

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

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

STATE	STATE PROJECT REFERENCE NO.	SHEET	TOTAL SHEETS
N.C.	U-3324	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34923.1.1	STPNHF-1(10)	P.E.	
		RW & UTIL.	

CONTENTS

LINE	STATION	PLAN	PROFILE	XSECT
-L-	12+50.00 to 59+04.70	4-6	12	13-16
-Y2-	10+37.33 to 17+86.79	4,7	8	
-Y4-	13+12.36 to 13+59.89	5	8	
-Y5-	10+00.00 to 16+00.00	4-5	9	
-Y6-	12+29.77 to 26+00.00	6	9-10	
-Y6LPA-	10+42.00 to 19+11.52	6	10	
-Y6RPA-	10+00.00 to 21+36.20	6	11	
RET WALL #1	35+00.00 to 40+50.00	5-6,12	12	

SAMPLES SHEET 17

ROADWAY
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34923.1.1 (U-3324) F.A. PROJ. STPNHF-1(10)
COUNTY MOORE
PROJECT DESCRIPTION PINEHURST-SOUTHERN PINES - INTERSECTION OF SR 1309 (MORGANTON ROAD) AND US 1 (SANDHILLS BOULEVARD)

INVENTORY

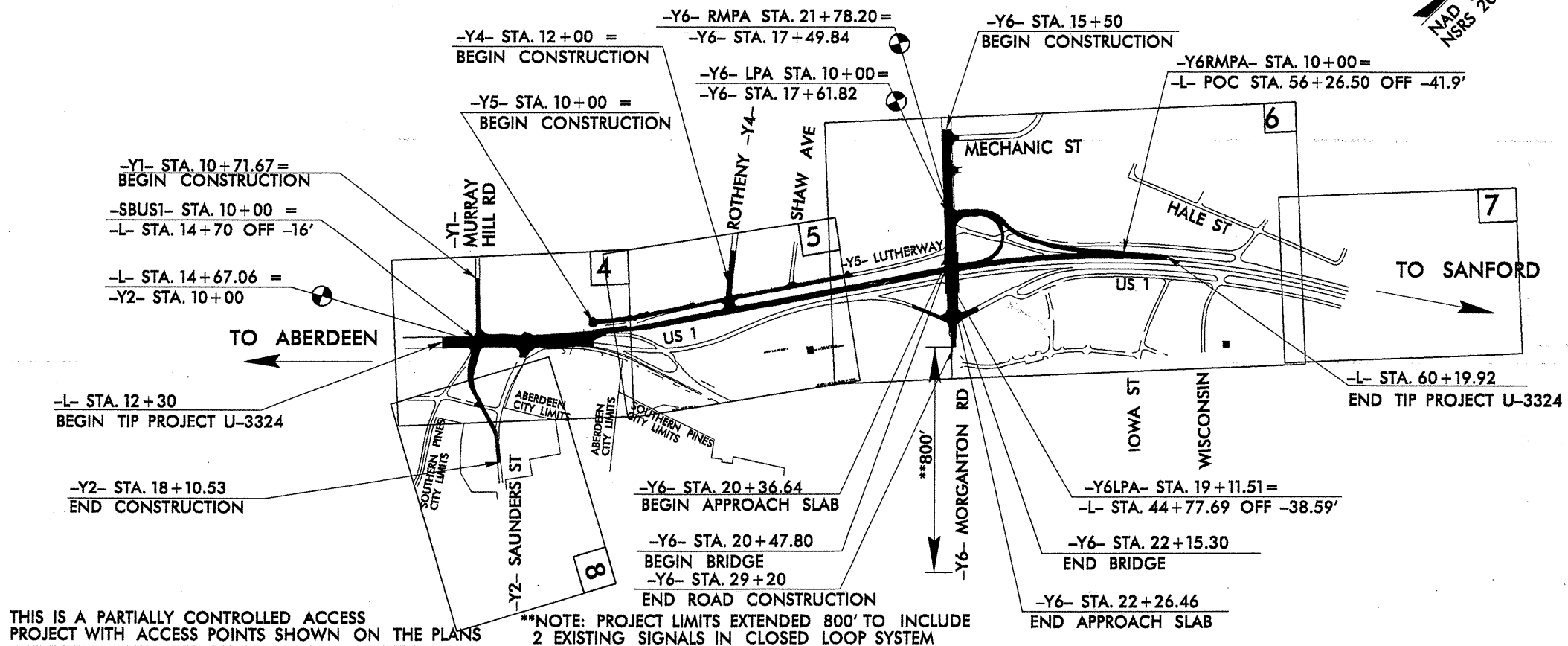
CAUTION NOTICE
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH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

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

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

ID: U-3324

CONTRACT: C202886



THIS IS A PARTIALLY CONTROLLED ACCESS PROJECT WITH ACCESS POINTS SHOWN ON THE PLANS
**NOTE: PROJECT LIMITS EXTENDED 800' TO INCLUDE 2 EXISTING SIGNALS IN CLOSED LOOP SYSTEM

