



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

October 18, 2006

U. S. Army Corps of Engineers  
Regulatory Field Office  
Post Office Box 1000  
Washington, NC 27889-1000

ATTENTION: Mr. William Wescott  
NCDOT Coordinator

Dear Sir:

Subject: **Nationwide 23 and 33 Permit Application and Tar-Pamlico Riparian Buffer Authorization Request** for the Replacement of Bridge No. 82 over Marsh Swamp on NC 561; Halifax County; TIP Project B-3853; Federal Aid Project No. BRSTP-561(1); State Project No.8.1301901; WBS 33000.1.1.

Please find enclosed the Preconstruction Notification (PCN), permit drawings, half-size plans, wetland restoration plan, and the Categorical Exclusion (CE) for the above-mentioned project. The North Carolina Department of Transportation proposes to replace existing Bridge No. 82 over Marsh Swamp on NC 561 in Halifax County. The project involves replacement of the existing functionally obsolete and structurally deficient bridge and approaches with a new bridge and approaches. The new bridge will feature two 12-foot lanes with 7.5-foot offsets. The east approach will be approximately 330 feet long and the west approach will be approximately 315 feet long. The project schedule calls for an April 17, 2007 let with a review date of February 27, 2007. Proposed impacts are 0.928 acre of riverine wetland.

**Impacts to Water of the United States**

General Description: Marsh Swamp is located in the 03020202 CU of the Tar-Pamlico River Basin. The Division of Water Quality (DWQ) has assigned Marsh Swamp a Stream Index Number of 28-79-30-1. DWQ has assigned a best usage classification of **C Sw NSW**.

Marsh Swamp is not designated as a North Carolina Natural or Scenic River, or as a National Wild and Scenic River, nor is it listed as a 303(d) stream. 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 mile of the project study area.

Permanent Impacts: Permanent impacts consist of fill in riverine wetlands. The total amount of proposed impacts is 0.244 acre.

Temporary Impacts: Temporary impacts consist of 0.304 acre of fill in wetlands and 0.370 acre of hand clearing. There will be 0.069 acre of temporary surface water impacts in order to construct the end bents.

Utility Impacts: There will be no jurisdictional impacts from utilities on this project. There is an existing 12" water line located on the south side of the project that will be relocated by directional bore beginning and ending in the existing roadway shoulders (high ground to high ground) on the north side of the project. There is an existing aerial power pole line located on the north side of the project that will remain in place.

Tar-Pamlico Buffer Rules: This project lies within the Tar-Pamlico River Basin; therefore, the regulations pertaining to the Tar-Pamlico River Buffer Rules will apply. The improvements associated with B-3853 will impact 8,178 square feet in zone 1 and 3,984 square feet in zone 2. Of these impacts, 10,506 square feet are considered allowable and 1,656 are allowable with mitigation.

### **Bridge Demolition**

The superstructure for Bridge No. 82 is a concrete deck on timber joists and will allow removal without dropping components into the water. Likewise, it should be possible to remove the timber piles and timber caps without dropping them into the water. Best Management Practices for Bridge Demolition and Removal will be implemented. Any component of the bridge dropped into the water shall be immediately removed. NCDOT will utilize Stream Crossing Guidelines for Anadromous Fish Passage.

### **Avoidance and Minimization**

Avoidance examines all appropriate and practicable possibilities of averting impacts to "Waters of the United States". Due to the presence of surface waters and wetlands within the project study area, avoidance of all impacts is not possible. The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts. Minimization measures were incorporated as part of the project design these included:

- NCDOT is replacing Bridge No. 82 in place.
- NCDOT is utilizing longer spans with less bents than the existing bridge.
- NCDOT is utilizing one end of an existing causeway for the on-site detour.
- NCDOT will adhere to the February 15 to June 15 in-water work moratorium for American shad.

## Mitigation

On-site mitigation is proposed for this project for the wetland impacts. NCDOT proposes to remove an abandoned causeway located to the south of the project. By grading to adjacent wetland elevation, restoring hydrology, and replanting with wetland plants, NCDOT will restore approximately 0.48 acre of riverine wetland. Please refer to the enclosed wetland restoration plan. Compensatory mitigation is not proposed for riparian buffer impacts because the threshold has not been exceeded, such that mitigation would be required.

## Federally Protected Species

As of April 27, 2006, the US Fish and Wildlife Service (USFWS) lists four federally protected species for Halifax County. The following table lists these species.

Common Name	Scientific Name	Status	Habitat	Conclusion
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	N	No Effect
Red-cockaded woodpecker	<i>Picooides borealis</i>	E	N	No Effect
Dwarf wedge mussel	<i>Alasmidonta heterodon</i>	E	N	No Effect
Tar River spiny mussel	<i>Elliptio steinstansana</i>	E	N	No Effect

E – endangered; T – threatened

## Regulatory Approvals

Section 404 Permit: This project is being processed by the Federal Highway Administration as a “Categorical Exclusion” in accordance with 23 CFR 771.115(b). Therefore, we do not anticipate requesting an individual permit but propose to proceed under Nationwide 23 and 33 as authorized by a Nationwide Permit 23 and Nationwide Permit 33 (67 FR 2020; January 15, 2002).

Section 401 Permit: We anticipate 401 General Certification numbers 3403 and 3366 will apply to this project. In accordance with 15A NCAC 2H, Section .0500(a) we are providing five copies of this application to the North Carolina Department of Environmental and Natural Resources, Division of Water Quality, for their review.

Tar-Pamlico River Basin Buffer Authorization: NCDOT requests that the NC Division of Water Quality review this application and issue a written approval for a Tar-Pamlico River Riparian Buffer Authorization.

A copy of this permit application will be posted on the NCDOT website at: <http://www.ncdot.org/doh/preconstruct/pe/neu/permit.html>.

If you have any questions or need additional information, please contact Chris Underwood at (919) 715-1451.

Sincerely,



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

W/attachment:

- Mr. John Hennessy, NCDWQ (5 Copies)
- Mr. Travis Wilson, NCWRC
- Mr. Gary Jordan, USFWS
- Mr. Ron Sechler, NMFS
- Mr. Michael Street, NCDMF
- Dr. David Chang, P.E., Hydraulics
- Mr. Greg Perfetti, P.E., Structure Design
- Mr. Mark Staley, Roadside Environmental
- Mr. Richard E. Greene, P.E., Division 4 Engineer
- Mr. Jamie Guerrero, Division 4 Environmental Officer

W/o attachment

- Mr. Scott McLendon, USACE, Wilmington
- Mr. Jay Bennett, P.E., Roadway Design
- Mr. Majed Alghandour, P. E., Programming and TIP
- Mr. Art McMillan, P.E., Highway Design
- Mr. Mark Pierce, P.E., PDEA

**Office Use Only:**

Form Version March 05

**USACE Action ID No.** \_\_\_\_\_ **DWQ No.** \_\_\_\_\_

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

**I. Processing**

1. Check all of the approval(s) requested for this project:

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Section 404 Permit              | <input checked="" type="checkbox"/> Riparian or Watershed Buffer Rules |
| <input type="checkbox"/> Section 10 Permit                          | <input type="checkbox"/> Isolated Wetland Permit from DWQ              |
| <input checked="" type="checkbox"/> 401 Water Quality Certification | <input type="checkbox"/> Express 401 Water Quality Certification       |

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

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

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

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

**II. Applicant Information**

1. Owner/Applicant Information

Name: Gregory J. Thorpe, Ph.D., Environmental Management Director

Mailing Address: 1598 Mail Service Center

Telephone Number: (919) 733-3141 Fax Number: (919) 733-9794

E-mail Address: \_\_\_\_\_

2. Agent/Consultant Information (A signed and dated copy of the Agent Authorization letter must be attached if the Agent has signatory authority for the owner/applicant.)

Name: \_\_\_\_\_

Company Affiliation: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

Telephone Number: \_\_\_\_\_ Fax Number: \_\_\_\_\_

E-mail Address: \_\_\_\_\_

### III. Project Information

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

1. Name of project: Replacement of Bridge No. 82 on NC 561 over Marsh Swamp
2. T.I.P. Project Number or State Project Number (NCDOT Only): B-3853
3. Property Identification Number (Tax PIN): N/A
4. Location  
County: Halifax Nearest Town: Halifax  
Subdivision name (include phase/lot number): N/A  
Directions to site (include road numbers/names, landmarks, etc.): Take I-95 north to NC 561 follow NC 561 to the project
5. Site coordinates (For linear projects, such as a road or utility line, attach a sheet that separately lists the coordinates for each crossing of a distinct waterbody.)  
Decimal Degrees (6 digits minimum): 36° 18' 07" °N 77° 39' 38" °W
6. Property size (acres): N/A
7. Name of nearest receiving body of water: Fishing Creek
8. River Basin: Tar-Pamlico  
(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: Forest
10. Describe the overall project in detail, including the type of equipment to be used: Replacing a structurally deficient bridge using top-down construction. Standard road building equipment will be used.

11. Explain the purpose of the proposed work: To replace a structurally deficient bridge.

**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. N/A

**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.  
No.

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

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

1. Provide a written description of the proposed impacts: 0.918 acre of wetland impacts.
2. Individually list wetland impacts. Types of impacts include, but are not limited to mechanized clearing, grading, fill, excavation, flooding, ditching/drainage, etc. For dams, separately list impacts due to both structure and flooding.

Wetland Impact Site Number (indicate on map)	Type of Impact	Type of Wetland (e.g., forested, marsh, herbaceous, bog, etc.)	Located within 100-year Floodplain (yes/no)	Distance to Nearest Stream (linear feet)	Area of Impact (acres)
Bridge	Fill	Riverine	Yes	0	0.244
Bridge	Hand clearing	Riverine	Yes	0	0.370
Bridge	Temporary fill	Riverine	Yes	0	0.304
Total Wetland Impact (acres)					0.918

3. List the total acreage (estimated) of all existing wetlands on the property: >1

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

Stream Impact Number (indicate on map)	Stream Name	Type of Impact	Perennial or Intermittent?	Average Stream Width Before Impact	Impact Length (linear feet)	Area of Impact (acres)
Bridge	Marsh Swamp	Temporary	P	75 ft		0.069
Total Stream Impact (by length and acreage)						0.069

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

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

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

Stream Impact (acres):	0.069
Wetland Impact (acres):	0.918
Open Water Impact (acres):	
Total Impact to Waters of the U.S. (acres)	0.987
Total Stream Impact (linear feet):	

7. Isolated Waters

Do any isolated waters exist on the property?  Yes  No

Describe all impacts to isolated waters, and include the type of water (wetland or stream) and the size of the proposed impact (acres or linear feet). Please note that this section only applies to waters that have specifically been determined to be isolated by the USACE.

N/A

8. Pond Creation

If construction of a pond is proposed, associated wetland and stream impacts should be included above in the wetland and stream impact sections. Also, the proposed pond should be described here and illustrated on any maps included with this application.

Pond to be created in (check all that apply):  uplands  stream  wetlands

Describe the method of construction (e.g., dam/embankment, excavation, installation of draw-down valve or spillway, etc.): N/A

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

Current land use in the vicinity of the pond: N/A

Size of watershed draining to pond: \_\_\_\_\_ Expected pond surface area: \_\_\_\_\_

**VII. Impact Justification (Avoidance and Minimization)**

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

**VIII. Mitigation**

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

USACE – In accordance with the Final Notice of Issuance and Modification of Nationwide Permits, published in the Federal Register on January 15, 2002, mitigation will be required when necessary to ensure that adverse effects to the aquatic environment are minimal. Factors including size and type of proposed impact and function and relative value of the impacted aquatic resource will be considered in determining acceptability of appropriate and practicable mitigation as proposed. Examples of mitigation that may be appropriate and practicable include, but are not limited to: reducing the size of the project; establishing and maintaining wetland and/or upland vegetated buffers to protect open waters such as streams; and replacing losses of

aquatic resource functions and values by creating, restoring, enhancing, or preserving similar functions and values, preferable in the same watershed.

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

The lengthening of the bridge and causeway removal will restore hydrology. NCDOT is proposing to remove an abandoned causeway restoring ~0.48 acre of wetland. Please refer to the enclosed mitigation plan.

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2. Mitigation may also be made by payment into the North Carolina Ecosystem Enhancement Program (NCEEP). Please note it is the applicant's responsibility to contact the NCEEP at (919) 715-0476 to determine availability, and written approval from the NCEEP indicating that they are will to accept payment for the mitigation must be attached to this form. For additional information regarding the application process for the NCEEP, check the NCEEP website at <http://h2o.enr.state.nc.us/wrp/index.htm>. If use of the NCEEP is proposed, please check the appropriate box on page five and provide the following information:

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

**IX. Environmental Documentation (required by DWQ)**

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

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

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

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

1. Will the project impact protected riparian buffers identified within 15A NCAC 2B .0233 (Neuse), 15A NCAC 2B .0259 (Tar-Pamlico), 15A NCAC 02B .0243 (Catawba) 15A NCAC 2B .0250 (Randleman Rules and Water Supply Buffer Requirements), or other (please identify \_\_\_\_\_)? Yes  No
2. If "yes", identify the square feet and acreage of impact to each zone of the riparian buffers. If buffer mitigation is required calculate the required amount of mitigation by applying the buffer multipliers.

Zone*	Impact (square feet)	Multiplier	Required Mitigation
1	706	3 (2 for Catawba)	
2	950	1.5	
Total	1656		

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

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

**XI. Stormwater (required by DWQ)**

Describe impervious acreage (existing and proposed) versus total acreage on the site. Discuss stormwater controls proposed in order to protect surface waters and wetlands downstream from the property. If percent impervious surface exceeds 20%, please provide calculations demonstrating total proposed impervious level. Impervious acreage will not appreciably increase as a result of the bridge construction.

**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.  
No wastewater will be generated from the implementation of the proposed project.

**XIII. Violations (required by DWQ)**

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

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

**XIV. Cumulative Impacts (required by DWQ)**

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

**XV. Other Circumstances (Optional):**

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

*E. L. Luck*

10.18.06

**Applicant/Agent's Signature** **Date**  
(Agent's signature is valid only if an authorization letter from the applicant is provided.)

**Marsh Swamp Wetland Restoration Plan  
At Bridge No. 82  
on NC 561  
Halifax County  
TIP B-3853  
Federal Aid Project No. BRSTP-561(1)**

**July 6, 2006**

The North Carolina Department of Transportation (NCDOT) will perform on-site mitigation for riverine swamp wetland impacts at the NC 561 overpass of the UT to Marsh Swamp. This mitigation site occurs within Transportation Improvement Program (TIP) B-3853. The project begins approximately 350 feet west of Bridge No. 82 and continues approximately 350 feet to the east of the bridge. NCDOT will restore approximately 0.48 acres of riverine swamp wetland as onsite mitigation for B-3853. The roadway project will impact 0.244 acres of unavoidable wetlands, leaving approximately 0.24 acres of wetland restoration assets on-site.

#### **EXISTING CONDITIONS**

The project is located in Halifax County about 10 miles south of Roanoke Rapids. The project study area land use is mixed age hardwood forests with a major portion in wetlands.

The Natural Resource Technical Document for TIP B-3853, dated November 2001, provides further details concerning existing roadway and project study area conditions.

The existing causeway for the approaches to Bridge No. 82 is located in the floodplain of the UT to Marsh Swamp. The floodplain wetland consists mainly of a riverine swamp forest dominated by canopy species of swamp chestnut oak (*Quercus michauxii*), cherrybark oak (*Quercus pagodifolia*), willow oak (*Quercus phellos*), black gum (*Nyssa sylvatica*), sweetgum (*Liquidambar styraciflua*), and red maple (*Acer rubrum*). The wetland runs generally along the toe of slope of the existing causeway. An abandoned causeway runs parallel to the existing causeway within the wetland community also. A short road crosses the wetland community, connecting the existing causeway to the abandoned causeway.

#### **PROPOSED CONDITIONS DESIGN**

The proposed wetland mitigation will consist of restoring 0.48 acres of riverine swamp wetland. The abandoned causeway and connecting road will be graded to wetland elevation. Target elevations will be based on elevations taken in the swamp wetland areas adjacent to the proposed restoration areas. All excavated areas shall be ripped and disked prior to planting of the site if necessary.

The Natural Environment Unit shall be contacted to provide construction oversight to ensure that the wetland mitigation area is constructed appropriately.

### **VEGETATION PLANTING**

The restoration site will be planted following the successful completion of the site grading. The site will be planted at a density of 680 trees/acre on 8 foot centers with the following species if available: swamp chestnut oak, cherrybark oak, willow oak and black gum.

### **MONITORING:**

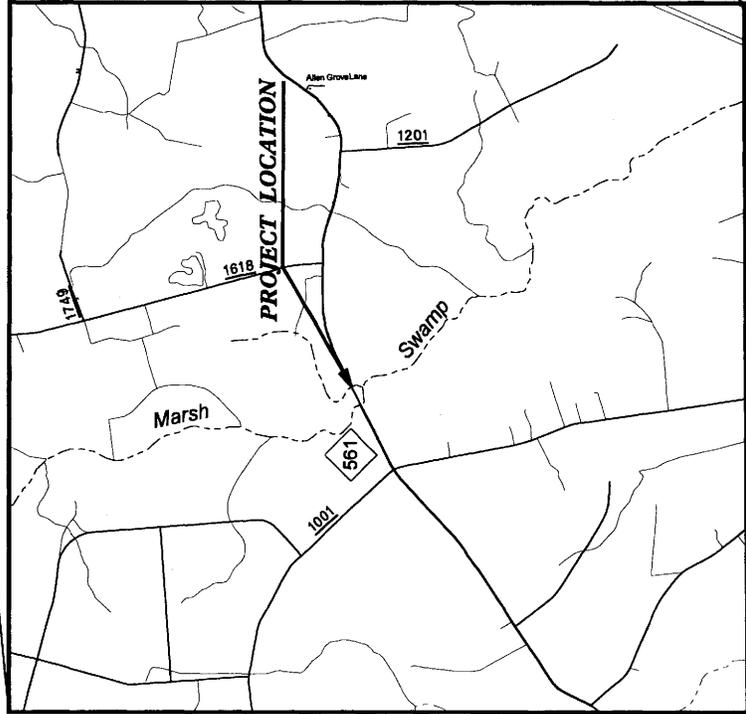
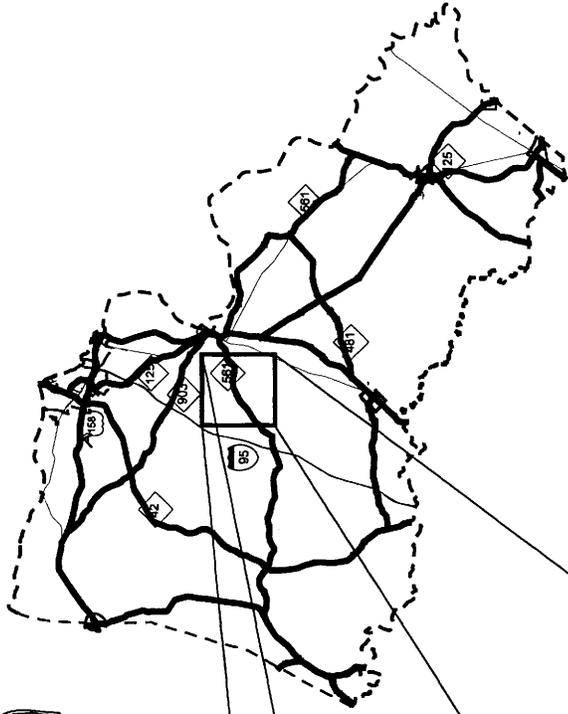
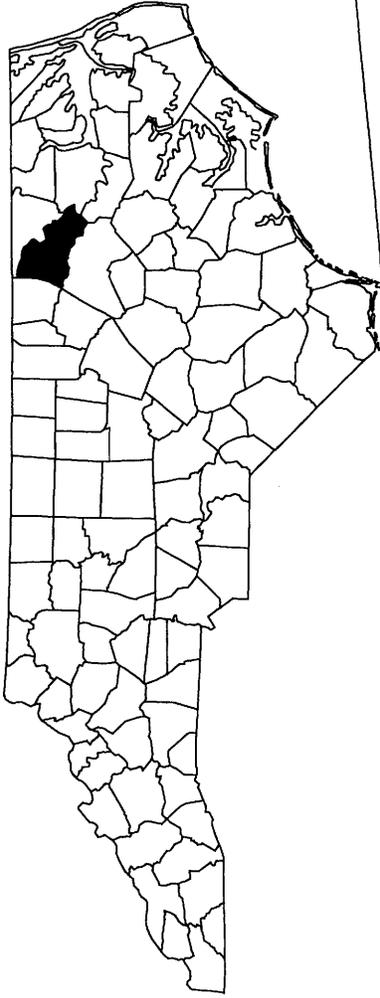
Upon successful completion of construction, the following monitoring strategy is proposed for the mitigation site. NCDOT will document monitoring activities on the site in an annual report distributed to the regulatory agencies.

### **HYDROLOGIC MONITORING**

No specific hydrological monitoring is proposed for this restoration site. The target elevation will be based on the adjacent wetland and verified during construction. Constructing the site at the adjacent wetland elevation will ensure the hydrology in the restored area is similar to the hydrology in the reference area.

### **VEGETATION SUCCESS CRITERIA**

NCDOT shall monitor the restoration site by visual observation and photo points for survival and density of vegetation. NCDOT shall monitor the site for a minimum of three years or until the site is deemed successful. Monitoring will be initiated upon completion of the site planting.

