Guilford County
SR 3394
Bridge No. 11 over Big Alamance Creek
Federal-Aid Project No. BRZ-3394(1)
State Project No. 33484.1.1
T.I.P. No. B-4131

CATEGORICAL EXCLUSION

U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

AND

N.C. DEPARTMENT OF TRANSPORTATION

APPROVED:

6.14.06
DATE

Gregory J. Thorpe, Ph.D.
Environmental Management Director
Project Development and Environmental Analysis Branch, NCDOT

6/15/06
DATE

John F. Sullivan III, P.E.
Division Administrator, FHWA

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June 2006

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PROJECT COMMITMENTS

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In addition to the standard Section 404 Nationwide Permit #23 Conditions, Regional Conditions, State Consistency Conditions, NCDOT's Guidelines for Best Management Practices for Protection of Surface Waters, Construction and Maintenance Activities, and for Bridge Demolition and Removal, and Section 401 Water Quality Certification Conditions, the following special commitments have been agreed to by NCDOT:

NONE

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INTRODUCTION: The replacement of Bridge No. 11 is included in the North Carolina Department of Transportation 2006-2012 Transportation Improvement Program and in the Federal-Aid Bridge Replacement Program. The location is shown in Figure 1A. No substantial environmental impacts are anticipated. The project is classified as a Federal "Categorical Exclusion". It should be noted the 2006-2012 Transportation Improvement Program describes TIP B-4131 as "Little Alamance Creek, replace Bridge No. 11." However, a U.S. Geological Survey map names the creek as "Big Alamance Creek"; therefore, this report will refer to the creek as Big Alamance Creek. Information for the project found in the Appendix refers to the creek as "Little Alamance Creek."

I. PURPOSE AND NEED STATEMENT

Bridge Maintenance Unit records indicate the bridge has a sufficiency rating of 43.2 out of a possible 100 for a new structure. The bridge is considered functionally obsolete and structurally deficient. The replacement of this inadequate structure will result in safer and more efficient traffic operations.

II. EXISTING CONDITIONS

SR 3394 (Company Mill Road) crosses over Big Alamance Creek in Guilford County approximately 0.54 mile south of its junction with US 421. Development in the surrounding area is primarily residential. The immediate area around the bridge primarily consists of woodlands. A rock dam is situated approximately 150 feet upstream from the bridge to the west. Two power towers are located northeast of the bridge. In the vicinity of the bridge, two residential dwellings and a farm are located on the north approach. Four houses are located on the south approach. SR 3394 is classified as a Rural Minor Collector in the Statewide Functional Classification System.

SR 3394 has an existing pavement width of 20 feet with 4-foot grass shoulders in the area of the bridge. The roadway approaches are on a tangent section and on downgrades toward the bridge. The vertical sag occurs at the bridge, but the bridge is flat. SR 3394 curves to the west approximately 300 feet north of the bridge.

The estimated annual daily traffic (ADT) for 2005 on SR 3394 at Big Alamance Creek is 2,900 vehicles per day (vpd), and for the design year 2025, the estimated ADT is 5,000 vpd. The volumes include an estimated 1 percent truck-tractor semi-trailer (TTST) and 3 percent dual-tired (DT) vehicles. The posted speed limit is 45 mph in the vicinity of the bridge.

The existing two-lane bridge was constructed in 1957 and has a timber deck on I-beams. Bridge No. 11, as shown in Figures 2A and 2B, has an overall length of 97 feet and a clear deck width of 19.2 feet. Bridge No. 11 has a bed-to-crown distance of approximately 14 feet. The substructure consists of one concrete abutment, two concrete interior bents, and one rubble masonry abutment. The current posted weight limit is 13 tons for single unit vehicles and 18 tons for truck-tractor semi-trailer vehicles.

One crash was reported in the vicinity of the bridge during a recent three year period.

An underground telephone line emerges and crosses Big Alamance Creek overhead on the east side of the bridge. Overhead utility lines cross over Bridge No. 11 diagonally from the east side of SR 3394 south of the bridge to the west side of SR 3394 north of the bridge. In addition, and overhead high-voltage transmission line crosses SR 3394 approximately 220 feet north of Bridge No. 11. The City of Greensboro has an 18-inch sanitary sewer line located north of the bridge, and associated manholes are present. No utilities are attached to the bridge. The impact on the utilities is considered high.

Nineteen school buses cross daily over the bridge.

III. ALTERNATIVES

A. Project Description

NCDOT proposes to replace Bridge No. 11 with a new bridge approximately 125 feet long. The new bridge will have a clear roadway width of 40 feet. The final length and width of the new bridge will be determined during design; however, Figure 3A shows a proposed bridge typical section. New approaches to the bridge will provide 12-foot travel lanes in each direction with 8-foot shoulders (2-foot paved). The proposed typical sections and design criteria are shown in Figure 3A. Figure 3B is the proposed detour criteria. The posted speed limit is 45 mph and the corresponding design speed is 50 mph.

B. Detailed Study Alternatives

Two alternatives were evaluated for the replacement of Bridge No. 11 over Big Alamance Creek. See Figures 4 and 5 for depictions of each alternative.

Alternative 1 replaces Bridge No. 11 at its existing location maintaining traffic with a temporary structure and detour on the east side. This alternative provides a 50 mph horizontal design speed and a 35 mph vertical design speed. Although the grade of the new bridge will be raised about 4 feet, a design exception will be required for the vertical alignment. The estimated cost of the detour is $750,000.

Alternative 2 replaces Bridge No. 11 on the east side maintaining traffic on the existing structure as an on-site detour at a cost comparable to Alternative 1. This alternate provides a horizontal and vertical design speed of 50 mph and would raise the grade of the new structure about 12 feet.

C. Alternatives Eliminated from Further Study

The No-Build or "do-nothing" alternative was also considered but this alternative would eventually necessitate closure of the bridge. The NCDOT Bridge Maintenance Unit indicates that rehabilitation of Bridge No. 11 is not feasible due to its age and deteriorated condition; therefore, this is not a viable alternative. The bridge has been classified as structurally deficient.

The site of the rock dam located on the west side of the bridge has been determined eligible for the National Register of Historic Places. It is not feasible to relocate the bridge or to provide a temporary structure for detour on this side without impacting the historic site. This option was not considered as an alternative.

The use of an off-site detour of SR 3394 traffic while constructing a new bridge in the existing location was considered. The most direct detour route (see Figure 6A) would utilize SR 3394, SR 3381, SR 3549, and US 421, a distance of about 7.3 miles. In accordance with the NCDOT Guidelines for Evaluation of Off-site Detours for Bridge Replacement Projects (April 2004), the average delay per motorist using the detour is estimated to range from 5-10 minutes for a construction period of 12 months, which falls under the Evaluation (E) range of the Guidelines. The Evaluation (E) range suggests an on-site detour is justifiable from a traffic operations standpoint but must be weighed with other project factors to determine if it is appropriate. The Division Engineer (October 10, 2002 memorandum) stated an off-site detour was not feasible due to the traffic count on SR 3394 (2900 ADT in 2005), and the location of a residential development just south of Bridge No. 11. The Division Engineer also noted the most logical detour would require traffic to cross 4-lanes of US 421. The EMS Department of Guilford County (phone conversation April 3, 2006) stated that SR 3394 is an important route used by EMS responders to this part of the County. Since there is no available detour route, road closure would require EMS responders to travel US 421 to NC 62, located approximately 3.8 miles south of the US 421/SR 3394 intersection and return to access the area south of Bridge No. 11. This

would result in considerable delays in EMS response time. The Guilford County TIMS Coordinator stated there are 19 school bus crossings of Bridge No. 11 per day. Road closure would add about 20 minutes to bus routes in the area, but the TIMS Coordinator also stated that the bridge replacement would not present an unworkable problem for the Guilford County Schools Transportation Department. Based on the above factors, road closure was not considered a viable alternative.

D. Preferred Alternative

Alternative 1, replacing the bridge at its existing location while maintaining traffic with an on-site temporary detour on the east side is the preferred alternative. This alternative has fewer impacts to wetlands and reduces impacts to residential driveways.

The new structure will be approximately 125 feet long with a maximum clear roadway width of 40 feet. New approaches to the bridge will provide 12-foot travel lanes with 8-foot shoulders including 2-foot paved shoulders. Approximately 800 feet of new approaches will be required.

The design speed of the replacement structure will be 50 mph; however, a design exception for the vertical alignment will be necessary. The design exception for the vertical curve with a design speed of 35 mph is required because maintaining a 50 mph design speed will result in a longer vertical curve and a higher vertical grade. A longer vertical curve and grade change will have a greater impact on adjacent property resulting in higher costs.

The estimated cost for Alternative 1 is $2,192,100. The current estimated cost of the project, as shown in the NCDOT 2006-2012 Transportation Improvement Program, is $350,000 for right-of-way and $1,375,000 for construction.

After further study, Alternative 2 is not being considered. This alternative would result in more environmental impacts than Alternative 1 and require significant relocation of existing residential driveways.

The Division Office concurs with the recommended improvements.

IV. ESTIMATED COST

The estimated costs of the alternatives studied, based on 2005 prices, are shown in the following table:

	Alternate 1 On-site Detour	Alternate 2 New Location
Structure Removal	$ 28,800.00	$ 28,800.00
Structure	$ 456,875.00	$ 548,250.00
Roadway Approaches	$ 251,175.00	$ 555,325.00
Mobilization and Miscellaneous	$ 186,150.00	$ 336,625.00
Engineering and Contingencies	$ 177,000.00	$ 231,000.00
Temporary Detour	$ 750,000.00	N/A
SUBTOTAL	$1,850,000.00	$1,700,000.00
Right-of-Way/Const. Ease./Util.	$ 342,100.00	$ 360,700.00
TOTAL	$2,192,100.00	$2,060,700.00

The above estimates are based on functional design plans; therefore, 45 percent is included for miscellaneous items and contractor mobilization, and 15 percent for engineering and contingencies.

V. NATURAL RESOURCES

A. Methodology

Materials and literature supporting this investigation have been derived from a variety of sources including U.S. Geological Survey (USGS) topographic mapping (Climax, NC 7.5- minute quadrangle [1982]), U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping (Climax, NC 7.5-minute quadrangle [1982]), Natural Resources Conservation Service (NRCS; formerly the Soils Conservation Service) soils mapping (SCS 1977), N.C. Wildlife Resources Commission (NCWRC) proposed Significant Aquatic Endangered Species Habitats (NCWRC 1998), and recent aerial photography (Ko & Associates).

Plant community descriptions are based on a classification system utilized by the N.C. Natural Heritage Program (NHP) (Schafale and Weakley 1990). When appropriate, community classifications were modified to better reflect field observations. Vascular plant names follow nomenclature found in Radford *et al.* (1968) with adjustments for updated nomenclature (Kartesz 1998). Jurisdictional areas were evaluated using the three-parameter approach following U.S. Army Corps of Engineers (USACE) delineation guidelines (DOA 1987). Subsequent mapping of jurisdictional boundaries was accomplished utilizing Trimble XRS GPS technology. Jurisdictional areas were characterized according to a classification scheme established by

Cowardin *et al.* (1979) and/or the N.C. Division of Environmental Management (DEM) *Field Guide to North Carolina Wetlands* (1996). Aquatic and terrestrial wildlife habitat requirements and distributions were determined by supportive literature (Martof *et al.* 1980, Potter *et al.* 1980, Webster *et al.* 1985, Menhinick 1991, Palmer and Braswell 1995, and Rohde *et al.* 1994). Water quality information for area streams and tributaries was derived from available sources (DWQ 2002, DWQ 2004b). Quantitative sampling was not undertaken to support existing data.

The most current USFWS listing of federally protected species with ranges extending into Guilford County (USFWS 2003) is considered in this report. In addition, NHP records documenting the presence of federally or state listed species were consulted on April 17, 2004, prior to field investigations. Furthermore, Significant Aquatic Endangered Species Habitats proposed by the NCWRC (1998) were consulted to determine the presence of Proposed Critical Habitats for aquatic species.

The project area (Figure 7) was visually surveyed on foot for significant features. The project study area is approximately 300 feet in width (centered on the existing roadway) and approximately 1,900 feet in length, encompassing approximately 12.9 acres. Potential impacts of construction will be limited to cut-fill boundaries for each alternative. Special concerns evaluated in the field include 1) potential protected species habitat and 2) wetlands and water quality protection of Big Alamance Creek.

B. Physiography and Soils

The project study area is located within the Southern Outer Piedmont ecoregion of the Piedmont physiographic province of North Carolina. This ecoregion is characterized by irregular plains with low hills (ecoregion map). The project area is located within a moderately sloping floodplain valley. Elevations within the project study area range from a high of approximately 710 feet National Geodetic Vertical Datum (NGVD), in the southwestern corner of the project area, to a low of approximately 637 feet NGVD within the channel of Big Alamance Creek (Climax, NC 7.5-minute quadrangle [1982]). Land uses within and adjacent to the project area consist of residential lots, woodlands, roadside shoulders, and a pond.

Based on soil mapping for Guilford County (SCS 1977), the project study area is underlain by three soil series including Chewacla sandy loam (*Fluvaquentic Dystrochrepts*), Enon fine sandy loam (*Ultic Hapludalfs*), and Wilkes fine sandy loam (*Typic Hapludalfs*). Within the project study area, Chewacla sandy loam occurs adjacent to the stream, while Enon fine sandy loam and Wilkes fine sandy loam are found on slopes. None of the above soil series are considered hydric by the NRCS (1996); however, depressions within the Chewacla series may contain inclusions of Wehadkee silt loam (*Typic Fluvaquents*), a hydric soil.

The Chewacla series, with 0 to 2 percent slopes, consists of somewhat poorly drained, moderately permeable, nearly level soils found on floodplains. Depth to bedrock is greater than 60.0 inches and the seasonal high water table occurs at a depth of 0.5 to 1.5 feet. This soil is subject to frequent flooding. Based on NRCS mapping (SCS 1977), within the project study area, the Chewacla series occupies the floodplain adjacent to Big Alamance Creek and encompasses approximately 1.6 acres of the project study area.

The Enon series, with 2 to 6 percent slopes, is a well drained, slowly permeable soil found on interstream divides and long, narrow side slopes. Depth to bedrock in the Enon soil is greater than 60.0 inches and the seasonal high water table occurs at a depth of 1 to 2 feet. Based on NRCS mapping (SCS 1977), the Enon series (2 to 6 percent slopes) occupies approximately 0.5 acre of the southwestern quadrant within the project study area.

The Enon series, with 6 to 10 percent slopes, is a well drained, slowly permeable soil found on long, narrow side slopes on uplands. Depth to bedrock in the Enon soil is greater than 60.0 inches and the seasonal high water table occurs at a depth of 1 to 2 feet. Based on NRCS mapping (SCS 1977), the Enon series (6 to 10 percent slopes) occupies portions of the northwestern and northeastern quadrants, encompassing approximately 1.6 acres of the project study area.

The Enon series, with 10 to 15 percent slopes, is a well drained, slowly permeable soil found on long, narrow side slopes on uplands. Depth to bedrock in the Enon soil is greater than 60.0 inches and the seasonal high water table occurs at a depth of 1 to 2 feet. Based on NRCS mapping (SCS 1977), the Enon series (10 to 15 percent slopes) occupies portions of all four quadrants, encompassing approximately 6.5 acres of the project study area.

The Wilkes series, with 15 to 45 percent slopes, is a well drained, moderately permeable soil typically found on side slopes adjacent to drainageways. Depth to bedrock is 40 to 80 inches and the seasonal high water table is at a depth greater than 6 feet. Based on NRCS mapping (SCS 1977), the Wilkes series occupies portions of the southwestern and southeastern quadrants, encompassing approximately 7 acres of the project study area.

C. Water Resources

1. Waters Impacted

The project study area is located within sub-basin 03-06-03 of the Cape Fear River Basin (DWQ 2000). This area is part of USGS Hydrologic Unit 03030002 (DWQ 2000) of the South Atlantic/Gulf Region. The structure targeted for replacement spans Big Alamance Creek and the

adjacent floodplain. The portion of Big Alamance Creek traversing the project study area has been assigned Stream Index Number 16-19-(1) by the N.C. Division of Water Quality (DWQ) (2004a).

2. Water Resources Characteristics

The project study area contains three streams: Big Alamance Creek and two unnamed tributaries (UT1 and UT2) to Big Alamance Creek (Figure 7). Big Alamance Creek generally flows eastward through the center of the project study area. The first of the unnamed tributaries (UT1) is located in the southeastern quadrant formed by the intersection of Company Mill Road and Big Alamance Creek. UT1 flows from south to north reaching a confluence with Big Alamance Creek approximately 85 feet east of the existing bridge. The second unnamed tributary (UT2) is located in the northeastern quadrant formed by the intersection of Company Mill Road and Big Alamance Creek. UT2 flows from northwest to southeast before discharging into a forested wetland 120 feet northeast of the existing bridge. UT1 and UT2 have not been assigned a Stream Index Number by the DWQ. Unless otherwise noted, unnamed tributaries typically assume the same Best Usage Classification as their receiving waters.

Big Alamance Creek flows from west to east, bisecting the project study area. A dam from a former mill occurs on Big Alamance Creek at the western edge of project study area. The dam impounds the reach of Big Alamance Creek immediately upstream of the project study area, creating a 2.6-acre pond. The pond discharges over the top of the dam into a 120-foot wide, 60 foot-long pool before defining to a more typical stream channel upon approaching the bridge. Big Alamance Creek is 30 feet wide upstream of the bridge and widens to 42 feet on the downstream side. Throughout the project study area, Big Alamance Creek has approximately 4-foot banks and a sand and gravel substrate. During field investigations, the water level appeared low and with a depth to 2 feet. Flow was moderate to slow and water clarity was moderate. No persistent emergent aquatic vegetation was observed within the stream, although, a filamentous alga was observed in the shallows. Opportunities for habitat within Big Alamance Creek include overhanging trees, undercut banks, fallen logs, and leaf packs.

UT1 is a first-order, intermittent stream with a sand substrate. UT1 originates from an 18-inch pipe underlying a driveway located 50 feet south of the existing bridge. This tributary likely formed as the result of the installation of the pipe, which concentrates runoff from areas upslope of the driveway. UT1 flows northward for approximately 85 feet before discharging into Big Alamance Creek. The bed of UT1 is eroding downward to the elevation of the Big Alamance Creek. Consequently, the bank height ranges from 4 feet at the Big Alamance Creek confluence to 2 feet at the pipe where UT1 originates. During the field investigation, no flow was observed in UT1, but standing water was present. In the past, the UT1 possibly only served as storm water conveyance; however, over time the stream bed may have eroded down to the water elevation of

Big Alamance Creek. This likely explains the presence of standing water in UT1. No persistent emergent aquatic vegetation was observed within the stream. Due to bed erosion, opportunities for habitat within UT1 are limited for much of the reach.

UT2 is 2-foot wide, first-order, intermittent stream with 1-foot banks and sand and gravel substrate. UT2 originates on the southern side of a driveway located 150 feet north of the existing bridge. Flow from a seep wetland on the north side of the driveway (Figure 7, Wetland 2) is collected and passed under the driveway through an 18-inch pipe. UT2 conveys outflow from the pipe southward for 85 feet, eventually discharging into a forested wetland within the floodplain of Big Alamance Creek. During field investigations, the water level was low with little flow. Water clarity was good. No persistent emergent aquatic vegetation was observed within the stream. Opportunities for habitat within UT2 are limited to leaf packs and vegetation along the stream banks.

A 0.35-acre portion of an approximate 0.88-acre pond (Figure 7, Pond 1) is located in the southeast quadrant of the project study area. The pond occurs in an upland area approximately 660 feet south of the existing bridge. Outflow from the Pond 1 exits through a pipe in the northeast of the pond, which is outside of the project study area. Pond 1 is not connected to any water bodies within the project study area.

