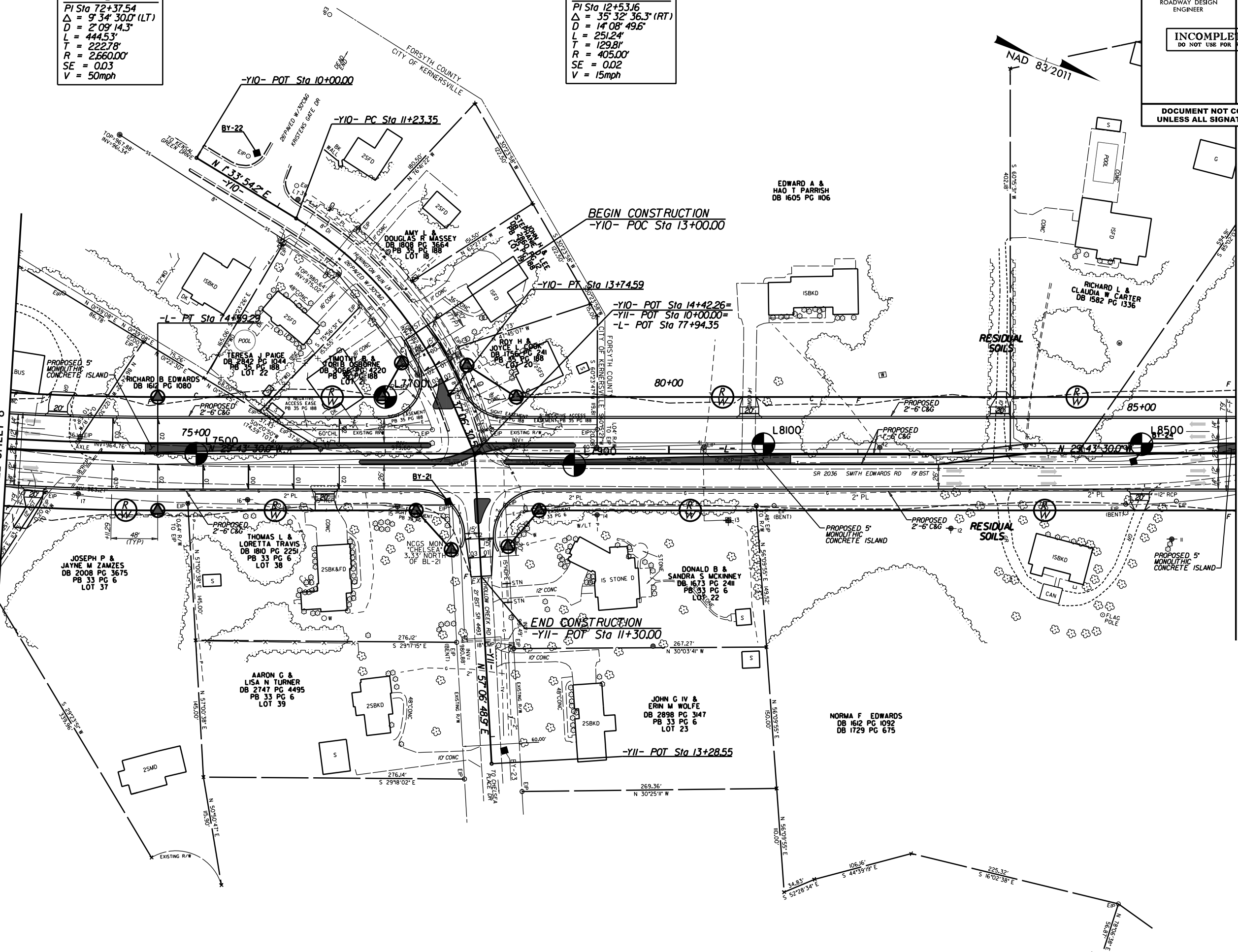
PROJECT REFERENCE NO.	SHEET NO.
U-4734	9
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

-L-
PI Sta 72+37.54
 $\Delta = 9' 34' 30.0''$ (LT)
D = 2' 09' 14.3"
L = 444.53'
T = 222.78'
R = 2,660.00'
SE = 0.03
V = 50mph

-Y10-
PI Sta 12+53.6
 $\Delta = 35' 32' 36.3''$ (RT)
D = 14' 08' 49.6"
L = 251.24'
T = 129.81'
R = 405.00'
SE = 0.02
V = 15mph

MATCHLINE -L- STA. 73+00
SEE SHEET 8

MATCHLINE -L- STA. 86+00
SEE SHEET 10



DATE: \$\$\$\$
USER: \$\$\$\$
SERIAL: \$\$\$\$

PROJECT REFERENCE NO.	SHEET NO.
U-4734	10
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

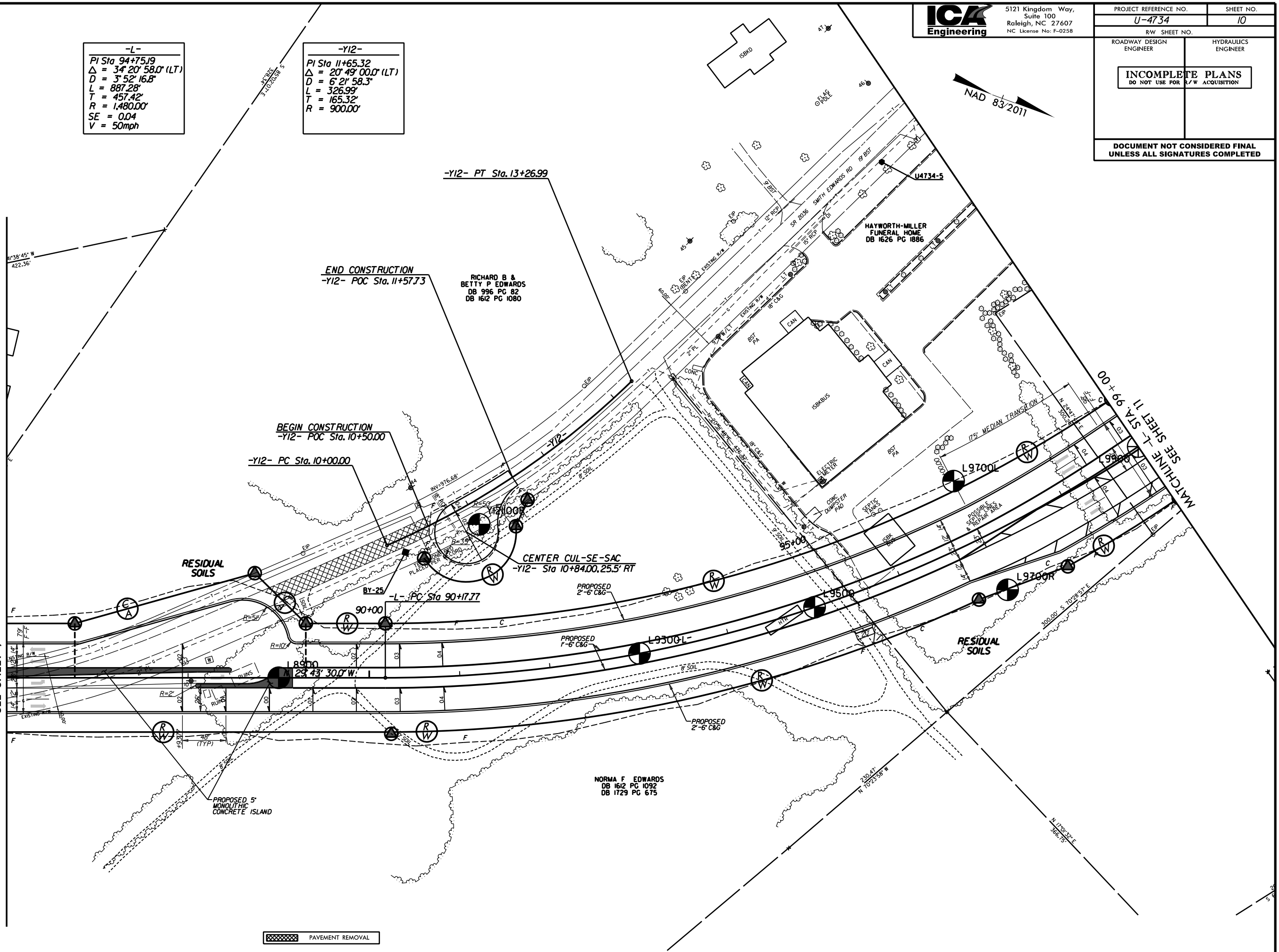
-L-
 PI Sta 94+75.19
 $\Delta = 34^{\circ} 20' 58.0" (LT)$
 $D = 3^{\circ} 52' 16.8"$
 $L = 887.28'$
 $T = 457.42'$
 $R = 1,480.00'$
 $SE = 0.04$
 $V = 50mph$

-Y12-
 PI Sta 11+65.32
 $\Delta = 20^{\circ} 49' 00.0" (LT)$
 $D = 6^{\circ} 21' 58.3"$
 $L = 326.99'$
 $T = 165.32'$
 $R = 900.00'$



MATCHLINE -L- STA. 86+00
SEE SHEET 9

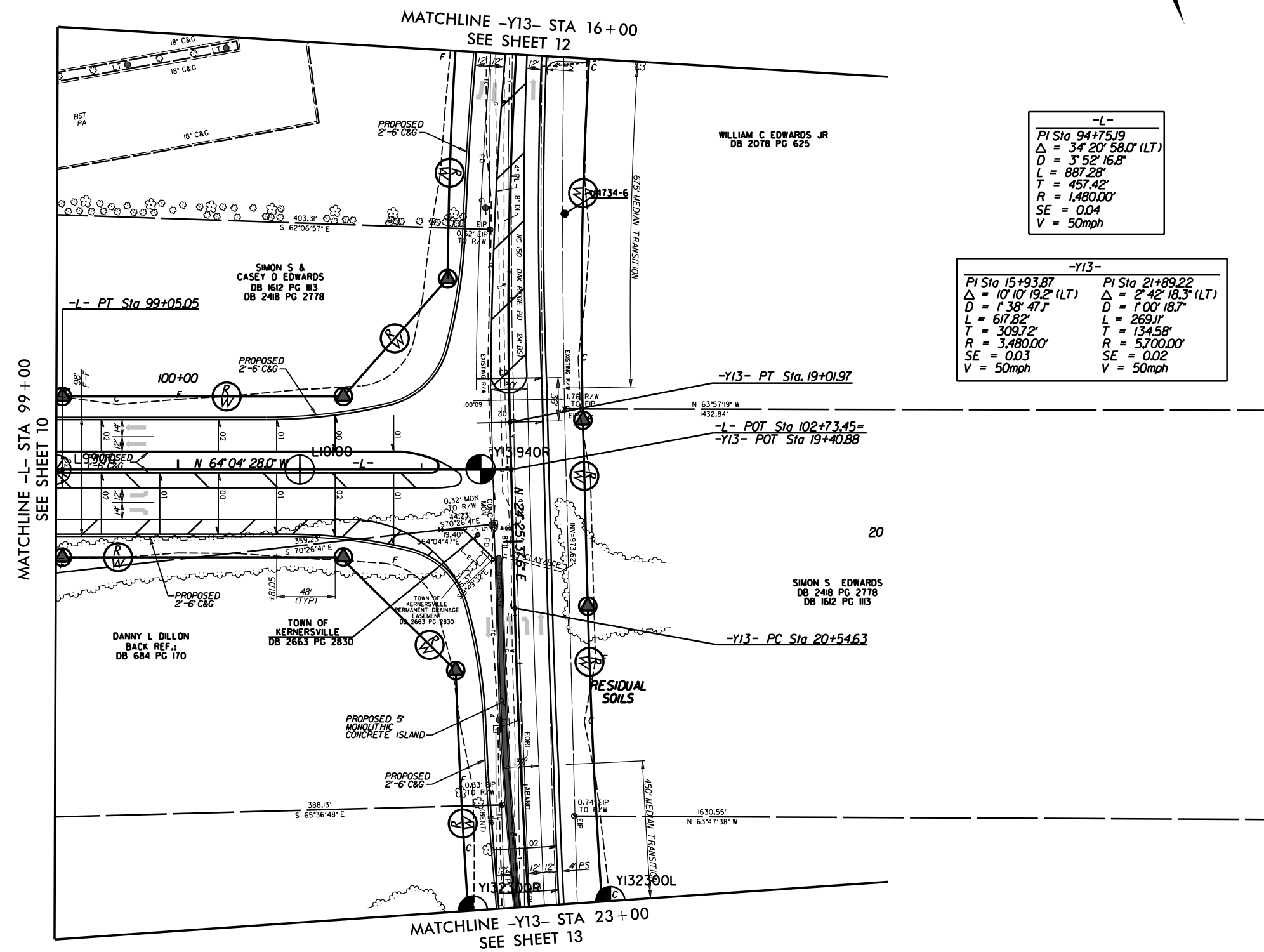
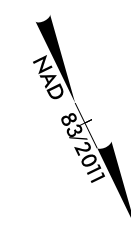
MATCHLINE -L- STA 99+00
SEE SHEET 11



DATE: \$\$\$\$
 USER: \$\$\$\$
 USER: \$\$\$\$

PAVEMENT REMOVAL

PROJECT REFERENCE NO.	SHEET NO.
U-4734	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



-L-

PI Sta 94+75.19
$\Delta = 34^{\circ} 20' 58.0"$ (LT)
$D = 3^{\circ} 52' 16.8"$
$L = 887.28'$
$T = 457.42'$
$R = 1,480.00'$
$SE = 0.04$
$V = 50\text{mph}$

