Transportation

PAT McCRORY
Governor

NICHOLAS J. TENNYSON
Secretary

December 17, 2015

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

ATTN: Ms. Loretta Beckwith
NCDOT Coordinator

SUBJECT: **Application for Section 404 Nationwide Permits 23, 33, and Section 401 Water Quality Certification** for the Proposed Replacement of Bridge No. 87 on US 64 over the Broad River in Rutherford County, Federal Aid Project No. BRSTP-64(84); Division 13; TIP No. B-4811; $240.00 debit WBS No. 38581.1.1.

Dear Madam:

The North Carolina Department of Transportation (NCDOT) proposes to replace bridge number 87 on US 64 over Broad River in Rutherford County with a triple span, 250' prestressed concrete girder bridge on a new alignment to the north. The existing bridge will be utilized as an onsite detour during construction. There will be 70 lf (0.39 ac) of permanent impacts to surface waters from roadway embankment for the project. There will be 0.10 acre of temporary impacts to surface waters resulting from causeways to construct the new bridge and demolish the existing bridge. Personal communication with Lori Beckwith of USACE on July 14, 2014 determined that the permanent impacts from this project are to an overflow channel of the Broad river where the water is basically ponded except during high flow events and therefore to be considered open water impacts that are jurisdictional but nonmitigable.

Please see enclosed copies of the Pre-Construction Notification (PCN), USFWS Concurrence Letter, Stormwater Management Plan, Permit Drawings, and Roadway Plansheets. A Categorical Exclusion (CE) was completed in July 2014 and distributed shortly thereafter. Additional copies are available upon request.

A letter from USFWS dated December 1, 2015, granted concurrence for the northern long-eared bat and Indiana bat with a call of May Affect, Not Likely to Adversely Affect for both species and a tree cutting moratorium was issued for the project extending from April 15 to August 15.

This project is located in a trout county; therefore comments from the NCWRC will be required prior to authorization by the Corps of Engineers. By copy of this letter and attachment, NCDOT hereby requests NCWRC Review. NCDOT requests that NCWRC forward their comments to the Corps of Engineers and the NCDOT within 30 calendar days of receipt of this application.

This project calls for a letting date of April 19, 2016 and a review date of March 1, 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 Jeff Hemphill at (919) 707-6126.

Sincerely,

for Richard W. Hancock, P.E., Manager
Project Development and Environmental Analysis Unit

cc:
NCDOT Permit Application Standard Distribution List

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

Pre-Construction Notification (PCN) Form

A. Applicant Information

1. Processing

1a. Type(s) of approval sought from the Corps:	☒ Section 404 Permit	☐ Section 10 Permit
1b. Specify Nationwide Permit (NWP) number: 23,33	or General Permit (GP) number:	
1c. Has the NWP or GP number been verified by the Corps?	☒ Yes	☐ No

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

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

☐ 401 Water Quality Certification – Express ☐ Riparian Buffer Authorization

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

2. Project Information

2a. Name of project:	Replacement of Bridge 87 over Broad River on US 64
2b. County:	Rutherford
2c. Nearest municipality / town:	Lake Lure
2d. Subdivision name:	*not applicable*
2e. NCDOT only, T.I.P. or state project no:	B-4811

3. Owner Information

3a. Name(s) on Recorded Deed:	North Carolina Department of Transportation
3b. Deed Book and Page No.	*not applicable*
3c. Responsible Party (for LLC if applicable):	*not applicable*
3d. Street address:	1598 Mail Service Center
3e. City, state, zip:	Raleigh, NC 27699-1598
3f. Telephone no.:	(919) 707-6126
3g. Fax no.:	(919) 212-5785
3h. Email address:	jhemphill@ncdot.gov

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

B. Project Information and Prior Project History	
1. Property Identification	
1a. Property identification no. (tax PIN or parcel ID):	*not applicable*
1b. Site coordinates (in decimal degrees):	Latitude: 35.4249 (DD.DDDDDD) Longitude: - 82.1655 (-DD.DDDDDD)
1c. Property size:	2.7 acres
2. Surface Waters	
2a. Name of nearest body of water (stream, river, etc.) to proposed project:	Broad River
2b. Water Quality Classification of nearest receiving water:	C
2c. River basin:	Broad
3. Project Description	
3a. Describe the existing conditions on the site and the general land use in the vicinity of the project at the time of this application: Forest communities, minor commercial and residential development.	
3b. List the total estimated acreage of all existing wetlands on the property: 0.0 acre	
3c. List the total estimated linear feet of all existing streams (intermittent and perennial) on the property: 377 lf	
3d. Explain the purpose of the proposed project: To replace a structurally deficient and functionally obsolete bridge.	
3e. Describe the overall project in detail, including the type of equipment to be used: The project involves replacing a 5 span 235-foot reinforced concrete deck girder bridge with a 250-foot, 3-span prestressed concrete girder bridge on a new alignment to the north with the existing bridge utilized as an onsite detour. Standard road building equipment, such as trucks, dozers, and cranes will be used.	
4. Jurisdictional Determinations	
4a. Have jurisdictional wetland or stream determinations by the Corps or State been requested or obtained for this property / project (including all prior phases) in the past? Comments:	☐ Yes ☒ No ☐ Unknown
4b. If the Corps made the jurisdictional determination, what type of determination was made?	☐ Preliminary ☐ Final
4c. If yes, who delineated the jurisdictional areas? Name (if known):	Agency/Consultant Company: Other:
4d. If yes, list the dates of the Corps jurisdictional determinations or State determinations and attach documentation.	
5. Project History	
5a. Have permits or certifications been requested or obtained for this project (including all prior phases) in the past?	☐ Yes ☒ No ☐ Unknown
5b. If yes, explain in detail according to “help file” instructions.	
6. Future Project Plans	
6a. Is this a phased project?	☐ Yes ☒ No
6b. If yes, explain.	

C. Proposed Impacts Inventory

1. Impacts Summary

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

☐ Wetlands ☐ Streams - tributaries ☒ Buffers

☒ Open Waters ☐ Pond Construction

2. Wetland Impacts

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

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

2h. Comments:

3. Stream Impacts

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

3a. Stream impact number - Permanent (P) or Temporary (T)	3b. Type of impact	3c. Stream name	3d. Perennial (PER) or intermittent (INT)?	3e. Type of jurisdiction (Corps - 404, 10 DWQ – non-404, other)	3f. Average stream width (feet)	3g. Impact length (linear feet)
Site 1 ☐ P ☒ T	Causeway	Broad River	☒ PER ☐ INT	☒ Corps ☐ DWQ	87	140
Site 1 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
Site 2 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
Site 3 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
Site 4 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
Site 5 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
					3h. **Total stream and tributary impacts**	0 Perm 140 Temp

3i. Comments:

4. Open Water Impacts

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

4a. Open water impact number – Permanent (P) or Temporary (T)	4b. Name of waterbody (if applicable)	4c. Type of impact	4d. Waterbody type	4e. Area of impact (acres)
O1 ☐ P ☐ T				
O2 ☒ P ☐ T	Broad River	Roadway fill	Overflow channel	0.39
O3 ☐ P ☐ T				
O4 ☐ P ☐ T				
4f. Total open water impacts				0.39ac Permanent (70 lf) 0 Temporary

4g. Comments:

5. Pond or Lake Construction

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

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

5g. Comments:

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

6. Buffer Impacts (for DWQ)

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

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

D. Impact Justification and Mitigation

1. Avoidance and Minimization

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

See Stormwater Management Plan. Existing roadway drainage consists of grass shoulders with ditches. Existing ditches flow through buffers in grass swales to lake. Proposed roadway includes hazardous spill basin / dry detention basins that collect roadway drainage and discharge on each side of bridge. The existing bridge will be utilized as an onsite detour.

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

Best Management Practices for Surface Waters will be used during all phases of construction.

