



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

April 8, 2005

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

Attention: Ms. Angie Pennock  
NCDOT Coordinator

Dear Madam:

Subject: **Nationwide Permit 23 Application** for the proposed replacement of Bridge No. 265 on SR-1791 (Ballenger Road) over Dunn Creek in Henderson County. Federal Project No. BRZ-1791(1), State Project No. 8.2952001, T.I.P. No. B-3665.

Please find enclosed three copies of the project planning report for the above referenced project, along with a project site map, and permit drawings. NCDOT plans to replace bridge No. 265 with a reinforced concrete box culvert with two barrels at 11 feet by eight feet and approximately 60 feet in length at the existing location. The proposed roadway cross section will include two 11-foot travel lanes and 5-foot turf shoulders. The new structure will be buried 12 inches below the bed of the creek. Traffic will be maintained on an offsite detour during construction. The project Let date is November 15, 2005 with a Review Date of September 27, 2005.

### Bridge Demolition

The superstructure of Bridge No. 265 is a single span structure consisting of a timber deck on steel I-beams supported by timber caps and piles, with an overall length of 31 feet and a clear roadway width of 20 feet. Bridge No. 265 can be removed without dropping components into Waters of the United States. Guidelines for bridge demolition and removal will be followed in addition to Best Management Practices for the Protection of Surface Waters and BMP's for Bridge Demolition and Removal.

### Waters of the United States

The water resource impacted for project B-3665 is a Dunn Creek. Dunn Creek is in the French Broad River Basin [sub-basin # 04-03-02]. The North Carolina Department of Environment and Natural Resources classifies Dunn Creek [DWQ Index # 5-55-8-1-1] as "C". Class "C" waters are suitable for secondary recreation, fishing, wildlife, fish and aquatic life propagation and survival, and agriculture.

There are no Outstanding Resource Waters (ORW), High Quality Waters (HQW), WS-I, or WS-II within 1 mile upstream or downstream of the project study area.

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

TELEPHONE: 919-715-1500  
FAX: 919-715-1501  
WEBSITE: [WWW.NCDOT.ORG](http://WWW.NCDOT.ORG)

LOCATION:  
2728 CAPITAL BLVD.  
PARKER LINCOLN BUILDING, SUITE 168  
RALEIGH NC 27604

Dunn Creek is not designated as a National Wild and Scenic River or a State Natural and Scenic River.

Permanent impacts will result from the construction of this project (see permit drawings). The proposed culvert will result in 170 linear feet of impacts to Dunn Creek and 0.03 acre to surface waters.

Temporary Impacts: Temporary dewatering is necessary for culvert installation. Diking materials and methods will be determined during construction by the contractor, and will adhere to NCDOT Best Management Practices for Construction and Maintenance Activities. Because all temporary dewatering will occur within the proposed limits of permanent impact, no additional temporary impacts to Dunn Creek are necessary for culvert installation.

### **Avoidance & Minimization**

The construction of this project has minimized the extent of the built-upon area by using the existing alignment for the widening. Traffic will be maintained using an off site detour. Best management practices (BMP's) will be utilized to minimize water quality impacts. In addition, the floor of the RCBC will be buried 12 inches below the streambed to allow aquatic organisms passage during low flow conditions. No portion of the project is located in the critical area of the watershed. In compliance with 15A NCAC 02B.0104(m) we have incorporated the use of BMP's in the design of the project.

### **Mitigation**

The U.S. Army Corps of Engineers' interpretation of Nationwide Permits is that all impacts to perennial streams or intermittent streams that exhibit important aquatic function require mitigation. Therefore, the remaining unavoidable impacts to 170 linear feet of stream will be offset by compensatory mitigation.

Based upon the agreements stipulated in the "Memorandum of Agreement Among the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U.S. Army Corps of Engineers, Wilmington District" (MOA), it is understood that the North Carolina Department of Environment and Natural Resources Ecosystem Enhancement Program (EEP), will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for NCDOT projects that are listed in Exhibit 1 of the subject MOA during the EEP transition period which ends on June 30, 2005.

Since the subject project is listed in Exhibit 1, the necessary compensatory mitigation to offset unavoidable impacts to waters that are jurisdictional under the federal Clean Water Act will be provided by the EEP. The offsetting mitigation will derive from an inventory of assets already in existence within the same 8-digit cataloguing unit. The Department has avoided and minimized impacts to jurisdictional resources to the greatest extent possible as described above.

### **Federally-Protected Species**

Plants and animals with federal classifications of Endangered, Threatened, Proposed Endangered, and Proposed Threatened are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of February 24, 2003, the Fish and Wildlife Service (FWS) lists eight federally protected species (Table 1) for Henderson County. Biological Conclusions of No Effect were reached for all protected species and remain valid.

**Table 1. Federally-protected species of Henderson County.**

Scientific Name	Common Name	Federal Status	Biological Conclusion
<i>Clemmys muhlenbergii</i>	Bog turtle	Threatened (S/A)	No Effect
<i>Alasmidonta raveneliana</i>	Appalachian elktoe	Endangered	No Effect
<i>Epioblasma capsaeformis</i>	Oyster mussel	Endangered	No Effect
<i>Isotria medeoloides</i>	Small-whorled pogonia	Threatened	No Effect
<i>Helonias bullata</i>	Swamp pink	Threatened	No Effect
<i>Sagittaria fasciculata</i>	Bunched arrowhead	Endangered	No Effect
<i>Sarracenia jonesii</i>	Mountain sweet pitcher plant	Endangered	No Effect
<i>Sisyrinchium dichotomum</i>	White irisette	Endangered	No Effect

Endangered – A taxon “in danger of extinction throughout all or a significant portion of its range.”

Threatened – A taxon “likely to become endangered within the foreseeable future throughout all or a significant portion of its range.”

Threatened (S/A) – Threatened due to similarity of appearance (e.g., American alligator)—a species that is threatened due to similarity of appearance with other rare species and is listed for its protection.

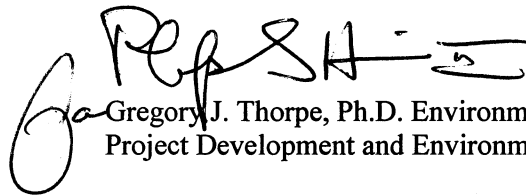
### Regulatory Approvals

**Section 404 Permit:** All aspects of this project are being processed by the Federal Highway Administration as a “Categorical Exclusion” in accordance with 23 CFR § 771.115(b). The NCDOT requests that these activities be authorized by a Nationwide Permit 23 (FR number 10, pages 2020-2095; January 15, 2002).

**Section 401 Certification:** We anticipate 401 General Certification number 3403 will apply to this project. In accordance with 15A NCAC 2H .0501(a) we are providing two copies of this application to the North Carolina Department of Environmental and Natural Resources, Division of Water Quality, for their records.

A copy of this permit application will be posted on the DOT website at: <http://www.ncdot.org/planning/pe/naturalunit/Permit.html>. If you have any questions or need additional information, please contact Tyler Stanton at [tstanton@dot.state.nc.us](mailto:tstanton@dot.state.nc.us) or (919) 715-1439.

Sincerely,



Gregory J. Thorpe, Ph.D. Environmental Management Director,  
Project Development and Environmental Analysis Branch

**W/attachment:**

- Mr. John Hennessy, NCDWQ (7 copies)
- Ms. Marella Buncick, USFWS
- Ms. Marla Chambers, NCWRC
- Mr. Harold Draper, TVA
- Mr. David Chang, P.E., Hydraulics
- Mr. Greg Perfetti, P.E., Structure Design
- Mr. Mark Staley, Roadside Environmental
- Mr. J. B. Setzer, P.E., Division Engineer
- Mr. Mark Davis, DEO

**W/o attachment:**

- Mr. Jay Bennett, P.E., Roadway Design
- Mr. Omar Sultan, Programming and TIP
- Mr. Art McMillan, P.E., Highway Design
- Mr. David Franklin, USACE,  
Wilmington
- Ms. Beth Harmon, EEP
- Ms. Laurie P. Smith, CPA, NCDOT,  
Program Management
- Mr. Khaled Al-Akhdar, P.E., PDEA



February 7, 2005

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

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

**B-3665, Bridge 265 over Dunn Creek, Henderson County**

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide stream mitigation for the subject project. Based on the information supplied by you in a letter dated December 21, 2004, the impacts are located in CU 06010105 of the French Broad River Basin in the Southern Mountains (SM) Eco-Region, and are as follows:

Stream Impacts: 170 feet

As stated in your letter, the subject project is listed in Exhibit 2 of the Memorandum of Agreement among the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U. S. Army Corps of Engineers, Wilmington District dated July 22, 2003. The mitigation for the subject project will be provided in accordance with this agreement.

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

Sincerely,

A handwritten signature in black ink that reads "James B. Gilmore, Jr." in a cursive script.

William D. Gilmore, P.E.  
EEP Director

cc: Ms. Angie Pennock, USACE-Asheville  
Mr. John Hennessy, Division of Water Quality, Wetlands/401 Unit  
File: B-3665

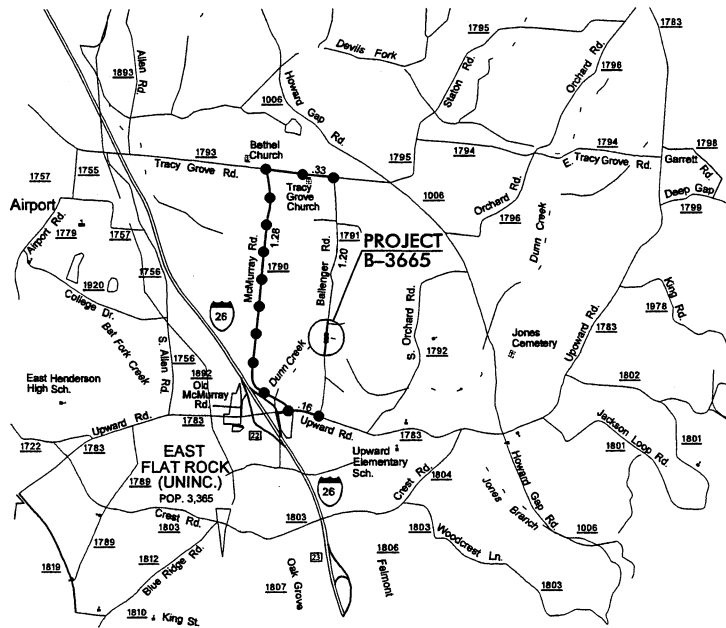
*Restoring... Enhancing... Protecting Our State*

North Carolina Ecosystem Enhancement Program, 1652 Mail Service Center, Raleigh, NC 27699-1652 / 919-715-0476 / [www.nceep.net](http://www.nceep.net)





# NORTH CAROLINA

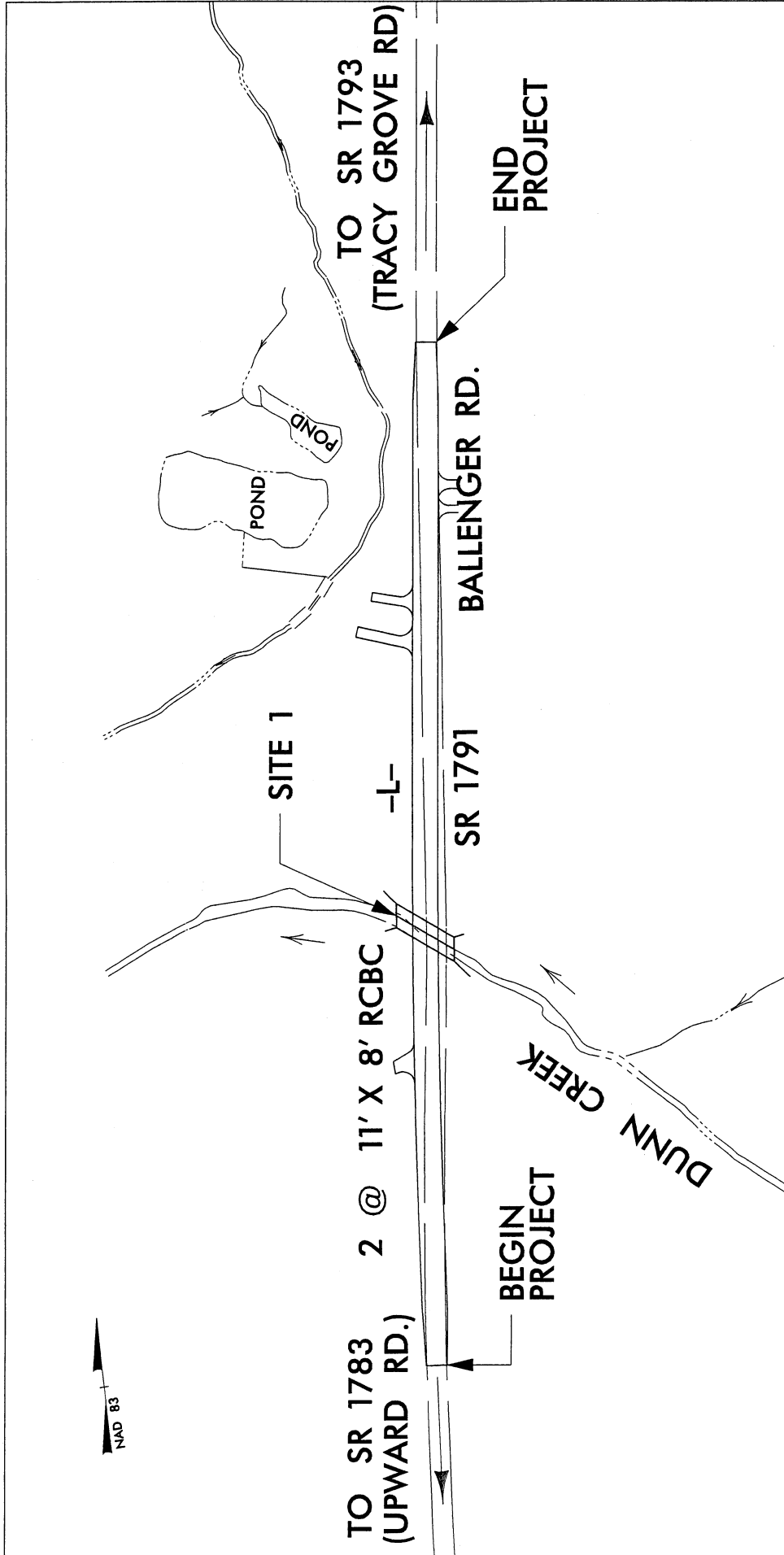


(NOT TO SCALE)

DETOUR ROUTE

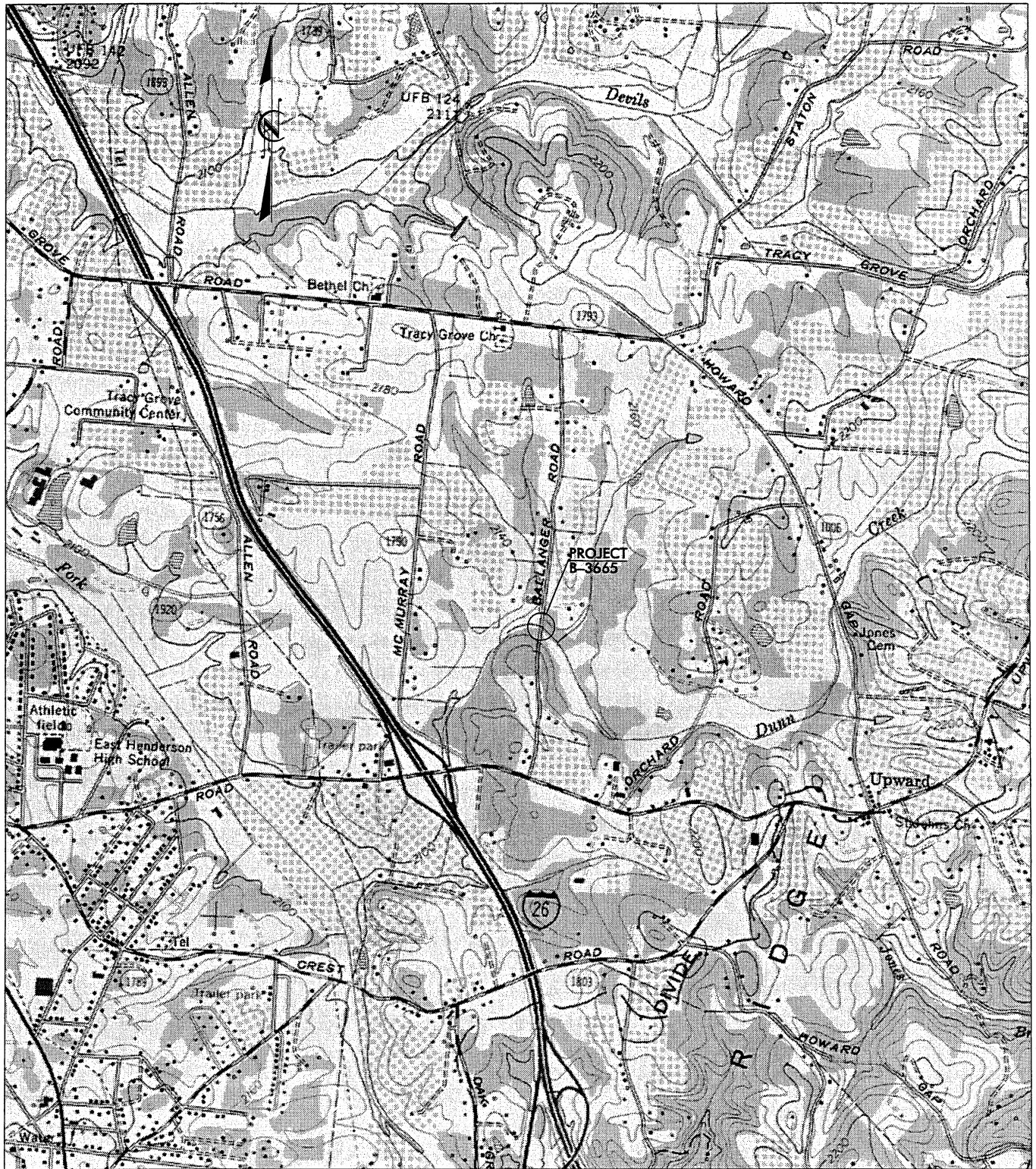
## VICINITY MAPS

NCDOT  
DIVISION OF HIGHWAYS  
HENDERSON COUNTY  
PROJECT: 33210.1.1 (B-3665)  
BRIDGE NO. 265 OVER  
DUNN CREEK AND  
APPROACHES ON SR 1791



**NCDOT**  
 DIVISION OF HIGHWAYS  
 HENDERSON COUNTY  
 PROJECT: 33210.1.1 (B-3665)  
 BRIDGE NO. 265 OVER  
 DUNN CREEK AND  
 APPROACHES ON SR 1791

SITE MAP  
 NOT TO SCALE



# TOPO MAP

SCALE: 1" : 2000'

## NCDOT

DIVISION OF HIGHWAYS

HENDERSON COUNTY

PROJECT: 33210.1.1 (B-3665)

BRIDGE NO. 265 OVER

DUNN CREEK AND

APPROACHES ON SR 1791

SHEET 3 OF 10

4/13/04

**PROPERTY OWNERS**  
NAMES AND ADDRESSES

REFERENCE NO.	NAMES	ADDRESSES
1	Billy & Kathy Hill	Rt. 1 Box 494A Flat Rock, NC 28731
2	John & Sarah Murray	Rt. 1 Box 493A Flat Rock, NC 28731
3	James & Clara Mann	Rt. 1 Box 493 Flat Rock, NC 28731
4	Bruce & Joyce Marsteller	Rt. 1 Box 495B Flat Rock, NC 28731

**NCDOT**

DIVISION OF HIGHWAYS  
HENDERSON COUNTY

PROJECT: 33210.1.1 (B-3665)

BRIDGE NO. 265 OVER  
DUNN CREEK AND  
APPROACHES ON SR 1791

8/17/99

DENOTES FILL IN SURFACE WATER

TRAVIS L. HILL  
NICOLE P. HILL  
D.B.1053 PG.044

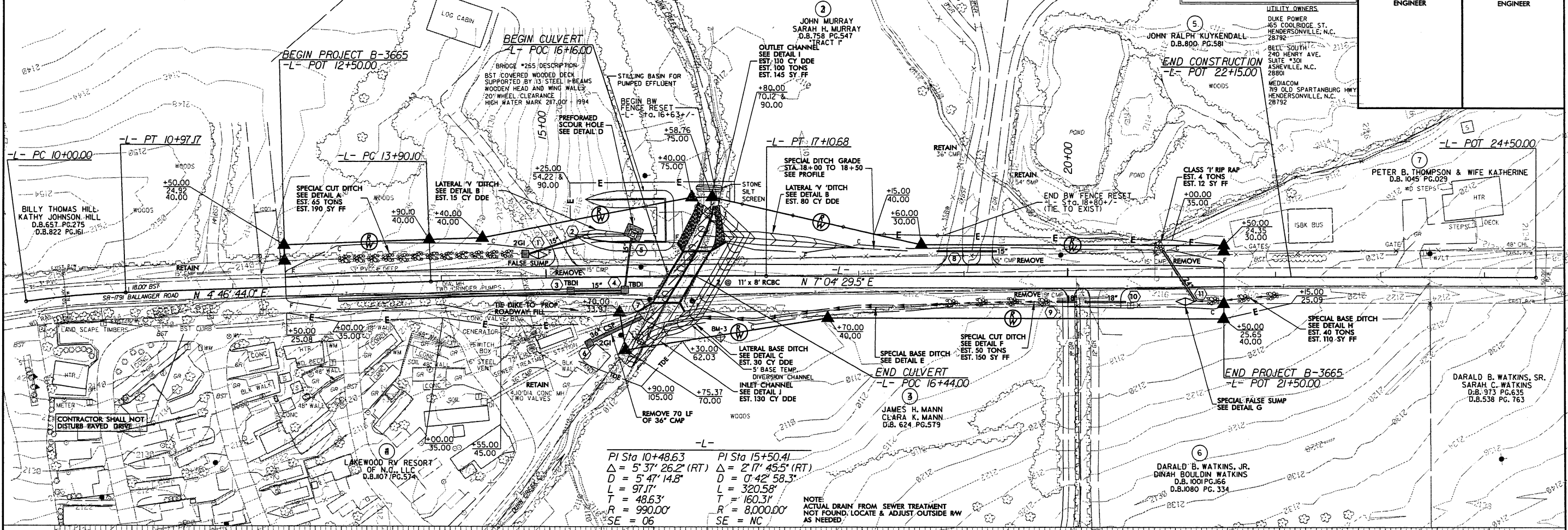
NAD 83

ENGLISH

MULKEY  
ENGINEERS & CONSULTANTS  
PO BOX 38127  
RANDOLPH, N.C. 27436  
(714) 881-1818 FAX  
WWW.MULKEYINC.COM

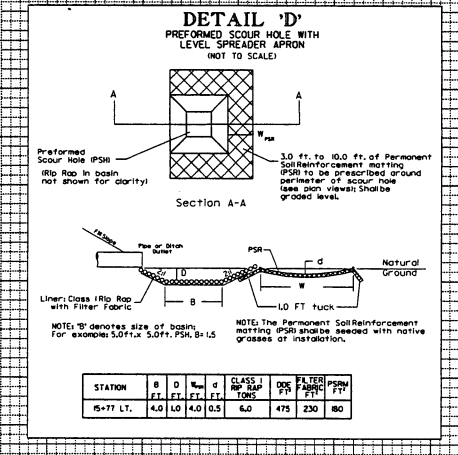
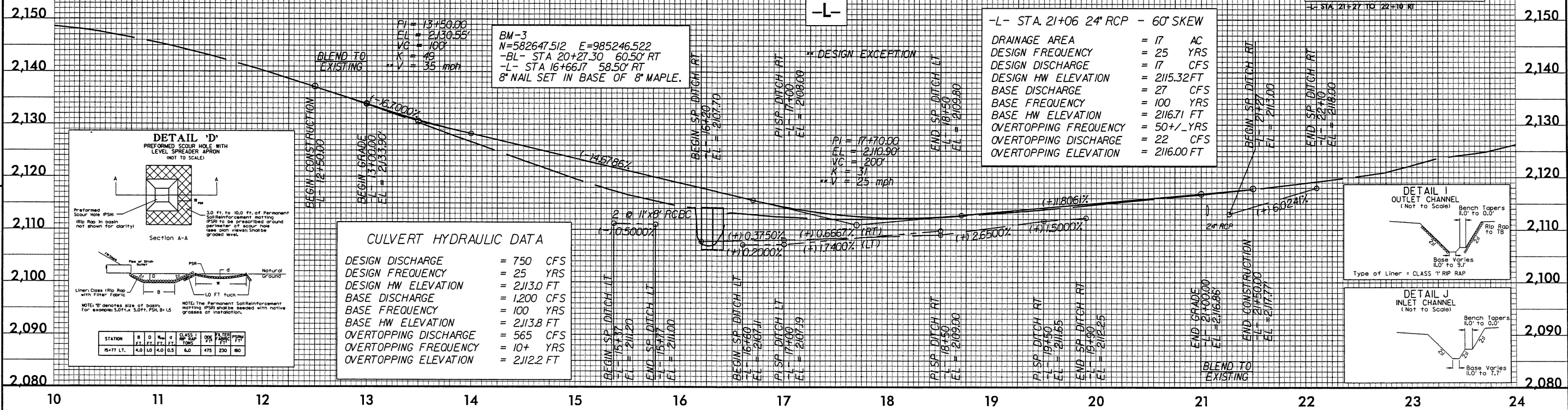
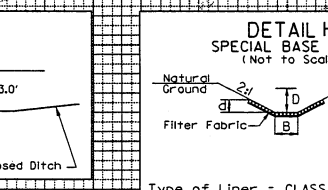
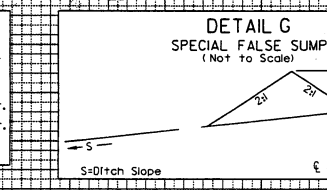
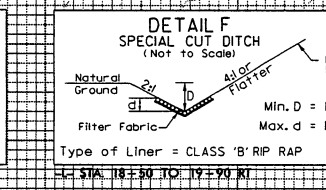
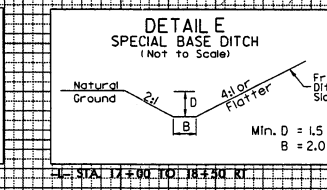
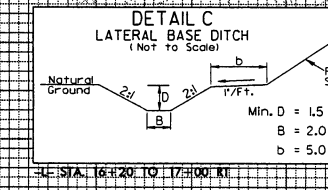
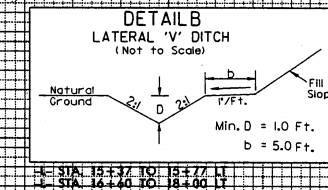
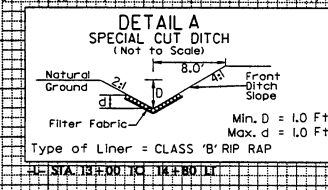
PROJECT REFERENCE NO. B-3665	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