-Y13-

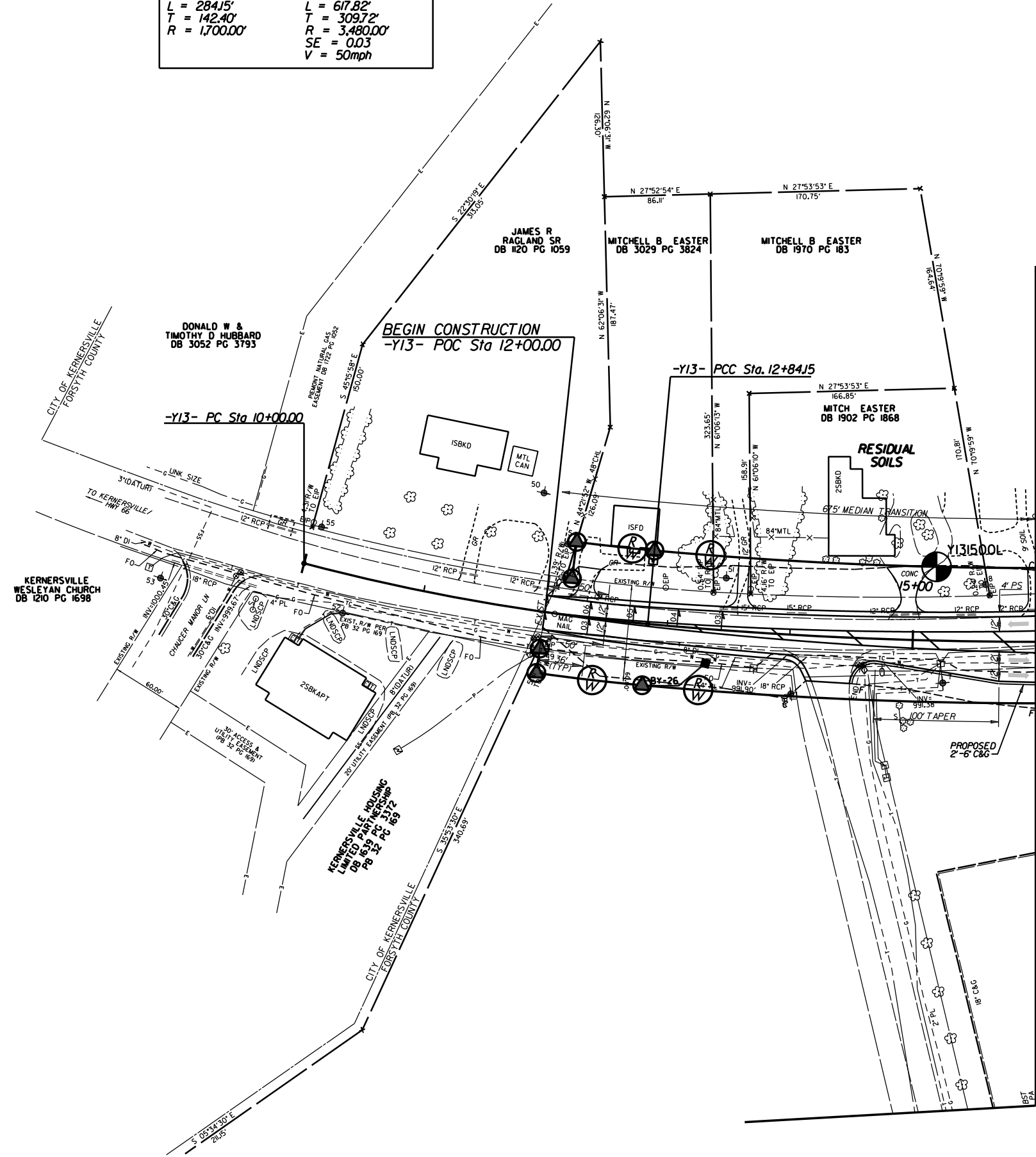
PI Sta 15+93.87	PI Sta 21+89.22
$\Delta = 10^{\circ} 10' 19.2"$ (LT)	$\Delta = 2^{\circ} 42' 18.3"$ (LT)
$D = 1^{\circ} 38' 47.7"$	$D = 1^{\circ} 00' 18.7"$
$L = 617.82'$	$L = 269.11'$
$T = 309.72'$	$T = 134.58'$
$R = 3,480.00'$	$R = 5,700.00'$
$SE = 0.03$	$SE = 0.02$
$V = 50\text{mph}$	$V = 50\text{mph}$

DATE: \$\$\$\$
 USER: \$\$\$\$
 USERNAME: \$\$\$\$

PROJECT REFERENCE NO.	SHEET NO.
U-4734	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



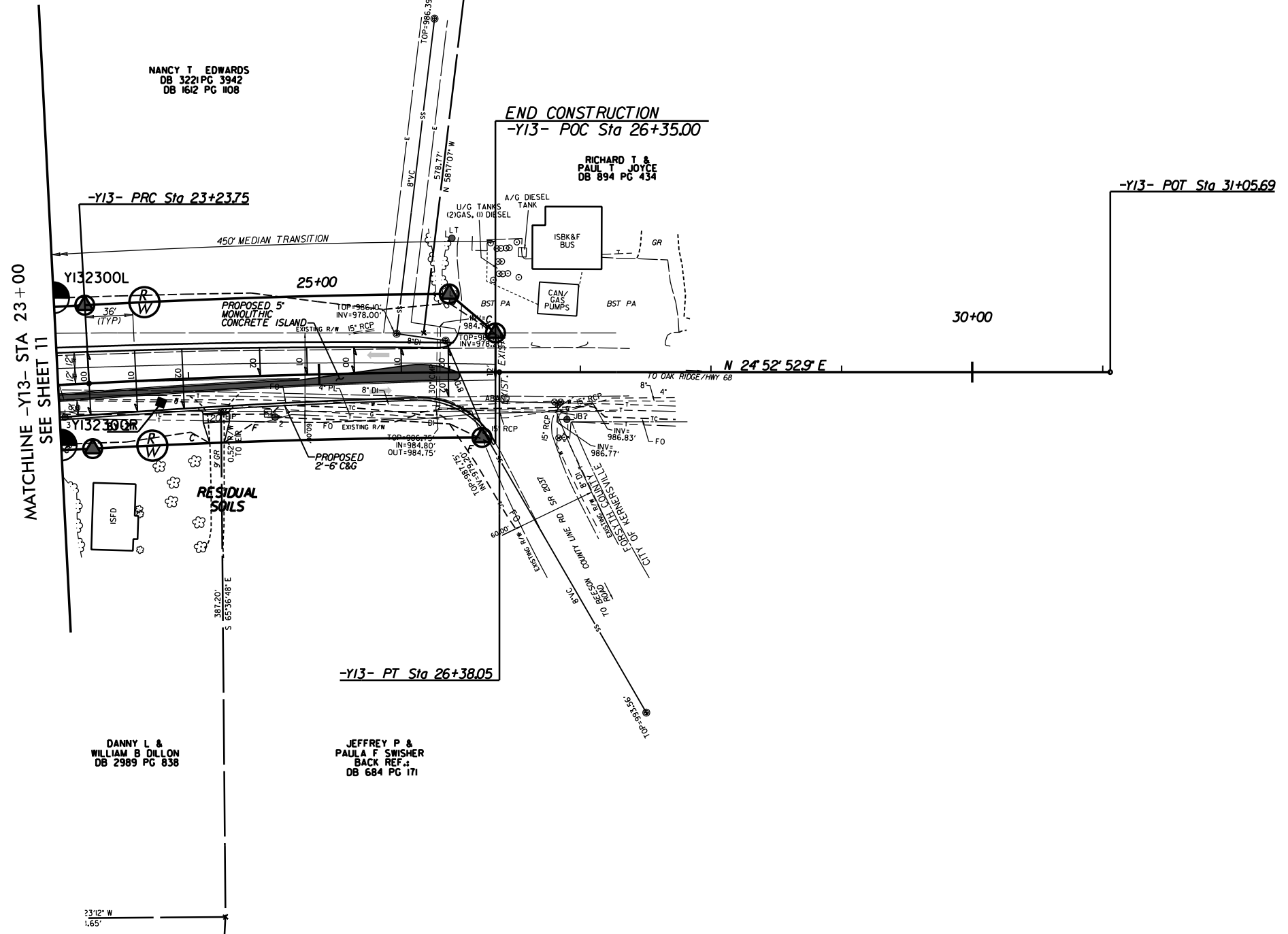
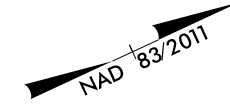
-Y13-	
PI Sta 11+42.40	PI Sta 15+93.87
$\Delta = 9' 34' 36.0''$ (LT)	$\Delta = 10' 10' 19.2''$ (LT)
D = 3' 22' 13.2"	D = 1' 38' 47.7"
L = 284.15'	L = 617.82'
T = 142.40'	T = 3097.2'
R = 1,700.00'	R = 3,480.00'
	SE = 0.03
	V = 50mph



MATCHLINE -Y13- STA 16+00
SEE SHEET 11

PROJECT REFERENCE NO.	SHEET NO.
U-4734	13
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

-Y13-	
PI Sta 21+89.22	PI Sta 24+80.94
$\Delta = 2' 42" 18.3" (LT)$	$\Delta = 3' 09" 33.6" (RT)$
$D = 1' 00" 18.7"$	$D = 1' 00" 18.7"$
$L = 269.11'$	$L = 314.30'$
$T = 134.58'$	$T = 157.19'$
$R = 5,700.00'$	$R = 5,700.00'$
$SE = 0.02$	$SE = 0.02$
$V = 50\text{mph}$	$V = 50\text{mph}$

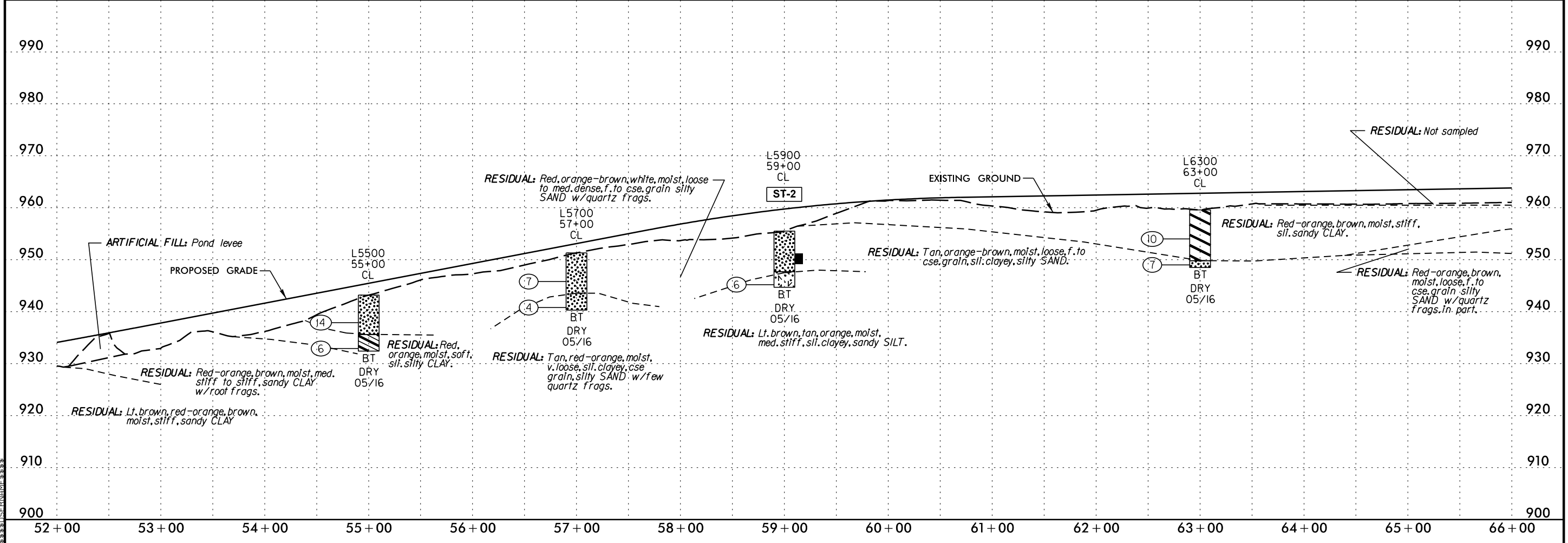
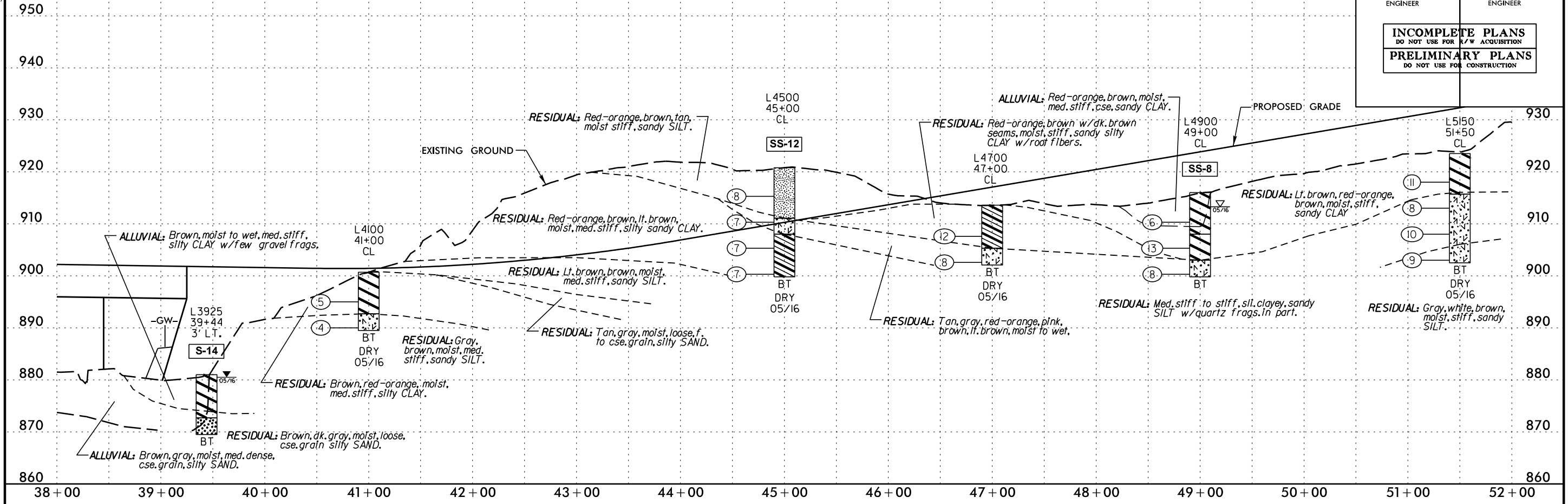


