

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.            | 47025.1.1 (U-5305)          | 1                  | 16           |
| STATE PROJ. NO. | F.A. PROJ. NO.              | DESCRIPTION        |              |
| 47025.1.1       | STPNHS-0049(30)             | P.E.<br>RW & UTIL. |              |
|                 |                             |                    |              |
|                 |                             |                    |              |

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|------|-------------------|------|---------|-------|
| L    | 10+50 TO 22+68.54 | 4    | N/A     | 8-9   |
| Y1   | 19+00 TO 28+35    | 4    | N/A     | 11    |
| Y1   | 10+30 TO 19+00    | 5    | N/A     | 10-11 |
| Y2   | 18+00 TO 24+30    | 4    | N/A     | 12-13 |
| Y2   | 17+60 TO 18+00    | 6    | N/A     | 12    |
| Y2   | 24+30 TO 27+10    | 7    | N/A     | 12    |

**ROADWAY  
SUBSURFACE INVESTIGATION**

PROJ. REFERENCE NO. 47025.1.1 (U-5305) F.A. PROJ. STPNHS-0049(30)  
COUNTY RANDOLPH COUNTY  
PROJECT DESCRIPTION ASHEBORO - NC 49 INTERSECTION WITH  
SR 1144 (MACK ROAD) AND CONNECTOR ROAD REALIGNMENT  
WITH US 64 WEST

**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) 707-6850. 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-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION, AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

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

CONTRACT: ID: U-5305

PERSONNEL

W. FELDER

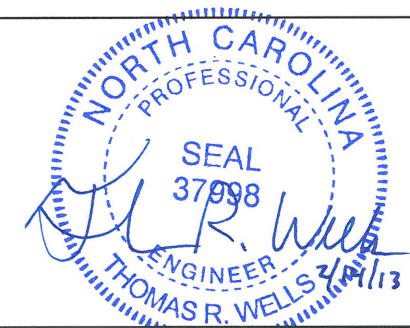
R. LEDBETTER

INVESTIGATED BY J. FREGOSI

CHECKED BY T. WELLS

SUBMITTED BY KLEINFELDER

DATE FEBRUARY 2013



DRAWN BY: W. FELDER

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

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
GEOTECHNICAL ENGINEERING UNIT

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| PROJECT REFERENCE NO.<br>47025.1(U-5305) | SHEET NO.<br>2 |
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## 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 (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:<br><i>VERY STIFF, GRAY-SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i> | <b>WELL GRADED</b> - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.<br><b>UNIFORM</b> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)<br><b>GAP-GRADED</b> - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.<br><b>ANGULARITY OF GRAINS</b><br>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: <b>ANGULAR</b> , <b>SUBANGULAR</b> , <b>SUBROUNDED</b> , OR <b>ROUNDED</b> .  | <b>HARD ROCK</b> 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:<br><b>WEATHERED ROCK (WR)</b><br><b>CRYSTALLINE ROCK (CR)</b><br><b>NON-CRYSTALLINE ROCK (NCR)</b><br><b>COASTAL PLAIN SEDIMENTARY ROCK (CP)</b>  | <b>ALLUVIUM (ALLUV.)</b> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.<br><b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA.<br><b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.<br><b>ARGILLACEOUS</b> - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.<br><b>ARTESIAN</b> - 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.<br><b>CALCAREOUS (CALC.)</b> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.<br><b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.<br><b>CORE RECOVERY (REC.)</b> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.<br><b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.<br><b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.<br><b>DIP DIRECTION (DIP AZIMUTH)</b> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.<br><b>FAULT</b> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.<br><b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.<br><b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.<br><b>FLOOD PLAIN (FP)</b> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.<br><b>FORMATION (FM)</b> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.<br><b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.<br><b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.<br><b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.<br><b>MOTTLED (MOT.)</b> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.<br><b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.<br><b>RESIDUAL (RES.) SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.<br><b>ROCK QUALITY DESIGNATION (RQD)</b> - 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.<br><b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.<br><b>SILL</b> - 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.<br><b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.<br><b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b> - NUMBER OF BLOWS (IN 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.<br><b>STRATA CORE RECOVERY (SREC.)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.<br><b>STRATA ROCK QUALITY DESIGNATION (SRQD)</b> - 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.<br><b>TOPSOIL (TS)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER. |
| <b>SOIL LEGEND AND AASHTO CLASSIFICATION</b><br>GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS<br>GROUP CLASS. A-1, A-3, A-2, A-4, A-5, A-6, A-7, A-1, A-2, A-3, A-4, A-5, A-6, A-7<br>SYMBOL<br>% PASSING: 10, 40, 200<br>LIQUID LIMIT PLASTIC INDEX<br>GROUP INDEX<br>USUAL TYPES OF MAJOR MATERIALS<br>GEN. RATING AS A SUBGRADE   | <b>MINERALOGICAL COMPOSITION</b><br>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.<br><b>COMPRESSIBILITY</b><br>SLIGHTLY COMPRESSIBLE<br>MODERATELY COMPRESSIBLE<br>HIGHLY COMPRESSIBLE<br><b>PERCENTAGE OF MATERIAL</b><br>ORGANIC MATERIAL GRANULAR SOILS SILT-CLAY SOILS OTHER MATERIAL<br>TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10%<br>LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20%<br>MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35%<br>HIGHLY ORGANIC >10% >20% HIGHLY 35% AND ABOVE   | <b>WEATHERING</b><br>FRESH ROCK FRESH, CRYSTALLINE BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.<br>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.<br>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.<br>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.<br>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><br>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><br>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><br>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>WEATHERING</b><br>FRESH ROCK FRESH, CRYSTALLINE BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.<br>VERY SLIGHT (V SLI.) 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ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i><br>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><br>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><br>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>CONSISTENCY OR DENSENESS</b><br>PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> )<br>GENERALLY GRANULAR MATERIAL (NON-COHESIVE) VERY LOOSE, LOOSE, MEDIUM DENSE, DENSE, VERY DENSE <4, 4 TO 10, 10 TO 30, 30 TO 50, >50 N/A<br>GENERALLY SILT-CLAY MATERIAL (COHESIVE) VERY SOFT, SOFT, MEDIUM STIFF, STIFF, VERY STIFF, HARD <2, 2 TO 4, 4 TO 8, 8 TO 15, 15 TO 30, >30 <0.25, 0.25 TO 0.50, 0.5 TO 1.0, 1 TO 2, 2 TO 4, >4  | <b>MISCELLANEOUS SYMBOLS</b><br>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION<br>SOIL SYMBOL<br>ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT<br>INFERRED SOIL BOUNDARY<br>INFERRED ROCK LINE<br>ALLUVIAL SOIL BOUNDARY<br>DIP & DIP DIRECTION OF ROCK STRUCTURES<br>SOUNDING ROD<br>TEST BORING W/ CORE<br>SPT N-VALUE<br>SPT REFUSAL<br>AUGER BORING<br>CORE BORING<br>MONITORING WELL<br>PIEZOMETER INSTALLATION<br>SLOPE INDICATOR INSTALLATION<br>CONE PENETROMETER TEST   | <b>ROCK HARDNESS</b><br>VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.<br>HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.<br>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.<br>MEDIUM HARD CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.<br>SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.<br>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>ROCK HARDNESS</b><br>VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.<br>HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.<br>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.<br>MEDIUM HARD CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.<br>SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.<br>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>TEXTURE OR GRAIN SIZE</b><br>U.S. STD. SIEVE SIZE OPENING (MM) 4, 10, 40, 60, 200, 270<br>4.76, 2.00, 0.42, 0.25, 0.075, 0.053<br>BOULDER (BLDR.), COBBLE (COB.), GRAVEL (GR.), COARSE SAND (CSE. SD.), FINE SAND (F SD.), SILT (SL.), CLAY (CL.)<br>GRAIN SIZE MM 305, 75, 2.0, 0.25, 0.05, 0.005<br>IN. 12, 3  | <b>ABBREVIATIONS</b><br>AR - AUGER REFUSAL<br>BT - BORING TERMINATED<br>CL - CLAY<br>CPT - CONE PENETRATION TEST<br>CSE. - COARSE<br>DMT - DILATOMETER TEST<br>DPT - DYNAMIC PENETRATION TEST<br>e - VOID RATIO<br>F - FINE<br>FOSS. - FOSSILIFEROUS<br>FRAC. - FRACTURED, FRACTURES<br>FRAGS. - FRAGMENTS<br>HI. - HIGHLY<br>MED. - MEDIUM<br>MICA. - MICACEOUS<br>MOD. - MODERATELY<br>NP - NON PLASTIC<br>ORG. - ORGANIC<br>PMT - PRESSUREMETER TEST<br>SAP. - SAPROLITIC<br>SD. - SAND, SANDY<br>SL. - SILT, SILTY<br>SLI. - SLIGHTLY<br>TCR - TRICONE REFUSAL<br>w - MOISTURE CONTENT<br>V - VERY<br>VST - VANE SHEAR TEST<br>WEA. - WEATHERED<br>γ - UNIT WEIGHT<br>γ <sub>d</sub> - DRY UNIT WEIGHT<br>S - BULK<br>SS - SPLIT SPOON<br>ST - SHELBY TUBE<br>RS - ROCK<br>RT - RECOMPACTED TRIAXIAL<br>CBR - CALIFORNIA BEARING RATIO | <b>FRACTURE SPACING</b><br>TERM SPACING<br>VERY WIDE MORE THAN 10 FEET<br>WIDE 3 TO 10 FEET<br>MODERATELY CLOSE 1 TO 3 FEET<br>CLOSE 0.16 TO 1 FEET<br>VERY CLOSE LESS THAN 0.16 FEET<br><b>BEDDING</b><br>TERM THICKNESS<br>VERY THICKLY BEDDED > 4 FEET<br>THICKLY BEDDED 1.5 - 4 FEET<br>THINLY BEDDED 0.16 - 1.5 FEET<br>VERY THINLY BEDDED 0.03 - 0.16 FEET<br>THICKLY LAMINATED 0.008 - 0.03 FEET<br>THINLY LAMINATED < 0.008 FEET   | <b>ROCK HARDNESS</b><br>VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.<br>HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.<br>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.<br>MEDIUM HARD CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.<br>SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.<br>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>SOIL MOISTURE - CORRELATION OF TERMS</b><br>SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION<br>LL - LIQUID LIMIT - SATURATED - (SAT.) USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE<br>PL - PLASTIC LIMIT - WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE<br>OM - OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE<br>SL - SHRINKAGE LIMIT - DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE  | <b>EQUIPMENT USED ON SUBJECT PROJECT</b><br>DRILL UNITS: MOBILE B-____, BK-51, CME-45C, CME-550, PORTABLE HOIST<br>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<br>HAMMER TYPE: AUTOMATIC, MANUAL<br>CORE SIZE: B, N, H<br>HAND TOOLS: POST HOLE DIGGER, HAND AUGER, SOUNDING ROD, VANE SHEAR TEST  | <b>INDURATION</b><br>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.<br>FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.<br>MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.<br>INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.<br>EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.  | <b>ROCK HARDNESS</b><br>VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.<br>HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.<br>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.<br>MEDIUM HARD CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.<br>SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.<br>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><br>NONPLASTIC LOW PLASTICITY MED. PLASTICITY HIGH PLASTICITY<br>PLASTICITY INDEX (PI) DRY STRENGTH VERY LOW SLIGHT MEDIUM HIGH<br>0-5, 6-15, 16-25, 26 OR MORE  |  |  | <b>TERMS AND DEFINITIONS</b><br>BENCH MARK: BL-102 (705,268 FT N, 1,751,055 FT E)<br>BL-103 (705, 881 FT N, 1,750,932 FT E) AND<br>BYI-105 (704,901 FT N, 1,750,364 FT E) ELEVATION: SEE NOTES FT.<br>NOTES:<br>BM ELEVATIONS:<br>BL-102: 873.34 FT MSL<br>BL-103: 851.62 FT MSL<br>BYI-105: 875.15 FT MSL   |
| <b>COLOR</b><br>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.  |  |  |  |

