STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

June 5, 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 Permit Application and Neuse River Basin Buffer Authorization** for the proposed replacement of Bridge No. 53 over Swift Creek on NC 102, in Pitt County. Federal Aid Project No. BRSTP-102(2), WBS 33574.1.1, TIP No. B-4231.

Please find enclosed the permit drawings, buffer drawings, Pre-construction Notification (PCN), Categorical Exclusion Action Classification Form (CE), Natural Resource Technical Report (NRTR) Executive Summary, and half-size plan sheets for the above referenced project. The North Carolina Department of Transportation (NCDOT) proposes to replace existing Bridge No. 53 on NC 102 over Swift Creek in Pitt County. The project involves replacement of the existing bridge structure with a single span 100-foot box beam bridge at approximately the same location and slightly higher roadway elevation of the existing structure using top-down construction. Since the proposed bridge will completely span Swift Creek, there will be no permanent impacts to jurisdictional resources. Traffic will be detoured off-site along surrounding roads, during construction.

Impacts to Waters of the United States

General Description: The project is located in the Neuse River Basin (Hydrologic Unit 03020202). A best usage classification of "C SW NSW" has been assigned to Swift Creek [DWQ Index # 27-97-(0.5)]. Neither High Quality Waters (HQW), Water Supplies (WS-I: undeveloped watersheds or WS-II: predominately undeveloped watersheds), listed Section 303(d) impairments, nor Outstanding Resource Waters (ORW) occur within 1.0 mile (1.6 km) of project study area. Swift Creek is not designated as a North Carolina Natural or Scenic River, or as a national Wild and Scenic River.

Permanent Impacts: No permanent impacts will occur as a result of the proposed project. The proposed bridge will completely span Swift Creek and no wetlands are present at the project site.

Temporary Impacts: No temporary impacts to jurisdictional resources will be necessary for the construction of this project.

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

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

WEBSITE: WWW.NCDOT.ORG

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC

Utility Impacts: No impacts to jurisdictional resources will occur due to relocation of utilities in the project area. Existing utility lines are in conflict with the proposed project; however, all utility work will be conducted outside of jurisdictional areas.

Neuse River Basin Buffer Rules

This project is located in the Neuse River Basin; therefore, the regulations pertaining to the buffer rules apply. There will be a total of 14,345 ft^2 of impacts to riparian buffers, 9,425 ft^2 in Zone 1 and 4,920 ft^2 in Zone 2, due to construction of the new bridge and stormwater management on NC 102 and Bridge No. 53 (See attached Stormwater Management Plan). All practicable measures to minimize impacts within buffer zones were followed. According to the buffer rules, bridges and road crossings are allowable. Uses designated as allowable may proceed within the riparian buffer provided that there are no practical alternatives to the requested use pursuant to Item (8) of this Rule. These uses require written authorization from the Division of Water Quality.

Bridge Demolition

The existing bridge consists of a concrete deck on steel I-beams with an asphalt-wearing surface. The substructure is composed of timber end bents and interior bents consisting of timber caps on timber piles and an additional timber crutch bent. The bridge can be removed without dropping components into Waters of the United States during construction. Best Management Practices for Bridge Demolition and Removal will be followed to avoid any temporary fill from entering Waters of the United States.

During project development, the National Marine Fisheries Service recommended restricting in-water work between the dates of February 15 to June 30 to protect anadromous fish. Therefore, Steam Crossing Guidelines for Anadromous Fish will be implemented.

Federally Protected Species

As of March 8, 2006 the US Fish and Wildlife Service (USFWS) lists four federally protected species for Pitt County (see Table 1). All biological conclusions remain valid for each protected species. No species have been added or deleted from the list since the completion of the CE (November 2004).

Table 1. Federally protected species of Pitt County.

Scientific Name	Common Name	Federal Status	Habitat Present	Biological Conclusion
Haliaeetus leucocephalus	Bald eagle	T(PFD)	No	No Effect
Trichechus manatus	West Indian Manatee	E	No	No Effect
Picoides borealis	Red-cockaded woodpecker	E	No	No Effect
Elliptio steinstansana	Tar spinymussel	E	No	No Effect

E – Endangered T (PFD) – Threatened "Proposed for Delisting".
T – Threatened

Avoidance and Minimization

Avoidance examines all appropriate and practicable possibilities of averting impacts to "Waters of the United States". The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts. Avoidance and minimization measures were incorporated as part of the project design these included:

- Use of an off-site detour during construction.
- Bridge will completely span Swift Creek
- Construction of a 24-foot longer bridge
- Best Management Practices will also be utilized during demolition of the existing bridge and construction of the new bridge.

Mitigation

No mitigation is proposed for this project.

Regulatory Approvals

Section 404 Permit: All aspects of this project are being processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance with 23 CFR 771.115(b). The NCDOT requests that these activities be authorized by a Nationwide Permit 23 (FR number 10, pages 2020-2095, January 15, 2002).

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

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

A copy of this application will be posted on the NCDOT website at: http://www.doh.dot.state.nc.us/preconstruct/pe/neu/permit.html. Thank you for your time and assistance with this project. Please contact Tyler Stanton at tstanton@dot.state.nc.us or (919) 715-1439 if you have any questions or need additional information.

Sincerely,

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

Cc W/attachment:
Mr. John Hennessy, NCDWQ (5 Copies)
Mr. Travis Wilson, NCWRC
Mr. Gary Jordan, USFWS
Mr. Ron Sechler, NMFS
Mr. Michael Street, NCDMF
Mr. Steve Sollod, NCDCM
Mr. Bill Arrington, NCDCM
Dr. David Chang, P.E., Hydraulics
Mr. Greg Perfetti, P.E., Structure Design
Mr. Mark Staley, Roadside Environmental
Mr. C. E. Lassiter, P.E., Division Engineer
Mr. Jay Johnson, Division 2 Environmental Officer

Cc 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. John Williams, 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:
   - ☒ Section 404 Permit
   - ☐ Section 10 Permit
   - ☒ 401 Water Quality Certification
   - ☒ Riparian or Watershed Buffer Rules
   - ☐ Isolated Wetland Permit from DWQ
   - ☐ Express 401 Water Quality Certification

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

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
   Raleigh, NC
   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: _____

2. T.I.P. Project Number or State Project Number (NCDOT Only): B-4231

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

4. Location
   County: Pitt Nearest Town: Ayden
   Subdivision name (include phase/lot number): N/A
   Directions to site (include road numbers/names, landmarks, etc.): _____
   _____
   _____

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): -77.3994 °N 35.4709 °W

6. Property size (acres): N/A

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

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

9. Describe the existing conditions on the site and general land use in the vicinity of the project at the time of this application: Rural with forested areas and scattered residential and farms.
   _____
   _____

10. Describe the overall project in detail, including the type of equipment to be used:
Replacement of the existing bridge structure with a 100-foot box beam bridge at approximately the same location and slightly higher roadway elevation of the existing structure using top-down construction.

11. Explain the purpose of the proposed work: The bridge is considered to be structurally deficient and functionally obsolete and the replacement will result in safer traffic operations.

IV. Prior Project History

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

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: N/A

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)
N/A					
				Total Wetland Impact (acres)	0

3. List the total acreage (estimated) of all existing wetlands on the property: N/A

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)
N/A						
Total Stream Impact (by length and acreage)					0	0

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)
N/A				
Total Open Water Impact (acres)				0

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

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

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.):
Current land use in the vicinity of the pond:
Size of watershed draining to pond:_____ Expected pond surface area:_____

VII. Impact Justification (Avoidance and Minimization)

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

techniques to be followed during construction to reduce impacts. Use of an off-site detour during construction, construction of a 26-foot longer single-span bridge, Best Management Practices will also be utilized during demolition of the existing bridge and construction of the new bridge.

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.
   N/A

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 Neuse)? 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	9,425	3 (2 for Catawba)	0
2	4,920	1.5	0
Total	14,345		0

* 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.
N/A

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. See Stormwater Management Plan

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.
N/A

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:
N/A

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).

_____

_____

_____ 6/5/06

Applicant/Agent's Signature **Date**

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

CATEGORICAL EXCLUSION ACTION CLASSIFICATION FORM

TIP Project No.	**B-4231**
State Project No.	**8.1222101**
W.B.S. No.	**33574.1.1**
Federal Project No.	**BRSTP-102 (2)**

A. Project Description:

The purpose of this project is to replace Pitt County Bridge No. 53 on NC 102 over Swift Creek. The replacement structure will be a bridge approximately 110 feet long and will accommodate a 30-foot wide travelway. The cross section will provide a minimum of two 12-foot lanes and 3-foot offsets. The roadway grade of the new structure will be approximately the same as the existing grade at this location

The approach roadway will extend approximately 370 feet from east end of the existing bridge and 350 feet from the west end of the existing bridge. The approach will be widened to a 24-foot pavement width providing two 12-foot lanes. Eight-foot shoulders including 2 feet paved and 6 feet of turf will be provided on each side. Shoulder width will be increased by 3-feet where guardrail is warranted. The roadway will be designed as a Rural Local Route with a 60 mile per hour design speed.

Traffic will be detoured offsite during construction (see Figure 1). The offsite detour must be improved to carry the traffic from NC 102. The pavement must be widened by 2 feet on both sides and then the whole road resurfaced. Bridge No. 53 on the detour SR 1122 (Hines Road) must be crutched and gates and signals must be placed at the rail crossing on SR 1122. Part of the funding (see Special Project Information, Section D) for improvements to the offsite detour will come from a source other than the Highway Bridge Replacement and Rehabilitation Program.

B. Purpose and Need:

Bridge No. 53 includes a three-span superstructure composed of an asphalt-wearing surface and concrete deck on I-beams. The substructure includes timber caps and piles. A timber crutch has been added for temporary support until the bridge can be replaced.

Bridge Maintenance Unit records indicate the bridge has a sufficiency rating of 8.2 out of a possible 100 for a new structure. The bridge is considered structurally deficient and functionally obsolete (structure appraisal of 2 out of 9, deck geometry appraisal of 2 out of 9) according to Federal Highway Administration (FHWA) standards and therefore eligible for FHWA's Highway Bridge Replacement and Rehabilitation Program.

The bridge carries 4200 vehicles a day and continues to remain open only because of a temporary timber crutch. Rehabilitation of the 66-year old timber substructure is not practical. If NC 102 is to continue its service to traffic into the future, Bridge No. 53 must be replaced.

C. Proposed Improvements:

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

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

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

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

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

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

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

4. Transportation corridor fringe parking facilities.

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

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

7. Approvals for changes in access control.

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

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

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

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

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

13. Acquisition and construction of wetland, stream and endangered species mitigation sites.

14. Remedial activities involving the removal, treatment or monitoring of soil or groundwater contamination pursuant to state or federal remediation guidelines.

D. Special Project Information:

Estimated Costs:

Total Construction	$ 575,000
Right of Way	28,000
Gates and Signals	135,000*
Crutching Bridge 176	135,000*
Offsite Detour Improvement	459,000*
Total	$ 1,304,000

*Funding for these portions of the project will come from a source other than the Federal Highway Bridge Replacement Program.

Estimated Traffic:

Current - 4200 vpd	Year 2025 - 7400 vpd
TTST - 2%	Dual – 3%

Design Exceptions: There are no anticipated design exceptions for this project.

Bridge Demolition: Based on current construction practices it is anticipated that the bridge can be removed without dropping any of its components into the water.

Offsite Detour: NCDOT Guidelines for Evaluation of Offsite Detours for Bridge Replacement Projects considers multiple project variables beginning with the additional time traveled by the average road user resulting from the offsite detour. The offsite detour for this project would include SR 1723, SR 1122, SR 1149 and back to NC 102. The detour for the average road user would result in 10 minutes additional travel time (2.6 miles additional travel at 35 mph) that falls within the range where consideration is given to an onsite detour. Given that both Emergency Services and the school system have indicated they could work with a duration of a few months and given the desire to avoid building a temporary bridge over an anadramous fish stream, an offsite detour has been determined an appropriate measure. Efforts should be made to keep the duration of the project to a minimum. The Division concurs in this recommendation.

Other Alternatives Considered: NCDOT developed two onsite detour alternatives; one to the north and one to the south. The onsite detour to the north was estimated at $1,050,000. The onsite detour to the south was estimated at $1,100,000. Had NCDOT elected an onsite detour, the northern alternative would have been preferred.

Funding: Federal Highways Administration (FHWA) has agreed to fund the project up to the cost of the onsite detour. The reasoning behind this decision is the desire to avoid spending money on a temporary bridge associated with the onsite detour when the same money could be spent on permanent improvements to make an offsite detour more acceptable. Therefore FHWA will fund up to $1,050,000 for the replacement of the bridge and improvements to the offsite detour. NCDOT's Program Development Branch has identified other funds available for this purpose.

E. Threshold Criteria

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

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

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

(14)	Will the project require any stream relocations or channel changes?		X

SOCIAL, ECONOMIC, AND CULTURAL RESOURCES		YES	NO
(15)	Will the project induce substantial impacts to planned growth or land use for the area?		X
(16)	Will the project require the relocation of any family or business?		X
(17)	Will the project have a disproportionately high and adverse human health and environmental effect on any minority or low-income population?		X
(18)	If the project involves the acquisition of right of way, is the amount of right of way acquisition considered minor?	X	
(19)	Will the project involve any changes in access control?		X
(20)	Will the project substantially alter the usefulness and/or land use of adjacent property?		X
(21)	Will the project have an adverse effect on permanent local traffic patterns or community cohesiveness?		X
(22)	Is the project included in an approved thoroughfare plan and/or Transportation Improvement Program (and is, therefore, in conformance with the Clean Air Act of 1990)?	X	
(23)	Is the project anticipated to cause an increase in traffic volumes?		X
(24)	Will traffic be maintained during construction using existing roads, staged construction, or on-site detours?	X	
(25)	If the project is a bridge replacement project, will the bridge be replaced at its existing location (along the existing facility) and will all construction proposed in association with the bridge replacement project be contained on the existing facility?	X	
(26)	Is there substantial controversy on social, economic, or environmental grounds concerning the project?		X
(27)	Is the project consistent with all Federal, State, and local laws relating to the environmental aspects of the project?	X	
(28)	Will the project have an "effect" on structures/properties eligible for or listed on the National Register of Historic Places?		X

(29)	Will the project affect any archaeological remains which are important to history or pre-history?		X
(30)	Will the project require the use of Section 4(f) resources (public parks, recreation lands, wildlife and waterfowl refuges, historic sites, or historic bridges, as defined in Section 4(f) of the U. S. Department of Transportation Act of 1966)?		X
(31)	Will the project result in any conversion of assisted public recreation sites or facilities to non-recreation uses, as defined by Section 6(f) of the Land and Water Conservation Act of 1965, as amended?		X
(32)	Will the project involve construction in, across, or adjacent to a river designated as a component of or proposed for inclusion in the National System of Wild and Scenic Rivers?		X

F. Additional Documentation Required for Unfavorable Responses in Part E

Response to Question 3: National Marine Fisheries Service has requested a risk averse approach regarding anadramous fish. They recommend applying a moratorium from February 15 to June 30 of any given year. Based on preliminary information, it appears as though there will be no "in-water" construction. If upon further analysis, it is determined that there will be in-water work, NCDOT will adhere to the moratorium.

G. CE Approval

TIP Project No.	**B-4231**
State Project No.	**8.1222101**
W.B.S. No.	**33574.1.1**
Federal Project No.	**BRSTP-102 (2)**

Project Description:

The purpose of this project is to replace Pitt County Bridge No. 53 on NC 102 over Swift Creek. The replacement structure will be a bridge approximately 110 feet long and will accommodate a 30-foot wide travelway. The cross section will provide a minimum of two 12-foot lanes and 3-foot offsets. The roadway grade of the new structure will be approximately the same as the existing grade at this location

The approach roadway will extend approximately 370 feet from east end of the existing bridge and 350 feet from the west end of the existing bridge. The approach will be widened to a 24-foot pavement width providing two 12-foot lanes. Eight-foot shoulders including 2 feet paved and 6 feet of turf will be provided on each side. Shoulder width will be increased by 3-feet where guardrail is warranted. The roadway will be designed as a Rural Local Route with a 60 mile per hour design speed.

Traffic will be detoured offsite during construction (see Figure 1). The offsite detour must be improved to carry the traffic from NC 102. The pavement must be widened by 2 feet on both sides and then the whole road resurfaced. Bridge No. 53 on the detour SR 1122 (Hines Road) must be crutched and gates and signals must be placed at the rail crossing on SR 1122. Part of the funding (see Special Project Information, Section D) for improvements to the offsite detour will come from a source other than the Highway Bridge Replacement and Rehabilitation Program.

Categorical Exclusion Action Classification:

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

Approved:

11/22/04 — Date

Assistant Manager
Project Development & Environmental Analysis Branch

11-22-04 — Date

Project Planning Unit Head
Project Development & Environmental Analysis Branch

For Type II(B) projects only:

11-29-04 — Date

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

PROJECT COMMITMENTS:

Pitt County
Bridge No. 53 on NC 102
Over Swift Creek
Federal Aid Project No. BRSTP-102 (1)
State Project No. 8.1222101
W.B.S. No. 33574.1.1
T.I.P. No. B-4231

All Design Groups/Division Resident Engineer – Anadramous Fish

Based on preliminary information, it appears that it may be possible to accomplish the replacement without in-water work. If this is the case, then the project let date is not constrained by a moratorium.

NCDOT will implement Stream Crossing Guidelines for Anadramous Fish Crossings.

If in later design it is determined that in-water work is required, then the North Carolina Division of Marine Fisheries has indicated that a moratorium on in-water construction will be in place from February 15 to June 30 of any given year.

- To the extent practical, construction should be accomplished without the use of construction pads in the water.
- To the extent practical, bridge demolition should occur without getting into the water.
- To the extent practical, the footprint of the proposed project should be minimized.

All Design Groups/Division Resident Engineer – Anadramous Fish
The offsite detour must be improved to carry the traffic from NC 102. The pavement must be widened by 2 feet on both sides and then the whole road resurfaced. Bridge No. 53 on the detour SR 1122 (Hines Road) must be crutched and gates and signals must be placed at the rail crossing on SR 1122.

