STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

October 6, 2004

US Army Corps of Engineers
Raleigh Regulatory Field Office
6508 Falls of the Neuse Road, Suite 120
Raleigh, North Carolina 27615

ATTENTION: Mr. Eric Alsmeyer
NCDOT Coordinator

Dear Mr. Alsmeyer:

Subject: **Nationwide 23 application and Buffer Certification Application,** for the replacement of Bridge No. 215 on SR 1007 (Poole Road) over Buffalo Creek, Wake County. Federal Aid Project No. BRSTP-1007(5), State Project No. 82407301, NCDOT Division 5, TIP Project No. B-3522, WBS Element 33131.1.1.

Please find enclosed a copy of the CE, Construction Consultation, permit drawings and ½ size plans, and a copy of the EEP request for the above referenced project. The original CE document states that the existing two lane bridge on SR 1007 will be replaced with a new two lane 275 foot long bridge to the north of the existing alignment. The Construction Consultation dated 7-3-03 changes the preferred alternative. The new alternative replaces the bridge on existing alignment. During construction, traffic will be routed onto a temporary on-site detour just south of the existing bridge. The new structure will be a cored slab bridge approximately 100 feet in length. There are 20 ft of temporary impacts to Buffalo Creek due to the relocation of a sewer line. Permanent wetland impacts total 0.03 acres and buffer impacts total 9,435 ft^2.

Impacts to Waters of the U.S.

Impacts to wetlands are permanent. Wetland impacts consist of 0.02 acres of fill and 0.01 acres of mechanized clearing.

Demolition: Bridge No. 215 is composed of timber with an asphalt-wearing surface. Therefore no fill is expected to result from removal of the existing bridge. NCDOT's Best Management Practices for bridge demolition and removal will be adhered for the removal of this bridge.

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.DOH.DOT.STATE.NC.US

LOCATION:
2728 CAPITOL BOULEVARD
PARKER LINCOLN BUILDING, SUITE 168
RALEIGH NC 27699

Utilities

Temporary impacts will occur to 20 feet (0.01 ac) of Little Creek due to the relocation of a sewer line. The sewer line will be buried under the stream by using an open cut. Directional boring methods cannot be used to bury the pipe because the sewer lines depends on gravity and pipes buried using directional boring have a variable slope. Attached to this letter, is a summary sheet and plan view sheet showing the placement of the sewer line.

Avoidance, Minimization, and Mitigation

The NCDOT is commited to incorporating all reasonable and practicable design features to avoid and minimize wetland impacts, and to provide full compensatory mitigation of all remaining wetland impacts. Avoidance measures were taken during the planning and NEPA phases; minimization measures were incorporated as part of the project design and include:

- In order to minimize impacts to the wetlands the temporary detour structure will be located to the south of the existing structure and will not result in additional wetland impacts.
- In order to minimize impacts to Buffalo Creek, no bents will be placed in the water.
- In order to protect the stream buffer, pre-formed scour holes will be placed in all four quadrants.

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. The remaining, unavoidable impacts to 0.03 acres of jurisdictional wetlands will be offset by compensatory mitigation provided by the EEP program.

Neuse River Basin Buffer Rules

As previously noted, this project is located in the Neuse River Basin (subbasin 03-04-06, HUC 03020201); therefore, the regulations pertaining to the buffer rules apply. Buffer impacts associated with this project total 4,949 ft^2 for Zone 1 and 4,486 ft^2 for Zone 2 due to the detour and construction of the new bridge. All practicable measures to minimize impacts within buffer zones were followed. According to the buffer rules, bridges are ALLOWABLE. Uses designated as allowable may proceed within the riparian buffer provided that there are no practical alternatives to the requested use pursuant to Item

(8) of this Rule. These uses require written authorization from the Division of Water Quality.

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 January 29, 2003, the Fish and Wildlife Service (FWS) lists four federally protected species for Wake County, Michaux's sumac, dwarf wedge mussel, red-cockaded woodpecker, and bald eagle.

A biological conclusion of "No Effect" was reached for the Bald Eagle, the red-cockaded woodpecker, and Michaux's sumac as reflected in the attached CE dated August 2001. No habitat is in the project area for the bald eagle, or the red-cockaded woodpecker. However there is marginal habitat for Michaux's sumac and the dwarf wedge mussel. Updated surveys for Michaux's sumac were conducted August 20, 2004 and no specimens were found, therefore a biological conclusion of "No Effect." Surveys for the dwarf wedge mussel will be conducted prior to the let date. Concurrence for the dwarf wedge mussel will be requested prior to project construction.

Regulatory Approvals

This project is being processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance with 23 CFR 771.115(b). Therefore, we do not anticipate requesting an individual permit but propose to proceed under a Nationwide 23 in accordance with 67 FR 2020, 2082, Jan 15, 2002. We anticipate a 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 Environment and Natural Resources, Division of Water Quality, for their records.

Neuse River Riparian Buffer Rules: NCDOT requests that the NC Division of Water Quality review this application and issue a written authorization for a Neuse River Riparian Buffer Certification.

A copy of this permit application will be posted on the NCDOT website at: http://www.ncdot.org/planning/pe/naturalunit/permit.html

If you have any questions or need additional information, please contact Brett Feulner at (919) 715-1488.

Sincerely,

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

Cc:
w/ attachment:
Mr. John Hennessy, NC Division of Water Quality (2 copies)
Mr. Travis Wilson, NCWRC
Mr. Gary Gordan, USFWS
Mr. Greg Perfetti, P.E., Structure Design

w/o attachment
Mr. David Franklin, USACE, Wilmington
Mr. Jay Bennett, P.E., Roadway Design
Mr. Omar Sultan, Programming and TIP
Mr. Art McMillan, PE, Highway Design
Mr. David Chang, P.E., Hydraulics
Mr. John Nance, P.E., Division 9 Engineer
Mr. Chris Murray, DEO
Ms. Stacy Baldwin, PDEA
Mr. John F. Sullivan, III, FHWA
Mr. Mark Staley, Roadside Environmental

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

September 24, 2004

Mr. William D. Gilmore, P.E.
EEP Transition Manager
Ecosystem Enhancement Program
1652 Mail Service Center
Raleigh, NC 27699-1652

Dear Mr. Gilmore:

Subject: **EEP Request for Mitigation** for the replacement of Bridge No. 215 on SR 1007 over Buffalo Creek, Wake County, TIP Project Number B-3522, Division 5, State Project No. 82407301, Federal Aid Project BRSTP-1007(5).

The purpose of this letter is to request that the North Carolina Ecosystem Enhancement Program (EEP) provide confirmation that the EEP is willing to provide compensatory mitigation for the project in accordance with the Memorandum of Agreement (MOA) signed July 22, 2003 by the USACE, the NCDENR and the NCDOT.

The North Carolina Department of Transportation proposes to replace Bridge No. 215 on SR 1007 in Wake County with the use of a temporary on-site detour. Jurisdictional impacts on this project occur in the Neuse River Basin. This project is on the list of projects covered by EEP.

RESOURCES UNDER THE JURISDICTION OF SECTION 404 AND 401 OF THE CLEAN WATER ACT.

We have avoided and minimized the impacts to jurisdictional resources to the greatest extent possible as described in the permit application. A copy of the permit application can be found at http://www.ncdot.org/planning/pe/naturalunit/Applications.html. The remaining impacts to jurisdictional resources will be compensated for by mitigation provided by the EEP program.

The project is located in the Piedmont Physiographic Province in Wake County in the Neuse River basin in Hydrological Cataloguing Unit 03020201.

- The wetland impacts total 0.02 acres of riverine wetland impacts. There are no stream impacts.

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
1548 MAIL SERVICE CENTER
RALEIGH NC 27699-1548

TELEPHONE: 919-733-3141
FAX: 919-733-9794

WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC

Please send the letter of confirmation to Eric Alsmeyer (USACE Coordinator) at U. S. Army Corps of Engineers, (6508 Fall of the Neuse Rd, Raleigh, NC 27615). Mr. Alsmeyer's FAX number is 876-5823. The current let date for the project is (January 18, 2004) for which the let review date is (December 7, 2004).

In order to satisfy regulatory assurances that mitigation will be performed; the NCDWQ requires a formal letter from EEP indicating their willingness and ability to provide the mitigation work requested by NCDOT. The NCDOT requests such a letter of confirmation be addressed to Mr. John Hennessy of NCDWQ, with copies submitted to NCDOT.

If you have any questions or need additional information please call Brett Feulner at 715-1488.

Sincerely,

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

cc
Mr. David Franklin, USACE
Mr. John Hennessy, DWQ
Mr. Travis Wilson, NCWWRC
Ms. Becky Fox, USEPA
Mr. Ronald Mikulak, USEPA
Mr. Gary Jordan, USFWS
Mr. John Sullivan III, P.E., FHWA
Mr. Greg Perfetti, P.E., Structure Design
Mr. Jay Bennett, P.E., Roadway Design
Mr. Omar Sultan, Project Management/ Scheduling Unit
Mr. Art McMillian, P.E., Highway Design
Mr. David Chang, P.E., Hydraulics Unit
Mr. Tracy Parrot, P.E., Division 5
Ms. Beth Harmon, EEP
Mr. Mark Staley, Roadside Environmental
Ms. Stacy Baldwin P.E., PDEA
Mr. Chris Murray, Division 5, DEO
Ms. Laurie P. Smith, CPA, EEP

Ecosystem Enhancement PROGRAM

October 19, 2004

Mr. Eric Alsmeyer
US Army Corps of Engineers
Raleigh Regulatory Field Office
6508 Falls of the Neuse Road, Suite 120
Raleigh, North Carolina 27615

Dear Mr. Alsmeyer:

Subject: EEP Mitigation Acceptance Letter:

B-3522, Bridge 215 over Buffalo Creek on SR 1007, Wake County; Neuse River Basin (Cataloging Unit 03200201); Central Piedmont Eco-Region

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide mitigation for the 0.02 acres of unavoidable riverine wetlands impacts associated with the above referenced project.

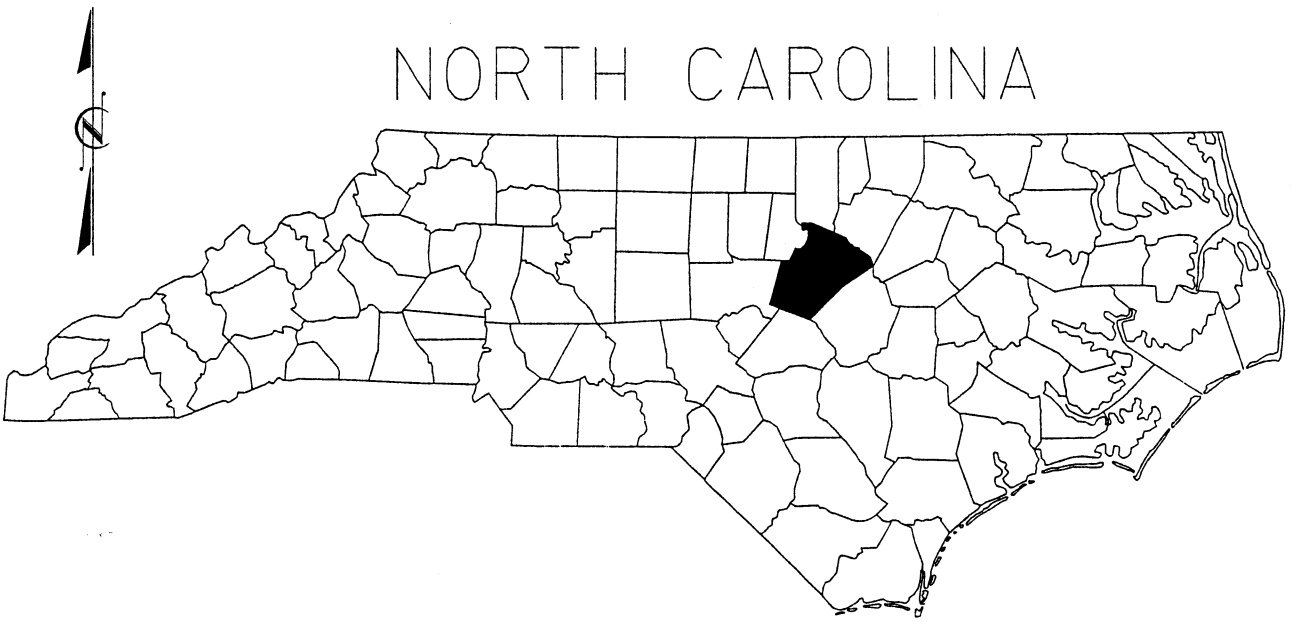
The subject project is listed in Exhibit 2 of the Memorandum of Agreement among the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U. S. Army Corps of Engineers, Wilmington District dated July 22, 2003; however, EEP intends to provide riverine wetland compensatory mitigation at a ratio up to 2:1 in Cataloging Unit 03020201 of the Neuse River Basin

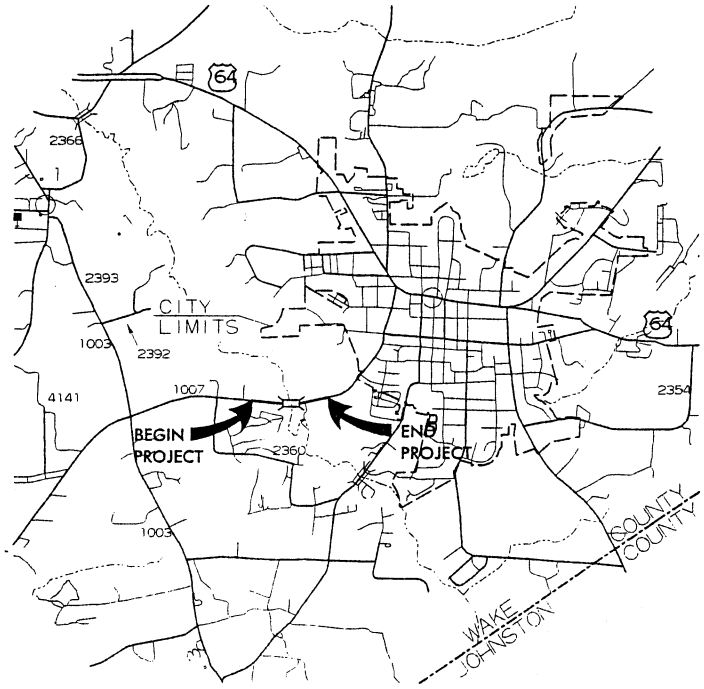
If you have any questions or need additional information, please contact Ms. Beth Harmon at (919) 715-1929.

Sincerely,

William D. Gilmore, P.E.
Transition Manager

cc: Phil Harris, Office of Natural Environment, NCDOT
John Hennessy, Division of Water Quality, Wetlands/401 Unit
File: B-3522





VICINITY MAPS

NCDOT

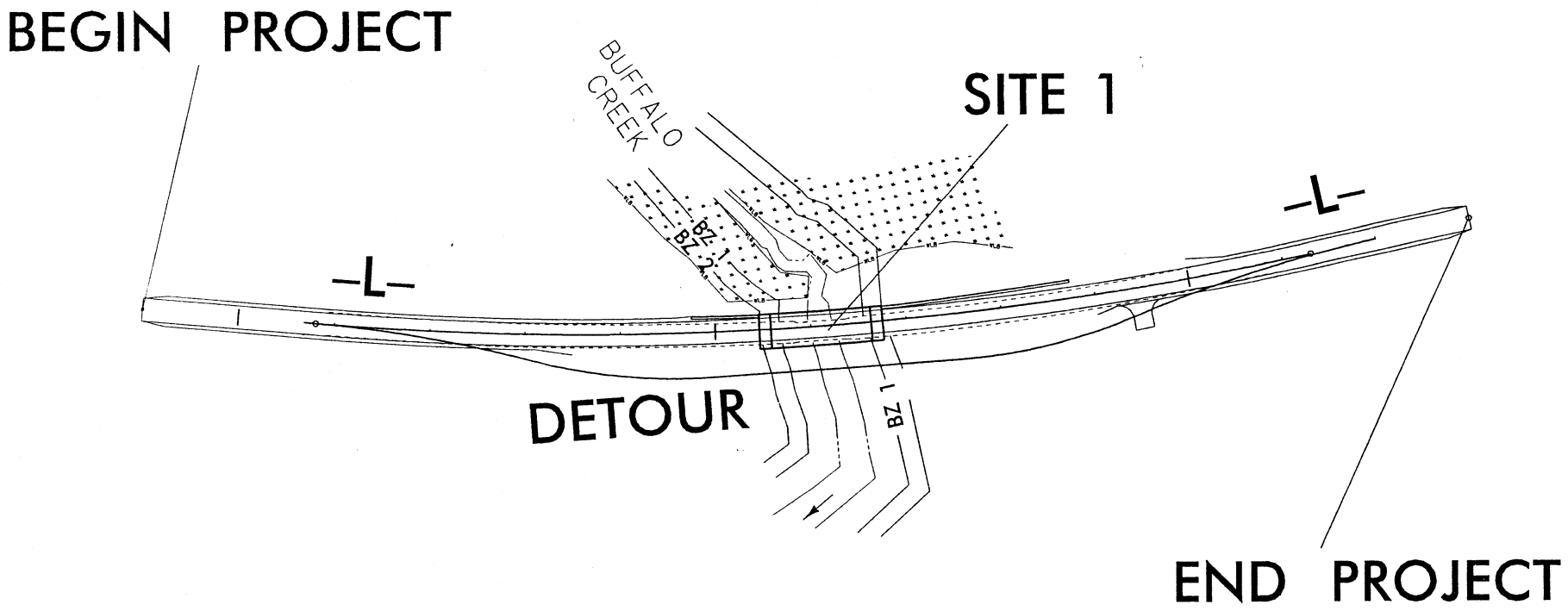
DIVISION OF HIGHWAYS

WAKE COUNTY

PROJECT: 33131.1.1 (B-3522)

BRIDGE NO. 215 OVER BUFFALO CREEK AND APPROACHES ON SR 1007 (POOLE ROAD) SOUTH OF WENDELL

SHEET 1 OF 11 8/16/03



SITE MAP

NCDOT

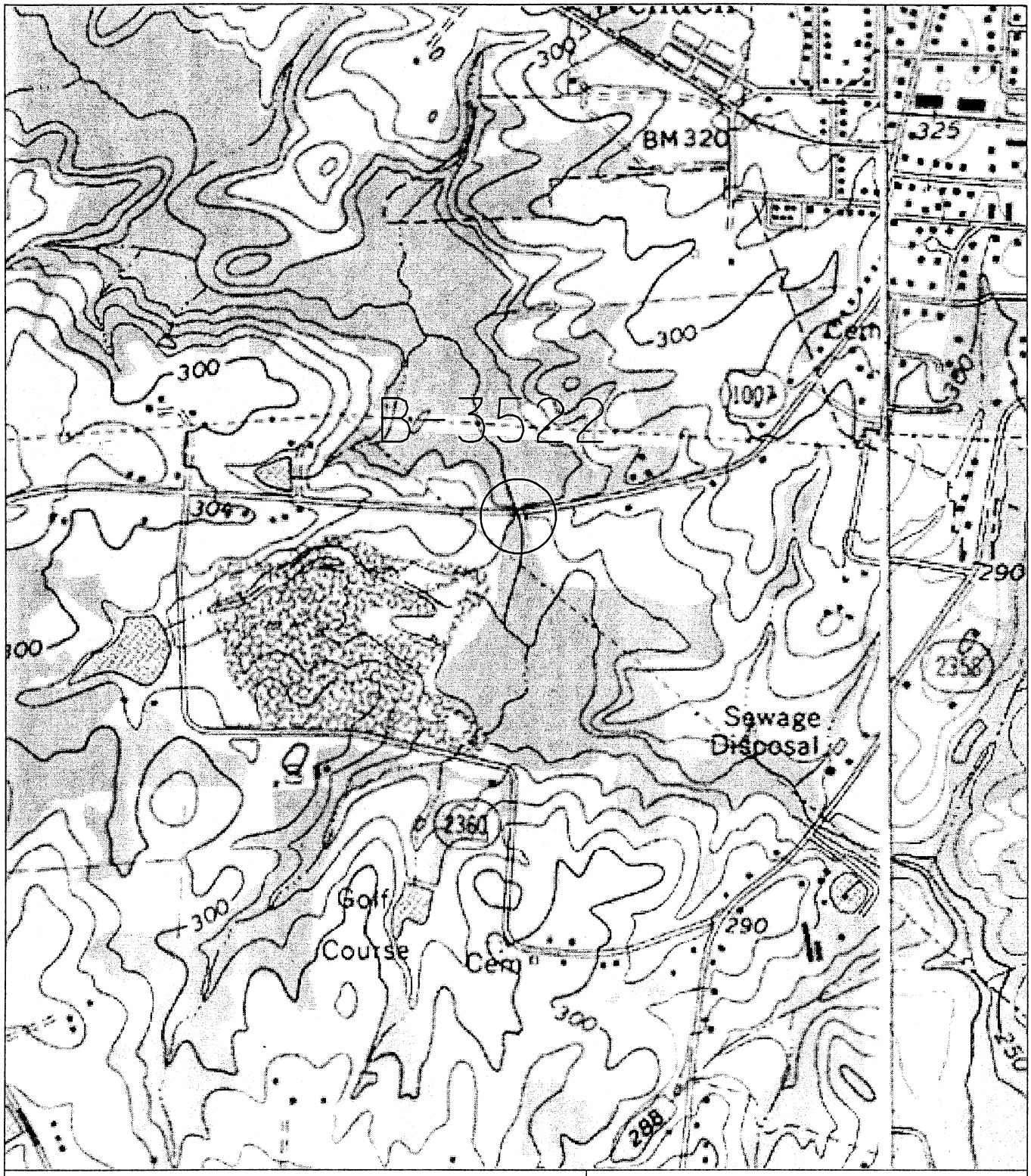
DIVISION OF HIGHWAYS

WAKE COUNTY

PROJECT: 33131.1.1 (B-3522)

BRIDGE NO. 215 OVER BUFFALO CREEK AND APPROACHES ON SR 1007 (POOLE ROAD) SOUTH OF WENDELL

SHEET 2 OF 11 8/16/03



TOPO MAP

SCALE: 1" = 1000'

DIVISION OF HIGHWAYS
WAKE COUNTY
PROJECT: 33131.1.1 (B-3522)
BRIDGE NO. 215 OVER BUFFALO CREEK
AND APPROACHES ON SR 1007
(POOLE ROAD) SOUTH OF WENDELL

WETLAND LEGEND

WLB —— WETLAND BOUNDARY

WLB / WLB — WETLAND

F F — DENOTES FILL IN WETLAND

S S — DENOTES FILL IN SURFACE WATER

P P — DENOTES FILL IN SURFACE WATER (POND)

T T — DENOTES TEMPORARY FILL IN WETLAND

E E — DENOTES EXCAVATION IN WETLAND

TS TS — DENOTES TEMPORARY FILL IN SURFACE WATER

DENOTES MECHANIZED CLEARING

FLOW DIRECTION

TB — TOP OF BANK

WE — EDGE OF WATER

C — PROP. LIMIT OF CUT

F — PROP. LIMIT OF FILL

PROP. RIGHT OF WAY

NG — NATURAL GROUND

PL — PROPERTY LINE

TDE — TEMP. DRAINAGE EASEMENT

PDE — PERMANENT DRAINAGE EASEMENT

EAB — EXIST. ENDANGERED ANIMAL BOUNDARY

EPB — EXIST. ENDANGERED PLANT BOUNDARY

WATER SURFACE

LIVE STAKES

BOULDER

CORE FIBER ROLLS

PROPOSED BRIDGE

PROPOSED BOX CULVERT

PROPOSED PIPE CULVERT
12"-48" PIPES
54" PIPES & ABOVE

(DASHED LINES DENOTE EXISTNG STRUCTURES)

SINGLE TREE

WOODS LINE

DRAINAGE INLET

ROOTWAD

RIP RAP

5 — ADJACENT PROPERTY OWNER OR PARCEL NUMBER IF AVAILABLE

PREFORMED SCOUR HOLE

LEVEL SPREADER (LS)

DITCH / GRASS SWALE

NCDOT

DIVISION OF HIGHWAYS

WAKE COUNTY

PROJECT: 33131.1.1 (B-3522)

BRIDGE NO. 215 OVER BUFFALO CREEK AND APPROACHES ON SR 1007 (POOLE ROAD) SOUTH OF WENDELL

MULKEY
ENGINEERS & CONSULTANTS

PROJECT REFERENCE NO.	SHEET NO.
B-3522	2-B

HYDRAULICS ENGINEER	HIGHWAY DESIGN ENGINEER
THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY JENNY SUMMERLIN FLEMING #25506, APRIL 26, 2004	THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY T.M. SCOTT HAYES, #19563, APRIL 21, 2004

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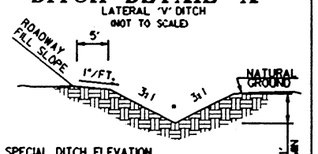
5 of 11

REVISIONS

DITCH DETAIL 'A'

LATERAL 'V' DITCH
(NOT TO SCALE)

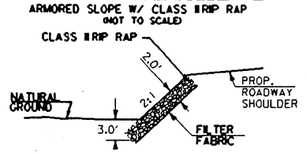


* SPECIAL DITCH ELEVATION

LINE	STA. TO STA.	DDE (FT^3)
-L-	23+25 - 25+30 RT.	1608
-L-	27+15 - 28+25 RT.	385

DITCH DETAIL 'B'

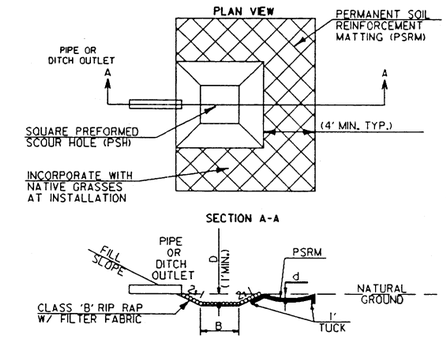
ARMORED SLOPE W/ CLASS II RIP RAP
(NOT TO SCALE)



LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC ($SQ. YDS.$)
-L-	24+00 - 25+58 LT.	330	450
-L-	25+00 - 25+58 RT.	120	150
-L-	26+63 - 29+00 LT.	530	725
-L-	26+63 - 27+50 RT.	200	300

DETAIL 'C'

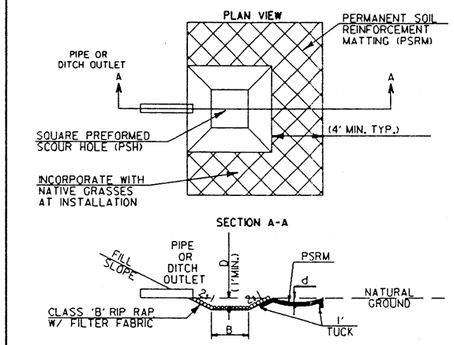
PREFORMED SCOUR HOLE
(NOT TO SCALED)



LINE	STATION	B (FT.)	D (FT.)	W_{PSR} (FT.)	d (FT.)	CLASS B RIP RAP (TONS)	DDE (FT^3)	FILTER FABRIC (YD^2)	PSRM (FT^2)
-L-	24+67 LT.	4.0	2.0	5.0	1.0	9.1	550	250	310
-L-	27+00 LT.	4.0	2.0	5.0	1.0	9.1	550	250	310

DETAIL 'D'

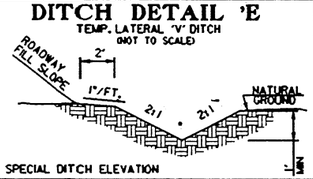
PREFORMED SCOUR HOLE
(NOT TO SCALED)



LINE	STATION	B (FT.)	D (FT.)	W_{PSR} (FT.)	d (FT.)	CLASS B RIP RAP (TONS)	DDE (FT^3)	FILTER FABRIC (YD^2)	PSRM (FT^2)
-L-	24+55 LT.	4.5	2.0	5.0	1.0	9.1	550	250	310
-L-	25+35 RT.	4.5	2.0	5.0	1.0	9.1	550	250	310
-L-	27+10 RT.	4.5	2.0	5.0	1.0	9.1	550	250	310

DITCH DETAIL 'E'

TEMP. LATERAL 'V' DITCH
(NOT TO SCALE)



* SPECIAL DITCH ELEVATION

LINE	STA. TO STA.	DDE (FT^3)
-L-	23+28 - 25+57.5 RT.	1195
-L-	27+09 - 28+85 RT.	984

DATES
FILES
STAKES

WETLAND IMPACTS

MULKEY
ENGINEERS & CONSULTANTS
P.O. BOX 30127
RALEIGH, N.C. 27622
(919) 851-1515
(919) 851-1516 (FAX)
WWW.MULKEYINC.COM

ENGLISH
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PROJECT REFERENCE NO.	SHEET NO.
B-3522	4

