

REFERENCE: R-2707E

PROJECT: 34497

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

ROADWAY
SUBSURFACE INVESTIGATION

COUNTY CLEVELAND

PROJECT DESCRIPTION US 74 (SHELBY BYPASS) FROM
EXISTING US 74 WEST OF SR 2238 (LONG BRANCH
RD.) TO WEST OF SR 1001 (STONE POINT RD.)

PAVEMENT AND SUBGRADE INVESTIGATION

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2707E	1	49

CAUTION NOTICE

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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.

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NOTES:

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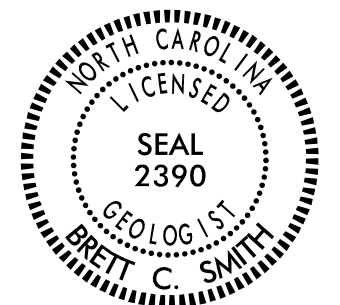
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DATE APRIL, 2019

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

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED 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 208, 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, *VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6*

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
	A-1	A-3	A-2	A-2-4	A-2-5	A-2-6	A-2-7	A-4	A-5	A-6	A-7	A-1, A-2	A-4, A-5	A-6, A-7
GROUP CLASS.	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7	A-4	A-5	A-6	A-7	A-1, A-2	A-4, A-5	A-6, A-7	
SYMBOL	[Patterned boxes for granular materials]							[Patterned boxes for silty-clay materials]				[Patterned boxes for organic materials]		
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 35 MX	35 MX 35 MX	35 MX 35 MX	35 MX 35 MX	36 MN 36 MN	36 MN 36 MN	36 MN 36 MN	36 MN 36 MN				
MATERIAL PASSING #40 LL PI	[Soil classification matrix with LL and PI values]													
GROUP INDEX	[Group index values for various soil types]													
USUAL TYPES OF MAJOR MATERIALS	[Soil types: Stone frags, Gravel, Sand, Silty, Clayey, etc.]													
GEN. RATING AS SUBGRADE	[Rating: Excellent to Good, Fair to Poor, Fair to Poor, Poor, Unsuitable]													

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

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	< 4 4 TO 10 10 TO 30 30 TO 50 > 50	N/A
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30	< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE OPENING (MM)	4	10	40	60	200	270
	4.75	2.00	0.42	0.25	0.075	0.053
BOULDER (BLDR.)						
COBBLE (COB.)						
GRAVEL (GR.)						
COARSE SAND (CS.E. SD.)						
FINE SAND (F SD.)						
SILT (SL.)						
CLAY (CL.)						

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
LL - LIQUID LIMIT	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
PL - PLASTIC LIMIT	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
OM - OPTIMUM MOISTURE SHRINKAGE LIMIT	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
SL - SHRINKAGE LIMIT	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NON PLASTIC	0-5	VERY LOW
SLIGHTLY PLASTIC	6-15	SLIGHT
MODERATELY PLASTIC	16-25	MEDIUM
HIGHLY PLASTIC	26 OR MORE	HIGH

COLOR

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

GRADATION

WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.
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.

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE LL < 31
 MODERATELY COMPRESSIBLE LL = 31 - 50
 HIGHLY COMPRESSIBLE LL > 50

PERCENTAGE OF MATERIAL

	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE 1 - 10%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE 10 - 20%
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME 20 - 35%
HIGHLY ORGANIC	> 10%	> 20%	HIGHLY 35% AND ABOVE

GROUND WATER

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

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
- INFERRERD SOIL BOUNDARY
- INFERRERD ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- DIP & DIP DIRECTION OF ROCK STRUCTURES
- SPT TEST BORING
- AUGER BORING
- CORE BORING
- MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING WITH CORE
- SPT N-VALUE

RECOMMENDATION SYMBOLS

- UNDERCUT
- SHALLOW UNDERCUT
- UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE
- UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK
- UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL

ABBREVIATIONS

- AR - AUGER REFUSAL
- BT - BORING TERMINATED
- CL - CLAY
- CPT - CONE PENETRATION TEST
- CSE - COARSE
- DMT - DILATOMETER TEST
- DPT - DYNAMIC PENETRATION TEST
- e - VOID RATIO
- F - FINE
- FOSS. - FOSSILIFEROUS
- FRAC. - FRACTURED, FRACTURES
- FRAGS. - FRAGMENTS
- HI. - HIGHLY
- MED. - MEDIUM
- MICA - MICACEOUS
- MOD. - MODERATELY
- NP - NON PLASTIC
- ORG. - ORGANIC
- PMT - PRESSUREMETER TEST
- SAP. - SAPROLITIC
- SD. - SAND, SANDY
- SL. - SILTY, SILTY
- SLI. - SLIGHTLY
- TCR - TRICONE REFUSAL
- w - MOISTURE CONTENT
- V - VERY
- VST - VANE SHEAR TEST
- WEA. - WEATHERED
- W - UNIT WEIGHT
- W_d - DRY UNIT WEIGHT
- S - BULK
- SS - SPLIT SPOON
- ST - SHELBY TUBE
- RS - ROCK
- RT - RECOMPACTED TRIAXIAL
- CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

- DRILL UNITS:
 - CME-45C
 - CME-55
 - CME-550
 - VANE SHEAR TEST
 - PORTABLE HOIST
 - CME-450
 -
- 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.
 - 4-INCH THIN WALL CORE BIT
 - .225" SOLID-STEM AUGERS
- HAMMER TYPE:
 - AUTOMATIC
 - MANUAL
- CORE SIZE:
 - B
 - H
 - N
- HAND TOOLS:
 - POST HOLE DIGGER
 - HAND AUGER
 - SOUNDING ROD
 - VANE SHEAR TEST
 - KESSLER DCP

ROCK DESCRIPTION

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

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

WEATHERING

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

ROCK HARDNESS

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

FRACTURE SPACING

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

BEDDING

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

INDURATION

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

TERMS AND DEFINITIONS

- ALLUVIUM (ALLUV.)** - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
- AQUIFER** - A WATER BEARING FORMATION OR STRATA.
- ARENACEOUS** - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
- ARGILLACEOUS** - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, 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 DISLOGGED 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.

BENCH MARK:

ELEVATION: FEET

NOTES:

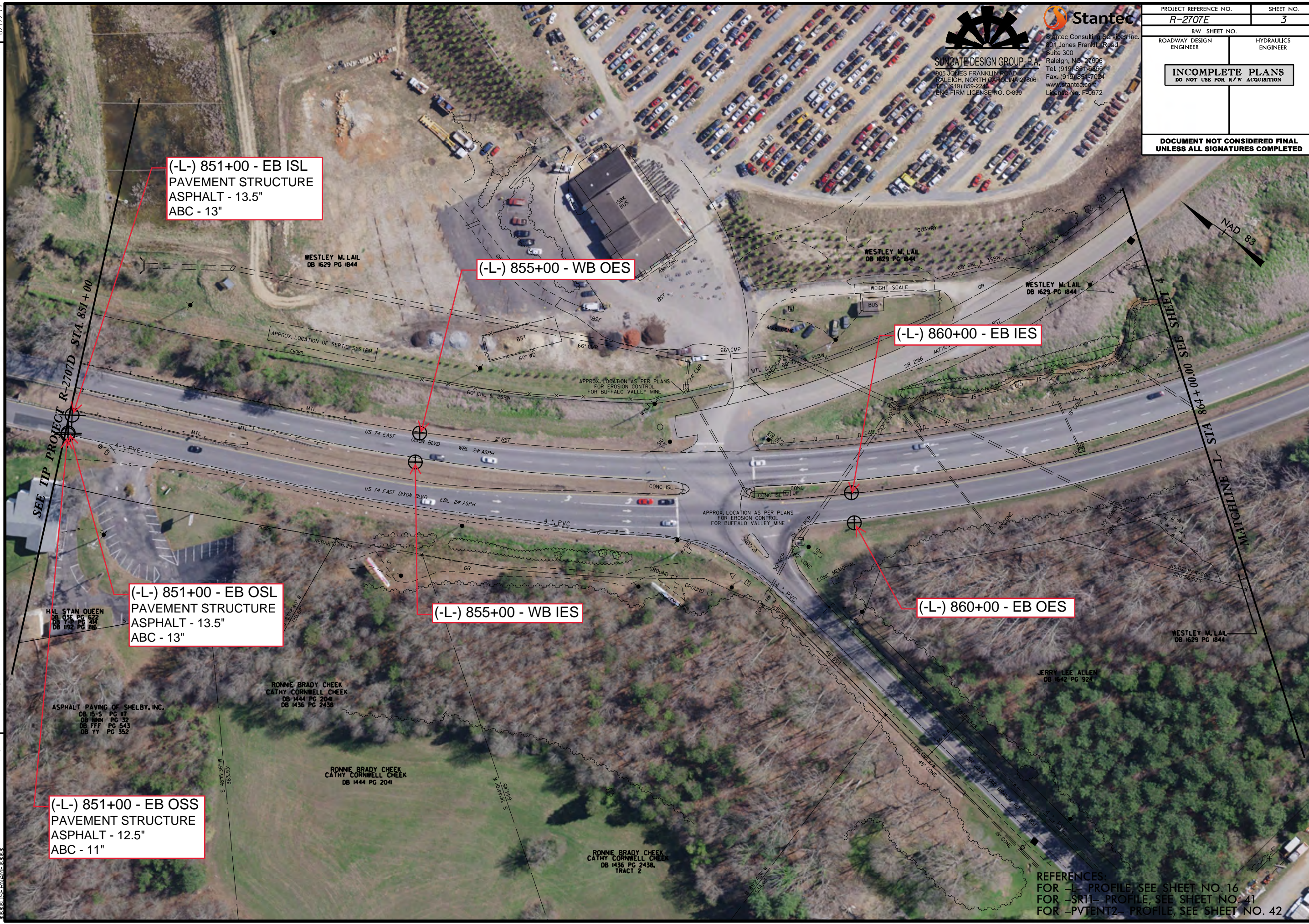
- EB = EASTBOUND
- WB = WESTBOUND
- ISS = INSIDE SHOULDER
- OSS = OUTSIDE SHOULDER
- OSL = OUTSIDE LANE
- ISL = INSIDE LANE

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Fax. (919) 851-7024
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PROJECT REFERENCE NO. R-2707E	SHEET NO. 3
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-) 851+00 - EB ISL
PAVEMENT STRUCTURE
ASPHALT - 13.5"
ABC - 13"

(-L-) 855+00 - WB OES

(-L-) 860+00 - EB IES

(-L-) 851+00 - EB OSL
PAVEMENT STRUCTURE
ASPHALT - 13.5"
ABC - 13"

(-L-) 855+00 - WB IES

(-L-) 860+00 - EB OES

(-L-) 851+00 - EB OSS
PAVEMENT STRUCTURE
ASPHALT - 12.5"
ABC - 11"

REFERENCES:
FOR -L- PROFILE, SEE SHEET NO. 16
FOR -SR11- PROFILE, SEE SHEET NO. 41
FOR -PVNT2- PROFILE, SEE SHEET NO. 42

8/17/99
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SUNGATE DESIGN GROUP P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

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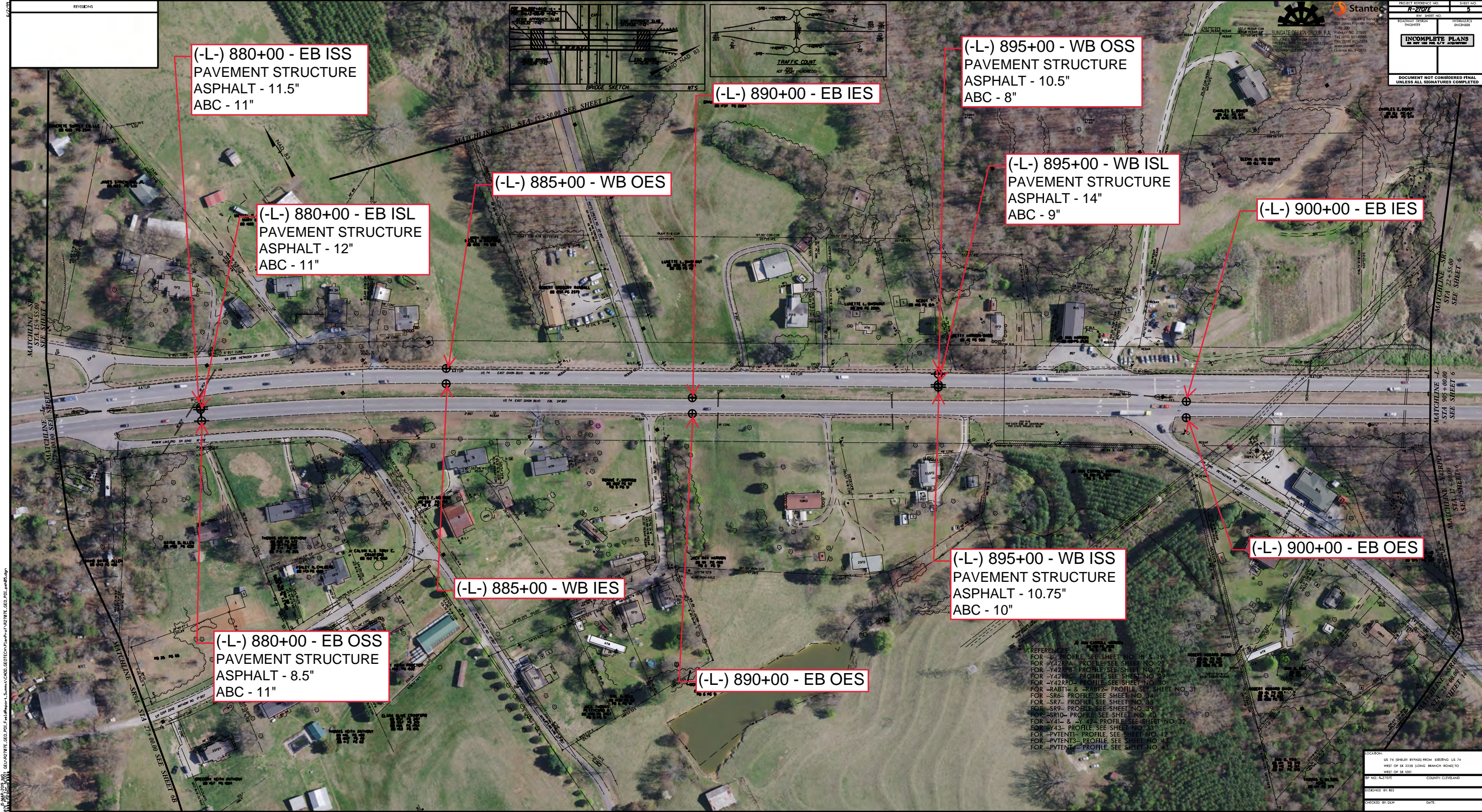
PROJECT REFERENCE NO. <i>R-2707E</i>	SHEET NO. 4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



REFERENCES:
FOR -L- PROFILE, SEE SHEET NO. 17
FOR -SR6- PROFILE, SEE SHEET NO. 34
FOR -Y42RPB- PROFILE, SEE SHEET NO. 28
FOR -Y42RPC- PROFILE, SEE SHEET NO. 29

NO.	REVISIONS

PROJECT NUMBER: HC2014	SHEET NO: 5
ROADWAY DESIGN: BRIDGE	PROJECT: BRIDGE
INCOMPLETE PLANS	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



**(-L-) 880+00 - EB ISS
PAVEMENT STRUCTURE
ASPHALT - 11.5"
ABC - 11"**

**(-L-) 880+00 - EB ISL
PAVEMENT STRUCTURE
ASPHALT - 12"
ABC - 11"**

(-L-) 885+00 - WB OES

(-L-) 885+00 - WB IES

**(-L-) 880+00 - EB OSS
PAVEMENT STRUCTURE
ASPHALT - 8.5"
ABC - 11"**

(-L-) 890+00 - EB IES

(-L-) 890+00 - EB OES

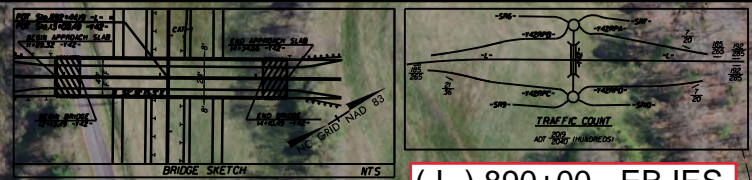
**(-L-) 895+00 - WB OSS
PAVEMENT STRUCTURE
ASPHALT - 10.5"
ABC - 8"**

**(-L-) 895+00 - WB ISS
PAVEMENT STRUCTURE
ASPHALT - 10.75"
ABC - 10"**

**(-L-) 895+00 - WB ISL
PAVEMENT STRUCTURE
ASPHALT - 14"
ABC - 9"**

(-L-) 900+00 - EB IES

(-L-) 900+00 - EB OES



- REFERENCES:
- FOR -L- PROFILE SEE SHEET NO. 18 & 19
 - FOR -Y22PA- PROFILE SEE SHEET NO. 27
 - FOR -Y42RPO- PROFILE SEE SHEET NO. 28
 - FOR -Y42RPO- PROFILE SEE SHEET NO. 29
 - FOR -Y42RPD- PROFILE SEE SHEET NO. 30
 - FOR -SABT1- & -SABT2- PROFILE SEE SHEET NO. 31
 - FOR -SR6- PROFILE SEE SHEET NO. 34
 - FOR -SR7- PROFILE SEE SHEET NO. 35
 - FOR -SR9- PROFILE SEE SHEET NO. 39
 - FOR -SR10- PROFILE SEE SHEET NO. 40
 - FOR -Y41- & -Y42- PROFILE SEE SHEET NO. 32
 - FOR -Y43- PROFILE SEE SHEET NO. 33
 - FOR -PVYENT1- PROFILE SEE SHEET NO. 42
 - FOR -PVYENT3- PROFILE SEE SHEET NO. 45
 - FOR -PVYENT- PROFILE SEE SHEET NO. 43

LOCATION:	US 74 BRIDGE BYPASS FROM EXISTING US 74 WEST OF SA 2228 ROND, BRANCH ROAD TO WEST OF SA 1001
PROJECT NO.:	HC2014
COUNTY:	CLEVELAND
DESIGNED BY:	RES
CHECKED BY:	DLW
DATE:	

PROJECT: US 74 BRIDGE BYPASS FROM EXISTING US 74 WEST OF SA 2228 ROND, BRANCH ROAD TO WEST OF SA 1001
 SHEET: 5 OF 5
 DATE: 08/27/2014
 PROJECT NO.: HC2014
 COUNTY: CLEVELAND
 DESIGNED BY: RES
 CHECKED BY: DLW

8/17/99
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 15-MAR-2018 11:32
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REVISIONS

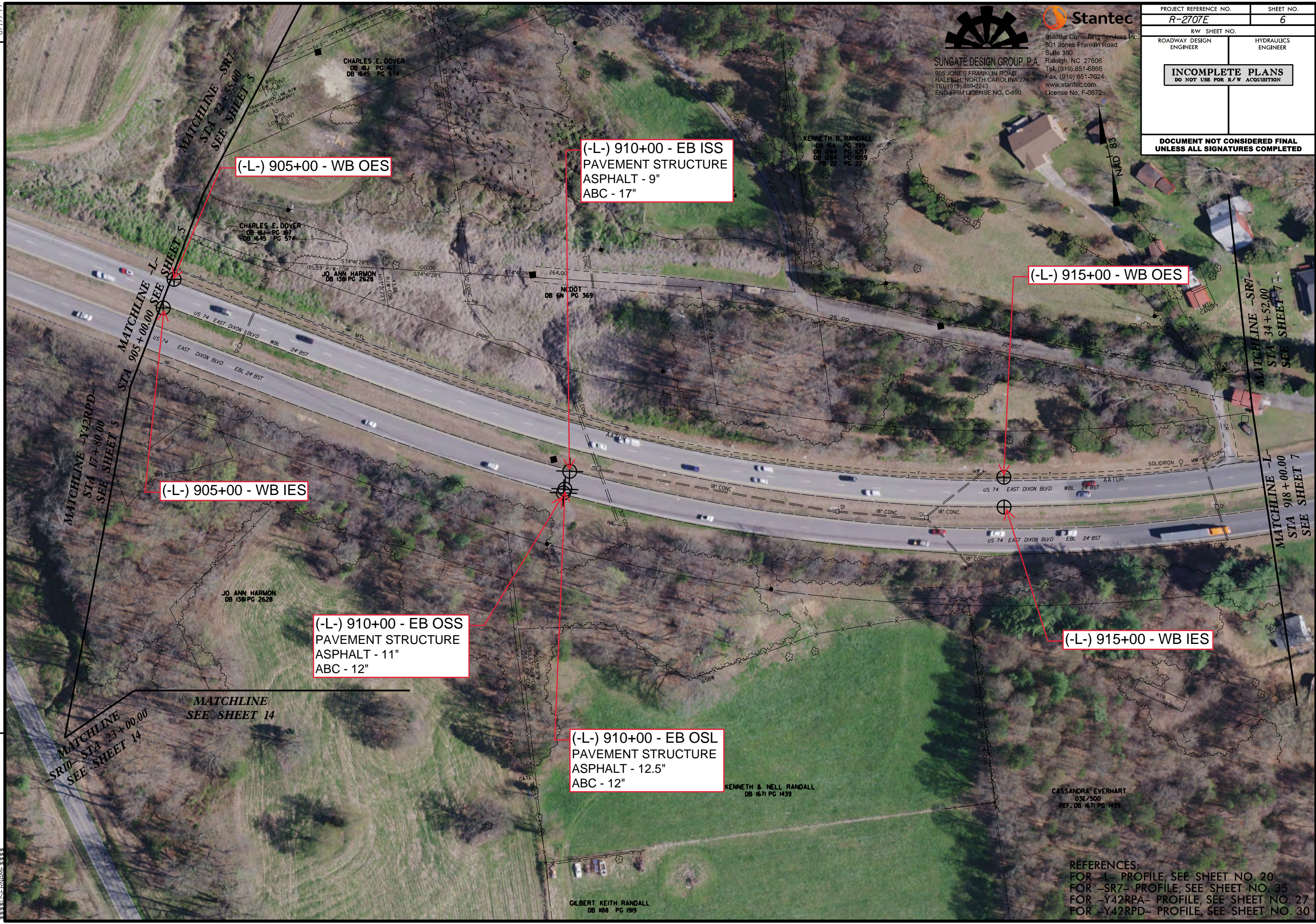


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PROJECT REFERENCE NO. <i>R-2707E</i>	SHEET NO. 6
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



(-L-) 905+00 - WB OES

**(-L-) 910+00 - EB ISS
PAVEMENT STRUCTURE
ASPHALT - 9"
ABC - 17"**

(-L-) 915+00 - WB OES

(-L-) 905+00 - WB IES

**(-L-) 910+00 - EB OSS
PAVEMENT STRUCTURE
ASPHALT - 11"
ABC - 12"**

(-L-) 915+00 - WB IES

**(-L-) 910+00 - EB OSL
PAVEMENT STRUCTURE
ASPHALT - 12.5"
ABC - 12"**

**MATCHLINE
SR10 - STA 23+00.00
SEE SHEET 14**

**MATCHLINE
SEE SHEET 14**

**MATCHLINE -Y42RPD-
STA 17+80.00
SEE SHEET 5**

**MATCHLINE -L-
STA 905+00.00
SEE SHEET 5**

**MATCHLINE -SR7-
STA 22+55.00
SEE SHEET 5**

**MATCHLINE -SR7-
STA 34+52.00
SEE SHEET 7**

**MATCHLINE -L-
STA 918+00.00
SEE SHEET 7**

CHARLES E. DOVER
DB 181 PG 574
DB 1645 PG 574

CHARLES E. DOVER
DB 181 PG 574
DB 1645 PG 574

JO ANN HARMON
DB 136 PG 2628

JO ANN HARMON
DB 136 PG 2628

KENNETH B. RANDALL
DB 15A PG 399
DB 1264 PG 1057
DB 224 PG 1059
PG 22

KENNETH & NELL RANDALL
DB 1671 PG 1439

GILBERT KEITH RANDALL
DB 188 PG 1919

CASSANDRA EVERHART
03E/500
REF. DB 1671 PG 1439

REFERENCES:
 FOR -L- PROFILE, SEE SHEET NO. 20
 FOR -SR7- PROFILE, SEE SHEET NO. 35
 FOR -Y42RPA- PROFILE, SEE SHEET NO. 27
 FOR -Y42RPD- PROFILE, SEE SHEET NO. 30

8/17/99
REVISIONS
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PROJECT REFERENCE NO. R-2707E	SHEET NO. 7
R/W 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-) 920+00 - EB IES

**(-L-) 925+00 - WB OSS
PAVEMENT STRUCTURE
ASPHALT - 12"
ABC - 12"**

**(-L-) 925+00 - WB OSL
PAVEMENT STRUCTURE
ASPHALT - 12.5"
ABC - 13"**

(-L-) 930+00 - EB IES

(-L-) 920+00 - EB OES

**(-L-) 925+00 - WB ISS
PAVEMENT STRUCTURE
ASPHALT - 11.75"
ABC - 12"**

(-L-) 930+00 - EB OES

REFERENCES:
FOR -L- PROFILE, SEE SHEET NO. 21
FOR -SR7- PROFILE, SEE SHEET NO. 35 & 36
FOR -SR8- PROFILE, SEE SHEET NO. 38
FOR -PVNTENT5- PROFILE, SEE SHEET NO. 44
FOR -PVNTENT6- PROFILE, SEE SHEET NO. 44

KENNETH B. RANDALL
DB 15A PG 399
DB 1284 PG 1057
DB 1284 PG 1059
PB 22 PG 22

JACK WILLIAMS
DB 1122 PG 548

JOHN M. OVERMAN
DB 1512 PG 1653

**MATCHLINE -L-
STA 918+00.00
SEE SHEET 6**

**MATCHLINE -SR7-
STA 34+52.00
SEE SHEET 6**

**MATCHLINE -SR7-
STA 47+00.00
SEE SHEET 8**

**MATCHLINE -L-
STA 931+00.00
SEE SHEET 8**

**MATCHLINE -SR8-
STA 131+00.00
SEE SHEET 8**

CASSANDRA EVERHART
03E/500
REF. DB 1671 PG 1439

WILLIAM PRESTON HARMON, JR.
DB 1232 PG 1503
DB 1596 PG 2139

JULIE J. HARMON
DB 15P PG 558
DB 15J PG 22
DB 15G PG 558

**SCOTT J. LEATHERMAN
& TONYA C. LEATHERMAN**
DB 1642 PG 1849
PB 35 PG 174

CHARLES CARRIGAN
DB 102 PG 285
DB 1039 PG 62
DB 1308 PG 664
PB 24 PG 17

**JAMES RALPH LEDBETTER
& LORA M. LEDBETTER**
DB 1484 PG 398

BETTY CARRIGAN
DB 1690 PG 785

BETTY CARRIGAN
DB 1278 PG 583
PB 31 PG 130

PROJECT REFERENCE NO. R-2707E	SHEET NO. 8
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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 NCDDOT GEUNR2707E_GEO_PDI for NCDDOT



(-L-) 935+00 - WB OES

**(-L-) 940+00 - EB ISS
PAVEMENT STRUCTURE
ASPHALT - 2"
CONCRETE - 9"
ABC - 8"**

(-L-) 935+00 - WB IES

**(-L-) 940+00 - EB ISL
PAVEMENT STRUCTURE
ASPHALT - 3"
CONCRETE - 9"
ABC - 8"**

**(-L-) 940+00 - EB OSS
PAVEMENT STRUCTURE
ASPHALT - 2.5"
CONCRETE - 10"
ABC - 6"**

REFERENCES:
 FOR -L- PROFILE, SEE SHEET NO. 22
 FOR -Y46- PROFILE, SEE SHEET NO. 33
 FOR -SR7- PROFILE, SEE SHEET NO. 36
 FOR -SR8- PROFILE, SEE SHEET NO. 38
 FOR -PVTENT7- PROFILE, SEE SHEET NO. 45

DB 1000 PG 205
 DB 1039 PG 62
 DB 139 PG 807
 DB 1508 PG 664
 PB 24 PG 87
 PB 30 PG 47
 CHARLES A. CARRIGAN
 DB 1615 PG 2444
 PB 30 PG 47
 J. SCOTT LEATHERMAN
 & TONYA LEATHERMAN
 DB 1678 PG 400



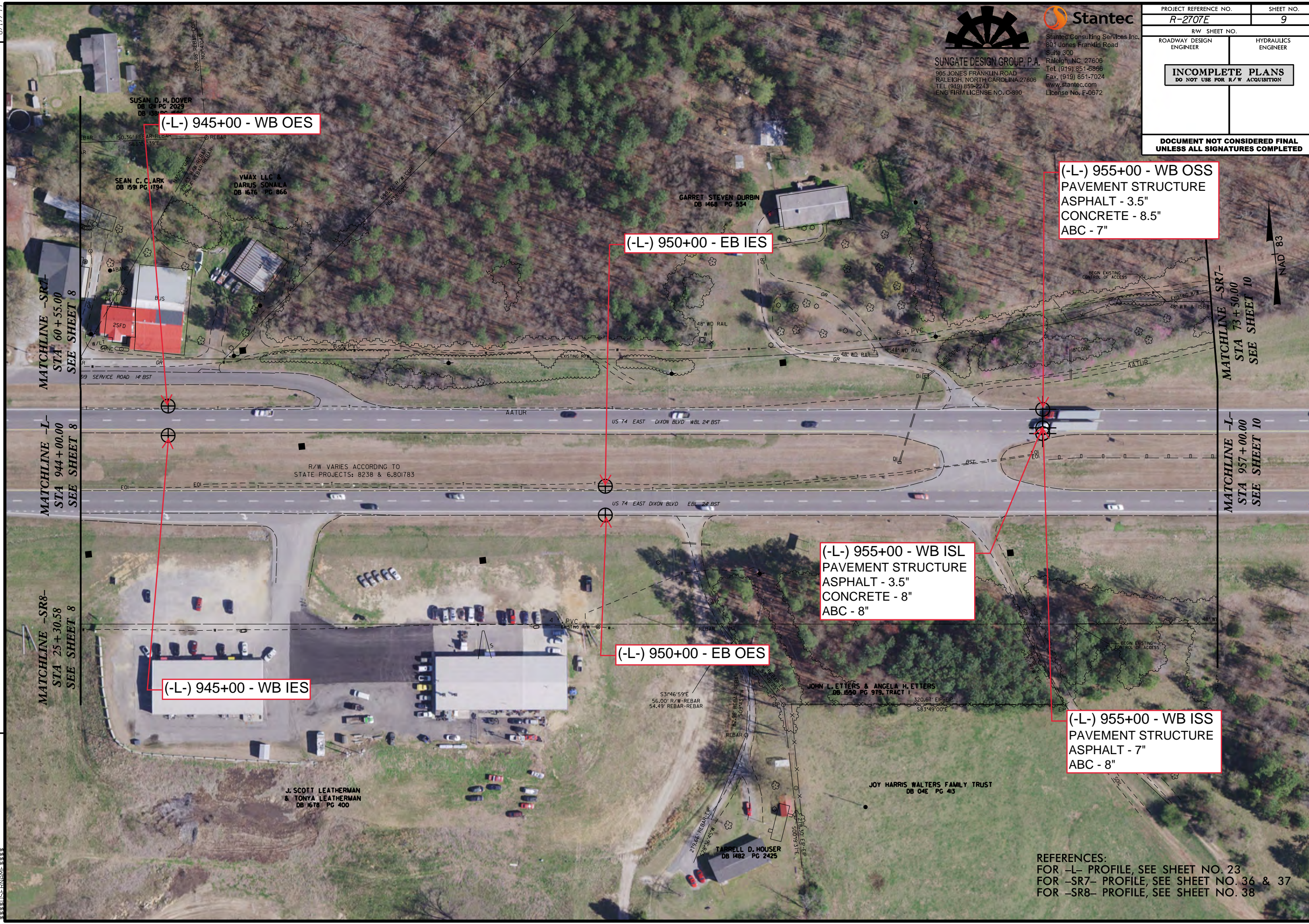
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 WWW.SUNGATEDESIGN.COM
 ENG FIRM LICENSE NO. C-890



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PROJECT REFERENCE NO. R-2707E	SHEET NO. 9
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	

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(-L-) 945+00 - WB OES

(-L-) 950+00 - EB IES

(-L-) 955+00 - WB OSS
 PAVEMENT STRUCTURE
 ASPHALT - 3.5"
 CONCRETE - 8.5"
 ABC - 7"

(-L-) 955+00 - WB ISL
 PAVEMENT STRUCTURE
 ASPHALT - 3.5"
 CONCRETE - 8"
 ABC - 8"

(-L-) 950+00 - EB OES

(-L-) 945+00 - WB IES

(-L-) 955+00 - WB ISS
 PAVEMENT STRUCTURE
 ASPHALT - 7"
 ABC - 8"

MATCHLINE -SR1-
 STA 60+55.00
 SEE SHEET 8

MATCHLINE -L-
 STA 944+00.00
 SEE SHEET 8

MATCHLINE -SR8-
 STA 25+30.58
 SEE SHEET 8

MATCHLINE -SR7-
 STA 73+50.00
 SEE SHEET 10

MATCHLINE -L-
 STA 957+00.00
 SEE SHEET 10

REFERENCES:
 FOR -L- PROFILE, SEE SHEET NO. 23
 FOR -SR7- PROFILE, SEE SHEET NO. 36 & 37
 FOR -SR8- PROFILE, SEE SHEET NO. 38

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PROJECT REFERENCE NO. <i>R-2707E</i>	SHEET NO. <i>10</i>
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-) 960+00 - EB IES

(-L-) 965+00 - WB OES

(-L-) 970+00 - EB ISS
 PAVEMENT STRUCTURE
 ASPHALT - 2"
 CONCRETE - 12.5
 ABC - 8"

MATCHLINE -SR7-
 STA 73+50.00
 SEE SHEET 9

MATCHLINE -L-
 STA 957+00.00
 SEE SHEET 9

MATCHLINE -L-
 STA 970+00.00
 SEE SHEET 11

(-L-) 960+00 - EB OES

(-L-) 965+00 - WB IES

(-L-) 970+00 - EB OSL
 PAVEMENT STRUCTURE
 ASPHALT - 3"
 CONCRETE - 8"
 ABC - 10"


(-L-) 970+00 - EB OSS
 PAVEMENT STRUCTURE
 ASPHALT - 3.5"
 CONCRETE - 8"
 ABC - 8"

REFERENCES:
 FOR -L- PROFILE, SEE SHEET NO. 24
 FOR -SR7- PROFILE, SEE SHEET NO. 37

8/17/99
 REVISIONS
 C:\Users\pshill\Documents\NCDDOT_PDI for NCDDOT GEUNR2707E_PDI.FielReport_Summit\CADD_GEO\TECH\Plan\Prof\VR2707E_GEO_PDI_pshill.dgn
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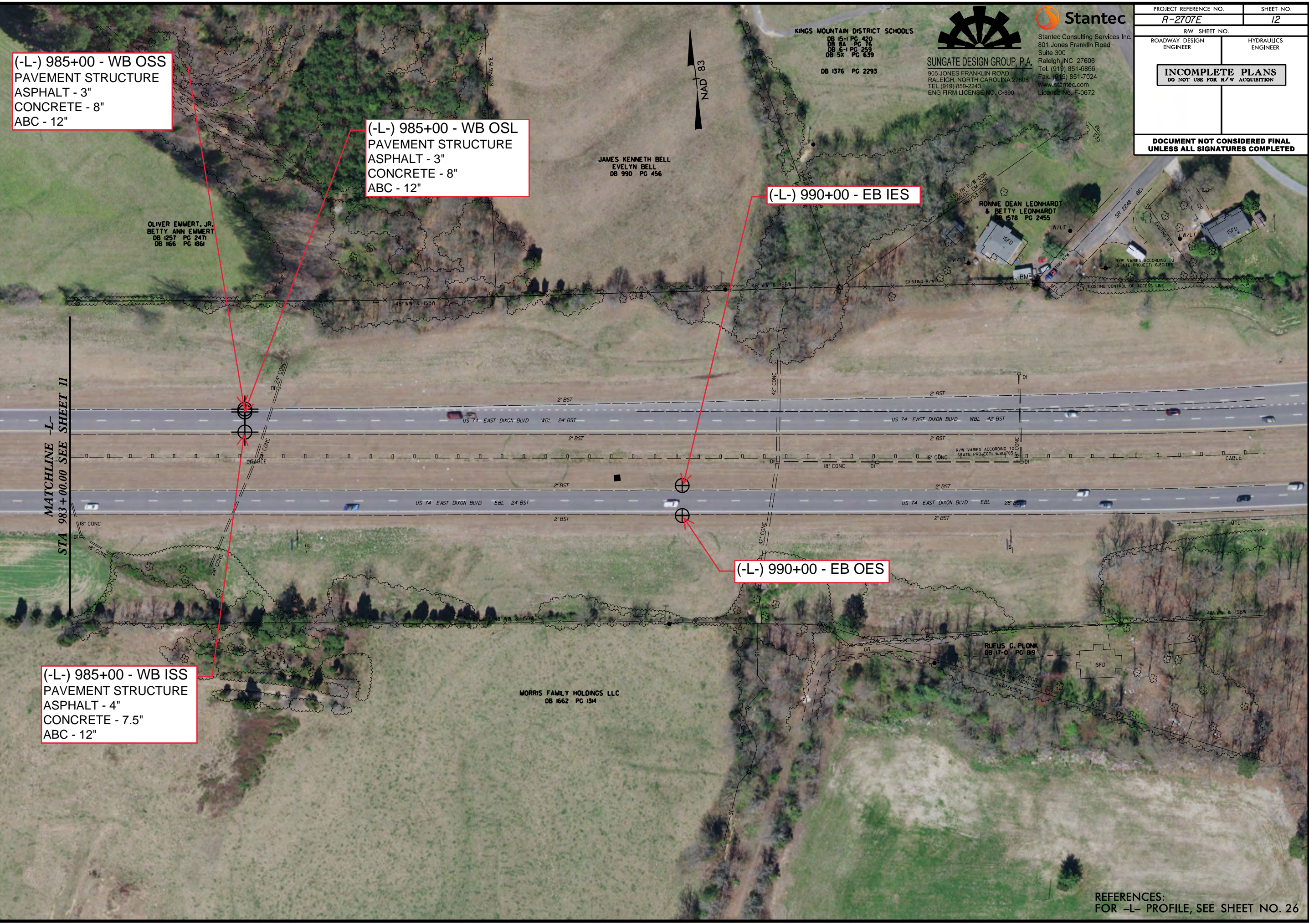
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PROJECT REFERENCE NO. <i>R-2707E</i>	SHEET NO. <i>11</i>
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



REFERENCES:
 FOR -L- PROFILE, SEE SHEET NO. 25

8/17/99
 REVISIONS
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(-L-) 985+00 - WB OSS
 PAVEMENT STRUCTURE
 ASPHALT - 3"
 CONCRETE - 8"
 ABC - 12"

(-L-) 985+00 - WB OSL
 PAVEMENT STRUCTURE
 ASPHALT - 3"
 CONCRETE - 8"
 ABC - 12"

(-L-) 990+00 - EB IES

(-L-) 990+00 - EB OES

(-L-) 985+00 - WB ISS
 PAVEMENT STRUCTURE
 ASPHALT - 4"
 CONCRETE - 7.5"
 ABC - 12"

KINGS MOUNTAIN DISTRICT SCHOOLS
 DB 15-1 PG 420
 DB 8A PG 76
 DB 6-1 PG 259
 DB 5X PG 639
 DB 1376 PG 2293

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PROJECT REFERENCE NO. R-2707E	SHEET NO. 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	