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

2a. Does the project require Compensatory Mitigation for impacts to Waters of the U.S. or Waters of the State?	☐ Yes ☒ No
	☐ DWQ ☐ Corps
2c. If yes, which mitigation option will be used for this project?	☐ Mitigation bank ☐ Payment to in-lieu fee program ☐ Permittee Responsible Mitigation

3. Complete if Using a Mitigation Bank

3a. Name of Mitigation Bank: not applicable

3b. Credits Purchased (attach receipt and letter)	Type	Quantity

3c. Comments:

4. Complete if Making a Payment to In-lieu Fee Program

4a. Approval letter from in-lieu fee program is attached.	☐ Yes
4b. Stream mitigation requested:	0 linear feet
4c. If using stream mitigation, stream temperature:	☐ warm ☐ cool ☐ cold
4d. Buffer mitigation requested (DWQ only):	0 square feet
4e. Riparian wetland mitigation requested:	0 acres
4f. Non-riparian wetland mitigation requested:	0 acres
4g. Coastal (tidal) wetland mitigation requested:	0 acres

4h. Comments:

5. Complete if Using a Permittee Responsible Mitigation Plan

5a. If using a permittee responsible mitigation plan, provide a description of the proposed mitigation plan.

6. Buffer Mitigation (State Regulated Riparian Buffer Rules) – required by DWQ				
6a. Will the project result in an impact within a protected riparian buffer that requires buffer mitigation?			☐ Yes	☒ No
6b. If yes, then identify the square feet of impact to each zone of the riparian buffer that requires mitigation. Calculate the amount of mitigation required.				
Zone	6c. Reason for impact	6d. Total impact (square feet)	Multiplier	6e. Required mitigation (square feet)
Zone 1				
Zone 2				
	6f. **Total buffer mitigation required:**			
6g. If buffer mitigation is required, discuss what type of mitigation is proposed (e.g., payment to private mitigation bank, permittee responsible riparian buffer restoration, payment into an approved in-lieu fee fund).				
6h. Comments:				

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

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

5. Endangered Species and Designated Critical Habitat (Corps Requirement)		
5a. Will this project occur in or near an area with federally protected species or habitat?	☒ Yes	☐ No
5b. Have you checked with the USFWS concerning Endangered Species Act impacts?	☒ Yes	☐ No
5c. If yes, indicate the USFWS Field Office you have contacted.	☐ Raleigh ☒ Asheville	
5d. What data sources did you use to determine whether your site would impact Endangered Species or Designated Critical Habitat? N.C. Natural Heritage Program database; USFWS-website; biological surveys for protected species listed for Rutherford County which includes: White irisette, Dwarf-flower heartleaf, Indiana bat & small whorled pogonia. Biological Conclusions of "No Effect" were rendered for these species. Habitat for the plant species exists, but surveys conducted in the study area in 2008, 2009 and 2014 resulted in no specimens being found. An Indiana bat report from 2009 determined that bats were at least night roosting on the bridge but the species were not identified. USFWS requested that bridge demolition take place between August 15 to May 15 to avoid the bats regardless of species though concurrence was not requested at the time for Indiana bat. After the NLEB was listed in 2015, concurrence was requested for both bat species. Concurrence was received for Indiana bat and the NLEB from USFWS on October, 2015 with a call of MANLTAA and a tree cutting moratorium from April 15 to August 15. An eagle survey was conducted on October 21, 2015 with no nests or birds observed. NHP listed a known eagle nest approximately 2 miles to the northwest of the project on Lake Lure. Another survey will be conducted prior to construction to ensure the eagles haven't moved their nest to within 660 feet of the project footprint.		
6. Essential Fish Habitat (Corps Requirement)		
6a. Will this project occur in or near an area designated as essential fish habitat?	☐ Yes	☒ No
6b. What data sources did you use to determine whether your site would impact Essential Fish Habitat? NMFS County Index		
7. Historic or Prehistoric Cultural Resources (Corps Requirement)		
7a. Will this project occur in or near an area that the state, federal or tribal governments have designated as having historic or cultural preservation status (e.g., National Historic Trust designation or properties significant in North Carolina history and archaeology)?	☐ Yes	☒ No
7b. What data sources did you use to determine whether your site would impact historic or archeological resources? NEPA Documentation		
8. Flood Zone Designation (Corps Requirement)		
8a. Will this project occur in a FEMA-designated 100-year floodplain?	☒ Yes	☐ No
8b. If yes, explain how project meets FEMA requirements: NCDOT Hydraulics Unit coordination with FEMA		
8c. What source(s) did you use to make the floodplain determination? FEMA Maps		

for Richard W. Hancock, P.E. Applicant/Agent's Printed Name	Applicant/Agent's Signature (Agent's signature is valid only if an authorization letter from the applicant is provided.)	12-18-2015 Date

United States Department of the Interior

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

December 1, 2015

Ms. Carla Dagnino
NC Department of Transportation
Western Region Environmental Program Supervisor II
1598 Mail Service Center
Raleigh, North Carolina 27699-1598

Dear Ms. Dagnino:

Subject: Endangered Species Concurrence for Proposed Replacement of Bridge Number 87 on US 64 over the Broad River, Rutherford County, North Carolina

On November 13, 2015, we received your letter (via email) requesting section 7 concurrence on effects the subject bridge replacement may have on the federally endangered Indiana bat (*Myotis sodalis*) and the federally threatened northern long-eared bat (*Myotis septentrionalis*). The following comments are provided in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (Act).

We have reviewed the information provided in your concurrence request letter and the North Carolina Department of Transportation's Section 7 survey results for the northern long-eared bat and the Indiana bat, associated with the replacement of bridge 87 over the Broad River on US 64 in Rutherford County (TIP No. B-4811). The action area for this proposed project is within the known range of the aforementioned bat species.

However, we agree with your project commitments requiring that tree removal activities take place during the period of August 15-April 15, in order to avoid effects to these bats, will reduce the potential for effects to bats to a discountable level. Additionally, since the existing bridge provides summer roosting potential for bats, we support the project commitment that a survey will be conducted prior to construction in any given year to ensure bats are not present. We also support the project commitment that an eagle survey will be conducted prior to construction to ensure eagles have not built a next within 660 feet of the project footprint since suitable habitat for bald eagle exists on Lake Lure approximately 1 mile west of the project site.

Accordingly, we concur with your biological conclusion that the proposed construction may affect, but is not likely to adversely affect the Indiana bat or the northern long-eared bat. Therefore, we believe the requirements under section 7(c) of the Act are fulfilled. However,

obligations under section 7 of the Act must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered, (2) this action is subsequently modified in a manner that was not considered in this review, or (3) a new species is listed or critical habitat is determined that may be affected by the identified action.

If we can be of assistance or if you have any questions about these comments, please contact Mr. Andrew Henderson of our staff at 828/258-3939, Ext. 227. In any future correspondence concerning this project, please reference our Log Number 4-2-16-064.

Sincerely,

Janet A. Mizzi
Field Supervisor

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.01; Released December 2014)

General Project Information

WBS Element:	38581.1.1	**TIP Number:**	B-4811	**Project Type:** Bridge Replacement	**Date:** 2/27/2015
NCDOT Contact:	Jonathan L. Moore, PE	**Contractor / Designer:**	HNTB North Carolina, P.C. / John F. Watson, PE		
Address:	1020 Birch Ridge Rd Raleigh, NC 27610	**Address:**	343 E. Six Forks Road, Suite 200 Raleigh, NC 27609		
Phone:	(919) 707-6738	**Phone:**	(919) 424-0444		
Email:	jlmoore6@ncdot.gov	**Email:**	jfwatson@hntb.com		
City/Town:	Lake Lure	**County(ies):**	Rutherford		
River Basin(s):	Broad	**CAMA County?**	No		
Wetlands within Project Limits?	No				

Project Description

Project Length (lin. miles or feet):	0.227 Mi	**Surrounding Land Use:**	Rural Residential / Forest

	Proposed Project	**Existing Site**
Project Built-Upon Area (ac.)	0.9 ac.	0.6 ac.
Typical Cross Section Description:	2 - 11' Lanes with 4' Paved Shoulders and Roadside Ditches.	2 - 11' Lanes with Grass Shoulders and Roadside Ditches.
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 4200 Year: 2035	Existing: 2846 Year: 2013

General Project Narrative: (Description of Minimization of Water Quality Impacts)

This project involves the replacement on Rutherford County Bridge #0087, an existing 1 @ 47' - 2", 3 @ 47' - 6", 1 @ 47' - 2" Reinforced Concrete (RC) Deck Girder Bridge on RC Piers, . The proposed bridge is a 1 @ 85' - 0", 1 @ 80' - 0", 1 @ 85' - 0" Prestressed Concrete Girder Bridge with 4' - 0" End Bent Caps and no Deck Drains. Roadway drainage will be collected in a combination of ditches and closed systems. No stormwater will be discharged directly into the Broad River.

