STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

August 22, 2005

US Army Corps of Engineers
Raleigh Field Office
6508 Falls of Neuse Road, Suite 120
Raleigh, NC 27615-6814

ATTENTION: Todd Tugwell
NCDOT Coordinator, Division 7

Dear Sir:

Subject: **Application for Nationwide Permit 23** for the replacement of Bridge No. 102 over Brush Creek on SR 2124, Guilford County. Federal Aid Project No. BRZ-2124(1), State Project No. 8.2496201, T.I.P. No. B-3848: NCDOT Division 7

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 102 over Brush Creek [DWQ Index # 16-11-4(1)], a Division of Water Quality Class "WS III NSW" Waters of the State. The project involves replacing the current 110-foot bridge on its existing location, while using an off-site detour to maintain traffic during construction. The proposed bridge will be a 3-span, 120-foot cored slab bridge with a width of 33 feet. The replacement structure will require spill-through abutments on each end. The structure provides two 12-foot lanes with 4.5-foot shoulders on each side. The proposed approach roadway will be two, 12-foot lanes with 2-foot paved and 6-foot grass shoulders. Please find enclosed a copy of the project planning report for the above referenced project, as well as half size plan sheets and permit drawings.

IMPACTS TO WATERS OF THE UNITED STATES

Permanent Impacts: The construction of the bridge and roadway approaches will impact riverine wetlands adjacent to the creek (lake). The resulting permanent impacts are 0.011 acre of fill and 0.080 acre of mechanized clearing for a total of 0.091 acre of riverine wetland impact. There will be impacts of 0.001 acre to surface waters from the two bridge bents. The proposed impacts are depicted in the attached drawings (Sheets 6 and 7 of 7).

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

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

WEBSITE: WWW.NCDOT.ORG

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC

Utilities: No impacts to jurisdictional areas will occur from any utility relocations.

BRIDGE DEMOLITION

Existing Bridge No. 102 is approximately 110 ft long with one main and four approach spans and a clear roadway width of 19.1 ft. The bridge has an asphalt-wearing surface on a timber floor. The end bents and bents 1 and 4 consist of timber cap and pile. Bents 2 and 3 consist of reinforced concrete cap and timber pile. There is the potential for fill to be temporarily placed into Waters of the United States, although all guidelines for bridge demolition and removal will be followed in addition to Best Management Practices for the Protection of Surface Waters. This project is classified as Case 3 in there are no special restrictions other than those outlined in Best Management Practices for the Protection of Surface Waters and Bridge Demolition and Removal.

AVOIDANCE, MINIMIZATION, MITIGATION

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts. Avoidance measures were taken during the planning and NEPA compliance stages; minimization measures were incorporated as part of the project design.

The following measure were taken to avoid and minimize impacts to jurisdictional areas:

- The bridge will be replaced on existing location with an off site detour
- Wetland impacts were minimized by the use of 2:1 slopes
- The number of bents in the creek were reduced from 4 to 2

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 EEP, will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for NCDOT projects that are listed in Exhibit 2 of the subject MOA during the EEP transition period which ends on June 30, 2005.

Although the subject project is not listed in Exhibit 2, or included on a supplemental project list submitted to EEP, EEP will provide the necessary compensatory mitigation to offset unavoidable impacts to waters that are jurisdictional under the federal Clean Water Act. The offsetting mitigation will derive from an inventory of assets already in existence within the same 8-digit cataloguing unit. The Department has avoided and minimized impacts to jurisdictional resources to the greatest extent possible as described above. The remaining, unavoidable impacts to 0.091 acre of riverine wetland in the Cape Fear Basin will be offset by compensatory mitigation provided by the EEP program. Enclosed in this application is the EEP acceptance letter.

SUMMARY

The project is being processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance with 23 CFR Section 771.115(b). Therefore, propose to proceed under Nationwide Permit 23 in accordance with 67 FR 2020, 2082; January 15, 2002. We anticipate a 401 General Certification (WQC #3361) will apply to this project, and are providing 2 copies of the CE document to the North Carolina Department of Environment, and Natural Resources, Division of Water Quality, for their review.

If you have any questions or need additional information, please call Rachelle Beauregard at 715-1383.

Sincerely,

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

cc: w/attachment
Mr. John Hennessy, NCDWQ (2 Copies)
Mr. Travis Wilson, NCWRC
Mr. Gary Jordan, USFWS
Dr. David Chang, P.E., Hydraulics
Mr. Greg Perfetti, P.E., Structure Design
Mr. Mark Staley, Roadside Environmental
Mr. J. M. Mills, P.E., Division Engineer
Mr. Jerry Parker, DEO
w/o attachment
Mr. Jay Bennett, P.E., Roadway Design
Mr. Omar Sultan, Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. Derrick Weaver, PDEA Project Planning Engineer
Mr. Scott McLendon, USACE, Wilmington
Ms. Beth Harmon, EEP
Mr. Todd Jones, NCDOT External Audit Branch

Ecosystem Enhancement PROGRAM

August 16, 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-3848, Bridge 102 over the Brush Creek on SR 2124, Guilford County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the riverine wetland mitigation for the subject project. Based on the information supplied by you in a letter dated August 2, 2005, the impacts are located in CU 03030002 of the Cape Fear River Basin in the Central Piedmont (CP) Eco-Region, and are as follows:

Riverine Wetland Impacts: 0.091 acre

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. Mitigation for this project will be provided in accordance with the above referenced agreement. EEP will commit to implementing sufficient compensatory wetland mitigation to offset the impacts associated with this project by the end of the MOA year in which this project is permitted, in accordance with Section X of the Tri-Party MOA.

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

Sincerely,

William D. Gilmore, P.E.
EEP Director

cc: Mr. John T. Thomas, Jr., USACE-Raleigh
Mr. John Hennessy, Division of Water Quality, Wetlands/401 Unit
File: B-3848

Ecosystem Enhancement PROGRAM

August 16, 2005

Mr. John T. Thomas, Jr.
U. S. Army Corps of Engineers
Raleigh Regulatory Field Office
6508 Falls of the Neuse Road, Suite 120
Raleigh, North Carolina 27615

Dear Mr. Thomas:

Subject: EEP Mitigation Acceptance Letter:

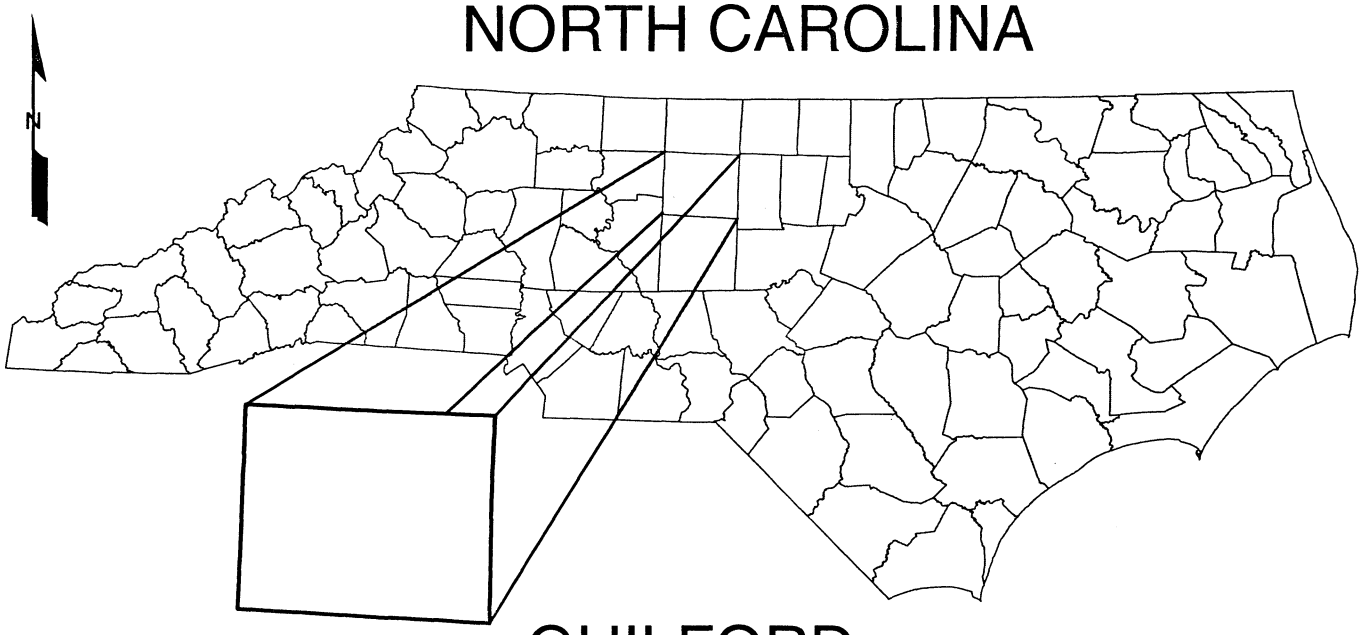
B-3848, Bridge 102 over Brush Creek on SR 2124, Guilford County; Cape Fear River Basin (CU 03030002); Central Piedmont (CP) Eco-Region

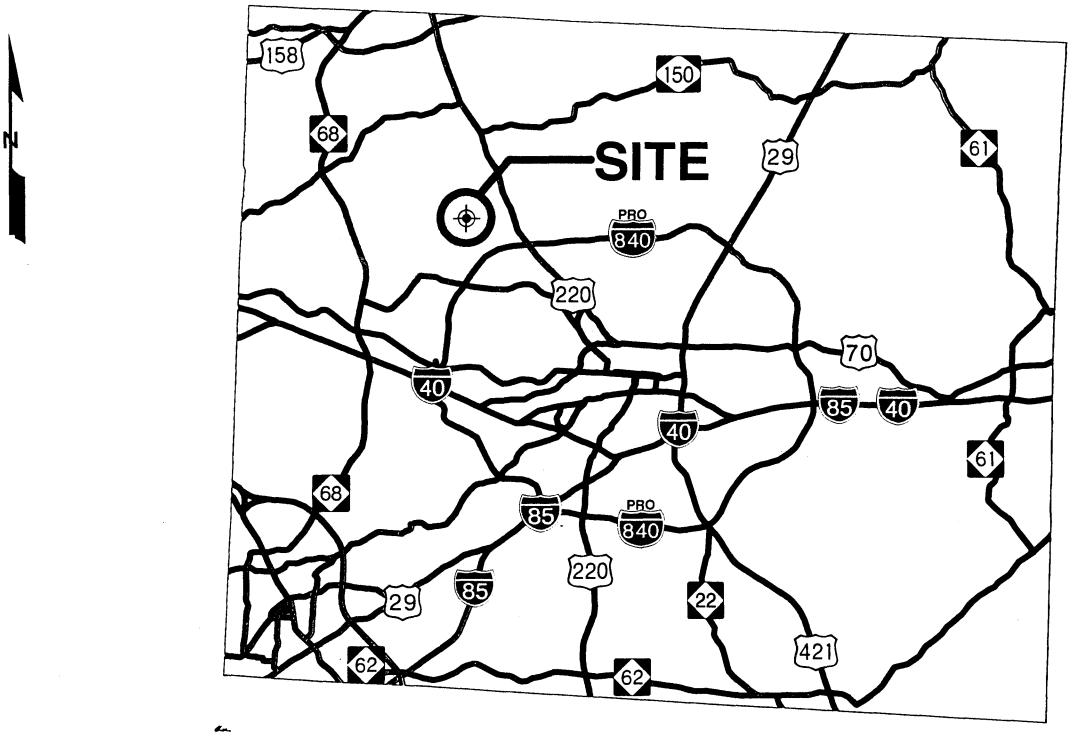
The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide compensatory riverine wetland mitigation for the unavoidable impacts associated with the above referenced project. As indicated in the NCDOT's mitigation request letter, the project will impact 0.091 acre of riverine wetlands.

EEP will commit to implementing sufficient compensatory riverine wetland mitigation to offset the impacts associated with this project by the end of the MOA year in which this project is permitted, in accordance with Section X of the Tri-Party MOA signed on July 22, 2003. EEP understands the USACE will allow remaining high quality preservation assets to be utilized as a component in the mitigation strategy at a 5:1 ratio. Therefore, EEP intends to utilize high quality riverine wetland preservation assets in the following manner:

High Quality Riverine Wetland Preservation (5:1) in Same Eco-Region

Allen Site, Franklin County Central Piedmont Eco-Region Tar-Pamlico River Basin, CU 03020101	0.455 acre





VICINITY MAP

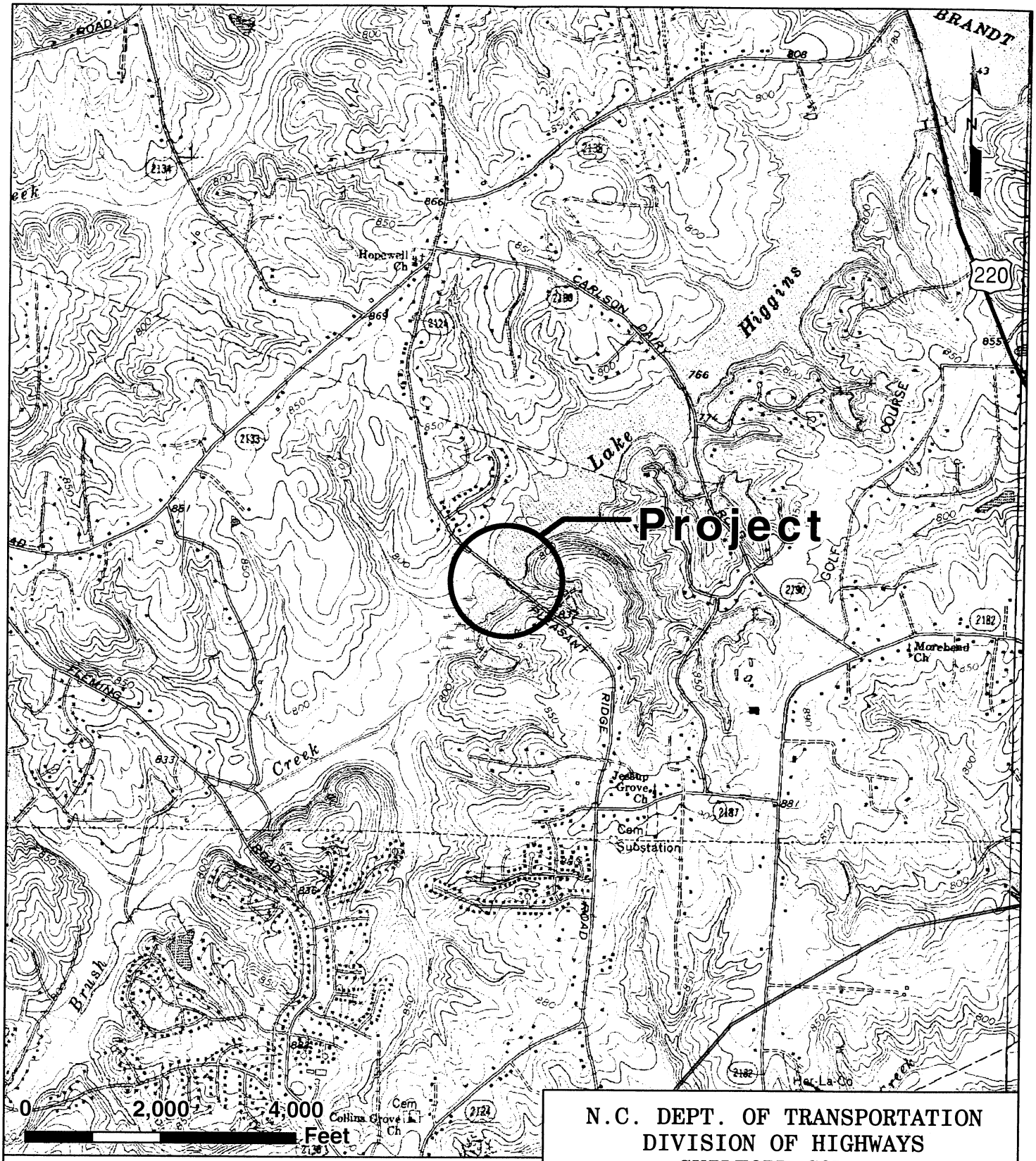
N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT NO. 33296.1.1 (B-3848)

BRIDGE NO. 102 AND APPROACHES
ON SR 2124 OVER BRUSH CREEK /
LAKE HIGGINS

Sheet 1 of 7

3/23/05



1 inch equals 2,000 feet

LOCATION

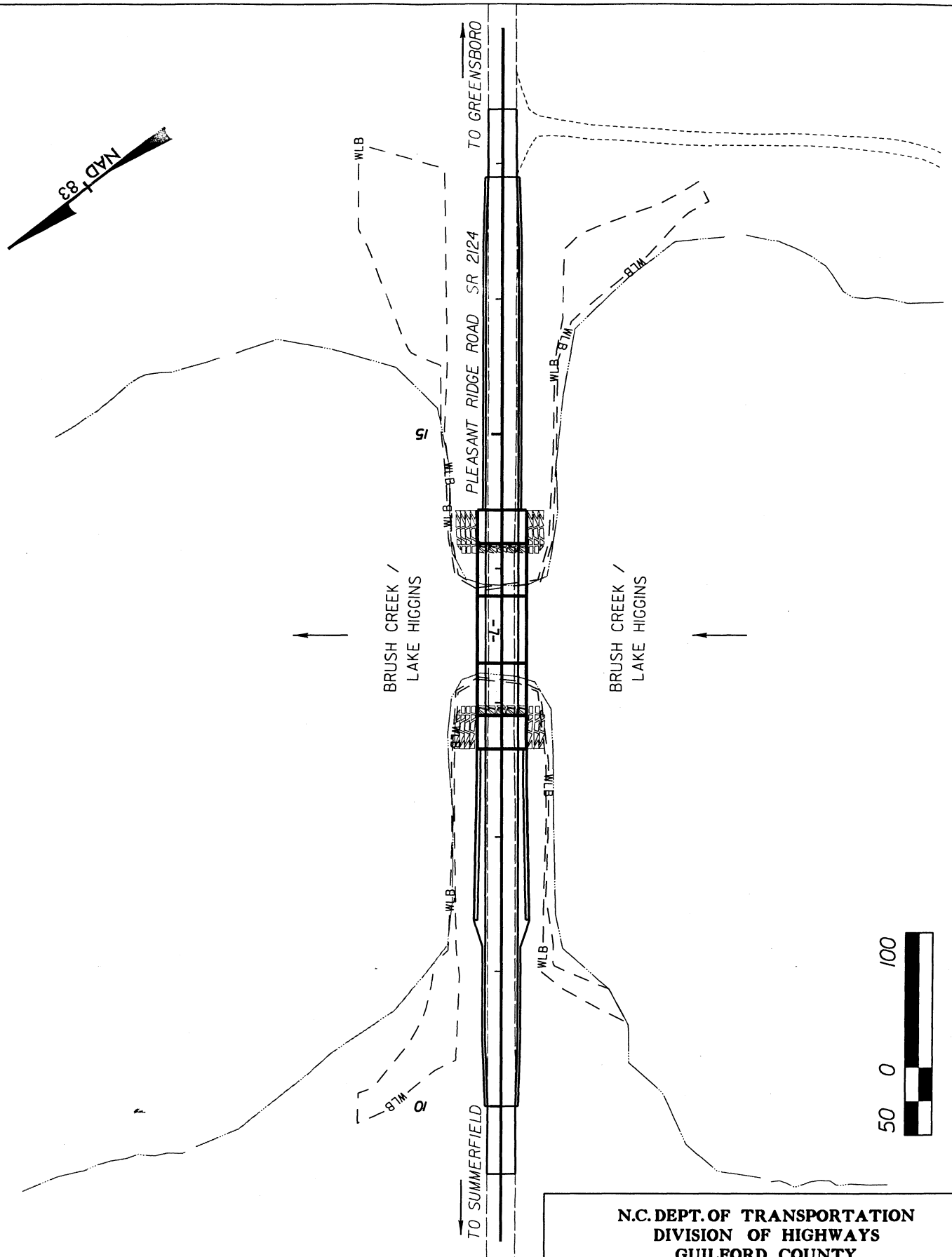
N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT NO. 33296.1.1 (B-3848)

BRIDGE NO. 102 AND APPROACHES
ON SR 2124 OVER BRUSH CREEK /
LAKE HIGGINS

Sheet 2 of 7 3/23/05

Source: USGS 7.5 Minute Quadrangles, Summerfield, NC



SITE MAP

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GUILFORD COUNTY

PROJECT 33296.1.1 (B-3848)

BRIDGE NO. 102 AND APPROACHES ON SR 2124 OVER BRUSH CREEK / LAKE HIGGINS

Sheet 3 of 7

03/16/05

R:\HYDRAULICS\B3848_PMT_SITE.DGN

PROP. NO.	PROPERTY OWNER NAME	PROP. OWNER MAILING ADDRESS
10	CITY OF GREENSBORO	DB 3855 / PG 1480 DB 1655 / PG 430 DB 2298 / PG 394 DB 3285 / PG 943 DB 3717 / PG 1716 DB 1787 / PG 57 PB 94 / PG 100 PB 115 / PG 85 PB 33 / PG 81 PB 40 / PG 64

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

GUILFORD COUNTY
PROJECT: 33296.1.1 (B-3848)

3/22/2005

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L- 13+50	BRIDGE	0.011			0.080		0.001				
TOTALS:			0.011			0.080		0.001				

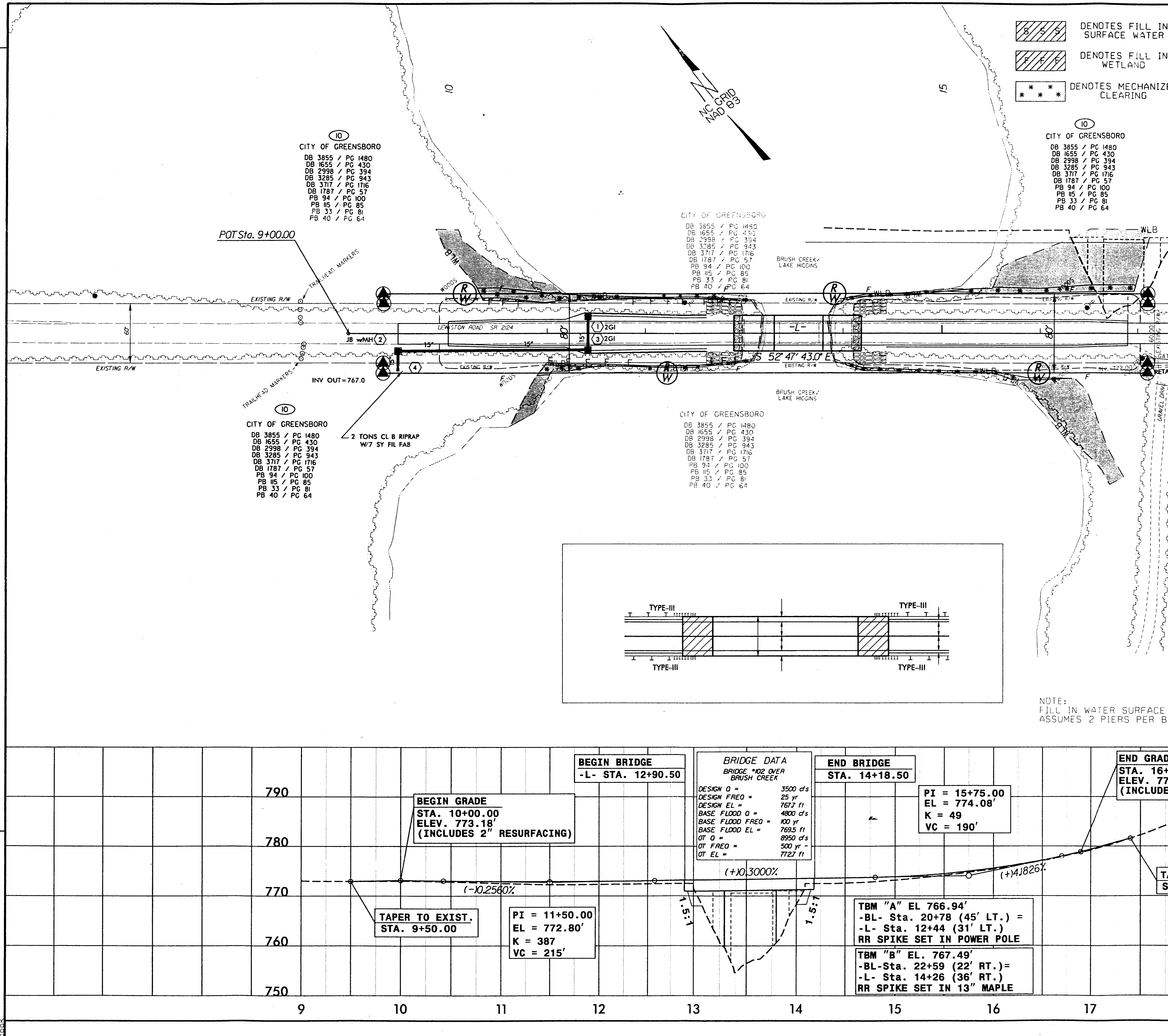
NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GUILFORD COUNTY
PROJECT 33296.1.1 (B-3848)

Sheet 5 of 7

4/22/2005

ATN Revised 3/31/05
R:\z-misc\Hydro\WetlandPermitSummaryE.xls



NC GRID NAD 83
CITY OF GREENSBORO
DB 3855 / PG 1480
DB 1655 / PG 430
DB 2998 / PG 394
DB 3285 / PG 943
DB 3717 / PG 1716
DB 1787 / PG 57
PB 94 / PG 100
PB 115 / PG 85
PB 33 / PG 81
PB 40 / PG 64
BRUSH CREEK/ LAKE HIGGINS
POT Sta. 9+00.00
POT Sta. 18+00.00
TRAILHEAD MARKERS
EXISTING R/W
LEWISTON ROAD SR 2124
-L-
S 52° 47' 43.0" E
JB wMH
2GI
INV OUT=767.0
2 TONS CL B RIPRAP W/7 SY FIL FAB
WLB
WOODS
GRAVEL DRIVE
VARIABLE WIDTH EXISTING R/W
MON. FOUND
N85°14'05"E 15.07 Ft.
N85°01'58"E 21.83 Ft.
N85°19'32"E 33.06 Ft.
N38°33'56"E 124.33 Ft.
TYPE-III
BEGIN GRADE
STA. 10+00.00
ELEV. 773.18'
(INCLUDES 2" RESURFACING)
BEGIN BRIDGE
-L- STA. 12+90.50
BRIDGE DATA
BRIDGE #102 OVER BRUSH CREEK
DESIGN Q = 3500 cfs
DESIGN FREQ = 25 yr
DESIGN EL = 767.7 ft
BASE FLOOD Q = 4800 cfs
BASE FLOOD FREQ = 100 yr
BASE FLOOD EL = 769.5 ft
OT Q = 8950 cfs
OT FREQ = 500 yr -
OT EL = 772.7 ft
END BRIDGE
STA. 14+18.50
PI = 15+75.00
EL = 774.08'
K = 49
VC = 190'
END GRADE
STA. 16+90.00
ELEV. 778.89'
(INCLUDES 2" RESURFACING)
TAPER TO EXIST.
STA. 9+50.00
PI = 11+50.00
EL = 772.80'
K = 387
VC = 215'
(-)0.2560%
(+)0.3000%
(+)4.1826%
1.5:1
TBM "A" EL 766.94'
-BL- Sta. 20+78 (45' LT.) =
-L- Sta. 12+44 (31' LT.)
RR SPIKE SET IN POWER POLE
TBM "B" EL. 767.49'
-BL-Sta. 22+59 (22' RT.)=
-L- Sta. 14+26 (36' RT.)
RR SPIKE SET IN 13" MAPLE
TAPER TO EXIST.
STA. 17+40.00
800
790
780
770
760
750
9
10
11
12
13
14
15
16
17
18

DENOTES FILL IN SURFACE WATER

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

NOTE:
FILL IN WATER SURFACE DUE TO BRIDGE BENTS ASSUMES 2 PIERS PER BENT AT 3.5' DIAMETERS.

