STATE	STATE PROJECT REFERENCE NO.		SHEET NO.	TOTAL SHEETS
N.C.	8.2230101		1	209
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION		
B-0682	BRS-1813(1)	P.E.		
		CONST.		

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJECT NO. 8.2230101 I.D. NO. B-0682

F.A. PROJECT BRS-1813(1) WBS ELEMENT NO. 32575.1.2

COUNTY BRUNSWICK

PROJECT DESCRIPTION BRIDGE 198 OVER INTRACOASTAL WATERWAY ON SR 1172 AT SUNSET BEACH

SITE DESCRIPTION STATION 31+90 TO 64+44 -L-

For Letting

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CAUTION NOTICE

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

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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.

DRAWN BY: R. RAHIE

INVESTIGATED BY MACTEC ENGINEERING AND CONSULTING, INC.

CHECKED BY J. VEITH

SUBMITTED BY M. LEAR

DATE 09/30/04

REVISED 05/12/05

PERSONNEL M. LEAR, W. DEOBALD, B. PARKS, D. WHITE, D. RHODES, T. HAHN

NORTH CAROLINA LICENSED SEAL 1927 GEOLOGIST MICHAEL B. LEAR

SEAL

MACTEC

MACTEC ENGINEERING AND CONSULTING, INC.
3301 ATLANTIC AVENUE
RALEIGH, NORTH CAROLINA 27604
(919) 876-0416

SIGNATURE

PROJECT: 8.2301101 I.D.: B-0682

ID	PROJECT NO.	SHEET NO.	TOTAL SHEETS
B-0682	8.2230101	2	209

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED OR WEATHERED EARTH MATERIALS WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:

VERY STIFF, GRAY SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (>35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL														
% PASSING # 10 # 40 # 200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
LIQUID LIMIT				40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
PLASTIC INDEX	6 MX		N.P.	10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN			
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	No MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS GRAVEL AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD			FAIR TO POOR				FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

P.I. OF A-7-5 ≤L.L. - 30 : P.I. OF A-7-6 ≥L.L. - 30

CONSISTENCY OR DENSENESS

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

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.0	0.42	0.25	0.075	0.053

BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F. SD.)	SILT (SL.)	CLAY (CL.)
GRAIN SIZE MM	305	75	2.0	0.25	0.05	0.005
GRAIN SIZE IN.	12"	3"				

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	26 OR MORE	HIGH

COLOR

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

GRADATION

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

UNIFORM- INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)

GAP-GRADED- INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 30
MODERATELY COMPRESSIBLE	LIQUID LIMIT 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 50

PERCENTAGE OF MATERIAL

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

GROUND WATER

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

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS
- INFERRED SOIL BOUNDARIES
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 — DIP/DIP DIRECTION OF ROCK STRUCTURES
- SOUNDING ROD
- SPT CPT DPT DMT VST PMT — TEST BORING
- AUGER BORING
- BULK SAMPLE LOCATION
- CORE BORING
- MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- SPT N-VALUE
- REF — SPT REFUSAL

SAMPLE DESIGNATIONS

S - BULK SAMPLE
SS - SPLIT SPOON SAMPLE
ST - SHELBY TUBE SAMPLE
RS - ROCK SAMPLE
RT - RECOMPACTED TRIAXIAL SAMPLE
CBR - CBR SAMPLE

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CI. - CAVE IN
CL. - CLAY
CPT - CONE PENETRATION TEST
CPU - COASTAL PLAIN UNDIVIDED
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e -VOID RATIO
F. - FINE
FIAD - FILLED IMMEDIATELY AFTER DRILLING
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED
FRAGS. - FRAGMENTS
MED. - MEDIUM
PMT - PRESSUREMETER TEST
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT
V. - VERY
VST - VANE SHEAR TEST
W - MOISTURE CONTENT

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] MOBILE B- ___
- [ ] BK-51
- [X] CME-55
- [X] CME-550
- [ ] PORTABLE HOIST
- [X] OTHER CME-45 BARGE
- [X] OTHER D-50 ATV

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [ ] 8" HOLLOW AUGERS
- [X] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [X] CASING [X] W/ ADVANCER
- [X] TRICONE 3" & 4" STEEL TEETH
- [ ] TRICONE_____ TUNG.-CARB.
- [X] CORE BIT
- [ ] OTHER_____

HAMMER TYPE:
- [ ] AUTOMATIC [X] MANUAL

CORE SIZE:
- [ ] -B_____
- [ ] -N WD4
- [X] -H Q

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [X] HAND AUGER
- [X] SOUNDING ROD
- [ ] VANE SHEAR TEST
- [ ] OTHER _____

ROCK DESCRIPTION

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

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

WEATHERING

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

ROCK HARDNESS

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

FRACTURE SPACING

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

BEDDING

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

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

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

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS WHICH HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IS IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (F.P.) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

SAPROLITE (SAP.) - RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.

SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, WHICH HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS

SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR B.P.F.) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS LESS THAN 0.1 FOOT PENETRATION WITH 60 BLOWS.

STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.

STRATA ROCK QUALITY DESIGNATION (S.R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: NCDOT BASELINE SURVEY POINTS BL-19 (ELEV: 4.37ft MSL) BL-25 (ELEV: 19.68ft MSL), AND BL-26 (ELEV: 26.25ft MSL)

NOTES:
Geotechnical Exploration Performed By:

MACTEC
MACTEC ENGINEERING AND CONSULTING, INC.
3301 ATLANTIC AVENUE
RALEIGH, NORTH CAROLINA 27604
(919) 876-0416

SUBJECT: **REVISED GEOTECHNICAL REPORT**

DESCRIPTION: **BRIDGE 198 OVER INTRACOASTAL WATERWAY ON SR 1172 AT SUNSET BEACH**

STATE PROJECT:	**8.2230101**
TIP:	**B-0682**
WBS ELEMENT NO.:	**32575.1.2**
F.A. NUMBER:	**BRS-1813(1)**

PROJECT DESCRIPTION

Background

The purpose of this investigation was to obtain geotechnical information for foundation design and construction of the proposed 3200-foot long bridge with 32 approach spans and a three span superstructure located along a new alignment (-L-) for SR 1172. The bridge will span the Intracoastal Waterway, adjacent marshy areas, and upland areas from the existing causeway on the barrier island to the existing roadway network on the mainland in the Town of Sunset Beach, Brunswick County, North Carolina.

The southern approach to the superstructure will consist of 11 spans, each 113 feet in length. The southern end bent and six of the interior bents will be located along the alignment of the existing island causeway SR 1172. The remaining four interior bents on the southern approach will be located in the open tidal waterway, west of the existing SR 1172 and adjacent to the Intracoastal Waterway.

The northern approach to the superstructure will consist of 21 spans ranging in length from 38 feet to 95 feet. The northern approach bents are located in an upland area on the mainland.

The superstructure consists of one channel span 230 feet long and two side spans each 150 feet long. The northern most bent for the superstructure will be located on the fringe of the marsh along the Intracoastal Waterway. The three remaining superstructure bents are located in open water.

The proposed bridge will replace an existing bridge along the current alignment of SR 1172. A site location and topographic site map are provided as Drawings 1 and 2 in this report. This geotechnical report describes the results of our investigation performed April to July, 2003 and May to August, 2004.

Field Testing

MACTEC advanced 38 borings at the locations shown on the Boring Location Plan (Drawing 3). One boring was drilled per bent with the exception of six bents; two borings were drilled at each of the four bents for the superstructure, and we did not complete a boring at two bents (Bents 29 and 34) due to finding consistent soil types in adjacent borings and short span lengths at that location. We completed four hand auger/push-rod probes at the pond near End-Bent 2-revised.

The land borings were drilled with a CME 550 rig mounted on an all-terrain vehicle and a CME 55 rig mounted on a trailer. Water borings were drilled with a CME 45C mounted on a barge. Rotary-wash drilling and soil/rock coring techniques were utilized to advance borings. Drilled shaft foundations were anticipated for bents at the southern approach. Drilled shaft or pile foundations were anticipated for bents at the northern approach. Drilled shaft foundations were anticipated for bents at the superstructure. Boring depths were predetermined by the NCDOT. Borings from End-Bent 1 to End-Bent 2 were drilled to approximately 120 feet below the ground surface or mudline. Borings from Bent 22 to Bent 27 were drilled to approximately 100 feet below the ground surface. Borings from Bent 28 to End-Bent 2-revised were drilled to approximately 70 feet below the ground surface.

MACTEC personnel located borings in the field with Trimble GPS navigation equipment. MACTEC personnel determined boring location northing and easting coordinates and stations and offsets from MicroStation plan drawings provided by the NCDOT. Actual boring location coordinates were captured with our GPS equipment and subsequently post-processed. MACTEC personnel utilized conventional survey techniques to measure the collar elevations at boring locations and selected ground surface points along the profile and cross sections. Elevations at these locations reference baseline point elevations provided by the NCDOT.

Standard Penetration Tests (SPT) were conducted and soil samples collected at approximately 5-foot intervals within the soil profile using a split-spoon sampler and a 140-lb manual hammer in accordance with procedures described in ASTM D 1586. Soil and sedimentary rock were cored using HQ core equipment.

In-situ pressuremeter tests were performed in boring B13-B. A summary of the methods used and the P-Y curves generated from the pressuremeter test data are included under separate cover in a supportive document titled, Testing Summary.

Laboratory Testing

We performed AASHTO classification and grain-size distribution tests on split-spoon samples SS-1 through SS-51. The natural moisture content was determined for cohesive soils. Organic content was determined for five soil samples. We performed consolidation and triaxial shear tests on three undisturbed samples, ST-1, ST-2 and ST-3. Laboratory testing was performed in accordance with applicable ASTM/AASHTO/NCDOT specifications.

NCDOT soils laboratory performed triaxial shear tests on six undisturbed samples, ST-1, ST-6, ST-7, ST-8, ST-10 and ST-11.

Results for soil tests performed by MACTEC are included in this report. Laboratory results for consolidation and triaxial shear tests performed by NCDOT and MACTEC are included in a separate supportive document titled, Testing Summary.

PHYSIOGRAPHY AND GEOLOGY

Site Description

The existing bridge spans a distance of approximately 500 feet between the causeway and the mainland. The main channel of the Intracoastal Waterway is approximately 90 feet wide and is flanked by a marsh/tidal flat. The elevation of the roadway-surface along the causeway is approximately four feet, mean sea level (MSL). The causeway is flanked on both sides by a marsh/tidal flat. The roadway surface along the causeway is approximately three to four feet above the marsh/tidal flat. Tidal waters extend across the flat to the toe of the causeway-embankment slope during high tide, and retreat to channel areas during low tide.

The ground surface elevation ranges from approximately 5 to 26 feet MSL on the mainland. Bent 14, which supports the superstructure, is located on a slope between the marsh/tidal flat and the mainland. The ground surface continues to slope gradually upward from Bent 15 to Bent 26, then slopes gradually downward to End-Bent 2-revised.

The proposed structure crosses the end of a pond located on the Sea Trail Golf Course at Bent 30 through Bent 32.

Site photographs included in this report show site conditions at the time of our field investigation.

Geology

The project site is located within the Carolina Coastal Plain Physiographic Province. Sediments of the Carolina Coastal Plain were deposited during depositional cycles caused by fluctuating sea-levels. Younger sediments lie at the surface near the coast. Older sediments, which underlie these younger sediments, lie at or near the surface further inland. The 1985 Geologic Map of North Carolina, compiled by the N.C. Geologic Survey, indicates the geology at the site consists of surficial deposits of sand, clay, gravel and peat, deposited in marine, fluvial, eolian and lacustrine environments. Older sediments of the Waccamaw Formation underlie the surficial deposits. The Waccamaw Formation consists of fossiliferous sand with silt and clay. Underlying the Waccamaw Formation is the Peedee Formation. The Peedee formation consists of sand, clayey sand, and clay with layers of limestone. The Waccamaw and Peedee Formations are marine in origin. Our investigation identified artificial and roadway embankment fill, underlain by alluvial and/or coastal plain sediments, underlain by the Waccamaw Formation, underlain by the Peedee Formation.

Alluvial sediment encountered at the site consists of muck. We interpret these soils to be Quaternary-aged (<2 million years ago) sediments. The alluvial sediments are underlain by coastal plain sediments consisting of clayey, silty, fine to coarse sand (A-2-6/A-2-4/A-3) with lenses and layers of silt and clay (A-4/A-6/A-7-6) and containing trace to moderate amounts of shell fragments and traces of organic debris. These sediments are interpreted as a transitional, stratigraphic unit between overlying alluvium and underlying Waccamaw and Peedee Formations, and are grouped as Coastal Plain Undivided (CPU).

N.C. Dept. of Transportation
May 13, 2005
Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
MACTEC Project No. 6468-03-0165 and 6468-04-0675

FOUNDATION MATERIALS

Boring and coring logs describing subsurface conditions at each of the boring locations are included with this report. A generalized profile, Drawings 7 to 17 in the report, depicts subsurface conditions along the proposed bridge center line -L-. Generalized cross-sections, Drawings 18 to 23 in the report, depict subsurface conditions along Bents 11, 12, 13, 14, 30, and 32, respectively.

Subsurface Conditions

Subsurface materials encountered at the project site during our investigation are divided into five major geologic strata including Artificial and Roadway Embankment Fill, Alluvium, Coastal Plain Undivided, Waccamaw Formation, and Peedee Formation. These five strata are divided into 8 major material units that generally occupy the following relative vertical positions downward from the surface:

Artificial and Roadway Embankment Fill
- *Sand and Gravel*

Alluvium
- *Muck*

Coastal Plain Undivided
- *Clay and Silt*
- *Sand*

Waccamaw Formation
- *Sand*
- *Clay and Silt*
- *Sand and Shell Hash Limestone*

Peedee Formation
- *Clay with Limestone layers*

Artificial and Roadway Embankment Fill: *Sand and Gravel*

The Artificial and Roadway Embankment Fill: Sand and Gravel material unit consists of very loose to dense, dry to wet, clayey, silty, fine to coarse sand and shell fragments (A-2-4/A-3/A-1-b) with ABC stone and trace amounts of organic debris (roots). Roadway Embankment Fill occurs as the surface unit in borings EB1 to B8, which were drilled along the causeway. Artificial Fill occurs as the surface unit in borings B28, B30-B, B31-B, B32-B, B33 and EB2-REV, which were drilled along the paved cart path for the Sea Trail golf course. The Artificial and Roadway Embankment Fill: Sand and Gravel unit ranges from 2.5 to 8.0 feet thick at the golf course, and from 7.4 to 12.4 feet thick along the causeway. The elevation of the base of the unit ranges from -7.0 to 9.5 feet MSL.

Alluvium: *Muck*

Alluvium: Muck occurs as the surface unit in push rod/hand auger borings B30-A, B30-C, B32-A, and B32-C, and underlies Artificial Fill: Sand and Gravel in boring B28. The unit is 0.3 to 2.5 feet thick and is characterized as very soft, saturated, Muck. Organic content of tested samples ranged

from 25.5% to 38.4%. The Alluvium: Muck material unit was only encountered in and around the golf course pond at the north end of the project site.

Coastal Plain Undivided: *Clay and Silt*

The CPU: Clay and Silt material unit consists of very soft to soft, wet to saturated, fine to coarse sandy, silt and clay (A-4/A-6/A-7-6) with trace shell fragments. The CPU: Clay and Silt unit was encountered underlying Roadway Embankment Fill: Sand and Gravel in borings B4, B6, B7, and B8, and occurs as the surface unit at Bents 11 to 13. The thickness of the unit, where encountered, ranges from 2.5 to 10.0 feet thick. The elevation of the base of the unit ranges from -15.1 to -8.1 feet MSL. The CPU: Clay and Silt unit is laterally discontinuous across the site and was not encountered north of the Intracoastal Waterway.

Coastal Plain Undivided: *Sand*

The CPU: Sand material unit consists of very loose to dense, dry to saturated, clayey, silty, fine to coarse sand (A-2-6/A-2-4/A-3) with trace to moderate shell fragments, trace organic debris, and trace quartz gravel. The CPU: Sand unit was encountered underlying Artificial and Roadway Embankment Fill: Sand and Gravel in borings B1, B2, B3, B5, B30-B, B31-B, B32-B, B33, and EB2-REV, and underlying Alluvium: Muck in borings B28, B30-A, B30-C, B32-A, and B32-C. The CPU: Sand unit occurs as the surface unit at borings B9-A and B10-B and at boring locations north of the Intracoastal Waterway, except where noted above. The unit ranges from less than 5 feet to more than 25 feet thick and is laterally discontinuous across the site. The elevation of the base of the unit ranges from -28.9 to 4.9 feet MSL.

Waccamaw Formation: *Sand*

The Waccamaw Formation: Sand material unit consists of very loose to medium dense, moist to saturated, silty, fine to coarse sand (A-2-4/A-3) with trace shell fragments and locally with trace very thinly interbedded clay (A-7-6). The Waccamaw Formation: Sand unit, where encountered, underlies Coastal Plain Undivided sediments and is not laterally continuous across the site. The material unit ranges from 3.5 to 9.2 feet thick and the elevation of the base of the material unit ranges from -28.4 to -0.1 feet MSL. The Waccamaw Formation: Sand material unit is interbedded with other Waccamaw Formation sediments.

Waccamaw Formation: *Clay and Silt*

The Waccamaw Formation: Clay and Silt material unit consists of very soft to stiff, moist to saturated, fine sandy, clay and silt (A-4/A-6/A-7-6) with trace shell fragments and organic debris and locally with trace, very thinly interbedded, friable, shell hash limestone. The Waccamaw Formation: Clay and Silt unit was encountered in all borings except B7 and EB2-REV. The unit pinches and swells in thickness across the project site and reaches a maximum thickness of 17.7 feet at boring B16. The elevation of the base of the unit ranges from -31.9 to -11.3 feet MSL. The Waccamaw Formation: Clay and Silt unit is interbedded with other Waccamaw Formation sediments.

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Waccamaw Formation: *Sand and Shell Hash Limestone*

The Waccamaw Formation: Sand and Shell Hash Limestone material unit consists of very loose to dense, wet to saturated, silty, fine to coarse sand (A-2-4/A-3) and very thinly to thinly bedded, friable, shell hash limestone. The unit thickens to the north from a minimum thickness of 2.0 feet at boring B6 to a maximum thickness of 20.0 feet at boring EB2. The elevation of the base of the unit ranges from -33.2 to -26.8 feet MSL. Weak artesian conditions were observed 24 hours after drilling at boring B14-A and are interpreted to be coming from this unit.

Peedee Formation: *Clay with Limestone Layers*

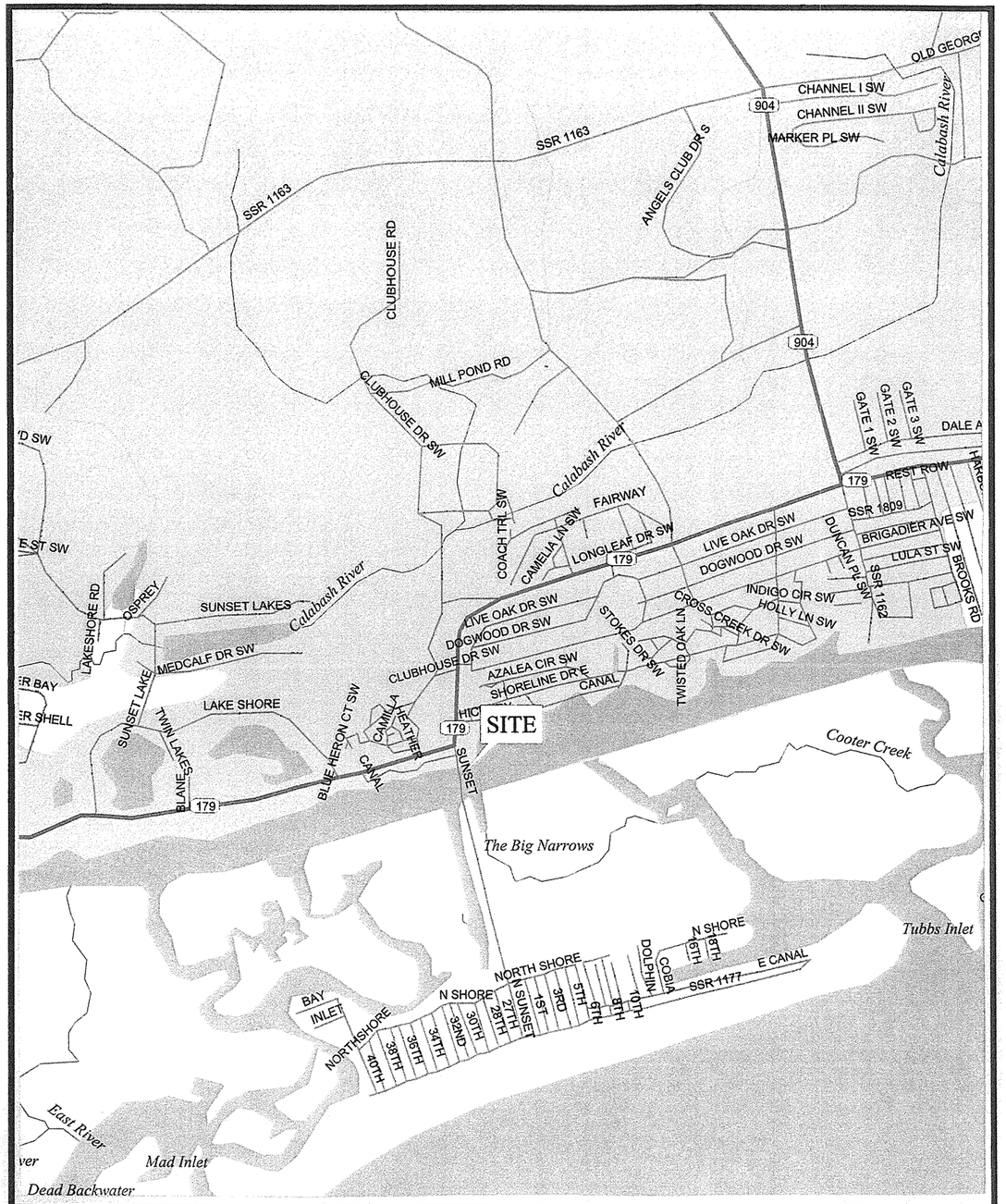
The Peedee Formation: Clay with Limestone Layers material unit consists of stiff to hard, moist, fine sandy, silty, clay (A-7-6) with very thinly to thickly bedded, friable to indurated, limestone. The Peedee Formation: Clay with Limestone Layers unit was encountered at all boring locations, except the pushrod/hand auger borings, and the top of the unit is very consistent across the site. Elevations of the top of the Peedee Formation range from -33.2 to -26.8 feet MSL. The unit underlies sediments of the Waccamaw Formation at all bent locations. All borings were terminated within the Peedee Formation: Clay with Limestone Layers unit.

GROUNDWATER

Zero-hour groundwater levels were at approximately 3 feet below ground surface (elevation 1 foot MSL) in borings advanced along the southern approach (causeway). A 24-hour groundwater level was measured at approximately 10 feet below ground surface (elevation 10 feet MSL) on the mainland at Bent 19. 24-hour groundwater levels were measured at approximately 4 feet below ground surface (elevation 10 feet MSL) on the mainland in borings near the Sea Trail pond. The water level in the pond is controlled by a weir at the approximate elevation of 10 feet MSL.

We observed artesian groundwater flow from boring B14-A the next day after drilling. Static hydraulic head was measured at 2.7 feet (elevation 8 feet MSL) above ground surface. Flow was estimated at approximately one gallon per minute. We were able to stop the artesian flow by reseating our surface-casing at about 38 feet below ground surface. Thus, it is our opinion that the artesian groundwater originates from a sandy, shell hash limestone layer at approximately 20 to 37 feet below ground surface. See bore log B14-A in this report.

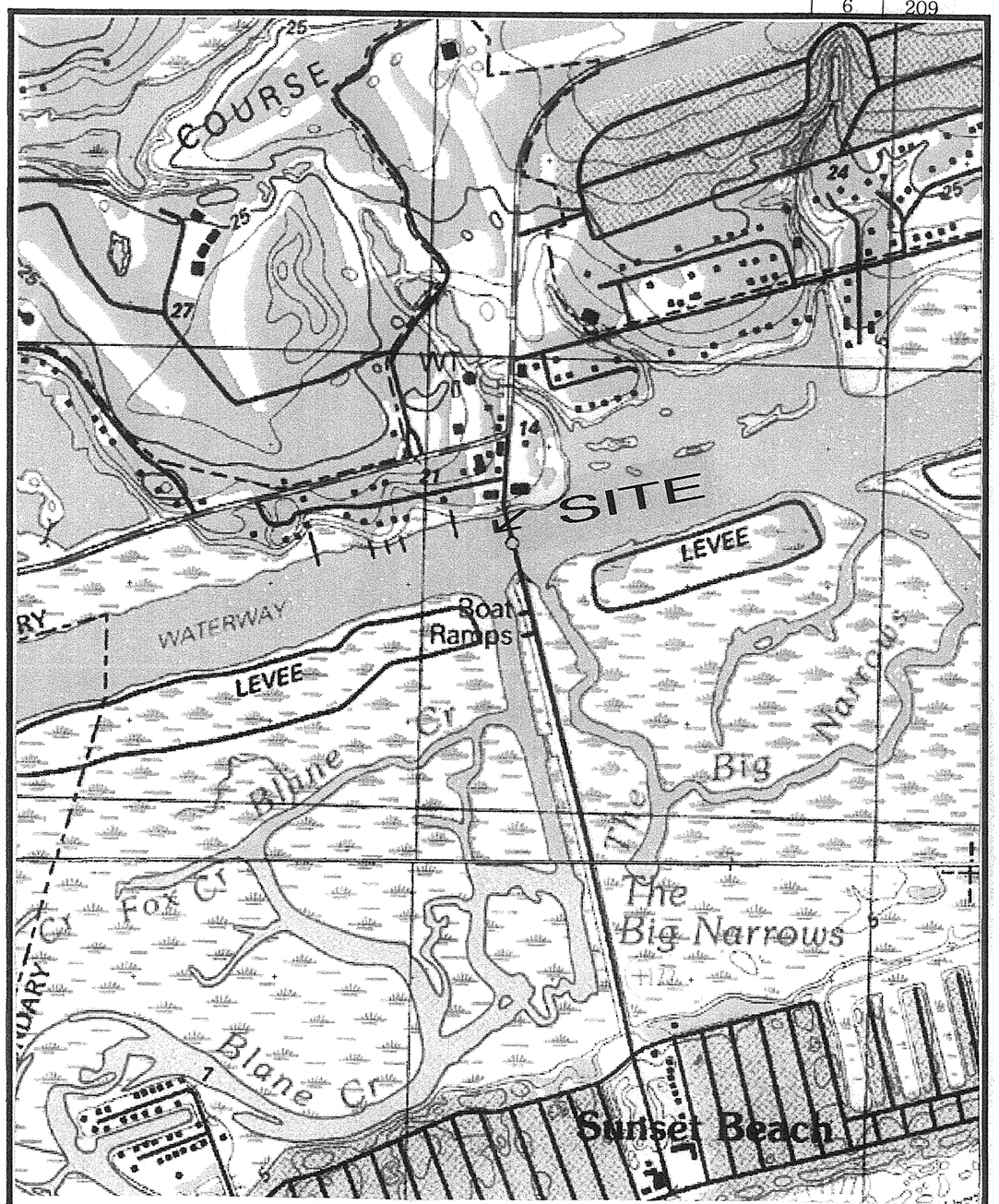
SHEET NO.	TOTAL SHEETS
6	209



SITE MAP
Bridge 198 Over the ICWW on SR 1172 at Sunset Beach
N.C. DOT Project No. 8.2230101 (B-0682)
F.A. No. BRS-1813(1)
Brunswick County, North Carolina

MACTEC
ENGINEERING AND CONSULTING, INC.
RALEIGH, NORTH CAROLINA

REF: Street Atlas, DeLorme, 1999 | SCALE: 1"= 0.49 Miles | DWG: 1 | DATE: October 2004 | MACTEC JOB NO: 6468-03-0165/6468-04-0675

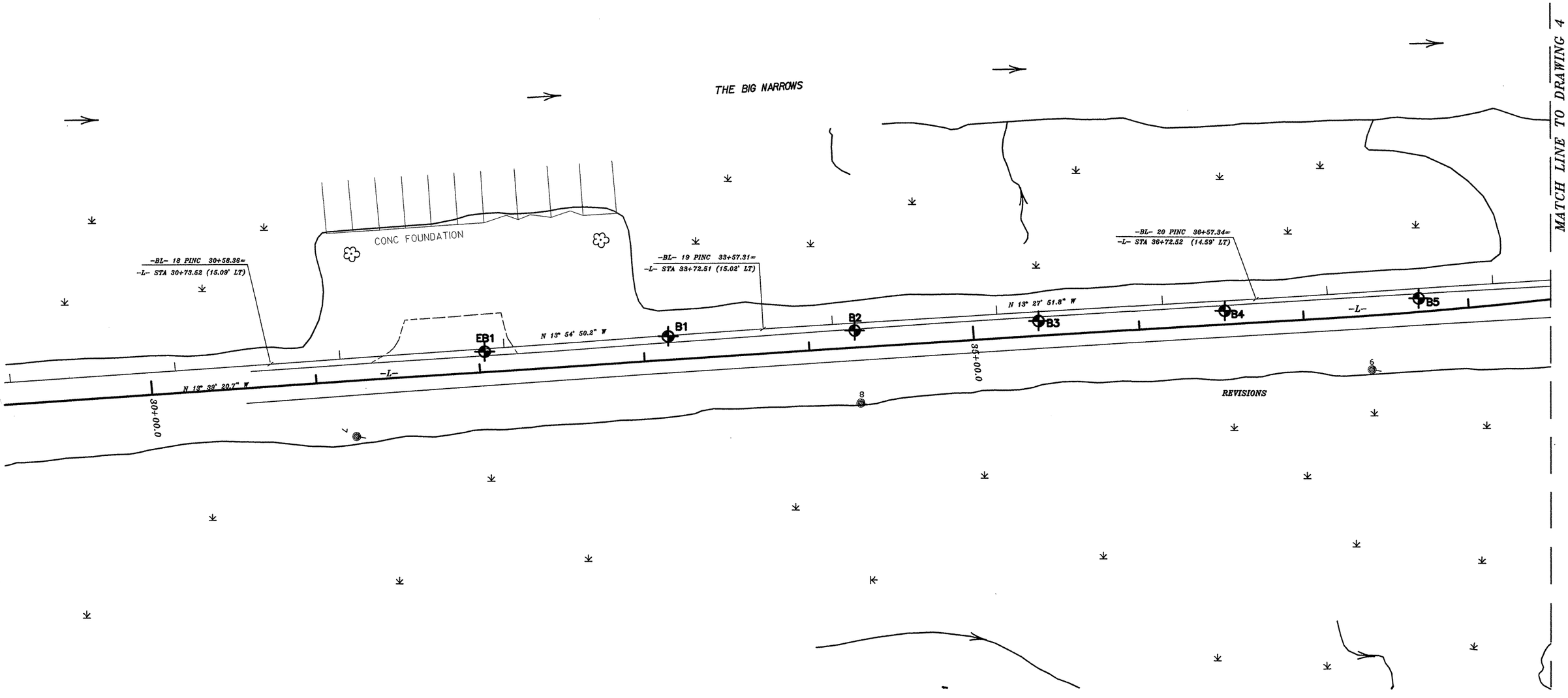


TOPOGRAPHIC SITE MAP
Bridge 198 Over the ICWW on SR 1172 at Sunset Beach
N.C. DOT Project No. 8.2230101 (B-0682)
F.A. No. BRS-1813(1)
Brunswick County, North Carolina

MACTEC
ENGINEERING AND CONSULTING, INC.
RALEIGH, NORTH CAROLINA

REF: Calabash, NC-SC & Little River USGS Quads. | SCALE: 1"= 12,000" | DWG: 2 | DATE: October 2004 | MACTEC JOB NO: 6468-03-0165/6468-04-0675

SKEW=90°



0 30' 60' 120'

SCALE (FEET)
1" : 60'

NAD 83

BORING LOCATION PLAN

BRIDGE 198 OVER INTRACOASTAL WATERWAY
ON SR 1172 AT SUNSET BEACH
NCDOT PROJECT NO. 8.2230101 (B-0682)
F.A. No. BRS-1813(1)
BRUNSWICK COUNTY, NORTH CAROLINA

MACTEC ENGINEERING AND CONSULTING, INC.
RALEIGH, NORTH CAROLINA

REVISIONS	DRAWN: R.R.	DATE: 09/30/04
05/12/05	DFT CHECK: B.W.D.	JOB : 6468-03-0165
	ENG CHECK: –	DWG: 3

SKEW=90°

MATCH LINE TO DRAWING 3

MATCH LINE TO DRAWING 5

EBB

TIDE

TIDE

EBB

THE BIG NARROWS

CHANNEL

N 27° 39' 52.5" W

-BL- 22 PINC 43+82.51=
-L- STA 43+86.66 (80.62' RT)

45+00.0

-L-

B12-A

B12-B

B11-A

B11-B OS
B11-B

B10-B

B9-A

-L-

SOIL

-BL-21 PINC 39+56.20=
-L- STA 39+72.12 (2.49' LT)

40+00.0

SOIL

B7

B8

N 13° 24' 31.4" W

RIPRAP

BRIDGE 198

N 13° 54' 54.3" W

B6

SUNSET BLVD. (SR 1172) 18.2' BST

12" PLASTIC

10

S

BLK SHED

RIPRAP

INTRACOASTAL WATERWAY

0 30' 60' 120'

SCALE (FEET)
1" : 60'

NAD 83

BORING LOCATION PLAN

BRIDGE 198 OVER INTRACOASTAL WATERWAY
ON SR 1172 AT SUNSET BEACH
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05/12/05	DFT CHECK: B.W.D.	JOB : 6468-03-0165
	ENG CHECK: –	DWG: 4

SKEW=90°

MATCH LINE TO DRAWING 4

MATCH LINE TO DRAWING 6

REVISIONS

4' WOOD PIER

2SFD

2SFD

WOODS

WOODS

WOODS

WOODS

WOODS

WOODS

SCATTERED TREES

SCATTERED TREES

SCATTERED TREES

-BL- 23 PINC 50+07.57=
-L- STA 50+04.29 (15.44' LT)
-T1- 23 POT 5+00.00
ELEV= 9.24'

-BL-24 PINC 52+03.46=
-L- STA 52+00.18 (14.34' LT)

-BL- 25 PINC 55+18.60=
-BY1-25 PINC 8+01.27=
-L- STA 55+14.96 (0.94' LT)

50+00.0

55+00.0

B13-A

B13-B

B14-A

B14-B

B15

B16

B17

B18

B19

B20

EB2

B22

-L-

N 27° 20' 26.7" W

N 22° 36' 43.9" W

N 74° 08' 00.9" E

N 75° 41' 40.0" E

-Y-

S

S

WOODS

SOIL & GRAVEL

GRAVEL PARKING

GRAVEL PARKING

GRAVEL PARKING

CANAL DR. (8' SOIL)

SHORE LINE DR. (NC 179)

ASPHALT PARKING

IS MTL BUS

FIRE DEPT

ASPHALT PARKING

GRAVEL

PLANTER

PLANTER

ISFBUS

WD DECK

0 30' 60' 120'

SCALE (FEET)
1" : 60'

NAD 83

BORING LOCATION PLAN

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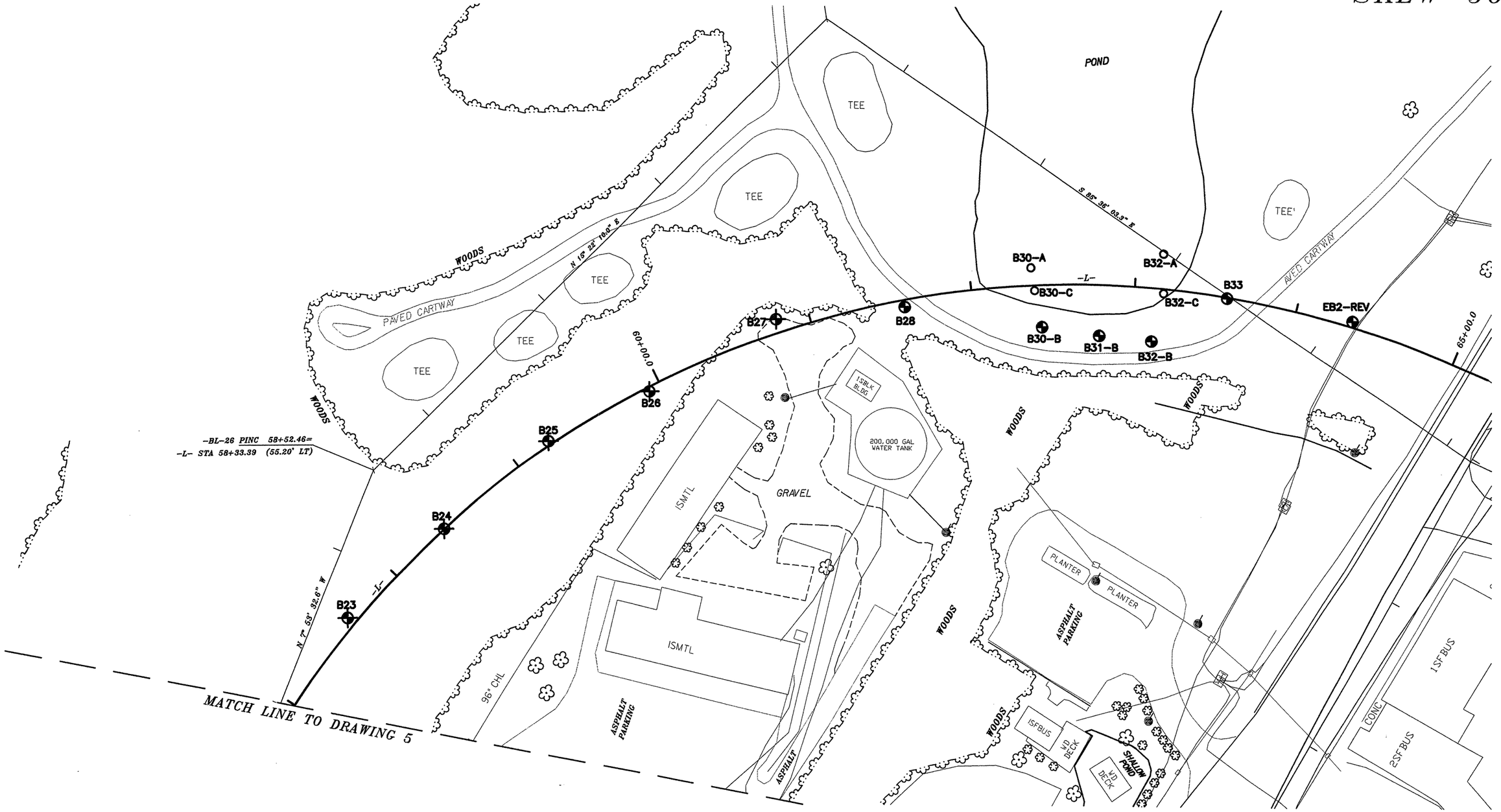
	ENG CHECK: —	DWG: 5

SKEW=90°



0 30' 60' 120'

SCALE (FEET)
1" : 60'

NAD 83

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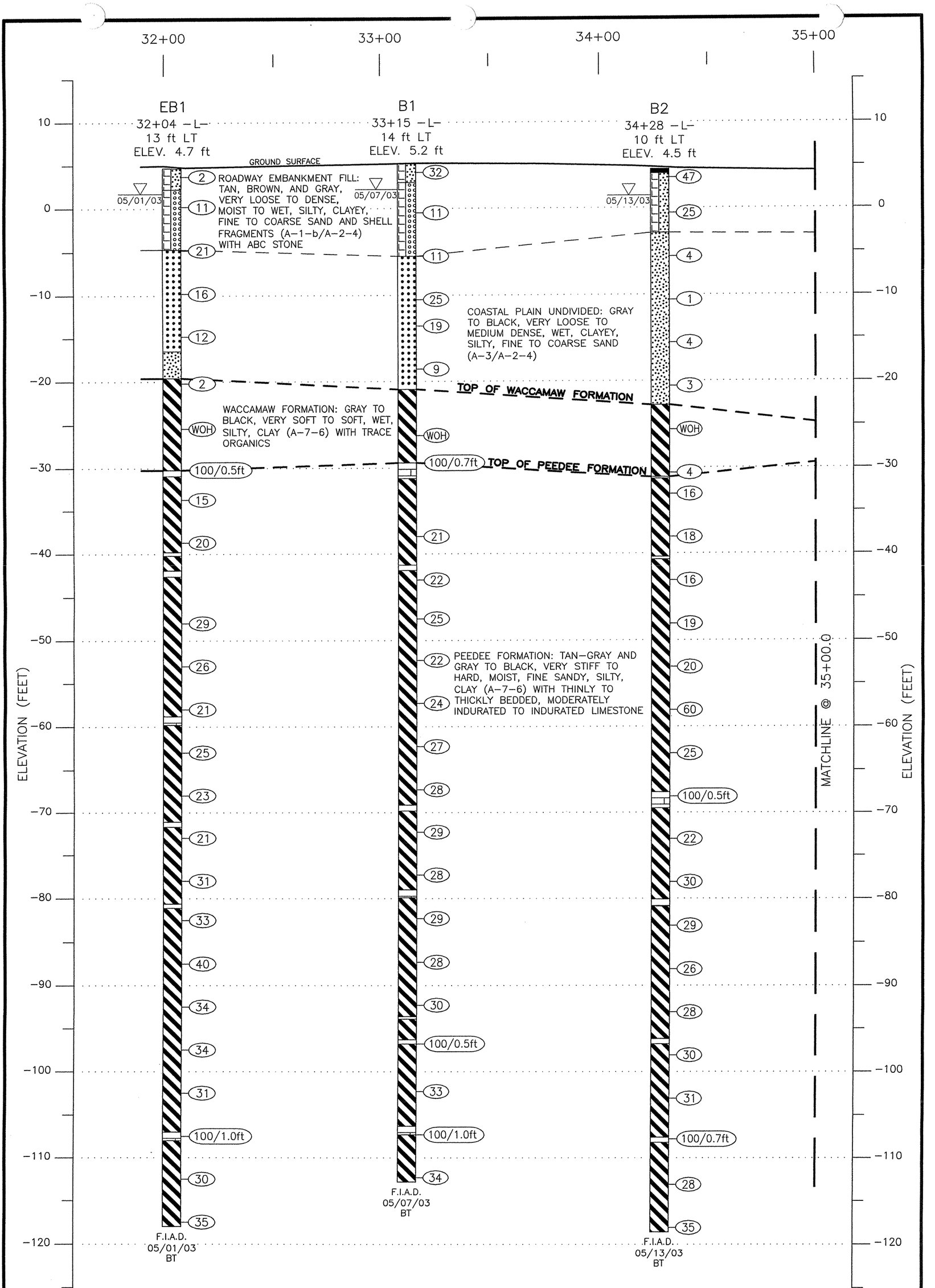

0 5' 10' 20'
VERTICAL SCALE (FEET)
1" : 10'

0 20' 40' 80'
HORIZONTAL SCALE (FEET)
1" : 40'

PROFILE ALONG -L- FROM STATION 31+90 TO 64+44
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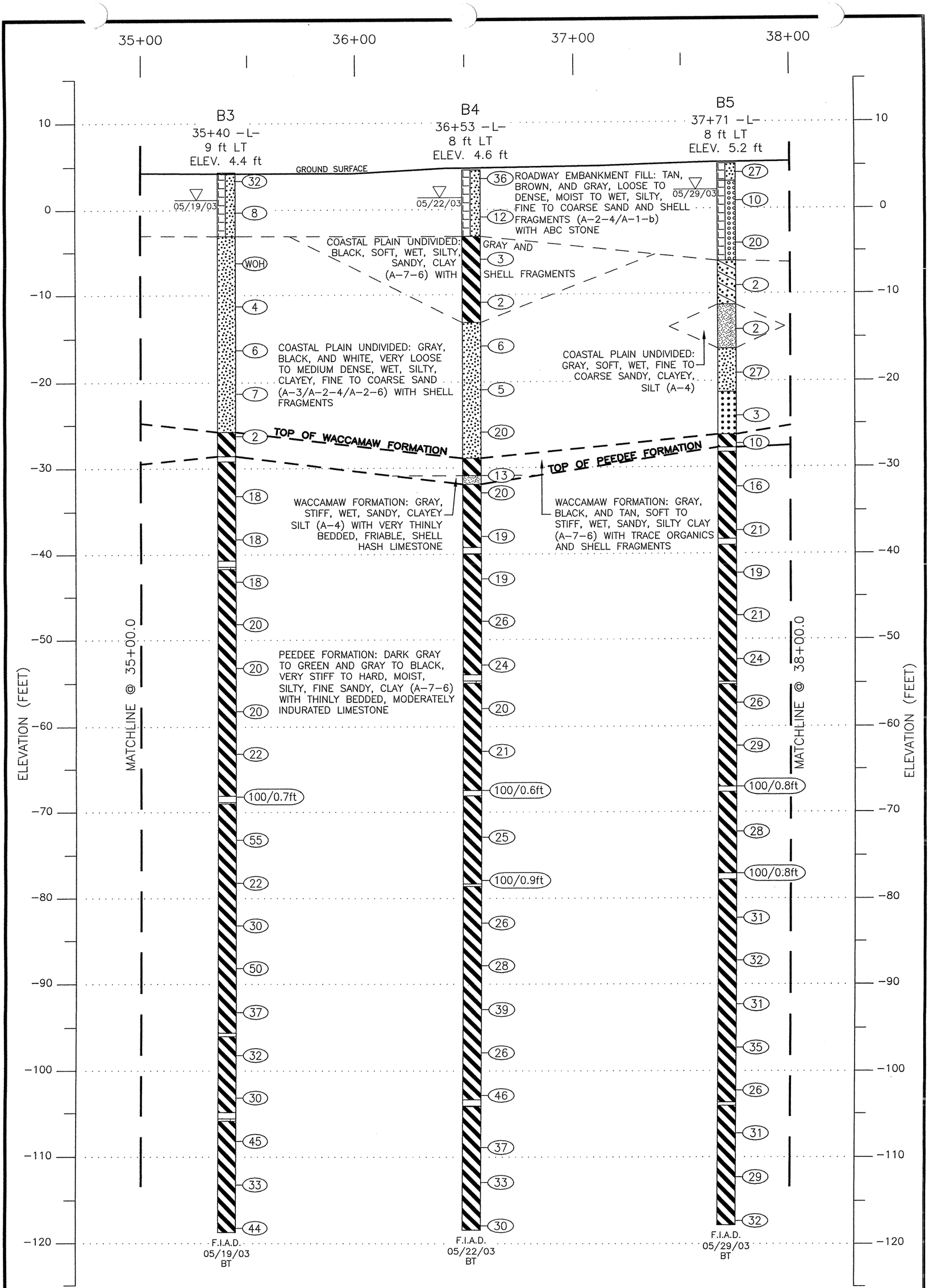
	ENG CHECK: S.J.C.	DWG: 7



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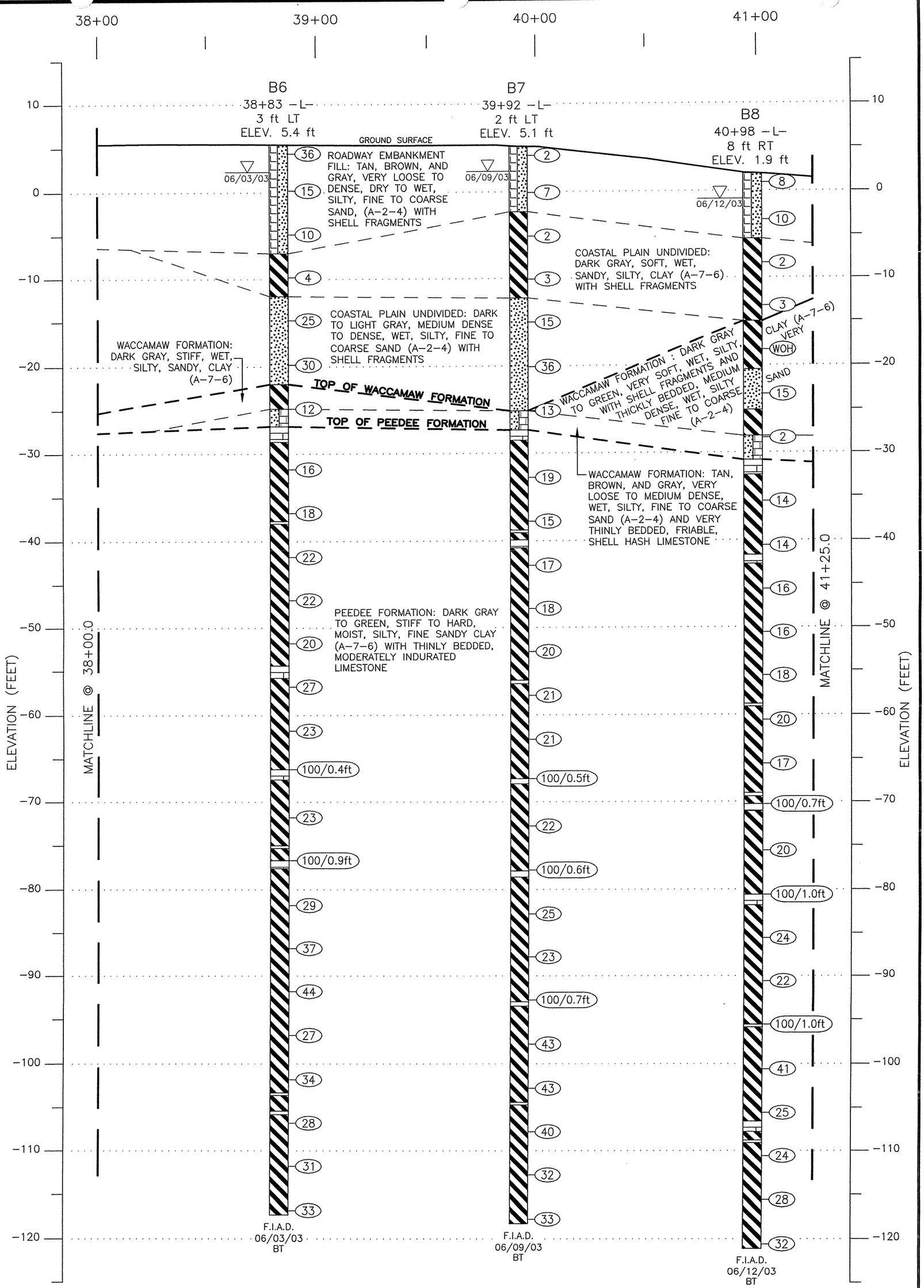
	ENG CHECK: S.J.C.	DWG: 8

SHEET: 12 OF 209



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1" : 40'

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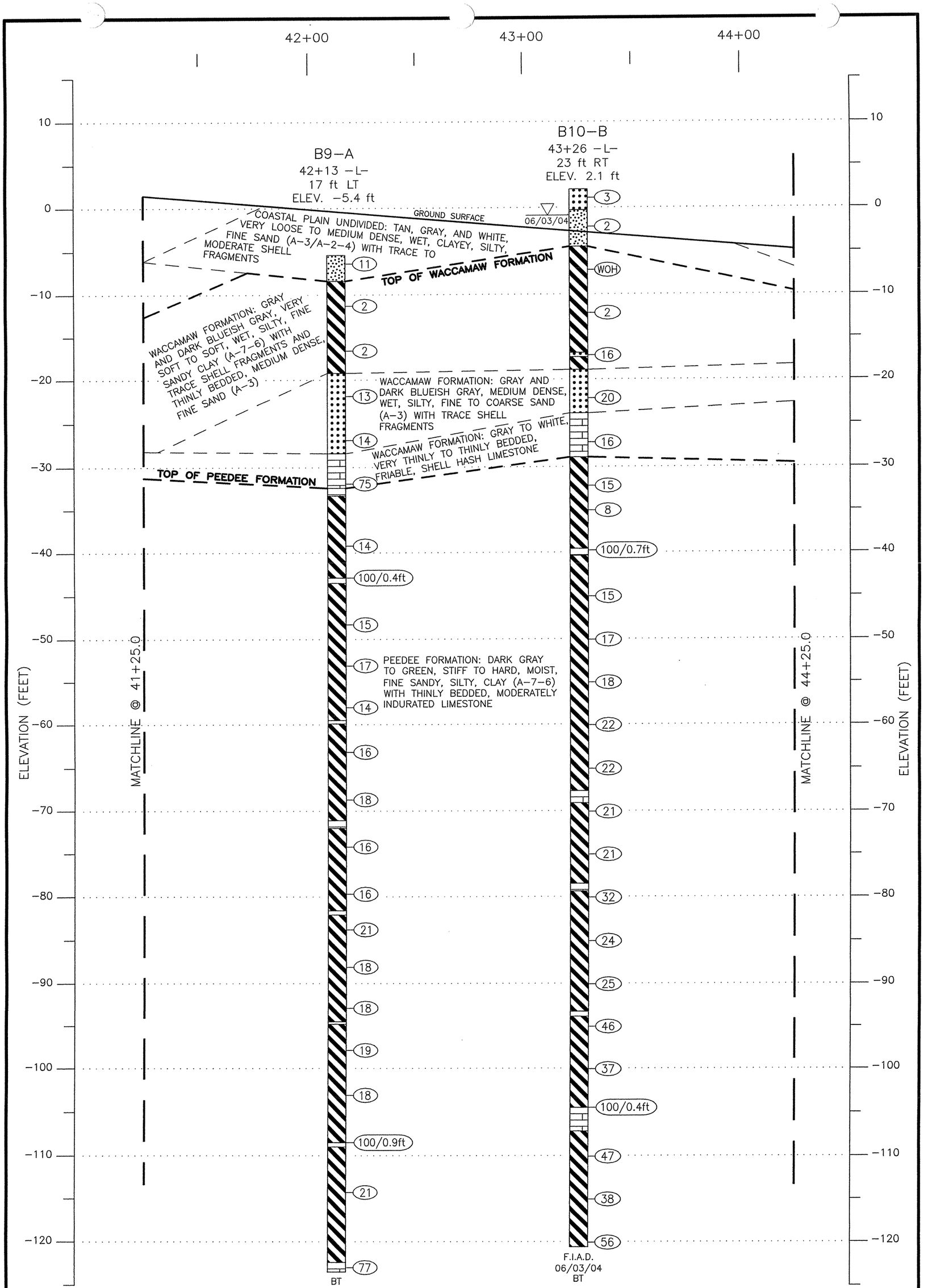
	ENG CHECK: S.J.C.	DWG: 9



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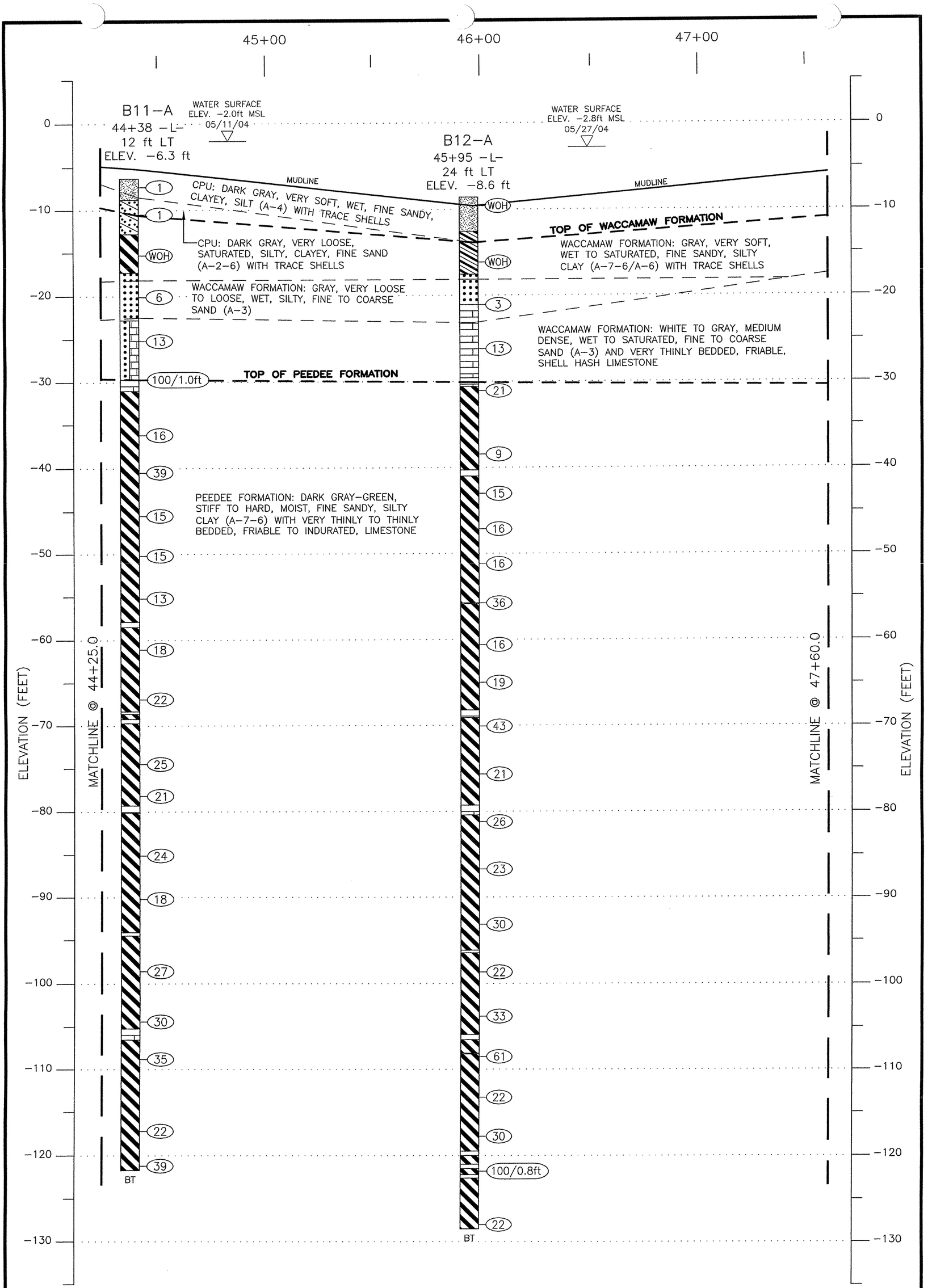
	ENG CHECK: S.J.C.	DWG: 10

SHEET: 14 OF 209



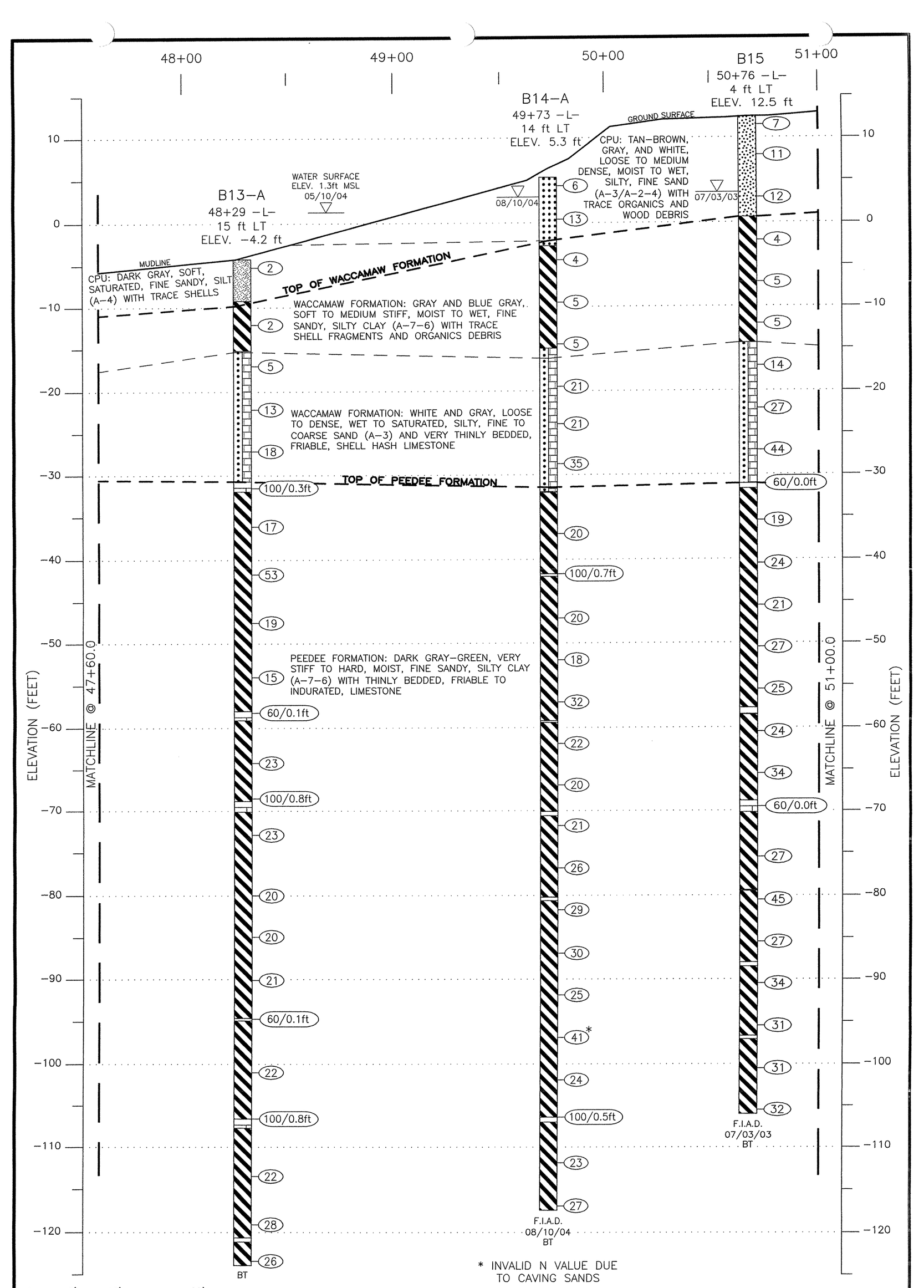
0 5' 10' 20'
VERTICAL SCALE (FEET)
1" : 10'

0 20' 40' 80'
HORIZONTAL SCALE (FEET)
1" : 40'

PROFILE ALONG –L– FROM STATION 31+90 TO 64+44
BRIDGE 198 OVER INTRACOASTAL WATERWAY ON SR 1172 AT SUNSET BEACH
NCDOT PROJECT NO. 8.2230101 (B–0682)
F.A. No. BRS–1813(1)
BRUNSWICK COUNTY, NORTH CAROLINA

MACTEC ENGINEERING AND CONSULTING, INC.
RALEIGH, NORTH CAROLINA

REVISIONS	DRAWN: R.R.	DATE: 09/30/04
05/12/05	DFT CHECK: W.B.D.	JOB : 6468–03–0165
	ENG CHECK: S.J.C.	DWG: 11



0 5' 10' 20'
VERTICAL SCALE (FEET)
1" : 10'