The DWQ has assembled a list of impaired waterbodies according to the Clean Water Act Section 303(d) and 40 CFR 130.7, hereafter referred to as the N.C. 2002 Section 303(d) list. The list is a comprehensive public accounting of all impaired waterbodies. An impaired waterbody is one that does not meet water quality standards including designated uses, numeric and narrative criteria, and anti-degradation requirements defined in 40 CFR 131. The standards violation may be due to an individual pollutant, multiple pollutants, pollution, or an unknown cause of impairment. The impairment could be from point sources, nonpoint sources, and/or atmospheric deposition. Some sources of impairment exist across state lines. North Carolina's methodology is strongly based on the aquatic life use support guidelines available in the Section 305(b) guidelines (EPA-841-B-97-002A and -002B). Those streams attaining only Partially Supporting (PS) or Not Supporting (NS) status are listed on the N.C. 2002 Section 303(d) list. Streams are further categorized into one of six parts within the N.C. 2002 Section 303(d) list, according to source of impairment and degree of rehabilitation required for the stream to adequately support aquatic life. Within Parts 1, 4, 5, and 6 of the list, North Carolina has developed a priority ranking scheme (low, medium, high) that reflects the relative value and benefits those waterbodies provide to the State. Big Alamance Creek is not listed on any section of the N.C. 2002 Section 303(d) list (DWQ 2002).

Classifications are assigned to waters of the State of North Carolina based on the existing or contemplated best usage of various streams or segments of streams in the basin. A Best Usage

Classification of WS-IV NSW has been assigned to this reach of Big Alamance Creek and its unnamed tributaries. Class WS-IV waters are used as sources of potable water. In general, WS-IV waters are in moderately to highly developed watersheds. There are no categorical restrictions on discharges in WS-IV waters. Additionally, WS-IV waters are suitable for all Class C uses, such as aquatic life propagation and protection, agriculture, and secondary recreation. Secondary recreation includes wading, boating, and other uses not involving human body contact with waters on an organized or frequent basis. Nutrient Sensitive Waters (NSW) are areas with water quality problems associated with excessive plant growth resulting from nutrient enrichment. No designated High Quality Waters (HQW), Outstanding Resource Waters (ORW), Water Supply I (WS-I), Water Supply II (WS-II) waters, or watershed Critical Areas (CA) occur within 1.0 mile of the project area (DWQ 2000).

The DWQ has initiated a whole-basin approach to water quality management for the 17 river basins within the state. Water quality for the proposed project area is summarized in the Cape Fear River Basinwide Water Quality Plan (DWQ 2000). Big Alamance Creek is currently listed by DWQ as Supporting its designated uses. No benthic macroinvertebrate monitoring stations occur within 1.0 mile of the project study area (DWQ 2000).

Sub-basin 03-06-03 of the Cape Fear River Basin supports six permitted, point source discharges with a total discharge of 12.1 million gallons-per-day; however, no permitted dischargers are located on or upstream of Big Alamance Creek at Bridge No. 11, or within the project study area. One of the permitted discharges is classified as a major discharger, discharging 12 million gallons-per-day. The five remaining permitted dischargers are minor (DWQ 2004b). Major non-point sources of pollution within the Cape Fear River Basin include runoff from construction activities, agriculture, timber harvesting, mining, hydrologic modification, failing septic systems, roads, parking lots, and roof tops. Sedimentation and nutrient inputs are major problems associated with non-point source discharges (DWQ 2000).

3. Anticipated Impacts to Water Resources

Impacts to water resources in the project area may result from activities associated with project construction. Activities that would result in impacts are clearing and grubbing on streambanks, riparian canopy removal, in-stream construction, fertilizers and pesticides used in revegetation, and pavement/culvert installation. The following impacts to surface water resources could result from the construction activities mentioned above.

- Increased sedimentation and siltation downstream of the crossing and increased erosion in the project area.

- Alteration of stream discharge due to silt loading and changes in surface and groundwater drainage patterns.
- Changes in light incidence and water clarity due to increased sedimentation and vegetation removal.
- Changes in and destabilization of water temperature due to vegetation removal.
- Alteration of water levels and flows due to interruptions and/or additions to surface and ground water flow from construction.
- Increased nutrient loading during construction via runoff from exposed areas.
- Increased concentrations of toxic compounds in roadway runoff.
- Increased potential for release of toxic compounds such as fuel and oil from construction equipment and other vehicles.

The proposed bridge replacement will allow for continuation of pre-project stream flows in Big Alamance Creek, thereby protecting the integrity of this waterway. Long-term impacts resulting from construction are expected to be negligible. In order to minimize impacts to water resources, NCDOT Best Management Practices for the Protection of Surface Waters will be strictly enforced during the life of the project.

Temporary construction impacts due to erosion and sedimentation will be minimized through implementation of a stringent erosion-control schedule and the use of Best Management Practices (BMPs). The contractor will follow contract specifications pertaining to erosion control measures as outlined in 23 CFR 650 Subpart B and Article 107-13 entitled Control of Erosion, Siltation, and Pollution (NCDOT, Specifications for Roads and Structures). These measures include the use of dikes, berms, silt basins, and other containment measures to control runoff; elimination of construction staging areas in floodplains and adjacent to waterways; re-seeding of herbaceous cover on disturbed sites; management of chemicals (herbicides, pesticides, de-icing compounds) with potential negative impacts on water quality; and avoidance of direct discharges into steams by catch basins and roadside vegetation.

4. Impacts Related to Bridge Demolition and Removal

The existing two-lane bridge has a timber deck on I-beams supported by mass concrete and rubble masonry. The structure is expected to be removed without dropping components into Big Alamance Creek.

D. BIOTIC RESOURCES

1. Plant Communities

Two distinct plant communities were identified within the project study area: disturbed/maintained land and Piedmont/Mountain Bottomland Forest. Plant communities were delineated to determine the approximate area and location of each (Figure 7). These communities are described below in order of their dominance within the project study area. Approximately 0.6 acre (4 percent) of the project study area is encompassed by open water systems and impervious surfaces.

a). Disturbed/Maintained Land

Approximately 10 acres (78 percent) of the project study area is encompassed by disturbed/maintained land, which occurs in all four quadrants. This community includes residential lots, roadside shoulders, and a power line corridor, all of which are maintained by mowing. Two wetland areas were found in this community.

Grasses and herbs dominate the vegetation in this community. Representative species include fescue (*Festuca* sp.), English plantain (*Plantago lanceolata*), false strawberry (*Duchesnea indica*), violet (*Viola* sp.), buttercup (*Ranunculus* sp.), white clover (*Trifolium repens*), red clover (*Trifolium pratense*), and blackberry (*Rubus* sp.).

Trees and shrubs are present to a lesser extent in the residential lots and powerline corridor. In general, the observed trees and shrubs have a scattered distribution, occurring in small groups or as individuals. There are, however, two strips of mixed forest on either side of Company Mill Road, approximately 250 feet south of the existing bridge. Observed tree species include Virginia pine (*Pinus virginiana*), northern red oak (*Quercus rubra*), sycamore (*Platanus occidentalis*), tulip poplar (*Liriodendron tulipifera*), loblolly pine (*Pinus taeda*), shortleaf pine (*Pinus echinata*), eastern red cedar (*Juniperus virginiana*), and eastern hemlock (*Tsuga canadensis*). Observed shrub species include Virginia pine, crape myrtle (*Lagerstroemia indica*), Leyland cypress (*Cupressocyparis leylandii*), azalea (*Rhododendron sp.*), eastern red cedar, flowering dogwood (*Cornus florida*), smooth sumac (*Rhus glabra*), lespedeza (*Lespedeza virginica*), and multiflora rose (*Rosa multiflora*).

Two wet areas, one 400 feet and the other 500 feet north of the existing bridge, support hydrophytic vegetation atypical to the rest of this community (Figure 7). Both areas are dominated by grasses and herbs such as soft rush (*Juncus effusus*), a sedge (*Carex* sp.), bushy seedbox (*Ludwigia alternifolia*), and dichanthelium (*Dichanthelium scoparium*). Shrubs observed in the wet areas include black willow (*Salix nigra*) and marsh elderberry (*Sambucus canadensis*).

b). Piedmont/Mountain Bottomland Forest

Piedmont/Mountain Bottomland Forest encompasses approximately 2.3 acres (18 percent) of the floodplain adjacent to Big Alamance Creek in all four quadrants of the project study area. This community occurs in the floodplain and floodplain slopes of Big Alamance Creek. It consists of a mature, secondary growth forest with well developed forest strata. A sewer corridor runs parallel to the north bank of Big Alamance Creek. Vegetation within the sewer corridor is maintained at a relatively lower height than the rest of the community. Three wetland areas were found within this community.

Canopy species observed in this community include red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), sycamore, American elm (*Ulmus americana*), and river birch (*Betula nigra*). Sapling and shrub layers include canopy species as well as multiflora rose, ironwood (*Carpinus caroliniana*), flowering dogwood, and eastern redbud (*Cercis canadensis*). The limited number of observed tree and shrub species reflects a community with little diversity.

The herbaceous layer is densest in the maintained sewer corridor, but does extend, albeit more sparsely, throughout rest of the community. The herbaceous layer consists of Japanese honeysuckle (*Lonicera japonica*), blackberry, goldenrod (*Solidago* sp.), jewelweed (*Impatiens capensis*), spring beauty (*Claytonia virginica*), violets (*Viola* spp.), poison ivy (*Toxicodendron radicans*), stellaria (*Stellaria* sp.), muscadine grape (*Vitis rotundifolia*), bidens (*Bidens* sp.), and woodland oats (*Chasmanthium* sp.)

The three wetlands in the Piedmont/Mountain Bottomland Forest are located approximately 120 feet northeast, 100 feet northwest, and 130 northwest of the existing bridge. Vegetation in the wetlands consists of unique species as well as species found throughout the rest of the community. Trees, shrubs, and herbs occur in the three wetlands. Red maple is the single tree species present. The shrub layer contains green ash (*Fraxinus pennsylvanica*), silky dogwood (*Cornus amomum*), marsh elderberry, and black willow. The herbaceous layer consists of jewelweed, soft rush, blackberry, and Japanese honey suckle.

2. Wildlife

a). Disturbed/Maintained Land

Avian diversity is expected to be moderate in disturbed/maintained areas, as shrubbery and canopy tree patches in residential areas afford roosting, nesting, and feeding habitat, as well as shelter from predators. In addition, most of these species are tolerant of habitat fragmentation and regular disturbance. Birds observed within disturbed/maintained land include turkey vulture (*Cathartes aura*), northern cardinal (*Cardinalis cardinalis*), common grackle (*Quiscalus*

quiscula), Carolina wren (*Thryothorus ludovicianus*), prairie warbler (*Dendroica discolor*), chimney swift (*Chaetura pelagica*), common yellowthroat (*Geothlypis trichas*), northern mockingbird (*Mimus polyglottos*), and eastern kingbird (*Tyrannus tyrannus*). Other bird species expected to be found within the disturbed/maintained portion of the project study area include American crow (*Corvus brachyrhynchos*), red-tailed hawk (*Buteo jamaicensis*), and American goldfinch (*Carduelis tristis*).

The diversity of faunal species utilizing this plant community is low, as little foraging, nesting, or breeding habitat is present. Mammalian species are expected to be especially scarce, but may include such adaptable species as least shrew (*Cryptotis parva*), eastern mole (*Scalopus aquaticus*), meadow vole (*Microtus pennsylvanicus*), hispid cotton rat (*Sigmodon hispidus*), eastern cottontail (*Sylvilagus floridanus*), and whitetail deer (*Odocoileus virginianus*). No terrestrial mammals were observed during the site visit, although, a beaver (*Castor canadensis*) lodge was seen in the impounded area of Big Alamance Creek upstream of the existing bridge.

An American toad (*Bufo americana*) was observed during the site visit. Other terrestrial reptiles and amphibians which may occur within maintained/disturbed land include eastern box turtle (*Terrapene carolina*), six-lined racerunner (*Cnemidomorphorus sexlineatus*), eastern garter snake (*Thamnophis sirtalis*), black racer (*Coluber constrictor*), southeastern five-lined skink (*Eumeces inexpectatus*), and northern cricket frog (*Acris crepitans*).

b). Piedmont/Mountain Bottomland Forest

Avian diversity is expected to be high as a result of high foliage height diversity and the availability of diverse foraging and nesting resources. Birds observed within the Piedmont/Mountain Bottomland Forest include Carolina wren, eastern phoebe (*Sayornis phoebe*), blue-gray gnatcatcher (*Polioptila caerulea*), and Carolina chickadee (*Poecile carolinensis*), downy woodpecker (*Picoides pubescens*), red-eyed vireo (*Vireo olivaceus*), northern cardinal, common yellowthroat, red-bellied woodpecker (*Melanerpes carolinus*), and red-shouldered hawk (*Buteo lineatus*).

The diversity of faunal species utilizing this plant community is expected to be high, as abundant foraging, nesting, or breeding habitat is present. In addition, semi-aquatic, as well as terrestrial mammals will utilize Piedmont/Mountain Bottomland Forest. A opossum (*Didelphis virginiana*) was observed during the site visit. Additional evidence of mammal activity includes raccoon (*Procyon lotor*), whitetail deer, and muskrat (*Ondatra zibethicus*) tracks. Mammal species expected to occur within the forested portion of the project study area are gray squirrel (*Sciurus carolinensis*), white-footed mouse (*Peromyscus leucopus*), and red bat (*Lasiurus borealis*).

Diverse water sources provide habitat for multiple species of amphibians, which provide prey for aquatic and terrestrial reptiles. Two species of amphibian, southern cricket frog (*Acris* gryllus) and bullfrog (*Rana* catesbeiana) were observed during the site visit. Some terrestrial reptiles and amphibians which may occur within the forest include eastern box turtle, eastern fence lizard (*Sceloporus undulatus*), five-lined skink (*Eumeces fasciatus*), southern ringneck snake (*Diadophis punctatus*), copperhead (*Agkistrodon contortrix*), gray treefrog (*Hyla versicolor*), spring peeper (*Pseudacris crucifer*), American toad, and slimy salamander (*Plethodon glutinosus*).

3. Aquatic Communities

Aquatic-oriented wildlife observed within the project study area include great blue heron (*Ardea herodias*), green heron (*Butorides virescens*), and unidentified tadpoles. All were observed in the Piedmont/Mountain Bottomland Forest: the herons on the impoundment of Big Alamance Creek and the tadpoles in pools of still water. Limited investigations resulted in no observations of aquatic reptiles. Aquatic or semi-aquatic reptiles and amphibians expected to occur within the project area vicinity include green frog (*Rana clamitans*), eastern musk turtle (*Sternotherus odoratus*), and two-lined salamander (*Eurycea bislineata*).

No sampling was undertaken in Big Alamance Creek to determine fishery potential and no fish species were observed during the field survey. Fish species that may be present in this reach of Big Alamance Creek include smaller fish species such as margined madtom (*Noturus insignis*), rosysided dace (*Clinostomus funduloides*), and spottail shiner (*Notropis hudsonius*). Shells of two species of bivalve were observed in shallows of Big Alamance Creek: Asian clam (*Corbicula fluminea*) and an unidentified mussel.

The North Carolina Wildlife Resources Commission (NCWRC) has developed a Significant Aquatic Endangered Species Habitat database to enhance planning and impact analysis in areas proposed by NCWRC as being critical due to the presence of Endangered or Threatened aquatic species. No Significant Aquatic Endangered Species Habitat occurs within the project area. The nearest Significant Aquatic Endangered Species Habitat within the Cape Fear River Basin occurs approximately 10 miles to the southeast (NCWRC 1998) on the North Prong Rocky River.

5. Anticipated Impacts to Biotic Communities

Project alternatives include both permanent and temporary impacts. Permanent impacts are considered to be those impacts that occur within proposed cut-fill limits. Temporary impacts are considered to be those impacts occurring within the cut-fill footprint associated with the temporary detour of Alternate 1. Plant communities within the project study area were delineated to determine the approximate area and location of each (Figure 7). A summary of plant community areas and the potential impacts to each is presented in Table 1.

Table 1. Plant Communities Within Cut/Fill Areas of Respective Alternatives[1]

Plant Community	Alternate 1 Permanent	Alternate 1 Temporary	Alternate 1 Total	Alternate 2 Permanent
Disturbed/Maintained Land	1.02	0.36	1.38	2.78
Piedmont/Mountain Bottomland Forest	0.24	0.09	0.33	0.19
Total	1.26	0.45	1.71	2.97

[1] Areas expressed in acres.

Of the two alternatives, Alternate 1 has the least amount of expected impacts to plant communities within the project study area. Projected permanent impacts to natural plant communities resulting from bridge replacements are generally restricted to narrow strips adjacent to the existing bridge and roadway approach segments. In terms of area, little of the natural plant community is expected to be permanently impacted by the proposed project. Temporary impacts result in additional impact to natural communities, and although these impacts are considered to be short-term, re-growth of this community to pre-project stand age and ecological function will require several decades.

No significant habitat fragmentation is expected as a result of project activities since potential improvements will be restricted to adjoining roadside margins. Construction noise and associated disturbances are anticipated to have short-term impacts on avifauna and migratory wildlife movement patterns.

No Significant Aquatic Endangered Species Habitat exists within or near the project area. Impacts associated with turbidity and suspended sediments resulting from bridge replacement will be minimized through stringent erosion control measures.

Potential downstream impacts to aquatic habitat are anticipated to be avoided by bridging the stream system to maintain regular flow and stream integrity. Short-term impacts associated with turbidity and suspended sediments may affect benthic populations. Temporary impacts to downstream habitat from increased sediment during construction will be minimized by the implementation of stringent erosion control measures.

E. SPECIAL TOPICS

1. "Waters of the United States": Jurisdictional Issues

Surface waters within the project study area are subject to jurisdictional consideration under Section 404 of the Clean Water Act as waters of the United States (33 CFR Section 328.3). The National Wetlands Inventory (NWI) system for classification of wetlands and deepwater habitats was used to determine the type of each wetland present (Cowardin *et al.* 1979). Section 404 jurisdictional areas are depicted by Figure 7.

Through the majority of the project study area, Big Alamance Creek exhibits characteristics of a well-defined, third-order, perennial stream with moderate flow over a sand and gravel substrate; the exception being the upstream-most portion of Big Alamance Creek which is impounded by a former mill dam. Big Alamance Creek can be classified as riverine, lower perennial with an unconsolidated bottom composed primarily of sand and gravel (R2UB2); and flows east through the project study area for approximately 300 feet. UT1 can be classified as a well-defined, first-order, lower perennial stream with low flow over an unconsolidated bottom of sand (R2UB2); and flows southeast for approximately 90 feet to its terminus at Wetland 3 (Figure 7). UT2 can be classified as a well-defined, first-order, lower perennial stream with low flow over an unconsolidated bottom composed of sand and gravel (R2UB2); and flows north for approximately 90 feet to its confluence with Big Alamance Creek.

Pond 1 is an approximate 0.88-acre upland pond. The pond is not hydrologically connected to any other water bodies in the project study area. Pond 1 can be classified as a palustrine system with an unconsolidated bottom of mud, that is permanently flooded (PUB3H).

Vegetated wetlands are defined by the presence of three primary criteria: hydric soils, hydrophytic vegetation, and evidence of hydrology at or near the surface for a portion (12.5 percent) of the growing season (DOA 1987). The project area contains five vegetated wetland areas (Figure 7).

A grass and herb dominated, 0.23-acre wet depression occurs in the northeast quadrant of the project study area, approximately 500 feet from the existing bridge (Figure 7, Wetland 1). The depression appears to accumulate groundwater seepage from an adjacent hill. The wetland can be classified as a palustrine, seasonally flooded wetland supporting scrub-shrub vegetation (PSS1C). Soils exhibit hydric chromas, though layering and mottling are absent due to disturbances associated with power and sewer line installation. Hydrology indicators include saturation to surface and oxidized rhizospheres. In terms of mitigation for impacts, this system would be considered "non-riverine" by DWQ.

A second grass and herb dominated wet depression occurs in the northeast quadrant of the project study area (Figure 7, Wetland 2). This depression is 0.19 acre in size and is located approximately 400 feet from the existing bridge. It appears to drain the adjacent field as well as accumulate groundwater seepage from an adjacent hill. From north to south, the wetland narrows from a broad depression to a 3-foot wide ditch paralleling Company Mill Road. At its southernmost point, the ditched portion of the wetland enters an 18-inch pipe underlying a driveway. The pipe connects this wetland to stream UT2. The wetland can be classified as a palustrine, seasonally flooded wetland supporting scrub-shrub vegetation (PSS1C). Soils exhibit hydric chromas, though layering and mottling are absent due to disturbances associated with

power and sewer line installation. Hydrology indicators include saturation to surface and oxidized rhizospheres. In terms of mitigation for impacts, this system would be considered "non-riverine" by DWQ.