English

PROJECT REFERENCE NO.	SHEET NO.
B-3848	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Sheet 6 of 7

REVISIONS

PLANS PREPARED BY :
RUMMEL KLEPPER & KAHL, LLP
consulting engineers
5800 FARINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
(919)-878-9560

FOR
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

04/25/2005
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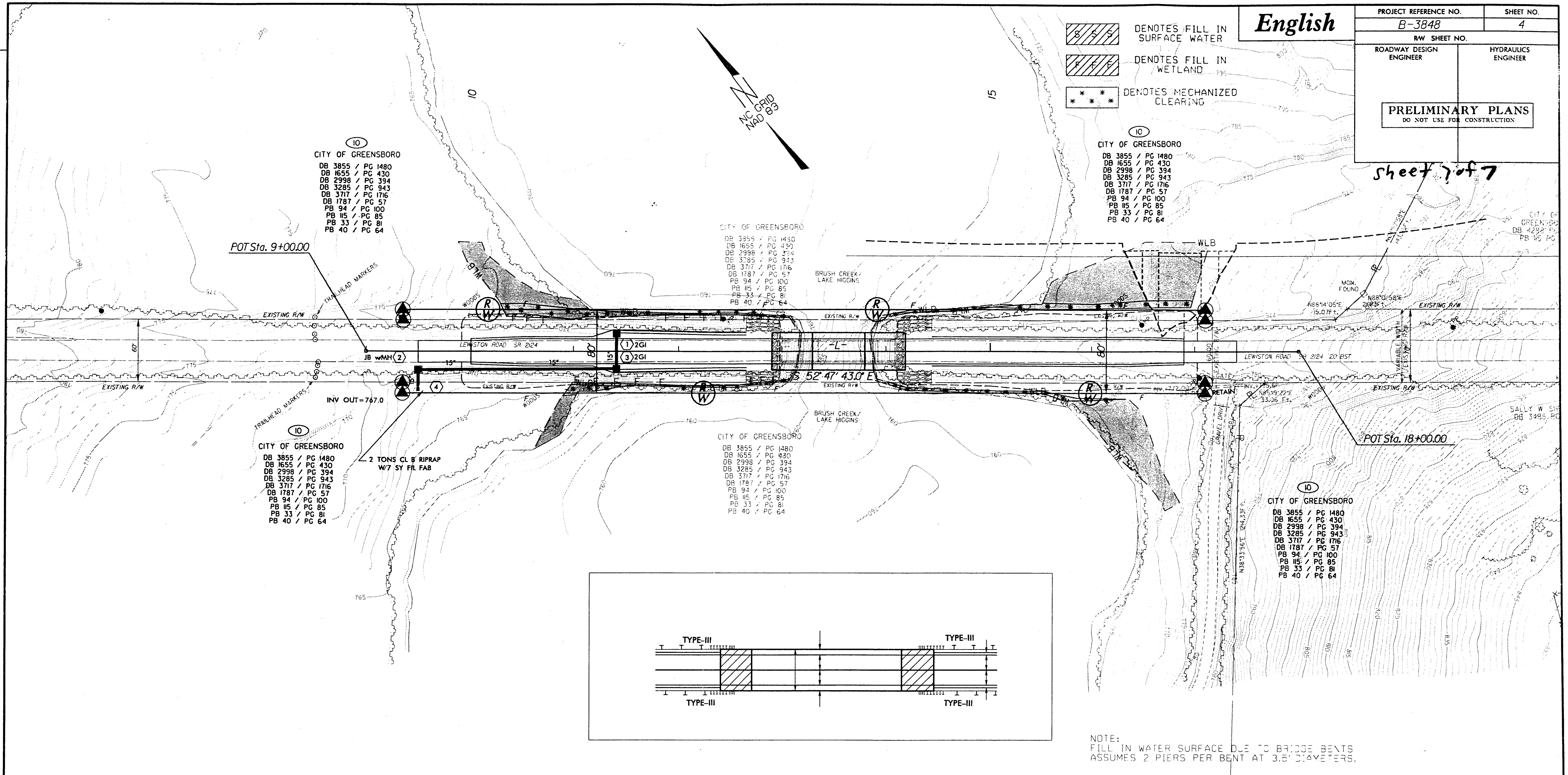

DENOTES FILL IN SURFACE WATER
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DENOTES MECHANIZED CLEARING
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BRUSH CREEK/ LAKE HIGGINS
EXISTING R/W
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TRAILHEAD MARKERS
WLB
WOODS
MON. FOUND
TYPE-III
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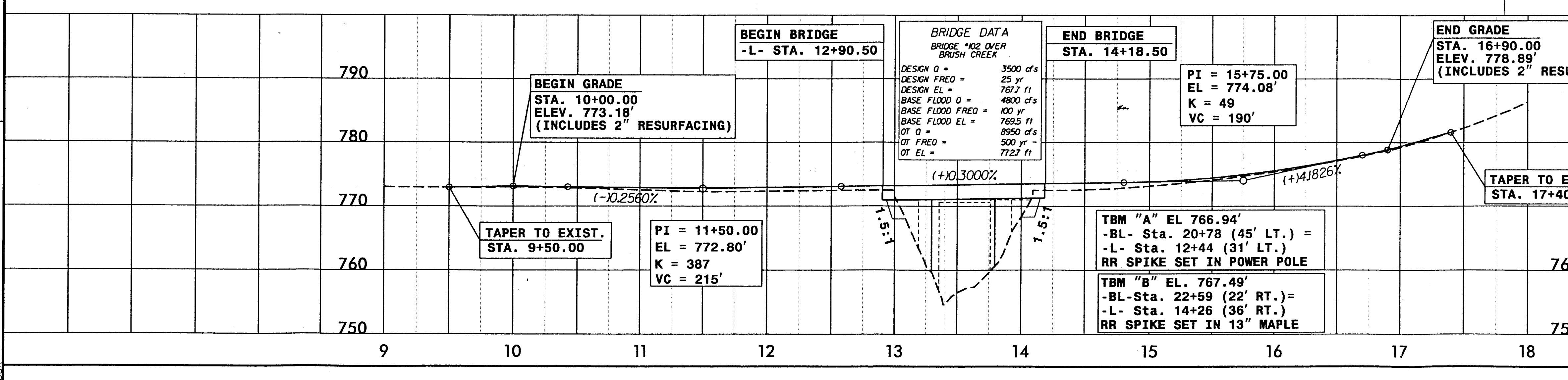
ASSUMES 2 PIERS PER BENT AT 3.5' DIAMETERS.



BEGIN BRIDGE
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-L- Sta. 14+26 (36' RT.)
RR SPIKE SET IN 13" MAPLE
TAPER TO EXIST.
STA. 17+40.00
800
790
780
770
760
750
9
10
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12
13
14
15
16
17
18

English

PROJECT REFERENCE NO.	SHEET NO.
B-3848	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

sheet 1 of 7

REVISIONS

PLANS PREPARED BY :
RUMMEL KLEPPER & KAHL, LLP
consulting engineers
5800 FARINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
(919)-878-9560

FOR
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

04/25/2005
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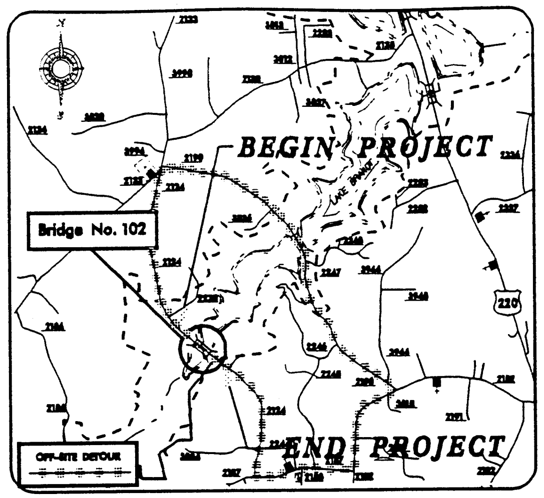
CONTRACT:

T.I.P. PROJECT: B-3848

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3848	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33296.1.1	BRZ-2124 (1)	P.E.	
33296.2.2		R/W / UTIL	

See Sheet 1-A For Index of Sheets



VICINITY MAP

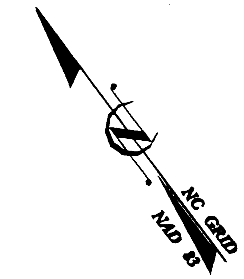
RW PLAN SUBMITTAL

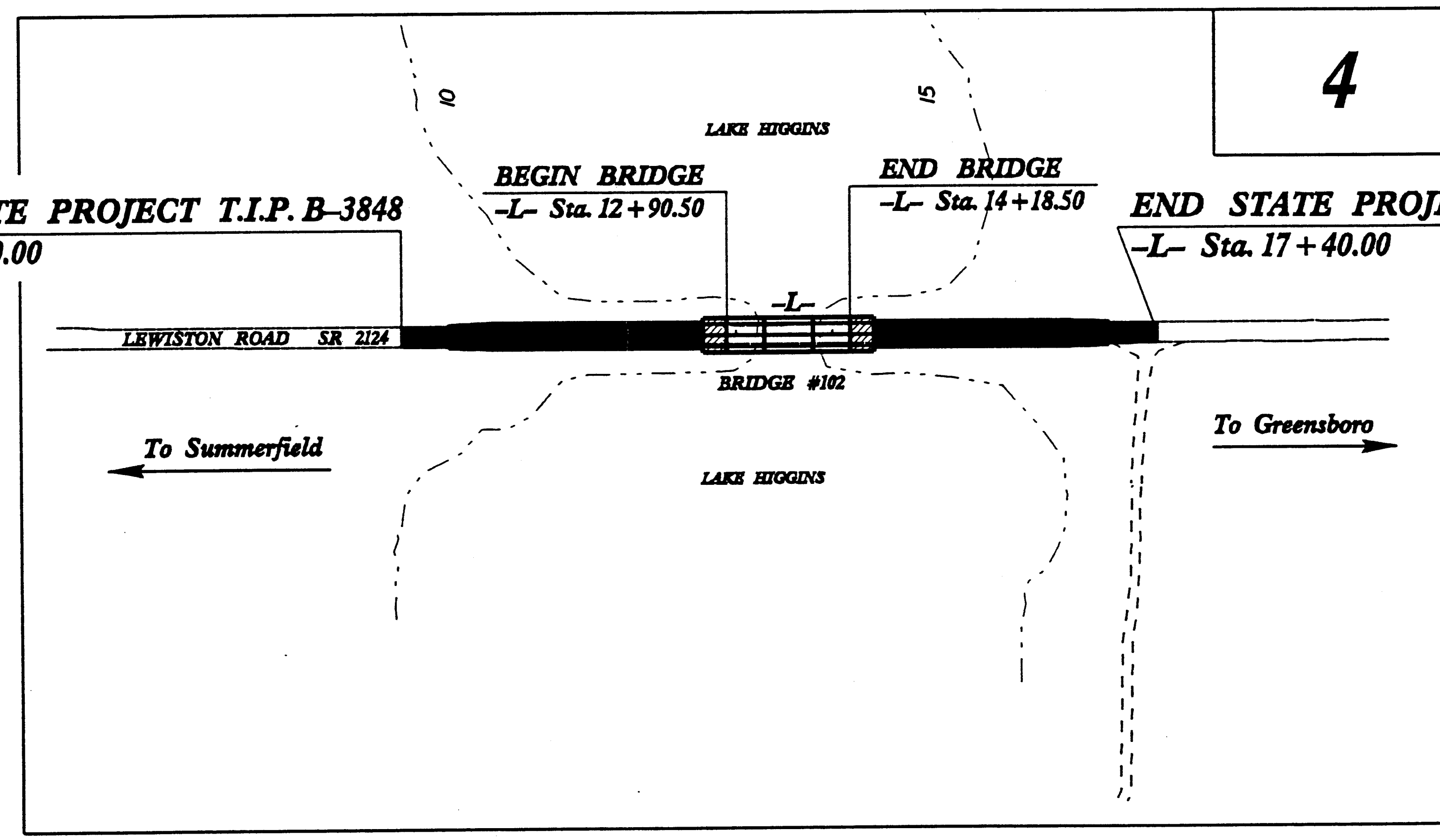
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

LOCATION: BRIDGE NO. 102 OVER BRUSH CREEK ON SR 2124 (LEWISTON ROAD)

TYPE OF WORK: GRADING, PAVING, DRAINAGE & STRUCTURE





NOTES:

- THIS PROJECT IS WITHIN THE CITY OF GREENSBORO MUNICIPAL BOUNDARIES.
- DESIGN EXCEPTION REQUIRED FOR VERTICAL ALIGNMENT
- CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

5 2.5 0 5 10
PROFILE (VERTICAL)

DESIGN DATA

ADT 2006= 3,100
ADT 2026= 5,300
DHV= 10 %
D = 60 %
T = 3 % *
V = 50 MPH

* TTST 1% DUAL 2%

PROJECT LENGTH

Length Roadway T.I.P. Project B-3848 .... 0.126 mi
Length Structure T.I.P. Project B-3848 .... 0.024 mi
Total Length T.I.P. Project B-3848 .... 0.150 mi

PLANS PREPARED BY:
KUMMEL, KLEPPER & KAHL, LLP
consulting engineers
5800 FARRINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR DIVISION OF HIGHWAYS

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: April 15, 2005

LETTING DATE: April 18, 2006

B. KEITH SKINNER, P.E.
PROJECT ENGINEER

MICHAEL T. MERRITT, P.E
PROJECT DESIGN ENGINEER

NCDOT CONTACT: Scott Blevins, P.E.
STATE ENGINEER COORDINATOR

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER P.E.

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR DATE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL SYMBOLS

*S.U.E = SUBSURFACE UTILITY ENGINEER

ROADS & RELATED ITEMS

- Edge of Pavement
- Curb
- Prop. Slope Stakes Cut
- Prop. Slope Stakes Fill
- Prop. Woven Wire Fence
- Prop. Chain Link Fence
- Prop. Barbed Wire Fence
- Prop. Wheelchair Ramp
- Curb Cut for Future Wheelchair Ramp
- Exist. Guardrail
- Prop. Guardrail
- Equality Symbol
- Pavement Removal

RIGHT OF WAY

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

HYDROLOGY

- Stream or Body of Water
- River Basin Buffer
- Flow Arrow
- Disappearing Stream
- Spring
- Swamp Marsh
- Shoreline
- Falls, Rapids
- Prop Lateral, Tail, Head Ditches

STRUCTURES

MAJOR

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

MINOR

- Head & End Wall
- Pipe Culvert
- Footbridge
- Drainage Boxes
- Paved Ditch Gutter

UTILITIES

- Exist. Pole
- Exist. Power Pole
- Prop. Power Pole
- Exist. Telephone Pole
- Prop. Telephone Pole
- Exist. Joint Use Pole
- Prop. Joint Use Pole
- Telephone Pedestal
- U/G Telephone Cable Hand Hold
- Cable TV Pedestal
- U/G TV Cable Hand Hold
- U/G Power Cable Hand Hold
- Hydrant
- Satellite Dish
- Exist. Water Valve
- Sewer Clean Out
- Power Manhole
- Telephone Booth
- Cellular Telephone Tower
- Water Manhole
- Light Pole
- H-Frame Pole
- Power Line Tower
- Pole with Base
- Gas Valve
- Gas Meter
- Telephone Manhole
- Power Transformer
- Sanitary Sewer Manhole
- Storm Sewer Manhole
- Tank; Water, Gas, Oil
- Water Tank With Legs
- Traffic Signal Junction Box
- Fiber Optic Splice Box
- Television or Radio Tower
- Utility Power Line Connects to Traffic Signal Lines Cut Into the Pavement
- Recorded Water Line
- Designated Water Line (S.U.E.*)
- Sanitary Sewer
- Recorded Sanitary Sewer Force Main
- Designated Sanitary Sewer Force Main(S.U.E.*)
- Recorded Gas Line
- Designated Gas Line (S.U.E.*)
- Storm Sewer
- Recorded Power Line
- Designated Power Line (S.U.E.*)
- Recorded Telephone Cable
- Designated Telephone Cable (S.U.E.*)
- Recorded U/G Telephone Conduit
- Designated U/G Telephone Conduit (S.U.E.*)
- Unknown Utility (S.U.E.*)
- Recorded Television Cable
- Designated Television Cable (S.U.E.*)
- Recorded Fiber Optics Cable
- Designated Fiber Optics Cable (S.U.E.*)
- Exist. Water Meter
- U/G Test Hole (S.U.E.*)
- Abandoned According to U/G Record
- End of Information

BOUNDARIES & PROPERTIES

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Property Line Symbol
- Exist. Iron Pin
- Property Corner
- Property Monument
- Property Number
- Parcel Number
- Fence Line
- Existing Wetland Boundaries
- High Quality Wetland Boundary
- Medium Quality Wetland Boundaries
- Low Quality Wetland Boundaries
- Proposed Wetland Boundaries
- Existing Endangered Animal Boundaries
- Existing Endangered Plant Boundaries

BUILDINGS & OTHER CULTURE

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

TOPOGRAPHY

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

VEGETATION

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

RAILROADS

- Standard Gauge
- RR Signal Milepost
- Switch

revised 02/02/00

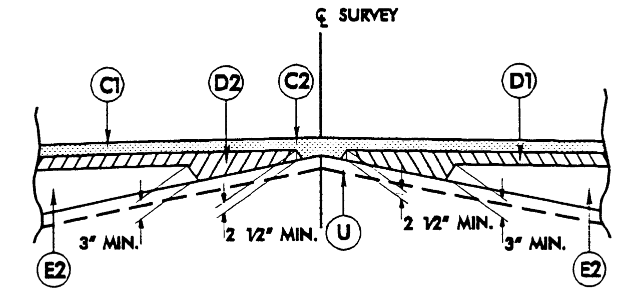
B-3848	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

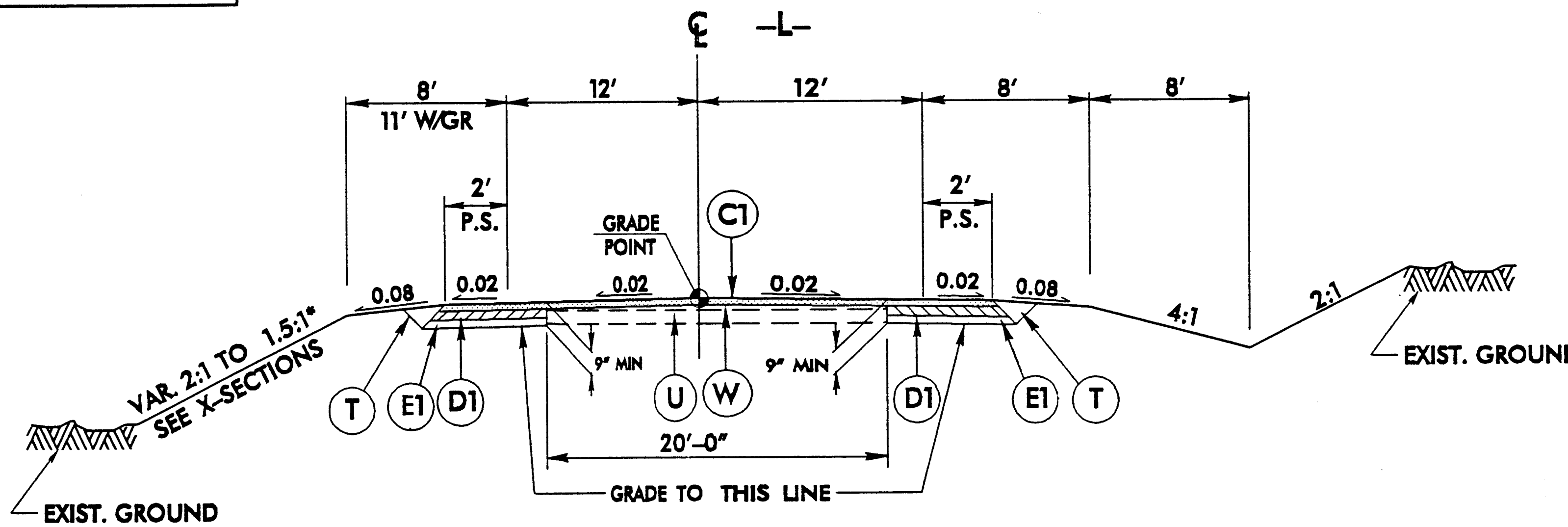
PAVEMENT SCHEDULE

ITEM	DESCRIPTION	ITEM	DESCRIPTION
C1	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 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 GREATER THAN 5 1/2" IN DEPTH OR LESS THAN 3" IN DEPTH.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	T	EARTH MATERIAL
D1	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	U	EXISTING PAVEMENT
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT GREATER THAN 4" IN DEPTH OR LESS THAN 2 1/2" IN DEPTH.	W	WEDGING (SEE DETAIL)
E1	PROP. APPROX. 4.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.		

NOTE: All Pavement Edge Slopes Are To Be 1:1 Unless Otherwise Shown.

