STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PATRICK L. MCCRORY
GOVERNOR

ANTHONY J. TATA
SECRETARY

January 7, 2013

U. S. Army Corps of Engineers
Regulatory Field Office
Post Office Box 1000
Washington, NC 27889-1000

ATTN: Mr. Tom Steffens
NCDOT Coordinator

Dear Sirs:

Subject: **Application re-submittal for Section 404 Nationwide Permit 23** for the Replacement of Bridge No. 147 on SR 1525 (Cornwallis Rd.) over Swift Creek in Johnston County, North Carolina. TIP No. B-4561. Federal Aid Project No. BRZ-1525(5); State Project No. 8.2313801; WBS Element 33772.1.1

The original permit application for this project (submitted August 14, 2012) was withdrawn on October 17, 2012 due to the absence of a Biological Opinion from the U.S. Fish and Wildlife Service, which has now been completed and is included with this application.

Please find enclosed the Pre-Construction Notification (PCN) form, stormwater management plan, permit drawings, utility drawings, and design plans for the above referenced project. A Categorical Exclusion (CE) was completed for this project on February 28, 2012 and distributed shortly thereafter. Additional copies are available upon request. The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 147 over Swift Creek on SR 1525 (Cornwallis Rd.) in Johnston County. The project involves replacement of the existing 151-foot structure with a 185-foot long bridge in approximately the same location. There will be <0.01 acre of permanent impacts to riparian wetlands for excavation resulting from utility relocations and 9,505 square feet of riparian buffer impacts on this project.

The proposed let date for this project is April 16, 2013 with a review date of February 26, 2013. However, the let date may advance as additional funds become available.

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT & ENVIRONMENTAL ANALYSIS UNIT
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1548

TELEPHONE: 919-707-6000
FAX: 919-212-5785

WEBSITE:NCDOT.GOV

LOCATION:
CENTURY CENTER, BUILDING B
1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610

Regulatory Approvals

Section 404 Permit: All aspects of this project are being processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance with 23 CFR 771.115(b). The NCDOT requests that these activities be authorized by a Nationwide Permit 23.

A copy of this permit application will be posted on the NCDOT Website at: http://www.ncdot.org/doh/preconstruct/pe/neu/permit.html

Thank you for your assistance with this project. If you have any questions or need additional information, please contact Amy James at aejames@ncdot.gov or (919) 707-6129.

Sincerely,

E. L. Lusk

for Gregory J. Thorpe, Ph.D., Manager
Project Development and Environmental Analysis Unit

cc: NCDOT Permit Application Standard Distribution List

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: 23	or General Permit (GP) number:	
1c. Has the NWP 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 No. 147 over Swift Creek on SR 1525 (Cornwallis Rd.)
2b. County:	Johnston
2c. Nearest municipality / town:	Clayton
2d. Subdivision name:	*not applicable*
2e. NCDOT only, T.I.P. or state project no:	B-4561

3. Owner Information

3a. Name(s) on Recorded Deed:	North Carolina Department of Transportation
3b. Deed Book and Page No.	*not applicable*
3c. Responsible Party (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) 707-6129
3g. Fax no.:	(919) 212-5785
3h. Email address:	aejames@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: 35.599998 (DD.DDDDDD)	Longitude: - 78.535582 (-DD.DDDDDD)
1c. Property size:	2.1 acres	
2. Surface Waters		
2a. Name of nearest body of water (stream, river, etc.) to proposed project:	Swift Creek	
2b. Water Quality Classification of nearest receiving water:	C; NSW	
2c. River basin:	Neuse	
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: Land use at the project site and in the vicinity consists primarily of forestland (primarily along stream corridors), medium to low density residential development, and agriculture (mostly pasture land).		
3b. List the total estimated acreage of all existing wetlands on the property: 0.9 acre		
3c. List the total estimated linear feet of all existing streams (intermittent and perennial) on the property: 355		
3d. Explain the purpose of the proposed project: To replace a structurally deficient bridge.		
3e. Describe the overall project in detail, including the type of equipment to be used: The project involves replacing a 151-foot bridge with a 185-foot, 3-span 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:	☒ 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): NCDOT (Amy James)	Agency/Consultant Company: Other:	
4d. If yes, list the dates of the Corps jurisdictional determinations or State determinations and attach documentation. A preliminary JD request was sent to the USACE on January 4, 2010, but no paperwork was received, nor was there a site visit.		
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 4 ☒ P ☐ T	Excavation	Bottomland Hardwood Forest	☒ Yes ☐ No	☒ Corps ☐ DWQ	<0.01
Site 5 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 6 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 7 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
				2g. **Total wetland impacts**	<0.01 Permanent 0.0 Temporary

2h. Comments: There will also be 0.12 acre of hand clearing in wetlands on this project for the relocation of an overhead power line.

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			☐ PER ☐ INT	☐ Corps ☐ DWQ		
Site 2 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
Site 3 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
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**	X Perm X Temp

3i. Comments:

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	X Permanent X 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)
Site 1 ☒ P ☐ T	Bridge	Swift Creek	☐ Yes ☒ No	5,030	2,750
Site 1 ☒ P ☐ T	Road crossing	Swift Creek	☐ Yes ☒ No	0	101
A1 ☒ P ☐ T	O/H Power Line	Swift Creek	☐ Yes ☒ No	1,012	0
A2 ☒ P ☐ T	O/H Power Line	Swift Creek	☐ Yes ☒ No	0	612
		6h. **Total buffer impacts**		6,042	3,463

6i. Comments:

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 34 feet longer than the existing bridge and at approximately the same grade and alignment; elimination of deck drains; the existing interior bent was moved from the center of the channel to the edge of bank; removal of existing road fill under the bridge to improve conveyance and reduce velocity; and the use of grassed shoulders which will promote sheet flow and improve water infiltration.

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

NCDOT Best Management Practices for Bridge Demolition, Removal and Construction will be followed, as well as Design Standards in Sensitive Watersheds; drainage from the berm gutter system will drain to a pre-formed scour hole before discharging into Swift Creek; implementation of an anadromous fish moratorium from Feb. 15-June 15; use of an off-site detour.

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: Due to the minimal amount of proposed wetland impacts, no compensatory mitigation is proposed.
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:**			
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:				

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 not, explain why. Comments: see attached buffer 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 N/A
5b. Have all of the 401 Unit submittal requirements been met?	☐ Yes ☐ No N/A

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? USFWS county list, field surveys in 2009 (Tar River spinymussel, dwarf wedgemussel, and Michaux's sumac) and 2012 (Michaux's sumac). A biological assessement (BA) was completed on 10/10/12 for dwarf wedgemussel on this project and the final Biological Opinion (BO) was issued by the USFWS on 12/17/12.		
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	E. L. Luske Applicant/Agent's Signature (Agent's signature is valid only if an authorization letter from the applicant is provided.)	1·7·13 Date

United States Department of the Interior

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

December 18, 2012

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. 147 over Swift Creek on SR 1525, located in Johnston County, North Carolina (TIP No. B-4561), 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 29, 2012 request for formal consultation was received on November 30, 2012. 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: Greg Thorpe, NCDOT, Raleigh, NC

electronic copy: Ken Graham, USFWS, Atlanta, GA
Brett Hillman, USFWS, Concord, NH
Tom Steffens, USACE, Washington, NC
Heather Wallace, NCDOT, Raleigh, NC
Amy James, NCDOT, Raleigh, NC
Chad Coggins, NCDOT, Wilson, NC
Chris Militscher, USEPA, Atlanta, GA
Travis Wilson, NCWRC, Creedmoor, NC
Rob Ridings, NCDWQ, Raleigh, NC

This Biological Opinion (BO) is based on information provided in the Biological Assessment (BA) submitted by the North Carolina Department of Transportation (NCDOT) dated October 2012, 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

April 29-30, 2009 – Service staff field inspects the project site and provides early coordination comments.

May 10, 2012 – Service staff provides additional early coordination comments.

May 31, 2012 – Service provides written concurrence with a biological conclusion of May Affect, Not Likely to Adversely Affect for the federally endangered Tar River spinymussel, and with a No Effect biological conclusion for the federally endangered red-cockaded woodpecker and Michaux's sumac. The Service restates the need for formal Section 7 consultation for the DWM.

August 16, 2012 – Service provides technical assistance in the development of the BA.

September 13, 2012 – Service provides comments on a draft BA from NCDOT.

October 10, 2012 – Service provides comments on a revised draft BA from NCDOT.

November 30, 2012 – The Service receives a letter from the Federal Highway Administration (FHWA), dated November 29, 2012, with the attached final BA, requesting formal Section 7 consultation on the proposed replacement of Bridge No. 147 over Swift Creek.

BIOLOGICAL OPINION

I. DESCRIPTION OF THE PROPOSED ACTION

The B-4561 project is located at the SR 1525 (Cornwallis Road) crossing of Swift Creek in Johnston County, North Carolina, approximately four miles southwest of Clayton. The existing three-span, 151 feet long and 28 feet wide bridge will be replaced with a three-span, approximately 185 feet long (1@55', 1@70', 1@60') and 36 feet wide bridge. The new bridge will be placed in the same horizontal alignment and at approximately the same elevation. The new bridge will completely span the channel of Swift Creek. Approximately 735 cubic yards of existing approach fill will be removed from the floodplain. Reconstruction of the approach road will extend approximately 323 feet south of the new bridge and 132 feet north of the new bridge. Traffic will be detoured onto other roads during construction.

To avoid dropping debris into the stream, the bridge deck and bent caps will be removed using a "top down" method. The existing timber piles located near the water's edge on one side of the

bridge will be removed using one of three methods, depending on the depth of the piles and the equipment available. If the piles are not too deep and the contractor has access to a crane of sufficient size, the timber piles will be pulled directly out of the substrate. If the piles cannot be pulled out, the contractor may use a vibratory hammer to loosen the pile. The last and most common method for removal of timber piles is to pull the pile over to break it off at or below the mud line. All equipment will be operated from the stream bank.

The bridge replacement will require the relocation of several public utilities (sewer, water, telephone, and overhead electrical lines). A combination of directional boring and open trenching will be utilized, but no excavation will occur within Swift Creek. Some minor hand clearing of woody vegetation will occur near Swift Creek.

Action Area

The action area is defined as the SR 1525 project right-of-way of B-4561, beginning 323 feet south of the bridge and extending 132 feet north of the bridge, plus Swift Creek 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 1525 pavement and bridge structure, and the Swift Creek channel. The action area occurs in the Swift Creek Sub-basin 030203 of the Neuse River Basin, as assigned by the North Carolina Division of Water Quality. At the project site, Swift Creek is approximately 35 feet wide. Riparian hardwood forest borders along each bank adjacent to 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.

- NCDOT's "Design Standards in Sensitive Watersheds" will be implemented (see Appendix D of BA).
- In areas identified as Environmentally Sensitive Areas (defined as a 50-foot buffer zone on both sides of the stream measured from top of stream bank), 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, erosion control measures will be used during excavation as well as during construction.