A 0.03-acre, forested wetland occurs within a low portion of the Big Alamance Creek floodplain in the northeast quadrant of the project study area, approximately 120 feet northeast of the existing bridge. (Figure 7, Wetland 3). The wetland originates at the terminus of UT2. The wetland can be classified as a palustrine, seasonally flooded, forested wetland supporting broad-leaved deciduous vegetation (PFO1C). Soils exhibit hydric chromas and mottles. Hydrology indicators include inundation, flow lines, water-stained leaves, and oxidized rhizospheres. In terms of mitigation for impacts, this system would be considered "riverine" by DWQ.

Two small, less than 0.01-acre, low, wet areas occur in the spillway of the former mill dam in the northwest quadrant of the project study area (Figure 7, Wetland 4 and Wetland 5). These wetlands can be classified as palustrine, seasonally flooded, forested wetlands supporting broad-leaved deciduous vegetation (PFO1C). Soils exhibit hydric chromas. Hydrology indicators are inundation and flow lines. In terms of mitigation for impacts, these systems would be considered "riverine" by DWQ.

Alternate 1 calls for the replacement of Bridge No. 11 at its current location while maintaining traffic with a temporary structure on the east side the bridge. In contrast, Alternate 2 calls for the replacement of Bridge No. 11 at a location approximately 50 feet east of the existing bridge. Permanent impacts associated with Alternate 1 will occur to the disturbed/maintained wetland in the northeast quadrant (Figure 7, Wetland 2). The Alternate 1 temporary detour will result in additional, temporary impacts to the Wetland 2 (Figure 7). Permanent impacts associated with Alternate 2 will occur to the unnamed tributary in the southeast quadrant (Figure 7, UT1) and to the two disturbed/maintained wetlands in the northeast quadrant (Figure 7, Wetland 1 and Wetland 2).

Information pertaining to jurisdictional area impacts within the project area is summarized in Table 2.

Table 2. Projected Impacts to Jurisdictional Areas[1] (Areas are depicted in Figure 7)

Jurisdictional Area	DEM Wetland Rating	Alternate 1			Alternate 2
		Permanent	Temporary	Total	Permanent
Big Alamance Creek	-	-	-	-	-
UT1	-	-	-	-	8
UT2	-	-	-	-	-
Pond 1	-	-	-	-	-
Total		-	-	-	8
Wetland 1	20	-	-	-	0.02
Wetland 2	20	0.03	<0.01	0.04	0.10
Wetland 3	42	-	-	-	-
Wetland 4	42	-	-	-	-
Wetland 5	42	-	-	-	-
Total		0.03	<0.01	0.04	0.12

[1] Stream impacts are expressed in linear feet. Wetland impacts are expressed in acres.

The existing bridge is expected to be removed without dropping components into Big Alamance Creek.

2. Permits

Impacts to jurisdictional areas are anticipated from the proposed project. As a result, construction activities will require permits and certifications from various regulatory agencies in charge of protecting the water quality of public water resources.

This project may be processed as a Categorical Exclusion (CE) under Federal Highway Administration (FHWA) guidelines. The USACE has made available Nationwide Permit (NWP) 23 (67 FR 2020, 2082; January 15, 2002) for CEs due to minimal impacts to waters of the U.S. expected with bridge construction. DWQ has made available a General 401 Water Quality Certification for NWP 23 (GC 3403). If temporary structures are necessary for construction activities, access fills, or dewatering of the site, then a NWP 33 (67 FR 2020, 2087; January 15, 2002) permit and the associated General 401 Water Quality Certification (GC 3366) will be required. Impacts to vegetated wetlands may be authorized under NWP 3 (67 FR 2020, 2078) and the associated General 401 Water Quality Certification (GC 3376). In the event that NWPs 23, 33, and 3 will not suffice, impacts attributed to bridge replacement and associated approach improvements may qualify under General Bridge Permit (GP) 031 issued by the Wilmington USACE District. DWQ has made available a General 401 Water Quality Certification for GP 031 (GC 3404). Notification to the Wilmington USACE District office is required if this general permit is utilized.

3. Mitigation

The USACE has adopted through the Council on Environmental Quality (CEQ) a wetland mitigation policy which embraces the concept of "no net loss of wetlands" and sequencing. The purpose of this policy is to restore and maintain the chemical, biological, and physical integrity of waters of the United States, and specifically wetlands. Mitigation of wetland impacts has been defined by the CEQ to include: avoiding impacts (to wetlands), minimizing impacts, rectifying impacts, reducing impacts over time and compensating for impacts (40 CFR 1508.20). Each of these three aspects (avoidance, minimization, and compensatory mitigation) must be considered sequentially.

Avoidance mitigation examines all appropriate and practicable possibilities of averting impacts to waters of the United States. According to a 1990 Memorandum of Agreement (MOA) between the Environmental Protection Agency (EPA) and the USACE, in determining "appropriate and practicable" measures to offset unavoidable impacts, such measures should be appropriate to the scope and degree of those impacts and practicable in terms of cost, existing technology and logistics in light of overall project purposes.

Minimization includes the examination of appropriate and practicable steps to reduce the adverse impacts to waters of the United States. Implementation of these steps will be required through project modifications and permit conditions. Minimization typically focuses on decreasing the footprint of the proposed project through the reduction to median widths, right-of-way widths, fill slopes, and/or road shoulder widths. All efforts will be made to decrease impacts to surface waters.

Compensatory mitigation is not normally considered until anticipated impacts to waters of the United States have been avoided and minimized to the maximum extent possible. It is recognized that "no net loss of wetlands" functions and values may not be achieved in each and every permit action. In accordance with 15A NCAC 2H .0506(h), DWQ may require compensatory mitigation for projects with greater than or equal to 1.0 acre of impacts to jurisdictional wetlands or greater than or equal to 150 linear feet of total perennial stream impacts. Furthermore, in accordance with 67 FR 2020, 2092 (January 15, 2002); the USACE requires compensatory mitigation when necessary to ensure that adverse effects to the aquatic environment are minimal. The size and type of the proposed project impact and the function and value of the impacted aquatic resource are factors considered in determining acceptability of appropriate and practicable compensatory mitigation. Appropriate and practicable compensatory mitigation is required for unavoidable adverse impacts which remain after all appropriate and practicable minimization has been required. Compensatory actions often include restoration,

preservation and enhancement, and creation of waters of the United States. Such actions should be undertaken first in areas adjacent to or contiguous to the discharge site.

Mitigation for Section 404 jurisdictional areas may not need to be proposed for this project due to the potentially limited nature of the project impacts. However, utilization of BMPs is recommended in an effort to minimize impacts. Temporary impacts to floodplains associated with construction activities could be mitigated by replanting disturbed areas with native riparian species and removal of temporary fill material upon project completion. A final determination regarding mitigation rests with the USACE and DWQ.

F. Protected Species

1. Federally Protected Species

Species with the federal classification of Endangered, Threatened, or officially Proposed for such listing are protected under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). The term "Endangered Species" is defined as "any species which is in danger of extinction throughout all or a significant portion of its range," and the term "Threatened Species" is defined as "any species which is likely to become an Endangered species within the foreseeable future throughout all or a significant portion of its range" (16 U.S.C. 1532).

The bald eagle (*Haliaeetus leucocephalus*) is the single federally protected species listed for Guilford County (USFWS 2003). The bald eagle is listed as Threatened.

***Haliaeetus leucocephalus* (Bald eagle)**
Threatened
Family: Accipitridae
Date Listed: March 11, 1967

The bald eagle is a large raptor with a wingspan greater than 6 feet. Adult bald eagles are dark brown with a white head and tail. Immature eagles are brown with whitish mottling on the tail, belly, and wing linings. Bald eagles typically feed on fish but may also take birds and small mammals. In the Carolinas, nesting season extends from December through May (Potter *et al.* 1980). Bald eagles typically nest in tall, living trees in a conspicuous location near open water. Eagles forage over large bodies of water and utilize adjacent trees for perching (Hamel 1992). Disturbance activities within a primary zone extending 750 to 1500 feet from a nest tree are considered to result in unacceptable conditions for eagles (USFWS 1987). The USFWS recommends avoiding disturbance activities, including construction and tree-cutting within this primary zone. Within a secondary zone, extending from the primary zone boundary out to a

distance of 1.0 mile from a nest tree, construction and land-clearing activities should be restricted to the non-nesting period. The USFWS also recommends avoiding alteration of natural shorelines where bald eagles forage, and avoiding significant land-clearing activities within 1500 feet of known roosting sites.

BIOLOGICAL CONCLUSION: **NO EFFECT**

As of April 17, 2004, NHP had no documentation for bald eagle within 2.0 miles of the project study area, and no bald eagles were observed during the field visit. The impoundment of Big Alamance Creek located just upstream of the project study area, as well as the pond located in the southeast quadrant of the project study area provide the open water communities that bald eagles require for foraging; however, a survey of those impoundments determined that there are no suitable trees for nesting, roosting, or feeding within those areas. Both shores of the Big Alamance Creek impoundment support secondary growth forest which lack tall trees. In addition, the pond is surrounded by maintained land and small trees less than 20 years old.

2. Federal Species of Concern

The USFWS list (USFWS 2003) also includes a category of species designated as "Federal species of concern" (FSC). A species with this designation is one that may or may not be listed in the future (formerly C2 candidate species or species under consideration for listing for which there is insufficient information to support listing). The FSC designation provides no federal protection under the ESA for the species listed. As of April 17, 2004, NHP had no documentation of this species within 2.0 miles of the project study area.

One FSC species is listed for Guilford County, the Carolina darter (*Etheostoma collis lepidinion*). Carolina darter habitat is slow creeks and small rivers with clear to slightly turbid water and mud, sand, and rock substrate (Rohde *et al.* 1994). The reach of Big Alamance Creek within the project study area does provide suitable habitat for Carolina darter.

Alternate 1 is anticipated to impact slightly less natural habitat and one-third of the vegetated wetland area anticipated with Alternate 2. Neither alternative is expected to adversely impact federally protected species.

VI. CULTURAL RESOURCES

A. Compliance Guidelines

This project is subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, implemented by the Advisory Council on Historic Preservation's

Regulations for Compliance with Section 106, codified at 36 CFR Part 800. Section 106 requires that for federally funded, licensed, or permitted projects having an effect on properties listed in or eligible for the National Register of Historic Places, the Advisory Council on Historic Preservation be given the opportunity to comment.

B. Historic Architecture

A field survey of the Area of Potential Effects (APE) was conducted on January 12, 2004. All structures within the APE were photographed, and later a NCDOT staff architectural historian reviewed these photos. There were 13 structures within the APE over 50 years of age, and 13 were determined to be ineligible for the National Register of Historic Places by the NCDOT staff architectural historian. The photographs were shown to the State Historic Preservation Office (HPO) in a meeting on September 13, 2004. At that meeting, HPO staff concurred that 12 of the structures were not eligible for the National Register; however, the property known as "Company Mill" would have to be evaluated by the NCDOT archaeology section. A form was signed that reflects these findings. In addition, a memorandum from the HPO, dated March 26, 2004, states that there are no historic structures within the APE for this project. Copies of all correspondence are included in the Appendix.

C. Archaeology

In May, 2005, an archaeological site evaluation for this project recommended the "Company Mill" property be eligible for inclusion in the National Register of Historic Places. The North Carolina Department of Cultural Resources – State Historic Preservation Office concurred that the property (31GF326**, Field-Company Mill Site) is eligible for the National Register in August, 2005. In September, 2005, the State Historic Preservation Office, the Office of Human Environment, and the North Carolina Office of State Archaeology determined this project would have no effect on the "Company Mill" property. See the Appendix for correspondence.

VII. ENVIRONMENTAL EFFECTS

The project is expected to have an overall positive impact by replacing a potentially unsafe bridge.

The project is considered a Federal "Categorical Exclusion" due to its limited scope and environmental consequences.

The bridge replacement will not have an adverse effect on the quality of the human or natural environment with the use of current NCDOT standards and specifications.

The project is not in conflict with any plan, existing land use, or zoning regulations. No significant change in land use is expected to result from replacement of the bridge.

The studied route does not contain any bicycle accommodations, nor is it a designated bicycle route; therefore, no bicycle accommodations have been included as part of this project.

No residential or business relocatees are anticipated as a result of the proposed project.

No adverse impacts on families or communities are anticipated.

No adverse effect on public facilities or services is anticipated. The project is not expected to adversely affect social, economic, or religious opportunities in the area.

The proposed project is excluded from the Farmland Protection Policy Act (FPPA) since the project is located within the Metropolitan Planning Organization (MPO) planning area of Greensboro (7 CFR Part 658).

There are no publicly owned parks, recreational facilities, or wildlife and waterfowl refuges of national, state, or local significance in the vicinity of the project.

The project is located in Guilford County, which is within the Greensboro-Winston-Salem-High Point nonattainment area for ozone (0_3) as defined by the EPA. The 1990 Clean Air Act Amendments (CAA) designed these areas as moderate nonattainment areas for O_3. However, due to improved monitoring data, these areas were redesignated as maintenance for O_3 on November 8, 1993. Section 176(c) of the CAAA requires that transportation plans, programs, and projects conform to the intent of the state air quality implementation plan (SIP). The current SIP does not contain any transportation control measures for Guilford County. The Greensboro Metropolitan Planning Organization (MPO) 2030 Long Range Transportation Plan (LRTP), the High Point MPO 2030 LRTP, the Burlington Graham MPO 2030 LRTP, and the 2006-2012 Metropolitan Transportation Improvement Programs (MTIPs) conform to the intent of the SIP. The USDOT made a conformity determination of the Greensboro MPO LRTP on April 1, 2006, the High Point MPO LRTP on April 1, 2006, the Burlington MPO LRTP on April 1, 2006, and the Greensboro MPO MTIP on October 1, 2005, the High Point MPO MTIP on October 1, 2005, and the Burlington Graham MPO MTIP on October 1, 2005. The current conformity determinations are consistent with the final conformity rule found in 40 CFR Parts 51 and 93. There are no significant changes in the project's design concept or scope, as used in the conformity analyses.

The project is located in Guilford County, which is within the Greensboro-Winston-Salem-High Point nonattainment area for fine particles PM 2.5 as defined by the EPA. This area was designed nonattainment for the PM 2.5 standard in accordance with the Clean Air Act Amendments (CAAA) on January 5, 2005, with an effective date of April 5, 2005. Section 176(c) of the CAAA requires that transportation plans, programs, and projects conform to the intent of the state air quality implementation plan (SIP). The current SIP does not contain any transportation control measures for Guilford County. The Greensboro Metropolitan Planning Organization (MPO) 2030 Long Range Transportation Plan (LRTP), the High Point MPO 2030 LRTP, the Burlington Graham MPO 2030 LRTP, and the 2006-2012 Metropolitan Transportation Improvement Programs (MTIPs) conform to the intent of the SIP. The USDOT made a conformity determination on the Greensboro MPO LRTP on April 5, 2006, the High Point MPO LRTP on April 5, 2006, the Burlington MPO LRTP on April 5, 2005, the Greensboro MPO MTIP on April 5, 2006, the High Point MPO MTIP on April 5, 2006 and the Burlington Graham MPO MTIP on April 5, 2006. The current conformity determinations are consistent with the final conformity rule found in 40 CFR Parts 51 and 93. There are no significant changes in the project's design concept or scope, as used in the conformity analyses.

Guilford County was designated as a moderate nonattainment for O_3 under the eight-hour ozone standard on April 15, 2004. Effective on November 22, 2004, EPA reclassified Guilford County from a moderate nonattainment area to a marginal nonattainment area. Guilford County is under an Early Action Compact and the effective date of the nonattainment designation has been deferred until December 31, 2006. 40 CFR Parts 51 and 93 are not applicable until December 31, 2007 (one year after the nonattainment designation becomes effective).

The results from a pre-scoping geotechnical and geoenvironmental investigation performed by the NCDOT Geotechnical Engineering Unit showed that no underground storage tank sites or hazardous waste sites or apparent landfills were identified within the project limits. The geotechnical pre-scoping report is included in the appendix.

On the basis of the above discussion, it is concluded that no significant adverse environmental effects will result from implementation of the project.

VIII. PUBLIC INVOLVEMENT

A "start of study" letter was distributed to local officials and agencies requesting information and concerns relative to the proposed study alternates. Their responses are included in the Appendix. Due to the isolated nature of this bridge replacement project, no formal public involvement program was initiated.

IX. AGENCY COORDINATION

Letters requesting comments and environmental input were sent to the following agencies:

US Army Corps of Engineers - Wilmington District
*US Fish and Wildlife Service
State Clearinghouse
*NC Department of Cultural Resources
*NC Wildlife Resources Commission
*NC Division of Water Quality
Federal Highway Administration
*Director, Guilford Community Development Department
Manager, Guilford County
Chairman, Guilford County Board of Commissioners
*Superintendent, Guilford County Public School System
Director, Guilford County Emergency Services
Sheriff, Guilford County
Greensboro Metropolitan Planning Organization

Asterisks (*) indicate agencies from which written/oral comments were received. Scoping comments and corresponding responses are given below. Copies of the comments received are in the Appendix.

1. United States Department of Interior – Fish and Wildlife Service
   Comment: "There is only one federally protected species listed for Guilford County – the bald eagle...If suitable habitat occurs within the project vicinity for [this] species, survey should be conducted to determine presence or absence of the species".

   Response: A survey of the project area determined it lacks suitable habitat for the bald eagle.

2. North Carolina Wildlife Resources Commission

   Comment: "We recommend replacing this bridge with a bridge".

   Response: A new bridge will replace the existing bridge at its current location.

   Comment: "A significant fishery for sunfish exists at this site, therefore we request an in-water work moratorium for sunfish from April 1 to June 30".

Response: FHWA, NCDOT and NCWRC have determined a moratorium for sunfish will not be required.

3. North Carolina Division of Water Quality

Comment: "[Big] Alamance Creek is listed as WS-IV NSW CA... Since the project is located within the Critical Area of a water supply watershed, hazardous spill catch basins may be required for this project based on traffic count, percent truck traffic or proximity to industries transporting hazardous materials. The project shall incorporate the requirements for WS-IV Waters within the critical area as specified in 15A NCAC 2B .0215".

Response: According to the natural resources technical report and the NCDWQ website (accessed 1/31/05), the project area for TIP B-4131 is not within a critical area of a water supply watershed.

Comment: "There are 30-foot vegetated buffer requirements in WS waters in addition to the requirements to minimize storm water runoff and maximize use of BMPs.
Response: Public road projects may be allowed within the buffer where no practicable alternative exists, as long as built-upon area is minimized, runoff is directed away from surface waters, and the use of Best Management Practices (BMPs) is maximized. In order to minimize impacts to water resources, NCDOT BMP's for the Protection of Surface Waters will be strictly enforced during the entire life of the project.

4. North Carolina Department of Cultural Resources – State Historic Preservation Office

Comment: "The proposed bridge replacement is likely to affect [an] archaeological site, so we recommend that the site be tested to evaluate its significance".

Response: The site was evaluated and the Office of State Archaeology determined the project would not affect the archaeological site. See comments in the Appendix.

REFERENCES

Amoroso, J.L. 2004. Natural Heritage Program List of the Rare Plant Species of North Carolina. North Carolina Natural Heritage Program, Division of Parks and Recreation, N.C. Department of Environment, Health and Natural Resources, Raleigh.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. FWS/OBS -79/31. Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC. 103 pp.

Department of the Army (DOA). 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS. 100 pp.

Division of Environmental Management (DEM). 1996. A Field Guide to North Carolina Wetlands. North Carolina Department of Environment, Health, and Natural Resources, Raleigh.

Division of Water Quality (DWQ). 2000. Cape Fear River Water Quality Management Plan. North Carolina Department of Environment and Natural Resources, Raleigh.

Division of Water Quality (DWQ). 2002. Water Quality Assessment and Impaired Waters List (online). Available: http://h2o.enr.state.nc.us/tmdl/General_303d.htm [April 26, 2004] North Carolina Department of Environment and Natural Resources, Raleigh.

