Avery County
Bridge No. 143 on SR 1536 (Greene Road)
over Linville River
Federal Aid Project BRZ-1536(5)
WBS No. 46098.1.1
TIP Project B-5383

CATEGORICAL EXCLUSION

UNITED STATES DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

AND

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

10/28/15
Date

FOR Richard W. Hancock, PE
Manager, Project Development & Environmental Analysis Unit

10/28/15
Date

for John F. Sullivan, III, PE
Division Administrator, FHWA

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CATEGORICAL EXCLUSION

October 2015

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10/28/15

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Project Development and Environmental Analysis Unit

10/28/15
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Project Development & Environmental Analysis Unit

10/28/15
Date

James A. McInnis Jr., PE
Project Engineer
Project Development & Environmental Analysis Unit

PROJECT COMMITMENTS

Avery County
Bridge No. 143 on SR 1536 (Greene Road)
over Linville River
Federal Aid Project No. BRZ-1536(5)
WBS No. 46098.1.1
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Hydraulics Unit - FEMA Coordination
The Hydraulics Unit will coordinate with the N.C. Floodplain Mapping Program (FMP), to determine status of project with regard to applicability of NCDOT'S Memorandum of Agreement, or approval of a Conditional Letter of Map Revision (CLOMR) and subsequent final Letter of Map Revision (LOMR).

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

All Design Groups/ Division Resident Construction Engineer - Trout Issues
NCWRC has identified Linville River as supporting a trout population. Therefore, a moratorium on all in-stream work and land disturbance within the 25-foot trout buffer will be in place from October 15 to April 15 of any given year. In addition, Design Standards in Sensitive Watersheds will be incorporated to reduce the risk of turbidity violations.

NCDOT will implement Guidelines for Construction of Highway Improvements Adjacent to or Crossing Trout Waters in North Carolina in the design and construction of this project.

Project Development & Environmental Analysis Unit - Natural Environment Section
A U.S. Fish and Wildlife Service proposal for listing the Northern Long-eared Bat (NLEB) (*Myotis septentrionalis*) as a Threatened species was published in the Federal Register in October 2013. Furthermore, this species is included in USFWS's current list of protected species for Avery County. NCDOT is working closely with the USFWS to understand how this proposed listing may impact NCDOT projects. NCDOT will continue to coordinate appropriately with USFWS to determine if this project will incur potential effects to the Northern long-eared bat, and how to address these potential effects, if necessary.

Construction authorization will not be requested until Endangered Species Act (ESA) compliance is satisfied for the NLEB.

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I. DESCRIPTION OF PROPOSED ACTION

A. Project Purpose

The purpose of the proposed project is to replace a deficient bridge.

B. General Description

The subject project involves the replacement of Bridge No. 143 carrying SR 1536 (Greene Road) over the Linville River in Avery County. The project is included in the 2016-2025 North Carolina State Transportation Improvement Program (STIP). The project is scheduled for right of way and construction in fiscal years 2016 and 2017, respectively, in the STIP. The bridge location is shown in Figure 1.

C. Cost Estimates

The cost estimate included in the 2016-2025 STIP for the project is $945,000. Of this total, $20,000 is estimated for right of way acquisition, $725,000 is estimated for construction, and $200,000 is prior years cost. Current cost estimates for the project are included in Table 1.

TABLE 1
SUMMARY OF ESTIMATED COST

	Alternative 1 Preferred
Total Construction Cost	$ 800,000
Right-of-way Costs	17,000
Utility Costs	43,000
Total Project Cost	$ 860,000

II. NEED FOR PROJECT

NCDOT Bridge Management Unit records indicate Bridge No. 143 has a sufficiency rating of 53.82 out of a possible 100 for a new structure. The bridge is considered functionally obsolete due to a deck geometry appraisal of 2 out of 9 according to Federal Highway Administration (FHWA) standards. The bridge is a one-lane structure, with only approximately 11 feet of clear roadway width.

When this bridge replacement project was initially programmed in 2011, Bridge No. 143 had a sufficiency rating of 34.2 out of a possible 100 with an estimated remaining life of 15 years. Since 2011, temporary repairs have been made to the bridge, including asphalt surface and repair / replacement and maintenance of concrete substructure components.

Although the sufficiency rating of Bridge No. 143 is now above 50, the bridge is expected to require additional work within the next few years to remain serviceable. Rehabilitation of a timber structure is generally practical only when a few members are damaged or prematurely deteriorated. However, past a certain degree of deterioration, timber structures become impractical to maintain and upon eligibility are programmed for replacement. Bridge No. 143 is approaching the end of its useful life as the substandard timber deck is becoming increasingly unacceptable.

III. EXISTING CONDITIONS

The project is located in southern Avery County approximately one mile south of the Town of Crossnore (Figure 1). The Gill State Forest and Linville River State Nursery, both operated by the North Carolina Forest Service, are located northwest of and immediately adjacent to the bridge. The bridge is situated about 250 feet east of the SR 1536 (Greene Road) and US 221 intersection. Development in the area consists primarily of agriculture, interspersed with residential development along roadways and forested mountains.

SR 1536 is classified as local in the Statewide Functional Classification System and is not a part of the National Highway System.

In the vicinity of the bridge, SR 1536 has a 19-foot pavement width with two to six-foot grass shoulders. The existing one-lane bridge is super elevated towards upstream. The bridge is in a sag vertical curve with both approaches on a slight uniform incline. The west approach is on a horizontal tangent with a stop sign at the intersection with US 221. The east approach is a horizontal curve. The bridge deck is situated approximately ten feet above the creek bed.

Bridge No. 143 is a two-span structure with an overall length of 64 feet and consists of a timber deck on continuous steel I-beams (low water type) with an asphalt-wearing surface. The bridge includes a concrete pier on a rock outcrop in the middle of the stream. Both end bents and wing walls are concrete and the westside end bent sits on a rock outcropping. The bridge has rusty steel girders with timber decking and wheel guards without guardrail. The bridge deck has a BST coating and both approaches have smooth asphalt with paved turn-outs for two-way traffic. Debris is frequently attached underneath the girders. The bridge has been overtopped numerous times and a 5 to 6-inch rain will overtop the bridge. There is a

barricade sitting on the shoulder that is used to close the road during flooding. The existing bridge was constructed in 1965 and rehabilitated in 1971. The clear roadway width is 11 feet. The lane width on the existing bridge consists of one 10-foot lane. The posted weight limit on this bridge is 21 tons for single vehicles and 28 tons for truck-tractor semi-trailers.

There are several utilities that cross the existing structure including overhead power lines and telephone cable. The area also has aboveground propane tanks, groundwater wells, and septic tank systems.

The current traffic volume of 100 vehicles per day (VPD) is projected to increase to 200 VPD by the year 2040. The projected volume includes one percent truck-tractor semi-trailer and seven percent dual-tired vehicles. There is no posted speed limit along SR 1536 (Greene Road) in the project area, but the statutory speed limit is 55 mph. Two school busses cross the bridge daily on their morning and afternoon routes. The bridge has moderate truck traffic due to the Avery County solid waste facility which is located at the intersection of US 221 and SR 1536 and the Christmas tree farm located along SR 1536.

There were four crashes reported in the vicinity of Bridge No. 143 during a ten-year period (2001-2011). None of these crashes were associated with the alignment or geometry of the bridge or its approach roadway.

This section of SR 1536 is not part of a designated bicycle route. Sidewalks do not exist on the existing bridge and there is no indication of pedestrian usage on or near the bridge.

IV. ALTERNATIVES

A. Alternatives Studied

Three alternatives for replacing Bridge No. 143, in addition to the no-build alternative, were studied and are described below.

Alternative 1 (Preferred)

Alternative 1 involves replacement of the structure along the existing roadway alignment with an onsite detour approximately 32 feet to the south. During development of this alternative, it was determined there is not a sufficient offsite detour available. Staged construction is not feasible for this bridge because the 12-foot deck width will not support removal of a portion of the bridge and maintenance of traffic on the remaining portion. No design exceptions are required for this alternative.

Alternative 2

Alternative 2 involves replacement of the existing structure north of its existing location. This alternative would require a new crossing of the Linville River upstream of the existing crossing. Under this alternative, the existing bridge would serve as an on-site detour. This alternative would be designed using 3R guidelines with a design speed of 40 miles per hour. No design exceptions are required for this alternative.

Alternative 3

Alternative 3 involves replacement of the existing structure south of its existing location. This alternative would require a new crossing of the Linville River downstream of the existing crossing. Under this alternative, the existing bridge would serve as an on-site detour. This alternative will be designed using 3R guidelines with a design speed of 40 miles per hour. No design exceptions are required for this alternative.

No-Build Alternative

The no-build alternative will eventually necessitate closure of the bridge. This is not acceptable due to the traffic service provided by SR 1536.

B. Preferred Alternative

Alternative 1 involves replacement of the structure along the existing roadway alignment with an onsite detour as shown in Figures 2a and 2b. The environmental impacts associated with Alternative 1 are anticipated to be lower than the other alternatives.

