STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

August 27, 2007

U. S. Army Corps of Engineers
Regulatory Field Office
6508 Falls of the Neuse Road
Suite 120
Raleigh, NC 27615

ATTN: Mr. John Thomas
NCDOT Coordinator

Subject: **Nationwide Permit 23 and 33 Application** for the proposed replacement of Bridge No. 142 over Abbott's Creek on SR 1741 in Davidson County, Federal Aid Project No. BRSTP-1741(2), State Project No. 8.2604801, WBS Element: 33456.1.1, Division 9, TIP B-4100

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 142 over Abbott's Creek on SR 1741. The existing Bridge No. 142 has an overall length of 106-feet and a clear deck width of 24-feet. The existing two-lane bridge has a reinforced concrete deck on I-beams supported by reinforced concrete caps and timber piles at approximate 35-foot centers. The bridge has a sufficiency rating of 34.6 compared to 100 for a new structure. It is proposed that the current bridge be replaced with a single span steel plate girder bridge, 140-feet in length, and will require two temporary causeways to be placed in Abbott's Creek in order to remove the 2 existing bridge bents in the water. The new bridge will be 130-feet in length 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. During construction traffic will be maintained with a temporary detour located on the north side of the bridge. Please find enclosed the pre-construction notification, permit drawings, design plan sheets, and a letter of acceptance from the Ecosystem Enhancement Program (EEP) for the proposed project. A Categorical Exclusion (CE) was completed for this project in April 2005 and distributed shortly thereafter. Additional copies are available upon request.

IMPACTS TO WATERS OF THE UNITED STATES

General Description: The project is located in the Yadkin-Pee Dee River Basin, subbasin 03-07-07 with a Hydrologic Unit Code of 03040103. Abbott's Creek has a Division of Water Quality (DWQ) stream index number of 12-119-1 and is a large tributary to High Rock Lake. A best usage classification of WS-III has been assigned to Abbott's Creek. There are wetlands in the project area. A Jurisdictional Determination (Action ID. 200420754) from the U.S. Army Corps of Engineers was given for the wetlands on April 18, 2006.

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1598

TELEPHONE: 919-715-1334
FAX: 919-715-5501

WEBSITE: WWW.NCDOT.ORG

LOCATION:
2728 CAPITAL BLVD
SUITE 240
RALEIGH NC 27604

No designated High Quality Waters (HQW), Outstanding Resource Waters (ORW), WS-I or WS-II waters occur within one-mile of the project area. Abbott's Creek is not listed on the 2006 List of impaired waters [Section 303(d)] for the Yadkin-Pee Dee River Basin nor does it drain into any 303(d) waters within 1-mile of the project area.

Permanent Impacts: Construction of the new bridge will require both excavation and filling of portions of wetlands located on the north side of the new bridge. There will be 0.04-acre of excavation for the installation of a lateral base ditch. There will be 0.06-acre of permanent fill due to the installation of the lateral base ditch. The total permanent impacts to riverine wetlands will be 0.1-acre. There will also be 39-feet of stream impacts to Abbott's Creek. The permanent stream impacts are from the need to stabilize the stream bank along the entire width of the bridge.

Temporary Impacts: There will be temporary impacts associated with the construction of Bridge No. 142. There will be 0.04 acres of temporary fill in wetlands due to the temporary detour. There will be 0.02 acre of temporary impacts to surface waters due to the use of a temporary causeway. The causeway will be used to remove the bents from the old bridge.

Utility Impacts: There will be no jurisdictional impacts from utility relocations due to this bridge replacement project.

Bridge Demolition: Bridge No. 142 has a reinforced concrete deck on I-beams supported by reinforced concrete caps and timber piles at approximately 35-foot centers. The bridge has an overall length of 106-feet and is 24-feet wide. The bridge will be removed without dropping any components into waters of the United States. NCDOT's Best Management Practices for Bridge Demolition and Removal will be followed.

RESTORATION PLAN

Following construction, all material used in the construction of the new bridge as well as the detour bridge will be removed. The impacted areas associated with the bridge are expected to recover naturally, since the natural streambed and plant material will not be effected. NCDOT does not propose any additional planting in this area. Class I riprap and filter fabric will be used for bank stabilization. Pre-project elevations will be restored. NCDOT will restore the wetlands to their pre-project contours. After the detour's purpose has been served the material used for installation of the temporary detour bridge will be removed and the areas will be restored to original contours.

REMOVAL AND DISPOSAL PLAN

The contractor will be required to submit a reclamation plan for the removal of and disposal of all material off-site at an upland location. The contractor will use excavation equipment for removal of any earthen material. Heavy–duty trucks, dozers, cranes and various other pieces of mechanical equipment necessary for construction of roadways and culverts will be used on site. All material placed in the stream will be removed from the stream at that time. The contractor will have the option of reusing any of the materials that the engineer deems suitable in the construction of project. After the erosion control devices are no longer needed, all temporary materials will become the property of the contractor.

FEDERALLY PROTECTED SPECIES

Plants and animals with federal classifications of Endangered, Threatened, Proposed Endangered and Proposed Threatened are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of May 10, 2007, the United States Fish and Wildlife Service (USFWS) lists three federally protected species for Davidson County. Table 1 lists the species, their status and biological conclusion.

Table 1. Federally-Protected Species for Davidson County, NC

Common Name	Scientific Name	Federal Status	Habitat Present	Biological Conclusion
Bald eagle	*Haleaeetus leucephalus*	Delisted	No	Not Required
Schweinitz's sunflower	*Helianthus schweinitzii*	E	Yes	No Effect
Bog turtle	*Clemmys muhlenbergii*	T (S/E)	N/A	Not Required

A Biological Conclusion of "No Effect" was given in the CE for the bald eagle and Schweinitz's sunflower.

No habitat is present within the study area for the bald eagle. There are no large bodies of water present within the study area to support foraging habitat nor are there trees large enough to support an eagle nest. The bald eagle has been delisted as a threatened species as of August 8, 2007.

A field survey for Schweinitz's sunflower was conducted in October 6, 2006 by NCDOT Biologists. No plants were observed during the 2006 survey. With the above information it is the conclusion of NCDOT that the original call of "No Effect" is still valid for the Schweinitz's sunflower.

Biological Conclusions are not required for the bog turtle since T (S/A) species are not afforded full protection under the ESA. No potential habitat occurs within the project area. No populations of this species have been reported in the project area. Therefore, the proposed project is not anticipated to result in an adverse impact to this species.

MITIGATION OPTIONS

Avoidance and Minimization and Compensatory Mitigation: The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts. Avoidance measures were taken during the planning and NEPA compliance stages; minimization measures were incorporated as part of the project design.

According to the Clean Water Act (CWA) §404(b)(1) guidelines, NCDOT must avoid, minimize, and mitigate, in sequential order, impacts to waters of the US. The following is a list of the project's jurisdictional stream avoidance/minimization activities proposed or completed by NCDOT:

Avoidance/Minimization:

- Bridge No. 142 will be replaced at its existing location while maintaining traffic with a temporary structure and detour on the north side. This will minimize construction for the approaches and lessen impacts to both wetlands and Abbott's Creek.
- In-stream activity will be limited only to the areas shown on the plan sheets.
- A preformed scour hole is to be located on the southwest side of Abbott's Creek.
- Temporary construction impacts due to erosion and sedimentation will be minimized through implementation of stringent erosion control methods and use of Best Management Practices (BMPs).
- The onsite detour structure will serve two bridge replacement projects, B-4100 and B-4101.

Compensatory Mitigation: The proposed action includes all practicable methods to avoid and/or minimize jurisdictional stream and buffer impacts that may result from such use. It was determined

that there are no practicable alternatives to the proposed construction in jurisdictional waters of the U.S.

Compensatory mitigation is proposed 0.1-acre of riverine wetland impacts. Compensatory mitigation will be provided through the EEP. The EEP acceptance letter, dated August 21, 2007, is attached. No compensatory mitigation is proposed for the 39-feet of stream impacts because the impacts are for bank stabilization and there will be no loss of aquatic use to Abbott's Creek.

SCHEDULE

The project calls for a letting of January 15, 2008 with a date of availability of February 26, 2008. Permits are needed by the review date of November 27, 2007. It is expected that the contractor will choose to start construction as soon as possible.

REGULATORY APPROVALS

Section 404 Permit: The project is being processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance with 23 CFR 771.115(b). The NCDOT requests that these activities be authorized by a Nationwide Permit 23 (Federal Register Vol. 72, No. 47 Pages 11092-11198, March 12, 2007). It is anticipated that the temporary impacts will be authorized under Section 404 Nationwide Permit 33 for the causeway and detour. We are therefore also requesting the issuance of a Nationwide Permit 33.

Section 401 Permit: We anticipate General Certification numbers 3403 and 3366 will apply to this project. All general conditions of the Water quality Certifications will be met. Therefore, in accordance with 15A NCAC 2H, Section .0500(a) and 15A NCAC 2B.0200 we are providing two copies of this application to the North Carolina Department of Environmental and Natural Resources, Division of Water Quality, for their notification.

Thank you for your time and assistance with this project. Please contact Sara Easterly at (919) 715-5499 if you have any questions or need any additional information.

Sincerely,

E. D. Lueck

for Gregory J. Thorpe, Ph.D.
Environmental Management Director, PDEA

w/attachment
- Mr. John Hennessy, NCDWQ (2 copies)
- Ms. Marla Chambers, NCWRC
- Mr. Mark Staley, Roadside Environmental
- Mr. Victor Barbour, P.E., Project Services Unit
- Ms. Kent Boyer, DEO
- Ms. Marella Buncick, USFWS
- Dr. David Chang, P.E., Hydraulics
- Mr. Greg Perfetti, P.E, Structure Design
- Mr. S. P. Ivey, P.E., Division Engineer

w/o attachment
- Mr. Scott McLendon, USACE, Wilmington
- Mr. Jay Bennett, P.E., Roadway Design
- Mr. Majed Alghandour, P.E., Programming and TIP
- Mr. Art McMillan, P.E., Highway Design
- Mr. Wade Kirby, PDEA Planning Engineer
- Ms. Beth Harmon, EEP
- Mr. Todd Jones, NCDOT External Audit Branch

Office Use Only:	Form Version March 05
USACE Action ID No. _____	**DWQ No.** _____

(If any particular item is not applicable to this project, please enter "Not Applicable" or "N/A".)

I. Processing

1. Check all of the approval(s) requested for this project:
   - ☒ Section 404 Permit
   - ☐ Section 10 Permit
   - ☐ 401 Water Quality Certification
   - ☐ Riparian or Watershed Buffer Rules
   - ☐ Isolated Wetland Permit from DWQ
   - ☐ Express 401 Water Quality Certification

2. Nationwide, Regional or General Permit Number(s) Requested: NW 23 & NW 33

3. If this notification is solely a courtesy copy because written approval for the 401 Certification is not required, check here: ☒

4. If payment into the North Carolina Ecosystem Enhancement Program (NCEEP) is proposed for mitigation of impacts, attach the acceptance letter from NCEEP, complete section VIII, and check here: ☒

5. If your project is located in any of North Carolina's twenty coastal counties (listed on page 4), and the project is within a North Carolina Division of Coastal Management Area of Environmental Concern (see the top of page 2 for further details), check here: ☐

II. Applicant Information

1. Owner/Applicant Information
   Name: Gregory J. Thorpe, Ph.D., Environmental Management Director
   Mailing Address: North Carolina Department of Transportation (NCDOT)
   Project Development and Environmental Analysis
   1598 Mail Service Center
   Raleigh, NC 27699-1598
   Telephone Number: 919-733-3141 Fax Number: 919-733-9794
   E-mail Address: gthorpe@dot.state.nc.us

2. Agent/Consultant Information (A signed and dated copy of the Agent Authorization letter must be attached if the Agent has signatory authority for the owner/applicant.)
   Name: _____
   Company Affiliation: _____
   Mailing Address: _____
   Telephone Number: _____ Fax Number: _____
   E-mail Address: _____

III. Project Information

Attach a **vicinity map** clearly showing the location of the property with respect to local landmarks such as towns, rivers, and roads. Also provide a detailed **site plan** showing property boundaries and development plans in relation to surrounding properties. Both the vicinity map and site plan must include a scale and north arrow. The specific footprints of all buildings, impervious surfaces, or other facilities must be

included. If possible, the maps and plans should include the appropriate USGS Topographic Quad Map and NRCS Soil Survey with the property boundaries outlined. Plan drawings, or other maps may be included at the applicant's discretion, so long as the property is clearly defined. For administrative and distribution purposes, the USACE requires information to be submitted on sheets no larger than 11 by 17-inch format; however, DWQ may accept paperwork of any size. DWQ prefers full-size construction drawings rather than a sequential sheet version of the full-size plans. If full-size plans are reduced to a small scale such that the final version is illegible, the applicant will be informed that the project has been placed on hold until decipherable maps are provided.

1. Name of project: Replacement of Bridge No. 142 on SR 1741 (Walburg-High Point Road) over Abbott's Creek

2. T.I.P. Project Number or State Project Number (NCDOT Only): B-4100

3. Property Identification Number (Tax PIN):

4. Location
   County: Davidson Nearest Town: High Point
   Subdivision name (include phase/lot number): NA
   Directions to site (include road numbers/names, landmarks, etc.): Highway 40 West to Highway 85 (going south) to junction with NC 109 (going north) to Walburg-Highpoint Road.

5. Site coordinates (For linear projects, such as a road or utility line, attach a sheet that separately lists the coordinates for each crossing of a distinct waterbody.)
   Decimal Degrees (6 digits minimum): 35° 59' 28" °N 80° 04' 31" °W

6. Property size (acres): Total project length is 0.341 miles

7. Name of nearest receiving body of water: Abbott's Creek

8. River Basin: Yadkin
   (Note – this must be one of North Carolina's seventeen designated major river basins. The River Basin map is available at http://h2o.enr.state.nc.us/admin/maps/.)

9. Describe the existing conditions on the site and general land use in the vicinity of the project at the time of this application: Project area is located in a rural community with the surrounding area being comprised mainly of agricultural land.

10. Describe the overall project in detail, including the type of equipment to be used: Bridge No. 142 will be replaced on existing location with a offsite detour. Heavy duty excavation equipment will be used such as trucks, dozers, cranes and other various equipment necessaryfor roadway construction.

11. Explain the purpose of the proposed work: Bridge No. 142 has a sufficiency rating of 34.6 out of a possible 100 for a new structure. The bridge is considered structurally deficient and functionally obsolete. The replacement of this inadequate structure will result in safer more efficient traffic operations.

IV. Prior Project History

If jurisdictional determinations and/or permits have been requested and/or obtained for this project (including all prior phases of the same subdivision) in the past, please explain. Include the USACE Action ID Number, DWQ Project Number, application date, and date permits and certifications were issued or

withdrawn. Provide photocopies of previously issued permits, certifications or other useful information. Describe previously approved wetland, stream and buffer impacts, along with associated mitigation (where applicable). If this is a NCDOT project, list and describe permits issued for prior segments of the same T.I.P. project, along with construction schedules. A Jurisdictional Determination (Action ID. 200420754) from the U.S. Army Corps of Engineers was given for the wetlands on April 18, 2006.

V. Future Project Plans

Are any future permit requests anticipated for this project? If so, describe the anticipated work, and provide justification for the exclusion of this work from the current application.
There are no future permit requests anticipated for this project.

VI. Proposed Impacts to Waters of the United States/Waters of the State

It is the applicant's (or agent's) responsibility to determine, delineate and map all impacts to wetlands, open water, and stream channels associated with the project. Each impact must be listed separately in the tables below (e.g., culvert installation should be listed separately from riprap dissipater pads). Be sure to indicate if an impact is temporary. All proposed impacts, permanent and temporary, must be listed, and must be labeled and clearly identifiable on an accompanying site plan. All wetlands and waters, and all streams (intermittent and perennial) should be shown on a delineation map, whether or not impacts are proposed to these systems. Wetland and stream evaluation and delineation forms should be included as appropriate. Photographs may be included at the applicant's discretion. If this proposed impact is strictly for wetland or stream mitigation, list and describe the impact in Section VIII below. If additional space is needed for listing or description, please attach a separate sheet.

1. Provide a written description of the proposed impacts: See cover letter

3. Individually list wetland impacts. Types of impacts include, but are not limited to mechanized clearing, grading, fill, excavation, flooding, ditching/drainage, etc. For dams, separately list impacts due to both structure and flooding.

Wetland Impact Site Number (indicate on map)	Type of Impact	Type of Wetland (e.g., forested, marsh, herbaceous, bog, etc.)	Located within 100-year Floodplain (yes/no)	Distance to Nearest Stream (linear feet)	Area of Impact (acres)
Site 1	Permanent Fill in Wetland	Herbaceous	NA	330	<0.01
Site 1	Temporary Fill in Wetland	Herbaceous	NA	330	<0.01
Site 1	Excavation in Wetland	Herbaceous	NA	330	0.01
Site 2	Permanent Fill in Wetland	Herbaceous	NA	270	0.05
Site 2	Temporary Fill in Wetland	Herbaceous	NA	270	0.02
Site 2	Excavation in Wetland	Herbaceous	NA	270	0.02

Site 3	Permanent Fill in Wetland	Herbaceous	NA	280	<0.01
Site 3	Temporary Fill in wetland	Herbaceous	NA	280	0.02
Site 3	Excavation in Wetland	Herbaceous	NA	280	0.01
Site 4	Permanent Fill in Wetland	Herbaceous	NA	15	0.01
Site 5	Permanent Fill in Wetland	Herbaceous	NA	5	<0.01
Total Wetland Impact (acres)					<0.18

4. List the total acreage (estimated) of all existing wetlands on the property: 0.70

5. Individually list all intermittent and perennial stream impacts. Be sure to identify temporary impacts. Stream impacts include, but are not limited to placement of fill or culverts, dam construction, flooding, relocation, stabilization activities (e.g., cement walls, rip-rap, crib walls, gabions, etc.), excavation, ditching/straightening, etc. If stream relocation is proposed, plans and profiles showing the linear footprint for both the original and relocated streams must be included. To calculate acreage, multiply length X width and then divide by 43,560.

Stream Impact Number (indicate on map)	Stream Name	Type of Impact	Perennial or Intermittent?	Average Stream Width Before Impact	Impact Length (linear feet)	Area of Impact (acres)
Site 6	Abbott's Creek	Rock Embankment/ Bent Removal/ Temporary Causeway	Perennial	33	39	0.01
Site 6	Abbott's	Temporary Causeway in Surface Water	Perennial	33	42	0.01
Site 7	Abbott's Creek	Bent Removal/ Temporary Causeway	Perennial	33	38	0.01
Total Stream Impact (by length and acreage)					119	0.03

6. Individually list all open water impacts (including lakes, ponds, estuaries, sounds, Atlantic Ocean and any other water of the U.S.). Open water impacts include, but are not limited to fill, excavation, dredging, flooding, drainage, bulkheads, etc.

Open Water Impact Site Number (indicate on map)	Name of Waterbody (if applicable)	Type of Impact	Type of Waterbody (lake, pond, estuary, sound, bay, ocean, etc.)	Area of Impact (acres)
NA	NA	NA	NA	0.00
Total Open Water Impact (acres)				NA

7. List the cumulative impact to all Waters of the U.S. resulting from the project:

Stream Impact (acres):	0.03
Wetland Impact (acres):	0.15
Open Water Impact (acres):	0.00
Total Impact to Waters of the U.S. (acres)	0.18
Total Stream Impact (linear feet):	119.00

8. Isolated Waters

Do any isolated waters exist on the property? ☐ Yes ☒ No
Describe all impacts to isolated waters, and include the type of water (wetland or stream) and the size of the proposed impact (acres or linear feet). Please note that this section only applies to waters that have specifically been determined to be isolated by the USACE.

9. Pond Creation

If construction of a pond is proposed, associated wetland and stream impacts should be included above in the wetland and stream impact sections. Also, the proposed pond should be described here and illustrated on any maps included with this application.
Pond to be created in (check all that apply): ☐ uplands ☐ stream ☐ wetlands
Describe the method of construction (e.g., dam/embankment, excavation, installation of draw-down valve or spillway, etc.):
Proposed use or purpose of pond (e.g., livestock watering, irrigation, aesthetic, trout pond, local stormwater requirement, etc.):
Current land use in the vicinity of the pond:
Size of watershed draining to pond: Expected pond surface area:

VII. Impact Justification (Avoidance and Minimization)

Specifically describe measures taken to avoid the proposed impacts. It may be useful to provide information related to site constraints such as topography, building ordinances, accessibility, and financial viability of the project. The applicant may attach drawings of alternative, lower-impact site layouts, and explain why these design options were not feasible. Also discuss how impacts were minimized once the desired site plan was developed. If applicable, discuss construction techniques to be followed during construction to reduce impacts. See cover letter.

VIII. Mitigation

DWQ - In accordance with 15A NCAC 2H .0500, mitigation may be required by the NC Division of Water Quality for projects involving greater than or equal to one acre of impacts to freshwater wetlands or greater than or equal to 150 linear feet of total impacts to perennial streams.

USACE – In accordance with the Final Notice of Issuance and Modification of Nationwide Permits, published in the Federal Register on January 15, 2002, mitigation will be required when necessary to ensure that adverse effects to the aquatic environment are minimal. Factors including size and type of proposed impact and function and relative value of the impacted aquatic resource will be considered in determining acceptability of appropriate and practicable mitigation as proposed. Examples of mitigation that may be appropriate and practicable include, but are not limited to: reducing the size of the project; establishing and maintaining wetland and/or upland vegetated buffers to protect open waters such as streams; and replacing losses of aquatic resource functions and values by creating, restoring, enhancing, or preserving similar functions and values, preferable in the same watershed.

If mitigation is required for this project, a copy of the mitigation plan must be attached in order for USACE or DWQ to consider the application complete for processing. Any application lacking a required mitigation plan or NCEEP concurrence shall be placed on hold as incomplete. An applicant may also choose to review the current guidelines for stream restoration in DWQ's Draft Technical Guide for Stream Work in North Carolina, available at http://h2o.enr.state.nc.us/ncwetlands/strmgide.html.

1. Provide a brief description of the proposed mitigation plan. The description should provide as much information as possible, including, but not limited to: site location (attach directions and/or map, if offsite), affected stream and river basin, type and amount (acreage/linear feet) of mitigation proposed (restoration, enhancement, creation, or preservation), a plan view, preservation mechanism (e.g., deed restrictions, conservation easement, etc.), and a description of the current site conditions and proposed method of construction. Please attach a separate sheet if more space is needed.
   Mitigation is proposed through EEP for the 0.1-acre of riverine wetland impacts.
2. Mitigation may also be made by payment into the North Carolina Ecosystem Enhancement Program (NCEEP). Please note it is the applicant's responsibility to contact the NCEEP at (919) 715-0476 to determine availability, and written approval from the NCEEP indicating that they are will to accept payment for the mitigation must be attached to this form. For additional information regarding the application process for the NCEEP, check the NCEEP website at http://h2o.enr.state.nc.us/wrp/index.htm. If use of the NCEEP is proposed, please check the appropriate box on page five and provide the following information:

   Amount of stream mitigation requested (linear feet):_____
   Amount of buffer mitigation requested (square feet):_____
   Amount of Riparian wetland mitigation requested (acres):__0.1__
   Amount of Non-riparian wetland mitigation requested (acres):_____
   Amount of Coastal wetland mitigation requested (acres):_____

IX. Environmental Documentation (required by DWQ)

1. Does the project involve an expenditure of public (federal/state/local) funds or the use of public (federal/state) land? Yes ☒ No ☐

2. If yes, does the project require preparation of an environmental document pursuant to the requirements of the National or North Carolina Environmental Policy Act (NEPA/SEPA)? Note: If you are not sure whether a NEPA/SEPA document is required, call the SEPA coordinator at (919) 733-5083 to review current thresholds for environmental documentation.
   Yes ☒ No ☐

3. If yes, has the document review been finalized by the State Clearinghouse? If so, please attach a copy of the NEPA or SEPA final approval letter. Yes ☒ No ☐

X. Proposed Impacts on Riparian and Watershed Buffers (required by DWQ)

It is the applicant's (or agent's) responsibility to determine, delineate and map all impacts to required state and local buffers associated with the project. The applicant must also provide justification for these impacts in Section VII above. All proposed impacts must be listed herein, and must be clearly identifiable on the accompanying site plan. All buffers must be shown on a map, whether or not impacts are proposed to the buffers. Correspondence from the DWQ Regional Office may be included as appropriate. Photographs may also be included at the applicant's discretion.

1. Will the project impact protected riparian buffers identified within 15A NCAC 2B .0233 (Neuse), 15A NCAC 2B .0259 (Tar-Pamlico), 15A NCAC 02B .0243 (Catawba) 15A NCAC 2B .0250 (Randleman Rules and Water Supply Buffer Requirements), or other (please identify_____)? Yes ☐ No ☒

2. If "yes", identify the square feet and acreage of impact to each zone of the riparian buffers. If buffer mitigation is required calculate the required amount of mitigation by applying the buffer multipliers.

Zone*	Impact (square feet)	Multiplier	Required Mitigation
1			
2			
Total			

* Zone 1 extends out 30 feet perpendicular from the top of the near bank of channel; Zone 2 extends an additional 20 feet from the edge of Zone 1.

