

CONTRACT C201474 ID. B-4255

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

| N.C. | B-4255 | 1 | 8 |
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| ITEM NO. | F.A. PROJ. NO. | DESCRIPTION | |
| 33597.1.1 | BRSTP-0801(3) | P.E. | |
| 33597.2.1 | BRSTP-0801(3) | ROW, UTL | |
| 33597.3.1 | BRSTP-0801(7) | CONST | |

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WAS 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 UNIT @ (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA IS 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.

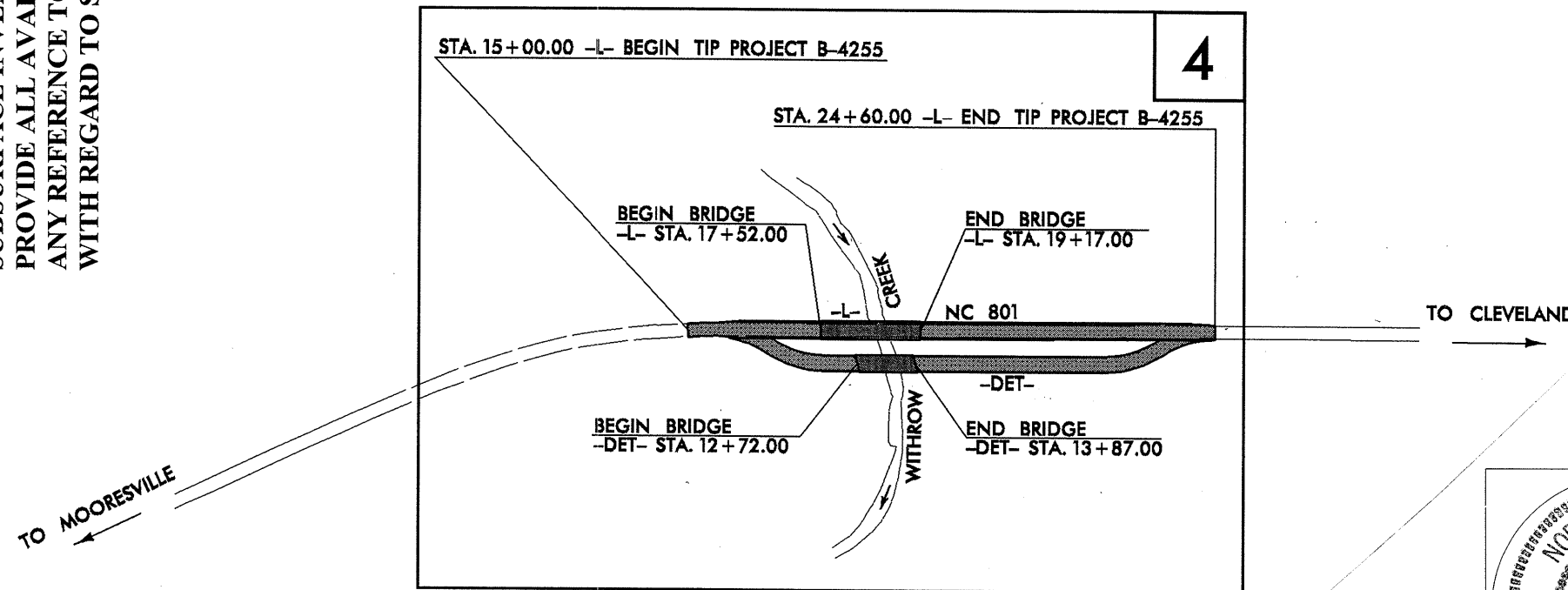
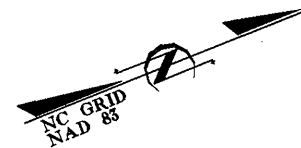
ROADWAY
SUBSURFACE INVESTIGATION

STATE PROJECT 33597.3.1 I.D. NO. B-4255
F.A. PROJECT _____
COUNTY ROWAN
DESCRIPTION BRIDGE NO. 28 & APPROACHES
OVER WITHROW CREEK ON NC 801
(BEAR POPLAR RD.)

INVENTORY

PLEASE NOTE:

THE DETOUR ALIGNMENT WAS REVISED AFTER COMPLETION OF THE SUBSURFACE INVENTORY. THE INVENTORY IS INCLUDED IN ORDER TO PROVIDE ALL AVAILABLE SUBSURFACE DATA, BUT BE AWARE THAT ANY REFERENCE TO THE -DET- ALIGNMENT WILL BE INCORRECT WITH REGARD TO STATION AND OFFSET.

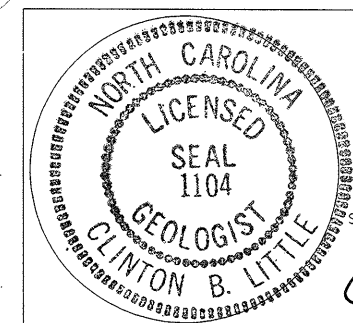


INVESTIGATED BY J.P. ROGERS PERSONNEL R.W. TODD
CHECKED BY C.B. LITTLE J.E. ESTEP
SUBMITTED BY C.B. LITTLE M.L. SMITH
DATE DECEMBER 2004

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 IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

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



1-5-05

SIGNATURE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL UNIT

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| ID | STATE PROJECT NO. | SHEET NO. | TOTAL SHEETS |
| B-4255 | 33597.11 | 2 | 8 |

