STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

February 10, 2011

North Carolina Division of Water Quality
1650 Mail Service Center
Raleigh, NC 27699-1650

ATTN: Mr. Rob Ridings
NCDOT Project Coordinator

SUBJECT: **Application for Section 401 Water Quality Certification and Tar-Pamlico Riparian Buffer Authorization and Notice of Intent to Use Section 404 Nationwide Permits 3 and 13** for the proposed replacement of Bridge No. 102 over the Tar River on SR 1150 (Gooch's Mill Road), Granville County, Division 5. State Project No. 8.2371401, F.A. Project No. BRZ – 1150(7), T.I.P. Project No. B-4522.

Debit $240.00 from WBS Element No. 33746.1.1

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 102 over the Tar River on SR 1150 (Gooch's Mill Road). Impacts will consist of 30 linear feet of permanent stream impacts due to the placement of roadway fill into an unnamed tributary of the Tar River (Stream SB), 107 linear feet of permanent stream impacts due to the placement of riprap bank stabilization along the Tar River, and 0.05 acres of temporary stream impacts due to the placement of temporary riprap work pads into the Tar River.

Please see the enclosed copies of the Pre-Construction Notification (PCN), U.S. Fish and Wildlife Service (USFWS) Biological Opinion (BO) regarding the dwarf wedgemussel (*Alasmidonta heteredon*), issued November 17, 2009, an amendment to the BO, issued October 12, 2010, stormwater management plan, U.S. Army Corps of Engineers (USACE) Jurisdictional Determination (JD), permit drawings, buffer impact drawings, and roadway design plans for the subject project. The JD was issued for this project by USACE on September 24, 2009 (USACE Action ID 2007-03806). A Programmatic Categorical Exclusion (PCE) was completed for this project in May 2008 and distributed shortly after completion. Additional copies are available upon request.

This project calls for a letting date of October 18, 2011 and a review date of August 30, 2011; however, the let date may advance as additional funding becomes available.

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

TELEPHONE: 919-431-2000

FAX: 919-431-2001

WEBSITE: WWW.NCDOT.ORG

PHYSICAL ADDRESS:
4701 Atlantic Ave.
Suite 116
Raleigh, NC 27604

A copy of this notice will be posted on the NCDOT website at: http://www.ncdot.org/doh/preconstruct/pe/neu/permit.html. If you have any questions or need additional information, please contact Jim Mason at either (919) 431-1593 or jsmason@ncdot.gov.

Sincerely,

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

W/attachment:

Mr. Brian Wrenn, NCDWQ (5 Copies)

W/o attachment (see website for attachments):

Mr. Eric Alsmeyer, USACE
Mr. J. Wally Bowman, P.E., Division 5 Engineer
Mr. Chris Murray, Division 5 DEO
Dr. David Chang, P.E., Hydraulics Unit
Mr. Mark Staley, Roadside Environmental Unit
Mr. Greg Perfetti, P.E., Structure Design Unit
Mr. Dewayne Sykes, P.E., Utilities Unit
Mr. Jay Bennett, P.E., Roadway Design Unit
Mr. Majed Alghandour, P.E., Programming and TIP
Mr. Art McMillan, P.E., Highway Design Unit
Mr. Gary Jordan, USFWS
Mr. Travis Wilson, NCWRC
Ms. Dionne Brown, PDEA Project Planning Engineer

Office Use Only:
Corps action ID no. _____
DWQ project no. _____
Form Version 1.3 Dec 10 2008

Pre-Construction Notification (PCN) Form

A. Applicant Information

1. Processing

1a. Type(s) of approval sought from the Corps:	☒ Section 404 Permit ☐ Section 10 Permit
1b. Specify Nationwide Permit (NWP) number: 3 13	or General Permit (GP) number:
1c. Has the N WP or GP number been verified by the Corps?	☐ Yes ☒ No

1d. Type(s) of approval sought from the DWQ (check all that apply):

☒ 401 Water Quality Certification – Regular ☐ Non-404 Jurisdictional General Permit

☐ 401 Water Quality Certification – Express ☒ Riparian Buffer Authorization

1e. Is this notification solely for the record because written approval is not required?	For the record only for DWQ 401 Certification: ☐ Yes ☒ No	For the record only for Corps Permit: ☒ Yes ☐ No
1f. Is payment into a mitigation bank or in-lieu fee program proposed for mitigation of impacts? If so, attach the acceptance letter from mitigation bank or in-lieu fee program.		☐ Yes ☒ No
1g. Is the project located in any of NC's twenty coastal counties. If yes, answer 1h below.		☐ Yes ☒ No
1h. Is the project located within a NC DCM Area of Environmental Concern (AEC)?		☐ Yes ☒ No

2. Project Information

2a. Name of project:	Replacement of Bridge 102 over the Tar River on SR 1150 (Gooch's Mill Road)
2b. County:	Granville
2c. Nearest municipality / town:	Hebron
2d. Subdivision name:	*not applicable*
2e. NCDOT only, T.I.P. or state project no:	B-4522

3. Owner Information

3a. Name(s) on Recorded Deed:	North Carolina Department of Transportation
3b. Deed Book and Page No.	*not applicable*
3c. Responsible Par ty (for LLC if applicable):	*not applicable*
3d. Street address:	1598 Mail Service Center
3e. City, state, zip:	Raleigh, NC 27699-1598
3f. Telephone no.:	(919) 431-1593
3g. Fax no.:	(919) 431-2002
3h. Email address:	jsmason@ncdot.gov

4. Applicant Information (if different from owner)	
4a. Applicant is:	☐ Agent ☐ Other, specify:
4b. Name:	*not applicable*
4c. Business name (if applicable):	
4d. Street address:	
4e. City, state, zip:	
4f. Telephone no.:	
4g. Fax no.:	
4h. Email address:	
5. Agent/Consultant Information (if applicable)	
5a. Name:	*not applicable*
5b. Business name (if applicable):	
5c. Street address:	
5d. City, state, zip:	
5e. Telephone no.:	
5f. Fax no.:	
5g. Email address:	

B. Project Information and Prior Project History	
1. Property Identification	
1a. Property identification no. (tax PIN or parcel ID):	*not applicable*
1b. Site coordinates (in decimal degrees):	Latitude: 36.2930 (DD.DDDDDD) Longitude: - 78.7067 (-DD.DDDDDD)
1c. Property size:	2.6 acres
2. Surface Waters	
2a. Name of nearest body of water (stream, river, etc.) to proposed project:	Tar River
2b. Water Quality Classification of nearest receiving water:	WS-IV NSW
2c. River basin:	Tar Pamlico
3. Project Description	
3a. Describe the existing conditions on the site and the general land use in the vicinity of the project at the time of this application: SR 1150 is a rural local route. Land use within the project vicinity consists of rural residential, agricultural, and forested land.	
3b. List the total estimated acreage of all existing wetlands on the property: 0	
3c. List the total estimated linear feet of all existing streams (intermittent and perennial) on the property: 200	
3d. Explain the purpose of the proposed project: To replace a structurally deficient and functionally obsolete bridge.	
3e. Describe the overall project in detail, including the type of equipment to be used: The project involves replacing a five-span, 201-foot bridge with a three-span, 230-foot box beam bridge on the existing alignment with an off-site detour. Standard road building equipment, such as trucks, dozers, and cranes will be used.	
4. Jurisdictional Determinations	
4a. Have jurisdictional wetland or stream determinations by the Corps or State been requested or obtained for this property / project (including all prior phases) in the past? Comments: USACE Action ID 2007-03806	☒ Yes ☐ No ☐ Unknown
4b. If the Corps made the jurisdictional determination, what type of determination was made?	☐ Preliminary ☒ Final
4c. If yes, who delineated the jurisdictional areas? Name (if known): R. Bode (LBG), J. Mason (NCDOT)	Agency/Consultant Company: Louis Berger Grp/NCDOT Other:
4d. If yes, list the dates of the Corps jurisdictional determinations or State determinations and attach documentation. September 24, 2009	
5. Project History	
5a. Have permits or certifications been requested or obtained for this project (including all prior phases) in the past?	☐ Yes ☒ No ☐ Unknown
5b. If yes, explain in detail according to "help file" instructions.	
6. Future Project Plans	
6a. Is this a phased project?	☐ Yes ☒ No
6b. If yes, explain.	

C. Proposed Impacts Inventory

1. Impacts Summary

1a. Which sections were completed below for your project (check all that apply):

☐ Wetlands ☒ Streams - tributaries ☒ Buffers

☐ Open Waters ☐ Pond Construction

2. Wetland Impacts

If there are wetland impacts proposed on the site, then complete this question for each wetland area impacted.

2a. Wetland impact number – Permanent (P) or Temporary (T)	2b. Type of impact	2c. Type of wetland (if known)	2d. Forested	2e. Type of jurisdiction (Corps - 404, 10 DWQ – non-404, other)	2f. Area of impact (acres)
Site 1 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 2 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 3 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 4 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 5 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 6 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
				2g. **Total wetland impacts**	0 Permanent 0 Temporary

2h. Comments: There are no wetland impacts associated with this project.

3. Stream Impacts

If there are perennial or intermittent stream impacts (including temporary impacts) proposed on the site, then complete this question for all stream sites impacted.

3a. Stream impact number - Permanent (P) or Temporary (T)	3b. Type of impact	3c. Stream name	3d. Perennial (PER) or intermittent (INT)?	3e. Type of jurisdiction (Corps - 404, 10 DWQ – non-404, other)	3f. Average stream width (feet)	3g. Impact length (linear feet)
Site 1 ☐ P ☒ T	Temporary Work Pads	Tar River	☒ PER ☐ INT	☒ Corps ☐ DWQ	95	0.05 ac.
Site 2 ☒ P ☐ T	Bank Stabilization	Tar River	☒ PER ☐ INT	☒ Corps ☐ DWQ	95	107
Site 3 ☒ P ☐ T	Permanent Fill	UT of Tar River	☐ PER ☒ INT	☒ Corps ☐ DWQ	5.5	30
Site 4 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
Site 5 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
Site 6 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
					3h. **Total stream and tributary impacts**	137 Perm 0.05 ac Temp

3i. Comments: 1) Only one temporary work pad will be present in the Tar River at any one time to avoid unnecessary constriction of the stream. 2) Coir fiber matting will be placed above the OHW mark and above permanent bank stabilization

impacts in an area downstream of the bridge, on the north bank of the Tar River. This matting will be live-staked and is necessary for further bank stablization in this area due to steep and eroding banks.

4. Open Water Impacts

If there are proposed impacts to lakes, ponds, estuaries, tributaries, sounds, the Atlantic Ocean, or any other open water of the U.S. then individually list all open water impacts below.

4a. Open water impact number – Permanent (P) or Temporary (T)	4b. Name of waterbody (if applicable)	4c. Type of impact	4d. Waterbody type	4e. Area of impact (acres)
O1 ☐ P ☐ T				
O2 ☐ P ☐ T				
O3 ☐ P ☐ T				
O4 ☐ P ☐ T				
			4f. Total open water impacts	0 Permanent 0 Temporary

4g. Comments:

5. Pond or Lake Construction

If pond or lake construction proposed, then complete the chart below.

5a. Pond ID number	5b. Proposed use or purpose of pond	5c. Wetland Impacts (acres)			5d. Stream Impacts (feet)			5e. Upland (acres)
		Flooded	Filled	Excavated	Flooded	Filled	Excavated	Flooded
P1								
P2								
	5f. Total							

5g. Comments:

5h. Is a dam high hazard permit required?	☐ Yes ☐ No If yes, permit ID no:
5i. Expected pond surface area (acres):	
5j. Size of pond watershed (acres):	
5k. Method of construction:	

6. Buffer Impacts (for DWQ)

If project will impact a protected riparian buffer, then complete the chart below. If yes, then individually list all buffer impacts below. If any impacts require mitigation, then you **MUST** fill out Section D of this form.

6a. Project is in which protected basin?			☐ Neuse ☐ Catawba	☒ Tar-Pamlico ☐ Randleman	☐ Other:
6b. Buffer impact number – Permanent (P) or Temporary (T)	6c. Reason for impact	6d. Stream name	6e. Buffer mitigation required?	6f. Zone 1 impact (square feet)	6g. Zone 2 impact (square feet)
B1 ☒ P ☐ T	Bridge Impact	Tar River	☐ Yes ☒ No	8375	2993
B2 ☒ P ☐ T	Road Crossing Impact	Tar River	☐ Yes ☒ No	186	1249
B3 ☐ P ☐ T			☐ Yes ☐ No		
			6h. **Total buffer impacts**	8561	4242

6i. Comments: 1) The topography in the project area is too steep for either a level spreader or to meet the grass swale criteria. Also, the existing ditches have erosion. Therefore, the rock-lined ditches have been continued through the buffer as they are replacing the existing ditches. This was approved by Rob Ridings in a meeting with the NCDOT Hydraulics Unit on January 23, 2009. 2) Temporary access roads will be built within the riparian buffer to build/access the temporary work pads. The access roads are within the Allowable Bridge and Road Crossing Impacts outlined above and are included in those impact numbers.

D. Impact Justification and Mitigation

1. Avoidance and Minimization

1a. Specifically describe measures taken to avoid or minimize the proposed impacts in designing project.

The proposed bridge is 29 feet longer than the existing bridge; the number of bents within the creek will be reduced from two to zero; the proposed bridge will be at approximately the same grade and alignment as the existing structure; a preformed scour hole will be installed outside of the riparian buffer in the southwest quadrant of the project to dissipate stormwater from the bridge; grass shoulders and grass ditches will be employed along the roadway, where possible, to minimize stormwater impacts; the roadway ditch in the the northeast quadrant will be lined with riprap; riprap-lined lateral base ditches will be installed in the northwest, northeast, and southeast quadrants to convey stormwater; riprap will be placed along the stream bank at the bottom of the lateral base ditches and along the water-ward side of the interior bents to control erosion and stabilize the bank; coir fiber matting will be placed and live-staked along a portion of the stream bank in the northeast quadrant as an additional erosion control measure.

Per the USFWS Biological Opinion for the dwarf wedgemussel, dated November 17, 2009, the following conservation measures will be also be employed: 1) In areas identified as Environmentally Sensitive Areas, the contractor may perform clearing operations, but not grubbing operations until immediately prior to beginning grading operations. 2) Once grading operations begin in identified Environmentally Sensitive Areas, work shall progress in a continuous manner until complete. 3) In areas identified as Environmentally Sensitive Areas, erosion control devices shall be installed immediately following the clearing operation. 4) In areas identified as Environmentally Sensitive Areas, seeding and mulching shall be performed on the areas disturbed by construction immediately following final grade establishment. 5) In areas identified as Environmentally Sensitive Areas, seeding and mulching shall be done in stages on cut and fill slopes that are greater than 20 feet in height measured along the slope, or greater than two acres in area, whichever is less. 6) An off-site detour will be utilized for this project. 7) No new bents will be constructed in the stream. New bents will be constructed at or beyond the top of bank. 8) Deck drains will not be allowed to discharge directly into the stream. 9) Removal of the existing bents will take place when water flow level is at a minimum point allowable within the project schedule and will be done in such a manner to minimize disturbance to the stream bed. 10) Special Sediment Control Fence (1/4" hardware cloth with small stone) will be installed along the top of the stream bank. Standard silt fence will be installed along the toe of the slope parallel to the stream. Once the disturbed areas of the project draining to the special sediment control fence have been stabilized, the special sediment control fence and all built up sediment adjacent to the fence will be removed to natural ground and stabilized with a native grass mix. 11) All sedimentation and erosion control measures, throughout the project limits, must be cleaned out when half full with sediment. 12) Rip rap slope protection will be installed simultaneously with the embankment construction. 13) A temporary access road for conveying construction equipment in the floodplain/buffer will be stabilized with rock. A rock work pad underlain with standard engineering fabric will also be utilized between the stream bank and the interior bents in the river for removal of the interior bents. Only one work pad will be present at anyone time to avoid unnecessary constriction of the stream. 14) Embankment construction and grading shall be managed in such a matter to prevent surface runoff/drainage from discharging untreated into the riparian buffer. Instead all interim surfaces will be graded to drain to temporary erosion control devices. Temporary berms, ditches, etc. will be incorporated, as necessary, to treat temporary runoff before discharging into the riparian buffer (As specified in NCDOT BMP Manual). 15) A preconstruction mussel survey will be conducted prior to the start of construction.

1b. Specifically describe measures taken to avoid or minimize the proposed impacts through construction techniques.

NCDOT Best Management Practices for Bridge Demolition and Removal will be implemented during the removal of the existing bridge; Best Management Practices for the Protection of Surface Waters will be employed; Design Standards in Sensitive Watersheds will be employed.

