



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE  
GOVERNOR

EUGENE A. CONTI, JR.  
SECRETARY

April 15, 2010

U. S. Army Corps of Engineers  
151 Patton Avenue, Room 208  
Asheville, NC 28801-5006

ATTN: Ms. Sarah Hair  
NCDOT Coordinator

Subject: **Application for Section 404 Nationwide Permits 13, 23, 33 and Section 401 Water Quality Certification** for the proposed replacement of Bridge No. 127 over Pinch Gut Creek on SR 1880 (St. James Church Road) in Catawba County, Federal Aid Project No. BRZ-1880(1); Division 12; TIP No. B-4062, \$240.00 debit WBS 33426.1.1

Dear Madam:

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 127 over Pinch Gut Creek on SR 1880 (St. James Church Road) with a culvert. An offsite detour will be used to control traffic during construction. There will be 54 linear feet of permanent impact to Pinch Gut Creek due to installation of a three barrel (12 ft. x 11 ft.) box culvert and 89 linear feet of permanent impact due to bank stabilization. An additional 0.01 acre of temporary impact will occur due to dewatering of Pinch Gut Creek during installation of the box culvert.

Please see enclosed copies of the Pre-Construction Notification (PCN), NCEEP acceptance letter, jurisdictional determination form, stormwater management plan, permit drawings and design plans for the above mentioned project. The Categorical Exclusion (CE) was completed in March 2009. Copies were distributed shortly thereafter. Additional copies are available upon request.

This project calls for a letting date of January 18, 2011 and a review date of November 30, 2010; however, the let date may advance as additional funding becomes available.

A copy of this permit application will be posted on the NCDOT Website at:  
<http://www.ncdot.org/doh/preconstruct/pe/>. If you have any questions or need additional information, please call Jason Dilday at (919) 431-6693.

Sincerely,

  
for

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

W/attachment

Mr. Brian Wrenn, NCDWQ (5 Copies)  
Ms. Marella Buncick, USFWS  
Ms. Marla Chambers, NCWRC

W/o attachment (see website for attachments)

Dr. David Chang, P.E., Hydraulics  
Mr. Greg Perfetti, P.E., Structure Design  
Mr. Victor Barbour, P.E., Project Services Unit  
Mr. Mark Staley, Roadside Environmental  
Mr. M.L. Holder, P.E. (Div. 12), Division Engineer  
Ms. Trish Simon (Div. 12), DEO  
Mr. Jay Bennett, P.E., Roadway Design  
Mr. Majed Alghandour, P. E., Programming and TIP  
Mr. Art McMillan, P.E., Highway Design  
Mr. Scott McLendon, USACE, Wilmington  
Ms. Beth Harmon, EEP  
Mr. Phillip Ayscue, NCDOT External Audit Branch  
Ms. Christie Huff, P.E., 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:	<input checked="" type="checkbox"/> Section 404 Permit	<input type="checkbox"/> Section 10 Permit
1b. Specify Nationwide Permit (NWP) number: 13, 23, 33 or General Permit (GP) number:		
1c. Has the NWP or GP number been verified by the Corps?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
1d. Type(s) of approval sought from the DWQ (check all that apply):		
<input checked="" type="checkbox"/> 401 Water Quality Certification – Regular <span style="margin-left: 100px;"><input type="checkbox"/> Non-404 Jurisdictional General Permit</span> <input type="checkbox"/> 401 Water Quality Certification – Express <span style="margin-left: 100px;"><input type="checkbox"/> Riparian Buffer Authorization</span>		
1e. Is this notification solely for the record because written approval is not required?	For the record only for DWQ 401 Certification: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	For the record only for Corps Permit: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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.	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
1g. Is the project located in any of NC's twenty coastal counties. If yes, answer 1h below.	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
1h. Is the project located within a NC DCM Area of Environmental Concern (AEC)?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

#### 2. Project Information

2a. Name of project:	Replacement of Bridge 127 over Pinch Gut Creek on SR 1880.
2b. County:	Catawba
2c. Nearest municipality / town:	Maiden
2d. Subdivision name:	<i>not applicable</i>
2e. NCDOT only, T.I.P. or state project no:	B-4062

#### 3. Owner Information

3a. Name(s) on Recorded Deed:	North Carolina Department of Transportation
3b. Deed Book and Page No.	<i>not applicable</i>
3c. Responsible Party (for LLC if applicable):	<i>not applicable</i>
3d. Street address:	1598 Mail Service Center
3e. City, state, zip:	Raleigh, NC 27699-1598
3f. Telephone no.:	(919) 431-6693
3g. Fax no.:	(919) 431-2002
3h. Email address:	jldilday@ncdot.gov

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

<b>B. Project Information and Prior Project History</b>	
<b>1. Property Identification</b>	
1a. Property identification no. (tax PIN or parcel ID):	<i>not applicable</i>
1b. Site coordinates (in decimal degrees):	Latitude: 35.61450 (DD.DDDDDD) Longitude: - 81.18924 (-DD.DDDDDD)
1c. Property size:	1.2 acres
<b>2. Surface Waters</b>	
2a. Name of nearest body of water (stream, river, etc.) to proposed project:	Pinch Gut Creek
2b. Water Quality Classification of nearest receiving water:	C
2c. River basin:	Catawba
<b>3. Project Description</b>	
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: Agriculture, forested communities and minor residential development.	
3b. List the total estimated acreage of all existing wetlands on the property: 0.0	
3c. List the total estimated linear feet of all existing streams (intermittent and perennial) on the property: 250 feet perennial (Pinch Gut Creek)	
3d. Explain the purpose of the proposed project: To replace a structurally deficient and functionally obsolete bridge (Sufficiency rating of 20 out of 100 in 2005).	
3e. Describe the overall project in detail, including the type of equipment to be used: The project involves replacing a 36-foot long bridge with a 3-barrel (12' x 11') box culvert. Standard road building equipment, such as trucks, dozers, and cranes will be used.	
<b>4. Jurisdictional Determinations</b>	
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: No JD was needed. Pinch Gut Creek is a perennial stream.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown
4b. If the Corps made the jurisdictional determination, what type of determination was made?	<input type="checkbox"/> Preliminary <input type="checkbox"/> Final
4c. If yes, who delineated the jurisdictional areas? Name (if known):	Agency/Consultant Company: Other:
4d. If yes, list the dates of the Corps jurisdictional determinations or State determinations and attach documentation.	
<b>5. Project History</b>	
5a. Have permits or certifications been requested or obtained for this project (including all prior phases) in the past?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown
5b. If yes, explain in detail according to "help file" instructions.	
<b>6. Future Project Plans</b>	
6a. Is this a phased project?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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 <input type="checkbox"/> P <input type="checkbox"/> T			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ	
Site 2 <input type="checkbox"/> P <input type="checkbox"/> T			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ	
Site 3 <input type="checkbox"/> P <input type="checkbox"/> T			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ	
Site 4 <input type="checkbox"/> P <input type="checkbox"/> T			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ	
Site 5 <input type="checkbox"/> P <input type="checkbox"/> T			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ	
Site 6 <input type="checkbox"/> P <input type="checkbox"/> T			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ	
<b>2g. Total wetland impacts</b>					X Permanent X Temporary

2h. Comments:

#### 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 <input checked="" type="checkbox"/> P <input type="checkbox"/> T	Box Culvert	Pinch Gut Creek	<input checked="" type="checkbox"/> PER <input type="checkbox"/> INT	<input checked="" type="checkbox"/> Corps <input type="checkbox"/> DWQ	20	54
Site 2 <input checked="" type="checkbox"/> P <input type="checkbox"/> T	Bank Stabilization at Culvert	Pinch Gut Creek	<input checked="" type="checkbox"/> PER <input type="checkbox"/> INT	<input checked="" type="checkbox"/> Corps <input type="checkbox"/> DWQ	20	89
Site 3 <input type="checkbox"/> P <input checked="" type="checkbox"/> T	Dewatering	Pinch Gut Creek	<input checked="" type="checkbox"/> PER <input type="checkbox"/> INT	<input checked="" type="checkbox"/> Corps <input type="checkbox"/> DWQ	20	30 (0.01 acre)
Site 4 <input type="checkbox"/> P <input type="checkbox"/> T			<input type="checkbox"/> PER <input type="checkbox"/> INT	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ		
Site 5 <input type="checkbox"/> P <input type="checkbox"/> T			<input type="checkbox"/> PER <input type="checkbox"/> INT	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ		
Site 6 <input type="checkbox"/> P <input type="checkbox"/> T			<input type="checkbox"/> PER <input type="checkbox"/> INT	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ		
<b>3h. Total stream and tributary impacts</b>						143 Perm 30 Temp

3i. Comments: Temporary impacts to Pinch Gut Creek due to installation of culvert equals 0.01 acres.

**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 <input type="checkbox"/> P <input type="checkbox"/> T				
O2 <input type="checkbox"/> P <input type="checkbox"/> T				
O3 <input type="checkbox"/> P <input type="checkbox"/> T				
O4 <input type="checkbox"/> P <input type="checkbox"/> T				
<b>4f. Total open water impacts</b>				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								
<b>5f. Total</b>								

5g. Comments:

5h. Is a dam high hazard permit required?	<input type="checkbox"/> Yes <input type="checkbox"/> 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?		<input type="checkbox"/> Neuse <input type="checkbox"/> Tar-Pamlico <input type="checkbox"/> Other: <input type="checkbox"/> Catawba <input type="checkbox"/> Randleman			
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 <input type="checkbox"/> P <input type="checkbox"/> T			<input type="checkbox"/> Yes <input type="checkbox"/> No		
B2 <input type="checkbox"/> P <input type="checkbox"/> T			<input type="checkbox"/> Yes <input type="checkbox"/> No		
B3 <input type="checkbox"/> P <input type="checkbox"/> T			<input type="checkbox"/> Yes <input type="checkbox"/> No		
<b>6h. Total buffer impacts</b>					
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.

Replacing a structurally deficient bridge with a structure that is safer for commuters. Placement of box culvert will reduce cost of maintenance. Use of a low flow channel through a single culvert barrel to maintain channel continuity with additional capacity added through floodplain culvert barrel sections. An off-site detour will be used during construction. NCDOT's "Best Management Practices for Protection of Surface Waters" will be adhered to during all phases of construction.

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

Rip rap for bank stabilization will be kept at a minimum and will only be used to protect the culvert.

**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:

2b. If yes, mitigation is required by (check all that apply):

DWQ       Corps

2c. If yes, which mitigation 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:

54 linear feet (due to culvert installation)

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: Mitigation is for the placement of the box culvert replacing the current bridge.

**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	
<b>6f. Total buffer mitigation required:</b>				

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:

<b>E. Stormwater Management and Diffuse Flow Plan (required by DWQ)</b>	
<b>1. Diffuse Flow Plan</b>	
1a. Does the project include or is it adjacent to protected riparian buffers identified within one of the NC Riparian Buffer Protection Rules?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
1b. If yes, then is a diffuse flow plan included? If no, explain why. Comments:	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>2. Stormwater Management Plan</b>	
2a. What is the overall percent imperviousness of this project?	N/A
2b. Does this project require a Stormwater Management Plan?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> 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?	<input type="checkbox"/> Certified Local Government <input type="checkbox"/> DWQ Stormwater Program <input type="checkbox"/> DWQ 401 Unit
<b>3. Certified Local Government Stormwater Review</b>	
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):	<input type="checkbox"/> Phase II <input type="checkbox"/> NSW <input type="checkbox"/> USMP <input type="checkbox"/> Water Supply Watershed <input type="checkbox"/> Other:
3c. Has the approved Stormwater Management Plan with proof of approval been attached?	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>4. DWQ Stormwater Program Review</b>	
4a. Which of the following state-implemented stormwater management programs apply (check all that apply):	<input type="checkbox"/> Coastal counties <input type="checkbox"/> HQW <input type="checkbox"/> ORW <input type="checkbox"/> Session Law 2006-246 <input type="checkbox"/> Other:
4b. Has the approved Stormwater Management Plan with proof of approval been attached?	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>5. DWQ 401 Unit Stormwater Review</b>	
5a. Does the Stormwater Management Plan meet the appropriate requirements?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5b. Have all of the 401 Unit submittal requirements been met?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> 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?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> 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)?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> 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:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> 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)?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
2b. Is this an after-the-fact permit application?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> 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?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> 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
--

<b>5. Endangered Species and Designated Critical Habitat (Corps Requirement)</b>		
5a. Will this project occur in or near an area with federally protected species or habitat?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
5b. Have you checked with the USFWS concerning Endangered Species Act impacts?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
5c. If yes, indicate the USFWS Field Office you have contacted.	<input type="checkbox"/> Raleigh <input type="checkbox"/> Asheville	
5d. What data sources did you use to determine whether your site would impact Endangered Species or Designated Critical Habitat? USFWS web page of T/E species for McDowell County and the NHP database of element occurrences.		
<b>6. Essential Fish Habitat (Corps Requirement)</b>		
6a. Will this project occur in or near an area designated as essential fish habitat?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
6b. What data sources did you use to determine whether your site would impact Essential Fish Habitat? NMFS County Index		
<b>7. Historic or Prehistoric Cultural Resources (Corps Requirement)</b>		
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)?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
7b. What data sources did you use to determine whether your site would impact historic or archeological resources? NEPA Documentation		
<b>8. Flood Zone Designation (Corps Requirement)</b>		
8a. Will this project occur in a FEMA-designated 100-year floodplain?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
8b. If yes, explain how project meets FEMA requirements: NCDOT Hydraulics coordination with FEMA		
8c. What source(s) did you use to make the floodplain determination? FEMA Maps		
<u>Dr. Gregory J. Thorpe, Ph D</u> Applicant/Agent's Printed Name	 _____ Applicant/Agent's Signature (Agent's signature is valid only if an authorization letter from the applicant is provided.)	<u>4.15.10</u> Date



March 23, 2010

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

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

**B-4062, Replace Bridge Number 127 over Pinch Gut Creek on SR 1880, Catawba County**

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory stream mitigation for the subject project. Based on the information supplied by you on March 17, 2010, the impacts are located in CU 03050102 of the Catawba River Basin in the Central Piedmont (CP) Eco-Region, and are as follows:

Catawba 03050102 CP	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non- Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	0	0	54	0	0	0	0	0
Mitigation Units (Credits-up to 2:1)	0	0	108	0	0	0	0	0

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

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

Sincerely,

William D. Gilmore, P.E.  
EEP Director

cc: Ms. Liz Hair, USACE – Asheville Regulatory Field Office  
Mr. Brian Wrenn, Division of Water Quality, Wetlands/401 Unit  
File: B-4062

*Restoring... Enhancing... Protecting Our State*



**APPROVED JURISDICTIONAL DETERMINATION FORM**  
**U.S. Army Corps of Engineers**

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

**SECTION I: BACKGROUND INFORMATION**

**A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):**

**B. DISTRICT OFFICE, FILE NAME, AND NUMBER: B-4062 (Replacement of Bridge 127 over Pinch Gut Creek on SR 1880)**

**C. PROJECT LOCATION AND BACKGROUND INFORMATION:**

State: NC County/parish/borough: Catawba City: Maiden  
 Center coordinates of site (lat/long in degree decimal format): Lat. 35.61450° N, Long. 81.18924° W.  
 Universal Transverse Mercator:

Name of nearest waterbody: Pinch Gut Creek

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: South Fork Catawba River

Name of watershed or Hydrologic Unit Code (HUC): 03050102

- Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.  
 Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

**D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):**

- Office (Desk) Determination. Date:  
 Field Determination. Date(s):

**SECTION II: SUMMARY OF FINDINGS**

**A. RHA SECTION 10 DETERMINATION OF JURISDICTION.**

There **Are no** "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

- Waters subject to the ebb and flow of the tide.  
 Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.  
 Explain:

**B. CWA SECTION 404 DETERMINATION OF JURISDICTION.**

There **Are** "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

**1. Waters of the U.S.**

**a. Indicate presence of waters of U.S. in review area (check all that apply):<sup>1</sup>**

- TNWs, including territorial seas  
 Wetlands adjacent to TNWs  
 Relatively permanent waters<sup>2</sup> (RPWs) that flow directly or indirectly into TNWs  
 Non-RPWs that flow directly or indirectly into TNWs  
 Wetlands directly abutting RPWs that flow directly or indirectly into TNWs  
 Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs  
 Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs  
 Impoundments of jurisdictional waters  
 Isolated (interstate or intrastate) waters, including isolated wetlands

**b. Identify (estimate) size of waters of the U.S. in the review area:**

Non-wetland waters: 500 linear feet: 20 width (ft) and/or acres.  
 Wetlands: acres.

**c. Limits (boundaries) of jurisdiction based on: Established by OHWM.**

Elevation of established OHWM (if known):

**2. Non-regulated waters/wetlands (check if applicable):<sup>3</sup>**

- Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.  
 Explain:

<sup>1</sup> Boxes checked below shall be supported by completing the appropriate sections in Section III below.

<sup>2</sup> For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

<sup>3</sup> Supporting documentation is presented in Section III.F

**SECTION III: CWA ANALYSIS**

**A. TNWs AND WETLANDS ADJACENT TO TNWs**

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

**1. TNW**

Identify TNW:

Summarize rationale supporting determination:

**2. Wetland adjacent to TNW**

Summarize rationale supporting conclusion that wetland is "adjacent":

**B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):**

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody<sup>4</sup> is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

**1. Characteristics of non-TNWs that flow directly or indirectly into TNW**

**(i) General Area Conditions:**

Watershed size: **Pick List**

Drainage area: **Pick List**

Average annual rainfall: inches

Average annual snowfall: inches

**(ii) Physical Characteristics:**

**(a) Relationship with TNW:**

Tributary flows directly into TNW.

Tributary flows through **Pick List** tributaries before entering TNW.

Project waters are **Pick List** river miles from TNW.

Project waters are **Pick List** river miles from RPW.

Project waters are **Pick List** aerial (straight) miles from TNW.

Project waters are **Pick List** aerial (straight) miles from RPW.

Project waters cross or serve as state boundaries. Explain:

Identify flow route to TNW<sup>5</sup>:

Tributary stream order, if known:

<sup>4</sup> Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

<sup>5</sup> Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

(b) General Tributary Characteristics (check all that apply):

Tributary is:  Natural  
 Artificial (man-made). Explain:  
 Manipulated (man-altered). Explain:

Tributary properties with respect to top of bank (estimate):

Average width: feet  
Average depth: feet  
Average side slopes: **Pick List**.

Primary tributary substrate composition (check all that apply):

Silts  Sands  Concrete  
 Cobbles  Gravel  Muck  
 Bedrock  Vegetation. Type/% cover:  
 Other. Explain:

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain:

Presence of run/riffle/pool complexes. Explain:

Tributary geometry: **Pick List**

Tributary gradient (approximate average slope): %

(c) Flow:

Tributary provides for: **Pick List**

Estimate average number of flow events in review area/year: **Pick List**

Describe flow regime:

Other information on duration and volume:

Surface flow is: **Pick List**. Characteristics:

Subsurface flow: **Pick List**. Explain findings:

Dye (or other) test performed:

Tributary has (check all that apply):

Bed and banks  
 OHWM<sup>6</sup> (check all indicators that apply):  
 clear, natural line impressed on the bank  the presence of litter and debris  
 changes in the character of soil  destruction of terrestrial vegetation  
 shelving  the presence of wrack line  
 vegetation matted down, bent, or absent  sediment sorting  
 leaf litter disturbed or washed away  scour  
 sediment deposition  multiple observed or predicted flow events  
 water staining  abrupt change in plant community  
 other (list):  
 Discontinuous OHWM.<sup>7</sup> Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

High Tide Line indicated by:  Mean High Water Mark indicated by:  
 oil or scum line along shore objects  survey to available datum;  
 fine shell or debris deposits (foreshore)  physical markings;  
 physical markings/characteristics  vegetation lines/changes in vegetation types.  
 tidal gauges  
 other (list):

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).

Explain:

Identify specific pollutants, if known:

<sup>6</sup>A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

<sup>7</sup>Ibid.

(iv) **Biological Characteristics. Channel supports (check all that apply):**

- Riparian corridor. Characteristics (type, average width):
- Wetland fringe. Characteristics:
- Habitat for:
  - Federally Listed species. Explain findings:
  - Fish/spawn areas. Explain findings:
  - Other environmentally-sensitive species. Explain findings:
  - Aquatic/wildlife diversity. Explain findings:

2. **Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW**

(i) **Physical Characteristics:**

(a) General Wetland Characteristics:

Properties:

Wetland size:        acres

Wetland type. Explain:

Wetland quality. Explain:

Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:

Flow is: **Pick List**. Explain:

Surface flow is: **Pick List**

Characteristics:

Subsurface flow: **Pick List**. Explain findings:

- Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

- Directly abutting
- Not directly abutting
  - Discrete wetland hydrologic connection. Explain:
  - Ecological connection. Explain:
  - Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW

Project wetlands are **Pick List** river miles from TNW.

Project waters are **Pick List** aerial (straight) miles from TNW.

Flow is from: **Pick List**.

Estimate approximate location of wetland as within the **Pick List** floodplain.

(ii) **Chemical Characteristics:**

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:

Identify specific pollutants, if known:

(iii) **Biological Characteristics. Wetland supports (check all that apply):**

- Riparian buffer. Characteristics (type, average width):
- Vegetation type/percent cover. Explain:
- Habitat for:
  - Federally Listed species. Explain findings:
  - Fish/spawn areas. Explain findings:
  - Other environmentally-sensitive species. Explain findings:
  - Aquatic/wildlife diversity. Explain findings:

3. **Characteristics of all wetlands adjacent to the tributary (if any)**

All wetland(s) being considered in the cumulative analysis: **Pick List**

Approximately (        ) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)      Size (in acres)      Directly abuts? (Y/N)      Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

### C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

**Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:**

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

### D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
  - TNWs: linear feet      width (ft), Or,      acres.
  - Wetlands adjacent to TNWs:      acres.
2. **RPWs that flow directly or indirectly into TNWs.**
  - Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Pinch Gut Creek is a perennial stream and has a NCDWQ stream rating scores greater than 30.
  - Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: 500 linear feet 20 width (ft).  
 Other non-wetland waters: acres.  
Identify type(s) of waters:

**3. Non-RPWs<sup>8</sup> that flow directly or indirectly into TNWs.**

- Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- Tributary waters: linear feet width (ft).  
 Other non-wetland waters: acres.  
Identify type(s) of waters:

**4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**

- Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.  
 Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:  
  
 Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

**5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**

- Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

**6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**

- Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

**7. Impoundments of jurisdictional waters.<sup>9</sup>**

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

- Demonstrate that impoundment was created from "waters of the U.S.," or  
 Demonstrate that water meets the criteria for one of the categories presented above (1-6), or  
 Demonstrate that water is isolated with a nexus to commerce (see E. below).