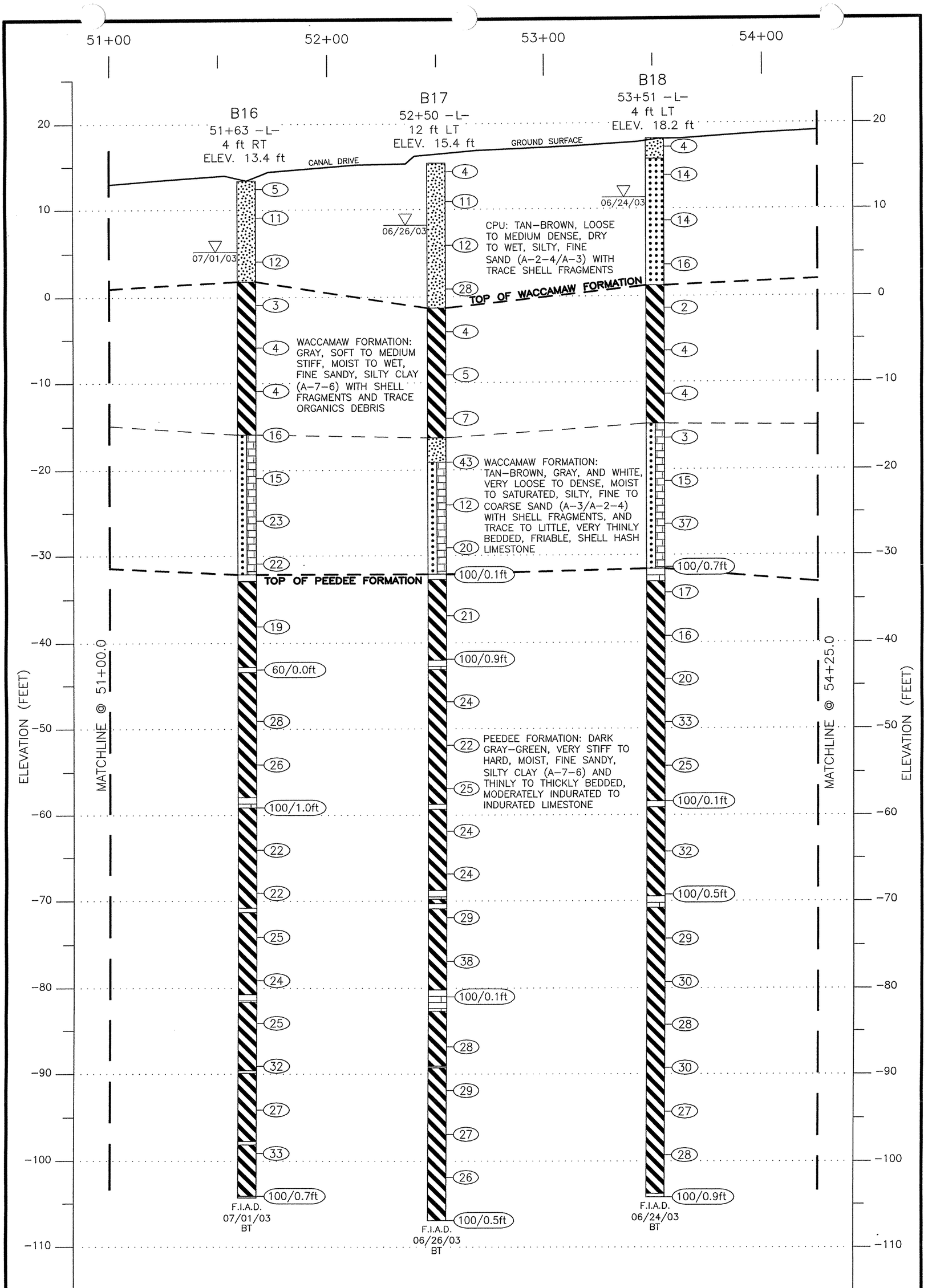
0 20' 40' 80'
HORIZONTAL SCALE (FEET)
1" : 40'

PROFILE ALONG -L- FROM STATION 31+90 TO 64+44
BRIDGE 198 OVER INTRACOASTAL WATERWAY ON SR 1172 AT SUNSET BEACH
NCDOT PROJECT NO. 8.2230101 (B-0682)
F.A. No. BRS-1813(1)
BRUNSWICK COUNTY, NORTH CAROLINA

MACTEC ENGINEERING AND CONSULTING, INC.
RALEIGH, NORTH CAROLINA

REVISIONS	DRAWN: R.R.	DATE: 09/30/04
05/12/05	DFT CHECK: W.B.D.	JOB : 6468-03-0165
	ENG CHECK: S.J.C.	DWG: 12

SHEET: 16 OF 209



0 5' 10' 20'
VERTICAL SCALE (FEET)
1" : 10'

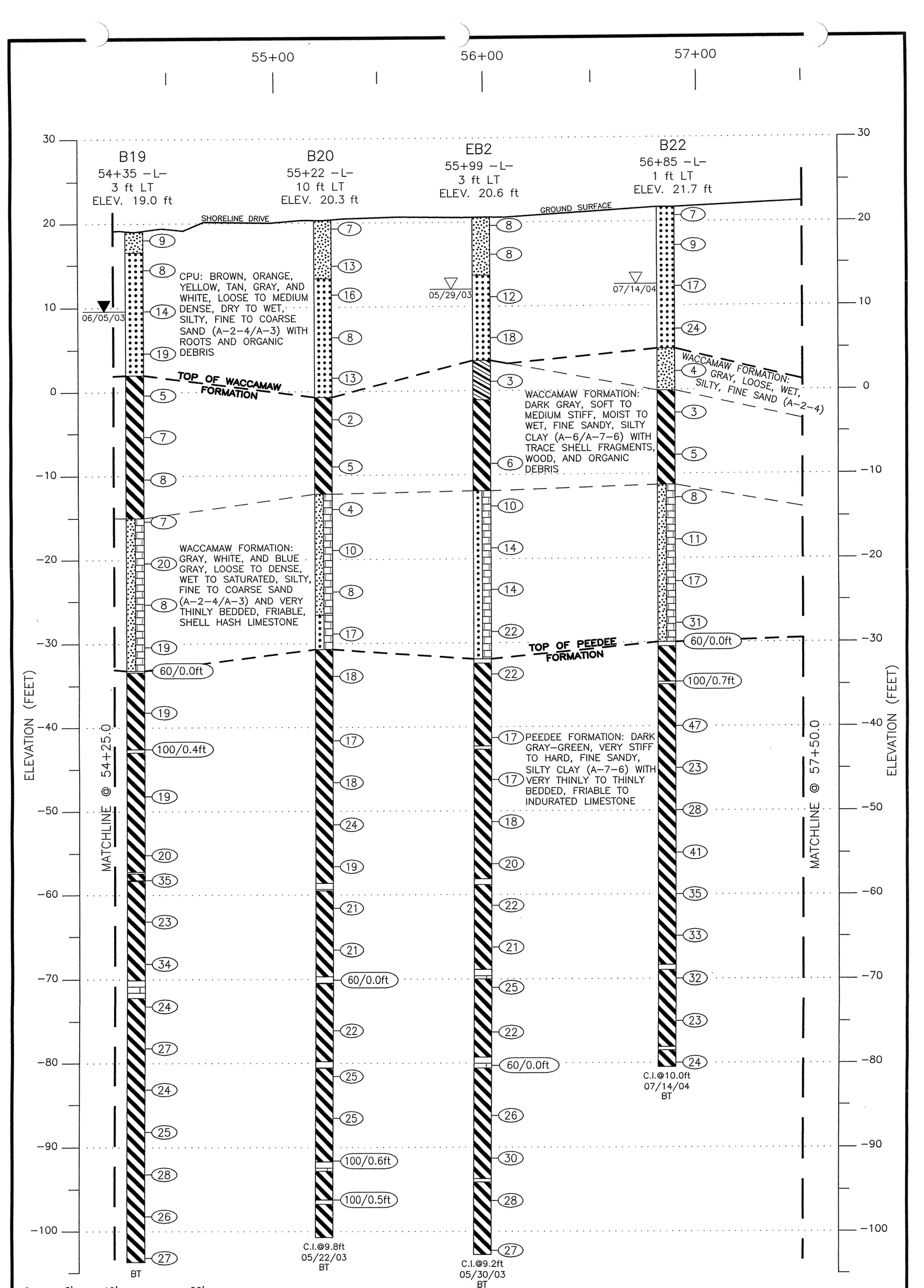
0 20' 40' 80'
HORIZONTAL SCALE (FEET)
1" : 40'

PROFILE ALONG -L- FROM STATION 31+90 TO 64+44
BRIDGE 198 OVER INTRACOASTAL WATERWAY ON SR 1172 AT SUNSET BEACH
NCDOT PROJECT NO. 8.2230101 (B-0682)
F.A. No. BRS-1813(1)
BRUNSWICK COUNTY, NORTH CAROLINA

MACTEC ENGINEERING AND CONSULTING, INC.
RALEIGH, NORTH CAROLINA

REVISIONS	DRAWN: R.R.	DATE: 09/30/04
05/12/05	DFT CHECK: W.B.D.	JOB : 6468-03-0165
	ENG CHECK: S.J.C.	DWG: 13

SHEET: 17 OF 209



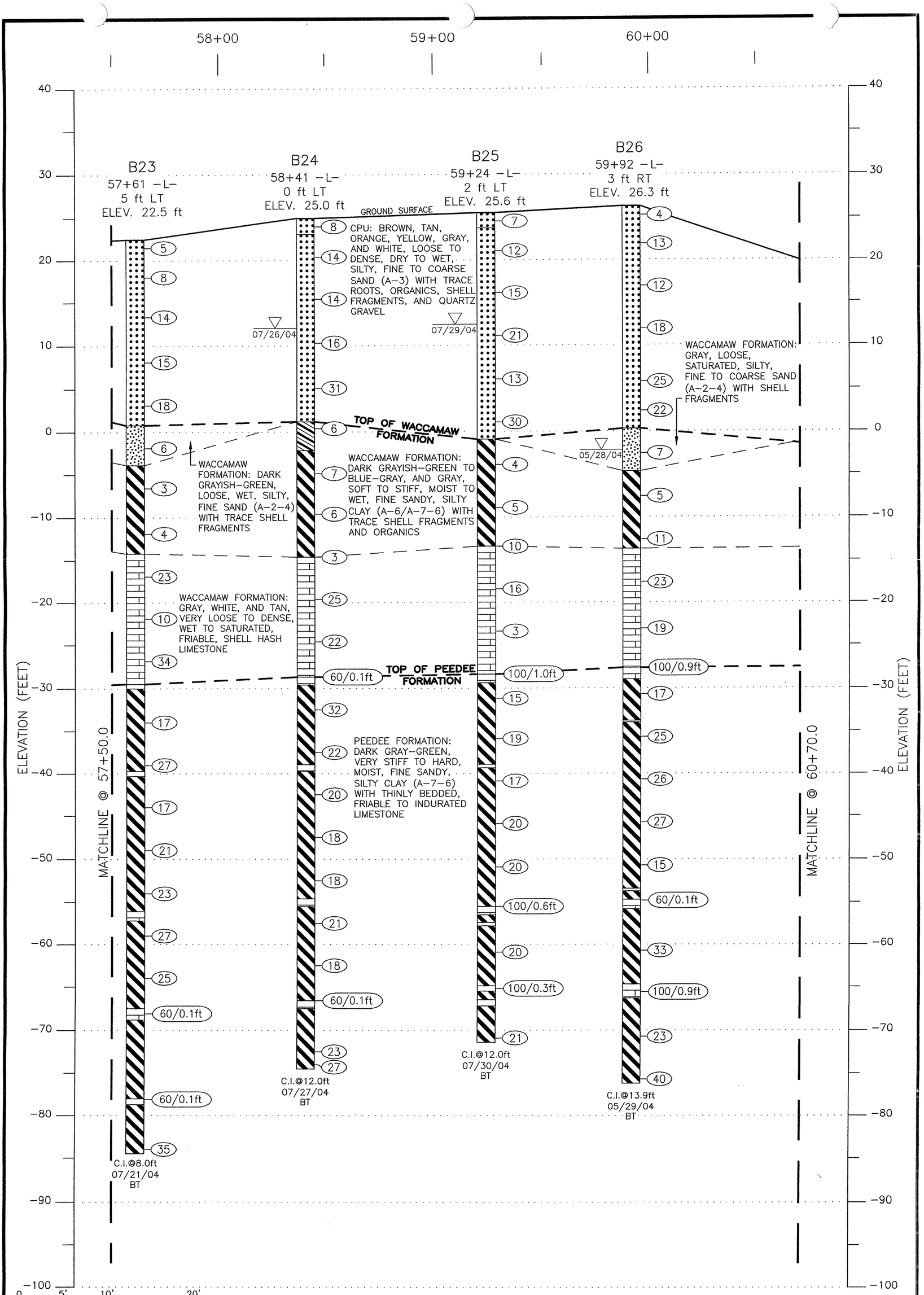
0 5' 10' 20'
VERTICAL SCALE (FEET)
1" : 10'

0 20' 40' 80'
HORIZONTAL SCALE (FEET)
1" : 40'

PROFILE ALONG -L- FROM STATION 31+90 TO 64+44
BRIDGE 198 OVER INTRACOASTAL WATERWAY ON SR 1172 AT SUNSET BEACH
NCDOT PROJECT NO. 8.2230101 (B-0682)
F.A. No. BRS-1813(1)
BRUNSWICK COUNTY, NORTH CAROLINA

MACTEC ENGINEERING AND CONSULTING, INC.
RALEIGH, NORTH CAROLINA

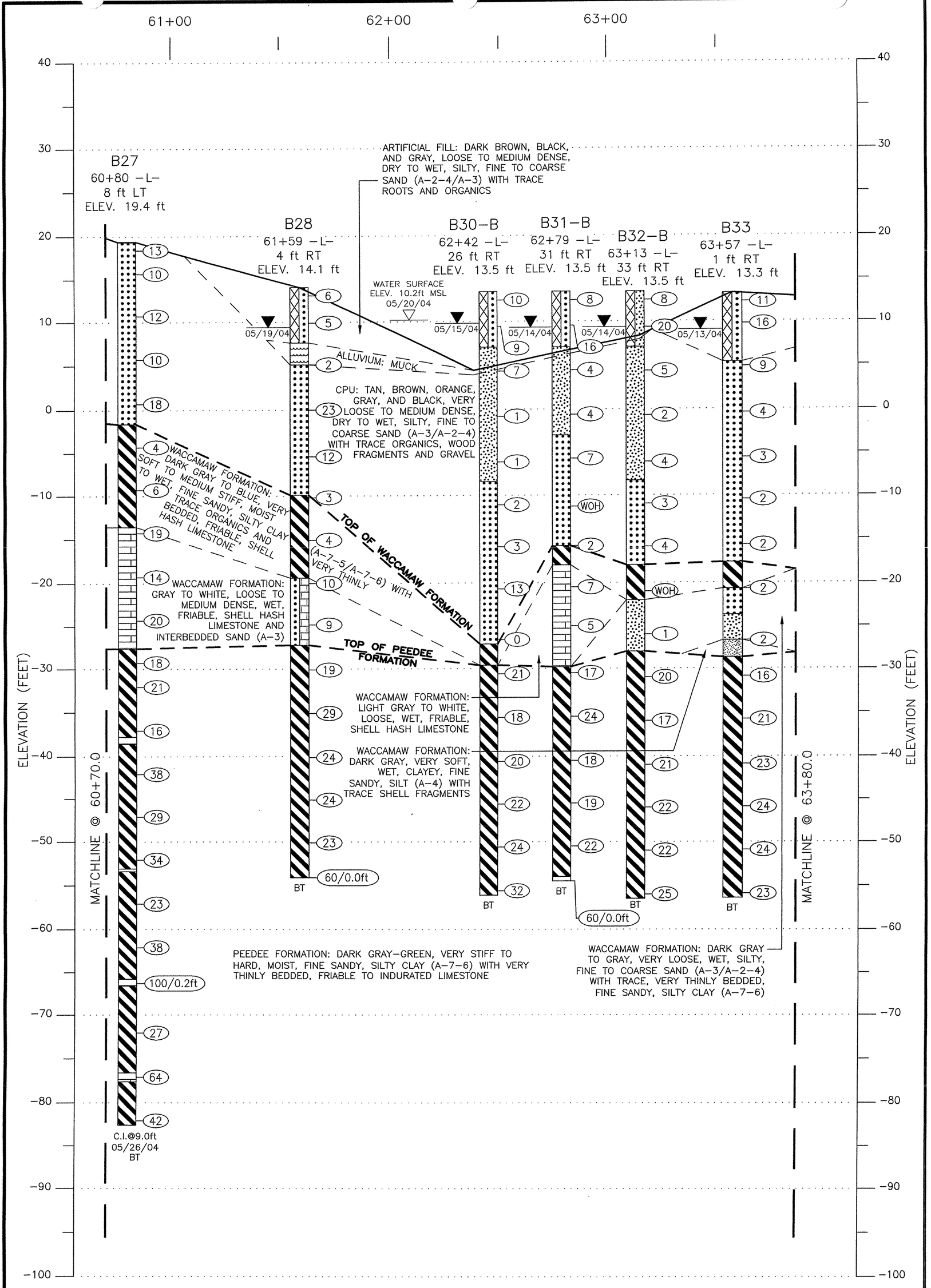
REVISIONS	DRAWN: R.R.	DATE: 09/30/04
05/12/05	DFT CHECK: W.B.D.	JOB : 6468-03-0165
	ENG CHECK: S.J.C.	DWG: 14



PROFILE ALONG -L- FROM STATION 31+90 TO 64+44
BRIDGE 198 OVER INTRACOASTAL WATERWAY ON SR 1172 AT SUNSET BEACH
NCDOT PROJECT NO. 8.2230101 (B-0682)
F.A. No. BRS-1813(1)
BRUNSWICK COUNTY, NORTH CAROLINA

MACTEC ENGINEERING AND CONSULTING, INC.
RALEIGH, NORTH CAROLINA

REVISIONS	DRAWN: R.R.	DATE: 09/30/04
05/12/05	DFT CHECK: W.B.D.	JOB : 6468-03-0165
	ENG CHECK: S.J.C.	DWG: 15

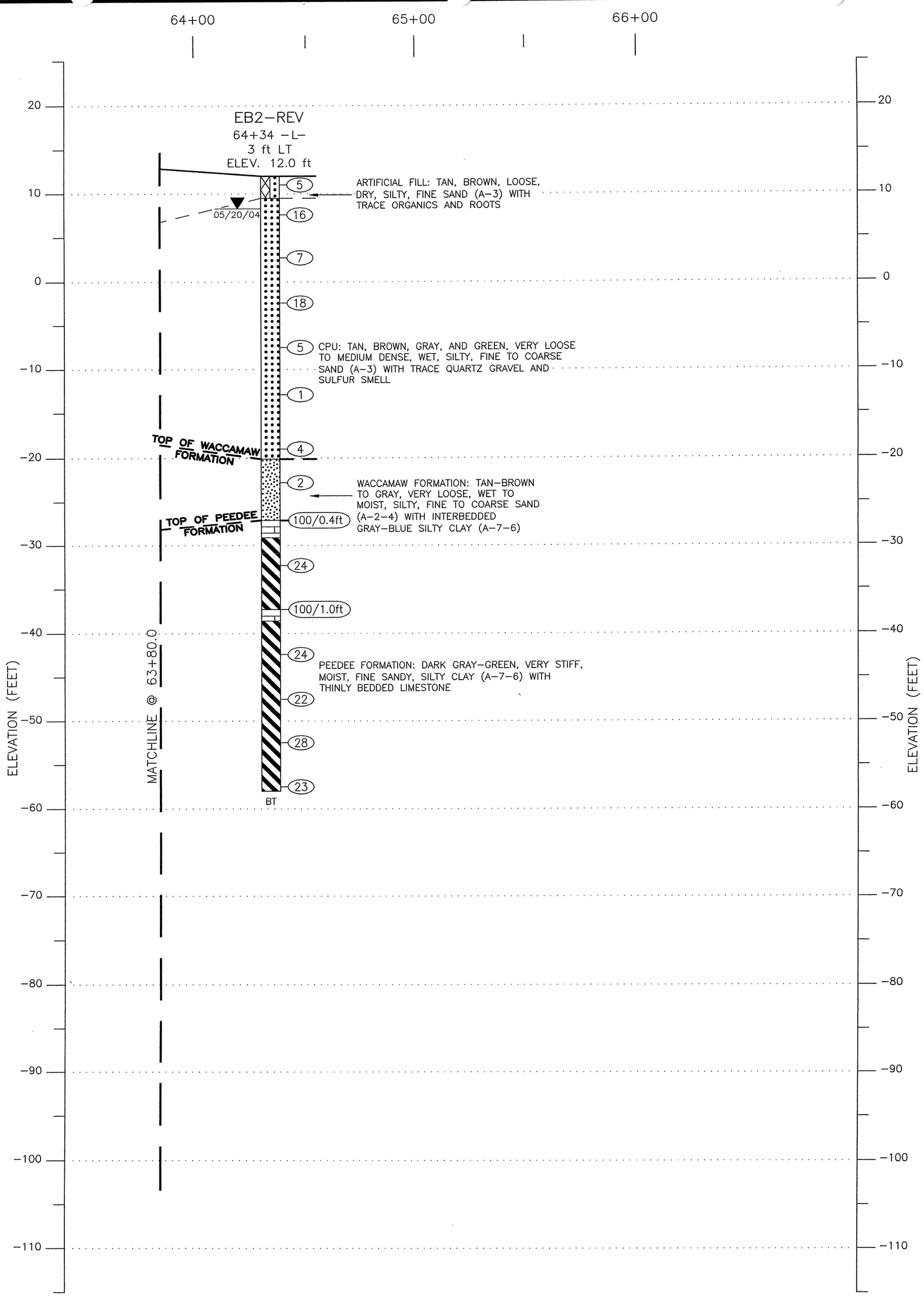


PROFILE ALONG -L- FROM STATION 31+90 TO 64+44
BRIDGE 198 OVER INTRACOASTAL WATERWAY ON SR 1172 AT SUNSET BEACH
NCDOT PROJECT NO. 8.2230101 (B-0682)
F.A. No. BRS-1813(1)
BRUNSWICK COUNTY, NORTH CAROLINA

MACTEC ENGINEERING AND CONSULTING, INC.
RALEIGH, NORTH CAROLINA

REVISIONS	DRAWN: R.R.	DATE: 09/30/04
05/12/05	DFT CHECK: W.B.D.	JOB : 6468-03-0165
	ENG CHECK: S.J.C.	DWG: 16

SHEET: 20 OF 209



0 5' 10' 20'
VERTICAL SCALE (FEET)
1" : 10'

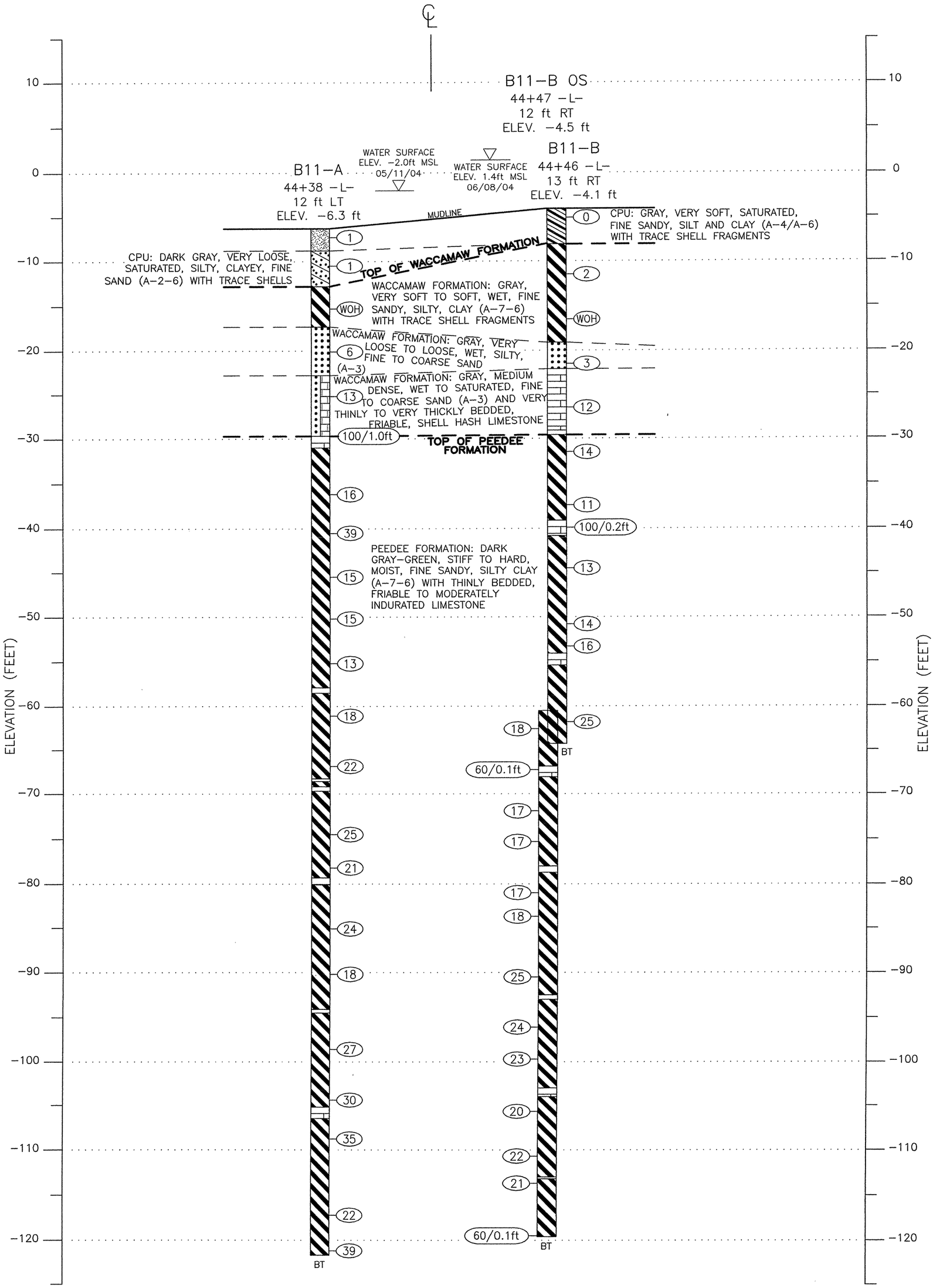
0 20' 40' 80'
HORIZONTAL SCALE (FEET)
1" : 40'

PROFILE ALONG –L– FROM STATION 31+90 TO 64+44
BRIDGE 198 OVER INTRACOASTAL WATERWAY ON SR 1172 AT SUNSET BEACH
NCDOT PROJECT NO. 8.2230101 (B–0682)
F.A. No. BRS–1813(1)
BRUNSWICK COUNTY, NORTH CAROLINA

MACTEC ENGINEERING AND CONSULTING, INC.
RALEIGH, NORTH CAROLINA

REVISIONS	DRAWN: R.R.	DATE: 09/30/04
05/12/05	DFT CHECK: W.B.D.	JOB : 6468–03–0165
	ENG CHECK: S.J.C.	DWG: 17

SHEET: 21 OF 209



0 5' 10' 20'
VERTICAL SCALE (FEET)
1" : 10'

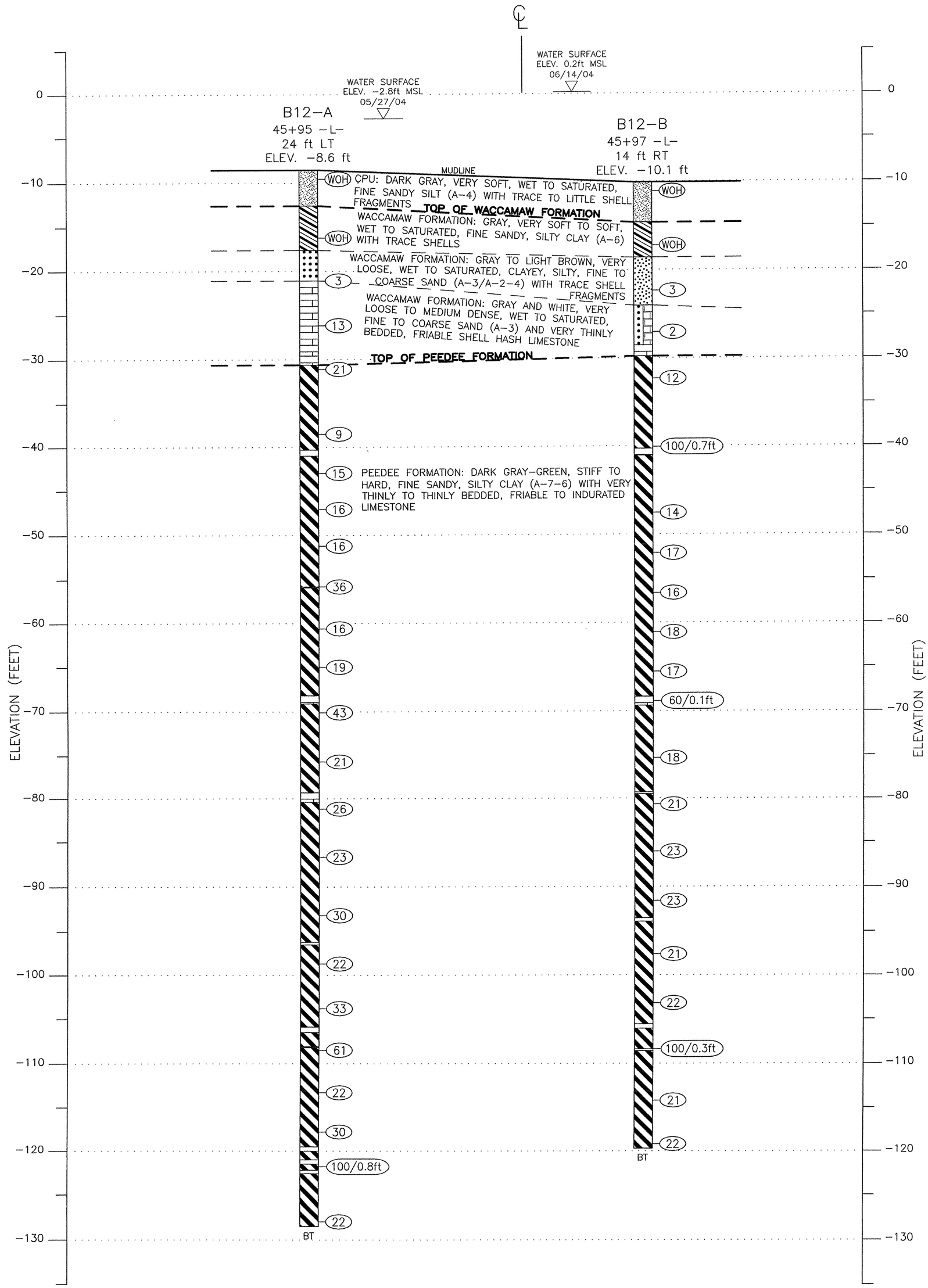
0 5' 10' 20'
HORIZONTAL SCALE (FEET)
1" : 10'

CROSS SECTION THROUGH BENT 11
BRIDGE 198 OVER INTRACOASTAL WATERWAY ON SR 1172 AT SUNSET BEACH
NCDOT PROJECT NO. 8.2230101 (B-0682)
F.A. No. BRS-1813(1)
BRUNSWICK COUNTY, NORTH CAROLINA

MACTEC ENGINEERING AND CONSULTING, INC.
RALEIGH, NORTH CAROLINA

REVISIONS	DRAWN: R.R.	DATE: 09/30/04
05/12/05	DFT CHECK: W.B.D.	JOB : 6468-03-0165
	ENG CHECK: S.J.C.	DWG: 18

SHEET: 22 OF 209



0 5' 10' 20'

VERTICAL SCALE (FEET)
1" : 10'

0 5' 10' 20'

HORIZONTAL SCALE (FEET)
1" : 10'

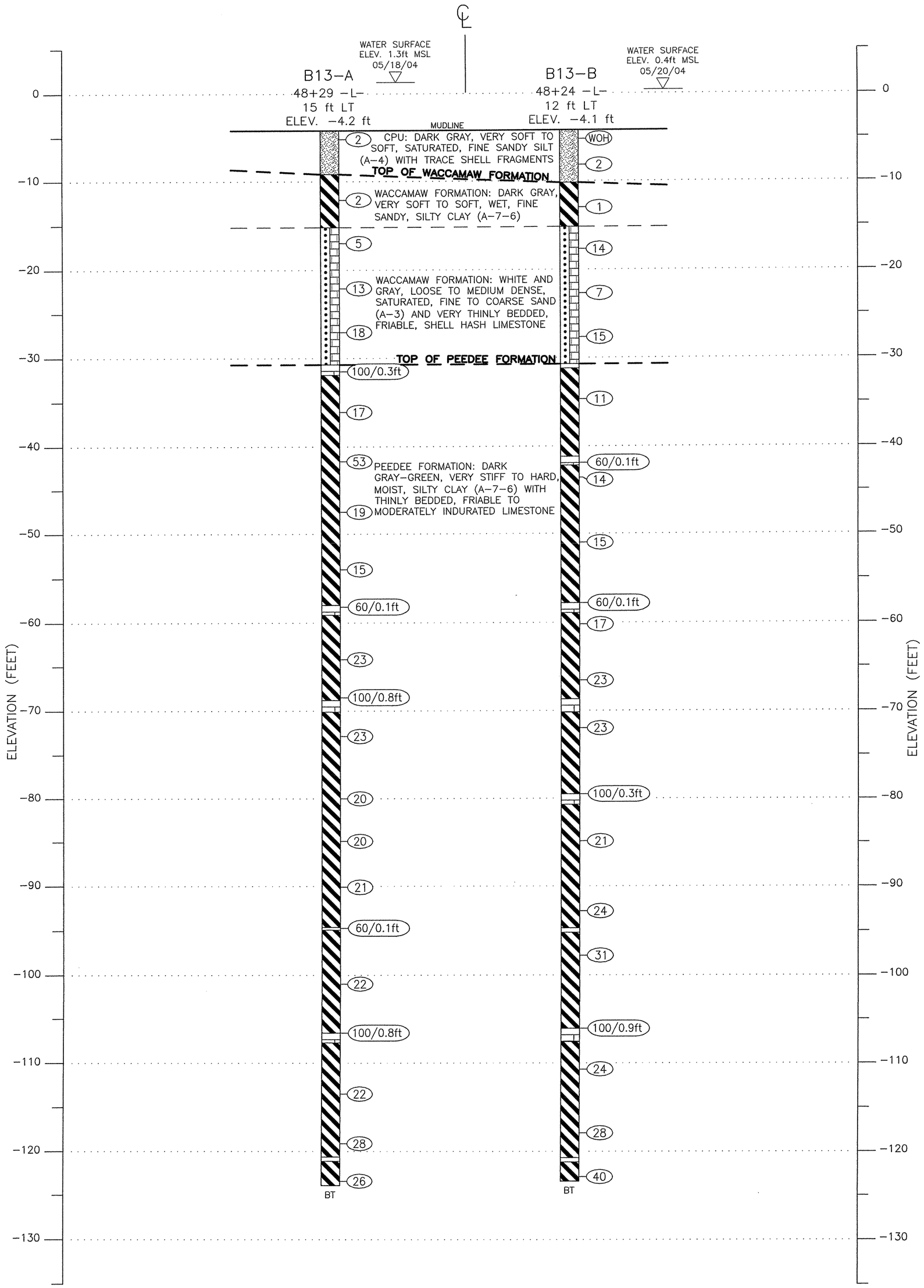
CROSS SECTION THROUGH BENT 12

BRIDGE 198 OVER INTRACOASTAL WATERWAY ON SR 1172 AT SUNSET BEACH
NCDOT PROJECT NO. 8.2230101 (B−0682)
F.A. No. BRS−1813(1)
BRUNSWICK COUNTY, NORTH CAROLINA

MACTEC ENGINEERING AND CONSULTING, INC.
RALEIGH, NORTH CAROLINA

REVISIONS	DRAWN: R.R.	DATE: 09/30/04
05/12/05	DFT CHECK: W.B.D.	JOB : 6468−03−0165
	ENG CHECK: S.J.C.	DWG: 19

SHEET: 23 OF 209



VERTICAL SCALE (FEET) 1" : 10'

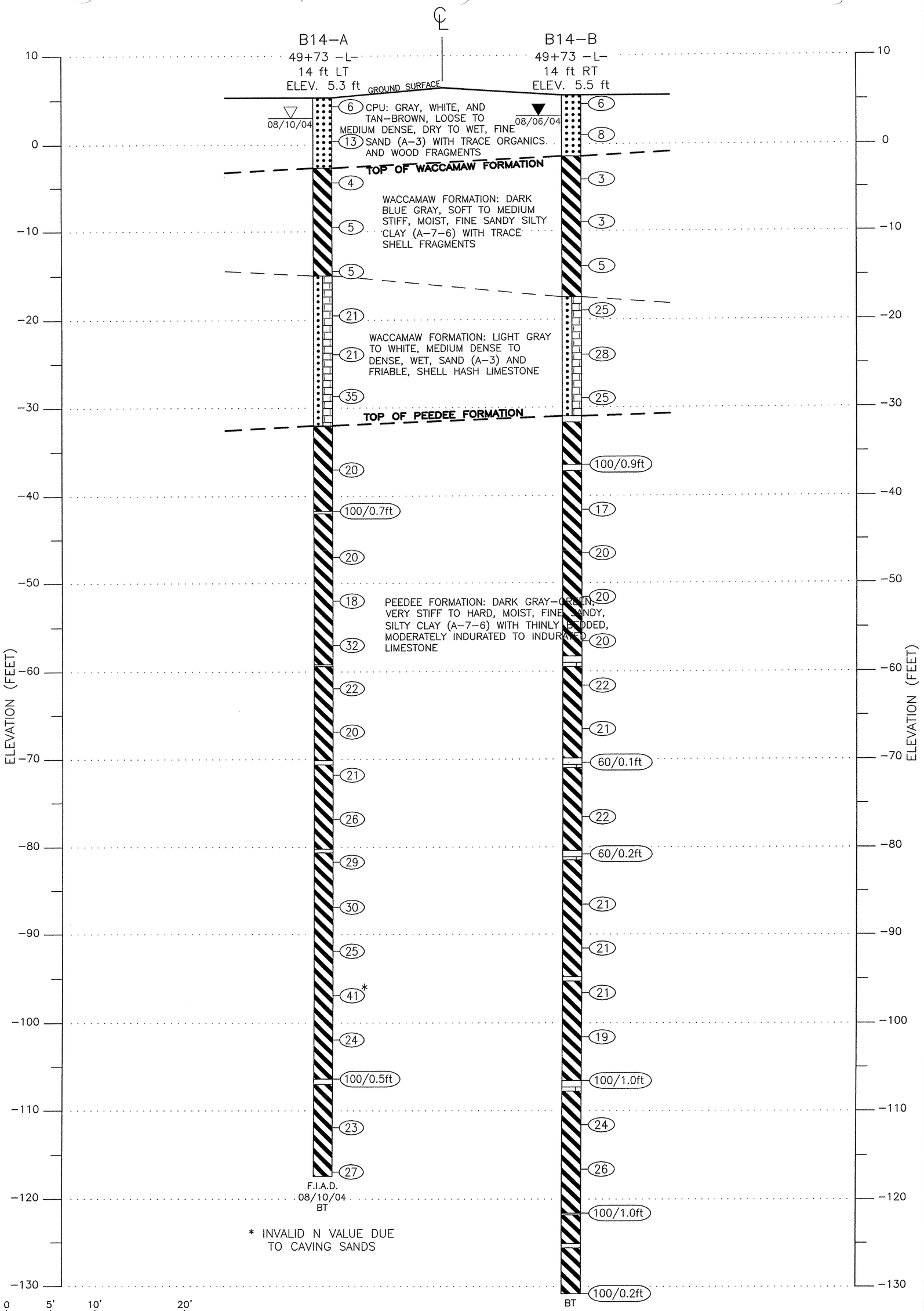
HORIZONTAL SCALE (FEET) 1" : 10'

CROSS SECTION THROUGH BENT 13

BRIDGE 198 OVER INTRACOASTAL WATERWAY ON SR 1172 AT SUNSET BEACH
NCDOT PROJECT NO. 8.2230101 (B–0682)
F.A. No. BRS–1813(1)
BRUNSWICK COUNTY, NORTH CAROLINA

MACTEC ENGINEERING AND CONSULTING, INC.
RALEIGH, NORTH CAROLINA

REVISIONS	DRAWN: R.R.	DATE: 09/30/04
05/12/05	DFT CHECK: W.B.D.	JOB : 6468–03–0165
	ENG CHECK: S.J.C.	DWG: 20

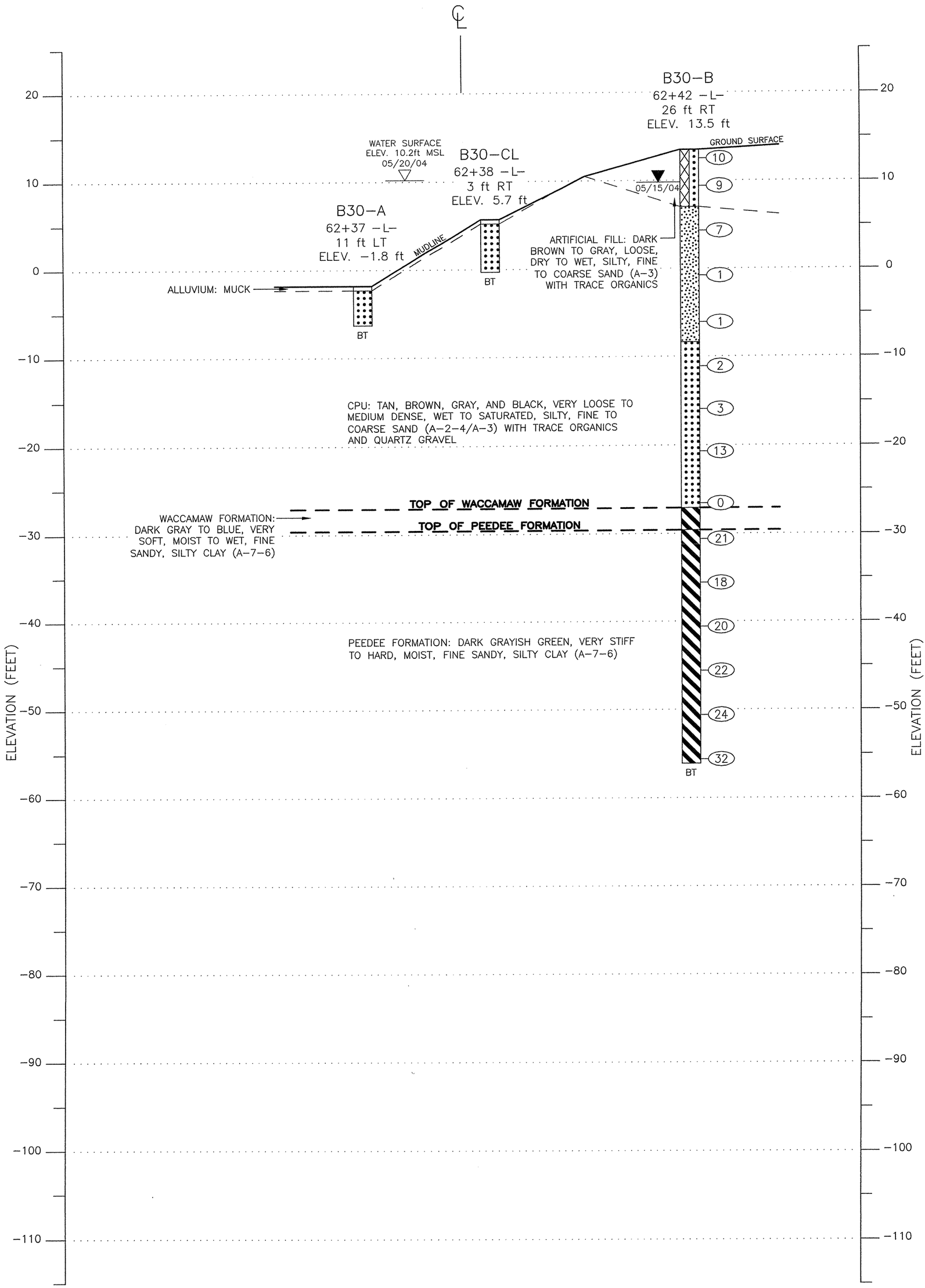


CROSS SECTION THROUGH BENT 14

BRIDGE 198 OVER INTRACOASTAL WATERWAY ON SR 1172 AT SUNSET BEACH
NCDOT PROJECT NO. 8.2230101 (B-0682)
F.A. No. BRS-1813(1)
BRUNSWICK COUNTY, NORTH CAROLINA

MACTEC ENGINEERING AND CONSULTING, INC.
RALEIGH, NORTH CAROLINA

REVISIONS	DRAWN: R.R.	DATE: 09/30/04
05/12/05	DFT CHECK: W.B.D.	JOB : 6468-03-0165
	ENG CHECK: S.J.C.	DWG: 21



0 5' 10' 20'
VERTICAL SCALE (FEET)
1" : 10'

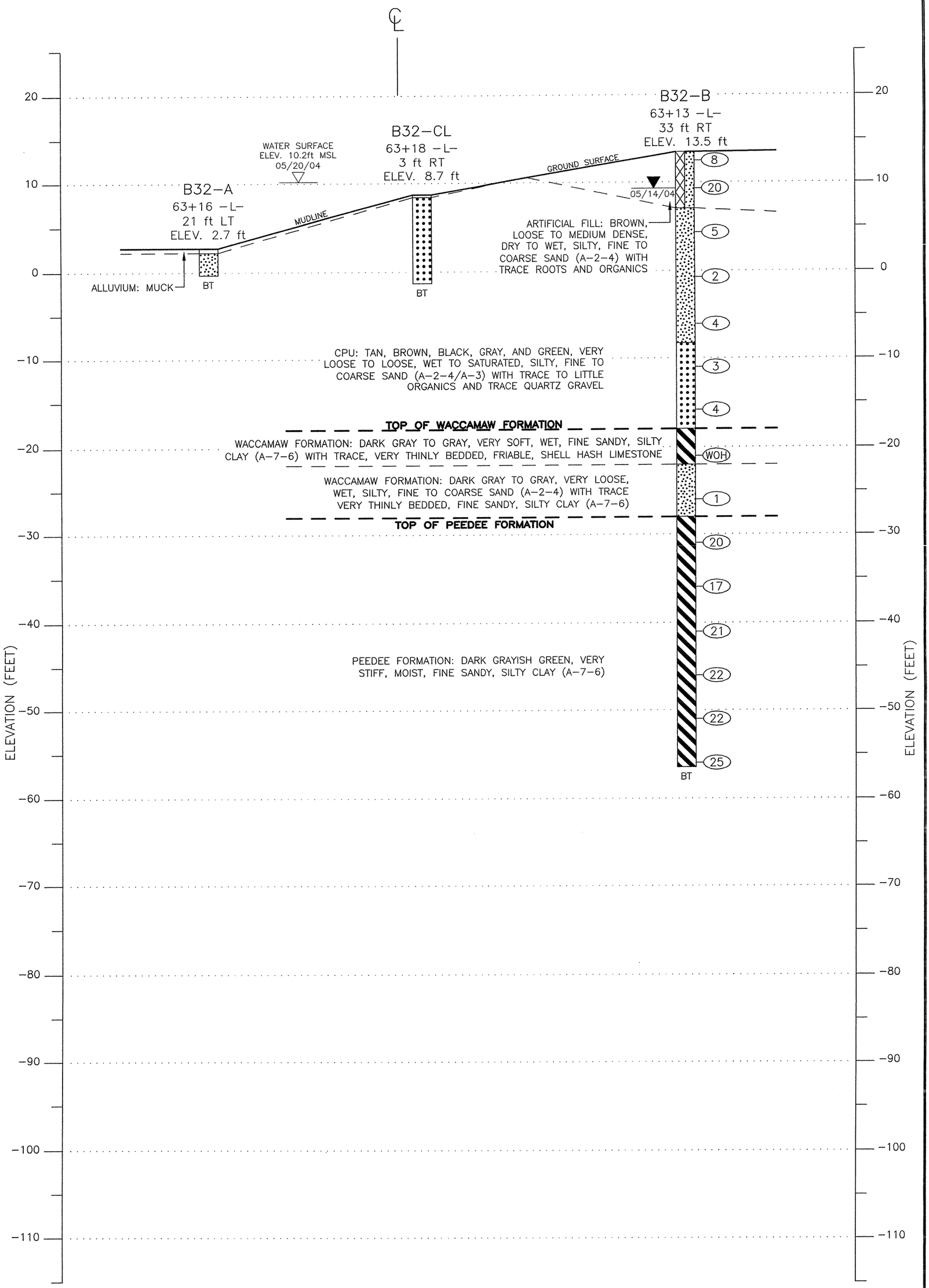
0 5' 10' 20'
HORIZONTAL SCALE (FEET)
1" : 10'

CROSS SECTION THROUGH BENT 30

BRIDGE 198 OVER INTRACOASTAL WATERWAY ON SR 1172 AT SUNSET BEACH
NCDOT PROJECT NO. 8.2230101 (B–0682)
F.A. No. BRS–1813(1)
BRUNSWICK COUNTY, NORTH CAROLINA

MACTEC ENGINEERING AND CONSULTING, INC.
RALEIGH, NORTH CAROLINA

REVISIONS	DRAWN: R.R.	DATE: 09/30/04
05/12/05	DFT CHECK: W.B.D.	JOB : 6468–03–0165
	ENG CHECK: S.J.C.	DWG: 22



0 5' 10' 20'
VERTICAL SCALE (FEET)
1" : 10'

0 5' 10' 20'
HORIZONTAL SCALE (FEET)
1" : 10'

CROSS SECTION THROUGH BENT 32

BRIDGE 198 OVER INTRACOASTAL WATERWAY ON SR 1172 AT SUNSET BEACH
NCDOT PROJECT NO. 8.2230101 (B–0682)
F.A. No. BRS–1813(1)
BRUNSWICK COUNTY, NORTH CAROLINA

MACTEC ENGINEERING AND CONSULTING, INC.
RALEIGH, NORTH CAROLINA

REVISIONS	DRAWN: R.R.	DATE: 09/30/04
05/12/05	DFT CHECK: W.B.D.	JOB : 6468–03–0165
	ENG CHECK: S.J.C.	DWG: 23

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET 1 OF 2

MACTEC

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. EB1	**BORING LOCATION** 32+04	**OFFSET** 13 ft LT	**ALIGNMENT** -L-	**0 HR.** 3.0
COLLAR ELEV. 4.7 ft	**NORTHING** 46,806 **US ft**	**EASTING** 2,148,815 **US ft**		**24 HR.** FIAD
TOTAL DEPTH 122.7 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Mud-Rotary/Core	**HAMMER TYPE** 140 lb Manual	
DATE STARTED 4/28/03	**COMPLETED** 5/1/03	**SURFACE WATER DEPTH** N/A		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
4.7					Ground Surface				
4.7	0.0	WOH	1	1	2		M		Roadway Embankment Fill: Tan-brown, silty, fine to coarse SAND (A-2-4) with ABC stone
1.2	3.5								4.7 / 0.0
		8	6	5	11	SS-1	M/W		Roadway Embankment Fill: Gray-brown, silty, clayey, fine to coarse SAND and Shell Fragments (A-1-b)
-3.8	8.5								2.2 / 2.5
		9	10	11	21	SS-2	M/W		-4.7 / 9.4
-8.8	13.5								Coastal Plain Undivided: Gray to black, silty, fine to coarse SAND (A-3)
		12	9	7	16	SS-3	W		
-13.8	18.5								
		5	6	6	12		W		-16.5 / 21.2
-19.2	23.9								Coastal Plain Undivided: Gray to black, silty, fine to coarse SAND (A-2-4)
		4	1	1	2		W		-19.6 / 24.3
-24.4	29.1								Waccamaw Fm.: Gray to black, silty clay (A-7-6) with trace organics
		WOH	WOH	WOH	WOH	SS-4	83.1%		
-29.7	34.4								-30.2 / 34.9
		100/0.5			100/0.5				-30.9 / 35.6
-32.7	37.4								Peedee Fm.: Gray to black, thinly bedded, indurated LIMESTONE
		1	5	10	15		W		Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
-37.7	42.4								
		5	9	11	20		W		-38.8 / 44.5
									-40.2 / 45.9
									-41.9 / 46.6
									-42.6 / 47.3
									Peedee Fm.: Gray to black, thinly bedded, moderately indurated LIMESTONE
									Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
-47.0	51.7								
		9	13	16	29	SS-5	32.2%		
-52.0	56.7								
		11	12	14	26		M		
-57.0	61.7								
		10	9	12	21		M		-58.8 / 63.5
-62.0	66.7								-59.8 / 64.5
		9	11	14	25		M		Peedee Fm.: Gray to black, thinly bedded, indurated LIMESTONE
-67.0	71.7								Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
		10	10	13	23		M		

NCDOT BORE SINGLE 0165SU-1.GPJ NC DOT.GDT 9/29/04

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET NO.	TOTAL SHEETS
28	209

SHEET 2 OF 2

MACTEC

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. EB1	**BORING LOCATION** 32+04	**OFFSET** 13 ft LT	**ALIGNMENT** -L-	**0 HR.** 3.0
COLLAR ELEV. 4.7 ft	**NORTHING** 46,806 **US ft**	**EASTING** 2,148,815 **US ft**		**24 HR.** FIAD
TOTAL DEPTH 122.7 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Mud-Rotary/Core	**HAMMER TYPE** 140 lb Manual	
DATE STARTED 4/28/03	**COMPLETED** 5/1/03	**SURFACE WATER DEPTH** N/A		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-70.1					Continued from previous page				
-72.0	76.7	10	9	12	21		M		
-77.0	81.7	13	14	17	31	SS-6	36.0%		
-81.5	86.2	10	17	16	33		M		
-86.5	91.2	6	13	27	40		M		
-91.5	96.2	11	17	17	34		M		
-96.5	101.2	16	16	18	34		M		
-101.5	106.2	14	14	17	31	SS-7	37.2%		
-106.5	111.2	16	48	52	100/4.0		M		
-111.5	116.2	10	13	17	30		M		
-116.5	121.2	14	16	19	35		M		
									-71.1 / 75.6
									-71.7 / 76.4
									Peedee Fm.: Gray to black, thinly bedded, indurated LIMESTONE
									Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
									-80.6 / 85.3
									-81.1 / 85.8
									Peedee Fm.: Gray to black, thinly bedded, indurated LIMESTONE
									Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
									-107.0 / 111.7
									-108.0 / 112.7
									Peedee Fm.: Gray to black, thinly bedded, moderately indurated LIMESTONE
									Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
									-118.0 / 122.7
									Boring terminated at 122.7 ft (Elev. -118.0 ft) in Peedee Fm.: Hard, fine sandy, silty CLAY (A-7-6)
									Bits Used: 0.3' roller cone; HQ core bit (surface set)
									Drilling Fluid Properties: 8.25 lbs/gal

NCDOT BORE SINGLE 0165SU-1.GPJ NC DOT.GDT 9/29/04

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

MACTEC

SHEET 1 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. EB1	**BORING LOCATION** 32+04	**OFFSET** 13 ft LT **ALIGNMENT** -L-	**0 HR.** 3.0
COLLAR ELEV. 4.7 ft	**NORTHING** 46,806 US ft	**EASTING** 2,148,815 US ft	**24 HR.** FIAD
TOTAL DEPTH 122.7 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Mud-Rotary/Core	**HAMMER TYPE** 140 lb Manual
DATE STARTED 4/28/03	**COMPLETED** 5/1/03	**SURFACE WATER DEPTH** N/A	
CORE SIZE HQ	**TOTAL RUN** 62.3 ft	**DRILLER** D. White	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 34.9 ft
-30.2	34.9	2.5	4:30 1:45 1:01/0.5	(0.7) 28%	(N/A)		(0.7) 100%	(N/A) (N/A)		-30.7 34.9 Peedee Fm.: Gray to black, thinly bedded, indurated LIMESTONE -32.7 37.4 Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
			N=15				(4.1) 69%			
-34.2	38.9	3.5	1:05 0:30 0:25	(3.5) 100%	(N/A)					
-37.7	42.4		0:20/0.5							
			N=20							
-39.2	43.9	2.9	5:30 1:30	(2.9) 100%	(N/A)		(0.4) 100%	(N/A)		-39.8 44.5 Peedee Fm.: Gray to black, thinly bedded, moderately indurated LIMESTONE -41.9 46.6 Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
-42.1	46.8		1:45/0.9				(1.7) 100%	(N/A)		-42.6 47.3 Peedee Fm.: Gray to black, thinly bedded, moderately indurated LIMESTONE
		4.9	2:35 1:41 1:12 1:27	(4.7) 96%	(N/A)		(0.5) 71%			Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
-47.0	51.7		1:19/0.9				(11.7) 100%			
			N=29			SS-5				
-48.5	53.2	3.5	1:20 1:06 1:30	(3.5) 100%	(N/A)					
-52.0	56.7		0:56/0.5							
			N=26							
-53.5	58.2	3.5	2:03 1:20 0:47	(3.5) 100%	(N/A)					
-57.0	61.7		0:26/0.5							
			N=21							-58.8 63.5
-58.5	63.2	3.5	3:30 2:12 1:21	(3.5) 100%	(N/A)		(1.0) 100%	(N/A) (N/A)		-59.8 64.5 Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
-62.0	66.7		0:30/0.5				(7.8) 94%			
			N=25							
-63.5	68.2	3.5	1:47 1:53 2:01	(3.5) 100%	(N/A)					
-67.0	71.7		0:33/0.5							
			N=23							
-68.5	73.2	3.5	0:56 2:02 4:30	(3.0) 86%	(N/A)					-71.1 75.8 -71.7 76.4 Peedee Fm.: Gray to black, thinly bedded, indurated LIMESTONE
-72.0	76.7		1:27/0.5				(0.6) 100%	(N/A) (N/A)		Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
			N=21				(5.9) 100%			
-73.5	78.2	3.5	1:35 1:33 1:50	(3.5) 100%	(N/A)					
-77.0	81.7		0:45/0.5							
			N=31			SS-6				
-78.5	83.2	3.0	2:41 2:05	(3.0) 100%	(N/A)					-80.6 85.3 -81.1 85.8 Peedee Fm.: Gray to black, thinly bedded, indurated LIMESTONE
-81.5	86.2		3:00				(0.5) 100%	(N/A) (N/A)		Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
			N=33				(11.2) 63%			
-83.0	87.7	3.5	2:06 1:46 1:50	(1.6) 46%	(N/A)					
-86.5	91.2		0:50/0.5							
			N=40							
-88.0	92.7	3.5	3:50 3:40 4:30	(0.0) 0%	(N/A)					
-91.5	96.2		1:37/0.5							
			N=34							
-93.0	97.7	3.5	3:08 3:58 1:58	(2.2) 63%	(N/A)					
-96.5	101.2		0:55/0.5							
			N=34							
-98.0	102.7	3.5	2:12 1:26 2:40	(3.5) 100%	(N/A)					
-101.5	106.2		1:03/0.5			SS-7				
			N=31							
-103.0	107.7	3.5	1:08 0:58	(3.5) 100%	(N/A)					

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

MACTEC

SHEET NO.	TOTAL SHEETS
29	209

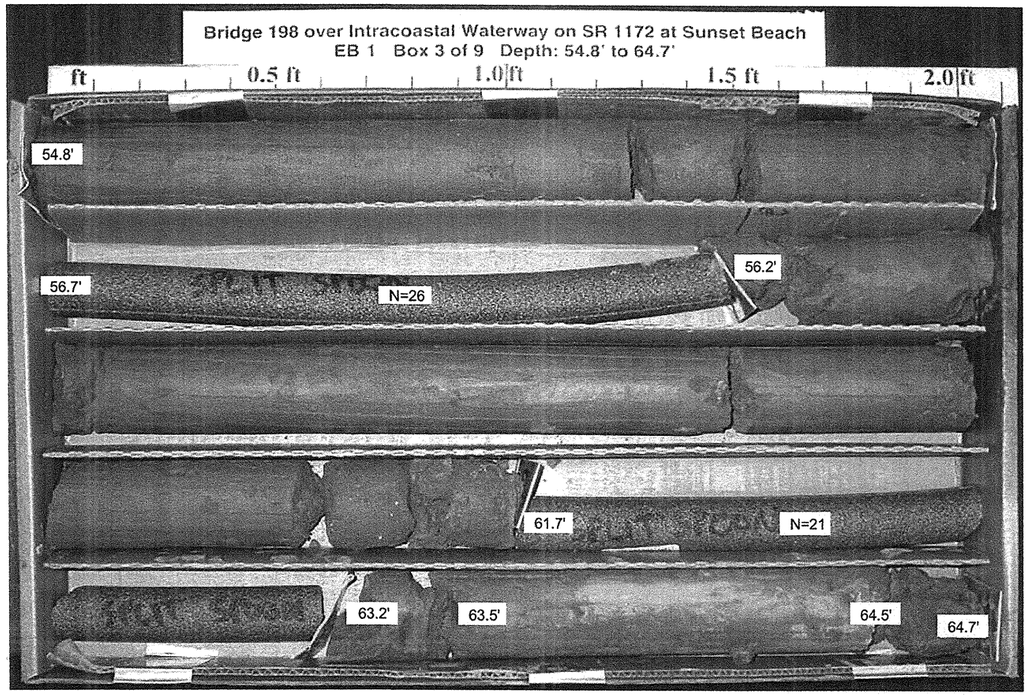
SHEET 2 OF 2

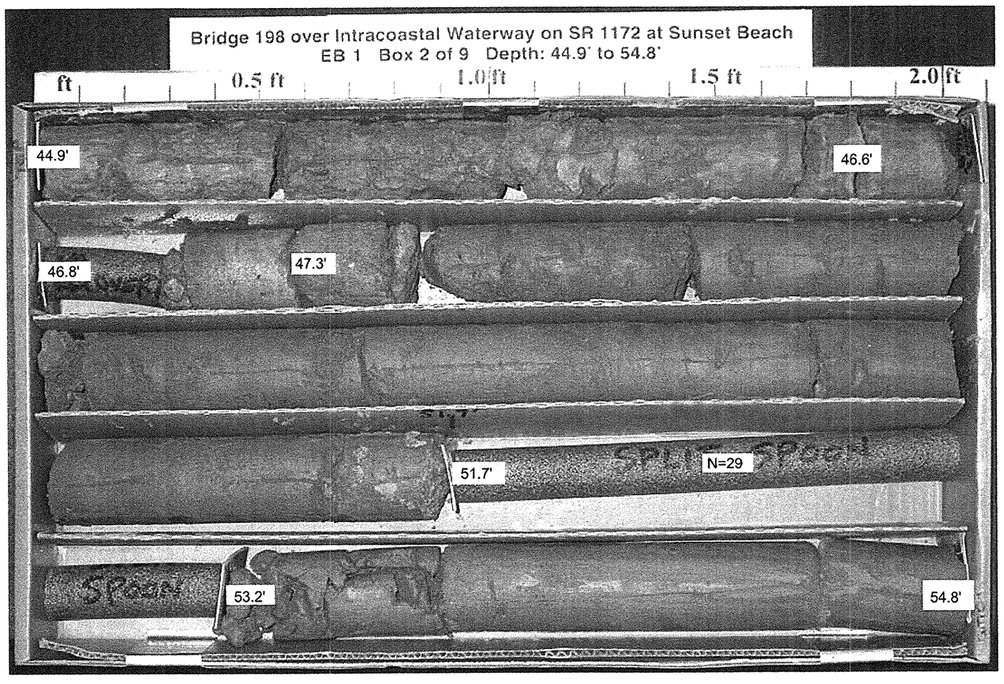
PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. EB1	**BORING LOCATION** 32+04	**OFFSET** 13 ft LT **ALIGNMENT** -L-	**0 HR.** 3.0
COLLAR ELEV. 4.7 ft	**NORTHING** 46,806 US ft	**EASTING** 2,148,815 US ft	**24 HR.** FIAD
TOTAL DEPTH 122.7 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Mud-Rotary/Core	**HAMMER TYPE** 140 lb Manual
DATE STARTED 4/28/03	**COMPLETED** 5/1/03	**SURFACE WATER DEPTH** N/A	
CORE SIZE HQ	**TOTAL RUN** 62.3 ft	**DRILLER** D. White	

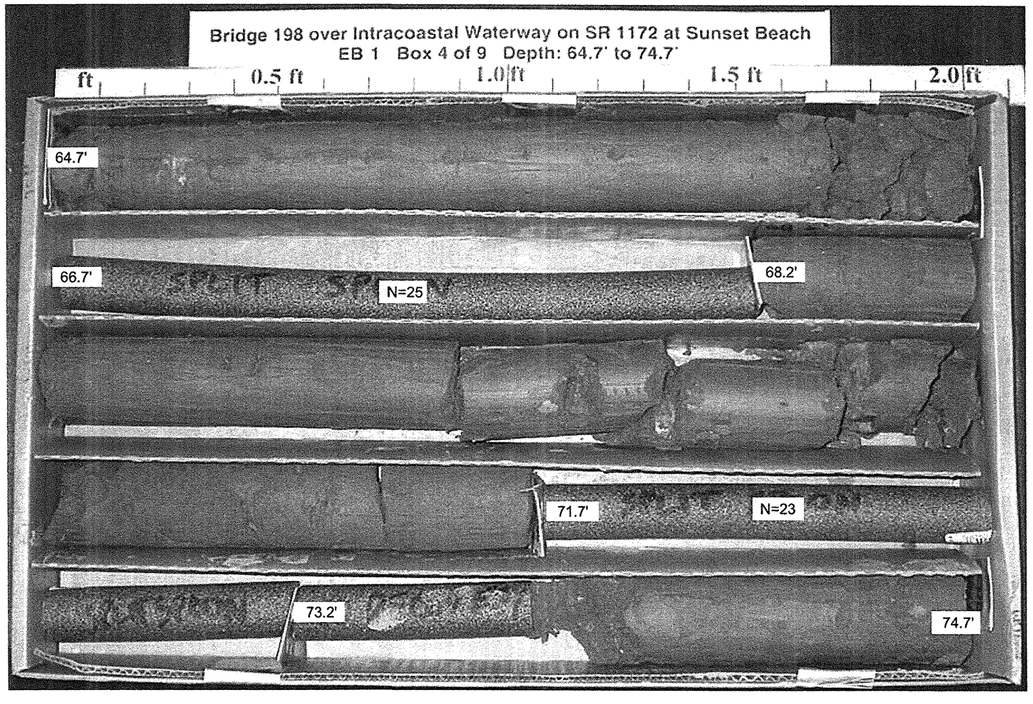
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Continued from previous page
-106.5	111.2		2:01 0:43/0.5							Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)*(continued)*
			N=100							-107.0 111.7 -108.0 112.7 Peedee Fm.: Gray to black, thinly bedded, moderately indurated LIMESTONE
-108.0	112.7	3.5	1:40 1:06 1:50	(3.0) 86%	(N/A)		(6.5) 93%	(N/A)		Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
-111.5	116.2		0:30/0.5							
			N=30							
-113.0	117.7	3.5	1:25 1:17 1:15	(3.5) 100%	(N/A)					
-116.5	121.2		0:43/0.5							-116.5 121.2 Coring terminated at 121.2 ft (Elev. -116.5 ft) in Peedee Fm.: Very stiff to hard, fine sandy, silty CLAY (A-7-6)