PERSONNEL
C.C. MURRAY
J.E. ESTEP
M.R. MOORE

INVESTIGATED BY C.C. MURRAY
CHECKED BY C.B. LITTLE
SUBMITTED BY C.B. LITTLE
DATE FEBRUARY 2010

DRAWN BY: J.K. McCLURE

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

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



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

PROJECT REFERENCE NO. 34923.LJ (U-3324)	SHEET NO. 2
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SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS																																																																																																																																																																											
<p>SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:</p> <p style="text-align: center;"><i>VERY STIFF, DARK SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH PLASTIC, A-7-6</i></p>	<p>WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) POORLY GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</p> <p style="text-align: center;">ANGULARITY OF GRAINS</p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: <u>ANGULAR</u>, <u>SUBANGULAR</u>, <u>SUBROUNDED</u>, OR <u>ROUNDED</u>.</p>	<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS, IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p> <p>WEATHERED ROCK (WR) - NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.</p> <p>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.</p> <p>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.</p> <p>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.</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, 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 (MOTL) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (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 style="text-align: center;">SOIL LEGEND AND AASHTO CLASSIFICATION</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">GENERAL CLASS.</th> <th colspan="7">GRANULAR MATERIALS (<= 35% PASSING #200)</th> <th colspan="7">SILT-CLAY MATERIALS (> 35% PASSING #200)</th> <th colspan="3">ORGANIC MATERIALS</th> </tr> <tr> <th>A-1</th> <th>A-3</th> <th colspan="2">A-2</th> <th colspan="2">A-4</th> <th>A-5</th> <th>A-6</th> <th>A-7</th> <th>A-1, A-2</th> <th colspan="2">A-4, A-5</th> <th colspan="3"></th> </tr> </thead> <tbody> <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-4-1</td> <td>A-4-2</td> <td>A-4-3</td> <td>A-4-4</td> <td>A-4-5</td> <td>A-4-6</td> <td>A-4-7</td> <td colspan="3"></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 colspan="3"></td> </tr> <tr> <td>% PASSING</td> <td>50 MX 30 MX 15 MX</td> <td>50 MX 30 MX 15 MX</td> <td>50 MX 30 MX 15 MX</td> <td>50 MX 30 MX 15 MX</td> <td>50 MX 30 MX 15 MX</td> <td>50 MX 30 MX 15 MX</td> <td>50 MX 30 MX 15 MX</td> <td>50 MX 30 MX 15 MX</td> <td>50 MX 30 MX 15 MX</td> <td>50 MX 30 MX 15 MX</td> <td>50 MX 30 MX 15 MX</td> <td>50 MX 30 MX 15 MX</td> <td>50 MX 30 MX 15 MX</td> <td colspan="3"></td> </tr> <tr> <td>LIQUID LIMIT PLASTIC INDEX</td> <td colspan="2">6 MX</td> <td colspan="2">NP</td> <td colspan="2">40 MX 30 MX 10 MX</td> <td colspan="2">40 MX 30 MX 10 MX</td> <td colspan="2">40 MX 30 MX 10 MX</td> <td colspan="2">40 MX 30 MX 10 MX</td> <td colspan="2">40 MX 30 MX 10 MX</td> <td colspan="3"></td> </tr> <tr> <td>GROUP INDEX</td> <td colspan="2">0</td> <td colspan="2">0</td> <td colspan="2">4 MX</td> <td colspan="2">8 MX 12 MX</td> <td colspan="2">16 MX No MX</td> <td colspan="3"></td> <td colspan="3"></td> </tr> <tr> <td>USUAL TYPES OF MAJOR MATERIALS</td> <td colspan="2">STONE FRAGS. GRAVEL, AND SAND</td> <td colspan="2">FINE SAND</td> <td colspan="2">SILTY OR CLAYEY GRAVEL AND SAND</td> <td colspan="2">SILTY SOILS</td> <td colspan="2">CLAYEY SOILS</td> <td colspan="3"></td> <td colspan="3">SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER</td> </tr> <tr> <td>GENERATING AS A SUBGRADE</td> <td colspan="4">EXCELLENT TO GOOD</td> <td colspan="4">FAIR TO POOR</td> <td colspan="2">FAIR TO POOR</td> <td colspan="2">POOR</td> <td colspan="3">UNSUITABLE</td> </tr> </tbody> </table> <p>PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30</p>	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-4, A-5					GROUP CLASS.	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7	A-4-1	A-4-2	A-4-3	A-4-4	A-4-5	A-4-6	A-4-7				SYMBOL																	% PASSING	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX				LIQUID LIMIT PLASTIC INDEX	6 MX		NP		40 MX 30 MX 10 MX		40 MX 30 MX 10 MX		40 MX 30 MX 10 MX		40 MX 30 MX 10 MX		40 MX 30 MX 10 MX					GROUP INDEX	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					SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER			GENERATING AS A SUBGRADE	EXCELLENT TO GOOD				FAIR TO POOR				FAIR TO POOR		POOR		UNSUITABLE			<p style="text-align: center;">MINERALOGICAL COMPOSITION</p> <p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.</p> <p style="text-align: center;">COMPRESSIBILITY</p> <p>SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50</p> <p style="text-align: center;">PERCENTAGE OF MATERIAL</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>GRANULAR MATERIALS</th> <th>SILT - CLAY MATERIALS</th> <th>OTHER MATERIAL</th> </tr> </thead> <tbody> <tr> <td>TRACE OF ORGANIC MATTER</td> <td>2 - 3%</td> <td>3 - 5%</td> <td>TRACE</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 5%</td> <td>5 - 12%</td> <td>LITTLE</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>12 - 20%</td> <td>SOME</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>>10%</td> <td>>20%</td> <td>HIGHLY</td> </tr> </tbody> </table> <p style="text-align: center;">GROUND WATER</p> <p> WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING</p> <p> STATIC WATER LEVEL AFTER 24 HOURS</p> <p> PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA</p> <p> SPRING OR SEEP</p>		GRANULAR MATERIALS	SILT - CLAY MATERIALS	OTHER MATERIAL	TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	HIGHLY ORGANIC	>10%	>20%	HIGHLY	<p style="text-align: center;">WEATHERING</p> <p>FRESH - ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.</p> <p>VERY SLIGHT (V SLI) - ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.</p> <p>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.</p> <p>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.</p> <p>MODERATELY SEVERE (MOD. SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i></p> <p>SEVERE (SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <i>IF TESTED, YIELDS SPT N VALUES > 100 BPF</i></p> <p>VERY SEVERE (V SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, YIELDS SPT N VALUES < 100 BPF</i></p> <p>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.</p> <p style="text-align: center;">ROCK HARDNESS</p> <p>VERY HARD - CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.</p> <p>HARD - CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>
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<p style="text-align: center;">PLASTICITY</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>NONPLASTIC</th> <th>PLASTICITY INDEX (PI)</th> <th>DRY STRENGTH</th> </tr> </thead> <tbody> <tr> <td>LOW PLASTICITY</td> <td>0-5</td> <td>VERY LOW</td> </tr> <tr> <td>MED. PLASTICITY</td> <td>6-15</td> <td>SLIGHT</td> </tr> <tr> <td>HIGH PLASTICITY</td> <td>16-25</td> <td>MEDIUM</td> </tr> <tr> <td></td> <td>26 OR MORE</td> <td>HIGH</td> </tr> </tbody> </table> <p style="text-align: center;">COLOR</p> <p>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.</p>	NONPLASTIC	PLASTICITY INDEX (PI)	DRY STRENGTH	LOW PLASTICITY	0-5	VERY LOW	MED. PLASTICITY	6-15	SLIGHT	HIGH PLASTICITY	16-25	MEDIUM		26 OR MORE	HIGH	<p style="text-align: center;">FRACURE SPACING</p> <p>DRILL UNITS:</p> <p><input type="checkbox"/> MOBILE B- _____</p> <p><input type="checkbox"/> BK-51</p> <p><input type="checkbox"/> CME-45C</p> <p><input type="checkbox"/> CME-550</p> <p><input type="checkbox"/> PORTABLE HOIST</p> <p><input type="checkbox"/> _____</p> <p><input type="checkbox"/> _____</p> <p><input type="checkbox"/> _____</p>	<p style="text-align: center;">ROCK HARDNESS</p> <p>VERY HARD</p> <p>HARD</p> <p>MODERATELY HARD</p> <p>MEDIUM HARD</p> <p>SOFT</p> <p>VERY SOFT</p>	<p style="text-align: center;">TERMS AND DEFINITIONS</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, 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 (MOTL) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (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 style="text-align: center;">BENCH MARK:</p> <p style="text-align: right;">ELEVATION: _____ FT.</p> <p>NOTES: BORING ELEVATIONS DERIVED FROM THE U3324.PS.TIN_080131.TIN FILE.</p>																																																																																																																																																												
NONPLASTIC	PLASTICITY INDEX (PI)	DRY STRENGTH																																																																																																																																																																												
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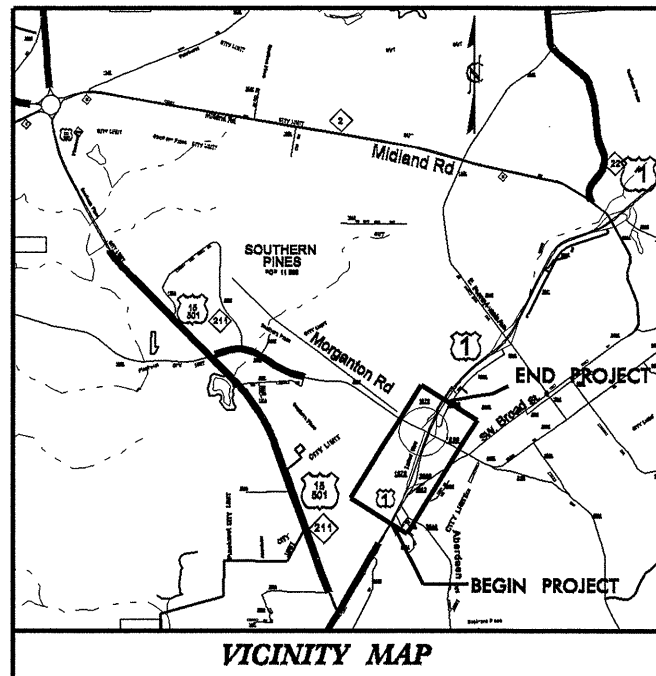
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

MOORE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3324	2A	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34923.1.1	STPNHF-1(10)	P.E.	

LOCATION: PINEHURST-SOUTHERN PINES - INTERSECTION OF SR 1309 (MORGANTON ROAD) AND US1 (SANDHILLS BOULEVARD)

TYPE OF WORK: RESURFACING, PAVING, GRADING, DRAINAGE, STRUCTURE, GUARDRAIL, CURB & GUTTER, SIGNING AND SIGNALS



-SBUS1- STA. 10+00 =
-L- STA. 14+70 OFF -16'

-L- STA. 14+67.06 =
-Y2- STA. 10+00

-Y4- STA. 12+00 =
BEGIN CONSTRUCTION

-Y6- RMPA STA. 21+78.20 =
-Y6- STA. 17+49.84

-Y6- STA. 12+29.77
BEGIN CONSTRUCTION

-Y6- LPA STA. 10+00 =
-Y6- STA. 17+61.82

-Y6RMPA- STA. 10+00 =
-L- POC STA. 56+26.50 OFF -41.9'

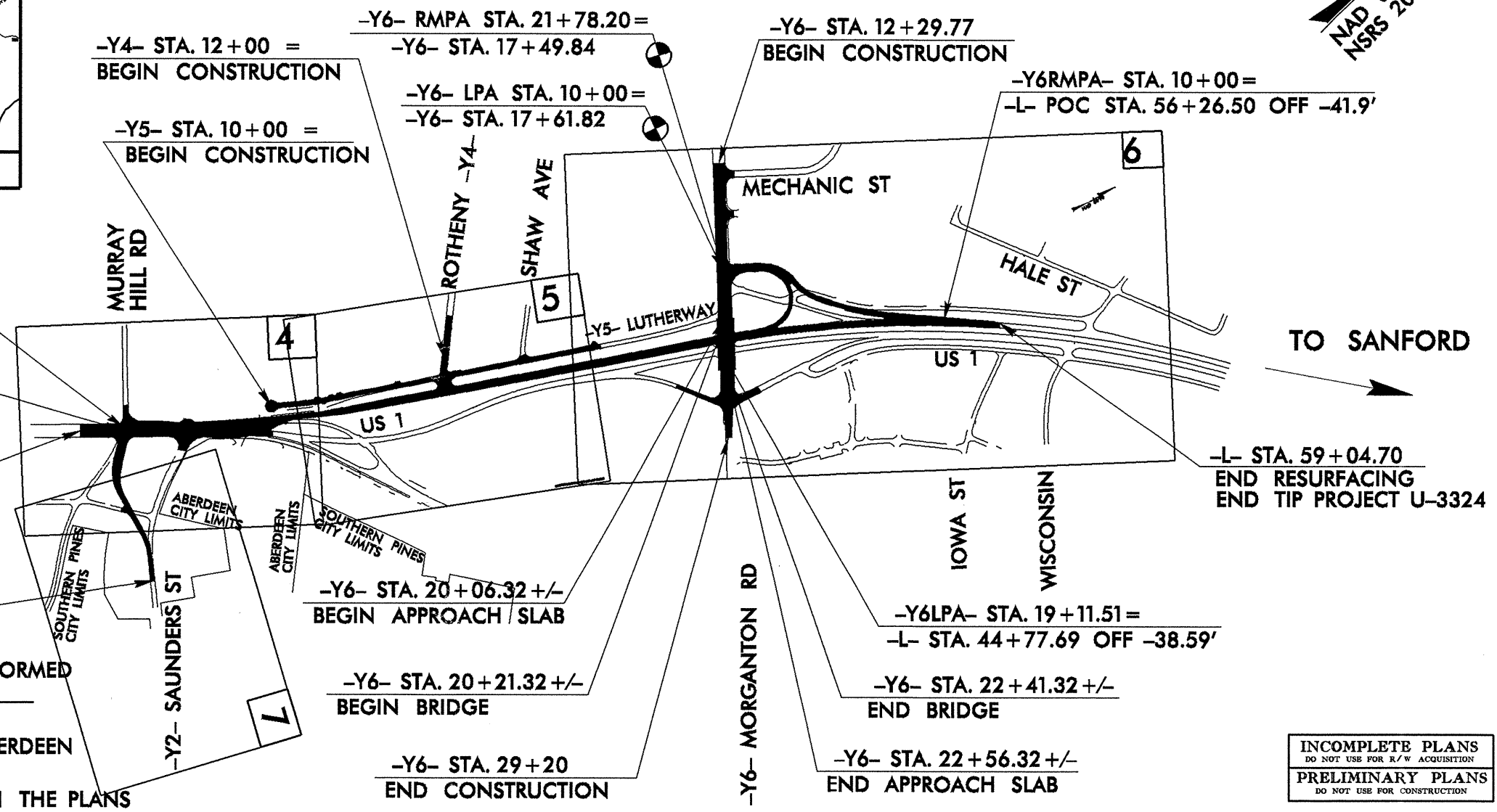
-L- STA. 12+50
BEGIN RESURFACING
BEGIN TIP PROJECT U-3324

-Y2- STA. 18+10.53
END CONSTRUCTION

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

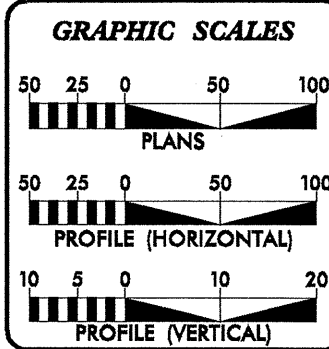
THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF SOUTHERN PINES AND ABERDEEN

THIS IS A PARTIALLY CONTROLLED ACCESS PROJECT WITH ACCESS POINTS SHOWN ON THE PLANS



-L- STA. 59+04.70
END RESURFACING
END TIP PROJECT U-3324

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



DESIGN DATA

**L- FUNCTIONAL CLASS. ARTERIAL FREEWAY

ADT 2009 = 27025
ADT 2030 = 45600

DHV = 55 %
D = 2 %
T = 3 % *
V = 60 MPH

* TTST 1 % DUAL 2 %

PROJECT LENGTH

LENGTH ROADWAY F.A PROJECT STPNHF-1(10) = 0.882 MI.
TOTAL LENGTH OF STATE PROJECT 34923.1.1 = 0.882 MI.

