



PAT McCrory  
*Governor*

NICHOLAS J. TENNYSON  
*Secretary*

June 1, 2016

U. S. Army Corps of Engineers  
Regulatory Field Office  
3331 Heritage Trade Drive, Suite 105  
Wake Forest, NC 27587

ATTN: Mr. David E. Bailey  
NCDOT Coordinator

Subject: **Application for Section 404 Nationwide Permit 13, 23 and 33 and Section 401 Water Quality Certification** for the proposed replacement of Bridge No. 169 over Cascade Creek on NC 770 in Rockingham County, Federal Aid Project No. BRSTP-0770(4), Division 7, TIP No. B-5343, Debit \$240 from WBS 46057.1.1.

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 169 over Cascade Creek with a 70' long, single span on existing alignment. Traffic will be maintained during construction via an on-site detour.

As a result of the bridge replacement and onsite temporary detour, there will be 15 feet of permanent bank stabilization, 10 feet of temporary bank stabilization, and 0.03 acre of temporary surface water impact for the construction of a temporary causeway to remove the interior bent of the existing structure.

An adjacent, undersized pipe approaching the bridge will also have to be replaced. This will result in 0.01 acre of permanent fill in wetlands, and 0.01 acre of mechanized clearing in wetlands.

Please see enclosed copies of the Pre-Construction Notification (PCN), stormwater management plan, permit drawings, design plans, Division of Mitigation Services acceptance letter, and Biological Opinion for the Roanoke logperch for the above-referenced project. The Categorical Exclusion (CE) was completed on May 28, 2015 and distributed shortly thereafter. Additional copies are available upon request.

This project calls for a letting date of November 15, 2016 and a review date of September 27, 2016; however, the let date may advance as additional funding becomes available.



A copy of this permit application and its distribution list will be posted on the NCDOT Website at: <http://connect.ncdot.gov/resources/Environmental>. If you have any questions or need additional information, please call Michael Turchy at (919) 707-6157.

Sincerely,



for

Philip S. Harris III, P.E., C.P.M.  
Natural Environment Section Head

cc:  
NCDOT Permit Application Standard Distribution List



Office Use Only:  
 Corps action ID no. \_\_\_\_\_  
 DWQ project no. \_\_\_\_\_  
 Form Version 1.4 January 2009

<b>Pre-Construction Notification (PCN) Form</b>		
<b>A. Applicant Information</b>		
<b>1. Processing</b>		
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: <b>13, 23, 33</b> 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"/> <b>No</b>	
1d. Type(s) of approval sought from the DWQ (check all that apply):		
<input checked="" type="checkbox"/> <b>401 Water Quality Certification – Regular</b> <input type="checkbox"/> Non-404 Jurisdictional General Permit <input type="checkbox"/> 401 Water Quality Certification – Express <input type="checkbox"/> Riparian Buffer Authorization		
1e. Is this notification solely for the record because written approval is not required?	For the record only for DWQ 401 Certification: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> <b>No</b>	For the record only for Corps Permit: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> <b>No</b>
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"/> <b>Yes</b> <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"/> <b>No</b>	
1h. Is the project located within a NC DCM Area of Environmental Concern (AEC)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> <b>No</b>	
<b>2. Project Information</b>		
2a. Name of project:	<b>Replacment of Bridge 169 over Cascade Creek on NC 770 in Rockingham County.</b>	
2b. County:	<b>Rockingham</b>	
2c. Nearest municipality / town:	<b>Eden</b>	
2d. Subdivision name:	<b>n/a</b>	
2e. NCDOT only, T.I.P. or state project no:	<b>B-5343</b>	
<b>3. Owner Information</b>		
3a. Name(s) on Recorded Deed:	<b>n/a</b>	
3b. Deed Book and Page No.	<b>n/a</b>	
3c. Responsible Party (for LLC if applicable):	<b>n/a</b>	
3d. Street address:	<b>n/a</b>	
3e. City, state, zip:	<b>n/a</b>	
3f. Telephone no.:	<b>n/a</b>	
3g. Fax no.:	<b>n/a</b>	
3h. Email address:	<b>n/a</b>	

<b>4. Applicant Information (if different from owner)</b>	
4a. Applicant is:	<input type="checkbox"/> Agent <input type="checkbox"/> Other, specify:
4b. Name:	
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:	
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):	
1b. Site coordinates (in decimal degrees):	Latitude: <b>36°31'54.2"N</b> Longitude: <b>- 79°39'00.1"W</b> (DD.DDDDDD) (-DD.DDDDDD)
1c. Property size:	<b>2 acres</b>
<b>2. Surface Waters</b>	
2a. Name of nearest body of water (stream, river, etc.) to proposed project:	<b>Cascade Creek</b>
2b. Water Quality Classification of nearest receiving water:	<b>C</b>
2c. River basin:	<b>Roanoke</b>
<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: <b>General land use around the project is forested and agricultural</b>	
3b. List the total estimated acreage of all existing wetlands on the property: <b>0.0062</b>	
3c. List the total estimated linear feet of all existing streams (intermittent and perennial) on the property: <b>150'</b>	
3d. Explain the purpose of the proposed project: <b>To replace structurally deficient and functionally obsolete bridge.</b>	
3e. Describe the overall project in detail, including the type of equipment to be used: <b>The project involves replacing a 50-foot two-span bridge with a 70-foot long single span bridge. Traffic will be maintained on an on-site, temporary detour structure downstream as due to no suitable off-site detour exists. Standard road building equipment, such as trucks, dozers, and cranes will be use.</b>	
<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: <b>Request date March 17, 2014</b>	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> No <input type="checkbox"/> Unknown
4b. If the Corps made the jurisdictional determination, what type of determination was made?	<input checked="" type="checkbox"/> <b>Preliminary</b> <input type="checkbox"/> Final
4c. If yes, who delineated the jurisdictional areas? Name (if known): <b>Gregory W. Price</b>	Agency/Consultant Company: <b>NCDOT</b> 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"/> <b>No</b> <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"/> <b>No</b>
6b. If yes, explain.	

C. Proposed Impacts Inventory

<b>1. Impacts Summary</b>						
1a. Which sections were completed below for your project (check all that apply):						
<input checked="" type="checkbox"/> <b>Wetlands</b> <input checked="" type="checkbox"/> <b>Streams - tributaries</b> <input type="checkbox"/> Buffers <input type="checkbox"/> Open Waters <input type="checkbox"/> Pond Construction						
<b>2. Wetland Impacts</b>						
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)	
<b>Site 1</b> <input checked="" type="checkbox"/> P <input type="checkbox"/> T	<b>Fill</b>	Riverine Swamp Forest	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> No	<input checked="" type="checkbox"/> <b>Corps</b> <input type="checkbox"/> DWQ	<b>0.01</b>	
<b>Site 1</b> <input checked="" type="checkbox"/> P <input type="checkbox"/> T	<b>Mechanized Clearing</b>	Riverine Swamp Forest	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> No	<input checked="" type="checkbox"/> <b>Corps</b> <input type="checkbox"/> DWQ	<b>&lt;0.01</b>	
<b>2g. Total wetland impacts</b>					<b>0.01</b>	
2h. Comments:						
<b>3. Stream Impacts</b>						
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)
<b>Site 2</b> <input checked="" type="checkbox"/> P <input type="checkbox"/> T	<b>Bank Stabilization</b>	<b>Cascade Creek</b>	<input checked="" type="checkbox"/> <b>PER</b> <input type="checkbox"/> INT	<input checked="" type="checkbox"/> <b>Corps</b> <input type="checkbox"/> DWQ	<b>45</b>	<b>&lt;0.01 ac (15')</b>
<b>Site 2</b> <input type="checkbox"/> P <input checked="" type="checkbox"/> T	<b>Temporary Impact from Bank Stabilization</b>	<b>Cascade Creek</b>	<input checked="" type="checkbox"/> <b>PER</b> <input type="checkbox"/> INT	<input checked="" type="checkbox"/> <b>Corps</b> <input type="checkbox"/> DWQ	<b>45</b>	<b>&lt;0.01 ac (10')</b>
<b>Site 2</b> <input type="checkbox"/> P <input checked="" type="checkbox"/> T	<b>Temporary Causeway</b>	<b>Cascade Creek</b>	<input checked="" type="checkbox"/> <b>PER</b> <input type="checkbox"/> INT	<input checked="" type="checkbox"/> <b>Corps</b> <input type="checkbox"/> DWQ	<b>45</b>	<b>0.03 ac (48')</b>
<b>3h. Total stream and tributary impacts</b>					<b>Temporary: 0.03 ac (58')</b> <b>Permanent: &lt;0.01 (15')</b>	
3i. Comments:						

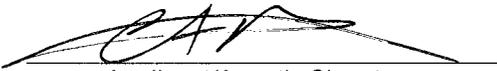
<b>4. Open Water Impacts</b>								
If there are proposed impacts to lakes, ponds, estuaries, tributaries, sounds, the Atlantic Ocean, or any other open water of the U.S. then individually list all open water impacts below.								
4a. Open water impact number – Permanent (P) or Temporary (T)	4b. Name 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>								
4g. Comments:								
<b>5. Pond or Lake Construction</b>								
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:								

<b>6. Buffer Impacts (for DWQ)</b>					
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 <b>MUST</b> 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:					
<b>D. Impact Justification and Mitigation</b>					
<b>1. Avoidance and Minimization</b>					
1a. Specifically describe measures taken to avoid or minimize the proposed impacts in designing project.  <p><b>The proposed replacement bridge will be very close to the same alignment as the existing bridge and will be longer single span structure. Permanent impacts to Cascade Creek have been reduced to only bank stabilization. The temporary work pad will be in for only as long as a practicable to remove the existing bridge bent. An undersized pipe on the bridge approaches will be replaced which is responsible for the wetland impacts. No new roadside ditches were introduced as part of this project. The ditches along the driveways are both acting as grass swales. The velocity of both roadside ditches draining into the wetlands is less than 2 feet per second.</b></p>					
1b. Specifically describe measures taken to avoid or minimize the proposed impacts through construction techniques.  <p><b>Design Standards for Sensitive Waters will be implemented for this project as a condition of the Biological Opinion for the Roanoke Logperch. Best Management Practices (BMPs) will be utilized during construction to attempt to reduce the stormwater impacts to the receiving streams due to erosion and runoff.</b></p>					
<b>2. Compensatory Mitigation for Impacts to Waters of the U.S. or Waters of the State</b>					
2a. Does the project require Compensatory Mitigation for impacts to Waters of the U.S. or Waters of the State?			<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> No		
2b. If yes, mitigation is required by (check all that apply):			<input type="checkbox"/> DWQ <input checked="" type="checkbox"/> <b>Corps</b>		
2c. If yes, which mitigation option will be used for this project?			<input type="checkbox"/> Mitigation bank <input checked="" type="checkbox"/> <b>Payment to in-lieu fee program</b> <input type="checkbox"/> Permittee Responsible Mitigation		

<b>3. Complete if Using a Mitigation Bank</b>				
3a. Name of Mitigation Bank:				
3b. Credits Purchased (attach receipt and letter)			Type	Quantity
3c. Comments:				
<b>4. Complete if Making a Payment to In-lieu Fee Program</b>				
4a. Approval letter from in-lieu fee program is attached.			<input checked="" type="checkbox"/> Yes	
4b. Stream mitigation requested:			linear feet	
4c. If using stream mitigation, stream temperature:			<input type="checkbox"/> warm <input type="checkbox"/> cool <input type="checkbox"/> cold	
4d. Buffer mitigation requested (DWQ only):			square feet	
4e. Riparian wetland mitigation requested:			0.01 acre	
4f. Non-riparian wetland mitigation requested:			acres	
4g. Coastal (tidal) wetland mitigation requested:			acres	
4h. Comments:				
<b>5. Complete if Using a Permittee Responsible Mitigation Plan</b>				
5a. If using a permittee responsible mitigation plan, provide a description of the proposed mitigation plan.				
<b>6. Buffer Mitigation (State Regulated Riparian Buffer Rules) – required by DWQ</b>				
6a. Will the project result in an impact within a protected riparian buffer that requires buffer mitigation?			<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
6b. If yes, then identify the square feet of impact to each zone of the riparian buffer that requires mitigation. Calculate the amount of mitigation required.				
Zone	6c. Reason for impact	6d. Total impact (square feet)	Multiplier	6e. Required mitigation (square feet)
Zone 1			3 (2 for Catawba)	
Zone 2			1.5	
6f. Total buffer mitigation required:				
6g. If buffer mitigation is required, discuss what type of mitigation is proposed (e.g., payment to private mitigation bank, permittee responsible riparian buffer restoration, payment into an approved in-lieu fee fund).				
6h. Comments:				

<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"/> <b>No</b>
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?	%
2b. Does this project require a Stormwater Management Plan?	<input checked="" type="checkbox"/> <b>Yes</b> <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:	
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?	
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>n/a</b>
<b>5. DWQ 401 Unit Stormwater Review</b>	
5a. Does the Stormwater Management Plan meet the appropriate requirements?	<input type="checkbox"/> Yes <input type="checkbox"/> No <b>n/a</b>
5b. Have all of the 401 Unit submittal requirements been met?	<input type="checkbox"/> Yes <input type="checkbox"/> No <b>n/a</b>

<b>F. Supplementary Information</b>	
<b>1. Environmental Documentation (DWQ Requirement)</b>	
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"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>
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"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>
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: <b>CE completed May 28, 2015.</b>	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>
<b>2. Violations (DWQ Requirement)</b>	
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"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b>
2b. Is this an after-the-fact permit application?	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b>
2c. If you answered "yes" to one or both of the above questions, provide an explanation of the violation(s):	
<b>3. Cumulative Impacts (DWQ Requirement)</b>	
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"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>No</b>
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.	
<b>4. Sewage Disposal (DWQ Requirement)</b>	
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.  <b>Not applicable.</b>	

<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 checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
5b. Have you checked with the USFWS concerning Endangered Species Act impacts?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
5c. If yes, indicate the USFWS Field Office you have contacted.	<input checked="" 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? <b>See attached Biological Opinion from USFWS dated 5/2/2016</b> <b>Smooth coneflower, No Effect, last survey 10/15/2015</b> <b>James spiny mussel, No Effect, last survey 4/14/2012</b>		
<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?		
<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?		
<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:		
8c. What source(s) did you use to make the floodplain determination?		
for <u>Philip S. Harris C.P.M., P.E.</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.)	06-01-2016 Date



PAT MCCRORY  
Governor

DONALD R. VAN DER VAART  
Secretary

May 13, 2016

Mr. Philip S. Harris, III, P.E., CPM  
Project Development and Environmental Analysis Unit  
North Carolina Department of Transportation  
1598 Mail Service Center  
Raleigh, North Carolina 27699-1598

Dear Mr. Harris:

Subject: Mitigation Acceptance Letter:

**B-5343, Replace Bridge 169 on NC 770 over Cascade Creek, Rockingham County**

The purpose of this letter is to notify you that the Division of Mitigation Services (DMS) will provide the compensatory riparian wetland mitigation for the subject project. Based on the information supplied by you on May 10, 2016, the impacts are located in CU 03010103 of the Roanoke River basin in the Central Piedmont (CP) Eco-Region, and are as follows:

Roanoke 03010103 CP	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	0	0	0	0.01	0	0	0	0

\*Some of the stream and/or wetland impacts may be proposed to be mitigated at a 1:1 mitigation ratio. See permit application for details.

The impacts and associated mitigation needs were under projected by the NCDOT in the 2016 impact data. DMS will commit to implement sufficient compensatory riparian wetland mitigation credits to offset the impacts associated with this project as determined by the regulatory agencies using the delivery timeline listed in Section F.3.c.iii of the In-Lieu Fee Instrument dated July 28, 2010. 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 DMS.

If you have any questions or need additional information, please contact Beth Harmon at 919-707-8420.