Resident Engineer/Bridge Maintenance Unit/Roadway Design/Program Development– Overlapping Detours

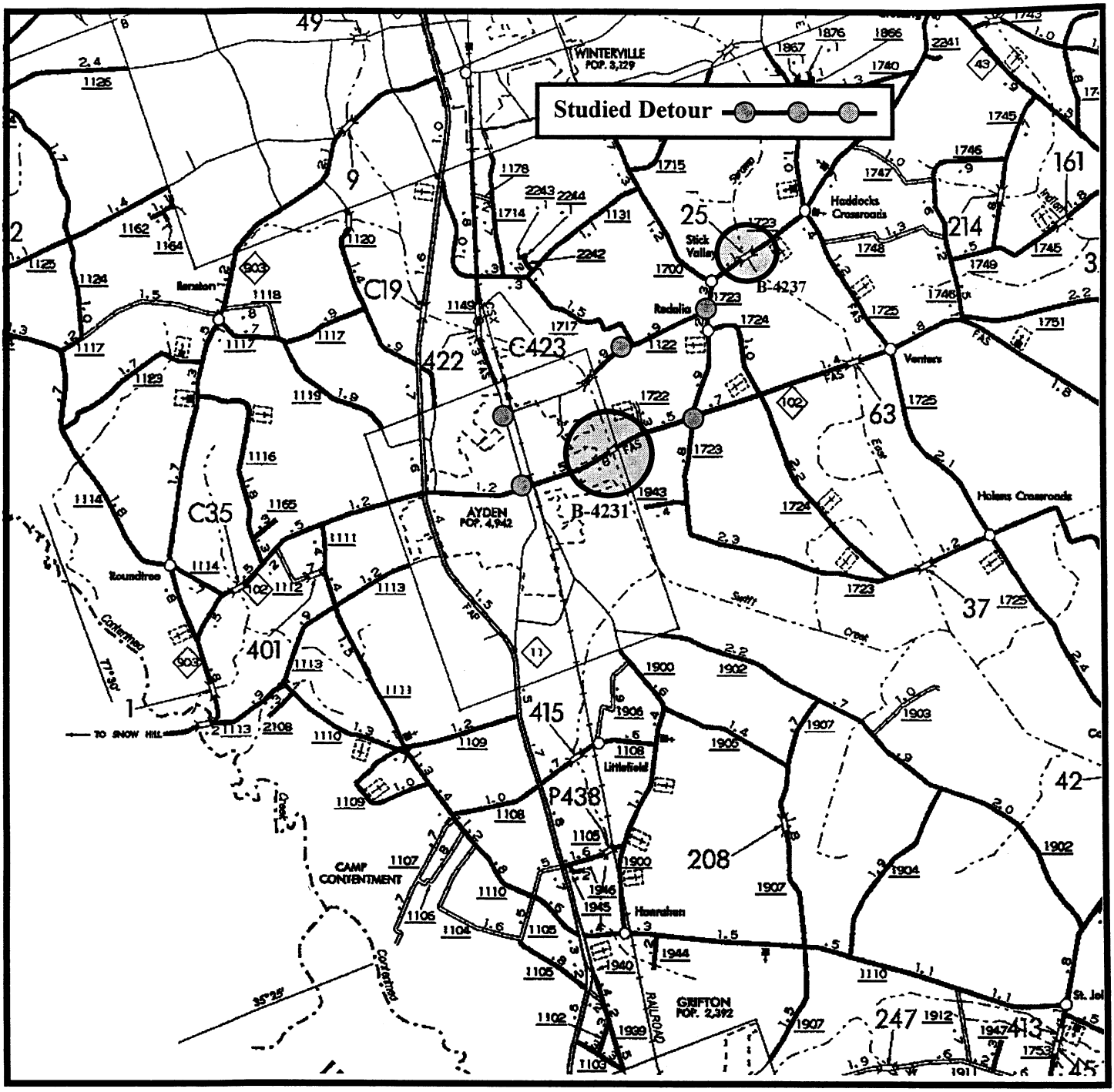
The detour routes for B-4231 and TIP Project B-4237 (see Figure 1) share SR 1723 as one leg of the detour. As part of B-4231, SR 1723 is to be resurfaced. B-4237 shall not begin utilizing an offsite detour until improvements on SR 1723 as part of B-4237 are complete.

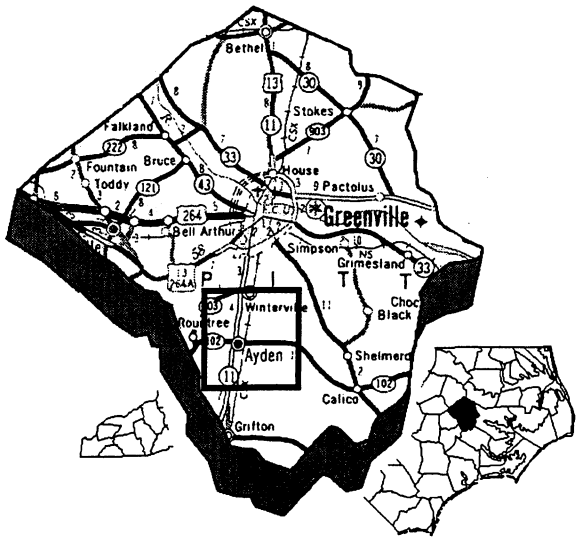
Roadway Design/Program Development – School Bus Concerns – Accelerating the Let

The Pitt County Schools Transportation Director has indicated that an offsite detour is not highly desirable but workable if the duration of the project is only a few months. He has requested that as much of the work as possible overlap the summer period (beginning in June) when school busses are not running. If it becomes apparent that there will be no "in-water" work associated with the project, and if it is practical to accelerate the Let so that some of the construction occurs during the summer months, then consideration should be given to accelerating the Let of the project.

Program Development – Funding

The Federal Highway Administration has agreed to fund up to the cost of the onsite detour ($1,050,000) out of the Highway Bridge Replacement and Rehabilitation Program. The Program Development Branch agreed (10-15-04) to fund the remainder of the project costs out of other funding sources. This remaining cost is estimated at $254,000





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

PITT COUNTY
REPLACE BRIDGE NO. 53 ON NC 102
OVER SWIFT CREEK
B-4231

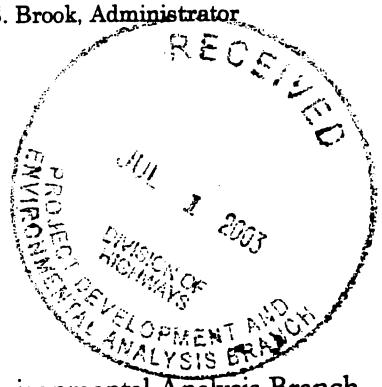
Figure 1

John Williams

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

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

Division of Historical Resources
David J. Olson, Director



June 25, 2003

MEMORANDUM

TO: Greg Thorpe, Manager
Project Development and Environmental Analysis Branch
NCDOT Division of Highways

FROM: David Brook DSB for David Brook

SUBJECT: Replacement bridge No. 53 on NC 102 over Swift Creek, B-4231, Pitt County, ER03-0960

Thank you for your letter of April 7, 2003, concerning the above project.

We have conducted a search of our maps and files and located the following structure of historical or architectural importance within the general area of this project:

Arden Historic District, listed in the National Register

We recommend that a Department of Transportation architectural historian identify and evaluate any structures over fifty years of age within the project area, and report the findings to us.

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

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

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

cc: Mary Pope Furr, NCDOT
Matt Wilkerson, NCDOT

Federal Aid # BRSTP-102(2) *TIP #* B-4231 *County*: Pitt

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

Project Description: Replace Bridge No. 53 on NC 102 over Swift Creek

On 08/02/2004, representatives of the

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

Reviewed the subject project at

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

All parties present agreed

- [ ] There are no properties over fifty years old within the project's area of potential effects.
- [x] There are no properties less than fifty years old which are considered to meet Criteria Consideration G within the project's area of potential effects.
- [x] There are properties over fifty years old within the project's Area of Potential Effects (APE), but based on the historical information available and the photographs of each property, the property identified as Bridge #53 is considered not eligible for the National Register and no further evaluation of it is necessary.
- [x] There are no National Register-listed or Study Listed properties within the project's area of potential effects.
- [x] All properties greater than 50 years of age located in the APE have been considered at this consultation, and based upon the above concurrence, all compliance for historic architecture with Section 106 of the National Historic Preservation Act and GS 121-12(a) has been completed for this project.
- [x] There are no historic properties affected by this project. (*Attach any notes or documents as needed*)

Signed:

Mary Pope Furr — 8-2-2004
Representative, NCDOT — Date

RW Hall — 8/2/04
FHWA, for the Division Administrator, or other Federal Agency — Date

Renee Gledhill-Earley — 8-2-04
Representative, HPO — Date

Renee Gledhill-Earley — 8-2-04
State Historic Preservation Officer — Date

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

Executive Summary

The following is a Natural Systems Technical Report for the proposed replacement of Bridge No. 53 on NC 102 over Swift Creek in Pitt County, North Carolina (TIP No. B-4231).

INTRODUCTION

The proposed project will replace Bridge No. 53 on NC 102 over Swift Creek in Pitt County, North Carolina. The project study area is primarily disturbed urban and agricultural lands and previously disturbed forests. The project study area is located in the Coastal Plain physiographic region, approximately 10 to 40 feet (3 to 12 meters) above mean sea level. Two hydric soils are within the project study area including: Bibb complex and Bladen fine sandy loam.

PHYSICAL CHARACTERISTICS

Water Resources

Water resources located within the project study area lie in North Carolina Division of Water Quality (NCDWQ) Subbasin 03-04-09 and the United States Geological Survey Subbasin 03020202 of the Neuse River Drainage Basin. The best usage classification of Fork Swamp (NCDWQ Stream Index #27-97-(0.5)) is Class C NSW SW (NCDEM, 2002). No water resources classified as High Quality Waters, Water Supplies, or Outstanding Resource Waters or waters on the 303(d) list are located within the project study area.

Biotic Resources

Two plant communities were found within the project study area, Coastal Plain bottomland hardwood and urban/agricultural disturbed. The following table shows the area of each of these communities occurring within the project area.

Plant Communities Within the Project Area

Community	Area
Coastal Plain Bottomland Hardwood	16.62 ac (6.73 ha)
Urban/Agricultural Disturbed Lands	8.97 ac (3.63 ha)

JURISDICTIONAL TOPICS

Surface Waters and Wetlands

Swift Creek is considered jurisdictional surface waters under Section 404 of the Clean Water Act. Based upon the results of the field investigation, the project study area also contains jurisdictional wetlands. Since no alternatives have been selected, impacts to these "Waters of the United States" cannot be determined. The tables below indicate the length or acreage of each jurisdictional surface water or wetland within the project area.

Surface Waters

Site	Length
Swift Creek	520 feet (158 meters)

Wetlands

Site	Total Area	Cowardin Classification	DWQ Rating
Wetland WA	0.15 ac (0.06 ha)	PF01Cd	47
Wetland WB	0.12 ac (0.09 ha)	PF01/2Cd	47
Wetland WC	0.10 ac (0.06 ha)	PF01/2Cd	47
Wetland WD	0.15 ac (0.06 ha)	PF01Cd	47

Due to the potential for water quality impacts during construction, in-stream construction moratoriums to limit the effects on fishery resources have been suggested. The moratorium applies if the following species are supported by the stream: sturgeon (February 1 to June 30), brown and brook trout (October 15 to April 15), rainbow trout (January 1 to April 15), spotfin chub (May 15 to August 15), smallmouth bass (May 1

to July 15), eastern sunfish (April 1 to June 30), western sunfish (May 1 to June 30), and other anadromous fish (February 15 to June 30). A 25 foot (7.6 m) buffer moratorium exists relative to the smallmouth bass. Qualified biologists from the NCDOT will assess the stream for the abovementioned species. Once the fish have been identified as being supported by the stream, the appropriate moratorium will be applied.

Essential fish habitat (EFH) is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The aforementioned waters include aquatic areas and their associated physical, chemical, and biological properties used by fish and include aquatic areas historically used by fish where appropriate. The aforementioned substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities. The proposed project is not anticipated to involve EFH.

Permits

The Nationwide Permit #23 (Approved Categorical Exclusions) should cover the impacts to jurisdictional stream in the project study area. Nationwide Permit #33 (Temporary Construction, Access, and Dewatering) may be needed for temporary construction access if that is not addressed in National Environmental Policy Act (NEPA) document. A final permitting strategy cannot be developed until a design alternative is selected.

A Section 401 General Water Quality Certification is also required for any activity that may result in a discharge into "Waters of the United States" or for which an issuance of a federal permit or license is issued. Certifications are administered through the NCDWQ. Final determination of permit applicability lies with the USACE.

Federally Protected Species

Plants and animals with federal classification of Endangered, Threatened, Proposed Endangered, and Proposed Threatened are protected under provisions of Section 7 and Section 9 of the Endangered Species Act. As of February 25, 2003, the United States Fish and Wildlife Service identified three endangered species and one threatened species as potentially occurring in Pitt County. The following table lists each species, its status and biological conclusion.

Scientific Name	Common Name	Federal Status	Biological Conclusion
Haliaeetus leucocephalus	Bald Eagle	Threatened	No Effect
Trichechus manatus	West Indian Manatee	Endangered	No Effect
Picoides borealis	Red-cockaded woodpecker	Endangered	No Effect
Elliptio steinstansana	Tar spinymussel	Endangered	Unresolved

Bald Eagle **Biological Conclusion: No Effect**

Suitable habitat for the bald eagle consisting of large bodies of water does not exist within the project study area. In addition, there is a large amount of human disturbance within and around the project study area. Review of NCNHP maps indicated no known populations of this species within one mile of the project study area. No impacts to this species from project construction are anticipated.

West Indian Manatee **Biological Conclusion: No Effect**

Suitable habitat for the West Indian manatee consisting of sufficient depth of at least 5 feet (1.5 meters) does not exist within the project study area. NCNHP has no records of any known populations of the West Indian Manatee within a one-mile radius of the project study area. No impacts to this species from project construction are anticipated.

Red-Cockaded Woodpecker **Biological Conclusion: No Effect**

Suitable habitat for the RCW consisting of old pine stands within or near the project study area does not exist. In addition, large agricultural fields fracture the landscape generating boundaries that RCWs do not typically cross. Therefore, a large enough area of appropriate habitat is not located within the project study area. The NCNHP lists no documented occurrences of the RCW within 5.0 miles of the project study area. No impacts are anticipated to the RCW because of project construction

Tar Spinymussel **Biological Conclusion: Unresolved**

Habitat needed to support Tar spinymussel is present within Fork Swamp of the project study area. ARCADIS biologists were not able to conduct a detailed survey for this species. A survey should be conducted to confirm the presence or absence of this species. NCNHP does not list any known occurrences of the Tar spinymussel within

the project study area. NCNHP does not list this species as occurring in Pitt County in over 20 years.

Surveys for these species are valid for two years from the survey data. If the project is not constructed within those two years, then the species may need to be resurveyed before the let date.

CONCLUSIONS

The project study area contains one perennial stream, approximately 520 linear feet (158 meters), and four jurisdictional wetland areas, totaling approximately 0.52 acres (0.21 ha). Since no alternatives have been selected, impacts to these "Waters of the United States" cannot be determined. A Nationwide Permit #33 and a Section 401 General Water Quality Certification may also be required for the project. No federally protected species, except the federally endangered Tar spinymussel, are likely to be impacted by this project.

During replacement of the bridge, construction of an onsite temporary detour bridge, use of existing roadways for an off-site detour, or construction of an offsite temporary detour bridge will be required. Approximately 0.52 acres (0.21 ha) of wetlands and a perennial stream are located within the project study area. One wetland area is located northeast of the existing bridge, two wetland areas are located southeast of the existing bridge, and one wetland area is located southwest of the existing bridge. Additionally, several residences are located approximately six hundred feet west of the existing bridge. If an onsite temporary detour crosses the wetlands, a geotechnical investigation of the wetland substrate's consolidation potential will have to be performed. Construction of a temporary detour bridge within the wetland areas will potentially degrade the ability of the wetland to function as well as it did before extreme compaction or distortion of the substrate occurred from the weight of the bridge.

Removal of sections of the existing causeway, thereby lengthening the bridge, will not be beneficial relative to wetland impacts since wetlands do not occur within the existing causeway. Due to the width of the stream channel relative to the existing causeway, lengthening of the bridge will not improve surface flows.

STORMWATER MANAGEMENT PLAN

State Project 33574.1.1 (B-4231)
Pitt County

Date: 4/28/06

ROADWAY DESCRIPTION

The project involves the removal and replacement of Bridge #53 over Swift Creek on NC 102 in Ayden. The existing 24 ft. wide paved road is a two-lane road with two 12 ft. paved lanes. The proposed road is 28 ft. wide with 12 ft. paved lanes and 2 ft. paved shoulders. There will be guardrail placed at the beginning and end of the bridges and the shoulder will be paved to the guardrail to help prevent erosion of the fill slopes. Bridge #53 is 76.2 ft. long and will be replaced with a 100 ft. long bridge. An off-site detour is proposed for this project.

ENVIRONMENTAL DESCRIPTION

Swift Creek is rated a Class C; Sw; NSW water classification. The project is located in the Neuse River Basin. No wetlands will be impacted by the proposed project.

BEST MANAGEMENT PRACTICES AND MAJOR STRUCTURES

Best Management Practices (BMPs) and measures used on the project to reduce the stormwater impacts are grassed swales. The proposed bridge is a single span structure eliminating the need for a bridge bent in the creek. There will be no deck drains on the proposed structure. Also the storm drainage is being discharged as far away from the stream as practicable. Off site drainage in northwest,northeast,and southeast quadrants was piped through transportation facility directly to the creek as there was no viable alternative for treatment within project limits.

The following summarizes where the BMPs used on the project:

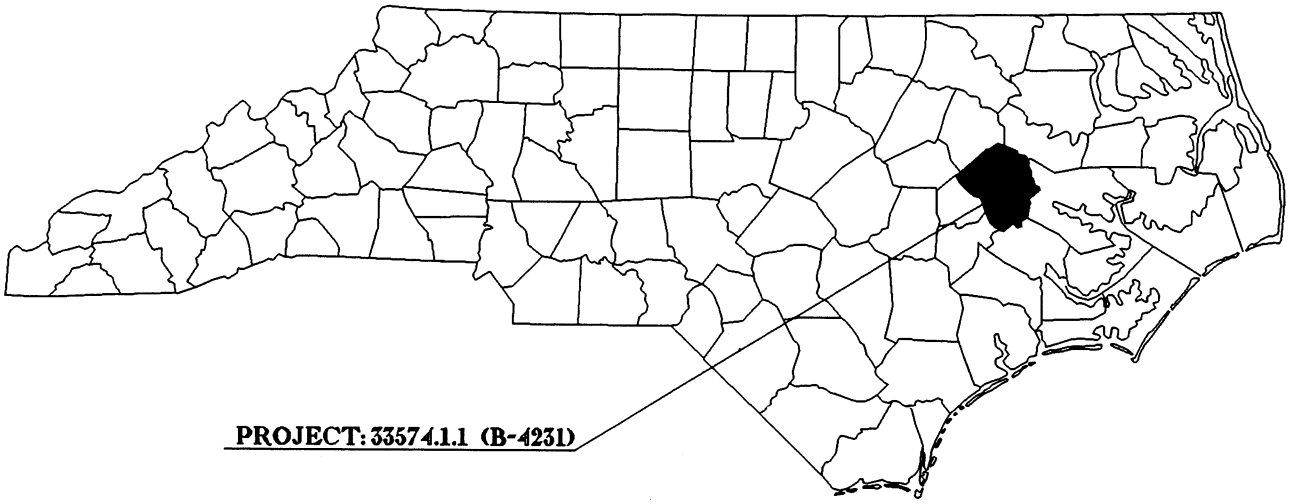
GRASSED SWALES

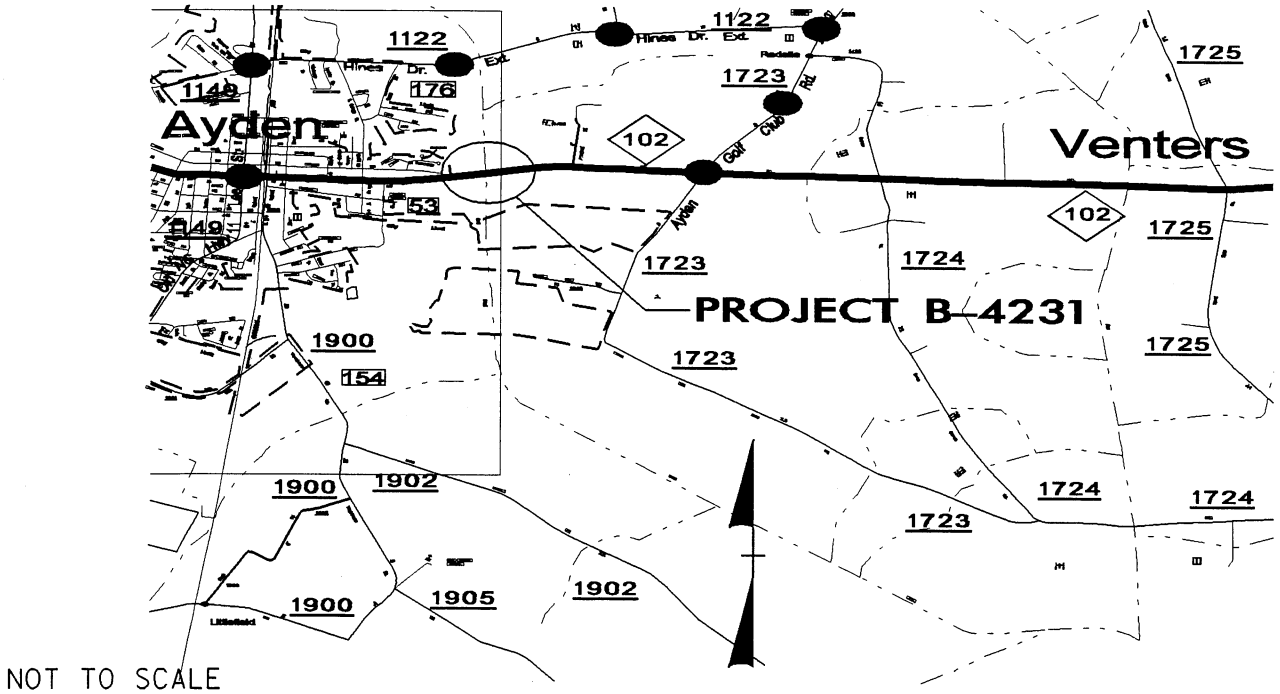
From station 20+00-L- to 22+20-L- left and right

From station 24+05-L- to 26+00-L- left.