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

| SOIL DESCRIPTION | GRADATION | ROCK DESCRIPTION | TERMS AND DEFINITIONS |
|--|---|--|--|
| SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED OR WEATHERED EARTH MATERIALS WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND 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 ARE DESIGNATED BY THE TERMS: ANGULAR , SUBANGULAR , SUBROUNDED , OR ROUNDED . | HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WHEN 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: WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP) | ALLUVIUM (ALLUV.) - SOILS WHICH 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 WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL. FLOOD PLAIN (F.P.) - 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 SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (R.Q.D.) - 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 WHICH 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, WHICH HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRODUCED 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 B.P.F.) 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 LESS THAN 0.1 FOOT PENETRATION WITH 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 (S.R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 10 CENTIMETERS DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER. |
| SOIL LEGEND AND AASHTO CLASSIFICATION GENERAL CLASS. GRANULAR MATERIALS (>35% PASSING #200) SILT-CLAY MATERIALS (>35% PASSING #200) ORGANIC MATERIALS GROUP CLASS. A-1, A-2, A-3, A-4, A-5, A-6, A-7, A-8, A-9, A-10, A-11, A-12, A-13, A-14, A-15, A-16, A-17, A-18, A-19, A-20, A-21, A-22, A-23, A-24, A-25, A-26, A-27, A-28, A-29, A-30, A-31, A-32, A-33, A-34, A-35, A-36, A-37, A-38, A-39, A-40, A-41, A-42, A-43, A-44, A-45, A-46, A-47, A-48, A-49, A-50, A-51, A-52, A-53, A-54, A-55, A-56, A-57, A-58, A-59, A-60, A-61, A-62, A-63, A-64, A-65, A-66, A-67, A-68, A-69, A-70, A-71, A-72, A-73, A-74, A-75, A-76, A-77, A-78, A-79, A-80, A-81, A-82, A-83, A-84, A-85, A-86, A-87, A-88, A-89, A-90, A-91, A-92, A-93, A-94, A-95, A-96, A-97, A-98, A-99, A-100, A-101, A-102, A-103, A-104, A-105, A-106, A-107, A-108, A-109, A-110, A-111, A-112, A-113, A-114, A-115, A-116, A-117, A-118, A-119, A-120, A-121, A-122, A-123, A-124, A-125, A-126, A-127, A-128, A-129, A-130, A-131, A-132, A-133, A-134, A-135, A-136, A-137, A-138, A-139, A-140, A-141, A-142, A-143, A-144, A-145, A-146, A-147, A-148, A-149, A-150, A-151, A-152, A-153, A-154, A-155, A-156, A-157, A-158, 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A-731, A-732, A-733, A-734, A-735, A-736, A-737, A-738, A-739, A-740, A-741, A-742, A-743, A-744, A-745, A-746, A-747, A-748, A-749, A-750, A-751, A-752, A-753, A-754, A-755, A-756, A-757, A-758, A-759, A-760, A-761, A-762, A-763, A-764, A-765, A-766, A-767, A-768, A-769, A-770, A-771, A-772, A-773, A-774, A-775, A-776, A-777, A-778, A-779, A-780, A-781, A-782, A-783, A-784, A-785, A-786, A-787, A-788, A-789, A-790, A-791, A-792, A-793, A-794, A-795, A-796, A-797, A-798, A-799, A-800, A-801, A-802, A-803, A-804, A-805, A-806, A-807, A-808, A-809, A-810, A-811, A-812, A-813, A-814, A-815, A-816, A-817, A-818, A-819, A-820, A-821, A-822, A-823, A-824, A-825, A-826, A-827, A-828, A-829, A-830, A-831, A-832, A-833, A-834, A-835, A-836, A-837, A-838, A-839, A-840, A-841, A-842, A-843, A-844, A-845, A-846, A-847, A-848, A-849, A-850, A-851, A-852, A-853, A-854, A-855, A-856, A-857, A-858, A-859, A-860, A-861, A-862, A-863, A-864, A-865, A-866, A-867, A-868, A-869, A-870, A-871, A-872, A-873, 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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY P.O. BOX 25201, RALEIGH, N.C. 27611-5201 LYND0 TIPPETT
GOVERNOR SECRETARY

December 15, 2004

STATE PROJECT: 33597.1.1 (B-4255)
FEDERAL PROJECT: BRSTP - 0801(3)
COUNTY: Rowan
DESCRIPTION: Bridge No. 28 over Withrow Creek on NC 801 (Bear Poplar Rd.)
SUBJECT: Geotechnical Report - Inventory

This project is located in eastern Rowan County near the town of Bear Poplar. Our investigation focused on the detour roadway and structure for the actual replacement of Bridge No. 28. Total length of lines investigated for this project is 0.283 miles. The Geotechnical field investigation was conducted in November 2004. Field data was collected primarily with an all-terrain CME 550-power auger machine equipped with an automatic hammer for Standard Penetration tests. Geologically, the project corridor is underlain predominantly by gabbro of the Concord Plutonic Suite located within the Charlotte Geological Belt.

The following baselines were investigated either by actual soil testing or visual reconnaissance:

| <u>Line</u> | <u>Stations</u> |
|-------------|-----------------|
| -DET- | 10+00 to 24+97 |

Items of Special Geotechnical Interest

1. Hard Rock

Hard, crystalline rock was encountered above or within ten feet of proposed grade at the following locations:

| <u>Line</u> | <u>Station</u> |
|-------------|----------------|
| -DET- | 11+50 to 14+50 |

The rock exposed in the existing cut between Stations 12+00 to 14+00 is a weathered and fractured gabbro. There is evidence of a former slope failure as well as a number of small boulders in the ditch/shoulder area that have dislodged from the slope face. The existing slope angle is approximately 1.5:1 (H:V). The cross-sections

for these areas can be found at the back of the attached Roadway Inventory plans beginning on page 6.

