

PROJECT: 45355.1.27

ID: BD-5109AA

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

STRUCTURE  
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 45355.1.27 (BD-5109AA) F.A. PROJ. BRZ-1809(5)  
COUNTY DAVIE  
PROJECT DESCRIPTION BRIDGE #60 ON SR 1802 (WILL BOONE RD)  
OVER PEELER CREEK

SITE DESCRIPTION

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 1919 ZSU-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (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-CLMATIC 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.

PERSONNEL

J. E. ESTEP

M. R. MOORE

C. C. MURRAY

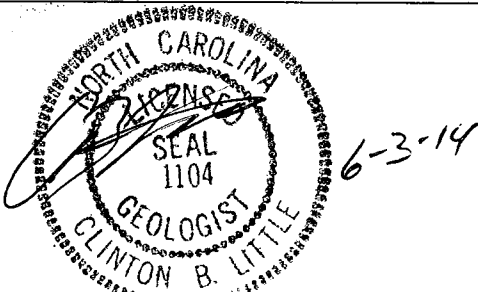
FALCON ENG. INC.

INVESTIGATED BY J. E. BEVERLY

CHECKED BY C. B. LITTLE

SUBMITTED BY C. B. LITTLE

DATE JUNE 2014



DRAWN BY: C. E. BURRIS

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

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

## NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

## DIVISION OF HIGHWAYS

## GEOTECHNICAL ENGINEERING UNIT

## SUBSURFACE INVESTIGATION

## SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

| SOIL DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |  |  |  |  |  |  |  | GRADATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |  |  |  |  |  |  |  |  | ROCK DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |  |  |  |  |  |  |  | TERMS AND DEFINITIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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| 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 T208, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:<br><i>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i> |  |  |  |  |  |  |  |  |  | <b>WELL GRADED</b> - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.<br><b>UNIFORM</b> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)<br><b>GAP-GRADED</b> - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.<br><b>ANGULARITY OF GRAINS</b><br>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: <b>ANGULAR</b> , <b>SUBANGULAR</b> , <b>SUBROUNDED</b> , OR <b>ROUNDED</b> . |  |  |  |  |  |  |  |  |  | <b>HARD ROCK</b> IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.<br>ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:<br><br><b>WEATHERED ROCK (WR)</b> - NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.<br><b>CRYSTALLINE ROCK (CR)</b> - FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, DIABASE, GABBRO, SCHIST, ETC.<br><b>NON-CRYSTALLINE ROCK (NCR)</b> - 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.<br><b>COASTAL PLAIN SEDIMENTARY ROCK (CPS)</b> - COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC. |  |  |  |  |  |  |  |  |  | <b>ALLUVIUM (ALLUV.)</b> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.<br><b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA.<br><b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.<br><b>ARGILLACEOUS</b> - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.<br><b>ARTESIAN</b> - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.<br><b>CALCAREOUS (CALC.)</b> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.<br><b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.<br><b>CORE RECOVERY (REC.)</b> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.<br><b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.<br><b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.<br><b>DIP DIRECTION (DIP AZIMUTH)</b> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.<br><b>FAULT</b> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.<br><b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.<br><b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.<br><b>FLOOD PLAIN (FP)</b> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.<br><b>FORMATION (FM)</b> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.<br><b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.<br><b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.<br><b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.<br><b>MOTTLED (MOT.)</b> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.<br><b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.<br><b>RESIDUAL (RES.) SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.<br><b>ROCK QUALITY DESIGNATION (RQD)</b> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.<br><b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.<br><b>SILL</b> - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.<br><b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.<br><b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b> - NUMBER OF BLOWS IN OR BPF OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.<br><b>STRATA CORE RECOVERY (SREC.)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.<br><b>STRATA ROCK QUALITY DESIGNATION (SRQD)</b> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.<br><b>TOPSOIL (TS)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER. |  |  |  |  |  |  |  |  |  |
| <b>SOIL LEGEND AND AASHTO CLASSIFICATION</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |  |  |  |  |  |  |  |  | <b>MINERALOGICAL COMPOSITION</b>                                                                                                                                                                                                                                                                                                                   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| 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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| 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                            |  |  |  |  |  |  |  |  |  | SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50                                                                                                                                                                                                                                                                                                                                |  |  |  |  |  |  |  |  |  | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| SYMBOL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |  |  |  |  |  |  |  |  | PERCENTAGE OF MATERIAL                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |  |  |  |  |  | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| %                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |  |  |  |  |  |  |  |  | ORGANIC MATERIAL GRANULAR SILT - CLAY OTHER MATERIAL                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |  |  |  |  |  | MODERATELY SEVERE (MOD. SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. IF TESTED, WOULD YIELD SPT REFUSAL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |  |  |  |  |  |
| LIQUID LIMIT PLASTIC INDEX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |  |  |  |  |  |  |  |  | GROUND WATER                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |  | 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |  |  |  |  |  |
| GROUP INDEX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |  |  |  |  |  |  |  | ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |  |  |  |  |  |  |  | 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |  |  |  |  |  |
| USUAL TYPES OF MAJOR MATERIALS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |  |  |  |  |  | SOIL SYMBOL                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |  |  |  |  |  | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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| GEN. RATING AS A SUBGRADE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |  |  |  |  |  | ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |  |  |  |  |  | ROCK HARDNESS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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| EXCELLENT TO GOOD FAIR TO POOR FAIR TO POOR POOR UNSUITABLE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |  |  |  |  |  |  |  | INFERRED SOIL BOUNDARY                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |  |  |  |  |  | VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          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| PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |  |  |  |  |  | INFERRED ROCK LINE                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |  |  |  |  |  | HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      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| CONSISTENCY OR DENSENESS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |  |  |  |  |  |  |  | ALLUVIAL SOIL BOUNDARY                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |  |  |  |  |  | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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| PRIMARY SOIL TYPE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |  |  |  |  |  |  |  |  | DIP & DIP DIRECTION OF ROCK STRUCTURES                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |  |  |  |  |  | MEDIUM HARD CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          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| COMPACTNESS OR CONSISTENCY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |  |  |  |  |  |  |  |  | DIP & DIP DIRECTION OF ROCK STRUCTURES                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |  |  |  |  |  | SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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| RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |  |  |  |  |  | DIP & DIP DIRECTION OF ROCK STRUCTURES                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |  |  |  |  |  | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 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| RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |  |  |  |  |  |  |  | DIP & DIP DIRECTION OF ROCK STRUCTURES                                                                                                                                                                                                                                                                                                             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| N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |  |  |  |  |  |  |  | DIP & DIP DIRECTION OF ROCK STRUCTURES                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |  |  |  |  |  | U.S. STD. SIEVE SIZE OPENING (MM)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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| N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |  |  |  |  |  |  |  | DIP & DIP DIRECTION OF ROCK STRUCTURES                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |  |  |  |  |  | BOULDER (BLDR.) COBBLE (COB.) GRAVEL (GR.) COARSE SAND (CSE, SD.) FINE SAND (F SD.) SILT (SL.) CLAY (CL.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |  |  |  |  |  |  |  | DIP & DIP DIRECTION OF ROCK STRUCTURES                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |  |  |  |  |  | SOIL MOISTURE - CORRELATION OF TERMS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       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                                                                                                                                 |  |  |  |  |  |  |  |  |  | SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      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                                                                                                                                 |  |  |  |  |  |  |  |  |  | PL PLASTIC LIMIT WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           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| N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |  |  |  |  |  |  |  | DIP & DIP DIRECTION OF ROCK STRUCTURES                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |  |  |  |  |  | OM OPTIMUM MOISTURE MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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                                                                                                                                 |  |  |  |  |  |  |  |  |  | SL SHRINKAGE LIMIT DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          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| N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |  |  |  |  |  |  |  | DIP & DIP DIRECTION OF ROCK STRUCTURES                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |  |  |  |  |  | NONPLASTIC LOW PLASTICITY MED. PLASTICITY HIGH PLASTICITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |  |  |  |  |  |  |  | DIP & DIP DIRECTION OF ROCK STRUCTURES                                                                                                                                                                                                                                                                                                             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| N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |  |  |  |  |  |  |  | DIP & DIP DIRECTION OF ROCK STRUCTURES                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |  |  |  |  |  | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |  |  |  |  |  |