2. Compensatory Mitigation for Impacts to Waters of the U.S. or Waters of the State

2a. Does the project require Compensatory Mitigation for impacts to Waters of the U.S. or Waters of the State?	☐ Yes ☒ No If no, explain: Total impacts to Tar River and UT of Tar River are each less than 150 linear ft; impacts to Tar River only comprised of bank stabilization and temporary impacts; UT is a low quality intermittent stream that NCDOT proposes should be considered an Unimportant feature with no mitigation (DWQ score of 25, USACE score of 34). USACE agreed to no mitigation for the UT via email on 1/6/2011.
2b. If yes, mitigation is required by (check all that apply):	☐ DWQ ☐ Corps

2c. If yes, which mitigat ion option will be used for this project?	☐ Mitigation bank ☐ Payment to in-lieu fee program ☐ Permittee Responsible Mitigation

3. Complete if Using a Mitigation Bank		
3a. Name of Mitigation Bank: not applicable		
3b. Credits Purchased (attach receipt and letter)	Type	Quantity
3c. Comments:		

4. Complete if Making a Payment to In-lieu Fee Program	
4a. Approval letter from in-lieu fee program is attached.	☐ Yes
4b. Stream mitigation requested:	linear feet
4c. If using stream mitigation, stream temperature:	☐ warm ☐ cool ☐ cold
4d. Buffer mitigation requested (DWQ only):	square feet
4e. Riparian wetland mitigation requested:	acres
4f. Non-riparian wetland mitigation requested:	acres
4g. Coastal (tidal) wetland mitigation requested:	acres
4h. Comments:	

5. Complete if Using a Permittee Responsible Mitigation Plan	
5a. If using a permittee responsible mitigation plan, provide a description of the proposed mitigation plan.	

6. Buffer Mitigation (State Regulated Riparian Buffer Rules) – required by DWQ	
6a. Will the project result in an impact within a protected riparian buffer that requires buffer mitigation?	☐ Yes ☒ No

6b. If yes, then identify the square feet of impact to each zone of the riparian buffer that requires mitigation. Calculate the amount of mitigation required.

Zone	6c. Reason for impact	6d. Total impact (square feet)	Multiplier	6e. Required mitigation (square feet)
Zone 1			3 (2 for Catawba)	
Zone 2			1.5	
		6f. **Total buffer mitigation required:**		0

6g. If buffer mitigation is required, discuss what type of mitigation is proposed (e.g., payment to private mitigation bank, permittee responsible riparian buffer restoration, payment into an approved in-lieu fee fund).
6h. Comments: All buffer impacts are Allowable.

E. Stormwater Management and Diffuse Flow Plan (required by DWQ)	
1. Diffuse Flow Plan	
1a. Does the project include or is it adjacent to protected riparian buffers identified within one of the NC Riparian Buffer Protection Rules?	☒ Yes ☐ No
1b. If yes, then is a diffuse flow plan included? If no, explain why. Comments: See attached permit drawings.	☒ Yes ☐ No
2. Stormwater Management Plan	
2a. What is the overall percent imperviousness of this project?	N/A
2b. Does this project require a Stormwater Management Plan?	☒ Yes ☐ No
2c. If this project DOES NOT require a Stormwater Management Plan, explain why:	
2d. If this project DOES require a Stormwater Management Plan, then provide a brief, narrative description of the plan: See attached permit drawings.	
2e. Who will be responsible for the review of the Stormwater Management Plan?	☐ Certified Local Government ☐ DWQ Stormwater Program ☐ DWQ 401 Unit
3. Certified Local Government Stormwater Review	
3a. In which local government's jurisdiction is this project?	not applicable
3b. Which of the following locally-implemented stormwater management programs apply (check all that apply):	☐ Phase II ☐ NSW ☐ USMP ☐ Water Supply Watershed ☐ Other:
3c. Has the approved Stormwater Management Plan with proof of approval been attached?	☐ Yes ☐ No
4. DWQ Stormwater Program Review	
4a. Which of the following state-implemented stormwater management programs apply (check all that apply):	☐ Coastal counties ☐ HQW ☐ ORW ☐ Session Law 2006-246 ☐ Other:
4b. Has the approved Stormwater Management Plan with proof of approval been attached?	☐ Yes ☐ No
5. DWQ 401 Unit Stormwater Review	
5a. Does the Stormwater Management Plan meet the appropriate requirements?	☒ Yes ☐ No
5b. Have all of the 401 Unit submittal requirements been met?	☒ Yes ☐ No

F. Supplementary Information		
1. Environmental Documentation (DWQ Requirement)		
1a. Does the project involve an expenditure of public (federal/state/local) funds or the use of public (federal/state) land?	☒ Yes	☐ No
1b. If you answered "yes" to the above, does the project require preparation of an environmental document pursuant to the requirements of the National or State (North Carolina) Environmental Policy Act (NEPA/SEPA)?	☒ Yes	☐ No
1c. If you answered "yes" to the above, has the document review been finalized by the State Clearing House? (If so, attach a copy of the NEPA or SEPA final approval letter.) Comments:	☒ Yes	☐ No
2. Violations (DWQ Requirement)		
2a. Is the site in violation of DWQ Wetland Rules (15A NCAC 2H .0500), Isolated Wetland Rules (15A NCAC 2H .1300), DWQ Surface Water or Wetland Standards, or Riparian Buffer Rules (15A NCAC 2B .0200)?	☐ Yes	☒ No
2b. Is this an after-the-fact permit application?	☐ Yes	☒ No
2c. If you answered "yes" to one or both of the above questions, provide an explanation of the violation(s):		
3. Cumulative Impacts (DWQ Requirement)		
3a. Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality?	☐ Yes ☒ No	
3b. If you answered "yes" to the above, submit a qualitative or quantitative cumulative impact analysis in accordance with the most recent DWQ policy. If you answered "no," provide a short narrative description. Due to the minimal transportation impact resulting from this bridge replacement, this project will neither influence nearby land uses nor stimulate growth. Therefore, a detailed indirect or cumulative effects study will not be necessary.		
4. Sewage Disposal (DWQ Requirement)		
4a. 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. not applicable		

5. Endangered Species and Designated Critical Habitat (Corps Requirement)		
5a. Will this project occur in or near an area with federally protected species or habitat?	☒ Yes	☐ No
5b. Have you checked with the USFWS concerning Endangered Species Act impacts?	☒ Yes	☐ No
5c. If yes, ind icate the USFWS Field Office you have contacted.	☒ Raleigh ☐ Asheville	
5d. What data sources did you use to determine whether your site would impact Endangered Species or Designated Critical Habitat? N.C. Natural Heritage Heritage Program database; USFWS-Raleigh Field Office website; biological surveys for protected species listed for Granville County, which include smooth coneflower, harperella, and dwarf wedgemussel. Smooth coneflower and harperella were last surveyed for on August 4, 2009 and have a Biological Conclusion of "No Effect". Dwarf wedgemussel was last surveyed for on June 3, 2009 and has a Biological Conclusion of "May Affect, Likely to Adversely Affect". A Biological Assessment was compeleted for the dwarf wedgemussel in November 2009. A Biological Opinion was issued by the USFWS in November 2009 and an amendment to the Biological Opinion was issued in October 2010; both are enclosed with this document.		
6. Essential Fish Habitat (Corps Requirement)		
6a. Will this project occur in or near an area designated as essential fish habitat?	☐ Yes	☒ No
6b. What data sources did you use to determine whether your site would impact Essential Fish Habitat? NMFS County Index		
7. Historic or Prehistoric Cultural Resources (Corps Requirement)		
7a. Will this project occur in or near an area that the state, federal or tribal governments have designated as having historic or cultural preservation status (e.g., National Historic Trust designation or properties significant in North Carolina history and archaeology)?	☐ Yes	☒ No
7b. What data sources did you use to determine whether your site would impact historic or archeological resources? NEPA Documentation		
8. Flood Zone Designation (Corps Requirement)		
8a. Will this project occur in a FEMA-designated 100-year floodplain?	☒ Yes	☐ No
8b. If yes, explain how project meets FEMA requirements: NCDOT Hydraulics Unit coordination with FEMA		
8c. What source(s) did you use to make the floodplain determination? FEMA Maps		

Dr. Gregory J. Thorpe, Ph D Applicant/Agent's Printed Name	Applicant/Agent's Signature (Agent's signature is valid only if an authorization letter from the applicant is provided.)	2/10/11 Date

FILE COPY

United States Department of the Interior

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

November 17, 2009

John F. Sullivan III, PE
Federal Highway Administration
310 New Bern Avenue, Suite 410
Raleigh, North Carolina 27601

Dear Mr. Sullivan:

This document transmits the U.S. Fish and Wildlife Service's (Service) Biological Opinion based on our review of the proposed replacement of Bridge No. 102 over Tar River on SR 1150, located in Granville County, North Carolina (TIP No. B-4522), and its effects on the federally endangered dwarf wedgemussel (*Alasmidonta heterodon*, DWM) in accordance with Section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543). Your November 12, 2009 request for formal consultation was received on November 13, 2009. If you have any questions concerning this biological opinion, please contact Mr. Gary Jordan at (919) 856-4520 (Ext. 32).

Sincerely,

Pete Benjamin
Field Supervisor

cc: Ken Graham, USFWS, Atlanta, GA
Susi von Oettingen, USFWS, Concord, NH
Eric Alsmeyer, USACE, Raleigh, NC
Greg Thorpe, NCDOT, Raleigh, NC
Logan Williams, NCDOT, Raleigh, NC
Jim Mason, NCDOT, Raleigh, NC
Chris Murray, NCDOT, Durham, NC
David Harris, NCDOT, Raleigh, NC
Chris Militscher, USEPA, Raleigh, NC
Travis Wilson, NCWRC, Creedmoor, NC
Rob Ridings, NCDWQ, Raleigh, NC

This Biological Opinion (BO) is based on information provided in the submitted Biological Assessment (BA) prepared by the North Carolina Department of Transportation (NCDOT), telephone conversations, emails, field investigations and other sources of information. A complete administrative record of this consultation is on file at this office.

CONSULTATION HISTORY

June 6, 2007 – Service staff attends an on-site field meeting with NCDOT staff to discuss the potential effects to the DWM.

June/July 2007 – Service staff and NCDOT staff have several discussions and email exchanges regarding the need for formal Section 7 consultation.

June 17, 2009 – The Service provides comments on a draft BA from NCDOT.

November 13, 2009 – The Service receives a letter from the Federal Highway Administration (FHWA), dated November 12, 2009, with the attached final BA, requesting formal consultation on the proposed Bridge No. 102 replacement over the Tar River.

BIOLOGICAL OPINION

I. DESCRIPTION OF THE PROPOSED ACTION

The B-4522 project is located at the SR 1150 (Gooches Mill Road) crossing of the Tar River in Granville County, North Carolina, approximately six miles west of Oxford. The existing five-span, 201 feet long bridge will be replaced with a three-span, 230 feet long bridge (1@65', 1@100', 1@65'). The new bridge will be placed in the same horizontal alignment, but the roadway grade will be raised approximately five feet. The new bridge will completely span the channel of the Tar River. A small amount of existing approach fill will be removed from the floodplain. Reconstruction of the approach road will extend 326 feet south of the new bridge and 453 feet north of the new bridge. Traffic will be detoured onto other roads during construction.

Removal of existing bents in the middle of the stream channel will require the construction of temporary work pads in the stream channel. Temporary work pads will consist of rock fill underlain with coir fiber fabric. Temporary work pads will be utilized on each bank for removing the in-stream concrete sills at the interior bents. Efforts will be made to minimize shattering of the concrete sills, but some amount of debris will likely fall within the temporary work pad. The work pad on the south bank will be constructed first and will remain in the stream for approximately 2 months. After demolition, the south work pad will be removed back to approximately five feet beyond the proposed bent, and sloped down to the waterline at a 1.5:1 slope for shaft drilling. After this, the work pad on the north bank will be constructed and removed similarly. Then a larger work pad on the downstream side will be constructed for the placement of the center-span box beams.

The area covered by the temporary work pad necessary for box beam placement is presently scoured and has eroding banks. In an effort to stabilize this area and prevent the continuance of bank sloughing, the river banks will be stabilized with a combination of class II rip rap and coir fiber matting. Additionally, a small section of class II rip rap will remain on the river-right bank to improve stability and prevent long-term erosion.

Action Area

The action area is defined as the SR 1150 project right-of-way (ROW) of B-4522, beginning 326 feet south of the bridge and extending 453 feet north of the bridge, plus the Tar River for a distance of 1,312 feet (400 meters) downstream and 328 feet (100 meters) upstream of the bridge. The action area consists mainly of a maintained/disturbed roadside vegetative community, the SR 1150 pavement and bridge structure, and the Tar River channel. The action area occurs in Tar River Sub-basin 03-03-01, as assigned by the North Carolina Department of Environment and Natural Resources, Division of Water Quality Section. At the project site, the Tar River is approximately 100 feet wide. Riparian hardwood forest borders along each bank within the action area.

Conservation Measures

Conservation measures represent actions, pledged in the project description, that the action agency will implement to minimize the effects of the proposed action and further the recovery of the species under review. Such measures should be closely related to the action and should be achievable within the authority of the action agency. Since conservation measures are part of the proposed action, their implementation is required under the terms of the consultation. The FHWA and NCDOT have proposed the following conservation measures.

- In areas identified as Environmentally Sensitive Areas, the contractor may perform clearing operations, but not grubbing operations until immediately prior to beginning grading operations.
- Once grading operations begin in identified Environmentally Sensitive Areas, work shall progress in a continuous manner until complete.
- In areas identified as Environmentally Sensitive Areas, erosion control devices shall be installed immediately following the clearing operation.
- In areas identified as Environmentally Sensitive Areas, seeding and mulching shall be performed on the areas disturbed by construction immediately following final grade establishment.
- In areas identified as Environmentally Sensitive Areas, seeding and mulching shall be done in stages on cut and fill slopes that are greater than 20 feet in height measured along the slope, or greater than two acres in area, whichever is less.
- An off-site detour will be utilized for this project.
- NCDOT Best Management Practices for Bridge Demolition and Removal will be implemented during the removal of the existing bridge.
- No new bents will be constructed in the stream. New bents will be constructed at or beyond the top of bank.

- Deck drains will not be allowed to discharge directly into the stream.
- Removal of the existing bents will take place when water flow level is at a minimum point allowable within the project schedule and will be done in such a manner to minimize disturbance to the stream bed.
- Special Sediment Control Fence (1/4" hardware cloth with small stone) will be installed along the top of the stream bank. Standard silt fence will be installed along the toe of the slope parallel to the stream. Once the disturbed areas of the project draining to the special sediment control fence have been stabilized, the special sediment control fence and all built up sediment adjacent to the fence will be removed to natural ground and stabilized with a native grass mix.
- All sedimentation and erosion control measures, throughout the project limits, must be cleaned out when half full with sediment.
- Rip rap slope protection will be installed simultaneously with the embankment construction.
- A temporary access road for conveying construction equipment in the floodplain/buffer will be stabilized with rock. A rock work pad underlain with coir fiber fabric will also be utilized between the stream bank and the interior bents in the river for removal of the interior bents. Only one work pad will be present at any one time to avoid unnecessary constriction of the stream.
- Embankment construction and grading shall be managed in such a manner to prevent surface runoff/drainage from discharging untreated into the riparian buffer. Instead all interim surfaces will be graded to drain to temporary erosion control devices. Temporary berms, ditches, etc. will be incorporated, as necessary, to treat temporary runoff before discharging into the riparian buffer (As specified in NCDOT BMP Manual).
- A preconstruction mussel survey will be conducted prior to the start of construction.

II. STATUS OF THE SPECIES

The DWM was federally listed as endangered on March 14, 1990. The DWM is found solely in Atlantic Coast drainage streams and rivers of various sizes and moderate current. It ranges from New Hampshire to North Carolina, in small creeks to deep rivers in stable habitat with substrates ranging from mixed sand, pebble and gravel, to clay and silty sand. In the southern portion of its range, it is often found buried under logs or root mats in shallow water (USFWS 1993); whereas in the northern portion of its range, it may be found in firm substrates of mixed sand, gravel or cobble, or embedded in clay banks in water depths of a few inches to greater than 20 feet (Fichtel and Smith 1995; Gabriel 1995; Gabriel 1996; Nedeau and Werle 2003; Nedeau 2004a, 2004b, 2006a).

The DWM's reproductive cycle is typical of other freshwater mussels, requiring a host fish on which its larvae (glochidia) parasitize and metamorphose into juvenile mussels. The DWM is not a long-lived species as compared to other freshwater mussels; life expectancy is estimated at 10 to 12 years (Michaelson and Neves 1995).