09/08/09

See Sheet 1-A For Index of Sheets

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**RANDOLPH COUNTY**

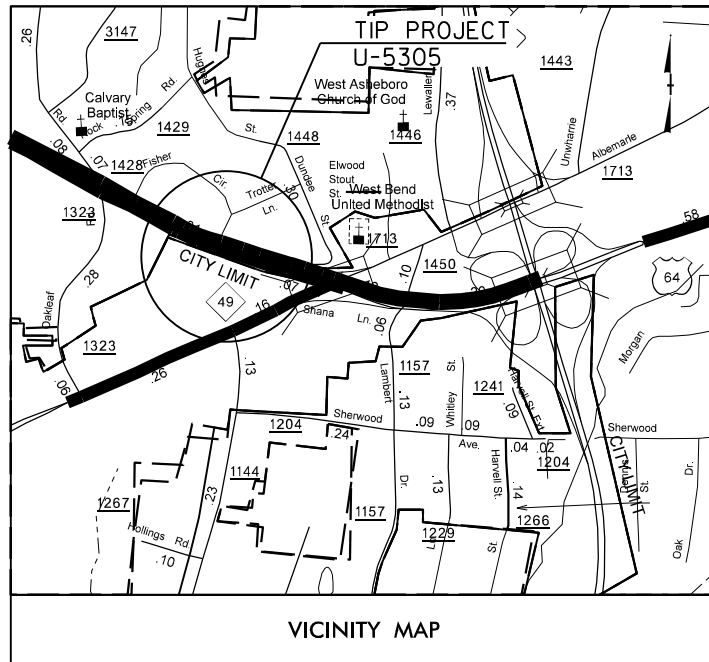
**LOCATION: ASHEBORO- NC 49 INTERSECTION WITH  
SR 1144 (MACK ROAD) AND CONNECTOR  
ROAD REALIGNMENT WITH US 64 WEST**

**TYPE OF WORK: GRADING, DRAINAGE, PAVING, CURB & GUTTER**

| STATE           | STATE PROJECT REFERENCE NO. | SHEET NO.   | TOTAL SHEETS |
|-----------------|-----------------------------|-------------|--------------|
| N.C.            | U-5305                      | 2A          | 16           |
| STATE PROJ. NO. | F.A. PROJ. NO.              | DESCRIPTION |              |
| 47025.1.1       | STPNHS-0049(30)             | PE          |              |
|                 |                             |             |              |
|                 |                             |             |              |
|                 |                             |             |              |
|                 |                             |             |              |

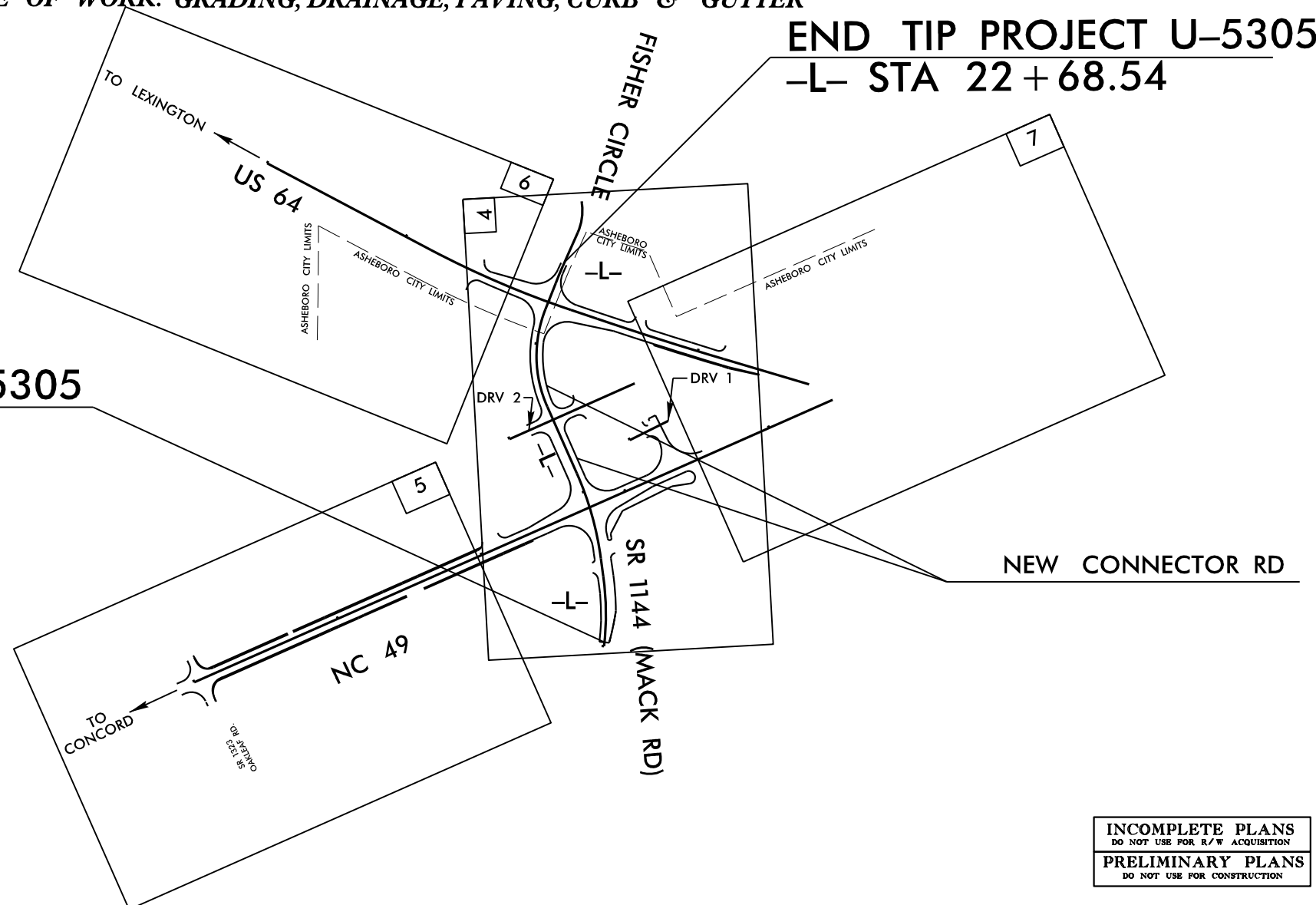


**TIP PROJECT: U-5305**



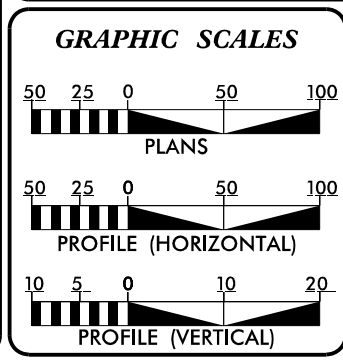
**END TIP PROJECT U-5305  
-L- STA 22 + 68.54**

