STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

May 26, 2004

U. S. Army Corps of Engineers
Regulatory Field Office
6508 Falls of the Neuse Road
Suite 120
Raleigh, NC 27615

ATTN: Mr. Eric Alsmeyer
NCDOT Coordinator

Subject: **Nationwide Permit 23 and 33 Application** for the proposed replacement of Bridge No. 260 over Muddy Creek on SR 1525 in Forsyth County, Federal Aid Project No. BRSTP-1525(3), State Project No. 8.2625201, WBS Element: 33074.1.1.1, Division 9, TIP B-3454

Dear Sir:

Please find enclosed three copies of the Categorical Exclusion (CE) Document as well as the Pre-Construction Notification, permit drawings, ½ size plans and Reforestation Detail Sheet for the above referenced project. NCDOT proposes to replace the 42-foot Bridge No. 260 over Muddy Creek with a new 3 span cored slab bridge. There will be no bents in the surface water. The total length of the bridge will be 100 feet and will be built at the same location as the existing bridge. There will be 0.005 acre temporary fill in surface water due to the temporary rock causeways. A temporary on-site detour bridge will be provided during construction to the south (downstream) of the existing structure.

IMPACTS TO WATERS OF THE UNITED STATES

General Description: The project is located in the Yadkin-Pee Dee River Basin YAD04 subbasin) with a Hydrologic Unit Code of 03040101. Muddy Creek is a large tributary of the Yadkin River and it flows in a southerly direction to its confluence with the mainstem. A best usage classification of "C" has been assigned to Muddy Creek. The "C' denotes waters protected for secondary recreation, fishing, wildlife, fish and aquatic life propagation and survival, agriculture and other uses. There are no wetlands in the project area.

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

TELEPHONE: 919-715-1500
FAX: 919-715-1501

WEBSITE: WWW.NCDOT.ORG

LOCATION:
2728 CAPITAL BLVD
PLB SUITE 168
RALEIGH NC 27604

Temporary Impacts: There will be 0.005 acre of temporary fill in Muddy Creek due to the installation of a temporary causeway. (See sheet 5 of 9 of the permit drawings). The soil foundation will not support the large machinery near the banks to allow for top-down construction, therefore a causeway will be needed.

Temporary Detour Bridge: There will be no temporary or permanent impacts to jurisdictional areas due to the temporary detour road and bridge located south of the existing bridge. The bridge will span the creek with no bents in the water. NCDOT's Best Management Practices for detour roads and bridges will be followed.

Utility Impacts: There will be no sewer, water, electric or other utility impacts due to this bridge replacement project.

Bridge Demolition: Bridge No. 260 is a one-span, two-lane structure that consists of reinforced concrete deck girders widened with reinforced concrete deck on I-beams. The substructure consists of reinforced concrete full height abutments. There is potential for components of the existing deck and rails to be dropped into the surface waters of Muddy Creek. The resulting temporary fill associated with the concrete deck and rails is approximately 62.1 cubic yards. This will be minimized to the extent that is possible. NCDOT's Best Management Practices for Bridge Demolition and Removal will be followed.

Restoration Plan: The material used for installation of the temporary causeway within the surface waters will be removed after its purpose has been served. The disturbed areas will be restored to their original contours. After the temporary fill is no longer needed, the contractor will use excavating equipment to remove all material within jurisdictional areas. All material will become the property of the contractor. Additionally, after the detour's purpose has been served the material used for installation of the temporary detour road and bridge will be removed and the areas will be restored to original contours and vegetative condition (see attached Reforestation Detail Sheet). The contractor will be required to submit a reclamation plan for removal and disposal of all material off-site. The project schedule calls for a December 21, 2004 let date. It is expected that the contractor will choose to begin construction of the temporary detour shortly after that date.

FEDERALLY PROTECTED SPECIES

Plants and animals with federal classifications of Endangered, Threatened, Proposed Endangered and Proposed Threatened are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of January 29, 2003 the US Fish and Wildlife Service (USFWS) lists two federally protected species for Forsyth County: Red-cockaded woodpecker and small-anthered bittercress. No species have been added to or deleted from this list since the completion of the referenced document. A Field survey was conducted in 2001 and it was determined that the project area does not contain habitat for the Red-cockaded woodpecker or the small anthered bittercress. Therefore a biological conclusion of "No Effect" has been given for these species.

AVOIDANCE AND MINIMIZATION

Avoidance examines all appropriate and practicable possibilities of averting impacts to "Waters of the United States". The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional stages; minimization measures were incorporated as part of the project design. As part of this commitment, the impacts to Muddy Creek are minimized by the replacement of a bridge that will span the creek. The outer spans of the new bridge will have 6-inch deck drains to discharge rainwater onto the side slope rip rap (as opposed to draining into surface waters). The proposed detour structure will also be installed to span the creek.

REGULATORY APPROVALS

Section 404 Permit: It is anticipated that the temporary stream diversion will be authorized under Section 404 Nationwide Permit 33. We are therefore requesting the issuance of a Nationwide Permit 33 for this diversion. The remaining aspects of the project are project is being processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance with 23 CFR 771.115(b). The NCDOT requests that these activities be authorized by a Nationwide Permit 23 (FR number 10, pages 2020-2095; January 15, 2002).

Section 401 Permit: We anticipate 401 General Certification numbers 3403 and 3366 will apply to this project. All general conditions of the Water quality Certifications will be met. Therefore, in accordance with 15A NCAC 2H, Section .0500(a) and 15A NCAC 2B.0200 we are providing two copies of this application to the North Carolina Department of Environmental and Natural Resources, Division of Water Quality, for their review.

Thank you for your time and assistance with this project. Please contact Carla Dagnino at (919) 715-1456 if you have any questions or need any additional information.

Sincerely,

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

w/attachment
Mr. John Hennessy, DWQ (2 copies)
Ms. Marla Chambers, NCWRC
w/o attachment
Mr. David Franklin, USACE, Wilmington
Mr. Jay Bennett, P.E., Roadway Design
Mr. Omar Sultan, Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. David Chang, P.E., Hydraulics
Ms. Marella Chambers, NCWRC
Mr. Greg Perfetti, P.E. Structure Design
Mr. Mark Staley, Roadside Environmental
Mr. John F. Sullivan, III, FHWA
Mr. S.P. Ivey, P.E., Division Engineer
Ms. Dian Hampton, P.E. DEO
Mr. Elmo Vance, PDEA Planning Engineer

Office Use Only: Form Version May 2002

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

2. Nationwide, Regional or General Permit Number(s) Requested: NW23, NW33.

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 Wetlands Restoration Program (NCWRP) is proposed for mitigation of impacts (verify availability with NCWRP prior to submittal of PCN), 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: NC Department of Transportation
   Mailing Address: 1548 Mail Service Center
   Raleigh, NC 27699-1548
   Telephone Number: (199)-733-3141 Fax Number: (919)-715-1501
   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: NA
   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. 260 over Muddy Creek

2. T.I.P. Project Number or State Project Number (NCDOT Only): B-3454

3. Property Identification Number (Tax PIN): N/A

4. Location
   County: Forsyth Nearest Town: Pfafftown
   Subdivision name (include phase/lot number): N/A
   Directions to site (include road numbers, landmarks, etc.): From Pfafftown take SR 1525 East until you reach the 1st bridge. This will be Bridge No.260 over Muddy Creek.

5. Site coordinates, if available (UTM or Lat/Long): 36.1541°N / 80.3515°W
   (Note – If project is linear, such as a road or utility line, attach a sheet that separately lists the coordinates for each crossing of a distinct waterbody.)

6. Property size (acres): 0.17 mile * 120 feet = 20.4 acres

7. Nearest body of water (stream/river/sound/ocean/lake): Muddy Creek

8. River Basin: Yadkin River Basin
   (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: The project area lies in the western part of Forsyth County. SR 1525 serves a residential area with numerous subdivisions.

10. Describe the overall project in detail, including the type of equipment to be used: The project will consist of replacing the old bridge over Muddy Creek with a new threee-span cored slab bridge in the same location. In addition, the NCDOT plans to construct a detour route and bridge south of the existing bridge for traffic during construction. Construction equipment will consist of heavy duty trucks, earth moving equipment, cranes, etc.

11. Explain the purpose of the proposed work: The existing bridge is considered structurally deficient and obsolete. The replacement of the bridge will result in a safer and more efficient use for traffic.

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.

NA

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.

NA

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. The applicant must also provide justification for these impacts in Section VII below. All proposed impacts, permanent and temporary, must be listed herein, and must be clearly identifiable on an accompanying site plan. All wetlands and waters, and all streams (intermittent and perennial) must 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.

Provide a written description of the proposed impacts: There will be 0.005 acre of temporary fill in the surface waters due to the temporary causeway installed for bridge construction.

1. Individually list wetland impacts below:

Wetland Impact Site Number (indicate on map)	Type of Impact*	Area of Impact (acres)	Located within 100-year Floodplain** (yes/no)	Distance to Nearest Stream (linear feet)	Type of Wetland***
NA					

* List each impact separately and identify temporary impacts. 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.

** 100-Year floodplains are identified through the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps (FIRM), or FEMA-approved local floodplain maps. Maps are available through the FEMA Map Service Center at 1-800-358-9616, or online at http://www.fema.gov.

*** List a wetland type that best describes wetland to be impacted (e.g., freshwater/saltwater marsh, forested wetland, beaver pond, Carolina Bay, bog, etc.) Indicate if wetland is isolated (determination of isolation to be made by USACE only).

List the total acreage (estimated) of all existing wetlands on the property: 0 acre
Total area of wetland impact proposed: 0 acre

2. Individually list all intermittent and perennial stream impacts below:

Stream Impact Site Number (indicate on map)	Type of Impact*	Length of Impact (linear feet)	Stream Name**	Average Width of Stream Before Impact	Perennial or Intermittent? (please specify)
1	Fill in SW (Temporary)	0.005 acre	Muddy Creek	18 ft	Perennial

* List each impact separately and identify temporary impacts. Impacts include, but are not limited to: culverts and associated rip-rap, dams (separately list impacts due to both structure and flooding), relocation (include linear feet before and after, and net loss/gain), stabilization activities (cement wall, rip-rap, crib wall, 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.

** Stream names can be found on USGS topographic maps. If a stream has no name, list as UT (unnamed tributary) to the nearest downstream named stream into which it flows. USGS maps are available through the USGS at 1-800-358-9616, or online at www.usgs.gov. Several internet sites also allow direct download and printing of USGS maps (e.g., www.topozone.com, www.mapquest.com, etc.).

Cumulative impacts (linear distance in feet) to all streams on site: 30 feet (all temporary)

3. Individually list all open water impacts (including lakes, ponds, estuaries, sounds, Atlantic Ocean and any other water of the U.S.) below:

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

* List each impact separately and identify temporary impacts. Impacts include, but are not limited to: fill, excavation, dredging, flooding, drainage, bulkheads, etc.

4. 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.): NA

Proposed use or purpose of pond (e.g., livestock watering, irrigation, aesthetic, trout pond, local stormwater requirement, etc.): NA

Size of watershed draining to pond: NA Expected pond surface area: NA

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.

The new bridge will be replace on same location and will span the creek with no permanent impacts associated with the new construction.

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 March 9, 2000, 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 NCWRP 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, available at http://h2o.enr.state.nc.us/ncwetlands/strmgide.html.

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.
   NA- no mitigation needed for 0.005 acre of temporary stream impacts

2. Mitigation may also be made by payment into the North Carolina Wetlands Restoration Program (NCWRP). Please note it is the applicant's responsibility to contact the NCWRP at (919) 733-5208 to determine availability and to request written approval of mitigation prior to submittal of a PCN. For additional information regarding the application process for the NCWRP, check the NCWRP website at http://h2o.enr.state.nc.us/wrp/index.htm. If use of the NCWRP is proposed, please check the appropriate box on page three and provide the following information:
   Amount of stream mitigation requested (linear feet): NA
   Amount of buffer mitigation requested (square feet): NA
   Amount of Riparian wetland mitigation requested (acres): NA
   Amount of Non-riparian wetland mitigation requested (acres): NA
   Amount of Coastal wetland mitigation requested (acres): NA

IX. Environmental Documentation (required by DWQ)

Does the project involve an expenditure of public (federal/state) funds or the use of public (federal/state) land?

Yes ☒ No ☐

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 ☐

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.

Will the project impact protected riparian buffers identified within 15A NCAC 2B .0233 (Neuse), 15A NCAC 2B .0259 (Tar-Pamlico), 15A NCAC 2B .0250 (Randleman Rules and Water Supply Buffer Requirements), or other (please identify_____)?

Yes ☐ No ☒ If you answered "yes", provide the following information:

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	13679	3	
2	8365	1.5	
Total	22044		

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

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

XI. Stormwater (required by DWQ)

Describe impervious acreage (both 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.

NA

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.

NA

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. 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).

NA

Ralph Short 5/26/04

Applicant/Agent's Signature **Date**

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

To Carla Dagnino	From Mark Staley
Co./Dept. PDEA-O.N.E.	Co. RE4
Phone # 715-1456	Phone # 733-2920
Fax # 715-1501	Fax # 733-9810

STATE	STATE PROJECT REFERENCE NO.	PROJECT NO.	TOTAL SHEETS
N.C.	B-3454	RF-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

REFORESTATION

☐ TREE REFORESTATION SHALL BE PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

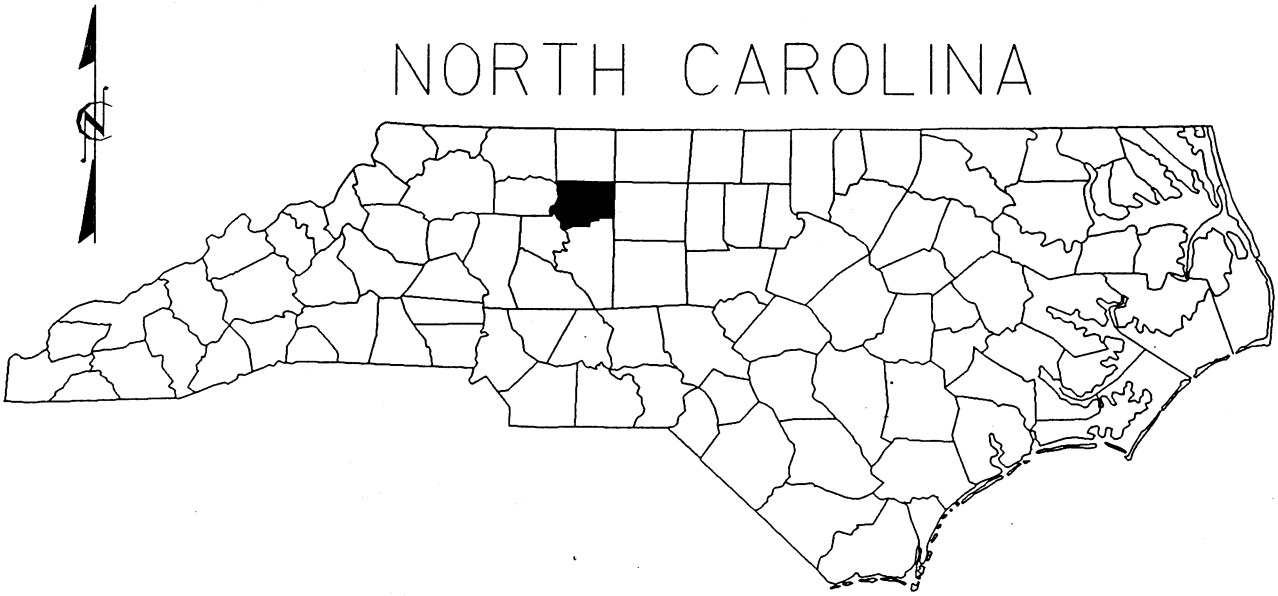
REFORESTATION

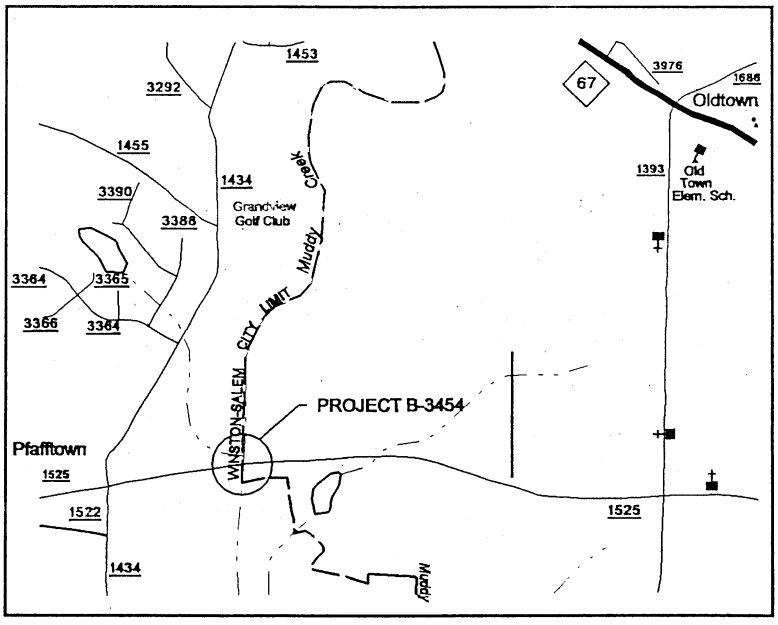
MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

25% LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in – 18 in BR
25% PLATANUS OCCIDENTALIS	SYCAMORE	12 in – 18 in BR
25% JUGLANS NIGRA	BLACK WALNUT	12 in – 18 in BR
25% QUERCUS RUBRA	NORTHERN RED OAK	12 in – 18 in BR

REFORESTATION DETAIL SHEET

N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT



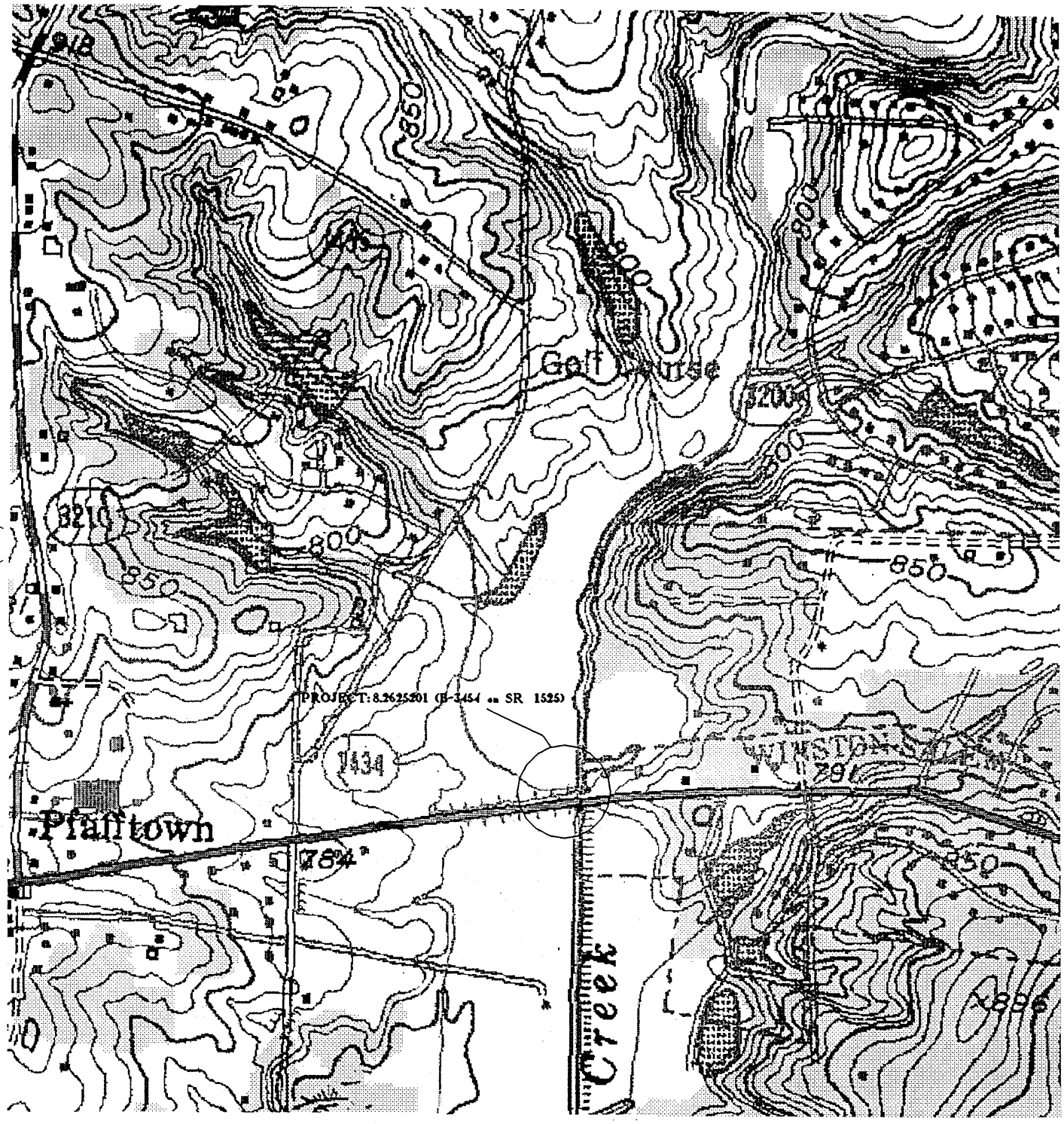


VICINITY MAPS

NCDOT

DIVISION OF HIGHWAYS
FORSYTH COUNTY
PROJECT: 8.2625201 (B-3454)
WINSTON-SALEM
SR1525(YADKINVILLE ROAD) BETWEEN
SR1320 AND SR1393

Sheet 1 of 9 3/16/04



VICINITY MAP

NCDOT

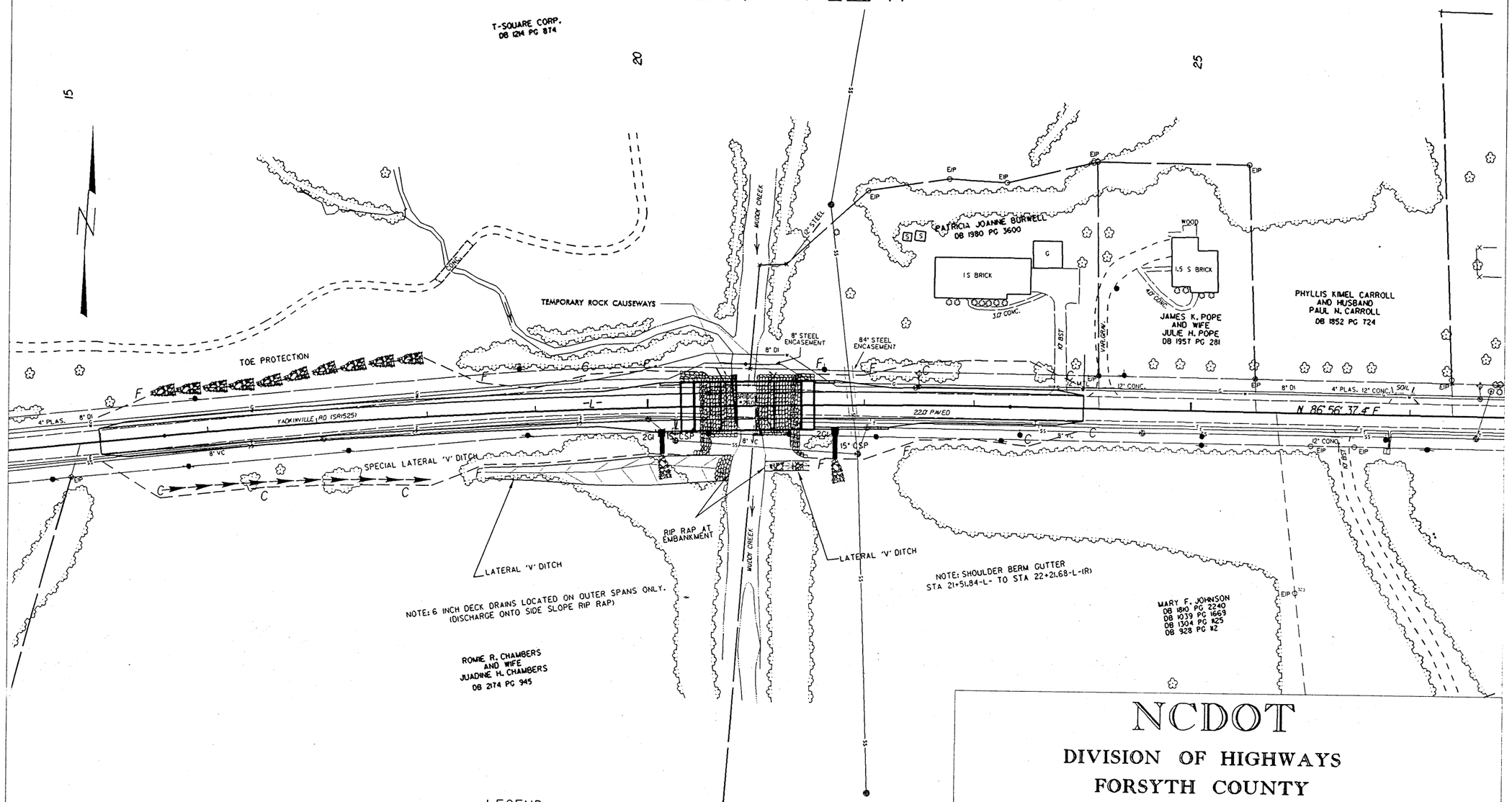
DIVISION OF HIGHWAYS
FORSYTH COUNTY
PROJECT: 8.2625201 (B-3454)
WINSTON-SALEM
SR 1525 (YADKINVILLE ROAD) BETWEEN
SR 1320 AND SR1393

