STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

April 14, 2004

U.S. Army Corps of Engineers
Regulatory Field Office
Post Office Box 1890
Wilmington, NC 28402-1890

Attention: Mr. Richard Spencer
NCDOT Coordinator

Dear Sir:

Subject: **Nationwide 23 application.** Hoke County, Replacement of Bridge No. 53 on SR 1422 over Puppy Creek, Federal Project No. BRZ-1422(5), State Project No. 8.2530401, TIP No. B-4152.

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 53 over Puppy Creek on SR 1422. Bridge No. 53 will be replaced on the existing alignment with a new cored slab bridge approximately 100 feet in length. Permanent impacts to wetlands associated with this project total 0.04 acre. An offsite detour will be utilized during construction.

Please find enclosed copies of the Categorical Exclusion (CE), permit drawings, half size plans, Natural Resources Technical Report, and the EEP approval letter.

Puppy Creek is located in the Cape Fear River Basin (Hydrological Cataloguing Unit 03030004) and classified by the Division of Water Quality as C. Class C waters are protected for secondary recreation, fishing, wildlife, fish and aquatic life propagation and survival, agriculture and other uses suitable for Class C. Secondary recreation includes wading, boating, and other uses involving human body contact with water where such activities take place in an infrequent, unorganized, or incidental manner.

PROPOSED IMPACTS TO WATERS OF THE UNITED STATES

Bridge Demolition: Bridge No. 53 has an asphalt wearing surface, and the remainder of the bridge, both superstructure and substructure, is composed of timber and steel. The asphalt wearing surface will be removed prior to demolition without dropping into the water. Also, all timber and steel components of this bridge will also be removed without dropping into

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

TELEPHONE: 919-715-1500
FAX: 919-715-1501
WEBSITE: WWW.NCDOT.ORG

LOCATION:
2728 CAPITAL BLVD
PLB SUITE 168
RALEIGH NC 27604

waters of the United States. Best Management Practices for Bridge Demolition and Removal, which dictates that all existing structures over water be removed by non-shattering methods, will be followed during demolition and construction.

Permanent Impacts: The permit drawings report wetland impacts of 0.04 acre of permanent fill and mechanized clearing. The permanent fill and mechanized clearing is due to the approach roadway fill for the proposed structure.

PROTECTED SPECIES

Threatened and Endangered Species: Plants and animals with federal classification 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 U.S. Fish and Wildlife Service (USFWS) lists 5 federally protected species for Hoke County. Habitat exists only for the endangered Michaux's sumac (*Rhus michauxii*). Since there were no Michaux's sumac found during surveys and there are no known populations of Michaux's sumac in the project vicinity, a biological conclusion of "No Effect" is valid for this species. Biological conclusions of "No Effect" for each of the remaining species are valid and are presented in the attached CE.

UTILITIES

There will be no impacts to jurisdictional wetlands or surface waters resulting from utility line relocations.

MITIGATION OPTIONS

AVOIDANCE AND MINIMIZATION: Specific avoidance and minimization measures for this project include using a maximum slope of 2:1, replacing the existing bridge in its current location, installing the bridge bents outside of the stream, and utilizing an offsite detour.

COMPENSATION: This project will permanently impact a total of 0.04 acre of wetlands. Despite the minimization strategies employed for the proposed project, the resulting wetland impacts will require mitigation.

Based upon the agreements stipulated in the "Memorandum of Agreement Among the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U.S. Army Corps of Engineers, Wilmington District (MOA)", it is understood that the North Carolina Department of Environment and Natural Resources Ecological Enhancement Program (EEP), will assume responsibility for satisfying the Section 404 compensatory mitigation requirements for NCDOT projects that are listed in Exhibit 1 of the subject MOA during the Ecological Enhancement Program (EEP) transition period which ends on July 1, 2005.

Since the subject project is scheduled to be let on September 20, 2005, after the transition period, 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 (see attached letter from EEP). The offsetting mitigation will derive from an inventory of assets already in existence within the same Ecoregion and the same 8-digit cataloguing unit. We have avoided and minimized the impacts to jurisdictional resources to the greatest extent possible as described above. The remaining, unavoidable impacts to 0.04 acre of jurisdictional wetlands will be offset by compensatory mitigation provided by the EEP program.

REGULATORY APPROVALS

Section 404 Permit: 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 Nationwide 23 as authorized by Nationwide Permit 23 (FR number 10, pages 2020-2095; January 15, 2002).

Section 401 Permit: We anticipate 401 General Certification number 3361 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.

Thank you for your assistance with this project. If you have any questions or need additional information please call Matt Haney at (919) 715-1428.

Sincerely

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

Cc: w/attachment
Mr. John Hennessy, Division of Water Quality
Mr. Gary Jordan, USFWS
Mr. Travis Wilson, NCWRC
Mr. David Chang, P.E., Hydraulics
Mr. Greg Perfetti, P.E., Structure Design
Mr. T. Johnson, P.E., Division Engineer
Mr. Art King, Division Environmental Officer
W/o attachment
Mr. David Franklin, USACE, Wilmington
Mr. Jay Bennett, P.E., Roadway Design
Mr. Omar Sultan, Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Ms. Jennifer Parish, Roadside Environmental
Mr. Dennis Pipkin, P.E., PDEA Project Planning Engineer
Ms. Beth Harmon, EEP

Ecosystem Enhancement
PROGRAM

February 14, 2005

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

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

B-4152, Bridge Number 53 over Puppy Creek on SR 1422, Hoke County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide riverine wetland mitigation for the subject project. Based on the information supplied by you in a letter dated December 10, 2004, the impacts are located in CU 03030004 of the Cape Fear River Basin in the Southern Inner Coastal Plain (SICP) Eco-Region, and are as follows:

Riverine Wetland Impacts: 0.04 acre

The subject project is <u>not</u> listed in Exhibit 2 of the Memorandum of Agreement among the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U. S. Army Corps of Engineers, Wilmington District dated July 22, 2003. The EEP is only committed to provide the mitigation needs for projects listed on Exhibit 2 during the first two years of the program; however Amendment 1 details how non-Exhibit 2 projects may be swapped for an appropriate project included on the Exhibit 2 list. Specifically, Amendment 1 states that:

> "Exhibit 2 may be modified if requested jointly by NCDENR and NCDOT, and approved in writing by the USACE. In no event may the total projected impacts of projects per cataloging unit on Exhibit 2 exceed the total projected impacts of projects per cataloging unit on Exhibit 2 as it existed at the time of the original execution of the MOA, July, 2003."

In this case, the NCDOT has not proposed to swap this project for an appropriate project included on the Exhibit 2 list. However, EEP currently has surplus riverine wetland and stream mitigation with sufficient assets to cover this years projected mitigation requirements plus the mitigation for the above referenced project. Therefore, the EEP agrees to accept this project and will provide compensatory riverine wetland and stream mitigation up to a 2:1 ratio in Cataloging Unit 03030004 of the Cape Fear River Basin.

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

Sincerely,

James B. Stanfill for

William D. Gilmore, P.E.
EEP Director

cc: Mr. Richard Spencer, USACE-Wilmington
Mr. John Hennessy, Division of Water Quality, Wetlands/401 Unit
File: B-4152

Ecosystem Enhancement PROGRAM

February 14, 2005

Mr. Richard Spencer
U. S. Army Corps of Engineers
Wilmington Regulatory Field Office
Post Office box 1890
Wilmington, North Carolina 28403-1890

Dear Mr. Spencer:

Subject: EEP Mitigation Acceptance Letter:

B-4152, Bridge Number 53 over Puppy Creek on SR 1422, Hoke County; Cape Fear River Basin (Cataloging Unit 03030004); Southern Inner Coastal Plain (SICP) Eco-Region

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide mitigation for the 0.04 acre of unavoidable riverine wetland impacts associated with the above referenced project.

The subject project is not listed in Exhibit 2 of the Memorandum of Agreement among the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U. S. Army Corps of Engineers, Wilmington District dated July 22, 2003. The EEP is only committed to provide the mitigation needs for projects listed on Exhibit 2 during the first two years of the program; however Amendment 1 details how non-Exhibit 2 projects may be swapped for an appropriate project included on the Exhibit 2 list. Specifically, Amendment 1 states that:

> "Exhibit 2 may be modified if requested jointly by NCDENR and NCDOT, and approved in writing by the USACE. In no event may the total projected impacts of projects per cataloging unit on Exhibit 2 exceed the total projected impacts of projects per cataloging unit on Exhibit 2 as it existed at the time of the original execution of the MOA, July, 2003."

In this case, the NCDOT has not proposed to swap this project for an appropriate project included on the Exhibit 2 list. However, EEP currently has surplus riverine wetland and stream mitigation with sufficient assets to cover this years projected mitigation requirements plus the mitigation for the above referenced project. Therefore, the EEP intends to provide compensatory riverine wetland and stream mitigation up to a

2:1 ratio in Cataloging Unit 03030004 of the Cape Fear River Basin. Mitigation sites currently containing surplus mitigation assets consists of, but not inclusive of, the Little River and Jumping Run Creek Mitigation Sites.

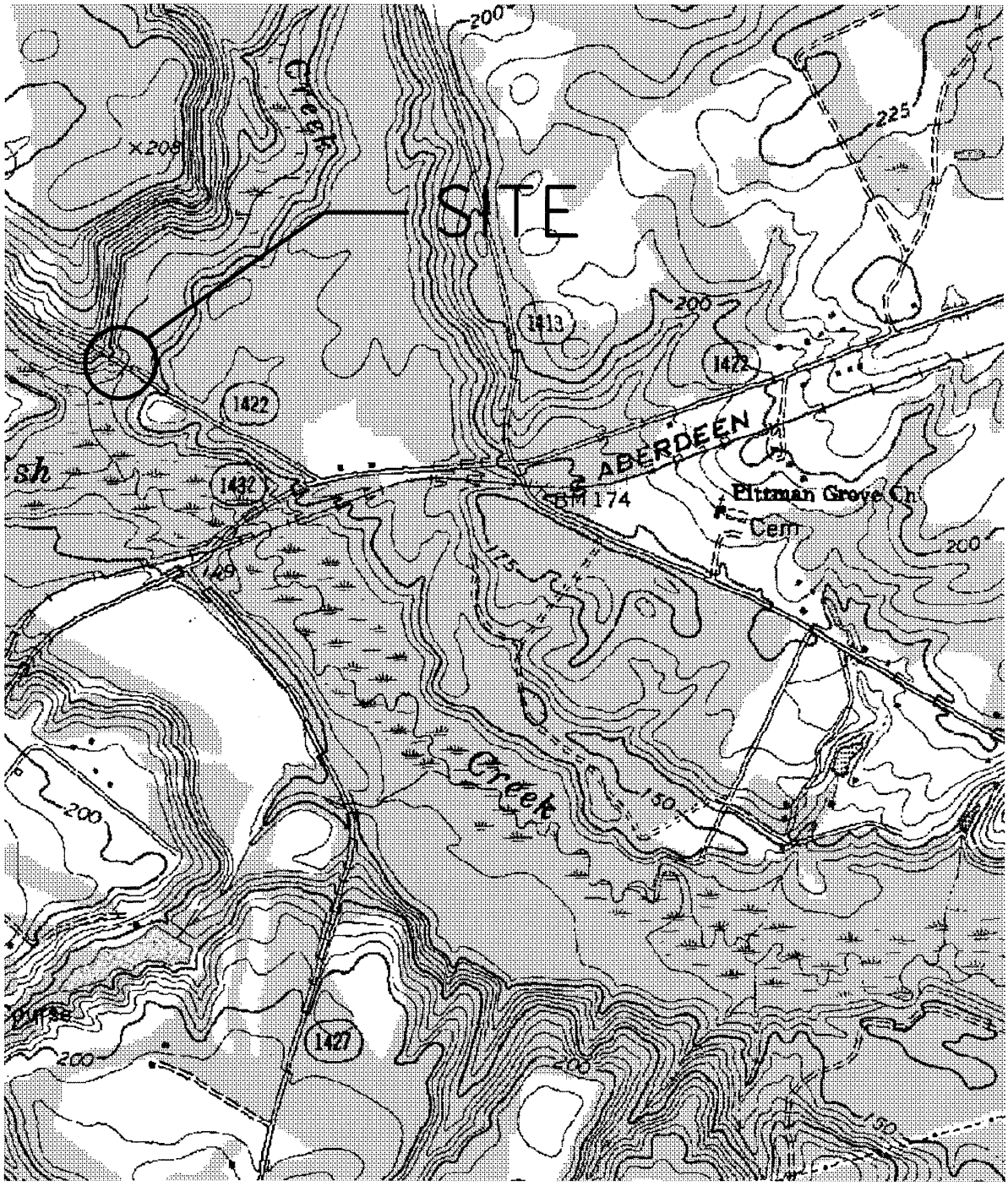
If you have any questions or need additional information, please contact Ms. Beth Harmon at (919) 715-1929.

Sincerely,

James B Stanfill for

William D. Gilmore, P.E.
EEP Director

cc: Phil Harris, Office of Natural Environment, NCDOT
John Hennessy, Division of Water Quality, Wetlands/401 Unit
File: B-4152



SITE MAP

NCDOT

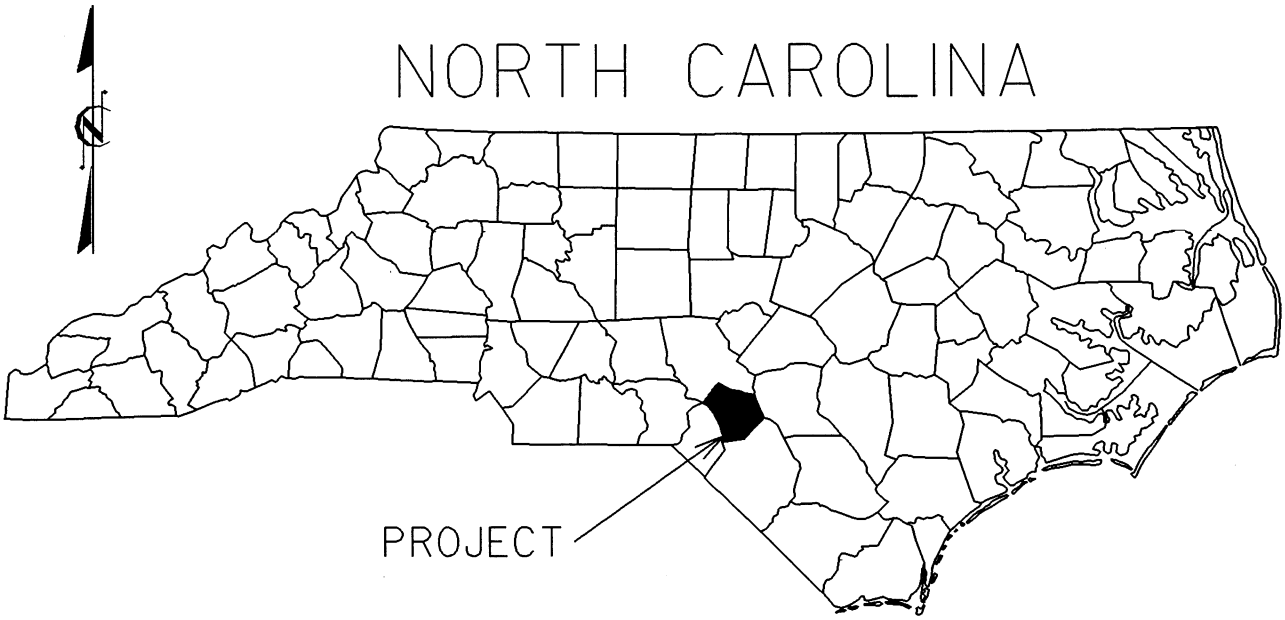
DIVISION OF HIGHWAYS

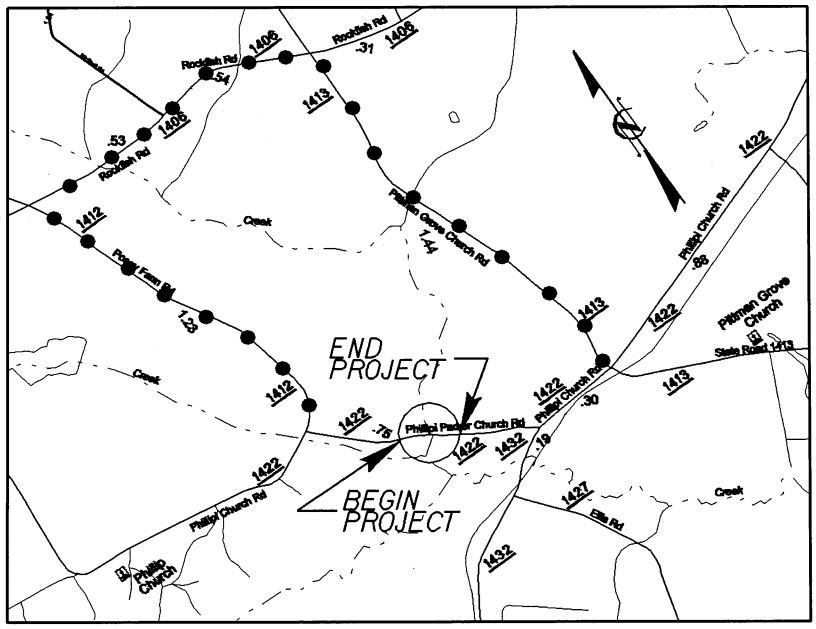
HOKE COUNTY

PROJECT: 33501.1 (B-4152)