HYDRAULICS ENGINEER	HIGHWAY DESIGN ENGINEER
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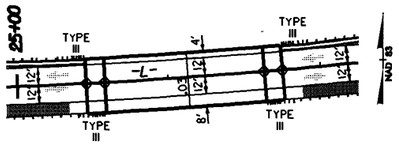
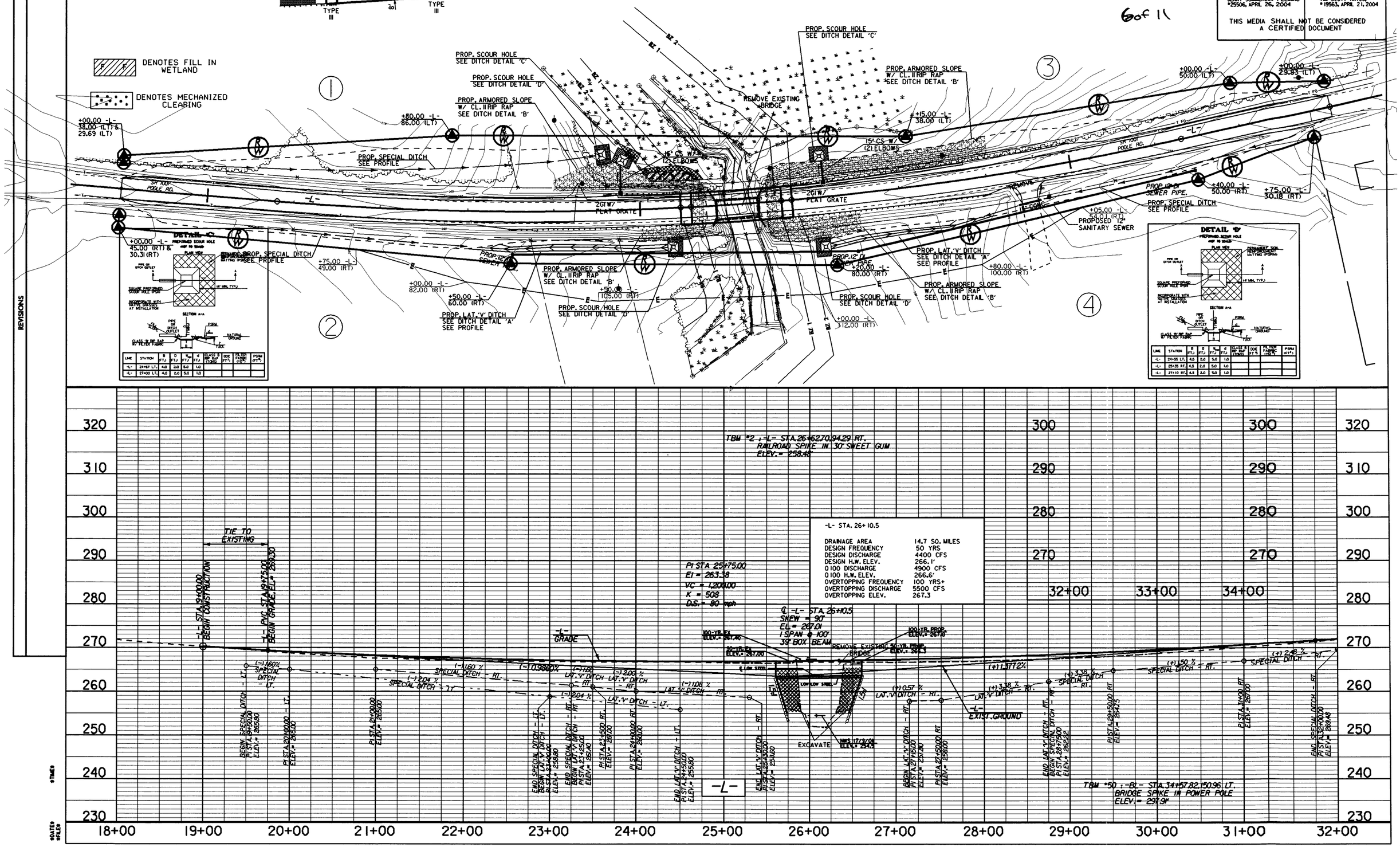
REVISIONS

DATE
BY

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING





LINE	STATION	B FT.)	D FT.)	Y_{min} FT.)	d FT.)	CLASS B RIP RAP (TONS)	CODE (FT.)	FILTER FABRIC (SQ.YDS.)	PSRM (FT.)
-L-	24+95 LT.	4.0	2.0	5.0	1.0				
-L-	24+87 LT.	4.0	2.0	5.0	1.0				
-L-	27+00 LT.	4.0	2.0	5.0	1.0				

LINE	STATION	B FT.)	B FT.)	Y_{min} FT.)	d FT.)	CLASS B RIP RAP (TONS)	CODE (FT.)	FILTER FABRIC (SQ.YDS.)	PSRM (FT.)
-L-	24+95 LT.	4.5	2.0	5.0	1.0				
-L-	25+35 RT.	4.5	2.0	5.0	1.0				
-L-	27+10 RT.	4.5	2.0	5.0	1.0				

WETLAND IMPACTS

MULKEY
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PO BOX 68167
RALEIGH, N.C. 27606
(919) 851-1815
(919) 851-1818 (FAX)
WWW.MULKEYINC.COM

ENGLISH
7 of 11

PROJECT REFERENCE NO.	SHEET NO.
B-3522	4

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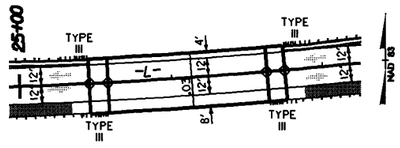
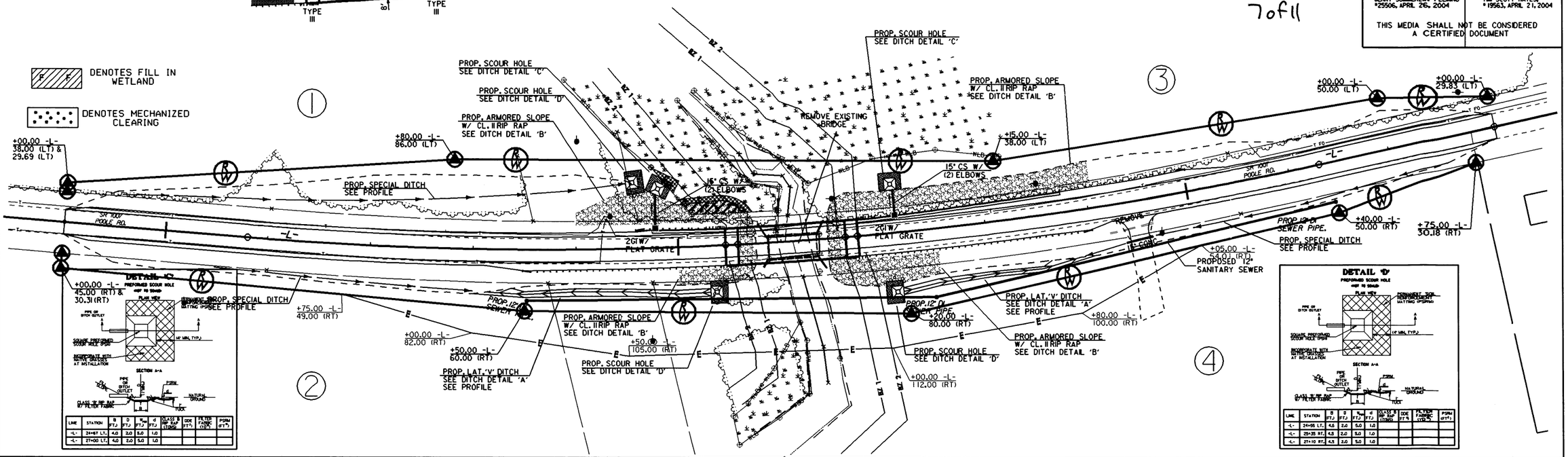
REVISIONS



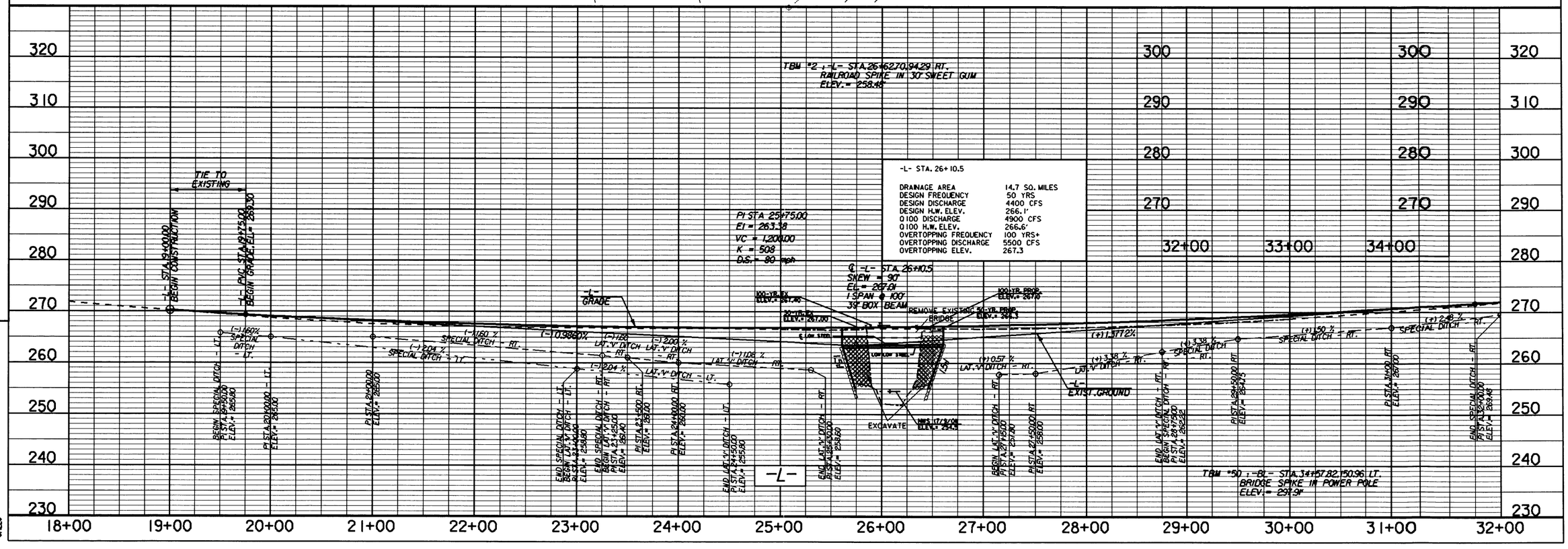
DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING



LINE	STATION	D FT.)	D FT.)	%	d FT.)	CLASS B RIP RAP (TONS)	DDE	FILTER FABRIC (SY)	PSRM (FT²)
-L-	24+98 LT.	4.0	2.0	5.0	1.0				
-L-	24+87 LT.	4.0	2.0	5.0	1.0				
-L-	27+00 LT.	4.0	2.0	5.0	1.0				

LINE	STATION	D FT.)	D FT.)	%	d FT.)	CLASS B RIP RAP (TONS)	DDE	FILTER FABRIC (SY)	PSRM (FT²)
-L-	24+98 LT.	4.5	2.0	5.0	1.0				
-L-	25+35 RT.	4.5	2.0	5.0	1.0				
-L-	27+10 RT.	4.5	2.0	5.0	1.0				



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#DATE#
#FILE#

WETLAND IMPACTS

MULKEY ENGINEERS & CONSULTANTS

PROJECT REFERENCE NO.	SHEET NO.
B-3522	2-C

HYDRAULICS ENGINEER: THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY JENNY SUMMERLIN FLEMING #25506, APRIL 26, 2004

HIGHWAY DESIGN ENGINEER: THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY TIM SCOTT HAYES, #19583, APRIL 21, 2004

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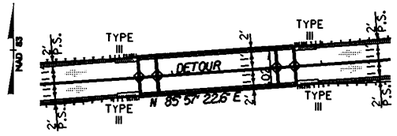
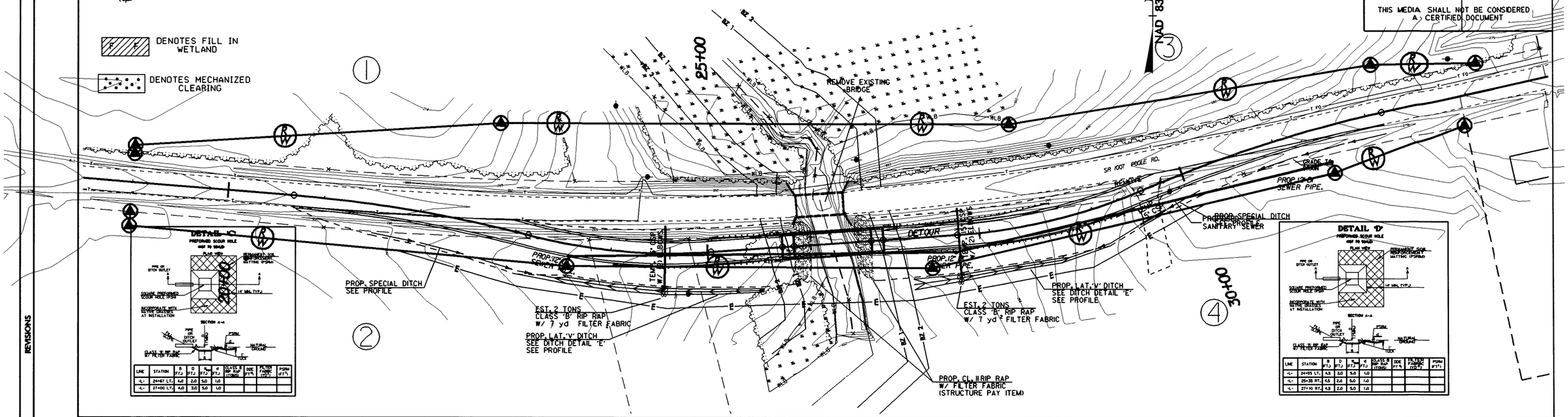
8 OF 11

NAD 83



DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

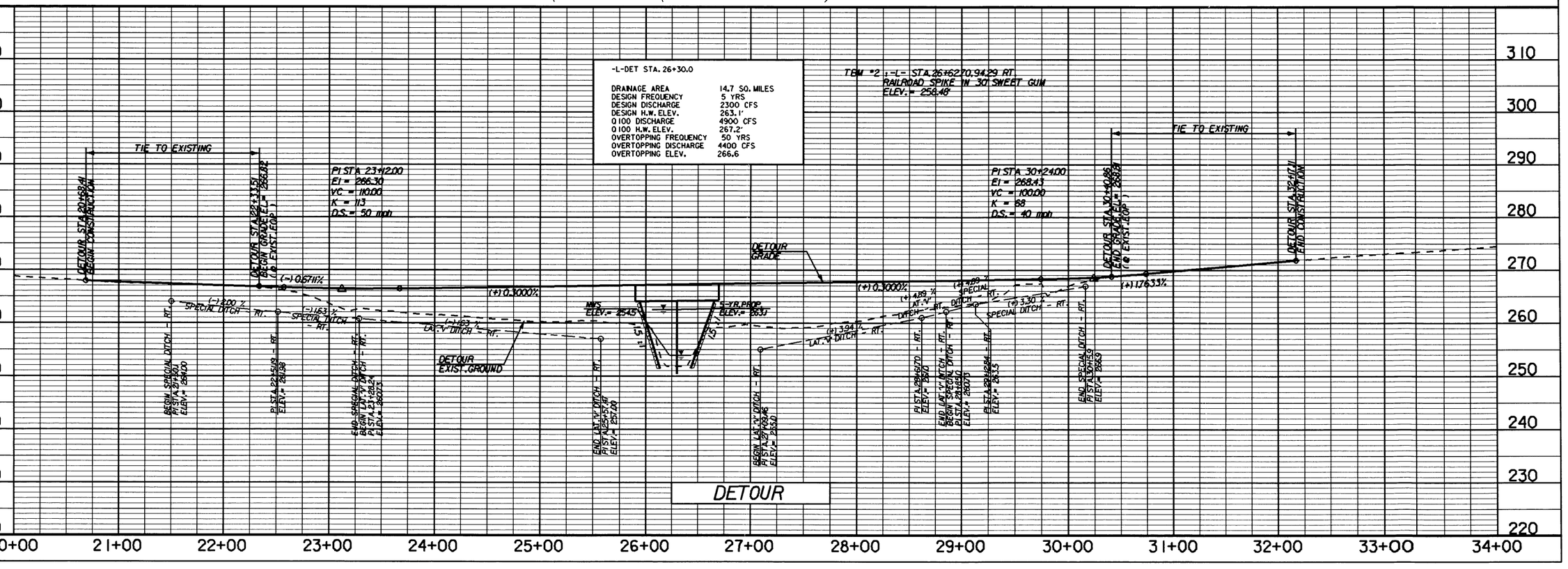


LINE	STATION	B FT.	D FT.	T_w FT.	d FT.	CLASS B RIP RAP (TONS)	SDC FT.	FILTER FABRIC (SQ.YD.)	PSRM FT.
-L-	24+83 LT.	4.0	2.0	5.0	1.0				
-L-	25+36 RT.	4.5	2.0	5.0	1.0				
-L-	27+10 RT.	4.0	2.0	5.0	1.0				

-L-DET STA. 26+30.0

DRAINAGE AREA	14.7 SQ. MILES
DESIGN FREQUENCY	5 YRS
DESIGN DISCHARGE	2300 CFS
DESIGN H.W. ELEV.	263.1'
Q100 DISCHARGE	4900 CFS
Q100 H.W. ELEV.	267.2'
OVERTOPPING FREQUENCY	50 YRS
OVERTOPPING DISCHARGE	4400 CFS
OVERTOPPING ELEV.	266.6

TEMP. -L- STA. 26+62 70.94 29 RT. RAILROAD SPIKE IN 30" SWEET GUM ELEV. = 256.48'



REVISIONS

DATE
FILE
TIME

WETLAND IMPACTS

PROJECT REFERENCE NO.	SHEET NO.
B-3522	2-C

MULKEY ENGINEERS & CONSULTANTS

ENGLISH
9 of 11

HYDRAULICS ENGINEER	HIGHWAY DESIGN ENGINEER
THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY JENNY SUMMERLIN FLEMING #25506, APRIL 26, 2004	THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY TIM SCOTT HAYES, #19563, APRIL 21, 2004

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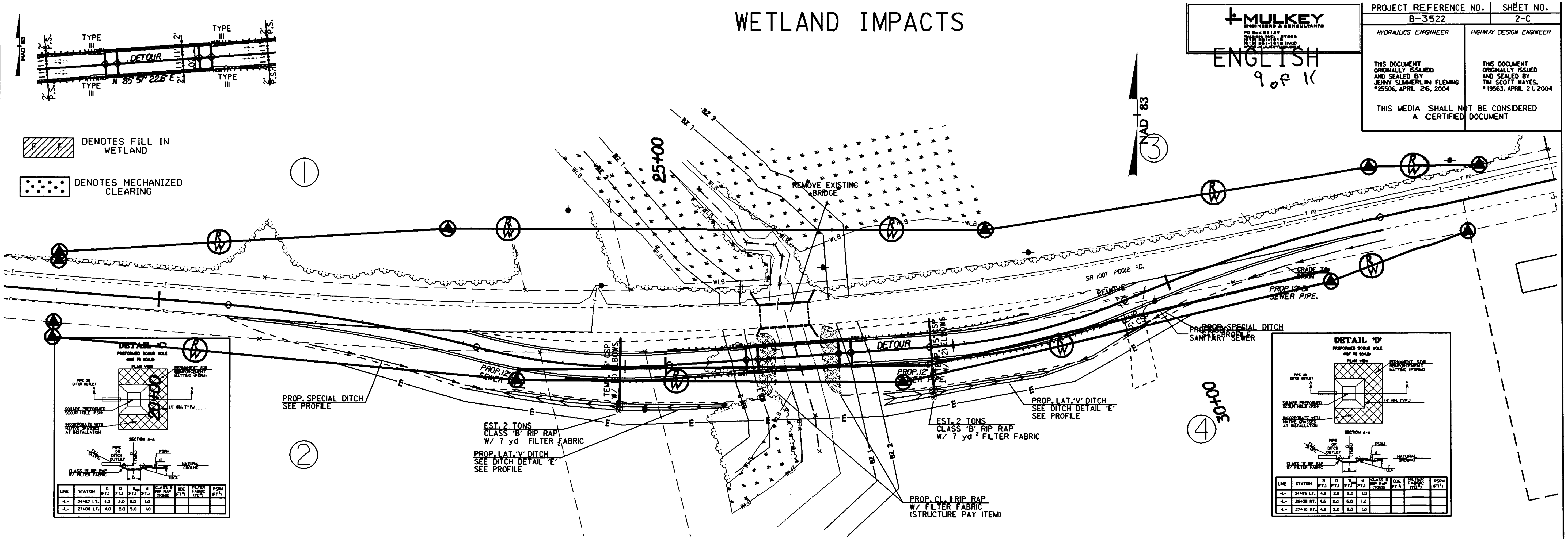
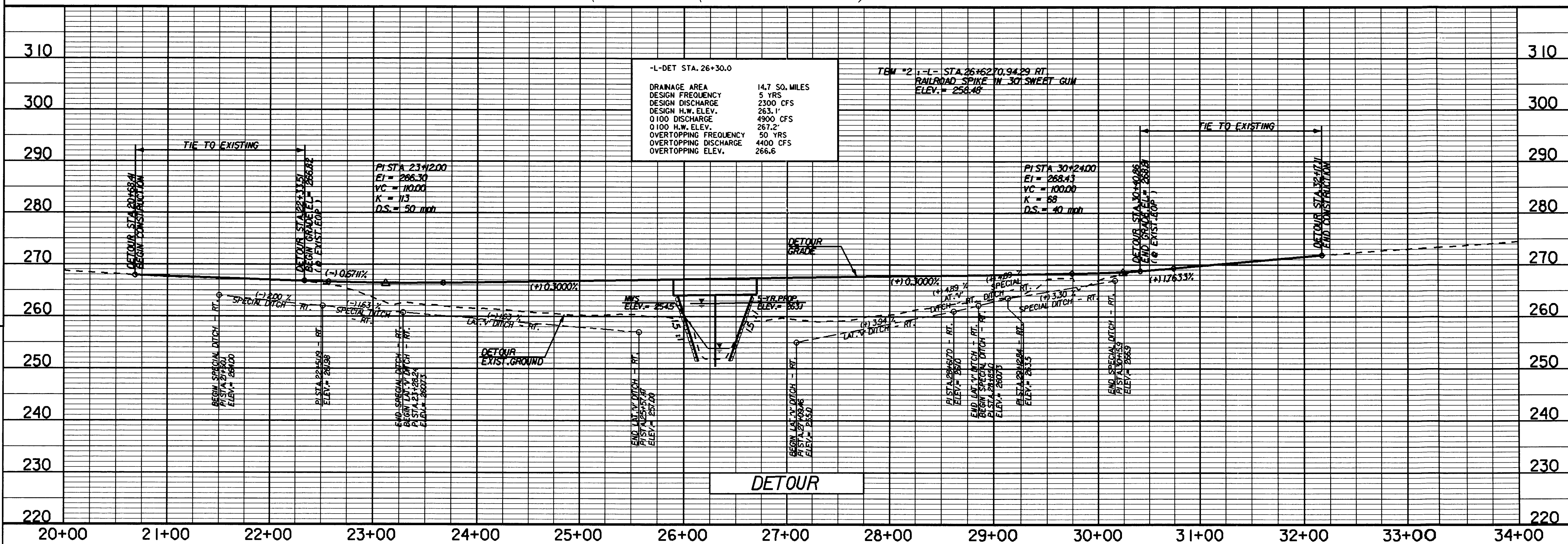
REVISIONS





PROPERTY OWNERS

NAMES AND ADDRESSES

REFERENCE NO.	NAMES	ADDRESSES
1	WACHOVIA BANK OF NC	PO BOX 27866 RALEIGH, NC 27611
2	JUNE M. FOWLER	5009 SHAMROCK DR. RALEIGH, NC 27612
3	NORTH CAROLINA BAPTIST FOUNDATION	201 CONVENTION DR. CARY, NC 27611
4	HERMAN T. MOSS	PO BOX 433 WENDELL, NC 27591

NCDOT

DIVISION OF HIGHWAYS

WAKE COUNTY

PROJECT: 33131.1.1 (B-3522)

BRIDGE NO. 215 OVER BUFFALO CREEK AND APPROACHES ON SR 1007 (POOLE ROAD) SOUTH OF WENDELL

WETLANDS IMPACT PERMIT SUMMARY

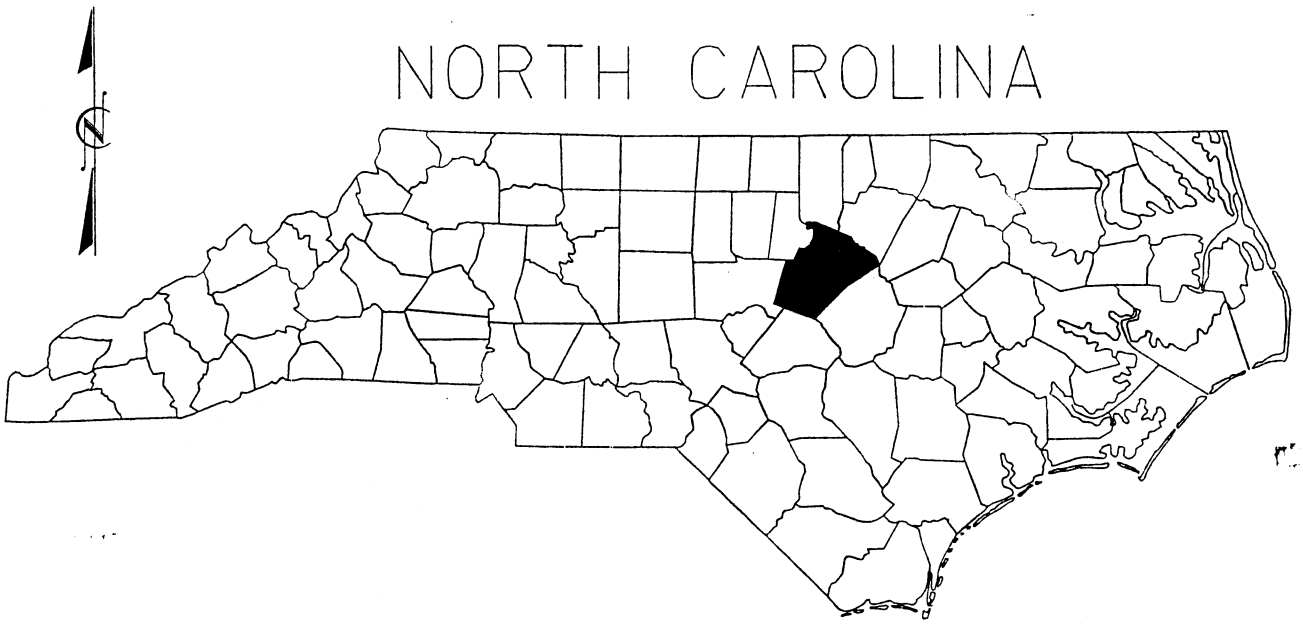
Site No.	Station (From/To)	Structure Size / Type	Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation In Wetlands (ac)	Mechanized Clearing (Method III) (ac)	Fill In SW (Natural) (ac)	Fill In SW (Pond) (ac)	Temp. Fill In SW (ac)	Existing Channel Impacted (ft)	Natural Stream Design (ft)
1	26+10.5 -L-	100', 39" BOX BEAM BRIDGE	0.02			0.012					
TOTALS:			0.02	0	0	0.012	0	0	0	0	0

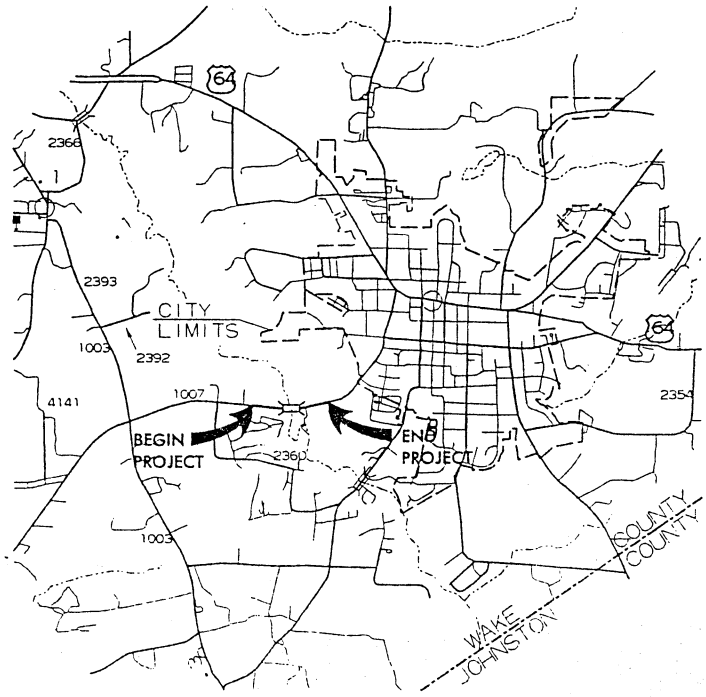
NCDOT

DIVISION OF HIGHWAYS
WAKE COUNTY
PROJECT 33131.1.1 (B-3522)
BRIDGE NO. 215 OVER BUFFALO CREEK AND APPROACHES ON SR 1007 (POOLE ROAD) SOUTH OF WENDELL