3. If buffer mitigation is required, please discuss what type of mitigation is proposed (i.e., Donation of Property, Riparian Buffer Restoration / Enhancement, or Payment into the Riparian Buffer Restoration Fund). Please attach all appropriate information as identified within 15A NCAC 2B .0242 or .0244, or .0260. _____

XI. Stormwater (required by DWQ)

Describe impervious acreage (existing and proposed) versus total acreage on the site. Discuss stormwater controls proposed in order to protect surface waters and wetlands downstream from the property. If percent impervious surface exceeds 20%, please provide calculations demonstrating total proposed impervious level._____

_____

XII. Sewage Disposal (required by DWQ)

Clearly detail the ultimate treatment methods and disposition (non-discharge or discharge) of wastewater generated from the proposed project, or available capacity of the subject facility.

_____

_____

XIII. Violations (required by DWQ)

Is this site in violation of DWQ Wetland Rules (15A NCAC 2H .0500) or any Buffer Rules?
Yes ☐ No ☒

Is this an after-the-fact permit application? Yes ☐ No ☒

XIV. Cumulative Impacts (required by DWQ)

Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality? Yes ☐ No ☒
If yes, please submit a qualitative or quantitative cumulative impact analysis in accordance with the most recent North Carolina Division of Water Quality policy posted on our website at http://h2o.enr.state.nc.us/ncwetlands. If no, please provide a short narrative description:_____

XV. Other Circumstances (Optional):

It is the applicant's responsibility to submit the application sufficiently in advance of desired construction dates to allow processing time for these permits. However, an applicant may choose to list constraints associated with construction or sequencing that may impose limits on work schedules (e.g., draw-down schedules for lakes, dates associated with Endangered and Threatened Species, accessibility problems, or other issues outside of the applicant's control).

E. L. Luke for Gregory J. Thorpe, PhD 8.27.07

Applicant/Agent's Signature **Date**

(Agent's signature is valid only if an authorization letter from the applicant is provided.)

Ecosystem Enhancement PROGRAM

August 21, 2007

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

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

B-4100, Replace Bridge Number 142 on SR 1745 over Abbotts Creek in Thomasville, Davidson County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory riparian wetland mitigation for the subject project. Based on the information supplied by you on August 7, 2007, the impacts are located in CU 03040103 of the Yadkin River Basin in the Central Piedmont (CP) Eco-Region, and are as follows:

Riparian Wetland: 0.10 acre

This mitigation acceptance letter replaces the mitigation acceptance letters issued on May 14, 2007 and May 29, 2007. EEP understands that the NCDOT no longer requires off-site stream mitigation for this project. EEP commits to implementing sufficient compensatory riparian wetland mitigation to offset the impacts associated with this project by the end of the MOA Year in which this project is permitted, in accordance with Section X of the Amendment No. 2 to the Memorandum of Agreement between the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U. S. Army Corps of Engineers, fully executed on March 8, 2007. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from EEP.

If you have any questions or need additional information, please contact Ms. Beth Harmon at 919-715-1929.

Sincerely,

James B. Stanfill for

William D. Gilmore, P.E.
EEP Director

cc: Mr. John Thomas, USACE – Raleigh
Mr. John Hennessy, Division of Water Quality, Wetlands/401 Unit
File: B-4100 Revised 2

Ecosystem Enhancement PROGRAM

August 21, 2007

Mr. John Thomas
U. S. Army Corps of Engineers
Raleigh Regulatory Field Office
6508 Falls of the Neuse Road, Suite 120
Raleigh, North Carolina 27615

Dear Mr. Thomas:

Subject: EEP Mitigation Acceptance Letter:

B-4100, Replace Bridge Number 142 over Abbotts Creek on SR 1741 in Thomasville, Davidson County; Yadkin River Basin (Cataloging Unit 03040103); Central Piedmont (CP) Eco-Region

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory riparian wetland mitigation for the unavoidable impact associated with the above referenced project. As indicated in the NCDOT's mitigation request dated August 7, 2007, compensatory riparian wetland mitigation from EEP is required for approximately 0.10 acre of impacts. The stream mitigation need from EEP has been eliminated.

This mitigation acceptance letter replaces the mitigation acceptance letters issued on May 14, 2007 and May 29, 2007. Compensatory riparian wetland mitigation associated with this project will be provided in accordance with Section X of the Amendment No. 2 to the Memorandum of Agreement between the N. C. Department of Environment and Natural Resources, the N. C. Department of Transportation, and the U. S. Army Corps of Engineers fully executed on March 8, 2007 (Tri-Party MOA). EEP commits to implement sufficient compensatory riparian wetland mitigation up to 0.20 riparian wetland credits to offset the impacts associated with this project by the end of the MOA year in which this project is permitted. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from EEP.

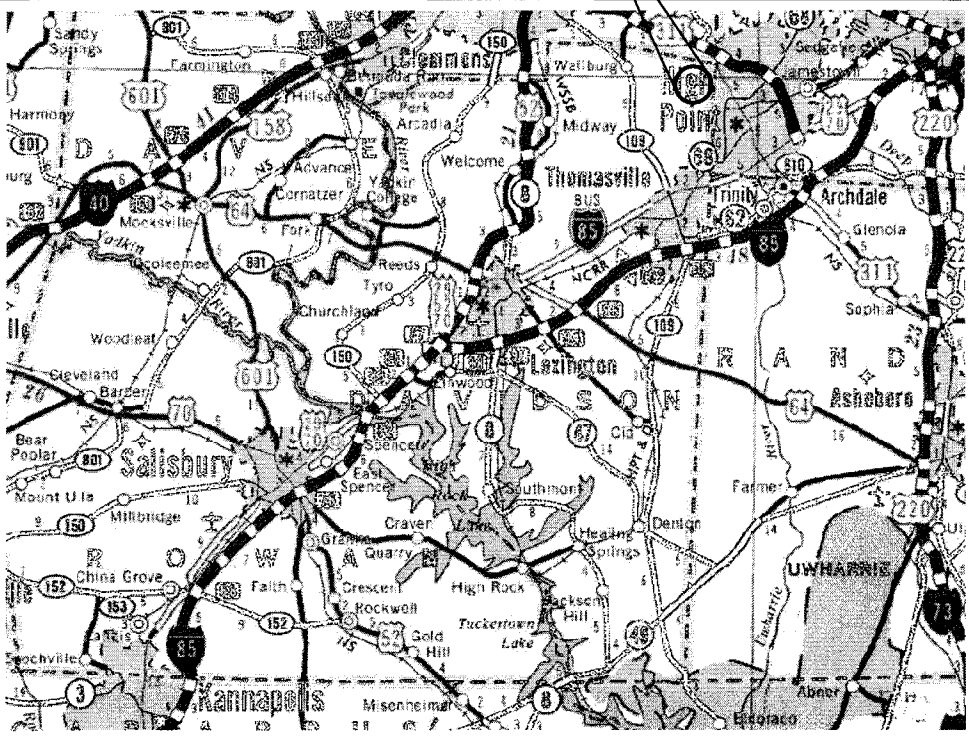
If you have any questions or need additional information, please contact Ms. Beth Harmon at 919-715-1929.

Sincerely,

James B. Stanfill for

William D. Gilmore, P.E.
EEP Director

cc: Mr. Gregory J. Thorpe, Ph.D., NCDOT-PDEA
Mr. John Hennessy, Division of Water Quality, Wetlands/401 Unit
File: B-4100 Revised 2



VICINITY MAP

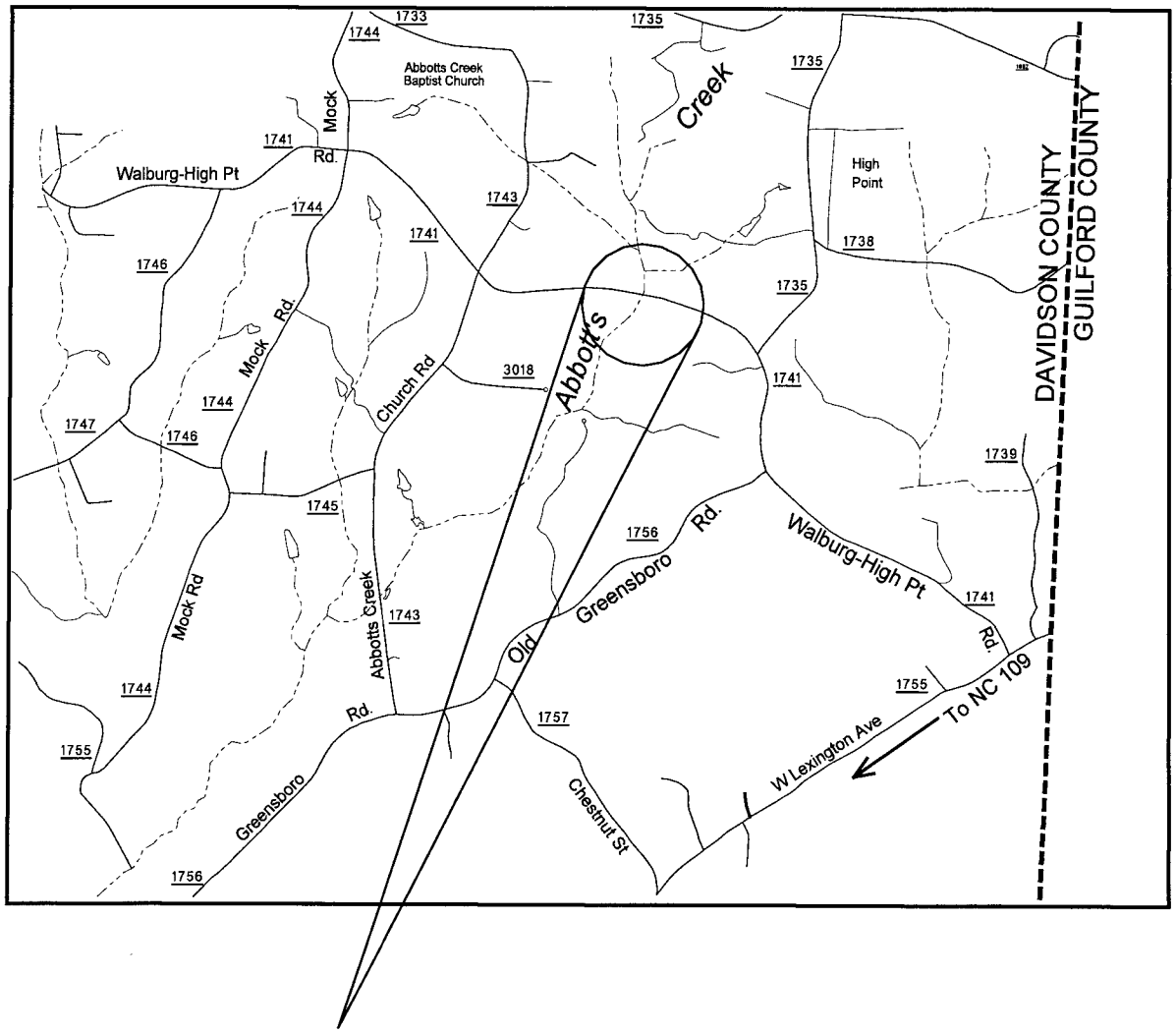
NCDOT

DIVISION OF HIGHWAYS
DAVIDSON COUNTY
PROJECT: 33456.1.1 (B-4100)
BRIDGE 142 OVER
ABBOTTS CREEK ON
SR 1741 IN THOMASVILLE

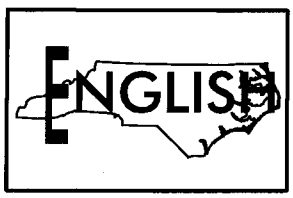
SHEET 1 OF 12 **7/20/07**

7/20/2007
11:16:51 AM
R:\Hydraulics\dgn\Permits\B4100_Hyd_prm_wet_teh.dgn

SITE MAP



SITE



NCDOT

DIVISION OF HIGHWAYS
DAVIDSON COUNTY
PROJECT: 33456.1.1 (B-4100)
BRIDGE 142 OVER
ABBOTTS CREEK ON
SR 1741 IN THOMASVILLE

SHEET 2 OF 12 7/20/07

7/20/2007
11:16:34 AM
R:\Hydraulics\dgn\Permits\B4100_Hyd_prm_wet_teh.dgn

WETLAND LEGEND

WLB — WETLAND BOUNDARY

WETLAND

F F — DENOTES FILL IN WETLAND

S S — DENOTES FILL IN SURFACE WATER

P P — DENOTES FILL IN SURFACE WATER (POND)

T T — DENOTES TEMPORARY FILL IN WETLAND

E E — DENOTES EXCAVATION IN WETLAND

TS TS — DENOTES TEMPORARY FILL IN SURFACE WATER

DENOTES MECHANIZED CLEARING

FLOW DIRECTION

TB — TOP OF BANK

WE — EDGE OF WATER

C — PROP. LIMIT OF CUT

F — PROP. LIMIT OF FILL

PROP. RIGHT OF WAY

NG — NATURAL GROUND

PL — PROPERTY LINE

TDE — TEMP. DRAINAGE EASEMENT

PDE — PERMANENT DRAINAGE EASEMENT

EAB — EXIST. ENDANGERED ANIMAL BOUNDARY

EPB — EXIST. ENDANGERED PLANT BOUNDARY

WATER SURFACE

LIVE STAKES

BOULDER

COIR FIBER ROLLS

PROPOSED BRIDGE

PROPOSED BOX CULVERT

PROPOSED PIPE CULVERT

(DASHED LINES DENOTE EXISTNG STRUCTURES)

12"-48" PIPES

54" PIPES & ABOVE

SINGLE TREE

WOODS LINE

DRAINAGE INLET

ROOTWAD

RIP RAP

5 — ADJACENT PROPERTY OWNER OR PARCEL NUMBER IF AVAILABLE

PREFORMED SCOUR HOLE

LEVEL SPREADER (LS)

DITCH / GRASS SWALE

NCDOT

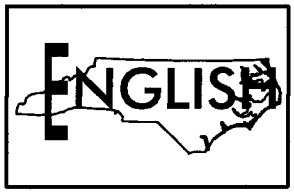
DIVISION OF HIGHWAYS
DAVIDSON COUNTY
PROJECT: 33456.1.1 (B-4100)
BRIDGE 142 OVER
ABBOTTS CREEK ON
SR 1741 IN THOMASVILLE

SHEET 3 OF 12 **7/20/07**

7/20/2007
8:51:11 AM
R:\Hydraulics\dgn\Permits\B4100_Hyd_prm_wet_tsh.dgn

SUMMARY OF AFFECTED PROPERTY OWNERS

TRACT NO.	PROPERTY OWNER	ADDRESS	SITE NO.
(2)	JOHNNIE H. HAYWORTH	3413 WALLBURG-HIGH POINT ROAD HIGH POINT, NC 27265	1, 2, 3 & 4
(4)	EVIE M SWAIM REVOCABLE TRUST	1722 HORNEYTOWN ROAD HIGH POINT, NC 27265	3 & 5



NCDOT

DIVISION OF HIGHWAYS

DAVIDSON COUNTY

PROJECT: 33456.1.1 (B-4100)

BRIDGE 142 OVER

ABBOTTS CREEK ON

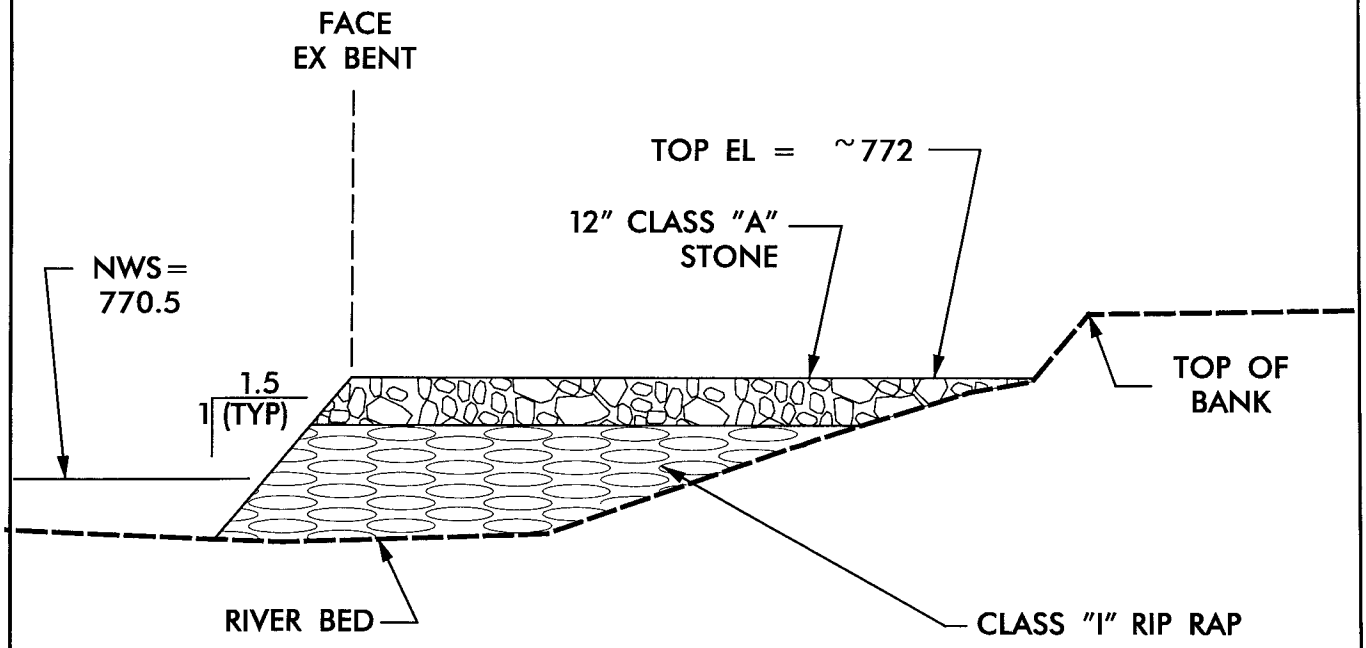
SR 1741 IN THOMASVILLE

SHEET 4 OF 12

7/20/07

7/20/2007
11:16:21 AM
R:\Hydraulics\dgn\Permitte\B4100_Hyd_prm_wet_teh.dgn

TYPICAL DETAIL OF ROCK CAUSEWAY FOR EXISTING BRIDGE REMOVAL



TEMPORARY SURFACE WATER IMPACT ROCK FILL (CLASS "I" RIP RAP) BELOW NWS	
EX BENT 1	AREA = 0.01 Ac VOLUME ~ 15 CY
EX BENT 2	AREA = 0.01 Ac VOLUME ~ 10 CY

ENGLISH

NCDOT

DIVISION OF HIGHWAYS

DAVIDSON COUNTY

PROJECT: 33456.1.1 (B-4100)

BRIDGE 142 OVER

ABBOTTS CREEK ON

SR 1741 IN THOMASVILLE

SHEET 5 OF 12

7/20/07

7/20/2007
11:17:50 AM
R:\Hydraulics\dgn\Permits\B4100_Hyd_prm_tempcw.dgn

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L- 19+42 to 21+86 LT	Rdwy / Detour / Lateral	< 0.01	< 0.01	0.01							
2	-L- 21+99 to 24+27 LT	Rdwy / Detour / Lateral	0.05	0.02	0.02							
3	-L- 24+88 to 29+88 LT	Rdwy / Detour / Lateral	< 0.01	0.02	0.01							
4	-L- 23+85 to 24+27 LT	Abandon Wetland Ditch	0.01									
5	-L- 24+88 to 25+10 LT	Abandon Wetland Ditch	< 0.01									
6	-L- 23+90 to 24+15	ROCK EMBANKMENT / BENT REMOVAL CAUSEWAY						0.01	0.01	39	42	
7	-L- 24+38 to 24+62	BENT REMOVAL CAUSEWAY							0.01		38	
TOTALS:			0.06	0.04	0.04	0.00	0.00	0.01	0.02	39	80	0

NOTE: IMPACT SUMMARY DOES NOT INCLUDE ANY PERMANENT OR TEMPORARY SURFACE WATER IMPACTS ASSOCIATED WITH THE ROCK VANE.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

DAVIDSON COUNTY
WBS - 33456.1.1 (B-4100)

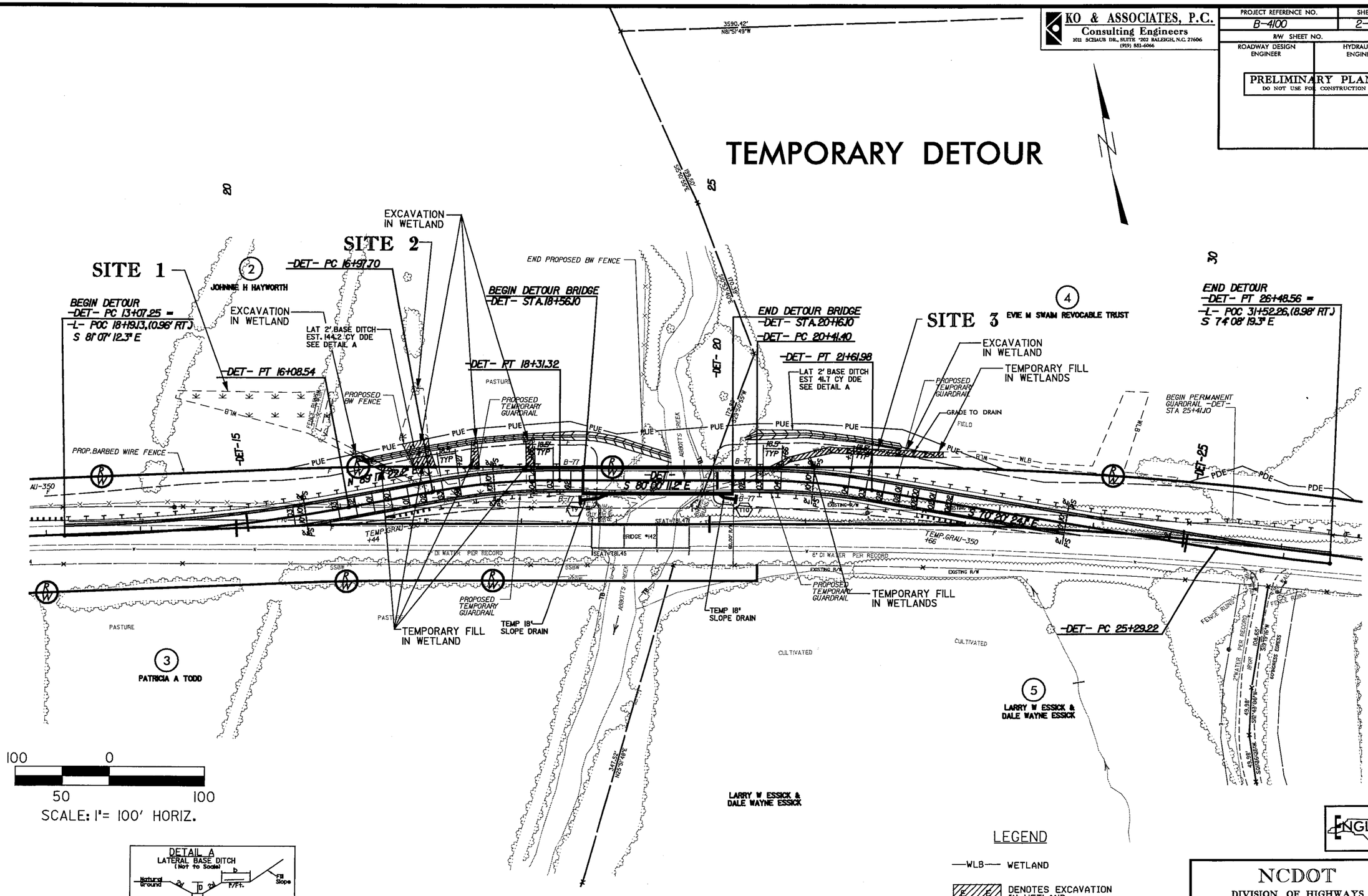
ATN Revised 3/31/06

8/17/99

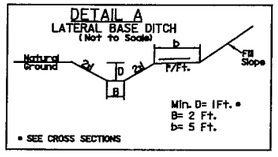
KO & ASSOCIATES, P.C. Consulting Engineers 1011 SCHAUB DR., SUITE 202 RALEIGH, N.C. 27606 (919) 851-6066	PROJECT REFERENCE NO. B-4100	SHEET NO. 2-B
	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

TEMPORARY DETOUR



DETAIL A
LATERAL BASE DITCH
(Not to Scale)



STATION TO STATION	SIDE
-DET- 16+25 – 19+47	LT
-DET- 20+29 – 21+84	LT

PLAN VIEW SITES 1, 2 & 3

LEGEND

—WLB— WETLAND

DENOTES EXCAVATION IN WETLAND

DENOTES TEMPORARY FILL IN WETLAND

ENGLISH

NCDOT
DIVISION OF HIGHWAYS
DAVIDSON COUNTY
PROJECT: 33456.1.1 (B-4100)
BRIDGE 142 OVER
ABBOTTS CREEK ON
SR 1741 IN THOMASVILLE

SHEET 7 OF 12 7/20/07

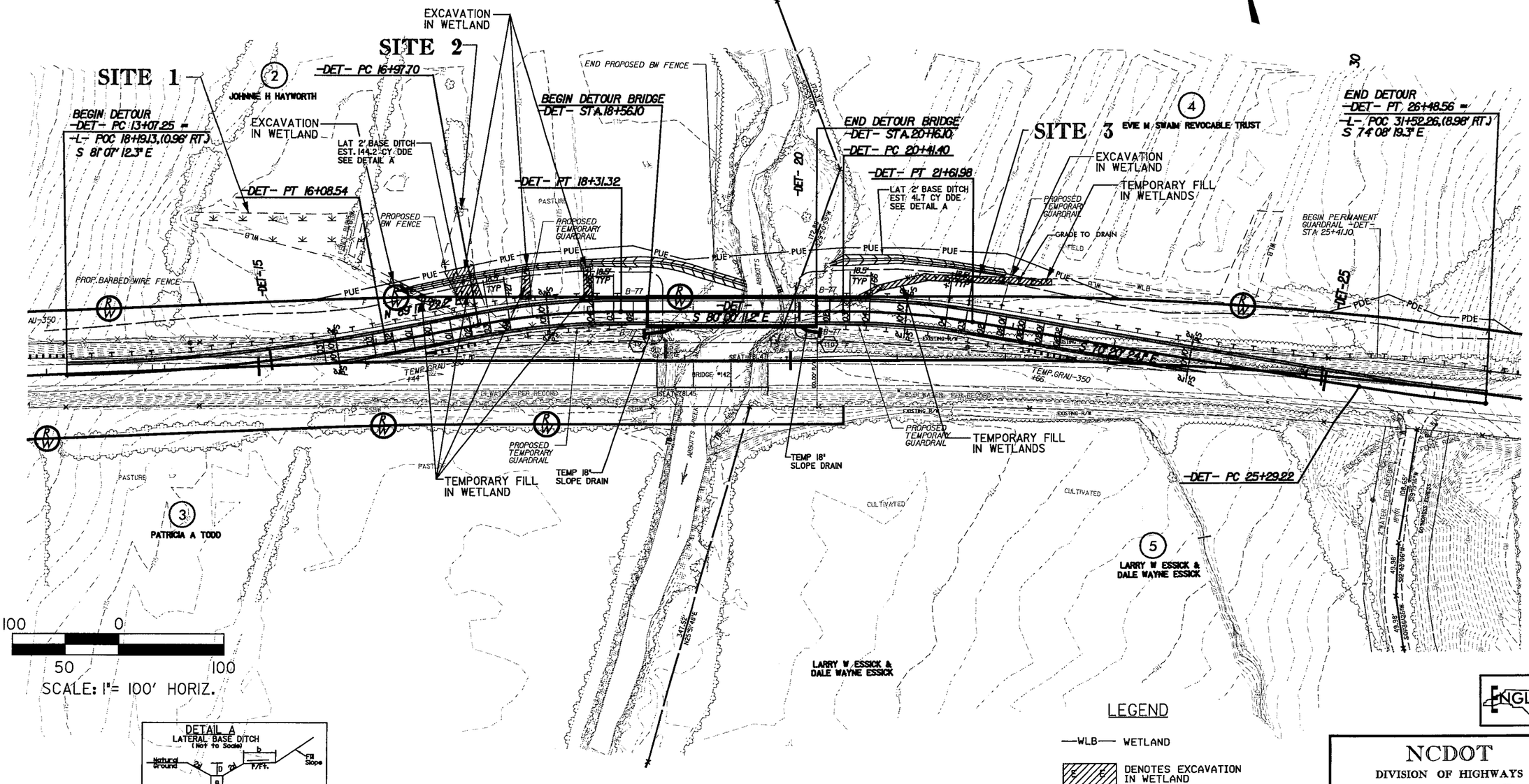
7/20/2007
R:\Hydraulics\dgn\Permits\b4100_hyd_prm_wet_det.dgn
KO & Associates, P.A.