Waterbody Information

Surface Water Body (1):	Broad River	**NCDWR Stream Index No.:**	9-(22)
NCDWR Surface Water Classification for Water Body	**Primary Classification:**	Class C	
	Supplemental Classification:		
Other Stream Classification:			
Impairments:	None		
Threatened/Endangered Species?	No Comments:		
NRTR Stream ID:		**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	N/A
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)	**Dissipator Pads Provided in Buffer?** N/A
(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)

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.01; Released December 2014)

WBS Element: 38581.1.1 **TIP No.:** B-4811 **County(ies):** Rutherford

Preformed Scour Holes and Energy Dissipators

Sheet No.	Station (Road Projects) or Coordinates (Non-Road Projects)	Surface Water Body	Energy Dissipator Type	Riprap Type	Drainage Area (ac)	Conveyance Structure	Pipe/Structure Dimensions (in)	Q10 (cfs)	V10 (fps)	BMP Associated w/ Buffer Rules?
4	-L- 14+65 RT	(1)Broad River	Riprap Apron / Pad	Class I	1.9	Pipe	18	4.3	2.7	N/A
4	-L- 17+48 LT	(1)Broad River	Riprap Apron / Pad	Class I	0.3	Pipe	15	1.6	2.4	N/A

Additional Comments

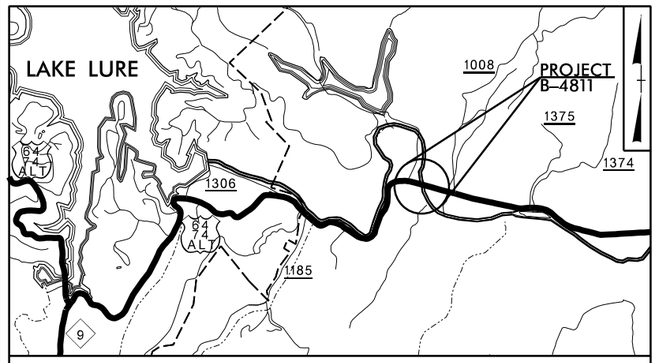
* Refer to the NCDOT Best Management Practices Toolbox (2014), NCDOT Standards, the Federal Highway Administration (FHWA) Hydraulic Engineering Circular No. 14 (HEC-14), Third Edition, Hydraulic Design of Energy Dissipators for Culverts and Channels (July 2006), as applicable, for design guidance and criteria.

09/08/99

TIP PROJECT: B-4811

CONTRACT:

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

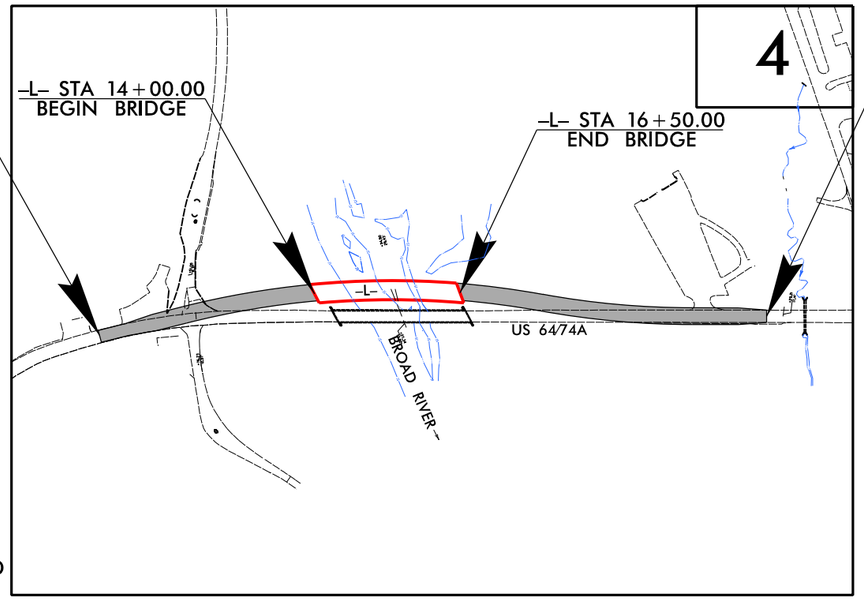
RUTHERFORD COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4811	1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
38581.1.1	BRSTP-64(84)	P.E.	

LOCATION: BRIDGE 87 OVER THE BROAD RIVER ON US 64

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

SURFACE WATER IMPACTS PERMIT



CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ___.
THERE IS NO CONTROL OF ACCESS ON THIS PROJECT.
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

PERMIT DRAWING
SHEET 1 OF 4

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2013 = 2846
ADT 2035 = 4200
K = 11 %
D = 60 %
T = 7 % *
V = 50 MPH
* TTST =1% DUAL=6%
FUNC CLASS=ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4811 = .178 MI.
LENGTH OF STRUCTURES TIP PROJECT B-4811 = .049 MI.
TOTAL LENGTH TIP PROJECT B-4811 = .227 MI.

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

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MARCH 27, 2015

LETTING DATE:
APRIL 19, 2016

KEVIN E. MOORE, PE
PROJECT ENGINEER

MARK HUSSEY
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

SIGNATURE: *P.E.*

2:33:44 PM
...\Drawings\B481l_hyd_tsh_wet.dgn
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PROJECT REFERENCE NO.	SHEET NO.
B-4811	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWING SHEET 2 OF 4

NOTE: SEE SHEET 5 FOR PROFILE

-L- CURVE DATA	
PI Sta 14+81.91	PI Sta 19+32.83
Δ = 24° 31' 19.4" (RT)	Δ = 10° 16' 45.2" (LT)
D = 3° 49' 11.0"	D = 3° 49' 11.0"
L = 641.99'	L = 269.11'
T = 325.98'	T = 134.92'
R = 1,500.00'	R = 1,500.00'
SE = 04	SE = 04
RO = 96'	RO = 96'

NAD 83

REVISIONS 8/17/99

BRIDGE NO. 87 OVER BROAD RIVER ON US 64/74A.

BRIDGE HAS CONCRETE GUARDRAIL & WHEEL GUARDS, CONCRETE DECK W/CONCRETE T-BEAMS AND CONCRETE BENTS AT WEST END AND CONCRETE BENTS AT EAST END.

SITE 1

SITE 2

BEGIN TIP PROJECT B-4811
-L- POT Sta.10+00.00

PC Sta. 11+55.93

CAUSEWAY FOR CONSTRUCTION OF PROPOSED BRIDGE

BROAD RIVER

BL=GPS-1

12+00

-L-

TDE

LATERAL BASE DITCH
SEE DETAIL D
EST. 60 TONS
EST. 150 SY GEO

PRC Sta. 17+97.92

CLASS 'I' RIP-RAP
EST. I TONS
EST. 5 SY GEO

15" W/ 2 ELBOWS

END TIP PROJECT B-4811
-L- POT Sta.22+00.00

PT Sta. 20+67.02

TOE PROTECTION
SEE DETAIL C
EST. 15 TONS
EST. 50 SY GEO

POT Sta. 22+67.02

20+00

S 89° 02' 00.0" E

S 74° 47' 25.8" E

2GI 15" RCP III

15" RCP III

REMOVE

18" W/ 1 ELBOW

SPECIAL LATERAL 'V' DITCH
SEE DETAIL A

SPECIAL LATERAL BASE DITCH
SEE DETAIL B

SPECIAL LATERAL DITCH
SEE DETAIL E
EST. 50 TONS
EST. 50 SY GEO

CLASS 'I' RIP-RAP
EST. I TONS
EST. 5 SY GEO

2GI FG 15" RCP III

END SBG STA. 17+50.00 (RT.)

BEGIN SBG STA. 16+75.64 (RT.)