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MAY 21, 2010

LETTING DATE: May 15, 2012

JIMMY GOODNIGHT, PE
PROJECT ENGINEER

TIM GOINS
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER

TIP PROJECT: U-3324

WBS: 34923.1.1

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STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. +20%		ROCK	SUITABLE	UNSUIT.	TOTAL
L 12+30 LT	L 42+00 LT	7,781				7,781	877		877	1,052			6,729		6,729
Y1 10+79.49	Y1 14+41.95	573				573	121		121	145			428		428
Y2 10+35.31	Y2 18+10.53	2,734				2,734	1,203		1,203	1,444			1,290		1,290
Y4 13+00	Y4 14+00	40				40	250		250	300	260				
WASTE IN LIEU OF BORROW											-260		-260		-260
SUBTOTAL		11,128				11,128	2,451		2,451	2,941			8,187		8,187
Y6 15+50	Y6 20+47.80	338				338	1,755		1,755	2,106	1,768				
Y6 22+15.30	Y6 29+20	200				200	4,244		4,244	5,093	4,893				
WASTE IN LIEU OF BORROW															
SUBTOTAL		538				538	5,999		5,999	7,199	6,661				
Y6 Loop 14+00	Y6 Loop 16+00	1,020				1,020	213		213	256			764		764
Y6 Ramp 14+00	Y6 Ramp 21+43.07						28,210		28,210	33,852	33,852				
L 42+00 LT	L 59+50 LT	7,219				7,219	1,068		1,068	1,282			5,937		5,937
WASTE IN LIEU OF BORROW											-6,702		-6,702		-6,702
SUBTOTAL		8,239				8,239	29,491		29,491	35,389	27,150		0		0
MEDIAN GUARDRAIL	27+50 - 60+20						605		605	726	726				
SUBTOTAL										726	726				
TOTAL		19,905				19,905	37,941		37,941	46,255	34,537		8,187		8,187
MATERIAL FOR SHOULDER CONSTRUCTION							1,765		1,765	2,118	2,118				
LOSS DUE TO CLEARING & GRUBBING		-850				-850					850				
ADDITIONAL UNDERCUT															
ROCK WASTE TO REPLACE BORROW															
ADJUST FOR ROCK WASTE															
PROJECT TOTAL		19,055				19,055	39,706		39,706	48,373	37,505		8,187		8,187
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT											1,875				
GRAND TOTAL		19,015									39,380		8,187		8,187
SAY		19,500 ✓									✓39,500				
EST. SHALLOW UNDERCUT 1000 CY ✓															
PER GEOTECH RECOMMENDATION, ESTIMATED 2500 CUBIC YARDS OF UNDERCUT TO BE USED IN THE DISCRETION OF THE RESIDENT ENGINEER.															

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



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

February 18, 2010

STATE PROJECT: 34923.1.1 (U-3324)
FEDERAL PROJECT: STPNHF-1(10)
COUNTY: Moore
DESCRIPTION: Pinehurst-Southern Pines – Intersection of SR 1309
(Morganton Road) and US 1 (Sandhills Boulevard)

SUBJECT: Geotechnical Report - Inventory

PROJECT DESCRIPTION

The project is located in southeastern Moore County, in the City of Southern Pines. The project includes replacement of the bridge on -Y6-(Morganton Road) over -L-(US 1), construction of a retaining wall between -L- (US 1) and -Y5- (Luther Way), construction of a new ramp and loop at Morganton Road, plus improvements and some relocation of several -Y- lines (Saunders Street, Luther Way, Morganton Road). The geotechnical investigation was conducted in August 2009, utilizing a CME 550 drill rig. A total of 27 Standard Penetration Test borings were conducted. Eight of the borings were focused on the retaining wall; two were near the proposed bridge end bents.

The following alignments were investigated:

-L- Station 12+50.00 to 59+04.70
-Y2- Station 10+37.33 to 17+86.79
-Y4- Station 13+12.36 to 13+59.89
-Y5- Station 10+00.00 to 16+00.00
-Y6- Station 12+29.77 to 26+00.00
-Y6LPA- Station 10+42.00 to 19+11.52
-Y6RPA- Station 10+00.00 to 21+36.20
RETWALL #1 Station 35+00.00 to 40+50.00

AREAS OF SPECIAL GEOTECHNICAL INTEREST

There are no areas of serious concern. Of a total of 119 soil samples collected, 14 returned a plasticity index greater than allowed in the Coastal Plain borrow criteria. None occurred near the proposed

grade. One isolated sample was in a proposed cut area. The majority of soils near proposed grade are coastal plain sands. Groundwater was encountered in only two borings, well below grade.

PHYSIOGRAPHY AND GEOLOGY

Terrain is typical of the sandhills region. There is some relief (approximately 40' total relief across the project), slopes are gentle. Loose surface sands are common. Geology is Coastal Plain. Tertiary Pinehurst Formation (mostly sands and clayey sands) are present near the surface. Cretaceous Middendorf Formation soils occur deeper. The Middendorf soils are more indurated and may contain hard clay layers; they will occur in the foundation strata for the bridge, but will not be a factor in the roadway construction.

The typical soil profile is 3' of loose sand (A-1, A-2-4, A-3) over clayey sand (A-2-6, A-2-7). There were minor occurrences of sandy clay (A-6, A-7). Of 119 total soil samples, 92 were classified as sand (A-1, A-2-4, A-3), 15 as clayey sand (A-2-6, A-2-7), 1 as silt (A-4), and 11 as clay (A-6, A-7). Standard Penetration Test "N" values varied, but it was common to see values of 3-4 in the upper five feet (typically the loose sand) with values in the teens and twenties below. The highest values noted were 31, at a depth of 35' in one of the preliminary bridge borings, and 39 at 40' depth in a retaining wall boring.

RETAINING WALL

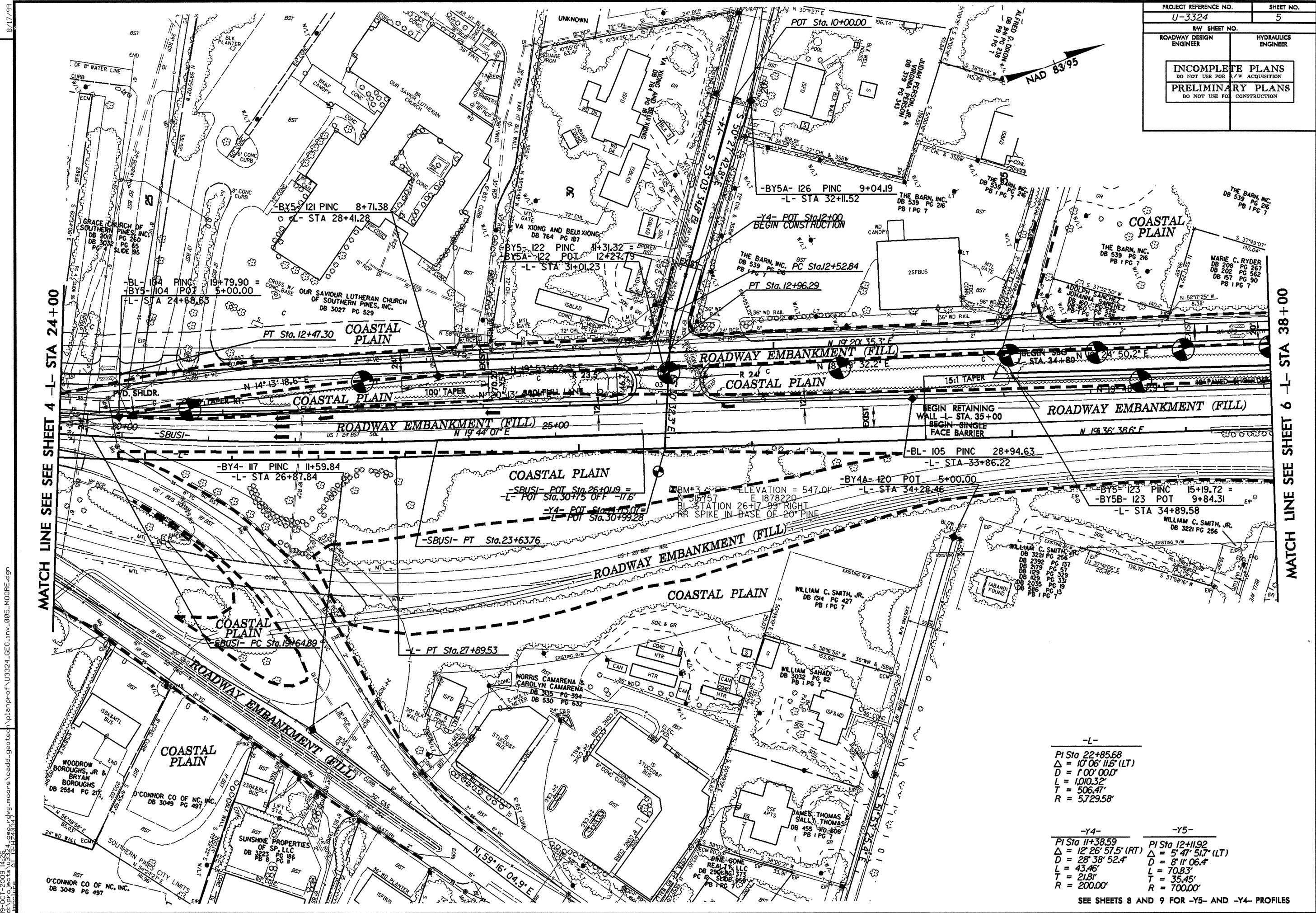
A soil profile through the retaining wall borings is included. The majority of the soils encountered were medium dense sands, with minor medium dense clayey sands and hard clay (at depth in one boring).