MATCHLINE -Y13- STA 23+00
SEE SHEET 11

DATE: \$\$\$\$
 USER: \$\$\$\$
 USER: \$\$\$\$

5/28/99

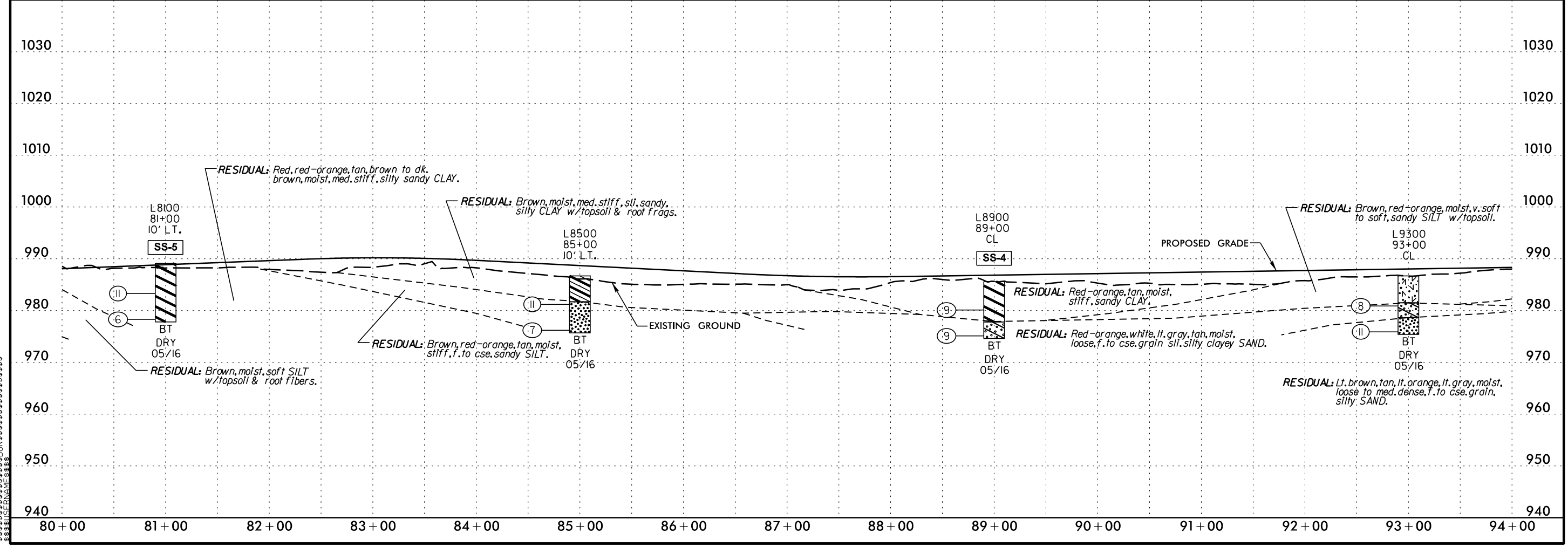
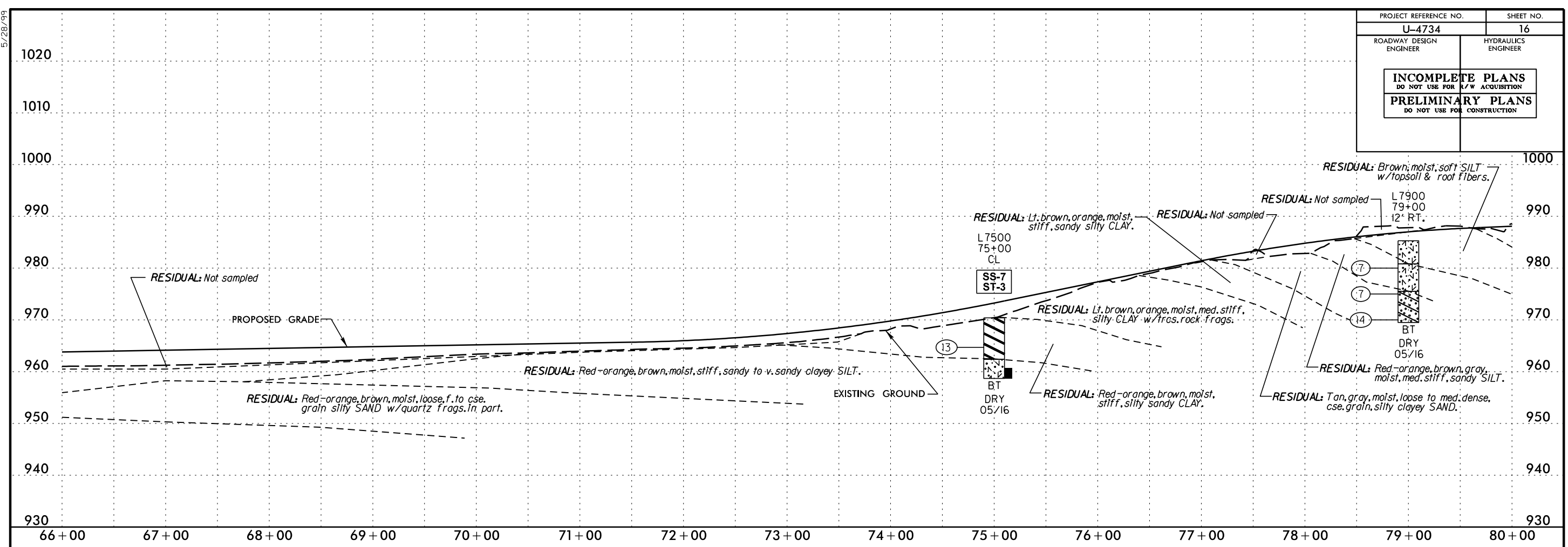
PROJECT REFERENCE NO. U-4734	SHEET NO. 15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



5/28/99

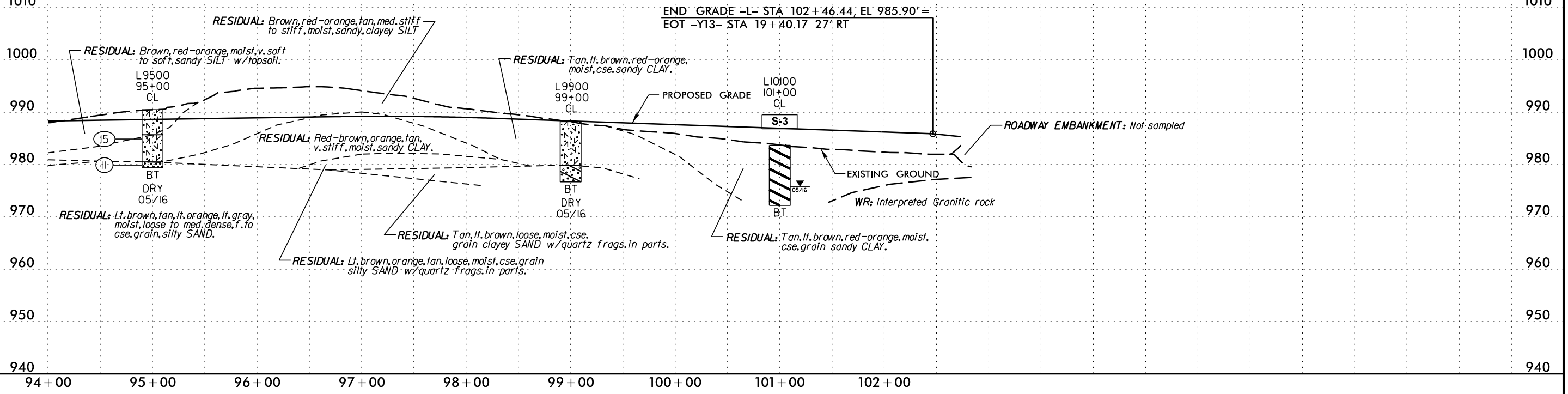
5/28/99
SECTION

PROJECT REFERENCE NO.	SHEET NO.
U-4734	16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



5/28/99

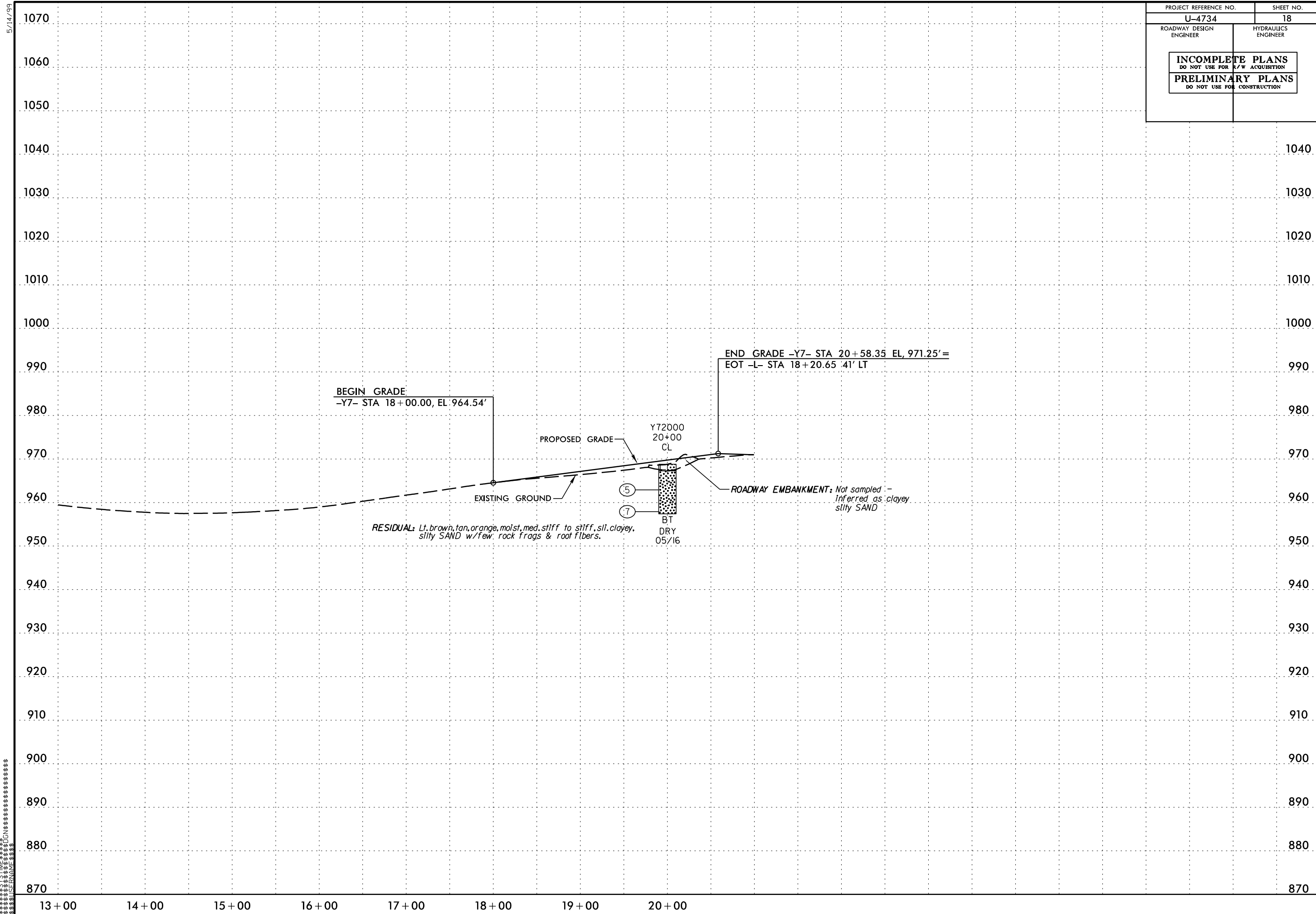
PROJECT REFERENCE NO.		SHEET NO.	
U-4734		17	
ROADWAY DESIGN ENGINEER			HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION			
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			