From station 24+10-L- to 26+00-L- right.

NORTH CAROLINA





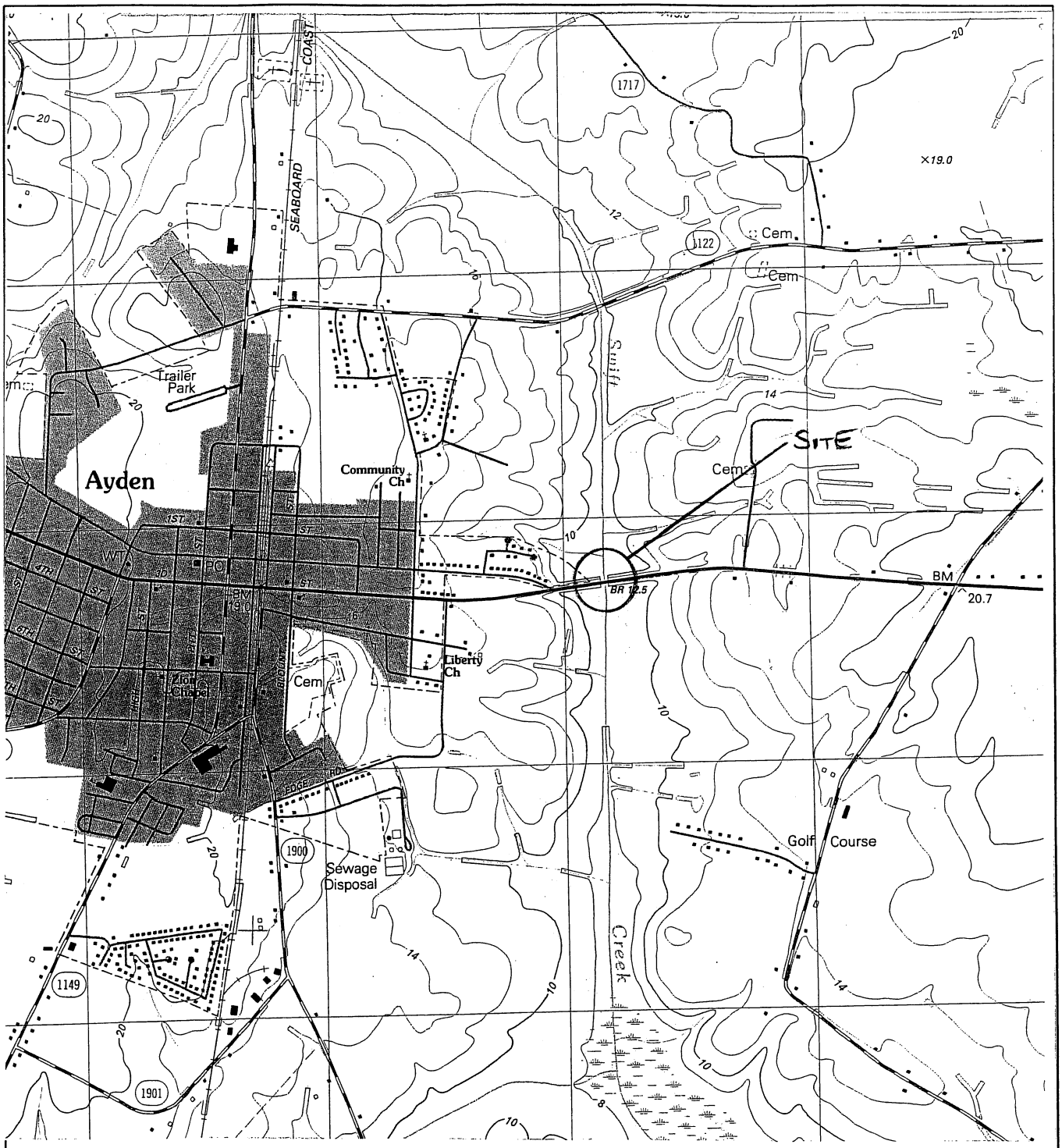
NOT TO SCALE

PERMIT DRAWINGS

VICINITY MAPS

NCDOT
DIVISION OF HIGHWAYS
PITT COUNTY
PROJECT: 33574.1.1 (B-4231)
REPLACE BRG# 53 OVER SWIFT CREEK ON NC 102

SHEET 1 OF 6 04/10/06



NOT TO SCALE

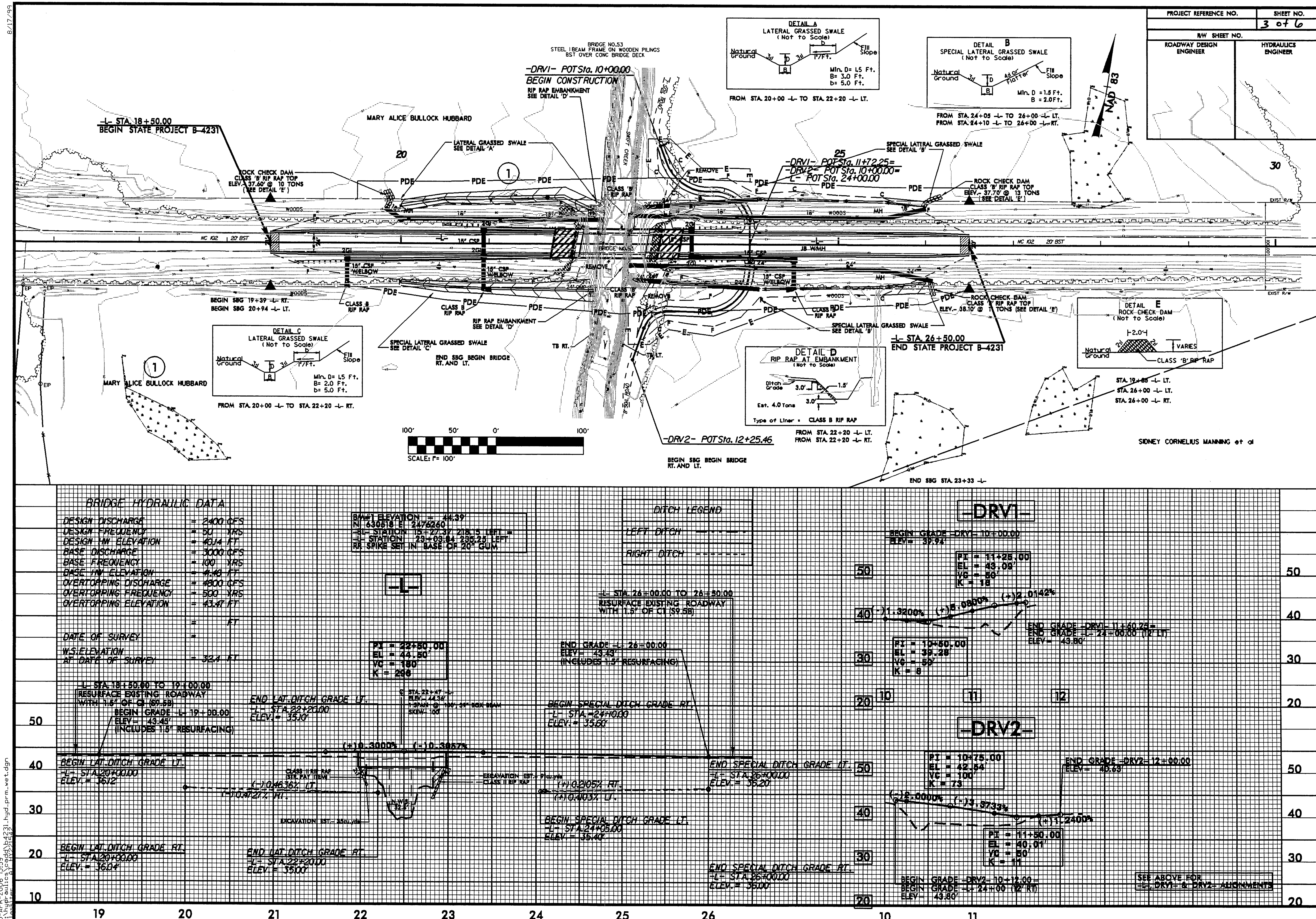
LOCATION MAPS

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

PROJECT: 33574.1.1 (B4231)

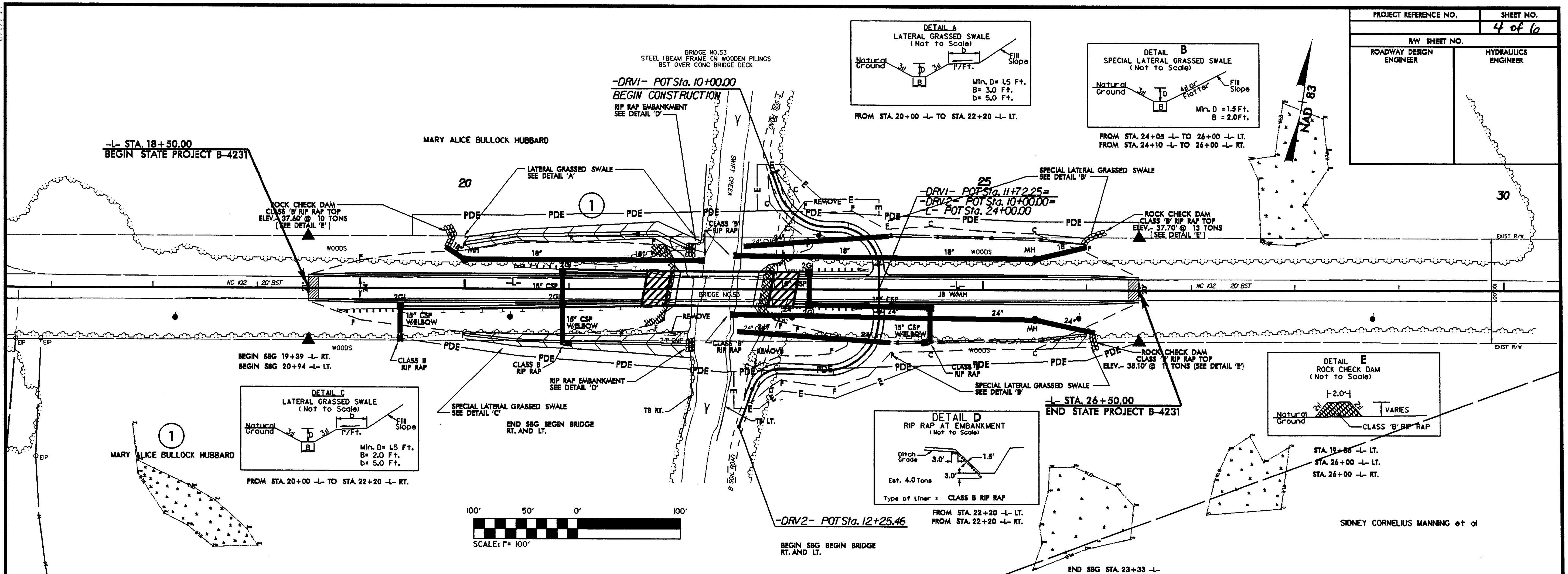
REPLACE BRG# 53 OVER SWIFT CREEK ON NC 102

SHEET 2 OF 6



PROJECT REFERENCE NO.
SHEET NO.
3 of 6
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
NAD 83
DETAIL A
LATERAL GRASSED SWALE
(Not to Scale)
Natural Ground
Fill Slope
Min. D= 1.5 Ft.
B= 3.0 Ft.
b= 5.0 Ft.
FROM STA. 20+00 -L- TO STA. 22+20 -L- LT.
DETAIL B
SPECIAL LATERAL GRASSED SWALE
(Not to Scale)
Min. D =1.5 Ft.
B = 2.0 Ft.
FROM STA. 24+05 -L- TO 26+00 -L- LT.
FROM STA. 24+10 -L- TO 26+00 -L- RT.
BRIDGE NO.53
STEEL I BEAM FRAME ON WOODEN PILINGS
BST OVER CONC BRIDGE DECK
-DRV1- POT Sta. 10+00.00
BEGIN CONSTRUCTION
RIP RAP EMBANKMENT
SEE DETAIL 'D'
-L- STA. 18+50.00
BEGIN STATE PROJECT B-4231
MARY ALICE BULLOCK HUBBARD
LATERAL GRASSED SWALE
SEE DETAIL 'A'
ROCK CHECK DAM
CLASS 'B' RIP RAP TOP
ELEV. 37.60' @ 10 TONS
(SEE DETAIL 'E')
SPECIAL LATERAL GRASSED SWALE
SEE DETAIL 'B'
-DRV1- POT Sta. 11+72.25=
-DRV2- POT Sta. 10+00.00=
-L- POT Sta. 24+00.00
ROCK CHECK DAM
CLASS 'B' RIP RAP TOP
ELEV. 37.70' @ 13 TONS
(SEE DETAIL 'E')
NC 102 20' BST
BRIDGE NO.53
EXIST R/W
BEGIN SBG 19+39 -L- RT.
BEGIN SBG 20+94 -L- LT.
CLASS B RIP RAP
RIP RAP EMBANKMENT
SEE DETAIL 'D'
SPECIAL LATERAL GRASSED SWALE
SEE DETAIL 'C'
END SBG BEGIN BRIDGE
RT. AND LT.
ROCK CHECK DAM
CLASS 'B' RIP RAP TOP
ELEV. 38.10' @ 11 TONS (SEE DETAIL 'E')
SPECIAL LATERAL GRASSED SWALE
SEE DETAIL 'B'
-L- STA. 26+50.00
END STATE PROJECT B-4231
DETAIL E
ROCK CHECK DAM
(Not to Scale)
2.0
VARIES
CLASS 'B' RIP RAP
DETAIL C
LATERAL GRASSED SWALE
(Not to Scale)
Min. D= 1.5 Ft.
B= 2.0 Ft.
b= 5.0 Ft.
FROM STA. 20+00 -L- TO STA. 22+20 -L- RT.
DETAIL D
RIP RAP AT EMBANKMENT
(Not to Scale)
Est. 4.0 Tons
Type of Liner = CLASS B RIP RAP
FROM STA. 22+20 -L- LT.
FROM STA. 22+20 -L- RT.
STA. 19+65 -L- LT.
STA. 26+00 -L- LT.
STA. 26+00 -L- RT.
-DRV2- POT Sta. 12+25.46
BEGIN SBG BEGIN BRIDGE
RT. AND LT.
SIDNEY CORNELIUS MANNING et al
END SBG STA. 23+33 -L-
SCALE: 1"= 100'
BRIDGE HYDRAULIC DATA
DESIGN DISCHARGE = 2400 CFS
DESIGN FREQUENCY = 50 YRS
DESIGN HW ELEVATION = 40.14 FT
BASE DISCHARGE = 3000 CFS
BASE FREQUENCY = 100 YRS
BASE HW ELEVATION = 41.48 FT
OVERTOPPING DISCHARGE = 4800 CFS
OVERTOPPING FREQUENCY = 500 YRS
OVERTOPPING ELEVATION = 43.47 FT
DATE OF SURVEY =
W.S. ELEVATION AT DATE OF SURVEY = 32.4 FT
BM#1 ELEVATION = 44.39'
N 630618 E 2476260
-BL- STATION 15+27.37 218.15 LEFT =
-L- STATION 23+03.84 235.25 LEFT
RR SPIKE SET IN BASE OF 20" GUM
DITCH LEGEND
LEFT DITCH
RIGHT DITCH
-L-
PI = 22+50.00
EL = 44.50'
VC = 180'
K = 296
-L- STA. 26+00.00 TO 26+50.00
RESURFACE EXISTING ROADWAY
WITH 1.5" OF C1 (S9.5B)
END GRADE -L- 26+00.00
ELEV= 43.43'
(INCLUDES 1.5" RESURFACING)
-L- STA. 18+50.00 TO 19+00.00
RESURFACE EXISTING ROADWAY
WITH 1.5" OF C1 (S9.5B)
BEGIN GRADE -L- 19+00.00
ELEV= 43.45'
(INCLUDES 1.5" RESURFACING)
END LAT. DITCH GRADE LT.
-L- STA.22+20.00
ELEV.= 35.10'
BEGIN SPECIAL DITCH GRADE RT.
-L- STA. 24+10.00
ELEV.= 35.60'
(+)0.3000% (-)0.3857%
BEGIN LAT. DITCH GRADE LT.
-L- STA.20+00.00
ELEV.= 36.12
(-)0.4636% LT.
(-)0.4727% RT.
(+)0.2105% RT.
(+)0.4103% LT.
END SPECIAL DITCH GRADE LT.
-L- STA.26+00.00
ELEV.= 35.20'
EXCAVATION EST.= 35cu.yds
BEGIN SPECIAL DITCH GRADE LT.
-L- STA.24+05.00
ELEV.= 35.40'
BEGIN LAT. DITCH GRADE RT.
-L- STA.20+00.00
ELEV.= 36.04'
END LAT. DITCH GRADE RT.
-L- STA.22+20.00
ELEV.= 35.00'
END SPECIAL DITCH GRADE RT.
-L- STA.26+00.00
ELEV.= 35.00'
-DRV1-
BEGIN GRADE -DRV1- 10+00.00
ELEV= 39.94'
PI = 11+25.00
EL = 43.09'
VC = 50'
K = 18
(-)1.3200% (+)6.0800% (+)2.0142%
END GRADE -DRV1- 11+60.75=
END GRADE -L- 24+00.00 (12' LT)
ELEV= 43.80'
PI = 10+50.00
EL = 39.28'
VC = 50'
K = 8
-DRV2-
PI = 10+75.00
EL = 42.54'
VC = 100'
K = 73
END GRADE -DRV2- 12+00.00
ELEV= 40.63'
(-)2.0000% (-)3.3733% (+)1.2400%
PI = 11+50.00
EL = 40.01'
VC = 50'
K = 11
BEGIN GRADE -DRV2- 10+12.00=
BEGIN GRADE -L- 24+00 (12' RT)
ELEV= 43.80'
SEE ABOVE FOR -L-, -DRV1- & -DRV2- ALIGNMENTS
19 20 21 22 23 24 25 26 10 11
10-APR-2006 13:59