2. Alluvial Deposits

Alluvial soils were encountered within the project corridor between Stations 16+40 to 19+80 -DET-. These soils are a maximum of 14' thick and consist of very soft to soft clay (A-6), and very loose to loose silty sand (A-2-4, A-1-b).

3. High P.I. clays

The cap clay in the following cut section was found to have plasticity indices greater than 27:

| <u>Location</u> | <u>P.I.</u> | <u>Depth (ft.)</u> |
|----------------------|-------------|--------------------|
| 13+25 to 13+75 -DET- | 29 | 4.0' - 6.0' |
| 13+75 to 14+75 " | 38 | 0 - 2.0' |

Soils Properties

Residual soils, derived from the weathering of parent rock materials, occur in the uplands as cut materials, in the flanks of hillsides as foundation soils for proposed fills, and underneath alluvial deposits in floodplains. Brown and brown-white clays (A-7-5, and A-7-6) cap most of the hills in varying thicknesses. In addition to these clays, a variety of saprolite soils are present. These include sandy silts (A-4) plus some weathered rock and hard rock.

If we can furnish any further information on this project, please advise.

Respectfully submitted,

J. P. Rogers
Project Engineering Geologist
Geotechnical Engineering Unit
Harrisburg Field Office

cc: Pat Ivey, PE
Division 9 Engineer

PROJECT NO. : B-4255

COUNTY: ROWAN

| LOCATION | EVCAVATION | | | | | EMBANKMENT | | | | BORROW | WASTE | | | |
|---|------------------|------|----------|------------|-------------|------------------|------|------------------|---------------------|--------------|-------|-------------|------------|-------------|
| | TOTAL EXCAVATION | ROCK | UNDERCUT | UNSUITABLE | SUITABLE | TOTAL EMBANKMENT | ROCK | EARTH EMBANKMENT | EMBANKMENT PLUS 15% | | ROCK | SUITABLE | UNSUITABLE | TOTAL |
| -DET- | | | | | | | | | | | | | | |
| 10+00 TO 18+00 | 20 | | | | 20 | 3783 | | 3783 | 4350 | 4330 | | | | |
| -DET- | | | | | | | | | | | | | | |
| 19+50 TO 25+00 | 545 | | | | 545 | 6229 | | 6229 | 7163 | 6618 | | | | |
| SUBTOTAL | 565 | | | | 565 | 10012 | | 10012 | 11513 | 10948 | | | | |
| -L- | | | | | | | | | | | | | | |
| 10+00 TO 18+00 | 132 | | | | 132 | 339 | | 339 | 390 | 258 | | | | |
| -L- | | | | | | | | | | | | | | |
| 19+50 TO 25+00 | 322 | | | | 322 | 1876 | | 1876 | 2157 | 1835 | | | | |
| SUBTOTAL | 454 | | | | 454 | 2215 | | 2215 | 2547 | 2093 | | | | |
| -L- W/ -DET- REMOVAL | | | | | | | | | | | | | | |
| 10+00 TO 18+00 | 1329 | | | | 1329 | 8 | | 8 | 9 | | | 1320 | | 1320 |
| -L- W/ -DET- REMOVAL | | | | | | | | | | | | | | |
| 19+50 TO 25+00 | 1713 | | | | 1713 | 50 | | 50 | 58 | | | 1655 | | 1655 |
| SUBTOTAL | 3042 | | | | 3042 | 58 | | 58 | 67 | | | 2975 | | 2975 |
| TOTAL | 4061 | | | | 4061 | 12285 | | 12285 | 14127 | 13041 | | 2975 | | 2975 |
| LOSS DUE TO CLEAR & GRUB EST. SHOULDER MATERIAL | -1000 | | | | -1000 | | | | | 1000 | | | | |
| | | | | | | 295 | | 295 | 339 | 339 | | | | |
| PROJECT TOTAL | 3061 | | | | 3061 | 12580 | | 12580 | 14466 | 14380 | | 2975 | | 2975 |
| EST. TO REPLACE TOPSOIL ON BORROW PIT | | | | | | | | | | 720 | | | | |
| GRAND TOTAL | 3061 | | | | | | | | | 15100 | | 2975 | | 2975 |
| SAY | 3100 | | | | | | | | | 15300 | | | | |

EST. DDE = 50

EST. UNDERCUT EXCAVATION = 1,000 CY (CONTINGENCY FROM GEOTECH)

EST. SELECT GRANULAR MATERIAL = 1,500 CY

EST. FABRIC FOR SOIL STABILIZATION = 1,750 SY

| -L- | | -DET- | |
|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| PI Sta 12+79.05 | PI Sta 11+76.52 | PI Sta 22+17.91 | PI Sta 24+04.43 |
| $\Delta = 23^\circ 52' 24.3"$ (RT) | $\Delta = 23^\circ 52' 23.3"$ (RT) | $\Delta = 12^\circ 47' 53.7"$ (LT) | $\Delta = 12^\circ 47' 54.8"$ (RT) |
| D = 4' 20' 26.1" | D = 6' 51' 42.4" | D = 6' 51' 42.4" | D = 6' 51' 42.3" |
| L = 550.00' | L = 347.92' | L = 186.52' | L = 186.52' |
| T = 279.05' | T = 176.52' | T = 93.65' | T = 93.65' |
| R = 1,320.00' | R = 835.00' | R = 835.00' | R = 835.00' |
| SE = 06 | SE = 06 | SE = 06 | SE = 06 |
| DS = 60 mph | DS = 50 mph | DS = 50 mph | DS = 50 mph |