**E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):<sup>10</sup>**

- which are or could be used by interstate or foreign travelers for recreational or other purposes.  
 from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.  
 which are or could be used for industrial purposes by industries in interstate commerce.  
 Interstate isolated waters. Explain:  
 Other factors. Explain:

**Identify water body and summarize rationale supporting determination:**

<sup>8</sup>See Footnote # 3.

<sup>9</sup>To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

<sup>10</sup>Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: linear feet width (ft).
- Other non-wetland waters: acres.
- Identify type(s) of waters:
- Wetlands: acres.

**F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):**

- If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
  - Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
- Other: (explain, if not covered above): .

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource: .
- Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: acres List type of aquatic resource: .
- Wetlands: acres.

**SECTION IV: DATA SOURCES.**

**A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):**

- Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:
- Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - Office concurs with data sheets/delineation report.
  - Office does not concur with data sheets/delineation report.
- Data sheets prepared by the Corps:
- Corps navigable waters' study:
- U.S. Geological Survey Hydrologic Atlas:
  - USGS NHD data.
  - USGS 8 and 12 digit HUC maps.
- U.S. Geological Survey map(s). Cite scale & quad name:
- USDA Natural Resources Conservation Service Soil Survey. Citation:
- National wetlands inventory map(s). Cite name:
- State/Local wetland inventory map(s):
- FEMA/FIRM maps:
- 100-year Floodplain Elevation is: (National Geodetic Vertical Datum of 1929)
- Photographs:  Aerial (Name & Date): .  
or  Other (Name & Date): .
- Previous determination(s). File no. and date of response letter:
- Applicable/supporting case law:
- Applicable/supporting scientific literature:
- Other information (please specify): .

**B. ADDITIONAL COMMENTS TO SUPPORT JD:**

# **STORMWATER MANAGEMENT PLAN**

Project: 33426.1.1

TIP #: B-4062

County: Catawba

02/12/2010

Hydraulics Project Manager: Roger Weadon, P.E. (MA Engineering),  
Marshal Clawson, P.E. (NCDOT Hydraulics Unit)

## **ROADWAY DESCRIPTION**

The project B-4062 consists of constructing a 3@12'x 11' RCBC to replace the existing bridge #127 in Catawba County on SR-1880 (St. James Church Road) over Pinch Gut Creek. The total project length is 0.075 miles. The project creates impacts to Pinch Gut Creek, which is located in the Catawba River Basin. The project drainage system consist of roadside ditches.

Jurisdiction Stream: Pinch Gut Creek

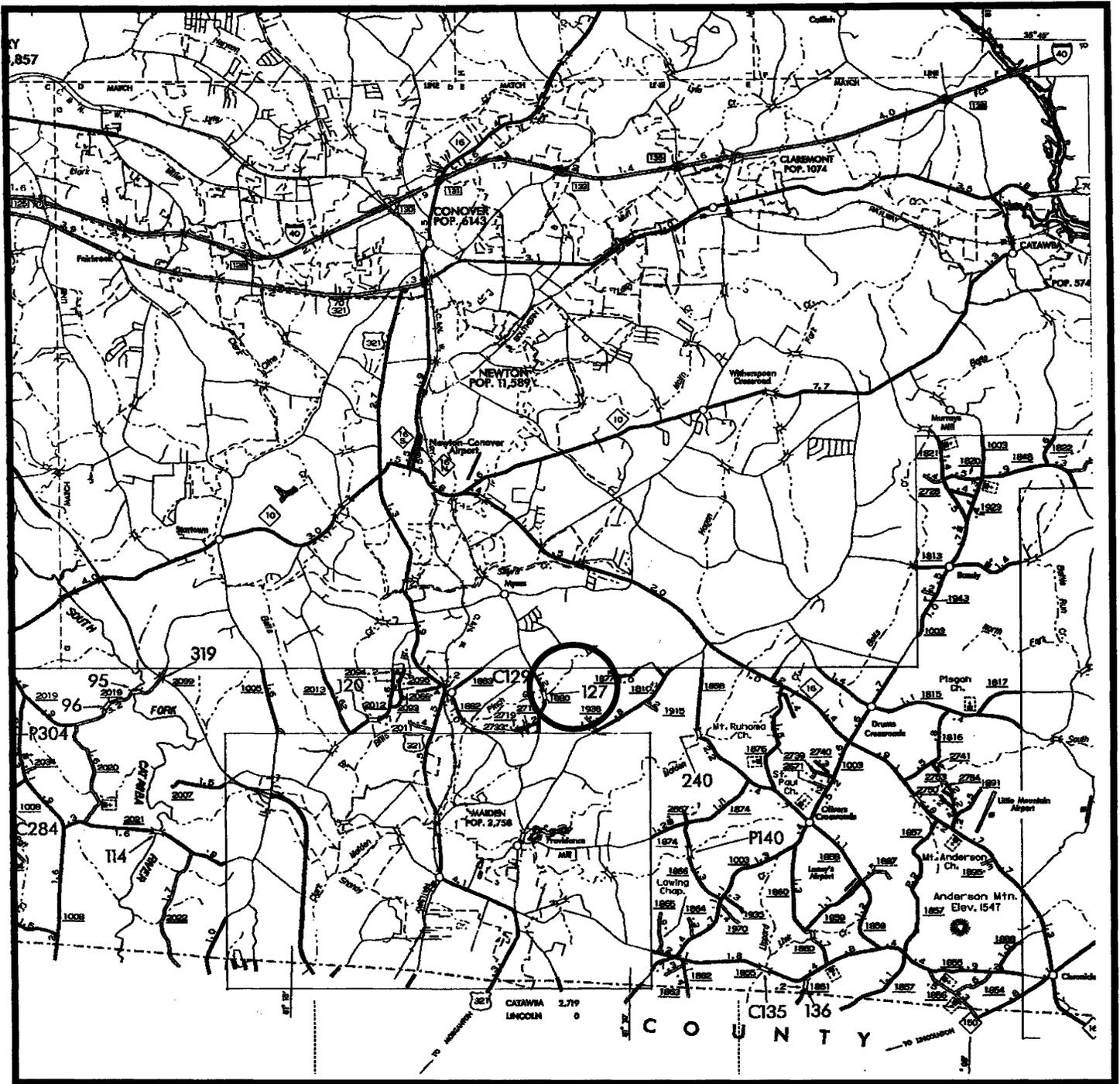
## **ENVIRONMENTAL DESCRIPTION**

The project is located within the Catawba River Basin in Catawba County. Impacts have been minimized by and using 2:1 roadway fill slopes at the culvert crossing, burying the culvert invert one foot, and use of a low flow channel through a single culvert barrel to maintain channel continuity.

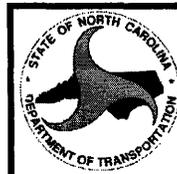
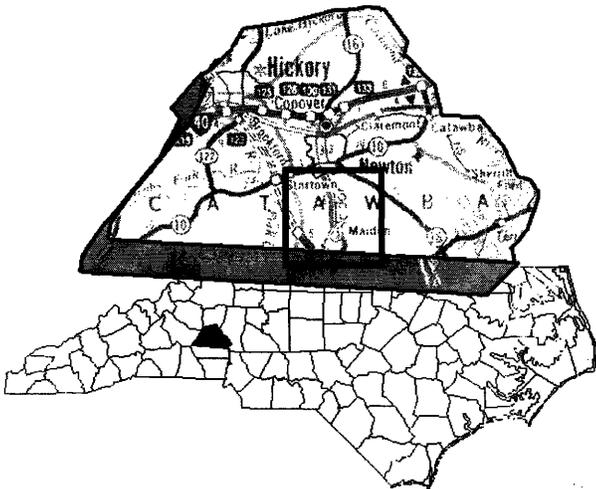
## **BEST MANAGEMENT PRACTICES AND MAJOR STRUCTURES**

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:

- Use of a low flow channel through a single culvert barrel to maintain channel continuity with additional capacity added though floodplain culvert barrel sections.
- Burying culvert invert 1'



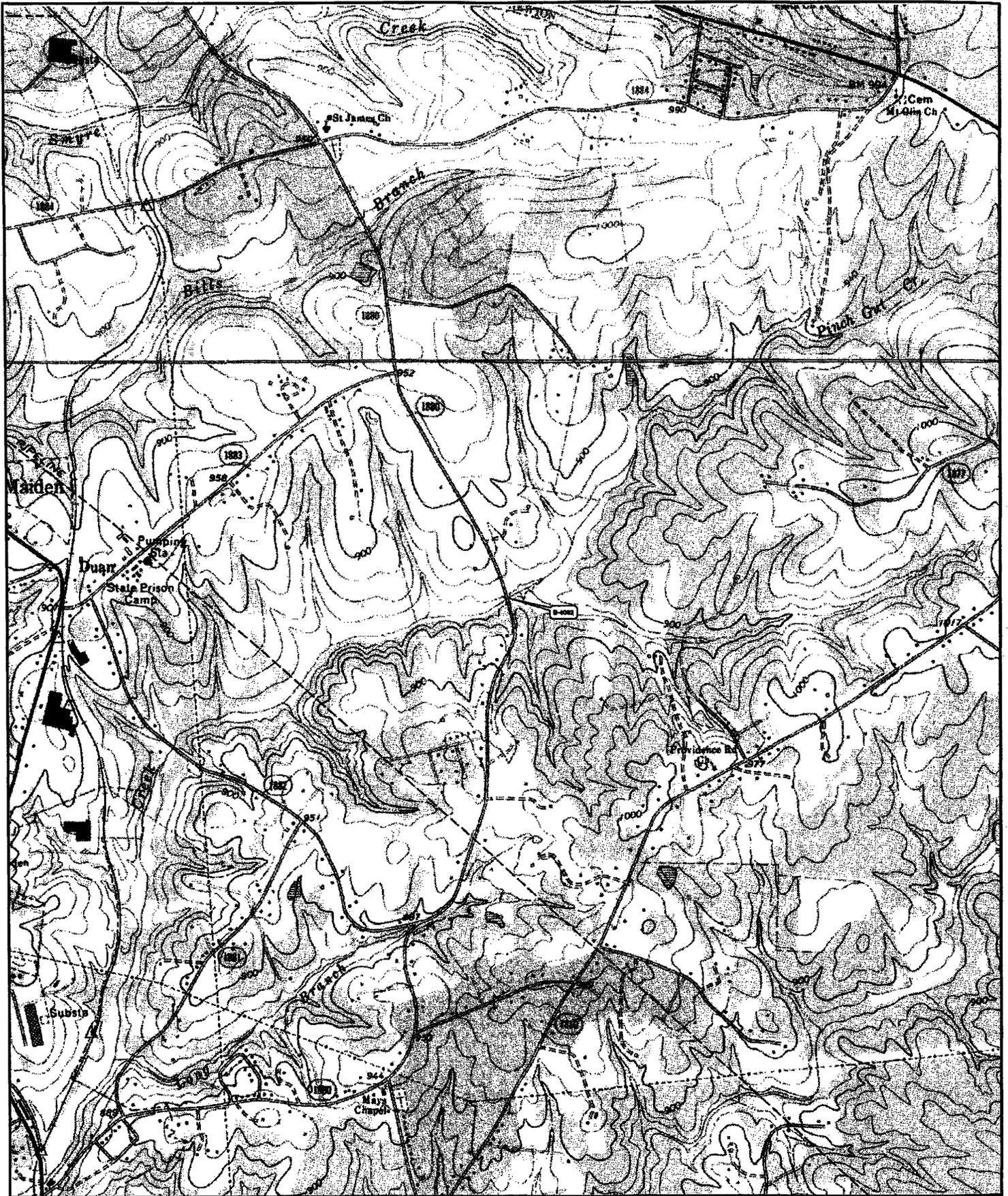
Permit Drawing  
of



NORTH CAROLINA DEPARTMENT OF  
TRANSPORTATION  
DIVISION OF HIGHWAYS  
PROJECT DEVELOPMENT &  
ENVIRONMENTAL ANALYSIS BRANCH

**CATAWBA COUNTY**  
**REPLACE BRIDGE NO. 127 ON SR 1880**  
**OVER PINCH GUT CREEK**  
**B-4062**

Figure 1



Name: MAIDEN  
Date: 1/25/2010  
Scale: 1 inch equals 2000 feet

Location: 035° 36' 51.43" N 681° 11' 22.59" W  
Caption: B-4062

Permit Drawing  
Sheet 2 of 7

# Property Owners

Parcel Number	Names	Addresses			
5	Douglas J. Delong	7138 Kidville Rd.	Denver	NC	28037
6	Terra Designs. Inc	2924 Blackburn Bridge Rd.	Lincolnton	NC	28092-7884
7	Gordon W. Wilson	2684 St. James Church Rd.	Newton	NC	28658

NC DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS

CATAWBA COUNTY  
WBS - 33426.1.1 (B-4062)

Permit Drawing  
Sheet 3 of 7

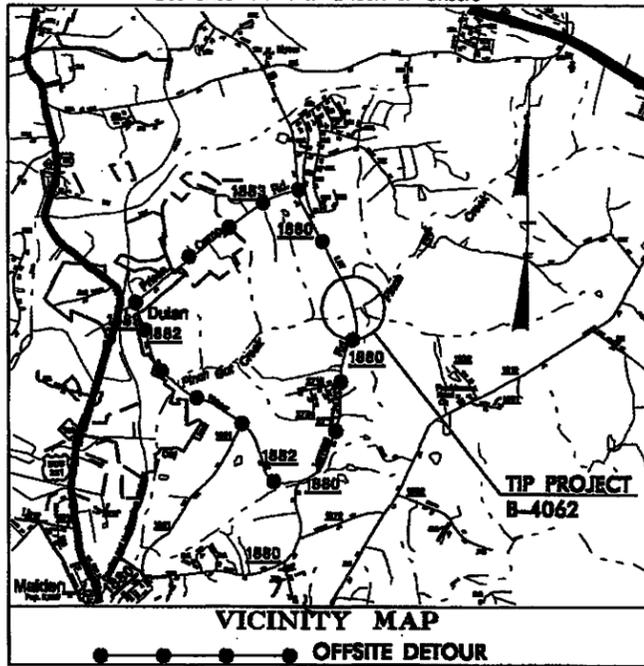
SHEET

2/9/2010



89/88/99

See Sheet 1-A For Index of Sheets



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**CATAWBA COUNTY**

LOCATION: BRIDGE NO. 127 OVER PINCH GUT CREEK  
ON SR 1880 (ST. JAMES CHURCH RD.)

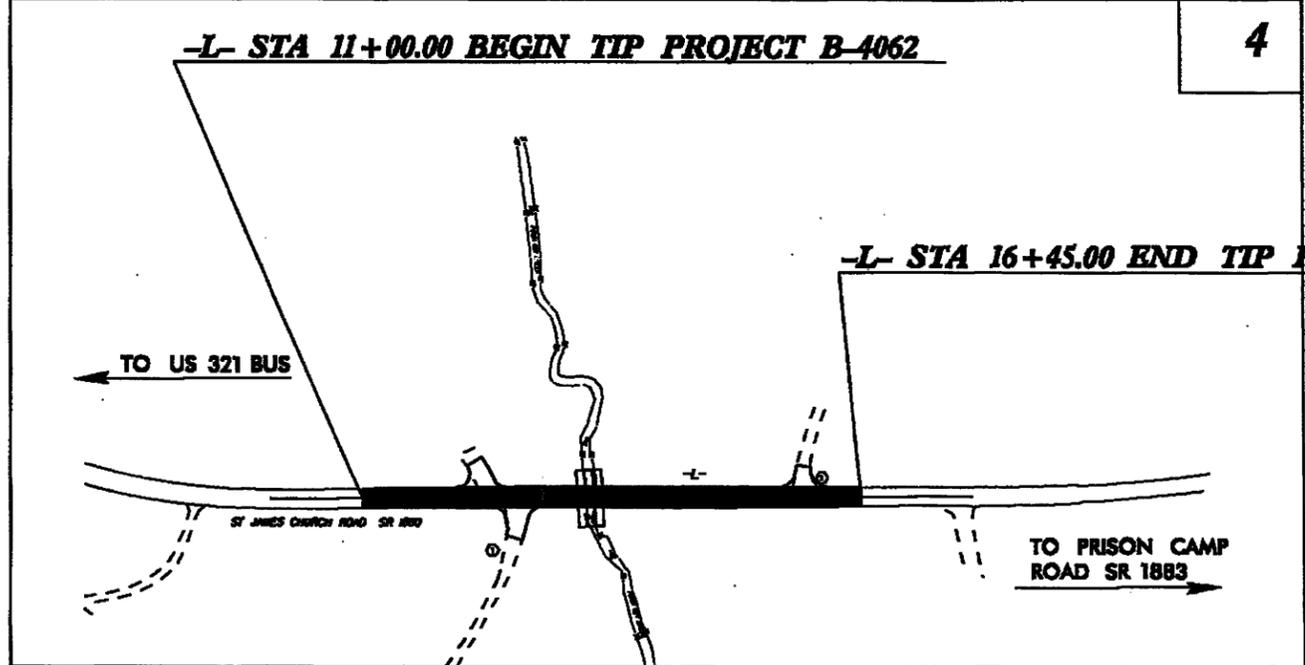
TYPE OF WORK: GRADING, PAVING, WIDENING, DRAINAGE,  
AND CULVERT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4062	1	
STATE FUNDING	F.A. PROJECT	DESCRIPTION	
33426.1.1	BRZ-1880(1)	P.E.	

Permit Drawing  
set 5 of 7



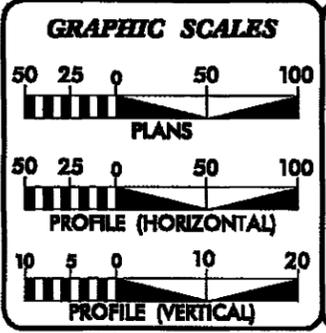
**TIP PROJECT: B-4062**



CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III  
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

**PRELIMINARY PLANS**  
DO NOT USE FOR CONSTRUCTION

**CONTRACT:**



**DESIGN DATA**

ADT (2009) = 3340
ADT (2035) = 5720
DHV = 12%
D = 70%
T = 6% *
V = 50 MPH
* (TST 2% + DUAL 4%)

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-4062	= 0.103 MILES
TOTAL LENGTH TIP PROJECT B-4062	= 0.103 MILES

Prepared in the Office of:  
**DIVISION OF HIGHWAYS**  
1889 Birch Ridge Dr., Raleigh, NC, 27619

2004 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: DECEMBER 16, 2009	<b>TED S. WALLS</b> PROJECT ENGINEER
LETTING DATE: JANUARY 15, 2011	<b>ALLISON K. WHITE</b> PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

SIGNATURE \_\_\_\_\_ P.E.

**ROADWAY DESIGN ENGINEER**

SIGNATURE \_\_\_\_\_ P.E.