UTILITY OWNERS  
DUKE POWER  
45 COOL RIDGE ST.  
HENDERSONVILLE, N.C.  
28792  
BELL SOUTH  
2ND HENRY AVE.  
SUITE 430  
ASHEVILLE, N.C.  
28801  
MEDACOM  
89 OLD SPARTANBURG HWY  
HENDERSONVILLE, N.C.  
28792



PI Sta 10+48.63      PI Sta 15+50.41  
 $\Delta = 5' 37" 26.2" (RT)$        $\Delta = 2' 17" 45.5" (RT)$   
 $D = 5' 47" 14.8"$        $D = 0' 42" 58.3"$   
 $L = 97.17'$        $L = 320.58'$   
 $T = 486.3'$        $T = 160.31'$   
 $R = 990.00'$        $R = 8,000.00'$   
 $SE = 06$        $SE = NC$

NOTE: ACTUAL DRAIN FROM SEWER TREATMENT NOT FOUND. LOCATE & ADJUST OUTSIDE RW AS NEEDED.

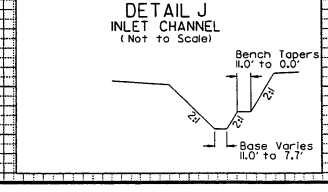
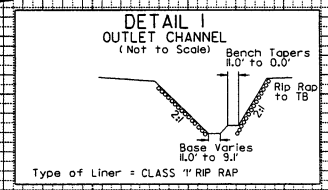


CULVERT HYDRAULIC DATA

DESIGN DISCHARGE = 750 CFS  
DESIGN FREQUENCY = 25 YRS  
DESIGN HW ELEVATION = 2113.0 FT  
BASE DISCHARGE = 1,200 CFS  
BASE FREQUENCY = 100 YRS  
BASE HW ELEVATION = 2113.8 FT  
OVERTOPPING DISCHARGE = 565 CFS  
OVERTOPPING FREQUENCY = 10+ YRS  
OVERTOPPING ELEVATION = 2112.2 FT

-L- STA. 21+06 24" RCP - 60' SKEW

DRAINAGE AREA = 17 AC  
DESIGN FREQUENCY = 25 YRS  
DESIGN DISCHARGE = 17 CFS  
DESIGN HW ELEVATION = 2115.32 FT  
BASE DISCHARGE = 27 CFS  
BASE FREQUENCY = 100 YRS  
BASE HW ELEVATION = 2116.71 FT  
OVERTOPPING FREQUENCY = 50+ YRS  
OVERTOPPING DISCHARGE = 22 CFS  
OVERTOPPING ELEVATION = 2116.00 FT





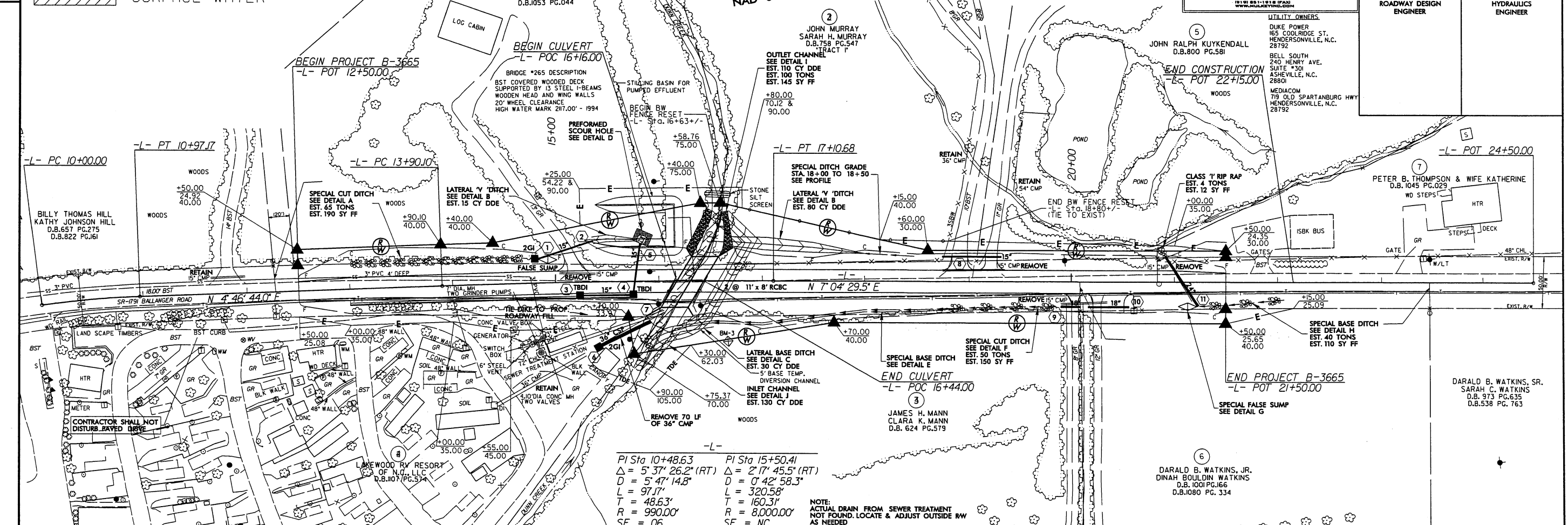
8/17/99

DENOTES FILL IN SURFACE WATER

# ENGLISH



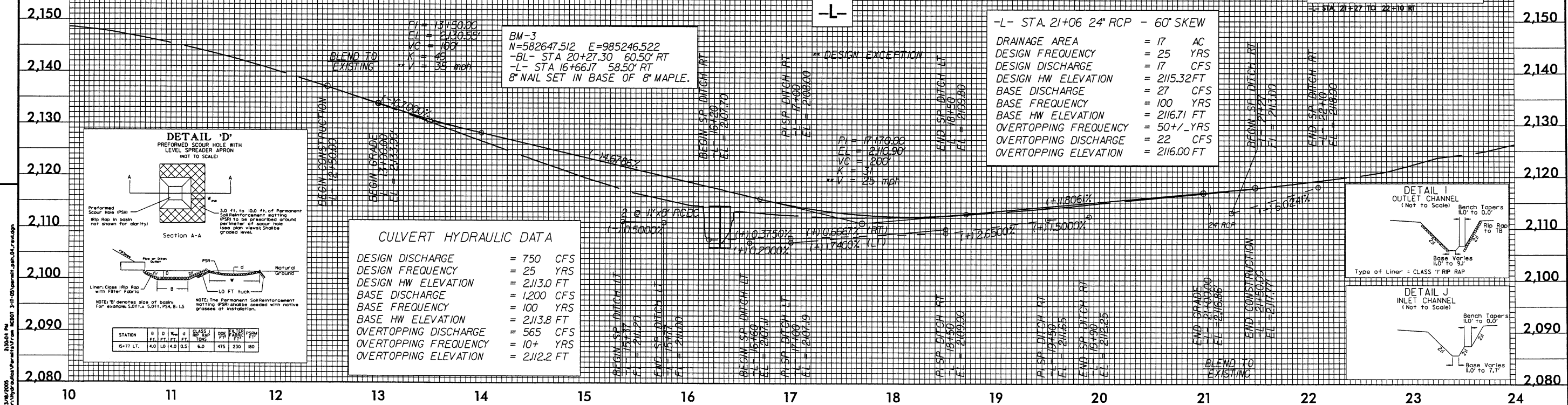
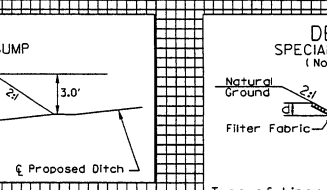
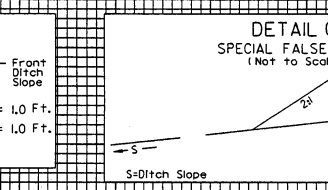
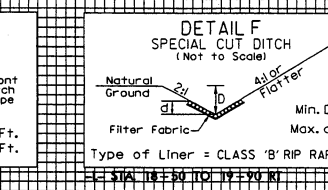
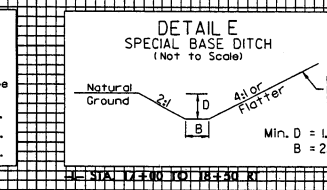
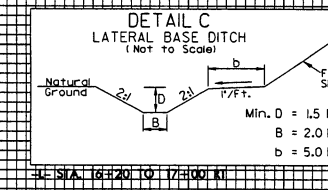
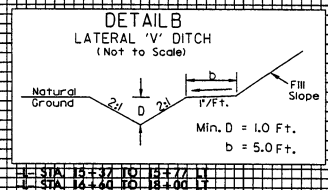
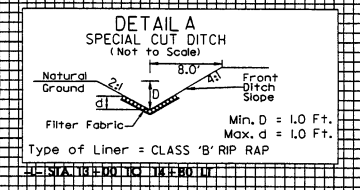
PROJECT REFERENCE NO. B-3665	SHEET NO. 6
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	



PI Sta 10+48.63 Δ = 5' 37" 26.2" (RT)  
 D = 5' 47" 14.8"  
 L = 97.17'  
 T = 48.63'  
 R = 990.00'  
 SE = 06

PI Sta 15+50.41 Δ = 2' 17" 45.5" (RT)  
 D = 0' 42" 58.3"  
 L = 320.58'  
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 R = 8,000.00'  
 SE = NC

NOTE: ACTUAL DRAIN FROM SEWER TREATMENT NOT FOUND. LOCATE & ADJUST OUTSIDE RW AS NEEDED



8/17/99

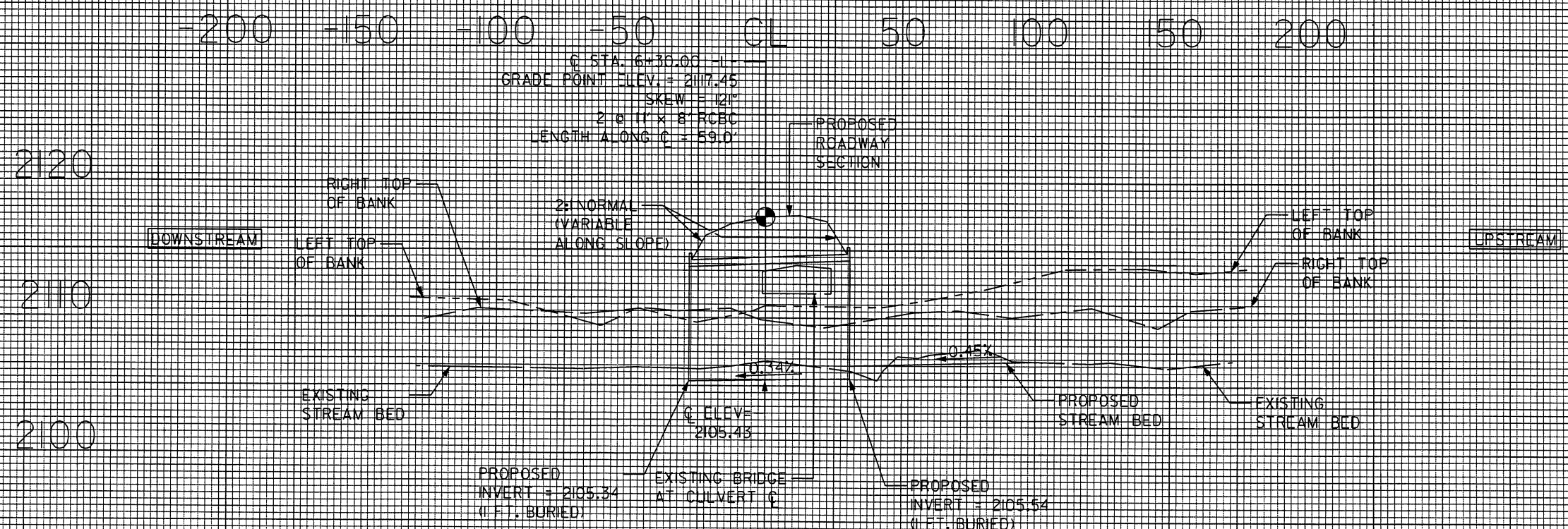
5/14/99

**MULKEY**  
ENGINEERS & CONSULTANTS  
PO BOX 32187  
1501 28th St. N.E.  
1501 28th St. N.E.  
1501 28th St. N.E.  
WWW.MULKEYINC.COM

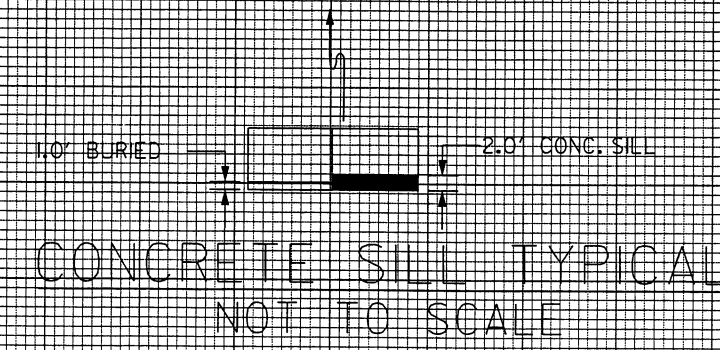
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ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

ENGLISH

SCALE  
HORIZONTAL: 1"=50'  
VERTICAL: 1"=10'



PROFILE ALONG STRUCTURE



5/14/99



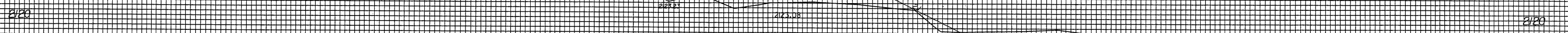
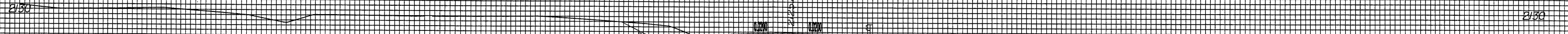
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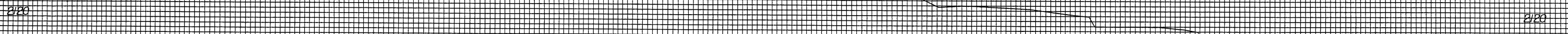
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B-3665

SHEET NO.  
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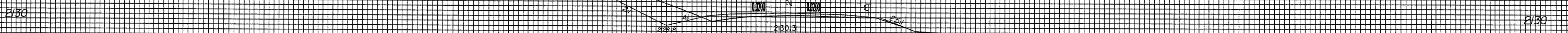
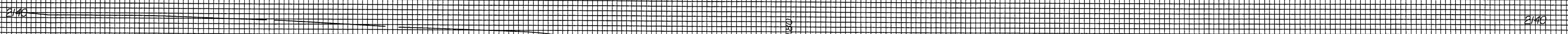
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14100.00

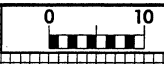


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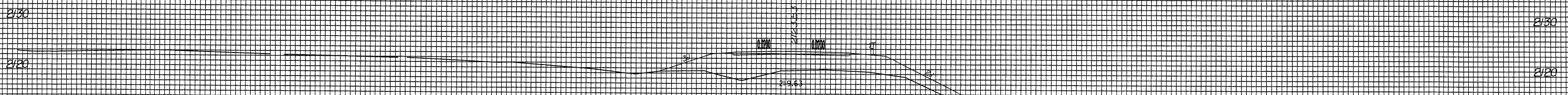
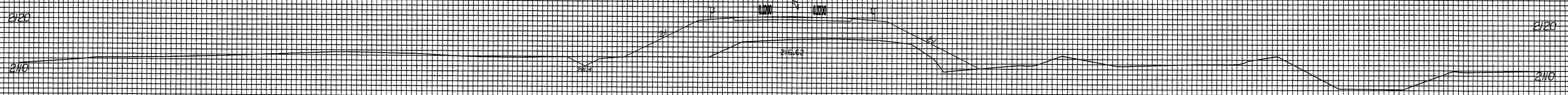
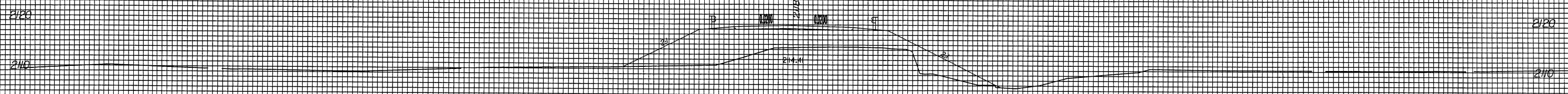
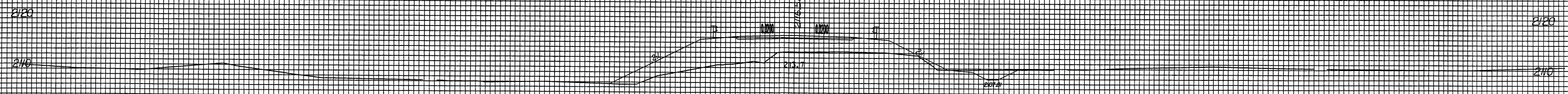
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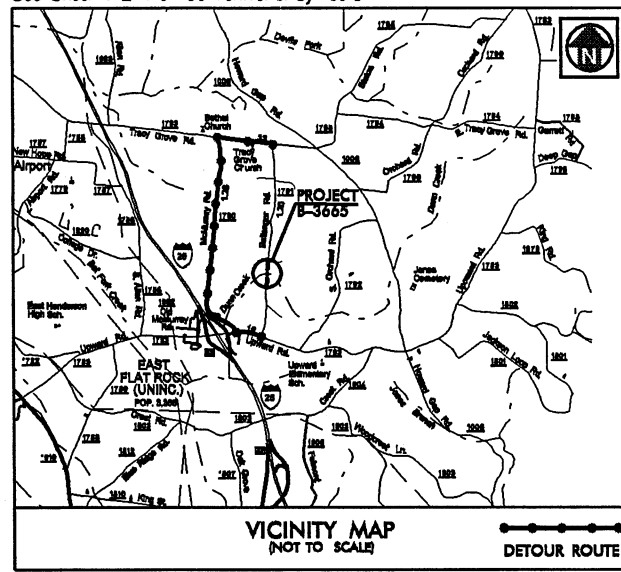


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**CONTRACT: TIP PROJECT: B-3665**

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



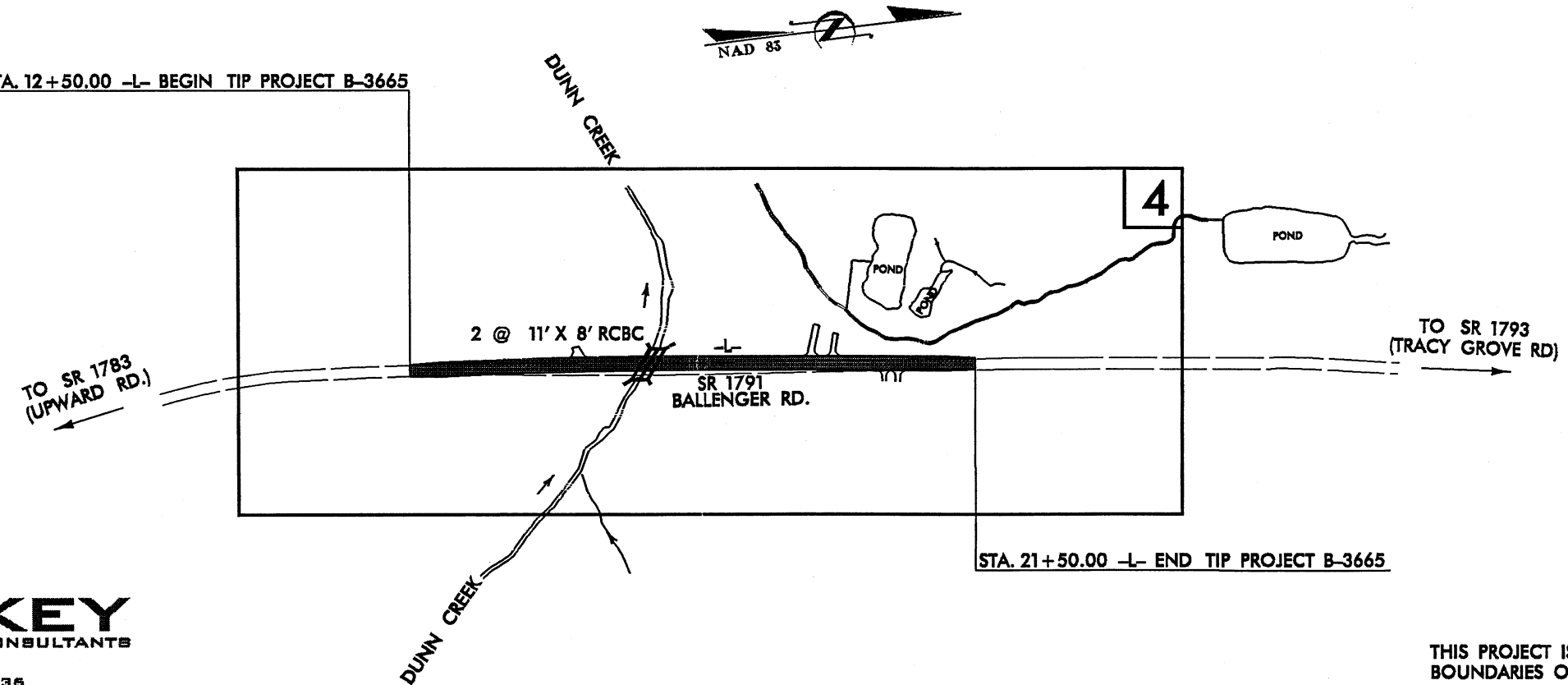
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**HENDERSON COUNTY**

LOCATION: BRIDGE NO. 265 OVER DUNN CREEK AND APPROACHES ON SR 1791 (BALLENGER ROAD)  
TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND CULVERT

STATE	STATE PROJECT REFERENCE NO.	SECT. NO.	TOTAL SHEETS
N.C.	B-3665	1	
ITEM NO.	P.L. PROFILE	DESCRIPTION	
33210.1.1	BRZ-1791(1)	P.E.	
33210.2.1	BRZ-1791(2)	R/W, UTL	

**PRELIMINARY PLANS**  
DO NOT USE FOR CONSTRUCTION

STA. 12+50.00 -L- BEGIN TIP PROJECT B-3665

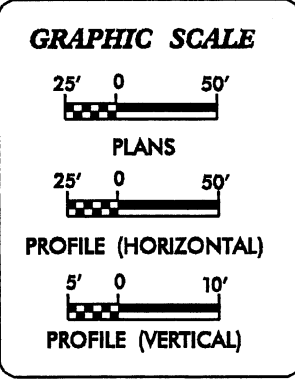


STA. 21+50.00 -L- END TIP PROJECT B-3665

**MULKEY**  
ENGINEERS & CONSULTANTS  
PO BOX 33127  
RALEIGH, N.C. 27636  
(919) 851-1912  
(919) 851-1918 (FAX)  
WWW.MULKEYINC.COM

THIS PROJECT IS NOT WITHIN THE MUNICIPAL BOUNDARIES OF HENDERSONVILLE.