\$\$\$SYTIME\$\$\$
 \$\$\$SHEETNO\$\$\$
 \$\$\$DRAWNO\$\$\$
 \$\$\$DATE\$\$\$

5/14/99

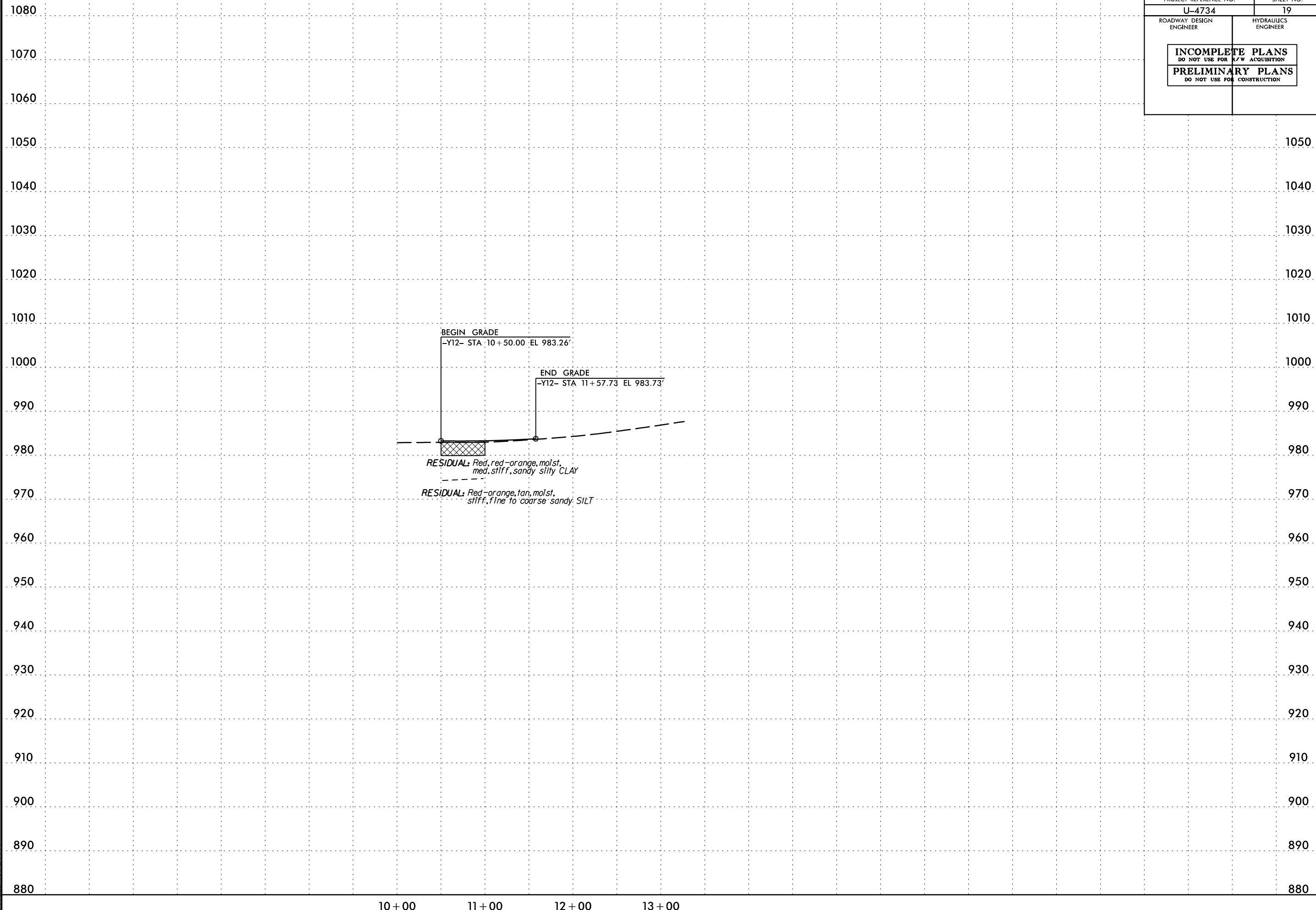
PROJECT REFERENCE NO.	SHEET NO.
U-4734	18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



DATE TIME DRAWN BY

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-4734	19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



BEGIN GRADE
 -Y12- STA 10+50.00 EL 983.26'

END GRADE
 -Y12- STA 11+57.73 EL 983.73'

RESIDUAL: Red, red-orange, moist,
 med. stiff, sandy silty CLAY

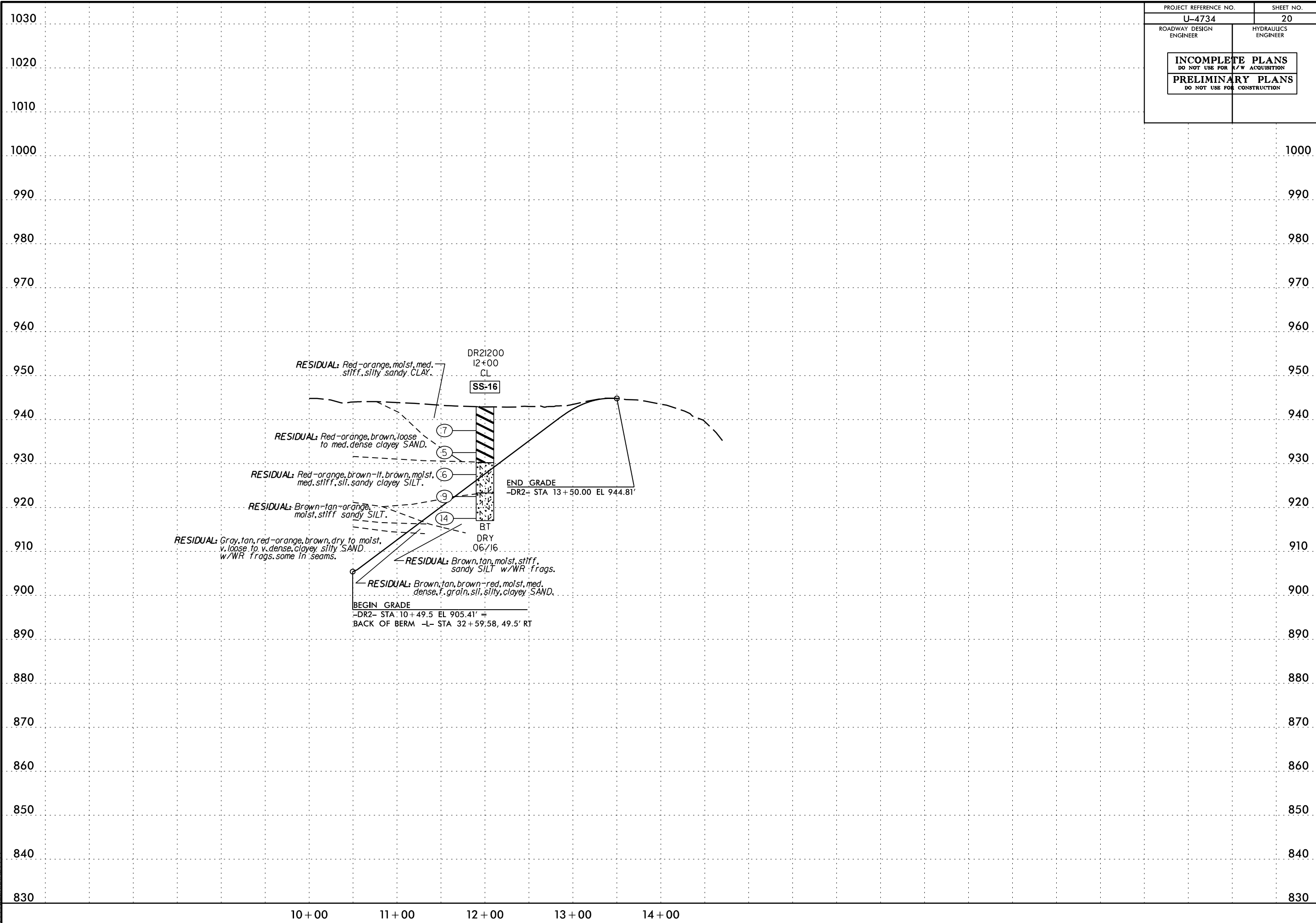
RESIDUAL: Red-orange, tan, moist,
 stiff, fine to coarse sandy SILT

DATE PLOTTED: 5/14/99
 TIME PLOTTED: 10:00 AM
 PLOTTER: HP-GL/PS

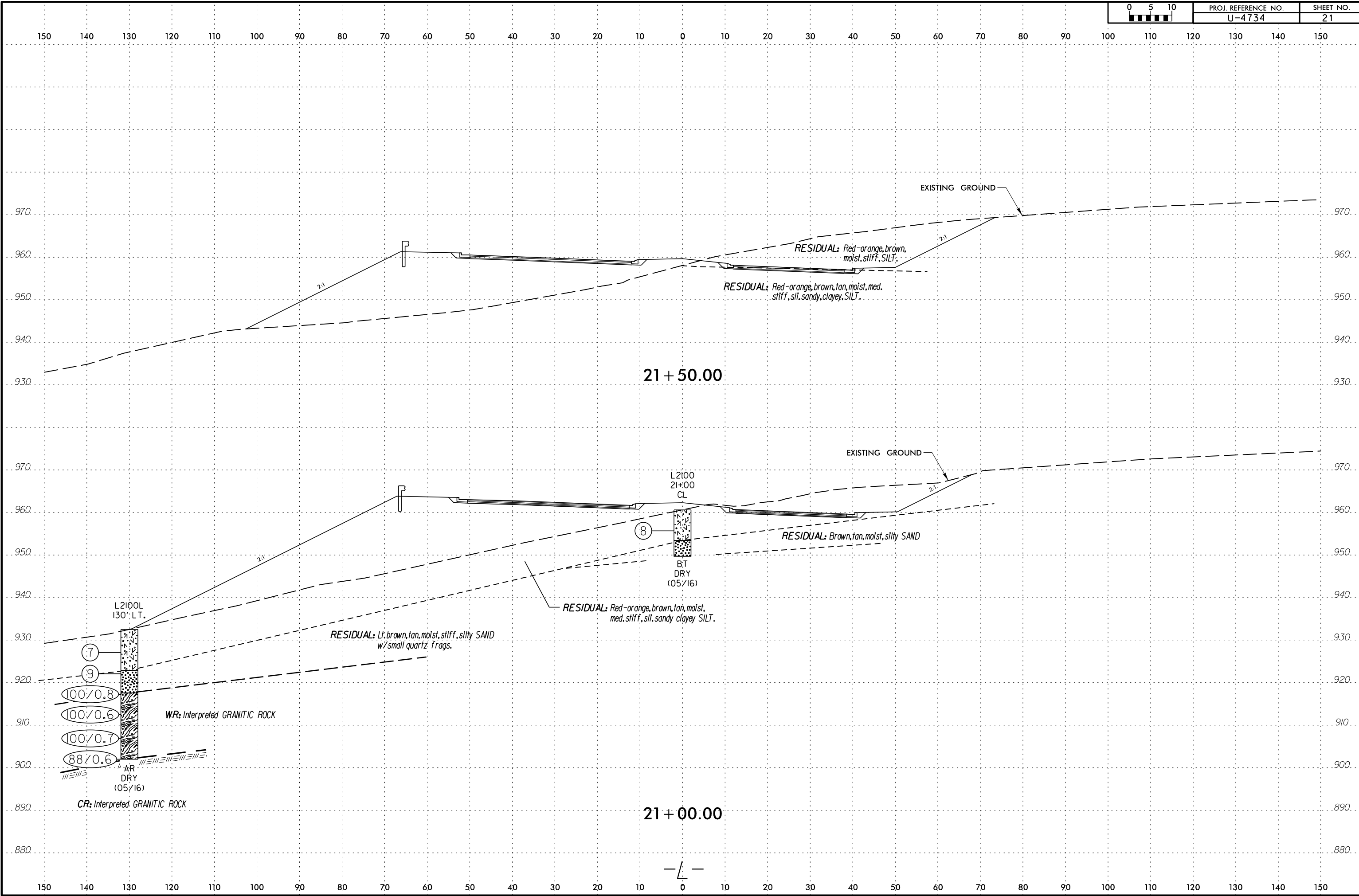
10+00 11+00 12+00 13+00

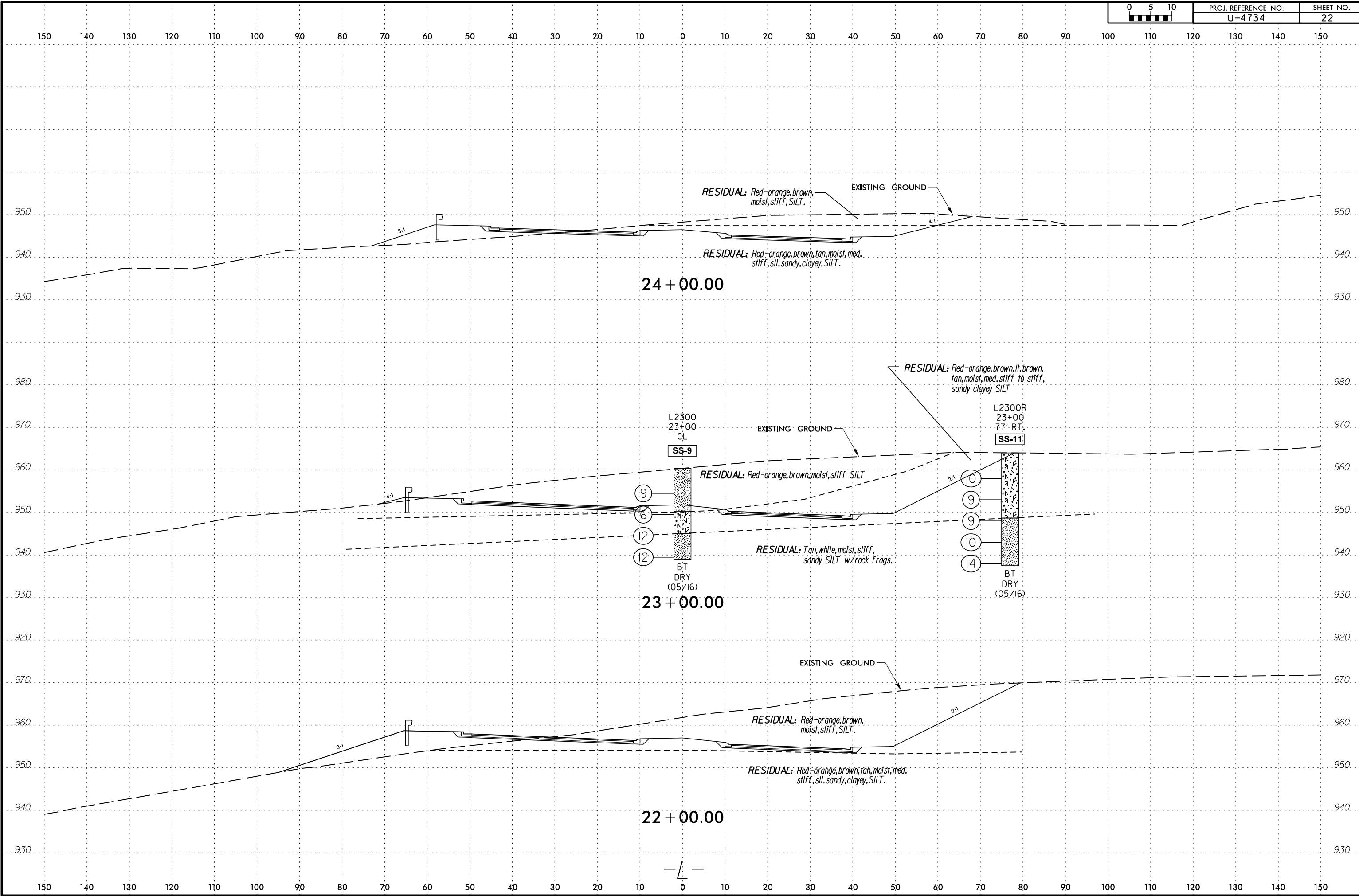
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-4734	20
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