Respectfully submitted,

Clint Little

Project Geological Engineer

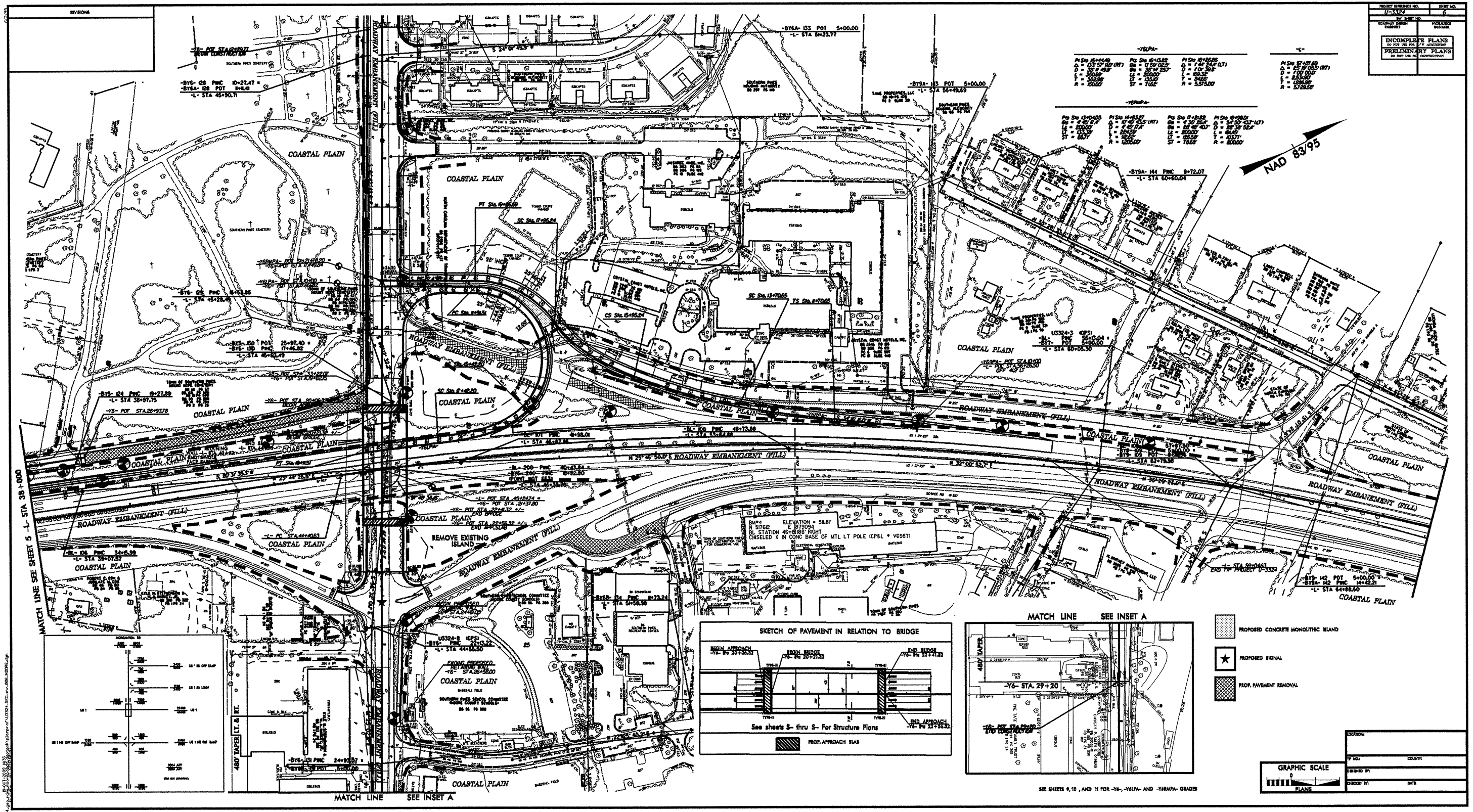
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ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			



8/17/99
 REVISIONS
 MATCH LINE SEE SHEET 4 -L- STA 24+00
 MATCH LINE SEE SHEET 6 -L- STA 38+00
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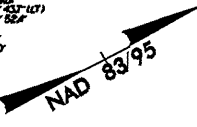
-L-	
PI Sta 22+85.68	
$\Delta = 10'06''11.6''$ (LT)	
D = 1'00'00.0'	
L = 1,010.32'	
T = 506.47'	
R = 5,729.58'	
-Y4-	-Y5-
PI Sta 11+38.59	PI Sta 12+11.92
$\Delta = 12'28''57.5''$ (RT)	$\Delta = 5'47''51.7''$ (LT)
D = 28'38'52.4'	D = 8'11'06.4'
L = 43.46'	L = 70.83'
T = 21.81'	T = 35.45'
R = 200.00'	R = 700.00'

SEE SHEETS 8 AND 9 FOR -Y5- AND -Y4- PROFILES



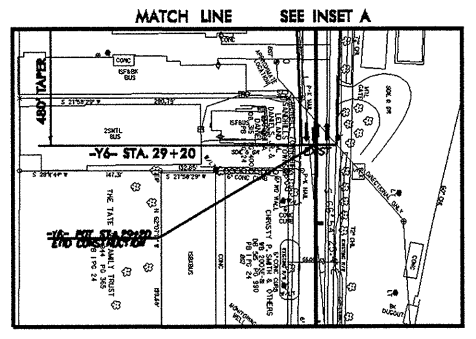
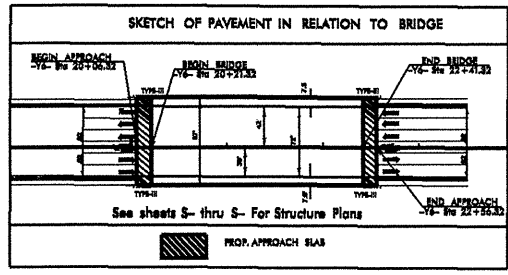
PROJECT NUMBER: 17-132
 SHEET NO. 5
 INCOMPLETE PLANS
 OF THE 18 PLS. 17-132
 PRELIMINARY PLANS
 DO NOT USE FOR CONSTRUCTION

-Y6PA-		-Y6A-	
PI STA 48+44.0	PI STA 48+44.0	PI STA 48+44.0	PI STA 48+44.0
Δ = 0.57' (HT)	Δ = 0.57' (HT)	Δ = 0.57' (HT)	Δ = 0.57' (HT)
L = 200.00'	L = 200.00'	L = 200.00'	L = 200.00'
E = 200.00'	E = 200.00'	E = 200.00'	E = 200.00'
R = 2000'	R = 2000'	R = 2000'	R = 2000'

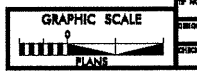


MATCH LINE SEE SHEET 5 - STA 38+00.0

MATCH LINE SEE INSET A



- PROPOSED CONCRETE MONOLITHIC ISLAND
- PROPOSED SIGNAL
- PROP. PAVEMENT REMOVAL



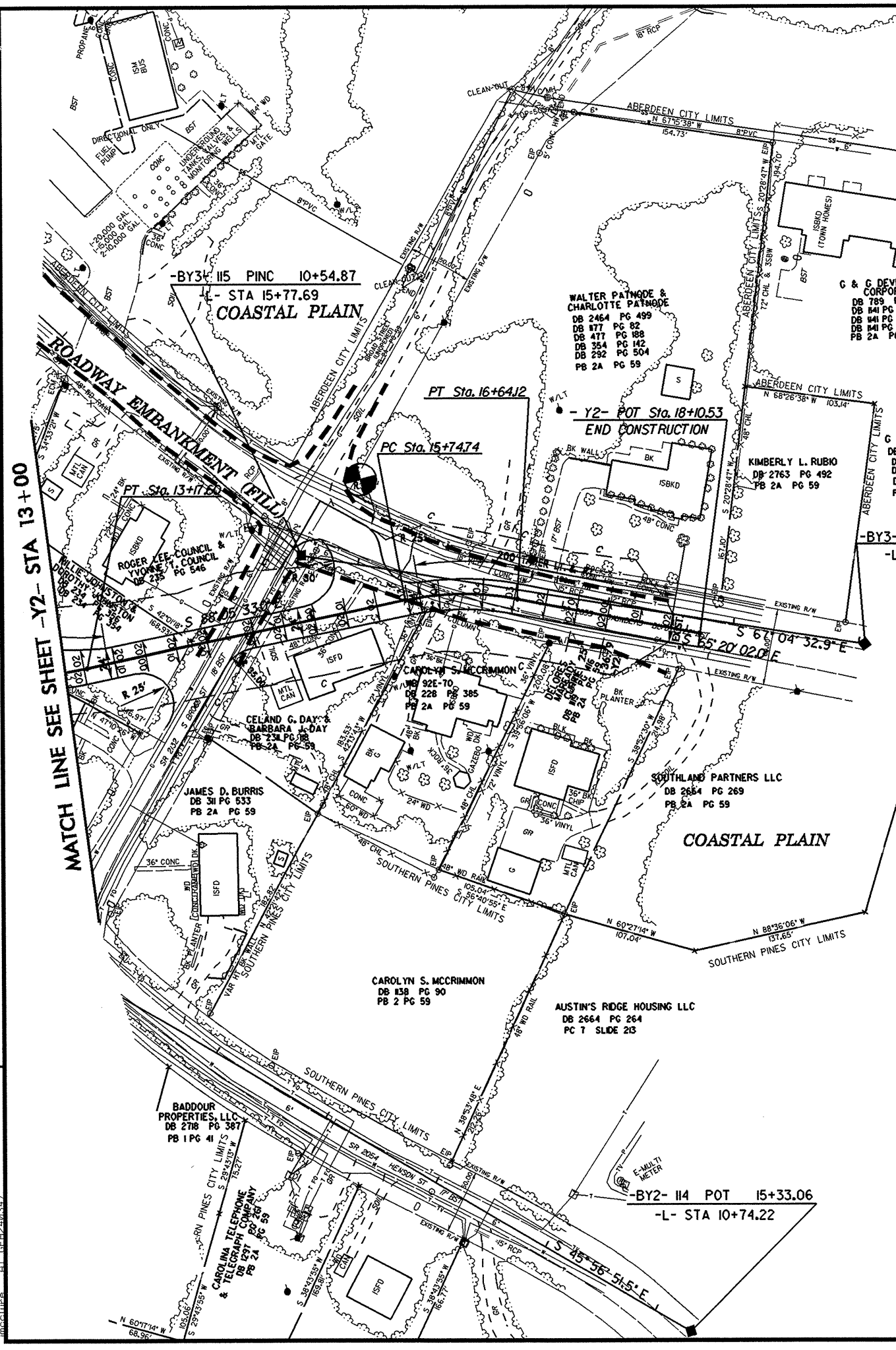
SEE SHEETS 9, 10, AND 11 FOR -Y6-, -Y6PA- AND -Y6A- GRADES

