STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

November 3, 2008

U. S. Army Corps of Engineers
PO Box 1890
Wilmington, NC 28402-1890

ATTN: Mr. Richard Spencer
NCDOT Coordinator

Subject: **Application for Nationwide Permit 23, 33** for the proposed replacement of Bridge No. 43 over McLendons Creek on NC 22/24/27 in Moore County, Federal Aid Project No. BRSTP-22(1) Division 8; TIP No. B-4207

$240.00 Debit to WBS Element 33554.1.1

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 43 over McLendons Creek on NC 22/24/27. There will be <0.01 acres of permanent surface water impacts, 0.03 acres of temporary surface water impacts, and <0.05 acres of permanent riparian wetland impacts.

Please see enclosed copies of the Pre-Construction Notification (PCN), permit drawings, and design plans. The Categorical Exclusion (CE) was completed April 18, 2006 and the Right of Way Consultation was completed January 7, 2008 and distributed shortly thereafter. Additional copies are available upon request.

This project calls for a letting date of May 19, 2009 and a review date of March 31, 2009.

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

TELEPHONE: 919-715-1334
FAX: 919-715-5501

WEBSITE: WWW.NCDOT.ORG

LOCATION:
2728 CAPITAL BLVD
PLB SUITE 240
RALEIGH NC 27604

A copy of this permit application will be posted on the NCDOT Website at: http://www.ncdot.org/doh/preconstruct/pe/. If you have any questions or need additional information, please call James Pflaum at (919) 715-7217.

Sincerely,

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

w/attachment
Mr. Brian Wrenn, NCDWQ **(5 Copies)**
W/o attachment (see website for attachments)
Dr. David Chang, P.E., Hydraulics
Mr. Mark Staley, Roadside Environmental
Mr. Greg Perfetti, P.E., Structure Design
Mr. Victor Barbour, P.E., Project Services Unit
Mr. Tim Johnson, P.E., Division 8 Engineer
Mr. Art King, Division 8 Environmental Officer
Mr. Jay Bennett, P.E., Roadway Design
Mr. Majed Alghandour, P. E., Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. Scott McLendon, USACE, Wilmington
Mr. Travis Wilson, NCWRC
Mr. Gary Jordan, USFWS
Mr. Vincent Rhea, PDEA

Office Use Only: Form Version March 05

USACE Action ID No. _____ **DWQ No.** _____

(If any particular item is not applicable to this project, please enter "Not Applicable" or "N/A".)

I. Processing

1. Check all of the approval(s) requested for this project:
   - ☒ Section 404 Permit
   - ☐ Section 10 Permit
   - ☒ 401 Water Quality Certification
   - ☐ Riparian or Watershed Buffer Rules
   - ☐ Isolated Wetland Permit from DWQ
   - ☐ Express 401 Water Quality Certification

2. Nationwide, Regional or General Permit Number(s) Requested: 23, 33

3. If this notification is solely a courtesy copy because written approval for the 401 Certification is not required, check here: ☐

4. If payment into the North Carolina Ecosystem Enhancement Program (NCEEP) is proposed for mitigation of impacts, attach the acceptance letter from NCEEP, complete section VIII, and check here: ☐

5. If your project is located in any of North Carolina's twenty coastal counties (listed on page 4), and the project is within a North Carolina Division of Coastal Management Area of Environmental Concern (see the top of page 2 for further details), check here: ☐

II. Applicant Information

1. Owner/Applicant Information
   Name: Gregory J. Thorpe, Ph.D., Environmental Management Director
   Mailing Address: North Carolina Department of Transportation
   1598 Mail Service Center, Raleigh, NC 27699
   Telephone Number: 919-733-3141 Fax Number: 919-715-5501
   E-mail Address: _____

2. Agent/Consultant Information (A signed and dated copy of the Agent Authorization letter must be attached if the Agent has signatory authority for the owner/applicant.)
   Name: _____
   Company Affiliation: _____
   Mailing Address: _____
   Telephone Number: _____ Fax Number: _____
   E-mail Address: _____

III. Project Information

Attach a **vicinity map** clearly showing the location of the property with respect to local landmarks such as towns, rivers, and roads. Also provide a detailed **site plan** showing property boundaries and development plans in relation to surrounding properties. Both the vicinity map and site plan must include a scale and north arrow. The specific footprints of all buildings, impervious surfaces, or other facilities must be included. If possible, the maps and plans should include the appropriate USGS Topographic Quad Map and NRCS Soil Survey with the property boundaries outlined. Plan drawings, or other maps may be included at the applicant's discretion, so long as the property is clearly defined. For administrative and distribution purposes, the USACE requires information to be submitted on sheets no larger than 11 by 17-inch format; however, DWQ may accept paperwork of any size. DWQ prefers full-size construction drawings rather than a sequential sheet version of the full-size plans. If full-size plans are reduced to a small scale such that the final version is illegible, the applicant will be informed that the project has been placed on hold until decipherable maps are provided.

1. Name of project: replacement of Bridge No. 43 over McLendons Creek on NC 22/24/27

2. T.I.P. Project Number or State Project Number (NCDOT Only): B-4207

3. Property Identification Number (Tax PIN): _____

4. Location
   County: Moore Nearest Town: Carthage
   Subdivision name (include phase/lot number): _____
   Directions to site (include road numbers/names, landmarks, etc.): 22/24/27 west out of Carthage.

5. Site coordinates (For linear projects, such as a road or utility line, attach a sheet that separately lists the coordinates for each crossing of a distinct waterbody.)
   Decimal Degrees (6 digits minimum): _____ °N _____ °W

6. Property size (acres): Project Study Area is approximately 9.5 acres.

7. Name of nearest receiving body of water: Deep River

8. River Basin: Cape Fear (HUC 03030003)
   (Note – this must be one of North Carolina's seventeen designated major river basins. The River Basin map is available at http://h2o.enr.state.nc.us/admin/maps/.)

9. Describe the existing conditions on the site and general land use in the vicinity of the project at the time of this application: rural, residential housing

10. Describe the overall project in detail, including the type of equipment to be used:

A three span 175-foot long 44-foot wide pre-stressed concrete girder bridge is proposed to replace the 158-foot long 32-foot wide reinforced concrete deck girder bridge. The bridge will be located approximately at the same location and elevation. A temporary causeway is proposed to enable bent removal and construction. One bent is proposed on the bank of McLendons Creek and will be constructed via drilled piers. An on-site detour will be used to route traffic during construction. The detour will completely span McLendons Creek, no jurisdictional waters will be impacted by the on-site detour. Heavy duty excavation equipment will be used such as trucks, dozers, cranes and other equipment necessary for roadway construction.

11. Explain the purpose of the proposed work: Improve safety and efficiency of overall traffic operations.

IV. Prior Project History

If jurisdictional determinations and/or permits have been requested and/or obtained for this project (including all prior phases of the same subdivision) in the past, please explain. Include the USACE Action ID Number, DWQ Project Number, application date, and date permits and certifications were issued or withdrawn. Provide photocopies of previously issued permits, certifications or other useful information. Describe previously approved wetland, stream and buffer impacts, along with associated mitigation (where applicable). If this is a NCDOT project, list and describe permits issued for prior segments of the same T.I.P. project, along with construction schedules.

V. Future Project Plans

Are any future permit requests anticipated for this project? If so, describe the anticipated work, and provide justification for the exclusion of this work from the current application.

VI. Proposed Impacts to Waters of the United States/Waters of the State

It is the applicant's (or agent's) responsibility to determine, delineate and map all impacts to wetlands, open water, and stream channels associated with the project. Each impact must be listed separately in the tables below (e.g., culvert installation should be listed separately from riprap dissipater pads). Be sure to indicate if an impact is temporary. All proposed impacts, permanent and temporary, must be listed, and must be labeled and clearly identifiable on an accompanying site plan. All wetlands and waters, and all streams (intermittent and perennial) should be shown on a delineation map, whether or not impacts are proposed to these systems. Wetland and stream evaluation and delineation forms should be included as appropriate. Photographs may be included at the applicant's discretion. If this proposed impact is strictly for

wetland or stream mitigation, list and describe the impact in Section VIII below. If additional space is needed for listing or description, please attach a separate sheet.

1. Provide a written description of the proposed impacts:

Permanent Impacts: There will be <0.05 acres of permanent riparian wetland impacts due to roadway fill and mechanized clearing for equipment access and roadway construction. There will be 10 square feet of impacts to McLendons Creek due to the placement of the western end bent.

Temporary Impacts: There will be 0.03 acres (75 feet) of temporary channel impacts to McLendon's Creek due to the placement of a temporary rock causeway.

Utility Impacts: There will be no impacts to surface waters or wetlands from sewer, water, electric or other utilities associated with this bridge replacement project.

2. Individually list wetland impacts. Types of impacts include, but are not limited to mechanized clearing, grading, fill, excavation, flooding, ditching/drainage, etc. For dams, separately list impacts due to both structure and flooding.

Wetland Impact Site Number (indicate on map)	Type of Impact	Type of Wetland (e.g., forested, marsh, herbaceous, bog, etc.)	Located within 100-year Floodplain (yes/no)	Distance to Nearest Stream (linear feet)	Area of Impact (acres)
Site 1	Mechanized Clearing	Herbaceous	Yes	40 feet	0.02
Site 2	Mechanized Clearing	Forested	Yes	25 feet	0.01
Site 1	Roadway Fill	Herbaceous	Yes	40 feet	<0.01
Site 2	Roadway Fill	Forested	Yes	25 feet	<0.01
					<0.05

3. List the total acreage (estimated) of all existing wetlands on the property: 0.07 acres

4. Individually list all intermittent and perennial stream impacts. Be sure to identify temporary impacts. Stream impacts include, but are not limited to placement of fill or culverts, dam construction, flooding, relocation, stabilization activities (e.g., cement walls, rip-rap, crib walls, gabions, etc.), excavation, ditching/straightening, etc. If stream relocation is proposed, plans and profiles showing the linear footprint for both the original and relocated streams must be included. To calculate acreage, multiply length X width, then divide by 43,560.

Stream Impact Number (indicate on map)	Stream Name	Type of Impact	Perennial or Intermittent?	Average Stream Width Before Impact	Impact Length (linear feet)	Area of Impact (acres)
Site 1	McLendon's Creek	Temporary Fill	Perennial	60 feet	75	0.03
Site 1	McLendon's Creek	Permanent Fill	Perennial	60 feet		<0.01
Total Stream Impact (by length and acreage)					75	<0.04

5. Individually list all open water impacts (including lakes, ponds, estuaries, sounds, Atlantic Ocean and any other water of the U.S.). Open water impacts include, but are not limited to fill, excavation, dredging, flooding, drainage, bulkheads, etc.

Open Water Impact Site Number (indicate on map)	Name of Waterbody (if applicable)	Type of Impact	Type of Waterbody (lake, pond, estuary, sound, bay, ocean, etc.)	Area of Impact (acres)
Total Open Water Impact (acres)				

6. List the cumulative impact to all Waters of the U.S. resulting from the project:

Stream Impact (acres):	<0.04
Wetland Impact (acres):	<0.05
Open Water Impact (acres):	0
Total Impact to Waters of the U.S. (acres)	<0.09
Total Stream Impact (linear feet):	75

7. Isolated Waters
   Do any isolated waters exist on the property? ☐ Yes ☒ No
   Describe all impacts to isolated waters, and include the type of water (wetland or stream) and the size of the proposed impact (acres or linear feet). Please note that this section only applies to waters that have specifically been determined to be isolated by the USACE.

   _____

   _____

8. Pond Creation
   If construction of a pond is proposed, associated wetland and stream impacts should be included above in the wetland and stream impact sections. Also, the proposed pond should be described here and illustrated on any maps included with this application.
   Pond to be created in (check all that apply): ☐ uplands ☐ stream ☐ wetlands

Describe the method of construction (e.g., dam/embankment, excavation, installation of draw-down valve or spillway, etc.):_____
Proposed use or purpose of pond (e.g., livestock watering, irrigation, aesthetic, trout pond, local stormwater requirement, etc.):_____
Current land use in the vicinity of the pond:_____
Size of watershed draining to pond:_____ Expected pond surface area:_____

VII. Impact Justification (Avoidance and Minimization)

Specifically describe measures taken to avoid the proposed impacts. It may be useful to provide information related to site constraints such as topography, building ordinances, accessibility, and financial viability of the project. The applicant may attach drawings of alternative, lower-impact site layouts, and explain why these design options were not feasible. Also discuss how impacts were minimized once the desired site plan was developed. If applicable, discuss construction techniques to be followed during construction to reduce impacts.

Roadway fill slopes are 2:1 to avoid and minimize impacts to adjacent wetlands. Existing bents will be cut at the mud level and no deck drains will be installed on the bridge. The temporary detour completely spans McLendon's Creek.

The 65 ft. midspan is pushing the prestressed girder to its design limits. Pushing the western bent further away from the stream edge would require a longer span and would require a 54 in. prestressed concrete girder. This bridge type would raise the grade and cause additional fill on the roadway approaches, increasing wetland impacts. A steel girder could have been used to increase the midspan and pull the bents out of the stream edge but it would increase the cost of the bridge by 27%.

A preformed scour hole will be constructed to prevent erosion.

NCDOT will implement Best Management Practices for Bridge Demolition and Removal. NCDOT BMP's for the protection of surface waters will be strictly enforced during the construction of this project.

VIII. Mitigation

DWQ - In accordance with 15A NCAC 2H .0500, mitigation may be required by the NC Division of Water Quality for projects involving greater than or equal to one acre of impacts to freshwater wetlands or greater than or equal to 150 linear feet of total impacts to perennial streams.

USACE – In accordance with the Final Notice of Issuance and Modification of Nationwide Permits, published in the Federal Register on January 15, 2002, mitigation will be required when necessary to ensure that adverse effects to the aquatic environment are minimal. Factors including size and type of proposed impact and function and relative value of the impacted

aquatic resource will be considered in determining acceptability of appropriate and practicable mitigation as proposed. Examples of mitigation that may be appropriate and practicable include, but are not limited to: reducing the size of the project; establishing and maintaining wetland and/or upland vegetated buffers to protect open waters such as streams; and replacing losses of aquatic resource functions and values by creating, restoring, enhancing, or preserving similar functions and values, preferable in the same watershed.

If mitigation is required for this project, a copy of the mitigation plan must be attached in order for USACE or DWQ to consider the application complete for processing. Any application lacking a required mitigation plan or NCEEP concurrence shall be placed on hold as incomplete. An applicant may also choose to review the current guidelines for stream restoration in DWQ's Draft Technical Guide for Stream Work in North Carolina (see DWQ website for most current version.).

1. Provide a brief description of the proposed mitigation plan. The description should provide as much information as possible, including, but not limited to: site location (attach directions and/or map, if offsite), affected stream and river basin, type and amount (acreage/linear feet) of mitigation proposed (restoration, enhancement, creation, or preservation), a plan view, preservation mechanism (e.g., deed restrictions, conservation easement, etc.), and a description of the current site conditions and proposed method of construction. Please attach a separate sheet if more space is needed.
   Mitigation is not being proposed for the <0.05 acres of wetland impacts or the 10 square feet of stream impacts. The impacts are minimal and bridge and roadway designs have avoided and minimized to the best extent practicable.

2. Mitigation may also be made by payment into the North Carolina Ecosystem Enhancement Program (NCEEP). Please note it is the applicant's responsibility to contact the NCEEP at (919) 715-0476 to determine availability, and written approval from the NCEEP indicating that they are will to accept payment for the mitigation must be attached to this form. For additional information regarding the application process for the NCEEP, check the NCEEP website at http://www.nceep.net/pages/inlieureplace.htm. If use of the NCEEP is proposed, please check the appropriate box on page five and provide the following information:

   Amount of stream mitigation requested (linear feet): 0
   Amount of buffer mitigation requested (square feet): 0
   Amount of Riparian wetland mitigation requested (acres): 0
   Amount of Non-riparian wetland mitigation requested (acres): 0
   Amount of Coastal wetland mitigation requested (acres): 0

IX. Environmental Documentation (required by DWQ)

1. Does the project involve an expenditure of public (federal/state/local) funds or the use of public (federal/state) land? Yes ☒ No ☐

2. If yes, does the project require preparation of an environmental document pursuant to the requirements of the National or North Carolina Environmental Policy Act (NEPA/SEPA)? Note: If you are not sure whether a NEPA/SEPA document is required, call the SEPA coordinator at (919) 733-5083 to review current thresholds for environmental documentation. Yes ☒ No ☐

3. If yes, has the document review been finalized by the State Clearinghouse? If so, please attach a copy of the NEPA or SEPA final approval letter. Yes ☒ No ☐

X. Proposed Impacts on Riparian and Watershed Buffers (required by DWQ)

It is the applicant's (or agent's) responsibility to determine, delineate and map all impacts to required state and local buffers associated with the project. The applicant must also provide justification for these impacts in Section VII above. All proposed impacts must be listed herein, and must be clearly identifiable on the accompanying site plan. All buffers must be shown on a map, whether or not impacts are proposed to the buffers. Correspondence from the DWQ Regional Office may be included as appropriate. Photographs may also be included at the applicant's discretion.

1. Will the project impact protected riparian buffers identified within 15A NCAC 2B .0233 (Neuse), 15A NCAC 2B .0259 (Tar-Pamlico), 15A NCAC 02B .0243 (Catawba) 15A NCAC 2B .0250 (Randleman Rules and Water Supply Buffer Requirements), or other (please identify_____)? Yes ☐ No ☒

2. If "yes", identify the square feet and acreage of impact to each zone of the riparian buffers. If buffer mitigation is required calculate the required amount of mitigation by applying the buffer multipliers.

Zone*	Impact (square feet)	Multiplier	Required Mitigation
1		3 (2 for Catawba)	
2		1.5	
Total			

* Zone 1 extends out 30 feet perpendicular from the top of the near bank of channel; Zone 2 extends an additional 20 feet from the edge of Zone 1.

3. If buffer mitigation is required, please discuss what type of mitigation is proposed (i.e., Donation of Property, Riparian Buffer Restoration / Enhancement, or Payment into the Riparian Buffer Restoration Fund). Please attach all appropriate information as identified within 15A NCAC 2B .0242 or .0244, or .0260. _____

_____

_____

XI. Stormwater (required by DWQ)

Describe impervious acreage (existing and proposed) versus total acreage on the site. Discuss stormwater controls proposed in order to protect surface waters and wetlands downstream from the property. If percent impervious surface exceeds 20%, please provide calculations demonstrating total proposed impervious level.

XII. Sewage Disposal (required by DWQ)

Clearly detail the ultimate treatment methods and disposition (non-discharge or discharge) of wastewater generated from the proposed project, or available capacity of the subject facility.

XIII. Violations (required by DWQ)

Is this site in violation of DWQ Wetland Rules (15A NCAC 2H .0500) or any Buffer Rules?
Yes ☐ No ☒

Is this an after-the-fact permit application? Yes ☐ No ☒

XIV. Cumulative Impacts (required by DWQ)

Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality? Yes ☐ No ☒
If yes, please submit a qualitative or quantitative cumulative impact analysis in accordance with the most recent North Carolina Division of Water Quality policy posted on our website at http://h2o.enr.state.nc.us/ncwetlands. If no, please provide a short narrative description:

XV. Other Circumstances (Optional):

It is the applicant's responsibility to submit the application sufficiently in advance of desired construction dates to allow processing time for these permits. However, an applicant may choose to list constraints associated with construction or sequencing that may impose limits on work schedules (e.g., draw-down schedules for lakes, dates associated with Endangered and Threatened Species, accessibility problems, or other issues outside of the applicant's control).

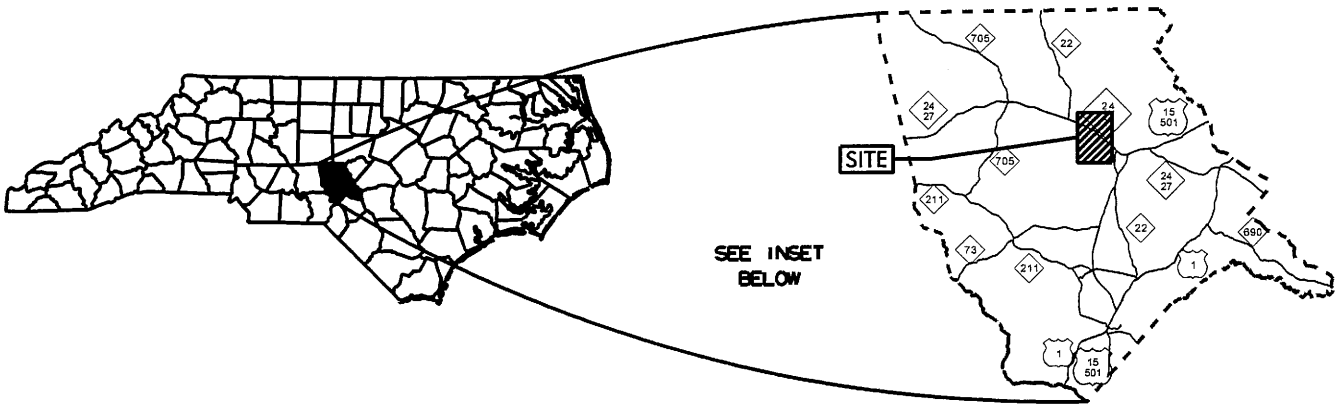
As of January 31, 2008 the United States Fish and Wildlife Service lists four federally protected species for Moore County the Cape Fear shiner, red-cockaded woodpecker, Michaux's sumac, and American chaffseed. No habitat was found for the Cape Fear shiner, red-cockaded wood pecker, or American chaffseed within the project study area. Habitat for Michaux's sumac in the form of maintained roadsides was present. Surveys performed on June 24, 2008 did not yield any individuals. This project

will have no effect on the above mentioned species. No further documentation or concurrence from the USFWS is required.

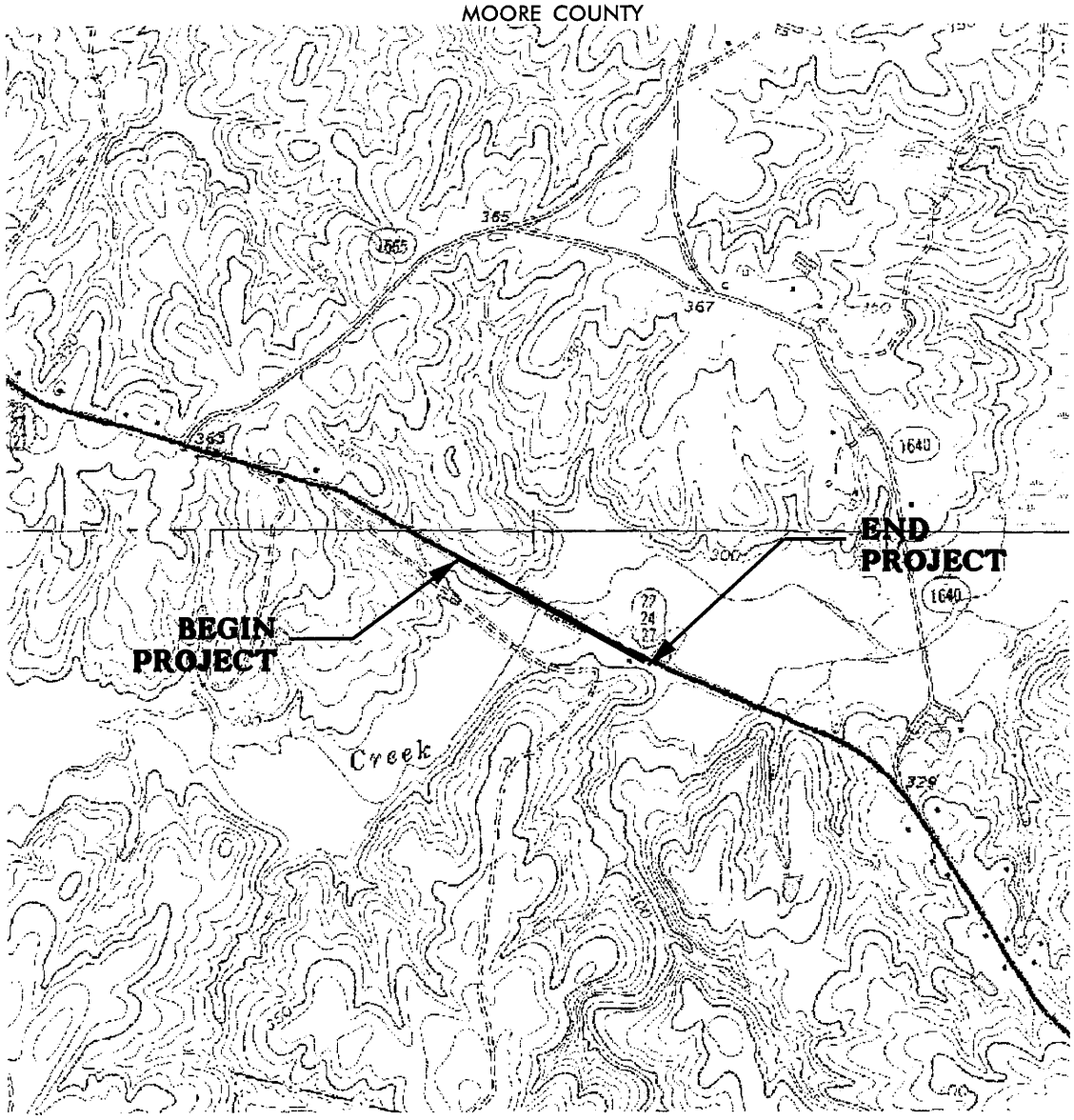
E. L. Lusk 11.4.08

Applicant/Agent's Signature **Date**

(Agent's signature is valid only if an authorization letter from the applicant is provided.)



MOORE COUNTY



WETLAND/STREAM IMPACTS
VICINITY MAP

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

PROJECT: 33554.1.1 (B-4207)
BRIDGE NO. 43 OVER McLENDONS
CREEK ON NC 22/24/27

SHEET 1 OF 11 8/1/08

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
1	JORDAN LUMBER AND SUPPLY	ADDRESSES

WETLAND/ STREAM IMPACTS

NCDOT

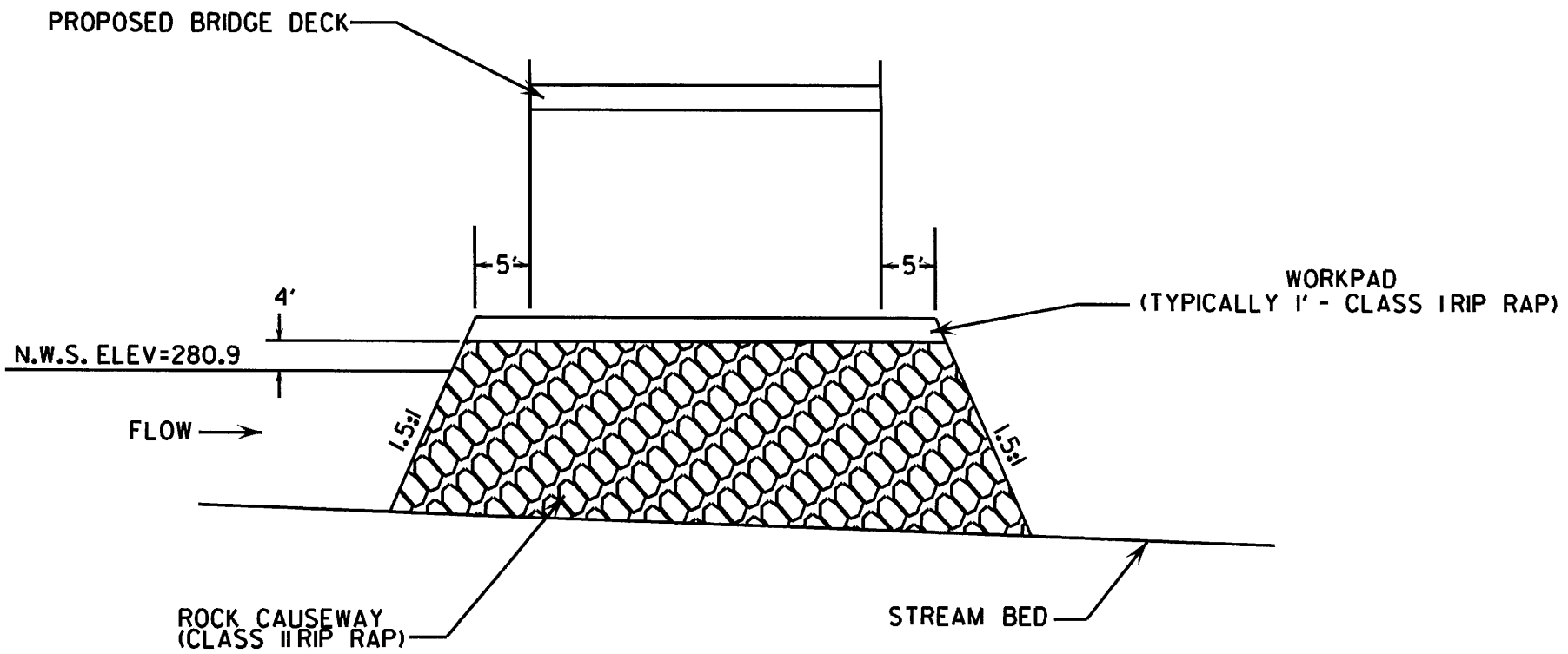
DIVISION OF HIGHWAYS

MOORE COUNTY

PROJECT: 33554.1.1 (B-4207)
BRIDGE NO. 43 OVER McLENDONS CREEK ON NC 22/24/27

8/1/08

WORKPAD DETAIL
(NOT TO SCALE)



QUANTITIES OF ESTIMATES

VOLUME OF CLASS II RIP RAP= 389 yds^3

AREA OF CLASS II RIP RAP= 0.025 ac

Estimate 580 Tons Class II Rip Rap

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

MOORE COUNTY
PROJECT: 33554.1.1 (B-4207)
BIRDGE NO. 43 OVER McLENDONS CREEK ON NC 22/24/27

SHEET 3 **OF** 11 **8/1/08**

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	13+50-L- LT	ROADWAY FILL	<0.01			0.02						
2	17+25 -L- LT	ROADWAY FILL	<0.01			0.01						
	14+70 -L-	TEMP. CAUSEWAY							0.03		75	
TOTALS:			0.01			0.03			0.03		75	

IMPACTS AT PROPOSED PIER = 10 SQ FT

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

MOORE COUNTY
PROJECT: 33554.1.1 (B-4207)

SHEET 4 of 11

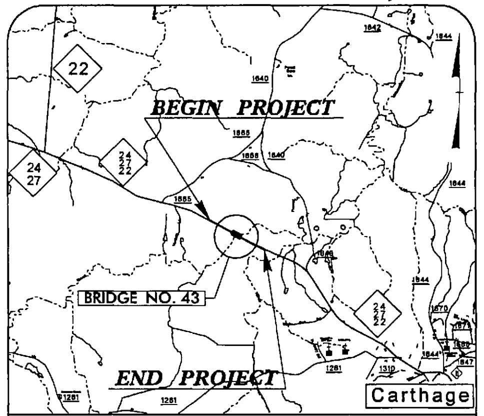
Revised 8/1/2008

ATN Revised 3/31/05

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4207	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
33554.1.1	BRSTP-22 (1)	PE
33554.2.1	BRSTP-22 (1)	R/W & UTIL.