NC GRID NAD 83

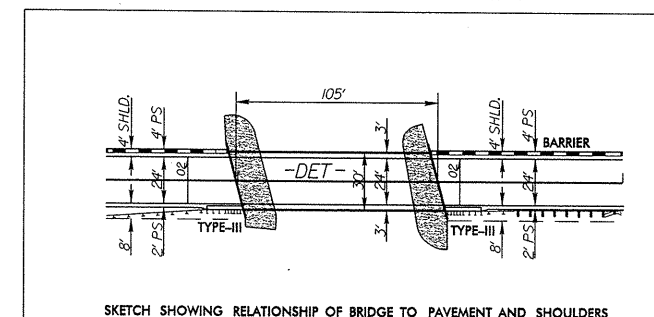
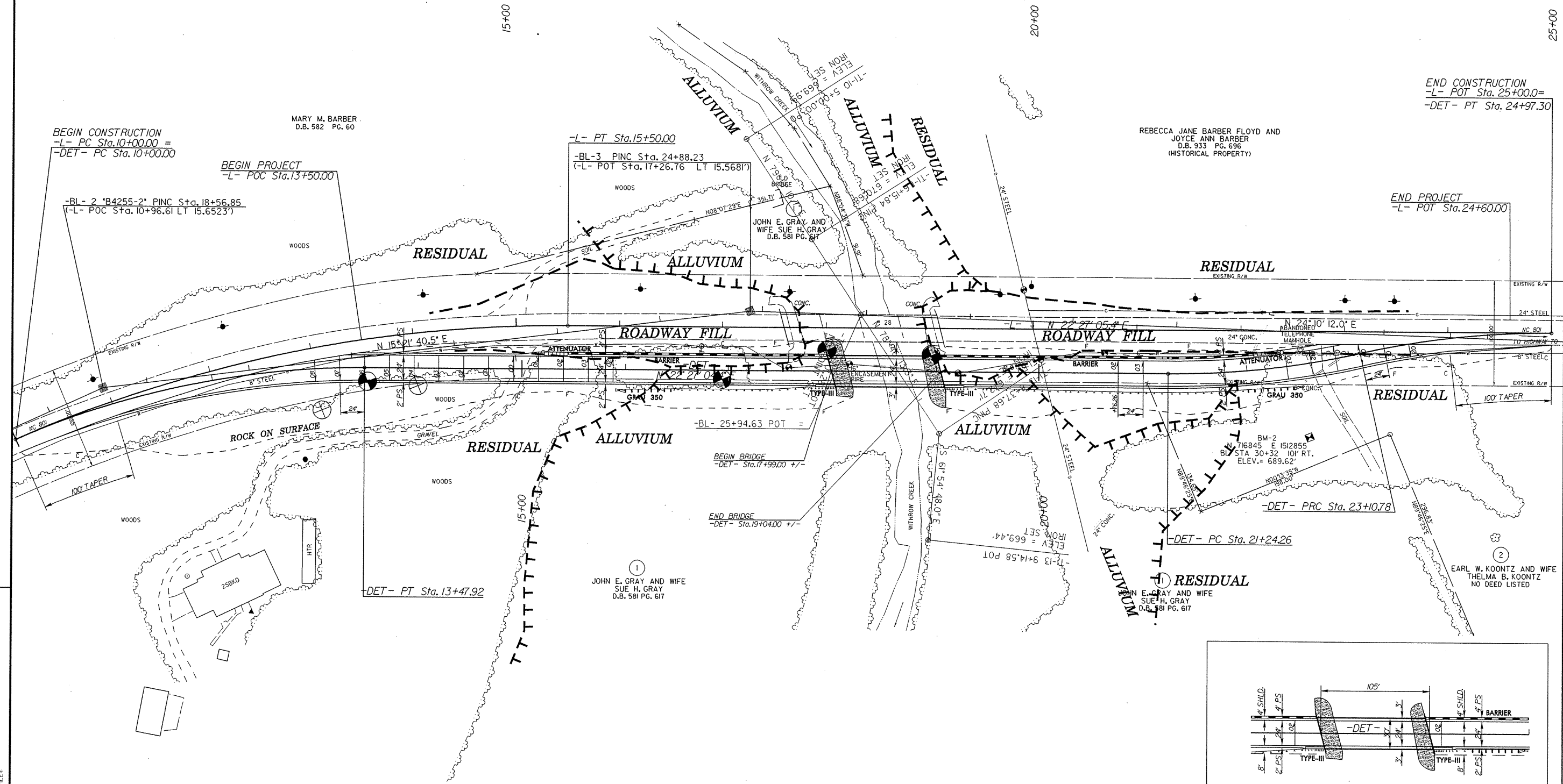


| | |
|--|---------------------|
| PROJECT REFERENCE NO. B-4255 | SHEET NO. 8 |
| RW SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
| 4/8 | |
| PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION | |
| INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION | |

FOR -DET- PROFILE SEE SHEET 5

REVISIONS

25+00



DATE: 8/15/03
BY: JLF

-BL-2
EL = 685.69
18" REBAR WITH CAP

-BL-3
EL = 680.64
18" REBAR WITH CAP

BM-2
N=716845 E=1512855
-BL- STA 30+32 101' RT
-L- STA 22+66.88 102.3843' RT
RAILROAD SPIKE SET IN BASE
OF 24" OAK TREE.