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PROJECT REFERENCE NO. U-3324	SHEET NO. 7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

-Y2-

PI Sta 12+37.15	PI Sta 16+200.3
$\Delta = 43^{\circ} 08' 06.0''$ (LT)	$\Delta = 22^{\circ} 45' 31.0''$ (RT)
$D = 25^{\circ} 27' 53.2''$	$D = 25^{\circ} 27' 53.2''$
$L = 169.39'$	$L = 89.37'$
$T = 88.94'$	$T = 45.28'$
$R = 225.00'$	$R = 225.00'$



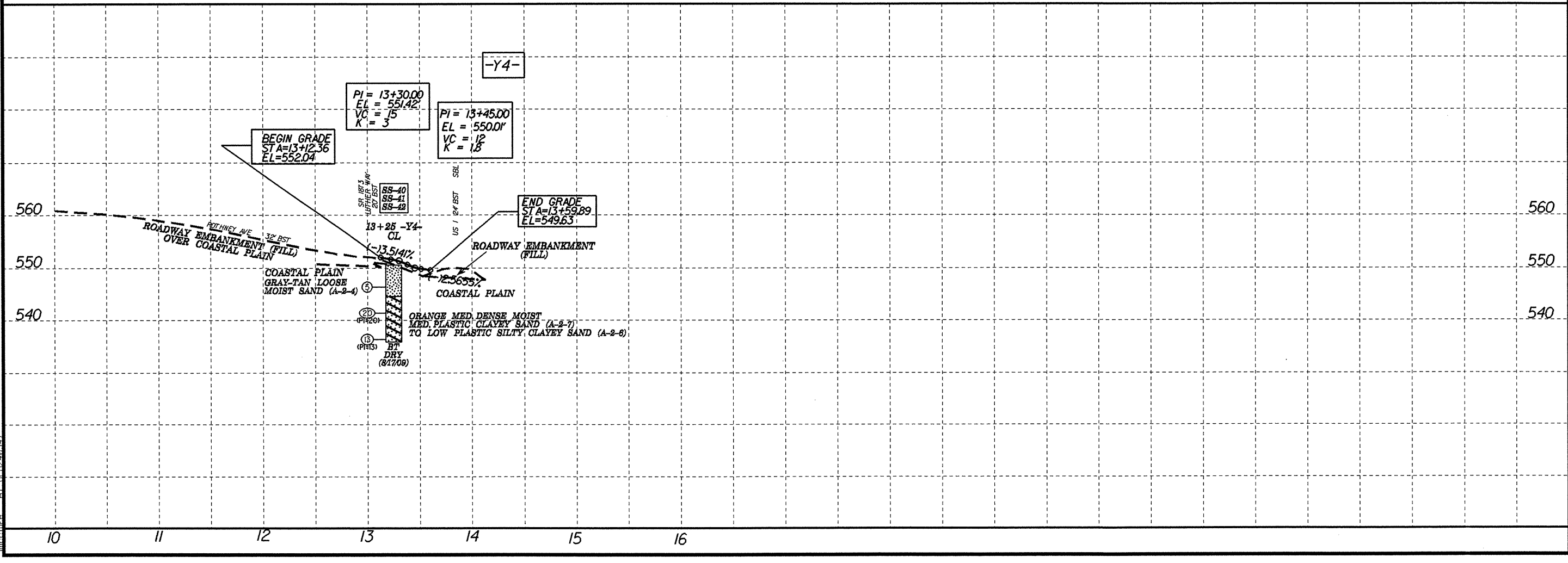
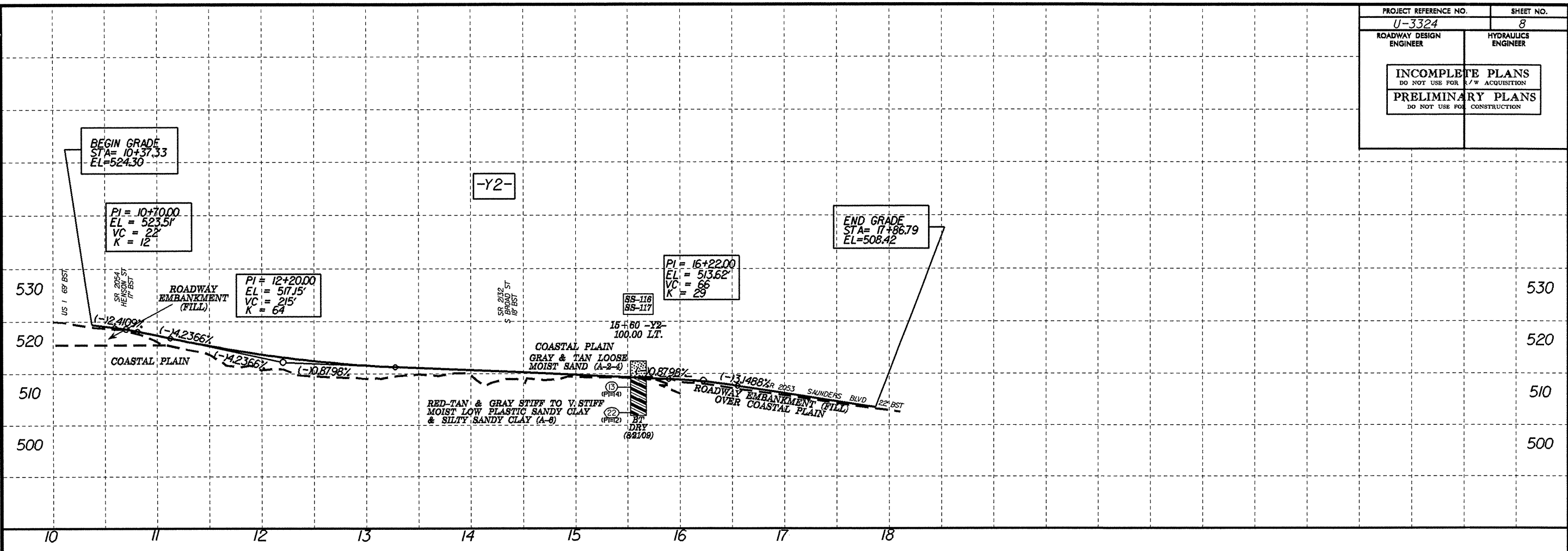
MATCH LINE SEE SHEET -Y2- STA 13+00