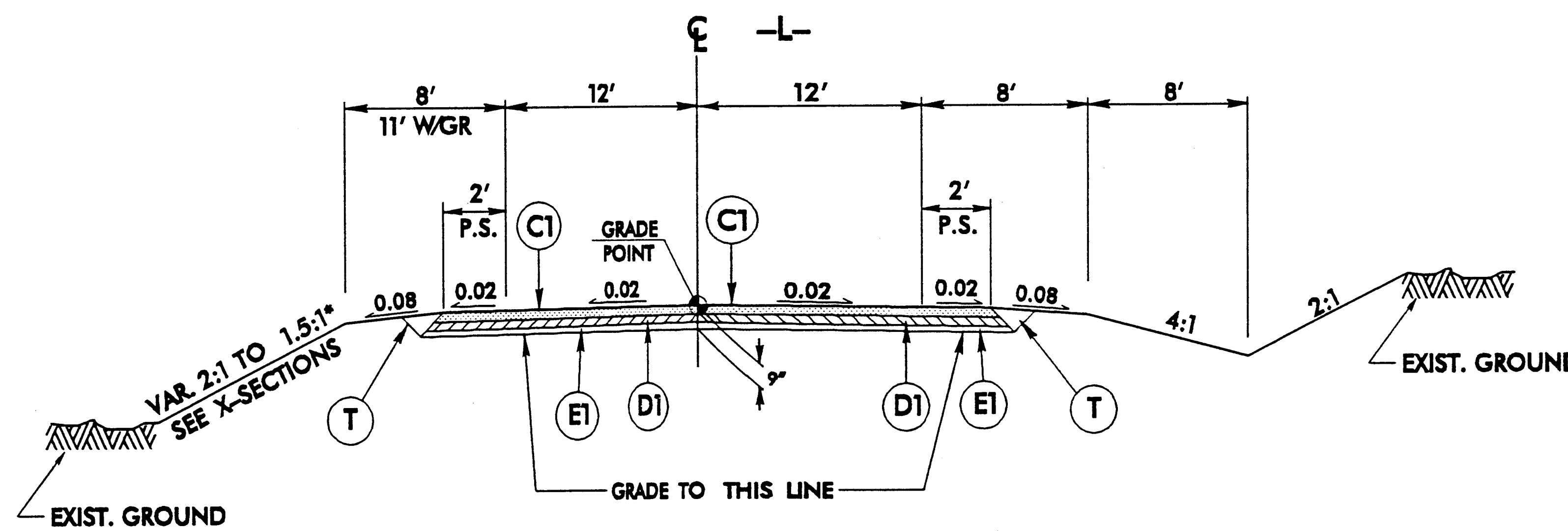


Detail Showing Method of Wedging



TYPICAL SECTION NO. 1

* SEE DETAIL 2-A FOR ROCK PLATING



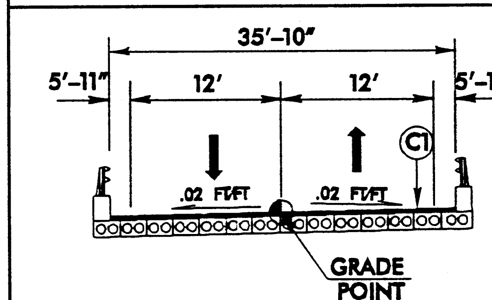
TYPICAL SECTION NO. 2

* SEE DETAIL 2-A FOR ROCK PLATING

USE TYPICAL SECTION NO. 1

-L- STA. 10+00.00 TO 12+55.00
-L- STA. 14+55.00 TO 16+90.00

DETAIL OF PAVING ACROSS CORED SLAB BRIDGE



-L- STA. 12+90.50 TO 14+18.50

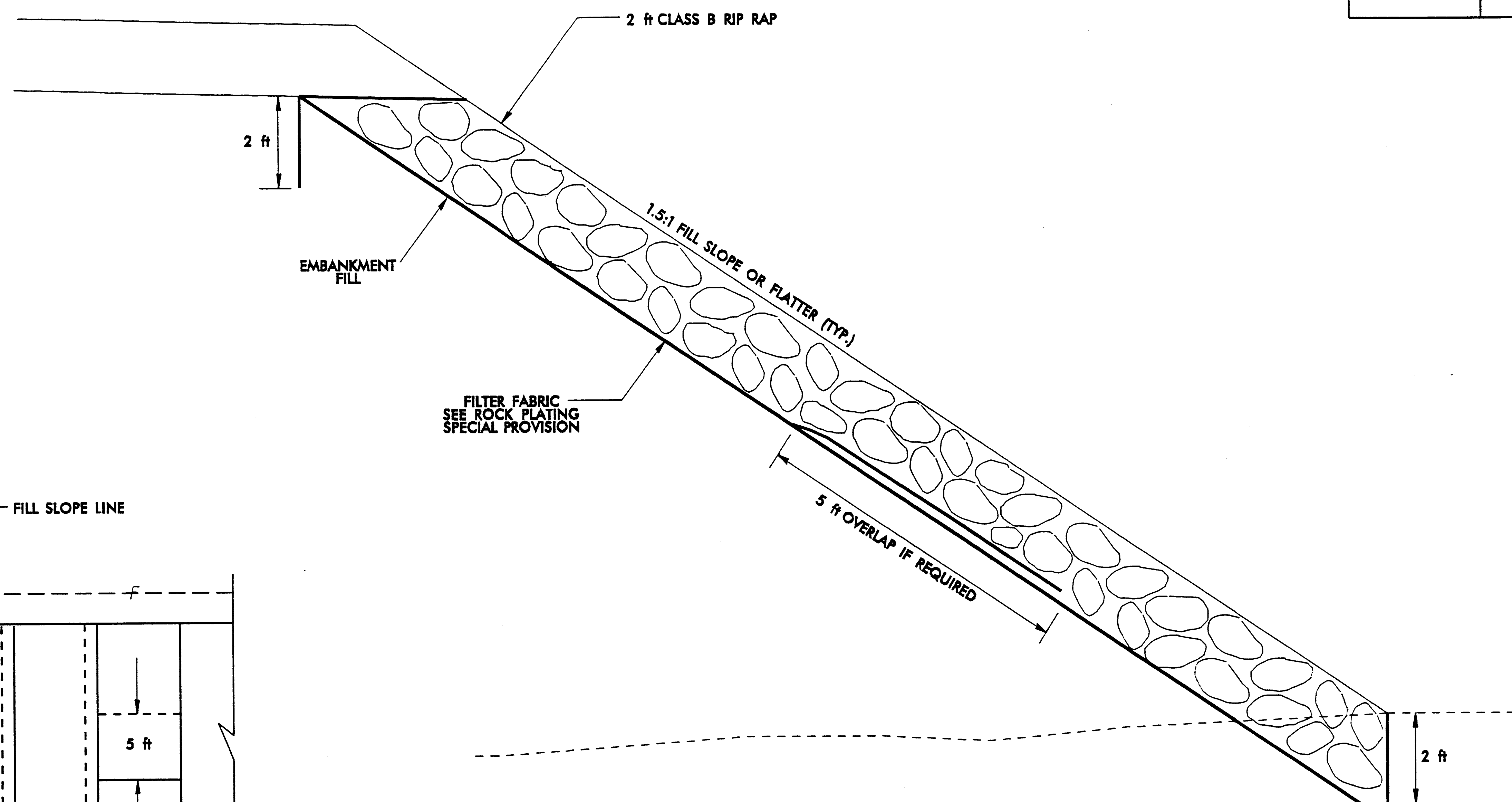
USE TYPICAL SECTION NO. 2

-L- STA. 12+55.00 TO 12+90.50 (BEG. BRIDGE)
-L- STA. 14+18.50 (END BRIDGE) TO 14+55.00

PLANS PREPARED BY :
RUMMEL · KLEPPER & KAHL, LLP
consulting engineers
5800 FARINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

B-3848	2-4
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

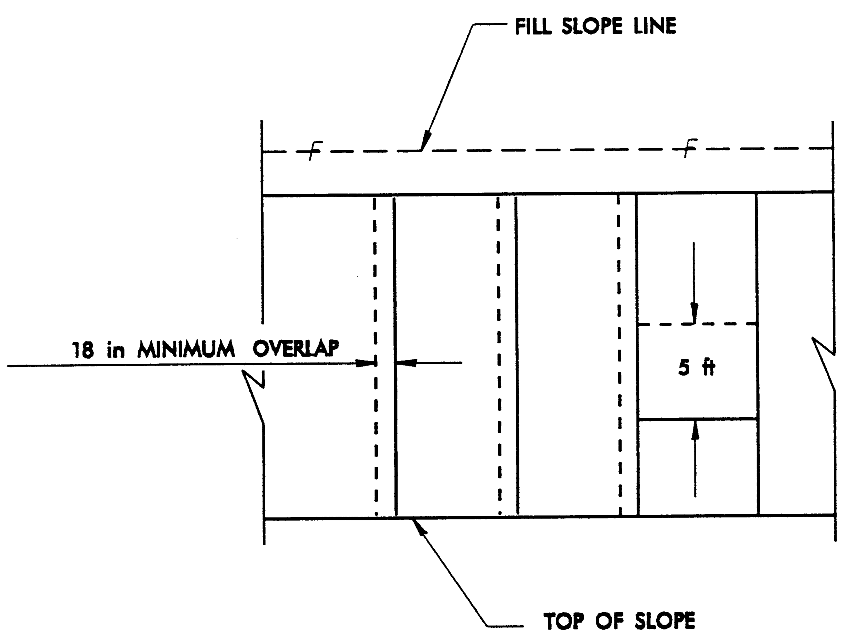
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



ROCK PLATING DETAIL

N.T.S.

-L- STA. 10+75.00 TO STA. 12+65.50
-L- STA. 14+42.50 TO STA. 15+25.00



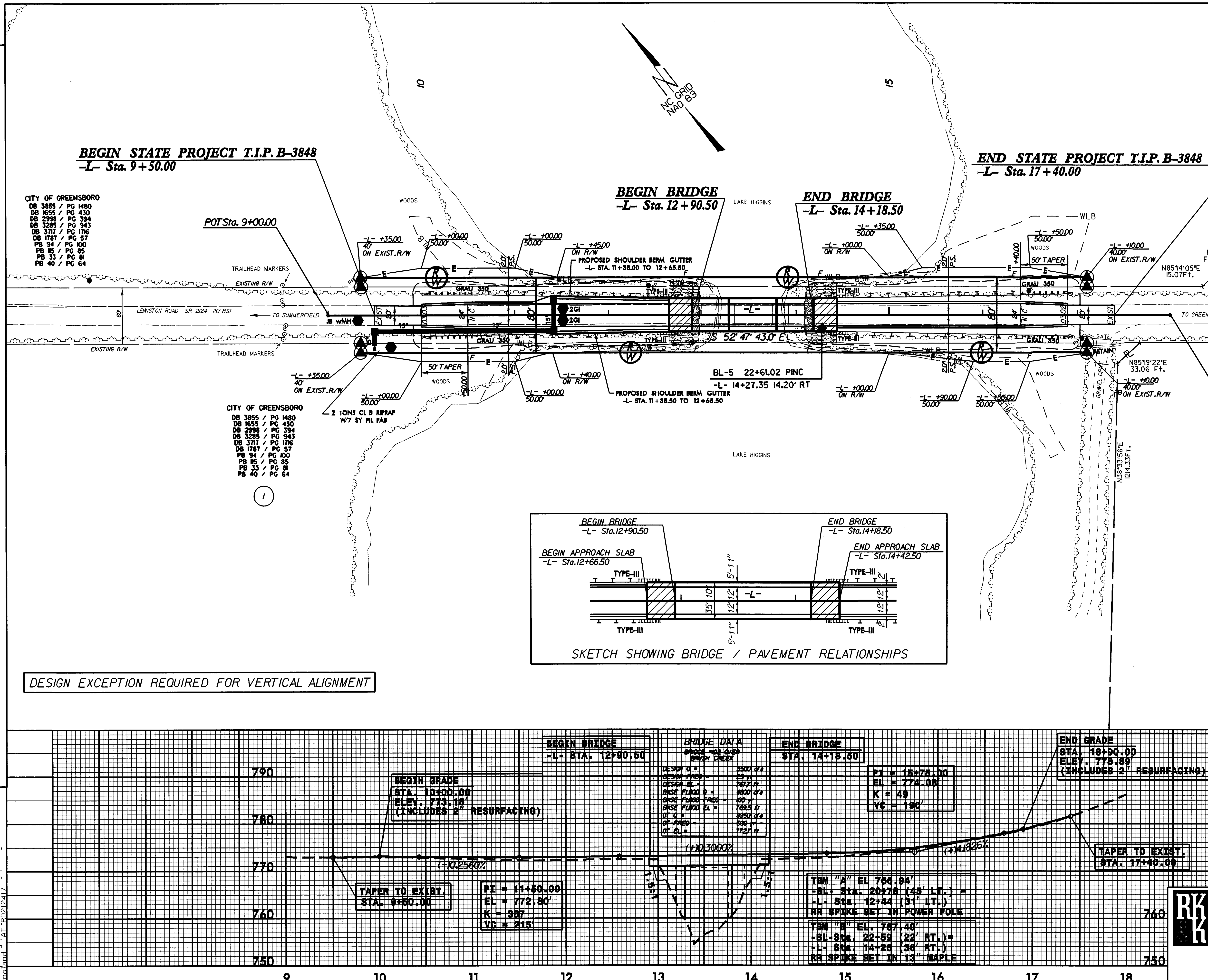
FABRIC OVERLAP DETAIL

N.T.S.

PLANS PREPARED BY :
RUMMEL KLEPPER & KAHL, LLP
consulting engineers
5800 FARINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-3848	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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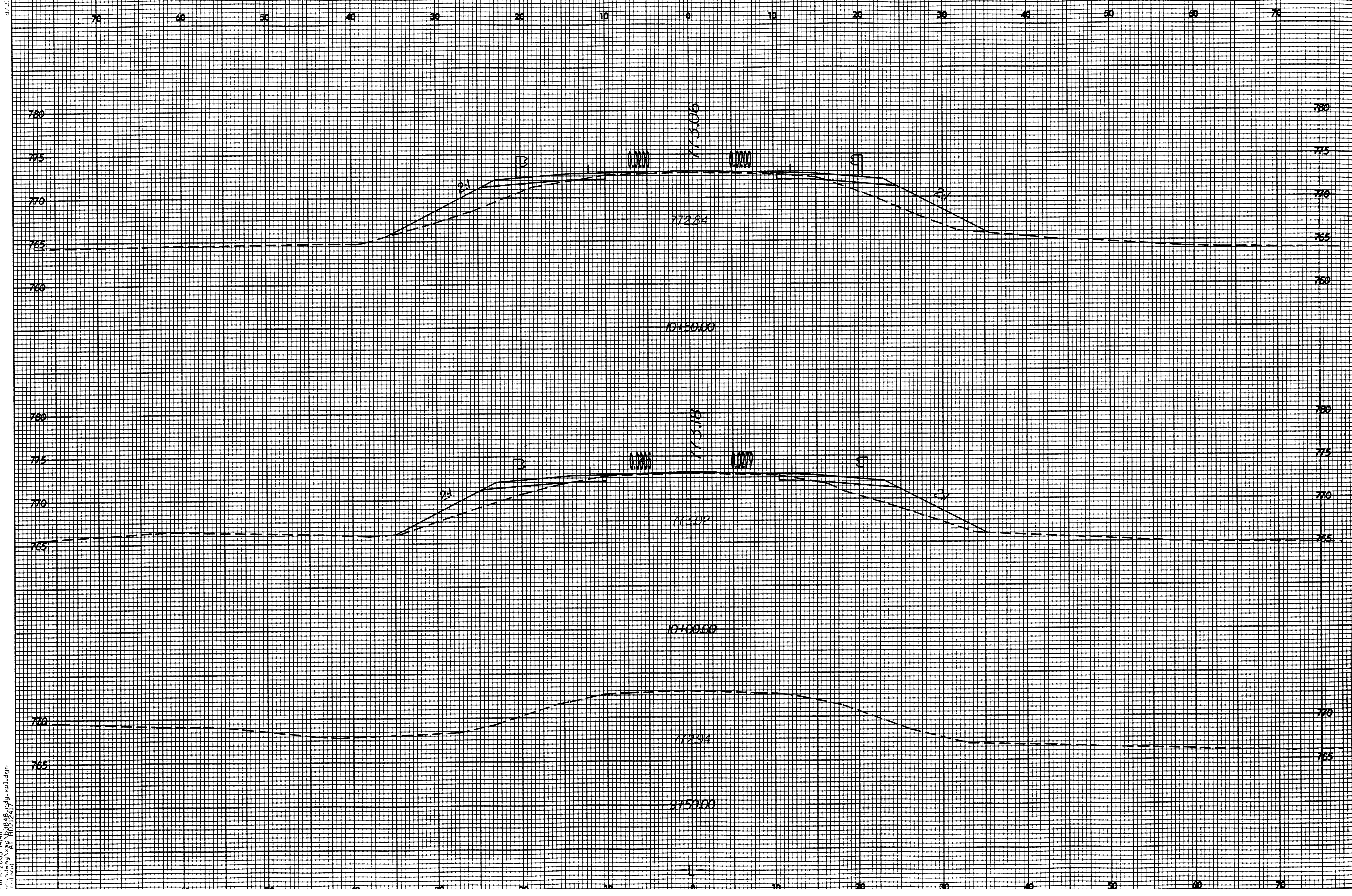
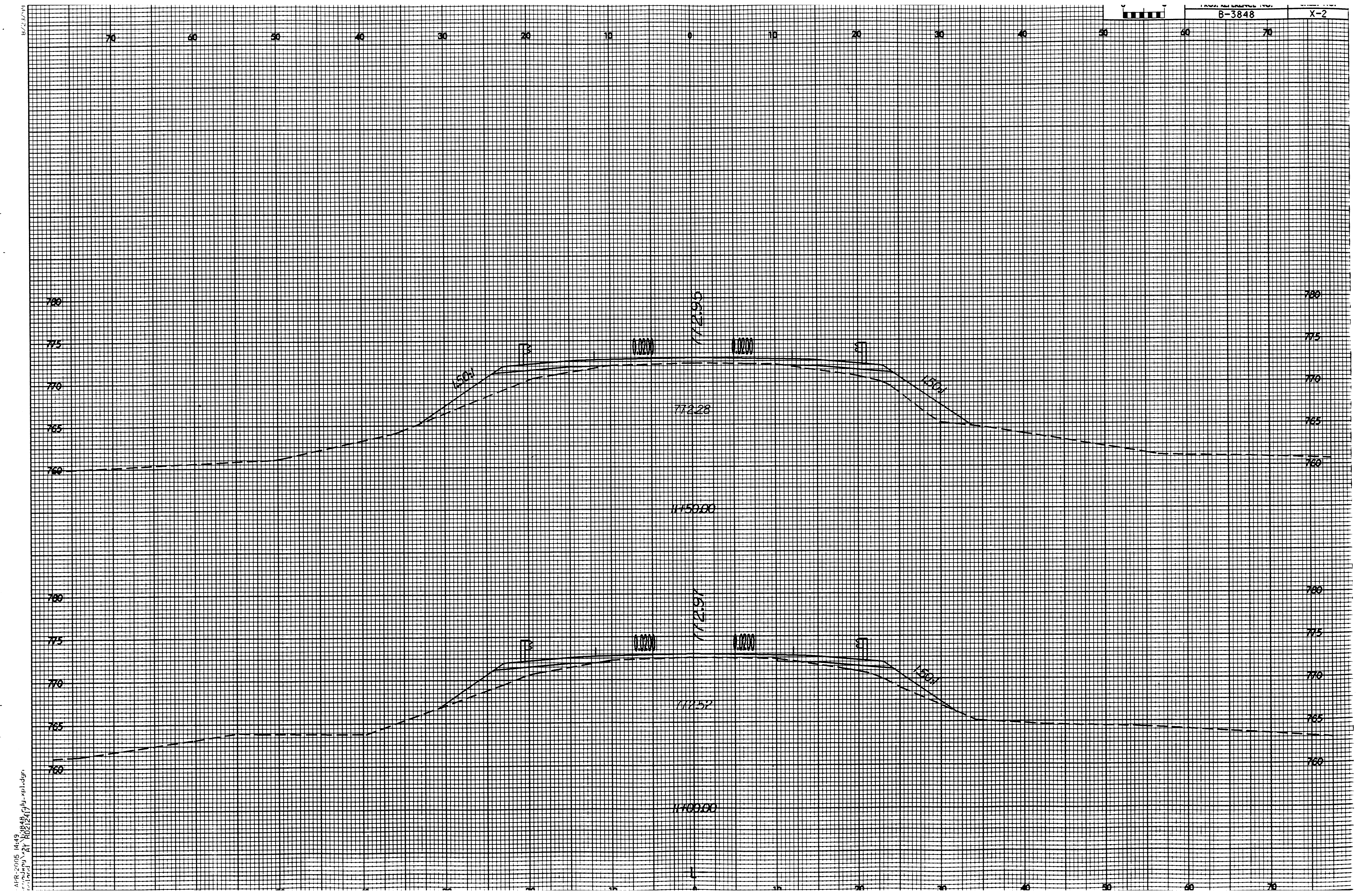
-L- Sta. 9+50.00
BEGIN BRIDGE
-L- Sta. 12+90.50
END BRIDGE
-L- Sta. 14+18.50
END STATE PROJECT T.I.P. B-3848
-L- Sta. 17+40.00
NC GRID NAD 83
CITY OF GREENSBORO
DB 3855 / PG 1480
DB 1655 / PG 430
DB 2998 / PG 394
DB 3285 / PG 943
DB 3717 / PG 1176
DB 1787 / PG 57
PB 94 / PG 100
PB 115 / PG 85
PB 33 / PG 81
PB 40 / PG 64
CITY OF GREENSBORO
DB 4288 PG 872
PB 115 PG 85
SALLY W SHELTON
DB 3485 PG 1194
POT Sta. 9+00.00
POT Sta. 18+00.00
LAKE HIGGINS
WOODS
TRAILHEAD MARKERS
EXISTING R/W
LEWISTON ROAD SR 2124 20' BST
TO SUMMERFIELD
TO GREENSBORO
PROPOSED SHOULDER BERM GUTTER
-L- STA. 11+38.00 TO 12+65.50
-L- STA. 11+38.50 TO 12+65.50
2 TONS CL B RIPRAP
W/7 SY FIL FAB
BL-5 22+61.02 PINC
-L- 14+27.35 14.20' RT
S 52° 47' 43.0" E
50' TAPER
ON EXIST. R/W
ON R/W
MON. FOUND
N85°14'05"E 15.07Ft.
N85°01'58"E 21.83Ft.
N64°57'58"E 143.85Ft.
N85°19'22"E 33.06 Ft.
N38°33'56"E 1214.33Ft.
WLB
GATE
DESIGN EXCEPTION REQUIRED FOR VERTICAL ALIGNMENT
BEGIN BRIDGE
-L- Sta.12+90.50
BEGIN APPROACH SLAB
-L- Sta.12+66.50
END BRIDGE
-L- Sta.14+18.50
END APPROACH SLAB
-L- Sta.14+42.50
TYPE-III
SKETCH SHOWING BRIDGE / PAVEMENT RELATIONSHIPS
BEGIN GRADE
STA. 10+00.00
ELEV. 773.18
(INCLUDES 2" RESURFACING)
BEGIN BRIDGE
-L- STA. 12+90.50
BRIDGE DATA
END BRIDGE
STA. 14+18.50
PI = 15+75.00
EL = 774.08
K = 49
VC = 190'
END GRADE
STA. 18+90.00
ELEV. 778.89
(INCLUDES 2" RESURFACING)
TAPER TO EXIST.
STA. 9+50.00
PI = 11+50.00
EL = 772.80'
K = 387
VC = 215'
TAPER TO EXIST.
STA. 17+40.00
(-)0.2560%
(+)0.3000%
(+)4.1826%
TBM "A" EL 766.94'
-BL- Sta. 20+76 (45' LT.) =
-L- Sta. 12+44 (31' LT.)
RR SPIKE SET IN POWER POLE
TBM "B" EL 767.40'
-BL- Sta. 22+58 (22' RT.)=
-L- Sta. 14+28 (36' RT.)
RR SPIKE SET IN 13" MAPLE
REVISIONS

PLANS PREPARED BY :
RUMMEL KLEPPER & KAHL, LLP
consulting engineers
5800 FARINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
(919)-878-9560
FOR
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

27-APR-2005 15:11

B-3848	X-1





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R021247

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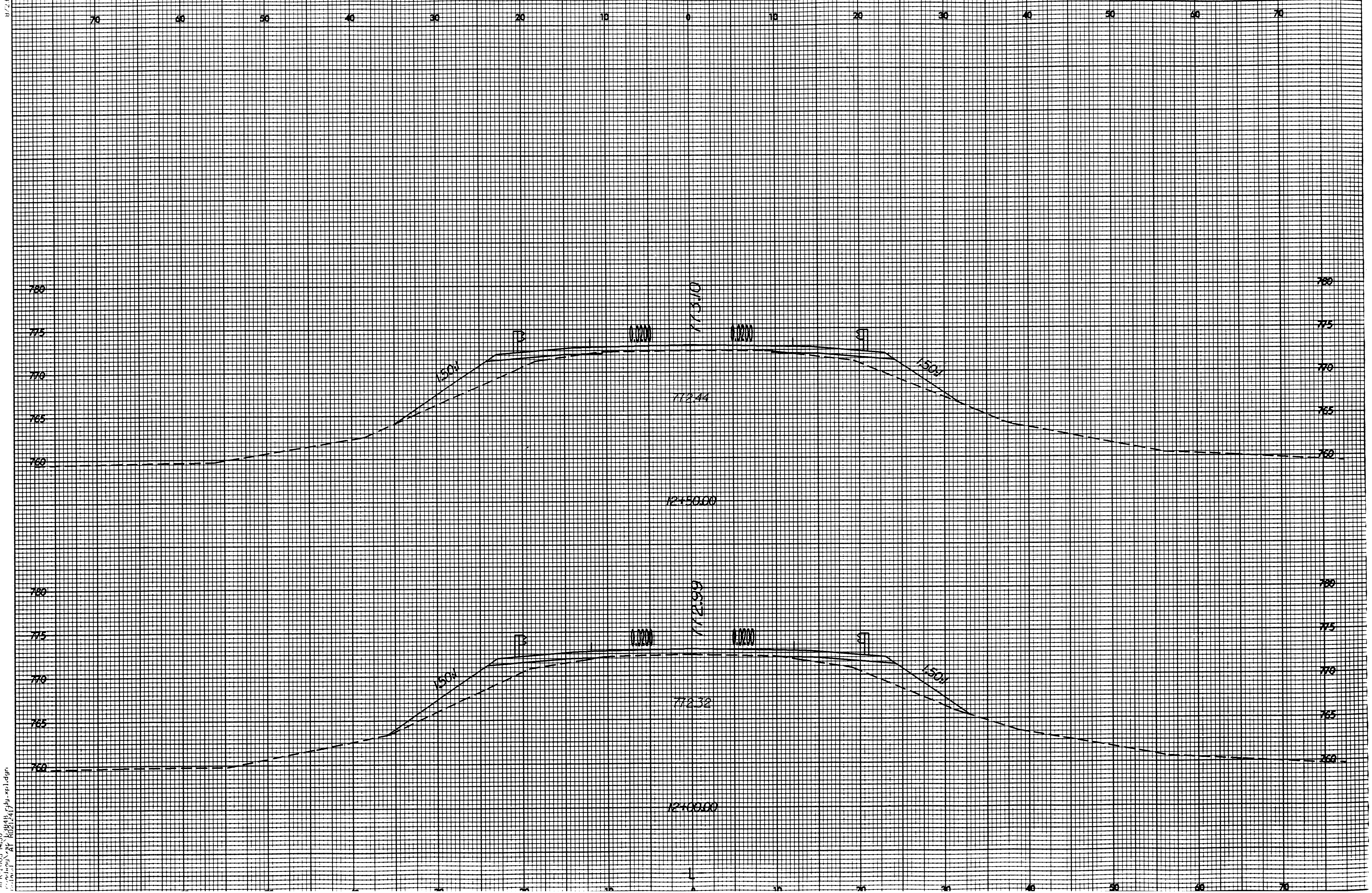

