STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

July 31, 2008

US Army Corps of Engineers
Regional Field Office
3331 Heritage Trade Drive, Suite 105
Wake Forest, NC 27587

ATTENTION: Eric Alsmeyer
NCDOT Coordinator, Division 5

Dear Sir:

Subject: **Application for Section 404 Nationwide Permits 23 and 13, Section 401 Water Quality Certification, and Neuse Riparian Buffer Authorization** for the replacement of Bridge No. 143 over Beaverdam Creek on SR 2217 (Old Milburnie Road), Wake County. Federal Aid Project Number BRZ-2217(1), WBS No. 33641.1.1, State Project No. 8.2409501, Division 5, T.I.P No. B-4304.

$570.00 Debit from WBS Element 33641.1.1.

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 143 over Beaverdam Creek. The existing bridge is currently in poor condition (bridge sufficiency rating of 4.0 out of 100) and in need of replacement. The replacement of this inadequate structure will result in safer, more efficient traffic operations.

The proposed structure will be approximately 130 feet in length with three spans at 40 feet, 50 feet, and 40 feet each. One interior bent will be placed in the streambed along the water's edge. The superstructure will be composed of pre-stressed 3-foot (width) by 21-inch (depth) cored slab units. The proposed bridge has 42.5 feet of clear roadway and will provide two travel lanes. The project proposes to demolish the existing bridge and replace with a new bridge on new alignment north of the existing bridge. During construction, traffic will be maintained on the existing bridge. Please see the enclosed copies of the permit drawings, buffer drawings, design plans, and Pre-Construction Notification (PCN) for the above-referenced project. The Categorical Exclusion (CE) was completed for this project in December 2006 and the Right of Way Consultation was completed in October 2007; each was distributed shortly thereafter. Additional copies of these documents are available upon request.

IMPACTS TO WATERS OF THE UNITED STATES

The project is located in the Neuse River Basin (subbasin 03-04-02) and USGS hydrologic unit 03020201. Beaverdam Creek and its unnamed tributary (UT), located in the project study area, are currently classified by the NC Division of Water Quality (DWQ) as C-NSW. No designated Outstanding

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

TELEPHONE: 919-715-1334 or
919-715-1335

FAX: 919-715-5501

WEBSITE: WWW.NCDOT.ORG

LOCATION:
2728 CAPITAL BLVD. SUITE 240
RALEIGH NC 27604

Resource Waters (ORW), High Quality Waters (HQW), Water Supply I (WS-I), or Water Supply (WS-II), waters occur within 1.0 mile of the study corridor. No portion of Beaverdam Creek or its tributary, or other surface waters within 1.0 mile of the project are listed on the North Carolina Division of Water Quality's (NCDWQ) 2006 Final 303(d) List of Impaired Waters.

Four riparian wetlands (Sites 1 – 4) are located within the project area and are classified as palustrine, seasonally flooded, forested wetland supporting broad-leaved deciduous vegetation, diked/impounded (PFO1Ch, Cowardin classification) A jurisdictional determination verifying the streams and wetlands was received by the USACE on July 1, 2004 (Action ID 200420510).

Permanent Impacts

There will be 150 feet of surface water impacts to Beaverdam Creek (Site 1) due to bank stabilization underneath the bridge. An additional 10 feet of fill in surface water of the UT to Beaverdam Creek will occur due to pipe extension (Site 2). Permanent impacts to wetlands in the project study area total 0.92 acres including 0.48 acre of fill (Sites 1 - 3), 0.26 acre of mechanized clearing (Sites 1 and 2), and 0.18 acre of excavation (Site 4).

Temporary Impacts

No temporary impacts to surface waters or wetlands are anticipated from project construction.

Utility Impacts

No utility impacts are anticipated from project construction.

Bridge Demolition

The existing bridge was constructed in 1948, has three spans, and totals 55 feet in length. The deck consists of a reinforced concrete floor with asphalt overlay on steel girders. The railings are concrete. The substructure is composed of reinforced concrete caps on timber piles and concrete abutments with steel crutch bents. The existing bridge will be removed without dropping components into Beaver Dam Creek. Best Management Practices for Bridge Demolition and Removal will be implemented during the demolition of this bridge.

IMPACTS TO NEUSE RIPARIAN BUFFER

Riparian Buffer Impacts

This project is located within the Neuse River Basin and is therefore subject to Neuse River riparian buffer rules (15A NCAC 2B .0233). There will be a total of 9,435 square feet of impacts to the buffers of Beaverdam Creek from the construction of the bridge (Site 1). A total of 8,066 square feet will occur in Zone 1 and 1,369 square feet will occur in Zone 2 (Table 1). According to the buffer rules, impacts associated with the construction of bridges are **Allowable**.

An additional 3,920 square feet of buffer impacts will occur along Beaverdam Creek beyond the end bents of the new bridge structure (Site 1). A total of 348 square feet will occur in Zone 1 and 3,572 square feet will occur in Zone 2 (Table 1). These impacts are categorized as *road crossing* and are **Allowable with Mitigation** because buffer impacts are greater than 150 feet.

Additional *road crossing* impacts totaling less than 40 linear feet of riparian buffer will also occur along the south side of the UT to Beaverdam Creek (Site 2). These impacts will be in both Zones 1 (897 square

feet) and 2 (604 square feet). The buffer impacts are below the minimum threshold to be considered Allowable and are therefore considered **Exempt** (Table 1). However, please note that these impacts are shown with the same hatching as Allowable impacts on the buffer drawings.

Buffer impacts (612 square feet) categorized as *road impacts other than crossings* occur along Neuseoca Lake (Site 1). A total of 148 square feet will occur in Zone 1 and 464 square feet will occur in Zone 2 (Table 1). These impacts are considered **Allowable with Mitigation**.

Table 1. Neuse River Buffer Impacts

Type of Impact	Bridge	Road Crossing	Road Crossing	Road Impacts Other Than Crossings
Mitigation requirements	Allowable	Exempt	Allowable with Mitigation	Allowable with Mitigation
Zone 1 Impacts (sq. ft)	8,066	897	348	148
Zone 2 Impacts (sq. ft)	1,369	604	3,572	464
Total (sq. ft)	9,435	1,501	3,920	612

Wetlands in Buffers

According to 15A NCAC 2B .0242, Section (3)(b)(iii), impacts to wetlands within Zones 1 and 2 of the riparian buffer that are subject to mitigation under 15A NCAC 2H .0506 shall comply with the mitigation ratios in 15A NCAC 2H .0506 only. Therefore, any wetland impacts that occur within either/both buffer zones will be subtracted from the buffer impacts and mitigated for as wetland impacts only. Wetland impacts overlap buffer impacts in all three (exempt, allowable, and allowable with mitigation) categories. Table 2 lists only the wetland impacts overlapping the allowable with mitigation buffer impacts along with the net total of mitigable buffer impacts.

Table 2. Wetlands in Buffers and Mitigable Neuse River Buffer Impacts

Type of Impact	Road Crossing	Road Impacts Other Than Crossings	**Total**
Mitigation requirements	Allowable with Mitigation	Allowable with Mitigation	
Zone 1 Impacts (sq. ft)	348	148	**496**
Wetlands In Buffer (WIB), Zone 1 (sq. ft)	239	0	**239**
Zone 2 Impacts (sq. ft)	3,572	464	**4,036**
WIB, Zone 2 (sq. ft)	2,115	0	**2,115**
Total Zone 1 Impacts, Minus WIB (sq. ft)	109	148	**257**
Total Zone 2 Impacts, Minus WIB (sq. ft)	1,457	464	**1,921**
Total [Zones 1 and 2, Minus WIB (sq. ft)]	1,566	612	**2,178**

Practical Alternatives Analysis

This bridge has been determined to be structurally deficient and functionally obsolete. Replacement of this inadequate structure on new alignment will result in safer and more efficient traffic operations. Because this bridge needs to be replaced, impacts to the riparian buffers of Beaverdam Creek and its UT are unavoidable.

Utility Impacts to Riparian Buffers

No utility impacts are anticipated from project construction.

FEDERALLY PROTECTED SPECIES

Plants and animals with federal classifications of Endangered, Threatened, Proposed Endangered, and Proposed Threatened are protected under the provisions of the Endangered Species Act of 1973, as amended. As of January 31, 2008, the US Fish and Wildlife Service (USFWS) lists three federally protected species for Wake County (Table 2). One species (bald eagle) was officially delisted on August 8, 2007 (CFR 50 Part 17). The biological conclusion for bald eagle in the CE was "No Effect" with no habitat available in the project area. The bald eagle still remains protected under the Bald and Golden Eagle Protection Act. A recent survey for the bald eagle was conducted on June 17, 2008 within the project study area to a 660-foot radius outside the project study area. No nests or specimens were observed.