- 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.
- No new bents will be constructed in the stream. New bents will be constructed at or beyond the top of bank resulting in a complete span of the stream channel.
- There will be no deck drains on the new bridge. Gutters will be utilized to direct stormwater to preformed scour holes adjacent to the bridge.
- All sediment and erosion control measures, throughout the project limits, will be maintained regularly to ensure proper function of the measures.
- An offsite detour will be utilized, with no improvements to the detour route.
- The overall bridge length for Bridge No. 147 will increase from 151 to 185 feet, thereby increasing the hydraulic opening.
- A preconstruction survey for DWM will be performed for an approximate distance of 100 meters downstream of the project crossing. A relocation plan for any DWM found in this area will be implemented (Appendix E in BA).

II. STATUS OF THE SPECIES

Dwarf Wedgemussel

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 floods of 2005 is uncertain at this time (USFWS 2007).

Other Species

In addition to the DWM that is the subject of this formal consultation, the FHWA has determined that the project will have no effect on the federally endangered Tar River spinymussel (*Elliptio steinstansana*), red-cockaded woodpecker (*Picoides borealis*), and Michaux's sumac (*Rhus michauxii*). Based on available information, the Service concurs with these conclusions. The Tar River spinymussel has never been observed in Swift Creek despite numerous surveys. Suitable habitat is not present within the action area for the red-cockaded woodpecker. A plant survey conducted on May 20, 2009 did not find any specimens of Michaux's sumac, and only marginal habitat was present within the action area. The species discussed in this paragraph will not be further considered in this BO.

III. ENVIRONMENTAL BASELINE

Under Section 7(a)(2) of the ESA, 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

Since the discovery of DWM in Swift Creek in 1991, a total of 50 live and 12 relict shells of the species have been found in the Swift Creek Sub-basin. This includes 44 live and 12 relict shells at 34 sites within a 21-mile reach of Swift Creek, three live DWM at two sites in Middle Creek, two live individuals at two sites in Little Creek, and one live individual in White Oak Creek. The most recent survey efforts from 2007-2012 within an 11-mile reach of Swift Creek revealed 19 live individuals. Within the action area, there is one record from 1994 of one live DWM being observed approximately 300 feet upstream of the SR 1525 bridge crossing. Just downstream of the action area, one live DWM was observed in 2010 approximately 1800 feet downstream of the bridge crossing. (North Carolina Wildlife Resources Commission unpublished data, The Catena Group unpublished data).

On July 7, 2009, NCDOT biologists surveyed Swift Creek within the action area (400 meters downstream to 100 meters upstream of the bridge crossing). Although suitable habitat was observed within the action area, no DWM were observed. However, the survey of the action area did reveal a diverse assemblage of mussels, including species considered associates. Therefore, the presence of DWM cannot be ruled out.

Factors Affecting the Species Environment Within the Action Area

The Swift Creek watershed has experienced rapid urbanization associated with sprawl from the Raleigh metropolitan area since the early 1990's. Although the rate of urbanization has slowed recently, it still continues. Two previous Section 7 consultations from 2005, Clayton Bypass and Dempsey Benton Water Treatment Plant, provided several conservation measures to help avoid or offset adverse effects to the Swift Creek watershed. Some of these conservation measures were wide-ranging in scope and were to be implemented by third parties. It is unknown how effective these measures have been in offsetting potential adverse effects to DWM. At the time of these consultations, the DWM population was considered to be in decline, and its long term viability was in question (Entrix 2005). Water quality degradation from increased development in the watershed, both past and potentially present, is likely the most significant factor affecting the species environment within the action area.

IV. EFFECTS OF THE ACTION

Under Section 7(a)(2) of the ESA, "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 within the action area have been unsuccessful, it is uncertain if any DWM occur within the action area. If the species does occur within the action area, the minimal amount of work within the channel (i.e. to remove timber piles at the water's edge) may cause adverse effects, but only for a short duration. The long term and overall effect of the project may be beneficial if there is significant recovery of the species in Swift Creek.

Analysis for Effects of the Action

Beneficial Effects: The removal of the existing timber piles in the channel and the commitment to completely span the channel will have beneficial effects. Given that in-channel piles 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 piles 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 piles (creating additional channel disturbance and downstream sedimentation), the elimination of the in-channel piles will thus preclude future disturbance for debris removal. The lengthening of the bridge from approximately 151 feet to approximately 185 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: Removal of the in-channel piles may disturb sediment which will redeposit downstream, potentially on DWM or within DWM habitat. However, this 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 stream within the action area during the removal of the existing bridge and approach fill, construction of the new bridge and approach road, and during utility relocation. 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. However, these erosion control measures are designed to handle a 25-year storm event. A greater magnitude storm event could overwhelm these erosion control measures and wash eroded soil from the disturbed construction area into the stream, thus smothering mussels, interfering with respiration and feeding, and degrading habitat.

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. Although removal of the existing timber piles and some approach fill in the floodplain may cause minor changes in flow dynamics and velocity, there will likely not be any measurable indirect, adverse effect on DWM or its habitat.

Interrelated and Interdependent Actions: The relocation of several utilities will involve some ground disturbance within the action area, which potentially could contribute to sedimentation of Swift Creek if erosion control measures were overwhelmed or improperly implemented (see Direct Effects section above).

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 specific known future local, state or private actions that are reasonably certain to occur within the action area. However, in general, increased urbanization upstream in the watershed is expected to continue at some unknown level, potentially affecting 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. 147 over Swift Creek on SR 1525 (TIP No. B-4561), 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 currently exists within the action area. The project has significant long-term beneficial effects. Several conservation measures will greatly reduce the potential for adverse effects. In-channel work will be minimal, thus limiting the potential for adverse 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 smothered or otherwise harmed by sedimentation 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 and on-site NCDOT staff understand and follow the measures listed in the "Conservation Measures" section of this BO.

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

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA 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 Swift Creek Sub-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 29, 2012 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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B-4561 NEU ENVIRONMENTAL PERMIT NARRATIVE

JOHNSTON COUNTY PUBLIC UTILITIES – 6 inch force sewer main: The 6" force sewer main (Force Sanitary Sewer; 6" FSS) will be directionally bored on the east end of the L-line and will require open trenching (excavation of 3 foot trench).outside the wetland boundaries. No impacts will occur due to the 6" force sewer line. Contact: Mrs. Chandra Coats – Public Works Director (water/sewer); Johnston County Public Utilities; P. O. Box 309 E. Market St. P.O. Box 2263 Smithfield, N.C. 27577; Phone 919-982-5046.

JOHNSTON COUNTY PUBLIC UTILITIES – 12 inch force sewer main: The 12" force sewer main (Force Sanitary Sewer; 12" FSS) will be directionally bored outside of wetland boundaries on the south end of the project but will require open trenching (excavation of 3 foot trench) and hand clearing within wetland boundaries from approximately L-16+95 to L-16+98. These impacts will occur in an area to be permitted for overhead power pole installation. Therefore hand clearing is not listed in the Utility Wetland Impact Summary. The 12" force sewer line will be excavated at a 3 feet. depth from L-15+82 to L-17+04, and on 2 feet each side of the 12" force sewer main. Therefore they are listed as excavation within the Wetland in the Utility Wetland Impact . Contact: Mrs. Chandra Coats – Public Works Director (water/sewer); Johnston County Public Utilities; P. O. Box 309 E. Market St. P.O. Box 2263 Smithfield, N.C. 27577; Phone 919-982-5046.

CENTURYLINK TELEPHONE: 3 telephone cables The overhead telephone lines and poles on the west side of the L-line will be relocated further away from the L-line by open trenching from L-11+23 to a hand hole at L-11+70 and from L-15+85 to a hand hole at L-15+60. The telephone lines will be installed overhead from L-L-11+70 to L-15+60 under Swift Creek. There will be no impacts to the wetland due to the telephone lines. Contact: Mr. Kevin Godwin 717 McGillary St. Fayetteville, N.C 28311.

JOHNSTON COUNTY PUBLIC UTILITIES – 8" water line: The 8" water line will be directionally bored outside of wetland boundaries on the west end of the L-line under Swift Creek but will require open trenching (excavation of 3 foot trench) from approximately L-10+56 to L-11+12 and from L 15+64 to L-16+27. No impacts to the wetland will occur due to installation of the water line. Contact: Mrs. Chandra Coats – Public Works Director (water/sewer); Johnston County Public Utilities; P. O. Box 309 E. Market St. P.O. Box 2263 Smithfield, N.C. 27577; Phone 919-982-5046.

PROGRESS ENERGY – overhead power – The overhead power line will be relocated further away from the L-line. The power poles will be removed near the bridge and relocated. The proposed line will run at an angle from west side of the L line to the east side of the L-line. On the east side of the L-line hand clearing will occur in buffer zone 1 and buffer zone 2 on both sides of Swift Creek 15 feet each side of the power line. The power line will cross a wetland on the north east side of the proposed bridge and will be hand cleared below the overhead power line in the wetland between L-15+82 to L-17+04. Contact: Mrs. Sheila Talton Senior Utilities Coordinator 1020 W. Chatham St. Cary, N.C. 27511 Phone 919 481-6126.

09/08/99

TIP PROJECT: B-4561

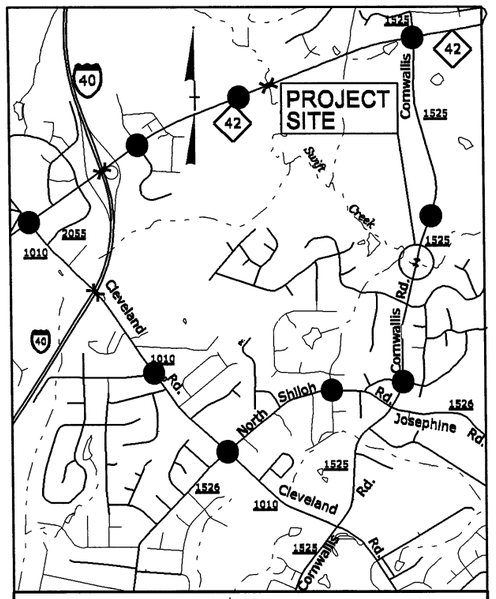
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