Sincerely,

James B. Stanfill  
Credit Management Supervisor

cc: Mr. David Bailey, USACE – Raleigh Regulatory Field Office  
Ms. Amy Chapman, NCDWR  
File: B-5343



North Carolina Department of Transportation

Highway Stormwater Program  
**STORMWATER MANAGEMENT PLAN**  
 FOR NCDOT PROJECTS



(Version 2.03; Released October 2015)

WBS Element: 46057.1.1      TIP No.: B-5343      County(ies): Rockingham      Page 1 of 2

**General Project Information**

WBS Element:	46057.1.1	TIP Number:	B-5343	Project Type:	Bridge Replacement	Date:	12/10/2015
NCDOT Contact:	Bill Elam		Contractor / Designer:	Kimley-Horn & Associates			
Address:	NCDOT Hydraulics Unit 1020 Birch Ridge Drive Raleigh, NC 27610		Address:	3001 Weston Parkway Cary, NC 27518			
	Phone:	919-707-6718		Phone:	919-677-2153		
	Email:	belam@ncdot.gov		Email:	jason.lawing@kimley-horn.com		
City/Town:	Eden		County(ies):	Rockingham			
River Basin(s):	Roanoke		CAMA County?	No			
Wetlands within Project Limits?	Yes						

**Project Description**

Project Length (lin. miles or feet):	0.18	Surrounding Land Use:	Rural
	<b>Proposed Project</b>		<b>Existing Site</b>
Project Built-Upon Area (ac.)	0.6	ac.	0.5
Typical Cross Section Description:	2 @ 12' wide lanes with typical 2' paved shoulders & side slopes that vary from 2:1 to 3:1 and lateral ditches with 4:1 and 3:1 front slopes and 2:1 and 3:1 back slopes.		2 @ 12' wide lanes with grass shoulders
Annual Avg Daily Traffic (veh/hr/day):	Design/Future:	4,800	Year: 2040
	Existing:	2,829	Year: 2016
General Project Narrative: (Description of Minimization of Water Quality Impacts)	<p>Replacement of Bridge No. 780169 on US-311/NC-770 over Cascade Creek in Rockingham County. The existing bridge, overall length (OAL) = 50' and width = 31', will be replaced with a bridge having an OAL = 70' and width 33'. The new bridge is wider than the existing bridge to provide the required shoulders necessary for roadway and drainage. The roadway is being slightly widened to provide the minimum lanes for safe travel. A detour bridge, overall length 90' and width 26.5', will be constructed south of the existing/proposed bridge. This bridge will be removed and area reforested once the primary bridge has been replaced. The detour design consists of removing an existing 24" pipe connecting wetlands at the beginning of the project. This pipe will need to be realigned due to the detour alignment and was undersized in the existing condition. It will be replaced by 2 @ 24" RCP's and some downstream channel improvements will be needed to tie in to the existing wetland. Some impacts to wetlands are anticipated due to the pipe installation. Roadside ditches that were affected due to the detour and mainline fill slopes were replaced in kind. No new roadside ditches were introduced as part of this project. The ditches along the driveway are both acting as grassed swales. The velocity of both roadside ditches draining into the wetlands are less than 2.0 fps.</p>		

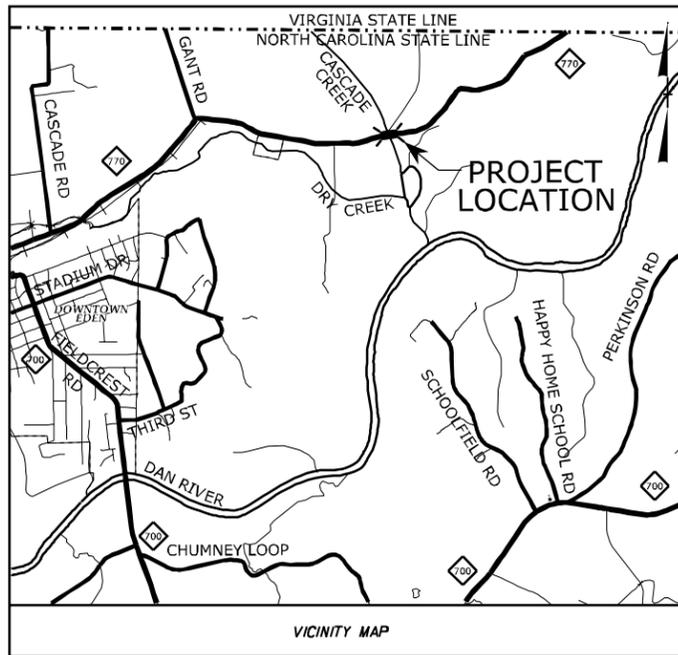
**Waterbody Information**

Surface Water Body (1):	Cascade Creek		NCDWR Stream Index No.:	22-45	
NCDWR Surface Water Classification for Water Body	Primary Classification:	Class C			
	Supplemental Classification:				
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SA		Buffer Rules in Effect:	N/A	
Project Includes Bridge Spanning Water Body?	Yes	Deck Drains Discharge Over Buffer?	No	Dissipator Pads Provided in Buffer?	No
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
	(If yes, provide justification in the General Project Narrative)				



**TIP PROJECT: B-5343**

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



STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS

**ROCKINGHAM COUNTY**

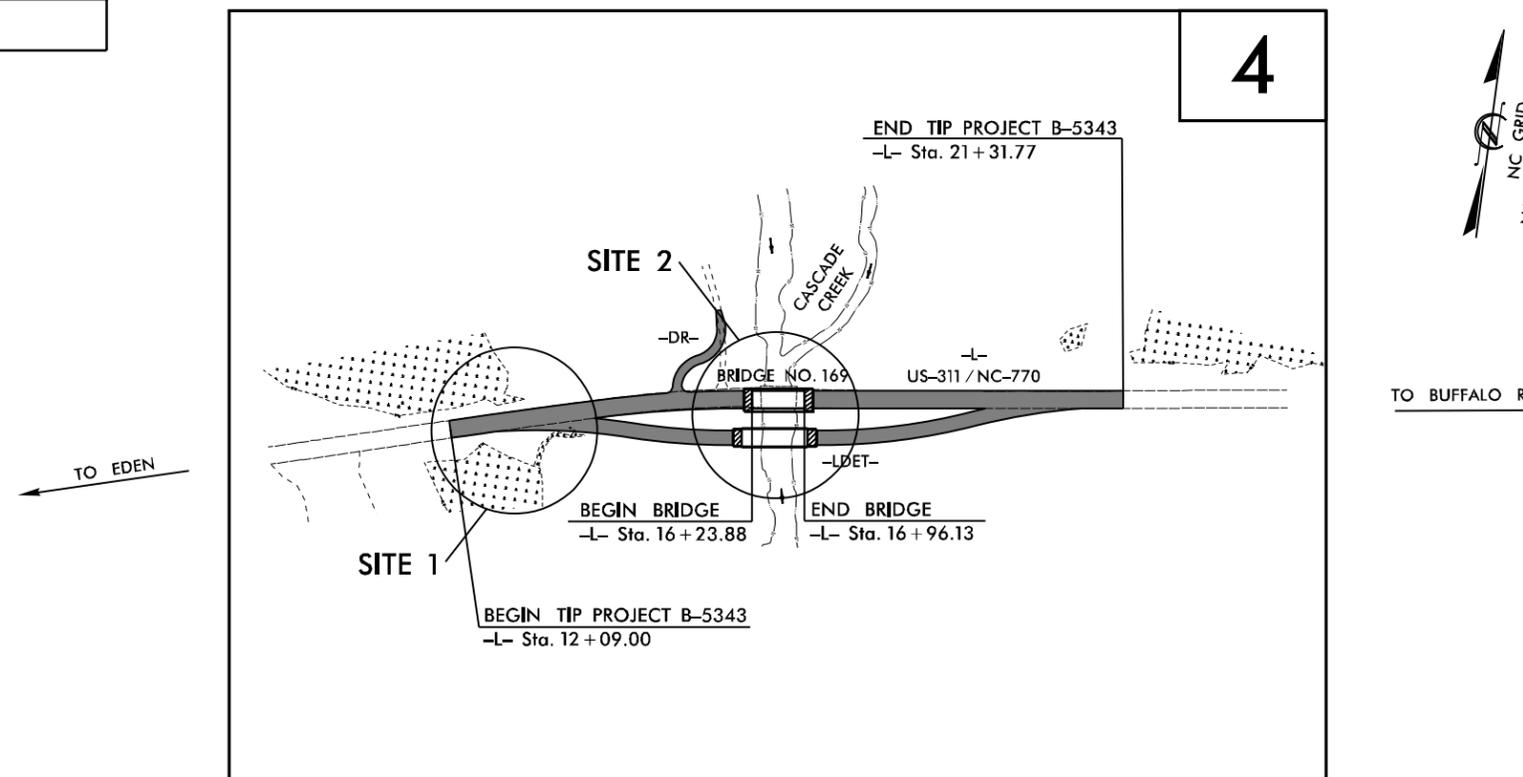
**LOCATION:** BRIDGE NO. 169 OVER CASCADE CREEK  
 ON US-311 / NC-770

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

WETLAND AND SURFACE WATER IMPACTS PERMIT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5343	1	
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
46057.1.1	BRSTP-0770(4)	P.E.	
46057.2.1	BRSTP-0770(4)	RIGHT-OF-WAY	
46057.2.1	BRSTP-0770(4)	UTILITIES	

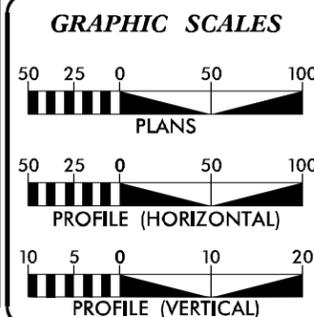
PERMIT DRAWING  
 SHEET 1 OF 11



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

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

**CONTRACT:**



**DESIGN DATA**

ADT 2016	=	2829 VPD
ADT 2040	=	4800 VPD
K	=	10%
D	=	55%
T	=	11%*
V	=	60 MPH
V <sub>DET</sub>	=	50 MPH

FUNCTIONAL CLASSIFICATION: RURAL MAJOR COLLECTOR

\* 8% TTST 3% DUAL SUB-REGIONAL TIER

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-5343	=	0.162 MILES
LENGTH STRUCTURE TIP PROJECT B-5343	=	0.013 MILES
TOTAL LENGTH TIP PROJECT B-5343	=	0.175 MILES

PLANS PREPARED FOR THE NCDOT BY:

**Kimley Horn**

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: NOVEMBER 20, 2015

LETTING DATE: NOVEMBER 15, 2016

JEFFREY W. MOORE, P.E.  
PROJECT ENGINEER

JASON PACE, P.E.  
PROJECT DESIGN ENGINEER

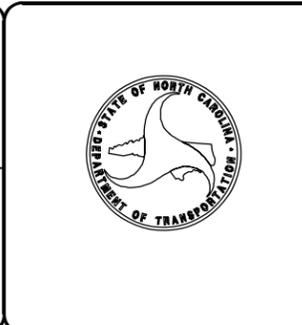
JAMES A. SPEER, P.E.  
PROJECT ENGINEER  
NCDOT ROADWAY DESIGN

HYDRAULICS ENGINEER

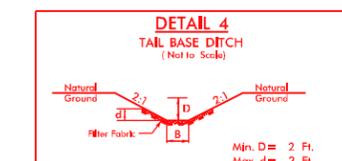
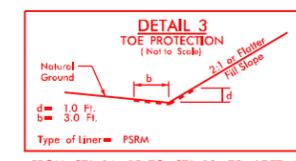
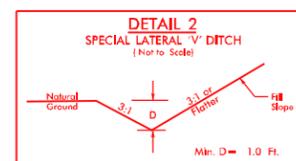
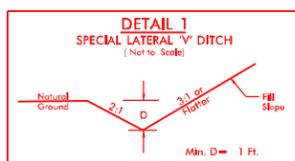
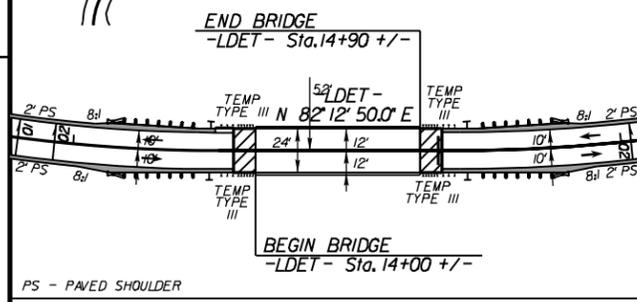
SIGNATURE: \_\_\_\_\_ P.E.

ROADWAY DESIGN ENGINEER

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

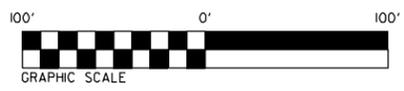
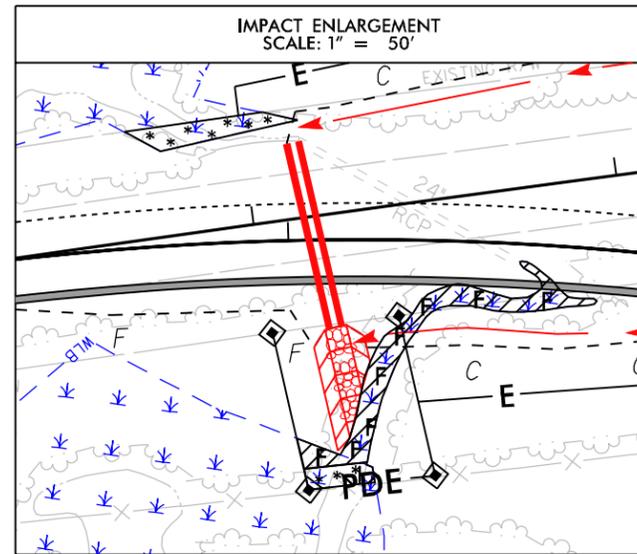
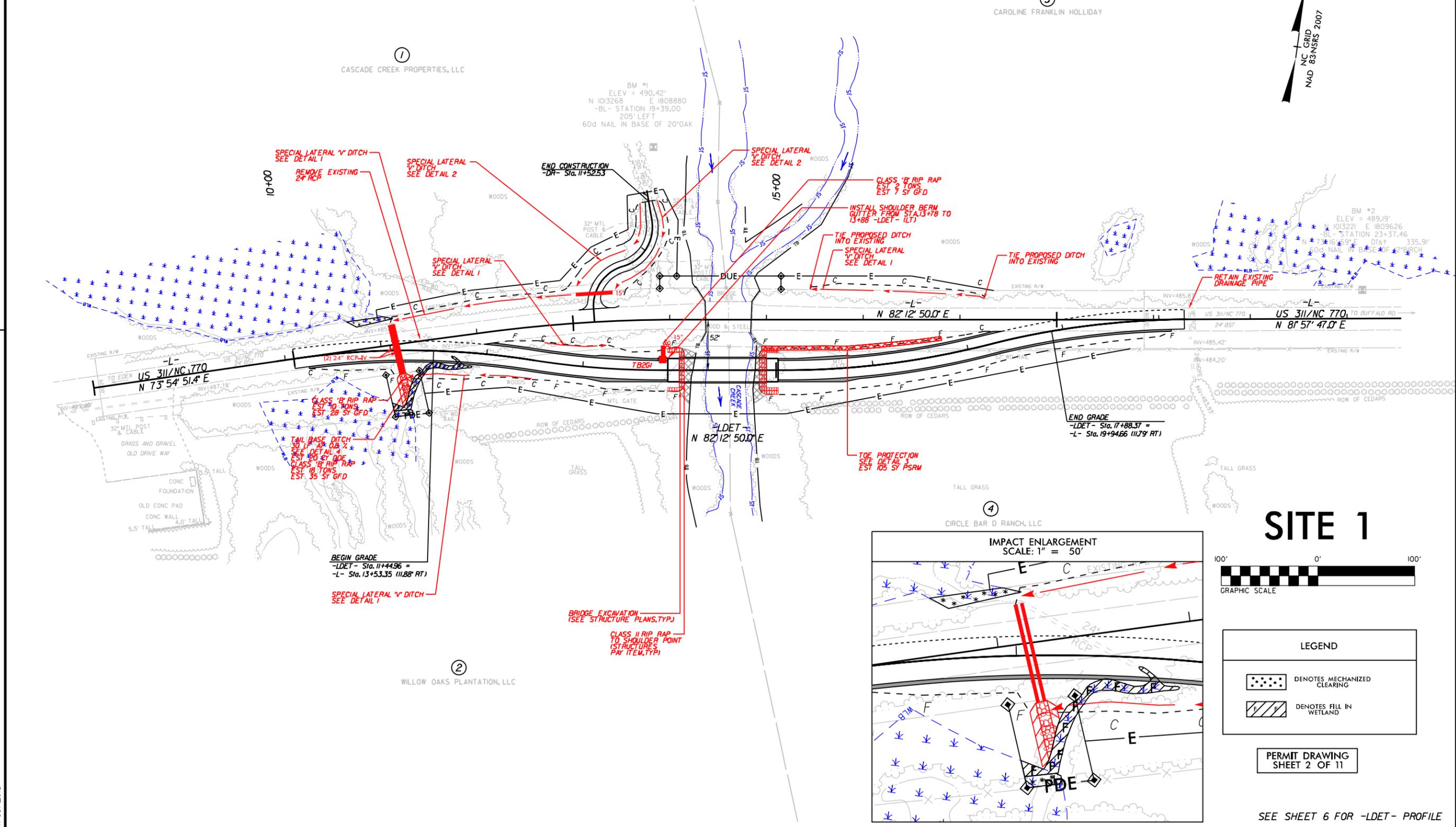