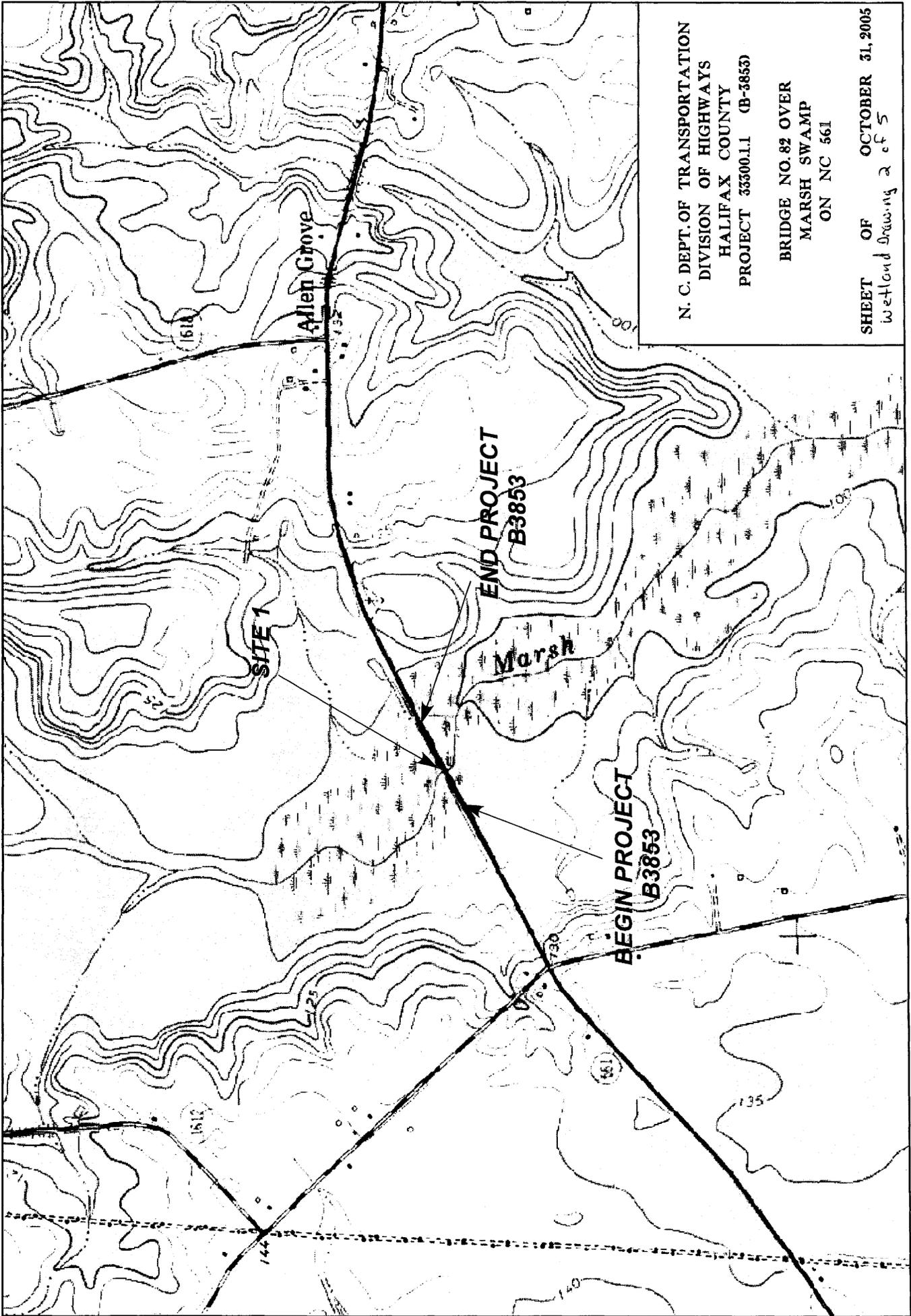


N. C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
HALIFAX COUNTY  
PROJECT 55300.11 (B-3853)

BRIDGE NO. 82 OVER  
MARSH SWAMP  
ON NC 561

SHEET OF OCTOBER 31, 2005  
Wetland Drawing 1 of 5

*Wetland Permit*

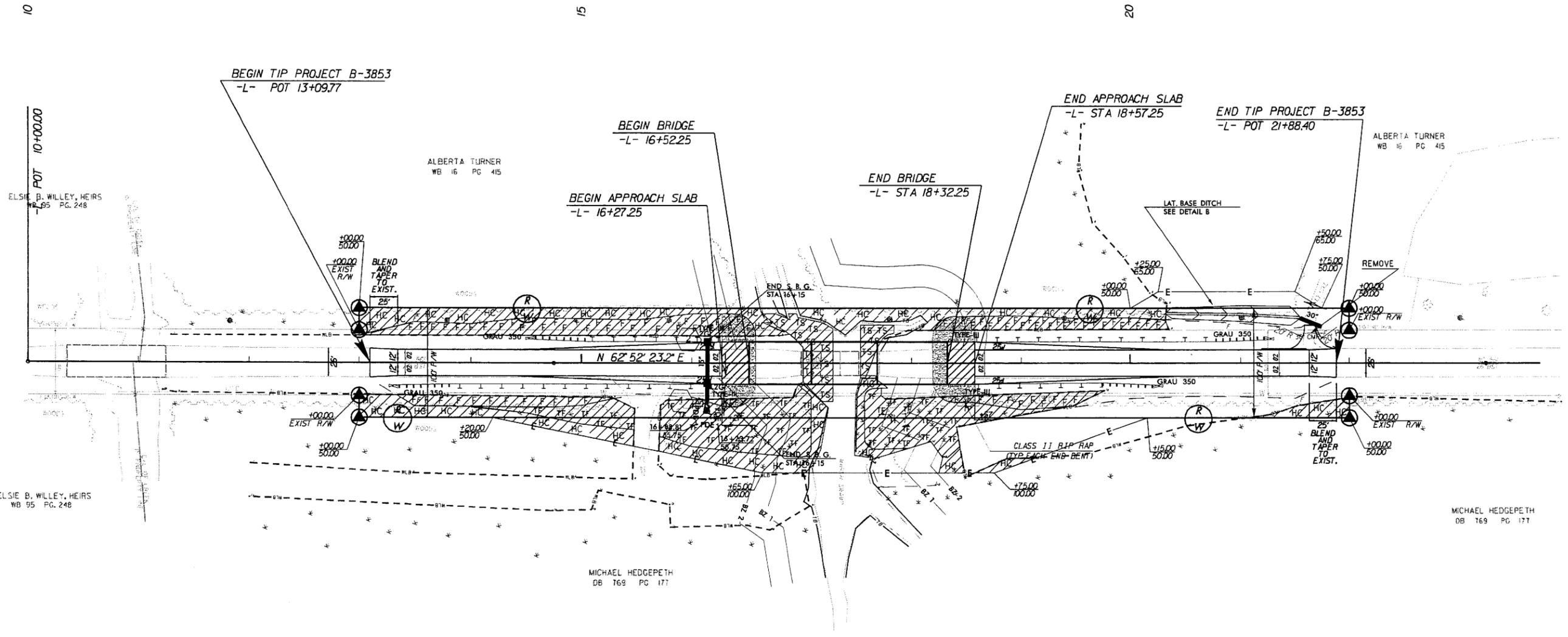
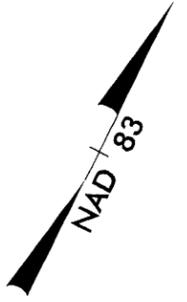
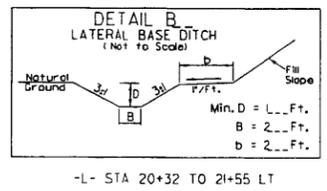


N. C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
HALIFAX COUNTY  
PROJECT 33300.1.1 (B-3853)

BRIDGE NO. 82 OVER  
MARSH SWAMP  
ON NC 561

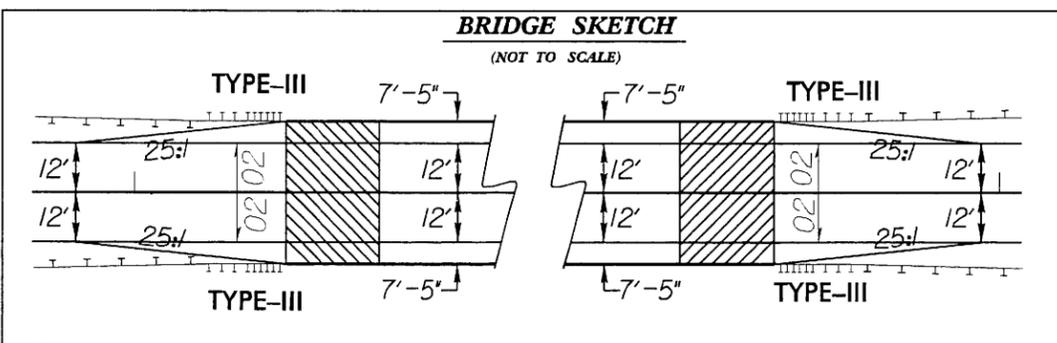
SHEET OF OCTOBER 31, 2005  
Wetland Drawing 2 of 5

Wetland Drawing 3 of 5



REVISIONS

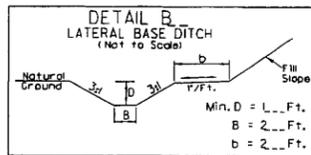
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- PERMANENT SURFACE WATER IMPACT
- HAND CLEARING
- TEMPORARY SURFACE WATER IMPACT
- TEMPORARY FILL IN WETLAND



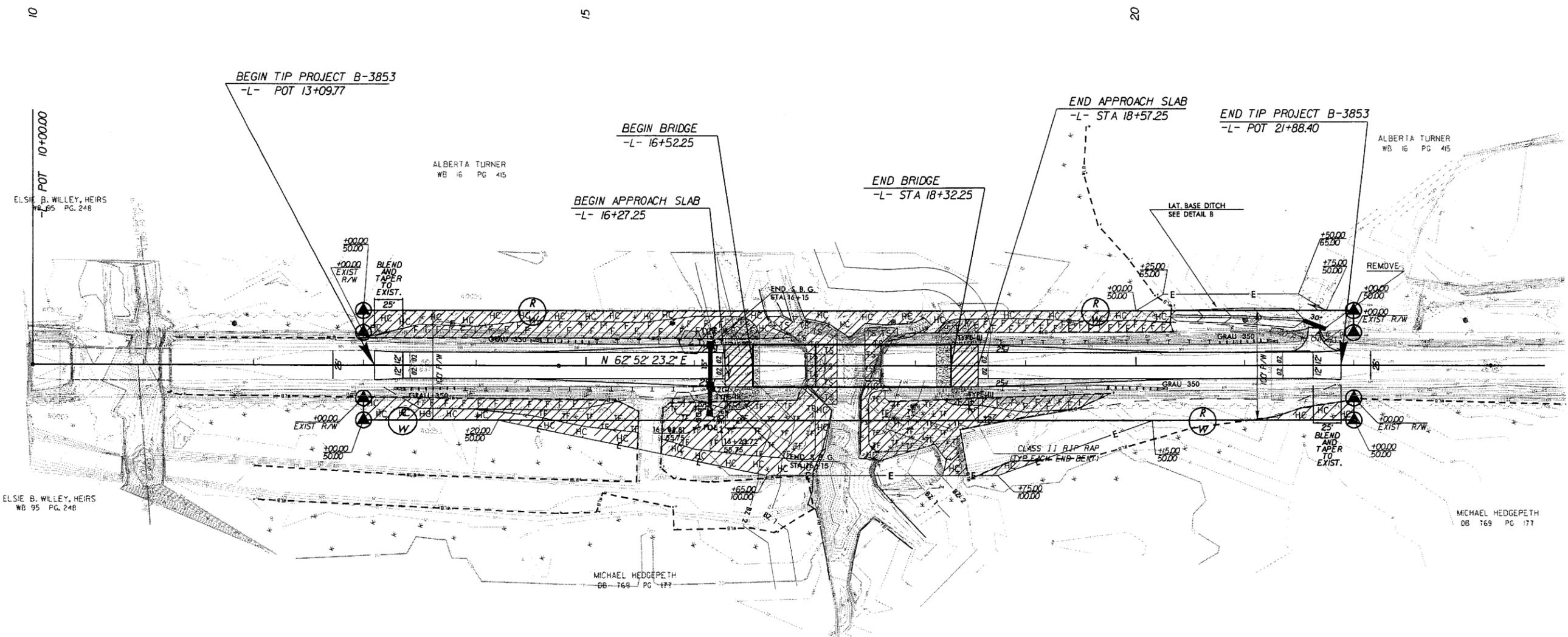
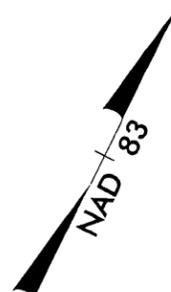
38.5 Square Ft Permanent Surface Water Impacts

N. C. DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 HALIFAX COUNTY  
 PROJECT NO. 53300.1.1 (B-3853)  
 BRIDGE NO. 82, OVER MARSH SWAMP  
 ON NC 561  
 SHEET OF 10 / 51 / 2005

Wetland Drawing 4 of 5

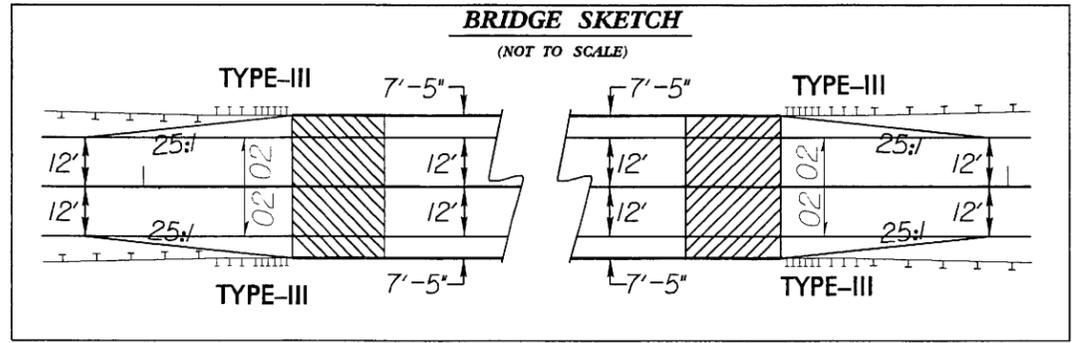


-L- STA 20+32 TO 21+55 LT



REVISIONS

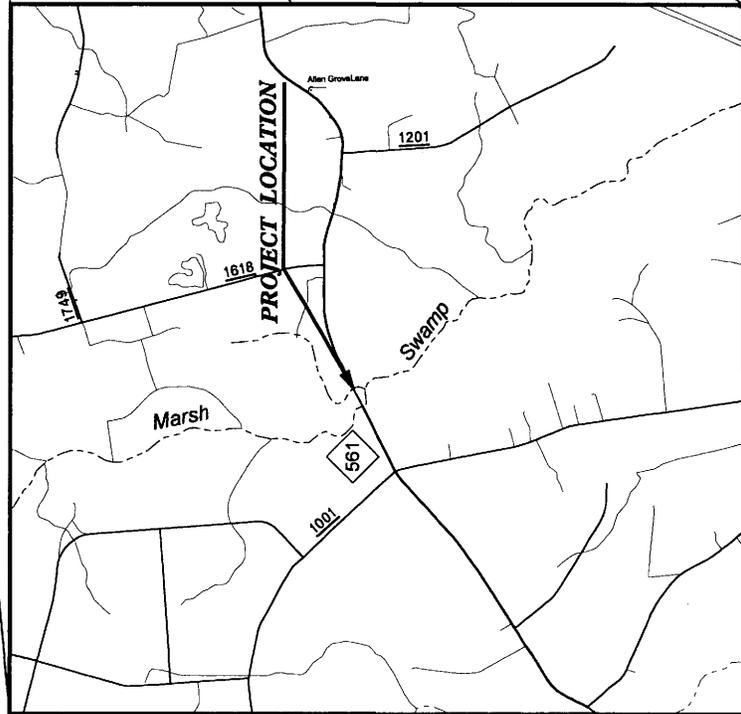
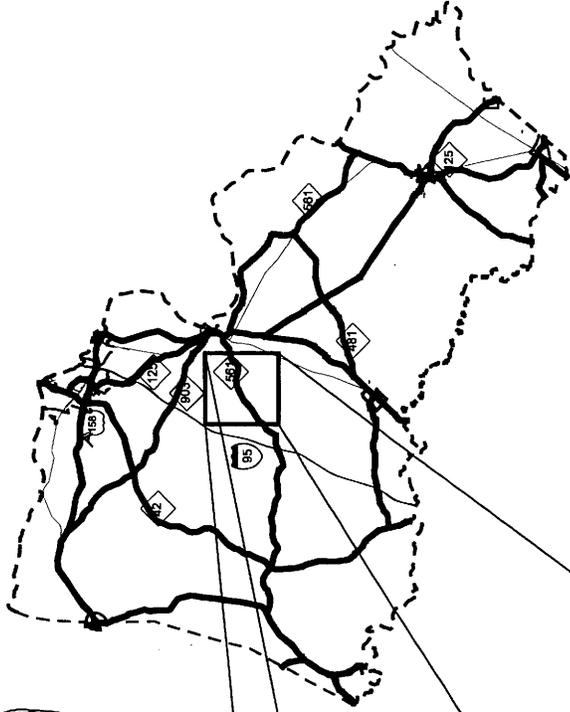
- FILL IN WETLAND
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- TEMPORARY SURFACE WATER IMPACT
- TEMPORARY FILL IN WETLAND



38.5 Square Ft Permanent Surface Water Impacts

N. C. DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
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 BRIDGE NO. 82, OVER  
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 SHEET OF 10 / 51 / 2005





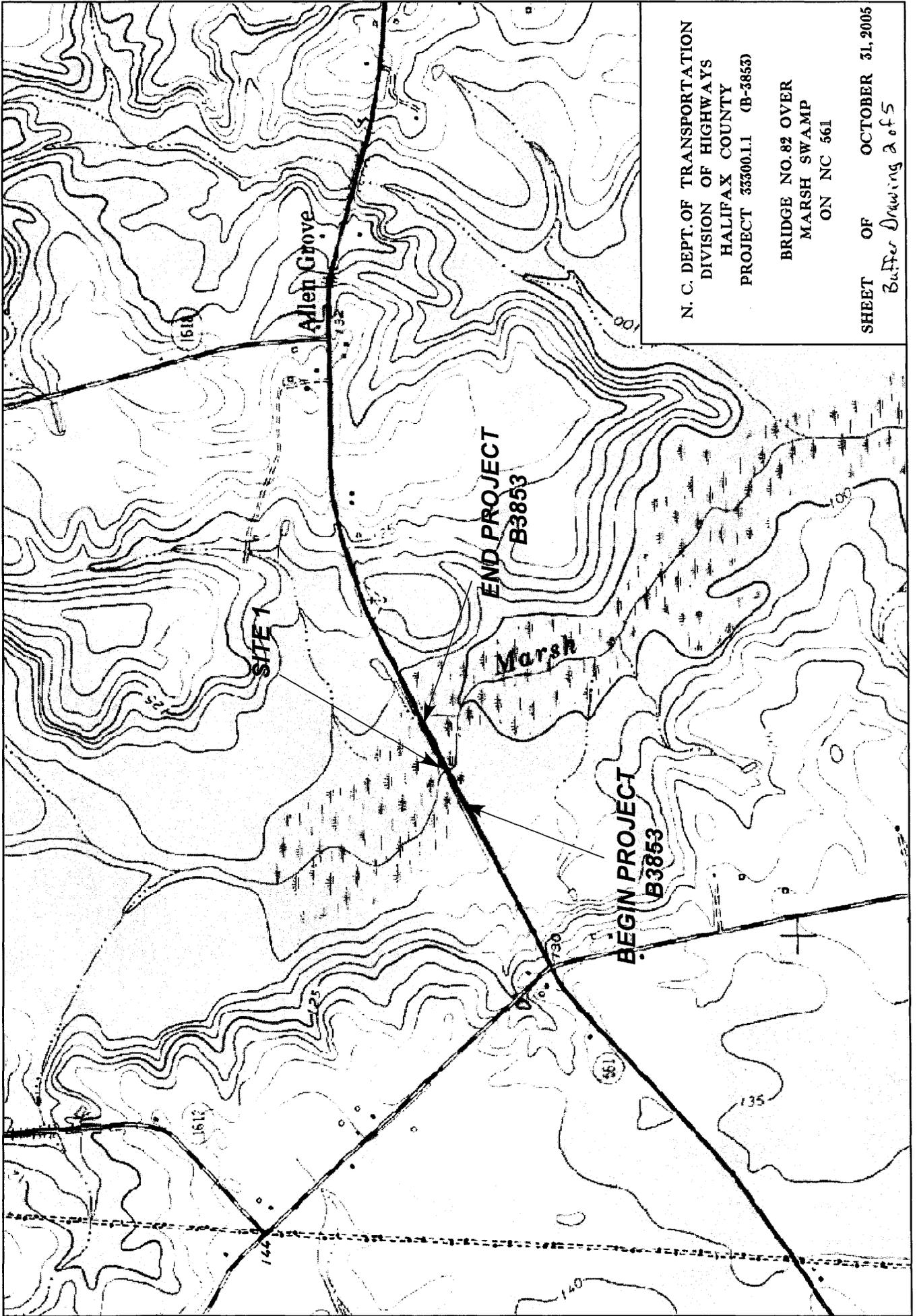
N. C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
HALIFAX COUNTY  
PROJECT 33300.11 (B-3853)

BRIDGE NO. 82 OVER  
MARSH SWAMP  
ON NC 561

SHEET OF OCTOBER 31, 2005

Buffer Drawing 1 of 5

*Buffer Permit*



N. C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
HALIFAX COUNTY  
PROJECT 33300.11 (B-3853)

BRIDGE NO. 82 OVER  
MARSH SWAMP  
ON NC 561

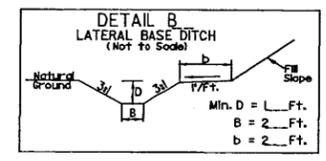
SHEET OF OCTOBER 31, 2005  
Buffer Drawing 2 of 5



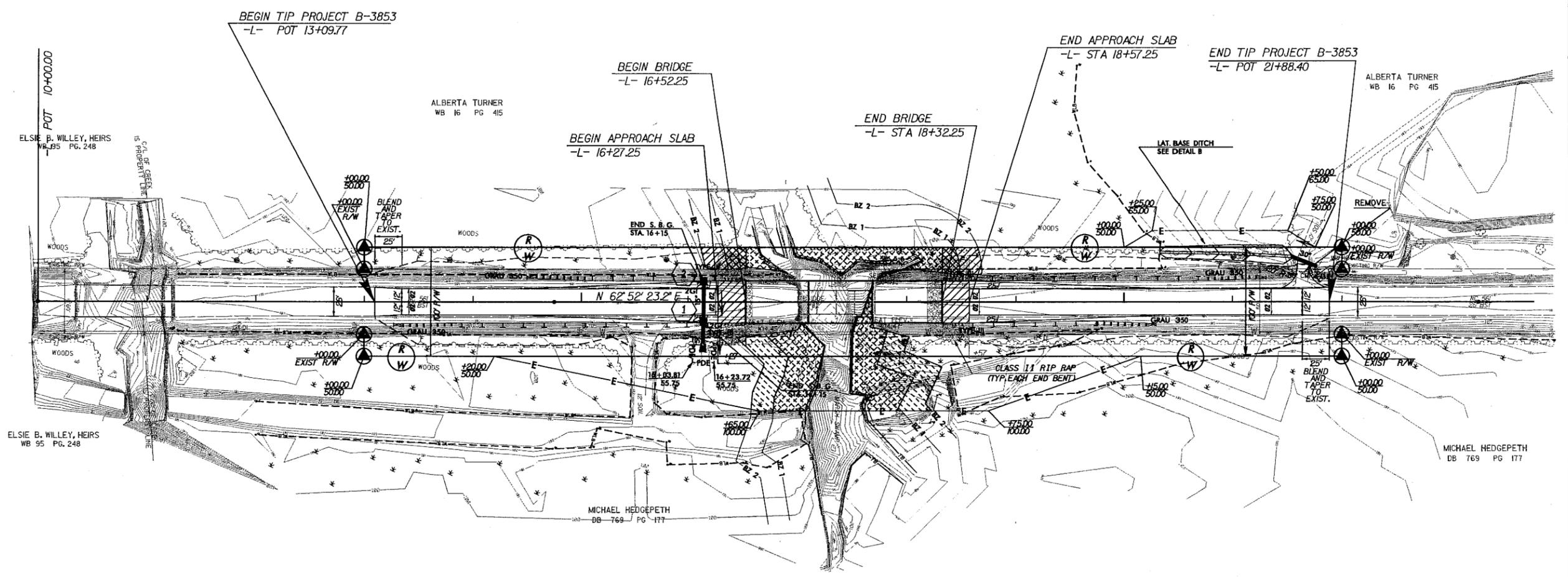
8/17/99  
 REVISIONS  
 SYSTEMS ENGINEERING

PROJECT REFERENCE NO. B-3853	SHEET NO. 5
RAW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