Sheet 2 of 9

3/16/04

NOTE: PROJECT IS IN ENGLISH UNITS

PLAN VIEW



LEGEND:

TS TS DENOTES TEMPORARY FILL IN SURFACE WATER

SCALE:

HORIZONTAL 1" = 100'

NCDOT

DIVISION OF HIGHWAYS

FORSYTH COUNTY

PROJECT: 8.2625201 (B-3454)

WINSTON-SALEM

SR1525(YADKINVILLE ROAD) BETWEEN

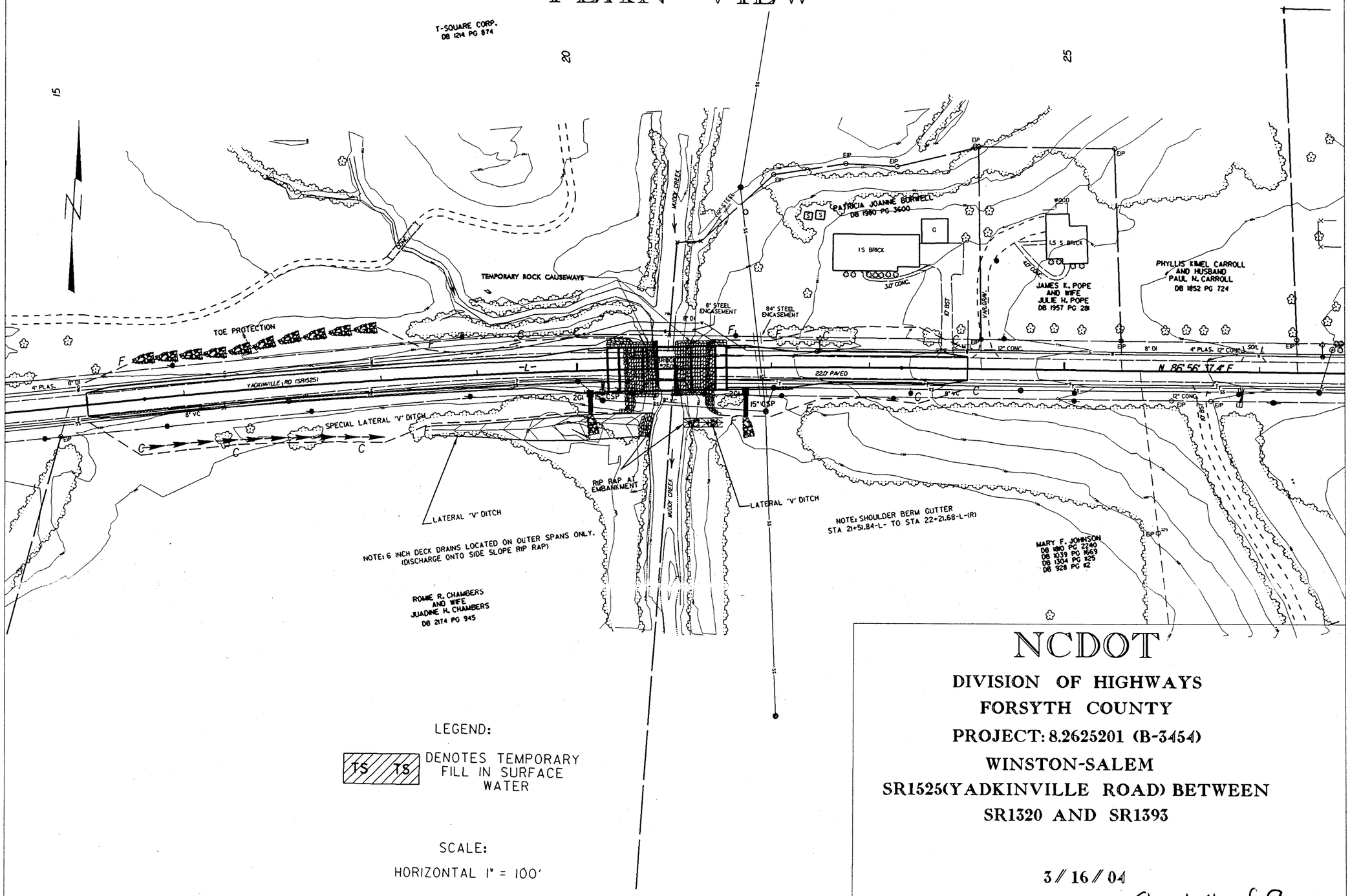
SR1320 AND SR1393

3/16/04

Sheet 3 of 9

NOTE: PROJECT IS IN ENGLISH UNITS

PLAN VIEW



LEGEND:

TS TS DENOTES TEMPORARY FILL IN SURFACE WATER

SCALE:

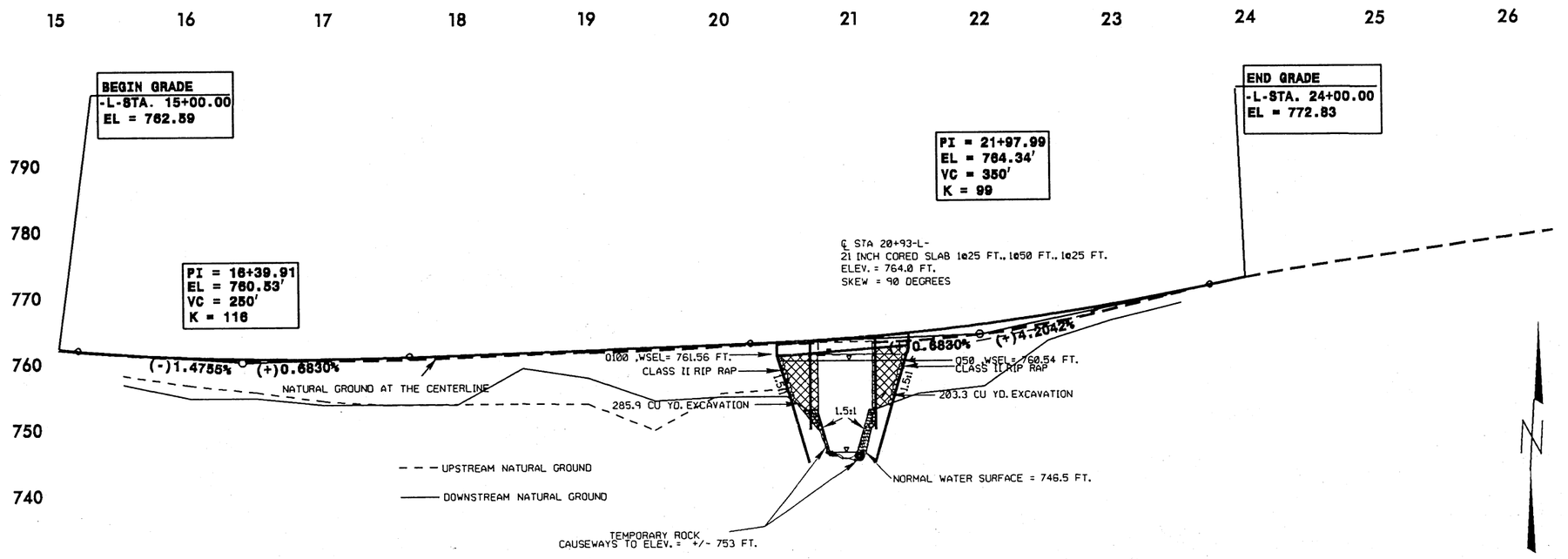
HORIZONTAL 1" = 100'

NCDOT

DIVISION OF HIGHWAYS
FORSYTH COUNTY
PROJECT: 8.2625201 (B-3454)
WINSTON-SALEM
SR1525(YADKINVILLE ROAD) BETWEEN
SR1320 AND SR1393

3/16/04

PROFILE
B3454



LEGEND:

TS TS DENOTES TEMPORARY FILL IN SURFACE WATER

NOTE:

TEMPORARY FILL IN SURFACE = .005 AC.

SCALE:

HORIZONTAL 1" = 100'

NCDOT

DIVISION OF HIGHWAYS

FORSYTH COUNTY

PROJECT: 8.2625201 (B-3454)

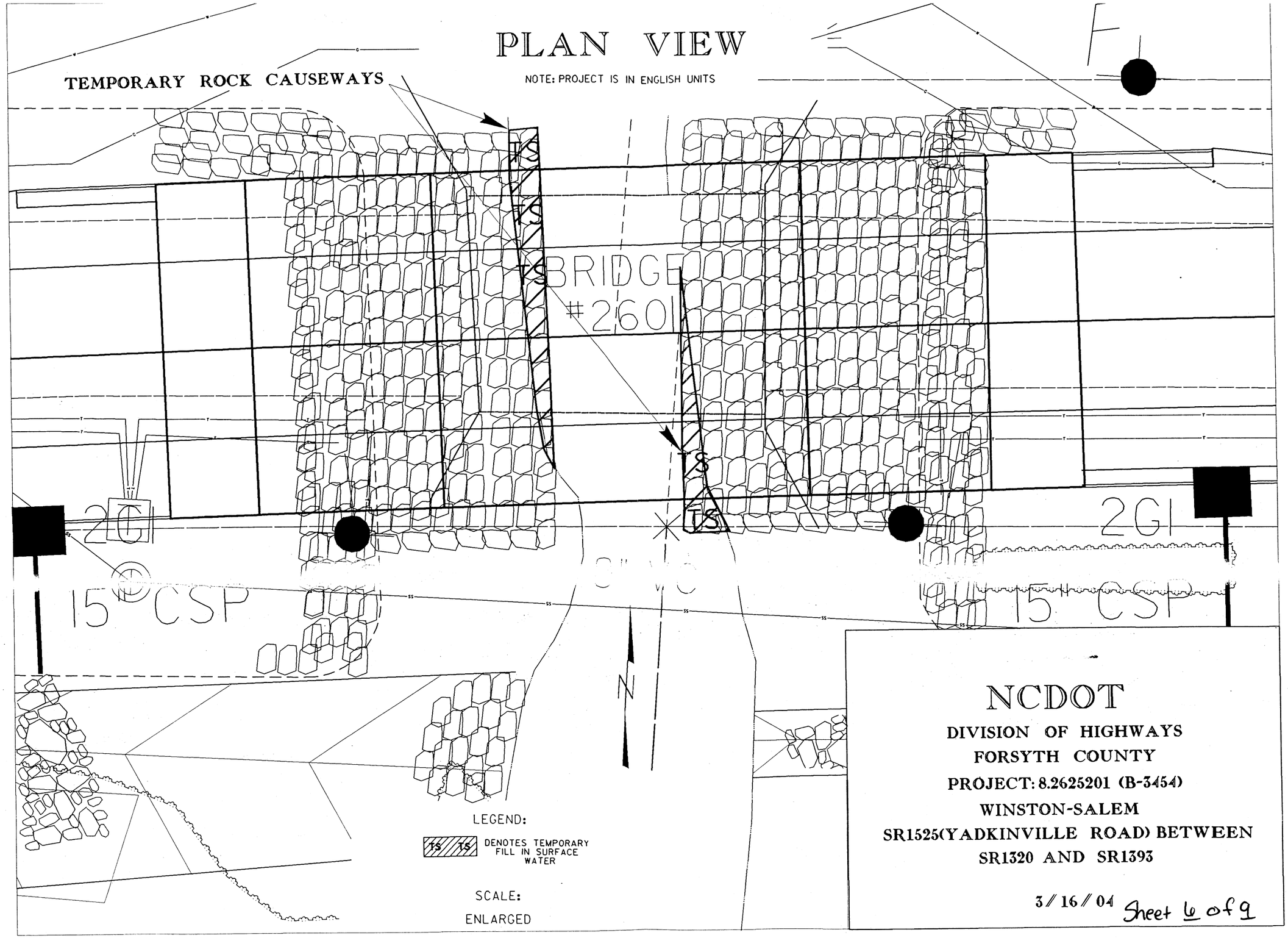
WINSTON-SALEM

SR1525(YADKINVILLE ROAD) BETWEEN SR1320 AND SR1393

3/16/04

PLAN VIEW

NOTE: PROJECT IS IN ENGLISH UNITS



LEGEND:

TS TS DENOTES TEMPORARY FILL IN SURFACE WATER

SCALE:

ENLARGED

NCDOT

DIVISION OF HIGHWAYS

FORSYTH COUNTY

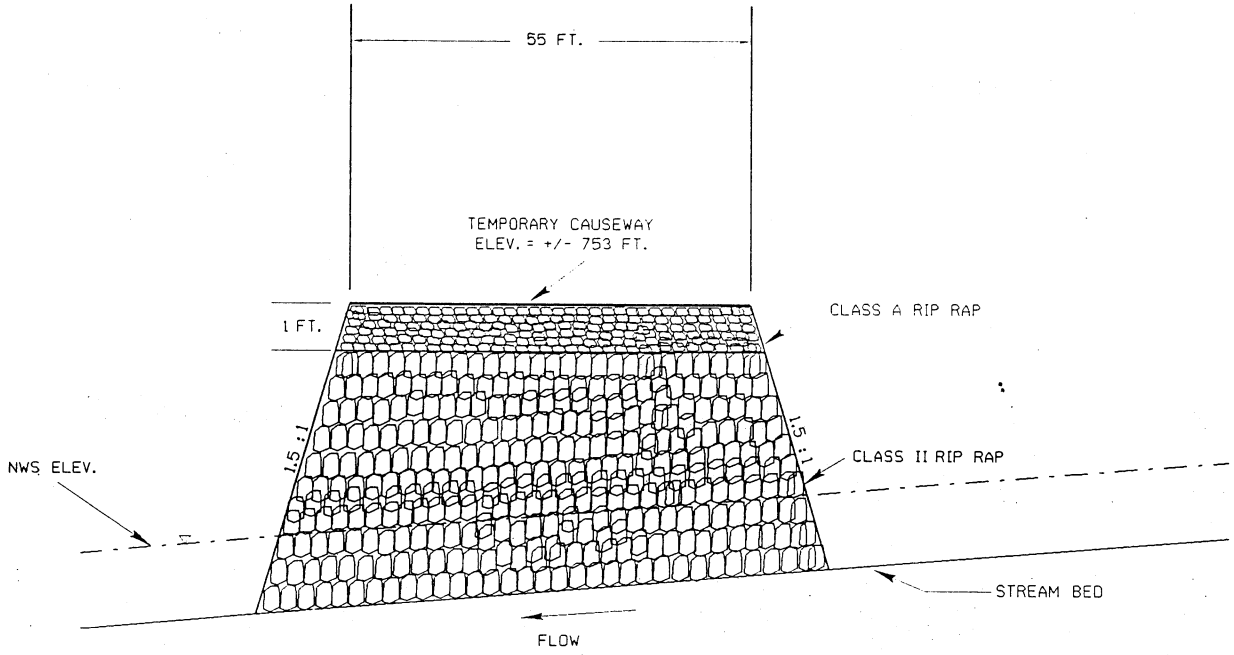
PROJECT: 8.2625201 (B-3454)

WINSTON-SALEM

SR1525(YADKINVILLE ROAD) BETWEEN SR1320 AND SR1393

3/16/04 Sheet 6 of 9

DETAIL OF CAUSEWAY



NOTE:
NOT TO SCALE

NCDOT

DIVISION OF HIGHWAYS
FORSYTH COUNTY
PROJECT: 8.2625201 (B-3454)
WINSTON-SALEM
SR1525(YADKINVILLE ROAD) BETWEEN
SR1320 AND SR1393

 3/16/04

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Fill In Wetlands (ac)	WETLAND IMPACTS: Temp. Fill In Wetlands (ac)	WETLAND IMPACTS: Excavation In Wetlands (ac)	WETLAND IMPACTS: Mechanized Clearing (Method III) (ac)	SURFACE WATER IMPACTS: Fill In SW (Natural) (ac)	SURFACE WATER IMPACTS: Fill In SW (Pond) (ac)	SURFACE WATER IMPACTS: Temp. Fill In SW (ac)	SURFACE WATER IMPACTS: Existing Channel Impacted (ft)	SURFACE WATER IMPACTS: Natural Stream Design (ft)
1	26+56.50 -L-	1 @ 25', 1@ 50' 1@25'									
		3 SPAN									
		CORED SLAB BRIDGE									
		TEMPORARY ROCK CAUSEWAY							0.005		
TOTALS:			0	0	0	0	0	0	0.005	0	0

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

FORSYTH COUNTY
PROJECT 8.2625201(B-3454)

5/19/2004

Form Revised 3/22/01

PROPERTY OWNERS

NAMES AND ADDRESSES

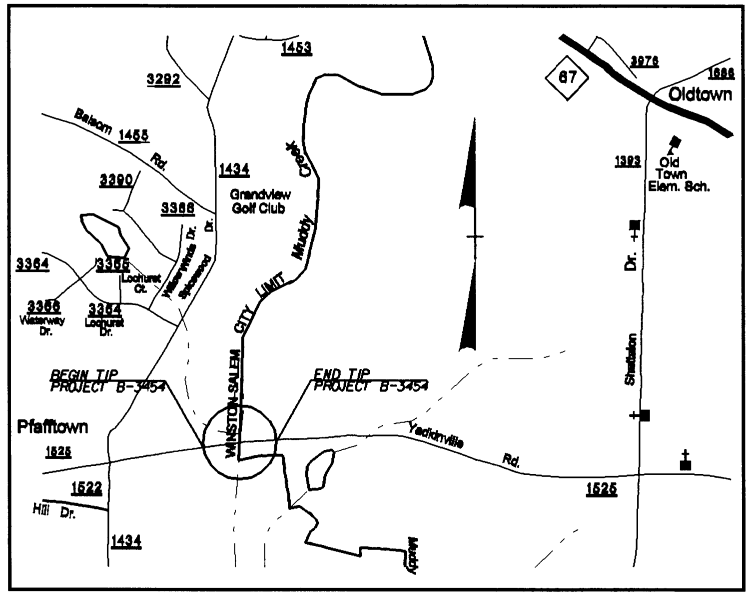
PARCEL NO.	NAMES	ADDRESSES
1.	T. SQUARE CORP.	
2.	ROMIE R. CHAMBERS AND WIFE JUADINE H. CHAMBERS	
3.	PATRICIA JOANNE BURWELL	
4.	MARY F. JOHNSON	

NCDOT
DIVISION OF HIGHWAYS
FORSYTH COUNTY
PROJECT: 8.2625201 (B-3454)
WINSTON-SALEM
SR1525(YADKINVILLE ROAD) BETWEEN
SR1320 AND SR1393
3/16/04

TIP PROJECT: B-3454

CONTRACT: C201122

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3454	1	
WBS ELEMENT	**F.A. PROJ. NO.**	**DESCRIPTION**	
33074.1.1	BRSTP-1525(3)	P.E.	
33074.2.2	BRSTP-1525(3)	ROW/UTL	

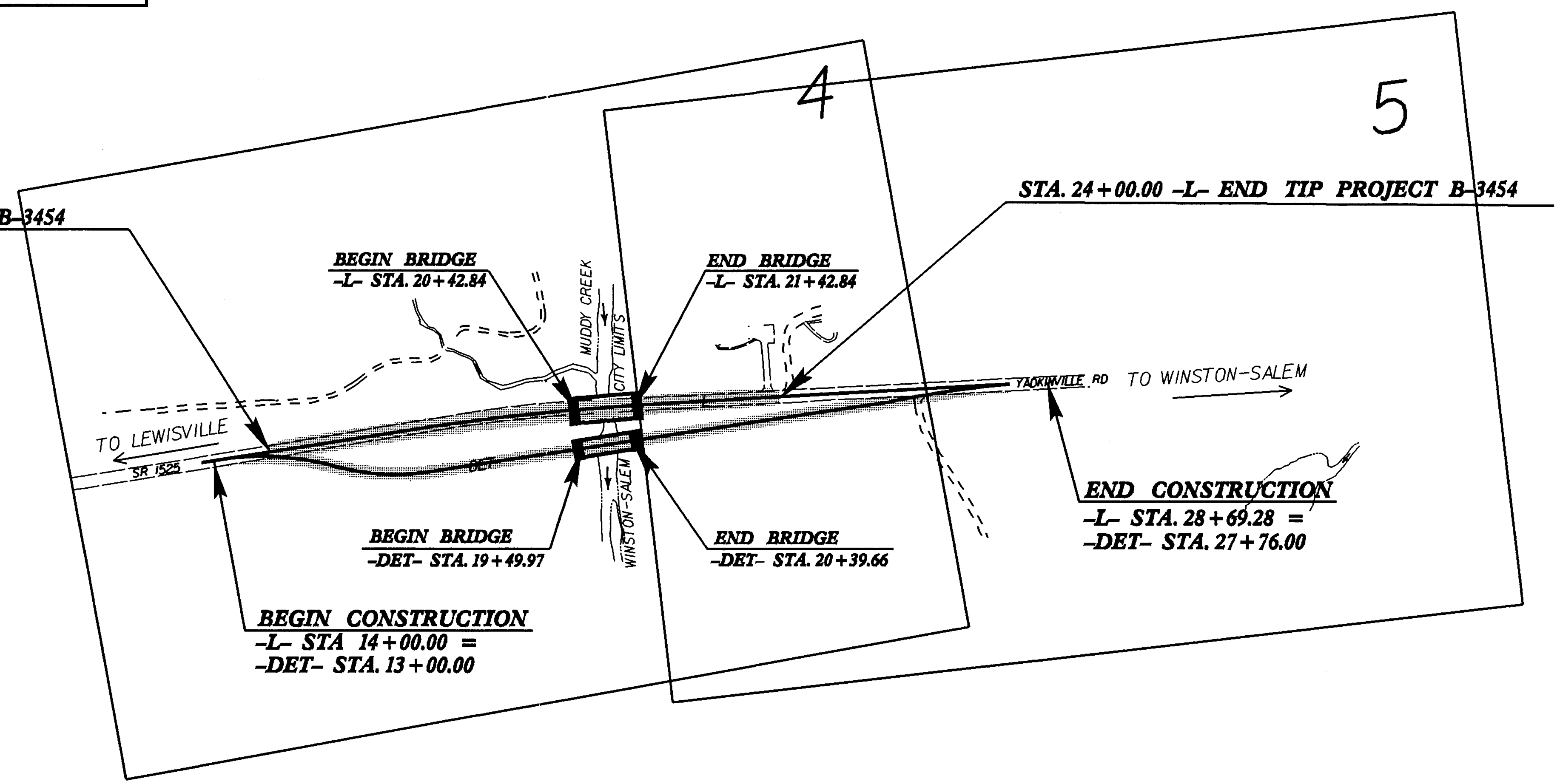
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