PROJECT REFERENCE NO. B-5343	SHEET NO. 5
RW SHEET NO.	
ROADWAY ENGINEER	HYDRAULICS ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	



REVISIONS

DETAIL SHOWING BRIDGE / PAVEMENT RELATIONSHIP



LEGEND	
	DENOTES MECHANIZED CLEARING
	DENOTES FILL IN WETLAND

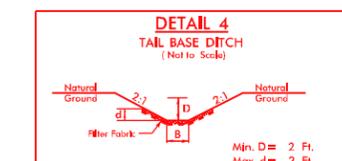
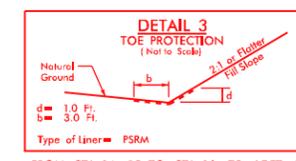
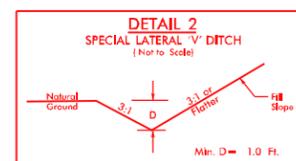
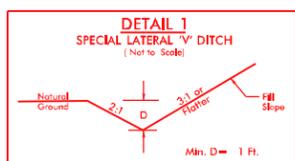
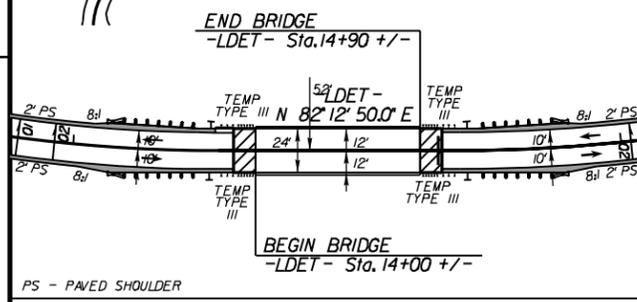
PERMIT DRAWING  
SHEET 2 OF 11

SEE SHEET 6 FOR -LDET- PROFILE

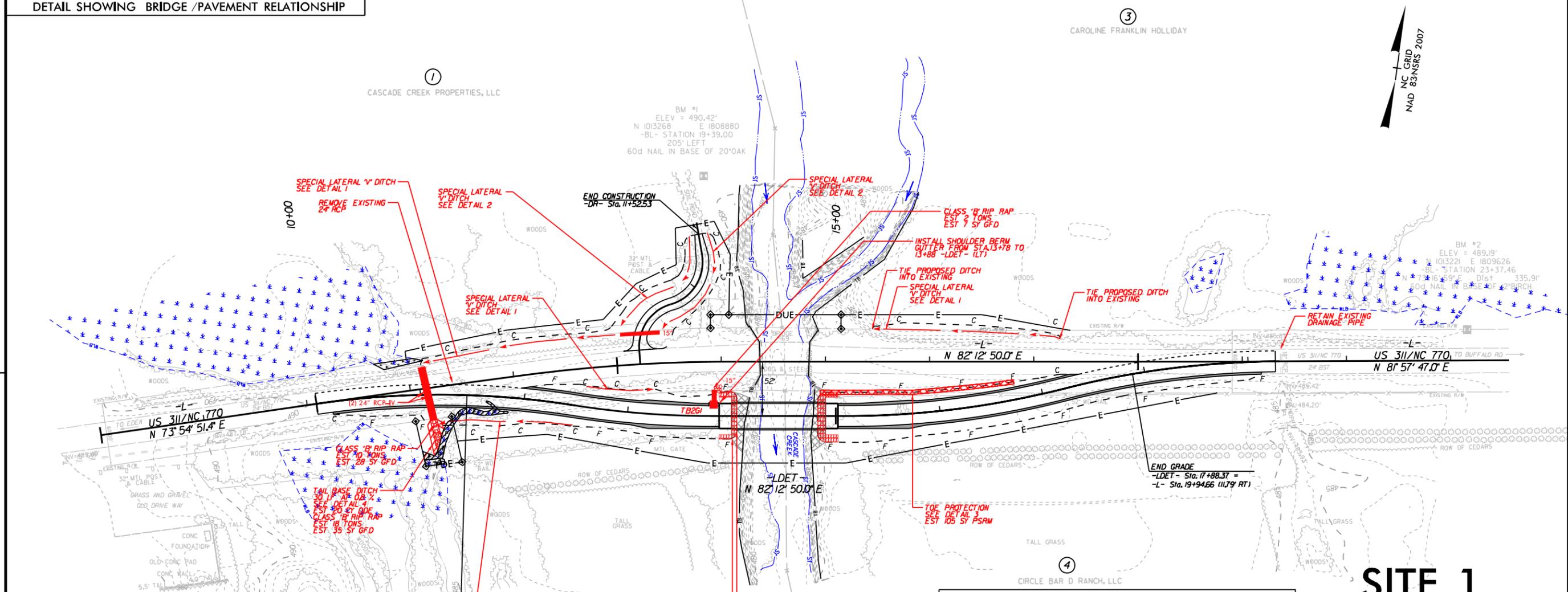
11/09/2015

PROJECT REFERENCE NO. B-5343	SHEET NO. 5
RW SHEET NO.	
ROADWAY ENGINEER	HYDRAULICS ENGINEER

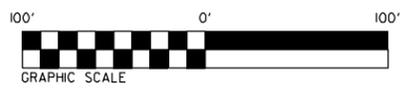
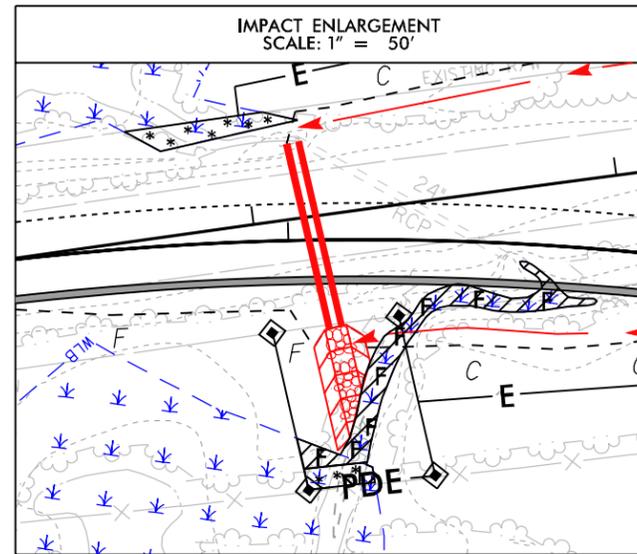
**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**



REVISIONS



**SITE 1**



**LEGEND**

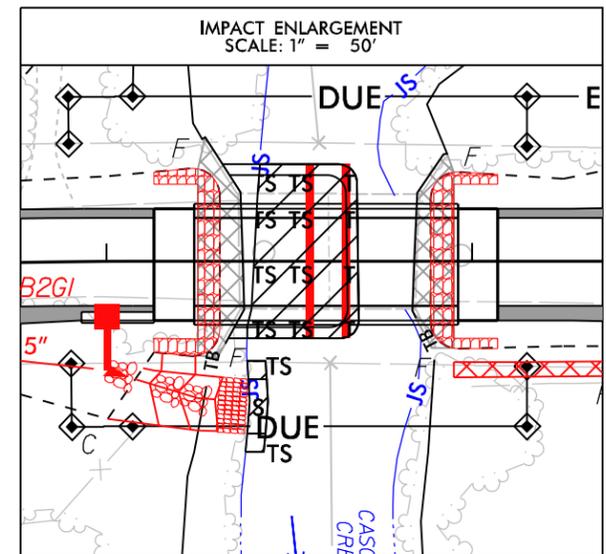
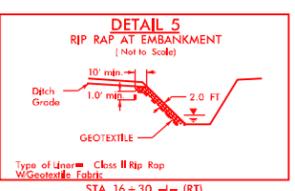
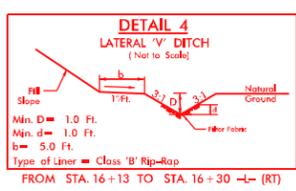
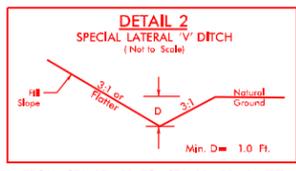
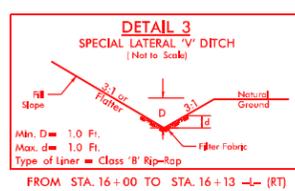
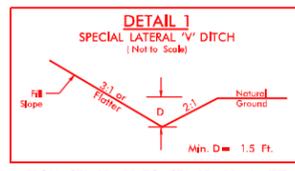
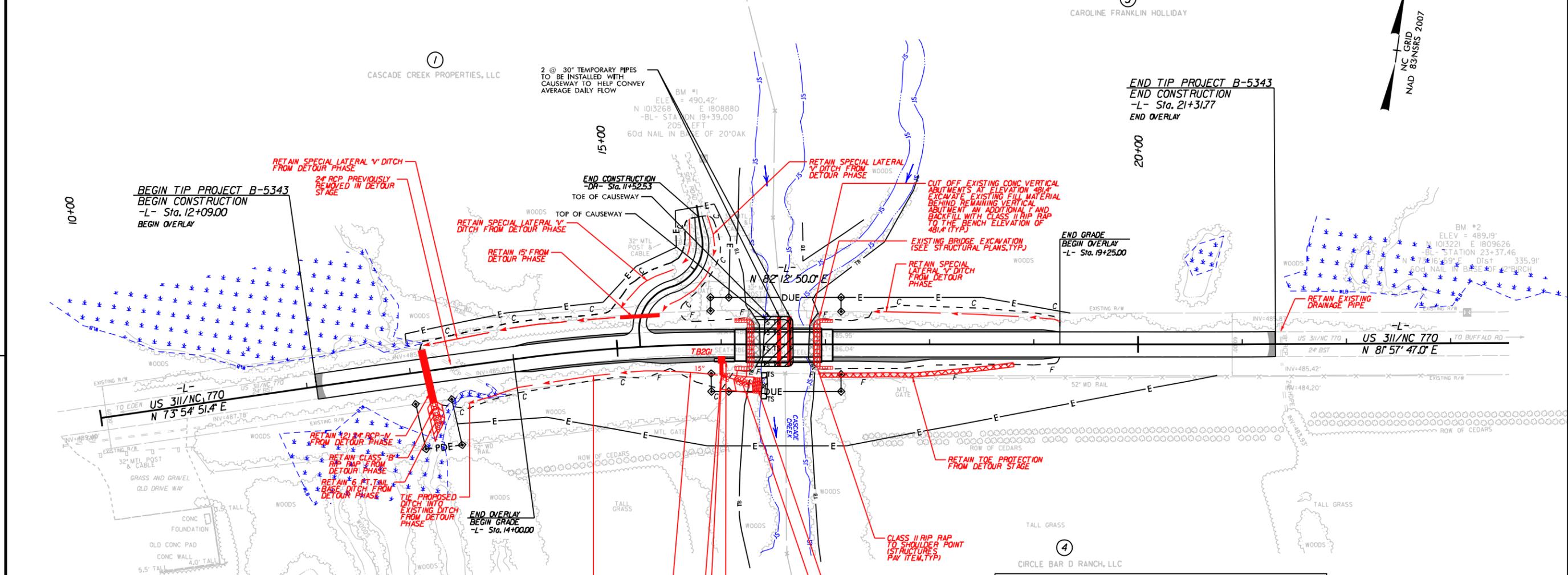
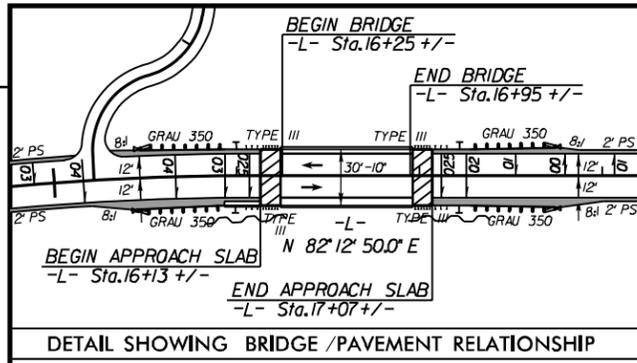
	DENOTES MECHANIZED CLEARING
	DENOTES FILL IN WETLAND

PERMIT DRAWING  
SHEET 3 OF 11

SEE SHEET 6 FOR -LDET- PROFILE

PROJECT REFERENCE NO. B-5343	SHEET NO. 4
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY ENGINEER	