T.I.P. NO.	SHEET NO.
B-4561	UC-1

NEU UTILITY
RELOCATION PLANS

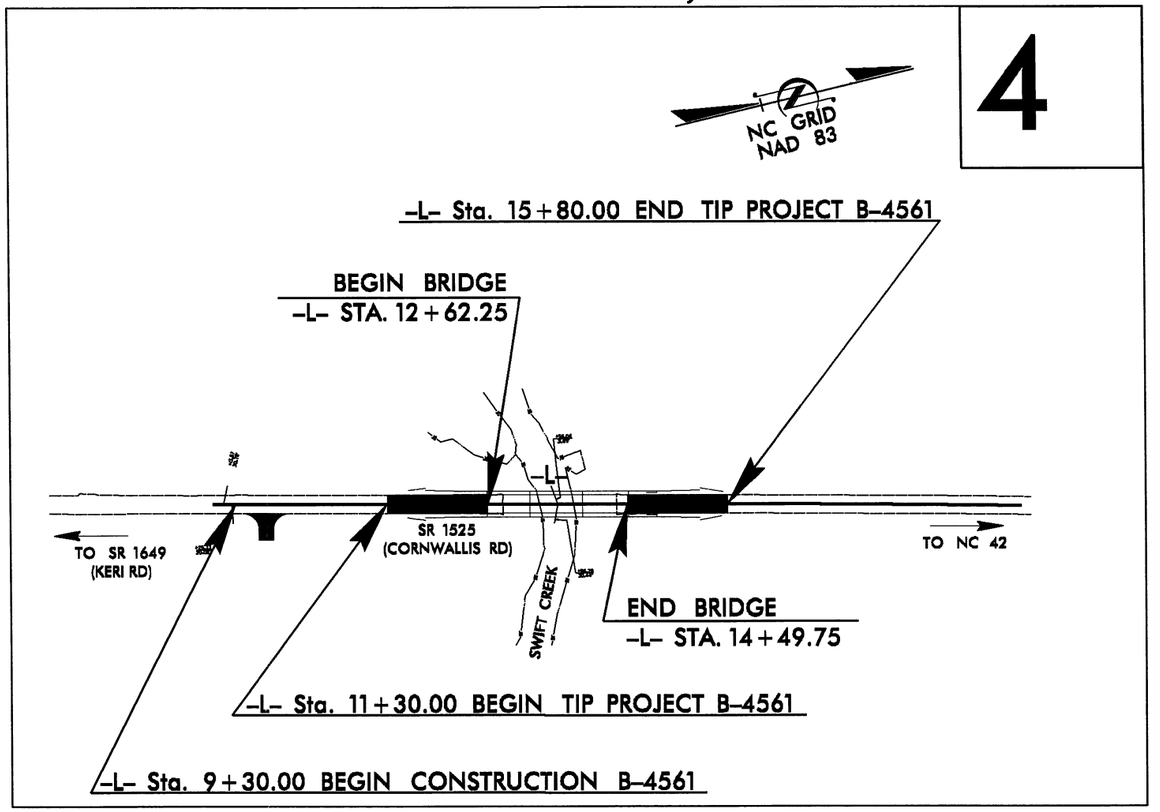
NEU
UTILITY RELOCATION PLANS
JOHNSTON COUNTY

LOCATION: BRIDGE NO. 147 OVER SWIFT CREEK ON SR 1525
TYPE OF WORK: RELOCATION OF WATER, SEWER AND TELEPHONE UTILITIES



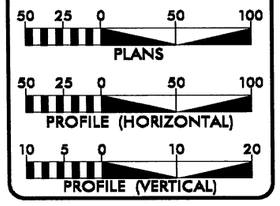
VICINITY MAP

●—●—● OFFSITE DETOUR



Utility Permit Drawing
Sheet 3 of 15

GRAPHIC SCALES



INDEX OF SHEETS

WATER AND SEWER OWNERS ON PROJECT

(1) *JOHNSTON COUNTY PUBLIC UTILITIES*
WATER AND SEWER
(2) *CENTURYLINK TELEPHONE*
(3) *PROGRESS ENERGY*

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 23041 ENGINEER COREY D. BOUSQUET

PREPARED IN THE OFFICE OF:
DIVISION OF HIGHWAYS
UTILITIES UNIT
UTILITIES ENGINEERING

1591 MAIL SERVICES CENTER
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Corey Bousquet, P.E. — *UTILITIES SQUAD LEADER PROJECT ENGINEER*
Kelvin Martin — *UTILITIES PROJECT DESIGNER*

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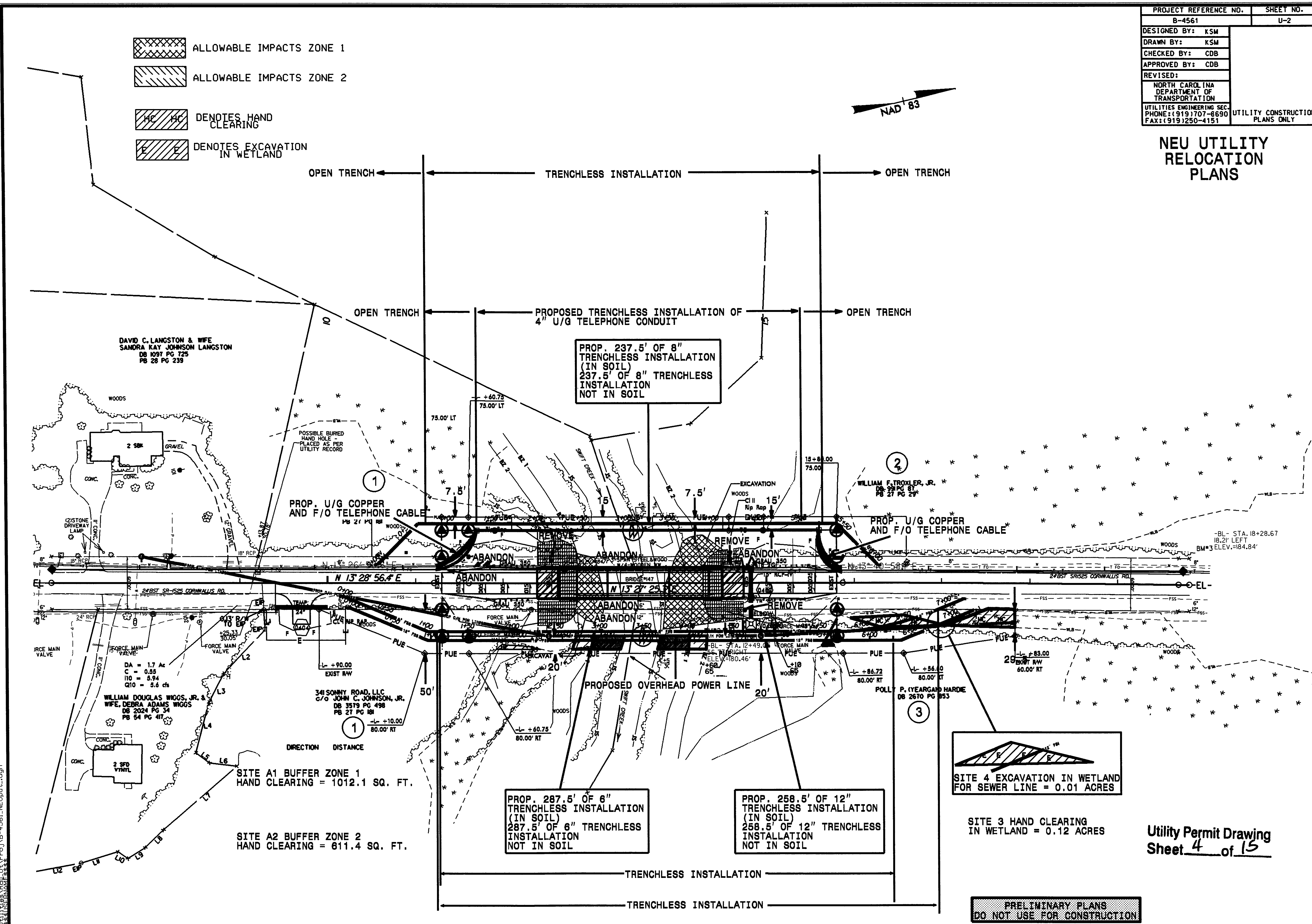