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



VICINITY MAP

(THIS PROJECT IS NOT INCLUDED WITHIN ANY MUNICIPAL BOUNDARIES)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

MOORE COUNTY

LOCATION: BRIDGE NO. 43 OVER MCLENDONS CREEK ON NC 22/24/27

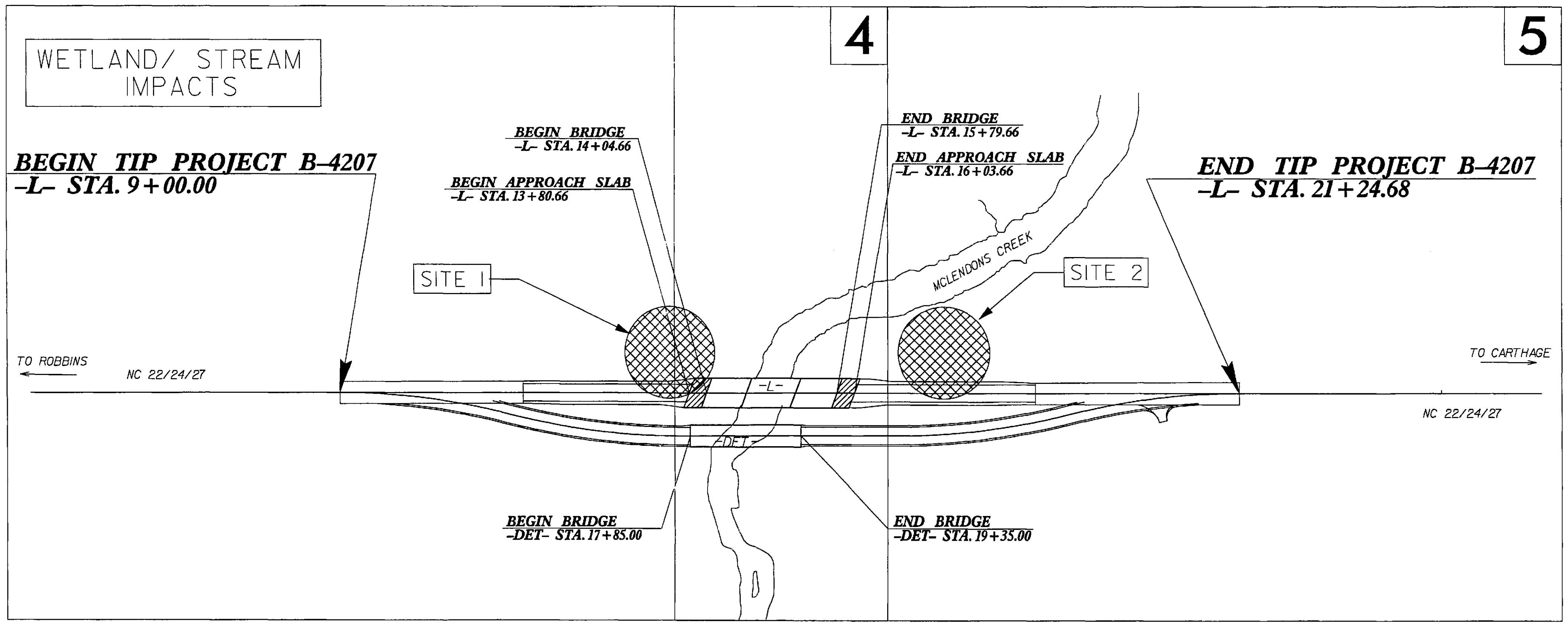
TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

R/W PLANS

Permit Drawing
Sheet 5 of 11

NAD 83/95

TIP PROJECT: B-4207



NCDOT CONTACT : CATHY HOUSER, P.E.
ROADWAY DESIGN-ENGINEERING COORDINATION

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)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2008 = 9,026
ADT 2028 = 15,113
DHV = 10 %
D ≐ 60 %
T = 17 % *
V = 60 MPH
* TTST 11% + DUAL 6%
FUNC. CLASS = RURAL MINOR ARTERIAL

PROJECT LENGTH

Length Structure TIP Project B-4207 = 0.033 Miles
Length Roadway TIP Project B-4207 = 0.199 Miles
Total Length TIP Project B-4207 = 0.232 Miles

Prepared in the Office of:
THE LPA GROUP TRANSPORTATION CONSULTANTS
THE LPA GROUP of North Carolina, p.a.
5000 Falls of Neuse Rd., Suite 304
Raleigh, North Carolina 27609

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MAY 16, 2008

LETTING DATE:
MAY 19, 2009

Jeanne K. Richter P.E.
PROJECT ENGINEER

Jody L. Cole
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

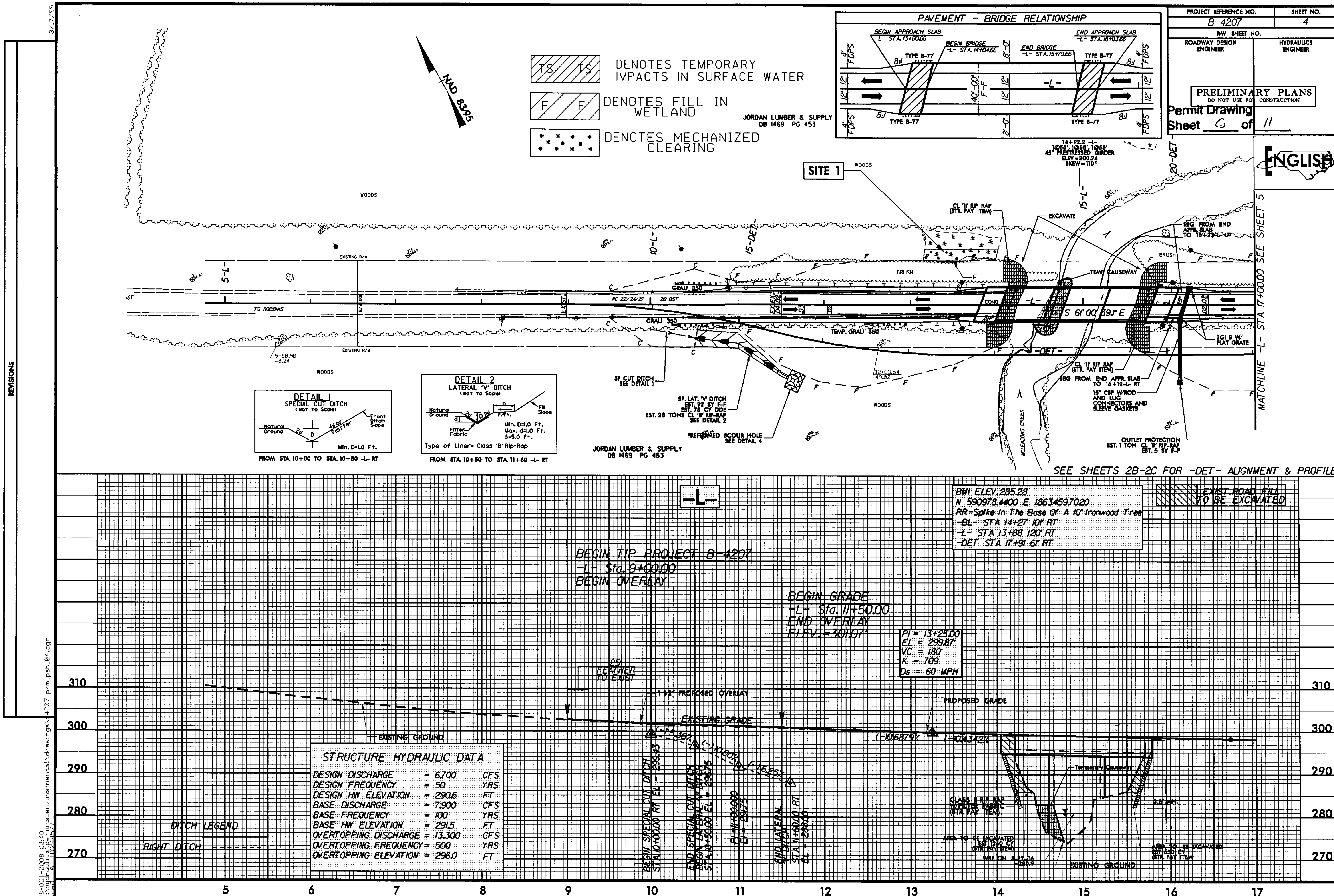
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY DESIGN ENGINEER P.E.

CONTRACT:

09/08/99

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$



PROJECT REFERENCE NO. B-4207
SHEET NO. 4
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Permit Drawing
Sheet 6 of 11
ENGLISH
PAVEMENT - BRIDGE RELATIONSHIP
BEGIN APPROACH SLAB -L- STA. 13+80.66
BEGIN BRIDGE -L- STA. 14+04.66
END BRIDGE -L- STA. 15+79.66
END APPROACH SLAB -L- STA. 16+03.66
TYPE B-77
14+92.2 -L-
1@55', 1@65', 1@55'
45" PRESTRESSED GIRDER
ELEV = 300.24
SKEW = 110°
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
NAD 83/95
JORDAN LUMBER & SUPPLY DB 1469 PG 453
SITE 1
WOODS
BRUSH
CL 'II' RIP RAP (STR. PAY ITEM)
EXCAVATE
TEMP. CAUSEWAY
S 61°00'59.1" E
TEMP. GRAU 350
SBG FROM END APPR. SLAB TO 16+12-L- RT
15" CSP W/ROD AND LUG CONNECTORS AND SLEEVE GASKETS
2GI-B W/ FLAT GRATE
OUTLET PROTECTION EST. 1 TON CL 'B' RIP-RAP EST. 5 SY F-F
SP. CUT DITCH SEE DETAIL 1
SP. LAT. 'V' DITCH EST. 92 SY F-F EST. 78 CY DDE EST. 28 TONS CL 'B' RIP-RAP SEE DETAIL 2
PREFORMED SCOUR HOLE SEE DETAIL 4
MCLENDONS CREEK
MATCHLINE -L- STA 17+00.00 SEE SHEET 5
SEE SHEETS 2B-2C FOR -DET- ALIGNMENT & PROFILE
DETAIL 1 SPECIAL CUT DITCH (Not to Scale)
Min. D=1.0 Ft.
FROM STA. 10+00 TO STA. 10+50 -L- RT
DETAIL 2 LATERAL 'V' DITCH (Not to Scale)
Min. D=1.0 Ft. Max. d=1.0 Ft. B=5.0 Ft.
Type of Liner= Class 'B' Rip-Rap
FROM STA. 10+50 TO STA. 11+60 -L- RT
-L-
BM1 ELEV. 285.28
N 590978.4400 E 1863459.7020
RR-Spike In The Base Of A 10" Ironwood Tree
-BL- STA 14+27 101' RT
-L- STA 13+88 120' RT
-DET STA 17+91 61' RT
EXIST ROAD FILL TO BE EXCAVATED
BEGIN TIP PROJECT B-4207
-L- Sta. 9+00.00
BEGIN OVERLAY
BEGIN GRADE
-L- Sta. 11+50.00
END OVERLAY
ELEV. = 301.07'
PI = 13+25.00
EL = 299.87'
VC = 180'
K = 709
Ds = 60 MPH
25' FEATHER TO EXIST
1 1/2" PROPOSED OVERLAY
PROPOSED GRADE
EXISTING GRADE
EXISTING GROUND
(-)0.6879%
(-)0.4342%
STRUCTURE HYDRAULIC DATA
DESIGN DISCHARGE = 6,700 CFS
DESIGN FREQUENCY = 50 YRS
DESIGN HW ELEVATION = 290.6 FT
BASE DISCHARGE = 7,900 CFS
BASE FREQUENCY = 100 YRS
BASE HW ELEVATION = 291.5 FT
OVERTOPPING DISCHARGE = 13,300 CFS
OVERTOPPING FREQUENCY = 500 YRS
OVERTOPPING ELEVATION = 296.0 FT
DITCH LEGEND
RIGHT DITCH
Temporary Causeway
CLASS B RIP RAP W/FILTER FABRIC (STR. PAY ITEM)
AREA TO BE EXCAVATED
310
300
290
280
270
5 6 7 8 9 10 11 12 13 14 15 16 17
REVISIONS
28-OCT-2008 08:40

PROJECT REFERENCE NO.	SHEET NO.
B-4207	4

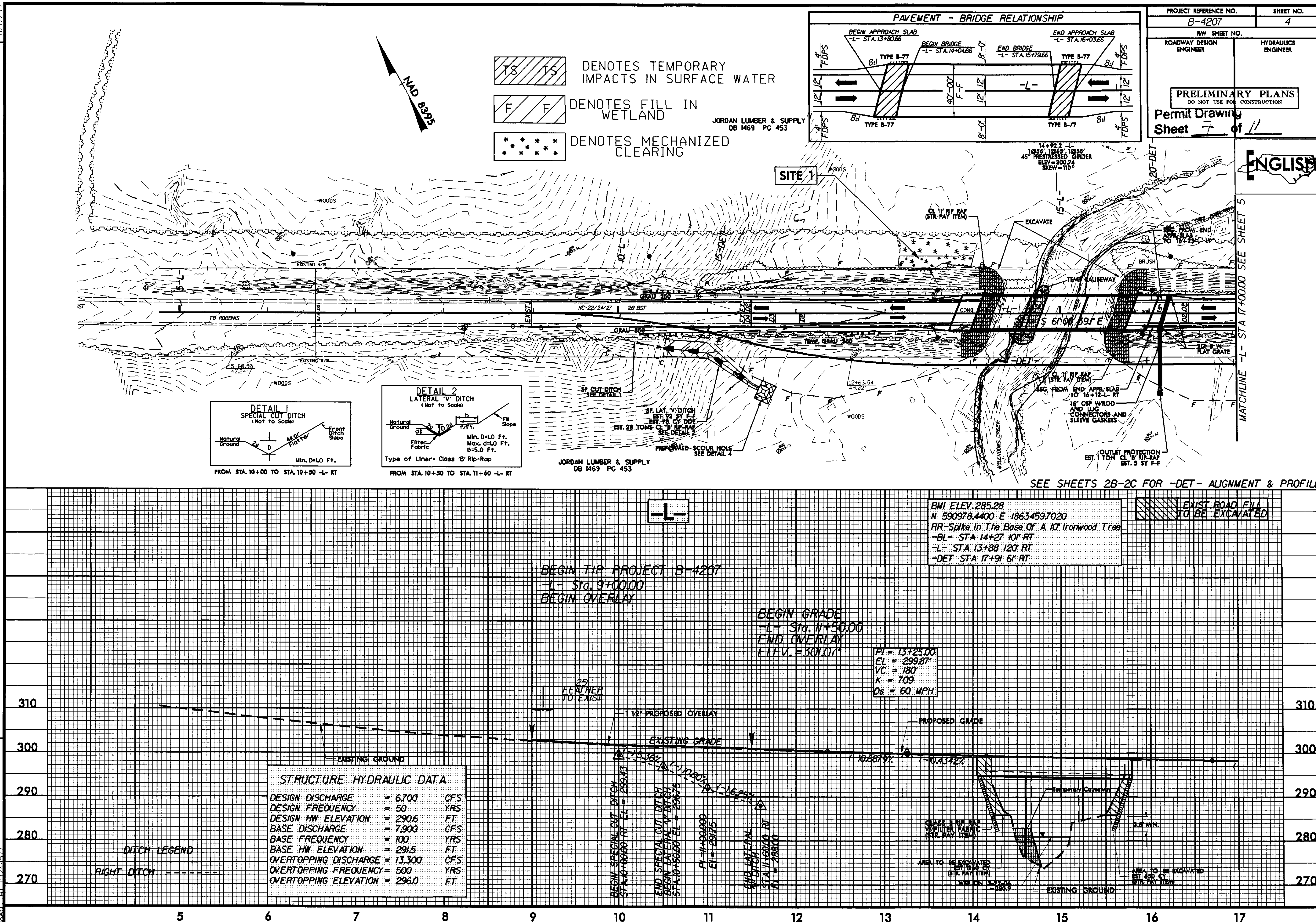
R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 7 of 11



ENGLISH
NAD 83/95
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
F F DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
PAVEMENT - BRIDGE RELATIONSHIP
BEGIN APPROACH SLAB -L- STA. 13+80.66
BEGIN BRIDGE -L- STA. 14+04.66
END BRIDGE -L- STA. 15+79.66
END APPROACH SLAB -L- STA. 16+03.66
TYPE B-77
JORDAN LUMBER & SUPPLY DB 1469 PG 453
SITE 1
WOODS
14+92.2 -L- 1@55', 1@65', 1@55' 45" PRESTRESSED GIRDER ELEV = 300.24 SKEW = 110°
CL 'II' RIP RAP (STR. PAY ITEM)
EXCAVATE
TEMP. CAUSEWAY
TEMP. GRAU 350
SP CUT DITCH SEE DETAIL 1
SP. LAT. 'V' DITCH EST. 92 SY F-F EST. 76 CY DDE EST. 28 TONS CL 'B' RIP-RAP SEE DETAIL 2
PREFORMED SCOUR HOLE SEE DETAIL 4
DETAIL 1 SPECIAL CUT DITCH (Not to Scale)
Natural Ground
Front Ditch Slope
Min. D=1.0 Ft.
FROM STA. 10+00 TO STA. 10+50 -L- RT
DETAIL 2 LATERAL 'V' DITCH (Not to Scale)
Natural Ground
Fill Slope
Filter Fabric
Min. D=1.0 Ft. Max. d=1.0 Ft. B=5.0 Ft.
Type of Liner= Class 'B' Rip-Rap
FROM STA. 10+50 TO STA. 11+60 -L- RT
18" CSP W/ROD AND LUG CONNECTORS AND SLEEVE GASKETS
OUTLET PROTECTION EST. 1 TON CL 'B' RIP-RAP EST. 5 SY F-F
MATCHLINE -L- STA 17+00.00 SEE SHEET 5
SEE SHEETS 2B-2C FOR -DET- ALIGNMENT & PROFILE
-L-
BM1 ELEV. 285.28
N 590978.4400 E 1863459.7020
RR-Spike In The Base Of A 10" Ironwood Tree
-BL- STA 14+27 101' RT
-L- STA 13+88 120' RT
-DET STA 17+91 61' RT
EXIST ROAD FILL TO BE EXCAVATED
BEGIN TIP PROJECT B-4207
-L- Sta. 9+00.00
BEGIN OVERLAY
BEGIN GRADE
-L- Sta. 11+50.00
END OVERLAY
ELEV. =301.07'
PI = 13+25.00
EL = 299.87'
VC = 180'
K = 709
Ds = 60 MPH
25' FEATHER TO EXIST
1 1/2" PROPOSED OVERLAY
PROPOSED GRADE
EXISTING GRADE
EXISTING GROUND
(-)0.6879%
(-)0.4342%
Temporary Causeway
DITCH LEGEND
RIGHT DITCH
310
300
290
280
270
5
6
7
8
9
10
11
12
13
14
15
16
17

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	=	6,700	CFS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	290.6	FT
BASE DISCHARGE	=	7,900	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	291.5	FT
OVERTOPPING DISCHARGE	=	13,300	CFS
OVERTOPPING FREQUENCY	=	500	YRS
OVERTOPPING ELEVATION	=	296.0	FT

REVISIONS

8/17/99

28-OCT-2008 08:42
r:\hydraulics\permits_environmental\drawings\b4207_prm_psh_04.dgn

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-4207	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 8 **of** 11

ENGLISH

SEE SHEETS 2B-2C FOR -DET- ALIGNMENT & PROFILE

$$$$SYSTIME$$$$
$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-4207	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 9 **of** 11

ENGLISH

8/17/99

REVISIONS

SEE SHEETS 2B-2C FOR -DET- ALIGNMENT & PROFILE

$$$$$$SYSTIME$$$$
$$$$$USERNAME$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
B-4207	X-5

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

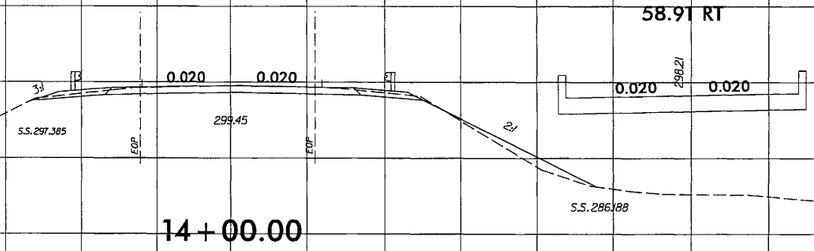
Permit Drawing
Sheet 10 of 11

SITE 1

FILL IN WETLAND

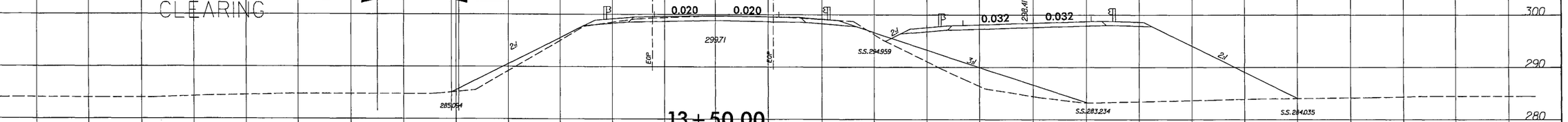
MECHANIZED CLEARING

–DET– 18+03.15
58.91 RT



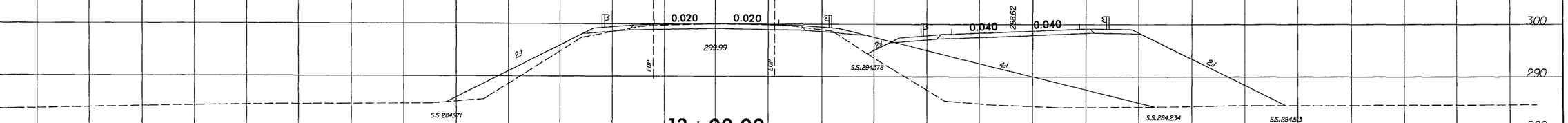
14+00.00

–DET– 17+53.15
58.90 RT



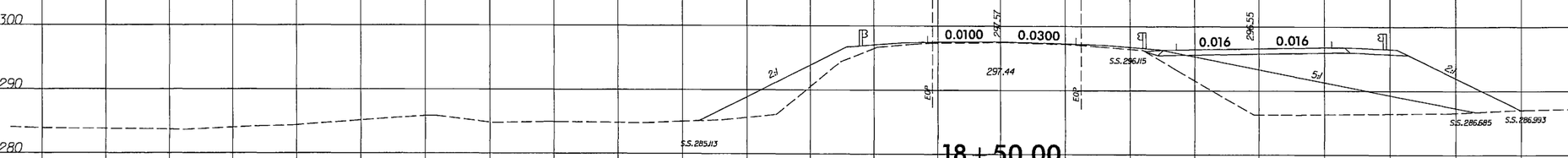
13+50.00

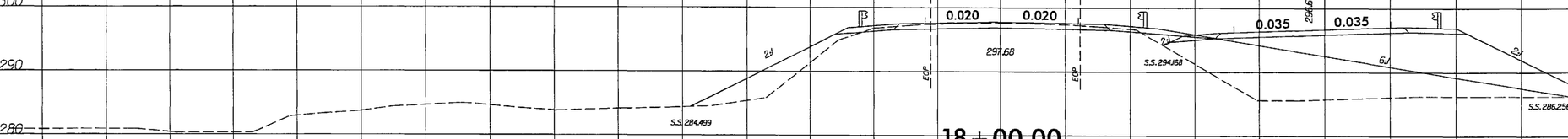
–DET– 17+02.23
56.73 RT

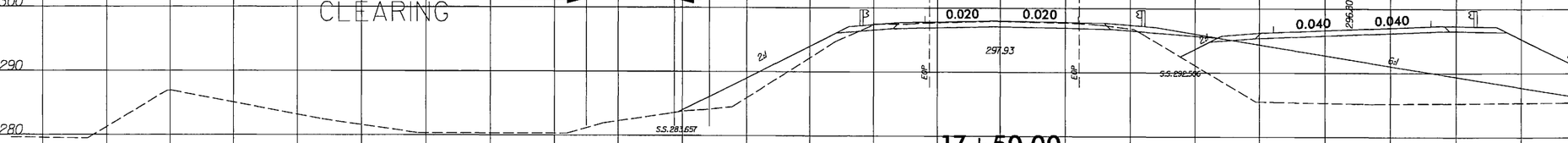


13+00.00

$$$$$$$SYSTIME$$$$$$$
$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$







8/23/99

PROJ. REFERENCE NO.	SHEET NO.
B-4207	X-8

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

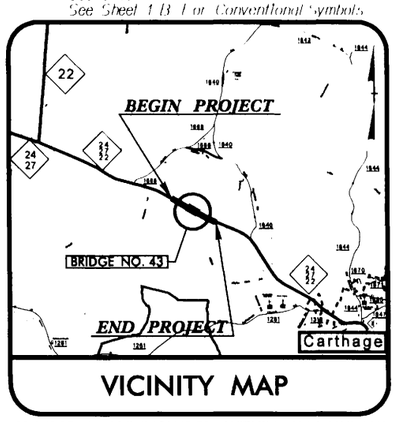
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 11 of 11

TIP PROJECT: B-4207

CONTRACT:

See Sheet 1A for Index of Sheets
See Sheet 1B for Conventional Symbols



VICINITY MAP

(THIS PROJECT IS NOT INCLUDED WITHIN ANY MUNICIPAL BOUNDARIES)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

MOORE COUNTY

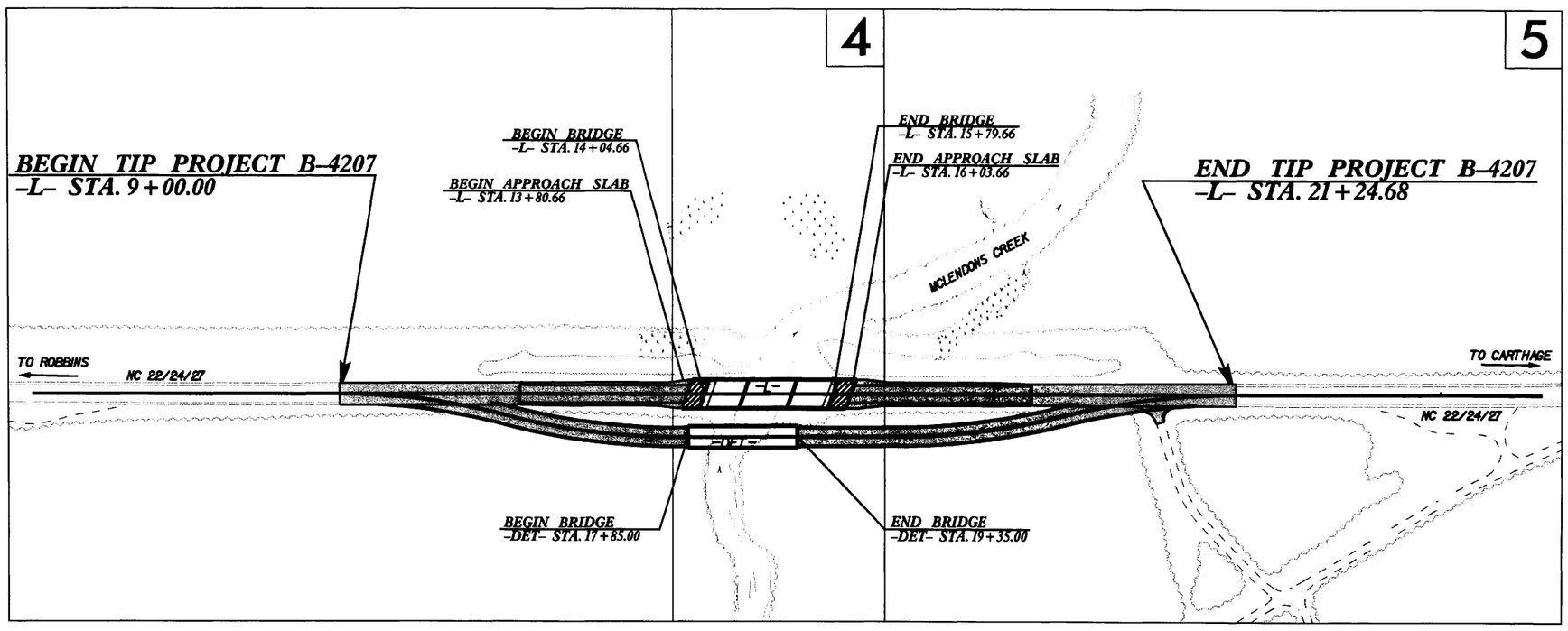
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4207	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33554.1.1	BRSTP-22 (1)	PE
33554.2.1	BRSTP-22 (1)	R/W & UTIL.