FORSYTH COUNTY

LOCATION: BRIDGE NO. 260 OVER MUDDY CREEK ON SR 1525

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

NAD 83/95



NOTE: THERE IS NO CONTROL OF ACCESS ON THIS PROJECT.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2004 = 14115
ADT 2025 = 23000
DHV = 11 %
D = 60 %
T = 5 % *
V = 50 MPH
V(DETOUR) = 40 MPH
* TTST 2% DUAL 3%

PROJECT LENGTH

Length of Roadway TIP Project B-3454 = 0.152 miles
Length of Structure TIP Project B-3454 = 0.019 miles
Total Length of TIP Project B-3454 = 0.170 miles

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

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 22, 2004

LETTING DATE:
DECEMBER 21, 2004

TONY HOUSER, P.E.
PROJECT ENGINEER

BRUCE B. PAYNE, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE:

ROADWAY DESIGN ENGINEER

SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR DATE

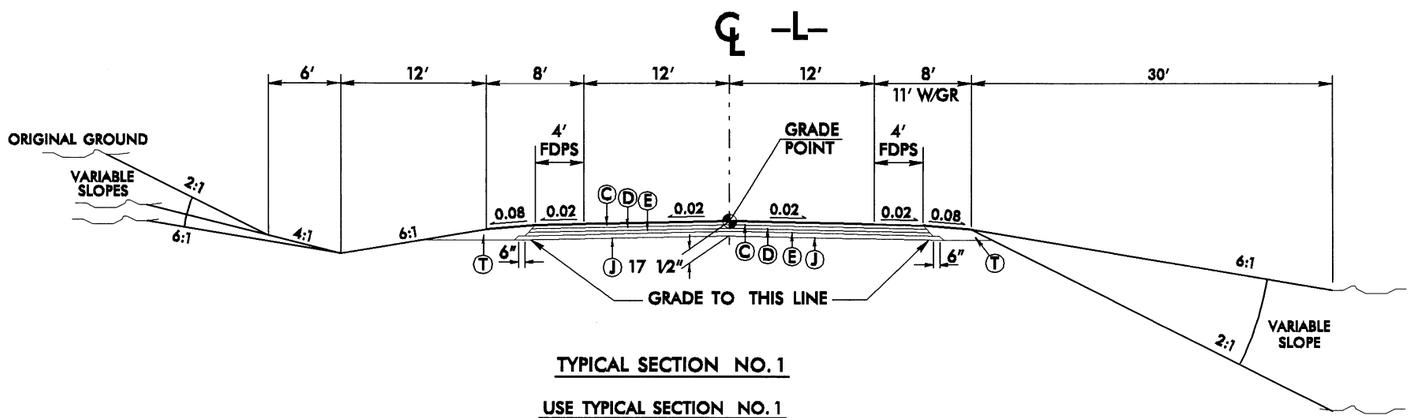
09/08/99
19-MAY-2004 08:31
R:\Roadway\Proj\B3454.tsh

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
B-3454	2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

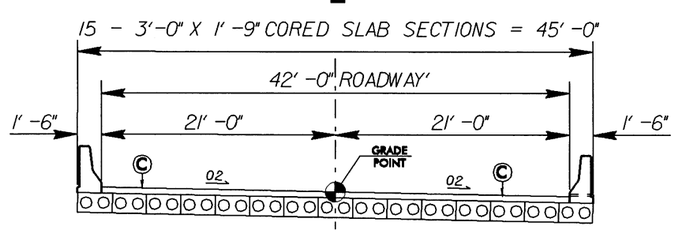
PAVEMENT SCHEDULE	
C	PROP. APPROX. 2½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 140 LBS. PER SQ. YD. IN EACH OF TWO LAYERS
D	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
E	PROP. APPROX. 4½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.
J	PROP. 8" AGGREGATE BASE COURSE.
T	EARTH MATERIAL.
P	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YD.



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

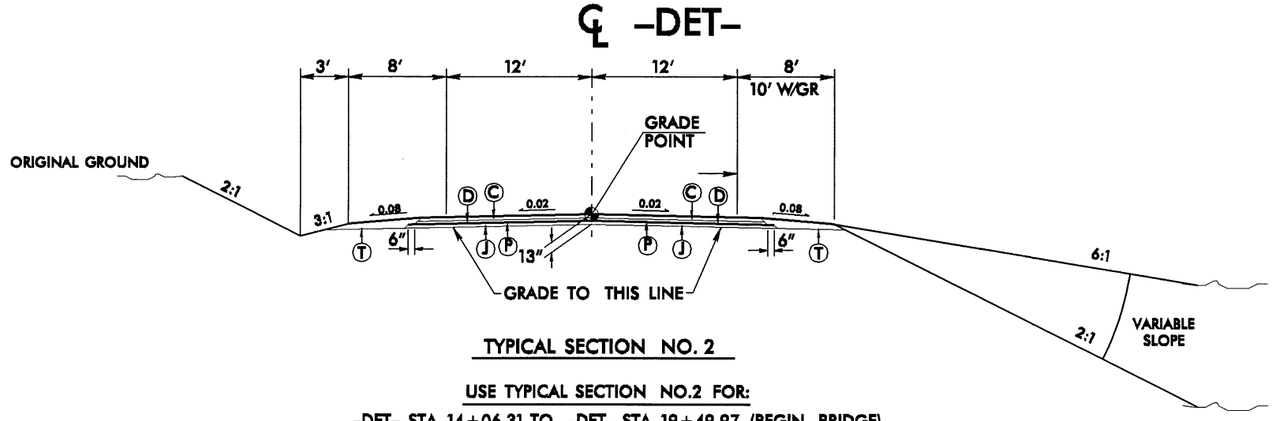
–L– STA. 15+00.00 TO –L– STA. 20+42.84 (BRIDGE)
–L– STA. 21+42.84 (BRIDGE) TO –L– STA. 24+00.00



TYPICAL SECTION NO. 1A

USE TYPICAL SECTION NO. 1A

–L– STA. 20+42.84 (BEGIN BRIDGE) TO
–L– STA. 21+42.84 (END BRIDGE)



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO.2 FOR:

–DET– STA. 14+06.31 TO –DET– STA. 19+49.97 (BEGIN BRIDGE)
–DET– STA. 20+39.66 (END BRIDGE) TO –DET– STA. 25+66.81

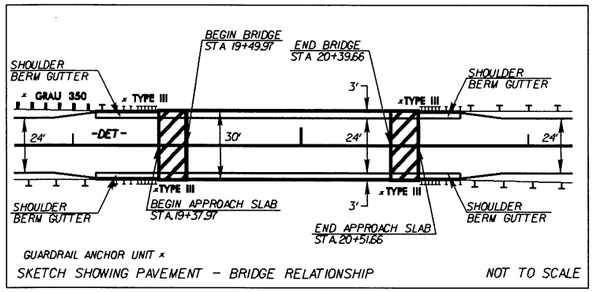
19-MAY-2004 08:30
V:\pat R:\Roadway\Proj\B3454.tup
AT HDI88610

8/17/99

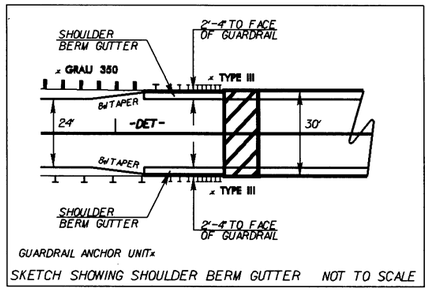
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-3454	2A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SKETCH SHOWING PAVEMENT - BRIDGE RELATIONSHIP NOT TO SCALE



SKETCH SHOWING SHOULDER BERM GUTTER NOT TO SCALE

~~PI Sta 19+46.45~~
~~Δ = 6° 19' 41.5" (RT)~~
~~D = 0° 49' 06.6"~~
~~L = 773.33'~~
~~T = 387.06'~~
~~R = 7,000.00~~

NOTE: FOR CLARITY -L- DATA IS CROSSED OUT BUT DATA IS CORRECT

T-SQUARE CORP.

BL- 2 (GPS-2) 20+91.47 PINC
-L- Sta. 20+56.36 OFF 23.56' (LT)

~~PCSta 15+59.39~~

~~PTSta 17+32.72~~

MUDDY CREEK

PATRICIA JOANNE BURWELL

JAMES K. POPE AND WIFE JULIE H. POPE

RICHARD T. WILLIAMS AND WIFE, JEAN M. WILLIAMS

SKYLARK FARMS, LTD

CENTEX HOMES

VADKINVILLE RD (SR1525)

TO STATESVILLE

N 80° 36' 50.5" E
N 80° 37' 36" E
N 69° 36' 35.51" E

N 79° 36' 35.5" E

N 85° 56' 02" E

BM = 1
BL STA. 13+74
246' RIGHT
ELEV. = 765.83

-DET- PCSTA 13+00.00 =
-L- STA 14+00.00
BEGIN CONSTRUCTION

PRCSta 15+05.69

PTSta 17+06.93

LATERAL 'V' DITCH SEE DETAIL 'B'

-DET- STA 19+37.97
BEGIN APPROACH SLAB

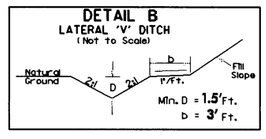
-DET- STA 19+49.97
BEGIN BRIDGE

-DET- STA 20+51.66
END APPROACH SLAB

-DET- STA 20+39.66
END BRIDGE

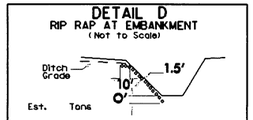
MATCHLINE SHEET 2B -DET- STA 24+55.77

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



STA 13+50 TO 19+75-DET- RT.

DETAIL D
RIP RAP AT EMBANKMENT
(Not to Scale)



STA 19+75-DET- RT.

-DET-

PI Sta 14+04.26	PI Sta 16+07.64	PI Sta 26+74.54
Δ = 23° 06' 28.0" (RT)	Δ = 22° 36' 33.0" (LT)	Δ = 5° 49' 07.0" (RT)
D = 11° 14' 04.1"	D = 11° 14' 04.1"	D = 2° 51' 53.2"
L = 205.69'	L = 201.25'	L = 203.11'
T = 104.26'	T = 101.95'	T = 101.64'
R = 510.00'	R = 510.00'	R = 2,000.00'

SEE SHEET 6 FOR -DET- PROFILE

19-MAY-2004 08:33
R:\Roadway\Prj\B3454-rdy-dsn-031120s2A.dgn
User: AT R018610

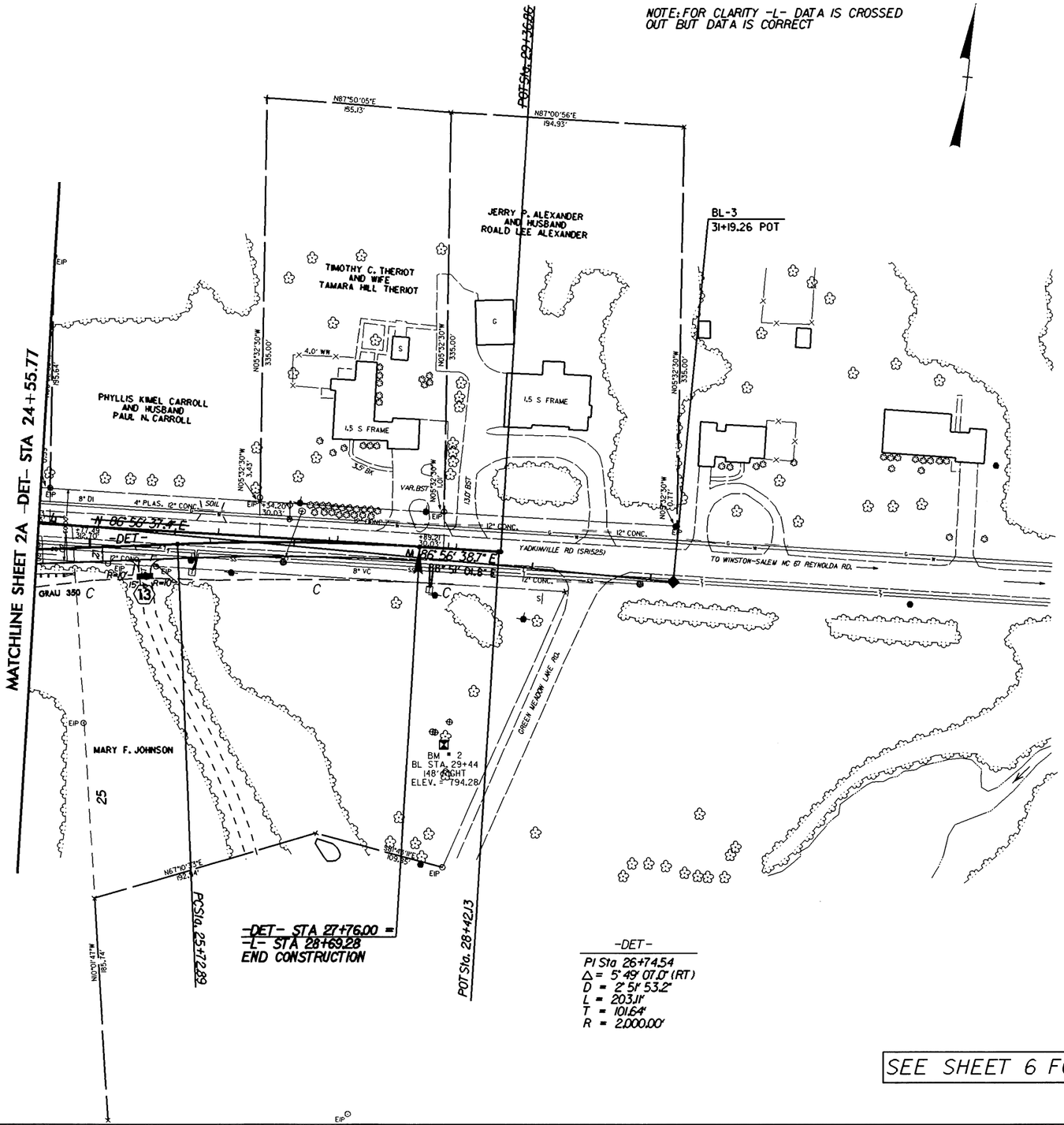
PROJECT REFERENCE NO.	SHEET NO.
B-3454	2B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

REVISIONS

NOTE: FOR CLARITY -L- DATA IS CROSSED OUT BUT DATA IS CORRECT



SEE SHEET 6 FOR -DET- PROFILE

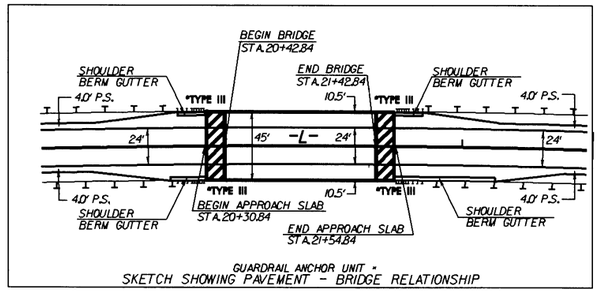
19-MAY-2004 08:34
R:\Roadway Proj\B3454-rdy-dsn-03li20s2B.dgn
User: RT RDIBBLE

PROJECT REFERENCE NO.	SHEET NO.
B-3454	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

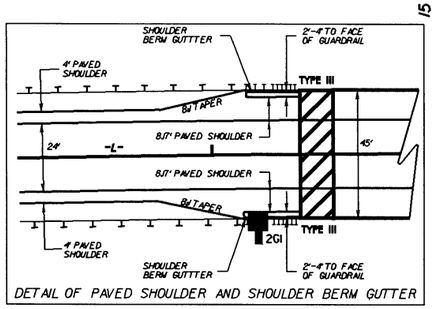
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

REVISIONS
4/26/04 NAMES OF PROPERTY OWNERS REVISED IN THE B-3454.BRL FILE: 1) TO CENTEX HOMES 3) SKYLARK FARMS LTD 5) TO RICHARD T. WILLIAMS AND WIFE, JEAN M. WILLIAMS psc



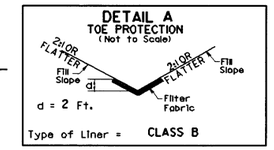
SKETCH SHOWING PAVEMENT - BRIDGE RELATIONSHIP



DETAIL OF PAVED SHOULDER AND SHOULDER BERM GUTTER

-L-
PI Sta 19+46.45
Δ = 6° 19' 47.1" (RT)
D = 0° 49' 06.6"
L = 773.33'
T = 387.06'
R = 7,000.00'

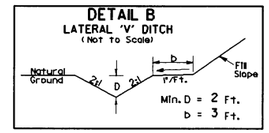
DETAIL A
TOE PROTECTION
(Not to Scale)



Type of Liner = CLASS B

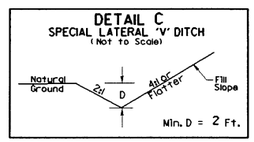
NOTE: STA 15+50 TO STA 18+50 -L- LT
PLACE CLASS B RIP RAP AT THE TOE OF SLOPE.

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



NOTE: STA 18+50 TO STA 20+79 -L- RT

DETAIL C
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



NOTE: STA 15+50 TO STA 18+00 -L- RT

2
T-SQUARE CORP.

-L- STA 15+00.00
BEGIN TIP PROJECT B-3454

BL- 2 (GPS-2) 20+91.47 PINC
-L- Sta. 20+56.36 OFF 23.56' (LT)

BEGIN BRIDGE
-L- STA 20+42.84

BEGIN APPROACH SLAB
-L- STA 20+30.84

END BRIDGE
-L- STA 21+42.84

END APPROACH SLAB
-L- STA 21+54.84

-L- STA 24+00.00
END TIP PROJECT B-3454

PI Sta 15+59.39
PT Sta 17+06.53
PT Sta. 23+32.22
PT Sta 17+46.93

BEGIN CONSTRUCTION
-DET- PC STA 13+00.00 =
-L- POT STA 14+00.00

TOE PROTECTION (SEE DETAIL A)
SPECIAL LATERAL 'V' DITCH (SEE DETAIL C)
LATERAL 'V' DITCH (SEE DETAIL B)
RIP RAP AT EMBANKMENT (SEE DETAIL D)
LATERAL 'V' DITCH (SEE DETAIL E)

N 80° 32' 36.0" E
N 80° 32' 36.0" E
N 79° 36' 35.0" E
N 80° 08' 31.0" E
N 86° 56' 37.4" E

TO LEWISVILLE
YADKINVILLE RD (SR1525)
MUDDY CREEK

1 CENTEX HOMES
3 SKYLARK FARMS, LTD
4 PATRICIA JOANNE BURWELL
5 RICHARD T. WILLIAMS AND WIFE, JEAN M. WILLIAMS
JAMES K. POPE AND WIFE JULIE H. POPE

NOTE: 6 INCH DECK DRAINS LOCATED ON OUTER SPANS ONLY.
(DISCHARGE ONTO SIDE SLOPE RIP RAP)

NOTE: SHOULDER BERM GUTTER
STA 21+51.84-L- TO STA 22+21.68-L-(R)

BM # 1
BL STA. 13+74
246' RIGHT
ELEV. = 765.83

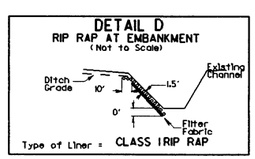
DATUM DESCRIPTION
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B3454-1" WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 817415.43970 EASTING: 1599450.81871
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99986480
THE NC LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B3454-1" TO -L- STATION 10+00.00 IS N 78° 15' 03.21" E 534.08'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

DET

~~PI Sta 14+04.26~~	~~PI Sta 16+07.64~~	~~PI Sta 26+74.54~~
~~Δ = 23° 06' 28.0" (RT)~~	~~Δ = 22° 36' 33.0" (LT)~~	~~Δ = 5° 49' 07.0" (RT)~~
~~D = 11° 14' 04.5"~~	~~D = 11° 14' 04.5"~~	~~D = 2° 51' 53.2"~~
~~L = 205.69'~~	~~L = 201.25'~~	~~L = 203.11'~~
~~T = 104.26'~~	~~T = 101.95'~~	~~T = 101.64'~~
~~R = 510.00'~~	~~R = 510.00'~~	~~R = 2,900.00'~~

NOTE: FOR CLARITY -DET- DATA IS CROSSED OUT BUT DATA IS CORRECT

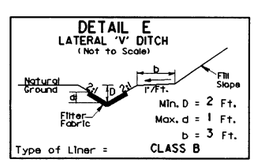
DETAIL D
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner = CLASS I RIP RAP

NOTE: LATERAL V DITCH OUTLET, STA 20+50-L- TO CREEK RT, EST. 15 TONS, CLASS I
NOTE: LATERAL V DITCH OUTLET, STA 21+07-L- TO CREEK RT, EST. 6 TONS, CLASS I

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



Type of Liner = CLASS B

NOTE: STA 21+07 TO STA 21+50 -L- RT

SEE SHEET 6 FOR -L- PROFILE

MATCHLINE SHEET 5 -L- STA 25+50.00

19-MAY-2004 08:32
R:\Roadway Proj\B3454-rdy-dsn-031120s04.dgn
AVogt AT RDIB8610

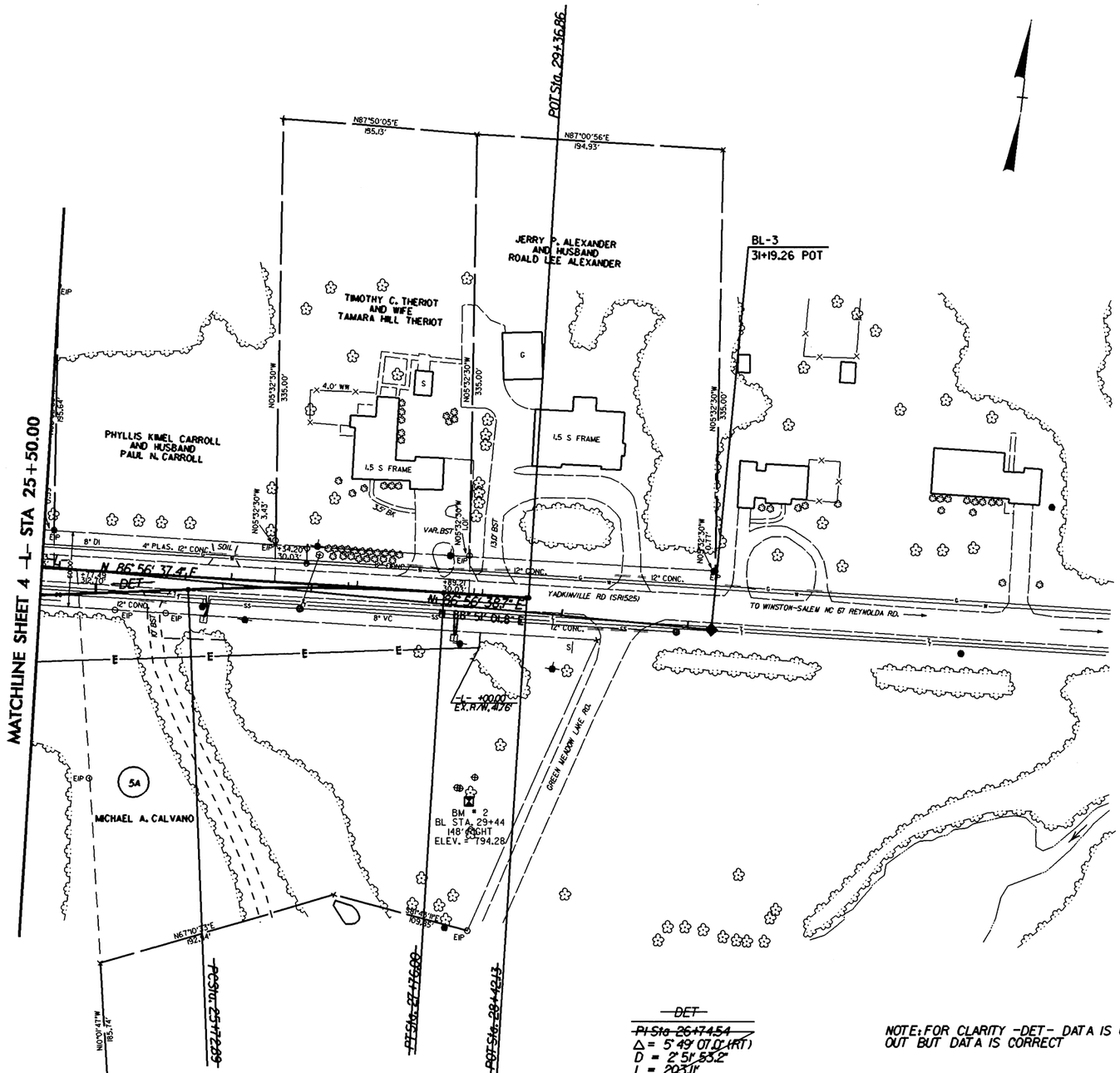
PROJECT REFERENCE NO.	SHEET NO.
B-3454	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