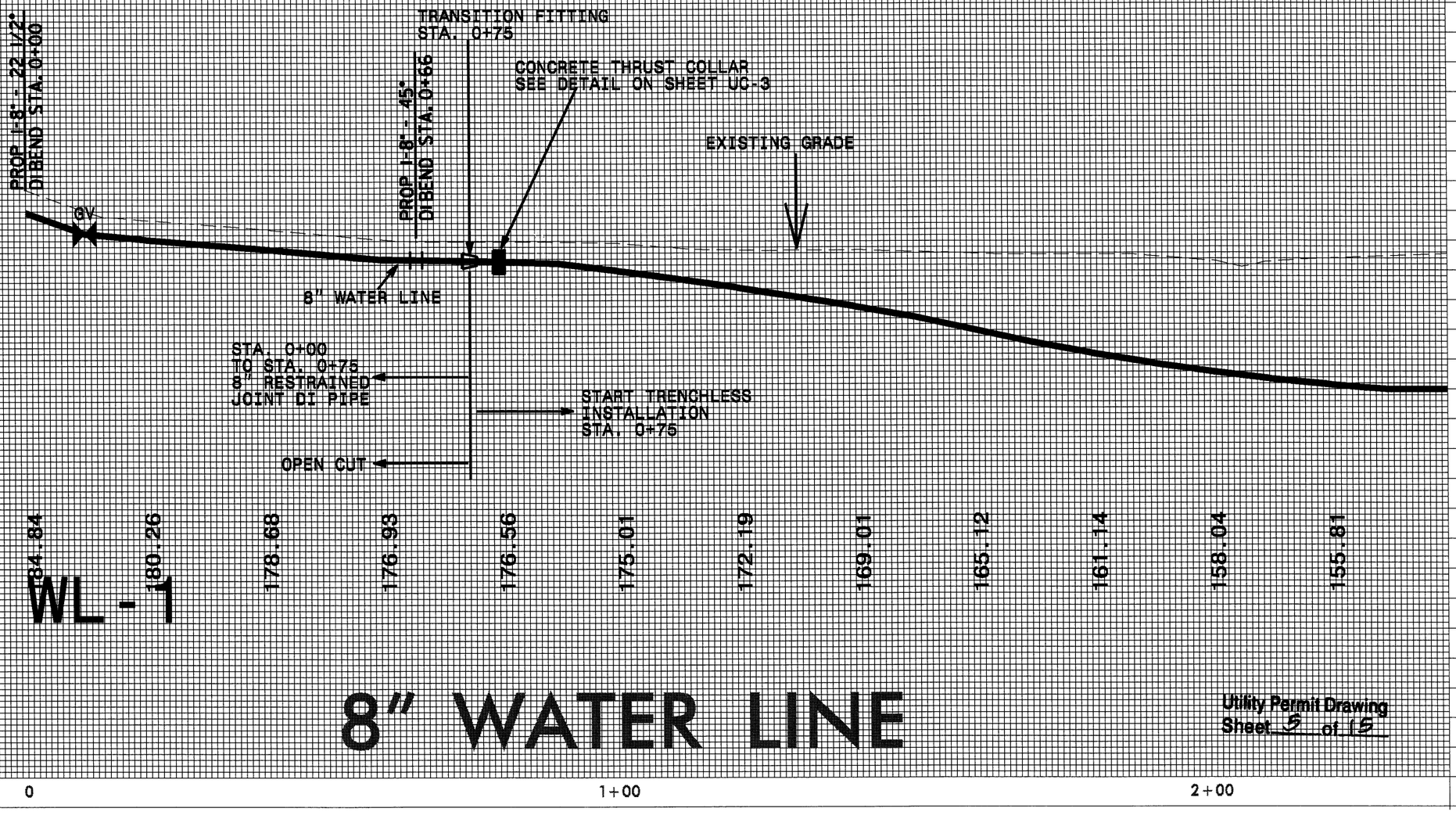
PROJECT REFERENCE NO. B-4561
SHEET NO. U-2
DESIGNED BY: KSM
DRAWN BY: KSM
CHECKED BY: CDB
APPROVED BY: CDB
REVISED:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151
UTILITY CONSTRUCTION PLANS ONLY
NEU UTILITY RELOCATION PLANS
ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
DENOTES HAND CLEARING
DENOTES EXCAVATION IN WETLAND
NAD 83
OPEN TRENCH
TRENCHLESS INSTALLATION
OPEN TRENCH
PROPOSED TRENCHLESS INSTALLATION OF 4" U/G TELEPHONE CONDUIT
PROP. 237.5' OF 8" TRENCHLESS INSTALLATION (IN SOIL) 237.5' OF 8" TRENCHLESS INSTALLATION NOT IN SOIL
DAVID C. LANGSTON & WIFE SANDRA KAY JOHNSON LANGSTON DB 1097 PG 725 PB 28 PG 239
PROP. U/G COPPER AND F/O TELEPHONE CABLE
WILLIAM F. TROXLER, JR.
PROP. U/G COPPER AND F/O TELEPHONE CABLE
-BL- STA. 18+28.67 18.21' LEFT BM#3 ELEV.=184.84'
REMOVE
ABANDON
N 13° 28' 56.4" E
24' BST SR-1525 CORNWALLIS RD.
PROPOSED OVERHEAD POWER LINE
DA = 1.7 Ac C = 0.55 I10 = 5.94 Q10 = 5.6 cfs
WILLIAM DOUGLAS WIGGS, JR. & WIFE, DEBRA ADAMS WIGGS DB 2024 PG 34 PB 54 PG 417
341 SONNY ROAD, LLC c/o JOHN C. JOHNSON, JR. DB 3579 PG 498 PB 27 PG 181
POLLY P. (YEARGAN) HARDIE DB 2670 PG 853
DIRECTION DISTANCE
SITE A1 BUFFER ZONE 1 HAND CLEARING = 1012.1 SQ. FT.
SITE A2 BUFFER ZONE 2 HAND CLEARING = 611.4 SQ. FT.
PROP. 287.5' OF 6" TRENCHLESS INSTALLATION (IN SOIL) 287.5' OF 6" TRENCHLESS INSTALLATION NOT IN SOIL
PROP. 258.5' OF 12" TRENCHLESS INSTALLATION (IN SOIL) 258.5' OF 12" TRENCHLESS INSTALLATION NOT IN SOIL
SITE 4 EXCAVATION IN WETLAND FOR SEWER LINE = 0.01 ACRES
SITE 3 HAND CLEARING IN WETLAND = 0.12 ACRES
Utility Permit Drawing Sheet 4 of 15
TRENCHLESS INSTALLATION
TRENCHLESS INSTALLATION
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4561	U-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



Utility Permit Drawing
Sheet 15 of 15

13-APR-2012 16:07
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$$$$USERNAME$$$$

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4561	U-4

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SWIFT CREEK
℄

15'

WETLAND BOUNDARY

WETLAND BOUNDARY

END TRENCHLESS INSTALLATION STA. 5+40

8" WATER LINE

8" WATER LINE

155.00 155.00 155.00 155.00 155.00 155.00 155.00 155.73 157.43 160.17 163.70 167.22 170.75 174.04

260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80

3+00 4+00 5+00

Utility Permit Drawing
Sheet 6 of 15

19-APR-2012 16:08
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$$$$USERNAME$$$$

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4561	U-5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

280
270
260
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100

CONCRETE THRUST COLLAR
SEE DETAIL ON SHEET UC-3

PROP 1-8"-45° DIBEND STA. 5+43

EXISTING GRADE

PROP 1-8"-45° DIBEND STA. 7+22

TRANSITION FITTING
STA. 5+40

GV

STA. 5+40
TO STA. 6+10
8" RESTRAINED
JOINT DI PIPE

OPEN CUT

176.04
176.03
176.02
176.00
178.85

8" WATER LINE

6+00

Utility Permit Drawing
Sheet 7 of 15

19-APR-2012 16:09
R:\Utilities\Rdu_Ut\Proj\8_ water line 19.dgn
$$$$USERNAME$$$$

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4561	U-6
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PROP. 1-22.5° DI BEND
STA. 0+00 - HORIZONTAL

PROPOSED GRADE

EXISTING GRADE

PROP. 1-22.5° DI BEND
STA. 0+97 - HORIZONTAL

STA. 0+00
TO STA. 1+10
12" RESTRAINED
JOINT DI PIPE

START TRENCHLESS
INSTALLATION
STA. 1+10

OPEN CUT

181.27 178.90 178.28 177.46 176.83 176.57 176.24 175.19 173.55 171.22 167.24 162.99

WL - 2

12" Force Main

Utility Permit Drawing
Sheet 2 of 15

260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90

0 1+00 2+00

19-APR-2012 16:15
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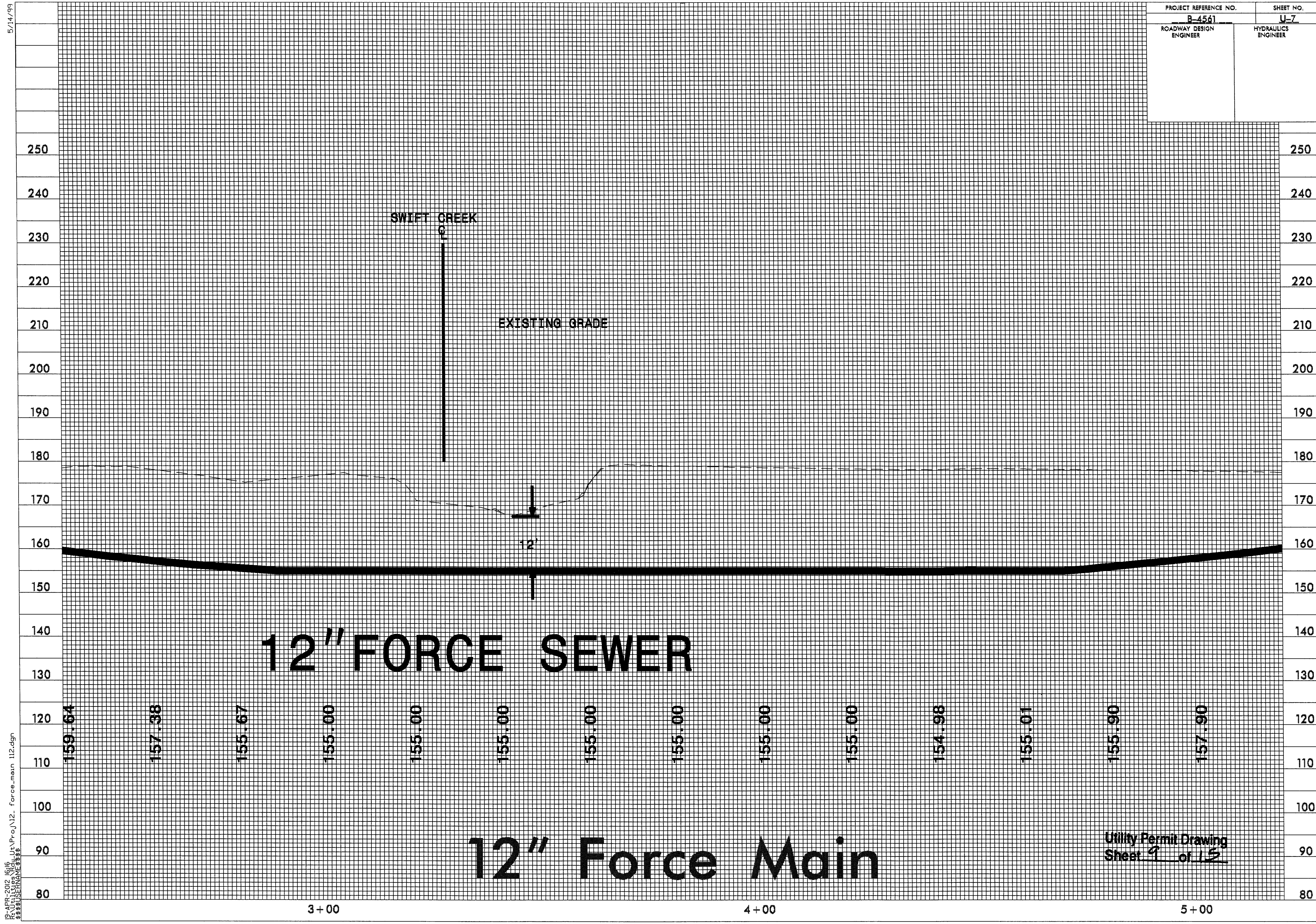

5/14/99
PROJECT REFERENCE NO.
B-4561
SHEET NO.
U-7
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
SWIFT CREEK
℄
EXISTING GRADE
12'
12"FORCE SEWER
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
159.64
157.38
155.67
155.00
155.00
155.00
155.00
155.00
155.00
155.00
154.98
155.01
155.90
157.90
3+00
4+00
5+00
12" Force Main
Utility Permit Drawing
Sheet 9 of 15
19-APR-2012 16:16
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$$$$USERNAME$$$$

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4561	U-8
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90

WETLAND BOUNDARY

WETLAND BOUNDARY

PROP. 1-22.5° DI BEND
STA. 6+36

PROP. 1-22.5° DI BEND
STA. 7+26

HORIZONTAL

STA. 6+27
TO STA. 7+26
12" DI RESTRAINED
JOINT

END 12" TRENCHLESS
INSTALLATION
STA. 6+27

OPEN
CUT

160.12 163.10 166.89 170.61 173.64 175.70 175.66 175.65 175.66 175.66 176.63

12" Force Main

6+00 7+00

Utility Permit Drawing
Sheet 10 of 15

19-APR-2012 16:16
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$$$$USERNAME$$$$

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4561	U-9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

260
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90

PROP. 1-6" - 22 1/2° DI BEND STA. 0+00 HORIZONTAL

PROPOSED GRADE

EXISTING GRADE

PROP. 1-6" - 22 1/2° DI BEND STA. 0+00 HORIZONTAL

STA. 0+00
TO STA. 1+15
6" RESTRAINED
JOINT PIPE

START TRENCHLESS
INSTALLATION
STA. 1+15

OPEN
CUT

187.74
182.87
180.54
178.92
177.65
177.38
176.68
175.18
172.74
169.82
166.08
161.84