R/W PLANS

LOCATION: BRIDGE NO. 43 OVER MCLENDONS CREEK ON NC 22/24/27

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE



NCDOT CONTACT : CATHY HOUSER, P.E.
ROADWAY DESIGN-ENGINEERING COORDINATION

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)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2008 = 9,026
ADT 2028 = 15,113
DHV = 10 %
D ÷ 60 %
T = 17 % *
V = 60 MPH
* TTST 11% + DUAL 6%
FUNC. CLASS = RURAL MINOR ARTERIAL

PROJECT LENGTH

Length Structure TIP Project B-4207 = 0.033 Miles
Length Roadway TIP Project B-4207 = 0.199 Miles
Total Length TIP Project B-4207 = 0.232 Miles

Prepared in the Office of:
THE LPA GROUP TRANSPORTATION CONSULTANTS
THE LPA GROUP of North Carolina, p.a.
5000 Falls of Neuse Rd., Suite 304
Raleigh, North Carolina 27609

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MAY 16, 2008

LETTING DATE: MAY 19, 2009

Jeanne K. Richter P.E.
PROJECT ENGINEER

Jody L. Cole
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

PROJECT REFERENCE NO.	SHEET NO.
B-4207	1-B

Note: Not to Scale

****S.U.E. = Subsurface Utility Engineering***

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream — JS
- Buffer Zone 1 — BZ 1
- Buffer Zone 2 — BZ 2
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

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

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line
- Proposed Right of Way Line with Iron Pin and Cap Marker
- Proposed Right of Way Line with Concrete or Granite Marker
- Existing Control of Access
- Proposed Control of Access
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Utility Easement — PUE

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Wheel Chair Ramp — WCR
- Proposed Wheel Chair Ramp Curb Cut — WCC
- Curb Cut for Future Wheel Chair Ramp — CCFR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole — HH
- H-Frame Pole
- Recorded U/G Power Line — P
- Designated U/G Power Line (S.U.E.*) — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Booth
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- Recorded U/G Telephone Cable — T
- Designated U/G Telephone Cable (S.U.E.*) — T
- Recorded U/G Telephone Conduit — TC
- Designated U/G Telephone Conduit (S.U.E.*) — TC
- Recorded U/G Fiber Optics Cable — T FO
- Designated U/G Fiber Optics Cable (S.U.E.*) — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- Recorded U/G Water Line — W
- Designated U/G Water Line (S.U.E.*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Satellite Dish
- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- Recorded U/G TV Cable — TV
- Designated U/G TV Cable (S.U.E.*) — TV
- Recorded U/G Fiber Optic Cable — TV FO
- Designated U/G Fiber Optic Cable (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- Recorded U/G Gas Line — G
- Designated U/G Gas Line (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- Recorded SS Forced Main Line — FSS
- Designated SS Forced Main Line (S.U.E.*) — FSS

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line — ?UTL
- U/G Tank; Water, Gas, Oil
- A/G Tank; Water, Gas, Oil
- U/G Test Hole (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

PROJECT REFERENCE NO.	SHEET NO.
B4207	1C
Location and Surveys	

SURVEY CONTROL SHEET B4207

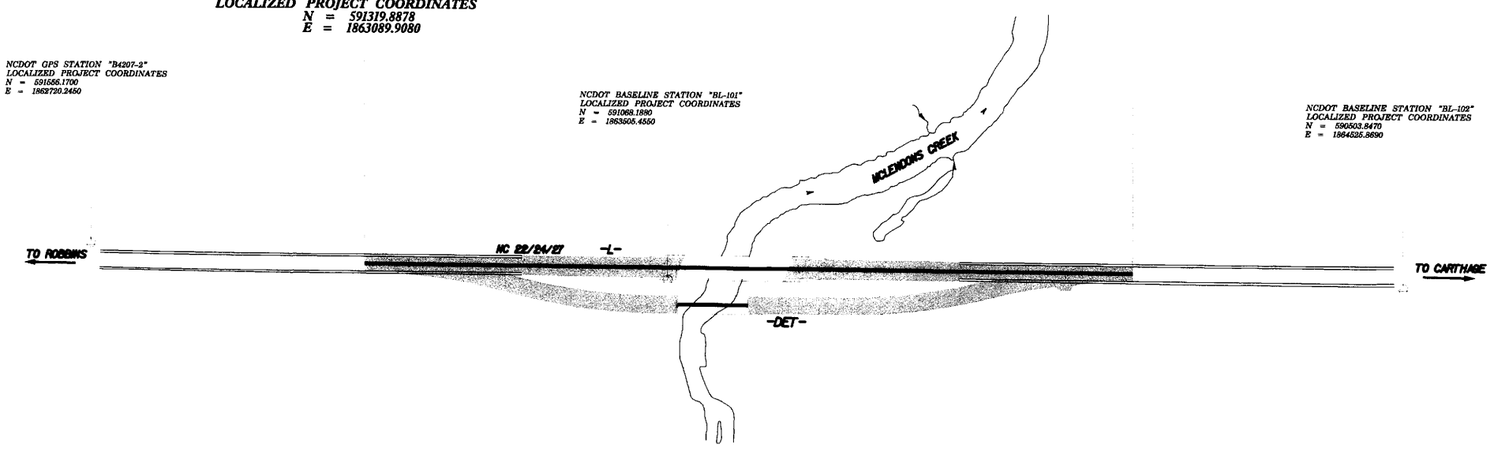
-L- STA. 9+00.00 BEGIN TIP PROJECT B-4207
LOCALIZED PROJECT COORDINATES
N = 591319.8878
E = 1863089.9080

-L- STA. 21+24.68 END TIP PROJECT B-4207
LOCALIZED PROJECT COORDINATES
N = 590726.3543
E = 1864161.1498

NCDOT GPS STATION "B4207-2"
LOCALIZED PROJECT COORDINATES
N = 591556.1700
E = 1862720.2450

NCDOT BASELINE STATION "BL-101"
LOCALIZED PROJECT COORDINATES
N = 591068.1880
E = 1863505.4550

NCDOT BASELINE STATION "BL-102"
LOCALIZED PROJECT COORDINATES
N = 590503.8470
E = 1864525.8690



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4207-2"
WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 591556.1700(ft) EASTING: 1862720.2450(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999864280
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4207-2" TO -L- STATION 9+00.00 IS S 57 24 50.4 E 438.725'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTES:

1. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:*
   HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

   THE FILES TO BE FOUND ARE AS FOLLOWS:
   B4207_LS_CONTROL_070314.HTML

   SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

∴ *INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.*
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION

NOTE: DRAWING NOT TO SCALE

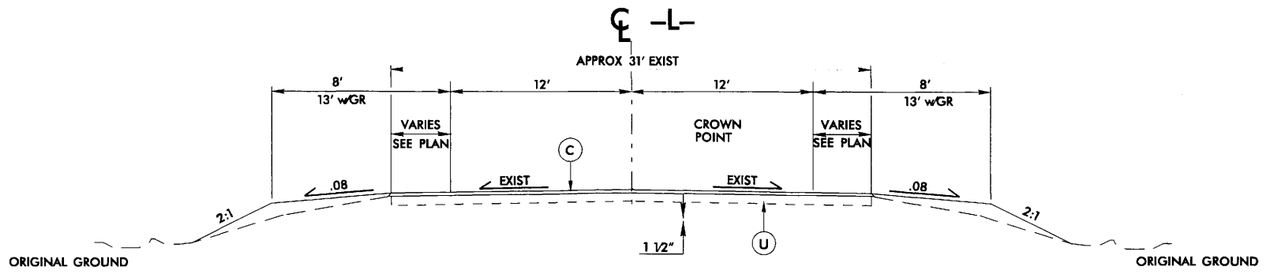
PROJECT REFERENCE NO.	SHEET NO.
B-4207	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PAVEMENT SCHEDULE

C	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN ONE LAYER.	D1	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	P	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YD.
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	T	EARTH MATERIAL
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	E1	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.	U	EXISTING PAVEMENT
D	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	J	PROP. 10" AGGREGATE BASE COURSE.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET 2A)

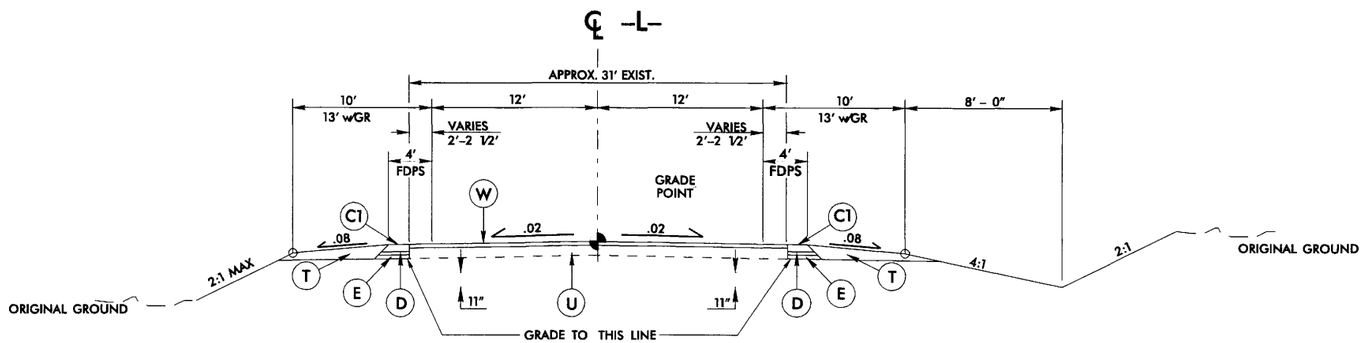
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



TYPICAL SECTION NO. 1

-L- STA. 9+00.00 TO STA. 11+50.00
-L- STA. 18+50.00 TO STA. 21+24.68

NOTE: OVERLAY EXISTING PAVEMENT AND GRADE SHOULDERS FOR GUARDRAIL PLACEMENT. SEE PLAN FOR LOCATIONS.



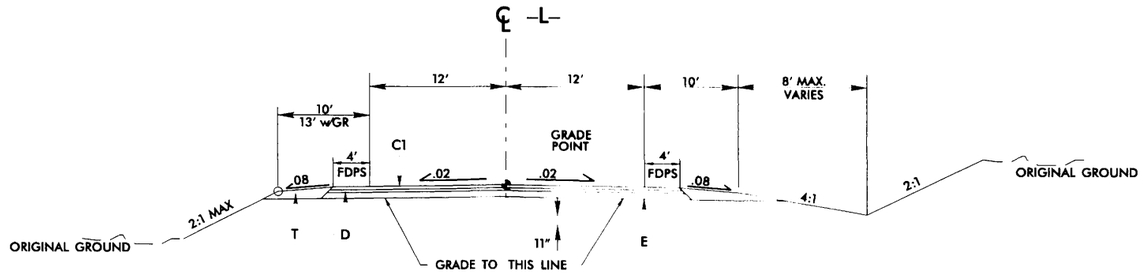
TYPICAL SECTION NO. 2

-L- STA. 11+50.00 TO STA. 12+58.00
-L- STA. 17+69.00 TO STA. 18+50.00

PAVEMENT SCHEDULE	
C	1½" S9.5C
C1	3" S9.5C
C2	VAR. S9.5C
D	4" I19.0C
D1	VAR. I19.0C
E	4" B25.0C
E1	VAR. B25.0C
J	10" ABC
P	.35 PRIME COAT
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING

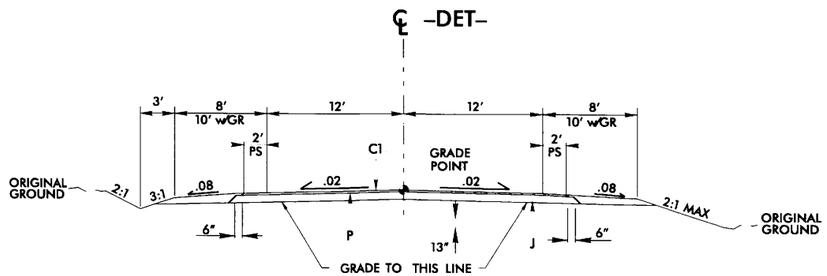
PROJECT REFERENCE NO.	SHEET NO.
B-4207	2A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



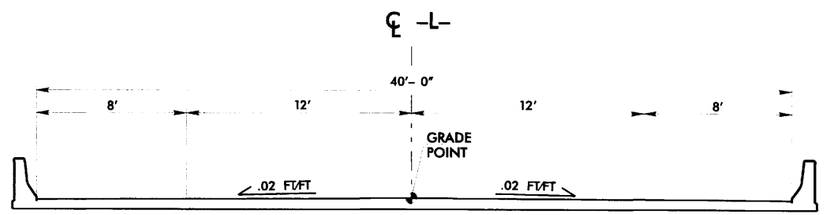
TYPICAL SECTION NO. 3

-L- STA. 12+58.00 TO STA. 13+80.66 (BEGIN APPROACH SLAB)
-L- STA. 16+03.66 (END APPROACH SLAB) TO STA. 17+69.00



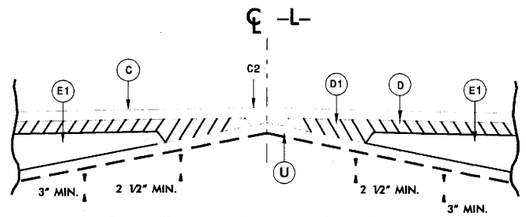
TYPICAL SECTION NO. 4

-DET- STA. 14+45.45 TO STA. 17+85.00 (BEGIN BRIDGE)
-DET- STA. 19+35.00 (END BRIDGE) TO STA. 23+83.08



TYPICAL BRIDGE SECTION NO. 5

-L- STA. 14+04.66 (BEGIN BRIDGE) TO STA. 15+79.66 (END BRIDGE)



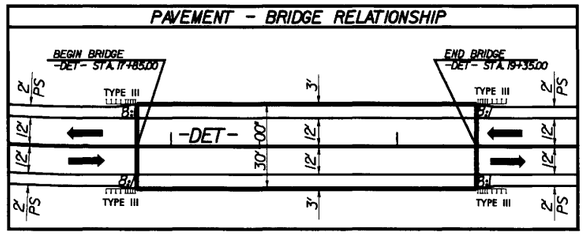
Detail Showing Method of Wedging

PROJECT REFERENCE NO.	SHEET NO.
B-4207	2B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

PAVEMENT - BRIDGE RELATIONSHIP



NAD 83/95

BEGIN CONSTRUCTION
-DET- PCSta. 12+98.13 =
-L- POT Sta. 9+00.00

JORDAN LUMBER & SUPPLY
DB 1469 PG 453

-DET-
PI Sta 16+51.38
Δ = 14° 38' 03.6" (LT)
D = 6° 11' 14.8"
L = 236.52'
T = 118.91'
R = 926.00'
DS = 50 MPH
e(max) = 0.04

-DET- PT Sta. 17+68.99
-DET- PRC Sta. 15+32.48

B4207-2
-BL- POT 5+00.00

-L- POT Sta. 4+77.42

S 61° 00' 39.1" E

S 61° 08' 42.7" E

S 61° 00' 39.1" E

-DET-
PI Sta 14+15.93
Δ = 14° 30' 00.0" (RT)
D = 6° 11' 14.8"
L = 234.35'
T = 117.80'
R = 926.00'
DS = 50 MPH
e(max) = 0.04

JORDAN LUMBER & SUPPLY
DB 1469 PG 453

DETAIL 3
TOE PROTECTION
(Not to Scale)
24' OR FLATTER
Fill Slope
d
Filter Fabric
d=1.0 Ft.
Type of Liner= Class 'B' Rip-Rap
FROM STA. 14+80 TO STA. 15+70 -DET- RT

TOE PROTECTION
EST. 77 SY F-F
EST. 23 TONS CL 'B' RIP-RAP
SEE DETAIL 3

-BL-101 PINC 14+24.49 =
-L- Sta. 13+85.47' (18.77' RT)
-DET- Sta. 17+88.68 (40.17' LT)

BMI

MATCHLINE -DET- STA. 20+00.00 SEE SHEET 2C

SEE SHEETS 4-5 FOR -L- ALIGNMENT & PROFILE

-DET-

BMI ELEV. 285.28
N 590978.4400 E 1863459.7020
RR-Spike In The Base Of A 10" Ironwood Tree
-BL- STA 14+27 10' RT
-L- STA 13+88 120' RT
-DET STA 17+91 6' RT

BEGIN GRADE
-DET- Sta. 14+45.45
ELEV. = 301.08

PI = 16+50.00
EL = 298.83'
VC = 100'
K = 143
Ds = 50 MPH

(-)1.009%
(-)0.4025%

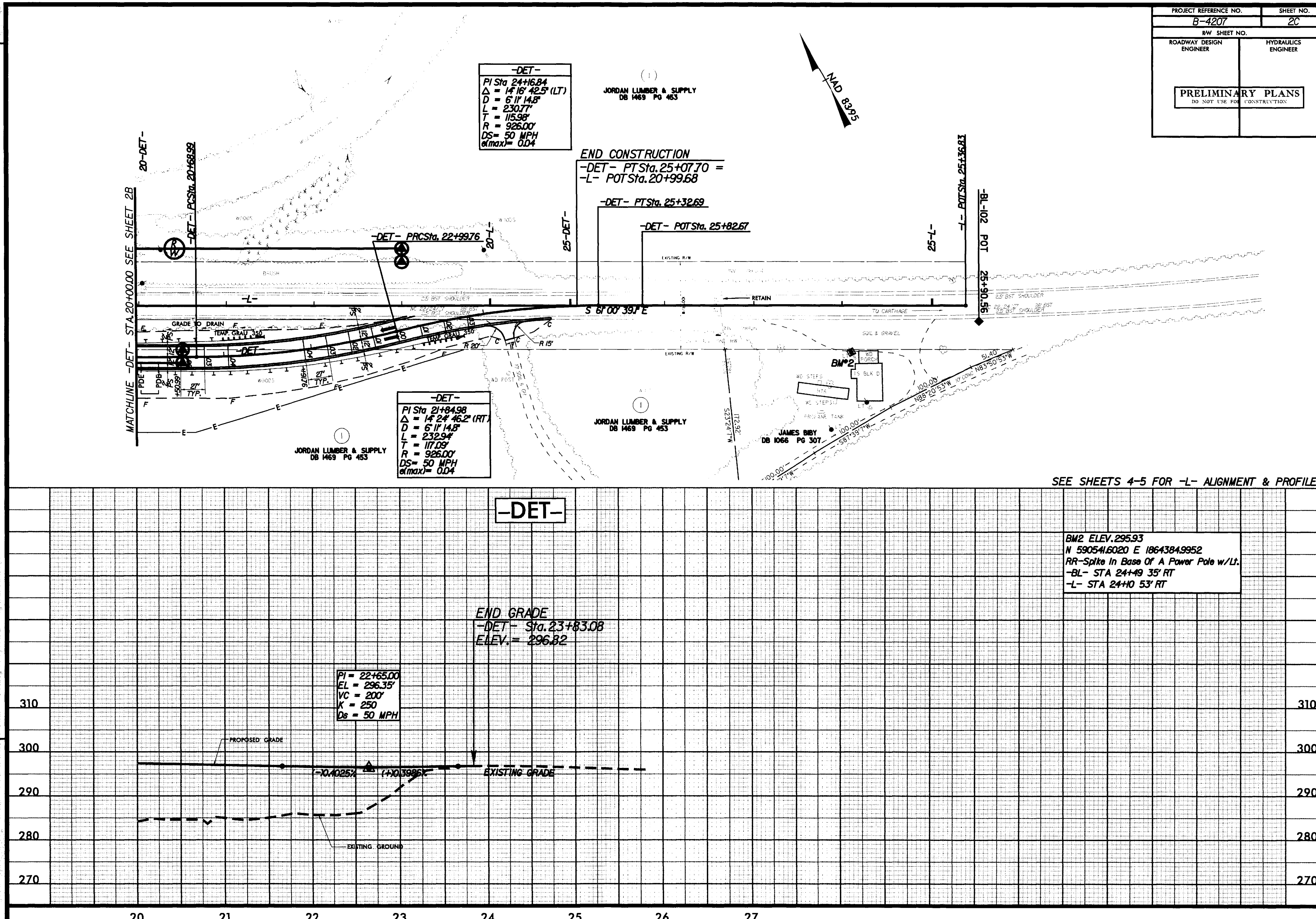
EXISTING GRADE
EXISTING GROUND
PROPOSED GRADE
PROPOSED TEMP DETOUR STRUCTURE
CL STA. 18+60 -DET-
ELEV. = 297.98
SKEW = 90°
OAL = 150'
WSE ON 4-22-06 = 280.27

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 6,700	CFS
DESIGN FREQUENCY	= 5	YRS
DESIGN HW ELEVATION	= 287.2	FT
BASE DISCHARGE	= 7,900	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 294.1	FT
OVERTOPPING DISCHARGE	= N/A	CFS
OVERTOPPING FREQUENCY	= N/A	YRS
OVERTOPPING ELEVATION	= N/A	FT

310 300 290 280 270

10 11 12 13 14 15 16 17 18 19 20


PROJECT REFERENCE NO. B-4207
SHEET NO. 2C
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
REVISIONS
NAD 83
-DET-
PI Sta 24+16.84
Δ = 14° 16' 42.5" (LT)
D = 6° 11' 14.8"
L = 230.77'
T = 115.98'
R = 926.00'
DS= 50 MPH
e(max)= 0.04
JORDAN LUMBER & SUPPLY
DB 1469 PG 453
END CONSTRUCTION
-DET- PT Sta. 25+07.70 =
-L- POT Sta. 20+99.68
-DET- PT Sta. 25+32.69
-DET- POT Sta. 25+82.67
-L- POT Sta. 25+36.83
-BL-102 POT 25+90.56
MATCHLINE -DET- STA.20+00.00 SEE SHEET 2B
-DET- PC Sta. 20+68.99
-DET- PRC Sta. 22+99.76
20-DET-
25-DET-
20-L-
25-L-
S 61° 00' 39.1" E
EXISTING R/W
RETAIN
TO CARTHAGE
GRADE TO DRAIN
TEMP. GRAU 350
TYP.
-DET-
PI Sta 21+84.98
Δ = 14° 24' 46.2" (RT)
D = 6° 11' 14.8"
L = 232.94'
T = 117.09'
R = 926.00'
DS= 50 MPH
e(max)= 0.04
BM#2
JAMES BIBY
DB 1066 PG 307
SEE SHEETS 4-5 FOR -L- ALIGNMENT & PROFILE
-DET-
BM2 ELEV.295.93
N 590541.6020 E 1864384.9952
RR-Spike In Base Of A Power Pole w/Lt.
-BL- STA 24+49 35' RT
-L- STA 24+10 53' RT
END GRADE
-DET- Sta. 23+83.08
ELEV.= 296.82
PI = 22+65.00
EL = 296.35'
VC = 200'
K = 250
Ds = 50 MPH
PROPOSED GRADE
(-)0.4025%
(+)0.3986%
EXISTING GRADE
EXISTING GROUND
310
300
290
280
270
20
21
22
23
24
25
26
27

COMPUTED BY: JLC DATE: 05/15/08
CHECKED BY: PEA DATE: 05/15/08

PROJECT REFERENCE NO.	SHEET NO.
B-4207	3A

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + 20%	BORROW	WASTE
PHASE I					
–DET– 14 + 00.00 TO	195		7,539	7,344	
17 + 85.00 (BEGIN BRIDGE)					
–DET– 19 + 35.00 (END BRIDGE) TO	76		10,273	10,197	
24 + 50.00					
SUBTOTAL	271		17,812	17,541	
PHASE II					
–L– 9 + 50.00 TO	466		3,253	2,787	
14 + 04.66 (BEGIN BRIDGE)					
–L– 15 + 79.66 (END BRIDGE) TO	321		4,859	4,538	
20 + 50.00					
SUBTOTAL	787		8,112	7,325	
PHASE III (–L– /W–DET– REMOVAL)					
–L– 10 + 00.00 TO	4,394				4,394
13 + 81.88 (BEGIN BRIDGE)					
–L– 15 + 31.88 (END BRIDGE) TO	5,752				5,752
20 + 50.00					
SUBTOTAL	10,146				10,146
LOSS DUE TO CLEARING AND GRUBBING	–25			25	
PROJECT TOTALS	11,179		25,924	24,891	10,146
EST. 5% FOR REPLACING					
TOPSOIL ON ON BORROW PIT				1,245	
GRAND TOTALS	11,179			26,136	10,146
SAY	11,200			26,200	

EST. DDE = 78 C.Y.
EST. SELECT GRANULAR MATERIAL = 1250 C.Y.
EST. UNDERCUT EXCAVATION = 1600 C.Y.
EST. CLASS IV SUBGRADE STABILIZATION = 620 TONS

NOTE: Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

NOTE: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Fine Grading, Clearing and Grubbing and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

PROJECT REFERENCE NO.	SHEET NO.
B-4207	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

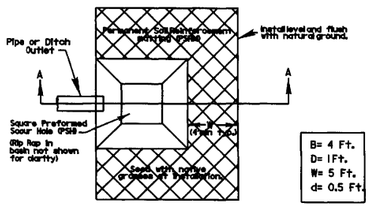
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

DETAIL 4

PREFORMED SCOUR HOLE

PLAN VIEW

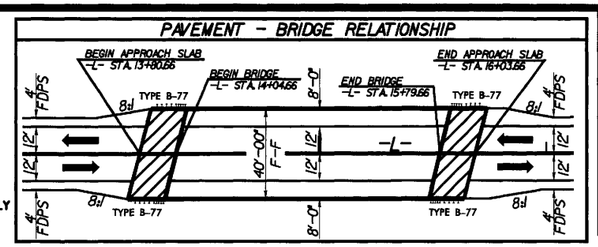


B= 4 Ft.
D= 1 Ft.
W= 5 Ft.
d= 0.5 Ft.