The recommended replacement structure will be an 18-inch cored slab bridge approximately 90 feet long providing a 27-foot clear deck width. The bridge will include two 10-foot travel lanes and 2-foot 4-inch minimum offsets. The bridge length is based on preliminary design information and is set by hydraulic requirements. The roadway grade of the new structure will be approximately the same as the existing structure.

The approach roadway will extend approximately 200 feet from the east end of the proposed bridge and 200 feet from the west end of the proposed bridge. The approaches will include a 20-foot pavement width providing two lanes. Three-foot grass shoulders will be provided on each side (7-foot shoulders where guardrail is required). The roadway will be designed as a Rural Local Route using Sub-Regional Tier Guidelines with a 40 mile per hour design speed.

The temporary on-site detour will be situated approximately 32 feet to the south of existing SR 1536 and is approximately 55 feet in length. The approaches along the detour will include a 10-foot pavement width providing one lane. Three-foot grass shoulders will be provided on each side (7-foot shoulders where guardrail is required). The detour will be designed with a 40 mile per hour design speed.

NCDOT Division 11 concurs with the selection of Alternative 1 as the preferred alternative.

V. PROBABLE ENVIRONMENTAL EFFECTS OF PROPOSED ACTION

A. Summary of Environmental Effects

Table 2 presents a summary of the environmental effects of the project alternatives.

TABLE 2
SUMMARY OF ENVIRONMENTAL EFFECTS

	Alternative 1 (Preferred)	Alternative 2	Alternative 3
Residential and Business Relocations	None	None	None
Minority/Low Income Populations - Disproportionate Impacts	No	No	No
Historic Properties (Adverse Effect)	None	None	None
Community Facilities Impacted	None	None	None
Section 4(f) Impacts	None	None	None
Forested Acres	0	0	0
Wetlands (acres)	0.01	0.01	0.04
Streams (linear feet)	0	0	0
Federally Protected Species	None	None	None

B. Natural Resources

Physical Characteristics

Water Resources

Water resources in the study area are part of the Catawba River basin (U.S. Geological Survey [USGS] Hydrologic Unit 03050101). Three streams were identified in the study area (Table 3). The location of each water resource is shown in Figure 3. A fourth stream is located outside of the study area but is the primary hydrology for Wetland WA and the pond located on the southeast quadrant of the site.

TABLE 3
WATER RESOURCES IN THE STUDY AREA

Stream Name	Map ID	NCDWQ Index Number	Best Usage Classification
Linville River	Linville River	11-29-(4.5)	B; Tr
Bill White Creek	Bill White Creek	11-29-11	C
UT to Linville River	SA	11-29-(4.5)	B; Tr

Notes: Class C - Waters protected for uses such as secondary recreation (i.e. wading, boating), fishing, wildlife, fish consumption, and aquatic life.

Class B - Waters protected for all Class C uses in addition to primary recreation (i.e. swimming, skin diving, water skiing).

Tr - Trout waters

One pond is located in the study area in the southeast quadrant (Figure 3). This pond consists of an artificially excavated pit from a derelict gravel mining

operation. Part of the pond wall has been breached and reduced the size of the original pond with the exposed portion now converted to a wetland (Wetland WA on Figure 3). The primary hydrology for the pond is a perennial stream located just outside of the study area. Approximately 0.27 acre of the pond is located in the study area.

There are no Outstanding Resource Waters (ORW) in the study area or High Quality Waters (HQW), Water Supplies (WS-I or WSII), or 303(d) streams within one mile downstream of the project study area. North Carolina's Division of Water Resources (formerly NCDWQ) Basinwide Assessment for the Catawba River Basin lists no macrobenthic or fish survey sites within one mile of the project study area.

Biotic Resources

Two terrestrial communities are found in the project area: Maintained/Disturbed and Montane Alluvial Forest. The locations of these biotic communities are shown on Figure 3.

Invasive Species

One species from the NCDOT Invasive Exotic Plant List for North Carolina was found to occur in the study area. The species identified was multiflora rose (Severe Threat). NCDOT will manage invasive plant species within the Department's right of way as appropriate.

Jurisdictional Topics

Surface Waters and Wetlands

Three jurisdictional streams were identified in the study area (Table 4). The location of these streams is shown on Figure 3. The proposed bridge will not result in permanent stream impacts. All jurisdictional streams in the study area have been designated as cold water streams for the purposes of stream mitigation.

TABLE 4
JURISDICTIONAL CHARACTERISTICS OF WATER RESOURCES IN THE STUDY AREA

Map ID	Length (feet)	Classification	Compensatory Mitigation Required	River Basin Buffer
Linville River	335	Perennial	Yes	Not Subject
Bill White Creek	30	Perennial	Yes	Not Subject
SA	120	Perennial	Yes	Not Subject
Total	**485**			

Two jurisdictional wetlands were identified within the study area (Figure 3). Wetland classification and quality rating data are presented in Table 5. All wetlands in the study area are within the Catawba River basin (USGS Hydrologic Unit

03050101). Wetland sites WA and WB are both included within the montane alluvial forest community.

TABLE 5
JURISDICTIONAL CHARACTERISTICS OF WETLANDS IN THE STUDY AREA

Map ID	NCWAM Classification	Hydrologic Classification	NCDWR Wetland Rating	Area (acre)
WA	Freshwater marsh	Riparian	53	0.35
WB	Floodplain pool	Riparian	20	0.04
			Total	**0.39**

The jurisdictional resources in the study area are not designated by the USACE as a Navigable Water under Section 10 of the Rivers and Harbors Act.

Permits

The proposed project has been designated as a Categorical Exclusion for the purposes of National Environmental Policy Act documentation. As a result, a Nationwide Permit (NWP) 23 will likely be applicable. A NWP No. 33 may also apply for temporary construction activities such as stream dewatering, work bridges, or temporary causeways that are often used during bridge construction or rehabilitation. The US Army Corps of Engineers holds the final discretion as to what permit will be required to authorize project construction. If a Section 404 permit is required then a Section 401 Water Quality Certification from the NCDWR will be needed.

Trout Moratorium

The Linville River in the study area is classified as Hatchery Supported Designated Public Mountain Trout Water and supports wild brown trout. Due to the designation as trout waters, as stated in a letter from the N.C. Wildlife Resources Commission dated June 27, 2012, a moratorium prohibiting in-stream work and land disturbance within the 25-foot trout buffer will be observed from October 15 to April 15 for the Linville River. Therefore, Design Standards in Sensitive Watersheds will be implemented during project construction. In an effort to minimize impacts to the trout stream and the project's effect on the regulatory floodway, the proposed design does not incorporate fishing access. However, the proposed roadway grade of the new structure will be approximately the same as the existing structure and therefore, fishing access would not be altered from what exists currently.

Federally Protected Species

As of July 24, 2015 the US Fish and Wildlife Service (USFWS) lists ten federally protected species for Avery County (Table 6).

TABLE 6
FEDERALLY PROTECTED SPECIES LISTED FOR AVERY COUNTY

Scientific Name	Common Name	Federal Status	Habitat Present	Biological Conclusion
Glyptemys muhlenbergii	Bog turtle	T(S/A)	Yes	Not Required
Glaucomys sabrinus coloratus	Carolina northern flying squirrel	E	No	No Effect
Myotis septentrionalis	Northern long-eared bat	T	Unresolved	Unresolved
Corynorhinus townsendii virginianus	Virginia big-eared bat	E	No	No Effect
Microhexura montivaga	Spruce-fir moss spider	E	No	No Effect
Solidago spithamaea	Blue Ridge goldenrod	T	No	No Effect
Liatris helleri	Heller's blazing star	T	No	No Effect
Hedyotis purpurea var. montana	Roan mountain bluet	E	No	No Effect
Geum radiatum	Spreading avens	E	No	No Effect
Gymnoderma lineare	Rock gnome lichen	E	No	No Effect

E - Endangered
T - Threatened
T(S/A) - Threatened due to similarity of appearance

With the exception of the bog turtle and possibly the northern long-eared bat, no habitat for any federally-listed species exists in the project area. Species listed as threatened due to similarity of appearance, such as the bog turtle, do not require Section 7 consultation with the USFWS. A review of NCNHP records on August 4, 2015 indicates no known bog turtle occurrence within one mile of the study area.

A U.S. Fish and Wildlife Service proposal for listing the Northern Long-eared Bat (NLEB) (*Myotis septentrionalis*) as a Threatened species was published in the Federal Register in October 2013. Furthermore, this species is included in USFWS's current list of protected species for Avery County. NCDOT is working closely with the USFWS to understand how this proposed listing may impact NCDOT projects. NCDOT will continue to coordinate appropriately with USFWS to determine if this project will incur potential effects to the Northern long-eared bat, and how to address these potential effects, if necessary.

Construction authorization will not be requested until Endangered Species Act compliance is satisfied for the NLEB.

Based upon a review of the NCNHP records, there is a known occurrence of the Northern long-eared bat within one mile of the study area.

Bald Eagle and Golden Eagle Protection Act

Habitat for the bald eagle primarily consists of mature forest in proximity to large bodies of open water for foraging. Large, dominant trees are utilized for nesting sites, typically within one mile of open water. There are no large bodies of open water within one mile of the project study area. Suitable habitat for bald eagle does not exist within the project study area.