Division of Water Quality (DWQ). 2004a. North Carolina Waterbodies Listed by Subbasin (online). Available: http://h2o.enr.state.nc.us/bims/reports/basinsandwaterbodies/03-03-06.pdf [April 26, 2004]. North Carolina Department of Environment and Natural Resources, Raleigh.

Division of Water Quality (DWQ). 2004b. List of Active Permits (online). Available: http://h2o.enr.state.nc.us/NPDES/documents/BIMS_031604.xls [April 26, 2004]. North Carolina Department of Environment and Natural Resources, Raleigh.

Griffith, G.E., J.M. Omernik, J.A. Comstock, M.P. Schafale, W.H. McNab, D.R. Lenat, T.F. MacPherson, J.B. Glover, and V.B. Shelbourne. 2002. Ecoregions of North Carolina and South Carolina (color poster with map, descriptive text, summary table, and photographs). U.S. Geological Survey, Reston, Virginia.

Hamel, P.B. 1992. Land Manager's Guide to the Birds of the South. The Nature Conservancy, Southeastern Region, Chapel Hill, NC. 437 pp.

Kartesz, J. 1998. A Synonymized Checklist of the Vascular Flora of the United States, Puerto Rico, and the Virgin Islands. Biota of North America Program.

Martof, B.S., W.M. Palmer, J.R. Bailey, and J.R. Harrison III. 1980. Amphibians and Reptiles of the Carolinas and Virginia. The University of North Carolina Press, Chapel Hill, NC. 264 pp.

Menhinick, E.F. 1991. The Freshwater Fishes of North Carolina. North Carolina Wildlife Resources Commission, Raleigh. 227 pp.

Natural Heritage Program (NHP). 1999. List of Significant Natural Heritage Areas. North Carolina Division of Parks and Recreation, Department of Environment and Natural Resources. Raleigh, NC.

Natural Resources Conservation Service (NRCS). 1996. U.S. Department of Agriculture. Hydric Soils, Guilford County, N.C. Technical Guide, Section II-A-2.

Palmer, W.M. and A.L. Braswell. 1995. Reptiles of North Carolina. The University of North Carolina Press, Chapel Hill, NC. 412 pp.

Potter, E.F., J.F. Parnell, and R.P. Teulings. 1980. Birds of the Carolinas. The University of North Carolina Press, Chapel Hill, NC. 408 pp.

Radford, A.E., H.E. Ahles, and C.R. Bell. 1968. Manual of the Vascular Flora of the Carolinas. The University of North Carolina Press, Chapel Hill, NC. 1183 pp.

Rohde, F.C., R.G. Arndt, D.G. Lindquist, and J.F. Parnell. 1994. Freshwater Fishes of the Carolinas, Virginia, Maryland, and Delaware. The University of North Carolina Press, Chapel Hill, N.C. 222 pp.

Schafale, M.P. and A.S. Weakley. 1990. Classification of the Natural Communities of North Carolina: Third Approximation. Natural Heritage Program, Division of Parks and Recreation, N.C. Department of Environment, Health, and Natural Resources. Raleigh. 325 pp.

Soil Conservation Service (SCS). 1977. Soil Survey of Guilford County, North Carolina, USDA National Cooperative Soil Survey.

U.S. Fish and Wildlife Service (USFWS). 1987. Habitat Management Guidelines for the Bald Eagle in the Southeast Region. U.S. Department of the Interior, Fish and Wildlife Service. 8 pp.

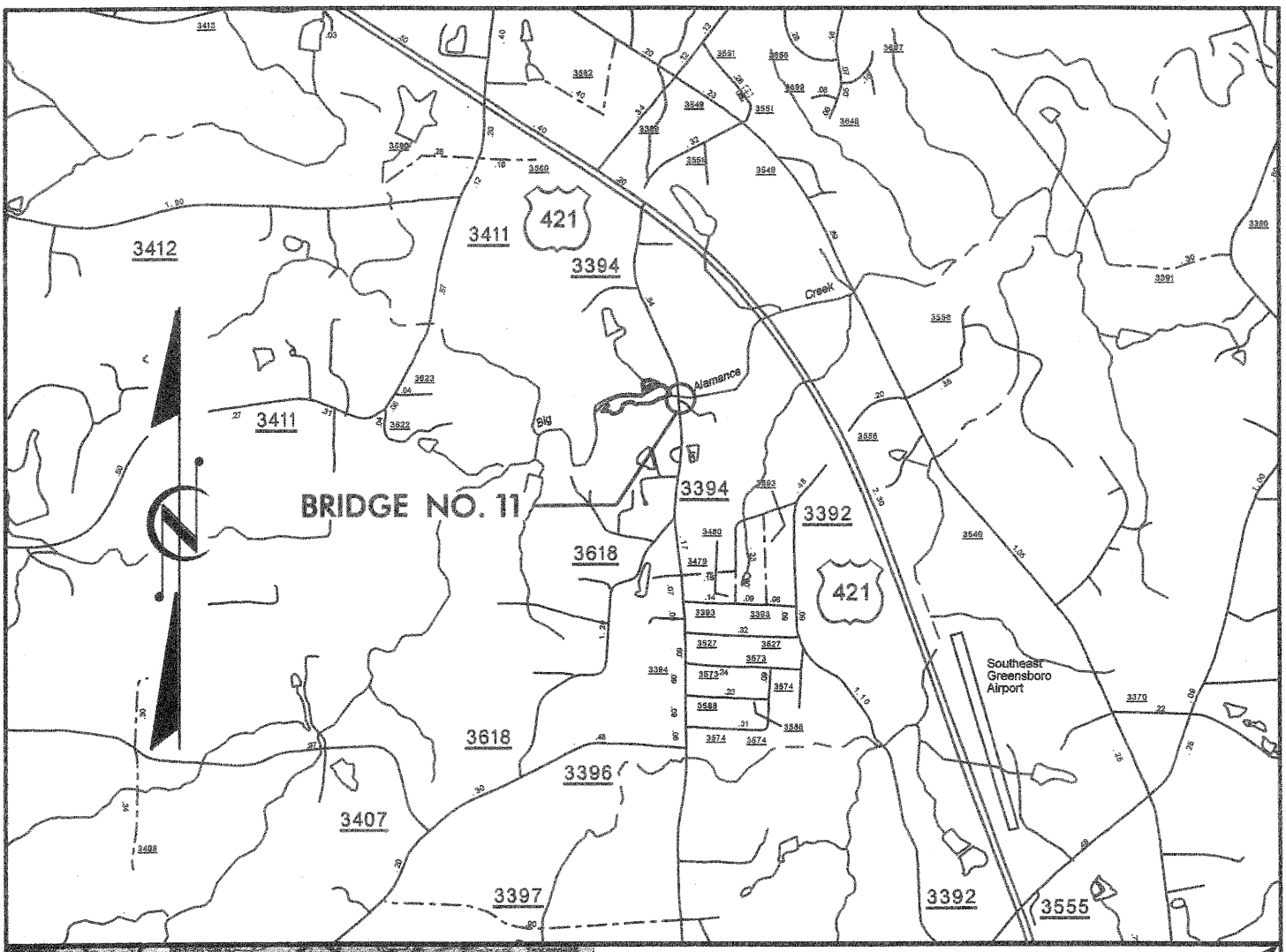
U.S. Fish and Wildlife Service (USFWS). 2002. National Wetlands Inventory (NWI) (online). Available: http://www.nwi.fws.gov [April 29, 2004]. U.S. Fish and Wildlife Service.

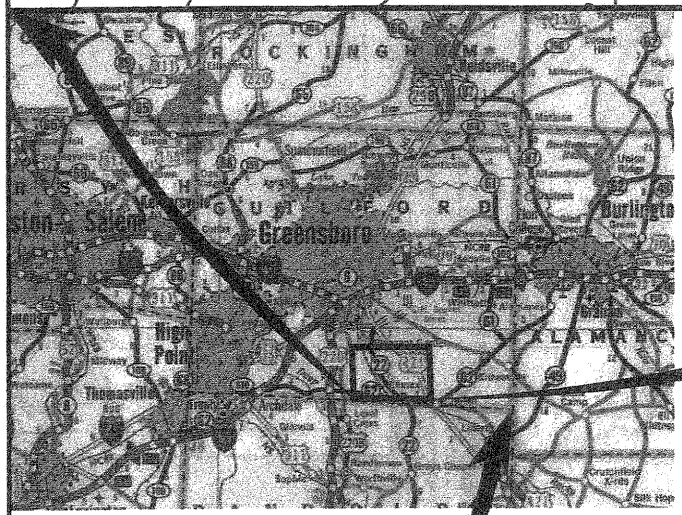
U.S. Fish and Wildlife Service (USFWS). 2003. Guilford County Endangered Species, Threatened Species, and Federal Species of Concern (online). Available: http://nc-es.fws.gov/es/cntylist/guilford.html [April 29, 2004]. U.S. Fish and Wildlife Service.

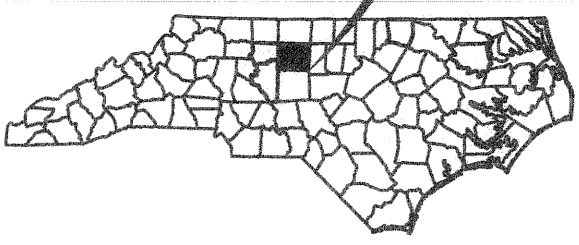
Webster, W.D., J.F. Parnell, and W.C. Biggs, Jr. 1985. Mammals of the Carolinas, Virginia, and Maryland. The University of North Carolina Press, Chapel Hill, NC. 255 pp.

Wildlife Resources Commission (NCWRC). 1998. Significant Aquatic Endangered Species Habitats. North Carolina Department of Environment and Natural Resources, Raleigh.

Figures







NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

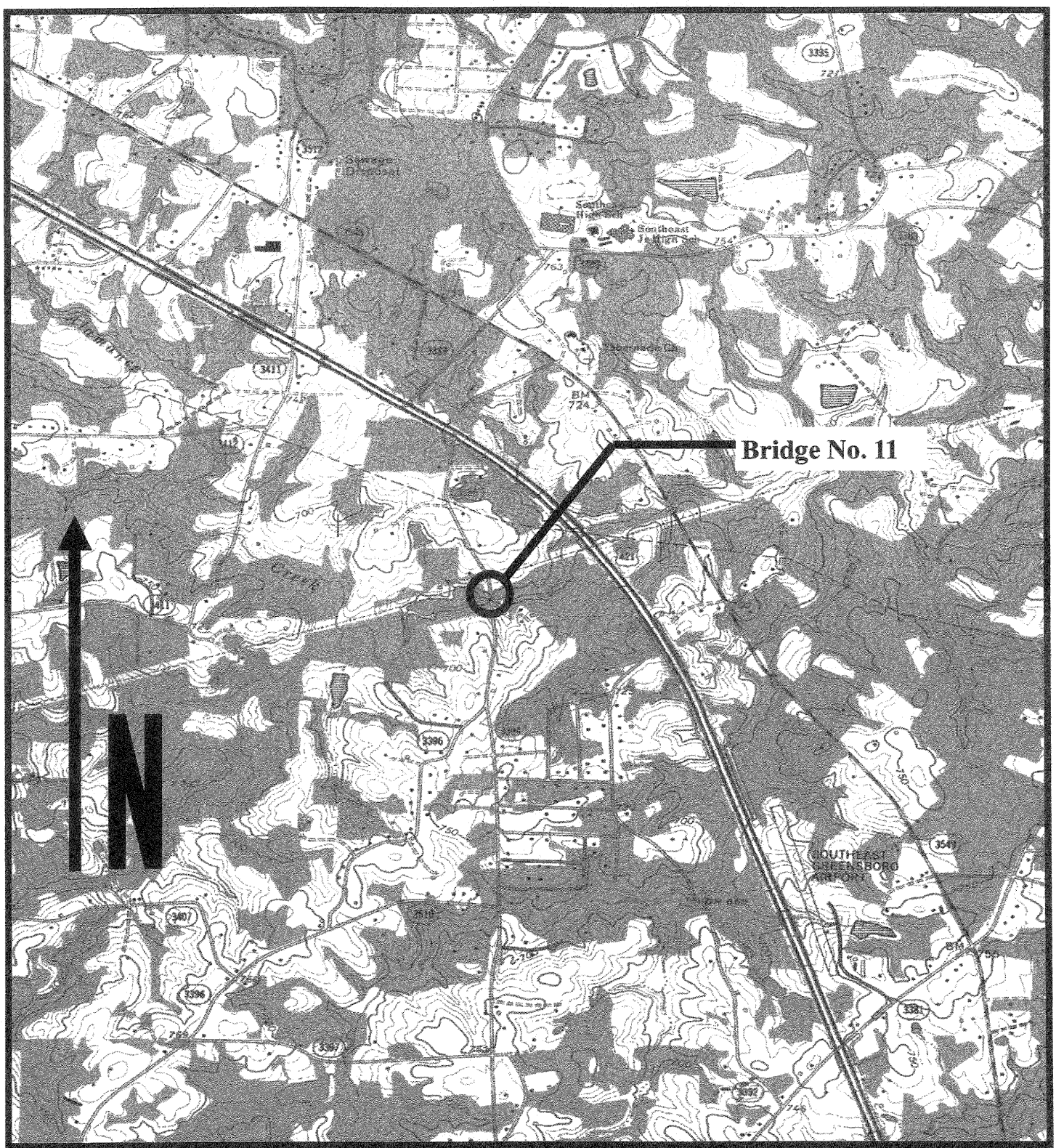
Project Development and Environmental Analysis Branch

BRIDGE NO. 11
SR 3394 OVER BIG ALAMANCE CREEK
GUILFORD COUNTY
B-4131

VICINITY MAP

0 0.5
GRAPHIC SCALE (MILES)

FIGURE 1A



North Carolina Department of Transportation

Project Development and Environmental Analysis Branch

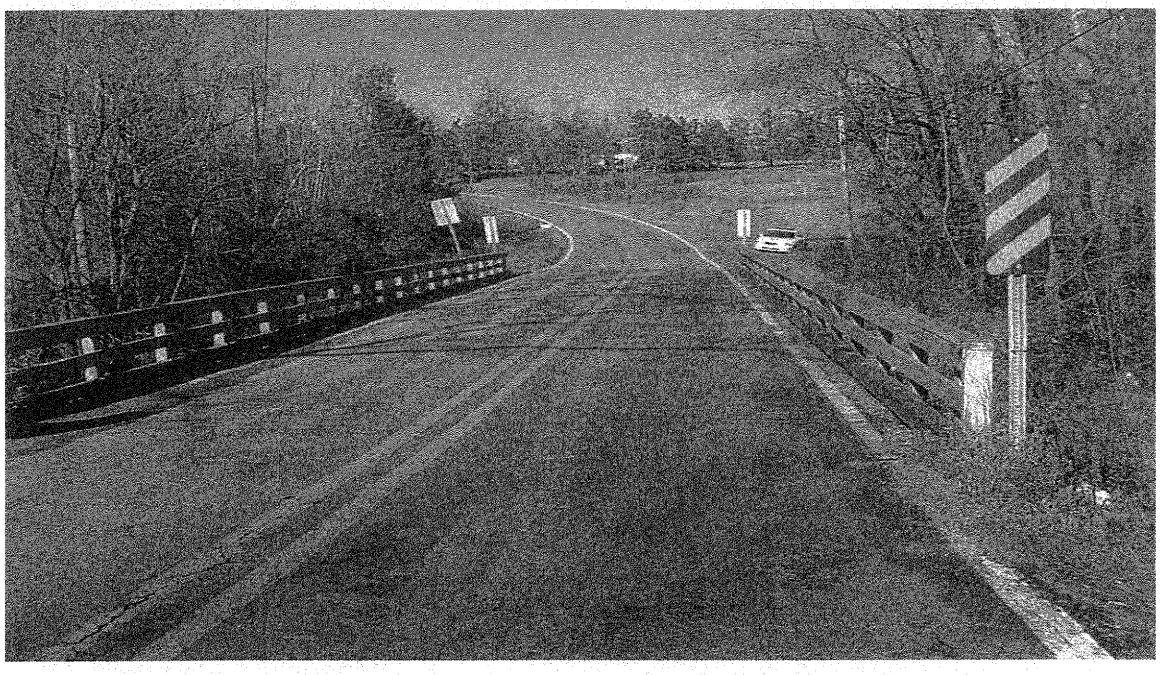
T.I.P. B-4131

Bridge No. 11 Over Big Alamance Creek

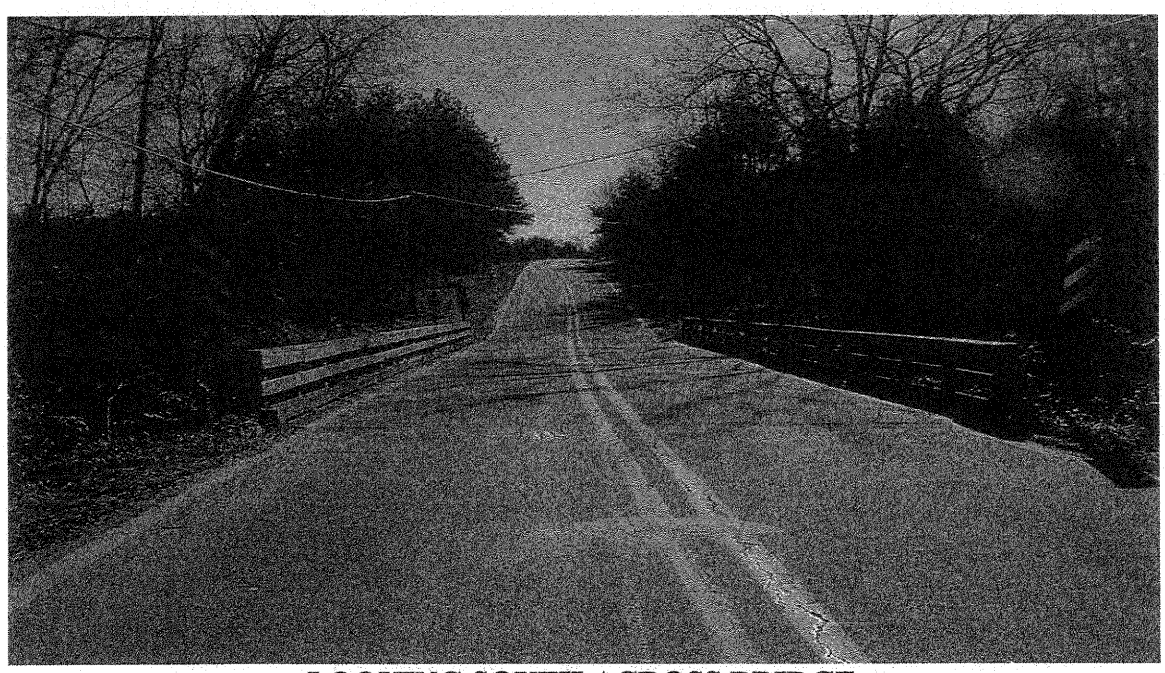
On SR 3394 - Guilford County, N.C.