**DATUM DESCRIPTION**

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "BL-1"

WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF  
 NORTHING: 768019.794(±) EASTING: 1549912.539(±)  
 ELEVATION: 684.80(±)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99989946

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "BL-1" TO -L- STATION IS

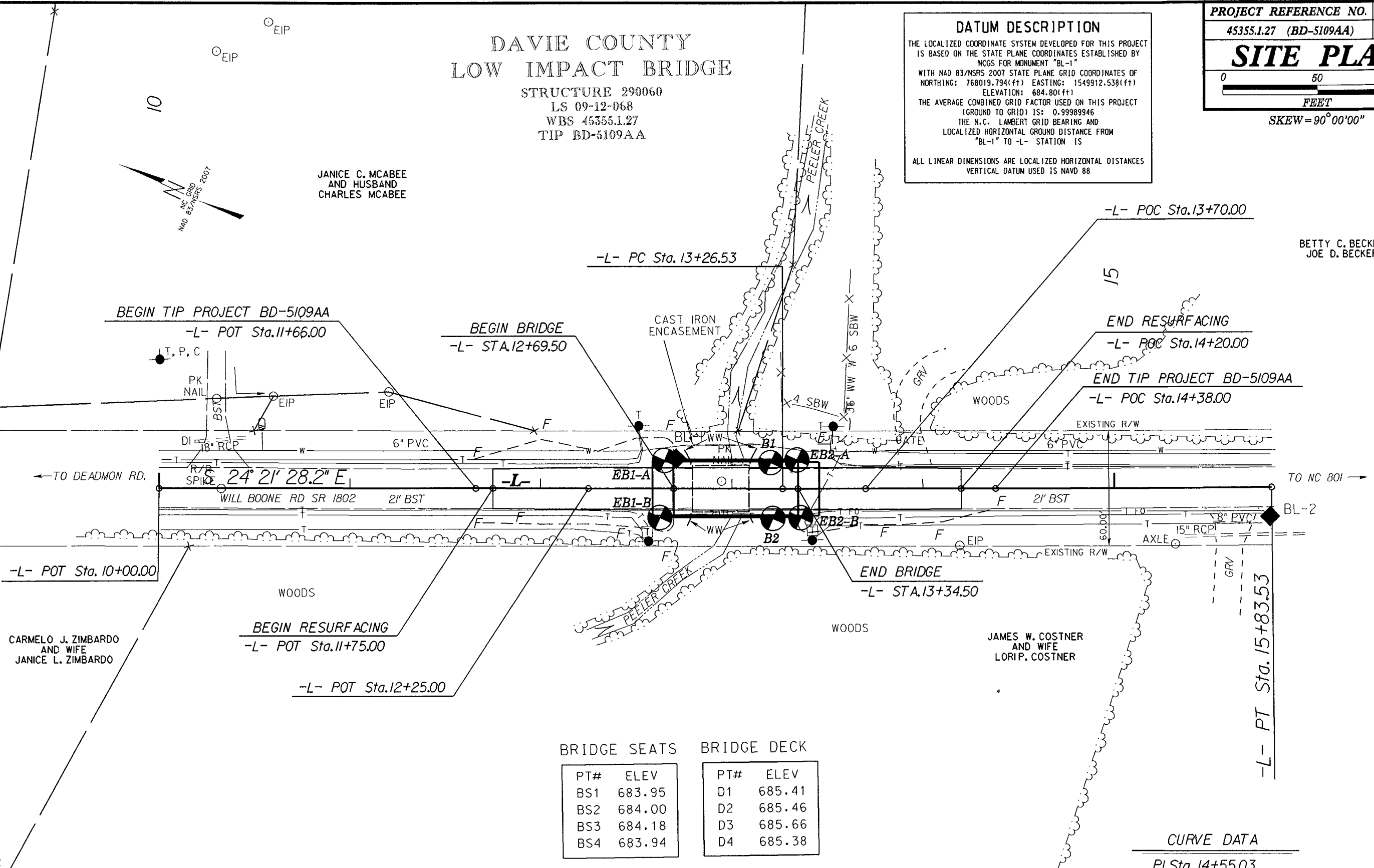
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES  
 VERTICAL DATUM USED IS NAVD 88