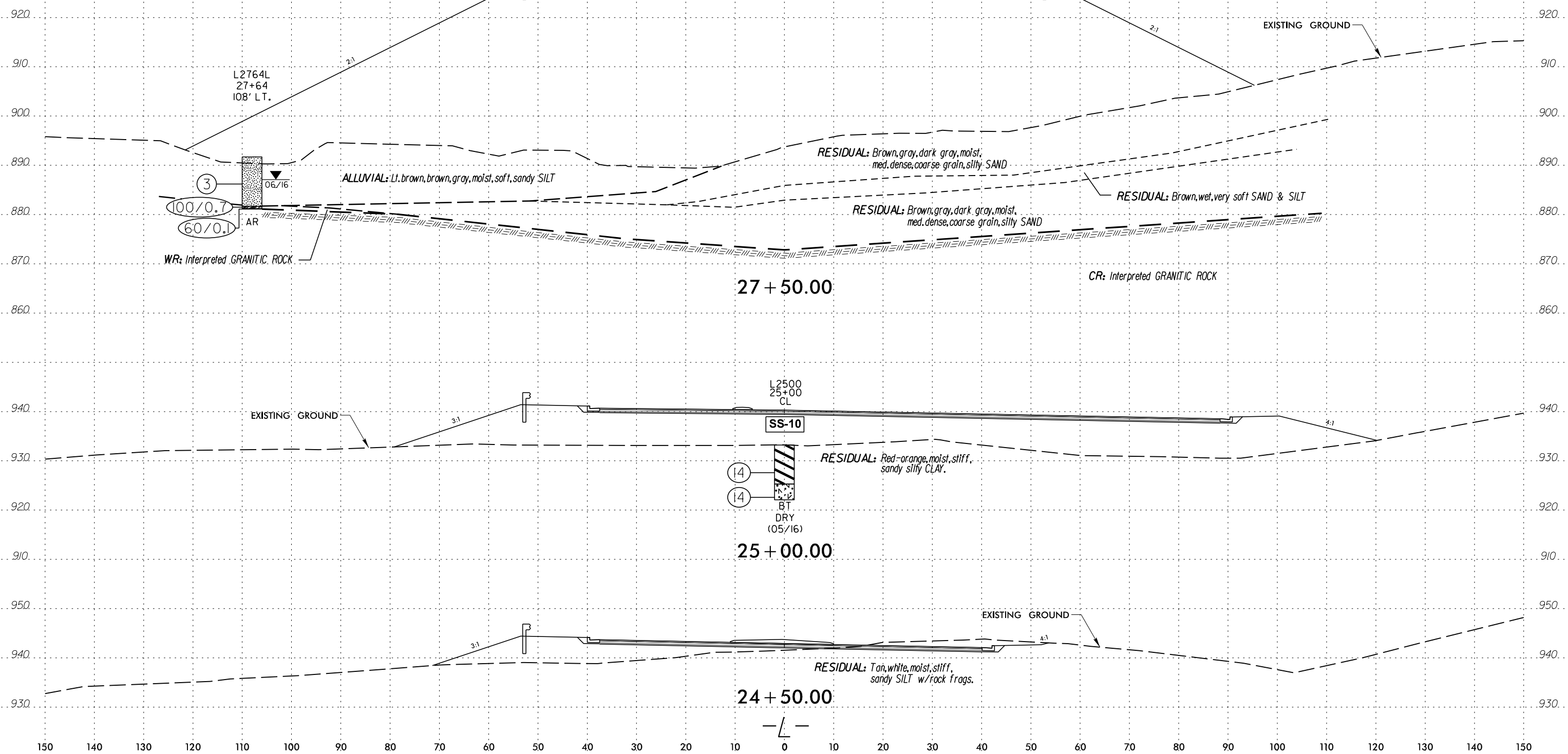
SYTIME\$DGN\$\$\$\$\$



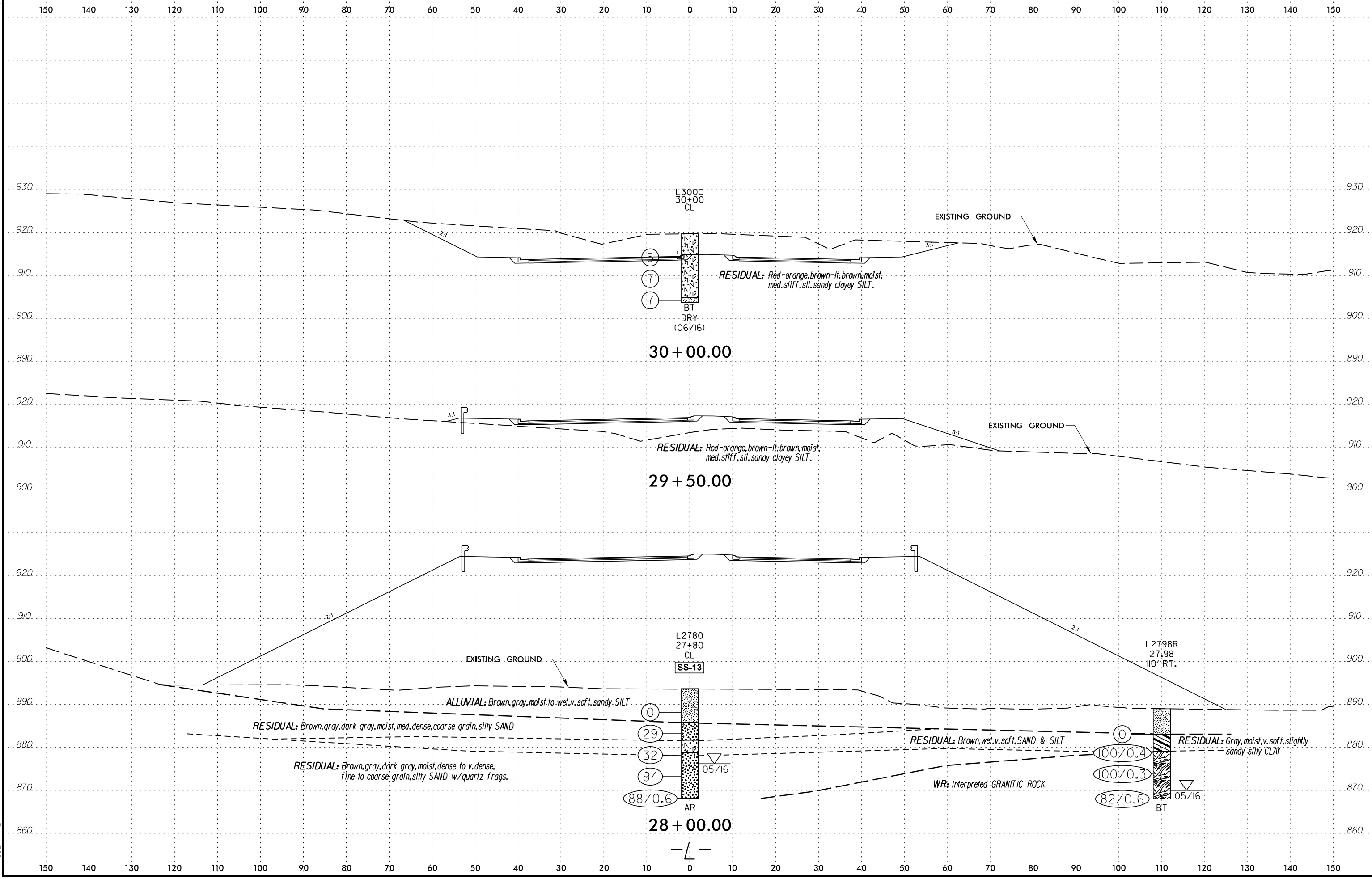


SCHEMATIC CROSS SECTION
FOR
REVISION
DATE
BY
APP
DATE

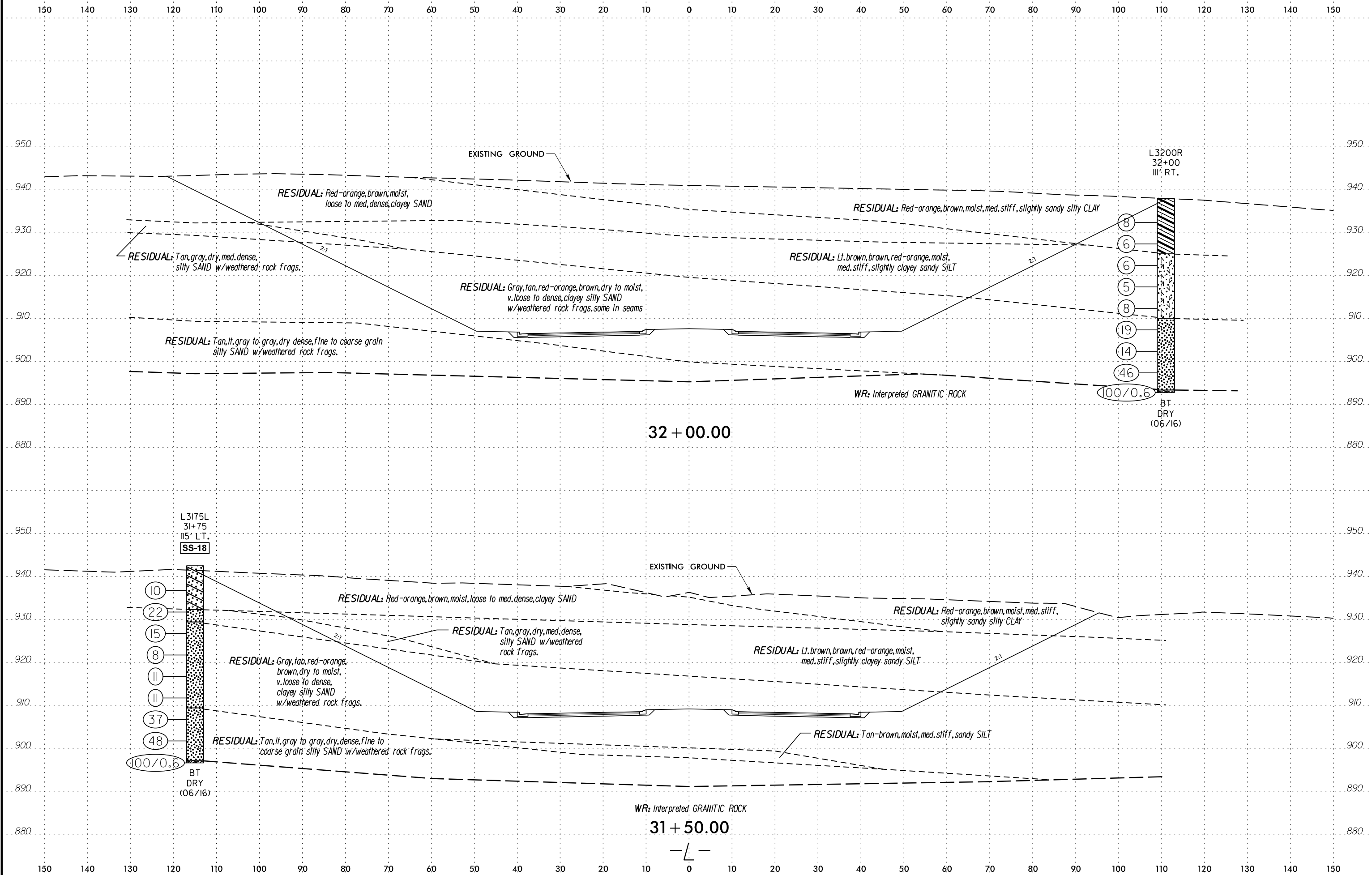
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



