

GEOTECHNICAL UNIT FIELD SCOUR REPORT

PROJECT: 8.2451201 ID: B-4139 COUNTY: Harnett

DESCRIPTION(1): Replacement of Bridge No. 106 over Black River on S.R. 1780

**INFORMATION ON EXISTING BRIDGES** Information obtained from:  field inspection  
 microfilm(Reel:      Pos:     )  
 other Bridge Survey and Hydraulic Design Report

COUNTY BRIDGE NO. 106 BRIDGE LENGTH 155.25' NO. BENTS IN: CHANNEL 4 FLOOD PLAIN 6

FOUNDATION TYPE: Timber Piles

**EVIDENCE OF SCOUR(2):**

ABUTMENTS OR END BENT SLOPES: Minor evidence of erosion beneath the existing bridge at the east and west timber abutments was observed.

INTERIOR BENTS: None observed at Interior Bents No. 2, No. 3, No. 4 and No. 5 due to bents being located in channel. Some erosion and ponded water located at Interior Bents No. 6, No. 7 and No. 8. Concrete has been cast in-place to repair lower portion of exterior timber piles on downstream side (south) at Interior Bents No.5 and No. 7.

CHANNEL BED: None observed

CHANNEL BANKS: Scour hole observed on west bank approximately 30 feet upstream (north) of existing bridge

**EXISTING SCOUR PROTECTION:**

TYPE(3): Timber wing walls and timber abutments at both End Bents

EXTENT(4): Wingwalls extend beyond timber abutments at both end bents.

EFFECTIVENESS(5): Relatively effective with some minor erosion at both abutments.

OBSTRUCTIONS(6) (DAMS,DEBRIS,ETC.): Several trees fallen into river along banks both upstream and downstream. Debris consisting of trees collected upstream side between interior bents No. 3 and No. 4

**DESIGN INFORMATION:**

CHANNEL BED MATERIAL(7) (SAMPLE RESULTS ATTACHED): Gray coarse to fine sand (A-2-4)(0) with little silt and clay and trace of gravel, tan fine to coarse sand (A-1-b)(0) with trace of clay and gravel and tan fine to coarse sand (A-3)(0) with trace of clay and organic matter

CHANNEL BANK MATERIAL(8) (SAMPLE RESULTS ATTACHED): Gray fine to coarse sand (A-2-4)(0) with trace of silt and clay and dark gray coarse to fine sandy silty clay (A-6)(7) with little organic matter

FOUNDATION BEARING MATERIAL(9): Middendorf Formation hard clays and dense to very dense sands

CHANNEL BANK COVER(10): Trees and underbrush

FLOOD PLAIN WIDTH(11): 1,500 +/- feet on west side of river and 350 +/- feet on east side of river

FLOOD PLAIN COVER(12): Trees, underbrush, residential area, open fields, pond and swamp

**DESIGN INFORMATION CONT.**

STREAM IS  DEGRADING  AGGRADING (13)

OTHER OBSERVATIONS AND COMMENTS: Seepage from the earthen dam and pond located northeast of the bridge drains into flood plain adjacent to and beneath the existing bridge. A swampy area is located northwest and southeast of the existing bridge.

CHANNEL MIGRATION TENDENCY (14): Migration tendency to the west

REPORTED BY: *J. Man Johnson* DATE: 4/23/03  
 S&ME, Inc.

GEOTECHNICALLY ADJUSTED SCOUR ELEVATION (15):  
 OVERTOPPING GASE  
 (IN FEET)

BENT 1	140.1
BENT 2	138.7
BENT3	143.4

REPORTED BY: *C. A. Y. J.* DATE: 6/5/03  
 NCDOT GEOTECHNICAL ENGINEERING UNIT  
 INSTRUCTIONS

- (1) GIVE THE DESCRIPTION OF THE SPECIFIC SITE GIVING ROUTE NUMBER AND BODY OF WATER CROSSED.
- (2) NOTE ANY EVIDENCE OF SCOUR AT THE EXISTING END BENTS OR ABUTMENTS (UNDERMINING, SLOUGHING, SCOUR LOCATIONS, DEGRADATIONS, ETC.)
- (3) NOTE ANY EXISTING SCOUR PROTECTION (RIP RAP, ETC.)
- (4) DESCRIBE THE EXTENT OF ANY EXISTING SCOUR PROTECTION.
- (5) DESCRIBE WHETHER OR NOT THE SCOUR PROTECTION APPEARS TO BE WORKING.
- (6) NOTE ANY DAMS, FALLEN TREES, DEBRIS AT BENTS, ETC.
- (7) DESCRIBE THE CHANNEL BED MATERIAL: A SAMPLE SHOULD BE TAKEN FOR GRAIN SIZE DISTRIBUTION, ATTACH LAB RESULTS.
- (8) DESCRIBE THE CHANNEL BANK MATERIAL: A SAMPLE SHOULD BE TAKEN FOR GRAIN SIZE DISTRIBUTION, ATTACH LAB RESULTS.
- (9) DESCRIBE THE FOUNDATION BEARING MATERIAL,
- (10) DESCRIBE THE BANK COVERING (GRASS, TREES, RIP RAP, NONE, ETC.)
- (11) GIVE THE APPROXIMATE FLOOD PLAIN WIDTH (ESTIMATE).
- (12) DESCRIBE THE FLOOD PLAIN COVERING (GRASS, TREES, CROPS, ETC.)
- (13) CHECK THE APPROPRIATE SPACE AS TO WHETHER THE STREAM IS DEGRADING OR AGGRADING
- (14) DESCRIBE THE POTENTIAL OF THE BODY OF WATER TO MIGRATE Laterally DURING THE LIFE OF THE BRIDGE (APPROXIMATELY 100 YEARS).
- (15) GIVE THE GEOTECHNICALLY ADJUSTED SCOUR ELEVATION EXPECTED OVER THE LIFE OF THE BRIDGE (APPROXIMATELY 100 YEARS). THIS CAN BE GIVEN AS AN ELEVATION RANGE ACROSS THE SITE, OR ON A BENT BY BENT BASIS WHERE VARIATIONS EXIST. DISCUSS RELATIONSHIP BETWEEN THE HYDRAULICS THEORETICAL SCOUR AND THE GEOTECHNICALLY ADJUSTED SCOUR ELEVATION. THE GEOTECHNICALLY ADJUSTED SCOUR ELEVATION IS BASED ON THE ERODABILITY OF MATERIALS WITH CONSIDERATION FOR JOINTING, FOLIATION, BEDDING ORIENTATION AND FREQUENCY; CORE RECOVERY PERCENTAGE; PERCENTAGE RQD; DIFFERENTIAL WEATHERING, SHEAR STRENGTH; OBSERVATIONS AT EXISTING STRUCTURES; OTHER TESTS DEEMED APPROPRIATE; AND OVERALL GEOLOGIC CONDITIONS AT THE SITE.