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.



**DESIGN DATA**

ADT 2005 = 778  
ADT 2025 = 1,300  
DHV = 14%  
D = 55%  
\* T = 3%  
\*\* V = 50 mph

Func Class = Local  
\* (Duals = 2% + TTST = 1%)  
\*\* Design Exception - Design Speed

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-3665 = 0.170 MILE  
TOTAL LENGTH TIP PROJECT B-3665 = 0.170 MILE

Prepared in the Office of:  
**Mulkey Engineers & Consultants**  
FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: APRIL 30, 2004

LETTING DATE:

NCDOT CONTACT: TERESA BRUTON, P.E.  
DESIGN SERVICES - PROJECT ENGINEER

TIM JORDAN, PE  
MULKEY E & C  
PROJECT MANAGER

JONATHAN SCARCE, PE  
MULKEY E & C  
HYDRAULICS ENGINEER

HYDRAULICS ENGINEER

ROADWAY DESIGN

SIGNATURE: \_\_\_\_\_ PE

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

STATE HIGHWAY ENGINEER - DESIGN

DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

APPROVED FOR DIVISION ADMINISTRATOR

DATE

PROJECT REFERENCE NO. B-3665		SHEET NO. 1B	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# CONVENTIONAL SYMBOLS

\*S.U.E = SUBSURFACE UTILITY ENGINEER

## ROADS & RELATED ITEMS

Edge of Pavement	-----
Curb	-----
Prop. Slope Stakes Cut	----- <sup>C</sup>
Prop. Slope Stakes Fill	----- <sup>F</sup>
Prop. Woven Wire Fence	-----○-----
Prop. Chain Link Fence	-----□-----
Prop. Barbed Wire Fence	-----◇-----
Prop. Wheelchair Ramp	-----WCB-----
Curb Cut for Future Wheelchair Ramp	-----CCPB-----
Exist. Guardrail	----- -----
Prop. Guardrail	----- -----
Exist. Cable Guiderail	----- -----
Prop. Cable Guiderail	----- -----
Equality Symbol	-----⊕-----
Pavement Removal	-----⊗-----

## RIGHT OF WAY

Baseline Control Point	-----◆-----
Existing Right of Way Marker	-----△-----
Exist. Right of Way Line w/Marker	-----△-----
Prop. Right of Way Line with Proposed	-----▲-----
R/W Marker (Iron Pin & Cap)	-----▲-----
Prop. Right of Way Line with Proposed	-----▲-----
(Concrete or Granite) R/W Marker	-----⊙-----
Exist. Control of Access Line	-----⊙-----
Prop. Control of Access Line	-----⊙-----
Exist. Easement Line	-----E-----
Prop. Temp. Construction Easement Line	-----E-----
Prop. Temp. Drainage Easement Line	-----TDE-----
Prop. Perm. Drainage Easement Line	-----PDE-----

## HYDROLOGY

Stream or Body of Water	-----
Flow Arrow	-----→-----
Disappearing Stream	-----∩-----
Spring	-----○-----
Swamp Marsh	-----⊥-----
Shoreline	----- -----
Falls, Rapids	----- -----
Prop Lateral, Tail, Head Ditches	-----FIM-----

## STRUCTURES

MAJOR	
Bridge, Tunnel, or Box Culvert	-----CONC-----
Bridge Wing Wall, Head Wall and End Wall	-----CONC WW-----

## MINOR

Head & End Wall	-----CONC HW-----
Pipe Culvert	-----≡-----
Footbridge	----->-----
Drainage Boxes	-----□ CB-----
Paved Ditch Gutter	----- -----

## UTILITIES

Exist. Pole	-----•-----
Exist. Power Pole	-----⊙-----
Prop. Power Pole	-----⊙-----
Exist. Telephone Pole	-----⊙-----
Prop. Telephone Pole	-----⊙-----
Exist. Joint Use Pole	-----⊙-----
Prop. Joint Use Pole	-----⊙-----
Telephone Pedestal	-----⊠-----
Cable TV Pedestal	-----⊠-----
Hydrant	-----⊙-----
Satellite Dish	-----∩-----
Exist. Water Valve	-----⊕-----
Sewer Clean Out	-----⊕-----
Power Manhole	-----⊕-----
Telephone Booth	-----⊠-----
Water Manhole	-----⊕-----
Light Pole	-----⊙-----
H-Frame Pole	-----⊙-----
Power Line Tower	-----⊠-----
Pole with Base	-----⊠-----
Gas Valve	-----⊕-----
Gas Meter	-----⊕-----
Telephone Manhole	-----⊕-----
Power Transformer	-----⊕-----
Sanitary Sewer Manhole	-----⊕-----
Storm Sewer Manhole	-----⊕-----
Tank; Water, Gas, Oil	-----○-----
Water Tank With Legs	-----⊕-----
Traffic Signal Junction Box	-----⊕-----
Fiber Optic Splice Box	-----⊕-----
Television or Radio Tower	-----⊕-----
Utility Power Line Connects to Traffic Signal Lines Cut Into the Pavement	-----TS-----

Recorded Water Line	----- -----
Designated Water Line (S.U.E.*)	----- -----
Sanitary Sewer	-----SS-----
Recorded Sanitary Sewer Force Main	-----FSS-----
Designated Sanitary Sewer Force Main(S.U.E.*)	-----FSS-----
Recorded Gas Line	-----G-----
Designated Gas Line (S.U.E.*)	-----G-----
Storm Sewer	-----S-----
Recorded Power Line	-----P-----
Designated Power Line (S.U.E.*)	-----P-----
Recorded Telephone Cable	-----T-----
Designated Telephone Cable (S.U.E.*)	-----T-----
Recorded U/G Telephone Conduit	-----TC-----
Designated U/G Telephone Conduit (S.U.E.*)	-----TC-----
Unknown Utility (S.U.E.*)	-----RUTL-----
Recorded Television Cable	-----TV-----
Designated Television Cable (S.U.E.*)	-----TV-----
Recorded Fiber Optics Cable	-----FO-----
Designated Fiber Optics Cable (S.U.E.*)	-----FO-----
Exist. Water Meter	-----⊕-----
U/G Test Hole (S.U.E.*)	-----⊕-----
Abandoned According to U/G Record	-----ATTUR-----
End of Information	-----E.O.I-----

## BOUNDARIES & PROPERTIES

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Property Line Symbol	-----PL-----
Exist. Iron Pin	-----⊕-----
Property Corner	-----⊕-----
Property Monument	-----⊕-----
Property Number	-----123-----
Parcel Number	-----6-----
Fence Line	-----X X X X-----
Existing Wetland Boundaries	-----WLB-----
Proposed Wetland Boundaries	-----WLB-----
Existing Endangered Animal Boundaries	-----EAB-----
Existing Endangered Plant Boundaries	-----EPB-----

## BUILDINGS & OTHER CULTURE

Buildings	-----
Foundations	-----
Area Outline	-----
Gate	-----
Gas Pump Vent or U/G Tank Cap	-----
Church	-----
School	-----
Park	-----
Cemetery	-----
Dam	-----
Sign	-----
Well	-----
Small Mine	-----
Swimming Pool	-----

## TOPOGRAPHY

Loose Surface	-----
Hard Surface	-----
Change in Road Surface	-----
Curb	-----
Right of Way Symbol	-----R/W-----
Guard Post	-----⊙ GP-----
Paved Walk	-----
Bridge	-----
Box Culvert or Tunnel	-----
Ferry	-----
Culvert	-----
Footbridge	-----
Trail, Footpath	-----
Light House	-----

## VEGETATION

Single Tree	-----
Single Shrub	-----
Hedge	-----
Woods Line	-----
Orchard	-----
Vineyard	-----

## RAILROADS

Standard Gauge	-----
RR Signal Milepost	-----
Switch	-----

7/2/99

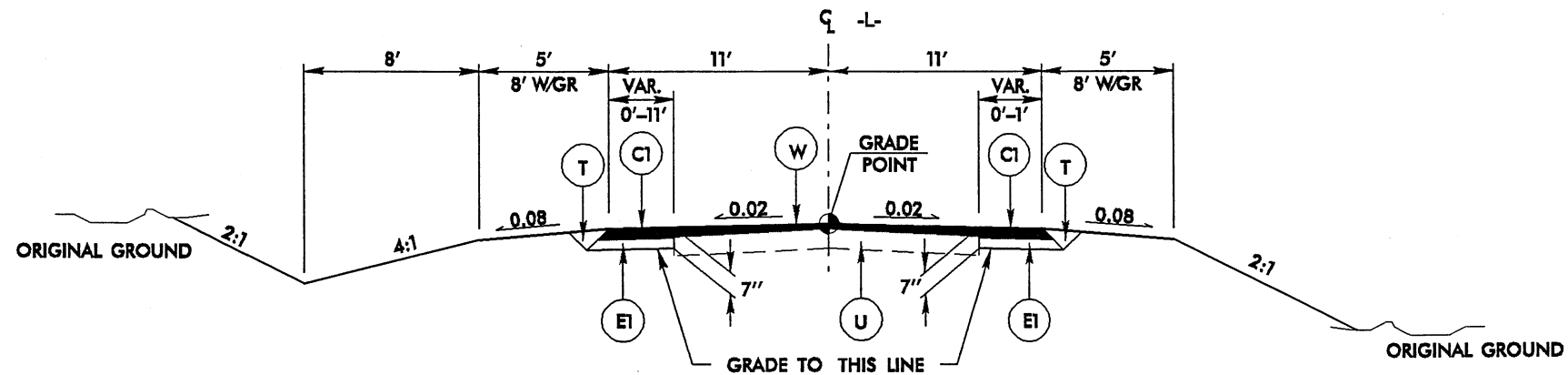
**PAVEMENT SCHEDULE**

C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5A, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5A, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1 1/2" 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 5 1/2" IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	WEDGING (SEE WEDGING DETAIL)

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

**MULKEY**  
ENGINEERS & CONSULTANTS  
22 Main Street  
Boston, MA 02108  
TEL: 617-552-1111  
WWW.MULKEYENR.COM

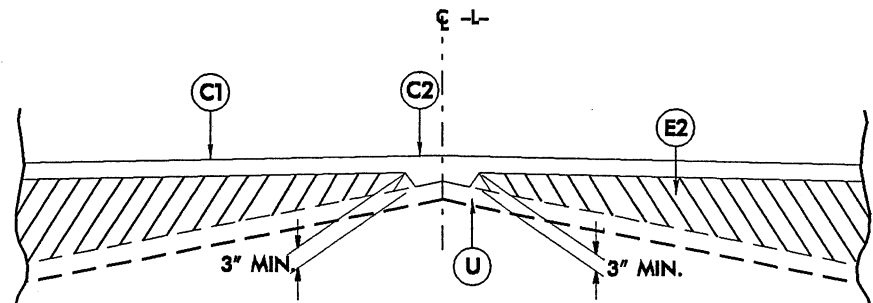
PROJECT REFERENCE NO. B-3665	SHEET NO. 2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	



**TYPICAL SECTION NO. 1**

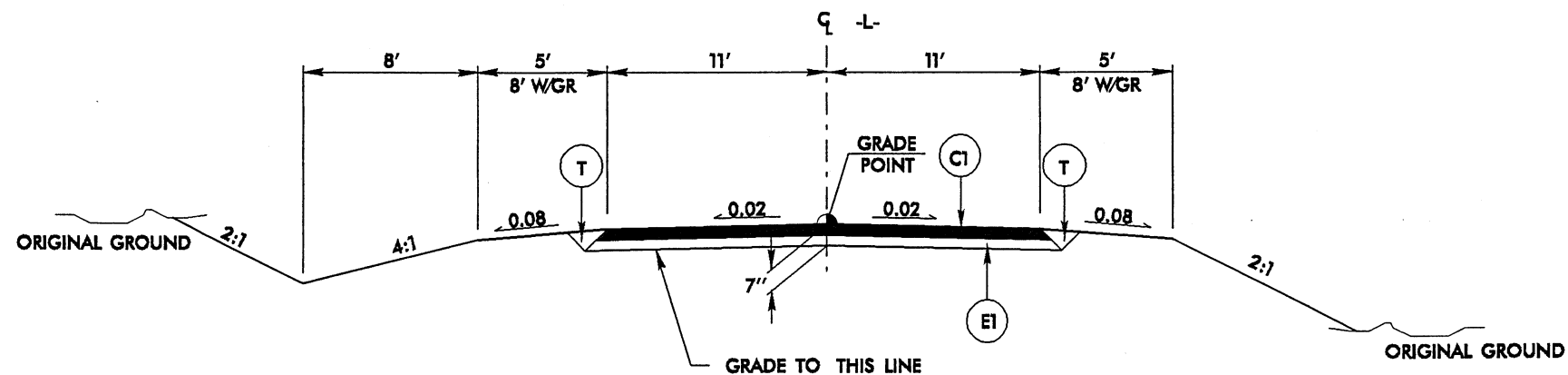
USE TYPICAL SECTION NO. 1 AT THE FOLLOWING LOCATIONS:

- L- STA 12+50.00 TO STA 13+75.00
- L- STA 17+50.00 TO STA 21+50.00



**DETAIL SHOWING METHOD OF WEDGING**

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 1



**TYPICAL SECTION NO. 2**

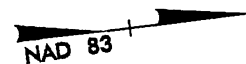
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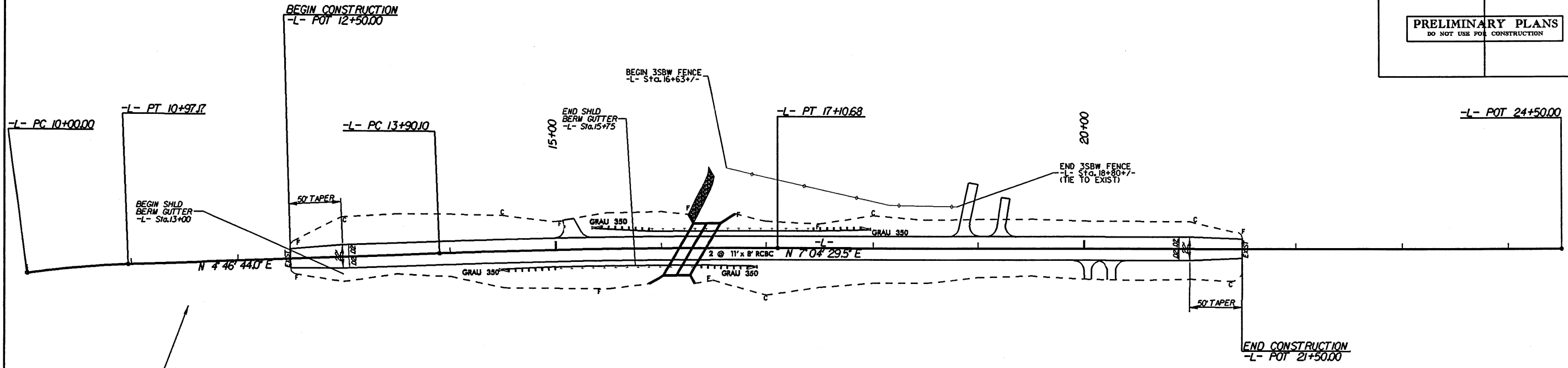
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istanton



8/17/99

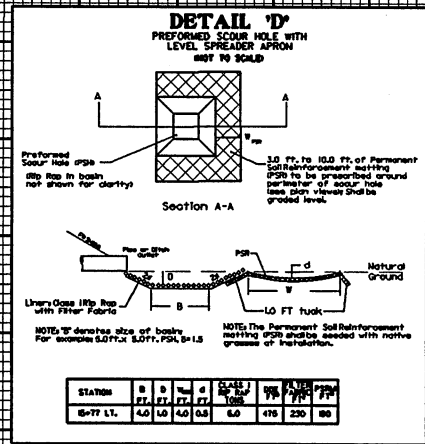
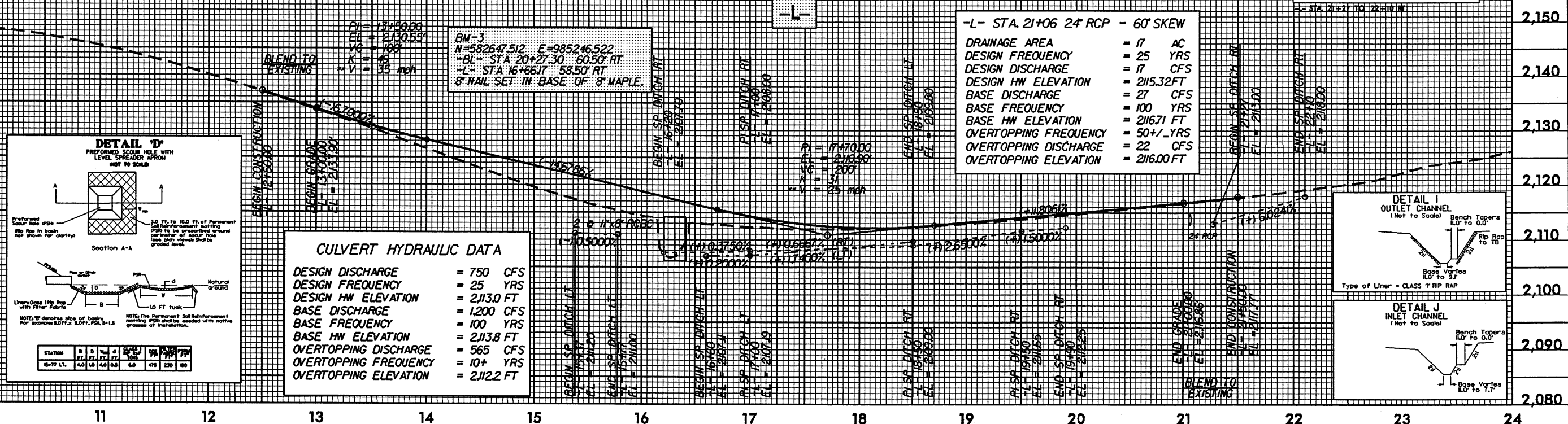
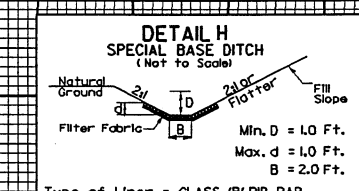
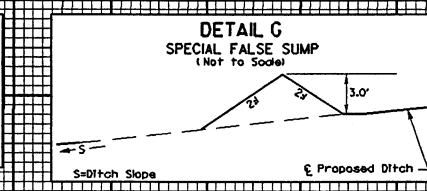
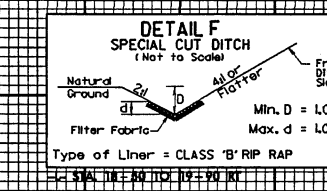
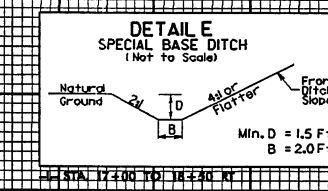
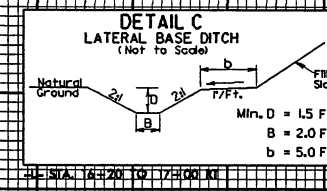
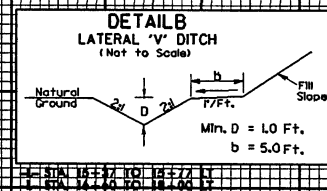
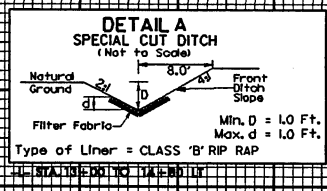


PROJECT REFERENCE NO. <b>B-3665</b>	SHEET NO. <b>4</b>
HW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	



CONTRACTOR SHALL NOT DISTURB PAVED DRIVE

-L-	
PI Sta 10+48.63	PI Sta 15+50.41
$\Delta = 5' 37" 26.2' (RT)$	$\Delta = 2' 17" 45.5' (RT)$
$D = 5' 47" 14.8'$	$D = 0' 42" 58.3'$
$L = 97.7'$	$L = 320.58'$
$T = 48.63'$	$T = 160.3'$
$R = 990.00'$	$R = 8,000.00'$
$SE = 06$	$SE = NC$

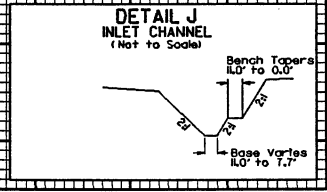
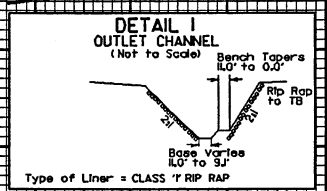