BRIDGE HYDRAULIC DATA
BOX GIRDER BRIDGE

DESIGN DISCHARGE = 6800 CFS
DESIGN FREQUENCY = 50 YRS
DESIGN HW ELEVATION = 675.9 FT
100 YEAR DISCHARGE = 8100 CFS
100 YEAR HW ELEVATION = 675.93 FT
OVERTOPPING DISCHARGE = 18400 CFS
OVERTOPPING FREQUENCY = 500 + YRS
OVERTOPPING ELEVATION = 681.38 FT

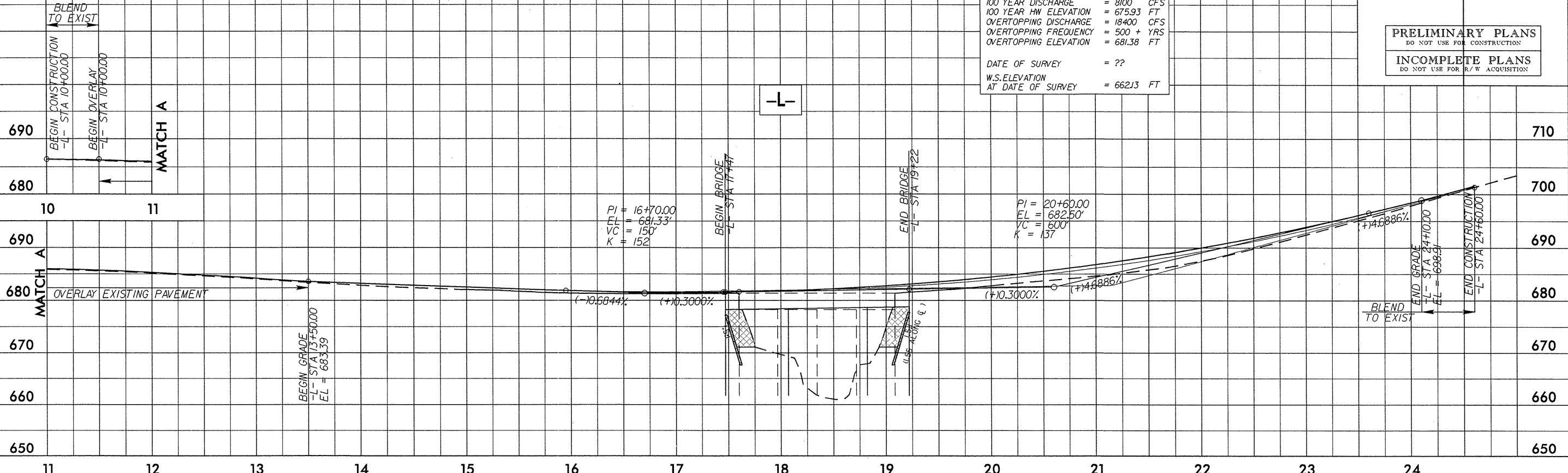
DATE OF SURVEY = ??
W.S.ELEVATION AT DATE OF SURVEY = 662.13 FT

MULKEY
ENGINEERS & CONSULTANTS
P.O. BOX 32187
DALLAS, TEXAS 75232
(214) 416-1912 FAX
(214) 416-1913
WWW.MULKEYINC.COM

PROJECT REFERENCE NO. B-4255 SHEET NO. 5
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