BRIDGE NO. 53 OVER PUPPY CREEK ON SR 1422

SHEET 1 **OF** 4 **11/29/04**





VICINITY MAPS

NCDOT

DIVISION OF HIGHWAYS

HOKE COUNTY

PROJECT: 33501.1 (B-4152)

BRIDGE NO. 53 OVER PUPPY CREEK ON SR 1422

SHEET 2 **OF** 4 **11/29/04**

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
1	TAR HEEL TURKEY HATCHERY	PO BOX 150 RAEFORD NC 28376
2	GEORGE BALCH	4204 PHILLIPI CHURCH RD. RAEFORD NC 28376

NCDOT

DIVISION OF HIGHWAYS

HOKE COUNTY

PROJECT: 33501.1 (B-4152)

BRIDGE NO. 53

OVER PUPPY CREEK

ON SR 1422

WETLAND PERMIT IMPACT SUMMARY

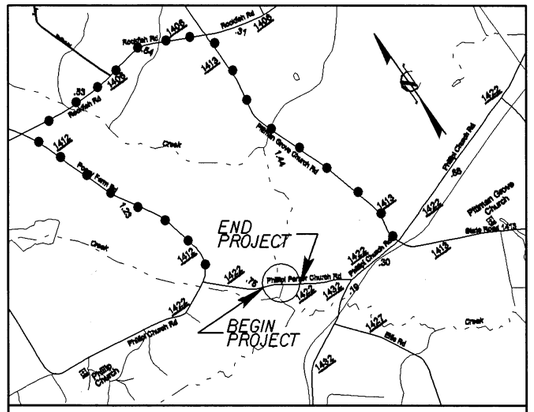
			WETLAND IMPACTS				SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation In Wetlands (ac)	Mechanized Clearing (Method III) (ac)	Fill In SW (Natural) (ac)	Fill In SW (Pond) (ac)	Temp. Fill In SW (ac)	Existing Channel Impacted (ft)	Natural Stream Design (ft)
1	14+70 -L-	21" CORED SLAB	0.0039			0.0409					
		LENGTH 100'									
		3 SPAN (23', 54', 23')									
TOTALS:			0.0039	0	0	0.0409	0	0	0	0	0

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

HOKE COUNTY
PROJECT 33501.1 B-4152

SHEET 4 OF 4 11/29/2004

Form Revised 3/22/01



09/08/99

29-NOV-2004 11:00
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aabillings AT

CONTRACT:

TIP PROJECT: B-4152

See Sheet 1-A For Index of Sheets

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HOKE COUNTY

LOCATION: BRIDGE NO. 53 OVER PUPPY CREEK ON SR 1422
TYPE OF WORK: GRADING, PAVING, DRAINAGE & STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4152	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
33501.1.1	BRZ-1422(5)	PE, UTL
33501.2.1	BRZ-1422(9)	R/W

VICINITY MAP
●-●-● DETOUR ROUTE

THERE IS NO MUNICIPAL BOUNDARIES ON THIS PROJECT
THERE IS NO CONTROL OF ACCESS WITH THIS PROJECT
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II
**** EXCEPTION FOR THE K VALUES OF THE SAG VERTICAL CURVES AND VERTICAL STOPPING SIGHT DISTANCES.**

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2004 = 1550
ADT 2025 = 2600
DHV = 13 %
D = 60 %
T = 3 % *
V = 55 MPH**
FUNC CLASS = LOCAL
* TTST 1% DUAL 2%

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4152 = 0.180 MI
LENGTH OF STRUCTURE TIP PROJECT B-4152 = 0.019 MI
TOTAL LENGTH OF TIP PROJECT B-4152 = 0.199 MI

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

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
SEPTEMBER 27, 2004

LETTING DATE:
SEPTEMBER 20, 2005

TONY HOUSER, PE
PROJECT ENGINEER

BRUCE PAYNE, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE:

ROADWAY DESIGN
ENGINEER

SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER

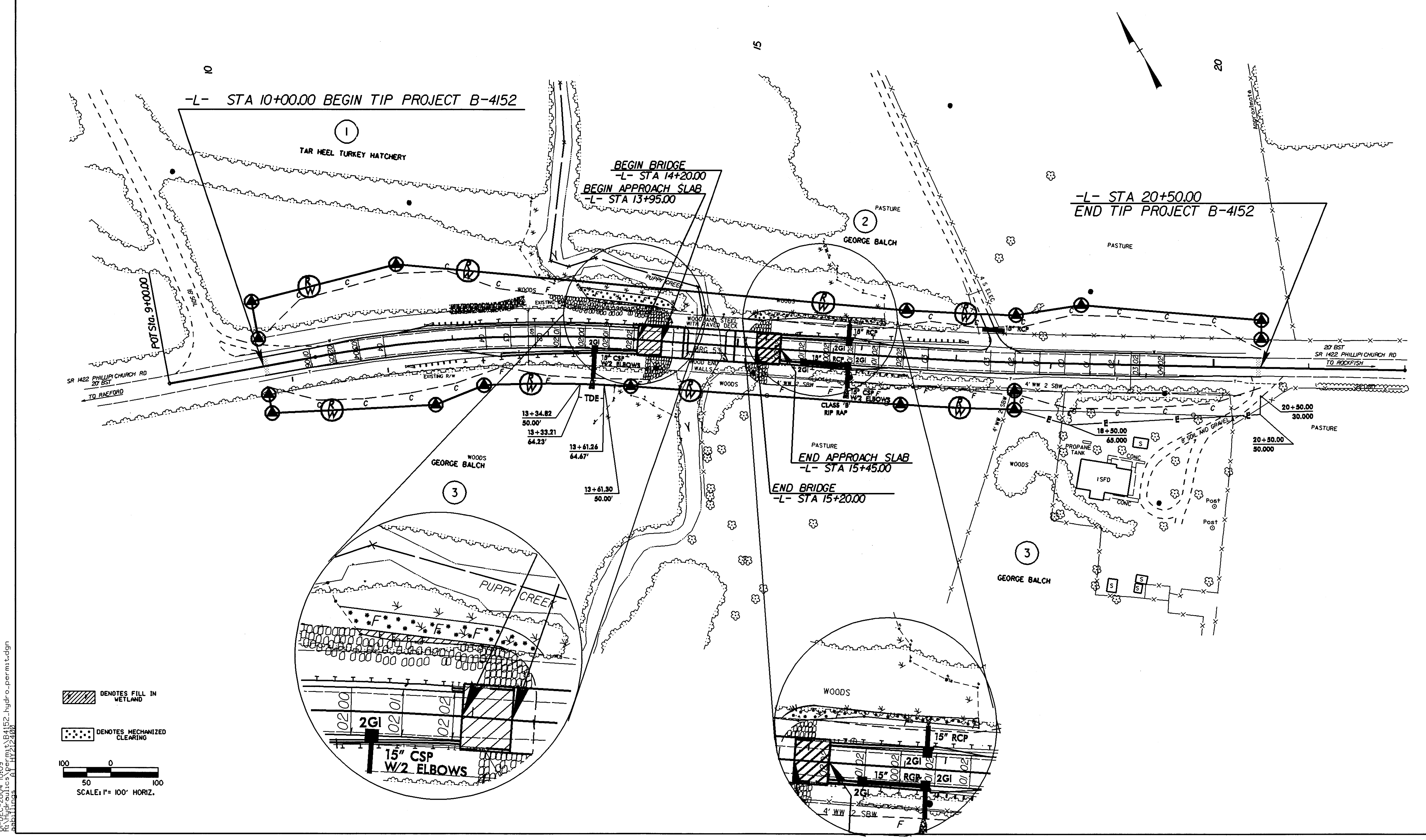
DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR DATE

PROJECT REFERENCE NO.	SHEET NO.
B-4152	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ENGLISH

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-L- STA 10+00.00 BEGIN TIP PROJECT B-4152
1
TAR HEEL TURKEY HATCHERY
BEGIN BRIDGE
-L- STA 14+20.00
BEGIN APPROACH SLAB
-L- STA 13+95.00
2
GEORGE BALCH
PASTURE
-L- STA 20+50.00
END TIP PROJECT B-4152
POT Sta. 9+00.00
SR 1422 PHILLIPI CHURCH RD
20' BST
TO RAEFORD
20' BST
SR 1422 PHILLIPI CHURCH RD
TO ROCKFISH
PUPPY CREEK
WOODS
EXISTING R/W
18" RCP
15" CSP W/2 ELBOWS
15" CSP W/2 ELBOWS
CLASS 'B' RIP RAP
4' WW 2 SBW
13+34.82
50.00'
13+33.21
64.23'
13+61.26
64.67'
13+61.30
50.00'
TDE
GEORGE BALCH
3
END APPROACH SLAB
-L- STA 15+45.00
END BRIDGE
-L- STA 15+20.00
18+50.00
65.000
20+50.00
30.000
20+50.00
50.000
PROPANE TANK
ISFD
CONC
Post
3
GEORGE BALCH
15" CSP
W/2 ELBOWS
2GI
15" RCP
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
100 0 50 100
SCALE: 1" = 100' HORIZ.

8/17/99

01-DEC-2004 10:09
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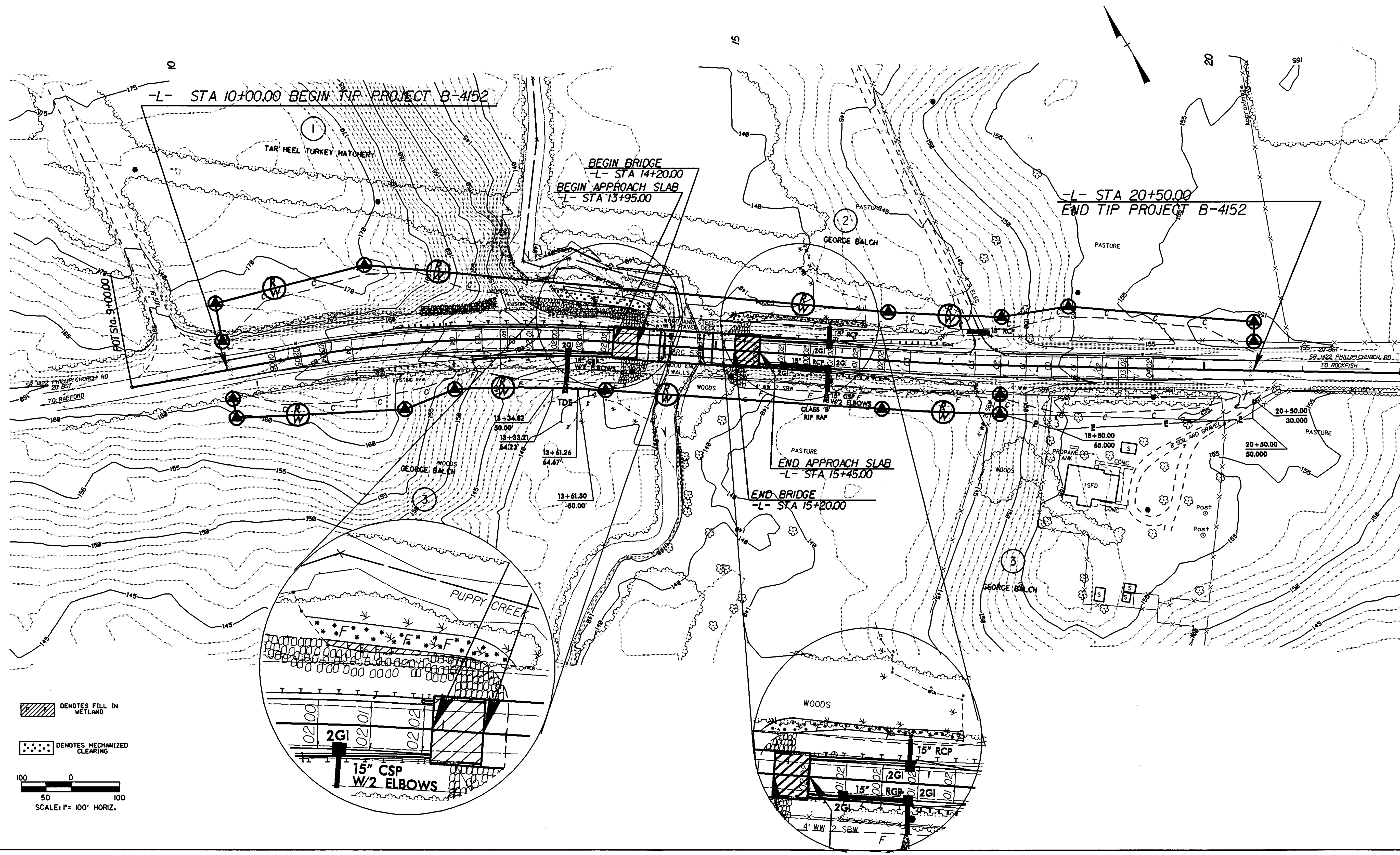
PROJECT REFERENCE NO.	SHEET NO.
B-4152	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ENGLISH

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-L- STA 10+00.00 BEGIN TIP PROJECT B-4152
TAR HEEL TURKEY HATCHERY
BEGIN BRIDGE
-L- STA 14+20.00
BEGIN APPROACH SLAB
-L- STA 13+95.00
-L- STA 20+50.00
END TIP PROJECT B-4152
GEORGE BALCH
PUPPY CREEK
PASTURE
WOODS
SR 1422 PHILLIPI CHURCH RD
TO RAEFORD
TO ROCKFISH
CLASS 'B' RIP RAP
END APPROACH SLAB
-L- STA 15+45.00
END BRIDGE
-L- STA 15+20.00
15" CSP W/2 ELBOWS
15" RCP
2GI
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
SCALE: 1" = 100' HORIZ.

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4152	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 2760 CFS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 145.69FT
BASE DISCHARGE	= 3480 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 147.14 FT
OVERTOPPING DISCHARGE	= 3480 CFS
OVERTOPPING FREQUENCY	= 50+ YRS
OVERTOPPING ELEVATION	= 146.25FT
	= FT
DATE OF SURVEY	= 8/13/04
W.S.ELEVATION AT DATE OF SURVEY	= 140.26FT

-L-

BM #1
-L- STA 14+92.59
105.36' LT
ELEV.140.26'

BEGIN GRADE -L- STA 10+50.00
EL = 161.48'

PI = 11+50.00
EL = 160.04'
K = 45
VC = 180'

TIE TO EXIST
INCIDENTAL MILLING AS NEEDED

(-)4.4415%

(-)5.4697%

+00 LT
154.44'

(-)5.3440%

SPECIAL CUT DITCH

(-)3.0920%

+50 LT
151.77'

#75 LT
151.00'

PI = 13+90.00
EL = 146.91'
K = 56
VC = 290'

BEGIN BRIDGE -L- STA 14+20.00
EL = 148.00'

END BRIDGE -L- STA 15+20.00
EL = 146.53'

(-)5.4697%

(-)10.3063%

PI = 17+08.00
EL = 145.94'
K = 59
VC = 220'

(-)0.3063%

(+)3.4246%

PI = 19+03.00
EL = 152.62'
K = 61
VC = 135'

(+)3.4246%

(+)1.2182%

END GRADE -L- STA 20+00.00
EL = 153.80'

TIE TO EXIST
INCIDENTAL MILLING AS NEEDED

SEE SHEET 4 FOR -L- ALIGNMENT

167
157
147
137

9 10 11 12 13 14 15 16 17 18 19 20 21 22

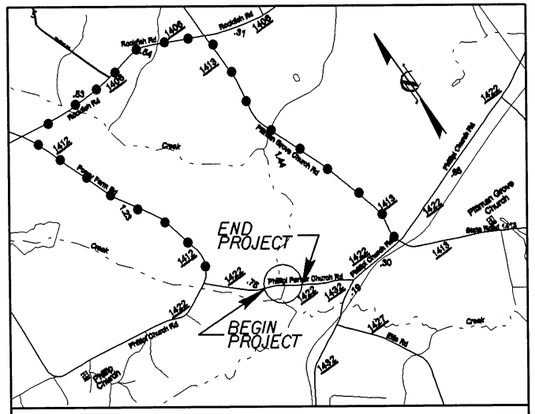
01-DEC-2004 09:49
R:\Hydraulics\Permit\B-4152_rdy_pfl_030219.dgn
Hydraulics

09/08/99

TIP PROJECT: B-4152

CONTRACT:

See Sheet 1-A For Index of Sheets



VICINITY MAP
DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

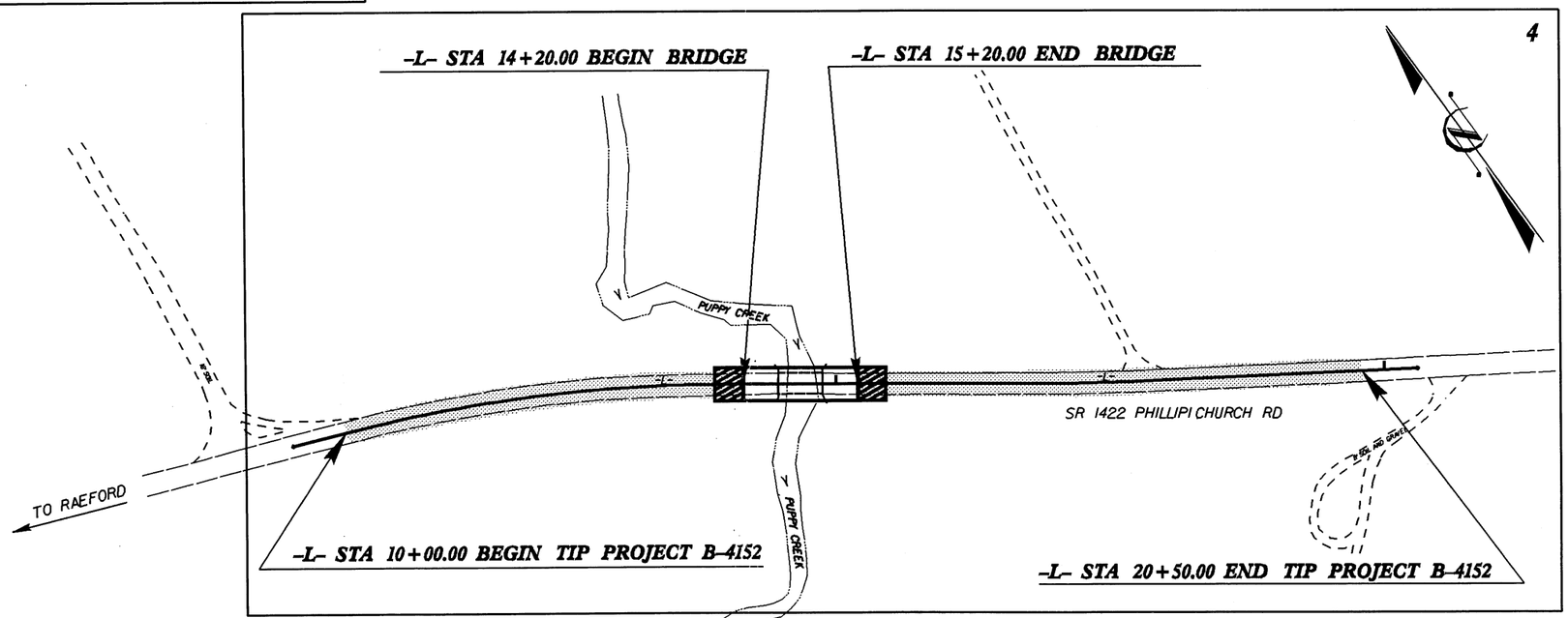
HOKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4152	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33501.1.1	BRZ-1422(5)	PE, UTL
33501.2.1	BRZ-1422(9)	R/W

LOCATION: BRIDGE NO. 53 OVER PUPPY CREEK ON SR 1422

TYPE OF WORK: GRADING, PAVING, DRAINAGE & STRUCTURE



THERE IS NO MUNICIPAL BOUNDARIES ON THIS PROJECT
THERE IS NO CONTROL OF ACCESS WITH THIS PROJECT
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II
***** EXCEPTION FOR THE K VALUES OF THE SAG VERTICAL CURVES AND VERTICAL STOPPING SIGHT DISTANCES.***

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2004 = 1550
ADT 2025 = 2600
DHV = 13 %
D = 60 %
T = 3 % *
V = 55 MPH**
FUNC CLASS = LOCAL
* TTST 1% DUAL 2%

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4152 = 0.180 MI
LENGTH OF STRUCTURE TIP PROJECT B-4152 = 0.019 MI
TOTAL LENGTH OF TIP PROJECT B-4152 = 0.199 MI

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

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: SEPTEMBER 27, 2004

LETTING DATE: SEPTEMBER 20, 2005

TONY HOUSER, PE
PROJECT ENGINEER

BRUCE PAYNE, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE:

ROADWAY DESIGN ENGINEER

SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR *DATE*

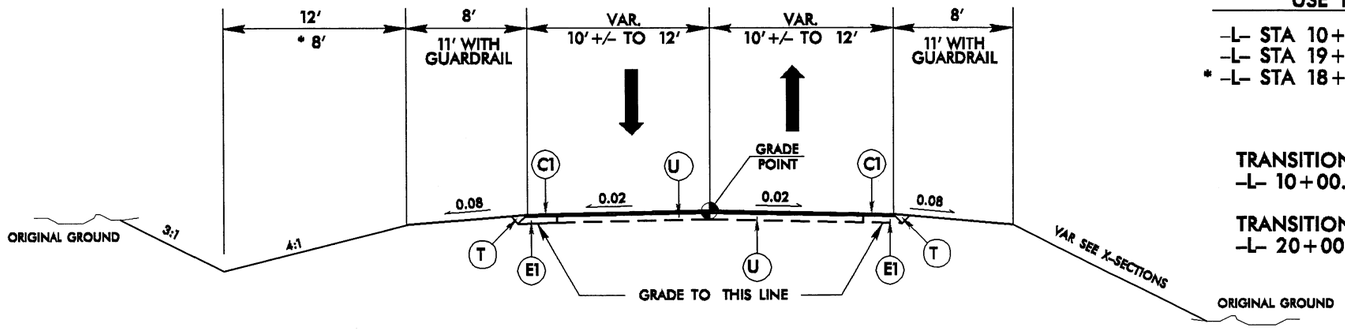
01-DEC-2004 08:50
R:\Roadway\Proj\B-4152_rdy_tsh_030219.dgn
CHLee
AT RD214496

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
B-4152	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

℄ –L– (PHILLIPI CHURCH ROAD)



TYPICAL SECTION NO. 1

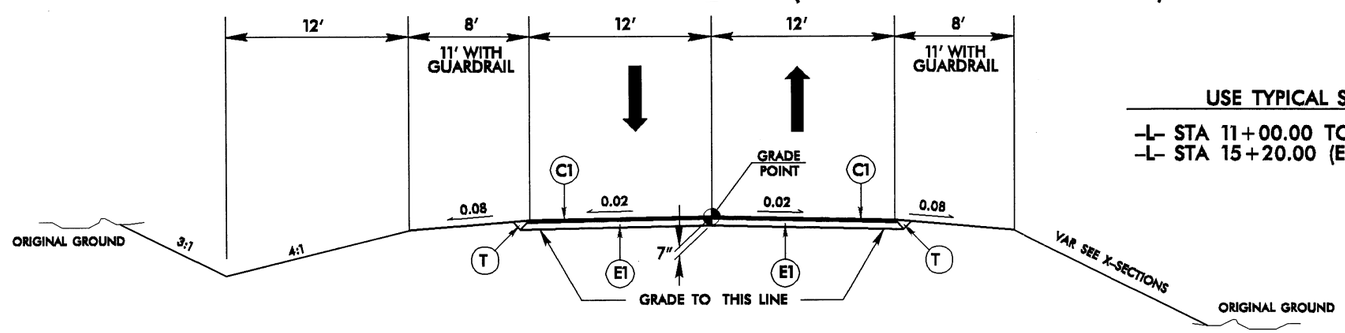
USE TYPICAL SECTION NO. 1 FOR

–L– STA 10+50.00 TO 11+00.00
–L– STA 19+50.00 TO 20+00.00
* –L– STA 18+50.00 TO 20+00.00 (RT)

TRANSITION FROM EXISTING TO PROPOSED
–L– 10+00.00 TO 10+50.00

TRANSITION FROM PROPOSED TO EXISTING
–L– 20+00.00 TO 20+50.00

℄ –L– (PHILLIPI CHURCH ROAD)

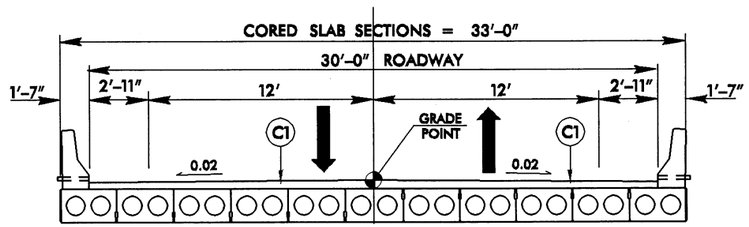


TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2 FOR

–L– STA 11+00.00 TO STA 14+20.00 (BEGIN BRIDGE)
–L– STA 15+20.00 (END BRIDGE) TO STA 19+50.00

℄ –L– (PHILLIPI CHURCH ROAD)



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3 FOR

–L– STA 14+20.00 (BRIDGE) TO STA 15+20.00 (BRIDGE)

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 2.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½″ IN DEPTH.
E1	PROP. APPROX. 4.5″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3″ IN DEPTH OR GREATER THAN 5½″ IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.

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

01-DEC-2004 08:50
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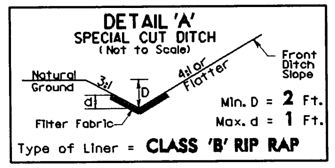
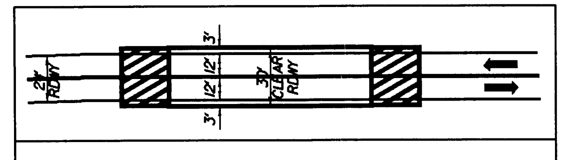
User: RJ214196

PROJECT REFERENCE NO.	SHEET NO.
B-4152	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

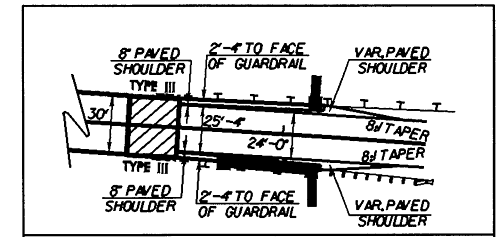
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



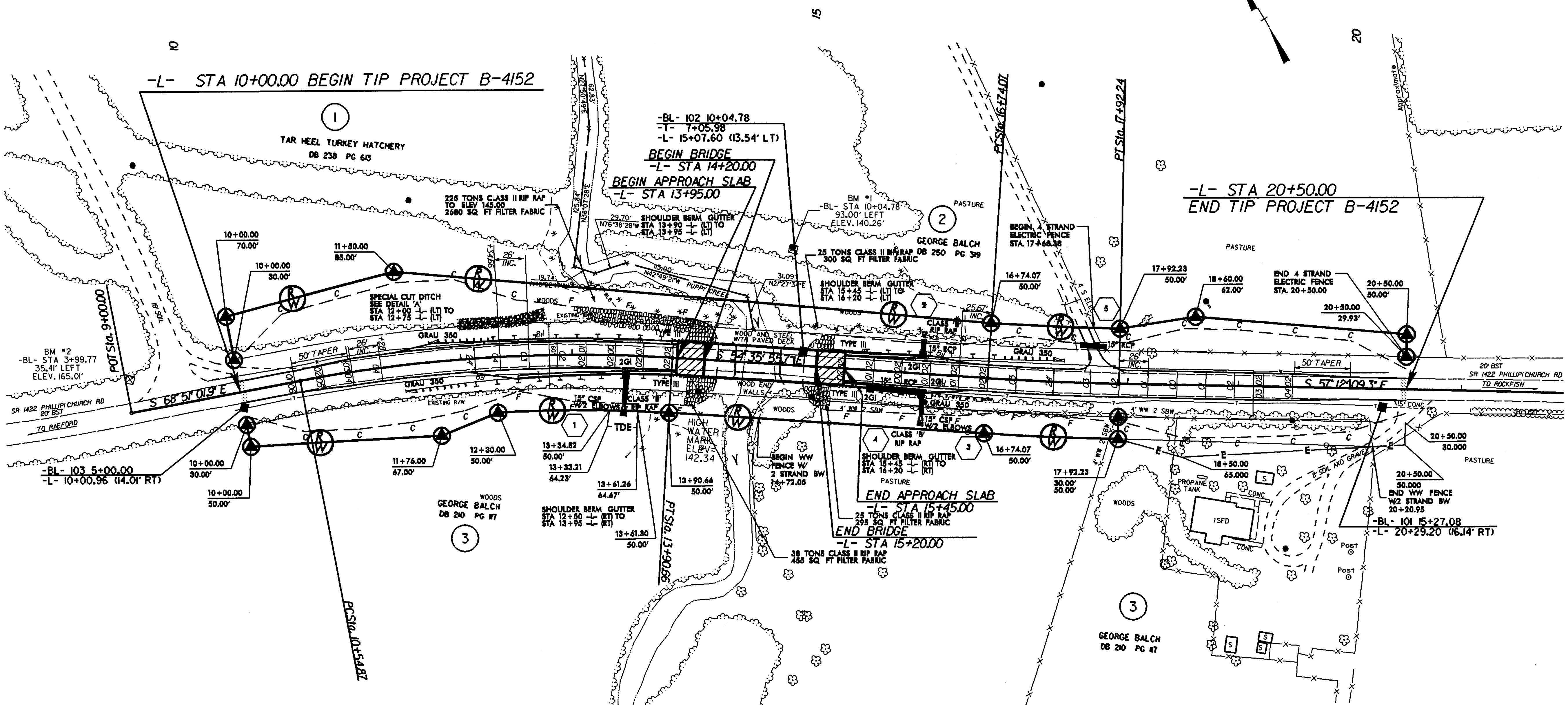
STA 12+00 -L- (LT) TO STA 12+75 -L- (LT)



DETAIL SHOWING PAVEMENT AND BRIDGE RELATIONSHIP



DETAIL OF PAVED SHOULDER AND SHOULDER BERM GUTTER



CURVE DATA

PI Sta 12+23.64	PI Sta 17+33.16
Δ = 14°15' 05.8" (RT)	Δ = 2°36' 14.4" (LT)
D = 4°14' 38.8"	D = 2°12' 13.3"
L = 335.80'	L = 118.16'
T = 168.77'	T = 59.09'
R = 1,350.01'	R = 2,599.98'

*DESIGN EXCEPTION FOR THE K VALUES OF THE SAG VERTICAL CURVES AND VERTICAL STOPPING SIGHT DISTANCE

SEE SHEET 5 FOR -L- PROFILE
SEE SHEET S-? THRU S-? FOR STRUCTURE PLANS

8/17/99

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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4152	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 2760 CFS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 145.69FT
BASE DISCHARGE	= 3480 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 147.14 FT
OVERTOPPING DISCHARGE	= 3480 CFS
OVERTOPPING FREQUENCY	= 50+ YRS
OVERTOPPING ELEVATION	= 146.25FT
	= FT
DATE OF SURVEY	= 8/13/04
W.S. ELEVATION AT DATE OF SURVEY	= 140.26FT

-L-

BM #1
-L- STA 14+92.59
105.36' LT
ELEV. 140.26'

BEGIN GRADE -L- STA 10+50.00
EL = 161.48'

TIE TO EXIST
INCIDENTAL MILLING AS NEEDED

PI = 11+50.00
EL = 160.04'
K = 45
VC = 180'

(-)1.4415%
(-)5.4697%
(-)5.3440%
(-)3.0920%
(-)10.306.3%

+00 LT
154.44

SPECIAL CUT DITCH

+50 LT
EL = 151.77

+75 LT
151.00

PI = 13+90.00
EL = 146.91'
K = 56
VC = 290'

BEGIN BRIDGE -L- STA 14+20.00
EL = 148.00'

END BRIDGE -L- STA 15+20.00
EL = 146.53'

PI = 17+08.00
EL = 145.94'
K = 59
VC = 220'

(+)3.4246%
(+)1.2182%

PI = 19+03.00
EL = 152.62'
K = 61
VC = 135'

END GRADE -L- STA 20+00.00
EL = 153.80'

TIE TO EXIST
INCIDENTAL MILLING AS NEEDED

SEE SHEET 4 FOR -L- ALIGNMENT

167
157
147
137

9 10 11 12 13 14 15 16 17 18 19 20 21 22

DEC-2004 09:45
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ppbillings

8/23/99

0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4152	X-1

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

S.S. 168.400

170
165
160
155

3:1

4:1

0.0100

161.48

161.23

0.0600

S.S. 161.653

4:1

3:1

158.200

157.120

10+50.00

170
165
160
155

161.95

10+00.00

165
160
155

162.08

9+50.00

"QUANTITIES ARE APPROXIMATE ONLY. THE RESIDENT ENGINEER WILL RECROSS-SECTION THE WORK ACCURATELY WHEN THE PROJECT IS STAKED OUT. THESE CROSS-SECTION NOTES WILL BE USED IN COMPUTING THE FINAL QUANTITIES FOR WHICH THE CONTRACTOR WILL BE PAID."