**DAVIE COUNTY  
 LOW IMPACT BRIDGE**

STRUCTURE 290060  
 LS 09-12-068  
 WBS 45355.1.27  
 TIP BD-5109AA

JANICE C. MCABEE  
 AND HUSBAND  
 CHARLES MCABEE

BETTY C. BECKER  
 JOE D. BECKER

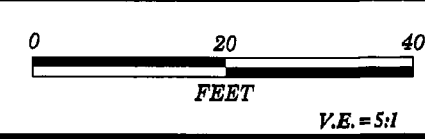


| BRIDGE SEATS |        | BRIDGE DECK |        |
|--------------|--------|-------------|--------|
| PT#          | ELEV   | PT#         | ELEV   |
| BS1          | 683.95 | D1          | 685.41 |
| BS2          | 684.00 | D2          | 685.46 |
| BS3          | 684.18 | D3          | 685.66 |
| BS4          | 683.94 | D4          | 685.38 |

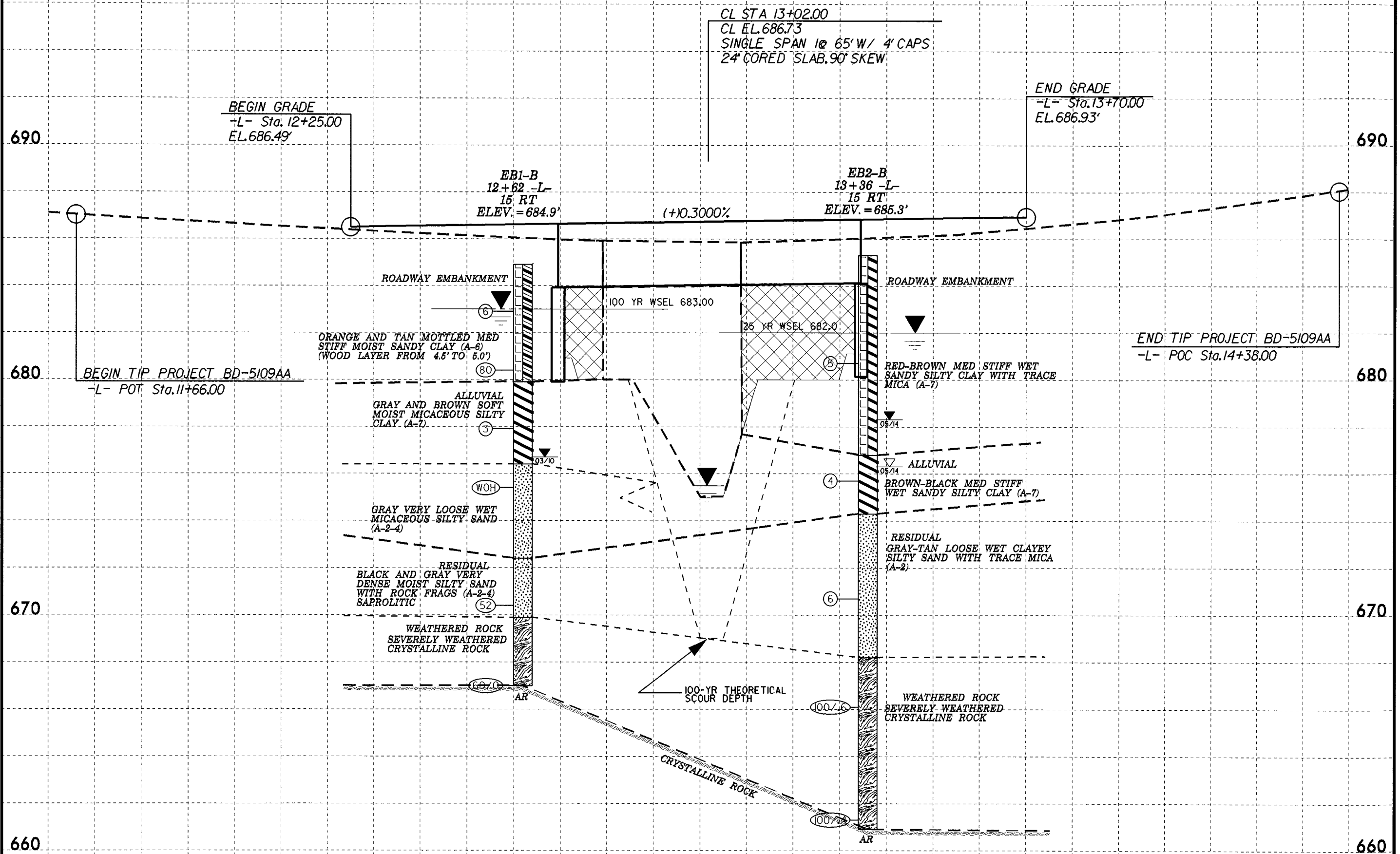
**CURVE DATA**

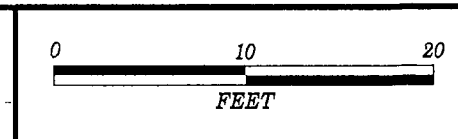
PI Sta 14+55.03  
 $\Delta = 0^\circ 32' 43.4''$  (LT)  
 $D = 0^\circ 12' 43.9''$   
 $L = 257.00'$   
 $T = 128.50'$   
 $R = 27,000.00'$

| BL POINT | DESC. | NORTH       | EAST         | ELEVATION | L STATION | OFFSET                 |
|----------|-------|-------------|--------------|-----------|-----------|------------------------|
| 2        | BL-2  | 767723.4090 | 1550014.2100 | 694.07    | 15+82.77  | 15.14 RT               |
| 1        | BL-1  | 768019.7940 | 1549912.5380 | 684.80    | 12+70.97  | 15.69 LT               |
| 3        | BL-3  | 768422.8400 | 1549732.1000 | 696.45    |           | OUTSIDE PROJECT LIMITS |