REVISIONS

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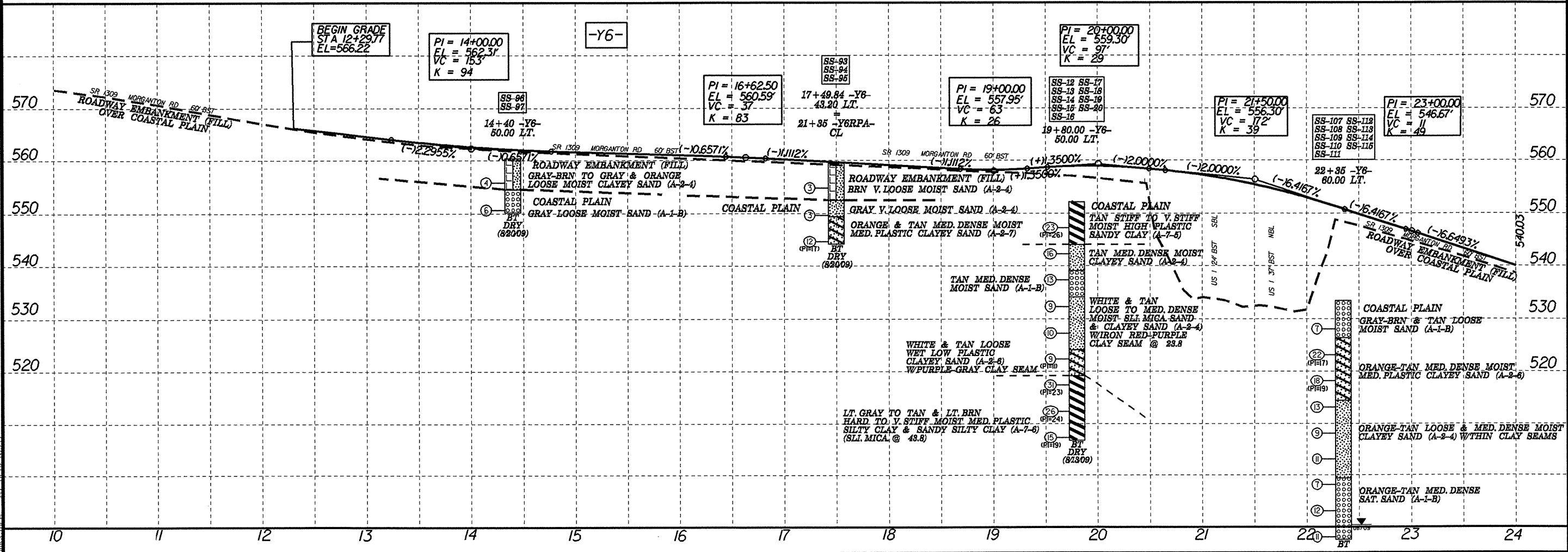
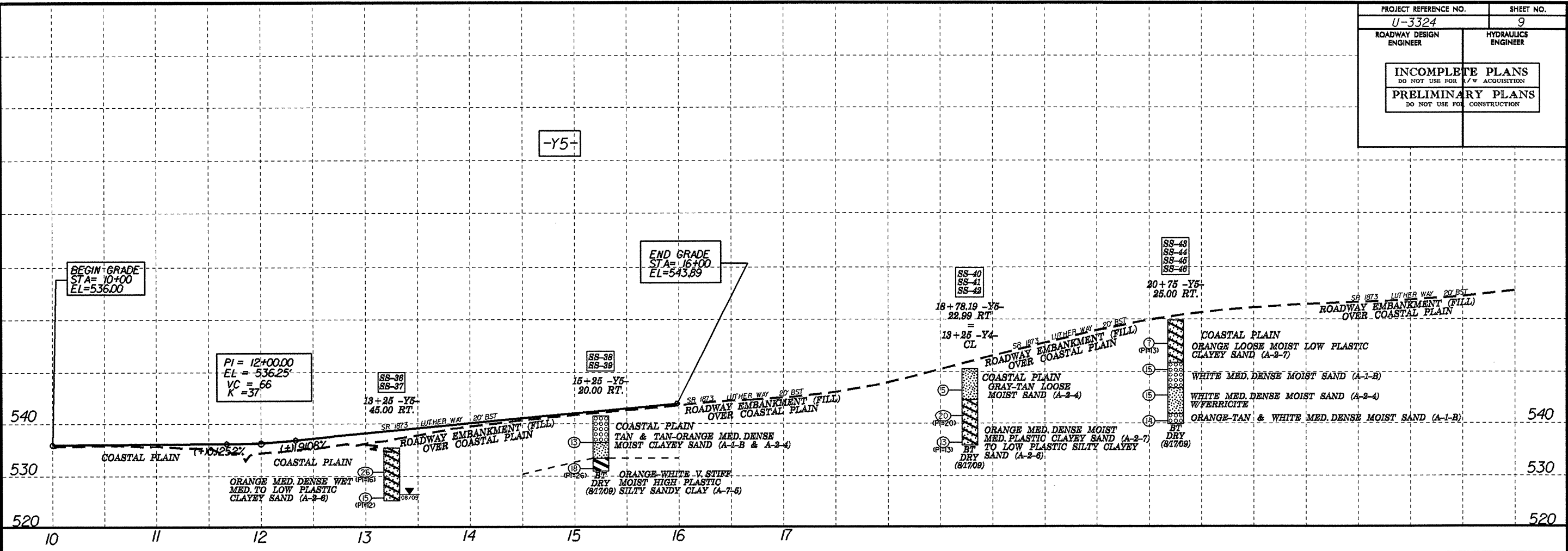
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INCOMPLETE PLANS DO NOT USE FOR E/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



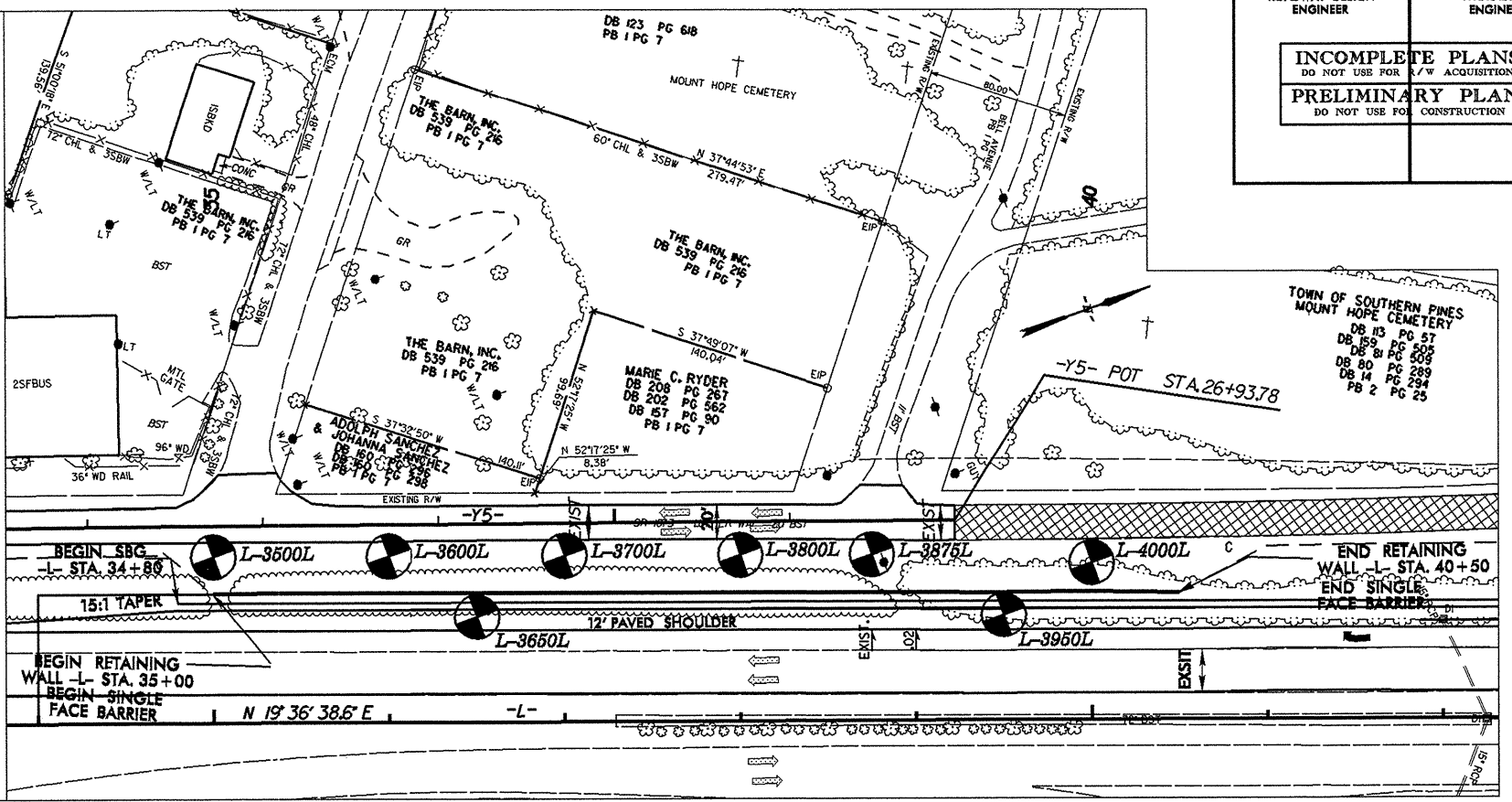
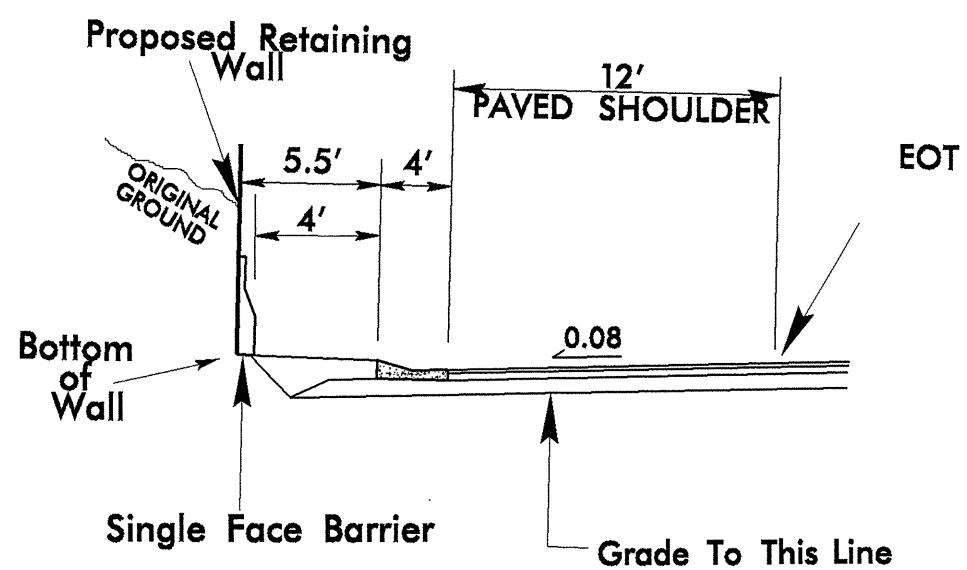
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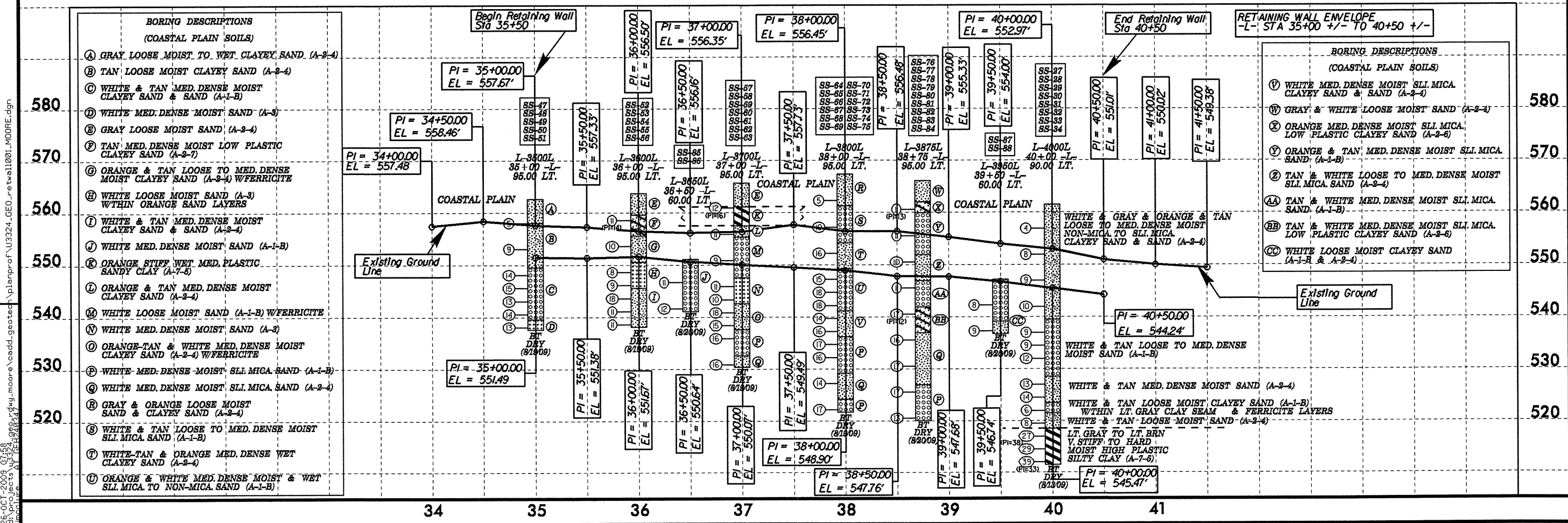
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ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