PROJECT REFERENCE NO.	SHEET NO.
	4 of 6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



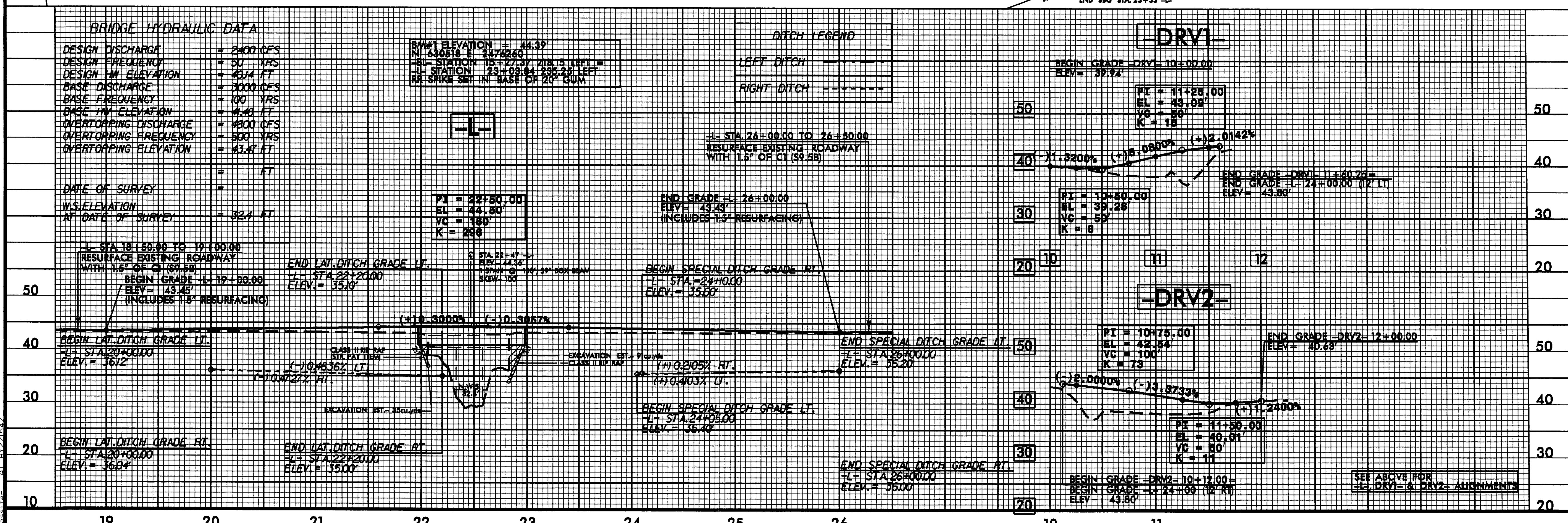
BRIDGE NO.53
STEEL I-BEAM FRAME ON WOODEN PILINGS
BST OVER CONC BRIDGE DECK
-DRV1- POT Sta. 10+00.00
BEGIN CONSTRUCTION
RIP RAP EMBANKMENT SEE DETAIL 'D'
-L- STA. 18+50.00
BEGIN STATE PROJECT B-4231
MARY ALICE BULLOCK HUBBARD
LATERAL GRASSED SWALE SEE DETAIL 'A'
ROCK CHECK DAM CLASS 'B' RIP RAP TOP ELEV.- 37.60' @ 10 TONS (SEE DETAIL 'E')
CLASS 'B' RIP RAP
SWIFT CREEK
-DRV1- POT Sta. 11+72.25=
-DRV2- POT Sta. 10+00.00=
-L- POT Sta. 24+00.00
SPECIAL LATERAL GRASSED SWALE SEE DETAIL 'B'
ROCK CHECK DAM CLASS 'B' RIP RAP TOP ELEV.- 37.70' @ 13 TONS (SEE DETAIL 'E')
WOODS
NC 102 20' BST
BRIDGE NO.53
15" CSP WELBOW
BEGIN SBG 19+39 -L- RT.
BEGIN SBG 20+94 -L- LT.
CLASS B RIP RAP
RIP RAP EMBANKMENT SEE DETAIL 'D'
SPECIAL LATERAL GRASSED SWALE SEE DETAIL 'C'
END SBG BEGIN BRIDGE RT. AND LT.
ROCK CHECK DAM CLASS 'B' RIP RAP TOP ELEV.- 38.10' @ 11 TONS (SEE DETAIL 'E')
-L- STA. 26+50.00
END STATE PROJECT B-4231
DETAIL A
LATERAL GRASSED SWALE
(Not to Scale)
Min. D= 1.5 Ft. B= 3.0 Ft. b= 5.0 Ft.
FROM STA. 20+00 -L- TO STA. 22+20 -L- LT.
DETAIL B
SPECIAL LATERAL GRASSED SWALE
(Not to Scale)
Min. D =1.5 Ft. B = 2.0 Ft.
FROM STA. 24+05 -L- TO 26+00 -L- LT.
FROM STA. 24+10 -L- TO 26+00 -L- RT.
DETAIL C
LATERAL GRASSED SWALE
(Not to Scale)
Min. D= 1.5 Ft. B= 2.0 Ft. b= 5.0 Ft.
FROM STA. 20+00 -L- TO STA. 22+20 -L- RT.
DETAIL D
RIP RAP AT EMBANKMENT
(Not to Scale)
Est. 4.0 Tons
Type of Liner = CLASS B RIP RAP
FROM STA. 22+20 -L- LT.
FROM STA. 22+20 -L- RT.
DETAIL E
ROCK CHECK DAM
(Not to Scale)
CLASS 'B' RIP RAP
STA. 19+85 -L- LT.
STA. 26+00 -L- LT.
STA. 26+00 -L- RT.
-DRV2- POT Sta. 12+25.46
BEGIN SBG BEGIN BRIDGE RT. AND LT.
END SBG STA. 23+33 -L-
SIDNEY CORNELIUS MANNING et al
NAD 83
SCALE: 1"= 100'

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 2400 CFS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 40.14 FT
BASE DISCHARGE	= 3000 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 41.46 FT
OVERTOPPING DISCHARGE	= 4800 CFS
OVERTOPPING FREQUENCY	= 500 YRS
OVERTOPPING ELEVATION	= 43.47 FT
	= FT
DATE OF SURVEY	=
W.S. ELEVATION AT DATE OF SURVEY	= 32.4 FT

BM#1 ELEVATION = 44.39'
N 630618 E 2474260
-EL- STATION 15+27.37 218.15 LEFT =
-L- STATION 23+03.84 235.25 LEFT
RR SPIKE SET IN BASE OF 20" GUM

DITCH LEGEND	
LEFT DITCH	— - — -
RIGHT DITCH	- - - - - -



-L-
-L- STA. 18+50.00 TO 19+00.00
RESURFACE EXISTING ROADWAY WITH 1.5" OF C1 (S9.5B)
BEGIN GRADE -L- 19+00.00
ELEV= 43.45'
(INCLUDES 1.5" RESURFACING)
PI = 22+50.00
EL = 44.50'
VC = 180'
K = 206
(+)0.3000%
(-)0.3057%
BEGIN LAT. DITCH GRADE LT.
-L- STA.20+00.00
ELEV.= 36.12'
END LAT. DITCH GRADE LT.
-L- STA.22+20.00
ELEV.= 35.10'
(-)0.4636% LT.
(-)0.4727% RT.
BEGIN LAT. DITCH GRADE RT.
-L- STA.20+00.00
ELEV.= 36.04'
END LAT. DITCH GRADE RT.
-L- STA.22+20.00
ELEV.= 35.00'
-L- STA. 26+00.00 TO 26+50.00
RESURFACE EXISTING ROADWAY WITH 1.5" OF C1 (S9.5B)
END GRADE -L- 26+00.00
ELEV= 43.43'
(INCLUDES 1.5" RESURFACING)
BEGIN SPECIAL DITCH GRADE RT.
-L- STA.24+10.00
ELEV.= 35.60'
(+)0.2105% RT.
(+)0.4403% LT.
BEGIN SPECIAL DITCH GRADE LT.
-L- STA.24+05.00
ELEV.= 35.40'
END SPECIAL DITCH GRADE LT.
-L- STA.26+00.00
ELEV.= 35.20
END SPECIAL DITCH GRADE RT.
-L- STA.26+00.00
ELEV.= 36.00'
-DRV1-
BEGIN GRADE -DRV1- 10+00.00
ELEV= 39.94'
PI = 11+25.00
EL = 43.09'
VC = 50'
K = 18
(-)1.3200%
(+)5.0800%
(+)2.0142%
PI = 10+50.00
EL = 39.28'
VC = 50'
K = 8
END GRADE -DRV1- 11+60.25=
END GRADE -L- 24+00.00 (12' LT)
ELEV= 43.80'
-DRV2-
PI = 10+75.00
EL = 42.54'
VC = 100'
K = 73
END GRADE -DRV2- 12+00.00
ELEV= 40.68'
(-)2.0000%
(-)3.5733%
(+)1.2400%
PI = 11+50.00
EL = 40.01'
VC = 50'
K = 11
BEGIN GRADE -DRV2- 10+12.00=
BEGIN GRADE -L- 24+00 (12' RT)
ELEV= 43.60'
SEE ABOVE FOR -L-, DRV1- & DRV2- ALIGNMENTS
19 20 21 22 23 24 25 26 10 11

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
	22+47 -L-	1 SPAN@ 100'	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0	0
		BOX BEAM										
TOTALS:			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0	0

REMARKS: Structures- This bridge is proposed as a single span bridge with no permanent impacts to the waterway.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PITT COUNTY
WBS - 33574.1.1 (B-4231)

SHEET 5 of 6 4/10/2006

ATN Revised 3/31/05

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
1	MARY ALICE HUBBARD	110 SPRINGMOOR DR RALEIGH, N.C. 27615

NCDOT

DIVISION OF HIGHWAYS

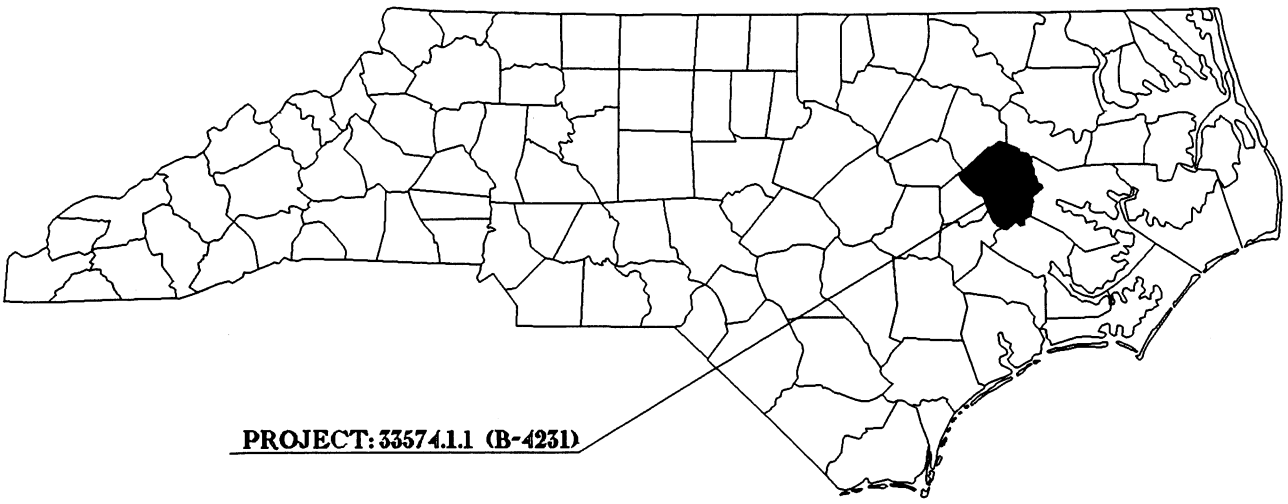
PITT COUNTY

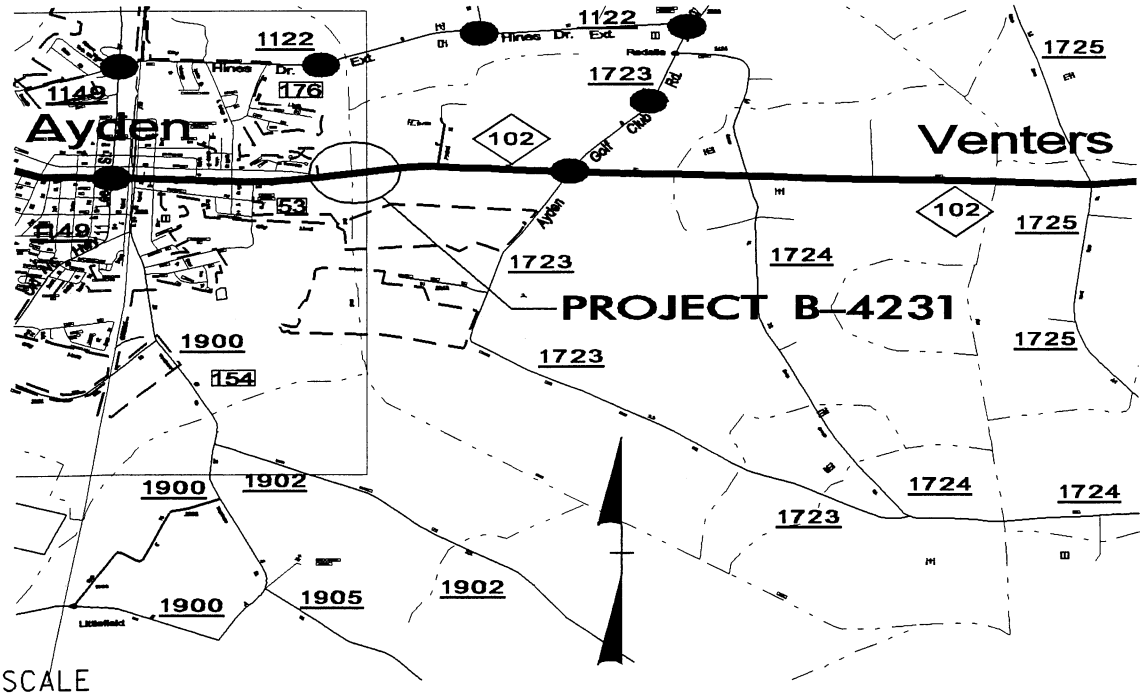
PROJECT: 33574.1.1 (B-4231)

REPLACE BRG #53 OVER SWIFT CREEK ON NC 102

 04/10/06

NORTH CAROLINA



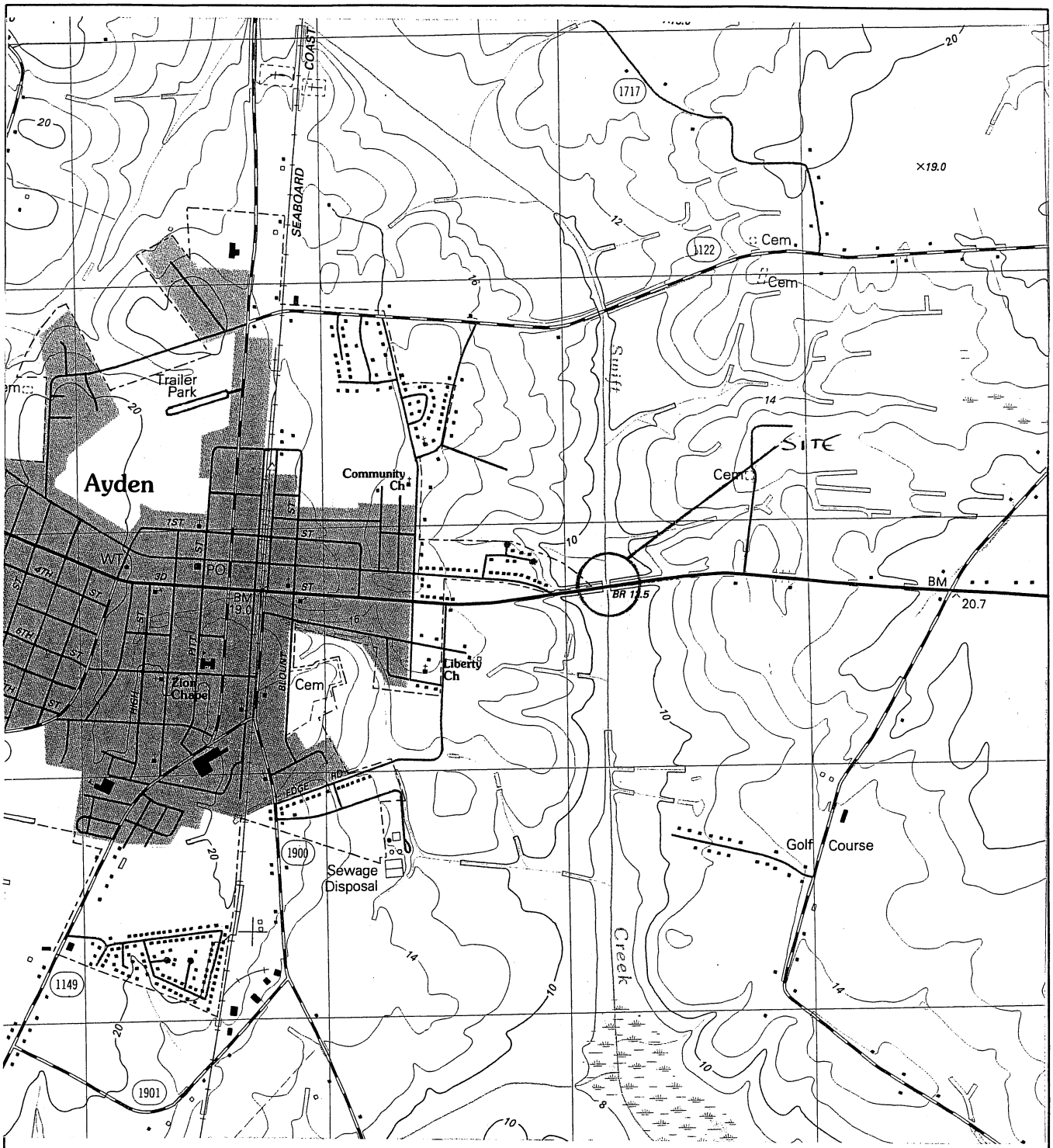


NOT TO SCALE

NEUSE RIVER BUFFER VICINITY MAPS

NCDOT
DIVISION OF HIGHWAYS
PITT COUNTY
PROJECT: 33574.1.1 (B-4231)
REPLACE BRG# 53 OVER SWIFT CREEK ON NC 102

SHEET 1 OF 6 04/10/06



NOT TO SCALE

NEUSE RIVER BUFFER

LOCATION MAPS

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

PROJECT: 33574.1.1 (B4231)

REPLACE BRG# 53 OVER SWIFT CREEK ON NC 102

SHEET 2 OF 6

BUFFER IMPACTS SUMMARY

			IMPACT								BUFFER REPLACEMENT	
			TYPE		ALLOWABLE			MITIGABLE				
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	ROAD CROSSING	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
1	1@100' BOX BEAM	21+97-L- TO	X		9425.0	4920.0	14345.0	0.0	0.0	0.0	0.0	0.0
	BRIDGE	22+97-L-										
							0.0					
							0.0					
							0.0					
TOTAL:					9425.0	4920.0	14345.0	0.0	0.0	0.0	0.0	0.0

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

PITT COUNTY
PROJECT: 33574.1.1 (B-4231)

4/10/2006
SHEET 5 OF 6

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
1	MARY ALICE HUBBARD	110 SPRINGMOOR DR RALEIGH, N.C. 27615

NCDOT

DIVISION OF HIGHWAYS

PITT COUNTY

PROJECT: 33574.1.1 (B-4231)

REPLACE BRG#53 OVER SWIFT CREEK ON NC 102

04/10/06

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
	3 of 6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

D.A.-0.3 AC.
Q2-1.1cfs
Q10-1.4cfs
D2-0.3 ft
D10-0.3 ft
V2-1.0 fps
V10-1.1 fps
Sa-0.005 ft/ft
LENGTH- 220ft.