C. Cultural Resources

This project is subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, and implemented by the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106, codified at Title 36 CFR Part 800. Section 106 requires Federal agencies to take into account the effect of their undertakings (federally funded, licensed, or permitted) on properties included in or eligible for inclusion in the National Register of Historic Places and afford the Advisory Council a reasonable opportunity to comment on such undertakings.

The NCDOT - Human Environment Section, under the provisions of a Programmatic Agreement with FHWA, NCDOT, HPO, OSA and the Advisory Council on Historic Preservation (effective July 1, 2009), reviewed the proposed project for historic architecture and archaeological resources and determined that no surveys are required. The forms dated January 13, 2013 and January 23, 2012 are included in Appendix B.

D. Community Impacts

No adverse impact on families or communities is anticipated. Right-of-way acquisition will be limited. No relocatees are expected with implementation of the proposed alternative.

No adverse effect on public facilities or services is expected. The project is not expected to adversely affect social, economic, or religious opportunities in the area.

The project is not in conflict with any plan, existing land use, or zoning regulation. No change in land use is expected to result from the construction of the project.

The project will not have a disproportionately high and adverse human health and environmental effect on any minority or low-income population.

E. Farmland

The Farmland Protection Policy Act requires all federal agencies or their representatives to consider the potential impact to prime farmland of all land acquisition and construction projects. There are soils classified as prime, unique, or having state or local importance in the vicinity of the project. However, the project will not involve the direct conversion of farmland acreage within these classifications. It is anticipated no new permanent right of way will be required for the project, although temporary easements may be required during construction. No permanent impacts to prime farmlands would result from the construction of this project.

F. Traffic Noise and Air Quality

The project is located in Avery County, which has been determined to comply with the National Air Quality Standards. The proposed project is located in an attainment area; therefore, 40 CFR Parts 51 and 93 are not applicable. This project is not anticipated to create any adverse effects on the air quality of this attainment area.

This project will not result in any meaningful changes in traffic volume, vehicle mix, location of the existing facility, or any other factor that would cause an increase in emissions impacts

relative to the no-build alternative. As such FHWA has determined this project will generate minimal air quality impacts for Clean Air Act criteria pollutants and has not been linked with any special mobile source air toxics (MSAT) concerns. Consequently, this project is exempt from analysis for MSAT's.

Noise levels may increase during project construction; however, these impacts are not expected to be substantial considering the relatively short-term nature of construction noise and the limitation of construction to daytime hours. The transmission loss characteristics of nearby natural elements and man-made structures are believed to be sufficient to moderate the effects of intrusive construction noise.

G. Section 4(f)/6(f) Resources

Section 4(f) of the U.S. Department of Transportation Act of 1966 specifies that publicly owned land from a public park, recreation area, wildlife and waterfowl refuge, and all historic sites of national, state, and local significance may be used for federal projects only if: a) there is no feasible and prudent alternative to the use of the land; and b) the project includes all possible planning to minimize harm to 4(f) lands resulting from such use.

The proposed project will not require right-of-way acquisition or easement from any land protected under Section 4(f) of the Department of Transportation Act of 1966.

Section 6(f) of the Land and Water Conservation Fund Act of 1965 stipulates that property acquired or developed with the assistance of the Fund may not be converted to a use other than public recreation unless suitable replacement property is provided. No properties acquired or developed with the assistance of the Land and Water Conservation Fund will be affected by the project.

H. Hazardous Materials

An examination of local, state, and federal regulatory records revealed no petroleum sites, hazardous waste sites, landfills, or other geoenvironmental concerns identified within the study area.

I. Floodplains

Avery County is a participant in the National Flood Insurance Program, administered by the Federal Emergency Management Agency (FEMA). The currently effective FEMA floodplain mapping indicates that the subject crossing of the Linville River is located within a flood hazard zone designated as Zone AE, with 100-year base flood elevations established in a "Limited Detailed Flood Study." According to the preliminary study, the existing bridge and approaches are overtopped by the 100-year storm.

VI. PROJECT COORDINATION AND PUBLIC INVOLVEMENT

NCDOT has sought input from the following agencies as a part of the project development: U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Forest Service, N.C. Department of Environment & Natural Resources, U.S. Fish & Wildlife Service, N.C.

Wildlife Resources Commission, Tennessee Valley Authority, and N.C. Division of Parks & Recreation.

A letter was sent to all property owners directly affected by the project. Property owners were invited to comment if they had questions about the project. One property owner called NCDOT to discuss the project. No other comments have been received. Based upon responses from the property owner letter, a public meeting was determined unnecessary.

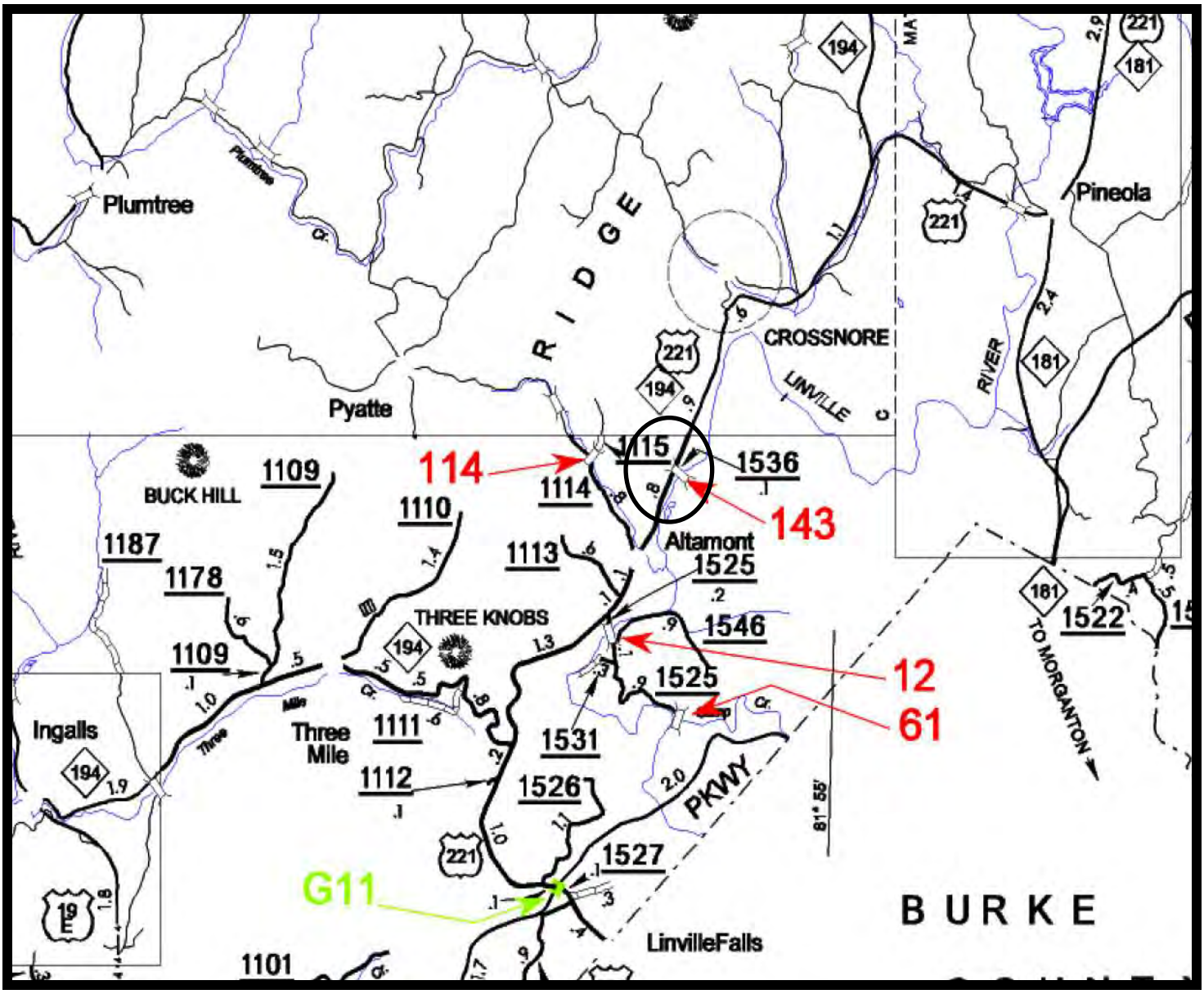
There is no substantial controversy on social, economic, or environmental grounds concerning the project.