Form Revised 3/22/01

8/25/04





VICINITY MAPS

NCDOT

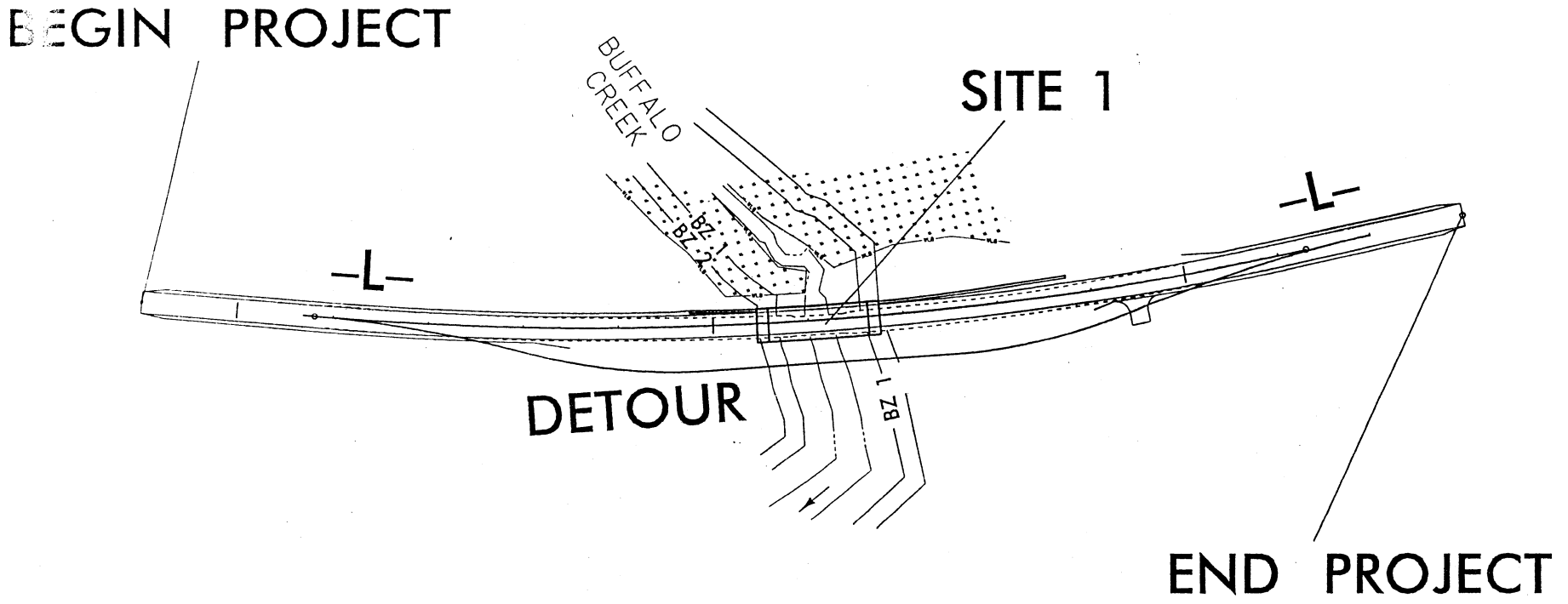
DIVISION OF HIGHWAYS

WAKE COUNTY

PROJECT: 33131.1.1 (B-3522)

BRIDGE NO. 215 OVER BUFFALO CREEK AND APPROACHES ON SR 1007 (POOLE ROAD) SOUTH OF WENDELL

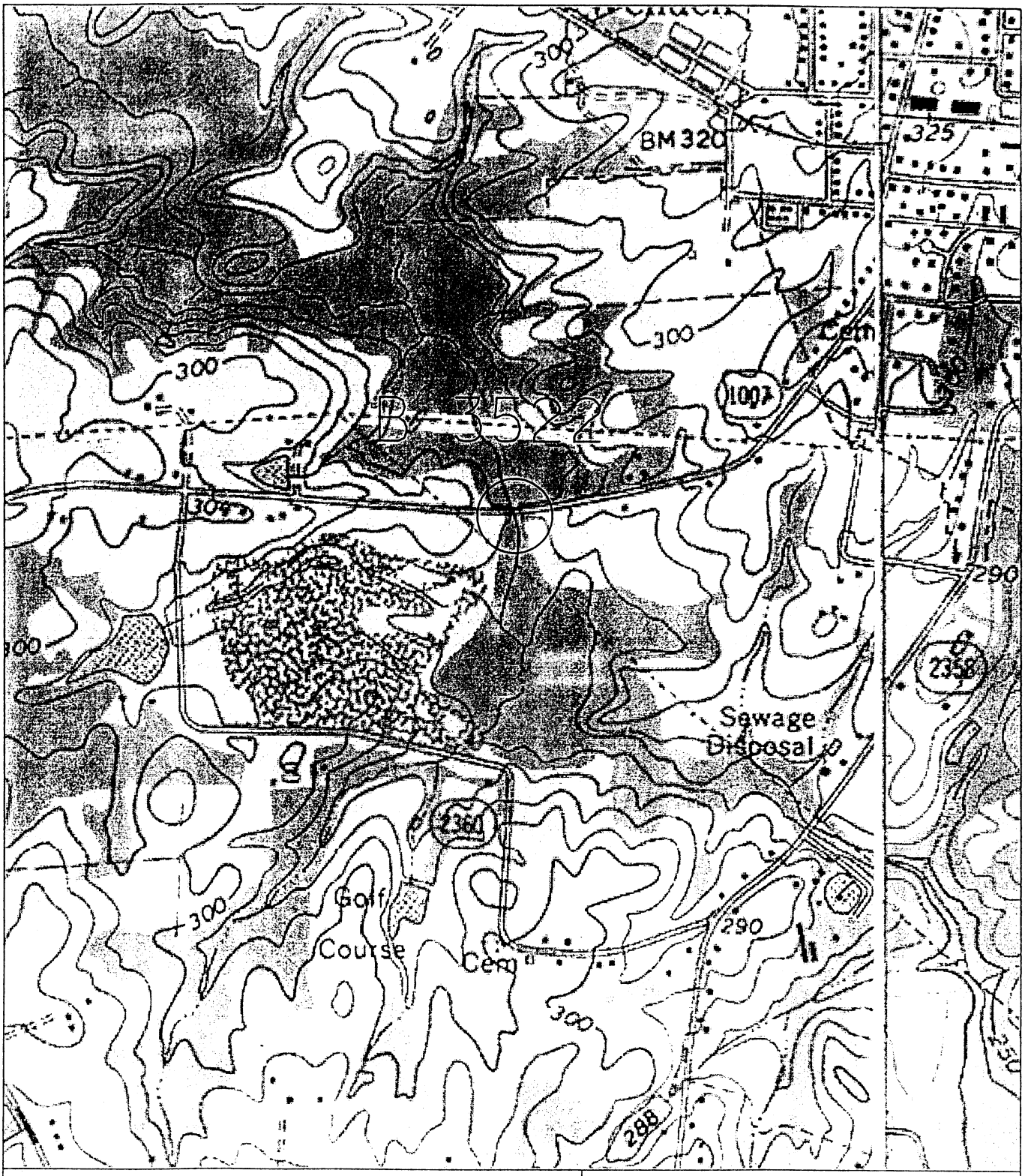
SHEET 1 OF 11 8/16/05



SITE MAP

NCDOT
DIVISION OF HIGHWAYS
WAKE COUNTY
PROJECT: 33131.1.1 (B-3522)
BRIDGE NO. 215 OVER BUFFALO CREEK
AND APPROACHES ON SR 1007
(POOLE ROAD) SOUTH OF WENDELL

SHEET 2 OF 11 8/16/03



TOPO MAP

SCALE: 1" = 1000'

DIVISION OF HIGHWAYS
WAKE COUNTY
PROJECT: 33131.1.1 (B-3522)
BRIDGE NO. 215 OVER BUFFALO CREEK
AND APPROACHES ON SR 1007
(POOLE ROAD) SOUTH OF WENDELL

SHEET 3 OF 11

8/16/03

BUFFER LEGEND

WLB — WETLAND BOUNDARY

WETLAND

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

BZ — RIPARIAN BUFFER ZONE

BZ1 — RIPARIAN BUFFER ZONE 1
30 ft (9.2m)

BZ2 — RIPARIAN BUFFER ZONE 2
20 ft (6.1m)

FLOW DIRECTION

TB — TOP OF BANK

WE — EDGE OF WATER

C — PROP. LIMIT OF CUT

F — PROP. LIMIT OF FILL

PROP. RIGHT OF WAY

NG — NATURAL GROUND

PL — PROPERTY LINE

TDE — TEMP. DRAINAGE EASEMENT

PDE — PERMANENT DRAINAGE EASEMENT

EAB — EXIST. ENDANGERED ANIMAL BOUNDARY

EPB — EXIST. ENDANGERED PLANT BOUNDARY

WATER SURFACE

LIVE STAKES

BOULDER

CORE FIBER ROLLS

PROPOSED BRIDGE

PROPOSED BOX CULVERT

PROPOSED PIPE CULVERT
12"-48" PIPES
54" PIPES & ABOVE

(DASHED LINES DENOTE EXISTNG STRUCTURES)

SINGLE TREE

WOODS LINE

DRAINAGE INLET

ROOTWAD

RIP RAP

5 — ADJACENT PROPERTY OWNER OR PARCEL NUMBER IF AVAILABLE

PREFORMED SCOUR HOLE (PSH)

LEVEL SPREADER (LS)

GRASS SWALE

NCDOT

DIVISION OF HIGHWAYS

WAKE COUNTY

PROJECT: 33131.1.1 (B-3522)

BRIDGE NO. 215 OVER BUFFALO CREEK AND APPROACHES ON SR 1007 (POOLE ROAD) SOUTH OF WENDELL

8/16/03

MULKEY ENGINEERS & CONSULTANTS

PROJECT REFERENCE NO.	SHEET NO.
B-3522	2-B

HYDRAULICS ENGINEER	HIGHWAY DESIGN ENGINEER
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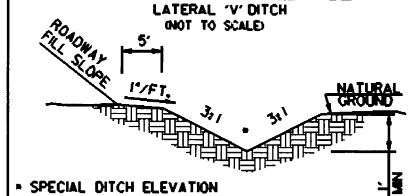
REVISIONS

DITCH DETAIL 'A

LATERAL 'V' DITCH
(NOT TO SCALE)

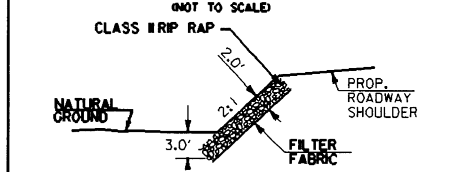


* SPECIAL DITCH ELEVATION

LINE	STA. TO STA.	DDE (FT^3)
-L-	23+25 - 25+30 RT.	1608
-L-	27+15 - 28+25 RT.	385

DITCH DETAIL 'B'

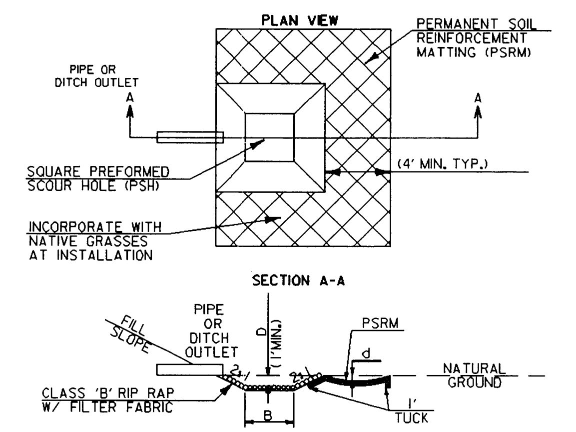
ARMORED SLOPE W/ CLASS II RIP RAP
(NOT TO SCALE)



LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (SQ. YDS.)
-L-	24+00 - 25+58 LT.	330	450
-L-	25+00 - 25+58 RT.	120	150
-L-	26+63 - 29+00 LT.	530	725
-L-	26+63 - 27+50 RT.	200	300

DETAIL 'C'

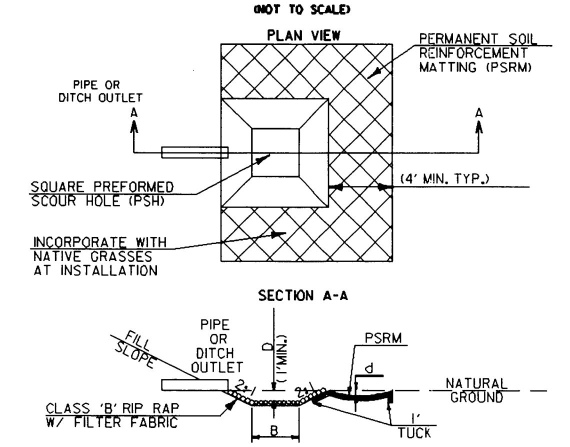
PREFORMED SCOUR HOLE
(NOT TO SCALE)



LINE	STATION	B (FT.)	D (FT.)	W_{PSR} (FT.)	d (FT.)	CLASS B RIP RAP (TONS)	DDE (FT^3)	FILTER FABRIC (YD^2)	PSRM (FT^2)
-L-	24+67 LT.	4.0	2.0	5.0	1.0	9.1	550	250	310
-L-	27+00 LT.	4.0	2.0	5.0	1.0	9.1	550	250	310

DETAIL 'D'

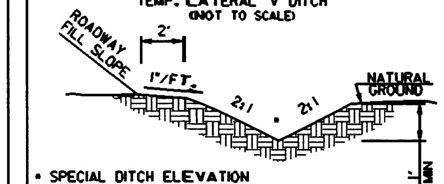
PREFORMED SCOUR HOLE
(NOT TO SCALE)



LINE	STATION	B (FT.)	D (FT.)	W_{PSR} (FT.)	d (FT.)	CLASS B RIP RAP (TONS)	DDE (FT^3)	FILTER FABRIC (YD^2)	PSRM (FT^2)
-L-	24+55 LT.	4.5	2.0	5.0	1.0	9.1	550	250	310
-L-	25+35 RT.	4.5	2.0	5.0	1.0	9.1	550	250	310
-L-	27+10 RT.	4.5	2.0	5.0	1.0	9.1	550	250	310

DITCH DETAIL 'E

TEMP. LATERAL 'V' DITCH
(NOT TO SCALE)



* SPECIAL DITCH ELEVATION

LINE	STA. TO STA.	DDE (FT^3)
-L-	23+28 - 25+57.5 RT.	1195
-L-	27+09 - 28+85 RT.	984

BUFFER IMPACTS

MULKEY
ENGINEERS & CONSULTANTS
RALEIGH, N.C. 27604
(919) 851-1515
(919) 851-1516 (FAX)
WWW.MULKEYINC.COM

Sheet 6 of 11

PROJECT REFERENCE NO.	SHEET NO.
B-3522	4

HYDRAULICS ENGINEER	HIGHWAY DESIGN ENGINEER
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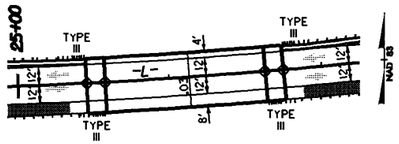
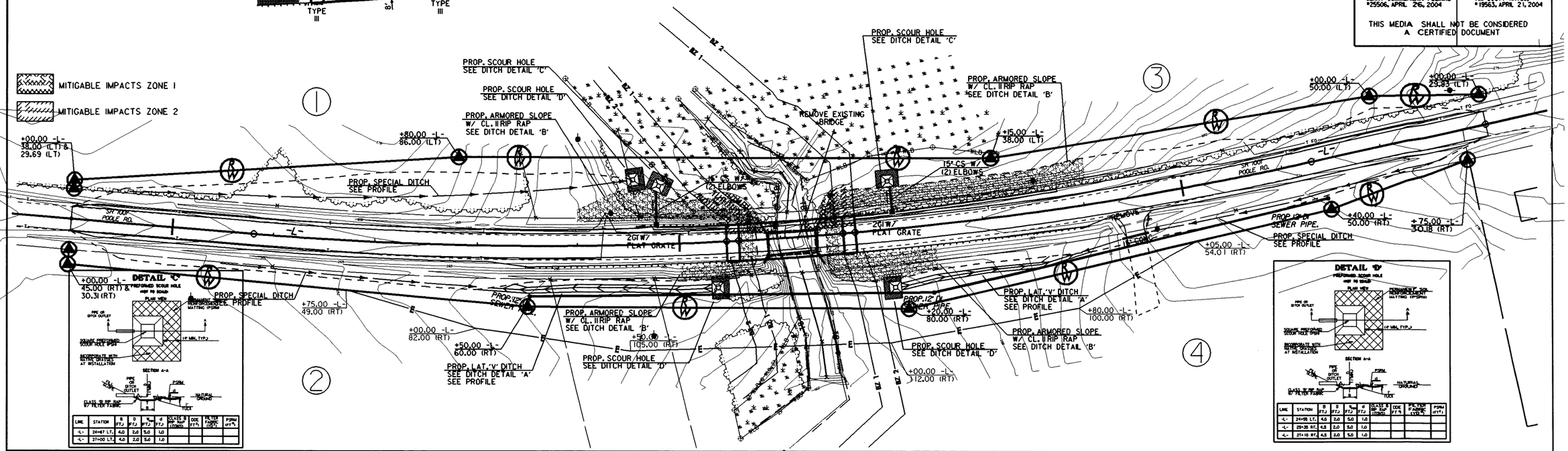
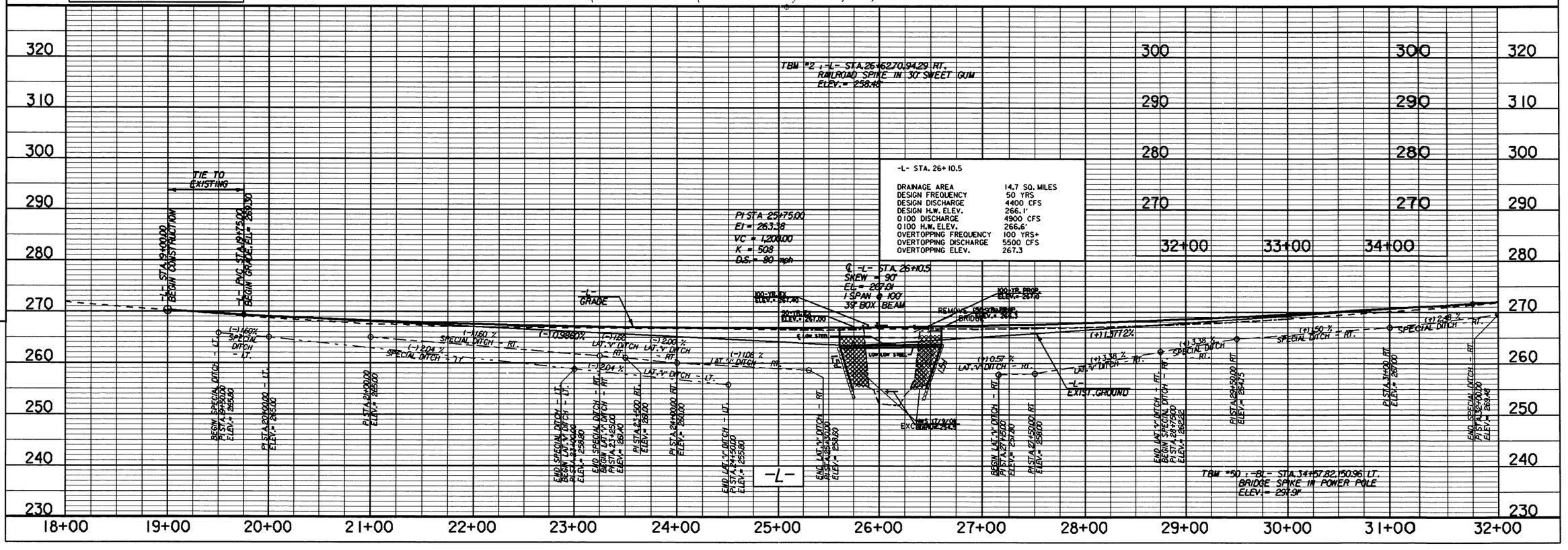
REVISIONS







STIMES
DATES
FILES

BUFFER IMPACTS

MULKEY ENGINEERS & CONSULTANTS

Sheet 7 of 11

PROJECT REFERENCE NO.	SHEET NO.
B-3522	4

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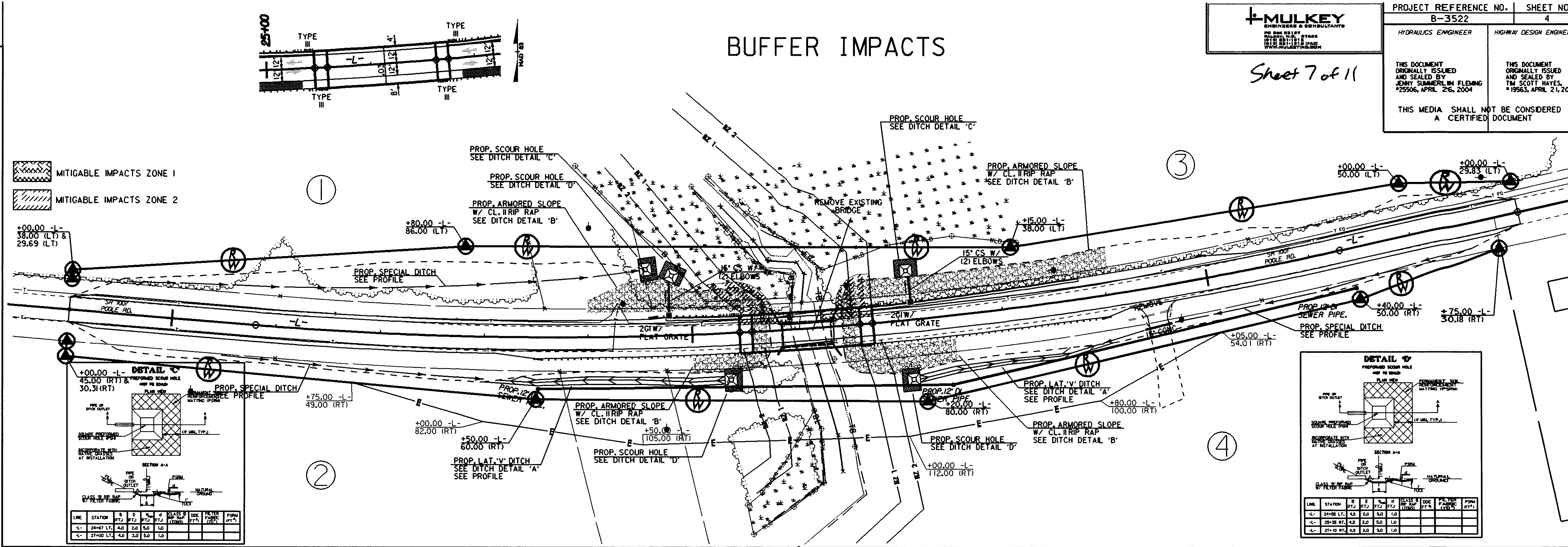

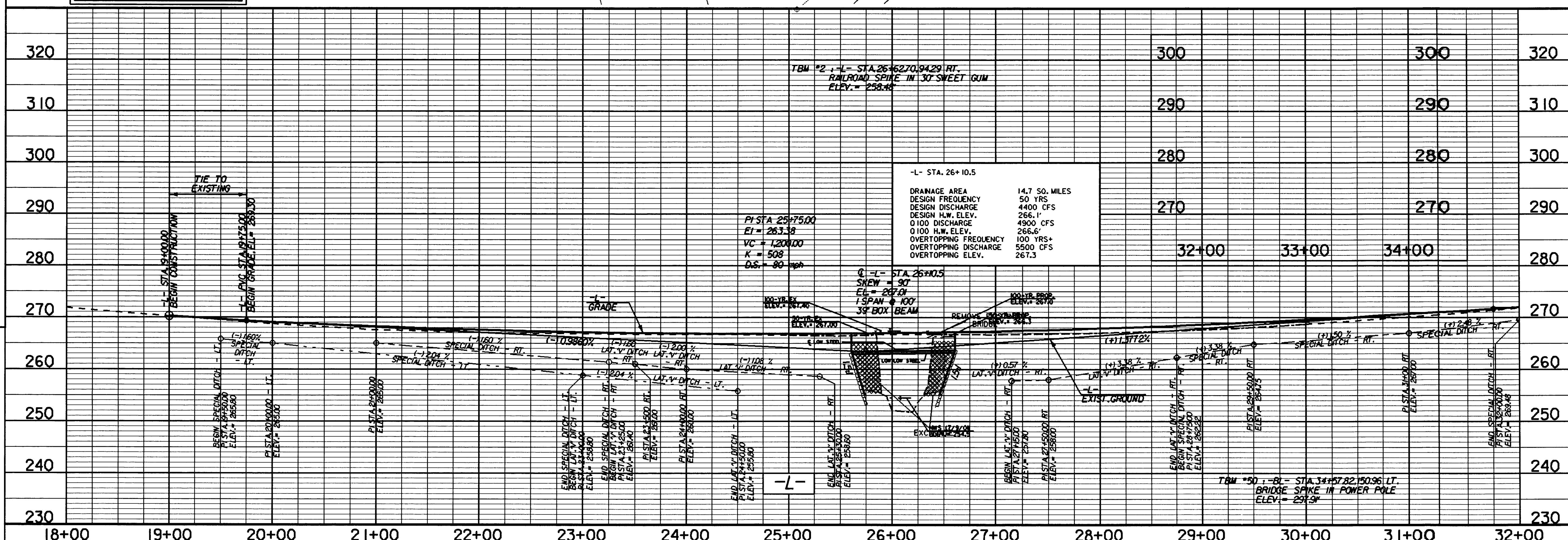

-L- STA. 26+10.5

DRAINAGE AREA	14.7 SQ. MILES
DESIGN FREQUENCY	50 YRS
DESIGN DISCHARGE	4400 CFS
DESIGN H.W. ELEV.	266.1'
Q100 DISCHARGE	4900 CFS
Q100 H.W. ELEV.	266.6'
OVERTOPPING FREQUENCY	100 YRS+
OVERTOPPING DISCHARGE	5500 CFS
OVERTOPPING ELEV.	267.3

REVISIONS

BUFFER IMPACTS

MULKEY ENGINEERS & CONSULTANTS
PO BOX 80187, RALEIGH, N.C. 27623
919 851-1815 FAX 919 851-8129
WWW.MULKEYENG.COM

Sheet 8 of V

PROJECT REFERENCE NO.	SHEET NO.
B-3522	2-C

HYDRAULICS ENGINEER	HIGHWAY DESIGN ENGINEER
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REVISIONS

NAD 83

TYPE III — DETOUR — TYPE III — N 85°54'22.6" E — TYPE III

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

REMOVE EXISTING BRIDGE

SR 1007 BOGLE RD.

PROP. SPECIAL DITCH SEE PROFILE

PROP. 12" CL. III RCP SEWER PIPE.

PROP. 12" DI SEWER PIPE.

GRADE TO MATCH

EST. 2 TONS CLASS 'B' RIP RAP W/ 7 yd² FILTER FABRIC

PROP. LAT.'V' DITCH SEE DITCH DETAIL 'E' SEE PROFILE

EST. 2 TONS CLASS 'B' RIP RAP W/ 7 yd² FILTER FABRIC

PROP. LAT.'V' DITCH SEE DITCH DETAIL 'E' SEE PROFILE

PROP. SPECIAL DITCH SEE PROFILE

PROP. CL. II RIP RAP W/ FILTER FABRIC (STRUCTURE PAY ITEM)

TEMP. SILT DIKE W/ DRAIN

DETOUR

25+00

30+00

DETAIL 'C'
PREFORMED SCOUR HOLE
NOT TO SCALE

PLAN VIEW

SECTION A-A

CLASS 'B' RIP RAP W/ FILTER FABRIC

LINE	STATION	B FT.)	D FT.)	d FT.)	CLASS B RIP RAP (TONS)	DDK FT.²)	FILTER FABRIC (YD.²)	PSRW (FT.²)
-L-	24+55 LT.	4.0	2.0	5.0	1.0			
-L-	24+67 LT.	4.0	2.0	5.0	1.0			
-L-	27+00 LT.	4.0	2.0	5.0	1.0			

DETAIL 'D'
PREFORMED SCOUR HOLE
NOT TO SCALE

PLAN VIEW

SECTION A-A

CLASS 'B' RIP RAP W/ FILTER FABRIC

LINE	STATION	B FT.)	D FT.)	d FT.)	CLASS B RIP RAP (TONS)	DDK FT.²)	FILTER FABRIC (YD.²)	PSRW (FT.²)
-L-	24+55 LT.	4.0	2.0	5.0	1.0			
-L-	25+35 RT.	4.0	2.0	5.0	1.0			
-L-	27+90 RT.	4.0	2.0	5.0	1.0			

-L-DET STA. 26+30.0

DRAINAGE AREA	14.7 SQ. MILES
DESIGN FREQUENCY	5 YRS
DESIGN DISCHARGE	2300 CFS
DESIGN H.W. ELEV.	263.1'
Q100 DISCHARGE	4900 CFS
Q100 H.W. ELEV.	267.2'
OVERTOPPING FREQUENCY	50 YRS
OVERTOPPING DISCHARGE	4400 CFS
OVERTOPPING ELEV.	266.6

TBM #2 ; -L- STA. 26+62 70.94 29 RT.
RAILROAD SPIKE IN 30" SWEET GUM
ELEV. = 258.48'

DETOUR STA. 20+58.84
BEGIN CONSTRUCTION

TIE TO EXISTING

DETOUR STA. 22+33.51
BEGIN GRADE (EL. = 266.82
(@ EXIST. EOP.)