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

01-DEC-2004 08:51
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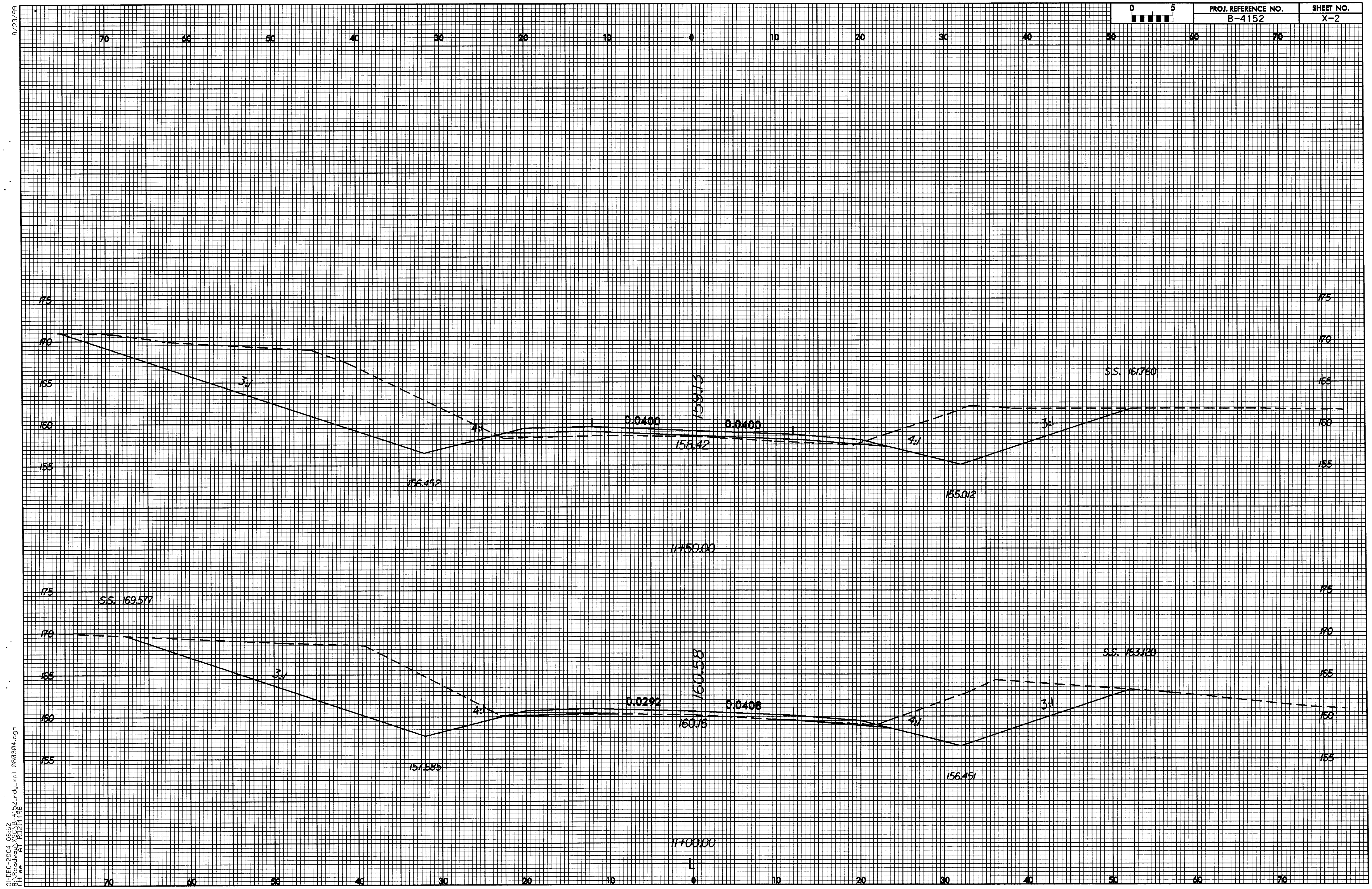
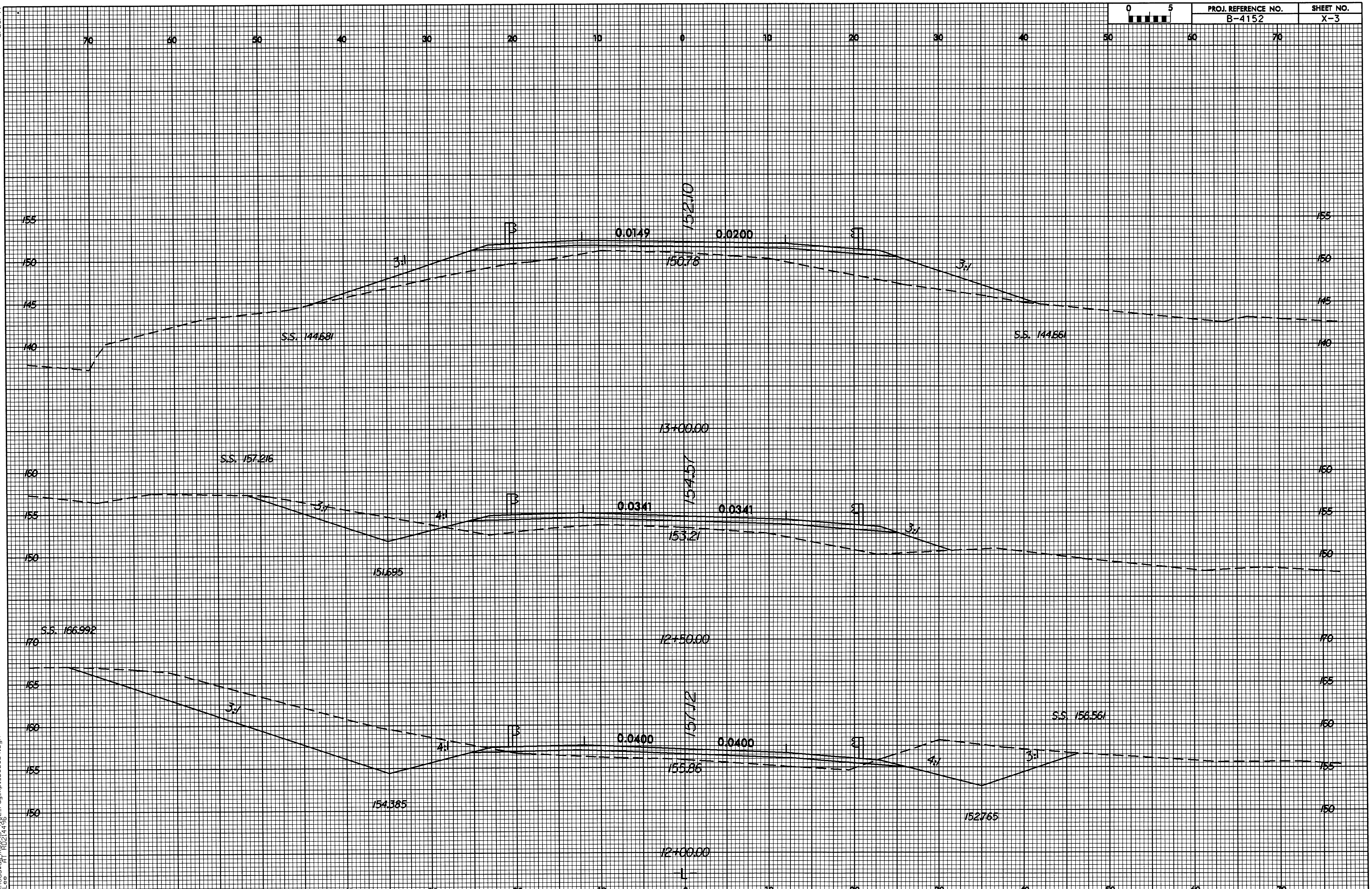
CHLee
AT RD21449

PROJ. REFERENCE NO.	SHEET NO.
B-4152	X-2



PROJ. REFERENCE NO.	SHEET NO.
B-4152	X-3



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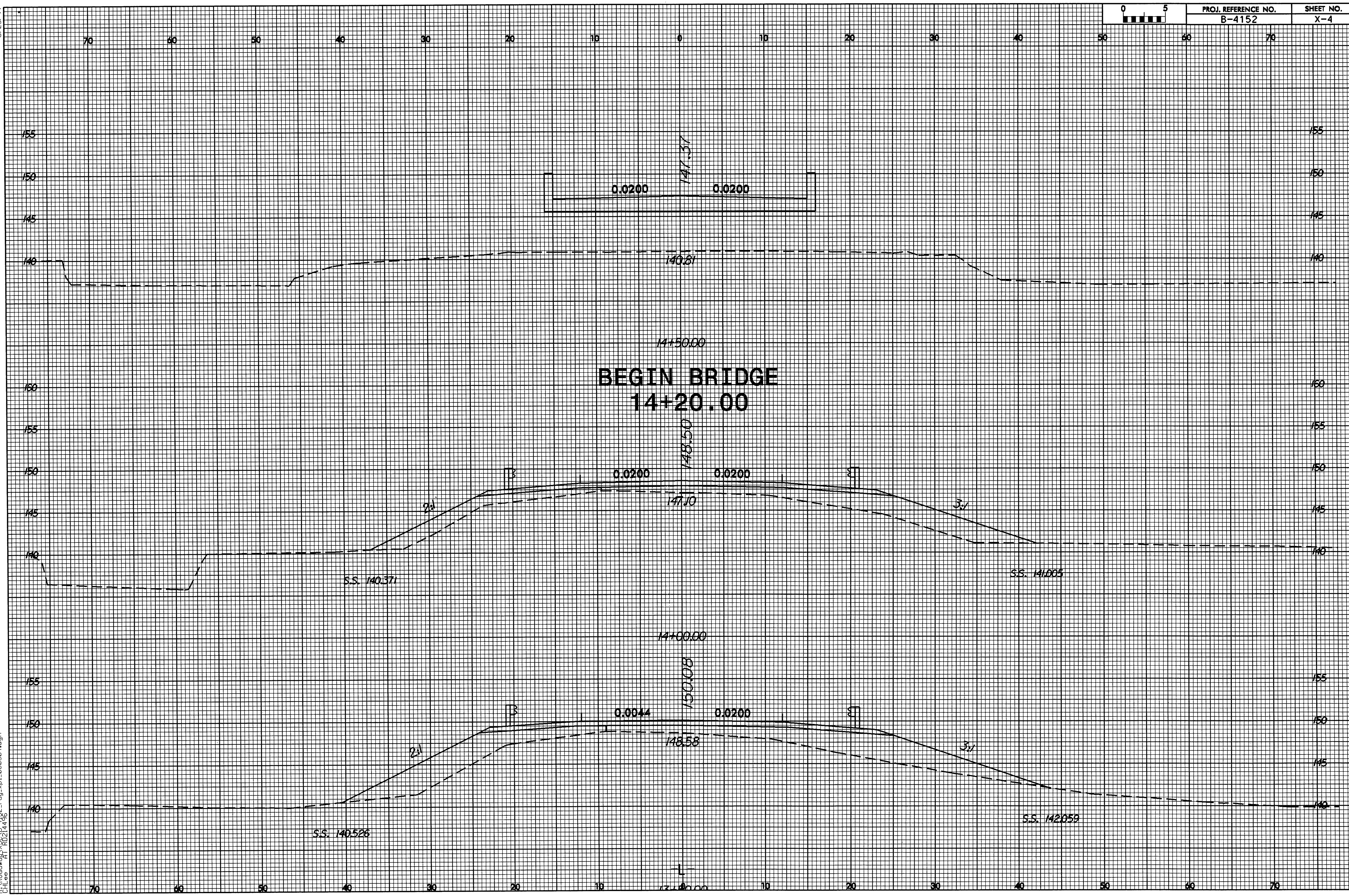
CHLee AT RD214496

PROJ. REFERENCE NO.	SHEET NO.
B-4152	X-4



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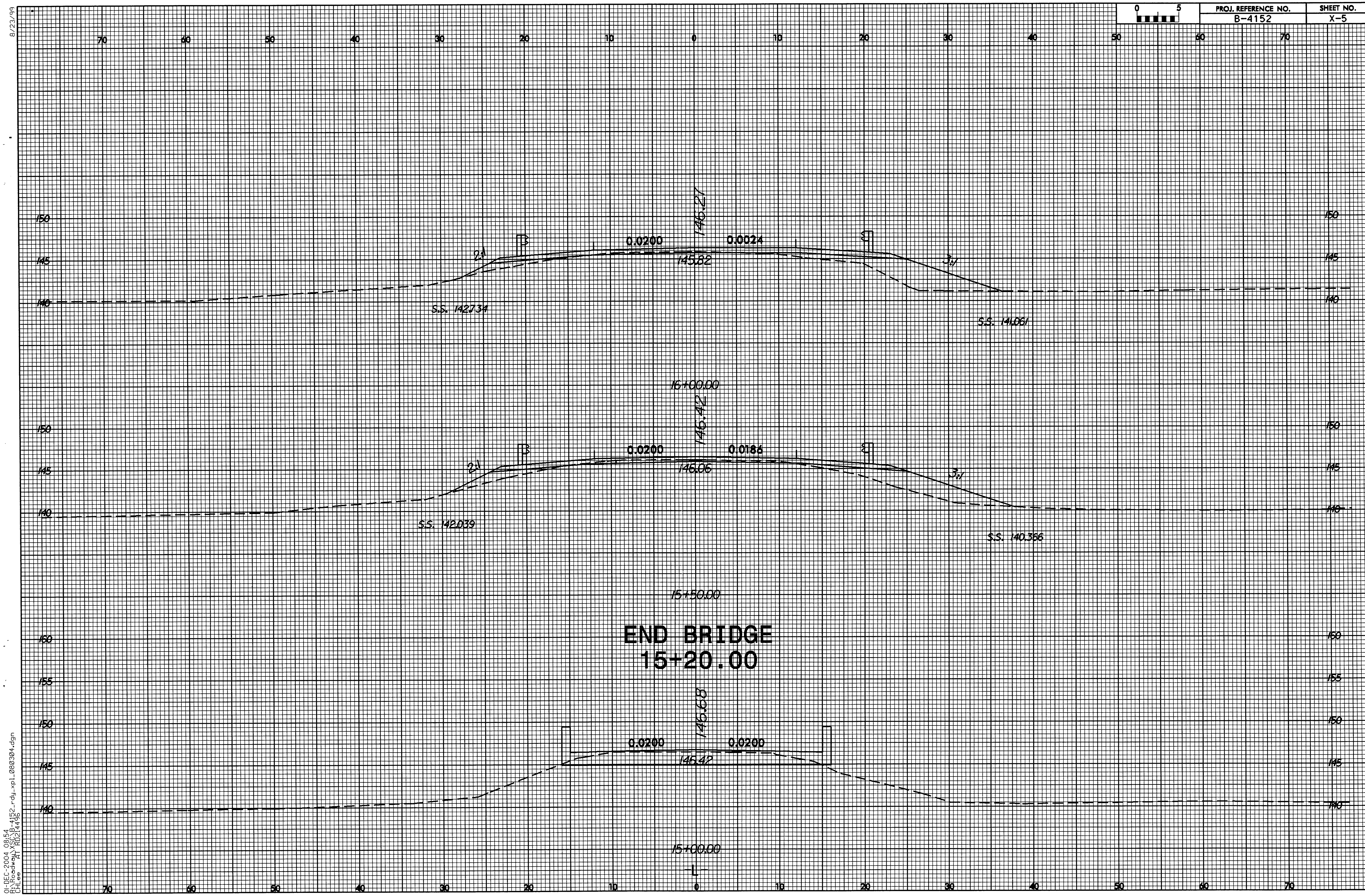
CHLee AT RD214496



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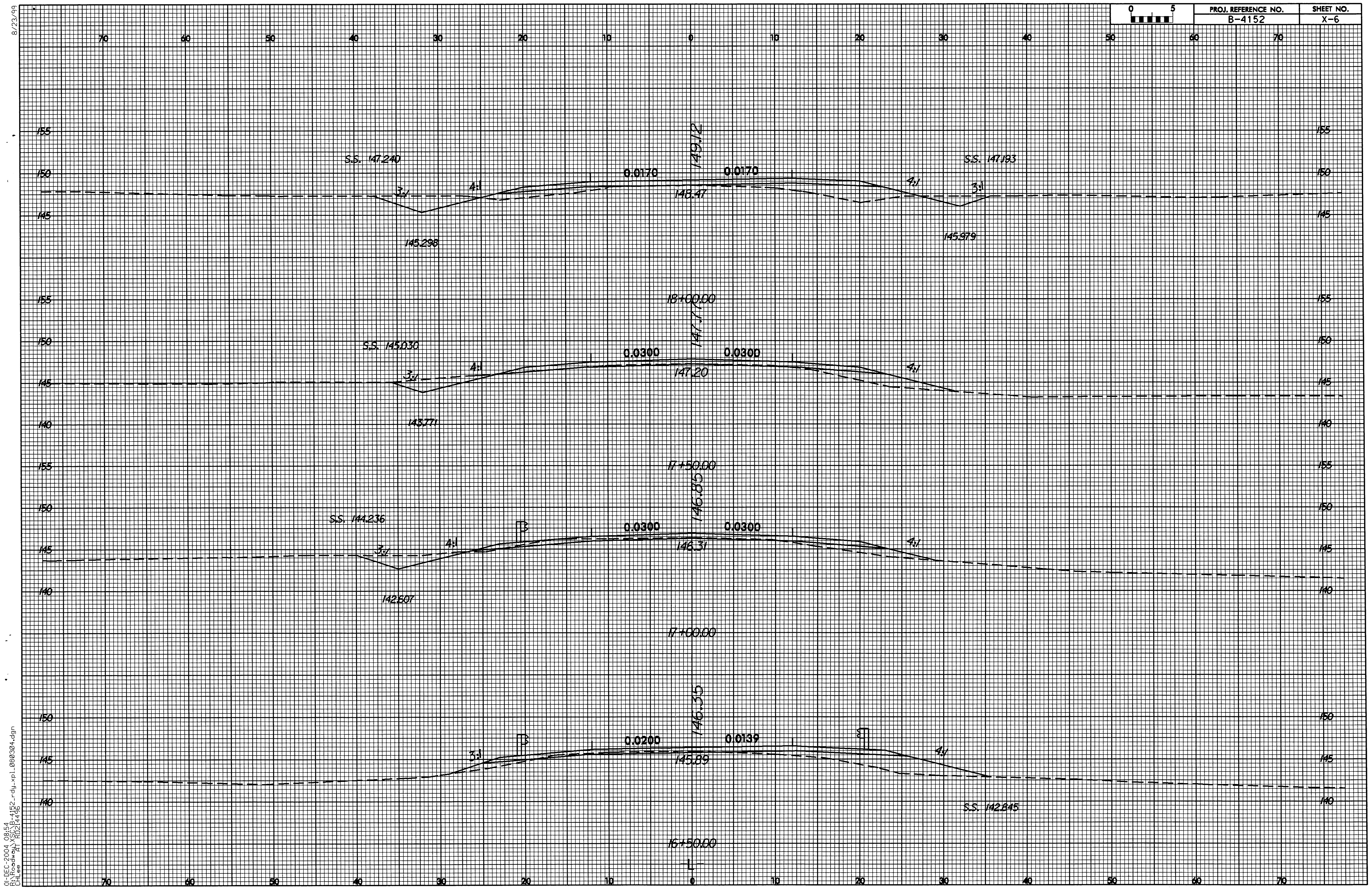
CHLee AT R0214496