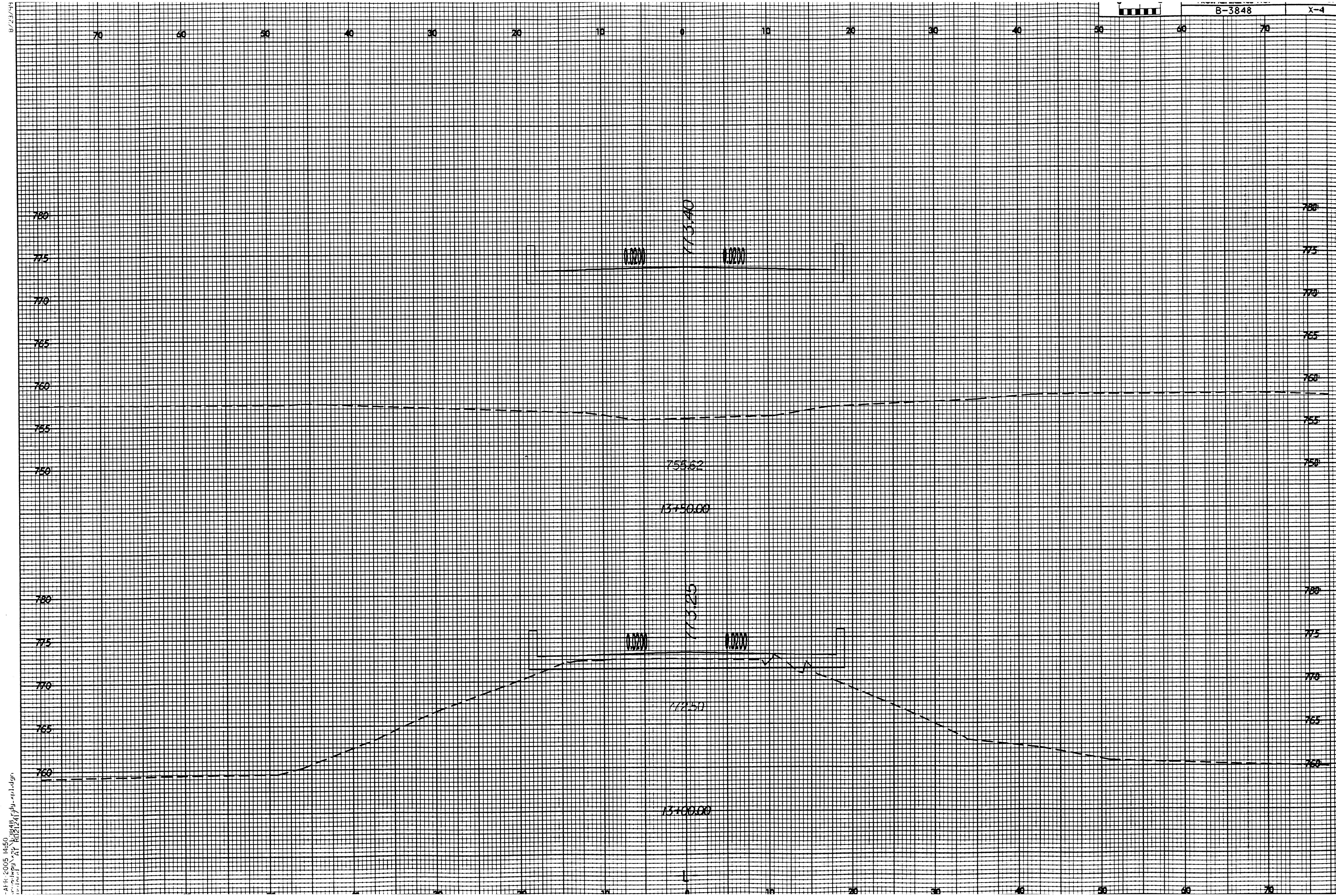
B-3848
X-4
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773.25
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13+00.00

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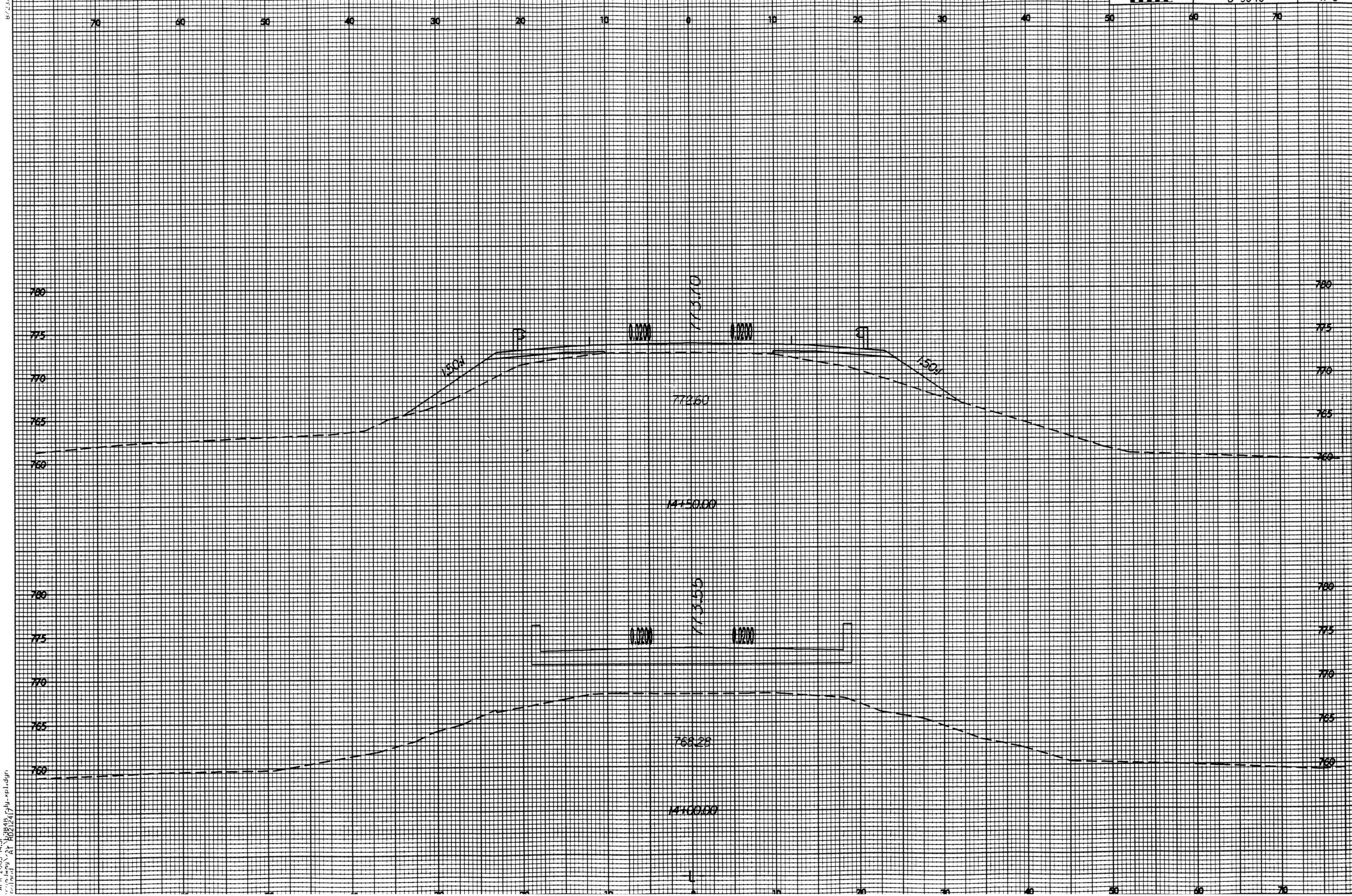

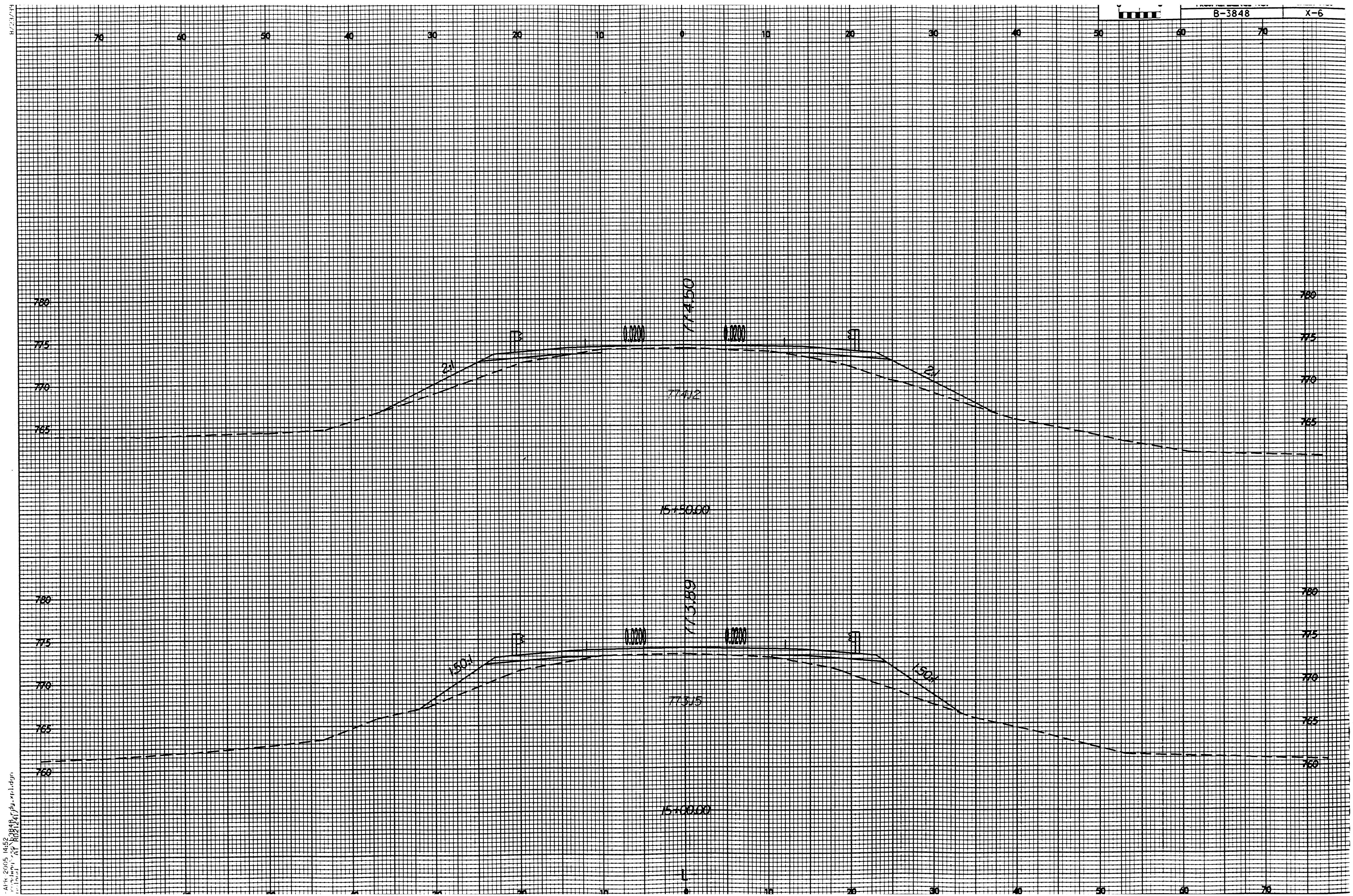
B-3848
X-6
15+50.00
774.50
774.12
2:1
2:1
0.0200
0.0200
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780
775
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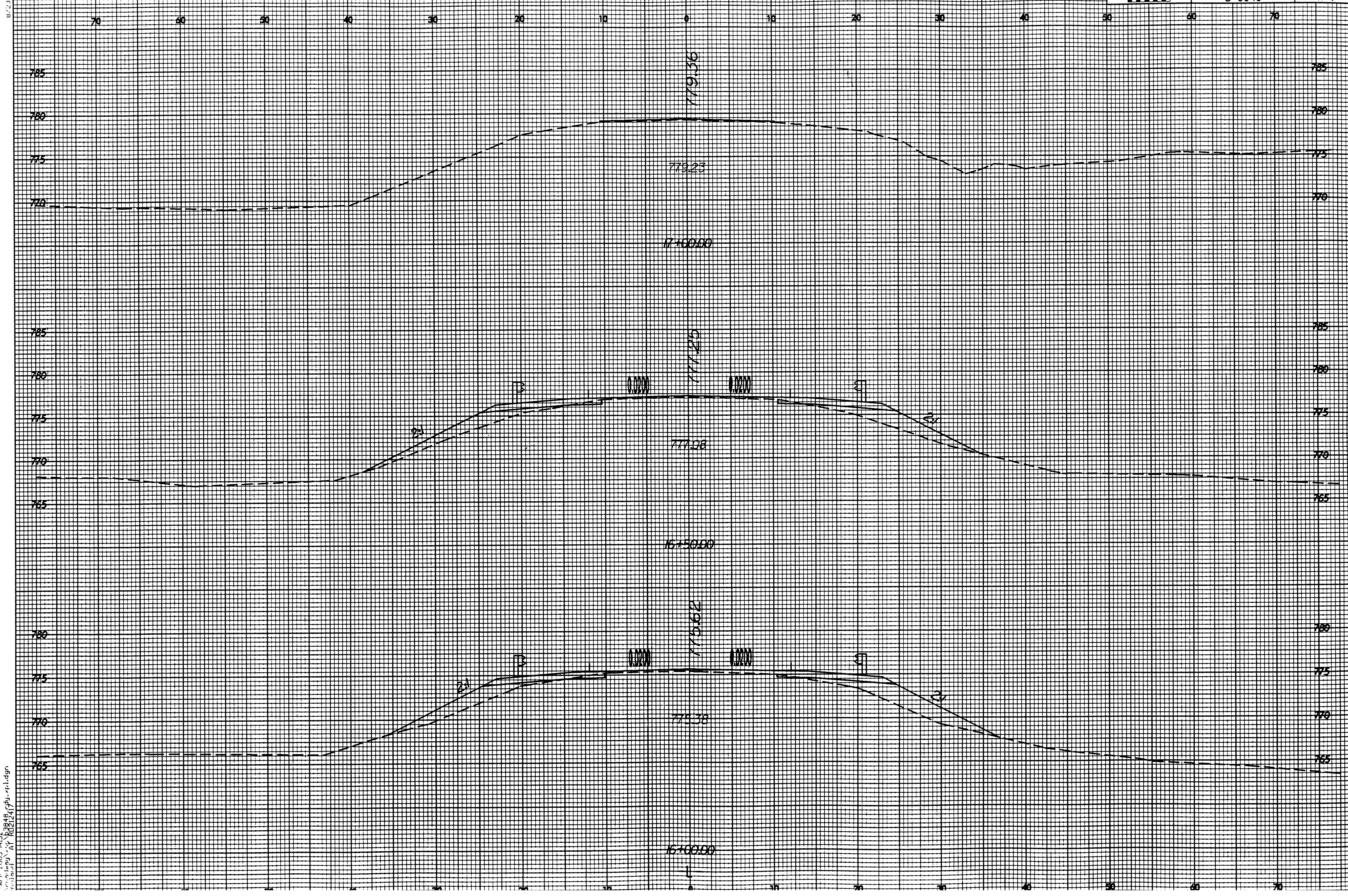
765
760

B-3848	X-7



Feulner

Guilford County

Bridge No. 102 on SR 2124 (Lewiston Road)

Over Brush Creek

Federal Aid Project No. BRZ-2124 (1)

State Project No. 8.2496201

T.I.P. No. B-3848

CATEGORICAL EXCLUSION
AND PROGRAMMATIC SECTION 4(f) EVALUATION

UNITED STATES DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
AND
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

APPROVED:

4/30/04
DATE

FOR Gregory J. Thorpe, Ph.D., Environmental Management Director
Project Development and Environmental Analysis Branch
North Carolina Department of Transportation

4/30/04
DATE

FOR John F. Sullivan III, P.E.
Division Administrator
Federal Highway Administration

Guilford County

Bridge No. 102 on SR 2124 (Lewiston Road)

Over Brush Creek

Federal Aid Project No. BRZ-2124 (1)

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CATEGORICAL EXCLUSION
AND PROGRAMMATIC SECTION 4(f) EVALUATION

April 2004

Document Prepared By:

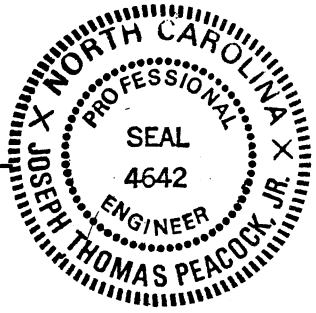
Rummel, Klepper & Kahl, LLP

Elizabeth S. Workman

Environmental Specialist

J. T. Peacock, Jr., P.E.

Associate



For the North Carolina Department of Transportation

Robert Andrew Joyner, P.E.

Project Manager

Consultant Engineering Unit

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LIST OF TABLES

PROJECT COMMITMENTS

Guilford County
Bridge No. 102 on SR 2124 (Lewiston Road)
Over Brush Creek
Federal Aid Project No. BRZ-2124 (1)
State Project No. 8.2496201
T.I.P. No. B-3848

In addition to the standard Nationwide Permit #23 Conditions, the General Nationwide Permit Conditions, Section 404 Only Conditions, Regional Conditions, State Consistency Conditions, NCDOT's Guidelines for Best Management Practices for the Protection of Surface Waters, NCDOT's Guidelines for Best Management Practices for Bridge Demolition and Removal, General Certification Conditions, and Section 401 Conditions of Certification, the following special commitments have been agreed to by NCDOT:

DESIGN SERVICES UNIT, DIVISION 7

- Per conversation with NCDOT biologists in March 2002, the project study area needs to be revisited during the bald eagle nesting season prior to the signing of the FHWA right-of-way consultation. A bald eagle survey was performed in March 2003. No nests were found within 1.3 miles of the project study area.
- NCDOT will provide the Greensboro Parks and Recreation Department an opportunity to review plan sheets prior to construction.
- NCDOT will consider alternative methods of construction with an aggressive construction schedule to minimize time of the road closure.

Guilford County
Bridge No. 102 on SR 2124 (Lewiston Road)
Over Brush Creek
Federal Aid Project No. BRZ-2124 (1)
State Project No. 8.2496201
T.I.P. No. B-3848

INTRODUCTION: The replacement of Bridge No. 102 is included in the 2004-2010 North Carolina Department of Transportation (NCDOT) Transportation Improvement Program (TIP) and in the Federal Aid Bridge Replacement Program. The location of this bridge is shown on Figure 1. No substantial environmental impacts are anticipated. The project is classified as a Federal "Categorical Exclusion".

I. PURPOSE AND NEED STATEMENT

During the August 6, 2002 inspection, the Bridge Maintenance Unit records indicated the bridge has a sufficiency rating of 19.3 out of a possible 100 for a new structure. This bridge is considered functionally obsolete and structurally deficient. The replacement of this inadequate structure will result in safer and more efficient traffic operations.

II. EXISTING CONDITIONS

The project is located in Guilford County on SR 2124 (Lewiston Road), approximately 0.8 mile south of the junction of SR 2133 (Pleasant Ridge Road). The local area surrounding the proposed project is protected for drinking water supplies and is used as recreational facilities managed by Greensboro Parks and Recreation Department. The area surrounding Lake Higgins/Brush Creek is a well-known environmentally sensitive area in the Lake Brandt watershed and used extensively for recreation at nearby parks and golf courses. Biking is common along the roadways and several bike routes are marked in the area. There is a multi-use trail crossing SR 2124 approximately 500 feet northwest of Bridge No. 102. Other land uses include agricultural areas with a few residences throughout.

SR 2124 is classified as a rural minor collector route in the Statewide Functional Classification System.

In the vicinity of the bridge, SR 2124 is a 20-foot paved, 2-lane roadway. The roadway grade is relatively flat through the project area. The roadway is situated approximately 16 feet above the riverbed at Bridge No. 102.

The 2002 traffic volume of 2,600 vehicles per day (VPD) is expected to increase to 5,200 VPD by the year 2025. The project volume includes 1-percent truck-tractor semi-trailer (TTST) and 2 percent dual-tired vehicles (DT). The posted speed limit in the project area is 45 mph.

There were 2 accidents reported in the vicinity of Bridge No. 102 during a recent 3-year period. These figures resulted in a total accident rate of 176 ACC/100 MVM.

Bridge No. 102 is a 110-foot long bridge with one main and four approach spans and a clear roadway width of 19.1 feet. The bridge has an asphalt-wearing surface on a timber floor. The end bents and bents 1 and 4 consist of timber cap and pile. Bents 2 and 3 consist of reinforced concrete cap and timber pile. The posted weight limit on this bridge is 18 tons for single vehicles and 23 tons for tractor trailer/semi-trucks. Bridge No. 102 was built in 1956 and is in fair condition.

In a letter dated March 6, 2001, the Piedmont Natural Gas Company stated, "at this time we have no existing natural gas pipelines or plans to install any in the foreseeable future" (see letter in Appendix). In a letter dated March 5, 2001, the City of Greensboro Water Resources Department stated, "there are no water or sewer lines affecting the listed properties" (see letter in Appendix). There are some underground and aerial utilities along the south side of SR 2124, but no utilities are attached directly to Bridge No. 102. Overall, utility impacts are anticipated to be low and any specific impacts will be coordinated with appropriate utility personnel during construction.

According to a letter dated March 12, 2001, Guilford County Schools reported that Bridge No. 102 is crossed 20 times daily by school buses on their routes. If the bridge is closed, routes can be detoured using SR 2136 (Fleming Road), SR 2187 (Jessup Grove Road), SR 2182 (Horse Pen Creek Road), and SR 2190 (Carlson Dairy Road). This detour would add approximately 10 minutes to each route. This project would not present unworkable problems for the Guilford County School Transportation Department. However if the bridge is closed, there is a request for a turn-around location south of Bridge No. 102 to allow for the pick up of students residing north of SR 3807 (Hackamore Road) (see letter in Appendix).

The City of Greensboro Police Department and Guilford County Sheriff's Department found no significant impacts on the response times to areas affected by the project. However, Guilford County Emergency Management Services uses this route to access a large housing development south of the bridge. Detouring traffic could add approximately three minutes or more to response times. They prefer an on-site detour.

III. ALTERNATIVES

A. Project Description

The replacement structure will consist of a multiple span cored-slab bridge approximately 120 feet long and 33 feet wide. The replacement structure will require spill-through abutments on each end. This structure provides two 12-foot lanes with 4.5-foot shoulders on each side. The proposed approach roadway will consist of a 24-foot pavement width to provide two 12-foot lanes with 2-foot paved and 6-foot grass shoulders on each side in accordance with current NCDOT Policy (see Figures 2a and 2b).

The recommended bridge length is based on a preliminary hydraulic review. The final design of the bridge will be such that the proposed roadway and structure will be placed at approximately the same elevation. Alternatives 1 and 2 follow these general guidelines and are therefore acceptable. The new structure will satisfy economic constraints, improve existing conditions, accommodate design flows, and minimize environmental impacts on any sensitive natural ecosystems that may be in the vicinity of the project study area.

B. Build Alternatives

The alternatives studied for replacing Bridge No. 102 are shown on Figure 3 and described below:

Alternative 1 (Preferred) – replaces the bridge with a 120-foot long bridge on the existing alignment. The approach work will extend from approximately 295 feet west of the bridge to approximately 485 feet east of the bridge for a total distance of approximately 900 feet. The design speed is 50 mph. A design exception will be necessary for this alternative due to the sag vertical curve at the east end of the bridge. An off-site detour will be used to maintain traffic during the construction period. The length of the off-site detour is approximately 4.6 miles using SR 2187, SR 2182, SR 2190, SR 2133 and SR 2124.

Alternative 2 – replaces the bridge with a 120-foot long bridge on the existing alignment. The approach work will extend from approximately 295 feet west of the bridge to approximately 485 feet east of the bridge for a total length of approximately 900 feet. The design speed is 50 mph. A design exception will be necessary for this alternative due to the sag vertical curve at the east end of the bridge. During construction, traffic will be maintained on a temporary detour structure located approximately 40 feet southwest of the existing bridge. The detour structure will be approximately 115 feet long and 26 feet wide (see Figure 2b). The detour approach work will extend from approximately 400 feet west of the bridge to approximately 540 feet east of the bridge for a total length of approximately 1055 feet. The design speed of the temporary detour is 40 mph. This alternative is not recommended because construction of an on-site detour would require more disturbances to Brush Creek. The cost of a temporary structure can be avoided by using the off-site detour presented in Alternative 1.

C. Alternatives Eliminated from Further Study

A box culvert was considered but is not a feasible alternative for this location.

The No-Build or "Do Nothing" alternative will eventually necessitate closure of the bridge. The Division believes that this alternative would not be acceptable to the public.

"Rehabilitation" of the existing structure is not feasible due to its age and deteriorated condition.

D. Preferred Alternative

Alternative 1, replacing the existing bridge on the existing alignment with an off-site detour is the preferred alternative. This alternative was selected because it minimizes the environmental impacts to Brush Creek/Lake Higgins, minimizes impacts to the Section 4(f) (public park) resources, and costs less than Alternative 2.

The NCDOT Division Engineer concurs with using an off-site detour to minimize environmental impacts to Brush Creek/Lake Higgins.

