

CONTRACT: ID: R-4903

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

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APPENDIX

4 SPT BORELOGS (2 SHEETS)
SOIL SAMPLE RESULTS (1 SHEET)

DRAWN BY: J.L. STONE

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

ROADWAY
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 40226.1.1 (R-4903) F.A. PROJ. NHF-87(15)
COUNTY BLADEN
PROJECT DESCRIPTION NC 87 AND US 701 INTERSECTION
CONSTRUCT INTERCHANGE

INVENTORY

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.

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-4903	1	41
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
40226.1.1	NHF-87(15)	P.E.	
		RAW & UTIL.	

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

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

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

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DATE NOVEMBER 2012






NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

PROJECT REFERENCE NO. R-4903	SHEET NO. 2
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SOIL DESCRIPTION		GRADATION		ROCK DESCRIPTION		TERMS AND DEFINITIONS					
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: <i>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH PLASTIC, A-7-6</i>		WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED). GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES 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.		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:  NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.  CRYSTALLINE ROCK (CR) FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.  NON-CRYSTALLINE ROCK (NCR) FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.  COASTAL PLAIN SEDIMENTARY ROCK (CP) COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.		ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS IN OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.					
SOIL LEGEND AND AASHTO CLASSIFICATION		MINERALOGICAL COMPOSITION		WEATHERING		ROCK HARDNESS					
GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS		MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.		FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (V SL.) 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 (SL.) 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. 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, YIELDS SPT N VALUES > 100 BPF 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. IF TESTED, YIELDS 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.		SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50		FRESH VERY SLIGHT (V SL.) SLIGHT (SL.) MODERATE (MOD.) MODERATELY SEVERE (MOD. SEV.) SEVERE (SEV.) VERY SEVERE (V SEV.) COMPLETE		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 GROUVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT CAN BE GROUVED 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.	
COMPRESSIBILITY		PERCENTAGE OF MATERIAL		GROUND WATER		MISCELLANEOUS SYMBOLS					
TRACE OF ORGANIC MATTER 2 - 3% LITTLE ORGANIC MATTER 3 - 5% MODERATELY ORGANIC 5 - 10% HIGHLY ORGANIC >10%		ORGANIC 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		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		ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP & DIP DIRECTION OF ROCK STRUCTURES SPT TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION CONE PENETROMETER TEST SOUNDING ROD TEST BORING W/ CORE SPT N-VALUE SPT REFUSAL					
CONSISTENCY OR DENSENESS		GROUND WATER		ROCK HARDNESS		ROCK HARDNESS					
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)		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		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 GROUVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT CAN BE GROUVED 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.		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 GROUVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT CAN BE GROUVED 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.					
GENERALLY GRANULAR MATERIAL (NON-COHESIVE) VERY LOOSE 4 TO 10 LOOSE 10 TO 30 MEDIUM DENSE 30 TO 50 DENSE >50 VERY DENSE >100		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		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 GROUVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT CAN BE GROUVED 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.		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 GROUVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT CAN BE GROUVED 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.					
GENERALLY SILT-CLAY MATERIAL (COHESIVE) VERY SOFT 2 TO 4 SOFT 4 TO 8 MEDIUM STIFF 8 TO 15 STIFF 15 TO 30 VERY STIFF >30 HARD >30		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		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 GROUVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT CAN BE GROUVED 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.		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 GROUVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT CAN BE GROUVED 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.					
TEXTURE OR GRAIN SIZE		ABBREVIATIONS		FRACATURE SPACING		BEDDING					
U.S. STD. SIEVE SIZE OPENING (MM) 4 10 40 60 200 270 4.76 2.00 0.42 0.25 0.075 0.053		AR - AUGER REFUSAL MED. - MEDIUM MICA - MICACEOUS BT - BORING TERMINATED CL. - CLAY MICA - MICACEOUS CL. - CLAY MOD. - MODERATELY CPT - CONE PENETRATION TEST NP - NON PLASTIC CSE. - COARSE ORG. - ORGANIC DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST DPT - DYNAMIC PENETRATION TEST SAP. - SAPROLITIC F - FINE SD. - SAND, SANDY FOSS. - FOSSILIFEROUS SL. - SILT, SILTY FRAC. - FRACTURED, FRACTURES TCR - TRICONE REFUSAL FRAGS. - FRAGMENTS W - MOISTURE CONTENT HI. - HIGHLY V - VERY		VERY WIDE MORE THAN 10 FEET WIDE 3 TO 10 FEET MODERATELY CLOSE 1 TO 3 FEET CLOSE 0.16 TO 1 FEET VERY CLOSE LESS THAN 0.16 FEET		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					
SOIL MOISTURE - CORRELATION OF TERMS		EQUIPMENT USED ON SUBJECT PROJECT		INDURATION		INDURATION					
SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION		DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE: CORE SIZE: HAND TOOLS:		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.		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.					
LL - LIQUID LIMIT PL - PLASTIC LIMIT OH - OPTIMUM MOISTURE SL - SHRINKAGE LIMIT		MOBILE B- BK-51 CME-45C CME-45B PORTABLE HOIST		CLAY BITS 6" CONTINUOUS FLIGHT AUGER 8" HOLLOW AUGERS HARD FACED FINGER BITS TUNG-CARBIDE INSERTS CASING w/ ADVANCER TRICONE 2 15/16" STEEL TEETH TRICONE * TUNG-CARB. CORE BIT		AUTOMATIC MANUAL B N H POST HOLE DIGGER HAND AUGER SOUNDING ROD VANE SHEAR TEST					
PLASTICITY		FRACATURE SPACING		INDURATION		INDURATION					
NONPLASTIC 0-5 LOW PLASTICITY 6-15 MED. PLASTICITY 16-25 HIGH PLASTICITY 26 OR MORE		VERY WIDE MORE THAN 10 FEET WIDE 3 TO 10 FEET MODERATELY CLOSE 1 TO 3 FEET CLOSE 0.16 TO 1 FEET VERY CLOSE LESS THAN 0.16 FEET		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.		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.					
COLOR		FRACATURE SPACING		INDURATION		INDURATION					
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.		VERY WIDE MORE THAN 10 FEET WIDE 3 TO 10 FEET MODERATELY CLOSE 1 TO 3 FEET CLOSE 0.16 TO 1 FEET VERY CLOSE LESS THAN 0.16 FEET		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.		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.					

See Sheet 1-A For Index of Sheets

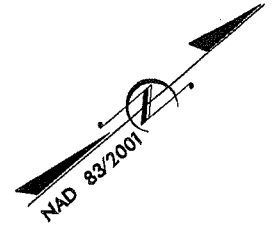
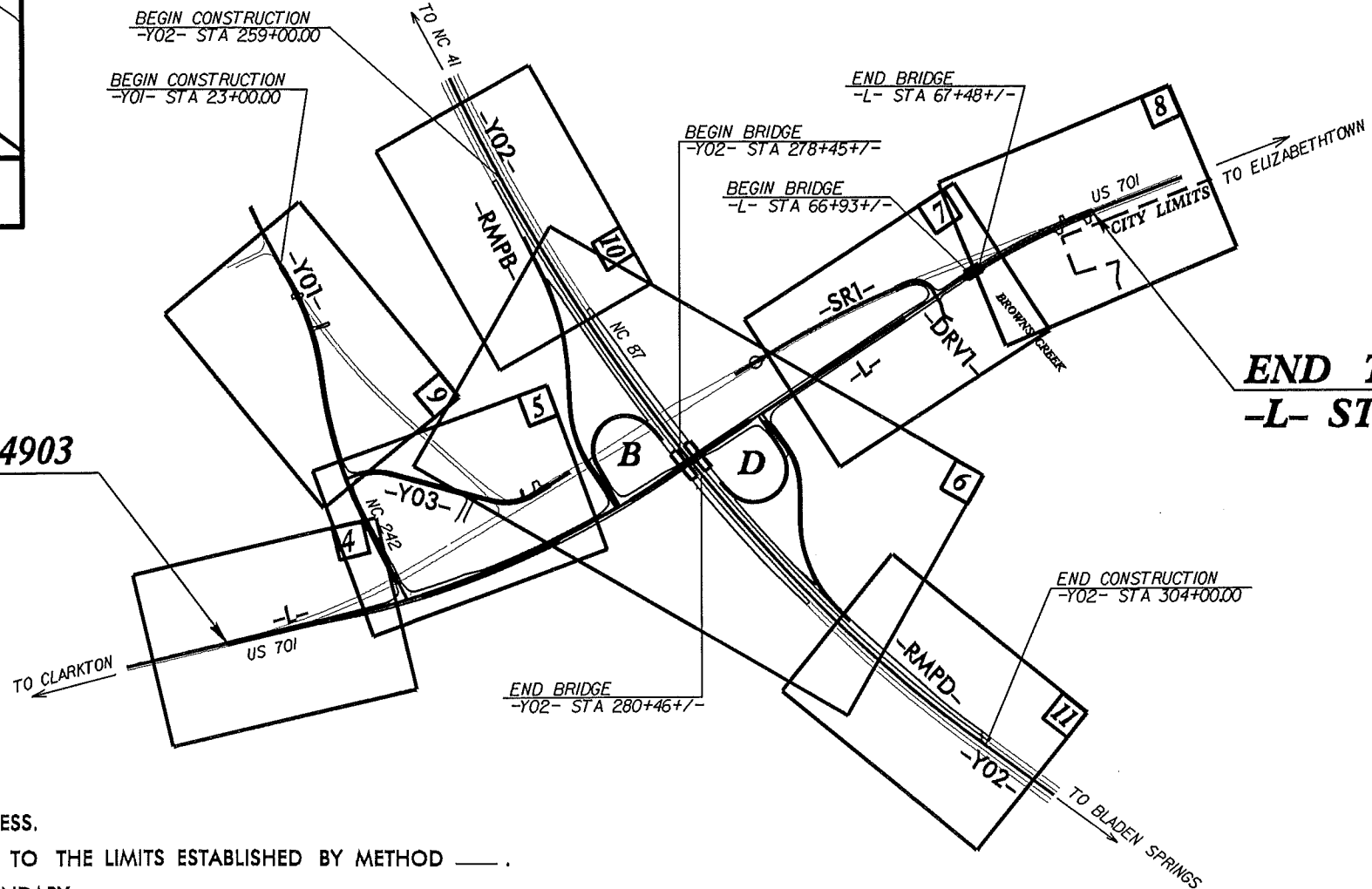
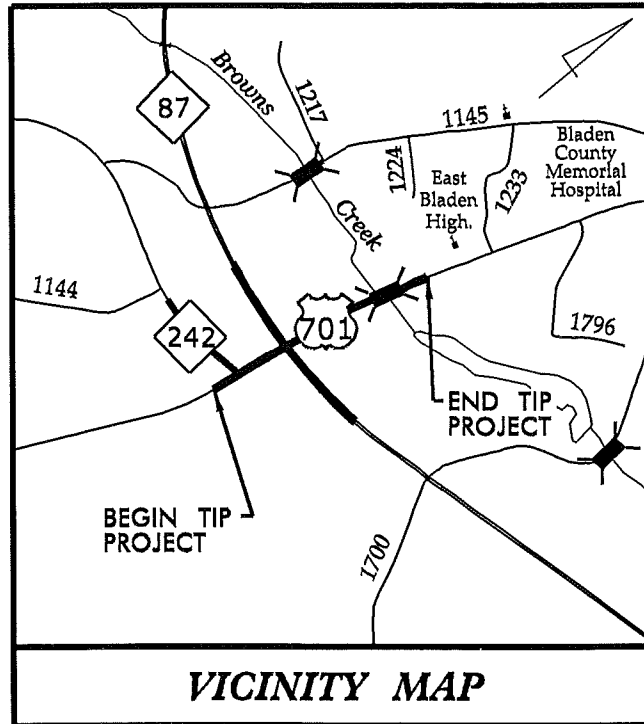
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BLADEN COUNTY

LOCATION: NC 87 - US 701 INTERSECTION.
CONSTRUCT INTERCHANGE

TYPE OF WORK: GRADING, DRAINAGE, STRUCTURE AND PAVING

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-4903	2A	41
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
40226.1.1	NHF-87(15)	P.E.	



TIP PROJECT: R-4903

CONTRACT:

BEGIN TIP PROJECT R-4903
-L- STA 16+60.00

END TIP PROJECT R-4903
-L- STA 75+10.00

NOTES:

1. A PORTION OF THIS PROJECT IS CONTROLLED ACCESS.
2. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ____.
3. THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARY.

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

<p>GRAPHIC SCALES</p>	<p>DESIGN DATA</p> <p>ADT 2014 = 11700 ADT 2034 = 17600 DHV = 11 % D = 60 % T = 14 % * V = 50 MPH * TTST = 9% DUAL 5% FUNC CLASS = RURAL MINOR ARTERIAL REGIONAL TIER</p>	<p>PROJECT LENGTH</p> <p>LENGTH OF ROADWAY TIP PROJECT R-4903 = 1.098 MILES LENGTH OF STRUCTURE TIP PROJECT R-4903 = 0.010 MILES TOTAL LENGTH OF TIP PROJECT R-4903 = 1.108 MILES</p>	<p>Prepared in the Office of: DIVISION OF HIGHWAYS 1000 Birch Ridge Dr., Raleigh NC, 27610</p> <p>2006 STANDARD SPECIFICATIONS</p> <p>RIGHT OF WAY DATE: SEPTEMBER 21, 2012</p> <p>LETTING DATE: MARCH 18, 2014</p> <p>GARY LOVERING, PE PROJECT ENGINEER</p> <p>ANTHONY C. WEST PROJECT DESIGN ENGINEER</p>	<p>HYDRAULICS ENGINEER</p> <p>SIGNATURE: _____ P.E.</p> <p>ROADWAY DESIGN ENGINEER</p> <p>SIGNATURE: _____ P.E.</p>	<p>DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA</p> <p>STATE HIGHWAY DESIGN ENGINEER</p>
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

November 16, 2012

STATE PROJECT: 40226.1.1 (R-4903)
F.A. PROJECT: NHF-87(15)
COUNTY: Bladen
DESCRIPTION: NC 87 and US 701 Intersection
SUBJECT: Geotechnical Inventory Report

Project Description

This project begins along existing US 701 approximately 3,000 feet south of the NC 87/ US 701 intersection, just south of Elizabethtown, and extends generally northward approximately 1.1 miles, ending along existing US 701 in Elizabethtown. This geotechnical investigation was confined to the areas of proposed construction.

Fieldwork was conducted in June of 2011 through April 2012. Standard Penetration Test and hand auger borings were completed along and at various offsets throughout the project corridor. Representative soil samples were collected for visual classification in the field and for laboratory analysis by the Materials and Tests Unit.

The following alignments were investigated. Subsurface profiles and selected cross sections of these alignments are included in this report.

<u>Line</u>	<u>Station(±)</u>
-L-	16+60 to 75+10
-Y01-	23+00 to 44+45
-Y02-	259+00 to 304+00
-Y03-	11+45 to 24+15
-RMPB-	10+00 to 27+44
-RMPD-	10+00 to 23+99
-LPB-	10+00 to 19+81
-LPD-	10+00 to 19+30

<u>Line</u>	<u>Station(±)</u>
-SR1-	20+90 to 23+78
-DRV1-	10+00 to 11+75

Areas of Special Geotechnical Interest

- 1) The following sections were found to exhibit seasonal high ground water or the potential for groundwater related construction problems.

<u>Line</u>	<u>Station(±)</u>
-L-	16+60 to 26+00
-L-	38+50 to 75+10
-Y02-	259+00 to 272+50
-Y02-	289+00 to 304+00
-RMPB-	10+00 to 27+44
-RMPD-	10+00 to 13+50
-RMPD-	20+00 to 23+99
-LPB-	13+50 to 19+81
-LPD-	15+75 to 19+30
-SR1-	22+50 to 23+78
-DRV1-	10+00 to 11+00

- 2) All but the following sections contain cohesive soils which have the potential to cause embankment/subgrade and or slope stability problems during construction.

<u>Line</u>	<u>Station(±)</u>
-L-	44+23 to 53+75
-L-	58+00 to 61+90
-L-	64+15 to 64+95
-L-	66+10 to 67+05
-Y02-	281+90 to 287+07
-Y02-	290+25 to 291+30
-Y02-	293+65 to 304+00
-RMPB-	20+49 to 21+51
-RMPD-	11+30 to 12+70
-RMPD-	17+20 to 23+99
-LPD-	11+05 to 19+30
-SR1-	23+51 to 23+78
-DRV1-	10+00 to 11+75

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT
1589 MAIL SERVICE CENTER
RALEIGH NC 27699-1589

TELEPHONE: 919-707-6850
FAX: 919-250-4237

WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:
CENTURY CENTER COMPLEX
ENTRANCE B-2
1020 BIRCH RIDGE DRIVE
RALEIGH NC

Physiography and Geology

This project corridor is located within the Coastal Plain Physiographic Province. Topography along the project ranges from mostly flat to sloping. Natural ground elevations ranged from 56± to 135± feet above sea level.

Surficial soils in this area are generally classified as undivided coastal plain sediments and alluvial sediments; all are underlain by formational soils belonging to the Black Creek Formation.

Ground Water

Ground water data was collected from June 2011 through April 2012, during a time of generally normal precipitation. Ground water elevations ranged from 55± to 114 ± feet above sea level.

Soils

Soils encountered within this project area have been divided into five categories, undivided coastal plain soils, formational soils, alluvial soils, artificial fill soils, and roadway embankment.

Soils identified as undivided coastal plain are composed of 6± to 36± feet of very loose to dense sand and clayey sand (A-2-4, A-3, A-1-b, A-2-6), with 3± to 5± feet of very soft to very stiff sandy and silty clay (A-6, A-7-6). Moisture samples taken within these cohesive units returned a natural moisture content from 24% to 34%.

Formational soils belonging to the Black Creek Formations were also encountered. In this area, Black Creek Formation is comprised of 4± to 20± feet of very soft to very stiff silty and sandy clay with sandy silt (A-7-6, A-6, A-4), and 3± to 12± feet of very loose to very dense sand (A-2-4, A-3).

Alluvial soils were identified within the Brown's Creek floodplain in the northern portion of the project area. They are comprised of 7± to 11± feet of loose sand (A-2-4) and 5± of soft silty clay (A-7-6).

Artificial fill soils were encountered in five soil test borings that penetrated an abandoned landfill site and one boring that penetrated a NCDOT soil stockpile along -RMPB-. The landfill soils were composed of 2± feet of loose sand (A-2-4), underlain by 15± to 24± feet of soft to stiff organic sandy silt (A-5), along with varying landfill debris. Records indicate that the majority of this landfill material is composed of fly ash. A sample collected within this ash

returned an organic content of 29.5%. The NCDOT stockpile soils were encountered from -RMPB- Sta. 19+50± to 22+00± and are composed of up to 18 feet of loose to medium dense sand (A-2-4).

Roadway embankment soils were found along the existing NC 87/US701 corridor and associated intersecting roads. Where encountered it was composed of 1± to 18± feet of loose to dense sand (A-2-4, A-3).

Prepared By:



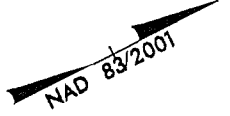
Joseph L. Stone, L.G.
Project Geological Engineer

8/17/99

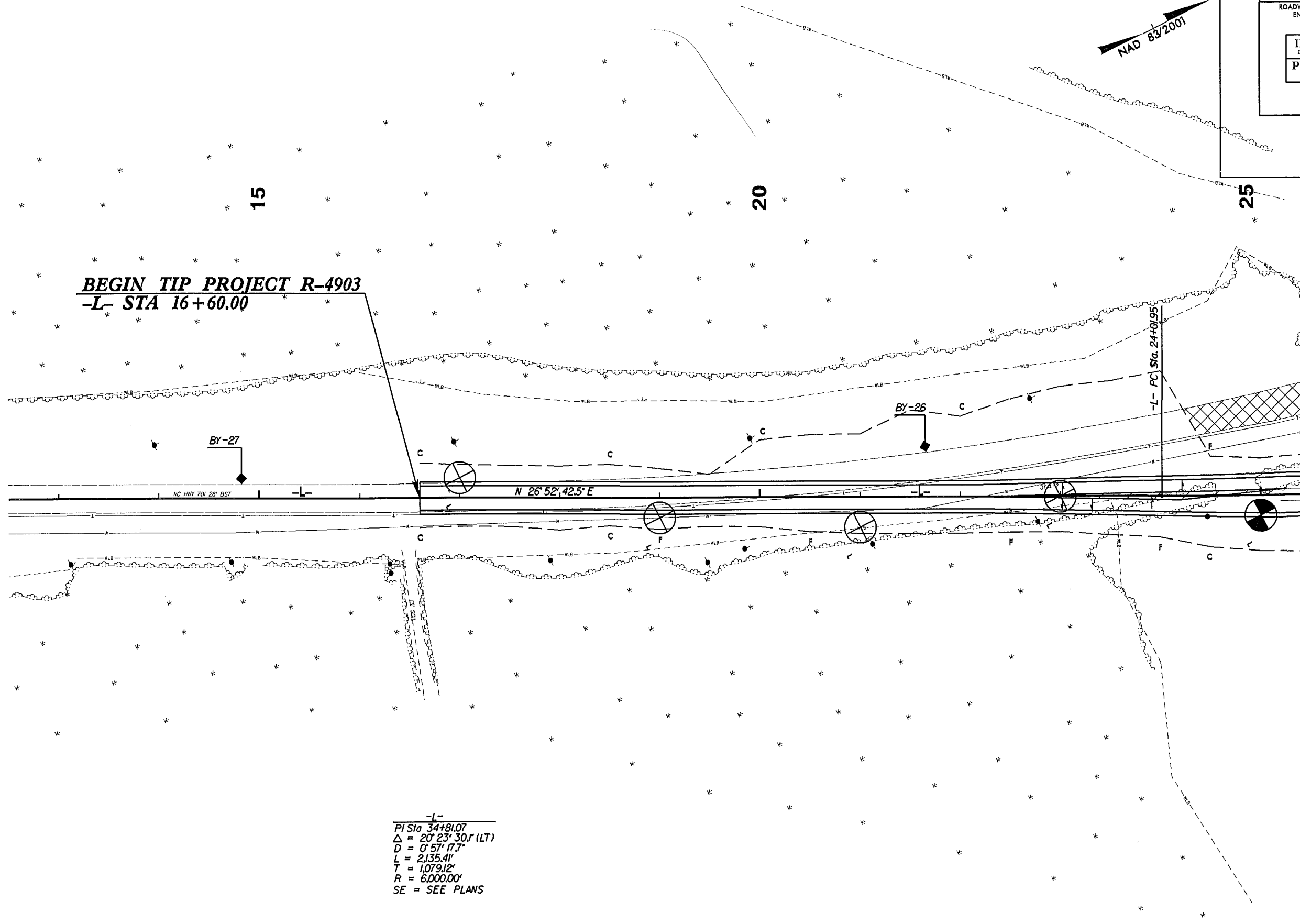
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REVISIONS

PROJECT REFERENCE NO. R-4903	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



PROPOSED PAVEMENT REMOVAL



BEGIN TIP PROJECT R-4903
-L- STA 16+60.00

MATCH LINE -L- STA. 25+50 SEE SHEET 5

-L-
 PI Sta 34+81.07
 $\Delta = 20^\circ 23' 30.1''$ (LT)
 $D = 0' 57' 17.7''$
 $L = 2,135.41'$
 $T = 1,079.12'$
 $R = 6,000.00'$
 SE = SEE PLANS