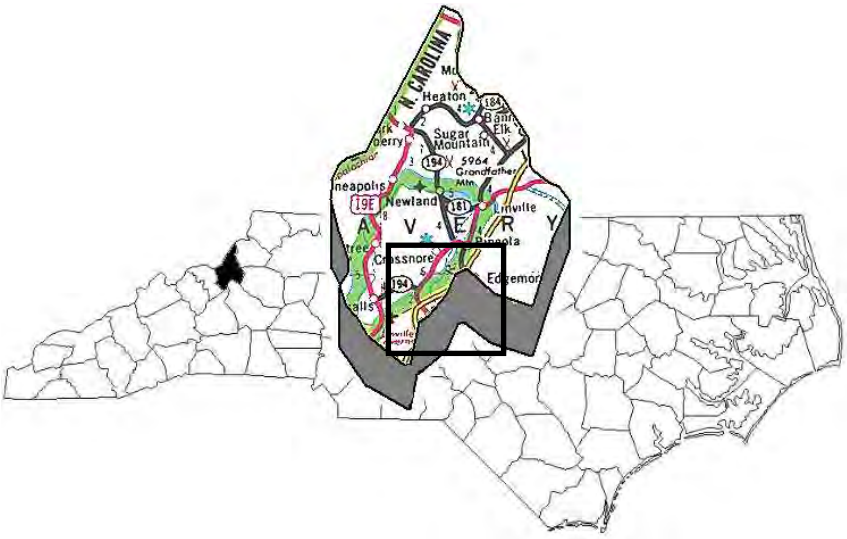
VII. CONCLUSION

On the basis of the above discussion, it is concluded that no substantial adverse environmental impacts will result from implementation of the project. The project is therefore considered to be a federal "Categorical Exclusion" due to its limited scope and lack of substantial environmental consequences.

APPENDIX A

Figures





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

AVERY COUNTY
REPLACE BRIDGE NO. 143 ON SR 1536
OVER LINVILLE RIVER
B-5383

Figure 1

8/17/99

REVISIONS

DESIGN REVISION: CHANGED PROPOSED STRUCTURE TO A CORED SLAB BRIDGE WITH T-101 RAIL ADJUSTED PROPOSED GUARDRAIL SUPERELEVATION CONSTRUCTION LIMITS, AND PROPOSED TEMPORARY CONSTRUCTION EASEMENT LIMITS. --SEC 9/17/15

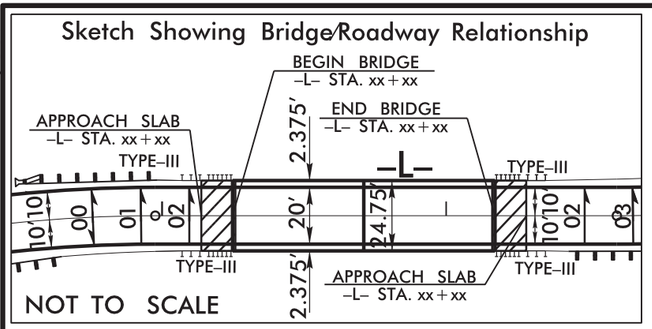
PROJECT REFERENCE NO.	SHEET NO.
B-5383	Figure 2a
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

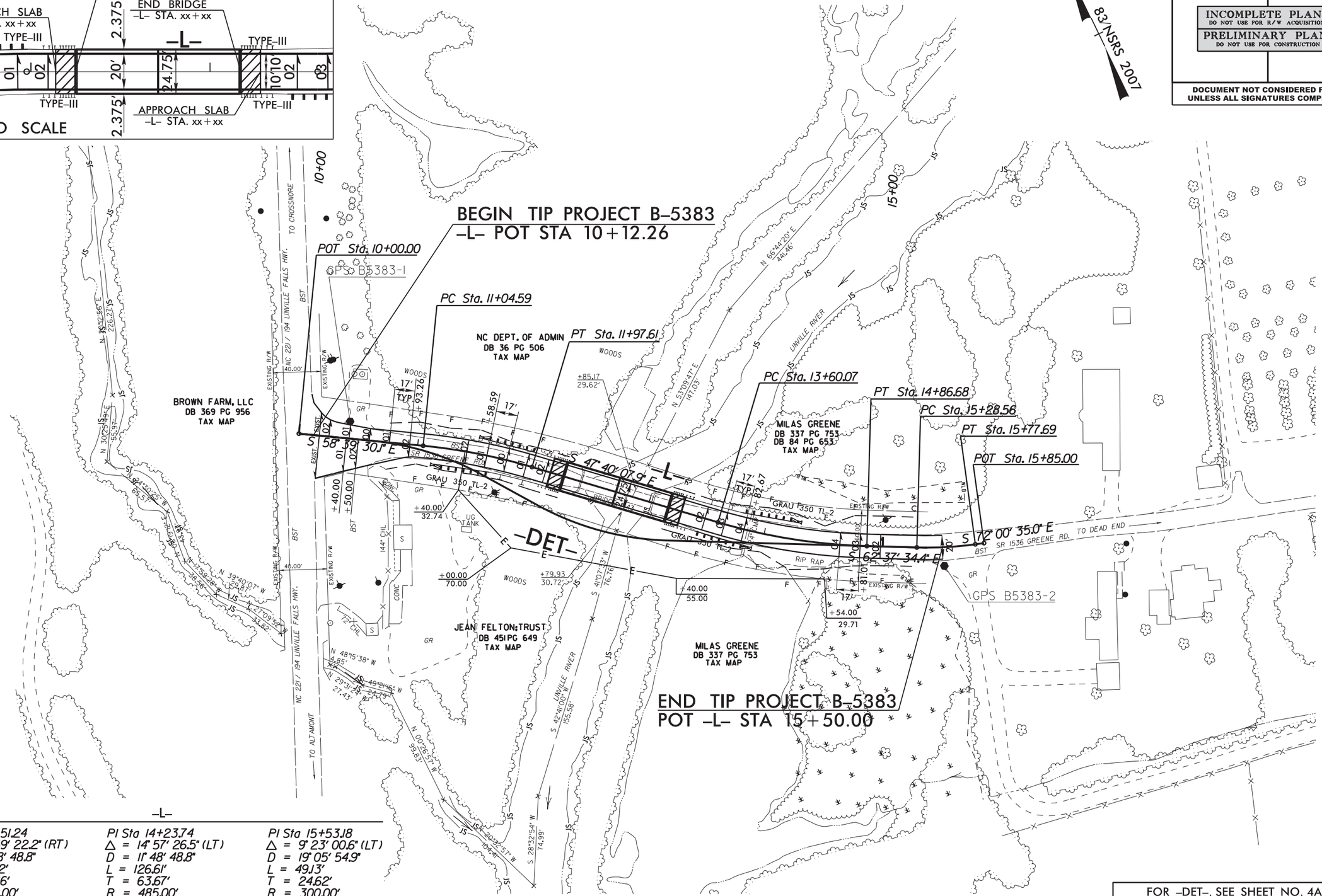
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Sketch Showing Bridge/Roadway Relationship



NAD 83/NSRS 2007



PI Sta 11+51.24	PI Sta 14+23.74	PI Sta 15+53.18
Δ = 10° 59' 22.2" (RT)	Δ = 14° 57' 26.5" (LT)	Δ = 9° 23' 00.6" (LT)
D = 11° 48' 48.8"	D = 11° 48' 48.8"	D = 19° 05' 54.9"
L = 93.02'	L = 126.61'	L = 49.13'
T = 46.66'	T = 63.67'	T = 24.62'
R = 485.00'	R = 485.00'	R = 300.00'
Superelevation = see plans	Superelevation = see plans	
Runoff = see plans	Runoff = see plans	

FOR –DET–, SEE SHEET NO. 4A
FOR –L– PROFILE, SEE SHEET NO. 5
FOR STRUCTURE PLANS, SEE SHEET S–? THRU S–??

17-SEP-2015 15:04
R:\Roadway\Proj\B5383_rdy_psh 4.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-5383	Figure 2b
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