IV. ESTIMATED COSTS

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

Table 1.0 Estimated Costs per Alternative		
	Alternative 1 (Preferred)	Alternative 2
Structure	$269,300	$269,300
Roadway Approaches	$340,400	$511,400
Structure Removal	$17,400	$17,400
Misc. and Mobilization	$162,900	$242,200
Temporary On-Site Detour	$0	$117,700
Engineering & Contingencies	$135,000	$192,000
TOTAL CONSTRUCTION COST	$925,000	$1,350,000
Right of Way / Utilities	$43,300	$81,600
TOTAL PROJECT COST	$968,300	$1,431,600

The estimated cost of the project, shown in the 2004-2010 North Carolina Department of Transportation's Transportation Improvement Program (TIP) is $ 663,000, including $ 63,000 for right-of-way and $ 600,000 for construction. Right-of-way acquisition is scheduled for fiscal year 2004. Construction is scheduled for fiscal year 2005.

V. NATURAL RESOURCES

The information contained in this section is based on the *Natural Systems Report* (March 2002) prepared by Rummel, Klepper & Kahl, LLP.

A. Methodology

The project study area was visited, walked, and visually surveyed for significant features on June 13, 2001 and September 20, 2001. The project study area encompasses the various alternatives under consideration and is approximately 2,350 feet in length and 350 feet in width. Impacts were calculated for each alignment using a width of approximately 60 feet; actual impacts will occur within construction limits and will be less than those calculated for this report. Special concerns evaluated in the field include potential habitat for protected species, streams, wetlands, and water quality protection.

Plant community descriptions are based on a classification system utilized by the North Carolina Natural Heritage Program (NHP) (Schafale and Weakley 1990). When appropriate, community classifications were modified to better reflect field observations. Vascular plant names follow nomenclature found in Radford *et al.* (1968). Jurisdictional areas were identified using the three

parameter approach (hydrophytic vegetation, hydric soils, wetland hydrology) following United States Army Corps of Engineers (USACE) delineation guidelines (1987). Jurisdictional areas were characterized according to a classification scheme established by Cowardin *et al.* (1979). Habitat used by terrestrial wildlife and aquatic organisms, as well as expected population distributions, were determined through field observations, evaluation of available habitat, and supportive documentation (Peterson 1980, Burt and Grossenheider 1980, Martof *et al.* 1980, Lee *et al.* 1982). Water quality information for area streams and tributaries was derived from available sources [Department of Environment, Health and Natural Resources (DEHNR) 1993 and 1997] [Department of Environment and Natural Resources (DENR) 2000 and 2001]. Quantitative sampling was not undertaken to support existing data. See Figures 4a and 4b for photographs of the project study area.

The most current United States Fish and Wildlife Service (USFWS) listing (internet update February 18, 2003) of federally protected species with ranges which extend into Guilford County was obtained prior to initiation of the field investigation. In addition, NHP records documenting presence of federal or state listed species were consulted before commencing the field investigation.

B. Physiography and Soils

The project study area is located in the Piedmont physiographic province. Topography is characterized by rolling hills and moderately steep slopes along drainages to small lakes/reservoirs. Elevations in the project study area range from approximately 770 feet above mean sea level (MSL) along the Brush Creek/Lake Higgins bank to approximately 820 feet above MSL on the project boundaries away from the lake (USGS Summerfield, NC quadrangle).

The project study area crosses five soil mapping units: Appling sandy loam (Typic Kanhapludults), 2 to 6% slopes; Chewacla sandy loam (Fluvaquentic Dystrudepts), nearly level slopes; Madison sandy loam (Typic Kanhapludults), 15 to 35% slopes; Madison clay loam (Typic Kanhapludults), 6 to 10% eroded slopes; Madison clay loam (Typic Kanhapludults), 15 to 25% slopes. (USDA 1975). Chewacla is classified as a hydric soil having Wehadkee (Fluvaquentic Endoaquepts) inclusions and is mapped at the northwestern end of the project study area. The remaining map units are listed as well-drained, non-hydric soils.

C. Water Resources

1. Waters Impacted

The project study area is located within the Reedy Fork Creek drainage basin, subbasin 03-06-02, of the Cape Fear River Basin (DENR 2000). This area is part of USGS hydrologic unit 03030002 (USGS 1974). Bridge No. 102 crosses Brush Creek approximately 0.8 mile south of the intersection of SR 2133. Within the project study area, Brush Creek flows into Lake Higgins from the south. From the source of Brush Creek to a point 0.5 mile downstream of SR 2190, the Stream Index Number (SIN) 16-11-4-(1) is assigned by the North Carolina Division of Water Quality (DWQ).

A small, unnamed ephemeral/intermittent tributary is located southeast of Bridge No.102, draining a nearby depression. It's channel extends for approximately 150 feet before it turns into a swale and flows toward Lake Higgins. The tributary lies 215 feet from SR 2124 and is outside of the 60-foot right-of-way. No SIN has been designated to the unnamed tributary.

2. Water Resource Characteristics

Stream Characteristics

Brush Creek is a perennial piedmont stream with substrate consisting of 90% sand at an upstream sampling site located at SR 2136. Because the project study area is located at the confluence of Brush Creek and Lake Higgins, the Natural Stream Channel Classification System (Rosgen 1996) does not apply to this site due to its lake characteristics. No obvious channel measurements could be made from Bridge No. 102. The substrate in the project study area consists of silt. Rooted aquatic vegetation and some branches and leaves were apparent along the banks. Table 3.0 shows linear footage as well as open water impacts associated with Brush Creek.

The unnamed tributary drains a depression by a roadbed located southeast of Bridge No. 102. The tributary was dry and covered with leaf litter on September 20, 2001. The one foot wide channel began at the depression and traveled towards the lake but dwindled into a swale. This swale that did not meet USACE requirements for jurisdictional wetlands through the three-parameter approach.

Best Usage Classifications and Water Quality

Classifications are assigned to waters of the State of North Carolina based on the existing or contemplated best usage of various streams or segments of streams in the basin. Brush Creek from the source to a point 0.5 mile downstream of SR 2190 has a best usage classification of WS-III NSW assigned on August 3, 1992 (DENR 1999). The designation "WS-III" denotes a moderately developed

water supply. The "NSW" designation means nutrient sensitive waters in which nutrient loading, primarily nitrogen and phosphorous, have exceeded acceptable levels in the area, and a specific program is needed to reduce nutrient inputs from human activities. Downstream from the project study area and from a point 0.5 mile downstream of SR 2190 to Lake Brandt, Brush Creek (Lake Higgins) has received a best usage classification of WS-III NSW CA. The supplemental classification "CA" indicates this is a critical area due to the City of Greensboro water supply intake located downstream. The unnamed tributary, located east of Bridge No. 102, has no separate best usage classification and therefore shares the classification of Brush Creek.

No High Quality Waters (**HQW**), Outstanding Resource Waters (**ORW**), **WS-I, WS-II** Waters occur within three miles of the project study area. Brush Creek is not designated as a North Carolina Natural and Scenic River, nor as a National Wild and Scenic River. Brush Creek is not a Designated Public Mountain Trout Water (DPMTW).

There are no NPDES dischargers on Brush Creek within one mile of the project study area.

No benthic macroinvertebrate monitoring stations occurred at SR 2124 over Brush Creek. However, one mile upstream of the project study area is a monitoring site located at SR 2136. This station received a bioclassification of Fair in 1998 (DENR 2000).

Another measure of water quality being used by DWQ is the North Carolina Index of Biotic Integrity (NCIBI), which assesses biological integrity using the structure and health of the fish community; however, no fish community structure sampling has been reported for Brush Creek in the project study area (DEM 1994).

3. Anticipated Impacts to Water Resources

After construction activities are completed, abandoned approaches associated with the existing structure and/or temporary detours will be removed and revegetated in accordance with NCDOT guidelines. See Table 3.0 for impacts to surface waters within the project study area.

Short-term impacts to water quality, such as sedimentation and turbidity, can be anticipated from construction-related activities. Best Management Practices (BMP's) can minimize impacts during construction, including implementing stringent erosion and sedimentation control measures, and avoiding using wetlands as staging areas can minimize construction impacts.

Other impacts to water quality that are anticipated as a result of this project include: elevated stream temperatures as a result of canopy removal, increased shade due to the construction of a new detour bridge, and changes in stormwater flows due to changes in the amount of impervious surface in the case of detour construction. Limited overall change in the surrounding areas are expected to be temporary in nature.

No adverse long-term impacts to water resources are expected to result from any of the alternatives being considered. These alternatives include bridge replacement and will allow for continuation of present stream flow in Brush Creek, thereby protecting stream integrity.

4. Impacts Related to Bridge Demolition and Removal

Section 402-2 of NCDOT's Standard Specifications for Roads and Structures is labeled **Removal of Existing Structure**. This section outlines restrictions and BMPs for Bridge Demolition and Removal, as well as guidelines for calculating maximum potential fill in the creek resulting from demolition.

No temporary fill associated with the removal of the superstructure of Bridge No. 102 is anticipated since the deck is composed entirely of steel and timber and will be removed in such a manner that no components will be dropped in the water. The removal of the substructure has the potential to result in temporary fill in Brush Creek. Per scoping comments on August 24, 2001, the Division advised that the existing structure is on creosote piles and the beams are coated with aluminum paint over red lead paint. Special precautions may be necessary.

This project is categorized as a Case 3 stream crossing. A Case 3 stream crossing occurs when there are no special restrictions beyond those outlined in BMPs for Protection of Surface Waters. This project is subject to BMPs for Bridge Demolition and Removal.

D. Biotic Resources

1. Plant Communities

Terrestrial communities are divided into three types: maintained/disturbed, upland, and wetland. The maintained/disturbed community has been severely altered by anthropogenic changes including mowed roadsides. The upland community consists of a mixed hardwood stand. The wetland community consists of a piedmont bottomland stand. The mixed hardwood stand and piedmont bottomland forest follow the Schafale and Weakley classifications of natural communities. Distribution and composition of

plant communities throughout the project study area reflect landscape-level variations in topography, soils, hydrology, and past or present land use practices. Natural land disturbances such as fire, hurricanes, and tornadoes result in uneven-aged vegetative stands or a patchy mosaic within even-aged communities. Impacts to these communities are shown on Table 2.0. Refer to Exhibit 3 in the *Natural Systems Report* (March 2002) for the locations of these communities.

a. Man-dominated Community (Maintained/Disturbed)

In the maintained areas along roadsides, the vegetation documented includes the following: poison ivy (*Toxicodendron radicans*), blackberry (*Rubus* spp.), greenbrier (*Smilax* spp.), trumpet creeper (*Campsis radicans*), loblolly pine (*Pinus taeda*), sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), and Japanese honeysuckle (*Lonicera japonica*).

b. Upland (Mixed Hardwood Stand)

Upland areas consist primarily of a mixed hardwood stand. Documented species include river birch (*Betula nigra*), red maple, red cedar (*Juniperus virginiana*), silky dogwood (*Cornus amomum*), shortleaf pine (*Pinus echinata*), white oak (*Quercus alba*), and sassafras (*Sassafras albidum*).

c. Wetland (Piedmont Bottomland Forest)

The wetland area consists of a piedmont bottomland forest. Within a few feet of Lake Higgins, there are wetland and flood-tolerant vegetative species that line the banks. These wetland features are lacustrine in nature. The bottomland hardwood forest surrounds the banks of Brush Creek and Lake Higgins. Therefore, alluvial sediments are not as prevalent as in riverine systems. However, lake flooding does occur, creating the hydrology and hydric soils for vegetation that is characteristic of bottomland communities. Tree and shrub species include tag alder (*Alnus serrulata*), silky dogwood, green ash (*Fraxinus pennsylvanica*), black willow (*Salix nigra*), arrow-wood (*Viburnum dentatum*), and swamp rose (*Rosa palustris*). Herbaceous vegetation grows thick with jewelweed (*Impatiens capensis*), netted chainfern (*Woodwardia areolata*), false nettle (*Boehmeria cylindrica*), arrow arum (*Peltandra virginica*), soft rush (*Juncus effusus*), grapevine (*Vitis rotundifolia*), and ground-nut (*Apios americana*). The littoral zone is covered by common cattail (*Typha latifolia*), waterlilies (*Nymphaea odorata*) and duckweed (*Lemna* spp.).

2. Wildlife

The study project area was visually surveyed for signs of terrestrial fauna. The white-tailed deer (*Odocoileus virginianus*), barred owl (*Strix varia*), red-tailed hawk (*Buteo jamaicensis*), northern cardinal

(*Cardinalis cardinalis*), Carolina chickadee (*Poecile carolinensis*), American crow (*Corvus brachyrhynchos*), and mourning dove (*Zenaida macroura*) were seen within the project study area. Mammal signs (tracks, scat, etc.) observed include the domestic dog (*Canis familiaris*), raccoon (*Procyon lotor*) and opossum (*Didelphis virginiana*). No terrestrial reptiles were observed within the project study area.

Expected wildlife species are those adapted to the ecotone between the maintained roadsides, open residential neighborhoods and adjacent hardwood forest. Bird species expected within and around the project study area include the belted kingfisher (*Megaceryle alcyon*), white-throated sparrow (*Zonotrichia albicollis*), great crested flycatcher (*Myiarchus crinitus*), wood thrush (*Hylocichla mustelina*), hairy and downy woodpeckers (*Picoides villosus* and *pubescens*), red-winged blackbird (*Agelaius phoeniceus*), and white-breasted nuthatch (*Sitta carolinensis*). Mammals expected include the cotton mouse (*Peromyscus gossypinus*), deer mouse (*Peromyscus maniculatus*), golden mouse (*Ochrotomys nuttalli*), meadow jumping mouse (*Zapus hudsonius*), meadow vole (*Microtus pennsylvanicus*), eastern cottontail (*Sylvilagus floridanus*), gray squirrel (*Sciurus carolinensis*), gray fox (*Urocyon cinereoargenteus*), muskrat (*Ondatra zibethicus*), and beaver (*Castor canadensis*). Expected reptile species include the eastern box turtle (*Terrapene carolina*), black racer (*Coluber constrictor*), rat snake (*Elaphe obsoleta*), copperhead (*Agkistrodon contortrix*) and eastern hognose (*Heterodon platyrhinos*).

3. Aquatic Communities

DWQ sample sites include 12 benthic macroinvertebrate sampling stations in this subbasin sampled since 1993. Sample site B-6 is located one mile upstream of the project study area at SR 2136 and Brush Creek. Here, the dominant EPT taxa were grazing baetid mayflies, especially those species that favor algae growing over a coarse sand substrate. Uncommon baetid species at this site included *Barbaetis*, *Paracloedoes*, and *Baetis cinctutus*. These taxa were abundant under the low flow condition observed during July of 1998, but might be washed downstream during periods of higher flow (DENR 1999). Through benthic macroinvertebrate collections and analysis, this sampling site received a bioclassification of Fair in 1998. This rating may be influenced by upstream land uses which include an airport, a golf course and many residential areas. Refer to Section V.B. for more information on physiography and soils surrounding Lake Higgins (DENR 1999).

Aquatic life from Brush Creek may find refuge in the deeper waters of Lake Higgins. Routine kick-net surveys and limited bottom sampling were not performed at this site due to the absence of leaf

packs, depth of water, and silt-covered substrate. Limited sources of food, oxygen, and shelter are expected to affect the diversity of benthic macroinvertebrates in the project study area.

Slope in the project study area limits the hydrophytic vegetation to the hydric soils at the normal-level water line. The littoral zone is covered by rooted emergent plants like arrow arum, common cattail, and soft rush. As the water gets deeper, floating plants like waterlilies and duckweed cover the water surface. Many reptiles and amphibians find refuge in these dense patches of vegetation. Aquatic conditions appeared to be normal, without obvious pollution from litter or pungent odors. Banks are well vegetated. No erosion problems were noticed.

Due to the shallow water and vegetation around the lake perimeter, the project study area is expected to provide a suitable breeding habitat for an array of frogs, toads, and salamanders. Limited surveys did not result in documentation of any salamanders in the unnamed tributary or Brush Creek and Lake Higgins. Amphibians expected to be found in the project study area include the eastern tiger salamander (*Ambystoma tigrinum*), spotted salamander (*Ambystoma maculatum*), marbled salamander (*Ambystoma opacum*), Fowler's toad (*Bufo woodhousei*), upland chorus frog (*Pseudacris triseriata*), northern spring peeper (*Hyla crucifer*), southern cricket frog (*Acris gryllus*), green frog (*Rana clamitans*), eastern mud salamander (*Pseudotriton montanus*), and bullfrog (*Rana catesbeiana*). Stable lake banks provide suitable habitat for a few aquatic and semi-aquatic reptiles such as the yellow-bellied slider (*Chrysemys scripta*), common snapping turtle (*Chelydra serpentina*), eastern mud turtle (*Kinosternon subrubrum*), stinkpot (*Sternotherus odoratus*), spotted turtle (*Clemmys guttata*), and various watersnakes (*Nerodia* spp.).

Small non-game fish in the area that inhabit Brush Creek include a variety of minnows, shiners, and dace. Darters can be found in riffles upstream of the project study area while sunfish travel between Brush Creek and Lake Higgins. Recreational fishing is one of the activities supported by Lake Higgins. There have been no recent reports of problems related to the quality of fishing at this lake. Game fish living in Brush Creek and Lake Higgins and found in the project study area are the following: red-eared sunfish (*Lepomis microlophus*), green sunfish (*Lepomis cyanellus*), warmouth (*Lepomis gulosus*), black crappie (*Pomoxis nigromaculatus*), white crappie (*Pomoxis annularis*), bullhead catfish (*Ictalurus natalis*), channel catfish (*Ictalurus punctatus*), largemouth bass (*Micropterus salmoides*) and bluegill (*Lepomis macrochirus*). Hybrid striped bass (*Morone* sp.) were stocked in Lake Higgins prior to year 1995 and may occasionally be caught (District 5 Fisheries Biologist, Division of Inland Fisheries, personal conversation).

4. Anticipated Impacts to Biotic Communities

a. Terrestrial Communities

Anticipated impacts to terrestrial communities are estimated based on the acreage of each plant community present within the proposed right-of-way width of 60 feet; actual impacts within construction limits will be less. Alternatives 1 and 2 both call for replacement of the existing structure; however, Alternative 2 uses an on-site temporary detour while Alternative 1 uses an off-site detour. Impacts for both alternatives are presented in Table 2.0.

Table 2.0 Plant Community Impacts per Alternative

	Alternative 1 (Preferred)	Alternative 2	
Community Types	Impacts in acres	Impacts in acres	Temporary Detour Impacts in acres
Maintained/Disturbed Community	0.55	0.55	0.05
Mixed Hardwood Stand	0.10	0.10	0.06
Piedmont Bottomland Forest	0.19	0.19	0.10
Total:	0.84	0.84	0.21
Total for Alts:	0.84	1.05	

All alternatives for this project are in close proximity to the existing structure, which will reduce permanent impacts to plant communities and limit community fragmentation. Impacts as a result of bridge replacement are generally limited to narrow strips adjacent at the existing bridge structure and roadway approach segments. Permanent community impacts are approximately 0.84 acre for Alternatives 1 and 2. Alternative 2 includes 0.21 acre of temporary impacts associated with the temporary detour placed southwest of Bridge No. 102. Alternative 2 contains the greatest amount of impacts, totaling 1.05 acres to all three communities.

Due to the limited extent of infringement on natural communities, the proposed bridge replacement will not result in significant loss or displacement of known terrestrial animal populations. Wildlife movement corridors are currently limited within the project study area and are not expected to be significantly impacted by the proposed project.

b. Wetland Communities

Through field surveys, USGS topographic maps, Guilford County Soil Survey, and NWI mapping, jurisdictional impacts were determined, flagged, surveyed per GPS methodology, and subsequently calculated. Field surveys occurred between June and September 2001. Table 3.0 shows the amount of jurisdictional impacts in each alternative.

Wetland values for representative areas within the project study area were evaluated using the Fourth Version of the *Guidance for Rating the Values of Wetlands in North Carolina.* This system rates the value of wetlands based on ability (characteristics such as hydrologic regime) and opportunity (fulfilling a given value such as removal of pollutants). Six categories are evaluated and a rating is determined. The categories are 1) water storage, 2) bank/shoreline stabilization, 3) pollutant removal, 4) wildlife habitat, 5) aquatic life value, and 6) recreation/education. One wetland evaluation was made that characterizes the piedmont bottomland forest that surrounds Lake Higgins. Hydrophytic vegetation is limited to this area because of the immediate elevation increase away from the lake. For the purposes of this study, values derived from the DWQ system were considered to exhibit medium value with scores between 40 and 49.

The assessment of wetland present in the project study area was performed using the three parameters (hydrophytic vegetation, hydrology, and hydric soils) outlined in the USACE Wetland Delineation Manual (1987). Below are the results from the wetland determination and rating.

Lake Higgins Wetland

Species include red maple, sycamore, tag alder, silky dogwood, swamp rose, arrow-wood, grapevine, ground-nut, poison ivy, jewelweed, soft rush and arrow arum. Hydrological indicators consist of water marks on trees, drift lines, sediment deposits and water–stained leaves. The depth of free water in the pit equaled 6 inches. Soil type is listed as Madison clay loam. Soil matrix colors were between 2.5Y2.5/1 and 5Y4/1. Sulfidic odor, aquic moisture regime, reducing conditions and low-chroma colors indicate hydric conditions. This wetland scored 47 points, giving it a medium wetland value.

c. Aquatic Communities

Potential down-stream impacts to aquatic habitat will be minimized by bridging the system to maintain regular flow and stream integrity. In addition, temporary impacts to downstream habitat from increased sediment during construction are expected to be reduced by limiting the amount of in-stream

work. BMPs for the Protection of Surface Waters should be strictly enforced to reduce impacts. BMPs for Bridge Demolition and Removal will be followed to minimize impacts due to anticipated bridge demolition.

E. Special Topics

1. "Waters of the United States": Jurisdictional Issues

Surface waters within the embankments of Brush Creek are subject to jurisdictional consideration under Section 404 of the Clean Water Act as "Waters of the United States" (33 CFR 328.3). Table 3.0 shows the jurisdictional features and related impacts. The construction limit from the preliminary design was used for calculation of jurisdictional wetland/open water impacts. Because the wetland acreages are affected by the water–level fluctuations, these impacts are lumped together as open water impacts. The 60-foot right-of-way width was used for the calculation of jurisdictional stream impacts as the areas had been surveyed per GPS methodology. Linear footage of impact for Brush Creek was calculated and is shown below even though open water impacts more accurately describe its potential impacts. The unnamed tributary southeast of Bridge No. 102 is outside of the project study area and therefore will not be impacted.

Table 3.0 Jurisdictional Wetland and Stream Impacts

Alternative		**Open Water** in acres		**Brush Creek** in linear feet		**Intermittent Tributary** in linear feet	
1		0.06		60		0	
2 (without temporary detour)	2	0.06	0.48	60	100	0	0
2 (temporary detour)		0.42		40		0	

The open water impacts for Alternatives 1 and 2 (without the temporary detour) are 0.06 acre. Alternative 2 has the larger impact of the two alternatives due to the temporary impacts associated with the detour. Temporary impacts for Alternative 2 are 0.42 acre; therefore, total impacts for both permanent and temporary structures associated with Alternative 2 are 0.48 acre. Stream impacts to Brush Creek are both 60 linear feet for Alternatives 1 and 2 (without the temporary detour). Alternative 2 has the larger impact of the two alternatives due to the temporary stream impacts of 40 linear feet; therefore total impacts for both permanent and temporary structures are 100 linear feet. See Figure 5 for locations of jurisdictional features.

The waters in Brush Creek within the project study area exhibit characteristics of lacustrine, limnetic, saturated, permanently flooded, diked/impounded waters (L1BHh) (Cowardin *et al.* 1979).

2. Permits

a. Section 404 of the Clean Water Act

This project is being processed as a Categorical Exclusion (CE) under Federal Highway Administration (FHWA) guidelines. Nationwide Permit (NWP) #23 [33 CFR 330.5(a)(23)] has been issued by the USACE for CEs due to expected minimal impact. DWQ has issued a General 401 Water Quality Certification for NWP #23. However, use of this permit will require written notice to DWQ. In the event that NWP #23 will not suffice, minor impacts attributed to bridging and associated approach improvements are expected to qualify under General Bridge Permit No. 31 issued by the Wilmington USACE District. Notification to the Wilmington USACE office is required if this general permit is utilized. NWP #33 may be used if temporary structures, work, and discharges, including cofferdams are necessary for this project.

b. Section 401 Water Quality Certification

Section 401 of the CWA delegates authority to the states to issue a 401 Water Quality Certification for all projects that require a Federal Permit, such as a Section 404 Permit. DWQ has issued a General 401 Water Quality Certification for NWP #23. Use of this permit will require written notice to DWQ. However, if mitigation is required, the project must be coordinated with DWQ for review of the mitigation plans.

c. Bridge Demolition and Removal

Section 402-2 of NCDOT's Standard Specifications for Roads and Structures is labeled **Removal of Existing Structure**. This section outlines restrictions and BMPs for Bridge Demolition and Removal, as well as guidelines for calculating maximum potential fill in Brush Creek resulting from demolition. This project is designated as a Case 3; no special restrictions beyond those outlined in BMPs for Protection of Surface Waters and Bridge Demolition and Removal. After construction activities are completed, abandoned approaches associated with the existing structure and/or temporary detours will be removed and revegetated in accordance with NCDOT guidelines. Per scoping comments on August 24, 2001, the Division advised that the existing structure is on creosote piles and the beams are coated with aluminum paint over red lead paint. Special precautions may be necessary.

d. Coast Guard

Bridge replacement or construction over navigable waters used for commerce or that have a maintained navigation channel may require United States Coast Guard (USCG) authorization pursuant to 33 CFR 114-115. Brush Creek is not designated as a navigable river.

e. Tennessee Valley Authority

Bridge No. 102 is located outside of the Tennessee River drainage area and no TVA land or land rights are involved. Therefore, TVA's approval of the plans pursuant to Section 26a of the TVA Act for Bridges and Indicated Locations is not required.

f. Designated Public Mountain Trout Water

Guilford County is not among the twenty-five mountain counties designated as having trout waters. Therefore, Brush Creek is not a Designated Public Mountain Trout Water (DPMTW) managed for stocked and wild trout by WRC. No trout moratoriums apply to this project.

g. Special Waters

No **HQW**, **ORW**, **WS-I**, or **WS-II** Waters occur within three miles upstream or downstream of the project study area (DEM 1993). Brush Creek and its unnamed tributary have not been designated as North Carolina Natural and Scenic Rivers, nor as National Wild and Scenic Rivers.