REFERENCES:
 FOR -L- PROFILE, SEE SHEET NO. 26

PAVEMENT INVESTIGATION DATA SHEET

Project: 34497.1.1
TIP: R-2707E

Route: US-74 (-L-)
County: Cleveland

Date: 12/17/18 - 1/8/19
Notes By: Brett Smith, PG

Position (Sta., Lane, Shldr.)	Cut/Fill (Est. of Amount in feet)	Width (ft.)		Offset Distance from White Line (ft.)	Crown "C" or Super "S" (in.)	Thickness (in.)					Subgrade				GPS Coordinates		
		Lane(s)	Shoulder			Gross to Top of Soil	Asphalt	ABC	Stabilized Subgrade Soil	Concrete	Description	AASHTO Classification	Soil Moisture	Probe Depth (ft.)	Asphalt Notes	Northing	Easting
851+00 - EB OSS	Fill 9	ISL = 12 OSL = 12	ISS = 2 OSS = 3	0	S-RT	23.5	12.5	11	N/A	N/A	(1.9'-5.0') RE: brown, moderately plastic, sandy CLAY with little silt	A-6	M	5	Asphalt observed to be in good condition, no signs of distress	557,044	1,266,158
851+00 - EB OSL	Fill 9	ISL = 12 OSL = 12	ISS = 2 OSS = 3	2	S-RT	26.5	13.5	13	N/A	N/A	(2.1'-5.0') RE: brown, moderately plastic, sandy CLAY with little silt Sample Number: S-8 (2.1 - 4.5 feet)	A-6	13%	5	Asphalt observed to be in good condition, no signs of distress	557,045	1,266,159
851+00 - EB ISL	Fill 9	ISL = 12 OSL = 12	ISS = 2 OSS = 3	23	S-RT	26.5	13.5	13	N/A	N/A	(2.1'-5.0') RE: gray, sandy SILT with some clay	A-4	M	5	Low severity longitudinal cracking observed on inside lane	557,054	1,266,179
855+00 - WB OES	Fill 3	ISL = 12 OSL = 12	ISS = 2 OSS = 4	5	S-LT	N/A	N/A	N/A	N/A	N/A	(0.0'-3.0') RE: brown, sandy SILT with some clay (3.0'-5.0') RES: brown, sandy SILT with some clay Sample Number: S-42 (0.0 - 5.0 feet)	A-4	16%	5	Asphalt observed to be in good condition, no signs of distress	556,722	1,266,398
855+00 - WB IES	Fill 3	ISL = 12 OSL = 12	ISS = 2 OSS = 4	29	S-LT	N/A	N/A	N/A	N/A	N/A	(0.0'-3.0') RE: brown, slightly plastic, sandy CLAY with little silt (3.0'-5.0') RES: brown, slightly plastic, sandy CLAY with little silt Sample Number: S-75 (0.0 - 5.0 feet)	A-6	20%	5	Asphalt observed to be in good condition, no signs of distress	556,706	1,266,368
860+00 - EB OES	Fill 3'	ISL = 12 OSL = 12	ISS = 3 OSS = 3	6	S-LT	N/A	N/A	N/A	N/A	N/A	(0.0'-3.0') RE: brown, slightly plastic, sandy CLAY with some silt (3.0'-5.0') RES: brown, slightly plastic, sandy CLAY with some silt Sample Number: S-10 (0.0 - 5.0 feet)	A-6	17%	5	Asphalt observed to be in good condition, no signs of distress	556,260	1,266,610
860+00 - EB IES	Fill 3	ISL = 12 OSL = 12	ISS = 3 OSS = 3	29	S-LT	N/A	N/A	N/A	N/A	N/A	(0.0'-3.0') - RE: brown, silty SAND with little clay (3.0'-5.0') - RES: brown, silty SAND with little clay Sample Number: S-44 (0.0 - 5.0 feet)	A-2-4	14%	5	Asphalt observed to be in good condition, no signs of distress	556,283	1,266,636
865+00 - WB OSS	Fill 5	ISL = 13 CTL = 9 OSL = 13	ISS = 1 OSS = 4	3	S-LT	22	10	12	N/A	N/A	(1.8'-5.0') RE: brown, sandy SILT with some clay Sample Number: S-41 (1.8 - 4.5 feet)	A-4	13%	5	Asphalt observed to be in good condition, no signs of distress	556,001	1,267,046
865+00 - WB OSL	Fill 5	ISL = 13 CTL = 9 OSL = 13	ISS = 1 OSS = 4	3	S-LT	26	13	13	N/A	N/A	(2.2'-5.0') RE: brown, sandy SILT with some clay	A-4	M	5	Asphalt observed to be in good condition, no signs of distress	555,996	1,267,042
865+00 - WB ISS	Fill 5	ISL = 13 CTL = 9 OSL = 13	ISS = 1 OSS = 4	33	S-LT	24.25	12.25	12	N/A	N/A	(2.0'-5.0') RE: orange, slightly plastic, sandy CLAY with little silt Sample Number: S-74 (2.2 - 4.5 feet)	A-6	18%	5	Asphalt observed to be in good condition, no signs of distress	555,972	1,267,027
870+00 - EB OES	Fill 3	ISL = 12 OSL = 12	ISS = 4 OSS = 3	5	C-1	N/A	N/A	N/A	N/A	N/A	(0.0'-3.0') RE: brown, silty SAND with little clay (3.0'-5.0') RES: brown, silty SAND with little clay Sample Number: S-11 (0.0 - 5.0 feet)	A-2-4	10%	5	Asphalt observed to be in good condition, no signs of distress	555,696	1,267,450
870+00 - EB IES	Fill 3	ISL = 12 OSL = 12	ISS = 4 OSS = 3	31	C-1	N/A	N/A	N/A	N/A	N/A	(0.0'-3.0') RE: brown, silty SAND with little clay (3.0'-5.0') RES: brown, silty SAND with little clay	A-2-4	M	5	Low severity longitudinal cracking observed on inside shoulder	555,728	1,267,465
875+00 - WB OES	Fill 9	ISL = 12 OSL = 12	ISS = 2 OSS = 4	4	C-1	N/A	N/A	N/A	N/A	N/A	(0.0'-5.0') RE: brown, sandy SILT with little clay and mica	A-4	M	5	Asphalt observed to be in good condition, no signs of distress	555,572	1,267,944
875+00 - WB IES	Fill 9	ISL = 12 OSL = 12	ISS = 2 OSS = 4	28	C-1	N/A	N/A	N/A	N/A	N/A	(0.0'-5.0') RE: brown, sandy SILT with little clay and mica Sample Number: S-73 (0.0 - 5.0 feet)	A-4	18%	5	Low severity transverse cracking observed on inside lane and inside shoulder	555,542	1,267,930
880+00 - EB OSS	Fill 3	ISL = 12 OSL = 12	ISS = 2 OSS = 4	2	S-RT	19.5	8.5	11	N/A	NA	(1.6'-3.0') RE: red, highly plastic, silty CLAY with some sand (3.0'-5.0') RES: red, highly plastic, silty CLAY with some sand Sample Number: S-12 (1.6 - 4.5 feet)	A-7-6	25%	5	Low severity transverse cracking observed on outside shoulder	555,283	1,268,357
880+00 - EB ISL	Fill 3	ISL = 12 OSL = 12	ISS = 2 OSS = 4	23	S-RT	23	12	11	N/A	N/A	(1.9'-3.0') RE: red, moderately plastic, highly sandy, silty CLAY (3.0'-5.0') RES: red, moderately plastic, highly sandy, silty CLAY	A-7-6	M	5	Low severity transverse cracking observed on inside lane	555,304	1,268,368

Notes:
 OSL = Outside Lane CTL = Center Turn Lane OSS = Outside Shoulder DL = Deceleration Lane WB = Westbound
 ISL = Inside Lane LTL = Left Turn Lane ISS = Inside Shoulder HA = Hand Auger EB = Eastbound
 RTL = Right Turn Lane PS = Paved Shoulder ACC = Acceleration Lane N/M = not measured

PAVEMENT INVESTIGATION DATA SHEET

Project: 34497.1.1
TIP: R-2707E

Route: US-74 (-L-)
County: Cleveland

Date: 12/17/18 - 1/8/19
Notes By: Brett Smith, PG

Position (Sta., Lane, Shldr.)	Cut/Fill (Est. of Amount in feet)	Width (ft.)		Offset Distance from White Line (ft.)	Crown "C" or Super "S" (in.)	Gross to Top of Soil	Thickness (in.)				Subgrade				GPS Coordinates		
		Lane(s)	Shoulder				Asphalt	ABC	Stabilized Subgrade Soil	Concrete	Description	AASHTO Classification	Soil Moisture	Probe Depth (ft.)	Asphalt Notes	Northing	Easting
880+00 - EB ISS	Fill 3	ISL = 12 OSL = 12	ISS = 2 OSS = 4	28	S-RT	22.5	11.5	11	N/A	N/A	(1.8'-3.0') RE: red, moderately plastic, highly sandy, silty CLAY (3.0'-5.0') RES: red, moderately plastic, highly sandy, silty CLAY Sample Number: S-47 (2.0 - 4.5 feet)	A-7-6	22%	5	Low severity transverse cracking observed on inside lane	555,308	1,268,369
885+00 - WB OES	Fill 2	ISL = 12 OSL = 12	ISS = 2 OSS = 3	4	S-RT	N/A	N/A	N/A	N/A	N/A	(0.0'-2.0') RE: orange, sandy SILT with some clay (2.0'-5.0') RES: orange, sandy SILT with some clay Sample Number: S-38 (0.0 - 5.0 feet)	A-4	21%	5	Asphalt observed to be in good condition, no signs of distress	555,110	1,268,835
885+00 - WB IES	Fill 2	ISL = 12 OSL = 12	ISS = 2 OSS = 3	27	S-RT	N/A	N/A	N/A	N/A	N/A	(0.0'-2.0') RE: brown, sandy SILT with little clay and mica (2.0'-5.0') RES: brown, sandy SILT with little clay and mica Sample Number: S-72 (0.0 - 5.0 feet)	A-4	23%	5	Asphalt observed to be in good condition, no signs of distress	555,083	1,268,818
890+00 - EB OES	Fill 6	ISL = 12 OSL = 12	ISS = 3 OSS = 3	5	C-1	N/A	N/A	N/A	N/A	N/A	(0.0'-5.0') RE: brown, slightly plastic, sandy CLAY with some silt Sample Number: S-13 (0.0 - 5.0 feet)	A-6	17%	5	Low severity transverse cracking observed on outside shoulder	554,767	1,269,210
890+00 - EB IES	Fill 6	ISL = 12 OSL = 12	ISS = 3 OSS = 3	27	C-1	N/A	N/A	N/A	N/A	N/A	(0.0'-5.0') RE: red, slightly plastic, highly sandy, silty CLAY Sample Number: S-48 (0.0 - 5.0 feet)	A-7-5	36%	5	Asphalt observed to be in good condition, no signs of distress	554,794	1,269,227
895+00 - WB OSS	Fill 1	ISL = 12 OSL = 12	ISS = 2 OSS = 3	1	C-2	18.5	10.5	8	N/A	N/A	(1.5'-5.0') RES: red, sandy SILT with little clay Sample Number: S-37 (1.9 - 4.5 feet)	A-4	12%	5	Low severity longitudinal cracking observed on outside lane	554,570	1,269,677
895+00 - WB ISL	Fill 1	ISL = 12 OSL = 12	ISS = 2 OSS = 3	21	C-2	23	14	9	N/A	N/A	(1.9'-5.0') RES: gray, sandy SILT with some clay Sample Number: S-71 (2.0 - 4.5 feet)	A-4	14%	5	Low severity transverse cracking across both lanes and moderate severity longitudinal cracking in the inside lane with low severity edge cracking also observed on the inside shoulder	554,551	1,269,665
895+00 - WB ISS	Fill 1	ISL = 12 OSL = 12	ISS = 2 OSS = 3	25	C-2	20.75	10.75	10	N/A	N/A	(1.7'-5.0') RES: brown, sandy SILT with some clay Sample Number: S-70 (1.7 - 4.5 feet)	A-4	14%	5	Low severity transverse cracking across both lanes and moderate severity longitudinal cracking in the inside lane with low severity edge cracking also observed on the inside shoulder	554,548	1,269,663
900+00 - EB OES	Fill 2	ISL = 12 CTL = 10 OSL = 12	ISS = 3 OSS = 3	5	S-LT	N/A	N/A	N/A	N/A	N/A	(0.0'-2.0') RE: orange, mod. plastic, highly sandy, silty CLAY (2.0'-5.0') RES: orange, mod. plastic, highly sandy, silty CLAY Sample Number: S-14 (0.0 - 5.0 feet)	A-7-6	24%	5	Low severity transverse cracking observed on outside shoulder	554,228	1,270,057
900+00 - EB IES	Fill 2	ISL = 12 CTL = 10 OSL = 12	ISS = 3 OSS = 3	28	S-LT	N/A	N/A	N/A	N/A	N/A	(0.0'-2.0') RE: red, mod. plastic, highly sandy, silty CLAY (2.0'-5.0') RES: red, mod. plastic, highly sandy, silty CLAY Sample Number: S-49 (0.0 - 5.0 feet)	A-7-5	28%	5	Asphalt observed to be in good condition, no signs of distress	554,256	1,270,075
905+00 - WB OES	Fill 38	ISL = 12 OSL = 12	ISS = 2 OSS = 4	5	S-LT	N/A	N/A	N/A	N/A	N/A	(0.0'-5.0') RE: brown, slightly plastic, sandy CLAY with little silt Sample Number: S-36 (0.0 - 5.0 feet)	A-6	18%	5	Asphalt observed to be in good condition, no signs of distress	554,034	1,270,525
905+00 - WB IES	Fill 38	ISL = 12 OSL = 12	ISS = 2 OSS = 4	30	S-LT	N/A	N/A	N/A	N/A	N/A	(0.0'-5.0') RE: orange, sandy SILT with some clay and mica Sample Number: S-69 (0.0 - 5.0 feet)	A-4	20%	5	Asphalt observed to be in good condition, no signs of distress	554,004	1,270,506
910+00 - EB OSS	Fill 2	ISL = 12 OSL = 12	ISS = 2 OSS = 3	1	S-LT	23	11	12	N/A	N/A	(1.9'-5.0') RES: orange, mod. plastic, sandy CLAY with little silt Sample Number: S-16 (2.1 - 4.5 feet)	A-6	21%	5	Asphalt observed to be in good condition, no signs of distress	553,703	1,270,911
910+00 - EB OSL	Fill 2	ISL = 12 OSL = 12	ISS = 2 OSS = 3	3	S-LT	24.5	12.5	12	N/A	N/A	(2.0'-5.0') RES: orange, mod. plastic, sandy CLAY with little silt	A-6	M	5	Asphalt observed to be in good condition, no signs of distress	553,707	1,270,913
910+00 - EB ISS	Fill 2	ISL = 12 OSL = 12	ISS = 2 OSS = 3	25	S-LT	26	9	17	N/A	N/A	(2.2'-5.0') RES: brown, moderately plastic, sandy CLAY Sample Number: S-50 (2.2 - 4.5 feet)	A-6	16%	5	Low severity longitudinal cracking observed on inside shoulder	553,725	1,270,923
915+00 - WB OES	Fill 3	ISL = 12 OSL = 12	ISS = 3 OSS = 3	5	S-LT	N/A	N/A	N/A	N/A	N/A	(0.0'-3.0') RE: orange, sandy SILT with some clay (3.0'-5.0') RES: orange, sandy SILT with some clay Sample Number: S-35 (0.0 - 5.0 feet)	A-4	16%	5	Asphalt observed to be in good condition, no signs of distress	553,617	1,271,407

Notes:
 OSL = Outside Lane CTL = Center Turn Lane OSS = Outside Shoulder DL = Deceleration Lane WB = Westbound
 ISL = Inside Lane LTL = Left Turn Lane ISS = Inside Shoulder HA = Hand Auger EB = Eastbound
 RTL = Right Turn Lane PS = Paved Shoulder ACC = Acceleration Lane N/M = not measured

PAVEMENT INVESTIGATION DATA SHEET

Project: 34497.1.1
TIP: R-2707E

Route: US-74
County: Cleveland

Date: 12/17/18 - 1/8/19
Notes By: Brett Smith, PG

Position (Sta., Lane, Shldr.)	Cut/Fill (Est. of Amount in feet)	Width (ft.)		Offset Distance from White Line (ft.)	Crown "C" or Super "S" (in.)	Thickness (in.)					Subgrade				GPS Coordinates		
		Lane(s)	Shoulder			Gross to Top of Soil	Asphalt	ABC	Stabilized Subgrade Soil	Concrete	Description	AASHTO Classification	Soil Moisture	Probe Depth (ft.)	Asphalt Notes	Northing	Easting
915+00 - WB IES	Fill 3	ISL = 12 OSL = 12	ISS = 3 OSS = 3	29	S-LT	N/A	N/A	N/A	N/A	N/A	(0.0'-3.0') RE: brown, mod. plastic, sandy CLAY with some mica (3.0'-5.0') RES: brown, mod. plastic, sandy CLAY with some mica Sample Number: S-68 (0.0 - 5.0 feet)	A-6	22%	5	Asphalt observed to be in good condition, no signs of distress	553,583	1,271,401
920+00 - EB OES	Fill 2	ISL = 12 OSL = 12	ISS = 3 OSS = 3	4	S-LT	N/A	N/A	N/A	N/A	N/A	(0.0'-2.0') RE: orange, slightly plastic, sandy CLAY with little silt (2.0'-5.0') RES: orange, slightly plastic, sandy CLAY with little silt Sample Number: S-17 (0.0 - 5.0 feet)	A-6	17%	5	Low severity longitudinal cracking observed on outside shoulder	553,493	1,271,898
920+00 - EB IES	Fill 2	ISL = 12 OSL = 12	ISS = 3 OSS = 3	28	S-LT	N/A	N/A	N/A	N/A	N/A	(0.0'-2.0') RE: red, slightly plastic, sandy CLAY (2.0'-5.0') RES: red, slightly plastic, sandy CLAY Sample Number: S-51 (0.0 - 5.0 feet)	A-6	19%	5	Asphalt observed to be in good condition, no signs of distress	553,524	1,271,897
925+00 - WB OSS	Fill 10	ISL = 12 OSL = 12	ISS = 2 OSS = 3	2	C-2	24	12	12	N/A	N/A	(2.0'-5.0') RE: orange, sandy SILT with some clay	A-4	D	5	Asphalt observed to be in good condition, no signs of distress	553,653	1,272,382
925+00 - WB OSL	Fill 10	ISL = 12 OSL = 12	ISS = 2 OSS = 3	3	C-2	25.5	12.5	13	N/A	N/A	(2.1'-5.0') RE: orange, sandy SILT with some clay Sample Number: S-33 (2.1 - 4.5 feet)	A-4	17%	5	Asphalt observed to be in good condition, no signs of distress	553,649	1,272,383
925+00 - WB ISS	Fill 10	ISL = 12 OSL = 12	ISS = 2 OSS = 3	25	C-2	23.75	11.75	12	N/A	N/A	(2.0'-5.0') RE: brown, sandy SILT with some clay and mica Sample Number: S-67 (2.5 - 4.5 feet)	A-4	18%	5	Moderate severity edge cracking observed on inside shoulder	553,628	1,272,387
930+00 - EB OES	Fill 2	ISL = 12 OSL = 12	ISS = 3 OSS = 3	4	C-1	N/A	N/A	N/A	N/A	N/A	(0.0'-2.0') RE: tan, sandy SILT with little clay (2.0'-5.0') RES: tan, sandy SILT with little clay Sample Number: S-18 (0.0 - 5.0 feet)	A-4	16%	5	Asphalt observed to be in good condition, no signs of distress	553,675	1,272,885
930+00 - EB IES	Fill 2	ISL = 12 OSL = 12	ISS = 3 OSS = 3	27	C-1	N/A	N/A	N/A	N/A	N/A	(0.0'-2.0') RE: brown, sandy SILT with little clay (2.0'-5.0') RES: brown, sandy SILT with little clay	A-4	M	5	Asphalt observed to be in good condition, no signs of distress	553,706	1,272,879
935+00 - WB OES	Fill 2	ISL = 12 CTL = 12 OSL = 12	ISS = 1 OSS = 1	2	S-RT	N/A	N/A	N/A	N/A	N/A	(0.0'-2.0') RE: brown, mod. plastic, highly sandy, silty CLAY (2.0'-5.0') RES: brown, mod. plastic, highly sandy, silty CLAY Sample Number: S-32 (0.0 - 5.0 feet)	A-7-6	19%	5	Low severity transverse and longitudinal cracking observed on outside lane and outside shoulder	553,858	1,273,365
935+00 - WB IES	Fill 2	ISL = 12 CTL = 12 OSL = 12	ISS = 1 OSS = 1	39	S-RT	N/A	N/A	N/A	N/A	N/A	(0.0'-2.0') RE: brown, sandy SILT with some clay and mica (2.0'-5.0') RES: brown, sandy SILT with some clay and mica Sample Number: S-66 (0.0 - 5.0 feet)	A-4	24%	5	Asphalt observed to be in good condition, no signs of distress	553,817	1,273,370
940+00 - EB OSS	Fill 3	ISL = 12 OSL = 12	ISS = 2 OSS = 3	1	S-RT	18.5	2.5	6	N/A	10	(1.5'-3.0') RE: gray, sli. plastic, sandy CLAY with little silt (3.0'-5.0') RES: gray, sli. plastic, sandy CLAY with little silt Sample Number: S-19 (1.5 - 4.5 feet)	A-6	16%	5	Low severity transverse and longitudinal cracking observed in both lanes	553,779	1,273,867
940+00 - EB ISL	Fill 3	ISL = 12 OSL = 12	ISS = 2 OSS = 3	22	S-RT	20	3	8	N/A	9	(1.7'-3.0') RE: gray, sandy SILT with little clay (3.0'-5.0') RES: gray, sandy SILT with little clay Sample Number: S-53 (1.8 - 4.5 feet)	A-4	5%	5	Moderate severity transverse cracking observed in both lanes and inside shoulder	553,801	1,273,868
940+00 - EB ISS	Fill 3	ISL = 12 OSL = 12	ISS = 2 OSS = 3	25	S-RT	19	2	8	N/A	9	(1.6'-3.0') RE: gray, sandy SILT with little clay (3.0'-5.0') RES: gray, sandy SILT with little clay	A-4	D	5	Moderate severity transverse cracking observed in both lanes and inside shoulder	553,805	1,273,868
945+00 - WB OES	Fill 3	ISL = 12 OSL = 12	ISS = 2 OSS = 3	4	C-2	N/A	N/A	N/A	N/A	N/A	(0.0'-3.0') RE: orange, sandy SILT with some clay (3.0'-5.0') RES: orange, sandy SILT with some clay	A-4	D	5	Low severity transverse and longitudinal cracking observed on both lanes and shoulders	553,850	1,274,372
945+00 - WB IES	Fill 3	ISL = 12 OSL = 12	ISS = 2 OSS = 3	30	C-2	N/A	N/A	N/A	N/A	N/A	(0.0'-3.0') RE: red, slightly plastic, sandy CLAY with some mica (3.0'-5.0') RES: red, slightly plastic, sandy CLAY with some mica Sample Number: S-65 (0.0 - 5.0 feet)	A-6	25%	5	Low severity longitudinal cracking observed along centerline	553,816	1,274,369
950+00 - EB OES	Fill 3	ISL = 12 OSL = 12	ISS = 2 OSS = 2	4	S-RT	N/A	N/A	N/A	N/A	N/A	(0.0'-2.5') RE: gray, silty SAND with little clay *Auger refusal at 2.5 feet	A-2-4	D	2.5	Low severity transverse cracking observed on outside shoulder	553,672	1,274,856

Notes:
OSL = Outside Lane CTL = Center Turn Lane OSS = Outside Shoulder DL = Deceleration Lane WB = Westbound
ISL = Inside Lane LTL = Left Turn Lane ISS = Inside Shoulder HA = Hand Auger EB = Eastbound
RTL = Right Turn Lane PS = Paved Shoulder ACC = Acceleration Lane N/M = not measured

PAVEMENT INVESTIGATION DATA SHEET

Project: 34497.1.1
TIP: R-2707E

Route: US-74
County: Cleveland

Date: 12/17/18 - 1/8/19
Notes By: Brett Smith, PG

Position (Sta., Lane, Shldr.)	Cut/Fill (Est. of Amount in feet)	Width (ft.)		Offset Distance from White Line (ft.)	Crown "C" or Super "S" (in.)	Gross to Top of Soil	Thickness (in.)				Subgrade				GPS Coordinates		
		Lane(s)	Shoulder				Asphalt	ABC	Stabilized Subgrade Soil	Concrete	Description	AASHTO Classification	Soil Moisture	Probe Depth (ft.)	Asphalt Notes	Northing	Easting
950+00 - EB IES	Fill 3	ISL = 12 OSL = 12	ISS = 2 OSS = 2	29	S-RT	N/A	N/A	N/A	N/A	N/A	(0.0'-3.0') RE: gray, fine to cse. SAND with little silt and clay (3.0'-5.0') RES: gray, fine to cse. SAND with little silt and clay Sample Number: S-55 (0.0 - 5.0 feet)	A-1-b	8%	5	Moderate severity transverse cracking observed on both lanes and shoulders	553,704	1,274,860
955+00 - WB OSS	Fill 2	ISL = 12 OSL = 12	ISS = 2 OSS = 3	1	S-LT	19	3.5	7	N/A	8.5	(1.6'-2.0') RE: gray, sandy SILT with some clay (2.0'-5.0') RES: gray, sandy SILT with some clay Sample Number: S-30 (1.6 - 4.5 feet)	A-4	13%	5	Low severity longitudinal cracking observed on outside lane	553,738	1,275,366
955+00 - WB ISL	Fill 2	ISL = 12 OSL = 12	ISS = 2 OSS = 3	20	S-LT	19.5	3.5	8	N/A	8	(1.7'-2.0') RE: red, mod. plastic, sandy CLAY with some mica (2.0'-5.0') RES: red, mod. plastic, sandy CLAY with some mica Sample Number: S-63 (2.0 - 4.5 feet)	A-6	21%	5	Low severity transverse cracking observed across outside lane, inside lane, and inside shoulder	553,717	1,275,634
955+00 - WB ISS	Fill 2	ISL = 12 OSL = 12	ISS = 2 OSS = 3	27	S-LT	15	7	8	N/A	N/A	(1.3'-2.0') RE: red, mod. plastic, sandy CLAY with some mica (2.0'-5.0') RES: red, mod. plastic, sandy CLAY with some mica	A-6	M	5	Low severity transverse cracking observed across outside lane, inside lane, and inside shoulder	553,710	1,275,363
960+00 - EB OES	Fill 3	ISL = 12 OSL = 12	ISS = 2 OSS = 2	4	S-RT	N/A	N/A	N/A	N/A	N/A	(0.0'-3.0') RE: gray, clayey, silty SAND (3.0'-5.0') RES: gray, clayey, silty SAND Sample Number: S-21 (0.0 - 5.0 feet)	A-2-5	10%	5	Low severity transverse cracking observed on outside shoulder	553,564	1,275,850
960+00 - EB IES	Fill 3	ISL = 12 OSL = 12	ISS = 2 OSS = 2	28	S-RT	N/A	N/A	N/A	N/A	N/A	(0.0'-3.0') RE: tan, sandy SILT with little clay (3.0'-5.0') RES: tan, sandy SILT with little clay Sample Number: S-56 (0.0 - 5.0 feet)	A-4	20%	5	Low severity transverse cracking observed on both lanes and shoulders	553,596	1,275,854
965+00 - WB OES	Fill 3	ISL = 12 OSL = 12	ISS = 2 OSS = 3	4	S-LT	N/A	N/A	N/A	N/A	N/A	(0.0'-3.0') RE: brown, sandy SILT with little clay (3.0'-5.0') RES: brown, sandy SILT with little clay	A-4	D	5	Asphalt observed to be in good condition, no signs of distress	553,633	1,276,361
965+00 - WB IES	Fill 3	ISL = 12 OSL = 12	ISS = 2 OSS = 3	31	S-LT	N/A	N/A	N/A	N/A	N/A	(0.0'-3.0') RE: brown, sandy SILT with little clay (3.0'-5.0') RES: brown, sandy SILT with little clay Sample Number: S-62 (0.0 - 5.0 feet)	A-4	23%	5	Low severity transverse cracking observed on both lanes and inside shoulder	553,598	1,276,357
970+00 - EB OSS	Fill 3	ISL = 12 OSL = 12	ISS = 2 OSS = 2	1	S-RT	19.5	3.5	8	N/A	8	(1.7'-3.0') RE: tan, sandy SILT with little clay (3.0'-5.0') RES: tan, sandy SILT with little clay Sample Number: S-23 (2.2 - 4.5 feet)	A-4	10%	5	Low severity transverse and longitudinal cracking observed on outside lane and shoulder	553,459	1,276,845
970+00 - EB OSL	Fill 3	ISL = 12 OSL = 12	ISS = 2 OSS = 2	2	S-RT	21	3	10	N/A	8	(1.7'-3.0') RE: tan, sandy SILT with little clay (3.0'-5.0') RES: tan, sandy SILT with little clay	A-4	D	5	Low severity transverse and longitudinal cracking observed on outside lane and shoulder	553,462	1,276,845
970+00 - EB ISS	Fill 3	ISL = 12 OSL = 12	ISS = 2 OSS = 2	26	S-RT	22.5	2	8	N/A	12.5	(1.8'-3.0') RE: orange, sandy SILT with some clay (3.0'-5.0') RES: orange, sandy SILT with some clay Sample Number: S-57 (2.0 - 4.5 feet)	A-4	19%	5	Low severity transverse cracking observed on both lanes and inside shoulder	553,485	1,276,847
975+00 - WB OES	Fill 5	ISL = 12 OSL = 12	ISS = 2 OSS = 2	4	S-LT	N/A	N/A	N/A	N/A	N/A	(0.0'-5.0') RE: red, highly plastic, highly sandy, silty CLAY Sample Number: S-28 (0.0 - 5.0 feet)	A-7-5	24%	5	Moderate severity transverse cracking observed across outside shoulder and outside lane	553,525	1,277,355
975+00 - WB IES	Fill 5	ISL = 12 OSL = 12	ISS = 2 OSS = 2	29	S-LT	N/A	N/A	N/A	N/A	N/A	(0.0'-5.0') RE: red, highly plastic, highly sandy, silty CLAY Sample Number: S-61 (0.0 - 5.0 feet)	A-7-5	19%	5	Low severity transverse cracking observed across inside lane and inside shoulder	553,492	1,277,351
980+00 - EB OES	Fill 2	ISL = 12 OSL = 12	ISS = 2 OSS = 3	4	S-RT	N/A	N/A	N/A	N/A	N/A	(0.0'-2.0') RE: orange, slightly plastic, highly sandy, silty CLAY (2.0'-5.0') RES: orange, slightly plastic, highly sandy, silty CLAY Sample Number: S-24 (0.0 - 5.0 feet)	A-7-5	22%	5	Moderate severity longitudinal and transverse cracking observed on the outside lane and shoulder	553,348	1,277,838
980+00 - EB IES	Fill 2	ISL = 12 OSL = 12	ISS = 2 OSS = 3	29	S-RT	N/A	N/A	N/A	N/A	N/A	(0.0'-2.0') RE: red, sandy SILT with some clay (2.0'-5.0') RES: red, sandy SILT with some clay	A-4	M	5	Moderate severity transverse cracking observed on inside lane and shoulder	553,380	1,277,842
985+00 - WB OSS	Fill 3	ISL = 12 OSL = 12	ISS = 2 OSS = 2	1	S-LT	23	3	12	N/A	8	(1.9'-3.0') RE: orange, slightly plastic, highly sandy, silty CLAY (3.0'-5.0') RES: orange, slightly plastic, highly sandy, silty CLAY Sample Number: S-27 (1.9 - 4.5 feet)	A-7-6	18%	5	Low severity transverse cracking observed on outside lane and outside shoulder	553,413	1,278,349

Notes:
 OSL = Outside Lane CTL = Center Turn Lane OSS = Outside Shoulder DL = Deceleration Lane WB = Westbound
 ISL = Inside Lane LTL = Left Turn Lane ISS = Inside Shoulder HA = Hand Auger EB = Eastbound
 RTL = Right Turn Lane PS = Paved Shoulder ACC = Acceleration Lane N/M = not measured

PAVEMENT INVESTIGATION DATA SHEET

Project: 34497.1.1
TIP: R-2707E

Route: US-74
County: Cleveland

Date: 12/17/18 - 1/8/19
Notes By: Brett Smith, PG

Position (Sta.,Lane,Shldr.)	Cut/Fill (Est. of Amount in feet)	Width (ft.)		Offset Distance from White Line (ft.)	Crown "C" or Super "S" (in.)	Gross to Top of Soil	Thickness (in.)				Subgrade				GPS Coordinates		
		Lane(s)	Shoulder				Asphalt	ABC	Stabilized Subgrade Soil	Concrete	Description	AASHTO Classification	Soil Moisture	Probe Depth (ft.)	Asphalt Notes	Northing	Easting
985+00 - WB OSL	Fill 3	ISL = 12 OSL = 12	ISS = 2 OSS = 2	2	S-LT	23	3	12	N/A	8	(1.9'-3.0') RE: orange, slightly plastic, highly sandy, silty CLAY (3.0'-5.0') RES: orange, slightly plastic, highly sandy, silty CLAY	A-7-6	D	5	Low severity transverse cracking observed on outside lane and outside shoulder	553,410	1,278,348
985+00 - WB ISS	Fill 3	ISL = 12 OSL = 12	ISS = 2 OSS = 2	26	S-LT	23.5	4	12	N/A	7.5	(2.0'-3.0') RE: orange, slightly plastic, highly sandy, silty CLAY (3.0'-5.0') RES: orange, slightly plastic, highly sandy, silty CLAY	A-7-6	M	5	Asphalt observed to be in good condition, no signs of distress	553,387	1,278,346
990+00 - EB OES	Fill 5	ISL = 12 OSL = 12	ISS = 2 OSS = 2	4	S-RT	N/A	N/A	N/A	N/A	N/A	(0.0'-5.0') RE: red, highly sandy, clayey SILT	A-5	D	5	Low severity transverse and longitudinal cracking observed on the outside lane and shoulder	553,238	1,278,833
990+00 - EB IES	Fill 5	ISL = 12 OSL = 12	ISS = 2 OSS = 2	29	S-RT	N/A	N/A	N/A	N/A	N/A	(0.0'-5.0') RE: red, highly sandy, clayey SILT Sample Number: S-59 (0.0 - 5.0 feet)	A-5	25%	5	Moderate severity transverse cracking observed on inside lane and inside shoulder	553,272	1,278,836

Notes:
 OSL = Outside Lane CTL = Center Turn Lane OSS = Outside Shoulder DL = Deceleration Lane WB = Westbound
 ISL = Inside Lane LTL = Left Turn Lane ISS = Inside Shoulder HA = Hand Auger EB = Eastbound
 RTL = Right Turn Lane PS = Paved Shoulder ACC = Acceleration Lane N/M = not measured

**CONE PENETROMETER
DATA CODE SHEET**

PROJECT NUMBER				PROJECT I.D.				ROUTE							
34497.1.1				R-2707E				US-74 (-L-)							
COUNTY				GEOLOGIST				TECHNICIANS							
Cleveland				Brett Smith, PG				Mike & Johnathon Moseley							
Station (location) information				Date run				Station (location) information				Date run			
851+00 - EB OSS				12/17/2018				851+00 - EB OSL				12/17/2018			
Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting
ABC	Fill - 9'	557,044	1,266,158	ABC	Fill - 9'	557,045	1,266,159								
Cumulative Penetration in Centimeters								Cumulative Penetration in Centimeters							
1.5	43.1	86.3		0.9	22.5	68.7	96.8								
2.3	43.7	87.2		1.3	23.7	70.4	96.9								
2.9	44.3	88.0		1.7	25.7	71.2	97.1								
3.3	44.6	88.8		2.0	27.2	71.9	97.3								
3.7	45.2	89.7		2.3	28.2	72.6	97.4								
4.1	45.7	90.2		2.8	28.8	73.2									
4.6	46.4	91.5		3.6	29.0	73.6									
4.9	47.0	92.3		3.8	29.3	74.7									
5.3	47.5	93.0		4.3	29.5	75.5									
5.7	48.0	93.5		4.7	29.7	76.3									
6.0	48.8	93.9		5.0	29.8	77.1									
6.3	49.1	94.2		5.3	29.9	77.9									
6.6	49.2			5.6	30.2	78.8									
7.1	50.5			6.0	30.3	79.7									
7.5	51.2			6.1	30.4	80.6									
7.9	52.4			6.6	30.8	81.3									
8.3	53.1			6.9	31.0	82.2									
8.7	54.3			7.2	31.3	83.0									
9.1	55.4			7.4	31.6	83.9									
9.5	56.4			7.8	32.3	84.7									
9.9	57.7			8.1	32.6	85.5									
10.4	59.1			8.4	32.9	86.3									
10.8	61.4			8.7	33.6	87.2									
11.4	63.6			9.1	34.3	88.0									
11.9	64.8			9.4	34.9	89.7									
12.5	65.7			9.7	35.6	89.8									
13.1	66.4			9.9	36.6	90.6									
13.6	67.2			10.2	37.3	91.3									
14.2	68.7			10.5	38.2	94.8									
14.7	69.3			10.7	39.2	92.6									
15.3	70.0			11.0	40.0	92.7									
16.0	70.8			11.4	40.9	92.9									
16.6	71.6			11.9	42.0	93.2									
17.4	72.5			12.3	43.1	93.5									
18.0	73.5			12.6	44.3	93.7									
18.8	74.5			12.8	45.8	93.9									
19.5	75.4			13.3	47.2	94.1									
20.5	76.0			13.6	48.9	94.4									
21.3	76.5			14.0	50.7	94.5									
22.1	77.1			14.2	52.3	94.7									
23.0	77.5			14.6	53.9	94.9									
23.8	78.0			14.9	55.2	95.1									
24.6	78.4			15.4	56.3	95.3									
25.4	78.8			15.9	57.2	95.5									
27.2	79.4			16.2	58.3	95.7									
30.3	80.0			16.3	59.3	95.8									
33.5	81.0			17.5	60.8	96.0									
36.4	81.6			17.9	62.0	96.1									
37.9	82.1			18.4	63.0	96.2									
39.0	82.7			19.0	64.2	96.3									
40.9	83.4			19.5	65.4	96.4									
41.8	84.2			20.4	66.6	96.5									
42.5	85.3			21.5	67.9	96.6									

**CONE PENETROMETER
DATA CODE SHEET**

PROJECT NUMBER				PROJECT I.D.				ROUTE							
34497.1.1				R-2707E				US-74 (-L-)							
COUNTY				GEOLOGIST				TECHNICIANS							
Cleveland				Brett Smith, PG				Mike & Johnathon Moseley							
Station (location) information				Date run				Station (location) information				Date run			
851+00 - EB ISL				12/19/2019				855+00 - WB OES				12/19/2019			
Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting
ABC	Fill - 9'	557,054	1,266,179	SG	Fill - 3'	556,722	1,266,398								
Cumulative Penetration in Centimeters								Cumulative Penetration in Centimeters							
1.5	41.7	94.0		5.8											
2.3	42.5			7.9											
2.9	43.4			12.1											
3.5	44.1			15.0											
4.0	45.0			17.8											
4.7	45.9			21.1											
5.4	46.3			24.9											
6.0	47.0			27.6											
6.7	47.6			30.3											
7.3	48.1			32.5											
7.9	48.8			34.1											
8.5	49.5			35.3											
9.0	50.0			36.6											
9.5	50.5			37.4											
10.1	51.0			38.2											
10.6	51.4			39.0											
11.2	51.7			39.9											
12.0	52.0			41.2											
12.7	52.4			42.4											
13.5	52.7			43.6											
14.3	53.1			45.0											
15.3	53.7			46.4											
16.4	54.0			47.9											
17.3	54.4			49.5											
18.4	55.0			51.2											
19.2	55.6			53.1											
19.9	56.3			55.1											
20.6	57.1			57.1											
21.6	57.9			59.2											
23.0	58.7			61.3											
24.5	59.2			63.4											
25.9	60.0			66.0											
27.0	61.0			68.2											
27.9	61.9			70.4											
28.5	62.7			72.4											
29.3	63.9			74.4											
30.1	65.6			76.4											
31.1	66.8			79.1											
31.8	67.7			82.6											
32.3	68.9			85.7											
33.1	69.6			88.0											
33.6	71.6														
34.2	73.1														
34.8	74.6														
35.4	76.1														
36.0	77.6														
36.5	79.5														
37.1	81.9														
37.8	84.5														
38.4	87.4														
39.1	91.1														
39.9	93.0														
40.7	93.8														

**CONE PENETROMETER
DATA CODE SHEET**

PROJECT NUMBER				PROJECT I.D.				ROUTE							
34497.1.1				R-2707E				US-74 (-L-)							
COUNTY				GEOLOGIST				TECHNICIANS							
Cleveland				Brett Smith, PG				Mike & Johnathon Moseley							
Station (location) information				Date run				Station (location) information				Date run			
865+00 - WB OSL				12/19/2018				865+00 - WB ISS				1/8/2019			
Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting
ABC	Fill - 5'	555,996	1,267,042	ABC	Fill - 5'	555,972	1,267,027								
Cumulative Penetration in Centimeters								Cumulative Penetration in Centimeters							
1.2	28.5			5.4											
1.7	29.3			12.1											
2.1	30.0			16.3											
2.5	30.8			19.4											
2.8	31.7			22.0											
3.2	32.8			24.6											
3.6	34.0			27.1											
3.8	35.2			29.4											
4.2	36.6			31.5											
4.5	38.1			33.4											
4.9	39.8			35.3											
5.1	41.8			37.5											
5.5	43.8			40.0											
5.8	45.7			42.8											
6.2	47.2			46.0											
6.7	49.3			49.5											
7.1	51.1			53.3											
7.7	52.5			56.9											
7.9	53.8			60.3											
8.4	55.2			63.0											
8.8	56.4			66.2											
9.4	57.8			69.3											
9.7	59.1			72.3											
10.5	60.3			75.2											
11.1	61.2			78.5											
11.6	62.9			80.9											
12.0	64.2			83.4											
12.5	65.7			86.4											
12.8	67.7			89.3											
13.4	70.6			91.7											
13.7	73.1			93.6											
14.1	75.4			95.1											
14.6	77.7														
15.2	79.9														
15.8	81.5														
16.4	83.9														
17.0	85.8														
17.7	86.4														
18.2	87.3														
18.6	88.0														
19.1	88.9														
19.6															
20.1															
20.9															
21.9															
22.9															
23.8															
24.7															
25.4															
26.1															
26.7															
27.4															
27.9															

>50/4" DCP Refusal in ABC Stone at 6.6 cm
 Auger was advanced to 13.8 cm
 Resume DCP at 13.8 cm with cumulative penetration count reset to 0.0 cm.