Core Photos
MACTEC Proj. No. 6468-03-0165

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)

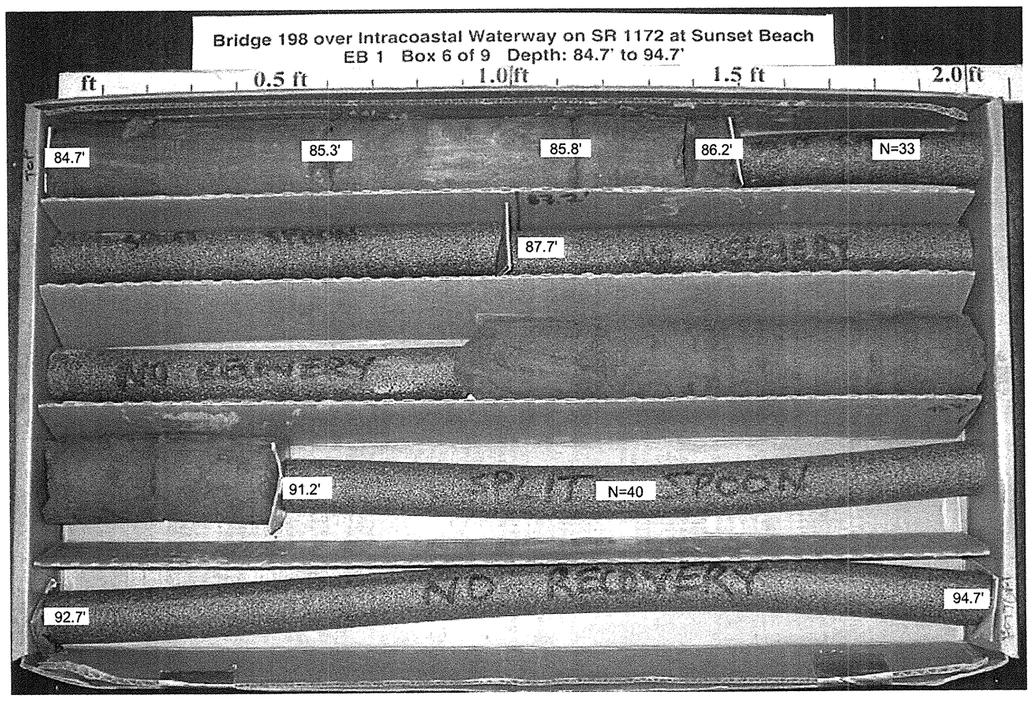


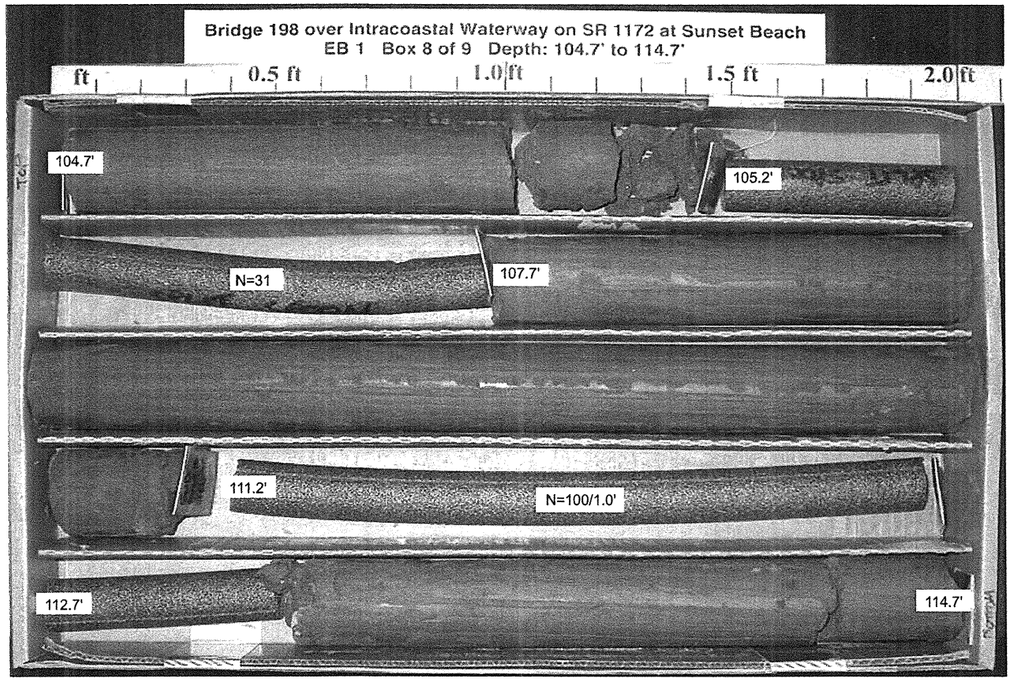


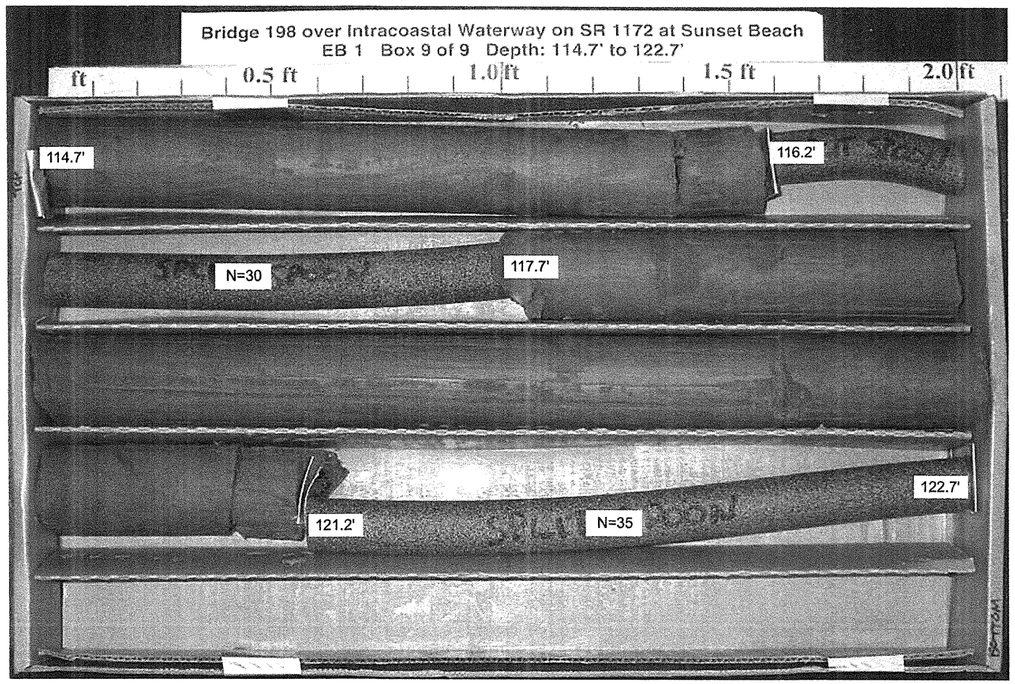


Core Photos
MACTEC Proj. No. 6468-03-0165

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)






Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
EB 1 Box 9 of 9 Depth: 114.7' to 122.7'
ft
0.5 ft
1.0 ft
1.5 ft
2.0 ft
114.7'
116.2'
N=30
117.7'
121.2'
N=35
122.7'

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET 1 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. B1	**BORING LOCATION** 33+15	**OFFSET** 14 ft LT	**ALIGNMENT** -L-	**0 HR.** 3.0
COLLAR ELEV. 5.2 ft	**NORTHING** 46,914 **US ft**	**EASTING** 2,148,787 **US ft**		**24 HR.** FIAD
TOTAL DEPTH 118.0 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Rotary-Wash/Core	**HAMMER TYPE** 140 lb Manual	
DATE STARTED 5/1/03	**COMPLETED** 5/7/03	**SURFACE WATER DEPTH** N/A		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
5.2					Ground Surface				5.2 0.0
5.2	0.0	15	16	16	32	SS-10	M		Roadway Embankment Fill: Tan-brown, silty, fine to coarse SAND (A-2-4) with ABC stone
0.5	4.7								3.0 2.2 Roadway Embankment Fill: Tan-brown, silty, clayey, SAND and Shell Fragments (A-1-b)
		6	5	6	11	SS-11	M/W		
-4.5	9.7								
		2	2	9	4		W		-5.5 10.7 Coastal Plain Undivided: Gray to black, silty, fine to coarse SAND (A-3)
-9.5	14.7								
		9	11	14	25	SS-8	W		
-12.6	17.8								
		6	8	11	19		W		
-17.6	22.8								
		10	5	4	9		W		
-25.2	30.4								-20.9 26.1 Waccamaw Fm.: Gray to black, silty clay (A-7-6)
		WOH	WOH	WOH	WOH	ST-1	W		ST-1: Shelby tube pushed from 27.9 ft to 30.1 ft; recovery 2.2 ft (100%)
-28.4	33.6								
		1	3	97/0.2	100/0.7		W		-29.4 34.6
-37.0	42.2								-31.2 36.4 Peedee Fm.: Gray to black, thickly bedded, indurated LIMESTONE
		7	10	11	21		M		Peedee Fm.: Gray to black, fine sandy, silty CLAY (A-7-6)
-42.0	47.2								-41.3 46.5
		7	10	12	22		M		-41.9 47.1 Peedee Fm.: Gray to black, thinly bedded, indurated LIMESTONE
-46.5	51.7								Peedee Fm.: Gray to black, fine sandy, silty CLAY (A-7-6)
		11	12	13	25		M		
-51.3	56.5								
		7	10	12	22		M		
-56.3	61.5								
		9	10	14	24		M		
-61.3	66.5								
		8	13	14	27		M		
-66.3	71.5								
		10	12	16	28		M		-69.1 74.3 -69.8 75.0

NCDOT BORE SINGLE 0165SU-1.GPJ NC_DOT.GDT 5/12/05

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET NO.	TOTAL SHEETS
33	209

SHEET 2 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. B1	**BORING LOCATION** 33+15	**OFFSET** 14 ft LT	**ALIGNMENT** -L-	**0 HR.** 3.0
COLLAR ELEV. 5.2 ft	**NORTHING** 46,914 **US ft**	**EASTING** 2,148,787 **US ft**		**24 HR.** FIAD
TOTAL DEPTH 118.0 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Rotary-Wash/Core	**HAMMER TYPE** 140 lb Manual	
DATE STARTED 5/1/03	**COMPLETED** 5/7/03	**SURFACE WATER DEPTH** N/A		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-69.6					Continued from previous page				
-71.3	76.5	9	13	16	29		M		Peedee Fm.: Gray to black, thinly bedded, indurated LIMESTONE *(continued)*
-76.3	81.5	10	13	15	28		M		Peedee Fm.: Gray to black, fine sandy, silty CLAY (A-7-6)
-81.3	86.5	10	14	15	29		M		-79.0 84.2 -79.9 85.1 Peedee Fm.: Gray to black, thinly bedded, indurated LIMESTONE
-86.3	91.5	11	12	16	28		M		Peedee Fm.: Gray to black, fine sandy, silty CLAY (A-7-6)
-91.3	96.5	10	15	15	30		M		-93.6 98.8 -93.9 99.1 Peedee Fm.: Gray to black, thinly bedded, indurated LIMESTONE
-96.3	101.5	100/0.5			100/0.5				-96.3 101.5 -96.8 102.0 Peedee Fm.: Gray to black, fine sandy, silty CLAY (A-7-6)
-101.3	106.5	9	14	19	33		M		Peedee Fm.: Gray to black, thinly bedded, indurated LIMESTONE
-106.3	111.5	66	34/0.5		100/1.0				Peedee Fm.: Gray to black, fine sandy, silty CLAY (A-7-6)
-111.3	116.5	10	15	19	34		M		-106.3 111.5 -107.3 112.5 Peedee Fm.: Gray to black, thinly bedded, indurated LIMESTONE
									Peedee Fm.: Gray to black, fine sandy, silty CLAY (A-7-6)
									-112.8 118.0 Boring terminated at 118.0 ft (Elev. -112.8 ft) in Peedee Fm.: Hard, silty, fine sandy CLAY (A-7-6)

Bits Used: 0.3' roller cone; HQ core bit (surface set)

Drilling Fluid Properties: Water

NCDOT BORE SINGLE 0165SU-1.GPJ NC_DOT.GDT 5/12/05

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

SHEET 1 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. B1	**BORING LOCATION** 33+15	**OFFSET** 14 ft LT **ALIGNMENT** -L-	**0 HR.** 3.0
COLLAR ELEV. 5.2 ft	**NORTHING** 46,914 **US ft**	**EASTING** 2,148,787 **US ft**	**24 HR.** FIAD
TOTAL DEPTH 118.0 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Rotary-Wash/Core	**HAMMER TYPE** 140 lb Manual
DATE STARTED 5/1/03	**COMPLETED** 5/7/03	**SURFACE WATER DEPTH** N/A	
CORE SIZE HQ	**TOTAL RUN** 59.7 ft	**DRILLER** D. White	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 35.8 ft
-30.6	35.8	1.4	3:00	(0.6)	(N/A)		(0.6)	(N/A)		-31.2 Peedee Fm.: Gray to black, thickly bedded, indurated LIMESTONE *(continued)* 35.4
-32.0	37.2	5.0	2:00/0.4	43%	(N/A)		100%	(N/A)		Peedee Fm: Dark gray to black, thinly bedded, LIMESTONE with fragments.
			2:04	(4.5)			(7.3)			Peedee Fm.: Gray to black, fine sandy, silty CLAY (A-7-6)
			1:25	90%			85%			
			1:22							
-37.0	42.2		0:52							
			1:06							
			N=21							
-38.5	43.7	3.5	1:03	(3.5)	(N/A)					
			1:10	100%						
-42.0	47.2		3:22							
			2:54/0.5							
			N=22							
-43.5	48.7	3.0	1:25	(2.6)	(N/A)		(0.6)	(N/A)		-41.3 Peedee Fm.: Gray to black, thinly bedded, indurated LIMESTONE 46.5
			1:10	87%			100%	(N/A)		-41.9 Peedee Fm.: Gray to black, fine sandy, silty CLAY (A-7-6) 47.1
-46.5	51.7		1:09				(17.5)			
			N=25				96%			
-48.0	53.2	3.3	1:45	(3.0)	(N/A)					
			1:55	91%						
-51.3	56.5		2:00							
			1:12/0.3							
			N=22							
-52.8	58.0	3.5	2:55	(3.5)	(N/A)					
			1:55	100%						
-56.3	61.5		1:30							
			0:56/0.5							
			N=24							
-57.8	63.0	3.5	1:06	(3.5)	(N/A)					
			1:15	100%						
-61.3	66.5		1:04							
			0:31/0.5							
			N=27							
-62.8	68.0	3.5	0:55	(3.5)	(N/A)					
			0:47	100%						
-66.3	71.5		1:00							
			0:26/0.5							
			N=28							
-67.8	73.0	3.5	1:10	(2.5)	(N/A)					-69.1 74.3
			3:25	71%			(0.7)	(N/A)		-69.8 Peedee Fm.: Gray to black, thinly bedded, indurated LIMESTONE 75.0
-71.3	76.5		1:15				100%	(N/A)		Peedee Fm.: Gray to black, fine sandy, silty CLAY (A-7-6)
			0:45/0.5				(5.2)			
			N=29				84%			
-72.8	78.0	3.5	0:55	(3.5)	(N/A)					
			0:50	100%						
-76.3	81.5		0:45							
			0:15/0.5							
			N=28							
-77.8	83.0	3.5	1:25	(2.1)	(N/A)					-79.0 84.2
			5:25	60%			(0.9)	(N/A)		-79.9 Peedee Fm.: Gray to black, thinly bedded, indurated LIMESTONE 85.1
-81.3	86.5		4:00				100%	(N/A)		Peedee Fm.: Gray to black, fine sandy, silty CLAY (A-7-6)
			1:00/0.5				(7.5)			
			N=29				82%			
-82.8	88.0	3.5	0:50	(3.5)	(N/A)					
			0:30	100%						
-86.3	91.5		0:35							
			0:18/0.5							
			N=28							
-87.8	93.0	3.5	1:20	(3.2)	(N/A)					
			1:45	91%						
-91.3	96.5		1:20							
			0:40/0.5							
			N=30							
-92.8	98.0	3.5	1:35	(3.5)	(N/A)					-93.6 98.8
			2:10	100%			(0.3)	(N/A)		-93.9 Peedee Fm.: Gray to black, thinly bedded, indurated LIMESTONE 99.1
-96.3	101.5		0:32				100%	(N/A)		Peedee Fm.: Gray to black, fine sandy, silty CLAY (A-7-6)
			0:35/0.5				(2.4)			-96.3 101.5
			N=100/0.5				100%	(N/A)		-96.6 Peedee Fm.: Gray to black, thinly bedded, indurated LIMESTONE 102.0
-96.8	102.0	4.5	2:15	(4.5)	(N/A)		(4.5)			Peedee Fm.: Gray to black, fine sandy, silty CLAY (A-7-6)
			1:10	100%			56%			
			1:15							
-101.3	106.5		0:45							
			0:45/0.5							
			N=33							
-102.8	108.0	3.5	2:15	(0.0)	(N/A)					
			2:17	0%						

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

SHEET NO.	TOTAL SHEETS
34	209

SHEET 2 OF 2

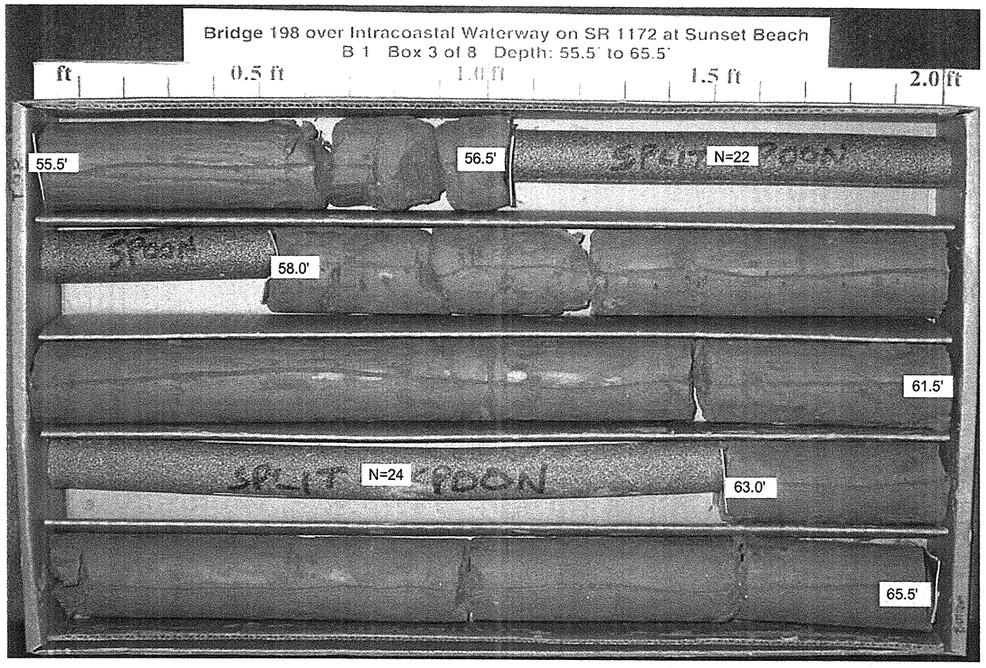
PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. B1	**BORING LOCATION** 33+15	**OFFSET** 14 ft LT **ALIGNMENT** -L-	**0 HR.** 3.0
COLLAR ELEV. 5.2 ft	**NORTHING** 46,914 **US ft**	**EASTING** 2,148,787 **US ft**	**24 HR.** FIAD
TOTAL DEPTH 118.0 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Rotary-Wash/Core	**HAMMER TYPE** 140 lb Manual
DATE STARTED 5/1/03	**COMPLETED** 5/7/03	**SURFACE WATER DEPTH** N/A	
CORE SIZE HQ	**TOTAL RUN** 59.7 ft	**DRILLER** D. White	

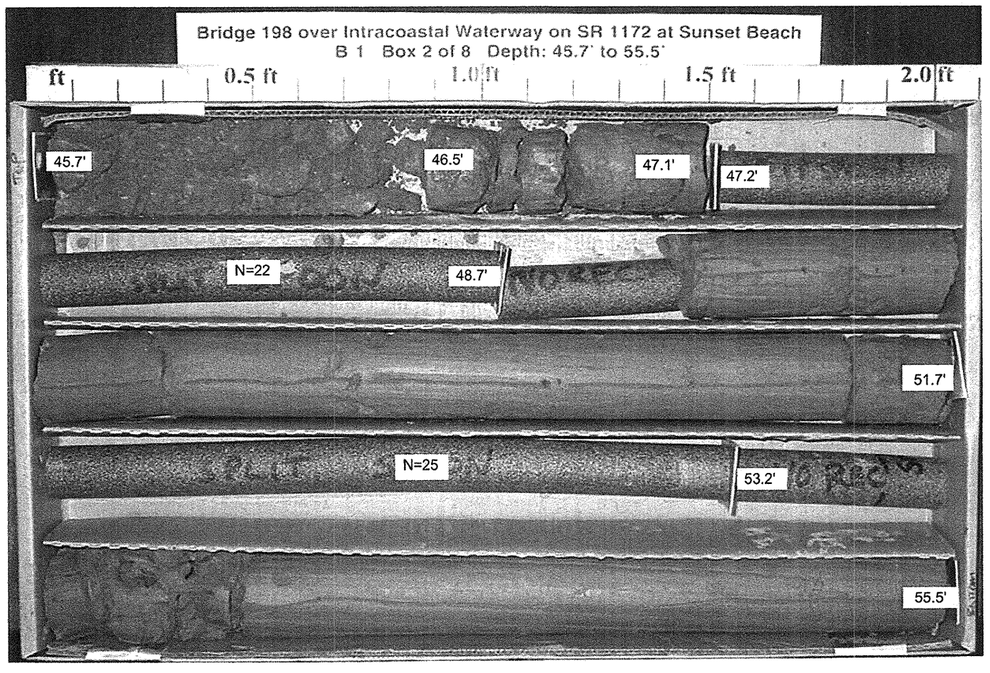
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Continued from previous page
-106.3	111.5		1:10							-106.3 111.5
			1:20/0.5							-107.3 Peedee Fm.: Gray to black, thinly bedded, indurated LIMESTONE 112.5
-107.3	112.5	4.0	*N=100/1.0*	(0.0)	(N/A)		(0.0)	(N/A)		Peedee Fm.: Gray to black, fine sandy, silty CLAY (A-7-6)
			2:20	0%			0%			
			2:43							
-111.3	116.5		3:20							-111.3 116.5
			3:11							Coring terminated at 116.5 ft (Elev. -111.3 ft) in Peedee Fm.: Hard, silty, fine sandy CLAY (A-7-6)

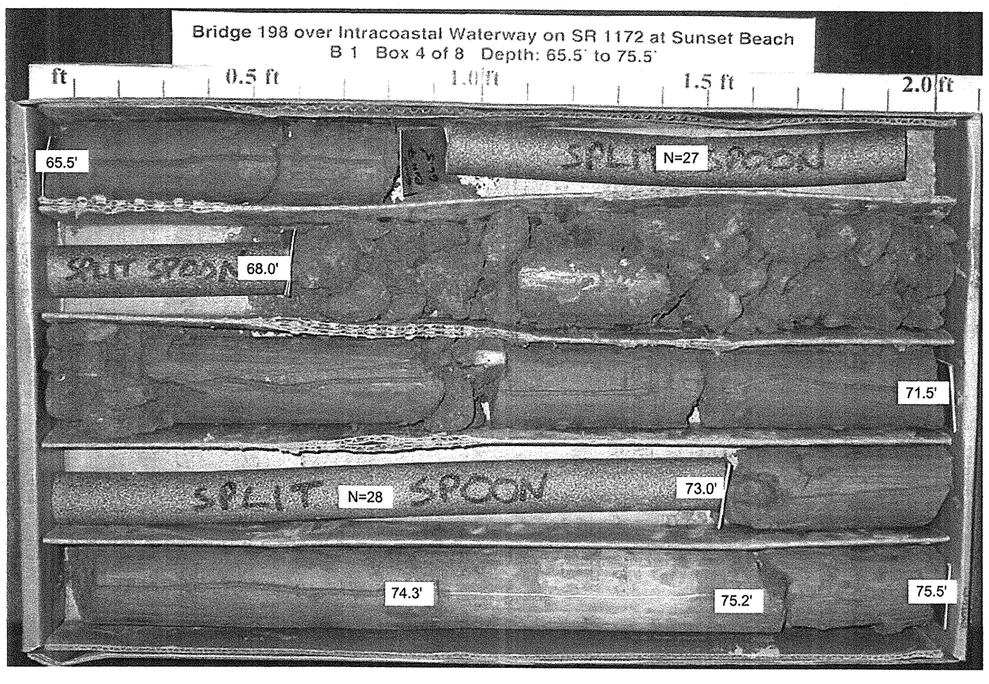
NCDOT CORE SINGLE 0165SU-1.GPJ NC DOT.GDT 5/12/05

Core Photos
MACTEC Proj. No. 6468-03-0165

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)

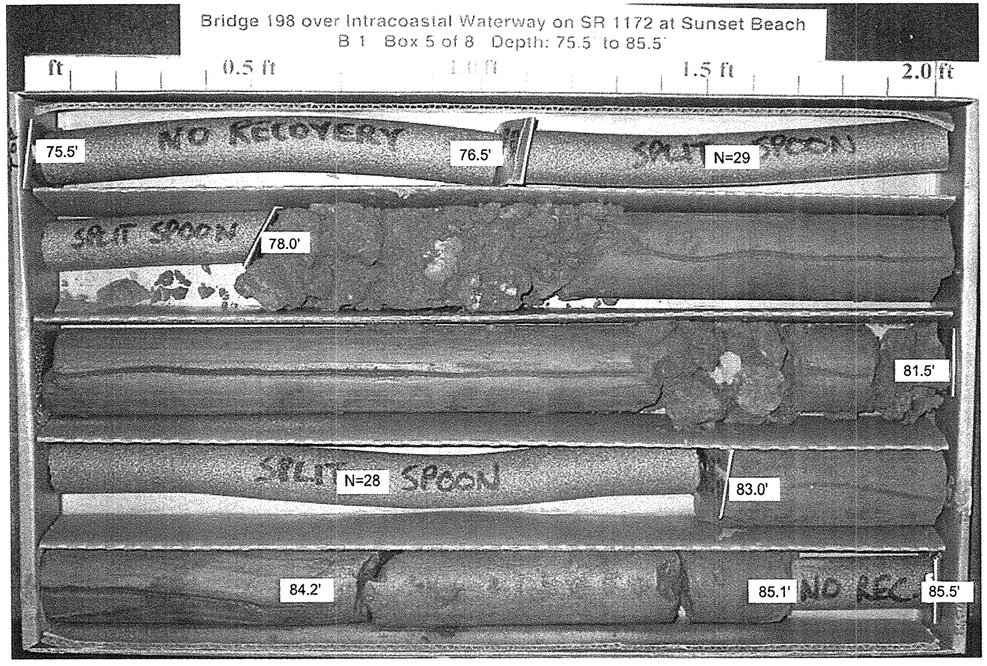


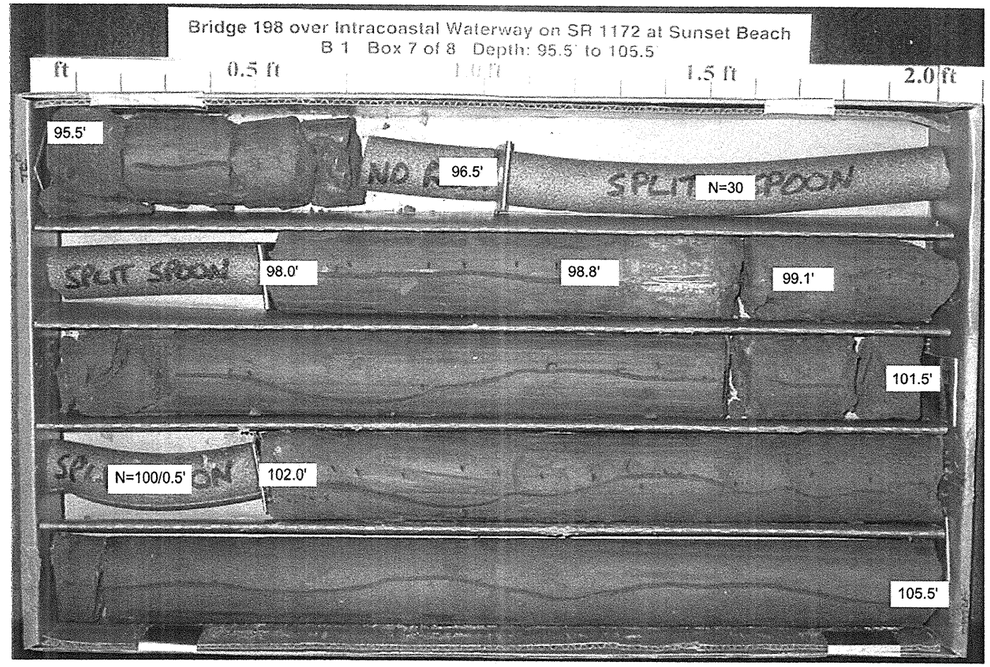


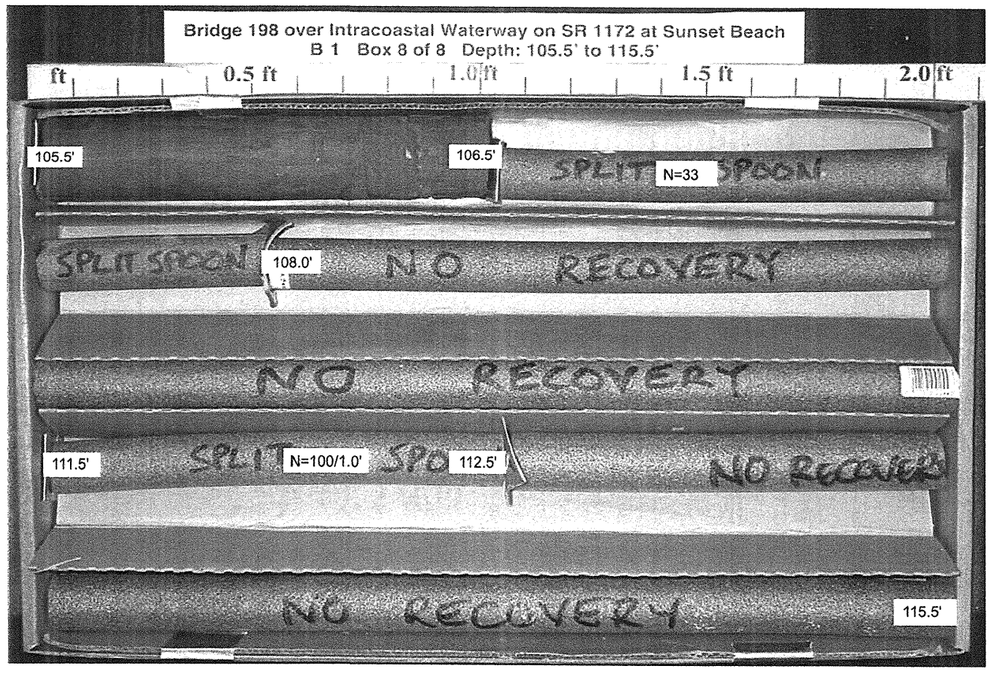


Core Photos
MACTEC Proj. No. 6468-03-0165

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)







N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET 1 OF 2

MACTEC

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. B2	**BORING LOCATION** 34+28	**OFFSET** 10 ft LT	**ALIGNMENT** -L-	**0 HR.** 3.1
COLLAR ELEV. 4.5 ft	**NORTHING** 47,025 **US ft**	**EASTING** 2,148,764 **US ft**		**24 HR.** FIAD
TOTAL DEPTH 123.1 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Rotary-Wash/Core	**HAMMER TYPE** 140 lb Manual	
DATE STARTED 5/7/03	**COMPLETED** 5/13/03	**SURFACE WATER DEPTH** N/A		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
4.5					Ground Surface				
4.5	0.0	17	23	24	47		M		ASPHALT 4.0 / 0.5
0.4	4.1								Roadway Embankment Fill: Tan-brown and gray, silty, fine to coarse SAND (A-2-4) with ABC stone and shell fragments
		11	11	14	25		M/W		
-4.6	9.1								-2.9 / 7.4
		2	1	3	4		W		Coastal Plain Undivided: Gray to black, silty, clayey, fine to coarse SAND (A-2-4) with shell fragments
-9.6	14.1								
		1	0	1	1	SS-12	W		
-14.6	19.1								
		2	2	2	4		W		
-19.6	24.1								
		3	1	2	3	SS-9	W		
-24.6	29.1								
		WOH	WOH	WOH	WOH		W		-22.8 / 27.3
-29.6	34.1								Waccamaw Fm.: Gray to black, silty clay (A-7-6) with trace organics
		WOH	1	3	4		W		-31.1 / 35.6
-32.1	36.6								Peedee Fm.: Tan-gray, thinly bedded, moderately indurated LIMESTONE
		4	7	9	16		M		Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
-37.1	41.6								
		6	8	10	18		M		-40.4 / 44.9
-42.1	46.6								Peedee Fm.: Gray to black, thinly bedded, moderately indurated LIMESTONE
		5	7	9	16		M		Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
-47.1	51.6								
		7	9	10	19		M		
-52.1	56.6								
		6	9	11	20		M		
-57.1	61.6								
		55	37	23	60		M		
-62.1	66.6								
		12	12	13	25		M		
-67.1	71.6								
		14	50	50/0.0	100/0.5		M		-67.6 / 72.1
									-69.5 / 74.0 Peedee Fm.: Gray to black, thinly bedded, moderately indurated LIMESTONE

NCDOT BORE SINGLE 0165SU~1.GPJ NC_DOT.GDT 9/27/04

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET NO.	TOTAL SHEETS
37	209

SHEET 2 OF 2

MACTEC

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. B2	**BORING LOCATION** 34+28	**OFFSET** 10 ft LT	**ALIGNMENT** -L-	**0 HR.** 3.1
COLLAR ELEV. 4.5 ft	**NORTHING** 47,025 **US ft**	**EASTING** 2,148,764 **US ft**		**24 HR.** FIAD
TOTAL DEPTH 123.1 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Rotary-Wash/Core	**HAMMER TYPE** 140 lb Manual	
DATE STARTED 5/7/03	**COMPLETED** 5/13/03	**SURFACE WATER DEPTH** N/A		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-70.3					Continued from previous page				
-72.1	76.6								
		7	10	12	22		M		Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6) *(continued)*
-77.1	81.6								
		9	14	16	30		M		
-82.1	86.6								-80.1 / 84.6
		12	13	16	29		M		-80.9 / 85.4 Peedee Fm.: Gray to black, thinly bedded, moderately indurated LIMESTONE
-87.1	91.6								Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
		9	13	13	26		M		
-92.1	96.6								
		10	13	15	28		M		
-97.1	101.6								-96.2 / 100.7 -96.8 / 101.3 Peedee Fm.: Gray to black, thinly bedded, moderately indurated LIMESTONE
		10	15	15	30		M		Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
-102.1	106.6								
		9	15	16	31		M		
-107.1	111.6								-107.6 / 112.1 -106.2 / 112.7 Peedee Fm.: Gray to black, thinly bedded, moderately indurated LIMESTONE
		10	90/0.2		100/0.7				Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
-112.1	116.6								
		10	13	15	28		M		
-117.1	121.6								
		12	16	19	35		M		-118.6 / 123.1
									Boring terminated at 123.1 ft (Elev. -118.6 ft) in Peedee Fm.: Hard, silty, fine sandy CLAY (A-7-6)
									Bits Used: 0.3' roller cone; HQ core bit (surface set)
									Drilling Fluid Properties: Water

NCDOT BORE SINGLE 0165SU~1.GPJ NC_DOT.GDT 9/27/04

MACTEC

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

SHEET 1 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. B2	**BORING LOCATION** 34+28	**OFFSET** 10 ft LT **ALIGNMENT** -L-	**0 HR.** 3.1
COLLAR ELEV. 4.5 ft	**NORTHING** 47,025 US ft	**EASTING** 2,148,764 US ft	**24 HR.** FIAD
TOTAL DEPTH 123.1 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Rotary-Wash/Core	**HAMMER TYPE** 140 lb Manual
DATE STARTED 5/7/03	**COMPLETED** 5/13/03	**SURFACE WATER DEPTH** N/A	
CORE SIZE HQ	**TOTAL RUN** 61.7 ft	**DRILLER** D. White	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 35.6 ft
-31.1	35.6	1.0	1:36	(1.0)	(N/A)		(0.2)	(N/A)		-31.1 Peedee Fm.: Tan-gray, thinly bedded, moderately indurated LIMESTONE 35.6
-32.1	36.6		N=16	100%			100%	(N/A)		Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
-33.6	38.1	3.5	1:30 1:50 2:15	(3.5) 100%	(N/A)		(6.1) 100%			
-37.1	41.6		1:15/0.5 N=18							
-38.6	43.1	3.5	0:55 3:26 2:00	(3.5) 100%	(N/A)					-40.4 44.9
-42.1	46.6		0:35/0.5 N=16				(0.3) 100%	(N/A) (N/A)		Peedee Fm.: Gray to black, thinly bedded, moderately indurated LIMESTONE Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
-43.6	48.1	3.5	1:05 1:15 1:43	(3.5) 100%	(N/A)		(13.0) 69%			
-47.1	51.6		0:56/0.5 N=19							
-48.6	53.1	3.5	1:53 1:16 0:42	(3.5) 100%	(N/A)					
-52.1	56.6		0:34/0.5 N=20							
-53.6	58.1	3.5	1:07 0:40 0:40	(2.3) 66%	(N/A)					
-57.1	61.6		0:27/0.5 N=60							
-58.6	63.1	3.5	2:22 2:30 4:00	(0.0) 0%	(N/A)					
-62.1	66.6		2:10/0.5 N=25							
-63.6	68.1	3.5	1:21 1:26 1:30	(2.3) 66%	(N/A)					
-67.1	71.6		0:35/0.5 N=100/0.5							-67.6 72.1
-68.1	72.6	4.0	4:25 2:57 1:50	(1.4) 35%	(N/A)		(1.4) 100%	(N/A)		Peedee Fm.: Gray to black, thinly bedded, moderately indurated LIMESTONE -69.5 74.0
-72.1	76.6		2:00 N=22				(4.3) 57%	(N/A)		Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
-73.6	78.1	3.5	2:00 1:30 1:25	(2.8) 80%	(N/A)					
-77.1	81.6		0:35/0.5 N=30							
-78.6	83.1	3.5	4:25 4:18 1:35	(3.5) 100%	(N/A)					-80.1 84.6
-82.1	86.6		0:35/0.5 N=29				(0.8) 100%	(N/A) (N/A)		-80.9 85.4 Peedee Fm.: Gray to black, thinly bedded, moderately indurated LIMESTONE Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
-83.6	88.1	3.5	1:45 0:45 1:15	(3.0) 86%	(N/A)		(10.3) 95%			
-87.1	91.6		1:00/0.5 N=26							
-88.6	93.1	3.5	1:38 1:05 1:10	(3.5) 100%	(N/A)					
-92.1	96.6		0:47/0.5 N=28							
-93.6	98.1	3.5	1:20 1:00 4:30	(3.2) 91%	(N/A)					-96.2 100.7
-97.1	101.6		1:07/0.5 N=30				(0.6) 100%	(N/A) (N/A)		-96.6 101.3 Peedee Fm.: Gray to black, thinly bedded, moderately indurated LIMESTONE Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
-98.6	103.1	3.5	2:37 1:40 1:53	(3.5) 100%	(N/A)		(7.3) 100%			
-102.1	106.6		1:14/0.5 N=31							
-103.6	108.1	3.5	1:48 1:50	(3.5) 100%	(N/A)					

NCDOT CORE SINGLE 0165SU-1.GPJ NC_DOT.GDT 9/27/04

MACTEC

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

SHEET NO.	TOTAL SHEETS
38	209

SHEET 2 OF 2

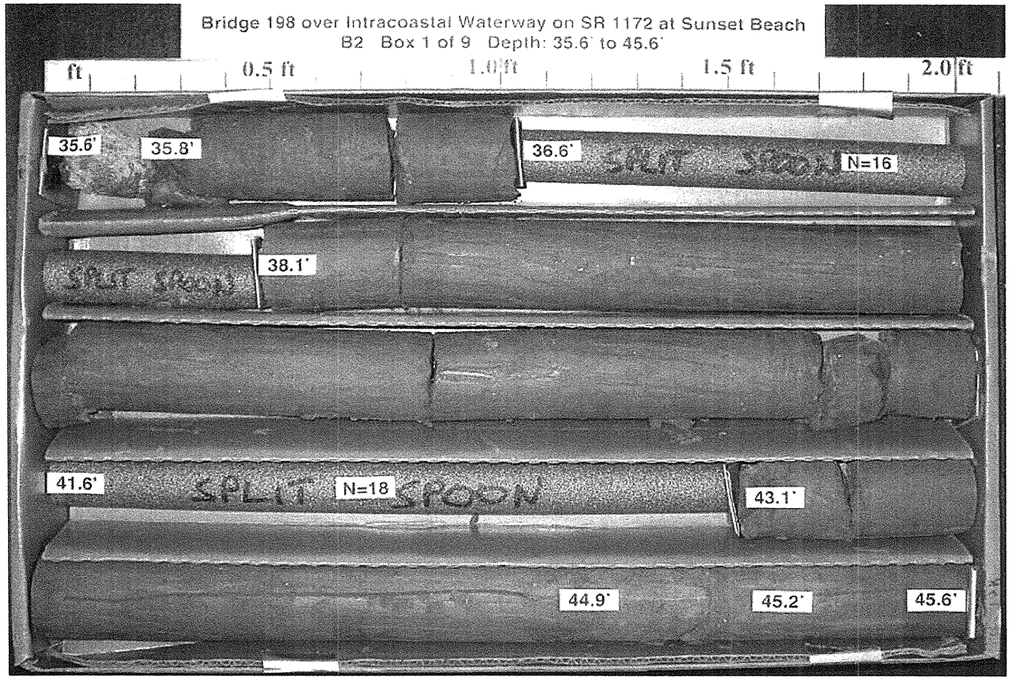
PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. B2	**BORING LOCATION** 34+28	**OFFSET** 10 ft LT **ALIGNMENT** -L-	**0 HR.** 3.1
COLLAR ELEV. 4.5 ft	**NORTHING** 47,025 US ft	**EASTING** 2,148,764 US ft	**24 HR.** FIAD
TOTAL DEPTH 123.1 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Rotary-Wash/Core	**HAMMER TYPE** 140 lb Manual
DATE STARTED 5/7/03	**COMPLETED** 5/13/03	**SURFACE WATER DEPTH** N/A	
CORE SIZE HQ	**TOTAL RUN** 61.7 ft	**DRILLER** D. White	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Continued from previous page
-107.1	111.6		1:30 1:17/0.5							-107.6 112.1 Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6) *(continued)*
-107.9	112.4	4.2	N=100/0.7 4:25 1:50 1:27	(4.2) 100%	(N/A)		(0.3) 100%	(N/A) (N/A)		-108.2 112.7 Peedee Fm.: Gray to black, thinly bedded, moderately indurated LIMESTONE Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
-112.1	116.6		1:43 0:34/0.2 N=28				(7.1) 96%			
-113.6	118.1	3.5	1:57 1:20 1:30	(3.2) 91%	(N/A)					
-117.1	121.6		1:00/0.5							-117.1 121.6 Coring terminated at 121.6 ft (Elev. -119.6 ft) in Peedee Fm.: Hard, silty, fine sandy CLAY (A-7-6)

NCDOT CORE SINGLE 0165SU-1.GPJ NC_DOT.GDT 9/27/04

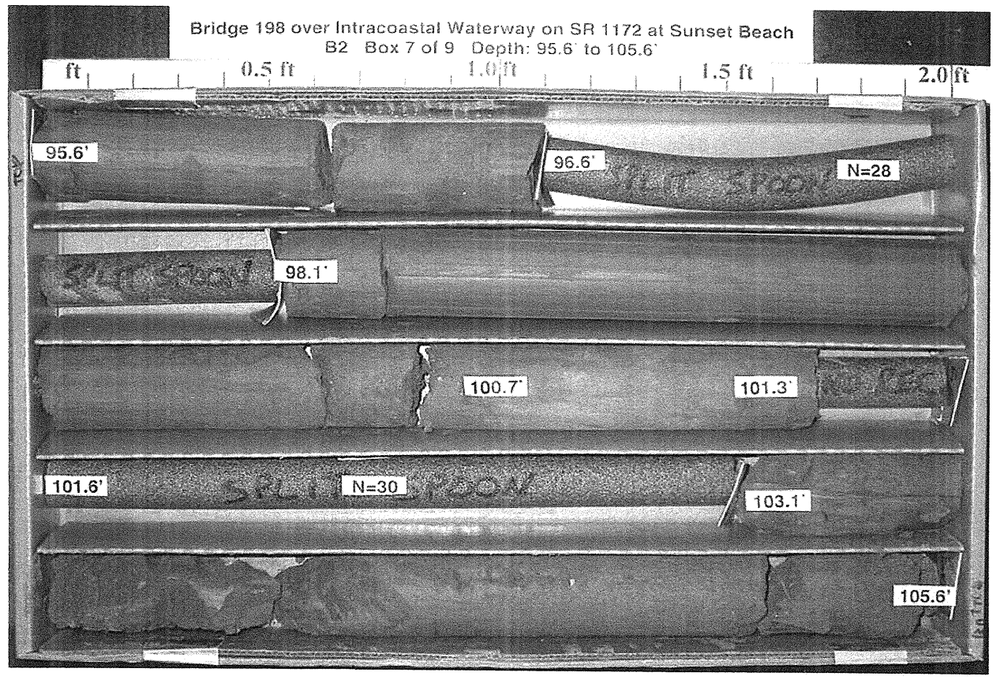
Core Photos
MACTEC Proj. No. 6468-03-0165

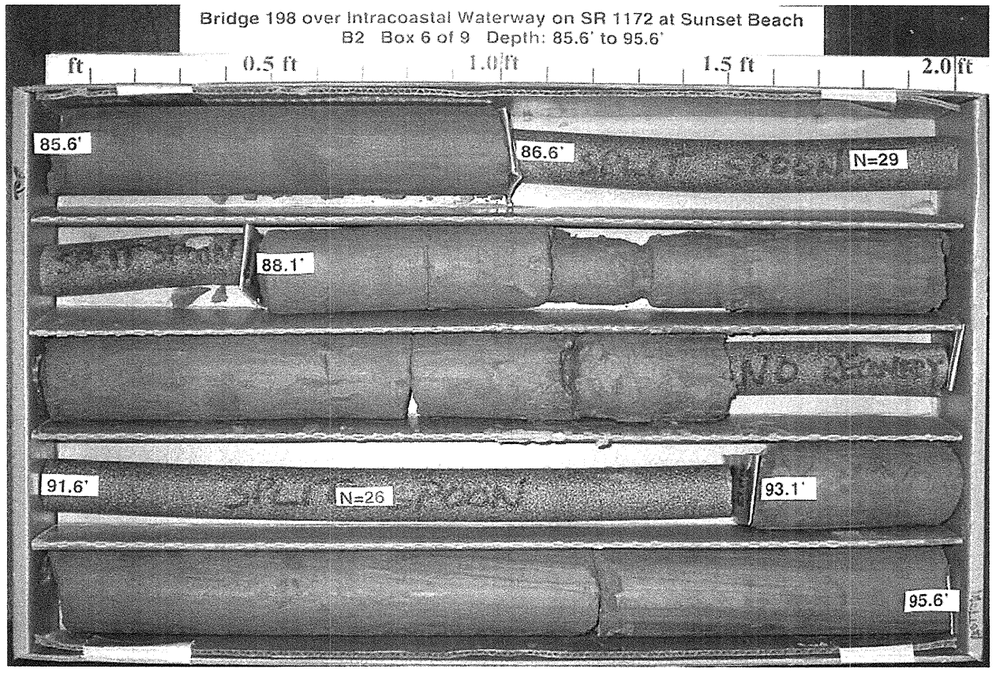
Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)

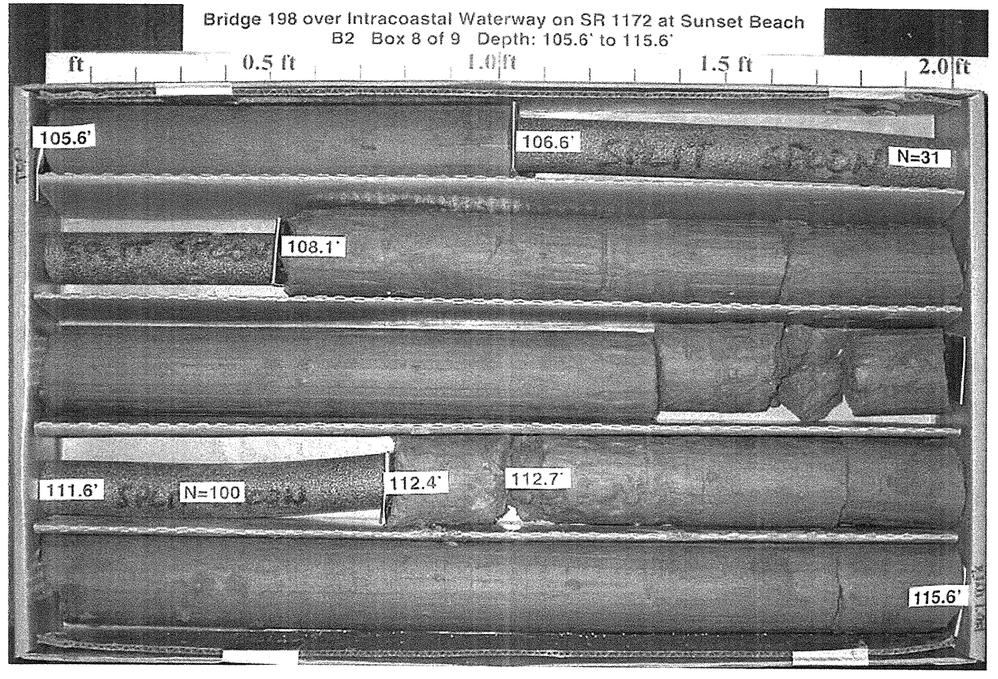


Core Photos
MACTEC Proj. No. 6468-03-0165

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)







Core Photos
MACTEC Proj. No. 6468-03-0165

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)

MACTEC

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET 1 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. B3	**BORING LOCATION** 35+40	**OFFSET** 9 ft LT	**ALIGNMENT** -L-
COLLAR ELEV. 4.4 ft	**NORTHING** 47,134 **US ft**	**EASTING** 2,148,739 **US ft**	**24 HR.** FIAD
TOTAL DEPTH 123.1 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Rotary-Wash/Core	**HAMMER TYPE** 140 lb Manual
DATE STARTED 5/13/03	**COMPLETED** 5/19/03	**SURFACE WATER DEPTH** N/A	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
4.4					Ground Surface				4.4 0.0
4.4	0.0	14	15	17	32		M		Roadway Embankment Fill: Tan-brown and gray, silty, fine to coarse SAND (A-2-4) with ABC stone and shell fragments
0.7	3.7						▽		
		5	5	3	8		M/W		
-3.1	7.5								Coastal Plain Undivided: Gray to dark gray and black, silty, clayey, fine to coarse SAND (A-2-4) w/ shell fragments
-5.3	9.7	WOH	WOH	WOH	WOH 0	SS-13	W		
-10.3	14.7	3	2	2	4		W		
-15.3	19.7	3	4	2	6		W		
-20.3	24.7	2	3	4	7	SS-14	W		
-25.3	29.7	6	1	1	2		W		
-25.8	30.2								Waccamaw Fm.: Gray to black, silty clay (A-7-6) with trace organics
-28.6	33.0								
-29.2	33.6								Peedee Fm.: Gray to black, thinly bedded, moderately indurated LIMESTONE
-32.2	36.6	6	8	10	18		M		Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
-37.2	41.6	7	8	10	18		M		
-40.7	45.1								
-41.7	46.1								Peedee Fm.: Gray to black, thinly bedded, moderately indurated LIMESTONE
-42.2	46.6	5	9	9	18		M		Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
-47.2	51.6	6	9	11	20		M		
-52.2	56.6	9	10	10	20		M		
-57.2	61.6	8	9	11	20		M		
-62.2	66.6	7	9	13	22		M		
-67.2	71.6								
-68.1	72.5	6	10	90/0.2	100/0.2		M		
-69.0	73.4								Peedee Fm.: Dark gray to green, thinly bedded, moderately indurated LIMESTONE

NCDOT BORE SINGLE 0165SU-1.GPJ NC DOT.GDT 9/27/04

MACTEC

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET NO.	TOTAL SHEETS
42	209

SHEET 2 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. B3	**BORING LOCATION** 35+40	**OFFSET** 9 ft LT	**ALIGNMENT** -L-
COLLAR ELEV. 4.4 ft	**NORTHING** 47,134 **US ft**	**EASTING** 2,148,739 **US ft**	**24 HR.** FIAD
TOTAL DEPTH 123.1 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Rotary-Wash/Core	**HAMMER TYPE** 140 lb Manual
DATE STARTED 5/13/03	**COMPLETED** 5/19/03	**SURFACE WATER DEPTH** N/A	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-70.4					Continued from previous page				
-72.2	76.6	18	32	23	55		M		Peedee Fm.: Dark gray to green, silty, fine sandy CLAY (A-7-6)*(continued)*
-77.2	81.6	3	10	12	22		M		
-82.2	86.6	19	15	15	30		M		
-87.2	91.6	11	28	22	50		M		
-92.2	96.6	10	18	19	37		M		
-95.6	100.0								
-96.0	100.4								Peedee Fm.: Dark gray to green, thinly bedded, moderately indurated LIMESTONE
-97.2	101.6	11	15	17	32		M		Peedee Fm.: Dark gray to green, silty, fine sandy CLAY (A-7-6)
-102.2	106.6	10	13	17	30		M		
-104.9	109.3								
-105.9	110.3								Peedee Fm.: Dark gray to green, thinly bedded, moderately indurated LIMESTONE
-107.2	111.6	16	24	21	45		M		Peedee Fm.: Dark gray to green, silty, fine sandy CLAY (A-7-6)
-112.2	116.6	11	13	20	33		M		
-117.2	121.6	17	20	24	44		M		
-118.7	123.1								Boring terminated at 123.1 ft (Elev. -118.7 ft) in Peedee Fm.: Hard, silty, fine sandy CLAY (A-7-6)

Bits Used: 0.3' roller cone; HQ core bit (surface set)

Drilling Fluid Properties: Water

NCDOT BORE SINGLE 0165SU-1.GPJ NC DOT.GDT 9/27/04

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

SHEET 1 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. B3	**BORING LOCATION** 35+40	**OFFSET** 9 ft LT	**ALIGNMENT** -L-	**0 HR.** 3.2
COLLAR ELEV. 4.4 ft	**NORTHING** 47,134 **US ft**	**EASTING** 2,148,739 **US ft**		**24 HR.** FIAD
TOTAL DEPTH 123.1 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Rotary-Wash/Core	**HAMMER TYPE** 140 lb Manual	
DATE STARTED 5/13/03	**COMPLETED** 5/19/03	**SURFACE WATER DEPTH** N/A		
CORE SIZE HQ	**TOTAL RUN** 65.2 ft	**DRILLER** D. White		

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 31.2 ft
-26.8	31.2	0.4	0:37/0.4	(0.0)	(N/A)		(1.4)	(N/A)		Waccamaw Fm: (A-7-6) No Recovery
-27.2	31.6	5.0	1:30 1:40 5:45 2:00	0%	(N/A)		78%			-28.6 33.0
				(2.0)			(0.6)	(N/A)		-29.2 Peedee Fm.: Gray to black, thinly bedded, moderately indurated LIMESTONE 33.6
				40%			100%	(N/A)		Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
-32.2	36.6		2:10				(5.5)			
			N=18				65%			
-33.7	38.1	3.5	1:20 1:03 1:06	(3.5)	(N/A)					
-37.2	41.6		0:25/0.5	100%						
			N=18							
-38.7	43.1	3.5	2:30 5:50 2:08	(3.0)	(N/A)					-40.7 45.1
-42.2	46.6		1:20/0.5	86%			(1.0)	(N/A)		-41.7 Peedee Fm.: Gray to black, thinly bedded, moderately indurated LIMESTONE 46.1
			N=18				100%	(N/A)		Peedee Fm.: Gray to black, silty, fine sandy CLAY (A-7-6)
-43.7	48.1	3.5	3:00 3:30 3:48	(3.2)	(N/A)		(16.1)			
-47.2	51.6		1:20/0.5	91%			89%			
			N=20							
-48.7	53.1	3.5	3:30 2:45 2:05	(2.9)	(N/A)					
-52.2	56.6		2:15/0.5	83%						
			N=20							
-53.7	58.1	3.5	1:00 0:35 0:48	(3.2)	(N/A)					
-57.2	61.6		0:40/0.5	91%						
			N=20							
-58.7	63.1	3.5	1:34 1:05 1:00	(3.4)	(N/A)					
-62.2	66.6		0:34/0.5	97%						
			N=22							
-63.7	68.1	3.5	1:15 1:00 0:50	(3.4)	(N/A)					
-67.2	71.6		0:35/0.5	97%						
			N=100/0.7							-68.1 72.5
-68.4	72.8	3.8	4:40 0:48 0:45	(1.0)	(N/A)		(0.6)	(N/A)		-69.0 Peedee Fm.: Dark gray to green, thinly bedded, moderately indurated LIMESTONE 73.4
-72.2	76.6		0:42/0.8	26%			100%	(N/A)		Peedee Fm.: Dark gray to green, silty, fine sandy CLAY (A-7-6)
			N=55				(6.6) 35%			
-73.7	78.1	3.5	3:00 3:10 3:25	(0.0)	(N/A)					
-77.2	81.6		0:36/0.5	0%						
			N=22							
-78.7	83.1	3.5	6:53 2:53 2:20	(0.3)	(N/A)					
-82.2	86.6		1:48/0.5	9%						
			N=30							
-83.7	88.1	3.5	2:15 1:52 1:51	(0.6)	(N/A)					
-87.2	91.6		0:55/0.5	17%						
			N=50							
-88.7	93.1	3.5	1:26 1:35 1:25	(3.5)	(N/A)					
-92.2	96.6		0:33/0.5	100%						
			N=37							
-93.7	98.1	3.5	1:25 3:18 3:20	(2.2)	(N/A)					-95.6 100.0
-97.2	101.6		0:37/0.5	63%			(0.4)	(NA)		-96.0 Peedee Fm.: Dark gray to green, thinly bedded, moderately indurated LIMESTONE 100.4
			N=32				100%	(N/A)		Peedee Fm.: Dark gray to green, silty, fine sandy CLAY (A-7-6)
-98.7	103.1	3.5	1:45 1:27 1:12	(3.3)	(N/A)		(4.5) 76%			

NCDOT CORE SINGLE 0165SU-1.GPJ NC_DOT.GDT 9/27/04

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

SHEET NO.	TOTAL SHEETS
43	209

SHEET 2 OF 2

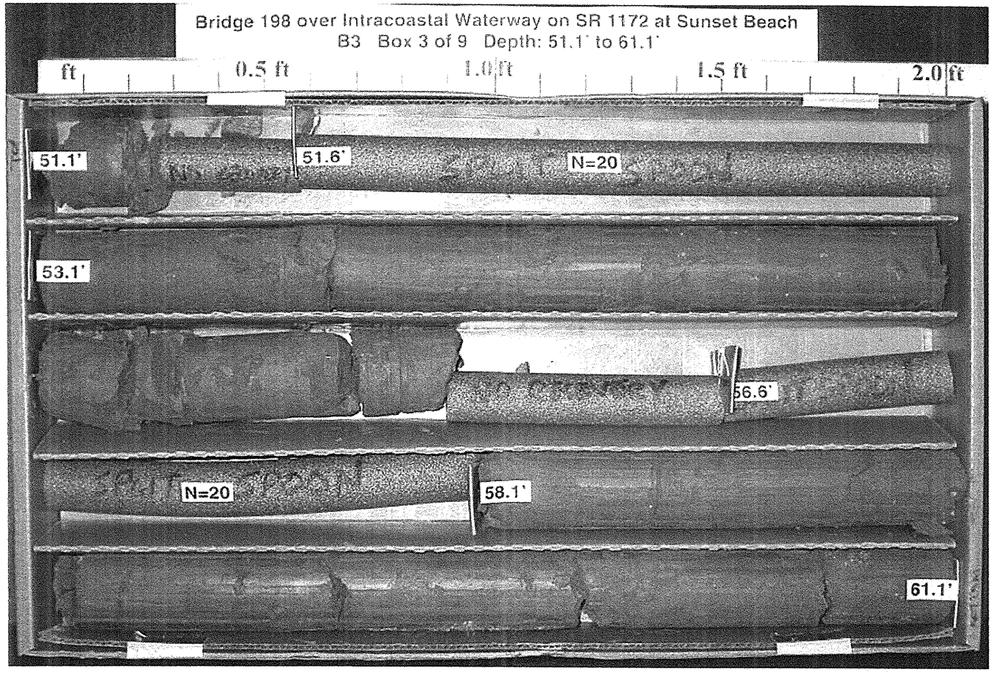
PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. B3	**BORING LOCATION** 35+40	**OFFSET** 9 ft LT	**ALIGNMENT** -L-	**0 HR.** 3.2
COLLAR ELEV. 4.4 ft	**NORTHING** 47,134 **US ft**	**EASTING** 2,148,739 **US ft**		**24 HR.** FIAD
TOTAL DEPTH 123.1 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Rotary-Wash/Core	**HAMMER TYPE** 140 lb Manual	
DATE STARTED 5/13/03	**COMPLETED** 5/19/03	**SURFACE WATER DEPTH** N/A		
CORE SIZE HQ	**TOTAL RUN** 65.2 ft	**DRILLER** D. White		