3. Buffer Rules

No buffer rules currently apply to the Cape Fear River Basin. This project is not within the Oak Hollow Lake, High Point Lake, Oakdale or Randleman Lake watersheds. Therefore, the Randleman Buffer Rules will not apply to this project.

4. Mitigation

Avoidance – Due to the presence of surface waters within the project study area, avoidance of impacts is not possible. Wetland and stream impacts are previously discussed in Section V.E.1.

Minimization – The alternatives presented were developed in part to demonstrate minimization of stream and open water impacts. Impacts to Brush Creek will be minimized during demolition by removing the existing structure in a way that avoids depositing debris in Brush Creek.

Mitigation - Compensatory mitigation probably will not be required for this project due to the limited nature of project impacts. However, utilization of BMPs is recommended in an effort to minimize impacts including avoidance of staging areas placed within wetlands. Temporary impacts associated with the construction activities could be mitigated by replanting disturbed areas with native species and removal of temporary fill material upon project completion.

The DWQ requires compensatory mitigation for impacts to Waters of the United States (including wetlands, open waters, stream channels, etc.) that exceed 0.10 acre of wetlands/open waters and/or 150 linear feet of jurisdictional stream channel. The USACE may require compensatory mitigation for impacts to Waters of the United States at its discretion.

F. Rare and Protected Species

1. Federally Endangered and Threatened Species

Species with the federal classification of Endangered (E) or Threatened (T), or officially proposed (P) for such listing, are protected under Sections 7 and 9 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). There is only one federally protected species listed for Guilford County (internet update February 18, 2003), the bald eagle (*Haliaeetus leucocephalus*):

Bald Eagle – The adults have a blackish-brown back and breast; a white head, neck, and tail; and yellow feet and bill. The bald eagle is the only eagle confined to North America. There are no other large black birds in North America with white heads and tails. The female bald eagle is 35 to 37 inches, slightly larger than the male, with a wingspan that varies from 79 to 90 inches. The male bald eagle has a body length from 30 to 34 inches. The wingspan ranges from 72 to 85 inches.

Even though they are fish eaters, they will take whatever prey is available and easiest to obtain. Bald eagles, which live along the coast and on major lakes and rivers, feed mainly on fish. Bald eagles fish in both fresh and salt water. Eagles are at the top of the food chain, making them more vulnerable to toxic chemicals in the environment, since each link in the food chain tends to concentrate chemicals from the lower link. Because of their size, they have few natural enemies and require a large hunting area.

The bald eagle lives near major lakes and rivers and feeds mainly on fish. Due to the size and continuation of Lake Higgins into Lake Brandt and Lake Townsend, habitat for the bald eagle is present. This is a well-known environmentally sensitive area. A bridge replacement immediately downstream (northeast) on Carlson Dairy Road was delayed for many months because of a

nesting eagle nearby. The bald eagle's recovery has lead to a proposal (50 CFR 17) for delisting it from the Endangered and Threatened List.

An aerial survey for the bald eagle was conducted by helicopter on March 10, 2003. No evidence of bald eagle nests was noted within 1.3 miles of the proposed bridge replacement during the field investigations for this project. A single active and single inactive bald eagle nest were noted approximately 1.8 and 2.0 miles, respectively, from the proposed bridge replacement. Land disturbing activities associated with the proposed bridge replacement will not occur within either the maximum primary zone or maximum secondary zone extending from the active nest. The proposed bridge replacement will not affect this species. Refer to the Bald Eagle Survey (March 2003) for more information. **Biological Conclusion: Not Likely to Adversely Affect.**

2. Federal Species of Concern

The February 18, 2003 USFWS list also includes a category of species designated as "Federal species of concern" (FSC). The FSC designation provides no federal protection under the ESA for the species listed. One FSC species, Carolina darter (*Etheostoma collies lepidinion*), was listed for Guilford County. The presence of potential suitable habitat (Amoroso 1999, LeGrand and Hall 1999) within the project study area has been evaluated for the Carolina darter. Potential habitat does occur within the project study area with the mud and sand creek bottom; however, no species were found during limited kick-net and seine surveys.

3. Summary of Anticipated Impacts

Neither the bald eagle nor the Carolina darter was found in or near Brush Creek. Potential habitat does exist for both rare species. NHP has two recorded sightings of the bald eagle within three miles of the project study area. In 2003, a bald eagle was sighted approximately 2.1 miles from Bridge No. 102. In 2001, a bald eagle was sighted approximately 2.6 miles from Bridge No. 102. However, the bald eagle survey in March 2003 found no active nests within 1.3 miles of the project. NHP has no recorded sightings of the Carolina darter within three miles of the project study area. The purple fringeless orchid, a state proposed significantly rare species, was reported by NHP in 1990 approximately 2.7 miles the project.

VI. CULTURAL RESOURCES

A. Compliance Guidelines

This project is subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, implemented by the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106, codified at 36 CFR 800. Section 106 requires that for federally funded, licensed, or permitted projects having an effect on properties listed in or eligible for the National Register of Historic Places, the Advisory Council on Historic Preservation be given the opportunity to comment.

B. Historic Architecture

A field survey of the area of potential affect (APE) was conducted. All structures within the APE were photographed, and later reviewed by the State Historic Preservation Office (HPO). In a concurrence form dated October 18, 2001 and a memorandum dated August 29, 2001, the State Historic Preservation Officer (SHPO) concurred that no properties of historical or architectural significance would be affected by the project. A copy of the concurrence form and memorandum are included in the Appendix.

C. Archaeology

In a memorandum dated August 29, 2001, the SHPO concurred that no properties of archaeological significance would be affected by the project. A copy of the SHPO memorandum is included in the Appendix.

VII. ENVIRONMENTAL EFFECTS

Field surveys were performed and a Hydraulic Technical Memorandum was produced for this project in February 2001. Guilford County is a participant in the National Flood Insurance Program. Bridge No. 102 is located in a 100-year Federal Emergency Management Agency (FEMA) floodplain, Zone A4 (see Figure 6). A detailed study was prepared and established a 100-year flood elevation of 769.2 feet for Bridge No. 102. There are no USGS gage sites on Brush Creek.

The project is expected to have an overall positive impact on the local area. Replacement of an inadequate bridge will result in safer and more efficient traffic operations.

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

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

The project is not in conflict with any plan, existing land use, or zoning regulation. No change in land use is expected to result from the construction of the project. The area is zoned as Public Institutional for watershed use. Surrounding areas are zoned as residential (Guilford County Planning Department).

No adverse effect on individual families or communities is anticipated. Right-of-way acquisition will be limited. No relocatees are expected with implementation of either alternative.

The proposed project will require right-of-way acquisition or easement land protected under Section 4(f) of the Department of Transportation Act of 1966. There is an insignificant impact anticipated on Lake Higgins, a publicly owned park. Due to the limited size and nature of the proposed bridge replacement, the project will not impair the use or intended purposes of the park. See Section X for a description of the facility and impacts associated with the proposed right-of-way limits. The project is not expected to affect economic or religious opportunities in the surrounding area.

No geodetic survey markers will be impacted.

NCDOT Bicycle and Pedestrian Transportation Unit stated that this section of SR 2124 is near the edge of the urban area growth boundary. In the next 20 years, this area will likely experience significant development. The revised NCDOT Bridge Policy (March 2000) advises that bridge replacements with shoulder approaches that are within urban area growth boundaries should allow for the future placement of sidewalks by providing additional shoulder width on the new bridge. There is also justification for accommodating bicycle safety with wider shoulders on the replacement structure. A 4-foot shoulder on the replacement structure will accommodate for bike and pedestrian traffic along SR 2124.

This project has been coordinated with the United States Natural Resources Conservation Service (NRCS). The Farmland Protection Policy Act requires all Federal agencies or their representatives to consider the potential impact to prime farmland of all land acquisition and construction projects. There are soils classified as prime, unique, or having state or local importance in the vicinity of the project. Found within a 0.5-mile search radius, prime farmland soils include Cecil sandy clay loam (CeC2), Appling sandy loam (ApB), and Madison clay loam (McB2). Of these prime farmland soils, the ApB is

found within the project study area and may be impacted. Found within a 0.5-mile search radius, state and local important soils include Madison clay loam (McC2), Appling sandy loam (ApC), Madison sandy loam (MaC), Vance sandy loam (VaD), and Madison clay loam (McD2). Of these state and locally important soils, McC2 is found within the project study area and may be impacted.

Ambient noise levels may increase during the construction of this project; however, this increase will be only temporary and usually confined to daylight hours. There should be no notable change in traffic volumes after this project is complete. Therefore, this project will have no adverse effect on existing noise levels. Noise receptors in the project area will not be impacted by this project. This evaluation completes the assessment requirements for highway noise set forth in 23 CFR Part 772. No additional reports are requested.

Guilford County is a designated non-attainment area, which means the area does not meet the National Ambient Air Quality Standard (NAAQS) for carbon monoxide (CO). Construction impacts will add minimal CO to the atmosphere and no permanent impacts to air quality are expected for the project. If vegetation is disposed of by burning, all burning shall be done in accordance with applicable local laws and regulations of the North Carolina State Implementation Plan (SIP) for air quality in compliance with 15 NCAC2D.0520. This evaluation completes the assessment requirements for highway traffic noise of 23 CFR 772 and for air quality (1190 Clean Air Act Amendments and the National Environmental Policy Act). No additional reports are required.

A search was performed of the project study area utilizing the ASTM Standard Practice for Environmental Site Assessments (E 1527-00). This search included the NPL (National Priority List), CERCLIS (Comprehensive Environmental Response, Compensation, and Liability Information System), RCRIS (Resource Conservation and Recovery Information), and UST (Petroleum Underground Storage Tank Database) as well as other applicable databases. The results of this search documented no mapped sites found on the target site or within the ASTM search radius.

Guilford County is a participant in the National Flood Insurance Regulatory Program (FIRM). The approximate 100-year floodplain in the project area is shown on Figure 6. There are no other practical alternatives to crossing Brush Creek and Lake Higgins.

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

VIII. PUBLIC INVOLVEMENT

Public involvement for this project initially involved compiling a database of property owners, area business persons and local public officials. This database was used to send out Newsletter No. 1 in October 2001 announcing the project and detailing the two alternatives being considered (see Appendix). No comments or questions were received from local public officials or citizens.

IX. AGENCY COMMENTS

Agencies have commented upon the proposed bridge replacement. These comments were noted, considered in the environmental and design processes, and included in the Appendix.

X. SECTION 4(f) RESOURCES

Section 4(f) of the Department of Transportation Act of 1966, as amended, states in part "The Secretary may approve a transportation project or program requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge, or land of a historic site of national, state, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park, recreation area, refuge, or site) only if –

- there is no prudent and feasible alternative to using that land; and,
- the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from such use.

The proposed project requires the use of any property used as a public owned park, recreation area, or wildlife and waterfowl refuge. Therefore, a Section 4(f) Evaluation is required.

In a letter dated November 5, 2003, the City of Greensboro Parks and Recreation Department preferred Alternative 1 due to the least impacts to the natural resources and recreational opportunities (see letter in Appendix). Jurisdiction of Lake Higgins Park is under authority of City of Greensboro. The Parks and Recreation Department manages the safety, security and recreation of the facility. The Water Resources Department manages the water quality and related issues. A Programmatic Section 4(f) Evaluation was completed for this project and is included in the Appendix.

Lake Higgins Park

Lake Higgins is one part of three connecting Greensboro Municipal Reservoirs that supply water to the citizens of Greensboro and some areas of surrounding Guilford County. It is the smallest of the

three City lakes, but offers some of the best fishing. All three lakes offer excellent recreational opportunities for a modest fee.

Lake Higgins is a 226-acre municipal reservoir, constructed in 1956. The office is located on Hamburg Mill Road off Hwy 220 North about 3.5 miles north of the city limits. Fishing, boating, picnicking, hiking, mountain biking, and nature study are some of the activities found at Lake Higgins.

Fishing, by boat or pier, is common throughout the park. Game fish species like largemouth bass, catfish, and crappie are commonly caught by anglers. Boating is a popular activity among park visitor in the warmer months. Rowboats, sailboats and canoes can be rented hourly. A launch ramp is also available for personal crafts. No motorized boats are permitted. Lake Higgins provides numerous educational activities for the general public and school groups. Indoor and outdoor classroom facilities are used for environmental education and are popular year-round. A snack area and restrooms are available.

The replacement of Bridge No. 102 may temporarily affect fishing and boating activities within the project study area during construction. BMPs for the Protection of Surface Waters should be strictly enforced to protect the water quality of Lake Higgins. Alternatives 1 and 2 are expected to impact approximately 0.06 acre of open water area due to the replacement of Bridge No. 102. Temporary impacts expected from Alternative 2's temporary detour are approximately 0.42 acre of open water area. Alternative 2 has a total impact of 0.48 acre and is the greater impact of the two alternatives.

In addition to open water impacts at Lake Higgins, land impacts within the proposed right-of-way limits would infringe on the park's property. For Alternatives 1 and 2, not including impacts associated with the temporary detour bridge, approximately 0.34 acre of the 226-acre park (approximately 0.1 percent of the park property) will be used to replace Bridge No. 102. Access to the land within the project study area will be temporarily unavailable to bicyclists and pedestrians, as well as automobiles, during construction. Since fishing is not permitted on Lake Higgins' bank, construction on land should not interfere with this recreational activity. After construction, this project will not impair the use of the park for its intended purposes.

Bald Eagle Trail

The Bald Eagle Trail is a multiple use, 3.0-mile trail at Lake Higgins, commonly used by mountain bikers. It can be accessed from a parking lot off Hamburg Mill Road just west of the Lake

Higgins Marina entrance. The trail winds along the edge of Lake Higgins and southwest of Lewiston Road to Brush Creek. The trail intersects with SR 2124 at approximately 500 feet northwest of Bridge No. 102. Impacts are not expected to occur to the Bald Eagle Trail.

XI. REFERENCES

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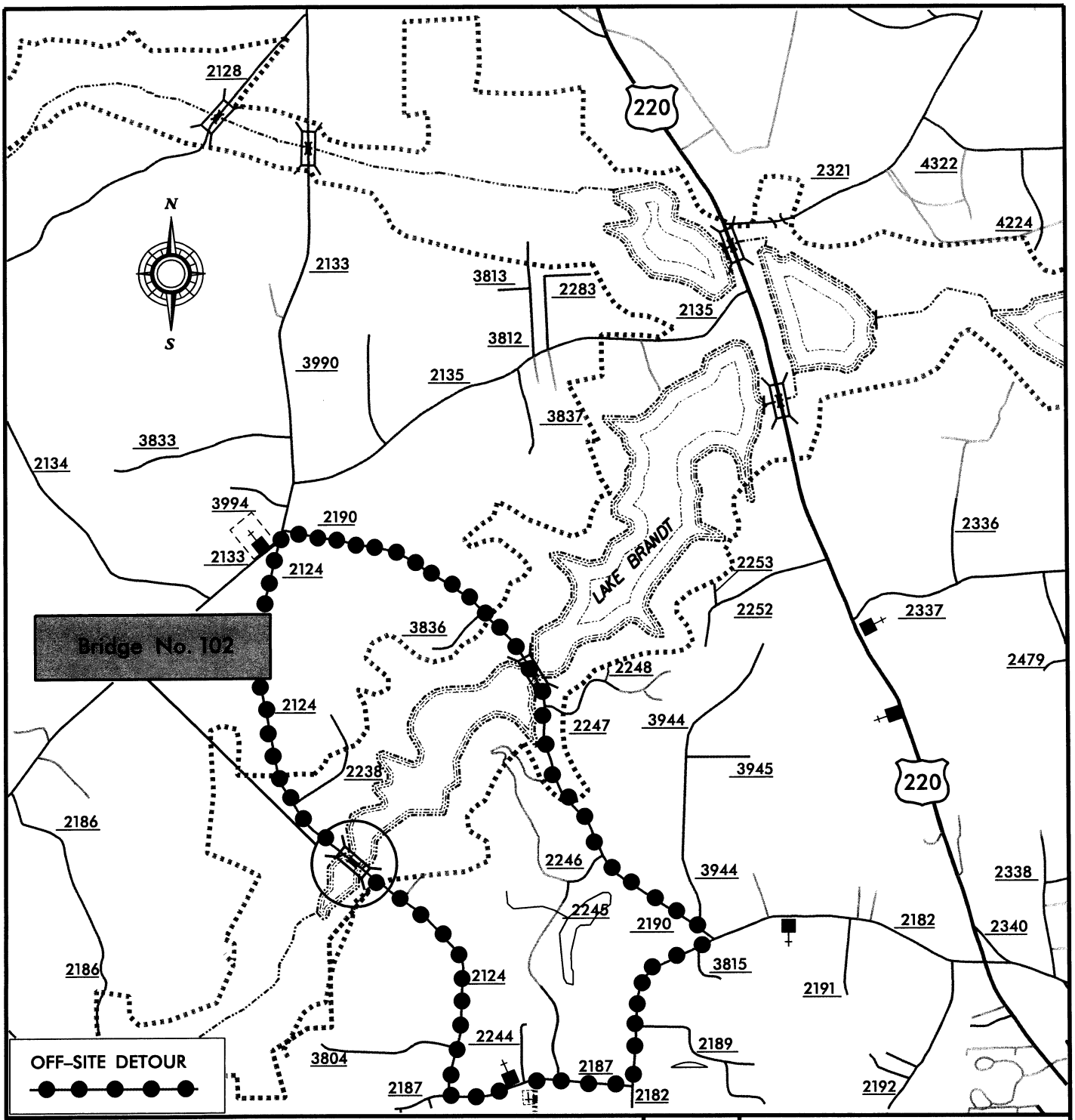
FIGURES



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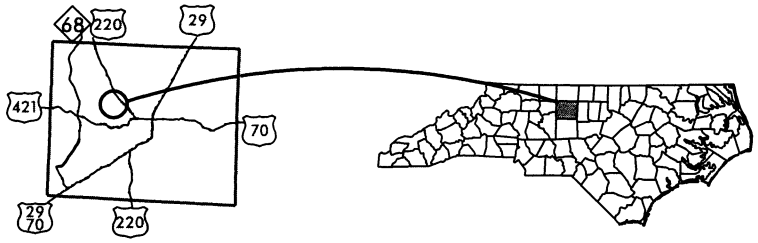


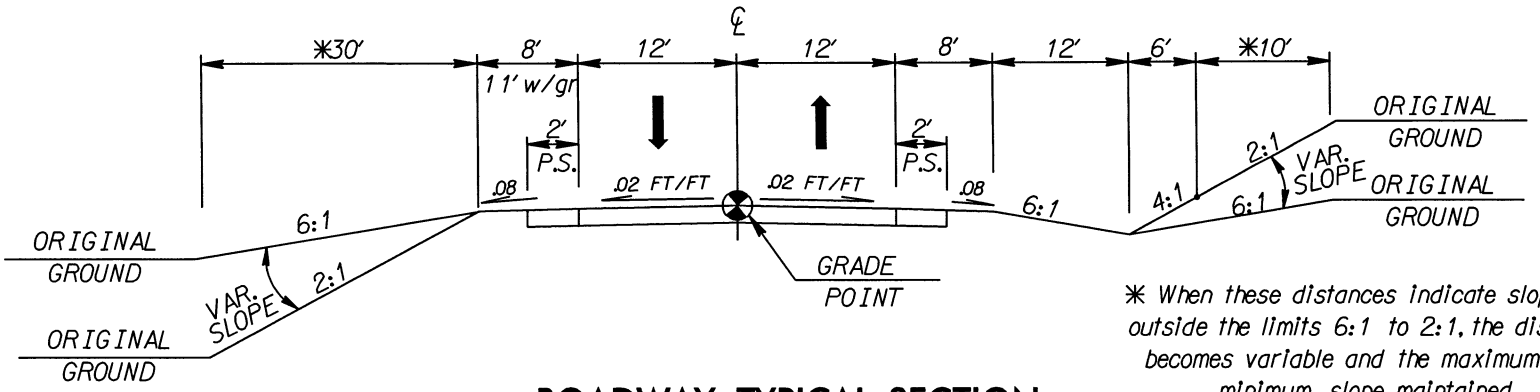
North Carolina Department of Transportation
Project Development and
Environmental Analysis Branch

GUILFORD COUNTY

BRIDGE No. 102
ON SR 2124 (LEWISTON ROAD)
OVER BRUSH CREEK

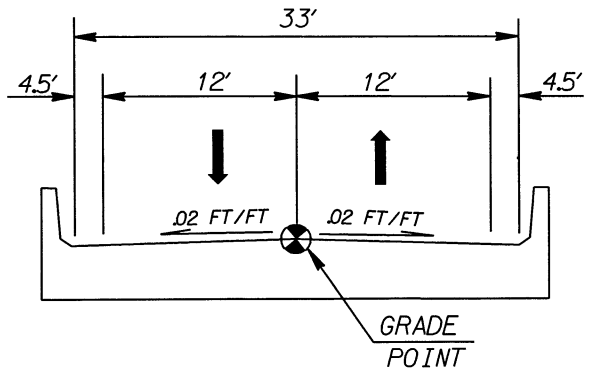
T.I.P. No. B-3848

FIGURE 1



ROADWAY TYPICAL SECTION

** When these distances indicate slopes outside the limits 6:1 to 2:1, the distance becomes variable and the maximum or minimum slope maintained.*



TYPICAL BRIDGE SECTION

EXISTING BRIDGE LENGTH IS 109 FT.