**CONE PENETROMETER
DATA CODE SHEET**

PROJECT NUMBER				PROJECT I.D.				ROUTE							
34497.1.1				R-2707E				US-74 (-L-)							
COUNTY				GEOLOGIST				TECHNICIANS							
Cleveland				Brett Smith, PG				Mike & Johnathon Moseley							
Station (location) information				Date run				Station (location) information				Date run			
870+00 - EB OES				12/17/2018				870+00 - EB IES				12/19/2018			
Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting
SG	Fill - 3'	555,696	1,267,450	SG	Fill - 3'	555,728	1,267,465								
Cumulative Penetration in Centimeters								Cumulative Penetration in Centimeters							
2.4	65.0			6.7											
4.5	65.7			11.7											
6.4	66.5			14.9											
8.7	67.3			19.3											
10.8	68.0			23.6											
12.4	68.8			27.7											
13.7	69.6			30.5											
14.7	70.2			33.3											
15.7	71.2			35.6											
16.7	72.3			38.1											
17.7	73.1			38.6											
19.0	74.1			39.3											
20.6	75.0			39.6											
22.6	75.9			40.2											
24.5	76.8			40.9											
26.3	77.5			41.7											
28.1	78.4			42.4											
30.0	79.2			43.2											
32.0	80.0			44.1											
33.8	80.9			45.6											
35.3	82.1			47.1											
36.8	83.2			48.6											
37.8	84.4			50.1											
38.9	85.8			51.6											
39.9				53.7											
41.0				55.0											
41.9				56.3											
42.9				57.4											
43.8				58.3											
44.9				59.1											
46.0				59.9											
47.1				60.1											
48.2				61.8											
49.3				62.9											
50.1				63.9											
51.0				64.9											
51.8				65.9											
52.6				66.9											
53.3				67.9											
54.1				68.8											
55.0				69.8											
55.7															
56.5															
57.4															
58.2															
59.0															
59.9															
60.5															
61.3															
62.0															
62.9															
63.5															
64.3															

**CONE PENETROMETER
DATA CODE SHEET**

PROJECT NUMBER				PROJECT I.D.				ROUTE							
34497.1.1				R-2707E				US-74 (-L-)							
COUNTY				GEOLOGIST				TECHNICIANS							
Cleveland				Brett Smith, PG				Mike & Johnathon Moseley							
Station (location) information				Date run				Station (location) information				Date run			
900+00 - EB OES				12/17/2018				900+00 - EB IES				12/18/2018			
Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting
sg	Fill - 2'	554,228	1,270,057	sg	Fill - 2'	554,256	1,270,075								
Cumulative Penetration in Centimeters								Cumulative Penetration in Centimeters							
7.1				8.2											
11.1				12.3											
16.7				17.4											
18.4				22.3											
21.2				25.9											
22.1				29.7											
23.2				33.4											
24.4				37.0											
25.7				39.9											
26.8				42.5											
28.1				45.1											
30.0				47.6											
32.4				50.8											
34.3				53.2											
36.2				55.9											
37.7				58.9											
39.1				61.2											
40.4				64.1											
42.0				67.4											
43.3				70.7											
44.8				73.0											
46.5				75.3											
48.4				77.1											
50.6				78.7											
52.9				81.0											
54.6				83.3											
56.6				85.2											
58.8				87.4											
61.5				89.4											
64.2				91.2											
67.0															
69.4															
71.9															
74.3															
77.0															
80.1															
83.7															
87.4															

**CONE PENETROMETER
DATA CODE SHEET**

PROJECT NUMBER				PROJECT I.D.				ROUTE							
34497.1.1				R-2707E				US-74 (-L-)							
COUNTY				GEOLOGIST				TECHNICIANS							
Cleveland				Brett Smith, PG				Mike & Johnathon Moseley							
Station (location) information				Date run				Station (location) information				Date run			
905+00 - WB OES				12/19/2018				905+00 - WB IES				1/7/2019			
Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting
sg	Fill - 38'	554,034	1,270,525	sg	Fill - 38'	554,004	1,270,506								
Cumulative Penetration in Centimeters								Cumulative Penetration in Centimeters							
4.9				8.0											
7.1				16.5											
8.8				26.0											
10.7				31.4											
13.1				36.7											
15.4				40.7											
17.0				44.5											
18.6				47.2											
20.0				49.6											
21.4				51.8											
22.9				53.5											
24.3				55.3											
25.6				57.4											
26.8				59.8											
28.1				61.9											
29.8				63.6											
32.2				65.6											
34.9				67.5											
37.1				69.6											
38.8				71.7											
40.9				73.7											
43.2				75.3											
45.3				76.7											
47.7				78.2											
50.1															
52.2															
54.3															
56.2															
58.6															
60.8															
62.4															
63.9															
66.0															
68.1															
69.7															
71.5															
73.0															
74.7															
76.5															
78.1															
79.5															
80.6															
81.6															
83.1															
84.4															
85.8															
87.3															
88.6															
90.2															

**CONE PENETROMETER
DATA CODE SHEET**

PROJECT NUMBER				PROJECT I.D.				ROUTE							
34497.1.1				R-2707E				US-74 (-L-)							
COUNTY				GEOLOGIST				TECHNICIANS							
Cleveland				Brett Smith, PG				Mike & Johnathon Moseley							
Station (location) information				Date run				Station (location) information				Date run			
910+00 - EB OSS				12/17/2018				910+00 - EB OSL				12/17/2018			
Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting
ABC	Fill - 2'	553,703	1,270,911	ABC	Fill - 2'	553,707	1,270,913								
Cumulative Penetration in Centimeters								Cumulative Penetration in Centimeters							
1.1	33.5	78.5		0.9	21.6	87.0									
1.9	35.2	78.7		1.3	22.3	88.0									
2.5	37.5	78.9		1.8	22.9	88.8									
3.1	39.9	79.0		2.2	23.4	89.7									
3.6	43.6	79.2		2.6	24.2	90.7									
4.0	45.8	79.4		2.9	25.1	91.5									
4.5	47.9	79.5		3.4	26.1	92.2									
5.0	48.4	80.4		3.7	27.0	92.8									
5.5	48.6	81.0		4.1	28.0	93.2									
5.9	48.9	81.2		4.5	29.1	93.5									
6.2	49.1	81.8		4.8	30.1	93.8									
6.7	49.3	82.1		5.1	31.1	94.0									
7.0	49.4	82.4		5.4	32.4	94.2									
7.4	49.6	82.8		5.7	33.7	94.3									
7.7	50.0	83.2		6.1	35.4	94.4									
8.2	50.1	83.7		6.4	37.2										
8.7	50.3	84.2		6.7	39.2										
9.1	50.4	84.8		7.0	41.4										
9.5	50.6	85.2		7.4	43.6										
10.0	50.9	85.8		7.7	45.7										
10.4	51.0	86.4		7.9	47.8										
10.8	51.3	87.2		8.2	49.8										
11.3	51.5	88.0		8.6	51.6										
11.7	51.7	88.8		8.9	53.4										
12.1	52.0	89.4		9.2	54.8										
12.6	52.4	90.0		9.6	56.4										
13.1	53.0			10.0	57.9										
13.6	53.7			10.2	59.5										
14.1	54.3			10.6	61.0										
14.4	55.2			11.0	62.5										
14.8	56.2			11.4	63.9										
15.3	57.2			11.6	65.3										
15.8	58.1			12.3	66.7										
16.3	59.1			12.6	68.0										
17.3	60.1			13.0	69.2										
17.8	60.9			13.4	70.3										
18.4	61.5			13.8	71.5										
19.0	62.4			14.0	72.5										
19.6	63.4			14.5	73.8										
20.2	64.6			14.9	74.7										
20.7	65.8			15.3	75.6										
21.3	66.9			15.7	76.6										
21.9	67.9			16.2	77.5										
22.6	68.6			16.5	78.7										
23.2	70.5			16.9	79.6										
24.7	71.4			17.4	80.6										
25.5	72.4			17.7	81.6										
26.3	73.6			18.2	82.5										
27.3	74.7			18.7	83.4										
28.3	75.7			19.3	84.0										
29.6	76.7			19.9	84.8										
30.9	77.7			20.4	85.4										
32.1	78.2			21.1	86.3										

**CONE PENETROMETER
DATA CODE SHEET**

PROJECT NUMBER				PROJECT I.D.				ROUTE							
34497.1.1				R-2707E				US-74 (-L-)							
COUNTY				GEOLOGIST				TECHNICIANS							
Cleveland				Brett Smith, PG				Mike & Johnathon Moseley							
Station (location) information				Date run				Station (location) information				Date run			
910+00 - EB ISS				12/19/2018				915+00 - WB OES				12/19/2018			
Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting
ABC	Fill - 2'	553,725	1,270,923	SG	Fill - 3'	553,617	1,271,407								
Cumulative Penetration in Centimeters								Cumulative Penetration in Centimeters							
2.9	49.6			5.2											
5.2	50.5			9.3											
6.9	51.6			12.1											
8.4	52.5			14.6											
10.2	53.5			16.8											
12.8	54.5			19.9											
15.6	55.4			22.8											
18.0	56.2			26.5											
22.2	57.1			31.7											
24.1	58.0			36.7											
25.7	59.0			40.9											
26.6	59.9			45.7											
27.2	60.8			49.9											
27.9	61.6			51.7											
28.6	62.6			53.0											
29.0	63.7			54.6											
29.6	64.7			56.2											
30.0	65.6			57.9											
30.4	66.5			59.9											
30.9	67.3			62.1											
31.2	68.2			64.1											
31.7	69.3			65.8											
32.2	70.8			67.5											
32.8	71.7			69.2											
33.1	72.8			70.9											
33.6	73.6			72.7											
34.1	74.8			74.9											
34.5	75.4			77.2											
35.0	76.3			79.4											
35.6	77.3			81.6											
36.1	78.2			83.9											
36.4	79.3			85.8											
36.9	80.0			87.6											
37.7	80.8			89.5											
38.1	81.7														
38.8	82.5														
39.1	83.2														
39.7	84.0														
40.0	84.8														
40.3	85.4														
40.7	86.0														
41.2	86.6														
41.6	87.5														
42.0	88.0														
42.3	88.7														
42.8	89.3														
43.1	89.7														
43.6	90.3														
44.1	90.9														
44.7															
45.5															
47.0															
48.2															

**CONE PENETROMETER
DATA CODE SHEET**

PROJECT NUMBER				PROJECT I.D.				ROUTE							
34497.1.1				R-2707E				US-74 (-L-)							
COUNTY				GEOLOGIST				TECHNICIANS							
Cleveland				Brett Smith, PG				Mike & Johnathon Moseley							
Station (location) information				Date run				Station (location) information				Date run			
925+00 - WB OSL				12/19/2018				925+00 - WB ISS				1/7/2019			
Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting
ABC	Fill - 10'	553,649	1,272,383	ABC	Fill - 10'	553,628	1,272,387								
Cumulative Penetration in Centimeters								Cumulative Penetration in Centimeters							
2.2	27.6	81.2		3.0	77.7										
3.1	28.2	82.7		4.9	79.1										
3.9	28.8	84.4		6.7	80.6										
4.7	29.3	86.1		8.4	82.5										
5.2	30.0	87.9		10.6	84.4										
5.6	30.6	90.0		12.7	86.0										
6.1	31.2	91.9		15.0	87.6										
6.5	31.9	93.7		17.5	89.1										
7.0	32.6			19.2	90.8										
7.4	33.3			20.6	92.0										
7.9	34.0			22.1	93.1										
8.5	34.8			23.5	93.9										
9.0	35.7			24.7	94.8										
9.4	36.8			26.0											
9.8	38.0			27.2											
10.0	39.4			28.3											
10.3	40.3			29.5											
10.6	41.0			30.7											
10.9	41.5			31.9											
11.3	42.0			32.8											
11.5	42.4			33.7											
11.9	42.9			34.5											
12.1	43.4			35.1											
12.4	43.9			35.7											
12.8	44.4			36.9											
13.2	45.2			38.7											
13.5	46.0			40.2											
13.9	46.9			41.8											
14.3	47.9			43.4											
14.5	48.7			45.1											
14.8	49.6			46.4											
15.1	50.3			47.9											
15.5	51.0			49.4											
16.0	51.4			50.5											
16.5	52.1			51.2											
16.9	52.9			52.0											
17.5	53.9			52.9											
18.0	55.0			54.0											
18.7	56.3			55.5											
19.1	57.9			57.0											
19.5	59.6			58.2											
20.1	61.0			59.3											
20.6	62.6			60.4											
21.3	64.0			61.2											
21.7	65.3			61.9											
22.4	66.7			63.2											
23.0	68.4			64.8											
23.7	70.4			66.8											
24.4	72.4			68.9											
25.0	74.4			70.9											
25.7	76.1			72.8											
26.3	77.7			74.6											
26.9	79.7			76.2											

**CONE PENETROMETER
DATA CODE SHEET**

PROJECT NUMBER				PROJECT I.D.				ROUTE							
34497.1.1				R-2707E				US-74 (-L-)							
COUNTY				GEOLOGIST				TECHNICIANS							
Cleveland				Brett Smith, PG				Mike & Johnathon Moseley							
Station (location) information				Date run				Station (location) information				Date run			
930+00 - EB OES				12/18/2018				930+00 - EB IES				12/19/2018			
Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting
SG	Fill - 2'	553,675	1,272,885	SG	Fill - 2'	553,706	1,272,879								
Cumulative Penetration in Centimeters								Cumulative Penetration in Centimeters							
5.8	58.0			9.0											
9.0	59.0			15.3											
14.1	60.0			20.5											
18.5	61.0			25.6											
22.2	62.1			27.6											
24.4	63.3			29.8											
25.7	64.4			31.3											
26.9	65.6			33.0											
28.0	66.7			35.0											
29.2	67.9			37.3											
30.5	68.9			40.5											
31.6	70.1			43.5											
32.5	71.2			47.0											
33.2	72.1			50.7											
34.0	73.2			54.3											
34.6	74.1			57.6											
35.3	75.0			59.9											
35.8	76.1			61.9											
36.3	77.2			64.0											
37.0	78.2			66.1											
37.8	79.0			68.1											
38.5	80.4			70.3											
39.0	81.1			72.7											
40.0	82.3			75.1											
41.8	83.4			77.5											
42.6	84.6			79.8											
43.3	85.8			82.3											
43.9	87.1			84.9											
44.5				87.4											
45.1															
46.0															
46.6															
47.2															
47.8															
48.4															
48.8															
49.4															
49.9															
50.4															
50.8															
51.2															
51.6															
52.0															
52.4															
52.8															
53.2															
53.5															
53.9															
54.4															
54.8															
55.4															
56.2															
57.1															

**CONE PENETROMETER
DATA CODE SHEET**

PROJECT NUMBER				PROJECT I.D.				ROUTE							
34497.1.1				R-2707E				US-74 (-L-)							
COUNTY				GEOLOGIST				TECHNICIANS							
Cleveland				Brett Smith, PG				Mike & Johnathon Moseley							
Station (location) information				Date run				Station (location) information				Date run			
935+00 - WB OES				12/17/2018				935+00 - WB IES				1/7/2019			
Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting
sg	Fill - 2'	553,585	1,273,365	sg	Fill - 2'	553,817	1,273,370								
Cumulative Penetration in Centimeters								Cumulative Penetration in Centimeters							
5.0				6.5											
7.9				10.7											
11.6				13.3											
15.0				16.1											
18.0				17.7											
20.9				19.1											
23.4				19.8											
25.6				20.3											
27.7				21.1											
30.0				21.9											
32.6				22.5											
35.0				23.3											
36.7				24.0											
37.7				24.9											
38.6				25.7											
39.5				26.6											
40.7				27.4											
41.9				28.4											
43.7				29.3											
46.3				30.2											
49.3				31.1											
52.9				32.2											
58.7				33.2											
64.0				34.3											
68.9				36.1											
72.9				37.2											
76.9				39.0											
79.2				41.8											
81.4				44.0											
87.4				45.9											
91.2				47.3											
				48.1											
				49.2											
				51.1											
				52.2											
				53.7											
				56.2											
				58.1											
				59.9											
				61.5											
				62.8											
				64.3											
				66.1											
				68.2											
				70.6											
				73.1											
				75.3											
				77.6											
				79.8											
				81.9											
				84.0											
				85.8											
				87.8											

**CONE PENETROMETER
DATA CODE SHEET**

PROJECT NUMBER				PROJECT I.D.				ROUTE							
34497.1.1				R-2707E				US-74 (-L-)							
COUNTY				GEOLOGIST				TECHNICIANS							
Cleveland				Brett Smith, PG				Mike & Johnathon Moseley							
Station (location) information				Date run				Station (location) information				Date run			
940+00 - EB OSS				12/18/2018				940+00 - EB ISL				12/19/2018			
Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting
ABC	Fill - 3'	553,779	1,273,867	ABC	Fill - 3'	553,801	1,273,868								
Cumulative Penetration in Centimeters								Cumulative Penetration in Centimeters							
4.0	50.6			2.1											
7.8	50.7			3.2											
11.7	51.0			4.3											
15.6	51.4			5.4											
17.7	51.5			6.3											
19.3	51.7			7.5											
20.5	51.9			8.7											
21.5	52.0			9.7											
22.4	52.2			10.5											
23.3	52.3			11.4											
24.0	52.4			12.8											
24.8	52.6			14.0											
25.5	52.7			15.2											
26.3	52.8			16.5											
27.0	52.9			17.8											
27.9	53.0			19.1											
28.7	53.3			20.3											
29.5	53.4			21.1											
30.5	53.6			22.0											
31.5	53.7			22.9											
32.4	53.9			23.6											
33.3	54.2			24.1											
34.2	54.4			24.9											
35.0	54.6			25.1											
36.1				25.7											
37.4				25.9											
38.9				26.2											
40.3				26.5											
41.6				26.7											
43.0				27.0											
44.7				27.3											
45.9				27.6											
46.8				27.8											
47.0				27.9											
47.3				28.1											
47.5				28.3											
47.7				28.8											
47.9															
48.1															
48.2															
48.3															
48.4															
48.6															
48.7															
48.9															
49.1															
49.3															
49.4															
49.6															
49.9															
50.1															
50.2															
50.4															

>50/4" DCP Refusal in ABC Stone at 7.5 cm

>50/4" DCP Refusal in subgrade at 28.8 cm

Auger was advanced to 15.0 cm

Resume DCP at 15.0 cm with cumulative penetration count reset to 0.0 cm.

>50/4" DCP Refusal in subgrade at 54.6 cm

**CONE PENETROMETER
DATA CODE SHEET**

PROJECT NUMBER				PROJECT I.D.				ROUTE							
34497.1.1				R-2707E				US-74 (-L-)							
COUNTY				GEOLOGIST				TECHNICIANS							
Cleveland				Brett Smith, PG				Mike & Johnathon Moseley							
Station (location) information				Date run				Station (location) information				Date run			
960+00 - EB OES				12/18/2018				960+00 - EB IES				12/20/2019			
Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting
sg	Fill - 3'	553,564	1,275,850	sg	Fill - 3'	553,596	1,275,854								
Cumulative Penetration in Centimeters								Cumulative Penetration in Centimeters							
1.7	88.4			8.8											
2.7	89.7			13.0											
3.8				17.1											
4.9				21.3											
5.9				25.6											
6.9				28.4											
8.3				30.8											
9.5				35.1											
11.0				39.0											
12.2				42.0											
13.1				45.7											
13.9				49.6											
14.8				53.6											
16.1				57.0											
17.4				60.0											
18.6				63.3											
20.3				66.9											
22.3				69.8											
24.6				72.0											
27.0				74.1											
29.3				76.0											
31.4				78.2											
33.1				80.8											
34.9				83.4											
36.8				85.8											
38.9				88.5											
40.9				90.7											
42.9															
45.1															
47.3															
49.3															
51.1															
53.7															
56.1															
58.3															
60.4															
62.7															
64.9															
67.3															
69.5															
71.8															
73.4															
74.4															
75.7															
75.9															
76.6															
77.1															
77.9															
79.2															
81.1															
83.2															
85.2															
87.0															

**CONE PENETROMETER
DATA CODE SHEET**

PROJECT NUMBER				PROJECT I.D.				ROUTE							
34497.1.1				R-2707E				US-74 (-L-)							
COUNTY				GEOLOGIST				TECHNICIANS							
Cleveland				Brett Smith, PG				Mike & Johnathon Moseley							
Station (location) information				Date run				Station (location) information				Date run			
965+00 - WB OES				12/18/2018				965+00 - WB IES				1/7/2019			
Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting
sg	Fill - 3'	553,633	1,276,361	sg	Fill - 3'	553,598	1,276,357								
Cumulative Penetration in Centimeters								Cumulative Penetration in Centimeters							
5.0				4.8											
8.5				8.7											
11.8				12.6											
14.6				16.3											
17.2				20.0											
19.5				24.5											
22.0				29.0											
24.7				33.9											
26.3				39.6											
27.1				45.3											
27.9				51.1											
28.8				56.8											
30.1				61.7											
31.7				65.7											
34.4				69.4											
36.0				73.0											
37.2				76.4											
38.8				79.5											
41.1				82.0											
43.6				84.7											
46.2															
48.8															
51.6															
54.6															
57.5															
60.2															
63.1															
65.6															
68.4															
70.7															
72.9															
75.1															
77.5															
79.9															
82.3															
84.2															
86.1															

**CONE PENETROMETER
DATA CODE SHEET**

PROJECT NUMBER				PROJECT I.D.				ROUTE							
34497.1.1				R-2707E				US-74 (-L-)							
COUNTY				GEOLOGIST				TECHNICIANS							
Cleveland				Brett Smith, PG				Mike & Johnathon Moseley							
Station (location) information				Date run				Station (location) information				Date run			
985+00 - WB OSL				12/18/2018				985+00 - WB ISS				1/7/2019			
Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting
ABC	Fill - 3'	553,410	1,278,348	ABC	Fill - 3'	553,387	1,278,346								
Cumulative Penetration in Centimeters								Cumulative Penetration in Centimeters							
1.0	73.9			2.5	51.0										
1.8	75.7			5.3	51.7										
2.6	77.3			7.5	52.4										
3.4	79.2			9.3	53.1										
4.3	81.0			11.0	53.9										
5.2	82.3			12.6	54.7										
6.8	84.0			14.2	55.6										
7.7	85.5			15.6	56.4										
8.5	86.7			17.0	57.0										
9.5	87.9			18.3	57.8										
10.4	89.0			19.6	58.6										
11.4	89.8			20.8	59.5										
12.4	90.4			21.8	60.2										
13.4	90.9			22.8	61.0										
14.5	91.4			23.8	61.8										
15.5				24.9	62.7										
16.7				25.9	63.7										
17.8				26.9	64.7										
19.0				28.0	66.1										
20.3				28.8	67.5										
21.6				29.8	68.9										
22.8				30.7	70.3										
24.2				31.5	71.6										
25.6				32.1	73.1										
26.9				32.7	74.7										
28.2				33.3	76.1										
29.2				33.7	77.3										
31.3				34.3	78.3										
32.9				34.7	79.3										
34.4				35.3	80.4										
35.7				35.8	81.3										
37.0				36.3	82.3										
38.4				36.8	83.3										
39.8				37.5	84.4										
41.4				38.0	85.4										
43.0				38.7	86.5										
44.3				39.4	87.6										
45.5				40.0	88.6										
46.8				40.6	89.7										
48.1				41.3	90.6										
49.4				41.9	91.6										
51.1				42.8	92.3										
52.4				43.5	92.9										
53.9				44.4	93.5										
55.8				45.3											
57.9				46.1											
59.8				46.8											
61.8				47.4											
63.6				48.0											
65.9				48.5											
68.0				49.2											
70.1				49.8											
72.0				50.4											

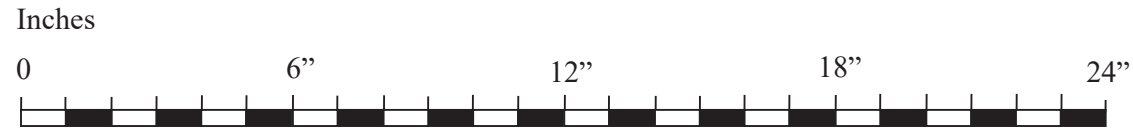
**CONE PENETROMETER
DATA CODE SHEET**

PROJECT NUMBER				PROJECT I.D.				ROUTE							
34497.1.1				R-2707E				US-74 (-L-)							
COUNTY				GEOLOGIST				TECHNICIANS							
Cleveland				Brett Smith, PG				Mike & Johnathon Moseley							
Station (location) information				Date run				Station (location) information				Date run			
990+00 - EB OES				12/18/2018				990+00 - EB IES				12/20/2019			
Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting	Datum	cut or fill	Northing	Easting
SG	Fill - 5'	553,238	1,278,833	SG	Fill - 5'	553,272	1,278,836								
Cumulative Penetration in Centimeters								Cumulative Penetration in Centimeters							
4.6				6.8											
8.1				11.6											
11.7				15.6											
14.8				19.5											
17.6				24.7											
20.0				29.9											
21.8				34.3											
24.5				38.7											
25.8				40.7											
25.9				42.3											
26.2				44.6											
26.4				46.6											
26.5				49.3											
26.7				51.8											
26.8				51.9											
26.9				53.9											
27.0				54.1											
27.2				56.8											
27.3				59.3											
27.5				61.4											
27.7				63.3											
27.9				63.4											
28.1				63.5											
28.2				65.4											
28.4				67.1											
				68.7											
				70.1											
				71.4											
				72.7											
				73.9											
				75.4											
				77.0											
				78.4											
				79.9											
				81.4											
				82.4											
				84.3											

>50/4" DCP Refusal in subgrade at 28.4 cm

North Carolina Department of Transportation
Geotechnical Unit
Asphalt Core Photo

Project No: 34497.1.1	I.D. No.: R-2707E	County: Cleveland	Dates: 12/19/18
Site Description: US 74 (Shelby Bypass) from Existing US 74 West of SR 2238 to West of SR 1001			
Driller: Mike Moseley	Core Size: 4 - inch	Drill Machine: CME - 450	
Geologist / Engineer: Brett Smith, PG			

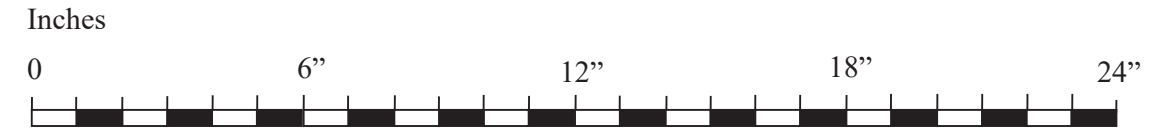


Notes:
EB = Eastbound
WB = Westbound
ISS = Inside Shoulder
ISL = Inside Lane
OSL = Outside Lane



North Carolina Department of Transportation
Geotechnical Unit
Asphalt Core Photo

Project No: 34497.1.1	I.D. No.: R-2707E	County: Cleveland	Dates: 12/17/18
Site Description: US 74 (Shelby Bypass) from Existing US 74 West of SR 2238 to West of SR 1001			
Driller: Mike Moseley	Core Size: 4 - inch	Drill Machine: CME - 450	
Geologist / Engineer: Brett Smith, PG			

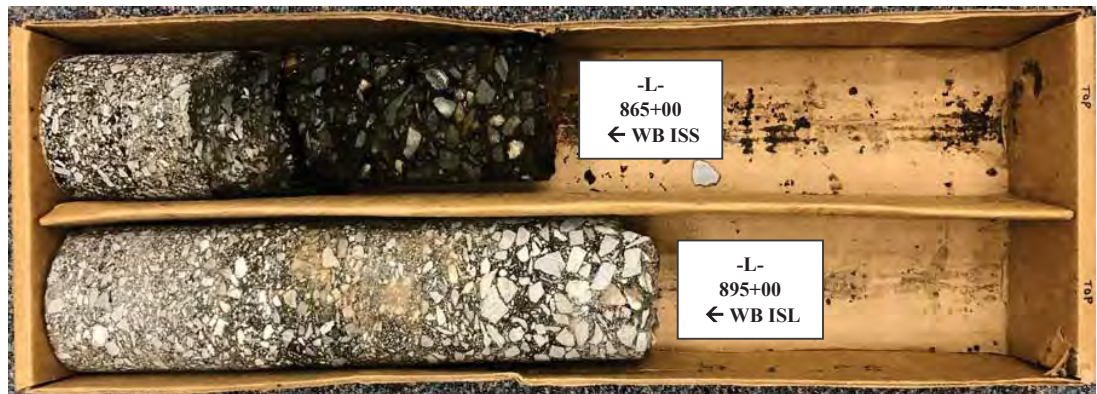
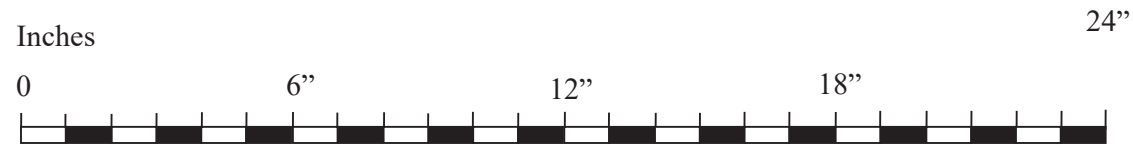


Notes:
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OSS = Outside Shoulder
OSL = Outside Lane



North Carolina Department of Transportation
Geotechnical Unit
Asphalt Core Photo

Project No: 34497.1.1	I.D. No.: R-2707E	County: Cleveland	Dates: 1/8/19
Site Description: US 74 (Shelby Bypass) from Existing US 74 West of SR 2238 to West of SR 1001			
Driller: Mike Moseley	Core Size: 4 - inch	Drill Machine: CME - 450	
Geologist / Engineer: Brett Smith, PG			

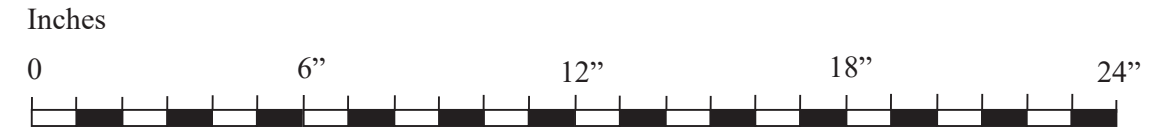


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ISL = Inside Lane



North Carolina Department of Transportation
Geotechnical Unit
Asphalt Core Photo

Project No: 34497.1.1	I.D. No.: R-2707E	County: Cleveland	Dates: 12/18 - 12/20/18
Site Description: US 74 (Shelby Bypass) from Existing US 74 West of SR 2238 to West of SR 1001			
Driller: Mike Moseley	Core Size: 4 - inch	Drill Machine: CME - 450	
Geologist / Engineer: Brett Smith, PG			

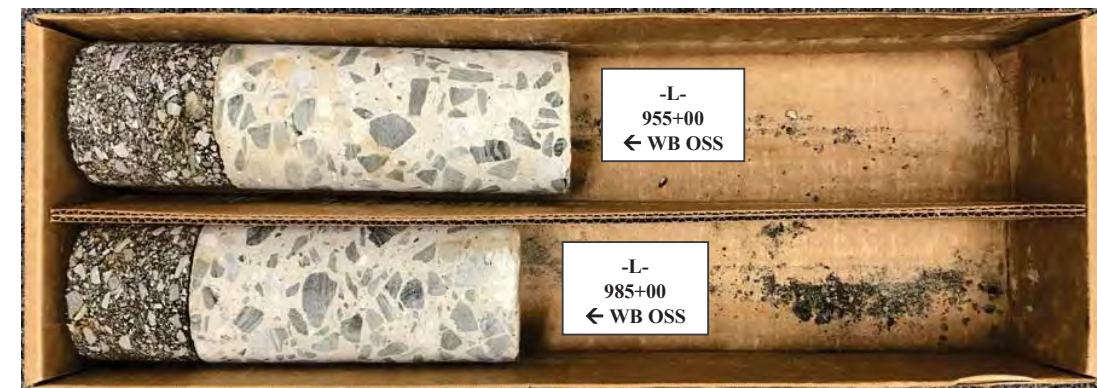
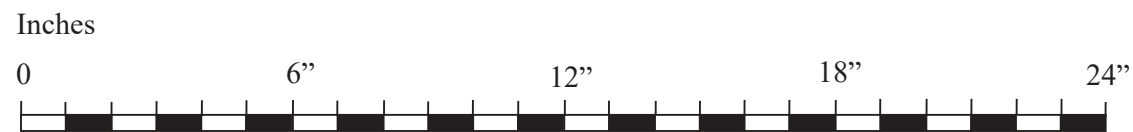


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North Carolina Department of Transportation
Geotechnical Unit
Asphalt Core Photo

Project No: 34497.1.1	I.D. No.: R-2707E	County: Cleveland	Dates: 12/18 - 12/19/18
Site Description: US 74 (Shelby Bypass) from Existing US 74 West of SR 2238 to West of SR 1001			
Driller: Mike Moseley	Core Size: 4 - inch	Drill Machine: CME - 450	
Geologist / Engineer: Brett Smith, PG			

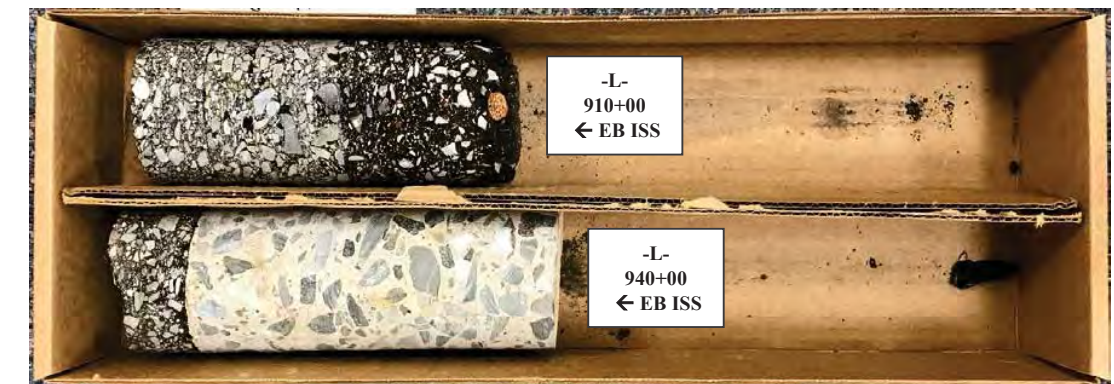
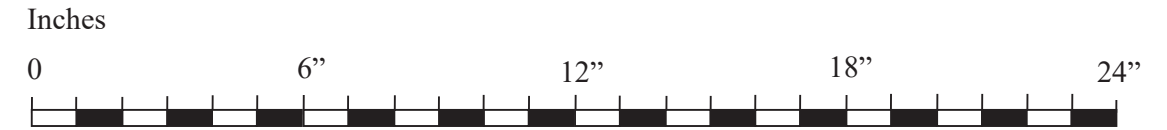


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North Carolina Department of Transportation
Geotechnical Unit
Asphalt Core Photo

Project No: 34497.1.1	I.D. No.: R-2707E	County: Cleveland	Dates: 12/19 - 12/20/18
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Geologist / Engineer: Brett Smith, PG			



Notes:
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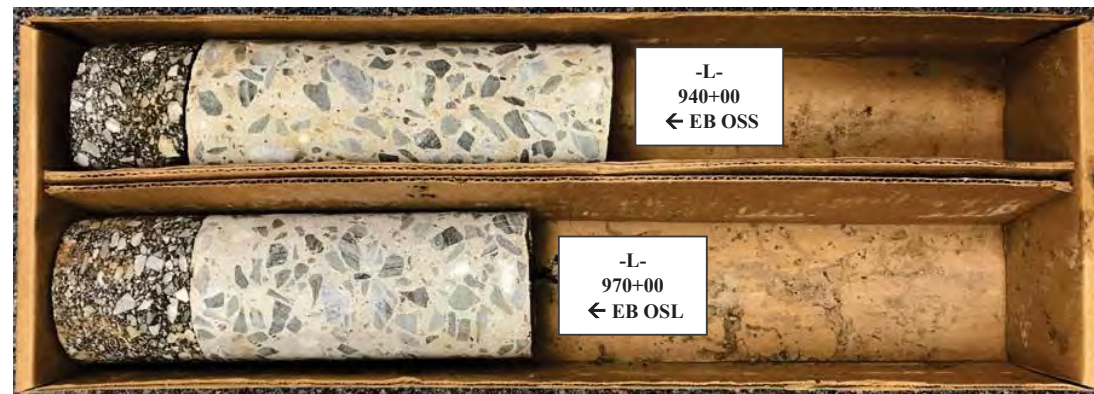
North Carolina Department of Transportation
Geotechnical Unit
Asphalt Core Photo

Project No: 34497.1.1	I.D. No.: R-2707E	County: Cleveland	Dates: 12/18/18
Site Description: US 74 (Shelby Bypass) from Existing US 74 West of SR 2238 to West of SR 1001			
Driller: Mike Moseley	Core Size: 4 - inch	Drill Machine: CME - 450	
Geologist / Engineer: Brett Smith, PG			

Inches
0 6" 12" 18" 24"



Inches
0 6" 12" 18" 24"



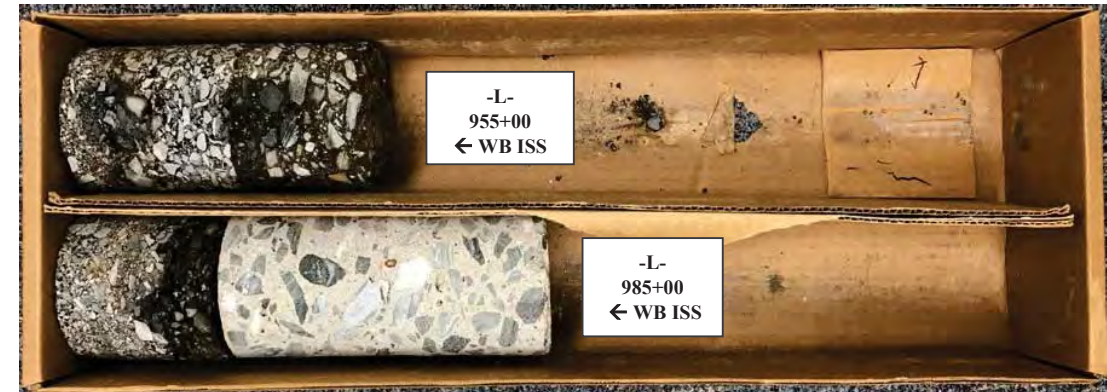
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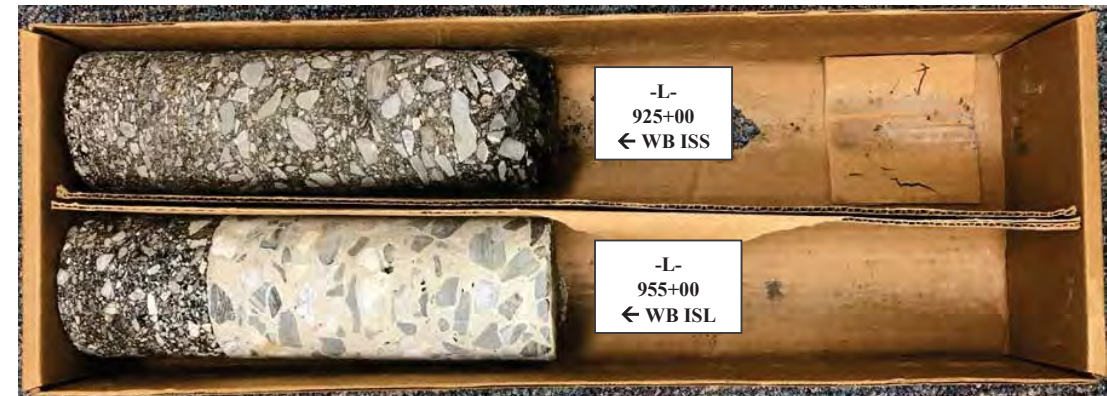
North Carolina Department of Transportation
Geotechnical Unit
Asphalt Core Photo

Project No: 34497.1.1	I.D. No.: R-2707E	County: Cleveland	Dates: 1/7/19
Site Description: US 74 (Shelby Bypass) from Existing US 74 West of SR 2238 to West of SR 1001			
Driller: Mike Moseley	Core Size: 4 - inch	Drill Machine: CME - 450	
Geologist / Engineer: Brett Smith, PG			

Inches
0 6" 12" 18" 24"



Inches
0 6" 12" 18" 24"



Notes:
WB = Westbound
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAY
 MATERIALS & TESTS UNIT
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAY
 MATERIALS & TESTS UNIT
 SOILS LABORATORY

T. I. P. No. R-2707E

REPORT ON SAMPLES OF PDI - US 74 Shelby Bypass

Project 34497.1.1 County Cleveland Owner Geotech
 Date: Sampled December 2018 Received 1/2/19 Reported _____
 Sampled from Pavement Design Investigation By Geotech
 Submitted by B. Smith 2008 Standard Specifications

T. I. P. No. R-2707E

REPORT ON SAMPLES OF PDI - US 74 Shelby Bypass

Project 34497.1.1 County Cleveland Owner Geotech
 Date: Sampled December 2018 Received 1/2/19 Reported _____
 Sampled from Pavement Design Investigation By Geotech
 Submitted by B. Smith 2008 Standard Specifications

2/14/19

TEST RESULTS

Proj. Sample No.	S-8	S-10	S-11	S-12	S-13	S-14
Boring No.	EB OSL	EB OES	EB OES	EB OSS	EB OES	EB OES
Retained #4 Sieve %	4	0	1	0	2	4
Passing #10 Sieve %	86	97	90	99	96	94
Passing #40 Sieve %	65	78	56	91	73	81
Passing #200 Sieve %	44	49	30	74	49	65

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60 %	33.8	32.0	48.9	13.3	33.9	20.4
Fine Sand Ret - #270 %	21.5	23.9	23.1	16.6	21.0	16.7
Silt 0.05 - 0.005 mm %	17.9	21.4	15.9	19.6	20.3	20.8
Clay < 0.005 mm %	26.8	22.7	12.1	50.6	24.7	42.1
Passing #40 Sieve %	75.4	79.7	62.6	91.7	75.6	86.4
Passing #200 Sieve %	50.6	50.2	33.9	74.5	50.9	68.4