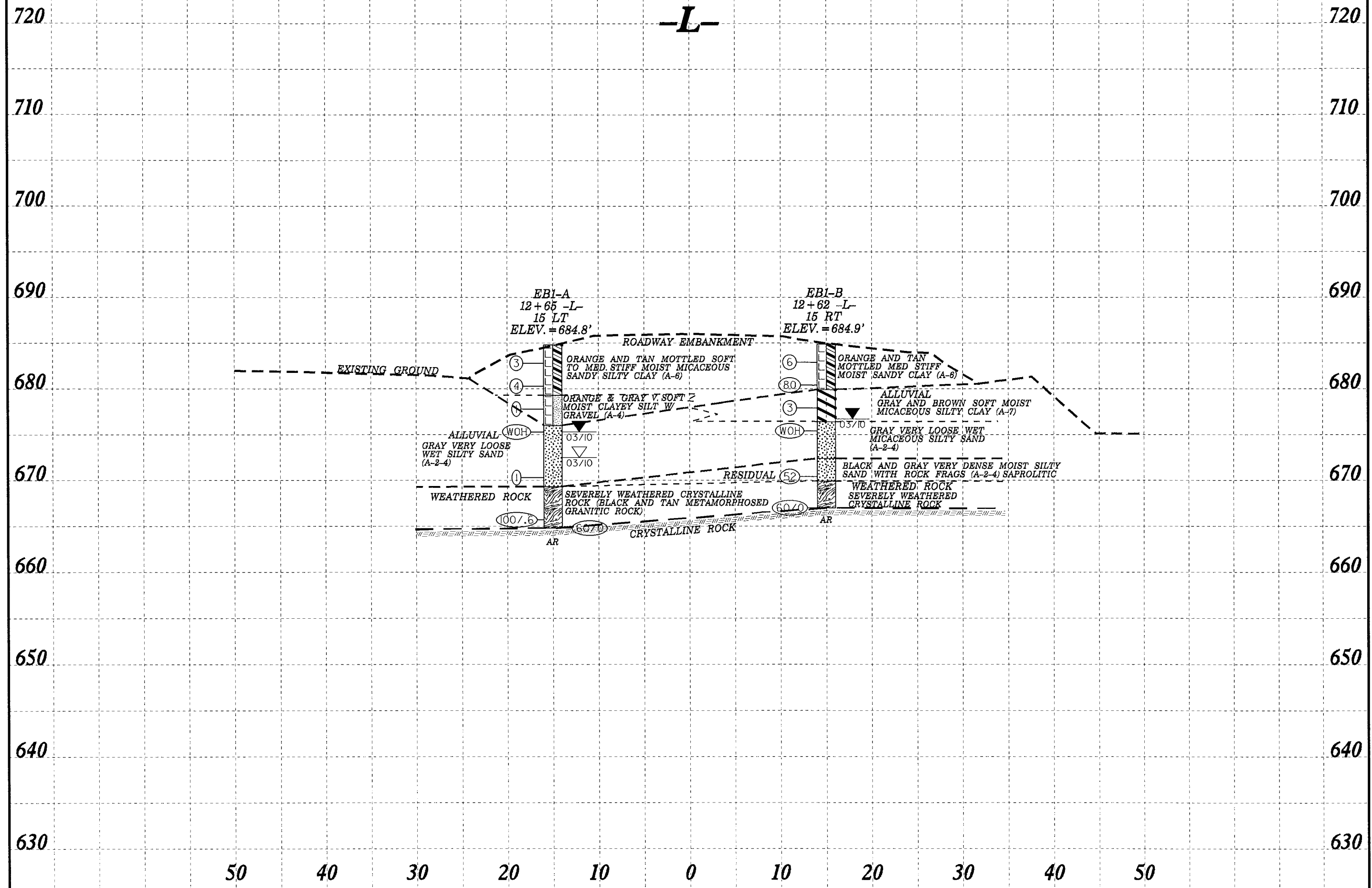


| PROJECT REFERENCE NO.                                            | SHEET |
|------------------------------------------------------------------|-------|
| 45355.1.27 (BD-5109AA)                                           | 4     |
| BRIDGE NO. 60 DAYIE CO.<br>PROFILE ALONG -L-<br>SKEW = 90°00'00" |       |