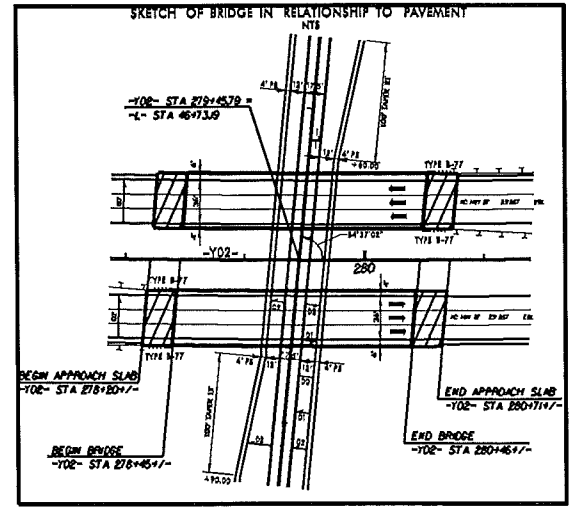
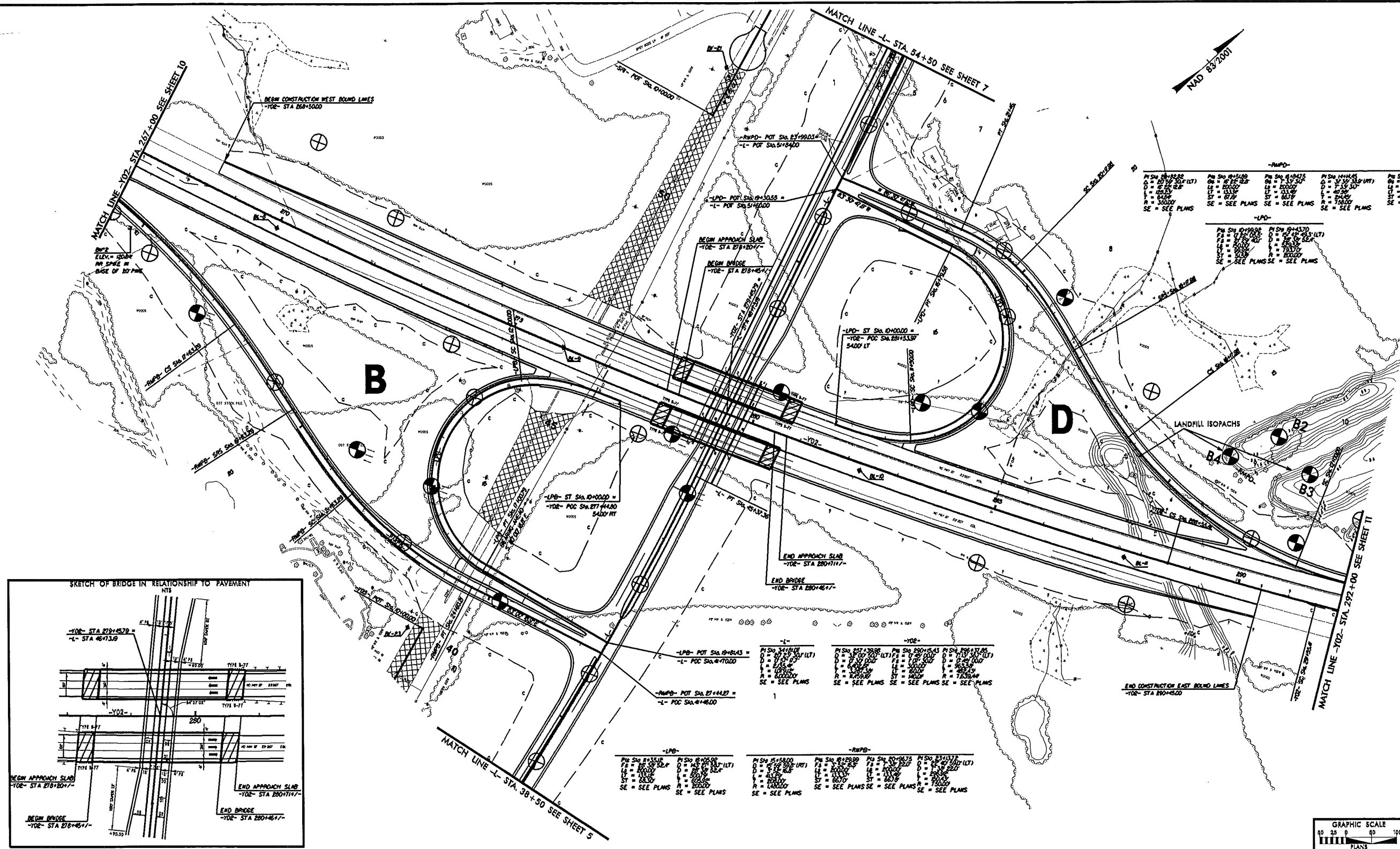
FOR -L- PROFILE, SEE SHEET 12

PROJECT NO.	1-157
SHEET NO.	8
INCOMPLETE PLANS DO NOT USE FOR CONSTRUCTION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

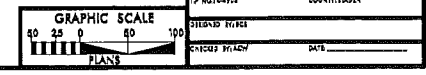
FOR -L- PROFILE SEE SHEET 13
 FOR -Y02- PROFILE SEE SHEET 18 & 19
 FOR -RWD- PROFILE SEE SHEET 18
 FOR -LFB- PROFILE SEE SHEET 18
 FOR -RWD- PROFILE SEE SHEET 18 & 19
 FOR -LFB- PROFILE SEE SHEET 18

☒ PROPOSED PAVEMENT REMOVAL

-RWD-		-LFB-	
PI STA 47+50.00	PI STA 47+50.00	PI STA 47+50.00	PI STA 47+50.00
PC STA 47+50.00	PC STA 47+50.00	PC STA 47+50.00	PC STA 47+50.00
PT STA 47+50.00	PT STA 47+50.00	PT STA 47+50.00	PT STA 47+50.00
L = 100.00	L = 100.00	L = 100.00	L = 100.00
E = 0.0000	E = 0.0000	E = 0.0000	E = 0.0000
R = 1000.00	R = 1000.00	R = 1000.00	R = 1000.00
SE = SEE PLANS	SE = SEE PLANS	SE = SEE PLANS	SE = SEE PLANS



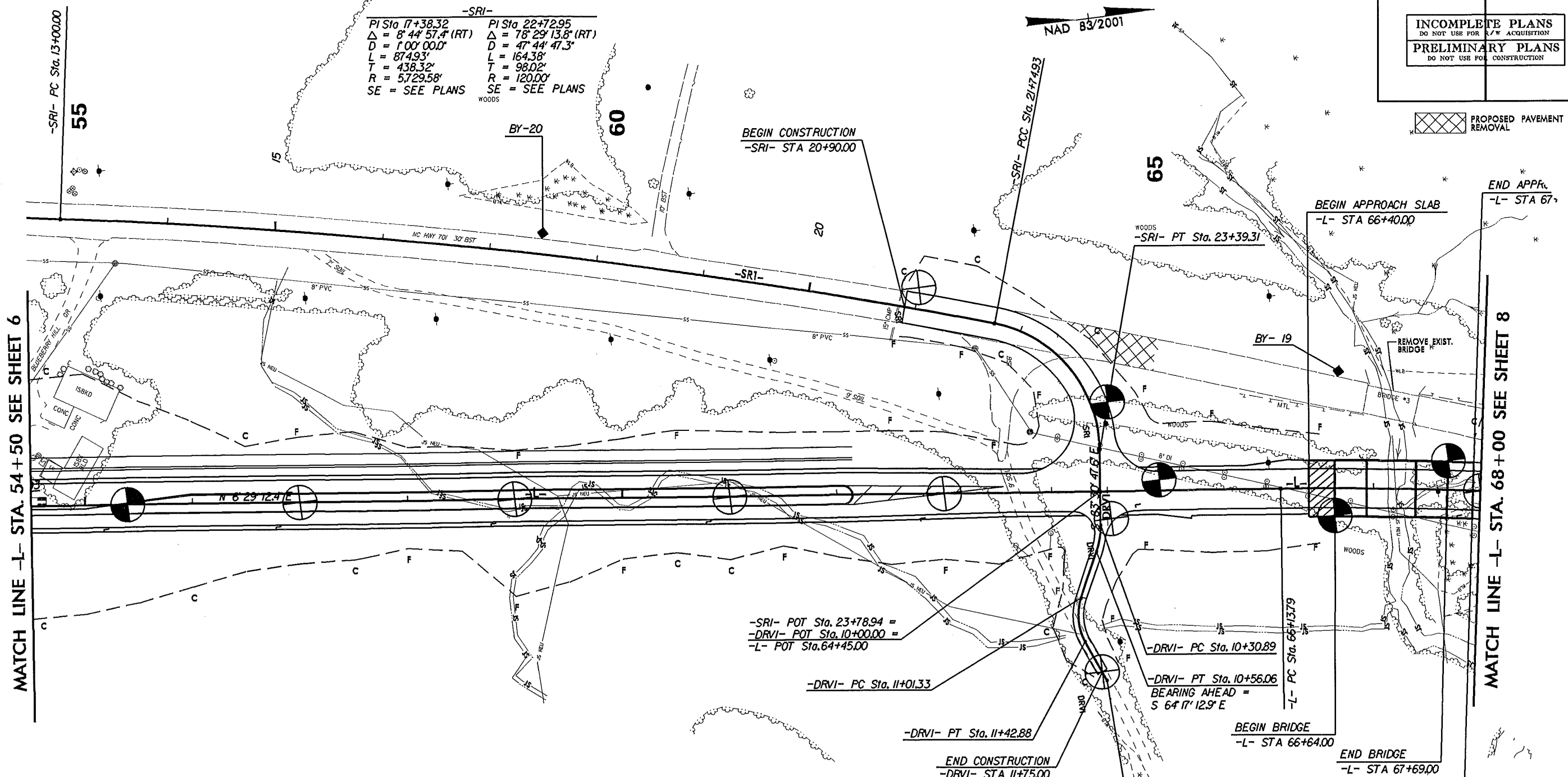
-LFB-		-RWD-	
PI STA 47+50.00	PI STA 47+50.00	PI STA 47+50.00	PI STA 47+50.00
PC STA 47+50.00	PC STA 47+50.00	PC STA 47+50.00	PC STA 47+50.00
PT STA 47+50.00	PT STA 47+50.00	PT STA 47+50.00	PT STA 47+50.00
L = 100.00	L = 100.00	L = 100.00	L = 100.00
E = 0.0000	E = 0.0000	E = 0.0000	E = 0.0000
R = 1000.00	R = 1000.00	R = 1000.00	R = 1000.00
SE = SEE PLANS	SE = SEE PLANS	SE = SEE PLANS	SE = SEE PLANS



8/17/99

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11/10/14

PROJECT REFERENCE NO. R-4903	SHEET NO. 7
RAW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



-SRI-
 PI Sta 17+38.32 Δ = 8° 44' 57.4" (RT)
 D = 1'00' 00.0" L = 87.493'
 T = 438.32' R = 5729.58'
 SE = SEE PLANS

PI Sta 22+72.95 Δ = 18° 29' 13.8" (RT)
 D = 47' 44' 47.3" L = 164.38'
 T = 98.02' R = 120.00'
 SE = SEE PLANS

BEGIN CONSTRUCTION
-SRI- STA 20+90.00

BEGIN APPROACH SLAB
-L- STA 66+40.00

END APPROACH
-L- STA 67+

-SRI- POT Sta. 23+78.94 =
 -DRVI- POT Sta. 10+00.00 =
 -L- POT Sta. 64+45.00

-DRVI- PC Sta. 11+01.33

-DRVI- PC Sta. 10+30.89
 -DRVI- PT Sta. 10+56.06
 BEARING AHEAD =
 S 64° 17' 12.9" E

-DRVI- PT Sta. 11+42.88

END CONSTRUCTION
-DRVI- STA 11+75.00

BEGIN BRIDGE
-L- STA 66+64.00

END BRIDGE
-L- STA 67+69.00

-DRVI- POT Sta. 11+84.01
 BEARING BACK = N 68° 05' 46.9" E

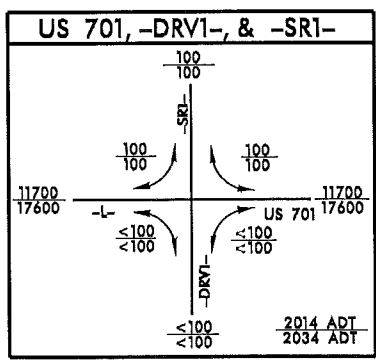
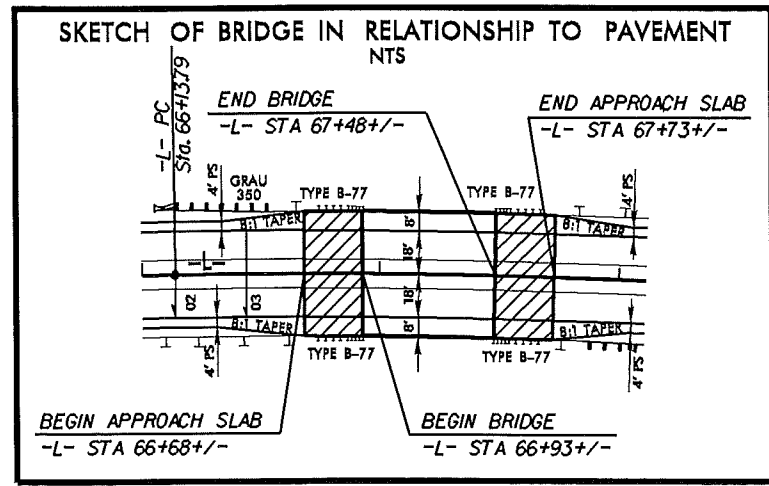
-L-
 PI Sta 70+56.07
 Δ = 12° 37' 08.6" (RT)
 D = 1' 25' 56.6"
 L = 880.98'
 T = 442.28'
 R = 4,000.00'
 SE = SEE PLANS

-DRVI-
 PI Sta 10+43.59 Δ = 19° 13' 34.7" (RT)
 D = 76° 23' 39.7" L = 25.17'
 T = 12.70' R = 75.00'
 SE = SEE PLANS

PI Sta 11+23.39 Δ = 47° 37' 00.2" (LT)
 D = 114° 35' 29.6" L = 41.55'
 T = 22.06' R = 50.00'
 SE = SEE PLANS

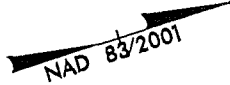
MATCH LINE -L- STA. 54+50 SEE SHEET 6

MATCH LINE -L- STA. 68+00 SEE SHEET 8

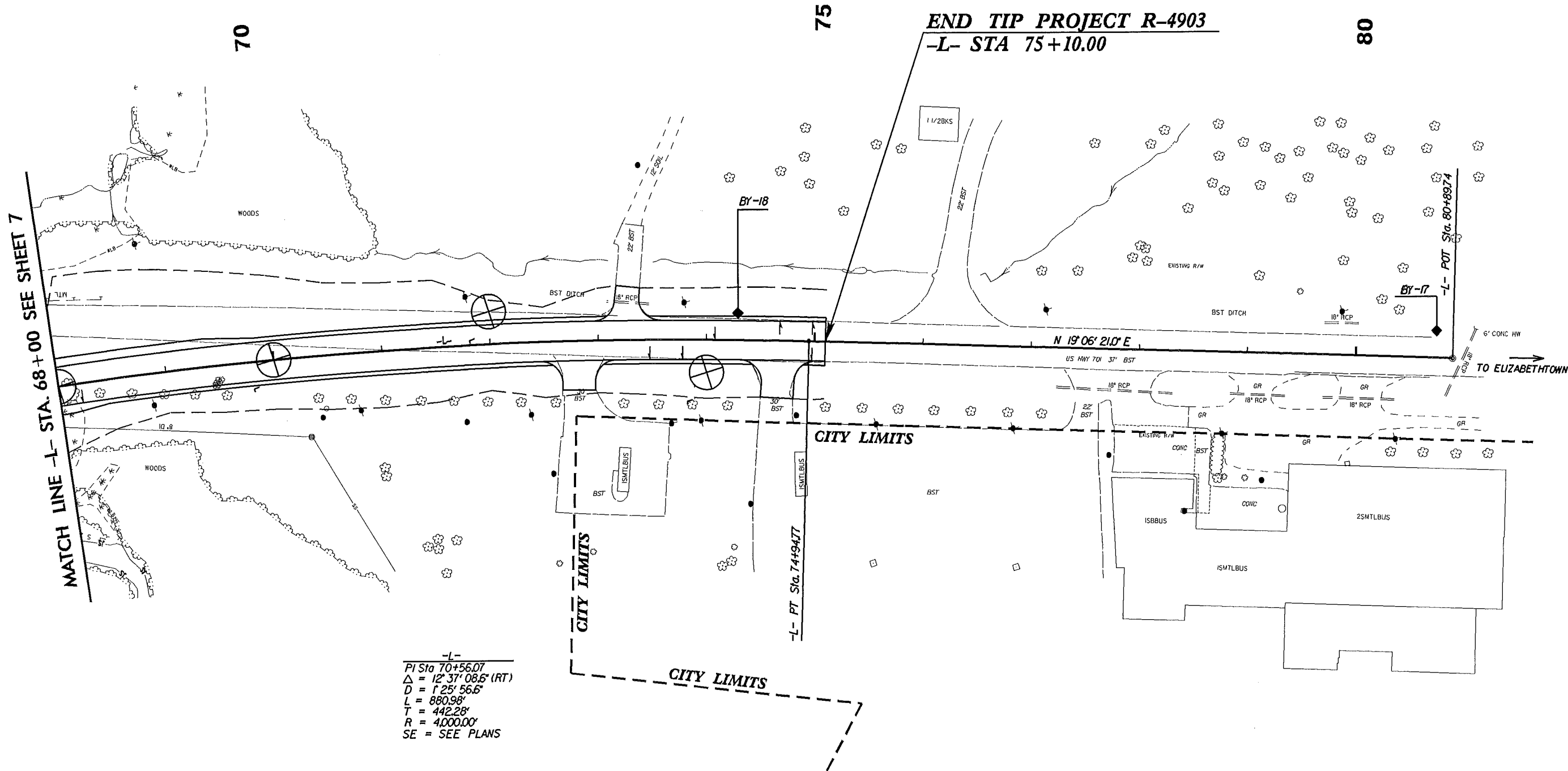


FOR -L- PROFILE, SEE SHEET 13 AND 14
 FOR -SRI- PROFILE, SEE SHEET 20
 FOR -DRVI- PROFILE, SEE SHEET 20

PROJECT REFERENCE NO. R-4903	SHEET NO. B
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



PROPOSED PAVEMENT REMOVAL



-L-
 PI Sta 70+56.07
 $\Delta = 12^\circ 37' 08.6''$ (RT)
 $D = 125' 56.6''$
 $L = 880.98'$
 $T = 442.28'$
 $R = 4000.00'$
 SE = SEE PLANS

FOR -L- PROFILE, SEE SHEET 14

REVISIONS

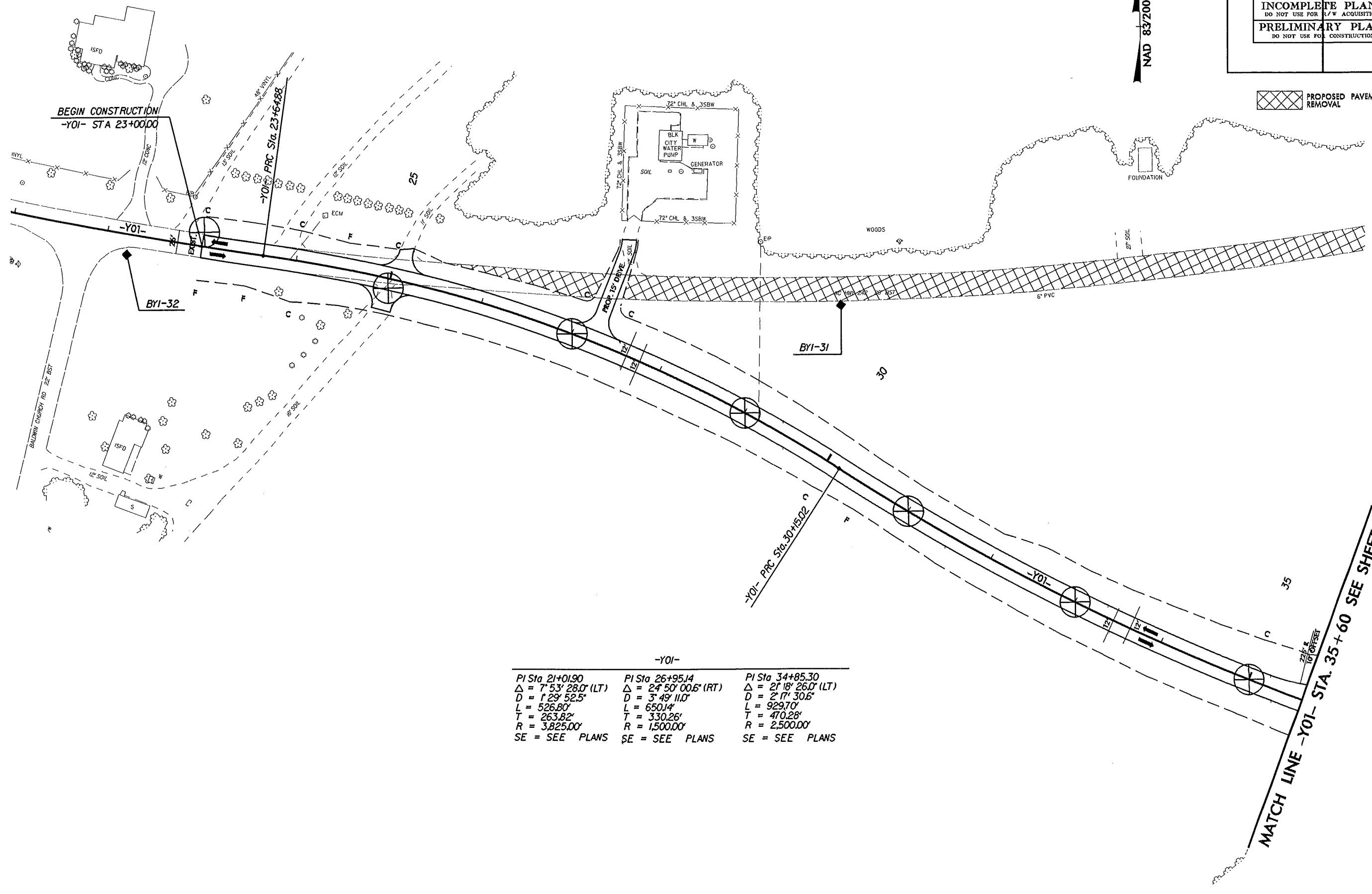
8/17/99
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PROJECT REFERENCE NO. R-4903	SHEET NO. 9
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

NAD 83/2001

PROPOSED PAVEMENT REMOVAL

5/14/99
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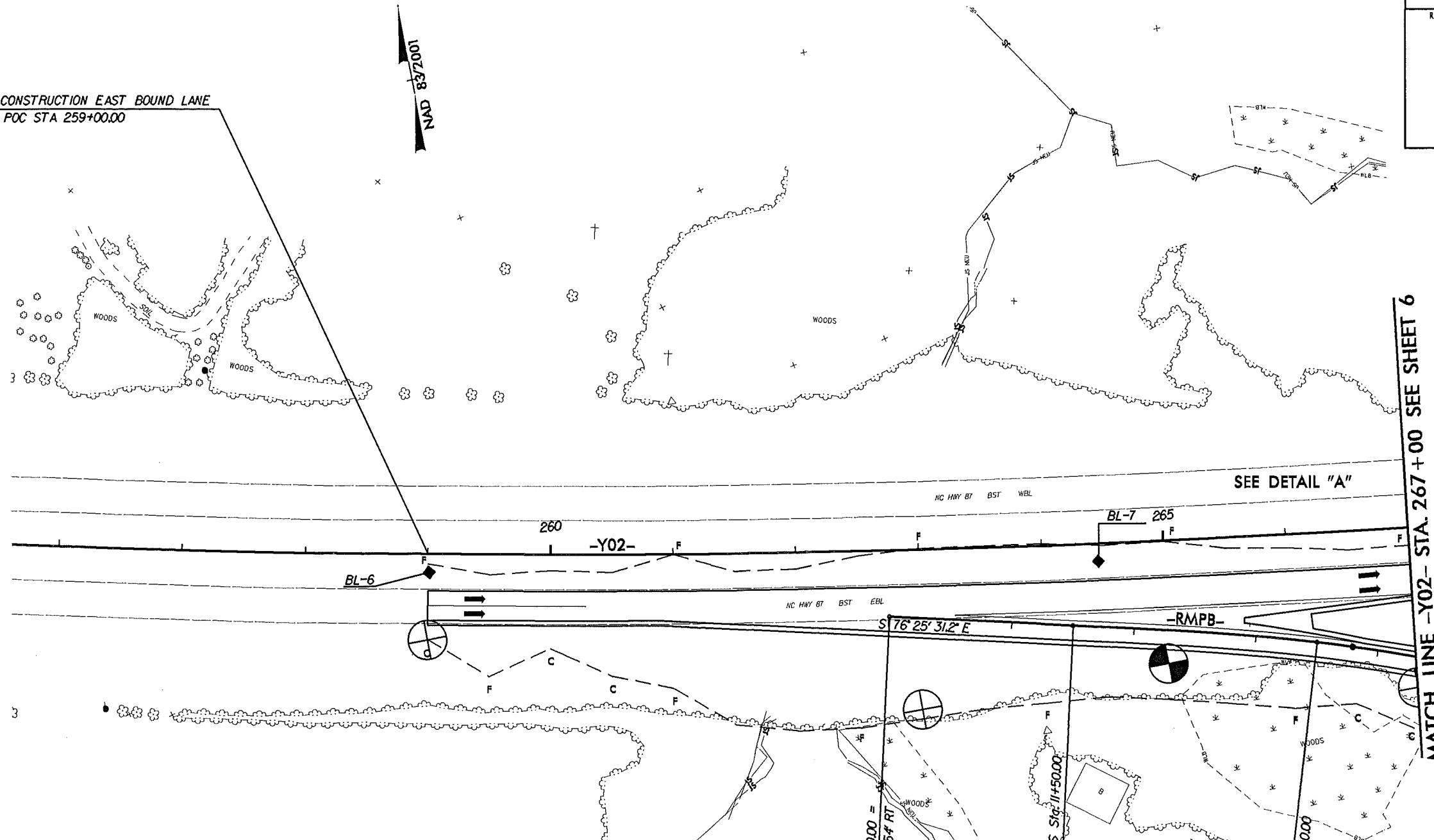