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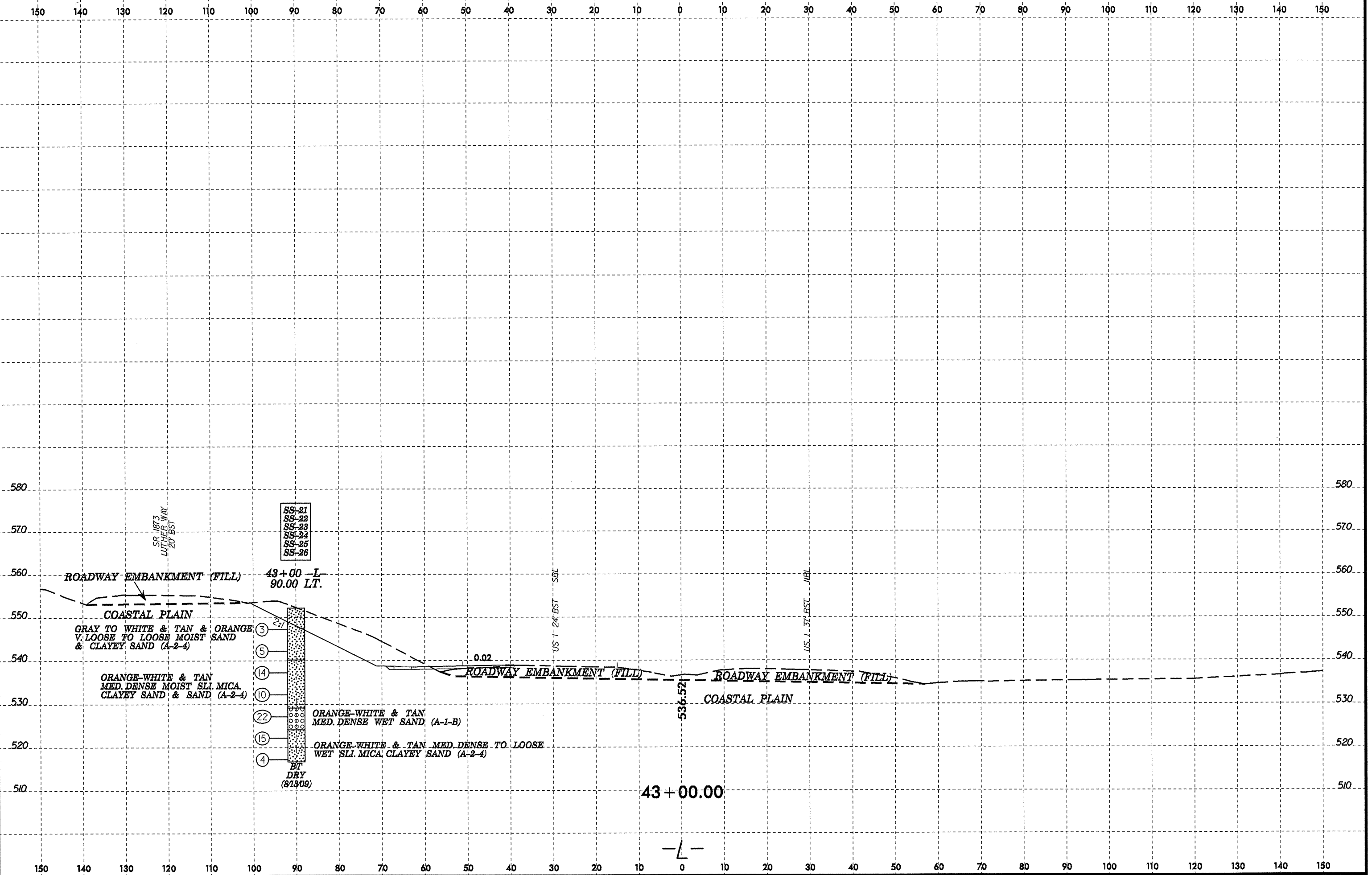


REVISIONS



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 26-OCT-2009 07:58
 C:\projects\U3324_GEO\retwall001.MOORE.dgn

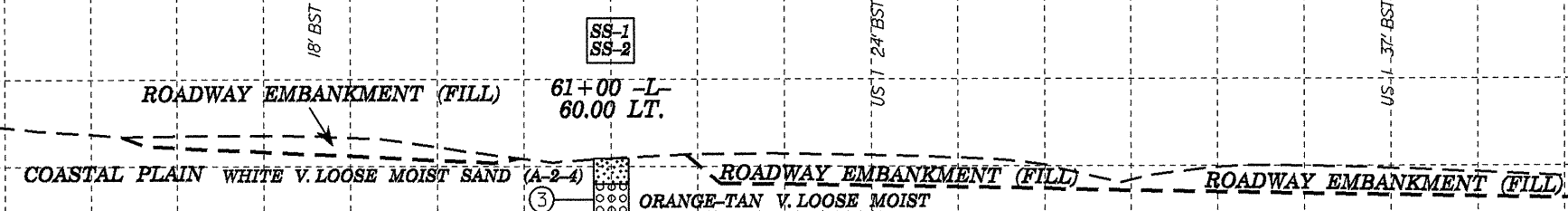
23-OCT-2009 15:28
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mccarthy



8/23/99

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

520 510 500 490 480



SS-1
SS-2

61+00 -L-
60.00 LT.

(A-2-4)

(3)

(13)
(PI=15)

ORANGE-TAN V. LOOSE MOIST SAND (A-1-B) W/CHARCOAL
ORANGE-TAN MED. DENSE MOIST LOW PLASTIC CLAYEY SAND (A-2-6) W/V. SMALL PEA GRAVEL
BT DRY (8/13/09)

US-11-24' BST - SBL

US-11-37' BST - NBL

61+00.00

-L-

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

23-OCT-2009 16:30
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imelure AT GEN120347