DATE: 6/23/16
DRAWN BY: [illegible]
CHECKED BY: [illegible]
SCALE: AS SHOWN

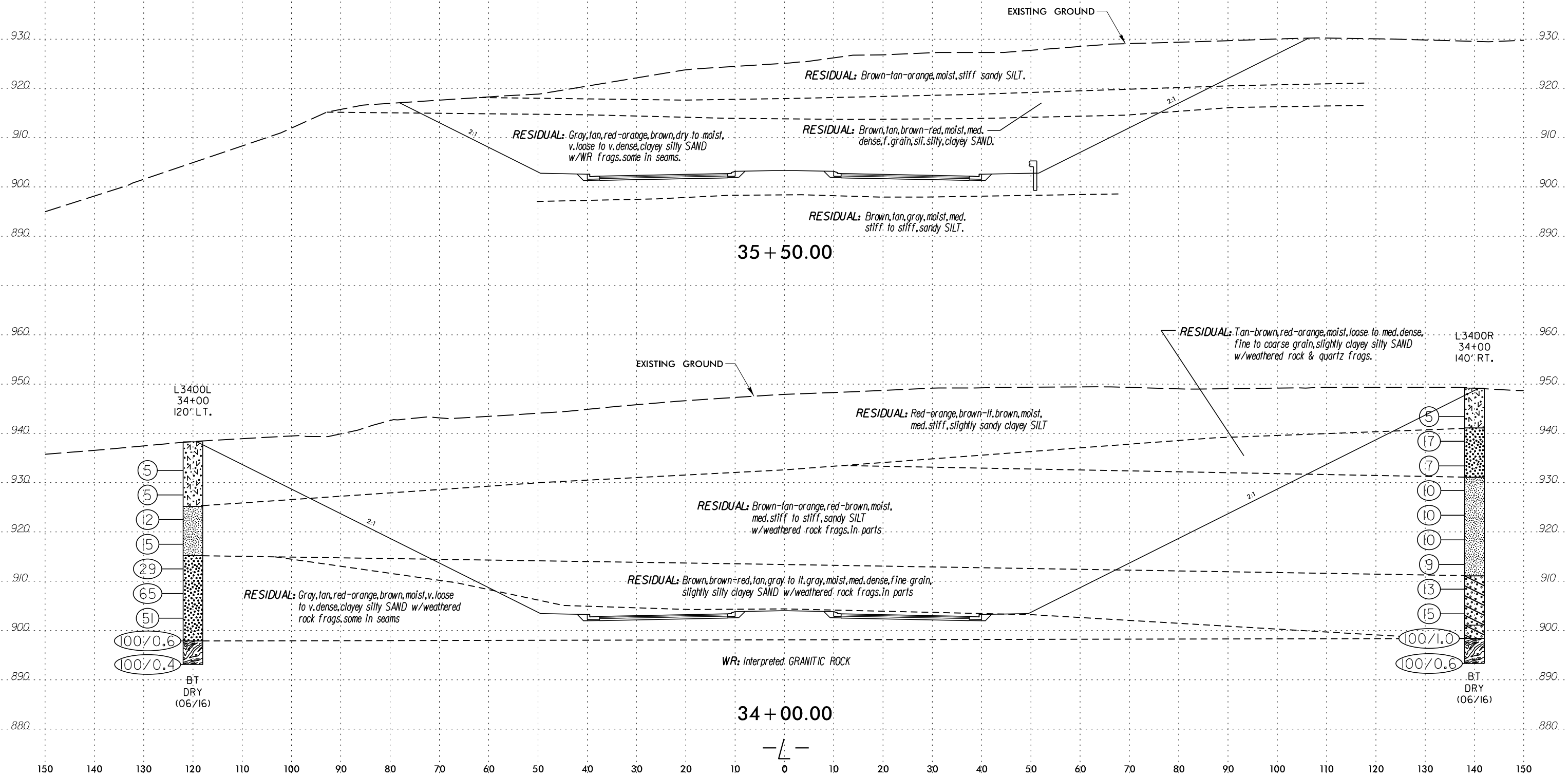


SCALE: 1"=20'

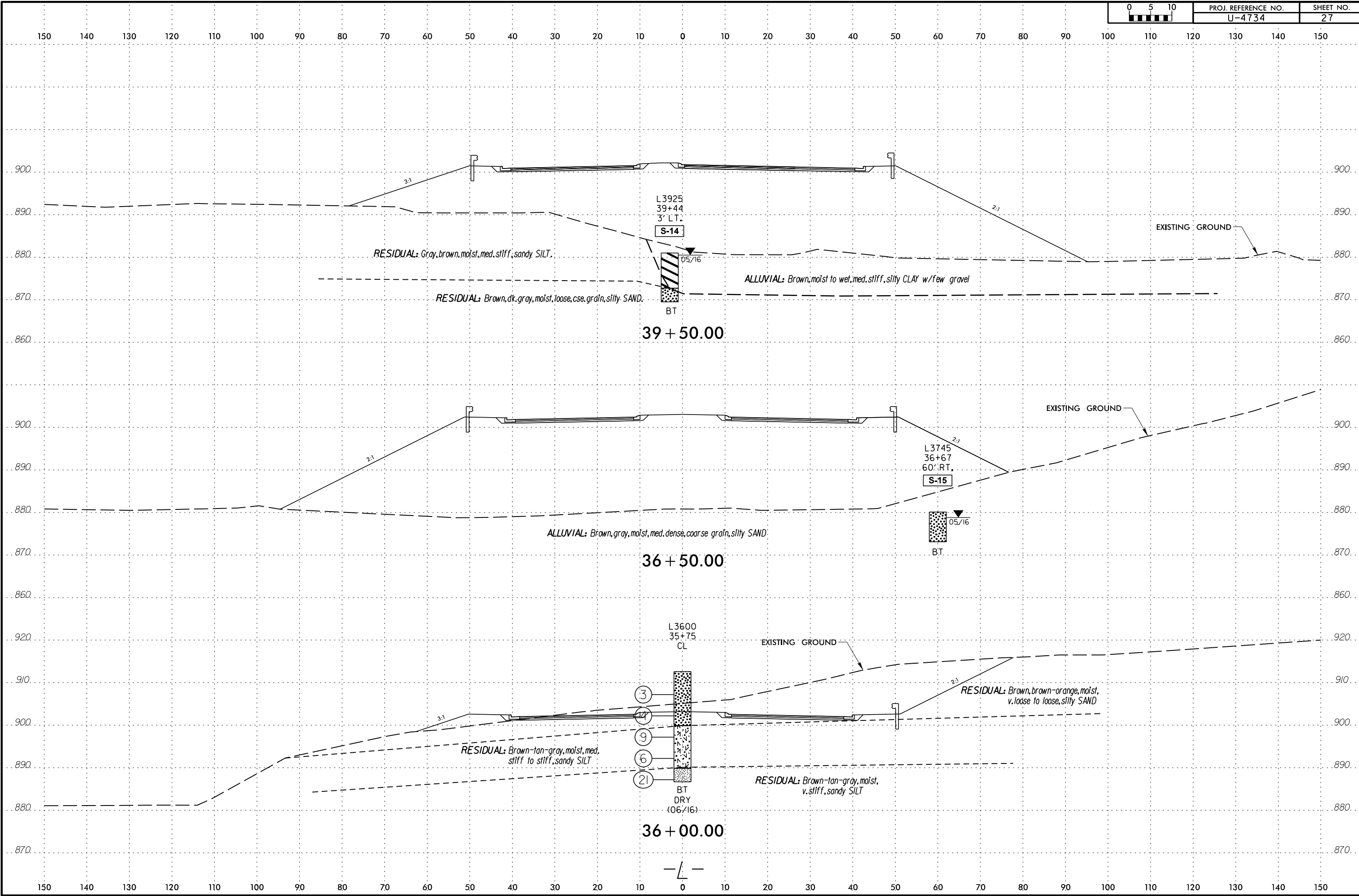


DATE PLOTTED: 06/23/16

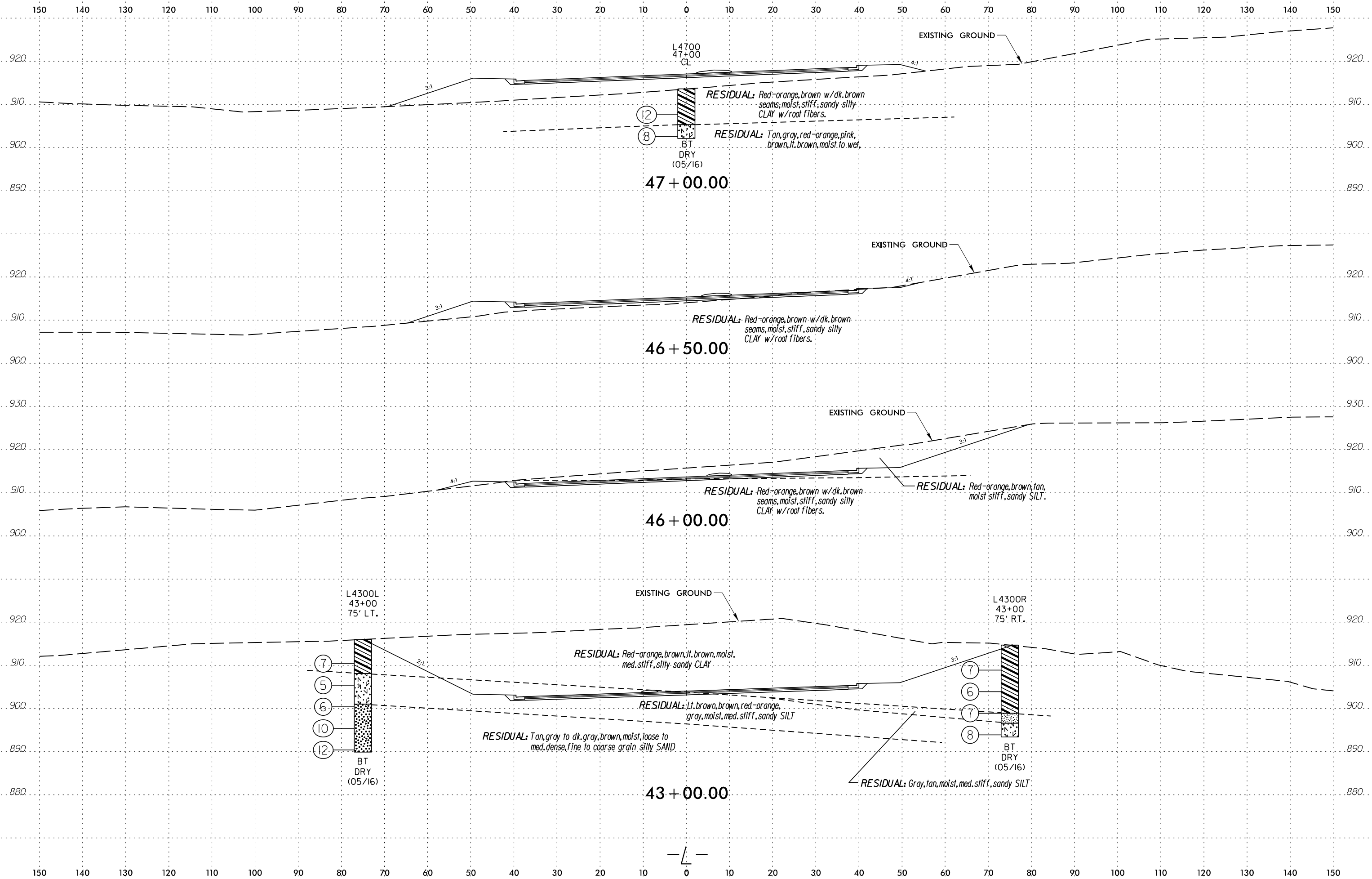
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