BRIDGE NO.53
STEEL I BEAM FRAME ON WOODEN PILINGS
BST OVER CONC BRIDGE DECK

-DRV1- POT Sta. 10+00.00
BEGIN CONSTRUCTION

RIP RAP EMBANKMENT SEE DETAIL 'D'

MARY ALICE BULLOCK HUBBARD

-L- STA. 18+50.00
BEGIN STATE PROJECT B-4231

LATERAL GRASSED SWALE SEE DETAIL 'A'

ROCK CHECK DAM CLASS 'B' RIP RAP TOP ELEV.- 37.60' @ 10 TONS (SEE DETAIL 'E')

SWIFT CREEK

WOODS

NC 102 | 20' BST

18" CSP

BRIDGE NO.53

18" CSP W/ELBOW

REMOVE

CLASS 'B' RIP RAP

PDE

BEGIN SBG 19+39 -L- RT.
BEGIN SBG 20+94 -L- LT.

CLASS B RIP RAP

RIP RAP EMBANKMENT SEE DETAIL 'D'

SPECIAL LATERAL GRASSED SWALE SEE DETAIL 'C'

END SBG BEGIN BRIDGE RT. AND LT.

TB RT.

TB LT.

D.A.-7.2 AC.
Q2-0.7cfs
Q10-3.2cfs
D2-0.3 ft
D10-0.6 ft
V2-1.0 fps
V10-1.5 fps
Sa-0.006 ft/ft
LENGTH- 720 ft.

MARY ALICE BULLOCK HUBBARD

DETAIL C
LATERAL GRASSED SWALE
(Not to Scale)
Natural Ground, 3:1, D, B, 3:1, Fill Slope, F/Ft.
Min. D= 1.5 Ft.
B= 2.0 Ft.
b= 5.0 Ft.

FROM STA. 20+00 -L- TO STA. 22+20 -L- RT.

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

100' 50' 0' 100'
SCALE: 1"= 100'

DETAIL A
LATERAL GRASSED SWALE
(Not to Scale)
Natural Ground, 3:1, D, B, 3:1, Fill Slope, F/Ft.
Min. D= 1.5 Ft.
B= 3.0 Ft.
b= 5.0 Ft.

FROM STA. 20+00 -L- TO STA. 22+20 -L- LT.

DETAIL B
SPECIAL LATERAL GRASSED SWALE
(Not to Scale)
Natural Ground, 3:1, D, B, 4:1 or Flatter, Fill Slope
Min. D = 1.5 Ft.
B = 2.0 Ft.

FROM STA. 24+05 -L- TO 26+00 -L- LT.
FROM STA. 24+10 -L- TO 26+00 -L- RT.

NAD 83

D.A.-0.5AC.
Q2- 1.8cfs
Q10- 2.3cfs
D2- 0.5 ft
D10- 0.6 ft
V2- 1.0 fps
V10- 1.1fps
Sa- 0.003 ft/ft
LENGTH- 195 ft.

-DRV1- POT Sta. 11+72.25=
-DRV2- POT Sta. 10+00.00=
-L- POT Sta. 24+00.00

SPECIAL LATERAL GRASSED SWALE SEE DETAIL 'B'

ROCK CHECK DAM CLASS 'B' RIP RAP TOP ELEV.- 37.70' @ 13 TONS (SEE DETAIL 'E')

JB W/MH

MH

24"

ROCK CHECK DAM CLASS 'B' RIP RAP TOP ELEV.- 38.10' @ 11 TONS (SEE DETAIL 'E')

SPECIAL LATERAL GRASSED SWALE SEE DETAIL 'B'

-L- STA. 26+50.00
END STATE PROJECT B-4231

DETAIL D
RIP RAP AT EMBANKMENT
(Not to Scale)
Ditch Grade, 3.0', 1.5', 3.0'
Est. 4.0 Tons
Type of Liner : CLASS B RIP RAP

FROM STA. 22+20 -L- LT.
FROM STA. 22+20 -L- RT.

DETAIL E
ROCK CHECK DAM
(Not to Scale)
2.0', 2:1, VARIES, Natural Ground, CLASS 'B' RIP RAP

STA. 19+88 -L- LT.
STA. 26+00 -L- LT.
STA. 26+00 -L- RT.

D.A.- 0.6 AC.
Q2- 2.1cfs
Q10- 3.2cfs
D2- 0.6 ft
D10- 0.7 ft
V2- 0.9fps
V10- 1.0fps
Sa- 0.002 ft/ft
LENGTH- 190 ft.

SIDNEY CORNELIUS MANNING et al

-DRV2- POT Sta. 12+25.46

BEGIN SBG BEGIN BRIDGE RT. AND LT.

END SBG STA. 23+33 -L-

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 2400 CFS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 40.14 FT
BASE DISCHARGE	= 3000 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 41.48 FT
OVERTOPPING DISCHARGE	= 4800 CFS
OVERTOPPING FREQUENCY	= 500 YRS
OVERTOPPING ELEVATION	= 43.47 FT
	= FT
DATE OF SURVEY	=
W.S. ELEVATION AT DATE OF SURVEY	= 32.4 FT

B/W#1 ELEVATION = 44.39'
N 630518 E 2476260
-BL- STATION 15+27.37 218.15 LEFT =
-L- STATION 23+09.84 295.25 LEFT
RR SPIKE SET IN BASE OF 20" GUM

DITCH LEGEND
LEFT DITCH
RIGHT DITCH

-L- STA. 18+50.00 TO 19+00.00
RESURFACE EXISTING ROADWAY WITH 1.5" OF CL (S9.5B)
BEGIN GRADE -L- 19+00.00
ELEV.= 43.45'
(INCLUDES 1.5" RESURFACING)

PI = 22+50.00
EL = 44.50'
VC = 180'
K = 286

END LAT. DITCH GRADE LT.
-L- STA. 22+20.00
ELEV.= 35.10'

℄ STA. 23+47 -L-
RCP 1.43%
1-9'WHH @ 100.34' SKEW 15 RAY
SKEW: 100

BEGIN LAT. DITCH GRADE LT.
-L- STA. 20+00.00
ELEV.= 36.12'

(+)0.3000% (-)0.3057%

CLASS 'B' RIP RAP STR. PAT. ITEM

EXCAVATION EST.- 97cu.yds
CLASS 'B' RIP RAP

(-)0.4636% LT.
(+)0.4727% RT.

EXCAVATION EST.- 35cu.yds

BEGIN LAT. DITCH GRADE RT.
-L- STA. 20+00.00
ELEV.= 36.04'

END LAT. DITCH GRADE RT.
-L- STA. 22+20.00
ELEV.= 35.00'

-L- STA. 26+00.00 TO 26+50.00
RESURFACE EXISTING ROADWAY WITH 1.5" OF CL (S9.5B)

END GRADE -L- 26+00.00
ELEV.= 43.45'
(INCLUDES 1.5" RESURFACING)

BEGIN SPECIAL DITCH GRADE RT.
-L- STA. -24+10.00
ELEV.= 35.60'

(+)0.2105% RT.
(+)0.4403% LT.

BEGIN SPECIAL DITCH GRADE LT.
-L- STA. 24+05.00
ELEV.= 35.40'

END SPECIAL DITCH GRADE LT.
-L- STA. 26+00.00
ELEV.= 35.20'

END SPECIAL DITCH GRADE RT.
-L- STA. 26+00.00
ELEV.= 35.00'

-DRV1-

BEGIN GRADE -DRV1- 10+00.00
ELEV.= 39.94'

PI = 11+25.00
EL = 43.05'
VC = 50'
K = 18

(-)1.3200% (+)6.0800% (+)2.0142%

END GRADE -DRV1- 11+60.25=
END GRADE -L- 24+00.00 (12' LT)
ELEV.= 43.80'

PI = 10+50.00
EL = 39.25'
VC = 55'
K = 8

-DRV2-

PI = 10+75.00
EL = 42.54'
VC = 100'
K = 73

(-)2.0000% (-)3.9733% (+)1.2400%

END GRADE -DRV2- 12+00.00
ELEV.= 40.63'

PI = 11+50.00
EL = 40.01'
VC = 50'
K = 11

BEGIN GRADE -DRV2- 10+12.00=
BEGIN GRADE -L- 24+00 (12' RT)
ELEV.= 43.80'

SEE ABOVE FOR -L- DRV1- & DRV2- ALIGNMENTS

10-APR-2006 14:30
r:\hydraulics\roads\b4231\hyd_prm_buf.dgn

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
	4 of 6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

D.A.-0.3 AC.
Q2-1.1cfs
Q10-1.4cfs
D2-0.3 ft
D10-0.3 ft
V2-1.0 fps
V10-1.1 fps
So-0.005 ft/ft
LENGTH- 220ft.

BRIDGE NO.53
STEEL I BEAM FRAME ON WOODEN PILINGS
BST OVER CONC BRIDGE DECK

-DRV1- POT Sta. 10+00.00
BEGIN CONSTRUCTION

RIP RAP EMBANKMENT SEE DETAIL 'D'

-L- STA. 18+50.00
BEGIN STATE PROJECT B-4231

MARY ALICE BULLOCK HUBBARD

LATERAL GRASSED SWALE SEE DETAIL 'A'

ROCK CHECK DAM CLASS 'B' RIP RAP TOP ELEV.- 37.60' @ 10 TONS (SEE DETAIL 'E')

PDE

CLASS 'B' RIP RAP

REMOVE

18" CSP

18" CSP W/ELBOW

JB WMH

MH

WOODS

NC 102 | 20' BST

BRIDGE NO.53

D.A.-7.2 AC.
Q2-0.7cfs
Q10-3.2cfs
D2-0.3 ft
D10-0.6 ft
V2-1.0 fps
V10-1.5 fps
So-0.006 ft/ft
LENGTH- 720 ft.

BEGIN SBG 19+39 -L- RT.
BEGIN SBG 20+94 -L- LT.

CLASS B RIP RAP

RIP RAP EMBANKMENT SEE DETAIL 'D'

SPECIAL LATERAL GRASSED SWALE SEE DETAIL 'C'

END SBG BEGIN BRIDGE RT. AND LT.

TB RT.

TB LT.

DETAIL C
LATERAL GRASSED SWALE
(Not to Scale)
Natural Ground 3:1 D 3:1 Fill Slope
B
P/Ft.
Min. D= 1.5 Ft.
B= 2.0 Ft.
b= 5.0 Ft.
FROM STA. 20+00 -L- TO STA. 22+20 -L- RT.

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

100' 50' 0' 100'
SCALE: 1"= 100'

DETAIL A
LATERAL GRASSED SWALE
(Not to Scale)
Natural Ground 3:1 D 3:1 Fill Slope
B
P/Ft.
Min. D= 1.5 Ft.
B= 3.0 Ft.
b= 5.0 Ft.
FROM STA. 20+00 -L- TO STA. 22+20 -L- LT.

DETAIL B
SPECIAL LATERAL GRASSED SWALE
(Not to Scale)
Natural Ground 3:1 D 4:1 or Flatter Fill Slope
B
Min. D = 1.5 Ft.
B = 2.0 Ft.
FROM STA. 24+05 -L- TO 26+00 -L- LT.
FROM STA. 24+10 -L- TO 26+00 -L- RT.

NAD 83

-DRV1- POT Sta. 11+72.25 =
-DRV2- POT Sta. 10+00.00 =
-L- POT Sta. 24+00.00

SPECIAL LATERAL GRASSED SWALE SEE DETAIL 'B'

ROCK CHECK DAM CLASS 'B' RIP RAP TOP ELEV.- 37.70' @ 13 TONS (SEE DETAIL 'E')

D.A.- 0.5AC.
Q2- 1.8cfs
Q10- 2.3cfs
D2- 0.5 ft.
D10- 0.6 ft
V2- 1.0 fps
V10- 1.1fps
So- 0.003 ft/ft
LENGTH- 195 ft.

EXIST R/W

SPECIAL LATERAL GRASSED SWALE SEE DETAIL 'B'

-L- STA. 26+50.00
END STATE PROJECT B-4231

ROCK CHECK DAM CLASS 'B' RIP RAP TOP ELEV.- 38.10' @ T TONS (SEE DETAIL 'E')

DETAIL D
RIP RAP AT EMBANKMENT
(Not to Scale)
Ditch Grade 3.0' 1.5' 3.0'
Est. 4.0 Tons
Type of Liner - CLASS B RIP RAP
FROM STA. 22+20 -L- LT.
FROM STA. 22+20 -L- RT.

DETAIL E
ROCK CHECK DAM
(Not to Scale)
2.0'
2:1 2:1
VARIES
Natural Ground
CLASS 'B' RIP RAP

STA. 19+85 -L- LT.
STA. 26+00 -L- LT.
STA. 26+00 -L- RT.

D.A.- 0.6 AC.
Q2- 2.1cfs
Q10- 3.2cfs
D2- 0.6 ft
D10- 0.7 ft
V2- 0.9fps
V10- 1.0fps
So- 0.002 ft/ft
LENGTH- 190 ft.

SIDNEY CORNELIUS MANNING et al

-DRV2- POT Sta. 12+25.46

BEGIN SBG BEGIN BRIDGE RT. AND LT.

END SBG STA. 23+33 -L-

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 2400 CFS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 40.14 FT
BASE DISCHARGE	= 3000 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 41.43 FT
OVERTOPPING DISCHARGE	= 4800 CFS
OVERTOPPING FREQUENCY	= 500 YRS
OVERTOPPING ELEVATION	= 43.49 FT
	= FT
DATE OF SURVEY	=
W.S.ELEVATION AT DATE OF SURVEY	= 32.4 FT

BM#1 ELEVATION = 44.39'
N 630618 E 2476260
-L- STATION 15+27.37 218.15 LEFT =
-L- STATION 23+03.84 235.29 LEFT
RR SPIKE SET IN BASE OF 20" GUM

DITCH LEGEND
LEFT DITCH
RIGHT DITCH

-L-

-L- STA. 26+00.00 TO 28+50.00
RESURFACE EXISTING ROADWAY WITH 1.5" OF CL (S9.5B)

-L- STA. 19+50.00 TO 19+00.00
RESURFACE EXISTING ROADWAY WITH 1.5" OF CL (S9.5B)

PI = 22+50.00
EL = 44.50'
VC = 180'
K = 256

℄ STA. 22+47.44 -L-
RT. 44.56'
1.5"PWM @ 100'; 25" SQX BEAM
SKEW: 100

BEGIN GRADE -L- 19+00.00
ELEV.= 43.45'
(INCLUDES 1.5" RESURFACING)

END GRADE -L- 26+00.00
ELEV.= 43.43'
(INCLUDES 1.5" RESURFACING)

END LAT. DITCH GRADE LT.
-L- STA. 22+20.00
ELEV.= 35.10'

BEGIN SPECIAL DITCH GRADE RT.
-L- STA.=24+10.00
ELEV.= 35.60'

BEGIN LAT. DITCH GRADE LT.
-L- STA. 20+00.00
ELEV.= 36.12

(+)10.3000% (-)10.3857%

CLASS II RIP RAP (ESTIMATED)

EXCAVATION EST.= 9 cu.yds
CLASS II RIP RAP

(-)0.4636% LT.
(+)10.4727% RT.

N.W.S. 32.7

EXCAVATION EST.= 35cu.yds

END SPECIAL DITCH GRADE LT.
-L- STA. 26+00.00
ELEV.= 35.20'

(+)0.2105% RT.
(+)0.4093% LT.

BEGIN SPECIAL DITCH GRADE LT.
-L- STA.24+05.00
ELEV.= 35.40'

BEGIN LAT. DITCH GRADE RT.
-L- STA. 20+00.00
ELEV.= 36.04'

END LAT. DITCH GRADE RT.
-L- STA. 22+20.00
ELEV.= 35.00'

END SPECIAL DITCH GRADE RT.
-L- STA. 26+00.00
ELEV.= 35.00'

-DRV1-

BEGIN GRADE -DRV1- 10+00.00
ELEV.= 39.94'

PI = 11+25.00
EL = 43.09'
VC = 50'
K = 18

(+)1.3200% (+)5.0800% (+)2.0142%

END GRADE -DRV1- 11+60.25 =
END GRADE -L- 24+00.00 (12' LT)
ELEV.= 43.80'

PI = 10+50.00
EL = 39.28'
VC = 50'
K = 8

-DRV2-

PI = 10+75.00
EL = 42.54'
VC = 100'
K = 73

END GRADE -DRV2- 12+00.00
ELEV.= 40.63'

(-)8.0000% (+)3.3733% (+)1.2400%

PI = 11+50.00
EL = 40.01'
VC = 50'
K = 11

BEGIN GRADE -DRV2- 10+12.00 =
BEGIN GRADE -L- 24+00 (12' RT)
ELEV.= 43.80'

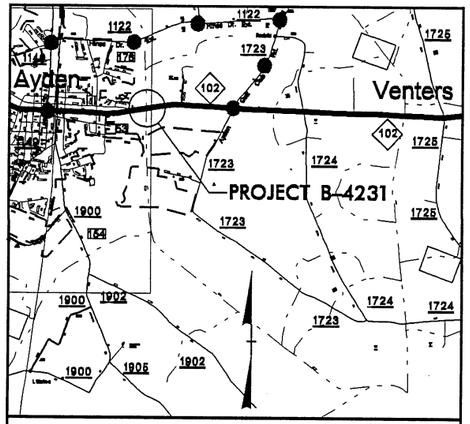
SEE ABOVE FOR -L-, -DRV1- & -DRV2- ALIGNMENTS

10-APR-2006 14:31
r:\hydraulics\cadd\b4231_hyd_prm_buf.dgn
classified
07 LEVEL

09/08/99

TIP PROJECT: B-4231

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional symbols
See Sheet 1-C For Survey Control Sheet



VICINITY MAP

OFFSITE DETOUR ROUTE
(SEE SHEET 2-B FOR DETOUR IMPROVEMENTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PITT COUNTY