-Y01-		
PI Sta 21+01.90	PI Sta 26+95.14	PI Sta 34+85.30
$\Delta = 7^{\circ} 53' 28.0''$ (LT)	$\Delta = 24^{\circ} 50' 00.6''$ (RT)	$\Delta = 21^{\circ} 18' 26.0''$ (LT)
D = 129' 52.5'	D = 3' 49' 11.0'	D = 2' 17' 30.6'
L = 526.80'	L = 650.14'	L = 929.70'
T = 263.82'	T = 330.26'	T = 470.28'
R = 3,825.00'	R = 1,500.00'	R = 2,500.00'
SE = SEE PLANS	SE = SEE PLANS	SE = SEE PLANS

FOR -Y01- PROFILE, SEE SHEET 14

PROJECT REFERENCE NO.	SHEET NO.
R-4903	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

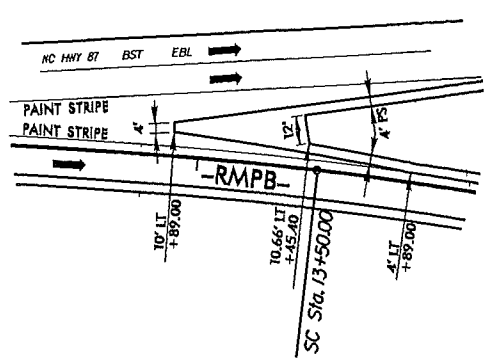
BEGIN CONSTRUCTION EAST BOUND LANE
 -Y02- POC STA 259+00.00



SEE DETAIL "A"

MATCH LINE -Y02- STA. 267 + 00 SEE SHEET 6

-Y02-		-RMPB-	
PI Sta 257+39.98	PI Sta 12+83.37	PI Sta 15+58.00	
$\Delta = 32^{\circ} 00' 50.7" (LT)$	$\theta_s = 3^{\circ} 52' 16.8"$	$\Delta = 15^{\circ} 59' 59.8" (RT)$	
$D = 0^{\circ} 30' 00.0"$	$L_s = 200.00'$	$D = 3^{\circ} 52' 16.8"$	
$L = 6,402.81'$	$LT = 133.37'$	$L = 413.29'$	
$T = 3,287.38'$	$ST = 66.70'$	$T = 208.00'$	
$R = 11,459.16'$	$SE = \text{SEE PLANS}$	$R = 1,480.00'$	
$SE = \text{SEE PLANS}$		$SE = \text{SEE PLANS}$	

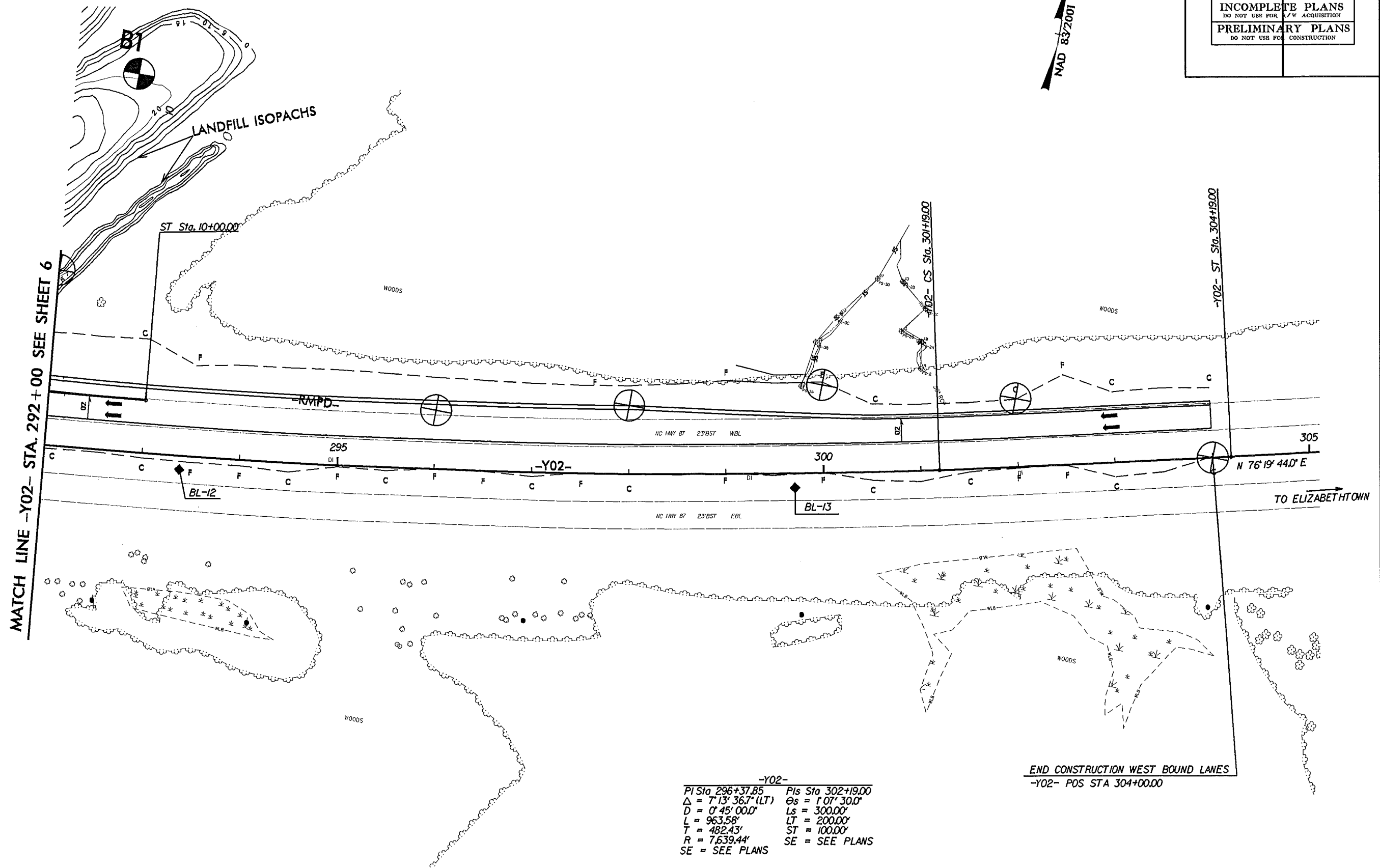


DETAIL "A"
 NTS

FOR -Y02- PROFILE, SEE SHEET 15
 FOR -RMPB- PROFILE, SEE SHEET 18

REVISIONS
 8/17/99
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PROJECT REFERENCE NO. R-4903	SHEET NO. 11
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



-Y02-

PI Sta 296+37.85	PIs Sta 302+19.00
$\Delta = 7^{\circ} 13' 36.7\" (LT)$	$\Theta_s = 1^{\circ} 07' 30.0\"$
$D = 0^{\circ} 45' 00.0\"$	$L_s = 300.00'$
$L = 963.58'$	$LT = 200.00'$
$T = 482.43'$	$ST = 100.00'$
$R = 7,639.44'$	$SE = \text{SEE PLANS}$
$SE = \text{SEE PLANS}$	

END CONSTRUCTION WEST BOUND LANES
-Y02- POS STA 304+00.00

FOR -Y02- PROFILE, SEE SHEET 16 AND 17
FOR -RMPD- PROFILE, SEE SHEET 18

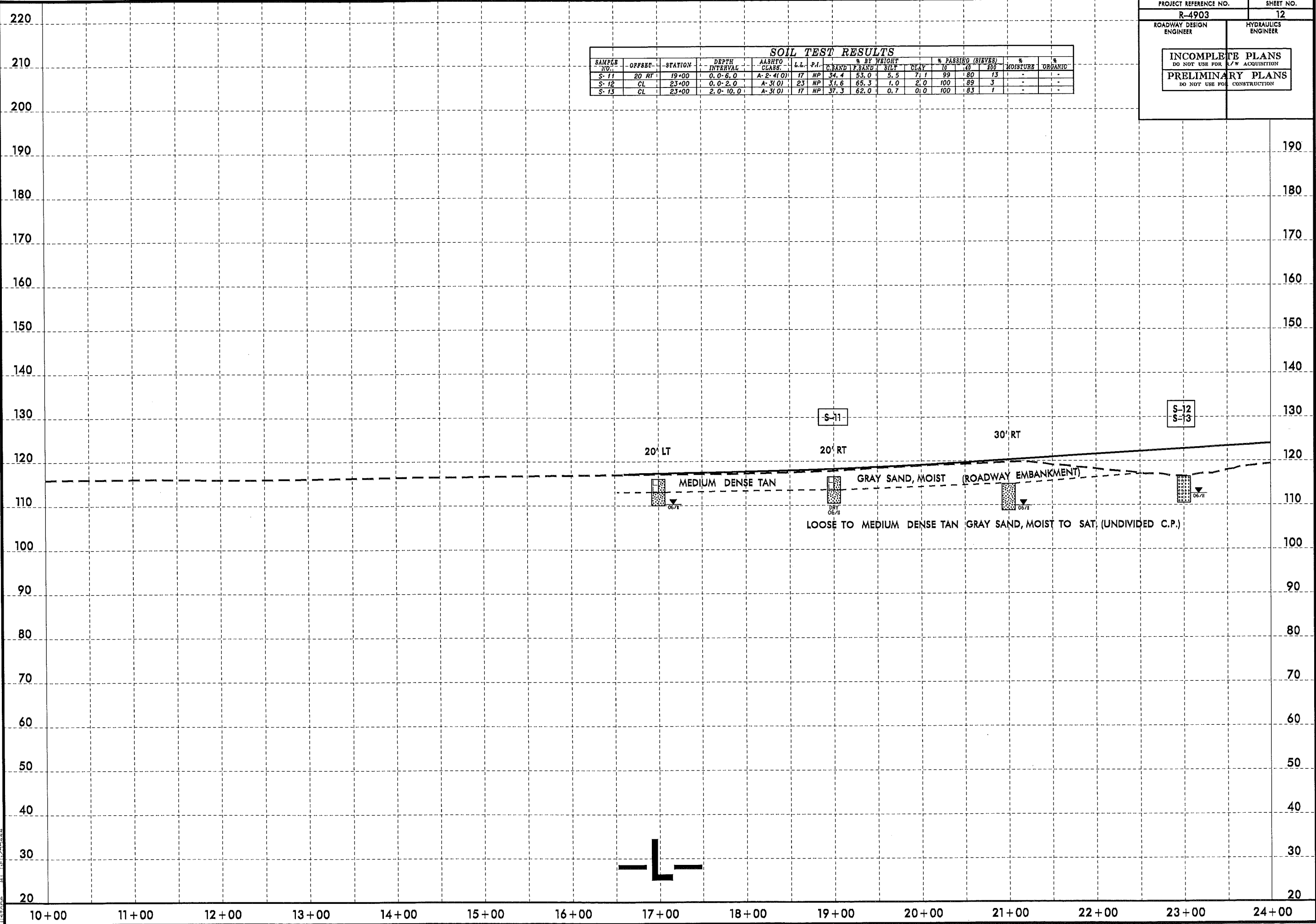
REVISIONS

8/17/99

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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT						% MOISTURE	% ORGANIC	
							C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES)	%			
S-11	20 RT	19+00	0.0-6.0	A-2-4(0)	17	NP	34.4	53.0	5.5	7.1	99	80	13	-	-
S-12	CL	23+00	0.0-2.0	A-3(0)	23	NP	31.6	65.3	1.0	2.0	100	89	3	-	-
S-13	CL	23+00	2.0-10.0	A-3(0)	17	NP	37.3	62.0	0.7	0.0	100	83	1	-	-

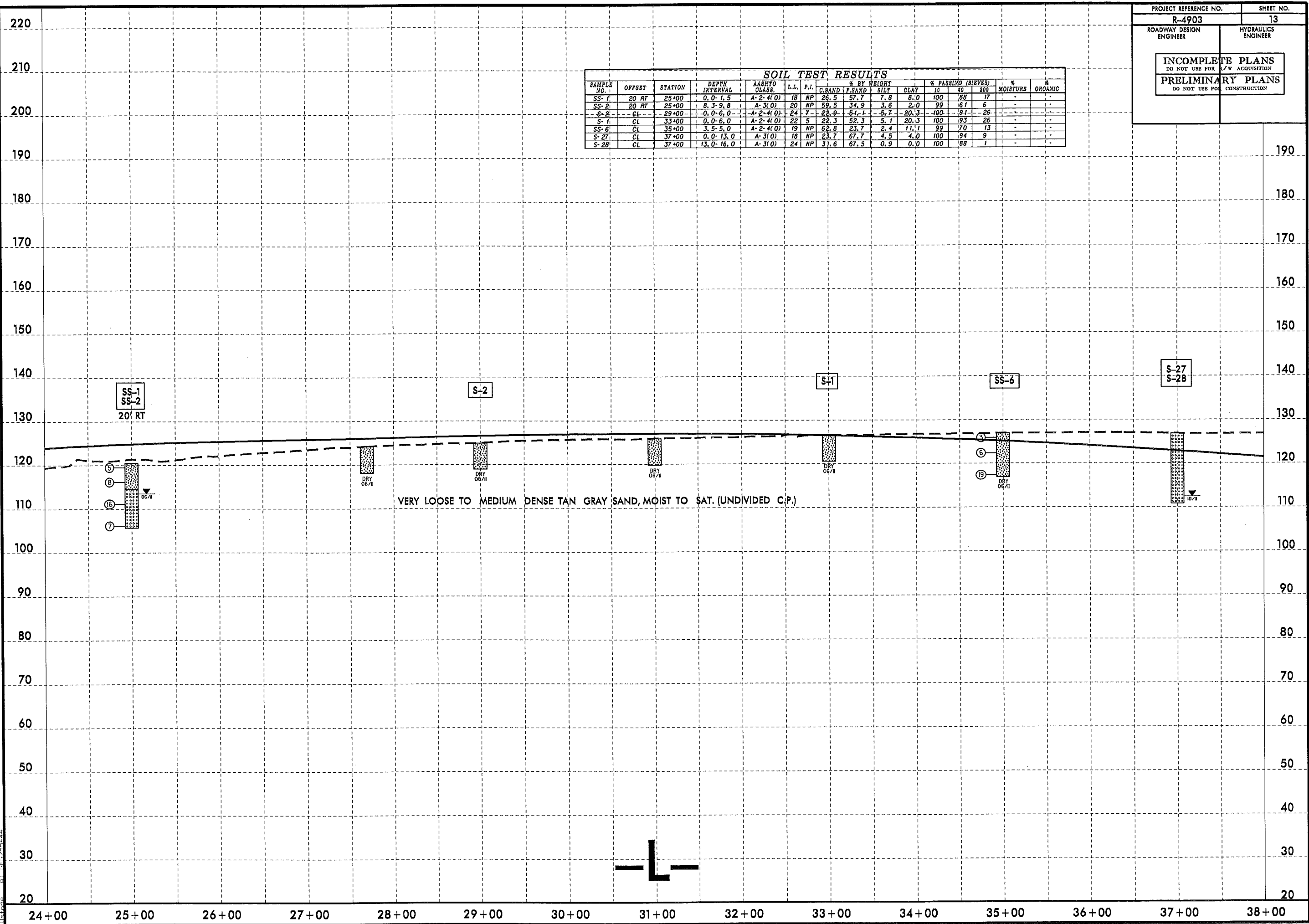
5/14/99
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 AT 06/25/2012



SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							G.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-1	20 RT	25+00	0.0-1.5	A-2-4(0)	18	NP	26.5	57.7	7.8	8.0	100	88	17	-	-
SS-2	20 RT	25+00	8.3-9.8	A-3(0)	20	NP	59.5	34.9	3.6	2.0	99	61	6	-	-
S-2	CL	29+00	0.0-6.0	A-2-4(0)	24	7	22.9	51.1	5.7	20.3	100	91	26	-	-
S-1	CL	33+00	0.0-6.0	A-2-4(0)	22	5	22.3	52.3	5.1	20.3	100	93	26	-	-
SS-6	CL	35+00	3.5-5.0	A-2-4(0)	19	NP	62.8	23.7	2.4	11.1	99	70	13	-	-
S-27	CL	37+00	0.0-13.0	A-3(0)	18	NP	23.7	67.7	4.5	4.0	100	94	9	-	-
S-28	CL	37+00	13.0-16.0	A-3(0)	24	NP	31.6	67.5	0.9	0.0	100	88	1	-	-

5/14/99

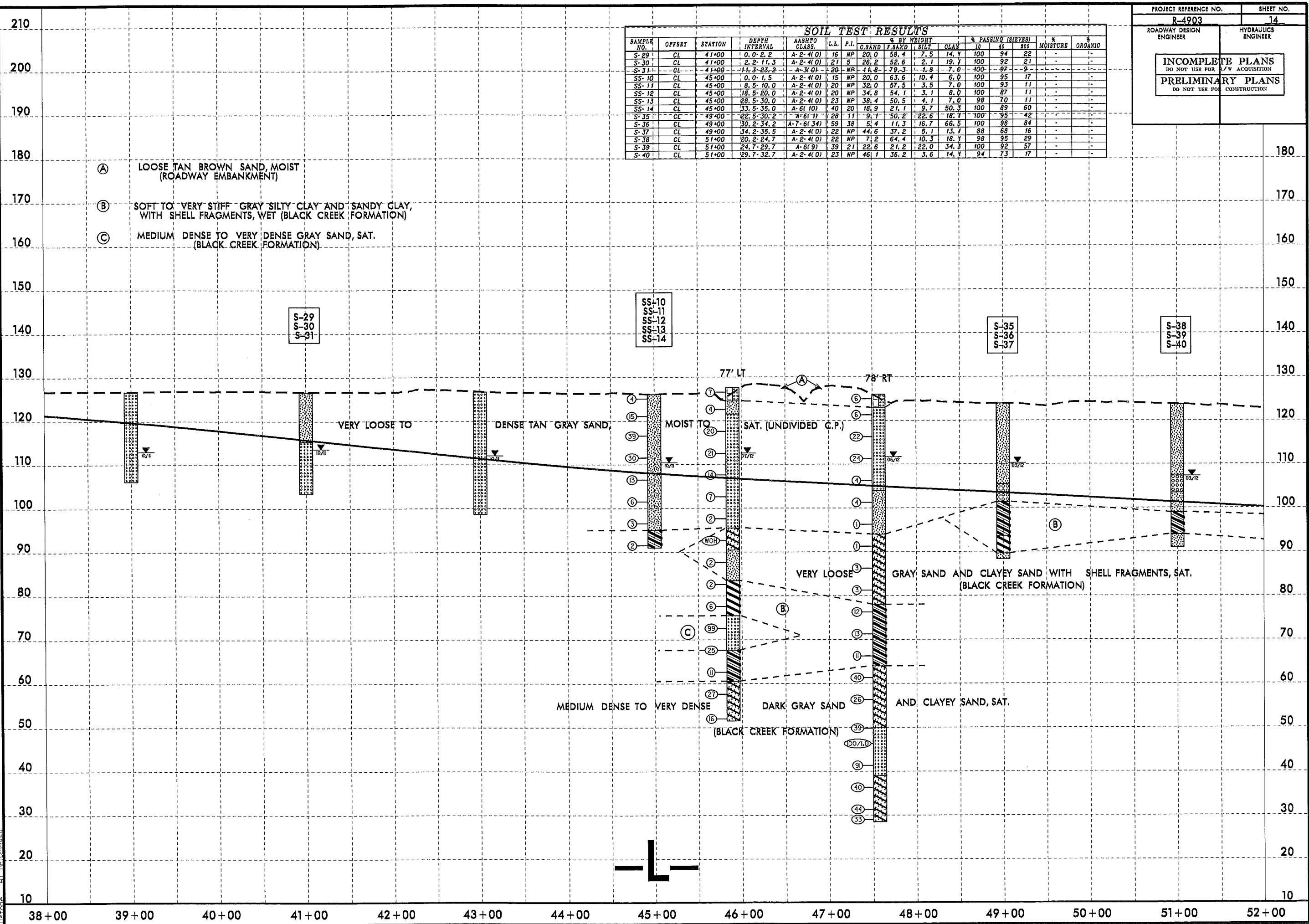
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SOIL TEST RESULTS

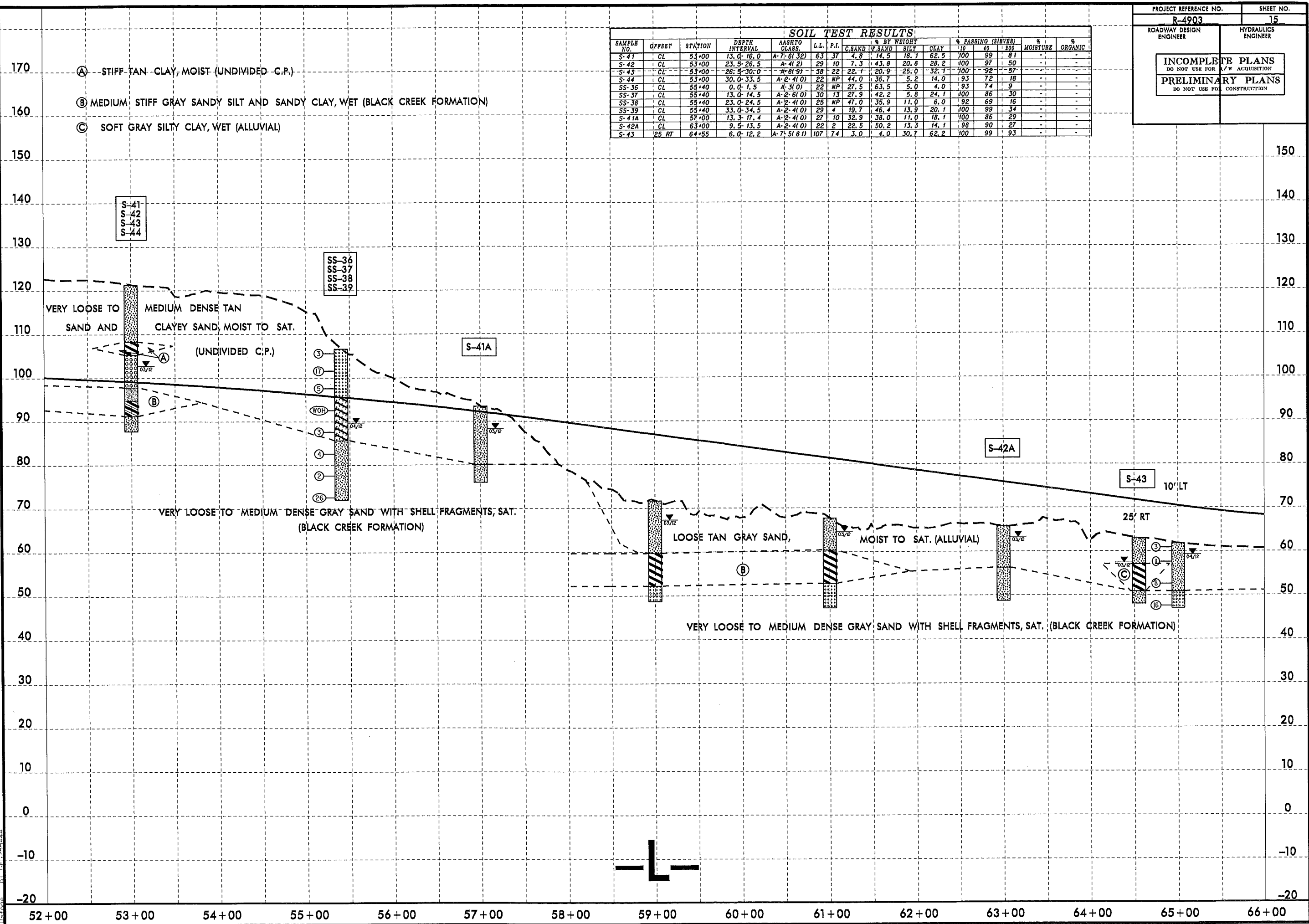
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT			% PASSING (SIEVES)			% MOISTURE	% ORGANIC	
							C. SAND	F. SAND	SILT	10	40	200			
S-29	CL	41+00	0.0-2.2	A-2-4(0)	16	NP	20.0	58.4	7.5	14.1	100	94	22	-	-
S-30	CL	41+00	2.2-11.3	A-2-4(0)	21	5	26.2	52.6	2.1	19.1	100	92	21	-	-
S-31	CL	41+00	11.3-23.2	A-3(0)	20	NP	14.8	79.3	1.8	7.0	100	97	9	-	-
SS-10	CL	45+00	0.0-1.5	A-2-4(0)	15	NP	20.0	63.6	10.4	6.0	100	95	17	-	-
SS-11	CL	45+00	8.5-10.0	A-2-4(0)	20	NP	32.0	57.5	3.5	7.0	100	93	11	-	-
S-12	CL	45+00	18.5-20.0	A-2-4(0)	20	NP	34.8	54.1	3.1	8.0	100	87	11	-	-
SS-13	CL	45+00	28.5-30.0	A-2-4(0)	23	NP	38.4	50.5	4.1	7.0	98	70	11	-	-
SS-14	CL	45+00	33.5-35.0	A-6(10)	40	20	18.9	21.1	9.7	50.3	100	89	60	-	-
S-35	CL	49+00	22.5-30.2	A-6(11)	28	11	9.1	50.2	22.6	18.1	100	95	42	-	-
S-36	CL	49+00	30.2-34.2	A-7-6(34)	59	38	5.4	11.3	16.7	66.5	100	98	84	-	-
S-37	CL	49+00	34.2-35.5	A-2-4(0)	22	NP	44.6	37.2	5.1	13.1	88	68	16	-	-
S-38	CL	51+00	20.2-24.7	A-2-4(0)	22	NP	7.2	64.4	10.3	18.1	98	95	29	-	-
S-39	CL	51+00	24.7-29.7	A-6(9)	39	21	22.6	21.2	22.0	34.3	100	92	57	-	-
S-40	CL	51+00	29.7-32.7	A-2-4(0)	23	NP	46.1	36.2	3.6	14.1	94	73	17	-	-