SYNOPSIS OF CONDITIONS

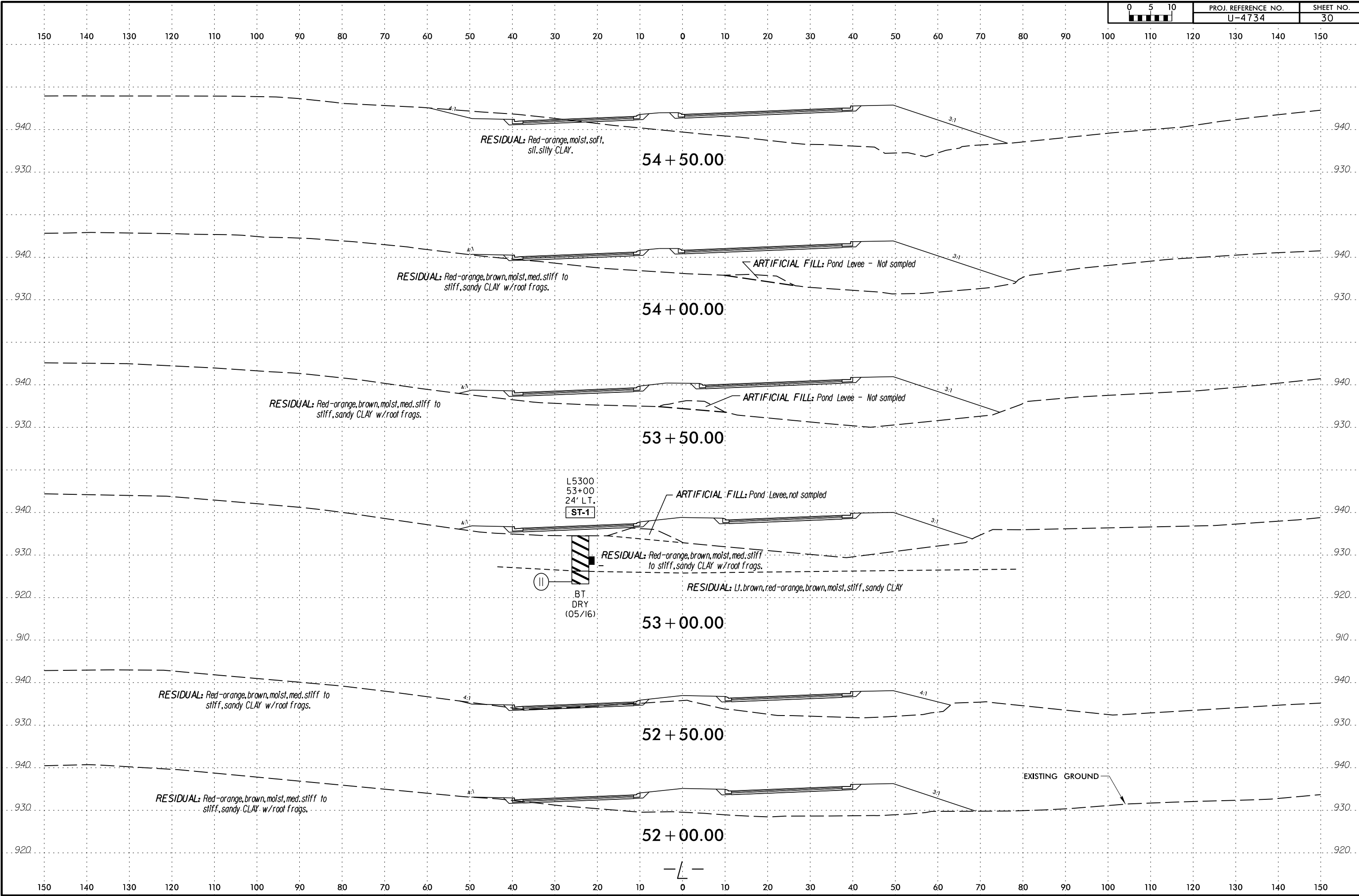


SECTION CONNECTION TO SHEET 26

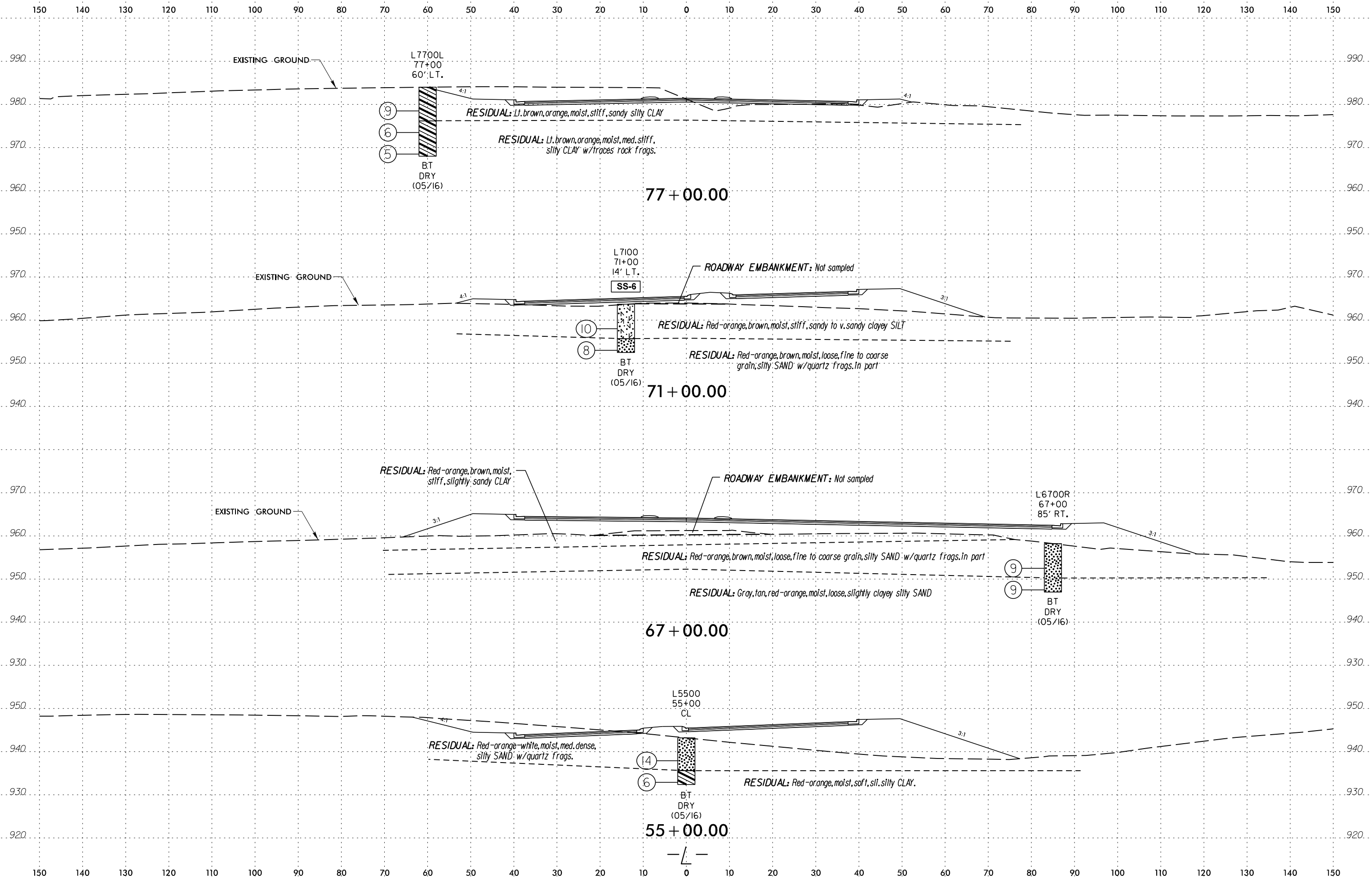


SCHEMATIC CROSS SECTION
 1/2" = 10'
 1/4" = 5'
 1/8" = 2.5'

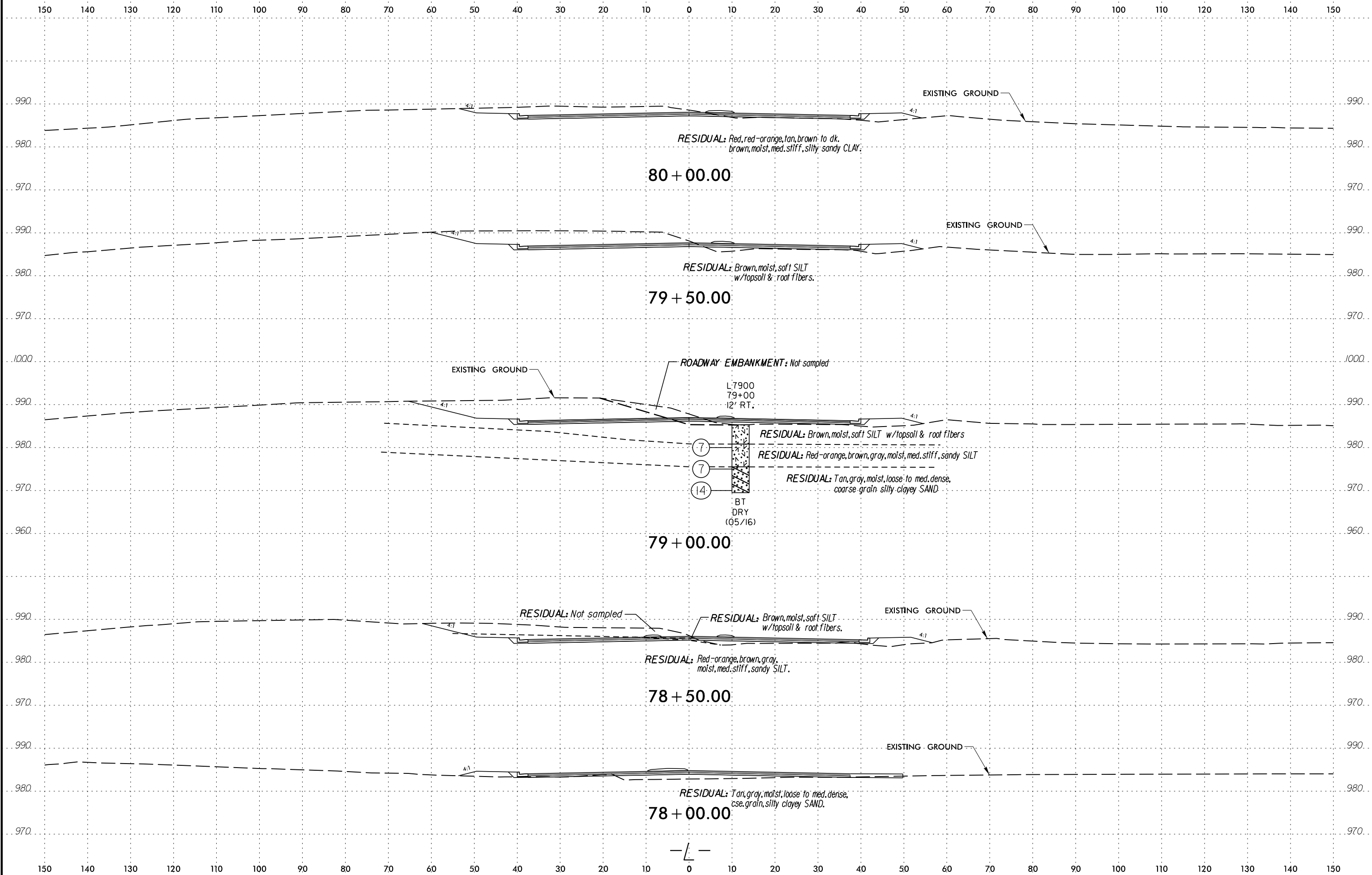
6/23/16



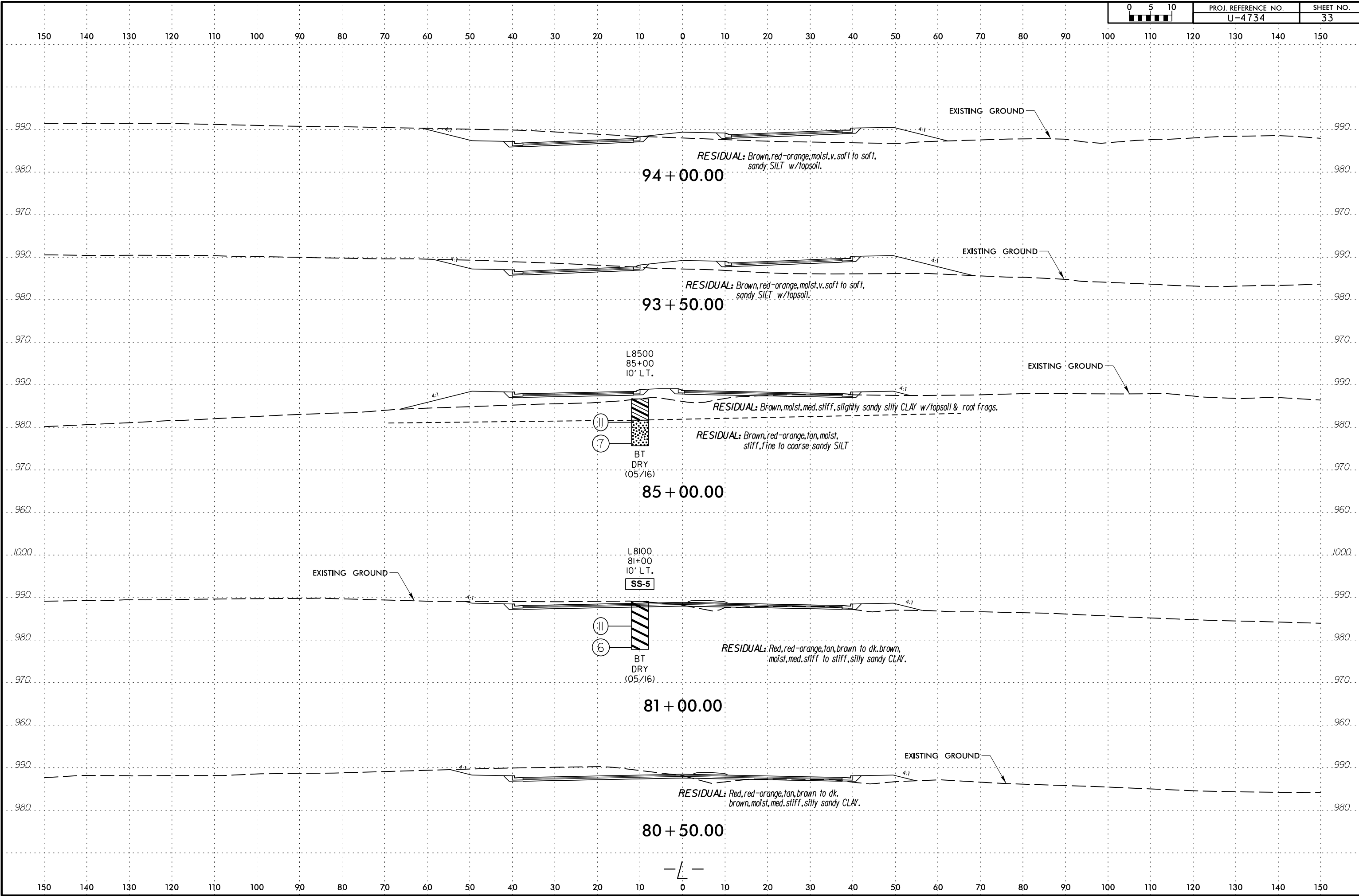
DATE PLOTTED: 06/23/16
 PLOT BY: J. B. BROWN
 CHECKED BY: J. B. BROWN
 APPROVED BY: J. B. BROWN



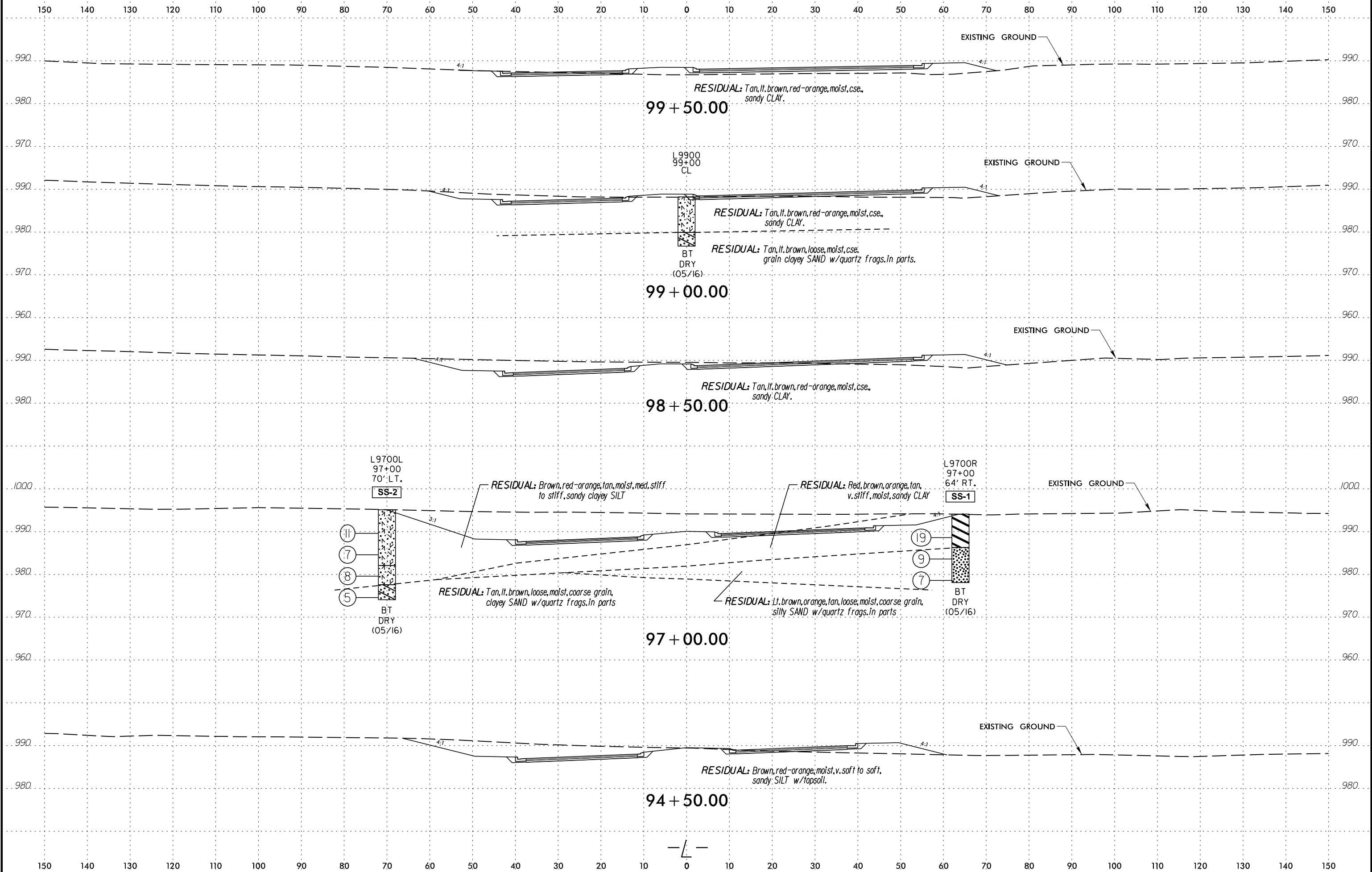
SCHEMATIC CROSS SECTION
 OF
 ROADWAY EMBANKMENT
 AT
 STATION 77+00.00
 TO
 STATION 55+00.00
 ON
 PROJECT U-4734
 SHEET 31 OF 31