8/17/99

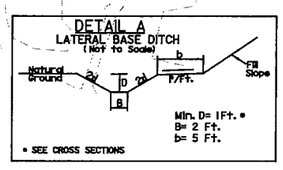
KO & ASSOCIATES, P.C. Consulting Engineers 1011 SCHAUB DR., SUITE 202 RALEIGH, N.C. 27606 (919) 851-6066	PROJECT REFERENCE NO. B-4100	SHEET NO. 2-B
	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

TEMPORARY DETOUR



DETAIL A
LATERAL BASE DITCH
(Not to Scale)



STATION TO STATION	SIDE
-DET- 16+25 - 19+47	LT
-DET- 20+29 - 21+84	LT

PLAN VIEW
SITES 1, 2 & 3

LEGEND

—WLB— WETLAND

DENOTES EXCAVATION IN WETLAND

DENOTES TEMPORARY FILL IN WETLAND

ENGLISH

NCDOT
DIVISION OF HIGHWAYS
DAVIDSON COUNTY
PROJECT: 33456.1.1 (B-4100)
BRIDGE 142 OVER
ABBOTTS CREEK ON
SR 1741 IN THOMASVILLE

SHEET 8 OF 12 7/20/07

7/20/2007
R:\Survey\Projects\B4100\Permits\b4100_hyd_prm_wet_det.dgn
KO & Associates, P.C.

8/17/99

KO & ASSOCIATES, P.C. Consulting Engineers 1011 SCHAUB DR., SUITE 202 RALEIGH, N.C. 27606 (919) 851-6066	PROJECT REFERENCE NO. B-4100	SHEET NO. 4
	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PLAN VIEW
SITES 1, 2, 3, 4, 5, 6, 7

SITE 1

SITE 2

SITE 3

SITE 4

SITE 5

SITE 6

SITE 7

JOHNNIE & JUNE HAYWORTH

2 JOHNNIE H HAYWORTH

4 EVE M SWAIM REVOCABLE TRUST

1 RUTH H SPURGEON

3 PATRICIA A TODD

5 LARRY W ESSICK & DALE WAYNE ESSICK

LAT 2' BASE DITCH W/ CLASS B RIPRAP EST. 36 TONS EST. 102 SY FF EST 36.8 CY DDE SEE DETAIL C

LAT 2' BASE DITCH EST 43.0 CY DDE EST 83 SY PSRM SEE DETAIL B

LAT 2' BASE DITCH EST 77.3 CY DDE EST 190.0 SY PSRM SEE DETAIL B

LAT 2' BASE DITCH EST 25.4 CY DDE EST 43.3 SY PSRM SEE DETAIL B

ROCK VANE EST. 45 TONS VANE LENGTH 35' VANE SLOPE = 7X FROM CHANNEL INVERT SEE DETAIL SHEET 2-C

CLASS II RIP RAP EMBANKMENT EST. 70 TONS EST. 50 SY FF

EXCAVATION IN WETLANDS

COLLAR & EXTEND 18" RCP

CLASS B RIPRAP EST. 2 TONS EST. 7 SY FF

PREFORMED SCOUR HOLE SEE DETAIL D

CLASS II RIP RAP UP TO ELEV. 779.00 (TYP)

CLASS II RIP RAP EST. 210 TONS EST. 300 SY FF

TEMPORARY SURFACE WATER IMPACT

FILL IN WETLANDS

PERMANENT & TEMPORARY SURFACE WATER IMPACT

-L- PC 12+91.51

-L- PT 17+35.95

-L- PCC 16+76.85

-L- PT 22+01.70

-L- PC 20+51.92

-L- PC 26+64.36

-MATCHLINE- STA. 27+00 SEE SHEET NO. 5

TO HWY 109

WALBURN - HIGH POINT RD SR 1741

ABBOTTS CREEK

EXISTING R/W

8" DI WATER PER RECORD

6SBW/ELEC

S 82° 28' 03.3" E

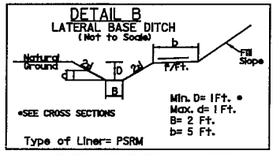
100 0 50 100

SCALE: 1"= 100' HORIZ.

LEGEND

- WLB — WETLAND
- F F — DENOTES FILL IN WETLAND
- E E — DENOTES EXCAVATION IN WETLAND
- S S — DENOTES PERMANENT SURFACE WATER IMPACT
- TS TS — DENOTES TEMPORARY SURFACE WATER IMPACT

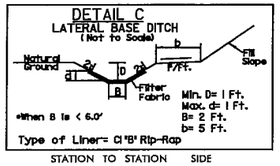
DETAIL B
LATERAL BASE DITCH
(Not to Scale)



Type of Liner= PSRM

STATION TO STATION	SIDE
-L- 16+00 - 17+48	RT
-L- 21+50 - 24+35	LT
-L- 24+90 - 25+55	LT
-L- 30+25 - 32+00	LT

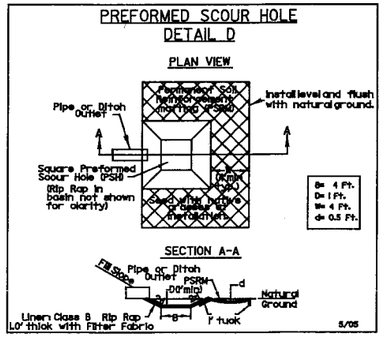
DETAIL C
LATERAL BASE DITCH
(Not to Scale)



Type of Liner= Cl 'B' Rip-Rap

STATION TO STATION	SIDE
-L- 16+50 - 17+30	LT

PREFORMED SCOUR HOLE
DETAIL D



ENGLISH

NCDOT
DIVISION OF HIGHWAYS
DAVIDSON COUNTY
PROJECT: 33456.1.1 (B-4100)
BRIDGE 142 OVER
ABBOTTS CREEK ON
SR 1741 IN THOMASVILLE

SHEET 9 OF 12 7/20/07

7/20/2007
R:\Hydraulics\dgn\Permits\B4100_hyd_prm_wet_04.dgn
KO & Associates, P.C.

8/17/99

KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE 202 RALEIGH, N.C. 27606
(919) 851-6066

PROJECT REFERENCE NO.	SHEET NO.
B-4100	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SITE 1

SITE 2

SITE 3

SITE 4

SITE 5

SITE 6

SITE 7

JOHNNIE & JUNE HAYWORTH

JOHNNIE H HAYWORTH

RUTH H SPURGEON

PATRICIA A TODD

LARRY W ESSICK & DALE WAYNE ESSICK

EVIE M SWAIN REVOCABLE TRUST

LAT 2' BASE DITCH
W/ CLASS B RIPRAP
EST. 36 TONS
EST. 102 SY FF
EST 36.8 CY DDE
SEE DETAIL C

LAT 2' BASE DITCH
EST 43.0 CY DDE
EST 83 SY PSRM
SEE DETAIL B

COLLAR & EXTEND 18" RCP

CLASS B RIPRAP
EST. 2 TONS
EST. 7 SY FF

EXCAVATION IN WETLANDS

LAT 2' BASE DITCH
EST 77.3 CY DDE
EST 190.0 SY PSRM
SEE DETAIL B

ROCK VANE
EST. 45 TONS
VANE LENGTH 35'
VANE SLOPE = 7%
FROM CHANNEL INVERT
SEE DETAIL SHEET 2-C

CLASS II RIP RAP
EMBANKMENT
EST. 70 TONS
EST. 50 SY FF

PREFORMED SCOUR HOLE
SEE DETAIL D

FILL IN WETLANDS

PERMANENT & TEMPORARY SURFACE WATER IMPACT

CLASS II RIP RAP UP TO ELEV. 779.00 (TYP)

GLASS II RIP RAP
EST. 210 TONS
EST. 300 SY FF

TEMPORARY SURFACE WATER IMPACT

LAT 2' BASE DITCH
EST 25.4 CY DDE
EST 43.3 SY PSRM
SEE DETAIL B

EXCAVATION IN WETLANDS

FILL IN WETLAND

-L- PC 12+91.51
-L- PT 17+35.95
-L- PCC 16+76.85
-L- PT 22+01.70
-L- PC 20+51.92
-L- PC 26+64.36

-MATCHLINE- STA. 27+00
SEE SHEET NO. 5

S 82° 26' 03.3" E

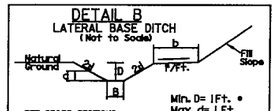
LEGEND

WLB	WETLAND
F F	DENOTES FILL IN WETLAND
E E	DENOTES EXCAVATION IN WETLAND
S S	DENOTES PERMANENT SURFACE WATER IMPACT
TS TS	DENOTES TEMPORARY SURFACE WATER IMPACT

100 0 50 100
SCALE: 1"= 100' HORIZ.

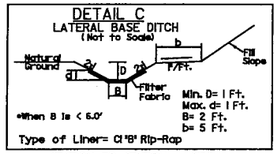
PLAN VIEW
SITES 1, 2, 3, 4, 5, 6, 7

DETAIL B
LATERAL BASE DITCH
(Not to Scale)



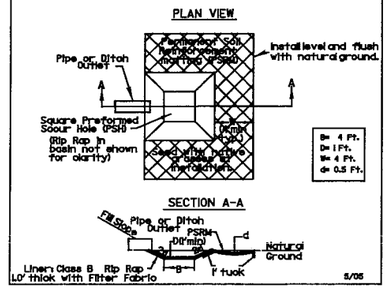
STATION TO STATION	SIDE
-L- 16+00 - 17+48	RT
-L- 21+50 - 24+35	LT
-L- 24+90 - 25+55	LT
-L- 30+25 - 32+00	LT

DETAIL C
LATERAL BASE DITCH
(Not to Scale)



STATION TO STATION	SIDE
-L- 16+50 - 17+30	LT

PREFORMED SCOUR HOLE
DETAIL D



ENGLISH

NCDOT
DIVISION OF HIGHWAYS
DAVIDSON COUNTY
PROJECT: 33456.1.1 (B-4100)
BRIDGE 142 OVER
ABBOTTS CREEK ON
SR 1741 IN THOMASVILLE

SHEET 10 OF 12

7/20/07

I/20/2007
B:\Hydraulics\dgn\Permits\B4100_hyd_prm_wet_04.dgn

5/28/99

PIPE HYDRAULIC DATA
EXISTING 18" RCP
STA 17+43 -L-

DRAINAGE AREA	= 3.50	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 5.00	CFS
DESIGN HW ELEVATION	= 791.22	FT
100 YEAR DISCHARGE	= 6.00	CFS
100 YEAR HW ELEVATION	= 791.39	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 21	CFS
OVERTOPPING ELEVATION	= 795.55	FT

BRIDGE HYDRAULIC DATA

DRAINAGE AREA	= 18.7	SQ MI
DESIGN DISCHARGE	= 3100	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 777.5	FT
BASE DISCHARGE	= 4600	CFS
BASE HW ELEVATION	= 779.0	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 13,000	CFS
OVERTOPPING ELEVATION	= 785.4	FT

-L-
FOR PLAN, SEE SHEET NO.4

BM # 2 EL.776.58
-L- STA.25+14.06, 135.05' LT
RR SPIKE SET IN BASE
OF 10" CRACK WILLOW

KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE 230 RALEIGH, N.C. 27606
(919) 851-6066

PROJECT REFERENCE NO. B-4100 | SHEET NO. 6
ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ENGLISH

BEGIN GRADE STA.16+00.00 EL.801.32 (INCLUDES 1½" RESURFACING)
-1.154%
BEG 16+90 LT ELEV 791.48
BEG 16+00 RT ELEV 797.28
-9.35%
-9.02%
PVC STA.16+85.00 EL.797.82
END 17+39 LT ELEV 790.00
END 17+46 RT ELEV 783.90
PVT STA.17+75.00 EL.794.40
-3.1862%
PVC STA.17+95.00 EL.793.70
EXISTING 18" RCP
PI = 17+30.00
EL = 795.91'
VC = 130'
K = 143
DS = 60 MPH
PI = 20+55.00
EL = 784.64'
VC = 520'
K = 136
DS = 60 MPH
PVT STA.21+15.00 EL.785.50
PVC STA.23+65.00 EL.786.65
PROPOSED SINGLE-SPAN PLATE GIRDER BRIDGE
PROPOSED GRADE
+0.3289%
EXISTING GROUND
NWS = 770.5
-0.80%
-0.55%
-0.80%
+4.30%
+4.43%
BEG 21+50 LT ELEV 773.30
22+90 LT ELEV 773.30
23+65 LT ELEV 773.00
23+65 LT ELEV 772.80
END 24+35 LT ELEV 770.00
BEG 24+90 LT ELEV 770.00
END 25+55 LT ELEV 772.80
BANK REPAIR, CLASS II RIP RAP EMBANKMENT
PERMANENT SURFACE WATER IMPACT
TEMPORARY SURFACE WATER IMPACTS FROM TEMP. ROCK CAUSEWAY

BM # 3 EL.830.31
-L- STA.36+83.37, 97.89' RT
RR SPIKE SET IN BASE
OF 9" PINE

-L-
FOR PLAN, SEE SHEET NO.5

END GRADE STA.34+00.00 EL.817.02 (INCLUDES 1½" RESURFACING)
PVT STA.32+95.00 EL.806.85
PROPOSED GRADE
+6.400%
BEG 31+05.89 EL.798.80
+5.1968%
EXISTING GROUND
+10.3289%
+9.6%
+8.00%
PI = 32+00.00
EL = 803.74'
VC = 190'
K = 132
DS = 50 MPH
END 32+00 LT ELEV 802.24
DESIGN EXCEPTION REQUIRED
PI = 28+85.00
EL = 787.37'
VC = 440'
K = 90
DS = 45 MPH
DESIGN EXCEPTION REQUIRED
BEG 30+65 LT ELEV 779.00
31+20 LT ELEV 788.60

LEGEND
5 5 DENOTES PERMANENT SURFACE WATER IMPACT
15 15 DENOTES TEMPORARY SURFACE WATER IMPACT

NCDOT
DIVISION OF HIGHWAYS
DAVIDSON COUNTY
PROJECT: 33456.1.1 (B-4100)
BRIDGE 142 OVER
ABBOTT'S CREEK ON
SR 1741 IN THOMASVILLE

SHEET 11 OF 12 7/20/07

7/20/2007
R:\Hydraulics\dgn\Permits\B4100_hyd_prm_pfl_06.dgn
KO & Associates, P.C.

5/28/99

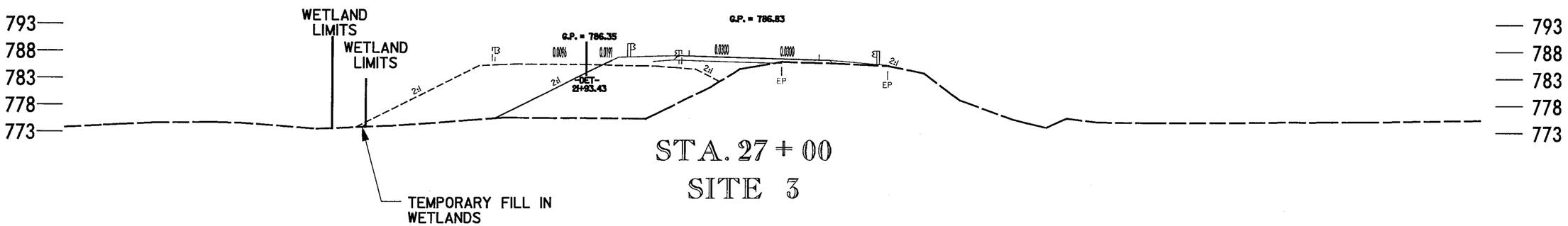
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE 202 RALEIGH, N.C. 27606
(919) 851-6066

PROJECT REFERENCE NO.	SHEET NO.
B-4100	XPL

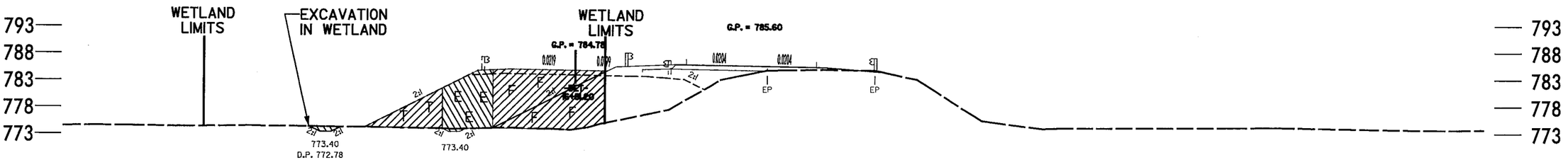
ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ENGLISH



STA. 27 + 00
SITE 3



STA. 22 + 00
SITE 2

80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80

TYPICAL X-SECTIONS

LEGEND
- DENOTES FILL IN WETLAND
- DENOTES TEMPORARY FILL IN WETLAND
- DENOTES EXCAVATION IN WETLAND

NCDOT
DIVISION OF HIGHWAYS
DAVIDSON COUNTY
PROJECT: 33456.1.1 (B-4100)
BRIDGE 142 OVER
ABBOTTS CREEK ON
SR 1741 IN THOMASVILLE
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 20'
SHEET 12 OF 12 7/20/07

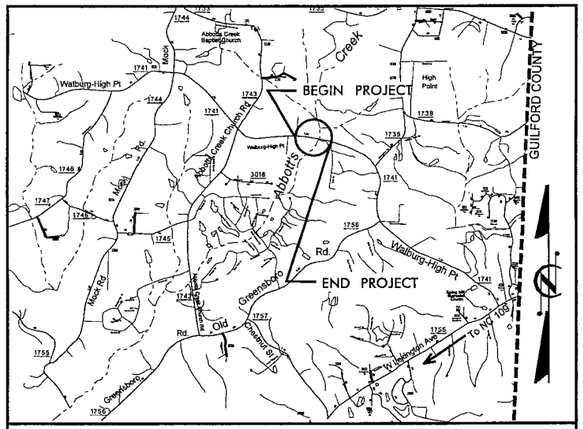
7/20/2007
R:\Projection\dgn\Permits\b4100_hyd_prm_wet_xpl.dgn
KO & Associates, P.

09/08/99

TIP PROJECT: B-4100

CONTRACT:

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols



VICINITY MAP

90% PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

DAVIDSON COUNTY

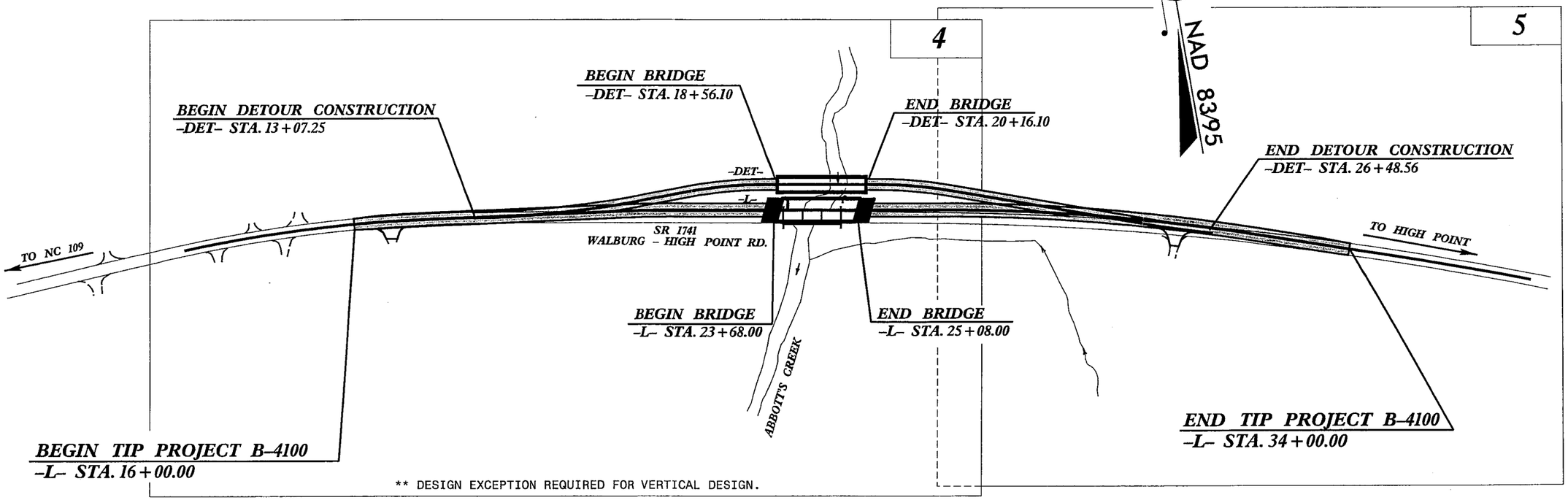
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4100	1	

WBS NO.	F.A. PROJ. NO.	DESCRIPTION
33456.1.1	BRSTP-1741(2)	P.E.
33456.2.1	BRSTP-1741(2)	RW, CONST.

LOCATION: BRIDGE NO. 142 OVER ABBOTT'S CREEK ON SR 1741 (WALBURG – HIGH POINT RD.)

TYPE OF WORK: GRADING, DRAINAGE, PAVING & STRUCTURES

NC GRID
NAD 83/95

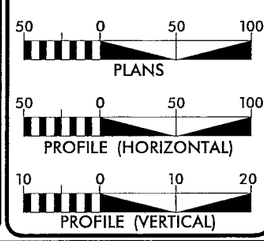


** DESIGN EXCEPTION REQUIRED FOR VERTICAL DESIGN.

NCDOT CONTACT: CATHY HOUSER, P.E.
ROADWAY DESIGN - ENGINEERING COORDINATION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES



DESIGN DATA

ADT 2007	=	4,440
ADT 2027	=	6,840
DHV	=	10 %
D	=	55 %
T	=	4 % *
** V	=	60 MPH

* TTST 1% DUAL 3%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4100	=	*0.314 MI.*
LENGTH STRUCTURES TIP PROJECT B-4100	=	*0.027 MI.*
TOTAL LENGTH OF TIP PROJECT B-4100	=	*0.341 MI.*

Prepared in the Office of:
KO & ASSOCIATES, P.C.
Consulting Engineers
1011 Schaub Dr. Suite 202 Raleigh NC 27606
(919) 851-6066

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: AUGUST 18, 2006

LETTING DATE: JANUARY 15, 2008

DAVID C. WALLER, PE
PROJECT ENGINEER

MICHAEL A. YOUNG, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

2/26/2007
R:\Roadway\Proj\B4100_Rdy_tsh.dgn
Ko & Associates, P.C.