Quad. Map: Climax

Figure 1B



LOOKING NORTH ACROSS BRIDGE



LOOKING SOUTH ACROSS BRIDGE

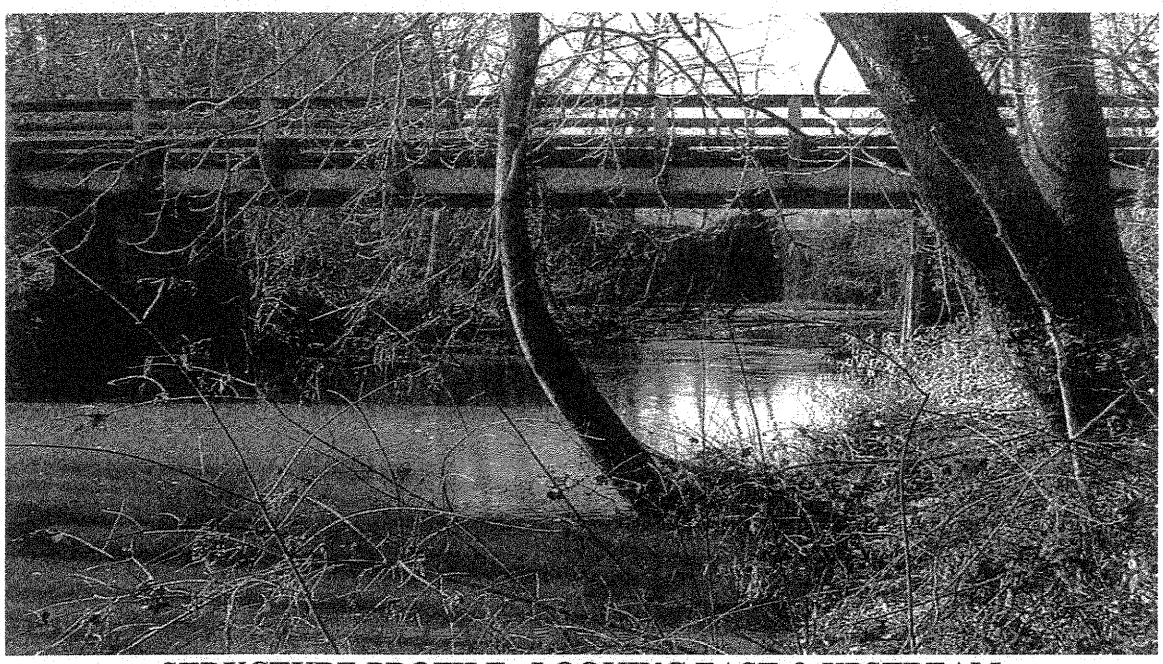
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

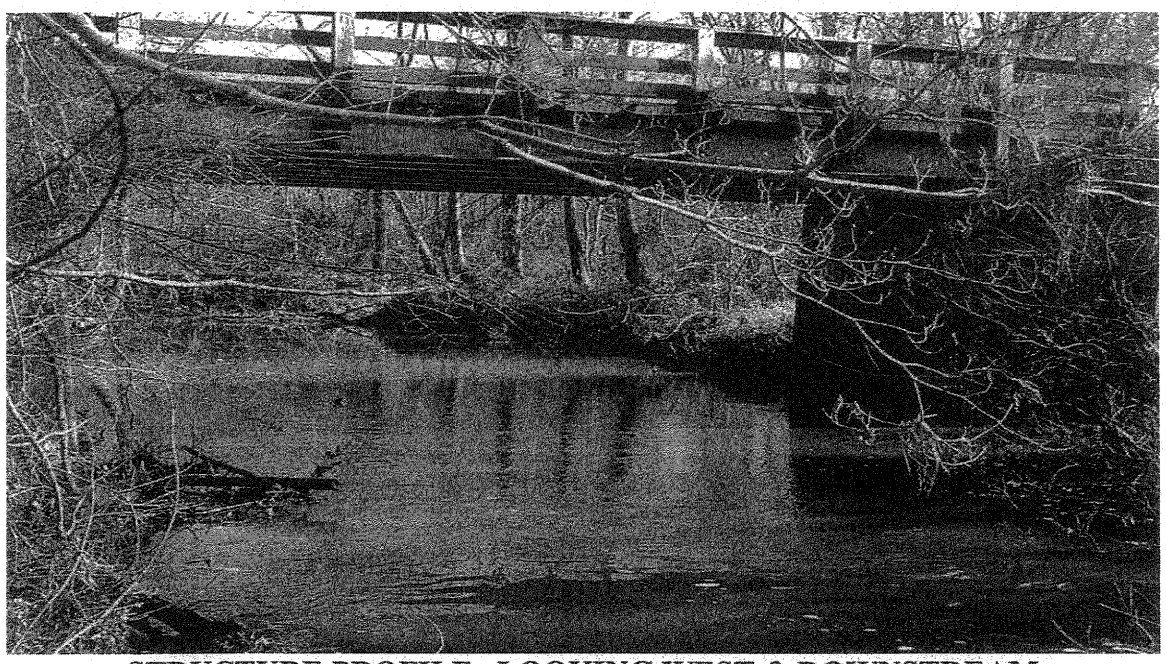
BRIDGE NO. 11

ON SR 3394 BIG ALAMANCE CREEK
GUILFORD COUNTY
B-4131

FIGURE 2A



STRUCTURE PROFILE , LOOKING EAST & UPSTREAM



STRUCTURE PROFILE , LOOKING WEST & DOWNSTREAM

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

BRIDGE NO. 11

ON SR 3394 BIG ALAMANCE CREEK
GUILFORD COUNTY
B-4131

FIGURE 2B

PROPOSED DESIGN CRITERIA

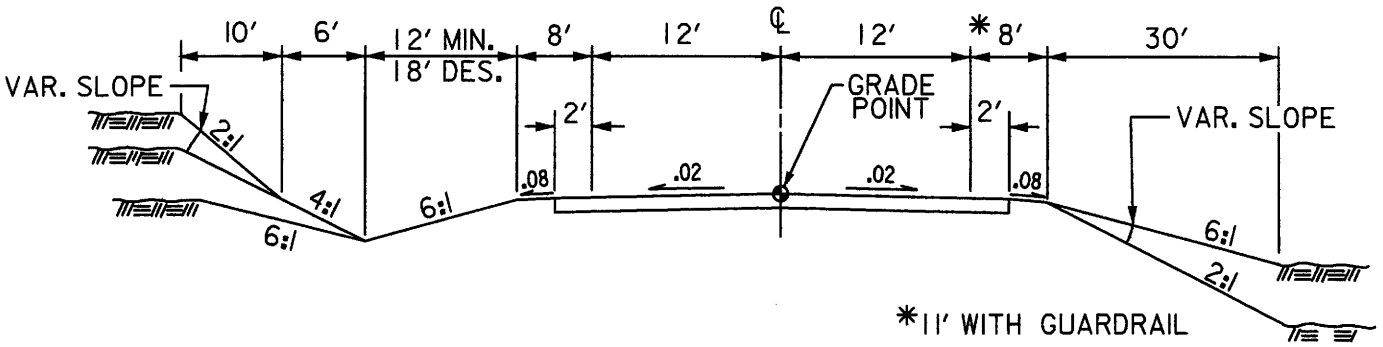
FIGURE 3A

REPLACE BRIDGE NO. 11 ON SR 3394
OVER BIG ALAMANCE CREEK
GUILFORD COUNTY
B-4131

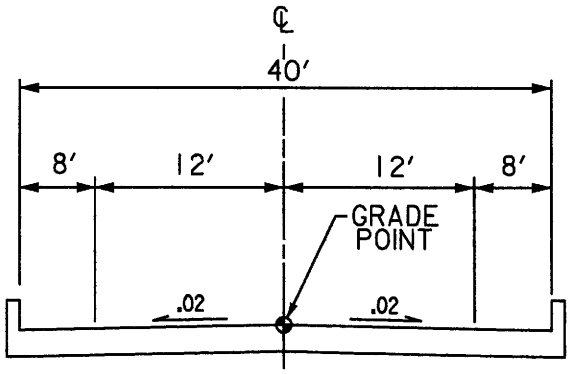
FUNCTIONAL CLASSIFICATION: RURAL MINOR COLLECTOR
POSTED SPEED: 45 MPH
ESTIMATED ADT:

2005 ADT	=	2,900
2025 ADT	=	5,000
TTST	=	1%
DUAL	=	3%
DHV	=	12%
DIR	=	65%

DESIGN SPEED: 50 MPH
MAXIMUM RATE OF SUPERELEVATION: 0.06 ft/ft
MAXIMUM DEGREE OF CURVE: 6°50'
MAXIMUM GRADE: 7%
MINIMUM DESIRABLE K FACTORS: Ksag = 96 Kcrest = 84
SHOULDER WIDTH & TYPE : 2.0 ft FDPS 8.0 ft TOTAL (11.0ft WITH GUARDRAIL)
LANE WIDTHS: 12.0 ft
BRIDGE DECK WIDTH: 40.0ft CLEAR
BRIDGE LENGTH: 125.0 ft - ALTERNATE 1
BRIDGE LENGTH: 150.0 ft - ALTERNATE 2



APPROACH ROADWAY TYPICAL SECTION



BRIDGE TYPICAL SECTION

NOTE:
HORIZONTAL & VERTICAL DESIGN EXCEPTIONS MAY BE REQUIRED.

PREPARED BY: KO & ASSOC. DATE: 02-04-04
APPROVED BY: _____ DATE: _____

FIGURE 3B

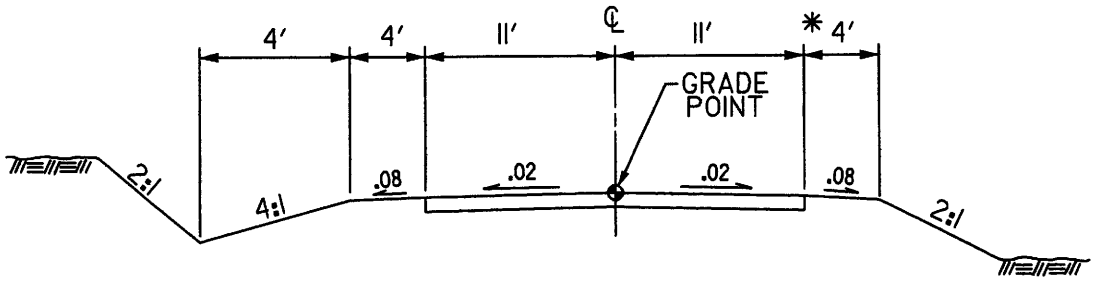
PROPOSED DETOUR CRITERIA

REPLACE BRIDGE NO. 11 ON SR 3394
OVER BIG ALAMANCE CREEK
GUILFORD COUNTY
B-4131

FUNCTIONAL CLASSIFICATION: RURAL MINOR COLLECTOR
POSTED SPEED: 45 MPH (ASSUMED)
ESTIMATED ADT:

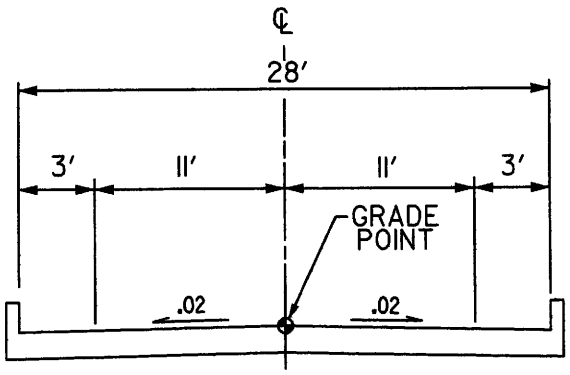
2005 ADT	=	2,900
2025 ADT	=	5,000
TTST	=	1%
DUAL	=	3%
DHV	=	12%
DIR	=	65%

DESIGN SPEED: 35 MPH
MAXIMUM RATE OF SUPERELEVATION: 0.08 ft/ft (USE .06 MAX. ON BRIDGE)
MAXIMUM DEGREE OF CURVE: 16°20' (7°30' ON BRIDGE)
MAXIMUM GRADE: 12%
MINIMUM DESIRABLE K FACTORS: Ksag = 49 Kcrest = 29
SHOULDER WIDTH & TYPE : 4.0 ft TOTAL (7.0ft WITH GUARDRAIL)
LANE WIDTHS: 11.0 ft
BRIDGE DECK WIDTH: 28.0ft CLEAR
BRIDGE LENGTH: 145.0 ft



* 7' WITH GUARDRAIL

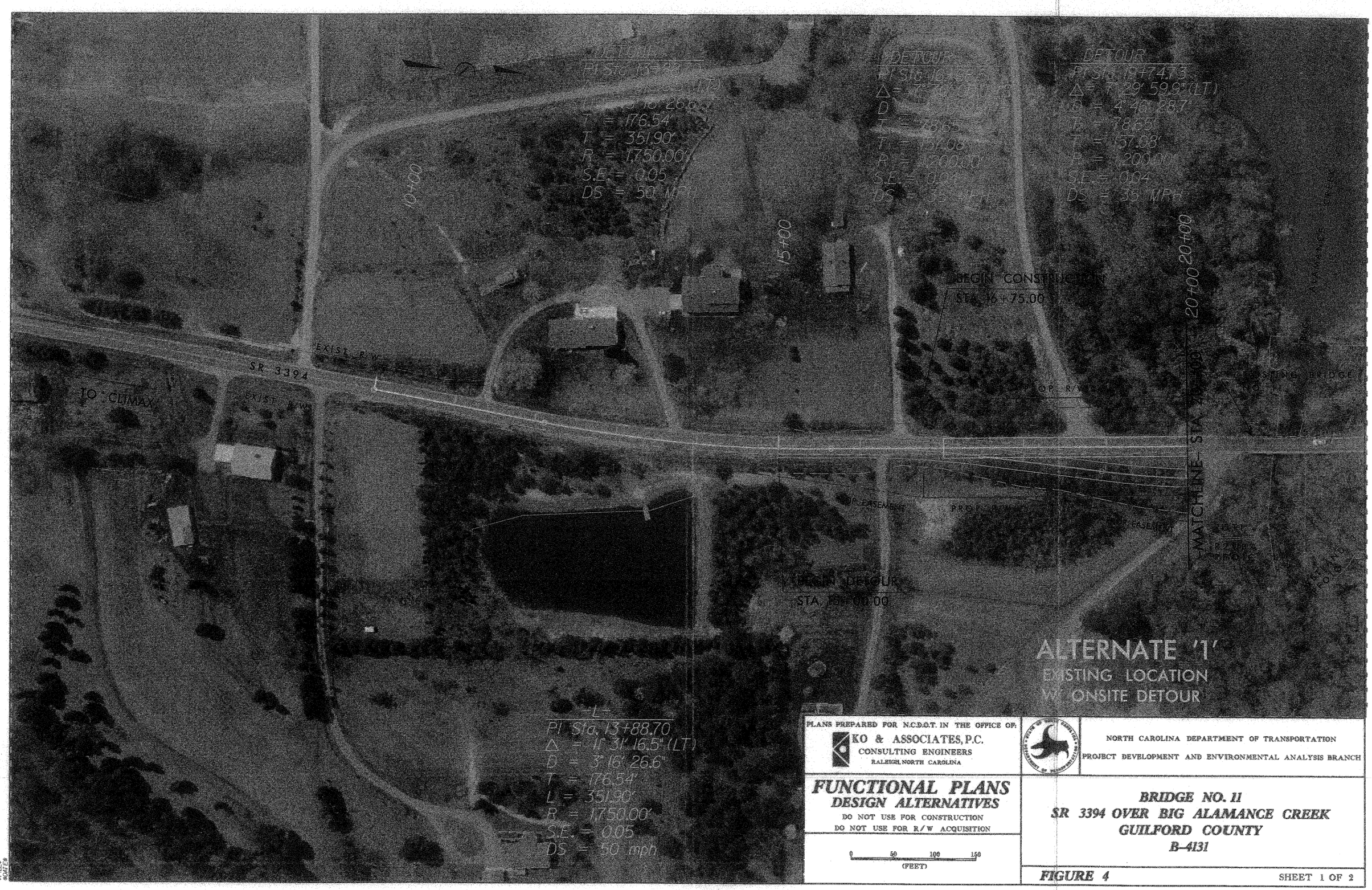
DETOUR APPROACH ROADWAY TYPICAL SECTION



DETOUR BRIDGE TYPICAL SECTION

NOTE:
HORIZONTAL & VERTICAL DESIGN EXCEPTIONS MAY BE REQUIRED.

PREPARED BY: KO & ASSOC. DATE: 02-04-04
REVISED BY: KO & ASSOC. DATE: 02-24-04
APPROVED BY: _____ DATE: _____



ALTERNATE '1'
EXISTING LOCATION W/ ONSITE DETOUR

PLANS PREPARED FOR N.C.D.O.T. IN THE OFFICE OF:
KO & ASSOCIATES, P.C.
CONSULTING ENGINEERS
RALEIGH, NORTH CAROLINA

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

FUNCTIONAL PLANS
DESIGN ALTERNATIVES
DO NOT USE FOR CONSTRUCTION
DO NOT USE FOR R/W ACQUISITION

0 50 100 150
(FEET)

BRIDGE NO. 11
SR 3394 OVER BIG ALAMANCE CREEK
GUILFORD COUNTY
B-4131

FIGURE 4

#FILE#
#DATE#

PLANS PREPARED FOR N.C.D.O.T. IN THE OFFICE OF:
KO & ASSOCIATES, P.C.
CONSULTING ENGINEERS
RALEIGH, NORTH CAROLINA

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

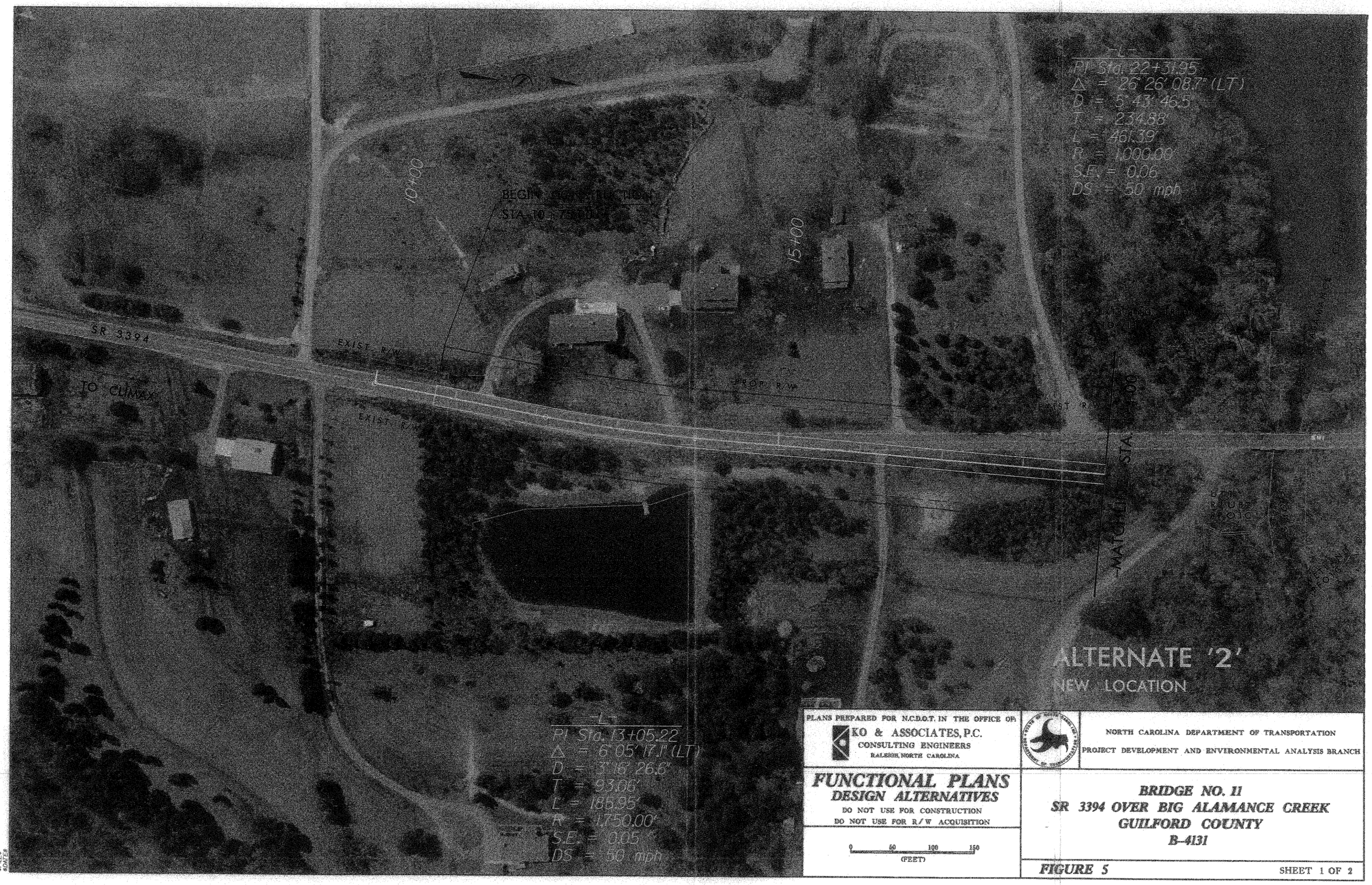
FUNCTIONAL PLANS
DESIGN ALTERNATIVES
DO NOT USE FOR CONSTRUCTION
DO NOT USE FOR R/W ACQUISITION