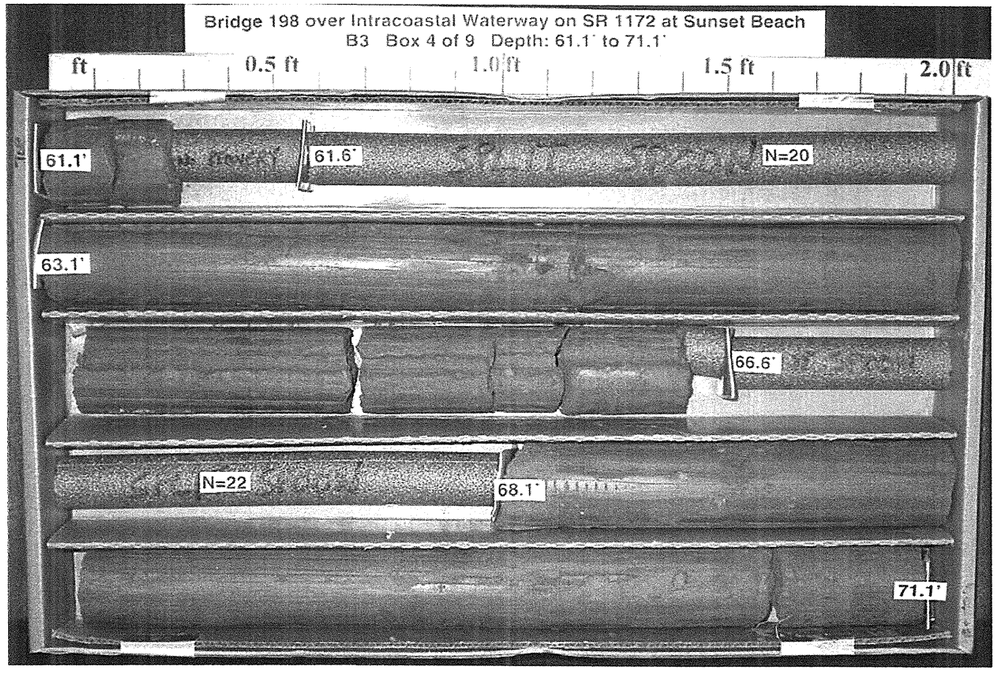
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Continued from previous page
-102.2	106.6		0:34/0.5							Peedee Fm.: Dark gray to green, silty, fine sandy CLAY (A-7-6) *(continued)*
			N=30							-104.9 109.3
-103.7	108.1	3.5	1:50 3:05 3:00	(2.2)	(N/A)					-105.9 Peedee Fm.: Dark gray to green, thinly bedded, moderately indurated LIMESTONE 110.3
-107.2	111.6		0:45/0.5	63%			(1.0)	(N/A)		Peedee Fm.: Dark gray to green, silty, fine sandy CLAY (A-7-6)
			N=45				100%	(N/A)		
-108.7	113.1	3.5	5:15 4:05 3:23	(0.0)	(N/A)		(2.9) 35%			
-112.2	116.6		0:35/0.5	0%						
			N=33							
-113.7	118.1	3.5	1:40 1:06 1:10	(2.9)	(N/A)					
-117.2	121.6		0:48/0.5	83%						-117.2 121.6
										Coring terminated at 121.6 ft (Elev. -117.2 ft) in Peedee Fm.: Hard, silty, fine sandy CLAY (A-7-6)

NCDOT CORE SINGLE 0165SU-1.GPJ NC_DOT.GDT 9/27/04

Core Photos
MACTEC Proj. No. 6468-03-0165

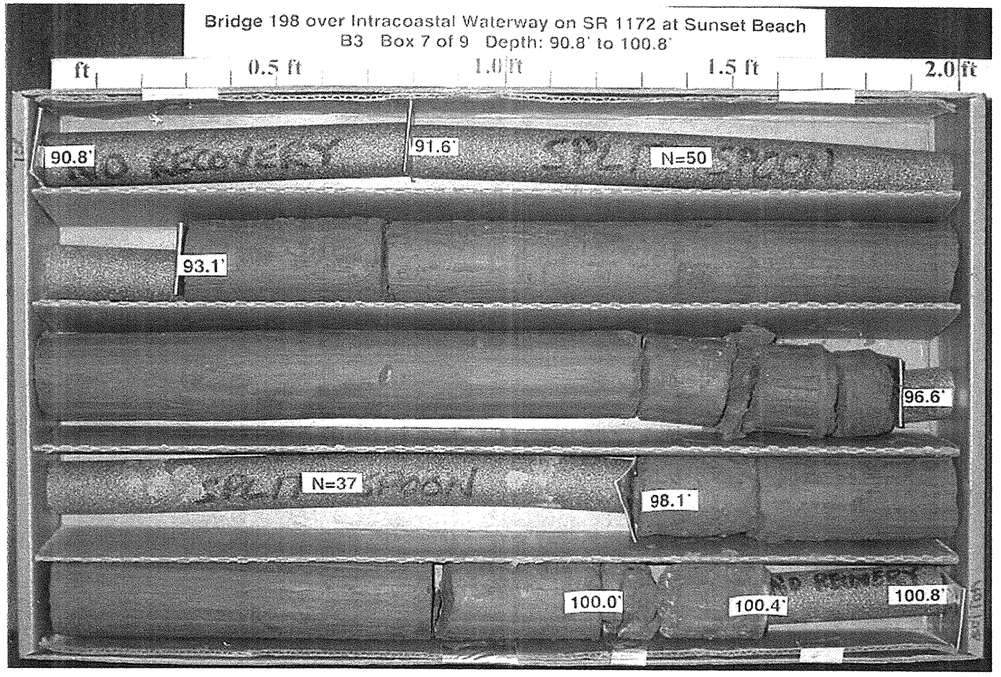
Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)

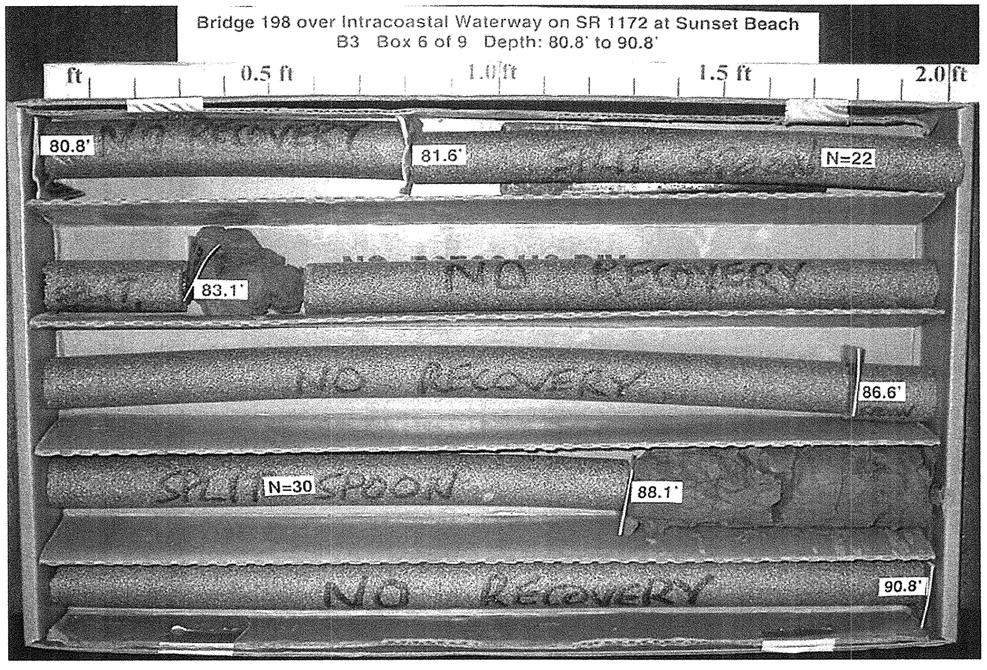




Core Photos
MACTEC Proj. No. 6468-03-0165

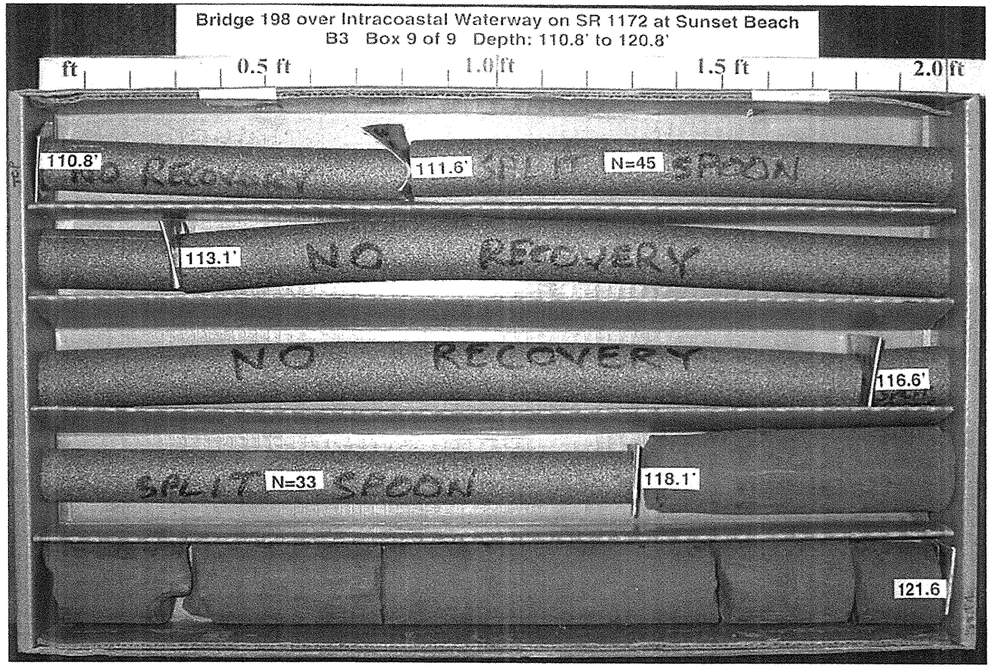
Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)





Core Photos
MACTEC Proj. No. 6468-03-0165

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)



N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET 1 OF 2

MACTEC

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. B4	**BORING LOCATION** 36+53	**OFFSET** 8 ft LT	**ALIGNMENT** -L-	**0 HR.** 3.2
COLLAR ELEV. 4.6 ft	**NORTHING** 47,244 **US ft**	**EASTING** 2,148,713 **US ft**		**24 HR.** FIAD
TOTAL DEPTH 123.0 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Rotary-Wash/Core	**HAMMER TYPE** 140 lb Manual	
DATE STARTED 5/20/03	**COMPLETED** 5/22/03	**SURFACE WATER DEPTH** N/A		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
4.6					Ground Surface				4.6 0.0
4.6	0.0	21	19	17	36		M		Roadway Embankment Fill: Tan, brown, and gray to dark gray, silty SAND (A-2-4) w/ shell fragments
0.1	4.5								
		9	7	5	12		M		-3.2 7.8
-4.9	9.5								CPU: Dark gray to gray and black, silty, sandy, CLAY (A-7-6) w/ shell fragments
		WOH	1	2	3		W		
-9.9	14.5								
		1	1	1	2		W		
-14.9	19.5								-13.2 17.8
		3	3	3	6		W		CPU: Dark gray to black and white, silty, f. to cse. SAND (A-2-4)
-19.9	24.5								
		2	2	3	5		W		
-24.9	29.5								
		10	7	13	20		W		
-29.9	34.5								-28.9 33.5
		7	8	5	13		W		Waccamaw Fm: Dark gray to black, silty CLAY (A-7-6)
-31.9	36.5								-30.9 35.5
		7	9	11	20		M		-31.9 36.5
-36.9	41.5								Waccamaw Fm: Light gray to gray, sandy, clayey, SILT (A-4) w/ v. thinly bedded, friable, shell hash LIMESTONE
		4	8	11	19		M		Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-41.9	46.5								-39.2 43.8
		6	8	11	19		M		-40.0 44.6
-46.9	51.5								Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE
		8	11	15	26		M		Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-51.9	56.5								
		6	10	14	24		M		
-56.9	61.5								-54.0 58.6
		7	9	11	20		M		-55.0 59.6
-61.9	66.5								Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE
		7	10	11	21		M		Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-66.9	71.5								
		9	91/0.1		100/0.0		M		-67.5 72.1
									-68.1 72.7
									Peedee Fm: Dark gray to green, thinly bedded, mod. indurated LIMESTONE

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET NO.	TOTAL SHEETS
47	209

SHEET 2 OF 2

MACTEC

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. B4	**BORING LOCATION** 36+53	**OFFSET** 8 ft LT	**ALIGNMENT** -L-	**0 HR.** 3.2
COLLAR ELEV. 4.6 ft	**NORTHING** 47,244 **US ft**	**EASTING** 2,148,713 **US ft**		**24 HR.** FIAD
TOTAL DEPTH 123.0 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Rotary-Wash/Core	**HAMMER TYPE** 140 lb Manual	
DATE STARTED 5/20/03	**COMPLETED** 5/22/03	**SURFACE WATER DEPTH** N/A		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-70.2					Continued from previous page				
-71.9	76.5								
		9	11	14	25		M		Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6) *(continued)*
-76.9	81.5								
		11	15	85/0.4	100/0.0		M		-78.3 82.9
-81.9	86.5								Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE
		8	12	14	26		M		Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-86.9	91.5								
		10	14	14	28		M		
-91.9	96.5								
		12	18	21	39		M		
-96.9	101.5								
		8	10	16	26		M		
-101.9	106.5								
		12	14	32	46		M		-103.4 108.0
-107.9	112.5								-104.2 108.8
		17	17	20	37		M		Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE
-111.9	116.5								Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
		13	14	19	33		M		
-116.9	121.5								
		12	14	16	30		M		-118.4 123.0
									Boring terminated at 123.0 ft (Elev. -118.4 ft) in Peedee Fm.: V. stiff, silty, sandy CLAY (A-7-6)
									Bits Used: 0.3' roller cone; HQ core bit (surface set)
									Drilling Fluid Properties: Water

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

MACTEC

SHEET 1 OF 2

PROJECT NO. 8.2230101	ID. B-0682	COUNTY Brunswick	GEOLOGIST B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			GROUND WATER (ft)
BORING NO. B4	BORING LOCATION 36+53	OFFSET 8 ft LT	ALIGNMENT -L-	0 HR. 3.2
COLLAR ELEV. 4.6 ft	NORTHING 47,244 US ft	EASTING 2,148,713 US ft	24 HR. FIAD
TOTAL DEPTH 123.0 ft	DRILL MACHINE CME 550	DRILL METHOD Rotary-Wash/Core	HAMMER TYPE 140 lb Manual
DATE STARTED 5/20/03	COMPLETED 5/22/03	SURFACE WATER DEPTH N/A	
CORE SIZE HQ	TOTAL RUN 60.0 ft	DRILLER D. White	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 38.0 ft
-33.4	38.0	3.5	1:37 0:53 0:50 0:30/0.5 N=19	(3.2) 91%	(N/A)		(4.0) 93%	(N/A)		Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6)
-36.9	41.5									
-38.4	43.0	3.5	3:00 5:31 1:13 0:45/0.5 N=19	(1.6) 46%	(N/A)		(0.8) 100%	(N/A) (N/A)		-39.2 43.8 -40.0 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE 44.6 Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-41.9	46.5						(7.0) 74%			
-43.4	48.0	3.5	0:59 1:01 1:05 0:40/0.5 N=26	(3.2) 91%	(N/A)					
-46.9	51.5									
-48.4	53.0	3.5	0:36 0:32 0:26 0:15/0.5 N=24	(3.2) 91%	(N/A)					
-51.9	56.5									-54.0 58.6
-53.4	58.0	3.5	1:41 3:42 3:20 1:15/0.5 N=20	(2.0) 57%	(N/A)		(1.0) 100%	(N/A) (N/A)		-55.0 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE 59.6 Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-56.9	61.5						(7.1) 80%			
-58.4	63.0	3.5	1:13 1:10 1:33 1:09/0.5 N=21	(3.2) 91%	(N/A)					
-61.9	66.5									
-63.4	68.0	3.5	1:30 1:20 1:16 0:38/0.5	(3.5) 100%	(N/A)					
-66.9	71.5									-67.5 72.1 -68.1 72.7
-67.5	72.1	4.4	N=100/0.6 4:45 2:21 1:36 1:20 0:21/0.4 N=25	(4.2) 95%	(N/A)		(0.6) 100% (6.8) 93%	(N/A) (N/A)		Peedee Fm: Dark gray to green, thinly bedded, mod. indurated LIMESTONE Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-71.9	76.5									
-73.4	78.0	3.5	0:47 0:52 1:03 0:40/0.5 N=100/0.9	(3.2) 91%	(N/A)					
-76.9	81.5									-78.3 82.9 -78.8 83.4
-78.3	82.9	3.6	4:30 1:36 1:13 1:00/0.6 N=26	(3.5) 97%	(N/A)		(0.3) 100% (12.8) 74%	(N/A) (N/A)		Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-81.9	86.5									
-83.4	88.0	3.5	1:42 1:05 1:15 0:31/0.5 N=28	(3.1) 89%	(N/A)					
-86.9	91.5									
-88.4	93.0	3.5	0:48 1:01 0:48 0:33/0.5 N=39	(3.0) 86%	(N/A)					
-91.9	96.5									
-93.4	98.0	3.5	2:02 1:58 1:15 0:32/0.5 N=26	(3.5) 100%	(N/A)					
-96.9	101.5									
-98.4	103.0	3.5	1:55 1:20 1:15 1:15/0.5 N=46	(0.0) 0%	(N/A)					Material washed away during core run
-101.9	106.5									-103.4 108.0 -104.2 108.8
-103.4	108.0	4.0	5:14 5:00 5:20 0:45/0.5 2:44/0.5	(0.8) 20%	(N/A)		(0.8) 100% (5.5) 60%	(N/A) (N/A)		Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-107.4	112.0									

NCDOT CORE SINGLE 0165SU-1.GPJ NC_DOT.GDT 9/27/04

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

MACTEC

SHEET NO.	TOTAL SHEETS
48	209

SHEET 2 OF 2

PROJECT NO. 8.2230101	ID. B-0682	COUNTY Brunswick	GEOLOGIST B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			GROUND WATER (ft)
BORING NO. B4	BORING LOCATION 36+53	OFFSET 8 ft LT	ALIGNMENT -L-	0 HR. 3.2
COLLAR ELEV. 4.6 ft	NORTHING 47,244 US ft	EASTING 2,148,713 US ft	24 HR. FIAD
TOTAL DEPTH 123.0 ft	DRILL MACHINE CME 550	DRILL METHOD Rotary-Wash/Core	HAMMER TYPE 140 lb Manual
DATE STARTED 5/20/03	COMPLETED 5/22/03	SURFACE WATER DEPTH N/A	
CORE SIZE HQ	TOTAL RUN 60.0 ft	DRILLER D. White	

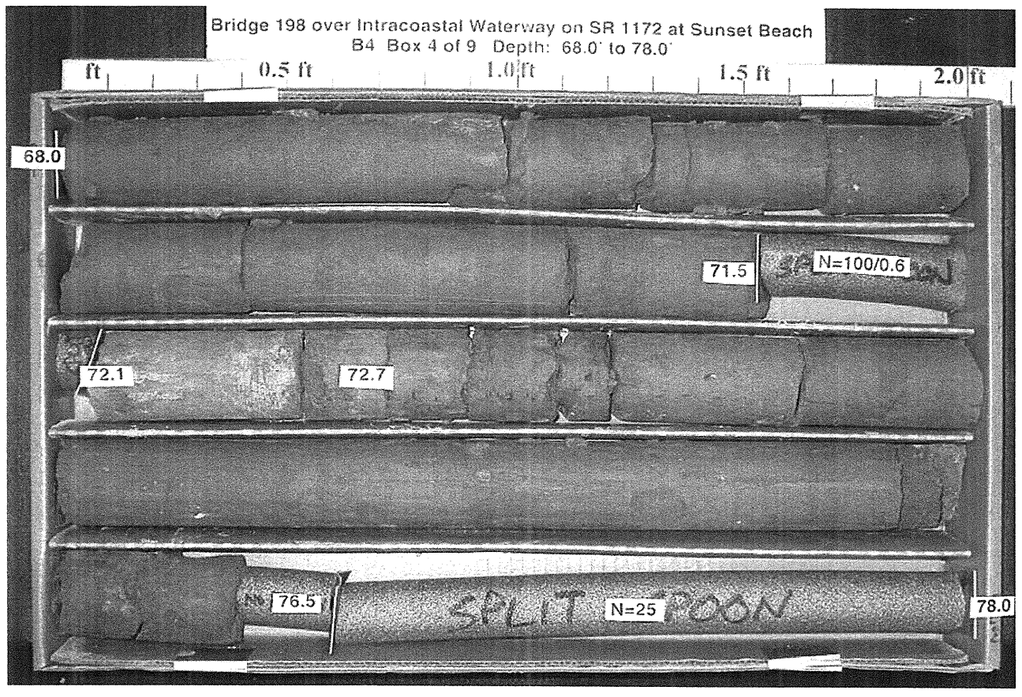
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Continued from previous page
			N=37							Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)*(continued)*
-109.4	114.0	2.5	2:15 1:11 0:30/0.5	(2.5) 100%	(N/A)					
-111.9	116.5		N=33							
-113.4	118.0	3.5	2:00 1:24 1:26 0:34/0.5	(3.0) 86%	(N/A)					
-116.9	121.5									-116.9 121.5 Coring terminated at 121.5 ft (Elev. -116.9 ft) in Peedee Fm.: V. stiff, silty, f. sandy CLAY (A-7-6)

NCDOT CORE SINGLE 0165SU-1.GPJ NC_DOT.GDT 9/27/04

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
B-4 Box 1 of 9 Depth: 38.0' to 48.0'
ft
0.5 ft
1.0 ft
1.5 ft
2.0 ft
38.0
41.5
N=19
43.0
43.8
44.6
NO RECOVERY
46.5
N=19
48.0

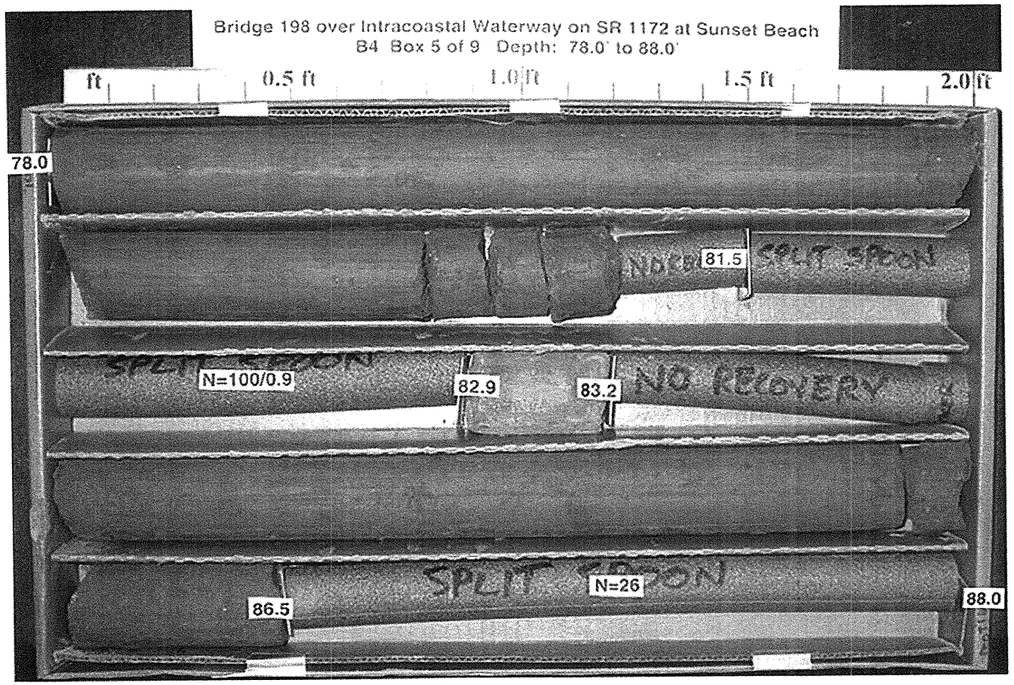
Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
B4 Box 3 of 9 Depth: 58.0' to 68.0'
ft
0.5 ft
1.0 ft
1.5 ft
2.0 ft
58.0
58.6
59.6
NO RECOVERY
61.5
N=20
63.0
66.5
N=21
68.0

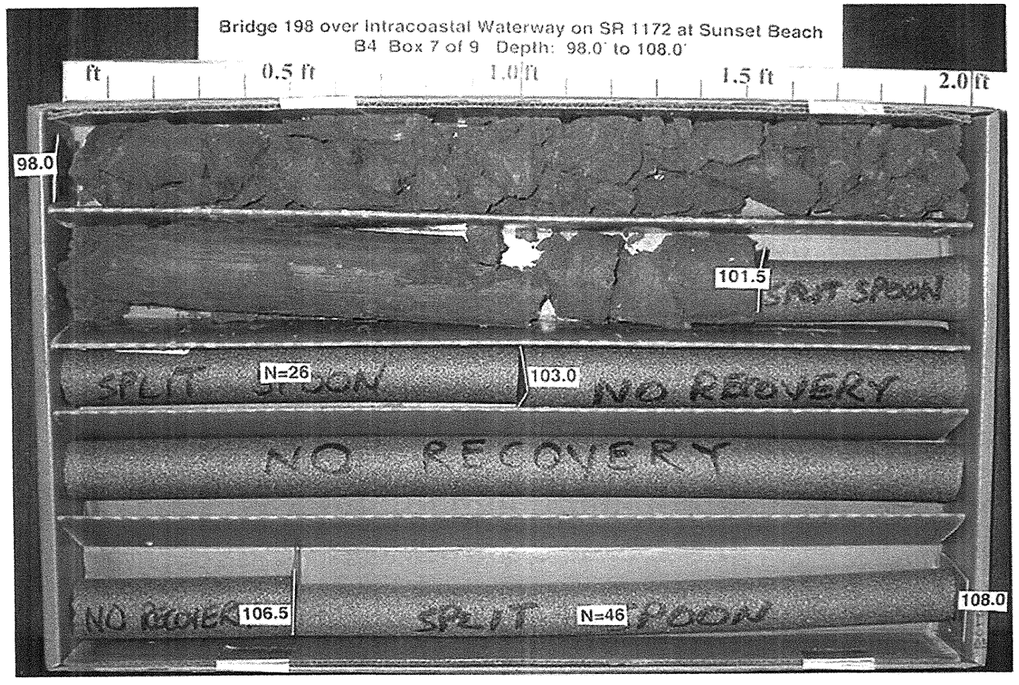
Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
B-4 Box 2 of 9 Depth: 48.0' to 58.0'
ft
0.5 ft
1.0 ft
1.5 ft
2.0 ft
48.0
51.5
N=26
53.0
56.5
N=24
58.0


Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
B4 Box 4 of 9 Depth: 68.0' to 78.0'
ft
0.5 ft
1.0 ft
1.5 ft
2.0 ft
68.0
71.5
N=100/0.6
72.1
72.7
76.5
N=25
78.0

Core Photos
MACTEC Proj. No. 6468-03-0165

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)





Core Photos
MACTEC Proj. No. 6468-03-0165

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET 1 OF 2

MACTEC

PROJECT NO. 8.2230101	ID. B-0682	COUNTY Brunswick	GEOLOGIST B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			GROUND WATER (ft)
BORING NO. B5	BORING LOCATION 37+71	OFFSET 8 ft LT	ALIGNMENT -L-	0 HR. 3.0
COLLAR ELEV. 5.2 ft	NORTHING 47,358 US ft	EASTING 2,148,685 US ft	24 HR. FIAD
TOTAL DEPTH 123.0 ft	DRILL MACHINE CME 550	DRILL METHOD Rotary-Wash/Core	HAMMER TYPE 140 lb Manual
DATE STARTED 5/22/03	COMPLETED 5/29/03	SURFACE WATER DEPTH N/A	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
5.2					Ground Surface				5.2 0.0
5.2	0.0	12	13	14	27		M		Roadway Embankment Fill: Light to dark gray and tan, silty, f. to cse. SAND (A-2-4) w/ shell fragments
1.9	3.3						▽		3.2 2.0
		7	5	5	10	SS-15	M-W		Roadway Embankment Fill: Light gray to gray, silty, SAND and Shell Fragments (A-1-b)
-3.1	8.3								
		2	8	12	20		W		
-8.1	13.3								-6.2 11.4
		2	1	1	2	SS-16	W		CPU: Dark gray to gray, silty, clayey, f. SAND (A-2-6) w/ shell fragments
-13.1	18.3								-11.3 16.5
		1	1	1	2		W		CPU: Dark gray to gray, f. to cse. sandy, clayey SILT (A-4)
-18.1	23.3								-16.3 21.5
		9	13	14	27	SS-17	W		CPU: Light gray to gray, silty, f. to cse. SAND (A-2-4)
-23.1	28.3								-21.3 26.5
		1	1	2	3	SS-18	W		CPU: Light gray to black, silty, clayey, f. to cse. SAND (A-3) w/ shell fragments
-26.3	31.5								-26.3 31.5
		1	3	7	10		W		Waccamaw Fm: Light gray to tan, silty, sandy, CLAY (A-7-6) w/ shell fragments
-31.3	36.5								-27.8 33.0 -28.3 33.5
		6	7	9	16		M		Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE
-36.3	41.5								Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
		6	9	12	21		M		-38.3 43.5
-41.3	46.5								-39.0 44.2
		4	9	10	19		M		Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE
-46.3	51.5								Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
		5	9	12	21		M		
-51.3	56.5								
		7	10	14	24		M		
-56.3	61.5								-54.9 60.1 -55.2 60.4
		8	12	14	26		M		Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE
-61.3	66.5								Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
		4	13	16	29		M		
-66.3	71.5								
		3	97/0.3		100/0.3		M		-67.1 72.3 -67.7 72.9
									Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE

NCDOT BORE SI... 0165SU-1.GPJ NC_DOT.GDT 9/27/04

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET NO.	TOTAL SHEETS
52	209

SHEET 2 OF 2

MACTEC

PROJECT NO. 8.2230101	ID. B-0682	COUNTY Brunswick	GEOLOGIST B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			GROUND WATER (ft)
BORING NO. B5	BORING LOCATION 37+71	OFFSET 8 ft LT	ALIGNMENT -L-	0 HR. 3.0
COLLAR ELEV. 5.2 ft	NORTHING 47,358 US ft	EASTING 2,148,685 US ft	24 HR. FIAD
TOTAL DEPTH 123.0 ft	DRILL MACHINE CME 550	DRILL METHOD Rotary-Wash/Core	HAMMER TYPE 140 lb Manual
DATE STARTED 5/22/03	COMPLETED 5/29/03	SURFACE WATER DEPTH N/A	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-69.6					Continued from previous page				
-71.3	76.5	8	12	16	28		M		Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6) *(continued)*
-76.3	81.5	46	54/0.3		100/0.3		M		-77.1 82.3 -77.8 83.0
-81.3	86.5	7	14	17	31		M		Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-86.3	91.5	9	14	18	32		M		
-91.3	96.5	9	13	18	31		M		
-96.3	101.5	7	18	17	35		M		
-101.3	106.5	8	12	14	26		M		-103.7 108.9 -104.1 109.3
-106.3	111.5	10	14	17	31		M		Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-111.3	116.5	9	13	16	29		M		
-116.3	121.5	11	14	18	32		M		
-117.8	123.0								Boring terminated at 123.0 ft (Elev. -117.8 ft) in Peedee Fm.: Hard, silty, sandy CLAY (A-7-6) Bits Used: 0.3' roller cone; HQ core bit (surface set) Drilling Fluid Properties: Water

NCDOT BORE SINGLE 0165SU-1.GPJ NC_DOT.GDT 9/27/04

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

SHEET 1 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. B5	**BORING LOCATION** 37+71	**OFFSET** 8 ft LT **ALIGNMENT** -L-	**0 HR.** 3.0
COLLAR ELEV. 5.2 ft	**NORTHING** 47,358 US ft	**EASTING** 2,148,685 US ft	**24 HR.** FIAD
TOTAL DEPTH 123.0 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Rotary-Wash/Core	**HAMMER TYPE** 140 lb Manual
DATE STARTED 5/22/03	**COMPLETED** 5/29/03	**SURFACE WATER DEPTH** N/A	
CORE SIZE HQ	**TOTAL RUN** 66.1 ft	**DRILLER** D. White	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 29.8 ft
-24.6	29.8	1.7	1:00	(0.0)	(N/A)		(0.0)	(N/A)		CPU: Light gray to black and tan, f. to cse. sandy, silty CLAY (A-7-6) w/ shell fragments (No Recovery) 31.5
-26.3	31.5		0:20/0.7	0%			0%			-26.3
			N=10							Waccamaw Fm: Light gray to tan, silty, sandy, CLAY (A-7-6) w/ shell fragments 33.0
-27.8	33.0	3.5	3:45	(0.5)	(N/A)		(0.5)	(N/A)		-27.8 -28.3 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE 33.5
			0:28	14%			100%	(N/A)		Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-31.3	36.5		1:20				(4.0)			
			0:57/0.5				57%			
			N=16							
-32.8	38.0	3.5	0:45	(3.5)	(N/A)					
			0:40	100%						
-36.3	41.5		1:00							
			0:20/0.5							
			N=21							
-37.8	43.0	3.5	6:03	(3.0)	(N/A)					-38.3 43.5
			4:24	86%			(0.7)	(N/A)		-39.0 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE 44.2
-41.3	46.5		1:40				100%	(N/A)		Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
			1:30/0.5				(10.9)			
			N=19				96%			
-42.8	48.0	3.5	1:50	(3.5)	(N/A)					
			1:20	100%						
-46.3	51.5		0:38							
			0:25/0.5							
			N=21							
-47.8	53.0	3.5	1:25	(3.5)	(N/A)					
			0:30	100%						
-51.3	56.5		0:55							
			0:30/0.5							
			N=24							
-52.8	58.0	3.5	0:45	(2.4)	(N/A)					
			0:55	69%						
-56.3	61.5		2:52				(0.3)	(N/A)		-54.9 60.1
			1:40/0.5				100%	(N/A)		Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE
			N=26				(5.8)			Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-57.8	63.0	3.5	1:35	(2.6)	(N/A)		72%			
			0:54	74%						
-61.3	66.5		0:40							
			0:17/0.5							
			N=29							
-62.8	68.0	3.5	2:20	(3.2)	(N/A)					
			0:53	91%						
-66.3	71.5		0:47							
			0:28/0.5							
			N=100/0.8							-67.1 72.3
-67.1	72.3	4.2		(4.2)	(N/A)		(0.6)	(N/A)		-67.1 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE 72.9
			6:30	100%			100%	(N/A)		Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
			2:15				(7.1)			
-71.3	76.5		1:10				100%			
			1:30							
			0:20/0.2							
			N=28							
-72.8	78.0	3.5	0:51	(3.5)	(N/A)					
			0:57	100%						
-76.3	81.5		1:05							
			0:24/0.5							
			N=100/0.8							-77.1 82.3
-77.1	82.3	4.2	6:30	(4.2)	(N/A)		(0.7)	(N/A)		-77.8 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE 83.0
			1:35	100%			100%	(N/A)		Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
			1:00				(15.4)			
-81.3	86.5		1:18				84%			
			0:15/0.2							
			N=31							
-82.8	88.0	3.5	1:55	(3.5)	(N/A)					
			1:08	100%						
-86.3	91.5		1:17							
			0:15/0.5							
			N=32							
-87.8	93.0	3.5	1:18	(3.5)	(N/A)					
			1:28	100%						
-91.3	96.5		1:45							
			0:45/0.5							
			N=31							
-92.8	98.0	3.5	1:15	(3.0)	(N/A)					
			1:03	86%						
-96.3	101.5		1:06							
			0:25/0.5							
			N=35							
-97.8	103.0	3.5	5:10	(1.0)	(N/A)					

NCDOT CORE SINGLE 0165SU~1.GPJ NC_DOT.GDT 9/27/04

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

SHEET NO.	TOTAL SHEETS
53	209

SHEET 2 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. B5	**BORING LOCATION** 37+71	**OFFSET** 8 ft LT **ALIGNMENT** -L-	**0 HR.** 3.0
COLLAR ELEV. 5.2 ft	**NORTHING** 47,358 US ft	**EASTING** 2,148,685 US ft	**24 HR.** FIAD
TOTAL DEPTH 123.0 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Rotary-Wash/Core	**HAMMER TYPE** 140 lb Manual
DATE STARTED 5/22/03	**COMPLETED** 5/29/03	**SURFACE WATER DEPTH** N/A	
CORE SIZE HQ	**TOTAL RUN** 66.1 ft	**DRILLER** D. White	

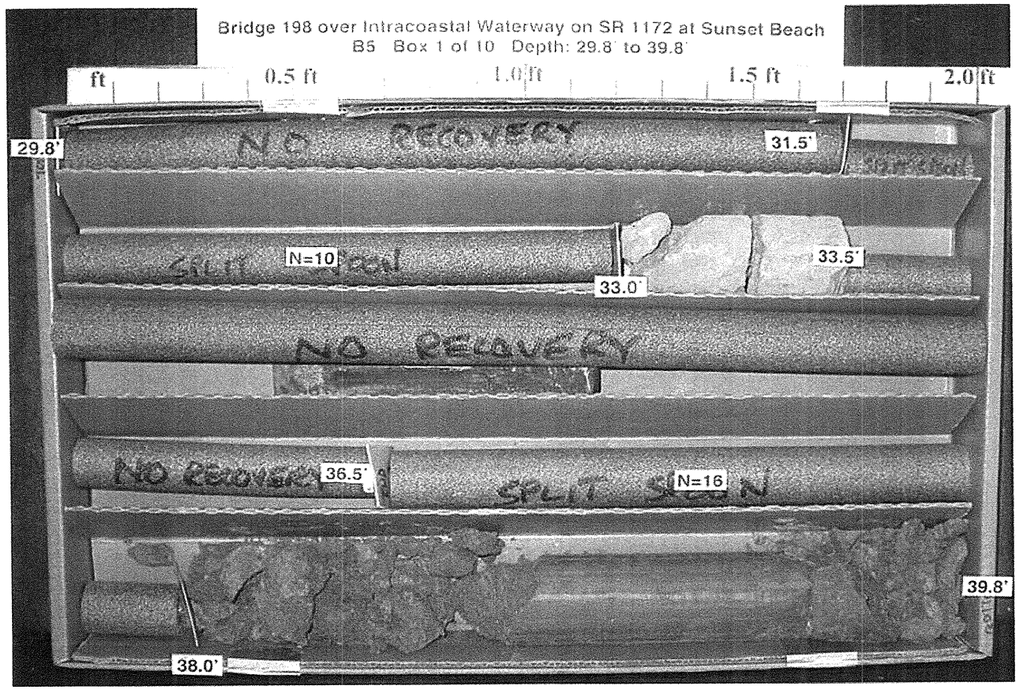
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Continued from previous page
-101.3	106.5		5:03	29%						Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6) *(continued)*
			3:13							
			0:44/0.5							
			N=26							
-102.8	108.0	3.5	2:00	(1.3)	(N/A)					
			3:30	37%						
-106.3	111.5		2:08							
			0:49/0.5							
			N=31							
-107.8	113.0	3.5	2:14	(3.0)	(N/A)					
			1:41	86%						
-111.3	116.5		1:26							
			0:31/0.5							
			N=29							
-112.8	118.0	3.5	2:00	(3.5)	(N/A)					
			1:30	100%						
-116.3	121.5		1:21							
			0:32/0.5							

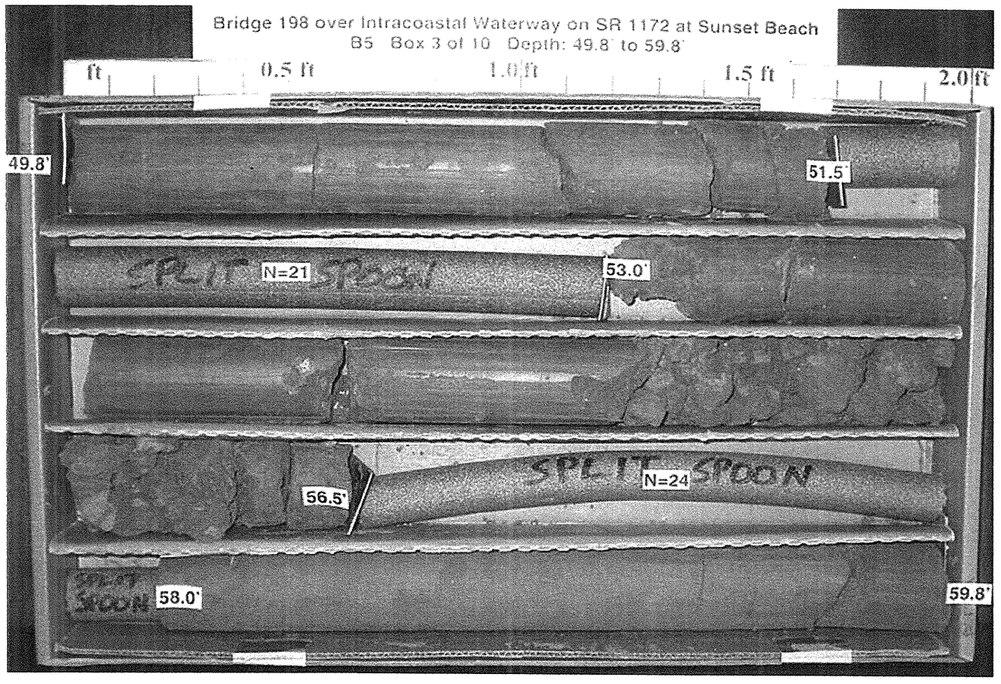
										-103.7 108.9
										-104.1 109.3 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE
							(0.4)	(N/A)		Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
							100%	(N/A)		
							(6.5)			
							71%			
										-116.3 121.5
										Coring terminated at 121.5 ft (Elev. -116.3 ft) in Peedee Fm.: Hard, silty, f. sandy CLAY (A-7-6)

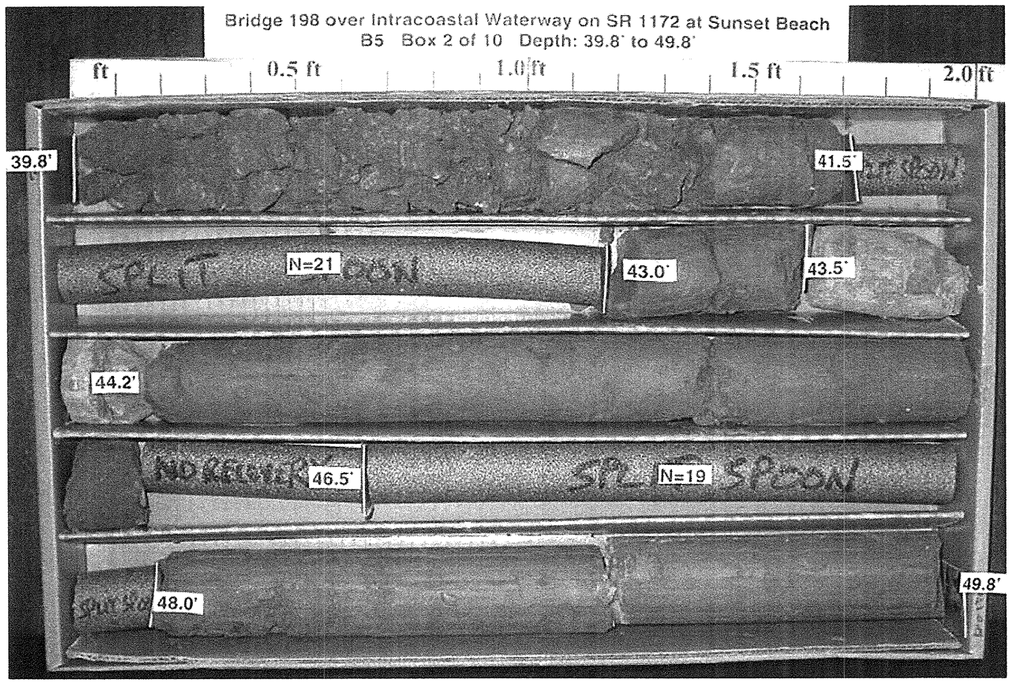
NCDOT CORE SINGLE 0165SU~1.GPJ NC_DOT.GDT 9/27/04

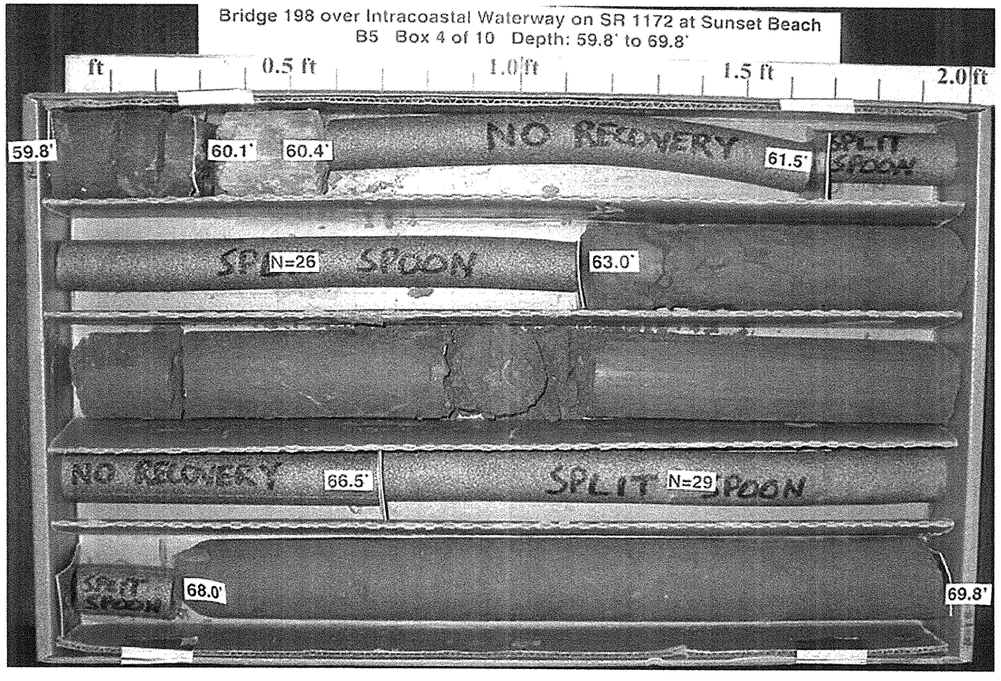
Core Photos
MACTEC Proj. No. 6468-03-0165

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)



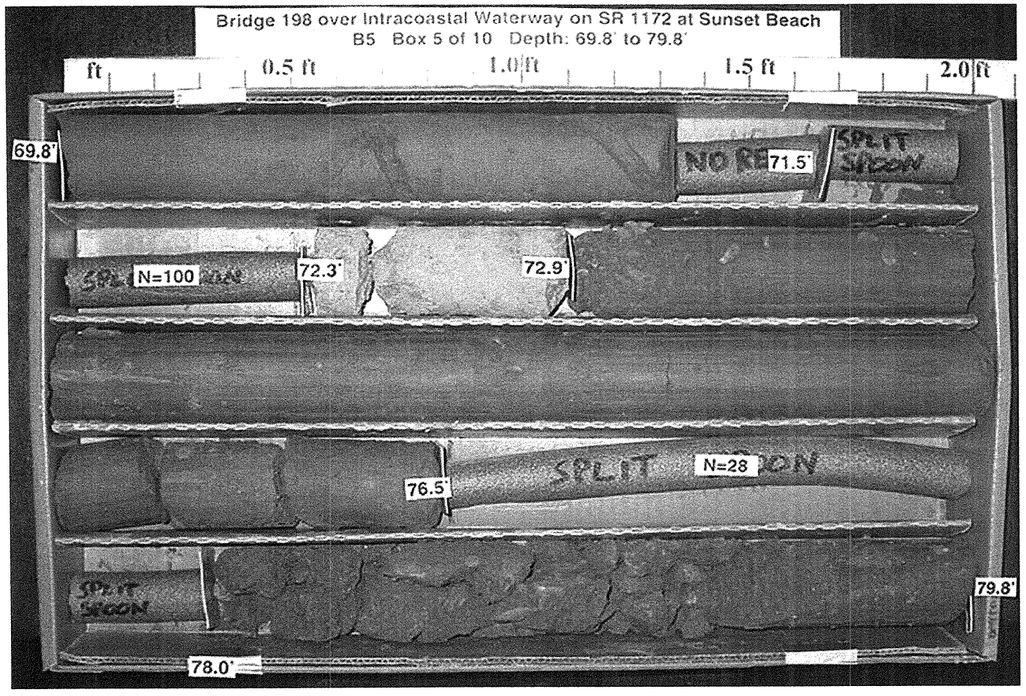


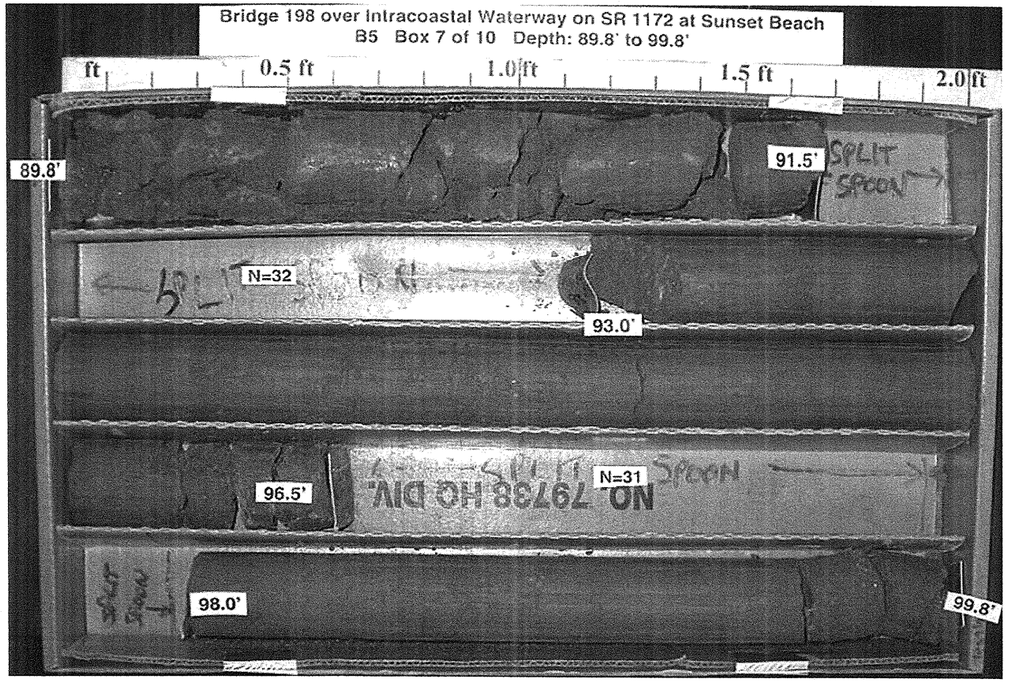


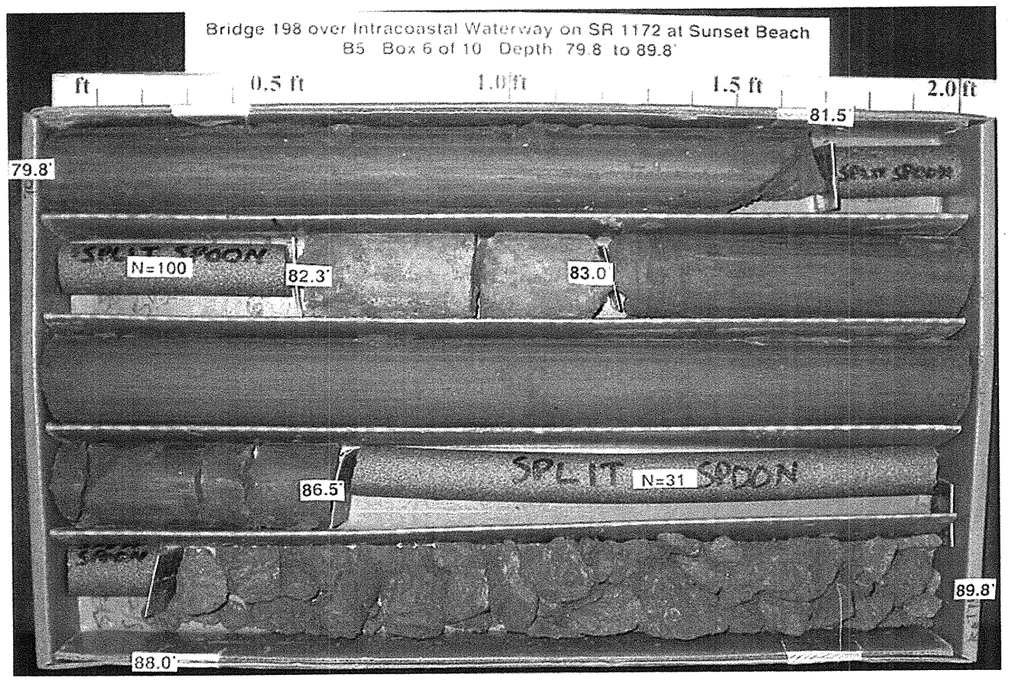


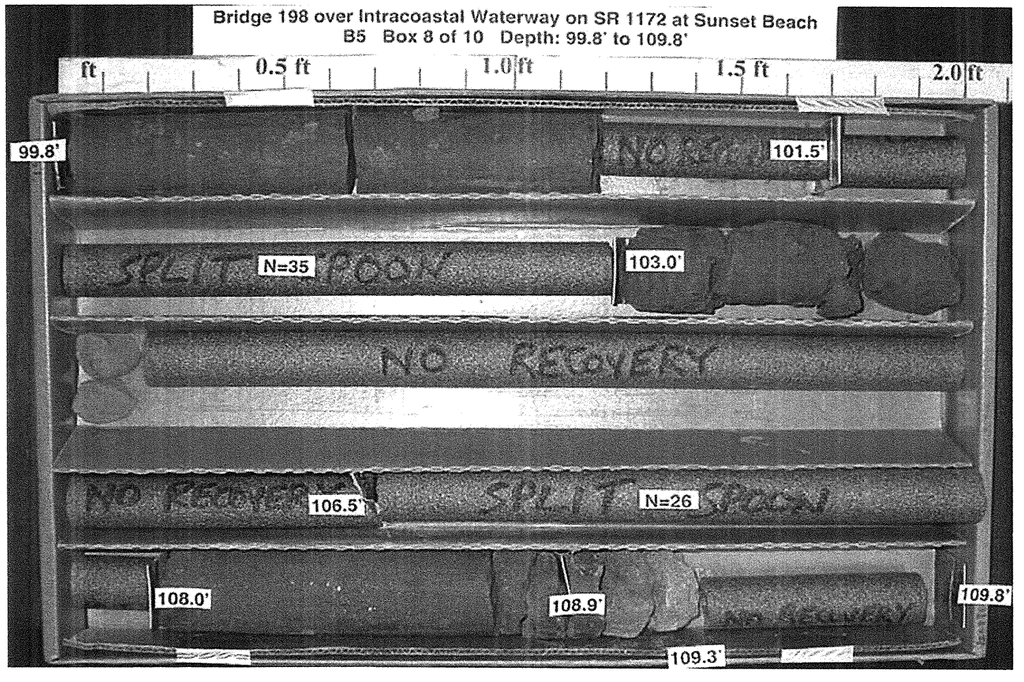
Core Photos
MACTEC Proj. No. 6468-03-0165

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)



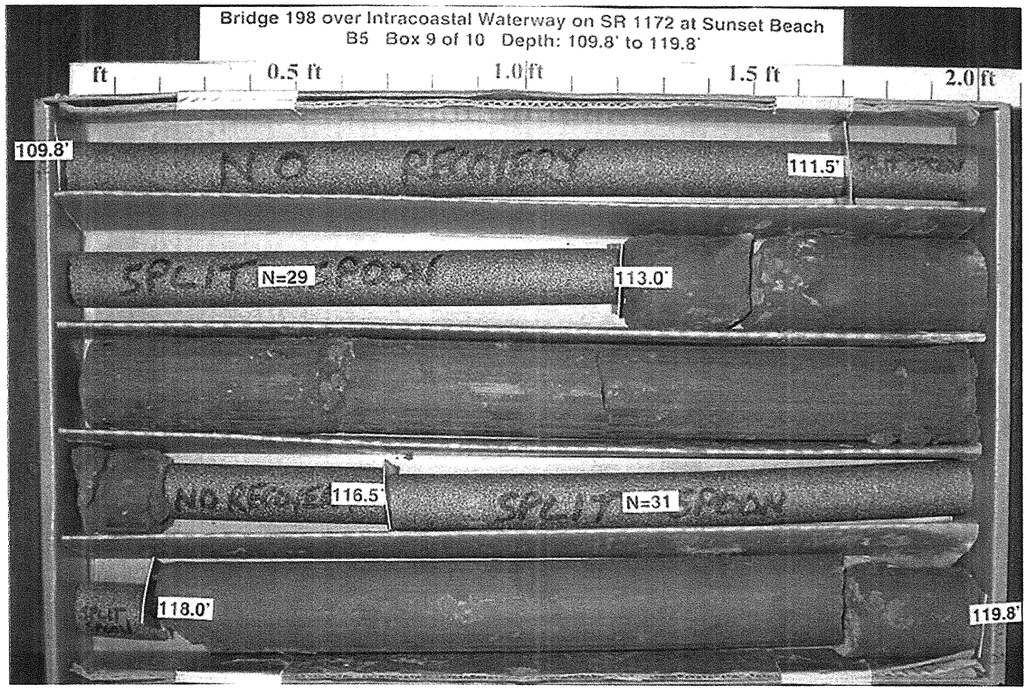


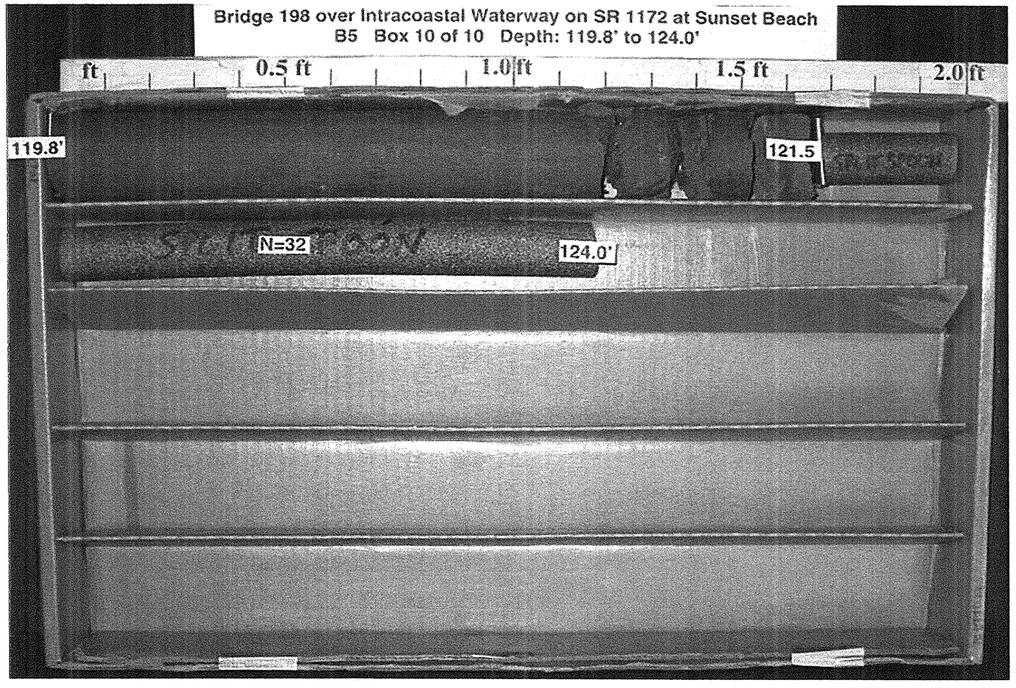




Core Photos
MACTEC Proj. No. 6468-03-0165

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)





N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET 1 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. B6	**BORING LOCATION** 38+83	**OFFSET** 3 ft LT	**ALIGNMENT** -L-	**0 HR.** 3.1
COLLAR ELEV. 5.4 ft	**NORTHING** 47,467 US ft	**EASTING** 2,148,659 US ft		**24 HR.** FIAD
TOTAL DEPTH 122.7 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Rotary-Wash/Core	**HAMMER TYPE** 140 lb Manual	
DATE STARTED 5/29/03	**COMPLETED** 6/3/03	**SURFACE WATER DEPTH** N/A		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
5.4					Ground Surface				
5.4	0.0	19	17	19	36 15		M		Roadway Embankment Fill: Tan, brown, and gray, silty, f. to cse. SAND (A-2-4) w/ shell fragments
1.2	4.2								
		11	8	7			W		
-3.8	9.2								
		3	4	6	10		W		
-8.8	14.2								-7.0 12.4
		1	2	2	4		W		CPU: Dark gray to gray, sandy, silty, CLAY (A-2-6) w/ shell fragments
-13.8	19.2								-12.0 17.4
		7	10	15	25		W		CPU: Dark gray, silty. f. to cse. SAND (A-2-4) w/ shell fragments
-18.8	24.2								
		7	14	16	30		W		-22.0 27.4
-23.8	29.2								Waccamaw Fm: Dark gray, silty, sandy CLAY (A-7-6)
		3	3	9	12		W		-24.8 30.2
-30.8	36.2								Waccamaw Fm: Tan and brown, silty, SAND (A-2-4) and v. thinly interbedded, friable, shell hash LIMESTONE (CP)
		6	7	9	16		M		-26.8 32.2
-35.8	41.2								-28.6 34.0
		6	8	10	18		M		Peedee Fm: Dark gray and tan, thinly bedded, mod. indurated LIMESTONE (CP)
-40.8	46.2								Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
		8	9	13	22		M		-37.7 43.1
-45.8	51.2								Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE (CP)
		6	9	13	22		M		Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-50.8	56.2								
		6	9	11	20		M		
-55.8	61.2								-54.4 59.8
		17	13	14	27		M		-55.8 61.2
-60.8	66.2								Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE (CP)
		8	11	12	23		M		Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-65.8	71.2								
		100/0.4			100/0.4		M		-66.2 71.6
									-67.4 72.8
									Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE (CP)

NCDOT BORE SINGLE 0165SU-1.GPJ NC_DOT.GDT 9/27/04

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET NO.	TOTAL SHEETS
57	209

SHEET 2 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. B6	**BORING LOCATION** 38+83	**OFFSET** 3 ft LT	**ALIGNMENT** -L-	**0 HR.** 3.1
COLLAR ELEV. 5.4 ft	**NORTHING** 47,467 US ft	**EASTING** 2,148,659 US ft		**24 HR.** FIAD
TOTAL DEPTH 122.7 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Rotary-Wash/Core	**HAMMER TYPE** 140 lb Manual	
DATE STARTED 5/29/03	**COMPLETED** 6/3/03	**SURFACE WATER DEPTH** N/A		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-69.4					Continued from previous page				
-70.8	76.2								
		7	11	12	23		M		Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6) *(continued)*
-75.8	81.2								-75.0 80.4
		10	90/0.4		100/0.9		M		-76.7 82.1
-80.8	86.2								-77.6 83.0
		11	13	16	29		M		Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE (CP)
-85.8	91.2								Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
		9	16	21	37		M		Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE (CP)
-90.8	96.2								Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
		13	22	22	44		M		
-95.8	101.2								
		9	12	15	27		M		
-100.8	106.2								
		15	15	19	34		M		
-105.8	111.2								-103.3 108.7
		13	13	15	28		M		-105.4 110.8
-110.8	116.2								Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE (CP)
		12	14	17	31		M		Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-115.8	121.2								Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE (CP)
		12	15	18	33		M		Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-117.3	122.7								Boring terminated at 122.7 ft (Elev. -117.3 ft) in Peedee Fm.: Hard, silty, sandy CLAY (A-7-6)

Bits Used: 0.3' roller cone; HQ core bit (surface set)

Drilling Fluid Properties: Water

NCDOT BORE SINGLE 0165SU-1.GPJ NC_DOT.GDT 9/27/04

MACTEC

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

SHEET 1 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. B6	**BORING LOCATION** 38+83	**OFFSET** 3 ft LT / **ALIGNMENT** -L-	**0 HR.** 3.1
COLLAR ELEV. 5.4 ft	**NORTHING** 47,467 **US ft**	**EASTING** 2,148,659 **US ft**	**24 HR.** FIAD
TOTAL DEPTH 122.7 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Rotary-Wash/Core	**HAMMER TYPE** 140 lb Manual
DATE STARTED 5/29/03	**COMPLETED** 6/3/03	**SURFACE WATER DEPTH** N/A	
CORE SIZE HQ	**TOTAL RUN** 66.7 ft	**DRILLER** D. White	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 30.7 ft
-25.3	30.7	5.5	2:05 3:43 4:12 1:06 1:35/1.5	(4.0) 73%	(N/A)		(0.0) 0%	(N/A)		-26.8 Waccamaw Fm: Tan and brown, silty, SAND (A-2-4) and v. thinly interbedded, friable, shell hash LIMESTONE (CP) 32.2
-30.8	36.2		*N=16*				(1.8) 100%	(N/A)		-28.6 Peedee Fm: Dark gray and tan, thinly bedded, mod. indurated LIMESTONE (CP) 34.0
-32.3	37.7	3.5	1:53 1:40 1:45 0:41/0.5	(3.5) 100%	(N/A)		(6.1) 100%			Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-35.8	41.2		*N=18*							
-37.3	42.7	3.5	1:35 3:00 2:10 1:16/0.5	(3.1) 89%	(N/A)		(0.3) 100%	(N/A) (N/A)		-37.7 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE (CP) 43.1 Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-40.8	46.2		*N=22*				(10.9) 92%			
-42.3	47.7	3.5	1:41 1:20 2:03 0:53/0.5	(3.1) 89%	(N/A)					
-45.8	51.2		*N=22*							
-47.3	52.7	3.5	1:25 1:24 1:42 1:10/0.5	(3.5) 100%	(N/A)					
-50.8	56.2		*N=20*							
-52.3	57.7	3.5	1:40 1:32 8:07 1:51/0.5	(3.3) 94%	(N/A)					-54.4 59.8
-55.8	61.2		*N=27*				(1.4) 100%	(N/A) (N/A)		-55.8 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE (CP) 61.2 Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-57.3	62.7	3.5	1:18 1:46 1:33 1:01/0.5	(3.5) 100%	(N/A)		(5.5) 79%			
-60.8	66.2		*N=23*							
-62.3	67.7	3.5	1:42 1:30 1:35 0:52/0.5	(2.0) 57%	(N/A)					-66.2 71.6
-65.8	71.2									
-66.2	71.6	4.6	*N=100/0.4*	(4.6) 100%	(N/A)		(1.2) 100%	(N/A) (N/A)		-67.4 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE (CP) 72.8 Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-70.8	76.2		10:04 1:54 1:57 1:52 1:06/0.6				(6.1) 100%			
-72.3	77.7	3.5	*N=23* 1:25 1:16 2:47 0:58/0.5	(3.0) 86%	(N/A)					-75.0 80.4
-75.8	81.2		*N=100/0.9*				(0.3) 100%	(N/A) (N/A)		-76.7 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE (CP) 82.1 Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-76.7	82.1	4.1	8:25 1:17 1:22 1:45 0:17/0.1	(4.1) 100%	(N/A)		(0.0) 0%	(N/A) (N/A)		-77.6 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE (CP) 83.0 Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-80.8	86.2		*N=29*				(0.9) 100%			
-82.3	87.7	3.5	2:07 1:45 2:38 0:20/0.5	(3.0) 86%	(N/A)		(16.8) 92%			
-85.8	91.2		*N=37*							
-87.3	92.7	3.5	2:05 2:25 2:35 1:24/0.5	(3.5) 100%	(N/A)					
-90.8	96.2		*N=44*							
-92.3	97.7	3.5	2:20 2:17 2:25 1:23/0.5	(3.5) 100%	(N/A)					
-95.8	101.2		*N=27*							
-97.3	102.7	3.5	2:50 2:12 2:15	(2.6) 74%	(N/A)					