**BEGIN TIP PROJECT U-5305  
-L- STA 10 + 50.00**



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

**CONTRACT:**



**DESIGN DATA**

|               |                 |
|---------------|-----------------|
| ADT 2012 =    | 4300            |
| ADT 2040 =    | 5600            |
| DHV =         | 11 %            |
| D =           | 90 %            |
| T =           | 9 % *           |
| V =           | 35 MPH          |
| * TTST =      | 6% DUAL 3%      |
| FUNC CLASS =  | URBAN, ARTERIAL |
| REGIONAL TIER |                 |

**PROJECT LENGTH**

|                                     |             |
|-------------------------------------|-------------|
| LENGTH ROADWAY TIP PROJECT U-5305 = | 0.231 MILES |
| TOTAL LENGTH TIP PROJECT U-5305 =   | 0.231 MILES |

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

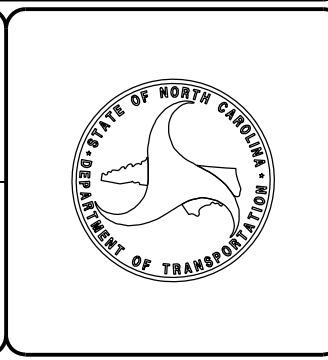
| 2012 STANDARD SPECIFICATIONS          |  |
|---------------------------------------|--|
| RIGHT OF WAY DATE:<br>AUGUST 16, 2013 | <b>JAMES A. SPEER, PE</b><br>PROJECT ENGINEER      |
| LETTING DATE:<br>AUGUST 19, 2014      | <b>ALLISON K. WHITE</b><br>PROJECT DESIGN ENGINEER |

**HYDRAULICS ENGINEER**

\_\_\_\_\_  
SIGNATURE: P.E.

**ROADWAY DESIGN ENGINEER**

\_\_\_\_\_  
SIGNATURE: P.E.







January 28, 2013

STATE PROJECT: 47025.1.1 (U-5305)  
 FEDERAL PROJECT: STPNHS-0049 (30)  
 COUNTY: Randolph  
 DESCRIPTION: Asheboro – NC49 at the Intersection with SR 1144 (Mack Road) and Connector Road Realignment with US 64 West

SUBJECT: Geotechnical Report - Inventory

**Project Description**

The project is located in Asheboro in central Randolph County, North Carolina. This project consists of a proposed 1,000 feet, two-lane roadway with a center turn lane (-L-) on a new location between NC 49 and US 64. Also proposed is the widening of NC 49 (-Y1-) and US 64 (-Y2-). The widened areas of NC 49 (-Y1-) and US 64 (-Y2-) are approximately 1,700 feet and 600 feet in length, respectively.

The geotechnical investigation was conducted during September 2012. Hand augers borings were utilized to investigate the subsurface conditions. Representative soil samples were collected in the field for laboratory analysis by Kleinfelder Southeast, Inc.

The following alignments, totaling 0.6 mile, were investigated. Cross sections of these alignments are included in this report.

| <u>Line</u> | <u>Stations</u>   |
|-------------|-------------------|
| -L-         | 10+50 to 22+68.54 |
| -Y1-        | 10+30 to 28+35    |
| -Y2-        | 17+60 to 23+60    |

**Areas of Special Geotechnical Interest**

Groundwater: The following location was found to have ground water within 3 feet of the existing grade.

| <u>Line</u> | <u>Stations</u> | <u>Offset</u> |
|-------------|-----------------|---------------|
| -Y2-        | 20+50           | 30' LT        |

**Physiography and Geology**

The project is located in the Piedmont Physiographic Province. The project corridor is comprised primarily of commercial properties and single family homes. The general topography of the site consists of rolling hills with flat to moderate slopes along the existing roadways.

Geologically, the project is located within the Carolina Slate Belt based on the 1985 Geologic Map on North Carolina. Soils are derived from the underlying bedrock which consists of early Cambrian or late Precambrian age metamorphic rocks with a portion having felsic volcanic rocks within the Uwharrie Formation and a portion having mafic volcanic rocks within the Cid Formation. The overlying residual soils are the product of the physical and chemical weathering of the underlying Non-Crystalline rock.

**Soil Properties**

Soils encountered during this investigation are separated into two categories based on origin. They consist of roadway embankment and residual soils.


Roadway Embankment soils are present along the existing roadways (-Y1- and -Y2-) on the project. The majority of these soils consist of orange, tan, red, and olive, moist to wet, coarse to fine sandy, silty clays (A-7-5, A-7-6). Minor amounts of tan, brown, red, gray, olive, and white, moist to wet, coarse to fine sandy silts (A-4) as well as damp gravel (A-1-a) are also present.

Residual soils are derived from the weathering of underlying Felsic and Mafic metavolcanic rocks. The majority of these soils consist of orange, tan, gray, and red, moist to saturated, sandy, silty clays (A-7-5, A-7-6) and tan, brown, gray, orange, red, black and white, moist to wet, coarse to fine sandy silts (A-4). Minor amounts of orange, tan, olive, and gray, moist, silty coarse to fine sand (A-2-4).

**Groundwater**

Groundwater was generally not encountered during the investigation with the exception of at one location, which is discussed under areas that exhibit high groundwater in "Areas of Special Geotechnical Interest."

Prepared by,

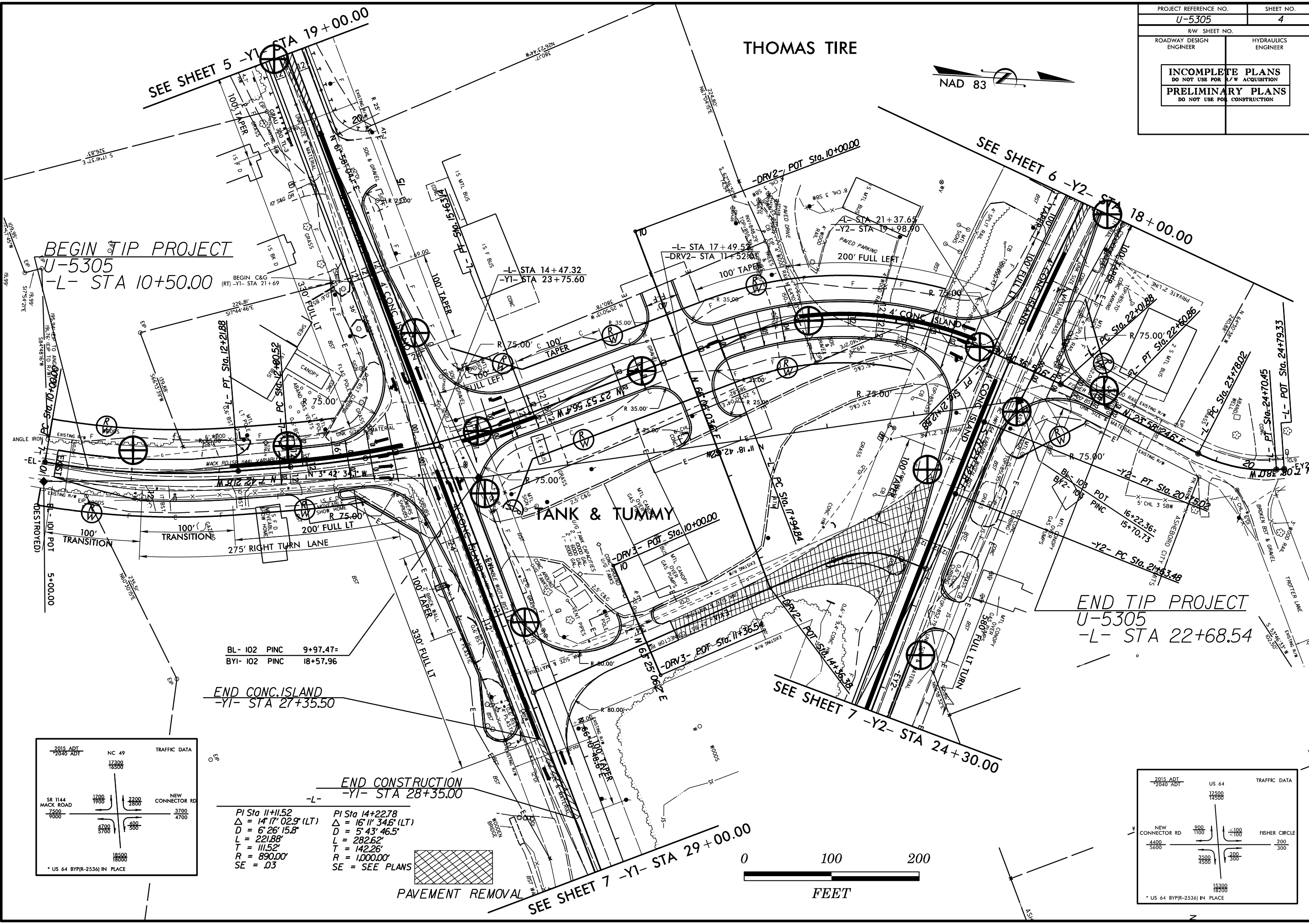
  
 Thomas R. Wells, P.E.  
 Senior Professional

  
 Xavier C. Barrett, P.E.  
 Principal Professional

|  |                     |
|--|---------------------|
| PROJECT REFERENCE NO.  | SHEET NO.           |
| U-5305   | 4                   |
| RW SHEET NO.   |                     |
| ROADWAY DESIGN ENGINEER  | HYDRAULICS ENGINEER |
| <b>INCOMPLETE PLANS</b><br>DO NOT USE FOR R/W ACQUISITION<br><b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION |                     |