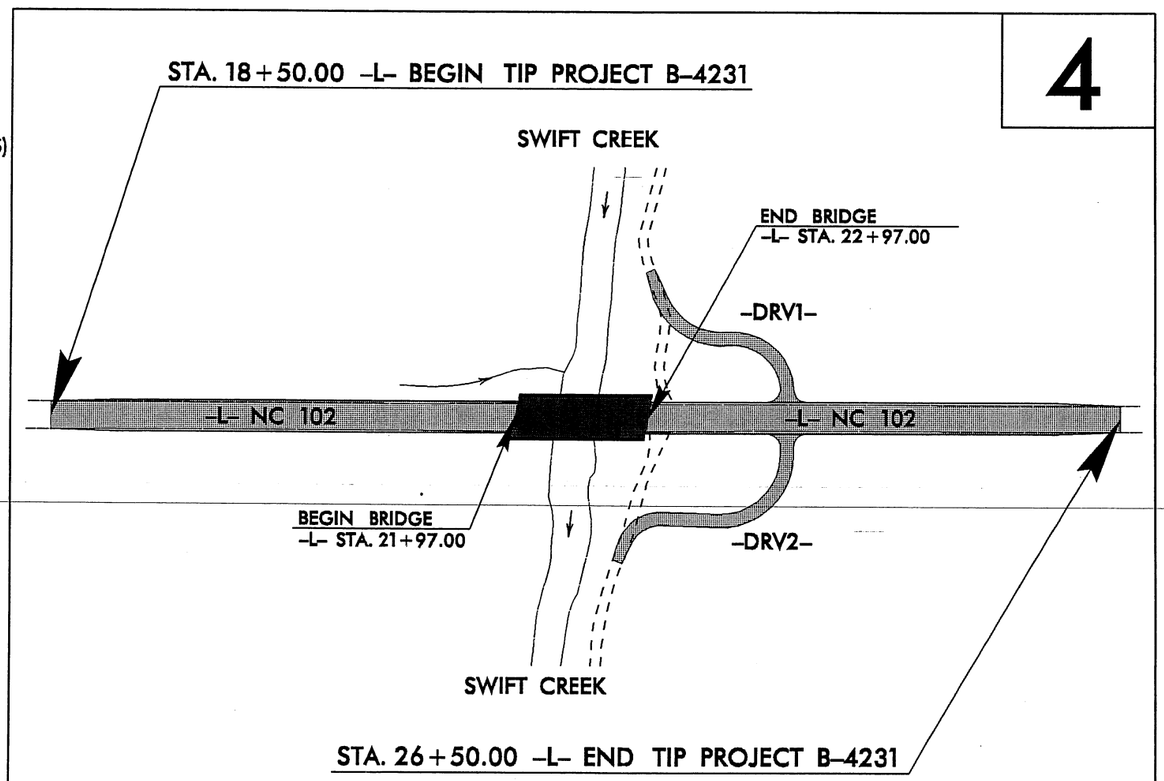
LOCATION: BRIDGE NO. 53 OVER SWIFT CREEK ON NC 102

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4231	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33574.1.1	BRSTP-102(2)	PE
33574.2.1	BRSTP-102(2)	R/W & UTILITIES

4



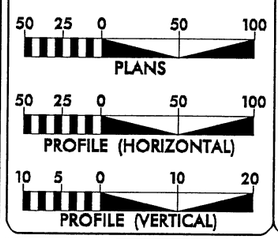
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.
THIS PROJECT IS NOT WITHIN THE MUNICIPAL BOUNDARIES OF AYDEN.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONTRACT:

04-APR-2006 12:04
R:\Roadway\Proj\B4231rdy_tsh.dgn
dwgardner AT RD212599

GRAPHIC SCALES



DESIGN DATA

ADT 2005 = 4620
ADT 2025 = 7400
DHV = 60 %
D = 10 %
T = 3 % *
V = 60 MPH
* TTST 1% DUAL 2%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4231 = 0.133 MILES
LENGTH STRUCTURE TIP PROJECT B-4231 = 0.019 MILES
TOTAL LENGTH OF TIP PROJECT B-4231 = 0.152 MILES

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

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: SEPTEMBER 16, 2005

LETTING DATE: FEBRUARY 19, 2007

JAMES A. SPEER, PE
PROJECT ENGINEER

DANNY GARDNER
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER P.E.

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR DATE

PROJECT REFERENCE NO.	SHEET NO.
B-4231	1-B

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

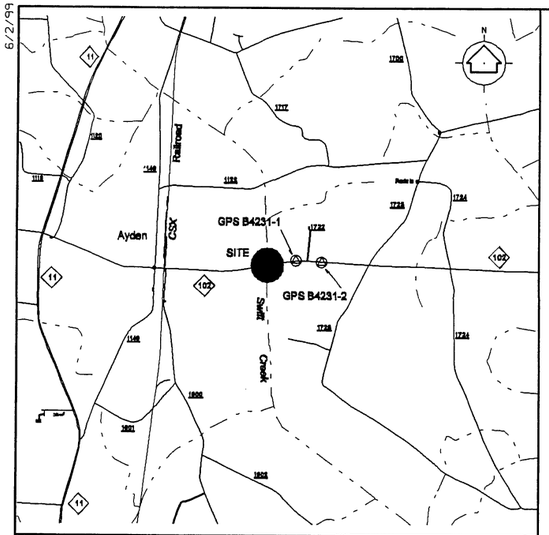
MISCELLANEOUS:

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

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
B-4231	1-C
Location and Surveys	

SURVEY CONTROL SHEET B-4231



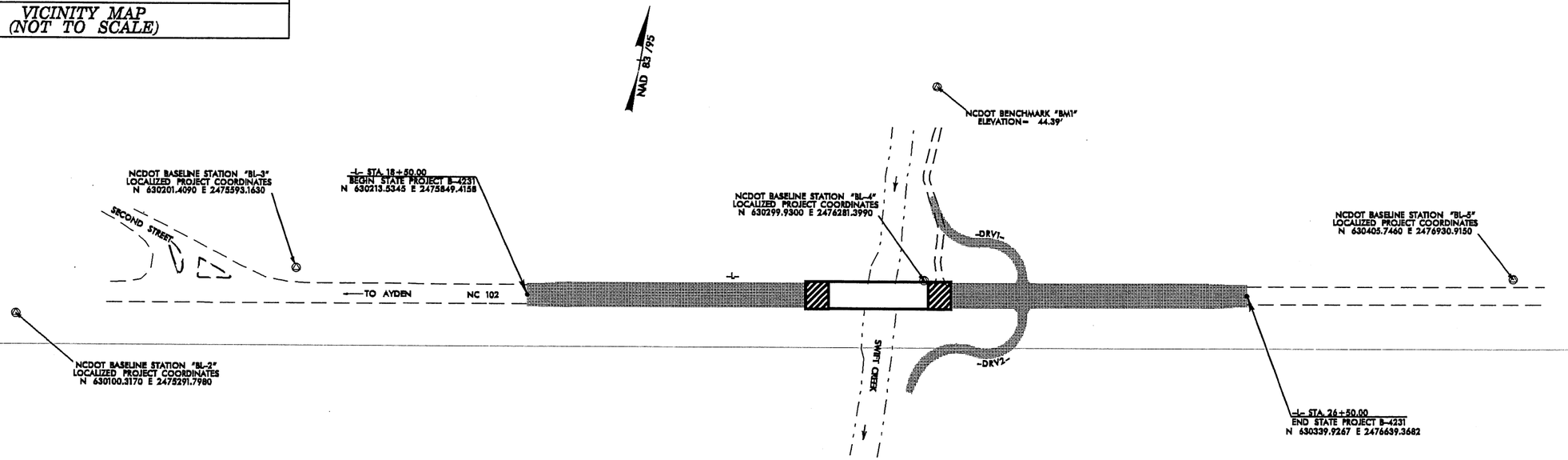
VICINITY MAP
(NOT TO SCALE)

CONTROL DATA

BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
2	BL-2	630100.3170	2475291.7980	44.96	12+81.50	23.70 RT
3	BL-3	630201.4090	2475593.1630	41.78	15+95.05	28.51 LT
4	BL-4	630299.9300	2476281.3990	42.70	22+90.21	17.06 LT
5	BL-5	630405.7460	2476930.9150	41.83	29+48.28	18.93 LT

BENCHMARK DATA

BM1 ELEVATION = 44.39
N 630518 E 2476260
L STATION 23+04 235 LEFT
RR SPIKE SET IN 20" GUM



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4231-1" WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 630502.6134(ft) EASTING: 2477564.8644(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99988327 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4231-1" TO -L- STATION 18+50.00 IS S 80°26'04.8" W 1739.635(ft) 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/b4231_ls_control_050223.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)

NOTE: DRAWING NOT TO SCALE

04-APR-2006 12:05
c:\projects\b4231\ls_lc_050223.dgn
$$$$USERNAME$$$$

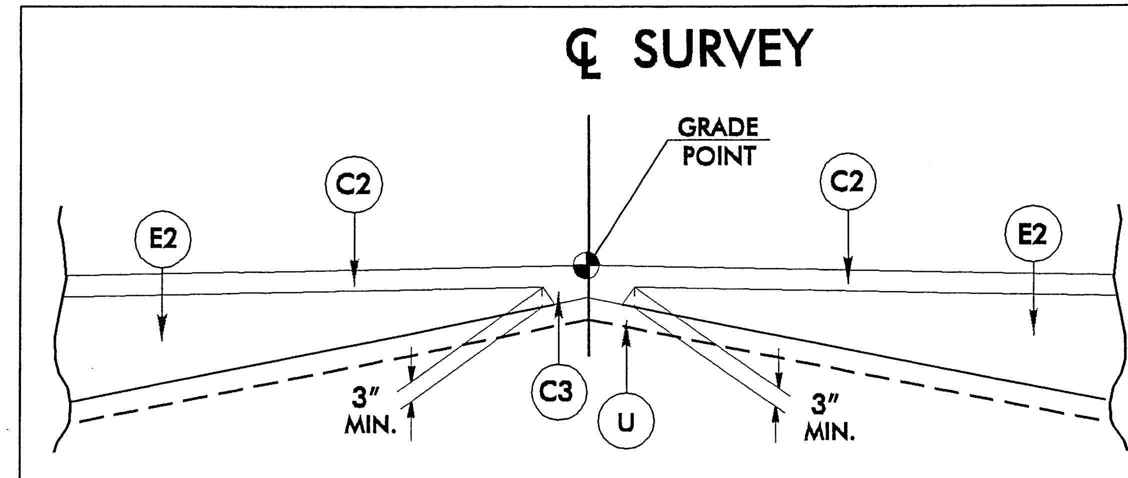
PROJECT REFERENCE NO.	SHEET NO.
B-4231	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

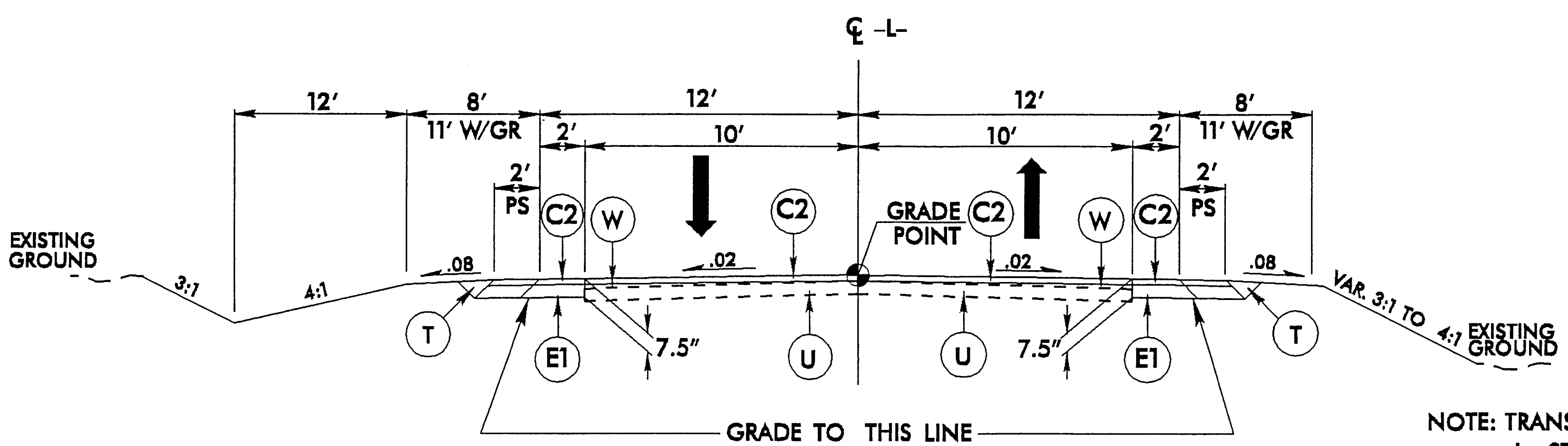
6/2/99

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 3" IN DEPTH.
E1	PROP. APPROX. 4½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
J	PROP. 6" AGGREGATE BASE COURSE.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT (SEE STANDARD WEDGING DETAIL).

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



DETAIL SHOWING METHOD OF WEDGING



TYPICAL SECTION NO. 1

NOTE: TRANSITION FROM EXISTING TO TYPICAL SECTION NO. 1
-L- STA. 18+50.00 TO STA. 19+00.00

USE TYPICAL SECTION NO. 1

-L- STA. 19+00.00 TO STA. 21+97.00 (BEGIN BRIDGE)
-L- STA. 22+97.00 (END BRIDGE) TO STA. 26+00.00

NOTE: TRANSITION FROM TYPICAL SECTION NO. 1 TO EXISTING
-L- STA. 26+00.00 TO STA. 26+50.00

6/2/99

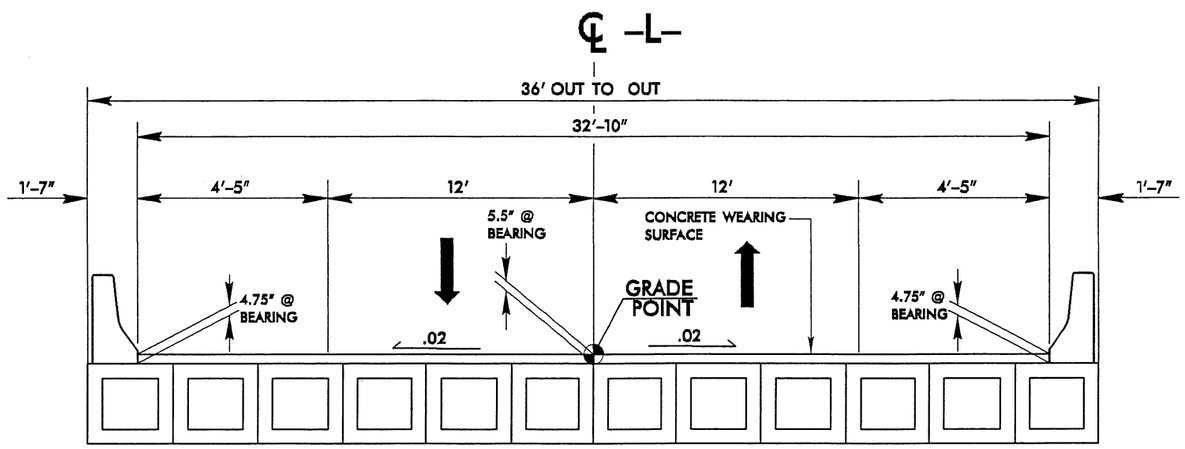
PROJECT REFERENCE NO.	SHEET NO.
B-4231	2-A

ROADWAY DESIGN ENGINEER

PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

C1	1½" TYPE S9.5B
C2	3" TYPE S9.5B
C3	VAR. DEPTH TYPE S9.5B
E1	4½" TYPE B25.0B
E2	VAR. DEPTH TYPE B25.0B
J	6" ABC
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING

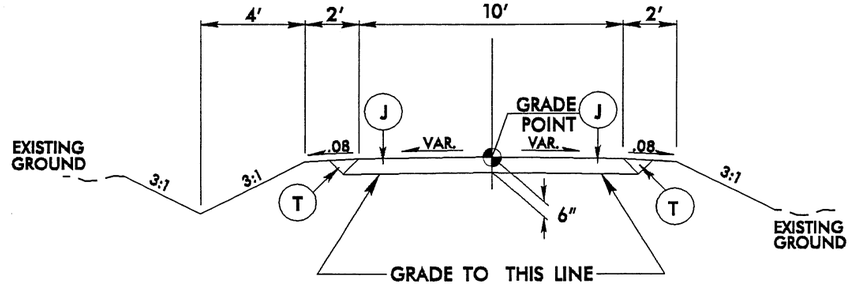


TYPICAL SECTION NO. 2

NOTE: BRIDGE HAS BEEN WIDENED TO ACCOMMODATE HYDRAULIC DESIGN SPREAD.

USE TYPICAL SECTION NO. 2

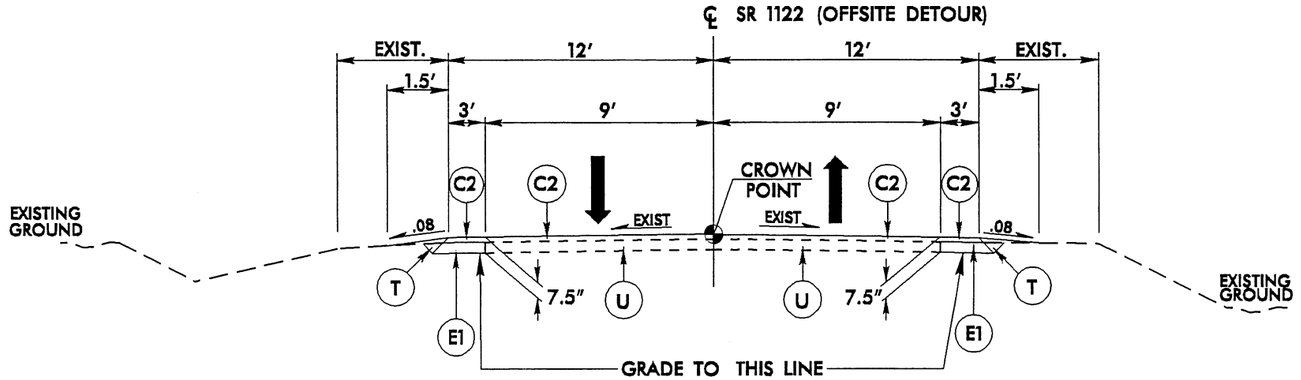
–L– STA. 21+97.00 (BEGIN BRIDGE) TO STA. 22+97.00 (END BRIDGE)



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

–DRV1– STA. 10+00.00 TO STA. 11+60.25
–DRV2– STA. 10+12.00 TO STA. 12+00.00



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4

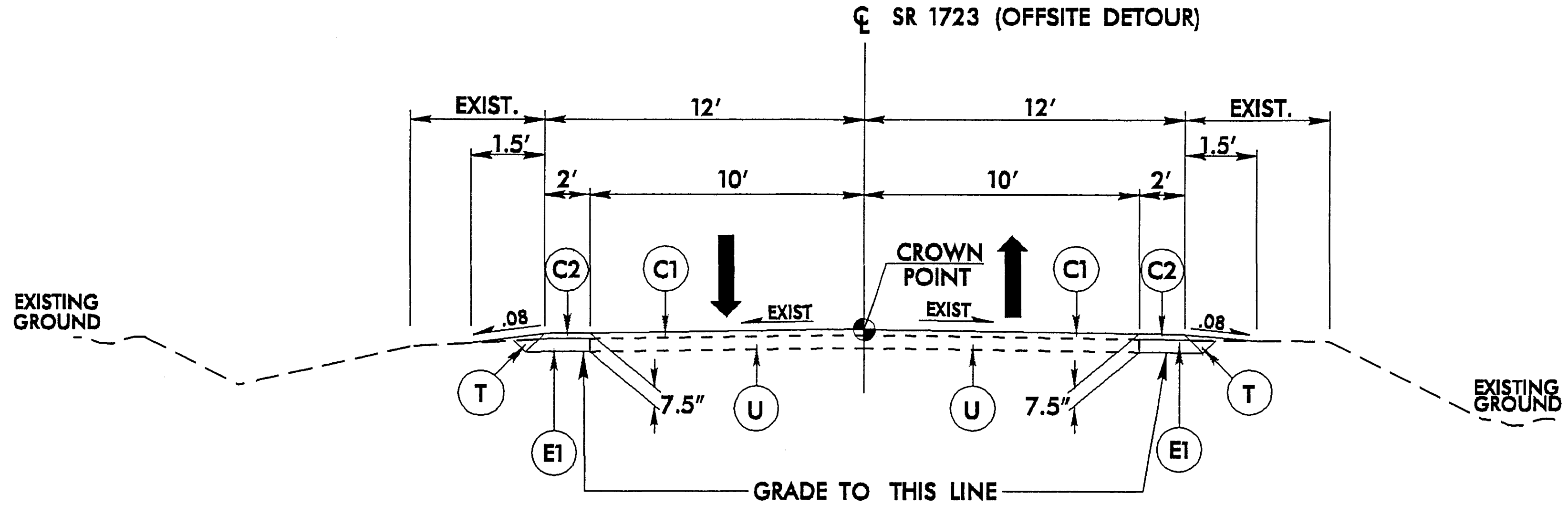
2.05 MILES SR 1122 (HINES DRIVE EXT.)