PI STA 23+12.00
EI = 266.30
VC = 110.00
K = 113
D.S. = 50 mph

(-) 0.67 11%

(-) 2.00 %
SPECIAL DITCH - RT.

(-) 1.63 %
SPECIAL DITCH - RT.

(-) 1.63 %
LAT.'V' DITCH - RT.

(+) 0.3000%

DETOUR EXIST. GROUND

MWS ELEV. = 254.5

3-7'8 PIPE ELEV. = 263.1

DETOUR GRADE

(+) 0.3000%

(+) 4.89 %
LAT.'V' DITCH - RT.

(+) 4.89 %
SPECIAL DITCH - RT.

(+) 3.30 %
SPECIAL DITCH - RT.

(+) 3.94 %
LAT.'V' DITCH - RT.

(+) 17.63 %

PI STA 30+24.00
EI = 268.43
VC = 100.00
K = 58
D.S. = 40 mph

DETOUR STA. 30+40.96
END GRADE (EL. = 268.89
(@ EXIST. EOP.)

TIE TO EXISTING

DETOUR STA. 33+47.11
END CONSTRUCTION

BEGIN SPECIAL DITCH - RT.
PI STA 21+50.1
ELEV. = 264.00

PI STA 22+54.9 - RT.
ELEV. = 261.38

END SPECIAL DITCH - RT.
BEGIN LAT.'V' DITCH - RT.
PI STA 23+28.24
ELEV. = 260.73

END LAT.'V' DITCH - RT.
PI STA 25+57.47
ELEV. = 257.00

BEGIN LAT.'V' DITCH - RT.
PI STA 26+46.96
ELEV. = 255.30

PI STA 28+96.70 - RT.
ELEV. = 260.0

END LAT.'V' DITCH - RT.
BEGIN SPECIAL DITCH - RT.
PI STA 29+11.60
ELEV. = 260.05

PI STA 29+96.94 - RT.
ELEV. = 261.5

END SPECIAL DITCH - RT.
PI STA 30+40.96
ELEV. = 258.89

DETOUR

310 300 290 280 270 260 250 240 230 220

20+00 21+00 22+00 23+00 24+00 25+00 26+00 27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00

STAKES
FILES

BUFFER IMPACTS

MULKEY
ENGINEERS & CONSULTANTS
PO BOX 551287
RALEIGH, N.C. 27655
(919) 851-1815
(919) 851-1816 (FAX)
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Sheet 9 of 11

PROJECT REFERENCE NO.	SHEET NO.
B-3522	2-C

HYDRAULICS ENGINEER	HIGHWAY DESIGN ENGINEER
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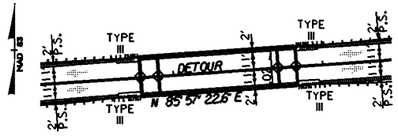


MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

① ② ③ ④

25+00

30+00

NAD 83

REMOVE EXISTING BRIDGE

SR 1007 POOLE RD.

REMOVE

GRADE TO MATCH

PROP. 12" CL. SEWER PIPE.

PROP. SPECIAL DITCH SEE PROFILE

PROP. 12" CL. III RCP SEWER PIPE.

TEMP. 5' OSPI W/ BOOMS.

DETOUR

EST. 2 TONS CLASS 'B' RIP RAP W/ 7 yd² FILTER FABRIC

PROP. LAT. 'V' DITCH SEE DITCH DETAIL 'E' SEE PROFILE

PROP. CL. II RIP RAP W/ FILTER FABRIC (STRUCTURE PAY ITEM)

PROP. LAT. 'V' DITCH SEE DITCH DETAIL 'E' SEE PROFILE

EST. 2 TONS CLASS 'B' RIP RAP W/ 7 yd² FILTER FABRIC

PROP. SPECIAL DITCH SEE PROFILE

DETAIL 'C'
PREFORMED SCOUR HOLE
NOT TO SCALE

PLAN VIEW

PERMANENT SOIL REINFORCEMENT MATTING (PSRM)

PIPE OR DITCH OUTLET

SOURCE PREFORMED SCOUR HOLE (PSH)

14' MIN. TYP.

REVEGETATE WITH NOTIFY ENGINEER AT INSTALLATION

SECTION A-A

PSRM

NATURAL GROUND

CLASS 'B' RIP RAP W/ FILTER FABRIC

TOE

TUCK

LINE	STATION	B FT.)	D FT.)	Y_{min} FT.)	d FT.)	CLASS B RIP RAP (TON)	DOC FT.²	FILTER FABRIC (YD.²)	PSRM FT.²)
-L-	24+65 LT.	4.0	2.0	5.0	1.0				
-L-	25+35 RT.	4.0	2.0	5.0	1.0				
-L-	27+10 RT.	4.0	2.0	5.0	1.0				

DETAIL 'D'
PREFORMED SCOUR HOLE
NOT TO SCALE

PLAN VIEW

PERMANENT SOIL REINFORCEMENT MATTING (PSRM)

PIPE OR DITCH OUTLET

SOURCE PREFORMED SCOUR HOLE (PSH)

14' MIN. TYP.

REVEGETATE WITH NOTIFY ENGINEER AT INSTALLATION

SECTION A-A

PSRM

PIPE OR DITCH OUTLET

NATURAL GROUND

CLASS 'B' RIP RAP W/ FILTER FABRIC

TOE

TUCK

LINE	STATION	B FT.)	D FT.)	Y_{min} FT.)	d FT.)	CLASS B RIP RAP (TON)	DOC FT.²	FILTER FABRIC (YD.²)	PSRM FT.²)
-L-	24+65 LT.	4.0	2.0	5.0	1.0				
-L-	25+35 RT.	4.0	2.0	5.0	1.0				
-L-	27+10 RT.	4.0	2.0	5.0	1.0				

-L-DET STA. 26+30.0

DRAINAGE AREA	14.7 SQ. MILES
DESIGN FREQUENCY	5 YRS
DESIGN DISCHARGE	2300 CFS
DESIGN H.W. ELEV.	263.1'
Q100 DISCHARGE	4900 CFS
Q100 H.W. ELEV.	267.2'
OVERTOPPING FREQUENCY	50 YRS
OVERTOPPING DISCHARGE	4400 CFS
OVERTOPPING ELEV.	266.6

TBM #2 ; -L- STA. 26+62 70.94 29 RT.
RAILROAD SPIKE IN 30" SWEET GUM
ELEV. = 256.48'

TIE TO EXISTING

DETOUR STA. 20+63.41
BEGIN CONSTRUCTION

DETOUR STA. 22+31.51
BEGIN GRADE EL. = 266.82
(@ EXIST. EOP)

PI STA 23+12.00
El = 266.30
VC = 110.00
K = 113
D.S. = 50 mph

(-) 0.67 11%

(-) 2.00 % SPECIAL DITCH - RT.

(-) 1.63 % SPECIAL DITCH - RT.

(-) 1.63 % LAT. 'V' DITCH - RT.

DETOUR EXIST. GROUND

(+) 0.3000%

MWS ELEV. = 254.5

4-YR PROB. ELEV. = 263.9

15"

2:1

2:1

DETOUR GRADE

BEGIN SPECIAL DITCH - RT.
PI STA 21+56.01
ELEV. = 264.00

P.I. STA 22+54.93 - RT.
ELEV. = 262.38

END SPECIAL DITCH - RT.
BEGIN LAT. 'V' DITCH - RT.
PI STA 23+28.24
ELEV. = 260.73

END LAT. 'V' DITCH - RT.
PI STA 25+57.87
ELEV. = 257.00

BEGIN LAT. 'V' DITCH - RT.
PI STA 25+70.96
ELEV. = 255.0

PI STA 30+24.00
El = 268.43
VC = 100.00
K = 58
D.S. = 40 mph

(+) 4.89 % SPECIAL DITCH - RT.

(+) 4.89 % LAT. 'V' DITCH - RT.

(+) 3.30 % SPECIAL DITCH - RT.

(+) 3.94 % LAT. 'V' DITCH - RT.

(+) 0.3000%

(+) 17.63 3%

PI STA 28+19.70 - RT.
ELEV. = 260.0

END LAT. 'V' DITCH - RT.
BEGIN SPECIAL DITCH - RT.
PI STA 28+48.50
ELEV. = 260.70

P.I. STA 29+12.84 - RT.
ELEV. = 263.5

END SPECIAL DITCH - RT.
PI STA 30+51.59
ELEV. = 266.3

TIE TO EXISTING

DETOUR STA. 30+40.96
END GRADE EL. = 268.39
(@ EXIST. EOP)

DETOUR STA. 32+47.11
END CONSTRUCTION

DETOUR

310 300 290 280 270 260 250 240 230 220

20+00 21+00 22+00 23+00 24+00 25+00 26+00 27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00

REVISIONS

STRUCTURE #

DATE #
FILE #

PROPERTY OWNERS

NAMES AND ADDRESSES

REFERENCE NO.	NAMES	ADDRESSES
1	WACHOVIA BANK OF NC	PO BOX 27866 RALEIGH, NC 27611
2	JUNE M. FOWLER	5009 SHAMROCK DR. RALEIGH, NC 27612
3	NORTH CAROLINA BAPTIST FOUNDATION	201 CONVENTION DR. CARY, NC 27611
4	HERMAN T. MOSS	PO BOX 433 WENDELL, NC 27591

NCDOT

DIVISION OF HIGHWAYS

WAKE COUNTY

PROJECT: 33131.1.1 (B-3522)

BRIDGE NO. 215 OVER BUFFALO CREEK

AND APPROACHES ON SR 1007

(POOLE ROAD) SOUTH OF WENDELL

BUFFER IMPACTS SUMMARY

			IMPACT								BUFFER REPLACEMENT	
			TYPE		ALLOWABLE			MITIGABLE				
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	ROAD CROSSING	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
1	100', 39" BOX BEAM BRIDGE	26+10 -L-	X		1971.3	2614.3	4585.6					
	DETOUR *				2977.3	1871.5	4848.8					
TOTAL:					4948.6	4485.8	9434.4					

* DETOUR TO BE REMOVED AFTER CONSTRUCTION IS COMPLETE AND AREA REGRADED TO PRE-CONSTRUCTION CONTOURS

N.C. DEPT. OF TRANSPORTATION

DIVISION OF HIGHWAYS
WAKE COUNTY
PROJECT: 33131.1.1 (B-3522)
BRIDGE NO. 215 OVER BUFFALO CREEK
AND APPROACHES ON SR 1007
(POOLE ROAD) SOUTH OF WENDELL
8/25/04
SHEET 10 OF 11

McKIM & CREED
200 MACKENAN COURT, SUITE 200
CARY, NORTH CAROLINA 27511
PHONE: (919) 233-8091
FAX: (919) 233-8031

PROJECT REFERENCE NO.	SHEET NO.
B-3522	UC-2
DESIGNED BY: CLW	
DRAWN BY: PEH	
APPROVED BY:	
REVISED:	

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

REVISIONS

LEGEND

- PROPOSED 12" SANITARY SEWER
- (S) PROPOSED SANITARY SEWER MANHOLE
- BUFFER / STREAM IMPACT AREA (SEWER LINE CONSTRUCTION ONLY)

PI Sta 26+09.52
D = 17° 11' 33.9" (LT)
D = 01°38'13.3"
L = 1,050.25'
T = 529.10'
R = 3,500.00'
Se = 0.03
D.S. = 50 mph

NAD 83

20+00

25+00

30+00

-L- PC 20+80.46

-L- POT 19+00.00
BEGIN CONSTRUCTION

-L- POC 25+46.00
BEGIN APPROACH SLAB

-L- POC 25+58.00
BEGIN BRIDGE

-L- POC 26+63.00
END BRIDGE

-L- POC 26+75.00
END APPROACH SLAB

-L- PT 31+30.65

-L- POT 33+00.00
END CONSTRUCTION

(1) WACHOVIA BANK OF NC
DB 6865 PG 288
PB 1982 PG 996
TRACT 1

(2) JUNE MAY FOWLER, ET AL
DB 6036 PG 993

(3) NORTH CAROLINA BAPTIST FOUNDATION INC.
DB 4389 PG 45
PB 1966 PG 1845

(4) HERMAN T. MOSS, ET UX
DB 2532 PG 332

WALTER E. MITCHELL, ET UX
DB 1857 PG 503

℄ OF CREEK IS PROPERTY LINE

BUFFALO CREEK

100' OPAL POWER EASEMENT

WOODS

WLS

EXIST. R/W

SR 1007 POOLE RD.

24.00' BST

EX. R/W

LINE 1

PROP. MH "C"
-L- STA. 23+52.46
49.95' RT
4' DIA. PRECAST CONC. SEWER MANHOLE (W/ WATER TIGHT RING & COVER AND VENT PIPE)

PROP. 400 LF 12" DI SEWER PIPE, CLASS 50 (WITH SPECIAL INTERIOR COATING)

PROP. MH "B"
-L- STA. 27+45.65
65.57' RT
4' DIA. PRECAST CONC. SEWER MANHOLE (W/ WATER TIGHT RING & COVER AND VENT PIPE)

PROP. MH "A"
-L- STA. 31+39.20
40.00' RT
5' DIA. PRECAST CONC. SEWER MANHOLE

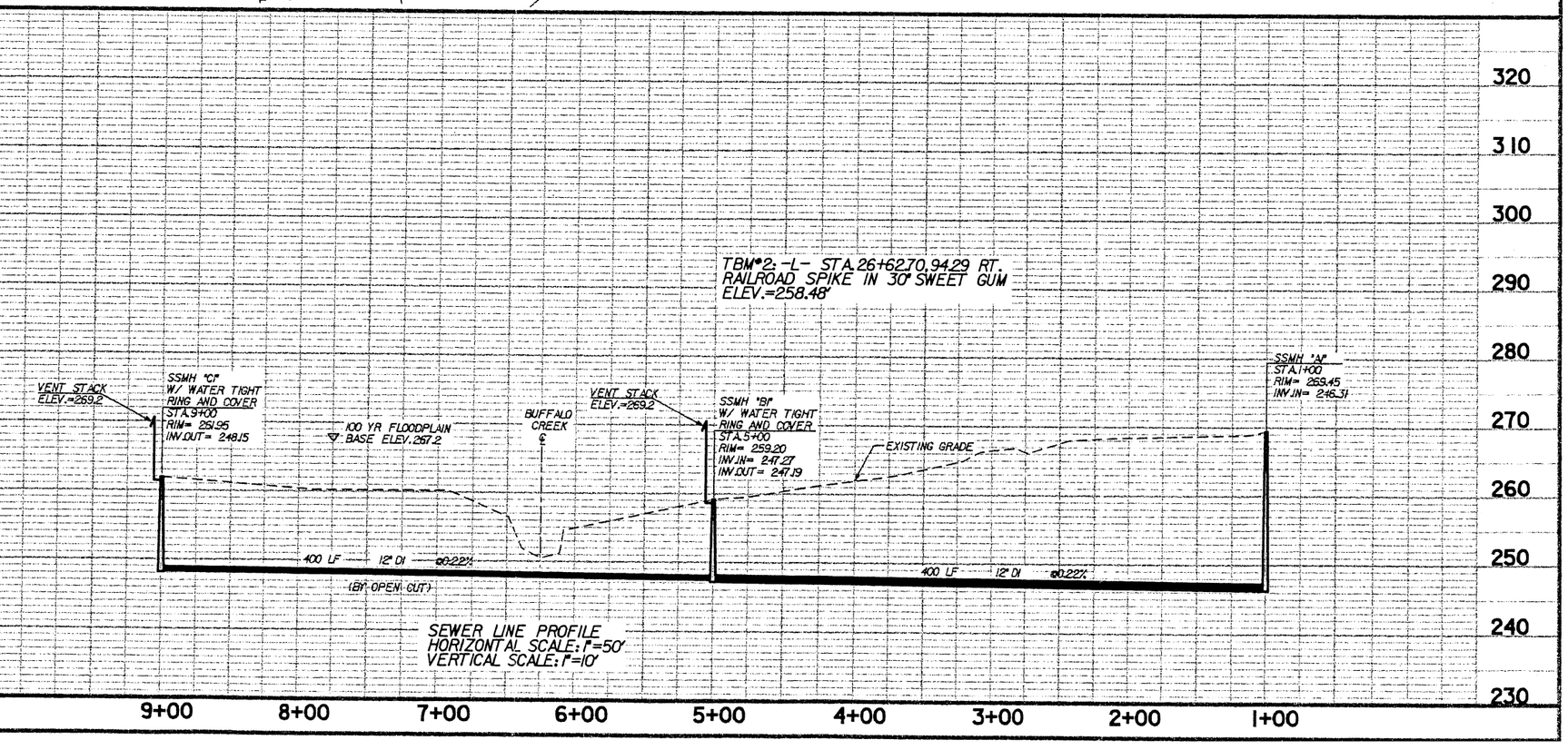
PROP. 400 LF 12" DI SEWER PIPE, CLASS 50 (WITH SPECIAL INTERIOR COATING)

157°23'06"

IMPACT AREA (2,572 SF)

STREAM IMPACT AREA (600 SF)
STREAM IMPACT LENGTH 20 LF

* BUFFER IMPACT AREA INCLUDED UNDER BRIDGE PERMIT.



SEWER LINE PROFILE
HORIZONTAL SCALE: 1"=50'
VERTICAL SCALE: 1"=10'

&TIME&
&FILES&

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS				SURFACE WATER IMPACTS				
			Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation In Wetlands (ac)	Mechanized Clearing (Method III) (ac)	Fill In SW (Natural) (ac)	Fill In SW (Pond) (ac)	Temp. Fill In SW (ac)	Existing Channel Impacted (ft)	Natural Stream Design (ft)
1	6+10 to 6+40 (Sewer Line Stations)	Sanitary Sewer Line							0.0138	20	
TOTALS:			0	0	0	0	0	0	0.0138	20	0

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY
PROJECT B-3522

SHEET 1 OF 1 9/1/2004

Form Revised 3/22/01

North Carolina Department of Transportation
PROJECT ENVIRONMENTAL CONSULTATION FORM
T.I.P. No. B-3522

I. GENERAL INFORMATION

a.	Consultation Phase:	Construction	
b.	Project Description:	Replace Bridge No. 215 on SR 1007 (Poole Road) over Buffalo Creek in Wake County	
c.	State Project: Federal Aid No.:	8.2407301 BRSTP-1007(5)	
d.	Document Type:	Categorical Exclusion	08/01 Date

II. CONCLUSIONS

The above environmental document has been reevaluated as required by 23 CFR 771. It was determined that the current proposed action is essentially the same as the original proposed action. Proposed changes, if any are noted below in Section III. It has been determined that anticipated social, economic, and environmental impacts were accurately described in the above referenced document unless noted otherwise herein. Therefore, the original Administrative Action remains valid.

III. CHANGES IN PROPOSED ACTION AND ENVIRONMENTAL CONSEQUENCES

There have been changes in potential environmental effects from those presented in the Categorical Exclusion. No new species have been added to the protected species list for Wake County since the approval of the Categorical Exclusion. The Biological Conclusion of "No Effect" documented in the original Categorical Exclusion remains valid for the Bald eagle, Red-cockaded woodpecker, Dwarf wedgemussel and Michaux's sumac.

The Categorical Exclusion indicated no designated High Quality Waters (HQW), Outstanding Resource Waters (ORW), Water Supply I (WS-I), or Water Supply II (WS-II) occur within 1.0 mile {1.6 kilometers (km)} of the project study area. There have been no changes to the water resource classification presented in the Categorical Exclusion according to the Natural Systems Specialist (see attached correspondence).

The recommended alternative has been changed from the one listed in the original Categorical Exclusion. In the original Categorical Exclusion, Alternate D (Preferred) replaces the bridge on new alignment just north of the existing bridge with a cored slab bridge. Subsequent to distribution of the Categorical Exclusion, the Hydraulic and Design

Services Units have selected a modified version of the Alternate B presented in the Categorical Exclusion. ***Alternate B (modified) is the Recommended*** Alternative. Alternative B modified revised the structure type and the proposed roadway grade.

Alternate B (modified) replaces the bridge with a new bridge on existing alignment. During construction, traffic will be routed onto a temporary on-site detour just to the south of the existing bridge. The new structure will be a cored slab bridge approximately 100 feet (33 meters) in length. The new bridge provides two 12-foot (3.6-meter) travel lanes, a 4-foot (1.2-meter) shoulder on the north side and an 8-foot (2.4-meter) shoulder on the south side.

The 8-foot (2.4-meter) shoulder on the south side provides adequate room for a future sidewalk. A cored slab bridge lends its self to future widening.

The proposed approach roadway will consist of two 12-foot (3.6-meter) travel lanes and 8-foot (2.4-meter) shoulders, including 4-foot (2.4-meter) paved shoulders. The existing grade will be maintained. The posted speed limit has been reduced to 45 mph (65 km/h). The design speed will be 50 mph (70 km/h). The estimated construction cost is $1,700,000.00. Jurisdictional wetland impacts within the proposed right-of-way is 0.03 acre (0.012 hectare).

All environmental conditions within the Categorical Exclusion remain valid.

IV. LIST OF ENVIRONMENTAL COMMITMENTS

All standard procedures and measures, including NCDOT's Best Management Practices for Protection of Surface Waters, will be implemented, as applicable, to avoid or minimize environmental impacts. The following measure will also be provided:

- The **PROJECT COMMITMENTS** *(green sheet)*

V. COORDINATION

Project Development and Environmental Analysis Branch personnel have discussed current project proposals with others as follows:

Design Engineer:	Zak Hamidi	Date 6/25/03
FHWA Engineer:	Jake Riggsbee	Date 6/25/03
Hydraulics Engineer:	Marshall Clawson	Date 6/23/03
Natural Systems Specialist:	Brett M. Feulner	Date 6/26/03

VI. NCDOT CONCURRENCE

Theresa T. Ellerby — Date 7/7/03
Theresa T. Ellerby
Project Manager

for Stacey B. Harvey — Date 07/07/03
L. Gail Grimes, P.E., Assistant Manager
Project Development and Environmental Analysis Branch

PROJECT COMMITMENTS

Wake County
SR 1007 (Poole Road)
Bridge No. 215 Over Buffalo Creek
Federal-Aid Project No. BRSTP-1007(5)
State Project No. 8.2407301
T.I.P. No. B-3522

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 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, Hydraulics Unit, and Division Engineer

In addition to NCDOT's Best Management practices for the Protection of Surface Waters (BMPs) there will be strict adherence to the NCDENR Riparian Buffer Rules for the Neuse River (15A NCAC 2B .0233).

Roadway Design Unit, Structure Design Unit and Division Engineer

Top down construction will be utilized to replace Bridge No. 215.

Roadside Environmental Unit

Erosion control methods designed for Protected Aquatic Species will be incorporated into project design and will be in place prior to clearing and grubbing activities.

Hydraulics Unit

Bridge deck drains will not discharge directly into Buffalo Creek.

State Contract Officer, Division Engineer

Project letting will be scheduled so that clearing and grubbing will be restricted from November 15 to April 1.

Division Engineer

United States Fish and Wildlife Service (USFWS) and the North Carolina Wildlife Resources Commission (NCWRC) will be provided with a written invitation to attend the preconstruction meeting.

An in-stream survey for mussels will be conducted prior to the construction let date. NCDOT Environmental Officer (Tim Savidge), NCDOT Environmental Specialist (Logan Williams) or NCDOT's Protected Species Specialist will be notified two (2) months prior to the project being awarded.

Additional Commitments:

Sediment and erosion controls will be in place prior to land clearing activities. No sediment from either bridge demolition or construction activities will be allowed to enter Buffalo Creek, as applicable.

Environmentally Sensitive Areas will be defined on the plans, which consist of 50' buffer zones on both sides of the stream.

The contractor may perform clearing operations April 2 thru November 4, but not grubbing operations in the "Environmentally Sensitive Areas", until immediately prior to beginning grading operations.

Once grading operations begin in "Environmentally Sensitive Areas" work will progress in a continuous manner until complete.

Seeding and mulching will be performed immediately following final grade establishment.

Stage seeding will be performed on cut and fill slopes as grading progresses.

WAKE COUNTY
SR 1007 (POOLE ROAD)
BRIDGE NO. 215 OVER BUFFALO CREEK
FEDERAL-AID PROJECT NO. BRSTP-1007(5)
STATE PROJECT NO. 8.2407301
T.I.P. NO. B-3522

CATEGORICAL EXCLUSION

UNITED STATES DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

AND

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

APPROVED:

8/21/01
DATE

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

8/21/01
DATE

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

WAKE COUNTY
SR 1007 (POOLE ROAD)
BRIDGE NO. 215 OVER BUFFALO CREEK
FEDERAL-AID PROJECT NO. BRSTP-1007(5)
STATE PROJECT NO. 8.2407301
T.I.P. NO. B-3522

CATEGORICAL EXCLUSION

August, 2001

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

Tommy Register

Tommy Register, EI
Project Manager

8/14/01
Date

W S Hood

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

8/10/01
Date

For the North Carolina Department of Transportation

Stacy B. Harris

Stacy B. Harris, PE
Project Manager
Consultant Engineering Unit

PROJECT COMMITMENTS

Wake County
SR 1007 (Poole Road)
Bridge No. 215 Over Buffalo Creek
Federal-Aid Project No. BRSTP-1007(5)
State Project No. 8.2407301
T.I.P. No. B-3522

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Roadway Design Unit, Structure Design Unit and Division Engineer

Top down construction will be utilized to replace Bridge No. 215.

Roadside Environmental Unit

Erosion control methods designed for Protected Aquatic Species will be incorporated into project design and will be in place prior to clearing and grubbing activities.

Hydraulics Unit

Bridge deck drains will not discharge directly into Buffalo Creek.

State Contract Officer, Division Engineer

Project letting will be scheduled so that clearing and grubbing will be restricted from November 15 to April 1.

Division Engineer

United States Fish and Wildlife Service (USFWS) and the North Carolina Wildlife Resources Commission (NCWRC) will be provided with a written invitation to attend the preconstruction meeting.

An in-stream survey for mussels will be conducted prior to the construction let date. NCDOT Environmental Officer (Tim Savidge), NCDOT Environmental Specialist (Logan Williams) or NCDOT's Protected Species Specialist will be notified two (2) months prior to the project being awarded.

Additional Commitments:

Sediment and erosion controls will be in place prior to land clearing activities. No sediment from either bridge demolition or construction activities will be allowed to enter Buffalo Creek, as applicable.

Environmentally Sensitive Areas will be defined on the plans, which consist of 50' buffer zones on both sides of the stream.

The contractor may perform clearing operations April 2 thru November 4, but not grubbing operations in the "Environmentally Sensitive Areas", until immediately prior to beginning grading operations.

Once grading operations begin in "Environmentally Sensitive Areas" work will progress in a continuous manner until complete.

Seeding and mulching will be performed immediately following final grade establishment.

Stage seeding will be performed on cut and fill slopes as grading progresses.

Wake County
SR 1007 (Poole Road)
Bridge No. 215 Over Buffalo Creek
Federal-Aid Project No. BRSTP-1007(5)
State Project No. 8.2407301
T.I.P. No. B-3522

INTRODUCTION: Bridge No. 215 is included in the 2002-2008 North Carolina Department of Transportation (NCDOT) Transportation Improvement Program (T.I.P.) and in the Federal-Aid Bridge Replacement Program. The 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 47.8 out of a possible 100 for a new structure. The bridge is considered functionally obsolete and structurally deficient. The replacement of this inadequate structure will result in safer and more efficient traffic operations.

II. EXISTING CONDITIONS

Bridge No. 215 is located on SR 1007 (Poole Road) in Wake County, approximately 0.5 miles (0.8 kilometers) from the southwestern city limit of Wendell. Poole Road is classified as a Rural Collector. Land use in the project area is predominately rural, with many fields used for crops or livestock. Some residential development is occurring north and south of SR 1007. Poole Road is a two-lane facility that currently serves commuting and local traffic.