Human activity has significantly degraded DWM habitat causing a general decline in populations and a reduction in distribution of the species. Primary factors responsible for the decline of the

DWM include: 1) impoundment of river systems, 2) pollution, 3) alteration of riverbanks, and 4) siltation (USFWS 1993).

Damming and channelization of rivers throughout the DWM's range have resulted in the elimination or alteration of much of its formerly occupied habitat (Watters 2001). Domestic and industrial pollution was the primary cause for mussel extirpation at many historic sites. Mussels are known to be sensitive to a wide variety of heavy metals and pesticides, and to excessive nutrients and chlorine (Havlik and Marking 1987). Mussel die-offs have been attributed to chemical spills, agricultural waste run-off and low dissolved oxygen levels.

Because freshwater mussels are relatively sedentary and cannot move quickly or for long distances, they cannot easily escape when silt is deposited over their habitat. Siltation has been documented to be extremely detrimental to mussel populations by degrading substrate and water quality, increasing exposure to other pollutants and by direct smothering of mussels (Ellis 1936, Markings and Bills 1979). In Massachusetts, a bridge construction project decimated a population of DWM by accelerated sedimentation and erosion (Smith 1981).

Most DWM populations are small and geographically isolated from each. This isolation restricts exchange of genetic material among populations and reduces genetic variability within populations (USFWS 1993).

At one time, DWM was recorded from 70 localities in 15 major drainages ranging from North Carolina to New Brunswick, Canada. Since the 1993 Recovery Plan, a number of new locations have been discovered and a number of known locations are possibly no longer extant. Based on preliminary information, the dwarf wedgemussel is currently found in 15 major drainages (Table 1), comprising approximately 70 "sites" (one site may have multiple occurrences). At least 45 of these sites are based on less than five individuals or solely on spent shells (USFWS 2007).

Table 1. Dwarf wedgemussel major drainages.

State	Major Drainage	County
NH	Upper Connecticut River	Coos, Grafton, Sullivan, Cheshire
VT	Upper Connecticut River	Essex, Orange, Windsor, Windham
MA	Middle Connecticut River	Hampshire, Hampden
CT	Lower Connecticut River	Hartford
NY	Middle Delaware	Orange, Sullivan, Delaware
NJ	Middle Delaware	Warren, Sussex
PA	Upper Delaware River	Wayne
MD	Choptank River	Queen Anne's, Caroline
MD	Lower Potomac River	St. Mary's, Charles
MD	Upper Chesapeake Bay	Queen Anne's
VA	Middle Potomac River	Stafford
VA	York River	Louisa, Spotsylvania
VA	Chowan River	Sussex, Nottoway, Lunenburg

NC	Upper Tar River	Granville, Vance, Franklin, Nash
NC	Fishing Creek	Warren, Franklin, Halifax
NC	Contentnea	Wilson, Nash
NC	Upper Neuse	Johnson, Wake, Orange

* The 15 major drainages identified in Table 1 do not necessarily correspond to the original drainages identified in the 1993 Recovery Plan although there is considerable overlap.

The main stem of the Connecticut River in New Hampshire and Vermont is considered to have the largest remaining DWM population, consisting of three distinct stretches of sporadically occupied habitat segmented by hydroelectric dams. It is estimated that there are hundreds of thousands of DWM scattered within an approximate 75-mile stretch of the Connecticut River. The Ashuelot River in New Hampshire, the Farmington River in Connecticut, and the Neversink River in New York harbor large populations, but these number in the thousands only. The remaining populations from New Jersey south to North Carolina are estimated at a few individuals to a few hundred individuals (USFWS 2007).

In summary, it appears that the populations in North Carolina, Virginia, and Maryland are declining as evidenced by low densities, lack of reproduction, or inability to relocate any DWM in follow-up surveys. Populations in New Hampshire, Massachusetts, and Connecticut appear to be stable, while the status of populations in the Delaware River watershed affected by the recent floods of 2005 is uncertain at this time (USFWS 2007).

III. ENVIRONMENTAL BASELINE

Under section 7(a)(2) of the Act, when considering the "effects of the action" on federally listed species, the Service is required to take into consideration the environmental baseline. The environmental baseline includes past and ongoing natural factors and the past and present impacts of all federal, state, or private actions and other activities in the action area (50 CFR 402.02), including federal actions in the area that have already undergone section 7 consultation, and the impacts of state or private actions which are contemporaneous with the consultation in process.

Status of the Species Within the Action Area

The action area occurs within the Upper Tar River Basin. Records maintained by the North Carolina Natural Heritage Program (NCNHP) show DWM to have been present in the Tar River main stem between SR 1150 (Gooches Mill Road) and US 158. Additionally, the following tributaries have been known to support DWM in the recent past: Cub Creek, Shelton Creek, Fox Creek and North Fork Tar River. All of the element occurrences in the Upper Tar River Basin are designated as NHP Element Occurrence No. 89, representing them as a single population of DWM.

Observations (G. Jordan, Service biologist, personal observations) of the Upper Tar River Basin suggest that the DWM in the Upper Tar River Basin are genetically isolated and may not be

represented as a single population. Shelton Creek and Fox Creek are a contiguous unit, separated from the Tar River main stem by Gooches Mill Dam. The dam is located approximately 200 meters downstream of the mouth of Shelton Creek and impounds the Tar River and Shelton Creek approximately 100 meters upstream of the SR 1150 bridge crossing. The habitat at their junction is not suitable for DWM or their host species and likely represents a complete barrier to movement between the two areas. Cub Creek is isolated by another mill dam at its mouth. This mill dam is partially breached and the impoundment behind it represents less of an obstacle; however the habitat at the mouth of Cub Creek is poor to marginal for DWM and its host species and may represent a genetic barrier (J. Mays, NCDOT biologist, personal communication). North Fork Tar River flows into the Tar River below Gooches Mill Dam, and the habitat at its mouth is heavily degraded by agricultural influences, primarily heavy erosion caused by unfenced cattle. North Fork Tar River could provide connectivity to the Tar River main stem, but not to the population upstream of the mill dam.

Recent efforts to locate DWM individuals in the Tar River have been unsuccessful. These efforts were sufficient enough to make the assertion that the population of DWM in the Tar River is not abundant. The apparent isolation of the DWM in the Tar River from the DWM in any of the populated tributaries increases the chances of extirpation from a series of single events and prevents the recolonization of areas affected by natural or anthropogenic disturbances.

Survey records maintained by the North Carolina Wildlife Resources Commission (NCWRC) Aquatic Database for the SR 1150 crossing site indicate that one DWM dead shell was found in a 1995 survey and one live individual was found in a 1999 survey. No DWM were encountered during NCWRC survey efforts in 1986 or in an additional survey in 1999. NCDOT surveys conducted at the SR 1150 crossing site on July 11, 2006; August 12, 2008; and June 3, 2009 did not find DWM, despite the presence of good quality habitat. The survey records at this site, though sparse, are sufficient to demonstrate that the population of DWM at this site is not, and has not historically been comparable to other populations of DWM such as in Shelton Creek, where catch per unit effort has been recorded as high as 19 DWM per search hour.

Severe droughts affecting the Tar River in recent years (2002 and 2007) appear to have had a drastic effect on DWM within the river basin. Mussel fauna, already stressed by combinations of human induced factors as well as environmental fluctuation, appear to have been reduced within the action area. While drought conditions persisted during the summer/fall of 2007 and early winter 2008, the entire watershed upstream of the action area was observed to have completely stopped flowing and was reduced to a series of small stagnant pools for a period greater than three months (G. Jordan, Service biologist, personal observations). Surveys conducted in this area following the return of flow within the system have demonstrated severe reduction of DWM as well as other mussel species in the area. DWM catch per unit effort within a well known area in Shelton Creek dropped from a high of 19 DWM/hour in 2005 to 0 DWM/hour in three 2009 surveys. It is unknown if any DWM survived the drought within the action area, although the NCDOT surveys in 2008 and 2009 demonstrate that a diverse assemblage of other mussel species have persisted.

Factors Affecting the Species Environment Within the Action Area

The existing bridge, especially the two bents in the channel, may have affected DWM habitat within the action area. DWM, like all mussels, are sensitive to changes within their watershed, particularly deforestation, urbanization and major construction activities. Presently the action area and surrounding areas are primarily rural and do not appear to be experiencing deforestation, urbanization or any other major construction activities. The most prevalent current factors affecting the species in and near the action area are the lingering effects of the 2002 and 2007 droughts and the lack of genetic connectivity with nearby, but isolated populations.

IV. EFFECTS OF THE ACTION

Under section 7(a)(2) of the Act, "effects of the action" refers to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action. The federal agency is responsible for analyzing these effects. The effects of the proposed action are added to the environmental baseline to determine the future baseline, which serves as the basis for the determination in this BO. Should the effects of the federal action result in a situation that would jeopardize the continued existence of the species, we may propose reasonable and prudent alternatives that the federal agency can take to avoid a violation of section 7(a)(2). The discussion that follows is our evaluation of the anticipated direct and indirect effects of the proposed project. Indirect effects are those caused by the proposed action that occur later in time but are still reasonably certain to occur (50 CFR 402.02).

Factors to be Considered

Since recent efforts to locate the DWM in the Tar River have been unsuccessful, it is uncertain that any DWM still occur within the action area. If the species does occur within the action area, the minimal amount of work within the channel is expected to have negative effects for only a short duration. The long term and overall effect of the project may be beneficial if there is significant recovery of the species in the Upper Tar Basin.

Analysis for Effects of the Action

Beneficial Effects: The removal of the existing bridge bents in the channel and the commitment to completely span the channel will have beneficial effects. Given that in-channel bents can trap debris during high flows and can change stream hydraulics in the immediate vicinity of the structure (causing scour and deposition), the elimination of the in-channel bents is expected to reduce the bridge's effects on stream-flow patterns. Also, given that large debris piles must often be removed from in-channel bents (creating additional channel disturbance and downstream sedimentation), the elimination of the in-channel bents will thus preclude future disturbance for debris removal. The lengthening of the bridge from approximately 201 feet to approximately 230 feet and the removal of some existing approach fill within the floodplain will allow the stream to access more of its floodplain, thus potentially reducing downstream bank scouring and sedimentation.

Direct Effects: The construction of temporary, rock work pads within the channel could crush any DWM within their footprint. The temporary work pads may cause temporary compaction of the underlying substrate, thus degrading DWM habitat. If a high water event occurs during the time a work pad is in place, the constricted flow could cause erosion of the substrate and the opposite bank. Work pads also create areas where debris can collect on, thus increasing the possibility of adjacent scouring and bank erosion. However, having only one work pad present at a time minimizes the chances of the negative effects occurring. Once removed, the negative effects of the work pads will likely be short-lived.

Removal of the interior in-channel bents may disturb sediment which will redeposit downstream, potentially on DWM or within DWM habitat. However, the small amount of sedimentation is likely sub-lethal. Of greater concern is prolonged erosion of the disturbed area on and along the banks of the river within the action area during the construction of the bridge and approach road. A major storm event could erode soil from within the disturbed construction area and wash it into the stream, thus smothering mussels, interfering with respiration and feeding, and degrading habitat. To avoid or minimize the potential for this effect, NCDOT has developed stringent erosion control measures and other conservation measures (see "Conservation Measures" section of this BO) which greatly reduce the likelihood of sediment entering the stream.

Indirect Effects: Since the project involves replacing an existing two-lane bridge with a new two-lane bridge, it is unlikely that the project will promote any secondary development or land use changes. Also, since no new bents will be placed in the channel, no negative indirect effects to stream flow are anticipated. Overall, the project is not likely to have any measurable indirect effect on DWM or its habitat.

Interrelated and Interdependent Actions: None known

V. CUMMULATIVE EFFECTS

Cumulative effects include the effects of future state, tribal, local or private actions that are reasonably certain to occur in the action area considered in this BO. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA. At this time there are no known future local, state or private actions, not requiring federal actions that are reasonably certain to occur within the action area.

VI. CONCLUSION

After reviewing the current status of the DWM, the environmental baseline for the action area, all effects of the proposed project, and the conservation measures identified in the BA, it is the Service's biological opinion that the proposed replacement of Bridge No. 102 over the Tar River on SR 1150 (TIP No. B-4522), as proposed, is not likely to jeopardize the continued existence of

this species. No critical habitat has been designated for this species; therefore, none will be affected.

This non-jeopardy opinion is based, in part, on the following facts: It is not known if the DWM still exists within the action area. The project has significant long-term beneficial effects. Several conservation measures will greatly reduce the potential for negative effects. In-channel work will be minimal, thus limiting the potential for negative effects.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and federal regulations pursuant to Section 4(d) of the ESA prohibit the taking of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns such as breeding, feeding or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of Section 7(b)(4) and Section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the FHWA so that they may become binding conditions of any grant or permit issued to the NCDOT, as appropriate, for the exemption in section 7(o)(2) to apply. The FHWA has a continuing duty to regulate the activity covered by this Incidental Take Statement. If the FHWA (1) fails to assume and implement the terms and conditions or (2) fails to require the NCDOT to adhere to the terms and conditions of the Incidental Take Statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the FHWA or the NCDOT must report the progress of the action and its impact on the species to the Service as specified in the Incidental Take Statement [50 CFR §402.14(I)(3)].

Amount or Extent of Take Anticipated

The Service anticipates that incidental take of the DWM may occur as a result of the bridge replacement. During demolition of the existing bridge and construction of the new bridge, individual mussels may be crushed, harmed by siltation or other water quality degradation, or dislocated because of physical changes in their habitat.

Because there are no reliable data on the number of DWM buried in the substrate compared to those on the surface (and even those on the surface are difficult to detect), it is not possible to base the amount of incidental take on numbers of individual mussels. Additionally, incidental

take will likely be difficult to detect and monitor. Although spent shells may be collected, attributing the cause of mortality may be difficult. Glochidia and juvenile mussels are also extremely difficult to sample, therefore it is difficult to document take of either of these life stages.

The level of incidental take of the DWM can be defined as all DWM that may be harmed, harassed, collected or killed within the action area (400 meters downstream and 100 meters upstream of the existing bridge). If incidental take is exceeded, all work should stop, and the Service should be contacted immediately.

Effect of the Take

In the accompanying BO, the Service has determined that the level of anticipated take is not likely to result in jeopardy to the DWM. Since critical habitat has not been designated for this species, the proposed project will not result in the destruction or adverse modification of critical habitat.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of the DWM. These nondiscretionary measures include, but are not limited to, the terms and conditions outlined in this BO.

1. All Conservation Measures previously described in this BO must be implemented.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the NCDOT must comply with the following terms and conditions, which implement the reasonable and prudent measures described previously and outline required reporting requirements. These terms and conditions are nondiscretionary.

1. NCDOT will ensure that the contractor understands and follows the measures listed in the"Conservation Measures" section of this BO.

2. NCDOT will ensure that a Division Environmental Officer maintains a level of oversight to insure that all appropriate erosion control measures are fully implemented to avoid/minimize sedimentation of the stream.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. The following conservation recommendations are discretionary agency activities to

minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. Conduct periodic DWM status surveys in the Upper Tar Basin and submit results to the Service.

2. Contribute funding and/or staff to any future DWM reintroduction or population augmentation efforts conducted by others.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

REINITIATION/CLOSING STATEMENT

This concludes formal consultation on the action outlined in your November 12, 2009 request for formal consultation. As provided in 50 CFR section 402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (2) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (3) a new species is listed or critical habitat designated that may be affected by the action.

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United States Department of the Interior

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October 12, 2010

FHWA-NC DIVISION

REC'D OCT 14 /10

	DIV ADMIN			
	ASST DIV ADMIN			
	CIV RGTS		ENG COORD	
	QUAL COORD			
	MAJ PROJ ENG			
	STRUCTURAL ENG			
	FINANCIAL MGR			
	FIN SPEC		FIN ASST	
	PROG ASST		COMP SPEC	
	P & PD TEAM LEADER			
	PL-1		PL-2	
	PL-3		AIR QLTY SPEC	
	CONG/MITS			
	PRECONST & ENV TEAM LEADER			
	A-1		A-2	
	A-3		ROW OFFCR	
	ENV PROG SPEC			
	OPS TEAM LEADER			
	TE-1		TE-2	
	TE-3/SAFETY		P & M ENG	
	AM PROG MGR			
	FILE		TRASH	

John F. Sullivan, III, P.E.
Federal Highway Administration
310 New Bern Avenue, Suite 410
Raleigh, North Carolina 27601

Dear Mr. Sullivan:

This letter constitutes an amendment to the November 17, 2009 Biological Opinion for the replacement of Bridge No. 102 over the Tar River on SR 1150, located in Granville County, North Carolina (TIP No. B-4522). The U.S. Fish and Wildlife Service received your October 8, 2010 letter regarding a minor change in the project description. The following information is provided in accordance with Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543).