04-APR-2006 12:05
R:\Roadway\Proj\b4231_rdy_typ.dgn
dgardner AT RD12399

PROJECT REFERENCE NO.	SHEET NO.
B-4231	2-B
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

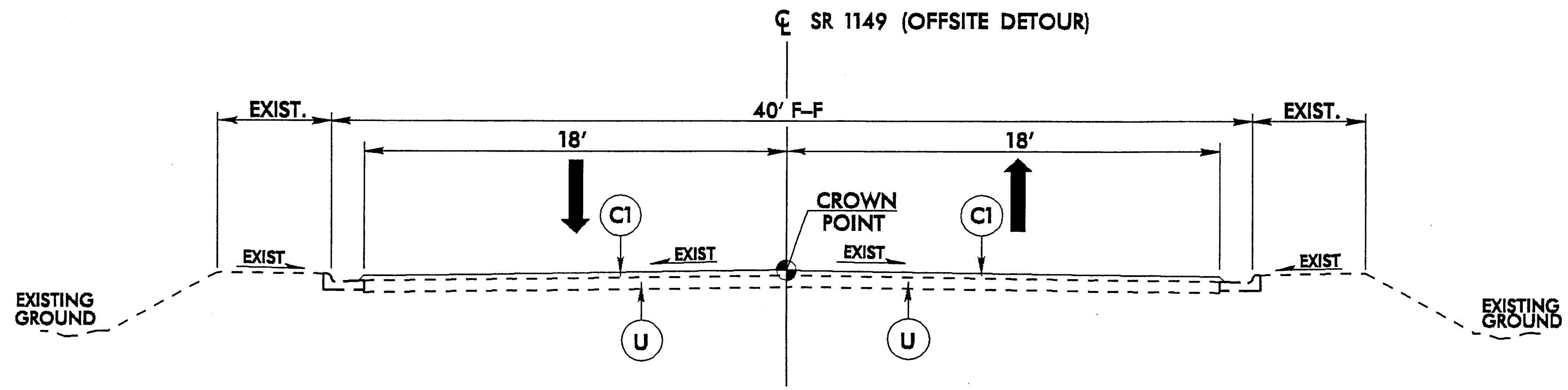
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

C1	1½" TYPE S9.5B
C2	3" TYPE S9.5B
C3	VAR. DEPTH TYPE S9.5B
E1	4½" TYPE B25.0B
E2	VAR. DEPTH TYPE B25.0B
J	6" ABC
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING



TYPICAL SECTION NO. 5

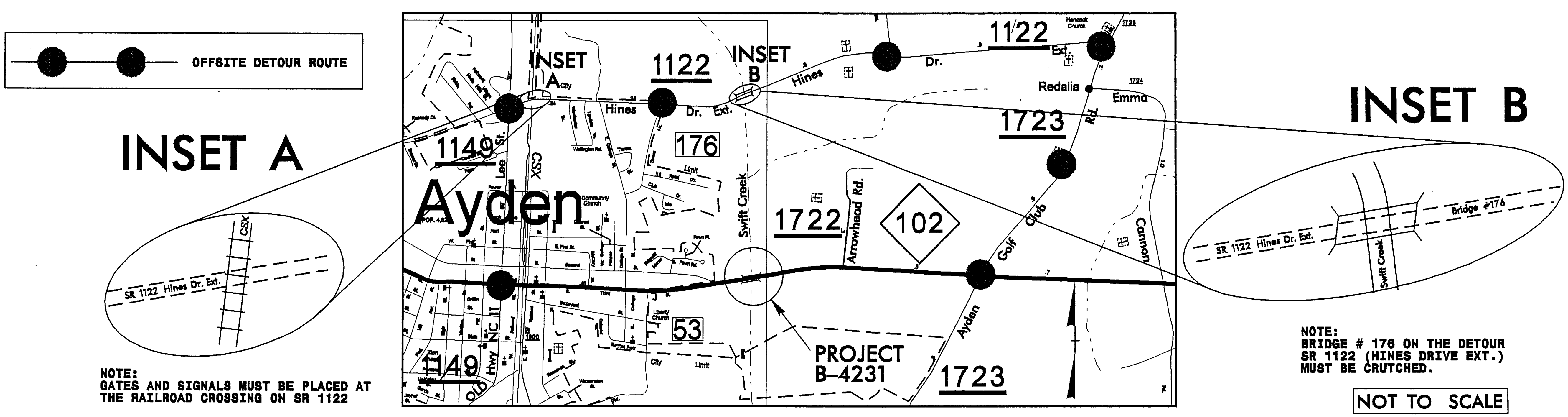
USE TYPICAL SECTION NO. 5
1.10 MILES SR 1723 (AYDEN GOLF CLUB ROAD)



TYPICAL SECTION NO. 6

USE TYPICAL SECTION NO. 6
0.68 MILES SR 1149 (LEE STREET)

NOTE: ADD INCIDENTAL STONE FOR APPROX. 27 DRIVEWAY TIE–INS ALONG THE DETOUR ROUTE. (16' AVG. WIDTH X 12' LONG)



NOTE:
GATES AND SIGNALS MUST BE PLACED AT THE RAILROAD CROSSING ON SR 1122

NOTE:
BRIDGE # 176 ON THE DETOUR SR 1122 (HINES DRIVE EXT.) MUST BE CRUTCHED.

NOT TO SCALE

6/2/99

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COMPUTED BY:_____ DATE:_____
CHECKED BY:_____ DATE:_____

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-4231	3-A

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & UNDER)

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHRWISE) .064 12"	.064 15"	.064 18"	.064 24"	.079 30"	.079 36"	.109 42"	.109 48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	CU. YDS. C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES * TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. "A" + (1.3 X COL."B") PER EACH (0' THRU 5.0')	LIN. FT. A 5.0' THRU 10.0'	LIN. FT. B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	M.D.I. TYPE "B" STD. 840.18 OR 840.27	M.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	T.B.I.B. STD. 840.34	M.H. FRAME & COVER STD. 840.54	CORR. STEEL ELBOWS NO. & SIZE	REMARKS
-L- STA. 19+39	RT.	1																								1							1	1				
		1	OUT														28																					1@15"	
-L- STA. 20+94	LT.	2																								1							1	1				
		2	3														32																						
-L- STA. 20+94	RT.	3																								1							1	1				
		3	OUT														40																					1@15"	
-L- STA. 23+33	LT.	4																								1							1	1				
		4	5														32																						
-L- STA. 23+33	RT.	5																								1							1	1				
		5	6														116																						
-L- STA. 24+49	RT.	6																								1									1	1		
		6	OUT														32																					1@15"	
-DRV1- STA. 11+20	CL	7																										80										
-DRV1- STA. 11+20	CL	8																										64										
PROJECT TOTAL																	280									6		144						5	5	1	1	3@15"	

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
M.D.I.	MEDIAN DROP INLET
M.D.I. (N.S.)	MEDIAN DROP INLET (NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUCTION BOX

GUARDRAIL SUMMARY

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.

W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOULDER WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	ANCHORS GRAU 350	ANCHORS TYPE III	IMPACT ATTENUATOR TYPE 350 EA	IMPACT ATTENUATOR TYPE 350 G	IMPACT ATTENUATOR TYPE 350 NG	REMARKS
-L-	18+81.80	21+81.80	RT	300			21+93.80		8	11					1	1				
-L-	23+05.80	23+80.80	RT	75				22+93.80	8	11					1	1				
-L-	20+50.35	21+87.85	LT	137.50				21+99.85	8	11					1	1				
-L-	23+11.85	23+86.85	LT	75			22+99.85		8	11					1	1				
			SUB-TOTAL	587.50											4	4				
		LESS DEDUCTIONS FOR ANCHORS																		
			GRAU-350 4@50 =	-200																
			TYPE III 4@18.75 =	-75																
			PROJECT TOTAL	312.50											4	4				
			SAY	325.00																
		ADDITIONAL GUARDRAIL POSTS = 10 EA.																		

SUMMARY OF EARTHWORK
IN CUBIC YARDS

LOCATION	UNCL. EXCAVATION	EMBT+%	BORROW	WASTE
SUMMARY NO. 1				
-L- STA 18+50.00 TO 21+97.00 (BEG BRG)	5	866	861	
TOTAL SUMMARY NO. 1	5	866	861	
SUMMARY NO. 2				
-L- STA 22+97.00 (END BRG) TO 26+50.00	185	1018	833	
-DRV1- STA 10+00.00 TO 11+60.25	11	409	398	
-DRV2- STA 10+12.00 TO 12+00.00	12	510	498	
TOTAL SUMMARY NO. 2	208	1937	1729	
SUMMARY TOTALS	213	2803	2590	
5% TO REPLACE TOPSOIL IN BORROW PIT			130	
PROJECT TOTAL	213		2720	
SAY	250 YD^3		2750 YD^3	
UNDERCUT = 200 CY	FABRIC FOR SOIL STABILIZATION = 100 SY			
SELECT GRANULAR = 100 CY	DRAINAGE DITCH EXCAVATION = 608 CY			

APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, BORROW EXCATION, FINE GRADING, CLEARING AND GRUBBING, BREAKING OF EXISTING PAVEMENT, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR "GRADING."

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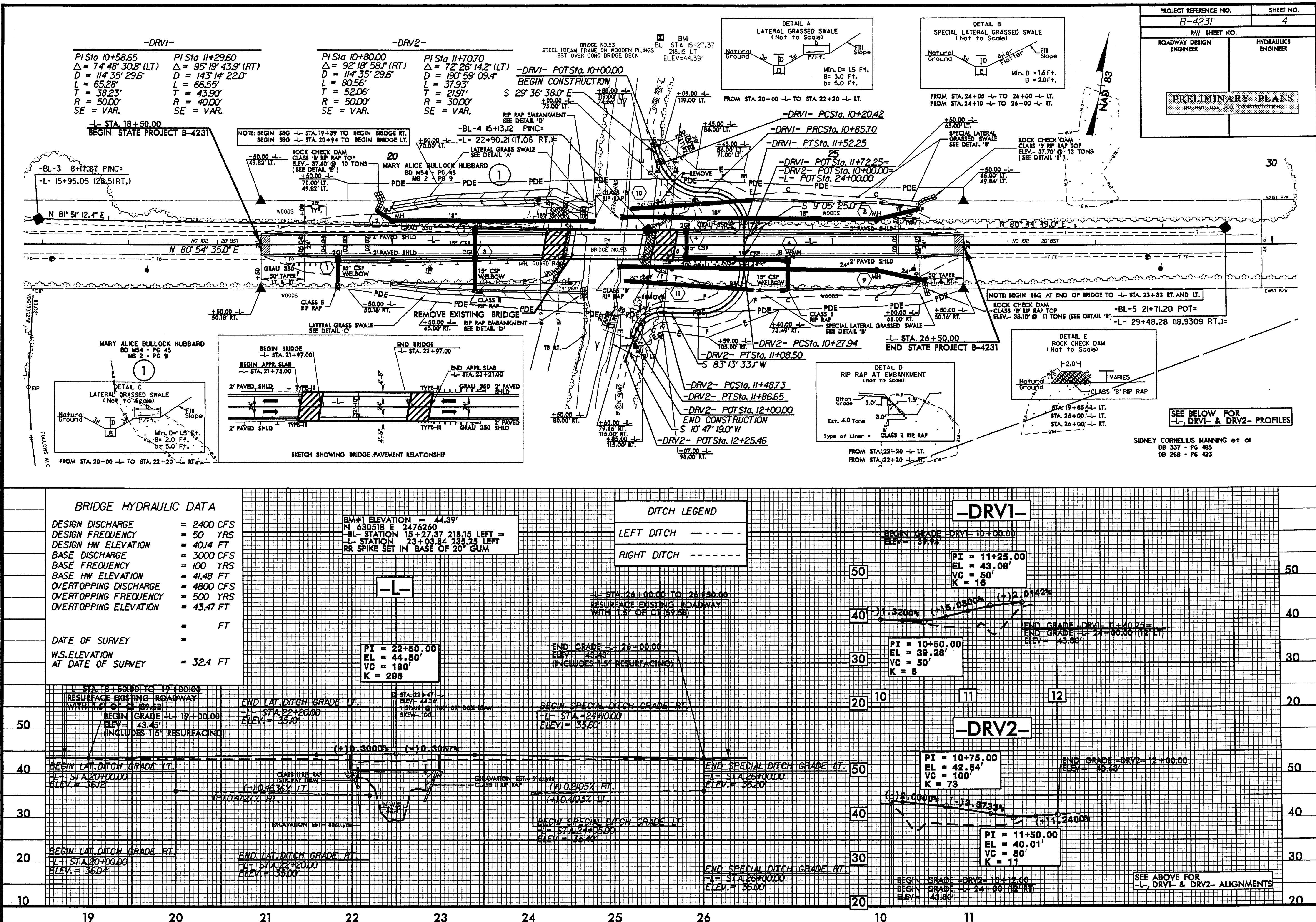
R/W REVISION 11/04/05 (DWG) - REVISED THE PDE AT -L- STA. 19+50 LT. AND -L- STA. 26+50 LT. ON PARCEL 1 (MARY ALICE BULLOCK HUBBARD)

PROJECT REFERENCE NO.	SHEET NO.
B-4231	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-DRV1-
PI Sta 10+58.65
Δ = 74° 48' 30.8" (LT)
D = 114° 35' 29.6"
L = 65.28'
T = 38.23'
R = 50.00'
SE = VAR.
PI Sta 11+29.60
Δ = 95° 19' 43.9" (RT)
D = 143° 14' 22.0"
L = 66.55'
T = 43.90'
R = 40.00'
SE = VAR.
-DRV2-
PI Sta 10+80.00
Δ = 92° 18' 58.1" (RT)
D = 114° 35' 29.6"
L = 80.56'
T = 52.06'
R = 50.00'
SE = VAR.
PI Sta 11+70.70
Δ = 72° 26' 14.2" (LT)
D = 190° 59' 09.4"
L = 37.93'
T = 21.97'
R = 30.00'
SE = VAR.
-L- STA. 18+50.00
BEGIN STATE PROJECT B-4231
-L- STA. 26+50.00
END STATE PROJECT B-4231
BRIDGE NO.53
STEEL I BEAM FRAME ON WOODEN PILINGS
BST OVER CONC BRIDGE DECK
BM1
-BL- STA 15+27.37
218.15 LT
ELEV=44.39'
-DRV1- POT Sta. 10+00.00
BEGIN CONSTRUCTION
S 29° 36' 38.0" E
-DRV1- PC Sta. 10+20.42
-DRV1- PRC Sta. 10+85.70
-DRV1- PT Sta. 11+52.25
-DRV1- POT Sta. 11+72.25=
-DRV2- POT Sta. 10+00.00=
-L- POT Sta. 24+00.00
-DRV2- PC Sta. 10+27.94
-DRV2- PT Sta. 11+08.50
S 83° 13' 33.1" W
-DRV2- PC Sta. 11+48.73
-DRV2- PT Sta. 11+86.65
-DRV2- POT Sta. 12+00.00
END CONSTRUCTION
S 10° 47' 19.0" W
-DRV2- POT Sta. 12+25.46
N 81° 51' 12.4" E
N 80° 54' 35.0" E
N 80° 44' 49.0" E
S 9° 05' 25.0" E
-BL-3 8+17.87 PINC=
-L- 15+95.05 (28.51 RT.)
-BL-4 15+13.12 PINC=
-L- 22+90.21 (17.06 RT.)=
-BL-5 21+71.20 POT=
-L- 29+48.28 (18.9309 RT.)=
NOTE: BEGIN SBG -L- STA. 19+39 TO BEGIN BRIDGE RT.
BEGIN SBG -L- STA. 20+94 TO BEGIN BRIDGE LT.
NOTE: BEGIN SBG AT END OF BRIDGE TO -L- STA. 23+33 RT. AND LT.
MARY ALICE BULLOCK HUBBARD
BD M54 - PG 45
MB 2 - PG 9
SIDNEY CORNELIUS MANNING et al
DB 337 - PG 485
DB 268 - PG 423
REMOVE EXISTING BRIDGE
DETAIL A
LATERAL GRASSED SWALE
(Not to Scale)
FROM STA. 20+00 -L- TO STA. 22+20 -L- LT.
DETAIL B
SPECIAL LATERAL GRASSED SWALE
(Not to Scale)
FROM STA. 24+05 -L- TO 26+00 -L- LT.
FROM STA. 24+10 -L- TO 26+00 -L- RT.
DETAIL C
LATERAL GRASSED SWALE
(Not to Scale)
FROM STA. 20+00 -L- TO STA. 22+20 -L- RT.
DETAIL D
RIP RAP AT EMBANKMENT
(Not to Scale)
FROM STA. 22+20 -L- LT.
FROM STA. 22+20 -L- RT.
DETAIL E
ROCK CHECK DAM
(Not to Scale)
SKETCH SHOWING BRIDGE/PAVEMENT RELATIONSHIP
BEGIN BRIDGE -L- STA. 21+97.00
BEGIN APPR. SLAB -L- STA. 21+73.00
END BRIDGE -L- STA. 22+97.00
END APPR. SLAB -L- STA. 23+21.00
SEE BELOW FOR -L-, DRV1- & DRV2- PROFILES
NAD 83
-L-
-DRV1-
-DRV2-
BM#1 ELEVATION = 44.39'
N 630518 E 2476260
-BL- STATION 15+27.37 218.15 LEFT =
-L- STATION 23+03.84 235.25 LEFT
RR SPIKE SET IN BASE OF 20" GUM
DITCH LEGEND
LEFT DITCH
RIGHT DITCH
PI = 22+50.00
EL = 44.50'
VC = 180'
K = 296
PI = 11+25.00
EL = 43.09'
VC = 50'
K = 16
PI = 10+50.00
EL = 39.28'
VC = 50'
K = 8
PI = 10+75.00
EL = 42.54'
VC = 100'
K = 73
PI = 11+50.00
EL = 40.01'
VC = 50'
K = 11
BEGIN GRADE -L- 19+00.00
ELEV= 43.45'
(INCLUDES 1.5" RESURFACING)
END GRADE -L- 26+00.00
ELEV= 43.43'
(INCLUDES 1.5" RESURFACING)
-L- STA. 26+00.00 TO 26+50.00
RESURFACE EXISTING ROADWAY WITH 1.5" OF C1 (S9.5B)
SEE ABOVE FOR -L-, DRV1- & DRV2- ALIGNMENTS

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 2400 CFS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 40.14 FT
BASE DISCHARGE	= 3000 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 41.48 FT
OVERTOPPING DISCHARGE	= 4800 CFS
OVERTOPPING FREQUENCY	= 500 YRS
OVERTOPPING ELEVATION	= 43.47 FT
	= FT
DATE OF SURVEY	=
W.S. ELEVATION AT DATE OF SURVEY	= 32.4 FT