The existing bridge was constructed in 1957. It is a single-span structure with an overall length of 50 feet (15.2 meters) and a clear roadway width of 21.1 feet (6.4 meters). The superstructure consists of timber rails, and a timber deck with an asphalt-wearing surface on a steel stringer/timber joist/steel floor beam system. The two main stringers consist of 30-inch (76-centimeter) I-beams and the steel floor beams consist of 21-inch (53-centimeter) I-beams. The substructure consists of reinforced concrete abutments. The bridge has a posted weight limit of 16 tons (14.5 metric tons) for single vehicle (SV) and 21 tons (19 metric tons) for truck-tractor semi trailer (TTST).

The approach roadway has two 10-foot (3-meter) travel lanes with a clear roadway width of 20 feet (6.1 meters) with 6-foot (1.8-meter) grass shoulders. In the vicinity of Bridge No. 215 the approaches on SR 1007 are on a 2-degree curve. The posted speed limit is 55 miles per hour (mph) {90 kilometers per hour (kmh)}.

Land use immediately south (downstream) of the bridge is agricultural or grass lands with expanding recreational development, while the majority of the land north of the SR 1007 corridor is forested. The Wendell Country Club Golf Course is situated on lands parallel to and south of SR 1007, but well outside of project limits. An overhead telephone line parallels the bridge on the upstream side of the road. Downstream there is an overhead power line that crosses the west approach

approximately 150 feet (45.7 meters) from the end of the bridge. There are no utilities attached to the bridge. It is anticipated that utility impacts will be minimal.

The 2001 estimated average daily traffic (ADT) volume is 4,800 vehicles per day (vpd). The projected ADT is 10,900 vpd by the design year 2025.

This section of SR 1007 (Poole Road) in Wake County is not part of a designated bicycle route nor is it listed in the NCDOT T.I.P. as needing incidental bicycle accommodations. However, bridges within an urban area boundary with shoulder approaches should allow sufficient offsets between travel lanes and outside railing to permit the future placement of sidewalks.

No accidents were reported in the vicinity of Bridge No. 215 during the period from January 1, 1995 to December 31, 1997.

Eleven buses cross Bridge No. 215 twice per day, for a total of twenty-two trips.

III. ALTERNATIVES

A. Project Description

Based on the preliminary hydraulics report the proposed replacement structure for Bridge No. 215 will be a bridge approximately 275 feet (27.4 meters) in length. The length and opening size of the proposed structure may increase or decrease as necessary to accommodate peak flows as determined by a more detailed hydraulic analysis to be performed during the final design phase of the project. Foundation borings will be necessary.

The proposed bridge will have two 12-foot (3.6-meter) travel lanes with a minimum shoulder width of 7.5 feet (2.25 meters) for a clear roadway width of 39 feet (11.7 meters) (See Figure 4).

The proposed approach roadway will consist of two 12-foot (3.6 meter) travel lanes and 8-foot (2.4 meter) shoulders, including 4-foot (1.2 meter) paved shoulders (See Figure 4). The proposed grade will be raised approximately 2 feet (0.6 meters).

B. Reasonable and Feasible Alternatives

Two alternatives were considered reasonable and feasible for this bridge replacement. A description is provided below.

Alternative B replaces the bridge with a new bridge on existing alignment. The proposed bridge will have a concrete girder superstructure on a 2-degree curve with a 0.06 superelevation. The proposed grade will be raised approximately 6 feet due to the depth of the concrete girders. During construction traffic will be routed onto an on-site detour located downstream (south) of the existing bridge. The approaches from both the east and west will be approximately 480 feet (146.3 meters) in length.

South

Alternative B was not selected as the preferred alternative for the following reasons:

- Increase in cost due to the use of onsite detours.
- Increased construction time due to the use of onsite detours.
- Increase in impacts to the natural environment and high quality wetlands associated with the construction of a causeway or temporary work bridge.

Alternative D (Preferred) replaces the bridge on new alignment just north of the existing bridge with a cored slab bridge (Figure 2). Top down construction will be utilized. The horizontal alignment will be on approximately a 0.8-degree curve with a 0.03 superelevation. The proposed grade will be raised approximately 2 feet (0.6 meters). The approach roadway from the west will be approximately 1200 feet (366 meters) in length. The approach roadway from the east will be approximately 984 feet (300 meters) in length.

C. Alternatives Eliminated From Further Study

Alternatives eliminated from further consideration and specific reasons for elimination are discussed below.

Alternative A consists of replacing the existing structure in place with a new bridge. Traffic will be detoured off-site. The off-site detour is approximately 2.6 miles (4.2 kilometers) in length (See Figure 1).

The projected ADT for SR 1007 (Poole Road) during the construction year 2002 is 5,000 vpd. Alternative A was eliminated as a reasonable and feasible alternative due to the high traffic volume and an undesirable detour route. SR 2358, the proposed detour, has poor horizontal curvature and a bridge with a weight limit of 6.5 tons. The off-site detour has a road user cost of $1,542,000.00 per year.

Alternative C replaces the bridge on new alignment with a new bridge downstream of the existing bridge. Traffic will be maintained on the existing roadway and bridge during construction. The existing roadway through the project is on a 2-degree curve. Alternative C was eliminated as a reasonable and feasible alternative due to the 4.25-degree back-to-back curves that are introduced at both ends of the project.

The "do-nothing' alternative was not considered reasonable and feasible because it would have eventually necessitated the closure of the existing bridge and road.

Investigation of the existing structure by the Bridge Maintenance Unit indicated that stage construction was not feasible. The structure is considered fracture critical because of non-redundancy of the two main steel stringers. Therefore the structure cannot be partially removed to maintain traffic. Rehabilitation of the existing structure was not feasible due to its age and deteriorated condition.

D. Preferred Alternative

Alternative D was selected as the preferred alternative for the following reasons:

- With the use of a cored slab bridge the grade only needs to be raised approximately 2 feet (0.6 meters), which minimizes wetland impacts.
- A cored slab bridge can be constructed from the **top down**, therefore eliminating the impacts associated with a causeway or temporary work bridge.
- A 0.8-degree curve will improve the existing horizontal alignment, sight distance, and it requires a lesser superelevation across the structure.
- Alternate D spans the High Quality Wetlands.
- Wetland restoration credits may be available for removing the existing roadway fill.
- Alternative D is more economical than Alternative B.

The NCDOT-Division 5 concurs with Alternative D as the preferred alternative.

IV. ESTIMATED COST

Table 1. The estimated costs of the preferred alternative, based on current prices:

	Alternative B	**Alternative D (Preferred)**
Structure Removal (Existing)	$ 8,800	$ 8,800
Structure Proposed	804,400	804,400
Detour Structure and Approaches	201,600	0
Roadway Approaches	569,300	545,400
Miscellaneous and Mobilization	715,900	616,400
Engineering Contingencies	350,000	325,000
ROW/Const. Easements/Utilities	78,000	92,000
Total	**$2,728,000.00**	**$2,392,000.00**

The estimated cost of the project as shown in the North Carolina Department of Transportation 2002-2008 Transportation Improvement Program is $418,000, including $28,000 for right-of-way and $330,000 for construction.

V. NATURAL RESOURCES

A. Methodology

Materials and research data in support of this investigation have been derived from a number of sources including applicable U.S. Geological Survey (USGS) topographic mapping (Knightdale, NC 7.5 minute quadrangle), U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping, Natural Resources Conservation Service (formerly the Soil Conservation Service) soils mapping (USDA 1970), and aerial photography. USFWS Endangered, Threatened, and Candidate Species and Federal Species of Concern in North Carolina (March 22, 2001, via http://nc-es.fws.gov/es/countyfr.html); North Carolina Natural Heritage Program (NCNHP) computer database, via the Internet, of rare species and unique habitats.

Bridge No. 215 was visited on August 30 and September 7, 2000. The study corridor was walked and visually surveyed for significant features. For purposes of field surveys, the study corridor was assumed to be approximately 900 feet (274.3 meters) in length and 300 feet (91.4 meters) in width to ensure all proposed alternatives received proper coverage. Impact calculations are based on right-of-way width, which is 60 feet (18.3 meters). Actual impacts will be limited to construction limits and are expected to be less than those shown for right-of-way. Special concerns evaluated in the field include potential habitats for protected species, wetlands, and water quality protection in Buffalo Creek.

Plant community descriptions are based on a classification system utilized by the 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). Jurisdictional areas were evaluated 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). Habitat used by terrestrial wildlife and aquatic organisms, as well as expected population distributions, were determined through field observations, evaluation of available habitat, and supportive documentation (Fish 1968, Martof *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 1999, DWQ 1998). Quantitative sampling was not undertaken to support existing data.

B. Physiography and Soils

The study corridor is underlain by the Neuse River Geologic Formation in a transitional zone between Piedmont and Coastal Plain physiographic provinces of North Carolina. Topography of the area is characterized as rolling with some steep areas along major streams. The study corridor is located in, and adjacent to, the floodplain of Buffalo Creek. Elevations in the study corridor are relatively level and average between 260 to 300 feet (79.3 to 91.4 meters) National Geodetic Vertical Datum (NGVD) (USGS Knightdale quadrangle).

The dominant soil mapping units in upland areas within the study corridor are Appling sandy loam and Durham loamy sand (both *Typic Hapludults*) (USDA 1970). Both soil types typically occur on broad, smooth interstream divides in areas with 2-5 percent slopes. Infiltration is fair to good and surface runoff is medium; however, these soils are often eroded.

The dominant soil type within the floodplain of Buffalo Creek is Wahee fine sandy loam (*Aeric Ochraquults*). Wahee soils occur on low stream terraces near major streams in Wake County. Permeability is slow and the available water capacity is medium. Areas characterized by the presence of Wahee soils are frequently flooded, but generally for short durations.

Small pockets of Colfax sandy loam (*Aquic Fragiudults*) occur along the edges of the Buffalo Creek floodplain. Colfax soils are typically found at the heads of drainageways, on foot slopes and in depressions. However, the distribution of these soils is limited within the project area. These soils

are not considered to be hydric in Wake County. However, both Wahee and Colfax soils may contain inclusions of hydric soils (USDA 1997).

C. Water Resources

1. Waters Impacted

The study corridor is located within sub-basin 03-04-06 of the Little River catchment in the Neuse River Basin (DWQ 1998). This area is part of USGS Hydrologic Unit 03020201. The bridge targeted for replacement spans Buffalo Creek with no direct involvement of additional streams or tributaries. This section of Buffalo Creek has been assigned Stream Index Number 27-57-16-(2) by the N.C. Division of Water Quality (DWQ 1999). The area of the drainage basin for Buffalo Creek at the subject site is 15.8 square miles

2. Stream Characteristics

Buffalo Creek is a well defined, meandering Piedmont/upper Coastal Plain stream with moderate flow. During field investigations, recent rains and subsequent flooding had caused the stream to over bank in places. Water clarity was poor and the creek bottom was difficult to see. The stream averages 15-20 feet (4.6-6.1 meters) in width and water depth exceeded 2 feet (0.6 meters) at the time of this survey. The substrate appears to be comprised primarily of sand and mud. The associated floodplain is well developed to the north of SR 1007 with wetland conditions in evidence including hydrophytic vegetation, presence of hydric soils, and evidence of regular and prolonged inundation. Segments of the stream south of the bridge are well defined and the floodplain has largely been converted to grass land with scattered trees in the southeast project quadrant; forest cover occurs to the southwest in a restricted band (agricultural fields are located to the southwest above floodplain reaches). Riparian vegetation is present on stream embankments along this lower (southern) stream segment.

It should be noted that farm impoundments were identified in the northwest, southeast, and southwest project quadrants. These systems are apparent from the road, but all systems occur well outside of project limits, and impacts to these water bodies are not anticipated.

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 **B** and Nutrient Sensitive Waters (NSW) have been assigned to Buffalo Creek (DWQ 1999). The designation **B** denotes that appropriate uses include aquatic life propagation and survival, fishing, wildlife, primary recreation, and agriculture. Primary recreation refers to human body contact with waters on an organized or frequent basis. The supplemental classification NSW refers to waters needing additional nutrient management because they are subject to excessive growth of microscopic and macroscopic vegetation (DWQ 1999). No designated High Quality Waters (**HQW**), Outstanding Resource Waters (**ORW**), Water Supply I (**WS-I**), or Water Supply II (**WS-II**) waters occur within 1 mile (1.6 kilometers) of the study corridor.

The 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 *Neuse River Basinwide Water Quality Management Plan* (DWQ 1998). Buffalo Creek has a biological rating of **Good-Fair.** The Biological Rating is based on macro-invertebrate sampling. Fisheries data for 1995 produced a Good rating for this creek. Buffalo Creek is rated as **Partially Supporting/Non-Supporting** for designated uses because of sediment and nutrient loading from point and non-point sources. The Kenly Regional Waste Water Treatment Plant is the only major discharger in Sub-basin 06. Total permitted flow is 0.52 million gallons (2.0 million liters) per day and the facility discharges directly to the Little River (below the project area, not into the project water source).

4. Anticipated Impacts to Water Resources

a. General Impacts

Proposed project alternatives include complete bridging of Buffalo Creek to maintain the current water quality, aquatic habitat, and flow regime. 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" (NC DOT, 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 Buffalo 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's Best Management Practices (BMPs) for the Protection of Surface Waters will be strictly enforced during the entire life of the project.

b. Impacts related to Bridge Demolition and Removal

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) will be applied for the removal of this bridge.

D. BIOTIC RESOURCES

1. Plant Communities

Four distinct plant communities were identified within the study corridor: 1) early successional/maintained grasslands, 2) swamp forest, 3) agricultural land, and 4) pine plantation. These plant communities are described below.

Early Successional/Maintained Grass Lands: These maintained plant communities occur along present roadside margins, within the power line right-of-way, which crosses the western portions of the project area in a north-south direction, and in mowed grasslands common in the southeast project quadrant bordering the creek. This community type is dominated by herbaceous ground cover. The type of coverage is largely a reflection of the degree of maintenance. Characteristic species include microstegium (*Microstegium vimineum*), goatsbeard (*Aruncus dioicus*), dog fennel (*Eupatorium capillifolium*), English plantain (*Plantago lanceolata*), lespedeza (*Lespedeza* sp.), panic grass (*Panicum* sp.), crabgrass (*Digitaria* sp.), fescue (*Festuca* sp.), paspalum (*Paspalum* sp.), and horse nettle (*Solanum carolinense*).

Maintained grass lands in the southeast project quadrant also support scattered mature trees in a park-like setting. Red maple (*Acer rubrum*), sweet gum (*Liquidambar styraciflua*), ironwood (*Carpinus caroliniana*), and river birch (*Betula nigra*) are scattered relicts of past swamp forest development.

In the power line right-of-way corridor, successional growth of ragweed (*Ambrosia artemisiifolia*), brier (*Smilax rotundifolia*), grape (*Vitis aestivalis*), pokeberry (*Phytolacca americana*), trumpet creeper (*Campsis radicans*), horseweed (*Erigeron canadensis*), and winged sumac (*Rhus copallina*) proliferates. In lower, wet areas within this right-of-way corridor, rushes (*Juncus* spp.), sedges (*Carex* spp.), flat sedge (*Cyperus* sp.), spike rush (*Eleocharis* sp.), meadow beauty (*Rhexia* sp.), ironweed (*Vernonia* sp.), smartweed (*Polygonum* sp.), bishopweed (*Ptilimnium capillaceum*), and rose mallow (*Hibiscus moscheutos*) prevail. Tag alder (*Alnus serrulata*), black willow (*Salix nigra*), and giant cane (*Arundinaria gigantea*) occur along creek banks.

Swamp Forest: An extensive swamp forest complex is located within the broad floodplain reach of Buffalo Creek in the northeast project quadrant. This system is subject to regular and prolonged inundation. It appears the swamp forest historically supported extensive growth of bald cypress (*Taxodium distichum*) which has been timbered or largely eliminated by other causes. Scattered large cypress specimen trees remain throughout the tract, along with an extensive network of cypress trees. A developing canopy is now dominated by red maple, sweet gum, green ash (*Fraxinus pennsylvanica*), ironwood, river birch, and American elm (*Ulmus americana*). The forest floor supports growth of jewelweed (*Impatiens capensis*), lizard's tail (*Saururus cernuus*), nettle (*Boehmeria cylindrica*), and sedges. Along roadside fringe areas where elevations are somewhat higher than the lower floodplain, opportunistic forest species such as red maple, sweet gum, and green ash prevail.

A small fringe of swamp forest borders the creek in the northwest quadrant before being replaced with successional herbaceous growth in the maintained power line. The floodplain in this quadrant is well defined and abruptly changes to upland within utility right-of-way limits.

A small riparian fringe of forest cover occurs along both sides of Buffalo Creek south of the bridge; this forest type becomes somewhat larger in size with distance away from the road. Swamp forest species as described above occur in this fringe area, joined by growth of black gum (*Nyssa sylvatica*).

Agricultural Land: Well-defined tracts of farmland occur in both southwestern and southeastern project quadrants. Corn (*Zea mays*) remains on the parcel in the southeastern quadrant behind a small family residence (outside of project limits). Another tract of cleared and recently plowed farm field parallels SR 1007 in the southwest quadrant between the road and the golf course.

Pine Plantation: A stand of young (less than 15 years of age) pines is positioned parallel to SR 1007 in the northwest project quadrant on high ground west of the power line right-of-way. This stand of trees currently supports exclusive growth of loblolly pine (*Pinus taeda*) in a plantation style arrangement.

2. Plant Communities within the Study Corridor

Plant communities areas are estimated based on the amount of each plant community present within the projected 60 ft (18.3 m) right-of-way (actual impacts within construction limits will be less). A summary of potential plant community impacts is presented below.

Table 2. Potential plant community impacts:

PLANT COMMUNITY	ESTIMATED AREA Acres (Hectares)	
	Alternative B	**Alternative D (Preferred)**
Successional/Grass Lands	1.57 (0.63)	1.58 (0.64)
Swamp Forest	0.28 (0.11)	0.70 (0.28)
Agricultural Land	1.33 (0.53)	0.12 (0.05)
Pine Plantation	0.03 (0.01)	0.28 (0.11)
TOTAL	3.21 (1.28)	2.68 (1.08)

Permanent impacts to plant communities resulting from bridge replacements are generally restricted to narrow strips adjacent to the existing bridges and roadway approach segments. Very little area of natural plant community is anticipated to be impacted by the proposed project.

Alternative B involves replacing in place and construction of an on-site detour during construction of the proposed bridge. Of the 3.21 ac (1.28 ha) of impact, approximately 1.23 ac (0.50 ha) of impact is due to the on-site detour. This area will be restored after completion of the bridge replacement. However, any impacts that exceed six months will be considered permanent impacts.

Alternative D involves permanent relocation to the north and spanning the wetlands. The existing roadbed will be removed and restored to natural conditions.

From an ecological perspective, impacts of upgrading existing road facilities are minimal. No new fragmentation of plant communities will be created, as the project will result only in alteration of communities bordering an existing highway. A maintained right-of-way, a utility line corridor, agricultural fields or grasslands currently bound much of the alignment. Therefore, the proposed project may only claim narrow strips of adjacent natural communities.

3. Wildlife

a. Terrestrial

Only one mammal, white-tailed deer *(Odocoileus virginianus)*, was observed within the study corridor. Other mammal species expected to occur are raccoon (*Procyon lotor*)), muskrat (*Ondatra zibethicus*), meadow vole (*Microtus pennsylvanicus*), white-footed mouse (*Peromyscus leucopus*), short-tailed shrew (*Blarina brevicauda*), and little brown bat (*Myotis lucifugus*).

Birds observed within or adjacent to the corridor were green heron (*Butorides striatus*), mourning dove (*Zenaida macroura*), red-shouldered hawk (*Buteo lineatus*), American robin (*Turdus migratorius*), American crow (*Corvus brachyrhynchos*), and northern bob white (*Colinus virginianus*). Additional avian species expected to occur within open habitat of the study corridor are red-tailed hawk (*Buteo jamaicensis*), eastern meadowlark (*Sturnella magna*), eastern bluebird (*Sialia sialis*), brown-headed cowbird (*Molothrus ater*), indigo bunting (*Passerina cyanea*), common yellowthroat (*Geothlypis trichas*), American goldfinch (*Carduelis tristis*), northern cardinal (*Cardinalis cardinalis*), and bluejay (*Cyanocitta cristata*). Avian species expected to occur within swamp forest habitat of the study corridor are red-eyed vireo (*Vireo olivaceous*), yellow warbler (*Dendroica petechia*), northern parula (*Parula americana*), Baltimore oriole (*Icterus galbula*), downy woodpecker (*Picoides pubescens*), and barred owl *(Strix varia)*.

There were no observations of terrestrial reptiles or amphibians within the study corridor; however, herptile species potentially occurring within the study corridor are eastern box turtle (*Terrapene carolina*), eastern fence lizard (*Sceloporus undulatus*), five-lined skink (*Eumeces fasciatus*), worm snake (*Carphophis amoenus*), rat snake (*Elaphe obsoleta*), brown snake (*Storeria dekayi*), eastern garter snake (*Thamnophis sirtalis*), and American toad (*Bufo americanus*).

b. Aquatic

Limited surveys resulted in documentation of one amphibian species: the bullfrog (*Rana catesbeiana*). No aquatic reptile species were observed within the study corridor. Buffalo Creek does, however, provide suitable habitat for the snapping turtle (*Chelydra serpentina*), gray treefrog (*Hyla chrysoscelis*), river cooter (*Pseudemys concinna*), northern water snake (*Nerodia sipedon*), queen snake (*Regina septemvittata*), cottonmouth (*Agkistrodon piscivorus*) eastern newt (*Notophthalmus viridescens*), northern dusky salamander (*Desmognathus fuscus*), two-lined salamander (*Eurycea cirrigera*), green frog (*Rana clamitans*), southern leopard frog (*Rana sphenocephala*), and pickerel frog (*Rana palustris*).

No sampling was undertaken in Buffalo Creek to determine fishery potential. A visual assessment of Buffalo Creek was impeded by the presence of poor water clarity at the time of this survey. However, this reach has reported fishing potential for bluegill (*Lepomis macrochirus*) and redbreast sunfish (*L. auritus*) (Fish 1968). Other species which may be present within Buffalo Creek include rosefin shiner (*Notropis ardens*), rosyside dace (*Clinostomus funduloides*), bluehead chub (*Nocomis leptocephalus*), tessellated darter (*Etheostoma olmstedi*), northern hog sucker (*Hypentelium nigricans*), and margined madtom (*Noturus insignis*) (Menhinick 1991, Rohde *et al.* 1994).

A mussel survey was conducted at the bridge site on October 20, 2000 and for a distance of 300 feet (91 meters) upstream and downstream for the dwarf wedge mussel. Habitat downstream from the bridge was somewhat degraded due to sediment loads. Habitat upstream of the bridge was more suitable for mussels. Dwarf Wedge Mussels have been recorded in Buffalo Creek in Johnston County south of Lake Wendell near SR 2130. Therefore, there will be a no clearing and grubbing construction moratorium, between November 15 and April 1. Erosion control plans for Protected Aquatic Species will be used. Sediment and erosion controls will be in-place prior to land clearing activities. No sediment from either bridge demolition or construction activities will be allowed to enter the stream.

c. Anticipated Impacts to Wildlife

Due to the limited extent of infringement on natural communities, the proposed bridge replacement will not result in substantial 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.

E. SPECIAL TOPICS

1. Waters of the United States

Surface waters within the embankments of Buffalo 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). Field investigations indicate that Buffalo Creek is a perennial stream system with adjacent wetlands primarily concentrated north of SR 1007.

Wetlands adjacent to Buffalo Creek are also subject to jurisdictional consideration. 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). Field investigations indicate wetlands occur within the study corridor primarily in the Buffalo Creek floodplain north of the bridge with relict wetlands to the south of the corridor. NWI mapping indicates that areas adjacent to Buffalo Creek exhibit characteristics of a palustrine, broad-leaved, deciduous forest system that is seasonally flooded (PFO1C) (Cowardin *et al.* 1979). Field investigations concluded that a portion of the floodplain in the northwest project quadrant could be classified as palustrine emergent (PEM) to palustrine scrub shrub (PSS) due to utility right-of-way maintenance.

Swamp forest wetlands are considered high quality systems important to the Buffalo Creek ecosystem. Important functions attributed to these wetlands include storm water attenuation,

sediment reduction and filtration, nutrient assimilation, and habitat for wildlife. Buffalo Creek swamp forest wetlands can contribute to water quality improvements within the Neuse River Basin.

The Neuse River Basin Rule applies to 50-foot (15.2-meters) wide riparian buffers directly adjacent to surface waters in the Neuse River Basin. Any change in land use within the riparian buffer is characterized as an impact. The Nutrient Sensitive Waters Management Strategy for the Protection and Maintenance of Riparian Buffers (15 A NCAC 2B .0233) provides a designation for uses that cause impacts to riparian buffers within the Neuse Basin. Expected activities involved with project development include a roadway crossing and bridge replacement for all three alternatives. These uses are designated **Allowable** within the riparian buffer, assuming project impacts are below 150 linear ft (45.7 m) of buffer (measured parallel to the stream) and/or 0.33 ac (0.13 ha). The size of riparian buffer located within the proposed right-of-way may be exceeded if construction extends beyond roadside right-of-way limits north of the bridge. If activities are concentrated to the south, the **Allowable** designation means that the intended uses may proceed within the riparian buffer provided that there are no practical alternatives. The area (ac/ha) and length (ft/m) of riparian buffer and jurisdictional stream and wetland potentially affected areas located within the project right-of-way are shown as follows:

Table 3. Potential jurisdictional stream and wetland impacts:

JURISDICTIONAL TYPE	BUFFERS AND JURISDICTIONAL AREAS WITHIN RIGHT-OF-WAY	
	Alternative B	**Alternative D (Preferred)**
Riparian Buffer Area (ac/ha)	0.15 (0.06)	0.09 (0.04)
Stream Linear Distance (ft/m)	128 (39)	74 (22.5)
Wetland Area (Swamp Forest) (ac/ha)	0.00 (0.00)	0.046 (0.018)

Although acreage and stream lengths within proposed right-of-way limits are identified in the table, no impacts are expected to the open water channel of Buffalo Creek as a result of construction activities. Complete bridging of the channel is proposed for the preferred alternative. Any encroachment into the creek should be avoided, if possible.

Jurisdictional wetlands are generally concentrated in swamp forest systems located north of the existing bridge. All alternatives potentially impact these high quality systems, as these wetlands occur within, or immediately adjacent to right-of-way limits. However, actual construction is expected to be controlled and may eliminate impacts to these communities.

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 has coordinate with the various resource agencies during project planning to ensure that all concerns regarding bridge demolition are resolved.

The riparian buffer calculations are based on the length of stream to be impacted (or within right-of-way limits) multiplied by the 50-ft (15.2 m) wide regulatory buffer width on each side of the stream. Riparian buffer impacts are not expected to exceed 150-ft (45.7 m) of linear stream length.

2. Permits

This project is being processed as a Categorical Exclusion under Federal Highway Administration (FHWA) guidelines. Nationwide Permit (NWP) No. 23 (61 FR 65874, 65916; December 13, 1996) has been issued by the US Army Corps of Engineers (COE) for Categorical Exclusions due to expected minimal impact. DENR has issued a General 401 Water Quality Certification for NWP No. 23. However, use of this permit will require written notice to DENR. In the event that NWP No. 23 will not suffice, minor impacts attributed to bridging and associated approach improvements are expected to qualify under General Bridge Permit 031 issued by the Wilmington COE District. Notification to the Wilmington COE office is required if this general permit is utilized.

3. Riparian Buffer Protection Rules for the Neuse River Basin

Since this project is within the Neuse River Basin, it is subject to NCDENR riparian buffer rules (15A NCAC 02B .0233). These rules were developed to protect and preserve existing riparian buffers and are part of larger nutrient reduction strategies for the basin.

The buffer rules require that up to 50 feet (15 meters) in width of riparian area be protected and maintained on the banks of waterways in the basin. The rules do not apply to portions of the riparian buffer where a use is existing and ongoing as of August 1, 2000. Existing uses include transportation facilities. Note that only the portion of the buffer that contains the footprint of the existing use is exempt.

Activities in the buffer area beyond the footprint of the existing use are classified as either "exempt", "allowable", "allowable with mitigation", or "prohibited". The following lists of activities that may be subject to buffer rules within the study area are provided along with their classifications. Depending upon project alternatives, not all of the uses listed may apply, and other uses not listed here, such as utility crossings and roadside drainage ditches, among others, may be regulated under the buffer rules. Guidelines should be consulted in entirety to review all project related uses subject to the buffer rules.