L. L.	36	35	34	59	39	44
P. I.	16	13	8	31	15	20
AASHTO Classification	A-6	A-6	A-2-4	A-7-6	A-6	A-7-6
Group Index	3	4	0	24	4	12
pH	N/A	N/A	N/A	N/A	N/A	N/A
Station	851+00	860+00	870+00	880+00	890+00	900+00
OFFSET	N/A	N/A	N/A	N/A	N/A	N/A
ALIGNMENT	-L-	-L-	-L-	-L-	-L-	-L-
Depth (Ft)	2.1	0.0	0.0	1.6	0.0	0.0
to	4.5	5.0	5.0	4.5	5.0	5.0
Natural Moisture %	13.4	16.6	9.7	24.9	16.7	23.6

Aaron Hackett
 Soils Engineer

2/14/19

TEST RESULTS

Proj. Sample No.	S-16	S-17	S-18	S-19	S-21	S-23
Boring No.	EB OSS	EB OES	EB OES	EB OSS	EB OES	EB OSS
Retained #4 Sieve %	1	2	0	1	1	2
Passing #10 Sieve %	97	94	99	94	93	88
Passing #40 Sieve %	74	73	76	71	62	64
Passing #200 Sieve %	49	47	44	46	35	38

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60 %	33.8	33.2	35.8	34.9	43.7	37.1
Fine Sand Ret - #270 %	21.6	23.5	27.1	22.3	25.8	26.1
Silt 0.05 - 0.005 mm %	16.3	17.9	22.4	20.0	16.3	20.6
Clay < 0.005 mm %	28.3	25.4	14.6	22.9	14.2	16.2
Passing #40 Sieve %	76.2	77.9	77.2	75.8	66.3	73.0
Passing #200 Sieve %	50.1	49.6	44.4	49.4	37.3	43.6

L. L.	35	35	33	39	46	32
P. I.	17	12	6	15	10	9
AASHTO Classification	A-6	A-6	A-4	A-6	A-2-5	A-4
Group Index	5	3	0	4	0	0
pH	N/A	N/A	N/A	N/A	N/A	N/A
Station	910+00	920+00	930+00	940+00	960+00	970+00
OFFSET	N/A	N/A	N/A	N/A	N/A	N/A
ALIGNMENT	-L-	-L-	-L-	-L-	-L-	-L-
Depth (Ft)	2.1	0.0	0.0	1.5	0.0	2.2
to	4.5	5.0	5.0	4.5	5.0	4.5
Natural Moisture %	21.1	16.6	15.5	15.6	9.9	9.6

Aaron Hackett
 Soils Engineer

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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T. I. P. No. R-2707E

REPORT ON SAMPLES OF PDI - US 74 Shelby Bypass

Project 34497.1.1 County Cleveland Owner Geotech
 Date: Sampled December 2018 Received 1/2/19 Reported _____
 Sampled from Pavement Design Investigation By Geotech
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T. I. P. No. R-2707E

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2/14/19

TEST RESULTS

Proj. Sample No.	S-24	S-27	S-28	S-30	S-32	S-33
Boring No.	EB OES	WB OSS	WB OES	WB OSS	WB OES	WB OSL
Retained #4 Sieve %	0	0	1	5	3	1
Passing #10 Sieve %	95	96	90	86	89	95
Passing #40 Sieve %	75	78	79	72	74	76
Passing #200 Sieve %	53	58	61	43	50	50

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60 %	30.2	26.3	19.1	27.5	27.5	30.5
Fine Sand Ret - #270 %	20.8	22.0	18.8	30.8	22.6	25.3
Silt 0.05 - 0.005 mm %	15.9	14.1	13.3	16.2	9.5	14.9
Clay < 0.005 mm %	33.1	37.6	48.8	25.4	40.4	29.2
Passing #40 Sieve %	79.6	81.5	87.5	83.2	83.7	79.8
Passing #200 Sieve %	56.0	60.1	67.7	50.0	56.1	52.2

L. L.	45	42	59	33	41	34
P. I.	15	14	29	9	18	9
AASHTO Classification	A-7-5	A-7-6	A-7-5	A-4	A-7-6	A-4
Group Index	6	6	16	1	6	2
pH	N/A	N/A	N/A	N/A	N/A	N/A
Station	980+00	985+00	975+00	955+00	935+00	925+00
OFFSET	N/A	N/A	N/A	N/A	N/A	N/A
ALIGNMENT	-L-	-L-	-L-	-L-	-L-	-L-
Depth (Ft)	0.0	1.9	0.0	1.6	0.0	2.1
to	5.0	4.5	5.0	4.5	5.0	4.5
Natural Moisture %	21.6	17.7	23.5	12.6	18.6	16.6

Aaron Hackett
 Soils Engineer

2/15/19

TEST RESULTS

Proj. Sample No.	S-35	S-36	S-37	S-38	S-41	S-42
Boring No.	WB OES	WB OES	WB OSS	WB OES	WB OSS	WB OES
Retained #4 Sieve %	5	3	2	2	3	3
Passing #10 Sieve %	89	95	95	97	92	93
Passing #40 Sieve %	70	75	69	81	68	71
Passing #200 Sieve %	41	51	39	55	44	45

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60 %	34.4	31.7	40.5	28.4	36.9	35.0
Fine Sand Ret - #270 %	27.2	20.0	25.5	20.9	21.8	22.9
Silt 0.05 - 0.005 mm %	9.8	13.9	16.6	21.3	19.2	14.2
Clay < 0.005 mm %	28.7	34.4	17.4	29.5	22.2	27.9
Passing #40 Sieve %	78.1	78.9	73.4	83.1	73.8	76.3
Passing #200 Sieve %	46.4	54.4	40.8	57.0	47.4	48.2

L. L.	30	33	17	33	25	30
P. I.	8	13	1	4	5	8
AASHTO Classification	A-4	A-6	A-4	A-4	A-4	A-4
Group Index	0	4	0	1	0	1
pH	N/A	N/A	N/A	N/A	N/A	N/A
Station	915+00	905+00	895+00	885+00	865+00	855+00
OFFSET	N/A	N/A	N/A	N/A	N/A	N/A
ALIGNMENT	-L-	-L-	-L-	-L-	-L-	-L-
Depth (Ft)	0.0	0.0	1.9	0.0	1.8	0.0
to	5.0	5.0	4.5	5.0	4.5	5.0
Natural Moisture %	16.0	17.8	12.1	21.0	13.1	15.6

Aaron Hackett
 Soils Engineer

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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REPORT ON SAMPLES OF PDI - US 74 Shelby Bypass

Project 34497.1.1 County Cleveland Owner Geotech
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3/11/19

TEST RESULTS

Proj. Sample No.	S-44	S-47	S-48	S-49	S-50	S-51
Boring No.	EB IES	EB ISS	EB IES	EB IES	EB ISS	EB IES
Retained #4 Sieve	% 0	3	0	3	2	2
Passing #10 Sieve	% 95	97	98	96	95	95
Passing #40 Sieve	% 51	71	82	83	67	70
Passing #200 Sieve	% 31	57	65	68	45	46

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60	% 56.6	32.2	22.7	19.0	40.7	38.3
Fine Sand Ret - #270	% 16.2	12.2	16.1	14.6	17.7	18.9
Silt 0.05 - 0.005 mm	% 15.0	11.4	20.0	21.8	10.1	12.8
Clay < 0.005 mm	% 12.2	44.1	41.3	44.6	31.5	30.0
Passing #40 Sieve	% 53.5	73.4	83.9	86.2	70.1	73.8
Passing #200 Sieve	% 32.0	59.1	66.2	71.0	47.3	48.1

L. L.	29	50	49	52	35	36
P. I.	1	25	15	21	17	11
AASHTO Classification	A-2-4	A-7-6	A-7-5	A-7-5	A-6	A-6
Group Index	0	12	10	14	4	2
pH	N/A	N/A	N/A	N/A	N/A	N/A
Station	860+00	880+00	890+00	900+00	910+00	920+00
OFFSET	N/A	N/A	N/A	N/A	N/A	N/A
ALIGNMENT	-L-	-L-	-L-	-L-	-L-	-L-
Depth (Ft)	0.0	2.0	0.0	0.0	2.2	0.0
to	5.0	4.5	5.0	5.0	4.5	5.0
Natural Moisture %	13.7	22.0	35.9	27.9	16.3	19.3

Aaron Hackett
 Soils Engineer

3/11/19

TEST RESULTS

Proj. Sample No.	S-53	S-55	S-56	S-57	S-59
Boring No.	EB ISL	EB IES	EB IES	EB ISS	EB IES
Retained #4 Sieve	% 0	7	0	2	1
Passing #10 Sieve	% 96	88	98	90	97
Passing #40 Sieve	% 67	43	68	72	82
Passing #200 Sieve	% 43	23	43	54	56

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%					
Coarse Sand Ret - #60	% 42.6	63.8	41.9	25.6	25.6
Fine Sand Ret - #270	% 17.9	13.8	19.7	20.0	21.9
Silt 0.05 - 0.005 mm	% 21.9	10.6	20.2	26.1	18.1
Clay < 0.005 mm	% 17.7	11.8	18.3	28.3	34.5
Passing #40 Sieve	% 70.0	49.4	69.7	80.4	84.3
Passing #200 Sieve	% 44.6	25.9	44.2	60.5	57.7

L. L.	21	21	27	35	45
P. I.	1	0	0	6	3
AASHTO Classification	A-4	A-1-b	A-4	A-4	A-5
Group Index	0	0	0	2	2
pH	N/A	N/A	N/A	N/A	N/A
Station	940+00	950+00	960+00	970+00	990+00
OFFSET	N/A	N/A	N/A	N/A	N/A
ALIGNMENT	-L-	-L-	-L-	-L-	-L-
Depth (Ft)	1.8	0.0	0.0	2.0	0.0
to	4.5	5.0	5.0	4.5	5.0
Natural Moisture %	5.3	7.8	19.9	18.5	24.9

Aaron Hackett
 Soils Engineer

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T. I. P. No. R-2707E

REPORT ON SAMPLES OF PDI - US 74 Shelby Bypass

Project 34497.1.1 County Cleveland Owner Geotech
 Date: Sampled January, 2019 Received 1/9/19 Reported 3/15/19
 Sampled from Pavement Design Investigation By Geotech
 Submitted by B. Smith 2008 Standard Specifications

T. I. P. No. R-2707E

REPORT ON SAMPLES OF PDI - US 74 Shelby Bypass

Project 34497.1.1 County Cleveland Owner Geotech
 Date: Sampled January, 2019 Received 1/9/19 Reported 3/15/19
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3/15/19

TEST RESULTS

Proj. Sample No.	S-61	S-62	S-63	S-65	S-66	S-67
Boring No.	WB IES	WB IES	WB ISL	WB IES	WB IES	WB ISS
Retained #4 Sieve %	1	2	2	0	0	1
Passing #10 Sieve %	95	97	95	99	100	95
Passing #40 Sieve %	83	72	80	80	79	73
Passing #200 Sieve %	64	44	56	55	56	47

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60 %	19.3	36.1	25.4	29.8	31.2	33.9
Fine Sand Ret - #270 %	17.0	24.5	21.6	20.8	16.7	22.0
Silt 0.05 - 0.005 mm %	10.9	23.1	12.7	14.9	19.4	17.3
Clay < 0.005 mm %	52.8	16.4	40.4	34.5	32.6	26.8
Passing #40 Sieve %	87.3	74.4	83.8	80.5	79.4	77.1
Passing #200 Sieve %	67.5	45.1	59.3	55.2	56.6	49.6

L. L.	59	34	40	36	36	33
P. I.	29	6	16	13	6	8
AASHTO Classification	A-7-5	A-4	A-6	A-6	A-4	A-4
Group Index	18	0	7	5	2	1
pH	N/A	N/A	N/A	N/A	N/A	N/A
Station	975+00	965+00	955+00	945+00	935+00	925+00
OFFSET	N/A	N/A	N/A	N/A	N/A	N/A
ALIGNMENT	-L-	-L-	-L-	-L-	-L-	-L-
Depth (Ft)	0.0	0.0	2.0	0.0	0.0	2.5
to	5.0	5.0	4.5	5.0	5.0	4.5
Natural Moisture %	19.4	23.1	20.8	25.2	24.3	18.1

Aaron Hackett
 Soils Engineer

3/15/19

TEST RESULTS

Proj. Sample No.	S-68	S-69	S-70	S-71	S-72	S-73
Boring No.	WB IES	WB IES	WB ISS	WB ISL	WB IES	WB IES
Retained #4 Sieve %	2	3	1	0	0	2
Passing #10 Sieve %	91	90	96	95	98	94
Passing #40 Sieve %	70	71	72	69	69	69
Passing #200 Sieve %	49	47	44	40	46	39

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60 %	33.5	31.8	37.1	41.2	38.5	39.3
Fine Sand Ret - #270 %	17.3	21.2	21.7	20.9	21.3	25.6
Silt 0.05 - 0.005 mm %	13.2	14.7	14.3	17.2	20.4	15.4
Clay < 0.005 mm %	36.0	32.3	27.0	20.7	19.8	19.7
Passing #40 Sieve %	77.7	78.4	75.1	72.4	70.4	73.6
Passing #200 Sieve %	53.9	52.2	46.0	42.3	46.8	41.3

L. L.	40	36	26	21	35	25
P. I.	17	7	9	4	0	0
AASHTO Classification	A-6	A-4	A-4	A-4	A-4	A-4
Group Index	5	1	1	0	0	0
pH	N/A	N/A	N/A	N/A	N/A	N/A
Station	915+00	905+00	895+00	895+00	885+00	875+00
OFFSET	N/A	N/A	N/A	N/A	N/A	N/A
ALIGNMENT	-L-	-L-	-L-	-L-	-L-	-L-
Depth (Ft)	0.0	0.0	1.7	2.0	0.0	0.0
to	5.0	5.0	4.5	4.5	5.0	5.0
Natural Moisture %	22.2	19.9	14.2	13.7	22.9	17.8

Aaron Hackett
 Soils Engineer

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T. I. P. No. R-2707E

REPORT ON SAMPLES OF PDI - US 74 Shelby Bypass

Project 34497.1.1 County Cleveland Owner Geotech
 Date: Sampled January, 2019 Received 1/9/19 Reported 3/15/19
 Sampled from Pavement Design Investigation By Geotech
 Submitted by B. Smith 2008 Standard Specifications

T. I. P. No. R-2707E

REPORT ON SAMPLES OF PDI-US 74 Shelby Bypass

Project 34497.1.1 County Cleveland Owner Geotech
 Date: Sampled December 2018 Received 1/2/19 Reported
 Sampled from Pavement Design Investigation By Geotech
 Submitted by B. Smith 2008 Standard Specifications

3/15/19

TEST RESULTS

Proj. Sample No.	S-74	S-75				
Boring No.	WB ISS	WB IES				
Retained #4 Sieve	%	1	2			
Passing #10 Sieve	%	90	93			
Passing #40 Sieve	%	71	76			
Passing #200 Sieve	%	48	51			

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60	%	29.7	27.9			
Fine Sand Ret - #270	%	21.8	22.2			
Silt 0.05 - 0.005 mm	%	15.3	16.6			
Clay < 0.005 mm	%	33.1	33.4			
Passing #40 Sieve	%	79.7	82.3			
Passing #200 Sieve	%	53.9	55.4			

L. L.		35	38			
P. I.		13	13			
AASHTO Classification		A-6	A-6			
Group Index		3	4			
pH		N/A	N/A			
Station		865+00	855+00			
OFFSET		N/A	N/A			
ALIGNMENT		-L-	-L-			
Depth (Ft)		2.2	0.0			
	to	4.5	5.0			
Natural Moisture %		17.5	19.7			

Aaron Hackett
 Soils Engineer

3/6/19

TEST RESULTS

Proj. Sample No.	S-1	S-2	S-3	S-4		
Boring No.	N/A	N/A	N/A	N/A		
Retained #4 Sieve	%	0	0	3	0	
Passing #10 Sieve	%	98	99	98	95	
Passing #40 Sieve	%	79	63	68	64	
Passing #200 Sieve	%	49	24	25	41	

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60	%	32.7	59.1	53.7	43.1	
Fine Sand Ret - #270	%	24.0	21.0	24.9	19.1	
Silt 0.05 - 0.005 mm	%	14.7	3.1	10.3	18.5	
Clay < 0.005 mm	%	28.5	16.8	11.1	19.2	
Passing #40 Sieve	%	80.1	63.5	69.5	67.7	
Passing #200 Sieve	%	49.8	24.2	25.5	42.6	

L. L.		36	33	29	41	
P. I.		7	1	0	10	
AASHTO Classification		A-4	A-2-4	A-2-4	A-5	
Group Index		1	0	0	1	
pH		N/A	N/A	N/A	N/A	
Station		860+00	870+00	910+00	970+00	
OFFSET		80' RT	65' RT	65' RT	94' LT	
ALIGNMENT		-L-	-L-	-L-	-L-	
Depth (Ft)		0.5	0.5	0.5	0.5	
	to	3.5	3.5	3.5	3.5	
Natural Moisture %		N/A	N/A	N/A	N/A	

Aaron Hackett
 Soils Engineer



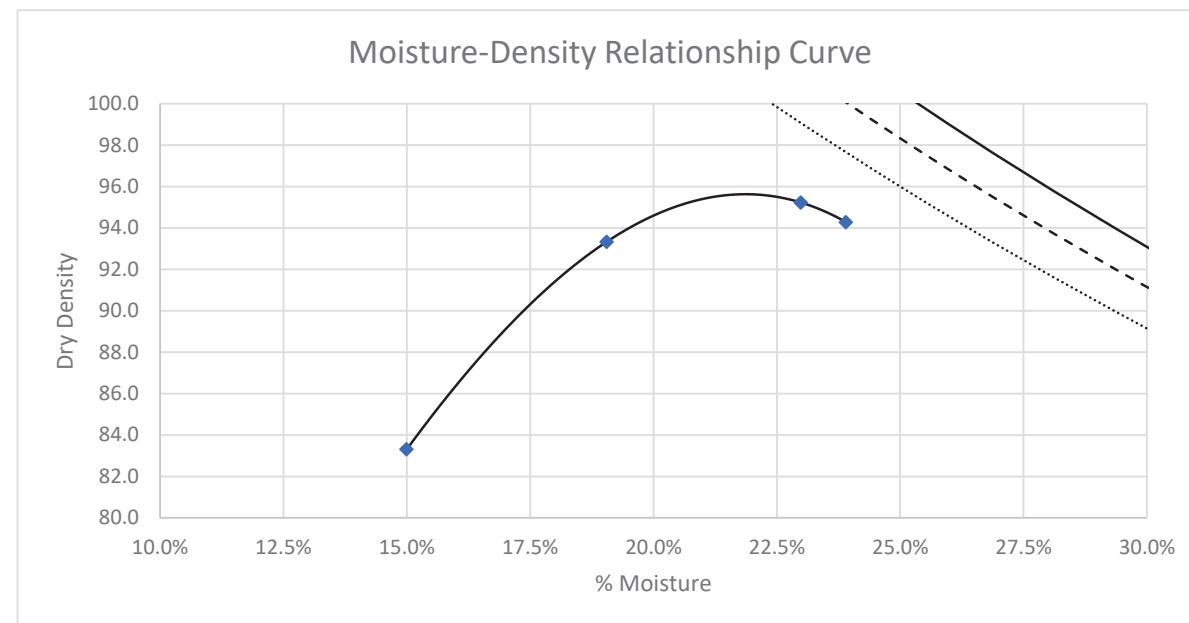
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504 Meadowland Drive, Hillsborough, NC 27278

Standard Moisture-Density Relationship Report

ASTM D698

Project Number **18-0173.I45** Date **3/4/2019**
Project Name **R-2707E** Sample Number **S-1**
Client **NCDOT**

Sample Description **A-4** Maximum Dry Density **95.6**
Sample Location **-L- 860+00 80' RT** Optimum Moisture **21.8%**



Natural Moisture: **N/A** Rammer Type: **Manual**
Specific Gravity: **2.60 (Assumed)** Preparation Method: **Dry**
Liquid Limit: **36** Method: **A**
Plasticity Index: **7** Oversize Correction: **Not Required**
% Fines: **49.0%**
% Sand: **51.0%**
% Gravel: **0.0%**

Aaron Hackett, EI
Lab Manager

Jeff Elliott, PE
CMT & SI Department Manager



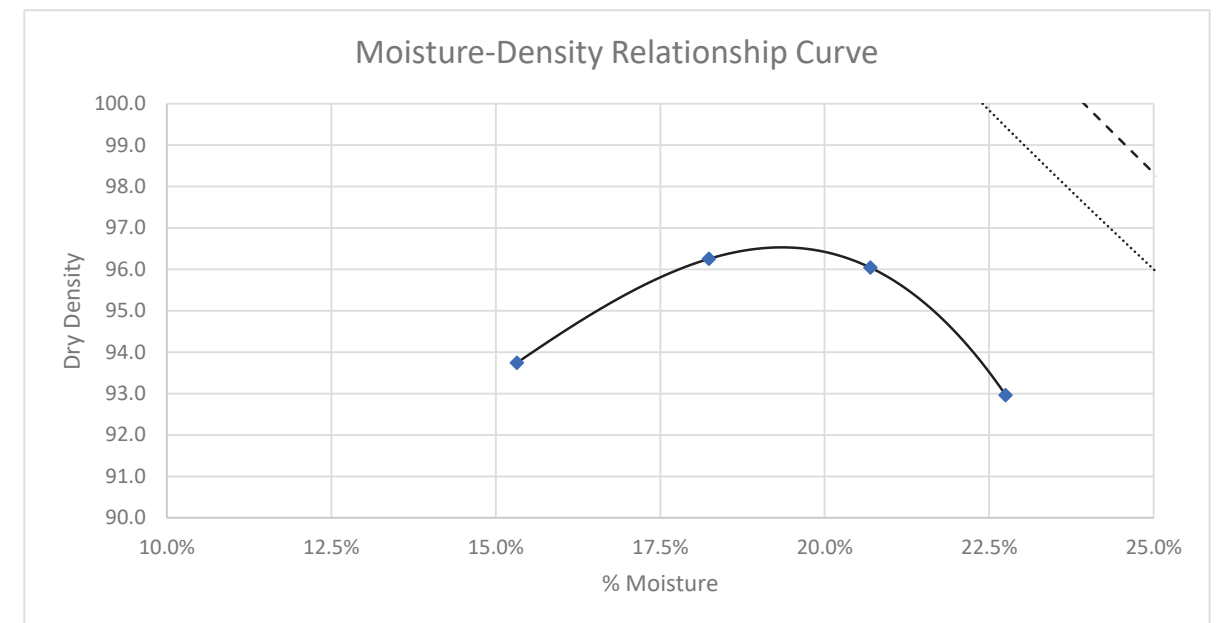
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504 Meadowland Drive, Hillsborough, NC 27278

Standard Moisture-Density Relationship Report

ASTM D698

Project Number **18-0173.I45** Date **1/0/1900**
Project Name **R-2707E** Sample Number **S-2**
Client **NCDOT**

Sample Description **A-2-4** Maximum Dry Density **96.5**
Sample Location **-L- 870+00 65' RT** Optimum Moisture **19.4%**



Natural Moisture: **N/A** Rammer Type: **Manual**
Specific Gravity: **2.60 (Assumed)** Preparation Method: **Dry**
Liquid Limit: **33** Method: **A**
Plasticity Index: **1** Oversize Correction: **Not Required**
% Fines: **24.0%**
% Sand: **76.0%**
% Gravel: **0.0%**

Aaron Hackett, EI
Lab Manager

Jeff Elliott, PE
CMT & SI Department Manager



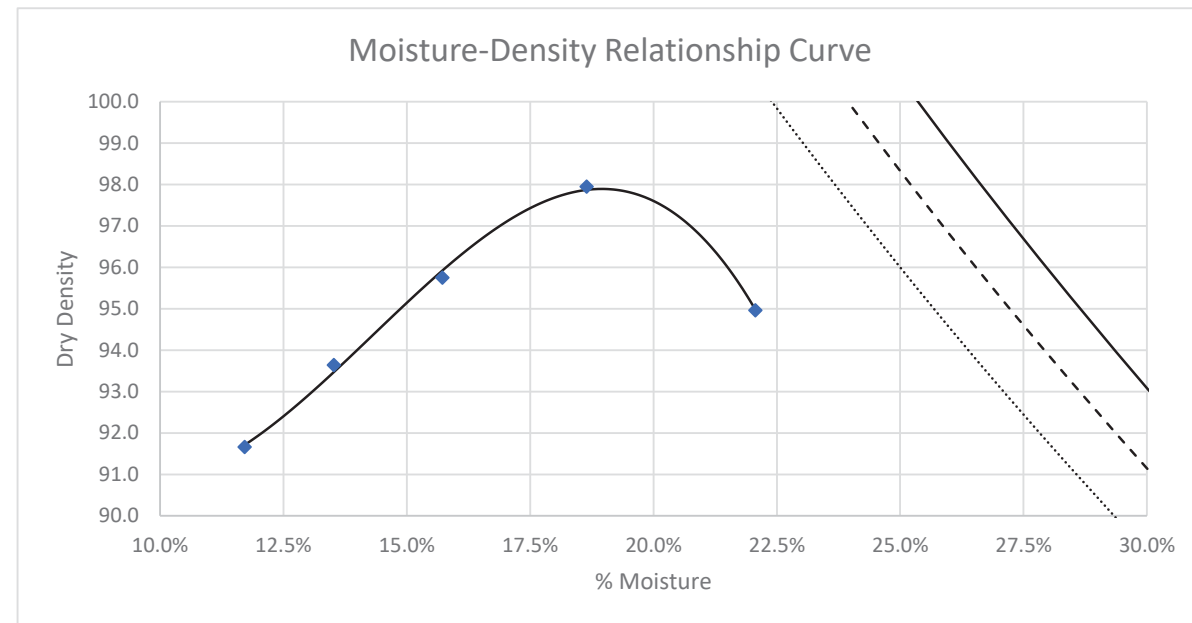
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Standard Moisture-Density Relationship Report

ASTM D698

Project Number **18-0173.I45** Date **3/5/2019**
Project Name **R-2707E** Sample Number **S-3**
Client **NCDOT**

Sample Description **A-2-4** Maximum Dry Density **97.9**
Sample Location **-L- 910+00, 65' RT** Optimum Moisture **18.9%**



Natural Moisture: **N/A** Rammer Type: **Manual**
Specific Gravity: **2.60 (Assumed)** Preparation Method: **Dry**
Liquid Limit: **29** Method: **A**
Plasticity Index: **0** Oversize Correction: **Not Required**
% Fines: **25.0%**
% Sand: **72.0%**
% Gravel: **3.0%**

Aaron Hackett, EI
Lab Manager

Jeff Elliott, PE
CMT & SI Department Manager



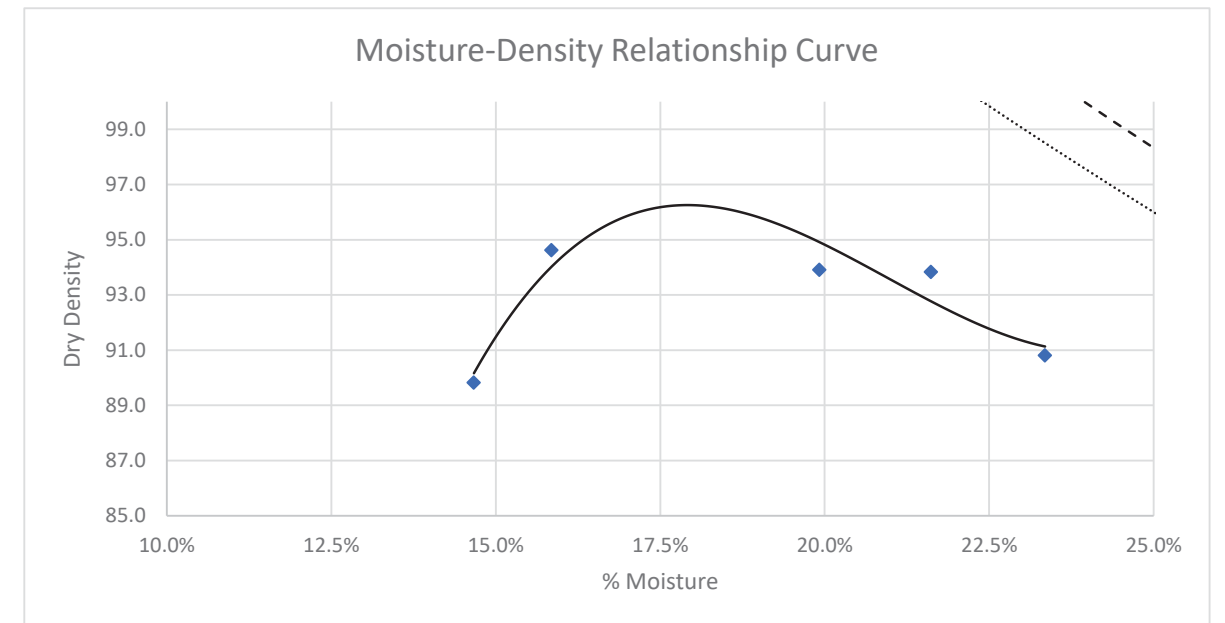
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Standard Moisture-Density Relationship Report

ASTM D698

Project Number **18-0173.I45** Date **3/5/2019**
Project Name **R-2707E** Sample Number **S-4**
Client **NCDOT**

Sample Description **A-5** Maximum Dry Density **96.3**
Sample Location **-L- 970+00 94' LT** Optimum Moisture **17.9%**



Natural Moisture: **N/A** Rammer Type: **Manual**
Specific Gravity: **2.60 (Assumed)** Preparation Method: **Dry**
Liquid Limit: **41** Method: **A**
Plasticity Index: **10** Oversize Correction: **Not Required**
% Fines: **41.0%**
% Sand: **59.0%**
% Gravel: **0.0%**

Aaron Hackett, EI
Lab Manager

Jeff Elliott, PE
CMT & SI Department Manager



Report on California Bearing Ratio (ASTM D 1883/AASHTO T 193)

Date	<u>1/23/2019</u>	Project Name	<u>R-2707E</u>
Sample No.	<u>S-1, Run #1</u>	Project No.	<u>18-0173.145</u>
Sample Location	<u>-L- 860+00 80' RT</u>	Client	<u>NCDOT</u>



Report on California Bearing Ratio (ASTM D 1883/AASHTO T 193)

Date	<u>1/23/2019</u>	Project Name	<u>R-2707E</u>
Sample No.	<u>S-1, Run #2</u>	Project No.	<u>18-0173.145</u>
Sample Location	<u>-L- 860+00 80' RT</u>	Client	<u>NCDOT</u>

Proctor and Classification Data

Sample Description	<u>N/A</u>
Classification	<u>A-4</u>
Max. Dry Density	<u>95.6</u>
Optimum Moisture	<u>21.8%</u>

CBR Preparation Data

Rammer Used	<u>5.5 lb, 12" drop</u>
Compaction Method	<u>3 Layers, 56 Blows</u>
Surcharge Amount	<u>10 lbs</u>
Soaked/Unsoaked	<u>Soaked</u>

Proctor and Classification Data

Sample Description	<u>N/A</u>
Classification	<u>A-4</u>
Max. Dry Density	<u>95.6</u>
Optimum Moisture	<u>21.8%</u>

CBR Preparation Data

Rammer Used	<u>5.5 lb, 12" drop</u>
Compaction Method	<u>3 Layers, 56 Blows</u>
Surcharge Amount	<u>10 lbs</u>
Soaked/Unsoaked	<u>Soaked</u>

CBR Results

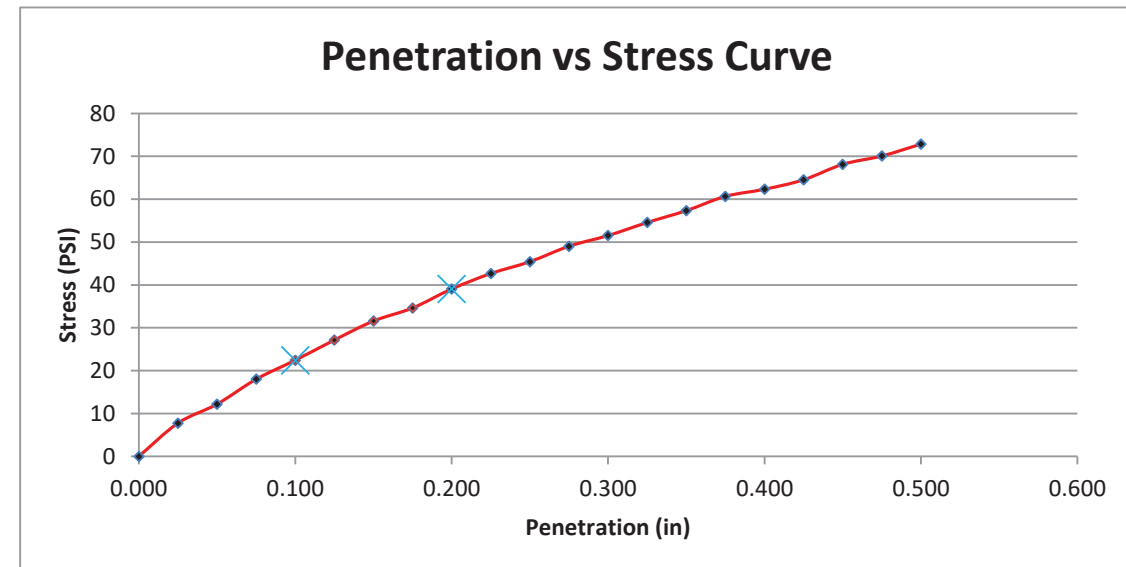
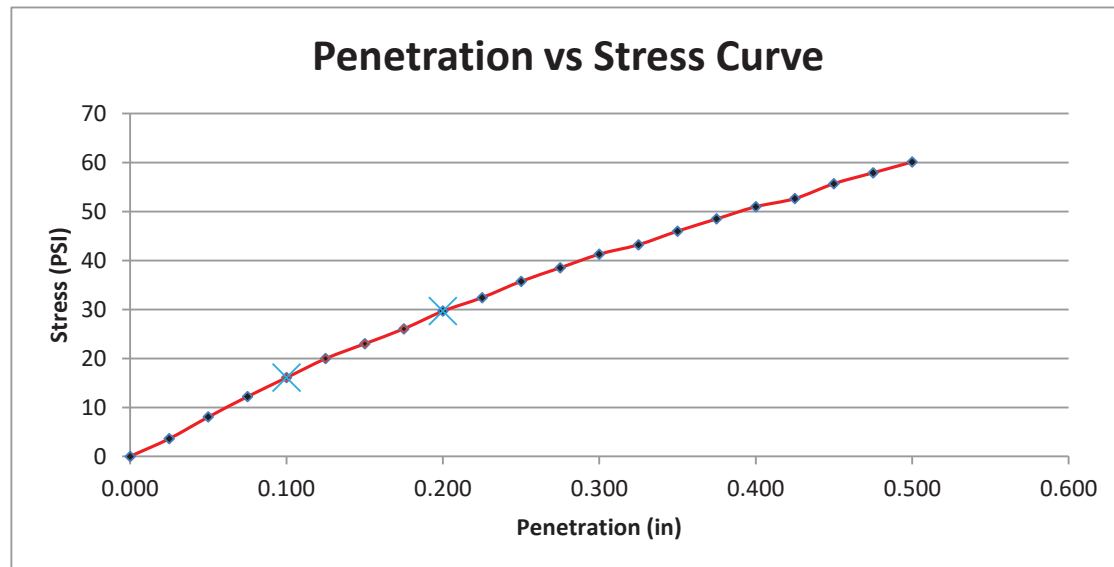
Compaction Moisture Content	<u>23.1%</u>	Dry unit weight (lbs/cu.ft)	<u>95.1</u>
Moisture Content of Top 1"		Percent of Max. Dry Density	<u>99.5%</u>
After Soaking	<u>28.0%</u>		
Swell	<u>0.2%</u>		

CBR Values		
Penetration (in)	<u>0.100</u>	<u>0.200</u>
Stress (psi)	<u>16.07</u>	<u>29.64</u>
CBR	<u>1.6</u>	<u>2.0</u>

CBR Results

Compaction Moisture Content	<u>23.1%</u>	Dry unit weight (lbs/cu.ft)	<u>94.1</u>
Moisture Content of Top 1"		Percent of Max. Dry Density	<u>98.4%</u>
After Soaking	<u>28.3%</u>		
Swell	<u>0.2%</u>		

CBR Values		
Penetration (in)	<u>0.100</u>	<u>0.200</u>
Stress (psi)	<u>22.44</u>	<u>39.06</u>
CBR	<u>2.2</u>	<u>2.6</u>



Remarks: No zero-point correction. All material passed the 3/4" sieve.

Remarks: No zero-point correction. All material passed the 3/4" sieve.

Aaron Hackett
Lab Manager

Jeff Elliott, P.E.
CMT & SI Dept. Manager

Aaron Hackett
Lab Manager

Jeff Elliott, P.E.
CMT & SI Dept. Manager



Report on California Bearing Ratio (ASTM D 1883/AASHTO T 193)

Date	<u>1/23/2019</u>	Project Name	<u>R-2707E</u>
Sample No.	<u>S-2, Run #1</u>	Project No.	<u>18-0173.145</u>
Sample Location	<u>-L- 870+00 65' RT</u>	Client	<u>NCDOT</u>



Report on California Bearing Ratio (ASTM D 1883/AASHTO T 193)

Date	<u>1/23/2019</u>	Project Name	<u>R-2707E</u>
Sample No.	<u>S-2, Run #2</u>	Project No.	<u>18-0173.145</u>
Sample Location	<u>-L- 870+00 65' RT</u>	Client	<u>NCDOT</u>

Proctor and Classification Data

Sample Description	<u>N/A</u>
Classification	<u>A-2-4</u>
Max. Dry Density	<u>95.6</u>
Optimum Moisture	<u>21.8%</u>

CBR Preparation Data

Rammer Used	<u>5.5 lb, 12" drop</u>
Compaction Method	<u>3 Layers, 56 Blows</u>
Surcharge Amount	<u>10 lbs</u>
Soaked/Unsoaked	<u>Soaked</u>

Proctor and Classification Data

Sample Description	<u>N/A</u>
Classification	<u>A-2-4</u>
Max. Dry Density	<u>95.6</u>
Optimum Moisture	<u>21.8%</u>

CBR Preparation Data

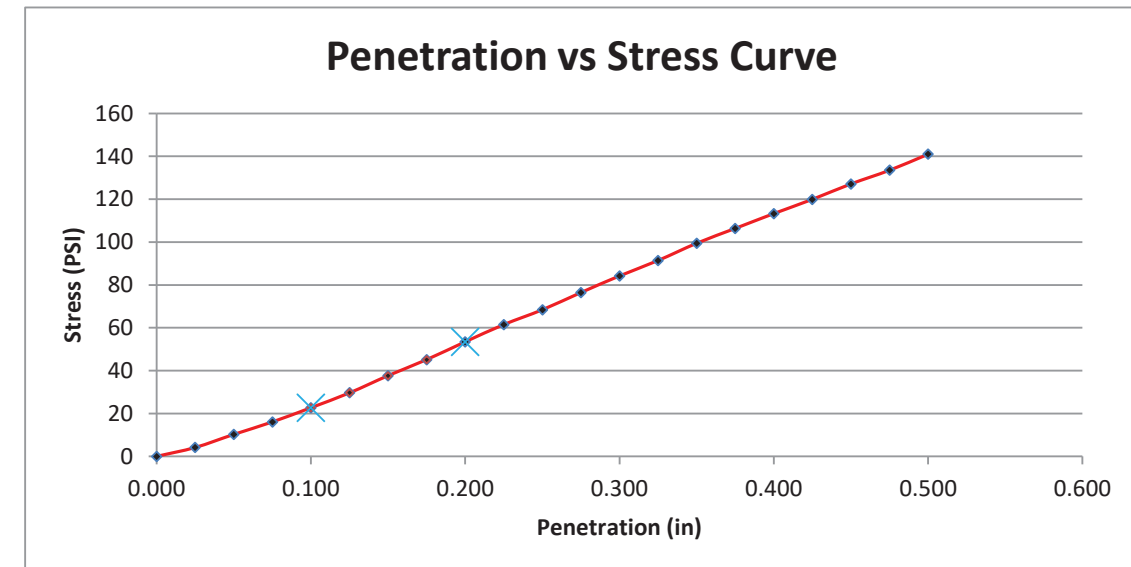
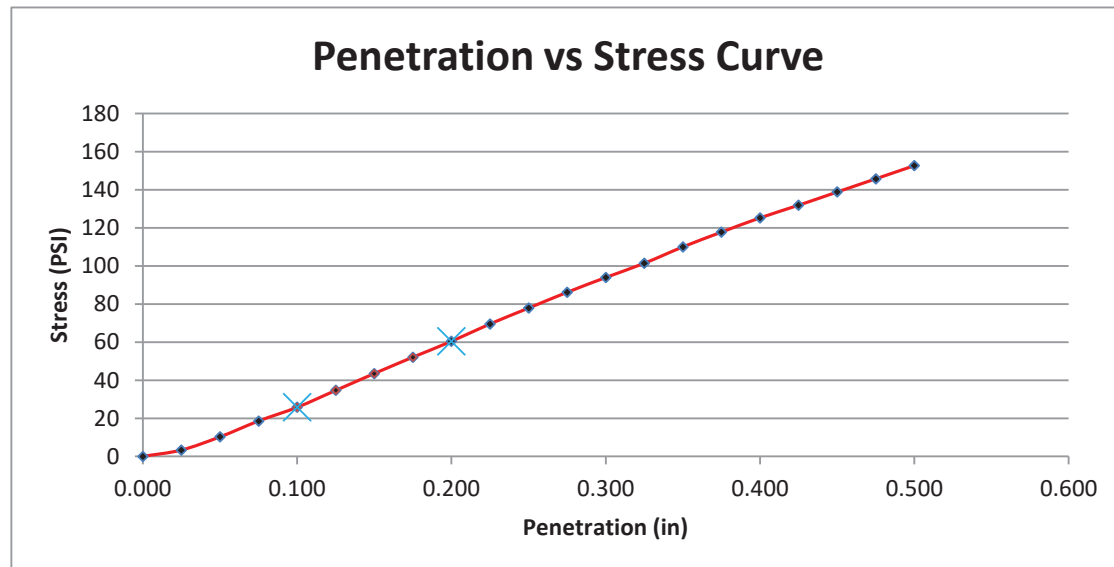
Rammer Used	<u>5.5 lb, 12" drop</u>
Compaction Method	<u>3 Layers, 56 Blows</u>
Surcharge Amount	<u>10 lbs</u>
Soaked/Unsoaked	<u>Soaked</u>

CBR Results

Compaction Moisture Content	<u>20.9%</u>	Dry unit weight (lbs/cu.ft)	<u>97.6</u>
Moisture Content of Top 1"		Percent of Max. Dry Density	<u>102.1%</u>
After Soaking	<u>23.0%</u>		
		CBR Values	
Swell	<u>0.1%</u>	Penetration (in)	<u>0.100 0.200</u>
		Stress (psi)	<u>25.76 60.38</u>
		CBR	<u>2.6 4.0</u>

CBR Results

Compaction Moisture Content	<u>20.9%</u>	Dry unit weight (lbs/cu.ft)	<u>97.9</u>
Moisture Content of Top 1"		Percent of Max. Dry Density	<u>102.4%</u>
After Soaking	<u>25.0%</u>		
		CBR Values	
Swell	<u>0.0%</u>	Penetration (in)	<u>0.100 0.200</u>
		Stress (psi)	<u>22.71 53.46</u>
		CBR	<u>2.3 3.6</u>



Remarks: No zero-point correction. All material passed the 3/4" sieve.