PROJ. REFERENCE NO.
B-4152
SHEET NO.
X-6
8/23/99
S.S. 147.240
S.S. 147.193
149.12
0.0170
0.0170
148.47
3:1
4:1
4:1
3:1
145.298
145.979
18+00.00
S.S. 145.030
147.77
0.0300
0.0300
147.20
3:1
4:1
4:1
143.771
17+50.00
S.S. 144.236
146.85
0.0300
0.0300
146.31
3:1
4:1
4:1
142.607
17+00.00
146.35
0.0200
0.0139
145.89
3:1
4:1
S.S. 142.845
16+50.00
01-DEC-2004 08:54
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CHLee AT R0214496

8/23/99

0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4152	X-7

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

160 155 150

S.S. 155.002 — 3:1 — 4:1 — 0.0200 — 155.76 — 152.73 — 0.0400 — 8' — S.S. 155.282 — 3:1 — 4:1

150.075 — 150.043

19+50.00

160 155 150 145

S.S. 155.382 — 3:1 — 4:1 — 0.0200 — 152.18 — 151.47 — 0.0214 — 8' — S.S. 155.448 — 3:1 — 4:1

149.096 — 149.278

19+00.00

160 155 150 145

S.S. 153.738 — 3:1 — 4:1 — 0.0022 — 150.79 — 149.97 — 0.0022 — 8' — S.S. 154.826 — 3:1 — 4:1

147.350 — 148.262

18+50.00

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

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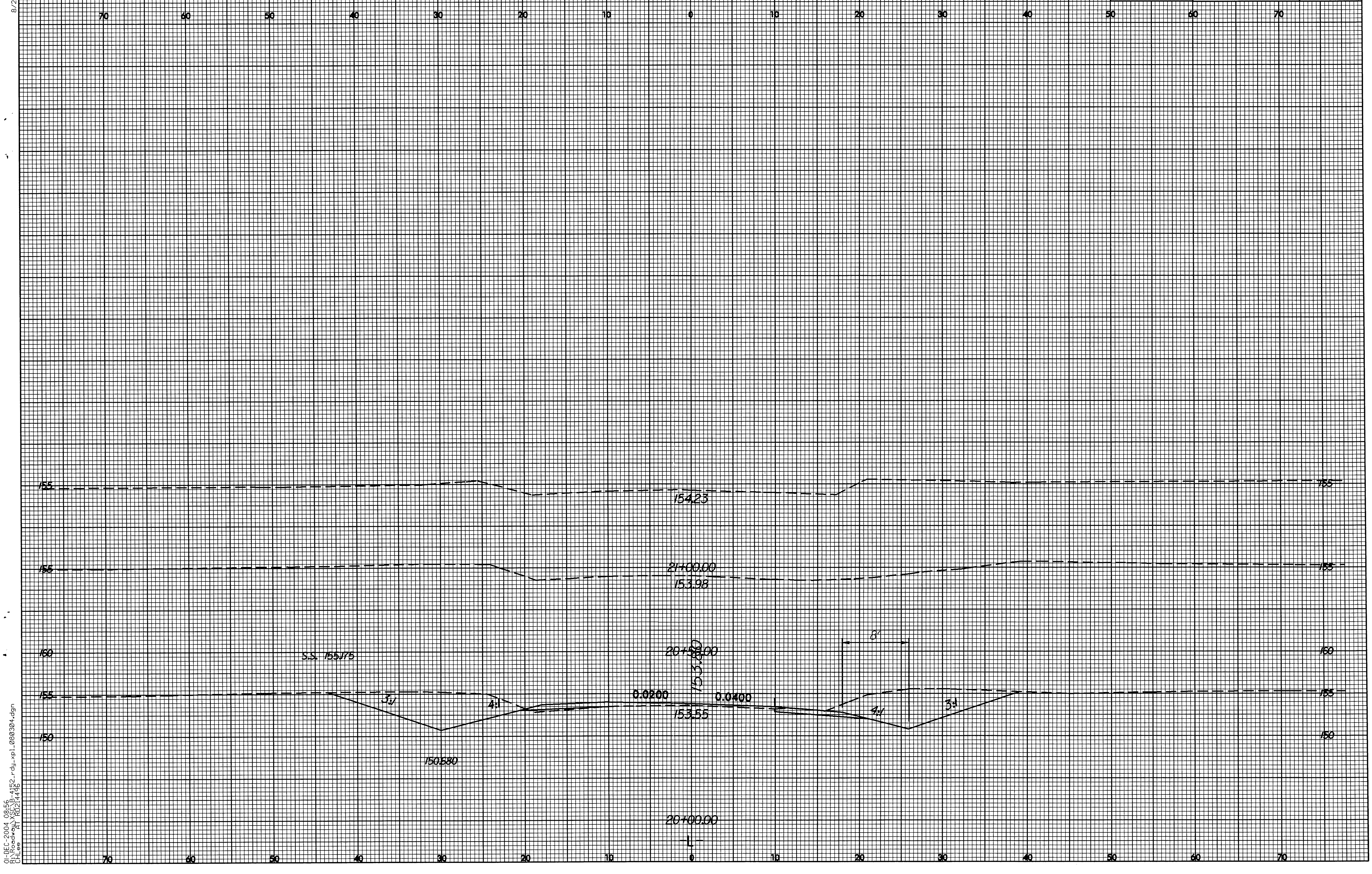
CHLee
41 AD214416

PROJ. REFERENCE NO.	SHEET NO.
B-4152	X-8



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CHLee AT R0214496

CATEGORICAL EXCLUSION ACTION CLASSIFICATION FORM

TIP Project No.	B-4152
State Project No.	8.2530401
Federal Project No.	BRZ-1422(5)

A. Project Description:

NCDOT will replace Bridge No.53 on SR 1422, over Puppy Creek, in Hoke County. Replacement will be at approximately the same location with a new bridge 105 feet (32 m) in length and 30 feet (9 m) in width. The new bridge will have a 22 foot (6.7 m) travelway. The offset of the bridge will be 4 feet (1.2 m) on each side.

The approach paved roadway will be 22 feet (6.7 m) in width. Turf shoulders will be 6 feet (2.0 m) in width. Shoulder width will be increased by at least 3 feet (1.0 m) where guardrail is warranted. Traffic will be detoured over existing secondary roads.

B. Purpose and Need: Replace obsolete bridge.

C. Proposed Improvements:

Circle one or more of the following Type II improvements which apply to the project:

1. Modernization of a highway by resurfacing, restoration, rehabilitation, reconstruction, adding shoulders, or adding auxiliary lanes (e.g., parking, weaving, turning, climbing).

    a. Restoring, Resurfacing, Rehabilitating, and Reconstructing pavement (3R and 4R improvements)
    b. Widening roadway and shoulders without adding through lanes
    c. Modernizing gore treatments
    d. Constructing lane improvements (merge, auxiliary, and turn lanes)
    e. Adding shoulder drains
    f. Replacing and rehabilitating culverts, inlets, and drainage pipes, including safety treatments
    g. Providing driveway pipes
    h. Performing minor bridge widening (less than one through lane)

2. Highway safety or traffic operations improvement projects including the installation of ramp metering control devices and lighting.

    a. Installing ramp metering devices

b. Installing lights
c. Adding or upgrading guardrail
d. Installing safety barriers including Jersey type barriers and pier protection
e. Installing or replacing impact attenuators
f. Upgrading medians including adding or upgrading median barriers
g. Improving intersections including relocation and/or realignment
h. Making minor roadway realignment
i. Channelizing traffic
j. Performing clear zone safety improvements including removing hazards and flattening slopes
k. Implementing traffic aid systems, signals, and motorist aid
l. Installing bridge safety hardware including bridge rail retrofit

3. Bridge rehabilitation, reconstruction, or replacement or the construction of grade separation to replace existing at-grade railroad crossings.

a. Rehabilitating, reconstructing, or replacing bridge approach slabs
b. Rehabilitating or replacing bridge decks
c. Rehabilitating bridges including painting (no red lead paint), scour repair, fender systems, and minor structural improvements
d. Replacing a bridge (structure and/or fill)

4. Transportation corridor fringe parking facilities.

5. Construction of new truck weigh stations or rest areas.

6. Approvals for disposal of excess right-of-way or for joint or limited use of right-of-way, where the proposed use does not have significant adverse impacts.

7. Approvals for changes in access control.

8. Construction of new bus storage and maintenance facilities in areas used predominantly for industrial or transportation purposes where such construction is not inconsistent with existing zoning and located on or near a street with adequate capacity to handle anticipated bus and support vehicle traffic.

9. Rehabilitation or reconstruction of existing rail and bus buildings and ancillary facilities where only minor amounts of additional land are required and there is not a substantial increase in the number of users.

10. Construction of bus transfer facilities (an open area consisting of passenger shelters, boarding areas, kiosks and related street improvements) when located in a commercial area or other high activity center in which there is adequate street capacity for projected bus traffic.

11. Construction of rail storage and maintenance facilities in areas used predominantly for industrial or transportation purposes where such construction is not inconsistent with existing zoning and where there is no significant noise impact on the surrounding community.

12. Acquisition of land for hardship or protective purposes, advance land acquisition loans under section 3(b) of the UMT Act. Hardship and protective buying will be permitted only for a particular parcel or a limited number of parcels. These types of land acquisition qualify for a CE only where the acquisition will not limit the evaluation of alternatives, including shifts in alignment for planned construction projects, which may be required in the NEPA process. No project development on such land may proceed until the NEPA process has been completed.

D. Special Project Information

Estimated Costs:

Total Construction Cost	$550,000
Right-of-Way and Utilities	29,000
Total Project Cost	$579,000

Estimated Traffic:

Current - 700 VPD
Year 2025 - 1,300 VPD

Proposed Typical Roadway Section:

The approach paved roadway will be 22 feet (6.7 m) in width. Turf shoulders will be 6 feet (2.0 m) in width. Shoulder width will be increased by at least 3 feet (1.0 m) where guardrail is warranted.

Design Speed:

The design speed will be 55 mph (88 km/hr).

Functional Classification:

SR 1422 is classified as a Rural Local facility in the Statewide Functional Classification System.

Division Office Comments:

The Division 8 Engineer supports road closure and replacement at the existing location.

E. Threshold Criteria

The following evaluation of threshold criteria must be completed for Type II actions.

ECOLOGICAL		YES	NO
(1)	Will the project have a substantial impact on any unique or important natural resource?	☐	X
(2)	Does the project involve any habitat where federally listed endangered or threatened species may occur?	☐	X
(3)	Will the project affect anadromous fish?	☐	X
(4)	If the project involves wetlands, is the amount of permanent and/or temporary wetland taking less than one-tenth (1/10) acre and have all practicable measures to avoid and minimize wetland takings been evaluated?	X	☐
(5)	Will the project require use of U. S. Forest Service lands?	☐	X
(6)	Will the quality of adjacent water resources be adversely impacted by proposed construction activities?	☐	X
(7)	Does the project involve waters classified as Outstanding Resource Waters (ORW) and/or High Quality Waters (HQW)?	☐	X
(8)	Will the project require fill in waters of the United States in any of the designated mountain trout counties?	☐	X
(9)	Does the project involve any known underground storage tanks (UST's) or hazardous materials sites?	☐	X

PERMITS AND COORDINATION	YES	NO
(10) If the project is located within a CAMA county, will the project significantly affect the coastal zone and/or any "Area of Environmental Concern" (AEC)?	☐	X
(11) Does the project involve Coastal Barrier Resources Act resources?	☐	X
(12) Will a U. S. Coast Guard permit be required?	☐	X
(13) Will the project result in the modification of any existing regulatory floodway?	☐	X
(14) Will the project require any stream relocations or channel changes?	☐	X

SOCIAL, ECONOMIC, AND CULTURAL RESOURCES	YES	NO
(15) Will the project induce substantial impacts to planned growth or land use for the area?	☐	X
(16) Will the project require the relocation of any family or business?	☐	X
(17) Will the project have a disproportionately high and adverse human health and environmental effect on any minority or low-income population?	☐	X
(18) If the project involves the acquisition of right of way, is the amount of right of way acquisition considered minor?	X	☐
(19) Will the project involve any changes in access control?	☐	X
(20) Will the project substantially alter the usefulness and/or land use of adjacent property?	☐	X
(21) Will the project have an adverse effect on permanent local traffic patterns or community cohesiveness?	☐	X
(22) Is the project included in an approved thoroughfare plan and/ or Transportation Improvement Program (and is, therefore, in conformance with the Clean Air Act of 1990)?	X	☐
(23) Is the project anticipated to cause an increase in traffic volumes?	☐	X

(24)	Will traffic be maintained during construction using existing roads, staged construction, or on-site detours?	X	☐
(25)	If the project is a bridge replacement project, will the bridge be replaced at its existing location (along the existing facility) and will all construction proposed in association with the bridge replacement project be contained on the existing facility?	X	☐
(26)	Is there substantial controversy on social, economic and environmental grounds concerning aspects of the action?	☐	X
(27)	Is the project consistent with all Federal, State, and local laws relating to the environmental aspects of the project?	X	☐
(28)	Will the project have an "effect" on structures/properties eligible for or listed on the National Register of Historic Places?	☐	X
(29)	Will the project affect any archaeological remains which are important to history or pre-history?	☐	X
(30)	Will the project require the use of Section 4(f) resources (public parks, recreation lands, wildlife and waterfowl refuges, historic sites or historic bridges, as defined in Section 4(f) of the U. S. Department of Transportation Act of 1966)?	☐	X
(31)	Will the project result in any conversion of assisted public recreation sites or facilities to non-recreation uses, as defined by Section 6(f) of the Land and Water Conservation Act of 1965, as amended?	☐	X
(32)	Will the project involve construction in, across, or adjacent to a river designated as a component of or proposed for inclusion in the natural Wild and Scenic Rivers?	☐	X

F. Additional Documentation Required for Unfavorable Responses in Part E

None.

G. CE Approval

TIP Project No.	B-4152
State Project No.	8.2530401
Federal Project No.	BRZ-1422(5)

Project Description:

NCDOT will replace Bridge No.53 on SR 1422, over Puppy Creek, in Hoke County. Replacement will be at approximately the same location with a new bridge 105 feet (32 m) in length and 30 feet (9 m) in width. Traffic will be detoured over existing secondary roads.

Categorical Exclusion Action Classification: (Check one)

X TYPE II(A)
____ TYPE II(B)

Approved:

8-29-03 Teresa Hart
Date Assistant Manager
Project Development and Environmental Analysis Branch

8-29-03 William F. Goodwin Jr.
Date Project Planning Unit Head
Project Development and Environmental Analysis Branch

8-28-03 Dennis Pilpain
Date Project Planning Engineer
Project Development and Environmental Analysis Branch

For Type II(B) projects only:

_____
Date Division Administrator
Federal Highway Administration

PROJECT COMMITMENTS:

B-4152, Hoke County

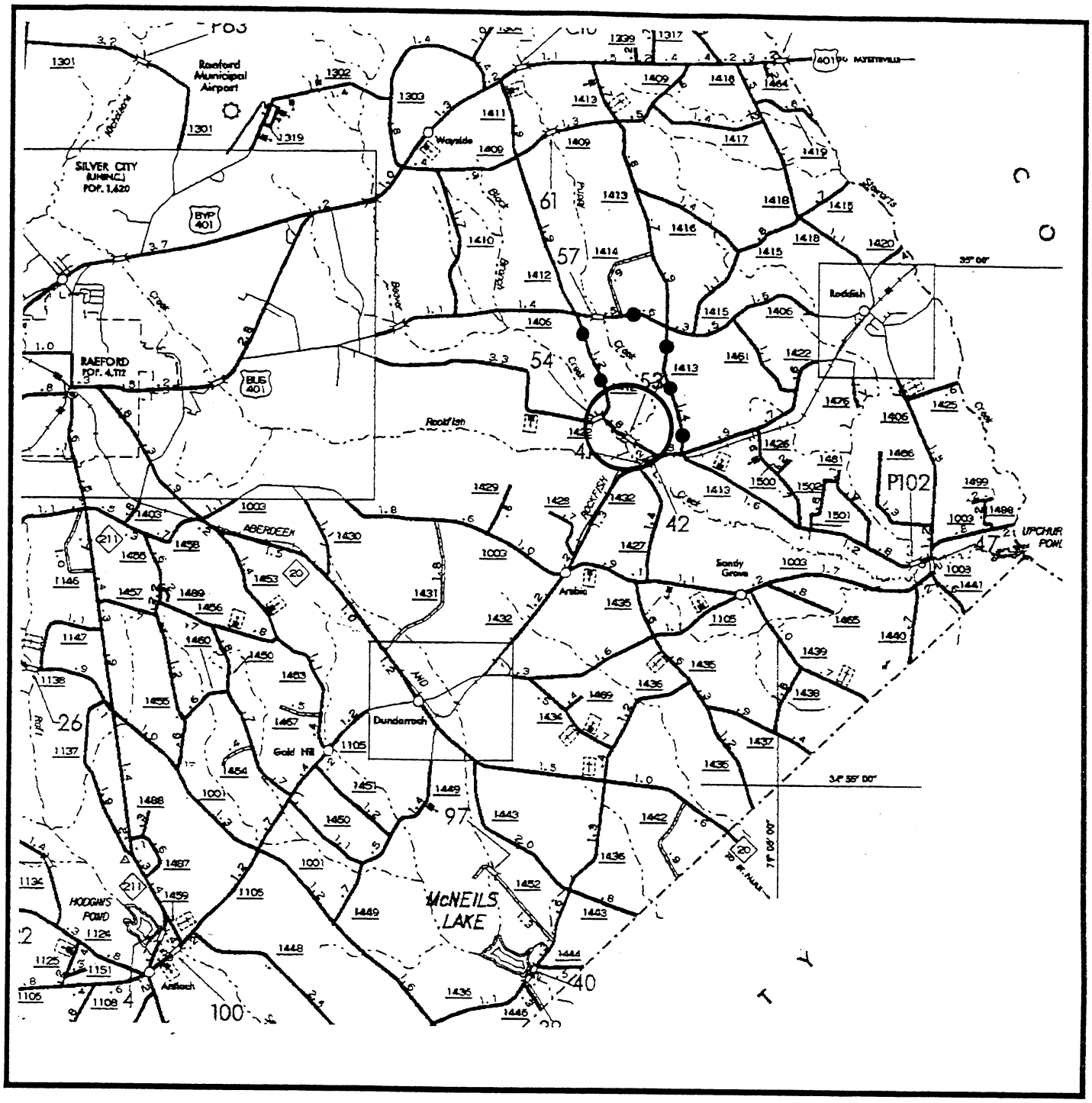
Bridge No. 53, on SR 1422
Over Puppy Creek
Federal Aid Project BRZ-1422(5)
State Project 8.2530401