Table 4. Buffer rule guidelines:

Use	Exempt	Allowable	Allowable With Mitigation	Prohibited
Bridges		X		
Road crossings that impact less than or equal to 40 linear feet (12 linear meters)	X			
Road crossings that impact greater than 40 linear ft. (12 linear meters) but less than or equal to 150 linear ft. (46 linear meters) or 0.33 acres (0.13 hectares) of riparian area		X		
Road crossings that impact greater than 150 linear ft. (46 linear meters) or greater than 0.33 acres (0.13 hectares) of riparian buffer			X	
Temporary roads used for bridge construction or replacement provided that restoration activities such as soil stabilization and revegetation occur immediately after construction		X		

Activities deemed "exempt" should be designed, constructed, and maintained to minimize soil disturbance and to provide the maximum water quality protection practicable. "Allowable" activities may proceed within the riparian buffer provided that there are no practical alternatives to the requested use. Written authorization from the DWQ or delegated local authority is required. Activities deemed "allowable with mitigation" may proceed within the riparian buffer if there are no practical alternatives to the requested use and an appropriate mitigation strategy has been approved. Written authorization from the DWQ or delegated local authority is required. "Prohibited" activities, none of which are listed above, may not proceed within the riparian buffer unless a variance is granted from the DWQ or delegated local authority.

4. 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 the 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 area streams may require compensatory mitigation in accordance with 15 NCAC 2H .0506(h). A final determination regarding mitigation to waters of the U.S. rests with the COE.

F. Protected Species

1. Federal Protected Species

Species with the federal classification of Endangered or Threatened, officially proposed for such listing, or Threatened due to Similarity of Appearance 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 (T/SA) is defined as a species, which is not Endangered or Threatened, but closely resembles an Endangered or Threatened species (16 U.S.C. 1532). T/SA species are not subject to Section 7 consultation.

Table 5. Federally protected species - recorded for Wake County (Updated March 22, 2001 USFWS list):

Common Name	Scientific Name	Status
Red-cockaded woodpecker	*Picoides borealis*	Endangered
Bald eagle	*Haliaeetus leucocephalus*	Threatened
Dwarf wedgemussel	*Alasmidonta heterodon*	Endangered
Michaux's sumac	*Rhus michauxii*	Endangered

Red-cockaded Woodpecker - This small woodpecker (7 to 8.5 inches [17.8 to 21.6 centimeters] long) has a black head, prominent white cheek patch, and black-and-white barred back. Males often have red markings (cockades) behind the eye, but the cockades may be absent or difficult to see (Potter *et al.* 1980). Primary habitat consists of mature to over-mature southern pine forests dominated by loblolly (*Pinus taeda*), long-leaf (*P. palustris*), slash (*P. elliotii*), and pond (*P. serotina*) pines (Thompson and Baker 1971). Nest cavities are constructed in the heartwood of living pines, generally older than 70 years, which have been infected with red-heart disease. Nest cavity trees tend to occur in clusters, which are referred to as colonies (USFWS 1985). The woodpecker drills holes into the bark around the cavity entrance, resulting in a shiny, resinous buildup around the entrance that allows for easy detection of active nest trees. Pine flatwoods or pine-dominated savannas, which have been maintained by frequent natural fires, serve as ideal nesting and foraging sites for this woodpecker. Development of a thick understory may result in abandonment of cavity trees.

> **BIOLOGICAL CONCLUSION:** The project corridor contains no suitable habitat for red-cockaded woodpecker foraging and nesting. The only pine plantation noted in the northwest project quadrant is unsuitable for use by red-cockaded woodpeckers. There is no identified nesting habitat within 1.0 mile (mi) (1.6 kilometers [km]) of the project corridor, and NHP records have no documentation of red-cockaded woodpeckers in the vicinity of the project corridor. (An RCW presence has been noted approximately 3 mi [4.8 km] west of the project). Due to the rapidly urbanizing character of the region, no improvement in habitat for this species is expected. Based on NHP record searches and surveys conducted during field investigations, this project will not affect red-cockaded woodpecker. **NO EFFECT**

Bald Eagle - The bald eagle is a large raptor with a wingspan greater than 6 feet (2 meters). Adult bald eagles are dark brown with a white head and tail. Immature eagles are brown with whitish mottling on the tail, belly, and wing linings. Bald eagles typically feed on fish but may also take birds and small mammals. In the Carolinas, nesting season extends from December through May (Potter *et al.* 1980). Bald eagles typically nest in tall, living trees in a conspicuous location near open water. Eagles forage over large bodies of water and utilize adjacent trees for perching (Hamel 1992). Disturbance activities within a primary zone extending 750 to 1500 feet (228.6 to 457.2 meters) from a nest tree are considered to result in unacceptable conditions for eagles (USFWS 1987). The USFWS recommends avoiding disturbance activities, including construction and tree-

cutting within this primary zone. Within a secondary zone, extending from the primary zone boundary out to a distance of 1.0 mi (1.6 km) from a nest tree, construction and land-clearing activities should be restricted to the non-nesting period. The USFWS also recommends avoiding alteration of natural shorelines where bald eagles forage, and avoiding significant land-clearing activities within 1500 ft (457.2 m) of known roosting sites.

BIOLOGICAL CONCLUSION: The project corridor contains no suitable habitat for bald eagle foraging and nesting. However, there is the potential for nesting habitat to occur within 1.0 mi (1.6 km) of the subject bridge because of extensive wetland forest development to the north of this alignment. However, NHP records have no documentation of bald eagle in the vicinity of the project corridor. Project impacts will be restricted to a relatively narrow area along the existing alignment. In addition, due to the rapidly-urbanizing character of the region, no improvement in habitat for this species is expected. Based on NHP record searches and an assessment of existing conditions conducted during field investigations, this project will not affect bald eagle. **NO EFFECT**

Dwarf Wedge Mussel - The dwarf wedge mussel is relatively small, averaging 1.0 to 1.5 inches (2.5 to 3.8 centimeters) long. The shells are olive-green to dark brown in color and are sub-rhomboidal shaped. The shells of females are swollen posteriorly, while males are generally flattened (TSCFTM 1990). The preferred habitats are streams with moderate flow velocities and bottoms varying in texture from gravel and coarse sand to mud, especially just downstream of debris and on banks of accreting sediment. This species was previously known only from a few, disjunct populations in the Neuse River basin (Johnston Co.) and Tar River basin (Granville Co.). Statewide surveys conducted since 1992 have expanded this species' range in North Carolina. This species is now known from the Neuse Basin in Orange, Wake, Johnston, and Nash Counties; and from Tar River Basin in Granville, Vance, Warren, Franklin, Halifax, and Nash Counties.

BIOLOGICAL CONCLUSION: Stream habitat within the study corridor is characterized by moderate flow over a sand/gravel/mud substrate. Buffalo Creek is a perennial meandering stream with the potential for riffle-pool structure and occasional sand-mud bars throughout its reach. Buffalo Creek also has a biological rating of Good-Fair. NHP files have no documentation of this species within 1.0 mi (1.6 km) of the project corridor and evidence of the species (relict shells, *etc.*) was not identified during recent field surveys. However, mussel surveys were conducted on October 20, 2000 at the bridge site for a distance of 300 feet (91 meters) upstream and downstream. The dwarf wedge mussel was not found. However, the following provisions will be strictly adhered to:

- An in-stream survey will be conducted prior to the construction let date. NCDOT Environmental Officer (Tim Savidge), NCDOT Environmental Specialist (Logan Williams) or NCDOT's Protected Species Specialist will be notified two (2) months prior to the project being awarded.
- The NCDOT resident engineer will be responsible for alerting Tim Savage or Logan Williams, two months prior to the project being awarded.
- There will be a no clearing and grubbing construction moratorium, between November 15 and April 1.
- Drainage shall be configured so that the run-off does not fall into the stream.

- United States Fish and Wildlife (USFWS) and the North Carolina Wildlife Resources Commission (NCWRC) will be provided with a written invitation to attend the preconstruction meeting.
- The erosion control plans for Protected Aquatic Species will be used.
- Sediment and erosion controls will be in place prior to land clearing activities. No sediment from either bridge demolition or construction activities will be allowed to enter Buffalo Creek.
- "Environmentally Sensitive Areas" will be defined on the plans, which consist of 50' buffer zones on both sides of the stream.
- The contractor may perform clearing operations April 2 thru November 4, but not grubbing operations in the "Environmentally Sensitive Areas", until immediately prior to beginning grading operations.
- Once grading operations begin in "Environmentally Sensitive Areas" work will progress in a continuous manner until complete.
- Seeding and mulching will be performed immediately following final grade establishment.
- Stage seeding will be performed on cut and fill slopes as grading progresses.

Provided that these provisions are strictly adhered to it can be concluded that project construction is **NOT LIKELY TO ADVERSELY AFFECT.**

Michaux's sumac - Michaux's sumac is a densely pubescent, deciduous, rhizomatous shrub, usually less than 2 feet (0.6 meters) high. The alternate, compound leaves consist of 9 to 13 hairy, round-based, toothed leaflets borne on a hairy rachis that may be slightly winged (Radford *et al.* 1968). Small male and female flowers are produced during June on separate plants; female flowers are produced on terminal, erect clusters followed by small, hairy, red fruits (drupes) in August and September. Michaux's sumac tends to grow in disturbed areas where competition is reduced by periodic fire or other disturbances, and may grow along roadside margins or utility right-of-ways. In the Piedmont, Michaux's sumac appears to prefer clay soil derived from mafic rocks or sandy soil derived from granite; in the Sandhills, it prefers loamy swales (Weakley 1993). Michaux's sumac ranges from south Virginia through Georgia in the inner Coastal Plain and lower Piedmont.

BIOLOGICAL CONCLUSION: Areas, which contain early-successional vegetation, such as the utility right-of-way, could support this species. An evaluation of roadside margins and grasslands indicated that regular maintenance has eliminated any likelihood that Michaux's sumac occurs in these areas. However, systematic surveys were conducted in the utility corridor (concentrated in upland portions) during this field investigation. Winged sumac was observed, but no species of Michaux's sumac was noted. NHP files have no documentation of this species within 1.0 mi (1.6 km) of the project corridor and the species was not identified during recent field surveys. **NO EFFECT**

Table 6. Federal Species of Concern - The USFWS list (Updated March 22, 2001) also includes a category of species designated as "Federal species of concern" (FSC) for Wake County:

Common Name	Scientific Name	Potential Habitat	State Status*
Southeastern myotis	*Myotis austroriparius*	YES	SC
Bachman's sparrow	*Aimophila aestivalis*	NO	SC
Southern hognose snake**	*Heterodon simus*	NO	SR
Carolina darter	*Etheostoma collis lepidinion*	YES	SC
Pinewoods shiner	*Lythrurus matutinus*	NO	SR
Diana fritillary butterfly**	*Speyeria diana*	YES	SR
Atlantic pigtoe	*Fusconaia masoni*	NO	T
Yellow lance	*Elliptio lanceolata*	NO	T
Green floater	*Lasmigona subviridus*	NO	E
Carolina least trillium	*Trillium pusillum var. pusillum*	NO	E
Sweet pinesap	*Monotropsis odorata*	NO	C

E = Endangered; T = Threatened; SC = Special concern; SR = Significantly rare; C = Candidate
* Based on listings by Amoroso(1999) and LeGrand and Hall (1999)
**Historic record - this species last observed in the county more than 50 years ago

The FSC designation provides no federal protection under the ESA for the species listed. NHP files have no documentation of FSC species within the study corridor or within 1.0 mi (1.6 km) of the study corridor.

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 terrestrial or aquatic State-listed species have been documented within 1.0 mi (1.6 km) of the study corridor.

However, Buffalo Creek is part of a Significant Natural Heritage Area (Little River Aquatic Habitat) (NHP 1999). In addition, wetlands immediately north of the bridge, and another segment of this creek near the community of Eagle Rock, have been identified by NHP as important and typical community types (Coastal Plain Small Stream Swamp [Brownwater subtype]) within the Little River basin.

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 with the Advisory Council on Historic Preservation's Regulations for Compliance Section 106, codified at 36 CFR Part 800. Section 106 requires that for federally funded, licensed, or permitted projects having an effect on properties listed in or eligible for the National Register of Historic Places, the Advisory Council on Historic Preservation be given the opportunity to comment.

B. Historic Architecture

A field survey of the Area of Potential Effects (APE) was conducted on March 1, 2000. All structures within the APE were photographed, and later reviewed by the North Carolina State Historic Preservation Office (HPO). In a concurrence form dated April 19, 2000 the North Carolina 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 North Carolina State Historic Preservation Officer (SHPO), in a memorandum dated July 3, 2000 stated, "We have conducted a review of the project and are aware of no properties of architectural, historic, or archaeological significance which would be affected by the project. Therefore, we have no comment on the project as currently proposed." 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 relocates 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). Since there are no prime or important farmlands in the immediate vicinity of the proposed bridge the Farmland Protection Policy does not apply.

The project is located in Wake County, which is within the Raleigh-Durham nonattainment area for ozone (O_3) and carbon monoxide (CO) as defined by the EPA. The 1990 Clean Air Act Amendments (CAAA) designated these areas as "moderate" nonattainment area for O_3 and CO. However, due to improved monitoring data, these areas were redesignated as "maintenance" for O_3 on June17, 1994, and "maintenance" for CO on September 18, 1995. Section 176(c) of the intent of the state air quality implementation plan (SIP). The current SIP does not contain any transportation control measures for Wake County. The Capital Area 2025 Long Range Transportation Plan (LRTP) and the 2000-2006 Metropolitan Transportation Improvement Program (MTIP) has been determined to conform to the intent of the SIP. The USDOT air conformity approval of the LRTP was August 20, 1999 and the USDOT air quality conformity approval for the MTIP was October 1, 1999. The current conformity determination is consistent with the final conformity rule found in 40 CFR Parts 51 and 93. There have been no significant changes in the project's design concept or scope, as used in the conformity analyses.

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.

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

Based on 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, there should be no environmental liability concerns for this project. However, unregulated USTs and unregulated landfills may be encountered

by Right-of-Way during initial contact with impacted properties. NCDOT will be notified of their presence prior to acquisition.

Wake County is a participant in the National Flood Insurance Regular Program. The project site on Buffalo Creek is included in a Detailed F.E.M.A. 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.

On the basis of the above discussion, it is concluded that no significant adverse environmental effects will result from implementation of the project.

VIII. PUBLIC INVOLVEMENT

Efforts were undertaken early in the planning process to contact local officials to involve them in the project development with scoping letters. A newsletter was mailed to local residents explaining the planning process and the selected Alternative.

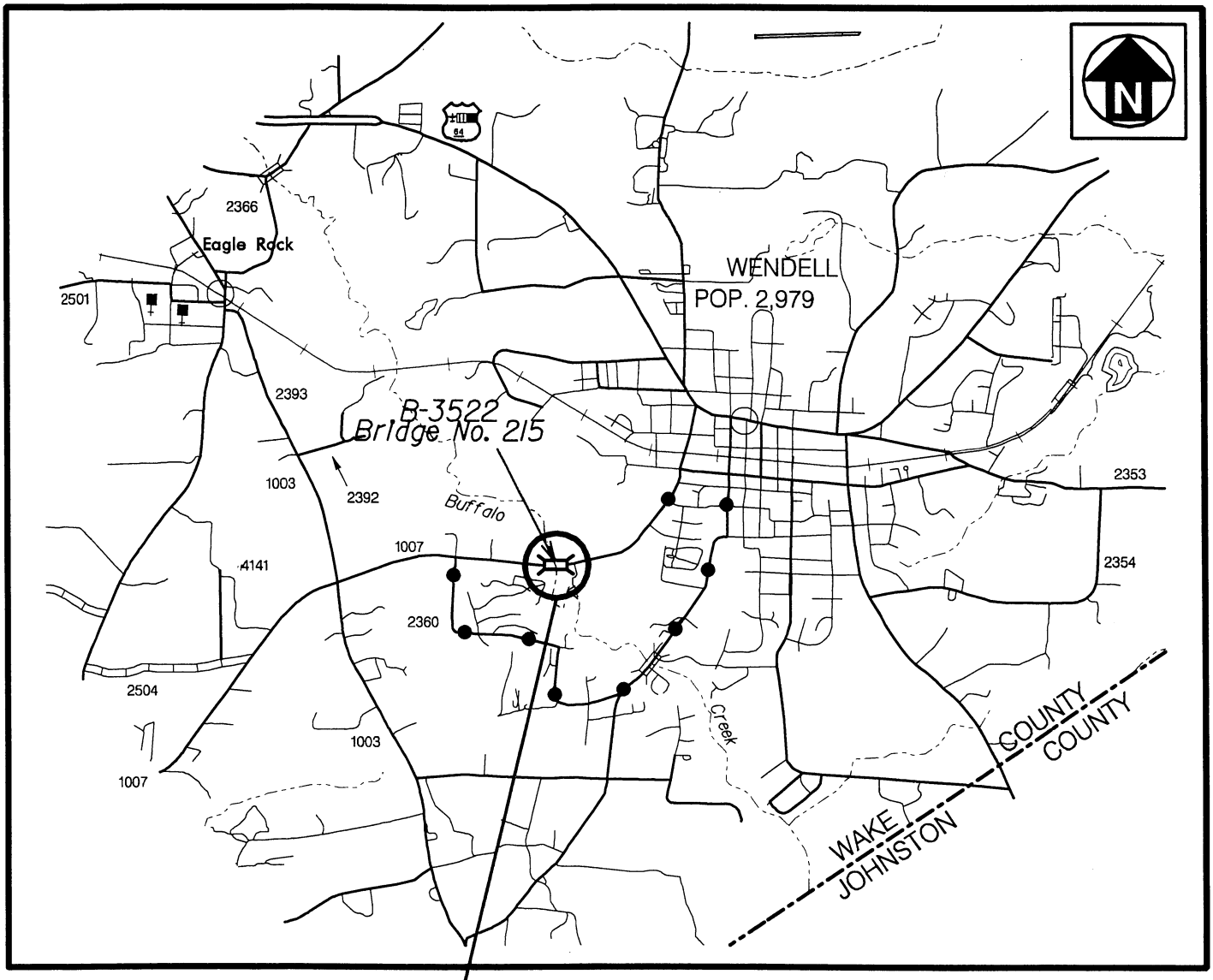
IX. AGENCY COMMENTS

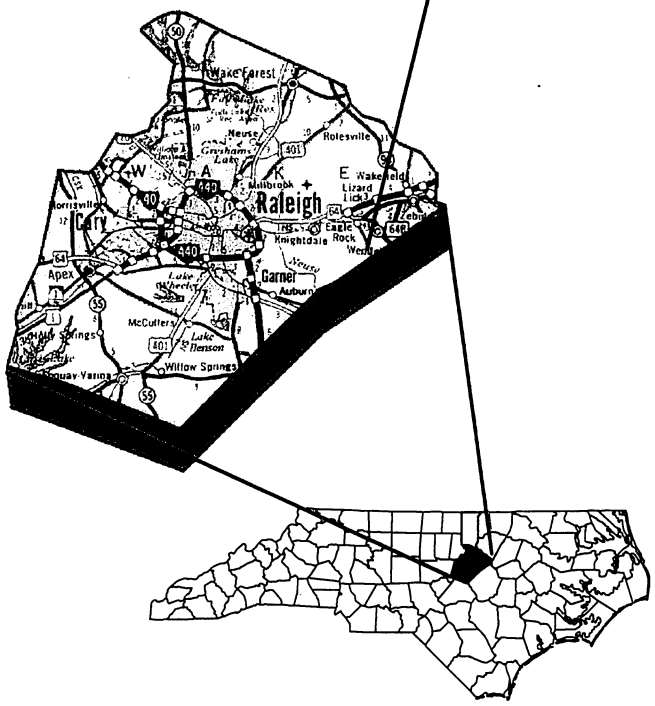
The following are comments received during the scoping process:

North Carolina Wildlife Resource Commission (NCWRC).

Comment: The following conditions should be applied: *"...no weep holes, winter clearing and grubbing restrictions, preconstruction surveys for mussels, preconstruction notification to agencies, and erosion control for sensitive species."*

Response: The above comments have been addressed in the commitments.





LEGEND

Studied Detour Route

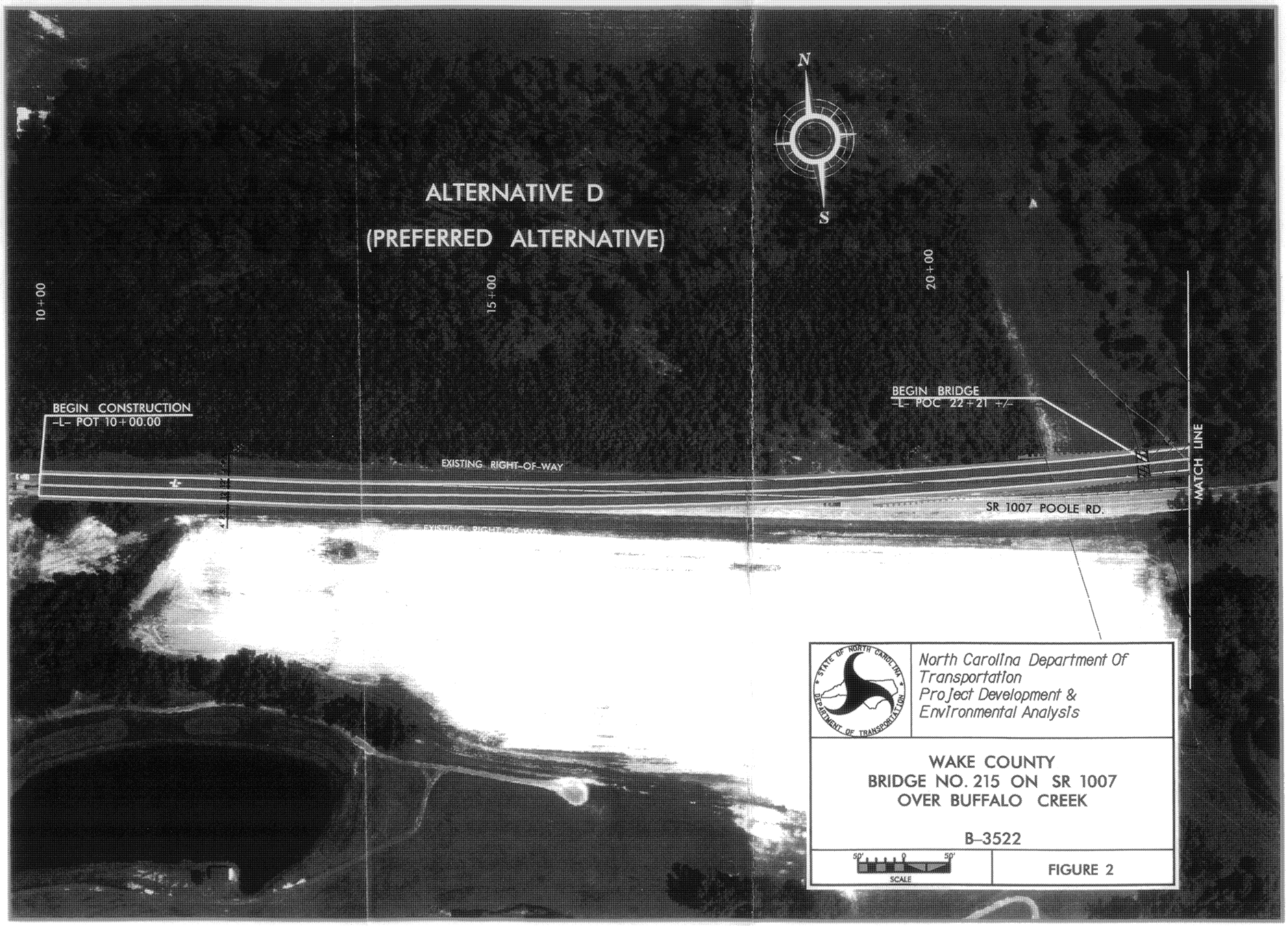
North Carolina Department Of Transportation
Project Development & Environmental Analysis

WAKE COUNTY
BRIDGE NO. 215 ON SR 1007
OVER BUFFALO CREEK
B-3522

0 kilometers 0.8 kilometers 1.6
0 miles 0.5 miles 1.0

FIGURE 1

ALTERNATIVE D
(PREFERRED ALTERNATIVE)



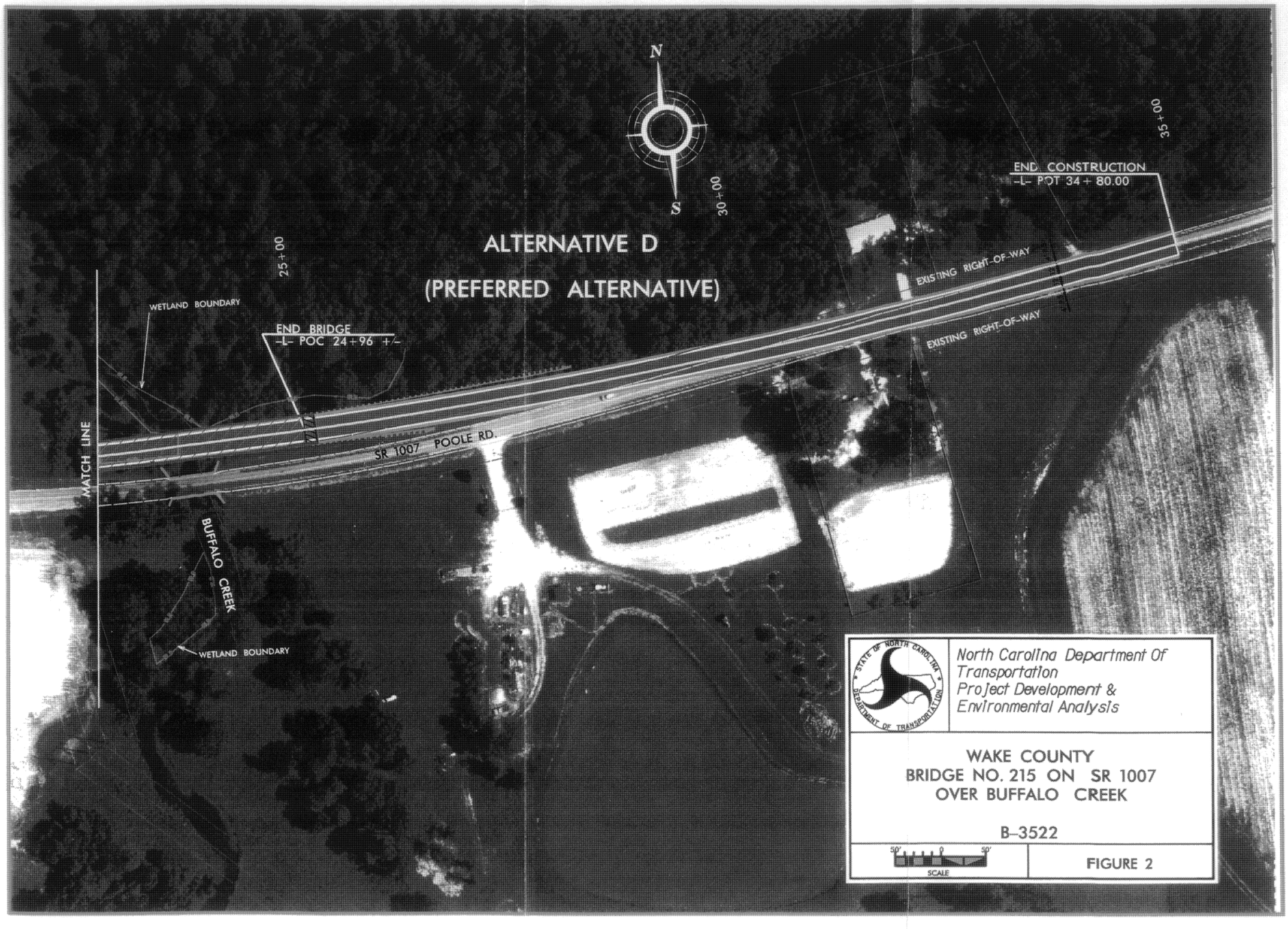
North Carolina Department Of Transportation
Project Development & Environmental Analysis

WAKE COUNTY
BRIDGE NO. 215 ON SR 1007
OVER BUFFALO CREEK

B-3522

50' 0 50'
SCALE

FIGURE 2



North Carolina Department Of Transportation
Project Development & Environmental Analysis

WAKE COUNTY
BRIDGE NO. 215 ON SR 1007
OVER BUFFALO CREEK

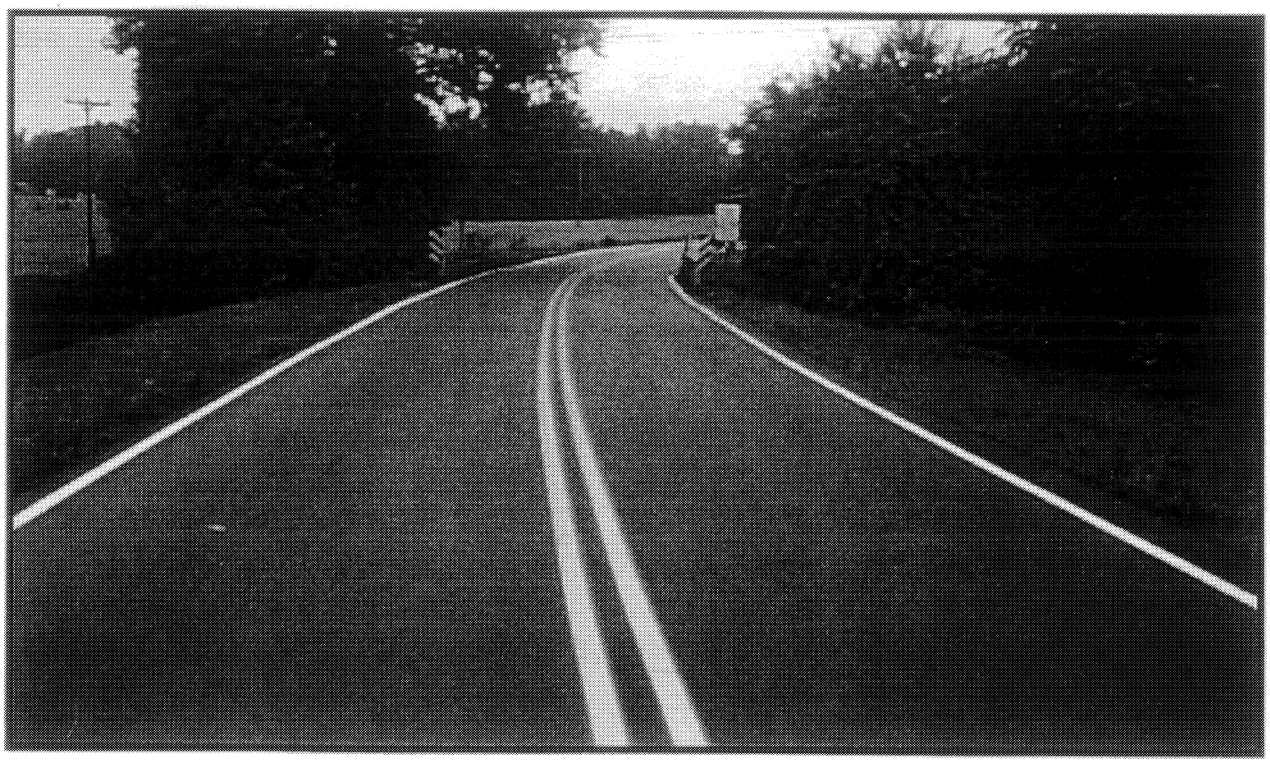
B-3522

50' 0 50'
SCALE

FIGURE 2

B-3522
Wake County
Bridge No 215 on SR 1007 over Buffalo Creek

Looking east along SR 1007 across Bridge No. 215.