Table 2. Federally Protected Species in Wake County, NC

Common Name	Scientific Name	Federal Status	Biological Conclusion	Habitat Present
Red-cockaded woodpecker	*Picoides borealis*	Endangered	No Effect	No
Dwarf wedgemussel	*Alasmidonta heterodon*	Endangered	No Effect	No
Michaux's sumac	*Rhus michauxii*	Endangered	No Effect	No

The biological conclusion of "No Effect" rendered for the three species in the CE still remains valid. It was determined that suitable habitat for these species does not occur in the project study area. A review of the Natural Heritage Program database in July 2008 revealed no occurrences of these species within 1.0 mile of the project study area.

MITIGATION OPTIONS

Avoidance and Minimization and Compensatory Mitigation

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

According to the Clean Water Act (CWA) §404(b)(1) guidelines, NCDOT must avoid, minimize, and mitigate, in sequential order, impacts to waters of the US. The following is a list of the project's jurisdictional stream, wetland, and Neuse Buffer avoidance/minimization activities proposed or completed by NCDOT:

Avoidance/Minimization

- NCDOTs BMPs for Protection of Surface Waters and Bridge Demolition and Removal will be implemented.
- New bridge will completely span Beaverdam Creek.
- During construction, traffic will be maintained on the existing structure.
- The new bridge will be constructed on a curve instead of a straight section of road to minimize wetland impacts.

Compensatory Mitigation

The Jeffreys Warehouse Mitigation Site was originally constructed as on-site mitigation for R-1030, US 117 from south of NC 581 in Goldsboro to the US 264 Bypass in Wilson. There are two parcels associated with this mitigation site. The west parcel (approximately 50.2 acres) is bounded on the northwest by the Little River and on the southeast by the US 117 right-of-way. The east parcel (approximately 37.5 acres) is bounded on the northwest by the US 117 right-of-way, on the northeast by a Wayne County Board of Education school bus maintenance shop, and on the east and southeast by private property. The site was constructed in 2007 and has undergone one year of hydrologic and vegetative monitoring.

The site was originally debited for R-1030AA. To offset the unavoidable 2,178 square feet (257 square feet for Zone 1 and 1,921 square feet for Zone 2) of buffer impacts (allowable with mitigation) associated with T.I.P B-4304, the Jeffreys Warehouse Mitigation Site will be debited 3,653 square feet (0.08 acres) of Neuse Buffer Restoration. A total of 0.92 acres of wetland restoration will also be debited from this mitigation site to offset the unavoidable 0.92 acres of wetland impacts.

No compensatory mitigation for permanent stream impacts is proposed. The 150 feet of permanent impacts are for bank stabilization of Beaverdam Creek (Site 1) underneath the bridge and do not constitute loss of waters of the U.S. The minimal impact of 10 feet of fill (pipe extension) will occur in the UT to Beaverdam Creek (Site 2).

SCHEDULE

The project calls for a letting of February 17, 2009 (review date of December 30, 2008) with a date of availability of March 31, 2009. It is expected that the contractor will choose to start construction in April 2009.

REGULATORY APPROVALS

Section 404 Permit: The project has been processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance with 23 CFR 771.115(b). The NCDOT requests that the wetland and stream impacts (10 feet) be authorized by a Nationwide Permit 23 (72 FR 11092; March 19, 2007). We are also requesting the issuance of a Nationwide Permit 13 for the work associated with the bank stabilization (150 feet) of Beaverdam Creek.

Section 401 Certification: We anticipate 401 General Certification numbers 3701 (fill in surface waters) and 3689 (bank stabilization) will apply to this project. This project will impact greater than 0.10 acre of wetlands and impact Neuse Riparian Buffers, requiring written concurrence. In accordance with 15A NCAC 2H, Section .0500(a) and 15A NCAC 2B.0200 we are providing five copies of this application to the North Carolina Department of Environment and Natural Resources, Division of Water Quality, for their review. In compliance with Section 143-215.3D(e) of the NCAC we will provide $570.00 to act as payment for processing the Section 401 permit application.

Buffer Authorization: This project has been designed to comply with the Neuse Riparian Buffer Regulations (15A NCAC 2B.0242). NCDOT requests a Neuse Riparian Buffer Authorization from the Division of Water Quality.

A copy of this permit application will be posted on the NCDOT website at: http://www.ncdot.org/doh/preconstruct/pe/. If you have any questions or need additional information, please call Greg Price at 715-5533.

Sincerely,

E. L. Lusk

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

w/attachment
Mr. Brian Wrenn, NCDWQ (5 Copies)
Mr. J. Wally Bowman, PE., Division Engineer
Mr. Chris Murray, DEO

w/o attachment (see permits website for attachments)
Mr. Travis Wilson, NCWRC
Mr. Gary Jordan, USFWS
Dr. David Chang, P.E., Hydraulics
Mr. Mark Staley, Roadside Environmental
Mr. Greg Perfetti, P.E., Structure Design
Mr. Victor Barbour, P.E., Project Services Unit
Mr. Jay Bennett, P.E., Roadway Design
Mr. Majed Alghandour, P. E., Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. Scott McLendon, USACE, Wilmington
Ms. Theresa Ellerby, PDEA Project Planning Engineer
Ms. LeiLani Paugh, NEU
Ms. Anne Deaton, NCDMF

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 & 13

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: North Carolina Department of Transportation
   Mailing Address: Gregory J. Thorpe, Ph.D., Manager
   Project Development and Environmental Analysis Branch
   1598 Mail Service Center
   Raleigh, NC 27699-1598
   Telephone Number: 919-733-3141 Fax Number: 919-733-9794
   E-mail Address: gthorpe@dot.state.nc.us

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: Replace Bridge No. 143 over Beaverdam Creek on SR 2217.

2. T.I.P. Project Number or State Project Number (NCDOT Only): B-4304

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

4. Location
   County: Wake Nearest Town: Raleigh
   Subdivision name (include phase/lot number): N/A
   Directions to site (include road numbers/names, landmarks, etc.): Site is located on SR 2217 (Old Milburnie Road) near SR 2218 (Tarheel Club Road) intersection.

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): 78.52215 °N 35.81830 °W

6. Property size (acres): Please refer to attached drawings.

7. Name of nearest receiving body of water: Beaverdam Creek

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: The local area surrounding the proposed project consists of gently rolling hills and land use is best described as residential development and natural forest vegetation.

10. Describe the overall project in detail, including the type of equipment to be used: NCDOT proposes to replace Bridge No. 143 over Beaverdam Creek on SR 2217 on new alignment. Heavy construction equipment such as cranes, excavators and dump trucks will be utilized during construction.

11. Explain the purpose of the proposed work: The existing bridge was constructed in 1948 and received a sufficiency rating of 4.0 out of a possible 100 for a new structure during the last bridge inspection. Based on this rating, the bridge is considered functionally obsolete and structurally deficient. The project proposes to demolish the existing bridge and replace with a bridge on new alignment, resulting in safer transportation.

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. A jurisdictional determination letter dated July 1, 2004 was received from USACE and remains valid until July 1, 2009 (Action ID 200420510).

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: Approximately 150 linear feet of warm perennial stream will be impacted resulting from bank stabilization. Another 10 feet

for UT to Beaverdam Creek will be impacted from pipe extension. Aproximately 0.92 acres of wetland will be permanently impacted by bridge and road realignment.

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

Wetland Impact Site Number (indicate on map)	Type of Impact	Type of Wetland (e.g., forested, marsh, herbaceous, bog, etc.)	Located within 100-year Floodplain (yes/no)	Distance to Nearest Stream (linear feet)	Area of Impact (acres)
Site 1	Permanent fill	Forested	Yes	20	0.38
Site 1	Mechanized clearing	Forested	Yes	10	0.19
Site 2	Permanent fill	Forested	Yes	10	0.08
Site 2	Mechanized clearing	Forested	Yes	10	0.07
Site 3	Permanent fill	Forested	No	120	0.02
Site 4	Excavation	Forested	No	230	0.18
Total Wetland Impact (acres)					0.92

3. List the total acreage (estimated) of all existing wetlands on the property: approx. 2.5 acre

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

Stream Impact Number (indicate on map)	Stream Name	Type of Impact	Perennial or Intermittent?	Average Stream Width Before Impact	Impact Length (linear feet)	Area of Impact (acres)
Site 1	Beaverdam Creek	Bank stabilization	Perennial	40 feet	150	0.07*
Site 2	UT Beaverdam Creek	Pipe extension	Perennial	10 feet	10	<0.01
Total Stream Impact (by length and acreage)					160	0.07*

* Impacts do not cover entire width of channel.