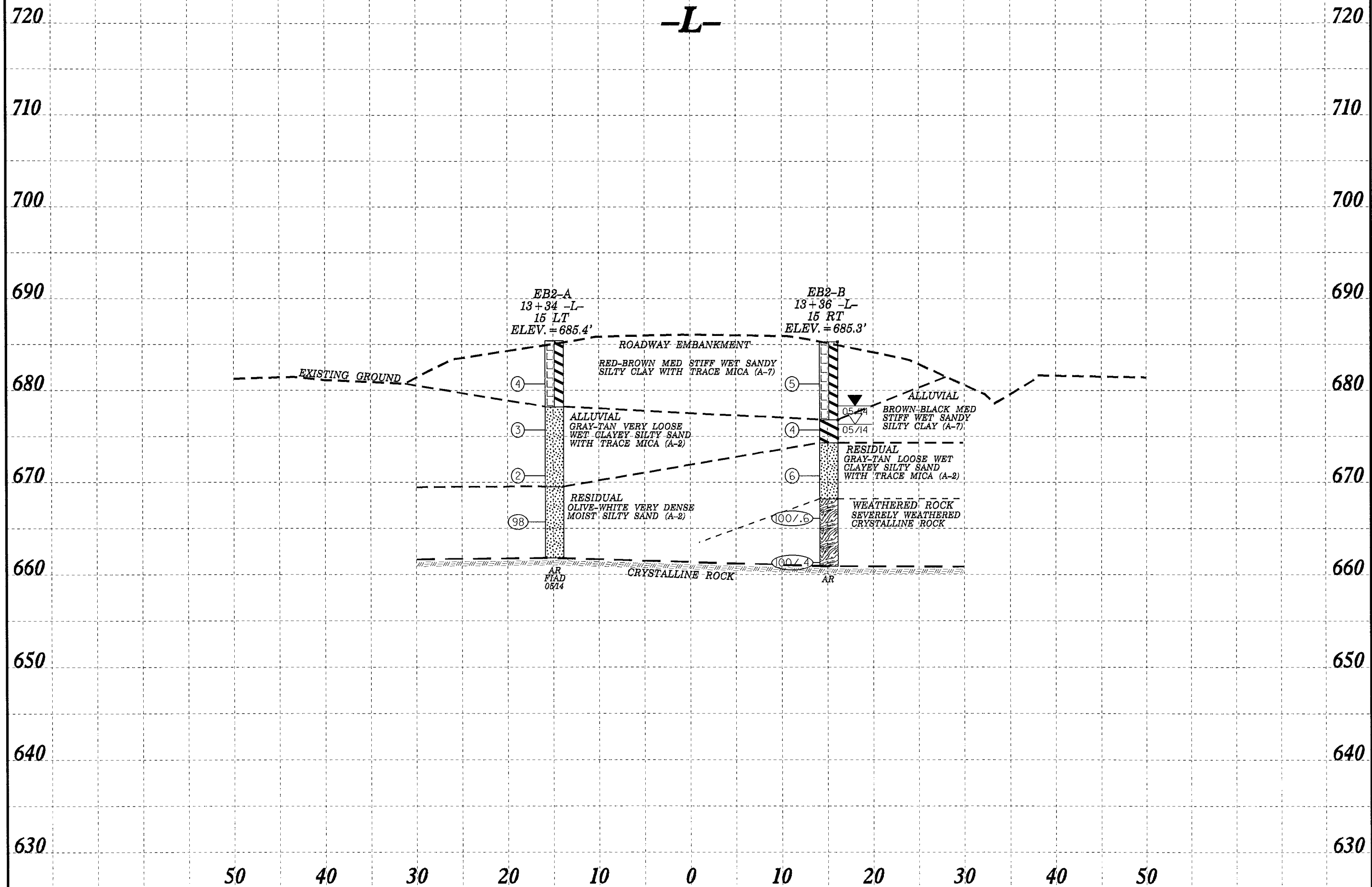


| PROJECT REFERENCE NO.                                        | SHEET |
|--------------------------------------------------------------|-------|
| 45355.1.27 (BD-5109AA)                                       | 5     |
| SECTION THROUGH EBI<br>STA. 12+69.50 -L-<br>SKEW = 90°00'00" |       |





| PROJECT REFERENCE NO.                                        | SHEET |
|--------------------------------------------------------------|-------|
| 45355.1.27 (BD-5109AA)                                       | 6     |
| SECTION THROUGH EB2<br>STA. 13+34.50 -L-<br>SKEW = 90°00'00" |       |





|                                                                             |                 |            |                     |       |       |                          |    |    |                         |       |           |            |                           |            |
|-----------------------------------------------------------------------------|-----------------|------------|---------------------|-------|-------|--------------------------|----|----|-------------------------|-------|-----------|------------|---------------------------|------------|
| WBS 45355.1.27                                                              |                 |            | TIP BD-5109AA       |       |       | COUNTY DAVIE             |    |    | GEOLOGIST Evans, T.     |       |           |            |                           |            |
| SITE DESCRIPTION Bridge No. 60 on SR 1802 (Will Boone Rd) over Peeler Creek |                 |            |                     |       |       |                          |    |    | GROUND WTR (ft)         |       |           |            |                           |            |
| BORING NO. EB1-A                                                            |                 |            | STATION 12+65       |       |       | OFFSET 15 ft LT          |    |    | ALIGNMENT -L-           |       |           | 0 HR. 12.3 |                           |            |
| COLLAR ELEV. 684.8 ft                                                       |                 |            | TOTAL DEPTH 20.0 ft |       |       | NORTHING 768,025         |    |    | EASTING 1,549,909       |       |           | 24 HR. 9.5 |                           |            |
| DRILL RIG/HAMMER EFF./DATE CME550X                                          |                 |            |                     |       |       | DRILL METHOD H.S. Augers |    |    | HAMMER TYPE Automatic   |       |           |            |                           |            |
| DRILLER Contract Driller                                                    |                 |            | START DATE 03/25/10 |       |       | COMP. DATE 03/25/10      |    |    | SURFACE WATER DEPTH N/A |       |           |            |                           |            |
| ELEV (ft)                                                                   | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT          |       |       | BLOWS PER FOOT           |    |    |                         |       | SAMP. NO. | LOG        | SOIL AND ROCK DESCRIPTION |            |
|                                                                             |                 |            | 0.5ft               | 0.5ft | 0.5ft | 0                        | 25 | 50 | 75                      | 100   |           | MOI        | ELEV. (ft)                | DEPTH (ft) |
| 685                                                                         |                 |            |                     |       |       |                          |    |    |                         |       |           |            | 684.8                     | 0.0        |
|                                                                             | 683.8           | 1.0        | 2                   | 1     | 2     |                          |    |    |                         |       |           | M          |                           |            |
|                                                                             | 681.3           | 3.5        | 1                   | 2     | 2     |                          |    |    |                         |       |           | M          |                           |            |
| 680                                                                         |                 |            |                     |       |       |                          |    |    |                         |       |           |            | 679.3                     | 5.5        |
|                                                                             | 678.8           | 6.0        | WOH                 | WOH   | 1     |                          |    |    |                         |       |           | M          |                           |            |
|                                                                             | 676.3           | 8.5        | WOH                 | WOH   | WOH   |                          |    |    |                         |       |           |            | 676.0                     | 8.8        |
| 675                                                                         |                 |            | WOH                 | WOH   | WOH   |                          |    |    |                         |       |           |            |                           |            |
|                                                                             | 671.3           | 13.5       | WOH                 | WOH   | 1     |                          |    |    |                         |       |           |            |                           |            |
| 670                                                                         |                 |            |                     |       |       |                          |    |    |                         |       |           | W          | 669.3                     | 15.5       |
|                                                                             | 666.3           | 18.5       | 60                  | 40/1  |       |                          |    |    |                         |       |           |            |                           |            |
| 665                                                                         | 664.8           | 20.0       | 60/0                |       |       |                          |    |    |                         | 100/6 |           | D          | 664.8                     | 20.0       |
|                                                                             |                 |            |                     |       |       |                          |    |    |                         | 60/0  |           | D          |                           |            |
|                                                                             |                 |            |                     |       |       |                          |    |    |                         |       |           |            |                           |            |
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|                                                                             |                 |            |                     |       |       |                          |    |    |                         |       |           |            |                           |            |
|                                                                             |                 |            |                     |       |       |                          |    |    |                         |       |           |            |                           |            |