MACTEC

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

SHEET NO.	TOTAL SHEETS
58	209

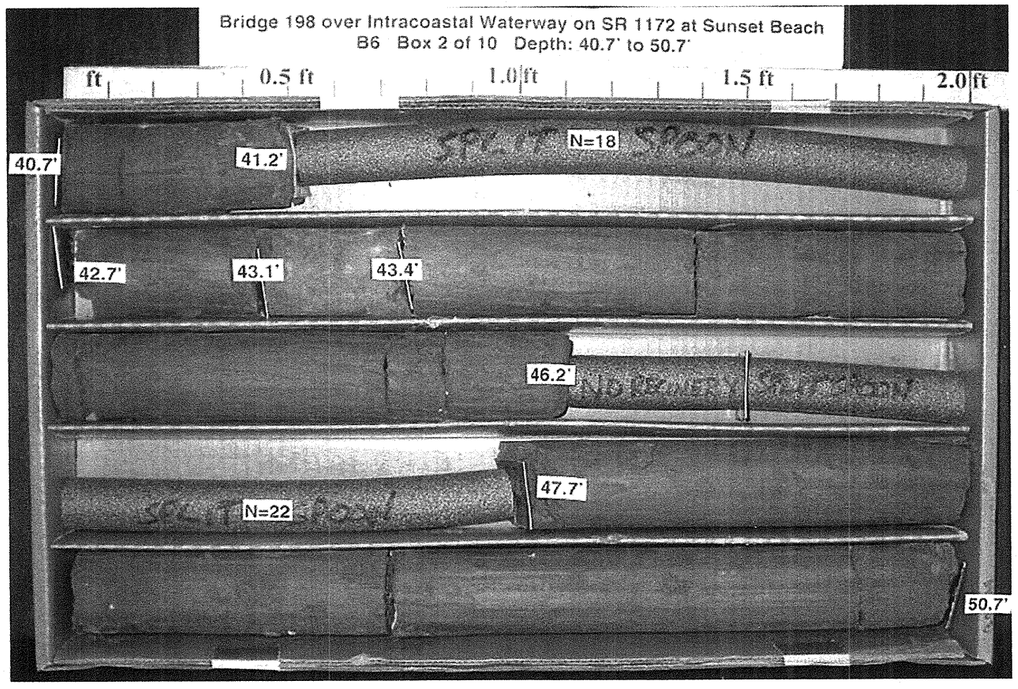
SHEET 2 OF 2

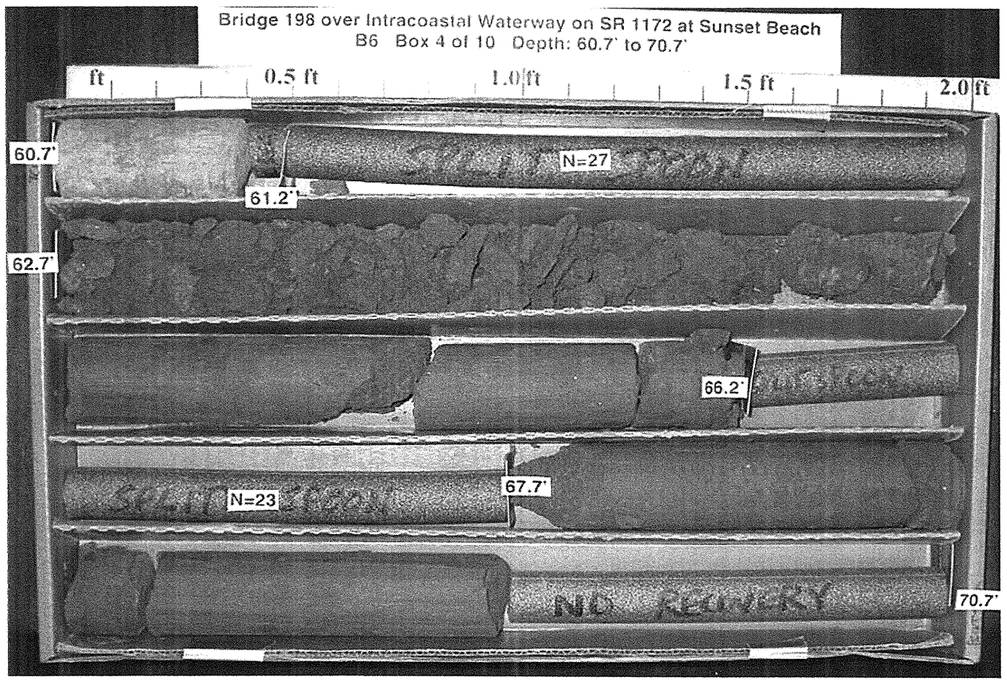
PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. B6	**BORING LOCATION** 38+83	**OFFSET** 3 ft LT / **ALIGNMENT** -L-	**0 HR.** 3.1
COLLAR ELEV. 5.4 ft	**NORTHING** 47,467 **US ft**	**EASTING** 2,148,659 **US ft**	**24 HR.** FIAD
TOTAL DEPTH 122.7 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Rotary-Wash/Core	**HAMMER TYPE** 140 lb Manual
DATE STARTED 5/29/03	**COMPLETED** 6/3/03	**SURFACE WATER DEPTH** N/A	
CORE SIZE HQ	**TOTAL RUN** 66.7 ft	**DRILLER** D. White	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Continued from previous page
-100.8	106.2		1:20/0.5 *N=34*							Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6) *(continued)*
-102.3	107.7	3.5	3:00 6:03 5:25 4:04/0.5	(3.5) 100%	(N/A)					-103.3 108.7 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE (CP)
-105.8	111.2		*N=28*				(0.3) 100%	(N/A) (N/A)		-105.4 110.8 Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-107.3	112.7	3.5	2:35 2:31 2:48 1:04/0.5	(3.5) 100%	(N/A)		(1.8) 100%	(N/A) (N/A)		-106.8 111.2 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE (CP)
-110.8	116.2		*N=31*				(0.4) 100%			Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-112.3	117.7	3.5	2:50 2:35 2:10 0:54/0.5	(0.0) 0%	(N/A)		(3.5) 50%			
-115.8	121.2									-115.8 121.2 Coring terminated at 121.2 ft (Elev. -115.8 ft) in Peedee Fm.: Hard, silty, f. sandy CLAY (A-7-6)

Core Photos
MACTEC Proj. No. 6468-03-0165

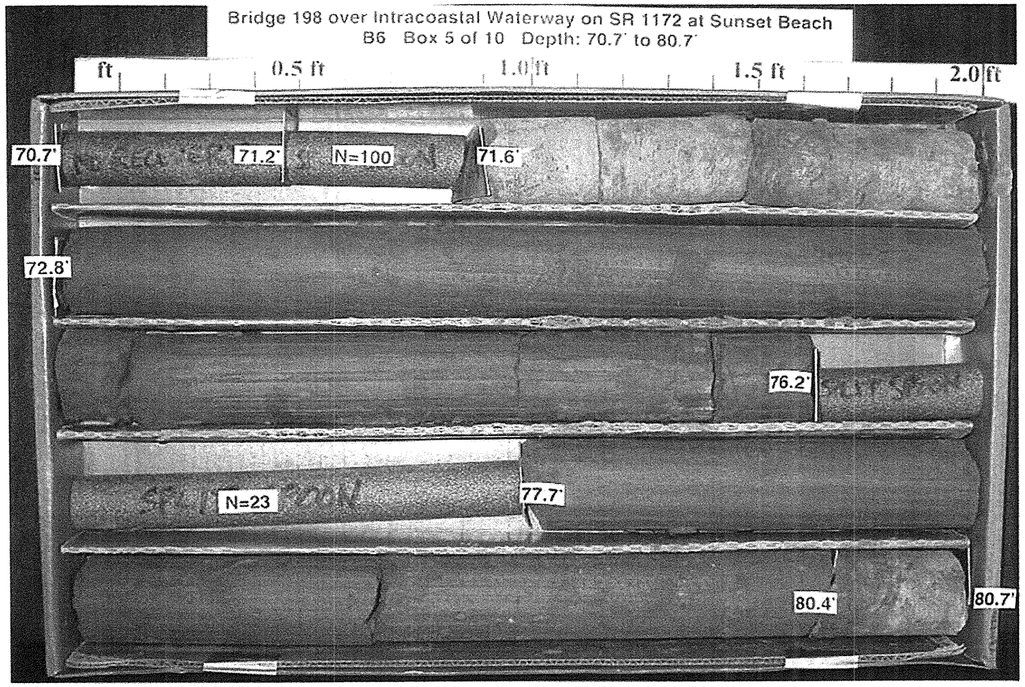
Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)

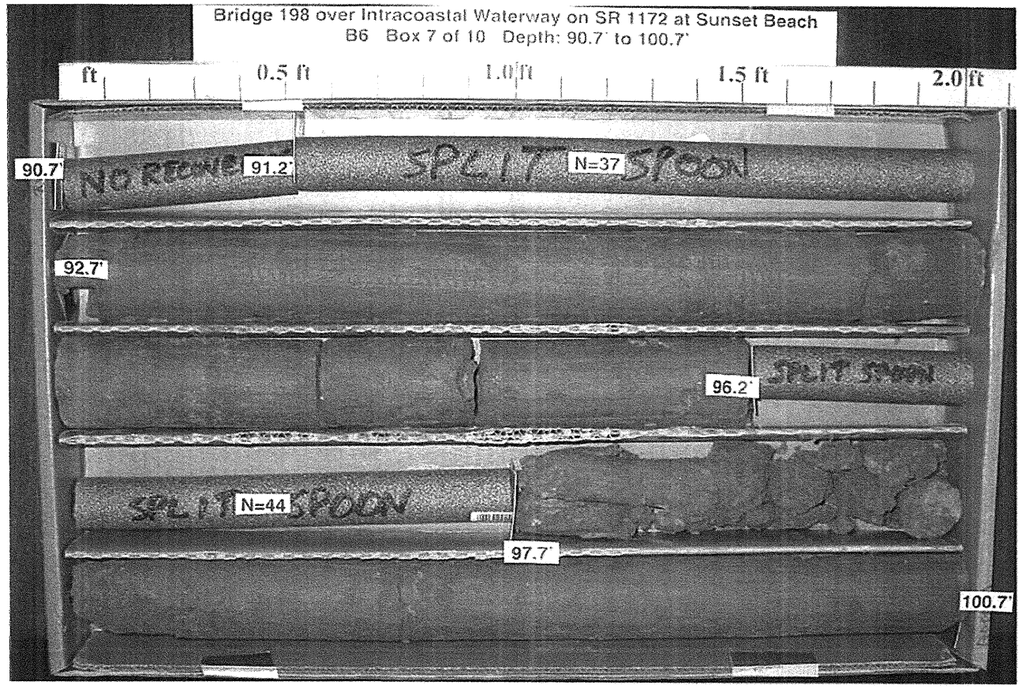


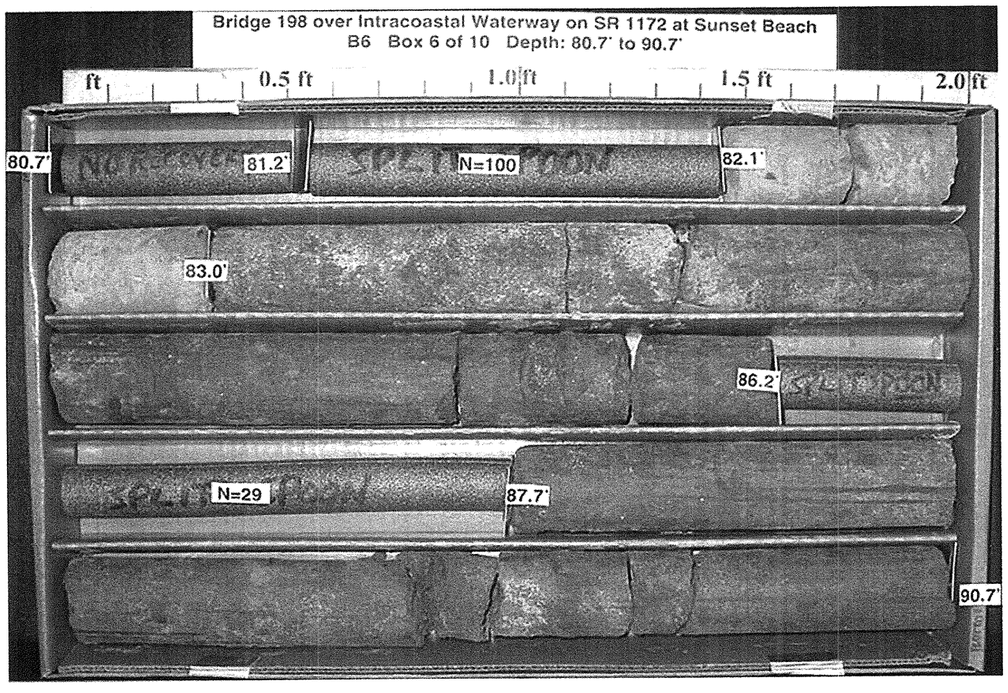


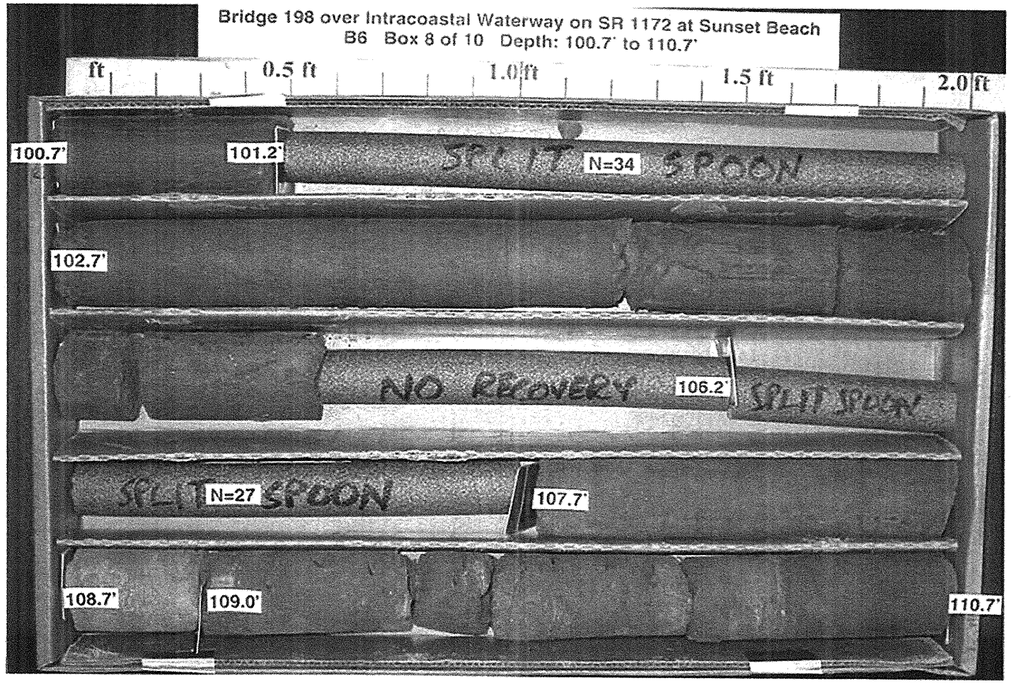
Core Photos
MACTEC Proj. No. 6468-03-0165

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)





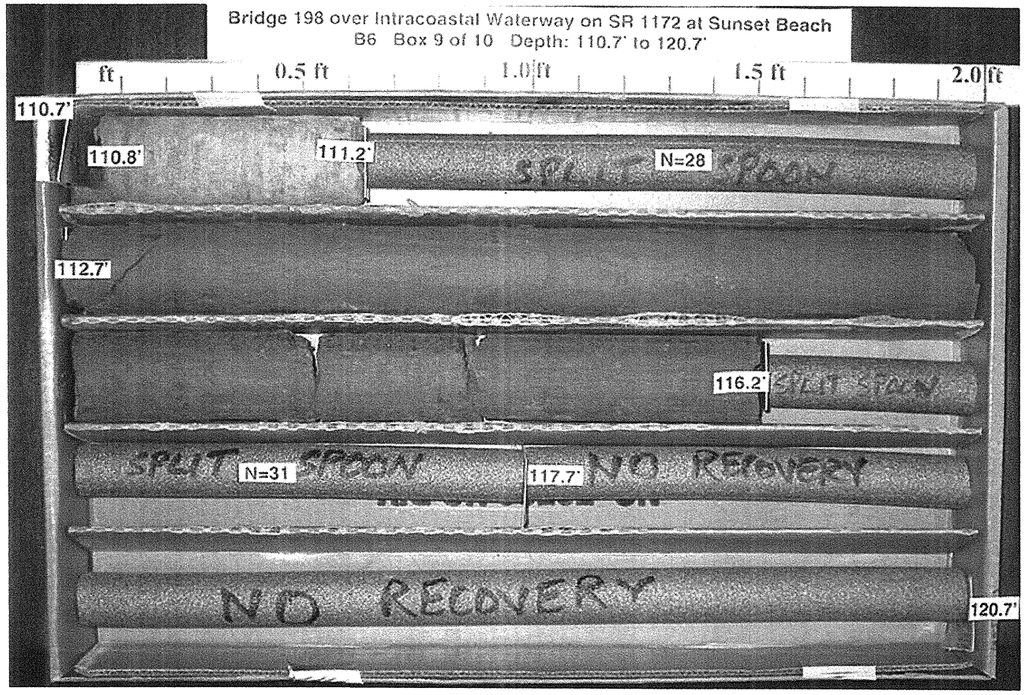


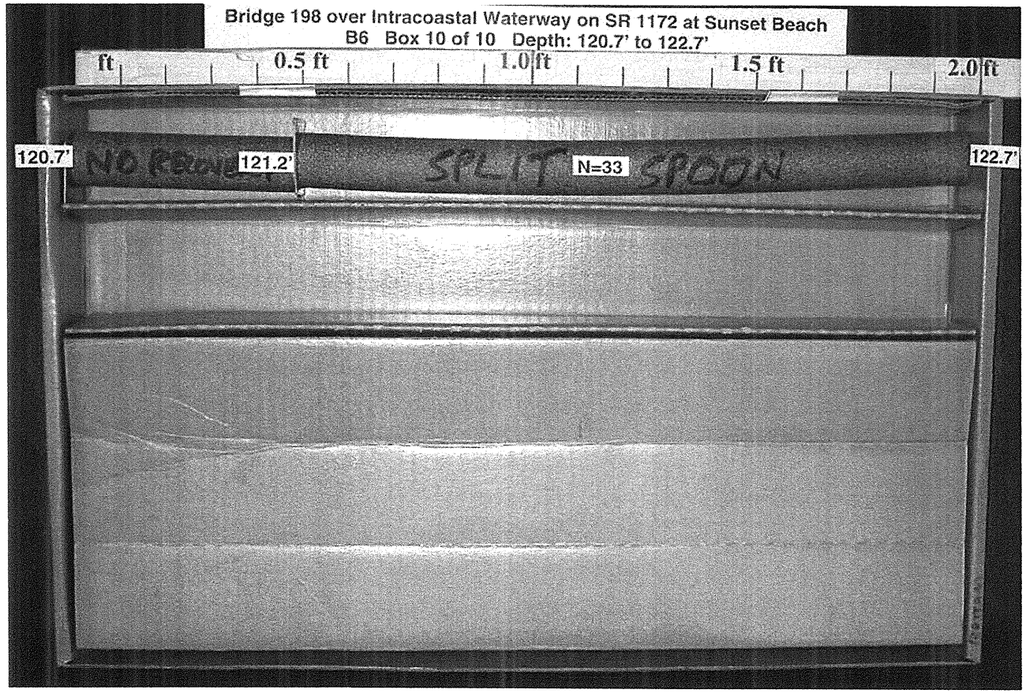


Core Photos
MACTEC Proj. No. 6468-03-0165

SHEET NO.	TOTAL SHEETS
61	209

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)





N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET 1 OF 2

MACTEC

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. B7	**BORING LOCATION** 39+92	**OFFSET** 2 ft LT	**ALIGNMENT** -L-	**0 HR.** 2.8
COLLAR ELEV. 5.1 ft	**NORTHING** 47,570 US ft	**EASTING** 2,148,625 US ft		**24 HR.** FIAD
TOTAL DEPTH 123.4 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Rotary-Wash/Core	**HAMMER TYPE** 140 lb Manual	
DATE STARTED 6/3/03	**COMPLETED** 6/9/03	**SURFACE WATER DEPTH** N/A		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
5.1					Ground Surface				5.1 / 0.0
5.1 / 0.9	0.0 / 4.2	1	1	1	2		M		Roadway Embankment Fill: Tan, brown, and gray, silty SAND (A-2-4) w/ shell fragments
-4.1	9.2	5	4	3	7		W		-2.3 / 7.4 CPU: Dark gray, silty, sandy CLAY (A-7-6) w/ shell fragments
-9.1	14.2	3	1	1	2		W		
-14.1	19.2	2	2	1	3		W		-12.3 / 17.4 CPU: Dark and light gray, silty, f. to cse. SAND (A-2-4) w/ shell fragments
-19.1	24.2	3	4	11	15		W		
-24.1	29.2	10	15	21	36		W		-25.1 / 30.2 Waccamaw Fm: Gray, silty SAND (A-2-4) and v. thinly bedded, friable, shell hash
-31.8	36.9	5	2	11	13		W		-27.3 / 32.4 LIMESTONE (CP)
-36.8	41.9	7	8	11	19		M		-28.5 / 33.6 Peedee Fm: Dark gray to gray, thinly bedded, mod. indurated LIMESTONE; Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-41.8	46.9	5	6	9	15		M		-38.8 / 43.9 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE
-46.8	51.9	6	8	9	17		M		-39.9 / 45.0 Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-51.8	56.9	5	8	10	18		M		-40.8 / 45.9 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE; Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-56.8	61.9	8	8	12	20		M		
-61.8	66.9	14	10	11	21		M		-56.1 / 61.2 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE; Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-66.8	71.9	7	9	12	21		M		
		100/0.5			100/0.5		M		-67.3 / 72.4 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE

NCDOT BORE SINGLE 0165SU-1.GPJ NC_DOT.GDT 9/27/04

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET NO.	TOTAL SHEETS
62	209

SHEET 2 OF 2

MACTEC

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. B7	**BORING LOCATION** 39+92	**OFFSET** 2 ft LT	**ALIGNMENT** -L-	**0 HR.** 2.8
COLLAR ELEV. 5.1 ft	**NORTHING** 47,570 US ft	**EASTING** 2,148,625 US ft		**24 HR.** FIAD
TOTAL DEPTH 123.4 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Rotary-Wash/Core	**HAMMER TYPE** 140 lb Manual	
DATE STARTED 6/3/03	**COMPLETED** 6/9/03	**SURFACE WATER DEPTH** N/A		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-69.7					Continued from previous page				
-71.8	76.9	6	10	12	22		M		Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6) *(continued)*
-76.8	81.9	8	27	73/0.1	100/0.6		M		-77.9 / 83.0 -78.6 / 83.7 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE; Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-81.8	86.9	10	12	13	25		M		
-86.8	91.9	6	10	13	23		M		
-91.8	96.9	5	12	88/0.2	100/0.7		M		-93.0 / 98.1 -93.5 / 98.6 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE; Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-96.8	101.9	15	20	23	43		M		
-101.8	106.9	13	18	25	43		M		-104.4 / 109.5 -104.7 / 109.8 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE; Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-106.8	111.9	16	18	22	40		M		
-111.8	116.9	9	15	17	32		M		
-116.8	121.9	12	15	18	33		M		-118.3 / 123.4 Boring terminated at 123.4 ft (Elev. -118.3 ft) in Peedee Fm.: Hard, silty, sandy CLAY (A-7-6)

Bits Used: 0.3' roller cone; HQ core bit (surface set)

Drilling Fluid Properties: Water

NCDOT BORE SINGLE 0165SU-1.GPJ NC_DOT.GDT 9/27/04

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

MACTEC

PROJECT NO. 8.2230101	ID. B-0682	COUNTY Brunswick	GEOLOGIST B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			GROUND WATER (ft)
BORING NO. B7	BORING LOCATION 39+92	OFFSET 2 ft LT	ALIGNMENT -L-	0 HR. 2.8
COLLAR ELEV. 5.1 ft	NORTHING 47,570 US ft	EASTING 2,148,625 US ft	24 HR. FIAD
TOTAL DEPTH 123.4 ft	DRILL MACHINE CME 550	DRILL METHOD Rotary-Wash/Core	HAMMER TYPE 140 lb Manual
DATE STARTED 6/3/03	COMPLETED 6/9/03	SURFACE WATER DEPTH N/A	
CORE SIZE HQ	TOTAL RUN 67.4 ft	DRILLER D. White	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 30.7 ft
-25.6	30.7	1.2	1:00 0:20/0.2	(0.0) 0%	(N/A)		(0.0) 0%	(N/A)		-27.3 Waccamaw Fm: No recovery - SAND (A-2-4) and v. thinly bedded, friable, shell hash LIMESTONE 32.4
-26.8	31.9	5.0	1:54 2:21 3:14 0:58 0:38	(4.5) 90%	(N/A)		(1.2) 100%	(N/A)		-28.5 Peedee Fm: Dark gray to gray, thinly bedded, mod. indurated LIMESTONE 33.6 Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-31.8	36.9		N=19				(6.5) 89%			
-33.3	38.4	3.5	1:03 1:00 1:32 0:20/0.5	(3.2) 91%	(N/A)					
-36.8	41.9		N=15							
-38.3	43.4	3.5	2:33 4:55 0:57 0:33/0.5	(3.0) 86%	(N/A)		(0.3) 100%	(N/A) (N/A)		-38.8 43.9 -39.1 44.2 -39.9 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE 45.0 -40.8 Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6) 45.9
-41.8	46.9		N=17				(0.8) 100%	(N/A) (N/A)		Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-43.3	48.4	3.5	0:45 1:10 1:17 0:31/0.5	(3.0) 86%	(N/A)		(0.9) 100%			
-46.8	51.9		N=18				(10.0) 93%			
-48.3	53.4	3.5	1:19 1:09 1:41 0:32/0.5	(3.2) 91%	(N/A)					
-51.8	56.9		N=20							
-53.3	58.4	3.5	1:25 1:06 4:08 2:51/0.5	(3.5) 100%	(N/A)					-56.1 61.2 -56.8 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE 61.9
-56.8	61.9		N=21				(0.4) 100%	(N/A) (N/A)		Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-58.3	63.4	3.5	2:19 2:43 2:50 1:15/0.5	(3.5) 100%	(N/A)		(7.3) 100%			
-61.8	66.9		N=21							
-63.3	68.4	3.5	1:27 1:36 1:28 0:30/0.5	(3.5) 100%	(N/A)					
-66.8	71.9		N=100/0.5							-67.3 72.4 -67.9 73.0
-67.3	72.4	4.5	6:50 1:19 1:27 1:35 0:22/0.5	(4.3) 96%	(N/A)		(0.6) 100%	(N/A) (N/A)		Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-71.8	76.9		N=22				(7.2) 97%			
-73.3	78.4	3.5	1:15 1:51 2:33 1:06/0.5	(3.5) 100%	(N/A)					
-76.8	81.9		N=100/0.6							-77.9 83.0 -78.6 83.7
-77.9	83.0	3.9	7:51 1:32 2:45 1:28/0.9	(3.7) 95%	(N/A)		(0.7) 100%	(N/A) (N/A)		Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-81.8	86.9		N=25				(7.7) 75%			
-83.3	88.4	3.5	1:33 1:47 2:00 0:45/0.5	(1.9) 54%	(N/A)					
-86.8	91.9		N=23							
-88.3	93.4	3.5	3:16 2:20 1:15 0:45/0.5	(2.8) 80%	(N/A)					
-91.8	96.9		N=100/0.7							-93.0 98.1 -93.9 99.0
-93.0	98.1	3.8	5:06 2:30 3:00 2:51/0.8	(1.3) 34%	(N/A)		(0.5) 100%	(N/A) (N/A)		Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-96.8	101.9		N=43				(2.8) 35%			
-98.3	103.4	3.5	3:53 3:25	(0.9) 26%	(N/A)					

0165SU-1.GPJ NC_DOT.GDT 9/27/04

NCDOT CORE S.

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

MACTEC

SHEET NO.	TOTAL SHEETS
63	209

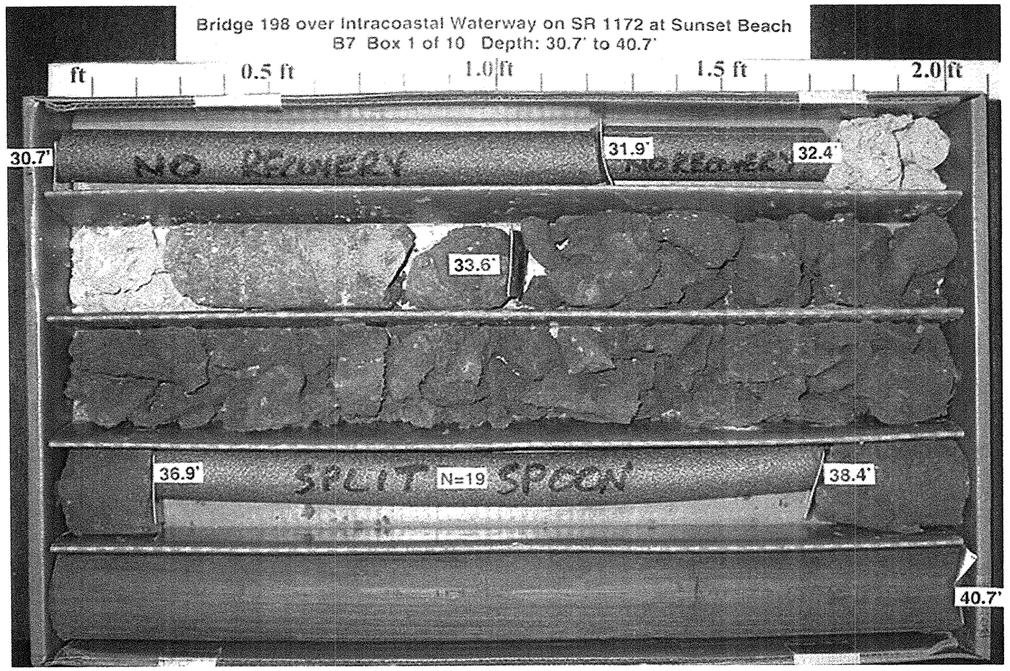
PROJECT NO. 8.2230101	ID. B-0682	COUNTY Brunswick	GEOLOGIST B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			GROUND WATER (ft)
BORING NO. B7	BORING LOCATION 39+92	OFFSET 2 ft LT	ALIGNMENT -L-	0 HR. 2.8
COLLAR ELEV. 5.1 ft	NORTHING 47,570 US ft	EASTING 2,148,625 US ft	24 HR. FIAD
TOTAL DEPTH 123.4 ft	DRILL MACHINE CME 550	DRILL METHOD Rotary-Wash/Core	HAMMER TYPE 140 lb Manual
DATE STARTED 6/3/03	COMPLETED 6/9/03	SURFACE WATER DEPTH N/A	
CORE SIZE HQ	TOTAL RUN 67.4 ft	DRILLER D. White	

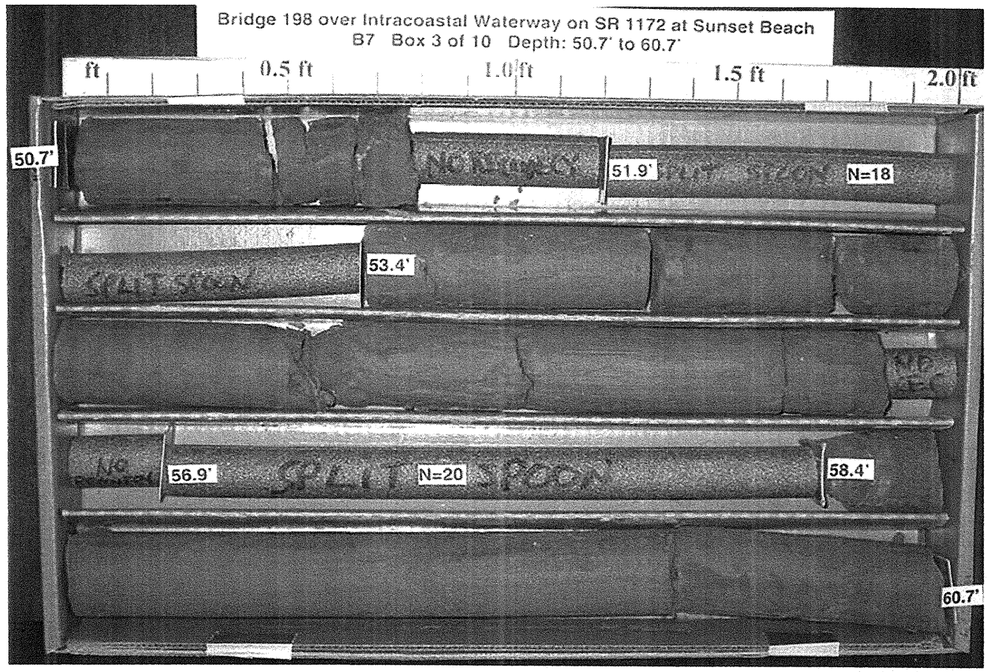
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Continued from previous page
-101.8	106.9		3:02 0:20/0.5							Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6) *(continued)*
			N=43							-104.4 109.5 -104.7 109.8
-103.3	108.4	3.5	4:05 5:30 2:38 1:39/0.5	(3.4) 97%	(N/A)		(0.3) 100%	(N/A) (N/A)		Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-106.8	111.9		N=40				(9.0) 99%			
-108.3	113.4	3.5	2:39 2:58 2:00 1:35/0.5	(3.5) 100%	(N/A)					
-111.8	116.9		N=32							
-113.3	118.4	3.5	2:00 2:19 2:22 1:02/0.5	(3.5) 100%	(N/A)					
-116.8	121.9									-116.8 121.9 Coring terminated at 121.9 ft (Elev. -116.8 ft) in Peedee Fm.: Hard, silty, sandy CLAY (A-7-6)

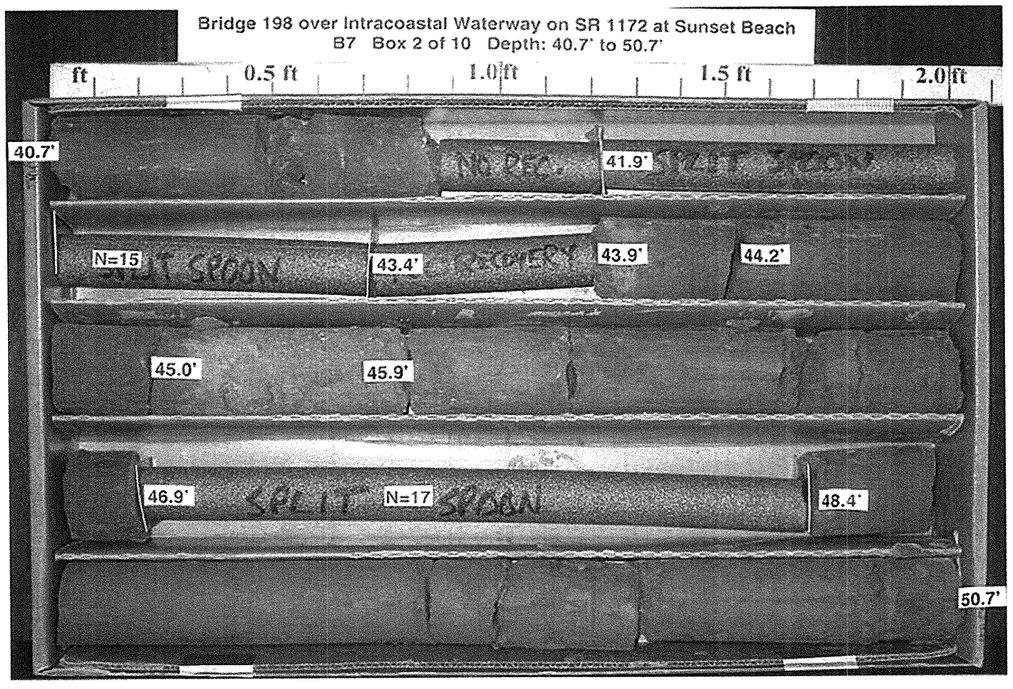
NCDOT CORE SINGLE 0165SU-1.GPJ NC_DOT.GDT 9/27/04

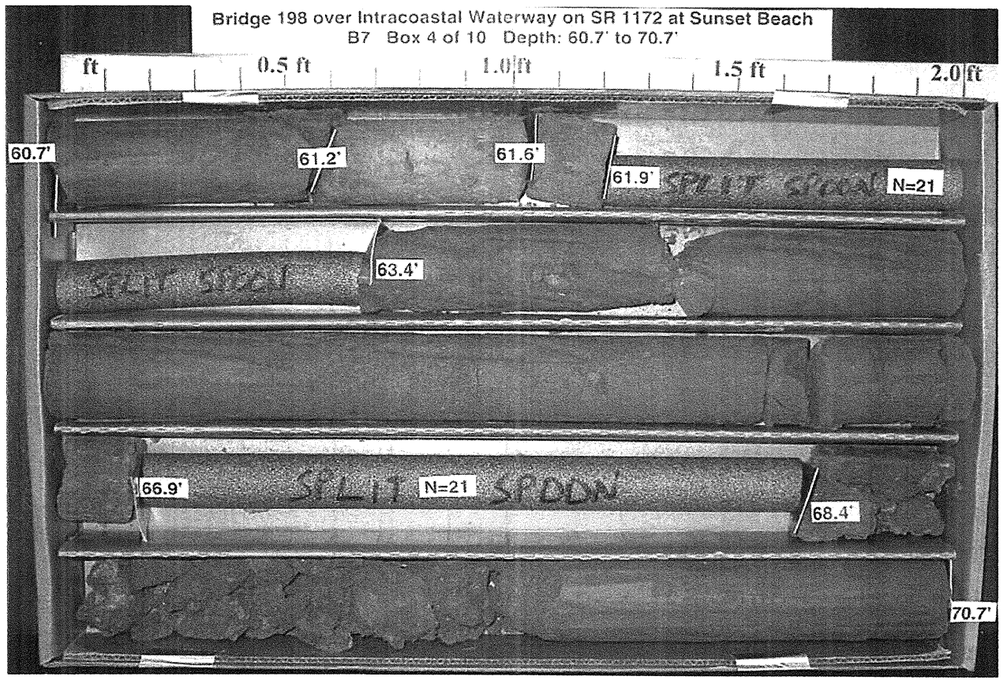
Core Photos
MACTEC Proj. No. 6468-03-0165

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)



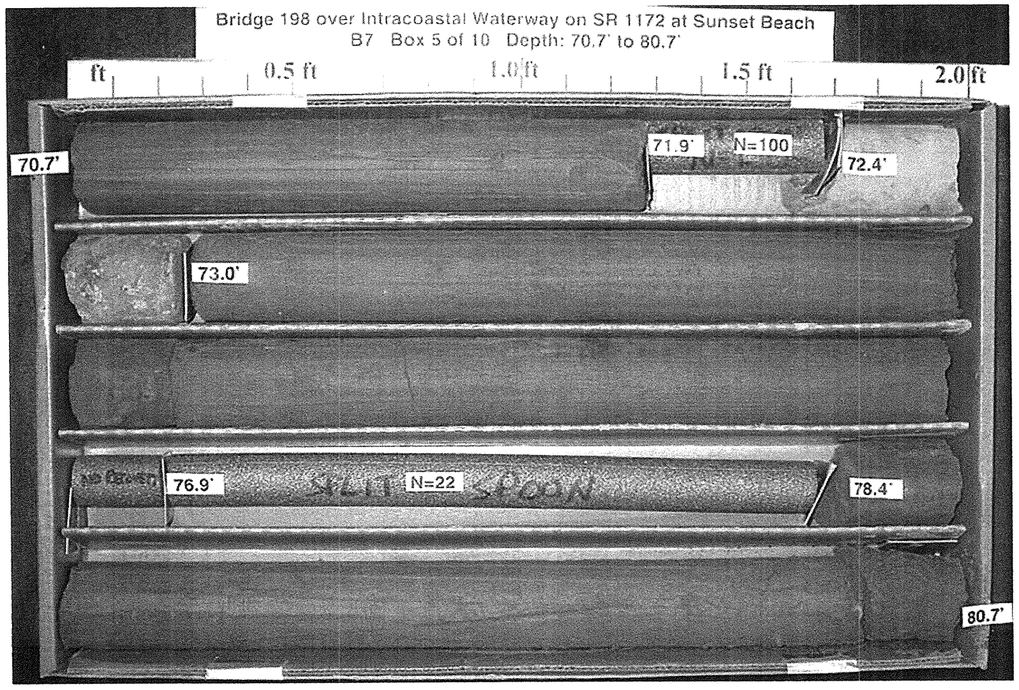


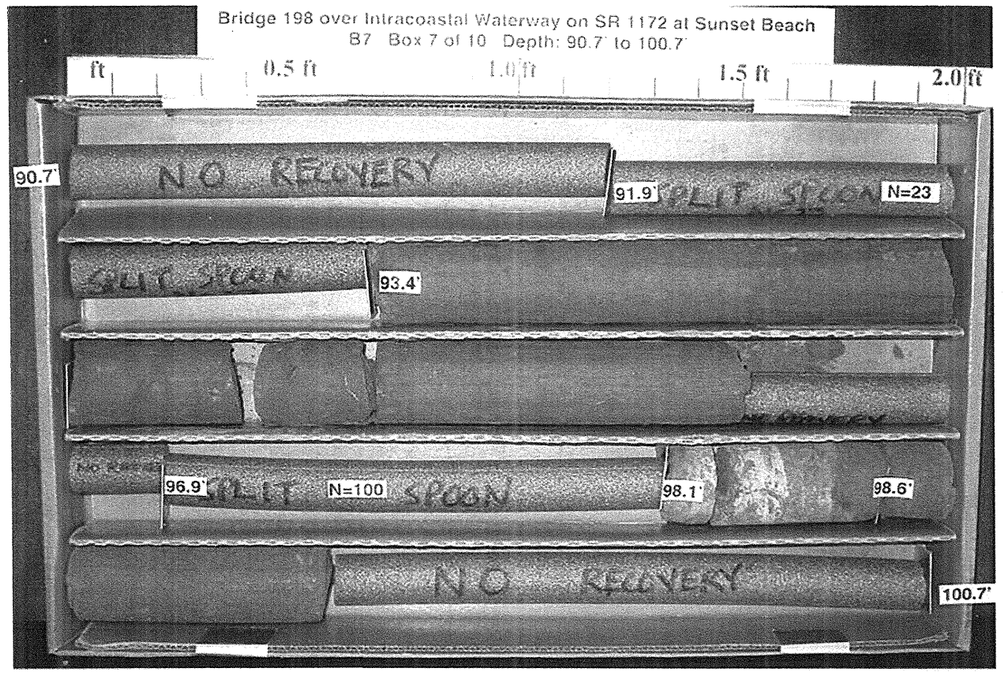


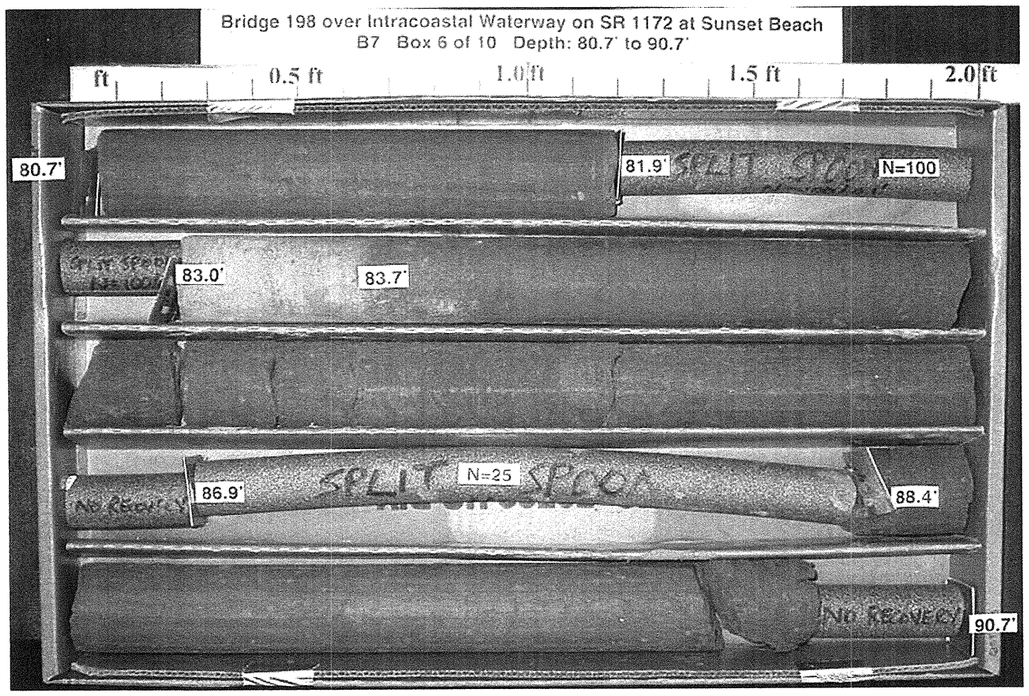


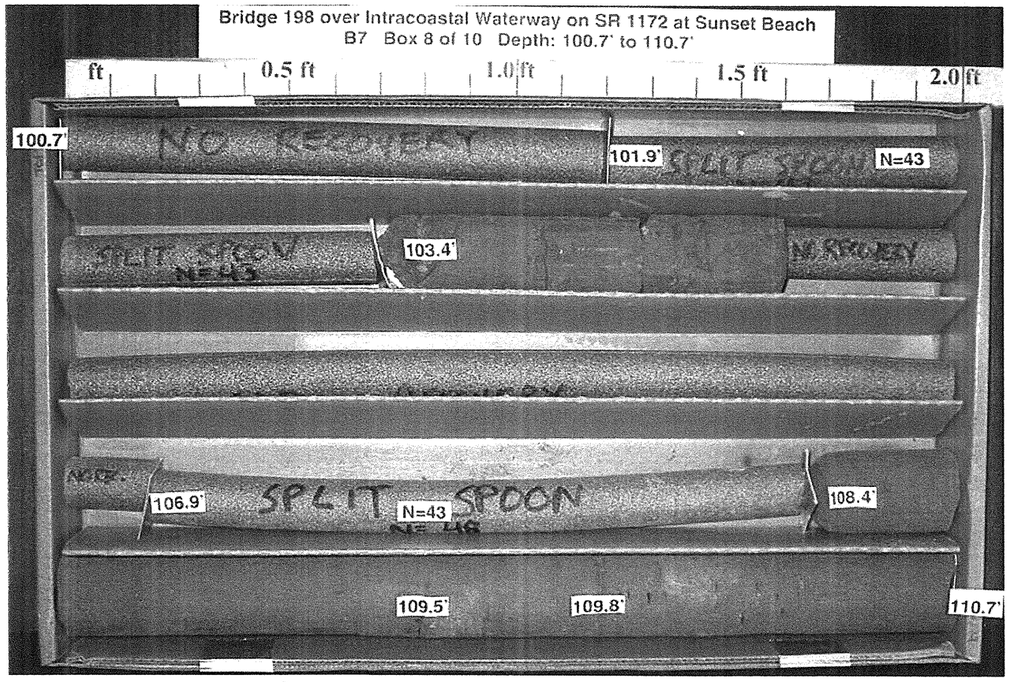
Core Photos
MACTEC Proj. No. 6468-03-0165

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)



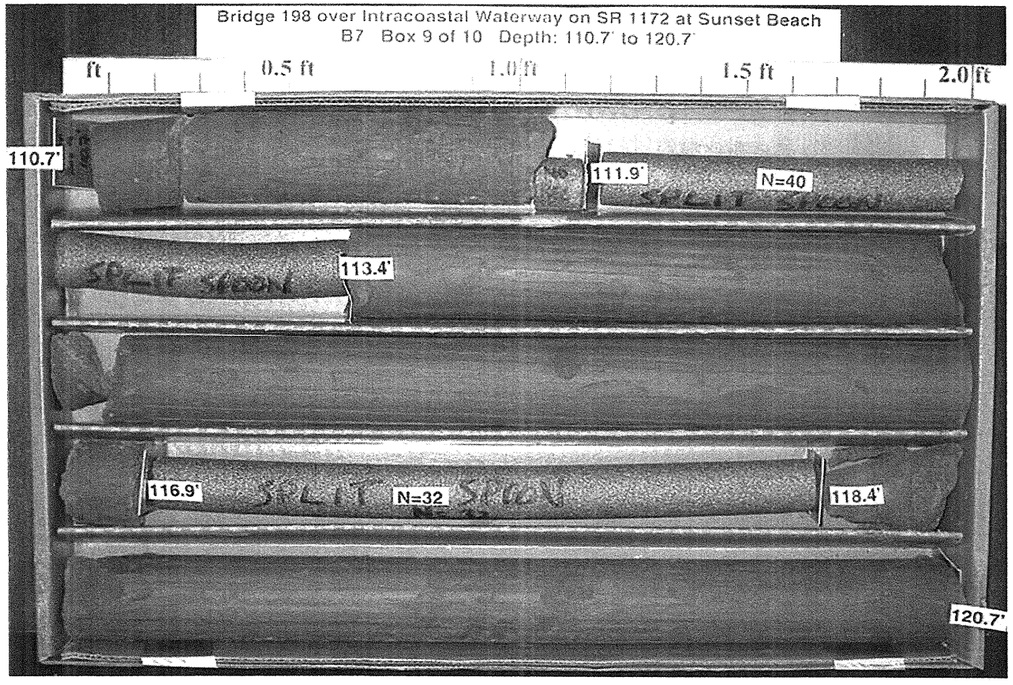


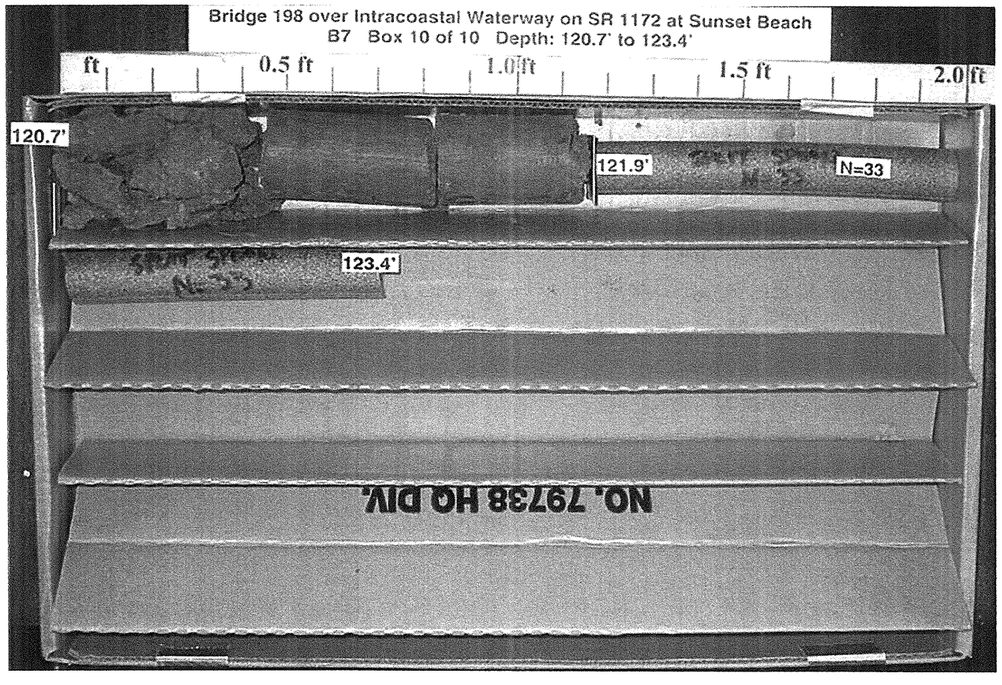




Core Photos
MACTEC Proj. No. 6468-03-0165

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)





MACTEC

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET 1 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. B8	**BORING LOCATION** 40+98	**OFFSET** 8 ft RT	**ALIGNMENT** -L-	**0 HR.** 2.8
COLLAR ELEV. 1.9 ft	**NORTHING** 47,673 **US ft**	**EASTING** 2,148,595 **US ft**	**24 HR.** FIAD
TOTAL DEPTH 123.0 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Rotary-Wash/Core	**HAMMER TYPE** 140 lb Manual
DATE STARTED 6/10/03	**COMPLETED** 6/12/03	**SURFACE WATER DEPTH** N/A	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1.9					Ground Surface				
1.9	0.0	3	4	4	8		D		Roadway Embankment Fill: Tan, brown, and dark gray, silty SAND (A-2-4) w/ shell fragments
-2.3	4.2	3	5	5	10		W		
-5.5	7.4								CPU: Dark gray, silty, sandy, CLAY (A-7-6) w/ shell fragments
-7.3	9.2	2	1	1	2		W		
-12.3	14.2	2	1	2	3		W		
-15.1	17.0								Waccamaw Fm: Dark gray, silty CLAY (A-7-6)
-17.3	19.2	WOH	WOH	WOH	WOH		W		
-20.5	22.4								Waccamaw Fm: Light gray to gray, silty, f. to cse. SAND (A-2-4)
-22.3	24.2	5	6	9	15		W		
-25.1	27.0								Waccamaw Fm: Dark gray to green, silty CLAY (A-7-6) w/ shell fragments
-27.3	29.2	WOH	WOH	2	2		W		
-28.1	30.0								Waccamaw Fm: Tan and brown, silty, f. to cse. SAND (A-2-4) and v. thinly bedded, friable, shell hash LIMESTONE
-30.9	32.8								Peedee Fm: Dark Gray, thinly bedded, mod. indurated LIMESTONE
-32.6	34.5								Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6)
-34.6	36.5	4	6	8	14		M		
-39.6	41.5	5	7	7	14		M		
-41.7	43.6								
-42.7	44.6								Peedee Fm: Dark Gray, thinly bedded, mod. indurated LIMESTONE
-44.6	46.5	5	7	9	16		M		Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6)
-49.6	51.5	5	7	9	16		M		
-54.6	56.5	6	8	10	18		M		
-58.8	60.7								
-59.6	61.5	6	8	12	20		M		Peedee Fm: Dark Gray, thinly bedded, mod. indurated LIMESTONE
-64.6	66.5	7	7	10	17		M		Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6)
-69.0	70.9								
-69.6	71.5	8	92/0.2		100/0.2				Peedee Fm: Dark Gray, thinly bedded, mod. indurated LIMESTONE
-70.3	72.2								
-71.1	73.0								Peedee Fm: Dark gray to green, silty, f. sandy

NCDOT BORE S. 0165SU-1.GPJ NC DOT.GDT 9/27/04

MACTEC

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET NO.	TOTAL SHEETS
67	209

SHEET 2 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			**GROUND WATER (ft)**
BORING NO. B8	**BORING LOCATION** 40+98	**OFFSET** 8 ft RT	**ALIGNMENT** -L-	**0 HR.** 2.8
COLLAR ELEV. 1.9 ft	**NORTHING** 47,673 **US ft**	**EASTING** 2,148,595 **US ft**	**24 HR.** FIAD
TOTAL DEPTH 123.0 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Rotary-Wash/Core	**HAMMER TYPE** 140 lb Manual
DATE STARTED 6/10/03	**COMPLETED** 6/12/03	**SURFACE WATER DEPTH** N/A	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-72.9					Continued from previous page				
-74.6	76.5	7	9	11	20		M		CLAY (A-7-6)
-79.6	81.5	7	93/0.5		100/1.0				Peedee Fm: Dark Gray, thinly bedded, mod. indurated LIMESTONE
-80.6	82.5								Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6) *(continued)*
-81.8	83.7								Peedee Fm: Dark Gray, thinly bedded, mod. indurated LIMESTONE
-84.6	86.5	8	10	14	24		M		Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6)
-89.6	91.5	8	8	14	22		M		
-94.6	96.5	7	93/0.5		100/1.0				
-95.6	97.5								
-99.6	101.5	15	19	22	41		M		Peedee Fm: Dark Gray, thinly bedded, mod. indurated LIMESTONE
-104.6	106.5	6	11	14	25		M		Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6)
-106.6	108.5								
-107.8	109.7								Peedee Fm: Dark Gray, thinly bedded, mod. indurated LIMESTONE
-108.8	110.7								Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-109.6	111.5	8	11	13	24		M		Peedee Fm: Dark Gray, thinly bedded, mod. indurated LIMESTONE
-114.6	116.5	9	12	16	28		M		Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6)
-119.6	121.5	9	15	17	32		M		
-121.1	123.0								Boring terminated at 123.0 ft (Elev. -121.1 ft) in Peedee Fm.: Hard, silty, sandy CLAY (A-7-6)

Bits Used: 0.3' roller cone; HQ core bit (surface set)

Drilling Fluid Properties: Water

NCDOT BORE SINGLE 0165SU-1.GPJ NC DOT.GDT 9/27/04

MACTEC

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

SHEET 1 OF 2

PROJECT NO. 8.2230101	ID. B-0682	COUNTY Brunswick	GEOLOGIST B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			GROUND WATER (ft)
BORING NO. B8	BORING LOCATION 40+98	OFFSET 8 ft RT	ALIGNMENT -L-	0 HR. 2.8
COLLAR ELEV. 1.9 ft	NORTHING 47,673 US ft	EASTING 2,148,595 US ft	24 HR. FIAD
TOTAL DEPTH 123.0 ft	DRILL MACHINE CME 550	DRILL METHOD Rotary-Wash/Core	HAMMER TYPE 140 lb Manual
DATE STARTED 6/10/03	COMPLETED 6/12/03	SURFACE WATER DEPTH N/A	
CORE SIZE HQ	TOTAL RUN 66.3 ft	DRILLER D. White	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 31.5 ft
-29.6	31.5	5.0	1:00 4:30 2:30 1:40 1:16	(3.7) 74%	(N/A)		(0.0) 0%	(N/A) (N/A)		-30.9 Waccamaw Fm: Tan and brown, silty, f. to cse. SAND (A-2-4) and v. thinly bedded, friable, shell hash LIMESTONE 32.8 -32.6 Peedee Fm: Dark Gray, thinly bedded, mod. indurated LIMESTONE 34.5 Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6)
-34.6	36.5		*N=14*				(1.7) 100%	(N/A)		
-36.1	38.0	3.5	1:38 0:58 1:45 0:17/0.5	(3.5) 100%	(N/A)		(6.1) 100%			
-39.6	41.5		*N=14*							-41.7 43.6
-41.1	43.0	3.5	2:32 8:15 2:12 0:54/0.5	(3.3) 94%	(N/A)		(1.0) 100%	(N/A) (N/A)		-42.7 Peedee Fm: Dark Gray, thinly bedded, mod. indurated LIMESTONE 44.6 Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6)
-44.6	46.5		*N=16*				(10.9) 94%			
-46.1	48.0	3.5	1:05 1:15 1:05 0:42/0.5	(3.2) 91%	(N/A)					
-49.6	51.5		*N=16*							
-51.1	53.0	3.5	2:20 1:07 1:25 1:08/0.5	(3.3) 94%	(N/A)					
-54.6	56.5		*N=18*							
-56.1	58.0	3.5	1:01 3:16 2:56 1:53/0.5	(3.0) 86%	(N/A)					-58.8 60.7 -59.6 Peedee Fm: Dark Gray, thinly bedded, mod. indurated LIMESTONE 61.5 Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6)
-59.6	61.5		*N=20*				(0.3) 100%	(N/A) (N/A)		
-61.1	63.0	3.5	1:04 1:00 1:13 0:45/0.5	(3.2) 91%	(N/A)		(6.1) 88%			
-64.6	66.5		*N=17*							
-66.1	68.0	3.5	1:15 1:06 1:45 1:59/0.5	(3.2) 91%	(N/A)					-69.0 70.9 -69.6 Peedee Fm: Dark Gray, thinly bedded, mod. indurated LIMESTONE 71.5 -70.3 Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6) 72.2 -71.1 Peedee Fm: Dark Gray, thinly bedded, mod. indurated LIMESTONE 73.0 Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6)
-69.6	71.5		*N=100/0.7*				(0.4) 100%	(N/A) (N/A)		
-70.3	72.2	4.3	3:43 1:45 1:56 1:53 0:24/0.3	(4.3) 100%	(N/A)		(0.0) 0%	(N/A) (N/A)		
-74.6	76.5		*N=20*				(0.8) 100%			
-76.1	78.0	3.5	1:12 1:06 1:05 0:33/0.5	(3.4) 97%	(N/A)		(6.9) 99%			
-79.6	81.5		*N=100/1.0*							-80.6 82.5
-80.6	82.5	4.0	11:15 4:26 1:35 2:12	(3.7) 93%	(N/A)		(1.2) 100%	(N/A) (N/A)		-81.8 Peedee Fm: Dark Gray, thinly bedded, mod. indurated LIMESTONE 83.7 Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6)
-84.6	86.5		*N=24*				(9.1) 93%			
-86.1	88.0	3.5	1:11 1:30 1:42 0:36/0.5	(3.4) 97%	(N/A)					
-89.6	91.5		*N=22*							
-91.1	93.0	3.5	1:58 1:37 2:21 0:58/0.5	(3.2) 91%	(N/A)					
-94.6	96.5		*N=100/1.0*							-95.6 97.5
-95.6	97.5	4.0	4:30 3:59 4:07 2:11	(2.7) 68%	(N/A)		(0.3) 100%	(N/A) (N/A)		-96.3 Peedee Fm: Dark Gray, thinly bedded, mod. indurated LIMESTONE 98.2 Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6)
-99.6	101.5		*N=41*				(2.9) 38%			
-101.1	103.0	3.5	3:48 3:40 4:00	(0.0) 0%	(N/A)					
-104.6	106.5									