In the "**Description of the Proposed Action**" section, the following statement "Temporary work pads will consist of rock fill underlain with coir fiber fabric." will be replaced with "Temporary work pads will consist of rock fill underlain with standard engineering fabric." Also, in the "**Conservation Measures**" section, the following statement "A rock work pad underlain with coir fiber fabric will also be utilized..." will be replaced with "A rock work pad underlain with standard engineering fabric..."

The remainder of the Biological Opinion remains unchanged, and no additional take of the endangered dwarf wedgemussel (*Alasmidonta heterodon*) and Tar River spinymussel (*Elliptio steinstansana*) is expected. If you have any questions regarding our response, please contact Mr. Gary Jordan at (919) 856-4520 (Ext. 32).

Sincerely,

Gary Jordan

for Pete Benjamin
Field Supervisor

cc: Eric Alsmeyer, USACE, Wake Forest, NC
Travis Wilson, NCWRC, Creedmoor, NC

STORMWATER MANAGEMENT PLAN

Project: 33746.1.1
TIP No. B-4522
Granville County 11/04/2010

Hydraulics Project Manager: Steve Bondor, P.E. (Greenhorne & O'Mara),
Marshall Clawson, P.E. (NCDOT Hydraulics Unit)

ROADWAY DESCRIPTION

The project consists of construction of a new 230 feet long 39" box beam bridge to replace the existing 200 feet long bridge #102 on SR 1150 over the Tar River. The total project length is 0.2 miles. The project is located in the Tar Pamlico Basin. The project drainage system consists of grass shoulders, grass ditches, riprap lined ditches, grated inlets with associated pipe system, and preformed scour hole at a pipe outfall.

Jurisdictional Streams: Tar River

ENVIRONMENTAL DESCRIPTION

The project is located within the Tar Pamlico River Basin in Granville County. The stream is classified as Class WS-IVNSW CA. There is one wetland site located approximately 20' beyond the project limit that is not impacted by the project. Stormwater impacts to the stream have been minimized by utilizing sheet flow on grass shoulders along the roadway, and by dissipating storm water from the bridge drain in a preformed scour hole upstream of the top of banks and the buffer. The existing drainage patterns have been maintained with the hydraulic design of the project.

BEST MANAGEMENT PRACTICES AND MAJOR STRUCTURES

The primary goal of Best Management Practices (BMPs) is to prevent degradation of the states surface waters by the location, construction and operation of the highway system. The BMPs are activities, practices and procedures taken to prevent or reduce stormwater pollution. The BMP measures used on this project to reduce stormwater impacts are:

- Sheet flow on grass shoulders
- preformed scour hole at pipe outlet

U.S. ARMY CORPS OF ENGINEERS
WILMINGTON DISTRICT

Mason

RECEIVED
SEP 25 2009
DIVISION OF HIGHWAYS
PDEA-OFFICE OF NATURAL ENVIRONMENT

Action ID. **2007-03806** County: **Granville** U.S.G.S. Quad: **Berea**

NOTIFICATION OF JURISDICTIONAL DETERMINATION

Property Owner/Agent: **NCDOT; Division of Highways**
Address: **ATTN: Gregory J. Thorpe, Ph.D**
1598 Mail Service Center
Raleigh, North Carolina 27699-1598
Telephone No.: **(919) 431-15931 (Jim Mason)**

Property description: **Study area for TIP #B-4522; On SR 1150 (Goochs Mill Rd), BR 102 over the Tar River, southeast of Berea, NC.**

Size (acres)	**N/A**	Nearest Town	**Berea**
Nearest Waterway	**Tar River**	River Basin	**Tar**
USGS HUC	**03020101**	Coordinates	N **36.2929** W **-78.7068**

Indicate Which of the Following Apply:

A. Preliminary Determination

_ Based on preliminary information, there may be wetlands on the above described property. We strongly suggest you have this property inspected to determine the extent of Department of the Army (DA) jurisdiction. To be considered final, a jurisdictional determination must be verified by the Corps. This preliminary determination is not an appealable action under the Regulatory Program Administrative Appeal Process (Reference 33 CFR Part 331).

B. Approved Determination

_ There are Navigable Waters of the United States within the above described project area subject to the permit requirements of Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

X There are waters of the U.S. including wetlands on the above described project area subject to the permit requirements of Section 404 of the Clean Water Act (CWA)(33 USC § 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

_ We strongly suggest you have the waters of the U.S. including wetlands on your project area delineated. Due to the size of your property and/or our present workload, the Corps may not be able to accomplish this wetland delineation in a timely manner. For a more timely delineation, you may wish to obtain a consultant. To be considered final, any delineation must be verified by the Corps.

X The waters of the U.S. including wetland on your project area have been delineated and the delineation has been verified by the Corps. We strongly suggest you have this delineation surveyed. Upon completion, this survey should be reviewed and verified by the Corps. Once verified, this survey will provide an accurate depiction of all areas subject to CWA jurisdiction on your property which, provided there is no change in the law or our published regulations, may be relied upon for a period not to exceed five years.

_ The waters of the U.S. including wetlands have been delineated and surveyed and are accurately depicted on the plat signed by the Corps Regulatory Official identified below on _____. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

_ There are no waters of the U.S., to include wetlands, present on the above described property which are subject to the permit requirements of Section 404 of the Clean Water Act (33 USC 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

_ The property is located in one of the 20 Coastal Counties subject to regulation under the Coastal Area Management Act (CAMA). You should contact the Division of Coastal Management in Washington, NC, at (252) 946-6481 to determine their requirements.

Placement of dredged or fill material within waters of the US and/or wetlands without a Department of the Army permit may constitute a violation of Section 301 of the Clean Water Act (33 USC § 1311). If you have any questions regarding this determination and/or the Corps regulatory program, please contact **Eric Alsmeyer** at **919-554-4884, Ext. 23**.

C. Basis For Determination

The study area contains perennial and intermittent stream channels (the Tar River and an unnamed tributary) with indicators of ordinary high water marks, which are Relatively Permanent Waters, and an adjacent wetland. The Tar River becomes a Section 10 water (Traditional Navigable Water) more than 50 miles downstream of the project.

D. Remarks

This JD replaces the previous JD for this project done on 8/21/2008, and was done as a desktop jurisdictional determination. The drawing, Figures 2 and 4 (copies att.), submitted on 11/13/2007 by The Louis Berger Group, Inc., and on 8/13/2009, together generally depict the jurisdictional waters of the US within the subject study area.

Appeals Information (This information applies only to approved jurisdictional determinations.)

Attached to this verification is an approved jurisdictional determination. If you are not in agreement with that approved jurisdictional determination, you can make an administrative appeal under 33 CFR 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and request for appeal (RFA) form. If you request to appeal this determination you must submit a completed RFA form to the following address:

District Engineer, Wilmington Regulatory Division
Attn: Jean Manuele, Field Office Chief,
Raleigh Regulatory Field Office
3331 Heritage Park Drive, Suite 105
Wake Forest, North Carolina 27587

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR part 331.5, and that it has been received by the District Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by 11/22/2009.
It is not necessary to submit an RFA form to the District Office if you do not object to the determination in this correspondence.

Corps Regulatory Official _____ Date: **9/24/2009** Determination Expiration Date: **9/24/2014**

The Wilmington District is committed to providing the highest level of support to the public. To help us ensure we continue to do so, please complete the Customer Satisfaction Survey located at our website at http://regulatory.usacesurvey.com/ to complete the survey online.

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL		
Applicant: **NCDOT; Division of Highways;**	File Number: **2007-03806**	Date: **9/24/2009**
Attached is:		See Section below
☐ INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)		A
☐ PROFFERED PERMIT (Standard Permit or Letter of permission)		B
☐ PERMIT DENIAL		C
☒ APPROVED JURISDICTIONAL DETERMINATION		D
☐ PRELIMINARY JURISDICTIONAL DETERMINATION		E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the district engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT	
REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)	
ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.	
POINT OF CONTACT FOR QUESTIONS OR INFORMATION:	
If you have questions regarding this decision and/or the appeal process you may contact: Jean Manuele U.S. Army Corps of Engineers, Raleigh Regulatory Field Office 3331 Heritage Trade Drive, Suite 105 Wake Forest, North Carolina 27587	If you only have questions regarding the appeal process you may also contact: Mr. Mike Bell, Administrative Appeal Review Officer CESAD-ET-CO-R U.S. Army Corps of Engineers, South Atlantic Division 60 Forsyth Street, Room 9M15 Atlanta, Georgia 30303-8801
RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.	
_____ Signature of appellant or agent.	Date: / Telephone number:

For appeals on Initial Proffered Permits and approved Jurisdictional Determinations send this form to:

District Engineer, Wilmington Regulatory Division, Attn: Jean Manuele, Project Manager, Raleigh Regulatory Field Office, 3331 Heritage Trade Drive, Suite 105, Wake Forest, North Carolina 27587

For Permit denials and Proffered Permits send this form to:

Division Engineer, Commander, U.S. Army Engineer Division, South Atlantic, Attn: Mr. Mike Bell, Administrative Appeal Officer, CESAD-ET-CO-R, 60 Forsyth Street, Room 9M15, Atlanta, Georgia 30303-8801

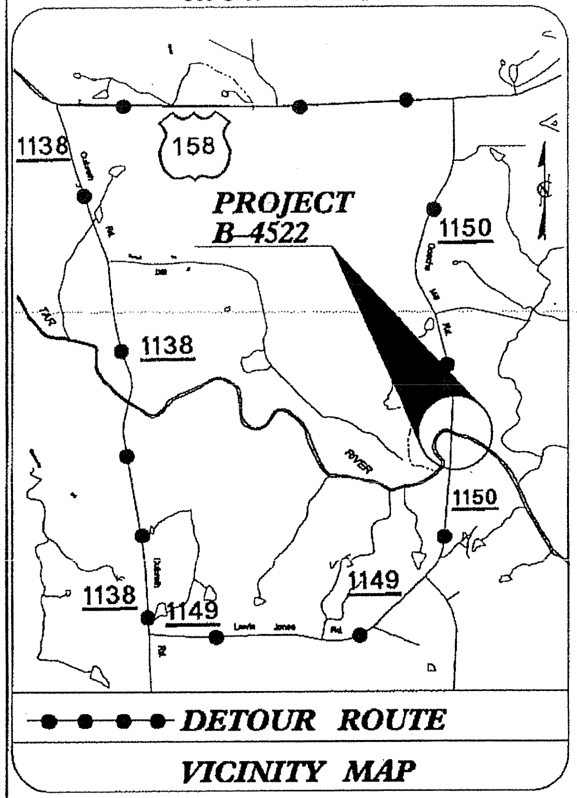
$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

09/08/99

CONTRACT:

TIP PROJECT: B-4522

See Sheet 1-A For Index of Sheets



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

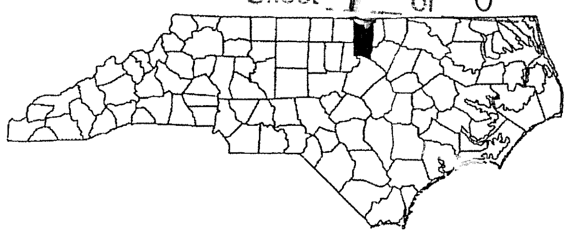
GRANVILLE COUNTY

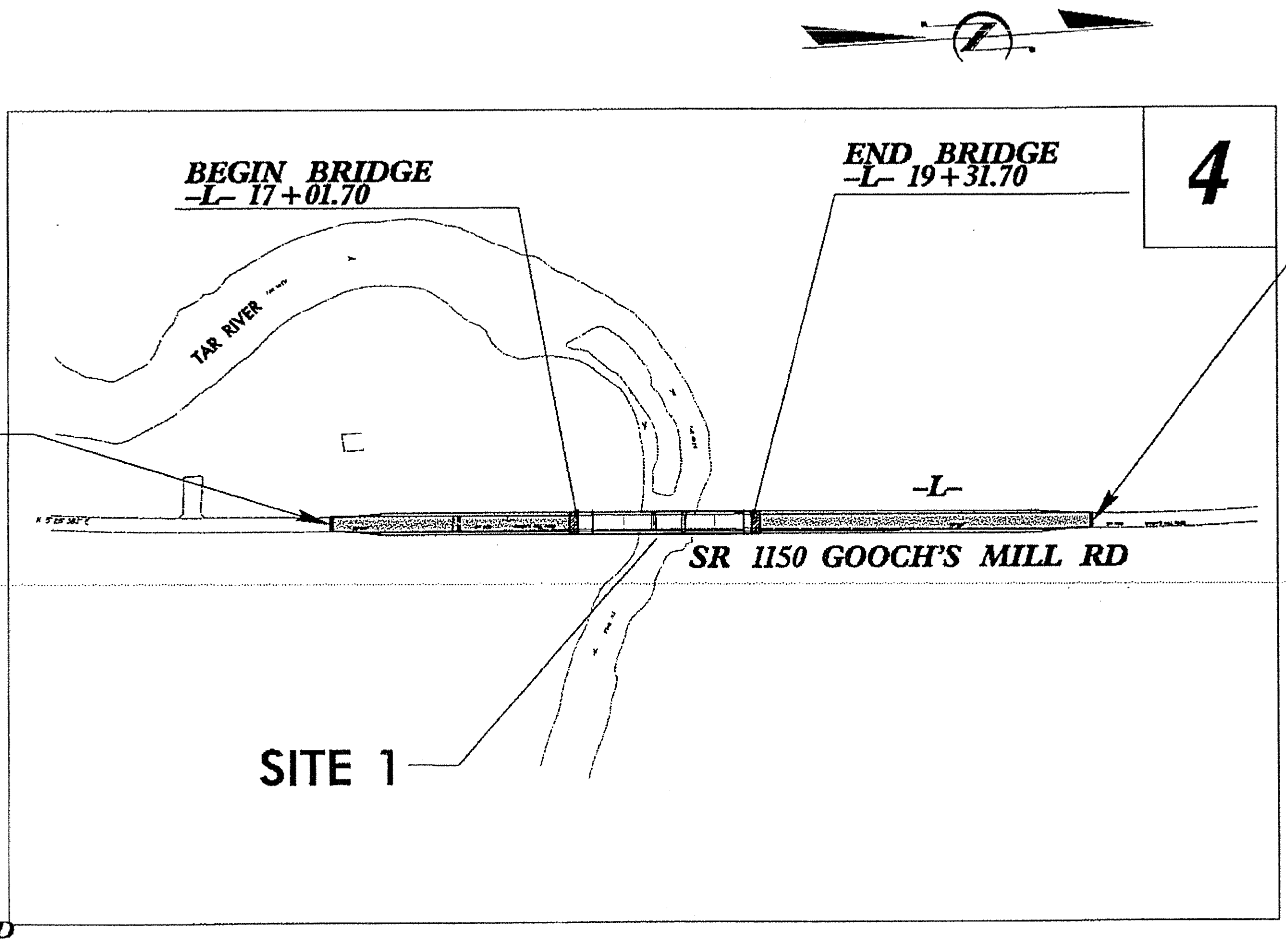
LOCATION: ***BRIDGE 102 OVER THE TAR RIVER ON SR 1150***

TYPE OF WORK: ***GRADING, DRAINAGE, PAVING, AND STRUCTURE***

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4522	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33746.1.1	BRZ - 1150(7)	P.E.	

Permit Drawing
Sheet 1 of 8





-L- STA 13+75.00 BEGIN
TIP PROJECT B-4522

TO SR 1138

-L- STA 23+85.00 END
TIP PROJECT B-4522

TO OXFORD

PERMIT DRAWINGS

THERE IS NO CONTROL OF ACCESS ON THIS PROJECT.

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD .

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2009 = 715
ADT 2030 = 1400
DHV = 13 %
D ≐ 60 %
T = 3 % *
V = 60 MPH
* TTST 1 % DUAL 2%
FUNC CLASS = LOCAL

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4522 = 0.148 mi.
LENGTH OF STRUCTURE TIP PROJECT B-4522 = 0.044 mi.
TOTAL LENGTH OF TIP PROJECT B-4522 = 0.191 mi.

Prepared In the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
SEPTEMBER 18, 2009

LETTING DATE:
SEPTEMBER 21, 2010

JIMMY GOODNIGHT, P.E.
PROJECT ENGINEER

MARK HUSSEY
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER P.E.