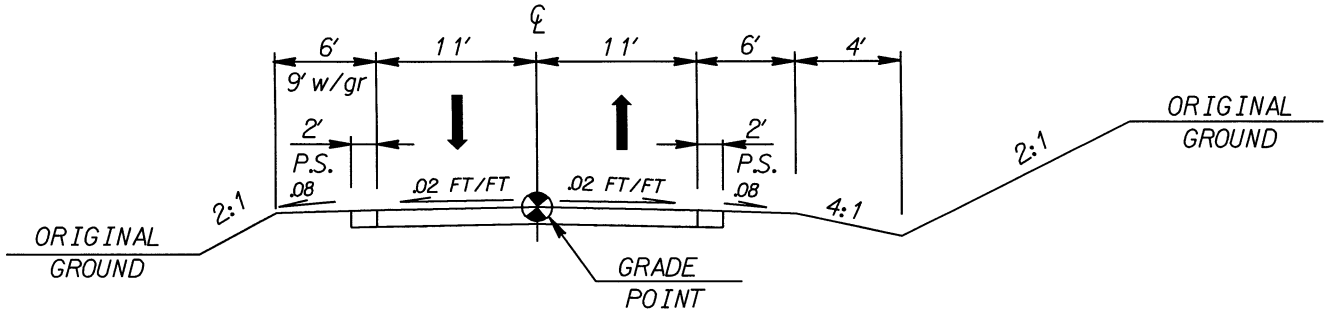
North Carolina Department of Transportation
Project Development and
Environmental Analysis Branch

GUILFORD COUNTY

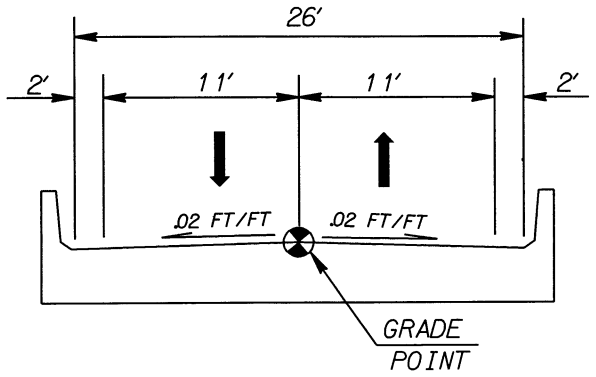
BRIDGE No. 102 ON SR 2124
OVER BRUSH CREEK

T.I.P. No. B-3848

FIGURE 2a



DETOUR ROADWAY TYPICAL SECTION



TYPICAL DETOUR BRIDGE SECTION

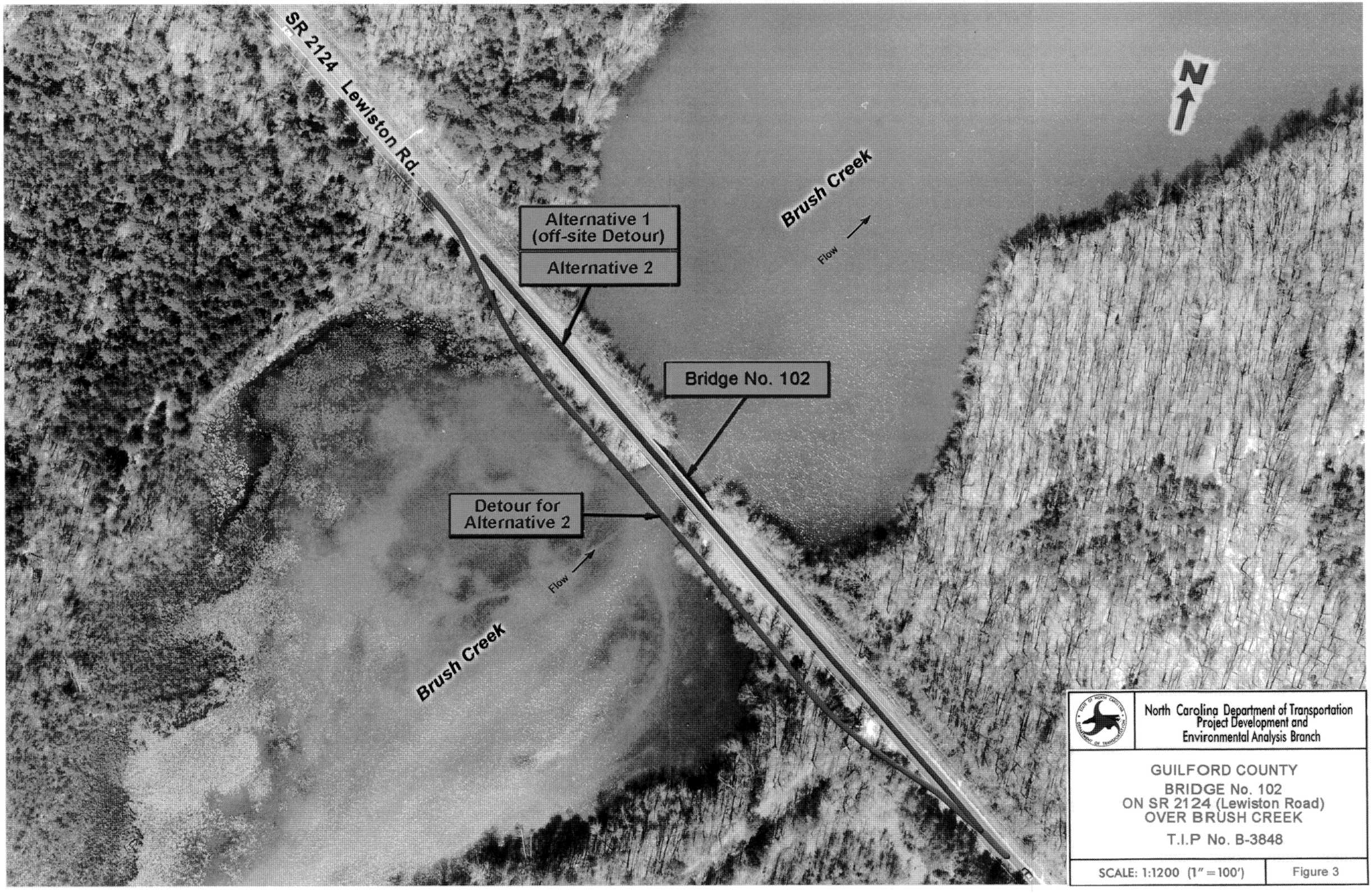
North Carolina Department of Transportation
Project Development and
Environmental Analysis Branch

GUILFORD COUNTY

BRIDGE No. 102 ON SR 2124
OVER BRUSH CREEK

T.I.P. No. B-3848

FIGURE 2b

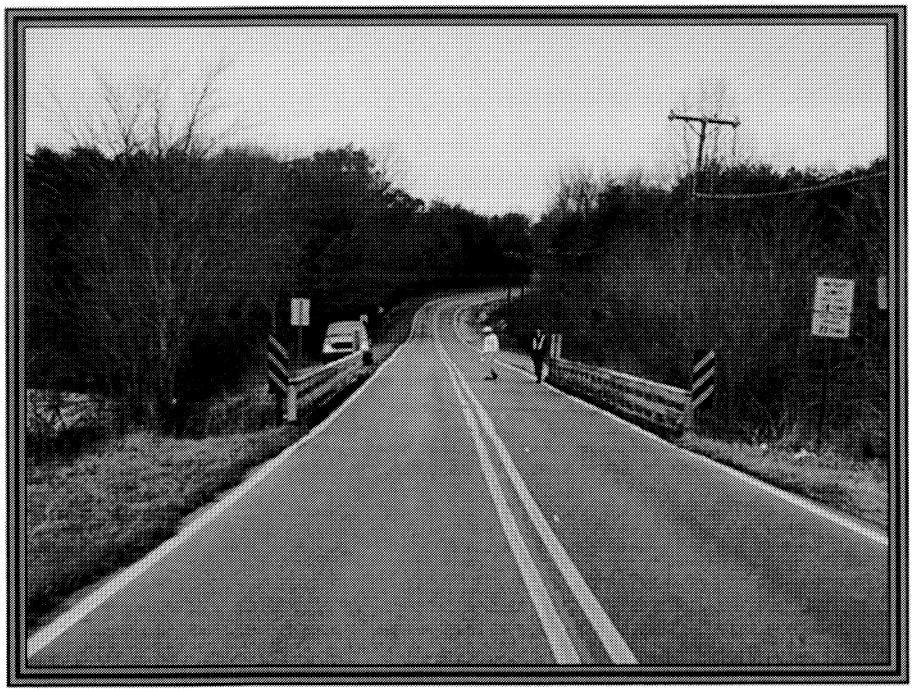


North Carolina Department of Transportation
Project Development and
Environmental Analysis Branch

GUILFORD COUNTY
BRIDGE No. 102
ON SR 2124 (Lewiston Road)
OVER BRUSH CREEK
T.I.P No. B-3848

SCALE: 1:1200 (1" = 100')

Figure 3

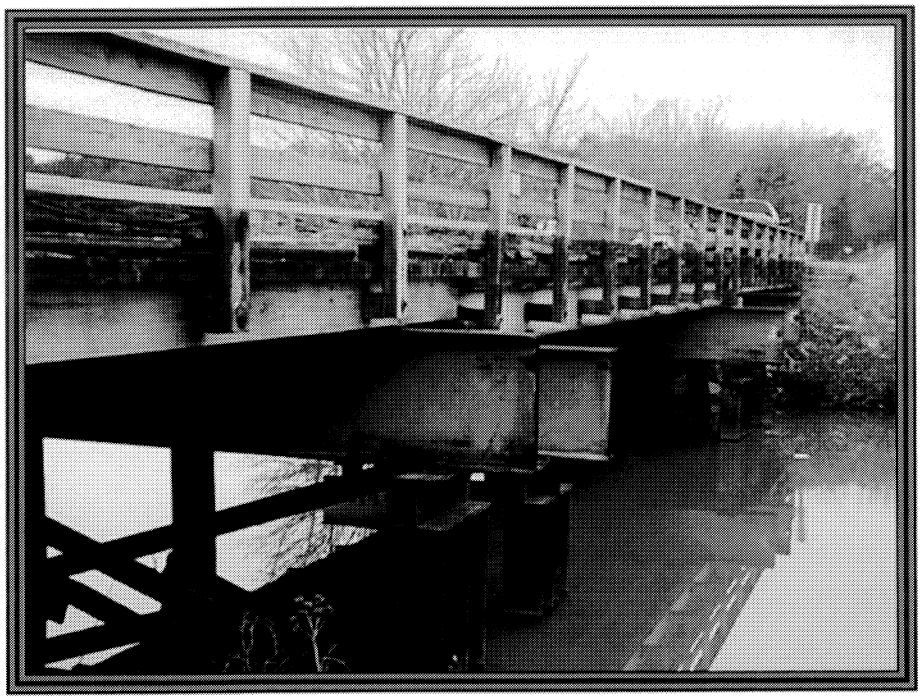


GUILFORD COUNTY
BRIDGE No. 102
B-3848

Looking Northwest

Looking Southeast

Figure 4a

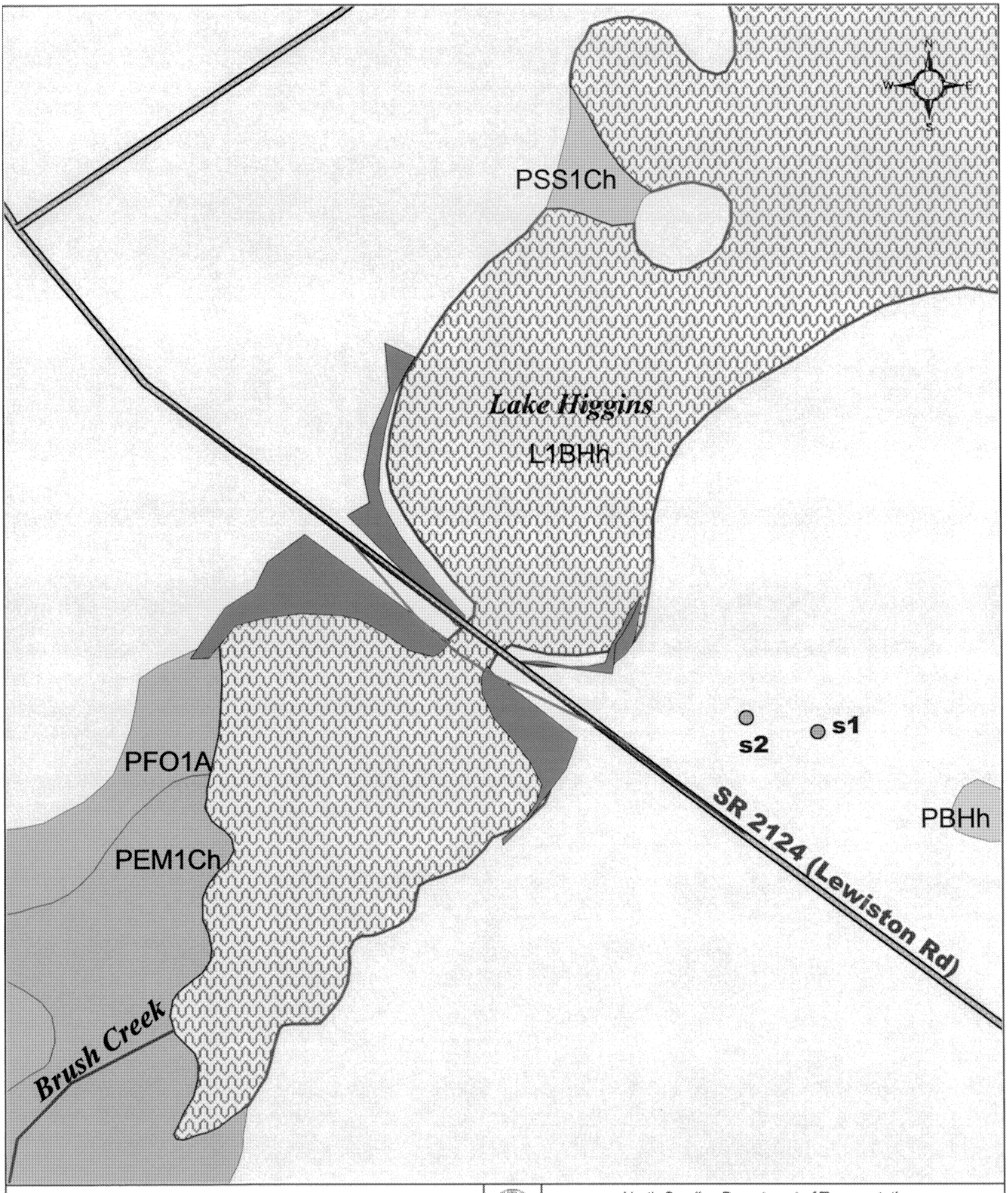


GUILFORD COUNTY
BRIDGE No. 102
B-3848

Looking at
Northwest side

Looking at
Southeast side

Figure 4b



Legend

- GPS Stream Delineation
- Jurisdictional Wetlands
- Alternative 1
- Alternative 2

1" = 250'

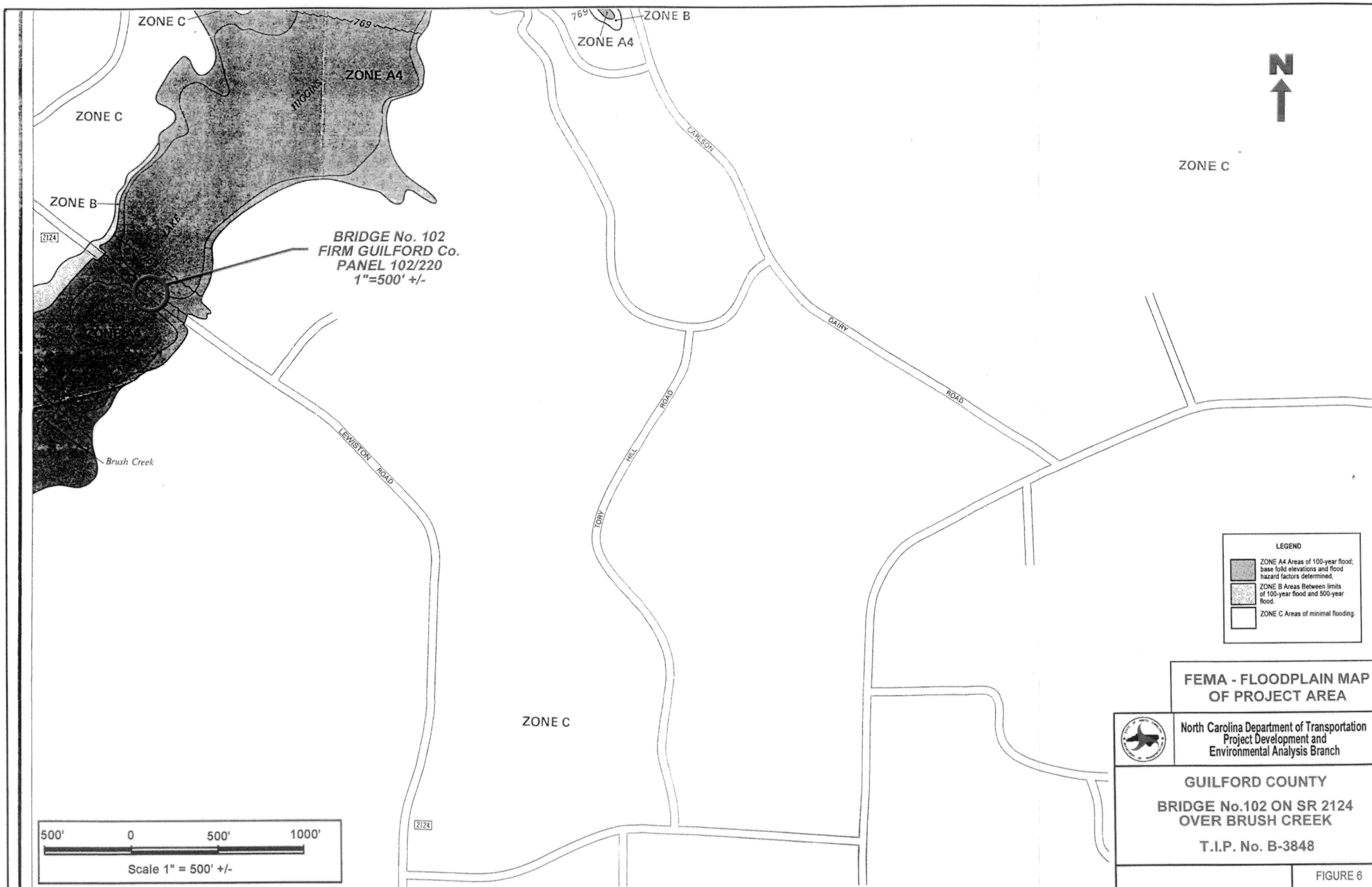
250 0 250 Feet

North Carolina Department of Transportation
Project Development and Environmental Analysis Branch

GUILFORD COUNTY
BRIDGE No. 102 ON SR 2124

Lewiston Road over Brush Creek T.I.P No. B-3848

Figure 5


ZONE C
769
ZONE B
ZONE A4
ZONE A4
HIGGINS
ZONE C
ZONE C
ZONE B
LAKE
2124
BRIDGE No. 102
FIRM GUILFORD Co.
PANEL 102/220
1"=500' +/-
CARLSON
DAIRY ROAD
TORY HILL ROAD
LEWISTON ROAD
Brush Creek
ZONE C
2124
N
LEGEND
ZONE A4 Areas of 100-year flood; base folld elevations and flood hazard factors determined.
ZONE B Areas Between limits of 100-year flood and 500-year flood.
ZONE C Areas of minimal flooding.
500' 0 500' 1000'
Scale 1" = 500' +/-

FEMA - FLOODPLAIN MAP OF PROJECT AREA

North Carolina Department of Transportation
Project Development and
Environmental Analysis Branch

GUILFORD COUNTY

BRIDGE No.102 ON SR 2124
OVER BRUSH CREEK

T.I.P. No. B-3848

FIGURE 6

APPENDIX

City of Greensboro
North Carolina

November 5, 2003

Ms. Elizabeth Workman
Environmental Specialist
Rummel, Klepper & Kahl, LLP
5800 Faringdon Place
Suite 105
Raleigh, NC 27609-3960

Ms. Workman:

Pertaining to bridge project No. 102 in Guilford County on SR 2124, T.I.P. No. B-3848 please let this letter serve as official notification that Greensboro Parks and Recreation Department recommends Alternative Number 1 (off-site detour). I feel this option impacts the natural resources and recreational opportunities the least of the two alternatives.

Jurisdiction of the property in question is maintained by the City of Greensboro. Parks and Recreation Department manages the safety, security and recreation of the facilities. The Water Resources Department manages water quality and related issues. May I suggest you contact Steve Drew, Water Quality Supervisor if you have not already. His number is 336-373-5855.

Please feel free to contact me if you have any additional questions.

Thank you,

Mike Simpson

Mike Simpson
Lakes, Trails and Greenways Director
Greensboro Parks and Recreation Department

NORTH CAROLINA DIVISION
FINAL NATIONWIDE SECTION 4(f) EVALUATION AND APPROVAL
FOR FEDERALLY-AIDED HIGHWAY PROJECTS WITH MINOR INVOLVEMENT
WITH PUBLIC PARKS, RECREATION LANDS, AND WILDLIFE AND
WATERFOWL REFUGES

F. A. Project BRZ – 2124 (1)

State Project 8.2496201

T. I. P. No. B-3848

Description:
NCDOT proposes to replace Bridge No. 102 on SR 2124 (Lewiston Road) over Brush Creek (T.I.P. No. B-3848). Two alternatives are being studied. Alternative 1 replaces the bridge on its existing location with an off-site detour. Alternative 2 replaces the bridge on its existing location with an on-site detour located 50 feet west of the existing bridge. Alternative 1 is preferred because it is the least disruptive to the public park and least expensive.

		Yes	No
1.	Is the proposed project designed to improve the operational characteristics, safety, and/or physical condition of existing highway facilities on essentially the same location?	X	☐
2.	Is the project on new location?	☐	X
3.	Is the Section 4(f) land a publicly owned public park, recreation land, or wildlife and waterfowl refuge located adjacent to the existing highway?	X	☐
4.	Does the amount and location of the land to be used impair the use of the remaining Section 4(f) land, in whole or in part, for its intended purpose? (See chart below)	☐	X

Total size of section 4(f) site		Maximum to be acquired
less than 10 acres	.....	10 percent of site
10 acres-100 acres	.....	1 acre
greater than 100 acres	.....	1 percent of site

For Alternatives 1 and 2, not including impacts associated with the temporary detour bridge, approximately 0.34 acre of the 226-acre park (approximately 0.1 percent) will be used to replace Bridge No. 102.

		Yes	No
5.	Do the proximity impacts of the project (e.g., noise, air and water pollution, wildlife and habitat effects, aesthetic values) on the remaining Section 4(f) land impair the use of such land for its intended purpose?	☐	X
6.	Do the officials having jurisdiction over the Section 4(f) land agree, in writing, with the assessment of the impacts of the proposed project on, and the proposed mitigation for, the Section 4(f) lands?	X	☐
7.	Does the project use land from a site purchased or improved with funds under the Land and Water Conservation Act (Section 6(f)), the Federal Aid in Fish Restoration Act (Dingell-Johnson Act), the Federal Aid in Wildlife Act (Pittman-Robertson Act), or similar laws, or are the lands otherwise encumbered with a Federal interest (e.g., former Federal surplus property)?	☐	X
8.	If the project involves lands described in Item 7 above, does the appropriate Federal Agency object to the land conversion or transfer?	☐	X
9.	Does the project require preparation of an EIS?	☐	X

ALTERNATIVES CONSIDERED AND FOUND NOT TO BE FEASIBLE AND PRUDENT

	Yes	No
The following alternatives were evaluated and found not to be feasible and prudent:	X	☐

1. Do-nothing.

Does the "do nothing" alternative:

		Yes	No
	(a) correct capacity deficiencies?	☐	X
or	(b) correct existing safety hazards?	☐	X
or	(c) correct deteriorated conditions?	☐	X
and	(d) create costs, unusual problems, or impacts of extraordinary measure?	X	☐

2. Improvement of the highway without using the adjacent public park, recreational land, or wildlife waterfowl refuge. — ☐ X

(a) Have minor alignment shifts, changes in standards, use of retaining walls, etc., or traffic management measures been evaluated? — X ☐

(b) The items in 2(a) would result in (circle, as appropriate)

(i) substantial adverse community impact

or (ii) substantial increased costs

or (iii) unique engineering, transportation, maintenance, or safety problems

or (iv) substantial social, environmental, or economic impacts

or (v) a project which does not meet the need

and (vi) impacts, costs, or problems which are extraordinary magnitude

	Yes	No
3. Build an improved facility on new location without using the public park, recreational land, or wildlife and waterfowl refuge. (This would be a localized "run around.")	X	☐

(a) An alternate on new location would result in: (circle, as appropriate)

(i) a project which does not solve the existing problems

or (ii) substantial social, environmental, or economic impacts

or (iii) a substantial increase in project cost or engineering difficulties

and (iv) such impacts, costs, or difficulties of truly unusual or unique or extraordinary magnitude

MINIMIZATION OF HARM

	Yes	No
1. The project includes all possible planning to minimize harm.	X	☐

2. Measures to minimize harm include the following:

   (circle those which are appropriate)

   a. Replacement of lands used with lands of reasonably equivalent usefulness and location and of at least comparable value.

   b. Replacement of facilities impacted by the project including sidewalks, paths, benches, lights, trees, and other facilities.

   (c.) Restoration and landscaping of disturbed areas.

   d. Incorporation of design features and habitat features, where necessary, to reduce or minimize impacts to the Section 4(f) property.

   e. Payment of the fair market value of the land and improvements taken or improvements to the remaining Section 4(f) site equal to the fair market value of the land and improvements taken.

   f. Additional or alternative mitigation measures as determined necessary based on consultation with the officials having jurisdiction over the parkland, recreation area, or wildlife or waterfowl refuge.

3. A discussion of specific mitigation measures is provided as follows:
   NCDOT coordinated with the Greensboro Parks and Recreation Department. They have not asked for additional minimization measures.

Note: Any response in a box requires additional information prior to approval. Consult Nationwide 4(f) evaluation.

The replacement of Bridge No. 102 without using the adjacent public park was not considered because it is not possible. The park surrounds the bridge; therefore any alternative except a "no build" alternative would cause an impact.

COORDINATION

The proposed project has been coordinated with the following (attach correspondence):

a. Officials having jurisdiction over the Section 4(f) Land
b. Local/State/Federal Agencies
c. US Coast Guard (for bridges requiring bridge permits)
d. DOI, if Section 6(f) lands are involved

SUMMARY AND APPROVAL

The project meets all criteria included in the programmatic 4(f) evaluation approved on December 23, 1986.

All required alternatives have been evaluated and the findings made are clearly applicable to this project. There are no feasible or prudent alternatives which avoid use of the Section 4(f) land.

The project includes all possible planning to minimize harm, and there are assurances that the measures to minimize harm will be incorporated in the project.

All appropriate coordination has been successfully completed.

Approved:

4/30/04 DERRICK G. WEAVER
Date for Manager, Planning & Environmental Branch
NCDOT

4/30/04
Date for Division Administrator, FHWA

North Carolina Wildlife Resources Commission

Charles R. Fullwood, Executive Director

TO: Ms. Kim Leight
Rummel, Klepper & Kahl

FROM: Maryellen Haggard, Highway Project Coordinator
Habitat Conservation Program

DATE: August 6, 2001

SUBJECT: NCDOT Bridge Replacements in Ashe, Wilkes, Watauga, and Alleghany counties of North Carolina. TIP Nos. B-3300, B-3607, B-3714, B-3922, B-3925, B-3926, B-3928, B-4007, and B-4010

Biologists with the N. C. Wildlife Resources Commission (NCWRC) have reviewed the information provided and have the following preliminary comments on the subject project. Our comments are provided in accordance with provisions of the National Environmental Policy Act (42 U.S.C. 4332(2)(c)) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667d).

On bridge replacement projects of this scope our standard recommendations are as follows:

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

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

3. Wet concrete should not be allowed to contact stream water. This will lessen the chance of altering the stream's water chemistry and causing a fish kill.

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

5. If temporary access roads or detours are constructed, they should be removed back to original ground elevations immediately upon the completion of the project. Disturbed areas should be seeded or mulched to stabilize the soil and native tree species should

be planted with a spacing of not more than 10'x10'. If possible, when using temporary structures the area should be cleared but not grubbed. Clearing the area with chain saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact, allows the area to revegetate naturally and minimizes disturbed soil.

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

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

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

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

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

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

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

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

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

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

16. All mechanized equipment operated near surface waters should be regularly inspected and maintained to prevent contamination of stream waters from fuels, lubricants, hydraulic fluids, or other toxic materials.

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

1. The culvert must be designed to allow for fish passage. The culvert or pipe invert should be buried at least 1 foot below the natural streambed. The installation of the culvert or pipe should insure that all waters flow without freefalling or damming on either end during low flow conditions. If culverts are long, notched baffles should be placed in reinforced concrete box culverts at 15 foot intervals to allow for the collection of sediments in the culvert, to reduce flow velocities, and to provide resting places for fish and other aquatic organisms moving through the structure.