REVISIONS

4/26/04 NAME OF PROPERTY OWNER REVISED IN THE B-3454ROW FILE; 5) TO SAJ MICHAEL A.CALVANO psc

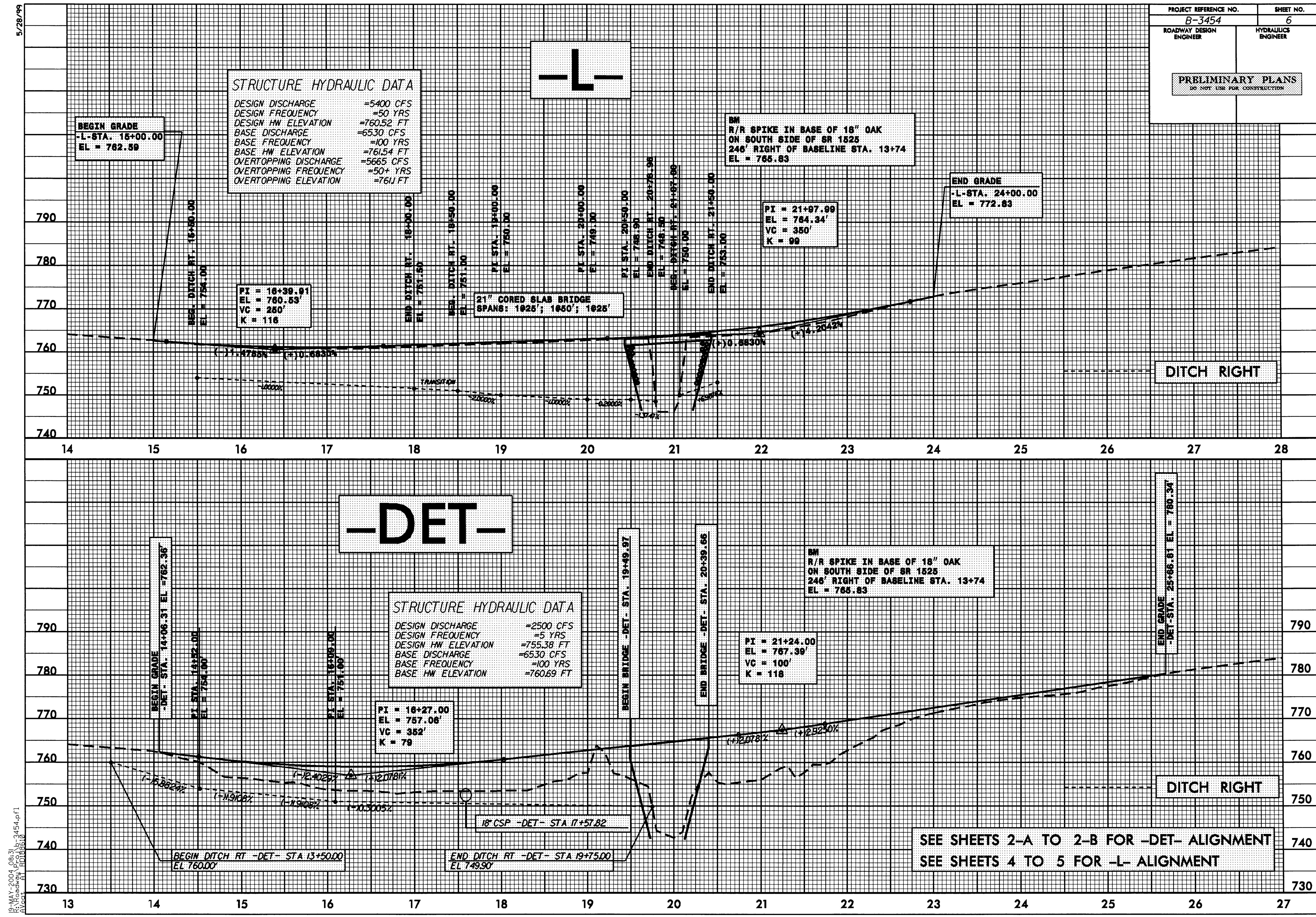


-DET-
~~PI Sta. 26+74.54~~
~~Δ = 5° 49' 07" (RT)~~
~~D = 2° 51' 55.2"~~
~~L = 203.71'~~
~~T = 101.84'~~
~~R = 2,000.00'~~

NOTE: FOR CLARITY -DET- DATA IS CROSSED OUT BUT DATA IS CORRECT

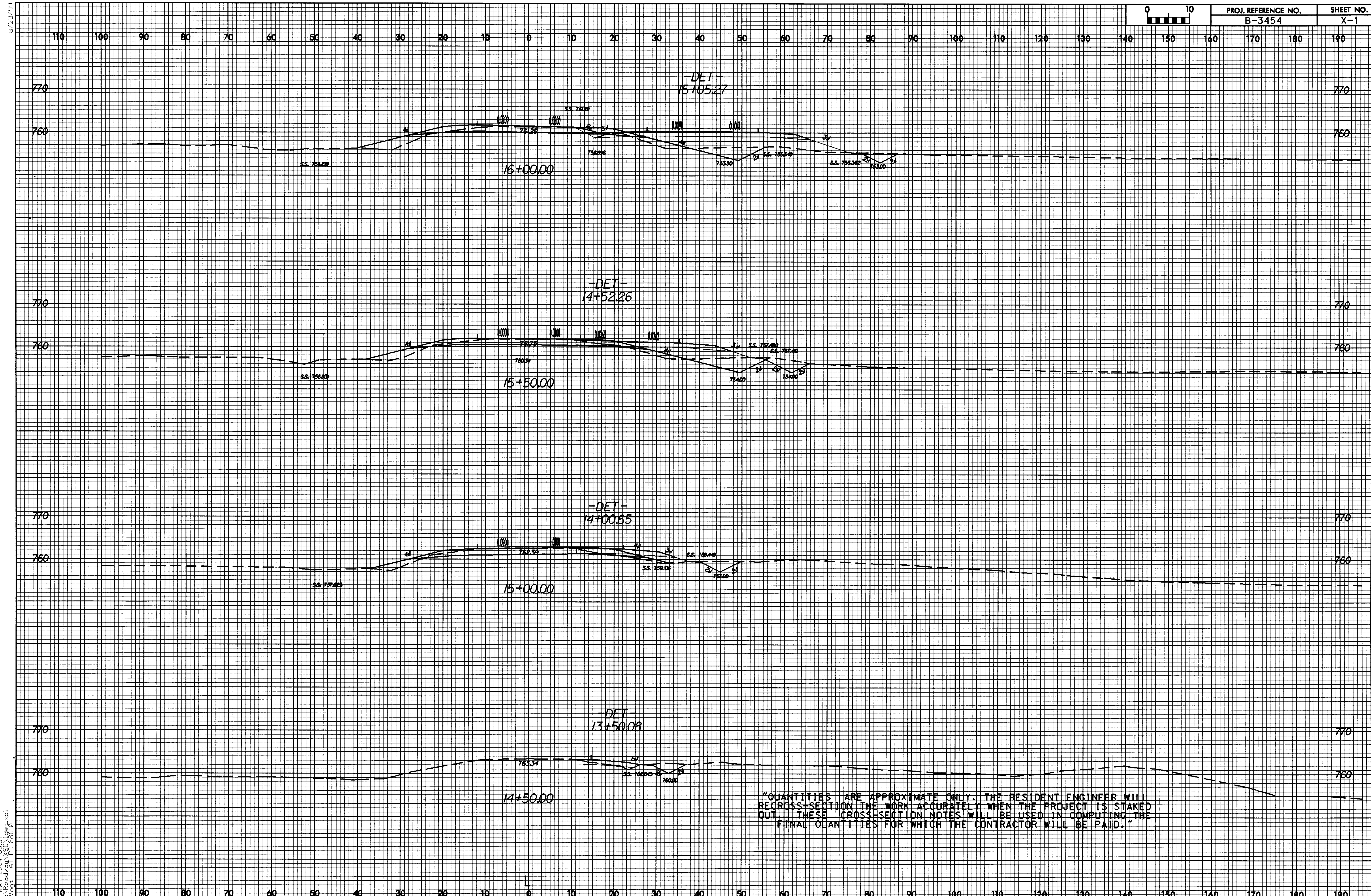
SEE SHEET 6 FOR -L- PROFILE

19-MAY-2004 08:33
R:\Roadway_PCs\B3454-rdy-dsn-031120s05.dgn
AVogt A1 R018610



PROJECT REFERENCE NO. B-3454
SHEET NO. 6
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
5/28/99
-L-
STRUCTURE HYDRAULIC DATA
DESIGN DISCHARGE =5400 CFS
DESIGN FREQUENCY =50 YRS
DESIGN HW ELEVATION =760.52 FT
BASE DISCHARGE =6530 CFS
BASE FREQUENCY =100 YRS
BASE HW ELEVATION =761.54 FT
OVERTOPPING DISCHARGE =5665 CFS
OVERTOPPING FREQUENCY =50+ YRS
OVERTOPPING ELEVATION =761.1 FT
BEGIN GRADE -L-STA. 15+00.00 EL = 762.59
BM R/R SPIKE IN BASE OF 18" OAK ON SOUTH SIDE OF SR 1525 246' RIGHT OF BASELINE STA. 13+74 EL = 765.83
END GRADE -L-STA. 24+00.00 EL = 772.83
PI = 21+97.99 EL = 764.34' VC = 350' K = 99
PI = 16+39.91 EL = 760.53' VC = 250' K = 116
21" CORED SLAB BRIDGE SPANS: 1@25'; 1@50'; 1@25'
BEG. DITCH RT. 15+50.00 EL = 754.00
END DITCH RT. 18+00.00 EL = 751.50
BEG. DITCH RT. 18+50.00 EL = 751.00
PI STA. 19+00.00 EL = 750.00
PI STA. 20+00.00 EL = 749.00
PI STA. 20+50.00 EL = 748.90
END DITCH RT. 20+78.98 EL = 748.50
BEG. DITCH RT. 21+07.98 EL = 750.00
END DITCH RT. 21+50.00 EL = 753.00
(-)1.4755%
(+)0.6830%
(+)4.2042%
DITCH RIGHT
-DET-
BEGIN GRADE -DET- STA. 14+06.31 EL =762.36'
PI STA. 14+52.00 EL = 754.00'
PI STA. 16+09.00 EL = 751.00'
PI = 16+27.00 EL = 757.06' VC = 352' K = 79
STRUCTURE HYDRAULIC DATA
DESIGN DISCHARGE =2500 CFS
DESIGN FREQUENCY =5 YRS
DESIGN HW ELEVATION =755.38 FT
BASE DISCHARGE =6530 CFS
BASE FREQUENCY =100 YRS
BASE HW ELEVATION =760.69 FT
BEGIN BRIDGE -DET- STA. 19+49.97
END BRIDGE -DET- STA. 20+39.66
BM R/R SPIKE IN BASE OF 18" OAK ON SOUTH SIDE OF SR 1525 246' RIGHT OF BASELINE STA. 13+74 EL = 765.83
PI = 21+24.00 EL = 767.39' VC = 100' K = 118
END GRADE -DET-STA. 25+66.81 EL = 780.34'
(-)2.4029%
(+)2.0781%
(+)2.0781%
(+)2.9250%
(-)5.8624%
(-)1.9108%
(-)1.9108%
(-)0.3005%
18" CSP -DET- STA 17+57.82
BEGIN DITCH RT -DET- STA 13+50.00 EL 760.00'
END DITCH RT -DET- STA 19+75.00 EL 749.90'
DITCH RIGHT
SEE SHEETS 2-A TO 2-B FOR -DET- ALIGNMENT
SEE SHEETS 4 TO 5 FOR -L- ALIGNMENT

PROJ. REFERENCE NO.	SHEET NO.
B-3454	X-1

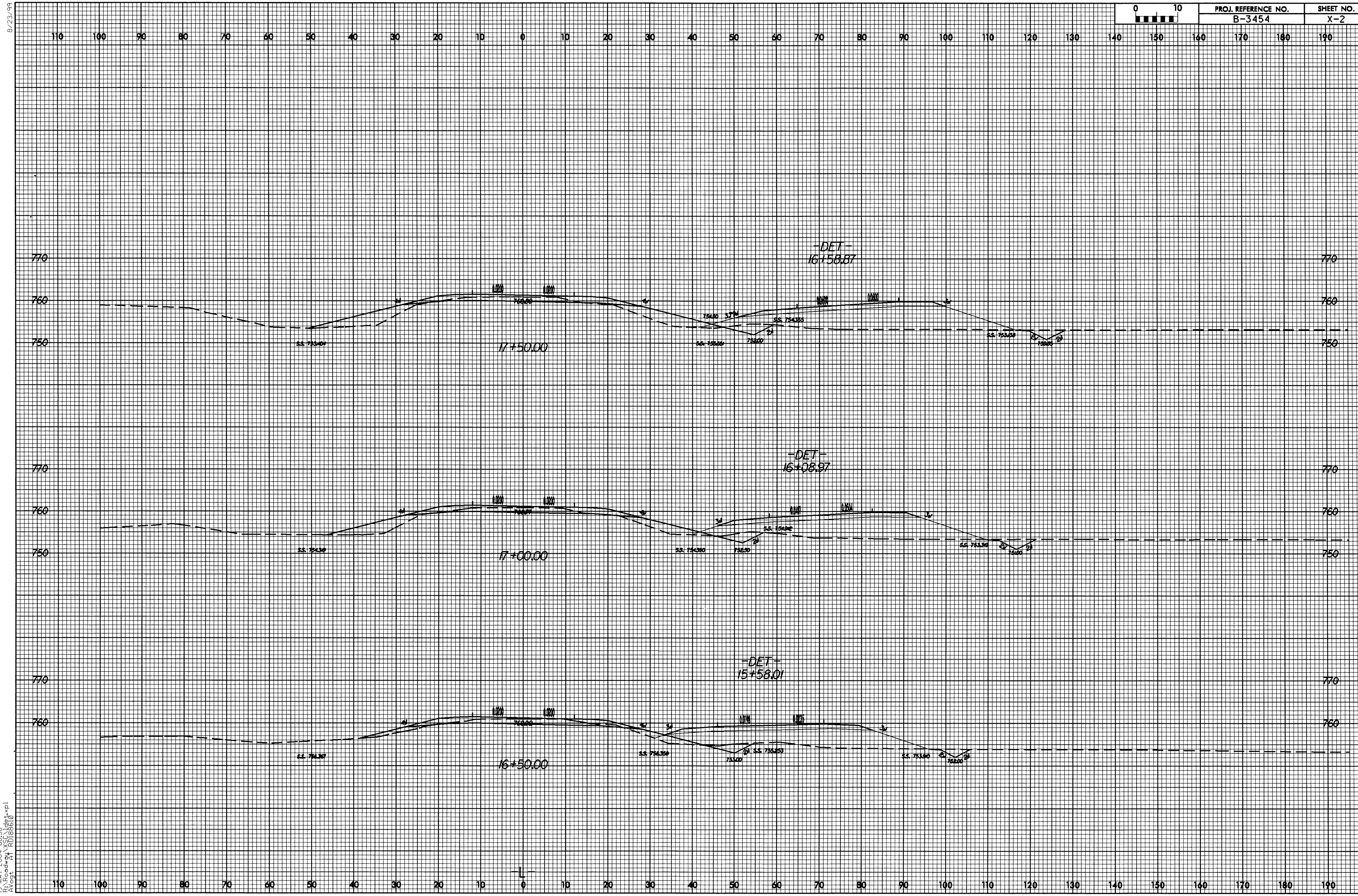


"QUANTITIES ARE APPROXIMATE ONLY. THE RESIDENT ENGINEER WILL RECROSS-SECTION THE WORK ACCURATELY WHEN THE PROJECT IS STAKED OUT. THESE CROSS-SECTION NOTES WILL BE USED IN COMPUTING THE FINAL QUANTITIES FOR WHICH THE CONTRACTOR WILL BE PAID."

8/23/99

19-MAY-2004 08:37

PROJ. REFERENCE NO.	SHEET NO.
B-3454	X-2



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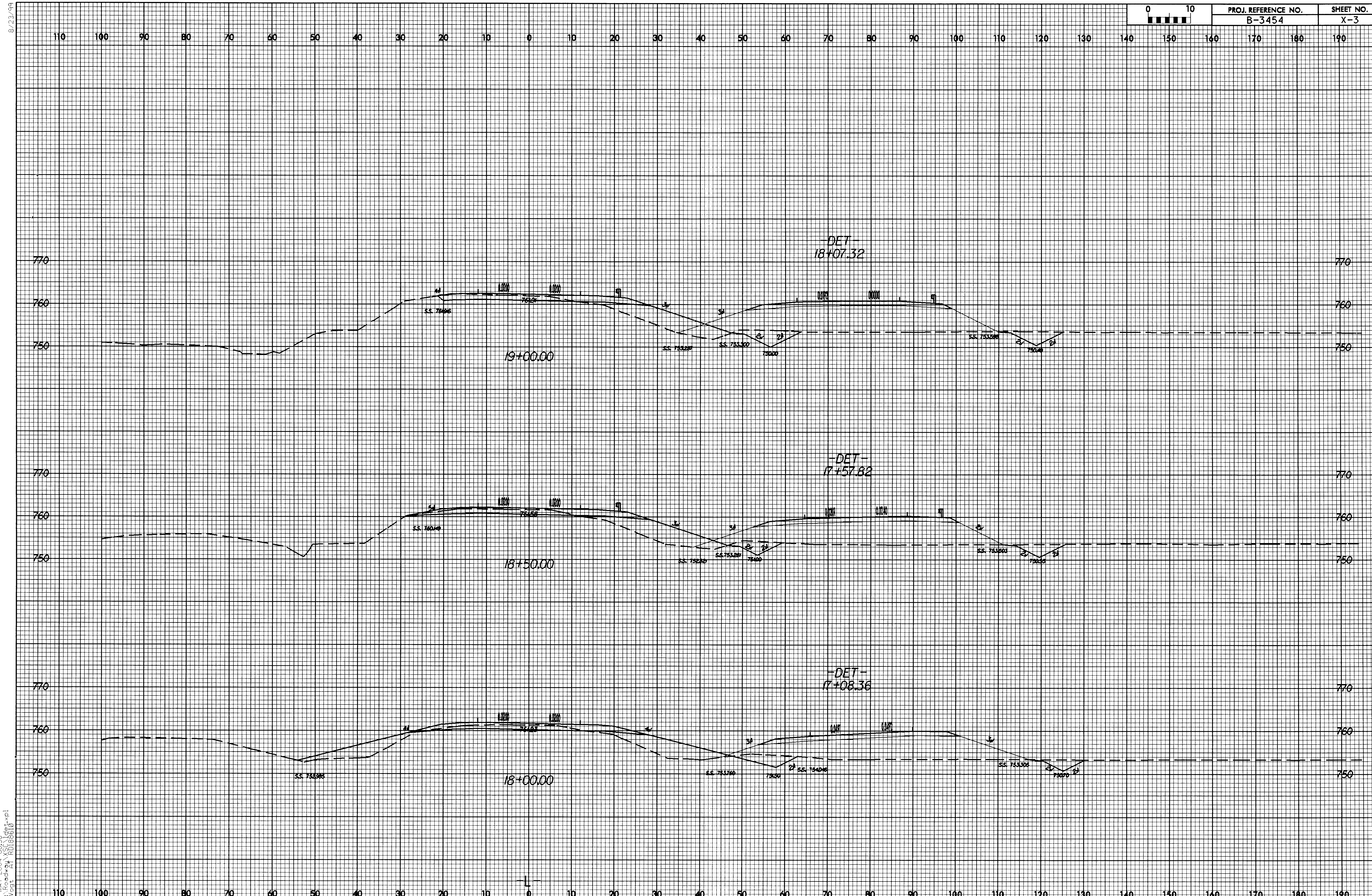