Remarks: No zero-point correction. All material passed the 3/4" sieve.

Aaron Hackett
Lab Manager

Jeff Elliott, P.E.
CMT & SI Dept. Manager

Aaron Hackett
Lab Manager

Jeff Elliott, P.E.
CMT & SI Dept. Manager



Report on California Bearing Ratio (ASTM D 1883/AASHTO T 193)

Date	<u>1/23/2019</u>	Project Name	<u>R-2707E</u>
Sample No.	<u>S-3, Run #1</u>	Project No.	<u>18-0173.145</u>
Sample Location	<u>-L- 910+00 65' RT</u>	Client	<u>NCDOT</u>



Report on California Bearing Ratio (ASTM D 1883/AASHTO T 193)

Date	<u>1/23/2019</u>	Project Name	<u>R-2707E</u>
Sample No.	<u>S-3, Run #2</u>	Project No.	<u>18-0173.145</u>
Sample Location	<u>-L- 910+00 65' RT</u>	Client	<u>NCDOT</u>

Proctor and Classification Data

Sample Description	<u>N/A</u>
Classification	<u>A-2-4</u>
Max. Dry Density	<u>97.9</u>
Optimum Moisture	<u>18.9%</u>

CBR Preparation Data

Rammer Used	<u>5.5 lb, 12" drop</u>
Compaction Method	<u>3 Layers, 56 Blows</u>
Surcharge Amount	<u>10 lbs</u>
Soaked/Unsoaked	<u>Soaked</u>

Proctor and Classification Data

Sample Description	<u>N/A</u>
Classification	<u>A-2-4</u>
Max. Dry Density	<u>97.9</u>
Optimum Moisture	<u>18.9%</u>

CBR Preparation Data

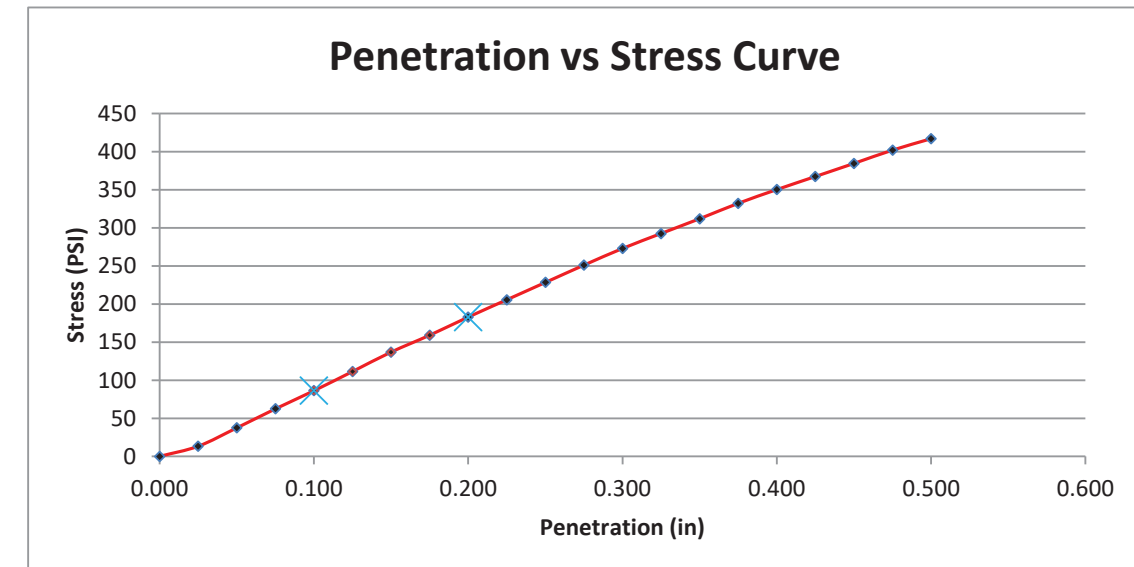
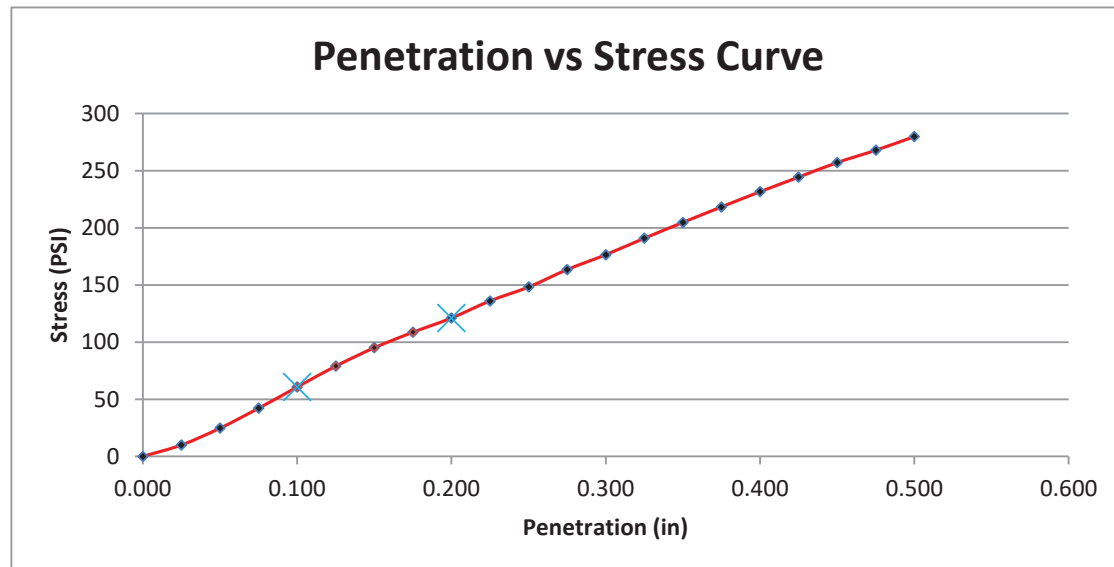
Rammer Used	<u>5.5 lb, 12" drop</u>
Compaction Method	<u>3 Layers, 56 Blows</u>
Surcharge Amount	<u>10 lbs</u>
Soaked/Unsoaked	<u>Soaked</u>

CBR Results

Compaction Moisture Content	<u>18.7%</u>	Dry unit weight (lbs/cu.ft)	<u>97.4</u>
Moisture Content of Top 1" After Soaking	<u>21.1%</u>	Percent of Max. Dry Density	<u>99.5%</u>
Swell	<u>0.1%</u>	CBR Values	
		Penetration (in)	<u>0.100</u> <u>0.200</u>
		Stress (psi)	<u>60.66</u> <u>121.04</u>
		CBR	<u>6.1</u> <u>8.1</u>

CBR Results

Compaction Moisture Content	<u>18.7%</u>	Dry unit weight (lbs/cu.ft)	<u>99.3</u>
Moisture Content of Top 1" After Soaking	<u>21.9%</u>	Percent of Max. Dry Density	<u>101.4%</u>
Swell	<u>0.1%</u>	CBR Values	
		Penetration (in)	<u>0.100</u> <u>0.200</u>
		Stress (psi)	<u>86.14</u> <u>182.81</u>
		CBR	<u>8.6</u> <u>12.2</u>



Remarks: No zero-point correction. All material passed the 3/4" sieve.

Remarks: No zero-point correction. All material passed the 3/4" sieve.

Aaron Hackett
Lab Manager

Jeff Elliott, P.E.
CMT & SI Dept. Manager

Aaron Hackett
Lab Manager

Jeff Elliott, P.E.
CMT & SI Dept. Manager



Report on California Bearing Ratio (ASTM D 1883/AASHTO T 193)

Date	<u>1/23/2019</u>	Project Name	<u>R-2707E</u>
Sample No.	<u>S-4, Run #1</u>	Project No.	<u>18-0173.145</u>
Sample Location	<u>-L- 970+00 94' LT</u>	Client	<u>NCDOT</u>



Report on California Bearing Ratio (ASTM D 1883/AASHTO T 193)

Date	<u>1/23/2019</u>	Project Name	<u>R-2707E</u>
Sample No.	<u>S-4, Run #2</u>	Project No.	<u>18-0173.145</u>
Sample Location	<u>-L- 970+00 94' LT</u>	Client	<u>NCDOT</u>

Proctor and Classification Data

Sample Description	<u>N/A</u>
Classification	<u>A-5</u>
Max. Dry Density	<u>96.3</u>
Optimum Moisture	<u>17.9%</u>

CBR Preparation Data

Rammer Used	<u>5.5 lb, 12" drop</u>
Compaction Method	<u>3 Layers, 56 Blows</u>
Surcharge Amount	<u>10 lbs</u>
Soaked/Unsoaked	<u>Soaked</u>

Proctor and Classification Data

Sample Description	<u>N/A</u>
Classification	<u>A-5</u>
Max. Dry Density	<u>96.3</u>
Optimum Moisture	<u>17.9%</u>

CBR Preparation Data

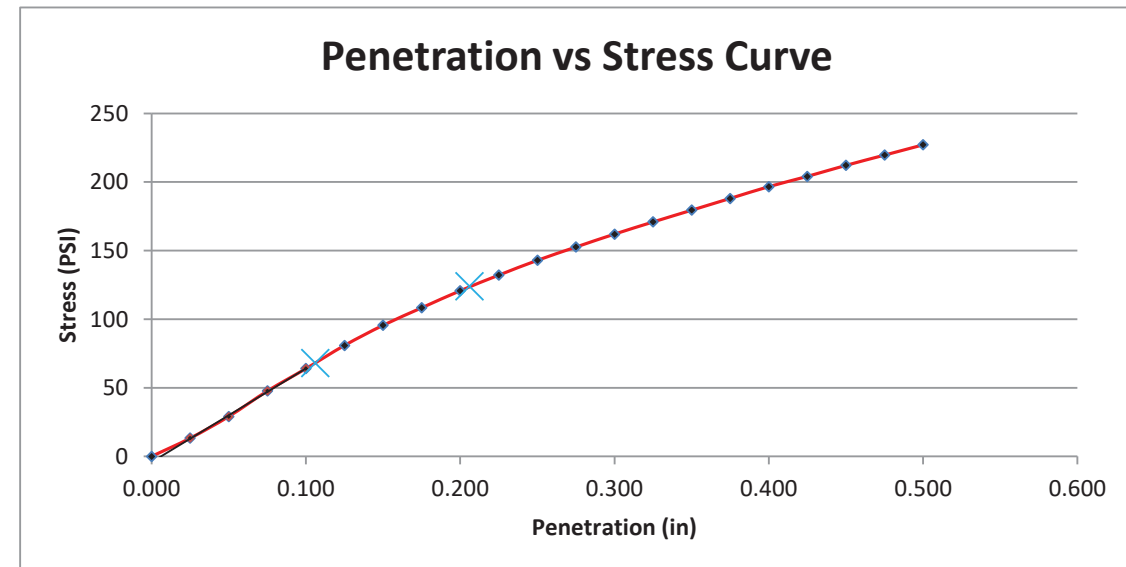
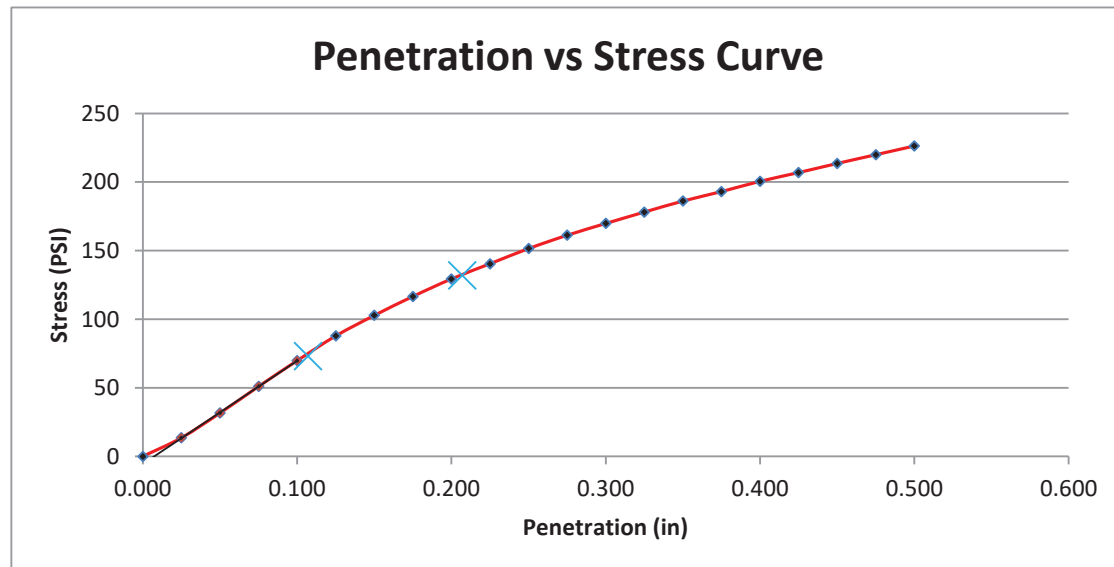
Rammer Used	<u>5.5 lb, 12" drop</u>
Compaction Method	<u>3 Layers, 56 Blows</u>
Surcharge Amount	<u>10 lbs</u>
Soaked/Unsoaked	<u>Soaked</u>

CBR Results

Compaction Moisture Content	<u>18.3%</u>	Dry unit weight (lbs/cu.ft)	<u>97.4</u>
Moisture Content of Top 1"		Percent of Max. Dry Density	<u>101.1%</u>
After Soaking	<u>25.3%</u>		
		CBR Values	
Swell	<u>0.7%</u>	Penetration (in)	<u>0.100 0.200</u>
		Stress (psi)	<u>73.00 132.00</u>
		CBR	<u>7.3 8.8</u>

CBR Results

Compaction Moisture Content	<u>18.3%</u>	Dry unit weight (lbs/cu.ft)	<u>97.5</u>
Moisture Content of Top 1"		Percent of Max. Dry Density	<u>101.3%</u>
After Soaking	<u>28.2%</u>		
		CBR Values	
Swell	<u>0.8%</u>	Penetration (in)	<u>0.100 0.200</u>
		Stress (psi)	<u>68.00 124.00</u>
		CBR	<u>6.8 8.3</u>



Remarks: Zero-point correction applied. All material passed the 3/4" sieve.

Remarks: Zero-point correction applied. All material passed the 3/4" sieve.

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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.	R-2707E	1	47

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:
- 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.
 - 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

HPC

TRIGON

GOODNIGHT, D.W.

WEIS, J.M.

LANE, R.W.

INVESTIGATED BY FALCON ENG.

DRAWN BY HILL, M. J.

CHECKED BY HUNSBERGER, W. S.

SUBMITTED BY FALCON ENG.

DATE OCTOBER 2018

ROADWAY
SUBSURFACE INVESTIGATION

COUNTY CLEVELAND

PROJECT DESCRIPTION US 74, SHELBY BYPASS FROM
WEST OF SR 2238 (LONG BRANCH RD.)

TO WEST OF SR 1001

INVENTORY

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LINE	STATION	PLAN	PROFILE
-L-	851+00.00 - 990+00.00	4-13	16-26
-Y42RPA-	10+00.00 - 23+66.43	6,7	27
-Y42RPB-	10+00.00 - 25+75.11	6	28
-Y42RPC-	10+00.00 - 25+48.29	6	29
-Y42RPD-	10+00.00 - 30+11.39	6,7	30
-RABTI-	10+00.00 - 12+89.02	6	31
-Y4I-	10+00.00 - 17+37.51	6,15	32
-Y42-	10+00.00 - 15+34.00	6	32
-Y46-	10+75.00 - 14+79.57	9	33
-SR6-	11+50.00 - 31+03.30	5,6	34
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-SR8-	10+75.00 - 35+75.00	8-10	38
-SR9-	10+00.00 - 21+38.92	6	39
-SR10-	10+20.00 - 28+50.00	6,14	40

APPENDICES

APPENDIX	TITLE	SHEETS
A	CORE LOGS AND PHOTOGRAPHS	41-42

REFERENCE: R-2707E

PROJECT: 34497



DocuSigned by:

W. Scott Hunsberger

10/26/2018 11:43:33 AM PDT

SIGNATURE

DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

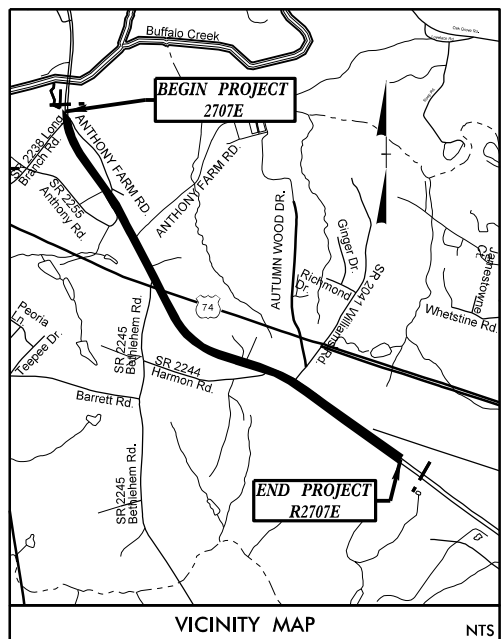
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
<p>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, VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</p>										<p>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.</p>										<p>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 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:</p>										<p>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 DISLOADED 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 (ROD) - 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 (SROD) - 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.</p>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
<p>SOIL LEGEND AND AASHTO CLASSIFICATION</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <th rowspan="2">GENERAL CLASS.</th> <th colspan="5">GRANULAR MATERIALS (≤ 35% PASSING #200)</th> <th colspan="5">SILT-CLAY MATERIALS (> 35% PASSING #200)</th> <th colspan="5">ORGANIC MATERIALS</th> </tr> <tr> <th>A-1</th> <th>A-3</th> <th>A-2</th> <th>A-4</th> <th>A-5</th> <th>A-6</th> <th>A-7</th> <th>A-1, A-2</th> <th>A-3</th> <th>A-4, A-5</th> <th>A-6, A-7</th> <th></th> <th></th> <th></th> <th></th> </tr> <tr> <td>GROUP CLASS.</td> <td>A-1-a</td> <td>A-1-b</td> <td>A-2-4</td> <td>A-2-5</td> <td>A-2-6</td> <td>A-2-7</td> <td>A-4</td> <td>A-5</td> <td>A-6</td> <td>A-7</td> <td>A-1, A-2</td> <td>A-3</td> <td>A-4, A-5</td> <td>A-6, A-7</td> <td></td> </tr> <tr> <td>SYMBOL</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>% PASSING #10 #40 #200</td> <td>50 MX 30 MX 15 MX</td> <td>50 MX 25 MX</td> <td>51 MN 35 MX 35 MX</td> <td>40 MX 35 MX</td> <td>41 MN 35 MX</td> <td>41 MN 35 MX</td> <td>40 MX 36 MN</td> <td>41 MN 36 MN</td> <td>40 MX 36 MN</td> <td>41 MN 36 MN</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>MATERIAL PASSING #40 LL PI</td> <td>- 6 MX</td> <td>- NP</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>GROUP INDEX</td> <td>0</td> <td>0</td> <td>0</td> <td>4 MX</td> <td>8 MX</td> <td>12 MX</td> <td>16 MX</td> <td>NO MX</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>USUAL TYPES OF MAJOR MATERIALS</td> <td>STONE FRAGS. GRAVEL, AND SAND</td> <td>FINE SAND</td> <td>SILTY OR CLAYEY GRAVEL AND SAND</td> <td>SILTY SOILS</td> <td>CLAYEY SOILS</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>GEN. RATING AS SUBGRADE</td> <td colspan="5">EXCELLENT TO GOOD</td> <td colspan="5">FAIR TO POOR</td> <td>FAIR TO POOR</td> <td>POOR</td> <td>UNSUITABLE</td> </tr> <tr> <td colspan="10">PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30</td> <td colspan="10"></td> </tr> <tr> <td colspan="10"> <p>CONSISTENCY OR DENSENESS</p> <table border="1" style="width: 100%;"> <tr> <th>PRIMARY SOIL TYPE</th> <th>COMPACTNESS OR CONSISTENCY</th> <th>RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)</th> <th>RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)</th> </tr> <tr> <td>GENERALLY GRANULAR MATERIAL (NON-COHESIVE)</td> <td>VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE</td> <td>< 4 4 TO 10 10 TO 30 30 TO 50 > 50</td> <td>N/A</td> </tr> <tr> <td>GENERALLY SILT-CLAY MATERIAL (COHESIVE)</td> <td>VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD</td> <td>< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30</td> <td>< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4</td> </tr> </table> </td> <td colspan="10"> <p>MISCELLANEOUS SYMBOLS</p> <table border="1" style="width: 100%;"> <tr> <td></td> <td>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION</td> <td></td> <td>DIP & DIP DIRECTION OF ROCK STRUCTURES</td> <td></td> <td>SLOPE INDICATOR INSTALLATION</td> </tr> <tr> <td></td> <td>SOIL SYMBOL</td> <td></td> <td>TEST BORING</td> <td></td> <td>CONE PENETROMETER TEST</td> </tr> <tr> <td></td> <td>ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT</td> <td></td> <td>AUGER BORING</td> <td></td> <td>SOUNDING ROD</td> </tr> <tr> <td></td> <td>INFERRED SOIL BOUNDARY</td> <td></td> <td>CORE BORING</td> <td></td> <td>MONITORING WELL</td> </tr> <tr> <td></td> <td>INFERRED ROCK LINE</td> <td></td> <td>PIEZOMETER INSTALLATION</td> <td></td> <td>TEST BORING WITH CORE</td> </tr> <tr> <td></td> <td>ALLUVIAL SOIL BOUNDARY</td> <td></td> <td>SPT N-VALUE</td> <td></td> <td></td> </tr> </table> </td> </tr> <tr> <td colspan="10"> <p>TEXTURE OR GRAIN SIZE</p> <table border="1" style="width: 100%;"> <tr> <th>U.S. STD. 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CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.</td> </tr> <tr> <th>SOFT</th> <td>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.</td> </tr> <tr> <th>VERY SOFT</th> <td>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.</td> </tr> </table> </td> </tr> <tr> <td colspan="10"> <p>FRACTURE SPACING</p> <table border="1" style="width: 100%;"> <tr> <th>TERM</th> <th>SPACING</th> </tr> <tr> <td>VERY WIDE</td> <td>MORE THAN 10 FEET</td> </tr> <tr> <td>WIDE</td> <td>3 TO 10 FEET</td> </tr> <tr> <td>MODERATELY CLOSE</td> <td>1 TO 3 FEET</td> </tr> <tr> <td>CLOSE</td> <td>0.16 TO 1 FOOT</td> </tr> <tr> <td>VERY CLOSE</td> <td>LESS THAN 0.16 FEET</td> </tr> </table> </td> <td colspan="10"> <p>BEDDING</p> <table border="1" style="width: 100%;"> <tr> <th>TERM</th> <th>THICKNESS</th> </tr> <tr> <td>VERY THICKLY BEDDED</td> <td>4 FEET</td> </tr> <tr> <td>THICKLY BEDDED</td> <td>1.5 - 4 FEET</td> </tr> <tr> <td>THINLY BEDDED</td> <td>0.16 - 1.5 FEET</td> </tr> <tr> <td>VERY THINLY BEDDED</td> <td>0.03 - 0.16 FEET</td> </tr> <tr> <td>THICKLY LAMINATED</td> <td>0.008 - 0.03 FEET</td> </tr> <tr> <td>THINLY LAMINATED</td> <td>< 0.008 FEET</td> </tr> </table> </td> </tr> <tr> <td colspan="10"> <p>INDURATION</p> <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <table border="1" style="width: 100%;"> <tr> <td>FRIABLE</td> <td>RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</td> </tr> <tr> <td>MODERATELY INDURATED</td> <td>GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</td> </tr> <tr> <td>INDURATED</td> <td>GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</td> </tr> <tr> <td>EXTREMELY INDURATED</td> <td>SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</td> </tr> </table> </td> <td colspan="10"> <p>BENCH MARK:</p> <p>BORING ELEVATIONS TAKEN FROM R2707_Is.trn.I80309.tin</p> <p>DATED 03/28/18 ELEVATION: FEET</p> <p>NOTES:</p> <p>FIAD - FILLED IMMEDIATELY AFTER DRILLING</p> </td> </tr> </table>										GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)					SILT-CLAY MATERIALS (> 35% PASSING #200)					ORGANIC MATERIALS					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					GROUP CLASS.	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7	A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7		SYMBOL																% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 35 MX 35 MX	40 MX 35 MX	41 MN 35 MX	41 MN 35 MX	40 MX 36 MN	41 MN 36 MN	40 MX 36 MN	41 MN 36 MN						MATERIAL PASSING #40 LL PI	- 6 MX	- NP	40 MX 41 MN 10 MX 11 MN	40 MX 41 MN 10 MX 11 MN	40 MX 41 MN 10 MX 11 MN	40 MX 41 MN 10 MX 11 MN	40 MX 41 MN 10 MX 11 MN	40 MX 41 MN 10 MX 11 MN	40 MX 41 MN 10 MX 11 MN	40 MX 41 MN 10 MX 11 MN						GROUP INDEX	0	0	0	4 MX	8 MX	12 MX	16 MX	NO MX								USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND	FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND	SILTY SOILS	CLAYEY SOILS											GEN. 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TIP PROJECT: R-2707E

CONTRACT: 34497

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



25% PLAN SUBMITTAL

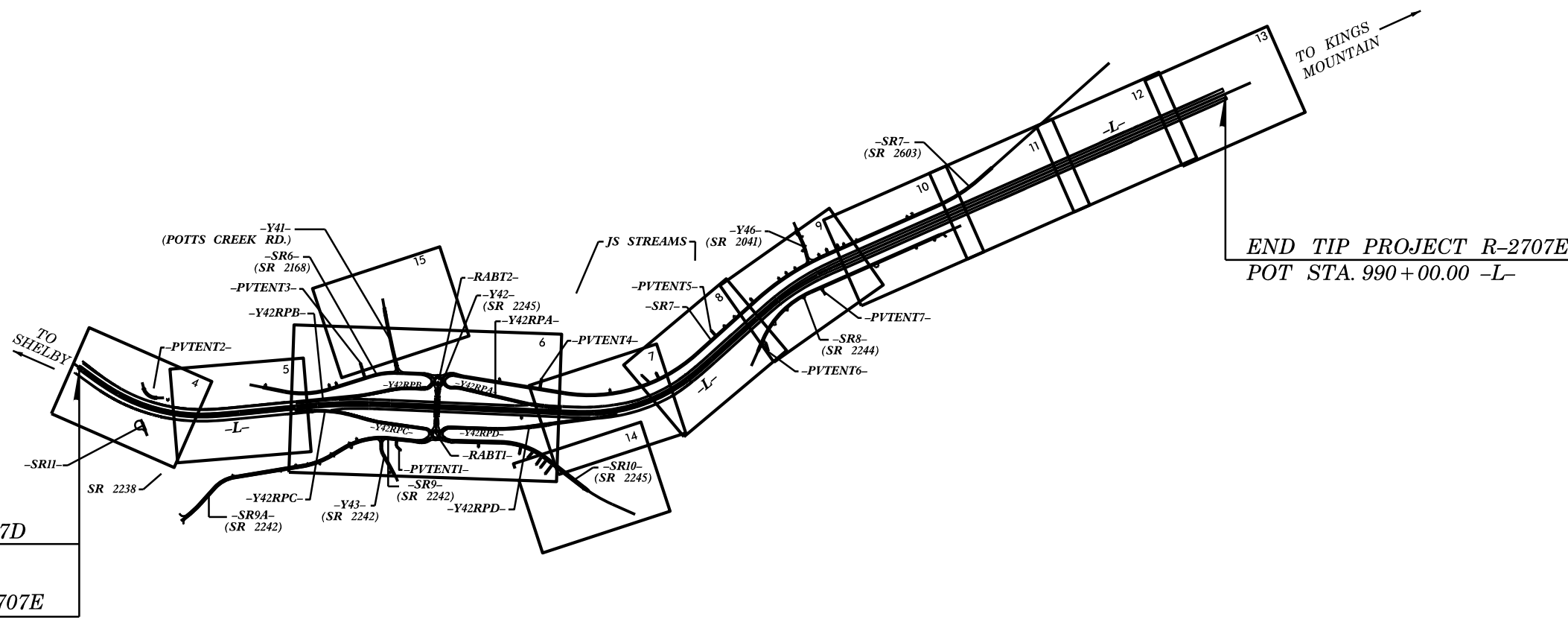
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CLEVELAND COUNTY

LOCATION: US 74 FROM EXISTING US 74 WEST OF SR 2238
(LONG BRANCH ROAD) TO WEST OF SR 1001

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURE, & SIGNING

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2707E	3	47
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34497.1.F56	N/A	P.E.	



END TIP PROJECT R-2707D
POT STA. 851+00.00 -L-

BEGIN TIP PROJECT R-2707E
POT STA. 851+00.00 -L-

END TIP PROJECT R-2707E
POT STA. 990+00.00 -L-

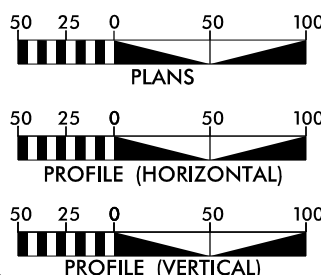
THIS PROJECT IS NOT WITHIN ANY CITY LIMITS

THIS IS A CONTROLLED ACCESS PROJECT
WITH ACCESS BEING LIMITED TO INTERCHANGES

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

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



DESIGN DATA

ADT 2019 = 41,600
ADT 2040 = 59,200
K = 11 %
D = 55 %
T = 15 % *
V = 70 MPH
* TTST = 10% DUAL 5%
FUNC CLASS = FREEWAY

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT R-2707E = 2.63 MI.
TOTAL LENGTH OF TIP PROJECT R-2707E = 2.63 MI.



PREPARED IN THE OFFICE OF:
STANTEC CONSULTING
801 Jones Franklin Road | Suite 300 | Raleigh, NC 27606
Tel. (919) 851-6866 | Fax. (919) 851-7024 | www.stantec.com
License No. F-0672

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 2018

LETTING DATE:
FEBRUARY 19, 2019

JOSEPH T. KELVINGTON, P.E.
PROJECT ENGINEER

MICHAEL D. LINDGREN, P.E.
PROJECT DESIGN ENGINEER

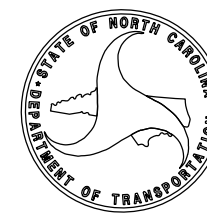
J. B. MCSWAIN
NCDOT DIVISION 12

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.





WBS: 34497.1.1
TIP: R-2707E
COUNTY: Cleveland
DESCRIPTION: US 74, Shelby Bypass From West of SR 2238 (Long Branch Road) to West of SR 1001
SUBJECT: Roadway Subsurface Investigation – Inventory

Roadway Subsurface Investigation Report - Inventory

US 74, Shelby Bypass from West of SR 2238 (Long Branch Road) to West of SR 1001
Cleveland County, North Carolina
WBS: 34497.1.1 TIP: R-2707E
Falcon Project No.: G17053.00

Prepared for:
Stantec
801 Jones Franklin Road, Suite 300
Raleigh, NC 27606-3563

Submitted by:
Falcon Engineering, Inc.
1210 Trinity Road, Suite 110
Cary, North Carolina 27513
(919) 871-0800
www.falconengineers.com

October 26, 2018

PROJECT DESCRIPTION

This project consists of 2.6 miles of proposed widening in Cleveland County. Existing US 74 will be widened/improved from the beginning of the project west of Long Branch Road to west of the existing US 74 Business Interchange. The bypass will include multiple ramps, service roads, and structures. Multiple side streets and attached drives will be widened, realigned, or graded at various locations, including a new grade separated interchange near existing Potts Creek Road with multiple service roads.

Included in this project is one bridge structure over the mainline. Borings for the bridge structure are not included herein and will be submitted under separate cover. Various stream relocations are proposed, and borings for those locations have been submitted separately.

The investigation was conducted between December 4, 2017 and May 1, 2018 in general accordance with our Proposal to Provide Geotechnical Engineering Services, dated July 12, 2017. The recommendations provided in this report are based solely on our site reconnaissance, soil test borings and laboratory test data, engineering evaluation of these data, and generally accepted soil and foundation engineering practices and principles.

A total of one hundred and fifty-eight (158) Standard Penetration Test (SPT) borings were drilled for the proposed roadway alignments. All mechanical borings were drilled using a CME-550X or Mobil B-57 ATV rig equipped with 2 ¼-inch inside diameter hollow-stem augers, and SPT testing was performed with an automatic hammer. Representative soil samples, collected with a split-barrel sampler or hand auger, were selected for laboratory testing to verify visual field classifications.





The following alignments, totaling approximately 2.63 miles were explicitly investigated. Other minor Y-lines and driveways are included on the project but improvements are not anticipated to be significant enough to warrant investigation.

<u>Alignment</u>	<u>Station (ft)</u>
-L- (Shelby Bypass)	851+00—990+00
-Y42RPA-	10+00.00—23+66.43
-Y42RPB-	10+00.00—25+75.11
-Y42RPC-	10+00.00—25+48.29
-Y42RPD-	10+00.00—30+11.39
-RABT1-	10+00.00—12+89.02
-Y41-	10+00.00—17+37.51
-Y42-	10+00.00—15+34.00
-Y46-	10+75.00—14+79.57
-SR6-	11+50.00—31+03.30
- SR7-	10+20.00—79+52.00
- SR8-	10+75.00—35+75.00
- SR9-	10+00.00—21+38.92
- SR10-	10+20.00—28+50.00

In many instances, multiple alignments run parallel, and a single boring may be considered relevant to two or more alignments.

AREAS OF SPECIAL GEOTECHNICAL INTEREST

- I. Shallow ground water was measured within the following area and may cause groundwater related stability problems during construction:

<u>Alignment</u>	<u>Station (ft)</u>
-SR10-	18+00

- II. Alluvial soils were encountered near the following locations. The potential for shallow groundwater and wet, soft or organic soils should be anticipated at these locations:

<u>Alignment</u>	<u>Station (ft)</u>
-L-	858+95
-L-	903+00

Isolated alluvial soils are likely to exist elsewhere on the site between borings in proximity to natural waterways.

- III. Artificial fill was encountered at the following locations:

<u>Alignment</u>	<u>Station (ft)</u>
-L-	903+00
-SR10-	20+00
-SR7-	62+48
-SR7-	72+00 – 75+93

- IV. Roadway Embankment was encountered at the following locations associated with private drives:

<u>Alignment</u>	<u>Station (ft)</u>
-L-	895+00 – 897+00
-L-	906+05
-L-	935+00
-L-	939+00
-L-	951+00 – 953+00
-L-	974+98 – 979+00
-L-	987+00 – 988+97
-Y42RPB-	22+00
-SR7-	26+03 – 28+00
-SR8-	21+00





- V. Shallow rock, within 6 feet of proposed subgrade was encountered at the following locations:

<u>Alignment</u>	<u>Station (ft)</u>
-L-	851+00 – 858+00
-L-	911+00 – 914+00
-SR7-	29+00 – 33+00

- VI. A small pond will be filled at the following location:

<u>Alignment</u>	<u>Station (ft)</u>
-SR10-	10+00 – 11+00

PHYSIOGRAPHY AND GEOLOGY

According to the *Geologic Map of North Carolina* (1985), the project site is in the Inner Piedmont Belt Physiographic Province of North Carolina. Specifically, bedrock at the site is noted as Cherryville Granite (**Mc**). The Cherryville Granite is of the Mississippian subperiod and is noted to consist of granite – massive to weakly foliated; containing pegmatites.

Existing site topography is typical of North Carolina's foothills region. The foothills region is a portion of the Western Piedmont that approaches the mountain region. Terrain is typically more rugged than the majority of the piedmont, but with less overall elevation change than the mountain region. Topography along the project is generally rolling, with steep ravines in the vicinity of streams. The existing ground surface generally grades upward in the upstation direction, with elevations ranging from a high of around 845 feet to a low of around 670 feet.

Existing land use is a mix of agriculture, residential, industrial, and commercial, with the majority of the project along the existing US 74 corridor. The corridor is heavily developed with mainly residential and commercial buildings.





SOIL PROPERTIES

A variety of soils were encountered along the project, including existing roadway embankments, artificial fill, alluvial deposits, residual soils, weathered rock and crystalline rock. Areas where soils at the ground surface are of a unique origin (i.e. not residual soils) are approximately delineated on the boring location plans based on subsurface conditions encountered in nearby borings, and various topographical, vegetative, or other visual surface features.

Topsoil and rootmat was encountered in grassy, brushy, and wooded areas ranging in thickness from 0.1 to 0.5 feet, and typically on the order of 0.3 to 0.4 feet.

Artificial Fill soils were encountered at the ground surface or beneath topsoil/rootmat. Consisting of approximately 3 to 8 feet of moist to wet, very loose to loose, silty sands (A-2-4) and moist to wet, very soft to stiff, sandy and silty clays (A-6, A-7).

Roadway Embankment soils were encountered at the ground surface or beneath topsoil/rootmat adjacent to existing roadways. These consist of 3 to 19 feet of moist to wet, very loose to medium dense, silty sand (A-2-4) and moist to wet, soft to very stiff, sandy silt and sandy and silty clay (A-4, A-6, A-7).

Alluvial soils were encountered at the ground surface or below artificial fill near the historic floodplains of natural waterways. These soils extended to depths of up to approximately 17 feet and consist of wet, very soft, silty clays (A-7) and loose to medium dense, silty and clayey sands (A-2-4, A-2-6) with trace amounts of organic material.

Residual soils were encountered at the ground surface, or beneath artificial fill, roadway embankments or alluvial deposits. These soils consist of dry to wet, loose to dense, clayey and silty sands (A-2-4 and A-2-6) and very soft to very stiff, sandy clay and silt, clayey silt, and silty clays (A-4, A-5, A-6, A-7).

Weathered Rock (WR) is a very hard material with properties intermediate of soil and rock. WR is classified as having an N-value of greater than 100 blows per one foot. WR encountered on the project generally consists of tan, white and gray weathered granite.

Crystalline Rock, in the form of granite, was encountered beneath weathered rock or residual soils at various locations throughout the site. CR is classified as material that yields auger refusal or SPT refusal (blow count of 60/0.0 or 60/0.1 feet.)

GROUNDWATER PROPERTIES

Groundwater levels were measured at the time of boring completion, and in many cases after a waiting period of at least 24 hours. Borings drilled within and in close proximity to existing roadways, and within residential or livestock areas were backfilled immediately after completion due to safety considerations.

Groundwater levels across the site were generally deep, with the exception of areas near streams and existing low, wet areas. One existing pond was noted within the project right of way limits. Nine wells were noted within the project right of way.





CLOSING

Falcon appreciates the opportunity to have provided our geotechnical engineering services for the above referenced project. If you have any questions concerning the contents of this report or need additional information, please do not hesitate to contact our office.

FALCON ENGINEERING, INC.

Report Prepared By:

Report Reviewed By:

A handwritten signature in blue ink, appearing to read "W. Scott Hunsberger".

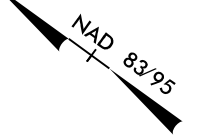
A handwritten signature in blue ink, appearing to read "Jeremy R. Hamm".