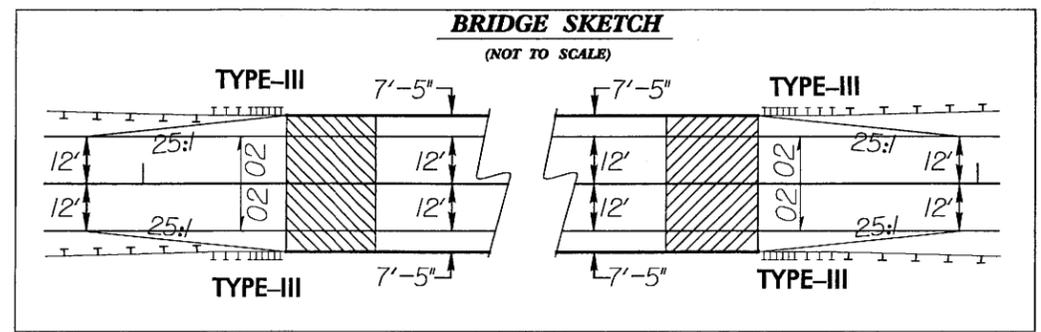
Buffer Drawing 5 of 5



-L- STA 20+32 TO 21+55 LT



- ALLOWABLE IMPACTS ZONE 1
- MITIGABLE IMPACTS ZONE 1
- ALLOWABLE IMPACTS ZONE 2
- MITIGABLE IMPACTS ZONE 2



N. C. DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 HALIFAX COUNTY  
 PROJECT NO. 33300.1.1 (B-3853)  
 BRIDGE NO. 82, OVER  
 MARSH SWAMP  
 ON NC 561  
 SHEET OF 10/31/2005

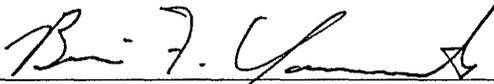


Halifax County  
NC 561  
Bridge No. 82 over Marsh Swamp  
Federal Aid Project No. BRSTP-561(1)  
State Project 8.1301901  
TIP Project No. B-3853

CATEGORICAL EXCLUSION  
US DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION  
AND  
NC DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS

APPROVED:

10-29-02  
DATE

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

10-29-02  
DATE

*for*   
\_\_\_\_\_  
Nicholas L. Graf, P.E.  
Division Administrator, FHWA

Halifax County  
NC 561  
Bridge No. 82 over Marsh Swamp  
Federal Aid Project No. BRSTP-561(1)  
State Project 8.1301901  
TIP Project No. B-3853

CATEGORICAL EXCLUSION

October 2002

Document Prepared by



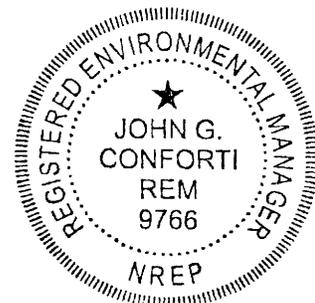
Edward B. McFalls, P.E.  
Project Manager  
Earth Tech



for the North Carolina Department of Transportation

Brian F. Yamamoto, Unit Head  
Consultant Engineering Unit  
Project Development and Environmental Analysis Branch

John Conforti, R.E.M., Project Manager  
Consultant Engineering Unit  
Project Development and Environmental Analysis Branch



## ***SPECIAL PROJECT COMMITMENTS***

**Halifax County  
NC 561  
Bridge No. 82 over Marsh Swamp  
Federal Aid Project No. BRSTP-561(1)  
State Project 8.1301901  
TIP Project No. B-3853**

In addition to the standard Nationwide Permit No. 23 Conditions, the General Nationwide Permit Conditions, Section 404 Only Conditions, Regional Conditions, State Consistency Conditions, NCDOT's Guidelines for Best Management Practices for Bridge Demolition and Removal, NCDOT's Guidelines for Best Management Practices for the Protection of Surface Waters, General Certification Conditions, and Section 401 Conditions of Certification, the following special commitments have been agreed to by NCDOT:

### **Project Development and Environmental Analysis Branch and Hydraulics Unit:**

The stream impacts associated with the project will likely be lower than the 150 linear-foot (45.7 m) threshold. If it becomes apparent during final design that more than 150 linear feet (45.7 m) of stream will be impacted, mitigation measures will be considered.

### **Highway Design Branch and Division 5:**

In-stream work associated with the bridge replacement project will be scheduled to avoid the spawning season, February 15 to June 15, for American Shad.

**Halifax County  
NC 561  
Bridge No. 82 over Marsh Swamp  
Federal Aid Project No. BRSTP-561(1)  
State Project 8.1301901  
TIP Project No. B-3853**

**INTRODUCTION:** The replacement of Bridge No. 82 is included in the 2002-2008 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**

NCDOT Bridge Maintenance Unit records indicate the bridge has a sufficiency rating of 7.0 out of a possible 100 for a new structure. The bridge is considered functionally obsolete and structurally deficient. The replacement of this inadequate structure will result in safer and more efficient traffic operations.

## **II. EXISTING CONDITIONS**

NC 561 in Halifax County is classified as “Rural Minor Arterial” in the Statewide Functional Classification System.

Through the project area, NC 561 has 26-foot (7.9 m) wide pavement and 3-foot (0.9 m) unstabilized shoulders. The horizontal and vertical alignments in the vicinity of the bridge are good. Existing right-of-way is 100 feet (30 m). There is no speed limit posted on NC 561 near the bridge, therefore the statutory speed limit of 55 miles per hour (88 kilometers per hour) applies.

The existing bridge was constructed in 1935. The superstructure consists of reinforced concrete floor on timber joists. The substructure consists of timber caps and timber piles with steel crutch bents added to a bent. The abutments are vertical. The existing bridge consists of four spans between 17 and 19 feet (5.2 and 5.8 m) in length. The clear roadway width is 22 feet (6.7 m). The crown of the roadway is situated 15 feet (4.6 m) over the bed of an unnamed tributary of Marsh Swamp. There is no posted weight limit, but the most recent Bridge Inspection Report recommends 20 tons for single vehicles and 27 tons for trucks with trailers. The bridge is located in a tangent section of NC 561. Photographs of the approaches to the existing bridge are shown in **Figure 4**.

The average daily traffic volume on NC 561 at Bridge No. 82 was 1,400 vehicles per day in 2002. By the design year 2025, the average daily traffic volume is expected to increase to 2,500 vehicles per day. The projected traffic volume includes four percent dual-tired vehicles and four percent truck-tractor semi-trailers. No school bus routes cross the bridge. NC 561 is not a designated bicycle route.

Three accidents were reported at the bridge between June 01, 1998 and May 31, 2001:

1. "Ran off Road Right" involving one vehicle. It occurred at night under dry road conditions. A bridge rail end was struck. The estimated speed was 65 mph. Alcohol, impairment suspected.
2. "Parked Motor Vehicle" involving two vehicles. It occurred at night under dry road conditions. Vehicle 1 was parked in a travel lane when Vehicle 2 struck it.
3. "Ran off Road Right" involving one vehicle. It occurred in daylight under dry road conditions. A bridge rail end was struck. The estimated speed was 55 mph.

Aerial utility lines are located along the north side of NC 561.

### III. ALTERNATIVES

#### *A. Project Description*

The project replaces Bridge Number 82, which crosses an unnamed tributary of Marsh Swamp. The bridge will have two 12-foot (3.6 m) lanes with 3-foot (0.9 m) shoulders. The approaches will have 12-foot (3.6 m) lanes with 8-foot (2.4 m) unpaved shoulders. **Figure 3** shows the typical cross-sections of the roadway approaches and bridge. The proposed design speed is 60 mph.

#### *B. Detailed Study Alternatives*

Two alternatives were carried forward for detailed study in this Categorical Exclusion. **Figure 2** shows sketches of all the alternatives listed below.

**Alternative 1.** This alternative replaces the bridge on its existing horizontal alignment, while using an on-site detour to the southeast of the existing bridge to maintain traffic during construction.

**Alternative 3.** This alternative replaces the bridge on its existing horizontal alignment, while using an off-site detour to maintain traffic during construction. There are several off-site detour alternatives, with the shorter routes being approximately 13 miles in length.

### ***C. Alternatives Eliminated from Further Study***

**No Action.** This alternative consists of short-term minor reconstruction and maintenance activities that are part of an ongoing plan for continuing operation of the existing bridge and roadway system in the project area. Many of the structural elements are decaying or corroding. Decay and corrosion has already reduced the bridge's safe load-bearing capacity. Although further maintenance activities will slow the decay, closing the bridge will eventually be necessary.

**Alternative 2.** This alternative replaces the bridge on its existing horizontal alignment, while using an on-site detour to the northwest of the existing bridge to maintain traffic during construction. **Alternative 2** was considered early in the process, but eliminated from further study because the on-site temporary detour for **Alternative 1** has fewer wetland impacts than the detour for **Alternative 2**. All other aspects of the two alternatives were equal.

### ***D. Preferred Alternative***

**Alternative 1**, replacing the existing bridge on the existing alignment while using an on-site detour southeast of the existing bridge to maintain traffic during construction, is the preferred alternative. **Alternative 3** is not desirable because of the magnitude of community and commuter disruption caused by using an off-site detour during construction. **Alternative 1** has greater impacts to the natural environment, but it has fewer impacts to the human environment.

## **IV. ESTIMATED COSTS**

Construction and right-of-way cost estimates for the alternatives studied are presented below in **Table 1**.

**Table 1: Estimated Costs**

	<b>Alternative 1</b>	<b>Alternative 3</b>
Structure Removal	\$14,200	\$14,200
Structure	\$360,000	\$360,000
Roadway Approaches	\$232,825	\$232,825
Detour Structure & Approaches	\$340,925	N/A
Miscellaneous and Mobilization	\$427,050	\$272,975
Engineering and Contingencies	\$200,000	\$120,000
Right-of-way/Utilities/Relocations	\$43,500	\$43,500
<b>Total Cost of Alternative</b>	<b>\$1,618,500</b>	<b>\$1,043,500</b>

The estimated cost of the project, as shown in the 2002-2008 Transportation Improvement Program, is \$608,000 including \$45,000 for right-of-way and \$450,000 for construction. Right-of-way acquisition is scheduled for Federal Fiscal Year 2003, with construction to follow in Federal Fiscal Year 2004.

There are no residential or business relocations on the proposed project.

## V. NATURAL RESOURCES

### A. Methodology

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

- United States Geological Survey (USGS) quadrangle map (Darlington, 1974)
- United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) Map (Darlington, 3-1982)
- NCDOT aerial photograph of project area (1:1200)
- Draft maps and descriptions of the soils in the project area (Halifax Soil Survey Office, Natural Resources Conservation Service [NRCS])
- North Carolina Department of Environment and Natural Resources (NCDENR) basin-wide assessment information (NCDENR, 1996)
- USFWS list of protected and candidate species.
- North Carolina Natural Heritage Program (NHP) files of rare species and unique habitats

Water resource information was obtained from publications posted on the World Wide Web by NCDENR Division of Water Quality. Information concerning the occurrence of federally protected species in the study area was obtained from the USFWS list of protected and candidate species (March 2002), posted on the World Wide Web by the Ecological Services branch of the USFWS office in North Carolina. Information concerning species under state protection was obtained from the NHP database of rare species and unique habitats. NHP files were reviewed for documented sightings of species on state or federal lists and locations of significant natural areas.

A general field survey was conducted along the proposed project route by Earth Tech biologists on November 1, 2000. Water resources were identified and their physical characteristics were recorded. For the purposes of this study, a brief habitat assessment was performed within the project area of the unnamed tributary (UT) to Marsh Swamp. Plant communities and their associated wildlife were identified using a variety of observation techniques, including active searching, visual observations, and identifying characteristic signs of wildlife (sounds, tracks, scats, and burrows). Terrestrial community classifications generally follow Schafale and Weakley (1990) where appropriate and plant taxonomy follows Radford *et al.* (1968). Vertebrate taxonomy follows Potter *et al.* (1980), Martof *et al.* (1980), and Webster *et al.* (1985). Vegetative communities

were mapped using aerial photography of the project site. Predictions regarding wildlife community composition involved general qualitative habitat assessment based on existing vegetative communities.

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

### ***B. Physiography and Soils***

The project area lies in the northeastern portion of North Carolina within the middle coastal plain physiographic province. Elevations in the project area are approximately 100 feet (30 m) above mean sea level (National Geodetic Vertical Datum, 1929). The topography of the project vicinity is moderately dissected, broad and gently undulating upland with wide meandering floodplains.

The proposed project is in a rural area in Halifax County approximately 10.3 miles (16.6 km) south of Roanoke Rapids, NC. Halifax County's major economic resources are retail sales and manufacturing. The population of Halifax County in 1999 was 54,752 (North Carolina Office of State Budget, Planning and Management 1999).

Information about soils in the project area was taken from draft maps and descriptions provided by the Halifax County Soil Survey Office. The provisional map units in the project area are Chastain-Bibb Soils and Gritney fine sandy loam.

- **Chastain and Bibb soil (CbA), 0 to 1% slopes, frequently flooded**, is mapped on both sides of UT to Marsh Swamp. These soils are mapped as a complex and not separated at this level of mapping. These soils occur on level to nearly level floodplains of streams and rivers. They are considered hydric soil due to frequent flooding, are very deep, poorly drained and are moderately permeable. Bibb soils formed in stratified loamy and sandy alluvium on the coastal plain. The water table is from 8 inches (20.3 centimeters [cm]) to the surface most of the year. Chastain soils formed in clayey fluvial sediments. The water table is from surface to 1 foot (30.5 cm) for 7 months of the year.
- **Gritney fine sandy loam (GtC), 6 to 10% slopes**, is mapped on the southeast side of the project area. These soils are deep, well to excessively drained. They occur on uplands in the coastal plain. The seasonal high water table is 1.5 to 3 feet (0.5-1 m). These soils are never flooded.

Site index is a measure of soil quality and productivity. The index is the average height, in feet, that dominant and co-dominant trees of a given species attain in a

specified number of years (typically 50). The site index applies to fully-stocked, even-aged, unmanaged stands. The soils in the project area have the following site indices:

- The Bibb soils have a site index of 100 for loblolly pine (*Pinus taeda*), 90 for sweetgum (*Liquidambar styraciflua*), and 90 for water oak (*Quercus nigra*).
- The Chastain soils have a site index of 90 for sweetgum.
- The Gritney soils have a site index of 80 for loblolly pine.

### **C. Water Resources**

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

#### **1. Waters Impacted**

The project is located in the Tar River basin (TAR04 sub-basin) on an unnamed tributary to Marsh Swamp (UT to Marsh Swamp). UT to Marsh Swamp originates about 0.8 miles (1.3 km) to the northeast of the project area and flows into Marsh Swamp south of the project site. Marsh Swamp is a broad, frequently flooded, nearly level, expanse with numerous poorly defined channels, shallow water and low hummocks. The channel for UT to Marsh Swamp north of the project is poorly defined until it nears the bridge. From the project area, UT to Marsh Swamp is in a defined channel that meanders in a southerly direction about 0.1 miles (0.16 km) to its confluence with Marsh Swamp. Marsh Swamp originates about 9.5 miles (15.2 km) northwest of the project area. From the project area, Marsh Swamp meanders in a southeasterly direction about 7.2 miles (11.6 km) to its confluence with Beech Swamp.

The channel under Bridge No. 82 at UT to Marsh Swamp is approximately 25 feet (7.6 m) wide in the study area. To the northwest of Bridge No. 82, the channel is poorly defined and becomes 40 feet (12.2 m) wide as it enters a swamp forest. There is a drainage ditch along NC 561 on the northeast side that is 3 to 5 feet (0.91 to 1.52 m) wide and holds 1 to 3 feet (0.3 to 0.6 m) of water. On the southeast side of Bridge No. 82 the channel splits, the main channel flowing south toward the channel of Marsh Swamp. A side channel runs easterly around an old bridge piling, then turns south to rejoin UT to Marsh Swamp. The stream has a sluggish flow. The substrate of UT to Marsh Swamp at this point consists of fine sand, silt and organic debris. The water was dark with tannins and organic matter the day of the site visit. Water depth ranged from about 3 feet (0.9 m) to 4 feet (1.2 m). The water level is near the top of the poorly defined

banks. Outside the main channel are shallow pools. Evidence of sediment and wrack lines indicate the stream banks overflow regularly.

The creek is about 90 percent shaded by trees behind the bank tops with black gum (*Nyssa sylvatica*), red maple (*Acer rubrum*), and oaks (*Quercus* sp.). To the east and north of NC 561 is a small private pond. This pond drains into the swamp north of the site.

## 2. Water Resource Characteristics

Surface waters in North Carolina are assigned a classification by the DWQ that is designed to maintain, protect, and enhance water quality within the state. UT to Marsh Swamp has not been classified. The nearby Marsh Swamp [Index # 28-79-30-1] is classified as a *Class C Sw NSW* water body (NCDENR, 2000). *Class C* water resources are waters protected for aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture. Secondary recreation includes wading, boating, and other uses involving human body contact with water where such activities take place in an infrequent, unorganized, or incidental manner. There are no restrictions on watershed development activities. The supplemental *Sw* classification indicates swamp waters. Swamp waters have normal seasonal interruptions of flow that limit faunal diversity. The designation of *NSW* indicates these waters are nutrient sensitive waters. The supplemental classification *NSW* is intended for waters needing additional nutrient management because of excessive growth of microscopic or macroscopic vegetation. In general, management strategies for point and non-point source pollution control require no increase in nutrients over background levels.

No waters classified as High Quality Water (HQW), Water Supplies (WS-I or WS-II) or Outstanding Resource Waters (ORW) occur with 1 mile (1.6 km) of the project study area.

The project area is in a largely undeveloped watershed. To the east and south of the project area are clear-cuts. No other disturbances to the landscape were observed in the immediate vicinity, and the area is largely unsuitable for most agricultural, residential, or industrial uses. Potential threats to stream quality in this area are agriculture and forestry operations that would result in increased soil erosion.

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

Point source discharges in North Carolina are permitted through the National Pollutant Discharge Elimination System (NPDES) program administered by the DWQ. Municipal, industrial, and other facilities that discharge directly into surface waters must be permitted. Homes that use a municipal wastewater system or a septic system, and do not discharge to surface waters do not require a permit under the program. There are no permits issued to discharge in Marsh Swamp as of February 2001 (NCDENR 2001).

### **3. Anticipated Impacts to Water Resources**

#### *a. General Impacts*

Any action that affects water quality can adversely affect aquatic organisms. Temporary impacts during the construction phases may result in long-term impacts to the aquatic community. In general, replacing an existing structure in the same location with an off-site detour is the preferred environmental approach. Bridge replacement at a new location results in more severe impacts, and physical impacts are incurred at the point of bridge replacement. An off-site detour was excluded because the total additional driving miles would exceed 10 miles. Alternative 1 will utilize portions of an existing abandoned railroad bed for the detour.

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

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

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

Within the project area, UT to Marsh Swamp is 25 feet (7.6 m) wide. Assuming a study corridor of 100 feet (30.5 m) for the alternate, the construction of the new bridge will impact 100 linear feet (30.5 m) of stream, and a total area of 2,500 square feet (232.3 sq m) of surface waters. Wetlands are present within the project area. Alternative 1 would have permanent impacts to 0.66 acres (0.27 ha) of the wetland community. The proposed temporary on-site detour would have temporary impacts to 0.46 acres (0.19 ha) of the wetland communities.

#### **4. Impacts Related to Bridge Demolition and Removal**

UT to Marsh Swamp is not known to provide habitat for aquatic species on the federal list of threatened and endangered species. No state-listed fish or mussel populations are known to exist in the project area. There is evidence of spawning of anadromous fish downstream. Therefore, Case 2 applies to the proposed replacement of Bridge No. 82 over UT to Marsh Swamp.

The superstructure consists of a reinforced concrete floor on timber joists. The substructure consists of timber caps on timber piles. Two piers are in the water. The maximum potential fill of demolished concrete is 129 cubic yards (98.6 cubic meters).

#### ***D. Biotic Resources***

Terrestrial and aquatic communities are included in the description of biotic resources. Living systems described in the following sections include communities of associated plants and animals. These descriptions refer to the dominant flora and fauna in each community and the relationships of these biotic components. Descriptions of the terrestrial systems are presented in the context of plant community classifications. These classifications follow Schafale and Weakley (1990) where possible. They are also cross-referenced to *The Nature Conservancy International Classification of Ecological Communities: Terrestrial Vegetation of the Southeastern United States* (Weakley *et al.*, 1998), which has recently been adopted as the standard land cover classification by the Federal Geographic Data Committee. Representative animal species that are likely to occur in these habitats (based on published range distributions) are also cited. Scientific nomenclature and common names (when applicable) are used for the plant and animal species described. Subsequent references to the same species are by the common name only.

##### **1. Plant Communities**

Four terrestrial communities were identified within the project area: a maintained roadside community, a swamp forest, a clear-cut, and an abandoned field. Dominant faunal components associated with these terrestrial areas will be discussed in each community description. Many species are adapted to the

entire range of habitats found along the project alignment, but may not be mentioned separately in each community description.

a. *Maintained Roadside Community*

This community covers the area along the road shoulders in the project area. Species include plantain (*Plantago* sp.), Japanese honeysuckle (*Lonicera japonica*), dandelion (*Taraxacum officinale*), Bermuda grass (*Cynodon dactylon*), old field broomsedge (*Andropogon* sp.) and other grasses. In roadside ditches and beneath the power line was standing water with wool grass (*Scirpus cyperinus*), smart weed (*Polygonum* sp.), and arrow arum (*Peltandra virginica*).

b. *Swamp Forest Community*

A swamp forest community is present on both sides and to the east of the bridge. This is a mixture of low-lying floodplain along the channel banks and swamp forest, some of which is inundated to 12 inches (30.5 cm) or more, and is jurisdictional wetlands. This is a forest community with a relatively closed canopy of oaks (*Quercus michauxii*, *Q. phellos*, and *Q. pagodifolia*), sweetgum, and black gum. A scattered mid-canopy consists of sweetbay (*Magnolia virginiana*), silky dogwood (*Cornus amomum*), and red maple. Much of this community has no herbaceous vegetation. At the time of the site visit shallow water areas were observed adjacent to the channel. Shallow waters also exist away from the channel but areas are less extensive.

This community is tentatively classified as the Coastal Plain Bottomland Hardwoods (Brownwater subtype) as described by Schafale and Weakley (1990). The TNC equivalent is I.B.2.N.d.16 *Quercus* (*Q. michauxii*, *Q. pagoda*, *Q. shumardii*) – *Liquidambar styraciflua* Temporarily Flooded Forest Alliance. Not all of this swamp forest community is jurisdictional wetlands. An old railroad bed to the south of NC 561 contains fill and is non-jurisdictional.

c. *Clear-cut Community*

This community occurs to the southeast of NC 561 and southwest of the project site. This two to three year old clear-cut consists of stump sprouts, weeds, tall grasses. No tree canopy exists. Much of this community is jurisdictional wetland. Originally this community was most likely a combination of the swamp forest community and an adjacent drier community that, over time, will succeed to a similar community type in the future. Species present now include black gum, black willow (*Salix nigra*), green ash (*Fraxinus pennsylvanica*), blackberry (*Rubus* sp.), tall grass (*Erianthus* sp.), dog fennel (*Eupatorium capillifolium*), sedges, and rushes. Not all of this clearcut community is jurisdictional wetlands. An old roadbed to the south of NC561 contains old fill and is nonjurisdictional.

#### d. *Abandoned Field Community*

This community occurs to the northeast of UT to Marsh Swamp on the north side of NC 561. Canopy species include loblolly pine, sweetgum, winged elm (*Ulmus alata*), willow oak (*Quercus phellos*), rushes and broomsedge. This community represents an early successional old field community.