CAUSEWAY FOR DEMOLITION OF EXISTING BRIDGE

BM#2
BL-STA 19+52.13
2.67' RIGHT
ELEV.=870.49'

BL- 4

US 64/74A 22.00' BST

AUE

WET AREA

WOODS

ISBK CHURCH
FF ELEV. = 868.12

ISF CHURCH (ABAND)

ISBKD FF ELEV. = 867.77

ISBK FF ELEV. = 866.98

ISROCK GUARD HOUSE

CAR PORT

MTL CANOPY

MAIL BOXES

GUIDE POLE

ROCK COLUMN

LIGHT POLE W/BASE

WD STEPS

WD RAMP

BLK WALL

BLK RETAINING WALL

I/S LOG CABIN (BUS)

PHEASANT ST

24" WD RAIL

KEY PAD

CONC WALK

PRIVATE EASEMENT

ROCK COLUMN

ARBOR

WD BAIT BOX

HTR

18" RCP

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

Fill Slope, 2:1, d, D, 2:1, Natural Ground

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

FROM -L- STA. 10+00.0 TO STA. 10+50.0 (RT)

DETAIL B
SPECIAL LATERAL BASE DITCH
(Not to Scale)

Natural Ground, 2:1, D, VAR, Fill Slope, B

Min. D = 1.0 Ft.
B = 2.0 Ft.

FROM -L- STA. 11+00 TO STA. 11+37.6 (RT)
FROM -L- STA. 12+00 TO STA. 12+35.9 (RT)

DETAIL C
TOE PROTECTION
(Not to Scale)

NATURAL GROUND, d, 2:1 OR FLATTER, FILL SLOPE, GEOTEXTILE

d = 1.0 Ft.

Type of Liner = Class 'I' Rip-Rap

FROM -L- STA. 19+50.0 TO STA. 20+25.0

DETAIL D
LATERAL BASE DITCH
(Not to Scale)

Natural Ground, 2:1, d, D, 2:1, b, 1'Ft., Fill Slope, GEOTEXTILE, B

*When B is < 6.0'

Min. D = 1.0 Ft.
Max. d = 5.0 Ft.
B = 10.0 Ft.
b = 5.0 Ft.

Type of Liner = Class I Rip-Rap

FROM -L- STA. 16+00 TO -L- STA. 16+50 (LT)

DETAIL E
LATERAL DITCH
(Not to Scale)

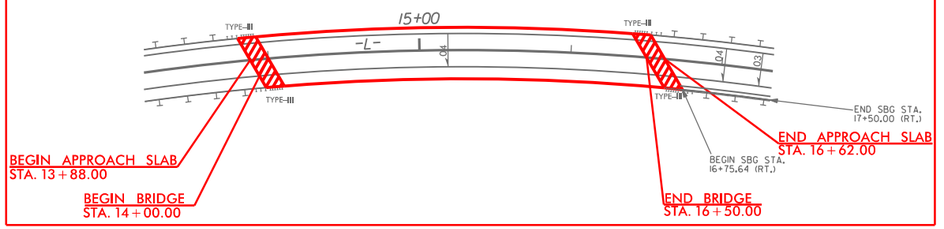
Fill Slope, b, 0.75', 2:1, d, D, 2:1, Proposed Excavation, GEOTEXTILE

Min. D = 1.0 Ft.
d Max. = 2.0 Ft.
b = 3.0 Ft.

Type of Liner = Class I Rip-Rap

FROM -L- STA. 13+00 TO -L- STA. 14+40 (RT)

BRIDGE / ROADWAY RELATIONSHIP SKETCH



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PROJECT REFERENCE NO.	SHEET NO.
B-4811	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWING SHEET 2 OF 4

NOTE: SEE SHEET 5 FOR PROFILE

-L- CURVE DATA	
PI Sta 14+81.91	PI Sta 19+32.83
Δ = 24° 31' 19.4" (RT)	Δ = 10° 16' 45.2" (LT)
D = 3° 49' 11.0"	D = 3° 49' 11.0"
L = 641.99'	L = 269.11'
T = 325.98'	T = 134.92'
R = 1,500.00'	R = 1,500.00'
SE = 04	SE = 04
RO = 96'	RO = 96'

NAD 83

SITE 1

SITE 2

BEGIN TIP PROJECT B-4811
-L- POT Sta.10+00.00

PC Sta. 11+55.93

PRC Sta. 17+97.92

PT Sta. 20+67.02

END TIP PROJECT B-4811
-L- POT Sta.22+00.00

POT Sta. 22+67.02

BROAD RIVER

CAUSEWAY FOR CONSTRUCTION OF PROPOSED BRIDGE

CAUSEWAY FOR DEMOLITION OF EXISTING BRIDGE

LATERAL BASE DITCH
SEE DETAIL D
EST. 60 TONS
EST. 150 SY GEO

CLASS 'I' RIP-RAP
EST. 1 TONS
EST. 5 SY GEO

TOE PROTECTION
SEE DETAIL C
EST. 15 TONS
EST. 50 SY GEO

15" W/ 2 ELBOWS

18" W/ 1 ELBOW

END SBG STA. 17+50.00 (RT.)

BEGIN SBG STA. 16+75.64 (RT.)

SPECIAL LATERAL 'V' DITCH
SEE DETAIL A

SPECIAL LATERAL BASE DITCH
SEE DETAIL B

SPECIAL LATERAL BASE DITCH
SEE DETAIL B

SPECIAL LATERAL DITCH
SEE DETAIL E
EST. 50 TONS
EST. 50 SY GEO

CLASS 'I' RIP-RAP
EST. 1 TONS
EST. 5 SY GEO

S 89° 02' 00.0" E

S 74° 47' 25.8" E

BL-GPS-L

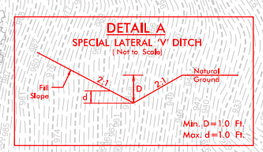
BL-4

BM#2
STA 19+52.13
2.67' RIGHT
ELEV.=870.49'

WET AREA

BRIDGE NO. 87 OVER BROAD RIVER ON US 64/74A.
BRIDGE HAS CONCRETE GUARDRAIL, 3' WHEEL GUARDS, CONCRETE DECK W/CONCRETE T-BEAMS AND CONCRETE BENTS AT WEST END AND CONCRETE BENTS AT EAST END.

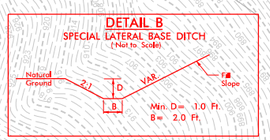
DETAIL A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



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

FROM -L- STA. 10+00.0 TO STA. 10+50.0 (RT)

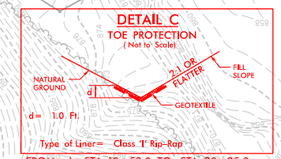
DETAIL B
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D = 1.0 Ft.
B = 2.0 Ft.

FROM -L- STA. 11+00 TO STA. 11+37.6 (RT)
FROM -L- STA. 12+00 TO STA. 12+35.9 (RT)

DETAIL C
TOE PROTECTION
(Not to Scale)

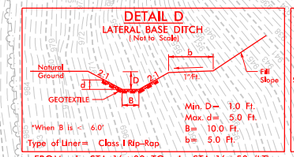


d = 1.0 Ft.

Type of Liner = Class 'I' Rip-Rap

FROM -L- STA. 19+50.0 TO STA. 20+25.0

DETAIL D
LATERAL BASE DITCH
(Not to Scale)



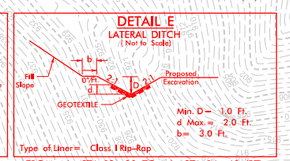
Min. D = 1.0 Ft.
Max. d = 5.0 Ft.
B = 10.0 Ft.
b = 5.0 Ft.

*When B is < 6.0'

Type of Liner = Class I Rip-Rap

FROM -L- STA. 16+00 TO -L- STA. 16+50 (LT)

DETAIL E
LATERAL DITCH
(Not to Scale)

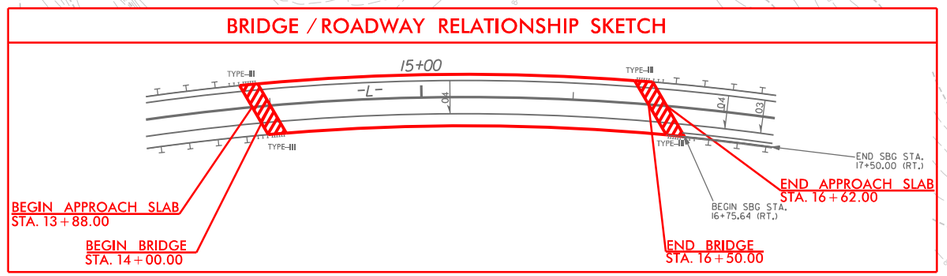


Min. D = 1.0 Ft.
d Max. = 2.0 Ft.
b = 3.0 Ft.