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	B-3454	X-4

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780 770 760 750

-DET-
19+55.28

20+50.00

780 770 760 750

-DET-
19+06.39

20+00.00

780 770 760 750

-DET-
18+56.84

19+50.00

-L-

110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190

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AVogt AT RD108610

8/23/99

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	B-3454	X-5

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780
770
760

-DET-
21+54.84

SS 764256
764082
764203
SS 763983
SS 763668
SS 754858

22+50.00

780
770
760

-DET-
21+05.04

SS 763870
762752
SS 760483
SS 756200
SS 754506

22+00.00

780
770
760

-DET-
20+55.30

SS 763434
763307
SS 760629
SS 756348
75300
SS 754108

21+50.00

760
750

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21+00.00

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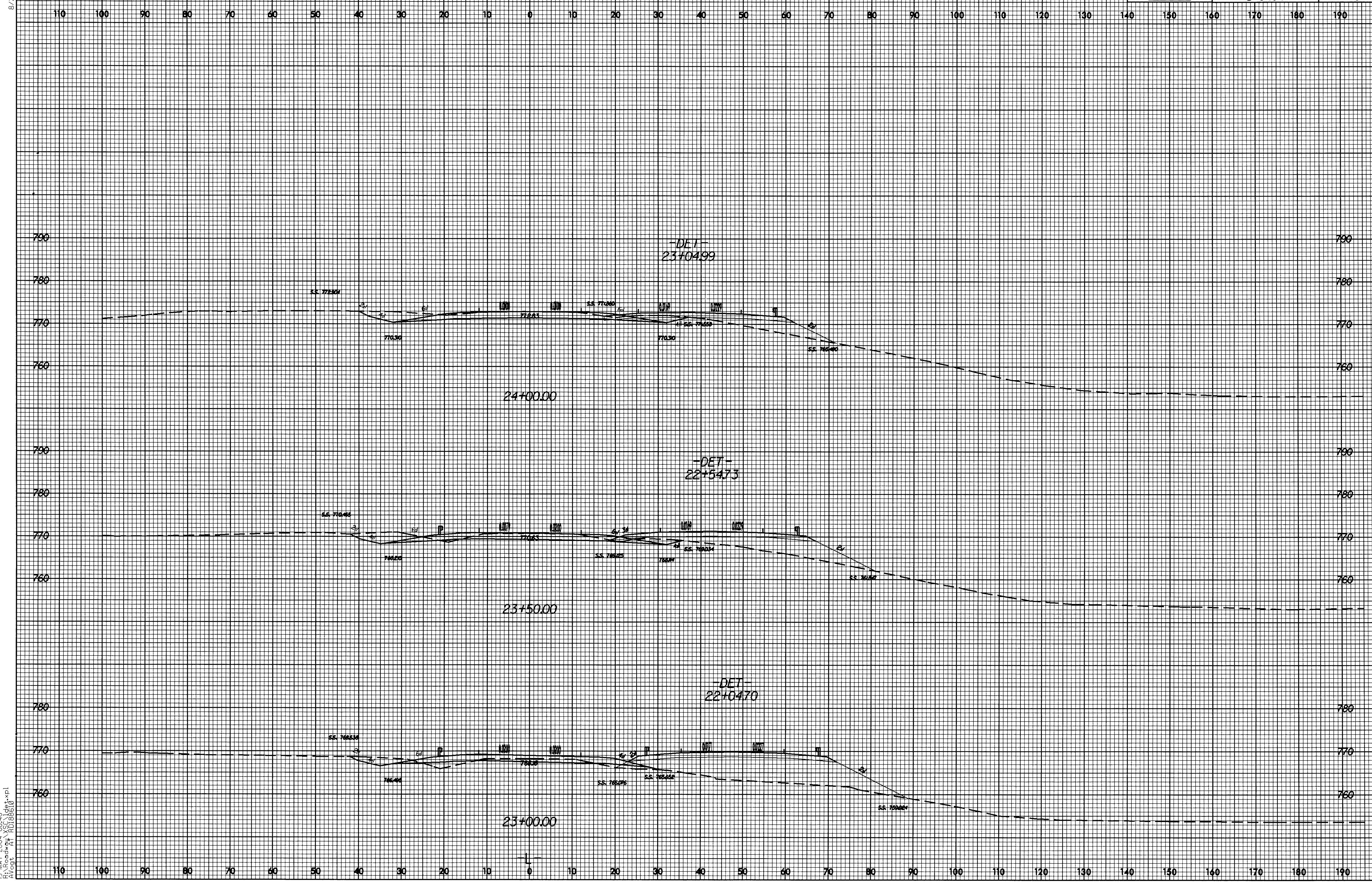

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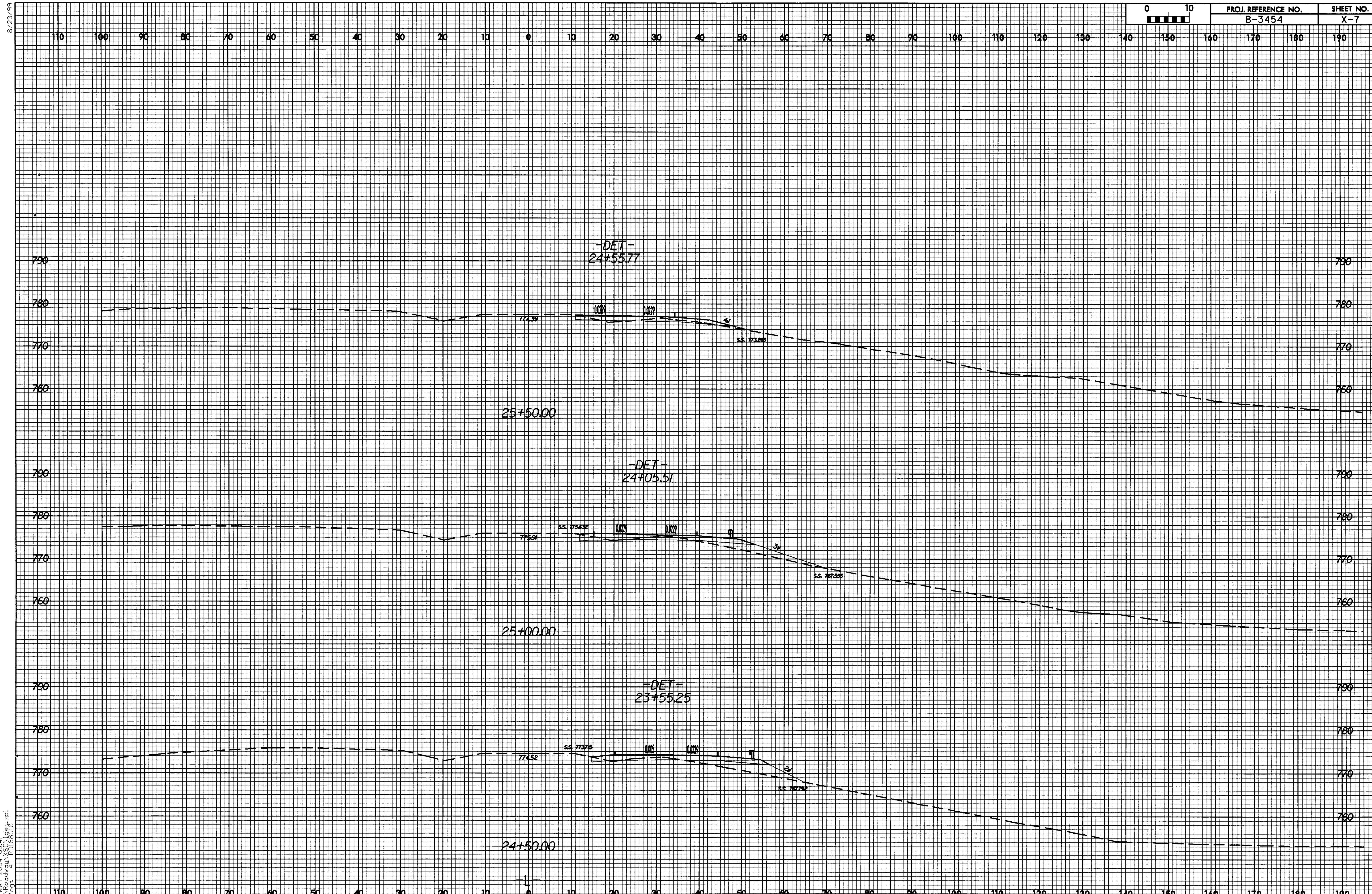

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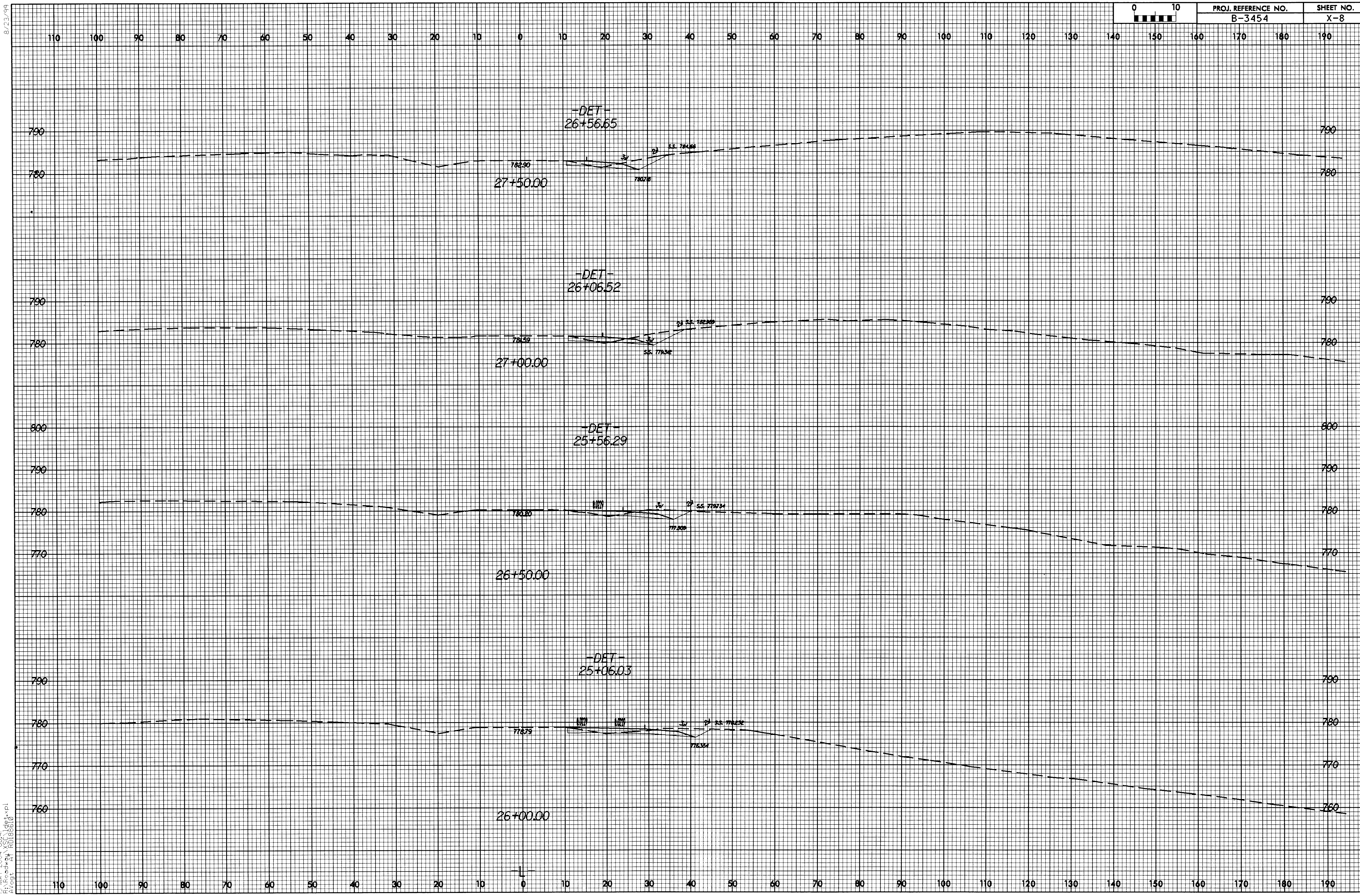

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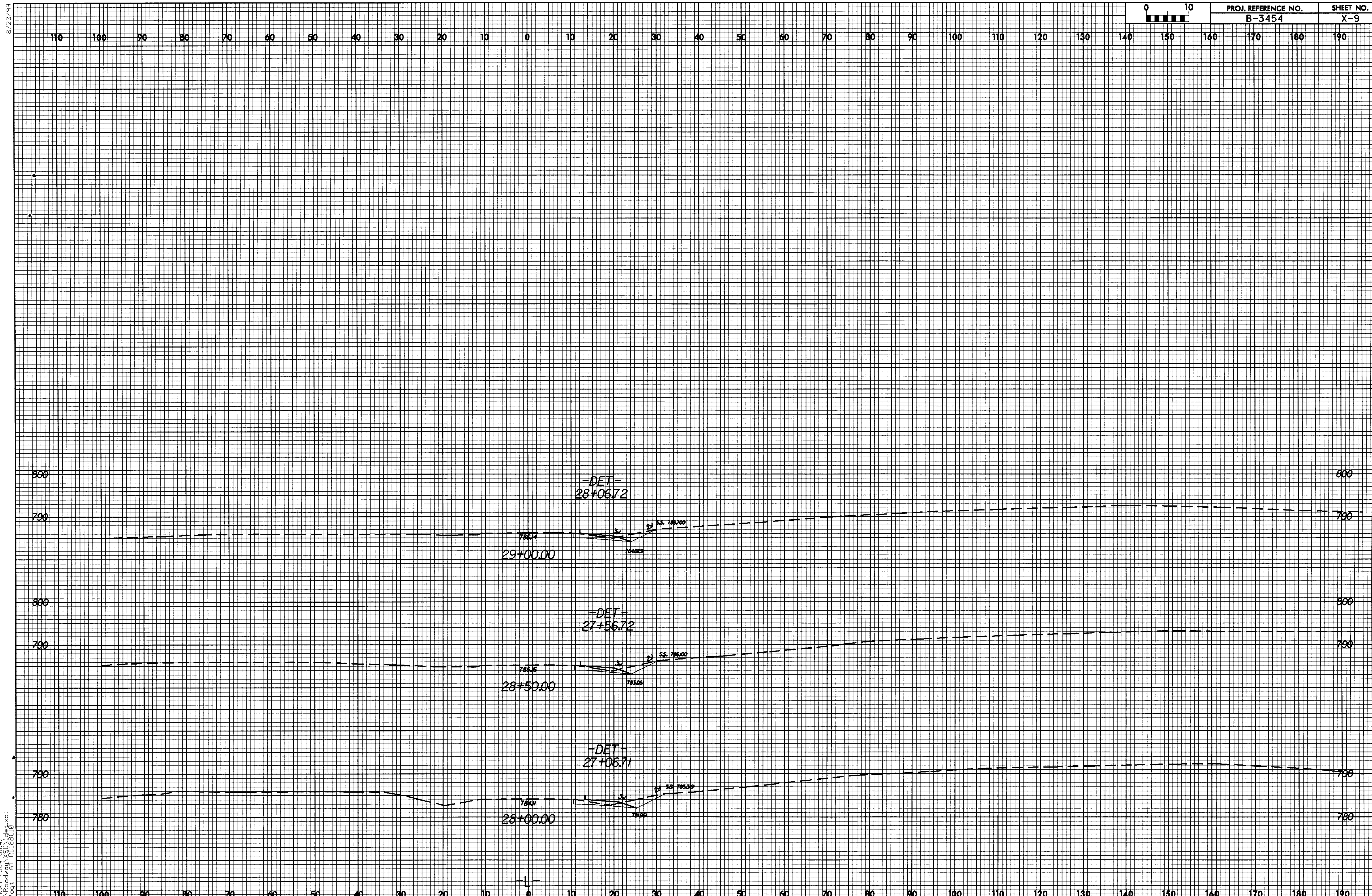

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Forsyth County
Bridge No. 260 on SR 1525 (Yadkinville Road)
over Muddy Creek
Federal Aid Project No. BRSTP-1525(3)
State Project No. 8.2625201
T.I.P. No. B-3454

CATEGORICAL EXCLUSION

UNITED STATES DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

AND

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

APPROVED:

01-11-03
DATE

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

7/15/03
DATE

for
John F. Sullivan, III, P.E.
Division Administrator, FHWA

Forsyth County
Bridge No. 260 on SR 1525 (Yadkinville Road)
over Muddy Creek
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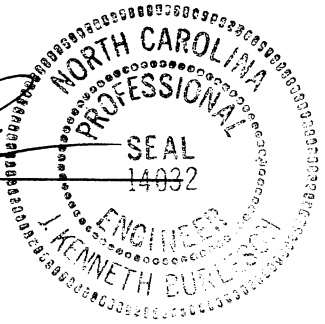
State Project No. 8.2625201
T.I.P. No. B-3454

CATEGORICAL EXCLUSION

July 2003

Documentation Prepared by:
TGS Engineers



J. Kenneth Burleson, P.E.
Project Manager

7/8/03
Date

For the North Carolina Department of Transportation

Elmo E. Vance
Project Manager
Consultant Engineering Unit

PROJECT COMMITMENTS

Forsyth County
Bridge No. 260 on SR 1525 (Yadkinville Road)
over Muddy Creek
Federal Aid Project No. BRSTP-1525(3)
State Project No. 8.2625201
T.I.P. No. B-3454

NCDOT has agreed to the standard Nationwide Permit No. 23 Conditions, the General Nationwide Permit Conditions, Section 404 Only Conditions, Regional Conditions, State Consistency Conditions, NCDOT's Guidelines for Best Management Practices for the Protection of Surface Waters, Design Standard for Sensitive Watersheds, Best Management Practices for Bridge Demolition and Removal (BMPs-BDR), General Certification Conditions, and Section 401 Conditions of Certification. The project falls under Case 3 of the BMPs-BDR.

Hydraulics Unit

1. Since this bridge is located within a designated floodway and 100-year floodplain in Forsyth County, the design of the replacement crossing must meet the requirements of their Unified Development Ordinances (UDO) Technical Code. Therefore, the project floodway and floodplain impacts will be coordinated with the Winston-Salem/Forsyth County Planning Department and the Winston-Salem/Forsyth County Inspections Department.

Forsyth County
Bridge No. 260 on SR 1525 (Yadkinville Road)
over Muddy Creek
Federal Aid Project No. BRSTP-1525(3)
State Project No. 8.2625201
T.I.P. No. B-3454

INTRODUCTION: Forysth County Bridge No. 260 is included in the 2004-2010 North Carolina Department of Transportation (NCDOT) Transportation Improvement Program (TIP) and in the Federal-Aid Bridge Replacement Program. The location is shown in Figure 1. No substantial environmental impacts are anticipated. The project is classified as a Federal "Categorical Exclusion".

I. PURPOSE AND NEED STATEMENT

NCDOT Bridge Maintenance Unit records indicate that Bridge No. 260 had a sufficiency rating of 46.5 out of a possible 100 for a new structure. The bridge is considered functionally obsolete. Subsequent work and reevaluation has resulted in a current sufficiency rating of 54.0. The replacement of this inadequate structure will result in safer and more efficient traffic operations.

II. EXISTING CONDITIONS

The project is located in the western part of Forsyth County (see Figure 1). SR 1525 (Yadkinville Road) is classified as an urban collector in the Statewide Functional Classification System. Although this route is not a designated bicycle route, SR 1525 serves a residential area with numerous subdivisions.

On the corner of SR 1525 and SR 1393 (Shattalon Drive) is a school for children with disabilities. Located on the corner of SR 1525 and SR 1434 (Grandview Club Road) is a gas station and a neighborhood shopping center, all of which generate traffic in the area. Located just northeast of the bridge is the Grandview Golf Course.

The 2003 traffic volume of 13,200 vehicles per day (VPD) is expected to increase to 26,000 VPD by the year 2030. The projected volume includes 2 percent truck-tractor semi-trailers (TTST), and 3 percent dual-tired vehicles (DT). The posted speed limit on this section of SR 1525 is 50 miles (80 kilometers) per hour. Approximately two miles (3.2 kilometers) east of the crossing, SR 1525 connects to NC 67 (Reynolda Road) which is a major traffic conveyor for the City of Winston-Salem, and accommodates a large volume of trucks due to businesses along NC 67.

The Winston-Salem Department of Recreation has requested provisions for a greenway under the crossing. The Greenway System Plan identifies a proposed greenway along Muddy Creek. The right of way for this proposed greenway has been acquired along the east side of Muddy Creek. This project is currently in the NCDOT Transportation Improvement Program as project E-4010.

In the vicinity of the bridge, SR 1525 has a 20-foot (6.1-meter) pavement width with 8-foot (2.4-meter) grass shoulders (See Figures 3 and 4). The roadway has good horizontal and vertical alignment at this site. The roadway is situated approximately 20.2 feet (6.2 meters) above the river bed.

Bridge No. 260 is a one-span, two-lane structure that consists of reinforced concrete deck girders widened with reinforced concrete deck on I-beams. The substructure consists of reinforced concrete full height abutments. The existing bridge (See Figure 3) was constructed in 1923 and reconstructed in 1961. The overall length of the structure is 42 feet (12.8 meters). The clear roadway width is 28 feet (8.5 meters). The posted weight limit on this bridge is 34 tons for single vehicles and legal gross weight for TTST's.

There are no utilities attached to the existing structure, but power and telephone lines are overhead. A 12-inch waterline is located along the south side of the roadway and a gas line is located along the north side of the roadway. Utility impacts are anticipated to be moderate.

One accident was reported in the vicinity of Bridge No. 260 during the period from January 1997 to December 1999. The accident, occurring during wet conditions, was a property damage only accident. A passenger car ran off the road to the right and struck a tree.

Nineteen school buses cross the bridge twice daily during their morning and afternoon routes.

III. ALTERNATIVES

A. Project Description

The proposed replacement structure is a 100-foot (30.5-meter) long bridge with a 40-foot (12.2-meter) clear width bridge to provide two 12-foot (3.6-meter) lanes with 8-foot (2.4-meter) shoulders on each side. The existing roadway will be widened to a 32-foot (9.8-meter) pavement width to provide two 12-foot (3.6-meter) traffic lanes, two 4-foot (1.2-meter) paved shoulders with 4-foot (1.2-meter) grass shoulders on each side. Typical sections of the proposed approach roadway are shown in Figure 4. This project will be designed to meet the AASHTO design requirements for a design speed of 50 miles per hour (80 kilometers per hour).

The roadway grade of the new crossing will be approximately the same as the existing structure.

The City of Winston-Salem has requested provisions for a 12-foot (3.6-meter) wide greenway beneath the crossing along the east side of Muddy Creek. The requested provisions include a 12-foot (3.6-meter) desirable (10-foot [3-meter] minimum) horizontal clearance with a 12-foot (3.6-meter) desirable (8-foot [2.4-meter] minimum) vertical clearance for a path as high above the flow elevation of the creek as possible. They also desire a connection to SR 1525 since this greenway as currently planned will temporarily terminate at this location. This request has been accommodated within the proposed design.

B. Build Alternatives

The two alternatives for replacing Bridge No. 260 are described below.

Alternative 1 involves replacement of the structure with a new bridge on a new alignment approximately 40 feet (12.2 meters) downstream (south) of the existing structure. The new alignment will have a design speed of 45 miles (72 kilometers) per hour. The existing structure and approaches would serve to maintain traffic on-site during the construction period.

This alternative was not selected because both the construction and right of way costs are estimated to exceed those of Alternative 2.

Alternative 2 (Preferred) involves replacement of the structure with a new bridge at its existing location. The design speed will be 50 miles per hour (80.0 kilometers per hour). A temporary on-site detour bridge will be provided during construction to the south (downstream) of the existing structure (Figure 2).

C. Alternatives Eliminated from Further Study

The "Do-Nothing" or "No-Build" alternative will eventually necessitate closure of the bridge. This is not desirable due to the traffic service provided by SR 1525.

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

D. Preferred Alternative

Bridge No. 260 will be replaced at the existing location as shown by Alternative 2 in Figure 2. A temporary detour structure and approaches will maintain traffic on-site during construction.

This alternative is preferred because it is the least expensive, allows on-site maintenance of traffic and has minimal impact to adjacent properties.

IV. ESTIMATED COSTS

The estimated costs for the two alternatives, based on current prices, are as follows:

	Alternative 1	Alternative 2 (Preferred)
Structure	$280,000	$280,000
Roadway Approaches	808,690	680,821
Detour Structure and Approaches	NA	105,300
Structure Removal	9,408	9,408
Misc. & Mob.	406,902	224,471
Eng. & Contingencies	245,000	200,000
Total Construction Cost	**$ 1,750,000**	**$ 1,500,000**
Right-of-Way Costs	109,300	44,125
Total Project Cost	**$ 1,859,300**	**$ 1,544,125**

The estimated cost of the project, shown in the 2004-2010 NCDOT Transportation Improvement Program (TIP), is $1,585,000, $1,450,000 for construction, and $135,000 prior years expense. The right of way costs are not individually estimated in the TIP.

V. NATURAL RESOURCES

Materials and research data in support of this investigation have been derived from a number of sources including applicable U.S. Geological Survey (USGS) topographic mapping (Rural Hall, NC 7.5 minute quadrangle, 1994), U.S. Fish and Wildlife Service (FWS) National Wetlands Inventory (NWI) mapping (FWS NWI 1994), and aerial photographs (scale: 1 inch=100 feet).