2. When two pipes are installed, only the lower pipe should be buried 12" into the substrate so that all base flows continue uninterrupted in the lower pipe during normal and low flow conditions to maintain aquatic life passage. The bottom of the second pipe should be placed at grade or at bankfull elevation. The second pipe should remain dry during normal flows to allow for wildlife passage. Where disrupted, natural floodplain benching should be restored upstream and downstream of the second, "dry", pipe.

3. Culverts or pipes should be situated so that no channel realignment or widening is required. Widening of the stream channel at the inlet or outlet of structures usually causes a decrease in water velocity causing sediment deposition that will require future maintenance.

4. Riprap should not be placed on the streambed.

In most cases, we prefer the replacement of the existing structure at the same location with road closure. If road closure is not feasible, a temporary detour should be designed and located to avoid wetland impacts, minimize the need for clearing and to avoid destabilizing stream banks. If the structure will be on a new alignment, the old structure should be removed and the approach fills removed from the 100-year floodplain. Approach fills should be removed down to the natural ground elevation. The area should be stabilized with grass and planted with native tree species. If the area that is reclaimed was previously wetlands, NCDOT should restore the area to wetlands. If successful, the site may be used as wetland mitigation for the subject project or other projects in the watershed.

Project specific comments:

1. B-3300 – Ashe County – Bridge No. 57 over Buffalo Creek. Buffalo Creek at this location in all likelihood contains wild trout. The bridge is located at a major intersection. A culvert would be a hindrance to fish as well as wildlife passage. We will require a trout moratorium from Oct. 15th - April 15th.

2. B-3607 – Ashe County – Bridge No. 503 over Buffalo Creek. Buffalo Creek at the bridge replacement in all likelihood contains wild trout. We will require a trout moratorium from Oct. 15th - April 15th.

3. B-3714 – Wilkes County – Bridge No. 83 over Mulberry Creek. Mulberry Creek supports small mouth bass and redbreast sunfish at this location. We will require a moratorium from May 1st - June 30th.

4. B-3922 – Watauga County – Bridge No. 316 over Cove Creek. Cove Creek is designated Public Mountain Trout Water. In addition to stocked fish, it contains some wild brown trout. We will require a trout moratorium from Oct. 15th - April 15th. The bridge should be replaced with another bridge. We are concerned that a box culvert will impede fish passage.

5. B-3925 – Watauga County – Bridge No. 35 over Meat Camp Creek. Meat Camp Creek is designated Public Mountain Trout Water. In addition to stocked fish, it contains some wild brown trout. We will require a trout moratorium from Oct. 15th - April 15th. The bridge should be replaced with another bridge. We are concerned that a box culvert will impede fish passage.

6. B-3926 – Watauga County – Bridge No. 36 over Meat Camp Creek. Same comments as B-3925.

7. B-3928 – Watauga-Ashe County – Bridge No. 334 over South Fork New River. We will require a small mouth bass/ rock bass moratorium from May 1st - June 30th. The South Fork New River is high quality water and designated "scenic" by the National Wild and Scenic Rivers System. The bridge should be replaced with another bridge. This is a popular canoe section; the new bridge should be at the appropriate height so boaters do not have to portage.

8. B-4007 – Alleghany County – Bridge No. 38 over Crab Creek. Crab Creek is in a High Quality Water Zone and is designated Hatchery Supported Water. We will require a trout moratorium from Oct. 15th - April 15th.

9. B-4010 – Ashe County – Bridge No. 7 over South Fork New River. We will require a small mouth bass/ rock bass moratorium from May 1st - June 30th. The South Fork New River is high quality water and designated "scenic" by the National Wild and Scenic Rivers System. The bridge should be replaced with another bridge.

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

If you need further assistance or information on NCWRC concerns regarding bridge replacements, please contact me at (336) 527-1549. Thank you for the opportunity to review and comment on these projects.

-104
SM
SC

Michael F. Easley, Governor
William G. Ross Jr., Secretary
North Carolina Department of Environment and Natural Resources

Gregory J. Thorpe, Ph.D.
Acting Director
Division of Water Quality

August 15, 2001

MEMORANDUM

To: Elmo Vance, NCDOT Project Development & Environmental Analysis Branch
Through: John Dorney, NC Division of Water Quality
From: Cynthia F. Van Der Wiele, NCDOT Coordinator

Subject: Scoping Comments for Eleven Bridge Replacement Projects

This memo is in reference to your correspondence dated July 23, 2001, in which you requested scoping comments for the above projects. The Division of Water Quality (DWQ) requests that the following topics be addressed:

1. Bridge projects shall comply with the requirements for Water Supply Watershed, High Quality Waters and Outstanding Resource Waters with regards to stormwater management, sedimentation and erosion control and buffer requirements.
2. Ensure that sediment & erosion control measures are not placed in wetlands.
3. Borrow/waste areas should avoid wetlands to the maximum extent practicable. Prior to the approval of any borrow/waste site in a wetland, the contractor must obtain a 401 certification from DWQ.
4. The DWQ prefers that the structures that will be replacing the eleven deficient bridges will be bridges. All structures shall be installed in such a manner that the original stream profiles are not altered (i.e. the depth of the channel must not be reduced by a widening of the streambed). Existing stream dimensions are to be maintained above and below locations of culvert extensions.
5. All work shall be performed during low flow conditions.
6. Disturbance of the stream channels must be limited to only what is necessary to perform the bridge demolition and removal. Heavy equipment must be operated from the banks rather than in the stream channel in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into the stream.
7. All mechanized equipment operated near surface waters should be regularly inspected and maintained to prevent contamination of stream waters from fuels, lubricants, hydraulic fluids, or other toxic materials.
8. Written concurrence of 401 Water Quality Certification may be required for these projects (e.g., applications requesting coverage under NW 14 or Regional General Permit 198200031). Please be aware that 401 certification may be denied if wetland or water impacts have not been avoided and minimized to the maximum extent practicable.

Thank you for requesting our input at this time. The DOT is reminded that issuance of a 401 Water Quality Certification requires that appropriate measures be instituted to ensure that water quality standards are met and designated uses are not degraded or lost. If you have any questions or require additional information, please contact Cynthia Van Der Wiele at (919) 733.5715.

Pc: Eric Alsmeyer, USACE Raleigh Field Office
Steve Lund, USACE Asheville Field Office
Tom McCartney, USFWS Raleigh Field Office
Marella Buncick, USFWS Asheville Field Office
MaryEllen Haggard, NCWRC
File Copy

300-10b
ESM

North Carolina Department of Cultural Resources

State Historic Preservation Office

David L. S. Brook, Administrator

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

Division of Archives and History
Jeffrey J. Crow, Director

August 29, 2001

MEMORANDUM

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

From: David Brook DB for David Brook
Deputy State Historic Preservation Officer

Re: Replace Bridge No. 102 on SR 2124 over Brush Creek, B-3848, Guilford County, ER 02-7214

Thank you for your memorandum of July 23, 2001, concerning the above project.

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

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

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

DB:kgc

cc: Mary Pope Furr, NC DOT
T. Padgett, NC DOT

bc: County
Reading

Federal Aid # BRZ- (1) *TIP* # B-3848 *County*: Guilford

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

Project Description: Replace Bridge No. 102 on SR 2124 over Brush Creek

On 10/18/01, representatives of the

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

Reviewed the subject project at

- [ ] Scoping meeting
- [x] Historic architectural resources photograph review session/consultation
- [ ] Other

All parties present agreed

- [x] There are no properties over fifty years old within the project's area of potential effects.
- [x] There are no properties less than fifty years old which are considered to meet Criteria Consideration G within the project's area of potential effects.
- [ ] There are properties over fifty years old within the project's Area of Potential Effects (APE), but based on the historical information available and the photographs of each property, properties identified as _____ are considered not eligible for the National Register and no further evaluation of them is necessary.
- [x] There are no National Register-listed or Study Listed properties within the project's area of potential effects.
- [ ] All properties greater than 50 years of age located in the APE have been considered at this consultation, and based upon the above concurrence, all compliance for historic architecture with Section 106 of the National Historic Preservation Act and GS 121-12(a) has been completed for this project.
- [x] There are no historic properties affected by this project. (*Attach any notes or documents as needed*)

Signed:

Mary Pope Furr — 10/18/01
Representative, NCDOT — Date

Michael C. Dawson — 10/18/01
FHWA, for the Division Administrator, or other Federal Agency — Date

Claudia R Brown — 10-18-01
Representative, HPO — Date

David Brook — 10/18/01
State Historic Preservation Officer — Date

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

WATER Resources
City of Greensboro

Administration
(336) 373-2055
Fax (336) 412-6305

Customer Service
(336) 373-2344
Fax (336) 412-3932

Water Supply
Mitchell Plant
(336) 373-5855
Fax (336) 373-5834

Townsend Plant
(336) 375-2230
Fax (336)375-2207

Water Reclamation
North Buffalo Plant
(336) 373-5913
Fax (336) 274-7585

T.Z. Osborne Plant
(336) 375-2240
Fax (336) 621-3523

Construction & Maintenance
Service Center
(336) 373-2033
Fax (336) 412-3936

Meter Services
(336) 373-2071
Fax (336) 574-4067

Water Conservation
(336) 335-5459
Fax (336) 412-6305

March 5, 2001

RUMMELL*KLEPPER & KAHL, LLP
5800 Faringdon Place Suite # 105
Raleigh, NC. 27609-3960

Re: T.I.P. No. B-3847; Bridge No.63 SR 1850, and T.I.P. No. B-3848; Bridge No. 102 SR 2124

Dear Ms. Mack,

Per our recent conversation and at your request, let this letter serve as verification that one of our engineers has checked and there is no water or sewer lines effecting the above listed properties.

Sincerely,

Michele Newberry
Services Specialist
City of Greensboro
Department of Water Resources

0002

JTP
F/300-106
ccc KSL
ESM
JTP

Piedmont
Natural Gas
Company

Post Office Box 29527
Greensboro, North Carolina 27429-9527

March 6, 2001

Elizabeth Mack
Rummel, Klepper, & Kahl
5800 Faringdon Place
Raleigh, NC 27609-3960

Re: T.I.P No. B-3847; Bridge No. 63 on Sandy Ridge Rd @ Deep River
T.I.P No. B-3848; Bridge No. 102 on Lewiston Rd @ Brush Creek

Dear Elizabeth:

I have compared the location sketches provided by your firm for the projects referenced above, to our facilities map. At this time we have no existing natural gas pipelines or plans to install any in the foreseeable future. Should this situation change we will submit a Right of Way Encroachment Agreement to our local NCDOT division office.

Please call me at 336-378-1831 ex 2311 if you have any questions of comments.

Sincerely,

Michael Stanley

Michael Stanley
Piedmont Natural Gas

GUILFORD COUNTY SCHOOLS

March 12, 2001

Elizabeth Mack
Rummel, Klepper & Kahl, LLP
5800 Faringdon Place, Suite 105
Raleigh, NC 27609-3960

SUBJECT: Effects on Guilford County School Buses in Relation to Bridge Replacement Projects - T.I.P. No. B-3847 and T.I.P. No. B-3848

Dear Ms. Elizabeth Mack

The purpose of this letter is to respond regarding the impact on school bus routing by the above named bridge replacement projects. Transportation routing software, TIMS, was used to compile data concerning the number of crossings by buses daily and alternate routes available.

T.I.P. No. B-3847; Bridge No. 63 on SR 1850 (Sandy Ridge Road) over Deep River

Data indicates that arranged school bus routes cross the above named bridge approximately 10 times daily. Currently, a division exists North of Sandy Ridge Rd separating adjacent school boundaries. If this bridge were closed during the current school year, it would have a major impact on bus routes. Routes would be detoured using Johnson St, Skeet Club Rd, Dilworth Rd and Squire Davis Rd. This would enable the routes to access students who reside East of Deep River on Sandy Ridge Rd. Detouring routes would add 20 minutes or more ride time to each route. An additional route in the afternoon may be created for the elementary school level, in order for the bus to arrive to the next school in time to pick up the middle/high school students.

The project would not have as much of an impact if it occurred in the subsequent school year, August 2001. The above mentioned separation of school boundaries will be merged in this area due to redistricting changes. In order to accommodate the bridge closing, buses would be routed off Bunker Hill Rd to access these students, adding approximately 10 minutes to each route.

131 Franklin Boulevard Greensboro, NC 27401
Phone (336) 370-8920 Fax (336) 370-8930

T.I.P. No. B-3848; Bridge No. 102 or SR 2124 (Lewiston Rd) over Brush Creek

Data indicates that arranged school bus routes cross the above named bridge approximately 20 times daily. Lewiston Rd is a connector between Fleming Rd and Pleasant Ridge Rd. If the bridge were closed, routes would be detoured using Fleming Rd, Jessup Grove Rd, Horse Pen Creek Rd and Carlson Dairy Rd. Detours would add approximately 10 minutes to each route.

The only problem I can conceive due to the bridge closing is having a turn-around location South of the bridge. We currently have a stop at 3859 Lewiston Rd. If a turn-around could not be constructed, students who reside at this location or any student who is North of Hackamore Rd would be required to meet the bus at the intersection of Hackamore Rd and Lewiston Rd.

In summary, the above named projects would not present unworkable problems for the Guilford County Schools Transportation Department. All routes involved would be impacted in varying levels. If given ample notification, one week if possible, our department would be able to make necessary adjustments and convey the changes to parties affected.

Sincerely,

Jeff Harris
TIMS Program Administrator II

City of Greensboro
North Carolina

June 26, 2001

Ms. Elizabeth Mack
RK and K
5800 Faringdon Place
Suite 105
Raleigh, NC 27609

Ms. Mack:

Enclosed please find information pertaining to our telephone conversation June 25, 2001 concerning trails and recreational activities in the vicinity of Lewiston Road and Brush Creek in Summerfield NC. Lake Higgins and the surrounding trail system usually accommodate 25,000 to 30,00 visitors annually. I should mention that two Bald Eagles (which are rare in our area) have nested near the bridge site you mentioned. However, storms have destroyed the nest but the eagles continue to frequent Lake Higgins.

If you have any additional questions please feel free to call me at 336-545-5955.

Thank you,

Mike Simpson

Mike Simpson,
Greensboro Parks and Recreation Department

REPLACEMENT OF BRIDGE NO. 102 OVER BRUSH CREEK

Guilford County, North Carolina

October 2001 T.I.P. No. B-3848 *Newsletter No. 1*

NCDOT to Replace Bridge No. 102

This newsletter is published by the North Carolina Department of Transportation (NCDOT) to inform citizens about the proposed replacement of Bridge No. 102 on SR 2124 over Brush Creek (tributary to the Haw River in the Cape Fear River basin) in Guilford County. Right-of-way acquisition and construction are scheduled to begin in 2003 and 2004, respectively.

Planning Studies Initiated

During **Step 1** of the planning process, information was collected on the existing human and natural environments. This information was used to identify preliminary alternatives for replacing Bridge No. 102. In **Step 2**, the preliminary alternatives were evaluated and, based on their potential impacts, two "reasonable and feasible" alternatives were selected for detailed environmental studies. **Step 3** involves conducting detailed environmental studies for the "reasonable and feasible" alternatives. Following completion of the detailed studies, **Step 4** will consist of selecting the preferred alternative. **Step 5** will be the completion of the environmental document.

PROJECT SCHEDULE

The schedule for the project is shown below:

Fall 2002	Complete Environmental Document
Fall 2002	Select Preferred Alternative
2003	Begin Right-of-Way Acquisition
2004	Begin Construction

HOTLINE

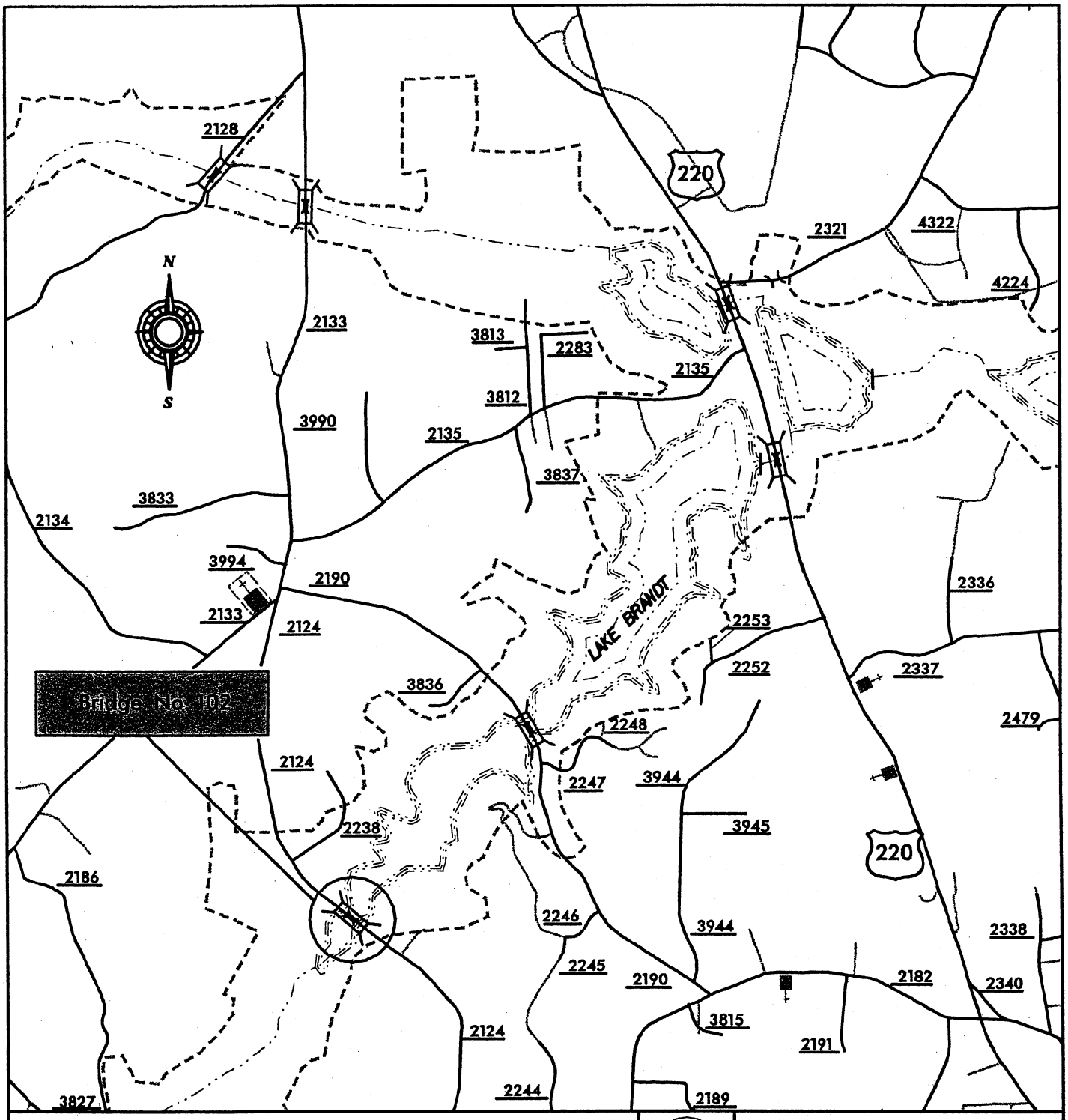
A project HOTLINE has been established to provide a toll free telephone number for information requests. Please call **(888) 521-4455** for information regarding the replacement of Bridge No. 102 over Brush Creek (T.I.P. No. B-3848).

Description of Alternatives

Two "reasonable and feasible" alternatives will be evaluated during Step 3 of the planning and environmental process. These alternatives are briefly described below:

Alternative 1 – replaces bridge on the existing alignment. An "off-site" detour will be used to maintain traffic during the construction period.

Alternative 2 - replaces bridge on the existing alignment. An "on-site" detour located along the west side will be used to maintain traffic during the construction period.



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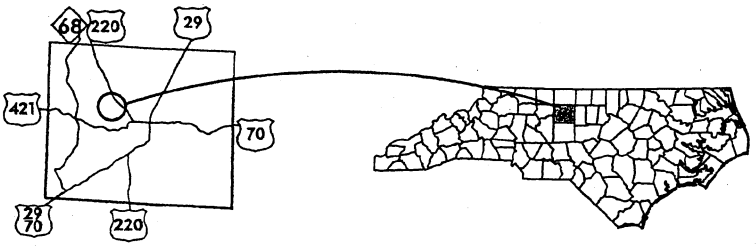
SCALE



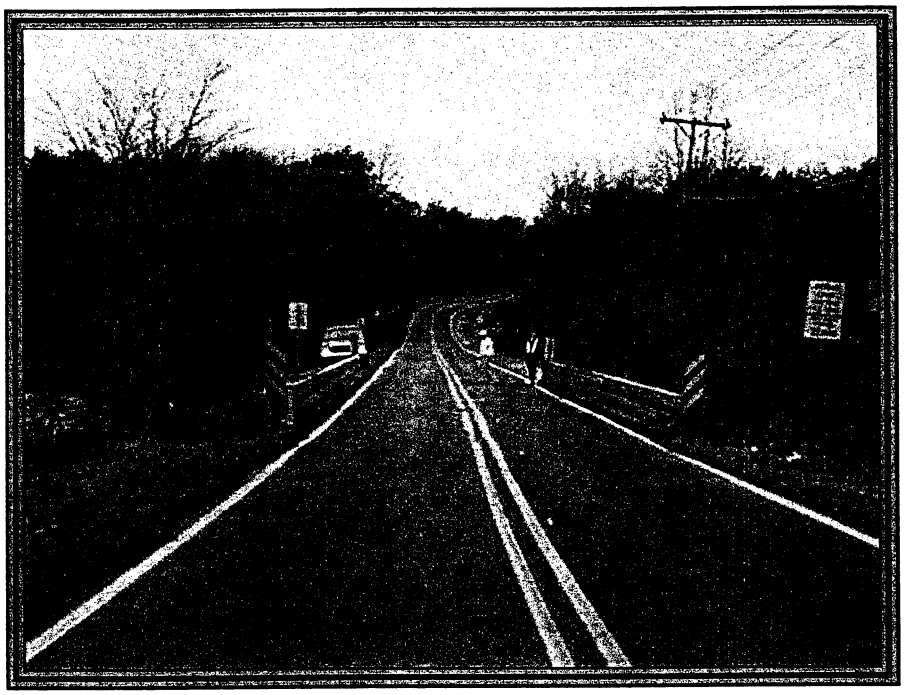
North Carolina Department of Transportation
Project Development and
Environmental Analysis Branch

GUILFORD COUNTY

BRIDGE No. 102 ON SR 2124
Lewiston Road
Brush Creek

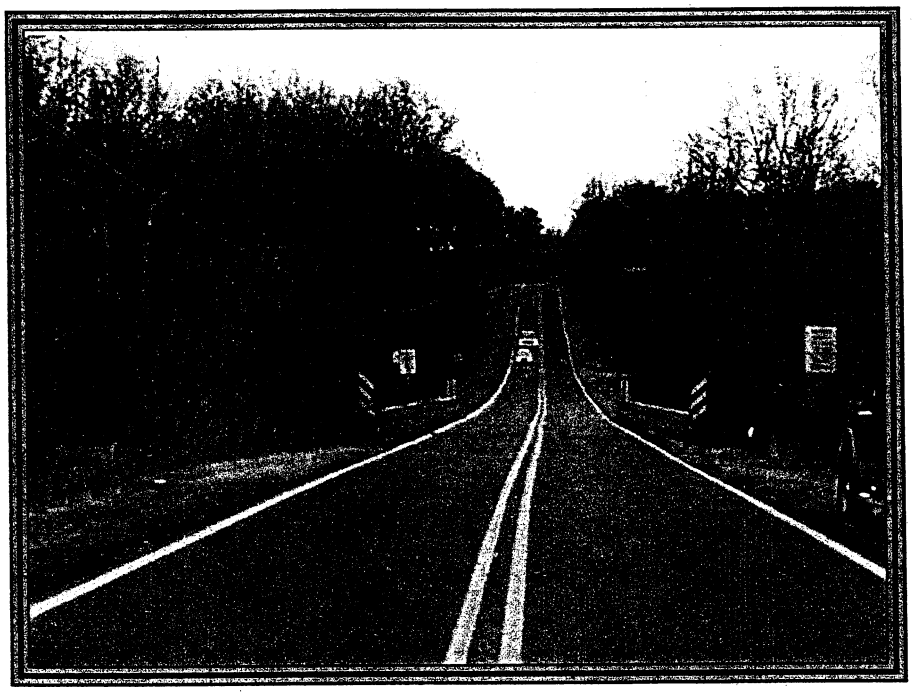
T.I.P. No. B-3848

FIGURE 1



GUILFORD COUNTY
BRIDGE No. 102
B-3848

Looking Northwest



Looking Southeast

NCDOT Welcomes Citizen Input

Public Involvement is an important part of the planning process. The North Carolina Department of Transportation is committed to ensuring all issues of concern to the public are addressed and considered before any recommendations or decisions are made. Your opinions are important to us! Please send your comments to the addresses listed below:

Mr. Elmo Vance
Project Development & Environmental Analysis Branch
North Carolina Department of Transportation
1548 Mail Service Center
Raleigh, NC 27699-1548
(919) 733-3141 Ext. 262
eevance@dot.state.nc.us

or

Mr. J. T. Peacock, Jr., P.E.
or **Ms. Kimberly S. Leight**
Rummel, Klepper & Kahl, LLP
5800 Faringdon Place, Suite 105
Raleigh, NC 27609-3960
(888) 521-4455
kleight@rkkengineers.com

If you have questions on other transportation projects, please call our Customer Service Office toll free at 1-877-DOT-4YOU or check our website at www.dot.state.nc.us.

Mr. Elmo Vance
North Carolina Department of Transportation
Project Development & Environmental Analysis Branch
1548 Mail Service Center
Raleigh, NC 27699-1548

ADDRESS CORRECTION REQUESTED