**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**



## SITE 2

GRAPHIC SCALE

**LEGEND**

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

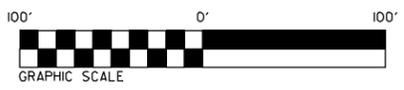
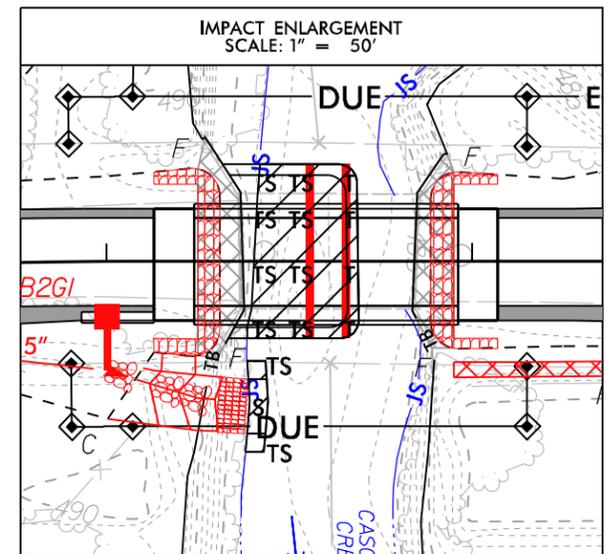
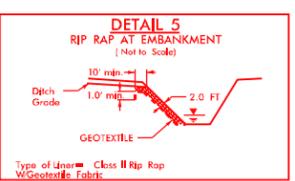
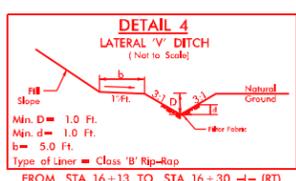
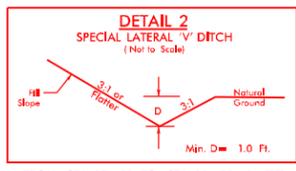
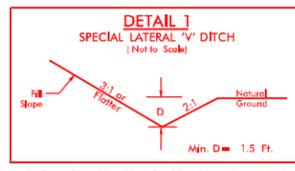
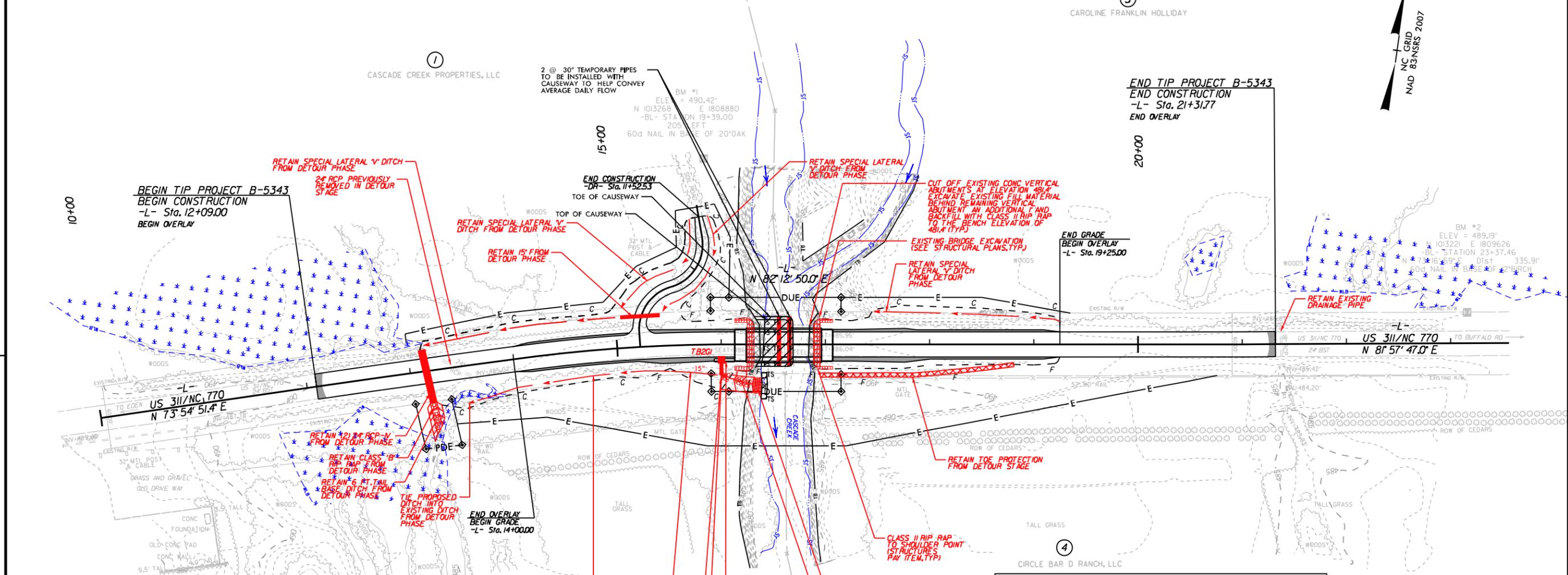
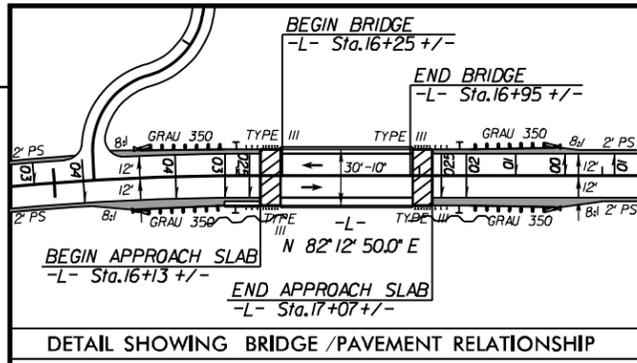
**PERMIT DRAWING**  
SHEET 4 OF 11

REVISIONS

SEE SHEET 5 FOR -L- PROFILE

PROJECT REFERENCE NO. B-5343	SHEET NO. 4
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY ENGINEER	

**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**



**LEGEND**

	DENOTES IMPACTS IN SURFACE WATER
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING  
SHEET 5 OF 11

SEE SHEET 5 FOR -L- PROFILE

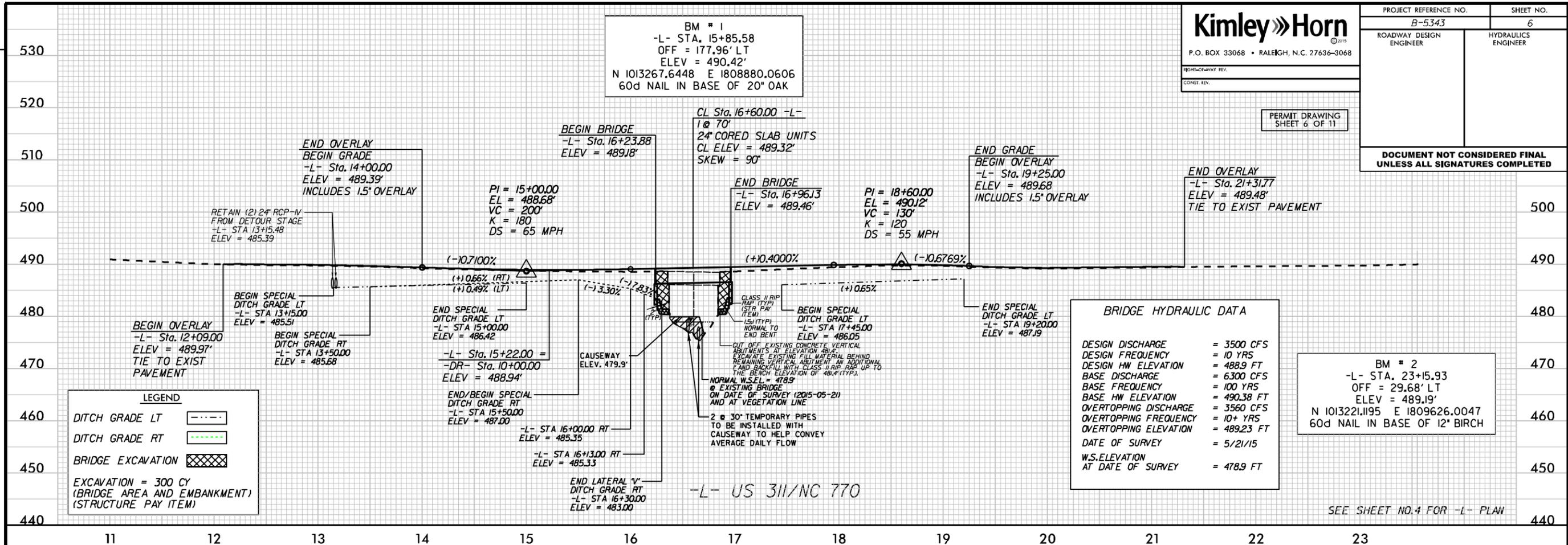
REVISIONS

11/09/2015

PERMIT DRAWING  
SHEET 6 OF 11

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

BM # 1  
-L- STA. 15+85.58  
OFF = 177.96' LT  
ELEV = 490.42'  
N 1013267.6448 E 1808880.0606  
60d NAIL IN BASE OF 20" OAK



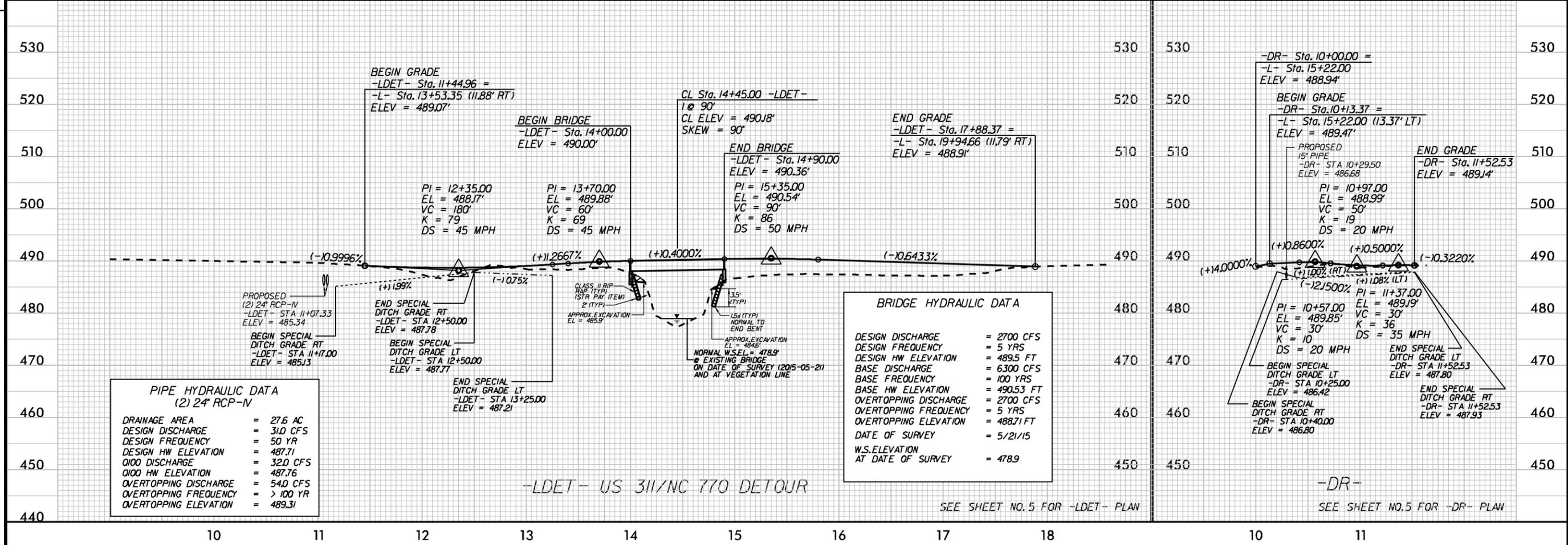
**LEGEND**

- DITCH GRADE LT
- DITCH GRADE RT
- BRIDGE EXCAVATION
- EXCAVATION = 300 CY (BRIDGE AREA AND EMBANKMENT) (STRUCTURE PAY ITEM)

**BRIDGE HYDRAULIC DATA**

- DESIGN DISCHARGE = 3500 CFS
- DESIGN FREQUENCY = 10 YRS
- DESIGN HW ELEVATION = 488.9 FT
- BASE DISCHARGE = 6300 CFS
- BASE FREQUENCY = 100 YRS
- BASE HW ELEVATION = 490.38 FT
- OVERTOPPING DISCHARGE = 3560 CFS
- OVERTOPPING FREQUENCY = 10+ YRS
- OVERTOPPING ELEVATION = 489.23 FT
- DATE OF SURVEY = 5/21/15
- W.S. ELEVATION AT DATE OF SURVEY = 478.9 FT

BM # 2  
-L- STA. 23+15.93  
OFF = 29.68' LT  
ELEV = 489.19'  
N 1013221.1195 E 1809626.0047  
60d NAIL IN BASE OF 12" BIRCH



**PIPE HYDRAULIC DATA**  
(2) 24" RCP-IV

- DRAINAGE AREA = 27.6 AC
- DESIGN DISCHARGE = 31.0 CFS
- DESIGN FREQUENCY = 50 YR
- DESIGN HW ELEVATION = 487.71
- Q100 DISCHARGE = 32.0 CFS
- Q100 HW ELEVATION = 487.76
- OVERTOPPING DISCHARGE = 54.0 CFS
- OVERTOPPING FREQUENCY = > 100 YR
- OVERTOPPING ELEVATION = 489.31

**BRIDGE HYDRAULIC DATA**

- DESIGN DISCHARGE = 2700 CFS
- DESIGN FREQUENCY = 5 YRS
- DESIGN HW ELEVATION = 489.5 FT
- BASE DISCHARGE = 6300 CFS
- BASE FREQUENCY = 100 YRS
- BASE HW ELEVATION = 490.53 FT
- OVERTOPPING DISCHARGE = 2700 CFS
- OVERTOPPING FREQUENCY = 5 YRS
- OVERTOPPING ELEVATION = 488.71 FT
- DATE OF SURVEY = 5/21/15
- W.S. ELEVATION AT DATE OF SURVEY = 478.9

-DR- Sta. 10+00.00 =  
-L- Sta. 15+22.00  
ELEV = 488.94'

BEGIN GRADE  
-DR- Sta. 10+13.37 =  
-L- Sta. 15+22.00 (13.37' LT)  
ELEV = 489.47'

PROPOSED  
15" PIPE  
-DR- STA. 10+29.50  
ELEV = 486.68

PI = 10+97.00  
EL = 488.99'  
VC = 50'  
K = 19  
DS = 20 MPH

END GRADE  
-DR- Sta. 11+52.53  
ELEV = 489.14'