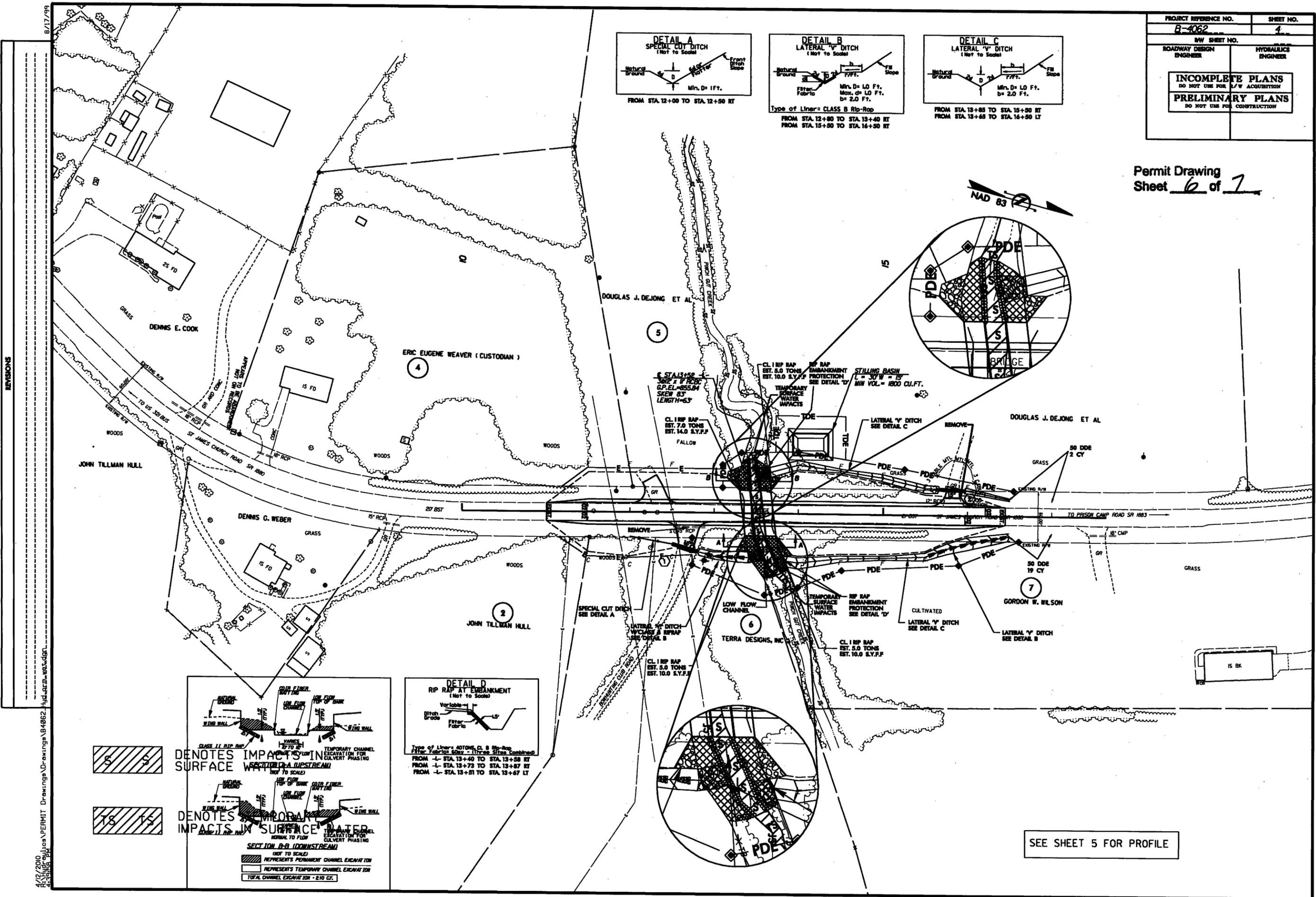
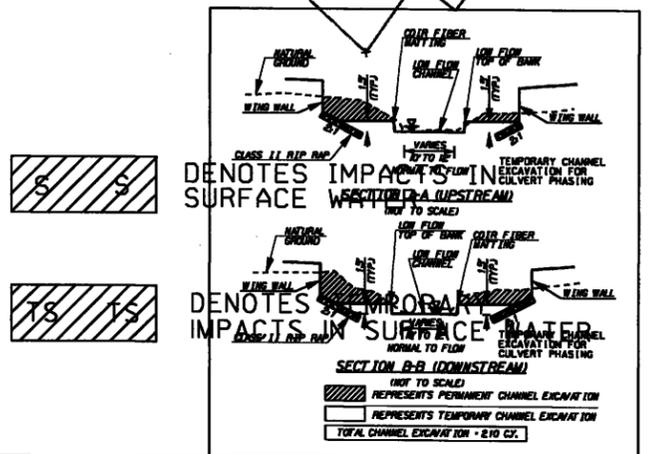
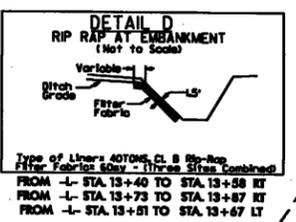
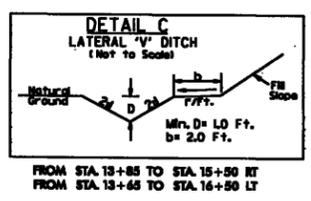
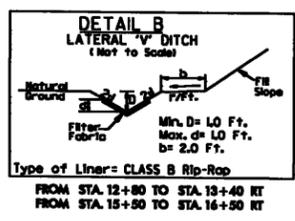
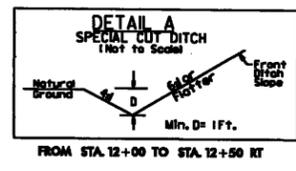
**DIVISION OF HIGHWAYS**  
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER P.E.

10-FEB-2010 12:46  
R:\Roadway\Projects\B-4062-rdy-tsh.dgn  
bzarman AT HY239448

PROJECT REFERENCE NO. <b>B-4062</b>	SHEET NO. <b>4</b>
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR A/C ACQUISITION	
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

Permit Drawing  
Sheet 6 of 7



SEE SHEET 5 FOR PROFILE

4/12/2010 10:05 AM PERMIT Drawings \Drawings\B4062 - Hyd - pr.m.west.dgn

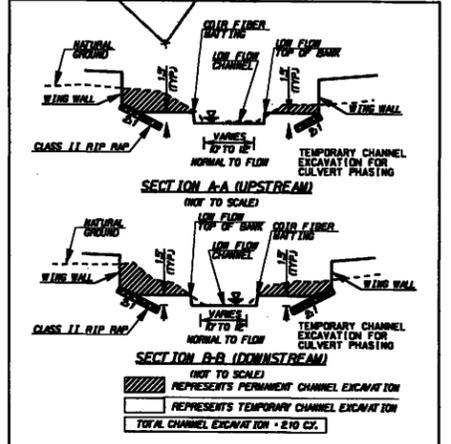
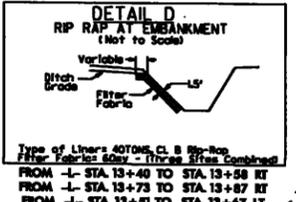
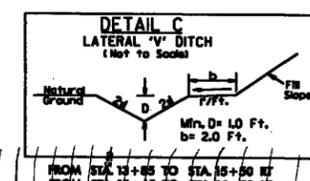
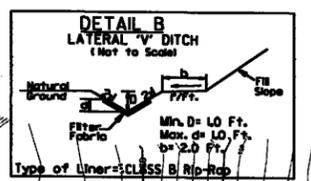
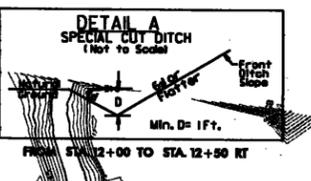
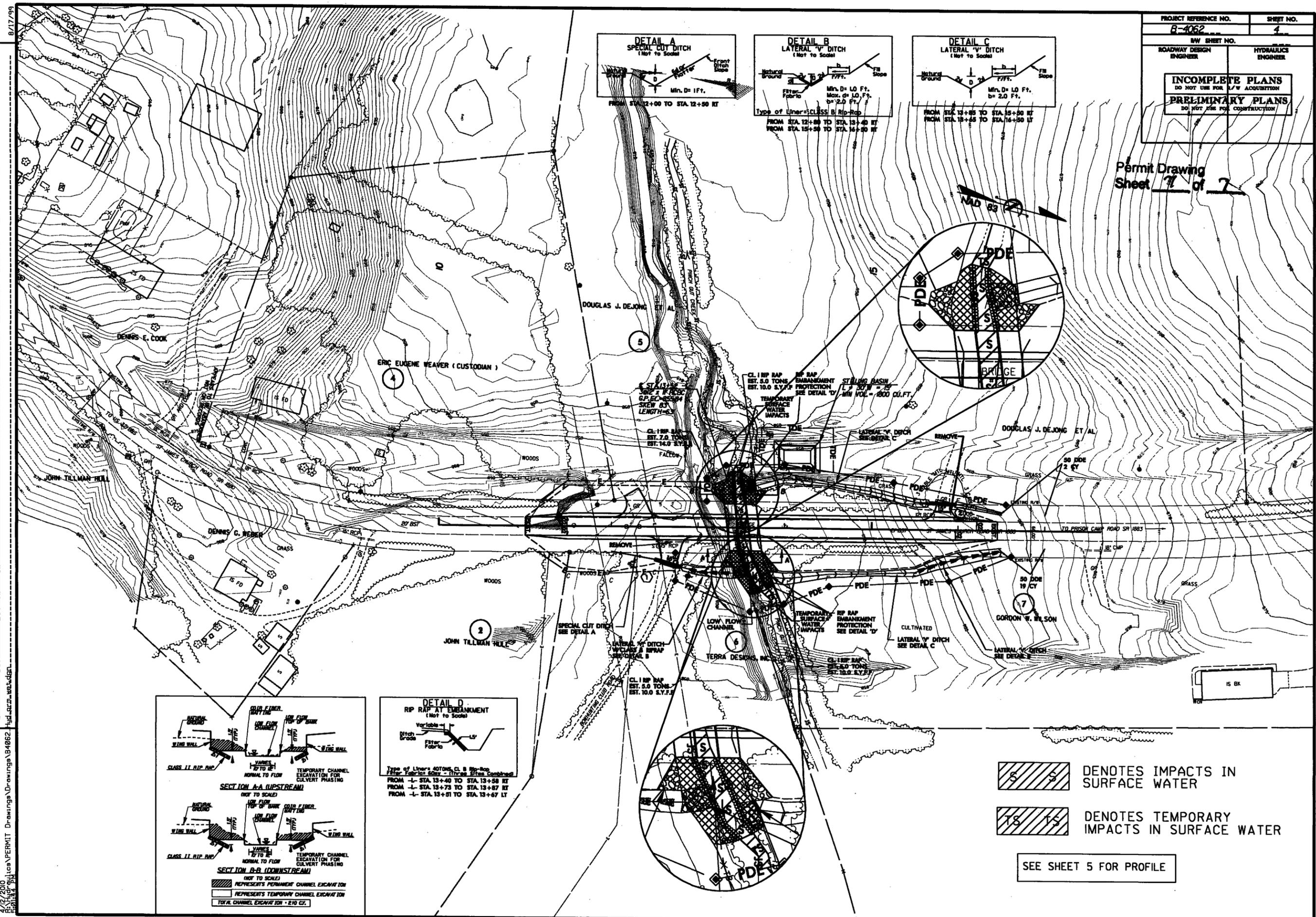
8/17/99

PROJECT REFERENCE NO. <b>B-4062</b>	SHEET NO. <b>4</b>
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR A/W ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

Permit Drawing Sheet **7** of **7**

REVISIONS

4/12/2010  
E:\100-001\100\PERMIT Drawings\Drawings\B4062\_Hyd\_perm\_wat.dwg



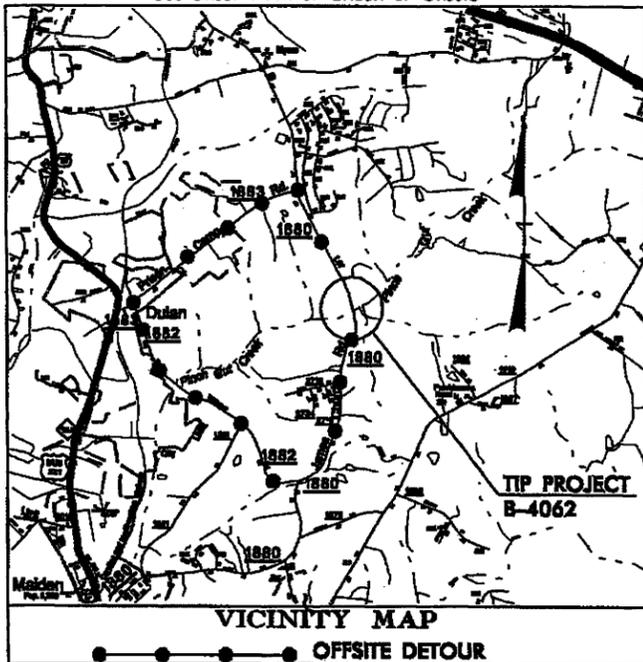
DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SEE SHEET 5 FOR PROFILE

95/08/99

See Sheet 1-A For Index of Sheets



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

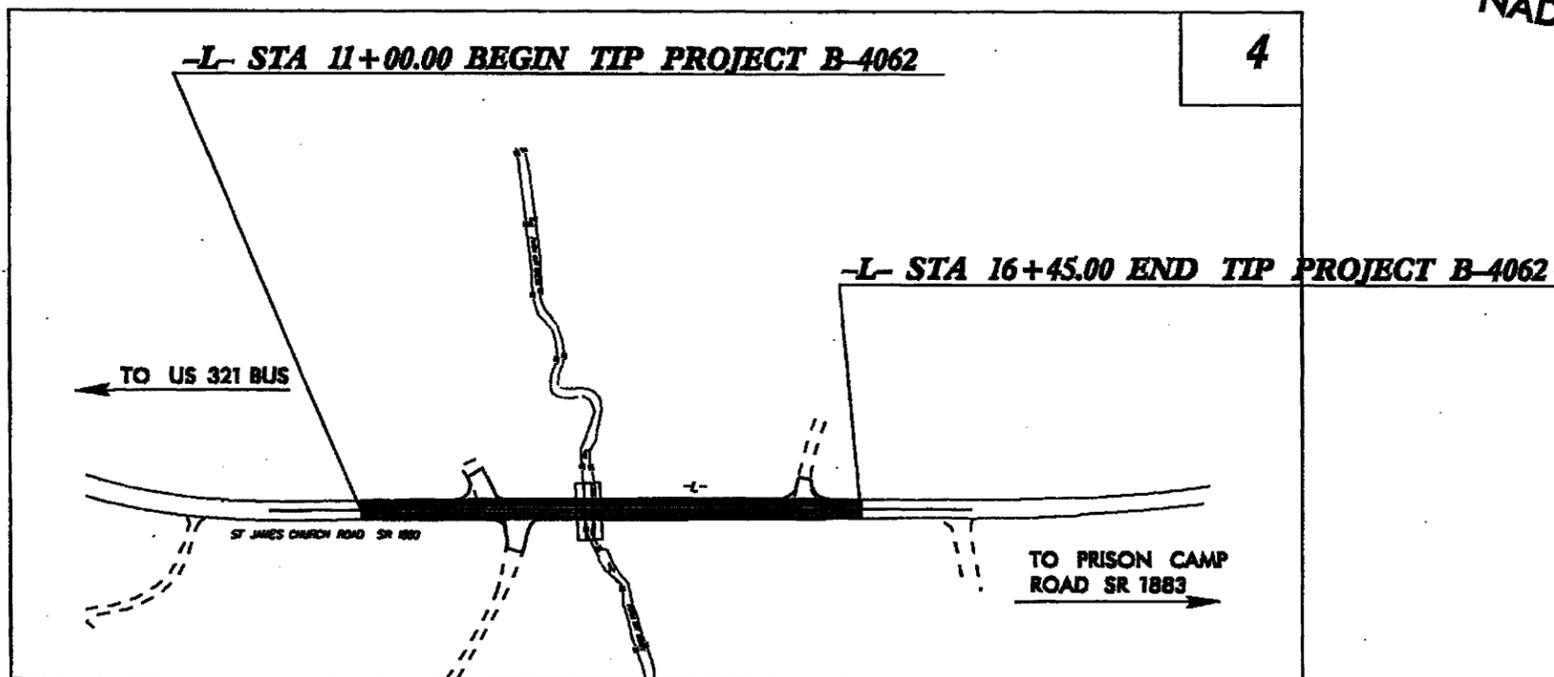
**CATAWBA COUNTY**

LOCATION: BRIDGE NO. 127 OVER PINCH GUT CREEK  
ON SR 1880 (ST. JAMES CHURCH RD.)

TYPE OF WORK: GRADING, PAVING, WIDENING, DRAINAGE,  
AND CULVERT

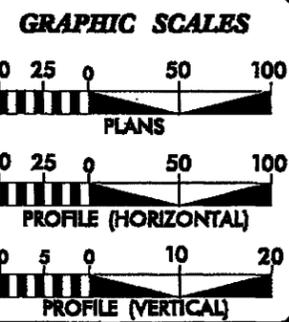
STATE	STATE PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
N.C.	B-4062	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33426.1.1	BRZ-1880(1)	P.E.	

**CONTRACT: TIP PROJECT: B-4062**



CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III  
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

PRELIMINARY PLANS



**DESIGN DATA**

ADT (2009) = 3340
ADT (2035) = 5720
DHV = 12%
D = 70%
T = 6%
V = 50 MPH
* (TTST 2% + DUAL 4%)

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-4062 = 0.103 MILES
TOTAL LENGTH TIP PROJECT B-4062 = 0.103 MILES

Prepared in the Office of:  
**DIVISION OF HIGHWAYS**  
1800 Birch Ridge Dr., Raleigh, NC, 27610

2009 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:  
DECEMBER 16, 2009

LETTING DATE:  
JANUARY 15, 2011

TED S. WALLS  
PROJECT ENGINEER

ALLISON K. WHITE  
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

ROADWAY DESIGN ENGINEER

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER

D:\FEB-2010\_07\39  
V:\WORK\PROJ\B-4062\_rdy\_tsh.dgn  
USER:RNAME

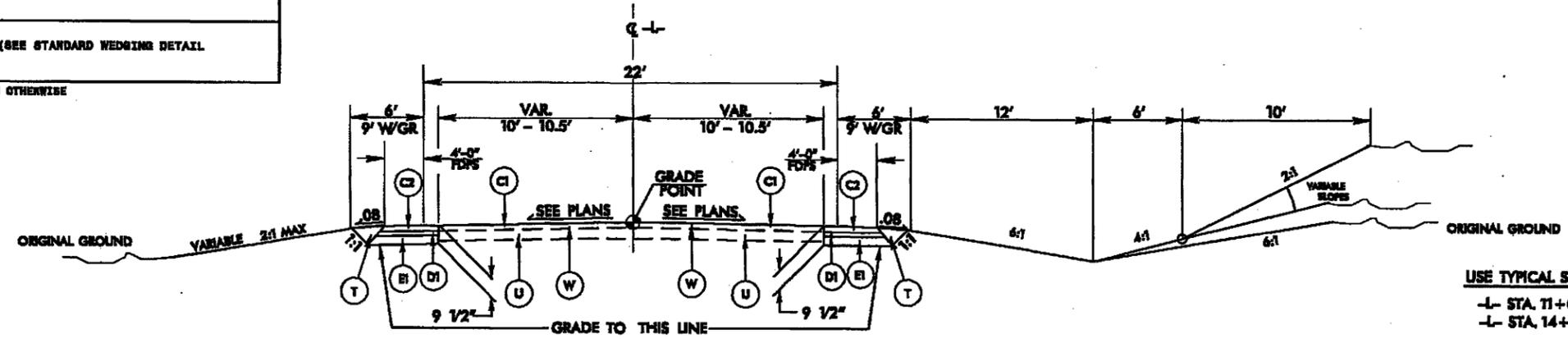
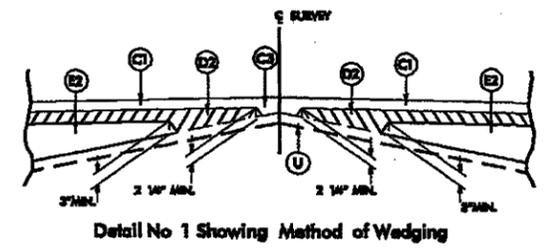
**CONTRACT:**

6/2/99

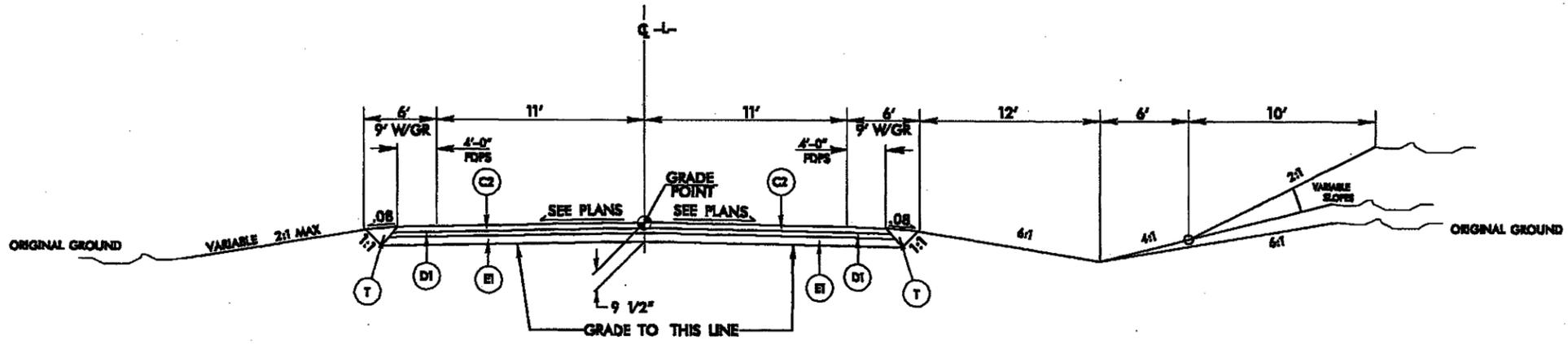
PROJECT REFERENCE NO. B-4062	SHEET NO. 2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE 80.8B, AT AN AVERAGE RATE OF 188 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE 80.8B, AT AN AVERAGE RATE OF 188 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE 80.8B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 119.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 119.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2¼" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE 825.0B, AT AN AVERAGE RATE OF 488 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE 825.0B, 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 8½" IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL NO. 1)