8/17/99

THOMAS TIRE



BEGIN TIP PROJECT  
U-5305  
-L- STA 10+50.00

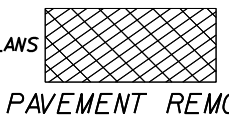
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U-5305  
-L- STA 22+68.54

BL- I02 PINC 9+97.47=  
BYI- I02 PINC 18+57.96

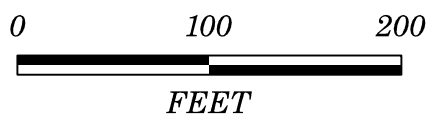
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-YI- STA 27+35.50

END CONSTRUCTION  
-YI- STA 28+35.00

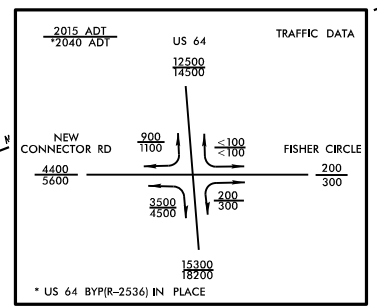
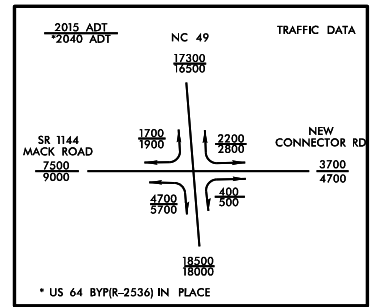
|                                    |                                    |
|------------------------------------|------------------------------------|
| PI Sta 11+11.52                    | PI Sta 14+22.78                    |
| $\Delta = 14^\circ 17' 02.9"$ (LT) | $\Delta = 16^\circ 11' 34.6"$ (LT) |
| $D = 6' 26' 15.8"$                 | $D = 5' 43' 46.5"$                 |
| $L = 221.88'$                      | $L = 282.62'$                      |
| $T = 111.52'$                      | $T = 142.26'$                      |
| $R = 890.00'$                      | $R = 1,000.00'$                    |
| $SE = .03$                         | $SE = \text{SEE PLANS}$            |



PAVEMENT REMOVAL



REVISIONS



8/17/99

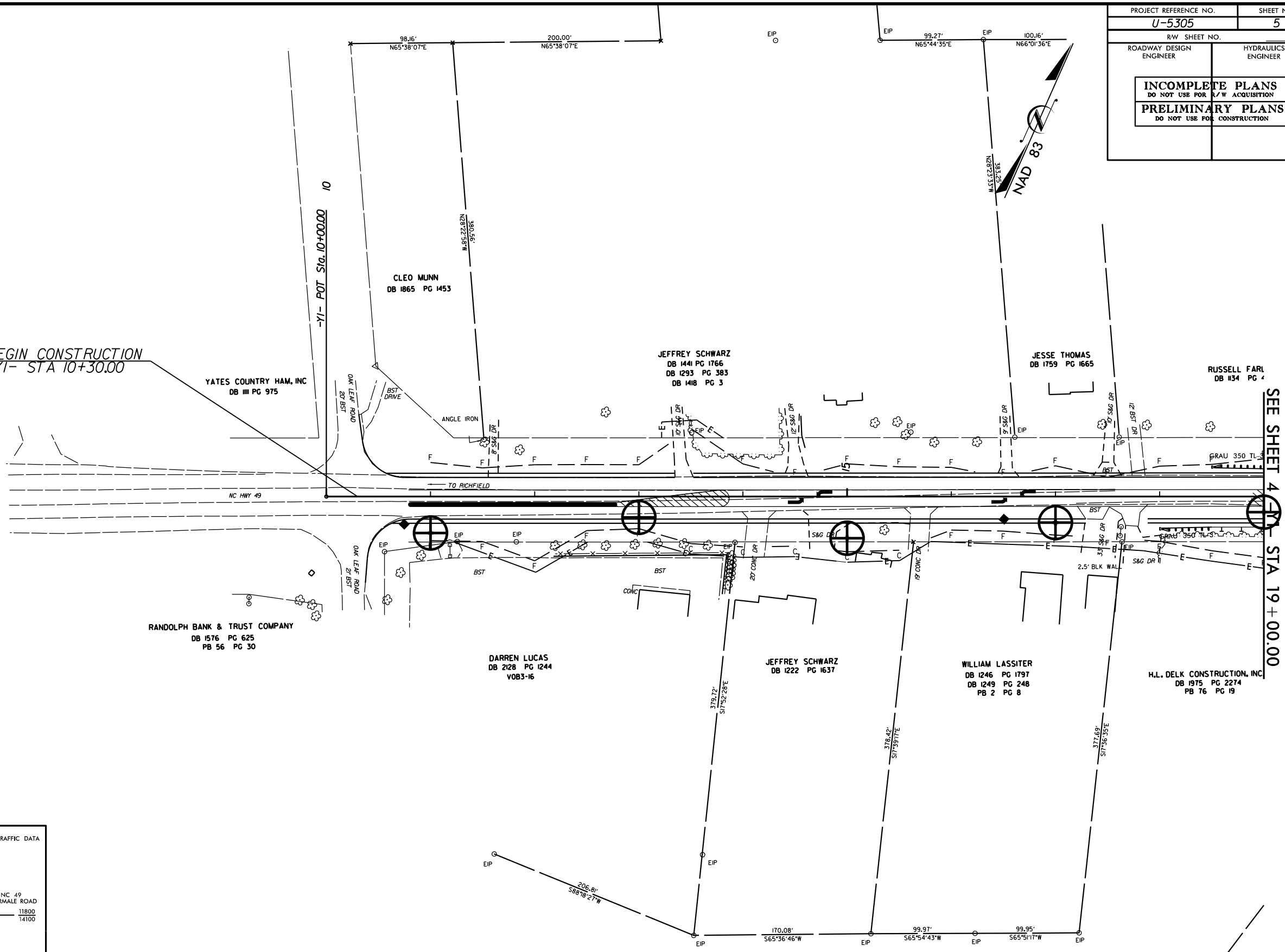
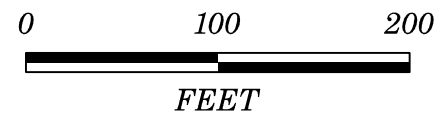
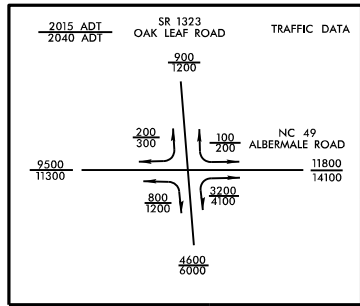
REVISIONS

|  |                       |
|--|-----------------------|
| PROJECT REFERENCE NO.<br><b>U-5305</b>   | SHEET NO.<br><b>5</b> |
| RW SHEET NO.   |                       |
| ROADWAY DESIGN ENGINEER  | HYDRAULICS ENGINEER   |
| <b>INCOMPLETE PLANS</b><br>DO NOT USE FOR A/W ACQUISITION<br><b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION |                       |