3/15/06

PROJECT REFERENCE NO.	SHEET NO.
B-4100	1-B

Note: Not to Scale

****S.U.E. = Subsurface Utility Engineering***

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream — JS
- Buffer Zone 1 — BZ 1
- Buffer Zone 2 — BZ 2
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch
- False Sump

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line
- Proposed Right of Way Line with Iron Pin and Cap Marker
- Proposed Right of Way Line with Concrete or Granite Marker
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Utility Easement — PUE

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Wheel Chair Ramp — WCR
- Proposed Wheel Chair Ramp Curb Cut — WCC
- Curb Cut for Future Wheel Chair Ramp — CCFR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard — Vineyard

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole — HH
- H-Frame Pole
- Recorded U/G Power Line — P
- Designated U/G Power Line (S.U.E.*) — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Booth
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- Recorded U/G Telephone Cable — T
- Designated U/G Telephone Cable (S.U.E.*) — T
- Recorded U/G Telephone Conduit — TC
- Designated U/G Telephone Conduit (S.U.E.*) — TC
- Recorded U/G Fiber Optics Cable — T FO
- Designated U/G Fiber Optics Cable (S.U.E.*) — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- Recorded U/G Water Line — W
- Designated U/G Water Line (S.U.E.*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Satellite Dish
- TV Pedestal — TC
- TV Tower
- U/G TV Cable Hand Hole — HH
- Recorded U/G TV Cable — TV
- Designated U/G TV Cable (S.U.E.*) — TV
- Recorded U/G Fiber Optic Cable — TV FO
- Designated U/G Fiber Optic Cable (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- Recorded U/G Gas Line — G
- Designated U/G Gas Line (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- Recorded SS Forced Main Line — FSS
- Designated SS Forced Main Line (S.U.E.*) — FSS

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line — PUTL
- U/G Tank; Water, Gas, Oil
- A/G Tank; Water, Gas, Oil
- U/G Test Hole (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

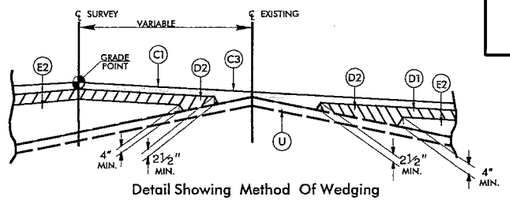
PAVEMENT SCHEDULE			
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 4" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	J	PROP. 8" AGGREGATE BASE COURSE.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	T	EARTH MATERIAL.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	W	VARIABLE DEPTH ASPHALT PAVEMENT
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.		

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE 202 RALEIGH, N.C. 27606
(919) 851-6066

PROJECT REFERENCE NO.	SHEET NO.
B-4100	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

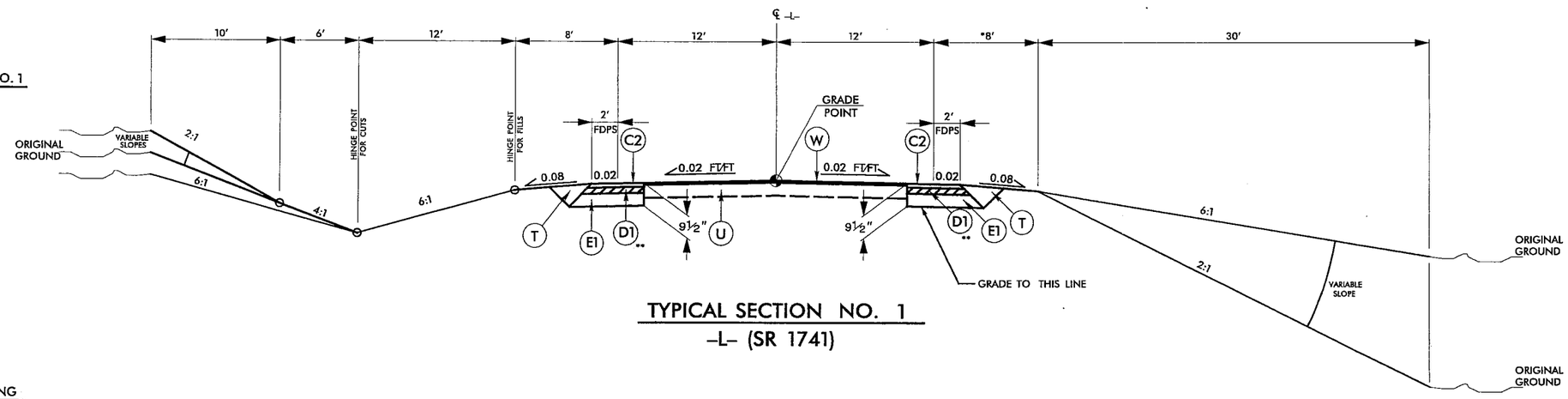


Detail Showing Method Of Wedging

* ADD 5' WITH GUARDRAIL
** FOR NARROW WIDENING LESS THAN 4', USE BASE COURSE IN LIEU OF INTERMEDIATE COURSE

TRANSITION FROM EXISTING TO T.S. NO. 1
–L– STA. 16+00.00 TO 16+50.00

USE TYPICAL SECTION NO. 1
–L– STA. 16+50.00 TO 22+75.00
–L– STA. 26+00.00 TO 33+50.00

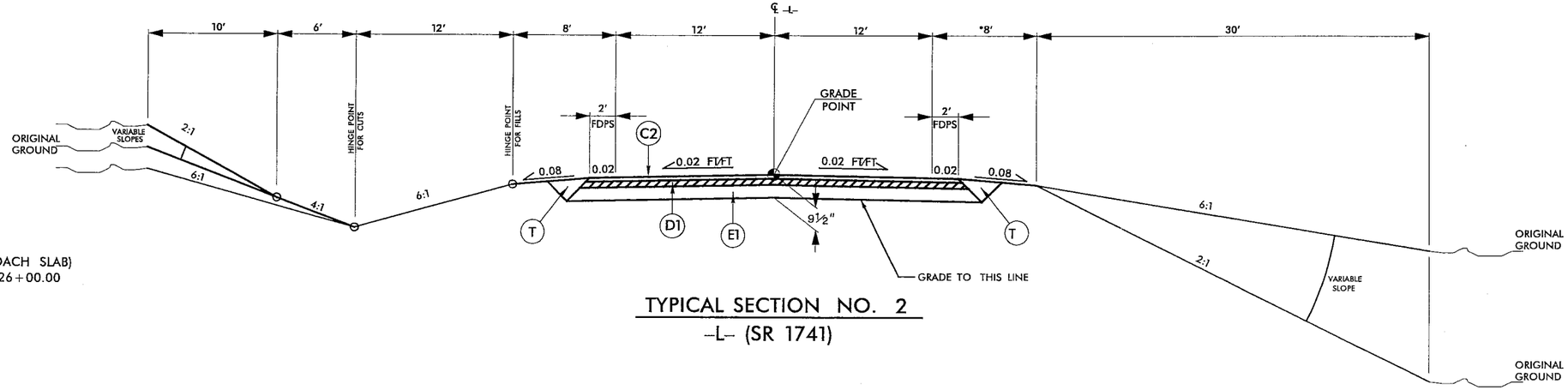


TYPICAL SECTION NO. 1
–L– (SR 1741)

TRANSITION FROM T.S. NO. 1 TO EXISTING
–L– STA. 33+50.00 TO 34+00.00

* ADD 5' WITH GUARDRAIL

USE TYPICAL SECTION NO. 2
–L– STA. 22+75.00 TO 23+43.00 (APPROACH SLAB)
–L– STA. 25+33.00(APPROACH SLAB) TO 26+00.00



TYPICAL SECTION NO. 2
–L– (SR 1741)

2/25/2007
R:\Roadway\Proj\b4100_rdy_typ.dgn
ko & Associates, p.a.

6/2/99

PAVEMENT SCHEDULE			
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 4" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	J	PROP. 8" AGGREGATE BASE COURSE.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	T	EARTH MATERIAL.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	W	VARIABLE DEPTH ASPHALT PAVEMENT
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.		

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE 202 RALEIGH, N.C. 27606
(919) 851-6066

PROJECT REFERENCE NO.	SHEET NO.
B-4100	2-A

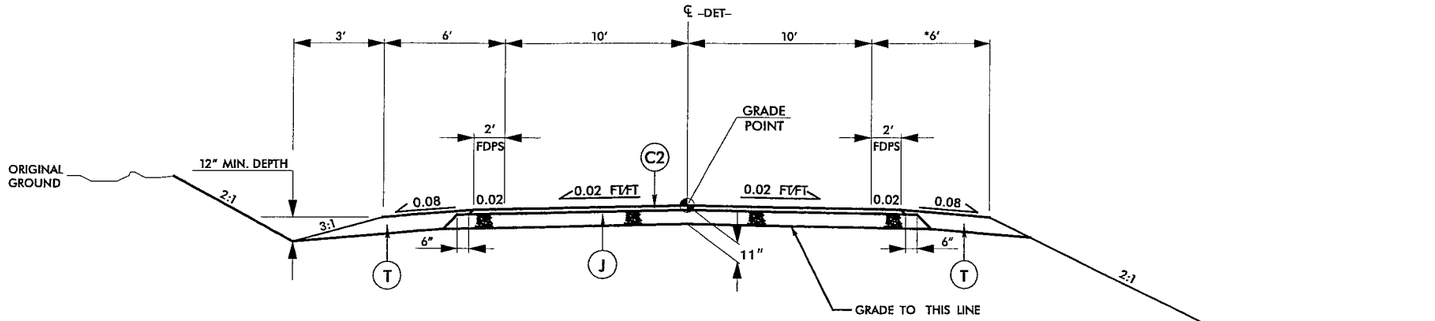
ROADWAY DESIGN ENGINEER

PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

* ADD 2' WITH GUARDRAIL

USE TYPICAL SECTION NO. 3
-DET- STA. 14+76.00 TO 18+56.10(BRIDGE)
-DET- STA. 20+16.10(BRIDGE) TO 24+85.00



TYPICAL SECTION NO. 3
-DET- (TEMP. DETOUR)

2/25/2007
H:\Roadway\Proj\b4100_rdy_typ.dgn
KO & Associates, P.C.

KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE 202 RALEIGH, N.C. 27606
(919) 851-6066

PROJECT REFERENCE NO.	SHEET NO.
B-4100	2-B
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

TEMPORARY DETOUR

-DET-
PI Sta 14+58.25
Δ = 9° 35' 25.5" (LT)
D = 3° 10' 59.2"
L = 301.29'
T = 151.00'
R = 1,800.00'

PI Sta 17+64.70
Δ = 10° 42' 26.6" (RT)
D = 8° 00' 48.2"
L = 133.62'
T = 67.00'
R = 715.00'
SE = 0.040
DS = 45 MPH

PI Sta 21+01.83
Δ = 9° 39' 47.1" (RT)
D = 8° 00' 48.2"
L = 120.59'
T = 60.44'
R = 715.00'
SE = 0.040
DS = 45 MPH

PI Sta 25+88.91
Δ = 3° 47' 55.3" (LT)
D = 3° 10' 59.2"
L = 119.34'
T = 59.69'
R = 1,800.00'

NAD83/95

BEGIN DETOUR
-DET- PC 13+07.25 =
-L- POC 18+19.13, (0.96' RT.)
S 81° 07' 12.3" E

-DET- PC 16+97.70

-DET- PT 16+08.54

BEGIN DETOUR BRIDGE
-DET- STA. 18+56.10

GPS B4100-2 14+08.36 PINC =
-L- POT 23+62.54, 1.64' LT

-DET- PT 18+31.32

END PROPOSED BW FENCE

END DETOUR BRIDGE
-DET- STA. 20+16.10

-DET- PC 20+41.40

-DET- PT 21+61.98

END DETOUR
-DET- PT 26+48.56 =
-L- POC 31+52.26, (8.98' RT.)
S 74° 08' 19.3" E

-BL- 3 21+68.90 PINC =
-L- POC 31+33.15, 5.67' LT

-DET- PC 25+29.22

JOHNNIE H HAYWORTH
DB 583 PG 15

PATRICIA A TODD
DB 1384 PG 439

EVIE M SWAIM REVOCABLE TRUST
DB 1089 PG 1720

LARRY W ESSICK & DALE WAYNE ESSICK
DB 1008 PG 1289

LAT 2' BASE DITCH
EST. 144.2 CY DDE
SEE DETAIL A

LAT 2' BASE DITCH
EST 41.7 CY DDE
SEE DETAIL A

PROP. BARBED WIRE FENCE

PROPOSED BW FENCE

PROPOSED TEMPORARY GUARDRAIL

GRADE TO DRAIN

BEGIN PERMANENT GUARDRAIL -DET- STA 25+41.10

TEMP. GRAU-350

TEMP 18" SLOPE DRAIN

BRIDGE #142

8" DI WATER PER RECORD

6" DI WATER PER RECORD

PASTURE

CULTIVATED

FENCE RUNNING

ABBOTT'S CREEK

N 89° 11' 29.2" E

S 80° 00' 11.2" E

S 70° 20' 23.1" E

3590.42'
N81°51'49"W

3477.52'
N28°51'48"E

189.84'
N30°01'22"E

DETAIL A
LATERAL BASE DITCH
(Not to Scale)

Min. D= 1Ft. *
B= 2 Ft.
b= 5 Ft.

* SEE CROSS SECTIONS

STATION	TO STATION	SIDE
-DET- 16+25	- 19+47	LT
-DET- 20+29	- 21+84	LT

PAVEMENT - BRIDGE RELATIONSHIP SKETCH

* GUARDRAIL ANCHORS

LEGEND
PAVED SHOULDER

FOR -DET- PROFILE, SEE SHEET NO. 7

REVISIONS 8/17/99

7/19/2007
R:\Roadway\P-o-j\b4100_rdy_psh_det.dgn
Ko & Associates, P.A.

KO & ASSOCIATES, P.C. Consulting Engineers 1011 SCHAUB DR., SUITE 202 RALEIGH, N.C. 27606 (919) 851-6066	PROJECT REFERENCE NO. B-4100	SHEET NO. 4
	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

REVISIONS

-L-

PI Sta 14+84.56	PI Sta 17+06.40	PI Sta 21+26.82	PI Sta 29+52.01
Δ = 8° 46' 33.4" (RT)	Δ = 0° 56' 26.5" (RT)	Δ = 2° 25' 52.1" (RT)	Δ = 9° 08' 12.4" (RT)
D = 2° 16' 38.9"	D = 1° 35' 29.6"	D = 1° 37' 23.2"	D = 1° 35' 29.6"
L = 385.34'	L = 59.11'	L = 149.78'	L = 574.08'
T = 193.05'	T = 29.55'	T = 74.90'	T = 287.65'
R = 2,515.76'	R = 3,600.00'	R = 3,530.00'	R = 3,600.00'
	SE = 0.030	SE = 0.030	SE = 0.030
	RO = 8%	RO = 8%	RO = 8%
	DS = 60 MPH	DS = 60 MPH	DS = 60 MPH

* LEAVE GAPS IN PROPOSED GUARDRAIL AS REQUIRED BY TRAFFIC CONTROL PLANS IN ORDER TO REMOVE DETOUR EMBANKMENT. SEE TRAFFIC CONTROL PLANS.

BEGIN PROJECT B-4100
-L- POC STA. 16+00.00
S 85° 07' 30.5" E

GPS B4100-2 14+08.36 PINC =
-L- POT 23+62.54, L 64' LT

-L- PC 12+91.51

-L- PT 22+01.70

-L- PC 20+51.92

-L- PT 17+35.95

-L- PCC 16+76.85

-L- PC 26+64.36

-MATCHLINE- STA. 27+00
SEE SHEET NO. 5

BEGIN SBG STA 23+29 LT

BEGIN SBG STA 23+24 RT

END PROP. BARBED WIRE FENCE
-L- STA. 24+27.45, TIE TO EXIST.

BEGIN PROP. BARBED WIRE FENCE
-L- STA. 16+08.50, TIE TO EXIST.

PROPOSED BARBED WIRE FENCE

TEMPORARY DETOUR

REMOVE

ROCK VANE
EST. 45 TONS
VANE LENGTH 35'
VANE SLOPE = 7%
FROM CHANNEL INVERT
SEE DETAIL SHEET 2-C

CLASS II RIP RAP EMBANKMENT
EST. 70 TONS
EST. 50 SY FF

LAT 2' BASE DITCH
EST 77.3 CY DDE
EST 190.0 SY PSRM
SEE DETAIL B

LAT 2' BASE DITCH
EST 25.4 CY DDE
EST 43.3 SY PSRM
SEE DETAIL B

LAT 2' BASE DITCH
W/ CLASS B RIPRAP
EST. 36 TONS
EST. 102 SY FF
EST 36.8 CY DDE
SEE DETAIL C

LAT 2' BASE DITCH
EST 43.0 CY DDE
EST 83 SY PSRM
SEE DETAIL B

CLASS B RIPRAP
EST. 2 TONS
EST. 7 SY FF

COLLAR & EXTEND 18" RCP

PREFORMED SCOUR HOLE
SEE DETAIL D

CLASS II RIP RAP UP TO ELEV. 779.00 (TYP)

CLASS II RIP RAP
EST. 210 TONS
EST. 300 SY FF

PROPOSED GUARDRAIL

END APPROACH SLAB
-L- STA. 25+33.00

END BRIDGE
-L- STA. 25+08.00

BEGIN APPROACH SLAB
-L- STA. 23+43.00

BEGIN BRIDGE
-L- STA. 23+68.00

GPS B4100-1 5+00.00 POT =
-L- POC 14+51.18, 25.21' RT.

1 RUTH H SPURGEON
DB 583 PG 13

2 JOHNNIE H HAYWORTH
DB 583 PG 15

3 PATRICIA A TODD
DB 1384 PG 439

4 EVIE M SWAIM REVOCABLE TRUST
DB 1089 PG 1720

5 LARRY W ESSICK & DALE WAYNE ESSICK
DB 1008 PG 1289

JOHNNIE & JUNE HAYWORTH
DB 365 PG 349

CANOPY

ISFD

CONC GUY

EXISTING R/W

TO HWY 109

WALBURG - HIGH POINT RD SR 1741

8" DI WATER PER RECORD

ABBOTTS CREEK

CULTIVATED

PASTURE

WLB

PUE

SSBW

DET - 15

DET - 20

DETAIL B
LATERAL BASE DITCH
(Not to Scale)

Natural Ground
Fill Slope
F/Ft.
*SEE CROSS SECTIONS
Min. D= 1Ft. *
Max. d= 1 Ft.
B= 2 Ft.
b= 5 Ft.
Type of Liner= PSRM

STATION TO STATION	SIDE
-L- 16+00 - 17+48	RT
-L- 21+50 - 24+35	LT
-L- 24+90 - 25+55	LT

PAVEMENT - BRIDGE RELATIONSHIP SKETCH
= GUARDRAIL ANCHORS

DETAIL C
LATERAL BASE DITCH
(Not to Scale)

Natural Ground
Fill Slope
F/Ft.
Filter Fabric
*When B is < 5.0'
Min. D= 1 Ft.
Max. d= 1 Ft.
B= 2 Ft.
b= 5 Ft.
Type of Liner= Cl "B" Rip-Rap

STATION TO STATION	SIDE
-L- 16+50 - 17+30	LT

PREFORMED SCOUR HOLE
DETAIL D

PLAN VIEW

Pipe or Ditch Outlet
Install level and flush with natural ground.
Square Preformed Scour Hole (PSH)
Rip Rap in basin not shown for clarity)
Sand Bag Pattern (Typical)
Rip Rap (Typ.)
B= 4 Ft.
D= 1 Ft.
W= 4 Ft.
d= 0.5 Ft.

SECTION A-A

Fill Slope
Pipe or Ditch Outlet
PSRM (6" min)
d
Natural Ground
B
Y tuck
Liner: Class B Rip Rap 1.0' thick with Filter Fabric
5/05

LEGEND
PAVED SHOULDER
APPROACH SLAB

FOR -L- PROFILE, SEE SHEET NO. 6

7/9/2007
R:\Roadway\Proj\B4100_Rdy_psh_04.dgn
KO & Associates, P.C.

KO & ASSOCIATES, P.C. Consulting Engineers 1011 SCHAUB DR., SUITE 202 RALEIGH, N.C. 27606 (919) 851-6066	PROJECT REFERENCE NO. B-4100	SHEET NO. 5
	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

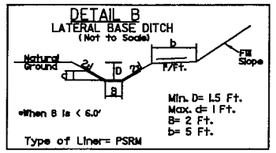
8/17/99

REVISIONS

-L-

PI Sta 29+52.01	PI Sta 36+14.07
Δ = 9°08'12.4" (RT)	Δ = 2°04'44.3" (RT)
D = 1°35'29.6"	D = 0°56'01.5"
L = 574.08'	L = 222.64'
T = 287.65'	T = 111.33'
R = 3,600.00'	R = 6,136.02'
SE = 0.030	
RO = 8%	
DS = 60 MPH	

DETAIL B
LATERAL BASE DITCH
(Not to Scale)



STATION TO STATION	SIDE
-L- 30+25 - 32+00	LT

* LEAVE GAPS IN PROPOSED GUARDRAIL AS REQUIRED BY TRAFFIC CONTROL PLANS IN ORDER TO REMOVE DETOUR EMBANKMENT. SEE TRAFFIC CONTROL PLANS.

30

35

-MATCHLINE- STA. 27+00 SEE SHEET NO. 4

4
EVIE M SWAIM REVOCABLE TRUST
DB 1089 PG 1720

-BL- 3 2+68.90 PINC =
-L- POC 31+33.15, 5.67' LT

-L- 30+44.50
TIE TO GUARDRAIL CONSTRUCTED DURING DETOUR CONSTRUCTION

PROPOSED * GUARDRAIL

TEMPORARY DETOUR

FIELD

PUE

WLB

BEGIN LATERAL 2' BASE DITCH
STA. 30+25 LT.
EST 79.4 CY DDE
EST 117 SY PSRM
TIE TO EXIST SWALE

GRAU-350

50' TAPER LT & RT

EXISTING R/W

PROPOSED GUARDRAIL

CULTIVATED

DO NOT DISTURB BRICK WALLS

PROP. BW FENCE

BEGIN PROP. BARBED WIRE FENCE
-L- STA. 32+00.00, TIE TO EXIST.

-L- PT 32+38.44

END PROP. BARBED WIRE FENCE
-L- STA. 34+00.00, TIE TO EXIST.

5
LARRY W ESSICK & DALE WAYNE ESSICK
DB 1008 PG 1289

6
HAZEL THORNBURG
DB 579 PG 89

WALTER FRANK & IRENE SELTZ JR
DB 567 PG 873

-BL- 4 PINC 27+40.15 =
-L- POC 36+93.74, 14.93' LT

N 10°57'55" W

200.00'
S66°42'12"E

241.38'
N23°08'35"E

231.63'
S23°08'35"W

WALBURG - HIGH POINT RD. SR 1141

TO HIGH POINT

-L- PC 35+02.74

-L- PT 37+25.38

END PROJECT B-4100
-L- POT STA. 34+00.00

MARY H HAYNES AKA MARY WEIR
DB 579 PG 90

8" DI WATER PER RECORD

8" WATER PER RECORD

20' BST

108.65'
S79°55'10"E

49.98'
S82°49'06"W

49.98'
S09°05'54"E

39.85'
S09°38'52"E

43.28'
S09°16'39"E

261.00'
S72°12'09"E

35.59'
N13°29'04"W

777.61'
N79°07'53"W

100.00'
S82°41'51"W

381.44'
N14°41'59"E

LEGEND
PAVED SHOULDER

FOR -L- PROFILE, SEE SHEET NO. 6

7/19/2007
R:\Projects\Proj\B4100_Rdy_psh_05.dgn

5/28/99

PIPE HYDRAULIC DATA
EXISTING 18" RCP
STA 17+43 -L-

DRAINAGE AREA	= 3.50	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 5.00	CFS
DESIGN HW ELEVATION	= 791.22	FT
100 YEAR DISCHARGE	= 6.00	CFS
100 YEAR HW ELEVATION	= 791.39	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 21	CFS
OVERTOPPING ELEVATION	= 795.55	FT

BRIDGE HYDRAULIC DATA

DRAINAGE AREA	= 187	SQ MI
DESIGN DISCHARGE	= 3100	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 777.5	FT
BASE DISCHARGE	= 4600	CFS
BASE HW ELEVATION	= 779.0	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 13,000	CFS
OVERTOPPING ELEVATION	= 785.4	FT

KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE 202 RALEIGH, N.C. 27606
(919) 851-6066

PROJECT REFERENCE NO.	SHEET NO.
B-4100	6

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

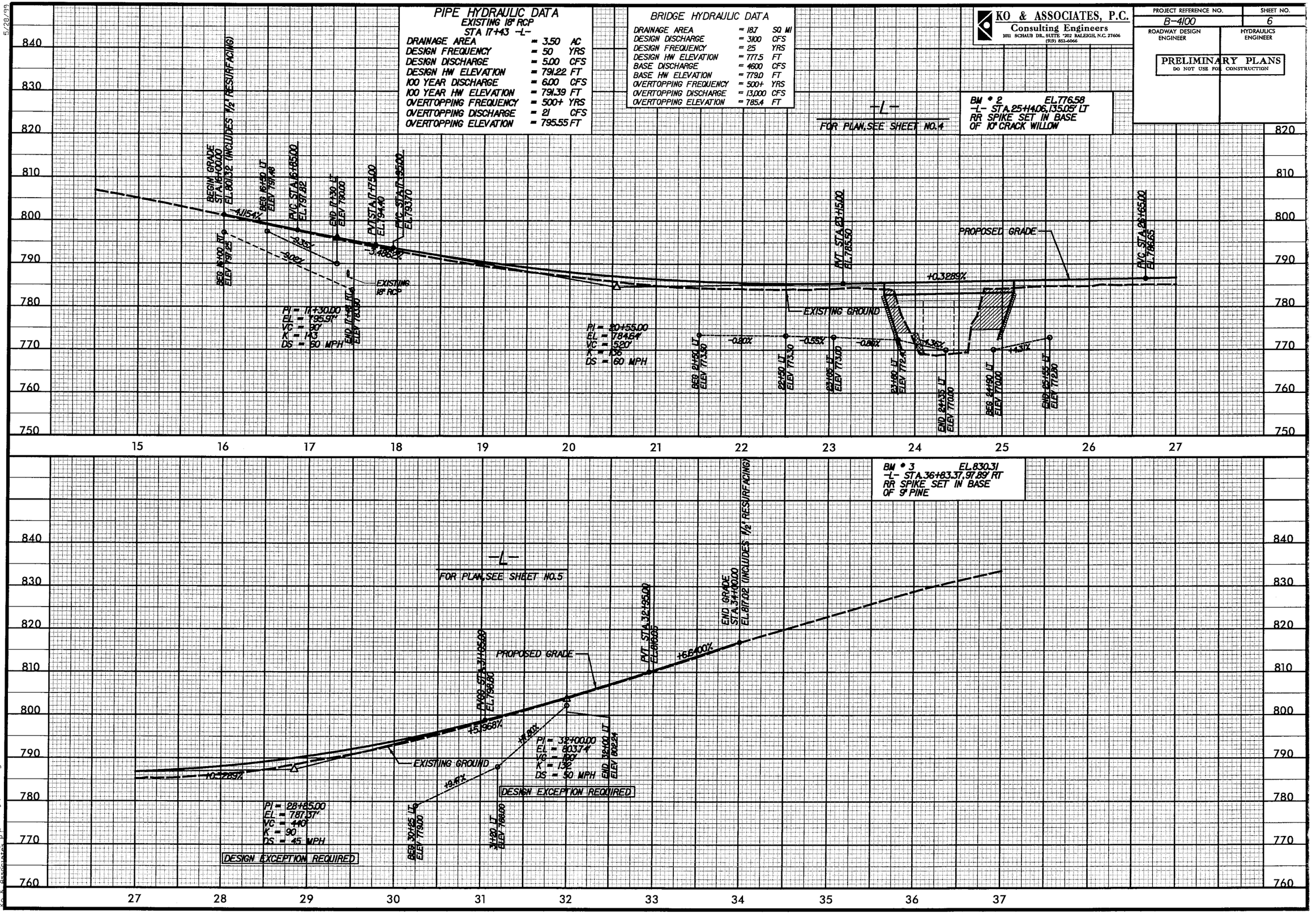
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

BM # 2 EL.776.58
-L- STA.25+14.06, 135.05' LT
RR SPIKE SET IN BASE
OF 10" CRACK WILLOW

-L-
FOR PLAN, SEE SHEET NO.4

BM # 3 EL.830.31
-L- STA.36+83.37, 97.89' RT
RR SPIKE SET IN BASE
OF 9" PINE

-L-
FOR PLAN, SEE SHEET NO.5



7/19/2007
R:\Roadway\Proj\B4100_Rdy_pf1_06.dgn
KO & Associates, P.A.