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



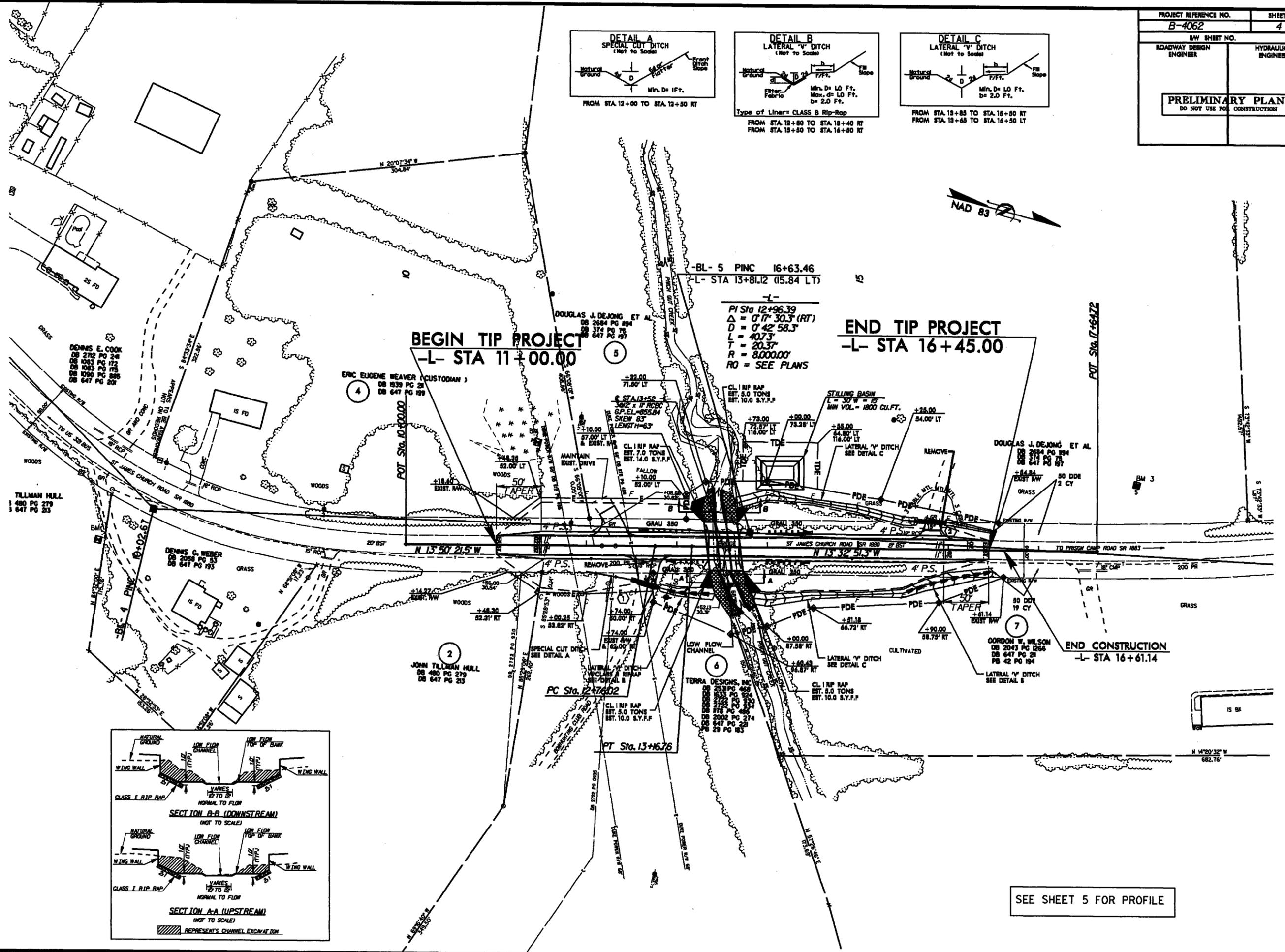
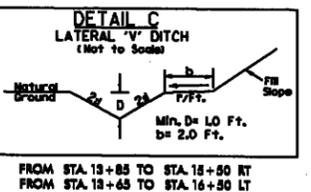
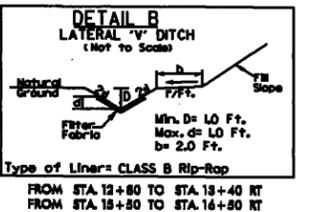
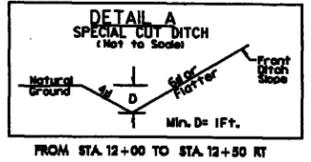
USE TYPICAL SECTION NO. 1 AS FOLLOWS:  
 -L- STA. 11+00.00 TO STA. 13+00.00  
 -L- STA. 14+00.00 TO STA. 16+45.00



USE TYPICAL SECTION NO. 2 AS FOLLOWS:  
 -L- STA. 13+00.00 TO STA. 14+00.00

10-FEB-2010 07:39  
 C:\PROJECTS\B-4062\rdj\_tjw.dgn

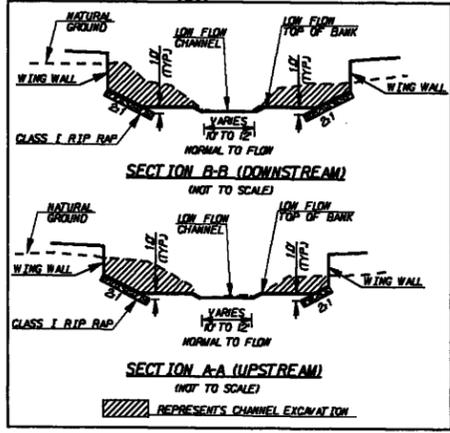
PROJECT REFERENCE NO. B-4062		SHEET NO. 4	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION			



-L-  
 PI Sta 12+96.39  
 $\Delta = 0' 17' 30.3''$  (RT)  
 $D = 0' 42' 58.3''$   
 $L = 40.73'$   
 $T = 20.37'$   
 $R = 8,000.00'$   
 $RO = \text{SEE PLANS}$

**END TIP PROJECT**  
 -L- STA 16+45.00

**END CONSTRUCTION**  
 -L- STA 16+61.14



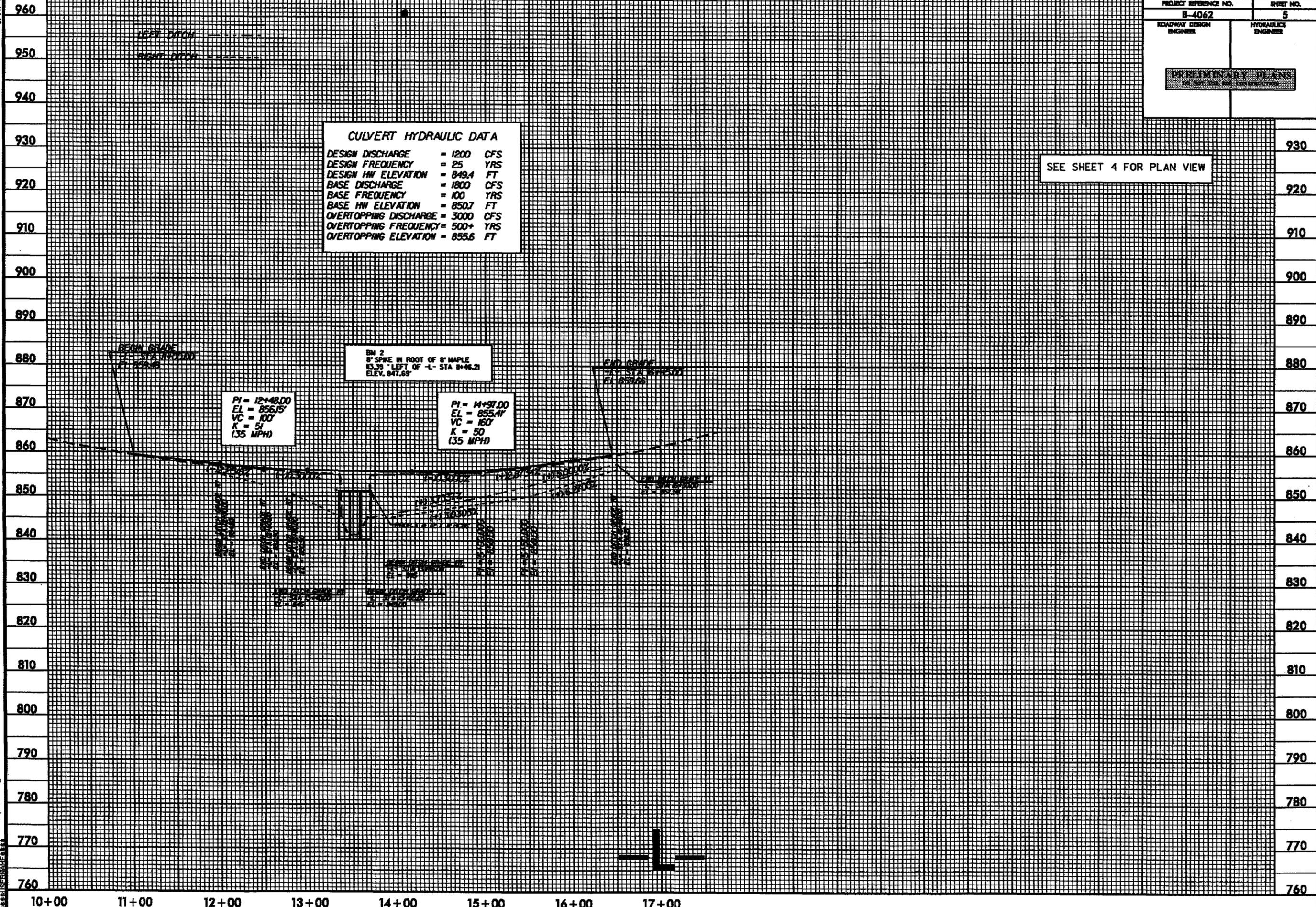
SEE SHEET 5 FOR PROFILE

REVISIONS

01-MAR-2010 14:28 R:\Roadway\B-4062\_rdy\_psh\_4.dgn  
 8/17/99

5/14/99

PROJECT REFERENCE NO. <b>B-4062</b>	SHEET NO. <b>5</b>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b>	



CULVERT HYDRAULIC DATA	
DESIGN DISCHARGE	= 1200 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 849.4 FT
BASE DISCHARGE	= 1800 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 850.7 FT
OVERTOPPING DISCHARGE	= 3000 CFS
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING ELEVATION	= 855.6 FT

BM 2  
8" SPIRE IN ROOT OF 8" MAPLE  
83.39' LEFT OF -L- STA 14+46.21  
ELEV. 847.69'

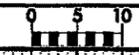
PI = 12+48.00  
EL = 856.15'  
VC = 100'  
K = 51  
(35 MPH)

PI = 14+97.00  
EL = 855.41'  
VC = 160'  
K = 50  
(35 MPH)

SEE SHEET 4 FOR PLAN VIEW

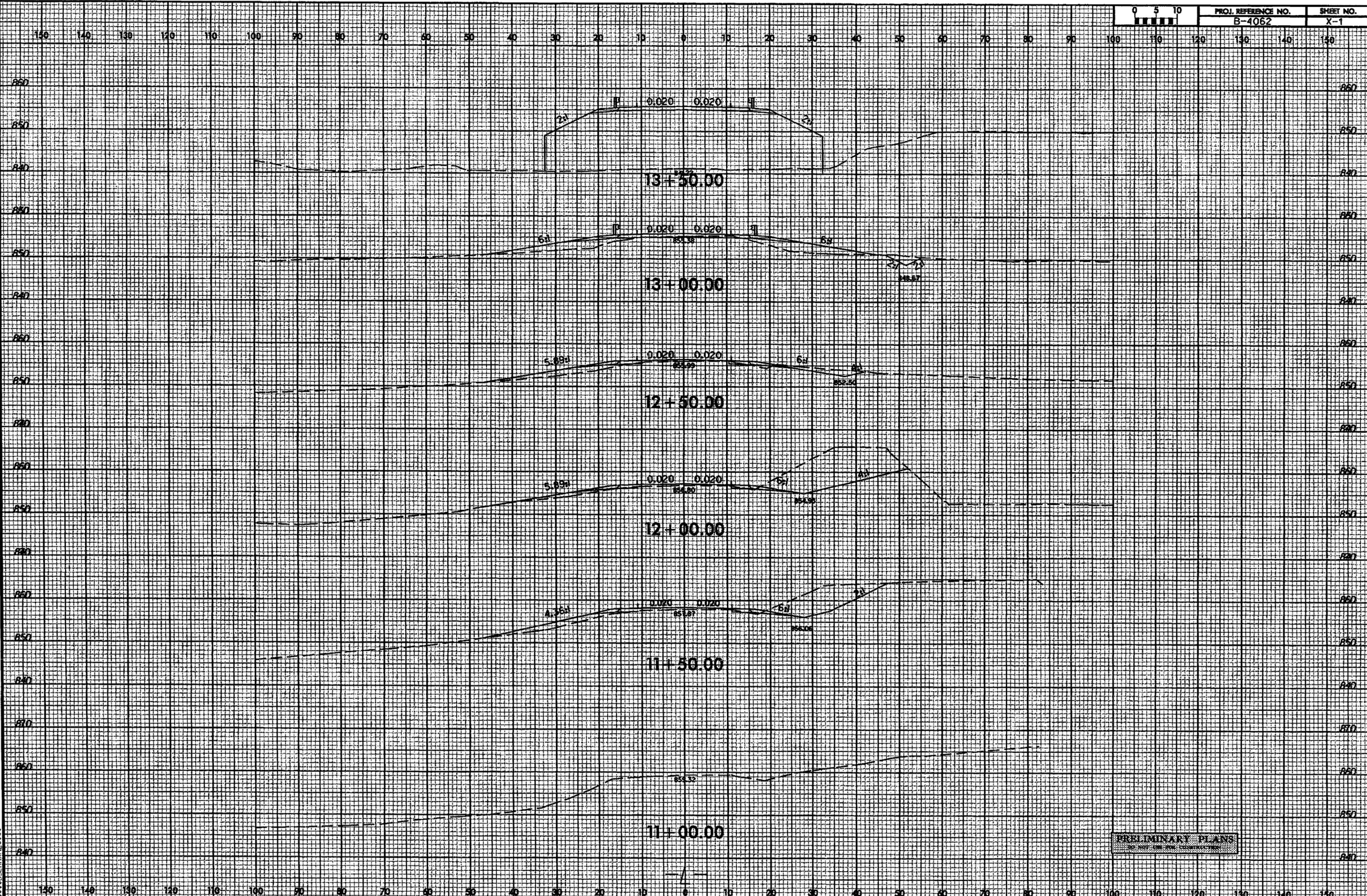
9-FEB-2010 07:59  
B:\PROJECTS\B-4062\p1\_s6.dgn

8/23/99



PROJ. REFERENCE NO.  
B-4062

SHEET NO.  
X-1

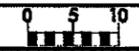


0-FEB-2000 07:45  
RAV\PC\X\501-4062.rdy\_xpl.dgn  
3:38 PM

PRELIMINARY PLANS



8/23/99

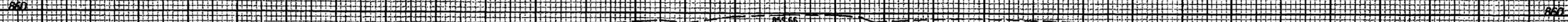


PROJ. REFERENCE NO.  
B-4062

SHEET NO.  
X-3

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

0-FEB-2000 07:45  
C:\PROJECTS\XSCN\B-4062-r-du-xpl.dgn  
\$\$\$\$\$



854.66  
16+50.00

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

CATEGORICAL EXCLUSION ACTION CLASSIFICATION FORM

TIP Project No.	<b>B-4062</b>
State Project No.	<b>8.2792401</b>
W.B.S. No.	<b>33426.1.1</b>
Federal Project No.	<b>BRZ-1880(1)</b>

A. Project Description:

The purpose of this project is to replace Catawba County Bridge No. 127 on SR 1880 over Pinch Gut Creek. The existing bridge is 36-feet in length with a clear roadway width of 19-feet, 4-inches. The replacement structure will consist of a triple barrel, 12-foot wide by 11-foot high reinforced concrete box culvert. The culvert size is based on preliminary design information and is set by hydraulic requirements. This structure will be of sufficient length to provide two 11-foot lanes with 6-foot shoulders on each side; four feet of the shoulder width will be paved. The roadway grade of the new structure will be approximately the same as the existing grade.

The approach roadway will extend approximately 150 feet from the southeast end of the new bridge and 200 feet from the northwest end of the new bridge. The approaches will be widened to include a 22-foot pavement width providing two 11-foot lanes. Six-foot grass shoulders (4-foot paved, 2-foot grass) will be provided on each side (9-foot shoulders where guardrail is included). The roadway will be designed as a Rural Minor Collector using Sub-Regional Tier Design guidelines with a 50 mile per hour design speed.

Traffic will be detoured off-site during construction (see Figure 1).

B. Purpose and Need:

NCDOT Bridge Management Unit records indicate Bridge No. 127 has a sufficiency rating of 20 out of a possible 100 for a new structure.

The bridge is considered structurally deficient due to superstructure condition appraisal of 4 out of 9 and a substructure condition appraisal of 4 out of 9 according to Federal Highway Administration (FHWA) standards and therefore eligible for FHWA's Highway Bridge Program. The bridge also meets the criteria for functionally obsolete due to structural appraisal of 2 out of 9 and a deck geometry appraisal of 2 out of 9.

The superstructure and substructure of Bridge No. 127 have timber elements with the exception of the steel I-beams that are forty-nine years old. Timber components have a typical life expectancy between 40 and 50 years due to the natural deterioration rate of wood. Rehabilitation of a timber structure is generally practical only when a few elements are damaged or prematurely deteriorated. This structure can no longer be addressed by reasonable maintenance activities; therefore, the bridge is approaching the end of its useful life.

Bridge No. 127 carries 3,300 vehicles per day with 4,800 vehicles per day projected for the future. The posted weight limit on the bridge is down to 13 tons for single vehicles and 17 tons for truck-tractor semi-trailers. The substandard deck width is becoming increasingly unacceptable and replacement of the bridge will result in safer traffic operations.

C. Proposed Improvements:

Circle one or more of the following Type II improvements which apply to the project:

1. Modernization of a highway by resurfacing, restoration, rehabilitation, reconstruction, adding shoulders, or adding auxiliary lanes (e.g., parking, weaving, turning, climbing).
  - a. Restoring, Resurfacing, Rehabilitating, and Reconstructing pavement (3R and 4R improvements)
  - b. Widening roadway and shoulders without adding through lanes
  - c. Modernizing gore treatments
  - d. Constructing lane improvements (merge, auxiliary, and turn lanes)
  - e. Adding shoulder drains
  - f. Replacing and rehabilitating culverts, inlets, and drainage pipes, including safety treatments
  - g. Providing driveway pipes
  - h. Performing minor bridge widening (less than one through lane)
  - i. Slide Stabilization
  - j. Structural BMP's for water quality improvement
2. Highway safety or traffic operations improvement projects including the installation of ramp metering control devices and lighting.
  - a. Installing ramp metering devices
  - b. Installing lights
  - c. Adding or upgrading guardrail
  - d. Installing safety barriers including Jersey type barriers and pier protection
  - e. Installing or replacing impact attenuators
  - f. Upgrading medians including adding or upgrading median barriers
  - g. Improving intersections including relocation and/or realignment
  - h. Making minor roadway realignment
  - i. Channelizing traffic
  - j. Performing clear zone safety improvements including removing hazards and flattening slopes
  - k. Implementing traffic aid systems, signals, and motorist aid
  - l. Installing bridge safety hardware including bridge rail retrofit
3. Bridge rehabilitation, reconstruction, or replacement or the construction of grade separation to replace existing at-grade railroad crossings.
  - a. Rehabilitating, reconstructing, or replacing bridge approach slabs
  - b. Rehabilitating or replacing bridge decks
  - c. Rehabilitating bridges including painting (no red lead paint), scour repair, fender systems, and minor structural improvements
  - d. Replacing a bridge (structure and/or fill)

4. Transportation corridor fringe parking facilities.
5. Construction of new truck weigh stations or rest areas.
6. Approvals for disposal of excess right-of-way or for joint or limited use of right-of-way, where the proposed use does not have significant adverse impacts.
7. Approvals for changes in access control.
8. Construction of new bus storage and maintenance facilities in areas used predominantly for industrial or transportation purposes where such construction is not inconsistent with existing zoning and located on or near a street with adequate capacity to handle anticipated bus and support vehicle traffic.
9. Rehabilitation or reconstruction of existing rail and bus buildings and ancillary facilities where only minor amounts of additional land are required and there is not a substantial increase in the number of users.
10. Construction of bus transfer facilities (an open area consisting of passenger shelters, boarding areas, kiosks and related street improvements) when located in a commercial area or other high activity center in which there is adequate street capacity for projected bus traffic.
11. Construction of rail storage and maintenance facilities in areas used predominantly for industrial or transportation purposes where such construction is not inconsistent with existing zoning and where there is no significant noise impact on the surrounding community.
12. Acquisition of land for hardship or protective purposes, advance land acquisition loans under section 3(b) of the UMT Act. Hardship and protective buying will be permitted only for a particular parcel or a limited number of parcels. These types of land acquisition qualify for a CE only where the acquisition will not limit the evaluation of alternatives, including shifts in alignment for planned construction projects, which may be required in the NEPA process. No project development on such land may proceed until the NEPA process has been completed.
13. Acquisition and construction of wetland, stream and endangered species mitigation sites.
14. Remedial activities involving the removal, treatment or monitoring of soil or groundwater contamination pursuant to state or federal remediation guidelines.

D. Special Project Information:

The estimated costs, based on 2008 prices, are as follows:

Structure	\$ 179,000
Roadway Approaches	\$ 162,000
Structure Removal	\$ 14,000
Misc. & Mob.	\$ 101,000
Eng. & Contingencies	\$ 69,000
Total Construction Cost	\$ 525,000
Right-of-way Costs	\$ 37,000
Right-of-way Utility Costs	\$ 10,000
Total Project Cost	\$ 572,000

**Estimated Traffic:**

Current	-	3300 vpd
Year 2025	-	4800 vpd
TTST	-	2%
Dual	-	4%

**Accidents:** Traffic Engineering has evaluated a recent three year period and found four accidents occurring in the vicinity of the project. None were associated with the geometry of the bridge or its approach roadways.

**Design Exceptions:** There are no anticipated design exceptions for this project.

**Pedestrian and Bicycle Accommodations:** This portion of SR 1880 is not a part of a designated bicycle route nor is it listed in the Transportation Improvement Program (TIP) as a bicycle project. However, the NCDOT Division of Bicycle and Pedestrian Transportation has determined this route as a suitable designated bicycle route in Catawba County; therefore, SR 1880 has been identified as a proposed bicycle route in accordance with the draft Catawba County Bike Route Map. As a result, 4-foot offsets and a minimum bridge rail height of 54-inches will be included in the design. Temporary bicycle or pedestrian accommodations are not required for this project

**Catawba County Schools:** The Director of School Transportation stated that although a bus turnaround point on each side of the bridge is not necessary, Catawba County Schools will allow their buses to turn around at Ellick Drive and Sunfields Drive on either side of the bridge. The school system shared their concern that NCDOT continue to maintain these turnaround points for safety.

**Bridge Demolition:** Bridge No. 127 is constructed entirely of timber and steel and should be possible to remove with no resulting debris in the water based on standard demolition practices.

**Alternatives Discussion:**

**No Build** – The no build alternative would result in eventually closing the road which is unacceptable given the volume of traffic served by SR 1880.

**Rehabilitation** – The bridge was constructed in 1960 and the timber materials within the bridge are reaching the end of their useful life.

Rehabilitation would require replacing the timber components which would constitute effectively replacing the bridge.

**Offsite Detour** – Bridge No. 127 will be replaced on the existing alignment. Traffic will be detoured offsite (see Figure 1) during the construction period. NCDOT Guidelines for Evaluation of Offsite Detours for Bridge Replacement Projects considers multiple project variables beginning with the additional time traveled by the average road user resulting from the offsite detour. The offsite detour for this project would include SR 1882 and SR 1883. The majority of traffic on the road is through traffic. The detour for the average road user would result in 4 minutes additional travel time (2.5 miles additional travel). Up to a 9-month duration of construction is expected on this project.