BEGIN CONSTRUCTION  
-YI- STA 10+30.00

-YI- POT Sta. 10+00.00 10

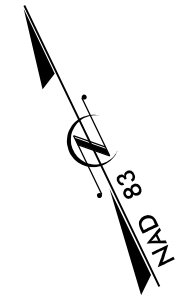
SEE SHEET 4  
STA 19+00.00



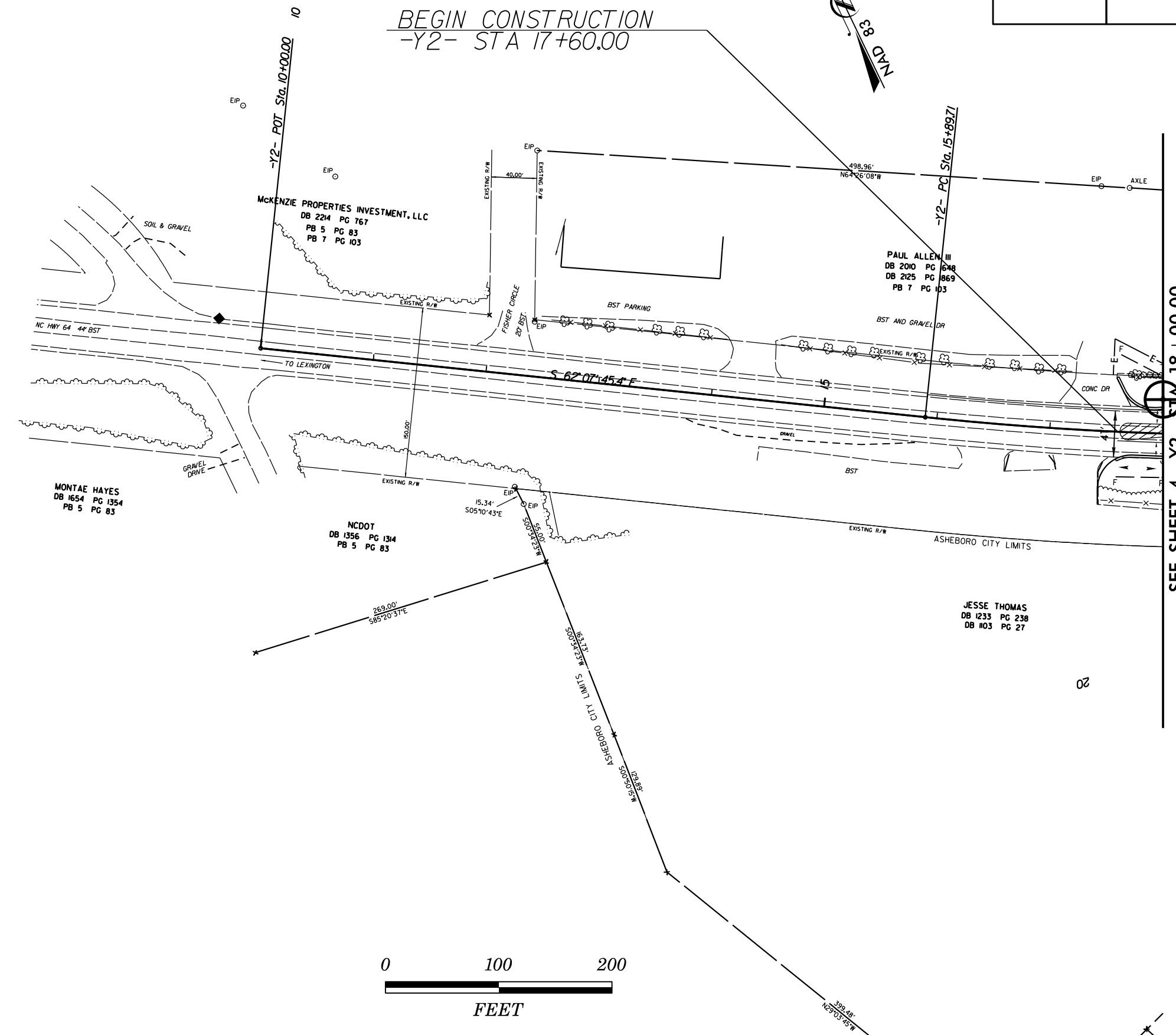
8/17/99

REVISIONS

|                                |  |                     |  |
|--------------------------------|--|---------------------|--|
| PROJECT REFERENCE NO.          |  | SHEET NO.           |  |
| U-5305                         |  | 6                   |  |
| RW SHEET NO.                   |  | HYDRAULICS ENGINEER |  |
| ROADWAY DESIGN ENGINEER        |  | HYDRAULICS ENGINEER |  |
| <b>INCOMPLETE PLANS</b>        |  |                     |  |
| DO NOT USE FOR R/W ACQUISITION |  |                     |  |
| <b>PRELIMINARY PLANS</b>       |  |                     |  |
| DO NOT USE FOR CONSTRUCTION    |  |                     |  |



BEGIN CONSTRUCTION  
-Y2- STA 17+60.00



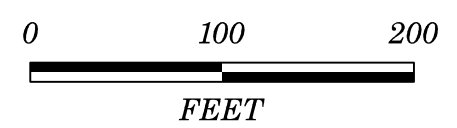
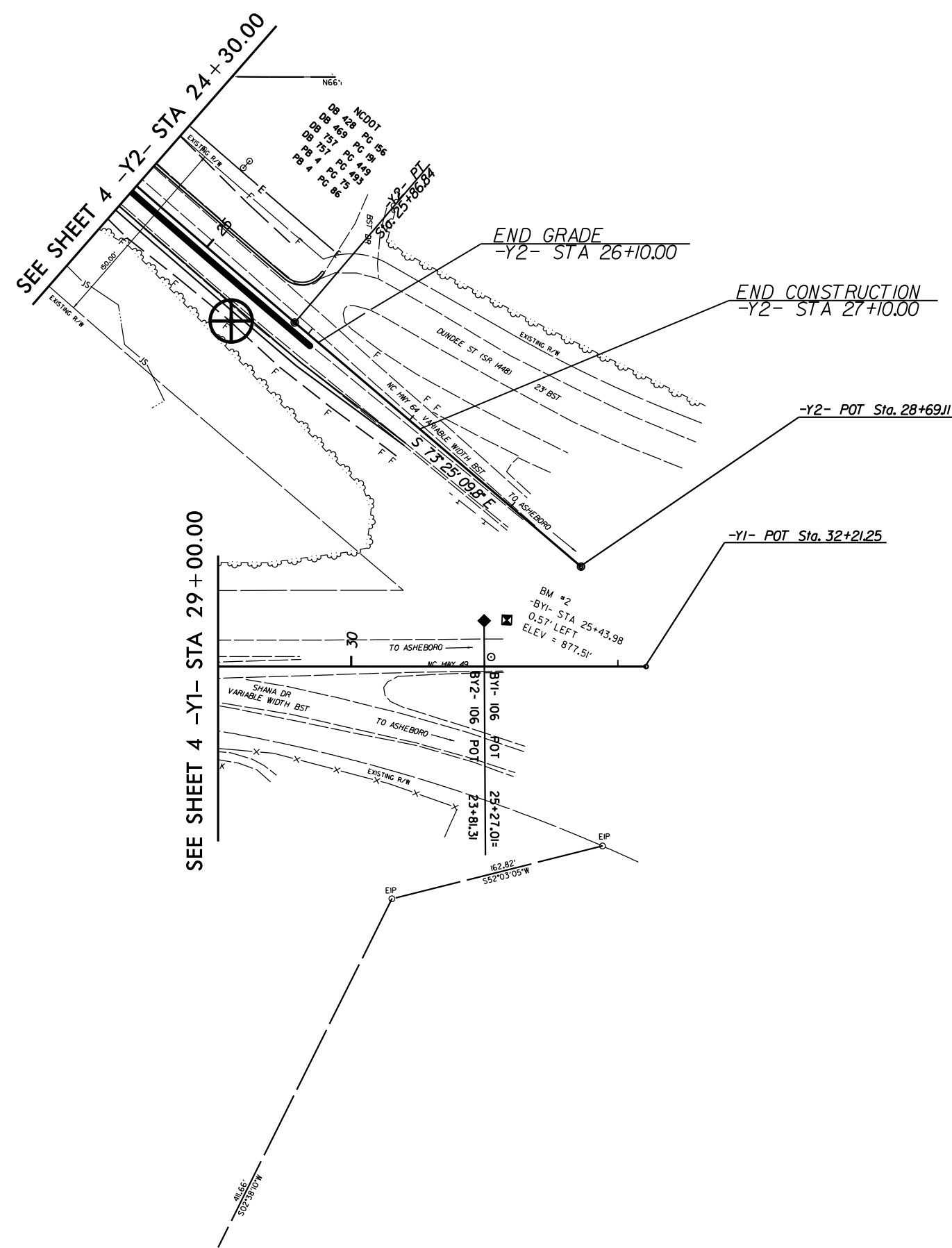
SEE SHEET 4 -Y2- STA 18+00.00

20

8/17/99

REVISIONS

|  |                     |
|--|---------------------|
| PROJECT REFERENCE NO.  | SHEET NO.           |
| U-5305   | 7                   |
| RW SHEET NO.   |                     |
| ROADWAY DESIGN ENGINEER  | HYDRAULICS ENGINEER |
| <b>INCOMPLETE PLANS</b><br>DO NOT USE FOR R/W ACQUISITION<br><b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION |                     |