0 50 100 150
(FEET)

BRIDGE NO. 11
SR 3394 OVER BIG ALAMANCE CREEK
GUILFORD COUNTY
B-4131

FIGURE 4 SHEET 2 OF 2

#FILE#
#DATE#



ALTERNATE '2'
NEW LOCATION

PLANS PREPARED FOR N.C.D.O.T. IN THE OFFICE OF:
KO & ASSOCIATES, P.C.
CONSULTING ENGINEERS
RALEIGH, NORTH CAROLINA

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

FUNCTIONAL PLANS
DESIGN ALTERNATIVES
DO NOT USE FOR CONSTRUCTION
DO NOT USE FOR R/W ACQUISITION

0 50 100 150
(FEET)

BRIDGE NO. 11
SR 3394 OVER BIG ALAMANCE CREEK
GUILFORD COUNTY
B-4131

FIGURE 5 SHEET 1 OF 2

$FILE$
$DATE$

-L-
PI Sta. 22+31.95
Δ = 26° 26' 08.7" (LT)
D = 5° 43' 46.5"
T = 234.88'
L = 461.39'
R = 1,000.00'
S.E. = 0.06
DS = 50 mph

END CONSTRUCTION
STA. 28+25.00

TO US 421

SR 3394

EXIST. R/W

PROP. EASEMENT

PROP. R/W

EXIST. R/W

WETLAND 5
PEMIC

WETLAND 4
PEMIC

WETLAND 2
PEMIC
HQ WLB
UT2
R2UB2

WETLAND 1
PEMIC
HQ WLB

WETLAND 3
PEMIC
HQ WLB

PROP. BRIDGE
30' X 150'

-L- STA. 19+00

20+00

23+00

ALTERNATE '2'
NEW LOCATION

PLANS PREPARED FOR N.C.D.O.T. IN THE OFFICE OF:
KO & ASSOCIATES, P.C.
CONSULTING ENGINEERS
RALEIGH, NORTH CAROLINA

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

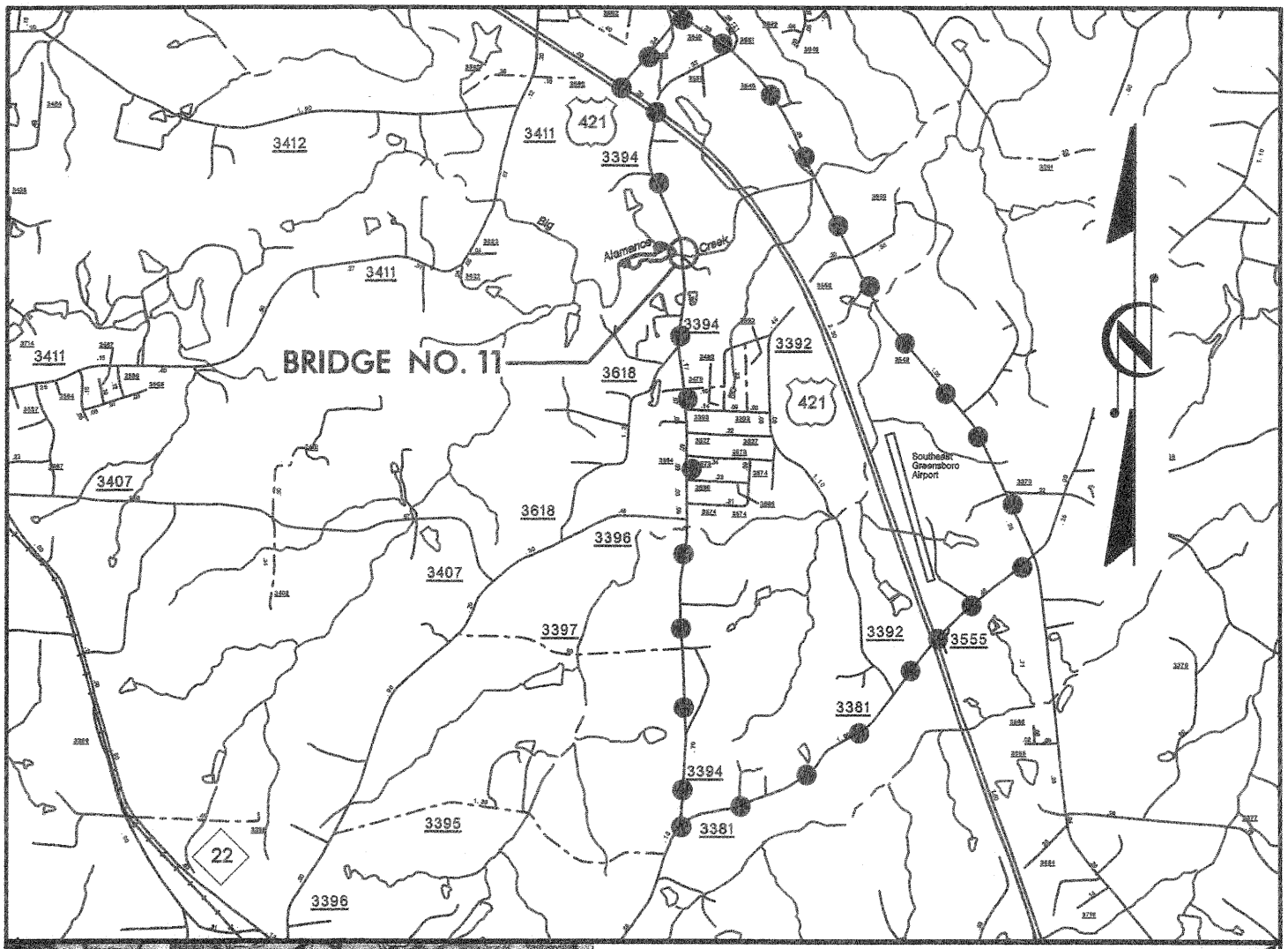
FUNCTIONAL PLANS
DESIGN ALTERNATIVES
DO NOT USE FOR CONSTRUCTION
DO NOT USE FOR R/W ACQUISITION

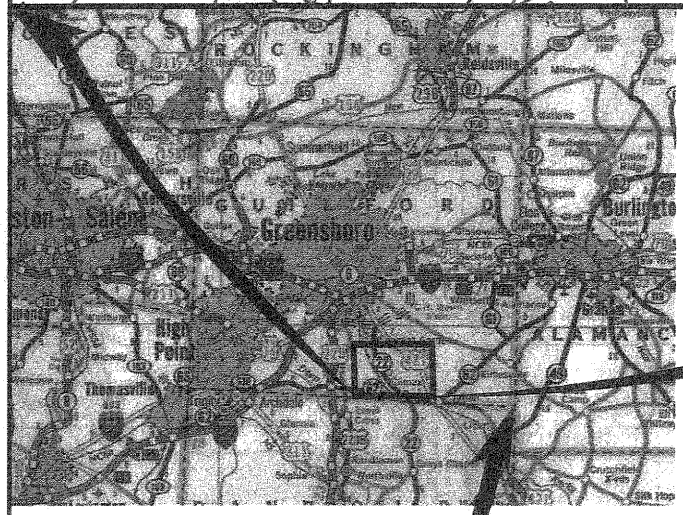
0 50 100 150
(FEET)

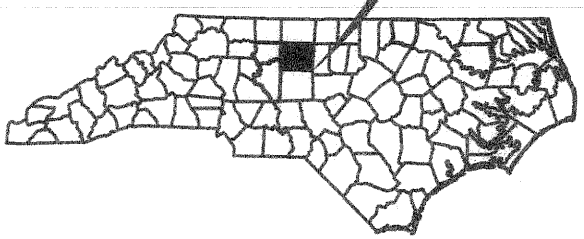
BRIDGE NO. 11
SR 3394 OVER BIG ALAMANCE CREEK
GUILFORD COUNTY
B-4131

FIGURE 5 SHEET 2 OF 2

$FILES
$DATE$







NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

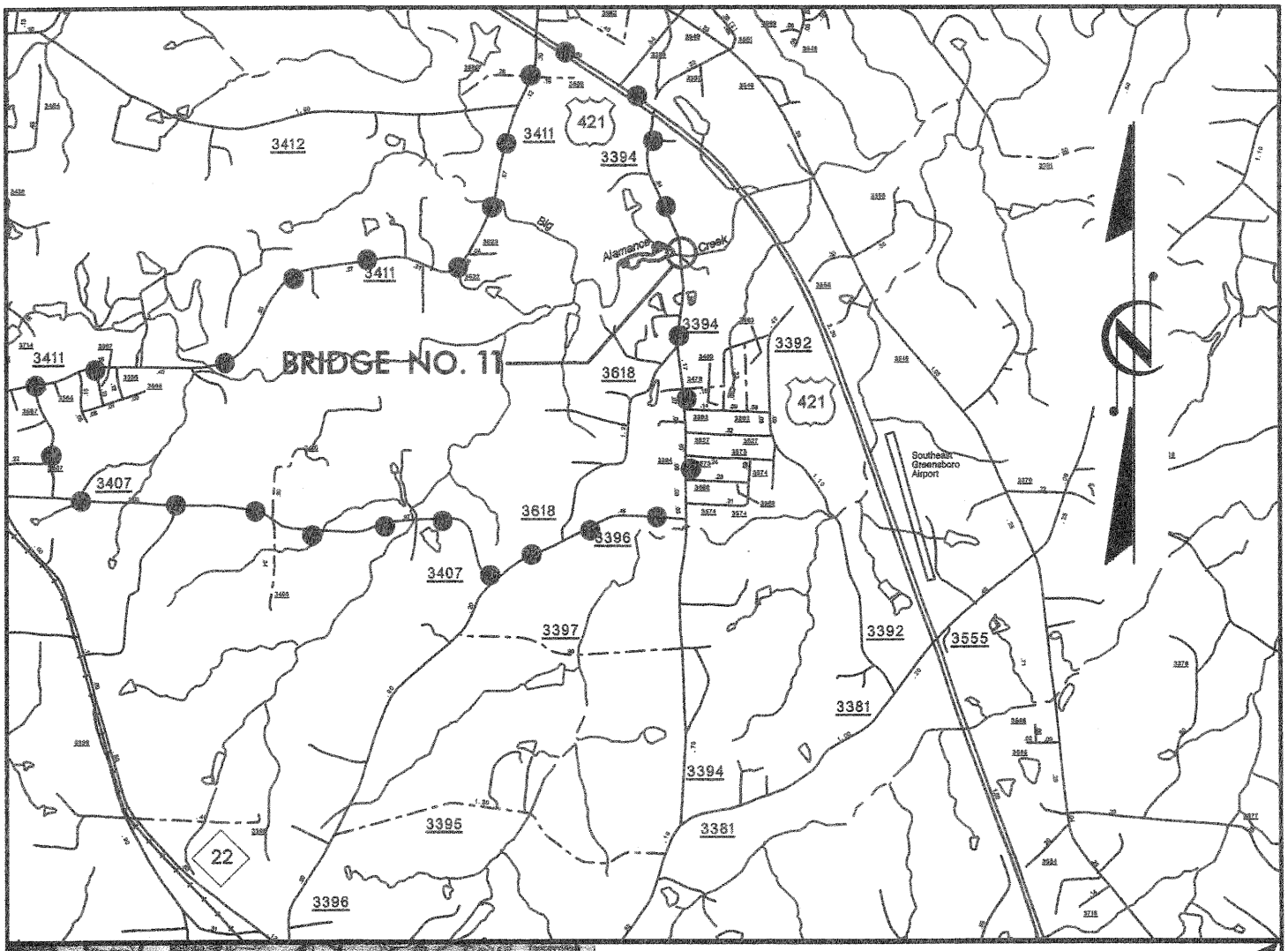
Project Development and Environmental Analysis Branch

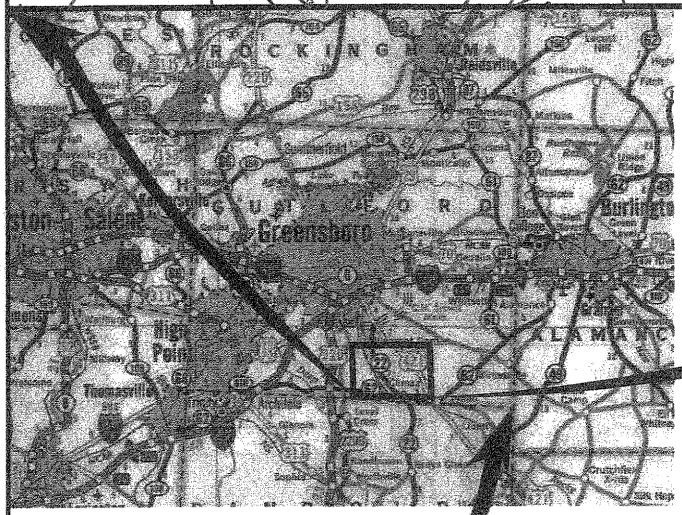
BRIDGE NO. 11
SR 3394 OVER BIG ALAMANCE CREEK
GUILFORD COUNTY
B-4131

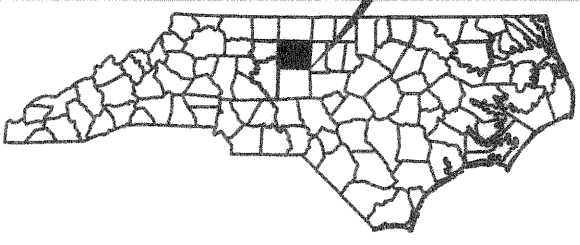
DETOUR MAP-A

0 0.5
GRAPHIC SCALE (MILES)

FIGURE 6A







NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

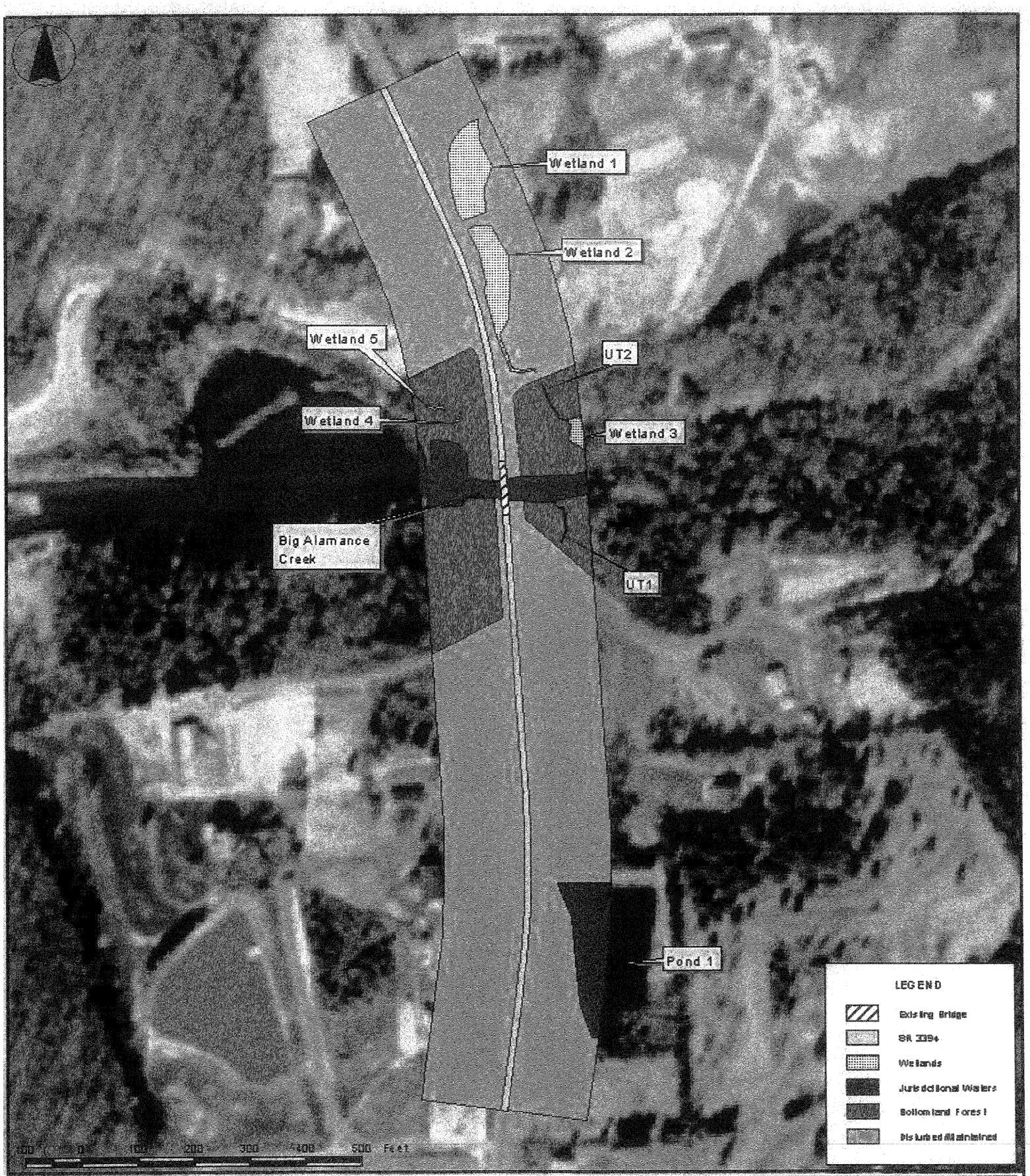
Project Development and Environmental Analysis Branch

BRIDGE NO. 11
SR 3394 OVER BIG ALAMANCE CREEK
GUILFORD COUNTY
B-4131

DETOUR MAP-B

0 0.5
GRAPHIC SCALE (MILES)

FIGURE 6B



EcoScience Corporation
Raleigh, North Carolina

Plant Communities

Dwn By:	TBA
Chk By:	TBA
Date:	MAY 2004
EBC Project No.:	04-185

FIGURE 7

Appendix

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

February 10, 2004

Dear :

Subject: Guilford County
B-4129, Bridge No. 226 on SR 3000 over Little Alamance Creek
B-4130, Bridge No. 228 on SR 3045 over Alamance Creek
B-4131, Bridge No. 11 on SR 3394 over Little Alamance Creek

The Project Development and Environmental Analysis Branch of the North Carolina Department of Transportation (NCDOT) has begun studying proposed improvements to the subject bridge replacement projects. The projects are included in the NCDOT's 2004-2010 Transportation Improvement Program and are scheduled for right-of-way in fiscal year 2005 and construction in fiscal year 2007.

B-4129, Bridge No. 226 on SR 3000 over Little Alamance Creek

The existing two-lane structure, constructed in 1952, crosses over Little Alamance Creek and is 63 feet long and 19 feet wide.

The following alternatives will be studied for this bridge project:

- Do-Nothing
- Rehabilitate the Existing Structure
- Replace on the east side maintaining traffic on the existing structure as an on-site detour.
- Replace on the west side maintaining traffic on the existing structure as an on-site detour.

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
1548 MAIL SERVICE CENTER
RALEIGH NC 27699-1548

TELEPHONE: 919-733-3141
FAX: 919-733-9794

WEBSITE: WWW.NCDOT.ORG

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC

B-4130, Bridge No. 228 on SR 3045 over Alamance Creek

The existing two-lane structure, constructed in 1950, crosses over Alamance Creek and is 105 feet long and 22.5 feet wide.

The following alternatives will be studied for this bridge project:

- Do-Nothing
- Rehabilitate the Existing Structure
- Replace on the east side maintaining traffic on the existing structure as an on-site detour
- Replace at existing location maintaining traffic with a temporary structure and detour on west side.
- Replace at existing location by closing the existing roadway and maintaining traffic with an off-site detour.

If the structure is replaced at its existing location utilizing an off-site detour route, SR 3045 will be closed to through traffic during the construction of the replacement structure. If you feel this would create undue travel hardships to the community please advise. Any comments regarding potential impacts to School Bus Routings and Emergency Response Units (fire, rescue, police, etc.) would be especially helpful.