SECTION A-A

5/05

PAVEMENT - BRIDGE RELATIONSHIP

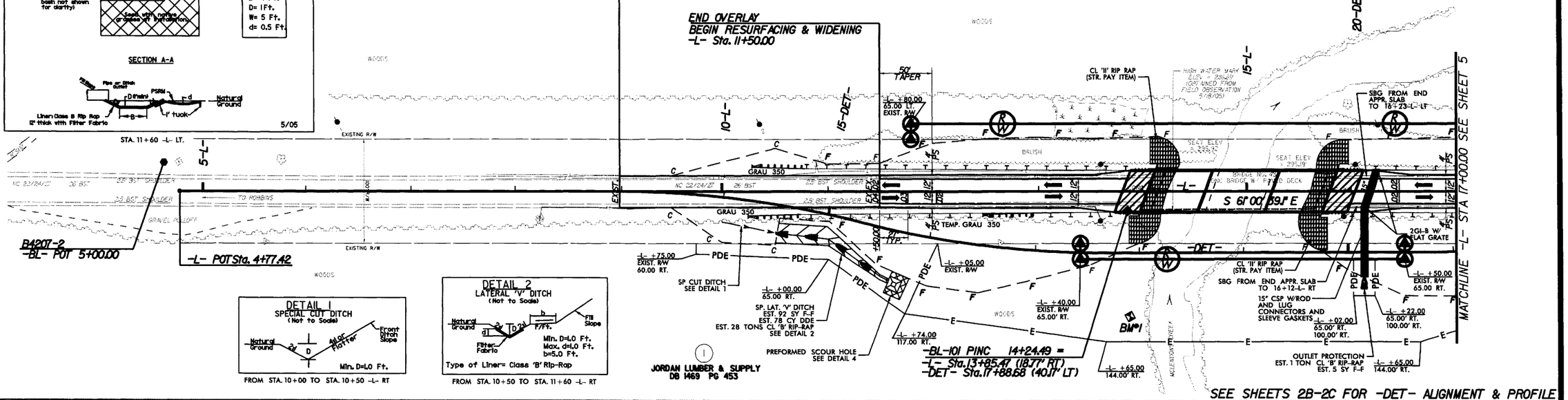


NAD 8395

BEGIN TIP PROJECT B-4207
-L- POT Sta. 9+00.00 =
-DET- PC Sta. 12+98.13

(1) JORDAN LUMBER & SUPPLY
DB 1469 PG 453

END OVERLAY
BEGIN RESURFACING & WIDENING
-L- Sta. 11+50.00



DETAIL 1
SPECIAL CUT DITCH
(Not to Scale)

FROM STA. 10+00 TO STA. 10+50 -L- RT

DETAIL 2
LATERAL 'V' DITCH
(Not to Scale)

FROM STA. 10+50 TO STA. 11+60 -L- RT

(1) JORDAN LUMBER & SUPPLY
DB 1469 PG 453

SEE SHEETS 2B-2C FOR -DET- ALIGNMENT & PROFILE

-L-

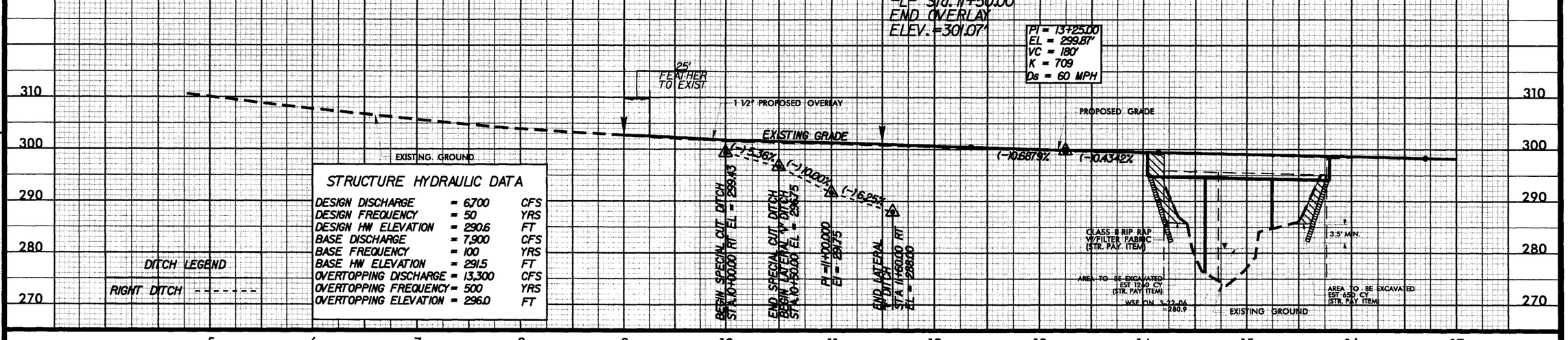
BMI ELEV. 285.28
N 590978.4400 E 18634597020
RR-Spike In The Base Of A 10" Ironwood Tree
-BL- STA 14+27 101' RT
-L- STA 13+88 120' RT
-DET STA 17+91 61' RT

EXIST. ROAD FILL TO BE EXCAVATED

BEGIN TIP PROJECT B-4207
-L- Sta. 9+00.00
BEGIN OVERLAY

BEGIN GRADE
-L- Sta. 11+50.00
END OVERLAY
ELEV. = 301.07'

PI = 13+25.00
EL = 299.87'
VC = 180'
K = 709
Ds = 60 MPH



STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 6,700	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 290.6	FT
BASE DISCHARGE	= 7,900	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 291.5	FT
OVERTOPPING DISCHARGE	= 13,300	CFS
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING ELEVATION	= 296.0	FT

DITCH LEGEND
RIGHT DITCH - - - - - - -

PROJECT REFERENCE NO.	SHEET NO.
B-4207	5

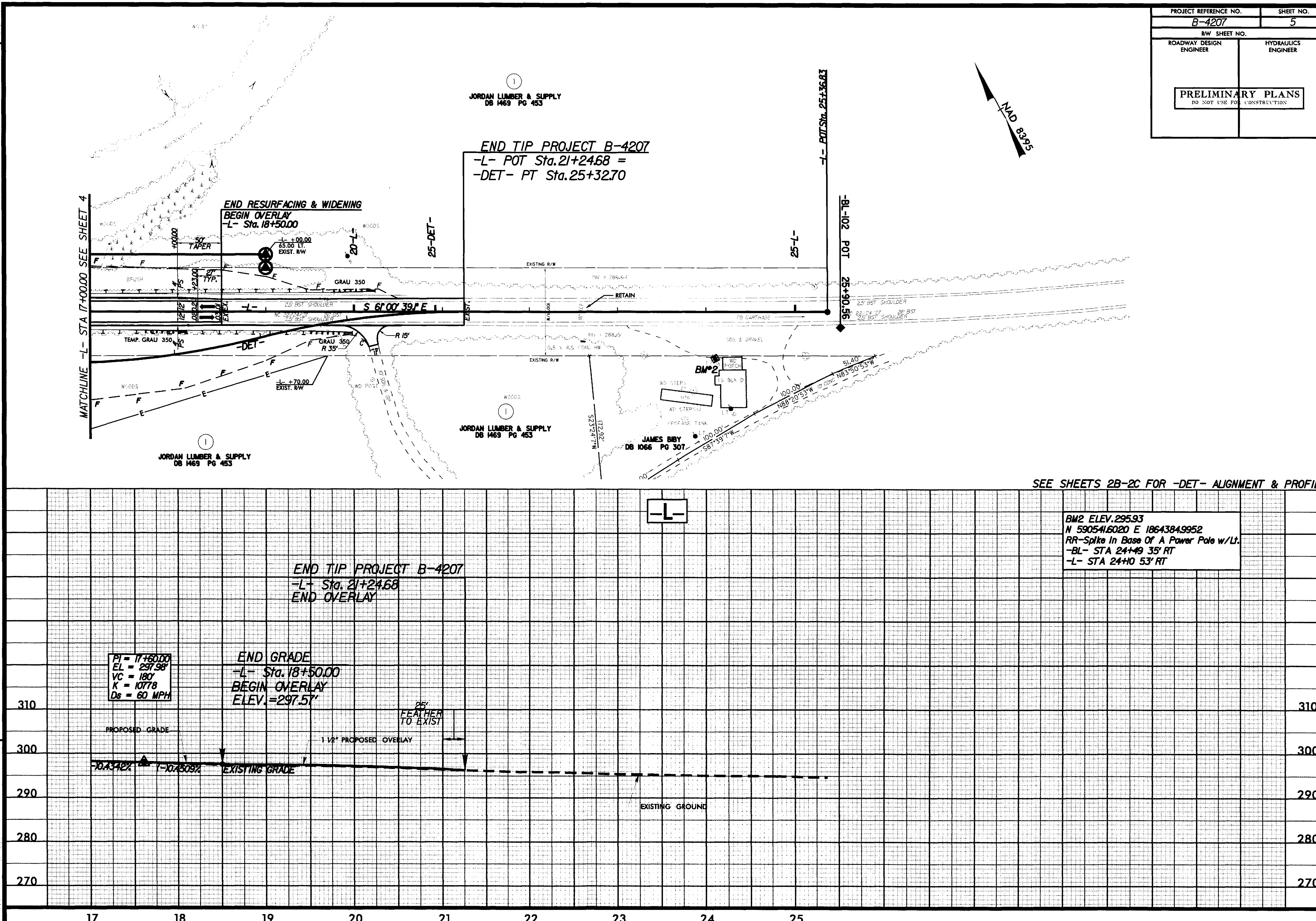
R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS



NAD 83/95
JORDAN LUMBER & SUPPLY DB 1469 PG 453
END TIP PROJECT B-4207
-L- POT Sta.21+24.68 =
-DET- PT Sta.25+32.70
-L- POT Sta. 25+36.83
MATCHLINE -L- STA 17+00.00 SEE SHEET 4
END RESURFACING & WIDENING
BEGIN OVERLAY
-L- Sta. 18+50.00
50' TAPER
-L- +00.00 65.00 LT. EXIST. R/W
2' TYP.
GRAU 350
S 6°00' 39.7" E
25' BST SHOULDER
EXISTING R/W
RETAIN
-BL-102 POT 25+90.56
-DET-
TEMP. GRAU 350
GRAU 350
R 35'
R 15'
-L- +70.00 EXIST. R/W
WOODS
BRUSH
BM#2
JAMES BIBY DB 1066 PG 307
S23°24'7"W 172.92'
100.00' N88°20'53"W
51.40' N83°50'53"W
100.00' S87°39'7"W
SEE SHEETS 2B-2C FOR -DET- ALIGNMENT & PROFILE
-L-
BM2 ELEV.295.93
N 590541.6020 E 1864384.9952
RR-Spike In Base Of A Power Pole w/Lt.
-BL- STA 24+49 35' RT
-L- STA 24+10 53' RT
END TIP PROJECT B-4207
-L- Sta. 21+24.68
END OVERLAY
PI = 17+60.00
EL = 297.98'
VC = 180'
K = 10778
Ds = 60 MPH
END GRADE
-L- Sta. 18+50.00
BEGIN OVERLAY
ELEV. =297.57'
25' FEATHER TO EXIST
PROPOSED GRADE
1 1/2" PROPOSED OVERLAY
-0.4342%
-0.45097%
EXISTING GRADE
EXISTING GROUND
310
300
290
280
270
17
18
19
20
21
22
23
24
25

Approximate quantities only. Unclassified excavation, borrow excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the lump sum price for "Grading"

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CROSS-SECTION SUMMARY

PROJ. REFERENCE NO.	SHEET NO.
B-4207	X-1

Stations DET	Uncl. Exc. (cu.yd.)	Embt (cu.yd)
14+00.00	0	0
14+50.00	116	0
15+00.00	56	64
15+50.00	11	416
16+00.00	8	996
16+50.00	4	1453
17+00.00	0	1682
17+50.00	0	1707
17+85.00	0	1221

Stations L	Uncl. Exc. (cu.yd.)	Embt (cu.yd)
9+50.00	0	0
10+00.00	0	0
10+50.00	136	2
11+00.00	69	8
11+50.00	1	217
12+00.00	24	618
12+50.00	49	898
13+00.00	52	867
13+50.00	61	500
14+00.00	68	140
14+04.66	6	3

Stations DET REM	Uncl. Exc. (cu.yd.)	Embt (cu.yd)
10+50.00	0	0
11+00.00	95	0
11+50.00	239	0
12+00.00	417	0
12+50.00	607	0
13+00.00	860	0
13+50.00	1163	0
13+81.84	1013	0

Stations DET	Uncl. Exc. (cu.yd.)	Embt (cu.yd)
19+35.00	0	0
19+50.00	0	823
20+00.00	0	1758
20+50.00	0	1568
21+00.00	0	1536
21+50.00	0	1428
22+00.00	0	1218
22+50.00	0	972
23+00.00	6	635
23+50.00	10	274
24+00.00	24	61
24+50.00	36	0

Stations L	Uncl. Exc. (cu.yd.)	Embt (cu.yd)
15+79.66	0	0
16+00.00	28	143
16+50.00	78	718
17+00.00	71	940
17+50.00	61	915
18+00.00	54	819
18+50.00	26	686
19+00.00	0	434
19+50.00	0	167
20+00.00	3	37
20+50.00	0	0

Stations DET REM	Uncl. Exc. (cu.yd.)	Embt (cu.yd)
15+31.91	0	0
15+50.00	711	0
16+00.00	1332	0
16+50.00	827	0
17+00.00	669	0
17+50.00	632	0
18+00.00	535	0
18+50.00	444	0
19+00.00	337	0
19+50.00	179	0
20+00.00	63	0
20+50.00	23	0

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4207	X-2

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

330 320 310 300 290 280

EXIST EXIST
302.24
EOP EOP
9+50.00

330 320 310 300 290

EXIST EXIST
302.78
EOP EOP
9+00.00

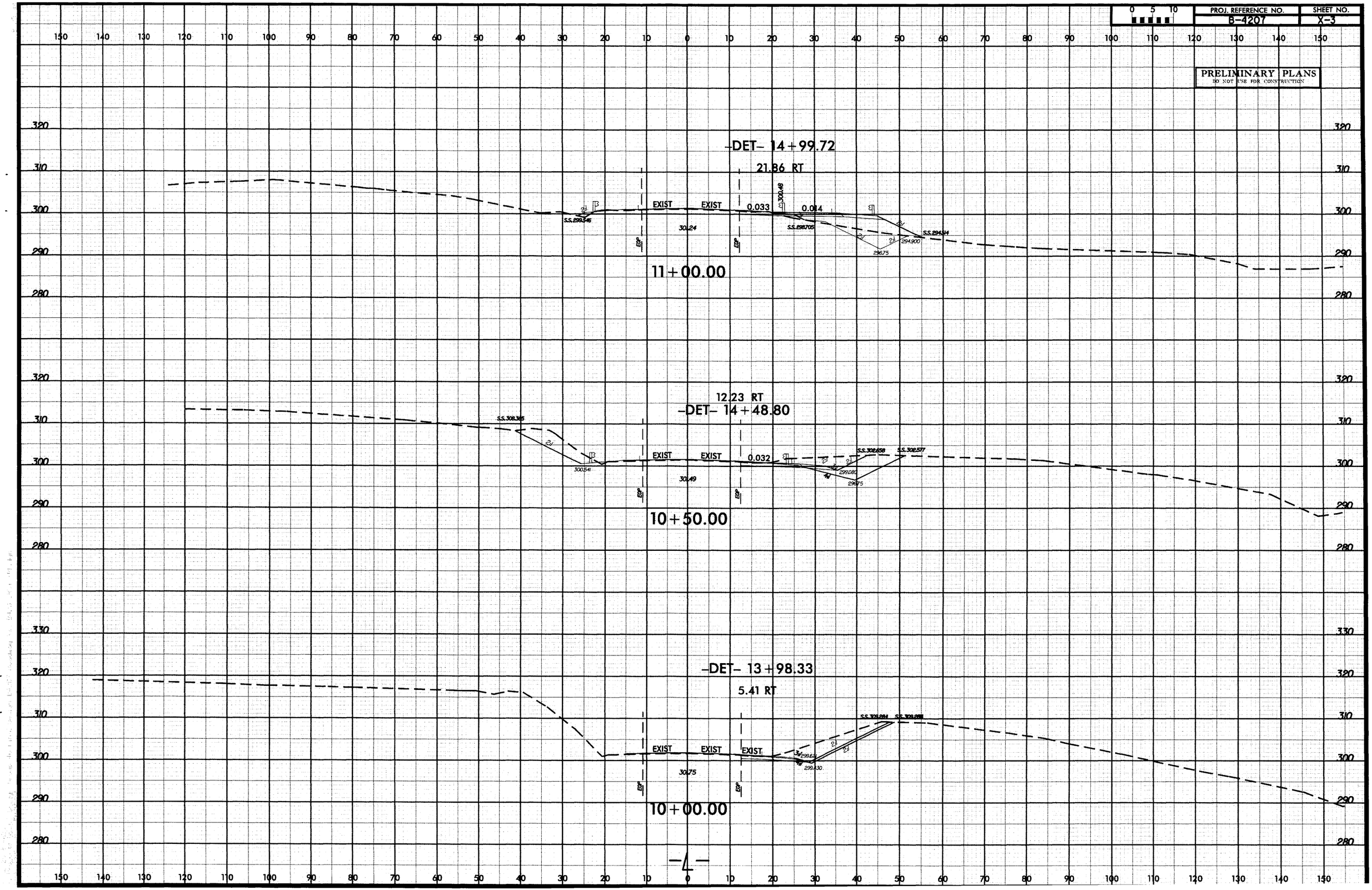
340 330 320 310 300 290

303.34
EOP EOP
8+50.00
-L-

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

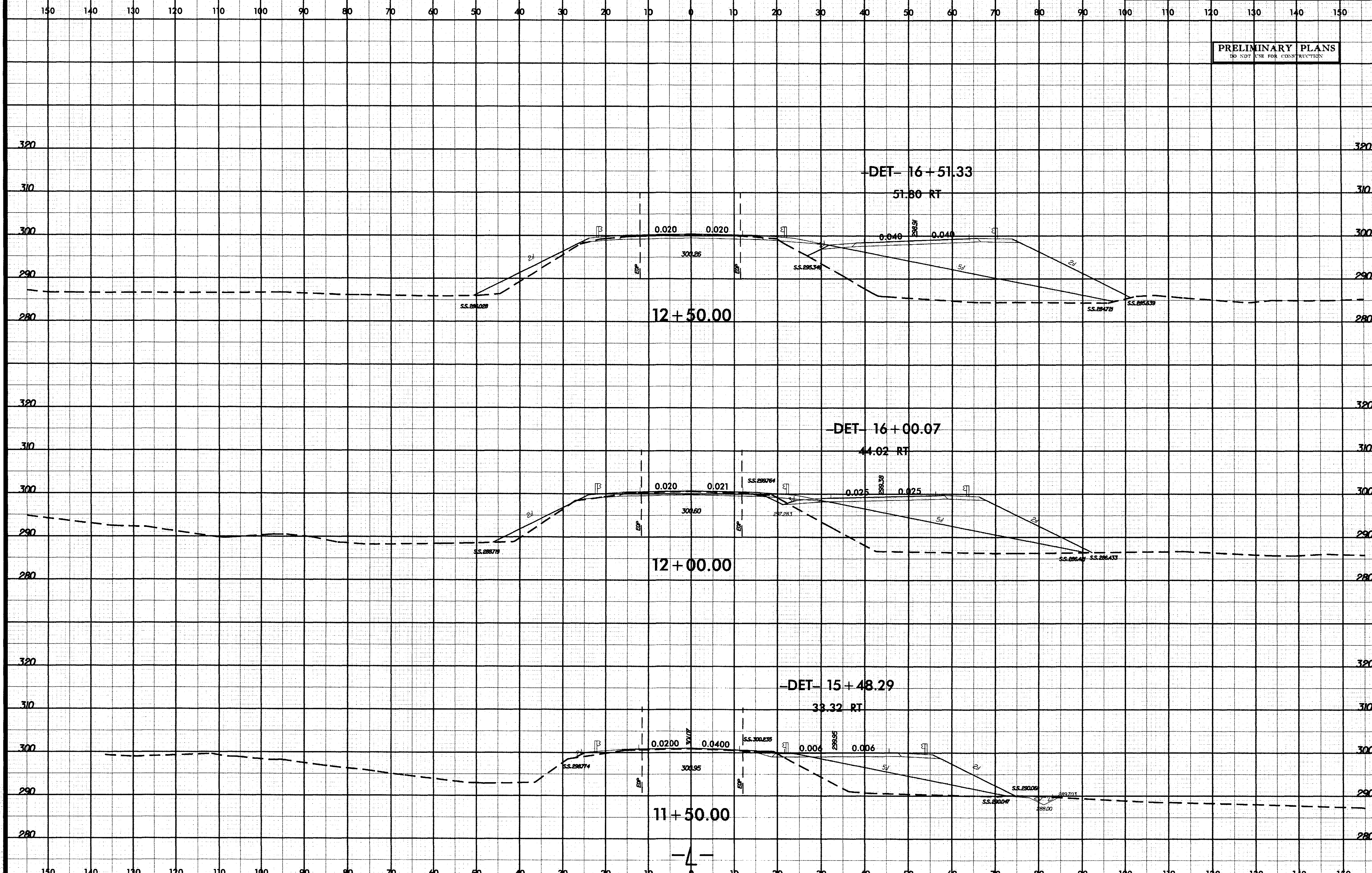
PROJ. REFERENCE NO. B-4207 | SHEET NO. X-3

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



PROJ. REFERENCE NO.	SHEET NO.
B-4207	X-4

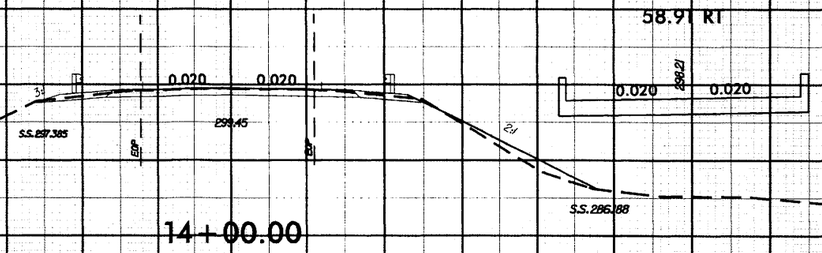
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



PROJ. REFERENCE NO.	SHEET NO.
B-4207	X-5

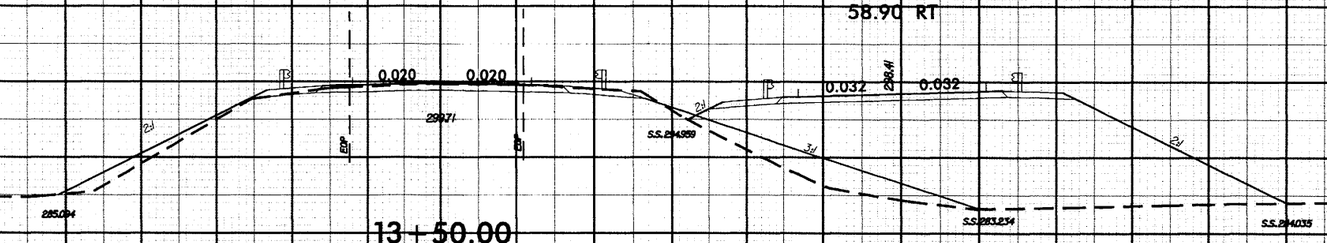
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-DET- 18+03.15
58.91 RT



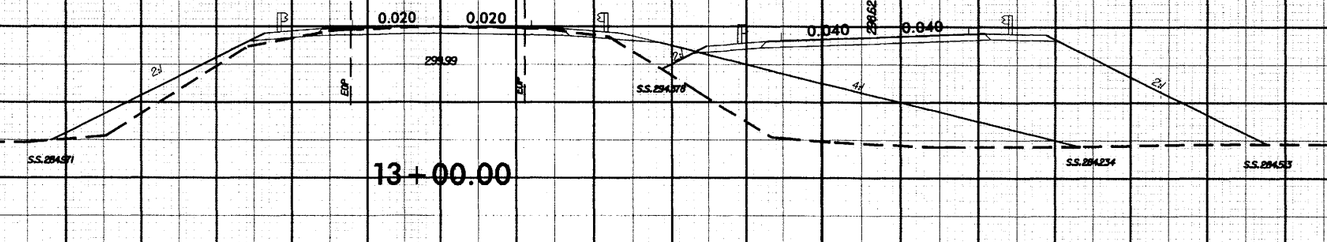
14+00.00

-DET- 17+53.15
58.90 RT



13+50.00

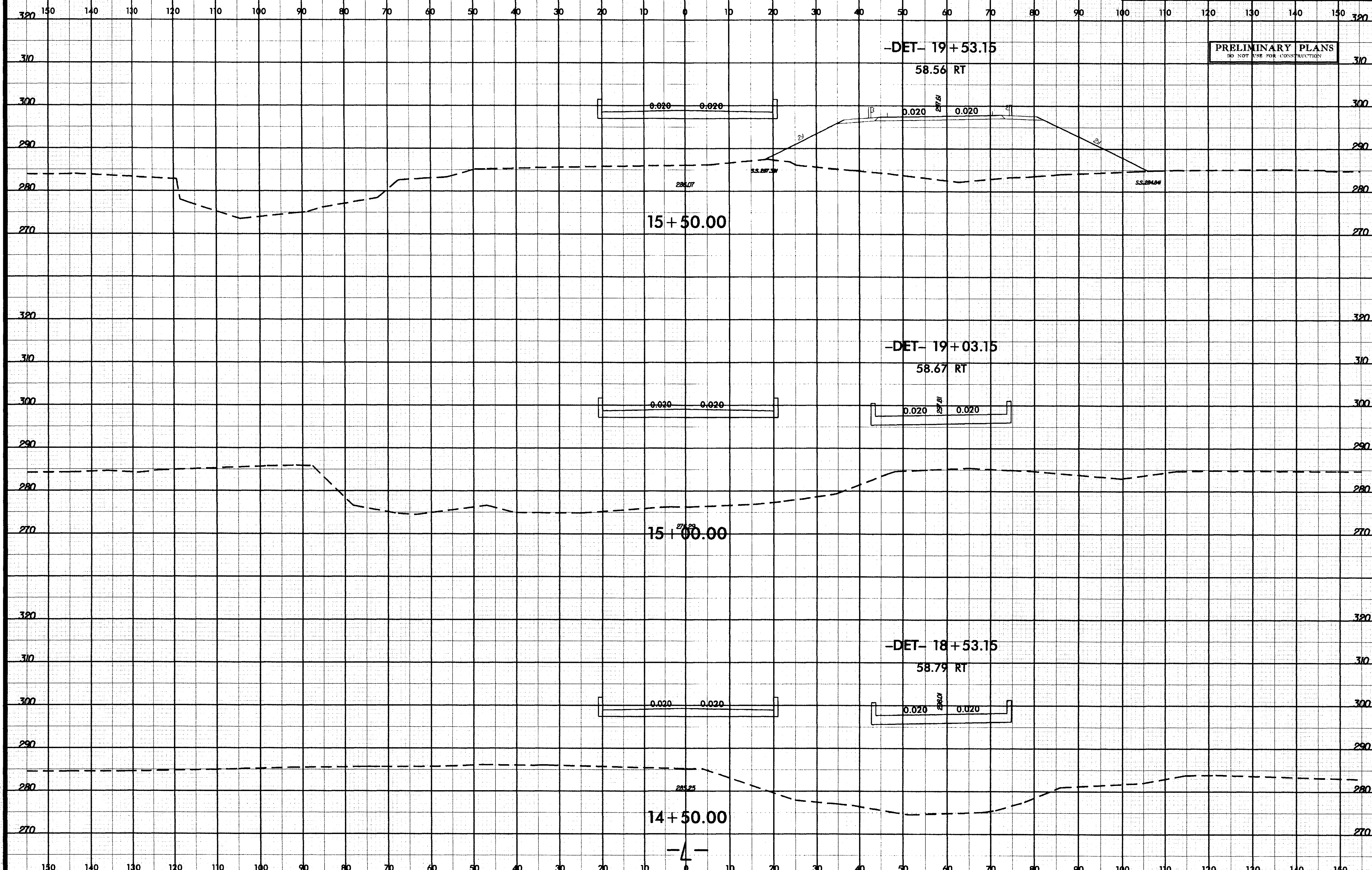
-DET- 17+02.23
56.73 RT



13+00.00

-L-

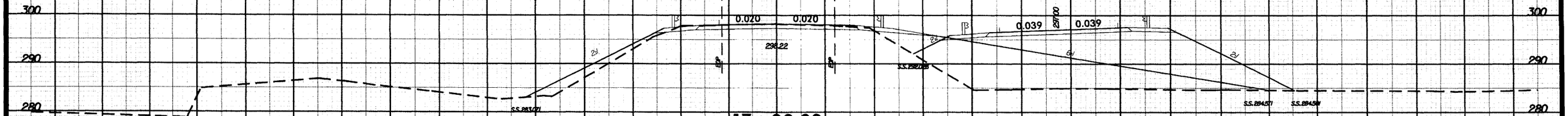
PROJ. REFERENCE NO.	SHEET NO.
B-4207	X-6



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4207	X-7

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-DET- 21+03.61
57.56 RT



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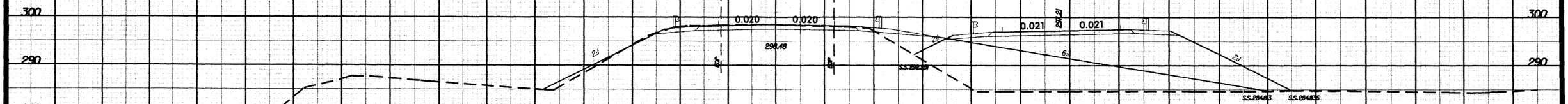

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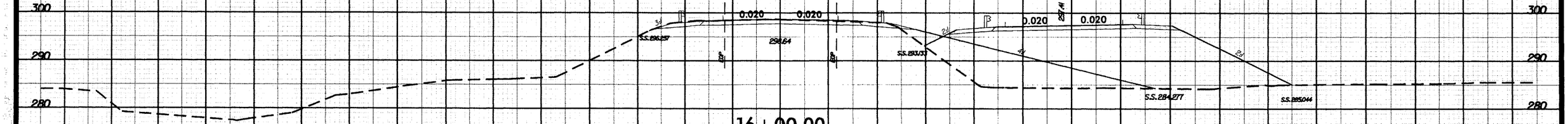

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PROJ. REFERENCE NO. B-4207 | SHEET NO. X-8

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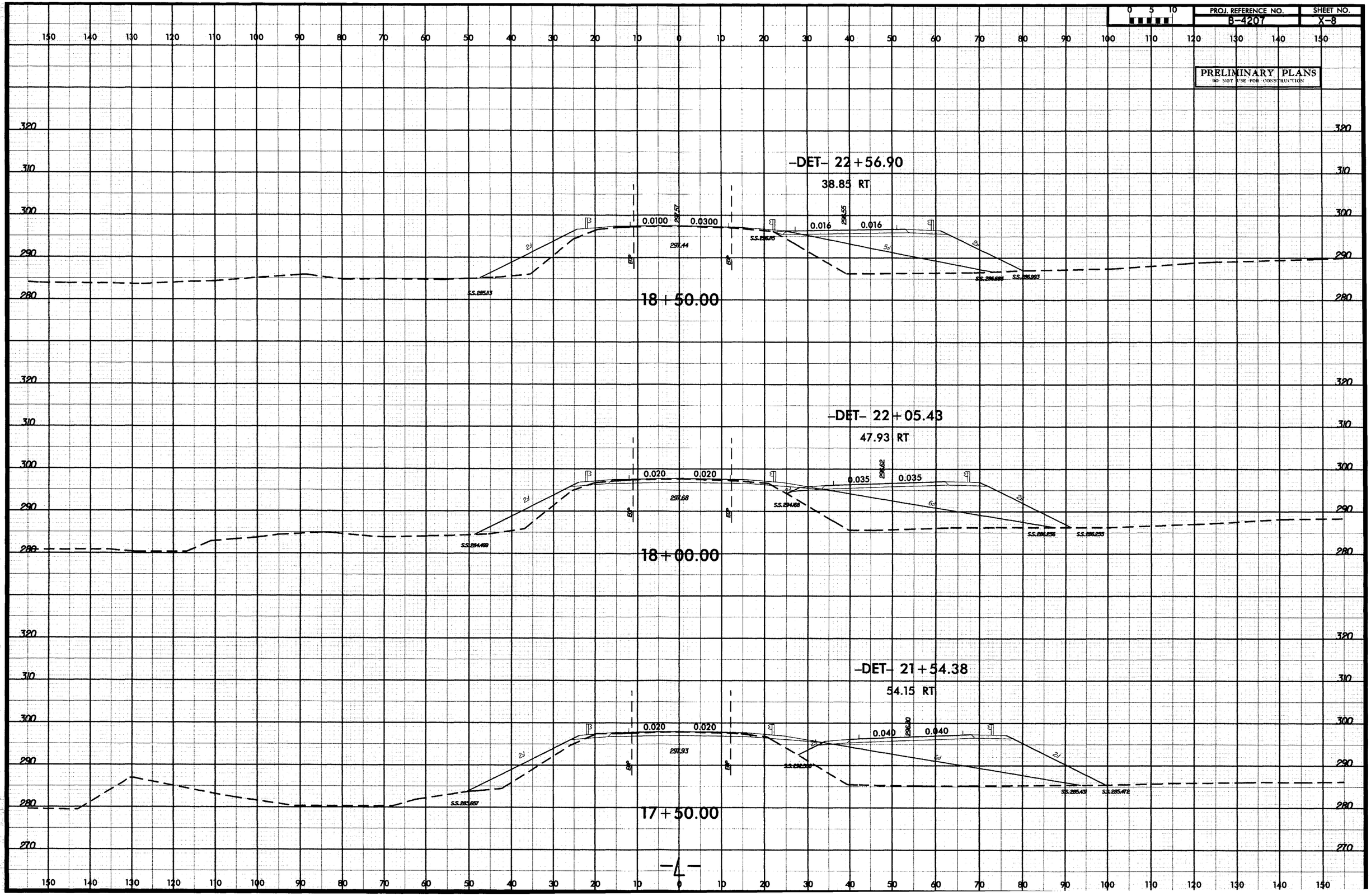