5/14/99
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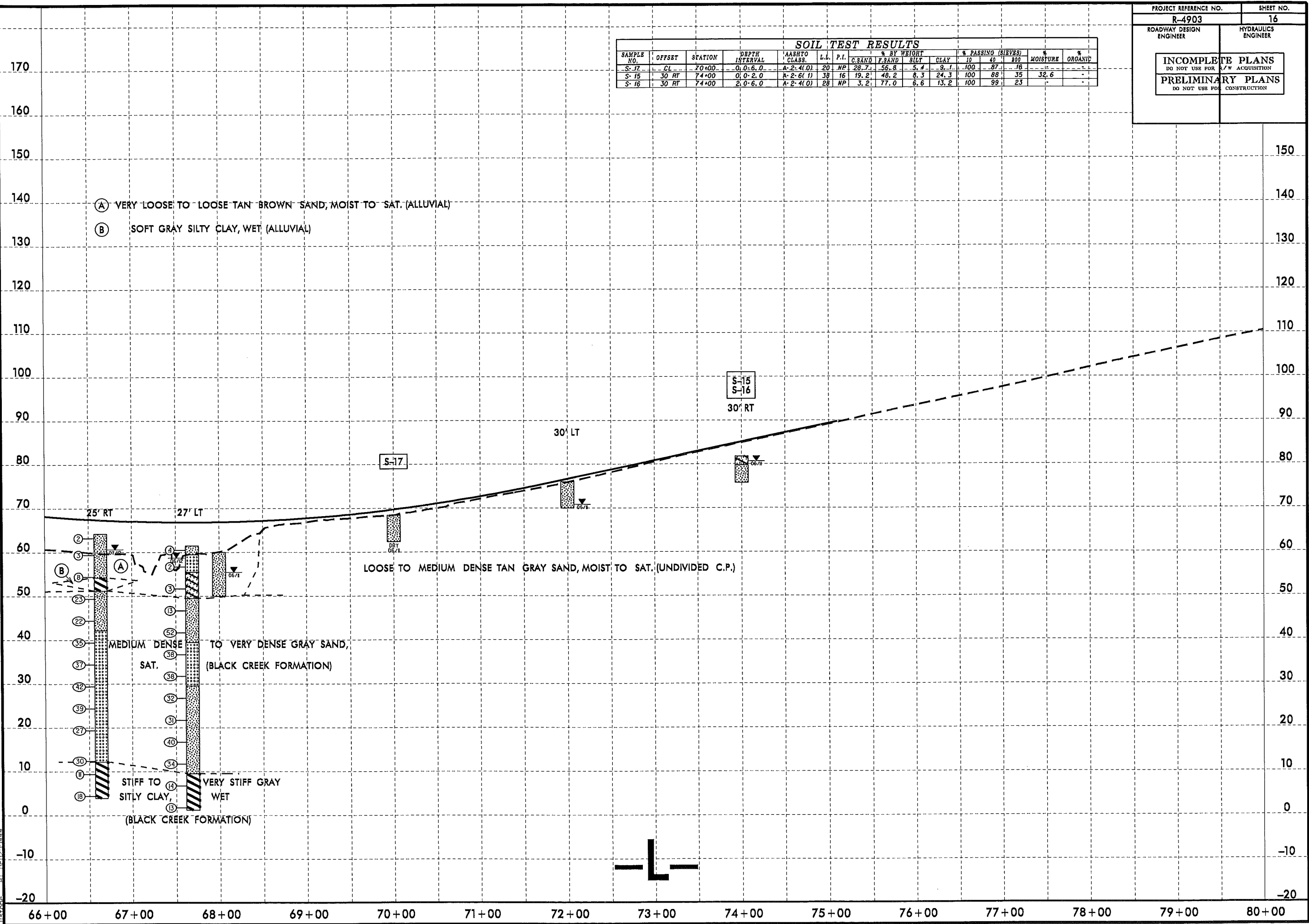
SOIL TEST RESULTS

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	20	40		
S-41	CL	53+00	13.0-18.0	A-7-6(32)	63	37	4.8	14.5	16.1	62.5	100	99	81	-	-
S-42	CL	53+00	23.5-26.5	A-4(2)	29	10	7.3	43.8	20.8	28.2	100	97	50	-	-
S-43	CL	53+00	26.5-30.0	A-6(9)	38	22	22.7	20.9	25.0	32.1	100	92	67	-	-
S-44	CL	53+00	30.0-33.5	A-2-4(0)	22	NP	44.0	36.7	5.2	14.0	93	72	18	-	-
SS-36	CL	53+00	0.0-1.5	A-3(0)	22	NP	27.5	63.5	5.0	4.0	100	86	30	-	-
SS-37	CL	53+00	13.0-14.5	A-2-6(0)	30	13	27.9	42.2	5.8	24.1	100	86	34	-	-
SS-38	CL	53+00	23.0-24.5	A-2-4(0)	25	NP	47.0	35.9	11.0	6.0	100	89	34	-	-
SS-39	CL	53+00	33.0-34.5	A-2-4(0)	29	4	19.7	46.4	13.9	20.1	100	99	34	-	-
S-41A	CL	57+00	13.3-17.4	A-2-4(0)	27	10	32.9	38.0	11.0	18.1	100	86	29	-	-
S-42A	CL	63+00	9.5-13.5	A-2-4(0)	22	2	22.5	50.2	13.3	14.1	100	90	27	-	-
S-43	25 RT	64+55	6.0-12.2	A-7-5(8)	107	74	3.0	4.0	30.7	62.2	100	99	93	-	-



5/14/99
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SOIL TEST RESULTS														
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT			% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT CLAY	10	40	200		
S-17	CL	70+00	0.0-6.0	A-2-4(0)	20	NP	28.7	56.8	5.4	9.1	100	87	16	-
S-15	30 RT	74+00	0.0-2.0	A-2-6(1)	38	16	19.2	48.2	8.3	24.3	100	88	35	32.6
S-16	30 RT	74+00	2.0-6.0	A-2-4(0)	28	NP	3.2	77.0	6.6	13.2	100	99	23	-



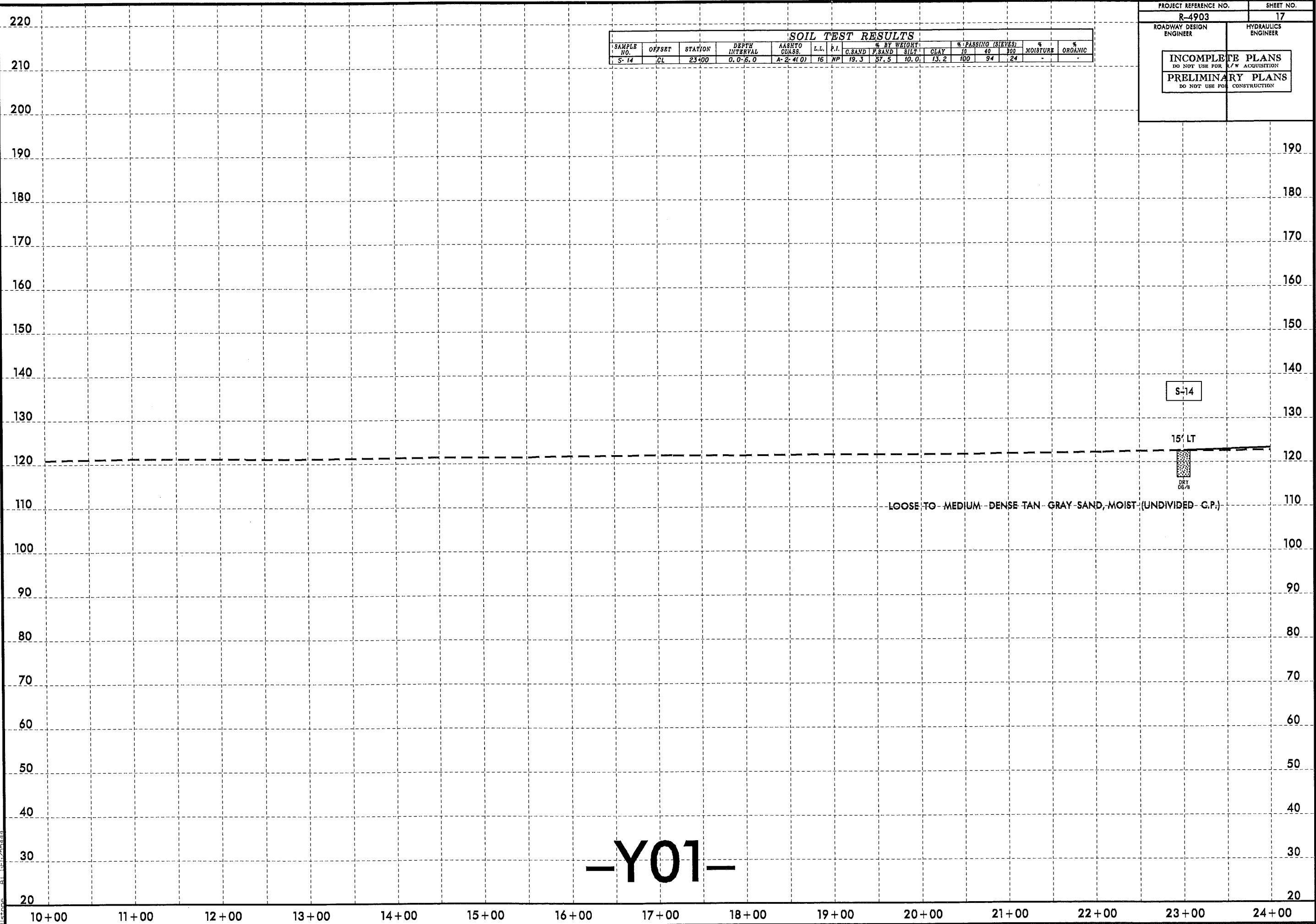
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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-14	CL	23+00	0.0'-6.0'	A-2-4(0)	16	NP	19.3	57.5	10.0	13.2	100	94	24	-	-

INCOMPLETE PLANS
DO NOT USE FOR ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

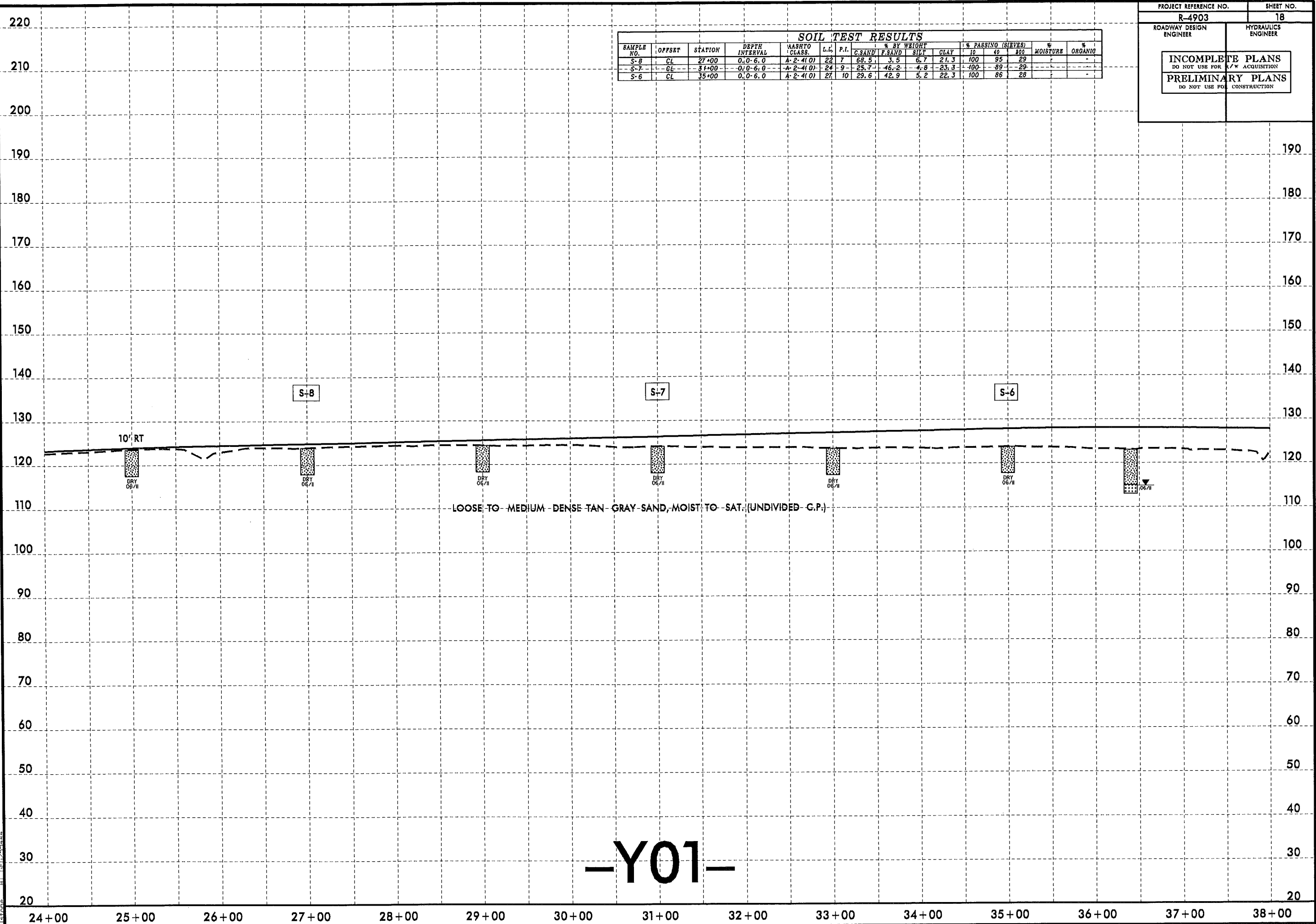
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11/25/94



-Y01-

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-8	CL	27+00	0.0-6.0	A-2-4(0)	22	7	68.5	3.5	6.7	21.3	100	95	29	-	-
S-7	CL	31+00	0.0-6.0	A-2-4(0)	24	9	25.7	46.2	4.8	23.3	100	89	29	-	-
S-6	CL	35+00	0.0-6.0	A-2-4(0)	27	10	29.6	42.9	5.2	22.3	100	86	28	-	-

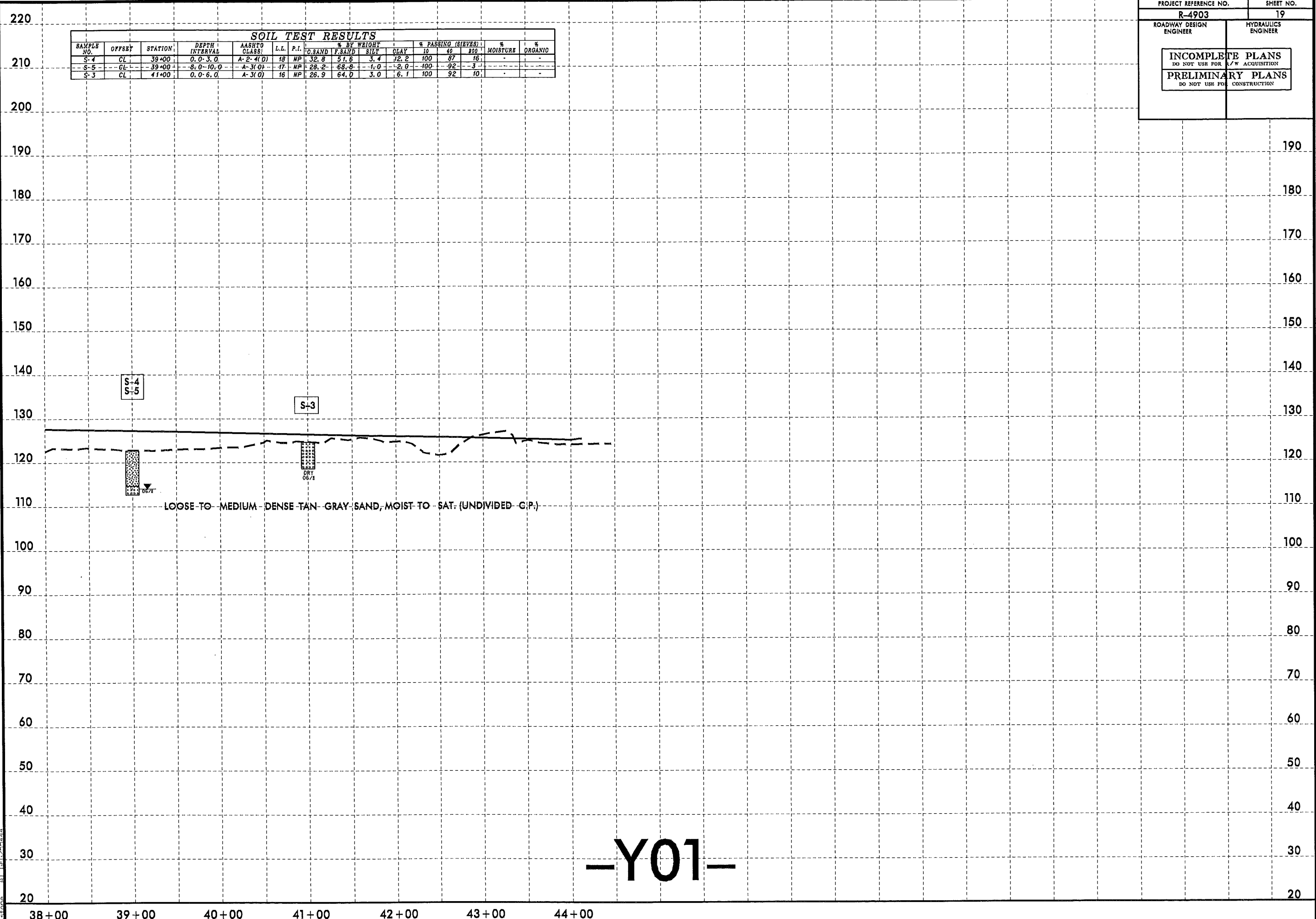
5/14/99
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 11:00:00 AM 05/25/2002



-Y01-

24+00 25+00 26+00 27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00 35+00 36+00 37+00 38+00

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	L.L.	P.L.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	60	200		
S-4	CL	39+00	0.0-3.0	A-2-4(D)	18	NP	32.8	51.6	3.4	12.2	100	87	16	-	-
S-5	CL	39+00	8.0-10.0	A-3(0)	17	NP	28.2	68.8	1.0	2.0	100	92	3	-	-
S-3	CL	41+00	0.0-6.0	A-3(0)	16	NP	28.9	64.0	3.0	6.1	100	92	10	-	-