NCDOT BORE SINGLE BD5109AA\_GEO\_BH\_BRD0060.GPJ NC\_DOT.GDT 5/30/14



|                                                                             |                 |            |                     |       |       |                          |    |    |                         |     |           |     |                           |            |
|-----------------------------------------------------------------------------|-----------------|------------|---------------------|-------|-------|--------------------------|----|----|-------------------------|-----|-----------|-----|---------------------------|------------|
| WBS 45355.1.27                                                              |                 |            | TIP BD-5109AA       |       |       | COUNTY DAVIE             |    |    | GEOLOGIST Evans, T.     |     |           |     |                           |            |
| SITE DESCRIPTION Bridge No. 60 on SR 1802 (Will Boone Rd) over Peeler Creek |                 |            |                     |       |       |                          |    |    | GROUND WTR (ft)         |     |           |     |                           |            |
| BORING NO. EB1-B                                                            |                 |            | STATION 12+62       |       |       | OFFSET 15 ft RT          |    |    | ALIGNMENT -L-           |     |           |     |                           |            |
| COLLAR ELEV. 684.9 ft                                                       |                 |            | TOTAL DEPTH 17.9 ft |       |       | NORTHING 768,015         |    |    | EASTING 1,549,881       |     |           |     |                           |            |
| DRILL RIG/HAMMER EFF./DATE CME550X                                          |                 |            |                     |       |       | DRILL METHOD H.S. Augers |    |    | HAMMER TYPE Automatic   |     |           |     |                           |            |
| DRILLER Contract Driller                                                    |                 |            | START DATE 03/25/10 |       |       | COMP. DATE 03/25/10      |    |    | SURFACE WATER DEPTH N/A |     |           |     |                           |            |
| ELEV (ft)                                                                   | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT          |       |       | BLOWS PER FOOT           |    |    |                         |     | SAMP. NO. | LOG | SOIL AND ROCK DESCRIPTION |            |
|                                                                             |                 |            | 0.5ft               | 0.5ft | 0.5ft | 0                        | 25 | 50 | 75                      | 100 |           |     | ELEV. (ft)                | DEPTH (ft) |
| 685                                                                         |                 |            |                     |       |       |                          |    |    |                         |     |           |     | 684.9                     | 0.0        |
|                                                                             | 683.9           | 1.0        |                     |       |       |                          |    |    |                         |     |           |     |                           |            |
|                                                                             | 681.4           | 3.5        | 2                   | 3     | 3     |                          |    |    |                         |     |           |     |                           |            |
| 680                                                                         |                 |            |                     |       |       |                          |    |    |                         |     |           |     | 679.9                     | 5.0        |
|                                                                             | 678.9           | 6.0        |                     |       |       |                          |    |    |                         |     |           |     |                           |            |
|                                                                             | 676.4           | 8.5        | WOH                 | 2     | 1     |                          |    |    |                         |     |           |     | 676.4                     | 8.5        |
| 675                                                                         |                 |            | WOH                 | WOH   | WOH   |                          |    |    |                         |     |           |     |                           |            |
|                                                                             | 671.4           | 13.5       |                     |       |       |                          |    |    |                         |     |           |     | 672.4                     | 12.5       |
| 670                                                                         |                 |            | 5                   | 26    | 26    |                          |    |    |                         |     |           |     | 669.9                     | 15.0       |
|                                                                             | 667.0           | 17.9       |                     |       |       |                          |    |    |                         |     |           |     | 667.0                     | 17.9       |
|                                                                             |                 |            | 60/0                |       |       |                          |    |    |                         |     |           |     |                           |            |
|                                                                             |                 |            |                     |       |       |                          |    |    |                         |     |           |     |                           |            |
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|                                                                             |                 |            |                     |       |       |                          |    |    |                         |     |           |     |                           |            |
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|                                                                             |                 |            |                     |       |       |                          |    |    |                         |     |           |     |                           |            |
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|                                                                             |                 |            |                     |       |       |                          |    |    |                         |     |           |     |                           |            |
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NCDOT BORE SINGLE BD5109AA\_GEO\_BH\_BRD0060.GPJ NC\_DOT.GDT 5/30/14