5/28/99

STRUCTURE HYDRAULIC DATA		
DRAINAGE AREA	= 187	SQ MI
DESIGN DISCHARGE	= 1800	CFS
DESIGN FREQUENCY	= 5	YRS
DESIGN HW ELEVATION	= 776.8	FT

KO & ASSOCIATES, P.C.
Consulting Engineers
1011 SCHAUB DR., SUITE 202 RALEIGH, N.C. 27606
(919) 851-6066

PROJECT REFERENCE NO.	SHEET NO.
B-4100	7

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-DET-

FOR PLAN SEE SHEET NO. 2-B

BEGIN DETOUR GRADE STA 14+76.00 EL 787.35

P/C STA 14+90.00 EL 786.83

-3.000%

P/I STA 16+80.00 EL 784.65

+0.318%

P/C STA 21+85.00 EL 786.32

+4.733%

END DETOUR GRADE STA 24+85.00 EL 791.06

P/I = 15+75.00
EA = 784.38'
VC = 170'
K = 51
DS = 35 MPH

0.5%

-0.20%

-0.58%

-0.82%

-3.82%

-0.65%

P/I = 23+35.00
EL = 786.80'
VC = 300'
K = 78
DS = 40 MPH

16+25 LT ELEV 773.53

16+98 LT ELEV 773.30

17+47 LT ELEV 773.50

17+88 LT ELEV 774.00

18+72 LT ELEV 778.41

END 19+47 LT ELEV 777.00

20+09 LT ELEV 777.00

END 21+84 LT ELEV 773.00

810 800 790 780 770 760 750

14 15 16 17 18 19 20 21 22 23 24 25 26

7/9/2007
K:\Projects\Proj\b4100_rdy_pf1_det.dgn
Kevin Lacy, P.E.

Davidson County
SR 1741 (Walburg-High Point Road)
Bridge No. 142 over Abbott's Creek
Federal-Aid Project No. BRSTP-1741(2)
State Project No. WBS 33456.1.1
T.I.P. No. B-4100

CATEGORICAL EXCLUSION

U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

AND

N.C. DEPARTMENT OF TRANSPORTATION

APPROVED:

4.8.05
DATE

for _____
Gregory J. Thorpe, Ph.D.
Environmental Management Director
Project Development and Environmental Analysis Branch
North Carolina Department of Transportation

4/8/05
DATE

for _____
John F. Sullivan III, P.E.
Division Administrator
Federal Highway Administration

Davidson County
SR 1741 (Walburg-High Point Road)
Bridge No. 142 over Abbott's Creek
Federal-Aid Project No. BRSTP-1741(2)
State Project No. WBS 33456.1.1
T.I.P. No. B-4100

CATEGORICAL EXCLUSION

April 2005

Documentation Prepared By Ko & Associates, P.C.

L. J. Ward, P.E.
Project Manager

For North Carolina Department of Transportation

Karen B. Taylor, P.E.
Project Development Engineer

PROJECT COMMITMENTS

Davidson County
SR 1741 (Walburg-High Point Road)
Bridge No. 142 over Abbott's Creek
Federal-Aid Project No. BRSTP-1741(2)
State Project No. WBS 33456.1.1
T.I.P. No. B-4100

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

Division 9 Construction Office:

Bridge replacement project B-4101 is located on SR 1741 in the general vicinity of B-4100. The construction schedule of these two projects should be coordinated to minimize impacts to the communities. The Division 9 staff has suggested B-4100 and B-4101 be grouped together (i.e. same contractor) so that the same temporary detour structure may be used for both projects.

Davidson County
SR 1741 (Walburg-High Point Road)
Bridge No. 142 over Abbott's Creek
Federal-Aid Project No. BRSTP-1741(2)
State Project No. WBS 33456.1.1
T.I.P. No. B-4100

INTRODUCTION: The replacement of Bridge No. 142 is included in the North Carolina Department of Transportation 2004-2010 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".

I. PURPOSE AND NEED STATEMENT

Bridge Maintenance Unit records indicated the bridge has a sufficiency rating of 34.6 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 1741 (Walburg-High Point Road) crosses over Abbott's Creek at the northeast corner of Davidson County approximately 0.7 mile east of its junction with SR 1743 (Abbott's Creek Church Road) and approximately 0.6 mile west of its junction with SR 1735 (Curry Road). Development in the proximity is low density residential and agricultural. Meadows and cultivated fields are located in all four quadrants. SR 1741 is classified as an Urban Minor Arterial in the Statewide Functional Classification System.

SR 1741 has a current pavement width of 20 feet with 6-foot grass shoulders in the area of the bridge. The bridge is located on tangent between two horizontal curves and two vertical sag curves. Vertical and horizontal alignments of the roadway approaches are good. The east approach curves to the right and is on a slight upgrade. Sight distance is good both to the west and to the east of the bridge.

The 2005 estimated traffic volumes on SR 1741 at Abbott's Creek are 4200 vehicles per day (vpd) and for the design year 2025 the estimated traffic volumes are 6600 vpd. The speed limit is 55 mph in the vicinity of the bridge.

Bridge No. 142, as shown in Figures 2A and 2B, has an overall length of 106 feet and a clear deck width of 24 feet. The existing two-lane bridge has a reinforced concrete deck on I-beams supported by reinforced concrete caps and timber piles at approximate 35-foot centers. The structure was constructed in 1949. The current posted weight limit is 28 tons for single unit vehicles and 34 tons for truck-tractor semi-trailer vehicles. A relatively large number of dump trucks were observed during field trip visits in October 2003. The bridge has a sufficiency rating of 34.6 compared to a rating of 100 for a new structure. Bridge No. 142 has a bed-to-crown distance of approximately 16 feet.

One accident was reported in the vicinity of the bridge during the period from April 1, 1999 to March 31, 2002. The accident rate is 114.05 accidents per 100 million vehicle miles (MVM). The statewide average accident rate for rural secondary routes (two lanes undivided) for the three-year period 2000–2002 is 347.58 accidents per 100 MVM.

There are aerial telephone cables along the north side of SR 1741 crossing over Abbott's Creek, and underground telephone cables along north side of SR 1741. No power lines are in the existing bridge vicinity. A water main is located along the south side of SR 1741. There are no utilities attached to the bridge. Utility conflicts are considered low.

Public school buses cross the existing bridge 14 times per day.

III. ALTERNATIVES

A. Project Description

NCDOT proposes to replace Bridge No. 142 with a new bridge approximately 130 feet long with a maximum clear roadway width of 40 feet. The final bridge length will be determined during final bridge design. 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 are shown in Figure 3A.

B. Detailed Study Alternatives

The studied alternatives were: (1) Replacing Bridge No. 142 at its existing location while maintaining traffic with a temporary structure and detour on the north side; and (2) Replacing Bridge No. 142 on the north side while maintaining traffic on the existing structure as an onsite detour. Alternatives 1 and 2 are shown in Figures 4 and 5. The posted speed limit is 55 mph and the corresponding design speed is 60 mph.

Replacing Bridge No. 142 with a new bridge in the existing location, closing SR 1741 to through traffic during construction and utilizing an offsite detour was investigated. The possible offsite detour route (Figure 6) includes SR 1743 (Abbotts Creek Church Road) and SR 1756 (Old Greensboro Road). The detour is approximately 5.3 miles in length.

In accordance with the NCDOT Guidelines for Evaluation of Offsite Detours for Bridge Replacement Projects (April 2004), the average delay per motorist using the offsite detour is estimated to range from 5-7 minutes for a construction period of 12 months, which falls under the Evaluation (E) range of the Guidelines. The Evaluation (E) range suggests that an onsite detour is justifiable from a traffic operations standpoint but must be weighed with other project factors to determine if it is appropriate. The TIMS Coordinator requests an acceptable bus turnaround if the offsite detour is to be utilized. Coordination with the Horney Town Fire Department indicates that road closure would cause problems due to lack of suitable detour. Based on these concerns the offsite detour is not considered appropriate.

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. This is not a desirable alternative due to the traffic service provided by SR 1741.

Investigation of the existing structure by the NCDOT Bridge Maintenance Unit indicates that rehabilitation of Bridge No. 142 is not feasible due to its age and deteriorated condition. The existing bridge is classified as structurally deficient.

Replacing the bridge in its existing location and maintaining traffic with an off site detour was eliminated from further consideration because (1) local Fire Department expressed concerns with their ability to serve the area, (2) school bus route disruptions (14 bus crossings per day), (3) on both field trips to the bridge area a significant number of construction trucks were observed using SR 1741, and (4) according to NCDOT Guidelines for Evaluation of Offsite Detours for Bridge Replacement Projects, the expected delay per motorist of 5-7 minutes was beyond the acceptable range.

An alternative to replace the bridge on the south side of the existing bridge was not considered. Due to the geometry of the existing roadway, double reverse curves would be required at both approaches for a southern alternative. Also, this alternative was not studied because of stream impacts.

D. Preferred Alternative

Alternate 1, replacing Bridge No. 142 at its existing location while maintaining traffic with a temporary structure and detour on the north side, is the preferred alternative. Alternate 1 was selected to keep the new bridge in the same location as the existing, because it minimizes construction for the approaches, and it lessens the impacts to adjacent properties.

The new structure will be approximately 130 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 2100 feet of new approaches will be required.

The design speed of the replacement structure will be 60 mph; however, a design exception for the vertical alignment will be necessary. The design exception for the vertical curve with a design speed of 50 mph is required because maintaining a 60 mph design speed will necessitate a longer vertical curve and raising the grade considerably. A longer vertical curve and grade change may impact adjacent residences and will increase the estimated cost of this alternate.

The estimated cost for the recommended proposed improvement is $1,795,000. The current estimated cost of the project, as shown in the NCDOT 2004-2010 Transportation Improvement Program, is $ 80,000 for right-of-way and $775,000 for construction.

The Division Office concurs with the recommended improvements.

IV. ESTIMATED COST

The estimated costs of the alternatives studied, based on 2004 prices, are shown in the following table:

	Alternate 1 Onsite Detour	**Alternate 2 New Location**
Structure Removal	$ 21,840.00	$ 21,840.00
Structure	$ 402,480.00	$ 448,920.00
Roadway Approaches	$ 222,540.00	$ 524,810.00
Mobilization and Miscellaneous	$ 164,140.00	$ 306,430.00
Engineering and Contingencies	$ 139,000.00	$ 198,000.00
Temporary Detour	$ 700,000.00	N/A
SUBTOTAL	$ 1,650,000.00	$ 1,500,000.00
Right-of-Way/Const./Util.	$ 145,000.00	$ 238,500.00
TOTAL	$ 1,795,000.00	$1,738,500.00

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 number of sources including U.S. Geological Survey (USGS) topographic mapping (High Point West, NC (1993) 7.5-minute quadrangle), U.S. Fish and Wildlife Service National Wetlands Inventory (NWI) mapping (High Point West, NC (1993) 7.5-minute quadrangle), Natural Resources Conservation Service (NRCS; formerly the Soils Conservation Service) soils mapping (SCS 1994), WRC proposed Significant Aquatic Endangered Species Habitats (WRC 1998), and recent aerial photography.

Plant community descriptions are based on a classification system utilized by the NC 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). Jurisdictional areas were characterized according to a classification scheme established by Cowardin *et al.* (1979) and/or the NC 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 2004a-c). Quantitative sampling was not undertaken to support existing data.

The most current FWS listing of federally protected species with ranges extending into Davidson County (February 11, 2003 FWS list) is considered in this report. In addition, NHP records documenting the presence of federally or state listed species were consulted on April 17, 2004 before commencing field investigations. In addition, Significant Aquatic Endangered Species Habitats proposed by the WRC (December 11, 1998 listing) were consulted to determine the presence of Proposed Critical Habitats for aquatic species.

The project study area is located at the crossing of Walburg-High Point Road over Abbott's Creek approximately 2.5 miles west of High Point, NC. Abbott's Creek flows to the south through the project study area, which is oriented along an east-west axis. The project study boundary is about 300 feet in width (centered on the existing roadway) and about 2775 feet in length, encompassing approximately 19.5 acres. The project study area was walked and visually surveyed for significant features. 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 Abbott's 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 dissected irregular plains, some low rounded hills and ridges; and low to moderate gradient streams with mostly cobble, gravel, and sandy substrates (Griffith *et al.* 2002). The project study area is located within a moderately sloping floodplain valley. Elevations within the project study area range from a high of approximately 850 feet National Geodetic Vertical Datum (NGVD) at the eastern end of the project study area, to a low of approximately 775 feet NGVD within the stream channel (High Point West, NC (1993) 7.5-minute quadrangle). Land uses within and adjacent to the project study area consist of woodlands, agriculture, residential lots, powerline corridors, and roadside shoulders.

Based on soil mapping for Davidson County (SCS 1994), the project study area is underlain by six soil series: Cecil sandy loam (*Typic Kanhapludults*), Chewacla loam (*Fluvaquentic Dystrochrepts*), Enon fine sandy loams (*Ultic Hapludalfs*), Poindexter sandy loams (*Typic Hapludalfs*), Zion sandy loams (*Ultic Hapludalfs*), and Vance sandy loam (*Typic Hapludults*). Chewacla loam occurs adjacent to the stream, and the remainder are found on the slopes. Poindexter and Zion fine sandy loams are intricately mixed within Davidson County. Chewacla loam is considered non-hydric with hydric inclusions in Davidson County (NRCS 1997), and underlies approximately 8.0 acres, or 41 percent of the project study area.

The Cecil series (2 to 8 percent slopes) consists of well-drained sandy loam on smooth upland ridges with moderate permeability. Erosion of this soil is a moderate hazard when the soil surface is bare and unprotected. Depth to bedrock is greater than 60 inches, and the seasonal high water table occurs at a depth greater than 6 feet.

The Chewacla series (0 to 2 percent slopes) consists of poorly drained soil in floodplains that was formed in recent alluvium. This soil tends to be flooded frequently. Permeability of this

soil is moderate, depth to bedrock is greater than 5 feet, and the seasonal high water table occurs between 0.5 and 1.5 feet.

The Enon series consists of well-drained fine sandy loam on upland ridges. Permeability of this soil is slow, and erosion is a moderate to severe hazard when the soil surface is bare and unprotected. Depth to bedrock is greater than 60 inches, and the seasonal high water table occurs at a depth greater than 6 feet.

The Poindexter series consists of well-drained fine sandy loams intermixed with Zion fine sandy loams on upland ridges and side slopes. Permeability of this soil is moderate, and, due to the slope and surface runoff, erosion is a moderate to severe hazard when the soil surface is bare and unprotected. Depth to bedrock occurs between 20 and 40 inches, and the seasonal high water table occurs at a depth greater than 6 feet.

The Vance series with 2 to 8 percent slopes consists of deep, well-drained sandy loam on narrow, upland ridges. Permeability of this soil is slow, and erosion is a severe hazard when the soil surface is bare and unprotected. Depth to bedrock is greater than 60 inches, and the seasonal high water table occurs at a depth greater than 6 feet.

The Zion series with consists of well-drained fine sandy loams intermixed with Poindexter fine sandy loams on upland ridges and side slopes. Permeability of this soil is slow to moderately slow, and erosion is a moderate to severe hazard when the soil surface is bare and unprotected. Depth to bedrock occurs between 20 and 40 inches, and the seasonal high water table occurs at a depth greater than 6 feet.

C. Water Resources

1. Waters Impacted

The project area is located within sub-basin 03-07-07 of the Yadkin River Basin (DWQ 2002). This area is part of USGS Hydrologic Unit 03040103 of the South Atlantic/Gulf Region. The portion of Abbott's Creek that lies within the project area has been assigned Stream Index Number 12-119-(1) by DWQ (DWQ 2004a).

2. Water Resources Characteristics

The project area contains two streams: Abbott's Creek and one unnamed tributary (UT) to Abbott's Creek. Abbott's Creek generally flows southward through the middle of the project area. The UT is located in the southeastern quadrant formed by the intersection of Walburg-High Point Road and Abbott's Creek. The UT flows northward into the project area, turning

west at the toe of the maintained right-of-way slope and continuing approximately 400 feet to a confluence with Abbott's Creek approximately 40 feet south of the existing bridge (Figure 7). The UT has not been assigned a SIN by DWQ.

Abbott's Creek enters the project area as a well-defined, third-order, perennial stream with moderate flow over a cobble, gravel, and sand substrate (containing some boulders). At Bridge No. 142, Abbott's Creek is approximately 30 feet wide with banks of approximately 7 feet. Moving away from the bridge, the banks of Abbott's creek range from 2 to 7 feet and are steeply sloping. During field investigations, the water level appeared low and ranged to approximately 1.5 feet deep. Water clarity was good, with visibility to the substrate, and flow velocity was moderate. No persistent emergent aquatic vegetation was observed within the stream. Abbott's Creek may provide good aquatic habitat for mussels and benthic macroinvertebrates due to the observation of little siltation within the stream and the channel substrate composition. Opportunities for habitat within Abbott's Creek include overhanging trees, undercut banks, and leaf packs.

The UT enters the project area as a well-defined, first-order, perennial stream with slow flow over a fine sand and silt substrate. The steeply sloping banks of the UT range from approximately 2 feet high as it enters the project area to approximately 5 feet at the confluence of Abbott's Creek. During field investigations, the water level appeared low and ranged to approximately 6 inches in depth. Water clarity was good, with visibility to the substrate, and flow velocity was slow. No persistent emergent aquatic vegetation was observed within the stream. Opportunities for habitat within the UT include overhanging trees, undercut banks, and leaf packs.

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. 2004 Section 303(d) list (DWQ 2004c). 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. 2004 Section 303(d) list. Streams are further categorized into one of six parts within the N.C. 2004 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. The reach of Abbott's Creek between U.S. Highways 29/70 and the Abbott's Creek Arm of High Rock Lake is on the N.C. 2004 Section 303(d) list due to impaired biological integrity (DWQ 2004c). This 8.0 mile reach of Abbott's Creek lies approximately 18 stream miles downstream of the project area. The reach of Abbott's Creek within the project area is not listed on any section of the N.C. 2004 Section 303(d) list.

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-III has been assigned to this reach of Abbott's Creek and its unnamed tributaries. Class WS-III waters are protected as water supplies which are generally in low to moderately developed watersheds, and are suitable for all class C uses. Class C waters are suitable for 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. 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 2002).

Pursuant to the NCDWQ Red Book (15 A NCAC 02B.0100 and .0200, August 1, 2004), vegetative buffers are required for all new development along all WS-III and WS-IV perennial waters indicated on the most recent versions of USGS 7.5-minute topographic mapping. The buffer width is determined by the development density option chosen by local governments. A minimum 100-foot vegetative buffer is required for non-residential development activities that exceed the low-density option; otherwise, a 30-foot buffer is required and stormwater runoff must be transported by vegetated conveyances to the maximum extent practicable. 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.

The Division of Water Quality (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 Yadkin River Basinwide Water Quality Plan (DWQ 2002). Abbott's Creek is currently listed by DWQ as Supporting its designated uses. No benthic macroinvertebrate monitoring stations occur within one mile of the project area (DWQ 2002).

Sub-basin 03-07-07 of the Yadkin River Basin supports 13 permitted, point source discharges with a total discharge of over 15.8 million gallons per day. Three of the permitted discharges are classified as major dischargers, discharging 15.7 million gallons per day. The 10 remaining permitted dischargers are minor, with one having no limits set on discharges (DWQ 2004b).

One discharger, Lakeview Mobile Home Park (permit number NC0051713) discharges into Cuddybum Creek (SIN 12-119-2), which comes to a confluence with Abbott's Creek approximately 2.0 miles upstream from the project study area. Lakeview Mobile Home Park is located approximately 2.5 miles upstream from the project study area, and is listed as a minor discharger with a flow of 15000 gallons per day (DWQ 2004b). Cuddybum Creek has been assigned a Best Usage Classification of **WS-III** and does not appear on any section of the NC 2004 303d list (DWQ 2004c). Major non-point sources of pollution within the Yadkin Basin include runoff from construction activities, agriculture, timber harvesting, 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 2002).

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 WRC 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 Yadkin River Basin occurs approximately 5.8 miles to the southeast (NCWRC 1998).

3. Anticipated Impacts to Water Resources

a) General Impacts

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 Abbott's 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's *Best Management Practices for the Protection of Surface Waters* will be strictly enforced during the entire 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.

b) Impacts Related to Bridge Demolition and Removal

The existing two-lane bridge has a reinforced concrete deck on I-beams supported by reinforced concrete caps and timber piles. The structure is expected to be removed without dropping components into Abbott's Creek.

D. BIOTIC RESOURCES

1. Plant Communities

Three distinct plant communities were identified within the project area: disturbed/maintained land, mixed pine/hardwood forest, and alluvial 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 area.

a) Disturbed/maintained land

Approximately 13.2 acres (68 percent) of the project study area is encompassed by disturbed/maintained land. This community dominates the western half of the project study area, and comprises approximately one half of the eastern portion of the project study area. Disturbed/maintained land includes roadside shoulders, pasture, agricultural fields, utility line corridors, and residential lots. In pastures and along roadside shoulders and agricultural land margins, grasses and herbs dominate the vegetation. Representative species include Carolina cranesbill (*Geranium carolinianum*), lyre-leafed sage (*Salvia lyrata*), white clover (*Trifolium repens*), red clover (*Trifolium pratense*), bachelor's button (*Centaurea cyanus*), common buttercup (*Ranunculus bulbosus*), vetch (*Vicia* sp.), fescue (*Festuca* sp.), and dandelion (*Taraxacum officinale*).

Along woodland edges, utility line corridors, and slopes adjacent to the maintained road right-of-way, the sapling/shrub layer is dominated by multiflora rosa (*Rosa multiflora*), with scattered individuals of sweetgum (*Liquidambar styraciflua*), tulip poplar (*Liriodendron tulipifera*), black cherry (*Prunus serotina*), river birch (*Betula nigra*), and red maple (*Acer rubrum*). Vines present include Japanese honeysuckle (*Lonicera japonica*) and muscadine grape (*Vitis rotundifolia*). Representative herbs include evening primrose (*Oenothera biennis*), ebony spleenwort (*Asplenium platyneuron*), periwinkle (*Vinca minor*), and bluet (*Houstonia caerulea*).