PI = 11+37.00  
EL = 489.19'  
VC = 30'  
K = 36  
DS = 35 MPH

BEGIN SPECIAL  
DITCH GRADE LT  
-DR- STA. 10+25.00  
ELEV = 486.42

END SPECIAL  
DITCH GRADE LT  
-DR- STA. 11+52.53  
ELEV = 487.80

BEGIN SPECIAL  
DITCH GRADE RT  
-DR- STA. 10+40.00  
ELEV = 486.80

END SPECIAL  
DITCH GRADE RT  
-DR- STA. 11+52.53  
ELEV = 487.93

REVISIONS

11/09/2015

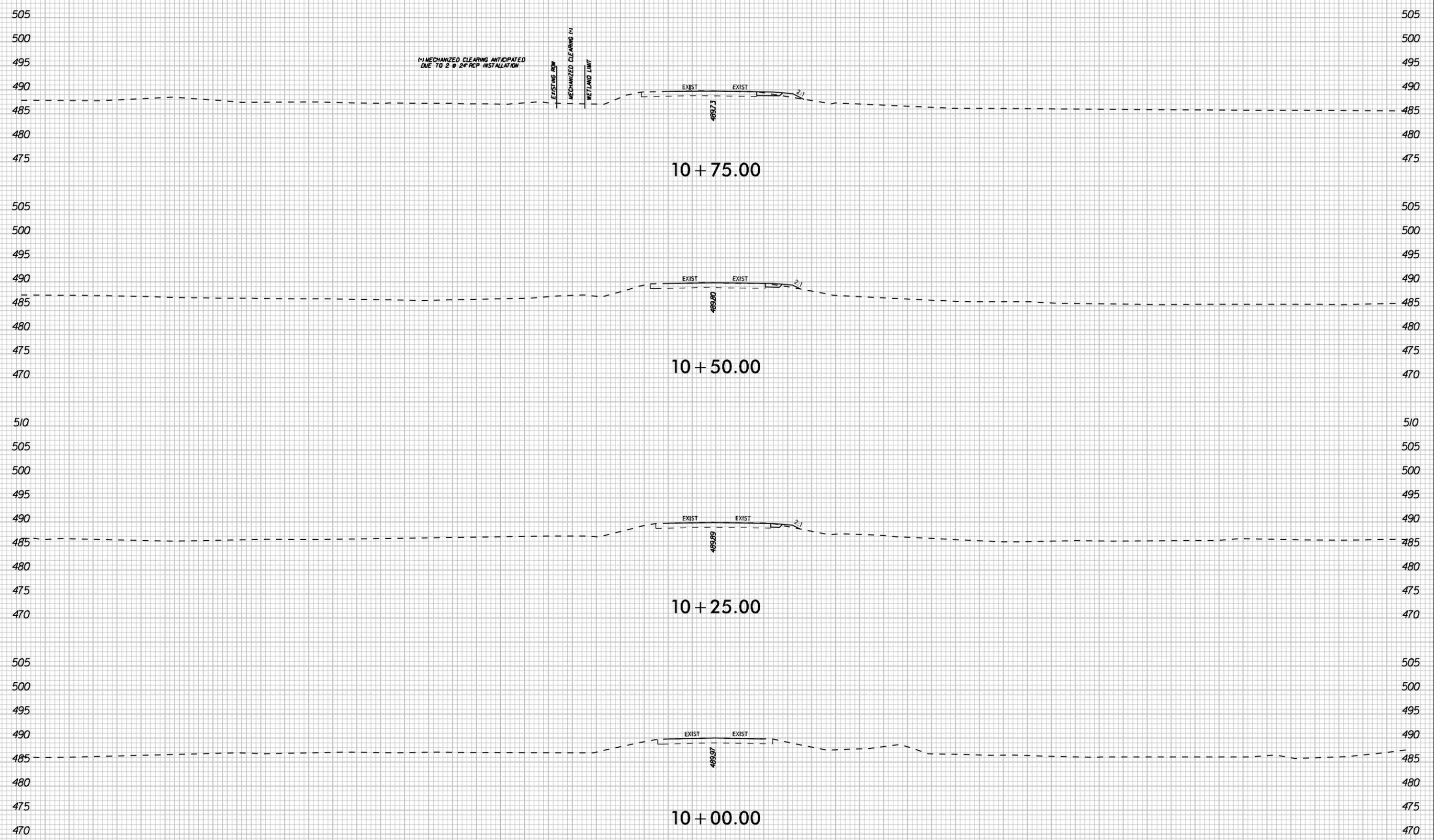
SEE SHEET NO. 4 FOR -L- PLAN

SEE SHEET NO. 5 FOR -LDET- PLAN

SEE SHEET NO. 4 FOR -L- PLAN

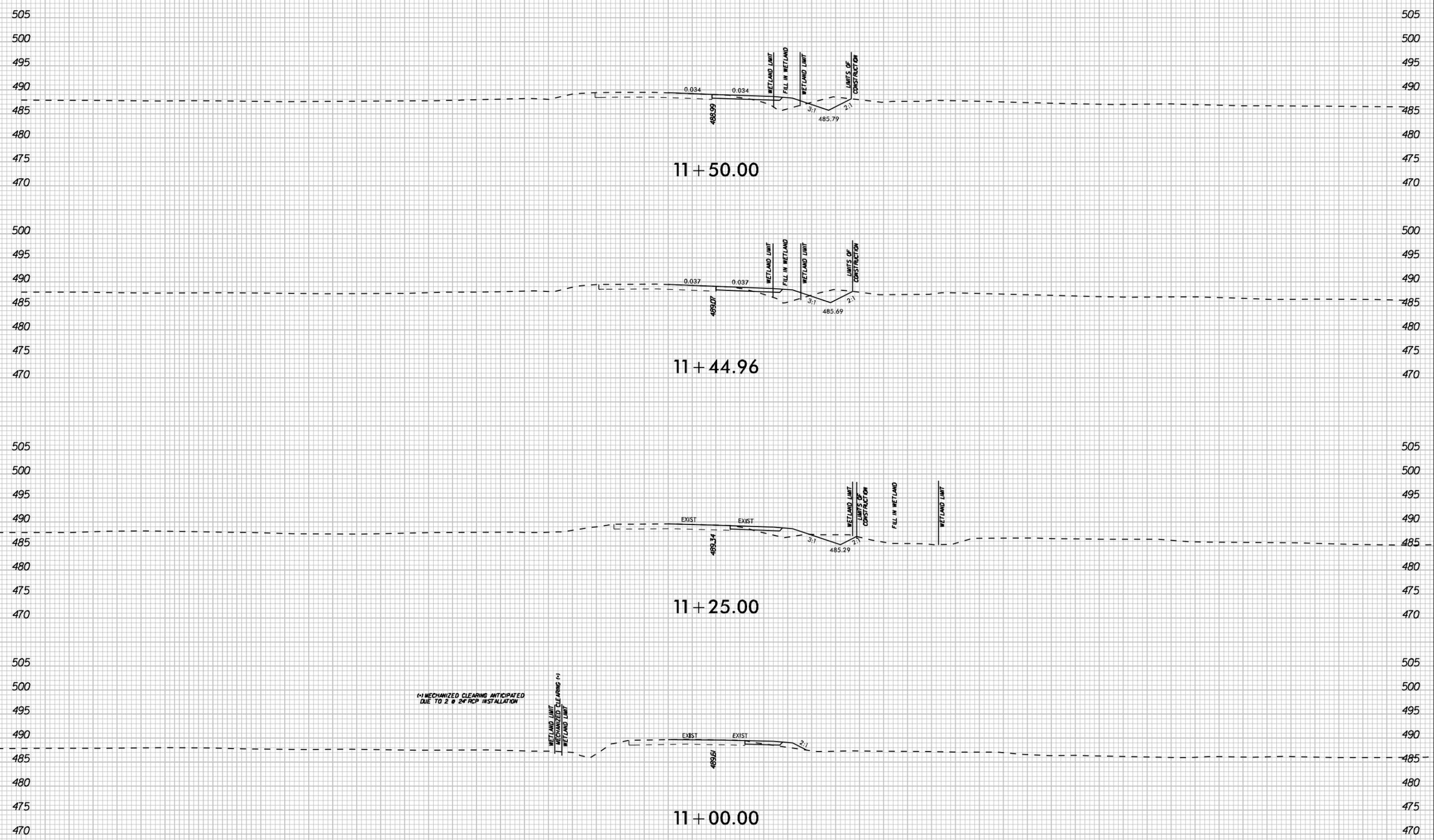
SEE SHEET NO. 5 FOR -DR- PLAN

PERMIT DRAWING  
SHEET 7 OF 11



-LDET- BERRY HILL RD (NC 770) DETOUR

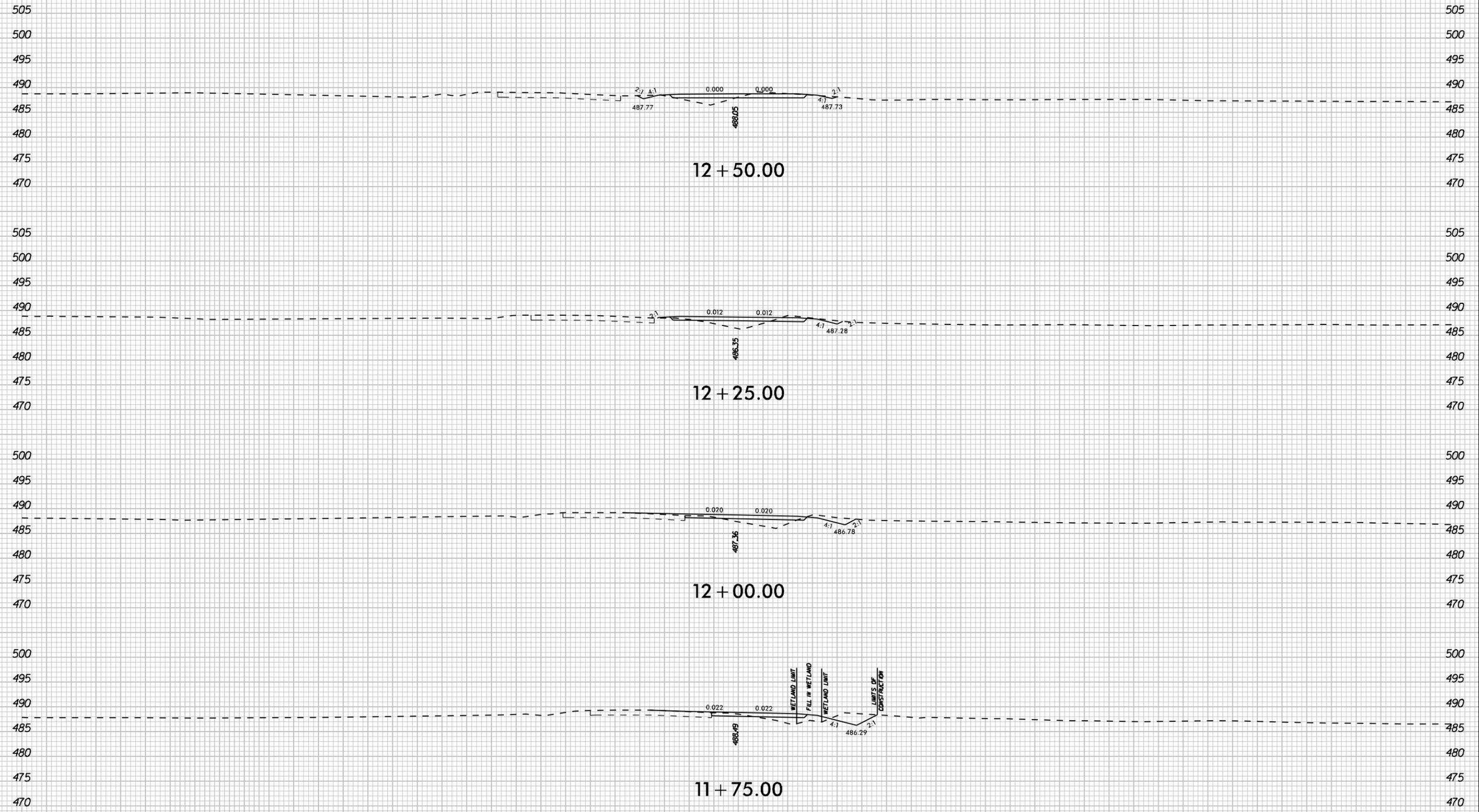
PERMIT DRAWING  
SHEET 8 OF 11



(1) MECHANIZED CLEARING ANTICIPATED  
DUE TO 2 @ 24" RCP INSTALLATION

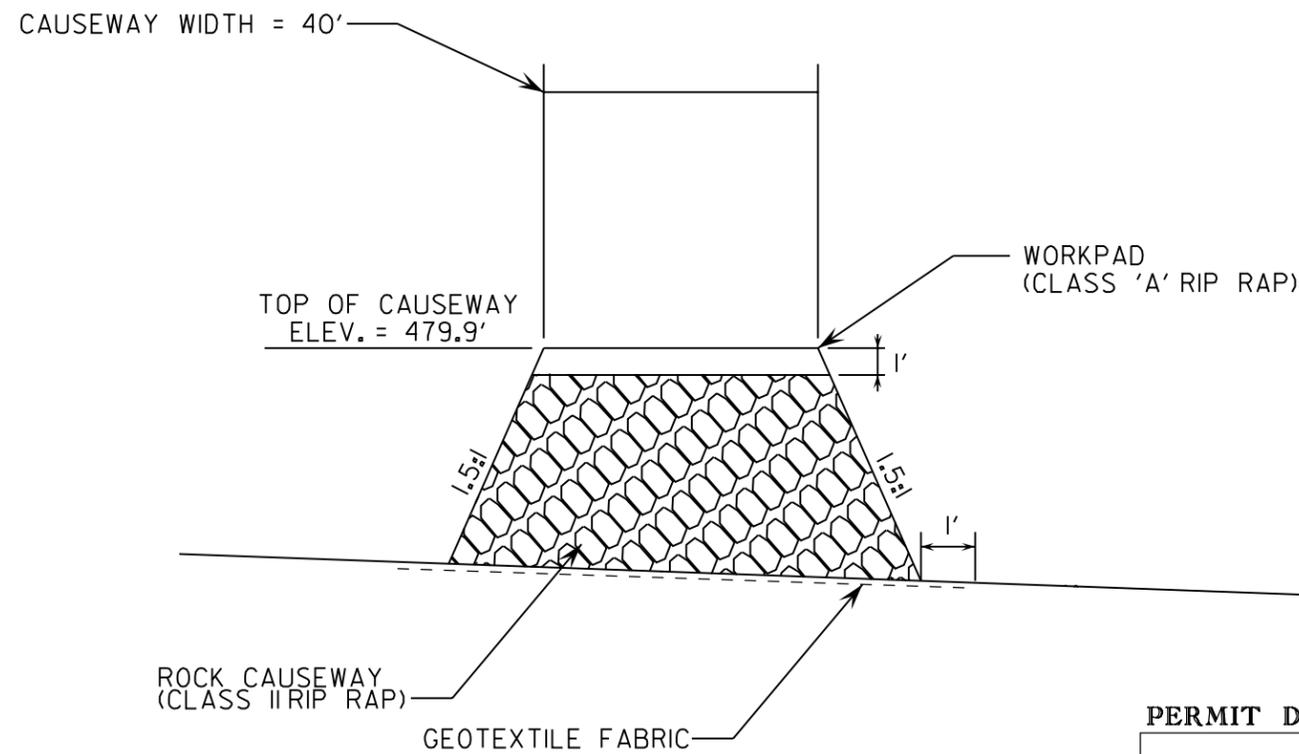
-LDET- BERRY HILL RD (NC 770) DETOUR

PERMIT DRAWING  
SHEET 9 OF 11



-LDET- BERRY HILL RD (NC 770) DETOUR

# CAUSEWAY DETAIL (NOT TO SCALE)



\$FILES\$  
12/10/2015

QUANTITIES OF ESTIMATES: CAUSEWAY  
 VOLUME OF CLASS 'A' RIP RAP= 50 yds<sup>3</sup>  
 AREA OF CLASS 'A' RIP RAP= 0.02 acres  
 Estimate 70 Tons Class 'A' Rip Rap  
 VOLUME OF CLASS II RIP RAP= 100 yds<sup>3</sup>  
 AREA OF CLASS II RIP RAP= 0.03 acres  
 Estimate 145 Tons Class II Rip Rap  
 Estimate 150 SY of Geotextile Fabric

PERMIT DRAWING SHEET 10 OF 11

**NCDOT**

DIVISION OF HIGHWAYS  
 ROCKINGHAM COUNTY  
 PROJECT: B-5343  
 BRIDGE NO. 169 OVER  
 CASCADE CREEK ON  
 US 311/ NC 770

12/10/2015

**WETLAND PERMIT IMPACT SUMMARY**

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	10+57.46 to 11+03.12 -LDET-(LT)	2 @ 24" RCP				< 0.01						
1	11+01.09 to 11+85.49 -LDET-(RT)	2 @ 24" RCP	0.01			< 0.01						
2	16+38.38 to 16+68.99 -L-	Causeway						0.03			48	
2	16+38.02 to 16+44.16 -L- (RT)	Bank Stabilization					< 0.01	< 0.01	15	10		
<b>TOTALS*:</b>			0.01			< 0.01		< 0.01	0.03	15	58	0

\*Rounded totals are sum of actual impacts

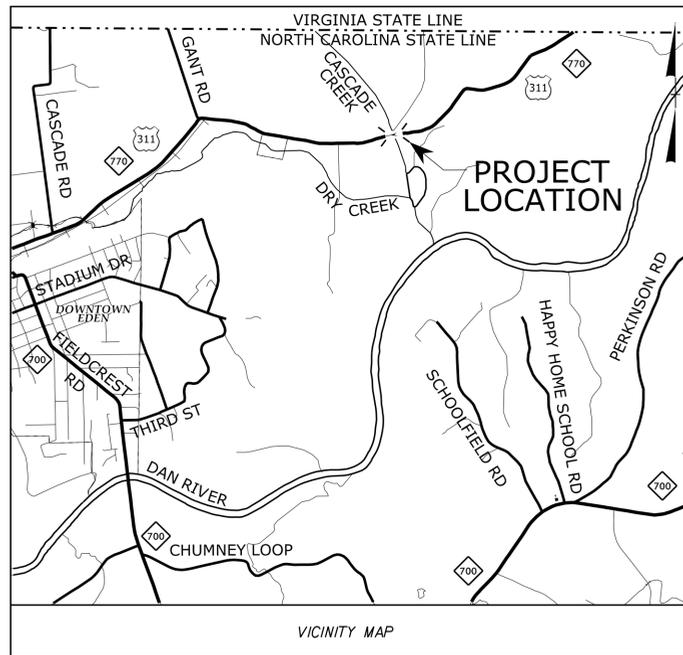
NOTES:  
 \* Total Permanent Channel Impacts along the centerline of Cascade Creek is 15 linear feet.  
 \*\* Total Temporary Channel Impacts along the centerline of Cascade Creek is 58 linear feet.  
 \*\*\* Causeway blocks more than 50% of the channel. Therefore, 2 @ 30" temporary pipes to be installed with causeway to help convey the average daily flow.