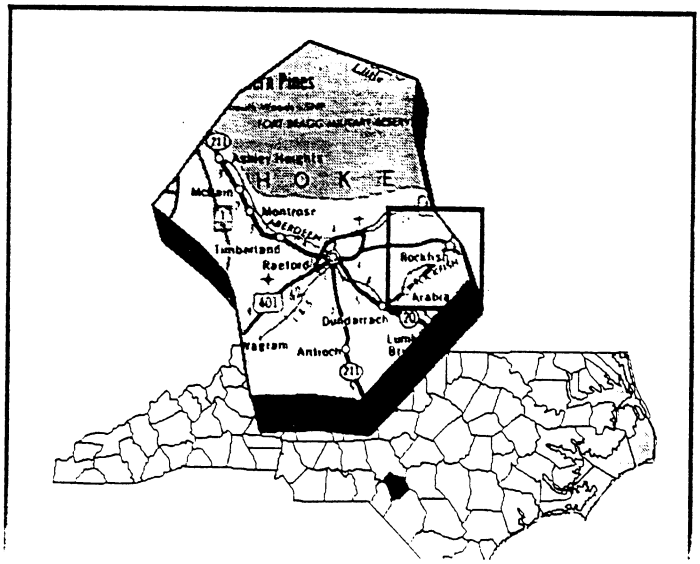
Roadway Design Unit, Structure Design Unit, Bridge Maintenance Unit, Project Development & Environmental Analysis Branch (Permits), Resident Engineer:

Bridge Demolition:

The existing bridge has an asphalt wearing surface, and the remainder of the bridge, both superstructure and substructure, is composed of timber and steel. The asphalt wearing surface will be removed prior to demolition without dropping into the water. Also, all timber and steel components of this bridge will also be removed without dropping into waters of the United States.

During construction, Best Management Practices for Bridge Demolition and Removal will be followed.





Studied Detour Route

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

HOKE COUNTY
REPLACE BRIDGE NO. 53 ON SR 1422
OVER PUPPY CREEK
B-4152

Figure 1

D. Pupkin

North Carolina Department of Cultural Resources
State Historic Preservation Office
David L. S. Brook, Administrator

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary
Jeffrey J. Crow, Deputy Secretary
Office of Archives and History

Division of Historical Resources
David J. Olson, Director

March 22, 2002

MEMORANDUM

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

FROM: David Brook RGH for David Brook

SUBJECT: Replace Bridge No. 53 and SR 1422 over Puppy Creek, B-4152, Hoke County, ER-02-8590

Thank you for your memorandum of September 25, 2001, concerning the above project.

There are no known archaeological sites within the project area. Based on our knowledge of the area, it is unlikely that any archaeological resources that may be eligible for conclusion in the National Register of Historic Places will be affected by the project. We, therefore, recommend that no archaeological investigation be conducted in connection with this project.

Because the Department of Transportation is in the process of surveying and evaluating the National Register eligibility of all of its concrete bridges, we are unable to comment on the National Register eligibility of the subject bridge. Please contact Mary Pope Furr, in the Architectural History Section, to determine if further study of the bridge is needed.

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 296 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919/72929-47629. In all future communication concerning this project, please cite the above-referenced tracking number.

DB:kgc

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

5-16-2003

Memorandum to: File

Subject: B-4152, B-4247 Historic Eligibility

From: Dennis Pipkin
Bridge Replacement Planning Unit
PDEA

The following emails document that neither of the subject bridges are eligible for the National Register from an historic standpoint. The decision was made by Mary Pope Furr, supervisor of the PDEA Historic Architecture unit. The SHPO in their letter dated March 22, 2002, had deferred to Ms. Furr for this decision.

Subject:
Question,B-4152,B-4247
Date:
Fri, 16 May 2003 16:02:49 -0400
From:
Dennis Pipkin <dpipkin@dot.state.nc.us>
To:
Mary Pope Furr <mfurr@dot.state.nc.us>

Hello Mary Pope:
I need to confirm if these bridges are considered eligible.
B-4152, Hoke Co, Bridge No.53 on SR 1422.
B-4247, Richmond Co, Bridge No. 129 on SR 1321.