Two wet areas dominated by grasses and herbs are located within the disturbed portion of the project area (Figure 7, Sites 1-2). These areas appear to have been excavated in order to lower the water table within the Abbott's Creek floodplain. These linear depressions were systematically excavated across the floodplain, and are interconnected in such a fashion to move surface water and surficial ground water from the floodplain into Abbott's Creek. These depressions are characterized by no evidence of flow and support hydrophytic vegetation such as spikerush (*Eleocharis* sp.), duckweed (*Lemna* sp.), soft rush (*Juncus effusus*), and tag alder (*Alnus serrulata*).

b) Mixed Pine/Hardwood Forest

Approximately 4.4 acres (23 percent) of the project study area is encompassed by mixed pine/hardwood forest. This community occurs on uplands in the project study area. Approximately one half of the eastern portion of the project study area is comprised of this community. A small area of mixed pine/hardwood forest also extends into the southwestern quadrant formed by the intersection of Abbott's Creek and Walburg-High Point Road. This community consists of a mature forest characterized by a closed canopy with a relatively dense understory.

In this community, the canopy is made up of red maple, sweetgum, black oak (*Quercus velutina*), loblolly pine (*Pinus taeda*), and shortleaf pine (*Pinus echinata*). The subcanopy/shrub layers include saplings of canopy species, flowering dogwood (*Cornus florida*), multiflora rose, eastern red cedar (*Juniperus virginiana*), and sourwood (*Oxydendrum arboreum*). Vines include common greenbrier (*Smilax rotundifolia*), Japanese honeysuckle, trumpet honeysuckle (*Lonicera sempervirens*), and Virginia creeper (*Parthenocissus quinquefolia*). Representative species of herbs include ebony spleenwort and poison ivy (*Toxicodendron radicans*).

c) Alluvial Forest

Approximately 0.5 acre (3 percent) of the project area is encompassed by alluvial forest. This community occurs within the floodplain of Abbott's Creek. This community consists of a mature forest characterized by a closed canopy with a relatively open understory. Canopy species include red maple, river birch, black willow (*salix nigra*), sweetgum, and American elm (*Ulmus americana*). The sapling/shrub layer consists of canopy species as well as box elder (*Acer negundo*) and multiflora rose. Herb species consist of tearthumb (*Polygonum sagittatum*), poison ivy, and jewelweed (*Impatiens capensis*), while vines present consist of common greenbrier and Japanese honeysuckle.

2. Wildlife

Wildlife directly observed in a plant community or determined to be present through evidence (tracks, scat, burrows, etc.) during field investigations are indicated with an asterisk (*). In addition, approximately 1.3 acres (7 percent) of the project study area is covered by the impermeable surface of Walburg-High Point Road.

Disturbed/maintained land

Wildlife which may occur within the open portion of the project study area include vegetation and seed eaters such as eastern harvest mouse (*Reithrodontomys humulis*), meadow vole (*Microtus pennsylvanicus*), hispid cotton rat (*Sigmodon hispidus*), and American goldfinch (*Carduelis tristis*); insectivores such as eastern mole (*Scalopus aquaticus*), least shrew (*Cryptotis parva*), red bat (*Lasiurus borealis*), killdeer (*Charadrius vociferous*), southeastern five-lined skink (*Eumeces inexpectatus*), and American toad (*Bufo americanus*); predators of small mammals, birds, and herptiles such as red fox (*Vulpes vulpes*), red-tailed hawk* (*Buteo jamaicensis*), American kestrel, and garter snake (*Thamnophis sirtalis*); and scavengers such as Virginia opossum (*Didelphis virginiana*), American crow* (*Corvus brachyrhynchos*), and turkey vulture (*Cathartes aura*).

Ecotones provide both food and cover for eastern cottontail (*Sylvilagus floridanus*) and white-tailed deer (*Odocoileus virginianus*). Birds commonly found in shrubby areas and along

forest/grassland ecotones include the omnivorous northern mockingbird (*Mimus polyglottos*), brown thrasher (*Toxostoma rufum*), and brown-headed cowbird* (*Molothrus ater*), and the seed-eating indigo bunting* (*Passerina cyanea*). Insectivorous species such as eastern fence lizard (*Sceloporus undulatus*) and gray treefrog (*Hyla chrysoscelis*), and predators including black racer (*Coluber constrictor*), utilize this habitat.

During the field visit, a mallard* (*Anas platyrhynchos*) was observed within one of these depressions. Herptiles expected in marshy areas such as these include spring peeper (*Pseudacris crucifer*), northern cricket frog (*Acris crepitans*), and northern water snake (*Nerodia sipedon*).

Mixed Pine/Hardwood Forest

The complexity and size of this community allow for a diverse assemblage of wildlife including forest interior species. This community should support predators such as grey fox (*Urocyon cinereoargenteus*), screech owl (*Otus asio*), sharp-shinned hawk (*Accipiter striatus*), copperhead (*Agkistrodon contortrix*), black rat snake (*Elaphe obsoleta*), and ringneck snake (*Diadophis punctatus*); herbivores such as gray squirrel (*Sciurus carolinensis*), southern flying squirrel (*Glaucomys volans*), white-footed mouse (*Peromyscus leucopus*), eastern cottontail, northern cardinal* (*Cardinalis cardinalis*), and eastern box turtle (*Terrapene carolina*); and insectivores such as pine warbler (*Dendroica pinus*), wood thrush (*Hylocichla mustelina*), golden-crowned kinglet (*Regulus satrapa*), Carolina wren (*Thryothorus ludovicianus*), red-eyed vireo (*Vireo olivaceous*), northern fence lizard (*Sceloporus undulatus*), five-lined skink (*Eumeces fasciatus*), and slimy salamander (*Plethodon glutinosus*).

Alluvial Forest

This relatively narrow community extends through the project study area along both sides of Abbott's Creek and provides food and cover and a travel corridor for wildlife within this riparian habitat. Species utilizing alluvial forest in this portion of the state include predators such as barred owl (*Strix varia*) and northern water snake; scavenging omnivores such as raccoon* (*Procyon lotor*); seed, vegetation, and insect eaters such as northern cardinal*, eastern phoebe* (*Sayornis phoebe*), summer tanager* (*Piranga rubra*), wood thrush (*Hylocichla mustelina*), golden-crowned kinglet, Carolina wren (*Thryothorus ludovicianus*), red-eyed vireo, gray squirrel, and red bat.

Many of these wildlife species are adaptable and can eat a wide variety of plant and animal material when the preferred food is absent. Many of these species can be found within disturbed areas, brushy edges of the forest, within heavy underbrush, or amongst shrubby plants.

Migration between communities of the project area may be frequent based on the needs of each species for food, cover, protection from predators, and nesting.

3. Aquatic Communities

The project study area includes two perennial streams, all bounded by natural vegetation. These streams are characterized by natural channels providing diverse habitats for fish and wildlife (riffle-pool complexes, undercut banks, rock and organic debris in the stream beds, and overhanging branches. These waters are expected to support a fishery and benthic population which serves as a food source for aquatic herptiles such as northern water snake, bullfrog* (*Rana catasbeina*), green frog (*Rana clamitans*), eastern musk turtle (*Sternotherus odoratus*), and two-lined salamander (*Eurycea bislineata*).

No sampling was undertaken in Abbott's 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 Abbott's Creek include smaller fish species such as creek chub (*Semotilus atromaculatus*), margined madtom (*Noturus insignis*), rosyside dace (*Clinostomus funduloides*), and spottail shiner (*Notropis hudsonius*).

4. Summary of Anticipated Impacts

Permanent and temporary impacts are anticipated as a result of this project. Permanent impacts are considered to be those impacts that occur within proposed cut-fill limits. Temporary impacts are considered to be those impacts which occur 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 lines of Respective Alternatives

	Alternate 1			Alternate 2
Plant Community	**Permanent**	**Temporary**	**Total**	**Permanent**
Maintained/Disturbed Land	1.41	1.63	3.04	3.03
MixedPine/Hardwood Forest	0.16	0.19	0.35	0.19
Alluvial Forest	--	0.04	0.04	0.05
Total	1.57	1.86	3.43	3.27

Areas are given in acres.

While total impacts to plant communities are roughly the same for both alternatives, permanent impacts resulting from the construction of Alternate 1 are approximately one half of the area permanently impacted by Alternate 2. In addition, construction of the temporary structure

associated with Alternative 1 will require approximately 0.04 acre of alluvial forest to be logged. Likewise, the new structure associated with Alternative 2 will require the removal of approximately 0.05 acre of alluvial forest.

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. Little area of natural plant community is expected to be permanently impacted by the proposed project. Temporary impacts present the greater amount of 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 study area (WRC 1998). 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. After bridge construction, temporary detour structures and approaches will be removed and the area reseeded.

E. JURISDICTIONAL TOPICS

1. Waters of the United States

Surface waters within the project 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.

Abbott's Creek exhibits characteristics of a well-defined, third-order, perennial stream with moderate flow over a gravel and sand substrate with some boulders. This stream contains several unvegetated point bars composed of sand and gravel. Abbott's Creek can be classified as riverine, upper perennial with an unconsolidated bottom composed primarily of gravel and sand (R3UB1). The UT can be classified as a well-defined, first-order, riverine, lower perennial stream with an unconsolidated bottom composed primarily of sand and silt (R2UB2).

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 study area contains two vegetated wetland areas (Figure 7, Wetlands 1 and 2).

A grass and herb dominated series of associated wetland, linear depressions is located in the northwest quadrant of the project study area, and drains the associated pasture land (Figure 7, Wetland 1). This wetland area includes a seepage slope on the outer edge of the floodplain and linear depressions excavated to drain a floodplain for use as pasture. This wetland area may be classified as palustrine, persistently emergent, and permanently flooded (PEM1H). Soils exhibit hydric chromas, and support hydrophytic vegetation such as spikerush and duckweed. Standing water is clear with light surface flow in places. Hydrology indicators include inundation, drainage patterns, and oxidized rhizospheres. This system would be considered a "riverine" wetland by DWQ, based upon its location within the Abbott's Creek floodplain.

A grass and herb dominated series of associated wetland, linear depressions is located in the northeast quadrant of the project study area, and drains the adjacent agricultural field (Figure 7, Wetland 2). This field, fallow this season, but most recently used to grow corn, appears to have been trenched in order to lower the water table. Similar to Wetland 1, Wetland 2 includes a seepage area on the outer edge of the floodplain. This wetland area exhibits hydrophytic vegetation such as spikerush, soft rush, and tag alder and may be classified as palustrine, persistently emergent, and seasonally flooded (PEM1C). Standing water is murky and shows little evidence of movement. Soils exhibit hydric chromas and hydrology indicators include inundation, light surface flow, and oxidized rhizospheres. This system would be considered a "riverine" wetland by DWQ, based upon its location within the Abbott's Creek floodplain.

Both alternatives will result in impacts to both Wetlands 1 and 2. Implementation of Alternate 1 will also result in temporary impacts to both wetlands. No temporary impacts are anticipated to result from Alternate 2 construction. No temporary or permanent impacts associated with either alternative are projected to result in direct impacts to surface waters. A summary of potential jurisdictional area impacts is summarized in Table 2.

Table 2. Projected Impacts to Jurisdictional Wetland Areas
(Wetlands are depicted on Figure 7. Area is expressed in acres.)

Jurisdictional Area	Alternate 1			Alternate 2
	Permanent	Temporary	Total	Permanent
Wetland 1	0.04	0.09	0.13	0.10
Wetland 2	<0.01	0.06	0.06	0.03
Total	0.04	0.15	0.19	0.13

The existing bridge is to be removed without dropping components into Abbott's Creek. Therefore, no fill is to be deposited into waters of the United States.

2. Permit

Impacts to jurisdictional areas are anticipated from the proposed project. As a result, construction activities will require permits and certifications from 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 of 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. Rare and Protected Species

1. Federally Protected Species

Species with the federal classification of Endangered (E), Threatened (T), or officially Proposed (P) 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).

Three federally protected species are listed for Davidson County (February 11, 2003 FWS list): Bald eagle (*Haliaeetus leucocephalus*), bog turtle (*Clemmys muhlenbergii*), and Schweinitz's sunflower (*Helianthus schweinitzii*) (FWS 2002a). The bald eagle is Threatened, the bog turtle is Threatened due to similarity of appearance (T S/A), and Schweinitz's sunflower is Endangered.

***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 (FWS 1987). The FWS 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 FWS 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

No suitable habitat or individuals were observed during field investigations, and NHP files list no documentation of bald eagle within 2.0 miles of the project area.

***Clemmys muhlenbergii* (Bog turtle)**
Threatened due to similarity of appearance
Family: Emydidae
Date Listed: May 1, 1997

The bog turtle is a small turtle reaching an adult size of approximately three to four inches. This otherwise darkly-colored species is readily identifiable by the presence of a bright orange or yellow blotch on the sides of the head and neck (Martof *et al.* 1980). The bog turtle has declined drastically within the northern portion of its range due to over-collection and habitat alteration. As a result, the FWS officially proposed in the January 29, 1997 Federal Register (62 FR 4229) to list bog turtle as Threatened within the northern portion of its range, and within the southern portion of its range, which includes North Carolina. The bog turtle was proposed for listing as Threatened due to Similarity of Appearance (T S/A) to the northern population. The listing would allow incidental take of bog turtles in the southern population resulting from otherwise lawful activity. The bog turtle is typically found in bogs, marshes, and wet pastures, usually in association with aquatic or semi-aquatic vegetation and small, shallow streams over soft bottoms (Palmer and Braswell 1995). In North Carolina, bog turtles have a discontinuous distribution in the Mountains and western Piedmont.

Suitable habitat does exist for bog turtle within the project area. However, no individuals were observed during field investigations and NHP files list no documentation of bog turtle within 2.0 miles of the project area. The bog turtle is listed as T(S/A) due to its similarity of appearance to another rare species listed for protection. T(S/A) species are not subject to Section 7 consultation and **a biological conclusion for this species is not required.**

***Helianthus schweinitzii* (Schweinitz's sunflower)**
Endangered
Family: Asteraceae
Date Listed: May 7, 1991

Schweinitz's sunflower is an erect, unbranched, rhizomatous, perennial herb that grows to approximately 6 feet in height. The stem may be purple, usually pubescent, but sometimes nearly smooth. Leaves are sessile, opposite on the lower stem but alternate above; in shape they are lanceolate and average five to ten times as long as wide. The leaves are rather thick and stiff,

with a few small serrations. The upper leaf surface is rough and the lower surface is usually pubescent with soft white hairs. Schweinitz's sunflower blooms from September to frost; the yellow flower heads are about 0.6 inch in diameter. The current range of this species is within approximately 60 miles of Charlotte, North Carolina, occurring on upland interstream flats or gentle slopes, in soils that are thin or clay in texture. The species needs open areas protected from shade or excessive competition, reminiscent of Piedmont prairies. Disturbances such as fire maintenance or regular mowing help sustain preferred habitat (FWS 1994).

BIOLOGICAL CONCLUSION: NO EFFECT

The project study area does contain suitable habitat for Schweinitz's sunflower within disturbed/maintained land, specifically roadside shoulders, utility line corridor, and forest edges. However, NHP files reviewed on April 17, 2004 list no documentation of this species within 2.0 miles of the project study area. In addition, detailed surveys for Schweinitz's sunflower conducted on August 19, 2004 revealed no individuals within the project study area.

2. Federal Species of Concern

The February 11, 2003 FWS list 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. NHP files list no documentation for FSC species within 2.0 miles of the project area.

Two FSC species are listed for Davidson County: the Carolina Darter (*Etheostoma collis collis*) which has a state status of Special Concern, and Heller's trefoil (*Lotus helleri*) which has a state status of Significantly Rare throughout its range (FWS 2002a, Amoroso 2004, LeGrand and Hall 2001). Carolina Darter habitat is sluggish to calm, clear to slightly turbid creeks and small rivers over a bed of mud, sand, and rock. The reach of Abbott's Creek within the project area does provide suitable habitat for Carolina darter. Heller's trefoil is typically found along roadsides and other disturbed areas such as fields and utility right-of-ways. Suitable habitat exists for this species within the project area.

Candidate Species - The February 11, 2003 FWS list also includes a category of species designated as "Candidate" (C1). A species with this designation is one that is a species under consideration for official listing for which there is sufficient information to support listing. The C1 designation provides no federal protection under the ESA for the species listed.

One C1 species is listed for Davidson County: Georgia aster (*Aster georgianus*) that has a state status of Threatened (FWS 2002a, Amoroso 2004, LeGrand and Hall 2001). Georgia aster populations typically prefer roadsides, woodland borders, dry rocky woods, and disturbed areas such as fields and utility right-of-ways. Suitable habitat exists for this species within the project area. However, NHP files list no documentation for C1 species within 2.0 miles of the project area.

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

In a memorandum dated March 10, 2004, the North Carolina State Historic Preservation Office (HPO) determined the project would not affect any historic structures. Accordingly, NCDOT architectural historians did not initiate a survey of the project area. A copy of this memorandum is included in the Appendix.

C. Archaeology

A memorandum from the HPO dated March 10, 2004 states that they are aware of no historic resources that would be affected by the project. According, NCDOT did not initiate an archaeological survey of the project area. A copy of the memorandum is included in the Appendix.

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 urban area of High Point. (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 an air quality "neutral" project, so it is not required to be included in the regional emissions analysis and a project level CO analysis is not required. 40 CFR Part 51 is not applicable because the proposed project is located in an attainment area. If vegetation or wood debris is disposed of by burning, it shall be done in accordance with applicable local laws and regulations of the North Carolina State Implementation Plan (SIP) for air quality in compliance with 15 NCAC 2D.0520 and 1990 Clean Air Act Amendments and the National Environmental Policy Act. Traffic volumes will not increase or decrease because of the replacement of the existing bridge. The noise levels will increase during the construction period, but will only be temporary. This evaluation completes the assessment requirements for highway traffic noise of Title 23, Code of Federal Regulations (CFR), Part 772 and for air quality (1990 Clean Air Act Amendments and the National Environmental Policy Act) and no additional reports are required.

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
US Department of Agriculture, Natural Resources Conservation Service
State Clearinghouse
*NC Department of Cultural Resources
*NC Wildlife Resources Commission, NC Division of Water Quality
Planning Director, Davidson County Planning & Zoning Department
Chairman, Davidson County Commissioners
*Superintendent, Davidson County Public Schools
Davidson County Emergency Management Services
Sheriff, Davidson County

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: "...we recommend conducting habitat assessments and surveying any suitable habitat in the project areas for these species [listed on the *Federal List of Endangered and Threatened Wildlife and Plants* or Federal Species of Concern] prior to any further planning or on-the-ground activities to ensure that no adverse impacts occur".

   Response: A survey of the project area concluded this project will not affect any threatened or endangered species.

Comment: "[Fish and Wildlife Service – Asheville Field Office officials] recommend spanning structures, preferably bridges, in all cases".

Response: Bridge No. 142 will be replaced with a new bridge approximately 130 feet long with a maximum clear roadway width of 40 feet.

Comment: "...off-site detours, which would reduce stream-bank disturbance, are preferable to temporary on-site crossings".

Response: Alternate 2, replacing Bridge No. 142 on the north side while maintaining traffic on the existing structure as an on-site detour, is the preferred alternative. An off-site detour was investigated but was not considered appropriate because of the relatively high traffic volumes (4200 vpd) and the lack of a suitable detour for local fire protection vehicles.

2. North Carolina Division of Water Quality

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.

3. North Carolina Wildlife Resources Commission

Comment: "...Abbotts [Creek is] classified WS-III waters. Sediment and erosion control measures should adhere to the design standards for sensitive watersheds to protect the water supply".

Response: NCDOT BMP's for the Protection of Surface Waters will be strictly enforced during the entire life of the project. The necessary sedimentation and erosion control measures will be determined during the final design and permitting process.

Comment: "Impacts to aquatic and terrestrial resources should be minimized. Standard requirements and BMP's should apply".

Response: 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. Davidson County Schools – School Transportation Director

Comment: There are 14 school bus crossings on Bridge No. 142 per day. Re-routing bus traffic would be difficult. Acceptable turn around areas would be preferred.

Response: The preferred alternate will maintain traffic with an on-site temporary detour. School buses will not need to be re-routed, and turn around areas will not be necessary.

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. US Army Engineer Waterways Experiment Station, Vicksburg, MS. 100 pp.

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

Division of Water Quality (DWQ). 2004a. Basinwide Information Management System (BIMS) (http://h2o.enr.state.nc.us/bims/Reports/reportsWB.html). N.C. Department of Environment, Health 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 8, 2004]. N.C. Department of Environment and Natural Resources, Raleigh.

Division of Water Quality (DWQ). 2004c. Water Quality Assessment and Impaired Waters List- Draft (online). Available: http://h2o.enr.state.nc.us/tmdl/General_303d.htm [April 14, 2004] N.C. Department of Environment and Natural Resources, Raleigh.

Division of Water Quality (DWQ). 2002. Yadkin River Water Quality Management Plan. 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.

LeGrand, H.E. and S.P. Hall. 2001. Natural Heritage Program List of the Rare Animal Species of North Carolina. North Carolina Natural Heritage Program, Division of Parks and Recreation, N.C. Department of Environment, Health, and Natural Resources, Raleigh.

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 Resources Conservation Service (NRCS). 1997. U.S. Department of Agriculture. Hydric Soils, Davidson 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). 1994. Soil Survey of Davidson County, North Carolina, USDA National Cooperative Soil Survey.

U.S. Fish and Wildlife Service (FWS). 2002a. Davidson County Endangered Species, Threatened Species, and Federal Species of Concern (online). Available: http://nc-es.fws.gov/es/cntylist/Davidson.html [March 29, 2004]. U.S. Fish and Wildlife Service.

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

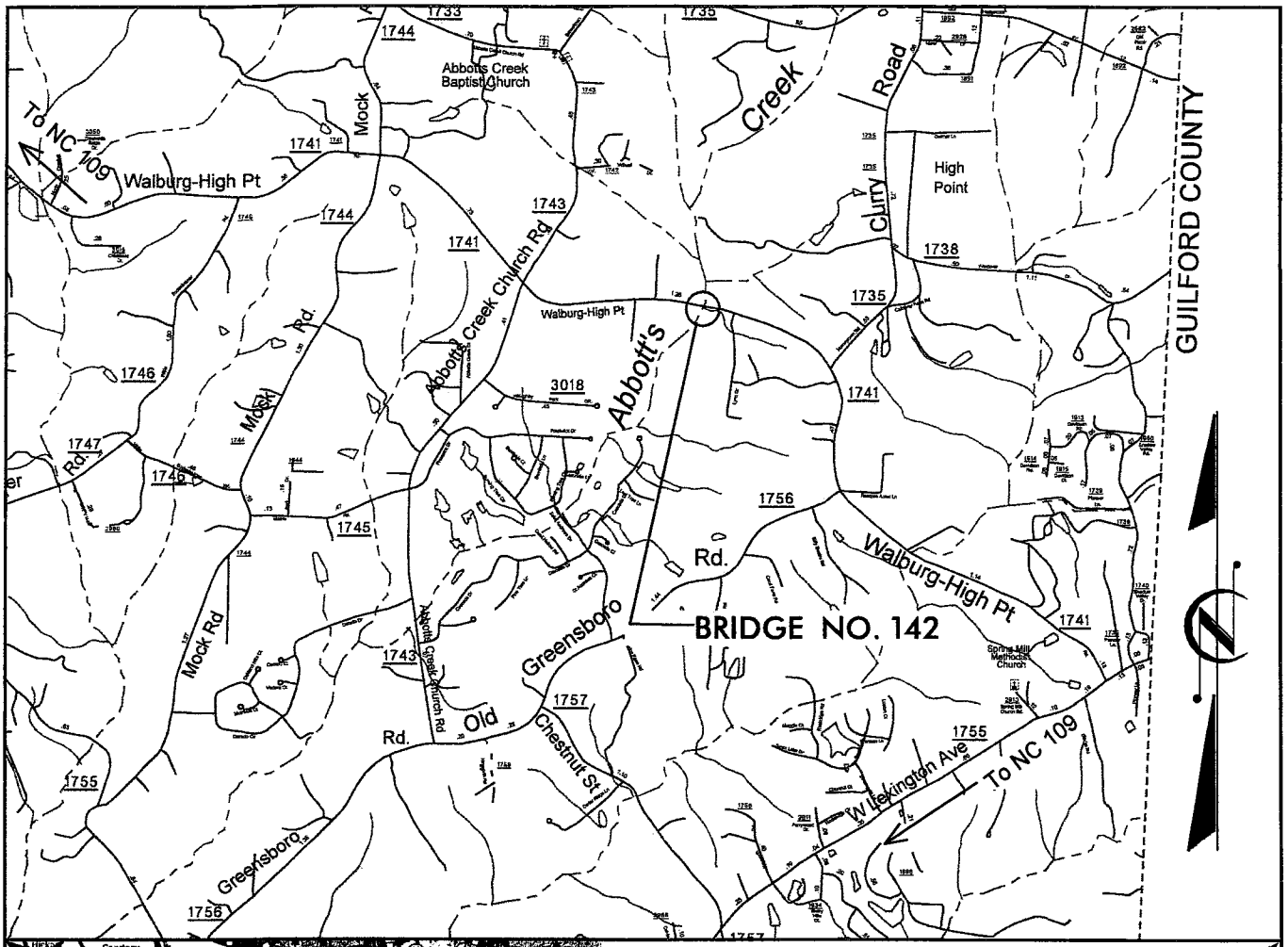
U.S. Fish and Wildlife Service (FWS). 1994. Schweinitz's Sunflower Recovery Plan. Atlanta, Ga.