NC DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
  
 ROCKINGHAM COUNTY  
 B-5343  
  
 SHEET 11 of 11 12/10/2015

**TIP PROJECT: B-5343**

**CONTRACT: C203802**

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



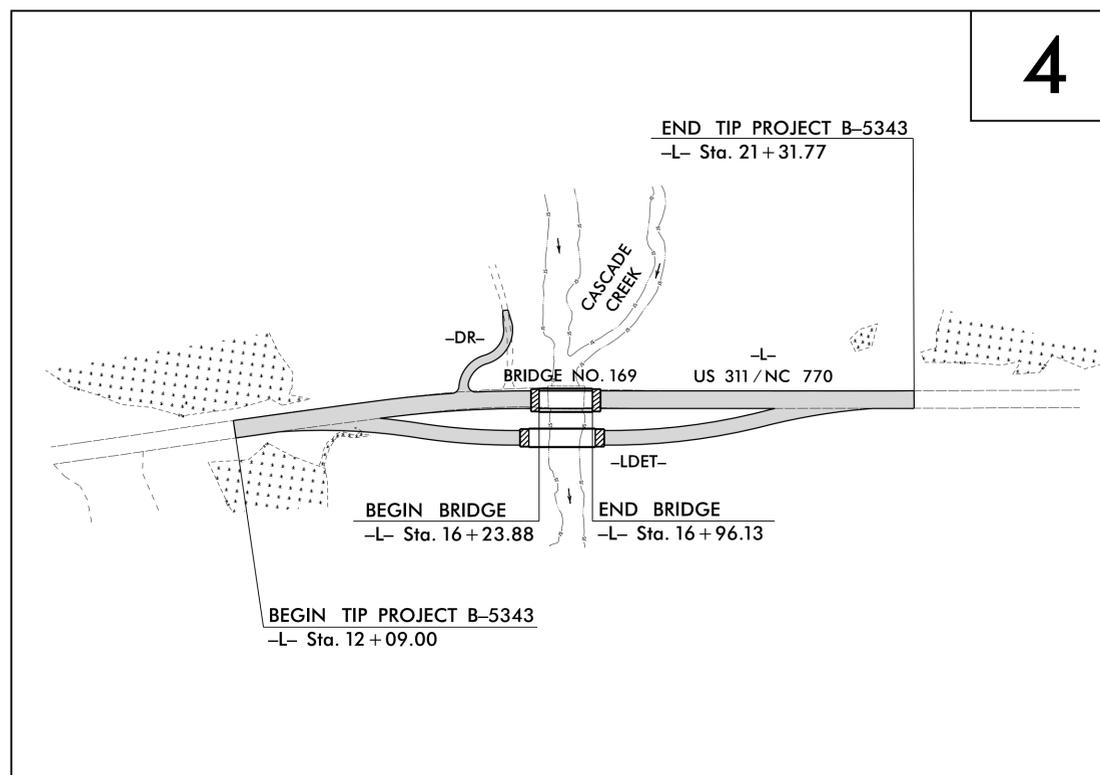
STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS

**ROCKINGHAM COUNTY**

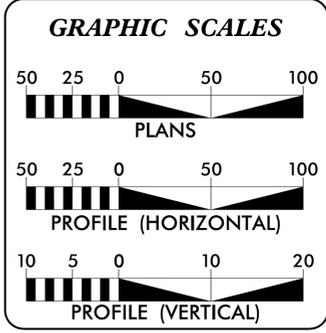
**LOCATION:** BRIDGE NO. 169 OVER CASCADE CREEK  
 ON US 311 / NC 770

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5343	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
46057.1.1	BRSTP-0770(4)	P.E.	
46057.2.1		RIGHT-OF-WAY	
46057.2.1		UTILITIES	
46057.3.1		CONSTRUCTION	



DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED



**DESIGN DATA**

ADT 2016	=	2829 VPD
ADT 2040	=	4800 VPD
K	=	10%
D	=	55%
T	=	11%*
V	=	60 MPH
V <sub>DET</sub>	=	50 MPH

FUNCTIONAL CLASSIFICATION: RURAL MAJOR COLLECTOR

\* 8% TTST 3% DUAL SUB-REGIONAL TIER

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-5343	=	0.161 MILES
LENGTH STRUCTURE TIP PROJECT B-5343	=	0.014 MILES
TOTAL LENGTH TIP PROJECT B-5343	=	0.175 MILES

PLANS PREPARED FOR THE NCDOT BY:

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: NOVEMBER 20, 2015

LETTING DATE: NOVEMBER 15, 2016

**Kimley»Horn**

JEFFREY W. MOORE, P.E. PROJECT ENGINEER

J. JASON PACE, P.E. PROJECT DESIGN ENGINEER

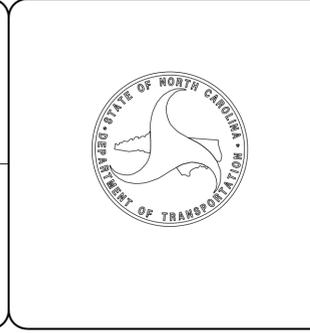
JAMES A. SPEER, P.E. PROJECT ENGINEER NCDOT ROADWAY DESIGN

**HYDRAULICS ENGINEER**

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

**ROADWAY DESIGN ENGINEER**

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



# STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale \*S.U.E. = Subsurface Utility Engineering

### BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EIP
Property Corner	-----
Property Monument	□ ECM
Parcel/Sequence Number	①23
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	-WLB-
Proposed Wetland Boundary	-WLB-
Existing Endangered Animal Boundary	-EAB-
Existing Endangered Plant Boundary	-EPB-
Existing Historic Property Boundary	-HPB-
Known Contamination Area: Soil	☠ ☠
Potential Contamination Area: Soil	☠ ☠
Known Contamination Area: Water	☠ ☠
Potential Contamination Area: Water	☠ ☠
Contaminated Site: Known or Potential	☠ ☠

### BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○
Well	○
Small Mine	✕
Foundation	□
Area Outline	□
Cemetery	□
Building	□
School	□
Church	□
Dam	▬

### HYDROLOGY:

Stream or Body of Water	-----
Hydro, Pool or Reservoir	□
Jurisdictional Stream	-JS-
Buffer Zone 1	-BZ 1-
Buffer Zone 2	-BZ 2-
Flow Arrow	←
Disappearing Stream	→
Spring	○
Wetland	⌵
Proposed Lateral, Tail, Head Ditch	▬
False Sump	◁

### RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○
Switch	□
RR Abandoned	-----
RR Dismantled	-----

### RIGHT OF WAY:

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	-----
Proposed Right of Way Line	-----
Proposed Right of Way Line with Iron Pin and Cap Marker	-----
Proposed Right of Way Line with Concrete or Granite RW Marker	-----
Proposed Control of Access Line with Concrete C/A Marker	-----
Existing Control of Access	-----
Proposed Control of Access	-----
Existing Easement Line	-----
Proposed Temporary Construction Easement	-----
Proposed Temporary Drainage Easement	-----
Proposed Permanent Drainage Easement	-----
Proposed Permanent Drainage / Utility Easement	-----
Proposed Permanent Utility Easement	-----
Proposed Temporary Utility Easement	-----
Proposed Aerial Utility Easement	-----
Proposed Permanent Easement with Iron Pin and Cap Marker	-----

### ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	-----
Proposed Slope Stakes Fill	-----
Proposed Curb Ramp	-----
Existing Metal Guardrail	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----
Equality Symbol	⊕
Pavement Removal	▨

### VEGETATION:

Single Tree	☼
Single Shrub	☼
Hedge	-----
Woods Line	-----

Orchard	☼ ☼ ☼ ☼
Vineyard	□

### EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	-----
Bridge Wing Wall, Head Wall and End Wall	-----
MINOR:	
Head and End Wall	-----
Pipe Culvert	-----
Footbridge	-----
Drainage Box: Catch Basin, DI or JB	□
Paved Ditch Gutter	-----
Storm Sewer Manhole	○
Storm Sewer	-----

### UTILITIES:

POWER:	
Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	⊕
Power Line Tower	⊠
Power Transformer	⊠
U/G Power Cable Hand Hole	●
H-Frame Pole	●
U/G Power Line LOS B (S.U.E.*)	-----
U/G Power Line LOS C (S.U.E.*)	-----
U/G Power Line LOS D (S.U.E.*)	-----

### TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	⊕
Telephone Pedestal	⊠
Telephone Cell Tower	⊠
U/G Telephone Cable Hand Hole	●
U/G Telephone Cable LOS B (S.U.E.*)	-----
U/G Telephone Cable LOS C (S.U.E.*)	-----
U/G Telephone Cable LOS D (S.U.E.*)	-----
U/G Telephone Conduit LOS B (S.U.E.*)	-----
U/G Telephone Conduit LOS C (S.U.E.*)	-----
U/G Telephone Conduit LOS D (S.U.E.*)	-----
U/G Fiber Optics Cable LOS B (S.U.E.*)	-----
U/G Fiber Optics Cable LOS C (S.U.E.*)	-----
U/G Fiber Optics Cable LOS D (S.U.E.*)	-----

### WATER:

Water Manhole	⊕
Water Meter	○
Water Valve	⊗
Water Hydrant	⊕
U/G Water Line LOS B (S.U.E.*)	-----
U/G Water Line LOS C (S.U.E.*)	-----
U/G Water Line LOS D (S.U.E.*)	-----
Above Ground Water Line	-----

### TV:

TV Pedestal	⊠
TV Tower	⊗
U/G TV Cable Hand Hole	●
U/G TV Cable LOS B (S.U.E.*)	-----
U/G TV Cable LOS C (S.U.E.*)	-----
U/G TV Cable LOS D (S.U.E.*)	-----
U/G Fiber Optic Cable LOS B (S.U.E.*)	-----
U/G Fiber Optic Cable LOS C (S.U.E.*)	-----
U/G Fiber Optic Cable LOS D (S.U.E.*)	-----

### GAS:

Gas Valve	◇
Gas Meter	◇
U/G Gas Line LOS B (S.U.E.*)	-----
U/G Gas Line LOS C (S.U.E.*)	-----
U/G Gas Line LOS D (S.U.E.*)	-----
Above Ground Gas Line	-----

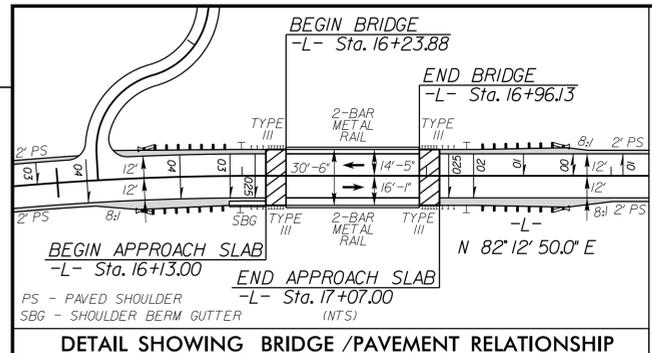
### SANITARY SEWER:

Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	-----
Above Ground Sanitary Sewer	-----
SS Forced Main Line LOS B (S.U.E.*)	-----
SS Forced Main Line LOS C (S.U.E.*)	-----
SS Forced Main Line LOS D (S.U.E.*)	-----

### MISCELLANEOUS:

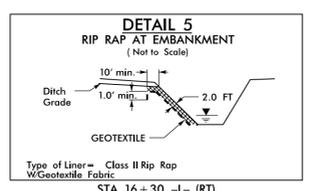
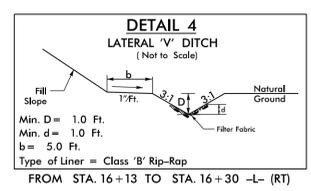
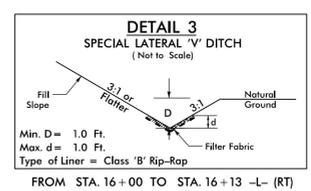
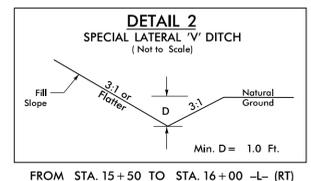
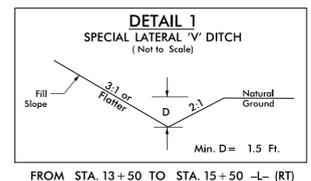
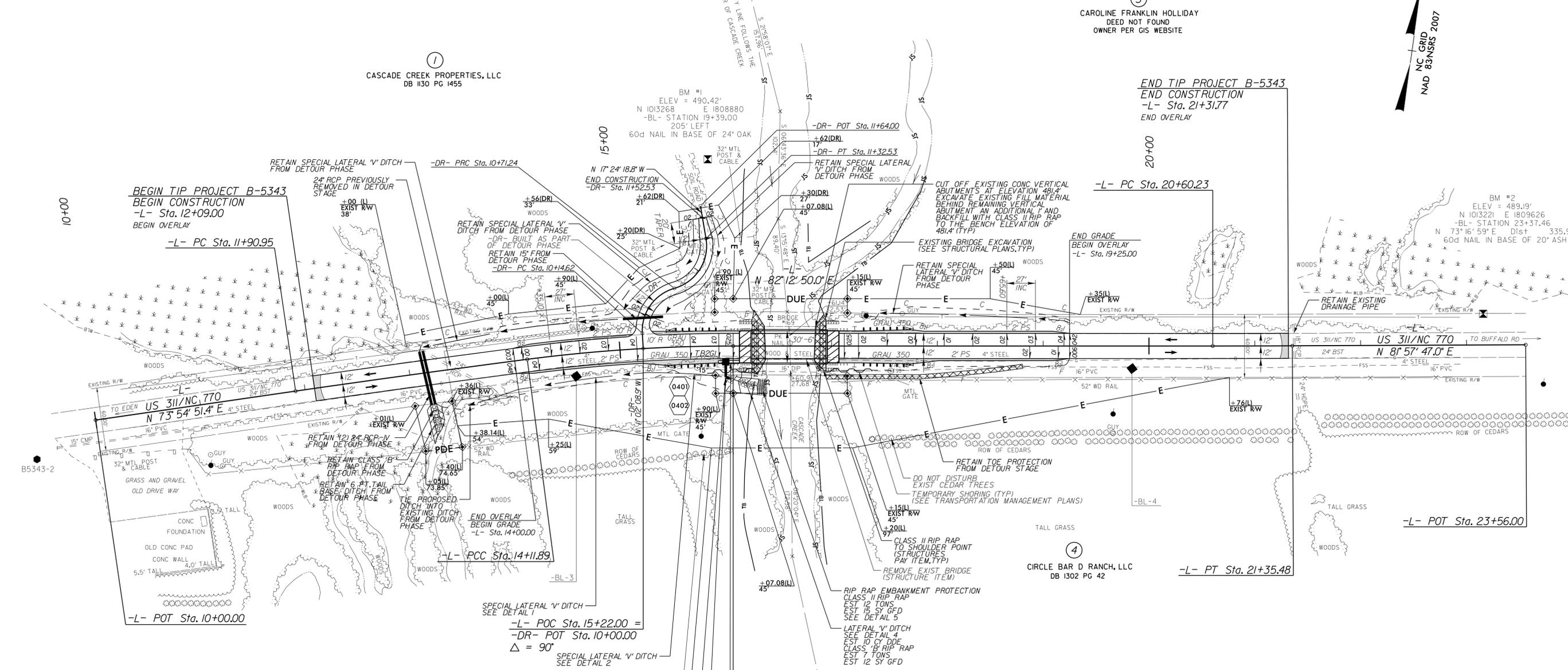
Utility Pole	●
Utility Pole with Base	⊠
Utility Located Object	○
Utility Traffic Signal Box	⊠
Utility Unknown U/G Line LOS B (S.U.E.*)	-----
U/G Tank; Water, Gas, Oil	□
Underground Storage Tank, Approx. Loc.	⊠
A/G Tank; Water, Gas, Oil	□
Geoenvironmental Boring	⊕
U/G Test Hole LOS A (S.U.E.*)	●
Abandoned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

-L-		-DR-	
PI Sta 13+01.42	PI Sta 15+09.62	PI Sta 20+97.86	PI Sta 10+47.99
$\Delta = 0^{\circ} 50' 38.2''$ (RT)	$\Delta = 7^{\circ} 27' 20.4''$ (RT)	$\Delta = 0^{\circ} 15' 03.0''$ (LT)	$\Delta = 96^{\circ} 05' 57.3''$ (RT)
D = 0' 22' 55.1"	D = 3' 49' 11.0"	D = 0' 20' 00.0"	D = 190' 59' 09.4"
L = 220.94'	L = 195.19'	L = 75.25'	L = 50.32'
T = 110.47'	T = 97.73'	T = 37.63'	T = 33.38'
R = 15,000.00'	R = 15,000.00'	R = 17,188.73'	R = 30.00'
DS = 60 MPH	DS = 60 MPH	DS = 60 MPH	DS = 15 MPH
SE = EXIST	SE = 0.04	SE = EXIST	SE = NC
RO = EXIST	RO = 108'	RO = EXIST	RO = N/A