A. Methodology

Bridge No. 260 was visited on July 18, 2001. During the site visit, the study corridor was walked and visually surveyed for significant features. For purposes of the field

investigation and to assure proper area coverage of both alternatives, the study corridor was assumed to be approximately 2000 feet (609.6 meters) in length, with a width extending approximately 200 feet (61.0 meters) south and 100 feet (30.5 meters) north of the SR 1525 centerline. Plant community impact calculations provided in this report are based on individual corridors centered on each of the two alternatives. Final impacts will be limited to cut-and-fill boundaries of the constructed alternative. Special concerns evaluated in the field include: 1) potential habitat for protected species and 2) wetlands and water quality protection in Muddy Creek.

Plant community descriptions are based on a classification system utilized by North Carolina Natural Heritage Program (NHP) (Schafale and Weakley 1990). When appropriate, community classifications were modified to better reflect field observations. Vascular plant names follow nomenclature found in Radford *et al.* (1968), with adjustments made to reflect more current nomenclature (Kartesz 1998). Jurisdictional areas were evaluated using the three-parameter approach following U.S. Army Corps of Engineers (COE) delineation guidelines (DOA 1987). Jurisdictional areas were characterized according to a classification scheme established by Cowardin *et al.* (1979). Geographical distribution and habitat requirements of terrestrial wildlife and aquatic organisms mentioned in this document were obtained by supportive literature (Webster *et al.* 1985, Potter *et al.* 1980, Hamel 1992, Martof *et al.* 1980, Rohde *et al.* 1994, Menhinick 1991, Palmer and Braswell 1995). Fish and wildlife nomenclature follow current standards. Water quality information for area streams and tributaries was derived from available sources (DWQ 1997, DWQ 1999). Quantitative sampling was not undertaken to support existing data.

The most current (4/12/2001) U.S. Fish and Wildlife Service (FWS) listing of federally protected species with ranges extending into Forsyth County was obtained prior to initiation of the field investigation. In addition, NHP records documenting presence of federally or state listed species were consulted before commencing the field investigation.

B. Physiography and Soils

The study corridor is located in the Charlotte and Milton Belt geologic formations within the Inner Piedmont physiographic province of North Carolina. Within the Piedmont soil region, the study corridor is included in the felsic crystalline soil system. The landscape is characterized by broad, gently sloping uplands, narrow convex ridges, and moderately steep valley slopes. Soil systems in this central, western portion of the Piedmont are determined by the local bedrock which is granite, granite gneiss, mica gneiss, and mica schist (Daniels *et al.* 1999). The floodplain is flat west of Muddy Creek, and slopes gently upward from the eastern

bank. Within the study corridor, elevations rise from approximately 750 feet (228.6 meters) National Geodetic Vertical Datum (NGVD) in the flood plain to approximately 790 feet (240.8 meters) NGVD at the extremes of the study corridor (USGS Rural Hall, NC quadrangle).

The Natural Resource Conservation Service (NRCS) indicates the following soils within the study corridor: Chewacla loam (fine-loamy, mixed, thermic *Aquic Fluvaquentic Dystrochrepts*) adjacent to the streambed, Wilkes soils (loamy, mixed, thermic, shallow *Typic Hapludalfs)* on the eastern slopes, Hiwassee loam (clayey, kaolinitic thermic *Typic Rhododults*) on the eastern terrace, and Wickham fine sandy loam (fine-loamy, mixed, thermic, *Typic Hapludults*) in the western end of the floodplain (SCS 1976). The Chewacla series can contain small inclusions of Wehadkee soils which is classified as hydric (NRCS 1996). During the site visit no inclusions of hydric soils were found within the study corridor. None of the remaining soil series mapped within the study corridor are considered hydric.

The Chewacla series consists of very frequently flooded, somewhat poorly drained, moderately permeable soils on floodplains. These soils formed in recent alluvium and slope is less than 2 percent. Chewacla soils have loamy A and B horizons that extend to a depth of more than 35 inches (88.9 centimeters). Depth to bedrock is more than 4 feet (1.2 meters). These soils range from medium acid to strongly acid unless lime has been added. Frequent flooding and a seasonal high water table limit the use of these soils.

The Wilkes series consists of well-drained soils sloping to steep upland soils. The surface horizon is thin and comprised of dark, fine, sandy loam. The subsoil is a yellowish-brown firm clay loam. These soils have medium fertility but low organic content. Available water capacity is low with moderate permeability. The slope and moderate permeability are the limiting factors in the use of these soils.

Hiwassee loams are well-drained soils on smooth, broad ridges of the uplands. They formed in old alluvium or from residuum from mixed acidic and basic rocks. Infiltration and permeability are moderate. These soils are low in fertility and organic matter content, and have moderate limitations for farm usage. Depth to the seasonal high water table is more than 5 feet (1.5 meters).

The Wickham series consists of well-drained, gently sloping to strongly sloping soils on stream terraces. They formed in old alluvium from material weathered from acidic rocks of the uplands. Wickham soils are low in natural fertility and organic matter content. Permeability is moderate, and the available water holding capacity is medium. Depth to the seasonal high water table is more than 5 feet (1.5 meters). The soils are well suited to pasture or crops.

C. Water Resources

1. Waters Impacted

The study corridor is located within sub-basin 03-07-04 of the Yadkin-Pee Dee River Basin (DWQ 1997). This area is part of USGS accounting unit 03040101 of the South Atlantic-Gulf Coast Region. The section of Muddy Creek crossed by the subject bridge has been assigned Stream Index Number 12-94-(0.5) by the N.C. Division of Water Quality (DWQ 1997).

2. Stream Characteristics

Muddy Creek is a third-order stream within a watershed primarily characterized by suburban residential and agricultural uses. Within the study corridor, Muddy Creek is entrenched and has apparently been dredged, with banks rising 8 feet (2.4 meters) above the water's surface. During the field visit, the stream width was approximately 18 feet (5.5 meters) at the point of the bridge crossing, and water depth was 4 to 18 inches (10.2 to 45.7 centimeters). A tributary flows into Muddy Creek in the northwest quadrant of the study corridor, along the edge of a golf course. The tributary originates in an ephemeral drainage ditch parallel to SR 1525 and develops into a jurisdictional stream within the study corridor. A dry relict drainage extends north from the edge of the southwest quadrant to join the roadside ditch south of SR 1525.

In Muddy Creek, visibility was approximately 12 inches (30.5 centimeters), and flow was moderate to swift. The substrate is composed of coarse sand and pebbles, with deposits of mud in deeper pools. Large, loose cobbles are scattered through the channel, and occasionally form rocky islands in the stream. The stream banks are composed of fine- to coarse-textured soil, and rise steeply to the floodplain. Persistent emergent aquatic vegetation was not observed.

Classifications are assigned to waters of the State of North Carolina based on the existing or contemplated best usage of various streams or segments of streams in the basin. A best usage classification of C has been assigned to Muddy Creek. The designation C denotes waters protected for secondary recreation, fishing, wildlife, fish and aquatic life propagation and survival, agriculture and other uses. Secondary recreation includes wading, boating, and other uses involving human body contact with water where such activities take place in an unfrequent, unorganized, or incidental manner. There are no restrictions on watershed development activities. No designated Outstanding Resource Waters (ORW), High Quality Waters

(HQW), Water Supply I (WS-I), or Water Supply II (WS-II) waters occur within 1.0 mile (1.6 kilometers) of the study corridor. No watershed Critical Area (CA) occurs within 1.0 mile (1.6 kilometers) of the study corridor.

The Division of Water Quality (DWQ) has initiated a whole-basin approach to water quality management for the 17 river basins within the state. Water quality for the proposed study corridor is summarized in the Yadkin-Pee Dee River basin management plan. Water quality in Muddy Creek currently has a use support rating of Support Threatened. Sub-basin 03-07-04 supports seven major and 43 minor point-source dischargers. Non-point and point source pollution and agriculture are the prime sources of impairment within this sub-basin (DWQ 1997). The study corridor supports forest vegetation, so the existing road and road shoulders are the prime source of non-point source pollution within the study corridor.

3. Anticipated Impacts

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

In both alternatives, the proposed bridging will allow for continuation of pre-project stream flows in Muddy Creek, thereby protecting the integrity of this waterway. Long-term impacts resulting from construction are expected to be negligible. In order to minimize impacts to water resources, NCDOT BMPs for the Protection of Surface Waters will be strictly enforced during the entire life of the project.

Bridge No. 260 will be removed without dropping components into Waters of the United States.

D. Biotic Resources

1. Plant Communities

Three distinct plant communities were identified within the study corridor: Piedmont/Low Mountain Alluvial Forest, Piedmont/Mountain Bottomland Forest, and disturbed/maintained land. These communities are described below.

Piedmont/Low Mountain Alluvial Forest- This community exists in a riparian fringe approximately 140 feet (42.6 meters) wide along the banks of Muddy Creek. The Muddy Creek tributary and roadside drainage ditches are also bordered by this community for a width ranging from 50 to 140 feet (15.2 to 42.6 meters) wide. Schafale and Weakley (1990) describe this community as occurring on river and stream floodplains in which separate fluvial landforms and associated vegetation zones are too small to distinguish. The community grades into Piedmont/Mountain Bottomland Forest (Schafale and Weakley 1990) at higher elevations away from open waters. Canopy tree components include tulip poplar (*Liriodendron tulipifera*), beech (*Fagus grandifolia*), bitternut hickory (*Carya cordiformis*), red maple (*Acer rubrum*), white ash (*Fraxinus americana*), sycamore (*Platanus occidentalis*), black willow (*Salix nigra*), river birch (*Betula nigra*), black walnut (*Juglans nigra*), sweetgum (*Liquidambar styraciflua*), northern red oak (*Quercus rubra*), swamp chestnut oak (*Q. michauxii*), and blackgum (*Nyssa sylvatica*). The shrub layer is of low density, but diverse, and is composed of southern arrowwood (*Viburnum dentatum*), black haw (*V. prunifolium*), box elder (*Acer negundo*), flowering dogwood (*Cornus florida*), swamp dogwood (*C. amomum*), and winged elm (*Ulmus alata*). Vines include cross vine (*Bignonia capreolata*), greenbrier (*Smilax glauca*), wild yam (*Dioscorea villosa*), matelea (*Matelea carolinensis*), and virgin's bower (*Clematis virginiana*). The herb layer contains heal-all (*Prunella vulgaris*), Nepal microstegium (*Microstegium vimineum*), panic grass (*Panicum* sp.), common blue violet (*Viola* sp.), Solomon's seal (*Polygonatum biflorum*), thimbleweed (*Anemone virginiana*), and wild quinine (*Parthenium integrifolium*).

Piedmont/Mountain Bottomland Forest - A wooded area in the southeast quadrant of the study corridor, the relict drainage in the southwest quadrant, and outer edges of Piedmont/Low Mountain Alluvial Forest community areas along streams exhibit characteristics of Piedmont/Mountain Bottomland Forest. According to Schafale and Weakley (1990), this community occurs on floodplain ridges and terraces. The plant species composition differs from alluvial forest, containing more upland species and disturbance-adapted

species. This community also exhibits a denser canopy layer than alluvial forest. Dominant canopy tree species are black locust (*Robinia pseudoacacia*), bitternut hickory, pignut hickory (*Carya glabra*), tulip poplar, white oak (*Quercus alba*), white pine (*Pinus strobus*), tulip poplar, white ash, black cherry (*Prunus serotina*), red maple, and blackgum. In dryer areas, Virginia pine (*P. virginiana*), black oak (*Q. velutina*), and southern red oak (*Q. falcata*) are occasionally found. Shrubs include tree of heaven (*Ailanthus altissima*), eastern red cedar (*Juniperus virginiana*), mulberry (*Morus rubra*), blackberry (*Rubus argutus*), redbud (*Cercis canadensis*), mimosa (*Albizia julibrissin*), persimmon (*Diospyros virginiana*), and box elder. Vines proliferate in sunny areas and edges, and include poison ivy (*Toxicodendron radicans*), Japanese honeysuckle (*Lonicera japonica*), trumpet creeper (*Campsis radicans*), Carolina jessamine (*Gelsemium sempervirens*), and passion vine (*Passiflora incarnata* and *P. lutea*). The herb layer is sparse under the forest canopy, and includes common blue violets, Indian strawberry (*Duchesnea indica*), pipsissewa (*Chimaphila maculata*), and bedstraw (*Galium* sp.). Forest edges provide habitat for wingstem (*Verbesina occidentalis*), plantain (*Plantago rugelii* and *P. lanceolata*), prairie dock (*Silphium terebinthinaceum*), wild quinine, yarrow (*Achillea millefolium*), milkweeds (*Asclepias* spp.), and wild lettuce (*Lactuca canadensis*), among others.

Disturbed/Maintained Land - Disturbed/maintained land occurs along the shoulders of SR 1525, on residential lots, and within active and fallow agricultural fields south of SR 1525. Roadside right-of-way areas are approximately 10 feet (3.0 meters) wide. Roadsides and lawns are planted with grasses, including Bermuda grass (*Cynodon dactylon*) and also contain weedy species such as goldenrod (*Solidago* sp.), dandelion (*Taraxacum officinale*), lyre-leaved sage (*Salvia lyrata*), dogbane (*Erigeron* sp.), wild onion (*Allium canadense*), dock (*Rumex crispus*), wood sorrel (*Oxalis* sp.), and horse nettle (*Solanum carolinense*). Agricultural fields are invaded by volunteer species including Queen Anne's lace (*Daucus carota*), wingstem, cocklebur (Xanthium strumarium), milkweeds, prostrate spurge (*Chamaesyce maculata*), sensitive brier (*Schrankia microphylla*), lespedeza (*Lespedeza* sp.), and pigweed (*Amaranthus hybridus*).

2. Plant Community Impacts

Plant community impacts are estimated based on the amount of each plant community present within each alternative corridor. A summary of plant community impacts resulting from each alternative is presented in the following table.

From an ecological perspective, impacts of upgrading existing road facilities are minimal for same location alternatives (Alternative 2). Impacts are greater for Alternative 1 because the construction corridor is much longer than for Alternative 2, and because the bridge is being constructed on a new alignment (40 feet [12.2 meters] to the south). For both alternatives, the greatest projected impacts will occur to the disturbed/maintained plant community.

Plant Community Impacts within Alternative Corridors.
Measurements are given in acres (hectares).

Plant Community	Alternative 1	Alternative 2 (Preferred)		
	Permanent	Temporary	Permanent	Total
Piedmont/Low Mountain Alluvial Forest	0.24 (0.10)	0.18 (0.07)	0.03 (0.01)	0.21 (0.08)
Piedmont/Mountain Bottomland Forest	0.80 (0.32)	0.13 (0.05)	0.14 (0.06)	0.27 (0.11)
Disturbed/Maintained Land	0.97 (0.39)	<0.01 (<0.01)	0.73 (0.30)	0.73 (0.30)
TOTAL:	2.01 (0.81)	0.31 (0.12)	0.90 (0.37)	1.21 (0.49)

No new fragmentation of natural (Piedmont/Low Mountain Alluvial Forest and Piedmont/Mountain Bottomland Forest) plant communities will be created by either alternative. Either alternative only claim narrow strips of adjacent natural communities.

Roadside-forest ecotones typically serve as vectors for invasive species into local natural communities. An example of an undesirable invasive species utilizing roadsides is kudzu (*Pueraria montana*). The establishment of a hardy groundcover on road shoulders as soon as practicable will limit the availability of construction areas to invasive and undesirable plants.

3. Wildlife

No mammals were observed within the study corridor. Mammals expected to occur within the disturbed, suburban habitat within the study corridor include white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), gray squirrel (*Sciurus*

carolinensis), northern short-tailed shrew (*Blarina brevicauda*), eastern mole (*Scalopus aquaticus*), eastern pipistrelle (*Pipistrellus subflavus*), red bat (*Lasiurus borealis*), long-tailed weasel (*Mustela frenata*), striped skunk (*Mephitis mephitis*), eastern cottontail (*Sylvilagus floridanus*), white-footed mouse (*Peromyscus leucopus*), and gray fox (*Urocyon cinereoargenteus*).

Bird species identified during the field visit are northern cardinal (*Cardinalis cardinalis*), Carolina chickadee (*Poecile carolinensis*), turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), red-bellied woodpecker (*Melanerpes carolinus*), American robin (Turdus migratorius), common grackle (*Quiscalus quiscula*), Carolina wren (*Thryothorus ludovicianus*), eastern phoebe (*Sayornis phoebe*), and barn swallow (*Hirundo rustica*). The disturbed, open areas of the study corridor may provide suitable habitat for common yellowthroat (*Geothlypis trichas*), blue jay (*Cyanocitta cristata*), tufted titmouse (*Baeolophus bicolor*), indigo bunting (*Passerina cyanea*), American goldfinch (*Carduelis tristis*), northern mockingbird (*Mimus polyglottos*), house finch (*Carpodacus mexicanus*), brown thrasher (*Toxostoma rufum*), eastern towhee (*Pipilo erythrophthalmus*), song sparrow (*Melospiza melodia)*, and morning dove (*Zenaida macroura*). The wooded stream-side habitat may also be expected to support pileated woodpecker (*Dryocopus pileatus*), summer tanager (*Piranga rubra*), northern flicker (*Colaptes auratus*), red-shouldered hawk (*Buteo lineatus*), barred owl (*Strix varia*), white-breasted nuthatch (*Sitta carolinensis*), gray catbird (*Dumetella carolinensis*), and white-eyed vireo (*Vireo griseus*).

No aquatic amphibian or reptile was observed within the study corridor. Terrestrial reptilian or amphibian species that might be expected in this habitat are eastern garter snake (*Thamnophis sirtalis*), rat snake (*Elaphe obsoleta*), eastern worm snake (*Carphophis amoenus*), eastern fence lizard (*Sceloporus undulatus*), eastern box turtle (*Terrapene carolina*), spotted salamander (*Ambystoma maculatum*), dusky salamander (*Desmognathus fuscus*), southern two-lined salamander (*Eurycea cirrigera*), red salamander (*Pseudotriton ruber*), slimy salamander (*Plethodon glutinous*), Fowler's toad (*Bufo woodhousei*), American toad (*Bufo americanus*), upland chorus frog (*Pseudacris triseriata*), and gray tree frog (*Hyla chrysoscelis*).

Two northern water snakes (*Nerodia sipedon*) were observed within the study corridor. Muddy Creek provides suitable habitat for other aquatic and semi-aquatic reptiles including painted turtle (*Chrysemys picta*), eastern musk turtle (*Sternotherus odoratus*), and queen snake (*Regina septemvittata*). Typical amphibian species for this habitat include green frog (*Rana clamitans*) and pickerel frog (*Rana palustris*).

No sampling was undertaken in Muddy Creek to determine fishery potential. Small minnows were seen during visual surveys, but no larger fish were noted. Species which may be present in Muddy Creek include rosyside dace (*Clinostomus funduloides*), bluehead chub (*Nocomis leptocephalus*), whitefin shiner (*Notropis niveus*), spottail shiner (*N. hudsonius*), white sucker (*Catostomus commersoni*), flat bullhead (*Ameiurus platycephalus*), margined madtom (*Noturus insignis*), and redbreast sunfish (*Lepomis auritus*).

4. Wildlife Impacts

Due to the limited extent of infringement on natural communities, the proposed bridge replacement will not result in substantial loss or displacement of known terrestrial animal populations. No substantial habitat fragmentation is expected since potential improvements will be restricted to or adjoining existing roadside margins. Construction noise and associated disturbances will have short-term impacts on avifauna and migratory wildlife movement patterns. Long-term impacts are expected to be minimal for both alternatives. Impacts associated with turbidity and suspended sediments resulting from the bridge replacement will affect benthic populations on a short-term basis. Temporary impacts to downstream habitats from increased sediment during construction will be minimized by the implementation of stringent erosion control measures.

E. Jurisdictional Issues

1. Waters of the United States

Surface waters within the embankments of Muddy Creek are subject to jurisdictional consideration under Section 404 of the Clean Water Act as "waters of the United States" (33 CFR section 328.3). Muddy Creek is classified as a riverine, lower perennial, permanently flooded and excavated stream with an unconsolidated bottom (R2UBHx), according to NWI mapping (Cowardin *et al.* 1979). The field visit verified this characterization, finding Muddy Creek to be a perennial stream with an unconsolidated bottom of sand, gravel and cobbles.

2. Jurisdictional Wetlands

Vegetated wetlands are defined by the presence of three primary criteria: hydric soils, hydrophytic vegetation, and evidence of hydrology at or near the surface for a portion (12.5 percent) of the growing season (DOA 1987). Vegetated areas in the proximate Muddy Creek floodplain are characterized on NWI mapping as a palustrine, scrub-shrub, broad leaved deciduous,

temporarily flooded wetlands (PSS1A), and as palustrine, forested, broad-leaved deciduous, temporarily flooded wetlands. The field investigation determined that no vegetated wetlands subject to jurisdictional consideration under Section 404 of the Clean Water Act as "waters of the United States" (33 CFR section 328.3) occur within the study corridor.

3. Permits Required

This bridge is located within the designated floodway and 100-year floodplain (See Figure 5). To meet the requirements of the Unified Development Ordinances (UDO) a "No Impact Certification" must be submitted to the Winston-Salem Inspections Department. If there is impact less than or equal to a 0.5-foot (0.15-meter) rise in the base elevation of the creek then Federal Emergency Management Authority (FEMA) regulations must be satisfied before local permits can be issued. If impacts to the creek are greater than a 0.5-foot (0.15-meter) rise in the base elevation of the creek then the project will not meet the regulations as specified in the UDO.

This project is being processed as a Categorical Exclusion (CE) under Federal Highway Administration (FHWA) guidelines. The COE has made available Nationwide Permit (NWP) #23 (61 FR 65874, 65916; December 13, 1996) for CEs due to expected minimal impact. DWQ has made available a General 401 Water Quality Certification for NWP #23. However, authorization for jurisdictional area impacts through use of this permit requires written notice to DWQ. In the event that NWP #23 will not suffice, minor impacts attributed to bridging and associated approach improvements are expected to qualify under General Bridge Permit 031 issued by the Wilmington COE District. Notification to the Wilmington COE office is required if this general permit is utilized.

4. Mitigation

Fill or alteration of streams may require compensatory mitigation in accordance with 15 NCAC 2H .0506(h). Compensatory mitigation is not expected to be offered for this project due to the lack of potential impacts to jurisdictional areas. Utilization of BMPs is recommended in an effort to minimize indirect impacts. A final determination regarding mitigation rests with the COE and DWQ.

F. Protected Species

1. Federal

Species with the federal classification of Endangered, Threatened, or officially Proposed for such listing are protected under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). The term "Endangered species" is defined as "any species which is in danger of extinction throughout all or a significant portion of its range", and the term "Threatened species" is defined as "any species which is likely to become an Endangered species within the foreseeable future throughout all or a significant portion of its range" (16 U.S.C. 1532). Federally protected species listed for Forsyth County (February 18, 2003 FWS list) are listed in the following table.

Federally Protected Species. Species name and status for federally protected species in Forsyth County (February 18, 2003 FWS list).

Common Name	Scientific Name	Federal Status
Red-cockaded woodpecker*	*Picoides borealis*	Endangered
Bog turtle	*Clemmys muhlenbergi*	Threatened (Due to Similarity of Appearance)
Small-anthered Bittercress	*Cardamine micranthera*	Endangered

* Historic record - obscure and incidental record.