W. Scott Hunsberger, PE
Geotechnical Engineer

Jeremy R. Hamm, PE
Geotechnical Engineering Manager



PROJECT REFERENCE NO. R-2707E	SHEET NO. 4
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	

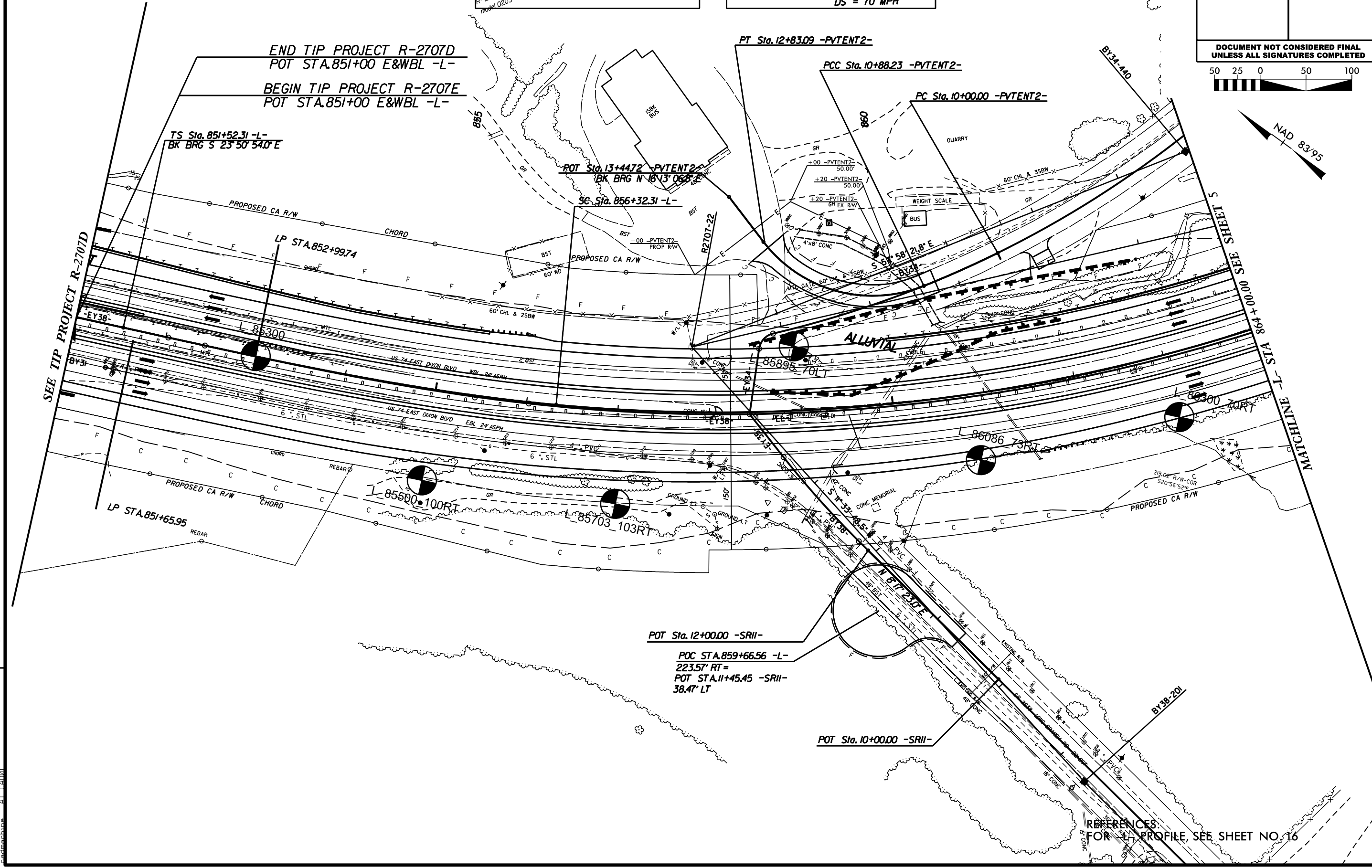


-PV TENT 2-

PI Sta 12+02.15 Δ = 74° 25' 49.3" (RT) D = 38' 11" 49.9" L = 194.86' T = 113.92' R = 150.00'	PI Sta 10+44.14 Δ = 4° 23' 44.6" (RT) D = 4' 58" 56.1" L = 88.23' T = 44.14' R = 1150.00'
---	--

-L-

PIs Sta 854+72.58 Θs = 7° 11' 58.1" Ls = 480.00' LT = 320.27' ST = 160.24'	PI Sta 860+97.91 Δ = 27° 23' 57.3" (LT) D = 2' 59" 59.2" L = 913.38' T = 465.59' R = 1910.00' SE = 08 DS = 70 MPH
--	--



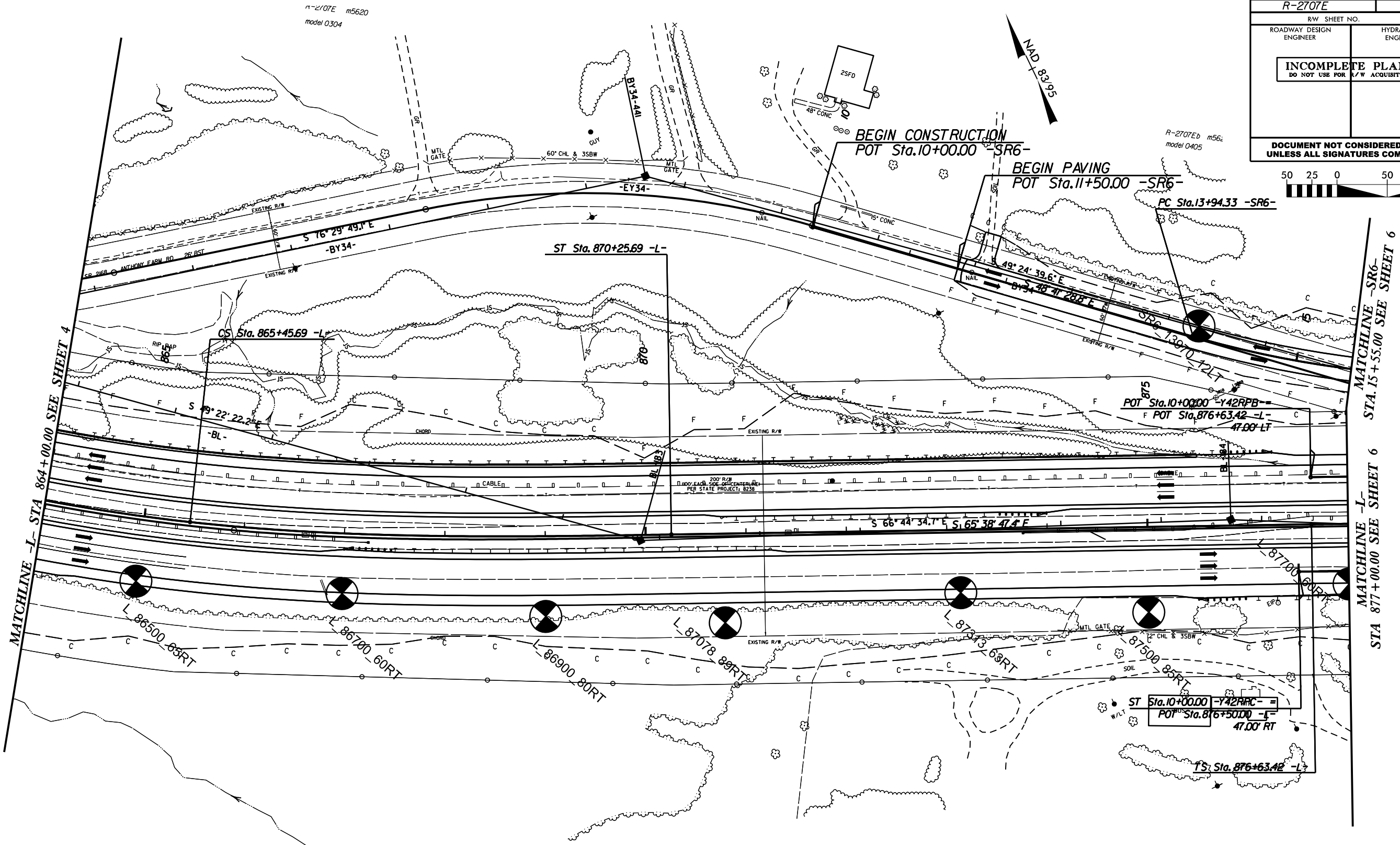
POT Sta. 12+00.00 -SR11-
POC STA. 859+66.56 -L-
223.57' RT=
POT STA. 11+45.45 -SR11-
38.47' LT

POT Sta. 10+00.00 -SR11-

REFERENCES FOR 31 PROFILE, SEE SHEET NO. 16

REVISIONS
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PROJECT REFERENCE NO. R-2707E	SHEET NO. 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	



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-L-		-L-		-SR6-	
PI Sta 860+97.91	PIs Sta 867+05.93	PIs Sta 878+23.42	PI Sta 16+60.45		
$\Delta = 27^\circ 23' 57.3''$ (LT)	$\Theta_s = 7' 11'' 58.1''$	$\Theta_s = 1' 11'' 59.7''$	$\Delta = 28^\circ 42' 22.6''$ (LT)		
$D = 2' 59' 59.2''$	$L_s = 480.00'$	$L_s = 240.00'$	$D = 5' 30' 33.2''$		
$L = 913.38'$	$LT = 320.27'$	$LT = 160.00'$	$L = 521.06'$		
$T = 465.59'$	$ST = 160.24'$	$ST = 80.00'$	$T = 266.12'$		
$R = 1,910.00'$			$R = 1,040.00'$		
$SE = .08$			$SE = .06$		
$DS = 70$ MPH			$RO = 150'$		
			$DS = 50$ MPH		

REFERENCES:
 FOR -L- PROFILE, SEE SHEET NO. 17
 FOR -SR6- PROFILE, SEE SHEET NO. 34

PROJECT REFERENCE NO.	SHEET NO.
R-2707E	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



-SR7-
 PI Sta 32+5676
 $\Delta = 51^{\circ}10'17.0''$ (LT)
 $D = 3^{\circ}13'07.9''$
 $L = 1,589.73'$
 $T = 852.29'$
 $R = 1,780.00'$
 $SE = .05$
 $RO = 1250'$
 $DS = 50$ MPH

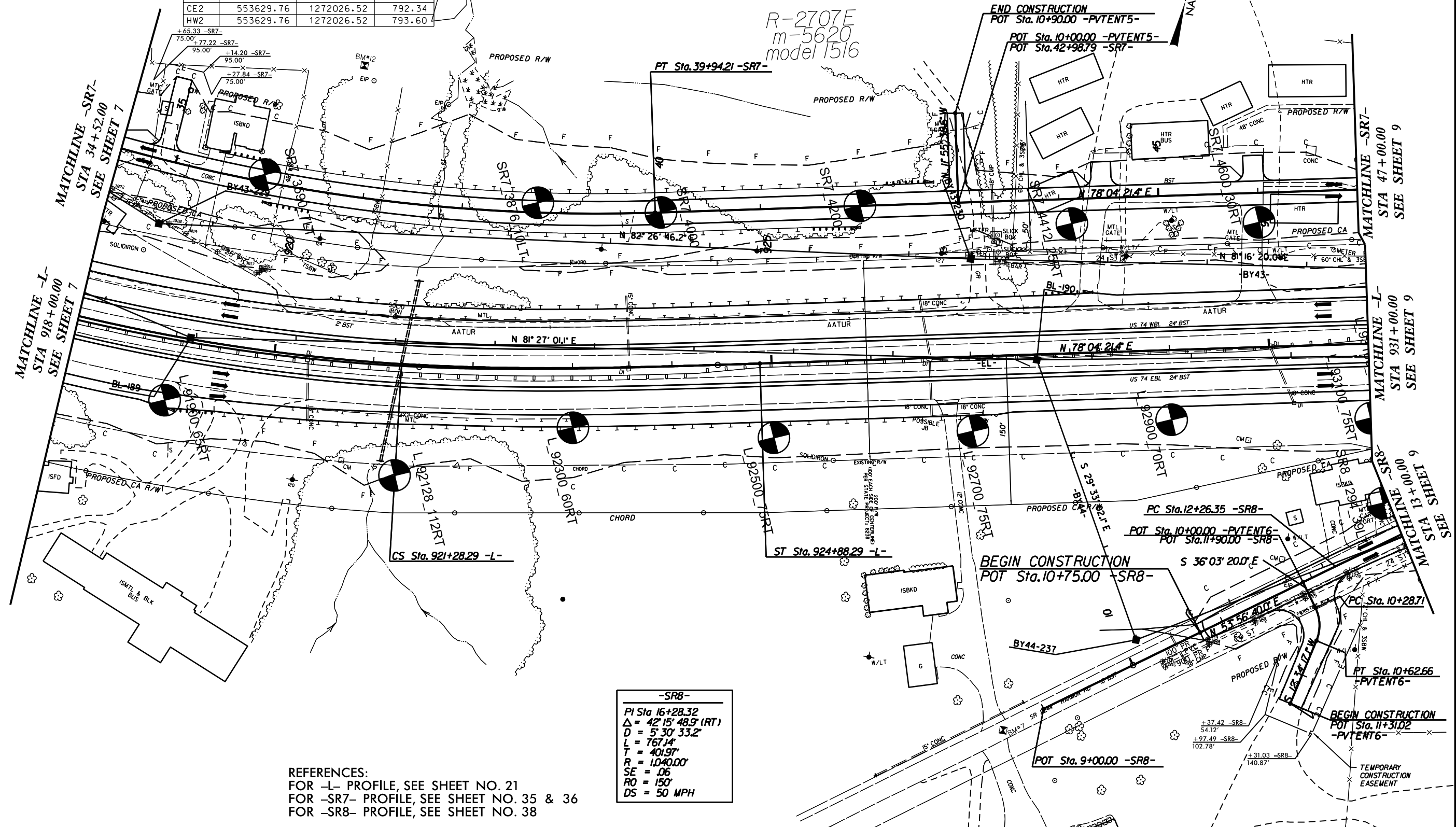
-L-
 PI Sta 915+8405
 $\Delta = 33^{\circ}39'17.0''$ (LT)
 $D = 2^{\circ}59'59.2''$
 $L = 1,121.91'$
 $T = 577.66'$
 $R = 1,910.00'$
 $SE = .08$
 $DS = 70$ MPH

PIs Sta 922+48.40
 $\Theta_s = 5^{\circ}23'58.6''$
 $L_s = 360.00'$
 $LT = 240.11'$
 $ST = 120.10'$

-SR8-
 PI Sta 16+28.32
 $\Delta = 42^{\circ}15'48.9''$ (RT)
 $D = 5^{\circ}30'33.2''$
 $L = 767.14'$
 $T = 401.97'$
 $R = 1,040.00'$
 $SE = .06$
 $RO = 150'$
 $DS = 50$ MPH

	NORTH	EAST	ELEV.
L1	553444.45	1272018.76	799.85
JL2	553444.38	1272020.76	799.85
CE1	553444.90	1272019.43	801.85
HW1	553444.90	1272019.43	803.75
CUL3	553630.54	1272025.34	790.34
CUL4	553630.47	1272027.34	790.34
CE2	553629.76	1272026.52	792.34
HW2	553629.76	1272026.52	793.60

CULVERT #1
ONE BARREL



REFERENCES:
 FOR -L- PROFILE, SEE SHEET NO. 21
 FOR -SR7- PROFILE, SEE SHEET NO. 35 & 36
 FOR -SR8- PROFILE, SEE SHEET NO. 38

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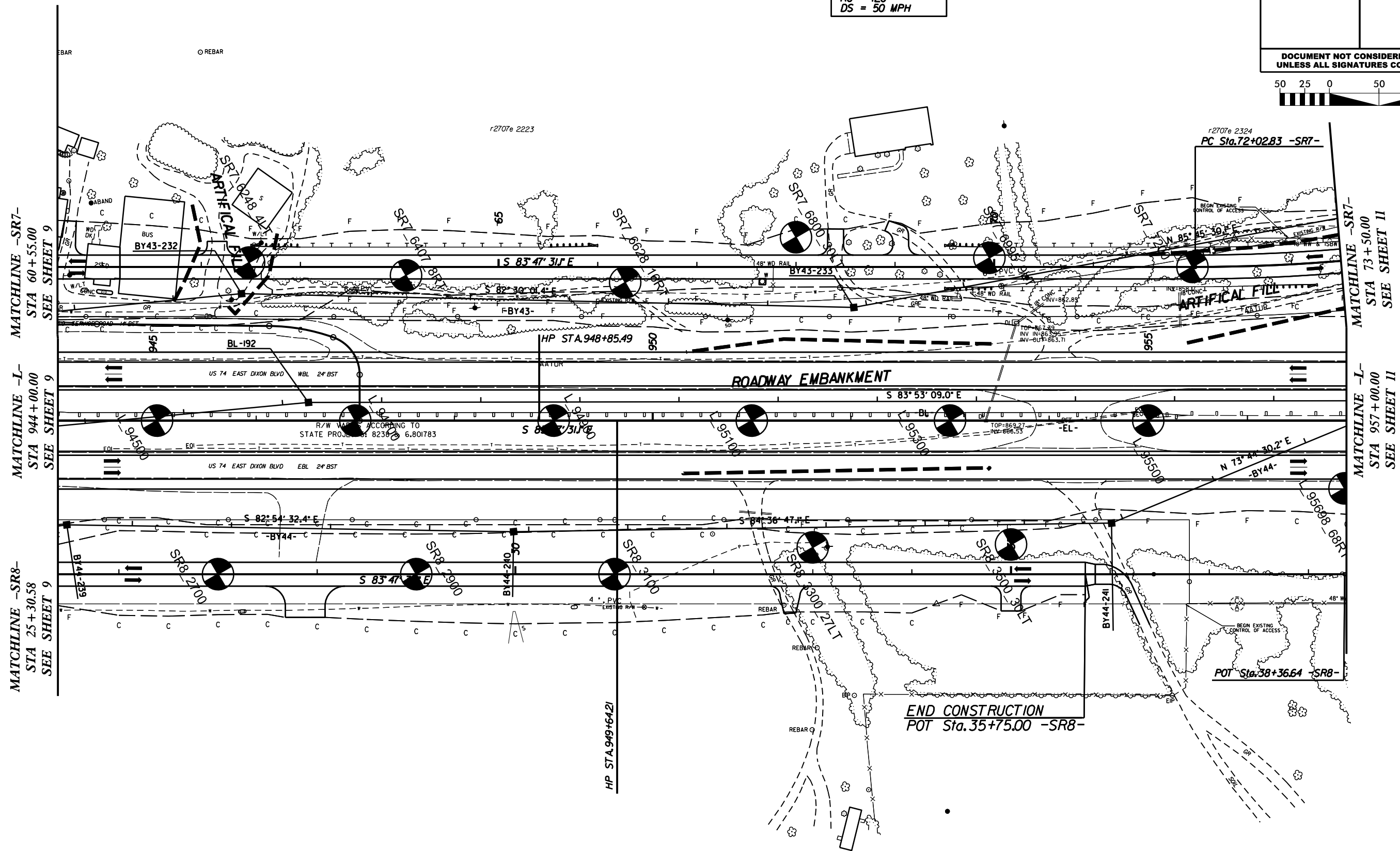
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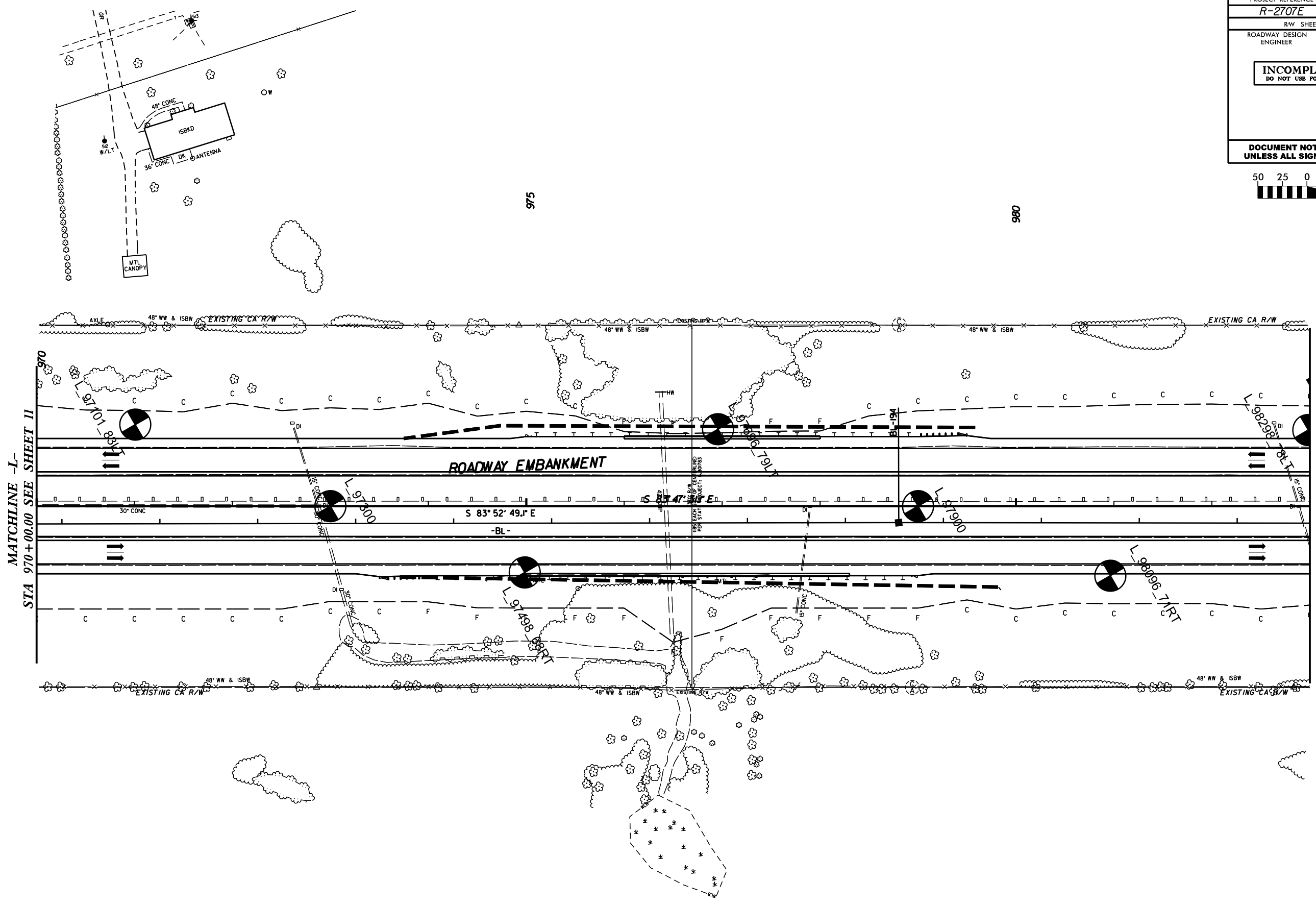
-SR7-
PI Sta 74+83.67
 $\Delta = 17^{\circ} 55' 53.6" (LT)$
 $D = 3^{\circ} 13' 07.9"$
 $L = 557.08'$
 $T = 280.83'$
 $R = 1780.00'$
 $SE = .05$
 $RO = 120'$
 $DS = 50 MPH$

PROJECT REFERENCE NO.	SHEET NO.
R-2707E	10
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	



REFERENCES:
 FOR -L- PROFILE, SEE SHEET NO. 23
 FOR -SR7- PROFILE, SEE SHEET NO. 36 & 37
 FOR -SR8- PROFILE, SEE SHEET NO. 38

PROJECT REFERENCE NO. <i>R-2707E</i>	SHEET NO. <i>12</i>
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	



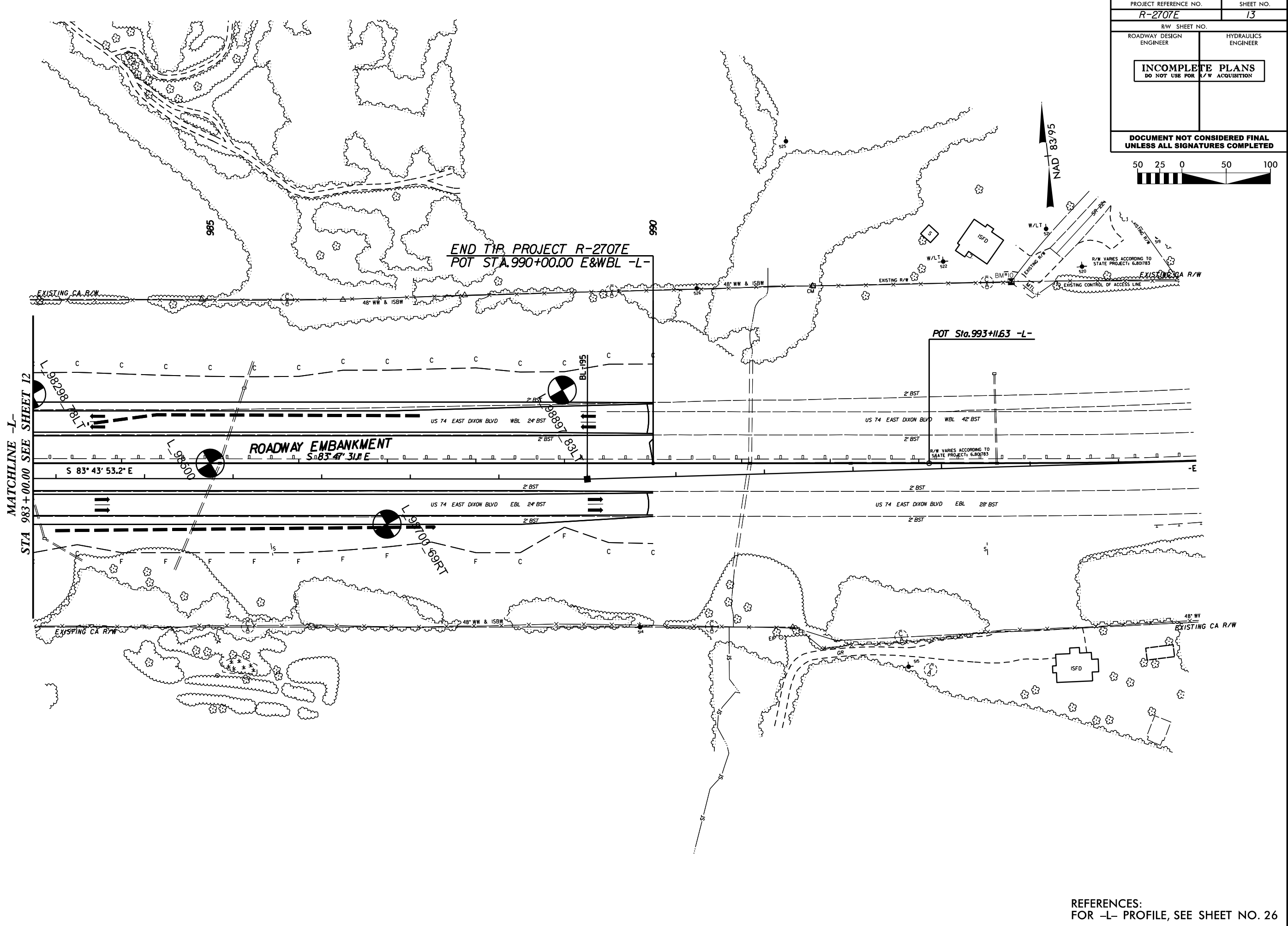
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 8/17/18

REFERENCES:
FOR -L- PROFILE, SEE SHEET NO. 25

PROJECT REFERENCE NO. <i>R-2707E</i>	SHEET NO. <i>13</i>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



NAD 83/95



END TIP, PROJECT R-2707E
POT STA. 990+00.00 E&WBL -L-

POT Sta. 993+11.63 -L-

MATCHLINE -L-
STA 983+00.00 SEE SHEET 12

REVISIONS

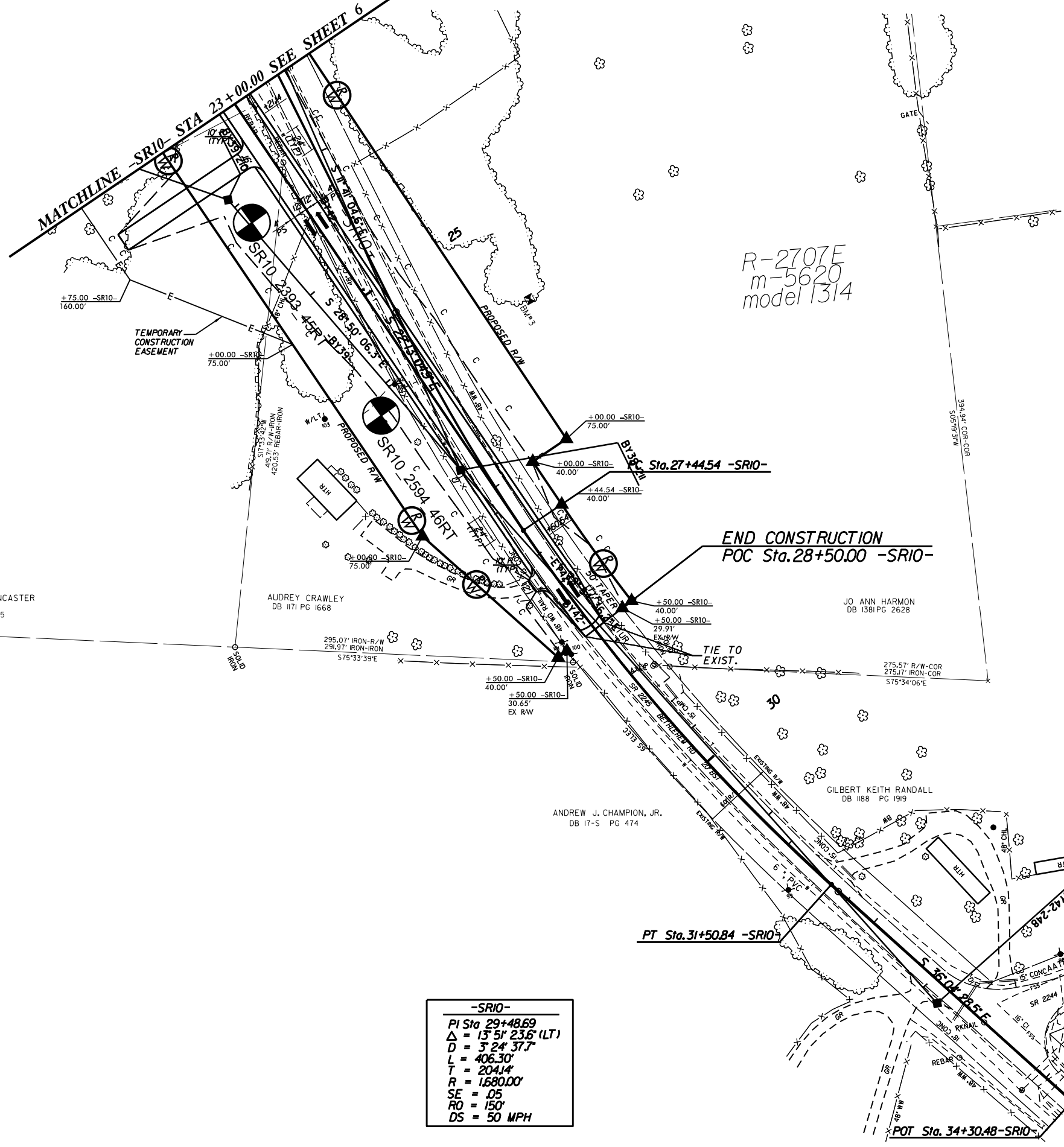
REFERENCES:
FOR -L- PROFILE, SEE SHEET NO. 26

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 8/17/19

PROJECT REFERENCE NO. R-2707E	SHEET NO. 14
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	



R-2707E
m-5620
model 1314



-SRIO-	
PI Sta	29+48.69
Δ	13° 51' 23.6" (LT)
D	3' 24' 37.7"
L	406.30'
T	204.14'
R	1680.00'
SE	.05
RO	150'
DS	50 MPH

REFERENCES:
FOR -SRIO- PROFILE, SEE SHEET NO. 40

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 8/17/18

PROJECT REFERENCE NO. <i>R-2707E</i>	SHEET NO. <i>15</i>
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



-Y41-
 PI Sta 12+57.79
 $\Delta = 3^{\circ}17'32.0''$ (LT)
 $D = 0^{\circ}27'36.7''$
 $L = 715.38'$
 $T = 357.79'$
 $R = 12,450.00'$
 $SE = NC$

-L-
 PI Sta 881+92.35
 $\Delta = 5^{\circ}46'23.6''$ (RT)
 $D = 0^{\circ}59'59.7''$
 $L = 577.37'$
 $R = 288.93'$
 $T = 57.30.00'$
 $SE = 04'$
 $DS = 70$ MPH

PI Sta 885+60.79
 $\Delta = 1^{\circ}11'59.7''$
 $Ls = 240.00'$
 $LT = 160.00'$
 $ST = 80.00'$

-SR6-
 PI Sta 16+60.45
 $\Delta = 28^{\circ}42'22.6''$ (LT)
 $D = 5^{\circ}30'33.2''$
 $L = 521.06'$
 $R = 266.12'$
 $T = 1040.00'$
 $SE = 06'$
 $RO = 150'$
 $DS = 50$ MPH

PI Sta 25+48.94
 $\Delta = 20^{\circ}11'49.7''$ (RT)
 $D = 6^{\circ}52'41.7''$
 $L = 293.64'$
 $R = 148.36'$
 $T = 833.00'$
 $SE = 06'$
 $RO = 150'$
 $DS = 50$ MPH

PI Sta 30+24.33
 $\Delta = 27^{\circ}09'52.8''$ (RT)
 $D = 31^{\circ}49'51.6''$
 $L = 85.34'$
 $R = 43.49'$
 $T = 180.00'$
 $SE = 02'$
 $RO = 40'$
 $DS = 15$ MPH

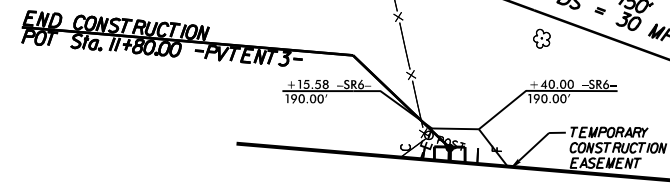
-Y42RPB-
 PI Sta 17+03.65
 $\Delta = 4^{\circ}00'00.0''$ (LT)
 $D = 1^{\circ}18'07.8''$
 $L = 307.18'$
 $T = 153.65'$
 $SE = 4.400.00'$

PIs Sta 19+07.18
 $\Delta = 0^{\circ}58'35.9''$
 $Ls = 150.00'$
 $LT = 100.00'$
 $ST = 50.00'$

-SR6-
 PI Sta 21+07.22
 $\Delta = 4^{\circ}59'48.2''$
 $D = 100.04'$
 $ST = 50.04'$

PI Sta 22+21.4
 $\Delta = 8^{\circ}39'44.3''$ (RT)
 $D = 127.78'$
 $L = 63.97'$
 $R = 860.00'$
 $T = 05'$
 $SE = 150'$
 $RO = 30$ MPH

PI Sta 25+08.57
 $\Delta = 60^{\circ}09'16.2''$ (LT)
 $D = 57^{\circ}17'44.8''$
 $L = 104.99'$
 $R = 57.91'$
 $T = 100.00'$
 $SE = 02'$
 $RO = 160'$
 $DS = 15$ MPH



MATCHLINE -Y41- STA 15+50.00 SEE SHEET 6

REVISIONS
 15-AUG-2018 13:47
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 8/17/18

REFERENCES:
 FOR -Y41- PROFILE, SEE SHEET NO. 32

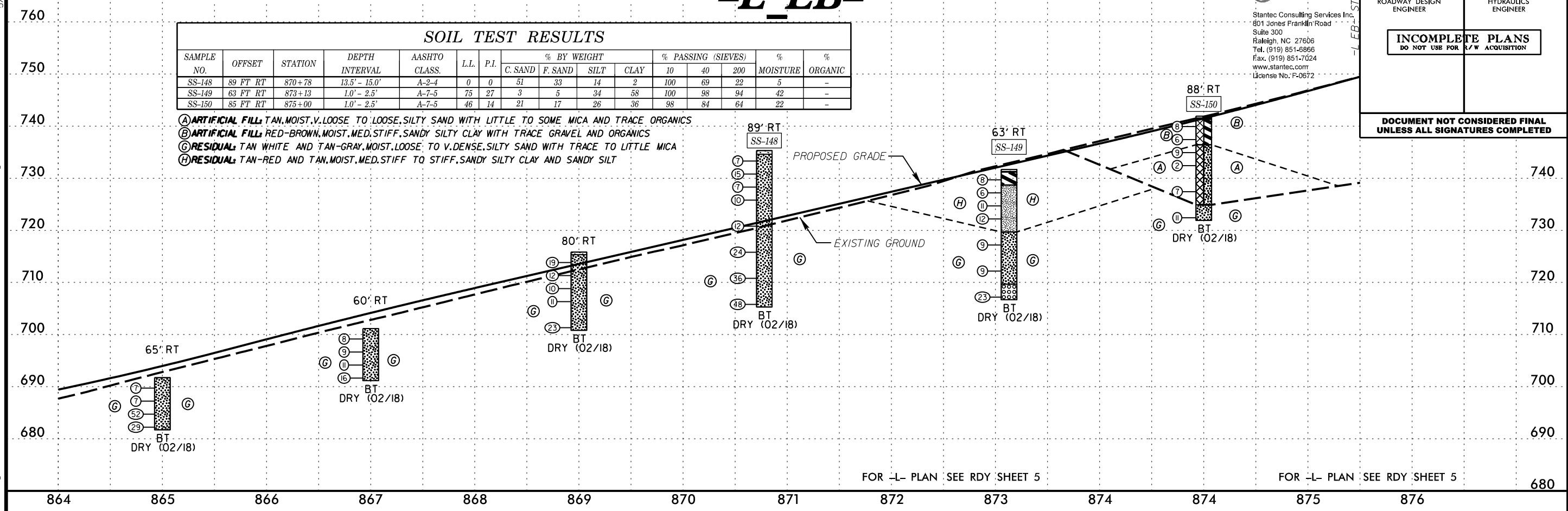
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PROJECT REFERENCE NO. R2707E	SHEET NO. 17
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

SOIL TEST RESULTS															
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		
SS-148	89 FT RT	870+78	13.5' - 15.0'	A-2-4	0	0	51	33	14	2	100	69	22	5	-
SS-149	63 FT RT	873+13	1.0' - 2.5'	A-7-5	75	27	3	5	34	58	100	98	94	42	-
SS-150	85 FT RT	875+00	1.0' - 2.5'	A-7-5	46	14	21	17	26	36	98	84	64	22	-

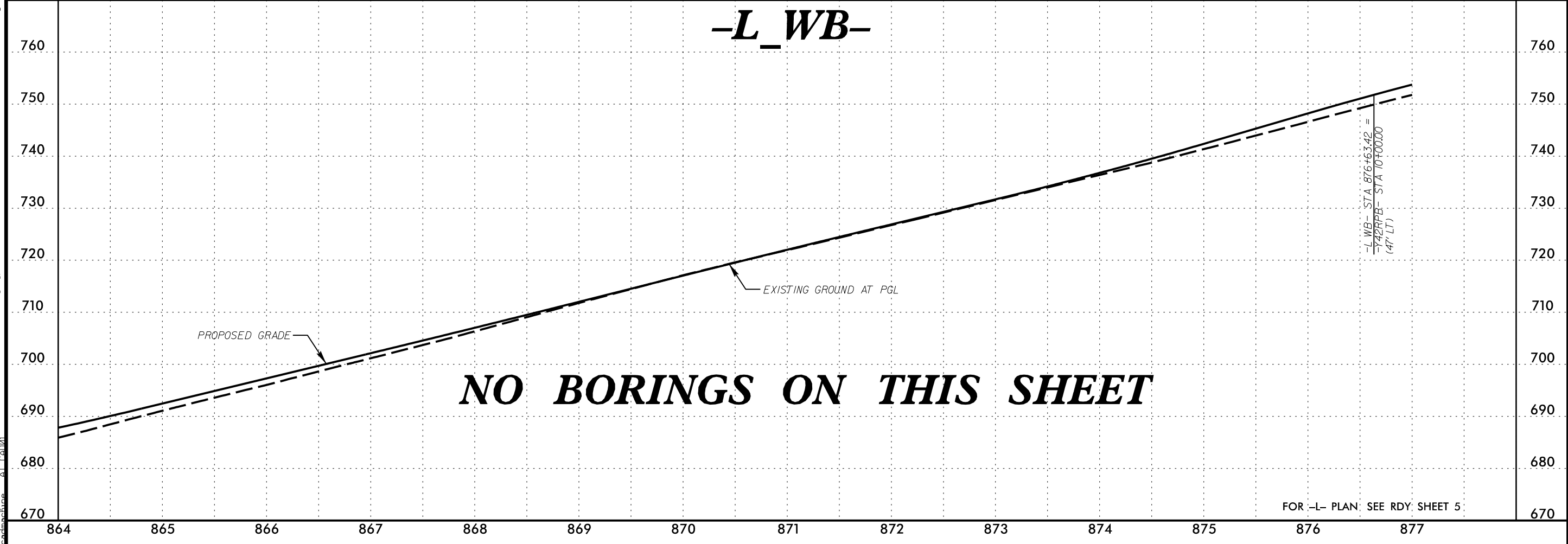
- (A) ARTIFICIAL FILL: TAN, MOIST, V. LOOSE TO LOOSE, SILTY SAND WITH LITTLE TO SOME MICA AND TRACE ORGANICS
- (B) ARTIFICIAL FILL: RED-BROWN, MOIST, MED. STIFF, SANDY SILTY CLAY WITH TRACE GRAVEL AND ORGANICS
- (C) RESIDUAL: TAN WHITE AND TAN-GRAY, MOIST, LOOSE TO V. DENSE, SILTY SAND WITH TRACE TO LITTLE MICA
- (H) RESIDUAL: TAN-RED AND TAN, MOIST, MED. STIFF TO STIFF, SANDY SILTY CLAY AND SANDY SILT