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):	0.07
Wetland Impact (acres):	0.92
Open Water Impact (acres):	NA
Total Impact to Waters of the U.S. (acres)	0.99
Total Stream Impact (linear feet):	160

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

8. Pond Creation
If construction of a pond is proposed, associated wetland and stream impacts should be included above in the wetland and stream impact sections. Also, the proposed pond should be described here and illustrated on any maps included with this application.
Pond to be created in (check all that apply): ☐ uplands ☐ stream ☐ wetlands
Describe the method of construction (e.g., dam/embankment, excavation, installation of draw-down valve or spillway, etc.): N/A
Proposed use or purpose of pond (e.g., livestock watering, irrigation, aesthetic, trout pond, local stormwater requirement, etc.): N/A
Current land use in the vicinity of the pond: N/A
Size of watershed draining to pond: N/A Expected pond surface area: N/A

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.

See cover letter.

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.
   Compensatory mitigation for permanent stream impacts is not proposed (see cover letter). Compensatory mitigation for permanent wetland impacts will be provided by NCDOT, utilizing surplus credits from the Jeffereys Warehouse mitigation project located in HUC 03020201. See cover letter for more details of mitigation site.

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

IX. Environmental Documentation (required by DWQ)

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

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

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

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

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

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

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

Zone*	Impact (square feet)	Multiplier	Required Mitigation
1	257	3	771
2	1,921	1.5	2,882
Total	2,178		3,653

* 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.

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. Mitigation will be provided by NCDOT, utilizing surplus credits from the Jeffereys Warehouse mitigation project located in HUC 03020201.

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.

N/A

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):

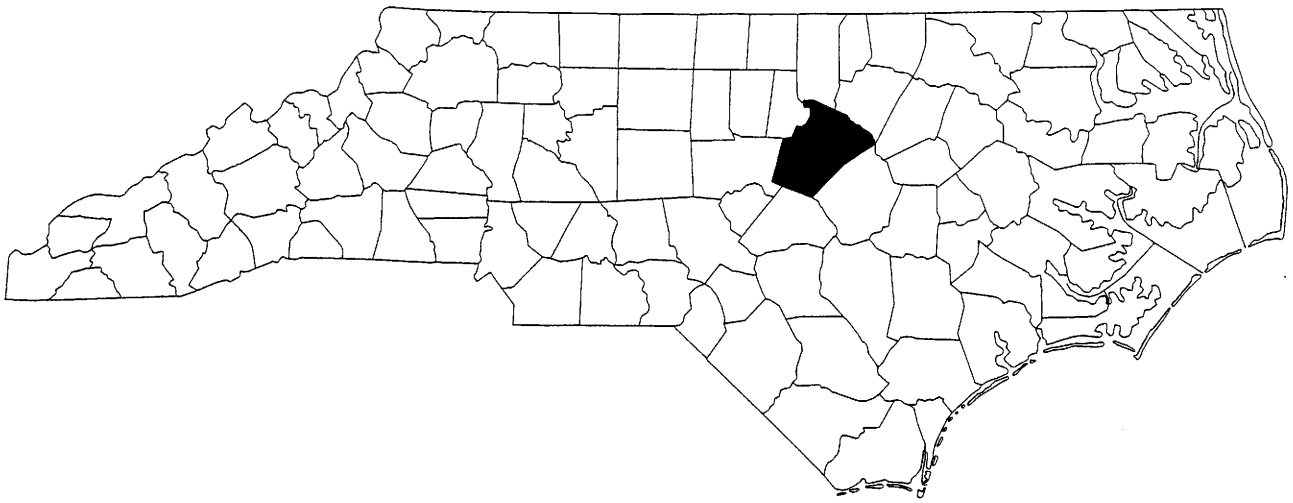
It is the applicant's responsibility to submit the application sufficiently in advance of desired construction dates to allow processing time for these permits. However, an applicant may choose to list constraints associated with construction or sequencing that may impose limits on work schedules (e.g.,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