**CULVERT HYDRAULIC DATA**

DESIGN DISCHARGE = 750 CFS  
 DESIGN FREQUENCY = 25 YRS  
 DESIGN HW ELEVATION = 2113.0 FT  
 BASE DISCHARGE = 1200 CFS  
 BASE FREQUENCY = 100 YRS  
 BASE HW ELEVATION = 2113.8 FT  
 OVERTOPPING DISCHARGE = 565 CFS  
 OVERTOPPING FREQUENCY = 10+ YRS  
 OVERTOPPING ELEVATION = 2112.2 FT

**-L- STA. 21+06 24" RCP - 60' SKEW**

DRAINAGE AREA = 17 AC  
 DESIGN FREQUENCY = 25 YRS  
 DESIGN DISCHARGE = 17 CFS  
 DESIGN HW ELEVATION = 2115.32 FT  
 BASE DISCHARGE = 27 CFS  
 BASE FREQUENCY = 100 YRS  
 BASE HW ELEVATION = 2116.71 FT  
 OVERTOPPING FREQUENCY = 50+ YRS  
 OVERTOPPING DISCHARGE = 22 CFS  
 OVERTOPPING ELEVATION = 2116.00 FT



REVISIONS

DATE

10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

**B-3665  
ALTERNATE A  
(PREFERRED)**

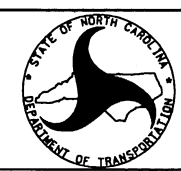
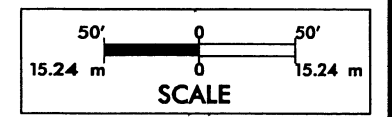
BEGIN CONSTRUCTION  
-ALTA- POT 12+15.00

100.0 FT. TAPER  
(LT & RT)

END CONSTRUCTION  
-ALTA- POT 24+50.00

100 FT. TRANSITION  
(LT & RT)

DUNN CREEK

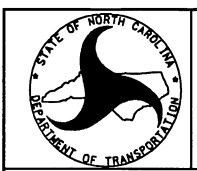
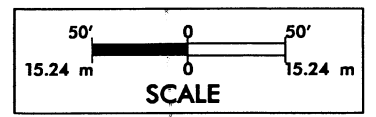
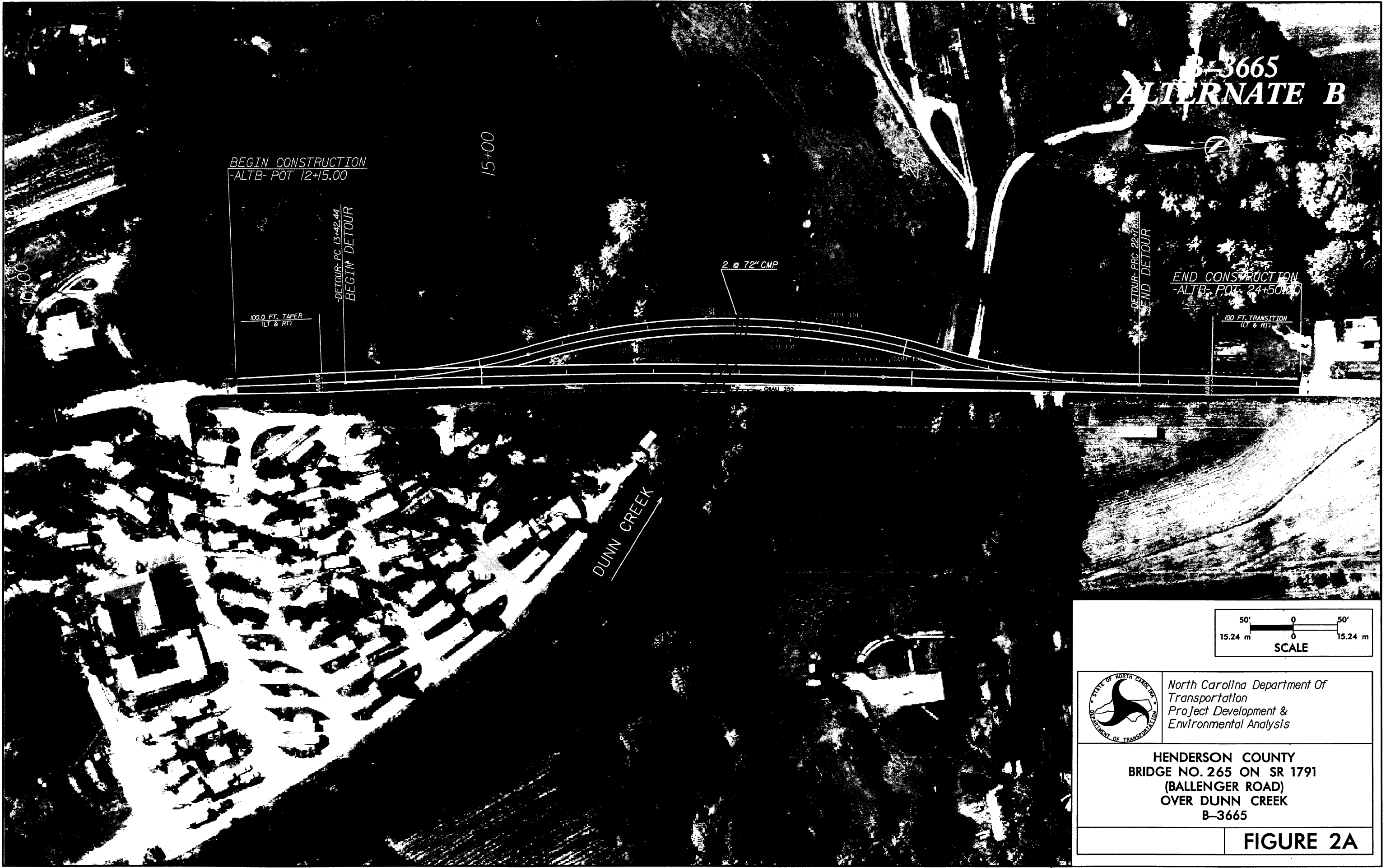


North Carolina Department Of  
Transportation  
Project Development &  
Environmental Analysis

HENDERSON COUNTY  
BRIDGE NO. 265 ON SR 1791  
(BALLENGER ROAD)  
OVER DUNN CREEK  
B-3665

**FIGURE 2**

B-3665  
**ALTERNATE B**



North Carolina Department Of  
Transportation  
Project Development &  
Environmental Analysis

HENDERSON COUNTY  
BRIDGE NO. 265 ON SR 1791  
(BALLENGER ROAD)  
OVER DUNN CREEK  
B-3665

**FIGURE 2A**



**B-3665  
ALTERNATE C**

BEGIN CONSTRUCTION  
ALTC POT 12+30.00

100.0 FT. TAPER  
(LT & RT)

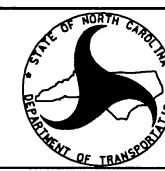
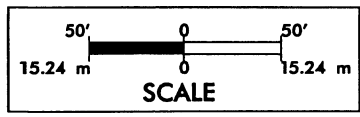
15+00

20+00

END CONSTRUCTION  
ALTC POT 25+50.00

100. FT. TAPER AT 25+50

DUNN CREEK



North Carolina Department Of  
Transportation  
Project Development &  
Environmental Analysis

HENDERSON COUNTY  
BRIDGE NO. 265 ON SR 1791  
(BALLENGER ROAD)  
OVER DUNN CREEK  
B-3665

**FIGURE 2B**

Henderson County  
SR 1791 (Ballenger Road)  
Bridge No. 265 Over Dunn Creek  
Federal-Aid Project No. BRZ-1791(1)  
State Project No. 8.2952001  
T.I.P. No. B-3665

CATEGORICAL EXCLUSION

UNITED STATES DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

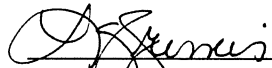
AND

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

APPROVED:

9/4/2002  
DATE

  
\_\_\_\_\_  
Gail Grimes, P.E., Assistant Manager  
Project Development and Environmental Analysis Branch,  
NCDOT

9/5/02  
DATE


  
\_\_\_\_\_  
for Nicholas L. Graf, P.E.  
Division Administrator, FHWA

Henderson County  
SR 1791 (Ballenger Road)  
Bridge No. 265 Over Dunn Creek  
Federal-Aid Project No. BRZ-1791(1)  
State Project No. 8.2952001  
T.I.P. No. B-3665

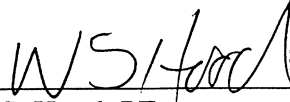
CATEGORICAL EXCLUSION

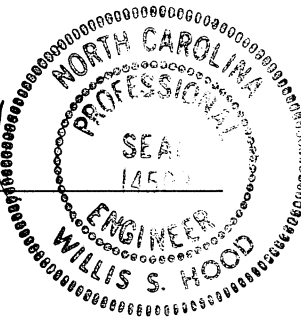
September 2002

Documentation Prepared by:  
Barbara H. Mulkey Engineering, Inc.

  
\_\_\_\_\_  
Tommy Register, EI  
Project Manager

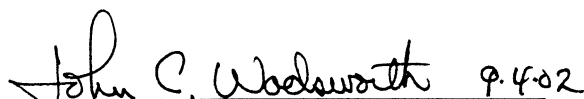
9/3/02  
Date

  
\_\_\_\_\_  
W. S. Hood, PE  
Principle-In-Charge



9/03/02  
Date

For the North Carolina Department of Transportation

  
\_\_\_\_\_  
John C. Wadsworth, PE  
Project Manager  
Consultant Engineering Unit

# PROJECT COMMITMENTS

**Henderson County  
SR 1791 (Ballenger Road)  
Bridge No. 265 Over Dunn Creek  
Federal-Aid Project No. BRZ-1791(1)  
State Project No. 8.2952001  
T.I.P. No. B-3665**

In addition to the standard Nationwide Permit No. 23 Conditions, the General Nationwide Permit Conditions, Section 404 Only Conditions, Regional Conditions, State Consistency Conditions, NCDOT's Guidelines for Best management Practices for the Protection of Surface Waters, Design Standards for Sensitive Watersheds, NCDOT's Guidelines for Best Management Practices for Bridge Demolition and Removal, General Certification Conditions, and Section 401 Conditions of Certification, the following special commitments have been agreed to by NCDOT:

***Project Development and Environmental Analysis Branch:***

A copy of the environmental planning document will be submitted to the Tennessee Valley Authority (TVA).

***Hydraulics Unit / Structure Design Unit:***

This project will be reviewed under Section 26a of the Tennessee Valley Authority (TVA) Act. The final bridge plans, hydraulic analysis of the effects of the replacement structure on the 100-year flood elevation, and notice of compliance with the Historic Preservation Act of 1966 will be forwarded to TVA for approval.

**Henderson County  
SR 1791 (Ballenger Road)  
Bridge No. 265 Over Dunn Creek  
Federal-Aid Project No. BRZ-1791(1)  
State Project No. 8.2952001  
T.I.P. No. B-3665**

**INTRODUCTION:** Bridge No. 265 is included in the North Carolina Department of Transportation (NCDOT) 2002-2008 Transportation Improvement Program (T.I.P.) and in the Federal-Aid Bridge Replacement Program. The bridge location is shown in Figure 1. No substantial environmental impacts are anticipated. The project is classified as a Federal "Categorical Exclusion".

**I. PURPOSE AND NEED**

The NCDOT Bridge Maintenance Unit records indicate the bridge has a sufficiency rating of 52.3 out of a possible 100 for a new structure. The bridge is considered functionally obsolete. The replacement of this inadequate structure will result in safer and more efficient traffic operations.

**II. EXISTING CONDITIONS**

Bridge No. 265 is located on Ballenger Road (SR 1791) in Henderson County over Dunn Creek. Ballenger Road is classified as rural local in the statewide functional classification system. Land use in the project area is rural, with apple orchards occupying a large portion of the cleared land in the area. Some residential development has begun along Ballenger Road and other similar roads nearby. Ballenger Road is a two-lane facility that serves local traffic. It is located approximately 2 miles (3.2 kilometers) east of the City of Hendersonville.

Bridge No. 265 is located in the jurisdiction of the Tennessee Valley Authority (TVA) oversight. Henderson County is designated as a trout county by the North Carolina Wildlife Resources Commission. However, Dunn Creek is not classified as trout waters.

The existing bridge is a single-span structure with an overall length of 31 feet (9.4 meters) and an existing roadway width of 20 feet (6.1 meters). It was constructed in 1962. The bridge consists of a timber deck on steel I-beams, with timber caps and piles. Bridge No. 265 has a single vehicle (SV) posted weight limit of 32 tons (32.5 metric tons). It is not posted for truck-tractor semi trailer (TTST).

On February 13, 1996 Bridge No. 265 had a sufficiency rating of 44.1. Minor repair work has been done on this bridge since 1996 raising the sufficiency rating to 52.3. The timber structure of this bridge will continue to create maintenance problems.

The approach roadway consists of two lanes with a clear roadway width of 18 feet (5.5 meters). Approximately 550 feet (168 meters) south of the bridge there is a curve with a radius of 750 feet (228 meters). At the bridge, there is a curve with a radius of approximately 7,639 feet (2,328 meters). The approach roadway north of the bridge has a curve with a radius of 22,918 feet (6985 meters).

An overhead power line is located west of the bridge and a telephone line is located east of the bridge. The telephone line is under ground until it reaches the stream. A 36-inch (900-millimeter) metal storm drain pipe enters the creek just upstream of the bridge on the left bank (looking downstream). It is anticipated that the utility impacts will be minimal.

Ballenger Road (SR 1791) has a posted speed limit of 45 miles per hour (mph) {70 kilometers per hour (km/h)} in the vicinity of Bridge No. 265.

The 2002 estimated average daily traffic (ADT) volume is 700 vehicles per day (vpd). The projected ADT is 1,300 vpd by the design year 2025. The percentages of truck traffic are 2% DUAL and 1% TTST.

This section of Ballenger Road (SR 1791) is not part of a designated bicycle route nor is it listed in the TIP as needing incidental bicycle accommodations.

No accidents were reported in the vicinity of Bridge No. 265 during the period from July 1, 1997 to June 30, 2000.

The Henderson County Public School was notified by a scoping letter and a request for the number of buses crossing Bridge No. 265 on a daily basis. Two buses cross Bridge No. 265 twice per day.

### III. ALTERNATIVES

#### A. Project Description

Based on the preliminary hydraulics report the proposed replacement structure for Bridge No. 265 will be a reinforced concrete box culvert with two (2) barrels at 9 feet (2.7 meters) by 8 feet (2.4 meters) and approximately 60 feet (18 meters) in length.

The drainage area of Dunn Creek at the proposed crossing is approximately 1.9 square miles (4.9 square kilometers). The length and opening size of the proposed structure may increase or decrease as necessary to accommodate peak flows as determined, by a detailed hydraulic analysis to be performed during the final design phase of the project.

The proposed approach roadway will consist of two 11-foot (3.3-meter) travel lanes and 5-foot (1.5-meter) turf shoulders (See Figure 3). The proposed grade will be approximately the same as the existing roadway.

The proposed design speed is 50 mph (80 km/h).

#### B. Build Alternatives

Three build alternatives studied for replacing the existing bridge are described below.

**Alternate A (Preferred)** replaces the bridge with a culvert at the existing location (See Figure 2). The approach work will extend approximately 550 feet (168 meters) south and approximately 500 feet (152 meters) north of the existing bridge. During construction, traffic

will be maintained by an off-site detour. The detour is approximately 2.9 miles (4.7 kilometers) in length along the following route; Upward Road, (SR 1783), McMurray Road (SR 1790), and Old McMurray (SR 1892), and Tracy Grove Road (SR 1793).

**Alternate B** replaces the bridge with a culvert at the existing location. The approach work will extend approximately 550 feet (167.6 meters) south and approximately 500 feet (152.4 meters) north of the existing bridge. During construction, traffic will be maintained by an on-site detour (See Figure 2A). The detour structure will consist of two 72-inch (1800 millimeter) corrugated metal pipes. The detour approaches will consist of two 9-foot (2.7-meter) travel lanes.

Alternative B was not selected as the preferred alternative because of the on-site detour and Alternatives A and C are more economical than Alternative B.

**Alternate C** replaces the bridge with a culvert on new alignment approximately 50 feet (15.24 meters) west (downstream) of the existing bridge. The length of the project will be approximately 1300 feet (396 meters). The new alignment will consist of three back-to-back curves. During construction, traffic will be maintained on the existing roadway.

Alternative C was not selected as the preferred alternative because it introduces three back-to-back curves in an existing tangent section of roadway. In addition, Alternative C has potentially greater environmental impacts due to the new alignment. Alternative C is less economical than Alternative A.

### **C. Alternatives Eliminated From Further Study**

The “do-nothing” alternative will eventually necessitate removal of the existing structure and closure of Ballenger Road (SR 1791). This is not desirable due to the service provided by Ballenger Road (SR 1791).

Investigation of the existing structure by the Bridge Maintenance Unit indicates that rehabilitation of the existing structure is not feasible due to its age and deteriorated condition.

### **D. Preferred Alternative**

Alternative A was selected as the preferred Alternative. There is a slight shift of approximately three feet to the west, in the horizontal alignment, to avoid impacts to the sewer treatment station. Alternative A also avoids introducing back-to-back curves in an existing tangent section of roadway. By replacing in place any possible environmental impacts are minimized.

The Division Engineer concurs with Alternative A as the preferred alternate.

#### IV. ESTIMATED COST

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

	<b>Alternate A (Preferred)</b>	<b>Alternate B</b>	<b>Alternate C</b>
Structure Removal (Existing)	\$ 5,280	\$ 5,280	\$ 5,280
Structure Proposed	92,500	92,500	92,500
Roadway Approaches	213,440	237,170	259,120
Temp. Structure	0	9,400	0
Temp Roadway Approaches	0	86,950	0
Miscellaneous and Mobilization	138,780	193,700	163,100
Engineering Contingencies	75,000	100,000	80,000
ROW/Const. Easements/Utilities	272,700	290,500	383,000
<b>TOTAL</b>	<b>\$797,700.00</b>	<b>\$1,015,500.00</b>	<b>\$983,000.00</b>

The estimated cost of the project as shown in the 2002-2008 Transportation Improvement Program is \$650,000, including \$300,000 for right-of-way and \$275,000 for construction.

#### V. NATURAL RESOURCES

##### A. Methodology

Materials and literature supporting this investigation have been derived from a number of sources including U.S. Geological Survey (USGS) topographic mapping (Hendersonville, NC 7.5 minute quadrangle), U.S. Fish and Wildlife Service (FWS) National Wetlands Inventory mapping (NWI) (Hendersonville, NC 7.5 minute quadrangle), Natural Resources Conservation Service (NRCS; formerly the Soils Conservation Service) soils mapping (SCS 1980), and recent aerial photography (scale 1:1200).

The site was visited on January 23 and June 6, 2001. The study corridor was walked and visually surveyed for significant features. For purposes of this evaluation, the study corridor is assumed to be the area encompassing the proposed alternatives (Figures 2-4) discussed in Section 1.1 "Project Description". Special concerns evaluated in the field include 1) potential protected species habitat and 2) wetlands and water quality protection in Dunn Creek.

Plant community descriptions are based on a classification system utilized by North Carolina Natural Heritage Program (NHP) (Schafale and Weakley 1990). When appropriate, community classifications were modified to better reflect field observations. Vascular plant names follow nomenclature found in Radford *et al.* (1968) with exceptions for updated nomenclature (Kartesz 1998). Jurisdictional areas were evaluated using the three-parameter approach following U.S. Army Corps of Engineers (COE) delineation guidelines (DOA 1987). Jurisdictional areas were characterized according to a classification scheme established by Cowardin *et al.* (1979). Aquatic and terrestrial wildlife habitat requirements and distributions were determined by supportive literature (Martof *et al.* 1980; Potter *et al.* 1980; Webster *et al.* 1985; Menhinick 1991; Hamel 1992; Palmer and Braswell 1995; Rohde *et al.* 1994). Water quality



information for area streams and tributaries was derived from available sources (DWQ 2000a, 2000b). Quantitative sampling was not undertaken to support existing data.

The most current FWS listing of federally protected species with ranges extending into Henderson County (March 7, 2002) was reviewed prior to competition of this investigation. In addition, NHP records documenting presence of federally or state listed species were consulted before commencing field investigations.

## B. Physiography and Soils

The study corridor is underlain by Henderson gneiss intrusive rocks and occurs within the Blue Ridge physiographic province of North Carolina. Topography is characterized as a broad, rolling intermountain plateau. The study corridor is located on uplands and across the floodplain of Dunn Creek. The elevation of the study corridor is approximately 2120 feet (646.6 meters) (National Geodetic Vertical Datum [NGVD]) (USGS Hendersonville, NC quadrangle).

Soil mapping units underlying the study corridor are Codorus loam (*Fluvaquentic Dystrochrepts*) and Hayesville loam (*Typic Hapludults*) (SCS 1980). The Codorus series occurs in depressions in wide floodplains and on narrow floodplains. This series occurs along the Dunn Creek floodplain and the entire northern half of the study corridor. The Codorus series is moderately well drained to somewhat poorly drained; permeability is moderate. Codorus soils are non-hydric in Henderson County, but in depressional areas may have inclusions of the hydric Toxoway (*Cumulic Humaquepts*) and Hatboro (*Typic Fluvaquents*) soils (NRCS 1996).

The Hayesville series occurs on broad, smooth ridgetops at lower elevations. This series occurs on uplands of the southern half of the study corridor. Hayesville loam is a well drained soil with moderate permeability. This soil is non-hydric in Henderson County (NRCS 1996).

## C. Water Resources

### 1. Waters Impacted

The study corridor is located within sub-basin 04-03-02 of the French Broad River Basin (DWQ 2000a). This area is part of USGS Hydrologic Unit 06010105 of the Tennessee Region. Structures targeted for replacement span the open water stream associated with Dunn Creek. There is no direct involvement of additional streams or tributaries. Dunn Creek has been assigned Stream Index Number 6-55-8-1-1 by the N.C. Division of Water Quality (DWQ 2000b). The nearest tributary to Dunn Creek is an unnamed tributary which joins Dunn Creek from the north approximately 340 feet (30.1 meters) upstream (east) of the study corridor. A second, unnamed tributary joins with Dunn Creek from the north approximately 600 feet (183.0 meters) downstream (west) of the study corridor. An approximately 150-foot (45.8-meter) section of this tributary occurs within the northwestern section of the study corridor.

### 2. Stream Characteristics

Dunn Creek is a well-defined stream with slow flow over a sand/silt substrate. At Bridge No. 265, Dunn Creek is approximately 20 feet (6.1 meters) wide. The banks are 3 to 4 feet (0.9 to 1.2 meters) high and

steeply sloping. During field investigations of Dunn Creek, water clarity was good, flow velocity was slow, and water depth varied from 6 inches (15.2 centimeters) to 3 feet (0.9 meter); bridge height above the water surface was approximately 5 feet (1.5 meters). The streambed is composed of sand, silt, mud, and gravel. A point source discharge pipe associated with Lakewood RV Resort and approximately 3 feet (0.9 meter) in diameter enters the south side of Dunn Creek approximately 10 feet (3.1 meters) east of Bridge No. 265. There was no apparent effluent from the discharge pipe during the site visit. The drainage area of Dunn Creek at the proposed crossing is 1.9 square miles (4.9 square kilometers).

A small, unnamed tributary drains into Dunn Creek from the north approximately 600 feet (183.0 meters) downstream (west) of the study corridor. An approximately 150-foot (45.8-meter) section of this tributary occurs within the northwestern section of the study corridor. This stream averages approximately 4 feet (1.2 meters) wide and has moderate flow over a sand/silt substrate. The banks are moderately sloping and approximately 1 foot (0.3 meter) high. Water clarity was poor during the site visit, presumably due to upstream pond construction.