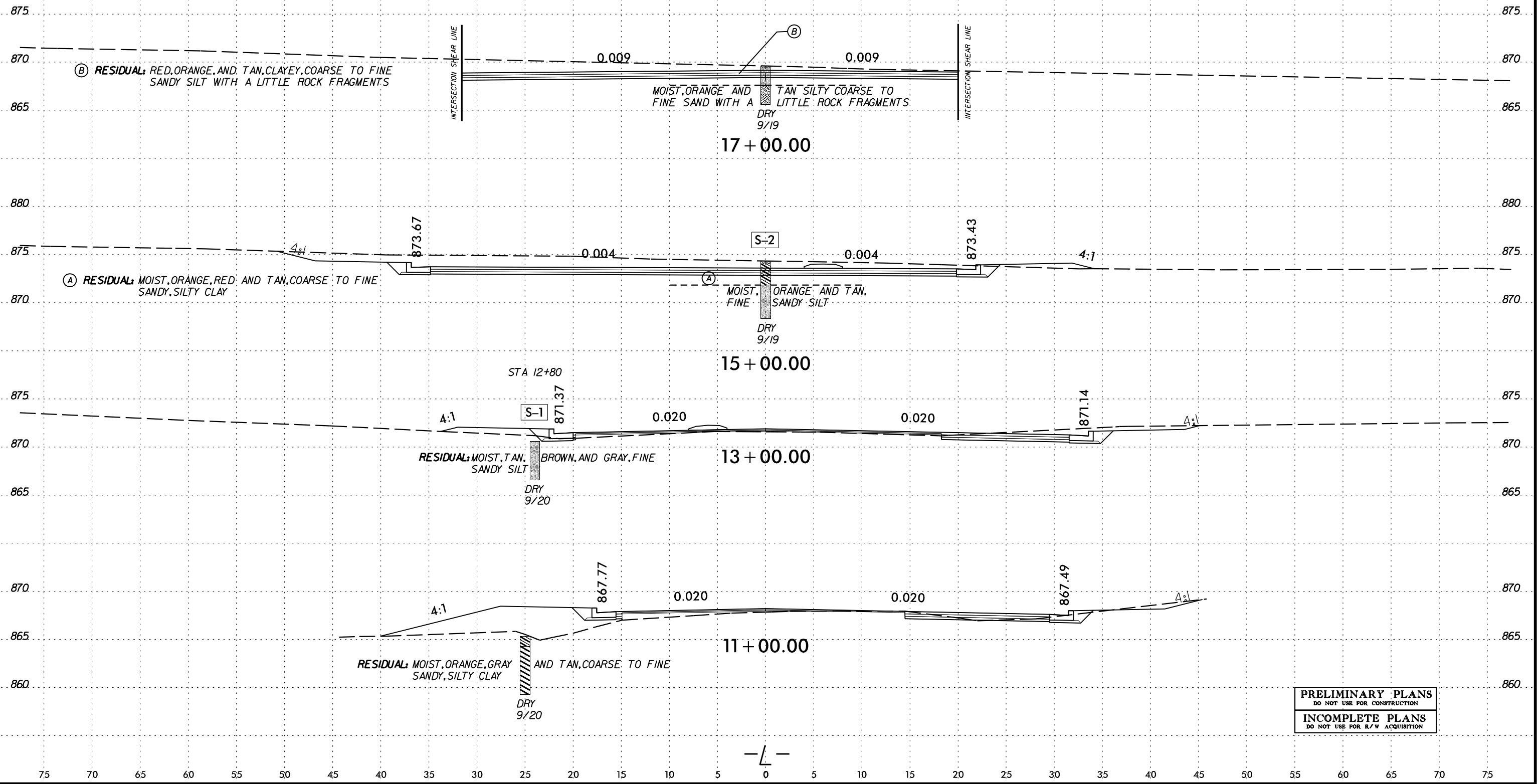




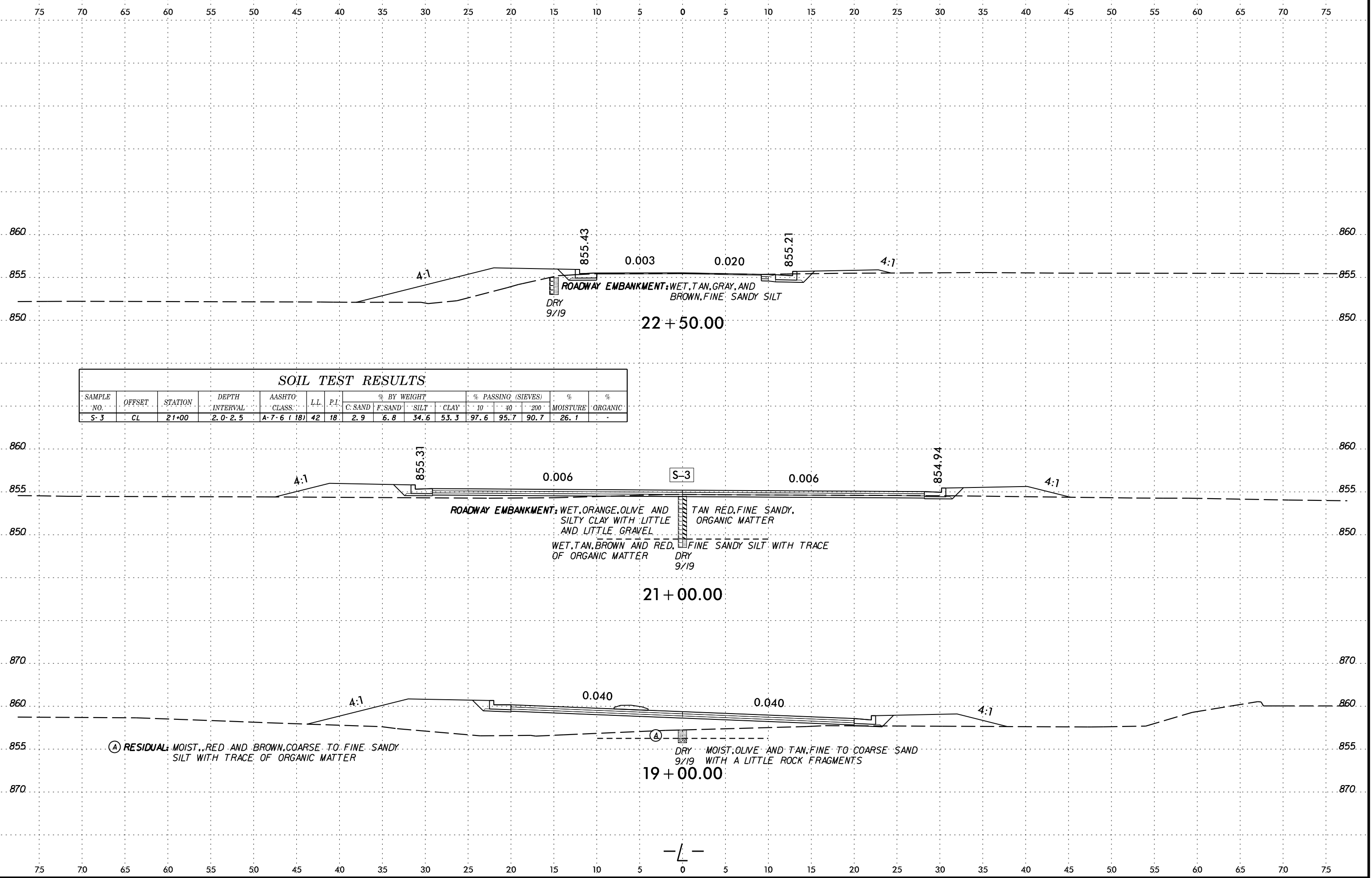
8/23/99

### SOIL TEST RESULTS

| SAMPLE NO. | OFFSET | STATION | DEPTH INTERVAL | AASHTO CLASS. | L.L. | P.L. | % BY WEIGHT |         |      |      | % PASSING (SIEVES) |      |      | % MOISTURE | % ORGANIC |
|------------|--------|---------|----------------|---------------|------|------|-------------|---------|------|------|--------------------|------|------|------------|-----------|
|            |        |         |                |               |      |      | C. SAND     | F. SAND | SILT | CLAY | #10                | #40  | #200 |            |           |
| S-1        | LT     | 12+80   | 1.0-1.5        | A-4(6)        | 32   | 6    | 1.4         | 12.0    | 49.2 | 35.3 | 99.9               | 99.2 | 90.0 | 17.9       | -         |
| S-2        | CL     | 15+00   | 1.0-1.5        | A-6(13)       | 39   | 14   | 2.6         | 11.1    | 38.3 | 44.8 | 96.8               | 95.1 | 87.1 | 20.4       | -         |