Type of Liner = Class I Rip-Rap

FROM -L- STA. 13+00 TO -L- STA. 14+40 (RT)

BRIDGE / ROADWAY RELATIONSHIP SKETCH



REVISIONS

8/17/99

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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4811	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

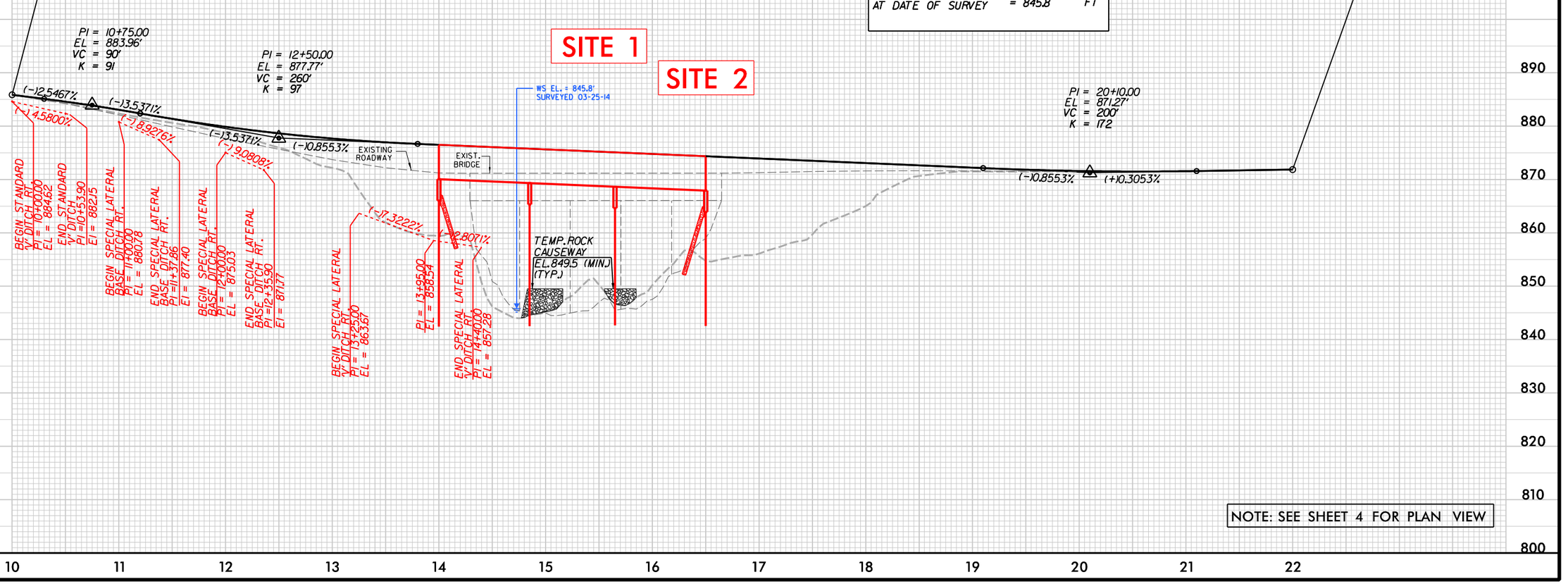
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWING SHEET 3 OF 4

BEGIN GRADE –L– STA. 10+00.00
EL. 885.87

END GRADE –L– STA. 22+00.00
EL. 871.85

BRIDGE HYDRAULIC DATA		
DESIGN DISCHARGE	= 30900	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 866.5	FT
BASE DISCHARGE	= 41500	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 871.88	FT
OVERTOPPING DISCHARGE	= 41500	CFS
OVERTOPPING FREQUENCY	= 100	YRS
OVERTOPPING ELEVATION	= 871.64	FT
DATE OF SURVEY	= 03-25-14	
W.S. ELEVATION AT DATE OF SURVEY	= 845.8	FT



NOTE: SEE SHEET 4 FOR PLAN VIEW

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WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L- 14+67 TO 16+05	Temporary Causeway							0.10		140	
2	-L- 16+08 TO 16+88 LT	Roadway Embankment						0.39		70		
TOTALS*:								0.39	0.10	70	140	0

*Rounded totals are sum of actual impacts

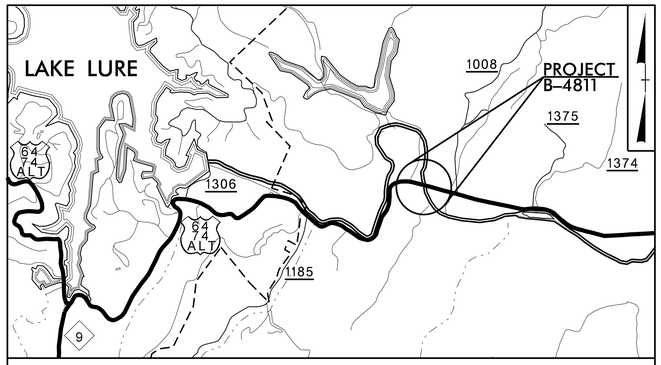
NOTES:
TOTAL IMPACT DUE TO DRILLED PIERS = 0.002 (95.4 SQ. FT.)

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
5/21/15
Rutherford
B-4811
38581.1.1
SHEET 4 OF 4

Revised 2013 10 24

09/08/99

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

RUTHERFORD COUNTY

LOCATION: BRIDGE 87 OVER THE BROAD RIVER ON US 64

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4811	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
38581.1.1	BRSTP-64(84)	P.E.
38581.2.3		R/W & UTIL.

NAD 83

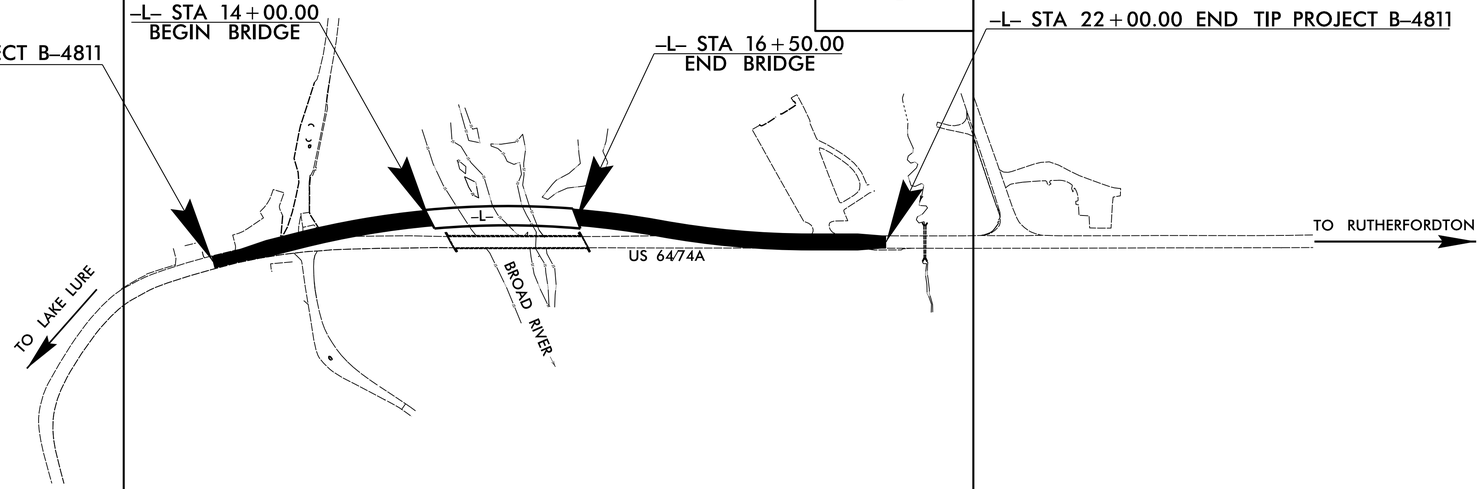
4

–L– STA 10+00.00 BEGIN TIP PROJECT B–4811

–L– STA 14+00.00 BEGIN BRIDGE

–L– STA 16+50.00 END BRIDGE

–L– STA 22+00.00 END TIP PROJECT B–4811



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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

TIP PROJECT: B–4811

CONTRACT:

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2016 = 3030
ADT 2036 = 4262
K = 11 %
D = 60 %
T = 7 % *
V = 50 MPH
* TTST = 1% DUAL = 6%
FUNC CLASS = ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B–4811 = 0.180 MI.
LENGTH OF STRUCTURES TIP PROJECT B–4811 = 0.047 MI.
TOTAL LENGTH TIP PROJECT B–4811 = 0.227 MI.