borehole

SOIL TEST RESULTS																Line or Boring ID
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC	
							C.SAND	F.SAND	SILT	CLAY	10	40	200			
SS-1	60 LT	61+00	3.8-5.3	A-1-b(0)	16	NP	74.0	15.3	1.6	9.0	99	44	12	-	-	L
SS-2	60 LT	61+00	8.8-10.3	A-2-6(0)	35	13	65.6	10.2	4.1	20.1	95	45	24	-	-	L
SS-3	60 LT	58+00	3.7-5.2	A-2-4(0)	16	NP	62.6	22.8	6.6	8.0	100	62	17	-	-	L
SS-4	60 LT	58+00	8.7-10.2	A-2-4(0)	36	10	51.4	17.9	6.7	24.1	98	66	31	-	-	L
SS-5	15 RT	10+00	4.0-5.5	A-2-4(0)	18	NP	52.6	28.9	6.5	12.0	100	72	21	-	-	Y6RPA
SS-6	15 RT	10+00	9.0-10.5	A-7-6(7)	46	18	34.5	13.8	7.5	44.1	100	81	53	-	-	Y6RPA
SS-7	CL	13+00	3.8-5.1	A-2-4(0)	16	NP	52.2	30.5	6.3	11.0	99	71	20	-	-	Y6RPA
SS-8	CL	13+00	8.6-10.1	A-2-4(0)	27	5	49.1	26.3	4.5	20.1	100	82	26	-	-	Y6RPA
SS-9	75 LT	50+00	4.0-5.5	A-2-4(0)	31	9	51.8	22.3	7.9	18.1	98	62	28	-	-	L
SS-10	75 LT	50+00	9.0-10.5	A-2-4(0)	19	NP	39.9	41.7	5.3	13.0	100	83	21	-	-	L
SS-11	75 LT	50+00	14.0-15.5	A-2-4(0)	29	10	22.9	45.3	7.7	24.1	100	92	35	-	-	L
SS-12	50 LT	19+80	3.8-5.3	A-7-5(14)	58	26	32.1	11.0	8.7	48.1	100	82	58	-	-	Y6
SS-13	50 LT	19+80	8.8-10.3	A-2-4(0)	30	8	65.6	14.0	5.3	15.0	99	57	21	-	-	Y6
SS-14	50 LT	19+80	13.8-15.3	A-1-b(0)	22	NP	84.3	8.8	2.9	4.0	100	24	8	-	-	Y6
SS-15	50 LT	19+80	18.8-20.3	A-2-4(0)	23	NP	39.5	47.0	5.4	8.0	100	95	15	-	-	Y6
SS-16	50 LT	19+80	23.8-25.3	A-2-4(0)	23	6	43.5	30.5	9.9	16.0	99	85	28	-	-	Y6
SS-17	50 LT	19+80	28.8-30.3	A-2-6(0)	31	11	64.4	10.4	9.1	16.0	96	57	26	-	-	Y6
SS-18	50 LT	19+80	33.8-35.3	A-7-6(26)	52	23	0.6	9.0	32.2	58.2	100	100	95	-	-	Y6
SS-19	50 LT	19+80	38.8-40.3	A-7-6(26)	53	24	1.2	10.2	28.4	60.2	100	100	92	-	-	Y6
SS-20	50 LT	19+80	43.8-45.3	A-7-6(20)	45	19	0.2	11.6	30.0	58.2	100	100	93	-	-	Y6
SS-21	90 LT	43+00	4.0-5.5	A-2-4(0)	16	NP	68.2	20.9	6.9	4.0	100	66	12	-	-	L
SS-22	90 LT	43+00	9.0-10.5	A-2-4(0)	29	10	71.3	8.7	3.9	16.0	100	49	21	-	-	L
SS-23	90 LT	43+00	14.0-15.5	A-2-4(0)	29	8	72.8	9.8	3.3	14.0	98	43	18	-	-	L
SS-24	90 LT	43+00	19.0-20.5	A-2-4(0)	19	NP	79.6	10.6	3.7	6.0	100	78	11	-	-	L
SS-25	90 LT	43+00	24.0-25.5	A-1-b(0)	24	3	82.2	8.3	3.4	6.0	99	27	10	-	-	L
SS-26	90 LT	43+00	34.0-35.5	A-2-4(0)	23	3	53.5	28.1	5.4	13.0	100	69	20	-	-	L
SS-27	90 LT	40+00	8.5-9.0	A-2-4(0)	25	3	74.3	8.9	4.7	12.0	100	59	18	-	-	L
SS-28	90 LT	40+00	13.5-15.0	A-2-4(0)	22	3	65.1	18.1	5.8	11.0	100	63	19	-	-	L
SS-29	90 LT	40+00	18.5-20.0	A-2-4(0)	22	NP	60.2	26.4	6.4	7.0	100	69	16	-	-	L
SS-30	90 LT	40+00	23.5-25.0	A-1-b(0)	20	NP	80.5	10.9	4.5	4.0	100	41	10	-	-	L
SS-31	90 LT	40+00	28.5-30.0	A-1-b(0)	20	NP	74.5	16.5	3.9	5.0	100	44	10	-	-	L
SS-32	90 LT	40+00	33.5-35.0	A-2-4(0)	21	NP	81.0	9.3	3.6	6.0	100	54	11	-	-	L
SS-33	90 LT	40+00	38.5-40.0	A-1-b(0)	22	3	71.7	13.4	2.9	12.0	96	49	16	-	-	L
SS-34	90 LT	40+00	43.5-45.0	A-7-5(45)	70	38	1.4	0.6	23.8	74.2	100	99	98	-	-	L
SS-35	90 LT	40+00	48.5-50.0	A-7-5(39)	63	33	1.2	1.8	26.8	70.2	100	99	98	-	-	L
SS-36	45 RT	13+25	3.7-5.2	A-2-6(0)	38	16	66.8	12.2	4.9	16.1	99	50	22	-	-	Y5
SS-37	45 RT	13+25	8.7-10.2	A-2-6(0)	31	12	77.4	7.7	2.8	12.0	100	37	16	-	-	Y5
SS-38	20 RT	15+25	4.0-5.5	A-1-b(0)	18	1	70.0	15.7	4.2	10.0	96	46	15	-	-	Y5
SS-39	20 RT	15+25	9.0-10.5	A-7-5(16)	56	26	19.1	22.7	18.2	40.1	100	86	63	-	-	Y5
SS-40	CL	13+25	3.2-4.7	A-2-4(0)	16	NP	63.3	23.8	6.9	6.0	99	65	15	-	-	Y4
SS-41	CL	13+25	8.2-9.7	A-2-7(1)	43	20	74.0	7.3	2.6	16.0	100	34	20	-	-	Y4
SS-42	CL	13+25	13.2-14.7	A-2-6(0)	35	13	51.0	20.3	10.7	18.1	99	70	31	-	-	Y4
SS-43	25 RT	20+75	3.4-4.9	A-2-7(0)	43	13	60.8	10.1	5.0	24.1	100	54	30	-	-	Y5
SS-44	25 RT	20+75	8.4-9.9	A-1-b(0)	23	3	80.6	10.8	3.5	5.0	97	28	9	-	-	Y5
SS-45	25 RT	20+75	13.4-14.9	A-2-4(0)	23	NP	51.5	34.7	5.8	8.0	99	80	16	-	-	Y5
SS-46	25 RT	20+75	18.4-19.9	A-1-b(0)	21	NP	79.2	11.5	4.2	5.0	96	30	10	-	-	Y5
SS-47	95 LT	35+00	3.5-5.0	A-2-4(0)	25	8	63.1	16.1	4.6	16.1	98	53	22	-	-	L
SS-48	95 LT	35+00	8.5-10.0	A-2-4(0)	34	9	56.9	19.2	3.8	20.2	100	68	26	-	-	L
SS-49	95 LT	35+00	13.5-15.0	A-1-b(0)	28	6	79.4	8.3	2.2	10.1	99	29	13	-	-	L
SS-50	95 LT	35+00	18.5-20.0	A-1-b(0)	22	NP	77.6	13.9	2.4	6.0	100	46	10	-	-	L
SS-51	95 LT	35+00	23.5-25.0	A-3(0)	20	NP	67.9	23.2	2.8	6.0	100	69	10	-	-	L
SS-52	95 LT	36+00	4.0-5.5	A-2-7(1)	44	14	57.5	12.5	1.8	28.2	96	53	30	-	-	L
SS-53	95 LT	36+00	9.0-10.5	A-2-4(0)	28	5	43.1	36.7	4.0	16.1	100	85	22	-	-	L
SS-54	95 LT	36+00	14.0-15.5	A-3(0)	21	NP	65.1	27.2	3.6	4.0	100	81	9	-	-	L
SS-55	95 LT	36+00	19.0-20.5	A-2-4(0)	29	8	79.6	8.5	1.8	10.1	94	26	12	-	-	L
SS-56	95 LT	36+00	24.0-25.5	A-2-4(0)	23	NP	72.0	18.5	3.4	6.0	100	54	11	-	-	L
SS-57	95 LT	37+00	3.7-5.2	A-7-5(2)	47	16	48.2	14.5	3.0	34.3	99	76	38	-	-	L
SS-58	95 LT	37+00	8.7-10.2	A-2-4(0)	23	NP	65.7	21.0	1.2	12.1	100	73	14	-	-	L
SS-59	95 LT	37+00	13.7-15.2	A-1-b(0)	24	4	85.1	6.5	2.4	6.0	91	30	8	-	-	L
SS-60	95 LT	37+00	18.7-20.2	A-3(0)	19	NP	78.2	12.3	3.4	6.0	100	61	10	-	-	L
SS-61	95 LT	37+00	23.7-25.2	A-2-4(0)	23	5	73.4	12.7	3.8	10.1	95	54	14	-	-	L
SS-62	95 LT	37+00	28.7-30.2	A-1-b(0)	25	4	78.2	11.3	2.4	8.1	99	40	11	-	-	L
SS-63	95 LT	37+00	33.7-35.2	A-2-4(0)	22	NP	73.2	15.9	2.8	8.1	100	58	12	-	-	L
SS-64	95 LT	38+00	4.0-5.5	A-2-4(0)	29	7	45.2	31.0	3.6	20.2	98	74	25	-	-	L
SS-65	95 LT	38+00	9.0-10.5	A-1-b(0)	23	NP	76.6	14.9	2.4	6.0	99	38	10	-	-	L
SS-66	95 LT	38+00	14.0-15.5	A-2-4(0)	33	9	70.8	9.5	5.6	14.1	97	43	22	-	-	L
SS-67	95 LT	38+00	19.0-20.5	A-1-b(0)	22	NP	81.3	9.5	3.2	6.0	99	42	10	-	-	L
SS-68	95 LT	38+00	21.5-23.0	A-1-b(0)	24	3	79.8	10.1	4.0	6.0	100	38	11	-	-	L
SS-69	95 LT	38+00	24.0-25.5	A-1-b(0)	20	NP	75.6	12.1	4.2	8.1	98	48	13	-	-	L

borehole

SOIL TEST RESULTS																Line or Boring ID
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-70	95 LT	38+00	26.5-28.0	A-2-4(0)	26	6	53.6	23.4	6.9	16.1	100	70	25	-	-	L
SS-71	95 LT	38+00	29.0-30.5	A-2-4(0)	23	3	72.6	14.5	4.8	8.1	99	51	14	-	-	L
SS-72	95 LT	38+00	31.5-33.0	A-1-b(0)	21	NP	77.8	13.1	1.0	8.1	99	39	10	-	-	L
SS-73	95 LT	38+00	34.0-35.5	A-1-b(0)	21	NP	77.9	12.6	4.5	5.0	99	49	10	-	-	L
SS-74	95 LT	38+00	39.0-40.5	A-2-4(0)	21	NP	74.7	14.4	5.8	5.0	100	87	12	-	-	L
SS-75	95 LT	38+00	44.0-45.5	A-1-b(0)	19	NP	85.0	7.3	3.7	4.0	100	35	8	-	-	L
SS-76	95 LT	38+75	4.4-5.9	A-2-6(0)	39	13	73.0	9.7	3.2	14.0	97	35	17	-	-	L
SS-77	95 LT	38+75	9.4-10.9	A-1-b(0)	29	3	81.4	6.5	3.1	9.0	100	26	13	-	-	L
SS-78	95 LT	38+75	14.4-15.9	A-2-4(0)	21	NP	79.4	8.2	3.4	9.0	100	72	13	-	-	L
SS-79	95 LT	38+75	19.4-20.9	A-1-b(0)	21	NP	79.7	10.5	3.8	6.0	100	45	11	-	-	L
SS-80	95 LT	38+75	24.4-25.9	A-2-6(0)	38	12	63.0	7.7	9.2	20.0	94	45	28	-	-	L
SS-81	95 LT	38+75	29.4-30.9	A-2-4(0)	25	NP	63.9	22.7	4.3	9.0	100	62	14	-	-	L
SS-82	95 LT	38+75	34.4-35.9	A-2-4(0)	23	NP	69.4	19.1	4.4	7.0	100	57	13	-	-	L
SS-83	95 LT	38+75	39.4-40.9	A-1-b(0)	18</											