## 2. **Wildlife Communities**

#### a. *Maintained Roadside Community*

The animal species present in these disturbed habitats are opportunistic and capable of surviving on a variety of resources, ranging from vegetation to both living and dead faunal components. Northern mockingbird (*Mimus polyglottos*), starling (*Sturnus vulgaris*), and American robin (*Turdus migratorius*) are common birds that use these habitats. The area may also be used by the Virginia opossum (*Didelphis virginiana*), various species of mice (*Peromyscus* sp.), striped skunk (*Mephitis mephitis*), American toad (*Bufo americanus*), and eastern garter snake (*Thamnophis sirtalis*).

#### b. *Swamp Forest Community*

Birds that utilize this community are prothonotary warbler (*Protonotaria citrea*), redbellied woodpecker (*Melanerpes carolinus*), blue-gray gnatcatcher (*Polioptila caerulea*), and yellow-billed cuckoo (*Coccyzus americanus*). Other inhabitants may include black bear (*Ursus americanus*), white-tailed deer (*Odocoileus virginianus*), green frog (*Rana clamitans melanota*), many-lined salamander (*Stereochilus marginatus*), southern two-lined salamander (*Eurycea bislineata*), northern water snake (*Natrix sipedon*), and eastern cottonmouth (*Agkistrodon piscivorus*).

#### c. *Clearcut Community*

The Carolina wren (*Thryothorus ludovicianus*), tufted titmouse (*Parus bicolor*), Carolina chickadee (*Parus carolinensis*), prairie warbler (*Dendroica discolor*), and yellow-rumped warbler (*Dendroica coronata*), forage and nest in this habitat type. Other inhabitants may include striped skunk, eastern cottontail (*Sylvilagus floridanus*), eastern harvest mouse (*Reithrodontomys humulis*), white-tailed deer, green anole (*Anolis carolinensis carolinensis*), eastern diamondback rattlesnake (*Crotalus adamanteus*), northern black racer (*Coluber constrictor*), and eastern cottonmouth.

#### d. *Abandoned Field Community*

Wildlife in this community can be expected to be similar to the clear-cut community.

### 3. Aquatic Communities

Within the project area, UT to Marsh Swamp is a low-gradient, first-order stream. The substrate of UT to Marsh Swamp at this point consists of fine sand, silt and organic debris. The day of the site visit the water was dark with tannins and organic matter. The riparian community is deciduous trees and mixed evergreen-deciduous shrubs.

According to a communication from Wayne Jones, District 3 Fisheries Biologist, no important spawning grounds or populations of state listed fish or mussel species are known to exist in UT to Marsh Swamp. According to the Division of Marine Fisheries, past evidence of spawning of anadromous fish (American shad) has been found in Fishing Creek below Marsh Swamp. It is quite possible that anadromous fish may utilize Marsh Swamp and UT to Marsh Swamp as well. As long as the bridge is replaced with a bridge and not a culvert, fish migration should not be significantly impacted. In-stream work associated with the bridge replacement project will be scheduled to avoid the spawning season, February 15 to June 15, for American Shad.

### 4. Anticipated Impacts to Biotic Communities

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

#### *a. Terrestrial Communities*

Terrestrial communities in the project area will be impacted permanently by project construction from clearing and paving. Estimated impacts are based on the length of the alternate and the entire study corridor width. Alternative 1 is 100 feet (30.5 m) wide and 650 feet (198 m) long. Detour 1 is 75 feet (22.9 m) wide and 1332 feet (406 m) long. **Table 2** describes the potential impacts to terrestrial communities by habitat type. Because impacts are based on the entire study corridor width, the actual loss of habitat will likely be less than the estimate.

**Table 2: Estimated Area of Impacts to Terrestrial Communities**

	Area of Impact in Acres (Hectares)	
	Alternative 1 and 3	Alternative 1 Detour
<b>Community</b>	<b>Permanent</b>	<b>Temporary</b>
Maintained Roadside	0.28 (0.11)	0.31 (0.13)
Swamp Forest	0.73 (0.30)	1.14 (0.46)
Clear-cut	0.00 (0.00)	0.36 (0.14)
<b>Total Impact</b>	<b>1.01 (0.41)</b>	<b>1.81 (0.73)</b>

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

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

*b. Wetland Communities*

Jurisdictional wetlands occur within the project area and will be impacted by project construction. Alternatives 1 and 3 would have permanent impacts to 0.66 acres (0.27 ha) of the wetland community. Alternative 1 Detour would have temporary impacts to 0.46 acres (0.19 ha) of the wetland communities. These impacts cannot be avoided since traffic must be maintained on-site. Minimization efforts must be practiced throughout the design process.

*c. Aquatic Communities*

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

Temporary and permanent impacts to aquatic organisms may result from increased sedimentation. Aquatic invertebrates may drift downstream during construction and recolonize the disturbed area once it has been stabilized. Sediments have the potential to affect fish and other aquatic life in several ways, including the clogging and abrading of gills and other respiratory surfaces,

affecting the habitat by scouring and filling of pools and riffles, altering water chemistry, and smothering different life stages. Increased sedimentation may cause decreased light penetration through an increase in turbidity.

Wet concrete should not come into contact with surface water during bridge construction. Potential adverse effects can be minimized through the implementation of NCDOT *Best Management Practices for Protection of Surface Waters*. Erosion control methods will be implemented as included in *NCDOT's Best Management Practices for Protection of Surface Waters and Erosion and Sediment Control Guidelines*.

### ***E. Special Topics***

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

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

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

Jurisdictional wetlands occur within the project area and will be impacted by project construction. Wetlands are present on both sides of UT to Marsh Swamp and along the entire study corridor. UT to Marsh Swamp meets the definition of surface waters, and is therefore classified as Waters of the United States. The channel ranges from 20-25 feet (6.1-7.6 m) wide within the project area.

Project construction cannot be accomplished without infringing on Waters of the US. Anticipated Water of the US impacts fall under the jurisdiction of the USACE and the DWQ. Within the project area, UT to Marsh Swamp is 25 feet (7.6 m) wide. Assuming a study corridor of 100 feet (30.5 m) for the alternative, the construction of the new bridge will impact 100 linear feet (30.5 m) of stream, and a total area of 2,500 sq feet (232.3 sq m) of surface waters. Wetlands are present within the project area. Alternative 1 would have permanent impacts to 0.66 acres (0.27 ha) of the wetland community. Detour 1 would have temporary impacts to 0.46 acres (0.19 ha) of the wetland communities. These impacts cannot be avoided since traffic must be maintained on-site. Minimization efforts must be practiced throughout the design process.

## 2. Permits

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

### *a. Section 404 of the Clean Water Act*

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

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

### *b. Section 401 Water Quality Certification*

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

### *c. Bridge Demolition and Removal*

Demolition and removal of a highway bridge over Waters of the United States requires a permit from the U.S. Army Corps of Engineers if dropping components of the bridge into the water is the only practical means of demolition. Effective 9/20/99, this permit is included with the permit for bridge reconstruction. The permit application henceforth will require disclosure of demolition methods and potential impacts to the body of water in the planning document for the bridge reconstruction.

Section 402-2 "Removal of Existing Structures" of NCDOT's Standard Specifications for Roads and Structures stipulates that "excavated materials shall not be deposited...in rivers, streams, or impoundments", and "the dropping of

parts or components of structures into any body of water will not be permitted unless there is no other practical method of removal. The removal from the water of any part or component of a structure shall be done so as to keep any resulting siltation to a minimum." To meet these specifications, NCDOT shall adhere to Best Management Practices for the Protection of Surface Waters, as supplemented with Best Management Practices for Bridge Demolition and Removal.

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

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

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

**Case 3)** No special restrictions other than those outlined in Best Management Practices for Protection of Surface Waters.

UT to Marsh Swamp is not known to provide habitat for aquatic species on the federal list of threatened and endangered species. No state-listed fish or mussel populations are known to exist in the project area. There is evidence of spawning of anadromous fish downstream. Therefore, Case 2 applies to the proposed replacement of Bridge No. 82 over UT to Marsh Swamp.

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

### **3. Tar-Pamlico River Basin: Nutrient Sensitive Water Management Strategy**

Pursuant to 15 NCAC 2B.0259, Riparian Area Rules for Nutrient Sensitive Waters apply. The rules state that roads, bridges, stormwater management facilities, ponds, and utilities may be allowed within the 50-foot riparian buffer area of subject streams where no practical alternative exists. They also state that these structures shall be located, designed, constructed, and maintained to have minimal disturbance, to provide maximum erosion protection, to have the least adverse effects on aquatic life and habitat, and to protect water quality to the maximum extent practical through the use of best management practices. Every reasonable effort will be made to avoid and minimize wetland and stream impacts.

Estimated impacts to the riparian buffers are quantified below in **Table 3**. Impacts to Zone 1 are based on a buffer width of 30 feet (9.1 m) measured landward from the top of bank or rooted vegetation. Impacts to Zone 2 are based on a buffer width of 20 feet (6.1) measured landward from the outer edge of Zone 1. The Authorization Certificate for Tar-Pamlico Buffer Impacts will be requested along with the 401 Water Quality Certification.

**Table 3: Estimated Impacts to Riparian Buffers for Marsh Swamp**

	<b>Alternative 1 and 3</b>	<b>Alternative 1 Detour</b>
<b>Zone 1 acres (ha)</b>	0.111 (0.18)	0.169 (0.27)
<b>Zone 2 acres (ha)</b>	0.097 (0.16)	0.073 (0.12)
<b>Total acres (ha)</b>	0.208 (0.34)	0.242 (1.39)

#### **4. Mitigation**

Because this project will likely be authorized under a Nationwide Permit, mitigation for impacts to surface waters may or may not be required by the USACE. In accordance with the Division of Water Quality Wetland Rules [15A NCAC 211 .0506 (h)] "Fill or alteration of more than one acre of wetlands will require compensatory mitigation; and fill or alteration of more than 150 linear feet (45.7 m) of streams may require compensatory mitigation." Because permanent wetland impacts will be less than an acre, wetland mitigation likely will not be required. A total of 100 linear feet (30.5 m) of UT to Marsh Swamp are located within the study corridor for the proposed project. If the final length of stream impact is greater than 150 linear feet (45.7 m), compensatory mitigation may be required.

#### ***F. Rare and Protected Species***

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

##### **1. Federally Protected Species**

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

The USFWS lists four species under federal protection for Halifax County as of May 2002. These species are listed in Table 4.

**Table 4: Species Under Federal Protection for Halifax County**

Common Name	Scientific name	Federal Status
<b>Vertebrates</b>		
Red-cockaded woodpecker	<i>Picoides borealis</i>	E
Bald eagle	<i>Haliaeetus leucocephalus</i>	T
<b>Invertebrates</b>		
Dwarf wedge mussel	<i>Alasmidonta heterodon</i>	E
Tar spiny mussel	<i>Elliptio steinstansana</i>	E
Notes:	E      Endangered-A species that is threatened with extinction throughout all or a significant portion of its range. T      Threatened-A species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.	

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

***Picoides borealis* (Red-cockaded Woodpecker)**

**Endangered**

Vertebrate Family: *Picidae*  
 Federally Listed: 1970

The red-cockaded woodpecker (*Picoides borealis*) is federally-listed as Endangered. It is a small to medium sized bird 7 to 8 inches (18 to 20 centimeters [cm]) long with a wingspan of 13.8 to 15 inches (35 to 38 cm). The back and top of the head are black. The cheek is white. Numerous small white spots arranged in horizontal rows give a ladder-back appearance. The chest is dull white with small black spots on the side. Males and females look alike except males have a small red streak above the cheek.

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

Roosting cavities are excavated in living pines, and usually in those which are infected with a fungus producing red-heart disease. A clan nests and roosts in a group of cavity trees called a colony. The colony may have one or two cavity trees to more than 12, but it is used only by one clan. In most colonies, all the cavity trees are within a circle about 1,500 (457.2 m) feet wide. Open stands of pines with a minimum age of 80 to 120 years provides suitable nesting habitat. Longleaf pines are the most commonly used, but other species of southern pine are also acceptable. Dense stands of pines or stands that have a dense hardwood understory are avoided. Foraging habitat is provided in pine and pine

hardwood stands 30 years or older with foraging preference for pine trees 10 inches (25.4 cm) or larger in diameter. The woodpeckers' diet consists mainly of insects, which includes ants, beetles, wood-boring insects, and caterpillars.

**Biological Conclusion:**

**No Effect**

No habitat exists in the project area for the red-cockaded woodpecker. The project area does not have the open mature stand of pines that the red-cockaded woodpecker needs. A search of the NHP database found no occurrence of this bird within the project vicinity. It can be concluded that the project will not impact this endangered species.

**Haliaeetus leucocephalus (bald eagle)**

**Threatened**

Family: Accipitridae

Date First Listed: March 11, 1967

Date Downlisted: July 12, 1995

The bald eagle is a large raptor with a wingspan reaching 7 feet (2.1 m). Adults have a dark brown body with a pure white head and tail, whereas the juvenile plumage is chocolate brown to blackish with white mottling on the tail, belly, and underwings. Adult plumage is fully acquired by the fifth or sixth year.

The bald eagle is primarily associated with coasts, rivers, and lakes, usually nesting near large bodies of water where it feeds. It preys primarily on fish, but will feed on birds, mammals, turtles, and carrion when fish are unavailable.

In the southeast, the nesting and breeding season runs from September to December. Large nests up to 6 feet (2 m) across and weighing hundreds of pounds are constructed from large sticks, weeds, cornstalks, grasses, and sod. Preferred nesting sites are usually within one-half mile of water, have an open view of the surrounding area, and are in the largest living tree, usually a pine or cypress. Excessive human activity may exclude an otherwise suitable site from use. Wintering areas generally have the same characteristics as nesting sites, but may be farther from shores.

The bald eagle ranges throughout all of North America. Breeding sites in the southeast are concentrated in Florida, coastal South Carolina, and coastal Louisiana, and sporadically located elsewhere.

**Biological Conclusion:**

**No Effect**

The Unnamed Tributary to Marsh Swamp is not large enough to provide an adequate food source for bald eagles and canopy coverage is estimated at 90 percent coverage. No large water bodies exist within 2 miles of the project area. No large conifers or other trees suitable for a large nest were noted in the project area. A search of the NHP database found no occurrence of this animal

within the project vicinity. It can be concluded that the project will not impact this Threatened species.

***Alasmidonta heterodon* (Dwarf wedge mussel)**

**Endangered**

Family: *Unionidae*

Federally Listed: 1990

The dwarf wedge mussel rarely exceeds 1.5 inches (3.8 cm) in length. It is the only American freshwater mussel that has two lateral teeth on the right valve, but only one on the left. The shell's outer surface is usually brown or yellowish brown in color, with faint green rays that are most noticeable in young specimens. The male and female shells differ slightly, with the female being wider to allow greater space for egg development.

The dwarf wedge mussel occurs along the Atlantic Coast from Canada south to North Carolina. There are a number of documented populations in North Carolina streams, including streams in the Tar River basin. The habitat is described as creek and river areas with a slow to moderate current and a substrate that consists of sand, gravel, or muddy bottom. These areas must be silt free.

Major factors contributing to the endangered status of the species include water quality degradation and loss of habitat. The mussel needs slow to moderate currents and a silt-free environment, conditions that often are modified by dam construction. Another significant factor is the exclusion of its anadromous fish host from some habitat areas by impoundment and dams. Increased acidity, runoff of agricultural chemicals and fertilizers, and the mussel's sensitivity to potassium, zinc, copper, cadmium and other elements associated with industrial pollution also contribute to its decline.

**Biological Conclusion:**

**No Effect**

A search of the NHP files found no occurrences of the dwarf wedge mussel in the project vicinity, although there are populations of dwarf wedge mussels within the Tar River basin. The dwarf wedgemussel's habitat requirements differ slightly from the Tar River spinymussel's in that the dwarf wedgemussel may be found in slower moving stream systems in areas of gravel, sand, or mud. Only very marginal habitat for the dwarf wedgemussel was noted in the unnamed tributary to Marsh Swamp. Given the lack of good habitat and the absence of any evidence of freshwater mussels in the vicinity, the construction of this project will not affect this species.

***Elliptio steinstansana* (Tar Spinymussel)**

**Endangered**

Family: *Unionidae*

Federally Listed: 1985

The Tar spiny mussel is one of only three freshwater mussels in the world with spines. It is a medium-sized mussel reaching about 2.5 inches (6.35 cm) in length. The shell's outer surface (periostracum) is an orange-brown color with greenish rays in young and adults are darker with inconspicuous rays. Juveniles may have as many as 12 spines; however, adult specimens tend to lose their spines as they mature.

The Tar spiny mussel feeds by siphoning and filtering small food particles that are suspended in the water. It requires relatively silt-free, uncompacted gravel and/or coarse sand in fast-flowing, well oxygenated stream reaches. It is found in association with other mussels, but it is never very numerous. The larvae must attach to the gills or fins of fish before transforming into juvenile mussels and dropping to the stream bottom.

Two relatively good populations are known to exist in two tributaries of the Tar River. Although they have been found in one other tributary of the Tar River, individuals are becoming harder to find.

**Biological Conclusion:**

**No Effect**

A search of the NHP files found no occurrence of Tar spiny mussel in the project vicinity. The Tar River spiny mussel typically requires silt-free gravel or sand in flowing stream systems. No such habitat was observed in the unnamed tributary to Marsh Swamp. Given the lack of appropriate habitat and the absence of any evidence of freshwater mussels in the vicinity, the construction of this project will not affect this species.

## **2. Federal Species of Concern**

Federal Species of Concern (FSC) are not legally protected under the Endangered Species Act and are not subject to any of its provisions, including Section 7, until they are formally proposed or listed as Threatened or Endangered. **Table 5** includes FSC species listed for Halifax County and their state classifications. Organisms which are listed as Endangered (E), Threatened (T), or Special Concern (SC) on the North Carolina Natural Heritage Program list of Rare Plant and Animal Species are afforded state protection under the State Endangered Species Act and the North Carolina Plant Protection and Conservation Act of 1979. However, the level of protection given to state-listed species does not apply to NCDOT activities.

**Table 5: Federal Species of Concern in Halifax County**

Common Name	Scientific Name	State Status	Habitat present
<b>Vertebrates</b>			
Bachman's Sparrow *	<i>Aimophila aestivalis</i>	SC	Y
Cerulean Warbler	<i>Dendroica cerulea</i>	SR	N
Southeastern Bat	<i>Myotis austroriparius</i>	SC	Y
<b>Invertebrates</b>			
Argo Ephemerellid Mayfly	<i>Ephemerella argo</i>	SR	N
Atlantic Pigtoe	<i>Fusconaia masoni</i>	T	Y
Chowanoke Crayfish	<i>Orconectes virginianus</i>	SR	N
Green Floater	<i>Lasmigona subviridis</i>	E	Y
Tar River Crayfish	<i>Procambarus medialis</i>	W3	Y
Yellow Lampmussel	<i>Lampsilis cariosa</i>	T	Y
Yellow Lance	<i>Elliptio lanceolata</i>	T	Y
<b>Vascular Plants</b>			
Bog St. John's-wort	<i>Hypericum adpressum</i>	C	Y
Carolina Least Trillium	<i>Trillium pusillum var pusillum</i>	E	N
Sources: Amoroso, ed., 1999; LeGrand and Hall, eds., 1999 Key: T = Threatened, E = Endangered, SC = Special Concern, C = Candidate, SR = Significantly Rare, W3 = Watch List – species reported but without adequate documentation. *=Historic record. The species was last observed in the county more than 50 years ago. **=Obscure record. The date and/or location of observation is uncertain.			

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

### 3. Summary of Anticipated Impacts

No impacts to federally protected species are anticipated.

## 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 of Historic Preservation's Regulations for Compliance with Section 106, codified as 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. All structures within the APE were photographed, and later reviewed by the State Historic Preservation Office (SHPO). In a concurrence form dated April 20, 2000 and memorandum dated November 16, 2000, the 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 concurrence form and memorandum are included in the Appendix.

### ***C. Archaeology***

The SHPO, in a memorandum dated November 16, 2000, recommended that no archaeological investigation be conducted in connection with this project. A copy of the memorandum is included in the Appendix. No archaeological resources are anticipated to be impacted by the project.

## **VII. ENVIRONMENTAL EFFECTS**

Anticipated impacts to the resources in the project area are described in this section. The project is considered to be a Federal "Categorical Exclusion" because of its limited scope and insignificant environmental consequences. The project is expected to have an overall positive impact. Replacement of the inadequate bridge will result in safer traffic operations.

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

No adverse effect on public facilities or services is anticipated. The project is not expected to adversely affect social, economic, or religious opportunities in the area.

No adverse effect on families or communities is anticipated. Right-of-way acquisition will be limited. No residences or businesses will be relocated.

There are no publicly owned parks, recreational facilities, or wildlife and waterfowl refuges of national, state, or local significance in the vicinity of the project.

The Farmland Protection Policy Act requires all federal agencies or their representatives to consider the potential impacts to prime and important farmland soils by all land acquisition and construction projects. Prime and important farmland soils are defined by the U.S. Natural Resources Conservation Service. No prime or important farmlands will be impacted by the proposed project. In

addition, the proposed project is anticipated to be limited to the existing right of way, and the land use adjacent to the project is residential.

This project is an air quality "neutral" project, so it is not required to be included in the regional emission analysis (if applicable) and a project level CO analysis is not required. This project is not anticipated to create any adverse effects on the air quality of this attainment area.

Traffic volumes will not increase or decrease because of this project. There are no receptors located in the immediate project area. The project's impact on noise and air quality will not be significant.

Noise levels could increase during construction but will be temporary. If vegetation is disposed of by burning, all burning shall be done in accordance with applicable local laws and regulations of the North Carolina SIP for air quality in compliance with 15 NAACO 2D.0520. This evaluation completes the assessment requirements for highway traffic noise (23 CFR Part 772) and for air quality (1990 CAAA and NEPA), and no additional reports are required.

An examination of records at the North Carolina Department of Environment and Natural Resources, Division of Water Quality, Groundwater Section and the Division of Waste Management revealed neither underground storage tanks, hazardous waste sites, regulated or unregulated landfills, nor dump sites in the project area.

Halifax County is a participant in the National Flood Insurance Program (NFIP). Flood Insurance Study maps for Halifax County show that Bridge No. 82 is located in a FEMA 100-year floodplain. Replacement of this bridge is not expected to affect the 100-year floodplain.