|                                                                             |                       |               |                     |       |       |                          |    |    |                         |     |              |             |     |                           |                                                                                         |            |
|-----------------------------------------------------------------------------|-----------------------|---------------|---------------------|-------|-------|--------------------------|----|----|-------------------------|-----|--------------|-------------|-----|---------------------------|-----------------------------------------------------------------------------------------|------------|
| WBS 45355.1.27                                                              |                       |               | TIP BD-5109AA       |       |       | COUNTY DAVIE             |    |    | GEOLOGIST Murray, C. C. |     |              |             |     |                           |                                                                                         |            |
| SITE DESCRIPTION Bridge No. 60 on SR 1802 (Will Boone Rd) over Peeler Creek |                       |               |                     |       |       |                          |    |    | GROUND WTR (ft)         |     |              |             |     |                           |                                                                                         |            |
| BORING NO. EB2-A                                                            |                       |               | STATION 13+34       |       |       | OFFSET 15 ft LT          |    |    | ALIGNMENT -L-           |     |              | 0 HR. FIAD  |     |                           |                                                                                         |            |
| COLLAR ELEV. 685.4 ft                                                       |                       |               | TOTAL DEPTH 23.6 ft |       |       | NORTHING 767,962         |    |    | EASTING 1,549,938       |     |              | 24 HR. FIAD |     |                           |                                                                                         |            |
| DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 81% 03/19/2014                   |                       |               |                     |       |       | DRILL METHOD H.S. Augers |    |    | HAMMER TYPE Automatic   |     |              |             |     |                           |                                                                                         |            |
| DRILLER Estep, J. E.                                                        |                       |               | START DATE 05/21/14 |       |       | COMP. DATE 05/21/14      |    |    | SURFACE WATER DEPTH N/A |     |              |             |     |                           |                                                                                         |            |
| ELEV<br>(ft)                                                                | DRIVE<br>ELEV<br>(ft) | DEPTH<br>(ft) | BLOW COUNT          |       |       | BLOWS PER FOOT           |    |    |                         |     | SAMP.<br>NO. | MOI         | LOG | SOIL AND ROCK DESCRIPTION |                                                                                         | DEPTH (ft) |
|                                                                             |                       |               | 0.5ft               | 0.5ft | 0.5ft | 0                        | 25 | 50 | 75                      | 100 |              |             |     |                           |                                                                                         |            |
| 690                                                                         |                       |               |                     |       |       |                          |    |    |                         |     |              |             |     |                           |                                                                                         |            |
| 685                                                                         |                       |               |                     |       |       |                          |    |    |                         |     |              |             |     |                           |                                                                                         |            |
| 680                                                                         | 681.7                 | 3.7           | 2                   | 2     | 2     |                          |    |    |                         |     |              |             |     |                           | GROUND SURFACE                                                                          | 0.0        |
|                                                                             |                       |               |                     |       |       |                          |    |    |                         |     |              |             |     |                           |                                                                                         |            |
| 675                                                                         | 676.7                 | 8.7           | 1                   | 1     | 2     |                          |    |    |                         |     |              |             |     |                           | ROADWAY EMBANKMENT<br>RED-BROWN MED STIFF WET SANDY<br>SILTY CLAY WITH TRACE MICA (A-7) |            |
|                                                                             |                       |               |                     |       |       |                          |    |    |                         |     |              |             |     |                           |                                                                                         |            |
| 670                                                                         | 671.7                 | 13.7          | 1                   | 1     | 1     |                          |    |    |                         |     |              |             |     |                           | ALLUVIAL<br>GRAY-TAN VERY LOOSE WET CLAYEY<br>SILTY SAND WITH TRACE MICA (A-2)          | 7.2        |
|                                                                             |                       |               |                     |       |       |                          |    |    |                         |     |              |             |     |                           |                                                                                         |            |
| 665                                                                         | 666.7                 | 18.7          | 27                  | 48    | 50    |                          |    |    |                         |     |              |             |     |                           | RESIDUAL<br>OLIVE-WHITE VERY DENSE MOIST SILTY<br>SAND (A-2)                            | 15.9       |
|                                                                             |                       |               |                     |       |       |                          |    |    |                         |     |              |             |     |                           |                                                                                         |            |
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NCDOT BORE SINGLE BD5109AA\_GEO\_BH\_BRDG0060.GPJ NC\_DOT\_GDT 5/30/14