B-4131, Bridge No. 11 on SR 3394 over Little Alamance Creek

The existing two-lane structure, constructed in 1957, crosses over Little Alamance Creek and is 97 feet long and 19.2 feet wide.

The following alternatives will be studied for this bridge project:

- Do-Nothing
- Rehabilitate the Existing Structure
- Replace on the east side maintaining traffic on the existing structure as an on-site detour.
- Replace at existing location maintaining traffic with a temporary structure and detour on east side.

We would appreciate any information you have that would be helpful in evaluating potential community and environmental impacts of the above projects. If applicable, please identify any permits and/or approvals required by your agency.

Please note that there will be no formal interagency scoping meeting for these projects. This letter constitutes solicitation for scoping comments related to the projects. It is desirable that you respond by March 31, 2004, so that your comments can be used in the preparation of a proposed Categorical Exclusion for the above projects. You may have previously been contacted concerning these bridge replacement projects, please note that the alternatives may have changed or additional alternatives may have been added.

If you have any questions concerning the projects, please contact Karen Taylor, P.E., Project Development Engineer, of this Branch at (919) 733-7844, extension 223.

Sincerely,

Gregory J. Thorpe, Ph.D.
Environmental Management Director
Project Development and
Environmental Analysis Branch

Attachments
KT/jw

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

March 3, 2004

Gregory Thorpe, Ph.D.
North Carolina Department of Transportation
Project Development and Environmental Analysis
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Dear Dr. Thorpe:

This letter is in response to your request for comments from the U.S. Fish and Wildlife Service (Service) on the potential environmental impacts of the proposed replacement of the following three bridges in Guilford County:

B-4129, Bridge No. 226 on SR 3000 over Little Alamance Creek
B-4130, Bridge No. 228 on SR 3045 over Alamance Creek
B-4131, Bridge No. 11 on SR 3394 over Little Alamance Creek

These comments provide scoping information in accordance with provisions of the Fish and Wildlife Coordination Act (16 U.S.C. 661-667d) and section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

For bridge replacement projects, the Service recommends the following general conservation measures to avoid or minimize environmental impacts to fish and wildlife resources:

1. Wetland, forest and designated riparian buffer impacts should be avoided and minimized to the maximum extent practical;

2. If unavoidable wetland impacts are proposed, every effort should be made to identify compensatory mitigation sites in advance. Project planning should include a detailed compensatory mitigation plan for offsetting unavoidable wetland impacts. Opportunities to protect mitigation areas in perpetuity via conservation easements, land trusts or by other means should be explored at the outset;

3. Off-site detours should be used rather than construction of temporary, on-site bridges. For projects requiring an on-site detour in wetlands or open water, such detours should be aligned along the side of the existing structure which has the least and/or least quality of fish and wildlife habitat. At the completion of construction, the detour area should be

entirely removed and the impacted areas be planted with appropriate vegetation, including trees if necessary;

4. Wherever appropriate, construction in sensitive areas should occur outside fish spawning and migratory bird nesting seasons. In waterways that may serve as travel corridors for fish, in-water work should be avoided during moratorium periods associated with migration, spawning and sensitive pre-adult life stages. The general moratorium period for anadromous fish is February 15 - June 30;

5. New bridges should be long enough to allow for sufficient wildlife passage along stream corridors;

6. Best Management Practices (BMP) for Protection of Surface Waters should be implemented;

7. Bridge designs should include provisions for roadbed and deck drainage to flow through a vegetated buffer prior to reaching the affected stream. This buffer should be large enough to alleviate any potential effects from run-off of storm water and pollutants;

8. The bridge designs should not alter the natural stream and stream-bank morphology or impede fish passage. To the extent possible, piers and bents should be placed outside the bank-full width of the stream;

9. Bridges and approaches should be designed to avoid any fill that will result in damming or constriction of the channel or flood plain. If spanning the flood plain is not feasible, culverts should be installed in the flood plain portion of the approach to restore some of the hydrological functions of the flood plain and reduce high velocities of flood waters within the affected area.

There is only one federally protected species listed for Guilford County - the bald eagle *(Haliaeetus leucocephalus)*. Although the North Carolina Natural Heritage Program (NCNHP) database does not indicate any known occurrences of this species near the project vicinity, use of the NCNHP data should not be substituted for actual field surveys if suitable habitat occurs near the project site. The NCNHP database only indicates the presence of known occurrences of federally protected species and does not necessarily mean that such species are not present. It may simply mean that the area has not been surveyed. Information about the habitats in which this species is often found is provided on our web site http://endangered.fws.gov/ . If suitable habitat occurs within the project vicinity for this species, surveys should be conducted to determine presence or absence of the species. All survey documentation must include survey methodologies and results.

We reserve the right to review any federal permits that may be required for this project, at the public notice stage. Therefore, it is important that resource agency coordination occur early in the planning process in order to resolve any conflicts that may arise and minimize delays in project implementation. In addition to the above guidance, we recommend that the environmental documentation for this project include the following in sufficient detail to facilitate a thorough review of the action:

1. A clearly defined and detailed purpose and need for the proposed project;

2. A description of the proposed action with an analysis of all alternatives being considered, including the "no action" alternative;

3. A description of the fish and wildlife resources, and their habitats, within the project impact area that may be directly or indirectly affected;

4. The extent and acreage of waters of the U.S., including wetlands, that are to be impacted by filling, dredging, clearing, ditching, or draining. Acres of wetland impact should be differentiated by habitat type based on the wetland classification scheme of the National Wetlands Inventory (NWI). Wetland boundaries should be determined by using the 1987 Corps of Engineers Wetlands Delineation Manual and verified by the U.S. Army Corps of Engineers;

5. The anticipated environmental impacts, both temporary and permanent, that would be likely to occur as a direct result of the proposed project. The assessment should also include the extent to which the proposed project would result in secondary impacts to natural resources, and how this and similar projects contribute to cumulative adverse effects;

6. Design features and construction techniques which would be employed to avoid or minimize impacts to fish and wildlife resources, both direct and indirect, and including fragmentation and direct loss of habitat;

7. If unavoidable wetland or stream impacts are proposed, project planning should include a detailed compensatory mitigation plan for offsetting the unavoidable impacts.

The Service appreciates the opportunity to comment on this project. Please continue to advise us during the progression of the planning process, including your official determination of the impacts of this project. If you have any questions regarding our response, please contact Mr. Gary Jordan at (919) 856-4520, ext. 32.

Sincerely,

Garland B. Pardue, Ph.D.
Ecological Services Supervisor

cc: John Thomas, USACE, Raleigh, NC
Beth Barnes, NCDWQ, Raleigh, NC
Travis Wilson, NCWRC, Creedmoor, NC
Chris Militscher, USEPA, Raleigh, NC

North Carolina Wildlife Resources Commission

Charles R. Fullwood, Executive Director

MEMORANDUM

TO: Karen Taylor
Project Development and Environmental Analysis Branch, NCDOT

FROM: Travis Wilson, Highway Project Coordinator
Habitat Conservation Program

DATE: March 19, 2004

SUBJECT: NCDOT Bridge Replacements in Rockingham, Randolph, and Guilford counties. TIP Nos. B-4252, B-4254, B-4243, B-4244, B-4246, B-4129, B-4130, and B-4131.

Biologists with the N. C. Wildlife Resources Commission (NCWRC) have reviewed the information provided and have the following preliminary comments on the subject project. Our comments are provided in accordance with provisions of the National Environmental Policy Act (42 U.S.C. 4332(2)(c)) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667d).

Our standard recommendations for bridge replacement projects of this scope are as follows:

1. We generally prefer spanning structures. Spanning structures usually do not require work within the stream and do not require stream channel realignment. The horizontal and vertical clearances provided by bridges allows for human and wildlife passage beneath the structure, does not block fish passage, and does not block navigation by canoeists and boaters.

2. Bridge deck drains should not discharge directly into the stream.

3. Live concrete should not be allowed to contact the water in or entering into the stream.

4. If possible, bridge supports (bents) should not be placed in the stream.

5. If temporary access roads or detours are constructed, they should be removed back to original ground elevations immediately upon the completion of the project. Disturbed areas should be seeded or mulched to stabilize the soil and native tree species should be planted with a spacing of not more than 10'x10'. If possible, when using temporary structures the area should be cleared but not grubbed. Clearing the area with chain saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact, allows the area to revegetate naturally and minimizes disturbed soil.

6. A clear bank (riprap free) area of at least 10 feet should remain on each side of the steam underneath the bridge.

7. In trout waters, the N.C. Wildlife Resources Commission reviews all U.S. Army Corps of Engineers nationwide and general '404' permits. We have the option of requesting additional measures to protect trout and trout habitat and we can recommend that the project require an individual '404' permit.

8. In streams that contain threatened or endangered species, NCDOT biologist Mr. Logan Williams should be notified. Special measures to protect these sensitive species may be required. NCDOT should also contact the U.S. Fish and Wildlife Service for information on requirements of the Endangered Species Act as it relates to the project.

9. In streams that are used by anadromous fish, the NCDOT official policy entitled "Stream Crossing Guidelines for Anadromous Fish Passage (May 12, 1997)" should be followed.

10. In areas with significant fisheries for sunfish, seasonal exclusions may also be recommended.

11. Sedimentation and erosion control measures sufficient to protect aquatic resources must be implemented prior to any ground disturbing activities. Structures should be maintained regularly, especially following rainfall events.

12. Temporary or permanent herbaceous vegetation should be planted on all bare soil within 15 days of ground disturbing activities to provide long-term erosion control.

13. All work in or adjacent to stream waters should be conducted in a dry work area. Sandbags, rock berms, cofferdams, or other diversion structures should be used where possible to prevent excavation in flowing water.

14. Heavy equipment should be operated from the bank rather than in stream channels in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into streams.

15. Only clean, sediment-free rock should be used as temporary fill (causeways), and should be removed without excessive disturbance of the natural stream bottom when construction is completed.

16. During subsurface investigations, equipment should be inspected daily and maintained to prevent contamination of surface waters from leaking fuels, lubricants, hydraulic fluids, or other toxic materials.

If corrugated metal pipe arches, reinforced concrete pipes, or concrete box culverts are used:

1. The culvert must be designed to allow for aquatic life and fish passage. Generally, the culvert or pipe invert should be buried at least 1 foot below the natural streambed (measured from the natural thalweg depth). If multiple barrels are required, barrels other than the base flow barrel(s) should be placed on or near stream bankfull or floodplain bench elevation (similar to Lyonsfield design). These should be reconnected to floodplain benches as appropriate. This may be accomplished by utilizing sills on the upstream and downstream ends to restrict or divert flow to the base flow barrel(s). Silled barrels should be filled with sediment so as not to cause noxious or mosquito breeding conditions. Sufficient water depth should be provided in the base flow barrel(s) during low flows to accommodate fish movement. If culverts are longer than 40-50 linear feet, alternating or notched baffles should be installed in a manner that mimics existing stream pattern. This should enhance aquatic life passage: 1) by depositing sediments in the barrel, 2) by maintaining channel depth and flow regimes, and 3) by providing resting places for fish and other aquatic organisms. In essence, base flow barrel(s) should provide a continuum of water depth and channel width without substantial modifications of velocity.

2. If multiple pipes or cells are used, at least one pipe or box should be designed to remain dry during normal flows to allow for wildlife passage.

3. Culverts or pipes should be situated along the existing channel alignment whenever possible to avoid channel realignment. Widening the stream channel must be avoided. Stream channel widening at the inlet or outlet end of structures typically decreases water velocity causing sediment deposition that requires increased maintenance and disrupts aquatic life passage.

4. Riprap should not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures should be professionally designed, sized, and installed.

In most cases, we prefer the replacement of the existing structure at the same location with road closure. If road closure is not feasible, a temporary detour should be designed and located to avoid wetland impacts, minimize the need for clearing and to avoid destabilizing stream banks. If the structure will be on a new alignment, the old structure should be removed and the approach fills removed from the 100-year floodplain. Approach fills should be removed down to the natural ground elevation. The area should be stabilized with grass and planted with native tree species. If the area reclaimed was previously wetlands, NCDOT should restore the area to wetlands. If successful, the site may be utilized as mitigation for the subject project or other projects in the watershed.

Project specific comments:

1. B-4252, Rockingham County, Bridge No. 67 over Little Beaver Creek and Bridge No. 95 over Big Beaver Creek on US 311. We recommend replacing this bridge with a bridge. A significant fishery for sunfish exists at the Big Beaver Creek site, therefore we request an in-water work moratorium for sunfish from April 1 to June 30. Standard recommendations apply.

2. B-4254, Rockingham County, Bridge No. 89 over Little Troublesome Creek on SR 2627. We recommend replacing this bridge with a bridge. A significant fishery for sunfish

exists at this site, therefore we request an in-water work moratorium for sunfish from April 1 to June 30. Standard recommendations apply.

3. B-4243, Randolph County, Bridge No. 71 over Reek Creek on SR 1504. We recommend replacing this bridge with a bridge. Standard recommendations apply.

4. B-4244, Randolph County, Bridge No. 140 over Gabriels Creek on SR 2215. We recommend replacing this bridge with a bridge. Standard recommendations apply.

5. B-4246, Randolph County, Bridge No. 228 over Richland Creek on SR 2834. We recommend replacing this bridge with a bridge. Standard recommendations apply.

6. B-4129, Guilford County, Bridge No. 226 over Little Alamance Creek on SR 3000. We recommend replacing this bridge with a bridge. A significant fishery for sunfish exists at this site, therefore we request an in-water work moratorium for sunfish from April 1 to June 30. Standard recommendations apply.

7. B-4130, Guilford County, Bridge No. 228 over Alamance Creek on SR 3045. We recommend replacing this bridge with a bridge. A significant fishery for sunfish exists at this site, therefore we request an in-water work moratorium for sunfish from April 1 to June 30. Standard recommendations apply.

8. B-4131, Guilford County, Bridge No. 11 over Little Alamance Creek on SR 3394. We recommend replacing this bridge with a bridge. A significant fishery for sunfish exists at this site, therefore we request an in-water work moratorium for sunfish from April 1 to June 30. Standard recommendations apply.

NCDOT should routinely minimize adverse impacts to fish and wildlife resources in the vicinity of bridge replacements. Restoring previously disturbed floodplain benches should narrow and deepen streams previously widened and shallowed during initial bridge installation. NCDOT should install and maintain sedimentation control measures throughout the life of the project and prevent wet concrete from contacting water in or entering into these streams. Replacement of bridges with spanning structures of some type, as opposed to pipe or box culverts, is recommended in most cases. Spanning structures allow wildlife passage along streambanks and reduce habitat fragmentation.

If you need further assistance or information on NCWRC concerns regarding bridge replacements, please contact me at (919) 528-9886. Thank you for the opportunity to review and comment on these projects.

Cc: Gary Jordan, U.S. Fish and Wildlife Service, Raleigh

Michael F. Easley, Governor
William G. Ross Jr., Secretary
North Carolina Department of Environment and Natural Resources

Alan W. Klimek, P.E., Director
Division of Water Quality
Coleen H. Sullins, Deputy Director
Division of Water Quality

March 24, 2004

MEMORANDUM

TO: Gregory J. Thorpe, PhD, Director
NCDOT Project Development and Environmental Analysis Branch

FROM: Robert Ridings, Env. Tech., DWQ 401 Unit

THROUGH: John Hennessy, Supervisor, DWQ 401 Transportation Unit

SUBJECT: Scoping Review of NCDOT's proposed bridge replacement projects: B-4281, B-4112, B-4252, B-4254, B-4100, B-4101, B-4243, B-4244, B-4246, B-4104, B-4129, B-4130, B-4131.

In reply to your correspondence dated February 10, 2004 (received February 18, 2004) to Cynthia Van der Wiele, in which you requested comments for the referenced projects, the NC Division of Water Quality has the following comments:

I. General Comments Regarding Bridge Replacement Projects

1. If corrugated metal pipe arches, reinforced concrete pipes, or concrete box culverts are used to replace the bridge, then DWQ recommends the use of Nationwide Permit No. 14 rather than Nationwide Permit 23.

2. Bridge demolition should be performed using Best Management Practices developed by NCDOT.

3. DWQ prefers spanning structures. Spanning structures usually do not require work within the stream and do not require stream channel realignment. The horizontal and vertical clearances provided by bridges allows for human and wildlife passage beneath the structure, does not block fish passage, and does not block navigation by canoeists and boaters.

4. Bridge deck drains should not discharge directly into the stream; stormwater should be directed across the bridge and pre-treated through site-appropriate means (grassed swales, pre-formed scour holes, vegetated buffers, etc.) before entering the stream. Please refer to NCDOT Best Management Practices for the Protection of Surface Waters

5. Live concrete should not be allowed to contact the water in or entering into the stream. Concrete is mostly made up of lime (calcium carbonate) and when in a dry or wet state (not hardened) calcium carbonate is very soluble in water and has a pH of approximately 12. In an unhardened state concrete or cement will change the pH of fresh water to very basic and will cause fish and other macroinvertebrate kills.

6. If possible, bridge supports (bents) should not be placed in the stream.

7. If temporary access roads or detours are constructed, they should be removed back to original ground elevations immediately upon the completion of the project. Disturbed areas should be seeded or mulched to stabilize the soil and native tree species should be planted with a spacing of not more than 10'x10'. If possible, when using temporary structures the area should be cleared but not grubbed. Clearing the area with chain saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact, allows the area to re-vegetate naturally and minimizes disturbed soil.

8. A clear bank (rip rap-free) area of at least 10 feet should remain on each side of the steam underneath the bridge.

9. Sedimentation and erosion control measures sufficient to protect water resources must be implemented prior to any ground disturbing activities. Structures should be *maintained regularly*, especially following rainfall events.

10. Bare soil should be stabilized through vegetation or other means as quickly as feasible to prevent sedimentation of water resources.

11. All work in or adjacent to stream waters should be conducted in a dry work area. Sandbags, rock berms, cofferdams, or other diversion structures should be used where possible to prevent excavation in flowing water.

12. Heavy equipment should be operated from the bank rather than in stream channels in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into streams. This equipment should be inspected daily and maintained to prevent contamination of surface waters from leaking fuels, lubricants, hydraulic fluids, or other toxic materials.

II. General Comments if Replacing the Bridge with a Culvert

1. The culvert must be designed to allow for aquatic life and fish passage. Generally, the culvert or pipe invert should be buried at least 1 foot below the natural streambed (measured from the natural thalweg depth). If multiple barrels are required, barrels other than the base flow barrel(s) should be placed on or near stream bankfull or floodplain bench elevation (similar to Lyonsfield design). These should be reconnected to floodplain benches as appropriate. This may be accomplished by utilizing sills on the upstream end to restrict or divert flow to the base flow barrel(s). Silled barrels should be filled with sediment so as not to cause noxious or mosquito breeding conditions. Sufficient water depth should be provided in the base flow barrel during low flows to accommodate fish movement. If culverts are longer than 40-50 linear feet, alternating or notched baffles should be installed in a manner that mimics existing stream pattern. This should enhance aquatic life passage: 1) by depositing sediments in the barrel, 2) by maintaining channel depth and flow regimes, and 3) by providing resting places for fish and other aquatic organisms. In essence, the base flow barrel(s) should provide a continuum of water depth and channel width without substantial modifications of velocity.

2. If multiple pipes or cells are used, at least one pipe or box should be designed to remain dry during normal flows to allow for wildlife passage.

3. Culverts or pipes should be situated along the existing channel alignment whenever possible to avoid channel realignment. Widening the stream channel must be avoided. Stream channel widening at the inlet or outlet end of structures typically decreases water velocity causing sediment deposition that requires increased maintenance and disrupts aquatic life passage.

4. Riprap should not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures should be professionally designed, sized, and installed.

In most cases, we prefer the replacement of the existing structure at the same location with road closure. If road closure is not feasible, a temporary detour should be designed and located to avoid wetland impacts, minimize the need for clearing and to avoid destabilizing stream banks. If the structure will be on a new alignment, the old structure should be removed and the approach fills removed from the 100-year floodplain. Approach fills should be removed down to the natural ground elevation. The area should be stabilized with grass and planted with native tree species. Tall fescue should not be used in riparian areas. If the area that is reclaimed was previously wetlands, NCDOT should restore the area to wetlands. If successful, the site may be used as wetland mitigation for the subject project or other projects in the watershed.