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

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MARCH 31, 2015

LETTING DATE:
APRIL 19, 2016

KEVIN E. MOORE, PE
PROJECT ENGINEER

MARK HUSSEY
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

SIGNATURE: *P.E.*

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6/2/99

PROJECT REFERENCE NO.	SHEET NO.
B-4811	2A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

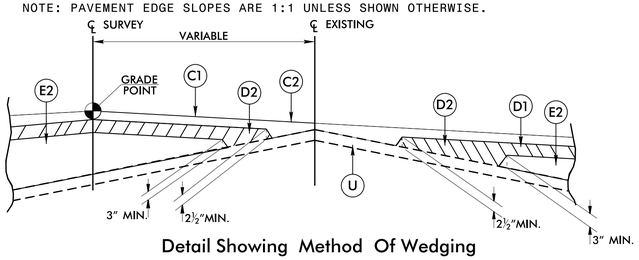
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PAVEMENT SCHEDULE

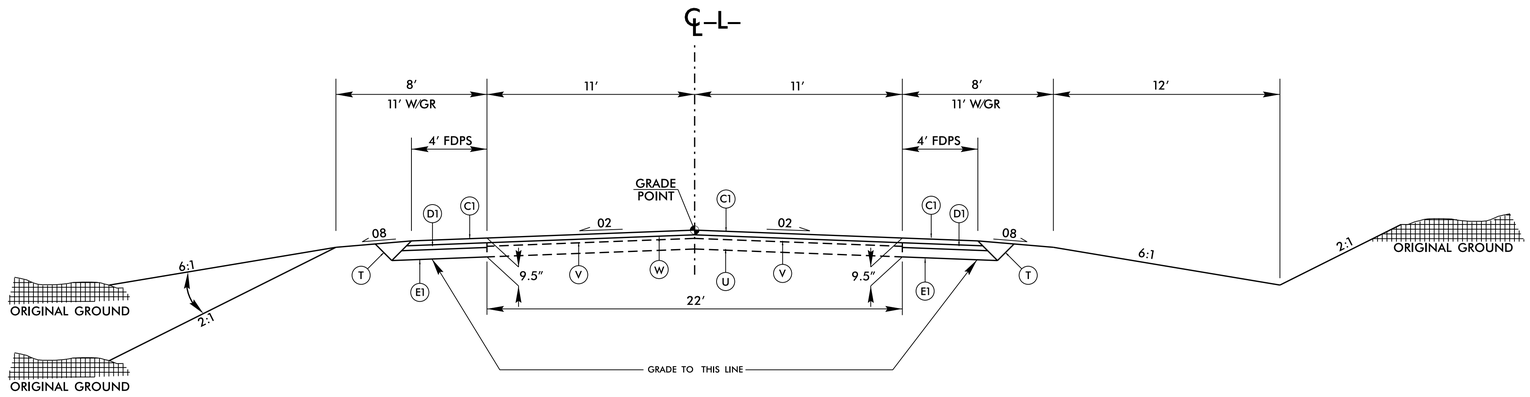
FINAL PAVEMENT DESIGN

C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
D1	PROP. APPROX. 2-1/2 " ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
R1	SHOULDER BERM GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	MILLING BITUMINOUS PAVEMENT, VAR. DEPTH.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL)

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

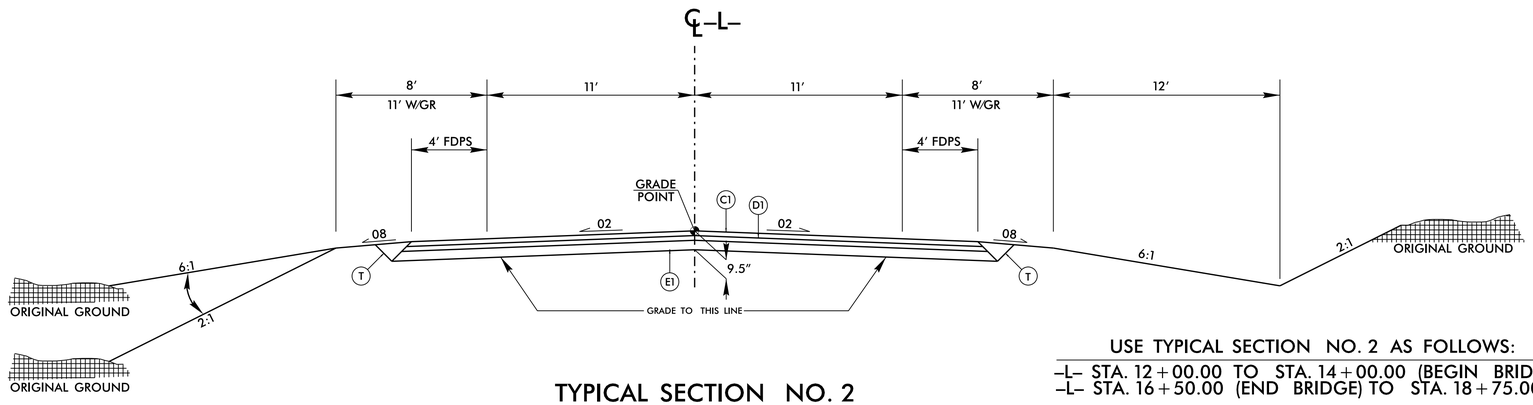


Detail Showing Method Of Wedging



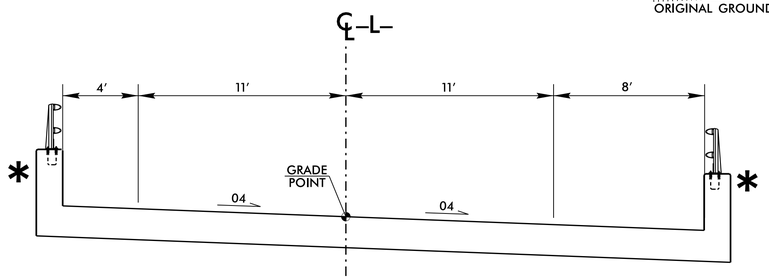
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1 AS FOLLOWS:
–L– STA. 10+00.00 TO STA. 12+00.00
–L– STA. 18+75.00 TO STA. 22+00.00



TYPICAL SECTION NO. 2

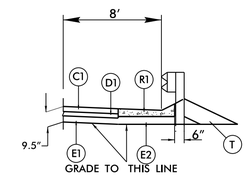
USE TYPICAL SECTION NO. 2 AS FOLLOWS:
–L– STA. 12+00.00 TO STA. 14+00.00 (BEGIN BRIDGE)
–L– STA. 16+50.00 (END BRIDGE) TO STA. 18+75.00



TYPICAL SECTION ON STRUCTURE

–L– STA. 14+00.00 (BEGIN BRIDGE) TO STA. 16+50.00 (END BRIDGE)

* BICYCLE SAFE RAILS REQUIRED



DETAIL OF SHOULDER BERM GUTTER (SBG) PLACEMENT
–L– STA. 16+75.64 (END APPROACH SLAB) TO –L– STA. 17+50.00 (RT)

PROJECT REFERENCE NO.	SHEET NO.
B-4811	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