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

## **VIII. AGENCY COMMENTS**

### ***A. Federal***

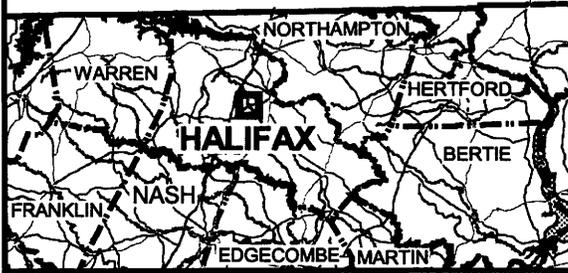
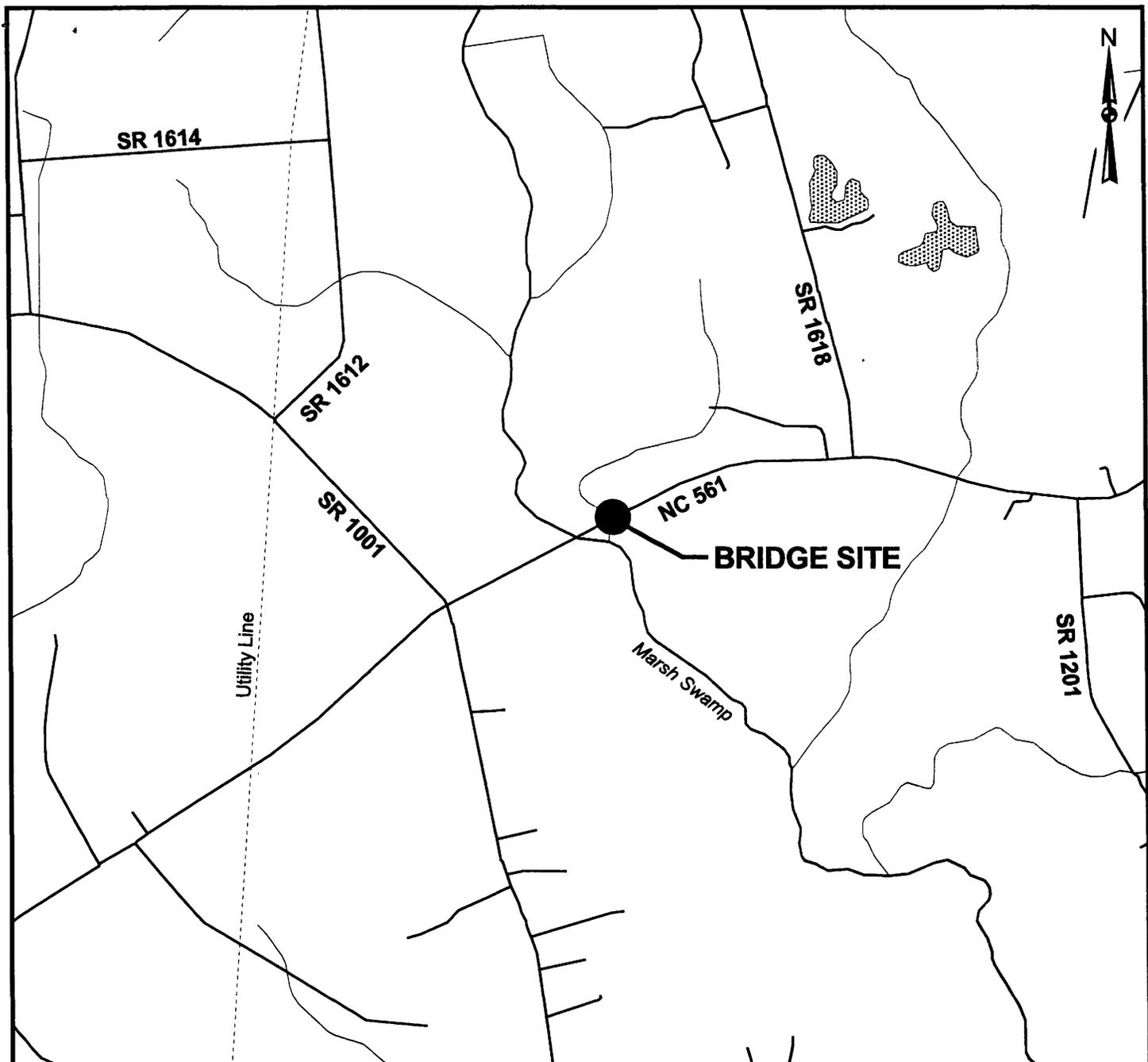
The United States Department of Agriculture's Natural Resource Conservation Service provided a letter stating they had no comments on the project. No other federal agencies provided written comments. Other agencies were contacted and some provided verbal or email input.

## ***B. State***

The North Carolina Wildlife Resource Commission provided a letter stating that their standard comments apply and that they are not aware of any threatened or endangered species in the project vicinity.

The Division of Marine Fisheries of the North Carolina Department of Environment and Natural Resources provided a letter stating although they did not sample the stream, that it is quite possible that anadromous fish may utilize Marsh Swamp. They mentioned that as long as the bridge is replaced with dimensions similar to those currently in place, it should not affect fish migration. In addition, they urged that the bridges not be replaced with a culvert.

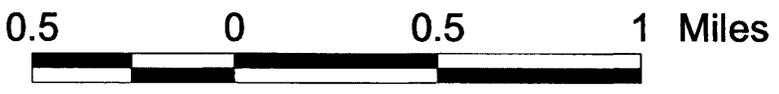
## **Figures**

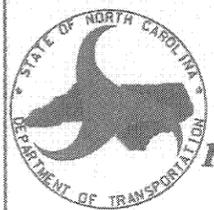
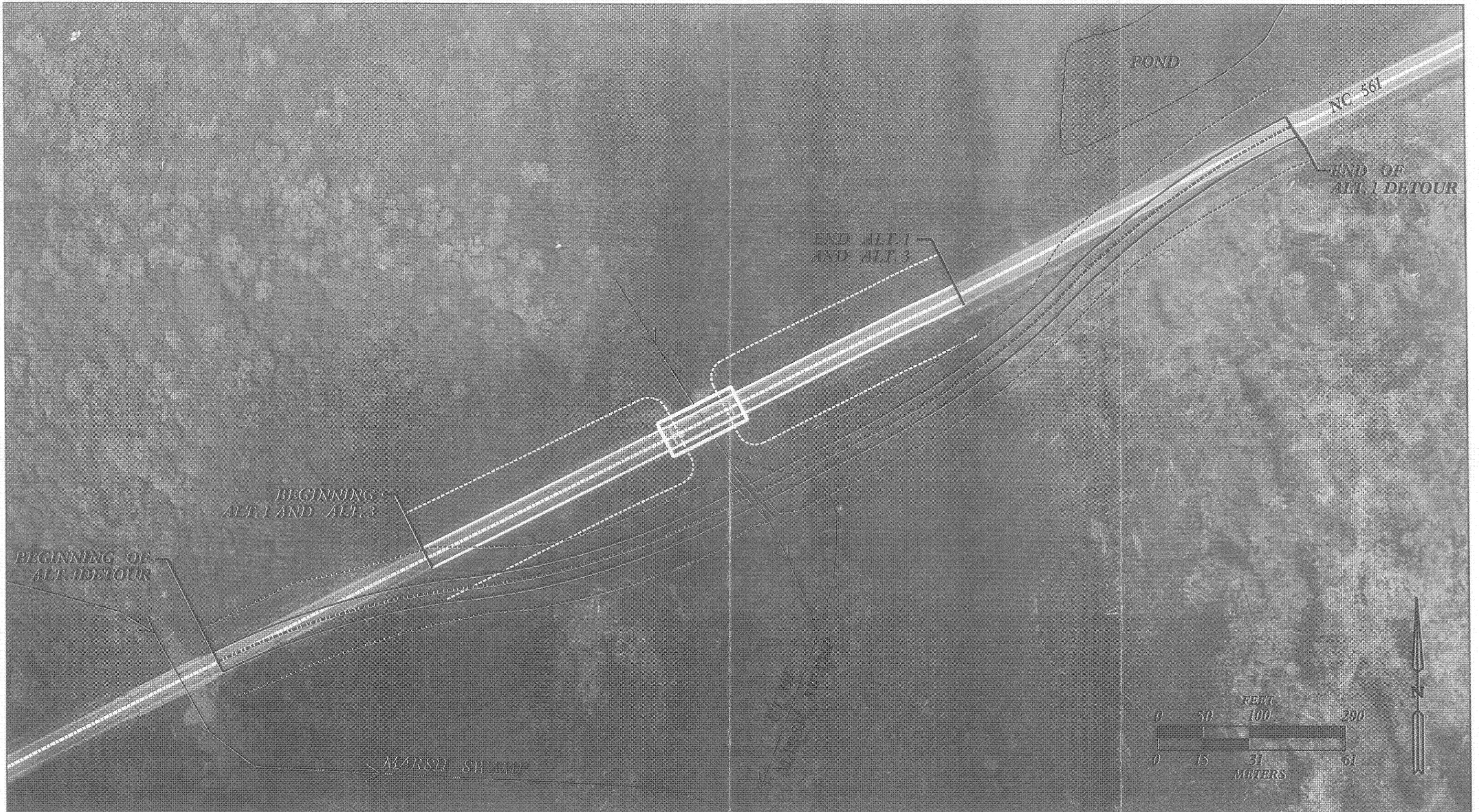


North Carolina - Department of Transportation  
 Division of Highways  
 Project Development and Environmental Analysis Branch

**FIGURE 1  
 VICINITY MAP**

**REPLACEMENT OF BRIDGE NUMBER 82  
 ON NC 561 OVER MARSH SWAMP  
 HALIFAX COUNTY  
 TIP NO. B-3853**





North Carolina Department of  
Transportation

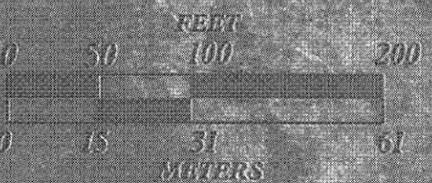
Division of Highways

Project Development & Environmental  
Analysis Branch

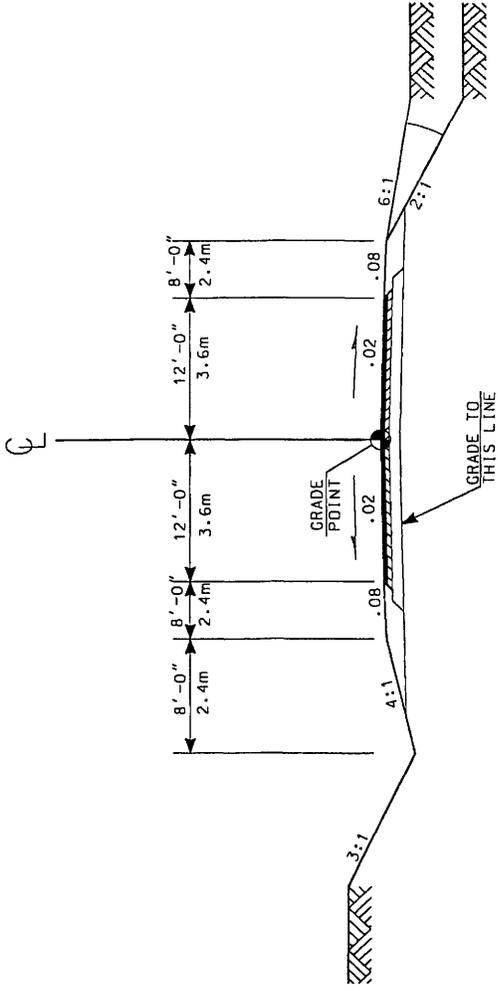
**FUNCTIONAL DESIGN  
LEGEND**

-  Alt. 1 and Alt. 3, Centerline
-  Alt. 1 and Alt. 3, Edge of Pavement
-  Alt. 1 and Alt. 3, Construction Limits

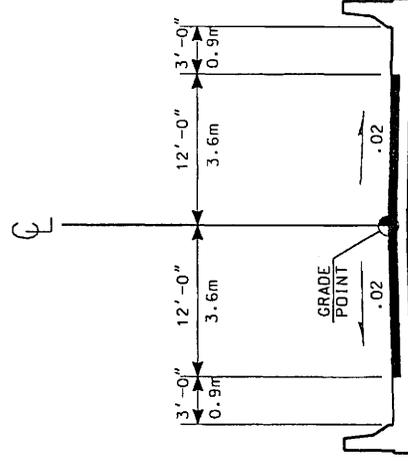
-  Detour for Alt. 1, Centerline
-  Detour for Alt. 1, Edge of Pavement
-  Detour for Alt. 1, Construction Limits



**FIGURE 2**  
**REPLACEMENT OF BRIDGE NO. 82**  
**ON NC 561 OVER**  
**MARSH SWAMP**  
**HALIFAX COUNTY**  
**TIP NO. B-3853**



TYPICAL ROADWAY APPROACH SECTION



TYPICAL SECTION ON STRUCTURE

TRAFFIC DATA

ADT 2002	1400
ADT 2025	2500
DUAL	4%
TTST	4%

FUNCTIONAL CLASSIFICATION: COLLECTOR

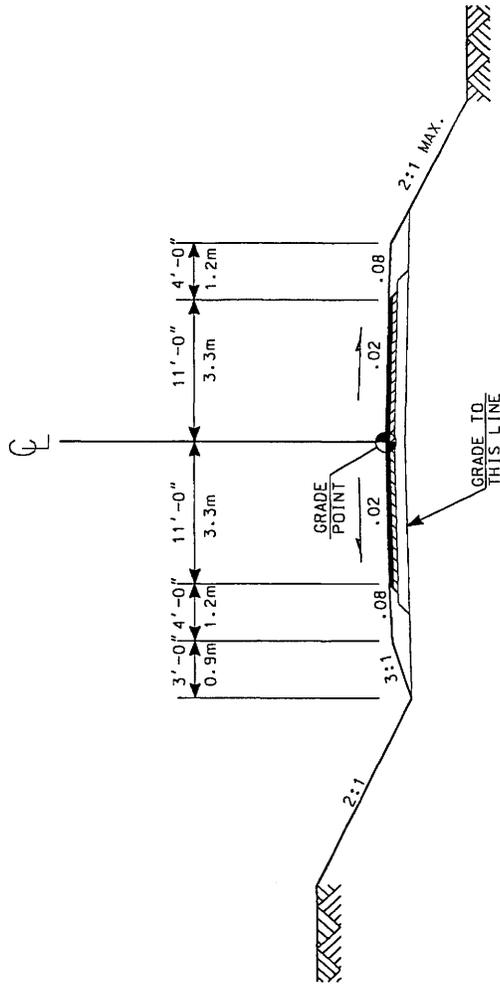


NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
PROJECT DEVELOPMENT AND  
ENVIRONMENTAL ANALYSIS BRANCH

HALIFAX COUNTY  
BRIDGE NO. 82 ON NC 561  
OVER MARSH SWAMP  
TIP B-3853

IN-PLACE ALTERNATIVE

FIGURE 3A



TYPICAL ROADWAY DETOUR APPROACH SECTION

TRAFFIC DATA

ADT 2002	1400
ADT 2025	2500
DUAL	4%
TTST	4%

FUNCTIONAL CLASSIFICATION: COLLECTOR



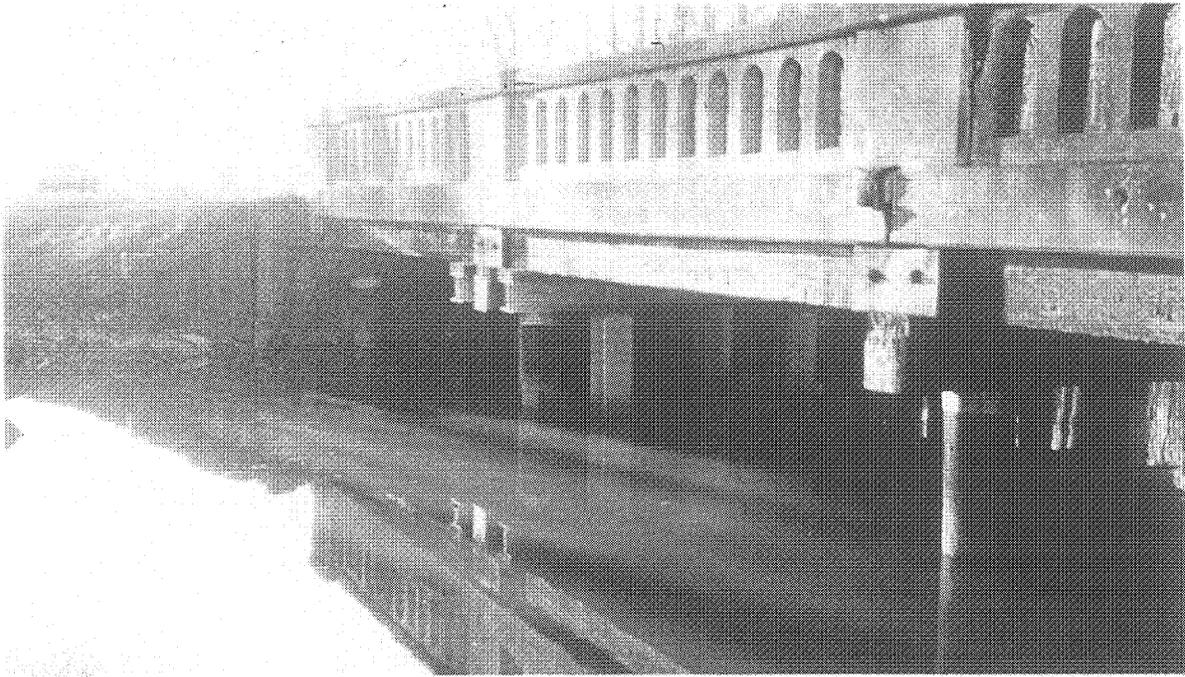
NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
PROJECT DEVELOPMENT AND  
ENVIRONMENTAL ANALYSIS BRANCH

HALIFAX COUNTY

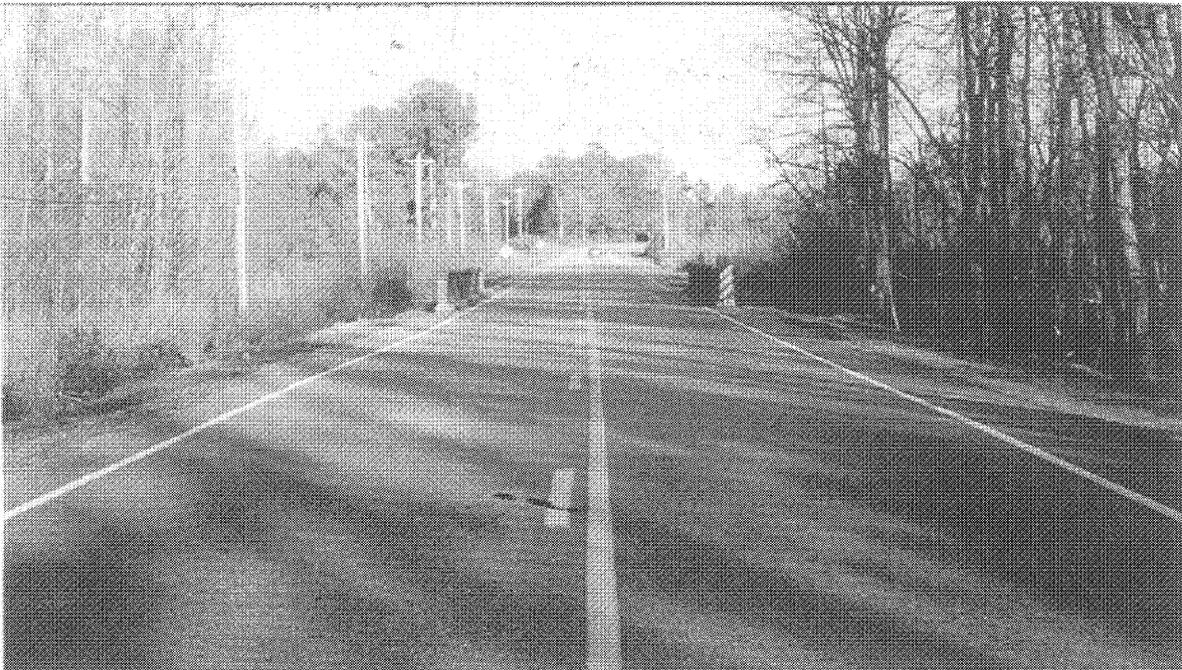
BRIDGE NO. 82 ON NC 561  
OVER MARSH SWAMP

TIP B-3853

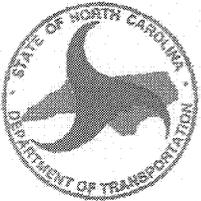
FIGURE 3B



Downstream side of the bridge.



Looking north at the bridge.



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

FIGURE 4a

REPLACEMENT OF BRIDGE NUMBER 82  
ON NC 561 OVER MARSH SWAMP  
HALIFAX COUNTY  
TIP NO. B-3853

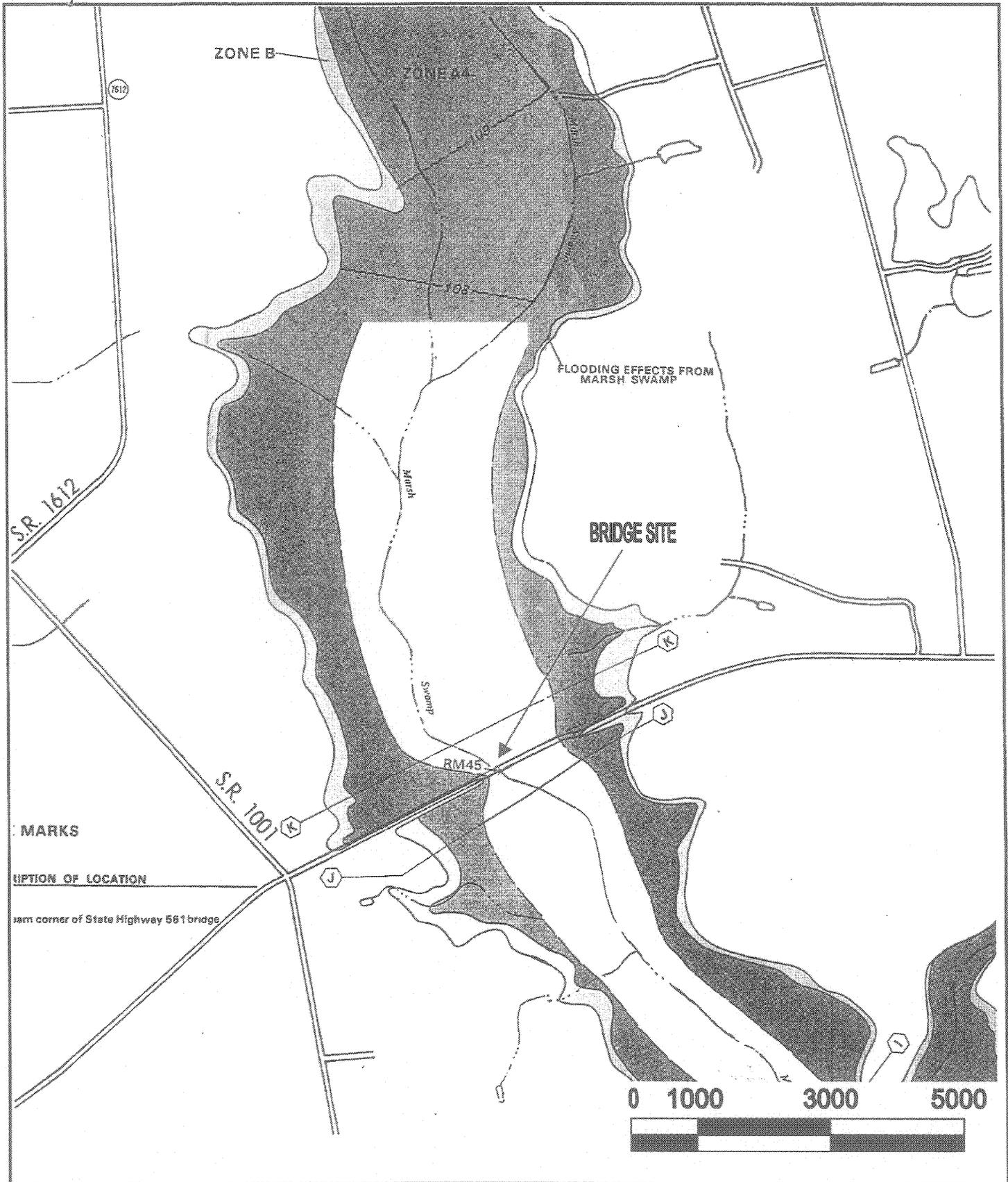


Looking downstream from the bridge.