FOR -L- PLAN SEE RDY SHEET 5

FOR -L- PLAN SEE RDY SHEET 5

-L_WB-



NO BORINGS ON THIS SHEET

FOR -L- PLAN, SEE RDY SHEET 5

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 17 - L_EB - STA 876
 17 - L_WB - STA 876+63.42 = -Y42RFB - STA 10F00.00 (47' LT)

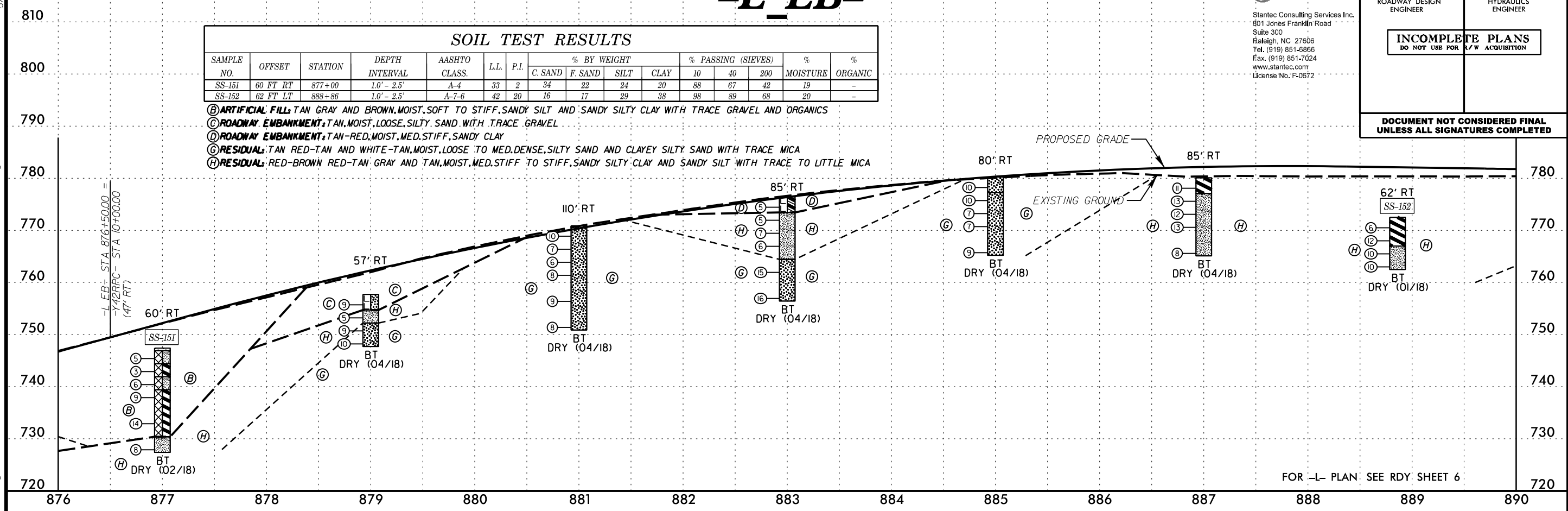
-L_EB-

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PROJECT REFERENCE NO. R-2707E	SHEET NO. 18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

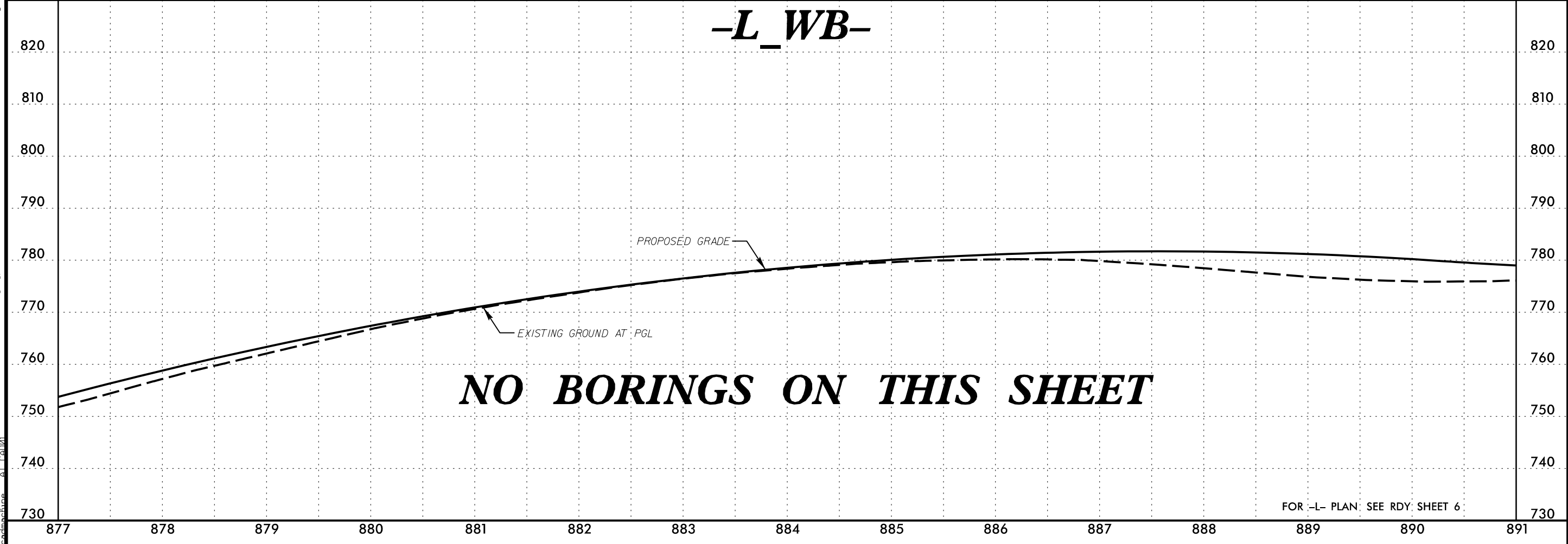
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-151	60 FT RT	877+00	1.0' - 2.5'	A-4	33	2	34	22	24	20	88	67	42	19	-
SS-152	62 FT LT	888+86	1.0' - 2.5'	A-7-6	42	20	16	17	29	38	98	89	68	20	-

- (B) ARTIFICIAL FILL: TAN GRAY AND BROWN, MOIST, SOFT TO STIFF, SANDY SILT AND SANDY SILTY CLAY WITH TRACE GRAVEL AND ORGANICS
- (C) ROADWAY EMBANKMENT: TAN, MOIST, LOOSE, SILTY SAND WITH TRACE GRAVEL
- (D) ROADWAY EMBANKMENT: TAN-RED, MOIST, MED. STIFF, SANDY CLAY
- (G) RESIDUAL: TAN RED-TAN AND WHITE-TAN, MOIST, LOOSE TO MED. DENSE, SILTY SAND AND CLAYEY SILTY SAND WITH TRACE MICA
- (H) RESIDUAL: RED-BROWN RED-TAN, GRAY AND TAN, MOIST, MED. STIFF TO STIFF, SANDY SILTY CLAY AND SANDY SILT WITH TRACE TO LITTLE MICA



FOR -L- PLAN, SEE RDY. SHEET 6

-L_WB-



FOR -L- PLAN, SEE RDY. SHEET 6

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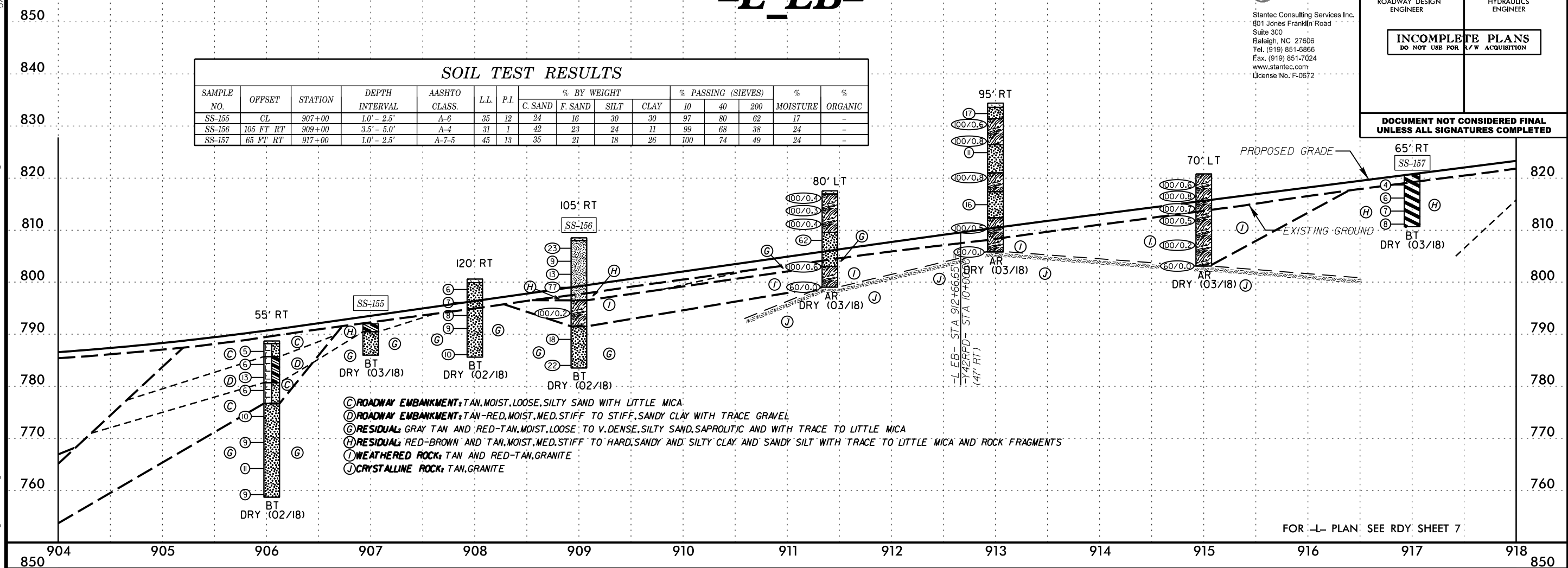
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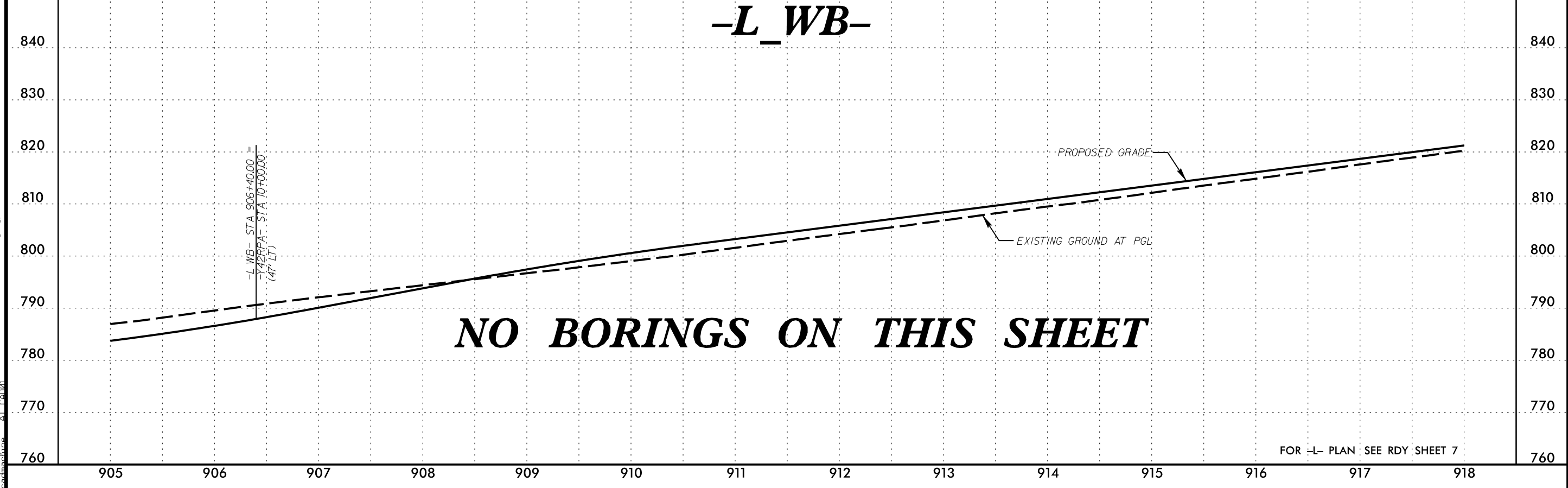
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PROJECT REFERENCE NO. R-2707E	SHEET NO. 20
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

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-155	CL	907+00	1.0' - 2.5'	A-6	35	12	24	16	30	30	97	80	62	17	-
SS-156	105 FT RT	909+00	3.5' - 5.0'	A-4	31	1	42	23	24	11	99	68	38	24	-
SS-157	65 FT RT	917+00	1.0' - 2.5'	A-7.5	45	13	35	21	18	26	100	74	49	24	-



-L_WB-



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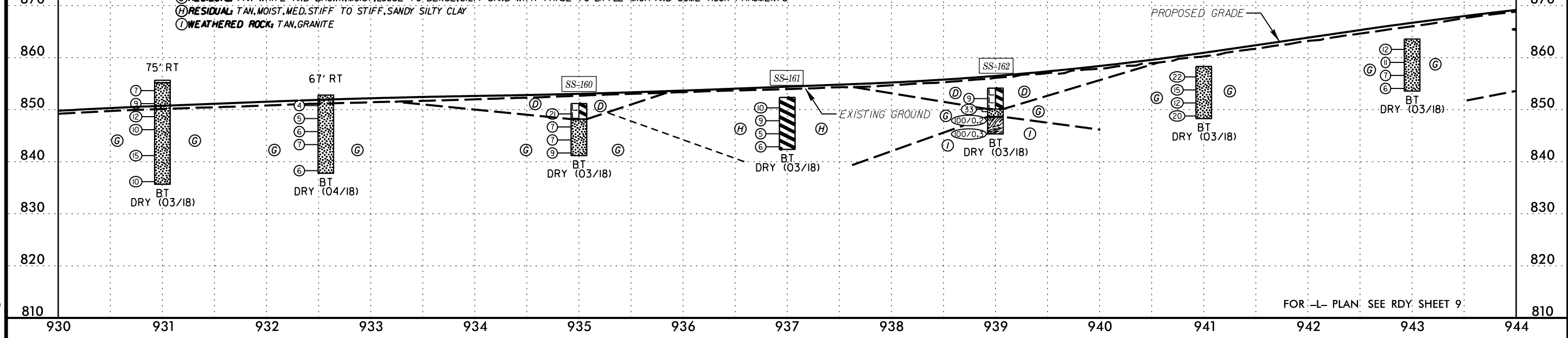
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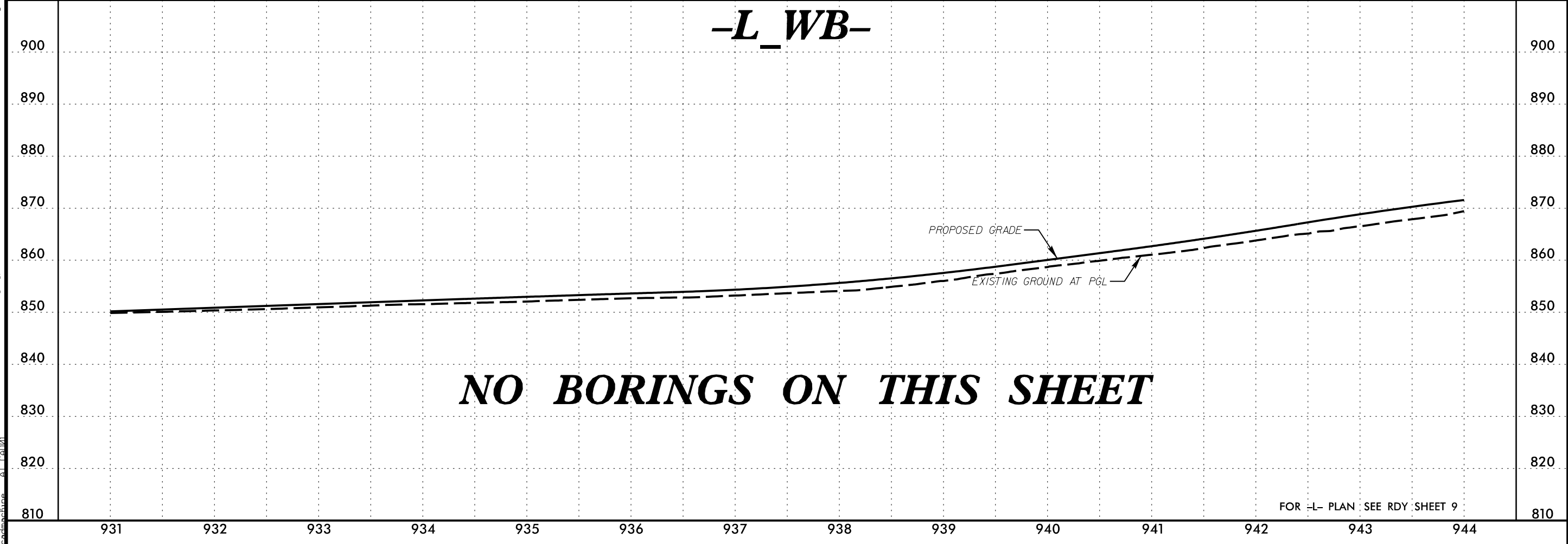
PROJECT REFERENCE NO. R-2707E	SHEET NO. 22
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

SOIL TEST RESULTS															
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		
SS-160	CL	935+00	1.0' - 2.5'	A-7-6	43	17	27	15	18	40	77	63	47	15	-
SS-161	CL	937+00	1.0' - 2.5'	A-7-5	48	15	25	19	25	81	99	84	61	21	-
SS-162	CL	939+00	1.0' - 2.5'	A-7-6	47	20	29	14	13	44	97	77	58	18	-

- Ⓓ **ROADWAY EMBANKMENT:** TAN AND TAN-RED, MOIST, STIFF TO V. STIFF, SANDY CLAY AND SILTY SAND CLAY WITH TRACE GRAVEL
- Ⓔ **RESIDUAL:** TAN WHITE AND BROWN, MOIST, LOOSE TO DENSE, SILTY SAND WITH TRACE TO LITTLE MICA AND SOME ROCK FRAGMENTS
- Ⓗ **RESIDUAL:** TAN, MOIST, MED. STIFF TO STIFF, SANDY SILTY CLAY
- Ⓘ **WEATHERED ROCK:** TAN, GRANITE



-L_WB-



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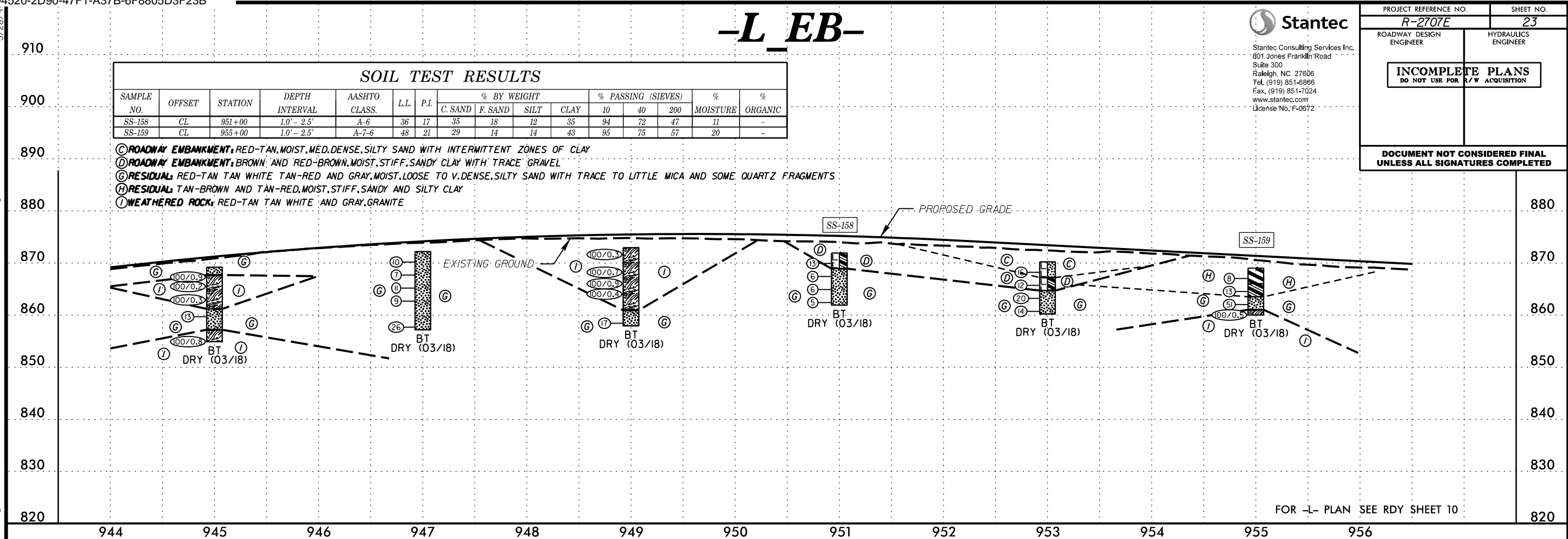


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PROJECT REFERENCE NO. R-2707E	SHEET NO. 23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

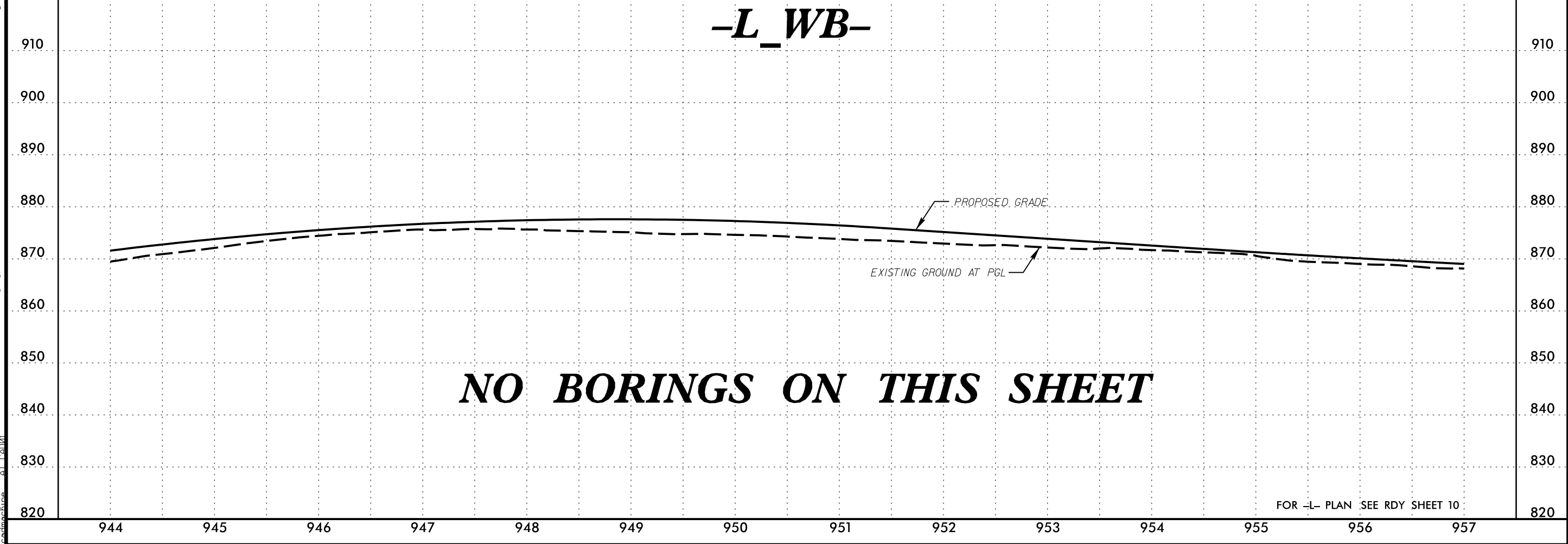
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-158	CL	951+00	1.0' - 2.5'	A-6	36	17	35	18	12	35	94	72	47	11	-
SS-159	CL	955+00	1.0' - 2.5'	A-7-6	48	21	29	14	14	43	95	75	57	20	-

- Ⓒ ROADWAY EMBANKMENT: RED-TAN, MOIST, MED. DENSE, SILTY SAND WITH INTERMITTENT ZONES OF CLAY
- Ⓓ ROADWAY EMBANKMENT: BROWN AND RED-BROWN, MOIST, STIFF, SANDY CLAY WITH TRACE GRAVEL
- Ⓔ RESIDUAL: RED-TAN TAN WHITE TAN-RED AND GRAY, MOIST, LOOSE TO V. DENSE, SILTY SAND WITH TRACE TO LITTLE MICA AND SOME QUARTZ FRAGMENTS
- Ⓕ RESIDUAL: TAN-BROWN AND TAN-RED, MOIST, STIFF, SANDY AND SILTY CLAY
- Ⓖ WEATHERED ROCK: RED-TAN TAN WHITE AND GRAY, GRANITE



FOR -L- PLAN SEE RDY SHEET 10

-L_WB-



NO BORINGS ON THIS SHEET

FOR -L- PLAN SEE RDY SHEET 10

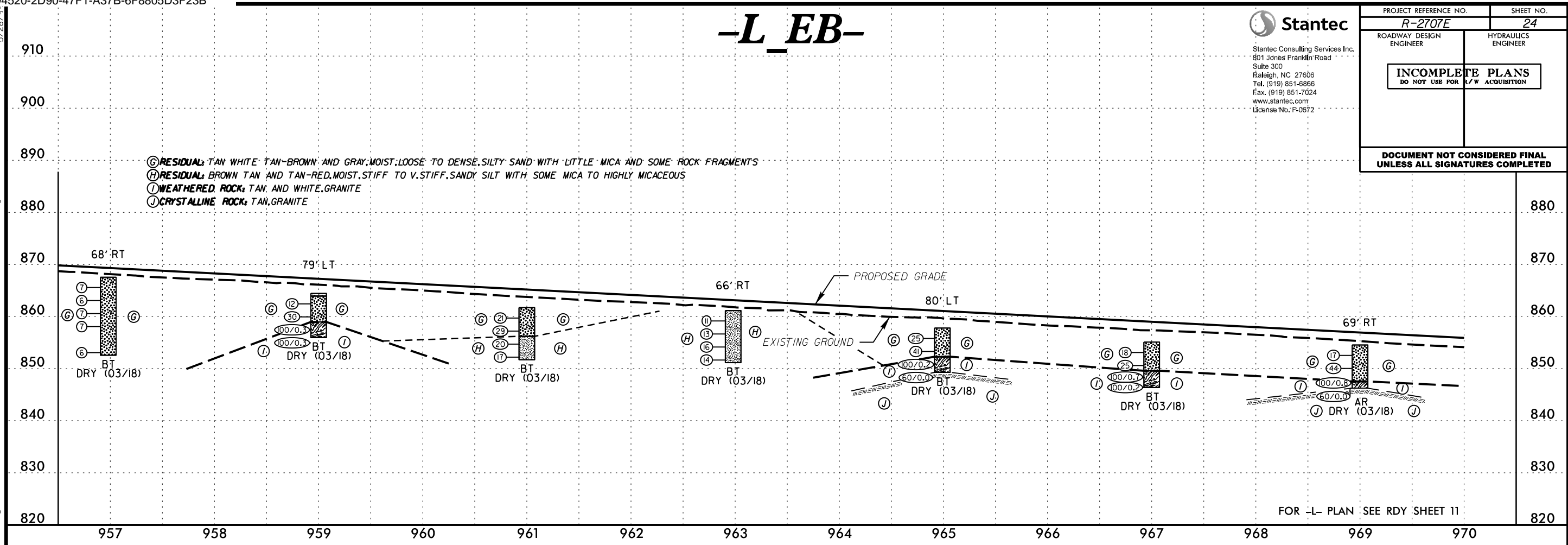
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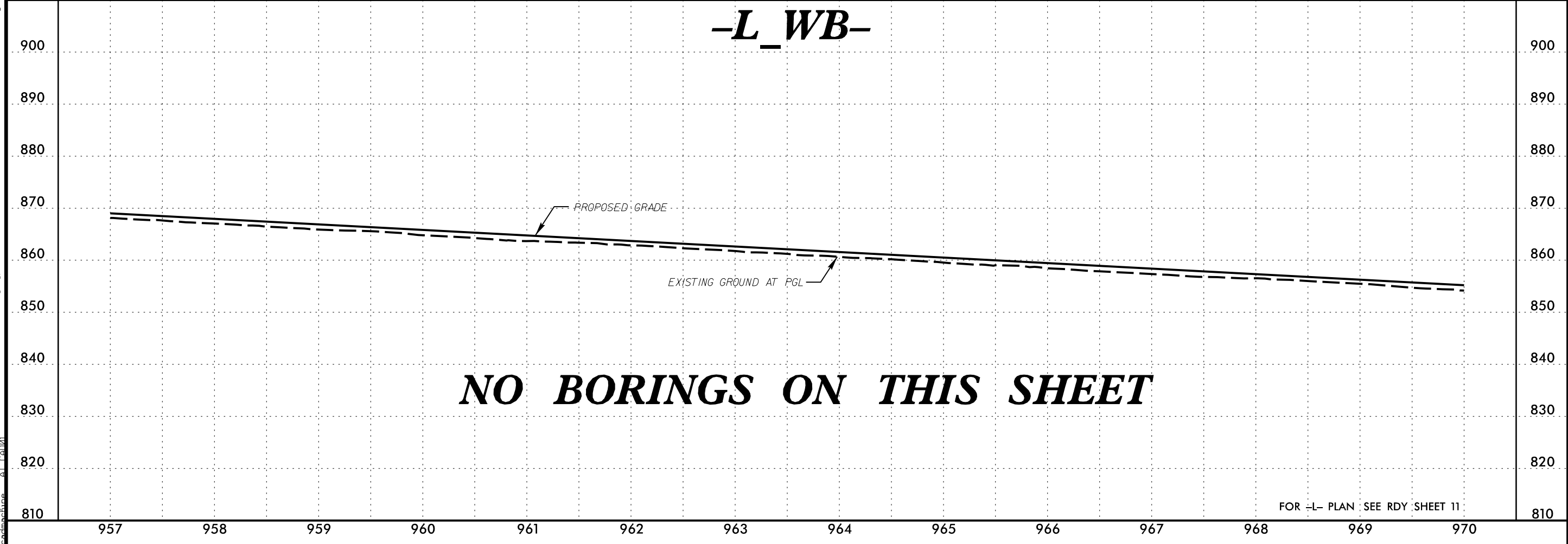


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PROJECT REFERENCE NO. <i>R-2707E</i>	SHEET NO. <i>24</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



-L_WB-



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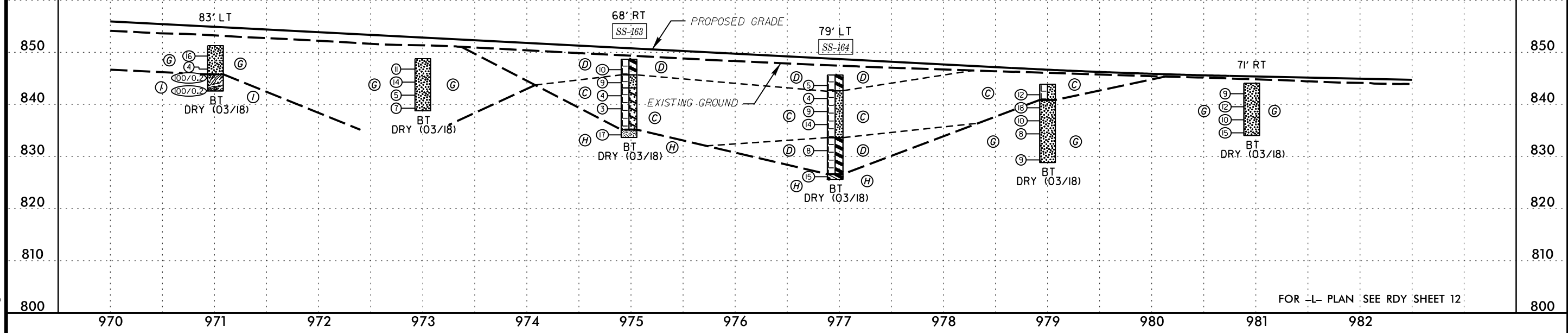
-L_EB-

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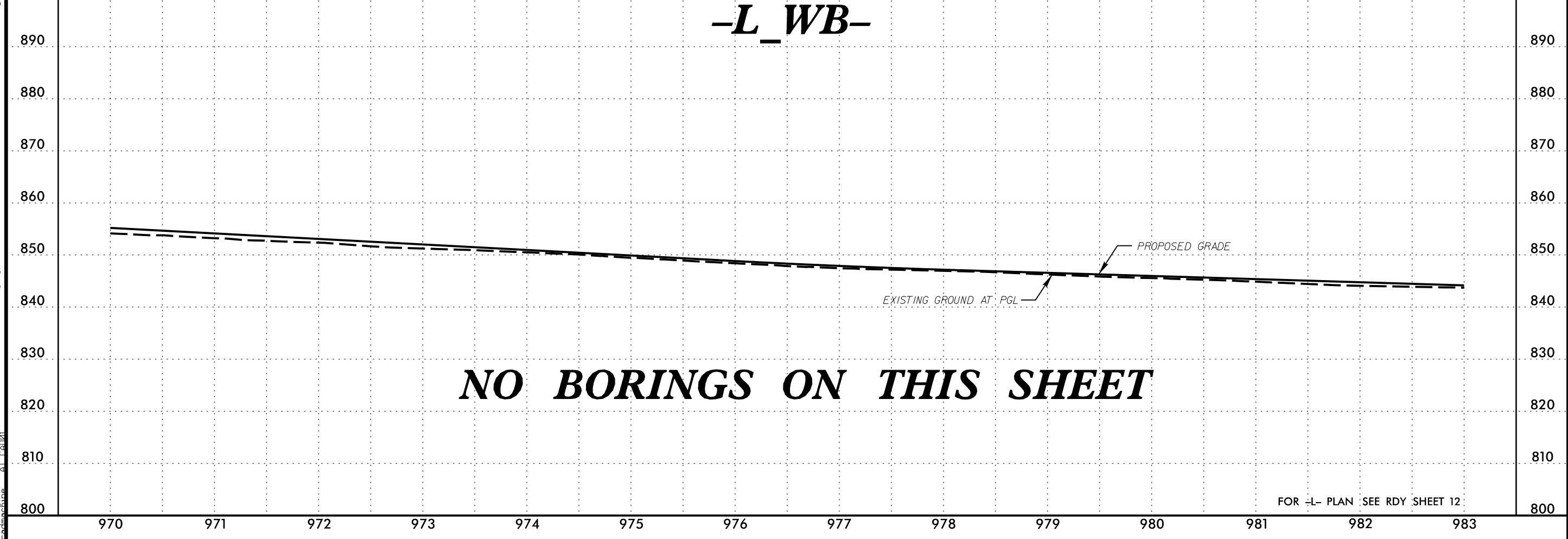
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INCOMPLETE PLANS DO NOT USE FOR ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

SOIL TEST RESULTS															
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		
SS-163	68 FT RT	974+98	1.0' - 2.5'	A-7-5	63	24	16	15	14	55	98	89	70	32	-
SS-164	79 FT LT	976+96	1.0' - 2.5'	A-7-5	45	15	29	24	15	32	91	74	46	27	-

- Ⓒ **ROADWAY EMBANKMENT:** TAN-GRAY GRAY BROWN AND RED-TAN, MOIST TO WET, LOOSE TO MED. DENSE, SILTY CLAYEY SAND WITH SOME ORGANICS (WOOD) DEBRIS AND TRACE TO LITTLE GRAVEL AND CLAY SEAMS
- Ⓓ **ROADWAY EMBANKMENT:** RED-BROWN RED AND BROWN, MOIST, STIFF TO MED. STIFF, SANDY SILTY CLAY WITH TRACE TO LITTLE MICA AND TRACE GRAVEL
- Ⓔ **RESIDUAL:** TAN RED-TAN AND WHITE, MOIST, LOOSE TO MED. DENSE, SILTY SAND WITH SOME ROCK FRAGMENTS AND TRACE TO LITTLE MICA
- Ⓕ **RESIDUAL:** RED TAN AND TAN-RED, MOIST, V. STIFF, SANDY CLAY AND SANDY SILT WITH LITTLE MICA
- Ⓖ **WEATHERED ROCK:** TAN, GRANITE



-L_WB-

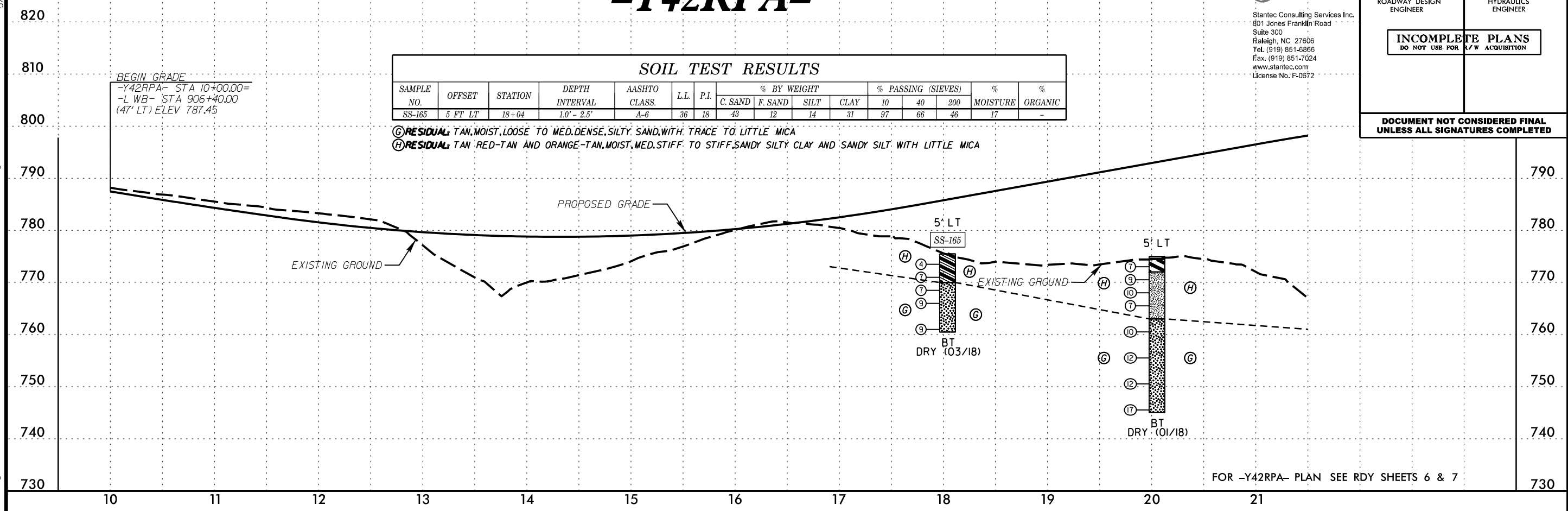


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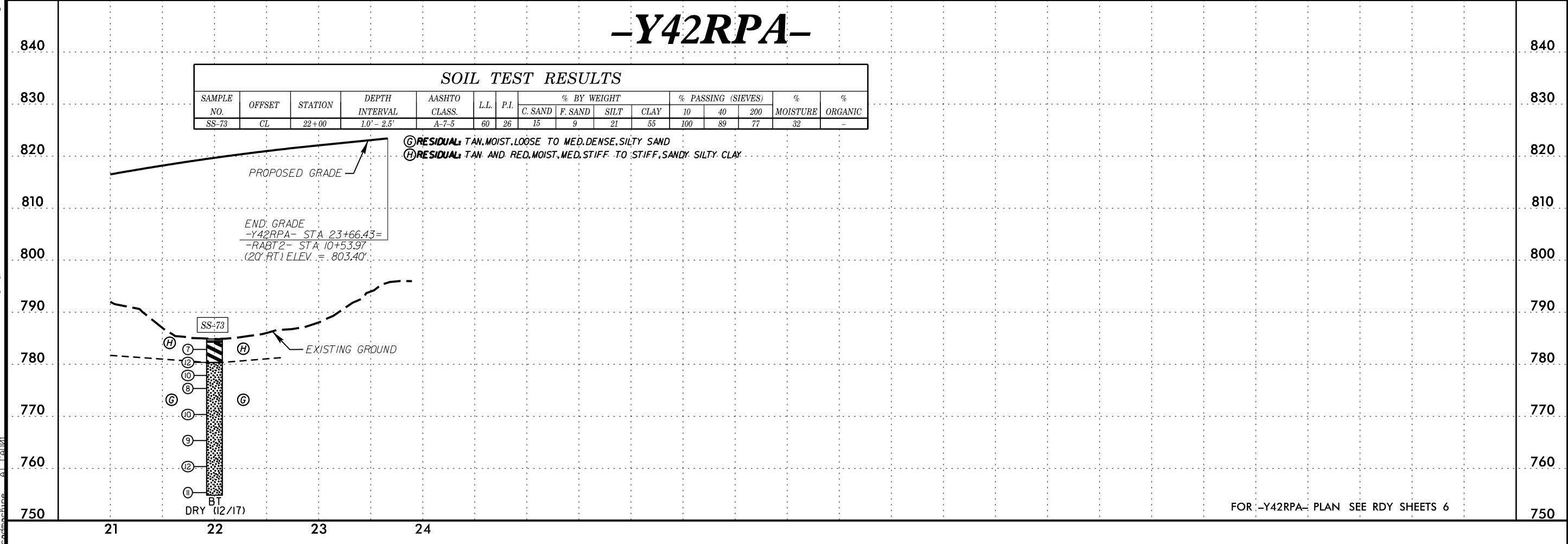
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PROJECT REFERENCE NO. R-2707E	SHEET NO. 27
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