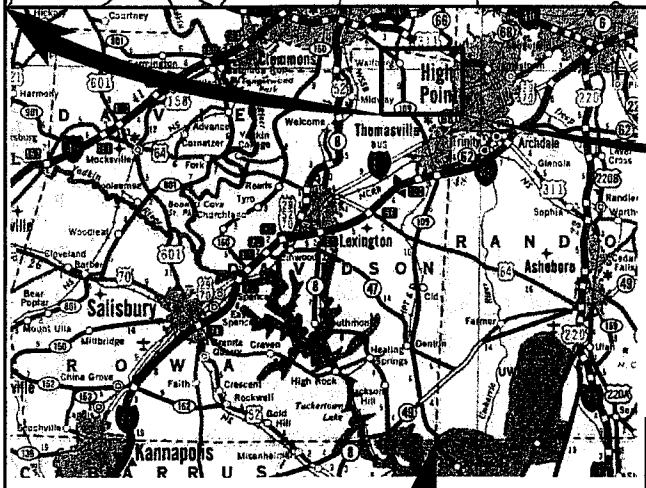
U.S. Fish and Wildlife Service (FWS). 1987. Habitat Management Guidelines for the Bald Eagle in the Southeast Region. U.S. Department of the Interior, Fish and Wildlife Service. 8 pp.

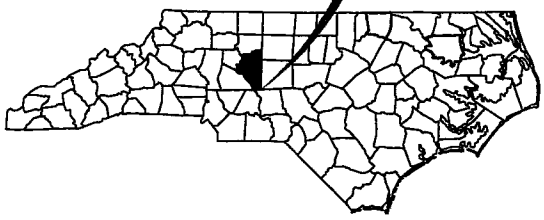
Webster, W.D., J.F. Parnell, and W.C. Biggs, Jr. 1985. Mammals of the Carolinas, Virginia, and Maryland. The University of North Carolina Press, Chapel Hill, NC. 255 pp.

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

Figures







NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

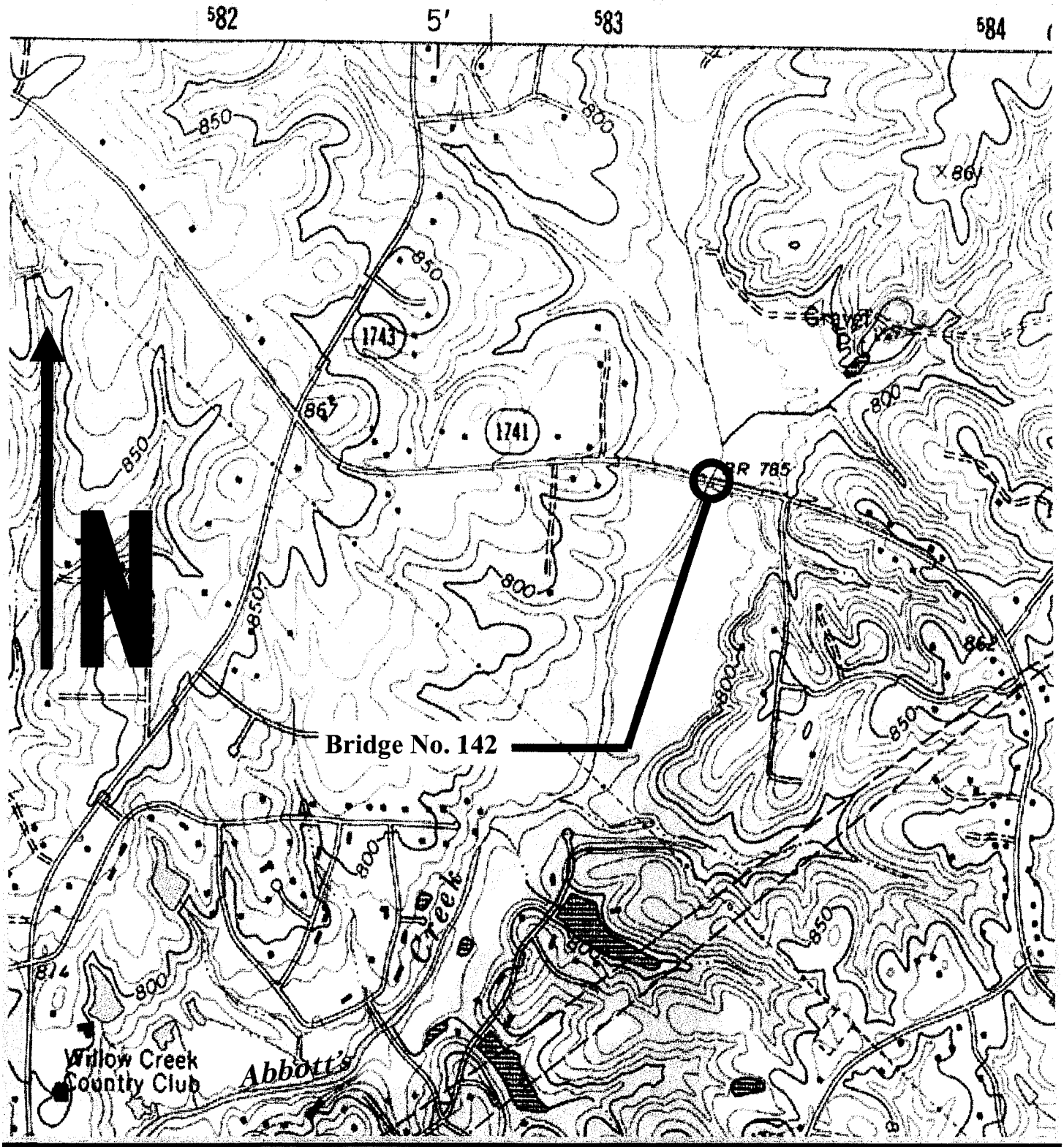
Project Development and Environmental Analysis Branch

BRIDGE NO. 142
SR 1741 OVER ABBOTT'S CREEK
DAVIDSON COUNTY
B-4100

VICINITY MAP

0 0.5
GRAPHIC SCALE (MILES)

FIGURE 1A

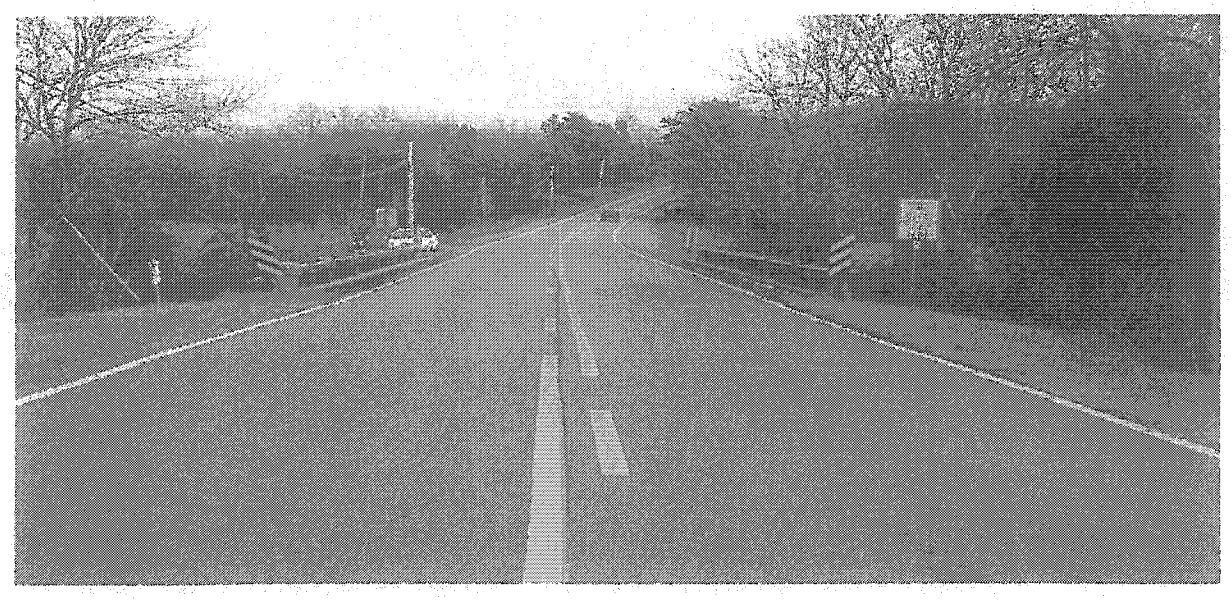


North Carolina Department of Transportation
Project Development and Environmental Analysis Branch

T.I.P. B-4100
Bridge No. 142 Over Abbott's Creek
On SR 1741 - Davidson County, N.C.

Quad. Map: High Point West

FIGURE 1B



LOOKING EAST ACROSS BRIDGE

LOOKING WEST ACROSS BRIDGE

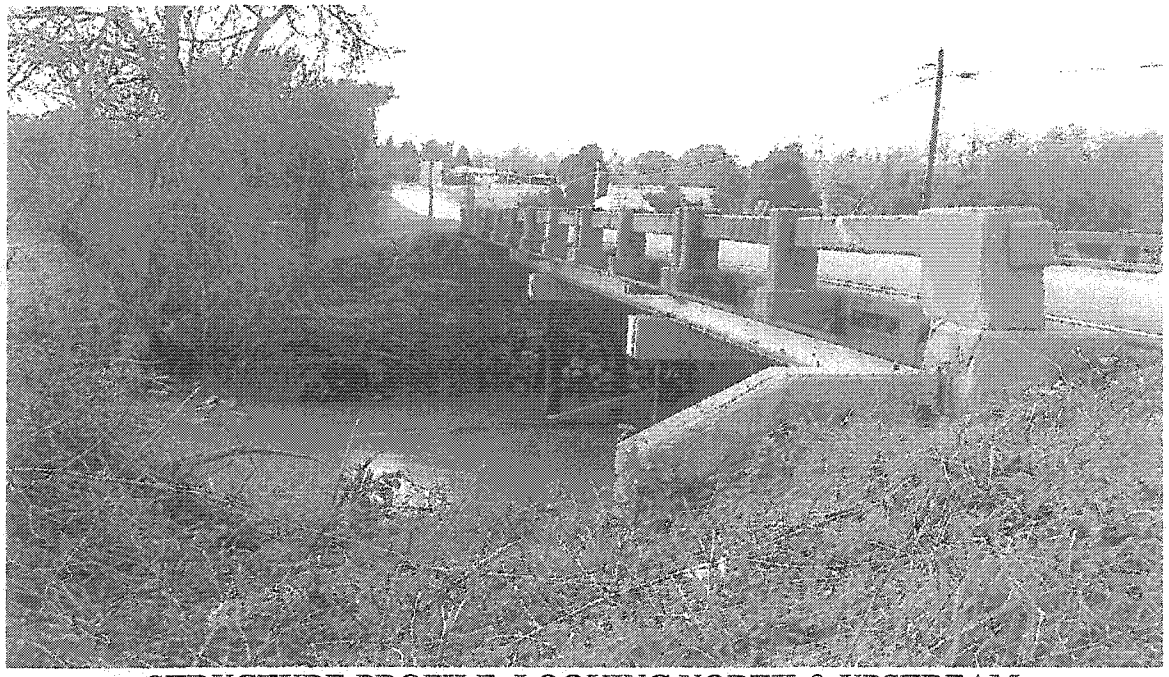
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

BRIDGE NO. 142

ON SR 1741 OVER ABBOTTS CREEK
DAVIDSON COUNTY
B-4100

FIGURE 2A



STRUCTURE PROFILE, LOOKING NORTH & UPSTREAM

STRUCTURE PROFILE, LOOKING SOUTH & DOWNSTREAM

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

BRIDGE NO. 142

ON SR 1741 OVER ABBOTTS CREEK
DAVIDSON COUNTY
B-4100

FIGURE 2B

PROPOSED DESIGN CRITERIA

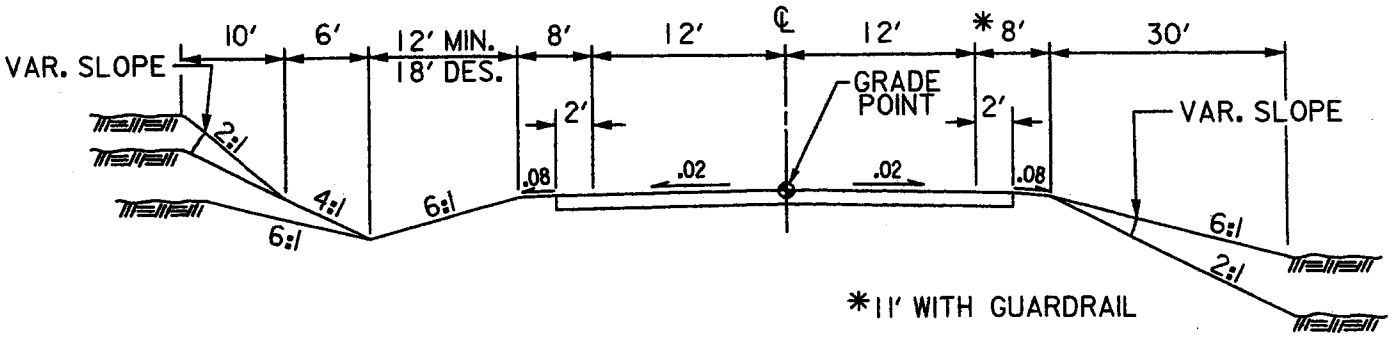
FIGURE 3 A

REPLACE BRIDGE NO. 142 ON SR 1741
OVER ABBOTT'S CREEK
DAVIDSON COUNTY
B-4100

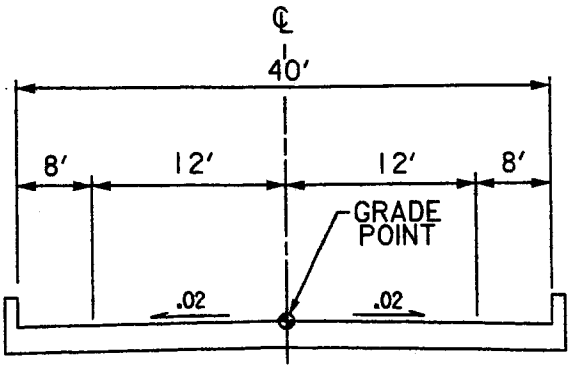
FUNCTIONAL CLASSIFICATION: URBAN MINOR ARTERIAL
POSTED SPEED: 55 MPH (ASSUMED)
ESTIMATED ADT:

2005 ADT	=	4,200
2025 ADT	=	6,600
TTST	=	1%
DUAL	=	3%
DHV	=	10%
DIR	=	55%

DESIGN SPEED: 60 MPH
MAXIMUM RATE OF SUPERELEVATION: 0.06 ft/ft
MAXIMUM DEGREE OF CURVE: 4°15'
MAXIMUM GRADE: 6%
MINIMUM DESIRABLE K FACTORS: Ksag = 136 Kcrest = 151
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: 130.0 ft



APPROACH ROADWAY TYPICAL SECTION



NOTE: A VERTICAL DESIGN EXCEPTION MAY BE NEEDED

BRIDGE TYPICAL SECTION

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

PROPOSED DETOUR CRITERIA

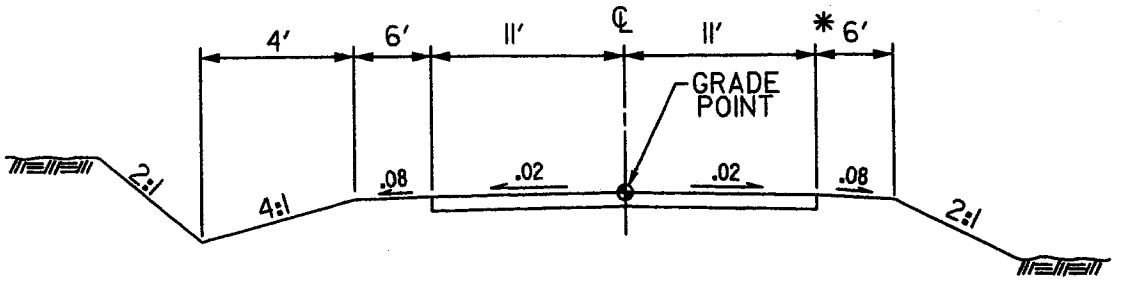
FIGURE 3 B

REPLACE BRIDGE NO. 142 ON SR 1741
OVER ABBOTT'S CREEK
DAVIDSON COUNTY
B-4100

FUNCTIONAL CLASSIFICATION: URBAN MINOR ARTERIAL
POSTED SPEED: 55 MPH (ASSUMED)
ESTIMATED ADT:

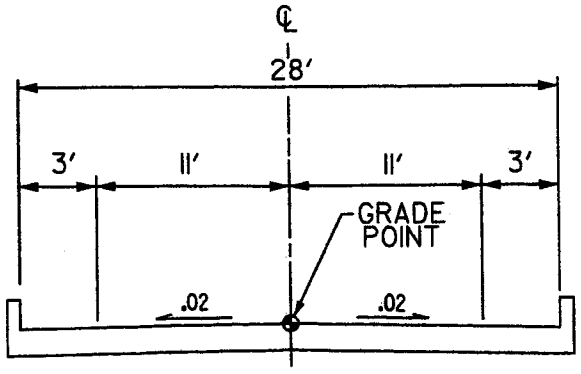
2005 ADT	=	4,200
2025 ADT	=	6,600
TTST	=	1%
DUAL	=	3%
DHV	=	10%
DIR	=	55%

DESIGN SPEED: 45 MPH
MAXIMUM RATE OF SUPERELEVATION: 0.06 ft/ft
MAXIMUM DEGREE OF CURVE: 8°50'
MAXIMUM GRADE: 9%
MINIMUM DESIRABLE K FACTORS: Ksag = 79 Krest = 61
SHOULDER WIDTH & TYPE : 6.0 ft TOTAL (9.0ft WITH GUARDRAIL)
LANE WIDTHS: 11.0 ft
BRIDGE DECK WIDTH: 28.0ft CLEAR
BRIDGE LENGTH: 140.0 ft



*9' WITH GUARDRAIL

DETOUR APPROACH ROADWAY TYPICAL SECTION



DETOUR BRIDGE TYPICAL SECTION

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

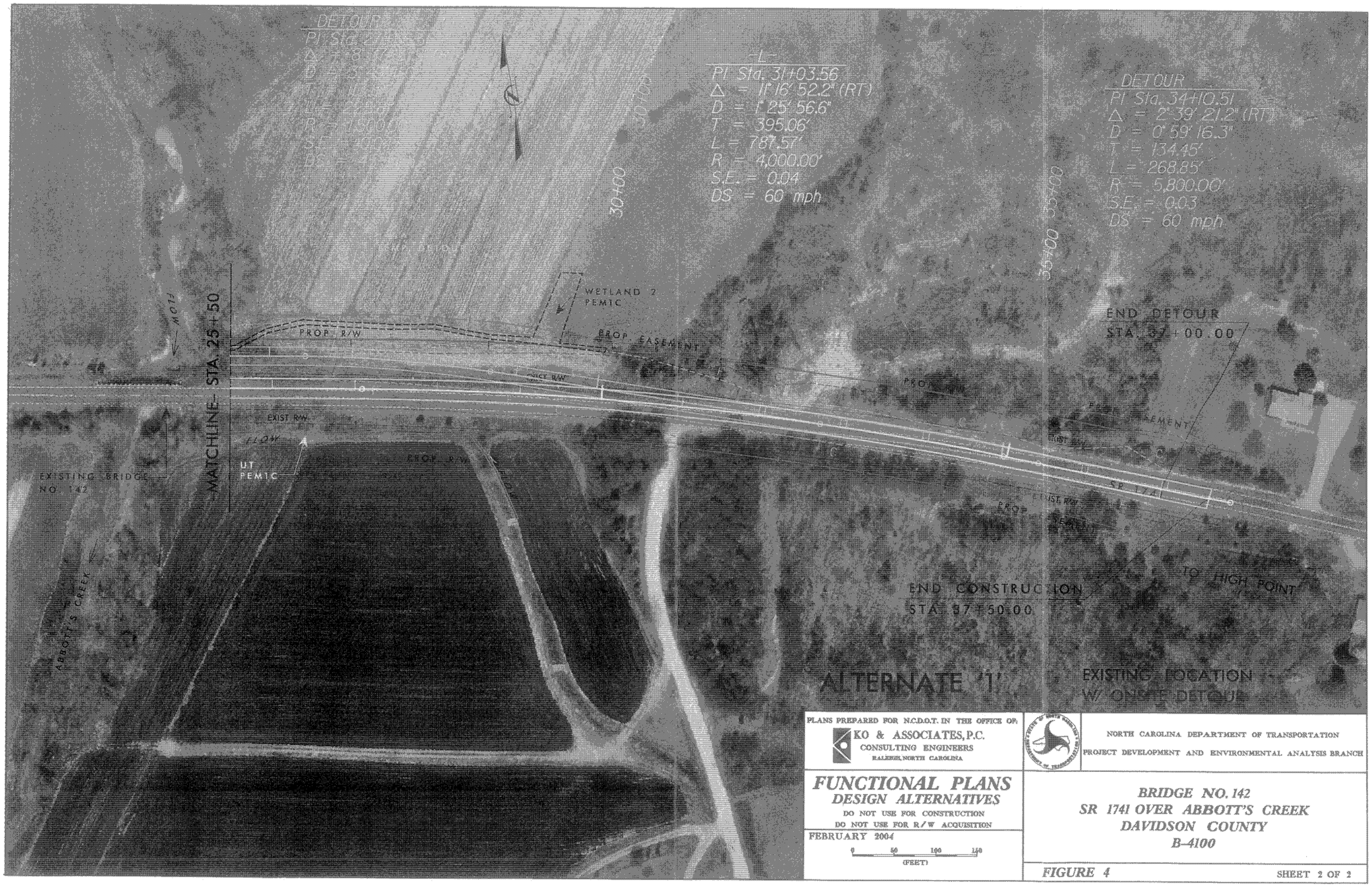
FEBRUARY 2004

0 50 100 150
(FEET)

BRIDGE NO. 142
SR 1741 OVER ABBOTT'S CREEK
DAVIDSON COUNTY
B-4100

FIGURE 4

SHEET 1 OF 2



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

FEBRUARY 2004

0 50 100 150
(FEET)

BRIDGE NO. 142
SR 1741 OVER ABBOTT'S CREEK
DAVIDSON COUNTY
B-4100

FIGURE 4

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

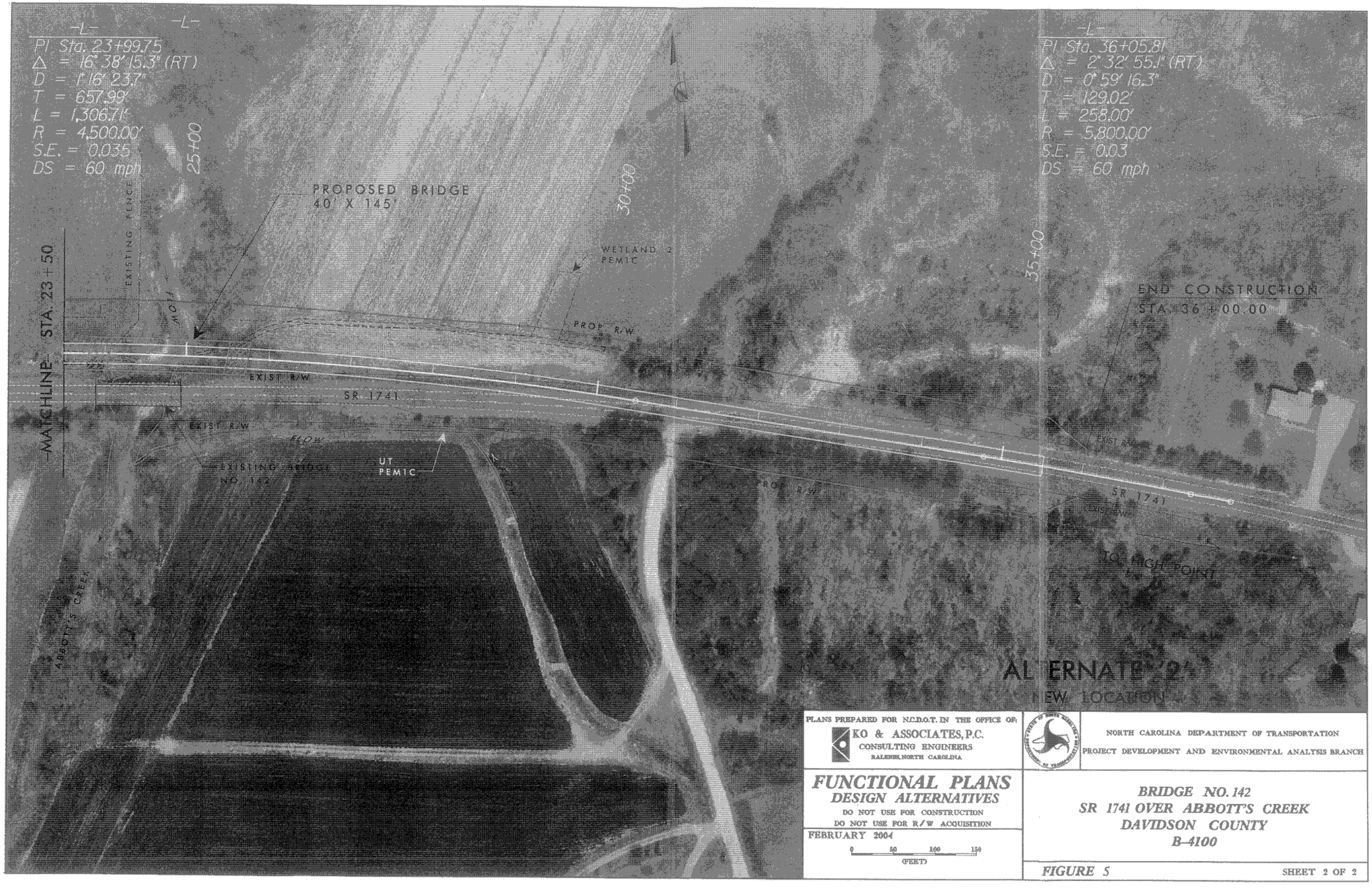
FEBRUARY 2004

0 50 100 150
(FEET)