Thanks
Dennis Pipkin

`````

Subject:
Re: Question,B-4152,B-4247
Date:
Fri, 16 May 2003 16:15:58 -0400
From:
"Mary Pope Furr" <mfurr@dot.state.nc.us>
Organization:
North Carolina Department of Transportation
To:
Dennis Pipkin <dpipkin@dot.state.nc.us>
References:
1

I just checked, neither is eligible.

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Natural Resources Technical Report

Proposed Bridge Replacement
SR 1422, Bridge No. 53 over Puppy Creek
Hoke County

TIP No. B-4152
State Project No. 8.2530401
FAP No. BRZ-1422(5)

North Carolina Department of Transportation
Division of Highways
Project Development and Environmental Analysis Branch

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Prepared for:

North Carolina Department of Transportation
Division of Highways
Project Development and Environmental Analysis Branch

Issued by:

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Earth Tech Project No. 46164

February 2002

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FIGURES (to be added later)

NOTE: Highlighted text denotes items not included in this draft that will be added later by NCDOT personnel after alignments are developed.

1.0 INTRODUCTION

This Natural Resources Technical Report is submitted to the North Carolina Department of Transportation (NCDOT) preliminary to the preparation of a Categorical Exclusion (CE) for the proposed project. The purpose of this technical report is to inventory, catalog, and describe the various natural resources likely to be impacted by the proposed action. The report also attempts to identify and estimate the likely consequences of the anticipated impacts to these resources. These descriptions and estimates are relevant only in the context of the preliminary design concepts. It may become necessary to conduct additional field investigations should design parameters and criteria change. These descriptions and estimates are relevant only in the context of the preliminary design concepts. It may become necessary to conduct additional field investigations should design parameters and criteria change.

1.1 Project Description

The proposed project involves the replacement of Bridge Number 53 on SR 1422 (Phillippi Church Road), which spans Puppy Creek. The project is located in eastern Hoke County about 6 miles (9.72 km) east of Raeford, NC (**Figure 1**).

Alternate 1
Insert Alternate information here.

Alternate 2
Insert Alternate information here.

1.2 Methodology

Published information and resources were collected prior to the field investigation. Information sources used to prepare this report include the following:

- United States Geological Survey (USGS) quadrangle map (Parkton, 1982)
- United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) Map (Parkton, 1995)
- NCDOT aerial photograph of project area (1:1200)
- *Soil Survey of Cumberland and Hoke Counties* (Soil Conservation Service, 1984)
- North Carolina Department of Environment and Natural Resources (NCDENR) basin-wide assessment information (NCDENR, 1996)
- USFWS list of protected and candidate species
- North Carolina Natural Heritage Program (NHP) files of rare species and unique habitats

Water resource information was obtained from publications posted on the World Wide Web by NCDENR Division of Water Quality (DWQ). Information concerning the occurrence of federally protected species in the study area was obtained from the USFWS

list of protected and candidate species (page last updated March 22, 2001; last accessed September 14, 2001), posted on the World Wide Web by the Ecological Services branch of the USFWS office in North Carolina. Information concerning species under state protection was obtained from the NHP database of rare species and unique habitats. NHP files were reviewed (June 29, 2001) for documented sightings of species on state or federal lists and locations of significant natural areas.

A general field survey was conducted along the proposed project route by Earth Tech biologists on July 23, 2001. Water resources were identified and their physical characteristics were recorded. For the purposes of this study, a brief habitat assessment was performed within the project area of Puppy Creek. Plant communities and their associated wildlife were identified using a variety of observation techniques, including active searching, visual observations, and identifying characteristic signs of wildlife (sounds, tracks, scats, and burrows). Terrestrial community classifications generally follow Schafale and Weakley (1990) where appropriate and plant taxonomy follows Radford *et al.* (1968). Vertebrate taxonomy follows Rohde *et al.* (1994), Conant *et al.* (1998), the American Ornithologists' Union (2001), Thorpe and Covich (1991), and Webster *et al.* (1985). Vegetative communities were mapped using aerial photography of the project site. Predictions regarding wildlife community composition involved general qualitative habitat assessment based on existing vegetative communities.

Jurisdictional wetlands, if present, were delineated and evaluated based on criteria established in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (USACE, 1987). Wetlands were classified based on Cowardin *et al.* (1979).

1.3 Terminology and Definitions

For the purposes of this report, the following terms are used for describing the limits of natural resources investigations. "Study corridor" and "project area" denote an area with a width of approximately 200 feet (60.6 m) as delineated on materials provided by NCDOT. The "project vicinity" is an area extending 1 mile (1.6 km) on all sides of the project area, and "project region" is an area equivalent in size to the area represented by a 7.5-minute USGS quadrangle map (about 61.8 sq miles or 163.3 sq km) with the project study area occupying the central location. When referring to stream banks, "left bank" and "right bank" are relative to an observer facing downstream.

1.4 Qualifications of the Principal Investigators

Investigator:	Jane Almon
Education	M.S. Forestry, North Carolina State University
Experience	Staff Biologist, Earth Tech- >2 years
Expertise	Natural resources surveys, wetland restoration

Investigator:	Daniel Ingram
Education	B.S., Forestry, North Carolina State University
Experience	Staff Biologist, Earth Tech- >1 year
Expertise	Wetland delineation, Wetland mitigation

2.0 PHYSICAL RESOURCES

Soil and water resources that occur in the project area are discussed with respect to possible environmental concerns.

2.1 Regional Characteristics

The project area lies in the eastern portion of North Carolina within the Sandhills physiographic province. Elevations in the project area are approximately 140 feet (42.6 m) (National Geodetic Vertical Datum, 1929). The topography of the project vicinity is generally flat.

The proposed project is in a rural area in Hoke County approximately 6 miles (9.72 km) east of Raeford, NC. Hoke County's major economic resources are agriculture, military-related employment, and manufacturing. The population of Hoke County in 2000 was 33,646 (North Carolina Office of State Budget, Planning and Management 2001).

2.2 Soils

Information about soils in the project area was taken from the *Soil Survey of Cumberland and Hoke Counties, North Carolina* (USDA 1984). The map units in the project area are Johnston loam, Blaney loamy sand with 8-15% slopes, Lakeland sand with 1-8% slopes, and Candor sand with 8-15% slopes. The Johnston soils are classified as hydric by the Natural Resources Conservation Service (NRCS).

- **Johnston soils (JT)** are mapped along the banks of Puppy Creek within the project area. These soils are nearly level and poorly drained. They are typical of flood plain areas in the Coastal Plain, and are frequently flooded. The permeability is moderate and the water table remains at or near the surface most of the year.
- **Blaney loamy sands with 8-15% slopes (BaB)** are mapped in the upland areas on the eastern side of Puppy Creek. These soils are characteristic of side slopes in upland areas. The permeability is moderate and the hazard of erosion is severe if the soil is exposed. A perched water table is frequently present.

- **Lakeland sandy soils with 1-8% slopes (LaB)** are mapped in the upland areas on the western side of Puppy Creek. Typically this soil is found on broad ridges of uplands and rims of bays. It is excessively drained and the available water capacity is very low. Included in this map unit are small areas of Autryville and Candor soils.
- **Candor sands with 8-15% slopes (CaD)** are mapped between the Lakeland and Blaney soils on the west side of Puppy Creek. These moderately well drained soils are characteristic of side slopes and uplands. The permeability is moderate and the available water capacity is very low.

Site index is a measure of soil quality and productivity. The index is the average height, in feet, that dominant and co-dominant trees of a given species attain in a specified number of years (typically 50). The site index applies to fully-stocked, even-aged, unmanaged stands. The soils in the project area have the following site indices:

- Johnston soils have a site index of 100 for the following tree species: loblolly pine (*Pinus taeda*), shortleaf pine (*Pinus echinata*), sweetgum (*Liquidambar styraciflua*), tulip poplar (*Liriodendron tulipifera*), willow oak (*Quercus phellos*), and cottonwood (*Populus deltoides*). Water oak (*Quercus nigra*) has a site index of 90-100.
- Blaney soils have a site index of 76 for loblolly pine and 66 for longleaf pine (*Pinus palustris*).
- Lakeland soils have a site index of 75 for loblolly pine and 60 for longleaf pine.
- Candor soils have a site index of 100 for loblolly pine.

2.3 Water Resources

This section contains information concerning water resources likely to be impacted by the proposed project. Water resources assessments include the physical characteristics likely to be impacted by the proposed project (determined by field survey), best usage classifications, and water quality aspects of the water resources. Probable impacts to surface waters are also discussed, as well as means to minimize impacts.

2.3.1 Physical Characteristics of Surface Waters

The project is located in the Cape Fear River basin (CPF15 sub-basin, HUC 03030004). Puppy Creek originates about 10 miles (16.2 km) north of the project area. It flows under Bridge 53 and joins Beaver Creek only 400 feet (60.6 m) downstream. Within another 600 feet (303 m) this larger stream then joins Rockfish Creek. This stream then flows in an easterly direction past Fayetteville, NC to its confluence with the Cape Fear River over 15 miles (24.3 km) downstream of the project area.

Within the project area, Puppy Creek is about 30 feet (9.2 m) wide under the bridge, narrowing to 20 feet (6.1 m) wide downstream. The banks are 6 feet (1.8 m) high and vertical, with scouring around the bridge. They are densely vegetated as described in Section 3.1.3 below. Canopy cover is about 50%.

The substrate is sand and silt. Eurasian milfoil (*Myriophyllum spicatum*) is rooted in the bed near the bridge, and large woody debris is abundant in the channel. Flow was moderate the day of the site visit, and the water was clear and tea-colored.

2.3.2 Best Usage Classification

Surface waters in North Carolina are assigned a classification by the DWQ that is designed to maintain, protect, and enhance water quality within the state. Puppy Creek [Index # 18-31-19] is classified as a *Class C* water body (NCDENR, 2001). *Class C* water resources are waters protected for aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture. Secondary recreation includes wading, boating, and other uses involving human body contact with water where such activities take place in an infrequent, unorganized, or incidental manner. There are no restrictions on watershed development activities.

No waters classified as High Quality Water (HQW), Water Supplies (WS-I or WS-II) or Outstanding Resource Waters (ORW) occur within 1.0 miles (1.6 km) of the project study area.

2.3.3 Water Quality

This section describes the quality of the water resources within the project area. Potential impacts to water quality from point and non-point sources are evaluated. Water quality assessments are based upon published resource information and field study observations.

2.3.3.1 General Watershed Characteristics

The project area is in a largely agricultural watershed. Disturbances to the landscape observed in the immediate vicinity include land cleared for pastures, row crops, and residential use. Potential threats to stream quality in this area are increased sediment and nutrient inputs from the pastures and agricultural fields.

2.3.3.2 Basin-wide Assessment Report

Basin-wide water quality assessments are conducted by the Environmental Sciences Branch, Water Quality Section, of the DWQ. The program has established monitoring stations for sampling selected benthic macroinvertebrates, which are known to have varying levels of tolerance to water pollution. An index of water quality can be derived from the number of taxa present and the ratio of tolerant to intolerant taxa. Streams can then be given a bioclassification ranging from Poor to Excellent. There are no benthic monitoring stations on Puppy Creek.

2.3.3.3 Point Source Discharge Permits

Point source discharges in North Carolina are permitted through the National Pollutant Discharge Elimination System (NPDES) program administered by the DWQ. All

dischargers are required to obtain a permit to discharge. There are no permits issued to discharge in Puppy Creek as of September 2001 (NCDENR 2001).

2.3.4 Summary of Anticipated Impacts

Any action that affects water quality can adversely affect aquatic organisms. Temporary impacts during the construction phases may result in long-term impacts to the aquatic community. In general, replacing an existing structure in the same location with an off-site detour is the preferred environmental approach. Bridge replacement at a new location results in more severe impacts, and physical impacts are incurred at the point of bridge replacement.

Project construction may result in the following impacts to surface water resources:

- Increased sediment loading and siltation as a consequence of watershed vegetation removal, erosion, and/or construction.
- Decreased light penetration/water clarity from increased sedimentation.
- Changes in water temperature with vegetation removal.
- Changes in the amount of available organic matter with vegetation removal.
- Increased concentration of toxic compounds from highway runoff, construction activities and construction equipment, and spills from construction equipment.
- Alteration of water levels and flows as a result of interruptions and/or additions to surface and groundwater flow from construction.

Construction impacts may not be restricted to the communities in which the construction activity occurs, but may also affect downstream communities. Efforts will be made to ensure that no sediment leaves the construction site. NCDOT's Best Management Practices for the Protection of Surface Waters will be implemented, as applicable, during the construction phase of the project to ensure that no sediment leaves the construction site.

The removal of the existing bridge has the potential to impact surface waters. NCDOT Best Management Practices for Bridge Demolition and Removal will be adhered to during the removal process. Further information concerning bridge demolition is found in Section 4.1.2.

3.0 BIOTIC RESOURCES

Terrestrial and aquatic communities are included in the description of biotic resources. Living systems described in the following sections include communities of associated plants and animals. These descriptions refer to the dominant flora and fauna in each community and the relationships of these biotic components. Descriptions of the terrestrial systems are presented in the context of plant community classifications. These classifications follow Schafale and Weakley (1990) where possible. They are also cross-referenced to *The Nature Conservancy International Classification of Ecological Communities: Terrestrial Vegetation of the Southeastern United States* (Weakley *et al.*,

1998), which has recently been adopted as the standard land cover classification by the Federal Geographic Data Committee. Representative animal species that are likely to occur in these habitats (based on published range distributions) are also cited. Scientific nomenclature and common names (when applicable) are used for the plant and animal species described. Subsequent references to the same species are by the common name only.

3.1 Terrestrial Communities

Three terrestrial communities were identified within the project area: human-maintained areas, a sand ridge woodland, and a floodplain forest. **(Figure 2)**. Dominant faunal components associated with these terrestrial areas will be discussed in each community description. Many species are adapted to the entire range of habitats found along the project alignment, but may not be mentioned separately in each community description.

3.1.1 Human-maintained areas

There are three types of human-maintained areas in the project corridor. Active pastures can be found on both sides of SR 1422 at the southern end of the study corridor. Planted forage grasses and widely scattered trees such as loblolly pine (*Pinus taeda)* and water oak (*Quercus nigra*) constitute this community. A 10-foot wide maintained roadside runs the length of the study area on both sides of SR 1422. Bahia grass (*Paspalum notatum*) dominates this community. Other plant species include sweetgum seedlings (*Liquidambar styraciflua*), Japanese honeysuckle (*Lonicera japonica*), asters (*Aster* spp.), a sunflower (*Helianthus* spp.), joe-pye-weed (*Eupatorium fistulosum*), trumpet creeper (*Campsis radicans*), Chinese privet (*Ligustrum sinense*), and winged sumac (*Rhus copallina*). The third maintained area is a powerline right-of-way that runs through the floodplain forest on the east side of SR 1422. This area is a wetland with seedlings and saplings of red maple (*Acer rubrum*) and sweetgum (*Liquidambar styraciflua*), giant cane (*Arundinaria gigantea*), cattail (*Typha latifolia*), rushes (*Juncus* spp.), and tearthumb (*Polygonum sagittatum*).

The animal species present in these disturbed habitats are opportunistic and capable of surviving on a variety of resources, ranging from vegetation to both living and dead faunal components. American crow (*Corvus brachyrynchos),* European starling (*Sturnus vulgaris*), and American robin (*Turdus migratorius*) are common birds that use these roadside habitats. The area may also be used by the Virginia opossum (*Didelphis virginiana*), various species of mice (*Peromyscus* sp.), eastern garter snake (*Thamnophis sirtalis*), and southern toad (*Bufo terrestris*). The animal species that frequent pasture areas are similar to those found in the maintained roadside community but may also include eastern bluebird (*Sialia sialia*), eastern kingbird (*Tyrannus tyrannus*), indigo bunting (*Passerina cyanea*), red-tailed hawk (*Buteo jamaicencis*), red fox (*Vulpes vulpes*), white-tailed deer (*Odocoileus virginianus*) and meadow vole (*Microtus pennsylvanicus*). Animals utilizing the wet powerline right-of-way will be similar to those utilizing the disturbed roadside areas, but may also include common yellowthroat (*Geothlypis trichas*), and Carolina wren (*Thryothorus ludovicianus*).

3.1.2 Sand Ridge Woodland

A sand ridge woodland community occupies the northern end of the study corridor on both sides of SR 1422. Canopy and mid-story trees in this community include blackjack oak (*Quercus marilandica*), water oak, post oak (*Quercus stellata*), highbush blueberry (*Vaccinium stamineum*), longleaf pine (*Pinus palustris*), loblolly pine (*Pinus taeda*), sassafras (*Sassafras albidum*), and turkey oak (*Quercus laevis*). A thick layer of pine needles covers the ground. The understory is sparse, consisting of seedlings of the canopy trees and a few herbs and vines such as muscadine (*Vitis rotundifolia*), spotted wintergreen (*Chimaphila maculata*), lowbush blueberry (*Vaccinium vacillans*), and reindeer lichen (*Cladonia* spp.). This community corresponds to the Pine/Scrub Oak Sandhill community as described by Schafale and Weakley (1990). The TNC equivalent is a II.A.4.N.a.130 *Pinus palustris/Quercus* spp. Woodland with characteristics of fire suppression.

Bird species expected in this community include pine warbler (*Dendroica pinus*), downy woodpecker (*Picoides pubescens*), brown-headed nuthatch (*Sitta pusilla*), ruby-crowned kinglet (*Regulus calendula*), and white-eyed vireo (*Vireo griseus*). Herpetofauna may include corn snake (*Elaphe guttata guttata*), eastern diamondback rattlesnake (*Crotalus adamanteus*), oak toad (*Bufo quercicus*), and pine woods treefrog (*Hyla femoralis*). The mammal species that may be found here include southern short-tailed shrew (*Blarina carolinensis*), southeastern shrew (*Sorex longirostris*), white-tailed deer, and white-footed mouse (*Peromyscus leucopus*).

3.1.3 Floodplain Forest

A floodplain forest covers the study corridor on both banks of Puppy Creek. It is bordered by the sand ridge community to the north and by pasture to the south. Most of this community is jurisdictional wetland. The portion of this community on the south bank of Puppy Creek and west of SR 1422 is heavily grazed. Species include sweetgum, water oak, loblolly pine, bald cypress (*Taxodium distichum*), blackgum (*Nyssa sylvatica*), American holly (*Ilex opaca*), red maple (*Acer rubrum*), flowering dogwood (*Cornus florida*), ti-ti (*Cyrilla racemiflora*), giant cane (*Arundinaria gigantea*), dog-hobble (*Leucothoe axillaris*), muscadine, sweet pepperbush (*Clethra alnifolia*), false stinging-nettle (*Boehmeria cylindrica*), netted chain-fern (*Woodwardia areolata*), cinnamon fern (*Osmunda cinnamomea*), sensitive fern (*Onoclea sensibilis*), poison ivy (*Toxicodendron radicans*), downy arrowwood (*Viburnum rafinesquianum*), and peatmoss (*Sphagnum* spp.). This community is a marginal example of the Coastal Plain Bottomland Hardwoods (Blackwater Subtype) community as described in Schafale and Weakley (1990). The TNC equivalent is the I.C.3.N.b *Pinus taeda-Quercus (phellos, nigra, laurifolia*) Temporarily Flooded Forest Alliance.

Bird species expected in this community include barred owl (*Strix varia*), red-shouldered hawk (*Buteo lineatus*), great blue heron (*Ardea herodias*), prothonotary warbler (*Protonotaria citrea*), Louisiana waterthrush (*Seiurus motacilla*), and yellow-billed cuckoo (*Coccyzus americanus*). Herpetofauna that may be encountered here include

eastern cottonmouth (*Agkistrodon piscivorus piscivorus*), redbelly water snake (*Nerodia erythrogaster erythrogaster*), yellowbelly slider (*Trachemys scripta scripta*), and southern dusky salamander (*Desmognathus auriculatus*). Mammal species such as Virginia opossum, raccoon, bobcat (*Felis rufus*), southern short-tailed shrew, and hispid cotton rat (*Sigmodon hispidus*) may be found in the floodplain forest.

3.2 Aquatic Communities

Within the project area, Puppy Creek is a low-gradient, second-order stream. The bed material consists mostly of sand with some fine gravel. On the day of the site visit, the water was clear with no suspended sediment. The riparian community is mostly deciduous trees and shrubs, and is described in Sections 3.1.2 and 3.1.5. Eurasian water-milfoil (*Myriophyllum spicatum*), a submerged aquatic plant, was rooted in the stream bed.

According to Keith Ashley, WRC District 4 Fisheries Biologist, Puppy Creek probably supports populations of the following commonly encountered fish, among others: largemouth bass (*Micropterus salmoides*), redear sunfish (*Lepomis microlepis*), redbreast sunfish (*Lepomis auritus*), bluegill (*Lepomis macrochirus*), warmouth (*Lepomis gulosus*), spotted sunfish (*Lepomis punctatus*), dollar sunfish (*Lepomis marginatus*), spotted sucker (*Minytrema melanops*), chain pickerel (*Esox niger*), redfin pickerel (*Esox americanus*), yellow perch (*Perca flavescens*), American eel (*Anguilla rostrata*), and various minnow species. Anadromous fish would probably not be found in Puppy Creek because of its small size.

3.3 Summary of Anticipated Impacts

Project construction will have various impacts to the previously described terrestrial and aquatic communities. Any construction activities in or near these resources have the potential to impact biological functions. This section quantifies and qualifies potential impacts to the natural communities within the project area in terms of the area impacted and the plants and animals affected. Temporary and permanent impacts are considered here along with recommendations to minimize or eliminate impacts.

3.3.1 Terrestrial Communities

Terrestrial communities in the project area will be impacted permanently by project construction from clearing and paving. Estimated impacts are based on the length of the alternate and the entire study corridor width. **Table 1** describes the potential impacts to terrestrial communities by habitat type. Because impacts are based on the entire study corridor width, the actual loss of habitat will likely be less than the estimate. **Insert Alternate dimensions here. Table 1 should be completed following project design.**

Table 1. Estimated Area of Impact to Terrestrial Communities

	Area of Impact in Acres (Hectares)			
	Alternate 1		Alternate 2	
Community	**Temporary**	**Permanent**	**Temporary**	**Permanent**
Total Impact				

Destruction of natural communities along the project alignment will result in the loss of foraging and breeding habitats for the various animal species that utilize the area. Animal species will be displaced into surrounding communities. Adult birds, mammals, and some reptiles are mobile enough to avoid mortality during construction. Young animals and less mobile species, such as many amphibians, may suffer direct loss during construction. The plants and animals that are found in the upland communities are generally common throughout eastern North Carolina.

Impacts to terrestrial communities, particularly in locations having steep to moderate slopes, can result in the aquatic community receiving heavy sediment loads as a consequence of erosion. Construction impacts may not be restricted to the communities in which the construction activity occurs, but may also affect downstream communities. Efforts should be made to ensure that no sediment leaves the construction site.