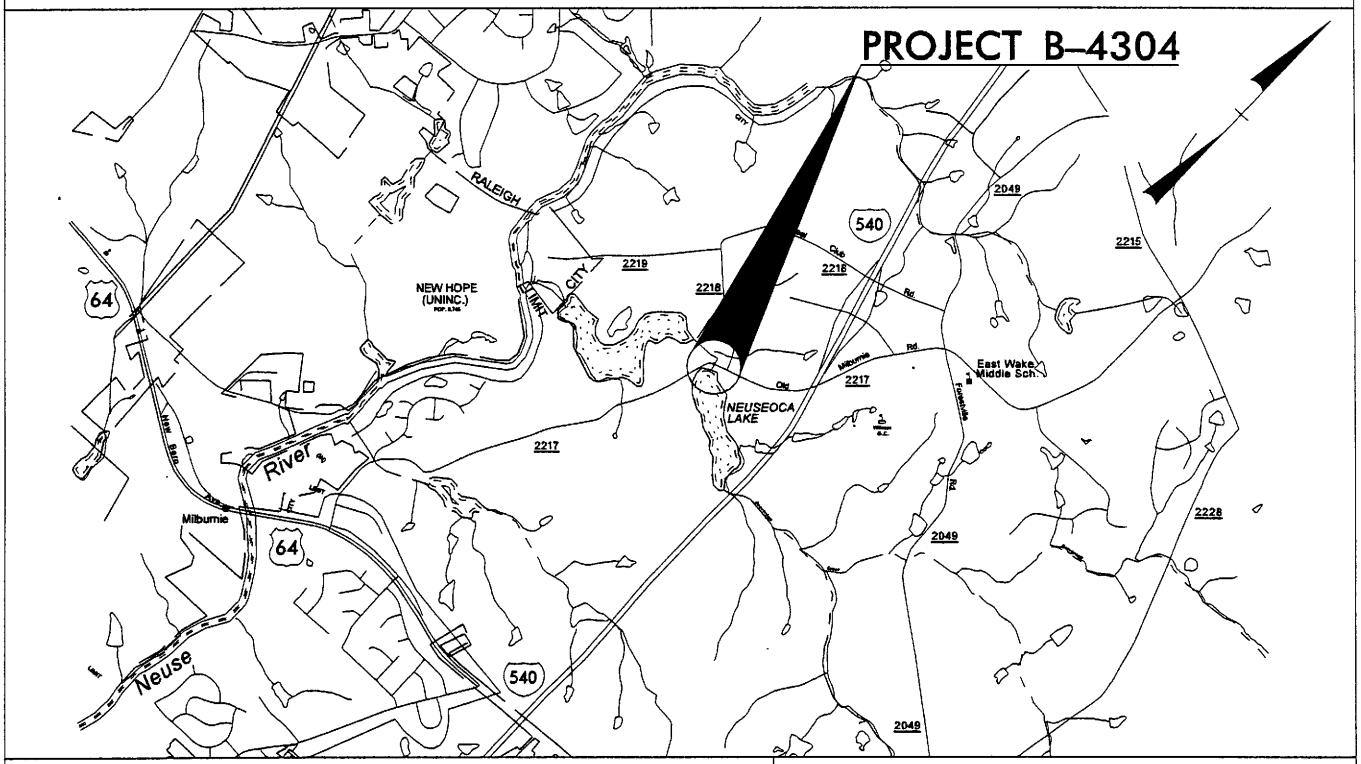
E. L. Lusk 8.4.08

Applicant/Agent's Signature **Date**

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

NORTH CAROLINA



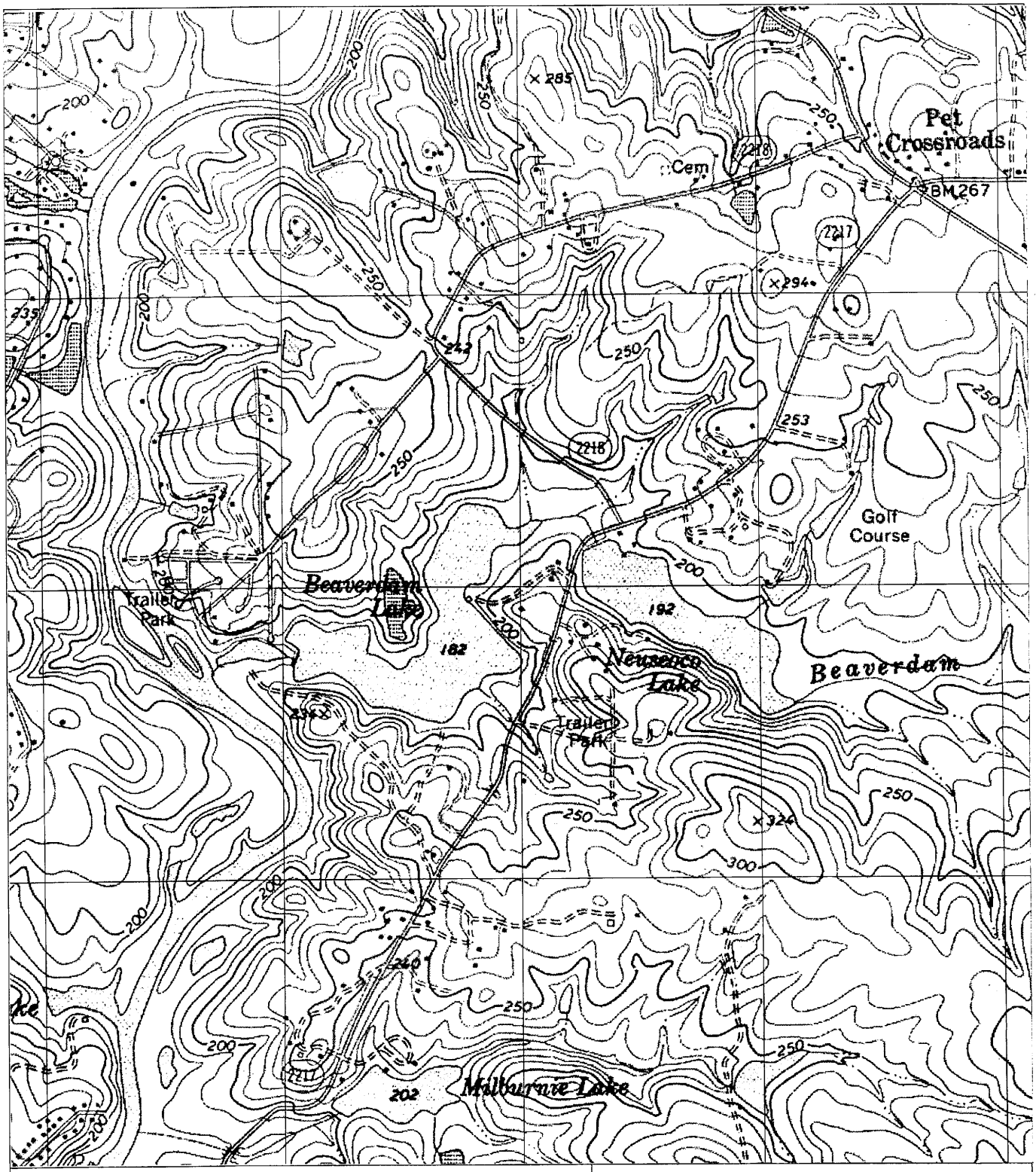


VICINITY MAPS

NCDOT

DIVISION OF HIGHWAYS
WAKE COUNTY
PROJECT: B-4304
BRIDGE NO. 143 OVER
BEAVER DAM CREEK
ON SR 2217
(OLD MILBURNIE RD.)

SHEET 1 OF 9 6/24/2008



TOPO MAP

SCALE: 1" : 1500'

NCDOT

DIVISION OF HIGHWAYS
WAKE COUNTY
PROJECT: B-4304
BRIDGE NO. 143 OVER
BEAVER DAM CREEK
ON SR 2217
(OLD MILBURNIE RD.)

SHEET 2 OF 9 6/24/2008

PROPERTY OWNERS

NAMES AND ADDRESSES

	NAMES	ADDRESSES
1	Eric Stephen Stroud	1832 Old Milburnie Road, Raleigh, NC 27604
2	Beaver Dam Lake, Inc.	1633 Glenwood Avenue, Raleigh, NC 27608

NCDOT

DIVISION OF HIGHWAYS
WAKE COUNTY
PROJECT: B-4304
BRIDGE NO. 143 OVER
BEAVER DAM CREEK
ON SR 2217
(OLD MILBURNIE RD.)

6/24/2008

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	18+07 TO 21+78 -L- LT/RT	BRIDGE	0.38			0.19		0.07		150		
2	22+35 TO 23+57 -L- LT/RT	Mainline Roadway	0.08			0.07		<.01		10		
3	23+77 TO 25+73 -L- RT	Mainline Roadway	0.02									
4	28+10 TO 28+95 -L- LT *	Mainline Roadway			0.18							
TOTALS:			0.48		0.18	0.26		0.07		160		

* Drawdown limit in wetland is 122'.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
Wake County
Project: B-4304 (Bridge #143)

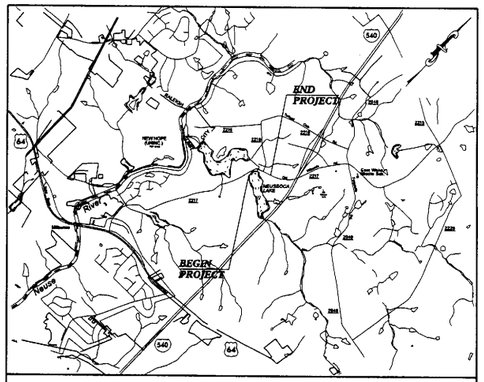
SHEET 4 of 9 7/8/2008

09/08/99

TIP PROJECT: B-4304

CONTRACT:

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



VICINITY MAP
(NOT TO SCALE)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4304	1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
33641.1.1	BRZ-2217(1)	P.E.	

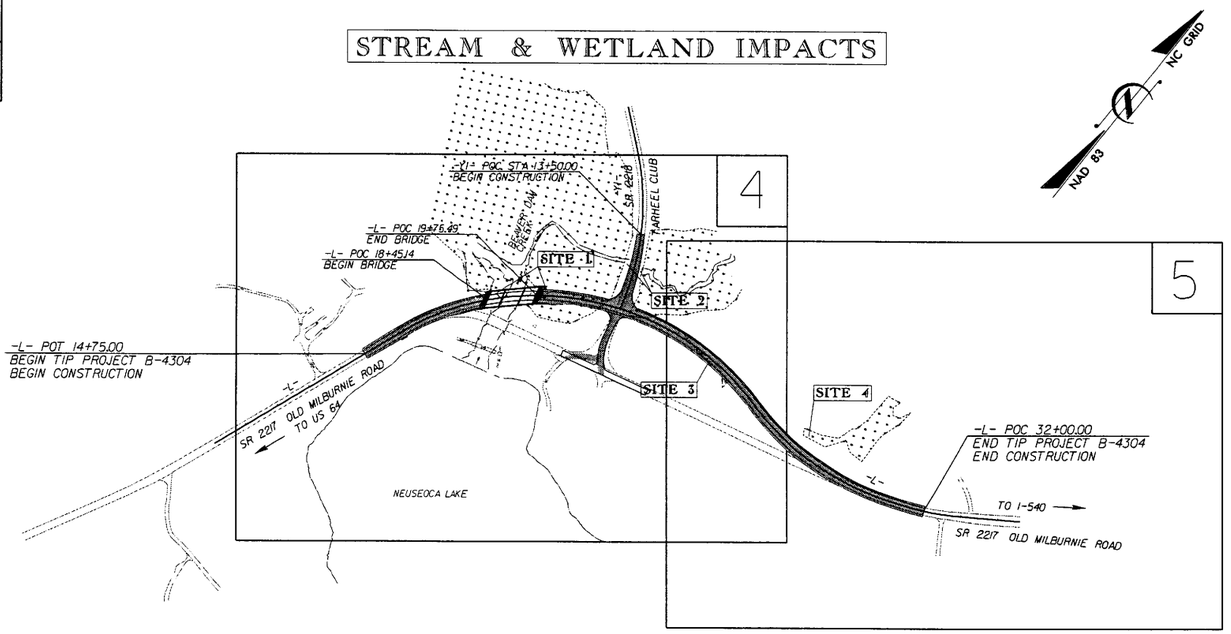
Permit Drawing
Sheet 5 of 9

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

LOCATION: BRIDGE NO. 143 OVER BEAVER DAM CREEK ON SR 2217 (OLD MILBURNIE ROAD)