Based on the Guidelines, the criteria above indicate that on the basis of delay alone the detour is acceptable. Catawba County Emergency Services along with Catawba County Schools Transportation have also indicated that the detour is acceptable. NCDOT Division 12 has indicated the condition of all roads, bridges and intersections on the offsite detour are acceptable without improvement and concurs with the use of the detour.

**Onsite Detour** – An onsite detour was not evaluated due to the presence of an acceptable offsite detour.

**Staged Construction** – Staged construction was not considered because the existing clear roadway width of 19-feet did not make staging of the existing structure practical. Additionally, due to the poor condition of the abutments, partial removal for staging is not recommended.

**New Alignment** – Given that the alignment for SR 1880 is acceptable, a new alignment was not considered as an alternative.

**Structure Type:** The current structure is a bridge built in 1960. The reason for building a bridge was not because a culvert would not work but because the design, materials and labor were not practical in the time when this structure was built. A culvert has been determined adequate from a hydraulics standpoint. There are no special resources such as trout or mussels present. Because a culvert is less than half the cost, twice the life expectancy, and virtually no maintenance in comparison to a bridge, a culvert is the preferred structure type.

**Other Agency Comments:**

The **N.C.D.E.N.R Division of Water Quality** in standardized letters provided a request that they prefer any replacement structure to be a spanning structure.

**Response:** At smaller stream crossing it is more economical to replace bridges with box culverts. Culverts cost less than bridges, require less maintenance throughout their service life than bridges, and last longer than bridges. Therefore, where appropriate NCDOT prefers to use box culverts to replace bridges. As there are no protected resources at this site, the proposed culvert will be designed according to current NCDOT design practices which include such measures as buried box bottoms to facilitate fish passage, dry cell(s) to allow wildlife passage, and placement to minimize channel widening and realignment.

The **North Carolina Department of Cultural Resources** was aware of no historic resources that would be affected by the project.

The **Planning Department of Catawba County** advised that Catawba County participates in the Federal floodplain program; therefore, the project must meet any applicable requirements.

**Response:** The Hydraulic Unit will coordinate with the Federal Emergency Management Agency (FEMA) to determine if a Conditional Letter of Map Revision (CLOMR) and a subsequent final Letter of Map Revision (LOMR) are required for the project. If required, the Division will submit sealed as-built construction plans to the Hydraulics Unit upon project completion certifying the project was built as shown on construction plans.

The **North Carolina Wildlife Resource Commission** and **US Fish and Wildlife Service** had no special concerns for this project. Standard recommendations should apply.

The **Army Corps of Engineers** nor **US Environmental Protection Agency** offered comments on the proposed bridge project.

**Public Involvement:**

A newsletter has been sent to all those living along SR 1880 and side roads within the project study area in March of 2008. No comments have been received to date.

Based on responses to the newsletter, a Citizen's Informational Workshop was determined unnecessary.

E. Threshold Criteria

The following evaluation of threshold criteria must be completed for Type II actions

<u>ECOLOGICAL</u>	<u>YES</u>	<u>NO</u>
(1) Will the project have a substantial impact on any unique or important natural resource?	<input type="checkbox"/>	<u>X</u>
(2) Does the project involve habitat where federally listed endangered or threatened species may occur?	<input checked="" type="checkbox"/>	_____
(3) Will the project affect anadromous fish?	<input type="checkbox"/>	<u>X</u>
(4) If the project involves wetlands, is the amount of permanent and/or temporary wetland taking less than one-tenth (1/10) of an acre and have all practicable measures to avoid and minimize wetland takings been evaluated?	<u>X</u>	<input type="checkbox"/>
(5) Will the project require the use of U. S. Forest Service lands?	<input type="checkbox"/>	<u>X</u>
(6) Will the quality of adjacent water resources be adversely impacted by proposed construction activities?	<input type="checkbox"/>	<u>X</u>
(7) Does the project involve waters classified as Outstanding Water Resources (OWR) and/or High Quality Waters (HQW)?	<input type="checkbox"/>	<u>X</u>
(8) Will the project require fill in waters of the United States in any of the designated mountain trout counties?	<input type="checkbox"/>	<u>X</u>
(9) Does the project involve any known underground storage tanks (UST's) or hazardous materials sites?	<input type="checkbox"/>	<u>X</u>
<u>PERMITS AND COORDINATION</u>	<u>YES</u>	<u>NO</u>
(10) If the project is located within a CAMA county, will the project significantly affect the coastal zone and/or any "Area of Environmental Concern" (AEC)?	<input type="checkbox"/>	<u>N/A</u>
(11) Does the project involve Coastal Barrier Resources Act resources?	<input type="checkbox"/>	<u>X</u>
(12) Will a U. S. Coast Guard permit be required?	<input type="checkbox"/>	<u>X</u>
(13) Could the project result in the modification of any existing regulatory floodway?	<input checked="" type="checkbox"/>	_____
(14) Will the project require any stream relocations or channel changes?	<input type="checkbox"/>	<u>X</u>

SOCIAL, ECONOMIC, AND CULTURAL RESOURCES

	<u>YES</u>	<u>NO</u>
(15) Will the project induce substantial impacts to planned growth or land use for the area?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(16) Will the project require the relocation of any family or business?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(17) Will the project have a disproportionately high and adverse human health and environmental effect on any minority or low-income population?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(18) If the project involves the acquisition of right of way, is the amount of right of way acquisition considered minor?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(19) Will the project involve any changes in access control?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(20) Will the project substantially alter the usefulness and/or land use of adjacent property?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(21) Will the project have an adverse effect on permanent local traffic patterns or community cohesiveness?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(22) Is the project included in an approved thoroughfare plan and/or Transportation Improvement Program (and is, therefore, in conformance with the Clean Air Act of 1990)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(23) Is the project anticipated to cause an increase in traffic volumes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(24) Will traffic be maintained during construction using existing roads, staged construction, or on-site detours?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(25) If the project is a bridge replacement project, will the bridge be replaced at its existing location (along the existing facility) and will all construction proposed in association with the bridge replacement project be contained on the existing facility?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(26) Is there substantial controversy on social, economic, or environmental grounds concerning the project?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(27) Is the project consistent with all Federal, State, and local laws relating to the environmental aspects of the project?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(28) Will the project have an "effect" on structures/properties eligible for or listed on the National Register of Historic Places?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(29) Will the project affect any archaeological remains which are important to history or pre-history?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

- |      |   |                          |              |
|------|---|--------------------------|--------------|
| (30) | Will the project require the use of Section 4(f) resources (public parks, recreation lands, wildlife and waterfowl refuges, historic sites, or historic bridges, as defined in Section 4(f) of the U. S. Department of Transportation Act of 1966)? | <input type="checkbox"/> | <u>  X  </u> |
| (31) | Will the project result in any conversion of assisted public recreation sites or facilities to non-recreation uses, as defined by Section 6(f) of the Land and Water Conservation Act of 1965, as amended?  | <input type="checkbox"/> | <u>  X  </u> |
| (32) | Will the project involve construction in, across, or adjacent to a river designated as a component of or proposed for inclusion in the National System of Wild and Scenic Rivers?   | <input type="checkbox"/> | <u>  X  </u> |

F. Additional Documentation Required for Unfavorable Responses in Part E

**Response to Question 2:** Habitat for the Dwarf-flowered heartleaf is present in Pinch Gut Creek. A systematic survey was conducted on April 14, 2005. No specimens of Dwarf-flowered heartleaf were located, thus the presence of this species within the project study area can be discounted. The biological conclusion is "No Effect."

**Response to Question 13:** The Hydraulics Unit will coordinate with the NC Floodplain Mapping Program (FMP), the delegated state agency for administering FEMA's National Flood Insurance Program, to determine status of project with regard to applicability of NCDOT'S Memorandum of Agreement with FMP (dated 6/5/08), or approval of a Conditional Letter of Map Revision (CLOMR) and subsequent final Letter of Map Revision (LOMR).

G. CE Approval

TIP Project No.	B-4062
State Project No.	8.2792401
W.B.S. No.	33426.1.1
Federal Project No.	BRZ-1880(1)

Project Description:

The purpose of this project is to replace Catawba County Bridge No. 127 on SR 1880 over Pinch Gut Creek. The existing bridge is 36-feet in length with a clear roadway width of 19-feet, 4-inches. The replacement structure will consist of a triple barrel, 12-foot wide by 11-foot high reinforced concrete box culvert. The culvert size is based on preliminary design information and is set by hydraulic requirements. This structure will be of sufficient length to provide two 11-foot lanes with 6-foot shoulders on each side; four feet of the shoulder width will be paved. The roadway grade of the new structure will be approximately the same as the existing grade.

The approach roadway will extend approximately 150 feet from the southeast end of the new bridge and 200 feet from the northwest end of the new bridge. The approaches will be widened to include a 22-foot pavement width providing two 11-foot lanes. Six-foot grass shoulders (4-foot paved, 2-foot grass) will be provided on each side (9-foot shoulders where guardrail is included). The roadway will be designed as a Rural Minor Collector using Sub-Regional Tier Design guidelines with a 50 mile per hour design speed.

Traffic will be detoured off-site during construction (see Figure 1).

Categorical Exclusion Action Classification:

         TYPE II(A)  
  X   TYPE II(B)

Approved:

<u>3/12/09</u> Date	<u>William J. Eberlein</u> Bridge Project Development Engineer Project Development & Environmental Analysis Branch
<u>3/12/09</u> Date	<u>John Miller</u> Project Engineer Project Development & Environmental Analysis Branch
<u>3/9/09</u> Date	<u>Christy M. Wright</u> Project Planning Engineer Project Development & Environmental Analysis Branch

For Type II(B) projects only:

<u>3/13/09</u> Date	<u>John F. Sullivan, III</u> for John F. Sullivan, III, PE, Division Administrator Federal Highway Administration
------------------------	---

## **PROJECT COMMITMENTS:**

**Catawba County  
Bridge No. 127 on SR 1880  
Over Pinch Gut Creek  
Federal Aid Project No. BRZ-1880(1)  
State Project No. 8.2792401  
W.B.S. No. 33426.1.1  
T.I.P. No. B-4062**

### **Division Twelve Construction, Resident Engineer's Office – Offsite Detour**

In order to have time to adequately reroute school busses, Dr. Timothy Markley (or acting Superintendent) for Catawba County Schools should be contacted at (828) 464-8333 at least one month prior to road closure.

Mr. Bryan Blanton (or acting EMS manager) for Catawba County Emergency Services needs to be contacted at (828) 465-8234 at least one month prior to road closure to make the necessary temporary reassignments to primary response units.

### **Hydraulic Unit – FEMA Coordination**

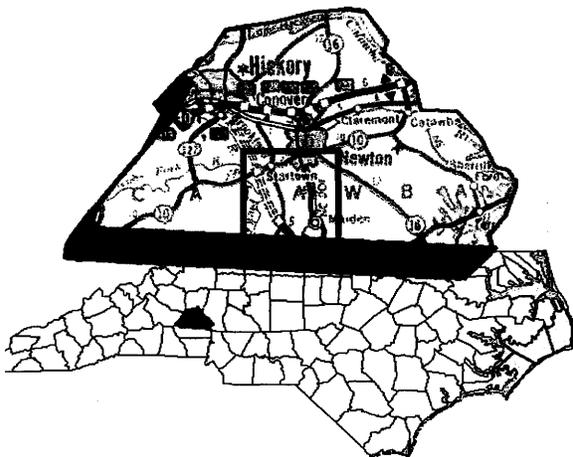
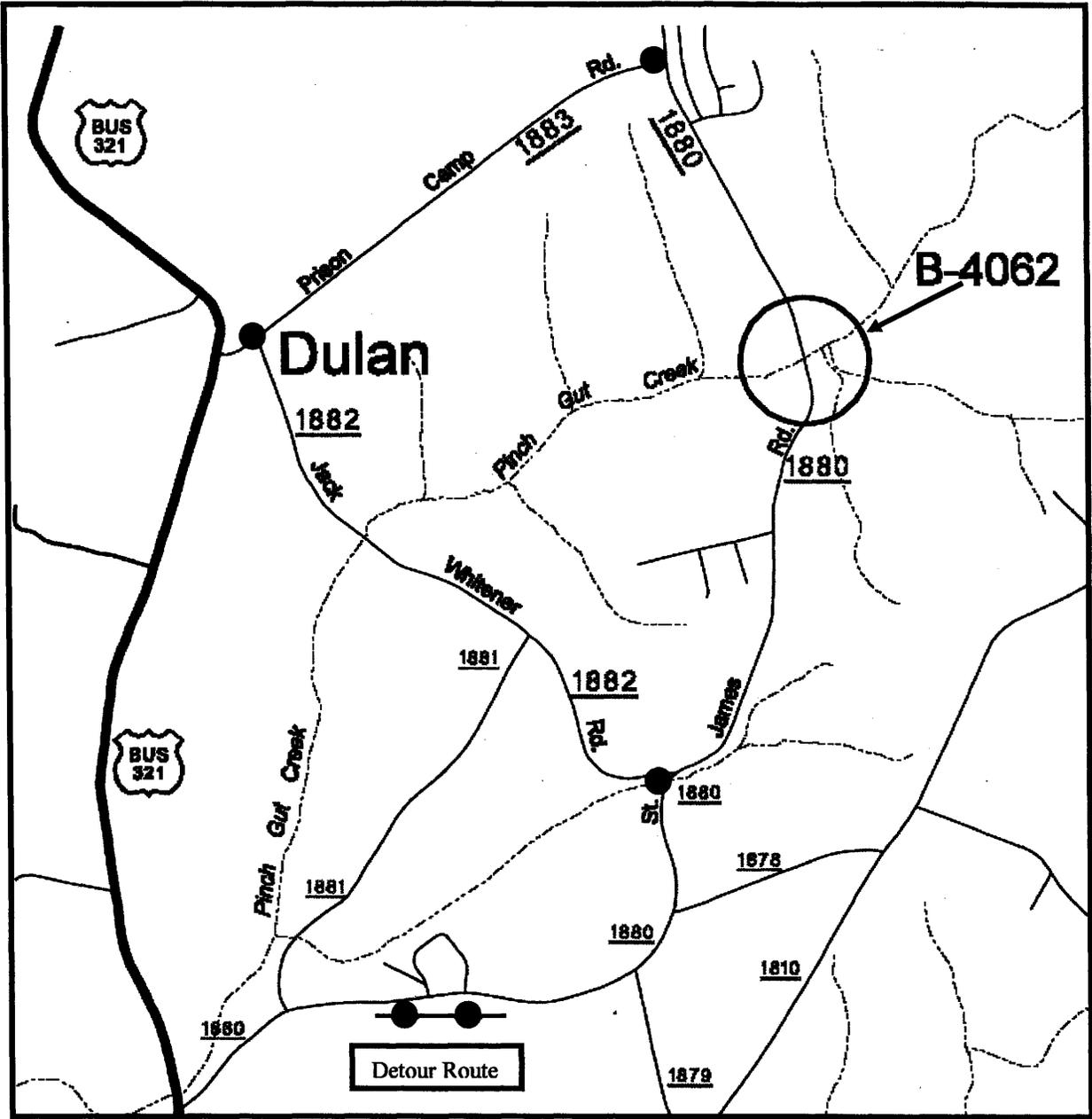
The Hydraulics Unit will coordinate with the NC Floodplain Mapping Program (FMP), the delegated state agency for administering FEMA's National Flood Insurance Program, to determine status of project with regard to applicability of NCDOT'S Memorandum of Agreement with FMP (dated 6/5/08), or approval of a Conditional Letter of Map Revision (CLOMR) and subsequent final Letter of Map Revision (LOMR).

### **Resident Engineer – As-built Construction Plans**

This project involves construction activities on or adjacent to FEMA – regulated stream(s). Therefore, the Division shall submit sealed as-built construction plans to the Hydraulics Unit upon completion of project construction, certifying that the drainage structure(s) and roadway embankment that are located within the 100-year floodplain were built as shown in the construction plans, both horizontally and vertically.

### **Roadway Design – Bicycle and Pedestrian Accommodations**

Allowance will be made for bicycle-safe bridge railing height of 54 inches and 4-foot wide paved shoulders in both directions for shoulder sections or 14-foot wide lanes in curb and gutter sections continued for at least 100-feet on either side of the improvements depending on the preferred cross section.



	<p>NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS PROJECT DEVELOPMENT &amp; ENVIRONMENTAL ANALYSIS BRANCH</p>
<p align="center"><b>CATAWBA COUNTY REPLACE BRIDGE NO. 127 ON SR 1880 OVER PINCH GUT CREEK B-4062</b></p>	
<p align="center"><b>FIGURE 1</b></p>	

BEGIN PROJECT  
-L- STA 11+85.00

END PROJECT  
-L- STA 15+80.00

3 Barrel Cuvert  
(12'x11')

ST. JAMES CHURCH ROAD SR 1880

4' PS

GRADE 300



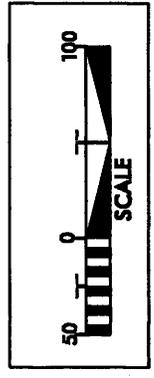
NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
PROJECT DEVELOPMENT &  
ENVIRONMENTAL ANALYSIS BRANCH

GATAWRA COUNTY

BRIDGE NO. 127 ON SR 1880  
OVER FINCH GUT CREEK

B-4062

FIGURE 2

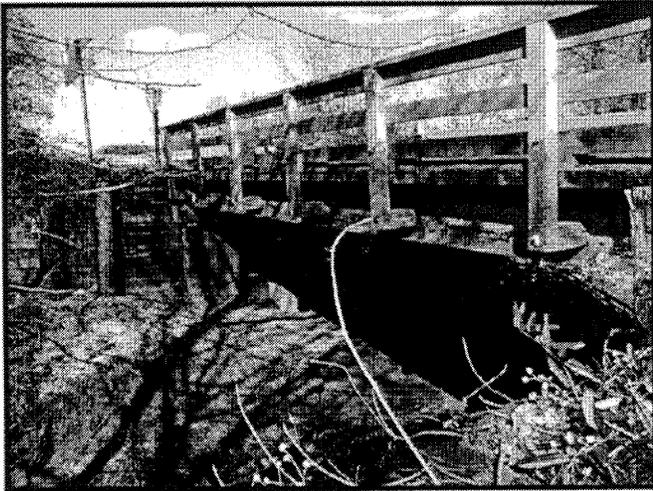




North approach of Bridge No. 127



South approach of Bridge No. 127



West face of Bridge No. 127



Looking downstream in  
Pinch Gut Creek

	<p>North Carolina Department of Transportation Division of Highways Planning &amp; Environmental Branch</p>
<p>Catawba County Replace Bridge No. 127 on SR 1880 Over Pinch Gut Creek B-4062</p>	
<p><b>FIGURE 3</b></p>	



North Carolina Department of Cultural Resources  
State Historic Preservation Office

Peter B. Sandbeck, Administrator

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

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

July 12, 2007

MEMORANDUM

TO: Christy M. Wright  
NCDOT PDEA – Bridge Project Development Unit

FROM: Peter Sandbeck *Peter B. Sandbeck*  
*Dep. MPM*

SUBJECT: Replacement of Bridge 127 on SR 1880 over Pinch Gut Creek, B-4062, Catawba County,  
ER 07-1273

Thank you for your letter of May 24, 2007, concerning the above project.

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

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

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763, ext. 246. In all future communication concerning this project, please cite the above referenced tracking number.

ADMINISTRATION  
RESTORATION  
SURVEY & PLANNING

Location  
507 N. Blount Street, Raleigh NC  
515 N. Blount Street, Raleigh NC  
515 N. Blount Street, Raleigh, NC

Mailing Address  
4617 Mail Service Center, Raleigh NC 27699-4617  
4617 Mail Service Center, Raleigh NC 27699-4617  
4617 Mail Service Center, Raleigh NC 27699-4617

Telephone/Fax  
(919)733-4763/733-8653  
(919)733-6547/715-4801  
(919)733-6545/715-4801

**NATURAL RESOURCES TECHNICAL REPORT**

**Replacement of Bridge No. 127  
SR 1880 (St. James Church Road) over Pinch Gut Creek**

**Catawba County, North Carolina  
(B-4062)  
(State Project No. 8.2792401)  
(Federal Aid No. BRZ-1880[1])**

**Prepared For:**



**The North Carolina Department of Transportation  
Raleigh, North Carolina**

**September 2007**

---

**TABLE OF CONTENTS**

1.0 INTRODUCTION ..... 1

    1.1 Project Description ..... 1

    1.2 Purpose ..... 1

    1.3 Methods ..... 1

    1.4 Qualifications ..... 3

    1.5 Definitions of Area Terminology ..... 4

2.0 PHYSICAL RESOURCES ..... 4

    2.1 Physiography and Soils ..... 4

    2.2 Water Resources ..... 5

    2.3 Summary of Potential Impacts to Water Sources ..... 7

3.0 BIOTIC RESOURCES ..... 8

    3.1 Terrestrial Communities ..... 8

    3.2 Aquatic Communities ..... 11

    3.3 Summary of Anticipated Impacts ..... 12

4.0 JURISDICTIONAL TOPICS ..... 12

    4.1 Waters of the United States ..... 12

    4.2 Permit Issues ..... 14

        4.2.1 Permits ..... 14

        4.2.2 Mitigation ..... 15

    4.3 Protected Species ..... 15

5.0 REFERENCES ..... 18

APPENDIX Completed USACE Data Forms

**LIST OF TABLES**

Table 1. Terrestrial Communities within the Project Study Area ..... 12

Table 2. Federal Species of Concern (FSC) Listed for Catawba County ..... 17

**LIST OF FIGURES**

Figure 1. Project Location ..... 2

Figure 2. Plant Community and Land Use ..... 9

Figure 3. Jurisdictional Areas ..... 14

---

**Replacement of Bridge No. 127  
SR 1880 (St. James Church Road) over Pinch Gut Creek  
Catawba County, North Carolina  
(B-4062)**

## **1.0 INTRODUCTION**

### **1.1 Project Description**

The North Carolina Department of Transportation (NCDOT) Transportation Improvement Program (TIP) project B-4062 proposes to replace Bridge No. 127, located on North Carolina Secondary Road 1880 (SR 1880, St. James Church Road), over Pinch Gut Creek in Catawba County, North Carolina (Figure 1). Bridge No. 127 on SR 1880 spans Pinch Gut Creek and its adjacent banks. The bridge is approximately 35.5 feet long and 20 feet wide.