**DETAIL SHOWING BRIDGE / PAVEMENT RELATIONSHIP**

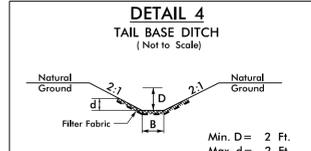
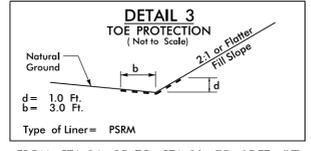
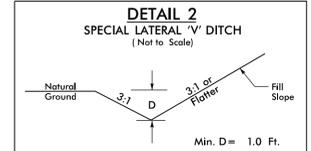
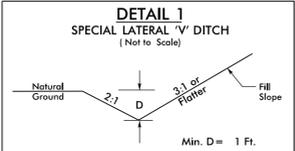
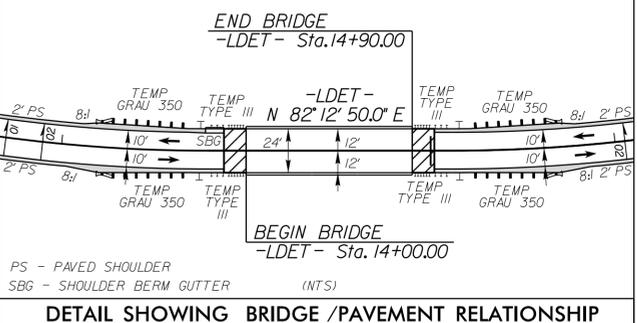
REVISIONS



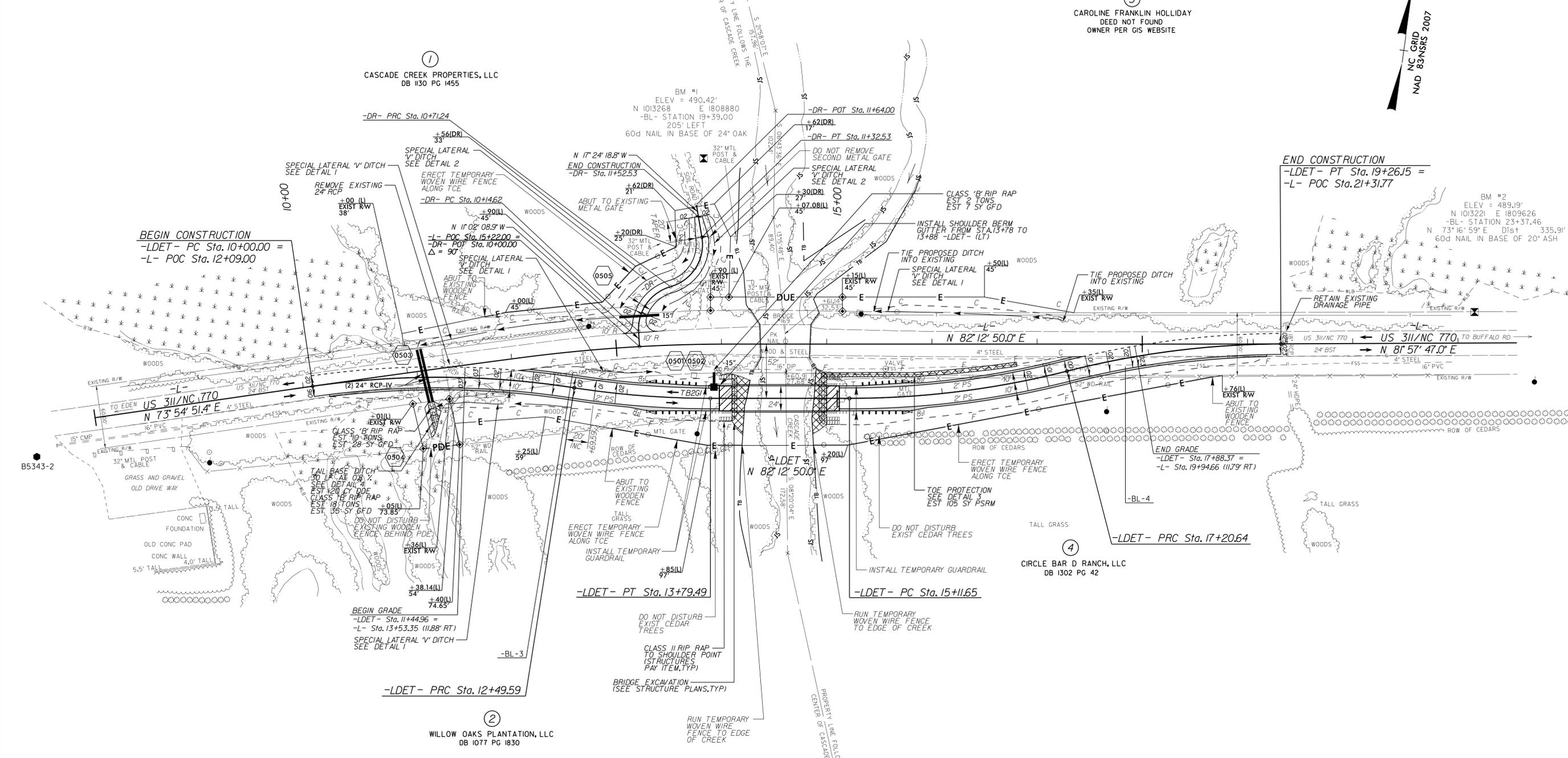
5/02/2016

SEE SHEET 6 FOR -L- PROFILE  
SEE SHEETS S-1 THRU S-? FOR STRUCTURE PLANS

PROJECT REFERENCE NO. B-5343	SHEET NO. 5
ROADWAY ENGINEER	HYDRAULICS ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	



REVISIONS



-LDET- (V<sub>DET</sub> = 50 MPH)

PI Sta 11+25.74 Δ = 17° 10' 03.0" (RT) D = 6' 52' 41.7" L = 249.59' T = 125.74' R = 833.00' DS = 50 MPH SE = RC RO = 40'	PI Sta 13+14.67 Δ = 8° 56' 05.3" (LT) D = 6' 52' 41.7" L = 129.90' T = 65.08' R = 833.00' DS = 50 MPH SE = RC RO = 40'	PI Sta 16+16.70 Δ = 14° 22' 28.1" (LT) D = 6' 52' 41.7" L = 208.98' T = 105.04' R = 833.00' DS = 50 MPH SE = RC RO = 40'	PI Sta 18+23.92 Δ = 14° 08' 09.7" (RT) D = 6' 52' 41.7" L = 205.52' T = 103.28' R = 833.00' DS = 50 MPH SE = RC RO = 40'
--	--	--	--

ALL TEMPORARY WOVEN WIRE FENCING TO BE INSTALLED BY ROADWAY CONTRACTOR

ALL TEMPORARY WOVEN WIRE FENCING TO BE REMOVED BY OTHERS

SEE SHEET 6 FOR -LDET- PROFILE

SEE SHEET 6 FOR -DR- PROFILE

SEE SHEETS S-1 THRU S-? FOR STRUCTURE PLANS



## United States Department of the Interior

FISH AND WILDLIFE SERVICE

Raleigh Field Office  
Post Office Box 33726  
Raleigh, North Carolina 27636-3726

May 2, 2016

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

Dear Mr. Sullivan:

This document transmits the U.S. Fish and Wildlife Service's (Service) Biological Opinion based on our review of the proposed replacement of Bridge No. 169 over Cascade Creek on US 311/NC 770 (TIP No. B-5343), located in Rockingham County, North Carolina, and its effects on the federally endangered Roanoke logperch (*Percina rex*) in accordance with Section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543). Your March 25, 2016 request for formal consultation was received on March 30, 2016. If you have any questions concerning this biological opinion, please contact Mr. Gary Jordan at (919) 856-4520 (Ext. 32).

Sincerely,

Pete Benjamin  
Field Supervisor

electronic copy:

Kimberly Smith, USFWS, Gloucester, VA  
Sarah McRae, USFWS, Raleigh, NC  
David Bailey, USACE, Wake Forest, NC  
Jerry Parker, NCDOT, Greensboro, NC  
Matt Haney, NCDOT, Raleigh, NC  
Neil Medlin, NCDOT, Raleigh, NC  
Travis Wilson, NCWRC, Creedmoor, NC  
Felix Davila, FHWA, Raleigh, NC

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

## **CONSULTATION HISTORY**

March 23, 2012 – The Service provided project scoping comments to NCDOT and requested a survey for Roanoke logperch.

May 2, 2013 – The Service was notified that a Roanoke logperch was captured during a survey.

May 23, 2013 – The Service met with NCDOT staff onsite to discuss the need for a formal Section 7 consultation.

February 25, 2016 – The Service provided comments to NCDOT on a draft BA.

March 30, 2016 – The Service received a letter from the Federal Highway Administration (FHWA), dated March 25, 2016 with the attached final BA, requesting formal Section 7 consultation on the proposed replacement of Rockingham County Bridge No. 169 over Cascade Creek.

## **BIOLOGICAL OPINION**

### **I. DESCRIPTION OF THE PROPOSED ACTION**

NCDOT proposes to replace Bridge No. 169 on US 311/NC 770 over Cascade Creek in Rockingham County, North Carolina. The bridge is located approximately 2.5 miles northeast of downtown Eden and one mile south of the North Carolina/Virginia border. The existing bridge is a two-span structure with an overall length of 50 feet that consists of an asphalt overlay on a concrete deck on steel I-beams supported by reinforced concrete abutments and a solid reinforced concrete interior pier. The bridge will be replaced on the existing alignment while traffic is maintained on a temporary two-lane onsite detour alignment to the south. The new bridge will have an overall length of 70 feet and an overall width of 33 feet. No interior piers will be placed in the water for the new bridge.

The roadway grade of the new structure will be approximately the same as the existing structure. The approach roadway will extend approximately 415 feet from the west end of the new bridge and 435 feet from the east end of the new bridge. The approaches will be widened to include a 24-foot pavement width providing two 12-foot lanes. Six-foot shoulders (two-foot paved and four-foot grass) will be provided on each side (nine-foot shoulders where guardrail is included).

An onsite detour is proposed to the south of the existing alignment with an alignment of 926 feet. The detour alignment will utilize a temporary bridge with an overall length of 90 feet and clear roadway width of 24 feet. The detour bridge will be removed and the area revegetated after the

old bridge has been replaced. The detour design includes the removal of an existing 24-inch pipe connecting wetlands at the beginning of the project. This pipe will be realigned and replaced with two 24-inch reinforced concrete pipes. Some drainage modifications will be needed to tie the pipes in to the existing wetland. Roadside ditches draining into wetlands that are affected by the detour and mainline fill slopes will be replaced in kind. No new roadside ditches will be introduced as part of this project.

For the bridge removal, the contractor will attach fabric on the rails and place a containment system beneath the bridge to keep debris out of the creek. The contractor will begin by scraping the asphalt from the deck, then remove the fabric from the rails, and then remove the bridge railing. The deck will then be removed by sawing the concrete in sections and lifting them to one of the end bents for hauling away. Once the deck is removed the steel girders will follow.

The existing concrete vertical abutments will be cut off at elevation 481.4 feet. The existing fill material behind the abutments will be excavated an additional foot and will be backfilled with Class II riprap. The embankment will also be protected with Class II riprap. A temporary causeway will be constructed from the west stream bank to remove the existing interior pier located in the middle of the stream. The causeway will be 48 feet long by 30 feet wide. The causeway will be in place for approximately two weeks and will block approximately 67% of the creek channel. Two 30-inch pipes will be placed in the causeway to help convey the average daily stream flow.

The City of Eden owns a 16-inch force main sewer that is located between the existing bridge and proposed detour bridge. The line is not active yet and will remain in place during project construction, but will be lowered in any areas where it conflicts with drainage crossings. Where the detour crosses the sewer line, steel plates may be installed in order to prevent traffic weight from damaging the line. Piedmont Natural Gas has a four-inch gas line attached to the bridge and running under the south shoulder of NC 770. The gas line will be removed from the bridge, moved south approximately 20 feet, and will be horizontally drilled 10 feet under the creek. CenturyLink has an underground copper line to the north that emerges onto poles to cross the creek aerially. The aerial crossing will be horizontally drilled under the creek and moved out to one foot inside the proposed right-of-way line.

### **Action Area**

The action area is defined as the US 311/NC 770 right-of-way at Rockingham County Bridge No. 169, beginning 415 feet west of the bridge and extending 435 feet east of the bridge, plus Cascade Creek for a distance of 1,312 feet (400 meters) downstream and 328 feet (100 meters) upstream of the bridge. The action area consists mainly of a maintained/disturbed roadside vegetative community, the US 311/NC 770 pavement and bridge structure, and the Cascade Creek channel. Cascade Creek arises in Virginia and empties into the Dan River in North Carolina. The action area occurs approximately 1.8 miles upstream of Cascade Creek's confluence with the Dan River. The Cascade Creek Watershed consists primarily of forest and agricultural land uses.

## **Conservation Measures**

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

The following “Design Standards in Sensitive Watersheds” are incorporated into NCDOT projects that occur within or upstream of water bodies that contain federally protected aquatic species:

- Erosion and sedimentation control measures, structures, and devices within a sensitive watershed shall be so planned, designed and constructed as to provide protection from the runoff of the 25-year storm which produces the maximum peak rate of runoff as calculated according to procedures in the “Erosion and Sediment Control Planning and Design Manual” or according to procedures adopted by the North Carolina Department of Transportation.
- Sediment basins within sensitive watersheds shall be designed and constructed such that the basin will have a settling efficiency of at least 70 percent for the 40 micron (0.04mm) size soil particle transported into the basin by the runoff of the two-year storm which produces the maximum peak rate of runoff as calculated according to procedures in the “Erosion and Sediment Control Planning and Design Manual” or according to procedures adopted by North Carolina Department of Transportation.
- Erosion and sedimentation control measures will include the use of flocculants in appropriate areas to improve the settling of sediment particles and reduce turbidity levels in construction runoff. The use of flocculants will conform to Division of Water Resources approved product list. No flocculants will be used at the perimeter of the site, and erosion control measures will be designed to prevent the release of treated soil into the stream.
- Newly constructed open channels in sensitive watersheds shall be designed and constructed with side slopes no steeper than two horizontal to one vertical if a vegetative cover is used for stabilization unless soil conditions permit a steeper slope or where the slopes are stabilized by using mechanical devices, structural devices or other acceptable ditch liners. In any event, the angle for side slopes shall be sufficient to restrain accelerated erosion. (The only channel work to be conducted as part of this project pertains to roadside ditches. Ditches affected by the detour and mainline fill slopes will be replaced in kind.)
- Ground cover sufficient to restrain erosion must be provided for any portion of a land-disturbing activity in a sensitive watershed within 14 calendar days following completion of construction or development.

Since the project is located in an Environmentally Sensitive Area, special procedures will be used for clearing and grubbing, temporary stream crossings, grading operations, and seeding and

mulching. The Environmentally Sensitive Area is defined as a 50-foot buffer zone on both sides of the stream measured from top of stream bank (see Figure 3 in BA).

- Clearing and grubbing – In areas identified as Environmentally Sensitive Areas, the contractor may perform clearing operations, but not grubbing operations until immediately prior to beginning grading operations as described in Article 200-1 of the *Standard Specifications*. Erosion control devices shall be installed immediately following the clearing operation.
- Grading – Once grading operations begin in Environmentally Sensitive Areas, work shall progress in a continuous manner until complete. All construction within these areas shall progress in a continuous manner such that each phase is complete and areas are permanently stabilized prior to beginning of next phase.
- Temporary stream crossings – Any crossing of streams within the limits of this project shall be accomplished in accordance with the requirements of Subarticle 107-12(B) of the *Standard Specifications*. Since the temporary causeway blocks more than 50% of the channel, two 30-inch pipes will be installed temporarily with the causeway to help convey the average daily stream flow.
- Seeding and mulching – Seeding and mulching shall be performed in accordance with Section 1660 of the *Standard Specifications*, and vegetative cover sufficient to restrain erosion shall be installed immediately following grade establishment. Seeding and mulching shall be performed on the areas disturbed by construction immediately following final grade establishment. No appreciable time shall lapse into the contract time without stabilization of slopes, ditches and other areas within the Environmentally Sensitive Areas.
- Stage seeding – The work covered by this section shall consist of the establishment of a vegetative cover on cut and fill slopes as grading progresses. Seeding and mulching shall be done in stages on cut and fill slopes that are greater than 20 feet in height measured along the slope, or greater than 2 acres in area. Each stage shall not exceed the limits stated above.