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

STREAM & WETLAND IMPACTS



MULKEY
ENGINEERS & CONSULTANTS
PO Box 33127
RALEIGH, N.C. 27636
(919) 851-1912
(919) 851-1918 (FAX)
WWW.MULKEYINC.COM

NCDOT CONTACT : DOUG TAYLOR, PE
PROJECT ENGINEER – ROADWAY DESIGN

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

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

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2008 = 6,100
ADT 2030 = 11,400
DHV = 11 %
D ≐ 60 %
T = 3% % *
V = 45 MPH
* (TTST 1%+DUALS 2%)
FUNCTIONAL = MINOR
CLASS. COLLECTOR
**DESIGN EXCEPTION– STOPPING SIGHT DISTANCE

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4304 = 0.302 MI
LENGTH STRUCTURE TIP PROJECT B-4304 = 0.025 MI
TOTAL LENGTH TIP PROJECT B-4304 = 0.327 MI

Prepared In the Office of:
MULKEY ENGINEERS & CONSULTANTS
FOR THE NORTH CAROLINA DEPT. OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 15, 2008

LETTING DATE:
FEBRUARY 17, 2009

TIM S. HAYES, PE
PROJECT ENGINEER

JOHNNY R. BANKS
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

ART McMILLAN, P.E.
STATE HIGHWAY DESIGN ENGINEER

7/7/2008
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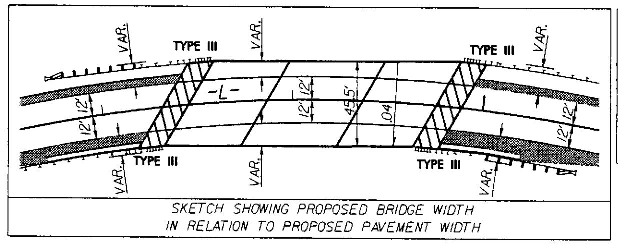
PROJECT REFERENCE NO.	SHEET NO.
B-4304	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

MULKEY ENGINEERS & CONSULTANTS

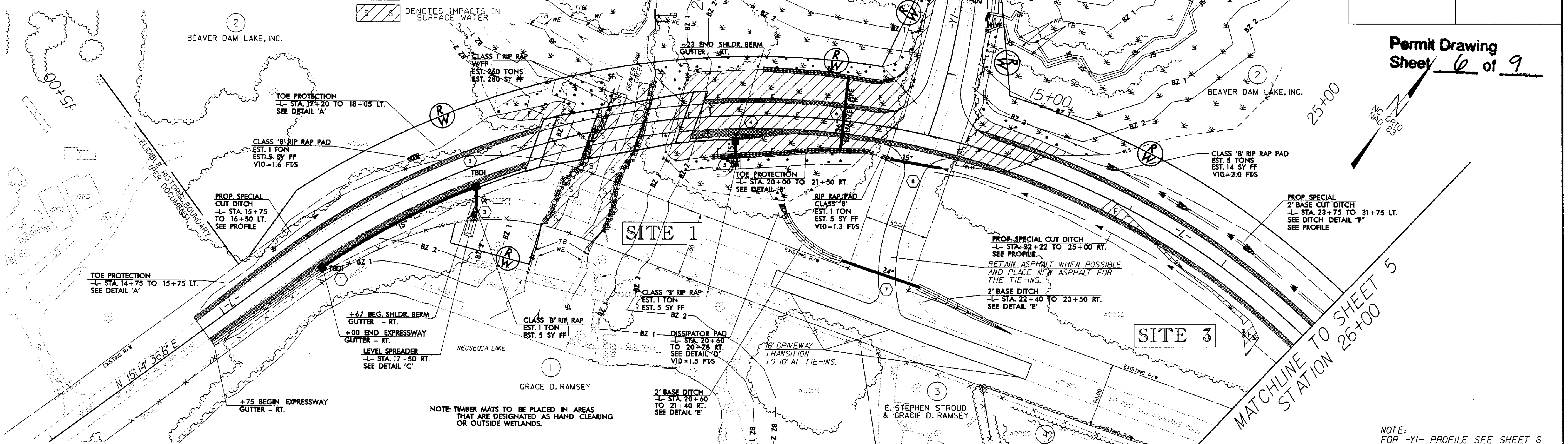
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

STREAM & WETLAND IMPACTS

Permit Drawing Sheet 6 of 9



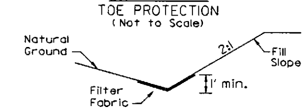
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
DENOTES IMPACTS IN SURFACE WATER



NOTE: TIMBER MATS TO BE PLACED IN AREAS THAT ARE DESIGNATED AS HAND CLEARING OR OUTSIDE WETLANDS.

NOTE: FOR -Y1- PROFILE SEE SHEET 6

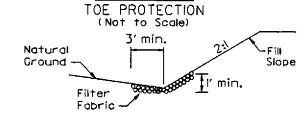
DETAIL 'A'
TOE PROTECTION
(Not to Scale)



Type of Liner= PSRM

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	14+75 - 15+75 LT.		
-L-	17+20 - 18+05 LT.		
-L-	20+50 - 21+65 LT.		

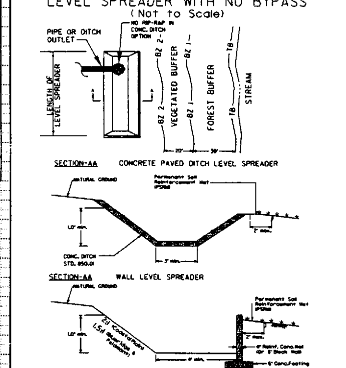
DETAIL 'B'
TOE PROTECTION
(Not to Scale)



Type of Liner= Class 'B' Rip-Rap

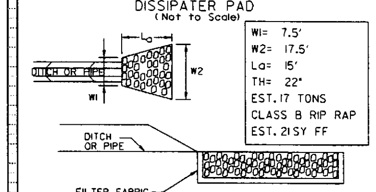
LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	20+00 - 21+50 RT.		

DETAIL 'C'
LEVEL SPREADER WITH NO BYPASS
(Not to Scale)



LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	17+50 RT.		

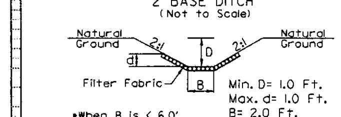
DETAIL 'D'
DISSIPATER PAD
(Not to Scale)



W1= 7.5'
W2= 17.5'
La= 15'
TH= 22"
EST. 17 TONS
CLASS B RIP RAP
EST. 21 SY FF

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	20+60 - 20+78 RT.		

DETAIL 'E'
2' BASE DITCH
(Not to Scale)

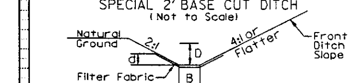


Min. D= 1.0 Ft.
Max. d= 1.0 Ft.
B= 2.0 Ft.
*When B is < 6.0'

Type of Liner= B Rip-Rap

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	20+60 - 21+40 RT.		
-L-	22+40 - 23+50 RT.		

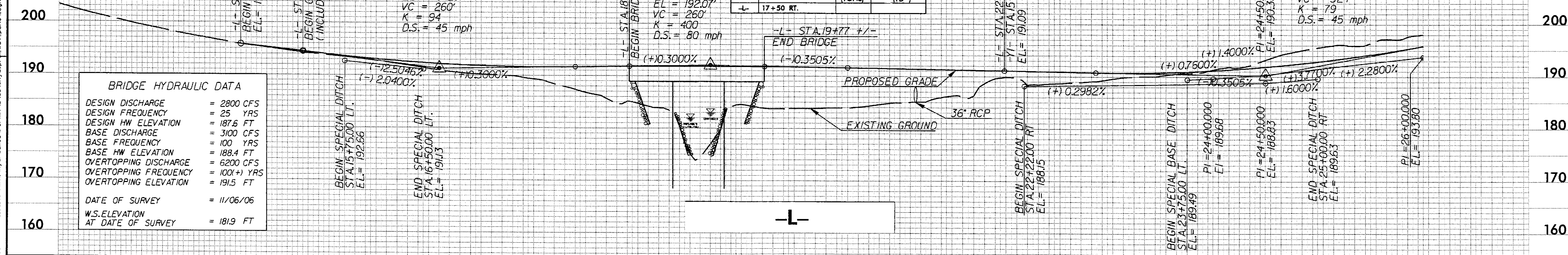
DETAIL 'F'
SPECIAL 2' BASE CUT DITCH
(Not to Scale)



Min. D = 1.5 Ft.
Max. d = 1.0 Ft.
B = 2.0 Ft.