The project study area is located approximately 1 mile south of Newton, North Carolina. SR 1880 is oriented along a north-south axis through the study area, while Pinch Gut Creek flows from east to west. The project study area has been determined to be approximately 300 feet in width (centered on the existing roadway) and approximately 1750 feet in length, encompassing approximately 12 acres.

One alternative has been proposed for the replacement of Bridge No. 127. The recommended replacement plan, Alternate 1, calls for the replacement of Bridge No. 127 in its current location. During construction, an offsite detour utilizing SR 1883 and NC 1882 will be used to maintain traffic.

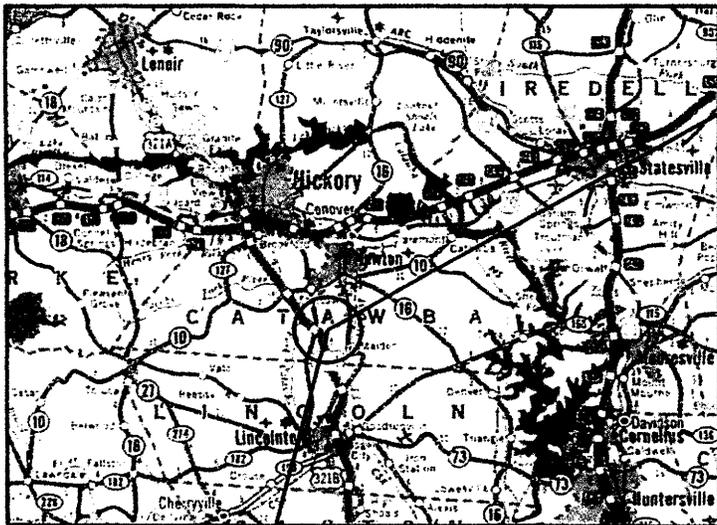
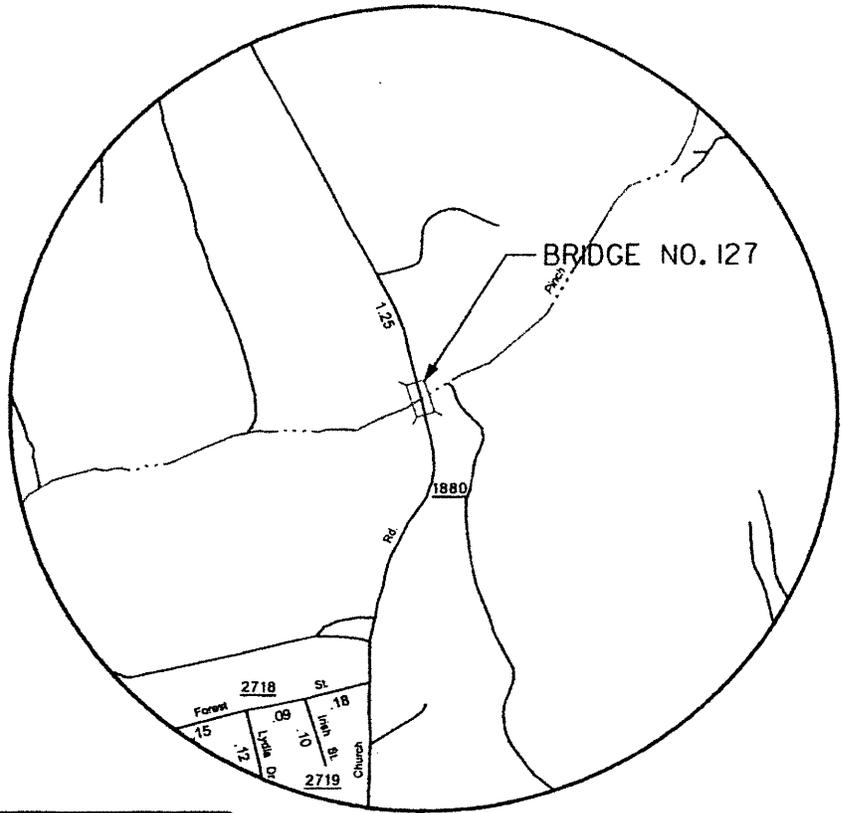
Bridge No. 127 was built in 1960 with a superstructure comprised of a timber deck on I-beams. The substructure consists of end bents with timber caps and timber piles on timber bulkheads. The existing bridge is to be removed without dropping components into Pinch Gut Creek; therefore, no potential fill in waters of the United States is anticipated. NCDOT will coordinate with resource agencies to alleviate concerns associated with bridge demolition.

### **1.2 Purpose**

The purpose of this study is to provide an evaluation of biological resources in the project study area. Specific tasks performed for this study include 1) an assessment of biological features within the project study area including descriptions of vegetation, wildlife, protected species, jurisdictional wetlands, and water quality; 2) a delineation of Section 404 jurisdictional areas and subsequent mapping of jurisdictional boundaries (utilizing Trimble XRS Differential Global Positioning System [GPS] technology); 3) an evaluation of plant communities and their extent within the project study area; and 4) a preliminary determination of permit needs.

### **1.3 Methods**

Materials and literature supporting this investigation have been derived from a number of sources including U.S. Geological Survey (USGS) topographic mapping (Maiden, NC 7.5-



	<p>NORTH CAROLINA DEPARTMENT OF TRANSPORTATION PROJECT DEVELOPMENT &amp; ENVIRONMENTAL ANALYSIS BRANCH</p>
<p>CATAWABA COUNTY BRIDGE NO. 127 ON SR 1880 OVER PINCH GUT CREEK TIP NO. B-4062</p>	
<p>LOCATION MAP FIGURE 1</p>	

---

minute quadrangle), U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping (Maiden, NC 7.5-minute quadrangle), Soils Conservation Service soils mapping (SCS 1975), and aerial photography.

Plant community descriptions are based on a classification system utilized by the North Carolina Natural Heritage Program (NCNHP) (Schafale and Weakley 1990). When appropriate, community classifications were modified to better reflect field observations. Vascular plant names follow nomenclature found in Radford et al. (1968) with adjustments for updated nomenclature (Kartesz 1998). Jurisdictional areas were evaluated using the three-parameter approach following U.S. Army Corps of Engineers (USACE) delineation guidelines (Environmental Laboratory 1987). Jurisdictional areas were characterized according to a classification scheme established by Cowardin et al. (1979) and/or the North Carolina Division of Environmental Management (NCDWM) *Field Guide to North Carolina Wetlands* (1996). Aquatic and terrestrial wildlife habitat requirements and distributions were determined by supportive literature (Martof et al. 1980, Menhinick 1991, Palmer and Braswell 1995, Potter et al. 1980, Rohde et al. 1994, and Webster et al. 1985). Water quality information for area streams and tributaries was derived from available sources (NCDWQ 2002, 2004a-c). Quantitative sampling was not undertaken to support existing data.

The most current USFWS listing of federally protected species with ranges extending into Catawba County (January 29, 2007 USFWS list) is considered in this report. In addition, NCNHP records documenting the presence of federally or state listed species were consulted before commencing field investigations (April 13, 2005).

The project study area was walked and visually mapped for significant features. Potential impacts of construction will be limited to cut-fill boundaries for each alternate. Special concerns evaluated in the field include 1) potential protected species habitat and 2) wetlands and water quality protection of Pinch Gut Creek

#### **1.4 Qualifications**

The field work for this investigation was conducted on July 7, 2004 by EcoScience Corporation biologists Matthew Thomas and Scott Davis and on April 14, 2005 by David O'Loughlin.

Mr. Thomas is a Project Scientist with two years of experience in the environmental field. Mr. Thomas holds a bachelor's degree in environmental science with a concentration in ecology from North Carolina State University. Professional expertise includes jurisdictional area delineation, plant and wildlife identification, stream assessment, community mapping, and environmental document preparation.

Mr. Davis is a Project Scientist with two years of experience in the environmental field. Mr. Davis holds a bachelor's degree in environmental science with a concentration in ecology from North Carolina State University. He is proficient in the identification of eastern woody tree and shrub species and in the identification of southeastern wetland flora. Professional expertise includes jurisdictional area delineation, benthic macroinvertebrate sampling, community mapping, and environmental document preparation.

---

Mr. O'Loughlin is a Project Scientist with two years of experience in the environmental field working toward a master of science degree in forestry from North Carolina State University, with minors in botany and statistics. He has taken pertinent courses including dendrology, botany, ecology, and wetland soils. His professional expertise includes natural resources assessment, stream and wetland delineations, and environmental document preparation.

### **1.5 Definitions of Area Terminology**

Definitions for descriptions used in this report are as follows: **Project Study Area** denotes the area bounded by proposed construction limits, and has been determined to be approximately 300 feet in width (centered on the existing roadway) and approximately 1750 feet in length, encompassing approximately 12 acres; **Project Vicinity** describes an area extending 0.5 mile on all sides of the project study area; and **Project Region** is equivalent to an area represented by a 7.5-minute USGS topographic quadrangle map with the project occupying the central position.

## **2.0 PHYSICAL RESOURCES**

### **2.1 Physiography and Soils**

The project study area is located in the Northern Inner Piedmont ecoregion of North Carolina. This ecoregion is characterized as rolling to hilly, with higher elevations, more rugged topography, and more monadnocks and mountains than other areas of the Piedmont (Griffith et al. 2002). The project study area is situated within a moderately sloping floodplain valley. Elevations within the project study area range from a high of approximately 860 feet National Geodetic Vertical Datum (NGVD [Maiden, NC 7.5-minute quadrangle]), in the southern portions of the project study area, to a low of approximately 840 feet NGVD (Maiden, NC 7.5-minute quadrangle ) within the channel of Pinch Gut Creek. Land uses within and adjacent to the project study area consist of pastures, agriculture lands, woodlands, and roadside shoulders.

Based on soil mapping for Catawba County (SCS 1975), the project study area is underlain by four soil series: including Chewacla loam (*Aquic Fulventic Dystrochrepts*), Hiwassee clay loam (*Typic Rhodudults*), Cecil clay loam (*Typic Hapludults*), and Hiwassee loam (*Typic Rhodudults*), in order of prominence. Within the project study area, Chewacla loam occurs in the floodplains adjacent to the stream, while Hiwassee clay loam, Cecil clay loam, and Hiwassee loam are found on slopes. None of the above soil series are considered hydric by the Natural Resource Conservation Service (Gregory 2002); although depressions within the Chewacla series may contain inclusions of Wehadkee fine sandy loam (*Fluventic Haplaquepts*), a predominantly hydric soil.

Chewacla loam is a somewhat poorly drained, moderately permeable, nearly level soil found on floodplains. The seasonal high water table occurs at a depth of 1 foot. Chewacla loam is subject to frequent flooding. Within the project study area, the Chewacla series occurs within

---

floodplains adjacent to Pinch Gut Creek. The Chewalca series occurs in all four quadrants, which underlies approximately 3.2 acres (26 percent) of the project study area.

Hiwassee clay loam, 6 to 10 percent slopes, eroded, is a well drained, moderately permeable soil found on upland slopes. Depth to the seasonal high water table is greater than 5 feet. This soil presents a severe erosion hazard in bare, unprotected areas. Hiwassee clay loam underlies an area of 4.5 acres (38 percent) on the slopes in the southeastern quadrant of the project study area.

Cecil clay loam, 6 to 10 percent slopes, eroded, is a well drained, moderately permeable soil occurring on slopes. Depth to the seasonal high water table depth is greater than 10 feet. This soil presents a severe erosion hazard in bare, unprotected areas. Within the project study area, Cecil clay loam underlies approximately 3.3 acres (28 percent) on the slopes in the northwest and northeast quadrants.

Hiwassee loam, 10 to 15 percent slopes, eroded, is a well drained, moderately permeable soil occurring on the lower parts of steep slopes. Depth to the seasonal high water table depth is greater than 5 feet. This soil presents a severe erosion hazard in bare, unprotected areas. Hiwassee loam underlies approximately 1.0 acre (8 percent) on the slopes near the southwestern quadrant of the project study area.

## **2.2 Water Resources**

The project study area is located within sub-basin 03-08-35 of the Catawba Basin (NCDWQ 2004c). This area is part of USGS Hydrologic Unit 03050102 of the South Atlantic/Gulf Region. The structure targeted for replacement spans Pinch Gut Creek and the adjacent floodplain. The portion of Pinch Gut Creek traversing the project study area has been assigned Stream Index Number 11-129-5-7 by NCDWQ (2004b).

Pinch Gut originates upstream of the project study area near the intersection of NC Highway 16 and Providence Mill Road, approximately 4200 feet upstream of the existing bridge. Within the project study area, Pinch Gut Creek is a well-defined, 20-foot wide, second-order, perennial stream. Pinch Gut Creek flows in a southwesterly direction, averaging 15 feet wide within the project study area. Pinch Gut Creek has a sand, gravel, and cobble substrate. The banks are 4 feet high and heavily vegetated. Trees form a canopy over the stream channel, while shrubs and vines dominate the understory around the stream bank. During field investigations, the water level appeared normal, ranging from 2 inches deep over riffles to 3 feet deep in pools. Flow was low, and water clarity was fair. No persistent emergent aquatic vegetation was observed within the stream. Pinch Gut Creek scored a 49 on the Army Corps of Engineer's Stream Quality Assessment Worksheet. Opportunities for habitat within Pinch Gut Creek include overhanging trees, undercut banks, fallen logs, and leaf packs.

Classifications are assigned to waters of the State of North Carolina based on the existing or contemplated best usage of various streams or segments of streams in the basin. A Best Usage Classification of C has been assigned to the entire length of Pinch Gut Creek. Class C waters are suitable for aquatic life propagation and protection, agriculture, and secondary

---

recreation. Secondary recreation includes wading, boating, and other uses not involving human body contact with waters on an organized or frequent basis. One designated High Quality Waters (HQW), Outstanding Resource Waters (ORW), Water Supply I (WS-I), Water Supply II (WS-II) waters, or watershed Critical Areas (CA) occur within 1.0 mile of the project study area (NCDWQ 2004c). Maiden Creek, a tributary that joins with Pinch Gut Creek 2.9 miles downstream from the project study area, is designated as a **WS-II** and **HQW**.

NCDWQ has initiated a whole-basin approach to water quality management for the 17 river basins within the state. Water quality for the proposed project study area is summarized in the Catawba River Basinwide Water Quality Plan (NCDWQ 2004c). Pinch Gut is currently listed by NCDWQ as **Not Rated** as its designated use. No benthic macroinvertebrate monitoring stations occur in the Pinch Gut Creek watershed or within 1.0 mile of the project area (NCDWQ 1999). With respect to temperature regimes, Pinch Gut Creek is designated as a warmwater stream (USACE et al. 2003).

NCDWQ has assembled a list of impaired waterbodies according to the Clean Water Act Section 303(d) and 40 CFR 130.7, hereafter referred to as the N.C. 2006 Final Section 303(d) list. The list is a comprehensive public accounting of all impaired waterbodies. An impaired waterbody is one that does not meet water quality standards; including, designated uses, numeric and narrative criteria, and anti-degradation requirements defined in 40 CFR 131. The standards violation may be due to an individual pollutant, multiple pollutants, pollution, or an unknown cause of impairment. The impairment could be from point sources, nonpoint sources, and/or atmospheric deposition. Some sources of impairment exist across state lines. North Carolina's methodology is strongly based on the aquatic life use support guidelines available in the Section 305(b) guidelines (EPA-841-B-97-002A and -002B). Those streams attaining only Partially Supporting (PS) or Not Supporting (NS) status are listed on the N.C. 2006 Final Section 303(d) list. Streams are further categorized into one of six parts within the N.C. 2004 Final Section 303(d) list, according to source of impairment and degree of rehabilitation required for the stream to adequately support aquatic life. Within Parts 1, 4, 5, and 6 of the list, North Carolina has developed a priority ranking scheme (low, medium, high) that reflects the relative value and benefits those waterbodies provide to the State. Pinch Gut Creek is not listed on any section of the N.C. 2006 Final Section 303(d) list (NCDWQ 2006).

Sub-basin 03-08-35 of the Catawba River Basin supports 23 permitted, point source discharges with a total discharge exceeding 27,331,300 million gallons per day. Six of the permitted dischargers are classified as major dischargers, discharging over 26.5 million gallons per day combined. The 17 remaining permitted dischargers are minor (NCDWQ 2004a). The closest NPDES discharger is along Carpenter Creek, a downstream tributary of Clark Creek, which Pinch Gut Creek flows into 1.4 miles downstream of the project study area. National Fruit Product Company, Incorporated holds a minor discharge permit (NC0023761) for Carpenter Creek (NCDWQ 2004a). Major non-point sources of pollution within the Catawba River Basin include agriculture, urban runoff, construction activities, timber harvesting, mining, failing septic systems, runoff from solid waste facilities. Sedimentation and nutrient inputs are major problems associated with non-point source discharges (NCDWQ 2004c).

---

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

### **2.3 Summary of Potential Impacts to Water Resources**

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

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

The proposed bridge replacement will allow for continuation of pre-project stream flows in Pinch Gut Creek, thereby protecting the integrity of this waterway. Long-term impacts resulting from construction are expected to be negligible. In order to minimize impacts to water resources, NCDOT *Best Management Practices for the Protection of Surface Waters* will be strictly enforced during the life of the project. NCDOT will coordinate with resource agencies to alleviate concerns associated with bridge demolition.

## **3.0 BIOTIC RESOURCES**

### **3.1 Terrestrial Communities**

Four distinct plant communities were identified within the project study area: disturbed/maintained land, mesic-mixed forest, agriculture land, and Piedmont alluvial forest.

---

Plant communities were delineated to determine the approximate area and location of each (Figure 2). These communities are described below in order of their dominance within the project study area.

**Disturbed/Maintained Land** – Disturbed/maintained land constitutes approximately 4.15 acres (55 percent) of the project study area. This community includes residential lots, roadside shoulders, and fragmented forest, all of which are maintained by some form of mowing or trimming. Residential lots occur in the southwest and southeast quadrants of the project study area, while roadside shoulders occur in all four quadrants.

Grasses and herbs dominate the vegetation in this community. Representative species include fescue (*Festuca* sp.), white clover (*Trifolium repens*), red clover (*Trifolium pretense*), poison ivy (*Toxicodendron radicans*), Japanese honeysuckle (*Lonicera japonica*), multiflora rose (*Rosa multiflora*), smooth sumac (*Rhus glabra*), pokeweed (*Phytolacca americana*), common greenbrier (*Smilax rotundifolia*), blackberry (*Rubus* sp.), and trumpet creeper (*Campsis radicans*). Trees and shrubs are present to a lesser extent in the disturbed/maintained community. Both have a scattered distribution, occurring in small groups or as individuals. In general, trees are confined to residential lots and field borders. Observed tree species include red oak (*Quercus rubra*), black cherry (*Prunus serotina*), and sycamore (*Platanus occidentalis*). Shrubs and saplings occur throughout the disturbed/maintained community, but are most abundant in areas that receive longer disturbance regime intervals. Observed shrub species include red maple (*Acer rubrum*), tulip poplar (*Liriodendron tulipifera*), black cherry, red oak, and sycamore.

Although this community is primarily made up of maintained fields, it can be expected that there will be some mammalian and avian diversity, as there is low residential density and vehicular traffic. No terrestrial mammals were observed during the site visit. However, there are several species that are well adapted to using the ecotone of the pasture and wooded communities. Opportunistic omnivores consume a wide variety of food such as wild fruit, fish, small mammals, reptiles, and birds. Omnivorous species with such adaptations that would utilize the project study area include raccoon (*Procyon lotor*), red fox (*Vulpes vulpes*), striped skunk (*Mephitis mephitis*), and Virginia opossum (*Didelphis virginiana*). Raccoons may be found closer to the streams or near residences. Eastern cottontail (*Sylvilagus floridanus*) is an herbivore that also prefers brushy clearings adjacent to woodlands. Insectivore species expected to occur within the open portion of the project study area include eastern mole (*Scalopus aquaticus*), red bat (*Lasiurus borealis*), and meadow vole (*Microtus pennsylvanicus*). The bobcat (*Lynx rufus*) is a carnivorous species that uses disturbed/maintained land for predation. Birds observed utilizing habitat within the project study area include common crow (*Corvus brachyrhynchos*) [an open area hunter of small animals and insects], red-tailed (*Buteo jamaicensis*) and red-shouldered hawks (*B. lineatus*), which are open-ground predators. Other species expected to utilize project study area habitats include other open-ground predators such as great-horned owl (*Bubo virginianus*), and other species that forage on invertebrates in the summer and fruits, nuts, and seeds in the winter. Such species include common grackle (*Quiscalus quiscula*), American robin (*Turdus migratorius*), eastern bluebird (*Sialia sialis*), red-winged blackbird (*Agelaius phoeniceus*), and eastern meadowlark (*Sturnella magna*) (Hamel 1992).