BRIDGE NO. 142
SR 1741 OVER ABBOTT'S CREEK
DAVIDSON COUNTY
B-4100

FIGURE 5

SHEET 1 OF 2



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

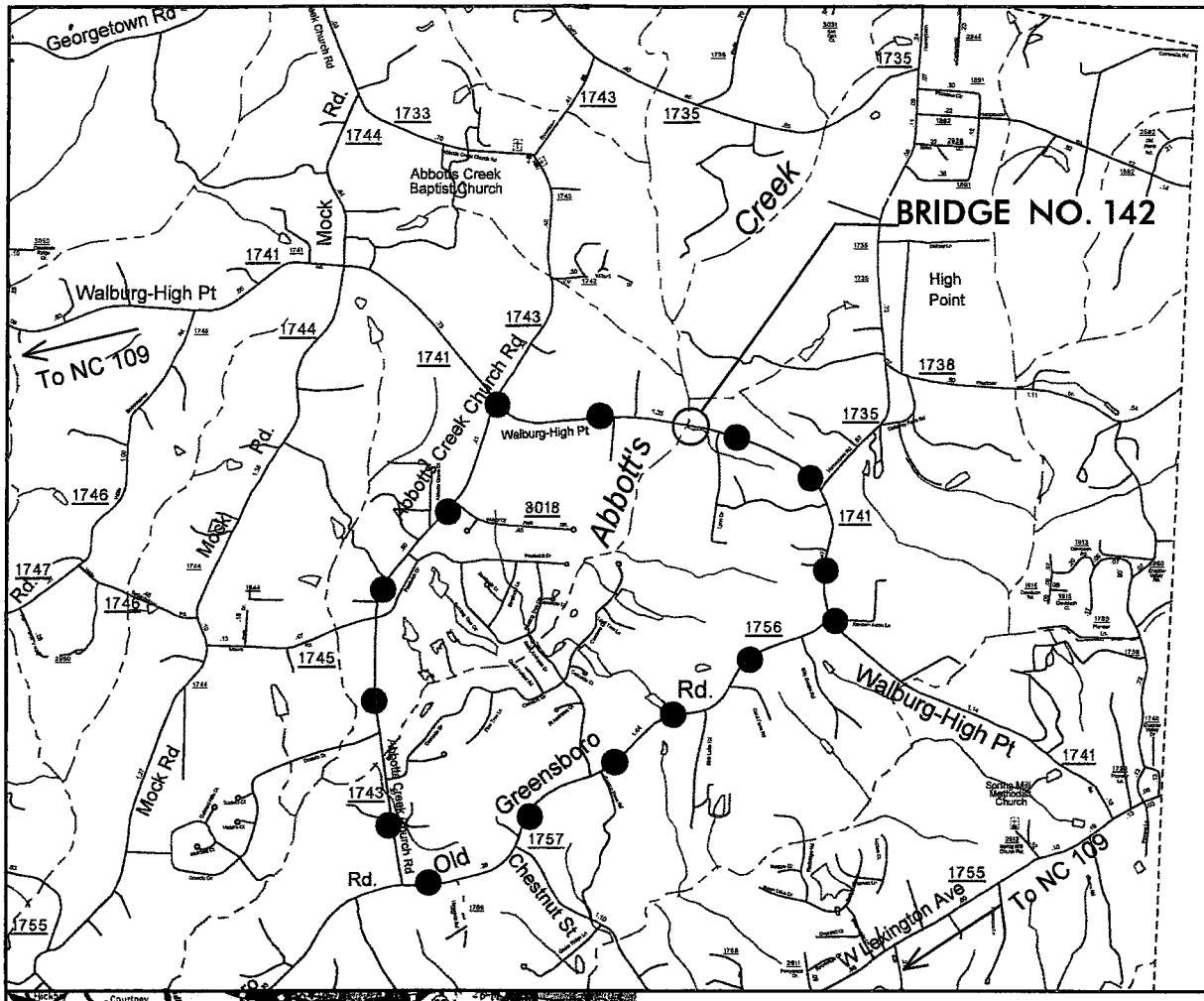
FUNCTIONAL PLANS
DESIGN ALTERNATIVES
DO NOT USE FOR CONSTRUCTION
DO NOT USE FOR R/W ACQUISITION

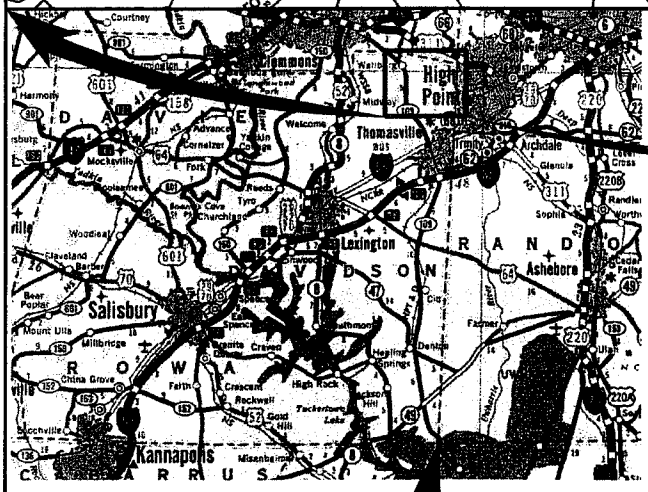
FEBRUARY 2004

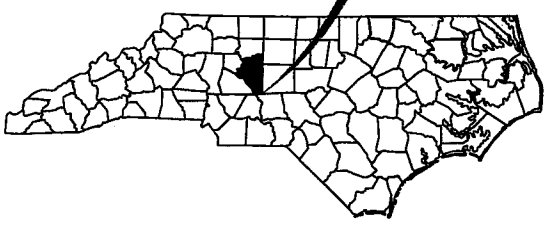
0 50 100 150
(FEET)

BRIDGE NO. 142
SR 1741 OVER ABBOTT'S CREEK
DAVIDSON COUNTY
B-4100

FIGURE 5







NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

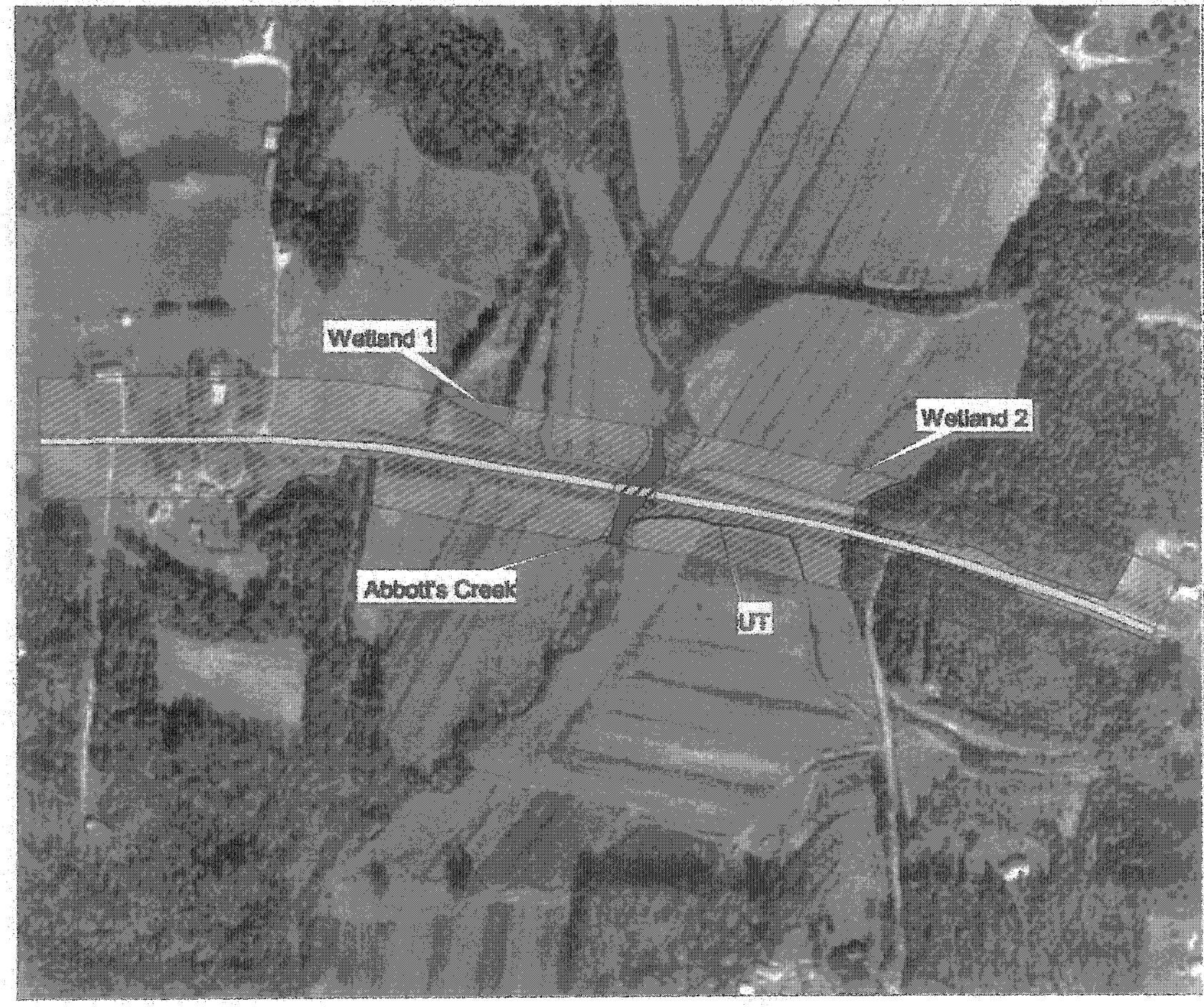
Project Development and Environmental Analysis Branch

BRIDGE NO. 142
SR 1741 OVER ABBOTT'S CREEK
DAVIDSON COUNTY
B-4100

DETOUR MAP

0.5
GRAPHIC SCALE (MILES)

FIGURE 6



EcoScience Corporation
1101 Haynes Street, Suite 101
Raleigh, NC 27604
Ph: 919-828-3433
Fax: 919-828-3518

B-4100
Bridge No. 142
SR 1741
(Wellburg-High Point Road)
over Abbott's Creek

Figure 7

Project Study Area

Legend:

- Project Study Area
- Bridge142
- SR 1741
- Abbotts Creek
- UT
- Wetlands
- Alluvial forest
- Mixed Pine/HW Forest
- Disturbed/Maintained Land

N
W E
S

500 0 500 1000 1500 2000 Feet

SCD 11/18/0

Appendix

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Asheville Field Office
160 Zillicoa Street
Asheville, North Carolina 28801

March 9, 2004

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

Dear Mr. Thorpe:

Subject: Scoping Comments for Five Bridge Replacement Proposals, Stokes, Davidson, Forsyth, and Davie Counties, North Carolina

We have reviewed the subject bridge replacement proposals and provide the following comments in accordance with the Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-667e), and section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (Act). Given the early stages of development for these projects, our comments are limited primarily to the known locations of listed species and federal species of concern. When the categorical exclusions are prepared and more information is available regarding environmental effects, we can offer more substantive comments.

Enclosed is a species list for the four counties included in this package. This list provides the names of species on the *Federal List of Endangered and Threatened Wildlife and Plants* as well as federal species of concern. Federal species of concern are not legally protected under the Act and are not subject to any of its provisions, including section 7, unless they are formally proposed or listed as endangered or threatened. We are including these species in our response to give you advance notification and to request your assistance in protecting them if any are found in the vicinity of your projects. Our records indicate the following:

Stokes County – B-4281, Bridge No. 60 on NC 8 and 89 over the Dan River (our Log No. 4-2-04-122) - Our records for Stokes County indicate known locations of the federally endangered James spinymussel (*Pleurobema collina*) in the project area. It is likely that James spinymussel individuals would be affected by this project; if that is the case, formal consultation will be required. In addition, there are occurrences of the federally endangered small-anthered bittercress (*Cardamine micrantherea*) near the project area.

Davidson County - B-4100, Bridge No. 142 on SR 1741, and B-4101, Bridge No.141 over Abbotts Creek (our Log Nos. 4-2-04-123, 4-2-04-124).

Forsyth County - B-4112, Bridge No. 30 on SR 1631 over Muddy Creek (our Log No. 4-2-04-125).

Davie County - B-4104, Bridge No. 21 on NC 801 over Carter Creek (our Log No. 4-2-04-128).

Our records for these counties and project areas indicate no known locations of listed species in the project areas. However, we recommend conducting habitat assessments and surveying any suitable habitat in the project areas for these species prior to any further planning or on-the-ground activities to ensure that no adverse impacts occur.

We are interested in the types of structures that will replace the existing bridges and would recommend spanning structures, preferably bridges, in all cases. In addition, off-site detours, which would reduce stream-bank disturbance, are preferable to temporary on-site crossings. We look forward to reviewing the completed categorical exclusion documents.

If you have questions about these comments, please contact Ms. Marella Buncick of our staff at 828/258-3939, Ext. 237. In any future correspondence concerning these projects, please reference the log numbers assigned with our comments for each project as shown above

Sincerely,

Brian P. Cole

Brian P. Cole
Field Supervisor

Enclosure

cc:
Mr. Eric Alsmeyer, U.S. Army Corps of Engineers, Raleigh Regulatory Field Office, 6508 Falls of the Neuse Road, Suite 120, Raleigh, NC 27615
Ms. Marla J. Chambers, Highway Projects Coordinator, North Carolina Wildlife Resources Commission, 12275 Swift Road, Oakboro, NC 28129
Ms. Cynthia Van Der Wiele, North Carolina Department of Environment and Natural Resources, Division of Water Quality, Wetlands Section, 1621 Mail Service Center, Raleigh, NC 27699-1621

ENDANGERED, THREATENED, AND CANDIDATE SPECIES AND FEDERAL SPECIES OF CONCERN, DAVIDSON, DAVIE, FORSYTH, AND STOKES COUNTIES, NORTH CAROLINA

This list was adapted from the North Carolina Natural Heritage Program's County Species List. It is a listing, for Davidson, Davie, Forsyth, and Stokes Counties, of North Carolina's federally listed and proposed endangered, threatened, and candidate species and Federal species of concern (for a complete list of rare species in the state, please contact the North Carolina Natural Heritage Program). The information in this list is compiled from a variety of sources, including field surveys, museums and herbaria, literature, and personal communications. The North Carolina Natural Heritage Program's database is dynamic, with new records being added and old records being revised as new information is received. Please note that this list cannot be considered a definitive record of listed species and Federal species of concern, and it should not be considered a substitute for field surveys.

Critical habitat: Critical habitat is noted, with a description, for the counties where it is designated or proposed.

Aquatic species: Fishes and aquatic invertebrates are noted for counties where they are known to occur. However, projects may have effects on downstream aquatic systems in adjacent counties.

COMMON NAME	SCIENTIFIC NAME	STATUS
DAVIDSON COUNTY		
Vertebrates		
Bog turtle	*Clemmys muhlenbergii*	T(S/A)[1]
Carolina darter	*Etheostoma collis collis*	FSC
Bald eagle	*Haliaeetus leucocephalus*	Threatened (proposed for delisting)
Vascular Plants		
Georgia aster	*Aster georgianus*	C1
Schweinitz's sunflower	*Helianthus schweinitzii*	Endangered
Heller's trefoil	*Lotus helleri*	FSC
DAVIE COUNTY		
Vertebrates		
Robust redhorse	*Moxostoma robustum*	FSC
Vascular Plants		
Creamy tick-trefoil	*Desmodium ochroleucum*	FSC*
Heller's trefoil	*Lotus helleri*	FSC*
Michaux's sumac	*Rhus michauxii*	Endangered
FORSYTH COUNTY		
Vertebrates		
Bog turtle	*Clemmys muhlenbergii*	T(S/A)[1]
Red-cockaded woodpecker	*Picoides borealis*	Endangered****

COMMON NAME	SCIENTIFIC NAME	STATUS
Invertebrates		
Brook floater	*Alasmidonta varicosa*	FSC
Vascular Plants		
Small-anthered bittercress	*Cardamine micranthera*	Endangered

STOKES COUNTY

Vertebrates		
Orangefin madtom	*Noturus gilberti*	FSC
Rustyside sucker	*Thoburnia hamiltoni*	FSC
Invertebrates		
Green floater	*Lasmigona subviridis*	FSC
James spinymussel	*Pleurobema collina*	Endangered
Diana fritillary butterfly	*Speyeria diana*	FSC*
Vascular Plants		
Small-anthered bittercress	*Cardamine micranthera*	Endangered
Schweinitz's sunflower	*Helianthus schweinitzii*	Endangered
Butternut	*Juglans cinerea*	FSC
Sweet pinesap	*Monotropsis odorata*	FSC

KEY:

Status	Definition
Endangered	A taxon "in danger of extinction throughout all or a significant portion of its range."
Threatened	A taxon "likely to become endangered within the foreseeable future throughout all or a significant portion of its range."
C1	A taxon under consideration for official listing for which there is sufficient information to support listing.
FSC	A Federal species of concern--a species 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).
T(S/A)	Threatened due to similarity of appearance (e.g., American alligator)--a species that is threatened due to similarity of appearance with other rare species and is listed for its protection. These species are not biologically endangered or threatened and are not subject to Section 7 consultation.

Species with 1, 2, 3, or 4 asterisks behind them indicate historic, obscure, or incidental records.

*Historic record - the species was last observed in the county more than 50 years ago.

**Obscure record - the date and/or location of observation is uncertain.

***Incidental/migrant record - the species was observed outside of its normal range or habitat.

****Historic record - obscure and incidental record.

[1]In the November 4, 1997, *Federal Register* (55822-55825), the northern population of the bog turtle (from New York south to Maryland) was listed as T (threatened), and the southern population (from Virginia south to Georgia) was listed as T(S/A) (threatened due to similarity of appearance). The T(S/A) designation bans the collection and interstate and international commercial trade of bog turtles from the southern population. The T(S/A) designation has no effect on land-management activities by private landowners in North Carolina, part of the southern population of the species. In addition to its official status as T(S/A), the U.S. Fish and Wildlife Service considers the southern population of the bog turtle as a Federal species of concern due to habitat loss.

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 proj 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 n 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 ar 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 proj

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 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 within the Critical Area of a water supply watershed, hazardous spill catch basins may be required for this project base 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 .021 (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 withi the Critical Area of a water supply watershed, hazardous spill catch basins may be required for this project base 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 .0 (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 Wildlife Resources Commission

Charles R. Fullwood, Executive Director

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

FROM: Marla Chambers, Highway Projects Coordinator
Habitat Conservation Program, NCWRC

DATE: August 12, 2004

SUBJECT: Scoping review of NCDOT's proposed replacement of Bridge No. 142 on SR 1741 over Abbotts Creek and Bridge No. 141 on SR 1741 over Sprugeon Creek, Davidson County. TIP Nos. B-4100 and B-4101.

North Carolina Department of Transportation (NCDOT) is requesting comments from the North Carolina Wildlife Resources Commission (NCWRC) regarding impacts to fish and wildlife resources resulting from the subject project. Staff biologists have reviewed the information provided and have the following preliminary comments. These comments are provided in accordance with the 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 stream 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, Mr. Logan Williams with the NCDOT - ONE 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.

17. If culvert installation is being considered, conduct subsurface investigations prior to structure design to determine design options and constraints and to ensure that wildlife passage issues are addressed.

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 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.

Project specific comments:

1. B-4100 and B-4101, Davidson Co., Bridge No. 142 on SR 1741 over Abbotts Creek and Bridge No. 141 on SR 1741 over Sprugeon Creek. Both Abbotts and Sprugeon Creeks are classified WS-III waters. Sediment and erosion control measures should adhere to the design standards for sensitive watersheds to protect the water supply. No other special concerns are indicated at this time. Impacts to aquatic and terrestrial resources should be minimized. Standard requirements and BMP's should apply.

We request that NCDOT routinely minimize adverse impacts to fish and wildlife resources in the vicinity of bridge replacements. The 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, reducing habitat fragmentation and vehicle related mortality at highway crossings.

If you need further assistance or information on NCWRC concerns regarding bridge replacements, please contact me at (704) 485-2384. Thank you for the opportunity to review and comment on this project.

cc: Marella Buncick, USFWS
Brian Wrenn, NCDWQ

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

Division of Historical Resources
David L. S. Brook, Director

March 10, 2004

MEMORANDUM

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

FROM: David Brook for David Brook

SUBJECT: Bridge No. 142 on SR 1741 over Abbotts Creek, B-4100; Bridge No. 141 on SR 1741 over Abbotts Creek, B-4101; Davidson County, ER04-0474 and ER04-0475

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

We have conducted a review of the proposed undertaking and are aware of no historic resources which would be affected by the project. Therefore, we have no comment on the undertaking as proposed.

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, 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
Matt Wilkerson

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

February 10, 2004

Dr. Jeffrey J. Crow
Division of Archives & History
N.C. Department of Cultural Resources
4610 Mail Service Center
Raleigh, North Carolina 27699-4610

Dear :Dr. Crow:

Subject: Davidson County
B-4100, Bridge No. 142 on SR 1741 over Abbotts Creek
B-4101, Bridge No. 141 on SR 1741 over Abbotts 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-4100, Bridge No. 142 on SR 1741 over Abbotts Creek

The existing two-lane structure, constructed in 1949, crosses over Abbotts Creek and is 106 feet long and 24 feet wide.

The following alternatives will be studied for this bridge project:

- Do-Nothing
- Rehabilitate the Existing Structure
- Replace on the north 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 north side.

B-4101, Bridge No. 141 on SR 1741 over Abbotts Creek

The existing two-lane structure, constructed in 1948, crosses over Abbotts Creek and is 75 feet long and 24 feet wide.

The following alternatives will be studied for this bridge project:

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

- Do-Nothing
- Rehabilitate the Existing Structure
- Replace at existing location by closing the existing roadway and maintaining traffic with an off-site detour.
- Replace at existing location maintaining traffic with a temporary structure and detour on north side (note: this alternative will not be pursued if preliminary investigation indicates that the temporary detour will require a taking of the house adjacent to the roadway and creek in the northeast quadrant).
- Replace at existing location maintaining traffic with a temporary structure and detour on south side.

If the structure is replaced at its existing location utilizing an off-site detour route, SR 1741 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.

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

August 21, 2002

MEMORANDUM

TO: Jay Temple
School Transportation Director
Davidson County Schools
PO Box 2057
Lexington, NC 27293

FROM: William T. Goodwin, Jr. PE
Project Development & Environmental Analysis Branch

SUBJECT: Replacement of Bridge No. 142 on SR 1741 over Abbotts Creek, Davidson County, Federal Aid Project No. BRSTP-1741(2), State Project No. 8.2604801, TIP No. B-4100

The N. C. Department of Transportation has begun the planning process to replace the above bridge, which is nearing the end of its useful life. Construction is planned for year 2006.

Alternative methods of replacing the bridge will be studied. Some alternatives may require road closure at the bridge site. In that case, all traffic would be detoured onto other local roads.

The type of bridge or structure that we select will determine how long the road would have to remain closed. However, the time of closure would not be longer than 8-12 months.

We would like to know the specific number of bus crossings per day and if road closure could be handled by re-routing or other changes, or if it would create an unworkable situation for your school bus operations. Of course, closure is not a realistic option for dead end roads. In such cases traffic will be maintained.

We ask that you let us know your opinion in writing by using the enclosed addressed envelope. We need your reply by December 2, 2002.

If you have any questions concerning the project, please contact Davis Moore at (919) 733-7844, ext. 258.

Attachment

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION

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

LOCATION:
TRANSPORTATION BUILDING

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-4100
WBS 33456.1.1
FEDERAL PROJECT: BRSTP-1741 (2)
COUNTY: Davidson
DESCRIPTION: Bridge 142 over Abbotts Creek on SR 1741 in Thomasville

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

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT
1589 MAIL SERVICE CENTER
RALEIGH NC 27699-1589

TELEPHONE: 919-250-4088
FAX: 919-250-4237

WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:
CENTURY CENTER COMPLEX
ENTRANCE B-2
1020 BIRCH RIDGE DRIVE
RALEIGH NC

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 26, 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 Cyrus Parker, LG at (919)-250-4088.

GEOTECHNICAL ISSUES

Techniques and Methodologies

The geotechnical investigation consisted of a reconnaissance conducted on May 26, 2004 and one Standard Penetration Test conducted on May 27, 2004. The boring was conducted on the shoulder of the existing roadway, in the southwest quadrant. It was collared about 15 feet above the streambed elevation.

Findings

The project area is within a very large floodplain associated with Abbotts Creek. The test boring found six feet of roadway fill over approximately twelve feet of very soft alluvial clay over residual soil. Weathered rock was encountered at 30' depth. Split spoon samples of the weathered rock are consistent with the mapped rock unit PPg, Granitic Rock of the Charlotte Belt.

There appears to be good potential for lateral migration of the stream within the floodplain. Streambank scour is occurring to the left (upstream) and to the right (under the existing bridge).

Anticipated Impacts

Consolidation of the alluvial clay is likely. This may require a waiting period between placement of the new fill and pile driving. Stabilization of the stream banks will need to be addressed. Based on limited preliminary data, a drilled shaft foundation seems likely.

If there are any questions regarding these Geotechnical comments, please contact Clinton B. Little, L.G or John L. Pilipchuk, L.G., P.E. at (704)-455-8902

NWW/CFP/CBL/dbm