III. Project-Specific Comments

B-4281, Bridge 60, Dan River, Stokes County
Dan River is classified as C Trout and is in the Roanoke River Basin. A moratorium prohibiting in-stream wo and land disturbance within the 25-foot trout buffer is recommended from October 15 to April 15 to protect the egg and fry stages of trout. DWQ would prefer this bridge to be replaced with a bridge and the use of BMPs (particularly for sediment and erosion control) to be maximized.

B-4112, Bridge 30, Muddy Creek, Forsyth County
Muddy Creek is classified as C and is in the Yadkin River Basin. DWQ has no special concerns with this proje Please refer to general recommendations listed above.

B-4252, Bridges 67 and 95, Little Beaver and Big Beaver Creeks, Rockingham County
Little Beaver and Big Beaver Creeks are both classified as C and are in the Roanoke River Basin. DWQ has nc special concerns with this project.

B-4254, Bridge 89, Little Troublesome Creek, Rockingham County
Little Troublesome Creek is listed as C NSW and is in the Cape Fear River Basin. It is a 303(d) listed water. NCDOT shall maximize the use of Best Management Practices for all work crossing or draining to the Critical Area of the Water Supply Watershed and 303(d)-listed waters. In addition, NCDOT shall strictly adhere to "Design Standards in Sensitive Watersheds" (15A NCAC 04B .0124).

B-4100 and B-4101, Bridges 142 and 141, Abbotts Creek, Davidson County
Abbotts Creek is listed as WS-III water supply stream and is in the Yadkin River Basin. There are 30-foot vegetated buffer requirements in WS waters in addition to the requirements to minimize storm water runoff and maximize use of BMPs. Refer to 15A NCAC 2B .0216(3)(b)(i)(F) and (G).

B-4243, Bridge 71, Hasketts Creek, Randolph County
Hasketts Creek is listed as C and is in the Cape Fear River Basin. It is a 303(d) listed water. NCDOT shall maximize the use of Best Management Practices for all work crossing or draining to the Critical Area of the Water Supply Watershed and 303(d)-listed waters. In addition, NCDOT shall strictly adhere to "Design Standards in Sensitive Watersheds" (15A NCAC 04B .0124).

B-4244, Bridge 140, Gabriels Creek, Randolph County
Gabriels Creek is listed as C and is in the Cape Fear River Basin. DWQ has no special concerns for this project

B-4246, Bridge 228, Richland Creek, Randolph County
Richland Creek is listed as C and is in the Cape Fear River Basin. It is a 303(d) listed water. NCDOT shall maximize the use of Best Management Practices for all work crossing or draining to the Critical Area of the Water Supply Watershed and 303(d)-listed waters. In addition, NCDOT shall strictly adhere to "Design Standards in Sensitive Watersheds" (15A NCAC 04B .0124).

B-4104, Bridge 21, Carter Creek, Davie County
Carter Creek is listed as WS-IV and is in the Yadkin River Basin. There are 30-foot vegetated buffer requirements in WS waters in addition to the requirements to minimize storm water runoff and maximize use of BMPs. Refer to 15A NCAC 2B .0216(3)(b)(i)(F) and (G).

B-4129, Bridge 226, Little Alamance Creek, Guilford County

Little Alamance Creek is listed as WS-IV NSW CA and is in the Cape Fear River Basin. There are 30-foot vegetated buffer requirements in WS waters in addition to the requirements to minimize storm water runoff an maximize use of BMPs. Refer to 15A NCAC 2B .0216(3)(b)(i)(F) and (G). Since the project is located withir the Critical Area of a water supply watershed, hazardous spill catch basins may be required for this project bas on traffic count, percent truck traffic or proximity to industries transporting hazardous materials. The project shall incorporate the requirements for WS-IV Waters within the critical area as specified in 15A NCAC 2B .02 (i.e., stormwater management, sedimentation and erosion control, and buffers).

B-4130, Bridge 228, Alamance Creek, Guilford County

Alamance Creek is listed as WS-IV NSW CA and is in the Cape Fear River Basin. There are 30-foot vegetated buffer requirements in WS waters in addition to the requirements to minimize storm water runoff and maximiz use of BMPs. Refer to 15A NCAC 2B .0216(3)(b)(i)(F) and (G). Since the project is located within the Critic Area of a water supply watershed, hazardous spill catch basins may be required for this project based on traffic count, percent truck traffic or proximity to industries transporting hazardous materials. The project shall incorporate the requirements for WS-IV Waters within the critical area as specified in 15A NCAC 2B .0215 (i. stormwater management, sedimentation and erosion control, and buffers).

B-4131, Bridge 11, Little Alamance Creek, Guilford County

Little Alamance Creek is listed as WS-IV NSW CA and is in the Cape Fear River Basin. There are 30-foot vegetated buffer requirements in WS waters in addition to the requirements to minimize storm water runoff an maximize use of BMPs. Refer to 15A NCAC 2B .0216(3)(b)(i)(F) and (G). Since the project is located withir the Critical Area of a water supply watershed, hazardous spill catch basins may be required for this project bas on traffic count, percent truck traffic or proximity to industries transporting hazardous materials. The project shall incorporate the requirements for WS-IV Waters within the critical area as specified in 15A NCAC 2B .02 (i.e., stormwater management, sedimentation and erosion control, and buffers).

Thank you for requesting our input at this time. The DOT is reminded that issuance of a 401 Water Quality Certification requires that appropriate measures be instituted to ensure that water quality standards are met and designated uses are not degraded or lost. If you have any questions or require additional information, please contact Robert Ridings at (919) 733-9817 or Cynthia Van der Wiele at (919) 733-5715.

cc: USACE Raleigh Field Office
File Copy

North Carolina Department of Cultural Resources

State Historic Preservation Office

Peter B. Sandbeck, Administrator

September 13, 2005

MEMORANDUM

TO: Matt Wilkerson
Office of Human Environment
NCDOT Division of Highways

FROM: Peter Sandbeck RGE for Peter Sandbeck

SUBJECT: Replacement of Bridge No. 11 on SR 3394 over Little Alamance Creek, B-4131, Guilford County, ER 04-0478

On September 8, 2005, Paul Mohler of your staff and Dolores Hall of the Office of State Archaeology met to examine the plans for the proposed replacement of Bridge No. 11 and potential effects to site 31GF326** (Field-Company Mill) which has been determined eligible for inclusion in the National Register of Historic Places.

The plans indicate that the bridge will be replaced in place and a detour structure will be constructed east of the existing bridge. As site 31GF326** is located west of the existing bridge, we concur that the site will not be affected by the proposed replacement and recommend no additional archaeological investigation in connection with this project.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763. In all future communication concerning this project, please cite the above-referenced tracking number.

cc: Paul Mohler, NCDOT

	Location	Mailing Address	Telephone/Fax
ADMINISTRATION	507 N. Blount Street, Raleigh NC	4617 Mail Service Center, Raleigh NC 27699-4617	(919)733-4763/733-8653
RESTORATION	515 N. Blount Street, Raleigh NC	4617 Mail Service Center, Raleigh NC 27699-4617	(919)733-6547/715-4801
SURVEY & PLANNING	515 N. Blount Street, Raleigh, NC	4617 Mail Service Center, Raleigh NC 27699-4617	(919)733-6545/715-4801

North Carolina Department of Cultural Resources

State Historic Preservation Office

Peter B. Sandbeck, Administrator

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

August 24, 2005

MEMORANDUM

TO: Matt Wilkerson, Archaeology Supervisor
NC Department of Transportation

FROM: Peter Sandbeck PBS for Peter Sandbeck

SUBJECT: Archaeological Site Evaluation, 31GF326**, Field-Company Mill Replacement of Bridge No. 11 on SR 3394 over Big Alamance Creek, B-4131, Guilford County, ER 04-0478

Thank you for your letter of May 2, 2005, transmitting the archaeological site evaluation report by Lee Tippett and Philip Pendleton of The Louis Berger Group, Inc. for the above project. We apologize for the delay in our response.

For purposes of compliance with Section 106 of the National Historic Preservation Act, we concur that the following property is eligible for the National Register of Historic Places under criterion A and D:

31GF326, Field-Company Mill Site**

This site is significant for its contributions to the broad patterns of the local economic history and industrial development and has the potential to yield information important in the study of the design and operation of early to mid-nineteenth century grain and saw mills.

The following property is determined not eligible for listing in the National Register of Historic Places:

31GF434

This isolated find retains no integrity or potential to yield important information.

The report meets our office's guidelines and those of the Secretary of the Interior. Specific concerns and/or corrections which need to be addressed in the preparation of a final report are attached for the author's use.

We recommend that project plans be forwarded to our office as soon as they are available so we can consult with your staff regarding effects of the proposed bridge replacement project on 31GF326**.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act of 1966, the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106, codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comments, please contact Ms. Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763. In all future communication concerning this project, please cite the above referenced tracking number.

Enclosure

cc: Paul Mohler, NCDOT
Lee Tippett, The Louis Berger Group, Inc.

North Carolina Department of Cultural Resources
State Historic Preservation Office

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary
Jeffrey J. Crow, Deputy Secretary
Office of Archives and History

March 26, 2004

MEMORANDUM

TO: Gregory J. Thorpe, Ph.D., Director
Project Development and Environmental Analysis Branch
NCDOT Division of Highways

FROM: David Brook DSE/or David Brook
Deputy State Historic Preservation Officer

SUBJECT: Replacement of Bridge No. 11 on SR 3394 over Little Alamance Creek, B-4131, Guilford County, ER04-0478

Thank you for your letter of February 10, 2004, concerning the above project.

We have determined that the project as proposed will not affect any historic structures.

Archaeological site 31GF326**, Company Mill, consists of a large well-preserved stone dam and the ruins of a wooden frame mill on the south end of the dam. This site was first recorded in 1991 by Thomas Hargrove but has not been evaluated as to its eligibility for inclusion in the National Register of Historic Places. The proposed bridge replacement is likely to affect this archaeological site, so we recommend that the site be tested to evaluate its significance. Historical research concerning the ownership and occupation of the mill site should also be undertaken. According to Mr. Hargrove's 1991 report, local tradition indicates that the mill was once owned by Governor John Motley Morehead.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763. In all future communication concerning this project, please cite the above-referenced tracking number.

cc: Mary Pope Furr, NCDOT
Matt Wilkerson, NCDOT

GUILFORD COUNTY SCHOOLS

March 11, 2004

MEMORANDUM

TO: Gregory J. Thorpe, Ph.D.
Project Development & Environmental Analysis Branch
NCDOT
1548 Mail Service Center
Raleigh, NC 27699-1548

FROM: Jeff Harris
Program Administrator II – TIMS Coordinator

SUBJECT: Effects on Guilford County School Buses in Relation to Bride Replacement Project for Bridge No. 11 on SR 3394 over Little Alamance Creek,
TIP No. B-4131

The purpose of this memo is to respond with the impacts to school bus routing in regard to the above named bridge replacement project. Transportation routing software, TIMS, was used to compile data concerning the number of crossings by buses daily and alternate routes available.

Data indicates that arranged school bus routes cross the above named bridge 19 times daily. These routes should only experience a minute time deviation if the existing bridge is not entirely closed. Previous documentation was sent on November 08, 2002 outlining the circumstances if the existing bridge was closed, causing a detour situation. I've enclosed a copy of this documentation.

In summary, the above named bridge replacement project will not present an unworkable problem for the Guilford County Schools Transportation Department. All routes involved will have minimal impact for which a solution can be developed.

B U I L D I N G F U T U R E S
131 Franklin Boulevard Greensboro, NC 27401
Phone (336) 370-8920 Fax (336) 370-8930

GUILFORD COUNTY SCHOOLS

November 8, 2002

MEMORANDUM

TO: William T. Goodwin, Jr. PE
Project Development & Environmental Analysis Branch
NCDOT
1548 Mail Service Center
Raleigh, NC 27699-1548

FROM: Jeff Harris
Program Administrator II – TIMS Coordinator

SUBJECT: Effects on Guilford County School Buses in Relation to Bride Replacement Project for Bridge No. 11 on SR 3394 over Little Alamance Creek, Federal Aid Project No. BRZ-3394(1), State Project No. 8.2497901, TIP No. B-4131

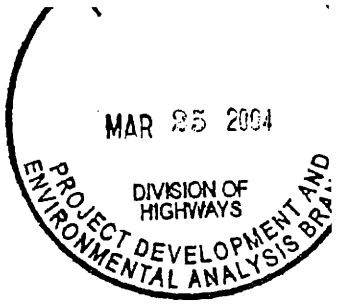
The purpose of this memo is to respond with the impacts to school bus routing in regard to the above named bridge replacement project. Transportation routing software, TIMS, was used to compile data concerning the number of crossings by buses daily and alternate routes available.

Data indicates that arranged school bus routes cross the above named bridge 19 times daily. It would be necessary to reroute all buses using the following roads as detours: Liberty Rd, Monnett Rd and Hagan Stone Park Rd. Detours or rerouting would increase the route time by up to 20 minutes per route, due to the distance required to travel back to the original origin of the bus route.

Currently, bus stops are located at addresses that would not be accessible if the bridge was closed, unless driveways on either side of the bridge could be utilized as turnaround locations. For the addresses located north of the bridge, a driveway with ample room to turn a bus around is located at 6329 Company Mill Rd. This driveway is approximately 30 feet north of the bridge. If this option is not possible, a second turnaround location could be made at 6209 Company Mill Rd. All students would be required to meet the bus at this location. The turnaround location that offers ample room for the addresses located south of the bridge and north of Mowery Rd is at 6342 Company Mill Rd. This driveway is approximately 60 feet south of the bridge. If this option were not possible, students would be required to meet the bus at Mowery Rd and Company Mill Rd.

The greatest impact on the bus routes would be additional time added to the routes and if the turnaround locations mentioned above are accessible. Other minor impacts would include the rearrangement of the stop order, reassignment of stops to other buses and possible earlier or later pickup times for students.

In summary, the above named bridge replacement project will not present an unworkable problem for the Guilford County Schools Transportation Department. All routes involved will have some level of impact for which a solution can be developed.



GUILFORD COUNTY
COMMUNITY DEVELOPMENT DEPARTMENT

March 22, 2004

Gregory J. Thorpe, Ph.D.
Project Development and
Environmental Analysis Branch
North Carolina Department of Transportation
1548 Mail Service Center
Raleigh, NC 27699-1548

Dear Mr. Thorpe:

The following comments and attachments are offered for your consideration by the Guilford County Community Development Department, Planning and Zoning Section, concerning **NCDOT's Bridge Projects B-4129, B4130, and B-4131:**

A) **B-4129,** Bridge No. 226 on SR 3000 over Little Alamance Creek and **B4130,** Bridge No. 228 on SR 3045 over Alamance Creek.

1) Although minor delays may occur, replacement or repair is the preferred alternative for these bridges. The Do-Nothing Alternative could have a negative consequence in the future when considering growth pressures occurring in this portion of Guilford County.

2) Residential growth in this portion of Guilford County has increased over the last several years placing more demand on McConnell, Millstream, and Mount Hope Church Roads. (See attachment title "Eastern Guilford County Residential Project.") Northwest of the project B-4129, the recent expansion approval to the Millstream/ Mount Hope Church Road Business Park will add an additional 1,000 - 1,200 new jobs attracting employees from surrounding residential areas.

3) As stated in the attached Guilford County School District letters dated November 8, 2000 and March 11, 2004, our Department feels these improvements will have a minimal/temporary impacts on school bus routes.

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Telephone: (336) 641-3334

4) Should Project B-4129 be replaced or rehabilitated at the same location, minimal impacts would occur to a possible adjacent historic structure. (See attachment Historic Properties/Cemeteries.)

B) **B-4131**, Bridge No. 11 on SR 3394 over Little Alamance Creek.

1) Although minor delays may occur, replacement or repair is the preferred alternative for these bridges. Growth demands of the area are not as great as those of the above mentioned. The Do-Nothing Alternative could have negative consequences when considering future realignments to Company Mill Road. (See attached portion of the Greensboro Urban Area Thoroughfare Plan, adopted June 28, 1996.)

2) As stated on the attached Guilford County School District letters dated November 8, 2000 and March 11, 2004, our Department feels these improvements will have a minimal/temporary impacts on school bus routes.

3) No known historic structures adjoin this project. (See Historic Properties/Cemeteries attachment.)

If you have any questions, please contact me at (336) 641-3635.

Sincerely,

Leslie P. Eger

Leslie P. Eger, AICP
Senior Planner

Attachments

CC: Mark Kirstner
Rob Bencini

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

Michael F. Easley
GOVERNOR

Lyndo Tippett
SECRETARY

September 8, 2004

MEMORANDUM TO: Mr. Gregory J. Thorpe, Ph.D., Director
Project Development and Environmental Analysis Branch

ATTENTION: Karen B. Taylor, PE
Project Development Engineer

FROM: Njoroge W. Wainaina, PE
State Geotechnical Engineer

TIP NO. B-4131
WBS 33484.1.1
FEDERAL PROJECT: BRZ-3394 (1)
COUNTY: Guilford
DESCRIPTION: Bridge # 11 over Little Alamance Creek on SR 3394

SUBJECT: Geotechnical Pre-Scoping Report

The Geotechnical Engineering Unit performed a limited pre-scoping investigation of the above reference project to provide an early identification of any Geotechnical and GeoEnvironmental issues that might impact the project's planning, design or construction. The following information summarizes our findings.

GEOENVIRONMENTAL ISSUES

Purpose

This report presents the results of a GeoEnvironmental impact evaluation conducted along the above referenced project. The main purpose of this investigation is to identify properties within

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the project study area that are or may be contaminated and therefore result in increased project costs and future liability if acquired by the Department. GeoEnvironmental impacts may include, but are not limited to, active and abandoned underground storage tank (UST) sites, hazardous waste sites, regulated landfills and unregulated dumpsites.

Techniques/Methodologies Used

The Geographical Information System (GIS) was consulted to identify known environmentally impacting sites in relation to the project corridor. GeoEnvironmental Section personnel conducted a field reconnaissance survey along the project corridor on April 20, 2004.

Findings

Underground Storage Tank (UST) Facilities

Based on our study, there are no UST sites identified within the project limits.

Hazardous Waste Sites

No Hazardous Waste Sites were identified within the project limits.

Land Fills

No apparent landfills were identified within the project limits.

Other GeoEnvironmental Concerns

No additional sites were encountered within the project limits.

Anticipated Impacts

We anticipate no monetary or scheduling impacts resulting from contaminated properties within the project limits.

The GeoEnvironmental Section observed no additional contaminated properties during the field reconnaissance and regulatory agencies' records search. Please note that discovery of additional sites not recorded by regulatory agencies and not reasonably discernable during the project

reconnaissance may occur. The GeoEnvironmental Section should be notified immediately after discovery of such sites so their potential impact(s) may be assessed.

If there are any questions regarding these or other GeoEnvironmental issues on the project, please contact Gene Tarascio, GIT at (919)-250-4088.

GEOTECHNICAL ISSUES

Techniques and Methodologies

The Eastern Regional Office conducted an office review and limited geotechnical investigation along the proposed bridge replacement project. The investigation consisted of reviewing existing bridge foundation types in the area and doing a field reconnaissance on June 4, 2004 at the proposed bridge replacement site to evaluate the geotechnical conditions. General foundation design practice was considered for this review. Considerations were given to each alignment alternative and detour preference as well as the anticipated structure foundation type.

Findings

After reviewing subsurface and design information from other projects in this area, it appears that the proximity of the rock-line is near the ground surface. The presence of rock outcrop was also observed in Little Alamance Creek near the existing bridge. Surficial floodplain soils are similar along both sides of the existing roadbed.

Anticipated Impacts

From the findings of our office and field investigations, there is no geotechnical preference for the location of the proposed alignment. Fabric for soil stabilization may be used to separate any proposed embankment from the existing floodplain soils. A pile type foundation does not appear suitable at this location due to the anticipated shallow rock-line; therefore, a drilled pier foundation is recommended for the proposed structure. Drilled piers will not accommodate top-down construction methods.

If there are any questions regarding the geotechnical issues, please contact Jamey Batts, P.E., or Neil Roberson, L.G. at (919)-662-4710.

NWW/CFP/JB/NR/dbm