6" Force Main

Utility Permit Drawing
Sheet 11 of 15

0
1+00
2+00

19-APR-2012 16:33
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$$$$USERNAME$$$$

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4561	U-10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70

SWIFT CREEK
℄

EXISTING GRADE

11'

6" FORCE SEWER

158.19 156.05 155.06 155.00 155.00 155.00 154.96 154.99 154.99 155.00 155.00 154.99 154.96 154.98

6" Force Main

Utility Permit Drawing
Sheet 12 of 15

19-APR-2012 16:11
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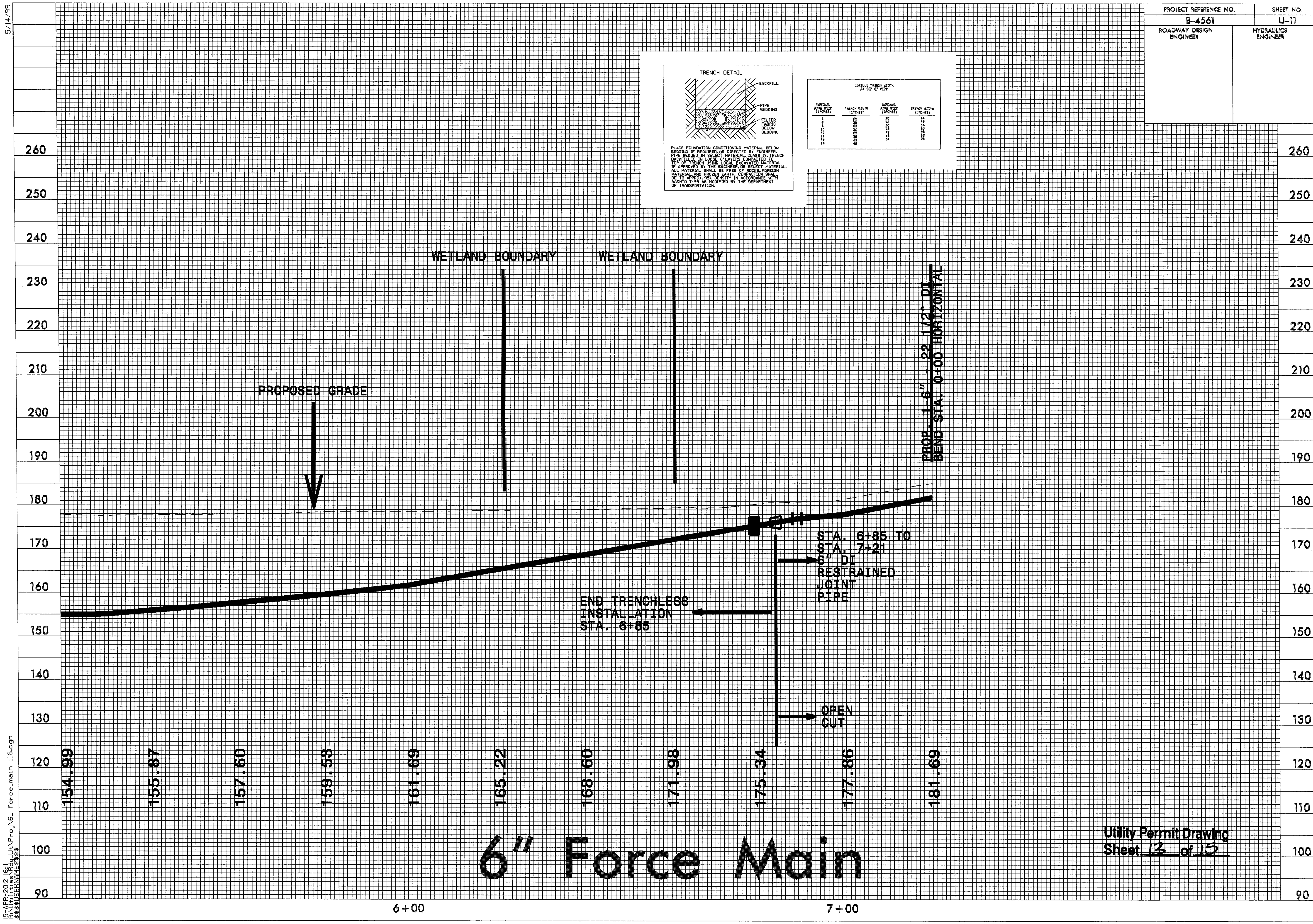
PROJECT REFERENCE NO.	SHEET NO.
B-4561	U-11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



TRENCH DETAIL
BACKFILL
PIPE BEDDING
FILTER FABRIC BELOW BEDDING
WETLAND BOUNDARY
WETLAND BOUNDARY
PROPOSED GRADE
PROP. 1-6" - 22 1/2° DI
BEND STA. 0+00 HORIZONTAL
STA. 6+85 TO
STA. 7+21
6" DI
RESTRAINED
JOINT
PIPE
END TRENCHLESS
INSTALLATION
STA. 6+85
OPEN
CUT
260
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
154.99
155.87
157.60
159.53
161.69
165.22
168.60
171.98
175.34
177.86
181.69
6+00
7+00
5/14/99

6" Force Main

Utility Permit Drawing
Sheet 13 of 15

19-APR-2012 16:11
R:\Utilities\Rdy_Ut\Proj\6_ force_main 116.dgn
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BUFFER IMPACTS SUMMARY

SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
			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)
A1	Power Line	13+02 to 13+36-L-,13+78 to 14+11				1012.0							
A2	Power Line	12+81 to 13+02 -L-, 14+11 to 14+31					612.0						
TOTALS:						1012.0	612.0						

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

JOHNSTON COUNTY
PROJECT: B-4561
Revised 07/09/2012

Rev. May 2006

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
3	11+92 to 17+93	O/H Power line					0.12					
4	16+95 to 16+98	12" Force Main			<0.01							
TOTALS:					<.0.01		0.12					

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

JOHNSTON COUNTY
WBS - 33772.1.1 (B-4561)

SHEET 15 OF 15 4/19/2012

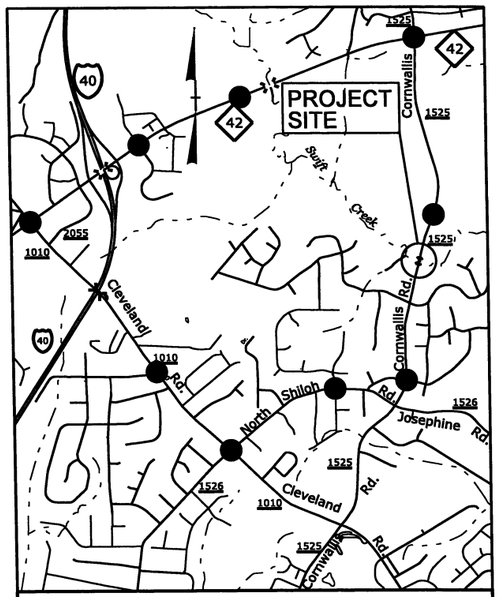
ATN Revised 3/31/05

09/08/99

TIP PROJECT: B-4561

CONTRACT:

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



ROW PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

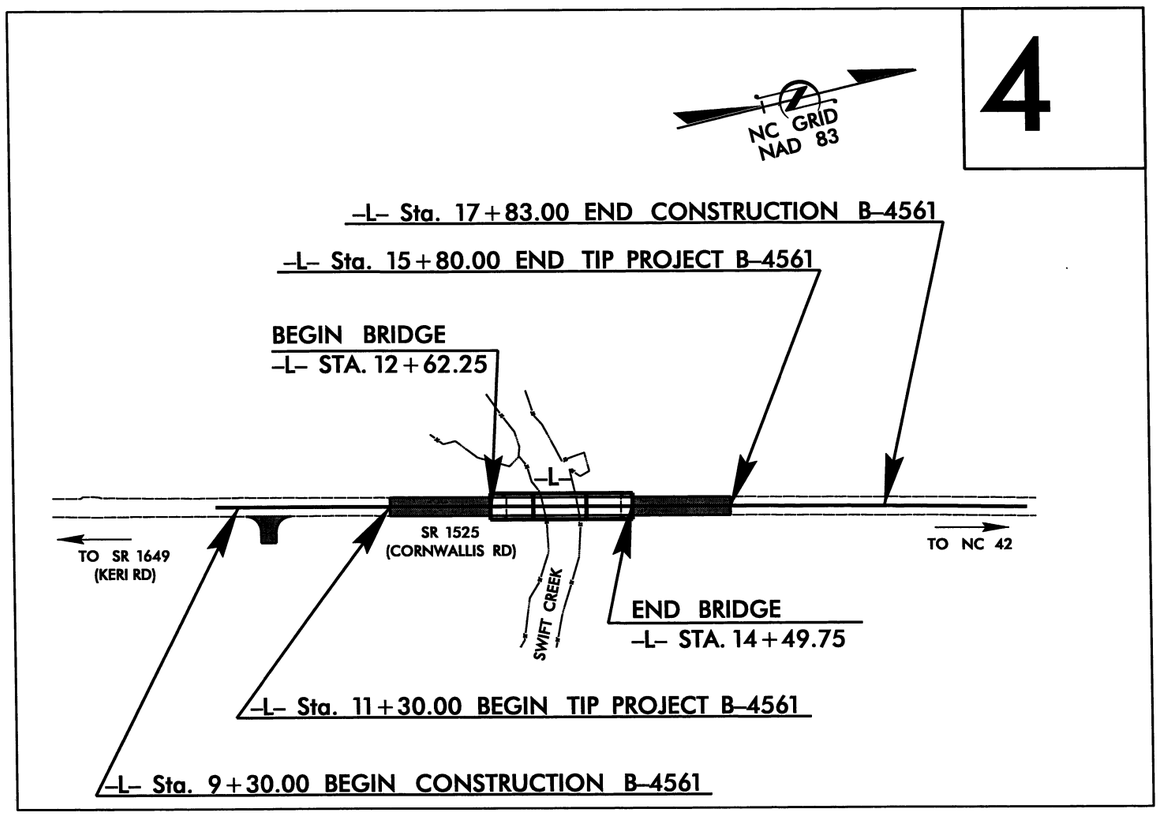
JOHNSTON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4561	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33772.1.1	BRZ-1525(5)	P.E.
33772.2.1	BRZ-1525(5)	R.W.