Type of Liner = PSRM

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	23+75 - 31+75 LT.		



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 2800 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 187.6 FT
BASE DISCHARGE	= 3100 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 188.4 FT
OVERTOPPING DISCHARGE	= 6200 CFS
OVERTOPPING FREQUENCY	= 100(+) YRS
OVERTOPPING ELEVATION	= 191.5 FT
DATE OF SURVEY	= 11/06/06
W.S. ELEVATION AT DATE OF SURVEY	= 181.9 FT

REVISIONS

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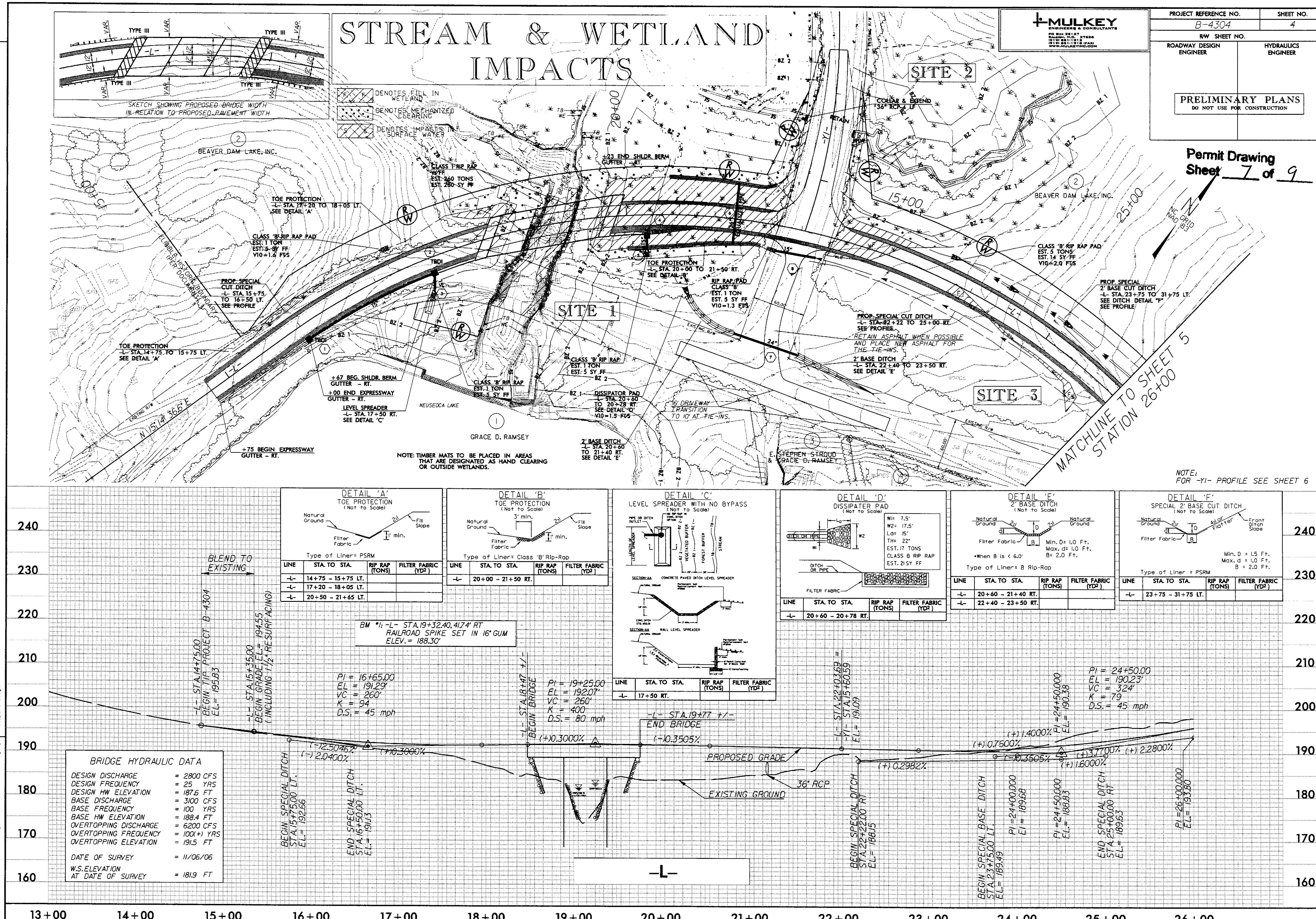
7/7/2008


STREAM & WETLAND IMPACTS
MULKEY ENGINEERS & CONSULTANTS
PROJECT REFERENCE NO. B-4304
SHEET NO. 4
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Permit Drawing Sheet 7 of 9
SKETCH SHOWING PROPOSED BRIDGE WIDTH IN RELATION TO PROPOSED PAVEMENT WIDTH
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
DENOTES IMPACTS IN SURFACE WATER
SITE 1
SITE 2
SITE 3
BEAVER DAM LAKE, INC.
GRACE D. RAMSEY
E. STEPHEN STROUD & GRACIE C. RAMSEY
NEUSEOCA LAKE
MATCHLINE TO SHEET 5 STATION 26+00
NOTE: TIMBER MATS TO BE PLACED IN AREAS THAT ARE DESIGNATED AS HAND CLEARING OR OUTSIDE WETLANDS.
NOTE: FOR -Y1- PROFILE SEE SHEET 6
TOE PROTECTION -L- STA. 17+20 TO 18+05 LT. SEE DETAIL 'A'
TOE PROTECTION -L- STA. 14+75 TO 15+75 LT. SEE DETAIL 'A'
TOE PROTECTION -L- STA. 20+00 TO 21+50 RT. SEE DETAIL 'B'
CLASS 'B' RIP RAP PAD EST. 1 TON EST. 5 SY FF V10=1.6 FPS
CLASS I RIP RAP W/FF EST. 260 TONS EST. 280 SY FF
CLASS 'B' RIP RAP PAD EST. 5 TONS EST. 14 SY FF V10=2.0 FPS
RIP RAP PAD CLASS 'B' EST. 1 TON EST. 5 SY FF V10=1.3 FPS
CLASS 'B' RIP RAP EST. 1 TON EST. 5 SY FF
DISSIPATOR PAD -L- STA. 20+60 TO 20+78 RT. SEE DETAIL 'D' V10=1.5 FPS
LEVEL SPREADER -L- STA. 17+50 RT. SEE DETAIL 'C'
2' BASE DITCH -L- STA. 20+60 TO 21+40 RT. SEE DETAIL 'E'
2' BASE DITCH -L- STA. 22+40 TO 23+50 RT. SEE DETAIL 'E'
PROP. SPECIAL CUT DITCH -L- STA. 22+22 TO 25+00 RT. SEE PROFILE
PROP. SPECIAL 2' BASE CUT DITCH -L- STA. 23+75 TO 31+75 LT. SEE DITCH DETAIL "F" SEE PROFILE
PROP. SPECIAL CUT DITCH -L- STA. 15+75 TO 16+50 LT. SEE PROFILE
RETAIN ASPHALT WHEN POSSIBLE AND PLACE NEW ASPHALT FOR THE TIE-INS.
16' DRIVEWAY TRANSITION TO 10' AT TIE-INS.
COLLAR & EXTEND 36" RCP 4 LF
+23 END SHLDR. BERM GUTTER - RT.
+67 BEG. SHLDR. BERM GUTTER - RT.
+00 END EXPRESSWAY GUTTER - RT.
+75 BEGIN EXPRESSWAY GUTTER - RT.
DETAIL 'A' TOE PROTECTION (Not to Scale) Type of Liner= PSRM
LINE | STA. TO STA. | RIP RAP (TONS) | FILTER FABRIC (YD²)
-L- | 14+75 - 15+75 LT.
-L- | 17+20 - 18+05 LT.
-L- | 20+50 - 21+65 LT.
DETAIL 'B' TOE PROTECTION (Not to Scale) Type of Liner= Class 'B' Rip-Rap
-L- | 20+00 - 21+50 RT.
DETAIL 'C' LEVEL SPREADER WITH NO BYPASS (Not to Scale)
-L- | 17+50 RT.
DETAIL 'D' DISSIPATER PAD
W1= 7.5' W2= 17.5' La= 15' TH= 22" EST. 17 TONS CLASS B RIP RAP EST. 21 SY FF
-L- | 20+60 - 20+78 RT.
DETAIL 'E' 2' BASE DITCH (Not to Scale) Min. D= 1.0 Ft. Max. d= 1.0 Ft. B= 2.0 Ft. Type of Liner= B Rip-Rap
-L- | 20+60 - 21+40 RT.
-L- | 22+40 - 23+50 RT.
DETAIL 'F' SPECIAL 2' BASE CUT DITCH (Not to Scale) Min. D = 1.5 Ft. Max. d = 1.0 Ft. B = 2.0 Ft. Type of Liner = PSRM
-L- | 23+75 - 31+75 LT.
BM #1: -L- STA. 19+32.40, 41.74' RT RAILROAD SPIKE SET IN 16" GUM ELEV.= 188.30'
BLEND TO EXISTING
-L- STA. 14+75.00 BEGIN TIP PROJECT B-4304 EL= 195.83
-L- STA. 15+35.00 BEGIN GRADE EL= 194.55 (INCLUDING 1 1/2" RESURFACING)
PI = 16+65.00 EL = 191.29' VC = 260' K = 94 D.S.= 45 mph
PI = 19+25.00 EL = 192.07' VC = 260' K = 400' D.S.= 80 mph
PI = 24+50.00 EL = 190.23' VC = 324' K = 79 D.S.= 45 mph
-L- STA. 18+47 +/- BEGIN BRIDGE
-L- STA. 19+77 +/- END BRIDGE
PROPOSED GRADE
EXISTING GROUND
36" RCP
BRIDGE HYDRAULIC DATA
DESIGN DISCHARGE = 2800 CFS
DESIGN FREQUENCY = 25 YRS
DESIGN HW ELEVATION = 187.6 FT
BASE DISCHARGE = 3100 CFS
BASE FREQUENCY = 100 YRS
BASE HW ELEVATION = 188.4 FT
OVERTOPPING DISCHARGE = 6200 CFS
OVERTOPPING FREQUENCY = 100(+) YRS
OVERTOPPING ELEVATION = 191.5 FT
DATE OF SURVEY = 11/06/06
W.S. ELEVATION AT DATE OF SURVEY = 181.9 FT
-L-
REVISIONS
7/7/2008