|                                                                             |                 |            |                     |       |       |                          |    |    |                         |       |           |     |                           |            |            |
|-----------------------------------------------------------------------------|-----------------|------------|---------------------|-------|-------|--------------------------|----|----|-------------------------|-------|-----------|-----|---------------------------|------------|------------|
| WBS 45355.1.27                                                              |                 |            | TIP BD-5109AA       |       |       | COUNTY DAVIE             |    |    | GEOLOGIST Murray, C. C. |       |           |     |                           |            |            |
| SITE DESCRIPTION Bridge No. 60 on SR 1802 (Will Boone Rd) over Peeler Creek |                 |            |                     |       |       |                          |    |    | GROUND WTR (ft)         |       |           |     |                           |            |            |
| BORING NO. EB2-B                                                            |                 |            | STATION 13+36       |       |       | OFFSET 15 ft RT          |    |    | ALIGNMENT -L-           |       |           |     |                           |            |            |
| COLLAR ELEV. 685.3 ft                                                       |                 |            | TOTAL DEPTH 24.4 ft |       |       | NORTHING 767,948         |    |    | EASTING 1,549,911       |       |           |     |                           |            |            |
| DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 81% 03/19/2014                   |                 |            |                     |       |       | DRILL METHOD H.S. Augers |    |    | HAMMER TYPE Automatic   |       |           |     |                           |            |            |
| DRILLER Estep, J. E.                                                        |                 |            | START DATE 05/21/14 |       |       | COMP. DATE 05/21/14      |    |    | SURFACE WATER DEPTH N/A |       |           |     |                           |            |            |
| ELEV (ft)                                                                   | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT          |       |       | BLOWS PER FOOT           |    |    |                         |       | SAMP. NO. | LOG | SOIL AND ROCK DESCRIPTION |            |            |
|                                                                             |                 |            | 0.5ft               | 0.5ft | 0.5ft | 0                        | 25 | 50 | 75                      | 100   |           | MOI |                           | ELEV. (ft) | DEPTH (ft) |
| 690                                                                         |                 |            |                     |       |       |                          |    |    |                         |       |           |     |                           |            |            |
| 685                                                                         |                 |            |                     |       |       |                          |    |    |                         |       |           |     |                           | 685.3      | 0.0        |
| 680                                                                         | 681.7           | 3.6        | 1                   | 2     | 3     | 5                        |    |    |                         |       |           |     |                           |            |            |
| 675                                                                         | 676.7           | 8.6        | 1                   | 2     | 2     | 4                        |    |    |                         |       |           |     |                           | 676.8      | 8.5        |
| 670                                                                         | 671.7           | 13.6       | 2                   | 4     | 2     | 6                        |    |    |                         |       |           |     |                           | 674.3      | 11.0       |
| 665                                                                         | 666.7           | 18.6       | 66                  | 44/1  |       |                          |    |    |                         | 100/6 |           |     |                           | 668.2      | 17.1       |
|                                                                             | 661.7           | 23.6       | 100/4               |       |       |                          |    |    |                         | 100/4 |           |     |                           | 660.9      | 24.4       |
|                                                                             |                 |            |                     |       |       |                          |    |    |                         |       |           |     |                           |            |            |
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|                                                                             |                 |            |                     |       |       |                          |    |    |                         |       |           |     |                           |            |            |
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|                                                                             |                 |            |                     |       |       |                          |    |    |                         |       |           |     |                           |            |            |
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|                                                                             |                 |            |                     |       |       |                          |    |    |                         |       |           |     |                           |            |            |
|                                                                             |                 |            |                     |       |       |                          |    |    |                         |       |           |     |                           |            |            |
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|                                                                             |                 |            |                     |       |       |                          |    |    |                         |       |           |     |                           |            |            |
|                                                                             |                 |            |                     |       |       |                          |    |    |                         |       |           |     |                           |            |            |
|                                                                             |                 |            |                     |       |       |                          |    |    |                         |       |           |     |                           |            |            |
|                                                                             |                 |            |                     |       |       |                          |    |    |                         |       |           |     |                           |            |            |
|                                                                             |                 |            |                     |       |       |                          |    |    |                         |       |           |     |                           |            |            |
|                                                                             |                 |            |                     |       |       |                          |    |    |                         |       |           |     |                           |            |            |
|                                                                             |                 |            |                     |       |       |                          |    |    |                         |       |           |     |                           |            |            |
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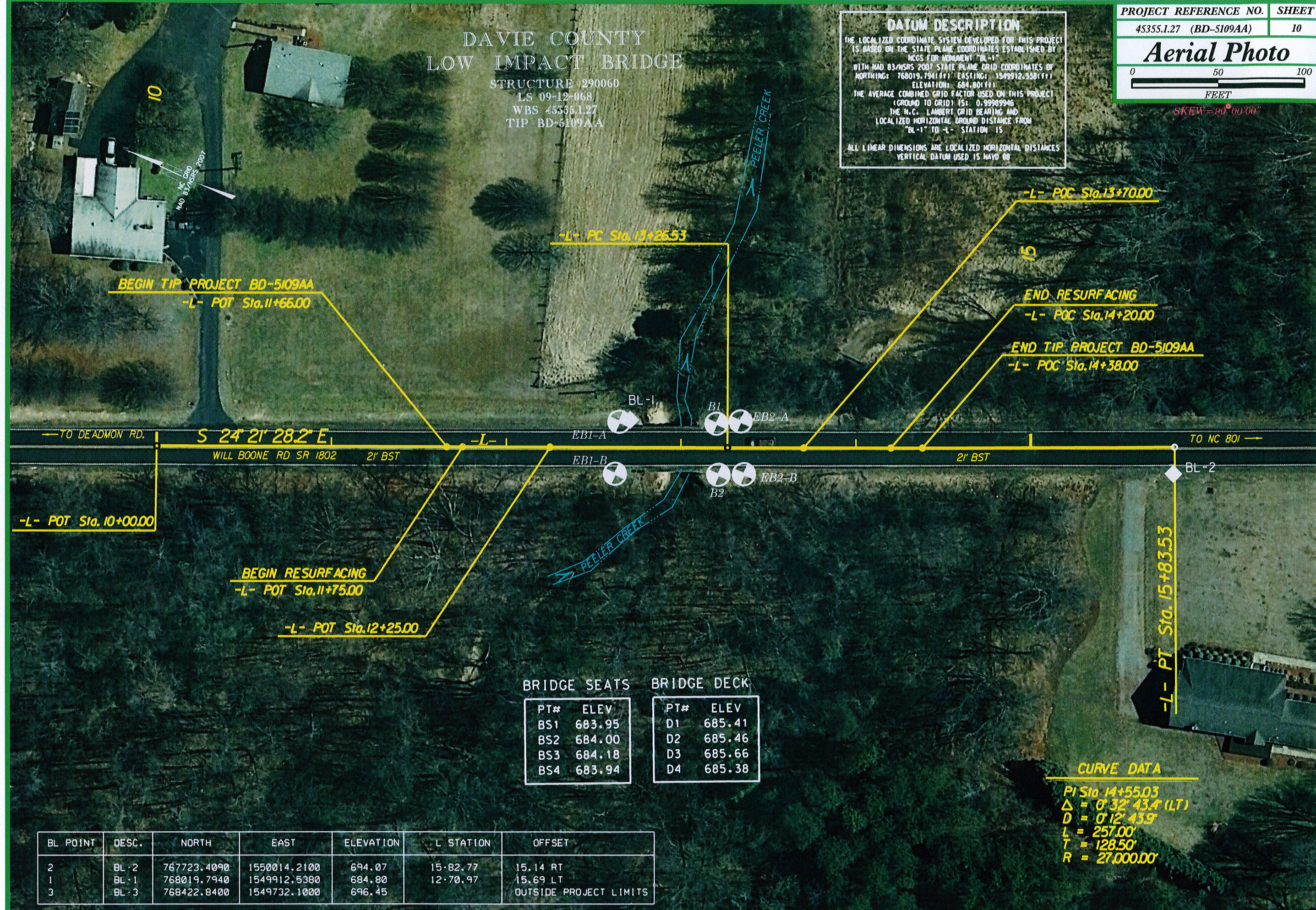
NCDOT BORE SINGLE BD5109AA\_GEO\_BH\_BRDG0060.GPJ NC\_DOT\_GDT 5/30/14



## WCDOT BORE SINGLE BD5109AA\_GEO\_BH\_BRDG0060.GPJ NC\_DOT.GDT 5/30/14

DAVIE COUNTY  
LOW IMPACT BRIDGE  
STRUCTURE 290060  
LS 09-12-068  
WBS 45355.1.27  
TIP BD-5109AA

**DATUM DESCRIPTION**  
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY MGS FOR MONUMENT "BL-1" WITH MAD 03/19/05 2007 STATE PLANE GRID COORDINATES OF NORTHING: 768019.7941111 EASTING: 1549912.5381111 ELEVATION: 684.001111 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99989946 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "BL-1" TO "L-" STATION IS ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 80



| BRIDGE SEATS |        | BRIDGE DECK |        |
|--------------|--------|-------------|--------|
| PT#          | ELEV   | PT#         | ELEV   |
| BS1          | 683.95 | D1          | 685.41 |
| BS2          | 684.00 | D2          | 685.46 |
| BS3          | 684.18 | D3          | 685.66 |
| BS4          | 683.94 | D4          | 685.38 |

**CURVE DATA**  
 PI Sta 14+55.03  
 Δ = 0° 32' 43.4" (LT)  
 D = 0° 12' 43.9"  
 L = 257.00'  
 T = 128.50'  
 R = 27,000.00'

| BL POINT | DESC. | NORTH       | EAST         | ELEVATION | L STATION | OFFSET                 |
|----------|-------|-------------|--------------|-----------|-----------|------------------------|
| 2        | BL-2  | 767723.4090 | 1550014.2100 | 694.07    | 15+82.77  | 15.14 RT               |
| 1        | BL-1  | 768019.7940 | 1549912.5380 | 684.80    | 12+70.97  | 15.69 LT               |
| 3        | BL-3  | 768422.8400 | 1549732.1000 | 696.45    |           | OUTSIDE PROJECT LIMITS |