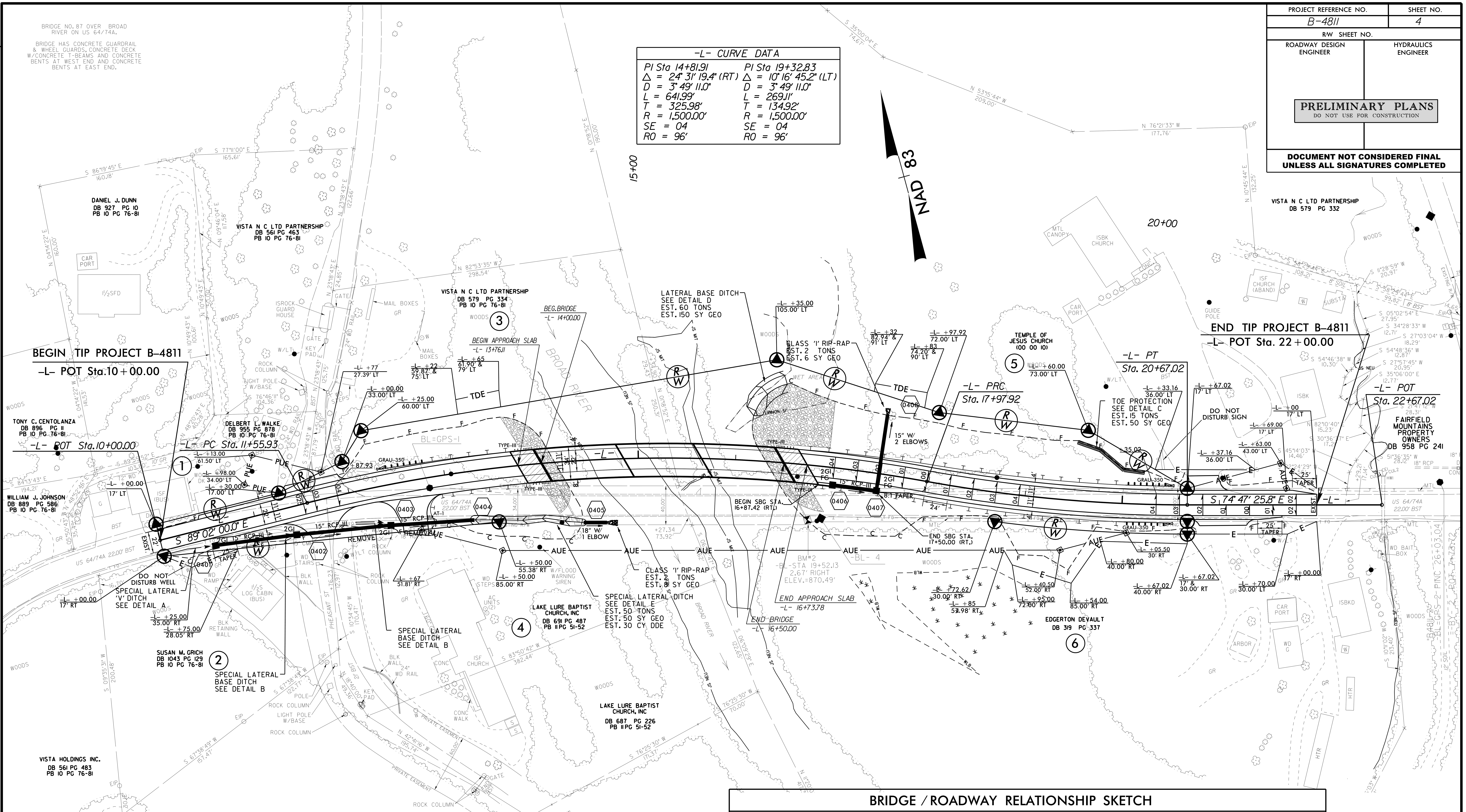
REVISIONS

R/W REVISION: REVISED PROPERTY OWNERS NAMES FOR #2, #4 & #5 hle 10/22/2015

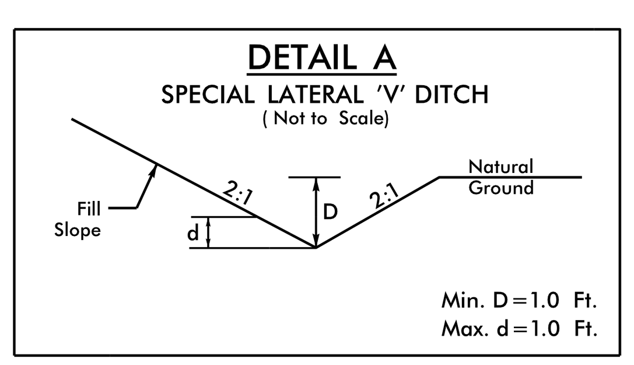
BRIDGE NO. 87 OVER BROAD RIVER ON US 64/74A.
BRIDGE HAS CONCRETE GUARDRAIL & WHEEL GUARDS, CONCRETE DECK W/CONCRETE T-BEAMS AND CONCRETE BENTS AT WEST END AND CONCRETE BENTS AT EAST END.

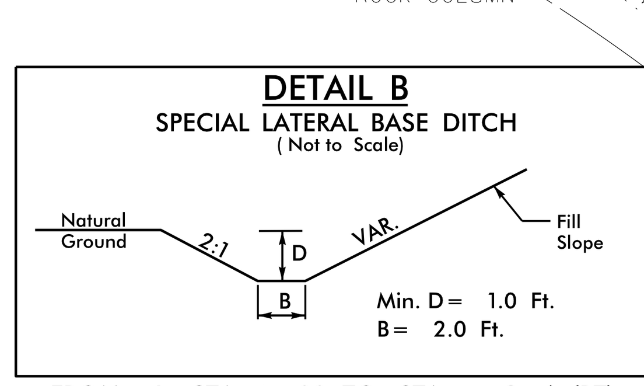
-L- CURVE DATA

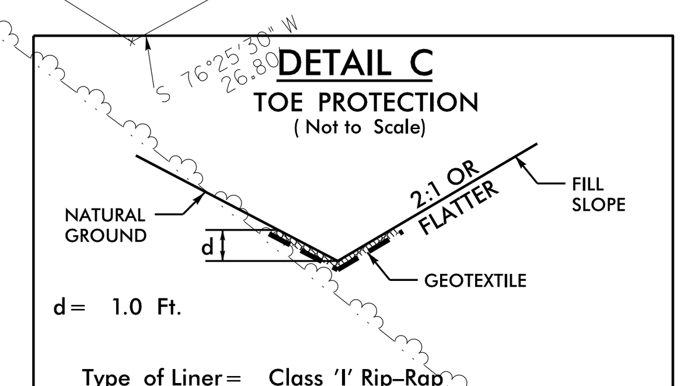
PI Sta 14+81.91	PI Sta 19+32.83
Δ = 24° 31' 19.4" (RT)	Δ = 10° 16' 45.2" (LT)
D = 3° 49' 11.0"	D = 3° 49' 11.0"
L = 641.99'	L = 269.11'
T = 325.98'	T = 134.92'
R = 1,500.00'	R = 1,500.00'
SE = .04	SE = .04
RO = 96'	RO = 96'