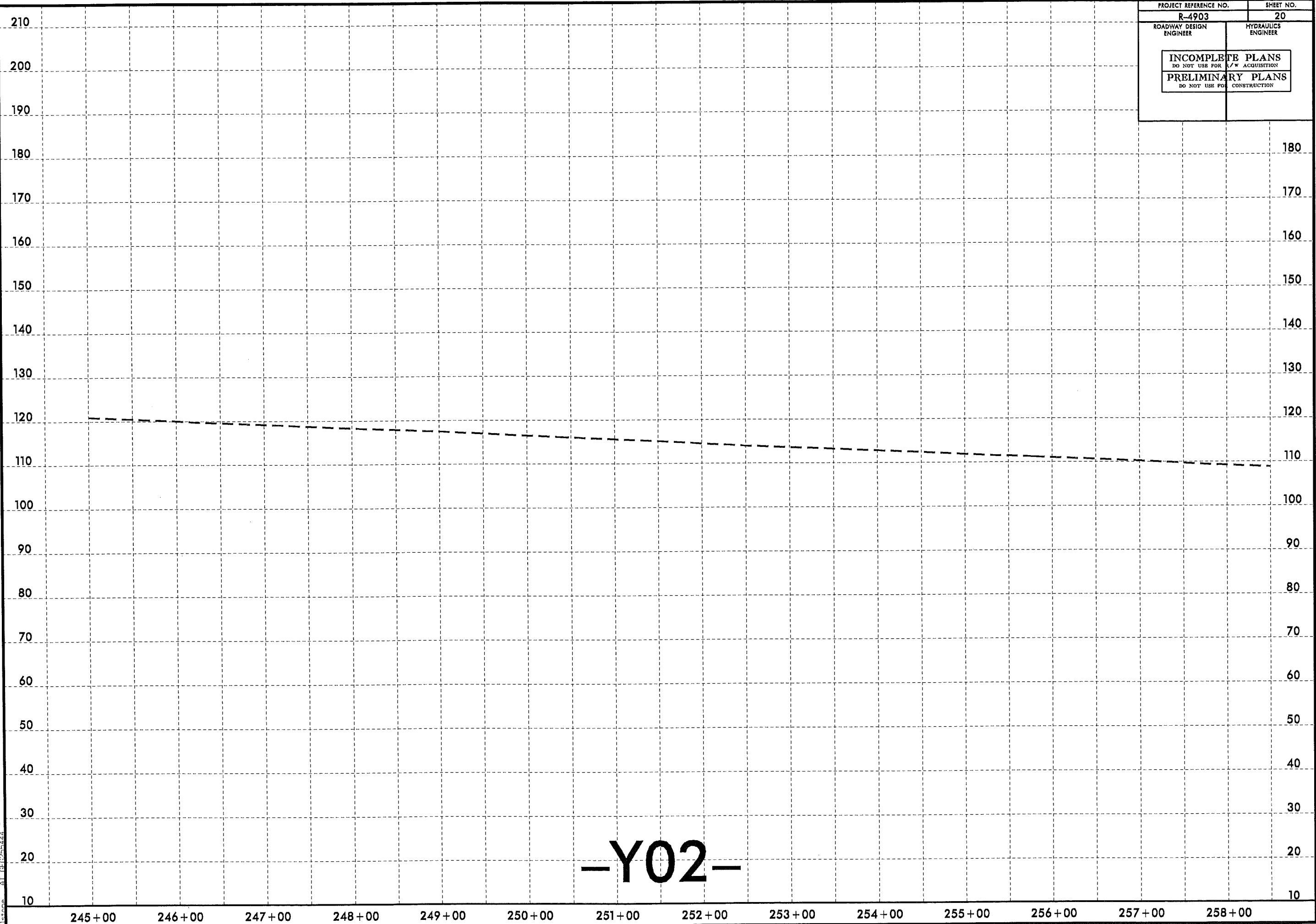
-Y01-

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 AT 06/25/2012

5/14/99

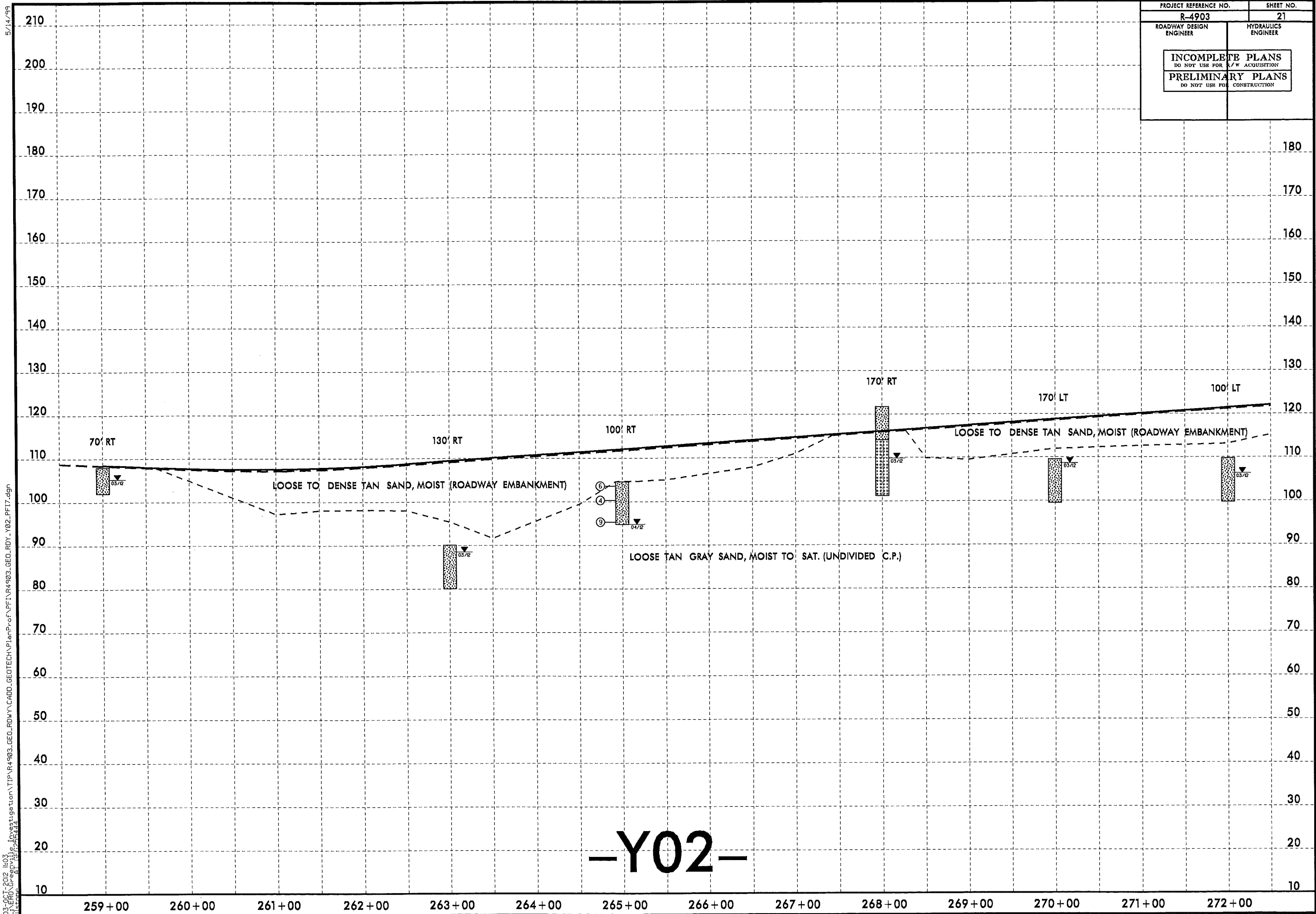
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AT 11:00 AM 5/14/99

PROJECT REFERENCE NO.		SHEET NO.	
R-4903		20	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION		PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



-Y02-

PROJECT REFERENCE NO.	SHEET NO.
R-4903	21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

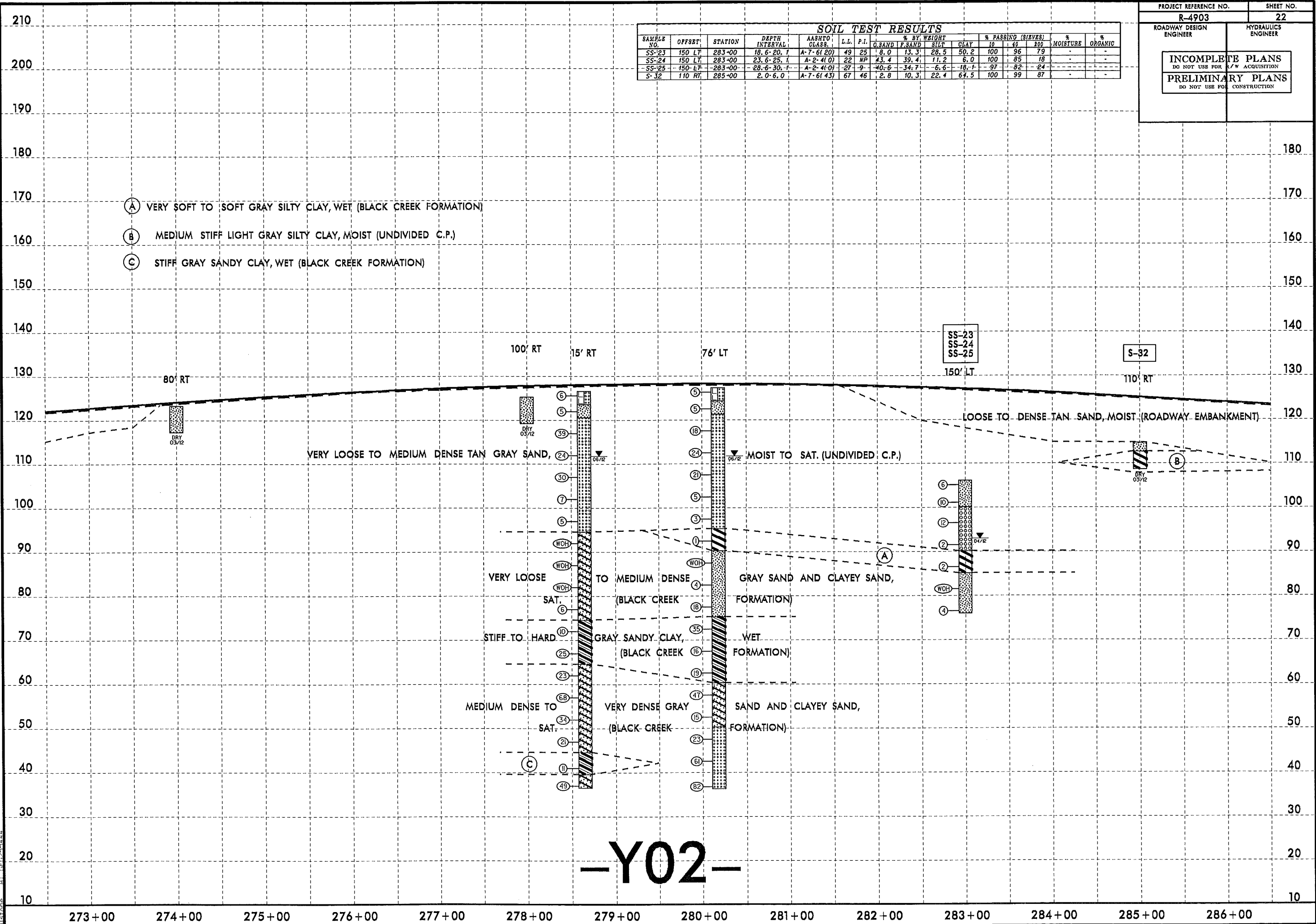


-Y02-

5/14/99
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PROJECT REFERENCE NO.	SHEET NO.
R-4903	22
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INCOMPLETE PLANS DO NOT USE FOR ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

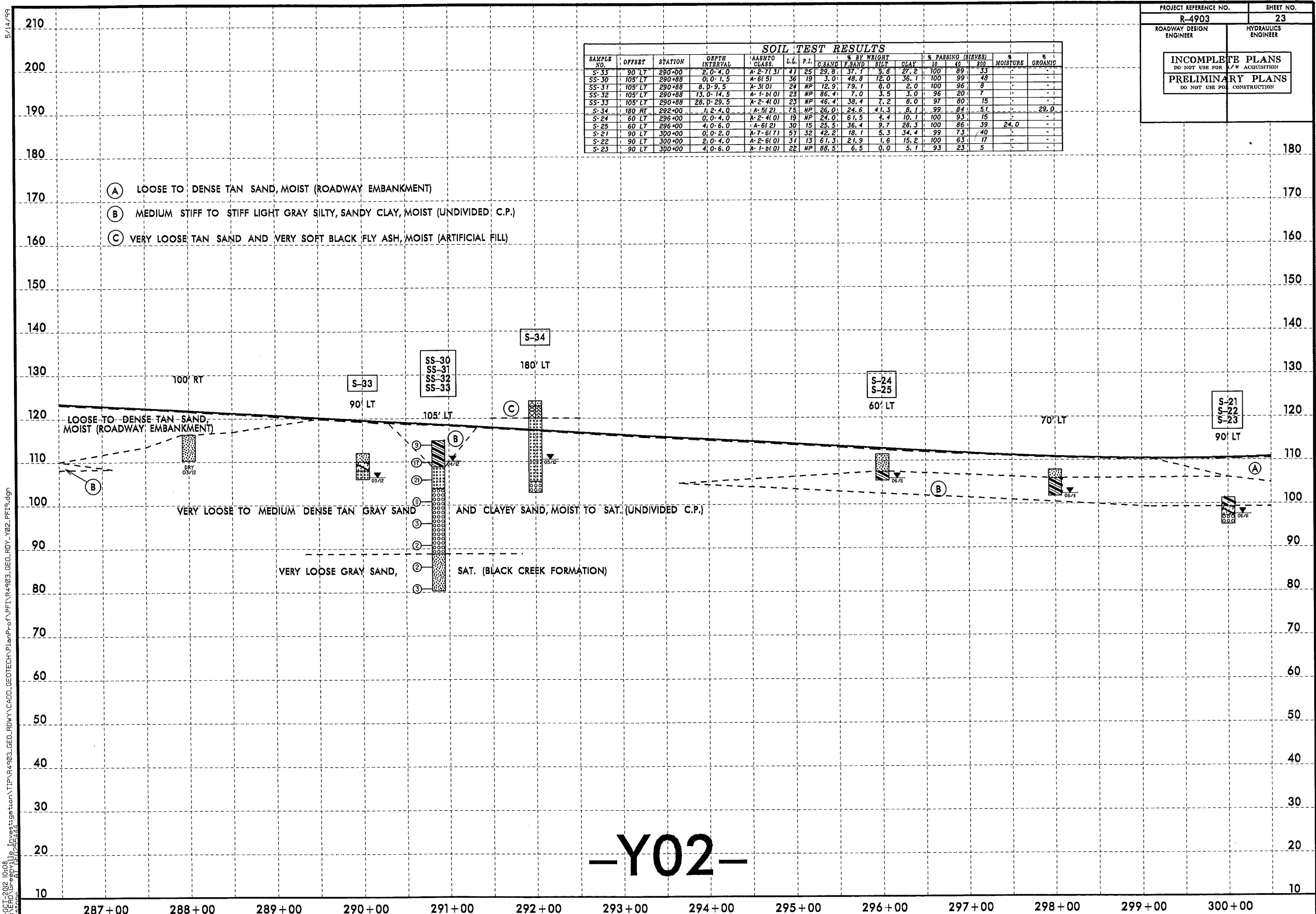
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT			% PASSING (SIEVES)			% MOISTURE	% ORGANIC	
							G.SAND	F.SAND	SILT	CLAY	10	40			200
SS-23	150 LT	283+00	18.6-20.1	A-7-6(20)	49	25	8.0	13.3	28.5	50.2	100	96	79	-	-
SS-24	150 LT	283+00	23.6-25.1	A-2-4(0)	22	NP	43.4	39.4	11.2	6.0	100	85	18	-	-
SS-25	150 LT	283+00	28.6-30.1	A-2-4(0)	27	9	40.6	34.7	6.6	18.7	97	82	24	-	-
S-32	110 RT	285+00	2.0-6.0	A-7-6(43)	67	46	2.8	10.3	22.4	64.5	100	99	87	-	-



-Y02-

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							G. SAND	F. SAND	SILT	CLAY	10	40	200		
S-33	90' LT	290+00	2.0-4.0	A-2-7(3)	41	25	29.8	37.1	3.6	27.2	100	89	33	-	-
SS-30	105' LT	290+88	0.0-1.5	A-6(5)	36	19	3.0	48.8	12.0	36.1	100	99	48	-	-
SS-31	105' LT	290+88	8.0-9.5	A-3(0)	24	NP	12.9	79.1	6.0	2.0	100	96	8	-	-
SS-32	105' LT	290+88	13.0-14.5	A-1-6(0)	23	NP	86.4	7.0	3.5	3.0	96	20	7	-	-
SS-33	105' LT	290+88	28.0-29.5	A-2-4(0)	23	NP	46.4	38.4	7.2	6.0	97	80	15	-	-
S-34	180' RT	292+00	1.2-4.0	A-5(2)	7.5	NP	26.0	24.6	4.3	8.1	99	84	5.1	-	29.0
S-24	60' LT	296+00	0.0-4.0	A-2-4(0)	19	NP	24.0	61.5	4.4	10.1	100	93	15	-	-
S-25	60' LT	296+00	4.0-6.0	A-6(2)	30	15	25.5	36.4	9.7	28.3	100	86	39	24.0	-
S-21	90' LT	300+00	0.0-2.0	A-7-6(7)	57	32	42.2	18.1	5.3	34.4	99	73	40	-	-
S-22	90' LT	300+00	2.0-4.0	A-2-6(0)	34	13	61.3	21.9	1.6	15.2	100	63	17	-	-
S-23	90' LT	300+00	4.0-6.0	A-1-6(0)	22	NP	88.5	6.5	0.0	5.1	93	23	5	-	-

- (A) LOOSE TO DENSE TAN SAND, MOIST (ROADWAY EMBANKMENT)
- (B) MEDIUM STIFF TO STIFF LIGHT GRAY SILTY, SANDY CLAY, MOIST (UNDIVIDED C.P.)
- (C) VERY LOOSE TAN SAND AND VERY SOFT BLACK FLY ASH, MOIST (ARTIFICIAL FILL)

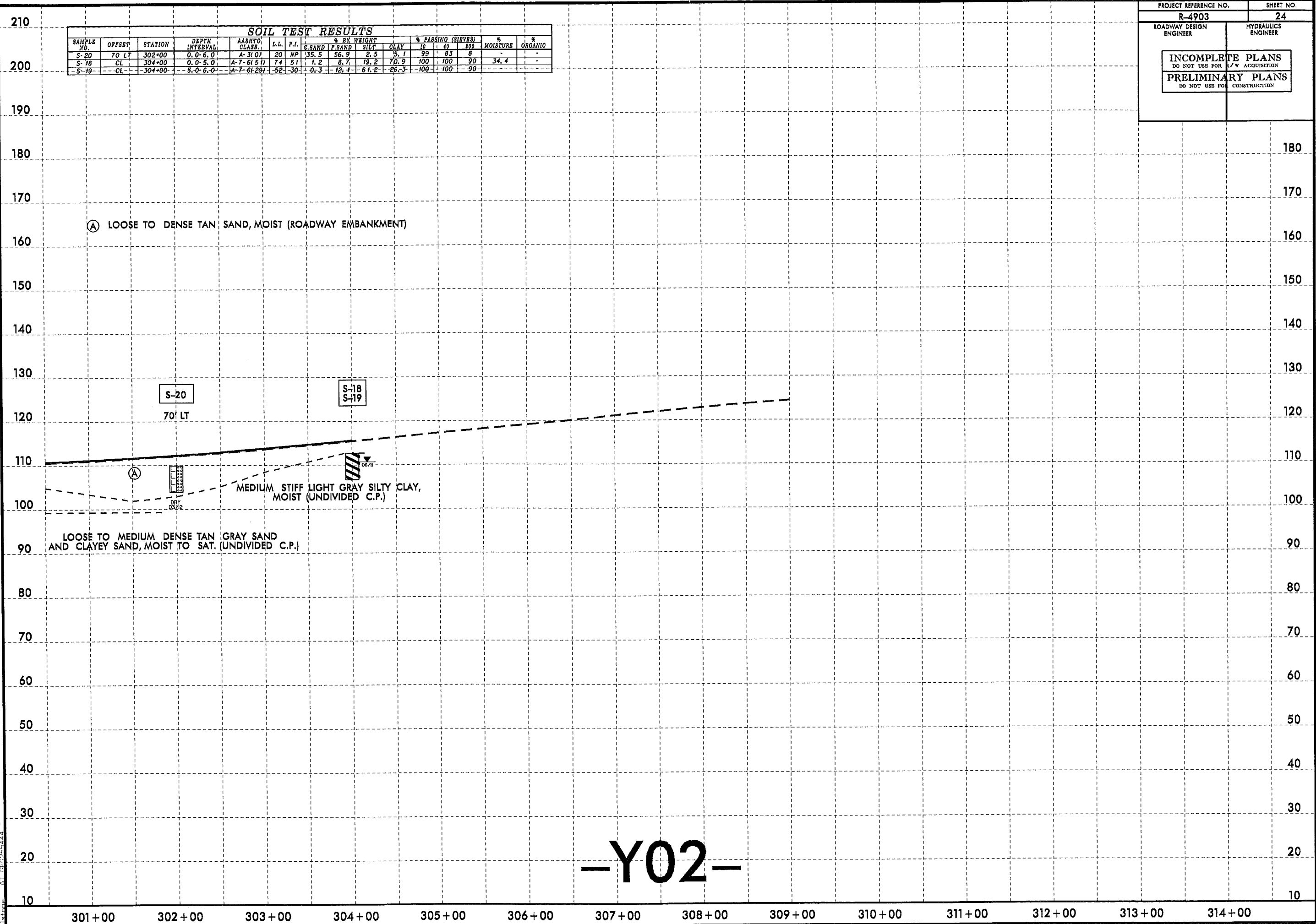


-Y02-

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 BY: GED/255444

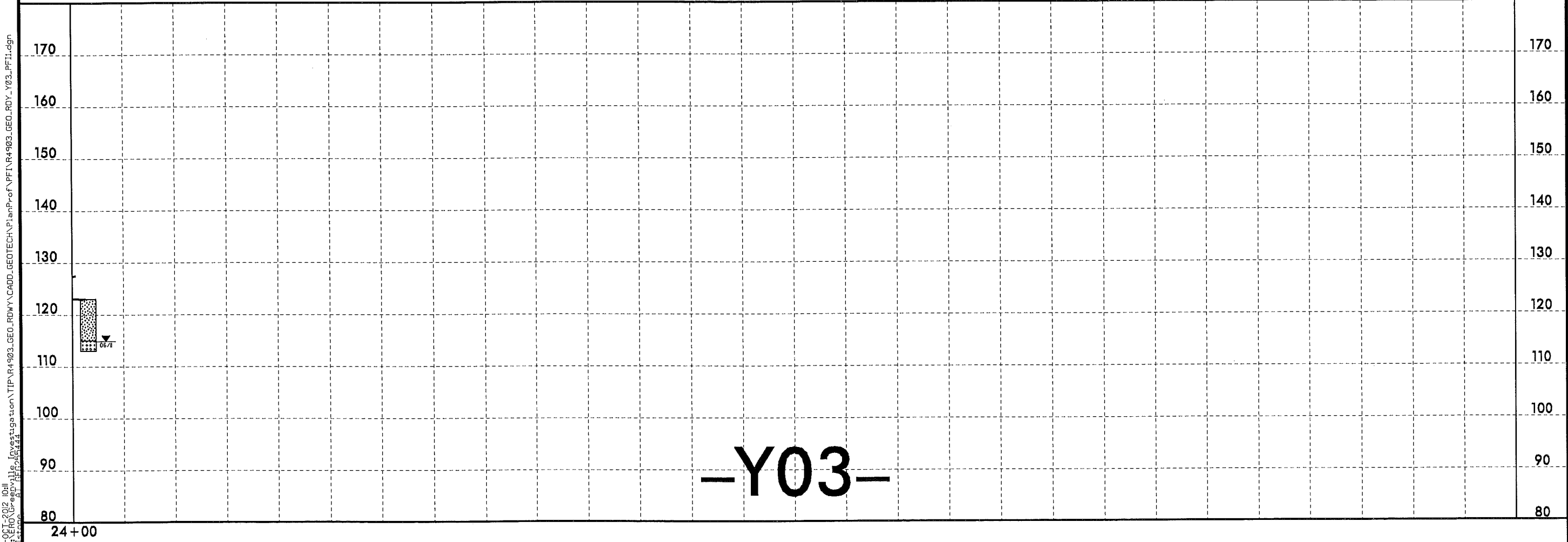
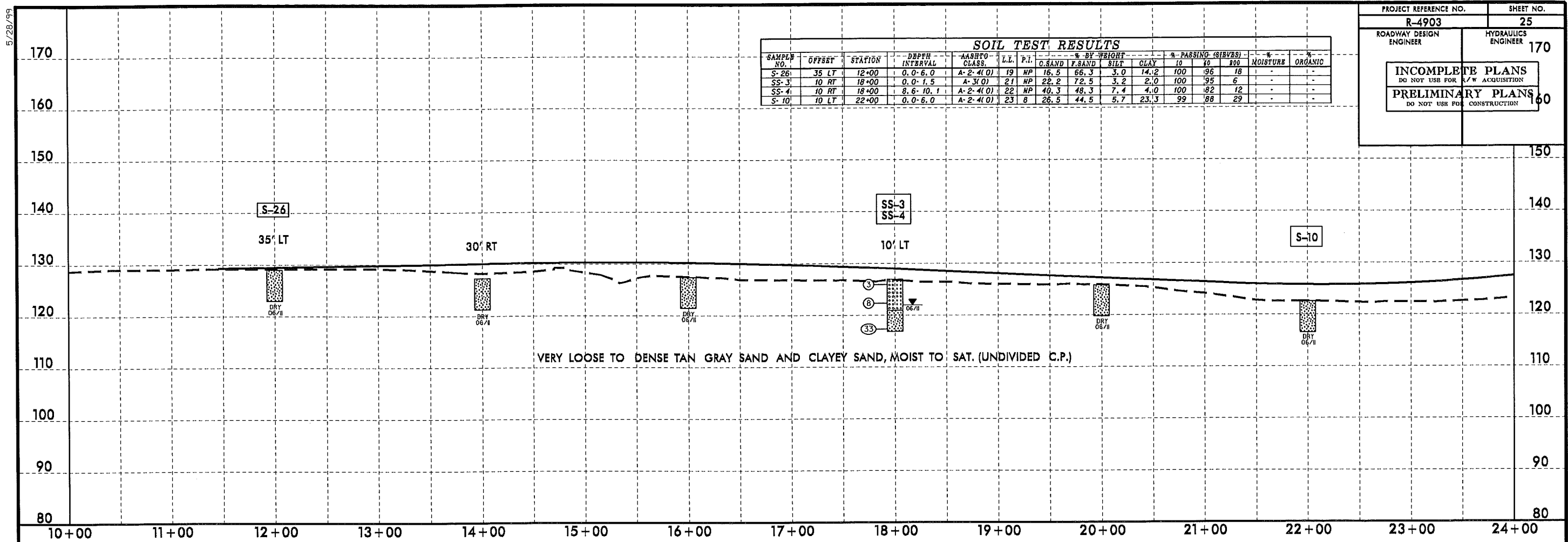
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							F SAND	F SAND	SILT	CLAY	10	40	100		
S-20	70 LT	302+00	0.0-6.0	A-3(0)	20	NP	135.5	56.9	2.5	5.1	99	83	8	-	-
S-18	CL	304+00	0.0-5.0	A-7-6(5)	74	51	1.2	8.7	19.2	70.9	100	100	90	34.4	-
S-19	CL	304+00	5.0-6.0	A-7-6(29)	52	30	0.3	12.1	61.2	26.3	100	100	90	-	-