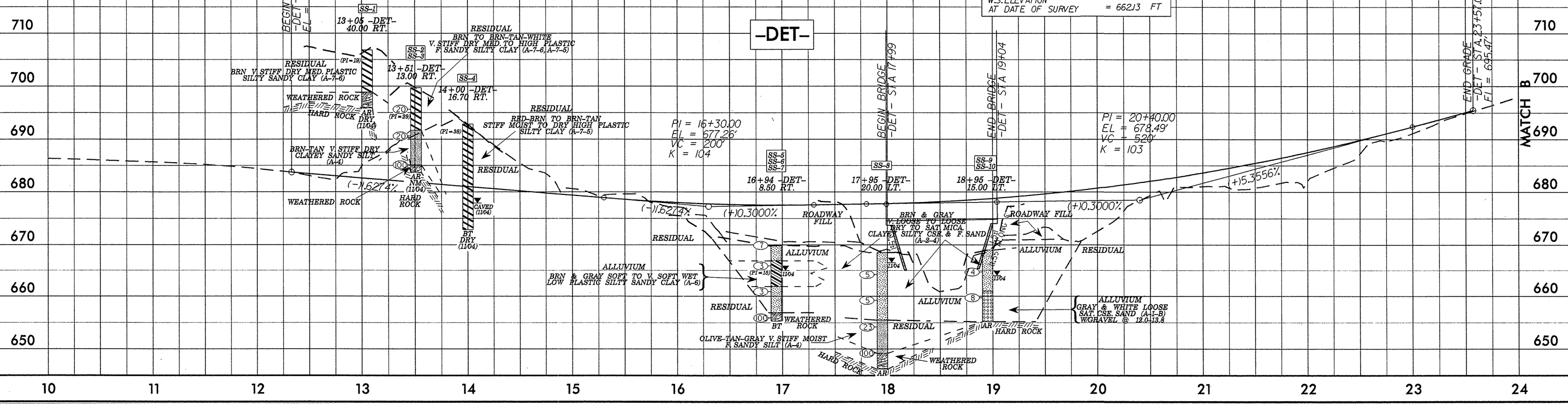
SOIL TEST RESULTS

| SAMPLE NO. | OFFSET | STATION | DEPTH INTERVAL | AASHTO CLASS | L.L. | P.L.I. | % BY WEIGHT | | | | % PASSING SIEVES | | | % MOISTURE | % ORGANIC |
|------------|---------|---------|----------------|--------------|------|--------|-------------|---------|------|------|------------------|----|-----|------------|-----------|
| | | | | | | | C. SAND | F. SAND | SILT | CLAY | 10 | 40 | 200 | | |
| SS-1 | 40 RT | 13+05 | 0.00-8.00 | A-7-6(6) | 43 | 19 | 24.2 | 24.8 | 30.9 | 20.1 | 87 | 70 | 50 | - | - |
| SS-2 | 13 RT | 13+51 | 4.10-5.60 | A-7-5(24) | 65 | 29 | 8.1 | 23.0 | 34.7 | 34.2 | 100 | 96 | 75 | - | - |
| SS-3 | 13 RT | 13+51 | 9.10-10.60 | A-4(0) | 27 | 5 | 29.0 | 24.4 | 28.5 | 18.1 | 79 | 55 | 38 | - | - |
| SS-4 | 16.7 RT | 14+00 | 0.00-5.00 | A-7-5(49) | 75 | 38 | 3.4 | 8.5 | 29.7 | 58.4 | 100 | 98 | 91 | - | - |
| SS-5 | 8.5 RT | 16+94 | 0.00-1.50 | A-2-4(0) | 25 | NP | 37.7 | 38.3 | 14.0 | 10.1 | 100 | 84 | 27 | - | - |
| SS-6 | 8.5 RT | 16+94 | 4.00-5.50 | A-6(3) | 35 | 15 | 21.8 | 36.9 | 15.2 | 26.2 | 99 | 90 | 44 | - | - |
| SS-7 | 8.5 RT | 16+94 | 9.00-10.50 | A-2-4(0) | 27 | NP | 25.7 | 50.3 | 14.0 | 10.1 | 100 | 93 | 30 | - | - |
| SS-8 | 20 LT | 17+95 | 14.30-16.80 | A-4(0) | 28 | NP | 17.7 | 47.9 | 30.3 | 4.0 | 99 | 92 | 46 | - | - |
| SS-9 | 15 LT | 18+95 | 0.00-4.30 | A-2-4(0) | 24 | NP | 24.6 | 49.1 | 12.2 | 14.1 | 100 | 90 | 31 | - | - |
| SS-10 | 15 LT | 18+95 | 9.30-10.80 | A-1-b(0) | 32 | NP | 74.4 | 17.6 | 4.9 | 3.0 | 94 | 40 | 9 | - | - |

BRIDGE HYDRAULIC DATA
BOX GIRDER BRIDGE

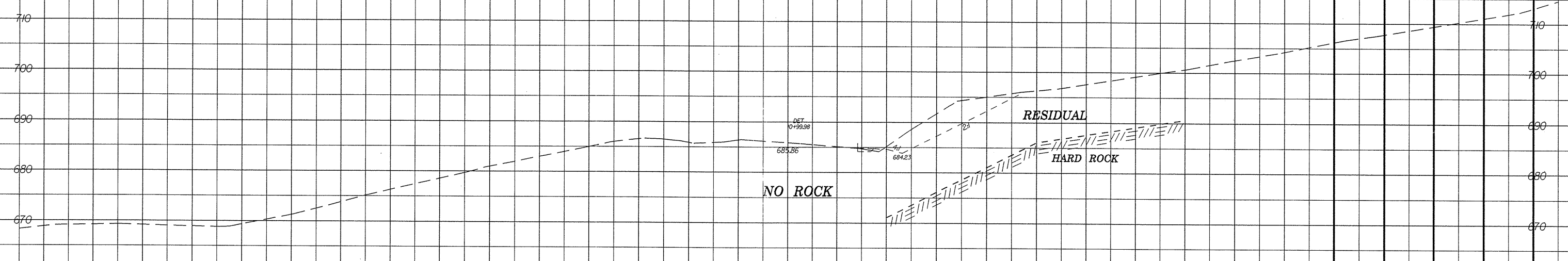
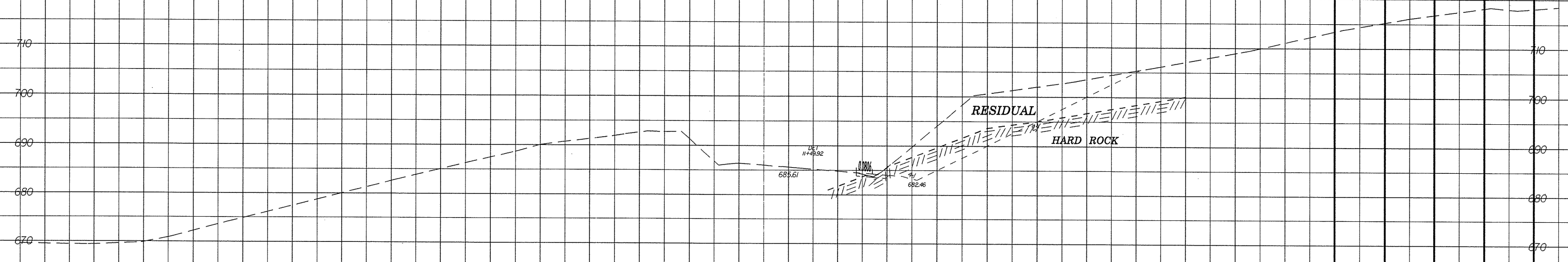
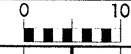
DESIGN DISCHARGE = 3200 CFS
DESIGN FREQUENCY = 5 YRS
DESIGN HW ELEVATION = 672.62 FT
100 YEAR DISCHARGE = CFS
100 YEAR HW ELEVATION = FT
OVERTOPPING DISCHARGE = CFS
OVERTOPPING FREQUENCY = YRS
OVERTOPPING ELEVATION = FT