Revised 2/2/11

PROJECT REFERENCE NO.	SHEET NO.
B-4522	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 2 of 8

6/17/98

REVISIONS

-L-

PI Sta 11+10.36	PI Sta 25+73.69
Δ = 2°05′ 33.3″ (LT)	Δ = 7°29′ 05.3″ (LT)
D = 1°26′ 47.3″	D = 2° 44′ 36.8″
L = 144.67′	L = 272.81′
T = 72.34′	T = 136.60′
R = 3,961.08′	R = 2,088.37′

NAD 83/95

SITE 1

SITE 2

BEGIN TIP PROJECT B-4522
-L- STA. 13+75.00

END TIP PROJECT B-4522
-L- STA. 23+85.00

PT Sta. 11+82.69

PC Sta. 24+37.09

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

WILLIAM C. NELMS & MARIE V. NELMS
DB 223 PG 427

GLADYS B. HENDRICK
DB III PG 42

GLADYS B. HENDRICK
DB 250 PG 548

WESLEY M. HENDRICK
DB 621 PG 309

WESLEY M. HENDRICK & DENISE E. HENDRICK
DB 1033 PG 03
MB 16 PG 04
MB 30 PG 27

MICHAEL E. WALTERS, III & PAULA A. WALTERS
DB 705 PG 557
MB 07 PG 108

-BL-101 STA 0+00.00 POT

BEGIN BRIDGE -L- STA. 17+01.70

BEGIN APPROACH SLAB -L- STA. 16+90.70

END BRIDGE -L- STA. 19+31.70

END APPROACH SLAB -L- STA. 19+42.70

CL II RIPRAP

SHOULDER BERM GUTTER -L- STA. 16+56 TO 17+02 LT

PREFORMED SCOUR HOLE

15" CS WITH ELBOWS ROD AND LUG CONNECTORS

RIPRAP BANK STABILIZATION -L- STA 17+65 TO 17+85 -L- STA 18+50 TO 18+70 SEE DETAIL C

TIE LAT DITCH TO EXISTING DITCH ADD RIPRAP BANK STABILIZATION STA 18+70 TO 18+95 LT

-BL-102 13+37.83 PINC =
-L- POT STA. 19+43.68 16.797' LT

SPRING BOX WITH 4" PVC PIPE TO STREAM BANK

PROP. ROCK PLATING SEE SHEET 2-A FOR ROCK PLATING DETAIL

LATERAL BASE DITCH -L- STA 18+94 TO 21+50 LT LINE WITH CL B RIPRAP SEE DETAIL A

50' TAPER LT. & RT.

EXISTING R/W

REMOVE EXIST. GUARDRAIL

TRANSITION FROM EXIST. "V" DITCH TO BASE -L- STA 16+50 TO 16+75 LINE WITH CL B RIP RAP

LINE ROADWAY DITCH WITH CL B RIPRAP -L- STA 20+50 TO 23+50 RT SEE DETAIL B

LATERAL BASE DITCH -L- STA 18+60 TO 19+50 RT LINE WITH CL B RIPRAP SEE DETAIL A

LATERAL BASE DITCH -L- STA 19+50 TO 20+75 RT LINE WITH CL B RIPRAP SEE DETAIL A

RIPRAP BANK STABILIZATION AT END OF LATERAL DITCH -L- STA 18+50 TO 18+60 SEE DETAIL D

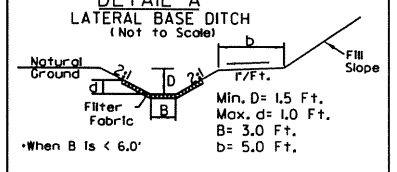
COIR FIBER MATTING

TEMPORARY SURFACE WATER IMPACTS AT WORK PADS

RIPRAP BANK STABILIZATION AT END OF LATERAL DITCH -L- STA 17+15 TO 17+30 SEE DETAIL D

LATERAL BASE DITCH -L- STA 16+75 TO 17+15 RT LINE WITH CL B RIPRAP SEE DETAIL A

DETAIL A
LATERAL BASE DITCH
(Not to Scale)

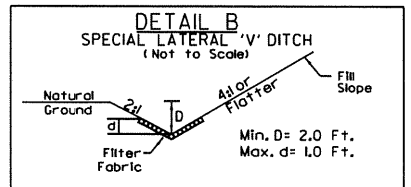


Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
B= 3.0 Ft.
b= 5.0 Ft.
*When B Is < 6.0'

Type of Liner= CL B Rip-Rap

FROM -L- STA. 18+95 TO STA.21+50 LT
-L- STA 19+50 TO STA 20+75 RT
-L-STA 18+60 TO STA 19+50 RT
-L- STA 16+50 TO STA 17+15 RT

DETAIL B
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

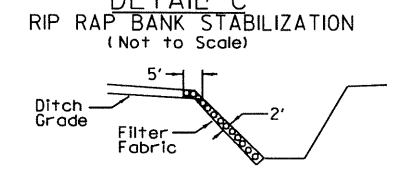


Min. D= 2.0 Ft.
Max. d= 1.0 Ft.

Type of Liner= CL B Rip-Rap

FROM -L- STA. 20+50 TO STA.23+50 RT

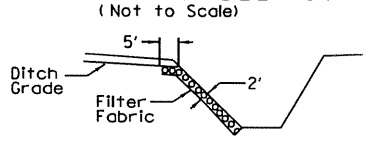
DETAIL C
RIP RAP BANK STABILIZATION
(Not to Scale)



Type of Liner= 200 TONS,CL II Rip-Rap
Filter Fabric= 180 sy

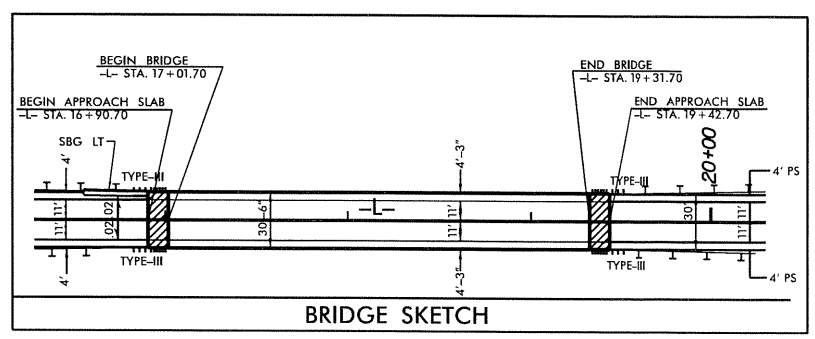
FROM -L- STA.17+65 TO -L- STA.17+85
-L- STA.18+50 TO -L- STA.18+70

DETAIL D
RIP RAP BANK STABILIZATION
(Not to Scale)



Type of Liner= 20 TONS,CL II Rip-Rap
Filter Fabric= 20sy

FROM -L- STA. 18+50 TO STA 18+60 RT
(AT END OF LATERAL BASE DITCH)
AT -L- STA. 18+70 TO 18+95 LT
AT -L- STA. 17+15 TO 17+30 RT



BRIDGE SKETCH

Revised 2/2/11

PROJECT REFERENCE NO.	SHEET NO.
B-4522	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 3 of 8

8/17/09

REVISIONS

-L-

PI Sta 11+10.36	PI Sta 25+73.69
△ = 2°05' 33.3" (LT)	△ = 7°29' 05.3" (LT)
D = 1°26' 47.3"	D = 2° 44' 36.8"
L = 144.67'	L = 272.81'
T = 72.34'	T = 136.60'
R = 3,961.08'	R = 2,088.37'

NAD 83/95

N 16°40'31" E
296.78'

N 05°45'14" E
330.04'

N 13°18'02" W
215.37'

S 87°00'00" E
1422.52'

S 85°55'48" E
1422.52'

SITE 1

SITE 2

BEGIN TIP PROJECT B-4522
-L- STA. 13+75.00

END TIP PROJECT B-4522
-L- STA. 23+85.00

PT Sta. 11+82.69

PC Sta. 24+37.09

-BL-101 STA. 500+00.00 POT

TAR RIVER

WILLIAM G. NELMS & MARIE V. NELMS
DB 223 PG 427

WESLEY M. HENDRICK
DB 621 PG 309

WESLEY M. HENDRICK & DENISE E. HENDRICK
DB 1033 PG 03
WB 16 PG 04
WB 30 PG 27

WILLIAM G. NELMS & MARIE V. NELMS
DB 223 PG 427

GLADYS B. HENDRICK
DB 111 PG 42

GLADYS B. HENDRICK
DB 250 PG 548

MICHAEL E. WALTERS, III & PAULA A. WALTERS
DB 705 PG 557
WB 07 PG 108

RIPRAP BANK STABILIZATION
-L- STA. 17+85 TO 17+85
-L- STA. 18+50 TO 18+70
SEE DETAIL C

TIE LAT. DITCH TO EXISTING DITCH AND RIPRAP BANK STABILIZATION
STA. 18+70 TO 19+35 LT

BEGIN BRIDGE
-L- STA. 17+01.70

BEGIN APPROACH SLAB
-L- STA. 16+90.70

END BRIDGE
-L- STA. 19+31.70

END APPROACH SLAB
-L- STA. 19+42.70

SPRING BOX WITH 4" PVC PIPE TO STREAM BANK

PROP. ROCK PLATING
SEE SHEET 2-A FOR ROCK PLATING DETAIL

LATERAL BASE DITCH
-L- STA. 18+94 TO 21+50 LT
LINE WITH CL B RIPRAP
SEE DETAIL A

SHOULDER BERM GUTTER
-L- STA. 16+58 TO 17+02 LT

PREFORMED SCOUR HOLE

15" CS WITH ELBOWS, ROD AND LUG CONNECTORS

TRANSITION FROM EXIST. 'V' DITCH TO BASE
-L- STA. 16+50 TO 16+75
LINE WITH CL B RIP RAP

REMOVE EXIST. GUARDRAIL

RIPRAP BANK STABILIZATION
-L- STA. 18+50 TO 19+50 RT
SEE DETAIL A

LATERAL BASE DITCH
-L- STA. 18+50 TO 20+75 RT
LINE WITH CL B RIPRAP
SEE DETAIL A

LINE ROADWAY DITCH WITH CL B RIPRAP
-L- STA. 20+50 TO 23+50 RT
SEE DETAIL B

RIPRAP BANK STABILIZATION
AT END OF LATERAL DITCH
-L- STA. 17+75 TO 17+90
SEE DETAIL D

LATERAL BASE DITCH
-L- STA. 15+75 TO 17+75 RT
LINE WITH CL B RIPRAP
SEE DETAIL A

CMP FIBER MATTING

TEMPORARY SURFACE WATER IMPACTS AT WORK PADS

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' TAPER LT. & RT.

EXISTING R/W

PROPOSED R/W

EDGE OF WATER

TOP OF BANK

TOE OF SLOPE

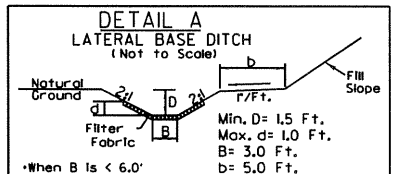
SR 1150 GOOCH'S MILL ROAD

20' BST

WOODS

CLEARING LIMITS

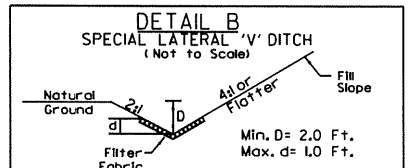
DETAIL A
LATERAL BASE DITCH
(Not to Scale)



Type of Liner= CL B Rip-Rap

FROM -L- STA. 18+95 TO STA.21+50 LT
-L- STA 19+50 TO STA 20+75 RT
-L-STA 18+60 TO STA 19+50 RT
-L- STA 16+50 TO STA 17+15 RT

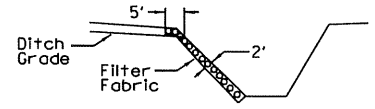
DETAIL B
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Type of Liner= CL B Rip-Rap

FROM -L- STA. 20+50 TO STA.23+50 RT

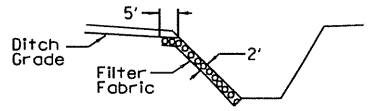
DETAIL C
RIP RAP BANK STABILIZATION
(Not to Scale)



Type of Liner= 200 TONS,CL II Rip-Rap
Filter Fabric= 180 sy

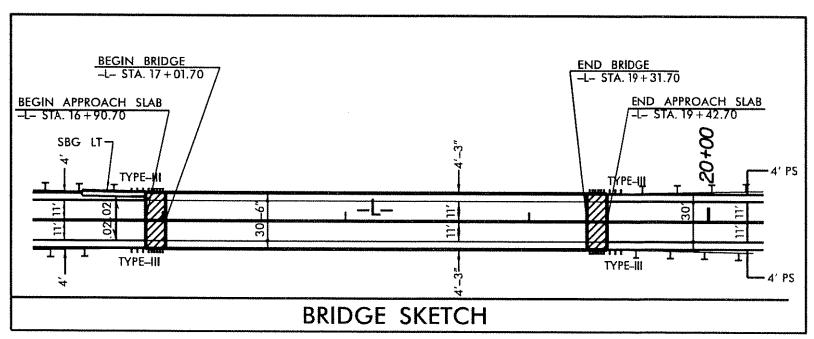
FROM -L- STA.17+65 TO -L- STA.17+85
-L- STA.18+50 TO -L- STA.18+70

DETAIL D
RIP RAP BANK STABILIZATION
(Not to Scale)



Type of Liner= 20 TONS,CL II Rip-Rap
Filter Fabric= 20sy

FROM -L- STA. 18+50 TO STA 18+60 RT
(AT END OF LATERAL BASE DITCH)
AT -L- STA. 18+70 TO 18+95 LT
AT -L- STA. 17+15 TO 17+30 RT



BRIDGE SKETCH

PROJECT REFERENCE NO.	SHEET NO.
B-4522	4-A

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 4 of 8

END TIP PROJECT B-4522

-L- STA. 23+85.00

SITE 2

RIPRAP BANK STABILIZATION
-L- STA 17+65 TO 17+85
-L- STA 18+50 TO 18+70
SEE DETAIL C

TIE LAT DITCH TO EXISTING DITCH
ADD RIPRAP BANK STABILIZATION
STA 18+70 TO 18+95 LT

SPRING BOX WITH
4" PVC PIPE TO
STREAM BANK

END BRIDGE
-L- STA. 19+31.70

END APPROACH SLAB
-L- STA. 19+42.70

+00
80' LT

-L- STA. 19+37.83 BK

WESLEY M. HENDRICK
DB 621 PG 309

PROP. ROCK PLATING
SEE SHEET 2-A FOR ROCK
PLATING DETAIL

LATERAL BASE DITCH
-L- STA 18+94 TO 21+50 LT
LINE WITH CL B RIPRAP
SEE DETAIL A

+50
EX. R/W

EXISTING R/W

N 2° 30' 27.5

GRAU-350

4' PS

-L-
N 3° 21' 05.5" E

20' BST

60.00'

EDGE OF WATER

EDGE OF WATER

RR SPIKE IN 16" SWEET GUM
ELEV.= 384.20'

BL STA 12+91
80' LEFT

S 80° 59' 12" W
98.97'

BM-1

+55.87
33.27

+60' TYP

+06.96
30.35

+50

SITE 2 ENLARGED PLANS

SCALE 1" = 20'

PROJECT REFERENCE NO.	SHEET NO.
B-4522	4 A

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 5 of 8

END TIP PROJECT B-4522

-L- STA. 23+85.00

SITE 2

RIPRAP BANK STABILIZATION
-L- STA 17+65 TO 17+85
-L- STA 18+50 TO 18+70
SEE DETAIL C

TIE LAT DITCH TO EXISTING DITCH
ADD RIPRAP BANK STABILIZATION
STA 18+70 TO 18+95 LT

SPRING BOX WITH
4" PVC PIPE TO
STREAM BANK

END BRIDGE
-L- STA. 19+31.70

END APPROACH SLAB
-L- STA. 19+42.70

+00
80' LT

WESLEY M. HENDRICK
DB 621 PG 309

PROP. ROCK PLATING
SEE SHEET 2-A FOR ROCK
PLATING DETAIL

LATERAL BASE DITCH
-L- STA 18+94 TO 21+50 LT
LINE WITH CL B RIPRAP
SEE DETAIL A

+50
EX. R/W

EXISTING R/W

N 2° 30' 27.