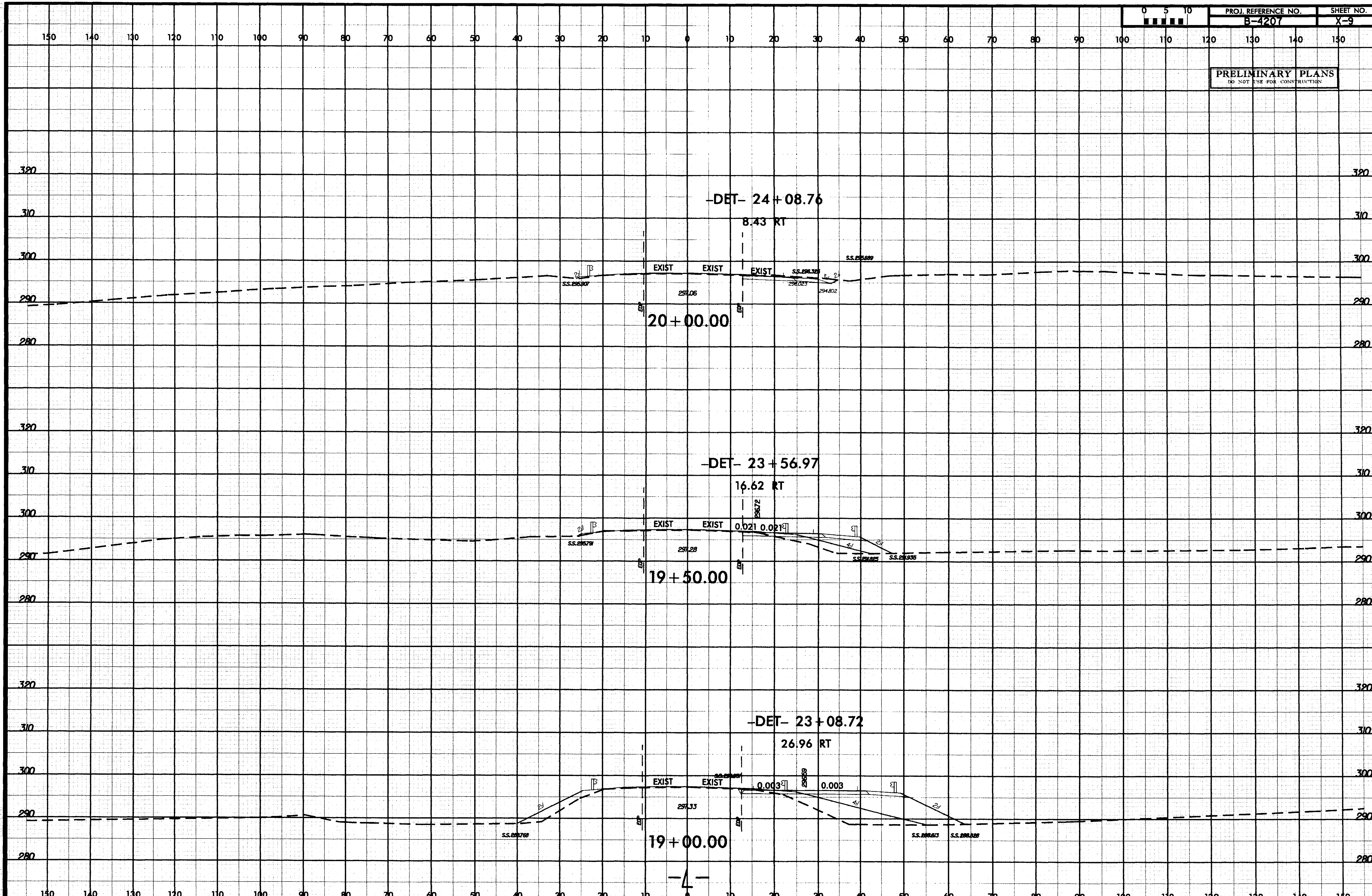
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NC 22-24-27
Bridge No. 43 Over McLendons Creek
Moore County
Federal-Aid Project No. BRSTP-22(1)
State Project No. 8.1561101
WBS No. 33554.1.1
TIP No. B-4207

Categorical Exclusion
United States Department of Transportation
Federal Highway Administration
And
North Carolina Department of Transportation

Approved:

4/18/06
Date

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

4/18/06
Date

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

NC 22-24-27
Bridge No. 43 Over McLendons Creek
Moore County
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TIP No. B-4207

Categorical Exclusion

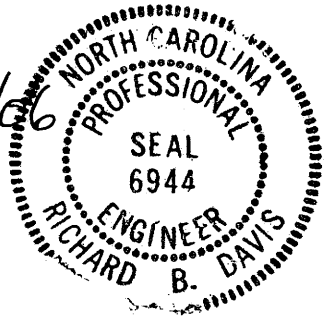
April 2006

Document Prepared by:

THE LPA GROUP OF NORTH CAROLINA, P.A.

4/6/06

Richard B. Davis, P.E.
Project Manager



For the North Carolina Department of Transportation

Vincent J. Rhea, P.E.
Project Development Engineer

PROJECT COMMITMENTS

NC 22-24-27
Bridge No. 43 Over McLendons Creek
Moore County
Federal-Aid Project No. BRSTP-22(1)
State Project No. 8.1561101
WBS No. 33554.1.1
TIP No. B-4207

In addition to the standard Nationwide Permit #23 and #33 Conditions, the General Nationwide Permit Conditions, Section 404 Conditions, Regional Conditions, State Consistency Conditions, NCDOT's Guidelines for Best Management Practices (BMPs) for the Protection of Surface Waters, the North Carolina Department of Transportation 's (NCDOT) Guidelines for Best Management Practices for Bridge Demolition and Removal, General Certification Conditions, and Section 401 Conditions of Certification, would all apply to the proposed bridge replacement project. There are no special commitments associated with the replacement of Bridge No. 43.

NC 22-24-27
Bridge No. 43 Over McLendons Creek
Moore County
Federal-Aid Project No. BRSTP-22(1)
State Project No. 8.1561101
WBS No. 33554.1.1
TIP No. B-4207

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Moore County
Federal-Aid Project No. BRSTP-22(1)
State Project No. 8.1561101
WBS No. 33554.1.1
TIP No. B-4207

INTRODUCTION: The replacement of Bridge No. 43 is included in the North Carolina Department of Transportation (NCDOT) 2006-2012 Transportation Improvement Program and in the Federal-Aid Bridge Replacement Program. The location is shown on Figure 1. No substantial environmental impacts are anticipated. The project is classified as a Federal "Categorical Exclusion."

I. PURPOSE AND NEED

The NCDOT Bridge Maintenance Unit records indicate the bridge has a sufficiency rating of 63.3 out of a possible 100 for a new structure, however; this rating is due to recent upgrades to the bridge. Prior to the current updates the sufficiency rating was 46.1. The bridge is considered to be functionally obsolete. The replacement of this inadequate structure would result in safer and more efficient traffic operations.

II. EXISTING CONDITIONS

The project is located in Moore County on NC 22-24-27 approximately 0.5 miles north of the junction of SR 1640 (Figure 1). The surrounding land use is mostly forested areas, with some residential properties and wetlands.

Bridge No. 43 was constructed in 1946 and currently does not have a posted weight limit. The overall length of the three span bridge is 158 feet, with a bed to crown height of 23 feet. It has a clear roadway width of 32 feet carrying two travel lanes. Bridge No. 43 has a reinforced concrete deck girder supported by a substructure consisting of reinforced concrete spill through abutments, and reinforced concrete post and web interior bents.

In the vicinity of the bridge, NC 22-24-27 is a 24-foot, two-lane roadway with 2-foot paved shoulders and 6-foot unpaved shoulders (8 feet total). The existing bridge is in a horizontal tangent and is skewed 110 degrees. Both approaches are in tangent with curves beginning approximately 1,000 feet away from each end of the bridge. The vertical grade for both approaches falls toward the bridge, which is located in a sag. Both approaches have good site distances. The speed limit is posted at 55 miles per hour (mph). NC 22-24-27 is classified as a Rural Minor Arterial in the Statewide Functional Classification System.

The current (2006) traffic volume of 8,400 vehicles per day (vpd) is expected to increase to 14,200 vpd by the year 2025. These volumes include 6 percent dual tired vehicles and 11 percent truck tractor with semi-trailers (TTSTs).

One crash was reported in the vicinity of the bridge during a recent three-year period. The accident involved a single car hitting a fixed object. The accident resulted in two non-fatal injuries.

There are no utilities attached directly to the structure; however, there are overhead power transmission lines along the north side of NC 22-24-27. There are also telephone lines overhead at the bridge on both sides of NC 22-24-27. Additionally, an underground fiber optic cable is located parallel to the north side of NC 22-24-27 that aerially crosses McLendons Creek.

There are seven school buses that cross the bridge twice daily. In a letter dated October 2, 2002, the Director of Transportation for the Moore County Schools stated that an alternative route is available. This route would utilize Myrick Rd. and Kelly Plantation Rd. These routes would be feasible for the Moore County School District; however, it would add 15-20 minutes to the current bus routes, which would require additional funds for their bus drivers. For this reason, the school district would prefer construction to begin in May. A copy of this letter is included in the Appendix.

In a phone conversation with Steadman Means of the Moore County Emergency Management Agency on September 9, 2004, Mr. Means stated that the studied off-site detour would not be compatible with emergency services routes. Mr. Means indicated that SR 1640 on the detour route floods during heavy rains and would not be a reliable route for emergency vehicles.

III. ALTERNATIVES

A. Project Description

The proposed project involves the removal and replacement of Bridge No. 43 on NC 22-24-27 over McLendons Creek with a wider and safer structure.

Based on a preliminary hydraulic analysis that was conducted in conjunction with a field reconnaissance of the site, the proposed replacement structure for No. 43 would be a 175-foot long bridge. The replacement bridge would provide a clear roadway width of 40 feet, carrying two 12-foot wide travel lanes with 8-foot offsets (Figure 3B).

The roadway approaches would provide two 12-foot travel lanes, 4-foot paved shoulders, and a total shoulder width of 8 feet (Figure 3A). The roadway grade would be approximately the same as the existing roadway. The design speed of the roadway approaches is 60 mph, with a posted speed limit of 55 mph.

B. Build Alternatives

There are two alternatives under consideration for the replacement of Bridge No. 43. These alternatives are described in detail below:

Alternative 1

Alternative 1 would replace the existing bridge with a new structure constructed in the same location as the existing bridge (Figures 2A, 2B, 2C, and 2D). With Alternative 1, a temporary on-site detour would be provided on the north side of the existing bridge to maintain traffic during construction. Permanent approach work would extend approximately 255 feet west of the bridge and approximately 170 feet east of the bridge for a total length (including the bridge) of 600 feet. The detour structure would be located approximately 45 feet, centerline to centerline, north of the existing bridge and provide a clear roadway width of 30 feet and would carry two 12-foot travel lanes with 3-foot offsets (Figure 3B). The detour roadway approaches would provide two 12-foot travel lines with 8-foot unpaved shoulders (Figure 3A). The design speed for the detour approaches is 50 mph, with a posted speed limit of 45 mph. The total length of the temporary detour is approximately 1,250 feet.

Alternative 2

Alternative 2 would replace the existing bridge with a new structure constructed in the same location as the existing bridge (Figure 2A). With Alternative 2, a temporary on-site detour would be provided on the south side of the existing bridge to maintain traffic during construction. Permanent approach work would extend approximately 255 feet west of the bridge and approximately 170 feet east of the bridge for a total length (including the bridge) of 600 feet. The detour structure would be located approximately 45 feet, centerline to centerline north, of the existing bridge and provide a clear roadway width of 30 feet and would carry two 12-foot travel lanes with 3-foot paved offsets (Figure 3B). The detour roadway approaches would provide two 12-foot travel lines with 8-foot unpaved shoulders (Figure 3A). The design speed for the detour approaches is 50 mph, with a posted speed limit of 45 mph. The total length of the temporary detour is approximately 1,250 feet.

C. Alternatives Eliminated from Further Study

The "Do-Nothing" Alternative was eliminated from further study because the existing bridge is considered functionally obsolete. Over time the bridge would continue to deteriorate and would have to be closed due to safety issues. The Do-Nothing Alternative is not an option, due to daily traffic flow on NC 22-24-27, and lack of suitable alternative routes.

The alternative of utilizing an off-site detour to maintain traffic during construction was considered (Figure 1). The off-site detour would utilize SR 1640 (Kelly Plantation Road), SR 1666 (Hunter Road), and SR 1665 (Myrick Road) as a detour route. This

detour is approximately 3.5 miles long and crosses one bridge, Bridge No. 62. Bridge No. 62 does not have a posted weight limit. SR 1640 is subject to flooding during heavy rains and SR 1666 is an unpaved road. All three of these secondary roads would need substantial upgrading to carry the heavy truck volume of NC 22-24-27. With an additional travel time of 7 minutes over the expected detour period of six to eight months, the delay for this off-site detour is considered to be justifiable from a traffic operations standpoint under NCDOT guidelines; however, the periodic flooding of SR 1640 makes it an unsuitable detour for this arterial route.

D. Preferred Alternative

Alternative 2, replacing the bridge in its existing location and utilizing a temporary on-site detour was selected as the Preferred Alternative. Alternative 2 was selected as the Preferred Alternative because it has less environmental impacts and is less costly than Alternative 1. The plan sheets for the Preferred Alternative are included in Figures 2B, 2C, and 2D.

IV. ESTIMATED COSTS

The estimated costs for each alternative, based on current dollars, are shown below:

Table 1. Estimated Project Costs

	ALT 1	ALT 2 (Preferred Alternative)
Roadway Approaches	$527,050	$466,720
Proposed New Bridge	$595,000	$595,000
Temporary Structure	$138,000	$140,000
Structure Removal	$60,600	$60,600
Misc. & Mobilization	$356,350	$329,680
Engineering & Contingencies	$273,000	$208,000
Total Construction Costs	**$1,950,000**	**$1,800,000**
Right of Way and Utilities	$17,500	$17,300
Total Project Cost	**$1,967,500**	**$1,817,300**

The estimated cost of the project, as shown in the 2006-2012 NCDOT Transportation Improvement Program is $1,925,000 including $250,000 spent in prior years, $100,000 for right-of-way and $1,575,000 for construction.

V. NATURAL RESOURCES

A. Methodology

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

- United States Geological Survey (USGS) 7.5 minute quadrangle maps (Carthage, NC 1980);
- NCDOT aerial photograph of the project area (2001);
- Soil maps and descriptions of the soils found in the project area (Moore County Soil Survey, Natural Resources Conservation Service [NRCS] 1995);
- North Carolina Division of Water Quality (DWQ) basin-wide assessment information (DWQ 2002);
- United States Fish and Wildlife Service (USFWS) list of protected and candidate species (USFWS 2003e); and
- North Carolina Natural Heritage Program (NHP) files of rare species and unique habitats.

Water resources information was obtained from publications posted on the World Wide Web by the North Carolina Department of Environment and Natural Resources (NCDENR) Division of Water Quality.

The USFWS provided a list of threatened and endangered species known to occur in Moore County on December 30, 2003 (updated March 14, 2006), prior to the field investigation. Information concerning species under state protection was obtained from the NHP database of rare species and unique habitats. The NHP database was consulted to determine if known protected species occurrences were present in the coverage area of the USGS Carthage quadrangle prior to field investigation. NHP files were reviewed for known locations of species on state or federal lists and locations of significant natural areas on March 29, 2004.

THE LPA GROUP of North Carolina, p.a. (LPA) biologists conducted a field investigation within the project study area on May 25, 2004. The project vicinity is an area extending 0.5-mile from the study area. The study area for B-4207 extends approximately 800 feet northwest of the existing bridge and approximately 760 feet southeast of the existing bridge (approximately 0.30 miles), and encompasses a 200-foot wide corridor centered along the existing centerline of NC 22-24-27.

Water resources were identified, and their physical characteristics were recorded. For the purposes of this study, a habitat assessment was performed within the project study area. Plant communities and their associated wildlife were identified using a variety of observation techniques, including active searching, visual observations, and identifying characteristic signs of wildlife (sounds, tracks, scats, and burrows). Terrestrial community classifications generally follow Schafale and Weakley (1990), where

appropriate, and plant nomenclature follows Radford *et al.* (1968). Biotic communities were mapped using sub-meter accuracy Global Positioning System (GPS) equipment and aerial photography of the project site. Vertebrate nomenclature follows Potter *et al.* (1980), Martof *et al.* (1980), the American Ornithologists' Union (2001), and Webster *et al.* (1991).

Jurisdictional areas were identified using the three-parameter approach (hydrophytic vegetation, hydric soils, wetland hydrology) established in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). The boundaries of the jurisdictional areas were flagged and mapped in the field using sub-meter accuracy GPS equipment. Jurisdictional wetland areas were characterized according to a classification scheme established by Cowardin *et al.* (1979).

B. Physiography and Soils

The project study area is located within the Coastal Plain and/or Piedmont physiographic province of North Carolina. The topography of the project study area can be characterized as nearly level to gently sloping. Elevations in the project study area range from approximately 290 to 300 feet above mean sea level (USGS 1980). Surrounding land use includes forested areas, a power-line right of way on the north side of NC 22-24-27, and residential areas outside of the project limits southeast of the bridge.

According to the Moore County Soil Survey, the project study area is located within the Mooshaunee-Hallison-Mayodan-Pinkston soil association (NRCS 1995). Soil associations contain one or more mapping units occupying a unique natural landscape. Mapping units are named for the major soil series within the unit, but may contain minor inclusions of other soil series. The soil survey describes the Mooshaunee-Hallison-Mayodan-Pinkston association as a gently sloping to steep, moderately deep and deep, moderately well drained to excessively drained soils that have a loamy or clayey subsoil; found on uplands.

There are six soil series mapped within the project study area which include:

- Congaree Loam, 0 to 2 percent slopes (*Typic Udifluvents*);
- Mooshaunee-Hallison complex, 2 to 8 percent slopes (*Aquic Hapludults-Typic Hapludults*);
- Mooshaunee-Hallison complex, 8-15 percent slopes (*Aquic Hapludults-Typic Hapludults*);
- Pinkston silt loam, 15 to 40 percent slopes (*Rupic-Ultic Dystrochrepts*);
- Tetotum silt loam, 0 to 3 percent slopes (*Aquic Hapludults*); and,
- Udorthents, loamy (*Udorthents*).

Tetotum Silt Loam is listed as having hydric inclusions in poorly drained soils along depressions and drainage ways (USDA 1994).

C. Water Resources

1. Waters Impacted

The project study area is located in the 03-06-10 sub-basin of the Cape Fear River Basin (DWQ 2004a), and is part of the USGS hydrologic unit 03030003 (EPA 2004). One main body of water, McLendons Creek is located in the study area. McLendons Creek originates southwest of the project area just north of Seven Lakes, and flows northeast to the Deep River, north of Carthage in central Moore County. McLendons Creek has been assigned Stream Index Number (SIN) 17-30 (DWQ 2004b).

2. Water Resource Characteristics

McLendons Creek is a perennial stream, which at the time of the field investigations had slow flow over substrate consisting of sand, silt, and gravel. Water clarity at the time of field inspection was poor and the water appeared to be muddy. McLendons Creek has a well-defined channel that has bank heights of approximately 10 feet, with wetlands located on both sides of the bank. McLendons Creek would provide a warm water habitat. Some scouring was observed on the bank at the upstream face of bent #1. Water depth at the bridge was estimated at five to six feet. The channel width of McLendons Creek is approximately 60 feet, with a bankfull width of approximately 75 feet. There is a well-defined channel with steep banks (near vertical in places) that are approximately 10 feet in height from the bed to the top of the bank. The study area encompasses a large slow flowing run approximately five to six feet deep. A Rosgen analysis was not performed for McLendons Creek; however based, on visual observations of stream morphology the stream was assigned the stream type B6 (SRI 2005).

2.1 Best Usage Classification and Water Quality

McLendons Creek has been assigned a Best Usage Classification of C (DWQ 2004b). The C indicates fresh waters that support aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture. Secondary recreation would include, wading, boating, and other uses involving human body contact with the water where such activities take place in an infrequent, unorganized, or incidental matter. There are also no restrictions on watershed development or types of discharges (DWQ 2004c). Point source discharges of treated wastewater are permitted in these waters, pursuant to Rules .0104 and .0211 of 15A North Carolina Administrative Code (NCAC) 2B; local programs to control non-point source and stormwater discharge of pollution are required.

There are no Outstanding Resource Waters (ORW), High Quality Waters (HQW), or Sensitive Supply Watersheds (WS-I), or WS-II waters within three miles up or downstream of the study area (DWQ 2004b). McLendons Creek is not designated as a North Carolina Natural and Scenic River, or as a National Wild and Scenic River (NPS 2004).

2.2 Macroinvertebrate Monitoring

There is one basinwide monitoring station located approximately eight miles north of the study area on Buffalo Creek at NC 22 (DWQ 2000a). This site was sampled in 1998 by the DWQ and received a rating of Good (DWQ 2000a).

2.3 North Carolina Index of Biotic Integrity

There is a DWQ Fish Monitoring Station located approximately six miles southwest of the study area on McLendons Creek at SR 1210 (DWQ 2000b). This site was sampled by the DWQ on May 5, 1998 and received a NCIBI rating of Good-Fair (NCDWQ 2000b).

2.4 Section 303(d) Waters

None of the water resources within the project study area are designated as biologically impaired water bodies regulated under the provisions of the Clean Water Act (CWA) §303(d) (DWQ 2004d).

2.5 Permitted Dischargers

There are no permitted discharges within a five-mile radius of the project area (DWQ 2000a).

2.6 Non-Point Source Discharges

LPA biologists reviewed aerial photography and conducted a limited visual observation of potential NPS discharges located within and near the project study area. Atmospheric deposition from passing vehicles was identified as a potential source of NPS pollution near the project study area.

3. Anticipated Impacts to Water Resources

Short term impacts to water quality such as sedimentation and turbidity, may occur during construction related activities. Impacts from sedimentation and erosion would be minimized during construction by the use of a stringent erosion control schedule and the use of BMPs. The contractor would follow contract specifications pertaining to erosion control measures outlined in 23 CFR 650 Subpart B and Article 107-13 entitled "Control of Erosion, Siltation, and Pollution pursuant to NCDOT's *Standard Specifications for Roads and Structures*." These measures include: the use of dikes, berms, silt basins, and other containment measures to control runoff and the elimination of construction staging areas in floodplains and adjacent waterways. Additional measures that could be taken to avoid water quality impacts would include keeping heavy equipment out of the stream channel, keeping staging areas out of wetlands, and also keeping live concrete out of the stream channel. After construction activities are completed, abandoned approaches

associated with the existing structure and/or temporary detours would be removed and revegetated in accordance with NCDOT guidelines.

Other impacts to water quality that would be anticipated as a result of this project include: changes in water temperature due to more exposure to sunlight (from the removal of streamside vegetation), increased shade due to construction of new structures, and changes to stormwater flows due to changes in the amount of impervious surface adjacent to the channel. However, due to the limited amount of overall change in the surrounding areas, impacts would be expected to be minimal and temporary in nature.

Waters within the study area have been assigned a Best Usage Classification of C, which falls into the category of a Case III stream according to Best Management Practices for Bridge Demolition and Removal (BMP-BDRs). A Case III stream has no special restrictions other than those outlined in BMPs for Protection of Surface Waters.

3.1 Impacts Related to Bridge Demolition and Removal

Section 404-2 of NCDOT's *Standard Specifications for Roads and Structures* is labeled **Removal of Existing Structure**. This section outlines restrictions and BMP-BDRs, as well as guidelines for calculating maximum potential fill in the creek resulting from demolition. These standards would be followed during the replacement of Bridge No. 43.

There is the potential that the superstructure and part of the substructure could be dropped into Waters of the United States during the demolition and removal of Bridge No. 43. The superstructure consists of a reinforced concrete deck girder with a weather surface and concrete curbs. The substructure is reinforced concrete post and web. The maximum (worst case) potential temporary fill resulting from demolition activities would be approximately 365 cubic yards.

D. Biotic Resources

Terrestrial and aquatic communities are included in the description of biotic resources. Systems described in the following sections refer to the dominant flora and fauna observed in each community during the field investigation. Descriptions of the terrestrial systems are presented in the context of plant community classifications. These classifications follow Schafale and Weakly (1990) where possible. Representative faunal species that are likely to occur in these habitats (based on published range distributions) are also cited. Scientific nomenclature and common names are used for the floral and faunal species described. Subsequent references to the same species are by the common name only. Fauna observed and/or heard (in the case of bird species) during field investigations are denoted with an asterisk (*).

1. Terrestrial Communities

Distribution and composition of plant communities throughout the project study area reflect landscape-level variations in topography, soils, hydrology, and past and present

land use practices. The presence of NC 22-24-27 and forestry practices have resulted in the present vegetation patterns. Three types of terrestrial plant communities occur within the study area: disturbed-maintained communities, mixed hardwood forest (piedmont subtype), and a floodplain pool. A description of each community type follows.

1.1 Disturbed-Maintained Communities

This community includes two types of habitat that have recently been or are currently impacted by human disturbance, including regularly maintained road shoulders and a power-line right-of-way. For purposes of this report, only the flora of the power-line right-of-way have been included together in a more simplified "disturbed-maintained" community. The majority of these habitats are kept in a low-growing or early successional state.

The power-line right-of-way consists of a low growing herbaceous layer dominated by elderberry (*Sambucus canadensis*), goldenrod (*Solidago* sp.), blackgum (*Nyssa sylvatica*), various grasses, and *Juncus* sp.

1.2 Mixed Hardwood Forest (Piedmont Subtype)

This forest type is found throughout the Piedmont and ranges into some of the lower elevation areas of the Blue Ridge. Soils are typically deep, well drained, and somewhat acidic. There are four upland areas within the project area, separated horizontally by NC 22-24-27 and laterally by McLendons Creek. These communities consist of mixed-pine hardwood forest adjacent to the wetland communities, disturbed maintained communities, and McLendons Creek. The hardwood forest is located on the slopes leading down to the banks of McLendons Creek. The dominant tree species in the canopy of the hardwood forest includes loblolly pine (*Pinus taeda*), tag alder (*Alnus serrulata*), red maple (*Acer rubrum*), willow oak (*Quercus phellos*), water oak (*Quercus nigra*), river birch (*Betula nigra*), black gum, and tulip poplar (*Liriodendron tulipifera*). Dominant understory/shrub species observed include American holly (*Ilex opaca*), red bud (*Cercis canadensis*), sourwood (*Oxydendrum aboreum*), eastern red cedar (*Juniperus virginiana*), Chinese privet (*Ligustrum sinense*), and Japanese honeysuckle (*Lonicera japonica*). Dominant species observed in the herbaceous layer include Jack in the pulpit (*Arisaema triphyllum*), netted chain fern (*Woodwardia areolata*), Christmas fern (*Polystichum acrostichoides*), and southern lady fern (*Athyrium asplenoides*). Dominant species of woody vines observed include muscadine grape (*Vitis rotundifolia*), cat briar (*Smilax glauca*), trumpet creeper (*Campsis radicans*), cross vine (*Anisostichus capreolata*), Virginia creeper (*Parthenocissus quinquefolia*), and poison ivy (*Rhus radicans*).

1.3 Wetland Community

One wetland area is present in the study area, Wetland F. This wetland appears to be a relic overflow channel for McLendons Creek. Wetland F has a very sparse herbaceous layer with a canopy resembling the surrounding hardwood forest. The dominant tree

species in Wetland F include: river birch, ironwood (*Carpinus caroliniana*), black gum, and red maple. The dominant species in the herbaceous layer is *Juncus* sp.

2. Wildlife

The study area was visually surveyed for signs of terrestrial and aquatic wildlife. Little wildlife was observed during the field investigation. Fauna likely to occur in the study area based on published ranges are also included.