NCDOT CORE SINGLE 0165SU-1.GPJ NC_DOT.GDT 9/27/04

MACTEC

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

SHEET NO.	TOTAL SHEETS
68	209

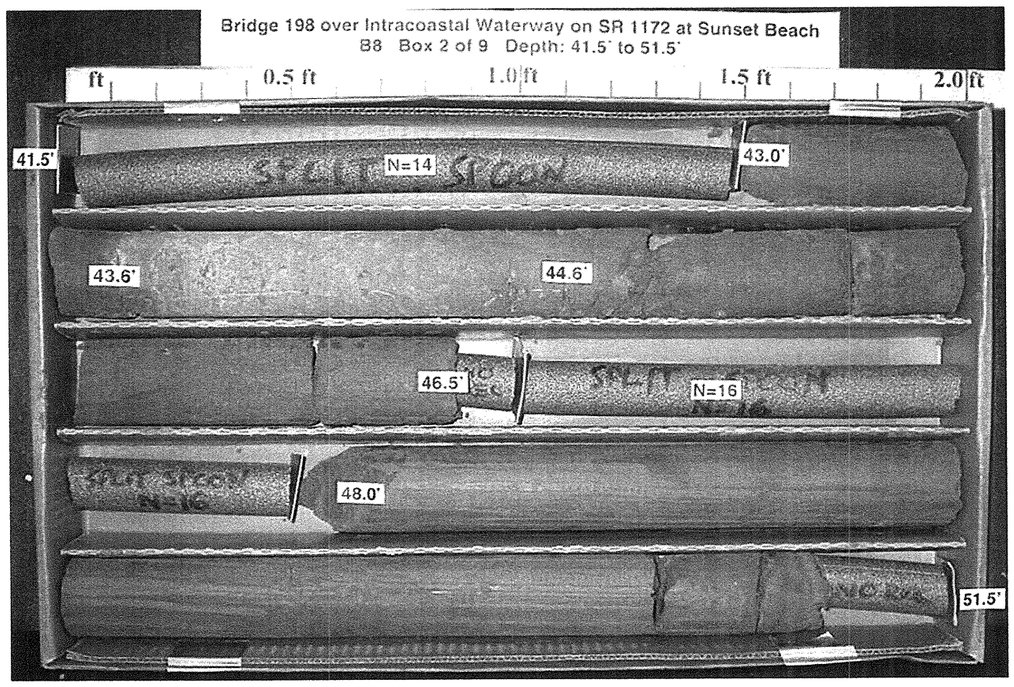
SHEET 2 OF 2

PROJECT NO. 8.2230101	ID. B-0682	COUNTY Brunswick	GEOLOGIST B. Parks
SITE DESCRIPTION Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-03-0165)			GROUND WATER (ft)
BORING NO. B8	BORING LOCATION 40+98	OFFSET 8 ft RT	ALIGNMENT -L-	0 HR. 2.8
COLLAR ELEV. 1.9 ft	NORTHING 47,673 US ft	EASTING 2,148,595 US ft	24 HR. FIAD
TOTAL DEPTH 123.0 ft	DRILL MACHINE CME 550	DRILL METHOD Rotary-Wash/Core	HAMMER TYPE 140 lb Manual
DATE STARTED 6/10/03	COMPLETED 6/12/03	SURFACE WATER DEPTH N/A	
CORE SIZE HQ	TOTAL RUN 66.3 ft	DRILLER D. White	

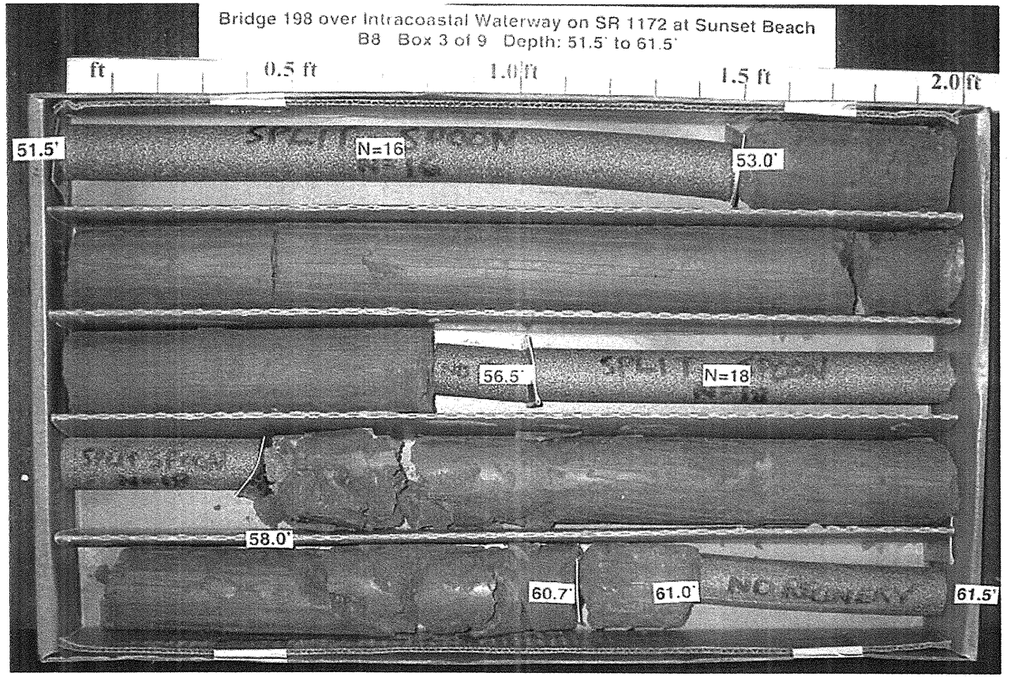
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Continued from previous page
			0:30/0.5							Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6) *(continued)*
			N=25							-106.6 108.5
-106.1	108.0	3.5	3:19 9:24 5:15 4:52/0.5	(3.2) 91%	(N/A)		(1.2) 100%	(N/A) (N/A)		-107.8 Peedee Fm: Dark Gray, thinly bedded, mod. indurated LIMESTONE 109.7 -108.8 Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6) 110.7 -109.1 Peedee Fm: Dark Gray, thinly bedded, mod. indurated LIMESTONE 111.0 Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6)
-109.6	111.5		*N=24*				(1.0) 100%	(N/A) (N/A)		
-111.1	113.0	3.5	2:48 2:14 1:43 1:28/0.5	(3.5) 100%	(N/A)		(0.3) 100%			
-114.6	116.5		*N=28*				(3.7) 49%			
-116.1	118.0	3.5	2:21 3:24 3:14 1:03/0.5	(0.0) 0%	(N/A)					-119.6 121.5 Coring terminated at 121.5 ft (Elev. -119.6 ft) in Peedee Fm.: Hard, silty, f. sandy CLAY (A-7-6)
-119.6	121.5									

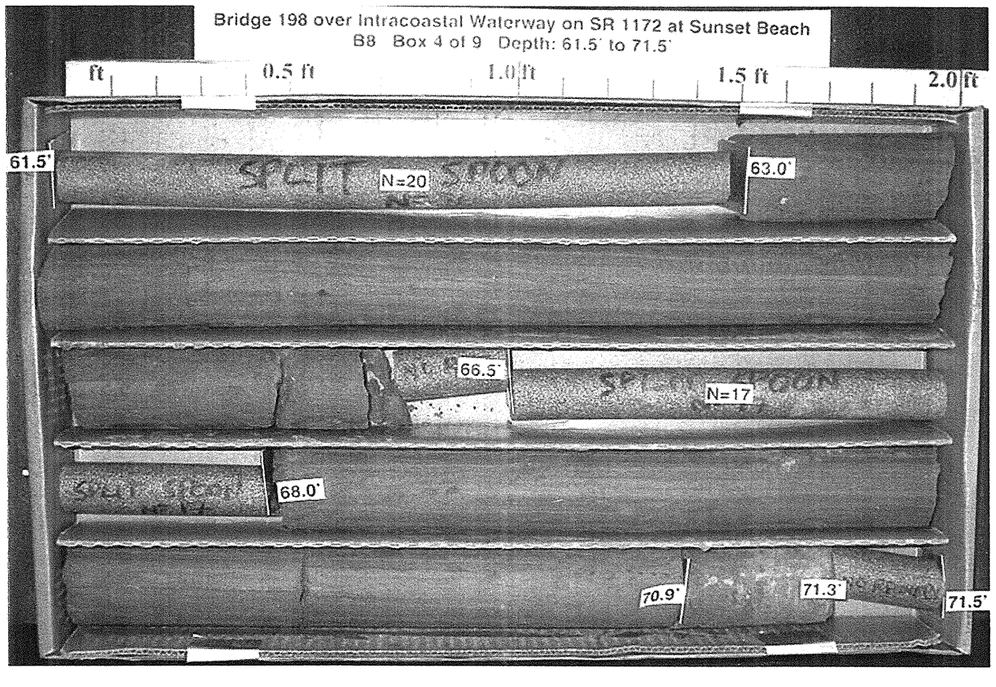
NCDOT CORE SINGLE 0165SU-1.GPJ NC_DOT.GDT 9/27/04

Core Photos
MACTEC Proj. No. 6468-03-0165



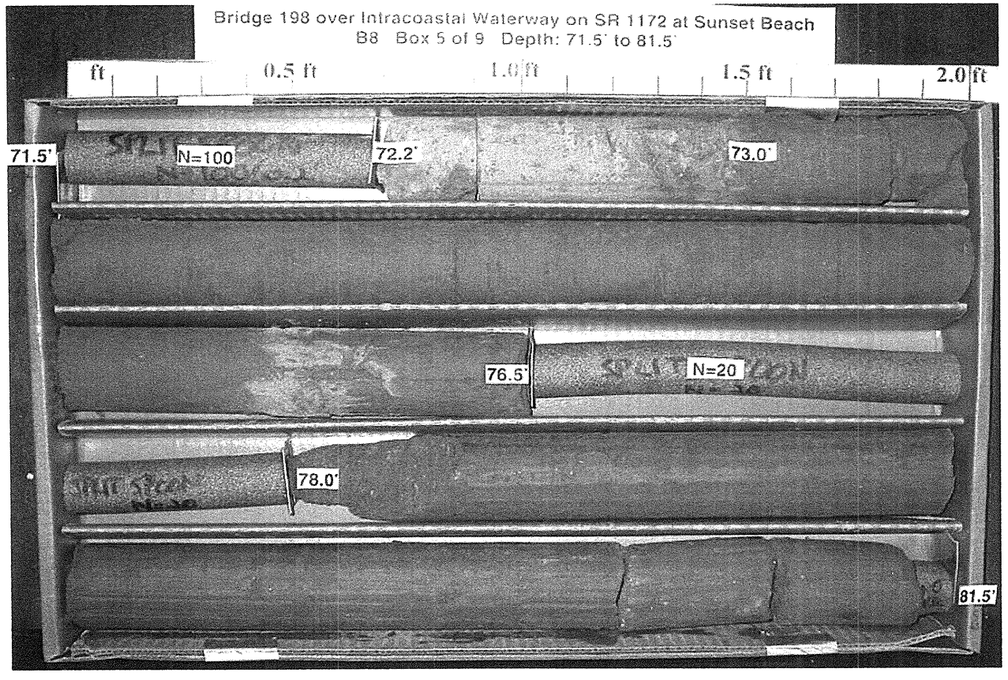
Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)

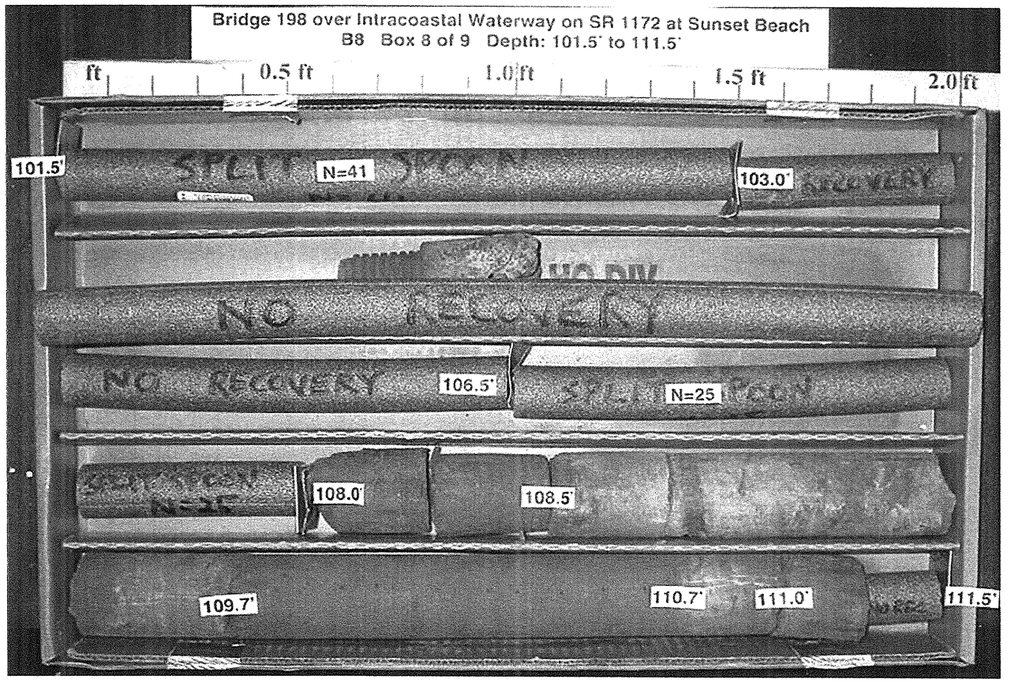


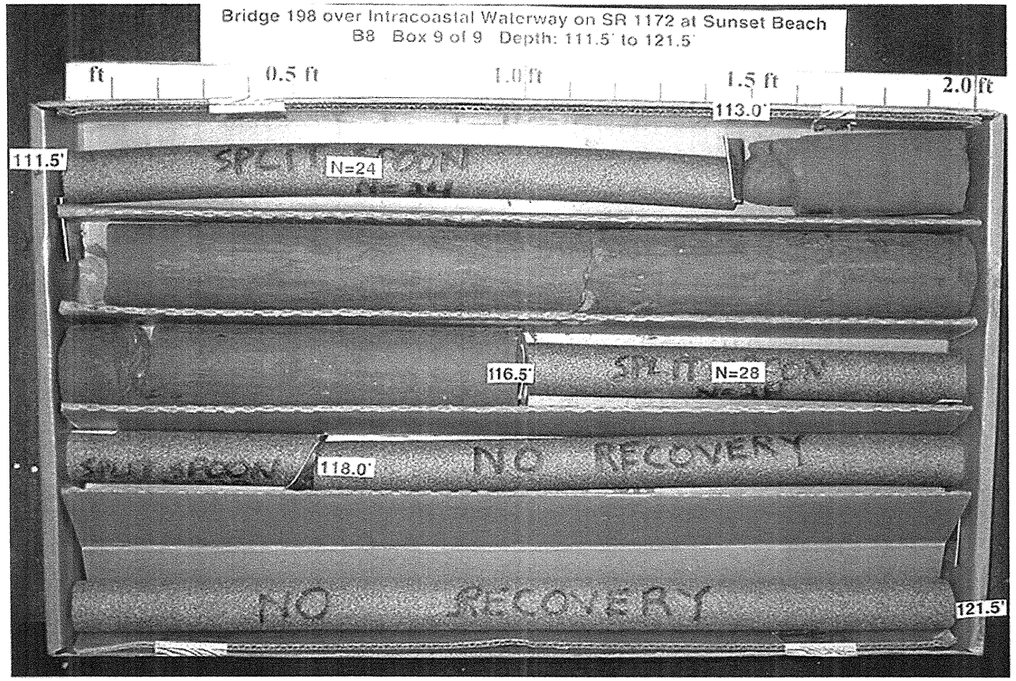


Core Photos
MACTEC Proj. No. 6468-03-0165

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)






Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
B8 Box 9 of 9 Depth: 111.5' to 121.5'
ft
0.5 ft
1.0 ft
1.5 ft
2.0 ft
113.0'
111.5'
N=24
116.5'
N=28
118.0'
NO RECOVERY
NO RECOVERY
121.5'

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET 1 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			**GROUND WATER (ft)**
BORING NO. B9-A	**BORING LOCATION** 42+13	**OFFSET** 17 ft LT	**ALIGNMENT** -L-	**0 HR.** Water
COLLAR ELEV. -5.4 ft	**NORTHING** 47,767 **US ft**	**EASTING** 2,148,525 **US ft**		**24 HR.** Boring
TOTAL DEPTH 118.1 ft	**DRILL MACHINE** CME-45 on Barge	**DRILL METHOD** Rotary Wash/Core	**HAMMER TYPE** 140 lb. Manual
DATE STARTED 6/2/04	**COMPLETED** 6/7/04	**SURFACE WATER DEPTH** 2.1	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-5.4					Mudline				-5.4
-5.4	0.0	5	8	3	11		W		CPU: Dark gray, silty, f. SAND (A-2-4) w/ trace shell fragments
-8.4	3.0								Waccamaw Fm: Dark blueish gray, silty CLAY (A-7-6)
-10.3	4.9	2	1	1	2				
-15.6	10.2								
		1	1	1	2	SS-25	72.8%		
-19.2	13.8								Waccamaw Fm: Dark blueish gray to gray, silty, f. to cse. SAND (A-3) w/ trace shell fragments
-20.9	15.5	7	5	8	13		W		
-25.9	20.5	5	6	8	14	SS-26	W		
-28.4	23.0								Waccamaw Fm: Light gray to white, friable, v. thinly bedded LIMESTONE
-30.9	25.5	7	9	66	75		W		
-32.4	27.0								
-33.3	27.9								Peedee Fm: Dark gray, thinly bedded, mod. indurated to indurated LIMESTONE
-38.2	32.8	6	6	8	14	SS-27	29.4%		Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-42.5	37.1	100/0.4			100/0.4				
-42.9	37.5								
-43.5	38.1								Peedee Fm: Dark gray, thinly bedded, mod. indurated to indurated LIMESTONE
-47.3	41.9	6	6	9	15		M		Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-52.1	46.7	5	7	10	17		M		
-57.0	51.6	6	6	8	14		M		
-59.5	54.1								
-59.9	54.5								Peedee Fm: Dark gray, thinly bedded, friable to mod. indurated to LIMESTONE
-62.2	56.8	7	7	9	16		M		Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-67.7	62.3	7	9	9	18		M		
-71.1	65.7								
-72.0	66.6								Peedee Fm: Dark gray, thinly bedded, mod. indurated to indurated LIMESTONE
-73.2	67.8	6	7	9	16		M		Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-78.7	73.3	7	8	8	16		M		

NCDOT BORE S...LE 0675.GPJ NC_DOT.GDT 9/28/04

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET NO.	TOTAL SHEETS
72	209

SHEET 2 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			**GROUND WATER (ft)**
BORING NO. B9-A	**BORING LOCATION** 42+13	**OFFSET** 17 ft LT	**ALIGNMENT** -L-	**0 HR.** Water
COLLAR ELEV. -5.4 ft	**NORTHING** 47,767 **US ft**	**EASTING** 2,148,525 **US ft**		**24 HR.** Boring
TOTAL DEPTH 118.1 ft	**DRILL MACHINE** CME-45 on Barge	**DRILL METHOD** Rotary Wash/Core	**HAMMER TYPE** 140 lb. Manual
DATE STARTED 6/2/04	**COMPLETED** 6/7/04	**SURFACE WATER DEPTH** 2.1	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-80.2					Continued from previous page				
-82.8	77.4	8	10	11	21		M		-81.6 76.2 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE
-87.1	81.7	8	9	9	18		M		Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-91.9	86.5	7	8	10	18		M		
-94.5	89.1								Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE
-96.9	91.5	8	8	11	19		M		Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-102.1	96.7	6	8	10	18		M		
-107.6	102.2	10	90/0.4		100/0.4		M		-108.5 103.1 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE
-113.3	107.9	8	10	11	21		M		Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-122.0	116.6	33	35	42	77		M		-122.4 117.0 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE
-123.5	118.1								Boring terminated at 118.1 ft (Elev. -123.5 ft) in Peedee Fm: Thinly bedded, mod. indurated LIMESTONE

Bits Used: HQ Core Bit-Surface Set

Drilling Fluid: Water

NCDOT BORE SINGLE 0675.GPJ NC_DOT.GDT 9/28/04

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

SHEET 1 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			**GROUND WATER (ft)**
BORING NO. B9-A	**BORING LOCATION** 42+13	**OFFSET** 17 ft LT	**ALIGNMENT** -L-	**0 HR.** Water
COLLAR ELEV. -5.4 ft	**NORTHING** 47,767 US ft	**EASTING** 2,148,525 US ft		**24 HR.** Boring
TOTAL DEPTH 118.1 ft	**DRILL MACHINE** CME-45 on Barge	**DRILL METHOD** Rotary Wash/Core	**HAMMER TYPE** 140 lb. Manual
DATE STARTED 6/2/04	**COMPLETED** 6/7/04	**SURFACE WATER DEPTH** 2.1	
CORE SIZE HQ	**TOTAL RUN** 67.3 ft	**DRILLER** D. White	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 27.0 ft
-32.4	27.0	1.5	3:45 0:28/0.5	(1.0) 67%	(N/A)		(0.9) 100%	(N/A)		-32.4 Peedee Fm: Dark gray, thinly bedded, mod. indurated to indurated LIMESTONE 27.0
-33.9	28.5	4.3	0:47 0:29 0:38 0:38	(4.3) 100%	(N/A)		(7.2) 94%			-33.9 Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-38.2	32.8		0:15/0.3 *N=14*			SS-27				
-39.7	34.3	2.8	1:30 0:38 0:31/0.8	(2.8) 100%	(N/A)					
-42.5	37.1									-42.9 Peedee Fm: Dark gray, thinly bedded, mod. indurated to indurated LIMESTONE 37.5
-42.9	37.5	4.4	*N=100/0.4* 2:42 1:17 0:38 0:36	(4.4) 100%	(N/A)		(0.6) 100% (11.5) 100%	(N/A)		-45.5 Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6) 38.1
-47.3	41.9		0:14/0.4 *N=15*							
-48.8	43.4	3.3	0:48 0:39 0:48	(3.3) 100%	(N/A)					
-52.1	46.7		0:05/0.3 *N=17*							
-53.6	48.2	3.4	1:14 0:58 0:43	(3.4) 100%	(N/A)					
-57.0	51.6		0:20/0.4 *N=14*							
-58.5	53.1	3.7	0:53 2:37 0:32	(1.4) 38%	(N/A)		(0.4) 100% (5.9) 72%	(N/A)		-58.9 Peedee Fm: Dark gray, thinly bedded, friable to mod. indurated to LIMESTONE 54.1
-62.2	56.8		0:22/0.7 *N=16*							Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-63.7	58.3	4.0	1:20 0:30 0:27 0:35	(4.0) 100%	(N/A)					
-67.7	62.3		*N=18*							
-69.2	63.8	4.0	0:35 2:00 5:45 0:47	(4.0) 100%	(N/A)					-71.1 65.7 -72.0 Peedee Fm: Dark gray, thinly bedded, mod. indurated to indurated LIMESTONE 66.6
-73.2	67.8		*N=16*				(0.9) 100% (6.6) 100%	(N/A)		Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-74.7	69.3	4.0	1:00 0:34 0:35 0:33	(4.0) 100%	(N/A)					
-78.7	73.3		*N=16*							
-80.2	74.8	2.6	0:58 8:45 1:50/0.6	(1.9) 73%	(N/A)					-81.6 76.2 -82.1 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE 76.7
-82.8	77.4		*N=21*				(0.5) 100% (7.2) 91%	(N/A)		Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-84.3	78.9	2.8	1:00 0:32 0:30/0.8	(2.8) 100%	(N/A)					
-87.1	81.7		*N=18*							
-88.6	83.2	3.3	0:58 0:48 0:40	(3.3) 100%	(N/A)					
-91.9	86.5		0:08/0.3 *N=18*							
-93.4	88.0	3.5	2:20 0:43 0:40	(3.5) 100%	(N/A)					-94.5 89.1 -94.9 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE 89.4
-96.9	91.5		0:25/0.5 *N=19*				(0.3) 100% (9.8) 100%	(N/A)		Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-98.4	93.0	3.7	0:45 0:48 0:42	(3.7) 100%	(N/A)					
-102.1	96.7		0:29/0.7 *N=18*							
-103.6	98.2	4.0	0:48 0:47 0:55	(4.0) 100%	(N/A)					

NCDOT CORE SINGLE 0675.GPJ NC_DOT.GDT 9/28/04

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

SHEET NO.	TOTAL SHEETS
73	209

SHEET 2 OF 2

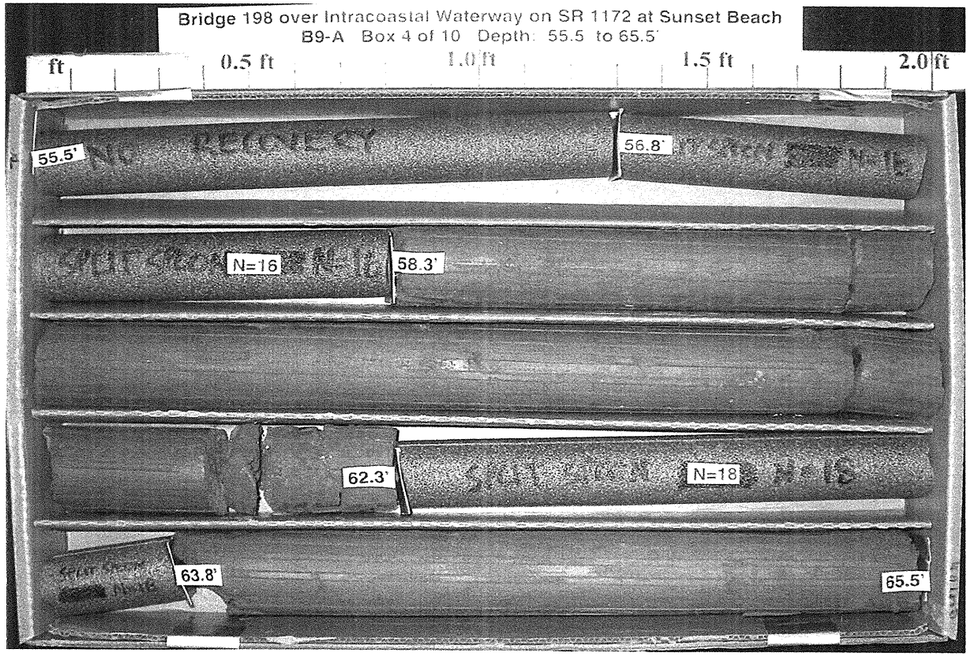
PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			**GROUND WATER (ft)**
BORING NO. B9-A	**BORING LOCATION** 42+13	**OFFSET** 17 ft LT	**ALIGNMENT** -L-	**0 HR.** Water
COLLAR ELEV. -5.4 ft	**NORTHING** 47,767 US ft	**EASTING** 2,148,525 US ft		**24 HR.** Boring
TOTAL DEPTH 118.1 ft	**DRILL MACHINE** CME-45 on Barge	**DRILL METHOD** Rotary Wash/Core	**HAMMER TYPE** 140 lb. Manual
DATE STARTED 6/2/04	**COMPLETED** 6/7/04	**SURFACE WATER DEPTH** 2.1	
CORE SIZE HQ	**TOTAL RUN** 67.3 ft	**DRILLER** D. White	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Continued from previous page
-107.6	102.2		0:18 *N=100/0.9*							-108.5 Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6) *(continued)* 103.1
-108.5	103.1	4.8	3:08 0:40 0:42 0:43 0:30/0.8	(4.8) 100%	(N/A)		(0.5) 100% (11.5) 100%	(N/A) (N/A)		-109.0 Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE 103.6 Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-113.3	107.9		*N=21*							
-114.8	109.4	7.2	0:40 0:40 0:55 0:30 0:30 0:30 0:35 0:10/0.2	(7.2) 100%	(N/A)					Run longer than 5 feet due to changing tide
-122.0	116.6									-122.0 116.6 Coring terminated at 116.6 ft (Elev. -122.0 ft) in Peedee Fm: V. stiff, f. sandy, silty CLAY (A-7-6)

NCDOT CORE SINGLE 0675.GPJ NC_DOT.GDT 9/28/04

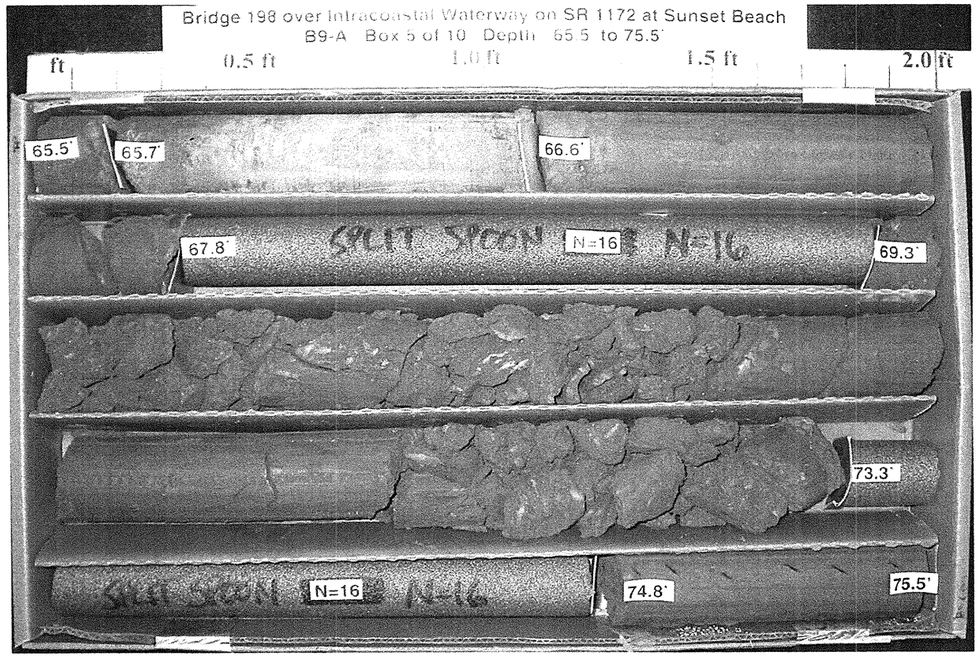
Core Photos
MACTEC Proj. No. 6468-04-0675

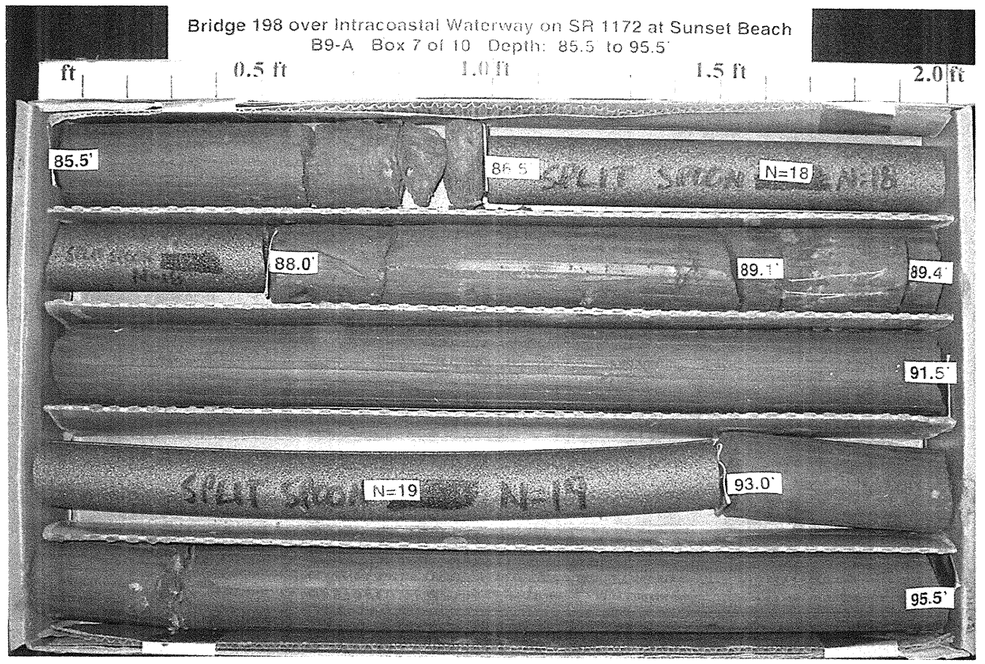
Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)

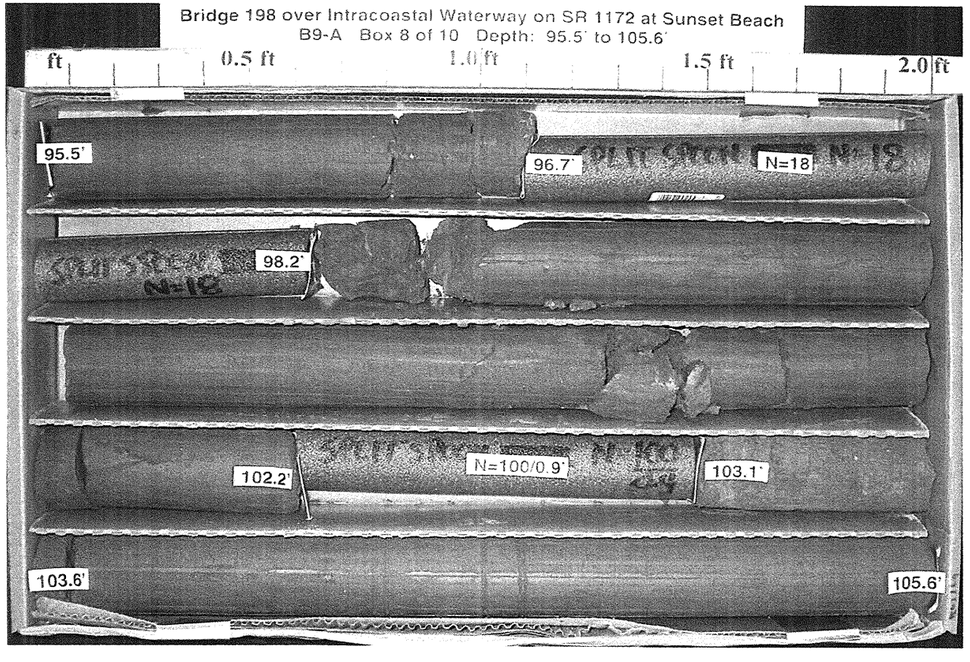


Core Photos
MACTEC Proj. No. 6468-03-0165

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)



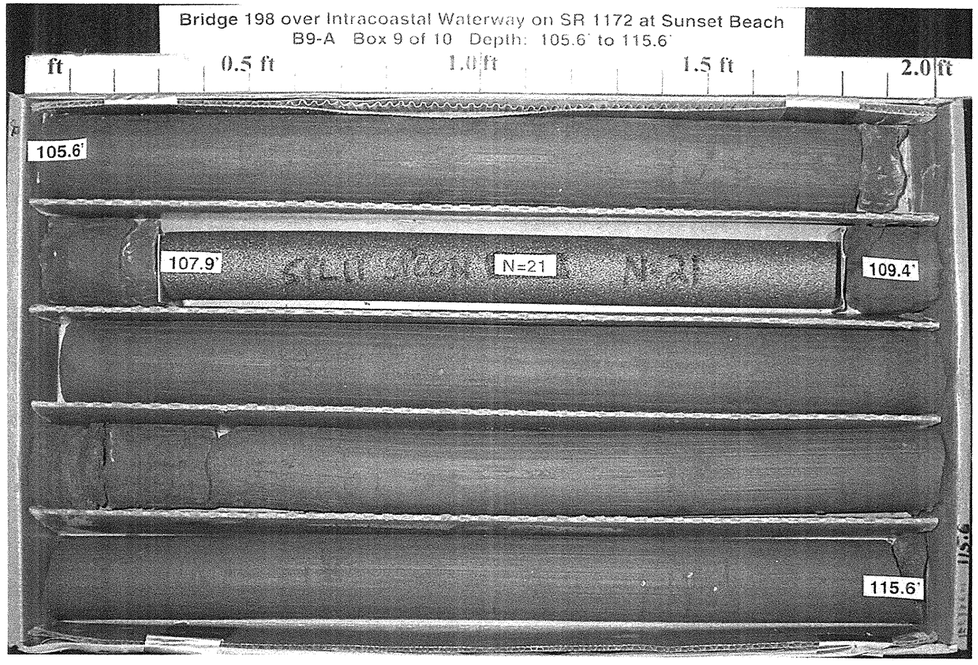




Core Photos
MACTEC Proj. No. 6468-04-0675

SHEET NO.	TOTAL SHEETS
76	209

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)



N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET 1 OF 2

MACTEC

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Deobald
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			**GROUND WATER (ft)**
BORING NO. B10-B	**BORING LOCATION** 43+26	**OFFSET** 23 ft RT	**ALIGNMENT** -L-	**0 HR.** 3.0
COLLAR ELEV. 2.1 ft	**NORTHING** 47,885 **US ft**	**EASTING** 2,148,509 **US ft**	**24 HR.** FIAD
TOTAL DEPTH 122.7 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Rotary Wash/Core	**HAMMER TYPE** 140 lb. Manual
DATE STARTED 6/2/04	**COMPLETED** 6/3/04	**SURFACE WATER DEPTH** N/A	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
2.1					Ground				2.1 0.0
2.1	0.0	2	2	1	3		W		CPU: Tan and white, mod. shelly, f. SAND (A-3)
-1.2	3.3								-0.3 2.4
		1	1	1	2	SS-28	W		CPU: Gray, clayey, silty, f. SAND (A-2-4)
-6.2	8.3								-4.5 6.6
		Woh	Woh	Woh	Woh 0		W		Waccamaw Fm: Gray, silty, f. sandy, CLAY (A-7-6) w/ trace shell fragments
-11.2	13.3								
		1	1	1	2		W		
-16.2	18.3								
		1	8	8	16		W		-16.9 19.0
-17.3	19.0								Waccamaw Fm: Gray, f. SAND (A-3)
-18.9	21.0								Waccamaw Fm: Gray, silty CLAY (A-7-6)
-21.2	23.3								Waccamaw Fm: Gray, silty, f. SAND (A-3) w/ trace shell fragments
		7	10	10	20		W		
-23.9	26.0								Waccamaw Fm: Gray, thinly bedded, friable, shell hash LIMESTONE
-26.2	28.3						Sat.		
		9	11	5	16				-28.9 31.0
-28.9	31.0								Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6)
-31.2	33.3								
		5	7	8	15		M		
-34.1	36.2								
		2	3	5	8		M		
-39.1	41.2								
		6	94/0.2		100/0.7		M		-39.6 41.7
-40.4	42.5								-40.4 42.5
-44.1	46.2								Peedee Fm: Green-gray, thinly bedded, friable to mod. indurated LIMESTONE
		4	7	8	15		M		Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6)
-49.1	51.2								
		8	7	10	17	SS-29	33.7%		
-54.1	56.2								
		7	8	10	18		M		
-59.1	61.2								
		10	10	12	22		M		
-64.1	66.2								
		4	10	12	22		M		
-67.7	69.8								-67.7 69.8
-69.1	71.2								-69.1 71.2 Peedee Fm: Green-gray, thinly bedded, mod. indurated LIMESTONE
		9	9	12	21		M		Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6)

NCDOT BORE SINGLE 0675.GPJ NC_DOT.GDT 9/28/04

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET NO.	TOTAL SHEETS
77	209

SHEET 2 OF 2

MACTEC

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Deobald
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			**GROUND WATER (ft)**
BORING NO. B10-B	**BORING LOCATION** 43+26	**OFFSET** 23 ft RT	**ALIGNMENT** -L-	**0 HR.** 3.0
COLLAR ELEV. 2.1 ft	**NORTHING** 47,885 **US ft**	**EASTING** 2,148,509 **US ft**	**24 HR.** FIAD
TOTAL DEPTH 122.7 ft	**DRILL MACHINE** CME 550	**DRILL METHOD** Rotary Wash/Core	**HAMMER TYPE** 140 lb. Manual
DATE STARTED 6/2/04	**COMPLETED** 6/3/04	**SURFACE WATER DEPTH** N/A	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-72.7					Continued from previous page				
-74.1	76.2								
		7	10	11	21		M		Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6) *(continued)*
-79.1	81.2								
		29	16	16	32		M		-78.5 80.6
-84.1	86.2								-79.4 81.5 Peedee Fm: Green-gray, thinly bedded, mod. indurated LIMESTONE
		10	11	13	24		M		Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6)
-89.1	91.2								
		7	11	14	25		M		
-94.1	96.2								
		10	13	33	46		M		-93.3 95.4
-99.1	101.2								-93.9 96.0 Peedee Fm: Green-gray, thinly bedded, mod. indurated LIMESTONE
		9	18	19	37		M		Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6)
-104.1	106.2								
		100/0.4			100/0.4		M		-104.5 106.6
-109.1	111.2								Peedee Fm: Green-gray, thickly bedded, mod. indurated LIMESTONE
		18	20	27	47		M		-107.2 109.3
-114.1	116.2								Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6)
		15	17	21	38		M		
-119.1	121.2								
		14	21	35	56		M		-120.6 122.7
									Boring terminated at 122.7 ft (Elev. -120.6 ft) in Peedee Fm: Hard, silty, f. sandy CLAY (A-7-6)
									Bits Used: 3" Roller Cone; HQ Core Bit-Surface Set
									Drilling Fluid: Water

NCDOT BORE SINGLE 0675.GPJ NC_DOT.GDT 9/28/04

MACTEC

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

PROJECT NO. 8.2230101	ID. B-0682	COUNTY Brunswick	GEOLOGIST B. Deobald
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			GROUND WATER (ft)
BORING NO. B10-B	BORING LOCATION 43+26	OFFSET 23 ft RT	ALIGNMENT -L-	0 HR. 3.0
COLLAR ELEV. 2.1 ft	NORTHING 47,885 US ft	EASTING 2,148,509 US ft	24 HR. FIAD
TOTAL DEPTH 122.7 ft	DRILL MACHINE CME 550	DRILL METHOD Rotary Wash/Core	HAMMER TYPE 140 lb. Manual
DATE STARTED 6/2/04	COMPLETED 6/3/04	SURFACE WATER DEPTH N/A	
CORE SIZE HQ	TOTAL RUN 62.8 ft	DRILLER D. Rhodes	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 34.8 ft
-32.7	34.8	1.4	1:10	(1.4)	(N/A)		(4.9)	(N/A)		Peedee Fm: Dark gray to green, silty, f. sandy CLAY (A-7-6) w/ trace shell fragments
-34.1	36.2		0:20/0.4	100%			100%			
			N=8							
-35.6	37.7	3.5	1:00	(3.5)	(N/A)					
			1:15	100%						
-39.1	41.2		0:45							
			0:25/0.5							
			N=100/0.7							
-39.8	41.9	4.3	2:08	(4.3)	(N/A)		(0.6)	(N/A)		Peedee Fm: Green-gray, thinly bedded, friable to mod. indurated LIMESTONE
			1:10	100%			100%	(N/A)		Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6)
			1:00				(12.8)			
-44.1	46.2		1:00				65%			
			0:30/0.3							
			N=15							
-45.6	47.7	3.5	1:35	(3.5)	(N/A)					
			1:30	100%						
-49.1	51.2		1:30							
			0:25/0.5			SS-29				
			N=17							
-50.6	52.7	3.5	0:50	(3.5)	(N/A)					
			1:00	100%						
-54.1	56.2		1:00							
			0:30/0.5							
			N=18							
-55.6	57.7	3.5	1:20	(0.0)	(N/A)					
			1:15	0%						
-59.1	61.2		1:20							
			0:25/0.5							
			N=22							
-60.6	62.7	3.5	1:00	(0.0)	(N/A)					
			1:10	0%						
-64.1	66.2		1:00							
			0:15/0.5							
			N=22							
-65.6	67.7	3.5	0:45	(3.5)	(N/A)					
			4:00	100%						
-69.1	71.2		2:30							
			0:30/0.5							
			N=21							
-70.6	72.7	3.5	1:00	(3.5)	(N/A)					
			0:50	100%						
-74.1	76.2		0:40							
			0:20/0.5							
			N=21							
-75.6	77.7	3.5	0:50	(3.5)	(N/A)					
			0:45	100%						
-79.1	81.2		3:00							
			1:00/0.5							
			N=32							
-80.6	82.7	3.5	1:15	(3.5)	(N/A)					
			0:55	100%						
-84.1	86.2		1:00							
			0:35/0.5							
			N=24							
-85.6	87.7	3.5	1:30	(3.5)	(N/A)					
			1:35	100%						
-89.1	91.2		1:25							
			0:40/0.5							
			N=25							
-90.6	92.7	3.5	1:35	(3.3)	(N/A)					
			1:35	94%						
-94.1	96.2		4:00							
			1:15/0.5							
			N=46							
-95.6	97.7	3.5	2:45	(1.6)	(N/A)					
			2:30	46%						
-99.1	101.2		1:30							
			0:30/0.5							
			N=37							
-100.6	102.7	3.5	2:55	(0.0)	(N/A)					
			4:15	0%						
-104.1	106.2		5:00							
			1:55/0.5							
-104.5	106.6	4.6	N=100/0.4	(4.4)	(N/A)		(2.5)	(N/A)		Peedee Fm: Green-gray, thickly bedded, mod. indurated LIMESTONE
			4:45	96%			93%			
			2:40							

-39.6 41.7 Peedee Fm: Green-gray, thinly bedded, friable to mod. indurated LIMESTONE
-40.4 42.5 Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6)

-67.7 69.8 Peedee Fm: Green-gray, thinly bedded, mod. indurated LIMESTONE
-69.1 71.2 Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6)

-78.5 80.6 Peedee Fm: Green-gray, thinly bedded, mod. indurated LIMESTONE
-79.4 81.5 Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6)

-93.3 95.4 Peedee Fm: Green-gray, thinly bedded, mod. indurated LIMESTONE
-93.9 96.0 Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6)

-104.5 106.6 Peedee Fm: Green-gray, thickly bedded, mod. indurated LIMESTONE
-107.2 109.3

NCDOT CORE SINGLE 0675.GPJ NC_DOT.GDT 9/28/04

MACTEC

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

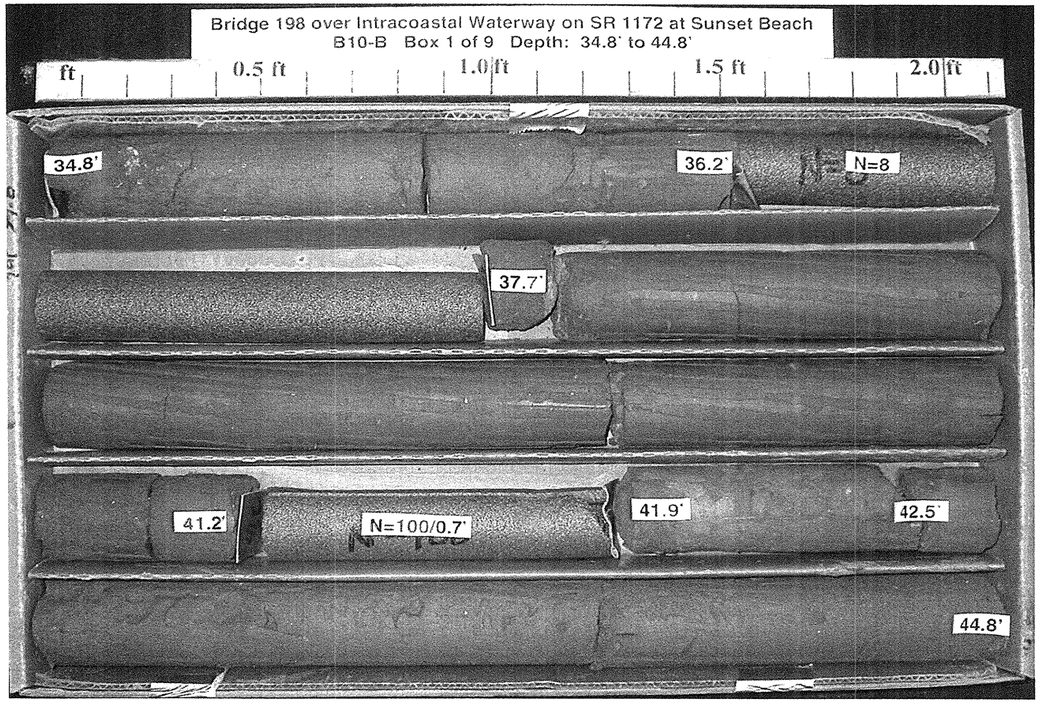
SHEET NO.	TOTAL SHEETS
78	209

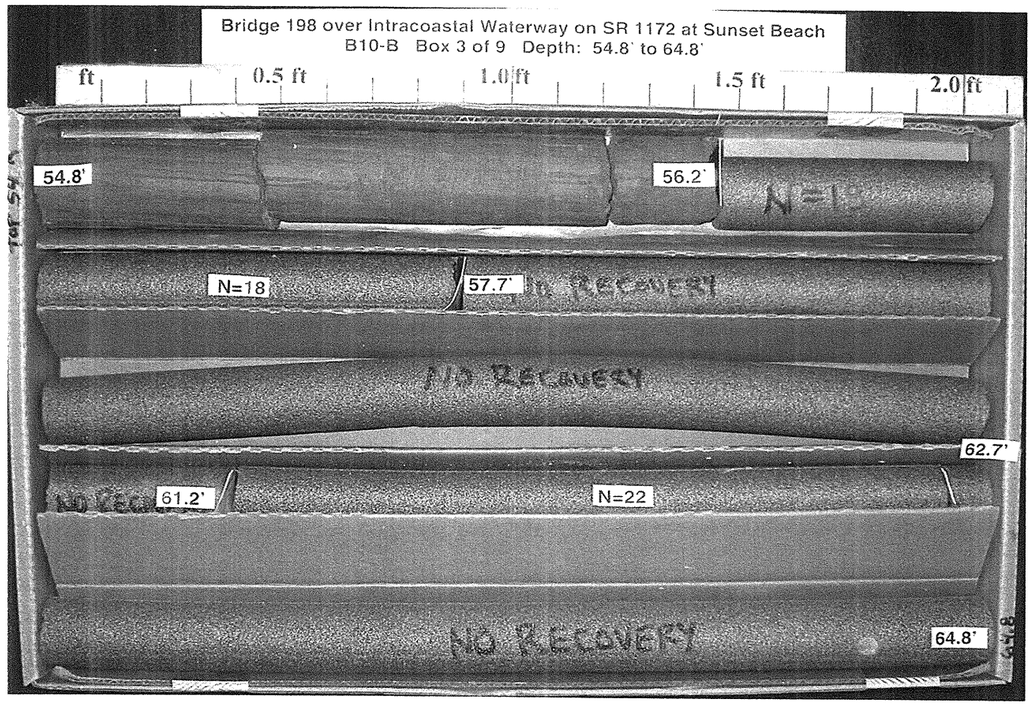
PROJECT NO. 8.2230101	ID. B-0682	COUNTY Brunswick	GEOLOGIST B. Deobald
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			GROUND WATER (ft)
BORING NO. B10-B	BORING LOCATION 43+26	OFFSET 23 ft RT	ALIGNMENT -L-	0 HR. 3.0
COLLAR ELEV. 2.1 ft	NORTHING 47,885 US ft	EASTING 2,148,509 US ft	24 HR. FIAD
TOTAL DEPTH 122.7 ft	DRILL MACHINE CME 550	DRILL METHOD Rotary Wash/Core	HAMMER TYPE 140 lb. Manual
DATE STARTED 6/2/04	COMPLETED 6/3/04	SURFACE WATER DEPTH N/A	
CORE SIZE HQ	TOTAL RUN 62.8 ft	DRILLER D. Rhodes	

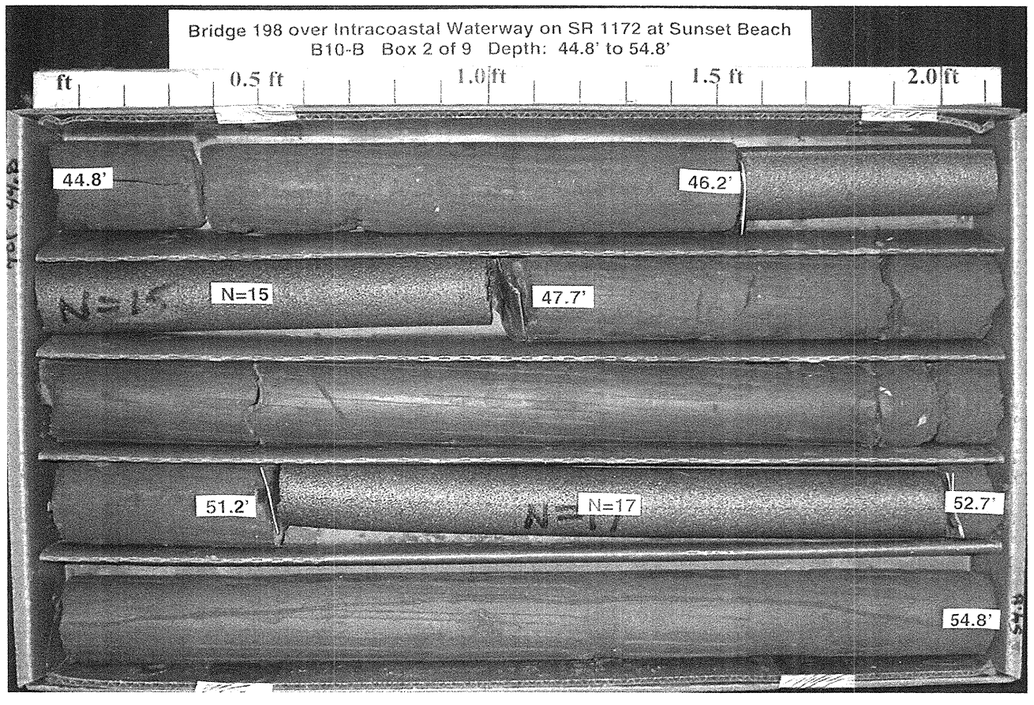
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Continued from previous page
-109.1	111.2		2:15				(7.0)	(N/A)		Peedee Fm: Dark gray to green, silty, f. sandy, CLAY (A-7-6) *(continued)*
			2:30				79%			
			0:45/0.6							
			N=47							
-110.6	112.7	3.5	1:00	(3.5)	(N/A)					
			1:00	100%						
-114.1	116.2		1:10							
			0:30/0.5							
			N=38							
-115.6	117.7	3.5	1:05	(1.6)	(N/A)					
			0:55	46%						
-119.1	121.2		0:55							
			0:25/0.5							

-119.1 121.2 Coring terminated at 121.2 ft (Elev. -119.1 ft) in Peedee Fm: Hard, silty, f. sandy CLAY (A-7-6)

NCDOT CORE SINGLE 0675.GPJ NC_DOT.GDT 9/28/04


Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
B10-B Box 1 of 9 Depth: 34.8' to 44.8'
ft
0.5 ft
1.0 ft
1.5 ft
2.0 ft
34.8'
36.2'
N=8
37.7'
41.2'
N=100/0.7'
41.9'
42.5'
44.8'

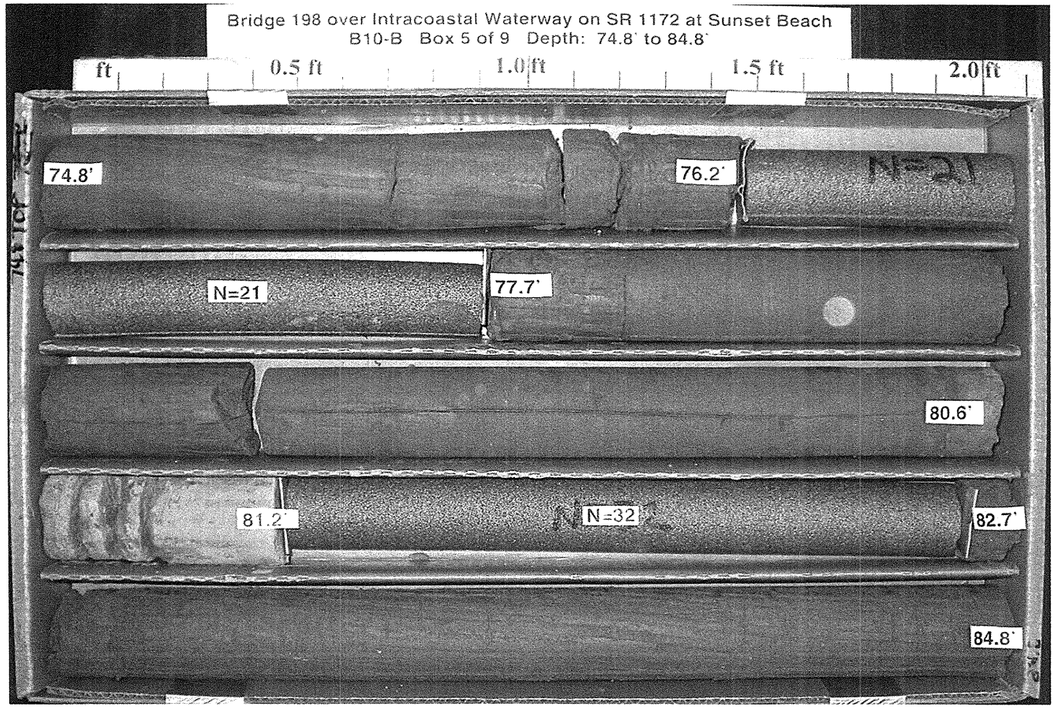

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
B10-B Box 3 of 9 Depth: 54.8' to 64.8'
ft
0.5 ft
1.0 ft
1.5 ft
2.0 ft
54.8'
56.2'
N=18
57.7'
NO RECOVERY
62.7'
61.2'
N=22
64.8'

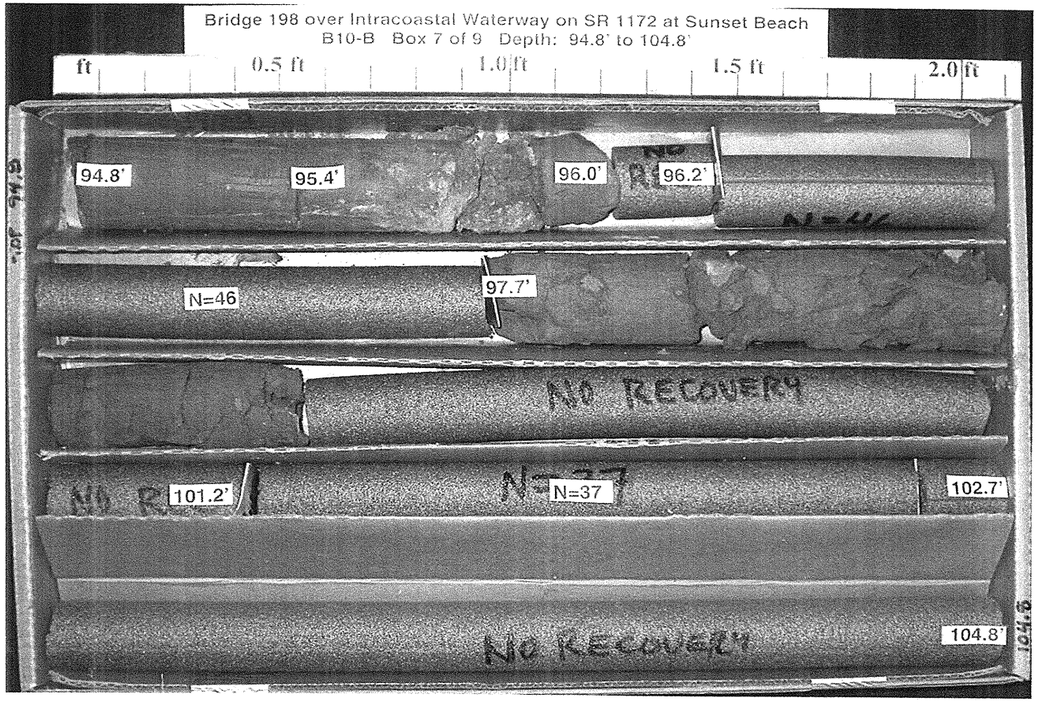

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
B10-B Box 2 of 9 Depth: 44.8' to 54.8'
ft
0.5 ft
1.0 ft
1.5 ft
2.0 ft
44.8'
46.2'
N=15
47.7'
51.2'
N=17
52.7'
54.8'

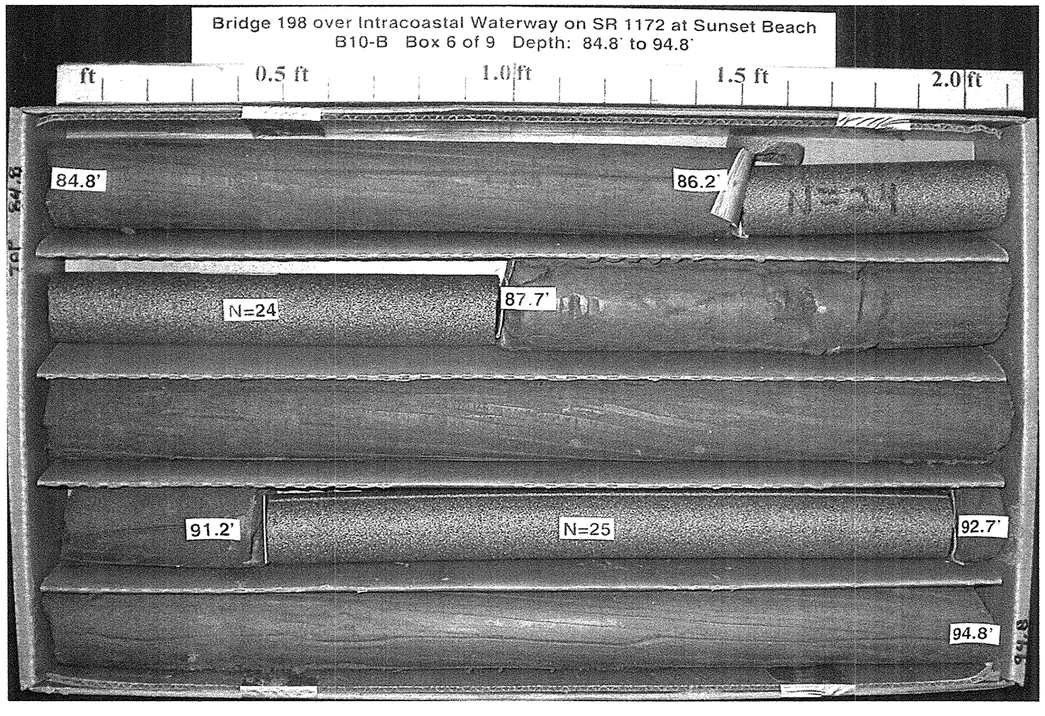
Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
B10-B Box 4 of 9 Depth: 64.8' to 74.8'
ft
0.5 ft
1.0 ft
1.5 ft
2.0 ft
64.8'
NO RECOVERY
66.2'
N=22
67.7'
69.8'
71.2'
N=21
72.7'
74.8'

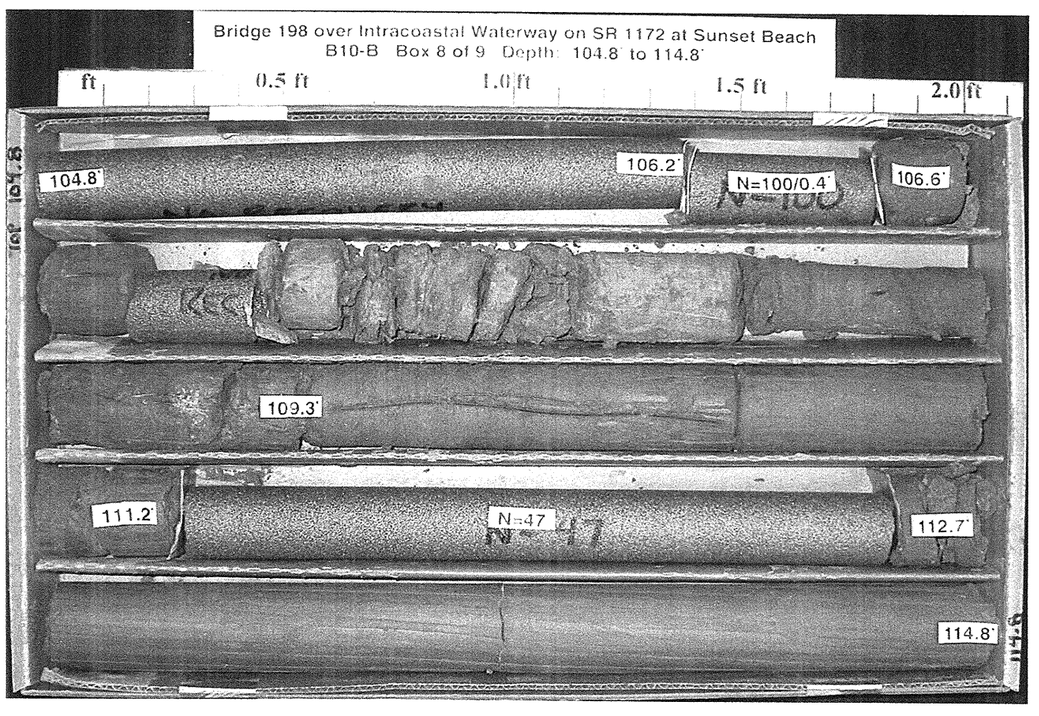
Core Photos
MACTEC Proj. No. 6468-04-0675

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)









Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
B10-B Box 9 of 9 Depth: 114.8' to 121.2'
ft
0.5 ft
1.0 ft
1.5 ft
2.0 ft
114.8
116.2'
N=38
N=38
117.7'
NO RECOVERY
121.2'
N=56

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET 1 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** M. Lear
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			**GROUND WATER (ft)**
BORING NO. B11-A	**BORING LOCATION** 44+38	**OFFSET** 12 ft LT	**ALIGNMENT** -L-	**0 HR.** Water
COLLAR ELEV. -6.3 ft	**NORTHING** 47,969 US ft	**EASTING** 2,148,426 US ft		**24 HR.** Boring
TOTAL DEPTH 115.4 ft	**DRILL MACHINE** CME-45 on Barge	**DRILL METHOD** Rotary Wash/Core	**HAMMER TYPE** 140 lb. Manual
DATE STARTED 5/11/04	**COMPLETED** 5/13/04	**SURFACE WATER DEPTH** 4.3	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-6.3					Mudline				
-6.3	0.0	1	0	1	1	SS-30	34.7%		CPU: Dark gray, f. sandy, clayey SILT (A-4) w/ trace shells
-9.5	3.2								-9.8 2.5 CPU: Dark gray, silty, clayey, f. SAND (A-2-6) w/ trace shells
		1	0	1	1	SS-31	Sat.		
-14.3	8.0								-12.8 6.5 Waccamaw Fm: Gray, silty CLAY (A-7-6) w/ trace shells
		Woh	Woh	Woh			W		
-19.1	12.8								-17.3 11.0 Waccamaw Fm: Gray, silty, f. to cse. SAND (A-3)
		2	2	4	6	SS-32	W		
-24.2	17.9								-22.8 16.5 Waccamaw Fm: Light gray, f. to cse. SAND (A-3) and v. thinly bedded, friable, shell hash LIMESTONE
		2	5	8	13		Sat.		
-28.7	22.4								-29.7 23.4 Peedee Fm: Dark gray-green, thinly bedded, friable to mod. indurated, LIMESTONE
		11	7	93	100/1.0		Sat.		-31.0 24.7 Peedee Fm: Dark green, silty CLAY (A-7-6)
-35.2	28.9								
		7	7	9	16		M		
-39.5	33.2								
		4	6	33	39		M		
-44.5	38.2								
		6	7	8	15		M		
-49.2	42.9								
		6	7	8	15		M		
-54.2	47.9								
		5	6	7	13		M		
-60.1	53.8								-57.9 51.6 -58.3 52.2 Peedee Fm: Gray-green, thinly bedded, mod. indurated, LIMESTONE
		6	8	10	18		M		Peedee Fm: Dark green, silty CLAY (A-7-6)
-65.9	59.6								
		9	9	13	22		M		-68.3 62.0 -68.7 62.4 Peedee Fm: Gray-green, thinly bedded, friable to mod. indurated, LIMESTONE
-73.5	67.2								-69.2 62.9 -69.7 63.4 Peedee Fm: Dark green, silty CLAY (A-7-6)
		13	12	13	25		M		Peedee Fm: Gray-green, thinly bedded, mod. indurated, LIMESTONE
-77.2	70.9								Peedee Fm: Dark green, silty CLAY (A-7-6)
		7	9	12	21		M		-79.3 73.0 -80.1 73.8 Peedee Fm: Gray-green, thinly bedded, mod.