Red-cockaded Woodpecker - This small woodpecker (7 to 8.5 inches [18 to 22 centimeters] long) has a black head, prominent white cheek patches, and a black-and-white barred back. Males often have red markings (cockades) behind the eye, but the cockades may be absent or difficult to see (Potter *et al.* 1980). Primary habitat consists of mature southern pine forests dominated by loblolly, long-leaf (*P. palustris*), slash (*P. elliottii*), and pond (*P. serotina*) pines (Thompson and Baker 1971). Nest cavities are constructed in the heartwood of living pines, generally older than 70 years, that have been infected with red-heart disease. Nest cavity trees tend to occur in clusters, which are referred to as colonies (FWS 1985). The woodpecker drills holes into the bark around the cavity entrance, resulting in a shiny, resinous buildup around the entrance that allows for easy detection of active nest trees. Pine flatwoods or pine-dominated savannas which have been maintained by frequent natural fires serve as ideal nesting and foraging sites for this woodpecker. Development of a thick understory may result in abandonment of cavity trees. The woodpeckers utilize pine stands in close

proximity to the colony site for foraging. Foraging areas, depending on the quality of habitat, have been found to range from 84 acres (33.9 hectares) to over 409 acres (165.5 hectares). Food sources include wood-boring insects, grubs, beetles, corn worms and other invertebrates found within 0.5 mile (0.8 kilometer) of the colony site. Stands preferred by foraging birds are dominated by pines greater than 30 years of age although mixed pine/hardwood stands are also used.

The study corridor contains scattered white pine (*Pinus strobus*) and Virginia pine (*Pinus virginiana*), but no specimens that are old enough to be cavity tree candidates. Few pines within the hardwood forest are large and old enough for foraging, and the canopy and sub-canopy contain a dense hardwood composition, reducing suitability for the woodpecker. NHP records have no documentation of red-cockaded woodpeckers within 5.0 miles (8.1 kilometers) of the study corridor. No red-cockaded woodpeckers were observed during the field visit.

BIOLOGICAL CONCLUSION: The study corridor contains no suitable foraging or nesting habitat for red-cockaded woodpeckers. NHP records document no occurrences of red-cockaded woodpeckers within 5.0 miles (8.1 kilometers) of the study corridor. Based on NHP records and field observations, the proposed project will not affect the red-cockaded woodpecker. **NO EFFECT**

Bog turtle - The bog turtle is a small turtle reaching an adult size of approximately 3 to 4 inches (8 to 10 centimeters). This otherwise darkly-colored species is readily identifiable by the presence of a bright orange or yellow blotch on the sides of the head and neck (Martof *et al.* 1980). The bog turtle has declined drastically within the northern portion of its range due to over-collection and habitat alteration. As a result, the FWS officially proposed in the January 29, 1997 Federal Register (62 FR 4229) to list bog turtle as threatened within the northern portion of its range, and within the southern portion of its range, which includes North Carolina, the bog turtle is proposed for listing as threatened due to similarity of appearance to the northern population. The proposed listing would allow incidental take of bog turtles in the southern population resulting from otherwise lawful activity.

The bog turtle is typically found in bogs, marshes, and wet pastures, usually in association with aquatic or semi-aquatic vegetation and small, shallow streams over soft bottoms (Palmer and Braswell 1995). In North Carolina, bog turtles have a discontinuous distribution in the Mountains and western Piedmont.

The bog turtle is listed as Threatened due to Similarity of Appearance (T S/A). T S/A species are not subject to Section 7 consultation and a biological conclusion is not required. However, this project is not expected to affect the bog turtle as no bogs, marshes, or wet pastures occur within the study corridor. In addition, Muddy Creek is characterized by moderate flow volumes with a sand and gravel substrate which is an unsuitable habitat for bog turtles. NHP records indicate that bog turtles have not been documented within 1.0 mile (1.6 kilometers) of the study corridor and no bog turtles were observed during field surveys.

Small-anthered Bittercress - Small-anthered bittercress is a low, erect, biennial or perennial herb with slender stems and fibrous roots. This herb has single (rarely more) simple or branched stems. The plant has crenate, lobed basal leaves 0.3 to 0.7 inches (1 to 2 centimeters) in length, and unlobed, create stem leaves that are slightly shorter. The small flowers have white petals to 0.1 inch (3 millimeters) long and bloom in the late spring. The stem leaves are alternate, mostly unlobed, crenate, and cuneate. Threats to small-anthered bittercress include agriculture, stream channelization, and exotic weeds.

Small-anthered bittercress requires open habitat along streambanks with sand bars and in moist soils of rock crevices, seepages, and moist woods and is know to exist along only a few streams in Forsyth and Stokes counties. North Carolina populations are presently confined to Little Peter's Creek, Peter's Creek, Elk Creek, and another unnamed tributary to the Dan River in Stokes County. Small-anthered bittercress occurs in soils of the Rion, Pacolet, and Wateree series, where slopes are 25 to 60 percent.

BIOLOGICAL CONCLUSION: According to the latest NHP records (last updated April 8, 2003) no known occurrences of small-anthered bittercress have been documented in Forsyth County since 1955, when a observation along Belews Creek was recorded. Other than this historic record which lies 16 miles from the project site, the next known occurrence is located over 20 miles away from the project area within the Dan River Drainage of Stokes County. This Stokes County record was last observed in 1996.

The Bridge No. 260 project area is not located in the Dan River Drainage and the banks of Muddy Creek do not provide suitable habitat for small-anthered bittercress. The study corridor contains no rock outcroppings, seepages, wet rock crevices, or wet woods and is characterized by dense vegetation along the banks of Muddy Creek. Sunlight is greatly limited within 10 feet (3.1 meters) on both banks of muddy Creek. The area is dominated by agriculture and the stream has been dredged which negatively impacts habitat suitability.

Based on the lack of suitable habitat and no known NHP occurrences within the project study area, it is concluded that this project will not affect the small-anthered bittercress. **NO EFFECT.**

Federal Species of Concern - The February 18, 2003 FWS list also includes a category of species designated as "Federal species of concern" (FSC) in Forsyth County. A species with this designation is one that may or may not be listed in the future (formerly C2 candidate species or species under consideration for listing for which there is insufficient information to support listing). One FSC species is currently listed for Forsyth County: The brook floater typically occurs in small rivers and streams with gravelly bottoms in the western Piedmont. This species is listed by the state as Endangered. Suitable habitat for this species does occur within the project corridor, but no individuals were observed during the site visit.

The FSC designation provides no federal protection under the ESA for species listed. NHP files do not document any occurrences of FSC species within 1.0 mile (1.6 kilometers) of the study corridor.

2. State

Plant and animal species which are on the North Carolina state list as Endangered, Threatened, Special Concern, Candidate, Significantly Rare, or Proposed (Amoroso 1999, LeGrand and Hall 1999) receive limited protection under the North Carolina Endangered Species Act (G.S. 113-331 *et seq.*) and the North Carolina Plant Protection Act of 1979 (G.S. 106-202 *et seq.*). No species with these designations are documented within 1.0 mile (1.6 kilometers) of the study corridor.

NHP records do not document the occurrence of any Significant Natural Heritage Area in the vicinity of the study corridor. A Dedicated State Nature Preserve, Bethama's Walnut Bluffs Nature Preserve, is located approximately 1.3 miles (2.1 kilometers) northeast (upstream) of the study corridor along Muddy Creek. The proposed project will not affect this Dedicated State Nature Preserve.

VI. CULTURAL RESOURCES

A. Compliance Guidelines

This project is subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, and implemented by the Advisory Council on

Historic Preservation's Regulations for Compliance with Section 106, codified at 36 CFR Part 800. Section 106 requires Federal agencies to take into account the effect of their undertakings (federally-funded, licensed, or permitted) on properties included in or eligible for inclusion in the National Register of Historic Places and to afford the Advisory Council a reasonable opportunity to comment on such undertakings.

B. Historic Architecture

A field survey of the Area of Potential Effects (APE) was conducted on February 29, 2000. All structures within the APE were photographed, and later reviewed by the State Historic Preservation Office (HPO). None of the properties were considered eligible, and in a concurrence form dated June 1, 2000, the State Historic Preservation Officer (SHPO) concurred that there are no historic architectural resources either listed in or eligible for listing in the National Register of Historic Places within the APE. A copy of the memorandum dated March 29, 2001 and the concurrence form is included in the Appendix.

C. Archaeology

The State Historic Preservation Officer (SHPO), in a memorandum dated December 23, 2002 recommended that "no archaeological investigation in connection with this project." A copy of the SHPO memorandum is included in the Appendix.

VII. ENVIRONMENTAL EFFECTS

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

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

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

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

No adverse impact on families or communities is anticipated. Right-of-Way acquisition will be limited. No relocatees are expected with implementation of the preferred alternative.

A GeoEnvironmental Impact Evaluation was conducted along the project. Based on the field reconnaissance survey and/or a review of the Geographical Information Service (GIS) map, there were no anticipated Underground Storage Tank (UST) impacts, no Superfund sites, no regulated or unregulated landfills or dumpsites within the project limits.

The project is located in Forsyth County, which is within the Greensboro-Winston-Salem-High Point nonattainment area for ozone (O_3) and the Winston-Salem nonattainment area for carbon monoxide (CO) as defined by the EPA. The 1990 Clean Air Act Amendments (CAAA) designated these areas as "moderate" nonattainment area for O_3 and CO. However, due to improved monitoring data, these areas were redesignated as "maintenance" for O_3 on November 8, 1993 and for CO on November 7, 1994. Section 176(c) of the CAAA requires that transportation plan, programs, and projects conform to the intent of the state air quality implementation plan (SIP). The current SIP does not contain any transportation control measures for Forsyth County. The Winston-Salem/Forsyth County Urban Area 2025 Long Range Transportation Plan (LRTP) and the 2002-2008 Metropolitan Transportation Improvement Program (MTIP) have been determined to conform to the intent of the SIP. The USDOT air quality conformity approval of the LRTP was May 28, 2002 and the USDOT air quality conformity approval of the MTIP was May 28, 2002. The current conformity determination is consistent with the final conformity rule found in 40 CFR Parts 51 and 93. There have been no substantial changes in the project's design concept or scope, as used in the conformity analyses.

Forsyth County Bridge No. 260 bridge replacement project is an air quality "neutral" project, so it is not required to be included in the regional emissions analysis (if applicable) and a project level CO analysis is not required. The noise transmission loss provided by the structure should be sufficient to moderate any intrusive traffic noise. The project will not substantially increase traffic volumes due to the scope of the project. The project's impact on noise and air quality will not be substantial.

If vegetation is disposed of by burning, all burning shall be done in accordance with applicable local laws and regulations of the North Carolina SIP for air quality in compliance with 15 NCAC 2D.0520. This evaluation completes the assessment requirements for highway traffic noise of Title 23 of the Code of Federal Regulations, Part 772, and for air quality of the 1990 Clean Air Act Amendments and the NEPA process, and no additional reports are necessary.
Additionally, all burning requests must be coordinated through the Forsyth County Department of Environmental Affairs.

The approximate 100- year floodplain in the project area is shown in Figure 5. The amount of floodplain area to be affected is not substantial. Since this bridge is located within a designated floodway and 100-year floodplain in Forsyth County, the design of the replacement crossing must meet the requirements of their Unified Development Ordinances (UDO) Technical Code. Therefore, the project floodway and floodplain impacts will be

coordinated with the Winston-Salem/Forsyth County Planning Department and the Winston-Salem/Forsyth County Inspections Department.

The project does not involve any known Section 4 (f) properties. There are no publicly-owned parks, recreational facilities, or wildlife and waterfowl refuges of the National, State, or local significance in the vicinity of the project.

On the basis of the above discussion, it is included that no substantial adverse environmental impacts will result from implementation of this project.

VIII. AGENCY COMMENTS

United States Department of the Interior - Fish and Wildlife Service (see Appendix)

Comment: There are no known locations of species of concern near these projects. However, we recommend surveying each of the project areas for species prior to any further planning or on-the-ground activities to ensure no adverse impacts occur.

Response: A natural resource field investigation was conducted for Bridge No. 52 on July 18, 2001. No species with Federal or State protection designations were located in the study corridor.

City-County Planning Board, Forsyth County & Winston-Salem (see Appendix)

Comment: "The Greenway System Plan, an element of Vision 2005, A Comprehensive Plan for Forsyth County, identifies a greenway along Muddy Creek at this location. Transportation Improvement Program (TIP) Project # E-4010 is scheduled for feasibility study of the greenway corridor along Muddy Creek from Robinhood Road to Yadkinville Road. We request a greenway access under the bridge and within the right-of-way of this project."

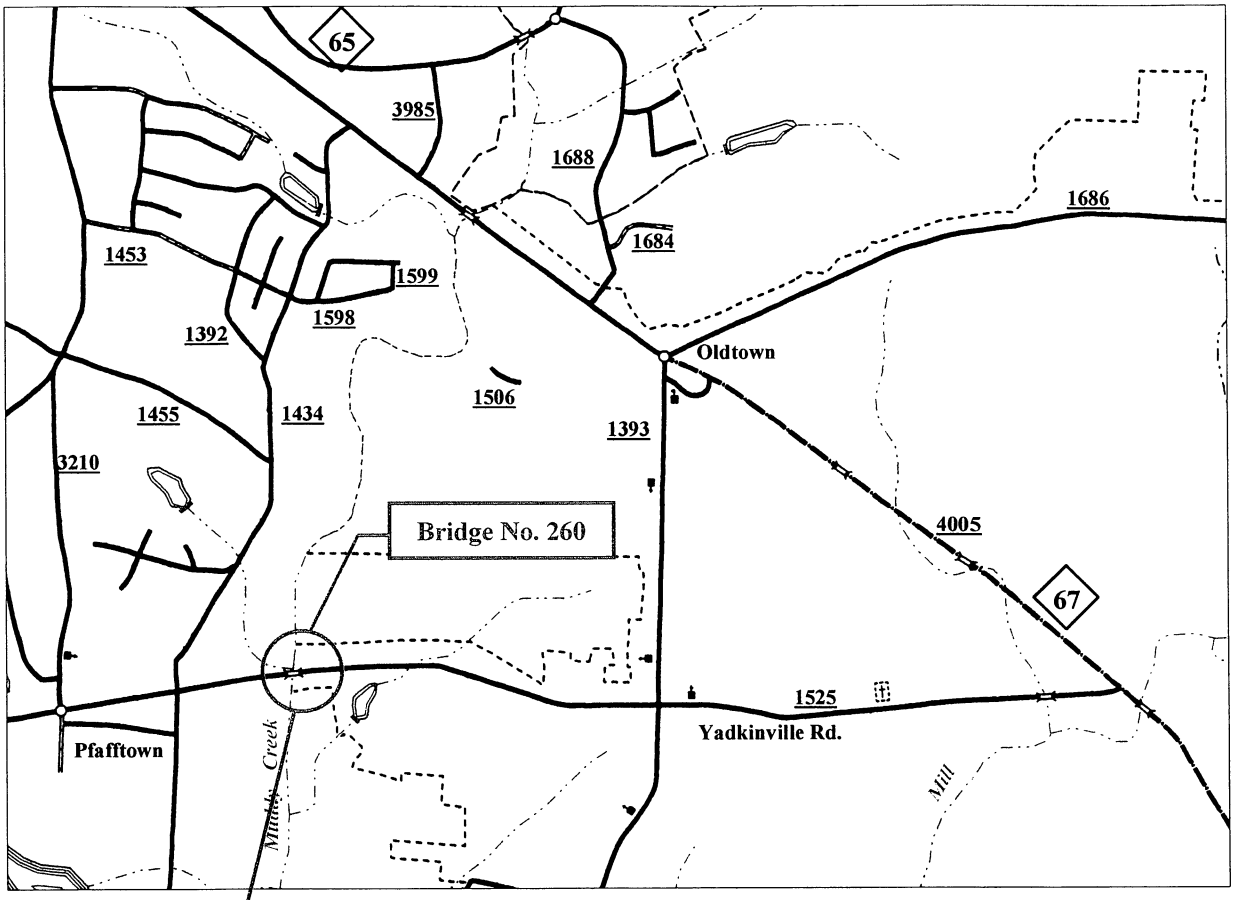
Response: This comment was investigated and the project will provide provisions for a 12-foot (3.6-meter) wide greenway beneath the crossing along the east side of Muddy Creek.

Comment: "We would like more detailed information regarding how traffic will be managed in this area during construction."

Response: Bridge No. 260 will be replaced at the existing location as shown by Alternative 2 in Figure 2. A temporary detour structure and approaches will maintain traffic on-site during the construction period.

Comment: "This bridge is located within the designated floodway and 100-year floodplain. To meet the requirements of the Unified Development Ordinances (UDO), a "No Impact Certification" must be submitted to the Winston-Salem Inspections Department."

Response: The project floodway and floodplain impacts will be coordinated with the Winston-Salem/Forsyth County Planning Department and the Winston-Salem/Forsyth County Inspections Department.



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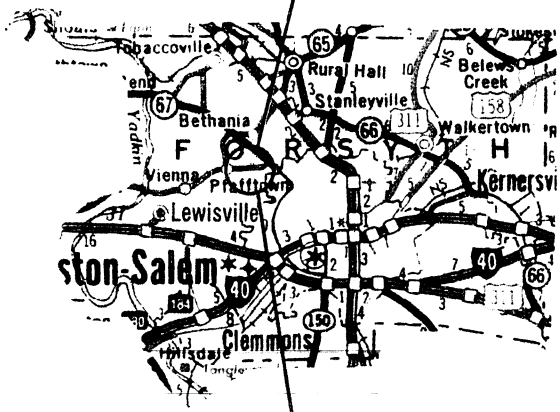
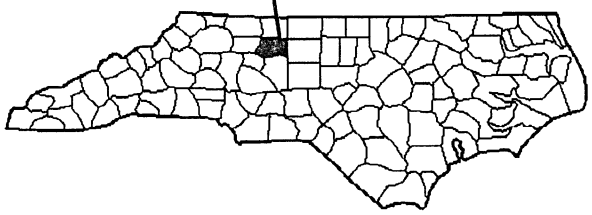
APPROXIMATE SCALE

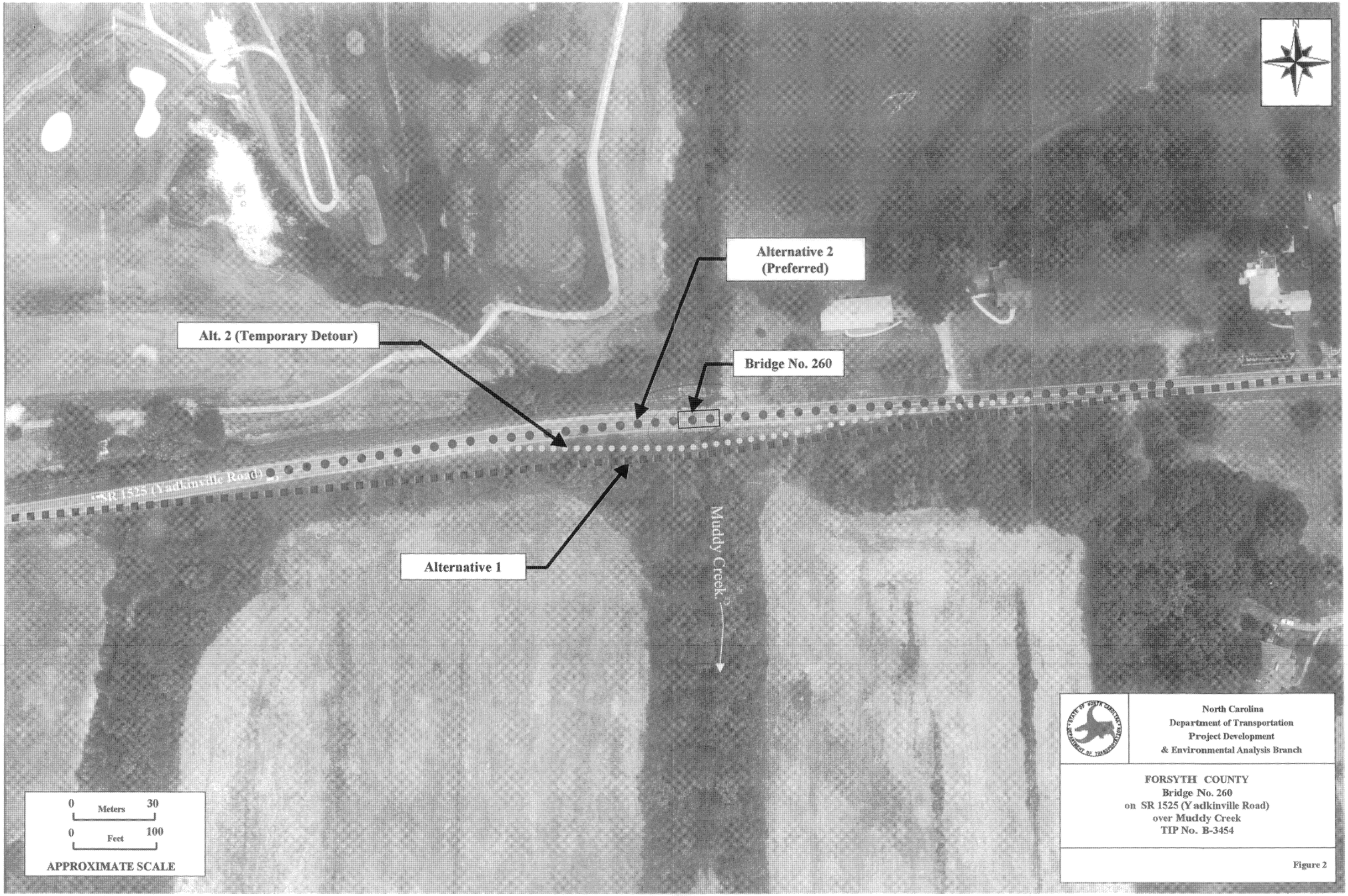


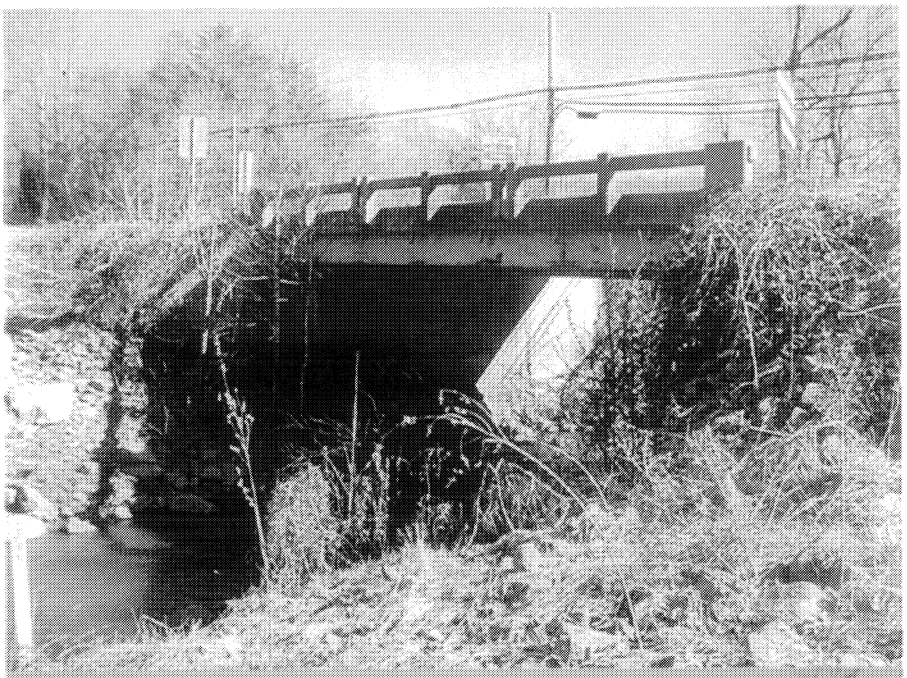


North Carolina
Department of Transportation
Project Development
& Environmental Analysis Branch

FORSYTH COUNTY
Bridge No. 260
on SR 1525 (Yadkinville Road)
over Muddy Creek
TIP No. B-3454