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

FIGURE 4b  
REPLACEMENT OF BRIDGE NUMBER 82  
ON NC 561 OVER MARSH SWAMP  
HALIFAX COUNTY  
TIP NO. B-3853



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

FIGURE 5  
 FEMA 100 – YEAR FLOODPLAIN MAP  
 REPLACEMENT OF BRIDGE NUMBER 82  
 ON NC 561 OVER MARSH SWAMP  
 HALIFAX COUNTY  
 TIP NO. B-3853

# **Appendix**

Federal Aid #BRSTP-561(1)

TIP #B-3853

County: Halifax

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

Project Description: Replace Bridge No. 82 on NC 561 over Marsh Swamp

On April 20, 2000, representatives of the

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

Reviewed the subject project at

- a scoping meeting
- 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.
- there are no properties less than fifty years old which are considered to meet Criterion Consideration G within the project's area of potential effect.
- there are properties over fifty years old (list attached) within the project's area of potential effect, but based on the historical information available and the photographs of each property, properties identified as Bridge No. 82 are considered not eligible for the National Register and no further evaluation of them is necessary.
- there are no National Register-listed properties located within the project's area of potential effect.

Signed:

Mary Pope  
Representative, NCDOT

4-20-00  
Date

Michael C. Dawson  
FHWA, for the Division Administrator, or other Federal Agency

4/20/00  
Date

J. L. W.  
Representative, SHPO

4/20/00  
Date

David Wood  
State Historic Preservation Officer

12/18/00  
Date



United States  
Department of  
Agriculture

October 30, 2000

Natural  
Resources  
Conservation  
Service

1415  
Bland Rd.  
Raleigh, NC 27609

Phone: 919-873-2134

Mr. John Conforti  
Project Development & Environmental Analysis Branch  
1548 Mail Service Center  
Raleigh, NC 27699-1548

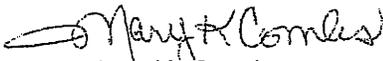
Dear Mr. Conforti:

Thank you for the opportunity to provide comments on Bridge Group XXVIII bridge replacement projects listed below:

TIP Project No.	County	Bridge Number	Road Carried	Stream Crossed
B-3643	Granville	72	SR1004 (Providence Rd.)	Hachers Run
B-3644	Granville	226	SR1120 (Veasey Rd.)	Knap of Reeds Creek
B-3645	Granville	201	SR 1435 (Davis Chapel Rd.)	Little Grassy Creek
B-3653	Halifax	162	SR1450 (Branch Rd.)	Chockoyotte Creek
B-3853	Halifax	82	NC561	Marsh Swamp
B-3702	Vance	19	SR 1305 (Barker Rd.)	Flat Creek
B-3915	Vance	21	SR 1303 (Hicksboro Rd.)	Flat Creek
B-3521	Wake	273	SR 1006 (Old Stage Rd.)	Middle Creek
B-3523	Wake	525	SR 1300 (Kildaire Farm Rd.)	Swift Creek
B-3530	Wake	174	SR 2320 (Riley Hill Rd.)	Buffalo Creek
B-3703	Wake	317	SR 1404 (Johnson Pond Rd.)	Middle Creek
B-3704	Wake	108	SR 1834 (Norwood Rd.)	Lower Bartons Creek
B-3705	Wake	125	SR 2045 (Burlington Mills Rd.)	Smiths Creek
B-3917	Wake	311	SR 1379 (Penny Rd.)	Lake Wheeler (Swift Cr.)
B-3918	Wake	127	SR 2044 (Ligon Mill Rd.)	Tom Creek

The Natural Resources Conservation Service does not have any comments at this time.

Sincerely,

  
Mary K. Combs  
State Conservationist



North Carolina Department of Cultural Resources

State Historic Preservation Office

David L. S. Brook, Administrator

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

Division of Archives and History
Jeffrey J. Crow, Director

November 16, 2000

MEMORANDUM

To: William D. Gilmore, P.E., Manager
Project Development and Environmental Analysis Branch
From: David Brook [Signature]
Deputy State Historic Preservation Officer
Re: Replace Bridge No. 82 on NC 561 over Marsh Swamp,
TIP No. B-3853, Halifax County, ER 01-7786

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

Bridge No. 82 was built in 1935

We recommend an architectural historian on your staff evaluate the above property to determine its eligibility for listing in the National Register of Historic Places and report the finds to us.

There are no known archaeological sites within the proposed project area. Based on our present knowledge of the area, it is unlikely that any archaeological resources, which may be eligible for inclusion in the National Register of Historic Places, will be affected by the project construction. We, therefore recommend that no archaeological investigation be conducted 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, contact Renee Gledhill-Earley, Environmental Review Coordinator, at 919/733-4763.

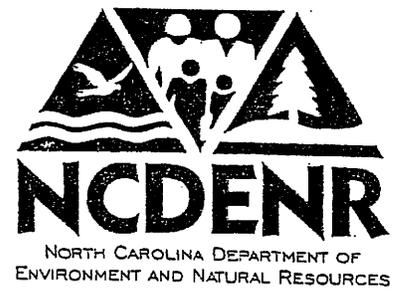
DB:kgc

cc: Mary Pope Furr, NCDOT
Nicholas Graf, FHWA

Table with 4 columns: Location, Mailing Address, Telephone/Fax, and a fourth column with various administrative codes.

State of North Carolina  
Department of Environment  
and Natural Resources  
Division of Marine Fisheries

James B. Hunt, Jr., Governor  
Bill Holman, Secretary  
Preston P. Pate, Jr., Director



10 October 2000

MEMORANDUM

TO: John Conforti, DOT  
FROM: Mike Street, DMF  
SUBJECT: Bridge replacements

The North Carolina Division of Marine Fisheries has reviewed the letter and attachments of 2 October 2000 concerning potential impacts of replacements of bridges 162 and 82 in Halifax County. We offer the following comment under authority of G.S. 113-131.

.. Sampling by the Division in the past found evidence of spawning of anadromous fish (American shad) in Fishing Creek at the U.S. 301 bridge. Since Marsh Swamp enters Fishing Creek well downstream from the U. S. 301 bridge, it is quite possible that anadromous fish may utilize Marsh Swamp. We did not sample that stream. As long as the bridges are replaced with bridges with dimensions similar to those currently in place, they should not affect fish migration. We would urge that the bridges not be replaced with culverts.

Mr. Wojciechowski has retired from state service. Please send future correspondence to me.

Thank you for the opportunity to comment.

cc: Sara Winslow

3852



## Halifax County Schools

Office of the Superintendent

Telephone: (919) 583-5111

October 12, 2000

Mr. John Conforti  
Project Development and Environmental Analysis  
1548 Mail Service Center  
Raleigh, NC 27699-1548

Dear Mr. Conforti:

Halifax County Schools Transportation Department has looked at TIP PROJECT NUMBER B-3653 and B-3853 for the school year 2000/2001. We do not have buses crossing either of these bridges.

Road closing for these bridges would not a pose any problem for Halifax County Schools or Weldon City Schools.

Sincerely,

Cliff Pearson  
Director of School Operations

aiw

B-3853



## North Carolina Wildlife Resources Commission

Charles R. Fullwood, Executive Director

TO: Yvonne G. G. Howell, PE  
Earth Tech

FROM: David Cox, Highway Project Coordinator  
Habitat Conservation Program *David Cox*

DATE: October 8, 2001

SUBJECT: NCDOT Bridge Replacements in Granville, Halifax, Vance, and Wake counties of North Carolina. TIP Nos. B-3643, B-3644, B-3645, B-3653, B-3853, B-3702, B-3915, B-3521, B-3523, B-3530, B-3703, B-3704, B-3705, B-3917, and B-3918.

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' x 10'. If possible, when using temporary structures the area should be cleared but not grubbed. Clearing the area with chain

Bridge Memo

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October 8, 2001

saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact, allows the area to revegetate naturally and minimizes disturbed soil.

6. A clear bank (riprap free) area of at least 10 feet should remain on each side of the stream underneath the bridge.
7. In trout waters, the N.C. Wildlife Resources Commission reviews all U.S. Army Corps of Engineers nationwide and general '404' permits. We have the option of requesting additional measures to protect trout and trout habitat and we can recommend that the project require an individual '404' permit.
8. In streams that contain threatened or endangered species, NCDOT biologist Mr. Tim Savidge should be notified. Special measures to protect these sensitive species may be required. NCDOT should also contact the U.S. Fish and Wildlife Service for information on requirements of the Endangered Species Act as it relates to the project.
9. In streams that are used by anadromous fish, the NCDOT official policy entitled "Stream Crossing Guidelines for Anadromous Fish Passage (May 12, 1997)" should be followed.
10. In areas with significant fisheries for sunfish, seasonal exclusions may also be recommended.
11. Sedimentation and erosion control measures sufficient to protect aquatic resources must be implemented prior to any ground disturbing activities. Structures should be maintained regularly, especially following rainfall events.
12. Temporary or permanent herbaceous vegetation should be planted on all bare soil within 15 days of ground disturbing activities to provide long-term erosion control.
13. All work in or adjacent to stream waters should be conducted in a dry work area. Sandbags, rock berms, cofferdams, or other diversion structures should be used where possible to prevent excavation in flowing water.
14. Heavy equipment should be operated from the bank rather than in stream channels in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into streams.
15. Only clean, sediment-free rock should be used as temporary fill (causeways), and should be removed without excessive disturbance of the natural stream bottom when construction is completed.
16. 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 bankfull stage (similar to Lyonsfield design). This could be

## Bridge Memo

3

October 8, 2001

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-3643 - Granville County - Bridge No. 72 over Hatchers Run. Standard comments apply. We are not aware of any threatened or endangered species in the project vicinity.
2. B-3644 - Granville County - Bridge No. 226 over Knap of Reeds Creek. NCDOT should be aware that NCWRC has designated NCWRC gamelands in the vicinity of this bridge. Impacts to gameland properties should be avoided. There are also records of state listed mussels upstream of the project. Therefore, due to the potential for impacts to listed species we request that NCDOT perform a mussel survey prior to the construction of this bridge.
3. B-3645 - Granville County - Bridge No. 201 over Little Grassy Creek. Standard comments apply. We are not aware of any threatened or endangered species in the project vicinity.
4. B-3653 - Halifax County - Bridge No. 162 over Chockyotte Creek. Due to the potential for anadromous fish at this location, NCDOT should closely follow the "Stream Crossing Guidelines for Anadromous Fish Passage". This includes an in-water work moratorium from February 15 to June 15. We are not aware of any threatened or endangered species in the project vicinity. Standard comments apply.
5. B-3853 - Halifax County - Bridge No. 82 over Marsh Swamp. Standard comments apply. We are not aware of any threatened or endangered species in the project vicinity.

Bridge Memo

4

October 8, 2001

6. B-3702 – Vance County – Bridge No. 19 over Flat Creek. Standard comments apply. We are not aware of any threatened or endangered species in the project vicinity.
7. B-3915 – Vance County – Bridge No. 21 over Flat Creek. Standard comments apply. We are not aware of any threatened or endangered species in the project vicinity.
8. B-3521 – Wake County – Bridge No. 273 over Middle Creek. Due to the potential for anadromous fish at this location, NCDOT should closely follow the "Stream Crossing Guidelines for Anadromous Fish Passage". This includes an in-water work moratorium from February 15 to June 15. There are also records of state listed mussels upstream of the project. Therefore, due to the potential for impacts to listed species we request that NCDOT perform a mussel survey prior to the construction of this bridge. Standard comments apply.
9. B-3523 – Wake County – Bridge No. 525 over Swift Creek. Standard comments apply. We are not aware of any threatened or endangered species in the project vicinity.
10. B-3530 – Wake County – Bridge No. 174 over Buffalo Creek. Standard comments apply. We are not aware of any threatened or endangered species in the project vicinity.
11. B-3703 – Wake County – Bridge No. 317 over Middle Creek. There are records of state listed mussels upstream of the project. Therefore, due to the potential for impacts to listed species we request that NCDOT perform a mussel survey prior to the construction of this bridge. Standard comments apply.
12. B-3704 – Wake County – Bridge No. 108 over Lower Bartons Creek. Standard comments apply. We are not aware of any threatened or endangered species in the project vicinity.
13. B-3705 – Wake County – Bridge No. 125 over Smiths Creek. Standard comments apply. We are not aware of any threatened or endangered species in the project vicinity.
14. B-3917 – Wake County – Bridge No. 311 over Lake Wheeler (Swift Creek). Standard comments apply. We are not aware of any threatened or endangered species in the project vicinity.
15. B-3918 – Wake County – Bridge No. 127 over Tom Creek. Standard comments apply. We are not aware of any threatened or endangered species in the project vicinity.

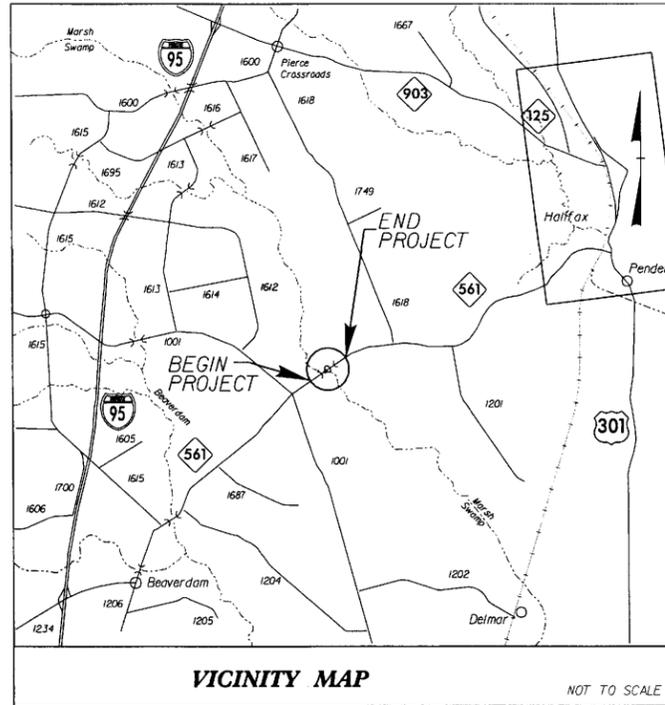
We request that NCDOT routinely minimize adverse impacts to fish and wildlife resources in the vicinity of bridge replacements. The NCDOT should install and maintain sedimentation control measures throughout the life of the project and prevent wet concrete from contacting water in or entering into these 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.

**T.I.P. NO. B-3853**

**CONTRACT:**

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



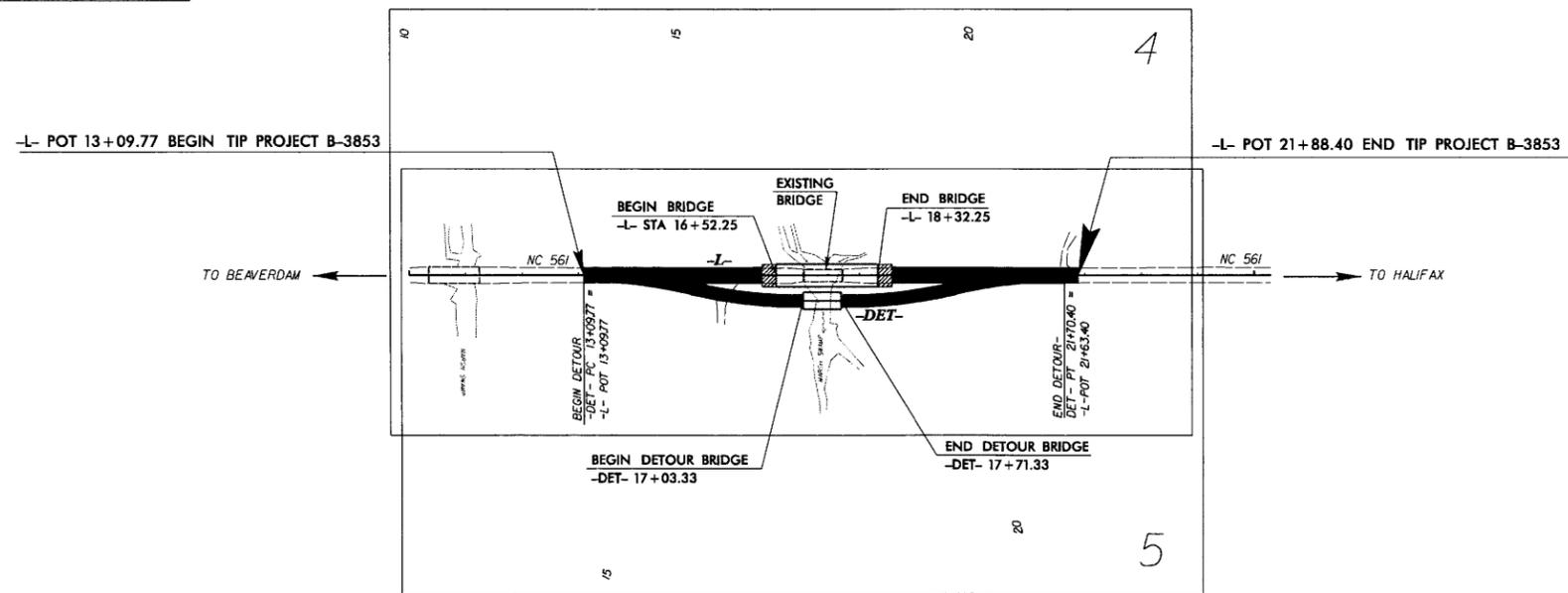
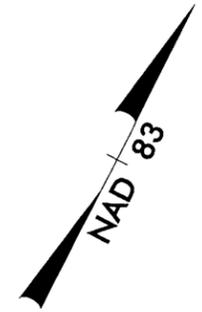
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# HALIFAX COUNTY

**LOCATION: BRIDGE NO. 82 OVER MARSH SWAMP AND  
APPROACHES ON NC 561**

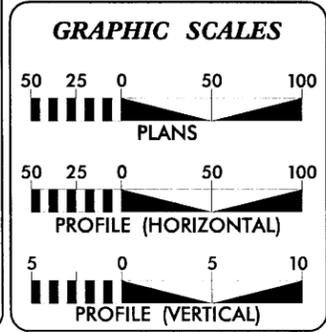
**TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND STRUCTURE**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	<b>B-3853</b>	<b>1</b>	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33300.1.1	BRSTP-561(1)	PE	
33300.2.2	BRSTP-561(13)	R/W & UTILITY	



THIS IS NOT A CONTROL-OF-ACCESS PROJECT

NCDOT CONTACT: C. S. HOUSER, PE



**DESIGN DATA**

ADT 2006 =	1,600 VPD
ADT 2026 =	2,550 VPD
DHV =	10 %
D =	60 %
T =	8 %
V =	60 MPH

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-3853	=	0.132 MI
LENGTH STRUCTURE TIP PROJECT B-3853	=	0.034 MI
LENGTH TIP PROJECT B-3853	=	0.166 MI

Prepared in the Office of:

W.K. DICKSON

ENGINEERS  
PLANNERS  
SURVEYORS

3121 JOHN HUMPHRIES WYND  
RALEIGH, NC 27612  
PHONE: (919) 782-8435  
FAX: (919) 782-9672

ATLANTA, GA  
CHARLOTTE, NC  
COLUMBIA, SC  
HICKORY, NC  
WILMINGTON, NC

---

2002 STANDARD SPECIFICATIONS

**RIGHT OF WAY DATE:**  
SEPTEMBER 16, 2005

**LETTING DATE:**  
SEPTEMBER 19, 2006

---

Tommy Register, PE

---

Mickey Dawes  
PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

SIGNATURE: \_\_\_\_\_

**ROADWAY DESIGN ENGINEER**

SIGNATURE: \_\_\_\_\_

**DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA**

P.E.

STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

---

APPROVED  
DIVISION ADMINISTRATOR

DATE

# INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
1C	SURVEY CONTROL SHEET
2 THRU 2A	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
3	SUMMARY OF QUANTITIES, SUMMARY OF EARTHWORK
3A	SUMMARY OF RIGHT OF WAY DATA, SUMMARY OF PAVEMENT REMOVAL DRAINAGE QUANTITIES, GUARDRAIL SUMMARY
4 THRU 5	PLAN SHEETS
6	PROFILE SHEET
X-1 THRU X-6	CROSS-SECTIONS

# GENERAL NOTES

GENERAL NOTES: 2002 SPECIFICATIONS  
EFFECTIVE: 01-15-02  
REVISED: 05-14-03

**GRADING AND SURFACING OR RESURFACING AND WIDENING:**  
THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

**CLEARING:**  
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE AREAS IN THE PLANS DESIGNATED SAFETY CLEARING. THE LIMITS ARE AS SHOWN AND THE CLEARING AND GRUBBING IS CONSIDERED A PART OF THE LUMP SUM ITEM FOR "CLEARING AND GRUBBING".

**SUPERELEVATION:**  
ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 OR 225.05 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

**SHOULDER CONSTRUCTION:**  
ASPHALT AND EARTH SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01 OR 560.02.

**SIDE ROADS:**  
THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

**SHOULDER DRAINS:**  
SHOULDER DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 816.02 OR 816.03 AND DETAILS IN PLANS AT LOCATIONS DIRECTED BY THE ENGINEER.

**DRIVEWAYS:**  
DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH DETAILS IN PLANS AT LOCATIONS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.  
STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.04 USING THE RADIUS NOTED ON PLANS.

**GUARDRAIL:**  
THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

**TEMPORARY SHORING:**  
SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING" OR "TEMPORARY SHORING-BARRIER SUPPORTED" DEPENDING UPON THE LOCATION OF THE SHORING.