-L-
N 3° 21' 05.5" E

BM-1
RR SPIKE IN 16" GUM
ELEV.= 384.20'

EDGE OF WATER

80' LEFT EDGE OF WATER

BL-1 STA 19+31.83 BK

GRAU 350

4" PS

20' BST

60.00'

+60' TYP

LINE ROADWAY DITCH WITH CL B RIPRA

SITE 2 ENLARGED PLANS

SCALE 1" = 20'

Revised 2/2/11

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4522	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 6 of 8

PI = 14+90.00
EL = 401.89'
VC = 180'
K = 143

PI = 15+70.00
EL = 400.14'
VC = 780'
K = 115

BEGIN GRADE -L- STA. 14+00.00
EL = 403.35

BM#1 ELEVATION = 384.20
N 925805 E 2086352
BL STATION 12+91.88' LEFT
RR SPIKE SET IN 16" GUM

END GRADE -L- STA. 23+60.00
EL = 425.15

BEG BRIDGE
-L- 17+01.70

END BRIDGE
-L- 19+31.70

TEMP. CAUSEWAY EL 381.0
CL. II RIPRAP

TEMP. CAUSEWAY EL 380.0
CL II RIPRAP

BEGIN DITCH GRADE
-L- STA. 16+50
EL = 384.0

PI STA 16+75 RT
EL = 382.9

PI STA 17+00 RT
EL = 379.2

END DITCH GRADE
-L- STA. 17+15 RT
EL = 378.0

BEGIN DITCH GRADE
-L- STA. 18+94 RT
EL = 376.5

PI -L- STA 19+50 LT
EL = 386.0

PI STA 19+50
EL = 395.0

PI STA 19+75
EL = 398.3

END DITCH GRADE
-L- STA. 20+50
EL = 404.5

PI STA 20+50
EL = 399.8

PI STA 20+75
EL = 400.0

END DITCH GRADE
-L- STA. 21+50 LT
EL = 407.6

+75 RESURFACING

+85 RESURFACING

-11.62117%

-10.5662%

END GRADE 5%

BEGIN GRADE 5%

4.9%

8.0%

DW WSEL = 373.2
10/30/2008

7.0%

13.0%

10.1%

4.3%

4.0%

3.0%

(7=1)5.41.38%

BRIDGE HYDRAULIC DATA		
DESIGN DISCHARGE	= 10110	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 393.9	FT
BASE DISCHARGE	= 15700	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 398.1	FT
OVERTOPPING DISCHARGE	= 22400	CFS
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING ELEVATION	= 402.5	FT
DATE OF SURVEY	= 12/03/2008	
W.S. ELEVATION AT DATE OF SURVEY	= 373.2	FT

$$$$LISTENAME$$$$ $$$$SYSTIME$$$$ $$$$DOCN$$$$

PROPERTY OWNERS

PARCEL	OWNER NAME	ADDRESS
*	SITE IMPACTS WITHIN EXISTING NCDOT ROW	N/A

DIVISION OF HIGHWAYS
N.C. DEPT. OF TRANSPORTATION

GRANVILLE COUNTY
PROJECT: 33746.1.1 (B-4522)

BRIDGE NO. 102 OVER
THE TAR RIVER
SR 1150

09/10/09

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND 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)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L-17-82 TO 18+18	TEMPORARY ACCESS PAD							0.03			
1	-L-18+27 TO 18+56	TEMPORARY ACCESS PAD							0.02			
1	-L-18+16.7 Bridge	RIPRAP BANK STABILIZATION								70		
1	-L-18+70 TO 18+95 LT	RIPRAP BANK STABILIZATION								20		
1	-L-17+15 TO 17+30 RT	RIPRAP BANK STABILIZATION								17		
2	-L-19+20 TO 19+50 LT	LAT BASE DITCH						<0.01*		30		
TOTALS:			0.00	0.00	0.00	0.00	0.00	<0.01 *	0.05	137	0.00	0.00

* impacts are 116 sq feet

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GRANVILLE COUNTY
PROJECT 33746.1.1 (B-4522)
BRIDGE NO. 102
OVER THE TAR RIVER ON SR 1150
SHEET 8 OF 8 12/17/2010

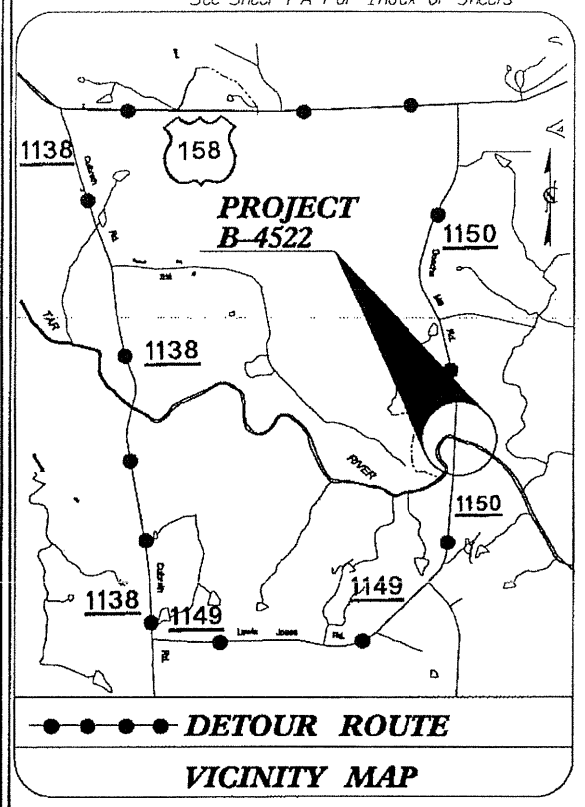
ATN Revised 3/31/05

09/09/09

TIP PROJECT: B-4522

CONTRACT:

$$$$$$SYSTIME$$$$$$
$$$$$$SYSTIME$$$$$$
$$$$$$USERNAME$$$$$$
$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$



VICINITY MAP

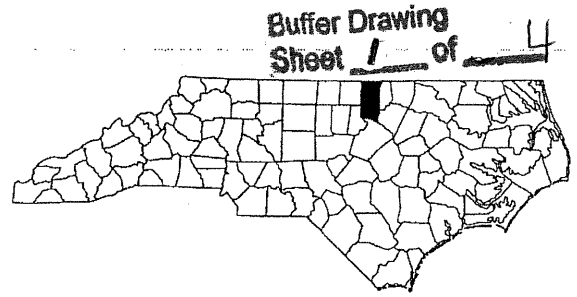
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

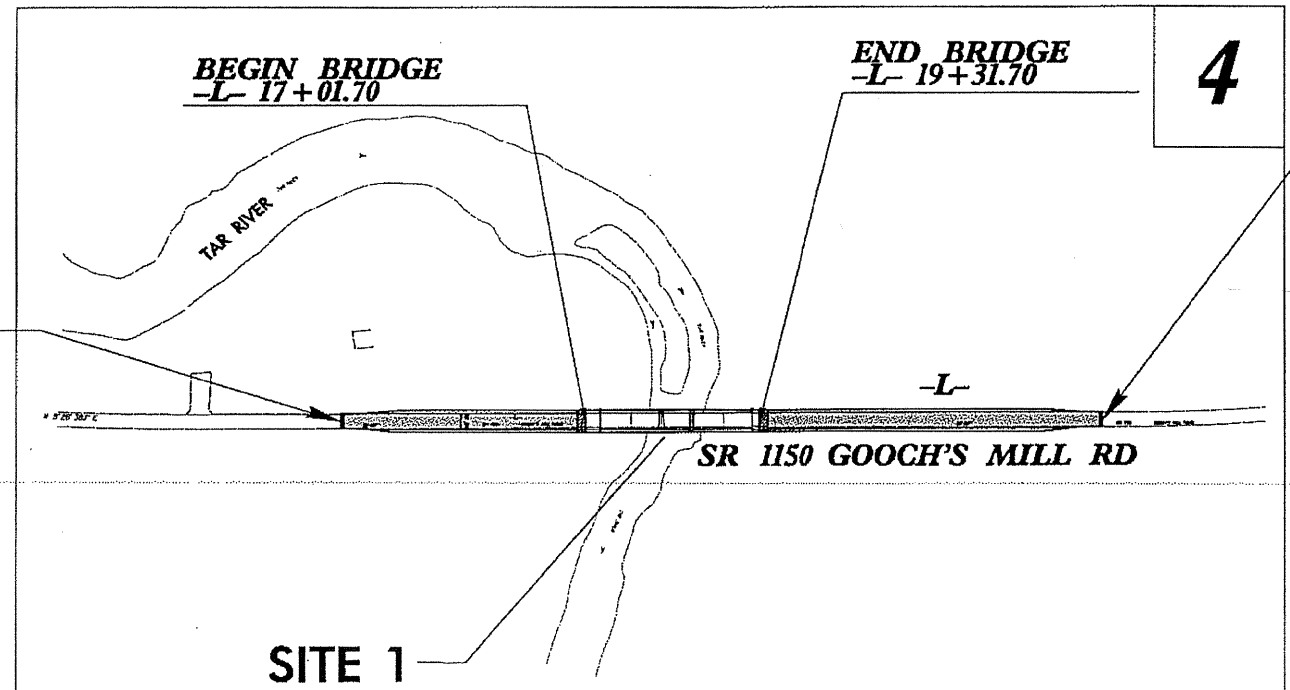
GRANVILLE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4522	1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
33746.1.1	BRZ - 1150(7)	P.E.	

LOCATION: *BRIDGE 102 OVER THE TAR RIVER ON SR 1150*

TYPE OF WORK: *GRADING, DRAINAGE, PAVING, AND STRUCTURE*





BUFFER PERMIT DRAWINGS

THERE IS NO CONTROL OF ACCESS ON THIS PROJECT.

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD .

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2009 = 715
ADT 2030 = 1400
DHV = 13 %
D = 60 %
T = 3 % *
V = 60 MPH
* TTST 1 % DUAL 2%
FUNC CLASS = LOCAL

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4522 = 0.148 mi.

LENGTH OF STRUCTURE TIP PROJECT B-4522 = 0.044 mi.

TOTAL LENGTH OF TIP PROJECT B-4522 = 0.191 mi.

Prepared In the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: SEPTEMBER 18, 2009

LETTING DATE: SEPTEMBER 21, 2010

JIMMY GOODNIGHT, P.E.
PROJECT ENGINEER

MARK HUSSEY
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

SIGNATURE: *P.E.*

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER *P.E.*

Revised 2/2/11

PROJECT REFERENCE NO.	SHEET NO.
B-4522	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Buffer Drawing
Sheet 2 of 54

8/17/99

REVISIONS

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

SITE 1

SITE 2

NAD 83/95

-L-

PI Sta 11+10.36
Δ = 2°05' 33.3" (LT)
D = 1°26' 47.3"
L = 144.67'
T = 72.34'
R = 3,961.08'

PI Sta 25+73.69
Δ = 7°29' 05.3" (LT)
D = 2° 44' 36.8"
L = 272.81'
T = 136.60'
R = 2,088.37'

BEGIN TIP PROJECT B-4522
-L- STA. 13+75.00

END TIP PROJECT B-4522
-L- STA. 23+85.00

PT Sta. 11+82.69

PC Sta. 24+37.09

-BL-101 5+00.00 POT

TAR RIVER

WILLIAM G. NELMS & MARIE V. NELMS
DB 223 PG 427

GLADYS B. HENDRICK
DB 111 PG 42

GLADYS B. HENDRICK
DB 250 PG 548

WILLIAM G. NELMS & MARIE V. NELMS
DB 223 PG 427

WESLEY M. HENDRICK
DB 621 PG 309

WESLEY M. HENDRICK & DENISE E. HENDRICK
DB 1033 PG 03
MB 16 PG 04
MB 30 PG 27

MICHAEL E. WALTERS, III & PAULA A. WALTERS
DB 705 PG 557
MB 07 PG 108

GOOCH'S MILL ROAD
SR 1150

N 3°21'05.5" E

N 2° 30' 27.5" E

EXISTING R/W

50' TAPER LT. & RT.

BEGIN BRIDGE -L- STA. 17+01.70

END BRIDGE -L- STA. 19+31.70

BEGIN APPROACH SLAB -L- STA. 16+90.70

END APPROACH SLAB -L- STA. 19+42.70

CL II RIPRAP

SHOULDER BERM GUTTER -L- STA. 16+56 TO 17+02 LT

PREFORMED SCOUR HOLE

15" CS WITH ELBOWS ROD AND LUG CONNECTORS

RIPRAP BANK STABILIZATION
-L- STA 17+55 TO 17+85
-L- STA 18+50 TO 18+70
SEE DETAIL C

TIE LAT DITCH TO EXISTING DITCH
ADD RIPRAP BANK STABILIZATION
STA 18+70 TO 18+95 LT
-BL-102 13+37.83 PINC =
-L- POT STA. 19+43.68 16.792' LT

SPRING BOX WITH 4" PVC PIPE TO STREAM BANK

PROP. ROCK PLATING SEE SHEET 2-A FOR ROCK PLATING DETAIL

LATERAL BASE DITCH -L- STA 18+94 TO 21+50 LT LINE WITH CL B RIPRAP SEE DETAIL A

REMOVE EXIST. GUARDRAIL

TRANSITION FROM EXIST. "V" DITCH TO BASE 16+50 TO 16+75 LINE WITH CL B RIP RAP

LINE ROADWAY DITCH WITH CL B RIPRAP -L- STA 20+50 TO 23+50 RT SEE DETAIL B

LATERAL BASE DITCH -L- STA 18+60 TO 19+50 RT LINE WITH CL B RIPRAP SEE DETAIL A

LATERAL BASE DITCH -L- STA 19+50 TO 20+75 RT LINE WITH CL B RIPRAP SEE DETAIL A

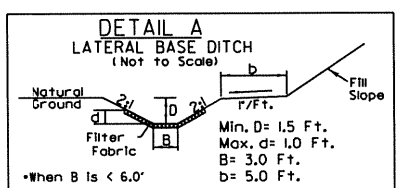
RIPRAP BANK STABILIZATION AT END OF LATERAL DITCH -L- STA 18+50 TO 18+60 SEE DETAIL D

COIR FIBER MATTING

RIPRAP BANK STABILIZATION AT END OF LATERAL DITCH -L- STA 17+15 TO 17+30 SEE DETAIL D

LATERAL BASE DITCH -L- STA 16+75 TO 17+15 RT LINE WITH CL B RIPRAP SEE DETAIL A

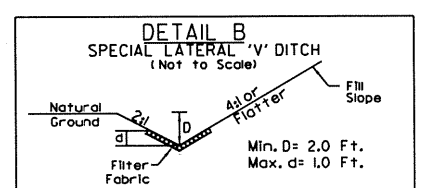
DETAIL A
LATERAL BASE DITCH
(Not to Scale)



Type of Liner= CL B Rip-Rap

FROM -L- STA. 18+95 TO STA.21+50 LT
-L- STA 19+50 TO STA 20+75 RT
-L-STA 18+60 TO STA 19+50 RT
-L- STA 16+50 TO STA 17+15 RT

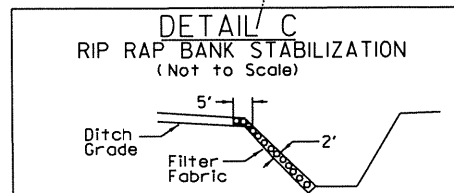
DETAIL B
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Type of Liner= CL B Rip-Rap

FROM -L- STA. 20+50 TO STA.23+50 RT

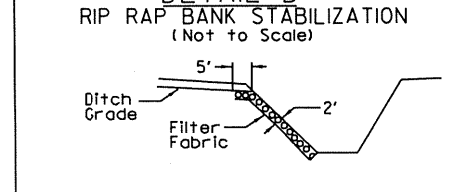
DETAIL C
RIP RAP BANK STABILIZATION
(Not to Scale)



Type of Liner= 200 TONS,CL II Rip-Rap
Filter Fabric= 180 sy

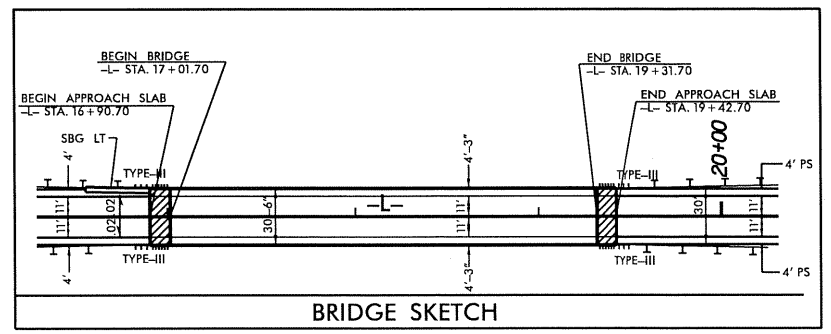
FROM -L- STA.17+65 TO -L- STA.17+85
-L- STA.18+50 TO -L- STA.18+70

DETAIL D
RIP RAP BANK STABILIZATION
(Not to Scale)



Type of Liner= 20 TONS,CL II Rip-Rap
Filter Fabric= 20sy

FROM -L- STA. 18+50 TO STA 18+60 RT
(AT END OF LATERAL BASE DITCH)
AT -L- STA. 18+70 TO 18+95 LT
AT -L- STA. 17+15 TO 17+30 RT



BRIDGE SKETCH

PROPERTY OWNERS

PARCEL	OWNER NAME	ADDRESS
*	SITE IMPACTS WITHIN EXISTING NCDOT ROW	N/A

DIVISION OF HIGHWAYS
N.C. DEPT. OF TRANSPORTATION

GRANVILLE COUNTY
PROJECT: 33746.1.1 (B-4522)