Figure 1


N
Alternative 2
(Preferred)
Alt. 2 (Temporary Detour)
Bridge No. 260
SR 1525 (Yadkinville Road)
Alternative 1
Muddy Creek
0 Meters 30
0 Feet 100
APPROXIMATE SCALE
North Carolina
Department of Transportation
Project Development
& Environmental Analysis Branch
FORSYTH COUNTY
Bridge No. 260
on SR 1525 (Yadkinville Road)
over Muddy Creek
TIP No. B-3454
Figure 2



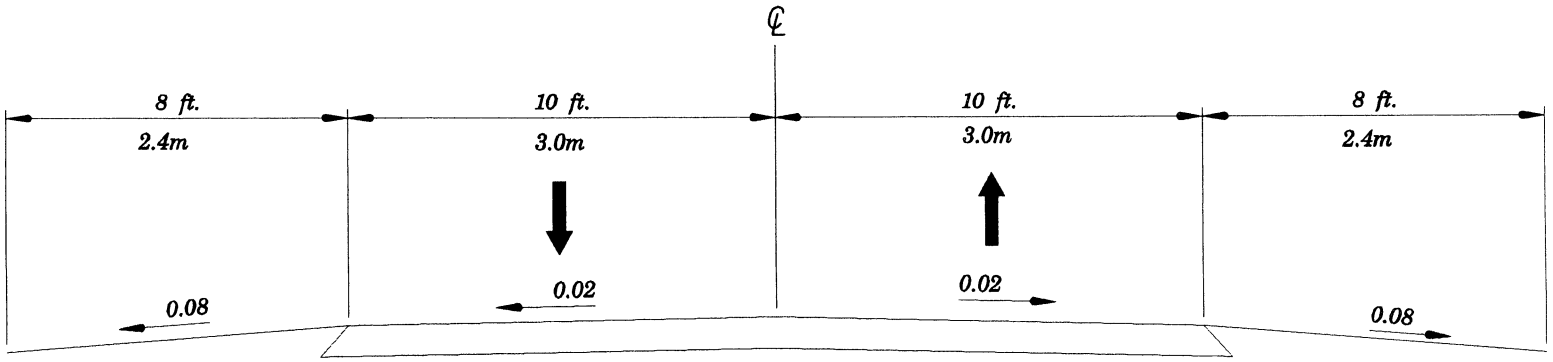
FORSYTH COUNTY
BRIDGE NO. 260 ON SR 1525 OVER
MUDDY CREEK
B-3454

SIDE VIEW
LOOKING
SOUTHEAST

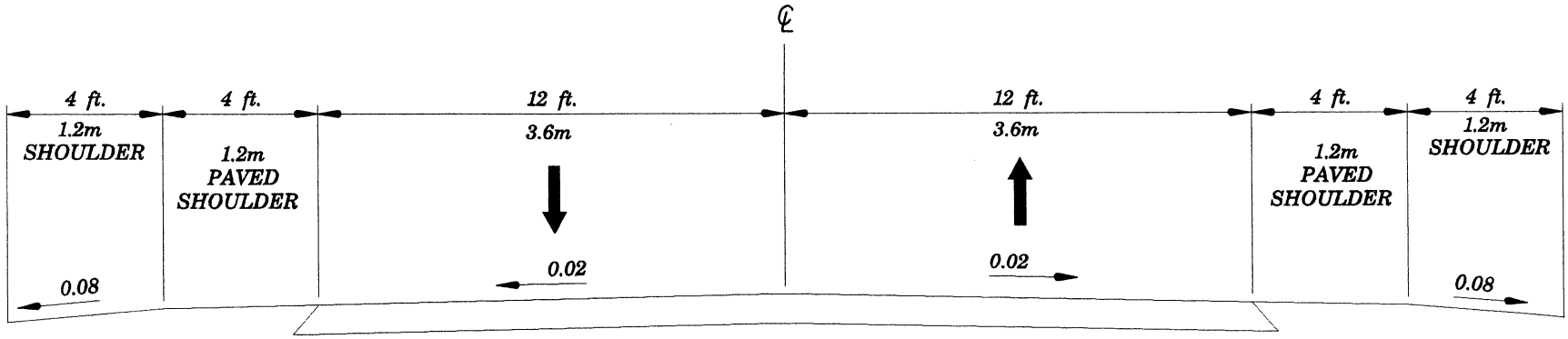
WEST APPROACH
LOOKING EAST

EAST APPROACH
LOOKING WEST

FIGURE 3



TYPICAL APPROACH SECTION
(EXISTING)



TYPICAL APPROACH SECTION
(PROPOSED)

FUNCTIONAL CLASSIFICATION: URBAN COLLECTOR

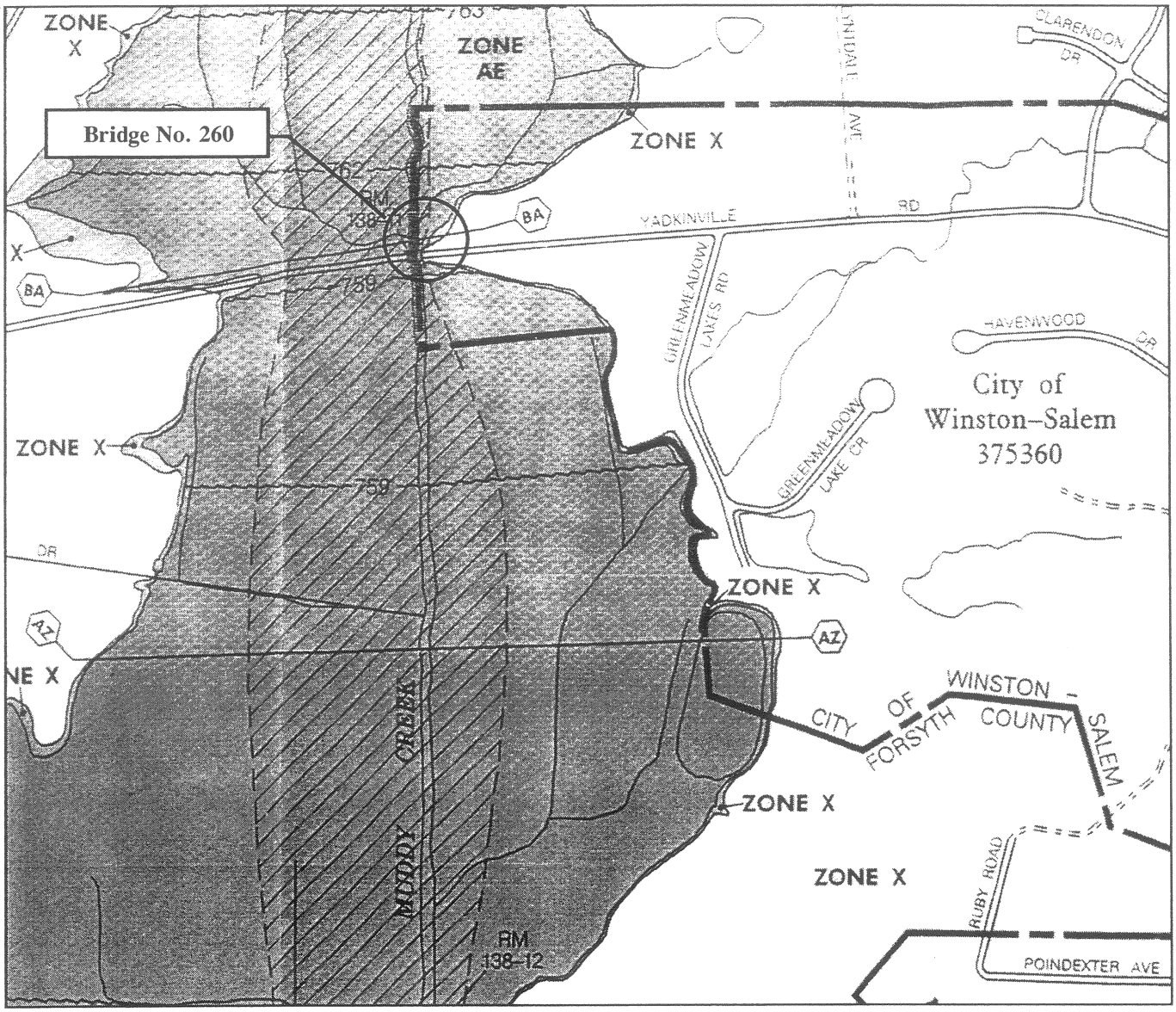
AVERAGE DAILY TRAFFIC

(EXISTING)	*2003*	=	*13200*
(DESIGN YR.)	*2030*	=	*26600*

North Carolina
Department of Transportation
Project Development
& Environmental Analysis Branch

FORSYTH COUNTY
Bridge No. 260
on SR 1525
over Muddy Creek
TIP No. B-3454

Figure 4



FEMA – Floodplain Map of Project Area

N

0 500

FEET

APPROXIMATE SCALE

North Carolina
Department of Transportation
Project Development
& Environmental Analysis Branch

FORSYTH COUNTY
Bridge No. 260
on SR 1525 (Yadkinville Road)
over Muddy Creek
TIP No. B-3454

Figure 5

APPENDIX

North Carolina Wildlife Resources Commission

512 N. Salisbury Street, Raleigh, North Carolina 27604-1188, 919-733-3391
Charles R. Fullwood, Executive Director

TO: John Conforti
Project Engineer, NCDOT

FROM: David Cox, Highway Project Coordinator
Habitat Conservation Program

DATE: January 2, 2001

SUBJECT: NCDOT Bridge Replacements in Anson, Cabarrus, Catawba, Cleveland, Davie, Forsythe, Gaston, Guilford, Mecklenburg, Randolph, Rockingham, and Stanly counties of North Carolina. TIP Nos. B-3404, B-3421, B-3822, B-3828, B-3637, B-3835, B-3454, B-3839, B-3840, B-3337, B-3652, B-3851, B-3677, B-3506, B-3694, and B-3700.

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

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

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

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

3. 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.

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

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

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

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

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

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

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

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

16. 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 fish passage. Generally, this means that the culvert or pipe invert is buried at least 1 foot below the natural stream bed. If

multiple cells are required the second and/or third cells should be placed so that their bottoms are at stream bankful stage (similar to Lyonsfield design). This could be accomplished by constructing a low sill on the upstream end of the other cells that will divert low flows to another cell. This will allow sufficient water depth in the culvert or pipe during normal flows to accommodate fish movements. If culverts are long, notched baffles should be placed in reinforced concrete box culverts at 15 foot intervals to allow for the collection of sediments in the culvert, to reduce flow velocities, and to provide resting places for fish and other aquatic organisms moving through the structure.

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

4. Riprap should not be placed on the stream bed.

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

Project specific comments:

1. B-3404 – Anson County – Bridge No. 314 over South Fork Jones Creek. We have no specific comments. We are not aware of any threatened of endangered species in the project vicinity.

2. B-3421 – Cabarrus County – Bridge No. 266 over Norfolk and Southern Railway. No comment.

3. B-3822 – Catawba County – Bridge No. 8 over unnamed tributary to the Catawba River. We request that High Quality Sedimentation and Erosion Control Measures be used due to the DWQ water quality classification of WS-IV. We are not aware of any threatened of endangered species in the project vicinity.

4. B-3828 – Cleveland County – Bridge No. 233 over Buffalo Creek. We have no specific comments. We are not aware of any threatened of endangered species in the project vicinity.

5. B-3637 – Davie County – Bridge No. 37 over I-40. No comment.

6. B-3835 – Davie-Forsyth counties – Bridge No. 35 over the Yadkin River. We request that High Quality Sedimentation and Erosion Control Measures be used due to the DWQ water quality classification of WS-IV. We request that the new bridge span the adjacent wetlands

entirely. The old fill causeways should then be removed and graded to natural ground level. We are not aware of any threatened of endangered species in the project vicinity.

7. B-3454 – Forsyth County – Bridge No. 260 over Muddy Creek. We have no specific comments. We are not aware of any threatened of endangered species in the project vicinity.

8. B-3839 – Forsyth County – Bridge No.139 over Fishers Branch. We have no specific comments. We are not aware of any threatened of endangered species in the project vicinity.

9. B-3840 – Gaston County – Bridge No. 52 over South Crowders Creek. We have no specific comments. We are not aware of any threatened of endangered species in the project vicinity.

10. B-3337 – Guilford County – Bridge No. 527 over North Buffalo Creek. We have no specific comments. We are not aware of any threatened of endangered species in the project vicinity.

11. B-3652 – Guilford County – Bridge No. 20 over the Deep River. SR 4121 crosses the Deep River just below the dam of High Point City Lake. This area supports good numbers of sunfish and may support a tailrace fishery. Therefore, we request that no in-water work be preformed from April 1 to May 31. We request that High Quality Sedimentation and Erosion Control Measures be used due to the DWQ water quality classification of WS-IV. We are not aware of any threatened of endangered species in the project vicinity.

12. B-3851 – Guilford County – Bridge No. 21 over US 29/70. No comment.

13. B-3677 – Mecklenburg County – Bridge No. 36 over Greasy Creek. We have no specific comments. We are not aware of any threatened of endangered species in the project vicinity.

14. B-3506 – Randolph County – Bridge No. 226 over Richland Creek. Richland Creek is a medium sized stream that supports good populations of sunfish. Therefore, we request that no in-water work be preformed from April 1 to May 31. We are not aware of any threatened of endangered species in the project vicinity.

15. B-3694 – Rockingham County – Bridge No. 55 over the Belews Lake Spillway. This bridge appears to be just downstream of the Belews Lake dam. This area supports good numbers of sunfish and may support a tailrace fishery. Therefore, we request that no in-water work be preformed from April 1 to May 31. We request that High Quality Sedimentation and Erosion Control Measures be used due to the DWQ water quality classification of WS-IV. We are not aware of any threatened of endangered species in the project vicinity.

16. B-3700 – Stanly County – Bridge No. 187 over Long Creek. This segment of Long Creek may support the state listed Carolina darter. Therefore, we request that High Quality Sedimentation and Erosion Control Measures be used to minimize project impacts to this species.

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

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

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Asheville Field Office
160 Zillicoa Street
Asheville, North Carolina 28801

January 25, 2001

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

Dear Mr. Gilmore:

Subject: Bridge Replacements: B-3677, Mecklenburg County; B-3822, Catawba County; B-3840, Gaston County; B-3700, Stanly County; B-3828, Cleveland County; B-3839, B-3454, Forsyth County; B-3421, Cabarrus County; B-3637, Davie County; B-3835, Davie-Forsyth Counties; B-3404, Anson County; DOT contractor TGS Engineers

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

The information we received for these 11 projects does not include descriptions of the structures that will replace the existing bridges, nor does it include any environmental information regarding the streams or whether or not habitat assessments or surveys for rare species have been conducted for any of these projects. Therefore, our comments are primarily limited to the known locations of listed species and species of federal concern. When the Categorical Exclusions are prepared and more information is available regarding environmental effects we can offer more substantive comments.

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

1. B-3822, Catawba County; B- 3840, Gaston County; B-3839, B-3454, Forsyth County; B-3421, Cabarrus County; B-3637, Davie County. There are no known locations of species of concern near these projects. However, we recommend surveying each of the project areas for

species prior to any further planning or on-the-ground activities to ensure no adverse impacts occur.

2. B-3677, Mecklenburg County; B-3700, Stanly County; B-3404, Anson County. Our records for these counties indicate known locations for the federally endangered Schweinitz's sunflower (*Helianthus schweinitzii*) in the vicinity of these projects. If this species occurs in the project areas, additional consultation will be required.

3. B-3828, Cleveland County. Our records for Cleveland County indicate there is a known location of the federally threatened dwarf-flowered heartleaf (*Hexastylis naniflora*) near the project. If this species occurs in the project area, additional consultation will be required.

4. B-3835, Davie-Forsyth Counties. Our records indicate there is a known location of the federally endangered Michaux's sumac (*Rhus michauxii*) near the project. If this species occurs in the project area, additional consultation will be required.

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

If you have questions about these comments, please contact Ms. Marella Buncick of our staff at 828/258-3939, Ext. 237. In any future correspondence concerning these projects, please reference our Log Number 4-2-01-252.

Sincerely,

Brian P. Cole

Brian P. Cole
State Supervisor

Enclosure

cc:
John Conforti, Project Development and Environmental Analysis Branch, North Carolina Department of Transportation, 1548 Mail Service Center, Raleigh, North Carolina 27699-1548
Mr. Ron Linville, Western Piedmont Region Coordinator, North Carolina Wildlife Resources Commission, 3855 Idlewild Road, Kernersville, North Carolina 27284-9180
Ms. Cynthia Van Der Wiele, North Carolina Department of Environment and Natural Resources, Division of Water Quality, Wetlands Section, 1621 Mail Service Center, Raleigh, North Carolina 27699-1621

Invertebrates		
Pee Dee crayfish ostracod	*Dactylocythere peedeensis*	FSC*
Carolina heelsplitter	*Lasmigona decorata*	Endangered**
Vascular Plants		
Schweinitz's sunflower	*Helianthus schweinitzii*	Endangered
Heller's trefoil	*Lotus helleri*	FSC

CATAWBA COUNTY

Invertebrates		
Catawba crayfish ostracod	*Dactyloctythere isabelae*	FSC
Vascular Plants		
Dwarf-flowered heartleaf	*Hexastylis naniflora*	Threatened
Sweet pinesap	*Monotropsis odorata*	FSC

CLEVELAND COUNTY

Vascular Plants		
Dwarf-flowered heartleaf	*Hexastylis naniflora*	Threatened
Sweet pinesap	*Monotropsis odorata*	FSC
Carolina saxifrage	*Saxifraga caroliniana*	FSC

DAVIE COUNTY

Vascular Plants		
Heller's trefoil	*Lotus helleri*	FSC*
Michaux's sumac	*Rhus michauxii*	Endangered

FORSYTH COUNTY

Vertebrates		
Bog turtle	*Clemmys muhlenbergii*	T(S/A)[1]
Red-cockaded woodpecker	*Picoides borealis*	Endangered****
Vascular Plants		
Small-anthered bittercress	*Cardamine micranthera*	Endangered

North Carolina Department of Cultural Resources

State Historic Preservation Office

David L. S. Brook, Administrator

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

Division of Historical Resources
David J. Olson, Director

December 23, 2002

MEMORANDUM

TO: Gregory J. Thorpe, Ph.D.
Environmental Management Director
Project Development and Environmental Analysis Branch
Division of Highways
Department of Transportation

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

SUBJECT: Replacement of Bridge #260 on SR 1525 over Muddy Creek, B-3454
Forsyth County, ER 01-8182

Thank you for your inquiry concerning the status of this project regarding archaeological resources.

During our review of the preliminary project information in December 2000, we determined that the proposed bridge replacement was unlikely to affect significant archaeological resources and we did not recommend any archaeological investigations. This information was inadvertently left out of our letter to you regarding the bridge replacement. We apologize for this omission and recommend no archaeological investigation in connection with this project.

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.

DB:doc

cc: Matt Wilkerson

North Carolina Department of Cultural Resources

State Historic Preservation Office
David L. S. Brook, Administrator

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

Division of Archives and History
Jeffrey J. Crow, Director

March 29, 2001

MEMORANDUM

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

From: David Brook
Deputy State Historic Preservation Officer

Re: Replacement of Bridge No. 260 on SR 1525 over Muddy Creek.
TIP No. B-3454, Forsyth County, ER 01-8182

On January 8, 2001 our office requested that Bridge No. 260 be evaluated to determine its eligibility for listing in the National Register of Historic Places, and that an architectural survey be conducted for the above project. However, on June 1, 2000 April Montgomery of our office signed a concurrence form stating that Bridge No. 260 was not eligible for listing and that there were no historic properties within the project's area of potential effect. We stand by our June 1, 2000 determination that there are no historic properties within the project's area of potential effect.

Please disregard our January 8, 2001 letter. We apologize for any inconvenience this may have caused.

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.

	Location	Mailing Address	Telephone/Fax
ADMINISTRATION	507 N. Blount St., Raleigh NC	4617 Mail Service Center, Raleigh NC 27699-4617	(919) 733-4763 • 733-8653
RESTORATION	515 N. Blount St., Raleigh NC	4613 Mail Service Center, Raleigh NC 27699-4613	(919) 733-6547 • 715-4801
SURVEY & PLANNING	515 N. Blount St., Raleigh NC	4618 Mail Service Center, Raleigh NC 27699-4618	(919) 733-6545 • 715-4801

Federal Aid #BRSTP-1525(3) *TIP* #B-3454 *County*: Forsyth

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

Project Description: Replace Bridge No. 260 on SR 1525 over Muddy Creek

On June 1, 2000, representatives of the

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

Reviewed the subject project at

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

All parties present agreed

- [ ] there are no properties over fifty years old within the project's area of potential effect.
- [x] there are no properties less than fifty years old which are considered to meet Criterion Consideration G within the project's area of potential effect.
- [x] there are properties over fifty years old (list attached) within the project's area of potential effect, but based on the historical information available and the photographs of each property, properties identified as Bridge #260 are considered not eligible for the National Register and no further evaluation of them is necessary.
- [x] there are no National Register-listed properties located within the project's area of potential effect.

Signed:

Mary Pope Furr — 6-1-00
Representative, NCDOT — Date

Michael C. Dawn — 6/1/00
FHWA, for the Division Administrator, or other Federal Agency — Date

April Montgomery — 6/1/00
Representative, SHPO — Date

David Brook, Deputy — 6/19/00
State Historic Preservation Officer — Date

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

City-County Planning Board
FORSYTH COUNTY & WINSTON-SALEM, NORTH CAROLINA

100 E. FIRST ST. • P.O. BOX 2511 • WINSTON-SALEM, N.C. 27102
336.727.2087 • fax 336.748.3163 • planning@ci.winston-salem.nc.us

December 22, 2000

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

RE: Bridge Replacement Project B-3454, Forsyth County, Replace Bridge 260 on Yadkinville Road/SR 1525 over Muddy Creek

Dear Mr. Gilmore:

The City-County Planning Department has reviewed the above referenced bridge replacement project and offer the following comments:

- The project appears to be consistent with the long range planing goals in Vision 2005, A Comprehensive Plan for Forsyth County, NC. The project is located at the boundary adjoining Growth Management Areas (GMAs) 3, Urban Area and 4A Short-Range Growth Area. Both GMA 3 and 4A recognize the need to improve the existing transportation system to promote and enhance planned and orderly development. Our plan would support improving Bridge 260 over Muddy Creek.
- The Greenway System Plan, an element of Vision 2005, identifies a greenway along Muddy Creek at this location. Transportation Improvement Program (TIP) Project # E-4010 is scheduled for feasibility study of the greenway corridor along Muddy Creek from Robinhood Road to Yadkinville Road. We request a greenway access under the bridge and within the right-of-way of this project.
- This is very high growth corridor for residential development. Adjacent to the bridge project to the north is Grandview Golf Course and a residentially developed property. Property to the south is vacant.
- Traffic volumes along Yadkinville Road in this area range between 9,900 and 12,000 vehicles per day. We would like more detailed information regarding how traffic flow will be managed in this area during construction. This information will also be needed so that emergency services can be informed of changes that may impact the timely delivery of services.

- This bridge is located within the designated floodway and 100-year floodplain. To meet the requirements of the Unified Development Ordinances (UDO) a "No Impact Certification" must be submitted to the Winston-Salem Inspections Department. If there is impact less than or equal to ½ foot rise in the base elevation of the creek then Federal Emergency Management Authority (FEMA) regulations must be satisfied before local permits can be issued. If impacts to the creek are greater than ½ foot rise in the base elevation of the creek then the project will not meet the regulations as specified in the UDO.

Please contact if you require additional information regarding this project.

Sincerely,

Loretta W. Barren
Principal Planner

pc: Mr. Graham Pervier, Forsyth County Manager
Mr. Paul Norby, Director, City-County Planning Board
Mr. Jeff Kopf, Winston-Salem Inspections Department