**END BENTS:**  
THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

**UTILITIES:**  
UTILITY OWNERS ON THIS PROJECT ARE CT&T

**RIGHT-OF-WAY MARKERS:**  
ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY OTHERS.

# ROADWAY ENGLISH STANDARDS

EFF. 01-15-02  
REV. 11-23-04

ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January 15, 2002 are applicable to this project and by reference hereby are considered a part of these plans:

STD. NO.	TITLE
<b>DIVISION 2 - EARTHWORK</b>	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
<b>DIVISION 3 - PIPE CULVERTS</b>	
300.02	METHOD OF PIPE INSTALLATION
<b>DIVISION 4 - MAJOR STRUCTURES</b>	
422.10	Reinforced Bridge Approach Fills (Beg. March 2003 Let Use Detail in Lieu of Standard)
<b>DIVISION 5 - SUBGRADE, BASES AND SHOULDERS</b>	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
<b>DIVISION 6 - ASPHALT BASES AND PAVEMENTS</b>	
610.04	Asphalt Wearing Surface on Approach Slab (Beg. July 2004 Let Do Not Use This Standard)
654.01	Pavement Repairs
<b>DIVISION 8 - INCIDENTALS</b>	
806.01	CONCRETE RIGHT-OF-WAY MARKER
820.04	DRAINAGE INSTALLATION IN SHOULDER BERM GUTTER
840.00	CONCRETE BASE PAD FOR DRAINAGE STRUCTURES
840.18	CONCRETE MEDIAN DROP INLET TYPE "D"
862.02	GUARDRAIL INSTALLATION
862.03	STRUCTURE ANCHOR UNITS
876.02	GUIDE FOR RIP RAP AT PIPE OUTLETS

Note: Not to Scale

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

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# CONVENTIONAL PLAN SHEET SYMBOLS

## BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EP
Property Corner	-----
Property Monument	□ ECM
Parcel/Sequence Number	①23
Existing Fence Line	-----
Proposed Woven Wire Fence	-----
Proposed Chain Link Fence	-----
Proposed Barbed Wire Fence	-----
Existing Wetland Boundary	-----
Proposed Wetland Boundary	-----
Existing High Quality Wetland Boundary	-----
Existing Endangered Animal Boundary	-----
Existing Endangered Plant Boundary	-----

## BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or UG Tank Cap	○
Sign	○
Well	○
Small Mine	✕
Foundation	□
Area Outline	□
Cemetery	⊕
Building	□
School	□
Church	□
Dam	-----

## HYDROLOGY:

Stream or Body of Water	-----
Hydro, Pool or Reservoir	-----
River Basin Buffer	-----
Flow Arrow	-----
Disappearing Stream	-----
Spring	○
Swamp Marsh	-----
Proposed Lateral, Tail, Head Ditch	-----
False Sump	-----

## RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○
Switch	○
RR Abandoned	-----
RR Dismantled	-----

## RIGHT OF WAY:

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	-----
Proposed Right of Way Line	-----
Proposed Right of Way Line with Iron Pin and Cap Marker	-----
Proposed Right of Way Line with Concrete or Granite Marker	-----
Existing Control of Access	○
Proposed Control of Access	○
Existing Easement Line	-----
Proposed Temporary Construction Easement	-----
Proposed Temporary Drainage Easement	-----
Proposed Permanent Drainage Easement	-----
Proposed Permanent Utility Easement	-----

## ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	-----
Proposed Slope Stakes Fill	-----
Proposed Wheel Chair Ramp	-----
Curb Cut for Future Wheel Chair Ramp	-----
Existing Metal Guardrail	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----
Equality Symbol	⊕
Pavement Removal	-----

## VEGETATION:

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

## EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	-----
Bridge Wing Wall, Head Wall and End Wall	-----
MINOR:	
Head and End Wall	-----
Pipe Culvert	-----
Footbridge	-----
Drainage Box: Catch Basin, DI or JB	□ CB
Paved Ditch Gutter	-----
Storm Sewer Manhole	○
Storm Sewer	-----

## UTILITIES:

POWER:	
Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	○
Power Line Tower	⊗
Power Transformer	⊗
UG Power Cable Hand Hole	□
H-Frame Pole	●
Recorded UG Power Line	-----
Designated UG Power Line (S.U.E.*)	-----

## TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	○
Telephone Booth	□
Telephone Pedestal	□
Telephone Cell Tower	⊗
UG Telephone Cable Hand Hole	□
Recorded UG Telephone Cable	-----
Designated UG Telephone Cable (S.U.E.*)	-----
Recorded UG Telephone Conduit	-----
Designated UG Telephone Conduit (S.U.E.*)	-----
Recorded UG Fiber Optics Cable	-----
Designated UG Fiber Optics Cable (S.U.E.*)	-----

## WATER:

Water Manhole	○
Water Meter	○
Water Valve	⊗
Water Hydrant	⊗
Recorded UG Water Line	-----
Designated UG Water Line (S.U.E.*)	-----
Above Ground Water Line	-----

## TV:

TV Satellite Dish	⊗
TV Pedestal	□
TV Tower	⊗
UG TV Cable Hand Hole	□
Recorded UG TV Cable	-----
Designated UG TV Cable (S.U.E.*)	-----
Recorded UG Fiber Optic Cable	-----
Designated UG Fiber Optic Cable (S.U.E.*)	-----

## GAS:

Gas Valve	◆
Gas Meter	⊗
Recorded UG Gas Line	-----
Designated UG Gas Line (S.U.E.*)	-----
Above Ground Gas Line	-----

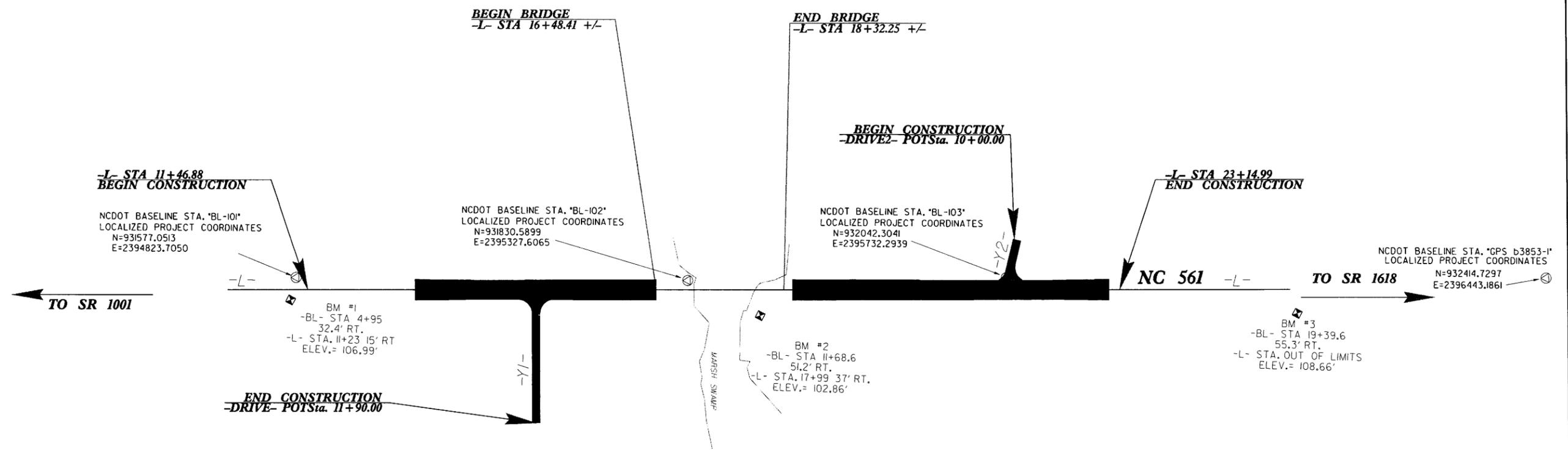
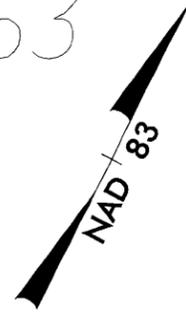
## SANITARY SEWER:

Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
UG Sanitary Sewer Line	-----
Above Ground Sanitary Sewer	-----
Recorded SS Forced Main Line	-----
Designated SS Forced Main Line (S.U.E.*)	-----

## MISCELLANEOUS:

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

# SURVEY CONTROL SHEET B-3853



## CONTROL DATA

BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
101	BL-101	931577.0513	2394823.7050	106.08	11+29.99	17.74 LT
102	BL-102	931830.5899	2395327.6065	105.86	16+94.06	13.63 LT
103	BL-103	932042.3041	2395732.2939	105.67	21+50.77	17.54 LT
1	GPS B3853-1	932414.7297	2396443.1861	110.49		OUTSIDE PROJECT LIMITS

## BENCHMARK DATA

```

.....
301      ELEVATION = 106.99'
N 931545      E 2394832
L STATION 11+23 15' RT
"X" CHISELED ONTO NE CORNER OF BRIDGE
BM #1
.....
302      ELEVATION = 102.86'
N 931833      E 2395444
L STATION 17+99 37' RT
RR SPIKE IN BASE OF 24" GUM
BM #2
.....
303      ELEVATION = 108.66'
N 932187      E 2396128
L STATION OUT OF LIMITS
RR SPIKE IN BASE OF 24" GUM
BM #3
.....

```

**DATUM DESCRIPTION**

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B3853-1" WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 932414.7297(11) EASTING: 2396443.1861(11) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.00004122 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B3853-1" TO -L- STATION (supplied by roadway) IS

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

## NOTES

THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:

[HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.doh.dot.state.nc.us/preconstruct/highway/location/project/)  
 FILE: u3853\_ls.control.050526.txt

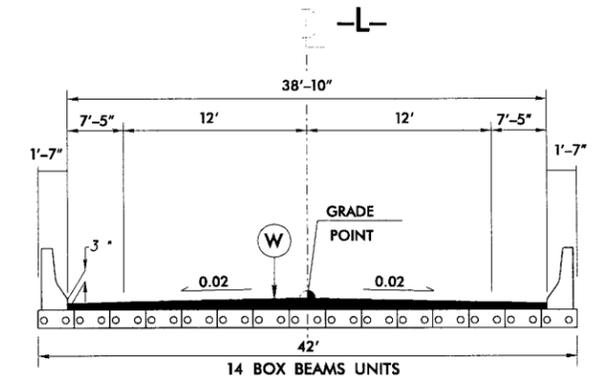
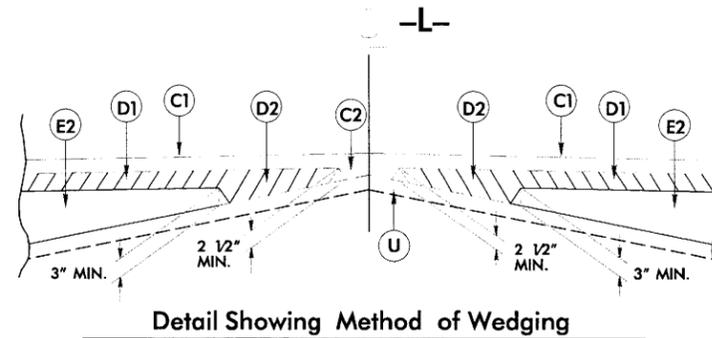
SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

Ⓢ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.  
 PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.  
 NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING USER SERVICE (OPUS)

PROJECT REFERENCE NO. B-3853	SHEET NO. 2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PAVEMENT SCHEDULE	
C1	PROPOSED APPROX. 2 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 275 LBS. PER SQ. YARD.
C2	PROPOSED VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YARD PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 1 1/2" IN DEPTH.
D1	PROPOSED APPROX. 2 1/4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 257 LBS. PER SQ. YARD.
D2	PROPOSED VARIABLE DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YARD PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 2 1/4" OR GREATER THAN 4" IN DEPTH.
E1	PROPOSED APPROX. 3" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YARD.
E2	PROPOSED VARIABLE DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YARD PER 1" DEPTH TO BE PLACED IN LAYERS NOT GREATER THAN 5 1/2" IN DEPTH OR LESS THAN 3" IN DEPTH.
J1	PROPOSED 8" AGGREGATE BASE COURSE.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)

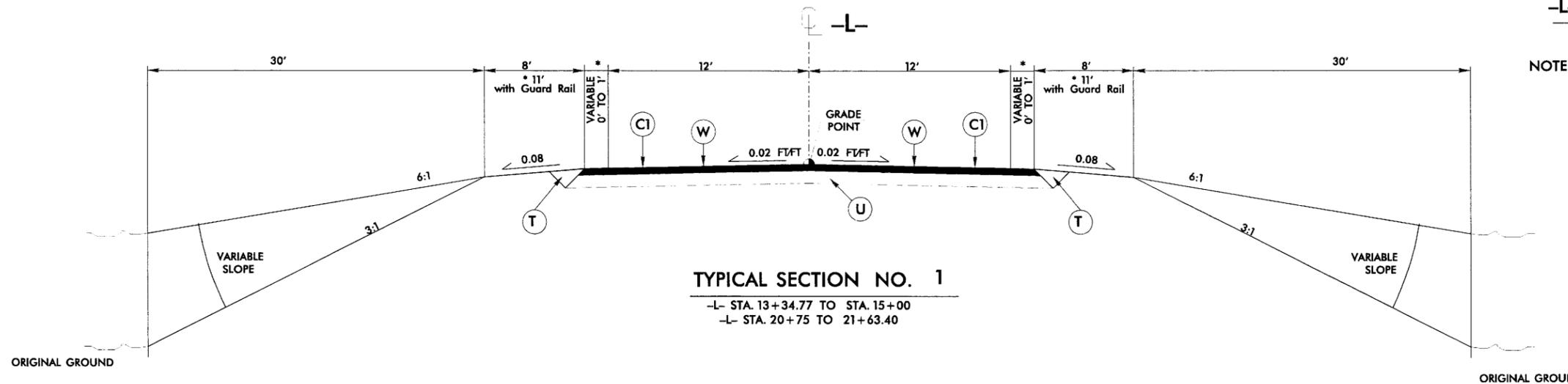
NOTE: ALL PAVEMENT EDGE SLOPES ARE 1H UNLESS OTHERWISE SHOWN.



**L- BRIDGE TYPICAL SECTION**

STA. 16+52.25 TO STA. 18+32.25

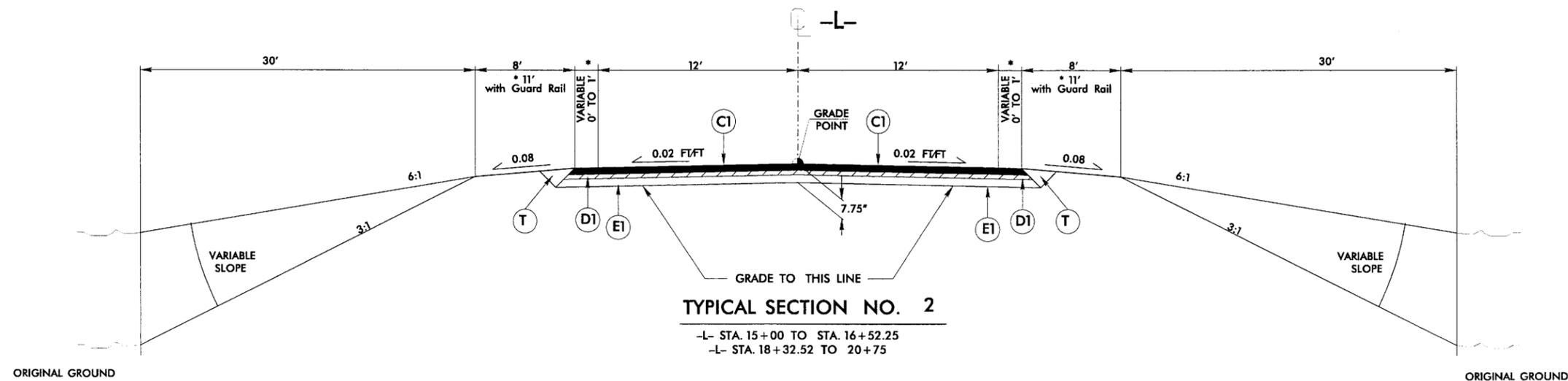
NOTE: 7'-5" SHOULDER WIDTH DUE TO HYDRAULIC SPREAD REQUIREMENTS.



**TYPICAL SECTION NO. 1**

L- STA. 13+34.77 TO STA. 15+00  
L- STA. 20+75 TO 21+63.40

\* MATCH EXISTING PAVEMENT WIDTH



**TYPICAL SECTION NO. 2**

L- STA. 15+00 TO STA. 16+52.25  
L- STA. 18+32.52 TO 20+75

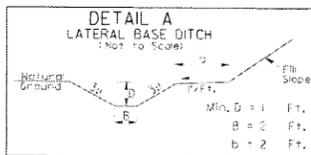
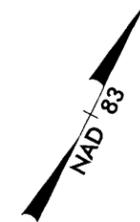
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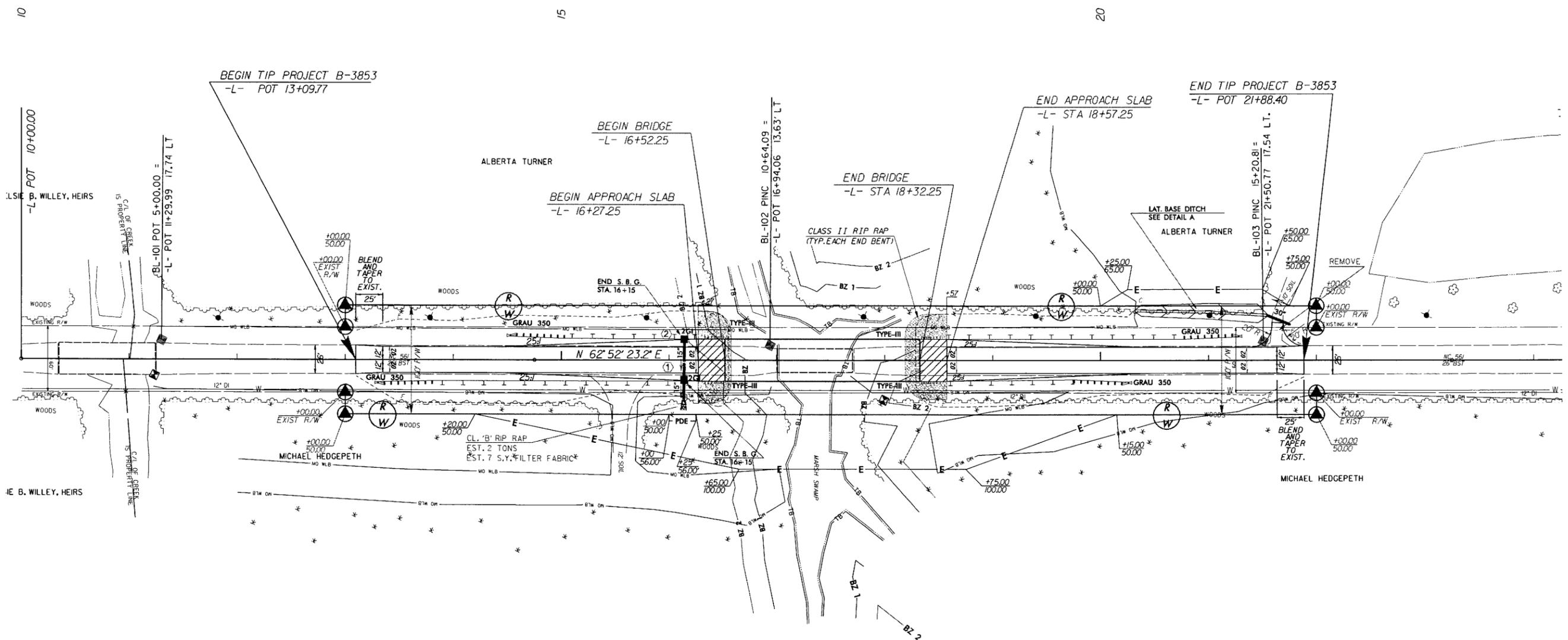




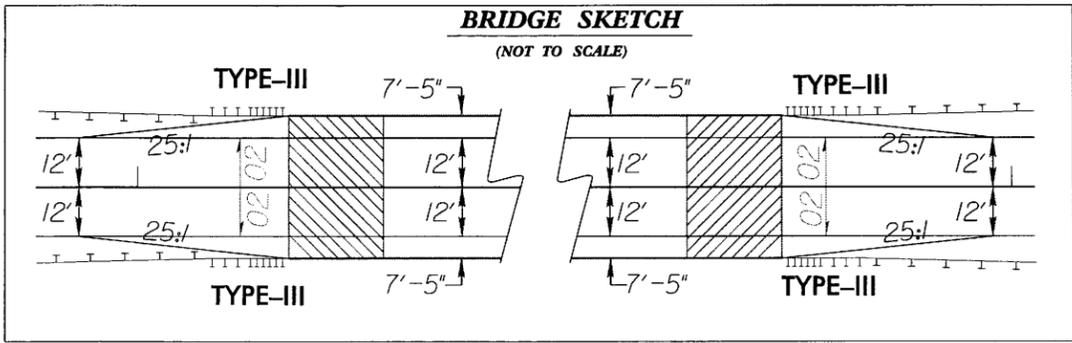
PROJECT REFERENCE NO. B-3853	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



-L- STA 20+32 TO 21+55 LT

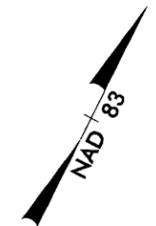


REVISIONS

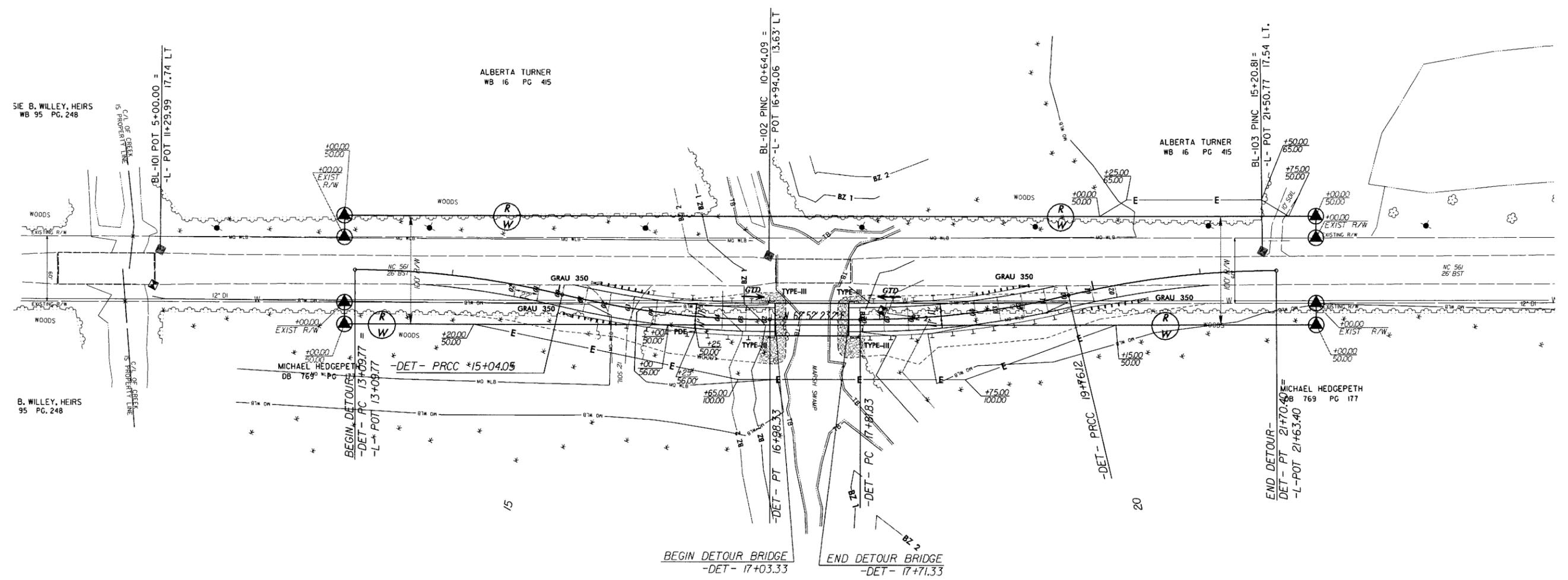


10  
15  
20

PROJECT REFERENCE NO. B-3853	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