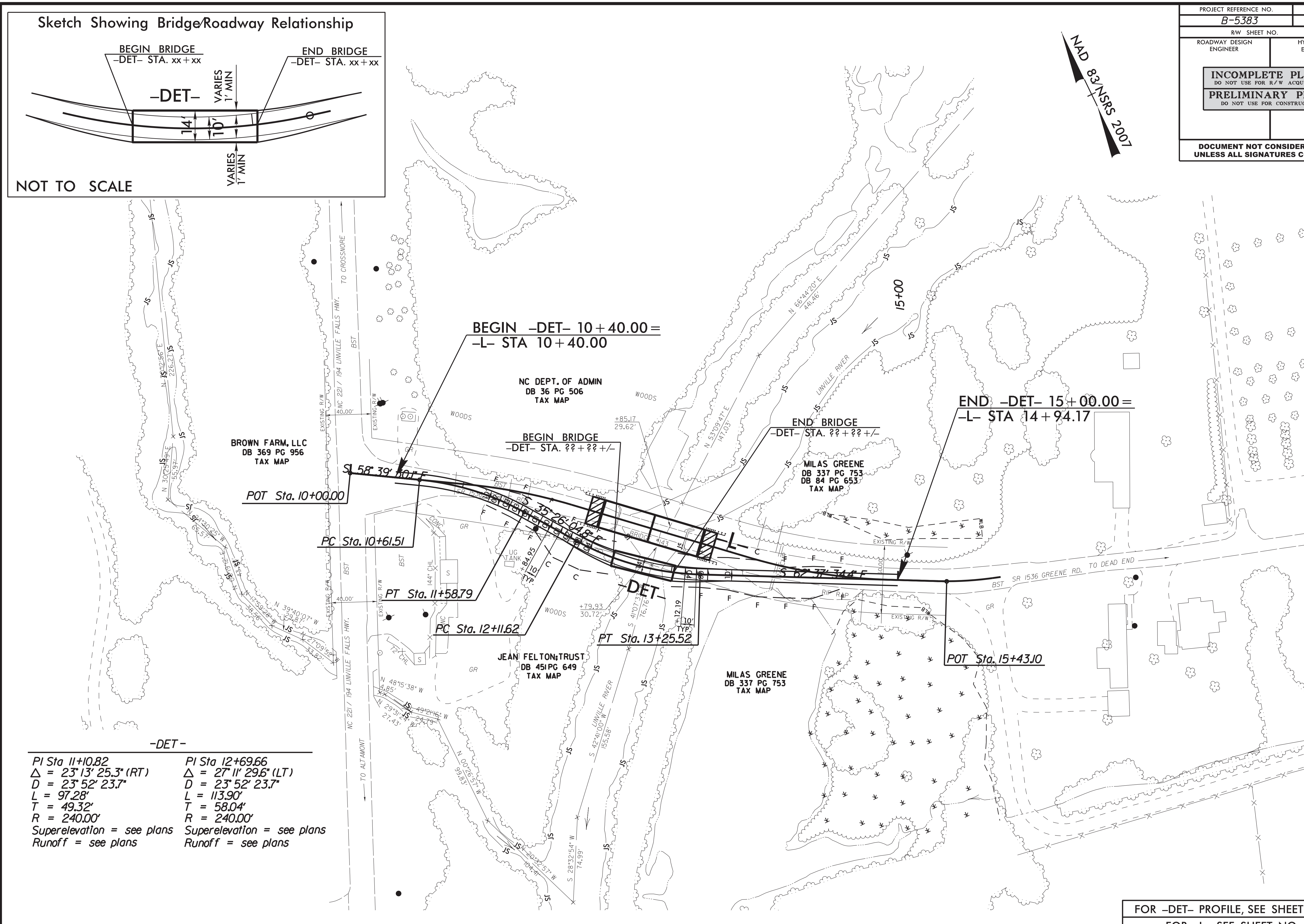
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

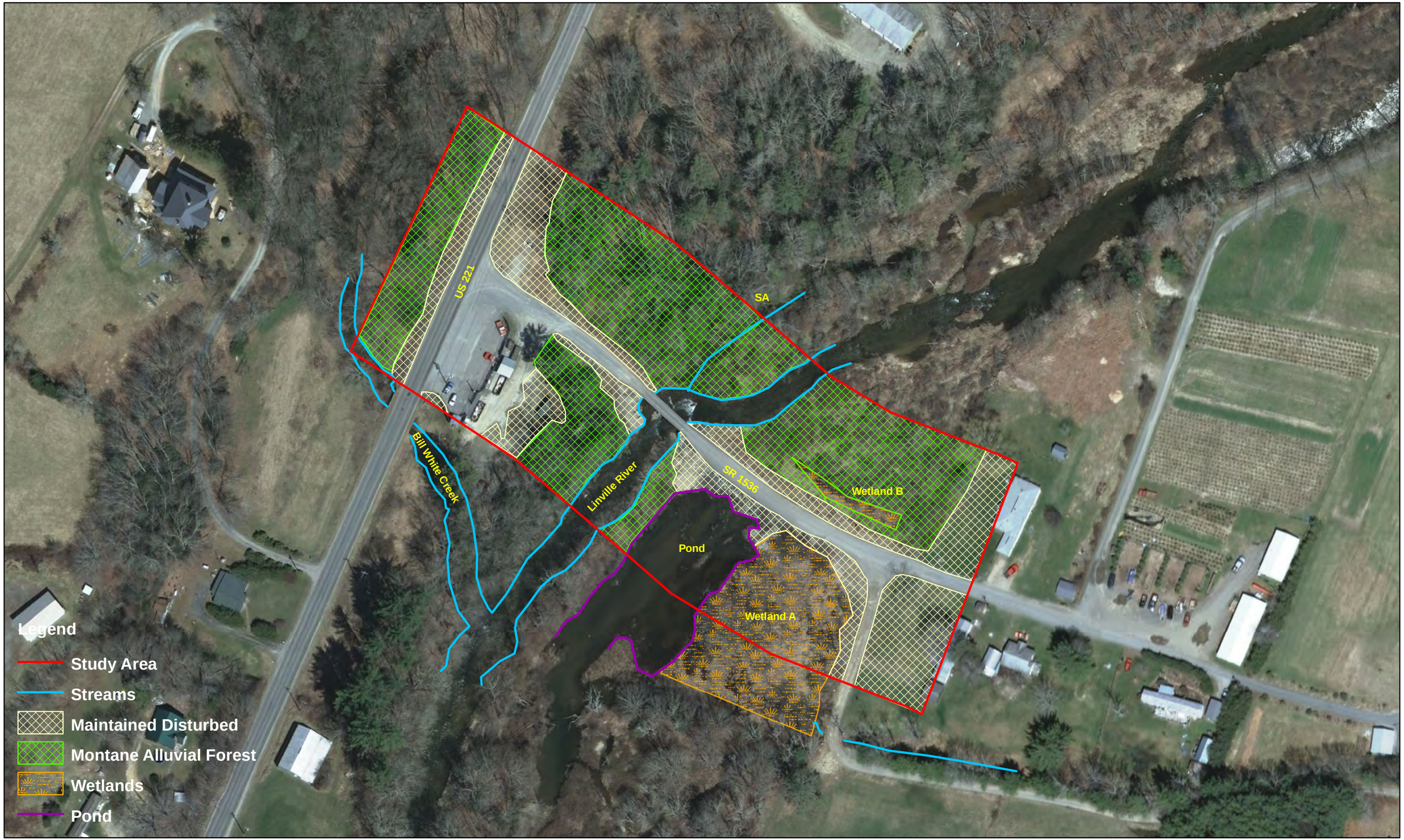
DESIGN REVISION: ADJUSTED PROPOSED -DET- ALIGNMENT, SUPERELEVATION AND CONSTRUCTION LIMITS. -- SEC 9/17/15



-DET-

PI Sta 11+10.82	PI Sta 12+69.66
Δ = 23° 13' 25.3" (RT)	Δ = 27° 11' 29.6" (LT)
D = 23° 52' 23.7"	D = 23° 52' 23.7"
L = 97.28'	L = 113.90'
T = 49.32'	T = 58.04'
R = 240.00'	R = 240.00'
Superelevation = see plans	Superelevation = see plans
Runoff = see plans	Runoff = see plans

FOR -DET- PROFILE, SEE SHEET NO. 5
FOR -L-, SEE SHEET NO. 4
FOR STRUCTURE PLANS, SEE SHEET S-? THRU S-??



NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND
ENVIRONMENTAL ANALYSIS

0 55 110 220 Feet

Figure 3

T.I.P. No. B-5383 Avery County
Replace Bridge No. 143 on SR 1536
Over the Linville River
Jurisdictional Resources & Natural Communites

N
W E
S

APPENDIX B

Reference Letters

Project Tracking No. (Internal Use)

12-01-0010

NO SURVEY REQUIRED FORM

PROJECT INFORMATION

Project No:	B-5383	*County:*	Avery
WBS No:	46098.1.1	*Document:*	CE/PCE
F.A. No:	BRZ-1536(5)	*Funding:*	☐ State ☒ Federal

Federal (USACE) Permit Required? ☒ Yes ☐ No *Permit Type:*

Project Description: Replace Bridge No. 143 over Linville River on SR 1536.

SUMMARY OF CULTURAL RESOURCES REVIEW

Brief description of review activities, results of review, and conclusions:
Review of HPO quad maps, HPO GIS information, historic designations roster, and indexes was undertaken on January 13, 2012. Based on this review, there are no existing NR, SL, LD, DE, or SS properties in the Area of Potential Effects, which is 300' from each end and 75' from the centerline each way. There are several structures within the vicinity of the APE. Southwest of the bridge is what appears to be a garbage/recycling center from aerial imagery; this structure is not historic. Approximately 360' east of the bridge on the northeast side is a house built in 1953 based on Avery County GIS/Tax information (127 Greene Road), this structure is outside of the APE and will not be affected. West of the bridge across NC 194 is a house built in 1915, (732 Perkins Rd SE), the house is outside of the APE and will not be affected. Southeast of the bridge is a mobile home. There are no historic properties present, and no survey is required. If design plans change, additional review will be required.

Brief Explanation of why the available information provides a reliable basis for reasonably predicting that there are no unidentified historic properties in the APE:
HPO quad maps and GIS information recording NR, SL, LD, DE, and SS properties for the Avery County survey, Avery County GIS and tax information, and Google Maps are considered valid for the purposes of determining the likelihood of historic resources being present. There are no historic resources present and no survey is required.

SUPPORT DOCUMENTATION

See attached: Maps.