2.1 Terrestrial Wildlife

Bird species observed or likely to occur in the include such species as the American robin (*Turdus migratorius*), American crow (*Corvus brachyrhynchos*), red tailed hawk* (*Beteo jamaicensis*), Carolina chickadee (*Parus carolinensis*), brown thrasher (*Toxostoma rufum*), catbird (*Dumetella carolinensis*), rufous-sided towhee (*Pipilo erythrophthalmus*), pileated woodpecker (*Dryocopus pileatus*), yellow-bellied sapsucker* (*Sphyrapicus varius*), blue jay (*Cyanocitta cristata*), tufted titmouse (*Parus bicolor*), and golden crowned kinglet (*Regulus satrapa*).

Mammals observed or likely to occur in the study area include such species as eastern cottontail (*Sylvilagus floridanus*), white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), gray squirrel (*Sciurus carolinensis*) and striped skunk (*Mephitis mephitis*).

Terrestrial reptiles observed or likely to occur in the study area include such species as garter snake (*Thamnophis sirtalis*), green anole (*Anolis carolinensis*), black rat snake (*Elaphe obsoleta*), milk snake (*Lampropeltis triangulum*), common king snake* (*Lampropeltis getulus*), and Eastern box turtle (*Terrapene carolina*).

Terrestrial amphibians likely to occur in the study area include such species as American toad (*Bufo americanus*), Fowlers toad (*Bufo woodhousei*), mud salamander (*Pseudotriton montamus*), northern cricket frog (*Acris crepitans*), and the four-toed salamander (*Hemidactylum scutatum*).

3. Aquatic Community

The aquatic communities consist of the stream channel and associated inundated wetlands. A visual survey of the stream and wetland was conducted to document the aquatic communities. No aquatic vegetation was observed in the stream channel during the field assessment. Vegetation found in the wetland community is described in Section 1.3, *Wetland Community*.

3.1 Aquatic Wildlife

Fish species expected to occur in drainages within the project vicinity include mosquito fish* (*Gambusia affinis*), creek chub (*Semotilus atromaculatus*), and the redbreast sunfish (*Lepomis auritus*).

Aquatic reptiles observed or expected to occur in the study area include such species as snapping turtle (*Chelydra serpintina*), yellowbelly slider (*Trachemys scripta*), mud snake (*Farancia abacura*), and banded water snake (*Nerodia fasciata*).

Aquatic amphibians observed or expected to occur in the study area include such species as southern leopard frog* (*Rana utricularia*), bull frog (*Rana catesbeiana*), and pickerel frog (*Rana palustris*).

Potential habitat exists in the study area to support wood duck (*Aix sponsa*), mallard (*Anas platyrhynchos*), and great blue heron (*Ardea herodias*).

Beaver* (*Castor canadensis*) appear to use the area as evident by gnawed tree trunks and beaver trails between the wetlands and the creek.

4. Anticipated Impacts to Biotic Communities

Impacts to terrestrial and aquatic communities associated with the replacement of the existing bridge and related detours are discussed in the following sections.

4.1 Terrestrial Communities

Terrestrial communities located within the study area total 9.51 acres (see Table 2). These areas are based on a 1,560-foot long study area with a width of approximately 200 feet, situated on the centerline of existing NC 22-24-27.

Table 2. Terrestrial Communities Occurring within the B-4207 Study Area

Plant Community	Area Occupied by Community (acres)	Potential Impacts (acres)			
		ALT 1		ALT 2 (Preferred Alternative)	
		Perm.	Temp.	Perm.	Temp.
Wetland	0.07	0.01	0.05	0.01	None
Mesic Mixed Hardwood Forest	5.00	0.14	0.06	0.14	1.05
Disturbed-Maintained	4.44	0.20	1.64	0.20	0.42
Total (acres)	**9.51**	0.35	1.75	0.35	1.47
Total Impacts for ALT (acres)		**2.10**		**1.82**	

Perm. - Permanent Impacts
Temp. - Temporary Impacts

Impacts to wildlife resulting from the proposed project would be minimal due to the limited amount of habitat that would be impacted. Permanent impacts would be confined to the existing road shoulders and minimal fill in the adjacent wetlands. Although some loss of habitat immediately adjacent to the existing road shoulders would result, these areas are of limited value to the wildlife that may utilize them.

4.2 Wetland Communities

Temporary impacts include those impacts that would result from demolition of the existing bridge and construction of the replacement bridge and temporary detour (see Table 3). Alternative 1, temporary on-site detour to the north would result in 0.05 acres of temporary impacts to Waters of the United States. Alternative 2, temporary on-site detour to the south (Preferred Alternative) would not result in temporary impacts to Waters of the United States. BMPs would be employed by the construction contractor to first avoid and then minimize impacts to Waters of the United States. Erosion and sedimentation would be controlled by implementation of a Sediment and Erosion Control Plan during construction. Any areas of Waters of the United States that are temporarily impacted would be restored to their original condition following completion of the disturbance activity.

Permanent impacts to Waters of the United States are those impacts that occur in areas within the construction limits where clearing would occur or areas would be permanently filled or excavated (Table 3). Improvement to the bridge approaches [Alternatives 1 and 2 (Preferred)] would result in the placement of 0.01-acre of fill material in wetlands adjacent to the existing road shoulders. The existing bridge is 157.7 feet long on concrete

girders with concrete spill through abutments and concrete post and web interior bents. A 175-foot long bridge would replace the existing bridge.

Table 3. Anticipated Impacts to Waters of the United States

Jurisdictional Areas	**ALT. 1**		**ALT. 2 (Preferred Alternative)**	
	Perm.	**Temp.**	**Perm.**	**Temp.**
Wetland F	0.01	0.05	0.01	None
Total (acres)	0.01	0.05	0.01	None
Total Wetland Impacts (acres)	**0.06**		**0.01**	
Stream Impacts (acres)	None	None	None	None
Stream Impacts (linear feet)	None	None	None	None
Total Stream Impacts (linear feet)	**No Impact**		**No Impact**	
Perm. - Permanent Impacts **Temp. - Temporary Impacts**				

4.3 Aquatic Communities

There would be approximately 0.01-acre of permanent impacts to water resources associated with the proposed project. Therefore, impacts to aquatic communities would be minimal.

Temporary impacts to aquatic organisms could result from increased sedimentation during construction. Aquatic invertebrates would likely drift downstream during construction and recolonize the disturbed area once it has been stabilized. Sediments have the potential to affect fish and other aquatic life in several ways, including the clogging and abrading of gills and other respiratory surfaces, affecting the habitat by filling wetlands, and altering water chemistry. Increased sedimentation may also cause decreased light penetration through an increase in turbidity. NCDOT's BMPs for the protection of surface waters would be enforced to reduce impacts during demolition and construction phases.

E. Special Topics

1. Waters of the United States

1.1 Wetlands

The jurisdictional wetland in the project study area is palustrine in nature, as defined in Cowardin et al. (1979). Palustrine systems include all non-tidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses and all wetlands where salinity due

to ocean-derived salts is below 0.5% (Cowardin et al. 1979). The dominant wetland type within the study area is dominated by broad-leaved deciduous vegetation, seasonally flooded, and saturated, giving it a Cowardin classification of PFO1E.

1.2 Jurisdictional Streams

McLendons Creek is located within the study area. This stream has a well-defined channel and associated wetlands. McLendons Creek is classified as Waters of the United States. There are approximately 251 linear feet of the stream within the project study corridor.

2.0 Permits and Certifications

The following federal permits, state permits, and certifications would be required prior to beginning construction.

2.1 Section 404

In accordance with provisions of Section 404 of the CWA (33 United States Code [USC] 1344), a permit would be required from the United States Army Corps of Engineers (USACE) for the discharge of dredged or fill material into Waters of the United States. Because of the project is being documented as a Categorical Exclusion, it is expected that the project would qualify for a Nationwide Permit 23, which applies to approved Categorical Exclusions. In addition, a Nationwide Permit 33 which applies to temporary construction, access, and dewatering would be required if temporary construction is required that is not described in the Categorical Exclusion.

2.2 Water Quality Certification

Section 401 of the CWA requires that the state issue or deny Water Quality Certifications (WQCs) for any federally permitted or licensed activity that may result in a discharge into Waters of the United States. Section 401 Certification allows surface waters to be temporarily impacted for the duration of the construction or other land manipulation. Issuance of a 401 Certification from the DWQ is a prerequisite to the issuance of a Section 404 permit. If the general conditions of the corresponding WQC will be met, written concurrence from the DWQ will not be required.

3.0 Mitigation

Mitigation has been defined in NEPA regulations to include efforts which: a) avoid; b) minimize; c) rectify; d) reduce or eliminate; or e) compensate for adverse impacts to the environment (40 Code of Federal Regulations [CFR] 1508.20 [a-e]).

Federal Highway Administration policy stresses that all practicable measures should be taken to avoid or minimize impacts to wetlands that would be affected by federally funded highway construction. A sequencing (step-down) procedure is recommended in

the event that avoidance is impossible. Mitigation employed outside of the highway right-of-way must be reviewed and approved on a case-by-case basis.

Avoidance – Wetlands and Waters of the United States are present along both sides of the proposed project. Because the project involves replacement of an existing structure, impacts to adjacent wetlands caused by improvements to the existing bridge approaches and replacement of bridge piers cannot be avoided.

Minimization – Using 3:1 fill slopes through wetlands will minimize impacts to the adjacent wetlands. No lateral ditches will be constructed in wetlands. The selection of Alternative 2 as the Preferred alternative minimizes impacts caused by temporary construction. Utilization of BMPs will be required of the contractor to further minimize wetland impacts.

Compensatory mitigation – According to the conditions of the Nationwide Permit, the USACE would determine if the impacts are minimal and would at the same time determine if compensatory mitigation is required. Due to the limited nature of impacts associated with the Preferred Alternative, (0.01-acre) to Waters of the United States; compensatory mitigation may be required. Final mitigation decision rests with the USACE.

F. Protected Species

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

1.0 Species Under Federal Protection

Species with the federal classification of Endangered (E) or Threatened (T), or officially proposed (P) for such listing, are protected under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Four federally protected species are listed for Moore County (USFWS database dated March 7, 2002, Moore County List updated March 14, 2006). See Table 4.

Table 4. Federally Protected Species Listed for Moore County, NC

Common Name	Scientific Name	Status*	Biological Conclusion
Vertebrates			
Red Cockaded Woodpecker	*Picoides borealis*	E	No Effect
Cape Fear Shiner	*Notropis mekistocholas*	E	No Effect
Vascular Plants			
Michaux's Sumac	*Rhus michauxii*	E	No Effect
American Chaffseed	*Schwalbea americana*	E	No Effect
*E - Endangered			

Red-cockaded woodpecker (RCW) (*Picoides borealis*)
The RCW is a cardinal sized seven to eight inch long, black and white woodpecker with a black cap on its head. It has a ladder pattern on the back and large white cheeks, which are unique among woodpeckers in its range (Audubon 2004). It is distinguished by two red streaks on each side of the black cap, which are referred to as cockades. They are normally only visible on adult males (NWF 2004).

Nesting habitat for the RCW is made up of large open pine stands (pine flatwoods and pine dominated savannas) that are typically at least 80 years of age with little or no mid-story. Fires that occur as a result of lighting strikes often naturally maintain this habitat. Foraging habitat is comprised of open pine or mixed pine/hardwood stands 30 years of age or older (Henry 1989). Nests are typically constructed 33 to 43 feet off of the ground in live pines that have been infected with red-heart disease. These nests can sometimes take several years to construct and are often reused. The RCW constructs resin wells below the opening to the nest to create a sticky coating on the bark of the tree; this coating protects the nest from predators such as rat snakes. The sticky coating has a shiny appearance, which allows the nest cavities to be easily seen from the ground. Red-cockaded woodpeckers forage in a wide variety of pine species and especially favor areas that contain large trees due to the large surface area of loose bark. They feed on adults, larvae, and eggs of arthropods, especially ants and termites, that they find by flaking bark from the tree (Audubon 2004).

Based on a review of NHP records, there are no documented occurrences of red-cockaded woodpeckers within a three-mile radius of the project study area.

BIOLOGICAL CONCLUSION: No Effect
According to the NHP element occurrence database records, there are no known occurrences of the red-cockaded woodpecker in the project vicinity. There are no mature pine-dominated stands that could be used for nesting, or foraging habitat by the red-cockaded woodpecker. Also, no cavity trees were observed within a 0.5-mile radius of the study area. The proposed project would have No Effect on this federally endangered species.

Analysis Details –
Methodology: Analysis of the possible presence of and potential impacts to the red-cockaded woodpecker was conducted through an evaluation of existing information, and assessment of the habitat requirements. Additionally, the NHP element occurrence database was consulted on March 29, 2004.

Cape Fear Shiner (*Notropis mekistocholas*)
The Cape Fear shiner is a small fish rarely growing over two inches in length. The fish's body is flushed with a pale silvery yellow, and a black band runs along its sides. The fins have a yellowish color and are somewhat pointed, with a black upper lip and a thin black bar on the margin of the lower lip. The Cape Fear Shiner's diet is made primarily of plant material (FWS 2003b).

The Cape Fear shiner's habitat consists of small rivers to medium-sized creeks near the Fall Line; areas of moderate gradient and riffles alternating with long deep pools, and substrate a mixture of sand-gravel, rubble, and boulders. Occurs in slow pools, riffles, and slow runs. In these habitats the species is typically associated with schools of other related species, but it is never the dominant species within these schools (FWS 2003b). Juveniles occupy slackwater, areas near rock outcrops, and flooded areas (NatureServe 2003a).

Based on a review of NHP records, there are no documented occurrences of Cape Fear shiner within the study area.

BIOLOGICAL CONCLUSION: No Effect
NCDOT staff members Neil Medlin, Anne Burroughs, Mike Sanderson, and Kathy Herring conducted a habitat and site evaluation along the length of the project on October 14, 2004. At the time of the site visit, McLendons Creek at NC 22-24-27 was too deep to wade downstream of the bridge, but was wadeable with good flow above the bridge. Based on the lack of appropriate habitat, and no occupied habitat within five miles of the project area, the completion of this project would not impact the Cape Fear shiner. Appropriate soil and erosion control measures should be in place during the construction of this project to insure that no additional sediment is added to McLendons Creek.

Analysis Details –
Methodology: Analysis of the possible presence of and potential impacts to the Cape Fear shiner was conducted through an evaluation of existing information, and assessment of the habitat requirements by the primary investigators and NCDOT biologists. Additionally, the NHP element occurrence database was consulted on March 29, 2004.

Michaux's Sumac (*Rhus michauxii*)
Michaux's sumac is a low-growing, densely soft-hairy, dioecious shrub with erect stems one to three feet tall. The shrub has compound leaves that are narrowly winged at their

base, dull on their tops, and veiny and slightly hairy on their bottoms, with fine teeth on the leaf's edge (FWS 2003c). It produces erect clusters of greenish-yellow to white flowers in June, followed (in the female plants) by conspicuous red fruits that persist from August through September or October (NatureServe 2003b).

Michaux's sumac typically grows in sandy or rocky open woods on basic soils (FWS 2003c) with a high magnesium content (CPC 2005). The plants growing in natural habitats are found in pine/scrub oak sandhill (loamy soil variant and blackjack-mixed oak variant) communities. Other sites include small wildlife food plots, forest clear cuts, abandoned building sites, and under sparse to moderately dense pine or pine/hardwood canopies. The species is shade-intolerant and therefore, is dependent on some type of disturbance to maintain the open condition of its habitat. Historically, this disturbance was in the form of naturally occurring fires, or possibly localized grazing by native wildlife (US Army 2003b). Michaux's sumac will also grow in areas such as highway rights-of way, roadsides, or on the edges of artificially maintained clearings (FWS 2003c).

Suitable habitat was observed within the study area. However, soils within the study area are not sandy in nature and according to the NRCS do not have a high magnesium content. The study area is also fire suppressed which would lead to Michaux's sumac being out-competed by other species.

Based on a review of NHP records, there are no documented occurrences of Michaux's sumac within a three-mile radius of the project study area.

BIOLOGICAL CONCLUSION: No Effect
According to the NHP element occurrence database records, there are no known occurrences of Michaux's sumac in the project vicinity. Suitable habitat was observed within the study area (power-line right-of-way/road shoulders). However, soils within the study area are not sandy in nature and according to the NRCS, do not have high magnesium content. The study area is also fire suppressed which would lead to Michaux's sumac being out competed by other species. A meandering pedestrian transect survey (with transects providing 100% visual coverage of suitable habitat) was completed in the study area in areas that appeared to be suitable habitat, during the bloom period on May 25, 2004. However, no specimens were observed within the study area. Additionally, prior to the field survey, LPA biologists examined a known location off of US 15-501 in Scotland County, NC on May 25, 2004. The proposed project would have no effect on this federally endangered species.

Analysis Details –
Methodology: Analysis of the possible presence of and potential impacts to Michaux's sumac was conducted through an evaluation of existing information, and assessment of the habitat requirements. Additionally, the NHP element occurrence database was consulted on March 29, 2004.

American Chaffseed (*Schwalbea americana*)
American chaffseed is a perennial herb with mostly unbranched stems, usually one to two feet tall. Leaves are largest at the base of the plant and gradually diminish in size towards the top of the stem. The two-lipped tubular flowers are yellow, suffused with purple. American chaffseed blooms from April through June in the South and from June to late July in the North (NatureServe 2003c). The leaves are alternate; lance shaped to elliptic, stalkless, and are one to two inches in length. The fruits are long and narrow and enclosed in a sac like structure, fruits mature from early summer in the south, to October in the north (FWS 2003a). This species is parasitic on the roots of a wide variety of woody and herbaceous plants (NatureServe 2003c).

American chaffseed typically grows in sandy (sandy peat, sandy loam), acidic, and seasonally moist to dry soils. It is generally found in habitats described as open, moist pine flatwoods, pine/wiregrass savannas, and ecotonal areas between peaty wetlands and xeric sandy soils (US Army 2003a). All of these habitats were historically maintained by human or lightning-caused wildfires. American chaffseed is dependent on factors such as fire, mowing, or fluctuating water tables to maintain the crucial open to partly-open conditions that it requires (FWS 2003a). These habitats are species-rich with grasses, sedges, and savanna dicots being especially numerous (US Army 2003a). Natural communities that could include American chaffseed are; open pine flatwoods, pitch pine lowland forests, seepage bogs, palustrine pine savannahs, and other grass and sedge-dominated plant communities (NatureServe 2003c).

Based on a review of NHP records, there are no documented occurrences of American chaffseed within a three-mile radius of the project study area.

BIOLOGICAL CONCLUSION: No Effect
According to the NHP element occurrence database records, there are no known occurrences of chaffseed in the project vicinity. There are no open, moist pine flatwoods, pine/wiregrass savannas, or ecotonal areas between peaty wetlands and xeric sandy soils that could support American chaffseed present within the project study area. The proposed project would have no effect on this federally endangered species.

Analysis Details –
Methodology: Analysis of the possible presence of and potential impacts to American chaffseed was conducted through an evaluation of existing information, and assessment of the habitat requirements. Additionally, the NHP element occurrence database was consulted on March 29, 2004.

2.0 Federal Species of Concern

The March 7, 2002 FWS list for Moore County (updated March 14, 2006) 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. The

presence of potential suitable habitat within the project study area has been evaluated for the following FSC species listed for Moore County is shown in Table 5.

Table 5. Federal Species of Concern (FSC) Listed for Moore County, NC

Common Name	Scientific Name	State Status*	Potential Habitat
Vertebrates			
Bachman's sparrow	*Aimophila aestivalis*	SC	Yes
American eel	*Anguilla rostrata*	#	Yes
Roanoke bass	*Ambloplites cavifrons*	SR	No
Southern hognose snake	*Heterodon simus*	SC	No
Northern pinesnake	*Pituophis melanoleucus melanoleucus*	SC~	No
Carolina darter-eastern Piedmont population	*Etheostoma collis collis*	SC	Yes
Carolina darter	*Etheostoma collis lepidinion*	SC	Yes
Pinewoods darter	*Etheostoma mariae*	SC	No
Carolina redhorse	*Moxostoma sp 2*	SR (PE)	No
Robust redhorse	*Moxostoma robustum*	#	Yes
Southeastern myotis	*Myotis austroriparius*	SC	Yes
Sandhills chub	*Semotilus lumbee*	SC	No
Invertebrates			
Brook floater	*Alasmidonta varicosa*	E	No
Atlantic pigtoe	*Fusconaia masoni*	E	No
Yellow lampmussel	*Lampsilis cariosa*	E	No
Carolina creekshell	*Villosa vaughaniana*	E	Yes
Argos skipper	*Atrytone argos argos*	SR**	No
Hessel's hairstreak	*Callophyrs hesseli*	#	Yes
Septima's clubtail	*Gomphus septima*	SR	No
Sandhills □lubtail dragonfly	*Gomphus parvidens carolinus*	#	No
Vascular Plants			
Georgia indigo-bush	*Amorpha georgiana var georgiana*	E~	No
Sandhills milk-vetch	*Astragalus michauxii*	T	No
Bog oatgrass	*Danthonia epilis*	SR-T	No
Venus flytrap	*Dionaea muscipula*	SR-L, SC	No
White wicky	*Kalmia cuneata*	#	No
Bog spicebush	*Lindera subcoriacea*	T	No
Carolina birdfoot-trefoil	*Lotus helleri*	SR-T	No
Sandhills bog lily	*Lilium iridollae*	#	No
Buttercup phacelia	*Phacelia covillei*	SR-T	Yes
Conferva pondweed	*Potamogeton confervoides*	SR-D	No
Sandhills pixie-moss	*Pyxidanthera barbulata var brevifolia*	E	No
Alabama beaksedge	*Rhynchospora crinipes*	E	No
Sun-facing coneflower	*Rudbeckia heliopsidis*	E	Yes
Spring-flowering goldenrod	*Solidago verna*	SR-L	No
Small-leaved meadow-rue	*Thalictrum macrostylum*	SR-L	No
Pickering's dawnflower	*Stylisma pickeringii var pickeringii*	E	No

Roughleaf yellow-eyed-grass	*Xyris scabrifolia*	SR-T	No
E - Endangered, T - Threatened, SR - Significantly Rare, SC - Special Concern, SR-T- Rare throughout its range, SR-L – Range is limited to NC and adjacent states, SR-P – Periphery of its range in NC. *No longer tracked by NCNHP, **Occurs on NCNHP list but not on USFWS list, #Not listed as a FSC on NCNHP list, ^Obscure record, ~Historic record (last observed over 50 years ago)			

NHP records were reviewed to determine the known locations of FSC within a three-mile radius of the project study area. NHP records document one occurrence of a FSC within a three-mile radius of the project study area. Georgia Indigo-bush occurred approximately 1.75 miles south of the project study area. This occurrence is listed as historic by the NHP (occurrence greater than 20 years old).

VI. CULTURAL RESOURCES

A. Compliance Guidelines

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

B. Historic Architecture

In a memorandum dated July 7, 2004 the State Historic Preservation Office (SHPO) states that the proposed project would not have an effect on historic resources. A copy of the memorandum is included in the Appendix.

C. Archaeology

An archaeological survey report was completed by Dr. Gerold Glover of NCDOT. During the course of the survey no prehistoric or historic archaeological sites were located within the project area. Due to the absence of cultural material, Dr. Glover has recommended that no further archaeological investigation be conducted in connection with the project. The SHPO concurred with this recommendation since the project would not involve significant archaeological resources. A copy of the SHPO memorandum dated August 10, 2004, is included in the Appendix.

VII. 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 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:

(1) There is no prudent or feasible alternative to using that land; and

(2) 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."

No publicly owned parks or recreational facilities, wildlife and waterfowl refuges, or historic sites of national, state, or local significance would be impacted as a result of proposed project. The proposed project would not require right-of-way acquisition or easement from any land protected under Section 4(f) of the Department of Transportation Act of 1966.

VIII. ENVIRONMENTAL EFFECTS

The project is expected to have a positive affect on transportation and the surrounding community. The replacement of the inadequate bridge would result in safer and more efficient traffic operations.

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

Replacement of Bridge No. 43 would not have a negative effect on the quality of the human or the natural environment.

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

No adverse impact on families or the community is expected. Right-of-way acquisition would be limited; no relocations are expected with the implementation of the Preferred Alternative.

In compliance with Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations) a review was conducted to determine whether minority or low-income populations would receive disproportionately high and adverse human health and environmental impacts as a result of this project. The

investigation determined the project would not disproportionately impact any minority or low-income populations.

No adverse effect on public facilities or services is expected. The project is not expected to adversely affect social, economic, or religious opportunities in the area. There would be some inconvenience to local travel due to construction activities on NC 22-24-27.

According to the NCDOT Bicycle Division Map "Tour Moore" map of bicycle routes in Moore County, the studied route does not contain bicycle accommodations, nor is it a designated bicycle route. Therefore, bicycle accommodations have not been included as a part of this project.

This project has been coordinated with the United States Department of Agriculture, 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 for all land acquisition and construction projects. Soils were identified within a 0.5-mile radius of the project area, and checked to see if they were classified as prime, unique, or have state or local importance. Six of the soils identified were on the NRCS list, *Important Farmlands of North Carolina, May 1998*. Soils in which all areas are considered prime farmland included, Tetotum Silt Loam, 0 to 3 percent slopes, rarely flooded (ToA). Soils in which all areas are farmland of statewide importance included, Mooshaunee-Hallison Complex, 8 to 15 percent slopes (MoD), Mayodan Fine Sandy Loam, 8 to 15 percent slopes (MdB), and Ailey Loamy Sand, 2 to 8 percent slopes (AeB). Soils in which only areas protected or not frequently flooded during the growing season are considered prime farmland included, Congaree Loam, 0 to 2 percent slopes, frequently flooded (Co). Soils in which only drained areas that are either protected from flooding or not frequently flooded during the growing season are considered prime farmland included, Chewacla Silt Loam, 0 to 2 percent slopes, frequently flooded (Ch). If impacts to these soils occur as a result of the proposed project, they are expected to be limited in nature.

No adverse effects to air quality are anticipated from this project. This project is an air quality "neutral" project, so it is not required to be included in the regional emissions analysis, and a project level CO analysis is not required.

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

If vegetation or wood debris are disposed of by open burning, it shall be done in accordance with applicable local laws and regulations of the North Carolina Implementation Plan (SIP) for air quality in compliance with 15 NCAC 2D.0520 and the 1990 Clean Air Act Amendments and the National Environmental Policy Act. This evaluation completes the assessments for air quality, and no additional reports are required.

Ambient noise levels may increase during the construction of this project; however this increase would be only temporary and usually confined to daylight hours. There should be no notable change in traffic volumes after the project is complete. Therefore, this project would have no adverse effect on existing noise levels. Noise receptors in the project area would not be impacted by this project. This evaluation completes the assessment requirements for highway noise set forth in 23 CFR Part 722. No additional reports are required.

A "Geo-Environmental Impact Evaluation" was conducted by the NCDOT at the project site to identify any properties that may contain hazardous waste materials and result in future environmental liability, if the property were to be acquired. These hazards include: underground storage tanks (USTs), hazardous waste sites, regulated landfills, unregulated dumpsites, and any other site or materials that are considered hazardous. A field reconnaissance survey, a file search of appropriate environmental agencies, and a Geographical Information System (GIS) were used to identify any known problem sites along the proposed project alignment. The field reconnaissance survey yielded no anticipated UST sites within the project area. A GIS analysis of the project corridor showed no regulated landfills, or unregulated dumpsites were within the project limits. GIS analysis and field reconnaissance found no potential RCRA or CERCLA sites within the project limits. Based on field reconnaissance and a records search, no contamination issues are anticipated for the B-4207 project.

Moore County is a participant in the Federal Flood Insurance Program. The bridge is located within an Approximate Study Area. The new structure should be designed to match or lower the existing 100-year storm elevation upstream of the roadway. Since the proposed replacement for Bridge No. 43 would be a structure similar in waterway opening size, it is not anticipated that it would have any substantial adverse impact on the existing floodplain, and it would not raise floodplain levels. The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for the project study area is attached.

Based on the above discussion, it is concluded that no substantial environmental impacts would result from the replacement of Bridge No. 43.