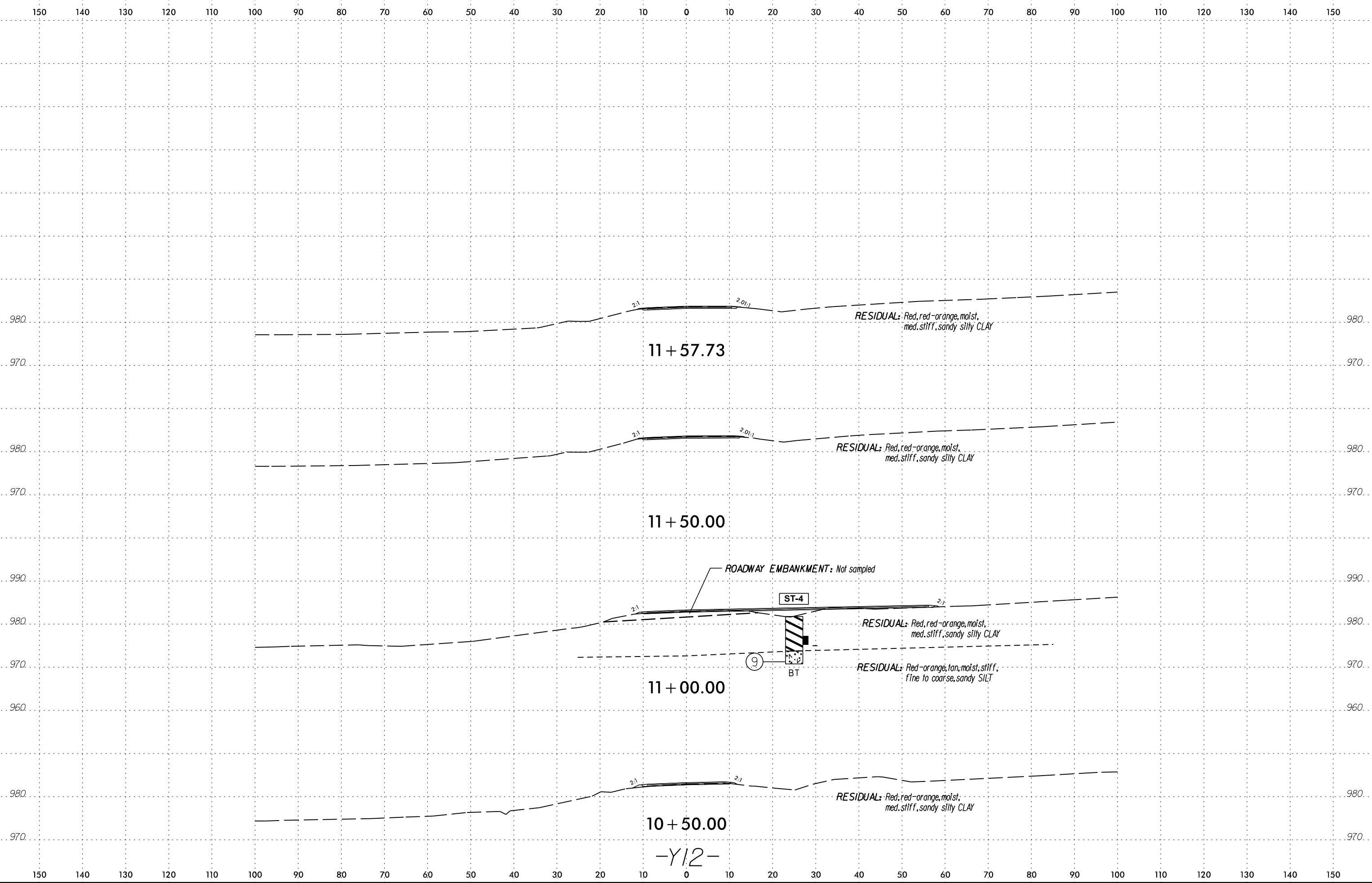
DATE: 6/23/16
DRAWN BY: [illegible]
CHECKED BY: [illegible]
SCALE: AS SHOWN
PROJECT: [illegible]



DATE: 6/23/16
 DRAWN BY: [illegible]
 CHECKED BY: [illegible]
 APPROVED BY: [illegible]



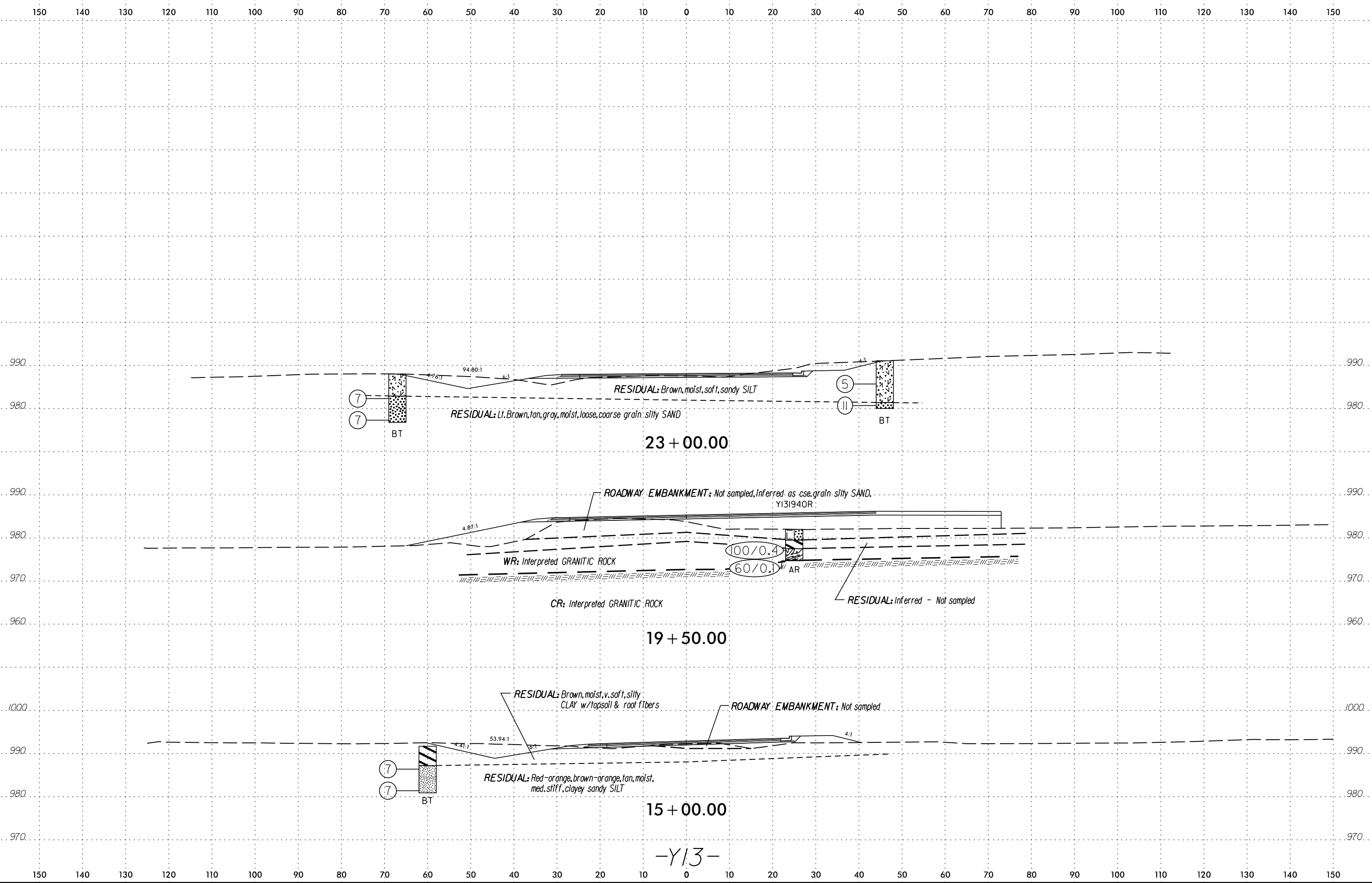
SCHEMATIC CROSS SECTION



DATE: 8/23/99
DRAWN BY: [illegible]
CHECKED BY: [illegible]
SCALE: AS SHOWN
PROJECT: [illegible]

-Y12-

8/23/99



TIME: 8:58 AM DATE: 8/23/99

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
APPENDIX A
LABORATORY RESULTS

REFERENCE: U-4734

PROJECT: 36600

REVISIONS

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-1	64' RT	97+00	4.5-6.0	A-7-5(5)	52	12	25.7	25.4	12.5	36.4	98.6	82.8	51.9	26.1	-
SS-2	70' LT	97+00	4.5-6.0	A-5(2)	46	7	28.7	27.3	15.4	28.5	95.9	77.9	46.2	31.9	-
S-3	CL	101+00	5.0-6.5	A-7-5(12)	62	24	32.3	15.2	14.2	38.2	99.7	75.1	54.6	37.9	-
SS-4	CL	89+00	4.5-6.0	A-7-5(6)	49	17	27.4	24.1	16.0	32.4	96.9	79.0	51.0	27.6	-
SS-5	10' LT	81+00	4.8-6.3	A-7-5(14)	69	25	23.3	21.3	16.0	39.4	97.4	84.1	56.2	41.7	-
SS-6	14' LT	71+00	9.7-11.2	A-2-5(0)	44	5	40.4	30.4	11.7	17.5	96.0	69.1	31.7	14.5	-
SS-7	CL	75+00	4.7-6.2	A-7-5(5)	59	14	31.8	22.9	14.0	31.3	99.8	86.8	47.2	27.5	-
SS-8	CL	49+00	4.7-6.2	A-7-6(9)	49	21	34.7	12.2	14.1	39.0	98.5	73.7	53.7	27.6	-
SS-9	CL	23+00	4.9-6.4	A-4(2)	40	6	20.8	34.2	23.7	21.4	99.8	89.0	54.5	22.2	-
SS-10	CL	25+00	4.6-6.1	A-7-5(14)	59	22	22.4	19.2	19.8	38.6	97.9	84.2	64.2	23.1	-
SS-11	77' RT	23+00	5.0-6.5	A-5(1)	44	3	25.3	34.0	19.3	21.4	98.1	85.7	50.0	29.7	-
SS-12	CL	45+00	4.5-6.0	A-4(0)	40	6	32.7	27.4	19.0	20.9	95.4	73.8	41.9	22.8	-
SS-13	CL	27+80	4.5-6.0	A-4(3)	35	9	17.3	30.6	25.9	26.2	99.0	90.2	56.8	54.5	-
S-14	3' LT	39+44	10.0-11.5	A-2-4(0)	37	4	52.1	26.3	13.7	7.8	96.6	64.6	24.0	33.1	-
S-15	60' RT	36+67	5.0-6.5	A-2-4(0)	29	NP	52.0	33.0	9.2	5.9	98.2	67.9	18.6	37.8	-
ST-1	24' LT	53+00	4.8-5.3	A-7-6(8)	47	22	30.5	18.8	11.9	38.9	93.1	73.9	50.1	30.2	-
ST-2	CL	59+00	4.3-6.3	A-2-5(0)	46	6	52.3	23.1	9.5	15.0	99.9	65.8	27.6	27.0	-
ST-3	CL	75+00	9.7-10.2	A-5(3)	49	10	17.8	39.0	19.7	23.5	99.5	92.9	48.6	23.7	-
ST-4	25' RT	11+00	4.8-5.3	A-7-5(34)	79	37	14.3	8.2	14.6	62.9	98.4	87.3	78.4	29.5	-
SS-16	CL -DR2-	12+00	4.4-5.9	A-7-5(6)	56	22	24.7	36.0	25.3	13.9	97.9	84.8	43.3	26.4	-
SS-17	CL	35+75	9.4-10.9	A-2-5(0)	43	7	36.0	36.8	13.0	14.2	97.3	77.7	31.3	29.4	-
SS-18	115' LT	31+75	4.8-6.3	A-2-7(1)	47	15	47.7	24.9	8.1	19.3	97.1	66.0	29.8	21.7	-
ST-5	CL	21+00	9.2-9.7	A-2-4(0)	40	NP	52.7	32.7	10.5	4.1	98.0	65.8	18.0	23.4	-

\$\$\$\$SYTIME\$\$\$\$
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