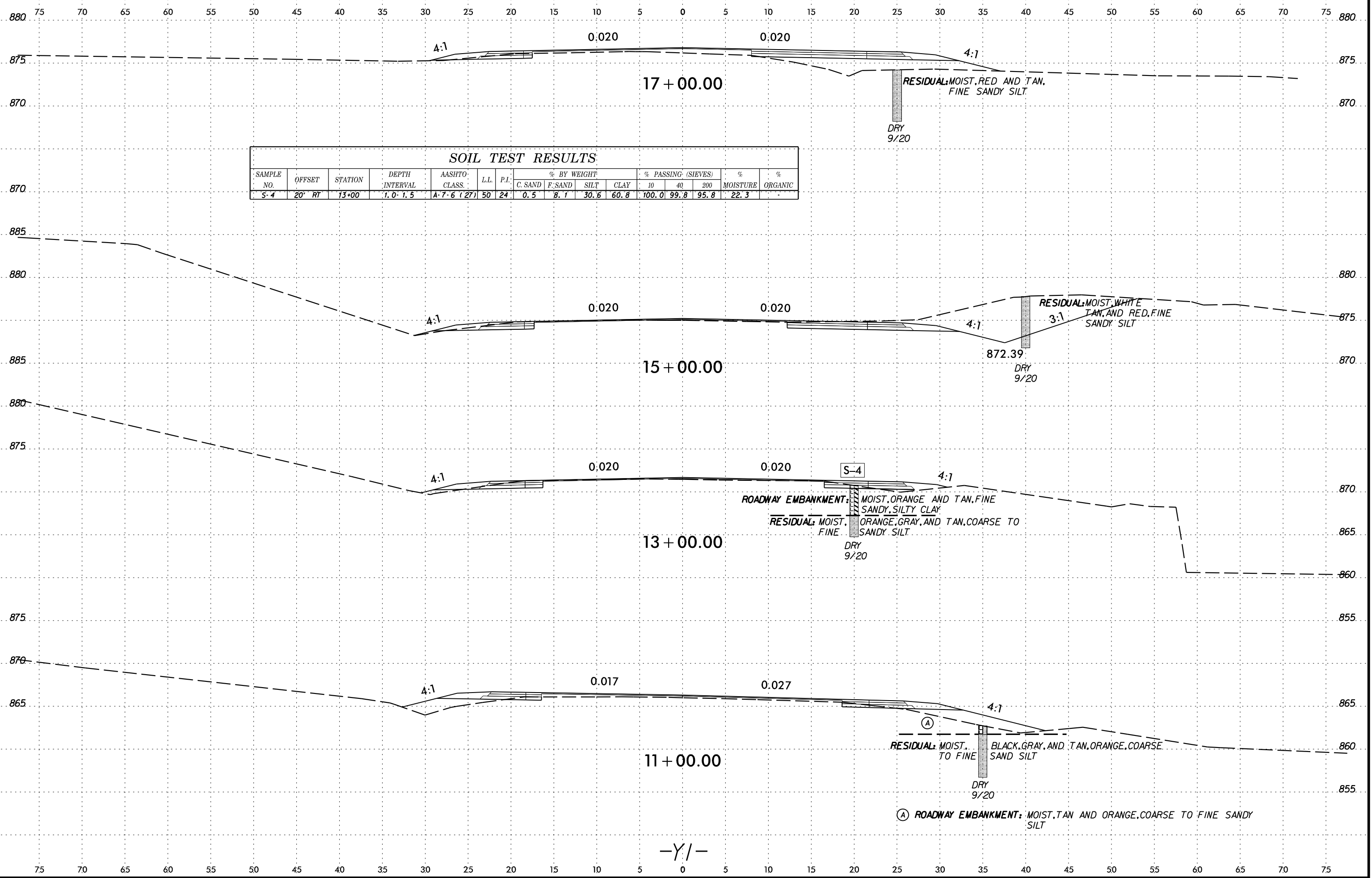
8/23/99



**SOIL TEST RESULTS**

| SAMPLE NO. | OFFSET | STATION | DEPTH INTERVAL | AASHTO CLASS | LL | PL | % BY WEIGHT |         |      |      | % PASSING (SIEVES) |      |      | MOISTURE | ORGANIC |
|------------|--------|---------|----------------|--------------|----|----|-------------|---------|------|------|--------------------|------|------|----------|---------|
|            |        |         |                |              |    |    | C. SAND     | F. SAND | SILT | CLAY | 10                 | 40   | 200  |          |         |
| S-3        | CL     | 21+00   | 2.0-2.5        | A-7-6 (18)   | 42 | 18 | 2.9         | 6.8     | 34.6 | 53.3 | 97.6               | 95.7 | 90.7 | 26.1     | -       |

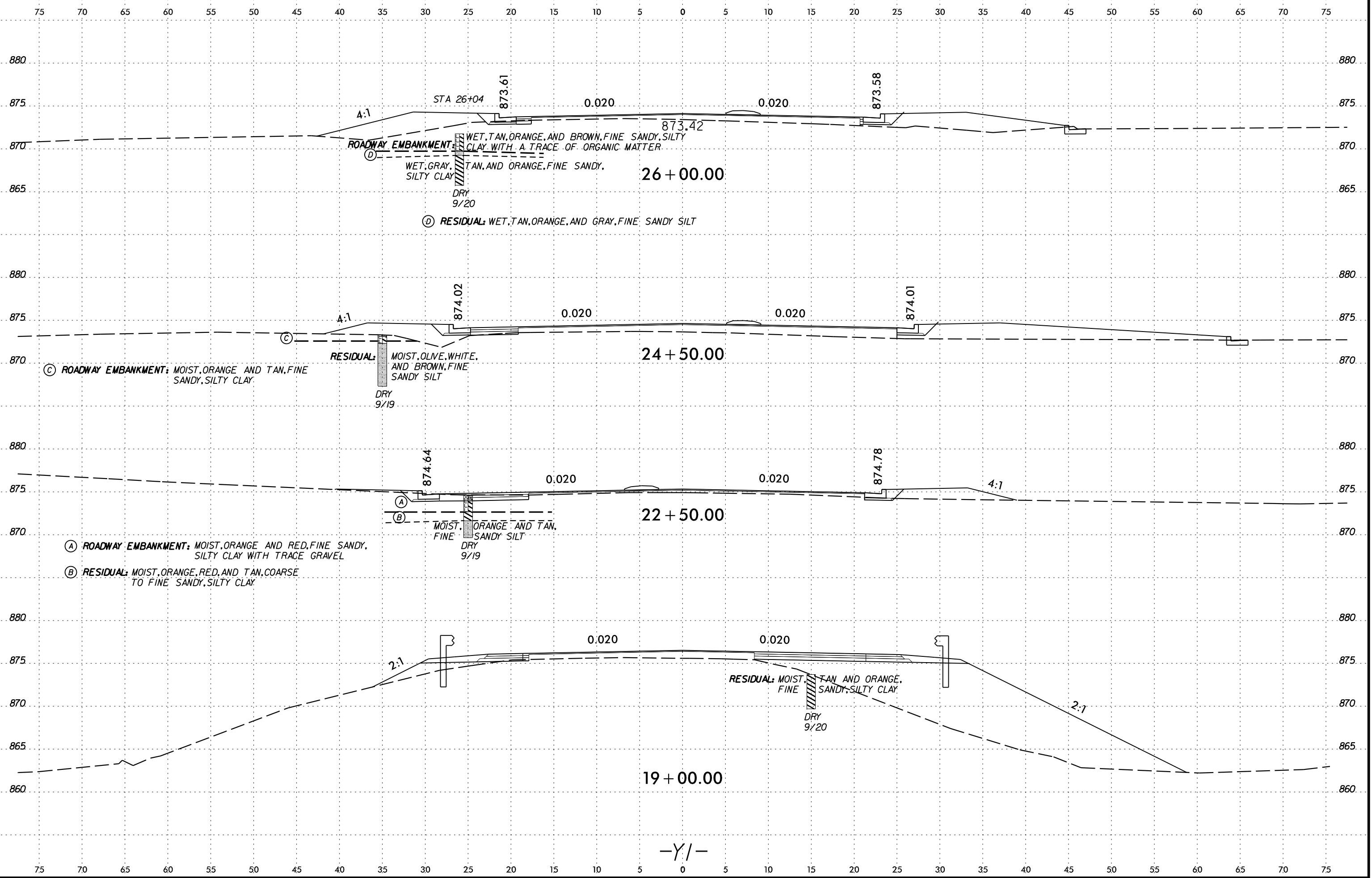
8/23/99

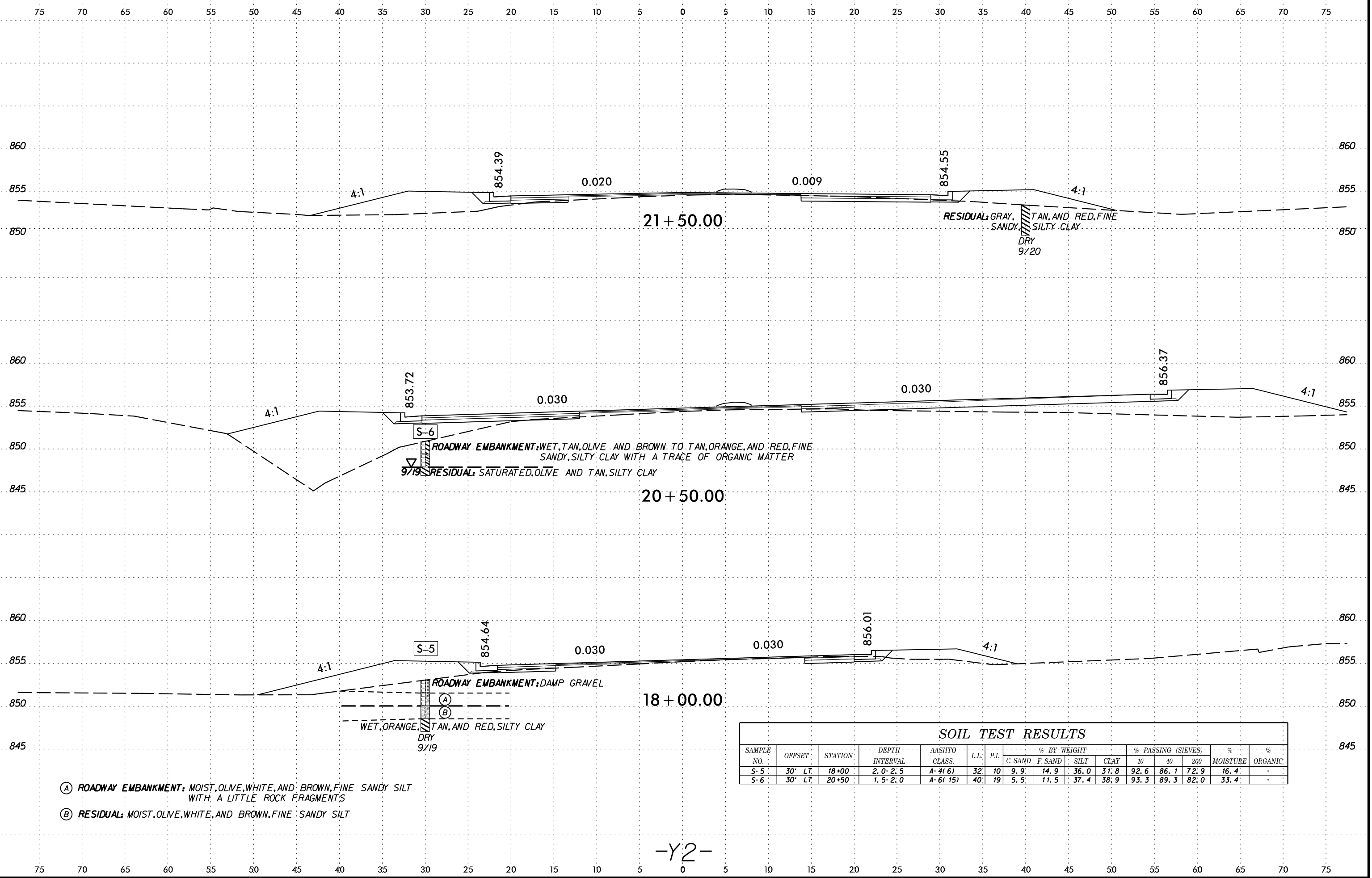


| SOIL TEST RESULTS |        |         |                |               |      |      |             |         |      |      |                    |      |      |            |           |
|-------------------|--------|---------|----------------|---------------|------|------|-------------|---------|------|------|--------------------|------|------|------------|-----------|
| 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-4               | 20' RT | 13+00   | 1.0-1.5        | A-7-6 (27)    | 50   | 24   | 0.5         | 8.1     | 30.6 | 60.8 | 100.0              | 99.8 | 95.8 | 22.3       |           |