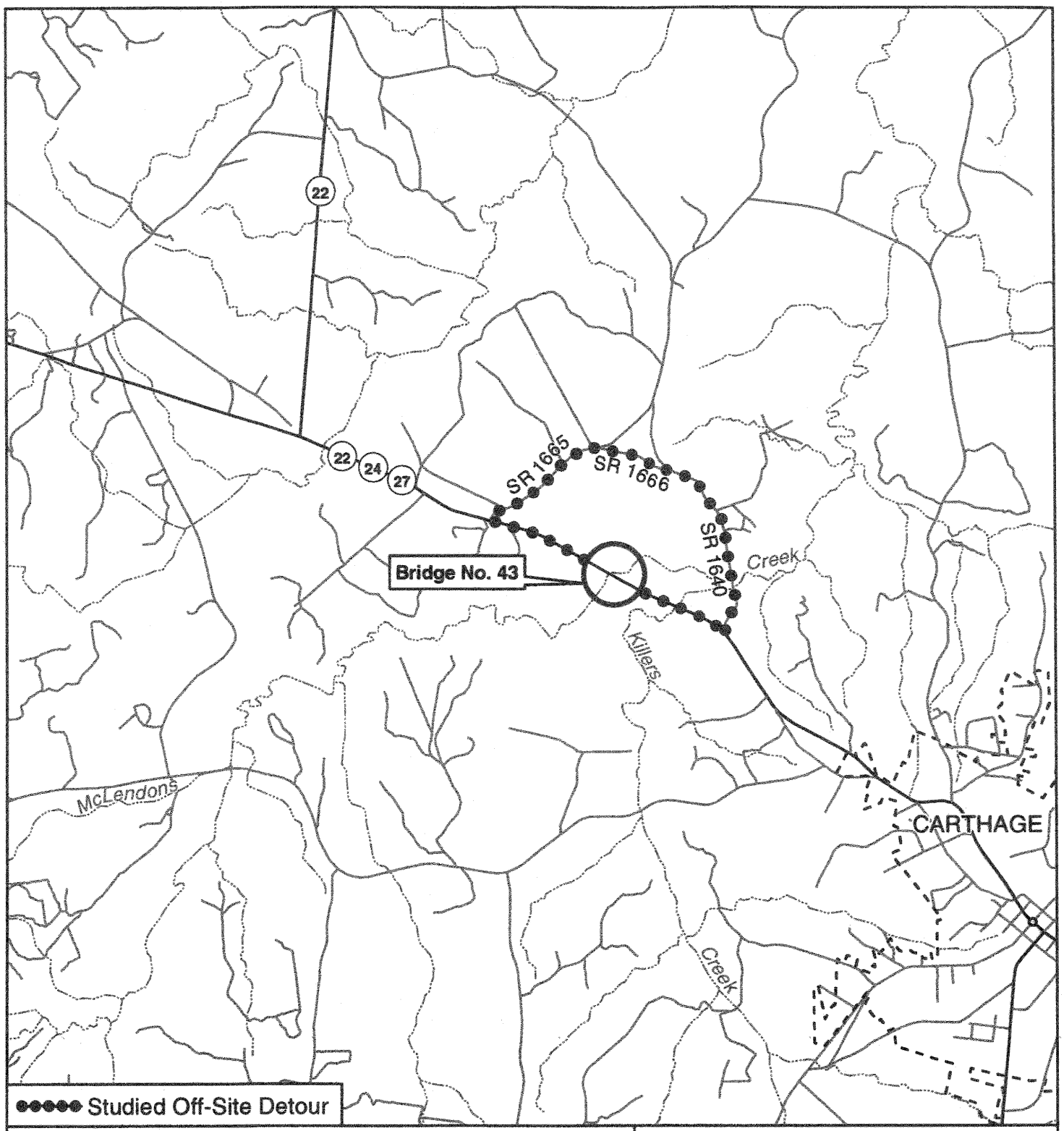
IX. PUBLIC INVOLVEMENT

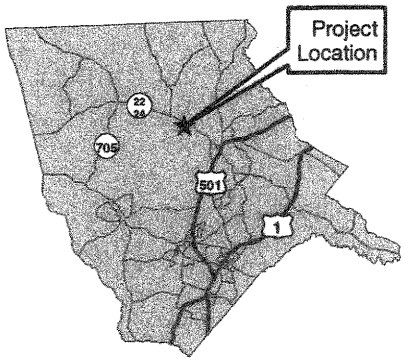
Newsletters describing the proposed bridge replacement project were sent to local residents. The newsletters give the public an opportunity to comment on the possible alternatives for the proposed bridge replacement. A copy of the newsletter is included in the Appendix. A local resident, who owns property downstream from the bridge, expressed concern over the potential for increased downstream flooding resulting from the construction of a replacement structure with a larger opening

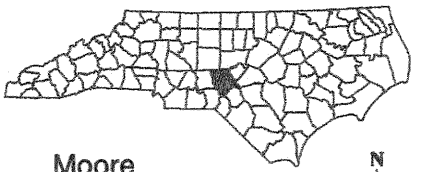
X. AGENCY COMMENTS

Comments on the proposed project were requested from federal, state and local agencies. Several agencies have commented upon the proposed bridge alignment. These comments have been considered during the environmental and design process and are included in the Appendix.

FIGURES







Moore
County, NC

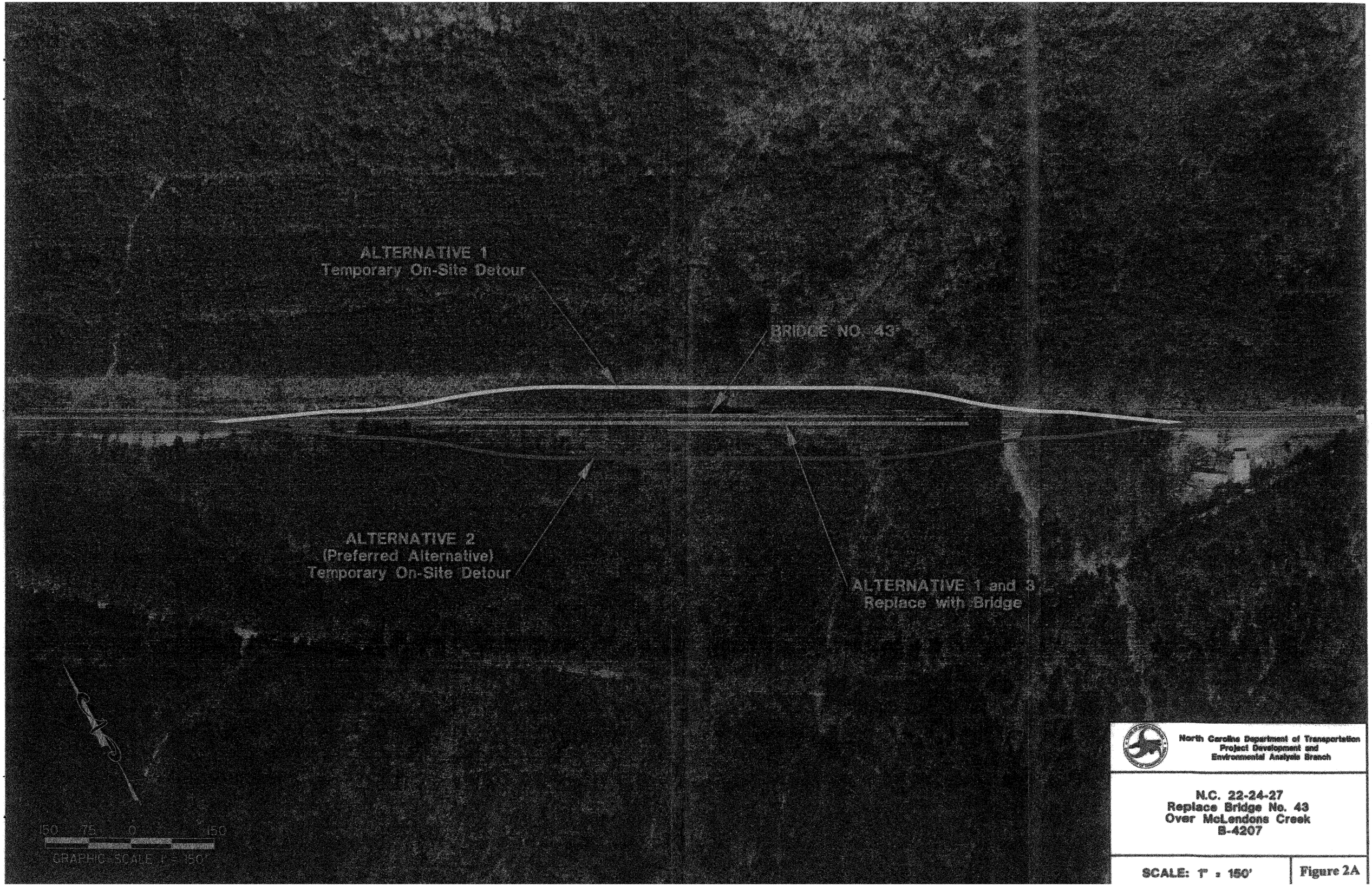
N
W E
S

0 4,000
Feet

North Carolina Department of Transportation
Project Development and
Environmental Analysis Branch

NC 22-24-27
Replace Bridge No. 43
Over McLendons Creek
Moore County
B-4207

PROJECT VICINITY MAP | Figure 1

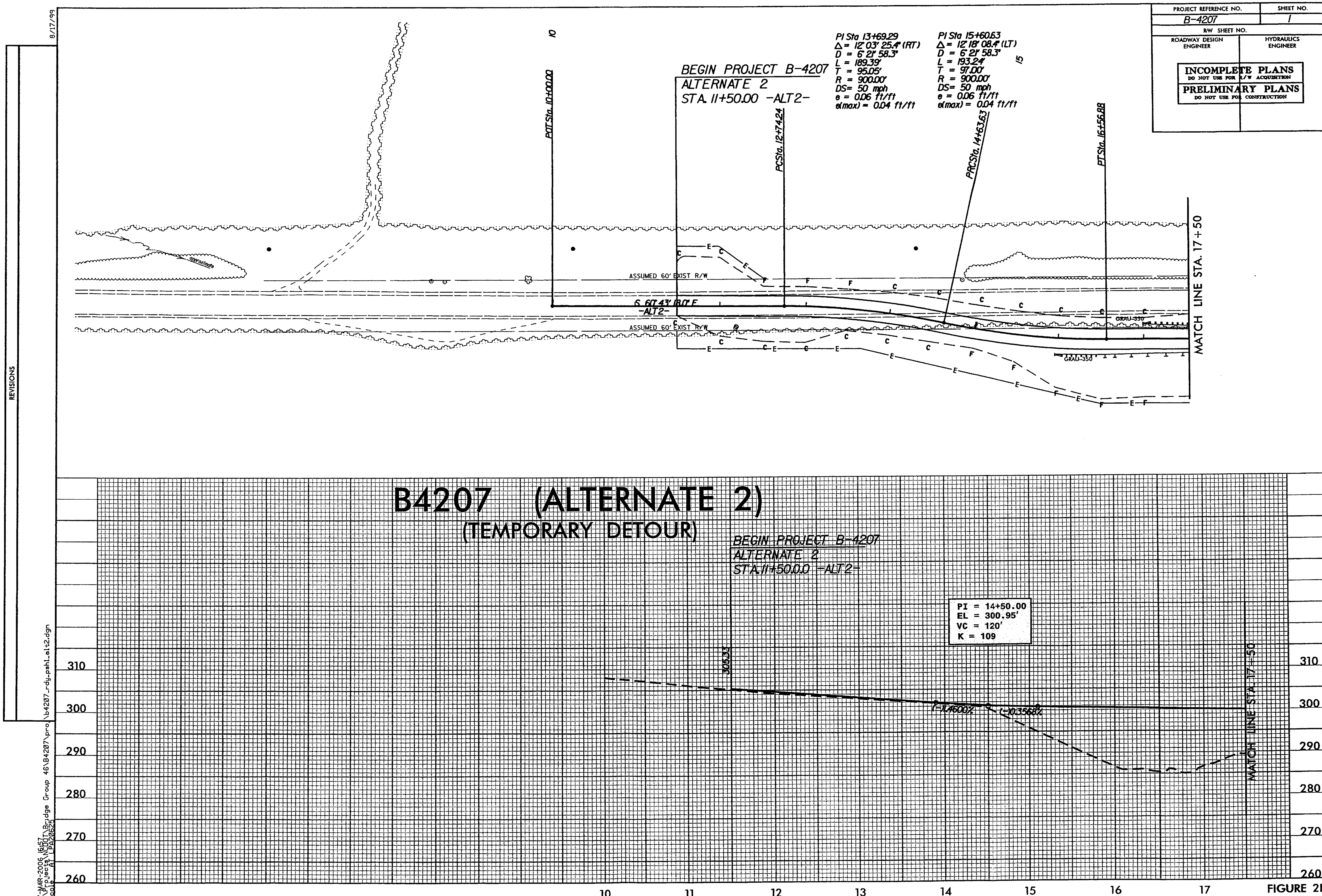


North Carolina Department of Transportation
Project Development and
Environmental Analysis Branch

N.C. 22-24-27
Replace Bridge No. 43
Over McLendons Creek
B-4207

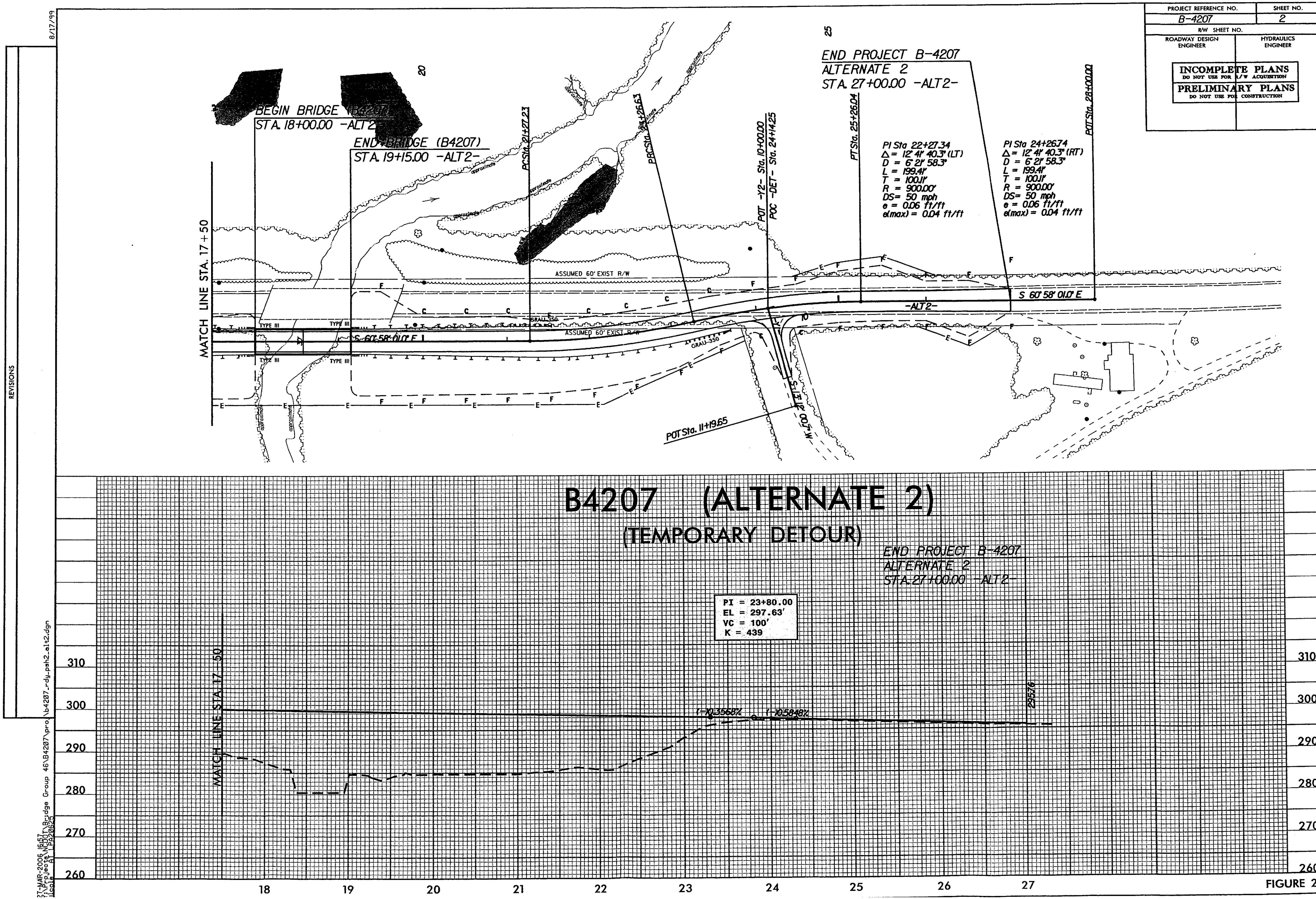
SCALE: 1" = 150'

Figure 2A



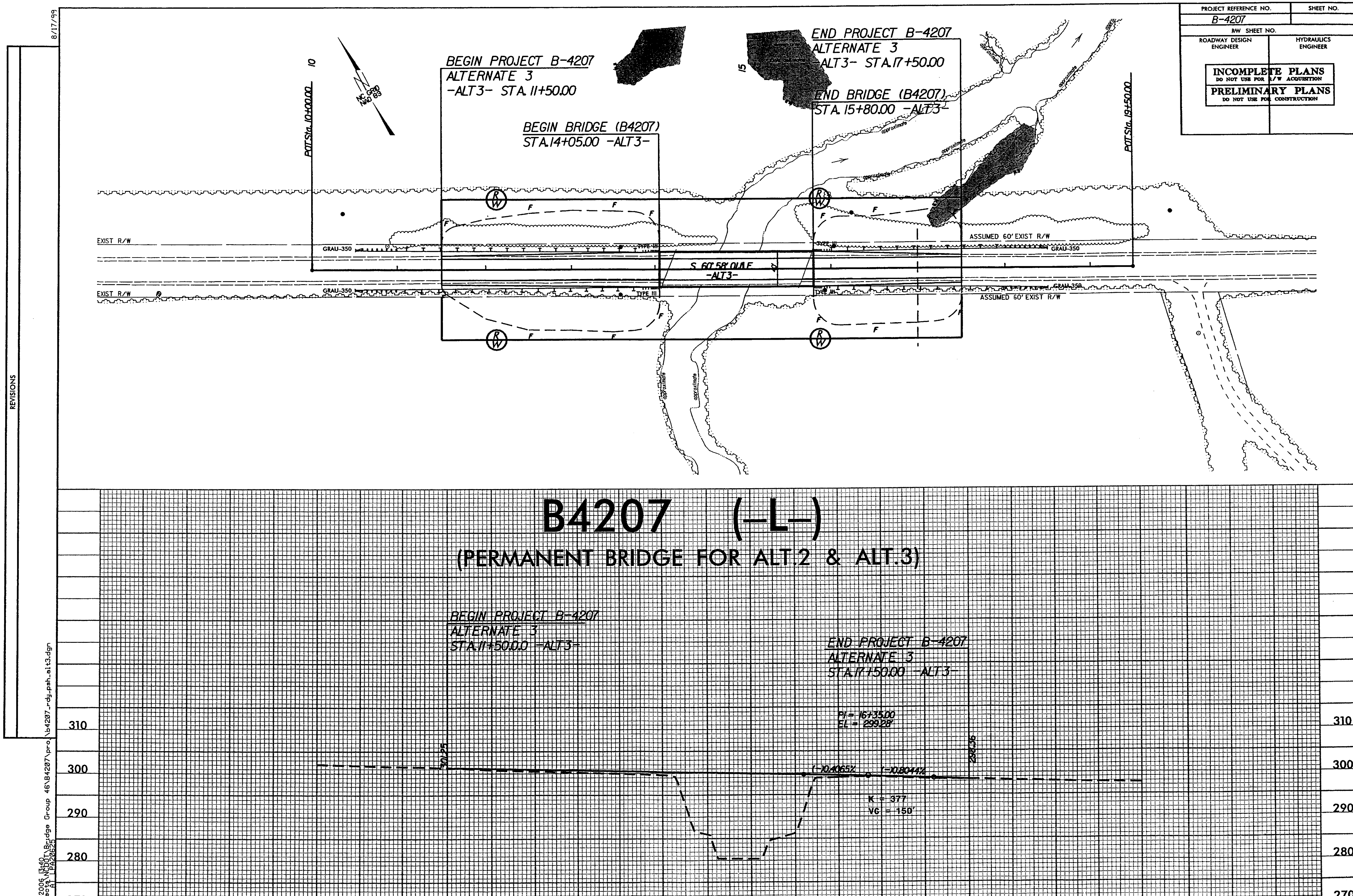
PROJECT REFERENCE NO.
SHEET NO.
B-4207
1
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
BEGIN PROJECT B-4207
ALTERNATE 2
STA. 11+50.00 -ALT2-
PI Sta 13+69.29
PI Sta 15+60.63
POT Sta. 10+00.00
PC Sta. 12+74.24
PRC Sta. 14+63.63
PT Sta. 16+56.88
ASSUMED 60' EXIST R/W
-ALT2-
MATCH LINE STA. 17+50
B4207 (ALTERNATE 2)
(TEMPORARY DETOUR)
PI = 14+50.00
EL = 300.95'
VC = 120'
K = 109

FIGURE 2B



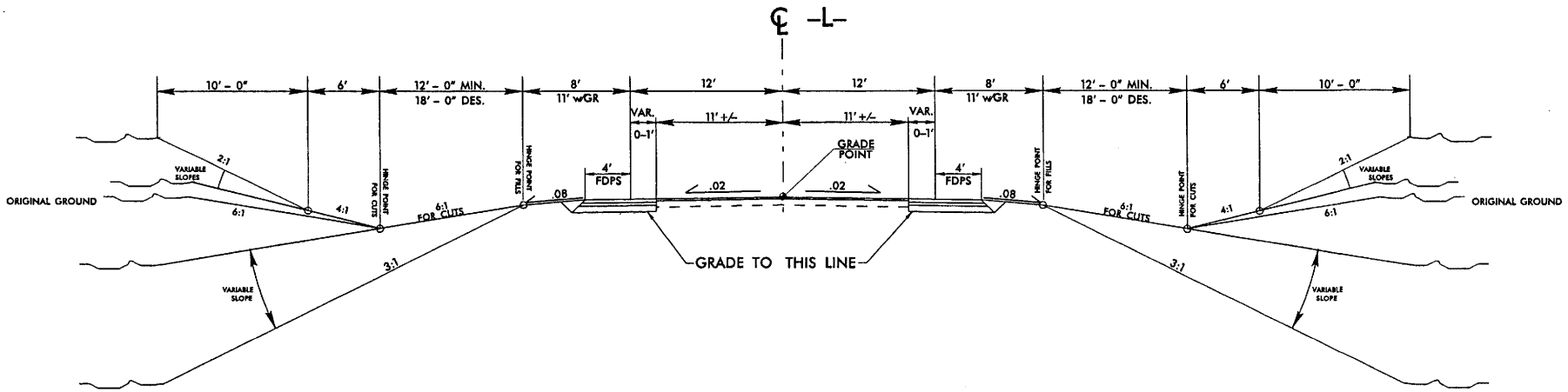
PROJECT REFERENCE NO.
SHEET NO.
B-4207
2
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
8/17/99
REVISIONS
BEGIN BRIDGE (B4207)
STA. 18+00.00 -ALT2-
END BRIDGE (B4207)
STA. 19+15.00 -ALT2-
END PROJECT B-4207
ALTERNATE 2
STA. 27+00.00 -ALT2-
PCSta. 21+27.23
PRCSta. 23+26.63
POT -Y2- Sta. 10+00.00
POC -DET- Sta. 24+14.25
PT Sta. 25+26.04
POT Sta. 28+00.00
PI Sta 22+27.34
Δ = 12° 41' 40.3" (LT)
D = 6° 21' 58.3"
L = 199.41'
T = 100.11'
R = 900.00'
DS= 50 mph
e = 0.06 ft/ft
e(max) = 0.04 ft/ft
PI Sta 24+26.74
Δ = 12° 41' 40.3" (RT)
D = 6° 21' 58.3"
L = 199.41'
T = 100.11'
R = 900.00'
DS= 50 mph
e = 0.06 ft/ft
e(max) = 0.04 ft/ft
MATCH LINE STA. 17+50
ASSUMED 60' EXIST R/W
S 60° 58' 01.0" E
-ALT2-
TYPE III
GRAU-350
POT Sta. 11+19.65
approximate
20
25
B4207 (ALTERNATE 2)
(TEMPORARY DETOUR)
END PROJECT B-4207
ALTERNATE 2
STA. 27+00.00 -ALT2-
PI = 23+80.00
EL = 297.63'
VC = 100'
K = 439
(-)0.3568%
(-)0.5848%
295.76
MATCH LINE STA. 17+50
310
300
290
280
270
260
18
19
20
21
22
23
24
25
26
27

FIGURE 2C

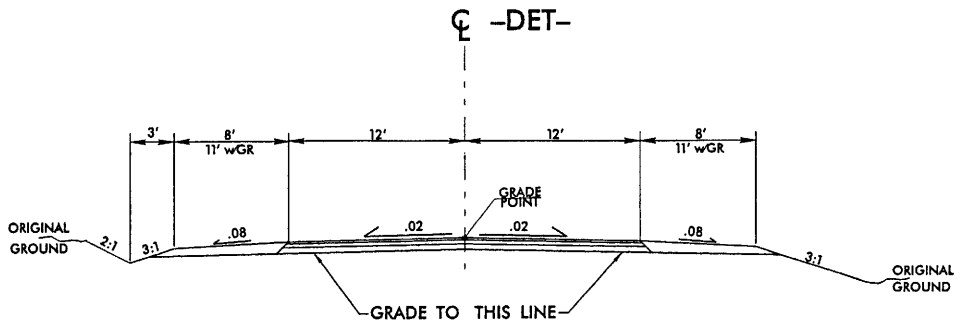


PROJECT REFERENCE NO.
SHEET NO.
B-4207
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
8/17/99
REVISIONS
NC GRID NAD 83
POT Sta. 10+00.00
POT Sta. 19+50.00
BEGIN PROJECT B-4207
ALTERNATE 3
-ALT3- STA. 11+50.00
BEGIN BRIDGE (B4207)
STA. 14+05.00 -ALT3-
END PROJECT B-4207
ALTERNATE 3
-ALT3- STA. 17+50.00
END BRIDGE (B4207)
STA. 15+80.00 -ALT3-
EXIST R/W
ASSUMED 60' EXIST R/W
GRAU-350
TYPE III
S 60°58'01.1" E
-ALT3-
approximate
B4207 (-L-)
(PERMANENT BRIDGE FOR ALT.2 & ALT.3)
BEGIN PROJECT B-4207
ALTERNATE 3
STA. 11+50.00 -ALT3-
END PROJECT B-4207
ALTERNATE 3
STA. 17+50.00 -ALT3-
PI = 16+35.00
EL = 299.28'
(-)0.4065%
(-)0.8044%
K = 377
VG = 150'
301.25
298.36
310
300
290
280
270
10
11
12
13
14
15
16
17
18
19

FIGURE 2D



TYPICAL SECTION NO. 1



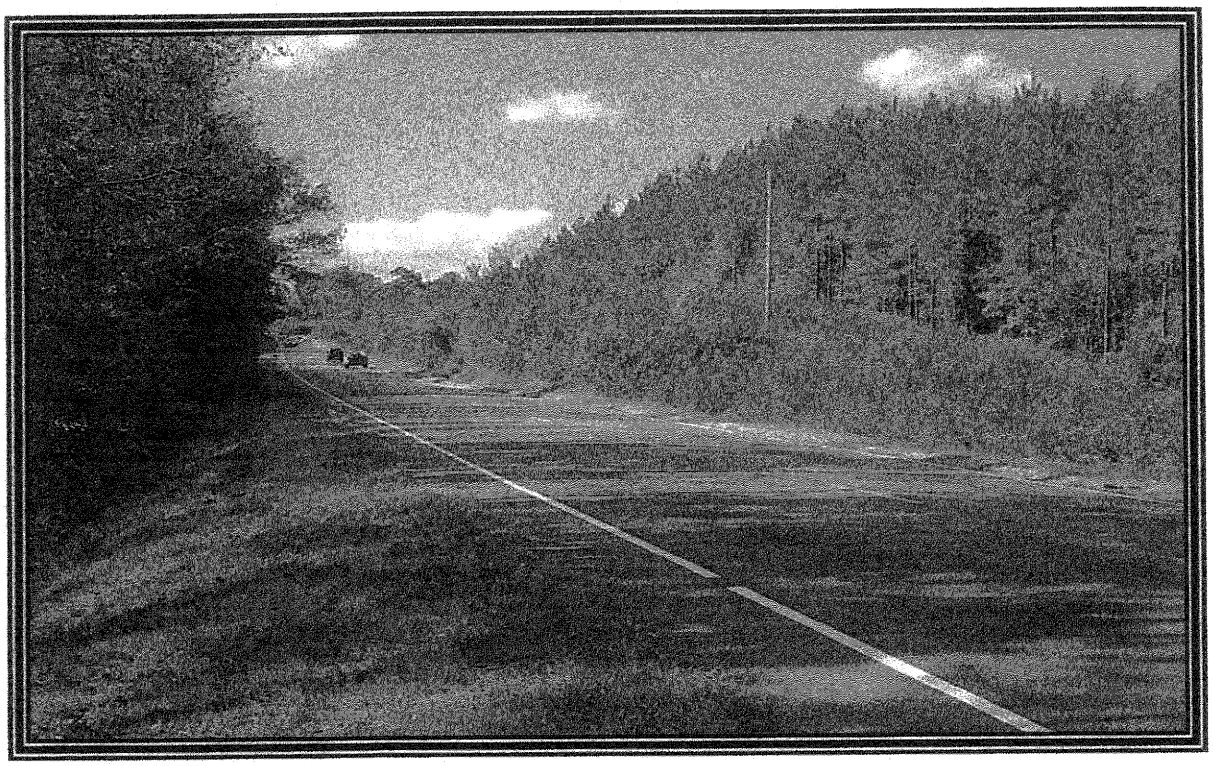
TYPICAL SECTION NO. 2

North Carolina Department of Transportation
Project Development and
Environmental Analysis Branch