Project:

**B-4062  
Replacement  
of Bridge  
No. 127  
over  
Pinch Gut  
Creek**

Catawba County,  
North Carolina

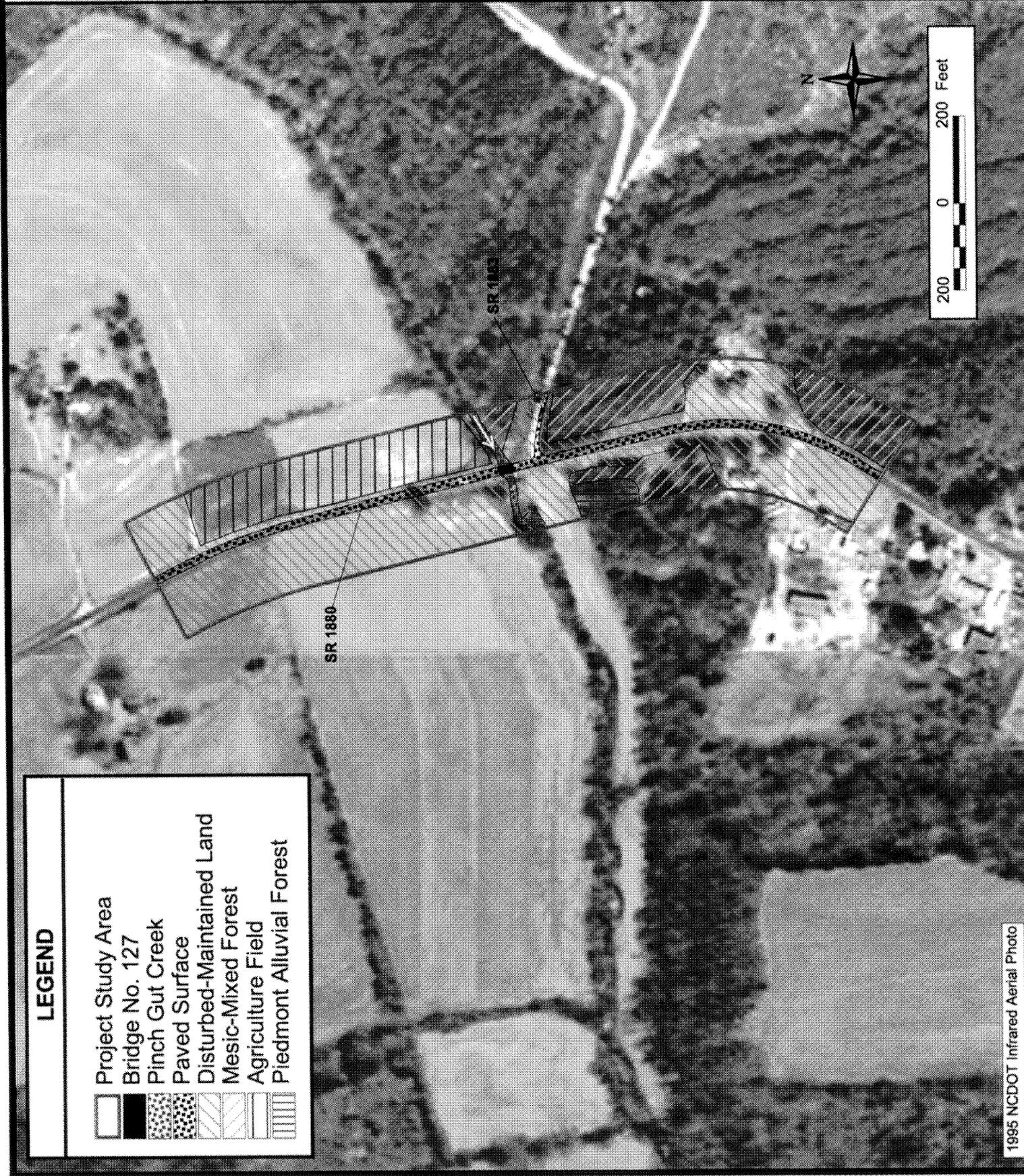
Title:

**Plant  
Communities  
and  
Land Use**

Drawn By:	ES	Checked By:	APS
Date:	MAR 2007	Scale:	AS SHOWN
ESC Project No.:		06-296.03	

FIGURE

2



**LEGEND**

-  Project Study Area
-  Bridge No. 127
-  Pinch Gut Creek
-  Paved Surface
-  Disturbed-Maintained Land
-  Mesic-Mixed Forest
-  Agriculture Field
-  Piedmont Alluvial Forest

---

study area habitats include other open-ground predators such as great-horned owl (*Bubo virginianus*), and other species that forage on invertebrates in the summer and fruits, nuts, and seeds in the winter. Such species include common grackle (*Quiscalus quiscula*), American robin (*Turdus migratorius*), eastern bluebird (*Sialia sialis*), red-winged blackbird (*Agelaius phoeniceus*), and eastern meadowlark (*Sturnella magna*) (Hamel 1992).

**Mesic-Mixed Forest** – The mesic-mixed forest community occupies a total of 1.47 acres (20 percent) in the southeast quadrant of the project study area. This community consists of mid-successional, mature forest with well developed forest strata. This stand of upland forest is adjacent to disturbed/maintained areas.

Canopy species include Virginia pine (*Pinus virginiana*), loblolly pine (*P. taeda*), tulip poplar, white oak (*Quercus alba*), black oak (*Q. velutina*), willow oak (*Q. phellos*), red maple, and box elder (*Acer negundo*). The shrub and sapling layer consists of sassafras (*Sassafras albidum*), American holly (*Ilex opaca*), and flowering dogwood (*Cornus florida*). The herbaceous layer is sparse through much of this community. Observed herbs include southern lady fern (*Athyrium asplenoides*), Christmas fern (*Polystichum acrostichoides*), pokeweed, muscadine (*Vitis rotundifolia*), common greenbrier, and poison ivy.

The Carolina chickadee (*Poecile carolinensis*) was observed during site visit. This community provides food for wildlife, while its stratification creates numerous shelter opportunities for species such as white-tailed deer (*Odocoileus virginianus*), raccoon, Virginia opossum, meadow vole, red bat, eastern mole, and eastern box turtle (*Terrapene carolina*). Wildlife species which may take advantage of food sources such as herbaceous vegetation, hardwood mast, or seeds from red maple and tulip poplar include gray squirrel (*Sciurus carolinensis*), white-footed mouse (*Peromyscus leucopus*), eastern chipmunk (*Tamias striatus*), southern flying squirrel (*Glaucomys volans*), northern cardinal (*Cardinalis cardinalis*), song sparrow (*Melospiza melodia*), tufted titmouse (*Baeolophus bicolor*), purple finch (*Carpodacus purpureus*), brown thrasher (*Toxostoma rufum*), and blue jay (*Cyanocitta cristata*). Some wildlife species that may take advantage of cover such as the forest floor, loose bark, and arboreal areas, or prey upon species utilizing these habitats include gray fox (*Urocyon cinereoargenteus*), southeastern shrew (*Sorex longirostris*), southern short-tailed shrew (*Blarina carolinensis*), eastern pipistrelle (*Pipistrellus subflavus*), sharp-shinned hawk (*Accipiter striatus*), eastern screech owl (*Otus asio*), northern flicker (*Colaptes auratus*), downy woodpecker (*Picoides pubescens*), hairy woodpecker (*Picoides villosus*), Carolina wren (*Thryothorus ludovicianus*), wood thrush (*Hylocichla mustelina*), red-eyed vireo (*Vireo olivaceus*), eastern wood-pewee (*Contopus virens*), eastern garter snake (*Thamnophis sirtalis*), copperhead (*Agkistrodon contortrix*), timber rattlesnake (*Crotalus horridus*), American toad (*Bufo americanus*), five-lined skink (*Eumeces fasciatus*), upland chorus frog (*Pseudacris triseriata*), and white-spotted slimy salamander (*Plethodon cylindriceus*).

**Agricultural Land** – Agricultural land encompasses approximately 1.39 acres (20 percent) of the project study area. This community is comprised of two open pastures located in the floodplain of the northwest and southwest quadrants of the project study area. The two fields

---

appear to have formerly served as grazing areas for livestock. A fallow field occurs in the northeast quadrant of the project study area.

Vegetation in the agricultural land community primarily consists of pasture and hayfield grasses, such as fescue. The otherwise grass monoculture is, however, diversified by opportunistic herbs such as white clover, buttercup (*Ranunculus* sp.), blackberry, microstegium (*Microstegium vimineum*), and thistle (*Carduus* sp.).

This community is similar to disturbed/maintained land in that it provides an easily-traveled corridor between forested communities as well as foraging habitat for granivores, insectivores, and carnivores, but little cover from predation. Wildlife species expected to be found within disturbed/maintained land would also be expected to occur within this community.

**Piedmont Alluvial Forest** – The Piedmont alluvial forest community constitutes approximately 0.27 acre (3 percent) of the project study area. This community occurs in the floodplain of the southwestern quadrant adjacent to Pinch Gut Creek. It consists of a mature, secondary growth forest with well developed vertical strata.

Canopy species observed in this community include box elder, sycamore, red maple, tulip poplar, river birch (*Betula nigra*) and American elm (*Ulmus americana*). Sapling and shrub layers include canopy species as well as flowering dogwood and tag alder (*Alnus serrulata*). The herbaceous layer is dense, creating a carpet layer that extends throughout the alluvial forest. The herbaceous layer consists of Virginia creeper (*Parthenocissus quinquefolia*), microstegium, pokeweed, Christmas fern, soft rush (*Juncus effusus*), jewelweed (*Impatiens pallida*), and arrowwood (*Viburnum dentatum*).

Blue jay, Carolina chickadee, and tufted titmouse were observed flying within the forest, while an American bullfrog was observed adjacent to Pinch Gut Creek. No mammals or reptiles were observed during the site visit, but observed evidence of mammal activity includes raccoon tracks and white-tailed deer scat. Much like mesic-mixed forest, this community provides food for wildlife, while its stratification creates numerous shelter opportunities for a diversity of species. Wildlife species expected to utilize mesic-mixed forest are also expected to utilize Piedmont alluvial forest. Additional wildlife species that may utilize the riparian corridor for foraging, nesting, and/or hunting include prothonotary warbler (*Protonotaria citrea*), eastern phoebe (*Sayonoris phoebe*), summer tanager (*Piranga rubra*), golden-crowned kinglet (*Regulus satrapa*), barred owl (*Strix varia*), southern ringneck snake (*Diadophis punctatus*), northern water snake (*Nerodia sipedon*), gray treefrog (*Hyla versicolor*), and spring peeper (*Pseudacris crucifer*).

### 3.2 Aquatic Communities

No sampling was undertaken in Pinch Gut Creek to determine fishery potential, and no fish species were observed during the field survey. Fish species that may be present in this reach of Pinch Gut Creek include smaller species such as margined madtom (*Noturus insignis*), rosyside dace (*Clinostomus funduloides*), spottail shiner (*Notropis hudsonius*), yellowfin shiner

(*Notropis lutipinnis*), bluehead chub (*Nocomis leptcephalus*), and redbreast sunfish (*Lepomis auritus*) (Menhinick 1991).

### 3.3 Summary of Terrestrial Communities

Plant communities within the project study area were delineated to determine the approximate area and location of each (Figure 1). A summary of plant community areas within the project study area is presented in Table 1. An additional 0.2 acre is occupied by the surface area of Pinch Gut Creek.

**Table 1.** Terrestrial Communities within the Project Study Area

Plant Community	Acres
Maintained/Disturbed Land	7.4
Mesic-Mixed Forest	2.3
Agriculture Land	2.0
Piedmont Alluvial Forest	0.2
<b>Total</b>	<b>11.9</b>

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

Turbidity and suspended sediments resulting from bridge replacement will be minimized through stringent erosion control measures.

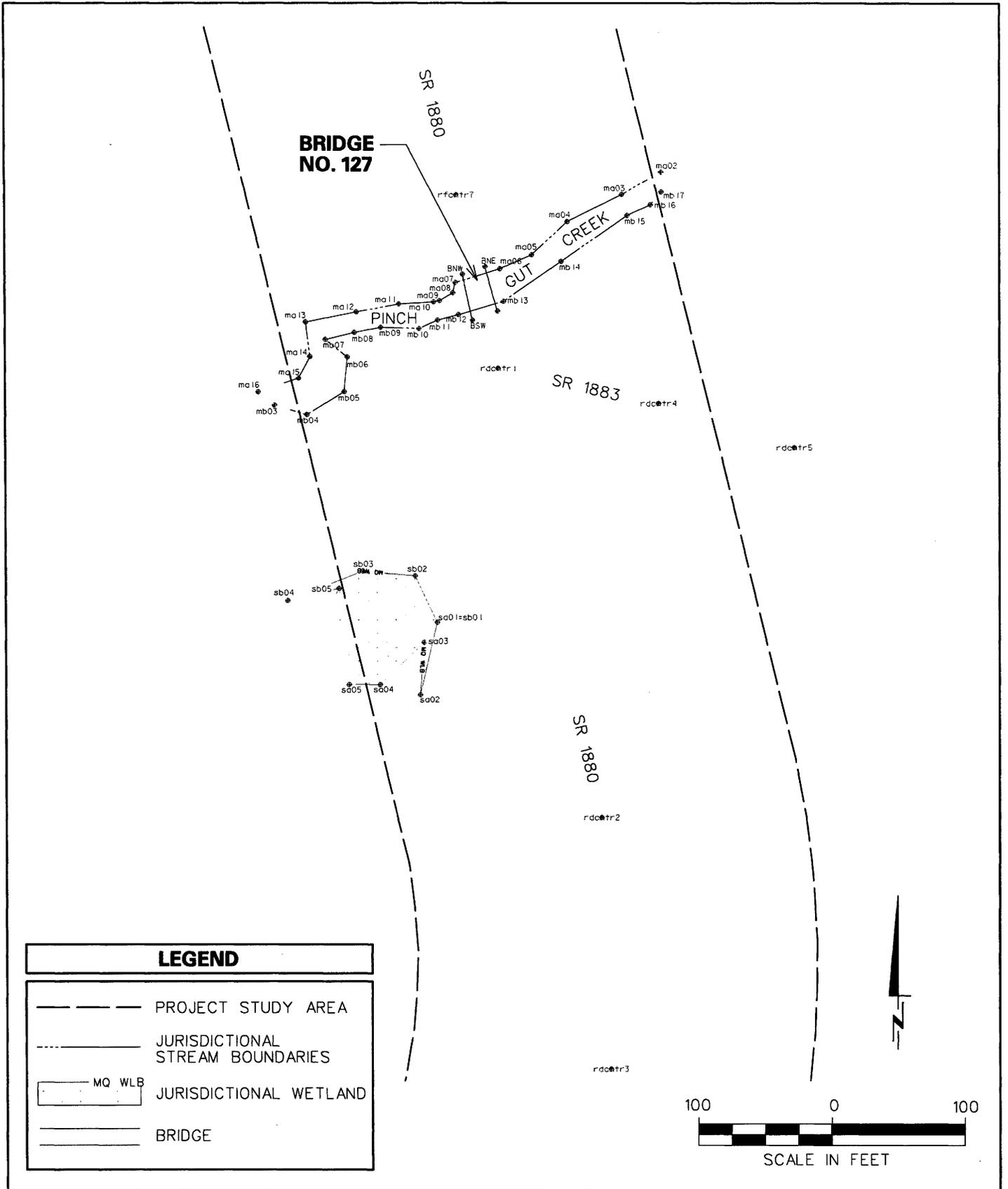
## 4.0 JURISDICTIONAL TOPICS

### 4.1 Waters of the United States

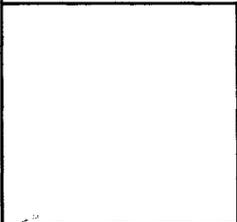
Surface waters within the project study area are subject to jurisdictional consideration under Section 404 of the Clean Water Act as waters of the United States (33 CFR Section 328.3). The National Wetlands Inventory (NWI) system for classification of wetlands and deepwater habitats was used to determine the type of wetland present (Cowardin et al. 1979). Section 404 jurisdictional areas are depicted by Figure 3.

Pinch Gut Creek exhibits the characteristics of a well-defined, second-order, perennial stream with low flow over sand, gravel, and cobble substrates. Pinch Gut Creek can be classified as riverine system, upper perennial, with an unconsolidated bottom composed of cobble, gravel, and sand (R3UB1). Pinch Gut Creek extends through the project study area for a distance of 341 linear feet, and occupies approximately 0.15 acre.

Vegetated wetlands are defined by the presence of three primary criteria: hydric soils, hydrophytic vegetation, and evidence of hydrology at or near the surface for a portion (12.5



LEGEND	
	PROJECT STUDY AREA
	JURISDICTIONAL STREAM BOUNDARIES
	JURISDICTIONAL WETLAND
	BRIDGE



Client:

Project:

**BRIDGE REPLACEMENT  
NO. 127 (B-4062)  
SR 1880 (ST. JAMES CHURCH ROAD)  
OVER PINCH GUT CREEK  
Catawba County, North Carolina**

Dwn By:	GWN	Ckd By:	ES
Date:	MAR 2007		
Scale:	1" = 100'		
ESC Project No.:	04-193		

FIGURE

**3**

---

percent) of the growing season (Environmental Laboratory 1987). The project study area contains one vegetated wetland area within the Piedmont alluvial forest. Within the project study area, the wetland occupies approximately 0.11 acre. A medium-quality, hardwood canopy dominated wetland, occurs within the project study area (Figure 2). The medium quality designation is based on North Carolina Division of Environmental Management (NCDEM) ratings guidelines [rating of 50 out of 100 (NCDEM 1995)]. Seepage from adjacent slopes seems to be the primary source of hydrology. This wetland can be classified as a palustrine, semipermanently to seasonally saturated wetland supporting broad-leaved, deciduous vegetation (PFO1Y). Soils exhibit hydric characteristics, and wetland hydrology is indicated by inundation, saturation within 12 inches of the surface, and water-stained leaves. This system would be considered a "riverine" wetland by NCDWQ, based upon its location within the Pinch Gut Creek floodplain. Since the existing bridge is proposed to be replaced by a bridge, and bridge demolition is not expected to result in impacts to open waters, the proposed project is not expected to impact Pinch Gut Creek.

Amanda Jones of the USACE was contacted on November 28, 2005 to verify the jurisdictional area delineations. No special restrictions apply beyond those outlined in *Best Management Practices for Protection of Surface Waters* and the supplements added to the document on Bridge Demolition. This project is subject to BMP-BDRs and the NCWRC's final classification.

## **4.2 Permit Issues**

### **4.2.1 Permits**

Impacts to jurisdictional areas are not anticipated from the proposed project. This project may be processed as a Categorical Exclusion (CE) under Federal Highway Administration (FHWA) guidelines. The USACE has made available Nationwide Permit (NWP) 23 (67 FR 2020, 2082; January 15, 2002) for CEs due to minimal impacts to waters of the U.S. expected with bridge construction. NCDWQ has made available a General 401 Water Quality Certification for NWP 23 (GC 3632). If temporary structures are necessary for construction activities, access fills, or dewatering of the site, then a NWP 33 (67 FR 2020, 2087; January 15, 2002) and the associated General 401 Water Quality Certification (GC 3634) will be required. If the NWPs 23 and 33 will not suffice, impacts attributed to bridge replacement and associated approach improvements may qualify under General Bridge Permit (GP) 031 issued by the Wilmington USACE District. NCDWQ has made available a General 401 Water Quality Certification for GP 031 (GC 3627). Notification to the USACE Wilmington District office is required if this general permit is utilized.

### **4.2.2 Mitigation**

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

---

these three aspects (avoidance, minimization, and compensatory mitigation) must be considered sequentially.

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

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

Compensatory mitigation is not normally considered until anticipated impacts to waters of the United States have been avoided and minimized to the maximum extent possible. It is recognized that "no net loss of wetlands" functions and values may not be achieved in each and every permit action. In accordance with 67 FR 2020, 2092 (January 15, 2002), the USACE requires compensatory mitigation when necessary to ensure that adverse effects to the aquatic environment are minimal. The size and type of the proposed project impact and the function and value of the impacted aquatic resource are factors considered in determining acceptability of appropriate and practicable compensatory mitigation. Appropriate and practicable compensatory mitigation is required for unavoidable adverse impacts which remain after all appropriate and practicable minimization has been required. Compensatory actions often include restoration, preservation and enhancement, and creation of waters of the United States. Such actions should be undertaken first in areas adjacent to or contiguous to the discharge site.

Utilization of BMPs is recommended in an effort to minimize impacts. Temporary impacts to floodplains associated with construction activities could be mitigated by replanting disturbed areas with native riparian species and removal of temporary fill material upon project completion. A final determination regarding mitigation rests with the USACE and NCDWQ.

#### **4.3 Protected Species**

NCNHP records documenting the presence of federally or state listed species were consulted on April 13, 2005. Species with the federal classification of Endangered, Threatened, or officially Proposed for such listing are protected under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). The term "Endangered Species" is defined as "any species which is in danger of extinction throughout all or a significant portion of its range," and the term "Threatened Species" is defined as "any species which is likely to become an Endangered species within the foreseeable future throughout all or a significant portion of its range" (16 U.S.C. 1532).

---

One federally protected species is listed for Catawba County (as of the September 6, 2007, USFWS list): dwarf-flowered heartleaf (*Hexastylis naniflora*), which has a federal status of Threatened.

***Hexastylis naniflora* (Dwarf-flowered heartleaf)**

Status: Threatened

Family: Birthwort

Date Listed: April 4, 1989

This species of heartleaf occurs in acidic sandy loam soils along bluffs and nearby slopes, hillsides and ravines, in boggy areas adjacent to creekheads and streams (Karl 1983). Soil type is the most important habitat requirement (Pacolet, Madison, or Musella types). They need sunlight in early spring for maximum flowering and seed production. A distinguishing characteristic of dwarf-flowered heartleaf is that this species has the smallest flowers of any North American *Hexastylis*. Most flowers are less than 0.4 inch long, with narrow sepal tubes (never more than 0.28 inch wide). The jug-shaped flowers range from beige to dark brown, sometimes greenish or purplish. Leathery evergreen leaves are dark green and heart-shaped (Karl 1983). In North Carolina, dwarf-flowered heartleaf is known from a few southwestern Piedmont counties (Franklin and Finnegan 2006).

**BIOLOGICAL CONCLUSION: NO EFFECT**

The NCNHP has no documentation for dwarf-flowered heartleaf within 1.0 mile of the project study area, and no dwarf-flowered heartleaf specimens were observed during the field visit. Suitable habitat includes acidic sandy loam soils along bluffs and nearby slopes, hillsides and ravines, in boggy areas adjacent to creekheads and streams. A systematic survey for dwarf-flowered heartleaf was conducted within wooded areas and along the banks of Pinch Gut Creek within the project study area on April 14, 2005 by EcoScience staff member, Mr. O'Loughlin. No specimens of dwarf-flowered heartleaf were located, thus the presence of this species within the project study area can be discounted.