FINDING BY NCDOT CULTURAL ~~RESOURCES PROFESSIONAL~~ NO SURVEY REQUIRED

ARCHAEOLOGY HISTORIC ARCHITECTURE (CIRCLE ONE)

Katherine S. Hufford January 13, 2012

NCDOT Cultural Resources Specialist Date

"No Survey Required" form for Minor Transportation Projects as Qualified in the 2007 Programmatic Agreement.
NCDOT Archaeology & Historic Architecture Groups

Project Tracking No. (Internal Use)

12-01-0010

NO SURVEY REQUIRED FORM

PROJECT INFORMATION

Project No:	B-5383	*County:*	Avery
WBS No:	46098.1.1	*Document:*	CE/PCE
F.A. No:	BRZ-1536(5)	*Funding:*	☐ State ☒ Federal

Federal (USACE) Permit Required? ☒ Yes ☐ No *Permit Type:* Unknown at this time

Project Description: This project calls for the replacement of Bridge No. 143 on SR 1536 (Greene Road) over Linville River. The bridge was originally constructed in 1965 and is considered to be structurally deficient. No other information has been offered for this project.

SUMMARY OF CULTURAL RESOURCES REVIEW

Brief description of review activities, results of review, and conclusions:

A map review and site file search was conducted at the Office of State Archaeology (OSA) on Tuesday, January 17, 2012. A comprehensive archaeological survey at this particular bridge location has never been conducted, and no archaeological sites have been recorded within one-half (1/2) mile of the proposed project. Digital copies of HPO's maps (Newland and Linville Falls Quadrangles) as well as the HPOWEB GIS Service (http://gis.ncdcr.gov/hpoweb/) were reviewed on Monday, January 23, 2012. There are no known historic architectural resources located within the project area that may have intact archaeological deposits within the footprint of the proposed project. In addition, topographic maps, historic maps (NCMaps website), USDA soil survey maps, and aerial photographs were utilized and inspected to gauge environmental factors that may have contributed to historic or prehistoric settlement within the project limits, and to assess the level of modern, slope, agricultural, hydrological, and other erosive-type disturbances within and surrounding the archaeological APE.

Brief Explanation of why the available information provides a reliable basis for reasonably predicting that there are no unidentified historic properties in the APE:

This is a Federally-funded project. Although a Federal permit is required, the type and number is unknown at this time. The dimensions of the APE suggest that project activities may fall outside the existing ROW (i.e. 50 ft.). Nevertheless, the entire APE consists of frequently flooded soils, primarily Nikwasi loam, 0 to 3 percent slopes (NkA), as well as Cullowhee loam, 0 to 3 percent slopes (CuA). Neighboring soils include Saunook loam, 8 to 15 percent slopes (SaC), near the intersection of SR 1536 (Greene Road) and US 221/NC 194, which is occupied by a solid waste facility (southern corner) and an electrical/utilities transformer box (northern corner). Although the Linville River can be considered a major drainage for Avery County, the environmental setting of the project area, given the hydric nature of the soils, would not be hospitable for prehistoric or historic settlement. However, when one considers soil types and topography, areas of archaeological potential are apparent but are also located well outside the Area of Potential Effects (APE) as defined for this project (see map). It should be noted that there have been no projects within one-half (1/2) mile of this bridge crossing requiring environmental review by the Office of State Archaeology (OSA). Based on the information provided above, it is believed that the APE for the proposed project is considered to have a low potential for containing intact archaeological materials. Therefore, an archaeological survey is not recommended. However, if design plans change, or are made available, prior to construction, then additional consultation may be required.

As currently proposed, this bridge replacement project is unlikely to affect any significant NRHP-eligible archaeological resources. No further archaeological work is recommended.

SUPPORT DOCUMENTATION

See attached: ☒ Map(s) ☐ Previous Survey Info ☐ Photos ☐ Correspondence
☐ Photocopy of County Survey Notes

FINDING BY NCDOT CULTURAL RESOURCES PROFESSIONAL - NO SURVEY REQUIRED

Archaeology Historic Architecture (Circle One)

Paul J. Mohler January 23, 2012

NCDOT Cultural Resources Specialist Date

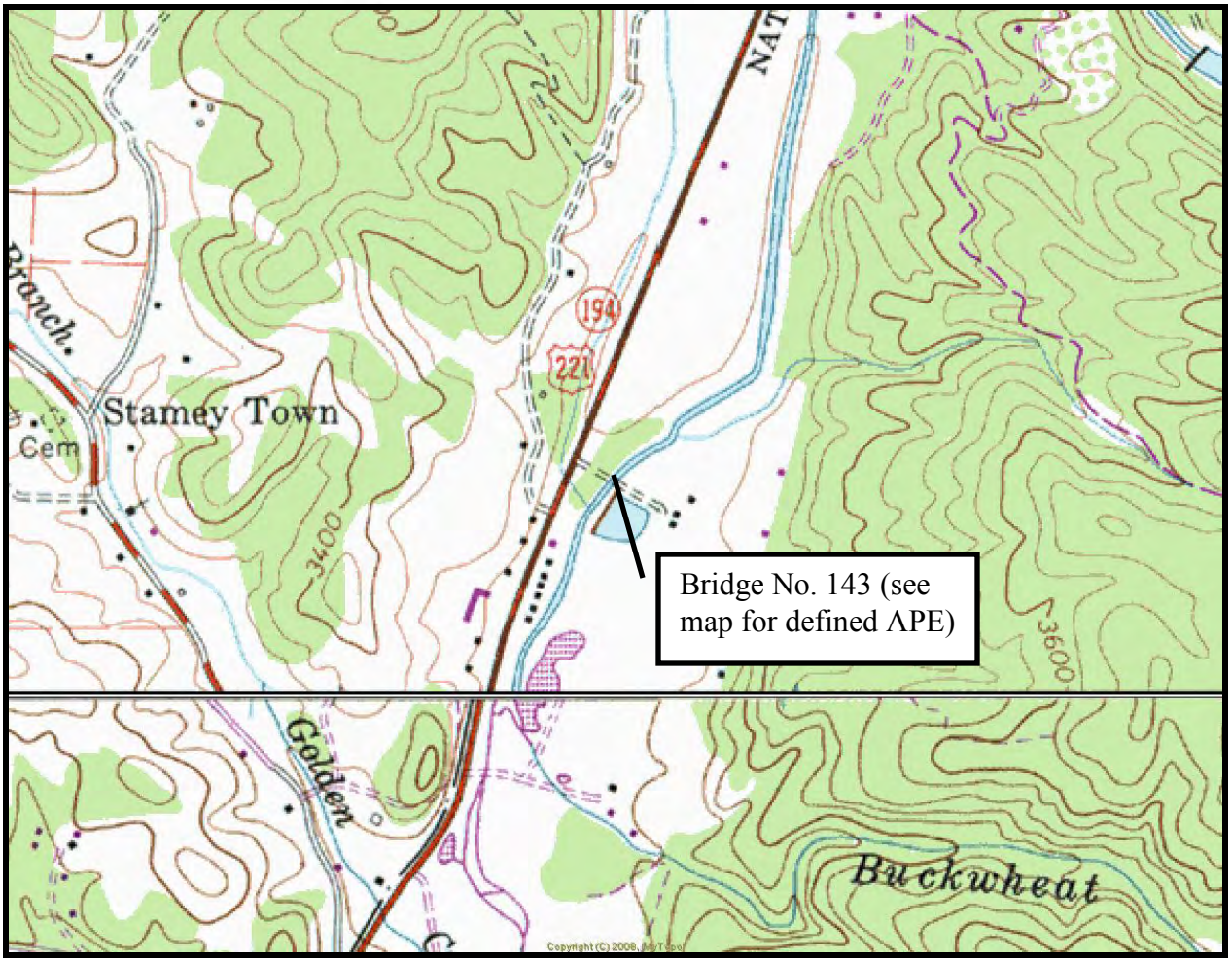


Figure 1: North - Newland, NC (USGS 1960 [PR1978]) and South - Linville Falls, NC (USGS 1994).

North Carolina Wildlife Resources Commission

Gordon Myers, Executive Director

TO: Carla Dagnino, Project Management, Western Region
Natural Environment Section, PDEA Branch, NCDOT

FROM: Marla Chambers, Western NCDOT Permit Coordinator Marla Chambers
Habitat Conservation Program, NCWRC

DATE: June 27, 2012

SUBJECT: Scoping review of NCDOT's proposed replacements in Avery, Burke, Rutherford, Transylvania and Wilkes Counties. TIP Nos. B-5380, B-5383, B-5398, B-5397, B-4823 and B-5381..

North Carolina Department of Transportation (NCDOT) has requested comments from the North Carolina Wildlife Resources Commission (NCWRC) regarding impacts to fish and wildlife resources resulting from the subject project. Staff biologists have reviewed the information provided. The following preliminary comments are provided in accordance with the provisions of the National Environmental Policy Act (42 U.S.C. 4332(2)(c)) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667d).

Our standard recommendations for bridge replacement projects of this scope are as follows:

1. We generally prefer spanning structures. Spanning structures usually do not require work within the stream and do not require stream channel realignment. The horizontal and vertical clearances provided by bridges allows for human and wildlife passage beneath the structure, does not block fish passage, and does not block navigation by canoeists and boaters.