N.C. 22-24-27
Replace Bridge No. 43
Over McLendons Creek
Moore County
B-4207

NOT TO SCALE

Figure 3A



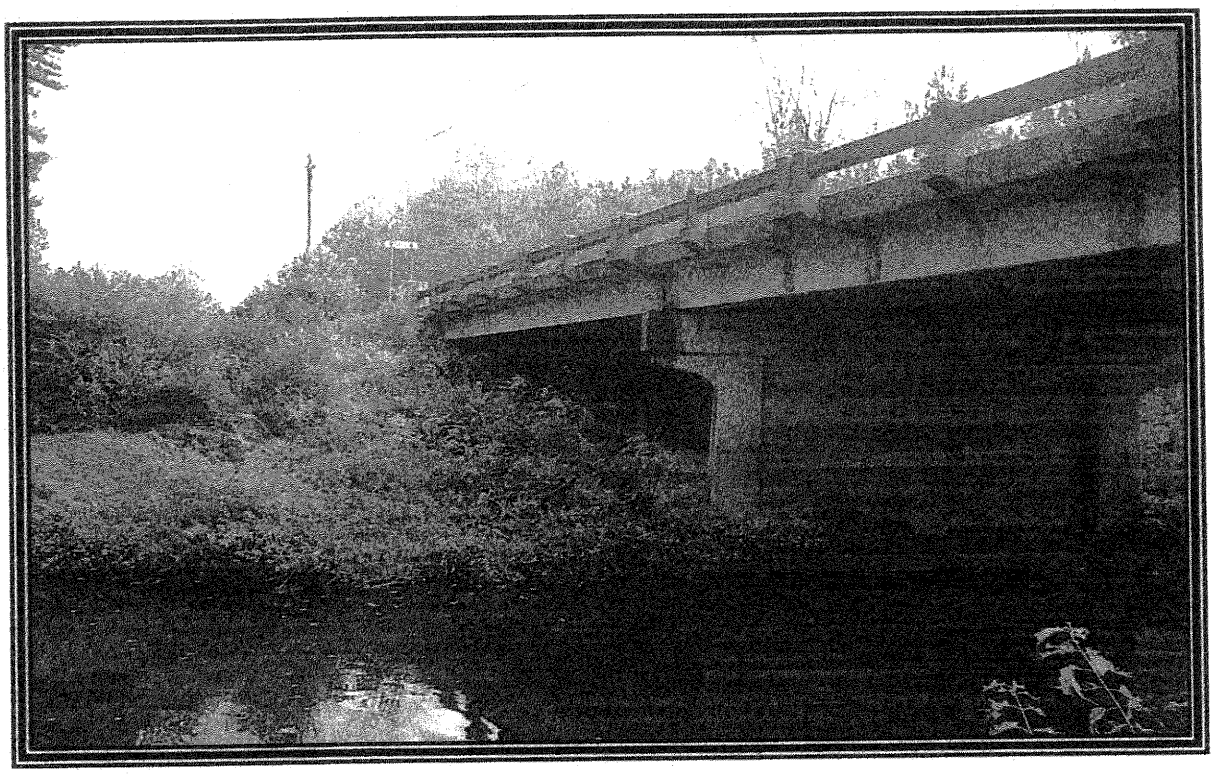
MOORE COUNTY
BRIDGE No. 43
B-4207

Looking West on NC 22/24/27

Looking East on NC 22/24/27

FIGURE 4A

MOORE COUNTY
BRIDGE No. 43
B-4207



Looking at the North Side of Bridge No. 43

Looking at the South Side of Bridge No. 43

FIGURE 4B

MOORE COUNTY
BRIDGE No. 43
B-4207

Looking Downstream at McLendons Creek

Looking Upstream at McLendons Creek

FIGURE 4C

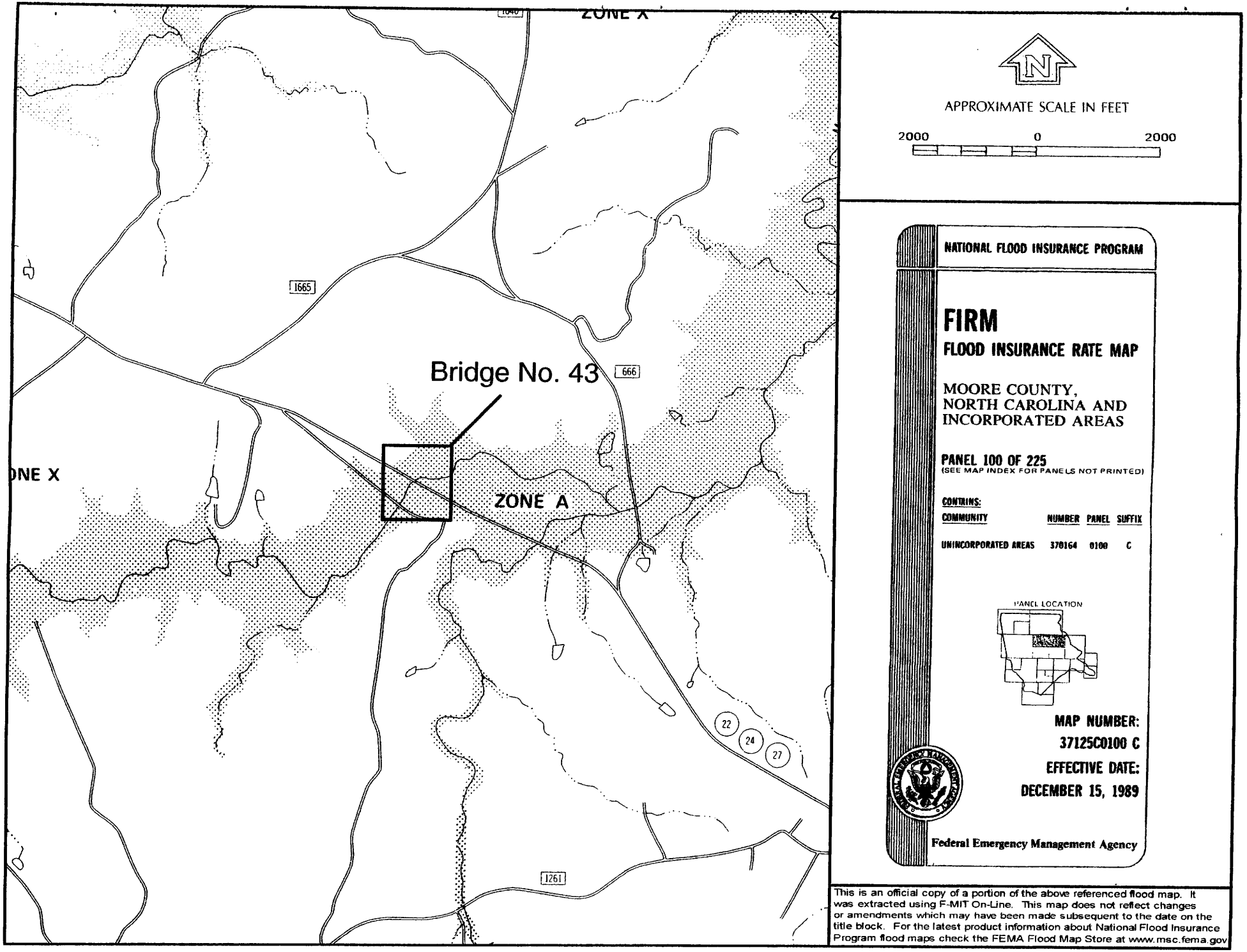

ZONE X
1665
Bridge No. 43
666
ONE X
ZONE A
22
24
27
1261
N
APPROXIMATE SCALE IN FEET
2000
0
2000
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
MOORE COUNTY,
NORTH CAROLINA AND
INCORPORATED AREAS
PANEL 100 OF 225
(SEE MAP INDEX FOR PANELS NOT PRINTED)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
UNINCORPORATED AREAS 370164 0100 C
PANEL LOCATION
MAP NUMBER:
37125C0100 C
EFFECTIVE DATE:
DECEMBER 15, 1989
Federal Emergency Management Agency
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Figure 5

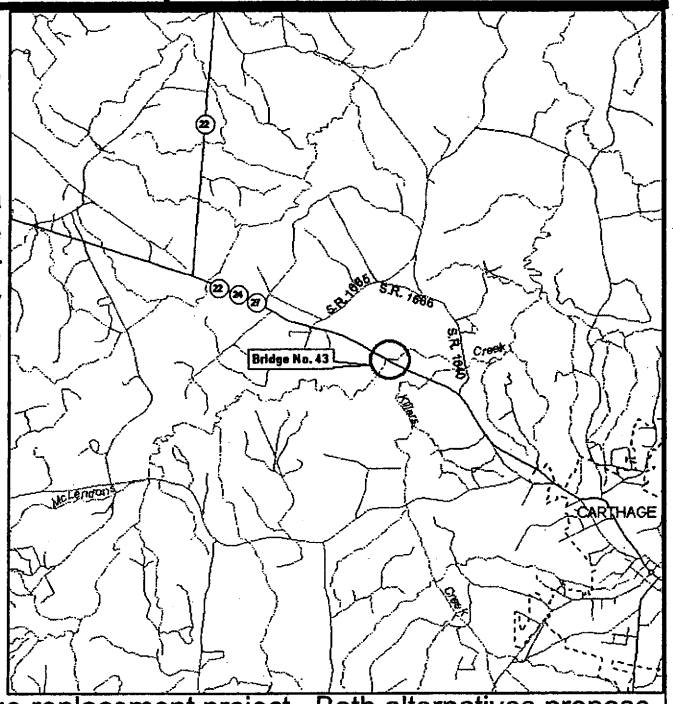
APPENDIX

Newsletter

NCDOT
T.I.P. B-4207

Volume I, Issue I

Proposed Replacement of Bridge No. 43 over McLendons Creek on NC 22-24-27



This newsletter is published by the North Carolina Department of Transportation to provide information of the status of the proposed replacement of the bridge over McLendons Creek on NC 22-24-27 illustrated in the vicinity map to the right. The proposed project is needed to improve safety due to the deteriorated condition of the existing bridge.

PROJECT SCHEDULE

The acquisition of right-of-way is scheduled for federal fiscal year (FFY) 2005, with construction in FFY 2006.

PROJECT DESCRIPTION

Two (2) alternatives have been studied for the proposed bridge replacement project. Both alternatives propose to replace the bridge in its existing location. Alternative 1 would maintain traffic with an on-site detour on the downstream (north) side of the existing bridge during construction. Alternative 2 would maintain traffic with an on-site detour on the upstream (south) side of the existing bridge during construction. Please see the figures shown on the back of this newsletter. Currently Alternative 2 has been recommended as the preferred alternative because it has a better crossing of the stream and the least environmental impacts.

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 final decisions are made. If you have any questions or comments concerning the project, please feel free to contact the study team members below:

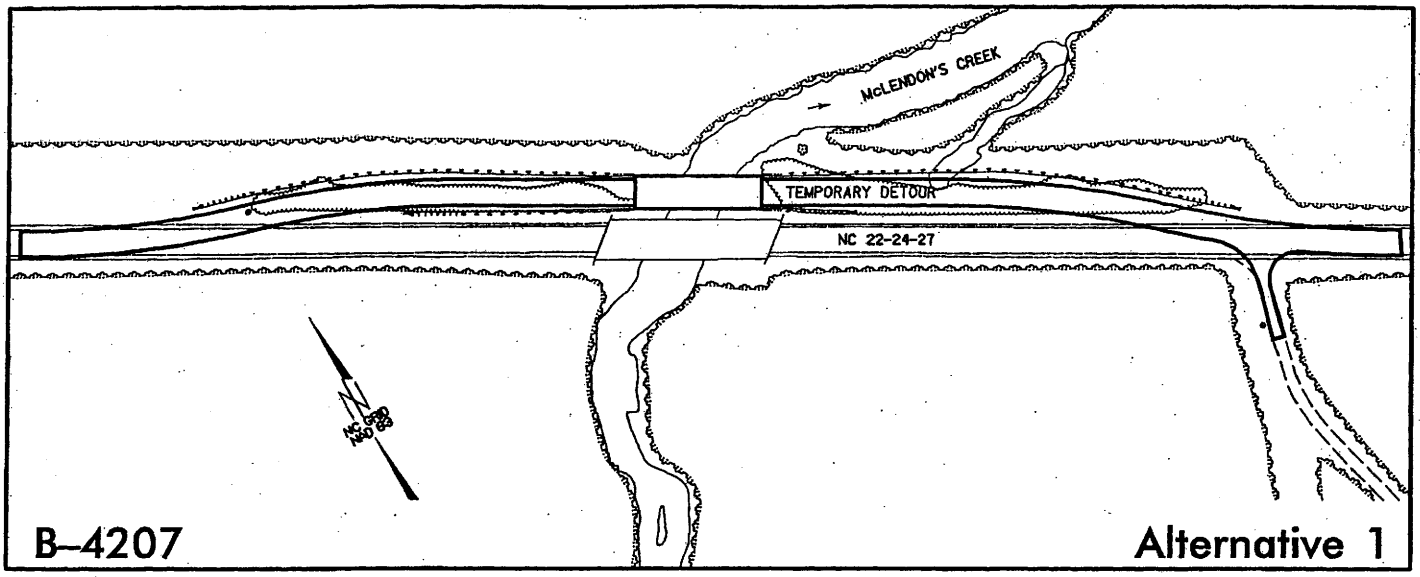
Mr. Vincent J. Rhea, PE
Project Manager
NCDOT-PDEA
1548 Mail Service Center
Raleigh, NC 27699-1548
(919) 733-7844 ext. 261
vrhea@dot.state.nc.us

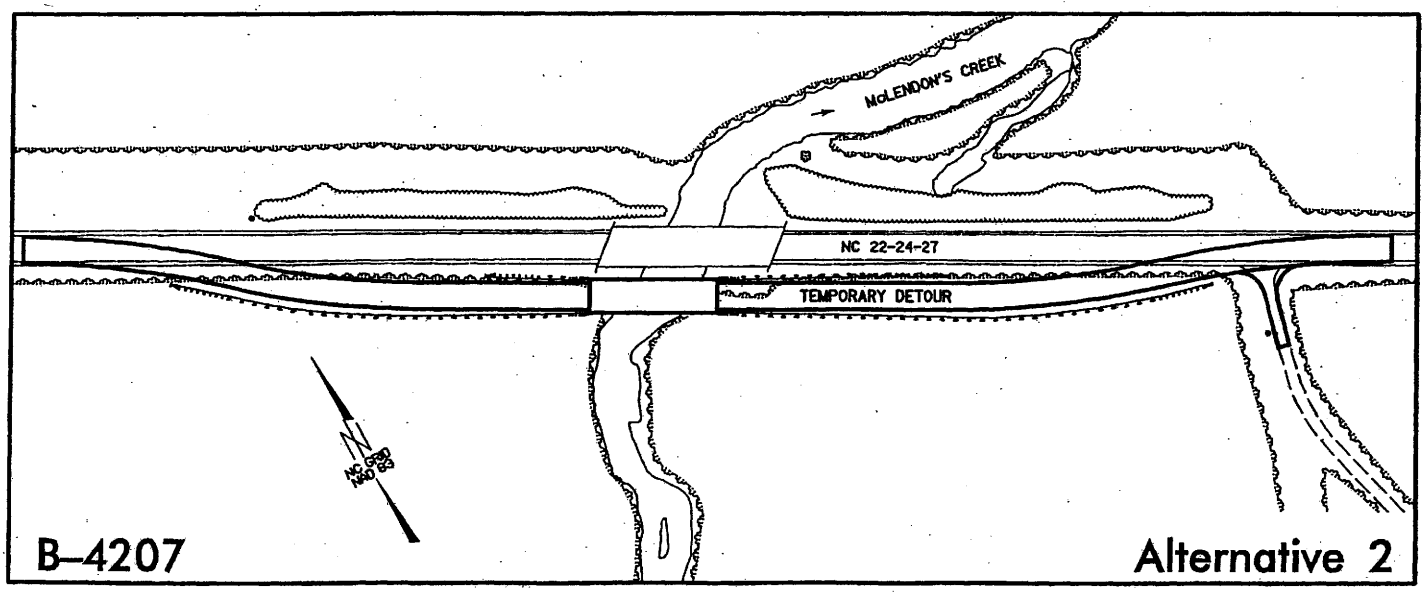
Mr. Richard Davis
Project Manager
The LPA GROUP of North Carolina, P.A.
4904 Professional Ct., Suite 201
Raleigh, NC 27609
(919) 954-1244
rdavis@lpagroup.com

NCDOT
T.I.P. B-4207

North Carolina Department of Transportation
Project Development & Environmental Branch
1548 Mail Service Center
Raleigh, NC 27699-1548

Postal Customer





United States Department of the Interior

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

December 23, 2003

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

Dear Dr. Thorpe:

This letter is in response to your request for comments from the U.S. Fish and Wildlife Service (Service) on the potential environmental impacts of the proposed replacement of Bridge No. 43 on NC 22-24-27 over McLendons Creek, Moore County, North Carolina (TIP No. B-4207). These comments provide scoping information in accordance with provisions of the Fish and Wildlife Coordination Act (16 U.S.C. 661-667d) and section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

For bridge replacement projects, the Service recommends the following general conservation measures to avoid or minimize environmental impacts to fish and wildlife resources:

1. Wetland, forest and designated riparian buffer impacts should be avoided and minimized to the maximum extent practical;

2. If unavoidable wetland impacts are proposed, every effort should be made to identify compensatory mitigation sites in advance. Project planning should include a detailed compensatory mitigation plan for offsetting unavoidable wetland impacts. Opportunities to protect mitigation areas in perpetuity via conservation easements, land trusts or by other means should be explored at the outset;

3. Off-site detours should be used rather than construction of temporary, on-site bridges. For projects requiring an on-site detour in wetlands or open water, such detours should be aligned along the side of the existing structure which has the least and/or least quality of fish and wildlife habitat. At the completion of construction, the detour area should be entirely removed and the impacted areas be planted with appropriate vegetation, including trees if necessary;

4. Wherever appropriate, construction in sensitive areas should occur outside fish spawning and migratory bird nesting seasons. In waterways that may serve as travel corridors for

fish, in-water work should be avoided during moratorium periods associated with migration, spawning and sensitive pre-adult life stages. The general moratorium period for anadromous fish is February 15 - June 30;

5. New bridges should be long enough to allow for sufficient wildlife passage along stream corridors;

6. Best Management Practices (BMP) for Protection of Surface Waters should be implemented;

7. Bridge designs should include provisions for roadbed and deck drainage to flow through a vegetated buffer prior to reaching the affected stream. This buffer should be large enough to alleviate any potential effects from run-off of storm water and pollutants;

8. The bridge designs should not alter the natural stream and stream-bank morphology or impede fish passage. To the extent possible, piers and bents should be placed outside the bank-full width of the stream;

9. Bridges and approaches should be designed to avoid any fill that will result in damming or constriction of the channel or flood plain. If spanning the flood plain is not feasible, culverts should be installed in the flood plain portion of the approach to restore some of the hydrological functions of the flood plain and reduce high velocities of flood waters within the affected area.

There are four federally protected species listed for Moore County: the Cape Fear Shiner (*Notropis mekistocholas*), red-cockaded woodpecker *(Picoides borealis*), American chaffseed (*Schwalbea americana*) and Michaux's sumac *(Rhus michauxii*). Although the North Carolina Natural Heritage Program (NCNHP) database does not indicate any known occurrences of these species near the project vicinity, use of the NCNHP data should not be substituted for actual field surveys if suitable habitat occurs near the project site. The NCNHP database only indicates the presence of known occurrences of federally protected species and does not necessarily mean that such species are not present. It may simply mean that the area has not been surveyed. Information about the habitats in which these species are often found is provided on our web site, http://endangered.fws.gov/ . If suitable habitat occurs within the project vicinity for any of the listed species, surveys should be conducted to determine presence or absence of the species. All survey documentation must include survey methodologies and results.

We reserve the right to review any federal permits that may be required for this project, at the public notice stage. Therefore, it is important that resource agency coordination occur early in the planning process in order to resolve any conflicts that may arise and minimize delays in project implementation. In addition to the above guidance, we recommend that the environmental documentation for this project include the following in sufficient detail to facilitate a thorough review of the action:

1. A clearly defined and detailed purpose and need for the proposed project;

2. A description of the proposed action with an analysis of all alternatives being considered, including the "no action" alternative;

3. A description of the fish and wildlife resources, and their habitats, within the project impact area that may be directly or indirectly affected;

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

5. The anticipated environmental impacts, both temporary and permanent, that would be likely to occur as a direct result of the proposed project. The assessment should also include the extent to which the proposed project would result in secondary impacts to natural resources, and how this and similar projects contribute to cumulative adverse effects;

6. Design features and construction techniques which would be employed to avoid or minimize the fragmentation or direct loss of wildlife habitat and waters of the US;

7. If unavoidable wetland impacts are proposed, project planning should include a detailed compensatory mitigation plan for offsetting the unavoidable impacts.

The Service appreciates the opportunity to comment on this project. Please continue to advise us during the progression of the planning process, including your official determination of the impacts of this project. If you have any questions regarding our response, please contact Mr. Gary Jordan at (919) 856-4520, ext. 32.

Sincerely,

Garland B. Pardue

Garland B. Pardue, Ph.D.
Ecological Services Supervisor

cc: Richard Spencer, USACE, Wilmington, NC
Dave Franklin, USACE, Wilmington, NC
Beth Barnes, NCDWQ, Raleigh, NC
Travis Wilson, NCWRC, Creedmoor, NC
Chris Militscher, USEPA, Raleigh, NC

North Carolina Wildlife Resources Commission

Charles R. Fullwood, Executive Director

MEMORANDUM

TO: Vincent J. Rhea
Project Development and Environmental Analysis Branch, NCDOT

FROM: Travis Wilson, Highway Project Coordinator
Habitat Conservation Program

DATE: February 5, 2004

SUBJECT: NCDOT Bridge Replacements in Johnston, Moore, Montgomery, Brunswick, Bladen, Cumberland, Scotland, and Columbus counties. TIP Nos. B-4165, B-4207, B-4204, B-4030, B-4029, B-4092, B-4274, B-4080, and B-4078.

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).

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

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

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

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

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

Mailing Address: Division of Inland Fisheries • 1721 Mail Service Center • Raleigh, NC 27699-1721
Telephone: (919) 733-3633 ext. 281 • Fax: (919) 715-7643

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 steam 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. Hal Bain should be notified. Special measures to protect these sensitive species may be required. NCDOT should also contact the U.S. Fish and Wildlife Service for information on requirements of the Endangered Species Act as it relates to the project.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Project specific comments:

1. B-4165, Johnston County, Bridge No. 89 over Sassarixa Swamp on SR 1162. We recommend replacing this bridge with a bridge. Standard recommendations apply.

2. B-4207, Moore County, Bridge No. 43 over McLendons Creek on NC 22-24-27. We recommend replacing this bridge with a bridge. McLendons Creek contains habitat suitable for the federally endangered Cape Fear shiner, a survey should be conducted to determine the presence or absence of this species. Standard recommendations apply.

3. B-4204, Montgomery County, Bridge No. 28 over Rock Creek on NC 109. We recommend replacing this bridge with a bridge. Standard recommendations apply.

4. B-4030, Brunswick County, Bridge No. 9 over Bear Branch on NC 103. We recommend replacing this bridge with a bridge. Standard recommendations apply.

5. B-4029, Bladen County, Bridge No. 8 over canal on NC 210. We recommend replacing this bridge with a bridge. Standard recommendations apply.

6. B-4092, Cumberland County, Bridge No. 80 over Little Rockfish Creek on SR 1108. We recommend replacing this bridge with a bridge. A significant fishery for sunfish exists at this site, therefore we request in in-water work moratorium for sunfish from April 1 to June 30. Standard recommendations apply.

7. B-4274, Scotland County, Bridge No. 14 over Big Shoe Heel Creek on NC 144. We recommend replacing this bridge with a bridge. A significant fishery for sunfish exists at this site, therefore we request in in-water work moratorium for sunfish from April 1 to June 30. Standard recommendations apply.

8. B-4080, Columbus County, Bridge No. 148 over Pine Log Swamp on SR 1437. We recommend replacing this bridge with a bridge. Standard recommendations apply.

9. B-4078, Columbus County, Bridge No. 10 over Waccamaw River Overflow on NC 130. We recommend replacing this bridge with a bridge. Standard recommendations apply.

NCDOT should routinely minimize adverse impacts to fish and wildlife resources in the vicinity of bridge replacements. Restoring previously disturbed floodplain benches should narrow and deepen streams previously widened and shallowed during initial bridge installation. NCDOT should install and maintain sedimentation control measures throughout the life of the project and prevent wet concrete from contacting water in or entering into these streams. Replacement of bridges with spanning structures of some type, as opposed to pipe or box culverts, is recommended in most cases. Spanning structures allow wildlife passage along streambanks and reduce habitat fragmentation.

If you need further assistance or information on NCWRC concerns regarding bridge replacements, please contact me at (919) 528-9886. Thank you for the opportunity to review and comment on these projects.

Cc: Gary Jordan, U.S. Fish and Wildlife Service, Raleigh

North Carolina Department of Cultural Resources
State Historic Preservation Office

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

Division of Historical Resources
David L. S. Brook, Director

February 18, 2004

MEMORANDUM

TO: Vincent J. Rhea, P.E.
Project Development and Environmental Analysis
NCDOT Division of Highways

FROM: David Brook

SUBJECT: Bridge No. 14 on NC 144 (formerly SR 1405), over Big Shoe Heel Creek, B-4274, Scotland County, ER03-3643
Bridge No. 80 on SR 1108 over Little Rockfish Creek, B-4092, Cumberland County, ER03-3636
Bridge No. 28 on NC 109 over Rock Creek, B-4204, Montgomery County, ER03-3641
Bridge No. 43 on NC 22-24-27 over McLendons Creek, B-4207, Moore County, ER03-3642

Thank you for your letters of December 8, 2004, concerning the above projects.

We are unable to comment on the potential effect of these projects on cultural historic resources until we receive further information.

Please forward a labeled 7.5 minute USGS quadrangle map for each of the above projects clearly indicating the project vicinity, location, and termini. In addition, please include the name of the quadrangle map.

For all projects except B-4207 in Moore County, there are no known archaeological sites within the proposed project area. Based on our knowledge of the area, it is unlikely that any archaeological resources that may be eligible for conclusion in the National Register of Historic Places will be affected by the project. We, therefore, recommend that no archaeological investigation be conducted in connection with this project.

Due to the on site detours to the north or south of B-4207, Moore County, we recommend that a comprehensive survey be conducted by an experienced archaeologist. The survey will identify and evaluate the significance of archaeological remains that may be damaged or destroyed by the proposed project. Potential effects on unknown resources must be assessed prior to the initiation of construction activities. Off site detours generally preclude the need for an archaeological survey of a bridge to be rebuilt on the same alignment.

Two copies of the resulting archaeological survey report, as well as one copy of the appropriate site forms, should be forwarded to us for review and comment as soon as they are available and well in advance of any construction activities.

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. In all future communication concerning this project, please cite the above referenced tracking number.

cc: Mary Pope Furr, NCDOT
Matt Wilkerson, NCDOT
John F. Sullivan, FWHA
Rodney J. Snedeker, Archaeologist, National Forests in NC

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JUL

DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

North Carolina Department of Cultural Resources
State Historic Preservation Office

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

July 7, 2004

MEMORANDUM

TO: Gregory J. Thorpe, Manager
Project Development and Environmental Analysis Branch
Division of Highways
Department of Transportation

FROM: David Brook DB for David Brook

SUBJECT: Replace Bridge 43 on NC 22-24-27 over McLendons Creek, B-4207, Moore County, ER03-3642

Thank you for transmitting the USGS quadrangle information in an undated memo received in our office on May 6, 1004.

We have determined that the project as proposed will not have an effect on any historic resources.

Due to the on site detours to the north and south, we recommend that a comprehensive survey be conducted by an experienced archaeologist. The survey will identify and evaluate the significance of archaeological remains that may be damaged or destroyed by the proposed project. Potential effects on unknown resources must be assessed prior to the initiation of construction activities. Off site detours generally preclude the need for an archaeological survey of a bridge to be rebuilt on the same alignment.

Two copies of the resulting archaeological survey report, as well as one copy of the appropriate site forms, should be forwarded to us for review and comment as soon as they are available and well in advance of any construction activities.

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

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763. In all future communication concerning this project, please cite the above-referenced tracking number.

cc: Mary Pope Furr
Matt Wilkerson

North Carolina Department of Cultural Resources

State Historic Preservation Office

Peter B. Sandbeck, Administrator

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

August 10, 2004

MEMORANDUM

TO: Matt Wilkerson, Archaeological Supervisor
Office of Human Environment
NCDOT Division of Highways

FROM: Peter Sandbeck RSE for Peter Sandbeck
Deputy State Historic Preservation Officer

SUBJECT: Archaeological Study, Replace Bridge No. 43 on NC 22-24-27 over McLendon's Creek, State Project 8.1561101, Federal Aid Project BRSTP-22(1), WBS# 33554.1.1, TIP B-4207, Division 8
Moore County, ER 03-3642

Thank you for your letter of June 30, 2004, transmitting the archaeological survey report by Gerold Glover of your staff for the above project.

During the course of the survey, no prehistoric or historic archaeological sites were located within the project area. Due to the absence of cultural material, Dr. Glover has recommended that no further archaeological investigation be conducted in connection with this project. We concur with this recommendation since the project will not involve significant archaeological resources.
The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763. In all future communication concerning this project, please cite the above-referenced tracking number.

PS:w

cc: John Sullivan, FHWA
Gerold Glover, NCDOT

MOORE COUNTY SCHOOLS
P.O. Box 1180 • Carthage, North Carolina 28327 • 910/947-2976 • FAX 910/947-3011

October 2, 2002

Mr. William T. Goodwin, Jr. PE
Project Development & Environmental Analysis Branch
State Department of North Carolina
Department of Transportation
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Mr. Goodwin,

I am writing in response to your memorandum dated August 21, 2002, concerning the "Replacement of Bridge No. 43 on NC 22, NC 24 & NC 27 over McLendons Creek, Moore County, Federal Aid Project No. BRSTP-22(1), State Project No. 8.1561101, TIP No. B-4207".

At present time Moore County Schools Transportation Department has seven buses that travel the above mention bridge. I am assuming that the detour would be Myrick Rd and Kelly Plantation Road. If this is the case, we will be able to cope with the detour with minimal disruption. It will cause an additional 15-20 minutes for our bus routes, which will require additional funds to pay our drivers. It would help out tremendously to plan this project to start at the beginning of May.

Thank you for allowing Moore County Schools to respond to your planning. If I can be of further assistance, please contact me at 910/947-5481.

Sincerely,

Lori Tadlock

Lori Tadlock
Director of Transportation
Moore County Schools
Post Office Box 940
Carthage, North Carolina 28327