-Y/-

8/23/99

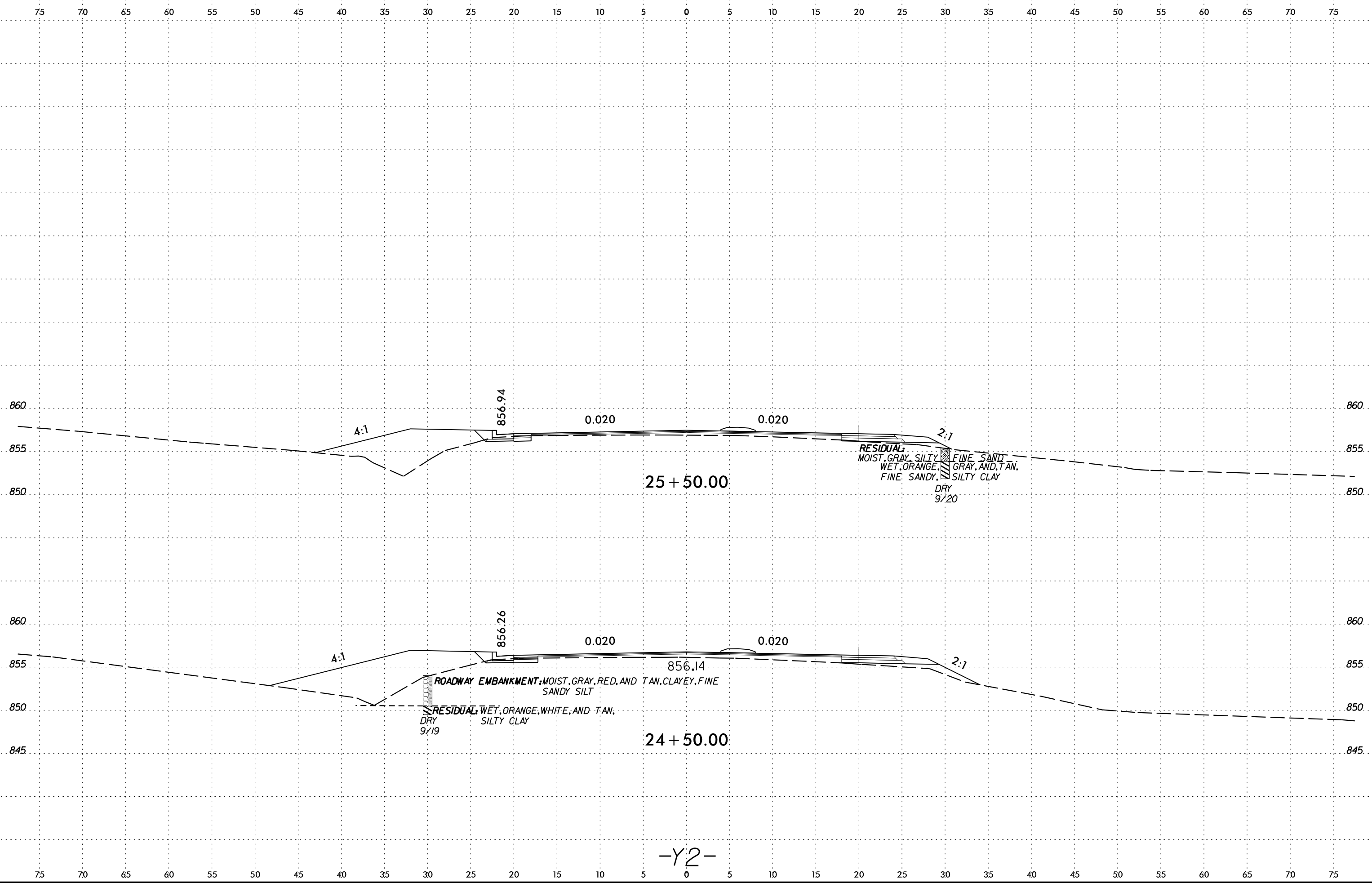




(A) ROADWAY EMBANKMENT: MOIST, OLIVE, WHITE, AND BROWN, FINE SANDY SILT WITH A LITTLE ROCK FRAGMENTS  
 (B) RESIDUAL: MOIST, OLIVE, WHITE, AND BROWN, FINE SANDY SILT

| SAMPLE NO. | OFFSET | STATION | DEPTH INTERVAL | AASHTO CLASS. | LL | P.I. | % BY WEIGHT |         |      |      | % PASSING (SIEVES) |      |      | % MOISTURE | % ORGANIC |
|------------|--------|---------|----------------|---------------|----|------|-------------|---------|------|------|--------------------|------|------|------------|-----------|
|            |        |         |                |               |    |      | C. SAND     | F. SAND | SILT | CLAY | 10                 | 40   | 200  |            |           |
| S-5        | 30' LT | 18+00   | 2.0-2.5        | A-4(6)        | 32 | 10   | 9.9         | 14.9    | 36.0 | 31.8 | 92.6               | 86.1 | 72.9 | 16.4       | -         |
| S-6        | 30' LT | 20+50   | 1.5-2.0        | A-6(15)       | 40 | 19   | 5.5         | 11.5    | 37.4 | 38.9 | 93.3               | 89.3 | 82.0 | 33.4       | -         |





**NCDOT Project No. 47025.1.1 TIP No. U-5305  
 Asheboro: NC 49 at the Intersection with SR 1144 (Mack Road) and Connector Road Realignment with US 64 West  
 Randolph County, North Carolina  
 SUMMARY OF LABORATORY TEST DATA**

| Boring Number | Sample Depth (ft.) | Sample No. | Natural Moisture Content (%) | AASHTO Class (Group Index) | N-Value (blows/ft.) | Atterberg Limits |      |      | Gradation Results |                |                 |                     |                 |               |          |          |
|---------------|--------------------|------------|------------------------------|----------------------------|---------------------|------------------|------|------|-------------------|----------------|-----------------|---------------------|-----------------|---------------|----------|----------|
|               |                    |            |                              |                            |                     | L.L.             | P.L. | P.I. | Pass #10 Sieve    | Pass #40 Sieve | Pass #200 Sieve | Retained #270 Sieve | Coarse Sand (%) | Fine Sand (%) | Silt (%) | Clay (%) |
| B-2           | 1.0 – 1.5          | S-1        | 17.9                         | A-4 (6)                    | NA                  | 32               | 26   | 6    | 99.9              | 99.2           | 90.0            | 13.7                | 1.4             | 12.0          | 49.2     | 35.3     |
| B-3           | 1.0 – 1.5          | S-2        | 20.4                         | A-6 (13)                   | NA                  | 39               | 25   | 14   | 96.8              | 95.1           | 87.1            | 15.8                | 2.6             | 11.1          | 38.3     | 44.8     |
| B-6           | 2.0 – 2.5          | S-3        | 26.1                         | A-7-6 (18)                 | NA                  | 42               | 24   | 18   | 97.6              | 95.7           | 90.7            | 11.8                | 2.9             | 6.8           | 34.6     | 53.3     |
| B-9           | 1.0 – 1.5          | S-4        | 22.3                         | A-7-6 (27)                 | NA                  | 50               | 26   | 24   | 100.0             | 99.8           | 95.8            | 7.7                 | 0.5             | 8.1           | 30.6     | 60.8     |
| B-16          | 2.0 – 2.5          | S-5        | 16.4                         | A-4 (6)                    | NA                  | 32               | 22   | 10   | 92.6              | 86.1           | 72.9            | 31.6                | 9.9             | 14.9          | 36.0     | 31.8     |
| B-17          | 1.5 – 2.0          | S-6        | 33.4                         | A-6 (15)                   | NA                  | 40               | 22   | 19   | 93.3              | 89.3           | 82.0            | 22.2                | 5.5             | 11.5          | 37.4     | 38.9     |

SS = Split-Barrel Sample (ASTM-D-1586) ST = Shelby Tube (Undisturbed) Sample

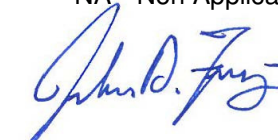
S = Grab Sample

NP -- Non Plastic

NA-- Non Applicable

Page: 1 of 1

Lab Technician:

  
 Joshua D. Fregosi

NCDOT Certification No.: 111-05-1203