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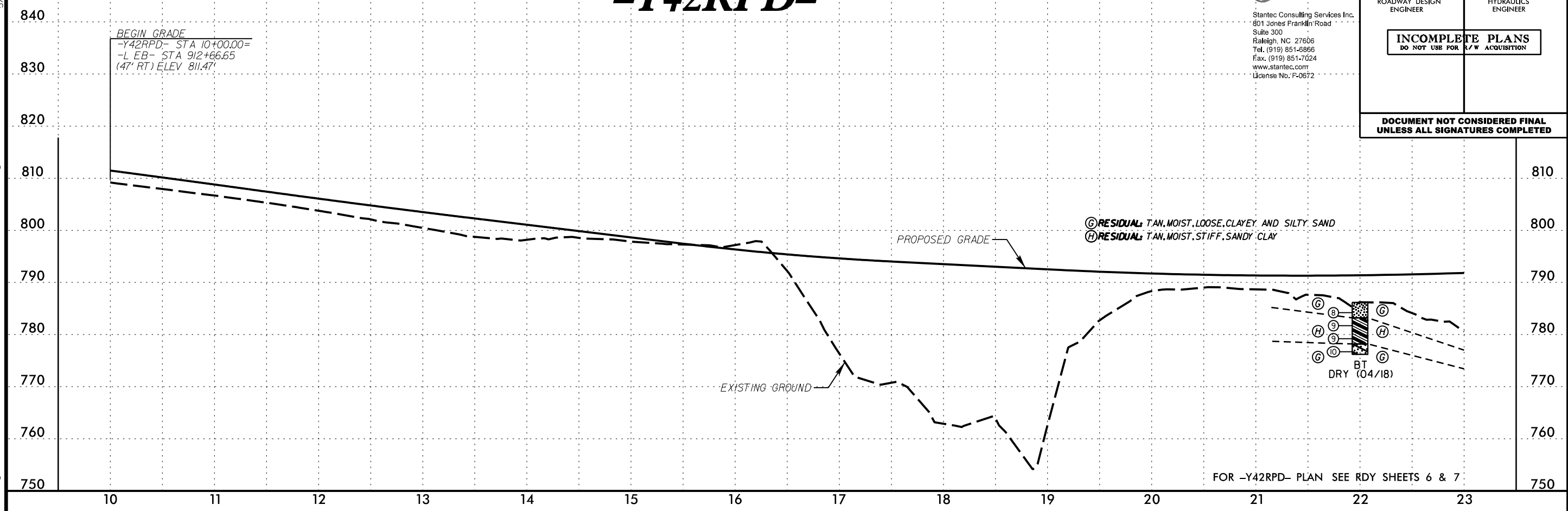


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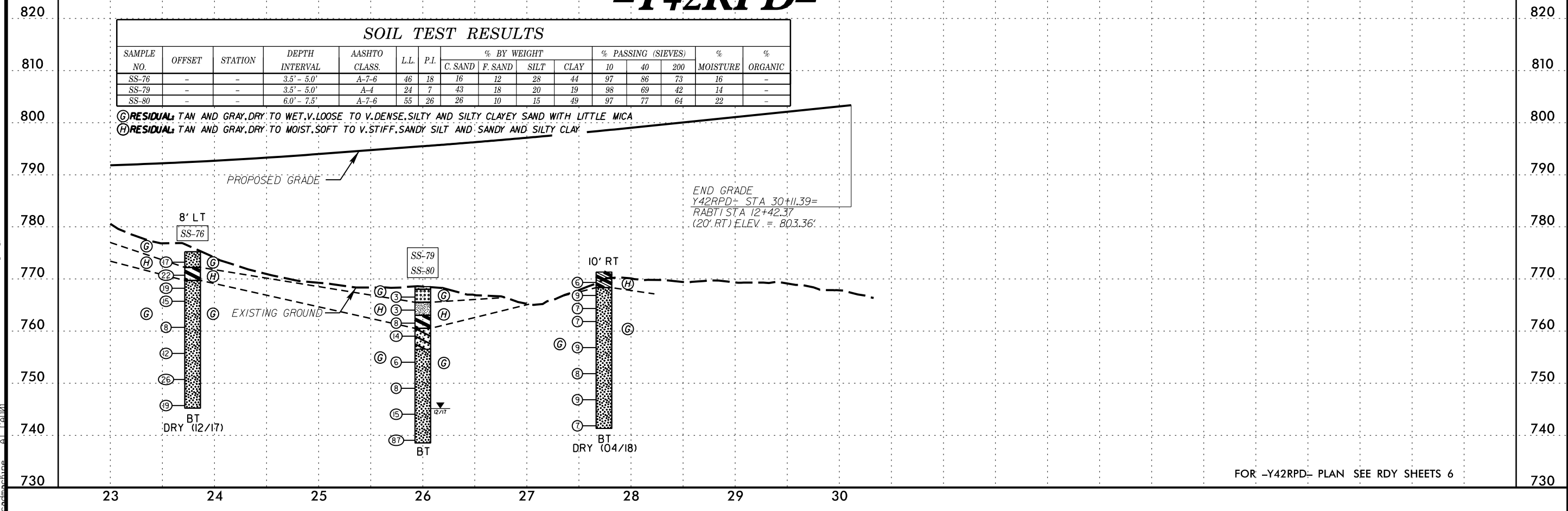
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PROJECT REFERENCE NO. R-2707E	SHEET NO. 30
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



-Y42RPD-

SOIL TEST RESULTS															
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		
SS-76	-	-	3.5' - 5.0'	A-7-6	46	18	16	12	28	44	97	86	73	16	-
SS-79	-	-	3.5' - 5.0'	A-4	24	7	43	18	20	19	98	69	42	14	-
SS-80	-	-	6.0' - 7.5'	A-7-6	55	26	26	10	15	49	97	77	64	22	-

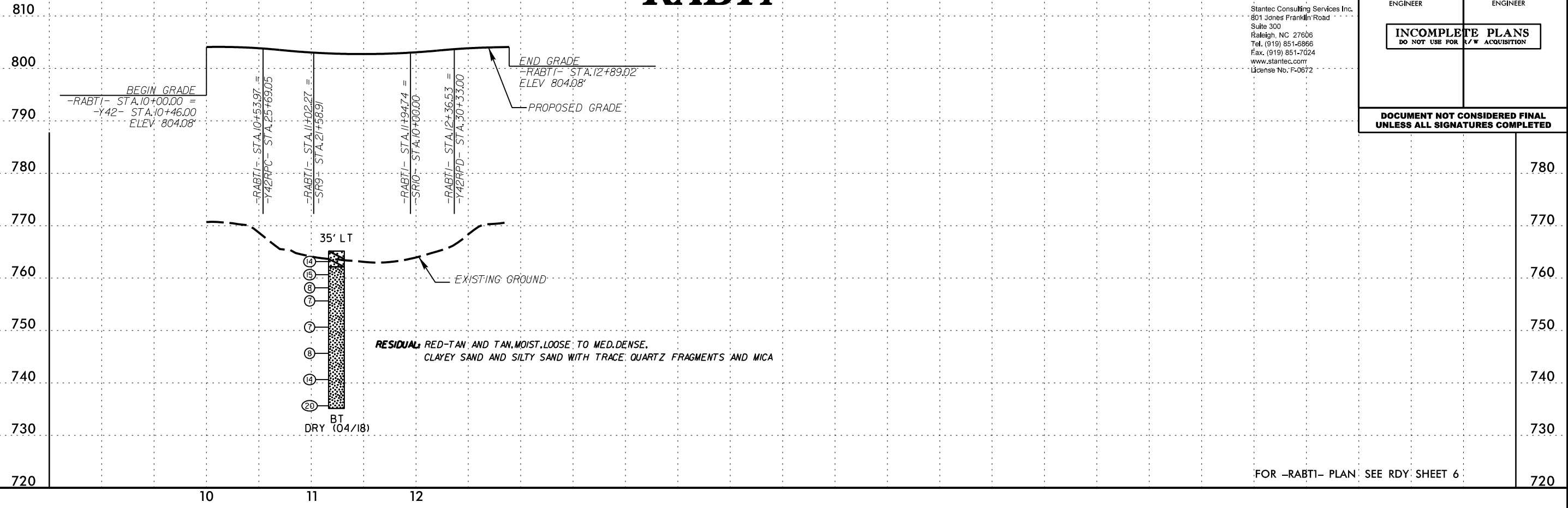


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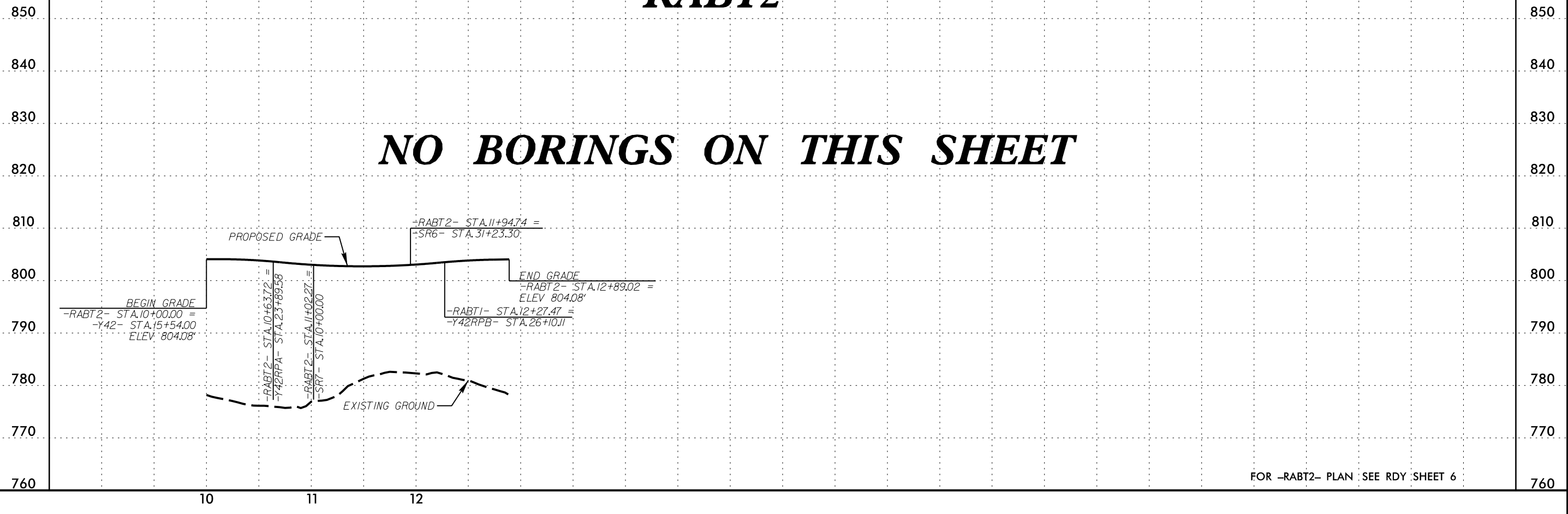
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PROJECT REFERENCE NO. <i>R-2707E</i>	SHEET NO. <i>31</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



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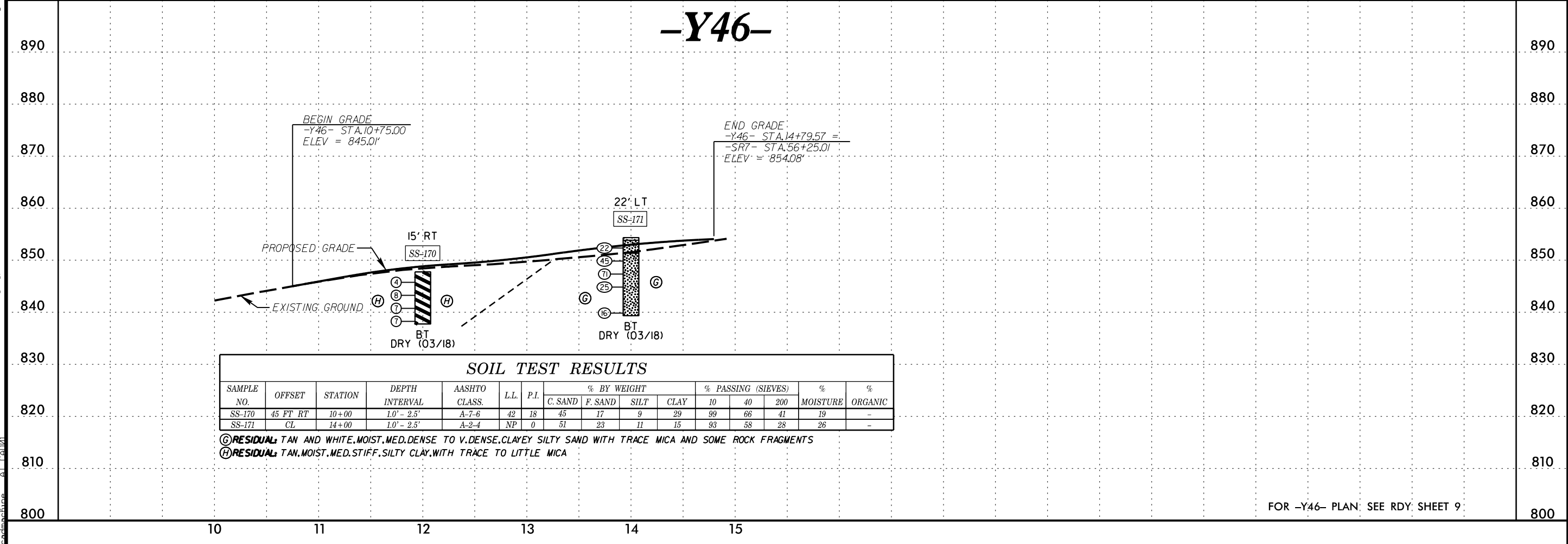
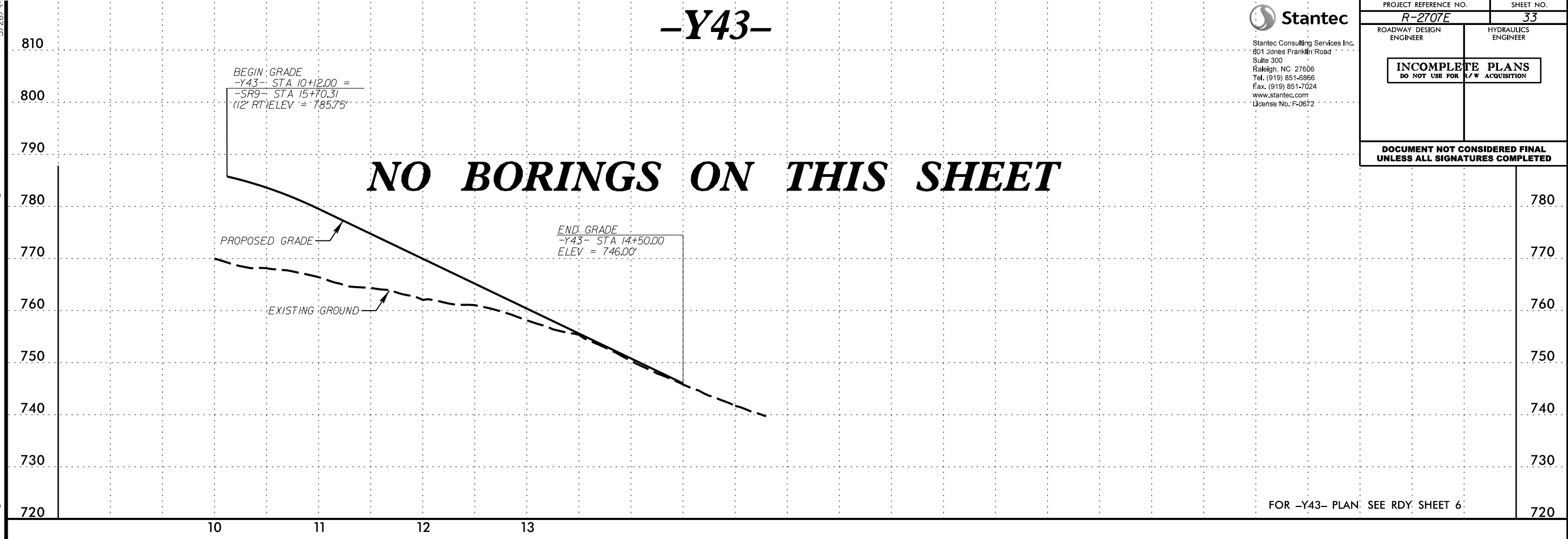
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PROJECT REFERENCE NO. <i>R-2707E</i>	SHEET NO. 33
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



-SR6-

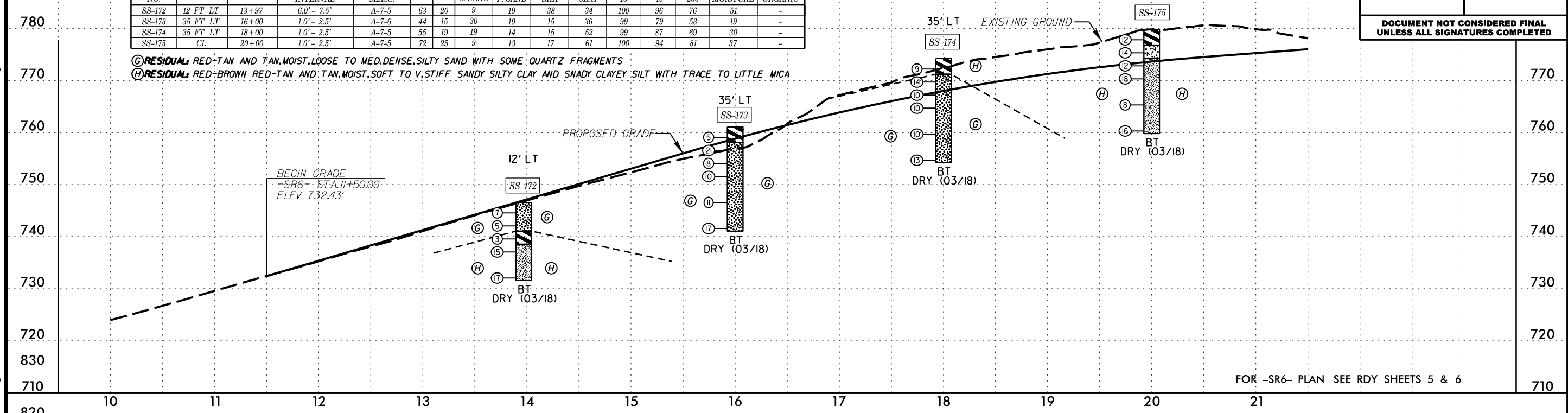


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PROJECT REFERENCE NO. R-2707E	SHEET NO. 34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

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-172	12 FT LT	13+97	6.0' - 7.5'	A-7-5	63	20	9	19	38	34	100	96	76	51	-
SS-173	35 FT LT	16+00	1.0' - 2.5'	A-7-6	44	15	30	19	15	36	99	79	53	19	-
SS-174	35 FT LT	18+00	1.0' - 2.5'	A-7-5	55	19	19	14	15	52	99	87	69	30	-
SS-175	CL	20+00	1.0' - 2.5'	A-7-5	72	25	9	13	17	61	100	94	81	37	-

(G) RESIDUAL: RED-TAN AND TAN, MOIST, LOOSE TO MED. DENSE, SILTY SAND WITH SOME QUARTZ FRAGMENTS
(H) RESIDUAL: RED-BROWN RED-TAN AND TAN, MOIST, SOFT TO V. STIFF SANDY SILTY CLAY AND SNAGGY CLAYEY SILT WITH TRACE TO LITTLE MICA

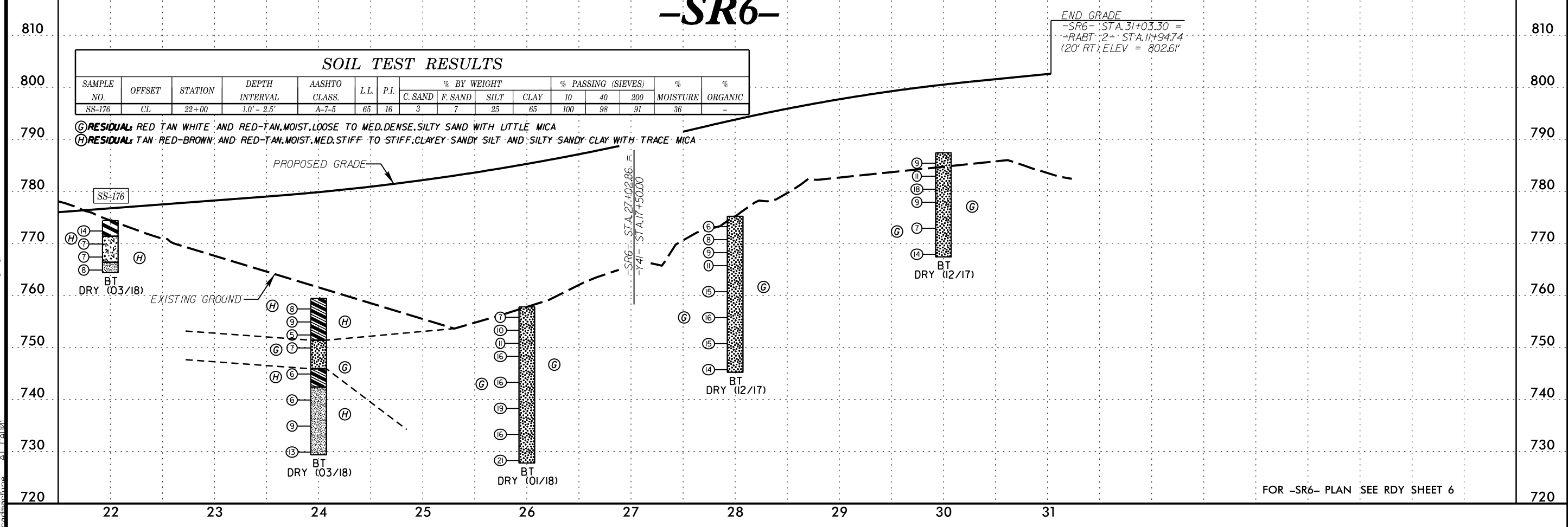


FOR -SR6- PLAN SEE RDY SHEETS 5 & 6

-SR6-

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-176	CL	22+00	1.0' - 2.5'	A-7-5	65	16	3	7	25	65	100	98	91	36	-

(G) RESIDUAL: RED TAN WHITE AND RED-TAN, MOIST, LOOSE TO MED. DENSE, SILTY SAND WITH LITTLE MICA
(H) RESIDUAL: TAN RED-BROWN AND RED-TAN, MOIST, MED. STIFF TO STIFF, CLAYEY SANDY SILT AND SILTY SANDY CLAY WITH TRACE MICA



END GRADE
 -SR6- STA. 31+03.30 =
 -RABT- 2'- STA. 11+94.74
 (20' RT) ELEV = 802.61'

FOR -SR6- PLAN SEE RDY SHEET 6

5/28/08
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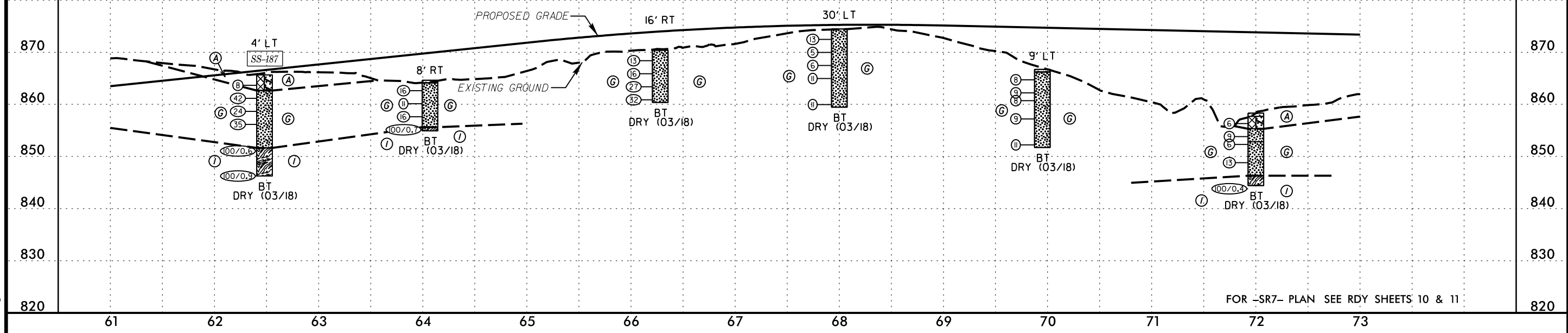
-SR7-

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PROJECT REFERENCE NO. R-2707E	SHEET NO. 37
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INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

SOIL TEST RESULTS															
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		
SS-187	4 FT LT	62+48	1.0' - 2.5'	A-2-7	44	11	31	18	24	27	67	62	35	26	-

- (A) ARTIFICIAL FILL: RED-TAN, MOIST, LOOSE, SILTY AND CLAYEY SAND WITH TRACE ROOTS AND GRAVEL
- (G) RESIDUAL: TAN RED-TAN WHITE ORANGE AND RED, MOIST, LOOSE TO DENSE, CLAYEY SILTY SAND AND SILTY SAND WITH TRACE TO LITTLE MICA
- (I) WEATHERED ROCK: TAN, GRANITE

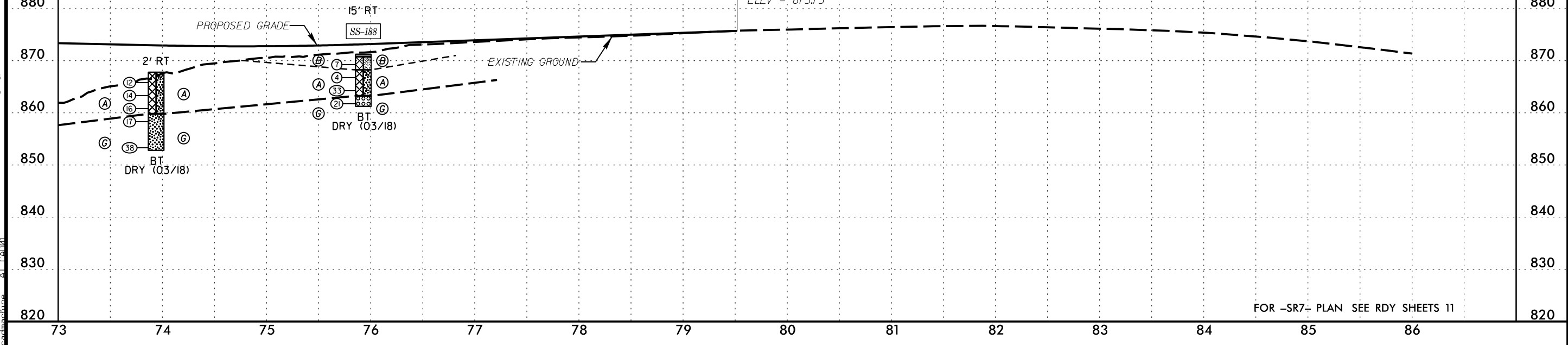


-SR7-

SOIL TEST RESULTS															
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		
SS-188	15 FT RT	75+93	1.0' - 2.5'	A-4	NP	0	38	18	27	17	80	62	36	20	-

- (A) ARTIFICIAL FILL: TAN, MOIST, LOOSE TO MED. DENSE, SILTY SAND, WITH SOME MICA AND TRACE TO LITTLE GRAVEL AND TRACE ORGANICS
- (B) ARTIFICIAL FILL: TAN AND BROWN, MOIST, MED. STIFF, SANDY SILT WITH LITTLE GRAVEL
- (G) RESIDUAL: TAN, DRY TO MOIST, MED. DENSE TO DENSE, SILTY SAND WITH SOME MICA

END GRADE
 -SR7- STA 79+52.00
 ELEV = 875.75'

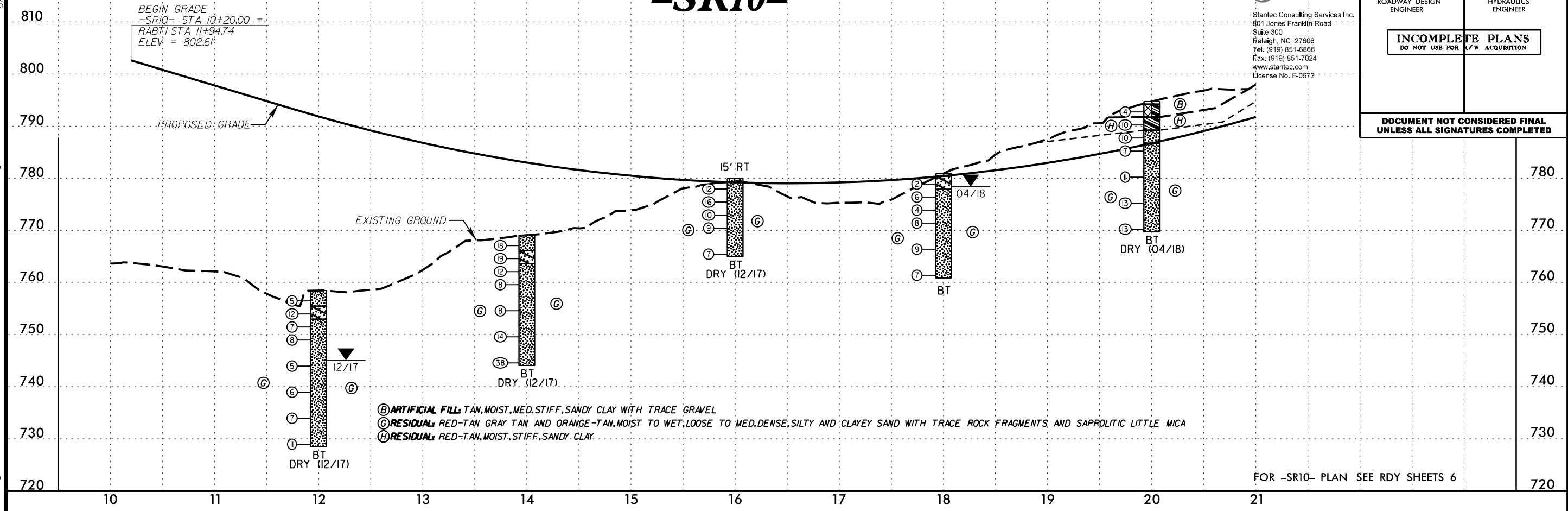


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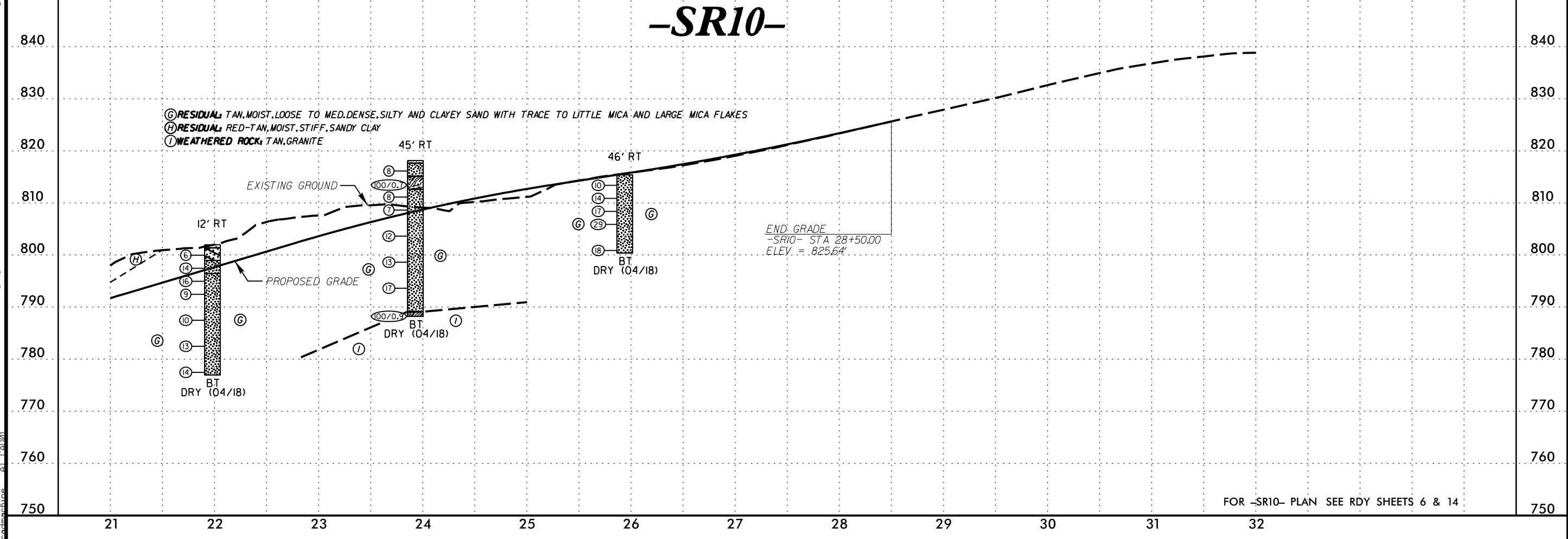
-SR10-

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PROJECT REFERENCE NO. <i>R-2707E</i>	SHEET NO. 40
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-SR10-



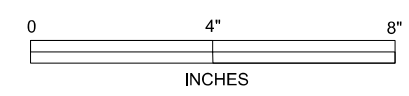
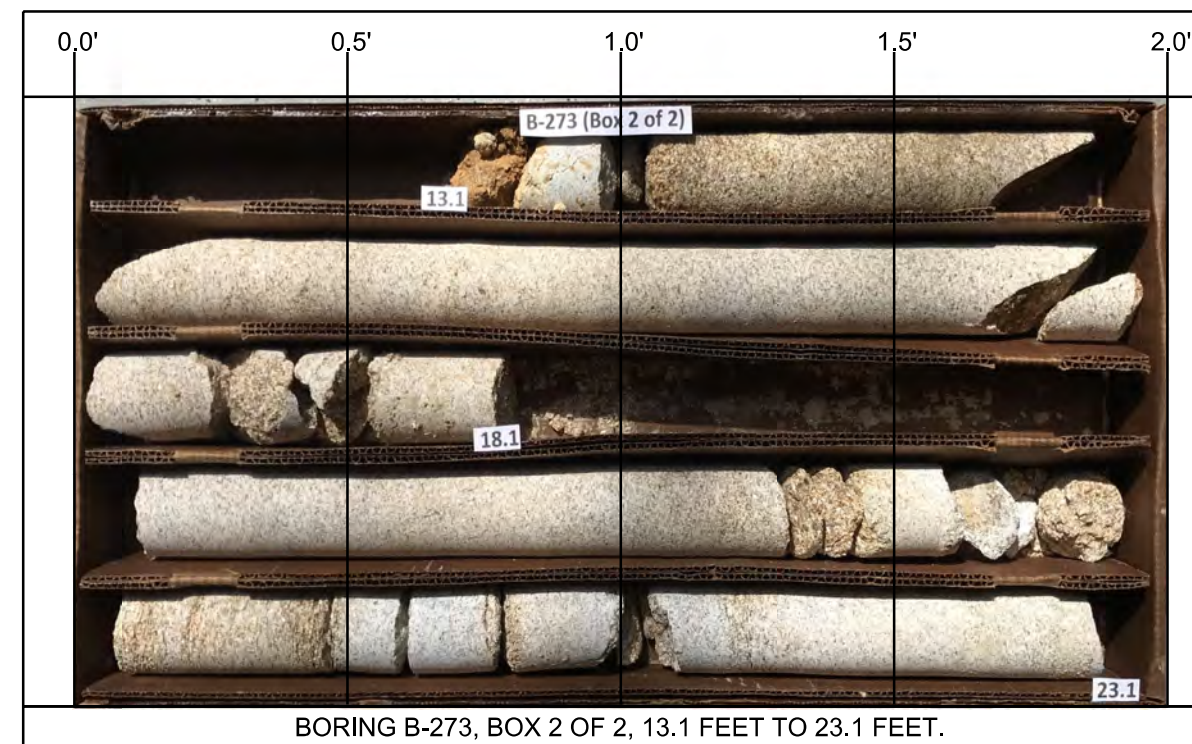
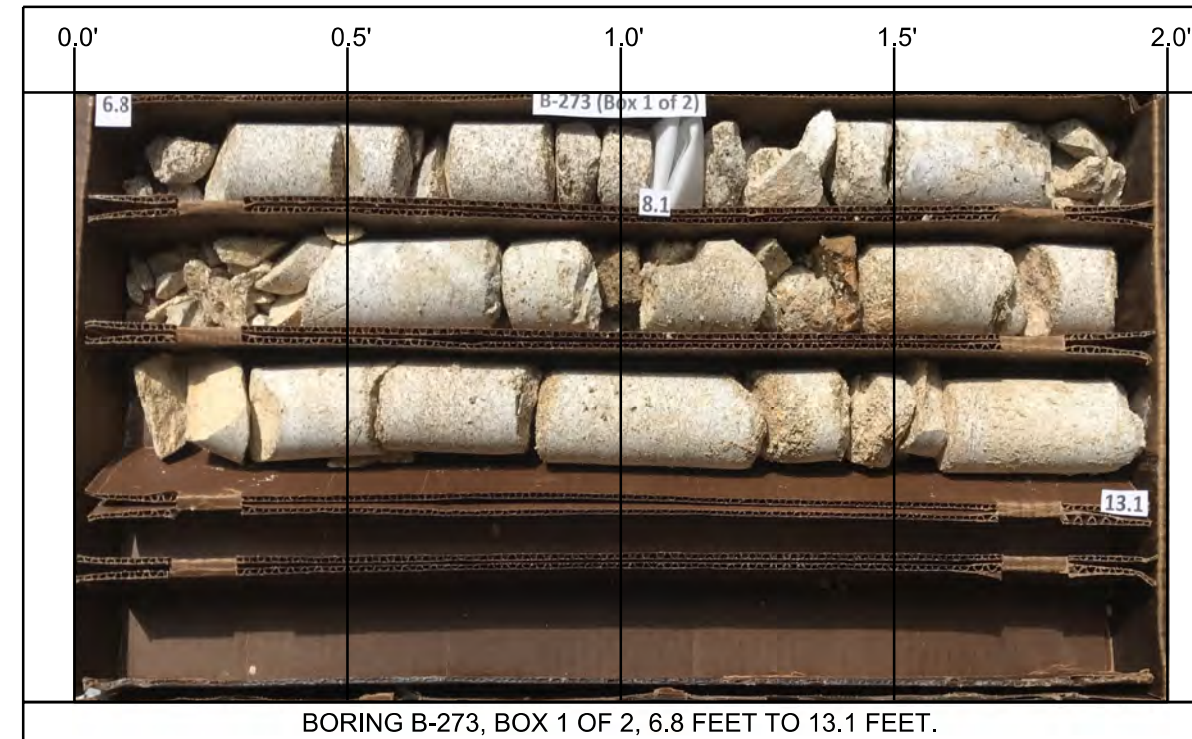
REFERENCE: R-2707E

PROJECT: 34497

*NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
APPENDIX A
CORE LOGS AND PHOTOGRAPHS*

GEOTECHNICAL BORING REPORT CORE LOG

WBS 34497.1.1		TIP R-2707E		COUNTY CLEVELAND		GEOLOGIST Goodnight, D. J.					
SITE DESCRIPTION US 74, Shelby Bypass from East of NC 150 to Existing US 17, West of SR 2238 (Long Branch Rd)							GROUND WTR (ft)				
BORING NO. B-273		STATION 30+00		OFFSET 20 ft RT		ALIGNMENT -SR7-					
COLLAR ELEV. 810.2 ft		TOTAL DEPTH 23.1 ft		NORTHING 553,790		EASTING 1,271,262					
DRILL RIG/HAMMER EFF./DATE HPC2473 CME-550 85% 01/10/2018				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic					
DRILLER Cain, J.		START DATE 03/14/18		COMP. DATE 03/14/18		SURFACE WATER DEPTH N/A					
CORE SIZE NQ2		TOTAL RUN 16.3 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %			
803.4	803.4	6.8	1.3	0:41/0.3	(0.9)	(0.0)	(12.6)	(6.9)		Begin Coring @ 6.8 ft CRYSTALLINE ROCK MODERATELY SEVERE TO MODERATE WEATHERING, MEDIUM TO MODERATELY HARD, TAN GRANITE WITH CLOSE TO MODERATELY CLOSE FRACTURE SPACING	6.8
	802.1	8.1	5.0	2:01/1.0 1:23/1.0 2:24/1.0 1:46/1.0 2:37/1.0	69%	0%					803.4
800					(4.4)	(1.8)					
	797.1	13.1			88%	36%					
795			5.0	0:54/1.0 1:18/1.0 1:46/1.0 1:49/1.0 1:59/1.0	(3.7)	(2.6)					
	792.1	18.1			74%	52%					
790			5.0	1:57/1.0 1:14/1.0 1:19/1.0 1:34/1.0 2:22/1.0	(3.6)	(2.5)					
	787.1	23.1			72%	50%					
Boring Terminated at Elevation 787.1 ft IN CRYSTALLINE ROCK: GRANITE											



<p style="font-size: 8px;">FALCON ENGINEERING, INC. 1210 TRINITY ROAD, SUITE 110 RALEIGH, NC 27607 PHONE: 919.871.0800 FAX: 919.871.0803</p>	<p>ROCK CORE PHOTOS</p> <p style="font-size: 8px;">US 74, SHELBY BYPASS FROM WEST OF SR 2238 TO WEST OF SR 1001 CLEVELAND COUNTY WBS: 34497.1.1 & TIP: R-2707E FALCON PROJECT NO. G17053.00</p>
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NCDOT CORE SINGLE R2707_GEO_BORINGS_AREA-E.GPJ NC_DOT.GDT 7/3/18