BRIDGE NO. 102 OVER
THE TAR RIVER
SR 1150

09/10/09

BUFFER IMPACTS SUMMARY

			IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
1	Bridge	-L- 16+64 To 19+43		X		8375	2993	11368					
1	Roadway	-L- 16+64 To 17+01 / 19+32 to 19+43	X			186	1249	1435					
TOTAL:						8561	4242	12803					

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

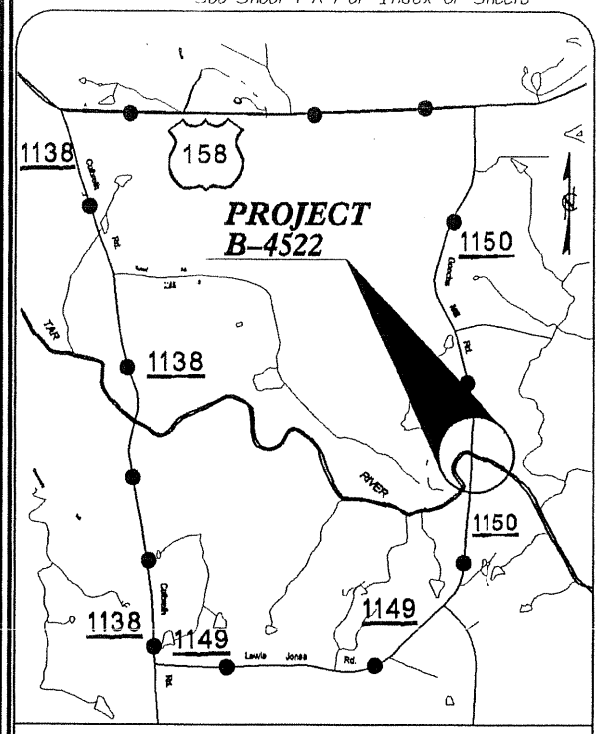
GRANVILLE COUNTY
PROJECT: 33746.1.1 (B-4522)
BRIDGE NO. 102
OVER THE TAR RIVER ON SR 1150
2/2/2011
SHEET 4 OF 4

05/03/99

TIP PROJECT: B-4522

CONTRACT:

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

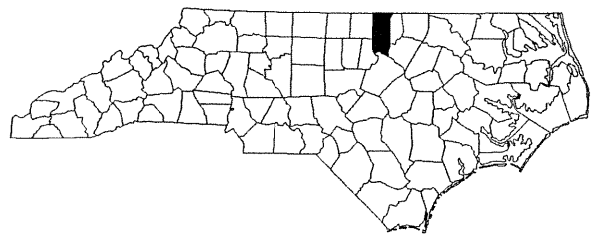
GRANVILLE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4522	1	

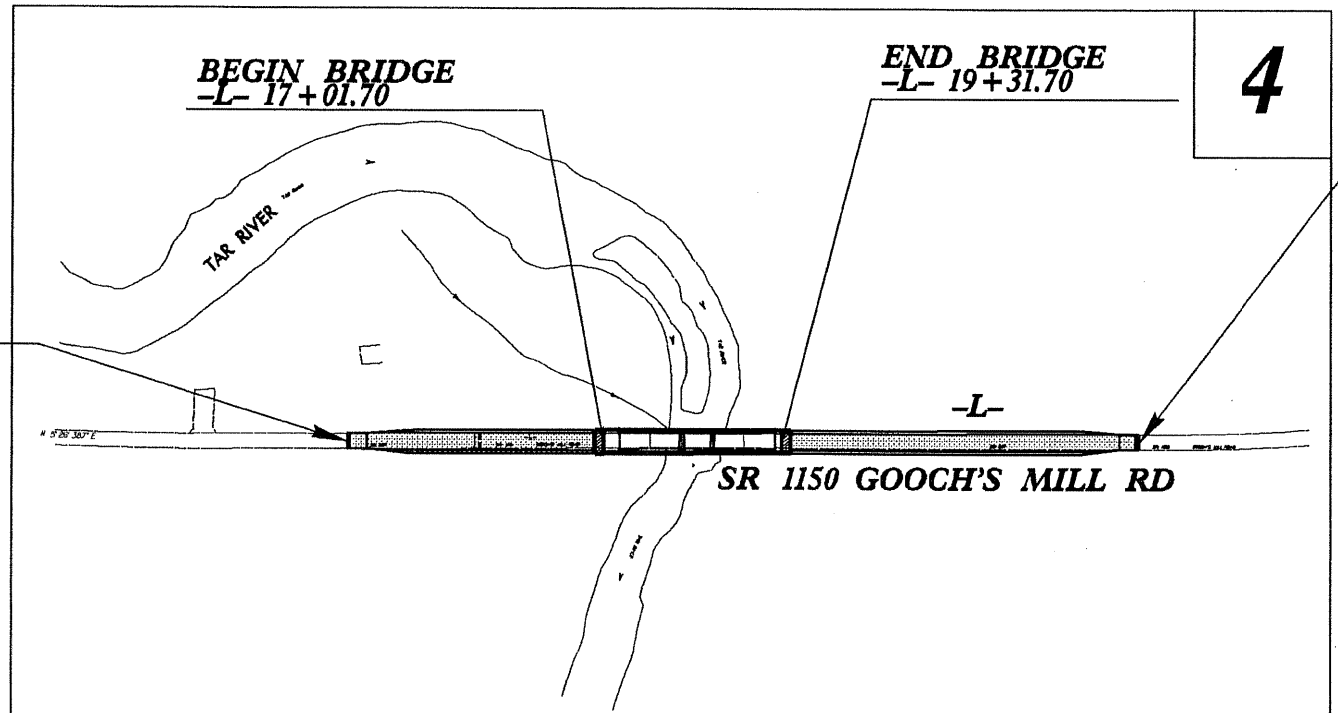
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
33746.1.1	BRZ - 1150(7)	P.E.
33746.2.1	BRZ-1150(7)	RW, UTIL

LOCATION: *BRIDGE 102 OVER THE TAR RIVER ON SR 1150*

TYPE OF WORK: *GRADING, DRAINAGE, PAVING, AND STRUCTURE*



NAD 83/95



-L- STA 13+75.00 BEGIN TIP PROJECT B-4522

TO SR 1138

-L- STA 23+85.00 END TIP PROJECT B-4522

TO OXFORD

THERE IS NO CONTROL OF ACCESS ON THIS PROJECT.

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2010 = 770
ADT 2030 = 1400
DHV = 13 %
D = 60 %
T = 3 % *
V = 60 MPH
* TTST 1 % DUAL 2%
FUNC CLASS = LOCAL

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4522 = 0.148 mi.

LENGTH OF STRUCTURE TIP PROJECT B-4522 = 0.044 mi.

TOTAL LENGTH OF TIP PROJECT B-4522 = 0.192 mi.

Prepared In the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: OCTOBER 21, 2010

LETTING DATE: OCTOBER 18, 2011

JIMMY GOODNIGHT, P.E.
PROJECT ENGINEER

MARK HUSSEY
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER P.E.

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$$$$USERNAME$$$$

3/15/06

PROJECT REFERENCE NO.	SHEET NO.
B-4522	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 — FLOW
- 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 — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite Marker — RW
- 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
- 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 — C
- 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 — ?UTL
- 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.

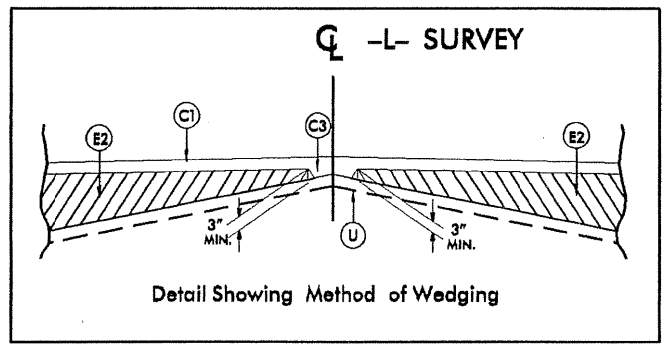
PROJECT REFERENCE NO.	SHEET NO.
B-4522	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

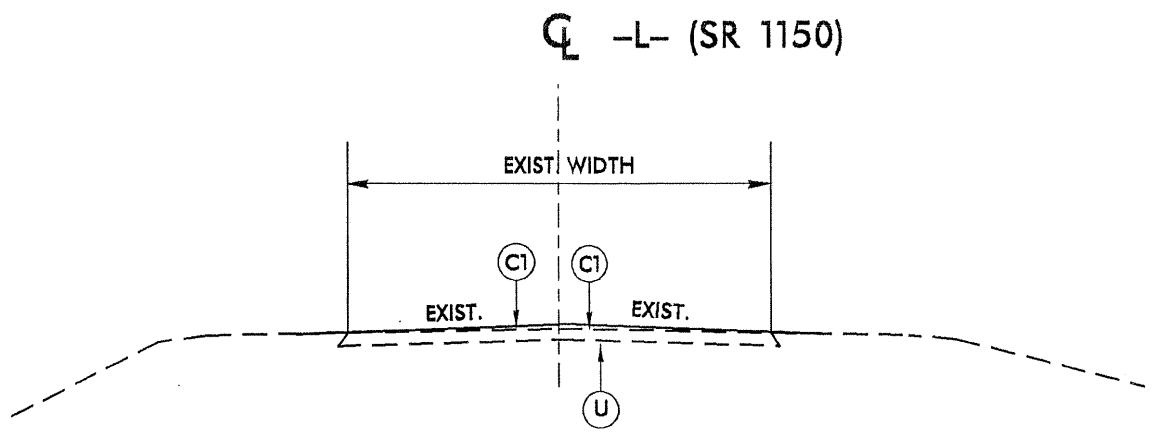
PAVEMENT SCHEDULE
(FINAL PAVEMENT DESIGN)

C1	PROP. APPROX. 1¼" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD.
C2	PROP. APPROX. 2½" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.
E1	PROP. APPROX. 6" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 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 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL).

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

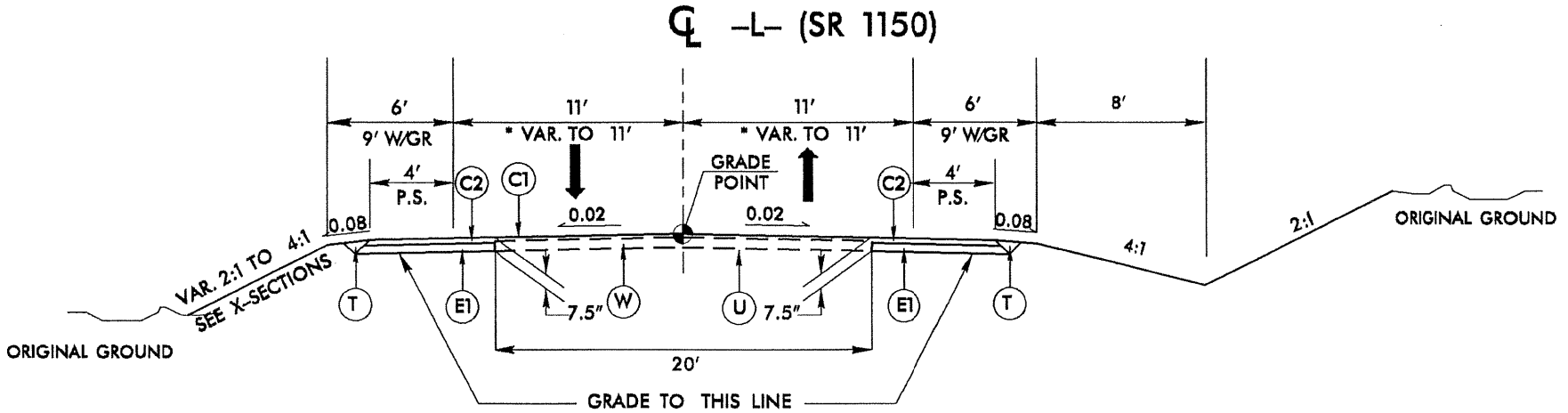


Detail Showing Method of Wedging



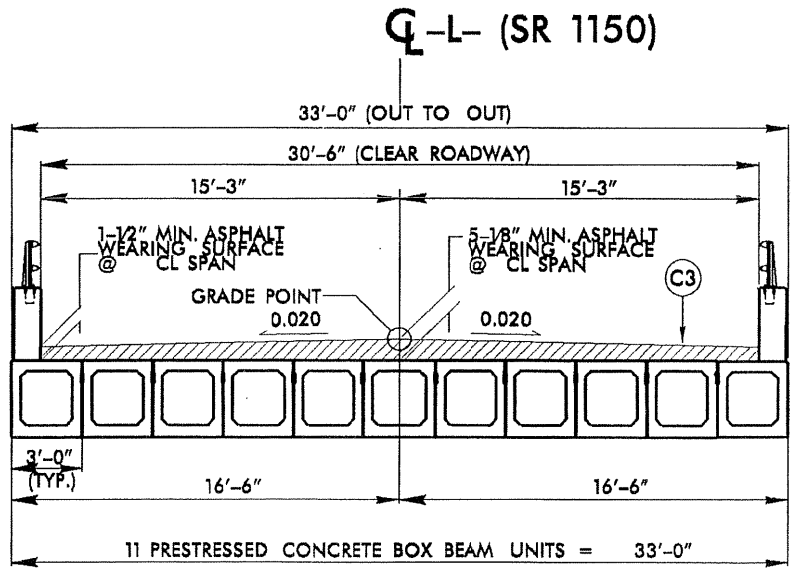
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO.1 AS FOLLOWS
–L– STA. 13+75.00 TO 14+00.00
–L– STA. 23+60.00 TO 23+85.00

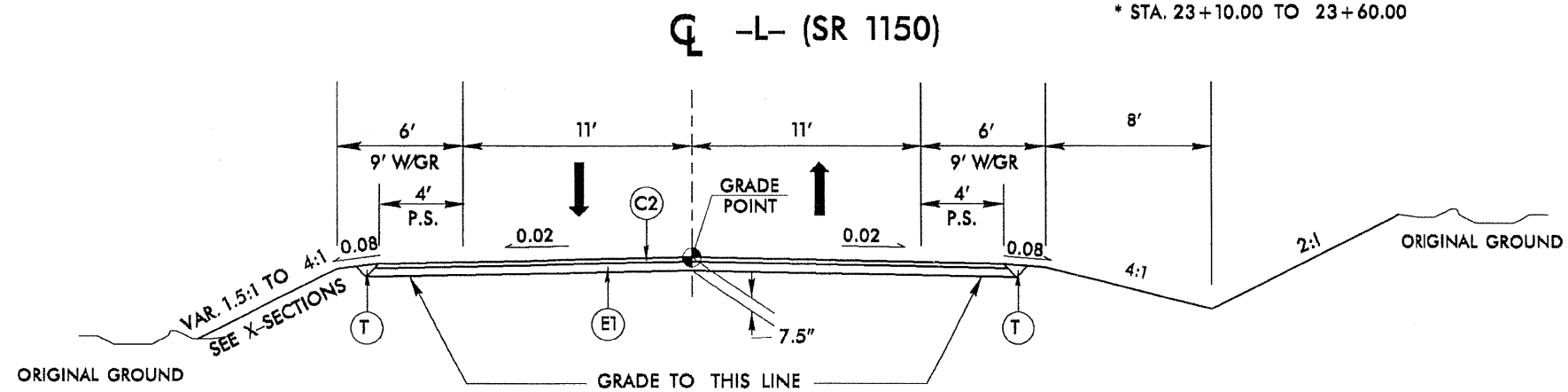


TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO.2 AS FOLLOWS
* STA. 14+00.00 TO 14+50.00
–L– STA. 14+50.00 TO 16+50
–L– STA. 22+50.00 TO STA. 23+10.00
* STA. 23+10.00 TO 23+60.00