NCDOT BORE SINGLE 0675.GPJ NC_DOT.GDT 9/28/04

MACTEC

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET NO.	TOTAL SHEETS
82	209

SHEET 2 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** M. Lear
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			**GROUND WATER (ft)**
BORING NO. B11-A	**BORING LOCATION** 44+38	**OFFSET** 12 ft LT	**ALIGNMENT** -L-	**0 HR.** Water
COLLAR ELEV. -6.3 ft	**NORTHING** 47,969 US ft	**EASTING** 2,148,426 US ft		**24 HR.** Boring
TOTAL DEPTH 115.4 ft	**DRILL MACHINE** CME-45 on Barge	**DRILL METHOD** Rotary Wash/Core	**HAMMER TYPE** 140 lb. Manual
DATE STARTED 5/11/04	**COMPLETED** 5/13/04	**SURFACE WATER DEPTH** 4.3	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-81.1					Continued from previous page				
-84.1	77.8								indurated, LIMESTONE
		9	11	13	24		M		Peedee Fm: Dark green, silty CLAY (A-7-6) *(continued)*
-89.2	82.9								
		8	8	10	18		M		
-97.6	91.3								-94.1 87.8 -94.5 88.2 Peedee Fm: Gray-green, thinly bedded, friable to mod. indurated, LIMESTONE
		11	11	16	27		M		Peedee Fm: Dark green, silty CLAY (A-7-6)
-103.4	97.1								
		12	13	17	30		M		-105.2 98.9 -106.5 100.2 Peedee Fm: Gray-green, thinly bedded, mod. indurated, LIMESTONE
-107.8	101.5								Peedee Fm: Dark green, silty CLAY (A-7-6)
		12	15	20	35		M		
-116.2	109.9								
		8	10	12	22		M		
-120.2	113.9								
		12	14	25	39		M		-121.7 115.4 Boring terminated at 115.4 ft (Elev. -121.7 ft) in Peedee Fm: Hard, silty CLAY (A-7-6)

Bits Used: HQ Core Bit-Surface Set

Drilling Fluid: Water

NCDOT BORE SINGLE 0675.GPJ NC_DOT.GDT 9/28/04

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

SHEET 1 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** M. Lear
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			**GROUND WATER (ft)**
BORING NO. B11-A	**BORING LOCATION** 44+38	**OFFSET** 12 ft LT	**ALIGNMENT** -L-	**0 HR.** Water
COLLAR ELEV. -6.3 ft	**NORTHING** 47,969 US ft	**EASTING** 2,148,426 US ft		**24 HR.** Boring
TOTAL DEPTH 115.4 ft	**DRILL MACHINE** CME-45 on Barge	**DRILL METHOD** Rotary Wash/Core	**HAMMER TYPE** 140 lb. Manual	
DATE STARTED 5/11/04	**COMPLETED** 5/13/04	**SURFACE WATER DEPTH** 4.3		
CORE SIZE HQ	**TOTAL RUN** 67.5 ft	**DRILLER** D. White		

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 23.9 ft
-30.2	23.9	5.0	3:00 1:19 0:45 0:52 0:48	(5.0) 100%	(N/A)		(0.8) 100% (19.4) 100%	(N/A) (N/A)		-31.0 Peedee Fm: Dark gray-green, thinly bedded, friable to mod. indurated, LIMESTONE 24.7 Peedee Fm: Dark green, silty CLAY (A-7-6)
-35.2	28.9		N=16							
-36.7	30.4	2.8	1:05 0:44 0:39/0.8	(2.8) 100%	(N/A)					
-39.5	33.2		N=39							
-41.0	34.7	3.5	0:24 0:22 0:23 0:15/0.5	(3.5) 100%	(N/A)					
-44.5	38.2		N=15							
-46.0	39.7	3.2	1:18 0:37 0:33 0:10/0.2	(3.2) 100%	(N/A)					
-49.2	42.9		N=15							
-50.7	44.4	3.5	0:48 0:36 0:38 0:18/0.5	(3.5) 100%	(N/A)					
-54.2	47.9		N=13							
-55.7	49.4	4.4	0:28 0:31 2:45 0:35 0:15/0.4	(4.4) 100%	(N/A)		(0.6) 100% (6.8) 100%	(N/A) (N/A)		-57.9 51.6 -58.3 52.2 Peedee Fm: Gray-green, thinly bedded, mod. indurated, LIMESTONE Peedee Fm: Dark green, silty CLAY (A-7-6)
-60.1	53.8		N=18							
-61.6	55.3	4.3	0:38 0:31 0:29 0:41 0:07/0.3	(4.3) 100%	(N/A)					
-65.9	59.6		N=22							
-67.4	61.1	6.1	2:05 1:44 0:27 0:28 0:29 0:40/1.1	(6.1) 100%	(N/A)		(0.3) 100% (0.6) 100% (0.5) 100% (6.6) 100%	(N/A) (N/A) (N/A)		-68.3 62.0 -68.6 62.3 Run longer than 5 ft due to changing tide -68.9 62.6 Peedee Fm: Gray-green, thinly bedded, friable to mod. indurated, LIMESTONE -69.2 62.9 -69.7 63.4 Peedee Fm: Dark green, silty CLAY (A-7-6) Peedee Fm: Gray-green, thinly bedded, mod. indurated, LIMESTONE Peedee Fm: Dark green, silty CLAY (A-7-6)
-73.5	67.2		N=25							
-75.0	68.7	2.2	0:28 0:29 0:17/0.2	(2.2) 100%	(N/A)					
-77.2	70.9		N=21							
-78.7	72.4	5.4	0:36 4:31 0:31 0:37 0:46/1.4	(5.4) 100%	(N/A)		(0.8) 100% (11.0) 100%	(N/A) (N/A)		-79.3 73.0 -80.1 73.8 Run longer than 5 ft due to changing tide Peedee Fm: Gray-green, thinly bedded, mod. indurated, LIMESTONE Peedee Fm: Dark green, silty CLAY (A-7-6)
-84.1	77.8		N=24							
-85.6	79.3	3.6	0:41 0:42 0:46 0:34/0.6	(3.6) 100%	(N/A)					
-89.2	82.9		N=18							
-90.7	84.4	6.9	0:38 0:33 0:32 1:07 0:33 0:36 0:25/0.9	(6.9) 100%	(N/A)					Run longer than 5 ft due to changing tide
-97.6	91.3		N=27							
-99.1	92.8	4.3	0:44 0:47 0:47 0:44 0:32/0.3	(4.1) 95%	(N/A)		(0.4) 100% (7.5) 97%	(N/A) (N/A)		-94.1 87.8 -94.5 88.2 Peedee Fm: Gray-green, thinly bedded, friable to mod. indurated, LIMESTONE Peedee Fm: Dark green, silty CLAY (A-7-6)
-103.4	97.1		N=30							-105.2 98.9

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

SHEET NO.	TOTAL SHEETS
83	209

SHEET 2 OF 2

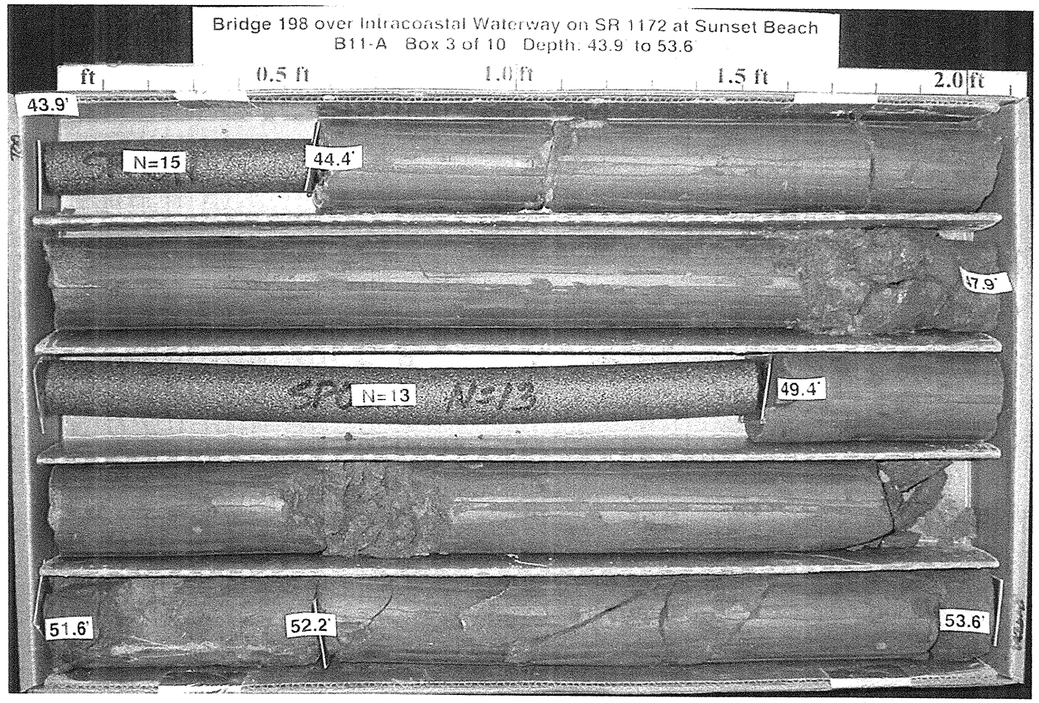
PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** M. Lear
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			**GROUND WATER (ft)**
BORING NO. B11-A	**BORING LOCATION** 44+38	**OFFSET** 12 ft LT	**ALIGNMENT** -L-	**0 HR.** Water
COLLAR ELEV. -6.3 ft	**NORTHING** 47,969 US ft	**EASTING** 2,148,426 US ft		**24 HR.** Boring
TOTAL DEPTH 115.4 ft	**DRILL MACHINE** CME-45 on Barge	**DRILL METHOD** Rotary Wash/Core	**HAMMER TYPE** 140 lb. Manual	
DATE STARTED 5/11/04	**COMPLETED** 5/13/04	**SURFACE WATER DEPTH** 4.3		
CORE SIZE HQ	**TOTAL RUN** 67.5 ft	**DRILLER** D. White		

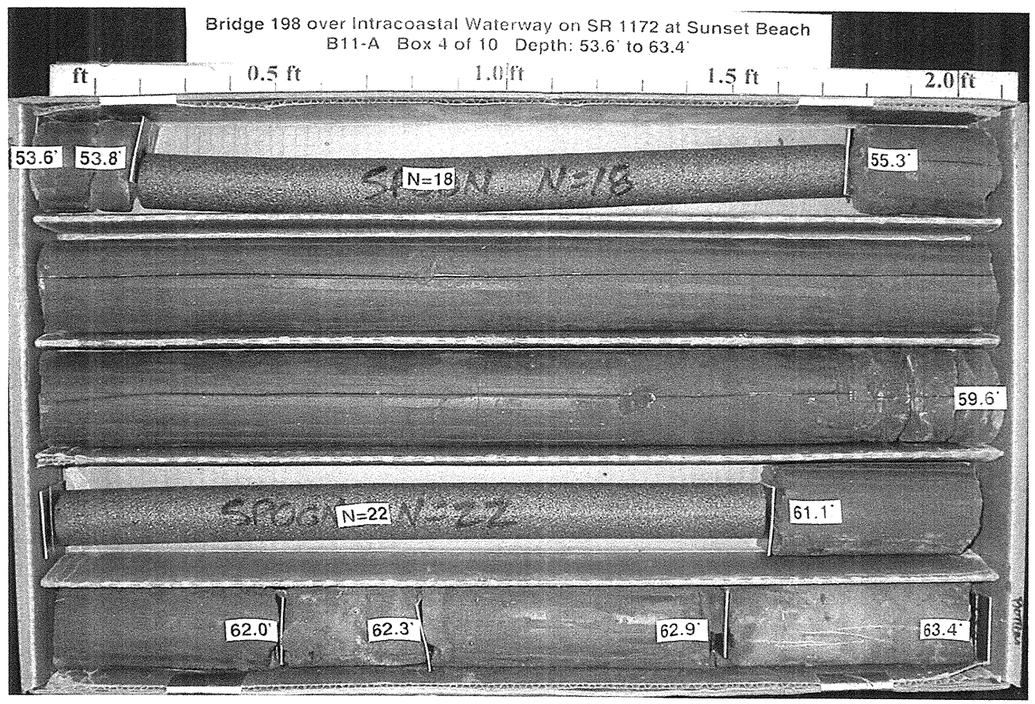
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Continued from previous page
-104.9	98.6	2.9	5:20 4:17 1:39/0.9	(2.9) 100%	(N/A)		(1.3) 100% (10.7) 100%	(N/A) (N/A)		-106.5 100.2 Peedee Fm: Gray-green, thinly bedded, mod. indurated, LIMESTONE Peedee Fm: Dark green, silty CLAY (A-7-6)
-107.8	101.5		N=35							
-109.3	103.0	6.9	1:02 0:57 1:45 1:34 0:55 0:52 0:52/0.9	(6.9) 100%	(N/A)					Run longer than 5 ft due to inner barrell would not release
-116.2	109.9		N=22							
-117.7	111.4	2.5	0:45 0:43 0:31/0.5	(2.5) 100%	(N/A)					-120.2 113.9 Coring terminated at 113.9 ft (Elev. -120.2 ft) in Peedee Fm: silty CLAY (A-7-6)
-120.2	113.9									

NCDOT CORE SINGLE 0675.GPJ NC_DOT.GDT 9/28/04

Core Photos
MACTEC Proj. No. 6468-04-0675

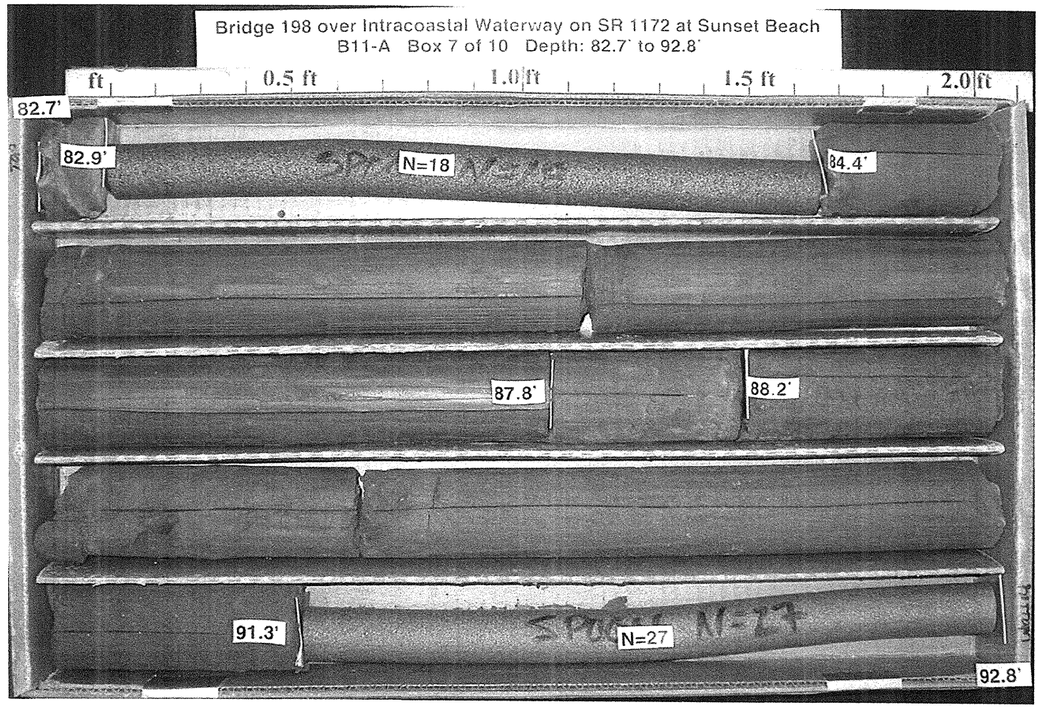
Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)

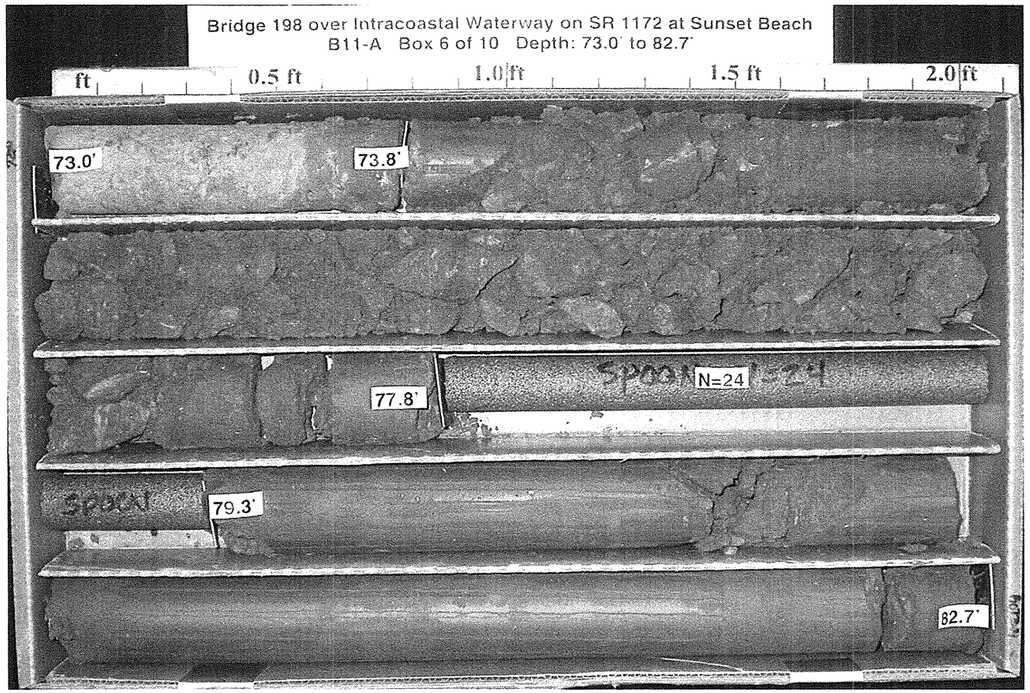




Core Photos
MACTEC Proj. No. 6468-04-0675

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)

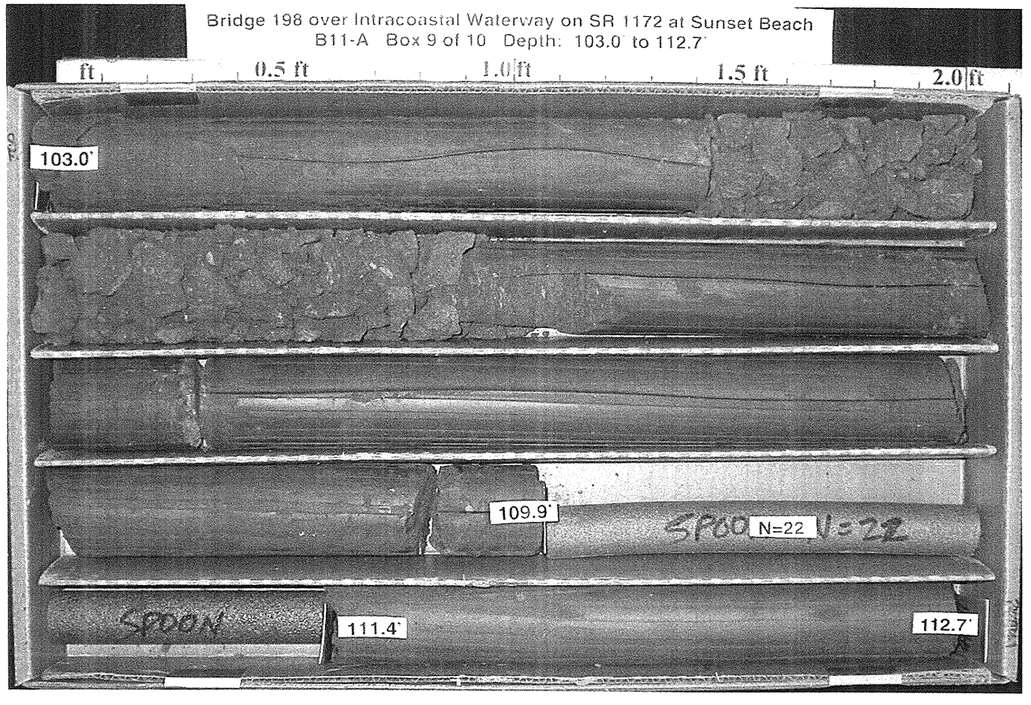


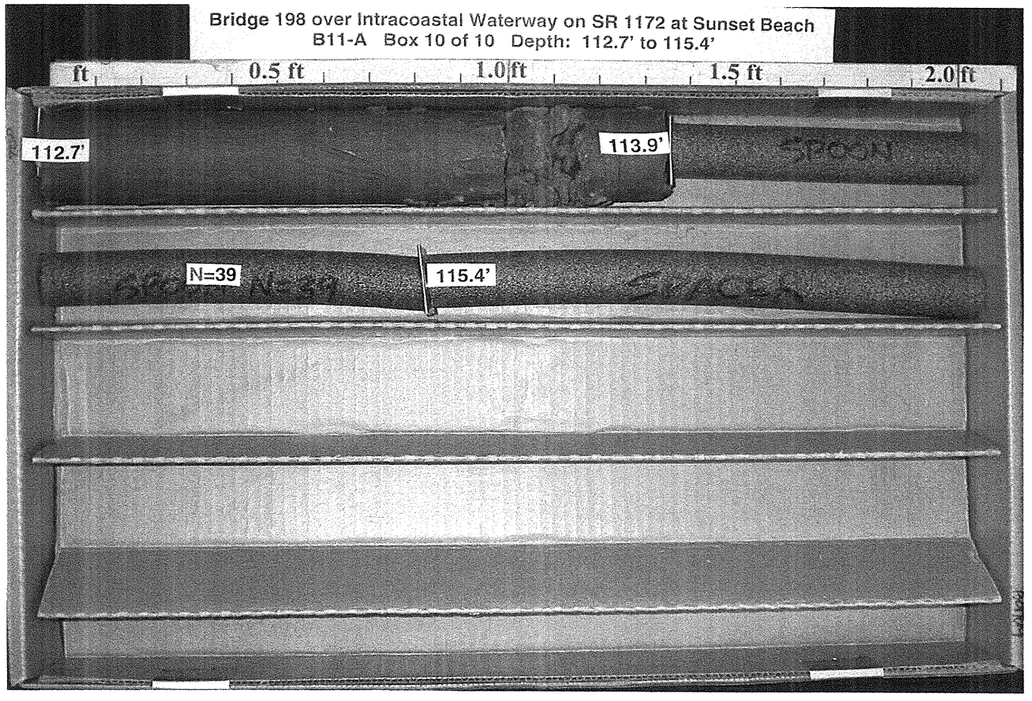


Core Photos
MACTEC Proj. No. 6468-04-0675

SHEET NO.	TOTAL SHEETS
86	209

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)





MACTEC

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET NO.	TOTAL SHEETS
87	209

SHEET 1 OF 1

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Deobald
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			**GROUND WATER (ft)**
BORING NO. B11-B	**BORING LOCATION** 44+46	**OFFSET** 13 ft RT	**ALIGNMENT** -L-
COLLAR ELEV. -4.1 ft	**NORTHING** 47,987 US ft	**EASTING** 2,148,445 US ft	**24 HR.** Boring
TOTAL DEPTH 60.2 ft	**DRILL MACHINE** CME-45 on Barge	**DRILL METHOD** Rotary Wash	**HAMMER TYPE** 140 lb. Manual
DATE STARTED 6/8/04	**COMPLETED** 6/9/04	**SURFACE WATER DEPTH** 5.5	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-4.1					Mudline				-4.1 0.0
-4.1	0.0	1	0	0	0		Sat.		CPU: Gray, f. sandy, silty CLAY (A-6) w/ trace shell fragments
-10.5	6.4								-8.1 4.0
		1	1	1	2		W		Waccamaw Fm: Gray, f. sandy, silty CLAY (A-7-6) w/ trace shell fragments
-15.5	11.4								
		woh	woh	woh	woh 0		W		
-20.5	16.4								-19.1 15.0
		2	1	2	3		W		Waccamaw Fm: Gray, f. to cse. SAND (A-3)
-25.5	21.4								-22.1 18.0
		8	6	6	12		W		Waccamaw Fm: Gray, v. thickly bedded, friable, shell hash LIMESTONE
-30.5	26.4								-29.1 25.0
		6	6	8	14		M		-29.6 25.5 Peedee Fm: Thinly bedded, mod. indurated LIMESTONE (Not Sampled)
-36.4	32.3								Peedee Fm: Dark gray to green, f. sandy, silty CLAY (A-7-6)
		5	5	6	11		M		Shelby tube: Pushed from 30.5 ft to 32.3 ft, recovery= 1.8 ft (100%)
-39.7	35.6								-39.1 35.0
		100/0.2			100/0.2				-40.8 36.7 Peedee Fm: Green-gray, thinly bedded, mod. indurated LIMESTONE
-43.5	39.4								Peedee Fm: Dark gray to green, f. sandy, silty CLAY (A-7-6)
		4	6	7	13		M		Shelby Tube: Pushed from 37.6 ft to 39.4 ft, recovery= 1.8 ft (100%)
-49.8	45.7								Shelby Tube: Pushed from 47.2 ft to 48.2 ft, recovery= 0.8 ft (80%), crushed end of tube
		6	6	8	14		M		
-52.3	48.2								
		6	7	9	16		M		-54.1 50.0
-60.8	56.7								-55.4 51.3 Peedee Fm: Green-gray, thinly bedded, mod. indurated LIMESTONE (Not Sampled)
		10	12	13	25		M		Peedee Fm: Dark gray to green, f. sandy, silty CLAY (A-7-6)
									Shelby Tube: Pushed from 58.2 ft to 60.2 ft, recovery= 0.0 (0%), Tube spun off the head during retrieval, attempts to recover failed, abandon boring, offset and cont. sampling. Tube left in hole.
									-64.3 60.2 Boring terminated/ abandoned at 60.2 ft (Elev. -64.3 ft) in Peedee Fm: V. stiff, f. sandy, silty CLAY (A-7-6)
									Bits Used: 4" Roller Cone
									Drilling Fluid: Water
									Boring abandoned due to shelby tube stuck in hole, unable to retrieve. Boring offset and continued as B11-B OS.

NCDOT BORE SINGLE 0675.GPJ NC_DOT.GDT 9/28/04

MACTEC

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET 1 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** M. Lear
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			**GROUND WATER (ft)**
BORING NO. B11-B OS	**BORING LOCATION** 44+47	**OFFSET** 12 ft RT	**ALIGNMENT** -L-	**0 HR.** Water
COLLAR ELEV. -4.5 ft	**NORTHING** 47,988 US ft	**EASTING** 2,148,443 US ft		**24 HR.** Boring
TOTAL DEPTH 115.1 ft	**DRILL MACHINE** CME-45 on Barge	**DRILL METHOD** Rotary Wash	**HAMMER TYPE** 140 lb. Manual	
DATE STARTED 6/9/04	**COMPLETED** 6/11/04	**SURFACE WATER DEPTH** 7.2		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-4.5					Mudline				-4.5 0.0
-61.6	57.1	6	8	10	18	ST-6	M		Boring offset from B11-B and wash drilled to 56.0 ft, casing set to 25.1 ft. resume sampling at 56.0 ft in Peedee Fm: Dark green, silty CLAY (A-7-6) -60.5 56.0
-66.3	61.8	10	60/0.1		60/0.1				Peedee Fm: Dark green, silty CLAY (A-7-6) Shelby Tube(ST-6): Pushed from 56.0 ft to 57.1 ft, recovery= 1.1 ft(100%), bottom of tube crushed -66.9 62.4
-70.9	66.4	7	7	10	17	ST-7	M		Peedee Fm: Thinly bedded, mod. indurated, LIMESTONE -68.1 63.6 Peedee Fm: Dark green, silty CLAY (A-7-6) Shelby Tube(ST-7): Pushed from 67.9 ft to 69.8 ft, recovery=1.9 ft(100%), bottom of tube crushed
-74.3	69.8	7	8	9	17		M		-78.0 73.5 -78.7 74.2 Peedee Fm: Thinly bedded, mod. indurated,

NCDOT BORE SINGLE 0675.GPJ NC_DOT.GDT 9/28/04

MACTEC

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET NO.	TOTAL SHEETS
88	209

SHEET 2 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** M. Lear
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			**GROUND WATER (ft)**
BORING NO. B11-B OS	**BORING LOCATION** 44+47	**OFFSET** 12 ft RT	**ALIGNMENT** -L-	**0 HR.** Water
COLLAR ELEV. -4.5 ft	**NORTHING** 47,988 US ft	**EASTING** 2,148,443 US ft		**24 HR.** Boring
TOTAL DEPTH 115.1 ft	**DRILL MACHINE** CME-45 on Barge	**DRILL METHOD** Rotary Wash	**HAMMER TYPE** 140 lb. Manual	
DATE STARTED 6/9/04	**COMPLETED** 6/11/04	**SURFACE WATER DEPTH** 7.2		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-79.3					Continued from previous page				
-80.0	75.5	7	8	9	17	ST-8	M		LIMESTONE Peedee Fm: Dark green, silty CLAY (A-7-6)
-82.7	78.2	8	9	9	18		M		Shelby Tube(ST-8): Pushed from 77.0 ft to 78.2 ft, recovery=1.2 ft (100%), bottom of tube crushed *(continued)*
-89.5	85.0	10	10	15	25		M		-92.5 88.0 -93.0 88.5 Peedee Fm: Thinly bedded, mod. indurated, LIMESTONE
-95.1	90.6	16	11	13	24	ST-10	M		Peedee Fm: Dark green, silty CLAY (A-7-6) Shelby Tube: Pushed from 92.1 ft to 93.1 ft, recovery=1.0 ft (100%), bottom of tube crushed
-98.7	94.2	10	11	12	23		M		Shelby Tube(ST-10): Pushed from 93.1 ft to 94.2 ft, recovery=1.1 ft (100%), bottom of tube crushed -103.0 98.5
-104.7	100.2	8	10	10	20		M		-104.0 99.5 Peedee Fm: Thinly bedded, mod. indurated, LIMESTONE Peedee Fm: Dark green, silty CLAY (A-7-6) Shelby Tube(ST-11): Pushed from 106.7 ft to 108.2 ft, recovery=1.5 ft (100%)
-109.7	105.2	9	10	12	22	ST-11	M		
-112.7	108.2	25	11	10	21		M		-113.0 108.5 -113.2 108.7 Peedee Fm: Dark gray green, very thinly bedded, friable LIMESTONE Peedee Fm: Dark green, silty CLAY (A-7-6)
-118.5	114.0	8	13	60/0.1	60/0.1				-119.6 115.1 Boring terminated at 115.1 ft (Elev. -119.6 ft) in Peedee Fm: Thinly bedded, mod. indurated LIMESTONE Bits Used: 4" Roller Cone Drilling Fluid: Water

NCDOT BORE SINGLE 0675.GPJ NC_DOT.GDT 9/28/04

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET 1 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			**GROUND WATER (ft)**
BORING NO. B12-A	**BORING LOCATION** 45+95	**OFFSET** 24 ft LT	**ALIGNMENT** -L-	**0 HR.** Water
COLLAR ELEV. -8.6 ft	**NORTHING** 48,102 US ft	**EASTING** 2,148,343 US ft		**24 HR.** Boring
TOTAL DEPTH 119.9 ft	**DRILL MACHINE** CME-45 on Barge	**DRILL METHOD** Rotary Wash/Core	**HAMMER TYPE** 140 lb. Manual	
DATE STARTED 5/27/04	**COMPLETED** 6/1/04	**SURFACE WATER DEPTH** 5.8		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-8.6					Mudline				
-8.6	0.0	Woh	Woh	Woh	Woh Woh		W		CPU: Dark gray, f. sandy SILT (A-4) w/ trace shells
-12.6	4.0								Waccamaw Fm: Dark gray, f. sandy, silty CLAY (A-6)
-15.2	6.6	Woh	Woh	Woh	Woh		W		
-17.6	9.0								Waccamaw Fm: Light gray to gray, f. to cse. SAND (A-3)
-20.1	11.5	2	1	2	3		W		
-21.1	12.5								Waccamaw Fm: White to gray, v. thinly bedded, friable, shell hash LIMESTONE
-25.2	16.6	6	7	6	13		W		
-29.6	21.0								
-30.1	21.5	23	10	11	21		W		
-30.6	22.0								Peedee Fm: Dark gray-green, thinly bedded, friable to mod indurated LIMESTONE
-37.5	28.9	2	2	7	9		M		Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-40.3	31.7								
-41.0	32.4								Peedee Fm: Dark gray, thinly bedded, mod. indurated to indurated LIMESTONE
-42.0	33.4	6	7	8	15		M		Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-46.1	37.5	6	6	10	16		M		
-50.2	41.6	6	7	9	16		M		
-54.8	46.2	7	11	25	36		M		
-55.8	47.2								Peedee Fm: Dark gray, v. thinly bedded, friable LIMESTONE
-59.6	51.0	6	7	9	16		M		Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-64.0	55.4	7	8	11	19		M		
-68.2	59.6								
-69.1	60.5	43	20	23	43		M		Peedee Fm: Dark gray, thinly bedded, mod. indurated to indurated LIMESTONE
-74.7	66.1	7	10	11	21		M		Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-79.3	70.7								
-80.2	71.6	26	13	13	26		M		Peedee Fm: Dark gray, thinly bedded, mod. indurated to indurated LIMESTONE
-80.4	71.8								Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)

NCDOT BORE SINGLE 0675.GPJ NC_DOT.GDT 9/28/04

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET NO.	TOTAL SHEETS
89	209

SHEET 2 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			**GROUND WATER (ft)**
BORING NO. B12-A	**BORING LOCATION** 45+95	**OFFSET** 24 ft LT	**ALIGNMENT** -L-	**0 HR.** Water
COLLAR ELEV. -8.6 ft	**NORTHING** 48,102 US ft	**EASTING** 2,148,343 US ft		**24 HR.** Boring
TOTAL DEPTH 119.9 ft	**DRILL MACHINE** CME-45 on Barge	**DRILL METHOD** Rotary Wash/Core	**HAMMER TYPE** 140 lb. Manual	
DATE STARTED 5/27/04	**COMPLETED** 6/1/04	**SURFACE WATER DEPTH** 5.8		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-83.4					Continued from previous page				
-85.7	77.1	7	10	13	23		M		Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6) *(continued)*
-92.2	83.6	10	14	16	30		M		
-96.2	87.6								Peedee Fm: Dark gray, thinly bedded, mod. indurated to indurated LIMESTONE
-97.7	89.1	7	10	12	22		M		Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-102.8	94.2	15	17	16	33		M		
-105.9	97.3								Peedee Fm: Dark gray, thinly bedded, mod. indurated to indurated LIMESTONE
-107.5	98.9	12	41	20	61		M		Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-108.1	99.5								Peedee Fm: Dark gray, v. thinly bedded, friable LIMESTONE
-112.3	103.7	7	10	12	22		M		Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-116.8	108.2	8	15	15	30		M		
-118.5	110.9								Peedee Fm: Dark gray, thinly bedded, indurated LIMESTONE
-121.0	112.4	85	15/0.3		100/0.8		M		Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-125.5	116.9								Peedee Fm: Dark gray, thinly bedded, friable LIMESTONE
-127.0	118.4	8	10	12	22		M		Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-128.5	119.9								Peedee Fm: Dark gray, thinly bedded, mod. indurated to indurated LIMESTONE
									Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
									Boring terminated at 119.9 ft (Elev. -128.5 ft) in Peedee Fm: V. stiff, silty CLAY (A-7-6)

Bits Used: HQ Core Bit-Surface Set

Drilling Fluid: Water

NCDOT BORE SINGLE 0675.GPJ NC_DOT.GDT 9/28/04

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

SHEET 1 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			**GROUND WATER (ft)**
BORING NO. B12-A	**BORING LOCATION** 45+95	**OFFSET** 24 ft LT	**ALIGNMENT** -L-	0 HR. Water
COLLAR ELEV. -8.6 ft	**NORTHING** 48,102 US ft	**EASTING** 2,148,343 US ft		24 HR. Boring
TOTAL DEPTH 119.9 ft	**DRILL MACHINE** CME-45 on Barge	**DRILL METHOD** Rotary Wash/Core	**HAMMER TYPE** 140 lb. Manual	
DATE STARTED 5/27/04	**COMPLETED** 6/1/04	**SURFACE WATER DEPTH** 5.8		
CORE SIZE HQ	**TOTAL RUN** 69.1 ft	**DRILLER** D. White		

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 23.0 ft
-31.6	23.0	5.9	0:34 0:33 0:44 0:44 0:37 0:35/0.9 *N=9*	(4.4) 75%	(N/A)		(4.4) 61%	(N/A)		Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-37.5	28.9									
-39.0	30.4	3.0	0:37 3:30 0:45 *N=15*	(0.7) 23%	(N/A)					-40.3 31.7
-42.0	33.4						(0.7) 100%	(N/A)		-41.0 32.4 Peedee Fm: Dark gray, thinly bedded, mod. indurated to indurated LIMESTONE
-43.5	34.9	2.6	1:02 0:50 0:30/0.6 *N=16*	(2.6) 100%	(N/A)		(7.7) 83%	(N/A)		Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-46.1	37.5									
-47.6	39.0	2.6	1:30 0:45 0:20/0.6 *N=16*	(2.6) 100%	(N/A)					
-50.2	41.6									
-51.7	43.1	3.1	0:45 0:47 0:25 0:10/0.1 *N=36*	(2.5) 81%	(N/A)					
-54.8	46.2									-55.8 47.2
-56.3	47.7	3.3	1:35 0:30 0:28 0:28/0.3 *N=16*	(3.0) 91%	(N/A)		(8.5) 96%	(N/A)		Peedee Fm: Dark gray, v. thinly bedded, friable LIMESTONE Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-59.6	51.0									
-61.1	52.5	2.9	1:00 0:55 0:39/0.9 *N=19*	(2.9) 100%	(N/A)					
-64.0	55.4									
-65.5	56.9	3.6	0:40 0:46 1:48 4:20/0.6 *N=43*	(3.5) 97%	(N/A)					-68.2 59.6
-69.1	60.5						(0.9) 100%	(N/A) (N/A)		-69.1 60.5 Peedee Fm: Dark gray, thinly bedded, mod. indurated to indurated LIMESTONE Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-70.6	62.0	4.1	0:56 0:43 0:45 0:42 0:05/0.1 *N=21*	(4.1) 100%	(N/A)		(7.2) 100%			
-74.7	66.1									
-76.2	67.6	4.0	0:23 0:20 0:25 8:00 *N=26*	(4.0) 100%	(N/A)					-79.3 70.7
-80.2	71.6						(0.9) 100%	(N/A) (N/A)		-80.4 71.8 Peedee Fm: Dark gray, thinly bedded, mod. indurated to indurated LIMESTONE Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-81.7	73.1	4.0	0:45 0:25 0:25 0:20 *N=23*	(4.0) 100%	(N/A)		(11.5) 100%			
-85.7	77.1									
-87.2	78.6	5.0	0:51 0:35 0:41 0:42 0:45 *N=30*	(5.0) 100%	(N/A)					
-92.2	83.6									
-93.7	85.1	4.0	0:33 0:37 3:25 0:42 *N=22*	(3.6) 90%	(N/A)					-96.2 87.6
-97.7	89.1						(0.3) 100%	(N/A) (N/A)		-98.1 87.9 Peedee Fm: Dark gray, thinly bedded, mod. indurated to indurated LIMESTONE Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-99.2	90.6	3.6	0:47 0:51 0:55 0:23/0.6 *N=33*	(3.6) 100%	(N/A)		(6.0) 94%			
-102.8	94.2									
-104.3	95.7	3.2	0:58 5:00	(3.2) 100%	(N/A)					-105.9 97.3 -106.3 97.9

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

SHEET NO.	TOTAL SHEETS
90	209

SHEET 2 OF 2

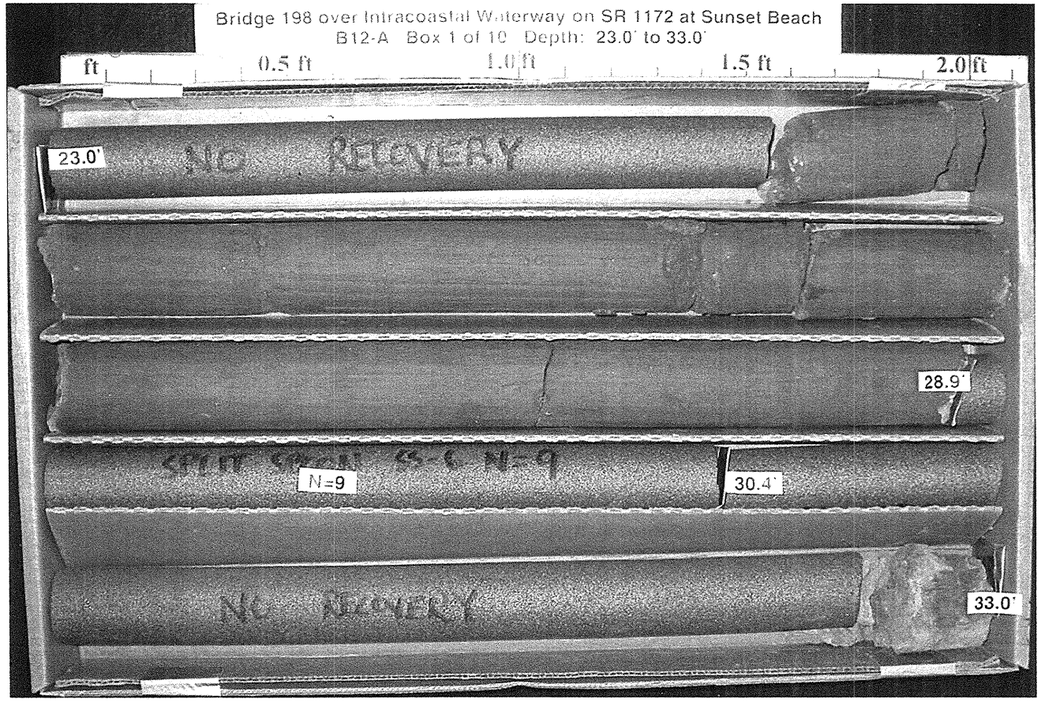
PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** B. Parks
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			**GROUND WATER (ft)**
BORING NO. B12-A	**BORING LOCATION** 45+95	**OFFSET** 24 ft LT	**ALIGNMENT** -L-	0 HR. Water
COLLAR ELEV. -8.6 ft	**NORTHING** 48,102 US ft	**EASTING** 2,148,343 US ft		24 HR. Boring
TOTAL DEPTH 119.9 ft	**DRILL MACHINE** CME-45 on Barge	**DRILL METHOD** Rotary Wash/Core	**HAMMER TYPE** 140 lb. Manual	
DATE STARTED 5/27/04	**COMPLETED** 6/1/04	**SURFACE WATER DEPTH** 5.8		
CORE SIZE HQ	**TOTAL RUN** 69.1 ft	**DRILLER** D. White		

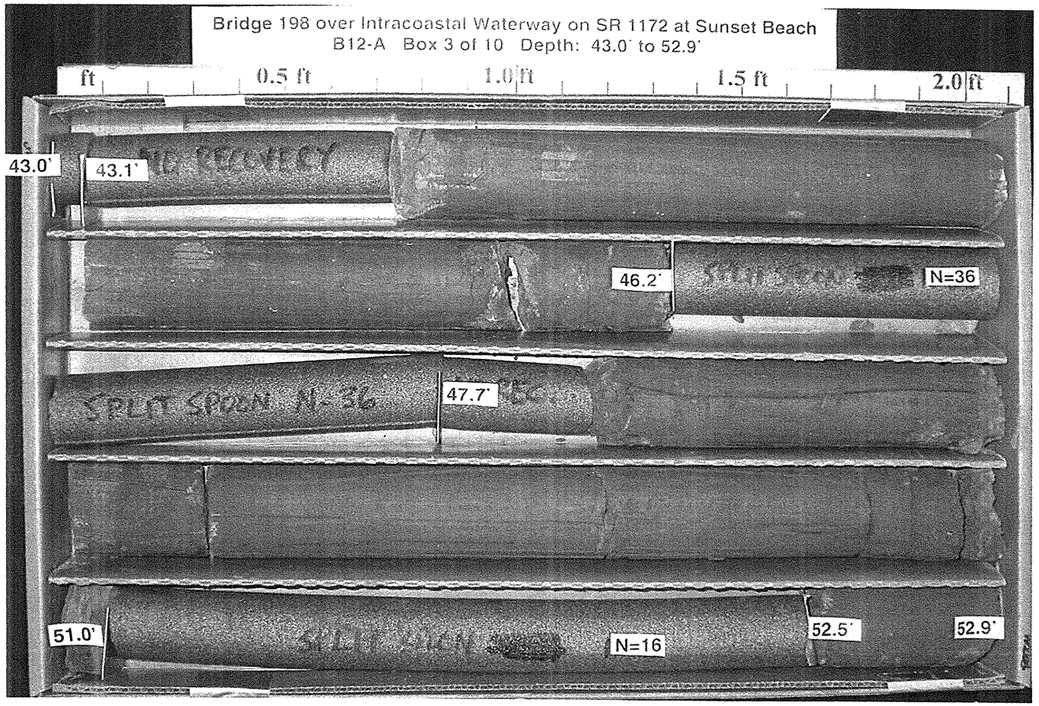
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Continued from previous page
-107.5	98.9		2:20 0:10/0.2 *N=61*				(0.6) 100%	(N/A) (N/A)		-108.1 99.5 Peedee Fm: Dark gray, thinly bedded, mod. indurated to indurated LIMESTONE
-109.0	100.4	3.3	1:12 0:57 0:59/1.3 *N=22*	(3.3) 100%	(N/A)		(1.0) 100%	(N/A)		*(continued)* Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6) Peedee Fm: Dark gray, v. thinly bedded, friable LIMESTONE
-112.3	103.7						(7.4) 99%			Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6)
-113.8	105.2	3.0	1:40 1:05 0:43 *N=30*	(2.9) 97%	(N/A)					
-116.8	108.2									
-118.3	109.7	2.7	0:49 4:20 0:20/0.7 *N=100/0.8*	(2.7) 100%	(N/A)					-119.5 110.9 -120.0 111.4 Peedee Fm: Dark gray, thinly bedded, indurated LIMESTONE
-121.0	112.4						(0.5) 100%	(N/A) (N/A)		-121.0 112.4 Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6) -121.9 113.3 Peedee Fm: Dark gray, thinly bedded, friable LIMESTONE
-121.8	113.2	5.2	0:48 3:00 0:40 0:35 0:30 0:20/0.2	(5.2) 100%	(N/A)		(1.0) 100%	(N/A) (N/A)		-122.6 113.9 Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6) Peedee Fm: Dark gray, thinly bedded, mod. indurated to indurated LIMESTONE
-127.0	118.4						(0.4) 100%	(N/A)		Peedee Fm: Dark grayish green, f. sandy, silty CLAY (A-7-6) -127.0 118.4 Coring terminated at 118.4 ft (Elev. -127.0 ft) in Peedee Fm: V. stiff, silty CLAY (A-7-6)
							(4.4) 100%			

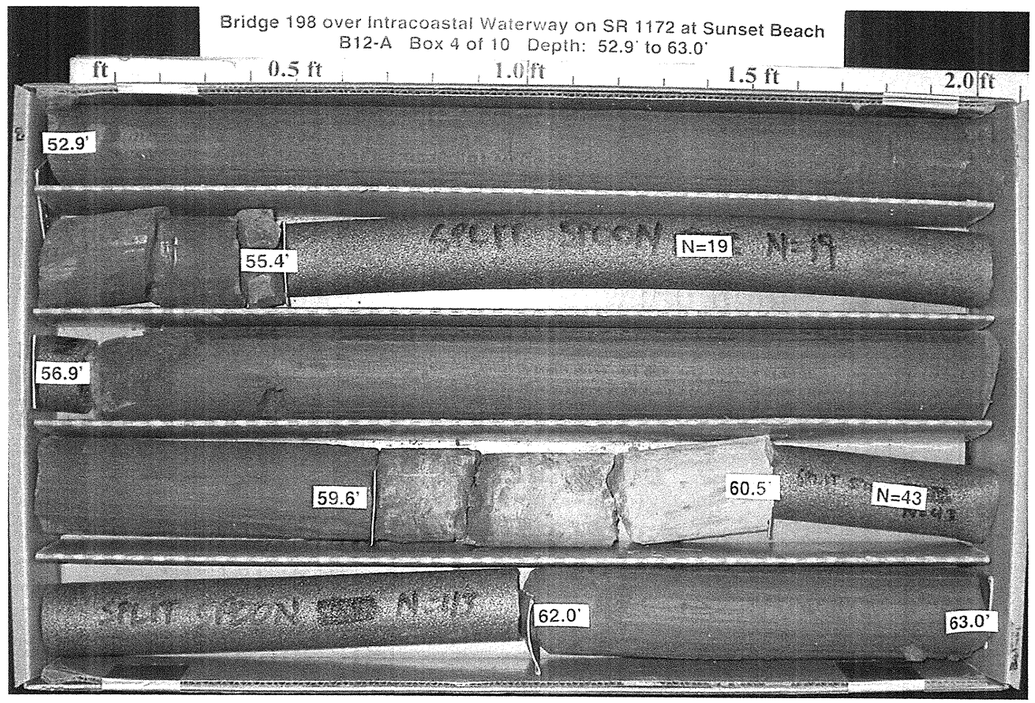
NCDOT CORE SINGLE 0675.GPJ NC_DOT.GDT 9/28/04

Core Photos
MACTEC Proj. No. 6468-04-0675

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)

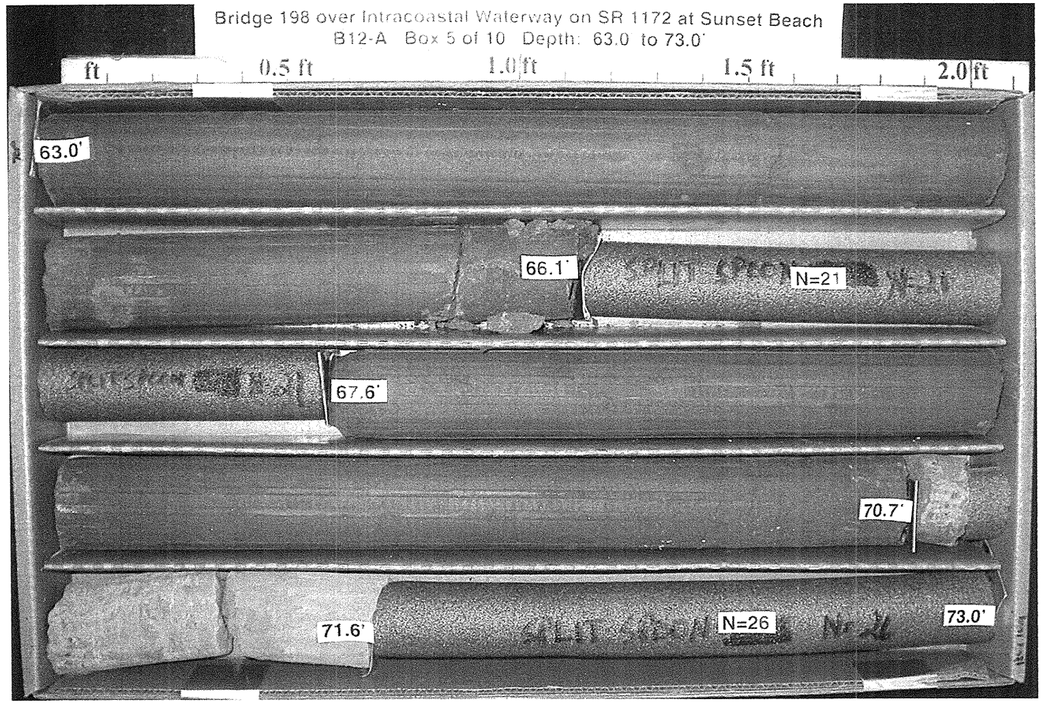


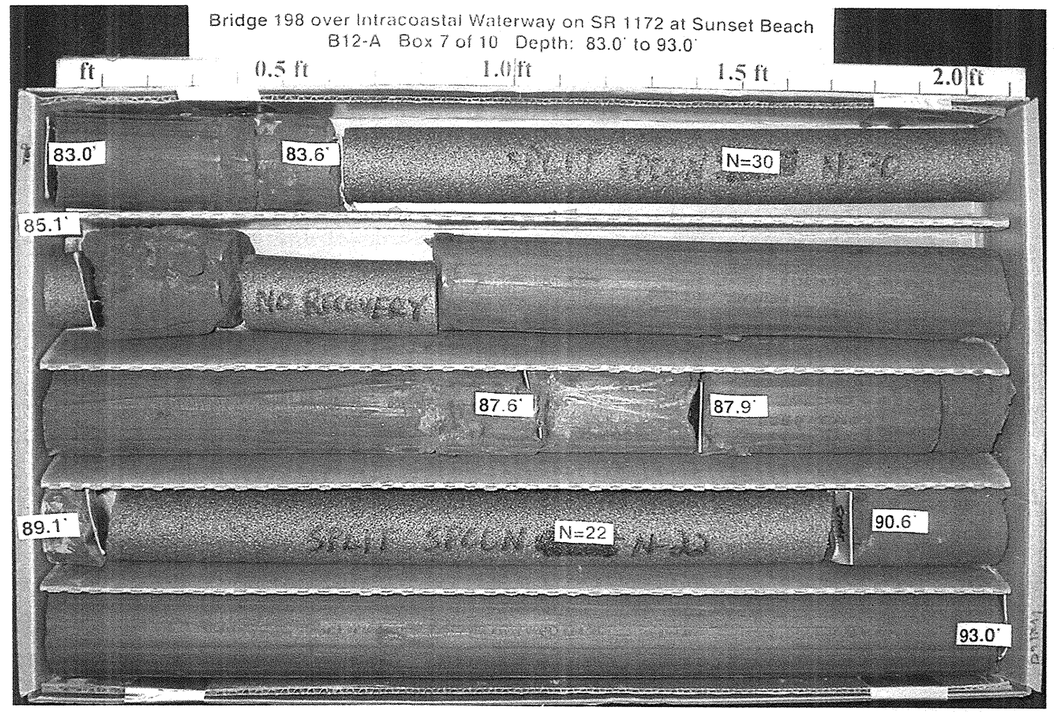


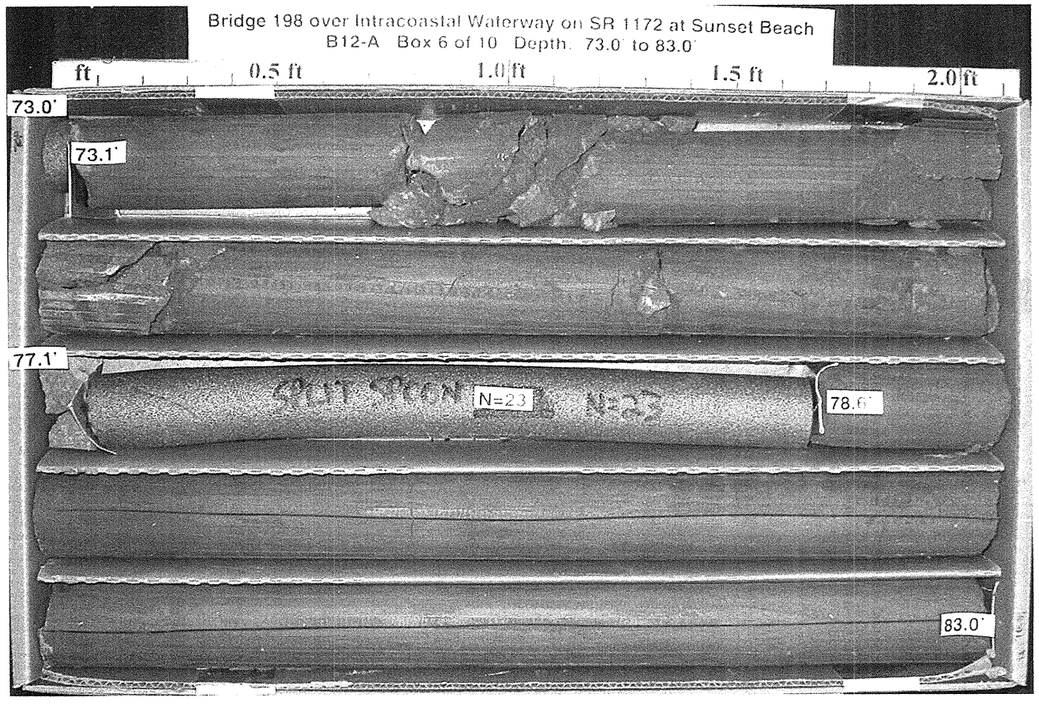


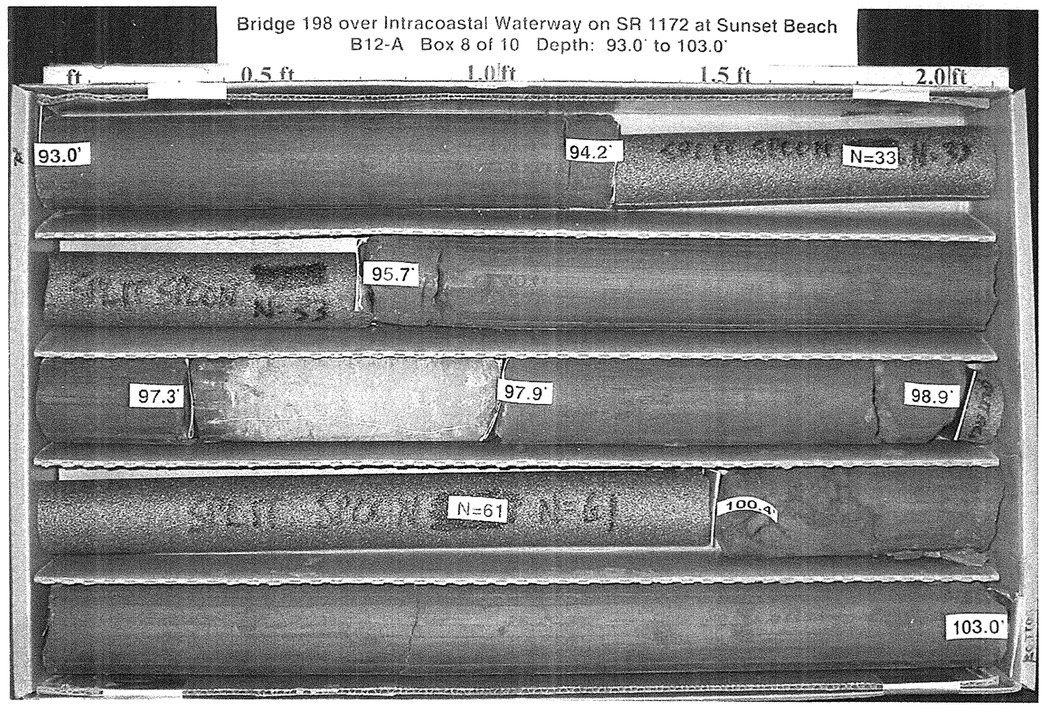
Core Photos
MACTEC Proj. No. 6468-04-0675

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)



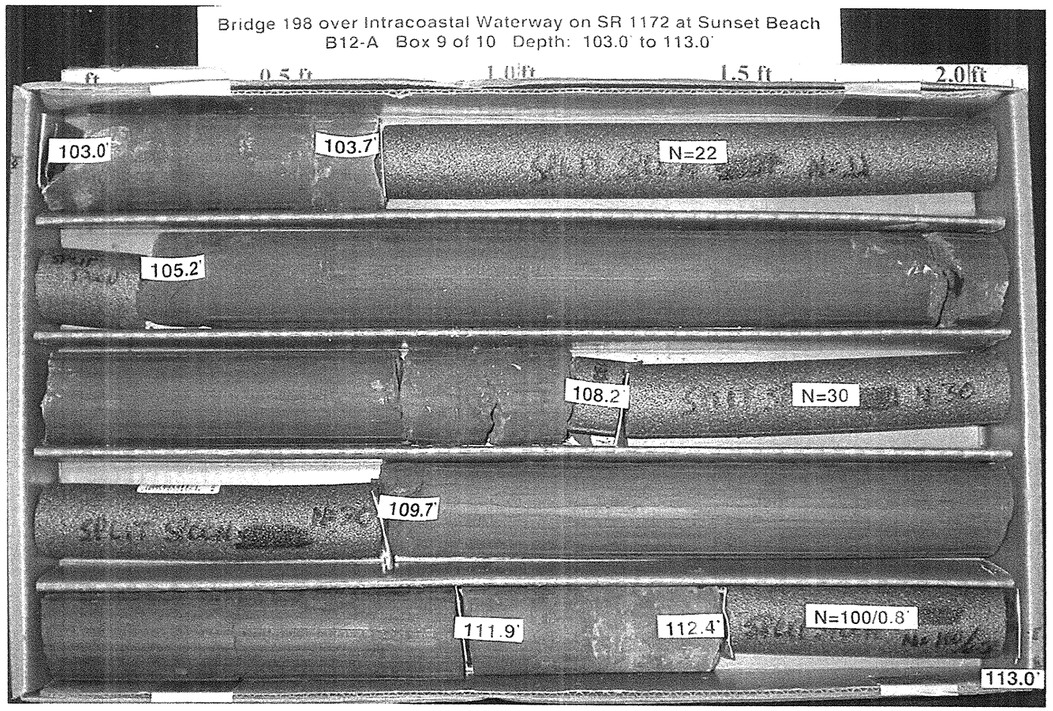


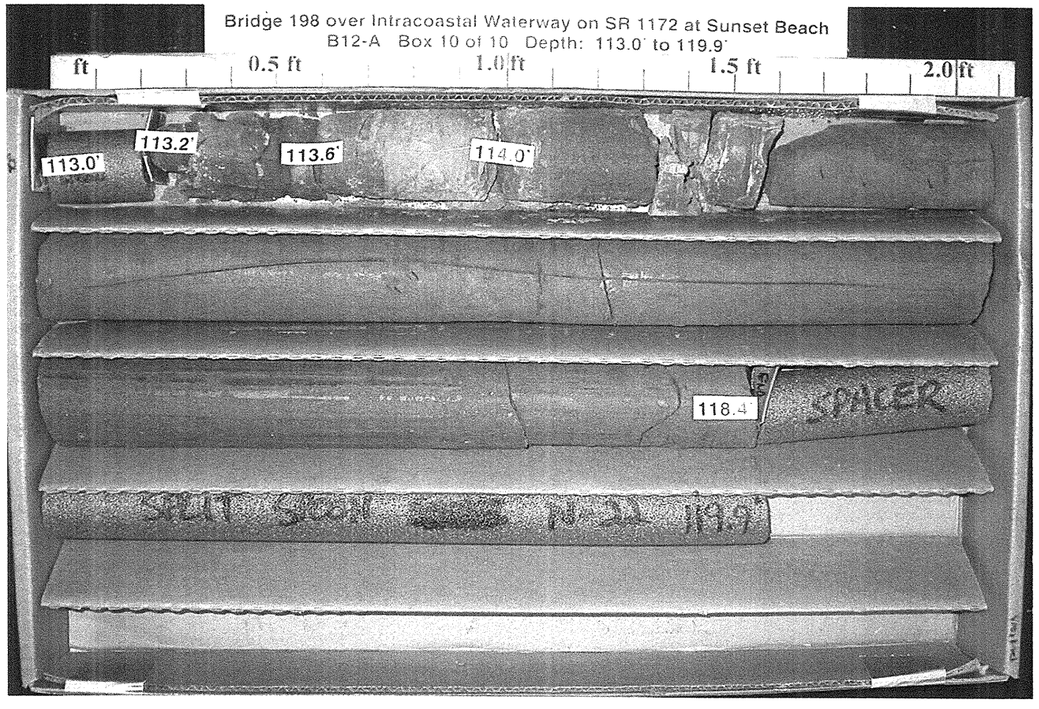




Core Photos
MACTEC Proj. No. 6468-04-0675

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)