5/14/99
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-Y02-

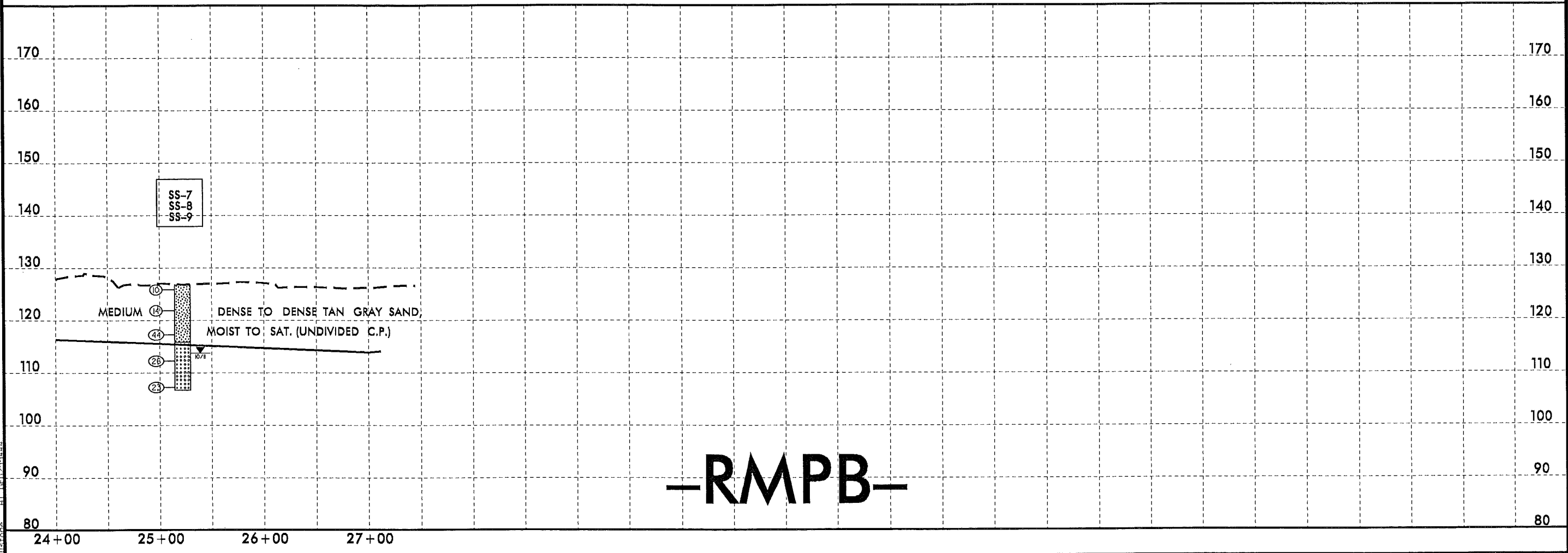
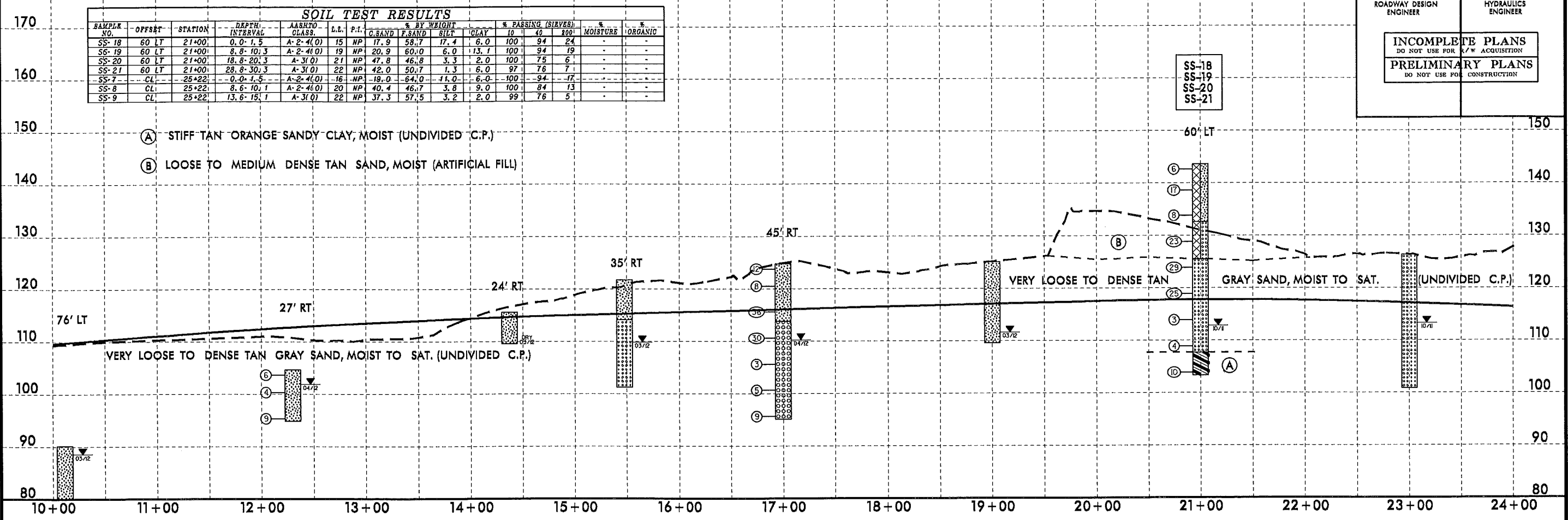
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			MOISTURE	ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-26	35' LT	12+00	0.0-6.0	A-2-4(0)	19	NP	16.5	66.3	3.0	14.2	100	96	18	-	-
SS-3	10' RT	18+00	0.0-1.5	A-3(0)	21	NP	22.2	72.5	3.2	2.0	100	95	6	-	-
SS-4	10' RT	18+00	8.6-10.1	A-2-4(0)	22	NP	40.3	48.3	7.4	4.0	100	82	12	-	-
S-10	10' LT	22+00	0.0-6.0	A-2-4(0)	23	B	26.5	44.5	5.7	23.3	99	88	29	-	-



-Y03-

5/28/99
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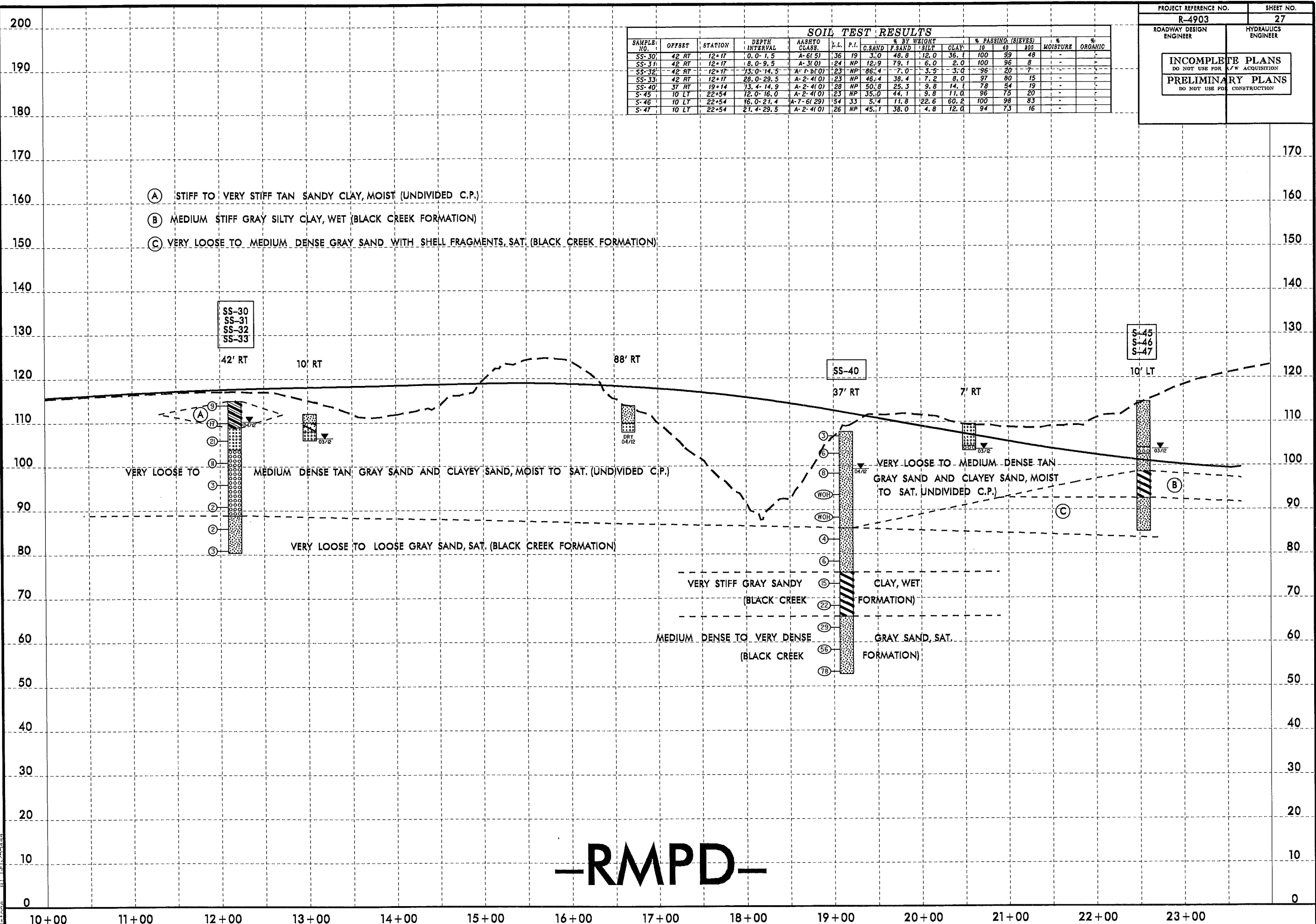
SOIL TEST RESULTS													
SAMP/NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L.	% BY WEIGHT			% PASSING (SIEVES)		% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	10	40		
SS-18	60 LT	21+00	0.0-1.5	A-2-4(0)	15	NP	17.9	58.7	17.4	6.0	100	94	24
SS-19	60 LT	21+00	8.8-10.3	A-2-4(0)	19	NP	20.9	60.0	6.0	13.1	100	94	19
SS-20	60 LT	21+00	18.8-20.3	A-3(0)	21	NP	47.8	46.8	3.3	2.0	97	75	6.1
SS-21	60 LT	21+00	28.8-30.3	A-3(0)	22	NP	42.0	50.7	1.3	6.0	97	76	7.1
SS-7	CL	25+22	0.0-1.5	A-2-4(0)	16	NP	19.0	64.0	16.0	6.0	100	94	17
SS-8	CL	25+22	8.6-10.1	A-2-4(0)	20	NP	40.4	46.7	3.8	9.0	100	84	13
SS-9	CL	25+22	13.6-15.1	A-3(0)	22	NP	37.3	57.5	3.2	2.0	99	76	5



-RMPB-

5/28/99
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 AT 10:24 AM

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT			% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	CLAY	10	40	200		
SS-30	42 RT	12+17	0.0-1.5	A-6(5)	36	19	3.0	48.8	12.0	36.1	100	99	48	-
SS-31	42 RT	12+17	8.0-9.5	A-3(0)	24	NP	12.9	79.1	6.0	2.0	100	96	8	-
SS-32	42 RT	12+17	13.0-14.5	A-7(20)	23	NP	86.4	7.0	3.5	3.0	96	20	7	-
SS-33	42 RT	12+17	20.0-29.5	A-2(40)	23	NP	46.4	38.4	7.2	8.0	97	80	15	-
SS-40	37 RT	19+14	13.4-14.9	A-2(40)	28	NP	50.8	25.3	9.8	14.1	78	54	19	-
S-45	10 LT	22+54	12.0-16.0	A-2(40)	23	NP	35.0	44.1	9.8	11.0	96	75	20	-
S-46	10 LT	22+54	16.0-21.4	A-7(29)	54	33	5.4	11.8	22.6	60.2	100	98	83	-
S-47	10 LT	22+54	21.4-29.5	A-2(40)	26	NP	45.1	38.0	4.8	12.0	94	73	16	-



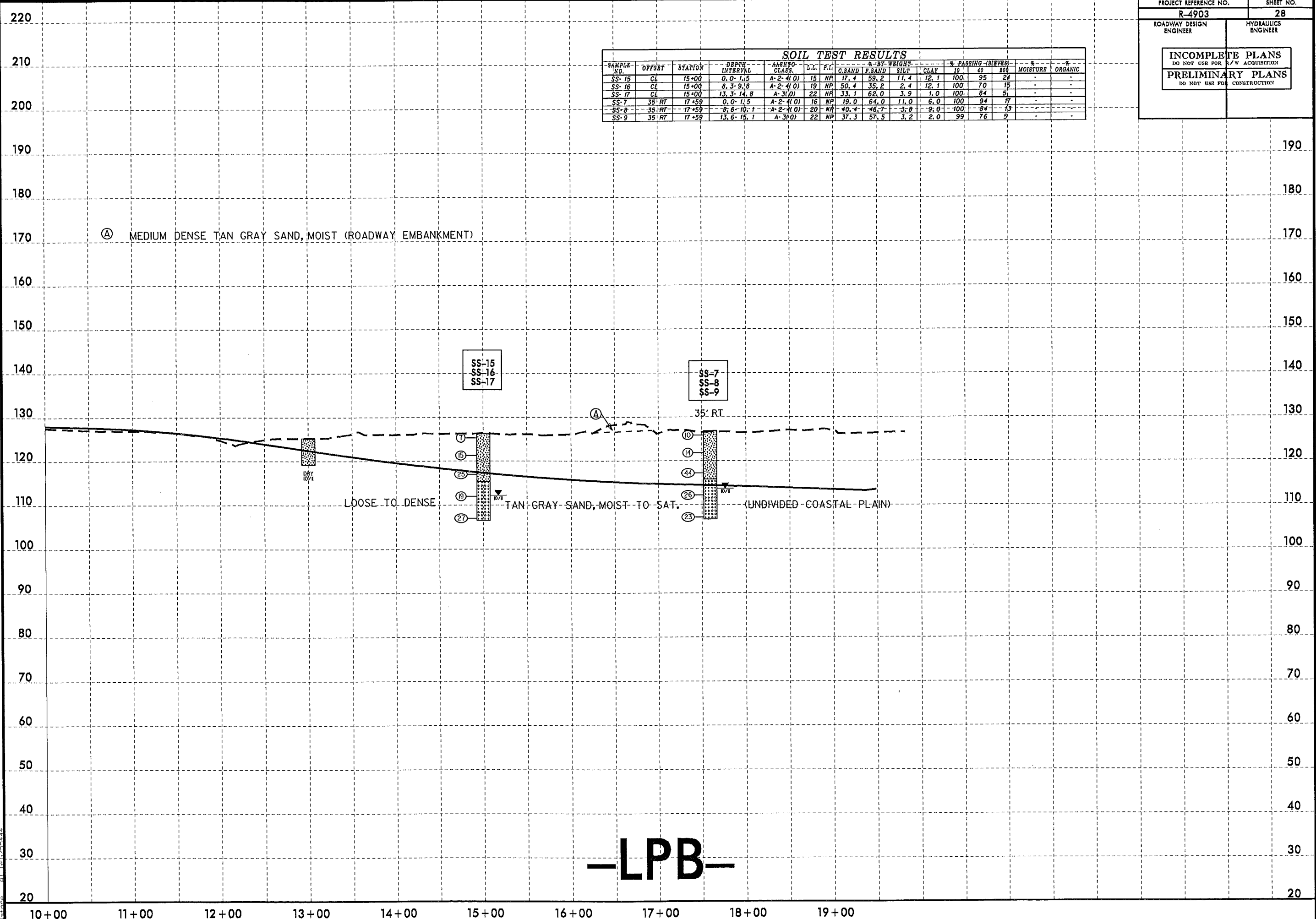
-RMPD-

5/14/99
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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	F.L.	% BY WEIGHT				% PASSING (SIEVES)			MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-15	CL	15+00	0.0-1.5	A-2-4(0)	15	NR	17.4	59.2	11.4	12.1	100	95	24	-	-
SS-16	CL	15+00	8.3-9.8	A-2-4(0)	19	NP	50.4	35.2	2.4	12.1	100	70	15	-	-
SS-17	CL	15+00	13.3-14.8	A-3(0)	22	NR	33.1	62.0	3.9	1.0	100	84	5	-	-
SS-7	35' RT	17+59	0.0-1.5	A-2-4(0)	16	NP	19.0	64.0	11.0	6.0	100	94	17	-	-
SS-8	35' RT	17+59	8.6-10.1	A-2-4(0)	20	NR	40.4	46.7	3.8	9.0	100	84	13	-	-
SS-9	35' RT	17+59	13.6-15.1	A-3(0)	22	NP	37.3	57.5	3.2	2.0	99	76	5	-	-

5/14/99

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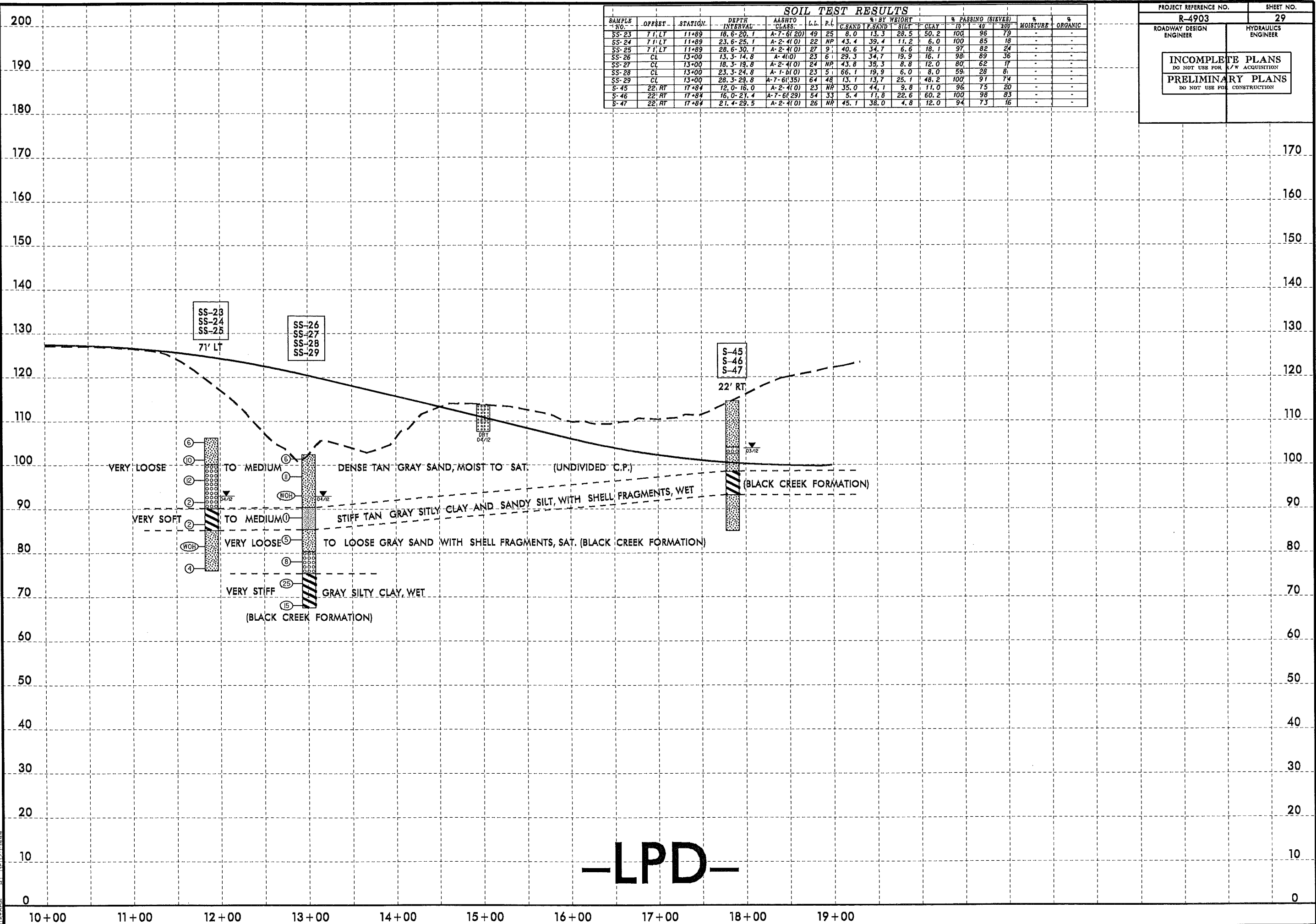


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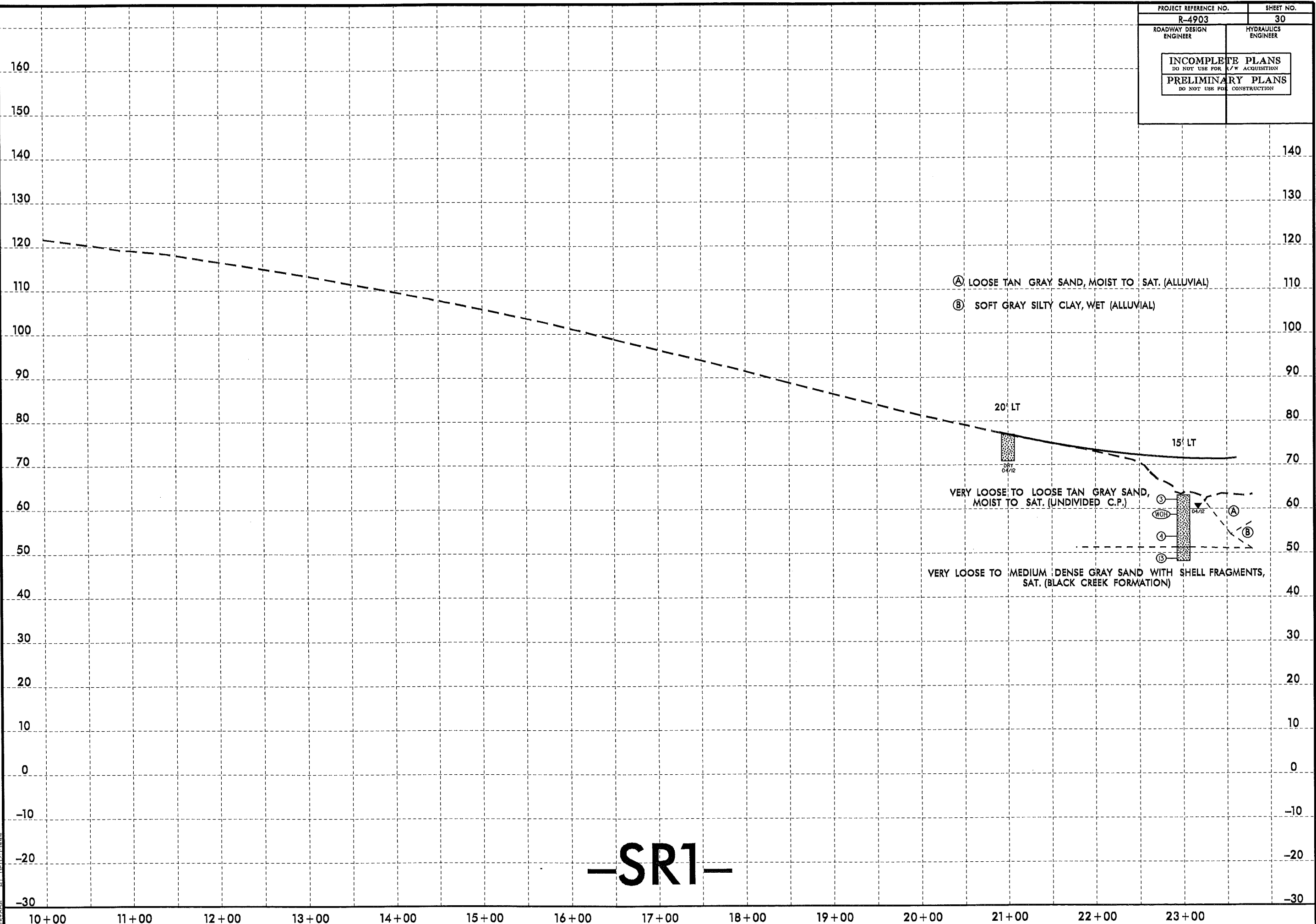
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 at 11:25:44