TYPICAL SECTION ON STRUCTURE



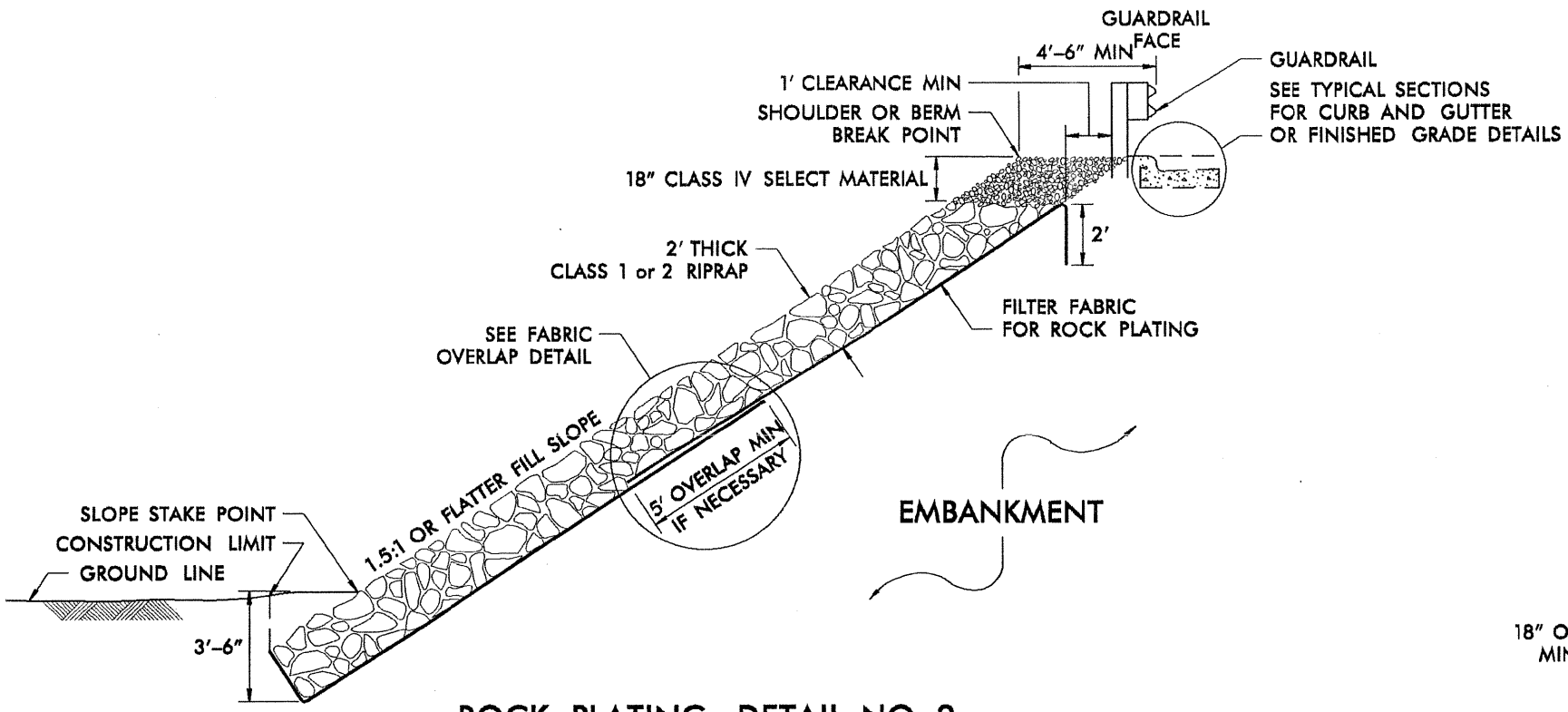
TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO.3 AS FOLLOWS
–L– STA. 16+50 TO BEG BRIDGE 17+01.70
–L– END BRIDGE STA. 19+31.70 TO STA. 22+50.00

6-2-99

PROJECT REFERENCE NO.	SHEET NO.
B-4522	2-A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

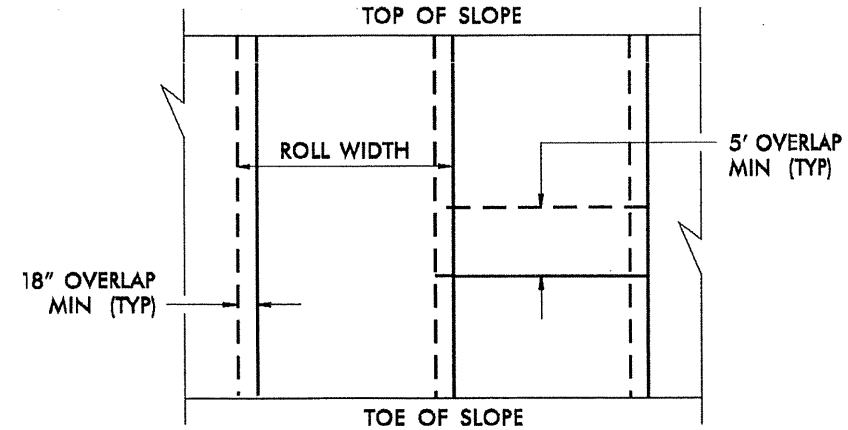


ROCK PLATING DETAIL NO. 2

USE ROCK PLATING DETAIL NO. 2
AT THE FOLLOWING LOCATIONS:

-L- STA 19+60 TO -L- STA 19+85
EXTEND ROCK PLATING LIMITS TO 2:1 SLOPES.

FOR ROCK PLATING,
SEE ROCK PLATING SPECIAL PROVISION.



FABRIC OVERLAP DETAIL
(PLAN VIEW)

ESTIMATED QUANTITIES:

ROCK PLATING ---------- 90 SQ. YD.

ROCK PLATING DETAIL(S) AND LOCATION(S) WERE PROVIDED THROUGH A SEALED DOCUMENT FROM THE GEOTECHNICAL ENGINEERING UNIT. THE DOCUMENT WAS SUBMITTED TO THE ROADWAY DESIGN UNIT ON 12/15/2008 AND SEALED BY A PROFESSIONAL ENGINEER, THEIN TUN ZAN, LICENSE #30943.

Revised 2/2/11

PROJECT REFERENCE NO.	SHEET NO.
B-4522	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

REVISIONS

25

NAD 83/95

–L–

PI Sta 11+10.36	PI Sta 25+73.69
△ = 2°05′ 33.3″ (LT)	△ = 7°29′ 05.3″ (LT)
D = 1°26′ 47.3″	D = 2° 44′ 36.8″
L = 144.67′	L = 272.81′
T = 72.34′	T = 136.60′
R = 3,961.08′	R = 2,088.37′

BEGIN TIP PROJECT B-4522
–L– STA. 13+75.00

–BL–101 5+00.00 POT

END TIP PROJECT B-4522
–L– STA. 23+85.00

PT Sta. 11+82.69

PC Sta. 24+37.09

WILLIAM G. NELMS & MARIE V. NELMS
DB 223 PG 427

GLADYS B. HENDRICK
DB 111 PG 42

GLADYS B. HENDRICK
DB 250 PG 548

WESLEY M. HENDRICK
DB 621 PG 309

WESLEY M. HENDRICK & DENISE E. HENDRICK
DB 1033 PG 03
MB 16 PG 04
MB 30 PG 27

MICHAEL E. WALTERS, III & PAULA A. WALTERS
DB 705 PG 557
MB 07 PG 108

TAR RIVER

ROCK DIKE & ROCK

ROCK DAM

WOODS

EDGE OF WATER

TOP OF BANK

RR SPIKE IN 16" GUM

BEGIN BRIDGE –L– STA. 17+01.70

END BRIDGE –L– STA. 19+31.70

BEGIN APPROACH SLAB –L– STA. 16+90.70

END APPROACH SLAB –L– STA. 19+42.70

CL. II RIPRAP

SHOULDER BERM GUTTER –L– STA. 16+56 TO R+02 LT

PREFORMED SCOUR HOLE

15" CS WITH ELBOWS ROD AND LUG CONNECTORS

RIPRAP BANK STABILIZATION –L– STA 17+65 TO 17+85 –L– STA 18+50 TO 18+70 SEE DETAIL C

TIE LAT DITCH TO EXISTING DITCH ADD RIPRAP BANK STABILIZATION STA 18+70 TO 18+95 LT

–BL–102 13+37.83 PINC = –L– POT STA. 19+43.68 16.797′ LT

SPRING BOX WITH 4" PVC PIPE TO STREAM BANK

PROP. ROCK PLATING SEE SHEET 2–A FOR ROCK PLATING DETAIL

LATERAL BASE DITCH –L– STA 18+94 TO 21+50 LT LINE WITH CL B RIPRAP SEE DETAIL A

50' TAPER LT. & RT.

EXISTING R/W

N 2° 30′ 27.5″ E

N 3° 21′ 05.5″ E

SR 1150 GOOCH'S MILL ROAD

20' BST

GRAU-350'

REMOVE EXIST. GUARDRAIL

TRANSITION FROM EXIST. "V" DITCH TO BASE –L– STA 16+50 TO 16+75 LINE WITH CL B RIP RAP

LATERAL BASE DITCH –L– STA 18+60 TO 19+50 RT LINE WITH CL B RIPRAP SEE DETAIL A

LATERAL BASE DITCH –L– STA 19+50 TO 20+75 RT LINE WITH CL B RIPRAP SEE DETAIL A

LINE ROADWAY DITCH WITH CL B RIPRAP –L– STA 20+50 TO 23+50 RT SEE DETAIL B

RIPRAP BANK STABILIZATION AT END OF LATERAL DITCH –L– STA 18+50 TO 18+60 SEE DETAIL D

COIR FIBER MATTING

RIPRAP BANK STABILIZATION AT END OF LATERAL DITCH –L– STA 17+65 TO 17+90 SEE DETAIL D

LATERAL BASE DITCH –L– STA 16+75 TO 17+15 RT LINE WITH CL B RIPRAP SEE DETAIL A

ISFD

CANOPY

CONC

SOIL

METER

3" SR

LP

S

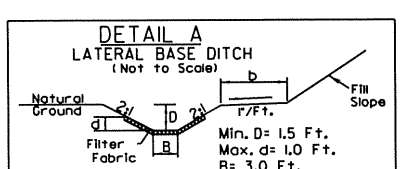
25' CONC

15" RCP

EQL

EXIST

DETAIL A
LATERAL BASE DITCH
(Not to Scale)



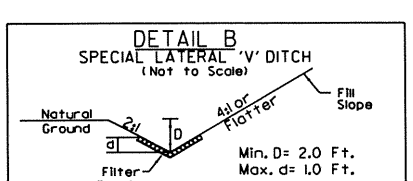
Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
B= 3.0 Ft.
b= 5.0 Ft.

*When B Is < 6.0'

Type of Liner= CL B Rip-Rap

FROM –L– STA. 18+95 TO STA.21+50 LT
–L– STA 19+50 TO STA 20+75 RT
–L–STA 18+60 TO STA 19+50 RT
–L– STA 16+50 TO STA 17+15 RT

DETAIL B
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

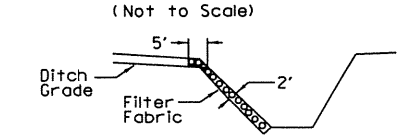


Min. D= 2.0 Ft.
Max. d= 1.0 Ft.

Type of Liner= CL B Rip-Rap

FROM –L– STA. 20+50 TO STA.23+50 RT

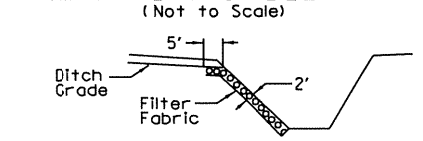
DETAIL C
RIP RAP BANK STABILIZATION
(Not to Scale)



Type of Liner= 200 TONS,CL II Rip-Rap
Filter Fabric= 180 sy

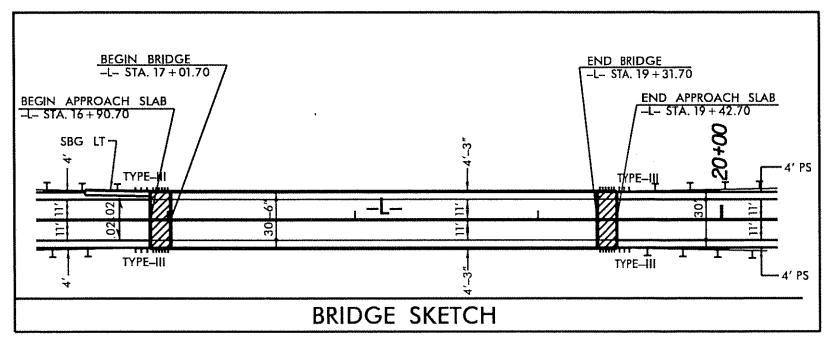
FROM –L– STA.17+65 TO –L– STA.17+85
–L– STA.18+50 TO –L– STA.18+70

DETAIL D
RIP RAP BANK STABILIZATION
(Not to Scale)



Type of Liner= 20 TONS,CL II Rip-Rap
Filter Fabric= 20sy

FROM –L– STA. 18+50 TO STA 18+60 RT
(AT END OF LATERAL BASE DITCH)
AT –L– STA. 18+70 TO 18+95 LT
AT –L– STA. 17+15 TO 17+30 RT



BRIDGE SKETCH

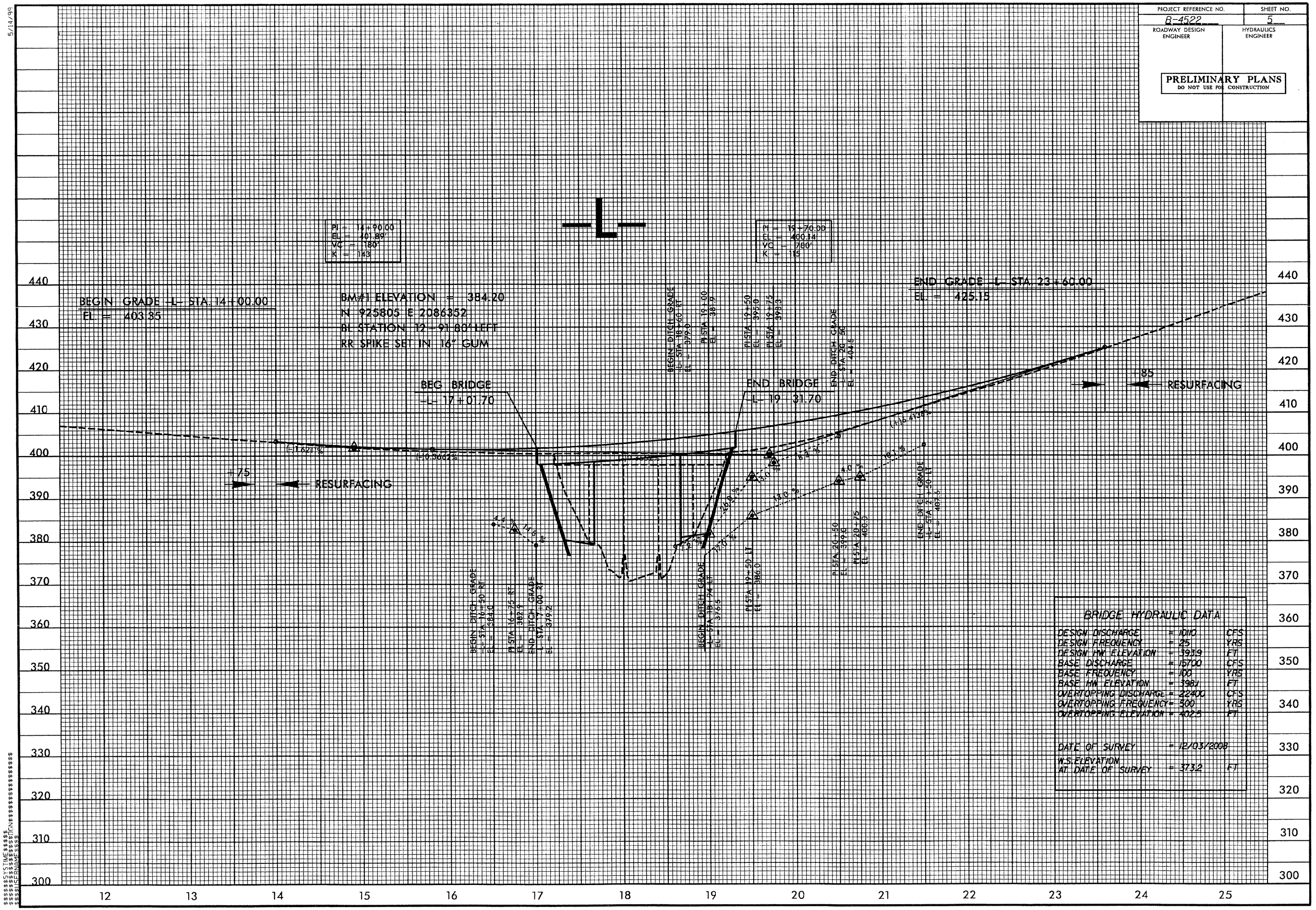
$$$$SYSTIME$$$$
$$$$SYSDATE$$$$
$$$$FILENAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-4522	5

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 1010	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 393.9	FT
BASE DISCHARGE	= 15700	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 398.1	FT
OVERTOPPING DISCHARGE	= 22400	CFS
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING ELEVATION	= 402.5	FT
DATE OF SURVEY	= 12/03/2008	
W.S. ELEVATION AT DATE OF SURVEY	= 373.2	FT