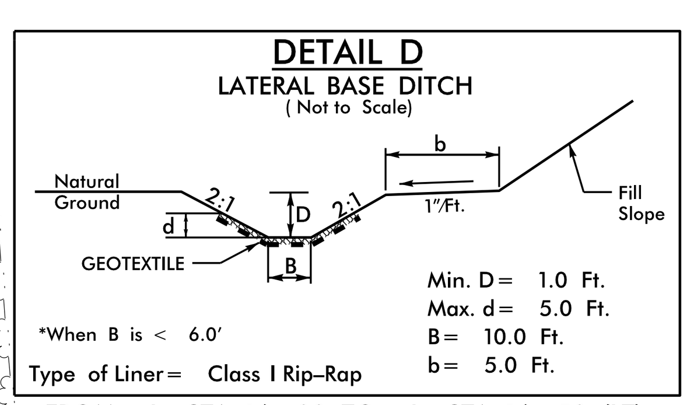


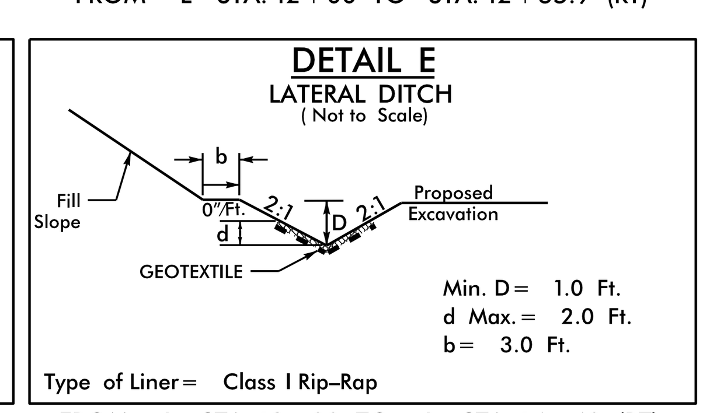
NAD 83
BEGIN TIP PROJECT B-4811
-L- POT Sta.10+00.00
END TIP PROJECT B-4811
-L- POT Sta. 22+00.00
-L- PC Sta. 11+55.93
-L- PRC Sta. 17+97.92
-L- PT Sta. 20+67.02
-L- POT Sta. 22+67.02
BEG.BRIDGE -L- 14+00.00
BEGIN APPROACH SLAB -L- 13+76.11
END APPROACH SLAB -L- 16+73.78
END BRIDGE -L- 16+50.00
BROAD RIVER
S 89° 02' 00.0" E
S 74° 47' 25.8" E
DANIEL J. DUNN DB 927 PG 10 PB 10 PG 76-81
VISTA N C LTD PARTNERSHIP DB 561 PG 463 PB 10 PG 76-81
VISTA N C LTD PARTNERSHIP DB 579 PG 334 PB 10 PG 76-81
VISTA N C LTD PARTNERSHIP DB 579 PG 332
TONY C. CENTOLANZA DB 896 PG 11 PB 10 PG 76-81
DELBERT L. WALKE DB 955 PG 878 PB 10 PG 76-81
WILLIAM J. JOHNSON DB 889 PG 586 PB 10 PG 76-81
SUSAN M. GRICH DB 1043 PG 129 PB 10 PG 76-81
LAKE LURE BAPTIST CHURCH, INC DB 691 PG 487 PB 11 PG 51-52
LAKE LURE BAPTIST CHURCH, INC DB 687 PG 226 PB 11 PG 51-52
TEMPLE OF JESUS CHURCH (00 00 10)
EDGERTON DEVAULT DB 319 PG 337
FAIRFIELD MOUNTAINS PROPERTY OWNERS DB 958 PG 241
VISTA HOLDINGS INC. DB 561 PG 483 PB 10 PG 76-81
LATERAL BASE DITCH SEE DETAIL D EST. 60 TONS EST. 150 SY GEO
CLASS 'I' RIP-RAP EST. 2 TONS EST. 6 SY GEO
TOE PROTECTION SEE DETAIL C EST. 15 TONS EST. 50 SY GEO
SPECIAL LATERAL 'V' DITCH SEE DETAIL A
SPECIAL LATERAL BASE DITCH SEE DETAIL B
SPECIAL LATERAL DITCH SEE DETAIL E EST. 50 TONS EST. 50 SY GEO EST. 30 CY DDE
CLASS 'I' RIP-RAP EST. 2 TONS EST. 8 SY GEO
DO NOT DISTURB WELL
DO NOT DISTURB SIGN
BEGIN SBG STA. 16+87.42 (RT.)
END SBG STA. 17+50.00 (RT.)
BM#2 -BL- STA 19+52.13 2.67' RIGHT ELEV.=870.49'
US 64/74A 22.00' BST
15+00
20+00



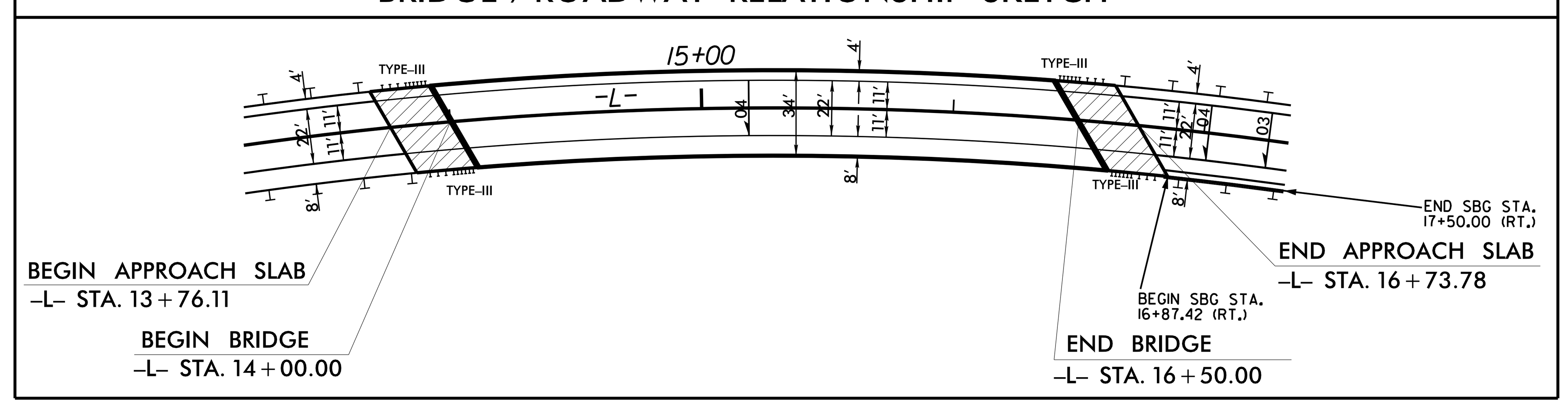








BRIDGE / ROADWAY RELATIONSHIP SKETCH



SEE SHEET 5 FOR PROFILE
SEE SHEET 2B FOR TEMPORARY PAVEMENT
SEE SHEET 2B FOR TEMPORARY SHORING

8/17/99

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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4811	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 30,900	CFS
DESIGN FREQUENCY	= 100	YRS
DESIGN HW ELEVATION	= 866.50	FT
BASE DISCHARGE	= 41,500	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 872.24	FT
OVERTOPPING DISCHARGE	= 38,000	CFS
OVERTOPPING FREQUENCY	= 100	YRS
OVERTOPPING ELEVATION	= 871.64	FT
DATE OF SURVEY	= 03/25/14	
W.S. ELEVATION AT DATE OF SURVEY	= 845.80	FT

BM1 ELEVATION = 902.40
N 624128 E 1056324
LOCATED S 6°40'28.99" E Dist 379.46'
FROM BL-2
BM1 IS A 8" SPIKE IN THE BASE OF A 24 INCH PINE TREE

BM2 ELEVATION = 870.49
N 624527 E 1057299
L STATION 16+80.00 56' RIGHT
BM2 IS A CHISLED "X" ON THE SE WING WALL OF BRIDGE

BEGIN GRADE -L- STA. 10+00.00
EL. = 885.87

END GRADE -L- STA. 22+00.00
EL. = 871.85

BEGIN BRIDGE -L- STA. 14+00.00

END BRIDGE -L- STA. 16+50.00

PI = 10+75.00
EL = 883.96'
VC = 90'
K = 91

PI = 12+50.00
EL = 877.77'
VC = 260'
K = 97

PI = 20+10.00
EL = 871.27'
VC = 200'
K = 172

(-)2.5467%
(-)1.9026%
(-)3.5371%
(-)2.9216%
(-)1.9080%
(-)10.8553%
(+)0.3053%

PI = 10+00.00
EL = 884.62

PI = 10+53.90
EL = 882.15

PI = 11+00.00
EL = 880.78

PI = 11+37.86
EL = 877.40

PI = 12+00.00
EL = 875.03

PI = 12+35.90
EL = 873.97

PI = 13+25.00
EL = 863.61

PI = 13+95.00
EL = 858.54

PI = 14+40.00
EL = 857.28

EXISTING ROADWAY

EXIST. BRIDGE

℄ BRIDGE STA. = 15+25.00 -L-
1@ 85'-0", 1@ 80'-0", 1@ 85'-0"
54" PPC GIRDER BRIDGE
SKEW = 90°
CROWN GRADE ELEV. = 875.42'

1.5H:1SLOPE (TYP.) NORMAL TO CAP (CL. II RIP RAP)

1.5H:1SLOPE (TYP.) NORMAL TO CAP (CL. II RIP RAP)

NOTE: SEE SHEET 4 FOR PLAN VIEW