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	#20			#40
SS-23	71' LT	11+89	18.6-20.1	A-7-6(20)	49	25	8.0	13.3	28.5	50.2	100	96	79	-	-
SS-24	71' LT	11+89	23.6-25.1	A-2-4(0)	22	NP	43.4	39.4	11.2	6.0	100	85	18	-	-
SS-25	71' LT	11+89	28.6-30.1	A-2-4(0)	27	9	40.6	34.7	6.6	18.1	97	82	24	-	-
SS-26	CL	13+00	13.3-14.8	A-4(0)	23	6	29.3	34.7	19.9	16.1	98	89	36	-	-
SS-27	CL	13+00	18.3-19.8	A-2-4(0)	24	NP	43.8	35.3	8.8	12.0	80	62	17	-	-
SS-28	CL	13+00	23.3-24.8	A-1-6(0)	23	5	66.1	19.9	6.0	8.0	59	28	8	-	-
SS-29	CL	13+00	28.3-29.8	A-7-6(35)	64	48	13.1	13.7	25.1	48.2	100	91	74	-	-
S-45	22' RT	17+84	12.0-16.0	A-2-4(0)	23	NR	35.0	44.1	9.8	11.0	96	75	20	-	-
S-46	22' RT	17+84	16.0-21.4	A-7-6(29)	54	33	5.4	11.8	22.6	60.2	100	98	83	-	-
S-47	22' RT	17+84	21.4-29.5	A-2-4(0)	26	NR	45.1	38.0	4.8	12.0	94	73	16	-	-

PROJECT REFERENCE NO. R-4903	SHEET NO. 29
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



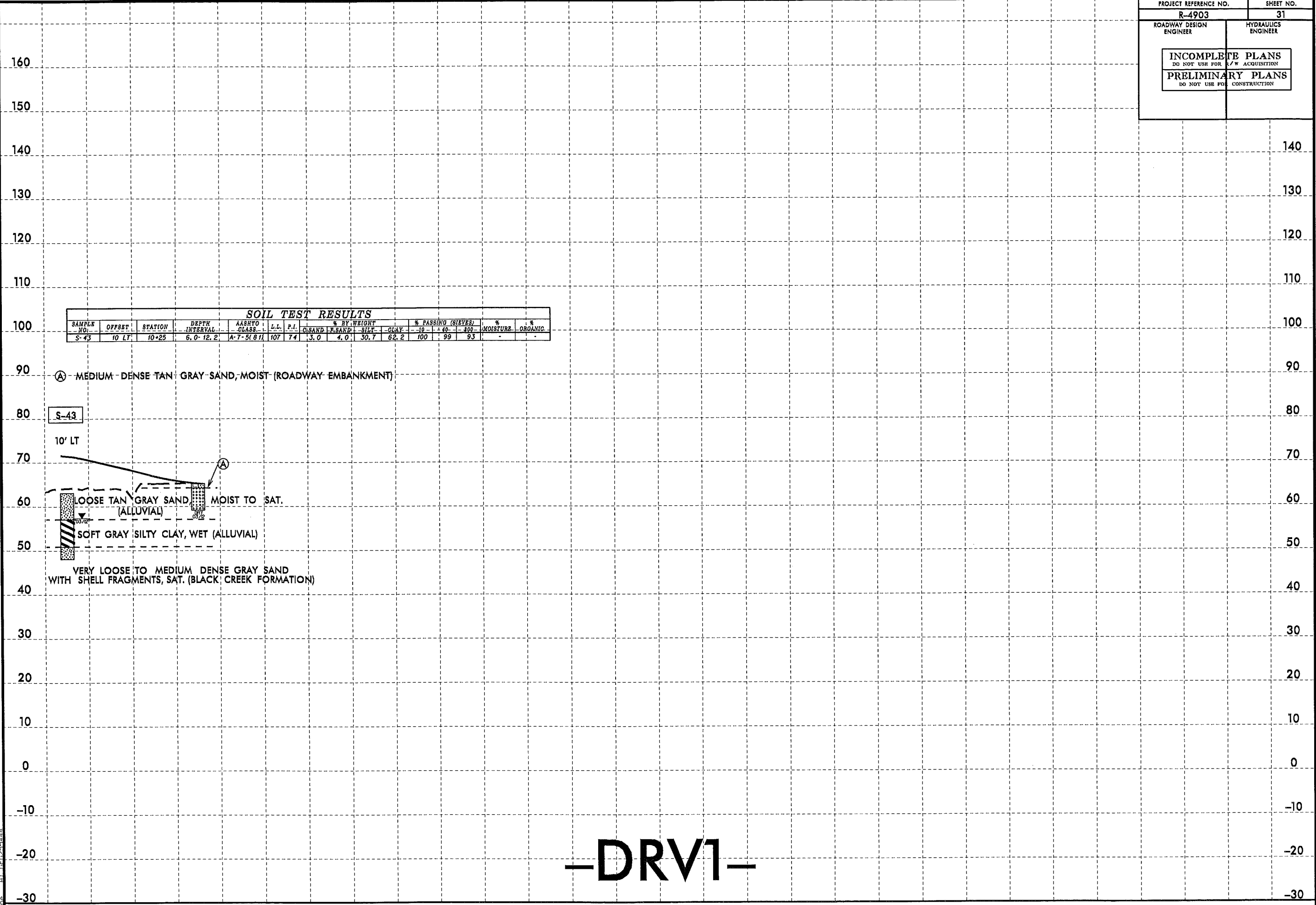
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ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



-SR1-

5/14/99

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11:50:05 AM 05/14/99



SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							SAND	F.SAND	SILT	CLAY	-10	-40	-200		
S-43	10 LT	10+25	6.0-12.2'	A-7-5(8)	107	74	3.0	4.0	30.7	62.2	100	99	93	-	-

Ⓐ MEDIUM DENSE TAN GRAY SAND, MOIST (ROADWAY EMBANKMENT)

S-43

10' LT

LOOSE TAN GRAY SAND (ALLUVIAL) MOIST TO SAT.

SOFT GRAY SILTY CLAY, WET (ALLUVIAL)

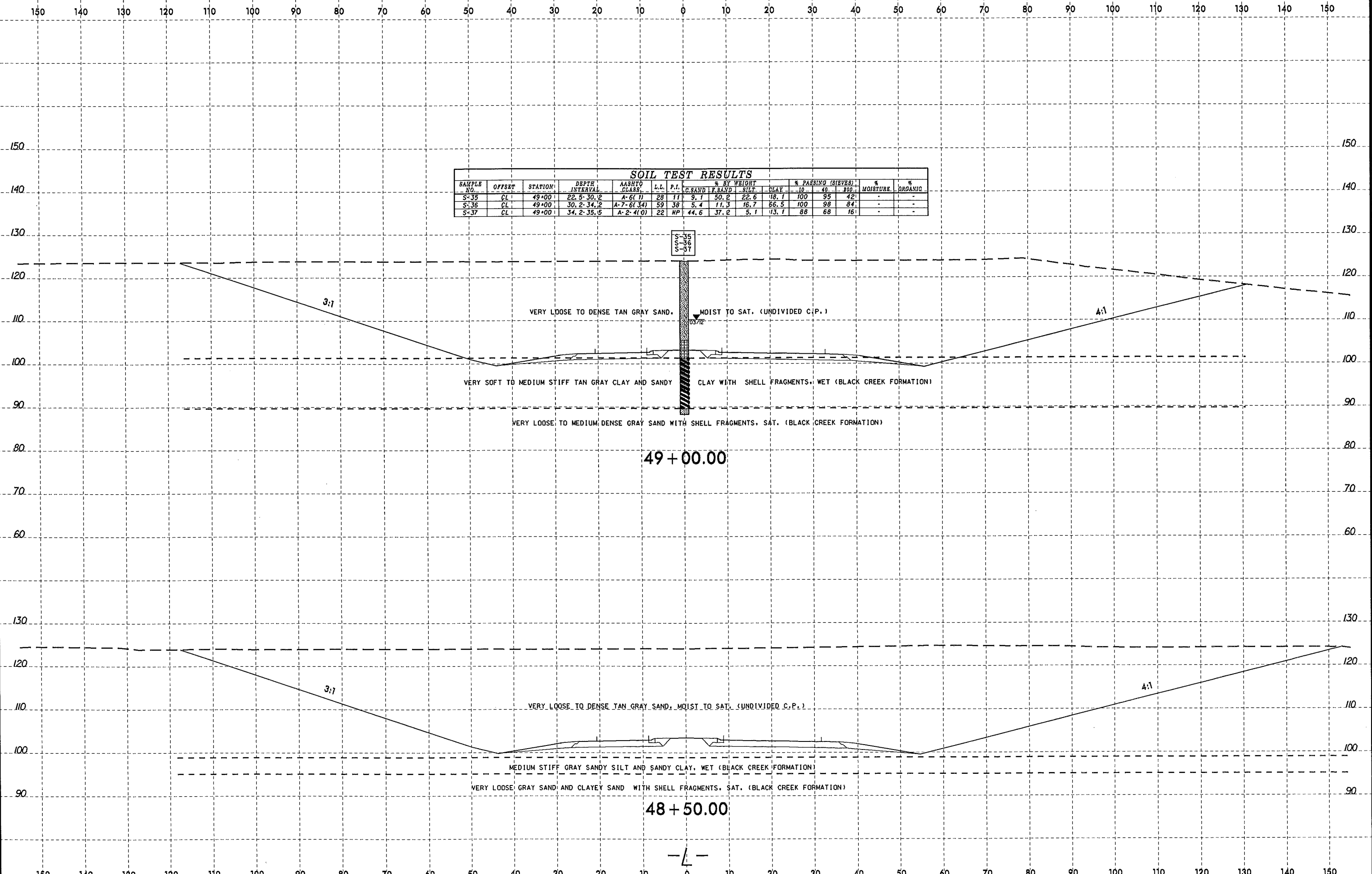
VERY LOOSE TO MEDIUM DENSE GRAY SAND WITH SHELL FRAGMENTS, SAT. (BLACK CREEK FORMATION)

-DRV1-

5/14/99
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10+00 11+00 12+00

8/23/99



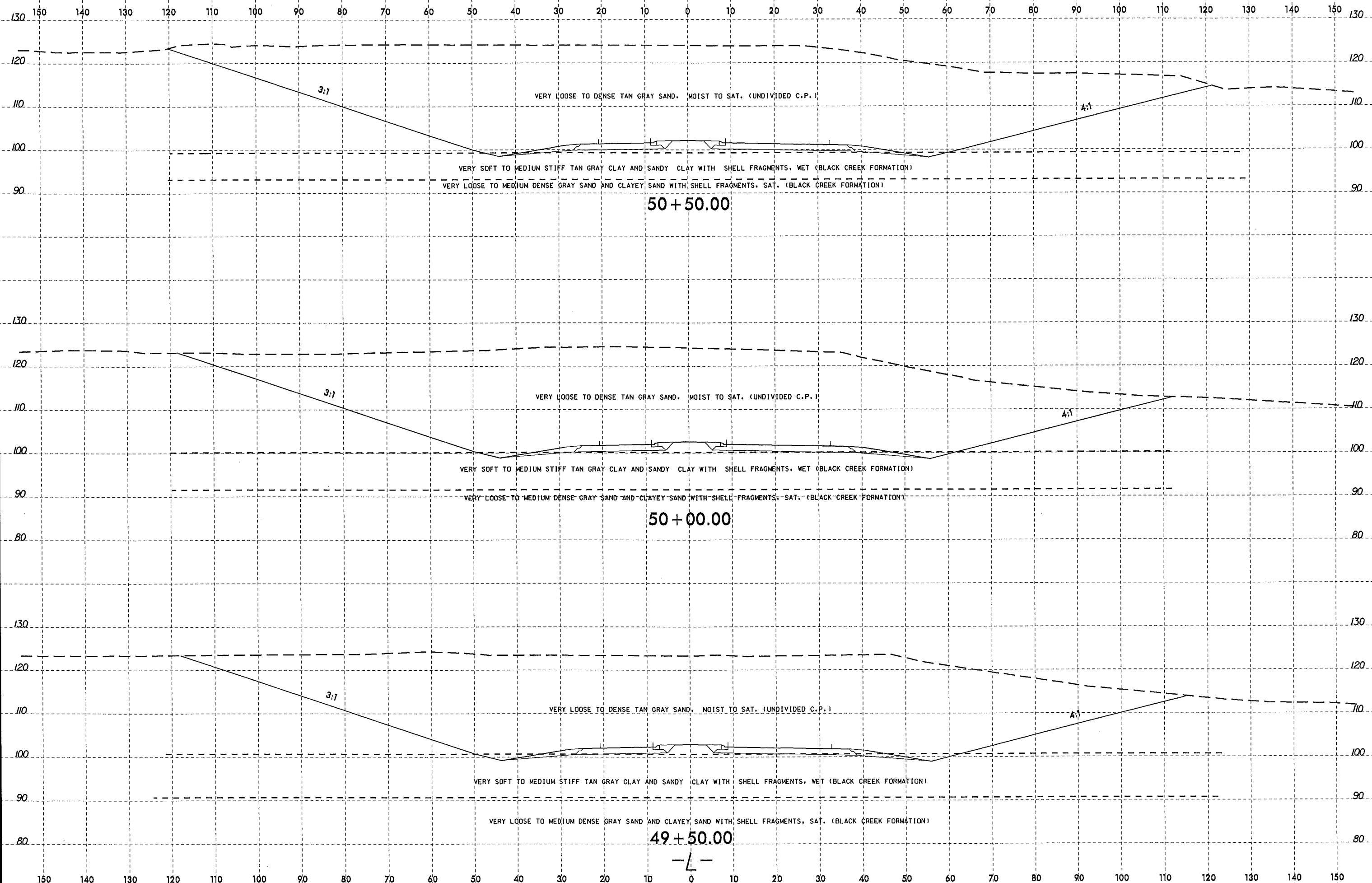
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT			% PASSING (SIEVES)			% MOISTURE	% ORGANIC	
							C.SAND	F.SAND	SILT	CLAY	-10	-40			-200
S-35	CL	49+00	22.5-30.2	A-6(U)	28	11	9.1	50.2	22.6	18.1	100	95	42	-	-
S-36	CL	49+00	30.2-34.2	A-7-6(34)	59	38	5.4	11.3	16.7	66.5	100	98	84	-	-
S-37	CL	49+00	34.2-35.5	A-2-4(O)	22	NP	44.6	37.2	5.1	13.1	88	68	16	-	-

49 + 00.00

48 + 50.00

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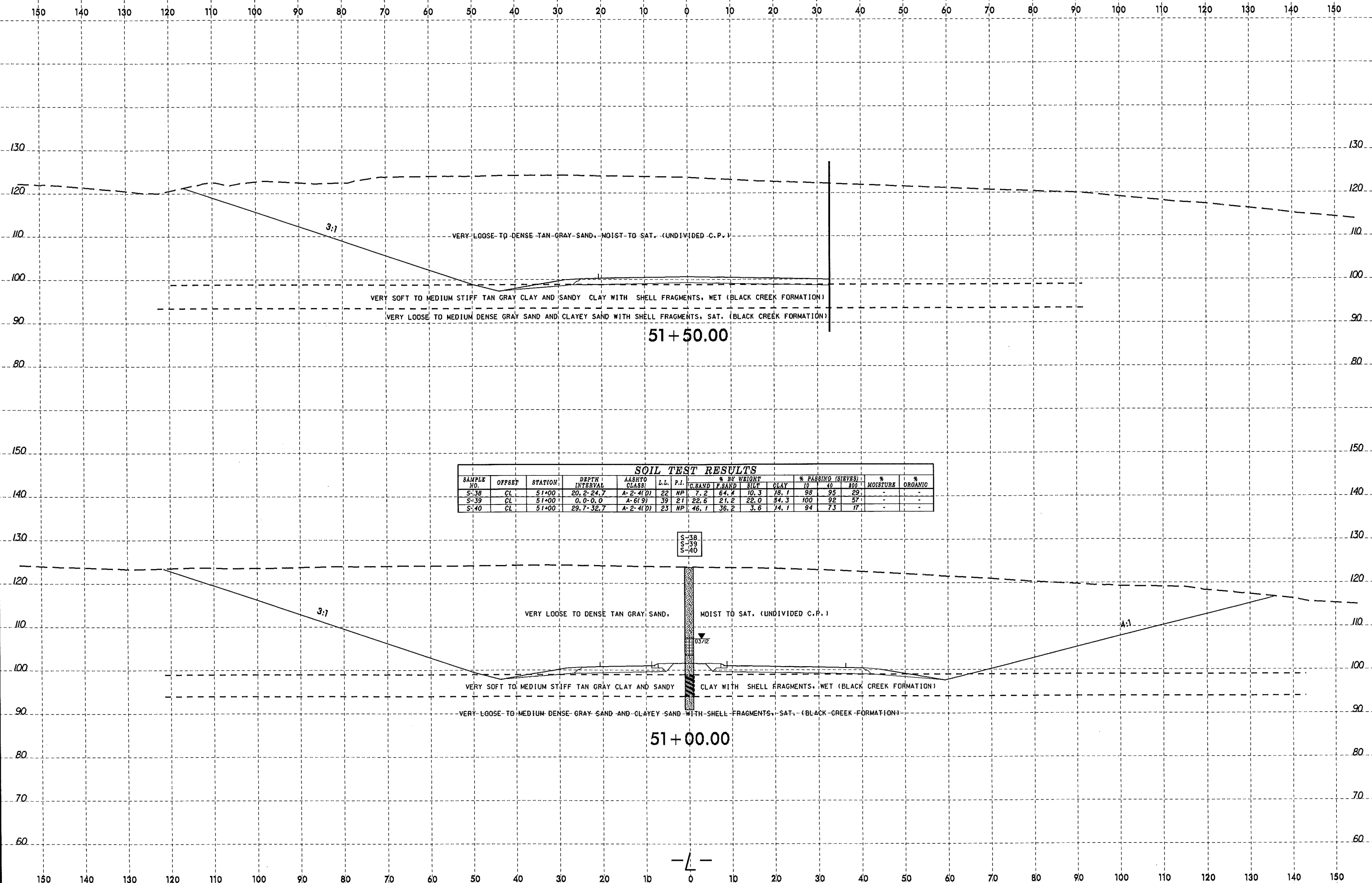
50 + 50.00

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49 + 50.00

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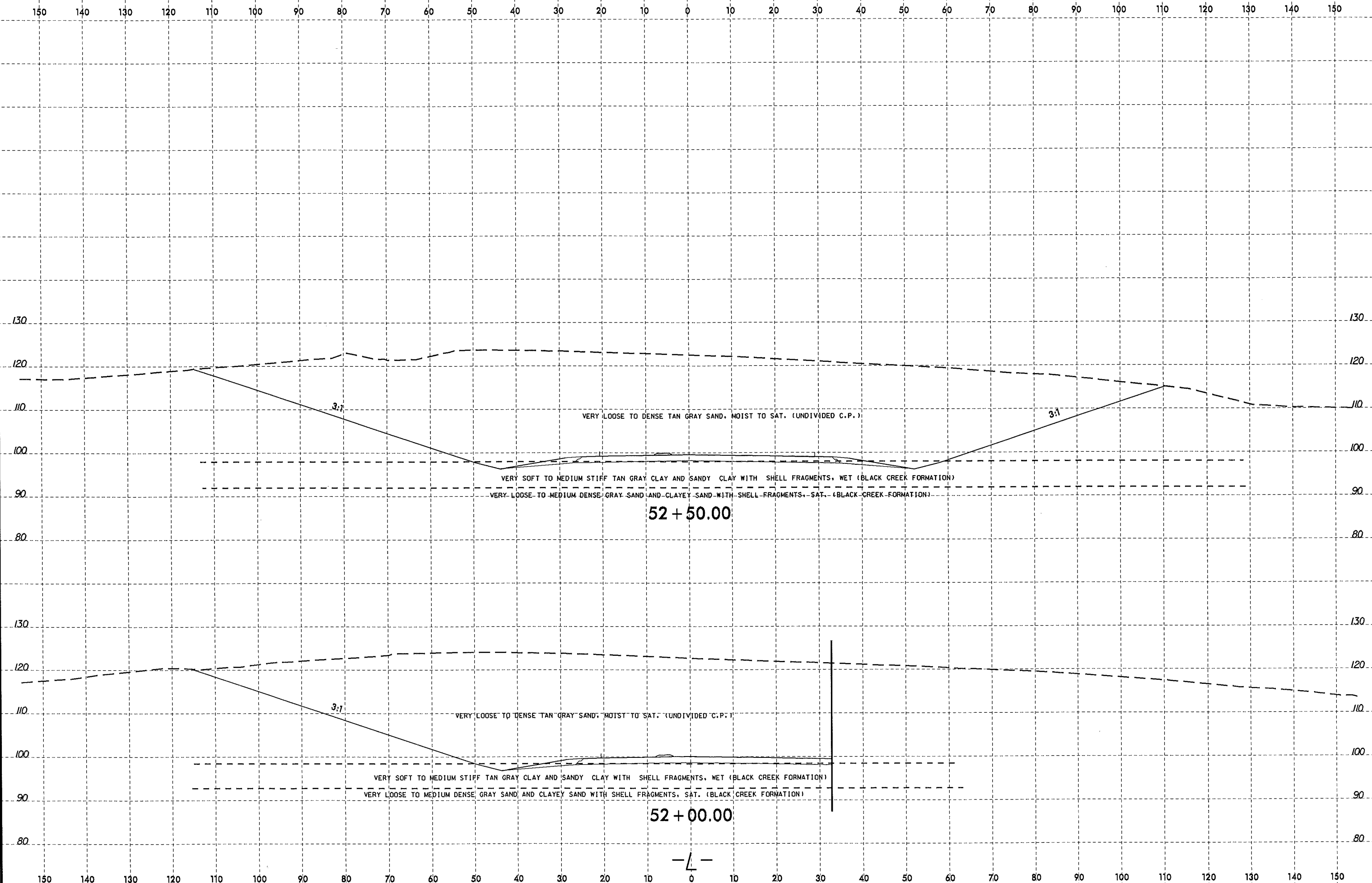


SOIL TEST RESULTS

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	100		
S-38	CL	51+00	20.2-24.7	A-2-4(D)	22	NP	7.2	64.4	10.3	18.1	98	95	29	-	-
S-39	CL	51+00	0.0-0.0	A-6(9)	39	21	22.6	21.2	22.0	54.3	100	92	57	-	-
S-40	CL	51+00	29.7-32.7	A-2-4(D)	23	NP	46.1	36.2	3.6	14.1	94	73	17	-	-