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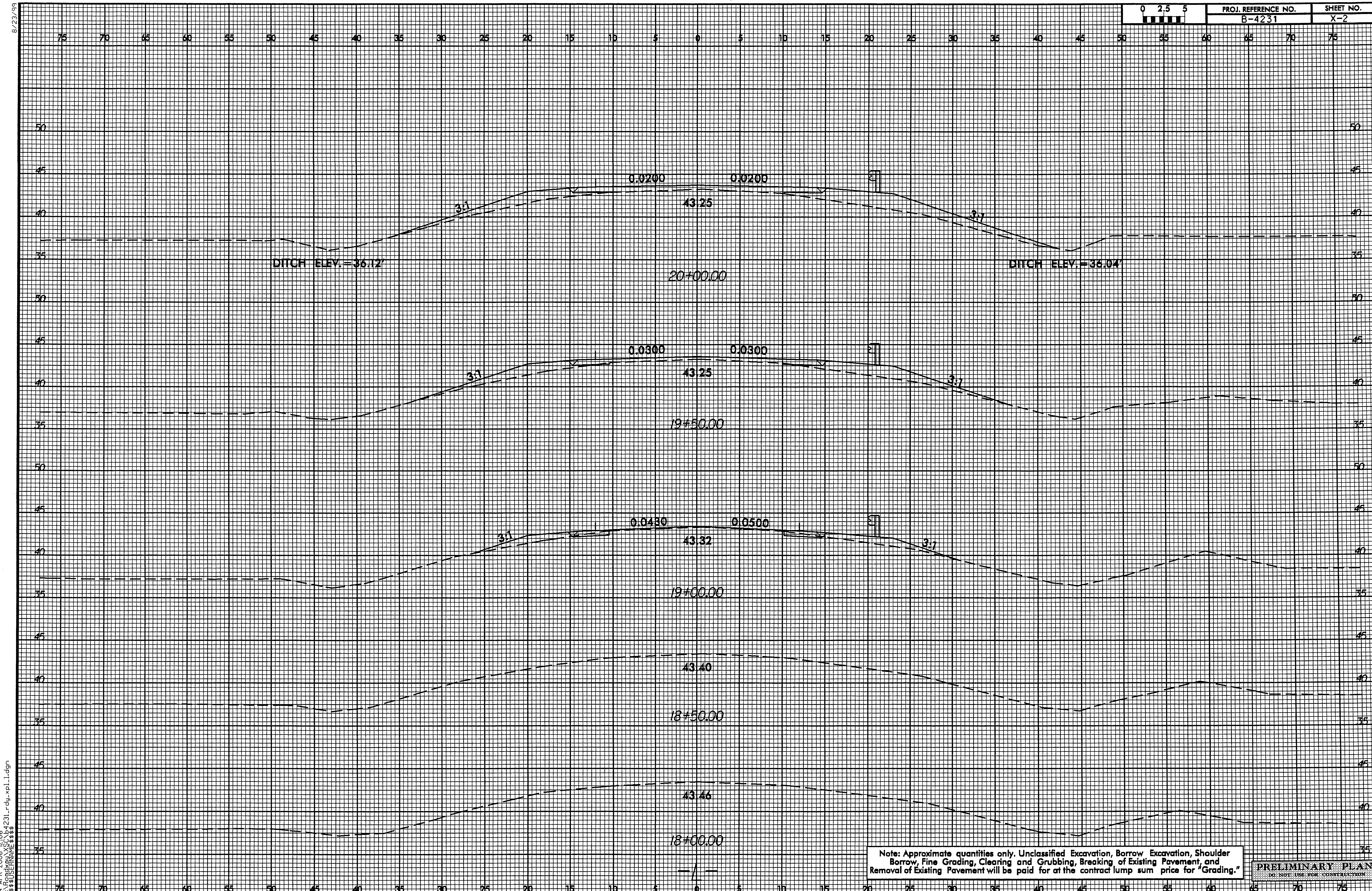
PROJ. REFERENCE NO.	SHEET NO.
B-4231	X-2



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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4231	X-3

BRIDGE

42.98

3:1 3:1

DITCH ELEV. = 35.19'

3:1 3:1

DITCH ELEV. = 35.10'

22+00.00

0.0200 0.0200

43.19

3:1 3:1

DITCH ELEV. = 35.43'

3:1 3:1

DITCH ELEV. = 35.33'

21+50.00

0.0200 0.0200

43.24

3:1 3:1

DITCH ELEV. = 35.66'

3:1 3:1

DITCH ELEV. = 35.57'

21+00.00

0.0200 0.0200

43.28

3:1 3:1

DITCH ELEV. = 35.89'

3:1 3:1

DITCH ELEV. = 35.80'

20+50.00

—/—

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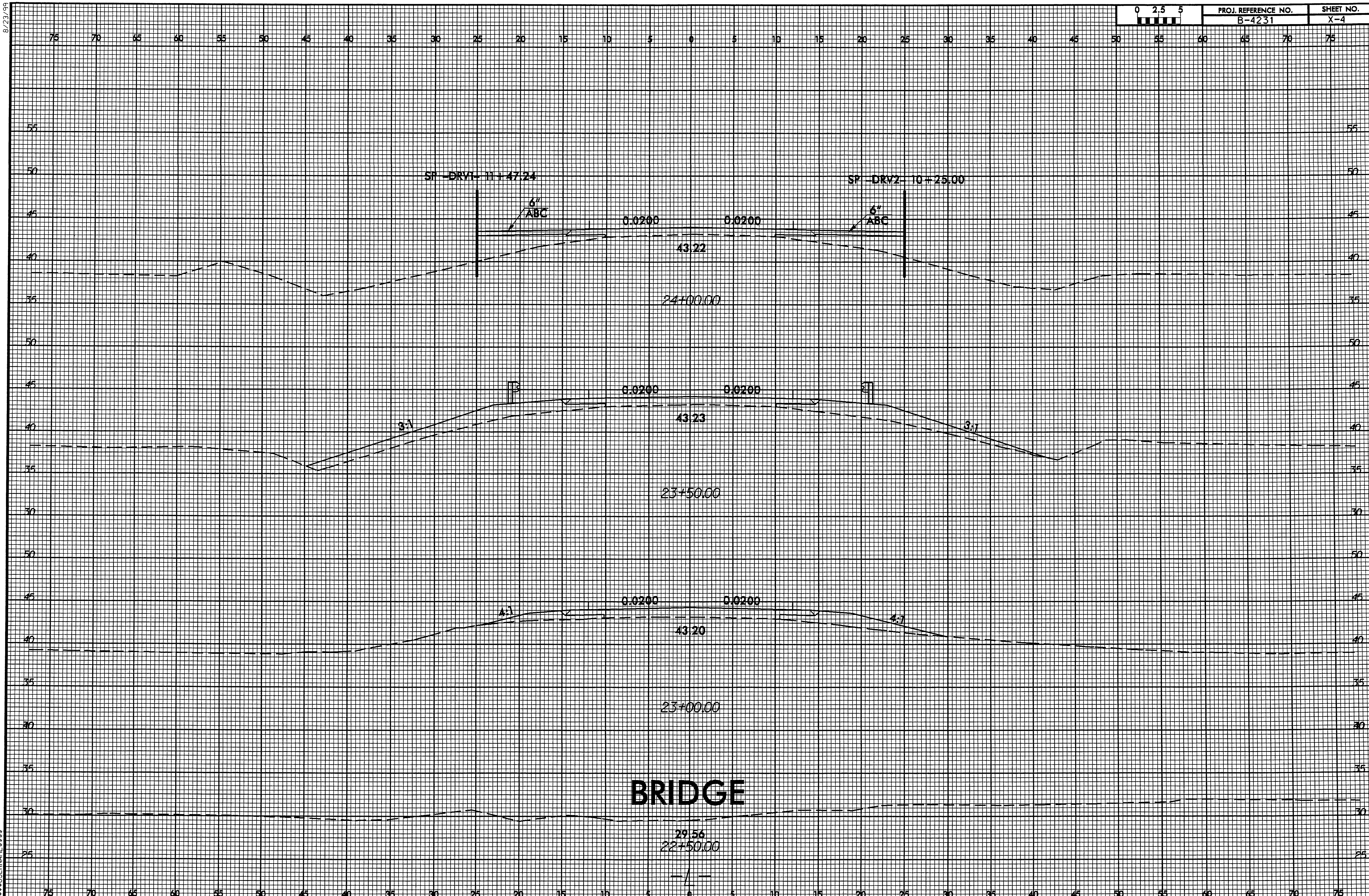

PROJ. REFERENCE NO.
B-4231
SHEET NO.
X-4
8/23/99
SP -DRV1- 11+47.24
SP -DRV2- 10+25.00
6"
ABC
0.0200
43.22
24+00.00
3:1
43.23
23+50.00
4:1
43.20
23+00.00
BRIDGE
29.56
22+50.00
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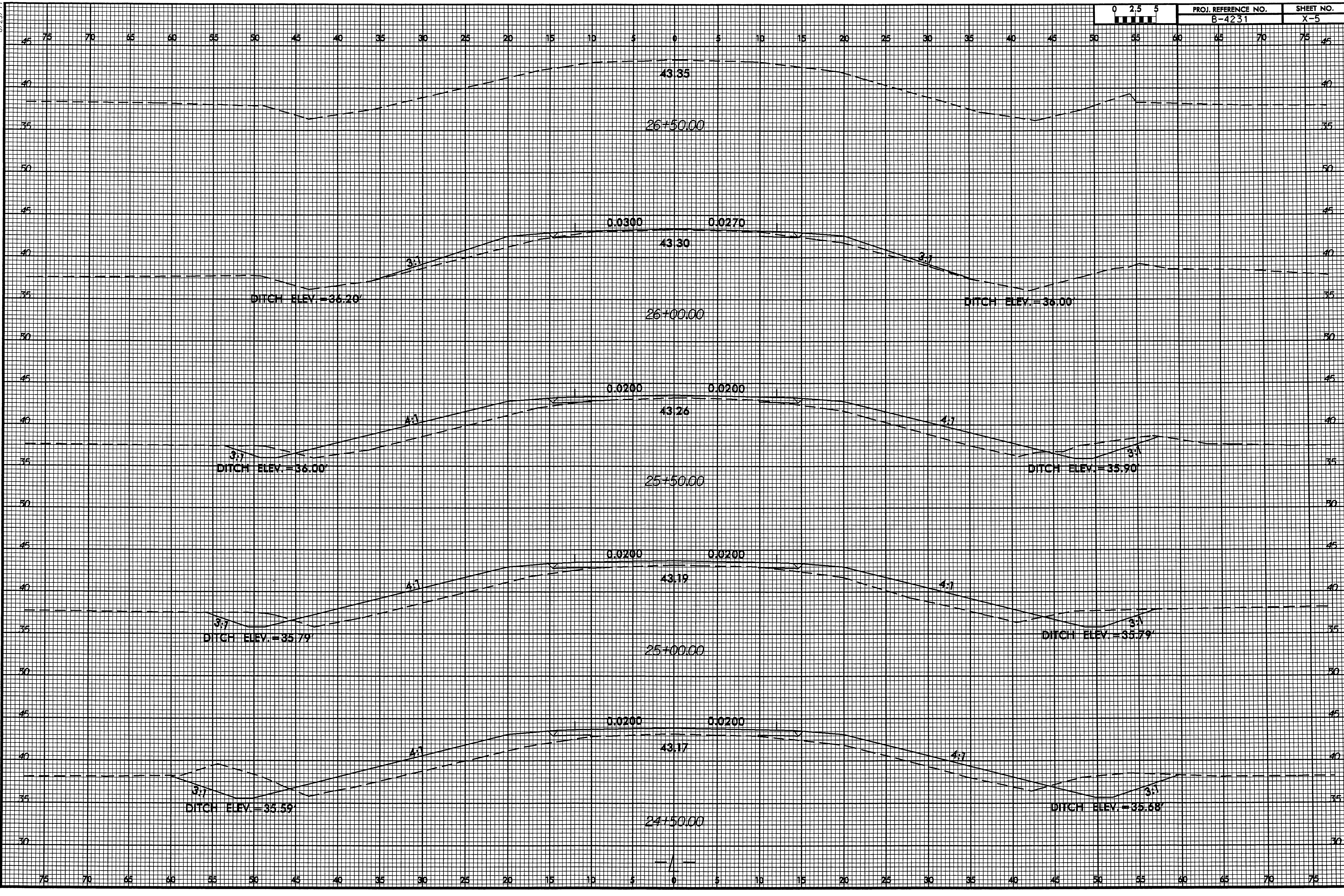
PROJ. REFERENCE NO.	SHEET NO.
B-4231	X-5



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0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
B-4231	X-6

43.39

27+00.00

—/—

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4231	X-7

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

3:1 0.0200 0.0200 3:1

38.24

10+75.00

3:1 0.0200 0.0200 3:1 3:1

38.88 38.42

10+50.00

3:1 3:1 0.0200 0.0200 3:1 3:1

38.35 39.54 38.35

10+25.00

39.94

10+00.00

—DRVI—

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

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0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4231	X-8

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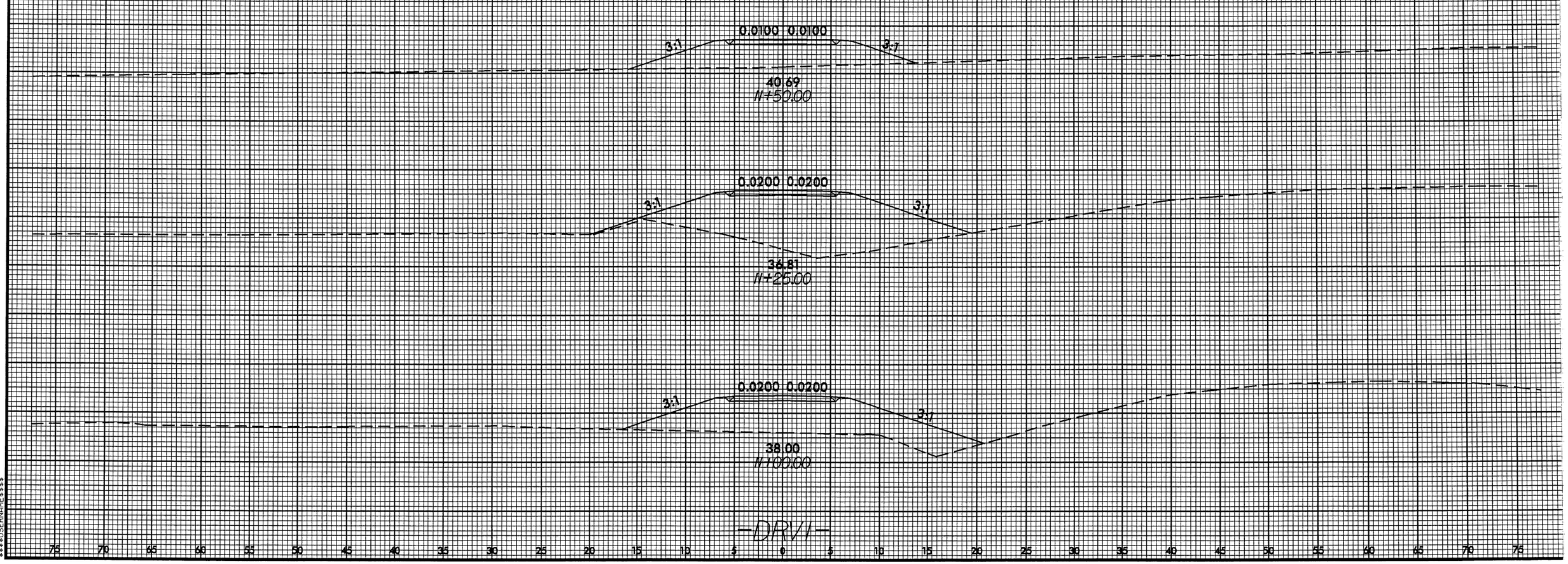

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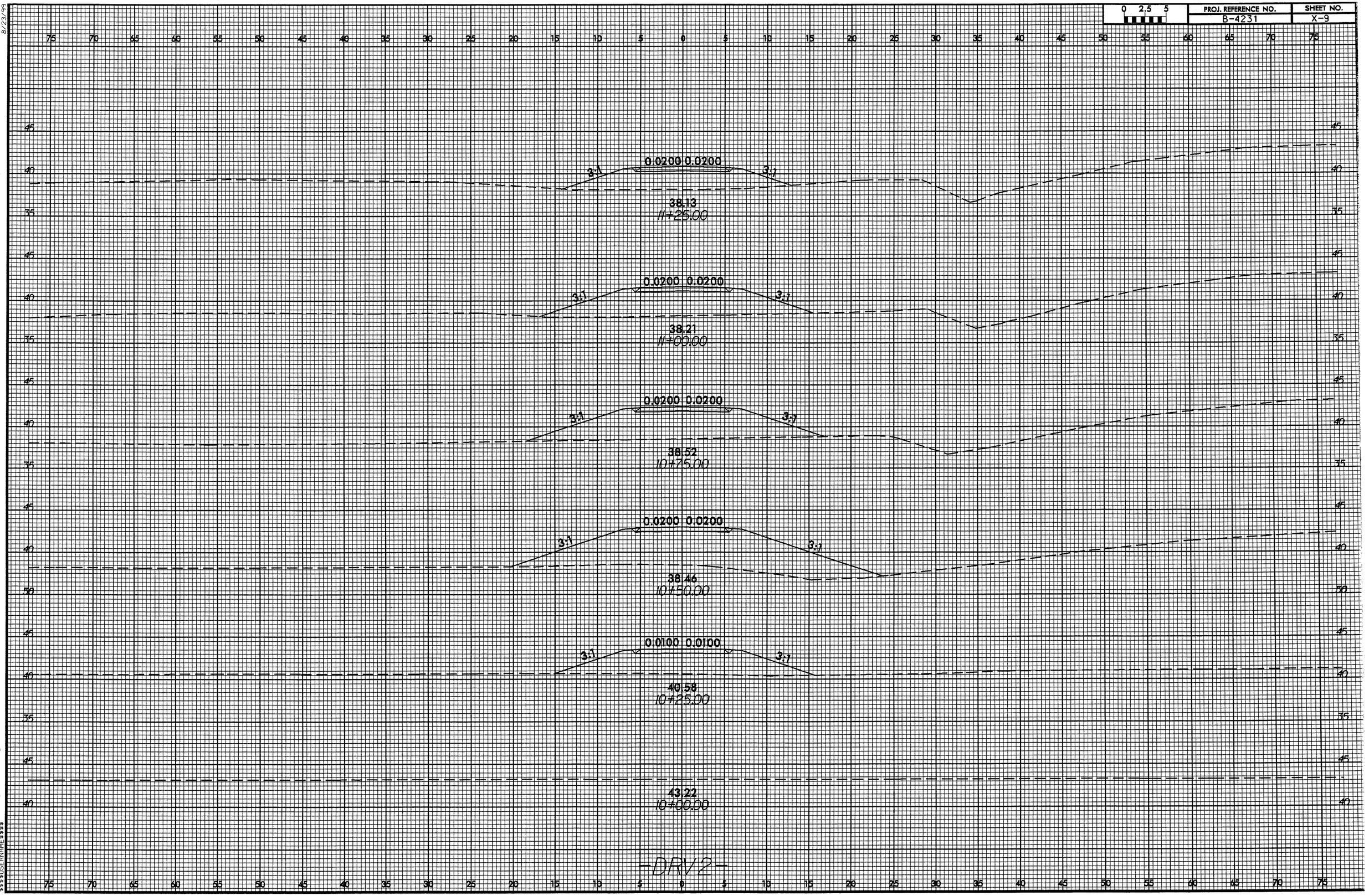
	B-4231	X-9



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0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4231	X-10

40.70

12+25.00

40.63

12+00.00

3:1 3:1 0.0200 0.0200 3:1 3:1

39.05 40.18 39.05

11+75.00

3:1 0.0200 0.0200 3:1

38.48

11+50.00

-DRV2-

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