STREAM & WETLAND IMPACTS

MULKEY
ENGINEERS & CONSULTANTS
PO Box 35157
RALEIGH, N.C. 27636
(919) 851-1888
(919) 851-1818 (FAX)
WWW.MULKEYINC.COM

PROJECT REFERENCE NO.	SHEET NO.
B-4304	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Permit Drawing
Sheet 8 of 9

REVISIONS

MATCHLINE TO SHEET 4 STATION 26+00

(2) BEAVER DAM LAKE, INC.

(5) JOHNNY MARSHALL HILL

(6) RICHARD ALEXANDER HILL

PROP. SPECIAL 2' BASE CUT DITCH -L- STA. 23+75 TO 31+75 LT. SEE DITCH DETAIL "F" SEE PROFILE

SITE 4

DENOTES EXCAVATION IN WETLAND

NC NAD 83 GRID

REMOVE

TIE TO EXISTING DITCH

TOE PROTECTION -L- STA. 29+50 TO 30+50 RT. SEE DETAIL 'A'

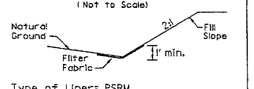
(4) RICHARD A. HILL

(5) JOHNNY MARSHALL HILL

(7) JOHNNY MARSHALL HILL

(8) JOHNNY MARSHALL HILL

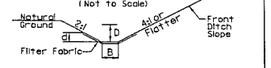
DETAIL 'A'
TOE PROTECTION
(Not to Scale)



Type of Liner= PSRM

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	29+50 - 30+50 RT.		

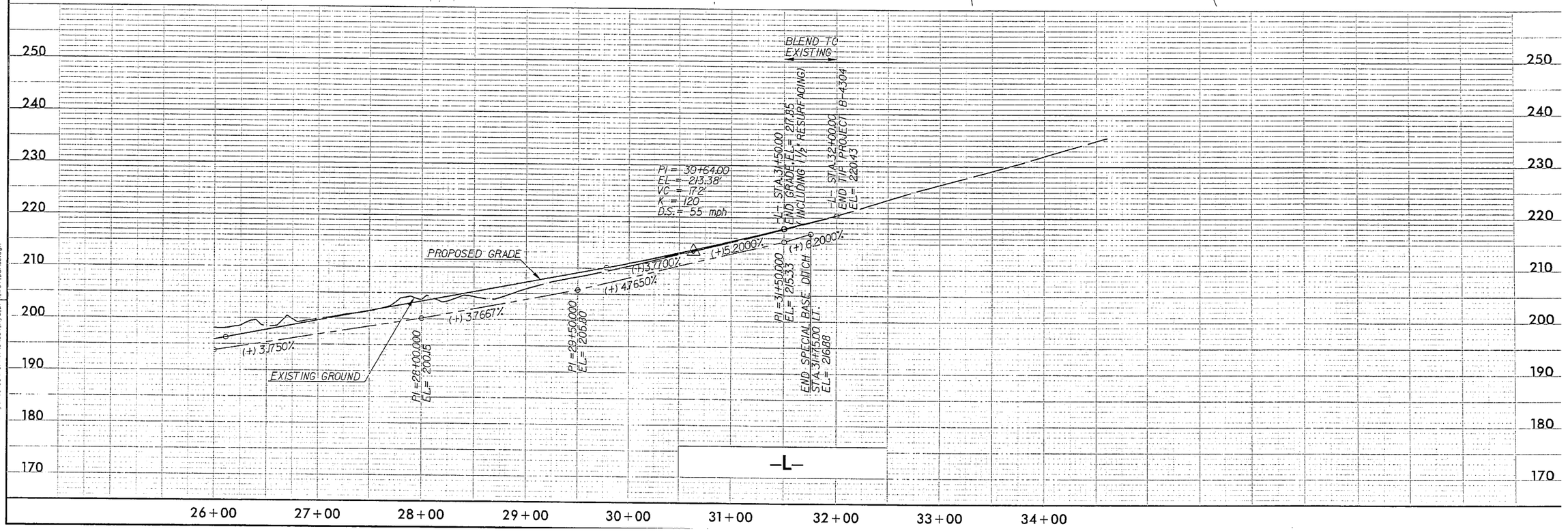
DETAIL 'F'
SPECIAL 2' BASE CUT DITCH
(Not to Scale)



Min. D = 1.5 Ft.
Max. d = 1.0 Ft.
B = 2.0 Ft.

Type of Liner = PSRM

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	23+75 - 31+75 LT.		



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6/1/2006

STREAM & WETLAND IMPACTS

MULKEY
ENGINEERS & CONSULTANTS
PO Box 93127
Raleigh, NC 27624
(919) 851-1101
(919) 851-1102 (FAX)
WWW.MULKEYINC.COM

PROJECT REFERENCE NO.	SHEET NO.
B-4304	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Permit Drawing Sheet 9 of 9

REVISIONS

MATCHLINE TO SHEET 4 STATION 26+00

BEAVER DAM LAKE, INC. (2)

JOHNNY MARSHALL HILL (5)

RICHARD ALEXANDER HILL (6)

PROF. SPECIAL 2' BASE CUT DITCH -L- STA. 23+75 TO 31+75 LT. SEE DITCH DETAIL "F" SEE PROFILE

SITE 4

E E DENOTES EXCAVATION IN WETLAND

REMOVE

TIE TO EXISTING DITCH

TOE PROTECTION -L- STA. 29+50 TO 30+50 RT. SEE DETAIL 'A'

RICHARD A. HILL (4)

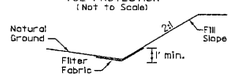
JOHNNY MARSHALL HILL (5)

JOHNNY MARSHALL HILL (7)

JOHNNY MARSHALL HILL (8)

NC NAD GRID 83

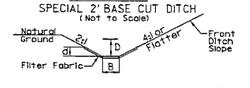
DETAIL 'A'
TOE PROTECTION
(Not to Scale)



Type of Liner= PSRM

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	29+50 - 30+50 RT.		