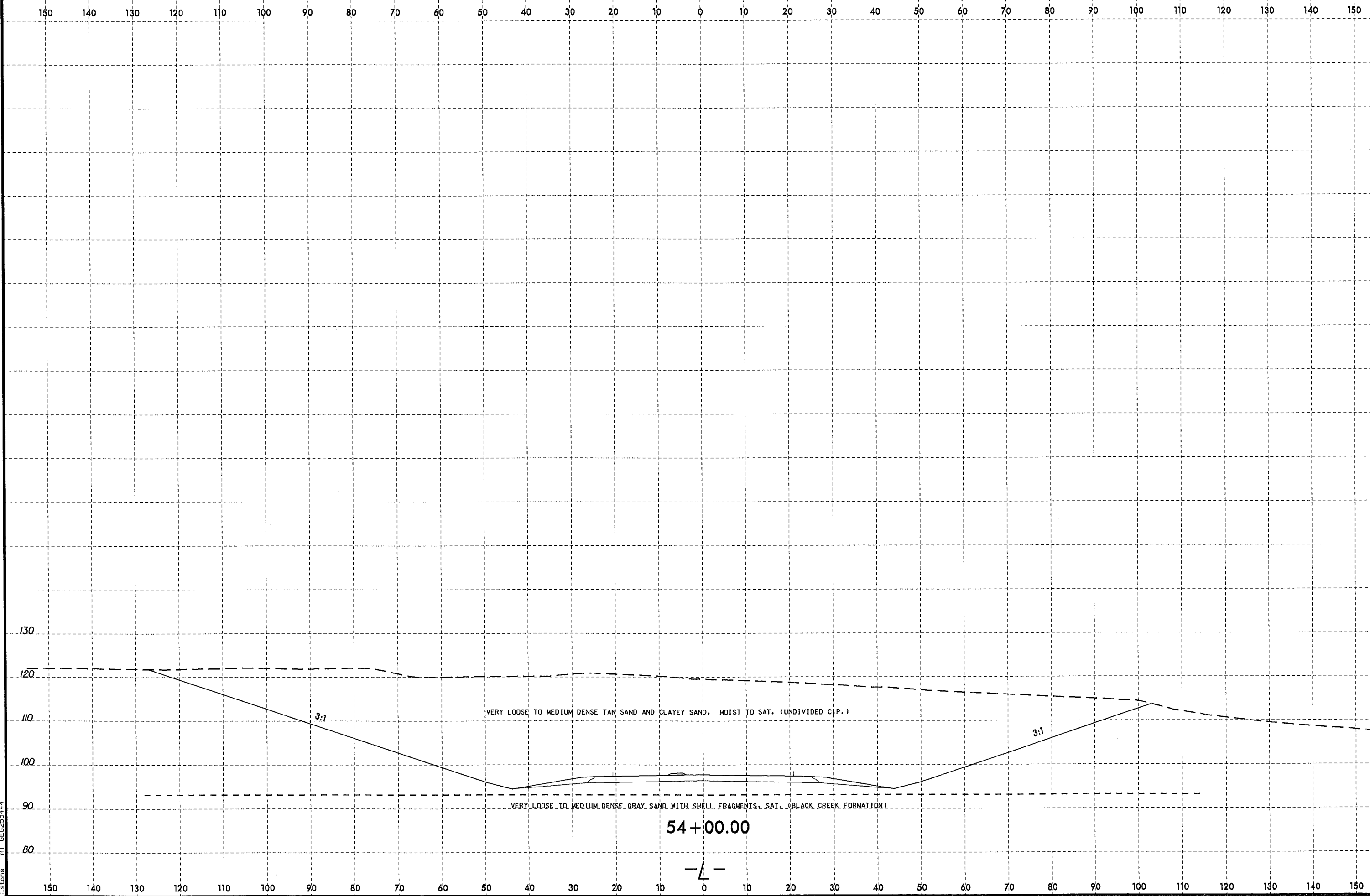
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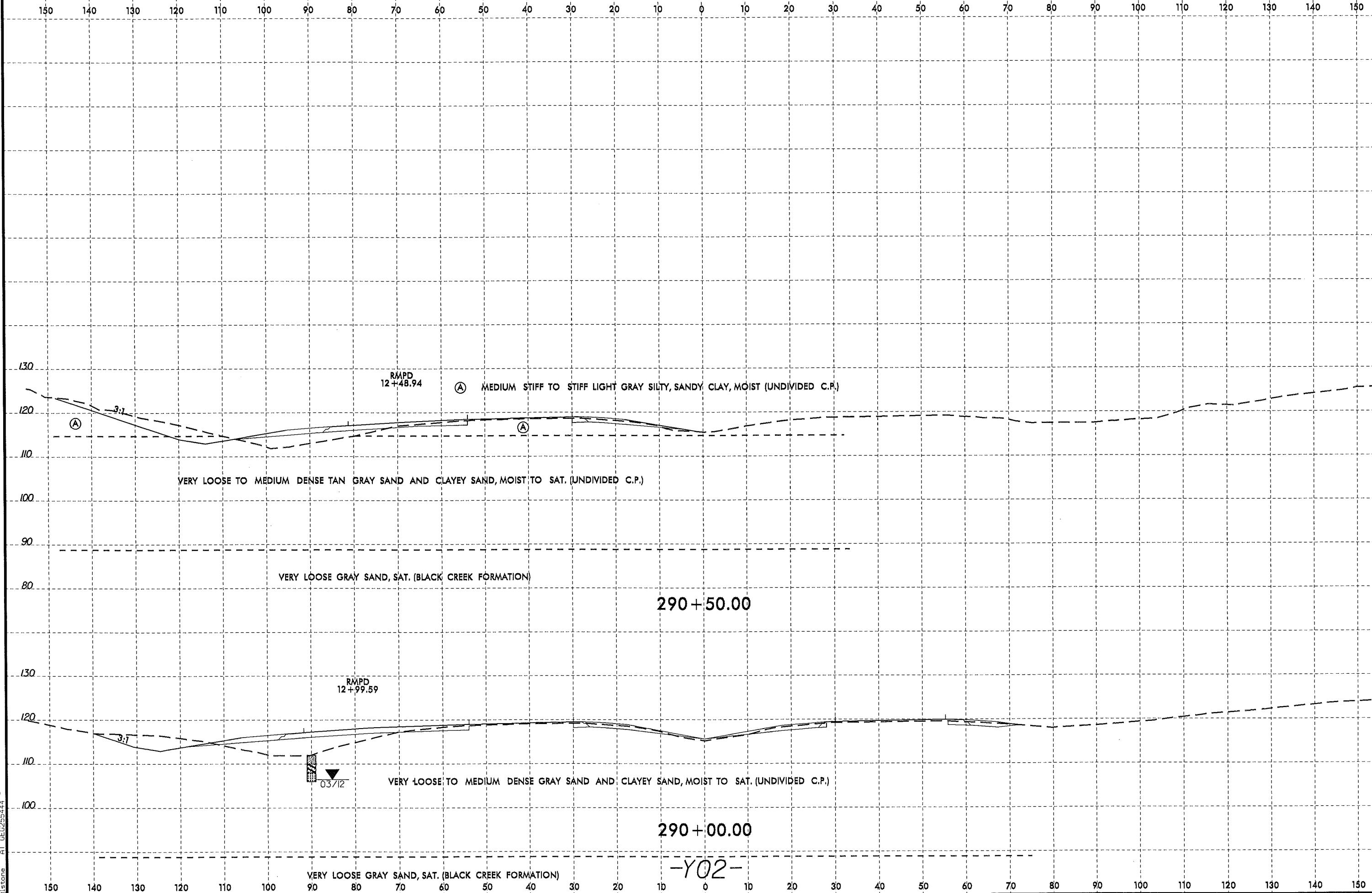
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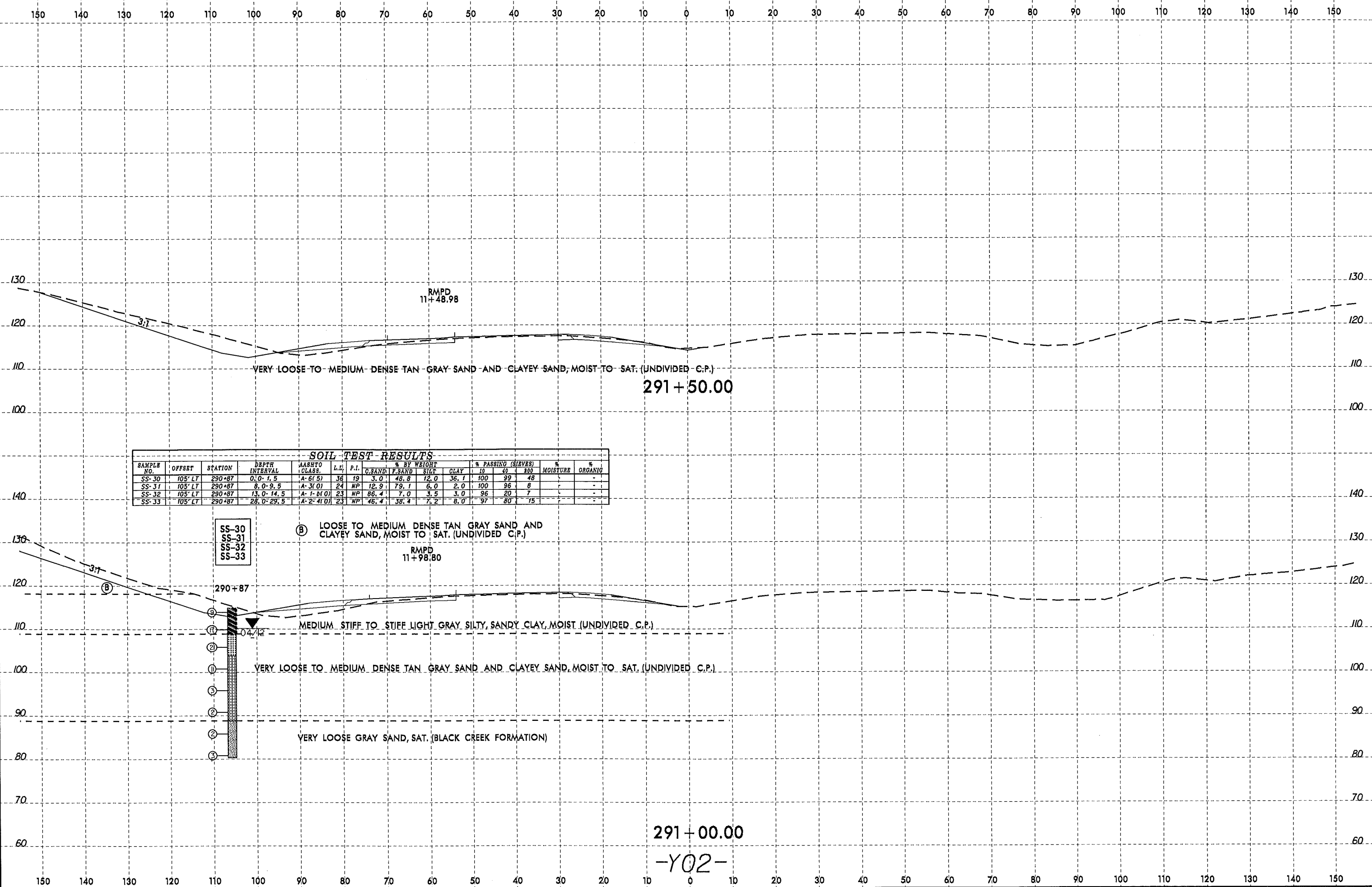


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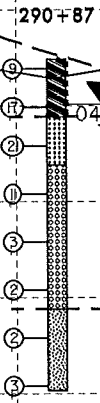
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							G.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-30	105' LT	290+87	0, 0 - 1, 5	A-6(5)	36	19	3.0	48.8	12.0	36.1	100	92	48	-	-
SS-31	105' LT	290+87	8, 0 - 9, 5	A-3(0)	24	NP	12.9	79.1	6.0	2.0	100	96	8	-	-
SS-32	105' LT	290+87	13, 0 - 14, 5	A-1-B(0)	23	NP	86.4	7.0	3.5	3.0	96	20	7	-	-
SS-33	105' LT	290+87	28, 0 - 29, 5	A-2-4(0)	23	NP	46.4	38.4	7.2	8.0	97	80	75	-	-

SS-30
SS-31
SS-32
SS-33

ⓑ LOOSE TO MEDIUM DENSE TAN GRAY SAND AND CLAYEY SAND, MOIST TO SAT. (UNDIVIDED C.P.)

RMPD
11+98.80



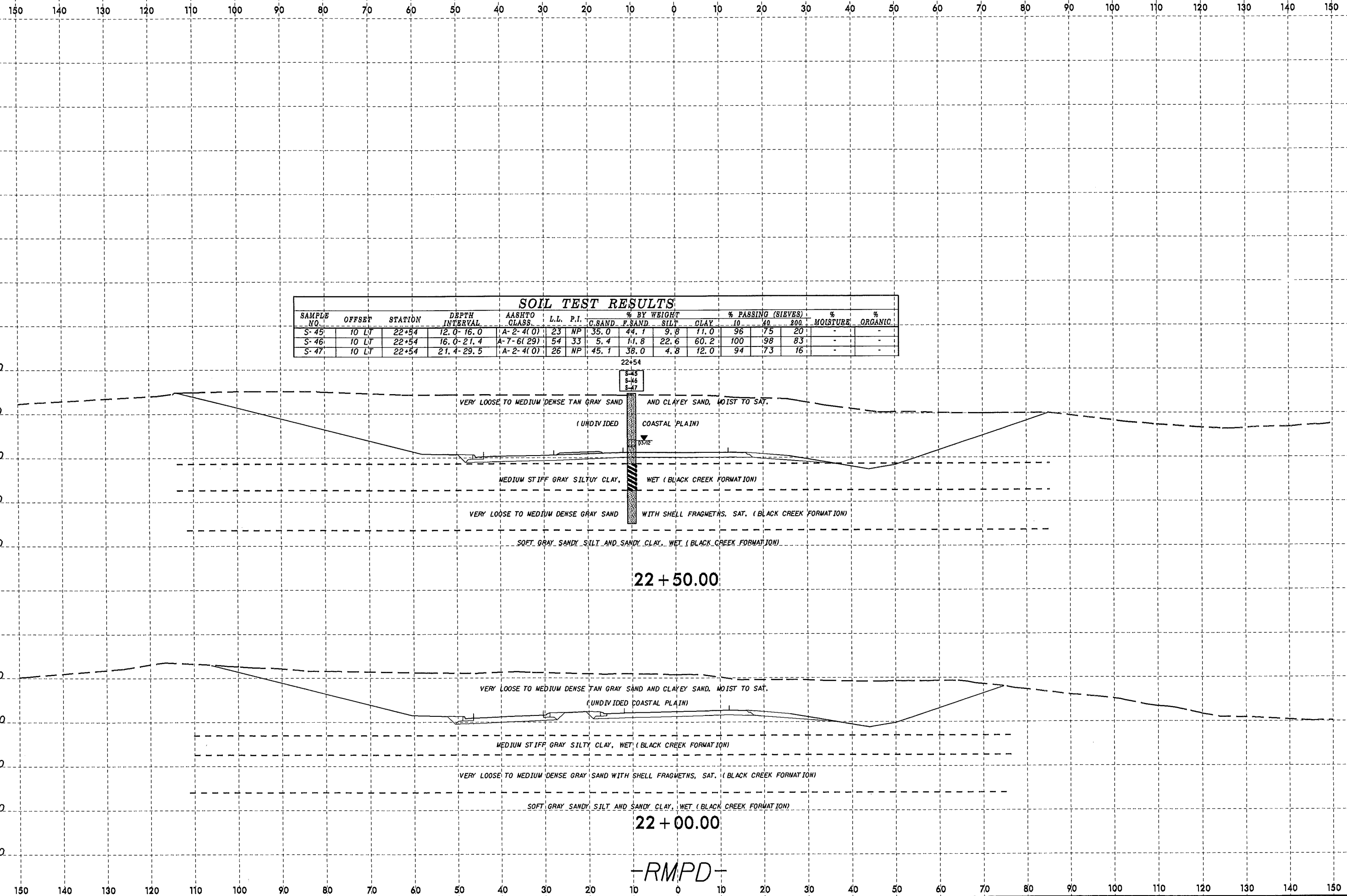
ⓑ MEDIUM STIFF TO STIFF LIGHT GRAY SILTY, SANDY CLAY, MOIST (UNDIVIDED C.P.)

VERY LOOSE TO MEDIUM DENSE TAN GRAY SAND AND CLAYEY SAND, MOIST TO SAT. (UNDIVIDED C.P.)

VERY LOOSE GRAY SAND, SAT. (BLACK CREEK FORMATION)

291+00.00

-Y02-



SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-45	10 LT	22+54	12.0-16.0	A-2-4(0)	23	NP	35.0	44.7	9.8	11.0	96	75	20	-	-
S-46	10 LT	22+54	16.0-21.4	A-7-6(29)	54	33	5.4	11.8	22.6	60.2	100	98	83	-	-
S-47	10 LT	22+54	21.4-29.5	A-2-4(0)	26	NP	45.1	38.0	4.8	12.0	94	73	16	-	-

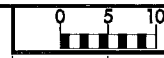
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-RMPD-

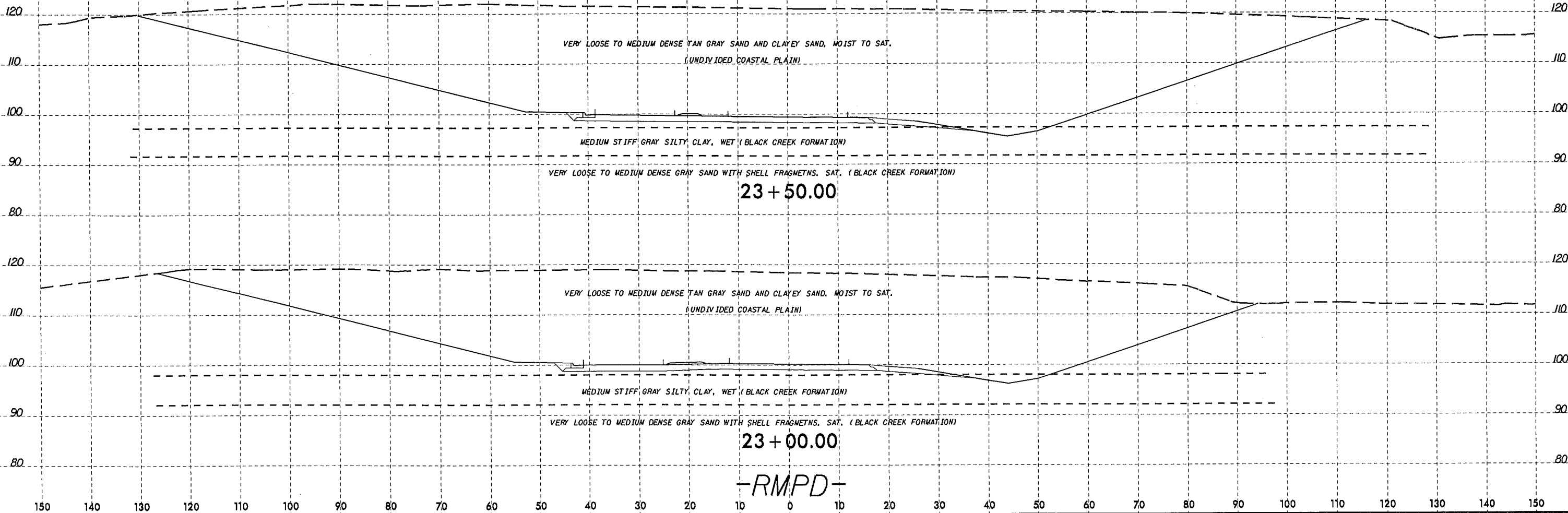
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 Plot Date: 08/23/99

8/23/99



PROJ. REFERENCE NO. R-4903 SHEET NO. 41

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NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 40226.1.1	TIP R-4903	COUNTY BLADEN	GEOLOGIST Contract Geologist
SITE DESCRIPTION NC 87 AND US 701 INTERSECTION			GROUND WTR (ft)
BORING NO. B1	STATION 10+35	OFFSET 332 ft RT	ALIGNMENT -RMPD-
COLLAR ELEV. 96.7 ft	TOTAL DEPTH 25.0 ft	NORTHING 311,294	EASTING 2,116,757
DRILL RIG/HAMMER EFF./DATE CAT6394 CME-45B 91% 02/19/2010			DRILL METHOD Mud Rotary
DRILLER Contract Driller			HAMMER TYPE Automatic
START DATE 07/06/12		COMP. DATE 07/06/12	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
100																
95	92.7	4.0	3	4	5									96.7	GROUND SURFACE	0.0
90	87.7	9.0	5	8	7									94.7	ARTIFICIAL FILL LANDFILL MATERIAL	2.0
85	82.7	14.0	WOH	1	1										ARTIFICIAL FILL LANDFILL MATERIAL	
80	77.7	19.0	5	6	7									79.7	UNDIVIDED COASTAL PLAIN TAN SAND, MOIST	17.0
75	72.7	24.0	WOH	WOH	1									71.7	Boring Terminated at Elevation 71.7 ft IN VERY LOOSE SAND	25.0

WBS 40226.1.1	TIP R-4903	COUNTY BLADEN	GEOLOGIST Contract Geologist
SITE DESCRIPTION NC 87 AND US 701 INTERSECTION			GROUND WTR (ft)
BORING NO. B2	STATION 13+69	OFFSET 207 ft RT	ALIGNMENT -RMPD-
COLLAR ELEV. 86.9 ft	TOTAL DEPTH 30.0 ft	NORTHING 311,180	EASTING 2,116,510
DRILL RIG/HAMMER EFF./DATE CAT6394 CME-45B 91% 02/19/2010			DRILL METHOD Mud Rotary
DRILLER Contract Driller			HAMMER TYPE Automatic
START DATE 07/06/12		COMP. DATE 07/06/12	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
90																
85	82.9	4.0	2	2	1									86.9	GROUND SURFACE	0.0
80	78.9	8.0	WOH	WOH	1									84.9	ARTIFICIAL FILL LANDFILL MATERIAL	2.0
75	73.9	13.0	WOH	WOH	1										ARTIFICIAL FILL LANDFILL MATERIAL	
70	68.9	18.0	WOH	WOH	1										UNDIVIDED COASTAL PLAIN TAN SAND, MOIST	26.0
65	62.9	24.0	1	1	1									60.9	UNDIVIDED COASTAL PLAIN TAN SAND, MOIST	26.0
60	58.9	28.0	5	8	9									56.9	Boring Terminated at Elevation 56.9 ft IN MEDIUM DENSE SAND	30.0

NCDOT BORE DOUBLE R4903 LANDFILL.GPJ NC DOT.GDT 10/11/12

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 40226.1.1	TIP R-4903	COUNTY BLADEN	GEOLOGIST Contract Geologist
SITE DESCRIPTION NC 87 AND US 701 INTERSECTION			GROUND WTR (ft)
BORING NO. B3	STATION 12+51	OFFSET 175 ft RT	ALIGNMENT -RMPD-
COLLAR ELEV. 103.6 ft	TOTAL DEPTH 25.0 ft	NORTHING 311,132	EASTING 2,116,591
DRILL RIG/HAMMER EFF./DATE CAT6394 CME-45B 91% 02/19/2010			DRILL METHOD Mud Rotary
DRILLER Contract Driller			HAMMER TYPE Automatic
START DATE 07/06/12		COMP. DATE 07/06/12	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
105														103.6	GROUND SURFACE	0.0
														101.6	ARTIFICIAL FILL LANDFILL MATERIAL ARTIFICIAL FILL LANDFILL MATERIAL	2.9
100	99.6	4.0	3	3	4											
95	94.6	9.0	4	5	5											
90	89.6	14.0	3	4	4											
85	84.6	19.0	2	2	2									86.6	UNDIVIDED COASTAL PLAIN TAN SAND, MOIST	17.0
80	79.6	24.0	8	12	16									78.6	Boring Terminated at Elevation 78.6 ft IN MEDIUM DENSE SAND	25.0

WBS 40226.1.1	TIP R-4903	COUNTY BLADEN	GEOLOGIST Wrike, C. M.
SITE DESCRIPTION NC 87 AND US 701 INTERSECTION			GROUND WTR (ft)
BORING NO. B4	STATION 14+38	OFFSET 120 ft RT	ALIGNMENT -RMPD-
COLLAR ELEV. 107.2 ft	TOTAL DEPTH 24.7 ft	NORTHING 311,112	EASTING 2,116,433
DRILL RIG/HAMMER EFF./DATE GFO0063 CME-45B 92% 06/27/2011			DRILL METHOD Mud Rotary
DRILLER Smith, R. E.			HAMMER TYPE Automatic
START DATE 04/04/12		COMP. DATE 04/04/12	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
110														107.2	GROUND SURFACE	0.0
														104.2	ARTIFICIAL FILL LANDFILL MATERIAL ARTIFICIAL FILL LANDFILL MATERIAL	3.0
105	107.2	0.0	WOH	2	3											
100	103.2	4.0	3	2	2											
95	99.0	8.2	1	1	1											
90	94.0	13.2	1	1	1											
85	89.0	18.2	17	24	24									90.2	UNDIVIDED COASTAL PLAIN TAN SAND, MOIST	17.0
	84.0	23.2	5	16	23									82.5	Boring Terminated at Elevation 82.5 ft IN DENSE SAND	24.7

NCDOT BORE DOUBLE R4903 LANDFILL.GPJ NC_DOT.GDT 10/11/12

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAY
 MATERIALS & TESTS UNIT
 SOILS LABORATORY

T. I. P. No. R-4903

REPORT ON SAMPLES OF SOILS FOR QUALITY

Project 40226.1.1 County BLADEN Owner _____
 Date: Sampled 4/1/12 Received 4/25/12 Reported 5/1/12
 Sampled from ROADWAY By J L STONE
 Submitted by N WAINAINA 1995 Standard Specifications

TEST RESULTS

Proj. Sample No.		SS-34	SS-35			
Lab. Sample No.		779386	779387			
Retained #4 Sieve	%	-	-			
Passing #10 Sieve	%	100	100			
Passing #40 Sieve	%	81	93			
Passing #200 Sieve	%	45	12			

SOIL MORTAR - 100%						
Coarse Sand Ret - #60	%	30.3	21.5			
Fine Sand Ret - #270	%	24.7	67.1			
Silt 0.05 - 0.005 mm	%	34.9	7.4			
Clay < 0.005 mm	%	10.0	4.0			
Passing #40 Sieve	%	-	-			
Passing #200 Sieve	%	-	-			

L. L.		65	21			
P. I.		NP	NP			
AASHTO Classification		A-5(0)	A-2-4(0)			
Station		14+38	14+38			
Offset		120 RT	120 RT			
Alignment		RMPD	RMPD			
Location						
Depth (Ft)		4.00	18.20			
	to	5.50	19.70			

cc: J L STONE

 Soils Engineer