### 3. Best Usage Classifications and Water Quality

Classifications are assigned to waters of the State of North Carolina based on the existing or contemplated best usage of various streams or segments of streams in the basin. A best usage classification of **C** has been assigned to this section of Dunn Creek. The designation **C** denotes that appropriate uses include aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture. Secondary recreation refers to human body contact with waters on an infrequent or incidental basis. There are no High Quality Waters (**HQW**), Outstanding Resource Waters (**ORW**), Water Supply I (**WS-I**), Water Supply II (**WS-II**), or Trout Waters (**TR**) within 1.0 mile (1.6 kilometers) of the study corridor. No designated watershed critical area (**CA**) occurs within 1.0 mile (1.6 kilometers) upstream of the study corridor (DWQ 2000a, DWQ 2000b).

The Division of Water Quality (DWQ) has initiated a whole-basin approach to water quality management for the 17 river basins within the state. Water quality for the proposed study corridor is summarized in the French Broad River basinwide water quality plan (DWQ 2000a). Dunn Creek is not rated of designated uses by DWQ; however, Bat Fork Creek, approximately 1.0 mile (1.6 kilometers) downstream of the study corridor, is classified as **Partially Supporting** of designated uses. This section of Bat Fork Creek has a bioclassification rating of **Fair** based on benthic sampling (DWQ 2000a).

This sub-basin (04-03-02) supports six major point-source dischargers and 77 minor point-source dischargers. Total permitted flow for six major dischargers is 53.8 million gallons per day (MGD) (203.9 million liters per day [MLD]). Total permitted flow for the 77 minor dischargers is 2.1 MGD (8.0 MLD). One minor point-source discharger, Lakewood RV Resort (NPDES Permit No. NC0017436), discharges treated wastewater directly into Dunn Creek within the study corridor (approximately 10 feet [3.1 meters] north of Bridge No. 265). Major non-point sources of pollution for the entire French Broad River Basin are agriculture, construction, forestry, mining, onsite wastewater disposal, solid waste disposal, and atmospheric deposition. Sedimentation and nutrient inputs are major problems associated with non-point source discharges and often result in fecal coliform, heavy metals, oil from roads and parking lots, and increased nutrient levels in surface waters (DWQ 2000a).

#### 4. Anticipated Impacts to Water Resources

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

The proposed bridge replacement will allow for continuation of pre-project stream flows in Dunn Creek, thereby protecting the integrity of these waterways. Long-term impacts to adjacent reaches resulting from construction are expected to be negligible. In order to minimize impacts to water resources, NCDOT Best Management Practices (BMPs) for the Protection of Surface Waters will be strictly enforced during the entire life of the project.

There is little potential for components of the bridge to be dropped into waters of the United States. Therefore, no temporary fill is expected to result from removal of the existing bridge. NCDOT's Best Management Practices for Bridge Demolition and Removal (BMP-BDR) must be applied for the removal of this bridge. Replacement of Bridge No. 265 with box culverts will result in permanent fill to waters of the U.S. The use of corrugated metal pipes for temporary bridging will also result in temporary fill to waters of the U.S.

#### D. Biotic Resources

##### 1. Plant Communities

Two distinct plant communities were identified within the study corridor: mixed pine/ hardwood forest and roadside/disturbed land. These plant communities are described below.

##### a) Mixed Pine/Hardwood Forest

Mixed pine/hardwood forest occurs within the study corridor on the upland slope south of Bridge No. 265 on the west side of SR 1791. This community represents approximately 30 percent of the total vegetated study corridor area. Along the slope, the canopy is somewhat open and dominated by dry-mesic oak species such as northern red oak (*Quercus rubra*), scarlet oak (*Quercus coccinea*), black oak (*Quercus velutina*), and southern red oak (*Quercus falcata*). Mature white pine (*Pinus strobus*) and sweetgum (*Liquidambar styraciflua*) are less numerous and scattered throughout the canopy. The sub canopy includes white pine, dogwood (*Cornus florida*), tulip poplar (*Liriodendron tulipifera*), American holly (*Ilex opaca*), and sourwood (*Oxydendrum arboreum*). At the base of the slope adjacent Dunn Creek, tulip poplar becomes the dominant canopy tree, and boxelder (*Acer negundo*) and tag alder (*Alnus serrulata*) are common understory species. Herbaceous vegetation throughout is sparse and includes blueberry (*Vaccinium* sp.) and common greenbrier (*Smilax rotundifolia*). A distinct bottomland hardwood plant community does not exist within the Dunn Creek floodplain because of past

disturbances; therefore, mesic bottomland species such as tulip poplar and boxelder have been included with this plant community.

b) Roadside/Disturbed Land

Roadside/disturbed land is defined as the present maintained roadside margins, pasture land, and residential land within the study corridor. This plant community represents approximately 70 percent of the total vegetated study corridor area. Plant species include loblolly pine (*Pinus taeda*), red maple (*Acer rubrum*), tulip poplar, sweetgum, wild rose (*Rosa* sp.), goldenrod (*Solidago* sp.), broomsedge (*Andropogon virginicus*), dog fennel (*Eupatorium capillifolium*), Tartarian honeysuckle (*Lonicera tatarica*), foxtail grass (*Setaria* sp.), Nepal microstegium (*Microstegium vimineum*), and bracken fern (*Pteridium aquilinum*).

## 2. Potential Impacts to Terrestrial Plant Communities

Plant community areas are estimated based on the amount of each plant community present within the proposed alternatives. Permanent impacts are considered to be the areas within the cut-fill boundaries; temporary impacts are considered to be the areas outside of cut-fill lines, but within the proposed right-of-way. Actual impacts will be limited to cut-fill boundaries and are expected to be less than the total impacts shown for each alternative. A summary of potential plant community impacts is presented in Table 1. Based on the proposed alternatives, impacts to natural plant communities (mixed pine/hardwood forest) are greatest for Alternate C (0.36 acre [0.15 hectare]) because of the proposed realignment to the west of the existing right-of-way. Alternate B presents the second largest area of impact (0.27 acre [0.11 hectare]) to pine/hardwood forest because of the proposed temporary alignment to the west of the existing alignment. Alternate A presents the least amount of impact (0.17 acre [0.07 hectare]) to mixed pine/hardwood forest.

**Table 1.** Area (acres [hectares]) of Potential Impacts to Terrestrial Plant Communities.

Alternative	Impact Type	Plant Community		
		Mixed Pine/Hardwood Forest*	Roadside/Disturbed Land	Total
A	Temporary	0.04 (0.02)	0.28 (0.11)	0.32 (0.13)
	Permanent	0.13 (0.05)	0.88 (0.36)	1.01 (0.41)
	Total	0.17 (0.07)	1.16 (0.47)	1.33 (0.54)
B	Temporary	0.14 (0.06)	0.22 (0.09)	0.36 (0.15)
	Permanent	0.13 (0.05)	0.88 (0.36)	1.01 (0.41)
	Total	0.27 (0.11)	1.10 (0.45)	1.37 (0.56)
C	Temporary	0.05 (0.02)	0.74 (0.30)	0.79 (0.32)
	Permanent	0.31 (0.13)	1.02 (0.41)	1.33 (0.54)
	Total	0.36 (0.15)	1.76 (0.71)	2.12 (0.86)

\*Natural plant community

Permanent impacts to plant communities resulting from bridge replacements are generally restricted to narrow strips adjacent to the existing bridge and roadway approach segments. Very little area of natural plant community is expected to be impacted by the proposed project. Much of the alignment is currently bounded by a maintained right-of-way; therefore, the proposed project may only claim narrow strips of adjacent natural communities.

No additional fragmentation of plant communities will be created, as the project will result only in alteration of existing community boundaries. Roadside-forest edges typically serve as vectors for movement of invasive species into adjacent natural communities. An example of an undesirable invasive species utilizing roadsides is kudzu (*Pueraria lobata*). The establishment of a hardy groundcover on road shoulders as soon as practicable will limit the availability of construction areas to invasive and undesirable plants.

### 3. Wildlife

#### a) Terrestrial

Signs of two mammal species, white-tailed deer (*Odocoileus virginianus*) and raccoon (*Procyon lotor*), were observed during the site visit. Other mammal species which are expected to occur within the study corridor are red fox (*Vulpes vulpes*), long-tailed weasel (*Mustela frenata*), eastern cottontail (*Sylvilagus floridanus*), eastern gray squirrel (*Sciurus carolinensis*), southern flying squirrel (*Glaucomys volans*), Virginia opossum (*Didelphis virginiana*), short-tailed shrew (*Blarina brevicauda*), hairy-tailed mole (*Parascalops breweri*), and white-footed mouse (*Peromyscus leucopus*).

Birds observed within or adjacent to the corridor were green heron (*Butorides virescens*), turkey vulture (*Cathartes aura*), downy woodpecker (*Picoides pubescens*), red-bellied woodpecker (*Melanerpes carolinus*), tufted titmouse (*Baeolophus bicolor*), Carolina chickadee (*Poecile carolinensis*), white-throated sparrow (*Zonotrichia albicollis*), eastern bluebird (*Sialia sialis*), American robin (*Turdus migratorius*), house finch (*Carpodacus mexicanus*), bluejay (*Cyanocitta cristata*), American crow (*Corvus brachyrhynchos*), and white-breasted nuthatch (*Sitta carolinensis*). Other avian species expected to occur in the study corridor are great blue heron (*Ardea herodias*), yellow-billed cuckoo (*Coccyzus americanus*), barn swallow (*Hirundo rustica*), blue-gray gnatcatcher (*Polioptila caerulea*), Acadian flycatcher (*Empidonax virescens*), eastern phoebe (*Sayornis phoebe*), eastern meadowlark (*Sturnella magna*), American redstart (*Setophaga ruticilla*), pileated woodpecker (*Dryocopus pileatus*), and red-tailed hawk (*Buteo jamaicensis*).

No terrestrial reptile or amphibian species were observed during the site visit. Some terrestrial reptiles and amphibians which may occur within the study corridor include eastern box turtle (*Terrapene carolina*), eastern fence lizard (*Sceloporus undulatus*), five-lined skink (*Eumeces fasciatus*), rough green snake (*Opheodrys aestivus*), worm snake (*Carphophis amoenus*), black rat snake (*Elaphe obsoleta*), eastern garter snake (*Thamnophis sirtalis*), copperhead (*Agkistrodon contortrix*), milk snake (*Lampropeltis triangulum*), gray treefrog (*Hyla versicolor*), American toad (*Bufo americanus*), southern redback salamander (*Plethodon serratus*), and slimy salamander (*Plethodon glutinosus*).

#### b) Aquatic

Limited surveys resulted in no observations of aquatic reptile or amphibian species within the study corridor. Aquatic or semi-aquatic reptiles and amphibians which are expected to occur within the study corridor include snapping turtle (*Chelydra serpentina*), northern water snake (*Nerodia sipedon*), queen snake (*Regina septemvittata*), wood frog (*Rana sylvatica*), green frog (*Rana clamitans*), spring peeper (*Pseudacris crucifer*), northern dusky salamander (*Desmognathus fuscus*), and spotted salamander (*Ambystoma maculatum*).

No sampling was undertaken in Dunn Creek to determine fishery potential. Visual surveys of Dunn Creek did not reveal the presence of fish, molluscan fauna, or other aquatic life; however, fish species which may be present in Dunn Creek include creek chub (*Semotilus atromaculatus*), bluehead chub (*Nocomis leptocephalus*), northern hog-sucker (*Hypentelium nigricans*), Tennessee shiner (*Notropis leuciodus*), greenside darter (*Etheostoma blennioides*), and yellow bullhead (*Ameiurus natalis*).

Potential game fish which may be present within the study corridor include redbreast sunfish (*Lepomis auritus*), bluegill (*Lepomis macrochirus*), and smallmouth bass (*Micropterus dolomieu*).

#### 4. Anticipated Impacts to Wildlife

Due to the limited extent of infringement on natural communities, the proposed bridge replacement will not result in significant loss or displacement of known terrestrial animal populations. No significant habitat fragmentation is expected since most improvements will be restricted to existing roadside margins. Construction noise and associated disturbances will have short-term impacts on avifauna and migratory wildlife movement patterns. However, long-term impacts are expected to be negligible. Potential down-stream impacts to aquatic habitat will be avoided by bridging the systems to maintain regular flow and stream integrity. Short-term impacts associated with turbidity and suspended sediments will affect benthic populations. Temporary impacts to downstream habitat from increased sediment during construction will be minimized by the implementation of stringent erosion control measures.

Based on a letter from N.C. Wildlife Resources Commission (WRC) to NCDOT (January 10, 2001), there are no substantial concerns regarding construction activities causing adverse impacts to wildlife and fisheries resources (including trout). Construction activities should minimize impacts to water quality and aquatic and riparian habitat. COE recognizes Henderson County as a “trout water county”; therefore, WRC will review any nationwide or general 404 permits for the proposed project. Dunn Creek is not classified by DWQ as Trout Waters; therefore, this project will not require a moratorium on instream construction activities during the trout spawning period.

#### E. Special Topics

##### 1. Waters of the United States

Surface waters within the embankments of Dunn Creek and an unnamed tributary to Dunn Creek are subject to jurisdictional consideration under Section 404 of the Clean Water Act as waters of the United States (33 CFR section 328.3). NWI mapping indicates that, within the study corridor, Dunn Creek exhibits characteristics of a forested, palustrine system that is temporarily flooded (PF01A; Cowardin *et al.* 1979). Field investigations indicate that, within the study corridor, Dunn Creek is a permanent stream with adjacent wetlands.

NWI mapping does not characterize the unnamed tributary to Dunn Creek that occurs on the west side of SR 1791; however, field investigations indicate that it is a perennial, bank-to-bank system. This system lacks a well-defined floodplain and does not support adjacent wetlands.

Wetlands are subject to jurisdictional consideration under Section 404 of the Clean Water Act as waters of the United States (33 CFR section 328.3). These areas are defined by the presence of three primary criteria: hydric soils, hydrophytic vegetation, and evidence of hydrology at or near the surface for a portion (12.5 percent) of the growing season (DOA 1987). NWI mapping indicates that, within the study corridor, floodplains of Dunn Creek exhibit characteristics of a palustrine, broad-leaved, deciduous forest system that is semi-permanently flooded (PFO1A; Cowardin *et al.* 1979). Field investigations indicate that, within the study corridor, floodplain wetlands do occur adjacent to Dunn

Creek north of Bridge No. 265 on the east side of SR 1791. These wetlands satisfy the three-parameter approach outlined by the COE (DOA 1987). Wetland vegetation species are boxelder, tulip poplar, sedges (*Carex* spp.), and rushes (*Juncus* spp.). These plants are growing on Codorus soils which exhibit values, chromas, and mottles characteristic of hydric soils. Evidence of wetland hydrology includes pooling and oxidized root channels. The area of wetland and the areas and linear distance of stream within the proposed alternatives are shown in Table 2.

Permanent impacts are considered to be the areas within the cut-fill boundaries; temporary impacts are considered to be the areas outside of cut-fill lines, but within the proposed right-of-way. Actual impacts will be limited to cut-fill boundaries and are expected to be less than the total impacts shown for each alternative.

Replacement of Bridge No. 265 with two 9- x 8-foot (2.7- x 2.4-meter) reinforced concrete box culverts will result in permanent fill to waters of the U.S. for all three proposed alternatives (See Table 2.).

**Table 2.** Area (acres [hectares]) of Wetland and the Area (acres [hectares]) and Linear Distance (feet [meters]) of Stream within proposed alternatives.

Alternate	Impact Type	Jurisdictional Area		
		Wetland	Stream	Stream Linear Distance
A (Preferred)	Temporary	-- --	-- --	-- --
	Permanent	0.008 (0.003)	0.025 (0.01)	70.0 (21.4)
	<b>Total</b>	<b>0.008</b> <b>(0.003)</b>	<b>0.025</b> <b>(0.01)</b>	<b>70.0</b> <b>(21.4)</b>
B	Temporary	-- --	0.010 (0.004)	40.0 (12.2)
	Permanent	0.009 (0.004)	0.025 (0.010)	70.0 (21.4)
	<b>Total</b>	<b>0.009</b> <b>(0.004)</b>	<b>0.035</b> <b>(0.014)</b>	<b>110.0</b> <b>(33.6)</b>
C	Temporary	-- --	-- --	-- --
	Permanent	-- --	0.029 (0.012)	160 (48.8)
	<b>Total</b>	<b>--</b> <b>--</b>	<b>0.029</b> <b>(0.012)</b>	<b>160</b> <b>(48.8)</b>

Upon completion of construction, temporary impacts associated with construction activities and temporary alignments will be restored to pre-project conditions. There is little potential that components of the existing bridge may be dropped into waters of the United States during construction. Therefore,



no temporary fill is expected to result from bridge removal. This project can be classified as Case 3, where there are no special restrictions other than those outlined in Best Management Practices for Protection of Surface Waters. NCDOT will coordinate with the various resource agencies during project planning to ensure that all concerns regarding bridge demolition are resolved.

## 2. Permits

### a) Section 404 of the Clean Water Act

In accordance with Section 404 of the Clean Water Act (CWA) (33 U.S.C. 1344.), a permit is required from the USACE for projects of this type for the discharge of dredged or fill material into waters of the United States. The USACE issues two types of permits for these activities. A general permit may be issued on a nationwide or regional basis for a category or categories of activities when: those activities are substantially similar in nature and cause only minimal individual and cumulative environmental impacts, or when the general permit would result in avoiding unnecessary duplication or regulatory control exercised by another Federal, state, or local agency provided that the environmental consequences of the action are individually and cumulatively minimal. If a general permit is not appropriate for a particular activity, then an individual permit must be utilized. Individual permits are authorized on a case-by-case evaluation of a specific project involving the proposed discharges.

It is anticipated that this project will fall under Nationwide Permit 23, which is a type of general permit. Nationwide Permit 23 is relevant to approved Categorical Exclusions. Activities under this permit are categorically excluded from environmental documentation because they are included within a category of activities, which neither individually nor cumulatively have a substantial effect on the human environment. Activities authorized under nationwide permits must satisfy all terms and conditions of the particular permit.

### b) Section 401 Water Quality Certification

A Section 401 Water Quality Certification from the state is necessary for projects that require Section 404 Permits. The state has General Certifications, which will match the permit type authorized by the USACE. Although a single form is utilized to request both the 404 Permit and the 401 Certification, the state must issue the 401 Certification before the USACE will issue the 404 Permit. Written concurrence/notification is not always required by the state, and varies depending upon the General Certification. If this project qualifies under Nationwide Permit 23, the DWQ must be notified, however written concurrence from the DWQ is not required.

Since this bridge is within a designated mountain trout county, the NCWRC will be consulted during the permitting process. The stream is not currently designated as a trout stream, so it is anticipated that implementing guidelines relevant to projects adjacent to trout waters will not be necessary. Should NCWRC opinion differ from this assumption, "Guidelines for Construction of Highway Improvements Adjacent to or Crossing Trout Waters in North Carolina" will be followed. Final determination on this matter rests with the NCWRC.

### c) Bridge Demolition and Removal

There is little potential that components of the existing bridge may be dropped into waters of the United States during construction. The bridge is composed completely of timber and steel (See Figure 4).

**Therefore, no temporary fill is expected to result from bridge removal.** Since the bridge is composed entirely of timber and steel, it can be removed without dropping any components into waters of the United States. This project can be classified as Case 3, where there are no special restrictions other than those outlined in Best Management Practices for Protection of Surface Waters.

The following guidelines will be used during construction of this project: “Pre-Construction Guidelines for Bridge Demolition and Removal”, “Policy: Bridge Demolition and Removal in Waters of the United States”, and “Best Management Practices for Bridge Demolition and Removal”. Guidelines followed for bridge demolition and removal are in addition to those implemented for Best Management Practices for the Protection of Surface Waters. If removal of the substructure will create disturbance in the streambed, use of a turbidity curtain will be considered to address sediment concerns.

d) Tennessee Valley Authority (TVA)

Henderson County is under the jurisdiction of the Tennessee Valley Authority (TVA). This project will be reviewed under Section 26a of the Tennessee Valley Authority Act. The final bridge plans, hydraulic analysis of the effects of the replacement structure on the 100-year flood elevation, and notice of compliance with the Historic Preservation Act of 1966 will be forwarded to TVA for approval.

3. Minimization

The preferred alternative (Alternative A) minimizes the amount of impacts to the “Waters of the United States” by replacing Bridge No. 265 at the existing location. Utilization of BMPs will be used in an effort to minimize impacts.

4. Avoidance

Bridge No. 265 will be replaced with a box culvert. Therefore minimum impacts to Dunn Creek cannot be avoided.

5. Mitigation

Compensatory mitigation is not proposed for this project due to the limited nature of project impacts. However, utilization of BMPs is recommended in an effort to minimize impacts. Temporary impacts to floodplains associated with construction activities could be mitigated by replanting disturbed areas with native wetland species and removal of temporary fill material upon project completion. Fill or alteration of more than 150 linear feet (45.8 linear meters) of stream may require compensatory mitigation in accordance with 15 NCAC 2H .0506(h). A final determination regarding mitigation rests with the COE and DWQ.

F. Protected Species

1. Federally Protected Species

Species with the federal classification of Endangered (E), Threatened (T), Threatened due to Similarity of Appearance (T [S/A]), or officially Proposed (P) for such listing are protected under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). The term “Endangered Species” is

defined as “any species which is in danger of extinction throughout all or a significant portion of its range”, and the term “Threatened Species” is defined as “any species which is likely to become an Endangered species within the foreseeable future throughout all or a significant portion of its range” (16 U.S.C. 1532). The term “Threatened due to Similarity of Appearance” is defined as a species which is not “Endangered” or “Threatened”, but “closely resembles an Endangered or Threatened species” (16 U.S.C. 1532). Federally protected species listed for Henderson County are presented in Table 3.

**Table 3.** Federally Protected Species Listed for Henderson County (March 7, 2002 FWS list).

Common Name	Scientific Name	Status
Bog turtle	<i>Clemmys muhlenbergii</i>	T (S/A)
Appalachian elktoe	<i>Alasmidonta raveneliana</i>	E
Oyster mussel*	<i>Epioblasma capsaeformis</i>	E
Swamp pink	<i>Helonias bullata</i>	T
Small-whorled pogonia	<i>Isotria medeoloides</i>	T
Bunched arrowhead	<i>Sagittaria fasciculata</i>	E
Mountain sweet pitcher plant	<i>Sarracenia jonesii</i>	E
White irisette	<i>Sisyrinchium dichotomum</i>	E

\*Historic occurrence in county - last seen more than 50 years ago

**Bog Turtle** -The bog turtle is a small turtle reaching an adult size of approximately 3 to 4 inches (8 to 10 centimeters). This otherwise dark-colored species is readily identifiable by the presence of a bright orange or yellow blotches on the sides of the head and neck (Martof *et. al.* 1980). The bog turtle is typically found in bogs, marshes, and wet pastures, usually in association with aquatic or semi-aquatic vegetation and small, shallow streams over soft bottoms (Palmer and Braswell 1995). In North Carolina, bog turtles have a discontinuous distribution in the mountains and western Piedmont. The bog turtle has declined drastically within the northern portion of its range due to over-collection and habitat alteration. As a result, the FWS officially proposed in the January 29, 1997 Federal Register (62 FR 4229) to list bog turtle as threatened within the northern portion of its range. Within the southern portion of its range, which includes North Carolina, the bog turtle listed as T (S/A) (to the northern population).