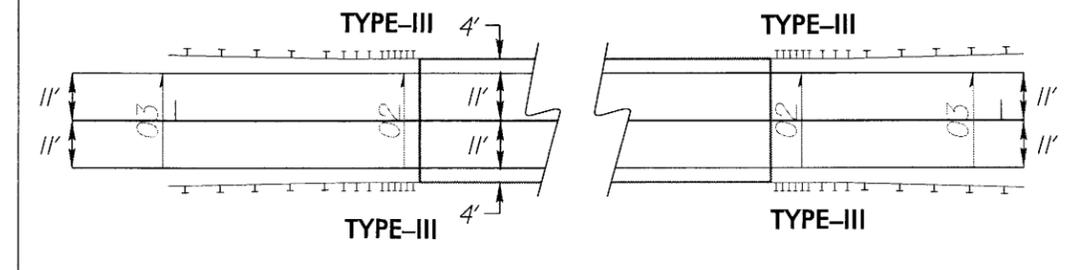
REVISIONS

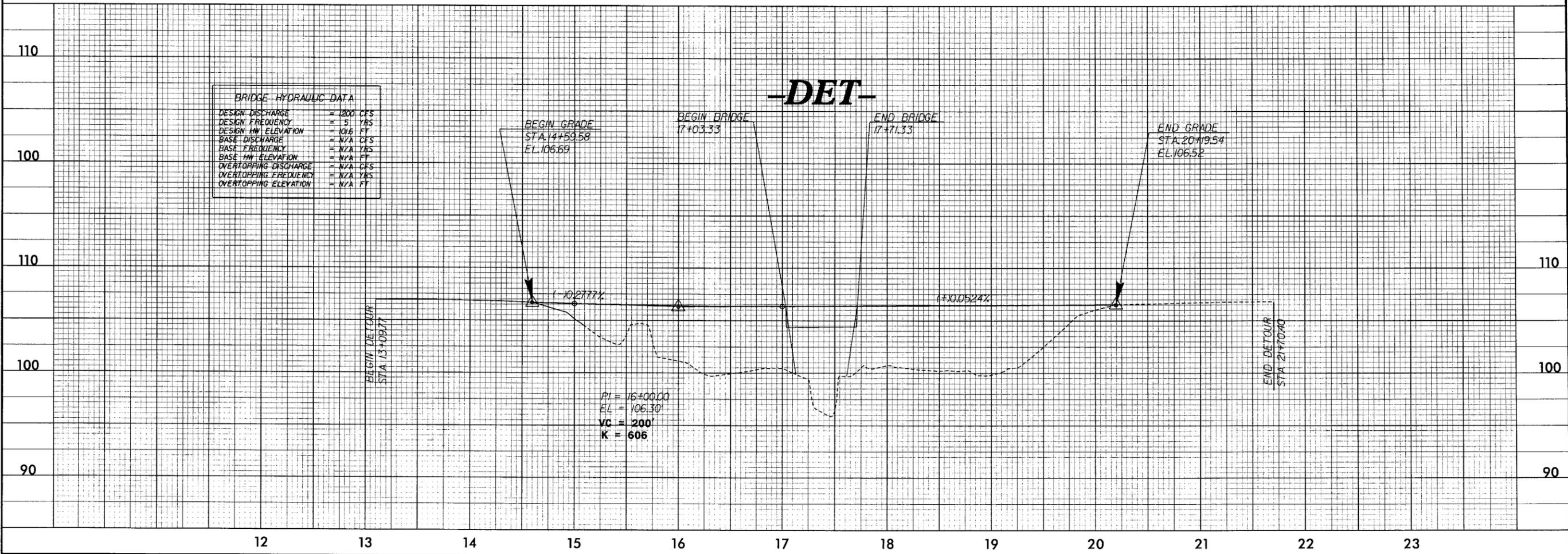
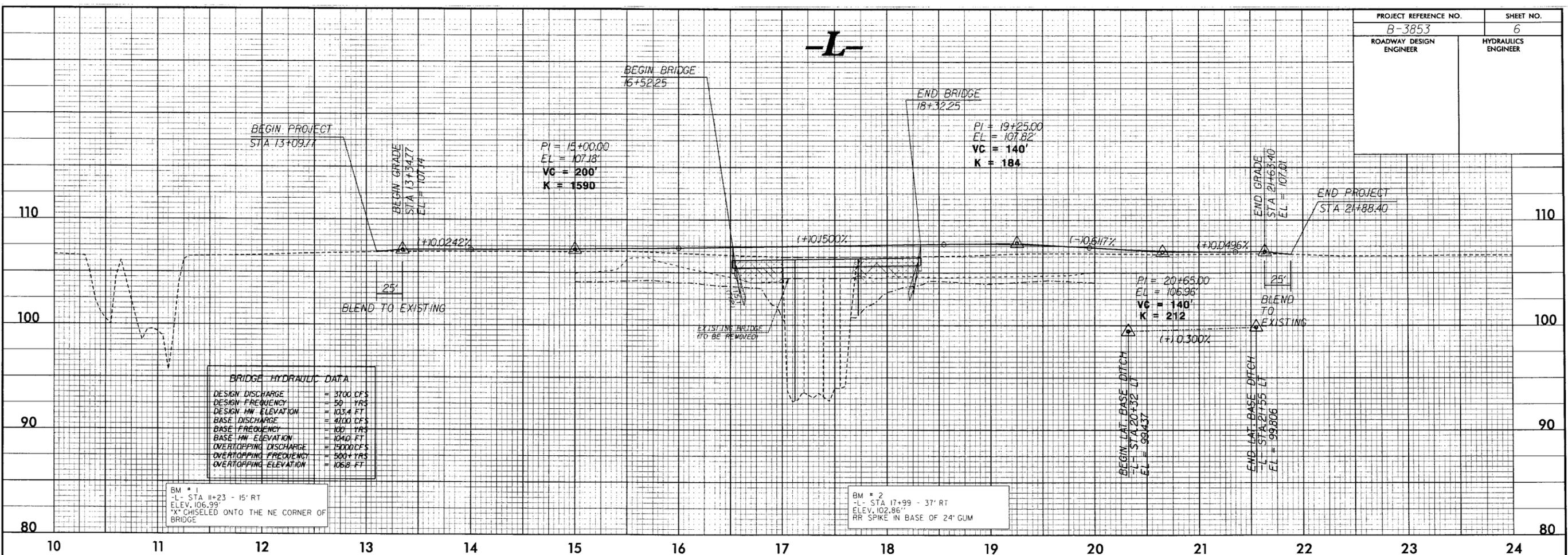


DETOUR ROAD CURVE DATA-

PI Sta 14+07.35 Δ = 13° 19' 51.7" (RT) D = 6° 51' 42.4" L = 194.28' T = 97.58' R = 835.00' V = 45 MPH' e = SEE PLANSHEET	PI Sta 16+01.63 Δ = 13° 19' 51.7" (LT) D = 6° 51' 42.4" L = 194.28' T = 97.58' R = 835.00' V = 45 MPH' e = SEE PLANSHEET	PI Sta 18+79.42 Δ = 13° 19' 51.8" (LT) D = 6° 51' 42.4" L = 194.28' T = 97.58' R = 835.00' V = 45 MPH' e = SEE PLANSHEET	PI Sta 20+73.70 Δ = 13° 19' 51.8" (RT) D = 6° 51' 42.4" L = 194.28' T = 97.58' R = 835.00' V = 45 MPH' e = SEE PLANSHEET
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DETOUR BRIDGE SKETCH



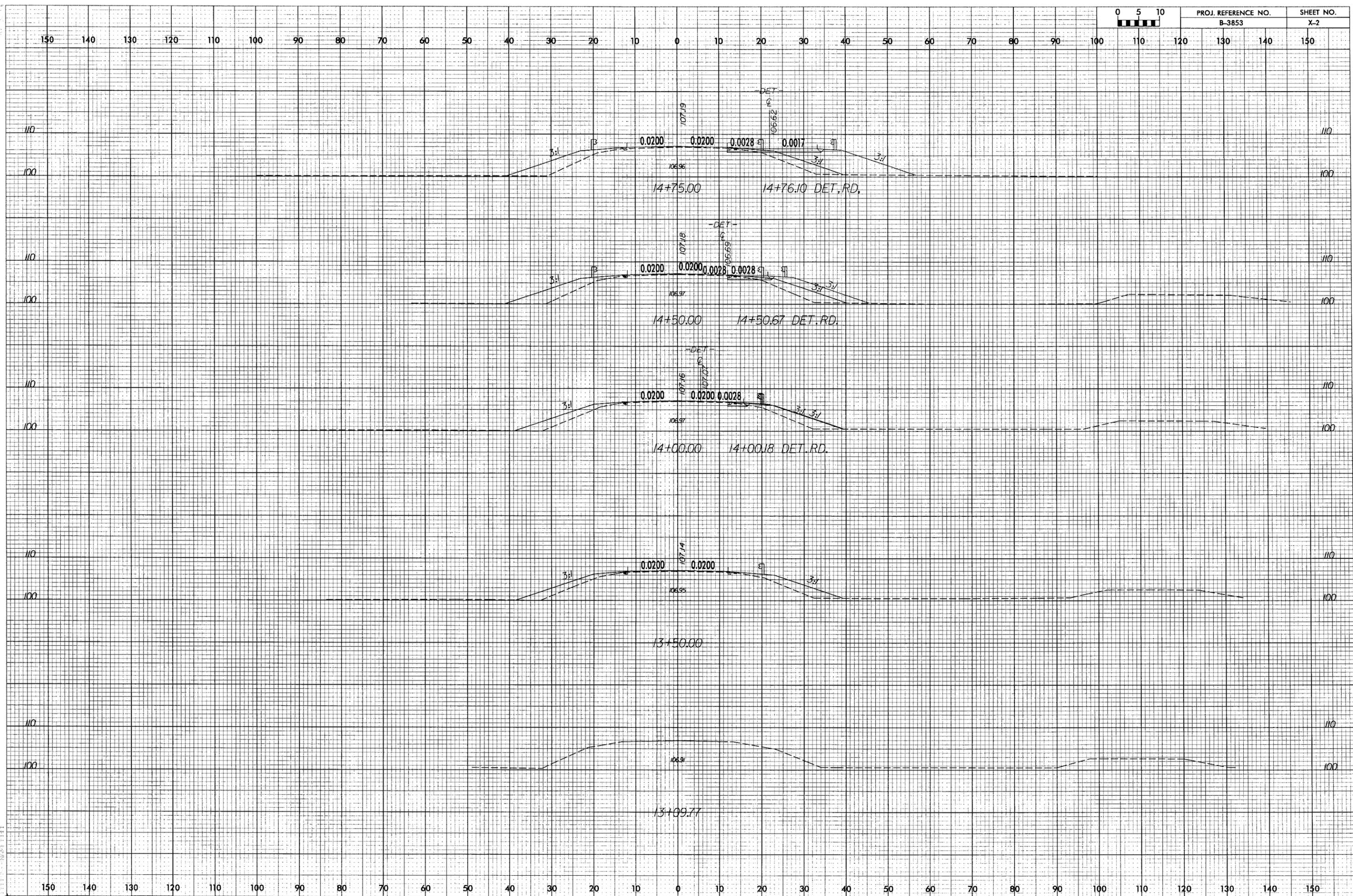


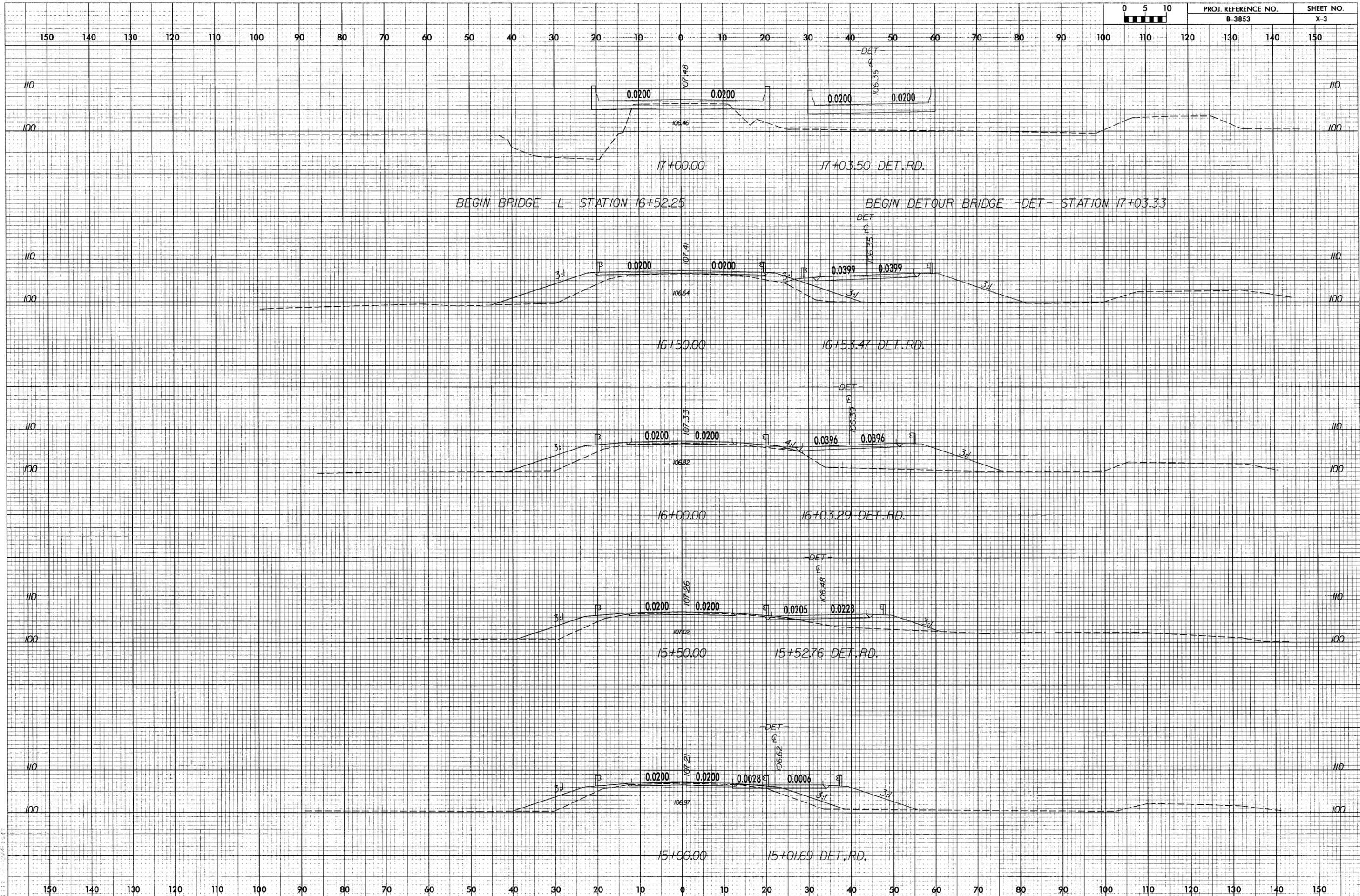
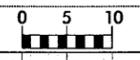
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

***CROSS SECTION INDEX SHEET***

LINE	STATION TO STATION		LINE	STATION TO STATION		SHEET
-L-	13+09.77	14+75	-DET-	14+00.18	14+76.10	X-2
	15+00	17+00		15+01.69	17+03.50	X-3
	17+50	18+50		17+53.50	18+53.58	X-4
	19+00	21+00		19+03.93	20+56.64	X-5
	21+50	22+00				X-6

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BEGIN BRIDGE -L- STATION 16+52.25

BEGIN DETOUR BRIDGE -DET- STATION 17+03.33

17+00.00

17+03.50 DET.RD.

16+50.00

16+53.47 DET.RD.

16+00.00

16+03.29 DET.RD.

15+50.00

15+52.76 DET.RD.

15+00.00

15+01.69 DET.RD.

0.0200

0.0200

0.0200

0.0200

0.0200

0.0200

0.0399

0.0399

0.0200

0.0200

0.0396

0.0396

0.0200

0.0200

0.0205

0.0223

0.0200

0.0200

0.0028

0.0006

107.48

106.46

DET

106.36

107.41

106.64

DET

106.25

107.33

106.82

DET

106.18

107.26

107.02

DET

106.48

107.21

106.97

DET

106.62

3:1

3:1

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3:1

4:1

4:1

3:1

3:1

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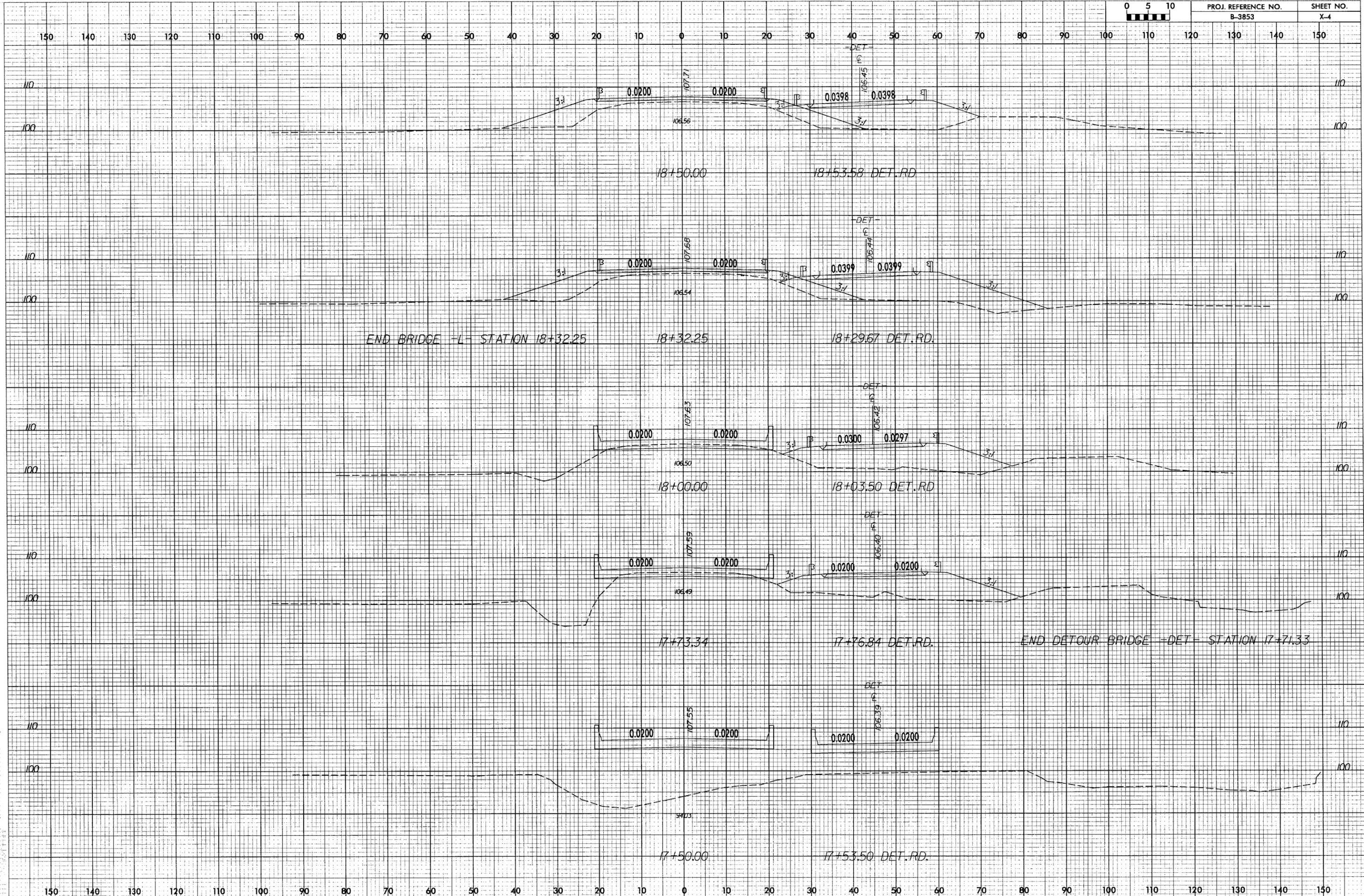
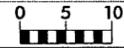
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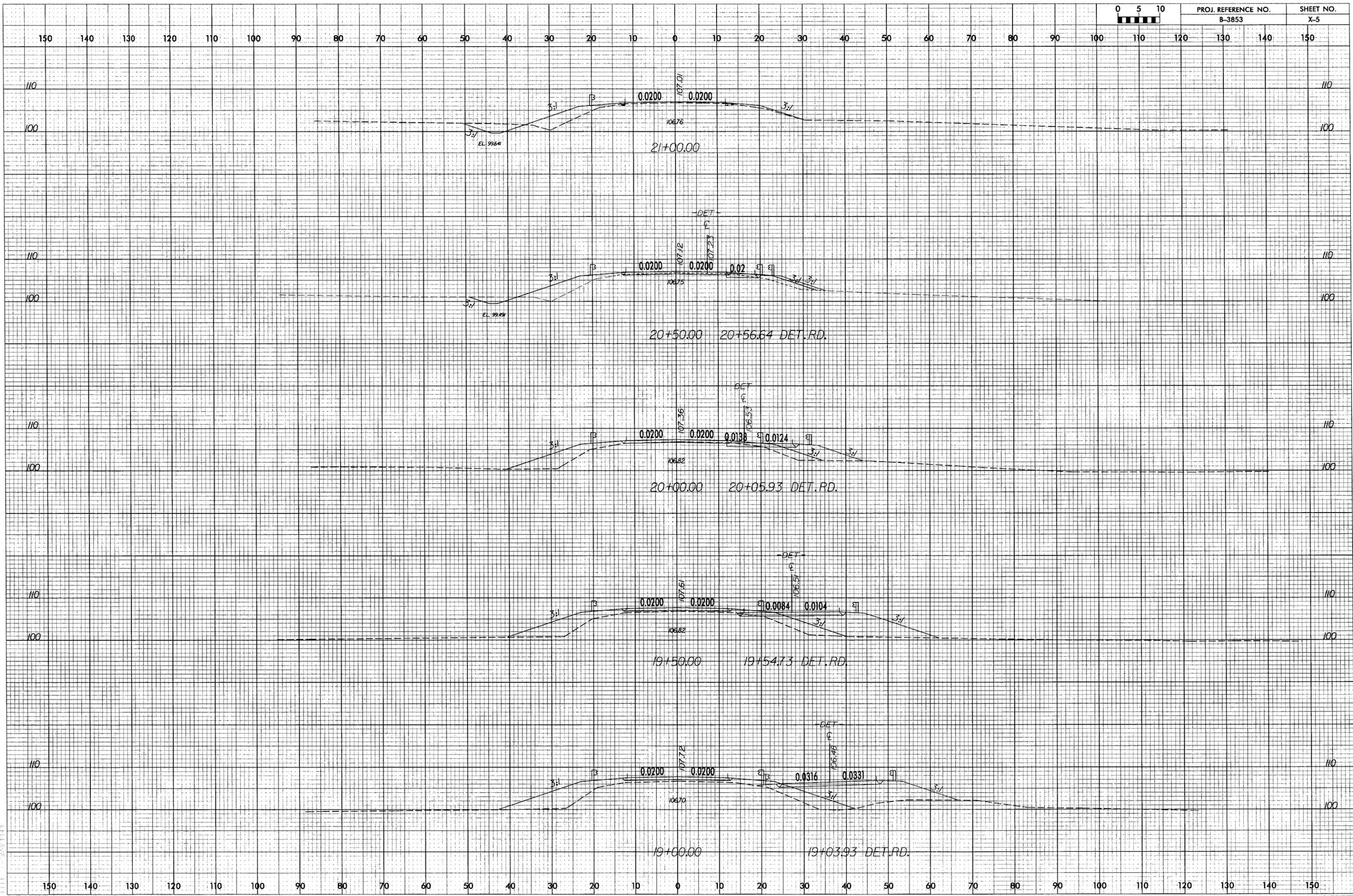
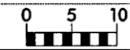
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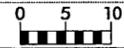
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PROJ. REFERENCE NO.  
B-3853

SHEET NO.  
X-6

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