**Federal Species of Concern** - The September 6, 2007 USFWS list also includes a category of species designated as "Federal species of concern" (FSC). FSC are not afforded federal protection under the Endangered Species Act of 1973, as amended, and are not subject to any of its provisions, including Section 7, until they are formally proposed or listed as Threatened or Endangered. An FSC is defined as a species that is under consideration for listing for which there is insufficient information to support listing. In addition, FSC listed as Endangered (E), Threatened (T), or Special Concern (SC) by the NCNHP list of Rare Plant and Animal Species are afforded state protection under the N.C. State Endangered Species Act and the N.C. Plant Protection and Conservation Act of 1979, as amended. NCNHP files list no documentation for FSC species within 2.0 miles of the project study area (Franklin and Finnegan 2006, LeGrand and Hall, 2006). Three FSC species are listed for Catawba County (as of September 6, 2007) and are listed in Table 2.

Habitat for the woodrat consists of forests, mainly in moist areas. Scattered woodlots along watercourses in and near the project study area may contain habitat for the Southern Appalachian eastern woodrat. Catawba crayfish ostracods are symbiotic to crayfish on Lyle

Creek in the Catawba drainage. The reach of Pinch Gut Creek within the project study area does not provide suitable habitat for Catawba crayfish because it is in a separate sub-basin. Sweet pinesap is found in pine dominated forests and on bluffs. Suitable habitat for sweet pinesap exists within the project study area. No FSC species were observed during field investigations, and the NCNHP lists no occurrences of FSC species within 2.0 miles of the project study area.

**Table 2. Federal Species of Concern (FSC) Listed for Catawba County**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Potential Habitat</b>	<b>State Status*</b>
Southern Appalachian eastern woodrat	<i>Neotoma floridana haematoreia</i>	Yes	T
Catawba crayfish ostracod	<i>Dactyloctyhere isabelae</i>	No	SR
Sweet pinesap	<i>Monotropsis odorata</i>	Yes	SR-T

\*State Status: T = Endangered; SC = Species of Concern; SR = Significantly Rare; and SR-T = Significantly Rare throughout species' range (Franklin et al. 2006, LeGrand et al. 2006).

---

## 5.0 REFERENCES

- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. FWS/OBS -79/31. Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC. 103 pp.
- Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS. 169 pp.
- Franklin, M.A. and J. T. Finnegan. 2006. Natural Heritage Program List of the Rare Plant Species of North Carolina. North Carolina Natural Heritage Program, Division of Parks and Recreation, N.C. Department of Environment, Health and Natural Resources, Raleigh.
- Gregory, J. D. 2002. Hydric Soils and Growing Season: Wetland Delineation Data for North Carolina. Department of Forestry, NC State University, Raleigh, NC. 33 pp.
- Griffith, G.E., J.M. Omernik, J.A. Comstock, M.P. Schafale, W.H. McNab, D.R. Lenat, T.F. MacPherson, J.B. Glover, and V.B. Shelbourne. 2002. Ecoregions of North Carolina and South Carolina (color poster with map, descriptive text, summary table, and photographs). U.S. Geological Survey, Reston, Virginia.
- Hamel, P.B. 1992. Land Manager's Guide to the Birds of the South. The Nature Conservancy, Southeastern Region, Chapel Hill, NC. 437 pp.
- Kral, R. 1983. A Report on Some Rare, Threatened, or Endangered Forest-related Vascular Plants of the South. United States Department of Agriculture, Forest Service, Southern Region, Atlanta, GA. Technical Publication R8-TP 2. 1305 pp.
- Kartesz, J. 1998. A Synonymized Checklist of the Vascular Flora of the United States, Puerto Rico, and the Virgin Islands. Biota of North America Program.
- LeGrand, H.E., S.E. McRae, S.P. Hall, and J.T. Finnegan. 2006. Natural Heritage Program List of the Rare Animal Species of North Carolina. North Carolina Natural Heritage Program, Office of Conservation and Community Affairs, N.C. Department of Environment and Natural Resources, Raleigh.
- Martof, B.S., W.M. Palmer, J.R. Bailey, and J.R. Harrison III. 1980. Amphibians and Reptiles of the Carolinas and Virginia. The University of North Carolina Press, Chapel Hill, NC. 264 pp.
- Menhinick, E.F. 1991. The Freshwater Fishes of North Carolina. North Carolina Wildlife Resources Commission, Raleigh. 227 pp.

- 
- North Carolina Division of Environmental Management (NCDEM). 1995. Guidance for Rating the Values of Wetlands in North Carolina. North Carolina Department of Environment, Health, and Natural Resources, Raleigh.
- North Carolina Division of Environmental Management (NCDEM). 1996. A Field Guide to North Carolina Wetlands. North Carolina Department of Environment, Health, and Natural Resources, Raleigh.
- North Carolina Division of Water Quality (NCDWQ). 2004a. List of Active Permits (online). Available: [http://h2o.enr.state.nc.us/NPDES/documents/BIMS\\_041204.xls](http://h2o.enr.state.nc.us/NPDES/documents/BIMS_041204.xls) [July 16, 2004]. North Carolina Department of Environment and Natural Resources, Raleigh.
- North Carolina Division of Water Quality (NCDWQ). 2004b. North Carolina Waterbodies Listed by Subbasin (online). Available: <http://h2o.enr.state.nc.us/bims/reports/basinsandwaterbodies/03-08-35.pdf> [July 16, 2004]. North Carolina Department of Environment and Natural Resources, Raleigh.
- North Carolina Division of Water Quality (NCDWQ). 2004c. Catawba River Basinwide Water Quality Management Plan. North Carolina Department of Environment and Natural Resources, Raleigh.
- N.C. Division of Water Quality (NCDWQ). 2006. Water Quality Assessment and Impaired Waters List (online). Available: [http://h2o.enr.state.nc.us/tmdl/General\\_303d.htm](http://h2o.enr.state.nc.us/tmdl/General_303d.htm). North Carolina Department of Environment and Natural Resources, Raleigh. [October 2006].
- North Carolina Natural Heritage Program (NCNHP). 1999. List of Significant Natural Heritage Areas. North Carolina Division of Parks and Recreation, Department of Environment and Natural Resources. Raleigh, NC.
- North Carolina Office of Conservation and Community Affairs (NCOCCA). 2004. On-line Database Search (online). Available: <http://www.ncsparks.net/nhp/search.html> [July 26, 2004]. North Carolina Department of Environment and Natural Resources, Raleigh.
- Palmer, W.M. and A.L. Braswell. 1995. Reptiles of North Carolina. The University of North Carolina Press, Chapel Hill, NC. 412 pp.
- Potter, E.F., J.F. Parnell, and R.P. Teulings. 1980. Birds of the Carolinas. The University of North Carolina Press, Chapel Hill, NC. 408 pp.
- Radford, A.E., H.E. Ahles, and C.R. Bell. 1968. Manual of the Vascular Flora of the Carolinas. The University of North Carolina Press, Chapel Hill, NC. 1183 pp.
- Rohde, F.C., R.G. Arndt, D.G. Lindquist, and J.F. Parnell. 1994. Freshwater Fishes of the Carolinas, Virginia, Maryland, and Delaware. The University of North Carolina Press, Chapel Hill, N.C. 222 pp.

---

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

Soil Conservation Service (NRCS). 1975. Soil Survey of Catawba County, North Carolina, USDA National Cooperative Soil Survey

United States Army Corps of Engineers (USACE), United States Environmental Protection Agency (USEPA), North Carolina Wildlife Resources Commission (NCWRC), Natural Resources Conservation Service (NRCS), and the North Carolina Division of Water Quality (NCDWQ). 2003. Stream Mitigation Guidelines. State of North Carolina.

United States Fish and Wildlife Service (USFWS). 2005. Catawba County Endangered Species, Threatened Species, and Federal Species of Concern (online). Available: <http://nc-es.fws.gov/es/cntylist/catawba.html> [April 13, 2005]. U.S. Fish and Wildlife Service.

United States Fish and Wildlife Service (USFWS). 2002. National Wetlands Inventory (NWI) (online). Available: <http://www.nwi.fws.gov> [July 16, 2004]. U.S. Fish and Wildlife Service.

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

**APPENDIX**

**Completed USACE Data Forms**

**DATA FORM  
ROUTINE WETLAND DETERMINATION  
(1987 COE Wetlands Delineation Manual)**

<b>Project/Site:</b> B-4062	<b>Date:</b> 9/5/04
<b>Applicant/Owner:</b> NCDOT	<b>County:</b> Catawba
<b>Investigator:</b> M. Thomas - EcoScience	<b>State:</b> NC
<b>Do Normal Circumstances Exist on the Site?</b> Yes      No	<b>Community ID:</b> Bottomland Hardwood
<b>Is the site significantly disturbed (Atypical)?</b> Yes      No	<b>Transect ID:</b> SB03
<b>Is the area a potential problem area?</b> Yes      No	<b>Plot ID:</b> Wet

**VEGETATION**

<i>Dominant Plant Species</i>	<i>Stratum</i>	<i>Indicator</i>	<i>Dominant Plant Species</i>	<i>Stratum</i>	<i>Indicator</i>
1. <i>Acer rubrum</i>	C	FAC	9. _____	_____	_____
2. <i>Liriodendron tulipifera</i>	C	FAC	10. _____	_____	_____
3. <i>Magnolia macrophylla</i>	_____	_____	11. _____	_____	_____
4. <i>Arundinaria gigantea</i>	S	FACW	12. _____	_____	_____
5. <i>Impatiens pallida</i>	H	FACW	13. _____	_____	_____
6. <i>Microstegium vimineum</i>	H	FAC+	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) 100%

Remarks:

**HYDROLOGY**

<p>____ Recorded Data (Describe in Remarks)</p> <p>____ Stream, Lake or Tide Gauge</p> <p>____ Aerial Photographs</p> <p>____ Other</p> <p><input checked="" type="checkbox"/> No Recorded Data Available</p> <p><i>Field Observations:</i></p> <p>Depth of Surface Water: _____ (in.)</p> <p>Depth to Free Water in Pit: <u>1</u> (in.)</p> <p>Depth to Saturated Soil: <u>0</u> (in.)</p>	<p><i>Primary Wetland Hydrology Indicators:</i></p> <p>____ Inundated</p> <p><input checked="" type="checkbox"/> Saturated in Upper 12 Inches</p> <p>____ Water Marks</p> <p>____ Drift Lines</p> <p>____ Sediment Deposits</p> <p><input checked="" type="checkbox"/> Drainage Patterns in Wetlands</p> <p><i>Secondary Indicators: (2 or more required):</i></p> <p>____ Oxidized Root Channels in Upper 12 Inches</p> <p>____ Water-Stained Leaves</p> <p>____ Local Soil Survey Data</p> <p>____ FAC-Neutral Test</p> <p>____ Other (Explain in Remarks)</p>
---	--

Remarks:

**SOILS**

Map Unit Name (Series and Phase): Chewacla loam,  
 Taxonomy (Subgroup): Fluvaquentic Dystrudepts  
 Drainage Class: SWPD  
 Field Observations Confirm Mapped Type: Yes No

**Profile Description:**

<u>Depth</u> <u>(inches)</u>	<u>Horizon</u>	<u>Matrix Color</u> <u>(Munsell Moist)</u>	<u>Mottle Colors</u> <u>(Munsell Moist)</u>	<u>Mottle</u> <u>Abundance/Contrast</u>	<u>Texture, Concretions</u> <u>Structure, etc.</u>
0 - 8	A	7.5YR 5/6	10YR 5/4	Few, faint	Fine, clay loam
8 - 12+	B	10YR 4/1	7.5YR 5/6	Many, common	Fine, clay loam

**Hydric Soil Indicators:**

- |   |   |
|---|---|
| <input type="checkbox"/> Histosol                               | <input type="checkbox"/> Concretions  |
| <input type="checkbox"/> Histic Epipedon                        | <input type="checkbox"/> High Organic Content in Surface layer in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor                          | <input type="checkbox"/> Organic Streaking in Sandy Soils                     |
| <input type="checkbox"/> Aquic Moisture Regime                  | <input type="checkbox"/> Listed on Local Hydric Soils List                    |
| <input type="checkbox"/> Reducing Conditions                    | <input type="checkbox"/> Listed on National Hydric Soils List                 |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | <input type="checkbox"/> Other (Explain in Remarks)                           |

Remarks:

**WETLAND DETERMINATION**

Hydrophytic Vegetation Present? <b>Yes</b> <b>No</b>	Is this Sampling Point Within a Wetland?  <b>Yes</b> <b>No</b>
Wetland Hydrology Present? <b>Yes</b> <b>No</b>	
Hydric Soils Present? <b>Yes</b> <b>No</b>	
Remarks:	

**DATA FORM  
ROUTINE WETLAND DETERMINATION  
(1987 COE Wetlands Delineation Manual)**

<b>Project/Site:</b> B-4062	<b>Date:</b> 9/5/04
<b>Applicant/Owner:</b> NCDOT	<b>County:</b> Catawba
<b>Investigator:</b> M. Thomas - EcoScience	<b>State:</b> NC
<b>Do Normal Circumstances Exist on the Site?</b> Yes      No	<b>Community ID:</b> Bottomland Hardwood
<b>Is the site significantly disturbed (Atypical)?</b> Yes      No	<b>Transect ID:</b> SB03
<b>Is the area a potential problem area?</b> Yes      No	<b>Plot ID:</b> Up

**VEGETATION**

<i>Dominant Plant Species</i>	<i>Stratum</i>	<i>Indicator</i>	<i>Dominant Plant Species</i>	<i>Stratum</i>	<i>Indicator</i>
1. <u>Acer rubrum</u>	C	FAC	9. _____	_____	_____
2. <u>Carya tomentosa</u>	C	UPL	10. _____	_____	_____
3. <u>Smilax rotundifolia</u>	S	FAC	11. _____	_____	_____
4. <u>Carex (sp.)</u>	H		12. _____	_____	_____
5. _____			13. _____	_____	_____
6. _____			14. _____	_____	_____
7. _____			15. _____	_____	_____
8. _____			16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) 33%

Remarks:

**HYDROLOGY**

<p>____ Recorded Data (Describe in Remarks)</p> <p>____ Stream, Lake or Tide Gauge</p> <p>____ Aerial Photographs</p> <p>____ Other</p> <p><u>x</u> No Recorded Data Available</p> <p><i>Field Observations:</i></p> <p>Depth of Surface Water: _____ (in.)</p> <p>Depth to Free Water in Pit: _____ (in.)</p> <p>Depth to Saturated Soil: <u>&gt;</u> <u>12</u> (in.)</p>	<p><i>Primary Wetland Hydrology Indicators:</i></p> <p>____ Inundated</p> <p>____ Saturated in Upper 12 Inches</p> <p>____ Water Marks</p> <p>____ Drift Lines</p> <p>____ Sediment Deposits</p> <p>____ Drainage Patterns in Wetlands</p> <p><i>Secondary Indicators: (2 or more required):</i></p> <p>____ Oxidized Root Channels in Upper 12 Inches</p> <p>____ Water-Stained Leaves</p> <p>____ Local Soil Survey Data</p> <p>____ FAC-Neutral Test</p> <p>____ Other (Explain in Remarks)</p>
Remarks:	

**SOILS**

Map Unit Name (Series and Phase): Chewacla loam,  
 Taxonomy (Subgroup): Fluvaquentic Dystrudepts  
 Drainage Class: SWPD  
 Field Observations Confirm Mapped Type: Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0 - 12+	A	10YR 5/6			Fine, sandy loam

Hydric Soil Indicators:

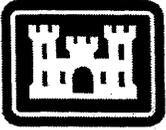
<input type="checkbox"/> Histosol	<input type="checkbox"/> Concretions
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High Organic Content in Surface layer in Sandy Soils
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils
<input type="checkbox"/> Aquic Moisture Regime	<input type="checkbox"/> Listed on Local Hydric Soils List
<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Listed on National Hydric Soils List
<input type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Other (Explain in Remarks)

Remarks:

**WETLAND DETERMINATION**

Hydrophytic Vegetation Present? <b>Yes</b> <b>No</b>	Is this Sampling Point Within a Wetland?  <b>Yes</b> <b>No</b>
Wetland Hydrology Present? <b>Yes</b> <b>No</b>	
Hydric Soils Present? <b>Yes</b> <b>No</b>	

Remarks:



## STREAM QUALITY ASSESSMENT WORKSHEET



Provide the following information for the stream reach under assessment:

1. Applicant's name: NCDOT
2. Evaluator's name: Matthew D. Thomas.
3. Date of evaluation: 09/05/04
4. Time of evaluation: 2 pm
5. Name of stream: Pinch Gut Creek
6. River basin: Catawba
7. Approximate drainage area: 2,180 ac
8. Stream order: 3<sup>rd</sup>
9. Length of reach evaluated: 325 ft
10. County: Catawba
11. Site coordinates (if known): 35.6145°N, 81.1894°W
12. Subdivision name (if any): \_\_\_\_\_
13. Location of reach under evaluation (note nearby roads and landmarks and attach map identifying stream(s) location): \_\_\_\_\_  
Located on SR 1880 south of intersection of SR 1880 and SR 1883
14. Proposed channel work (if any): Bridge replacement
15. Recent weather conditions: 85°F, partly cloudy
16. Site conditions at time of visit: Avg. temps., avg. ppt.
17. Identify any special waterway classifications known:
 

Section 10	Tidal Waters	Essential Fisheries Habitat	
Trout Waters	Outstanding Resource Waters	Nutrient Sensitive Waters	Water Supply Watershed _____ (I-IV)
18. Is there a pond or lake located upstream of the evaluation point? **YES NO** If yes, estimate the water surface area: 3, 1 ac ponds
19. Does channel appear on USGS quad map? **YES NO**
20. Does channel appear on USDA Soil Survey? **YES NO**
21. Estimated watershed land use:
 

<u>10%</u> Residential	____% Commercial	____% Industrial	<u>40%</u> Agricultural
<u>40%</u> Forested	<u>10%</u> Cleared / Logged	____% Other ( _____ )	
22. Bankfull width: \_\_\_\_\_ 15'
23. Bank height (from bed to top of bank): \_\_\_\_\_ 3 -4'
24. Channel slope down center of stream:
 

Flat (0 to 2%)	<b>Gentle (2 to 4%)</b>	Moderate (4 to 10%)	Steep (>10%)
----------------	-------------------------	---------------------	--------------
25. Channel sinuosity:
 

Straight	<b>Occasional bends</b>	Frequent meander	Very sinuous	Braided channel
----------	-------------------------	------------------	--------------	-----------------

**Instructions for completion of worksheet (located on page 2):** Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 49

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Evaluator's Signature \_\_\_\_\_

Date \_\_\_\_\_

This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in gathering the data required by the United States Army Corps of Engineers to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change – version 06/03. To Comment, please call 919-876-8441 x 26.

# STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	<b>Presence of flow / persistent pools in stream</b> (no flow or saturation = 0; strong flow = max points)	0-5	0-4	0-5	3
	2	<b>Evidence of past human alteration</b> (extensive alteration = 0; no alteration = max points)	0-6	0-5	0-5	3
	3	<b>Riparian zone</b> (no buffer = 0; contiguous, wide buffer = max points)	0-6	0-4	0-5	1
	4	<b>Evidence of nutrient or chemical discharges</b> (extensive discharges = 0; no discharges = max points)	0-5	0-4	0-4	3
	5	<b>Groundwater discharge</b> (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0-3	0-4	0-4	2
	6	<b>Presence of adjacent floodplain</b> (no floodplain = 0; extensive floodplain = max points)	0-4	0-4	0-2	2
	7	<b>Entrenchment / floodplain access</b> (deeply entrenched = 0; frequent flooding = max points)	0-5	0-4	0-2	0
	8	<b>Presence of adjacent wetlands</b> (no wetlands = 0; large adjacent wetlands = max points)	0-6	0-4	0-2	2
	9	<b>Channel sinuosity</b> (extensive channelization = 0; natural meander = max points)	0-5	0-4	0-3	2
	10	<b>Sediment input</b> (extensive deposition = 0; little or no sediment = max points)	0-5	0-4	0-4	1
	11	<b>Size &amp; diversity of channel bed substrate</b> (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0-4	0-5	2
STABILITY	12	<b>Evidence of channel incision or widening</b> (deeply incised = 0; stable bed & banks = max points)	0-5	0-4	0-5	1
	13	<b>Presence of major bank failures</b> (severe erosion = 0; no erosion, stable banks = max points)	0-5	0-5	0-5	2
	14	<b>Root depth and density on banks</b> (no visible roots = 0; dense roots throughout = max points)	0-3	0-4	0-5	3
	15	<b>Impact by agriculture, livestock, or timber production</b> (substantial impact = 0; no evidence = max points)	0-5	0-4	0-5	1
	16	<b>Presence of riffle-pool/ripple-pool complexes</b> (no riffles/ripples or pools = 0; well-developed = max points)	0-3	0-5	0-6	3
HABITAT	17	<b>Habitat complexity</b> (little or no habitat = 0; frequent, varied habitats = max points)	0-6	0-6	0-6	3
	18	<b>Canopy coverage over streambed</b> (no shading vegetation = 0; continuous canopy = max points)	0-5	0-5	0-5	3
	19	<b>Substrate embeddedness</b> (deeply embedded = 0; loose structure = max)	NA*	0-4	0-4	3
	20	<b>Presence of stream invertebrates (see page 4)</b> (no evidence = 0; common, numerous types = max points)	0-4	0-5	0-5	2
BIOLOGY	21	<b>Presence of amphibians</b> (no evidence = 0; common, numerous types = max points)	0-4	0-4	0-4	2
	22	<b>Presence of fish</b> (no evidence = 0; common, numerous types = max points)	0-4	0-4	0-4	2
	23	<b>Evidence of wildlife use</b> (no evidence = 0; abundant evidence = max points)	0-6	0-5	0-5	3
	<b>Total Points Possible</b>			100	100	100
<b>TOTAL SCORE</b> (also enter on first page)						49

\* These characteristics are not assessed in coastal streams.