**No bogs or other habitat suitable for bog turtles exists within the study corridor. NHP records do not document bog turtles within 1.0 mile (1.6 kilometers) of the study corridor, and bog turtle was not observed during the site visit. T (S/A) species are not subject to Section 7 consultation and a biological conclusion is not required.**

**Appalachian Elktoe** - Appalachian elktoe is a small, subovate- to kidney-shaped freshwater mussel that grows to approximately 3.1 inches (8.0 centimeters) in length, 1.4 inches (3.5 centimeters) in height, and 1.0 inch (2.5 centimeters) in width (Clarke 1981). The shell is thin, but not fragile, and exhibits slight inflation along the posterior ridge near the center of the shell. Beaks project only slightly above the hinge line. Lateral teeth are absent; however, the hinge plate of both valves is thickened. Small,

pyramidal, compressed pseudocardinal teeth are present, and an interdental projection is present in the left valve. Juveniles are yellowish brown, but the periostracum (outer shell surface) is thicker and dark brown in adults. Individuals may be variably marked with prominent to obscure greenish rays. The nacre (shell interior) is shiny, blue to bluish white with salmon, pinkish, or brownish coloring in the central portion of the shell and beak cavity.

Appalachian elktoe is endemic to the upper Tennessee River system in the mountains of western North Carolina and eastern Tennessee. In North Carolina, this species may now be restricted to the Little Tennessee and Nolichucky drainages (LeGrand and Hall 1999). Recent N.C. Wildlife Resources Commission surveys have documented this species in the Little Tennessee River in Macon and Swain Counties, Cane River in Yancey County, Nolichucky and North Toe Rivers in Yancey and Mitchell Counties. A new population has recently been found in the Little River near the Henderson-Transylvania County line (personal communication, Mark Cantrell, FWS, July 11, 2001). The Pigeon River once supported a population of this mussel, but now is reported to be severely polluted and no longer likely to support the species (TSCFTM 1990). Suitable habitat for Appalachian elktoe is well-oxygenated riffle areas with sand and gravel substrate among cobbles and boulders. Current is usually moderate to swift and depth is no more than 3 feet (0.9 meter) (Parmalee and Bogan 1998).

Within the study corridor, Dunn Creek and the unnamed tributary to Dunn Creek are characterized as having slow to moderate flow over a sand/silt/mud substrate with some gravel. These streams are somewhat channelized and lack riffle-pool morphology. Therefore, suitable habitat for oyster mussel does not exist within the study corridor. NHP records document no occurrence of Appalachian elktoe within 1.0 miles (1.6 kilometers) of the study corridor. The nearest known population occurs in the Little River approximately 12 miles (19.3 kilometers) southwest of the study corridor.

**BIOLOGICAL CONCLUSION: NHP records indicate that the Appalachian elktoe has not been documented to occur within 1.0 mile (1.6 kilometers) of the study corridor, and the study corridor contains no suitable habitat for this species. Based on a NHP record search and habitat types within the study corridor, this project will not affect Appalachian elktoe. NO EFFECT**

**Oyster Mussel** - The oyster mussel is a small, freshwater mussel reaching approximately 2.1 inches (7.0 centimeters) in length. The shell is dull to sub-shiny and yellowish to green with numerous dark green rays. The nacre (inside shell surface) is whitish to bluish in color. Shells of females are slightly inflated and thinner toward the posterior margin. Oyster mussels inhabit small to medium-sized rivers with sand/gravel substrate, in shallow riffles and fast water less than 3 feet (0.9 meter) deep (Parmalee and Bogan 1998). This species is sometimes associated with water willow (*Justicia americana*) and is found in gravel pockets between bedrock and swift currents. Four species of fish have been identified as hosts: spotted darter (*Etheostoma maculatum*), redline darter (*E. rufilineatum*), dusky darter (*Percina sciera*), and banded sculpin (*Cottus carollinae*) (FWS 2000).

The oyster mussel is endemic to the Cumberland and Tennessee River drainages in Alabama, Kentucky, Tennessee, Virginia, and North Carolina. Within North Carolina, the species was known to have been abundant in the early 1900s in the upper Tennessee River system of the mountains of western North Carolina and Tennessee. Currently, the oyster mussel survives in nine tributaries of the Tennessee and Cumberland River systems in Kentucky, Tennessee, and Virginia. This species is now considered to

have been “formerly reported” from the French Broad River (LeGrand and Hall 1999). Much of the historic range of this species has been impounded by projects of the Tennessee Valley Authority and the U.S. Army Corps of Engineers. Other populations have probably been lost due to pollution and siltation. All known populations are small and vulnerable to disturbance.

Within the study corridor, Dunn Creek and the unnamed tributary to Dunn Creek are characterized as having slow to moderate flow over a sand/silt/mud substrate with some gravel. These streams are somewhat channelized and lack riffle-pool morphology. Therefore, suitable habitat for oyster mussel does not exist within the study corridor. Oyster mussels have been documented within the French Broad River basin only historically, and NHP records document no occurrence of oyster mussel within 1.0 miles (1.6 kilometers) of the study corridor.

**BIOLOGICAL CONCLUSION: NHP records indicate that the oyster mussel has not been documented to occur within 1.0 mile (1.6 kilometers) of the study corridor, and the study corridor contains no suitable habitat for this species. Based on a NHP record search and habitat types within the study corridor, this project will not affect oyster mussel. NO EFFECT**

**Swamp Pink** - Swamp pink is a perennial, hydrophytic herb in the lily family with simple leaves in a basal rosette. Small scale-like leaves or bracts are found on a hollow, flowering stem which may be 16 inches (40.6 centimeters) tall in flower and 24 inches (61.0 centimeters) tall in fruit. The inflorescence consists of pink to lavender flowers borne on a raceme without bracts. Fruits consist of three-lobed, papery capsules. Vegetative portions of the plant may emerge in April and persist through September. Flowering occurs in April and May, with fruits present from May through July (Massey *et al.* 1983). In North Carolina, swamp pink is found in mountain swamps and bogs. Swamp pink occurs along small watercourses in permanently saturated, acidic, organic soils or black muck which is mostly sphagnum (Porter and Wieboldt 1991). Swamp pink does not tolerate prolonged inundation, but can survive infrequent and brief flooding. In North Carolina, the current distribution is restricted to Henderson, Jackson, and Transylvania Counties (Amoroso 1999).

No swamp or bog areas occur within the study corridor. Therefore, suitable habitat for swamp pink does not exist within the proposed study corridor. Furthermore, NHP records do not document swamp pink within 1.0 mile (1.6 kilometers) of the study corridor, and swamp pink was not detected during a recent (June 8, 2001) plant survey of the proposed alternatives.

**BIOLOGICAL CONCLUSION: NHP records indicate that the swamp pink has not been documented to occur within 1.0 mile (1.6 kilometers) of the study corridor, and the study corridor contains no suitable habitat for this species. Based on a NHP record search and habitat types within the study corridor, this project will not affect swamp pink. NO EFFECT**

**Small Whorled Pogonia** - Small whorled pogonia is a terrestrial orchid growing to about 10 inches (25.4 centimeters) high. Five or six drooping, pale dusty green, widely rounded leaves with pointed tips are arranged in a whorl at the apex of the greenish or purplish, hollow stem. Typically a single, yellowish green, nearly stalkless flower is produced just above the leaves; a second flower rarely may be present. Flowers consist of three petals, which may reach lengths of 0.7 inch (1.7 centimeters),

surrounded by three narrow sepals up to 1 inch (2.5 centimeters) in length. Flower production occurs from May to July and is followed by the formation of an erect ellipsoidal capsule 0.7 to 1.2 inches (1.7 to 3.0 centimeters) in length (Massey *et al.* 1983). This species may remain dormant for periods up to 10 years between blooming periods (Newcomb 1977).

Populations of small whorled pogonia are sparse and widely distributed. The species is found in open, dry deciduous or mixed pine-deciduous forest and along stream banks. Examples of suitable habitat conditions (open canopy and shrub layer with a sparse herb layer) where small whorled pogonia has been found include oldfields, pastures, windthrow areas, cutover forests, old orchards, and semi-permanent canopy breaks along roads, streams, lakes, and cliffs (Massey *et al.* 1983). Habitat forests are generally in second- or third-growth forests. Soils are often sandy or stony, acid, nutrient-poor soils overlain by leaf litter. Beyond the common characteristics of soils, sparse ground cover and open canopy with persistent breaks, myriad exceptions and local variations occur (FWS 1992). In the mountains and Piedmont of North Carolina, this species is usually found in association with white pine (Weakley 1993), or at scattered locations in the mountains, Piedmont and Sandhills (Amoroso 1999), including wooded slopes and streamsides (Radford *et al.* 1968).

Mixed pine/hardwood forest and adjacent sections of roadside provide suitable habitat for small whorled pogonia. This area occurs along a moisture gradient from dry along the slope to mesic at the slope base and adjacent Dunn Creek. Roadside and disturbed areas provide persistent canopy breaks. Leaf litter provides a continuous ground cover. The associated tree species, white pine, occurs within the study corridor. Therefore, systematic surveys for this species were conducted during the flowering period (on June 8, 2001) within all areas of suitable habitat, resulting in no findings of small whorled pogonia within the proposed alternatives. NHP records do not document small whorled pogonia within 1.0 miles (1.6 kilometers) of the study corridor.

**BIOLOGICAL CONCLUSION: The study corridor does contain suitable habitat for this species; however, based on a NHP record search and a systematic survey conducted for this species during the flowering period, this project will not affect small whorled pogonia. NO EFFECT**

**Bunched Arrowhead** - Bunched arrowhead is a perennial, emergent, aquatic herb growing to 14 inches (35.6 centimeters) in height with simple, basal leaves. Two leaf forms are produced: phyllodes (bladeless) early in the season, and progressively longer, broader leaves later in the season (Kral 1983). The phyllodes are linear, distinctively flattened, spongy, and are up to 4 inches (10.2 centimeters) long and 0.8 inch (2.0 centimeters) wide. Later leaves may be spoon-shaped or narrowly oblanceolate and strap-like, growing to lengths of 14 inches (35.6 centimeters) and widths of 1.6 inches (4.0 centimeters). Unisexual flowers are borne on an erect flowering stem in two to four whorls, with each whorl subtended by three bracts fused at the base. Fruits consist of a round aggregate of large, distinctively crested achenes. Flowering has been reported to occur from May to July, with fruits present from May through September. Vegetative portions of the plant may emerge in April and persist through September (Massey *et al.* 1983; Kral 1983). Bunched arrowhead is found rooted in shallow water in or along shallow, sluggish streams flowing through mountain swamps or bogs (Kral 1983). Typical substrate is reported to be siliceous and micaceous silty muck, often with high sulfide content (Kral 1983). The current distribution is restricted to Buncombe and Henderson Counties in the mountains of North Carolina (Amoroso 1999) and Greenville County in the upper Piedmont of South Carolina.

No swamp or bog areas occur within the study corridor, and Dunn Creek is not characterized as having a silt/muck substrate. Therefore, suitable habitat for bunched arrowhead does not exist within the proposed study corridor. NHP records do not document swamp pink within 1.0 mile (1.6 kilometers) of the study corridor, and bunched arrowhead was not observed during the recent plant survey (June 8, 2001) of areas within the proposed alternatives.

**BIOLOGICAL CONCLUSION: NHP records indicate that the bunched arrowhead has not been documented to occur within 1.0 mile (1.6 kilometers) of the study corridor, and the study corridor contains no suitable habitat for this species. Based on a NHP record search, habitat types within the study corridor, and a recent plant survey within the study corridor, this project will not affect bunched arrowhead. NO EFFECT**

**Mountain Sweet Pitcher Plant** - Mountain sweet pitcher plant is an insectivorous, perennial, hydrophytic herb growing to 30 inches (76.2 centimeters) in height with hollow, trumpet-shaped leaves. The pitcher chamber is narrow but expands sharply along the upper quarter of the length. An ascending, cordate-shaped hood is held high over the exposed pitcher chamber orifice. Solitary flowers are produced on erect flowering stems. Petals are dark red to maroon on the outside, with the inner surface often yellow-green tinged with red. Flowering has been reported from April to June with fruits formed by August. Vegetative portions of the plant may emerge in April and persist through August (Massey *et al.* 1983). Mountain sweet pitcher plant is treated as a subspecies of the more common sweet pitcher plant (*S. rubra*). Mountain sweet pitcher plant is found in mountain bogs and along streams on granite rock faces. The current distribution is restricted to Buncombe, Henderson, and Transylvania Counties in the mountains of North Carolina (Amoroso 1999) and Greenville and Pickens Counties in western South Carolina.

No swamps, bog areas, or granite rock faces occur within the study corridor. Therefore, suitable habitat for mountain sweet pitcher plant does not exist within the proposed study corridor. NHP records do not document mountain sweet pitcher plant within 1.0 mile (1.6 kilometers) of the study corridor, and this species was not observed during a recent plant survey (June 8, 2001) of the proposed alternatives.

**BIOLOGICAL CONCLUSION: NHP records indicate that the mountain sweet pitcher plant has not been documented to occur within 1.0 mile (1.6 kilometers) of the study corridor, and the study corridor contains no suitable habitat for this species. Based on a NHP record search, habitat types within the study corridor, and a recent plant survey within the study corridor, this project will not affect mountain sweet pitcher plant. NO EFFECT**

**White Irisette** - White irisette is a perennial herb in the iris family that grows to 16 inches (40.6 centimeters) tall. Stem leaves are at least as wide as the winged stem and may reach 5.5 inches (14.0 centimeters) long and 0.2 inch (0.5 centimeter) wide. Basal leaves reach one-third to one-half the height of the plant and may be up to 7.5 inches (19.0 centimeters) long and 0.14 inches (0.4 centimeter) wide. White irisette differs from other blue-eyed grasses by having three to five nodes with successively shorter internodes between dichotomous branches (FWS 1995). Four to six flowers with white, recurved perianth units are borne per spathe. Flowering occurs from late May through July. White irisette is found in dry to mesic, open oak-hickory forest on mid-elevation mountain slopes at elevations

from 1300 to 3300 feet (400 to 1000 meters) with aspects ranging primarily from southeast to southwest (FWS 1995). White irisette grows in shallow, circumneutral soils, especially over weathered amphibolite. White irisette is reported to grow best on regularly disturbed sites, such as power lines, roadsides, and woodland edges, which mimic suppressed natural disturbances and maintain open habitat (FWS 1995). The current distribution is restricted to Forsyth, Henderson, Polk, and Rutherford Counties in North Carolina (Amoroso 1999) and Greenville County in western South Carolina.

Some aspects of suitable habitat for white irisette exist within forested areas of the study corridor, such as a dry-mesic moisture regime, proper elevation, and an oak-dominated canopy; however, the slope aspect of this area is northward, and the canopy is only moderately open. Also, areas of regular disturbance such as steep roadsides and woodland edges occur within the proposed alternatives. Therefore, all areas of suitable habitat were systematically searched for this species during the flowering period (on June 8, 2001), resulting in no findings of white irisette within the proposed alternatives. According to NHP records, white irisette has not documented to occur within 1.0 mile (1.6 kilometers) of the study corridor.

**BIOLOGICAL CONCLUSION: The study corridor does contains suitable habitat for this species; however, based on a NHP record search and a systematic search conducted within suitable habitat types of each proposed alternative, this project will not affect white irisette. NO EFFECT.**

**Federal Species of Concern** - The March 7, 2002 FWS list also includes a category of species designated as "Federal species of concern" (FSC). A species with this designation is one that may or may not be listed in the future (formerly C2 candidate species or species under consideration for listing) for which there is insufficient information to support listing). The FSC designation provides no federal protection under the ESA for the species listed. FSC species listed for Henderson County are presented in Table 4. NHP files have no documentation of FSC listed species within the study corridor or within 1.0 mile (1.6 kilometers) of the study corridor.



**Table 4.** Federal Species of Concern listed for Henderson County (April 12, 2001 FWS list).

Common Name	Scientific Name	Potential Habitat	State Status*
Green salamander	<i>Aneides aeneus</i>	no	E
Hellbender	<i>Cryptobranchus alleganiensis</i>	no	SC
Eastern small-footed myotis	<i>Myotis leibii</i>	yes	SC
Southern Appalachian woodrat	<i>Neotoma floridana haematoreia</i>	no	T
French Broad crayfish**	<i>Cambarus reburus</i>	yes	W2
Tennessee heelsplitter	<i>Lasmigona holstonia</i>	yes	E
Diana fritillary butterfly**	<i>Speyeria diana</i>	no	SR
Schweinitz's sedge	<i>Carex schweinitzii</i>	no	E
Mountain heartleaf	<i>Hexastylis contracta</i>	no	E
French Broad heartleaf	<i>Hexastylis rhombiformis</i>	no	C
Butternut	<i>Juglans cinerea</i>	no	W5
Rough rush	<i>Juncus caesariensis</i>	no	E
Gray's lily	<i>Lilium grayi</i>	no	T-SC
Fraser's loosestrife***	<i>Lysimachia fraseri</i>	yes	E
Large-flowered Barbara's buttons**	<i>Marshallia grandiflora</i>	no	C
Sweet pinesap**	<i>Monotropsis odorata</i>	yes	C
Bog asphodel**	<i>Narthecium americanum</i>	no	E
White fringeless orchid	<i>Plantantherea integrilabia</i>	no	E
Divided-leaf ragwort**	<i>Senecio millefolium</i>	no	T
Mountain catchfly	<i>Silene ovata</i>	yes	C

\* E = Endangered; T = Threatened; SC = Special concern; SR = Significantly Rare; C = Candidate; P = Species has been formally proposed for listing as Endangered, Threatened, or Special Concern; W2 = NC Plant Watch List: rare, but taxonomically questionable; W5 = NC Plant Watch List: rare because of severe decline (Amoroso 1999; LeGrand and Hall 1999).

\*\* Historic occurrence in county - last seen more than 50 years ago

\*\*\* Obscure record date and/or location of observation is uncertain

## 2. State Protected Species

Plant and animal species which are on the North Carolina state list as Endangered (E), Threatened (T), Special Concern (SC), Candidate (C), Significantly Rare (SR), or Proposed (P) (Amoroso 1999;

LeGrand and Hall 1999) receive limited protection under the North Carolina Endangered Species Act (G.S. 113-331 *et seq.*) and the North Carolina Plant Protection Act of 1979 (G.S. 106-202 *et seq.*). NHP records indicate that no state listed species have been documented to occur within 1.0 mile (1.6 kilometers) of the study corridor.

## **VI. CULTURAL RESOURCES**

### **A. Compliance Guidelines**

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 Section 106, codified at 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 to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings.

### **B. Historic Architecture**

A field survey of the Area of Potential Effects (APE) was conducted on September 28, 2000. All structures within the APE were photographed, and later reviewed by the State Historic Preservation Office (HPO). In a concurrence form dated December 8, 2000 the State Historic Preservation Officer (SHPO) concurred that there are no historic architectural resources either listed or eligible for listing in the National Register of Historic Places within the APE. A copy of the concurrence form is included in the Appendix.

### **C. Archaeology**

The SHPO, in a memorandum dated February 5, 2001 stated, "There are no recorded archaeological sites within the proposed project area... If, however, the replacement is to be on new location, please forward a map to this office indicating the location of the new alignment so we may evaluate the potential effects of the replacement upon archaeological resources." A copy of the SHPO memorandum is included in the Appendix.

## **VII. ENVIRONMENTAL EFFECTS**

The project is expected to have an overall positive impact. Replacement of an inadequate bridge will result in safer traffic operations.

The project is a Federal "Categorical Exclusion" due to its limited scope and lack of significant environmental consequences.

The bridge replacement will not have an adverse effect on the quality of the human or natural environment with the use of current NCDOT standards and specifications.

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

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.

In compliance with Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations) a review was conducted to determine whether minority or low-income populations were receiving disproportionately high and adverse human health or environmental impacts as a result of this project. The investigation determined the project would not disproportionately impact any minority or low-income populations.

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

There are no publicly owned recreational facilities, or wildlife and waterfowl refuges of national, state, or local significance in the vicinity of the project.

The Farmland Protection Policy Act requires all federal agencies or their representatives to consider the potential impacts to prime and important farmland soils by all land acquisition and construction projects. Prime and important farmland soils are defined by the Natural Resources Conservation Service (NRCS). There are 82,824 acres of prime or important soils found in Henderson County. The proposed project will not impact soils defined as prime and statewide or local important farmland soils

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

This project is an air quality “neutral” project, so it is not required to be included the regional emission analysis (if applicable) and a project level CO analysis is not required.

The traffic volumes will not increase or decrease because of this project. There are no receptors located in the immediate project area. The project’s impact on noise and air quality will not be significant.

Noise levels could increase during construction but will be temporary. If vegetation is disposed of by burning, all burning shall be done in accordance with applicable local laws and regulations of the North Carolina SIP for air quality in compliance with 15 NCAC 2D.0520. This evaluation completes the assessment requirements for highway traffic noise (23 CFR Part 772) and for air quality (1990 CAAA and NEPA) and no additional reports are required.

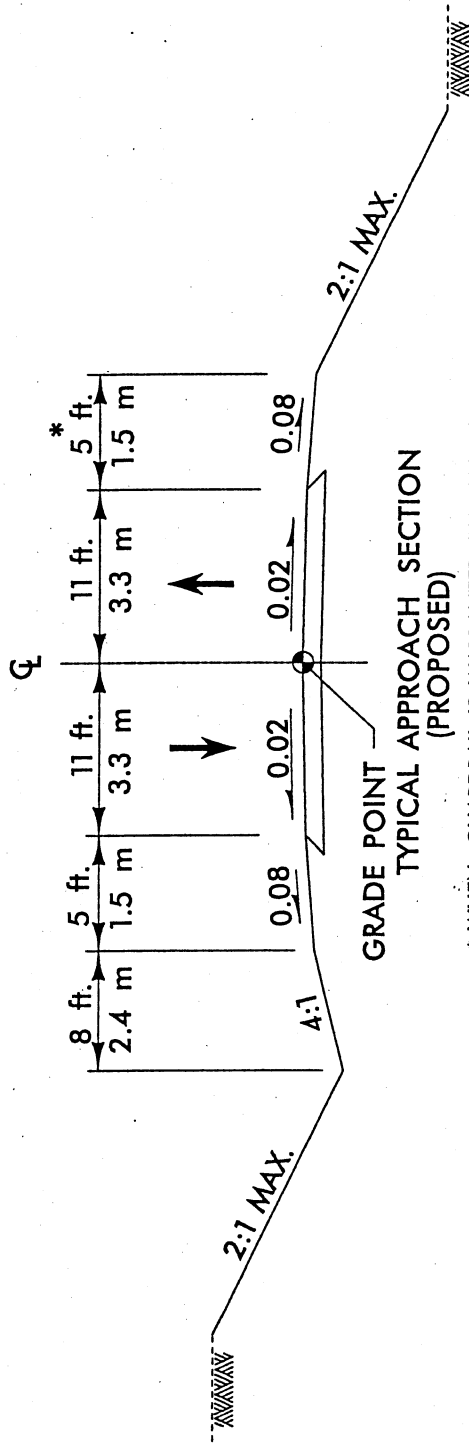
An examination of records at the North Carolina Department of Environment and Natural Resources, Division of Water Quality, Groundwater Section and the North Carolina Department of Human Resources, Solid Waste Management Section revealed no hazardous waste sites in the project area

Henderson County is not currently participating in the National Flood Insurance Program. The project site over Dunn Creek is located in a designated flood hazard zone but is not included in a detailed study. Attached is a copy of the Flood Insurance Rate Map (Figure 5), on which are shown the approximate limits of the 100-year flood plain in the vicinity of the project.