LOCATION: ***BRIDGE NO. 147 OVER SWIFT CREEK ON SR 1525***

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



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

PLANS: 50 25 0 50 100
PROFILE (HORIZONTAL): 50 25 0 50 100
PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2013 = 9,400
ADT 2033 = 19,600
DHV = 10 %
D = 60 %
T = 3 % *
V = 50 MPH
* TTST =1 DUAL =2
FUNC CLASS =
LOCAL RURAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4561 = 0.049 MI

LENGTH OF STRUCTURES TIP PROJECT B-4561 = 0.036 MI

TOTAL LENGTH OF TIP PROJECT B-4561 = 0.085 MI

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

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: APRIL 26, 2012

LETTING DATE: APRIL 16, 2013

BRENDA MOORE, PE
PROJECT ENGINEER

TATIA L. WHITE, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

SIGNATURE: *P.E.*

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION

25-APR-2012 11:27
R:\Roadway\Proj\B4561_Rdy_tsh.dgn
$$$$USERNAME$$$$

04/16/11

PROJECT REFERENCE NO.	SHEET NO.
B-4561	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 — IP
- Property Corner
- Property Monument — CM
- Parcel/Sequence Number — 23
- 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
- Known Soil Contamination: Area or Site
- Potential Soil Contamination: Area or Site

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign
- Well
- 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 — FWF
- False Sump

RAILROADS:

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

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line
- Proposed Right of Way Line with Iron Pin and Cap Marker
- Proposed Right of Way Line with Concrete or Granite R/W Marker
- Proposed Control of Access Line with Concrete C/A Marker
- Existing Control of Access
- Proposed Control of Access
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage / Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- 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
- 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 — 3
- 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:

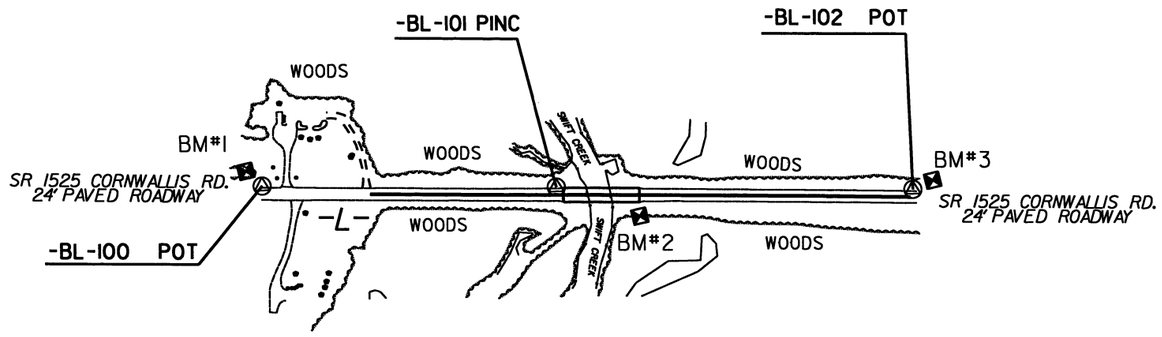
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line — ?UTL?
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole (S.U.E.*)
- Abandoned According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

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
B-4561	1C
Location and Surveys	

SURVEY CONTROL SHEET B-4561

NC GRID NAD 83



BENCHMARK DATA

```
**************************************
1134       ELEVATION = 215.76
N 672953      E 2137853
L STATION 5+00.00
S 55°48'42.75" W  DIST     43.30
BM#1 RR SPIKE IN BASE OF 10" PINE
**************************************

**************************************
1084       ELEVATION = 180.46
N 673692      E 2138119
L STATION 12+49.00 57 RIGHT
BM#2 RR SPIKE IN BASE OF 20" OAK
**************************************

**************************************
1133       ELEVATION = 184.84
N 674273      E 2138183
L STATION 5+00.00
N 12°47'40.74" E  DIST   1328.78
BM#3 RR SPIKE IN BASE OF 18" PINE
**************************************
```

BASELINE DATA

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
100	-BL- 100	672976.8410	2137889.0630	205.57	OUTSIDE PROJECT LIMITS	
101	-BL- 101	673545.0260	2138024.9380	186.72	12+69.51	15.55 LT
102	-BL- 102	674229.9300	2138191.6820	186.69	OUTSIDE PROJECT LIMITS	

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B-4561 GPS-2" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 675150.675 (FT) EASTING: 2138568.214 (FT) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99988675 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B-4211 GPS-2" TO -L- STATION 19+69.20 IS S 21°19'57.5" W 99.72 FT ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

NOTES:

1. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT: HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/*

   THE FILES TO BE FOUND ARE AS FOLLOWS: B4561_LS_CONTROL_110707.TXT

   SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

△ *INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.*

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING USER SERVICE (OPUS)

25-APR-2012 11:27
N:\Location&Surveys\B4561_ls_lc.dgn
$$$$USERNAME$$$$

6/2/99

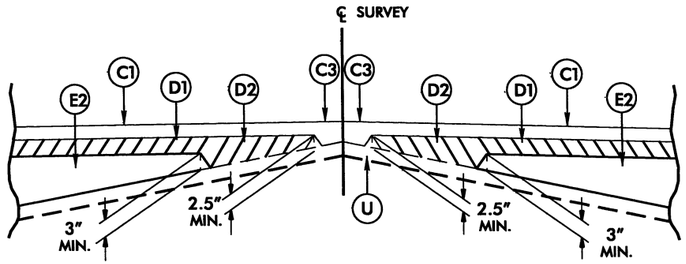
FINAL PAVEMENT SCHEDULE

C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
C4	PROP. APPROX. 1¼" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 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	WEDGING

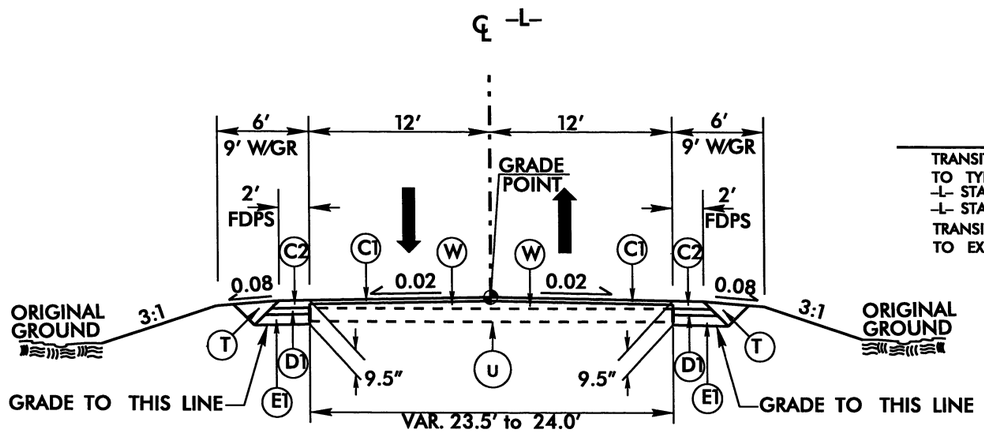
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

PROJECT REFERENCE NO.	SHEET NO.
B-4561	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



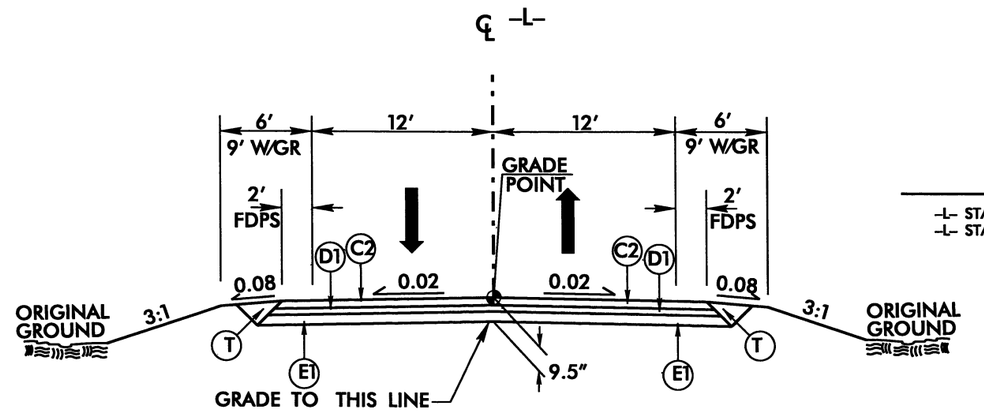
Detail Showing Method of Wedging



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1
AT THE FOLLOWING LOCATIONS:

TRANSITION FROM EXISTING AT -L- STA. 11+30.00
TO TYPICAL SECTION NO. 1 AT -L- STA. 11+80.00
-L- STA. 11+80.00 TO -L- STA. 12+50.00
-L- STA. 14+80.00 TO 15+30.00
TRANSITION FROM TYPICAL SECTION NO. 1 AT -L- STA. 15+30.00
TO EXISTING AT -L- STA. 15+80.00



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2
AT THE FOLLOWING LOCATIONS:

-L- STA. 12+50.00 TO -L- STA. 12+62.25 (BEGIN BRIDGE)
-L- STA. 14+49.75 (END BRIDGE) TO 14+80.00

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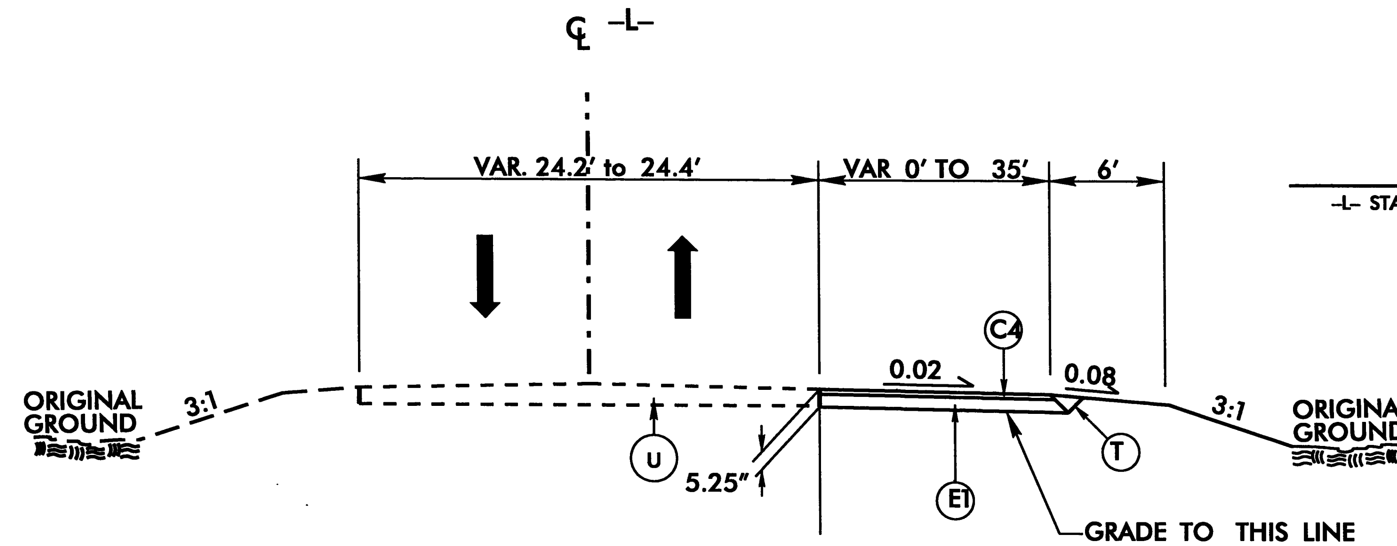
6/2/99