The following additional measures are intended to further reduce deleterious construction related effects to the waterway and aquatic fauna:

- Vegetated grass swales will be used where practicable.
- No direct discharge of deck drains over water will be allowed on the permanent structure. There will be grated inlets that will outfall into roadside ditches or swales prior to discharging into the stream. The stream will be reinforced with riprap embankment protection at those ditch discharge points.
- There will be no fill within the stream banks, although there will be some excavation of the existing road embankment behind the old bridge at the beginning and end of the proposed bridge. This excavation will go down to the elevation of the natural floodplain elevation. The vertical concrete abutments of the existing bridge will be cut off at the floodplain bench elevation to avoid impacts in the stream from abutment removal.
- Machines will be refueled outside of the Environmentally Sensitive Area and inside a specific containment area designed to contain any spills and facilitate easy cleanup.
- Machines will be inspected daily to catch and repair leaks of hydraulic fluid.
- A storm water management plan will be completed with the permit drawings.

## **II. STATUS OF THE SPECIES/CRITICAL HABITAT**

### **A. Species/critical habitat description**

The Roanoke logperch is a large darter with an elongate body up to 165 mm in total length (Roberts and Rosenberger 2008). It has a bulbous snout, eight to 11 lateral blotches, dorsal scrawling, and an orange streak on the first dorsal fin which is especially vivid in mature males (Jenkins and Burkhead 1994).

The Roanoke logperch has a small geographic range and narrow habitat preferences, occurring primarily in medium-size rivers with silt-free, unembedded pebble and gravel substrate. It can be found in larger streams in the upper Roanoke, Smith, Pigg, Big Otter, Nottoway river systems and Goose Creek in Virginia, and in the Dan, Mayo, and Smith river systems in North Carolina (Lahey and Angermeier 2007). Its upstream range in the Dan and Mayo rivers is presumably impeded by dams (USFWS 2016).

The Roanoke logperch was listed as a federally endangered species in 1989 (U.S. Federal Register 54:34468-34472). No critical habitat has been designated for the Roanoke logperch.

### **B. Life history**

The Roanoke logperch is a benthic invertivore that uses a feeding tactic whereby it flips pebbles and gravels with its snout and eats the exposed invertebrates. Because of this specialized feeding behavior, they prefer habitat with loose, unembedded, and unsilted substrates and substrates of a size that are easily flipped (Rosenberger and Angermeier 2003, Lahey and Angermeier 2007).

The maximum life span is approximately 6.5 years (Burkhead 1983), and reproductive maturity occurs at 2-3 years (Jenkins and Burkhead 1994). In Virginia, spawning occurs in April or May in deep runs over gravel and small cobble. Logperch typically bury their eggs and provide no subsequent parental care (Jenkins and Burkhead 1994).

### **C. Population dynamics**

The Roanoke logperch is considered uncommon to rare, and populations are isolated from each other by dams and unsuitable habitat reaches (Roberts 2008, Roberts 2012). Survey efforts for the species have demonstrated a low sampling efficiency (Rosenberger 2007). This low catchability, along with patchy distribution and low abundance, make them difficult to detect (Lahey and Angermeier 2007). Given these factors, abundance data on the species is extremely difficult to obtain and may have limited meaning (Rosenberger 2007).

Until recently, there were thought to be approximately eight known discrete populations of Roanoke logperch. The population in the upper Roanoke River is probably the largest and most important in the species' range (USFWS 2007). Although populations may have once occurred

throughout the Roanoke, Dan, and Nottoway river drainages, many reaches and river systems are now unsuitable due to habitat degradation (Rosenberger 2007).

Over the past few years, Roanoke logperch have been newly discovered in the main-stem Dan River and several tributaries to the Dan River in Rockingham County, North Carolina – including Mayo River, Smith River, Big Beaver Island Creek, Wolf Island Creek, and Cascade Creek. These discoveries may suggest that the geographic range is expanding, or it could mean that the geographic range is larger than previously thought (Roberts 2012). However, the smaller tributaries to the Dan River (Big Beaver Island Creek, Wolf Island Creek, and Cascade Creek) may not hold permanent populations (Thomas Russ, North Carolina Wildlife Resources Commission, personal communication, October 6, 2015).

#### **D. Status and distribution**

Due to its presumed rarity, decline, and susceptibility to additional habitat loss and fragmentation, the Roanoke logperch was listed as endangered in 1989 (U.S. Federal Register 54:34468-34472). Known and potential threats to the species include large dams and reservoirs, small dams and reservoirs, watershed urbanization, agricultural/silvicultural activities, channelization, road building, toxic spills, riparian/woody debris loss, and water withdrawals (USFWS 2007).

The species appears to be reproducing throughout its range, but a poor understanding of abundance at the time of listing makes it difficult to determine whether populations are increasing, stable, or declining over the long term (USFWS 2007). However, the number of known populations and the geographical range of the species have increased since the species was listed in 1989 (USFWS 2007, Roberts 2012).

It appears that massive habitat loss associated with the construction of several large impoundments in the Roanoke River Basin in the 1950s and 1960s (e.g. Leesville, Smith Mountain, and Philpott Reservoirs) caused the greatest overall loss of Roanoke logperch habitat and reduction in the species original range (USFWS 2007). Today's isolated populations probably represent remnants of much larger populations that once occupied a much larger geographical range. The remaining populations are small and no genetic exchange occurs among them. These factors, along with the potential for local catastrophic events (e.g. flooding, draught, toxic chemical spills) increase each population's vulnerability to extirpation.

The most widespread current threat to Roanoke logperch is non-point source pollution in the form of fine sediment from both urban and poor agricultural practices (USFWS 2007). Microhabitats that contain loosely embedded sediment free of heavy silt cover are critical for this species (Rosenberger and Angermeier 2003). Urbanization and agricultural activities have exposed many streams within the range of the species to heavy siltation, a process that fills substrate interstitial spaces, thereby reducing the suitability of habitat for logperch (Lahey and Angermeier 2007).

The best known and largest population of Roanoke logperch, which inhabits the upper Roanoke from the City of Roanoke upstream into the North and South Forks, has been subjected to

considerable stress from human uses in the basin (USFWS 2007). The adverse effects to aquatic systems from increased urbanization and impervious surface is well understood (Wheeler et al. 2005, Rosenberger 2007). Although there are no trend data available, the continued urbanization of the upper Roanoke threatens the existing population density and abundance in this portion of the species' range (USFWS 2007).

#### **E. Analysis of the species/critical habitat likely to be affected**

The FHWA and NCDOT have determined that the project will adversely affect the Roanoke logperch. No critical habitat has been designated for the Roanoke logperch, so none will be affected. The FHWA and NCDOT have determined that the project will have no effect on the federally endangered James spiny mussel (*Pleurobema collina*) and smooth cone flower (*Echinacea laevigata*). The Service concurs with these "no effect" biological conclusions, and these two species will not be further addressed in this BO.

### **III. ENVIRONMENTAL BASELINE**

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

#### **A. Status of the species within the action area**

The Roanoke logperch was not known to occur in Cascade Creek until 2009. In that year, a fish kill occurred in Cascade Creek in Virginia approximately 1.5 miles upstream from the project site that extended south toward the state line with North Carolina. Ten thousand fish were killed, including two Roanoke logperch. In a fish survey conducted on April 24, 2012 at the project site, a single Roanoke logperch was observed. A subsequent survey conducted on July 17, 2015 did not find the species. Since only three specimens of Roanoke logperch have ever been detected in Cascade Creek, it is not possible to determine the overall status of the species within this stream. However, it is thought that smaller tributaries to the Dan River such as Cascade Creek may not hold permanent populations (Thomas Russ, North Carolina Wildlife Resources Commission, personal communication, October 6, 2015).

#### **B. Factors affecting the species environment within the action area**

The existing bridge, especially the bent in the channel and the approach fill in the floodplain, may currently have some localized effect on Roanoke logperch habitat within the action area (e.g. affecting flow characteristics). Good quality habitat for the Roanoke logperch occurs within the action area; however, some bank erosion is occurring.

#### **IV. EFFECTS OF THE ACTION**

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

##### **A. Factors to be considered**

Since Cascade Creek may not hold a permanent population of Roanoke logperch, and given the paucity of records of the species within the creek, Roanoke logperch may or may not be present within the action area while the bridge is replaced. Although the contractor is anticipated to take up to four months to complete the entire project, the actual in-water work to remove one bent will be limited to approximately two weeks. This in-water work will be limited in scope and nature.

Given the mobility of the species during normal flow conditions, the potential for exposure to adverse effects is low. The duration and severity of disturbance from the project will likely be minimal. The clearing and excavation work outside the channel could potentially expose Roanoke logperch habitat to detrimental effects for a longer duration if erosion control methods were inadequate or were compromised during a severe storm. However, these potential adverse effects would be limited and temporary, and perhaps indistinguishable from the effects of a large rain event.

##### **B. Analysis for effects of the action**

**Beneficial effects:** The removal of the existing bridge bent in the channel and the commitment to completely span the channel will have beneficial effects. Given that in-channel bents can trap debris during high flows and can change stream hydraulics in the immediate vicinity of the structure (causing scour and deposition), the elimination of the in-channel bent is expected to reduce the bridge’s effects on stream flow patterns. Also, given that large debris piles must often be removed from in-channel bents (creating additional channel disturbance and downstream sedimentation), the elimination of the in-channel bent will thus preclude future disturbance from debris removal. The lengthening of the bridge from 50 feet to 70 feet and increasing the hydraulic opening under the bridge will allow the stream to access more of its floodplain, thus potentially reducing downstream bank scouring and sedimentation. Also, the elimination of drop inlets on the new bridge will lessen the potential for toxic agents to enter the stream at the project location.

**Direct effects:** Given the mobile nature of the species, it is unlikely that any Roanoke logperch mortality would occur as a result of the project. However, habitat for the species may be directly affected by the removal of the in-channel bent and temporary causeway. Disturbed sediment could redeposit downstream within Roanoke logperch habitat. However, the increased turbidity and substrate disturbance would likely be temporary and have sub-lethal effects on the species. Upstream or downstream movements of Roanoke logperch could be hindered temporarily by the disturbance created during bent removal and the placement/removal of the temporary causeway. However, this disturbance is expected to only occur for approximately two weeks.

Of greater concern is prolonged erosion of the disturbed area on and along the banks of the stream within the action area during the construction of the bridge and approach road. A major storm event could erode soil from within the disturbed construction area and wash it into the stream, potentially interfering with respiration, feeding, or spawning and otherwise degrading habitat. To avoid or minimize the potential for this effect, NCDOT has developed stringent erosion control measures and other conservation measures (see “Conservation Measures” section of this BO) which greatly reduce the likelihood of sediment entering the stream. In the unlikely event of catastrophic failure of erosion control measures, the effects are still likely sub-lethal. Given the mobility of the species under normal flow conditions, Roanoke logperch could temporarily relocate to areas of better habitat.

**Indirect effects:** Since the project involves replacing an existing two-lane bridge with a new two-lane bridge, it is unlikely that the project will promote any secondary development or land use changes. The removal of the existing bent in the channel will likely alter flow patterns at the bridge thus forcing the stream to reach a new equilibrium. Though some minimal sediment deposition may occur due to a localized reduction of velocity, the effect is likely minimal and possibly undetectable. Overall, the project is not likely to have any measurable, indirect effect on Roanoke logperch.

**Interrelated and interdependent actions:** A four-inch gas utility line and an underground copper line will be relocated within the project right-of-way by others. The utility lines will be directionally bored underneath Cascade Creek and no adverse effects are expected.

### **C. Species response to the action**

With the implementation of the conservation measures previously described, Roanoke logperch are not likely to experience any mortality. However, Roanoke logperch behavior and movements may be altered for approximately two weeks during the in-water work, or could be altered at any time during the project construction in the event of catastrophic failure of erosion control measures. The use of some portion of the action area could be temporarily denied to Roanoke logperch. Roanoke logperch would likely be forced to utilize more suitable habitat upstream or downstream of the project. However, any such disruptions to normal Roanoke logperch behavior would be short-lived.

## **V. CUMMULATIVE EFFECTS**

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

## **VI. CONCLUSION**

After reviewing the current status of the Roanoke logperch, the environmental baseline for the action area, all effects of the proposed project, and the conservation measures identified in the BA, it is the Service's biological opinion that the proposed replacement of Bridge No. 169 over Cascade Creek on US 311/NC 770 in Rockingham County, as proposed, is not likely to jeopardize the continued existence of this species. No critical habitat for this species has been designated, therefore none will be affected.

This non-jeopardy opinion is based on the following factors: Cascade Creek may not contain a permanent population of Roanoke logperch. Roanoke logperch may not be present during the project construction. In-channel work will be minimal, thus limiting the potential for adverse effects. Several conservation measures will greatly reduce the potential for adverse effects. Adverse effects are likely sub-lethal and short-term in duration. The project has important long-term beneficial effects.

## **INCIDENTAL TAKE STATEMENT**

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

The measures described below are non-discretionary, and must be undertaken by the FHWA so that they become binding conditions of any grant or permit issued to the NCDOT, as appropriate, for the exemption in section 7(o)(2) to apply. The FHWA has a continuing duty to regulate the activity covered by this Incidental Take Statement. If the FHWA (1) fails to assume and implement the terms and conditions or (2) fails to require the NCDOT to adhere to the terms and

conditions of the Incidental Take Statement through enforceable terms that are added to the grant or permit document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the FHWA or the NCDOT must report any detectable impacts on the species to the Service as specified in the Incidental Take Statement [50 CFR §402.14(I)(3)].

### **Amount or Extent of Take Anticipated**

The Service anticipates that incidental take of Roanoke logperch may occur as a result of the bridge replacement. However, we believe that incidental take for this species may be difficult to detect for the following reasons: The most likely form of take would occur as harm or harassment due to temporary disturbance and/or temporary habitat degradation resulting in behavioral modification of Roanoke logperch. Roanoke logperch movements, breeding, feeding or sheltering could be temporarily disrupted. Incidental take resulting from behavioral modification would be very difficult to detect and monitor in a small, mobile aquatic species. Actual habitat degradation may be detectable, but knowing whether a specific degradation actually affected the species would be difficult to determine.

Because there is no practical way to know the number of Roanoke logperch that may be present within the action area at any given time, or to know whether or not sub-lethal incidental take has even occurred, it is not possible to base the overall amount of incidental take on numbers of individual fish. Therefore, the level of incidental take of Roanoke logperch can be defined as all Roanoke logperch that may be harmed, harassed, or killed within the action area (400 meters downstream and 100 meters upstream of the existing bridge). If incidental take is exceeded, all work should stop, and the Service should be contacted immediately.

### **Effect of the Take**

In the accompanying BO, the Service has determined that the level of anticipated take is not likely to result in jeopardy to the Roanoke logperch. The proposed project will not result in the destruction or adverse modification of any critical habitat.

### **Reasonable and Prudent Measures**

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

1. Avoid affecting Roanoke logperch during spawning season.
2. Adverse effects to Roanoke logperch habitat must be minimized to the maximum extent practicable.
3. Report any detectable incidental take of Roanoke logperch.

### **Terms and Conditions**

In order to be exempt from the prohibitions of section 9 of the ESA, the FHWA and NCDOT must comply with the following terms and conditions, which implement the reasonable and

prudent measures described previously and outline required reporting requirements. These terms and conditions are nondiscretionary.

1. No in-water work may occur during the timeframe of March 1 – June 15. (RPM 1)
2. NCDOT will ensure that the contractor and on-site NCDOT staff understand and follow the measures listed in the “Conservation Measures” section of this BO. (RPM 2)
3. If fish mortality is observed within the action area during the construction of the project, the dead fish must be identified to species to determine the presence or absence of Roanoke logperch. If Roanoke logperch are identified, the NCDOT must notify the Service of the take. (RPM 3)

## CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. The following conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. Conduct or assist with periodic Roanoke logperch status surveys within its known range and submit results to the Service.
2. Contribute funding and/or staff to any future Roanoke logperch research or conservation efforts conducted by others.

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

## REINITIATION/CLOSING STATEMENT

This concludes formal consultation on the action outlined in your March 25, 2016 request for formal consultation. As provided in 50 CFR section 402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (2) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (3) a new species is listed or critical habitat designated that may be affected by the action.

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