GRADE POINT  
TYPICAL APPROACH SECTION  
(PROPOSED)

\* WHEN GUARDRAIL IS WARRANTED, THE MINIMUM SHOULDER WIDTH IS INCREASED BY 3'-0" (1.0 m)  
REPLACE BRIDGE NO. 265 WITH A REINFORCED CONCRETE BOX CULVERT WITH 2 BARRELS @ 9' X 8' (2.7 m X 2.4 m)

DESIGN DATA

(EXISTING) 2002 ADT = 700 LOS B DESIGN SPEED 50 MPH (80 km/h)  
 (CONST. YR.) 2003 ADT = 725 LOS B POSTED SPEED LIMIT 45 MPH (70 km/h)  
 (DESIGN YR.) 2025 ADT = 1,300 LOS B MIN. RADIUS OF CURVE 835 FT (90 m)  
 DUAL 2% MAX. GRADE 9%  
 TTST 1% MIN. DES. K FAC.: K<sub>sag</sub> = 96 K<sub>crest</sub> = 84  
 METRIC (K<sub>sag</sub> = 30 K<sub>crest</sub> = 26)  
 e<sub>max</sub> = .06  
 terrain = mountainous

FUNCTIONAL CLASSIFICATION : RURAL LOCAL



North Carolina Department  
Of Transportation  
Project Development &  
Environmental Analysis

HENDERSON COUNTY  
BRIDGE NO. 265 ON SR 1791  
BALLENGER ROAD  
OVER DUNN CREEK  
TIP NO: B-3665

FIGURE 3





B-3665 Henderson County  
Bridge No 265 on SR 1791 over Dunn Creek

Looking south along SR 1791  
across Bridge No. 265.



Looking north along SR 1791 across  
Bridge No. 265.

Side view of Bridge No. 265.





B-3665  
Henderson County  
Bridge No 265 on SR 1791 over North Branch Bat Fork Creek

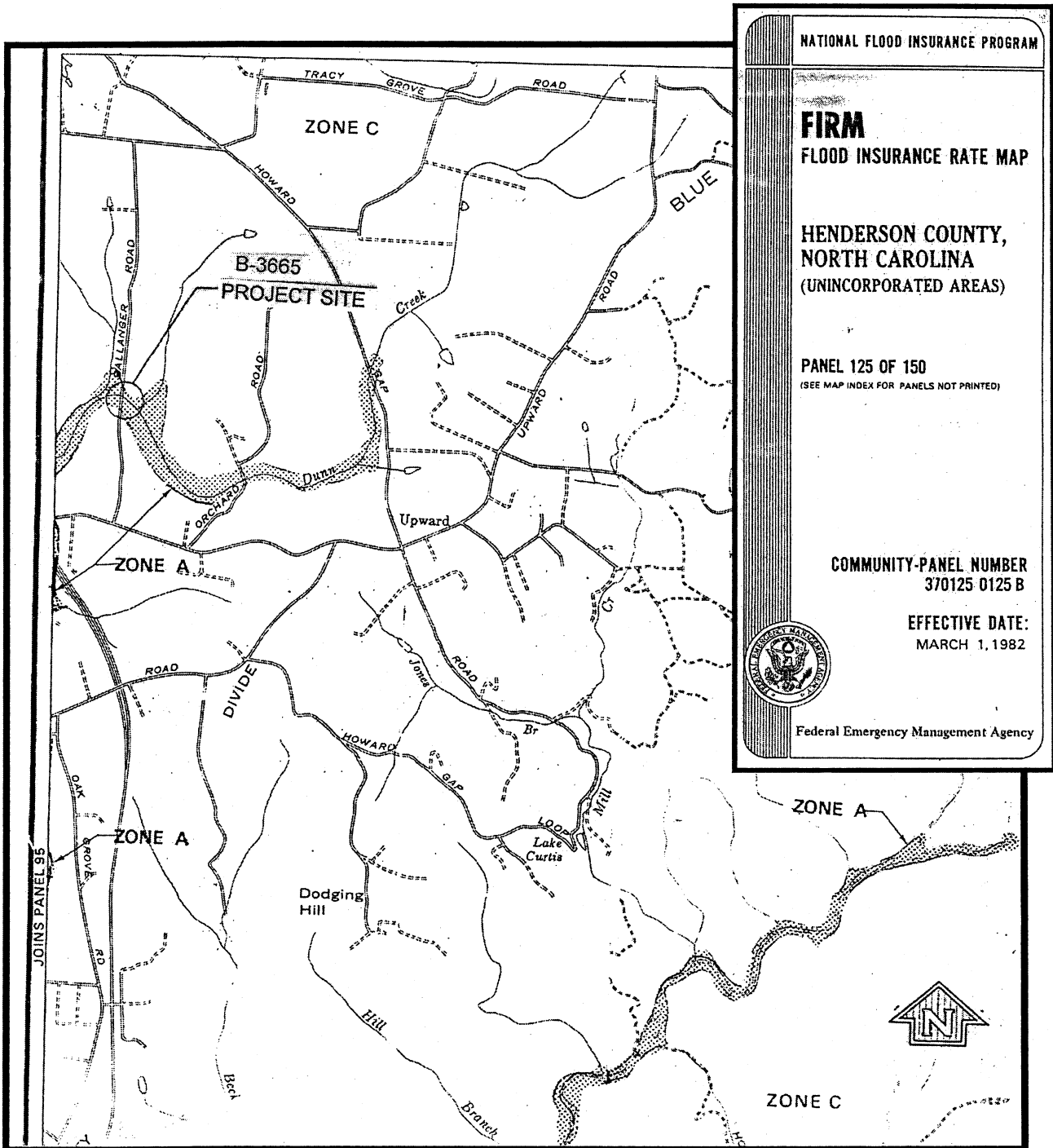


FIGURE 5  
FEMA FLOOD MAP



# APPENDIX





# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Asheville Field Office  
160 Zillicoa Street  
Asheville, North Carolina 28801

February 7, 2001

Mr. William D. Gilmore, P.E., Manager  
Project Development and Environmental Analysis Branch  
North Carolina Department of Transportation  
1548 Mail Service Center  
Raleigh, North Carolina 27699-1548

Dear Mr. Gilmore:

Subject: Bridge Replacements - Avery County (B-3808); Henderson County (B-3475, B-3662, B-3663, B-3664, B-3665, B-3666, and B-3857); McDowell County (B-3673); and Watauga County (B-3709 and B-3710)

We have reviewed the subject projects and are providing the following comments in accordance with the Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-667e), and Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (Act).

The information we received for these 11 projects does not include descriptions of the structures that will replace the existing bridges, and it does not include any environmental information regarding the streams or whether habitat assessments or surveys for rare species have been conducted for any of the projects. Therefore, our comments are limited primarily to the known locations of listed species and species of Federal concern. When the categorical exclusions are prepared and more information is available regarding environmental effects, we can then offer more substantive comments.

Enclosed is a list of species from the four counties involved. This list provides the names of species that are on the Federal List of Endangered and Threatened Wildlife and Plants, as well as species of Federal concern. Federal species of concern are not legally protected under the Act and are not subject to any of its provisions, including Section 7, unless they are formally proposed or listed as endangered or threatened. We are including these species in our response to give you advance notification and to request your assistance in protecting them if any are found in the vicinity of these projects. Our records indicate the following:



## Henderson County

Project B-3475. Known locations of the federally endangered bunched arrowhead (*Sagittaria fasciculata*) and the federally threatened small-whorled pogonia (*Isotria medeoloides*) occur near this project. We recommend surveying the project area for these species prior to any further planning or on-the-ground activities. If these species occur in the project area, further consultation will be required.

Project B-3665. Known locations of the federally endangered bunched arrowhead (*Sagittaria fasciculata*) and mountain sweet pitcher plant (*Sarracenia jonesii*) occur in the vicinity of this project. We recommend surveying the project area for these species prior to any further planning or on-the-ground activities. If these species occur in the project area, further consultation will be required.

Projects B-3662 and B-3664. These projects occur in the general vicinity of Mud Creek, an area with several occurrences of bunched arrowhead (*Sagittaria fasciculata*) and mountain sweet pitcher plant (*Sarracenia jonesii*). Currently there are no known locations of these species in the immediate project area. However, a lack of any systematic surveys throughout the Mud Creek drainage may account for the apparent absence of these species. In the areas affected by these projects, we recommend conducting habitat assessments and surveying any suitable habitat for these species.

Projects B-3666, B-3663, and B-3857. Our records for Henderson County indicate no known locations of listed species in the project areas. However, we recommend conducting habitat assessments and surveying any suitable habitat in the project areas for these species prior to any further planning or on-the-ground activities to ensure that no adverse impacts occur.

## McDowell County

Project B-3673. Our records indicate known locations for the bog turtle (*Clemmys muhlenbergii*) near this project. Habitat assessments and surveys of suitable habitat should be conducted in the project area for this species. If the bog turtle occurs in the project area, it should be protected from impacts.

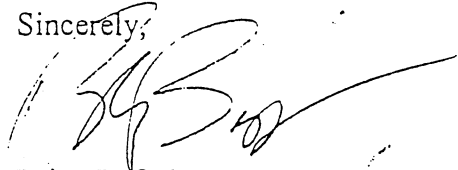
## Watauga and Avery Counties

Projects B-3709, B-3710, and B-3808. Although our records for Watauga and Avery Counties indicate no known locations of listed species in the project areas, we recommend conducting habitat assessments in the affected area of each project. Any suitable habitat should be surveyed for these species prior to any further planning or on-the-ground activities to ensure that no adverse impacts occur.

We are interested in the types of structures that will replace these existing bridges and would recommend spanning structures, preferably bridges, in all cases. We look forward to reviewing the completed categorical exclusion documents.

If you have questions about these comments, please contact Ms. Marella Buncick of our staff at 828/258-3939, Ext. 237. In any future correspondence concerning this project, please reference our Log Number 4-2-01-278.

Sincerely,

*for*   
Brian P. Cole  
State Supervisor

Enclosure

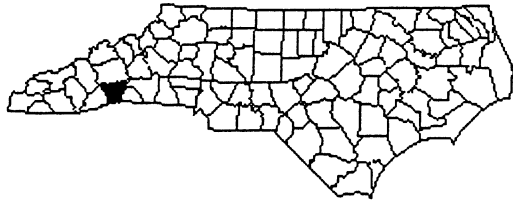
cc:

Ms. Stacy Harris, Project Development and Environmental Analysis Branch, North Carolina  
Department of Transportation, 1548 Mail Service Center, Raleigh, NC 27699-1548

Mr. Owen Anderson, Mountain Region Coordinator, North Carolina Wildlife Resources  
Commission, 20830 Great Smoky Mtn. Expressway, Waynesville, NC 28786

Ms. Cynthia Van Der Wiele, North Carolina Department of Environment and Natural Resources,  
Division of Water Quality, Wetlands Section, 1621 Mail Service Center, Raleigh, NC  
27699-1621

Updated: 05/31/2002

**U.S. Fish & Wildlife Service****HENDERSON COUNTY**

Common Name	Scientific Name	Status
<b>Vertebrates</b>		
<u>Bog turtle</u>	<i>Clemmys muhlenbergii</i>	T(S/A) <sup>1</sup>
Eastern small-footed myotis	<i>Myotis leibii</i>	FSC
Green salamander	<i>Aneides aeneus</i>	FSC
Hellbender	<i>Cryptobranchus alleganiensis</i>	FSC
Southern Appalachian woodrat	<i>Neotoma floridana haematorea</i>	FSC
<b>Invertebrates</b>		
<u>Appalachian elktoe</u>	<i>Alasmidonia raveneliana</i>	Endangered
Diana fritillary butterfly	<i>Speyeria diana</i>	FSC*
French Broad crayfish	<i>Cambarus reburus</i>	FSC*
<u>Oyster mussel</u>	<i>Epioblasma capsaeformis</i>	Endangered
Tennessee heelsplitter	<i>Lasmigona holstonia</i>	FSC
<b>Vascular Plants</b>		
Bog asphodel	<i>Nartheceum americanum</i>	C1*
<u>Bunched arrowhead</u>	<i>Sagittaria fasciculata</i>	Endangered
Butternut	<i>Juglans cinerea</i>	FSC
Divided-leaf ragwort	<i>Senecio millefolium</i>	FSC*
Fraser's loosestrife	<i>Lysimachia fraseri</i>	FSC**
French Broad heartleaf	<i>Hexastylis rhombiformis</i>	FSC
Gray's lily	<i>Lilium grayi</i>	FSC
Large-flowered Barbara's buttons	<i>Marshallia grandiflora</i>	FSC*
Mountain catchfly	<i>Silene ovata</i>	FSC
Mountain heartleaf	<i>Hexastylis contracta</i>	FSC
<u>Mountain sweet pitcher plant</u>	<i>Sarracenia jonesii</i>	Endangered
Rough rush	<i>Juncus caesariensis</i>	FSC
Schweinitz's sedge	<i>Carex schweinitzii</i>	FSC
<u>Small-whorled pogonia</u>	<i>Isotria medeoloides</i>	Threatened

Sweet pinesap	<i>Monotropsis odorata</i>	FSC*
White fringeless orchid	<i>Plantantherea integrilabia</i>	FSC
<u>White irisette</u>	<i>Sisyrinchium dichotomum</i>	Endangered

KEY:

Status	Definition
<b>Endangered -</b>	A taxon "in danger of extinction throughout all or a significant portion of its range."
<b>Threatened -</b>	A taxon "likely to become endangered within the foreseeable future throughout all or a significant portion of its range."
<b>Proposed -</b>	A taxon proposed for official listing as endangered or threatened.
<b>C1 -</b>	A taxon under consideration for official listing for which there is sufficient information to support listing.
<b>FSC -</b>	A Federal species of concern--a species that may or may not be listed in the future (formerly C2 candidate species or species under consideration for listing for which there is insufficient information to support listing).
<b>T(S/A) -</b>	Threatened due to similarity of appearance (e.g., <u>American alligator</u> )--a species that is threatened due to similarity of appearance with other rare species and is listed for its protection. These species are not biologically endangered or threatened and are not subject to Section 7 consultation.
<b>EXP -</b>	A taxon that is listed as experimental (either essential or nonessential). Experimental, nonessential endangered species (e.g., red wolf) are treated as threatened on public land, for consultation purposes, and as species proposed for listing on private land.

Species with 1, 2, 3, or 4 asterisks behind them indicate historic, obscure, or incidental records.

\*Historic record - the species was last observed in the county more than 50 years ago.

\*\*Obscure record - the date and/or location of observation is uncertain.

\*\*\*Incidental/migrant record - the species was observed outside of its normal range or habitat.

\*\*\*\*Historic record - obscure and incidental record.

<sup>1</sup>In the November 4, 1997, Federal Register (55822-55825), the northern population of the bog turtle (from New York south to Maryland) was listed as T (threatened), and the southern population (from Virginia south to Georgia) was listed as T(S/A) (threatened due to similarity of appearance). The T(S/A) designation bans the collection and interstate and international commercial trade of bog turtles from the southern population. The T(S/A) designation has no effect on land-management activities by private landowners in North Carolina, part of the southern population of the species.

Federal Aid #BRZ-1791(1)

TIP #B-3665

County: Henderson

CONCURRENCE FORM FOR PROPERTIES NOT ELIGIBLE FOR THE NATIONAL REGISTER OF HISTORIC PLACES

Project Description: Replace Bridge No.265 on SR 1791 over N. Branch of Bat Fork Creek

On December 8, 2000, representatives of the

- North Carolina Department of Transportation (NCDOT)
- Federal Highway Administration (FHWA)
- North Carolina State Historic Preservation Office (SHPO)

Reviewed the subject project at

- a scoping meeting
- photograph review session/consultation
- other

All parties present agreed

- there are no properties over fifty years old within the project's area of potential effect.
- there are no properties less than fifty years old which are considered to meet Criterion Consideration G within the project's area of potential effect.
- there are properties over fifty years old (list attached) within the project's area of potential effect, but based on the historical information available and the photographs of each property, properties identified as Prop. # 132 are considered not eligible for the National Register and no further evaluation of them is necessary.
- there are no National Register-listed properties located within the project's area of potential effect.

Signed:

Mary Pope 12/8/00  
Representative, NCDOT Date

Michael C. Davison 12/19/00  
FHWA, for the Division Administrator, or other Federal Agency Date

Mary 12/8/00  
Representative, SHPO Date

David Hood 12/20/00  
State Historic Preservation Officer Date



North Carolina Department of Cultural Resources  
State Historic Preservation Office

David L. S. Brook, Administrator

Division of Archives and History  
Jeffrey J. Crow, Director

Michael F. Easley, Governor  
Lisbeth C. Evans, Secretary

February 5, 2001

MEMORANDUM

To: William D. Gilmore, P.E., Manager  
Project Development and Environmental Analysis Branch

From: David Brook *Plse for David Brook*  
Deputy State Historic Preservation Officer

Re: Replace Bridge #265 on SR 1791 over North Branch Bat Fork Creek,  
B-3665, Henderson County, ER 01-8268

Thank you for your letter of December 6, 2000, concerning the above project.

We have conducted a search of our files and are aware of no structures of historical or architectural importance located within the planning area. However, since a survey has not been conducted in over a decade, there may be structures of which we are unaware located within the planning area.

If there are any structures more than fifty years old on or adjacent to the project site, please send us photographs (Polaroid type snapshots are fine) of each structure. These photographs should be keyed to a map that clearly shows the site location. If there are no building over fifty years old on or adjacent to the project, please notify us of this in writing.

There are no recorded archaeological sites within the proposed project area. If the replacement is to be located along the existing alignment, it is unlikely that significant archaeological resources would be affected and no investigations would be recommended. If, however, the replacement is to be in a new location, please forward a map to this office indicating the location of the new alignment so we may evaluate the potential effects of the replacement upon archaeological resources.

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

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, Environmental Review Coordinator, at 919/733-4763.

cc: Mary Pope Furr, NCDOT  
Tom Padgett, NCDOT

	Location	Mailing Address	Telephone/Fax
Administration	507 N. Blount St, Raleigh, NC	4617 Mail Service Center, Raleigh 27699-4617	(919) 733-4763 • 715-8653
Restoration	515 N. Blount St, Raleigh, NC	4613 Mail Service Center, Raleigh 27699-4613	(919) 733-6547 • 715-4801
Survey & Planning	515 N. Blount St, Raleigh, NC	4618 Mail Service Center, Raleigh 27699-4618	(919) 733-4763 • 715-4801



## ☒ North Carolina Wildlife Resources Commission ☒

Charles R. Fullwood, Executive Director

### MEMORANDUM

TO: William D. Gilmore, P.E., Manager  
Project Development and Environmental Analysis Branch, NCDOT

FROM: Owen F. Anderson, *Owen F. Anderson*  
Mountain Region Coordinator  
Habitat Conservation Program

DATE: January 10, 2001

SUBJECT: Scoping for Bridge Replacements B3475, B3662, B-3663, B-3664, ~~B-3666~~ B-3666, B-3673, and B-3857, Henderson and McDowell Counties

This memorandum responds to your request for our concerns regarding impacts on fish and wildlife resources resulting from the subject projects. The North Carolina Wildlife Resources Commission (NCWRC) has reviewed the proposed projects, and our comments are provided in accordance with 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).

The proposed work involves nine bridge replacement projects in western North Carolina. Construction impacts on wildlife and fisheries resources will depend on the extent of disturbance in the streambed and surrounding riparian areas. We prefer bridge designs that do not alter the natural stream morphology or impede fish passage and provide for wildlife passage under the bridge. We prefer that existing bridges be replaced with another spanning structure. Bridge designs should also include provisions for the deck drainage to flow through a vegetated upland buffer prior to reaching the subject surface waters. In some cases, we are specifically concerned about impacts to trout waters. Environmental documentation for these projects should include description of any streams or wetlands on the project site and surveys for any threatened or endangered species that may be affected by construction.

#### **B-3475 – Bridge No. 356 on SR1127 (Caswell Street) over Wash Creek, Henderson County**

No specific concerns other than minimization of impacts to water quality and aquatic and riparian habitat.

#### **B-3662 – Bridge No. 20 on SR 1006 (Howard Gap Road) over Featherstone Creek in Henderson County.**

No specific concerns other than minimization of impacts to water quality and aquatic and riparian habitat.



**B-3663 – Bridge No 320 on SR 1212 (Old Homestead Road) over Shaws Creek in Henderson County**

No specific concerns other than minimization of impacts to water quality and aquatic and riparian habitat.

**B-3664 – Bridge No. 21 on SR 1528 (Brookside Camp Road) over Mud Creek in Henderson County**

No specific concerns other than minimization of impacts to water quality and aquatic and riparian habitat.

**B-3665 - Bridge No. 265 on SR 1791 (Ballenger Road) over North Branch Bat Fork Creek in Henderson County**

No specific concerns other than minimization of impacts to water quality and aquatic and riparian habitat.

**B-3666 - Bridge No. 53 on SR 1799 (Deep Gap Road) over Hungry River in Henderson County.**

This bridge appears to be located at the edge of the Pisgah Game Lands. This reach is classified as trout water by the Division of Water Quality and is designated by the NCWRC as Hatchery Supported Waters. The new bridge should span the adjacent floodplain and provide sufficient space for wildlife to move under the bridge. An inwater work moratorium from October 15-April 15 is requested for this project.

**B-3673 – Bridge No. 17 on US 221 over Second Broad River in McDowell County**

This stream is Classified WS-IV. No specific fish and wildlife concerns other than minimization of impacts to water quality and aquatic and riparian habitat. The new bridge should span the adjacent floodplain and/or provide a wildlife movement corridor under the bridge.

Because the Corps of Engineers (COE) recognizes all of the above counties as “trout water counties”, the NCWRC will review any nationwide or general 404 permits for the proposed projects. The following conditions are likely to be placed on the subject 404 permits:

1. Adequate sedimentation and erosion control measures must be implemented and maintained on the project site to avoid impacts to downstream aquatic resources. Structures should be inspected and maintained regularly, especially following rainfall events.
2. 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.
3. All work in or adjacent to stream waters should be conducted in a dry work area. Sandbags, cofferdams, or other diversion structures should be used to minimize impacts to downstream aquatic resources. Spoil materials and wastewater captured in the cofferdam should be pumped out and disposed of on upland sites.

4. If concrete is used during construction, a dry work area must be maintained to prevent direct contact between curing concrete and stream water. Uncured concrete affects water quality and is highly toxic to fish and other aquatic organisms.
5. Grading and backfilling should be minimized, and tree and shrub growth should be retained if possible to ensure long term availability of shoreline cover for gamefish and wildlife.
6. **In trout waters, instream construction is prohibited during the trout-spawning period of October 15 to April 15 to avoid impacts on trout reproduction.**
7. 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.
8. If multi-celled reinforced concrete box culverts are utilized, they should be designed so that all water flows through a single cell (or two if necessary) during low flow conditions. This could be accomplished by constructing a low sill on the upstream end of the other cells that will divert water to a single cell during below bankfull events. This will facilitate fish passage at low flows.
9. Notched baffles should be placed in reinforced concrete box culverts at 15-foot intervals to allow for the collection of sediments in the culvert, reduce flow velocities, and to provide resting areas for fish moving through the structure.
10. Only clean, sediment-free rock should be used as temporary fill (causeways), and should be removed without excessive disturbance of the natural river bottom when construction is completed. Temporary causeways should not block more than 30% of the stream width to prevent an impediment to fish movement.
11. Equipment operated near surface waters should be inspected daily and maintained to prevent contamination of waters from leaking fuels, lubricants, hydraulic fluids, or other toxic materials.
12. Stormwater should be directed to upland buffer areas or retention basins and should not be discharged directly into streams.