2. Bridge deck drains should not discharge directly into the stream.

3. Live concrete should not be allowed to contact the water in or entering into the stream.

4. If possible, bridge supports (bents) should not be placed in the stream.

Mailing Address: N.C. Wildlife Resources Commission • 1701 Mail Service Center • Raleigh NC 27699-1701
Telephone: (919) 707-0010

5. If temporary access roads or detours are constructed, they should be removed back to original ground elevations immediately upon the completion of the project. Disturbed areas should be seeded or mulched to stabilize the soil and native tree species should be planted with a spacing of not more than 10'x10'. If possible, when using temporary structures the area should be cleared but not grubbed. Clearing the area with chain saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact, allows the area to revegetate naturally and minimizes disturbed soil.

6. A clear bank (riprap free) area of at least 10 feet should remain on each side of the stream underneath the bridge.

7. In trout waters, the N.C. Wildlife Resources Commission reviews all U.S. Army Corps of Engineers nationwide and general '404' permits. We have the option of requesting additional measures to protect trout and trout habitat and we can recommend that the project require an individual '404' permit.

8. In streams that contain threatened or endangered species, Mr. Logan Williams with the NCDOT - ONE should be notified. Special measures to protect these sensitive species may be required. NCDOT should also contact the U.S. Fish and Wildlife Service for information on requirements of the Endangered Species Act as it relates to the project.

9. In streams that are used by anadromous fish, the NCDOT official policy entitled "Stream Crossing Guidelines for Anadromous Fish Passage (May 12, 1997)" should be followed.

10. In areas with significant fisheries for sunfish, seasonal exclusions may also be recommended.

11. Sedimentation and erosion control measures sufficient to protect aquatic resources must be implemented prior to any ground disturbing activities. Structures should be maintained regularly, especially following rainfall events.

12. Temporary or permanent herbaceous vegetation should be planted on all bare soil within 15 days of ground disturbing activities to provide long-term erosion control.

13. All work in or adjacent to stream waters should be conducted in a dry work area. Sandbags, rock berms, cofferdams, or other diversion structures should be used where possible to prevent excavation in flowing water.

14. Heavy equipment should be operated from the bank rather than in stream channels in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into streams.

15. Only clean, sediment-free rock should be used as temporary fill (causeways), and should be removed without excessive disturbance of the natural stream bottom when construction is completed.

16. During subsurface investigations, equipment should be inspected daily and maintained to prevent contamination of surface waters from leaking fuels, lubricants, hydraulic fluids, or other toxic materials.

17. If culvert installation is being considered, conduct subsurface investigations prior to structure design to determine design options and constraints and to ensure that wildlife passage issues are addressed.

If corrugated metal pipe arches, reinforced concrete pipes, or concrete box culverts are used:

1. The culvert must be designed to allow for aquatic life and fish passage. Generally, the culvert or pipe invert should be buried at least 1 foot below the natural streambed (measured from the natural thalweg depth). If multiple barrels are required, barrels other than the base flow barrel(s) should be placed on or near stream bankfull or floodplain bench elevation (similar to Lyonsfield design). These should be reconnected to floodplain benches as appropriate. This may be accomplished by utilizing sills on the upstream end to restrict or divert flow to the base flow barrel(s). Silled barrels should be filled with sediment so as not to cause noxious or mosquito breeding conditions. Sufficient water depth should be provided in the base flow barrel during low flows to accommodate fish movement. If culverts are longer than 40-50 linear feet, alternating or notched baffles should be installed in a manner that mimics existing stream pattern. This should enhance aquatic life passage: 1) by depositing sediments in the barrel, 2) by maintaining channel depth and flow regimes, and 3) by providing resting places for fish and other aquatic organisms. In essence, the base flow barrel(s) should provide a continuum of water depth and channel width without substantial modifications of velocity.

2. If multiple pipes or cells are used, at least one pipe or box should be designed to remain dry during normal flows to allow for wildlife passage.

3. Culverts or pipes should be situated along the existing channel alignment whenever possible to avoid channel realignment. Widening the stream channel must be avoided. Stream channel widening at the inlet or outlet end of structures typically decreases water velocity causing sediment deposition that requires increased maintenance and disrupts aquatic life passage.

4. Riprap should not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures should be professionally designed, sized, and installed.

In most cases, we prefer the replacement of the existing structure at the same location with road closure. If road closure is not feasible, a temporary detour should be designed and located to avoid wetland impacts, minimize the need for clearing and to avoid destabilizing stream banks. If the structure will be on a new alignment, the old structure should be removed and the approach fills removed from the 100-year floodplain. Approach fills should be removed down to the

natural ground elevation. The area should be stabilized with grass and planted with native tree species. Tall fescue should not be used in riparian areas. If the area that is reclaimed was previously wetlands, NCDOT should restore the area to wetlands. If successful, the site may be used as wetland mitigation for the subject project or other projects in the watershed.

Project specific comments:

1. B-5380, Avery Co., Bridge No. 141 over Fall Branch on SR 1114 (Big Plumtree Cr. Rd). Fall Branch supports wild rainbow and brown trout in the project area. A moratorium prohibiting in-stream work and land disturbance within the 25-foot trout buffer is recommended from October 15 to April 15 to protect the egg and fry stages of trout. Sediment and erosion control measures should adhere to the Design Standards in Sensitive Watersheds.

2. B-5383, Avery Co., Bridge No. 143 over Linville R., on SR 1536 (Greene Rd). Linville River is Hatchery Supported Designated Public Mountain Trout Water (HS-DPMTW) and supports wild brown trout in the project area. A moratorium prohibiting in-stream work and land disturbance within the 25-foot trout buffer is recommended from October 15 to April 15 to protect the egg and fry stages of trout. Sediment and erosion control measures should adhere to the Design Standards in Sensitive Watersheds. We also recommend that NCDOT incorporate angler access into their plans for this project for safe public access, in accordance with the MOA between our agencies.

3. B-5398, Burke Co., Bridge No. 21 over Henry Fork River on SR 1803 (Johnson Bridge Rd.). To protect the egg and fry stages of spawning smallmouth bass, a popular game fish, we recommend that NCDOT voluntarily make special efforts to prevent sediment from entering the waterway from May 1 to July 15. We also recommend that NCDOT incorporate angler access parking into their plans for this project for safe public access, in accordance with the MOA between our agencies.

4. B-5397, Rutherford Co., Bridge No. 51 over Floyds Creek on SR 2213 (Bethany Church Rd.). Rare species of fish and crayfish occur in Floyds Creek. Stringent sedimentation and erosion control measures and standard recommendations should apply.

5. B-4823, Transylvania Co., Bridge No. 12 over E. Branch of French Broad R.? (Appears to be Hogsed Creek) on SR 1538 (Becky Mountain Rd.). This stream supports wild rainbow and brown trout in the project area. A moratorium prohibiting in-stream work and land disturbance within the 25-foot trout buffer is recommended from October 15 to April 15 to protect the egg and fry stages of trout. Sediment and erosion control measures should adhere to the Design Standards in Sensitive Watersheds.

6. B-5381, Wilkes Co., Bridge No. 403 over Harley Creek? (Appears to be Little Creek) on SR 1302. No special concerns are indicated at this time. Standard recommendations should apply.

We request that NCDOT routinely minimize adverse impacts to fish and wildlife resources in the vicinity of bridge replacements. The NCDOT should install and maintain sedimentation control measures throughout the life of the project and prevent wet concrete from contacting water in or entering into these streams. Replacement of bridges with spanning structures of some type, as opposed to pipe or box culverts, is recommended in most cases. Spanning structures allow wildlife passage along streambanks, reducing habitat fragmentation and vehicle related mortality at highway crossings.

If you need further assistance or information on NCWRC concerns regarding bridge replacements, please contact me at (704) 485-8291. Thank you for the opportunity to review and comment on this project.

cc: Mike Parker, NCDWQ
Amy Euliss, NCDWQ
Jason Mayes, USFWS

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Water Quality
Charles Wakild, P.E.
Director

Beverly Eaves Perdue
Governor

Dee Freeman
Secretary

January 30, 2012

MEMORANDUM

TO: Gregory M. Blakeney, Bridge Project Planning Engineer, NCDOT

FROM: Michael R. Parker, NCDWQ, Asheville Regional Office
Amy Euliss, NCDWQ, Winston Salem Regional Office

SUBJECT: Avery and Wilkes Counties Bridge Replacement
Scoping Review Comments

In reply to your request, the NCDWQ offers the following comments for the projects listed below:

Project Specific Comments

B-5380: Bridge No. 141 over Fall Branch, NCSR 1114, Avery County

1. Fall Branch is class WS-V waters which flows a short distance to Plumtree Creek which is class WS-V;trout. Due to the steep slopes and short distance to Plumtree Creek NCDWQ recommends that the most protective sediment and erosion control BMP's be implemented to reduce the risk of turbidity violations in trout waters. In addition, all disturbances within trout buffers shall be conducted in accordance with the NC Division of Land Resources and NC Wildlife Resources Commission.
2. Should NC Wildlife Resources Commission (NCWRC) identify these waters as naturally reproducing trout waters, NCDOT will be required to observe the NCWRC recommended moratoria for trout. In additions, NCDWQ will require that NCDOT strictly adhere to North Carolina regulations entitled "Design Standards in Sensitive Watersheds" [15A NCAC 04B .0124] throughout design and construction of the project.