FINAL PAVEMENT SCHEDULE	
C1	1½" TYPE S9.5B
C2	3" TYPE S9.5B
C3	VAR. DEPTH TYPE S9.5B
C4	1¼" TYPE SF9.5A
D1	2½" TYPE I19.0B
D2	VAR. DEPTH TYPE I19.0B
E1	4" TYPE B25.0B
E2	VAR. DEPTH TYPE B25.0B
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING

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

PROJECT REFERENCE NO.	SHEET NO.
B-4561	2-A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

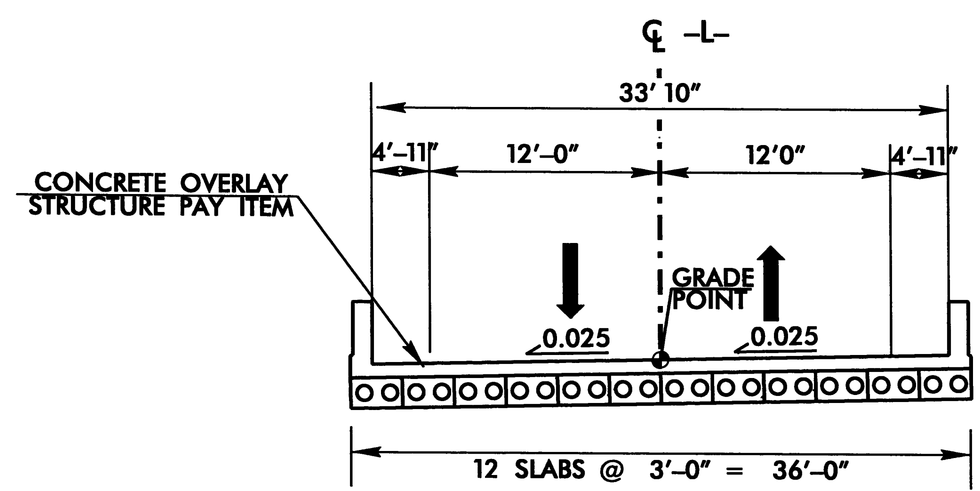
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3
AT THE FOLLOWING LOCATIONS:

-L- STA. 9+40.00 TO 10+00.00



TYPICAL SECTION ON STRUCTURE

USE TYPICAL SECTION ON STRUCTURE
AT THE FOLLOWING LOCATIONS:

-L- STA. 12+62.25 (BEGIN BRIDGE) TO -L- STA. 14+49.75 (END BRIDGE)

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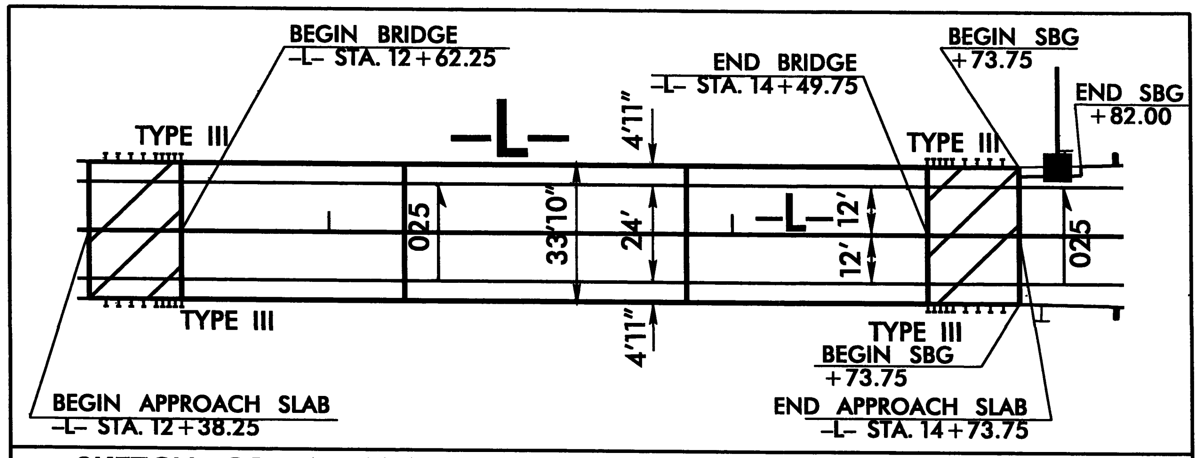
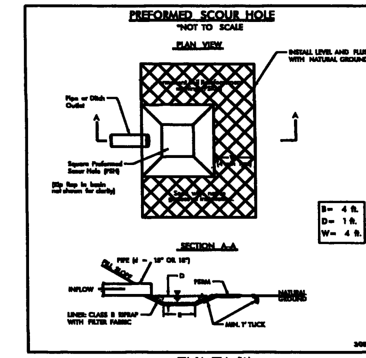
PROJECT REFERENCE NO.	SHEET NO.
B-4561	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



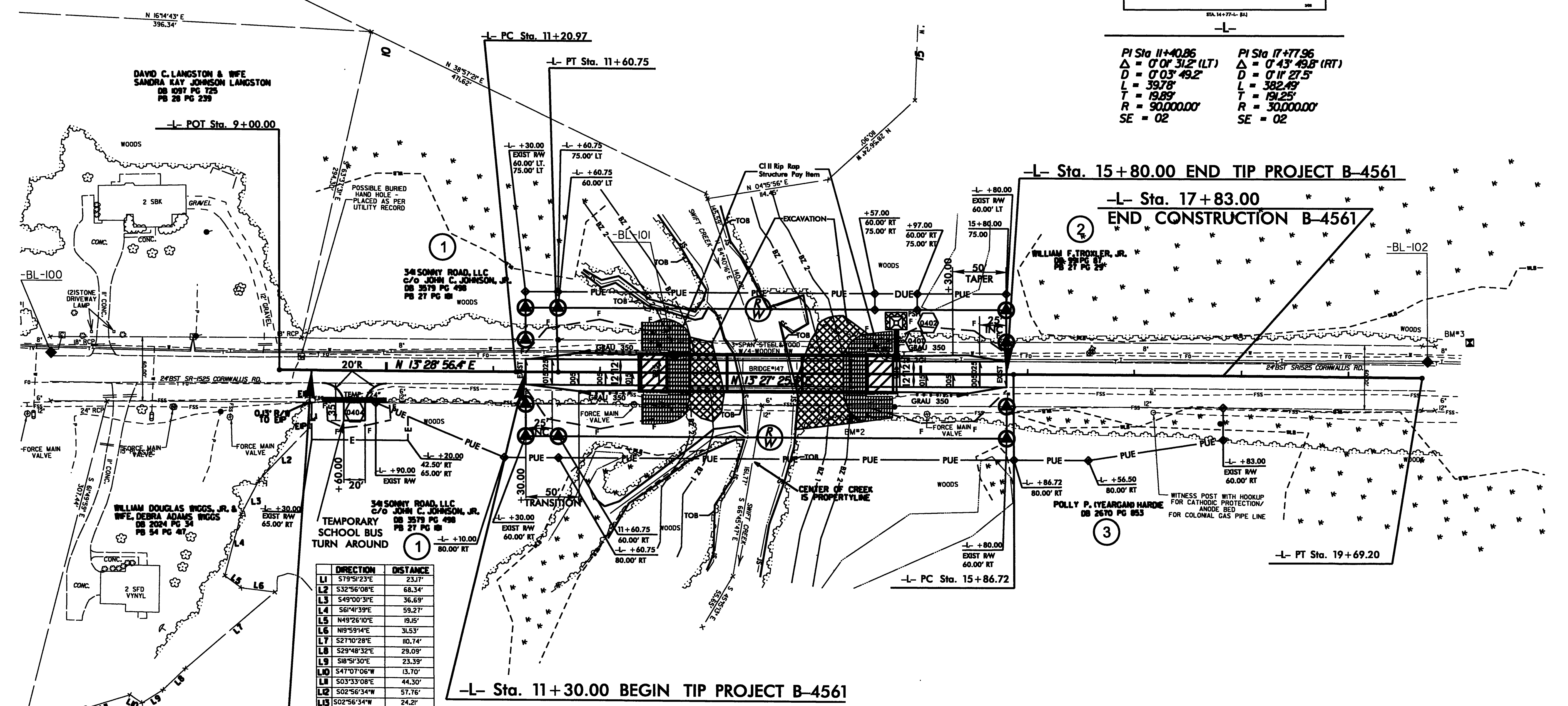
SKETCH OF PAVEMENT IN RELATION TO PROPOSED BRIDGE
NOT TO SCALE

NC GRID NAD 83



-L-

PI Sta 11+40.86	PI Sta 17+77.96
Δ = 0°01' 31.2" (LT)	Δ = 0°43' 49.8" (RT)
D = 0°03' 49.2"	D = 0°11' 27.5"
L = 39.78'	L = 382.49'
T = 19.89'	T = 191.25'
R = 90,000.00'	R = 30,000.00'
SE = .02	SE = .02



	DIRECTION	DISTANCE
L1	S79°51'23"E	23.17'
L2	S32°56'08"E	68.34'
L3	S49°00'31"E	36.69'
L4	S61°41'39"E	59.27'
L5	N49°26'10"E	19.15'
L6	N19°59'14"E	31.53'
L7	S27°10'28"E	110.74'
L8	S29°48'32"E	29.09'
L9	S18°51'30"E	23.39'
L10	S47°07'06"W	13.70'
L11	S03°33'08"E	44.30'
L12	S02°56'34"W	57.76'
L13	S02°56'34"W	24.21'
L14	S31°11'47"W	89.06'

-L- Sta. 11+30.00 BEGIN TIP PROJECT B-4561

-L- Sta. 9+30.00 BEGIN CONSTRUCTION B-4561

NOTES:

1. SEE SHEET 5 FOR -L- PROFILE.
2. SEE SHEETS S-1 THROUGH S-?? FOR STRUCTURE PLANS.

REVISIONS

8/17/99

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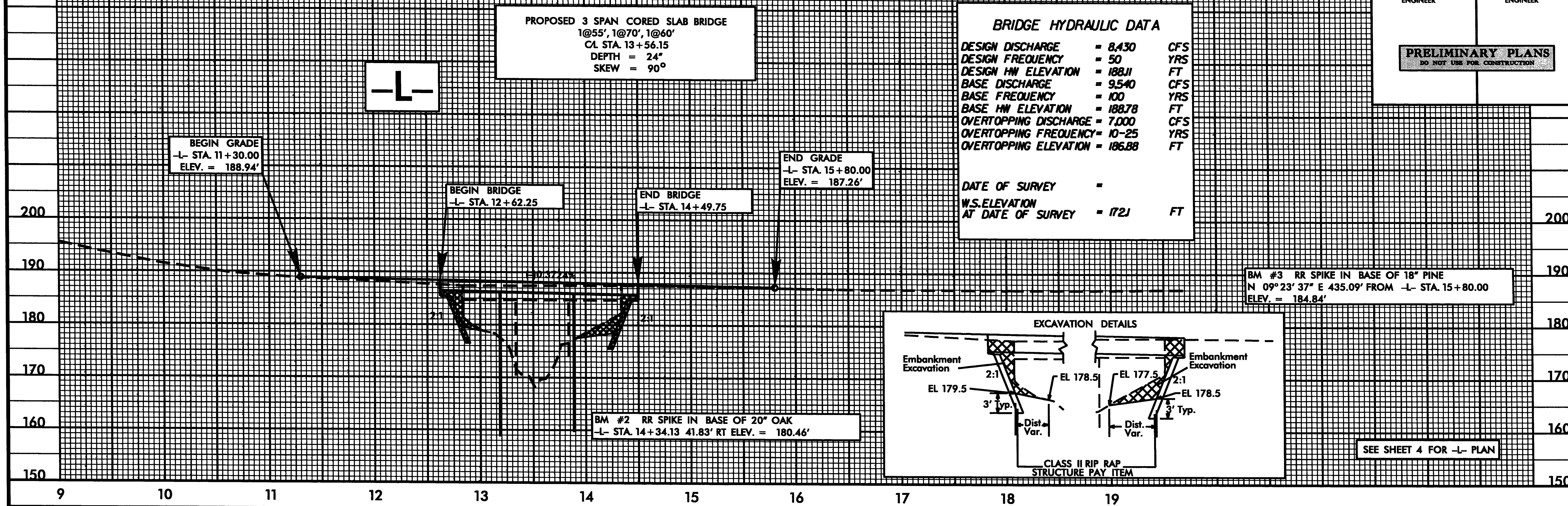
PROJECT REFERENCE NO.	SHEET NO.
B-4561	5

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 8,430	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 188.11	FT
BASE DISCHARGE	= 9,540	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 188.78	FT
OVERTOPPING DISCHARGE	= 7,000	CFS
OVERTOPPING FREQUENCY	= 10-25	YRS
OVERTOPPING ELEVATION	= 186.88	FT
DATE OF SURVEY	=	
W.S. ELEVATION AT DATE OF SURVEY	= 172.1	FT

5/28/99

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8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4561	X-1

0.013 0.027 3:1

188.81

11+30.00

BEGIN PROJECT -L- 11+30.00

189.25

11+00.00

190.13

10+50.00

191.48

10+00.00

0.020 3:1

192.23

9+80.00

0.020 3:1

193.06

9+60.00

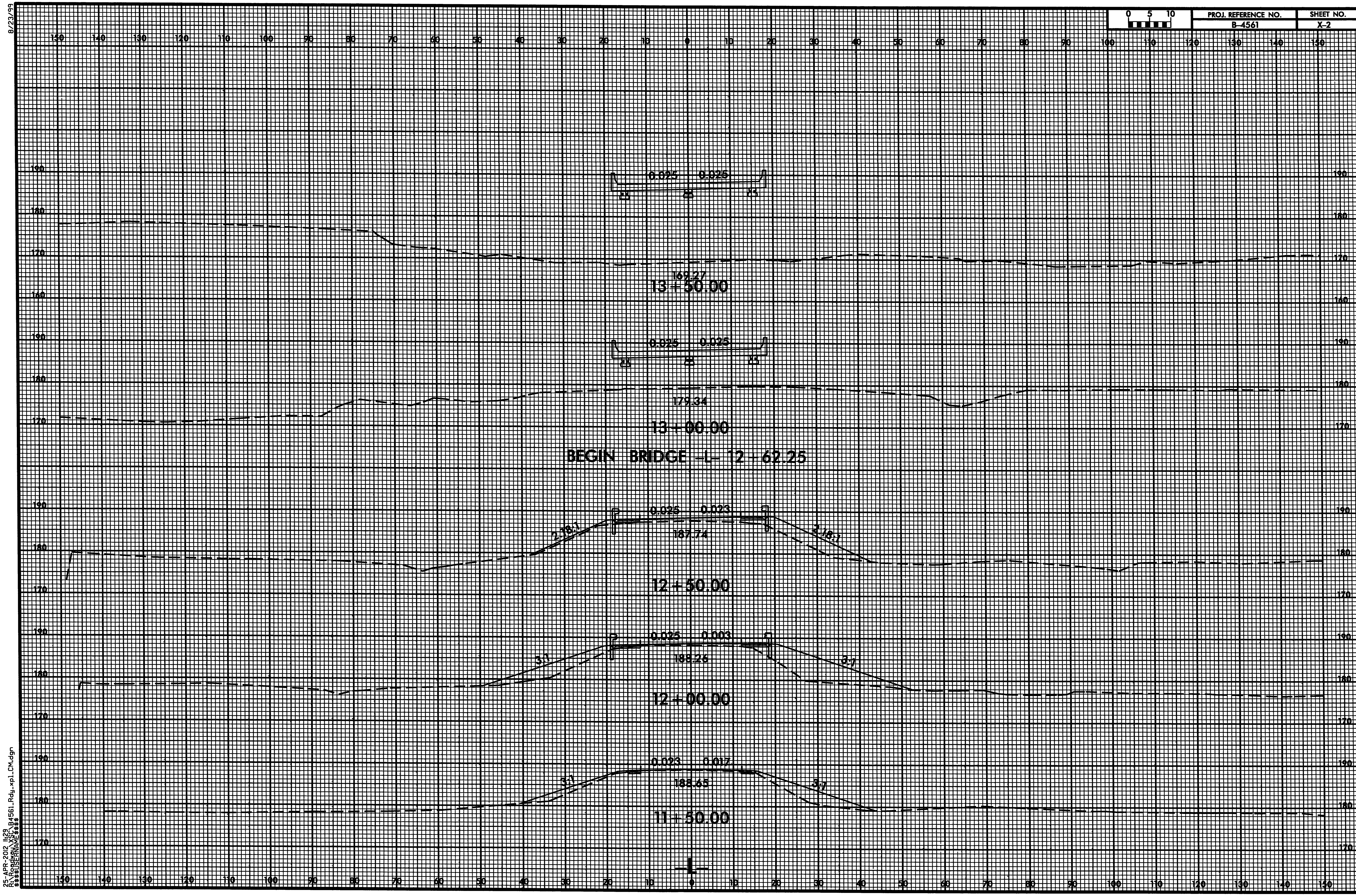
193.39

9+50.00

BEGIN CONSTRUCTION -L- 9+30.00

-L-

PROJ. REFERENCE NO.	SHEET NO.
B-4561	X-2



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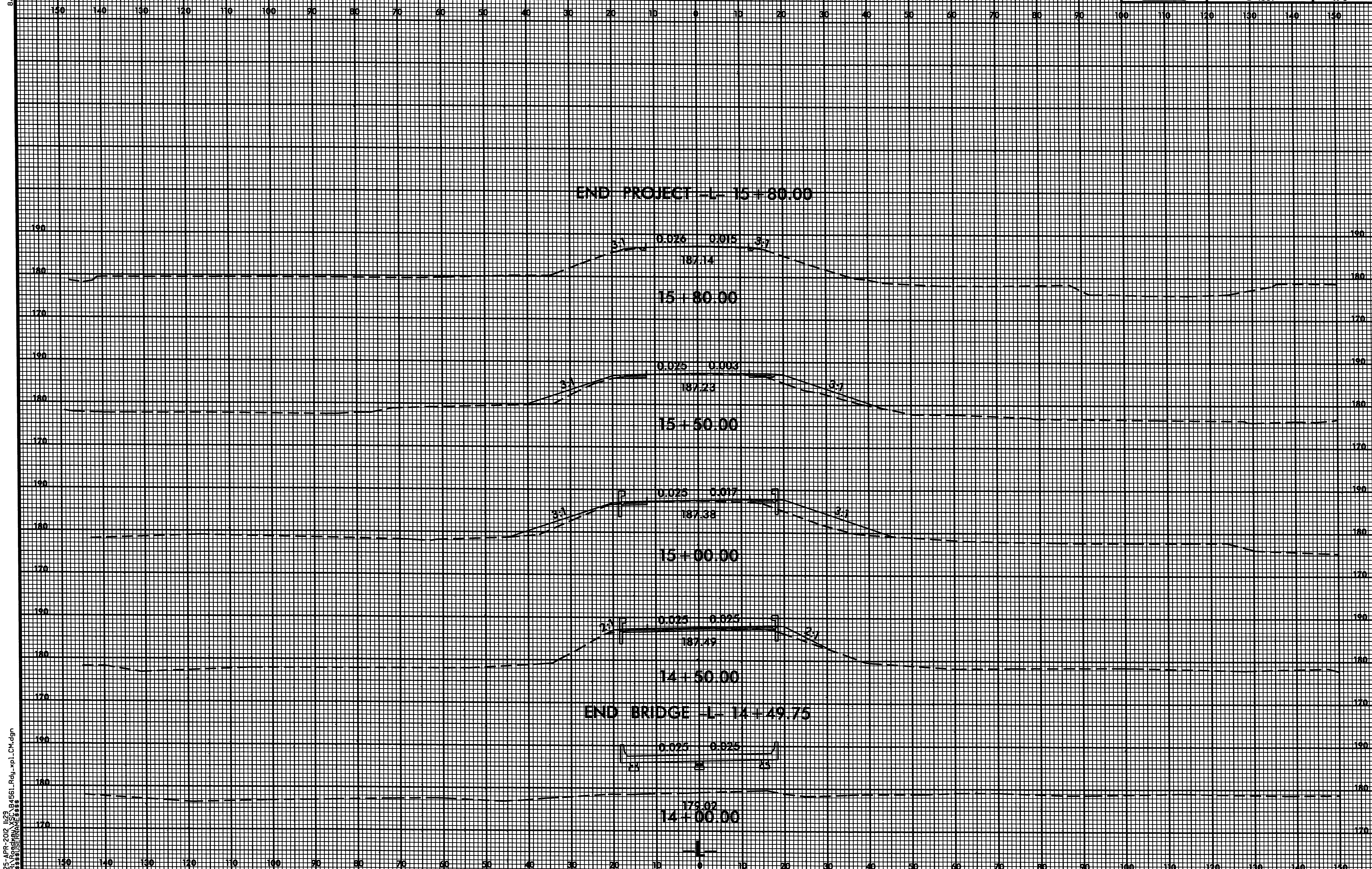
PROJ. REFERENCE NO.	SHEET NO.
B-4561	X-3



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$$$$USERNAME$$$$

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4561	X-4

186.85
18+00.00
END CONSTRUCTION -L- 17+83.00

186.88
17+50.00

186.89
17+00.00

186.94
16+50.00

187.07
16+00.00

-L-

25-APR-2012 11:29
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