Thank you for the opportunity to review and comment during the early stages of these projects. If you have any questions regarding these comments, please contact me at (828) 452-2546.

cc: Mr. Steven Lund, NCDOT Coordinator, COE, Asheville  
Ms. Stacy Harris, P.E., PD & EA Branch, NCDOT, Raleigh  
Ms. Marella Buncick, Biologist, USFWS Asheville

State of North Carolina  
Department of Environment  
and Natural Resources  
Division of Water Quality



James B. Hunt, Jr., Governor  
Bill Holman, Secretary  
Kerr T. Stevens, Director

December 11, 2000

MEMORANDUM

To: William D. Gilmore, P.E., Manager  
NCDOT, Project Development & Environmental Analysis

Through: John Dorney, NC Division of Water Quality

From: Cynthia F. Van Der Wiele *cvdew*

Subject: Scoping comments on the proposed replacement of Bridge No. 265 on SR 1791 over Dunn Creek in Henderson County, T.I.P. Project B-3665.

This memo is in reference to your correspondence dated December 6, 2000, in which you requested scoping comments for the above project. The stream is actually Dunn Creek, not North Branch Bat Fork Creek, and the DWQ index number for the stream is 6-55-8-1-1 and is classified as C waters. The Division of Water Quality requests that NCDOT consider the following environmental issues for the proposed project:

- A. DWQ prefers replacement of bridges with bridges. However, if the new structure is to be a culvert, it should be countersunk to allow unimpeded fish and other aquatic organisms passage through the crossing. Please be aware that floodplain culverts are required under Nationwide 14.
- B. The document should provide a detailed and itemized presentation of the proposed impacts to wetlands and streams with corresponding mapping.
- C. There should be a discussion on mitigation plans for unavoidable impacts. If mitigation is required, it is preferable to present a conceptual (if not finalized) mitigation plan with the environmental documentation. While the NCDWQ realizes that this may not always be practical, it should be noted that for projects requiring mitigation, appropriate mitigation plans will be required prior to issuance of a 401 Water Quality Certification.
- D. When practical, the DWQ requests that bridges be replaced on the existing location with road closure. If a detour proves necessary, remediation measures in accordance with the NCDWQ requirements for General 401 Certification 2726/Nationwide Permit No. 33 (Temporary Construction, Access and Dewatering) must be followed.
- E. If applicable, DOT should not install the bridge bents in the creek, to the maximum extent practicable.

- F. Wetland and stream impacts should be avoided (including sediment and erosion control structures/measures) to the maximum extent practical. If this is not possible, alternatives that minimize wetland impacts should be chosen. Mitigation for unavoidable impacts will be required by DWQ for impacts to wetlands in excess of one acre and/or to streams in excess of 150 linear feet.
- G. Borrow/waste areas should not be located in wetlands. It is likely that compensatory mitigation will be required if wetlands are impacted by waste or borrow.
- H. If foundation test borings are necessary; it should be noted in the document. Geotechnical work is approved under General 401 Certification Number 3027/Nationwide Permit No. 6 for Survey Activities.
- I. In accordance with the NCDWQ Wetlands Rules { 15A NCAC 2H.0506(b)(6)}, mitigation will be required for impacts of greater than 150 linear feet to any single perennial stream. In the event that mitigation becomes required, the mitigation plan should be designed to replace appropriate lost functions and values. In accordance with the NCDWQ Wetlands Rules { 15A NCAC 2H.0506 (h)(3)}, the Wetland Restoration Program may be available for use as stream mitigation.
- J. Sediment and erosion control measures should not be placed in wetlands.
- K. The 401 Water Quality Certification application will need to specifically address the proposed methods for stormwater management. More specifically, stormwater should not be permitted to discharge directly into the creek. Instead, stormwater should be designed to drain to a properly designed stormwater detention facility/apparatus.
- L. While the use of National Wetland Inventory (NWI) maps and soil surveys is a useful office tool, their inherent inaccuracies require that qualified personnel perform onsite wetland delineations prior to permit approval.

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 Cynthia Van Der Wiele at (919) 733.5715.

Pc: Steve Lund, USACE Asheville Field Office  
Marella Buncick, USFWS  
David Cox, NCWRC  
File Copy  
Central Files



HENDERSON COUNTY  
OFFICE OF THE COUNTY MANAGER

100 NORTH KING STREET  
HENDERSONVILLE, N.C. 28792-5097  
PHONE (828) 697-4809 FAX (828) 698-6014  
www.henderson.lib.nc.us/county

David E. Nicholson  
County Manager

Avalina Merrill  
Administrative Assistant

January 10, 2001

William D. Gilmore, P.E., Manager  
NC Department of Transportation  
Project Development and Environmental Analysis  
1548 Mail Service Center  
Raleigh NC 27699-1548

Dear Mr. Gilmore,

I am writing in response to your December 6, 2000 letter concerning the bridge replacement projects for Henderson County that are contained within the NCDOT's 2002-2008 Draft Transportation Improvement Program. Attached is a report that contains our comments on these projects.

Should you have any additional questions, please contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "David E. Nicholson", is written over a faint, larger version of the same signature.

David E. Nicholson  
County Manager

DEN/abm

Attachment

Cc: Board of Commissioners  
Transportation Advisory Committee Members

---

Henderson County Government Report on  
NCDOT BRIDGE REPLACEMENT PROJECTS  
B-3475, B-3662, B-3663, B-3665, B-3666 and B-3857

January 10, 2001

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Henderson County appreciates the opportunity to study and comment on the proposed bridge replacement projects identified by NCDOT as B-3475, B-3662, B-3663, B-3665, B-3666 and B-3857. The following report contains the County's comments regarding the projects.

**B-3475 - Bridge No. 356 on SR 1127 (Caswell Street) over Wash Creek**

Bridge No. 356 is located in the City of Hendersonville on Caswell Street, between Washington Street and Lily Pond Road, in an area known as "Busy Bend." According to the Flood Insurance Rate map for that area, the area around and including the bridge is in the flood zone for Wash Creek.

The area around the bridge is commercial in character. Dal-Kawa Cycle Center is located adjacent to the bridge on the south and an automobile detailing business is located next to the bridge to the north. There are a number of other small businesses and a couple of churches in the area as well as the Whitmire Activity Building/Tom's Park owned by the City of Hendersonville. There is a considerable amount of traffic that enters/exits Hendersonville via Kanuga Road. Residents and businesses around the bridge area as well as those that use Kanuga Road to access Hendersonville will be impacted. The detour that is shown on the NCDOT map (using Lily Pond Drive, West Allen Street and Washington Street), is approximately 0.5 mile in length.

Erica Thompson, Program Coordinator for the *Start with Your Heart* program with the Henderson County Partnership for Health, Inc., has been working on a Bicycle/Pedestrian Assessment Project in the Henderson County. At her request, Henderson County has agreed to ask NCDOT to consider widening the sidewalk on Bridge No. 356 when the bridge itself is widened. According to Ms. Thompson, the current sidewalk is too narrow.

Henderson County understands that the City of Hendersonville is submitting its own comments regarding the subject bridge project as well.

**B-3662 - Bridge No. 20 on SR 1006 (Howard Gap Road) over Featherstone Creek**

The subject bridge is located on Howard Gap Road in an area that is mainly residential in character but which also contains several churches, small businesses and an industry. The intersection of Howard Gap Road and Brookside Camp Road is located to the northwest. Vulcan Materials (including the APAC asphalt plant) is located at the intersection of Howard Gap Road and Clear Creek Road, to the southeast. The Mountain Home Volunteer Fire and Rescue department has a substation located to the southeast of the intersection of Salisbury Road and Howard Gap Road. The bridge is located in the Mountain Home Fire District.

The "studied detour route" shown on the map provided by NCDOT requires that one travel approximately 2.5 miles using Brookside Camp Road and Salisbury Road, both of which are paved. The route passes through a residential area once it leaves Howard Gap Road and it is somewhat hilly and curvy. Heavy truck traffic and others that make regular use of Howard Gap

Road as north-south route may find US 25 to be a better alternative. Access to/from US 25 may be made via the new road to Park Ridge Hospital, Brookside Camp Road, Clear Creek Road, and, possibly, Balfour Road.

Residents and business owners in the area of the proposed bridge project will probably be impacted the most. However, there may be impacts on alternative routes due to the need to detour trucks, including those from Vulcan, around the bridge construction project.

While it is probably unlikely that NCDOT would undertake the subject project and project B-3664 on Brookside Camp Road simultaneously, the County would like to specifically request that the projects be scheduled at different times. If they were to occur together, the impacts on the area would be intensified, particularly because the bridge to be replaced on Howard Gap Road is on the detour route for the Brookside Camp Road bridge project (described below).

**B-3663 - Bridge No. 320 on SR 1212 (Old Homestead Road) over Shaws Creek**

Old Homestead Road, located off of US 64 West, has a paved surface. The subject bridge crosses Shaws Creek, adjacent to a Southern Railway track. One must cross the bridge, then the track. There is no railroad crossing signal on the road.

There are a number of residences that are served by Old Homestead Road once it crosses Shaws Creek. The area is zoned R-30 by the County and is within a WS-IV Water Supply Watershed. The land immediately adjacent to the bridge is undeveloped. According to the Flood Insurance Rate Map of the area, Shaws Creek is shown to have a narrow area of flood zone which includes the area around the bridge.

As one approaches the bridge from US 64, there is a gravel area adjacent to, but at a lower elevation than, the left side of the bridge. Rocky Hyder, Henderson County Fire Marshal/Emergency Management Director, identified this as a fire department draft point. The draft point would allow water to be drawn from Shaws Creek if needed to fight a fire in the vicinity.

Because there is no outlet from Old Homestead Road, the NCDOT map does not show a detour route. Homes on the southwestern end of Old Homestead Road as well as those on Summer Rain Drive, Kilpatrick Road and Abbey Lane will be impacted during replacement of the bridge. Henderson County expects that NCDOT will maintain some sort of bridge so residents may continue to use Old Homestead Road while the bridge is upgraded. Also, the fire department draft point should be taken into consideration during the project.

**B-3664 - Bridge No. 21 on SR 1528 (Brookside Camp Road) over Mud Creek**

Bridge No. 21 on Brookside Camp Road is located south of the I-26 overpass. Double Tee Golf Center is located to the northwest and Wolverine Paintball is located to the northeast. Vacant fields are located immediately adjacent to the bridge, along Mud Creek. The bridge is in a low area that has been subject to flooding in the past. The area is within a flood zone, according to the Flood Insurance Rate Map. It is also in the Mountain Home Fire District.

Brookside Camp Road provides access from US 25 to Grimesdale, Hickory Hills and several smaller subdivisions. It also serves to connect US 25 to Howard Gap Road and the residences and businesses in that area.



The detour shown on the map provided by NCDOT is comprised of a loop, approximately 6.7 miles in length, which uses Brookside Camp Road, US 25, Berkeley Road, Balfour Road, Clear Creek Road and Howard Gap Road. The detour passes over another bridge proposed for replacement, bridge No. 20 over Featherstone Creek (see B-3663, above). It is possible that to avoid some of the curves on Balfour Road, some detoured truck traffic may take US 25 to either the new road over I-26 (to Park Ridge Hospital) or to Clear Creek Road to get to Howard Gap Road.

The replacement of the bridge may cause some inconvenience to area residents and to business owners. According to Rocky Hyder, Henderson County Fire Marshal/Emergency Management Director, emergency services personnel and local property owners are probably accustomed to using alternate routes because of the flooding history of the road.

**B-3665 - Bridge No. 265 on SR 1791 (Ballenger Road) over North Branch, Bat Fort Creek**

Ballenger Road is located to the east of I-26, between Tracy Grove Road and Upward Road. Land Uses in the area around the bridge include Lakewood RV Park and some single-family dwellings. The Flood Insurance Rate Map for the area shows the land in the vicinity of the bridge as being in a flood zone.

The detour shown on the NCDOT map makes use of Tracy Grove Road and McMurray Road, both of which are paved. Much of the northern end of Mc Murray Road consists of orchards and some single-family dwellings. As one approaches Upward Road, there are some commercial uses, including an antique shop, a quilt shop, a produce stand, an RV supply store and the Dish Barn. A commercial project is currently underway near the intersection of Upward Road and McMurray Road. Since Ballenger Road is not a major thoroughfare, the bridge project is more likely to affect local traffic. The detour will probably increase the number of vehicles entering/exiting Upward Road near the I-26 ramps.

**B-3666 - Bridge No. 53 on SR 1799 (Deep Gap Road) over North Branch, Hungry River**

The subject bridge on Deep Gap Road is the third bridge as one travels east along the road. While the majority of Deep Gap Road is paved, the road has a gravel surface beginning at a point just before the subject bridge.

The eastern end of Deep Gap Road has a few single family dwellings, however much of the land, particularly that near the bridge, is undeveloped. Deep Gap Road has a number of curves as one descends into the river valley. Because there is only "one way in," the NCDOT map does not show a detour route.

Since Deep Gap road is not a "through" road, people would need to have a reason to travel its full length. That property (or properties) accessed by Deep Gap Road beyond Bridge No. 53 will be impacted primarily. Hungry River LLC is listed as the owner of approximately 2073 acres at and beyond the subject bridge.

**B-3857 - Bridge No. 8 on SR 1314 (Ladson Road) over Boylston Creek**

The subject bridge is located on Ladson Road approximately 0.2 mile from its intersection with NC 191. Land use in the area surrounding the bridge is agricultural, except that there is one dwelling just to the southwest of the bridge. Other residences are located further along Ladson Road. The bridge is located in a flood zone, according to the Flood Insurance Rate Map for the

area. The area around the bridge is in the County's R-30 zoning district and it is also within the WS-IV Water Supply Watershed.

The detour route shown on the map provided by NCDOT requires one to travel along Banner Farm Road and Schoolhouse Road, which will add several miles to the trip for those who normally use Ladson Road. The detour route also passes by Mills River Elementary School.

There is a change in fire districts as one travels along Ladson Road. Mills River Fire and Rescue services the portion of Ladson Road near the subject bridge while the area further south of the bridge is serviced by Etowah-Horse Shoe Fire and Rescue. According to Rocky Hyder, Henderson County Fire Marshal/Emergency Management Director, both departments typically respond to all calls in the area. However, for the Mills River department to respond to the area in its district that is south of the bridge, it will have to use the proposed detour along Schoolhouse Road, which will probably increase its response time slightly.

#### Other General Comments

County staff did not have a chance to fully investigate the environmental conditions in the areas around the bridges other than to note areas that may be subject to flooding. However, as with any projects undertaken near waterways, the County expects that NCDOT will use erosion and sedimentation controls and other measures to minimize negative impacts on water quality.

Also, because of ongoing projects in the County to establish safe pedestrian walkways and bike routes adjacent to roadways, the County suggests that, when reasonable and feasible, NCDOT consider ways to improve the bridges for these purposes as well as for vehicle travel.

Finally, if it is not already a customary practice, Henderson County suggests that some time prior to initiation of each bridge replacement project, it would be helpful if NCDOT forwarded information regarding the actual detours to the Superintendent of Henderson County Public Schools in order for County bus routes to be adjusted accordingly. In addition, such detour information would be helpful to other County departments and agencies. Therefore, NCDOT should also consider sending such information to the County Manager's office for distribution.

*Note: Henderson County does not participate in the federal flood insurance program. Flood Insurance Rate Maps referenced in comments for projects in the County's jurisdiction (B-3662, B-3663, B-3665, B-3666 and B-3857) are dated March 1, 1982. The City of Hendersonville does participate in the federal flood insurance program. The Federal Insurance Rate Map referenced in the comments for the project in the City's jurisdiction (B-3475) is dated January 20, 1982.*

## Wetland Rating Worksheet

Project name B-3615; Bridge #265 over DUNN CREEK Nearest road SR1791  
 County Henderson Name of Evaluator Eco Science / Shay GARROCK Date 1/23/01

### Wetland location

- on pond or lake
- on perennial stream
- on intermittent stream
- within interstream divide
- other

### Adjacent land use (within 1/2 mile upstream)

- forested/natural vegetation 20 %
- agriculture, urban/suburban 80 %
- impervious surface 0 %

### Dominant Vegetation

- Soil Series Turagentic Dystrachrepts - Cadorus
- predominantly organic-humus, muck, or peat
  - predominantly mineral- non-sandy
  - predominantly sandy
- (1) Tulip poplar  
 (2) Boxelder  
 (3) Red maple

### Flooding and Wetness

- semipermanently to permanently flooded or inundated
- seasonally flooded or inundated
- intermittently flooded or temporary surface water
- no evidence of flooding or surface water

### Hydraulic Factors

- steep topography
- ditched or channelized
- wetland width  $\geq$  50 feet

### Wetland Type (select one)

- Bottomland hardwood forest
- Headwater forest
- Swamp forest
- Wet flat
- Pocosin
- Pine savanna
- Freshwater marsh
- Bog/fen
- Ephemeral wetland
- Other

\*The rating system cannot be applied to salt or brackish marshes

Water storage	<u>2</u>	*	4	=	<u>8</u>	Total score <u>64</u>
Bank/Shoreline stabilization	<u>4</u>	*	4	=	<u>16</u>	
Pollutant removal	<u>4</u>	*	5	=	<u>20</u>	
Wildlife habitat	<u>1</u>	*	2	=	<u>2</u>	
Aquatic life value	<u>4</u>	*	4	=	<u>16</u>	
Recreation/Education	<u>2</u>	*	1	=	<u>2</u>	

Add 1 point if in sensitive watershed and  $>$ 10% nonpoint disturbance within 1/2 mile upstream

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

Project/Site: <u>B-3665, SR1791 over Dunn Creek</u> Applicant/Owner: _____ Investigator: <u>Eco Science / Shaw Construction</u>	Date: <u>1/23/01</u> County: <u>Henderson</u> State: <u>NC</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No (If needed, explain on reverse)	Community ID: <u>Disturbed</u> Transect ID: <u>VA</u> Plot ID: <u>VA06</u>

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Pinus strobus</u>	<u>C</u>	<u>FACU</u>	9. _____	_____	_____
2. <u>Quercus falcata</u>	<u>C</u>	<u>FACU-</u>	10. _____	_____	_____
3. <u>Acer rubrum</u>	<u>C</u>	<u>FAC</u>	11. _____	_____	_____
4. <u>Ilex opaca</u>	<u>S</u>	<u>FAC-</u>	12. _____	_____	_____
5. <u>Ligustrum sinense</u>	<u>S</u>	<u>FAC</u>	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) 40%

Remarks:

**HYDROLOGY**

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Recorded Data Available	<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators:</b> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <span style="float:right">NONE</span> <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands <b>Secondary Indicators (2 or more required):</b> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations:  Depth of Surface Water: <u>N/A</u> (in.) Depth to Free Water in Pit: <u>N/A</u> (in.) Depth to Saturated Soil: <u>N/A</u> (in.)	
Remarks: <u>No Hydrology Present</u>	

**SOILS**

Map Unit Name (Series and Phase): <u>Codurus</u>		Drainage Class: <u>moderate to poorly well drained</u>	
Taxonomy (Subgroup): <u>Fluvaquentic Dystrachrepts</u>		Field Observations Confirm Mapped Type: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
<b>Profile Description:</b>			
Depth Concretions, (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)
		Abundance/Contrast	Texture, Structure, etc.
<u>0-1</u>			<u>organic</u>
<u>1-10</u>		<u>10YR 3/2</u>	<u>none</u>
<u>10+</u>		<u>10YR 5/4</u>	<u>none</u>
Hydric Soil Indicators: <u>NONE</u>			
<input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Sulfidic Odor <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Reducing Conditions <input type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Concretions <input type="checkbox"/> High Organic Content in Surface layer in Sandy Soils <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric Soils List <input type="checkbox"/> Other (Explain in Remarks)	
Remarks: <u>NO hydric soil indicators</u>			

**WETLAND DETERMINATION**

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (Circle) Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (Circle) Hydric Soils Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (Circle)	(Circle) Is this Sampling Point Within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (Circle)
Remarks:	

Approved by HQUSACE 2/92

HJL  
8/93

VA06 wet

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

Project/Site: <u>B-3665; SR 1791 over Dunn Creek</u>	Date: <u>1/23/01</u>
Applicant/Owner: <u>NCDOT</u>	County: <u>HENDERSON</u>
Investigator: <u>Eco Science / Shaw Gardner</u>	State: <u>NC</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No	Community ID: <u>Mixed Deciduous</u>
Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No	Transect ID: <u>VA</u>
Is the area a potential Problem Area? <input checked="" type="radio"/> Yes <input type="radio"/> No	Plot ID: <u>VA06</u>
(If needed, explain on reverse)	

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Acer rubrum</u>	<u>C</u>	<u>FAC</u>	9. _____	_____	_____
2. <u>Acer negundo</u>	<u>C</u>	<u>FACW</u>	10. _____	_____	_____
3. <u>Pinus strobus</u>	<u>C</u>	<u>FACU</u>	11. _____	_____	_____
4. <u>Liriodendron tulipifera</u>	<u>C</u>	<u>FAC</u>	12. _____	_____	_____
5. <u>Ipsum sinense</u>	<u>S</u>	<u>FAC</u>	13. _____	_____	_____
6. <u>Carex sp.</u>	<u>H</u>	<u>-</u>	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) 80%

Remarks:

**HYDROLOGY**

<p>Recorded Data (Describe in Remarks):</p> <p><input type="checkbox"/> Stream, Lake or Tide Gauge</p> <p><input type="checkbox"/> Aerial Photographs</p> <p><input type="checkbox"/> Other</p> <p><input checked="" type="checkbox"/> No Recorded Data Available</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p><input checked="" type="checkbox"/> Inundated</p> <p><input checked="" type="checkbox"/> Saturated in Upper 12 Inches</p> <p><input type="checkbox"/> Water Marks</p> <p><input type="checkbox"/> Drift Lines</p> <p><input checked="" type="checkbox"/> Sediment Deposits</p> <p><input type="checkbox"/> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p><input checked="" type="checkbox"/> Oxidized Root Channels in Upper 12 Inches</p> <p><input checked="" type="checkbox"/> Water-Stained Leaves</p> <p><input checked="" type="checkbox"/> Local Soil Survey Data</p> <p><input type="checkbox"/> FAC-Neutral Test</p> <p>Other (Explain in Remarks)</p>
<p>Field Observations:</p> <p>Depth of Surface Water: <u>4.0</u> (in.)</p> <p>Depth to Free Water in Pit: <u>-</u> (in.)</p> <p>Depth to Saturated Soil: <u>0</u> (in.)</p>	
Remarks:	

SOILS

VH06 WET

Map Unit Name (Series and Phase): <u>Codurus</u>		Drainage Class: <u>moderately to poorly well drained</u>	
Taxonomy (Subgroup): <u>Fluvaquentic Dystrochrepts</u>		Field Observations Confirm Mapped Type: Yes <input type="radio"/> No <input checked="" type="radio"/>	
<b>Profile Description:</b>			
Depth Concretions, (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)
			Mottle Abundance/Contrast
			Texture, Structure, etc.
<u>0-1</u>			
<u>1-5</u>		<u>10YR 3/2</u>	<u>none</u>
<u>5+</u>		<u>10YR 4/1</u>	<u>10YR 4/6</u>
			<u>organic</u>
			<u>clay loam</u>
Hydric Soil Indicators:			
<input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Sulfidic Odor <input type="checkbox"/> Aquic Moisture Regime <input checked="" type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Concretions <input type="checkbox"/> High Organic Content in Surface layer in Sandy Soils <input type="checkbox"/> Organic Streaking in Sandy Soils <input checked="" type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric Soils List <input type="checkbox"/> Other (Explain in Remarks)	
Remarks:			

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes No (Circle)	(Circle)
Wetland Hydrology Present?	Yes No	
Hydric Soils Present?	Yes No	Is this Sampling Point Within a Wetland? Yes No
Remarks:		

Approved by HQUSACE 2/92

HJL  
8/93