N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET 1 OF 2

MACTEC

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** M. Lear
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			**GROUND WATER (ft)**
BORING NO. B12-B	**BORING LOCATION** 45+97	**OFFSET** 14 ft RT	**ALIGNMENT** -L-	**0 HR.** Water
COLLAR ELEV. -10.1 ft	**NORTHING** 48,122 US ft	**EASTING** 2,148,375 US ft		**24 HR.** Boring
TOTAL DEPTH 109.6 ft	**DRILL MACHINE** CME-45 on Barge	**DRILL METHOD** Rotary Wash/Core	**HAMMER TYPE** 140 lb. Manual	
DATE STARTED 6/14/04	**COMPLETED** 6/16/04	**SURFACE WATER DEPTH** 10.3		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-10.1					Mudline				
-10.1	0.0	woh	woh	woh	woh		Sat.		CPU: Dark gray, f. sandy, SILT (A-4) w/ trace to little shell fragments
-14.6	4.5								Waccamaw Fm: Gray, silty, f. sandy, CLAY (A-6) w/ trace shells
-16.2	6.1	1	1	2	3		Sat.		
-18.6	8.5								Waccamaw Fm: Gray to light brown, clayey, silty, f. SAND (A-2-4) w/ trace shell fragments
-21.4	11.3	3	2	1	3	SS-33	Sat.		
-24.1	14.0								Waccamaw Fm: Gray to white, f. to cse. SAND (A-3) and v. thinly bedded, friable shell hash LIMESTONE
-26.1	16.0	1	1	1	2		Sat.		
-28.6	18.5								
-29.8	19.7								Peedee Fm: Thinly bedded, mod. indurated, LIMESTONE (Not Sampled)
-31.3	21.2	5	6	6	12		M		Peedee Fm: Dark green, silty CLAY (A-7-6)
-39.1	29.0	5	7	93/0.2	100/0.7		M		
-40.3	30.2								
-41.1	31.0								Peedee Fm: Dark gray-green, thinly bedded, mod. indurated LIMESTONE
-46.6	36.5	5	6	8	14		M		Peedee Fm: Dark green, silty CLAY (A-7-6)
-51.1	41.0	7	7	10	17		M		
-55.6	45.5	6	6	10	16		M		
-60.1	50.0	7	8	10	18		M		
-64.6	54.5	6	8	9	17		M		
-68.4	58.3								
-68.8	58.7	60/0.1			60/0.1		M		
-69.4	59.3								Peedee Fm: Dark gray-green, thinly bedded, mod. indurated to indurated LIMESTONE
-74.3	64.2	6	8	10	18		M		Peedee Fm: Dark green, silty CLAY (A-7-6)
-79.3	69.2								
-79.7	69.6	8	10	11	21		M		Peedee Fm: Dark gray-green, thinly bedded, friable LIMESTONE
-85.1	75.0								Peedee Fm: Dark green, silty CLAY (A-7-6)

NCDOT BORE SINGLE 0675.GPJ NC_DOT.GDT 9/28/04

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET NO.	TOTAL SHEETS
94	209

SHEET 2 OF 2

MACTEC

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** M. Lear
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			**GROUND WATER (ft)**
BORING NO. B12-B	**BORING LOCATION** 45+97	**OFFSET** 14 ft RT	**ALIGNMENT** -L-	**0 HR.** Water
COLLAR ELEV. -10.1 ft	**NORTHING** 48,122 US ft	**EASTING** 2,148,375 US ft		**24 HR.** Boring
TOTAL DEPTH 109.6 ft	**DRILL MACHINE** CME-45 on Barge	**DRILL METHOD** Rotary Wash/Core	**HAMMER TYPE** 140 lb. Manual	
DATE STARTED 6/14/04	**COMPLETED** 6/16/04	**SURFACE WATER DEPTH** 10.3		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-84.9					Continued from previous page				
-90.6	80.5	8	11	12	23		M		Peedee Fm: Dark green, silty CLAY (A-7-6) *(continued)*
-93.5	83.4								
-93.9	83.8								Peedee Fm: Dark gray-green, thinly bedded, mod. indurated LIMESTONE
-96.6	86.5	9	10	13	23		M		Peedee Fm: Dark green, silty CLAY (A-7-6)
-102.2	92.1	8	10	11	21		M		
-105.6	95.5	9	10	12	22		M		
-106.1	96.0								Peedee Fm: Dark gray-green, thinly bedded, mod. indurated LIMESTONE
-108.1	98.0	100/0.3			100/0.3		M		
-108.4	98.3								Peedee Fm: Dark green, silty CLAY (A-7-6)
-108.8	98.7								Peedee Fm: Dark gray-green, thinly bedded, mod. indurated LIMESTONE
-113.2	103.1	9	9	12	21		M		Peedee Fm: Dark green, silty CLAY (A-7-6)
-118.2	108.1	8	10	12	22		M		
-119.7	109.6								Boring terminated at 109.6 ft (Elev. -119.7 ft) in Peedee Fm: V. stiff, silty CLAY (A-7-6)

Bits Used: HQ Core Bit-Surface Set

Drilling Fluid: Water

NCDOT BORE SINGLE 0675.GPJ NC_DOT.GDT 9/28/04

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

SHEET 1 OF 2

PROJECT NO. 8.2230101	ID. B-0682	COUNTY Brunswick	GEOLOGIST M. Lear
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			GROUND WATER (ft)
BORING NO. B12-B	BORING LOCATION 45+97	OFFSET 14 ft RT	ALIGNMENT -L-	0 HR. Water
COLLAR ELEV. -10.1 ft	NORTHING 48,122 US ft	EASTING 2,148,375 US ft	24 HR. Boring
TOTAL DEPTH 109.6 ft	DRILL MACHINE CME-45 on Barge	DRILL METHOD Rotary Wash/Core	HAMMER TYPE 140 lb. Manual
DATE STARTED 6/14/04	COMPLETED 6/16/04	SURFACE WATER DEPTH 10.3	
CORE SIZE HQ	TOTAL RUN 65.8 ft	DRILLER D. White	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 22.7 ft
-32.8	22.7	6.3	0:41 0:35 1:16 0:51 1:04 1:01/1.3	(2.5) 40%	(N/A)		(2.5) 40%	(N/A)		Peedee Fm: Dark green, silty CLAY (A-7-6)
-39.1	29.0		*N=100/0.7*							
-40.3	30.2	1.7	5:29 0:21/0.7	(1.0) 59%	(N/A)		(0.8) 100%	(N/A)		-40.3 Peedee Fm: Dark gray-green, thinly bedded, mod. indurated LIMESTONE 30.2 / 31.0
-42.0	31.9	4.6	0:54 0:49 0:42 0:44 0:24/0.6	(4.6) 100%	(N/A)		(19.1) 96%	(N/A)		-41.1 Peedee Fm: Dark green, silty CLAY (A-7-6)
-46.6	36.5		*N=14*							
-48.1	38.0	3.0	1:00 0:46 0:32	(3.0) 100%	(N/A)					
-51.1	41.0		*N=17*							
-52.6	42.5	3.0	0:42 0:37 0:43	(3.0) 100%	(N/A)					
-55.6	45.5		*N=16*							
-57.1	47.0	3.0	0:58 0:34 0:28	(3.0) 100%	(N/A)					
-60.1	50.0		*N=18*							
-61.6	51.5	3.0	0:42 0:37 0:35	(3.0) 100%	(N/A)					
-64.6	54.5		*N=17*							
-66.1	56.0	2.7	0:42 0:45 4:34/0.7	(2.7) 100%	(N/A)					
-68.8	58.7		*N=60/0.1*							-68.4 58.3
-68.9	58.8	5.4	4:02 0:42 0:28 0:28 0:43/1.4	(5.4) 100%	(N/A)		(0.9) 100%	(N/A)		-69.4 Peedee Fm: Dark gray-green, thinly bedded, mod. indurated to indurated LIMESTONE 59.3
-74.3	64.2		*N=18*				(8.4) 100%			Peedee Fm: Dark green, silty CLAY (A-7-6)
-75.8	65.7	3.9	0:42 0:34 0:36	(3.9) 100%	(N/A)					
-79.7	69.6		1:46/0.9 *N=21*							-79.3 69.2
-81.2	71.1	3.9	0:40 0:25 0:25	(3.9) 100%	(N/A)		(0.2) 100%	(N/A)		Peedee Fm: Dark gray-green, thinly bedded, friable LIMESTONE
-85.1	75.0		0:22/0.9 *N=23*				(9.5) 100%			Peedee Fm: Dark green, silty CLAY (A-7-6)
-86.6	76.5	4.0	0:42 0:32 0:33	(4.0) 100%	(N/A)					
-90.6	80.5		0:28 *N=23*							
-92.1	82.0	4.5	0:32 2:52 0:27 0:31	(4.5) 100%	(N/A)					-93.5 83.4
-96.6	86.5		0:11/0.5 *N=21*				(0.4) 100%	(N/A)		Peedee Fm: Dark gray-green, thinly bedded, mod. indurated LIMESTONE
-98.1	88.0	4.1	0:32 0:32 0:48	(4.1) 100%	(N/A)		(8.7) 100%			Peedee Fm: Dark green, silty CLAY (A-7-6)
-102.2	92.1		0:42 0:07/0.1 *N=22*							
-103.7	93.6	4.4	0:52 3:28 2:08 0:37	(4.4) 100%	(N/A)					-105.6 95.5
							(0.5) 100%	(N/A)		Peedee Fm: Dark gray-green, thinly bedded, mod. indurated LIMESTONE

NCDOT CORE SINGLE 0675.GPJ NC_DOT.GDT 9/28/04

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

SHEET NO.	TOTAL SHEETS
95	209

SHEET 2 OF 2

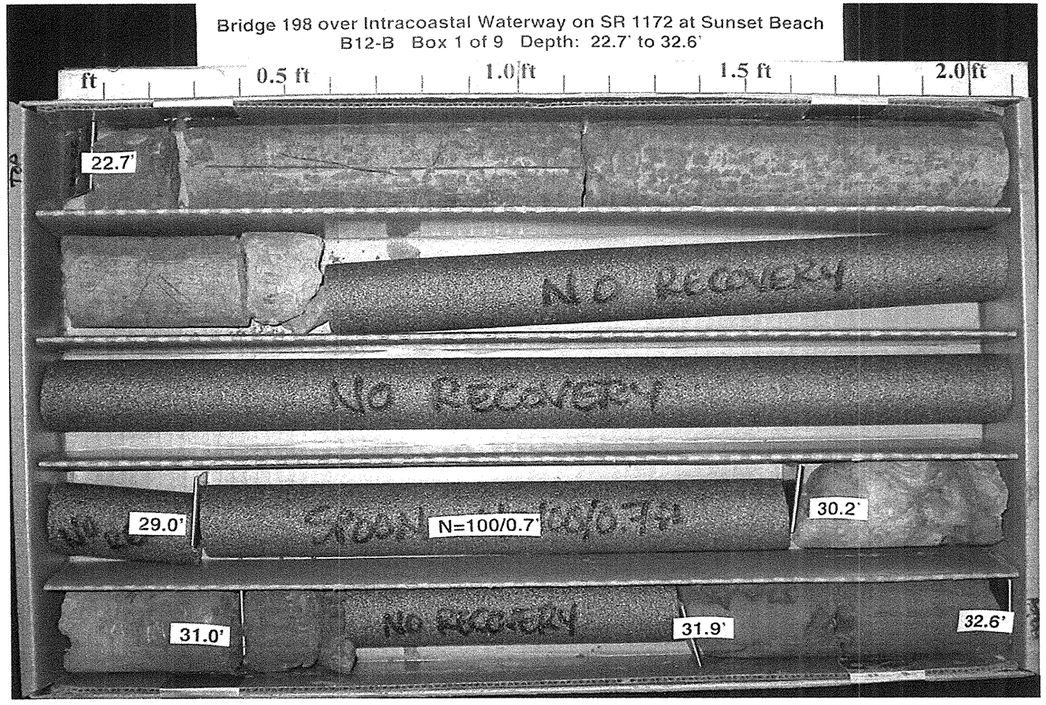
PROJECT NO. 8.2230101	ID. B-0682	COUNTY Brunswick	GEOLOGIST M. Lear
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			GROUND WATER (ft)
BORING NO. B12-B	BORING LOCATION 45+97	OFFSET 14 ft RT	ALIGNMENT -L-	0 HR. Water
COLLAR ELEV. -10.1 ft	NORTHING 48,122 US ft	EASTING 2,148,375 US ft	24 HR. Boring
TOTAL DEPTH 109.6 ft	DRILL MACHINE CME-45 on Barge	DRILL METHOD Rotary Wash/Core	HAMMER TYPE 140 lb. Manual
DATE STARTED 6/14/04	COMPLETED 6/16/04	SURFACE WATER DEPTH 10.3	
CORE SIZE HQ	TOTAL RUN 65.8 ft	DRILLER D. White	

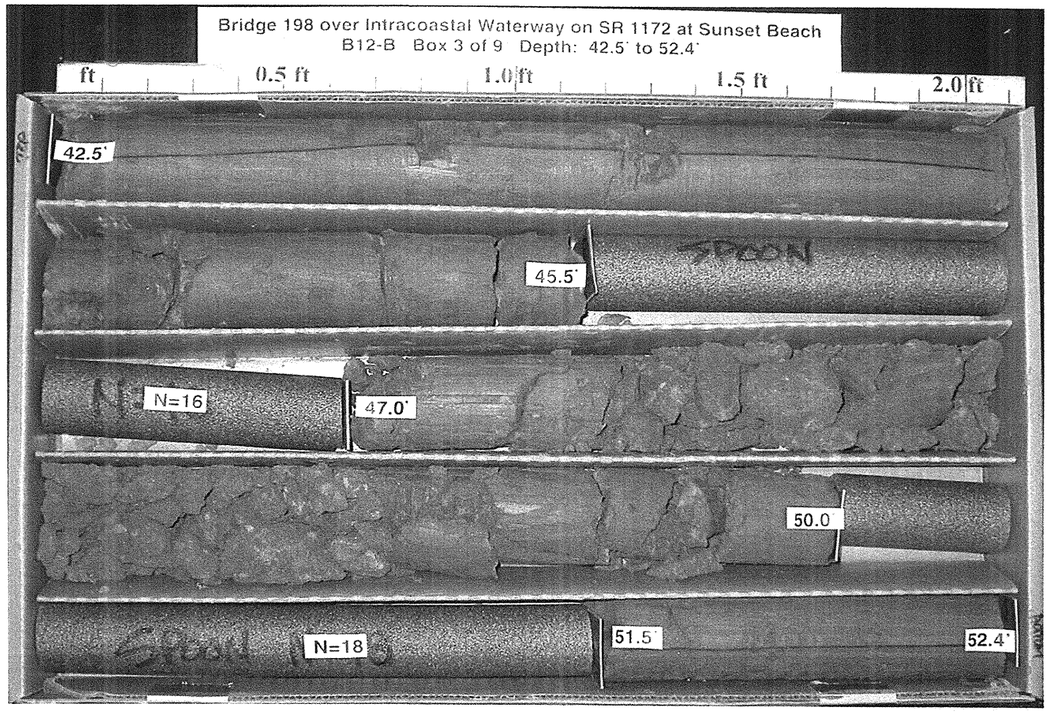
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Continued from previous page
-108.1	98.0	4.8	0:20/0.4 *N=100/0.3*	(4.8) 100%	(N/A)		(2.0) 100%	(N/A)		-108.4 98.3 / -108.8 98.7 Peedee Fm: Dark gray-green, thinly bedded, mod. indurated LIMESTONE
-108.4	98.3		1:49 0:28 0:26				(0.2) 100%	(N/A)		Peedee Fm: Dark green, silty CLAY (A-7-6)
-113.2	103.1		0:26 0:18/0.8 *N=21*				(8.1) 100%			
-114.7	104.6	3.5	0:42 0:42 0:43	(3.5) 100%	(N/A)					
-118.2	108.1		0:15/0.5							-118.2 108.1 Coring terminated at 108.1 ft (Elev. -118.2 ft) in Peedee Fm: V. stiff, silty CLAY (A-7-6)

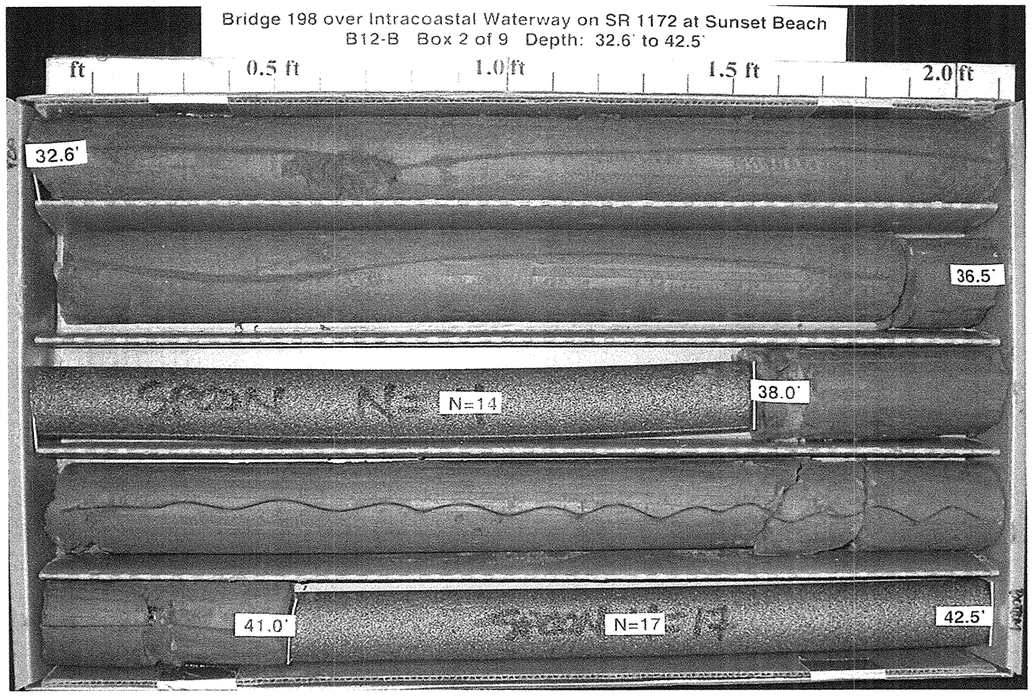
NCDOT CORE SINGLE 0675.GPJ NC_DOT.GDT 9/28/04

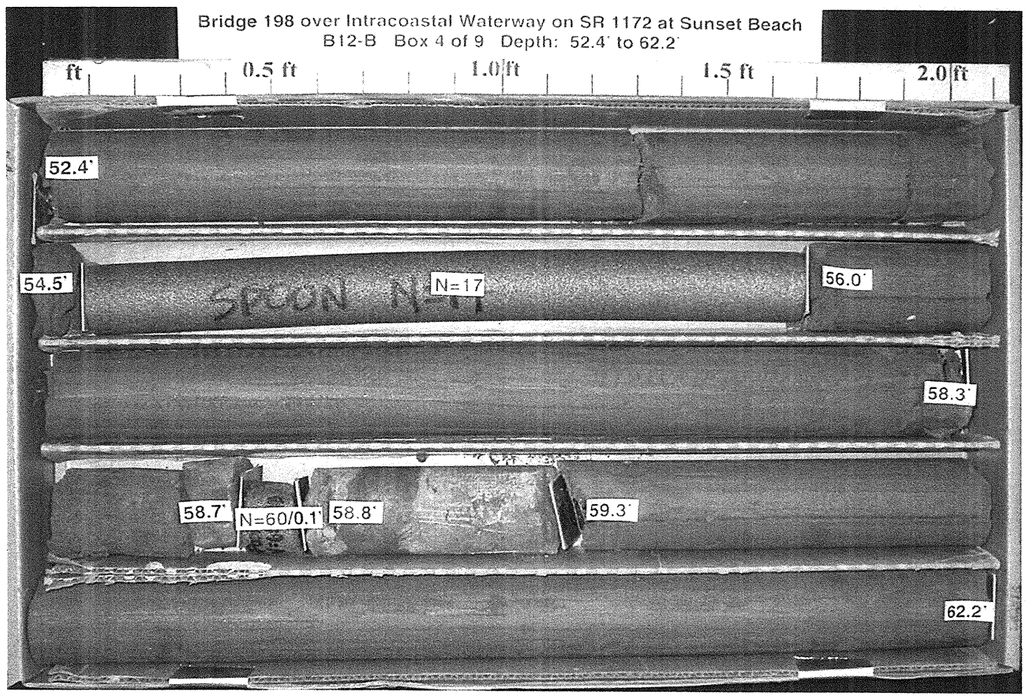
Core Photos
MACTEC Proj. No. 6468-04-0675

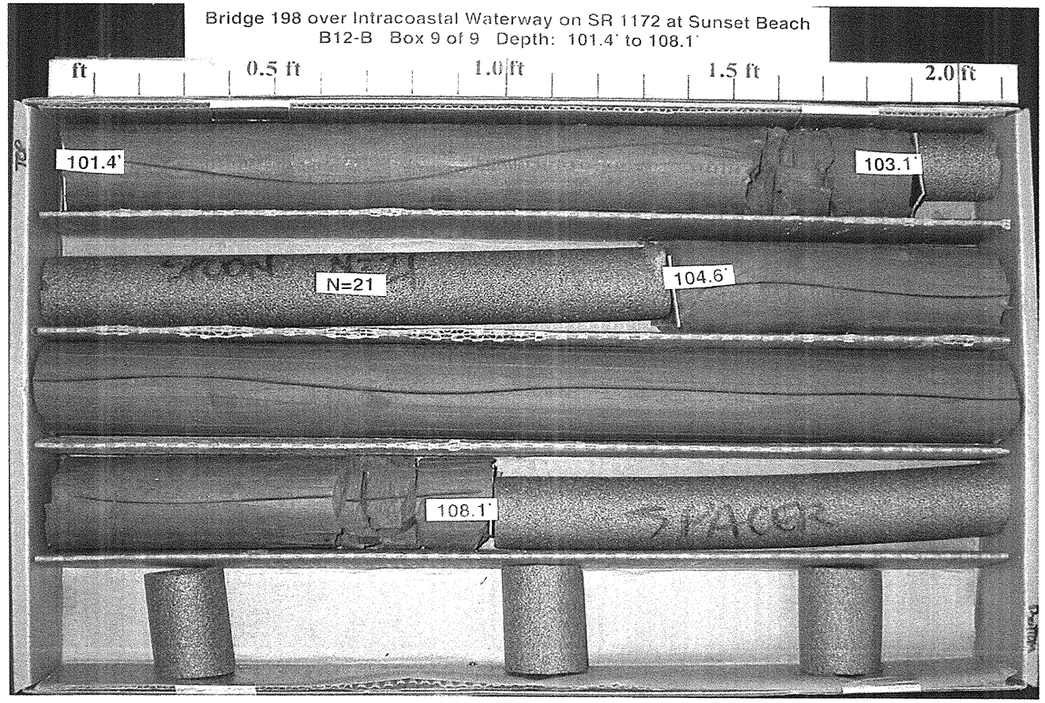
Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)





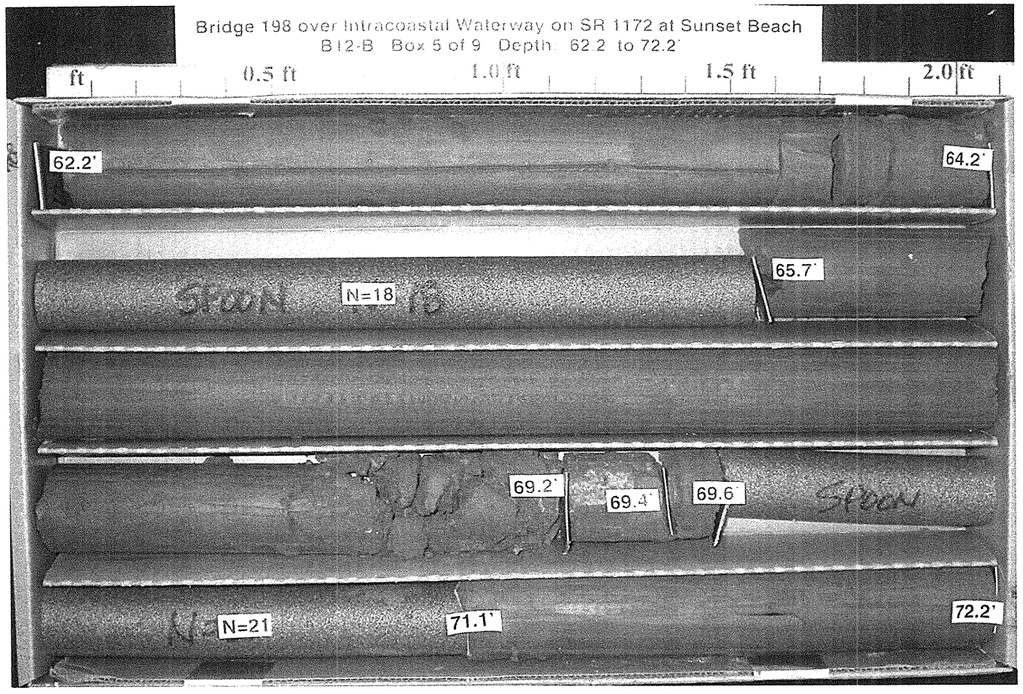


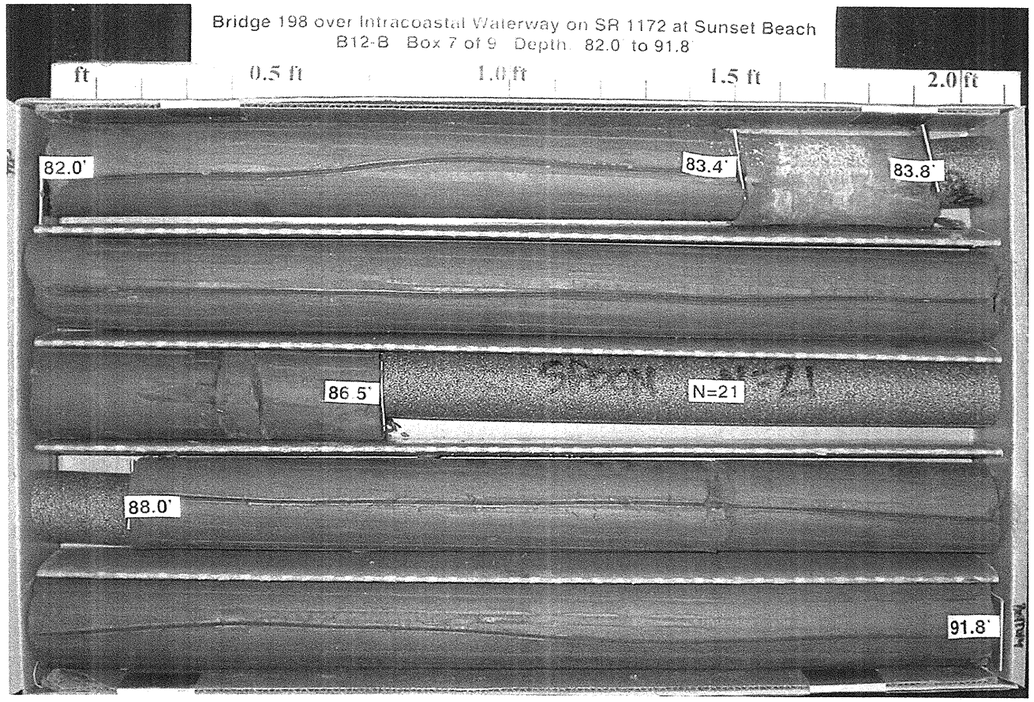


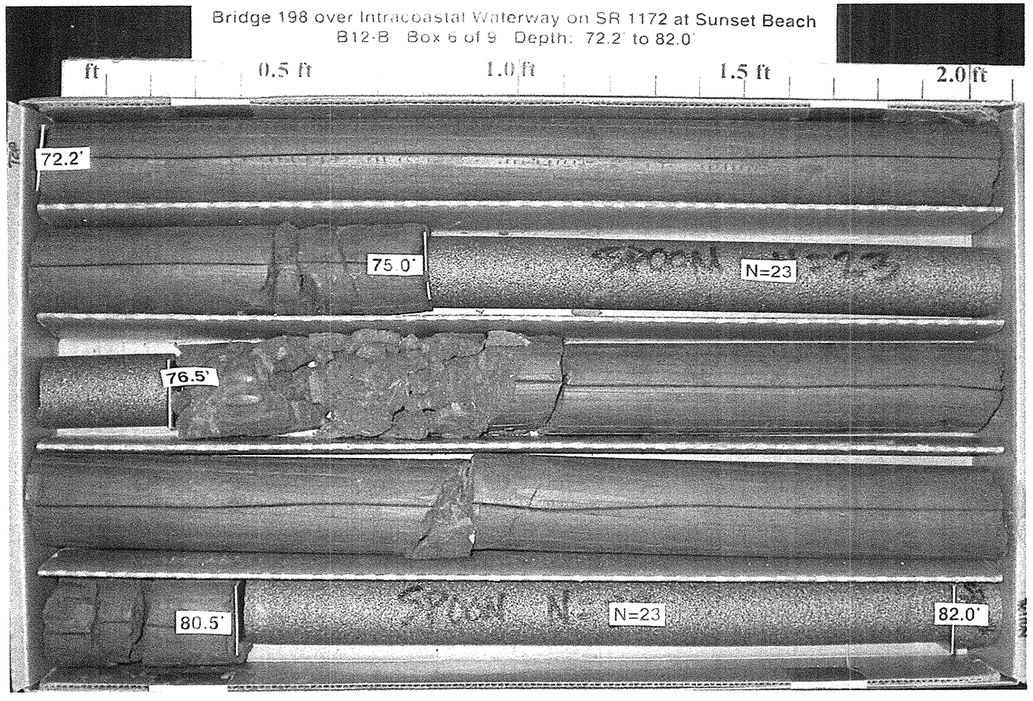

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
B12-B Box 9 of 9 Depth: 101.4' to 108.1'
ft
0.5 ft
1.0 ft
1.5 ft
2.0 ft
TOP
101.4'
103.1'
N=21
104.6'
108.1'

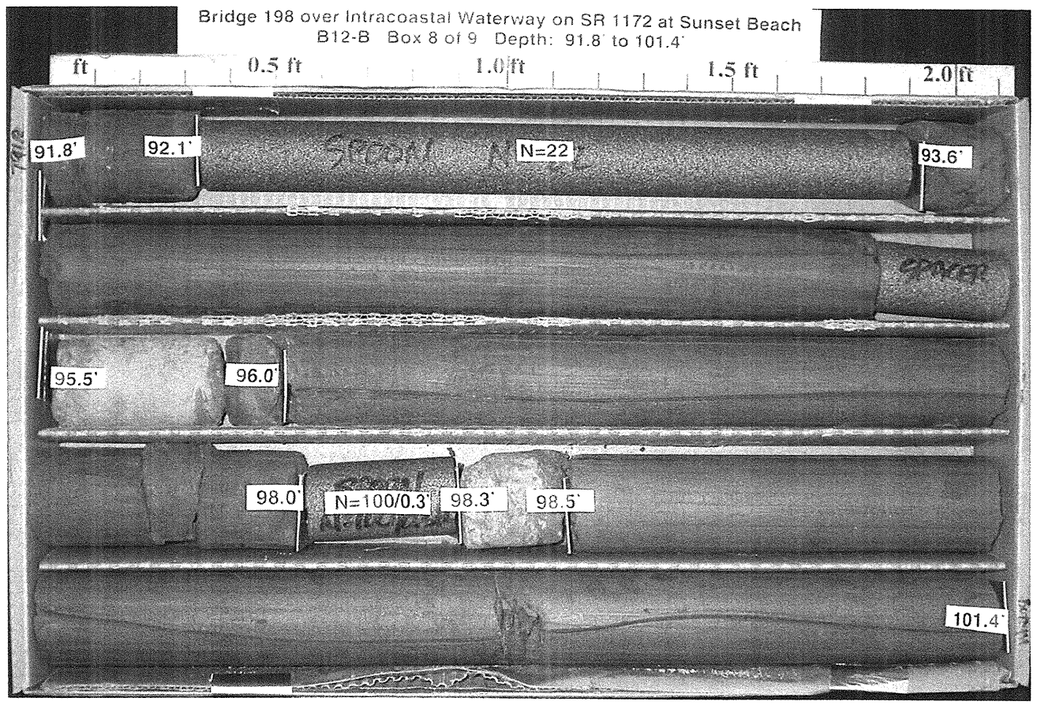
Core Photos
MACTEC Proj. No. 6468-04-0675

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)









MACTEC

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET 1 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** M. Lear
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			**GROUND WATER (ft)**
BORING NO. B13-A	**BORING LOCATION** 48+29	**OFFSET** 15 ft LT	**ALIGNMENT** -L-	**0 HR.** Water
COLLAR ELEV. -4.2 ft	**NORTHING** 48,313 US ft	**EASTING** 2,148,242 US ft		**24 HR.** Boring
TOTAL DEPTH 119.7 ft	**DRILL MACHINE** CME-45 on Barge	**DRILL METHOD** Rotary Wash/Core	**HAMMER TYPE** 140 lb. Manual	
DATE STARTED 5/18/04	**COMPLETED** 5/19/04	**SURFACE WATER DEPTH** 5.5		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-4.2					Mudline				
-4.2	0.0	Woh	1	1	2		Sat.		CPU: Dark gray, f. sandy, SILT (A-4) w/ trace shells
-9.2	5.0								Waccamaw Fm: Dark gray, silty CLAY (A-7-6)
-11.1	6.9	Woh	1	1	2		W		
-15.2	11.0								Waccamaw Fm: White and gray to dark gray, f. to cse. SAND (A-3) and v. thinly bedded, friable, shell hash LIMESTONE
-16.0	11.8	2	2	3	5		Sat.		
-21.1	16.9	13	8	5	13		Sat.		
-26.1	21.9	11	7	11	18		Sat.		
-30.7	26.5								
-31.2	27.0	100/0.3			100/0.3				
-31.9	27.7								Peedee Fm: Dark gray-green, thinly bedded, mod. indurated LIMESTONE
-35.1	30.9	6	7	10	17		M		Peedee Fm: Dark green, silty CLAY (A-7-6)
-40.7	36.5	6	22	31	53		M		
-46.5	42.3	6	9	10	19		M		
-53.0	48.8	6	7	8	15		M		
-58.0	53.8								
-58.1	53.9	60/0.1			60/0.1				
-59.1	54.9								Peedee Fm: Dark gray-green, thinly bedded, mod. indurated to indurated LIMESTONE
-63.2	59.0	10	10	13	23		M		Peedee Fm: Dark green, silty CLAY (A-7-6)
-67.5	63.3	10	11	89/0.3	100/0.8		M		
-68.8	64.6								
-70.1	65.9								Peedee Fm: Dark gray-green, thinly bedded, mod. indurated LIMESTONE
-71.9	67.7	9	10	13	23		M		Peedee Fm: Dark green, silty CLAY (A-7-6)
-79.0	74.8								

NCDOT BORE SINGLE 0675.GPJ NC_DOT.GDT 9/28/04

MACTEC

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET NO.	TOTAL SHEETS
99	209

SHEET 2 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** M. Lear
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			**GROUND WATER (ft)**
BORING NO. B13-A	**BORING LOCATION** 48+29	**OFFSET** 15 ft LT	**ALIGNMENT** -L-	**0 HR.** Water
COLLAR ELEV. -4.2 ft	**NORTHING** 48,313 US ft	**EASTING** 2,148,242 US ft		**24 HR.** Boring
TOTAL DEPTH 119.7 ft	**DRILL MACHINE** CME-45 on Barge	**DRILL METHOD** Rotary Wash/Core	**HAMMER TYPE** 140 lb. Manual	
DATE STARTED 5/18/04	**COMPLETED** 5/19/04	**SURFACE WATER DEPTH** 5.5		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-79.0					Continued from previous page				
-83.9	79.7	8	8	12	20		M		Peedee Fm: Dark green, silty CLAY (A-7-6) *(continued)*
-89.1	84.9	7	9	11	20		M		
-94.6	90.4	8	10	11	21		M		
-94.6	90.4								Peedee Fm: Dark gray-green, thinly bedded, mod. indurated LIMESTONE
-100.0	95.8	60/0.1			60/0.1				Peedee Fm: Dark green, silty CLAY (A-7-6)
-105.8	101.6	8	10	12	22		M		
-106.6	102.4	10	90/0.3		100/0.8		M		
-107.7	103.5								Peedee Fm: Dark gray-green, thinly bedded, friable to mod. indurated LIMESTONE
-112.5	108.3	9	9	13	22		M		Peedee Fm: Dark green, silty CLAY (A-7-6)
-118.1	113.9	11	13	15	28		M		
-120.6	116.4								
-121.1	116.9								Peedee Fm: Dark gray-green, thinly bedded, friable to mod. indurated LIMESTONE
-122.4	118.2	11	12	14	26		M		Peedee Fm: Dark green, silty CLAY (A-7-6)
-123.9	119.7								Boring terminated at 119.7 ft (Elev. -123.9 ft) in Peedee Fm: V. stiff, silty CLAY (A-7-6)

Bits Used: HQ Core Bit-Surface Set

Drilling Fluid: Water

NCDOT BORE SINGLE 0675.GPJ NC_DOT.GDT 9/28/04

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

SHEET 1 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** M. Lear
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			**GROUND WATER (ft)**
BORING NO. B13-A	**BORING LOCATION** 48+29	**OFFSET** 15 ft LT **ALIGNMENT** -L-	**0 HR.** Water
COLLAR ELEV. -4.2 ft	**NORTHING** 48,313 US ft	**EASTING** 2,148,242 US ft	**24 HR.** Boring
TOTAL DEPTH 119.7 ft	**DRILL MACHINE** CME-45 on Barge	**DRILL METHOD** Rotary Wash/Core	**HAMMER TYPE** 140 lb. Manual
DATE STARTED 5/18/04	**COMPLETED** 5/19/04	**SURFACE WATER DEPTH** 5.5	
CORE SIZE HQ	**TOTAL RUN** 70.6 ft	**DRILLER** D. White	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 27.3 ft
-31.5	27.3	3.6	1:26 0:53 0:47	(3.6) 100%	(N/A)		(0.4) 100% (19.1) 95%	(N/A) (N/A)		-31.9 Peedee Fm: Dark gray-green, thinly bedded, mod. indurated LIMESTONE 27.7 Peedee Fm: Dark green, silty CLAY (A-7-6)
-35.1	30.9		0:29/0.6							
			N=17							
-36.6	32.4	4.1	0:42 0:37 0:35	(4.1) 100%	(N/A)					
-40.7	36.5		0:37/1.1							
			N=53							
-42.2	38.0	4.3	0:34 0:25 0:26 0:28	(4.3) 100%	(N/A)					
-46.5	42.3		0:17/0.3							
			N=19							
-48.0	43.8	5.0	0:40 0:34 0:34 0:38 0:35	(4.0) 80%	(N/A)					
-53.0	48.8		*N=15*							
-54.5	50.3	3.6	0:25 0:27 0:26	(3.6) 100%	(N/A)					
-58.1	53.9		2:55/0.6							-58.0 53.8
-58.2	54.0	5.0	*N=60/0.1*	(5.0) 100%	(N/A)		(1.0) 100% (6.9) 100%	(N/A) (N/A)		-59.1 Peedee Fm: Dark gray-green, thinly bedded, mod. indurated to indurated LIMESTONE 54.9 Peedee Fm: Dark green, silty CLAY (A-7-6)
			3:00 1:23 0:31							
-63.2	59.0		0:23 0:21							
			N=23							
-64.7	60.5	2.8	0:51 0:47	(2.8) 100%	(N/A)					
-67.5	63.3		0:41/0.8							
			N=100/0.8							-68.8 64.6
-68.8	64.6	3.1	4:12 1:14	(3.1) 100%	(N/A)		(1.3) 100% (18.5) 100%	(N/A) (N/A)		-70.1 Peedee Fm: Dark gray-green, thinly bedded, mod. indurated LIMESTONE 65.9 Peedee Fm: Dark green, silty CLAY (A-7-6)
-71.9	67.7		0:32/1.1							
			N=23							
-73.4	69.2	5.6	0:32 0:26 0:28 0:29 0:27	(5.6) 100%	(N/A)					
-79.0	74.8		0:14/0.6							
			N=20							
-80.5	76.3	3.4	0:31 0:31 0:37	(3.4) 100%	(N/A)					
-83.9	79.7		0:20/0.4							
			N=20							
-85.4	81.2	3.7	0:41 0:34 0:33	(3.7) 100%	(N/A)					
-89.1	84.9		0:23/0.7							
			N=21							
-90.6	86.4	4.0	0:37 0:31 0:30	(4.0) 100%	(N/A)					
-94.6	90.4		0:33							-94.6 90.4
-94.7	90.5	5.3	*N=60/0.1*	(5.3) 100%	(N/A)		(0.2) 100% (9.4) 100%	(N/A) (N/A)		Peedee Fm: Dark gray-green, thinly bedded, mod. indurated LIMESTONE Peedee Fm: Dark green, silty CLAY (A-7-6)
			1:42 0:22 0:31 0:36							
-100.0	95.8		0:45/1.3							
			N=22							
-101.5	97.3	4.3	0:29 0:32 0:30	(4.3) 100%	(N/A)					
-105.8	101.6		0:33 0:11/0.3							

NCDOT CORE SINGLE 0675.GPJ NC_DOT.GDT 9/28/04

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

SHEET NO.	TOTAL SHEETS
100	209

SHEET 2 OF 2

PROJECT NO. 8.2230101	**ID.** B-0682	**COUNTY** Brunswick	**GEOLOGIST** M. Lear
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			**GROUND WATER (ft)**
BORING NO. B13-A	**BORING LOCATION** 48+29	**OFFSET** 15 ft LT **ALIGNMENT** -L-	**0 HR.** Water
COLLAR ELEV. -4.2 ft	**NORTHING** 48,313 US ft	**EASTING** 2,148,242 US ft	**24 HR.** Boring
TOTAL DEPTH 119.7 ft	**DRILL MACHINE** CME-45 on Barge	**DRILL METHOD** Rotary Wash/Core	**HAMMER TYPE** 140 lb. Manual
DATE STARTED 5/18/04	**COMPLETED** 5/19/04	**SURFACE WATER DEPTH** 5.5	
CORE SIZE HQ	**TOTAL RUN** 70.6 ft	**DRILLER** D. White	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Continued from previous page
-106.6	102.4	5.9	*N=100/0.8*	(4.7)	(N/A)		(1.1) 100%	(N/A) (N/A)		-106.6 -107.7 Peedee Fm: Dark gray-green, thinly bedded, friable to mod. indurated LIMESTONE 103.5
			4:52 1:53 1:19 0:42 0:39	80%			(8.4) 85%			Peedee Fm: Dark green, silty CLAY (A-7-6)
-112.5	108.3		0:30/0.9							
			N=22							
-114.0	109.8	4.1	0:31 0:28 0:29	(3.8) 93%	(N/A)					
-118.1	113.9		0:38/1.1							
			N=28							
-119.6	115.4	2.8	1:34 1:45	(2.8) 100%	(N/A)					-120.6 118.4
-122.4	118.2		0:52/0.8				(0.5) 100%	(N/A) (N/A)		-121.1 -122.4 Peedee Fm: Dark gray-green, thinly bedded, friable to mod. indurated LIMESTONE 118.2 Peedee Fm: Dark green, silty CLAY (A-7-6)
							(1.3) 100%			Coring terminated at 118.2 ft (Elev. -122.4 ft) in Peedee Fm: silty CLAY (A-7-6)

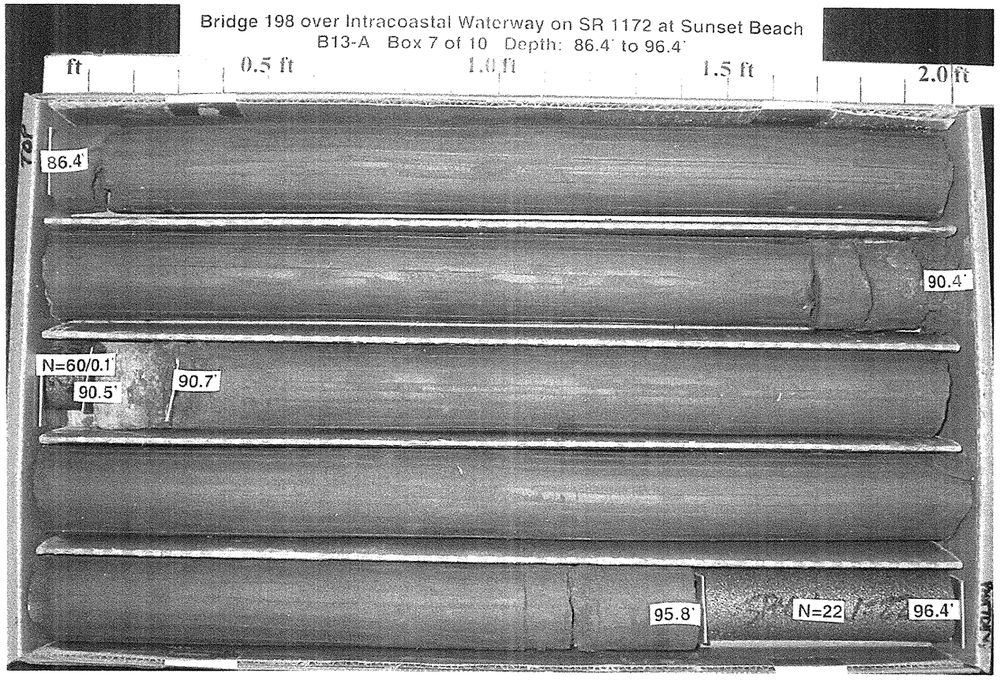
NCDOT CORE SINGLE 0675.GPJ NC_DOT.GDT 9/28/04

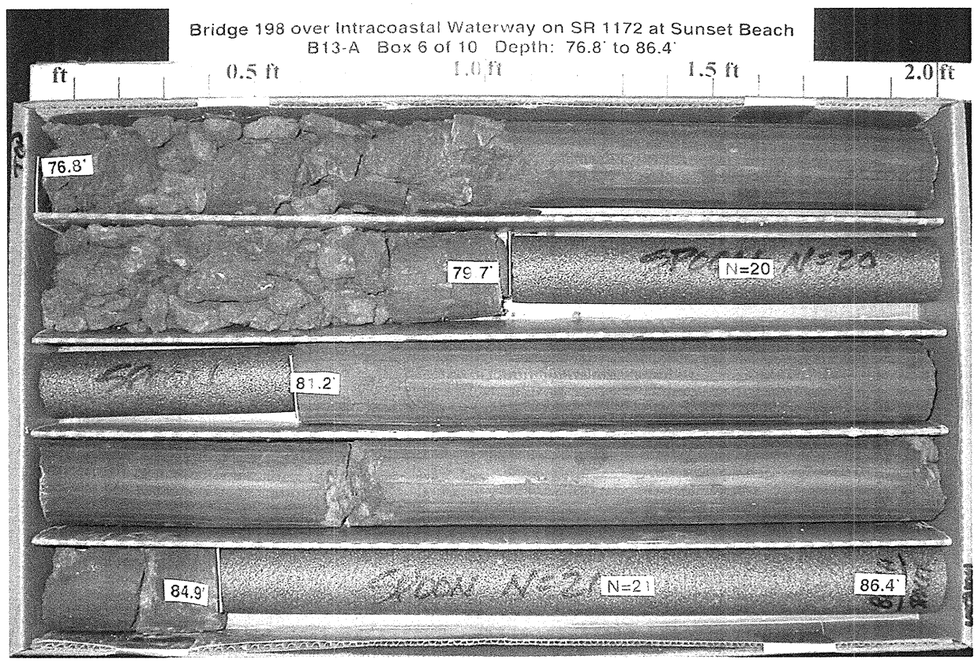
Core Photos
MACTEC Proj. No. 6468-04-0675

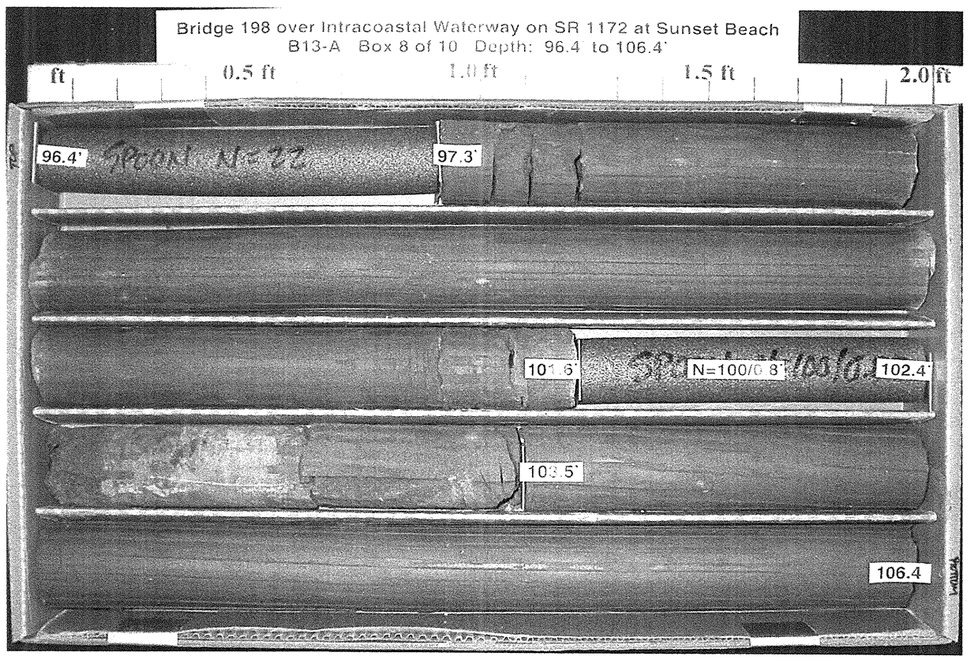
Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)

Core Photos
MACTEC Proj. No. 6468-04-0675

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)



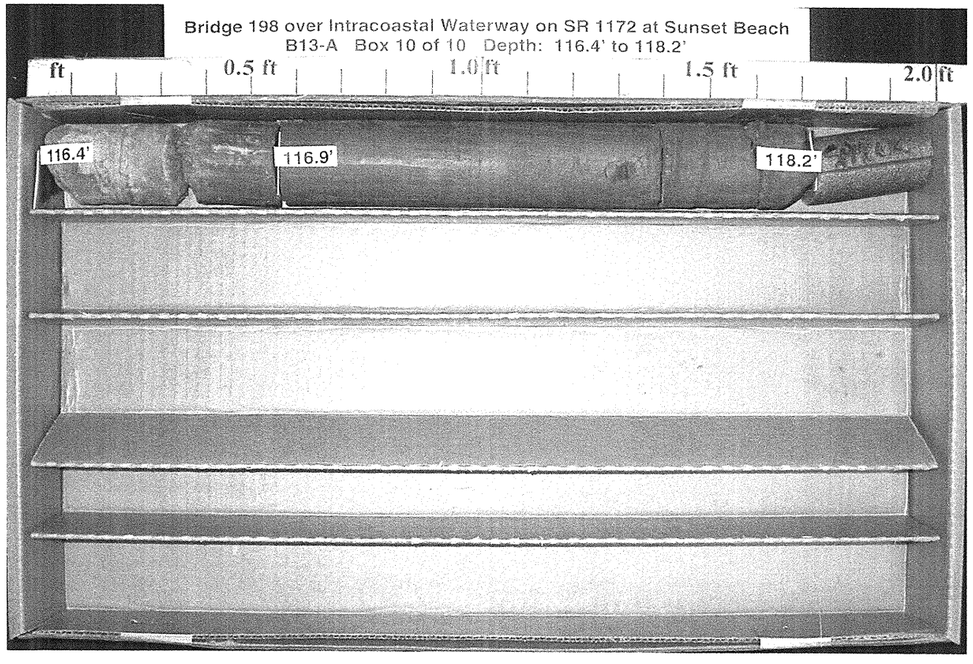




Core Photos
MACTEC Proj. No. 6468-04-0675

SHEET NO.	TOTAL SHEETS
103	209

Bridge 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
NCDOT Proj. No. 8.2230101 (B-0682)



MACTEC

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET 1 OF 2

PROJECT NO. 8.2230101	ID. B-0682	COUNTY Brunswick	GEOLOGIST M. Lear
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			GROUND WATER (ft)
BORING NO. B13-B	BORING LOCATION 48+24	OFFSET 12 ft RT	ALIGNMENT -L-	0 HR. Water
COLLAR ELEV. -4.1 ft	NORTHING 48,321 US ft	EASTING 2,148,267 US ft	24 HR. Boring
TOTAL DEPTH 119.2 ft	DRILL MACHINE CME-45 on Barge	DRILL METHOD Rotary Wash	HAMMER TYPE 140 lb. Manual
DATE STARTED 5/20/04	COMPLETED 5/26/04	SURFACE WATER DEPTH 4.5	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-4.1					Mudline				-4.1 0.0
-4.1	0.0	Woh	Woh	Woh	Woh		Sat.		CPU: Dark gray, f. sandy, SILT (A-4) w/ trace shell fragments
-7.1	3.0	Woh	1	1	2		Sat.		
-10.1	6.0								Waccamaw Fm: Dark gray, f. sandy, silty CLAY (A-7-6)
-11.9	7.8	Woh	Woh	1	1		W		
-15.1	11.0								Waccamaw Fm: White and gray, f. to cse. SAND (A-3) and v. thinly bedded, friable, shell hash LIMESTONE
-16.6	12.5	8	4	10	14		Sat.		
-21.6	17.5	8	3	4	7		Sat.		
-26.6	22.5	13	6	9	15	PMT-1	Sat.		PMT-1 at 24.5 ft.
-30.6	26.5								Peedee Fm: Thinly bedded, mod. indurated LIMESTONE (Not Sampled)
-31.1	27.0								Peedee Fm: Dark green, silty CLAY (A-7-6)
-33.6	29.5	5	5	6	11	PMT-2	M		PMT-2 at 32.0 ft.
-41.1	37.0								Peedee Fm: Thinly bedded, mod. indurated LIMESTONE (No Recovery)
-41.7	37.6				60/0.1				Peedee Fm: Dark green, silty CLAY (A-7-6)
-42.1	38.0	60/0.1							
-42.5	38.4	6	6	8	14	PMT-4	M		PMT-4 at 41.2 ft.
-49.9	45.8					PMT-5			PMT-5 at 44.5 ft.
-57.1	53.0	7	7	8	15	PMT-6	M		PMT-6 at 48.5 ft.
-57.7	53.6					PMT-7			PMT-7 at 51.8 ft.
-58.8	54.7								Peedee Fm: Dark gray-green, thinly bedded, mod. indurated LIMESTONE
-59.1	55.0	6	60/0.1		60/0.1		M		Peedee Fm: Dark green, silty CLAY (A-7-6)
-65.5	61.4	8	8	9	17	PMT-8	M		PMT-8 at 57.8 ft.
-68.6	64.5					PMT-9			PMT-9 at 59.9 ft.
-70.1	66.0								Peedee Fm: Thinly bedded, mod. indurated LIMESTONE (Not Sampled)
-70.9	66.8	7	10	13	23		M		Peedee Fm: Dark green, silty CLAY (A-7-6)
-79.1	75.0	9	11	12	23	PMT-10	M		PMT-10 at 69.5 ft.
						PMT-11			PMT-11 at 72.8 ft.

MACTEC

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET NO.	TOTAL SHEETS
104	209

SHEET 2 OF 2

PROJECT NO. 8.2230101	ID. B-0682	COUNTY Brunswick	GEOLOGIST M. Lear
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			GROUND WATER (ft)
BORING NO. B13-B	BORING LOCATION 48+24	OFFSET 12 ft RT	ALIGNMENT -L-	0 HR. Water
COLLAR ELEV. -4.1 ft	NORTHING 48,321 US ft	EASTING 2,148,267 US ft	24 HR. Boring
TOTAL DEPTH 119.2 ft	DRILL MACHINE CME-45 on Barge	DRILL METHOD Rotary Wash	HAMMER TYPE 140 lb. Manual
DATE STARTED 5/20/04	COMPLETED 5/26/04	SURFACE WATER DEPTH 4.5	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-78.9					Continued from previous page				-79.4 75.3
		100/0.3			100/0.3		M		-80.6 Peedee Fm: Dark gray-green, thinly bedded, mod. indurated LIMESTONE 76.5
-83.8	79.7	9	10	11	21	PMT-12	M		Peedee Fm: Dark green, silty CLAY (A-7-6)
-91.7	87.6	9	11	13	24	PMT-13	M		PMT-12 at 82.4 ft.
-94.6	90.5								PMT-13 at 85.7 ft.
-95.1	91.0								Peedee Fm: Thinly bedded, friable to mod. indurated LIMESTONE
-96.7	92.6	17	14	17	31	PMT-14	M		Peedee Fm: Dark green, silty CLAY (A-7-6)
-105.1	101.0	12	88/0.4		100/0.9	PMT-15			PMT-14 at 96.4 ft.
-106.0	101.9								PMT-15 at 99.7 ft.
-107.5	103.4								Peedee Fm: Thinly bedded, friable to mod. indurated LIMESTONE
-109.6	105.5	10	10	14	24	PMT-16	M		Peedee Fm: Dark green, silty CLAY (A-7-6)
-116.8	112.7	9	12	16	28	PMT-17	M		PMT-16 at 108.2 ft.
-120.6	116.5								PMT-17 at 111.5 ft.
-121.1	117.0								Peedee Fm: Thinly bedded, friable to mod. indurated LIMESTONE
-121.8	117.7	15	14	26	40		M		Peedee Fm: Dark green, silty CLAY (A-7-6) 119.2
-123.3	119.2								Boring terminated at 119.2 ft (Elev. -123.3 ft) in Peedee Fm: Hard, silty CLAY (A-7-6)

Bits Used: 3" Roller Cone

Drilling Fluid: Water

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET 1 OF 2

MACTEC

PROJECT NO. 8.2230101	ID. B-0682	COUNTY Brunswick	GEOLOGIST B. Parks
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			GROUND WATER (ft)
BORING NO. B14-A	BORING LOCATION 49+73	OFFSET 14 ft LT	ALIGNMENT -L-	0 HR. 2.3
COLLAR ELEV. 5.3 ft	NORTHING 48,442 US ft	EASTING 2,148,176 US ft	24 HR. FIAD
TOTAL DEPTH 122.7 ft	DRILL MACHINE B. Parks	DRILL METHOD Mud Rotary/Core	HAMMER TYPE 140 lb. Manual
DATE STARTED 8/6/04	COMPLETED 8/10/04	SURFACE WATER DEPTH N/A	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
5.3					Ground Surface				
5.3	0.0	1	3	3	6 13		M		CPU: Dark gray to white, f. SAND (A-3) w/ trace organics and wood fragments
1.4	3.9								5.3 / 0.0
		2	6	7			W		
-3.4	8.7								-2.7 / 8.0
		1	2	2	4		M		Waccamaw Fm: Dark blue gray, f. sandy, silty CLAY (A-7-6) w/ trace shell fragments
-8.5	13.8								
		2	2	3	5		M		
-13.5	18.8								
		2	2	3	5		M		-15.0 / 20.3
-18.5	23.8								Waccamaw Fm: Light gray to white, friable, shell hash LIMESTONE and SAND (A-3)
		14	13	8	21		W		
-22.9	28.2								
		10	10	11	21		W		
-27.7	33.0								
		7	19	16	35		W		-32.9 / 37.3
-36.0	41.3								Peedee Fm: Dark gray, thinly bedded, mod. indurated LIMESTONE
		6	10	10	20		M		Peedee Fm: Dark green, f. sandy, silty CLAY (A-7-6)
-41.0	46.3								
		6	94/0.2		100/0.7		M		-41.7 / 47.0
-46.0	51.3								Peedee Fm: Dark gray, thinly bedded, mod. indurated to indurated LIMESTONE
		8	9	11	20		M		Peedee Fm: Dark green, f. sandy, silty CLAY (A-7-6)
-51.0	56.3								
		6	8	10	18		M		
-56.0	61.3								
		6	12	20	32		M		-59.2 / 64.5
-60.9	66.2								Peedee Fm: Dark gray, thinly bedded, mod. indurated to indurated LIMESTONE
		9	10	12	22		M		Peedee Fm: Dark green, f. sandy, silty CLAY (A-7-6)
-65.9	71.2								
		8	10	10	20		M		

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET NO.	TOTAL SHEETS
105	209

SHEET 2 OF 2

MACTEC

PROJECT NO. 8.2230101	ID. B-0682	COUNTY Brunswick	GEOLOGIST B. Parks
SITE DESCRIPTION Bridge 198 Over ICWW on SR 1172 at Sunset Beach (MACTEC Proj. No. 6468-04-0675)			GROUND WATER (ft)
BORING NO. B14-A	BORING LOCATION 49+73	OFFSET 14 ft LT	ALIGNMENT -L-	0 HR. 2.3
COLLAR ELEV. 5.3 ft	NORTHING 48,442 US ft	EASTING 2,148,176 US ft	24 HR. FIAD
TOTAL DEPTH 122.7 ft	DRILL MACHINE B. Parks	DRILL METHOD Mud Rotary/Core	HAMMER TYPE 140 lb. Manual
DATE STARTED 8/6/04	COMPLETED 8/10/04	SURFACE WATER DEPTH N/A	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-69.5					Continued from previous page				
-70.8	76.1								
		7	10	11	21		M		
-75.8	81.1								
		9	11	15	26		M		
-80.7	86.0								
		10	12	17	29		M		-80.2 / 85.5
-85.9	91.2								Peedee Fm: Dark gray, thinly bedded, mod. indurated to indurated LIMESTONE
		8	12	18	30		M		Peedee Fm: Dark green, f. sandy, silty CLAY (A-7-6)
-90.9	96.2								
		8	12	13	25		M		101.2 ft: Blow counts invalid due to caving sands in borehole.
-95.9	101.2								
		9	11	30	41		M		
-100.9	106.2								
		8	10	14	24		M		
-105.9	111.2								
		100/0.5			100/0.5		M		-106.4 / 111.7
-110.9	116.2								-107.6 / 112.9
		9	10	13	23		M		Peedee Fm: Dark gray, thinly bedded, mod. indurated to indurated LIMESTONE
-115.9	121.2								Peedee Fm: Dark green, f. sandy, silty CLAY (A-7-6)
		10	12	15	27		M		Artesian conditions noted while pulling core string from boring. Conditions occured with 120.6 ft of core pipe in boring and had a head of 2.7 ft AGL.
-117.4	122.7								Boring terminated at 122.7 ft (Elev. -117.4 ft) in Peedee Fm: V. stiff, silty CLAY (A-7-6)

Bits Used: 3" Roller Cone; HQ Core Bit-Surface Set

Drilling Fluid: Water

NCDOT BORE SINGLE 0675.GPJ NC_DOT.GDT 9/28/04