B-5383: Bridge No. 143 over Linville River, NCSR 1536, Avery County

1. The Linville River is class B-trout waters. NCDWQ recommends that the most protective sediment and erosion control BMP's be implemented to reduce the risk of turbidity violations in trout waters. In addition, all disturbances within trout buffers shall be conducted in accordance with the NC Division of Land Resources and NC Wildlife Resources Commission.
2. Should NC Wildlife Resources Commission (NCWRC) identify these waters as naturally reproducing trout waters, NCDOT will be required to observe the NCWRC recommended moratoria for trout. In additions, NCDWQ will require that NCDOT strictly adhere to North Carolina regulations entitled "Design Standards in Sensitive Watersheds" [15A NCAC 04B .0124] throughout design and construction of the project.
3. There are several acres of wetlands located on the south side of the Linville River in the study area. Impacts to this area should be avoided.

Bridge No. 403 (SR 1302) over Little Creek in Wilkes County, TIP B-5381

1. Little Creek are class C; Tr waters of the State. DWQ recommends that the most protective sediment and erosion control BMPs be implemented to reduce the risk of turbidity violations in

SURFACE WATER PROTECTION SECTION-Asheville Regional Office
2090 U.S. Highway 70, Swannanoa, North Carolina 28778-8211
Phone: 828-296-4500 \ FAX: 828-299-7043
Customer Service: 1-877-623-6748
Internet: www.ncwaterquality.org

trout waters. In addition, all disturbances within trout buffers shall be conducted in accordance with NC Division of Land Resources and NC Wildlife Resources Commission requirements.

General Project Comments:

1. The environmental document shall provide a detailed and itemized presentation of the proposed impacts to wetlands and streams with corresponding mapping. If mitigation is necessary as required by 15A NCAC 2H.0506(h), it is preferable to present a conceptual (if not finalized) mitigation plan with the environmental documentation. Appropriate mitigation plans will be required prior to issuance of a 401 Water Quality Certification.

2. Environmental assessment alternatives shall consider design criteria that reduce the impacts to streams and wetlands from storm water runoff. These alternatives shall include road designs that allow for treatment of the storm water runoff through best management practices as detailed in the most recent version of NC DWQ *Stormwater Best Management Practices*, such as grassed swales, buffer areas, preformed scour holes, retention basins, etc.

3. After the selection of the preferred alternative and prior to an issuance of the 401 Water Quality Certification, the NCDOT is respectfully reminded that they will need to demonstrate the avoidance and minimization of impacts to wetlands (and streams) to the maximum extent practical. In accordance with the Environmental Management Commission's Rules {15A NCAC 2H.0506(h)}, mitigation will be required for impacts of greater than 1 acre to wetlands. In the event that mitigation is required, the mitigation plan shall be designed to replace appropriate lost functions and values. The NC Ecosystem Enhancement Program may be available for use as wetland mitigation.

4. In accordance with the Environmental Management Commission's Rules {15A NCAC 2H.0506(h)}, mitigation will be required for impacts of greater than 150 linear feet to any single perennial stream. In the event that mitigation is required, the mitigation plan shall be designed to replace appropriate lost functions and values. The NC Ecosystem Enhancement Program may be available for use as stream mitigation.

5. DWQ is very concerned with sediment and erosion impacts that could result from this project. NC DOT shall address these concerns by describing the potential impacts that may occur to the aquatic environments and any mitigating factors that would reduce the impacts.

6. If a bridge is being replaced with a hydraulic conveyance other than another bridge, DWQ believes the use of a Nationwide Permit may be required. Please contact the US Army Corp of Engineers to determine the required permit(s).

7. If the old bridge is removed, no discharge of bridge material into surface waters is allowed unless otherwise authorized by the US ACOE. Strict adherence to the Corps of Engineers guidelines for bridge demolition will be a condition of the 401 Water Quality Certification.

8. Bridge supports (bents) shall not be placed in the stream when possible.

9. Whenever possible, the DWQ prefers spanning structures. Spanning structures usually do not require work within the stream or grubbing of the streambanks and do not require stream channel realignment. The horizontal and vertical clearances provided by bridges allow for human and wildlife passage beneath the structure, do not block fish passage and do not block navigation by canoeists and boaters.

10. Bridge deck drains shall not discharge directly into the stream. Stormwater shall be directed across the bridge and pre-treated through site-appropriate means (grassed swales, pre-formed scour holes,

vegetated buffers, etc.) before entering the stream. Please refer to the most current version of NC DWQ *Stormwater Best Management Practices.*

11. If concrete is used during construction, a dry work area shall be maintained to prevent direct contact between curing concrete and stream water. Water that inadvertently contacts uncured concrete shall not be discharged to surface waters due to the potential for elevated pH and possible aquatic life and fish kills.

12. If temporary access roads or detours are constructed, the site shall be graded to its preconstruction contours and elevations. Disturbed areas shall be seeded or mulched to stabilize the soil and appropriate native woody species should be planted. When using temporary structures the area shall be cleared but not grubbed. Clearing the area with chain saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact allows the area to re-vegetate naturally and minimizes soil disturbance.

13. Placement of culverts and other structures in waters, streams, and wetlands shall be below the elevation of the streambed by one foot for all culverts with a diameter greater than 48 inches, and 20 percent of the culvert diameter for culverts having a diameter less than 48 inches, to allow low flow passage of water and aquatic life. Design and placement of culverts and other structures including temporary erosion control measures shall not be conducted in a manner that may result in dis-equilibrium of wetlands or streambeds or banks, adjacent to or upstream and down stream of the above structures. The applicant is required to provide evidence that the equilibrium is being maintained if requested in writing by DWQ. If this condition is unable to be met due to bedrock or other limiting features encountered during construction, please contact the NC DWQ for guidance on how to proceed and to determine whether or not a permit modification will be required.

14. If multiple pipes or barrels are required, they shall be designed to mimic natural stream cross section as closely as possible including pipes or barrels at flood plain elevation and/or sills where appropriate. Widening the stream channel shall be avoided. Stream channel widening at the inlet or outlet end of structures typically decreases water velocity causing sediment deposition that requires increased maintenance and disrupts aquatic life passage.

15. If foundation test borings are necessary; it should be noted in the document. Geotechnical work is approved under General 401 Certification Number 3624/Nationwide Permit No. 6 for Survey Activities.

16. Sediment and erosion control measures sufficient to protect water resources must be implemented and maintained in accordance with the most recent version of North Carolina Sediment and Erosion Control Planning and Design Manual and the most recent version of NCS000250.

17. All work in or adjacent to stream waters shall be conducted in a dry work area unless otherwise approved by NC DWQ. Approved BMP measures from the most current version of NCDOT Construction and Maintenance Activities manual such as sandbags, rock berms, cofferdams and other diversion structures should be used to prevent excavation in flowing water.

18. Sediment and erosion control measures shall not be placed in wetlands and streams.

19. Borrow/waste areas shall avoid wetlands to the maximum extent practical. Impacts to wetlands in borrow/waste areas could precipitate compensatory mitigation.

20. While the use of National Wetland Inventory (NWI) maps, NC Coastal Region Evaluation of Wetland Significance (NC-CREWS) maps and soil survey maps are useful tools, their inherent inaccuracies require that qualified personnel perform onsite wetland delineations prior to permit approval.

21. Heavy equipment shall be operated from the bank rather than in stream channels in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into streams. This equipment shall be inspected daily and maintained to prevent contamination of surface waters from leaking fuels, lubricants, hydraulic fluids, or other toxic materials.

22. In most cases, the DWQ prefers the replacement of the existing structure at the same location with road closure. If road closure is not feasible, a temporary detour should be designed and located to avoid wetland impacts, minimize the need for clearing and to avoid destabilizing stream banks. If the structure will be on a new alignment, the old structure shall be removed and the approach fills removed from the 100-year floodplain. Approach fills should be removed and restored to the natural ground elevation. The area shall be stabilized with grass and planted with native tree species. Tall fescue shall not be used in riparian areas.

23. Riprap shall not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures should be properly designed, sized and installed.

Thank you for requesting our input at this time. The DOT is reminded that issuance of a 401 Water Quality Certification requires that appropriate measures be instituted to ensure that water quality standards are met and designated uses are not degraded or lost. If you have any questions or require additional information, please contact Mike Parker (Avery County Bridges) at 828-296-4500 or Amy Euliss (Wilkes County Bridge) at (336) 771-4959.

cc: Monte Matthews, US Army Corps of Engineers, Raleigh Field Office (electronic copy only)
Environmental Protection Agency (electronic copy only)
Marla Chambers, NC Wildlife Resources Commission (electronic copy only)
Mike Parker, ARO (electronic copy only)
Amy Euliss, WSRO
Wetlands/ 401 Transportation Permitting Unit (electronic copy only)