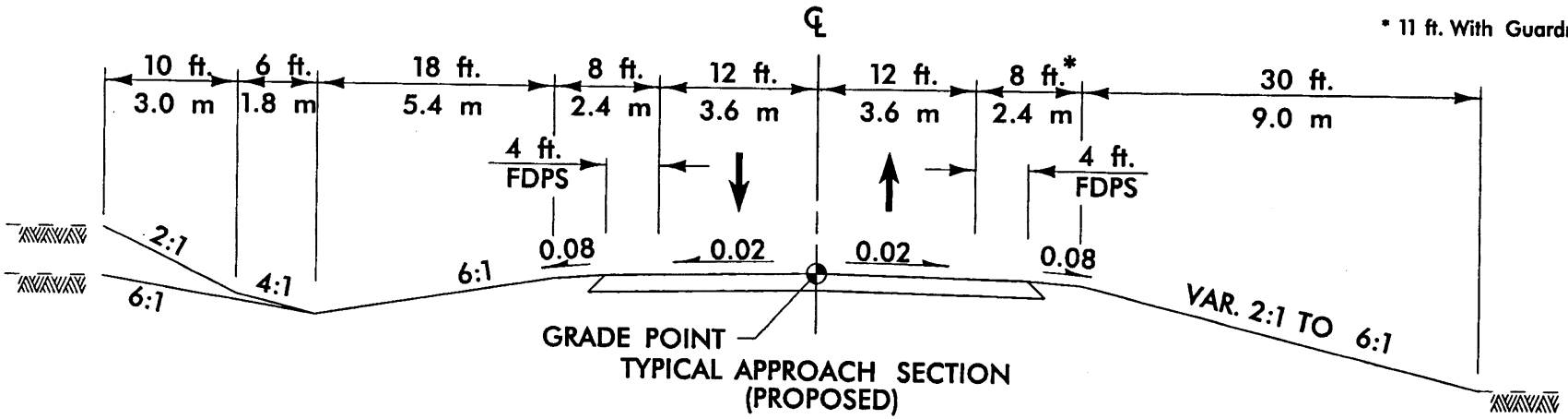


Looking west along SR 1007 across Bridge No. 215.

FIGURE 3

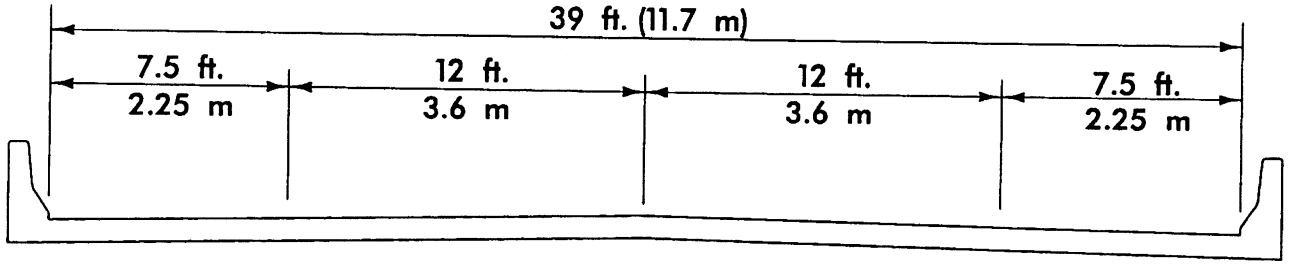
Side view of Bridge No. 215.

FIGURE 3



TYPICAL APPROACH SECTION
(PROPOSED)

** WHEN THESE DISTANCES INDICATE SLOPES OUTSIDE THE LIMITS 6:1 TO 2:1 THE DISTANCE BECOMES VARIABLE AND THE MAX. OR MIN. SLOPE MAINTAINED



TYPICAL BRIDGE SECTION
EXISTING BRIDGE NO.215 LENGTH IS 50'

DESIGN DATA

(EXISTING)	2000 ADT = 4,500	LOS C	
(CONST. YR.)	2002 ADT = 5,000	LOS C	
(DESIGN YR.)	2025 ADT = 10,900	LOS D	
DUAL	3%		
TTST	1%		

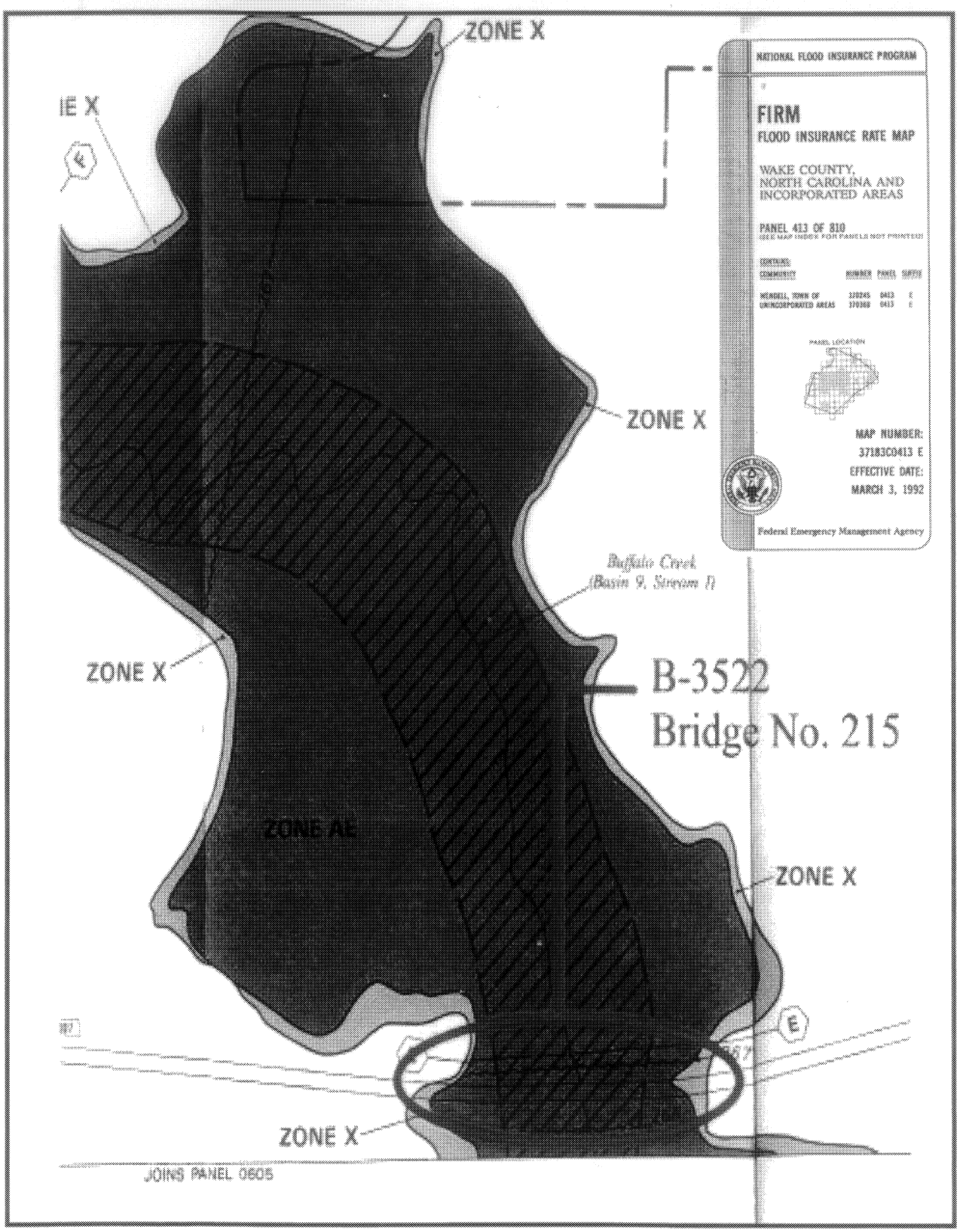
DESIGN SPEED	60 MPH (100 KPH)
POSTED SPEED LIMIT	55 MPH (90 KPH)
MAX. DEGREE OF CURVE	4 Degrees
MAX. GRADE	5%
MIN. DES. K FAC.:	Ksag=120–160 Kcrest=190–310

FUNCTIONAL CLASSIFICATION : RURAL COLLECTOR

North Carolina Department
Of Transportation
Project Development &
Environmental Analysis

WAKE COUNTY
BRIDGE NO. 215 ON SR 1007
POOLE ROAD
OVER BUFFALO CREEK
TIP NO: B-3522

FIGURE 4


ZONE X
IE X
ZONE X
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
WAKE COUNTY, NORTH CAROLINA AND INCORPORATED AREAS
PANEL 413 OF 810
CONTAINS:
COMMUNITY
NUMBER PANEL SUFFIX
WENDELL, TOWN OF 370245 0413 E
UNINCORPORATED AREAS 370369 0413 E
PANEL LOCATION
MAP NUMBER:
3718JC0413 E
EFFECTIVE DATE:
MARCH 3, 1992
Federal Emergency Management Agency
Buffalo Creek
(Basin 9, Stream I)
ZONE X
B-3522
Bridge No. 215
ZONE AE
ZONE X
E
ZONE X
JOINS PANEL 0605

APPENDIX

Harris

7/6/00

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

June 30, 2000

Mr. William D. Gilmore, P.E., Manager
NCDOT
Project Development and Environmental Analysis Branch
1548 Mail Service Center
Raleigh, NC 27699-1548

Dear Mr. Gilmore:

Thank you for your June 2, 2000 request for information from the U.S. Fish and Wildlife Service (Service) on the potential environmental impacts of proposed bridge replacements in Wake and Durham Counties, North Carolina. This report provides scoping information and is provided in accordance with provisions of the Fish and Wildlife Coordination Act (FWCA) (16 U.S.C. 661-667d) and Section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543). This report also serves as initial scoping comments to federal and state resource agencies for use in their permitting and/or certification processes for this project.

The North Carolina Department of Transportation (NCDOT) proposes to replace the following bridge structures:

1. B-3375 Bridge No. 301 over Swift Creek and Bridge No 471 over Lake Wheeler Spillway on SR 1375 (Lake Wheeler Road), Wake County;

2. B-3450 Bridge No. 217 over New Hope Creek and Bridge No. 122 over Sandy Creek on SR 1116 (Garrett Road), Durham County;

3. B-3451 Bridge No. 119 over Prong of Mud Creek on SR 1306 (Lemur Lane), Durham County;

4. B-3522 Bridge No. 215 over Buffalo Creek on SR 1007 (Poole Road), Wake County; and,

5. B-3528 Bridge No. 429 over Sycamore Creek on SR 1839 (Leesville Road), Wake and Durham Counties.

The following recommendations are provided to assist you in your planning process and to facilitate a thorough and timely review of the project:

Generally, the Service recommends that wetland impacts be avoided and minimized to the maximum extent practical as outlined in Section 404 (b)(1) of the Clean Water Act Amendments of 1977. In regard to avoidance and minimization of impacts, we recommend that proposed highway projects be aligned along or adjacent to existing roadways, utility corridors, or previously developed areas in order to minimize habitat fragmentation and encroachment. Areas exhibiting high biodiversity or ecological value important to the watershed and region should be avoided. Crossings of streams and associated wetland systems should use existing crossings and/or occur on a structure wherever feasible. Where bridging is not feasible, culvert structures that maintain natural water flows and hydraulic regimes without scouring, or impeding fish and wildlife passage, should be employed. Highway shoulder and median widths should be reduced through wetland areas. Roadway embankments and fill areas should be stabilized by using appropriate erosion control devices and techniques. Wherever appropriate, construction in sensitive areas should occur outside fish spawning and migratory bird nesting seasons.

The National Wetlands Inventory (NWI) maps of the Lake Wheeler, Knightdale, Southeast Durham, and Southwest Durham 7.5 Minute Quadrangles show wetland resources in the specific work areas. However, while the NWI maps are useful for providing an overview of a given area, they should not be relied upon in lieu of a detailed wetland delineation by trained personnel using an acceptable wetland classification methodology. Therefore, in addition to the above guidance, we recommend that the environmental documentation for this project include the following in sufficient detail to facilitate a thorough review of the action.

1. The extent and acreage of waters of the U.S., including wetlands, that are to be impacted by filling, dredging, clearing, ditching, or draining. Acres of wetland impact should be differentiated by habitat type based on the wetland classification scheme of the National Wetlands Inventory. Wetland boundaries should be determined by using the 1987 Corps of Engineers Wetlands Delineation Manual and verified by the U.S. Army Corps of Engineers.

2. If unavoidable wetland impacts are proposed, we recommend that every effort be made to identify compensatory mitigation sites in advance. Project planning should include a detailed compensatory mitigation plan for offsetting unavoidable wetland impacts. Opportunities to protect mitigation areas in perpetuity, preferably via conservation easement, should be explored at the outset.

The enclosed lists identify the federally-listed endangered and threatened species, and Federal Species of Concern (FSC) that are known to occur in Durham and Wake Counties. The Service recommends that habitat requirements for the listed species be compared with the available habitats at the respective project sites. If suitable habitat is present within the action area of the project, biological surveys for the listed species should be performed. Environmental documentation that includes survey methodologies, results, and NCDOT's recommendations based on those results, should be provided to this office for review and comment.

FSC's are those plant and animal species for which the Service remains concerned, but further biological research and field study are needed to resolve the conservation status of these taxa. Although FSC's receive no statutory protection under the ESA, we encourage the NCDOT to be

alert to their potential presence, and to make every reasonable effort to conserve them if found. The North Carolina Natural Heritage Program should be contacted for information on species under state protection.

The Service appreciates the opportunity to comment on these projects. Please continue to advise us during the progression of the planning process, including your official determination of the impacts of these projects. If you have any questions regarding these comments, please contact Tom McCartney at 919-856-4520, ext. 32.

Sincerely,

For Tom Augspurger

Dr. Garland B. Pardue
Ecological Services Supervisor

Enclosures

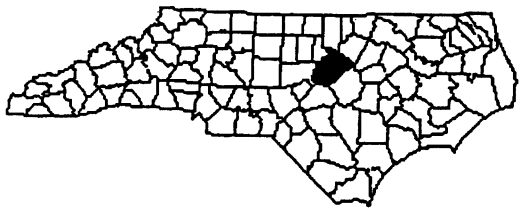
cc:
COE, Raleigh, NC (Eric Alsmeyer)
NCDWQ, Raleigh, NC (John Hennessey)
NCDNR, Northside, NC (David Cox)
FHWA, Raleigh, NC (Nicholas Graf)
EPA, Atlanta, GA (Ted Bisterfield)

FWS/R4:TMcCartney:TM:06/28/00:919/856-4520 extension 32:\bdgswake.dur

Updated: 03/22/2001

U.S. Fish & Wildlife Service

WAKE COUNTY



Common Name	Scientific Name	Status
Vertebrates		
Bachman's sparrow	*Aimophila aestivalis*	FSC
Bald eagle	*Haliaeetus leucocephalus*	Threatened
Carolina darter	*Etheostoma collis lepidinion*	FSC
Pinewoods shiner	*Lythrurus matutinus*	FSC
Red-cockaded woodpecker	*Picoides borealis*	Endangered
Southeastern myotis	*Myotis austroriparius*	FSC
Southern hognose snake	*Heterodon simus*	FSC*
Invertebrates		
Atlantic pigtoe	*Fusconaia masoni*	FSC
Diana fritillary butterfly	*Speyeria diana*	FSC*
Dwarf wedge mussel	*Alasmidonta heterodon*	Endangered
Green floater	*Lasmigona subviridus*	FSC
Yellow lance	*Elliptio lanceolata*	FSC
Vascular Plants		
Carolina least trillium	*Trillium pusillum var. pusillum*	FSC
Michaux's sumac	*Rhus michauxii*	Endangered
Sweet pinesap	*Monotropsis odorata*	FSC

KEY:

Status	Definition
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."
Proposed -	A taxon proposed for official listing as endangered or threatened.
C1 -	A taxon under consideration for official listing for which there is sufficient information to support listing.

Subject: RE: Bridge Replacement over Buffalo Crk (B-3522)
Date: Sun, 4 Mar 2001 18:14:20 -0500
From: "Judith Johnson" <johnsonj5@mindspring.com>
To: "Logan Williams" <ljwilliams@dot.state.nc.us>

Hi Logan,

The record for dwarf wedgemussel in Buffalo Creek is in Johnston Co. If the bridge you are talking about is 1007 Wake Co., we do not need to meet in the field on this project. Below is a list of special conditions that were sent to me by John Williams for projects in Franklin and Warren County. I think these conditions are the "erosion control for sensitive species"; please incorporate these conditions as well as the other commitments you mentioned - "no weep holes, winter clearing and grubbing restrictions,preconstuction survey, preconstruction notification to agencies and erosion control for sensitive species" :

1) The erosion control plans will be designed to HQW standards.

2) "Environmentally Sensitive Areas" will be defined on the plans which consist of a 50 ft. buffer zone on both sides of the stream.

3) The Contractor may perform clearing operations, but not grubbing operations in the "Environmentally Sensitive Areas", until immediately prior to beginning grading operations.

4) Once grading operations begin in "Environmentally Sensitive Areas", as specified on the plans, work will progress in a contiuous manner until complete.

5) Seeding and mulching will be performed immediately following final grade establishent.

6) Stage seeding will be performed on cut and fill slopes as grading progresses.

Also, John conducted a suvey of Hannah Creek, Johnston County in 1991 and found only Elliptio spp., I don't find any records of surveys in Bernal Branch, Johnston County.

Call or email if you need more information.

Thanks,
JUDY

Judith A. Johnson
North Carolina Wildlife Resources Commission
Nongame & Endangered Wildlife Program
4913 Mandavilla Way
Apex, NC 27502

(919)367-9108
johnsonj5@mindspring.com

-----Original Message-----
From: Logan Williams [mailto:ljwilliams@dot.state.nc.us]
Sent: Friday, March 02, 2001 10:09 AM
To: johnsonj5@mindspring.com

FSC - 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).

T(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. These species are not biologically endangered or threatened and are not subject to Section 7 consultation.

EXP - 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.

For additional information regarding this Web page, contact Mark Cantrell, in Asheville, NC, at mark_a_cantrell@fws.gov
Visit the North Carolina ES Homepage
Visit the U.S. Fish and Wildlife Service Home Page

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF SOIL AND WATER CONSERVATION

SOIL & WATER CONSERVATION

NCDENR

JAMES B. HUNT JR.
GOVERNOR

BILL HOLMAN
SECRETARY

DAVID S. VOGEL
DIRECTOR

MEMORANDUM:

July 6, 2000

TO: Melba McGee

FROM: David Harrison

SUBJECT: NCDOT Bridge Replacement Projects B-3375, B-3450, B-3451, B-3522 and B-3528.

The detour routes included in the bridge replacement plans should eliminate any farmland impacts.

If additional land is needed beyond the existing right-of-way the environmental assessment should include information on adverse impacts to Prime or Statewide Important Farmland. The definition of Prime or Statewide Important Farmland is based on the soil series and not on its current land use. Areas that are developed or are within municipal boundaries are exempt from consideration as Prime or Important Farmland.

For additional information, contact the soils specialists with the Natural Resources Conservation Service, USDA, Raleigh, NC at (919) 873-2141.

Cc: Stacy Harris

1614 MAIL SERVICE CENTER, RALEIGH, NORTH CAROLINA 27699-1614
PHONE 919-733-2302 FAX 919-715-3559

North Carolina Department of Cultural Resources

State Historic Preservation Office

David L. S. Brook, Administrator

James B. Hunt Jr., Governor
Betty Ray McCain, Secretary

Division of Archives and History
Jeffrey J. Crow, Director

July 3, 2000

MEMORANDUM

TO: William D. Gilmore, P.E., Manager
Project Development and Environmental Analysis Branch
Division of Highways
North Carolina Department of Transportation

FROM: David Brook RLE for David Brook
Deputy State Historic Preservation Officer

RE: B-3522, Replacement of Bridge No. 215 over Buffalo Creek on SR 1007 (Poole Road), Wake County, ER 00-10113

Thank you for your letter of June 2, 2000, concerning the above project.

We have conducted a review of the project and are aware of no properties of architectural, historic, or archaeological significance which would be affected by the project. Therefore, we have no comment on the project as currently proposed.

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

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

DB:kgc

cc: B. Church, NC DOT
T. Padgett, NC DOT

complete

Federal Aid #BRSTP-1007(5) *TIP* #B-3522 *County*: Wake

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

Project Description: Replace Bridge No. 215 on SR 1007 over Buffalo Creek

On March 27, 2000, representatives of the

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

Reviewed the subject project at

- [ ] a scoping meeting
- [x] photograph review session/consultation
- [ ] other

All parties present agreed

- [x] there are no properties over fifty years old within the project's area of potential effect.
- [x] 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 _____ are considered not eligible for the National Register and no further evaluation of them is necessary.
- [x] there are no National Register-listed properties located within the project's area of potential effect.

Signed:

Mary Pope Furr — 3.27.00
Representative, NCDOT — Date

Michael C. Dawson — 4/13/00
FHWA, for the Division Administrator, or other Federal Agency — Date

Representative, SHPO — 3/27/00
Date

David Brook, Deputy — 4/19/00
State Historic Preservation Officer — Date

If a survey report is prepared, a final copy of this form and the attached list will be included.

#215 Wetland Rating Worksheet

B-3522

Project Name Bridge # 210 **Nearest Road** NC 1007

County Wake **Name of Evaluator** McCrain **Date** 9/7/00

Wetland Location

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

Adjacent Land Use (within 0.5 mile upstream)

- forested/natural vegetation X
- agriculture, urban/suburban X
- impervious surface ____

Soil Series Wahee

- ____ predominantly organic humus, muck or peat
- ____ predominantly mineral, non-sandy
- ____ predominantly sandy

Dominant Vegetation

1) Acer rubrum
2) Fraxinus pennsylvanica
3) Taxodium distichum

Hydraulic Factors

- ____ steep topography
- ____ ditched or channelized
- X wetland width >/= 50 feet

Flooding and Wetness

- ____ semi-permanently to permanently or inundated
- X seasonally flooded or inundated
- ____ intermittently flooded or temporary surface water
- ____ no evidence of flooding or surface water

Wetland Type

- X bottomland hardwood forest
- ____ headwater forest
- X swamp forest
- ____ wet flat
- ____ pocosin
- ____ pine savanna
- ____ freshwater marsh
- ____ bog/fen
- ____ ephemeral wetland
- ____ other ____

Water storage	4	X	4	=	16
Bank/Shoreline stabilization	5	X	4	=	20
Pollutant removal	4	X	5	=	20
Wildlife habitat	4	X	2	=	8
Aquatic life value	4	X	4	=	16
Recreation/Education	2	X	1	=	2

Total Score 82

B-5522 WC1
Flag # JMW1 wetland

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

Project/Site: Bridge #215 SW quadrant	Date: 9/7/00
Applicant/Owner: NCDOT	County: Wake
Investigator: M McCrain	State: NC
Do Normal Circumstances Exist on the Site? (Yes) No	Community ID:
Is the site significantly disturbed (Atypical)? Yes (No)	Transect ID: at JMW1
Site is disturbed	
Is the area a potential problem area? Yes (No)	Plot ID:

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Acer rubrum	canopy	FAC	9. Bocharia cyl.	herb	FACW+
2. Nyssa sylvatica	"	FAC	10. Toxicodendron rad.	"	FAC
3.			11. Arundinaria gig	"	FACW
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

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

Remarks:

HYDROLOGY

Recorded Data (Describe in Remarks)

- ___ Stream, Lake or Tide Gauge
- ___ Aerial Photographs
- ___ Other
- X No Recorded Data Available

Wetland Hydrology Indicators:

Primary Indicators:

- X Inundated
- X Saturated in Upper 12 Inches
- ___ Water Marks
- X Drift Lines
- X Sediment Deposits
- ___ Drainage Patterns in Wetlands

Field Observations:

Depth of Surface Water: < 2 (in.)

Depth to Free Water in Pitt: Surface (in.)

Depth to Saturated Soil: Surface (in.)

Secondary Indicators: (2 or more required):

- ___ Oxidized Root Channels in Upper 12 Inches
- X Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:
Backwater slough

B-3522 upland
Flag # JMW2
upland

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

Project/Site: Bridge #215 NW quadrant	Date: 9/7/00
Applicant/Owner: NCDOT	County: Wake
Investigator: M'Crain	State: NC
Do Normal Circumstances Exist on the Site? Yes (No)	Community ID:
Is the site significantly disturbed (Atypical)? (Yes) No	Transect ID: JMW 2
Is the area a potential problem area? Yes (No)	Plot ID:

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Ulmus alata	herb/sapl	FACU+	9.		
2. Acer rubrum	"	FAC	10.		
3.			11.		
4. Vitis sp	"	FAC+	12.		
5. Campsis rad.	"	FAC	13.		
6. Erigeron canad.	"		14.		
7. Rubus sp	"		15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) 25 of 70

Remarks:
on raised elevational gradient above Floodplain in powerline ROW

HYDROLOGY

___ Recorded Data (Describe in Remarks)	Wetland Hydrology Indicators:
___ Stream, Lake or Tide Gauge	Primary Indicators:
___ Aerial Photographs	___ Inundated
___ Other	___ Saturated in Upper 12 Inches
X No Recorded Data Available	___ Water Marks
	___ Drift Lines
	___ Sediment Deposits
Field Observations:	___ Drainage Patterns in Wetlands
Depth of Surface Water: ___ (in.)	Secondary Indicators: (2 or more required):
Depth to Free Water in Pitt: ___ (in.)	___ Oxidized Root Channels in Upper 12 Inches
Depth to Saturated Soil: ___ (in.)	___ Water-Stained Leaves
	___ Local Soil Survey Data
Remarks: NONE	___ FAC-Neutral Test
	___ Other (Explain in Remarks)

B-3522 wet

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

Flag # JMW2 wetland

Project/Site: Bridge #215 NW quadrant	**Date:** 9/7/00
Applicant/Owner: NCDOT	**County:** Wake
Investigator: M McCrain	**State:** NC
Do Normal Circumstances Exist on the Site? Yes (No)	**Community ID:**
Is the site significantly disturbed (Atypical)? (Yes) No	**Transect ID:** JM W2
Is the area a potential problem area? Yes (No)	**Plot ID:**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Carex sp	herb	FACW/OBL	9.		
2. Juncus eff.	"	FACW+	10.		
3. Polygonum penn.	"	FACW+	11.		
4. Mikania scandens	"		12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

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

Remarks:
in Power line ROW - no canopy

HYDROLOGY

Recorded Data (Describe in Remarks)

- ___ Stream, Lake or Tide Gauge
- ___ Aerial Photographs
- ___ Other
- X No Recorded Data Available

Wetland Hydrology Indicators:

Primary Indicators:

- X Inundated
- X Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- Drainage Patterns in Wetlands

Field Observations:

Depth of Surface Water: <1" (in.)