DATE OF SURVEY = ??
W.S.ELEVATION AT DATE OF SURVEY = 662.13 FT



REVISIONS

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

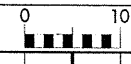


11+50.00

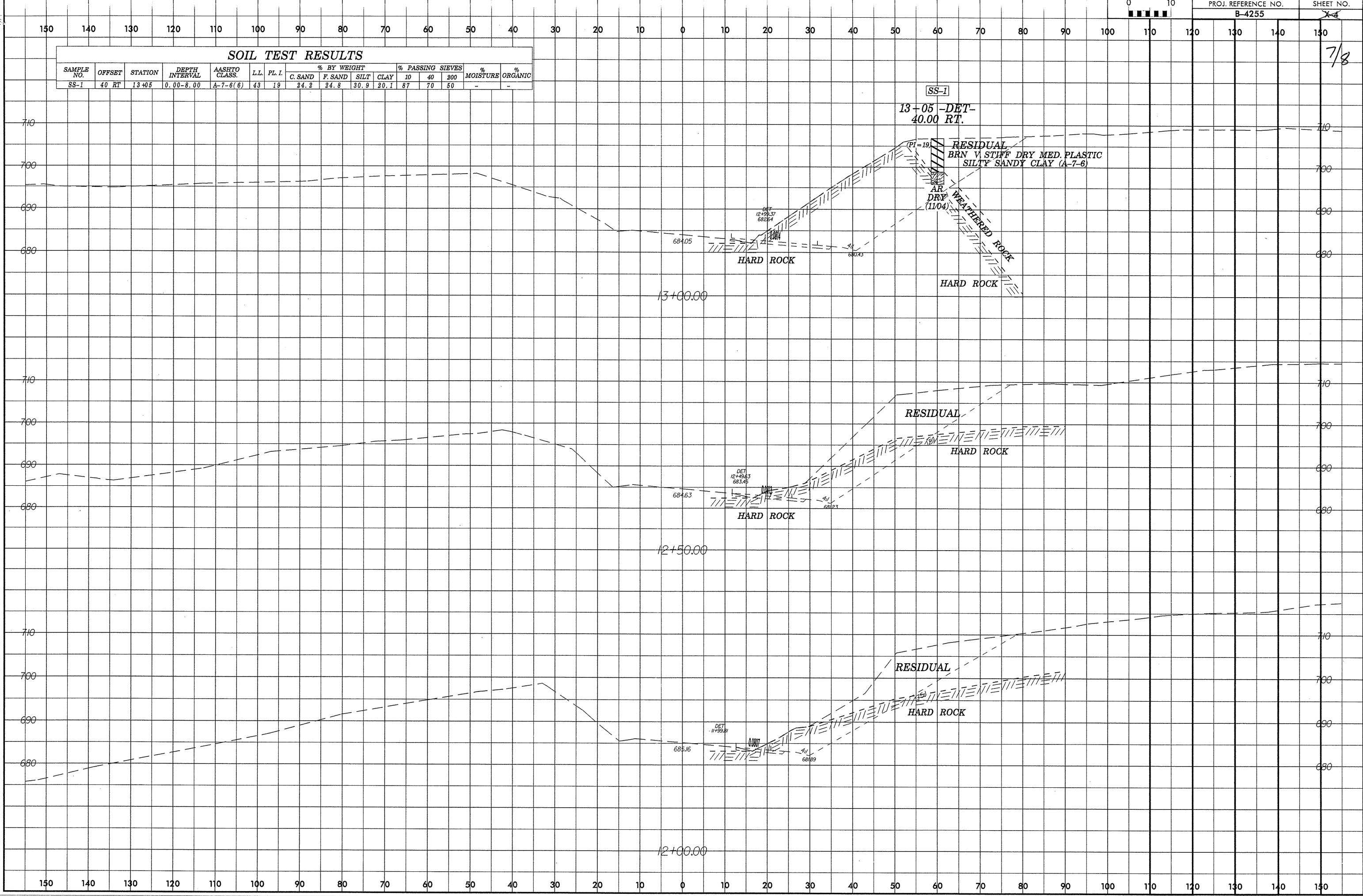
NO ROCK

11+00.00

DATE: _____
PRICE: _____

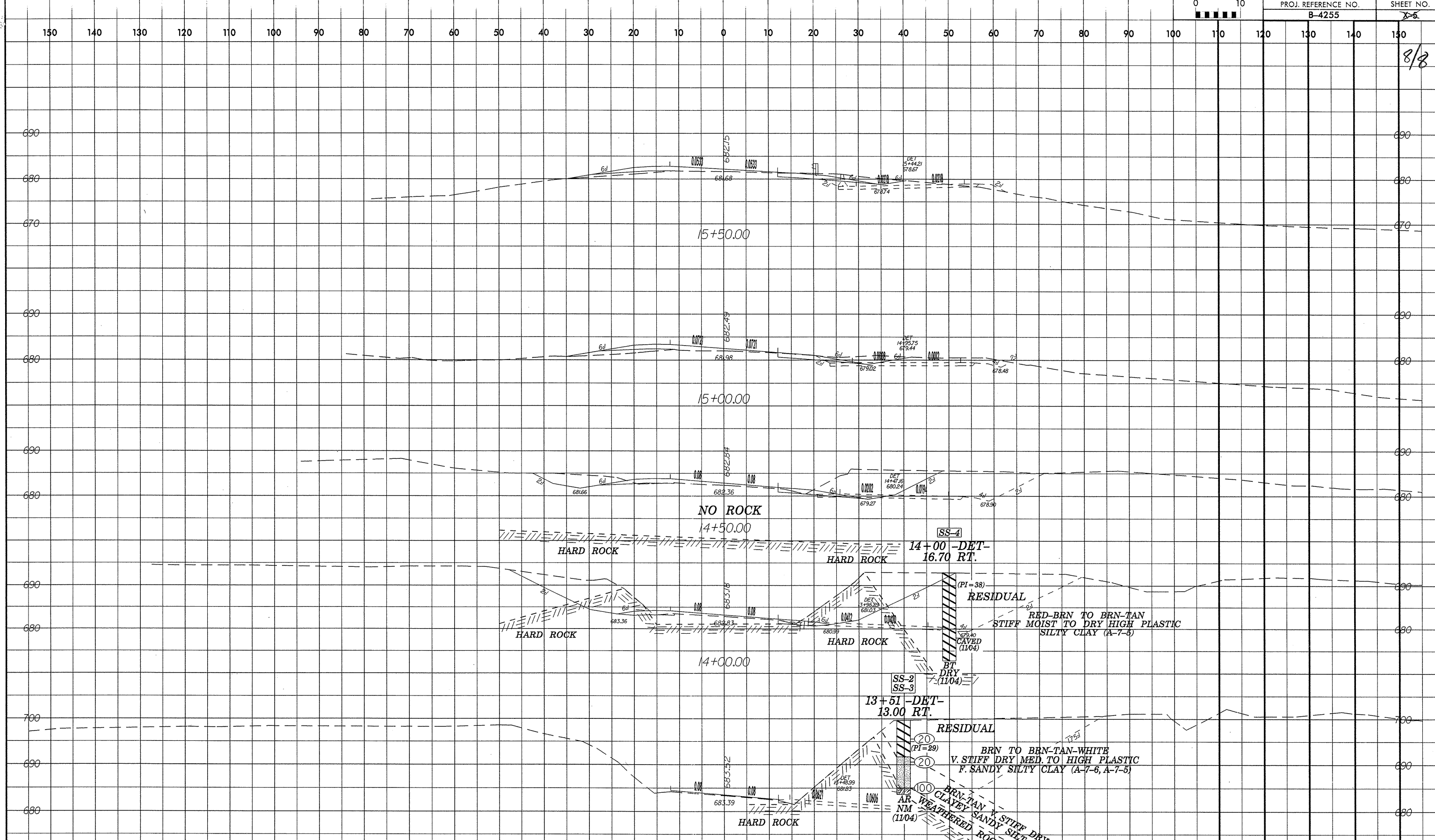


| SOIL TEST RESULTS | | | | | | | | | | | | | | | |
|-------------------|--------|---------|----------------|---------------|------|---------|-------------|---------|------|------|------------------|----|-----|------------|-----------|
| SAMPLE NO. | OFFSET | STATION | DEPTH INTERVAL | AASHTO CLASS. | L.L. | P.L. I. | % BY WEIGHT | | | | % PASSING SIEVES | | | % MOISTURE | % ORGANIC |
| | | | | | | | C. SAND | F. SAND | SILT | CLAY | 10 | 40 | 200 | | |
| SS-1 | 40 RT | 13+05 | 0.00-8.00 | A-7-6(6) | 43 | 19 | 24.2 | 24.8 | 30.9 | 20.1 | 87 | 70 | 50 | - | - |



7/8

DATE: FILE:



SOIL TEST RESULTS

| SAMPLE NO. | OFFSET | STATION | DEPTH INTERVAL | AASHTO CLASS. | L.L. | P.L. I. | % BY WEIGHT | | | | % PASSING SIEVES | | | % MOISTURE | % ORGANIC |
|------------|---------|---------|----------------|---------------|------|---------|-------------|---------|------|------|------------------|----|-----|------------|-----------|
| | | | | | | | C. SAND | F. SAND | SILT | CLAY | 10 | 40 | 200 | | |
| SS-2 | 13 RT | 13+51 | 4.10-5.60 | A-7-5(24) | 65 | 29 | 8.1 | 23.0 | 34.7 | 34.2 | 100 | 96 | 75 | - | - |
| SS-3 | 13 RT | 13+51 | 9.10-10.60 | A-4(0) | 27 | 5 | 29.0 | 24.4 | 28.5 | 18.1 | 72 | 55 | 38 | - | - |
| SS-4 | 16.7 RT | 14+00 | 0.00-5.00 | A-7-5(42) | 75 | 38 | 3.4 | 8.5 | 29.7 | 58.4 | 100 | 98 | 91 | - | - |

DATE: _____ TIME: _____