3.3.2 Aquatic Communities

Impacts to aquatic communities include fluctuations in water temperatures as a result of the loss of riparian vegetation. Shelter and food resources, both in the aquatic and terrestrial portions of these organisms' life cycles, will be affected by losses in the terrestrial communities. The loss of aquatic plants and animals will affect terrestrial fauna that rely on them as a food source.

Temporary and permanent impacts to aquatic organisms may result from increased sedimentation. Although aquatic invertebrates may drift downstream during construction and recolonize the disturbed area once it has been stabilized, sediments have the potential to affect fish and other aquatic life in several ways, including the clogging and abrading of gills and other respiratory surfaces, affecting the habitat by scouring and filling of pools and riffles, altering water chemistry, and smothering different life stages. Increased sedimentation may cause decreased light penetration through an increase in turbidity.

Wet concrete should not come into contact with surface water during bridge construction because it is toxic to some aquatic life. Potential adverse effects can be minimized

through the implementation of NCDOT *Best Management Practices for Protection of Surface Waters.*

4.0 JURISDICTIONAL TOPICS

This section provides inventories and impact analyses for two federal and state regulatory issues: "Waters of the United States" and rare and protected species.

4.1 Waters of the United States

Wetlands and surface waters fall under the broad category of "Waters of the United States" as defined in 33 CFR § 328.3 and in accordance with provisions of Section 404 of the Clean Water Act (33 U.S.C. 1344). These waters are regulated by the U.S. Army Corps of Engineers (USACE). Any action that proposes to dredge or place fill material into surface waters or wetlands falls under these provisions.

4.1.1 Characteristics of Wetlands and Surface Waters

Jurisdictional wetlands occur within the project area and will be impacted by project construction. The wetlands are present on both sides of Puppy Creek between the sand ridge and the pasture (**Figure 2**). The powerline right-of-way wetland is described in Section 3.1.1 and the floodplain forest wetland is described in Section 3.1.3. Puppy Creek meets the definition of surface waters, and is therefore classified as Waters of the United States. The channel ranges from 20-30 feet (6.1-9.1 m) wide within the project area.

4.1.2 Bridge Demolition

Demolition and removal of a highway bridge over Waters of the United States must be addressed when applying to the U.S. Corps of Engineers (COE) for a permit. A worst-case scenario of dropping components of the bridge in the water is assumed. Effective 9/20/99, this issue is included in the permit application for bridge reconstruction. The permit application henceforth will require disclosure of demolition methods and potential impacts to the body of water in the planning document for the bridge reconstruction.

Section 402-2 "Removal of Existing Structures" of NCDOT's Standard Specifications for Roads and Structures stipulates that "excavated materials shall not be deposited....in rivers, streams, or impoundments," and "the dropping of parts or components of structures into any body of water will not be permitted unless there is no other practical method of removal. The removal from the water of any part or component of a structure shall be done so as to keep any resulting siltation to a minimum." To meet these specifications, NCDOT shall adhere to Best Management Practices for the Protection of Surface Waters, as supplemented with Best Management Practices for Bridge Demolition and Removal.

In addition, all in-stream work shall be classified into one of three categories as follows:

Case 1) In-water work is limited to an absolute minimum, due to the presence of Outstanding Resource Waters or threatened and/or endangered species, except for the removal of the portion of the sub-structure below the water. The work is carefully coordinated with the responsible agency to protect the Outstanding Resource Water or T&E species.

Case 2) No work at all in the water during moratorium periods associated with fish migration, spawning, and larval recruitment into nursery areas.

Case 3) No special restrictions other than those outlined in Best Management Practices for Protection of Surface Waters and supplements added by the Bridge Demolition document, dated 9/20/99.

Puppy Creek in the vicinity of the proposed project is a Class C water. It is not known to provide habitat for aquatic species on the federal list of threatened and endangered species. Therefore, Cases 3 applies to the proposed replacement of Bridge No. 53 over Puppy Creek.

Insert information regarding superstructure here.

The stream bed in the project area is sand and silt. Therefore, conditions in the stream raise sediment concerns and a turbidity curtain is recommended.

4.1.3 Summary of Anticipated Impacts

Add information regarding wetland impacts here. Project construction cannot be accomplished without infringing on the surface waters. Anticipated surface water impacts fall under the jurisdiction of the USACE and the DWQ. **Add information regarding stream impacts here.**

4.1.4 Permits

Impacts to jurisdictional surface waters are anticipated from the proposed project. Permits and certifications from various state and federal agencies may be required prior to construction activities.

Construction is likely to be authorized by Nationwide Permit (NWP) No. 23, as promulgated under 61 FR 65874, 65916; December 13, 1996. This permit authorizes activities undertaken, assisted, authorized, regulated, funded, or financed in whole or in part, by another Federal agency or department where that agency or department has determined that, pursuant to the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act:

- the activity, work, or discharge is categorically excluded from environmental documentation because it is included within a category of actions that neither individually nor cumulatively have a significant effect on the human environment; and
- the Office of the Chief Engineer has been furnished notice of the agency's or department's application for the categorical exclusion and concurs with that determination.

This project will also require a 401 Water Quality Certification or waiver thereof, from the Department of Environment and Natural Resources (DENR) prior to issuance of the NWP 23. Section 401 of the Clean Water Act requires that the state issue or deny water certification for any federally permitted or licensed activity that results in a discharge into Waters of the U.S. Final permit decision rests with the USACE.

4.1.5 Avoidance, Minimization, Mitigation

Because this project will likely be authorized under a Nationwide Permit, mitigation for impacts to surface waters may or may not be required by the USACE. In accordance with the Division of Water Quality Wetland Rules [15A NCAC 2H .0506 (h)] "Fill or alteration of more than one acre of wetlands will require compensatory mitigation; and fill or alteration of more than 150 linear feet of streams may require compensatory mitigation." If wetland impacts are less than an acre, wetland mitigation will not be required. **Add information regarding stream and wetland impacts here.** If the final length of stream impact is greater than 150 linear feet (45.6 m), compensatory mitigation may be required.

4.2 Rare and Protected Species

Some populations of plants and animals are declining either as a result of natural forces or their difficulty competing with humans for resources. Rare and protected species listed for Graham County, and any likely impacts to these species as a result of the proposed project construction, are discussed in the following sections.

4.2.1 Species Under Federal Protection

Plants and animals with a federal classification of Endangered (E), Threatened (T), Proposed Endangered (PE), and Proposed Threatened (PT) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended.

The USFWS lists 5 species under federal protection for Hoke County as of September 2001 (USFWS 2001). These species are listed in **Table 2**.

Table 2. Species Under Federal Protection in Hoke County

Common Name	Scientific Name	Federal Status
Vertebrates		
Red-cockaded woodpecker	*Picoides borealis*	E
Invertebrates		
Saint Francis' Satyr	*Neonympha mitchellii francisci*	E
Vascular Plants		
American chaffseed	*Schwalbea americana*	E
Michaux's sumac	*Rhus michauxii*	E
Rough-leaved loosetrife	*Lysimachia asperulaefolia*	E

Notes:
- E — Endangered-A species that is threatened with extinction throughout all or a significant portion of its range.
- T — Threatened-A species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.
- T S/A — Similarity of Appearance-A species that is listed as threatened due to similarity of appearance with other rare species.

A brief description of the characteristics and habitat requirements of each species follows, along with a conclusion regarding potential project impact.

***Picoides borealis* (Red-cockaded woodpecker)** **Endangered**

Vertebrate Family: Picidae
Federally Listed: 1970

The red-cockaded woodpecker is a small to medium sized bird 7.4 to 8.5 inches (18 to 20 cm) long with a wingspan of 14 to 15 inches (35 to 38 cm). The back and top of the head are black. The cheek is white. Numerous small white spots arranged in horizontal rows give a ladder-back appearance. The chest is dull white with small black spots on the side. Males and females look alike except males have a small red streak above the cheek.

Among woodpeckers, the red-cockaded has an advanced social system. They live in a group termed a clan. The clan may have from two to nine birds, but never more than one breeding pair. The other adults are usually males and are called helpers. The helpers are usually the sons of the breeding male and can be from 1 to 3 years old. The helpers assist in incubating eggs, feeding young, making new cavities, and defending the clan's area from other red-cockaded woodpeckers.

Roosting cavities are excavated in living pines, and usually in those that are infected with a fungus producing red-heart disease. A clan nests and roosts in a group of cavity trees called a colony. The colony may have one or two cavity trees to more than 12, but it is used only by one clan. In most colonies, all the cavity trees are within a circle about 450 m (1,500 ft) wide. Open stands of pines with a minimum age of 80 to 120 years provide suitable nesting habitat. Longleaf pines are the most commonly used, but other species of southern pine are also acceptable. Dense stands of pines, or stands that have a dense

hardwood understory are avoided. Foraging habitat is provided in pine and pine hardwood stands 30 years or older with foraging preference for pine trees 10 inches (25 cm) or larger in diameter. The woodpeckers diet consists mainly of insects that include ants, beetles, wood-boring insects, and caterpillars.

Biological Conclusion **No Effect**

There are no mature pine stands in the project area that would serve as either nesting or foraging habitat for the red-cockaded woodpecker. No occurrences of the red-cockaded woodpecker within the project vicinity were found in the NHP files. Therefore, it can be concluded that the project will not impact this threatened species.

***Neonympha mitchellii francisci* (Saint Francis' Satyr)** **Endangered**

Family: Nymphalidae
Listed: 1992

The Saint Francis' Satyr is a small, dark brown butterfly with conspicuous "eye spots" on the lower surfaces of both the fore and hind wings. The spots are usually round to oval in shape and have a dark maroon-brown center that contain lighter silvery spots within them. The border of these eyespots is straw yellow with an outermost band of dark brown. Two bright orange bands along the posterior wing margins and two slightly darker orange-brown bands across the center of each wing further accentuate the spots.

This species prefers areas of open wet meadows, interspersed with woody stems, and dominated by a high diversity of sedges (*Carex* sp.) and other wetland graminoids. Other wetland types may be suitable but specific habitat requirements for this species are poorly understood. It appears beavers and frequent fires may play an important role in habitat development and maintenance. This species has also been observed in pitcher plant (*Sarracenia flava*) swales, with cane (*Arundinaria techta*), and with rare plants such as rough-leaved loosestrifes (*Lysimachia asperulaefolia*) and pocosin lily (*Lilium iridollai*).

The Saint Francis' Satyr is one of the most rare and least known American butterflies. It is currently known to exist only on Fort Bragg in Cumberland County. This is a disjunct population over 400 miles (643.6 km) south of the nearest historic locality of its nominate species (*N. m. mitchellii*).

Biological Conclusion **No Effect**

There are no wet areas within the project area that are dominated by a diversity of sedges or wetland graminoids. A search of the NHP database showed no occurrences of this endangered species within the project area. Therefore, it may be concluded that the proposed project will have no effect on the Saint Francis' satyr.

American chaffseed (*Schwalbea americana*) **Endangered**

Family: Scrophulariaceae
Federally Listed: 1992

American chaffseed is an erect perennial herb with unbranched stems. The large, purplish-yellow tubular flowers are borne singly on short stalks in the axils of the uppermost, reduced leaves. The leaves are alternate, lance-shaped to elliptic, stalkless, 0.78 to 1.9 inches (2 to 5 cm long), and entire. The entire plant is densely but minutely hairy throughout, including the flowers. Flowering occurs from April to June, with the fruits maturing in early summer.

American chaffseed occurs in sandy (sandy peat, sandy loam), acidic, seasonally moist to dry soils. It is generally found in habitats described as open, moist pine flatwoods, fire-maintained savannas, ecotonal areas between peaty wetlands and xeric sandy soils, and other open grass/sedge systems. Chaffseed is dependant upon factors such as fire, mowing, or fluctuating water tables to maintain the open to partly open conditions that it requires. Historically, the species existed on savannas and pinelands throughout the coastal plain and on sandstone knobs and plains inland where frequent, naturally occurring fires maintained these sub-climax communities. The American chaffseed is hemiparasitic (partially dependant upon another plant as host). However, it is not host-specific, requiring a specialized host, and can use a variety of other plant species as a host.

Fifty populations of American chaffseed are known from New Jersey, South Carolina, Georgia, and Florida. Only one population is known in North Carolina. Although never a common species, the population has significantly declined because of loss of habitat to development or fire suppression.

Biological Conclusion **No Effect**

No habitat for American chaffseed fitting the above descriptions exists within the project area. A search of the NHP database showed no occurrences of this endangered species within the project vicinity. Therefore, it may be concluded that the proposed project will have no effect on the American chaffseed.

***Rhus michauxii* (Michaux's sumac)** **Endangered**

Family: Anacardiaceae
Federally Listed: 1989

Michaux's sumac or false poison sumac is a densely hairy colonial shrub with erect stems, which are 1 to 3 feet (0.3-0.9 m) in height. The shrub's compound leaves are narrowly winged at their base, dull on their tops, and veiny and slightly hairy on their bottoms. Each leaf is finely toothed on its edges. Flowers are greenish-yellow to white and are 4- to 5-parted. Each plant is unisexual. With a male plant the flowers and fruits are solitary, with a female plant all flowers are grouped in 3 to 5 stalked clusters. The

plant flowers from April to June; its fruit, a dull red drupe, is produced in October and November.

Michaux's sumac grows in sandy or rocky open woods in association with basic soils. Apparently, this plant survives best in areas where some form of disturbance has provided an open area. Most of the plant's remaining populations are on highway rights-of-way, roadsides, or on the edges of artificially maintained clearings. Other populations are in areas with periodic fires, or on sites undergoing natural succession. One population is situated in a natural opening on the rim of a Carolina bay. Currently, the plant survives in the following North Carolina Counties: Richmond; Hoke, Scotland, Franklin, Davie, Robeson, and Wake.

Biological Conclusion **No Effect**

Potential habitat for Michaux's sumac is present in the project area in the maintained roadside and sand ridge communities. However, a search conducted by Earth Tech biologists found no occurrences of this endangered species. A search of the NHP database shows no occurrences of this species within the project vicinity. Therefore, it may be concluded that the proposed project will have no effect on Michaux's sumac.

***Lysimachia asperulaefolia* (Rough-leaved loosestrife)** **Endangered**

Plant Family: Primulaceae
Federally Listed: 1987

The rough-leaved loosestrife is a perennial rhizomatous herb, with erect stems 12 to 24 inches (30 to 60 cm) in height. Leaves are usually sessile, occurring in whorls of 3 or 4. They are broadest at the base [0.3 to 0.8 inches (0.8 to 2 cm) wide], entire, and have three prominent veins. The yellow, bisexual flowers are borne on a loose, terminal raceme. The inflorescence usually has five petals with ragged margins near the apex and with dots or steaks. Flowering occurs from late May to early June, and seeds are formed by August. Despite winter dormancy, the plant is easy to recognize in the fall because of the reddish color and distinctive leaf patterns.

The habitat for the rough-leaved loosestrife is generally the ecotone between longleaf pine or oak savannas and wetter, shrubby areas, where moist, sandy, or peaty soils occur and where low vegetation allows abundant sunlight into the herb layer. Fire is the main factor for the suppression of taller vegetation. The rough-leaved loosestrife is associated with six natural community types: low pocosin, high pocosin, wet pine flatwoods, pine savannah, streamhead pocosin, and sandhill seep.

Biological Conclusion **No Effect**

None of the six natural community types with which the rough-leaved loosestrife is usually associated occur in the project area. A search of the NHP database showed no occurrences of this endangered plant in the project vicinity. In addition, Earth Tech biologists conducted a search for the plant within the project area and found no

occurrences. Therefore, it may be concluded that the proposed project will have no effect on the rough-leaved loosestrife.

4.2.2 Federal Species of Concern and State Status

Federal Species of Concern (FSC) are not legally protected under the Endangered Species Act and are not subject to any of its provisions, including Section 7, until they are formally proposed or listed as Threatened or Endangered. **Table 3** includes FSC species listed for Hoke County and their state classifications. Organisms that are listed as Endangered (E), Threatened (T), or Special Concern (SC) on the North Carolina Natural Heritage Program list of Rare Plant and Animal Species are afforded state protection under the State Endangered Species Act and the North Carolina Plant Protection and Conservation Act of 1979. However, the level of protection given to state-listed species does not apply to NCDOT activities.

Table 3. Federal Species of Concern in Hoke County

Common Name	Scientific Name	State Status	Habitat present
Vertebrates			
Bachman's sparrow	*Aimophila aestivalis*	SC	NO
Carolina gopher frog	*Rana capito capito*	SC	YES
Northern pine snake	*Pituophis melanoleucus melanoleucus*	SC	YES
Southern hognose snake	*Heterodon simus*	SR	YES
Vascular Plants			
Alabama beaksedge	*Rynchospora crinipes*	E	YES
Awned meadowbeauty	*Rhexia aristosa*	T	NO
Bog spicebush	*Lindera subcoriacea*	E	NO
Boykin's lobelia	*Lobelia boykinii*	C	NO
Carolina asphodel	*Tofieldia glabra*	C	NO
Carolina grass-of-parnassus	*Parnassia caroliniana*	E	NO
Conferva pondweed	*Potamogeton confervoides*	C	NO
Georgia indigo-bush	*Amorpha georgiana* var. *georgiana*	E	NO
Loose watermilfoil	*Myriophyllum laxum*	T	NO
Pickering's dawnflower	*Stylisma pickeringii* var. *pickeringii*	E	YES
Pondspice	*Litsea aestivalis*	C	NO
Resinous boneset	*Eupatorium resinosum*	T-SC	NO
Roughleaf yellow-eyed grass	*Xyris scabrifolia*	C	NO
Sandhills bog lily	*Lilium iridolae*	T	NO
Sandhills milkvetch	*Astragalus michauxii*	T	YES
Sandhills pyxie-moss	*Pyxidanthera barbulata* var. *breviflora*	E	NO
Savanna cowbane	*Oxypolis ternata*		NO

Common Name	Scientific Name	State Status	Habitat present
Spiked medusa	*Pteroglossaspis ecristata*	E	NO
Spring-flowered goldenrod	*Solidago verna*	T	NO
Venus flytrap	*Dionea muscipula*	C-SC	NO
White wicky	*Kalmia cuneata*	E-SC	NO
Wavyleaf wild quinine	*Parthenium radfordii*		NO

Sources: Amoroso, ed., 1999; LeGrand and Hall, eds., 1999
Key: T = Threatened, E = Endangered, SC = Special Concern, C = Candidate, SR = Significantly Rare
*=Historic record. The species was last observed in the county more than 50 years ago.
**=Obscure record. The date and/or location of observation are uncertain.

Savanna cowbane and wavyleaf wild quinine both appear on the USFWS website (last updated March 22, 2001 and last viewed on September 17, 2001) listing protected species in Hoke County, however these species do not appear on the more recently updated (July 2001) NC NHP website. John Finnegan, Data Systems Manager for the NC NHP, stated that the organization no longer tracks savanna cowbane because it is more abundant than once thought. Furthermore, wavyleaf wild quinine has been lumped with another species (*Parthenium integrifolium* var. *mabryanum*), which is also fairly common and is not tracked by the NC NHP.

No FSC species were observed during the site visit, and none are recorded at NHP as occurring within 2 miles (3.2 km) of the project area.

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

Project/Site:	*B-4152*	Date:	*7/23/2001*
Applicant/Owner:	*NCDOT*	County:	*Hoke*
Investigator:	*Almon & Ingram*	State:	*NCDOT*
Do Normal Circumstances exist on the site?	Yes x No	Community ID:	*Forested wetland*
Is the site significantly disturbed (Atypical Situation)?	Yes _____ No x	Transect ID:	
Is the area a potential Problem Area?	Yes _____ No x	Plot ID:	
(If needed, explain in remarks.)			

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Liquidambar styraciflua	*Canopy*	*FAC+*	*Arundinaria gigantea*	*Herb*	*FACW*
Quercus nigra	*Canopy*	*FAC*	*Boehmeria cylindrica*	*Herb*	*FACW+*
Taxodium distichum	*Canopy*	*OBL*	*Woodwardia areolata*	*Herb*	*OBL*
Nyssa sylvatica var biflora	*Canopy*	*OBL*	*Osmunda cinnamomea*	*Herb*	*FACW+*
Cyrilla racemiflora	*Subcan.*	*FACW*	*Osmunda regalis*	*Herb*	*OBL*
Cornus florida	*Subcan.*	*FACU*			
Ilex opaca	*Subcan.*	*FAC-*			
Leucothoe axillaris	*Shrub*	*FACW*			
Clethra alnifolia	*Shrub*	*FACW*			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) 86

Remarks:

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 Pit: _____ (in.)

Depth to Saturated Soil: *6* (in.)

Wetland Hydrology Indicators:
Primary Indicators:
_____ Inundated
x 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 in.
_____ Water-Stained Leaves
_____ Local Soil Survey Data
_____ FAC-Neutral Test
_____ Other (Explain in Remarks)

Remarks:

Community ID: *Forested wetland*
Transect ID:
Plot ID:

SOILS

Map Unit Name (Series and Phase): *Johnston*

Drainage Class: *poorly drained*

Confirm Mapped Type?
___ Yes
x No

Taxonomy Subgroup: *Cumulic humaquept*

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1		*10YR 2/2*			*sandy loam, organic matter, many fine roots*
1-6		*10YR 3/1*			*silt loam, few roots*
6-18+		*10YR 3/1*			*silt loam*

Hydric Soil Indicators:

___	Histosol	___	Concretions
___	Histic Epipedon	x	High Organic Content in Surface Layer in Sandy Soils
___	Sulfidic Odor	___	Organic Streaking in Sandy Soils
x	Aquic Moisture Regime	___	Listed on Local Hydric Soils List
x	Reducing Conditions	x	Listed on National Hydric Soils List
x	Gleyed or Low-Chroma Colors	___	Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	x Yes	___ No
Wetland Hydrology Present?	x Yes	___ No
Hydric Soils Present?	x Yes	___ No
Is this Sampling Point Within a Wetland?	x Yes	___ No

Remarks:

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

Project/Site:	*B-4152 SR 1422 over Puppy Creek*		Date: *7/23/2001*
Applicant/Owner:	*NCDOT*		County: *Hoke*
Investigator:	*Almon & Ingram*		State: *NC*
Do Normal Circumstances exist on the site?	Yes x	No	Community ID: *Upland*
Is the site significantly disturbed (Atypical Situation)?	Yes	No x	Transect ID:
Is the area a potential Problem Area? (If needed, explain in remarks.)	Yes	No x	Plot ID:

VEGETATION

Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
Pinus taeda	*Canopy*	*FAC*				
Acer rubrum	*Canopy*	*FAC*				
Quercus nigra	*Canopy*	*FAC*				
Hamamelis virginiana	*Subcan.*	*FACU*				
Ilex opaca	*Subcan.*	*FAC-*				
Arundinaria gigantea	*Herb*	*FACW*				
Smilax rotundifolia	*Vine*	*FAC*				

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) 71

Remarks:

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 Pit: _____ (in.)

Depth to Saturated Soil: _____ (in.)

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 in.
_____ Water-Stained Leaves
_____ Local Soil Survey Data
_____ FAC-Neutral Test
_____ Other (Explain in Remarks)

Remarks:

Community ID: *Upland*
Transect ID:
Plot ID:

SOILS

Map Unit Name (Series and Phase): *Blaney loamy sand*

Drainage Class: *well drained*

Confirm Mapped Type?
____ Yes
_x_ No

Taxonomy Subgroup: *Arenic Hapludult*

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

____ Histosol
____ Histic Epipedon
____ Sulfidic Odor
____ Aquic Moisture Regime
____ Reducing Conditions
____ Gleyed or Low-Chroma Colors
____ Concretions
____ High Organic Content in Surface Layer in Sandy Soils
____ Organic Streaking in Sandy Soils
____ Listed on Local Hydric Soils List
____ Listed on National Hydric Soils List
____ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	____ Yes	_x_ No
Wetland Hydrology Present?	____ Yes	_x_ No
Hydric Soils Present?	____ Yes	_x_ No
Is this Sampling Point Within a Wetland?	____ Yes	_x_ No

Remarks:

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