Depth to Free Water in Pitt: Surface (in.)

Depth to Saturated Soil: Surface (in.)

Secondary Indicators: (2 or more required):

- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- Other (Explain in Remarks)

Remarks:

D-2022 Flag # JMW1 upland

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

Project/Site: Bridge #215 SW quadrant	Date: 9/7/00
Applicant/Owner: NCDOT	County: Wake
Investigator: M'Crain	State: NC
Do Normal Circumstances Exist on the Site? (Yes) No	Community ID:
Is the site significantly disturbed (Atypical)? Yes (No) Site is disturbed	Transect ID: at JMW1
Is the area a potential problem area? Yes (No)	Plot ID:

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Acer rubrum	Canopy	FAC	9. Arundinaria gig	herb	FACW
2. Liquidambar st.	"	FAC+	10.		
3. Betula nigra	"	FACW	11.		
4. Carpinus car.	"	FAC	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

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

Remarks: on fill/disturbed land
Former floodplain

HYDROLOGY

Recorded Data (Describe in Remarks)
___ Stream, Lake or Tide Gauge
___ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:
Depth of Surface Water: _____ (in.)
Depth to Free Water in Pitt: _____ (in.)
Depth to Saturated Soil: _____ (in.)

Remarks: None

Wetland Hydrology Indicators:

Primary Indicators:
___ Inundated
___ Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
Drainage Patterns in Wetlands

Secondary Indicators: (2 or more required):
___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
Local Soil Survey Data
___ FAC-Neutral Test

B-3522 upland
Flag # JMW 3.3 upland

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

Project/Site: Bridge #215 NE quadrant	Date: 9/7/00
Applicant/Owner: NCDOT	County: Wake
Investigator: M°Crain	State: NC
Do Normal Circumstances Exist on the Site? (Yes) No	Community ID:
Is the site significantly disturbed (Atypical)? Yes (No)	Transect ID: JMW3.3
Is the area a potential problem area? Yes (No)	Plot ID:

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Acer rubrum	canopy	FAC	9. Smilax rot.	Understory	FAC
2. Liquidambar sty.	"	FAC+	10. Lonicera jap	"	FAC-
3. Ulmus americ.	"	FACW	11. Rubus sp.	"	-
4.			12. Panicum sp	"	-
5.			13.		
6.			14.		
7.			15.		
8.			16.		

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

Remarks:

HYDROLOGY

Recorded Data (Describe in Remarks)

___ Stream, Lake or Tide Gauge

___ Aerial Photographs

___ Other

___ No Recorded Data Available

NONE

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Free Water in Pitt: _____ (in.)

Depth to Saturated Soil: _____ (in.)

Remarks:

Wetland Hydrology Indicators:

Primary Indicators:

___ Inundated

___ Saturated in Upper 12 Inches

___ Water Marks

___ Drift Lines

___ Sediment Deposits

Drainage Patterns in Wetlands

Secondary Indicators: (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches

___ Water-Stained Leaves

___ Local Soil Survey Data

___ FAC-Neutral Test

___ Other (Explain in Remarks)

B-3522 wet
Flag # JMW3.3 wetland

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

Project/Site: Bridge #215 NE quadrant	Date: 9/7/00
Applicant/Owner: NCDOT	County: Wake
Investigator: M SCHAIN	State: NC
Do Normal Circumstances Exist on the Site? (Yes) No	Community ID:
Is the site significantly disturbed (Atypical)? Yes (No)	Transect ID: JMW3.3
Is the area a potential problem area? Yes (No)	Plot ID:

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Taxodium dist	canopy	OBL
2. Acer rubrum	subcanopy	FAC
3. Fraxinus penn	"	FACW
4. Salix nigra	"	OBL
5.		
6.		
7.		
8.		

Dominant Plant Species	Stratum	Indicator
9. Mainia neglecta	herb	
10. Boehmeria cyl.	"	FACW
11. carex sp	"	FACW/OBL
12.		
13.		
14.		
15.		
16.		

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

Remarks: cypress knees aoundant

Former cypress swamp

HYDROLOGY

Recorded Data (Describe in Remarks)

___ Stream, Lake or Tide Gauge

___ Aerial Photographs

___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 2/ (in.)

Depth to Free Water in Pitt: Surface (in.)

Depth to Saturated Soil: Surface (in.)

Remarks:

Wetland Hydrology Indicators:

Primary Indicators:

___ Inundated

X Saturated in Upper 12 Inches

X Water Marks

___ Drift Lines

X Sediment Deposits

___ Drainage Patterns in Wetlands

Secondary Indicators: (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches

X Water-Stained Leaves

___ Local Soil Survey Data

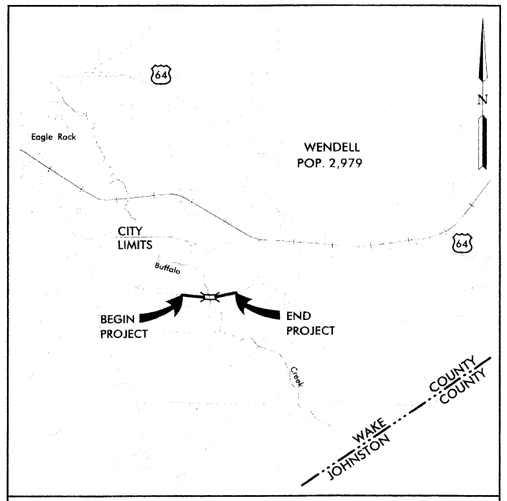
___ FAC-Neutral Test

___ Other (Explain in Remarks)

TIP: B-3522

CONTRACT: C201140

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



VICINITY MAP
(NOT TO SCALE)

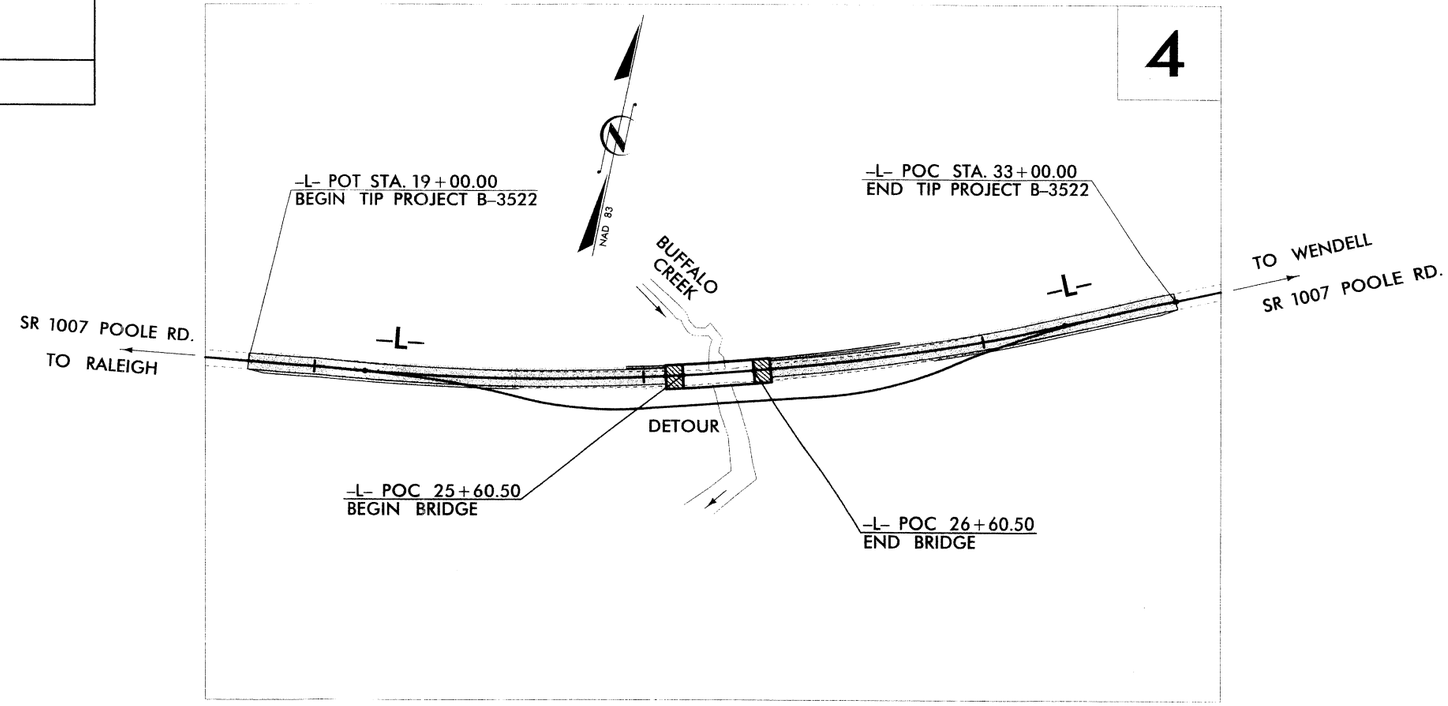
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3522	1	

WBS NO.	F.A. PROJ. NO.	DESCRIPTION
33131.1.1	BRSTP-1007(5)	P.E.
33131.2.1	BRSTP-1007(5)	R/W, UTIL
33131.3.1	BRSTP-1007(5)	CONST

LOCATION: BRIDGE NO. 215 OVER BUFFALO CREEK AND APPROACHES ON SR 1007 (POOLE ROAD) SOUTH OF WENDELL

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



MULKEY
ENGINEERS & CONSULTANTS
PO Box 33127
RALEIGH, N.C. 27636
(919) 851-1512
(919) 851-1212 (FAX)
WWW.MULKEYINC.COM

GRAPHIC SCALE

25' 0 50'
PLANS
25' 0 50'
PROFILE (HORIZONTAL)
5' 0 10'
PROFILE (VERTICAL)

DESIGN DATA

ADT 2004 = 5,525
ADT 2024 = 10,645
DHV = 12%
D = 65%
T = 4% *
V = 50 mph

* (Duals = 3% + TTST = 1%)

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-3522 = 0.246 MILES
LENGTH STRUCTURES TIP PROJECT B-3522 = 0.019 MILES
TOTAL LENGTH TIP PROJECT B-3522 = 0.265 MILES

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

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: SEPTEMBER 19, 2003

LETTING DATE: JANUARY 18, 2005

T. S. HAYES, P.E.
MULKEY E & C
PROJECT MANAGER

JOHNNY BANKS
MULKEY E & C
PROJECT DESIGN ENGINEER

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

HYDRAULICS ENGINEER
SIGNATURE: PE

ROADWAY DESIGN
SIGNATURE: PE

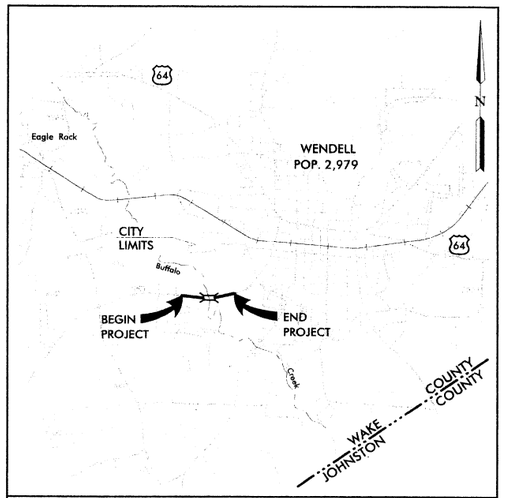
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
PE
STATE HIGHWAY ENGINEER - DESIGN

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED FOR
DIVISION ADMINISTRATOR DATE

TIP: B-3522

CONTRACT: C201140

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



VICINITY MAP
(NOT TO SCALE)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3522	1	

WBS NO.	F. A. PROJ. NO.	DESCRIPTION
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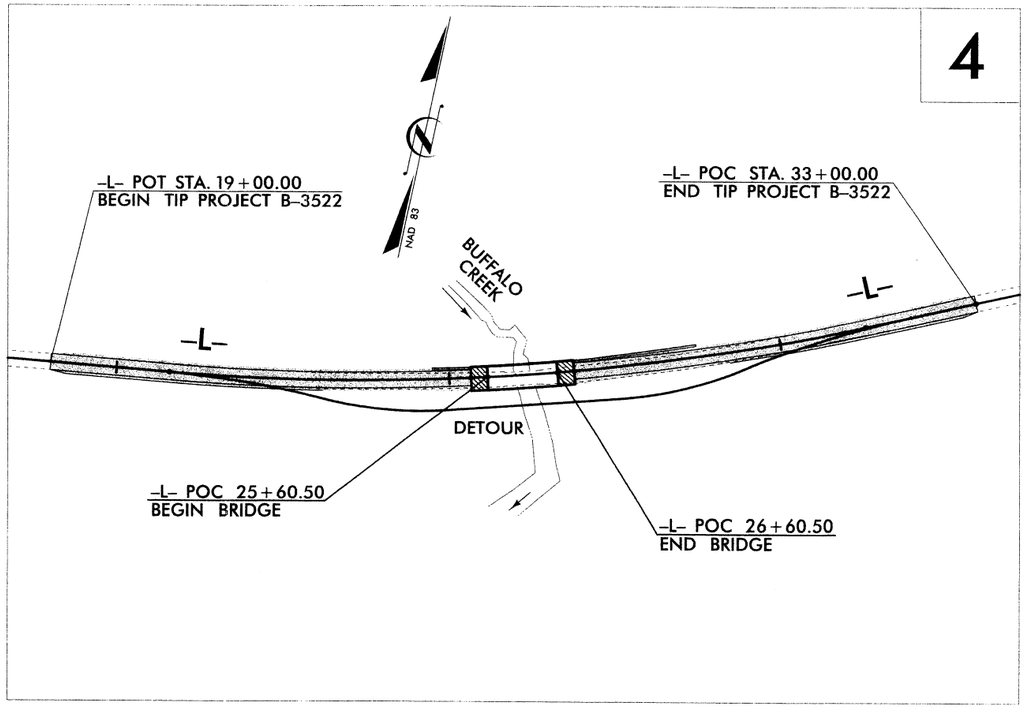

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WWW.MULKEYINC.COM

GRAPHIC SCALE

25′ 0 50′
PLANS
25′ 0 50′
PROFILE (HORIZONTAL)
5′ 0 10′
PROFILE (VERTICAL)

DESIGN DATA

ADT 2004 = 5,525
ADT 2024 = 10,645
DHV = 12%
D = 65%
T = 4% *
V = 50 mph

* (Duals = 3% + TTST = 1%)

PROJECT LENGTH

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LENGTH STRUCTURES TIP PROJECT B-3522 = 0.019 MILES

TOTAL LENGTH TIP PROJECT B-3522 = 0.265 MILES

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

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: SEPTEMBER 19, 2003

LETTING DATE: JANUARY 18, 2005

T. S. HAYES, P.E.
MULKEY E & C
PROJECT MANAGER

JOHNNY BANKS
MULKEY E & C
PROJECT DESIGN ENGINEER

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

HYDRAULICS ENGINEER

SIGNATURE: PE

ROADWAY DESIGN

SIGNATURE: PE

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PE
STATE HIGHWAY ENGINEER - DESIGN

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED FOR
DIVISION ADMINISTRATOR DATE

MULKEY
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Raleigh, N.C. 27636
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(919) 851-1918 (FAX)
WWW.MULKEYINC.COM

PROJECT REFERENCE NO.	SHEET NO.
B-3522	1-A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARDS

MULKEY
ENGINEERS & CONSULTANTS
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(919) 851-1918 (FAX)
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PROJECT REFERENCE NO.	SHEET NO.
B-3522	1-B

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 — C
Prop. Slope Stakes Fill — F
Prop. Woven Wire Fence
Prop. Chain Link Fence
Prop. Barbed Wire Fence
Prop. Wheelchair Ramp — WCR
Exist. Guardrail
Prop. Guardrail
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 — CA
Prop. Control of Access Line — CA
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 — FLOW

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 — T
Cable TV Pedestal — C
Hydrant
Satellite Dish
Exist. Water Valve
Sewer Clean Out
Power Manhole
Telephone Booth — P
Water Manhole — W
Light Pole
H-Frame Pole
Power Line Tower
Pole with Base
Gas Valve
Gas Meter
Telephone Manhole — T
Power Transformer
Sanitary Sewer Manhole — S
Storm Sewer Manhole
Tank; Water, Gas, Oil
Water Tank With Legs
Traffic Signal Junction Box — S
Fiber Optic Splice Box — F
Television or Radio Tower
Utility Power Line Connects to Traffic Signal Lines Cut Into the Pavement — TS TS

Recorded Water Line — W W
Designated Water Line (S.U.E.*) — W W
Sanitary Sewer — SS SS
Recorded Sanitary Sewer Force Main — FSS FSS
Designated Sanitary Sewer Force Main(S.U.E.*) — FSS FSS
Recorded Gas Line — G G
Designated Gas Line (S.U.E.*) — G G
Storm Sewer — S S
Recorded Power Line — P P
Designated Power Line (S.U.E.*) — P P
Recorded Telephone Cable — T T
Designated Telephone Cable (S.U.E.*) — T T
Recorded U/G Telephone Conduit — TC TC
Designated U/G Telephone Conduit (S.U.E.*) — TC TC
Unknown Utility (S.U.E.*) — ?UTL ?UTL
Recorded Television Cable — TV TV
Designated Television Cable (S.U.E.*) — TV TV
Recorded Fiber Optics Cable — FO FO
Designated Fiber Optics Cable (S.U.E.*) — FO 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 — EIP
Property Corner
Property Monument — ECM
Property Number — 123
Parcel Number — 6
Fence Line — WW & ISBW
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 — G
Church
School
Park
Cemetery — †
Dam
Sign — S
Well — W
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 — VINEYARD

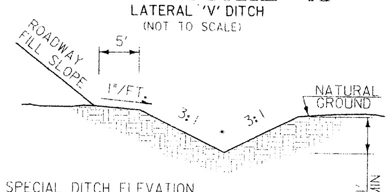
RAILROADS

Standard Gauge
RR Signal Milepost — CSX TRANSPORTATION — MILEPOST 35
Switch — SWITCH

revised 02/26/97

DITCH DETAIL 'A'

LATERAL 'V' DITCH
(NOT TO SCALE)

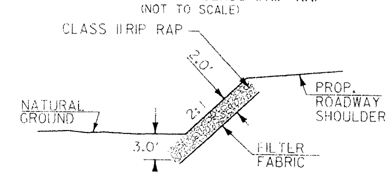


* SPECIAL DITCH ELEVATION

LINE	STA. TO STA.	DDE (FT³)
-L-	23+25 - 25+30 RT.	1608
-L-	27+15 - 28+25 RT.	385

DITCH DETAIL 'B'

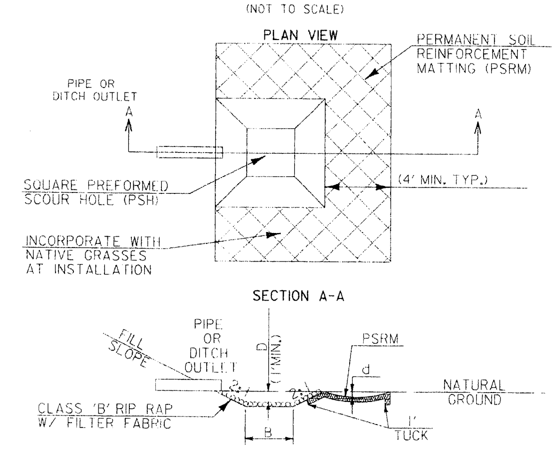
ARMORED SLOPE W/ CLASS II RIP RAP
(NOT TO SCALE)



LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (SQ. YDS.)
-L-	24+00 - 25+58 LT.	330	450
-L-	25+00 - 25+58 RT.	120	150
-L-	26+63 - 29+00 LT.	530	725
-L-	26+63 - 27+50 RT.	200	300

DETAIL 'C'

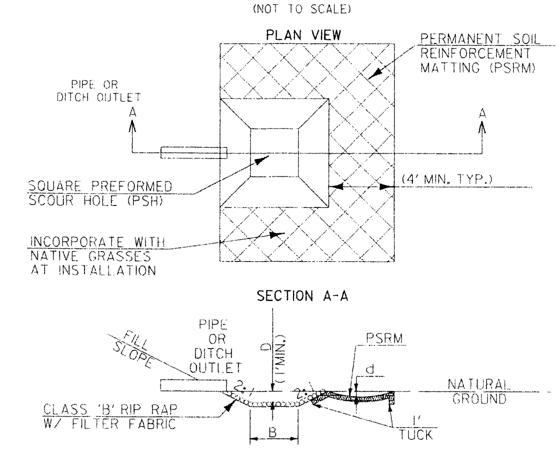
PREFORMED SCOUR HOLE
(NOT TO SCALE)



LINE	STATION	B (FT.)	D (FT.)	W_{PSR} (FT.)	d (FT.)	CLASS B RIP RAP (TONS)	DDE (FT³)	FILTER FABRIC (YD²)	PSRM (FT²)
-L-	24+67 LT.	4.0	2.0	5.0	1.0	9.1	550	250	310
-L-	27+00 LT.	4.0	2.0	5.0	1.0	9.1	550	250	310

DETAIL 'D'

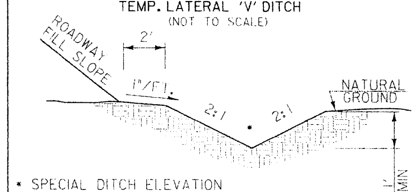
PREFORMED SCOUR HOLE
(NOT TO SCALE)



LINE	STATION	B (FT.)	D (FT.)	W_{PSR} (FT.)	d (FT.)	CLASS B RIP RAP (TONS)	DDE (FT³)	FILTER FABRIC (YD²)	PSRM (FT²)
-L-	24+55 LT.	4.5	2.0	5.0	1.0	9.1	550	250	310
-L-	25+35 RT.	4.5	2.0	5.0	1.0	9.1	550	250	310
-L-	27+10 RT.	4.5	2.0	5.0	1.0	9.1	550	250	310

DITCH DETAIL 'E'

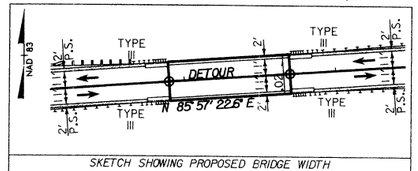
TEMP. LATERAL 'V' DITCH
(NOT TO SCALE)



* SPECIAL DITCH ELEVATION

LINE	STA. TO STA.	DDE (FT³)
-L-	23+28 - 25+57.5 RT.	1195
-L-	27+09 - 28+85 RT.	984

REVISIONS



SKETCH SHOWING PROPOSED BRIDGE WIDTH IN RELATION TO PROPOSED PAVEMENT WIDTH

DETOUR

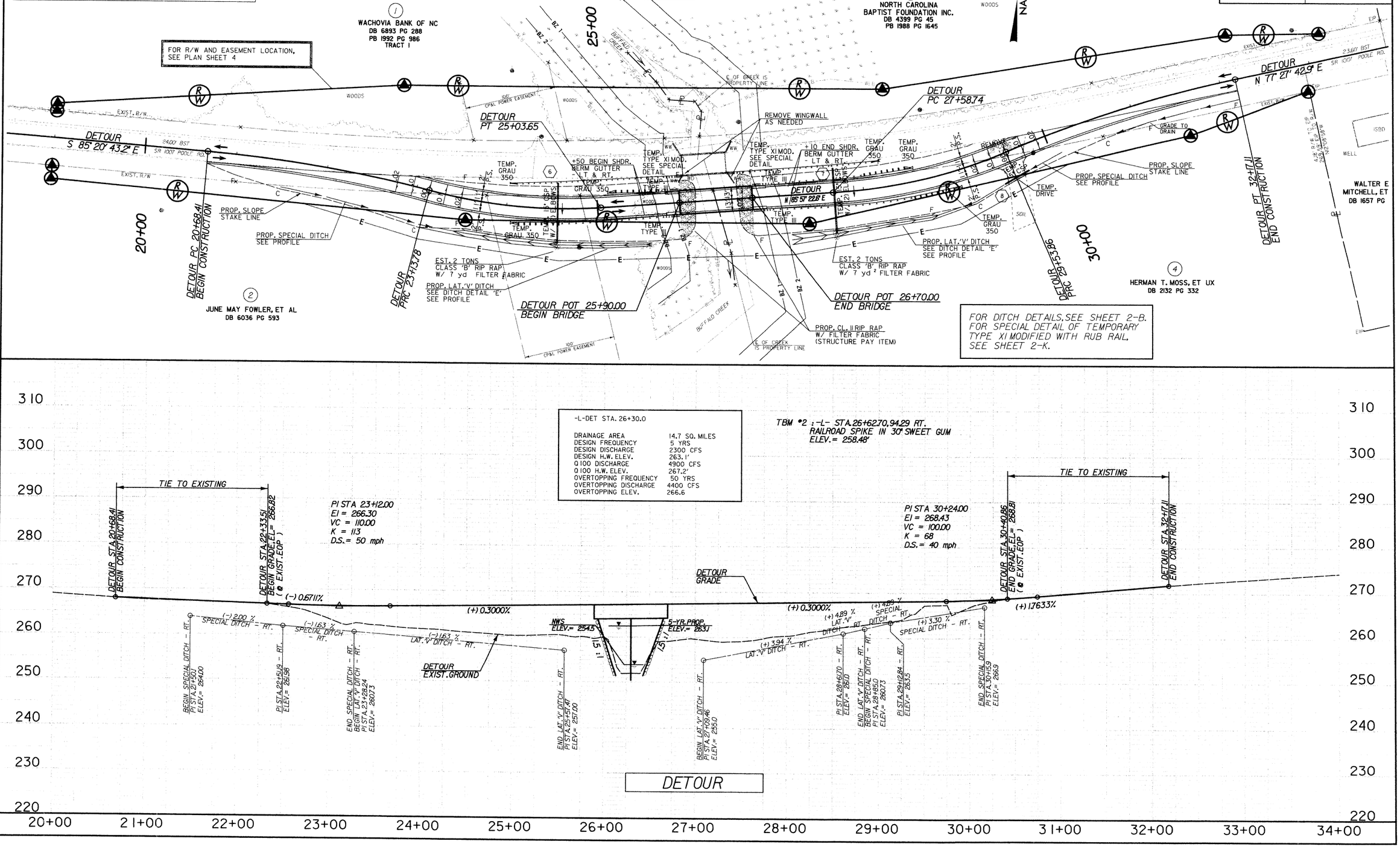
PI Sta 21+91.40	PI Sta 24+09.55	PI Sta 28+57.20	PI Sta 30+85.85
Δ = 09° 48' 52.3" (RT)	Δ = 18° 30' 46.5" (LT)	Δ = 19° 01' 27.7" (LT)	Δ = 10° 31' 48.0" (RT)
D = 04° 00' 00.0"	D = 09° 45' 00.0"	D = 09° 45' 00.0"	D = 04° 00' 00.0"
L = 245.36'	L = 189.88'	L = 195.12'	L = 263.25'
T = 122.98'	T = 95.77'	T = 98.47'	T = 132.00'
R = 1,432.39'	R = 587.65'	R = 587.65'	R = 1,432.39'
Se = RC	Se = RC	Se = RC	Se = RC
D.S. = 35 mph	D.S. = 35 mph	D.S. = 35 mph	D.S. = 35 mph

DETOUR

MULKEY
ENGINEERS & CONSULTANTS
PO Box 33127
Raleigh, NC 27636
(919) 851-1912
(919) 851-1918 (FAX)
WWW.MULKEYINC.COM

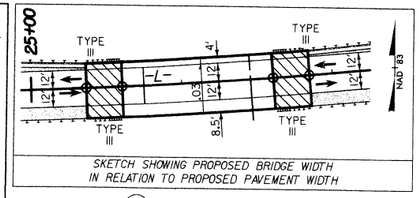
PROJECT REFERENCE NO.	SHEET NO.
B-3522	2-C
HYDRAULICS ENGINEER	HIGHWAY DESIGN ENGINEER

REVISIONS



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B3522-1" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 737849.856(ft) EASTING: 2187704.118(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999990580
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B3522-1" TO -L- STATION 19+00.00 IS S 87° 30' 06.6" W 412.97'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29



SKETCH SHOWING PROPOSED BRIDGE WIDTH IN RELATION TO PROPOSED PAVEMENT WIDTH

-L-
PI Sta 26+09.52
D = 17° 11' 33.9" (LT)
D = 01°38'13.3"
L = 1,050.25'
T = 529.10'
R = 3,500.00'
Se = 0.03
D.S. = 50 mph

MULKEY
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Raleigh, N.C. 27636
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(919) 851-1918 (FAX)
WWW.MULKEYINC.COM

PROJECT REFERENCE NO.	SHEET NO.
B-3522	4
HYDRAULICS ENGINEER	HIGHWAY DESIGN ENGINEER

REVISIONS