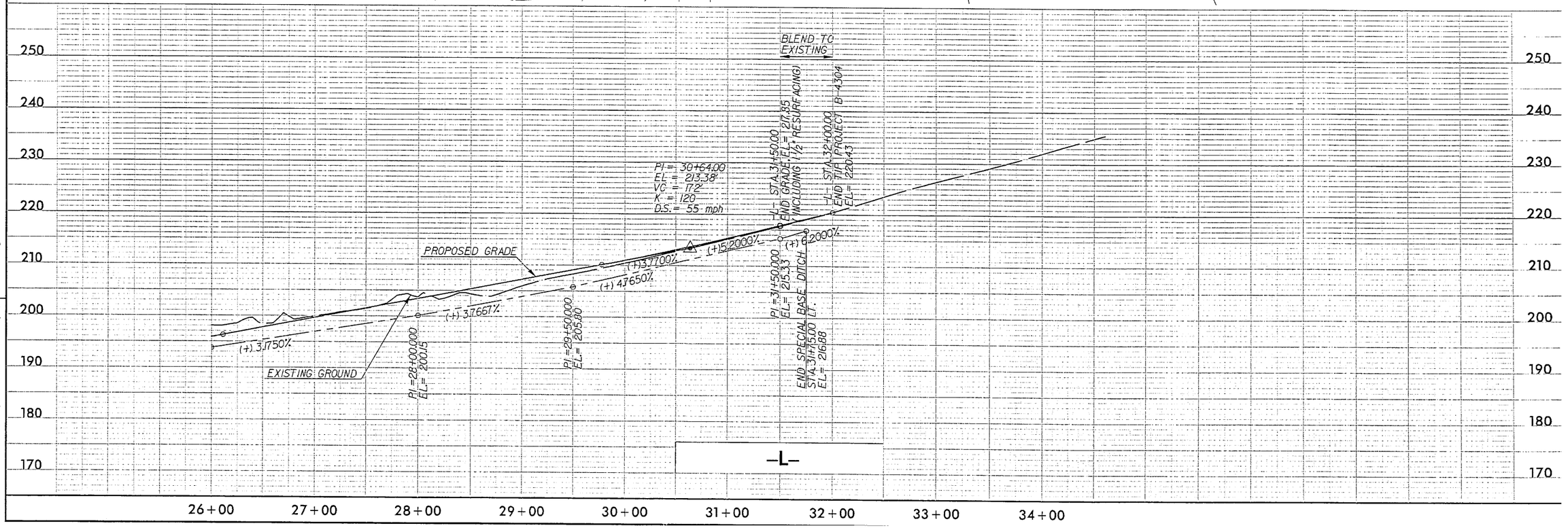
DETAIL 'F'
SPECIAL 2' BASE CUT DITCH
(Not to Scale)



Min. D = 1.5 Ft.
Max. d = 1.0 Ft.
B = 2.0 Ft.

Type of Liner = PSRM

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	23+75 - 31+75 LT.		



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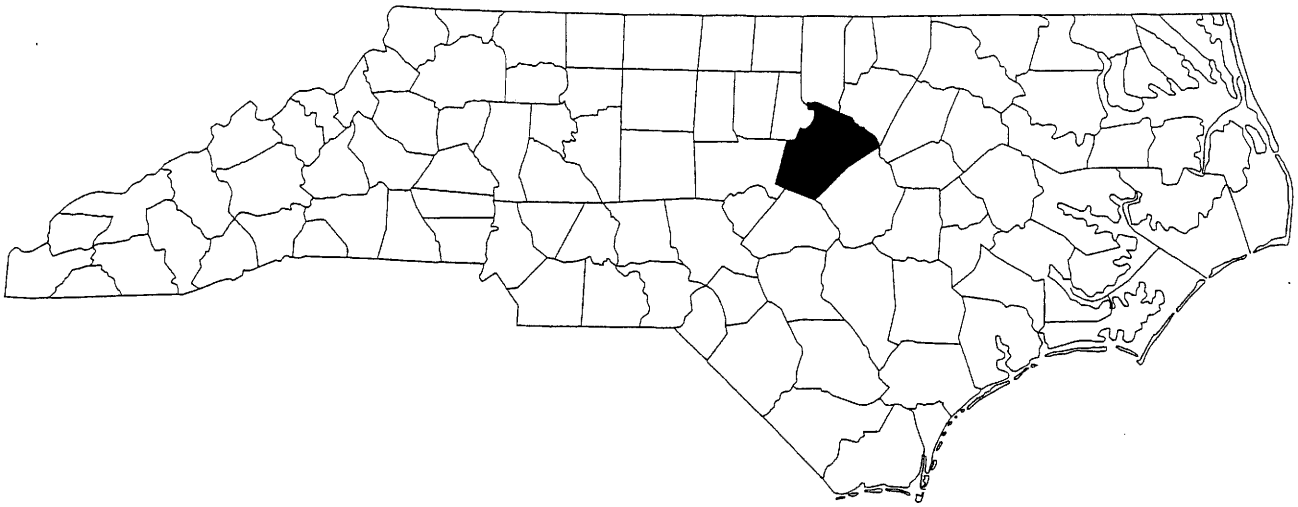
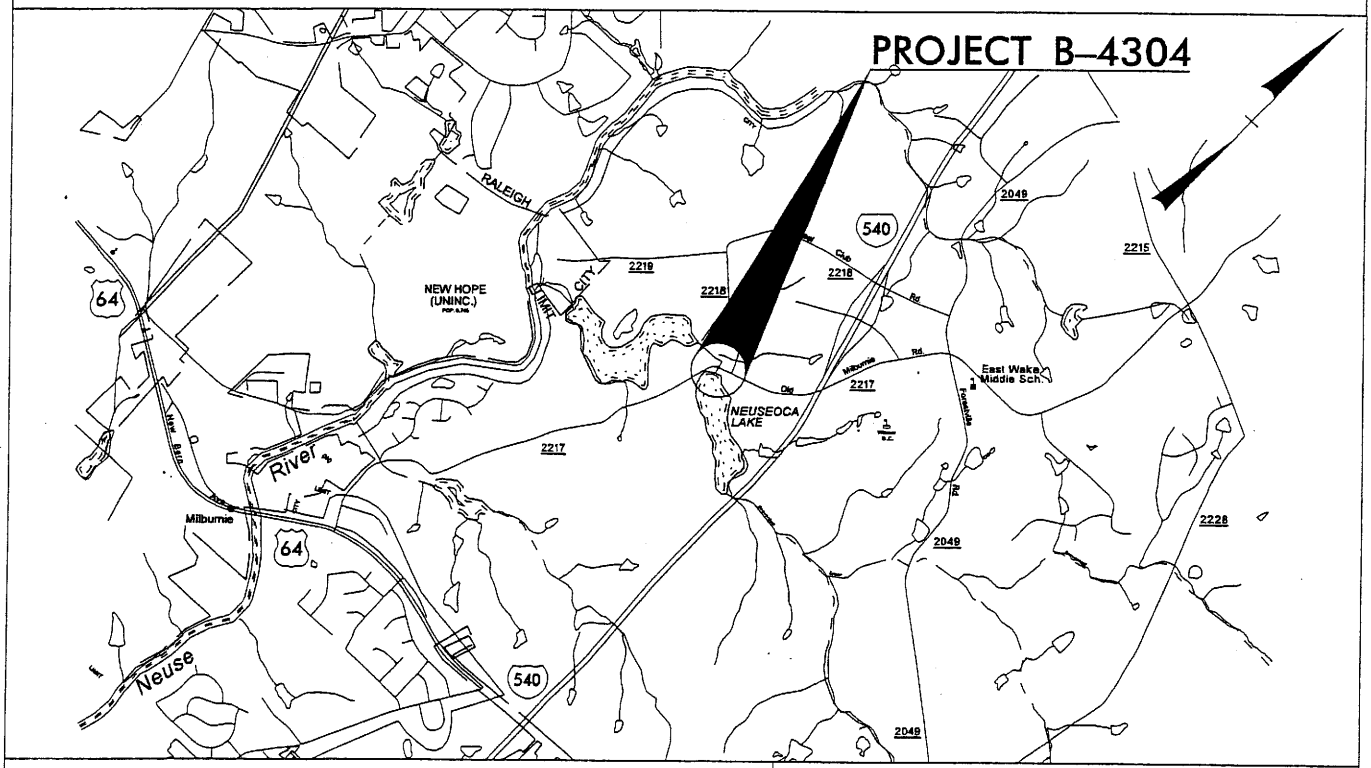
4/1/2008

NORTH CAROLINA





BUFFER IMPACTS

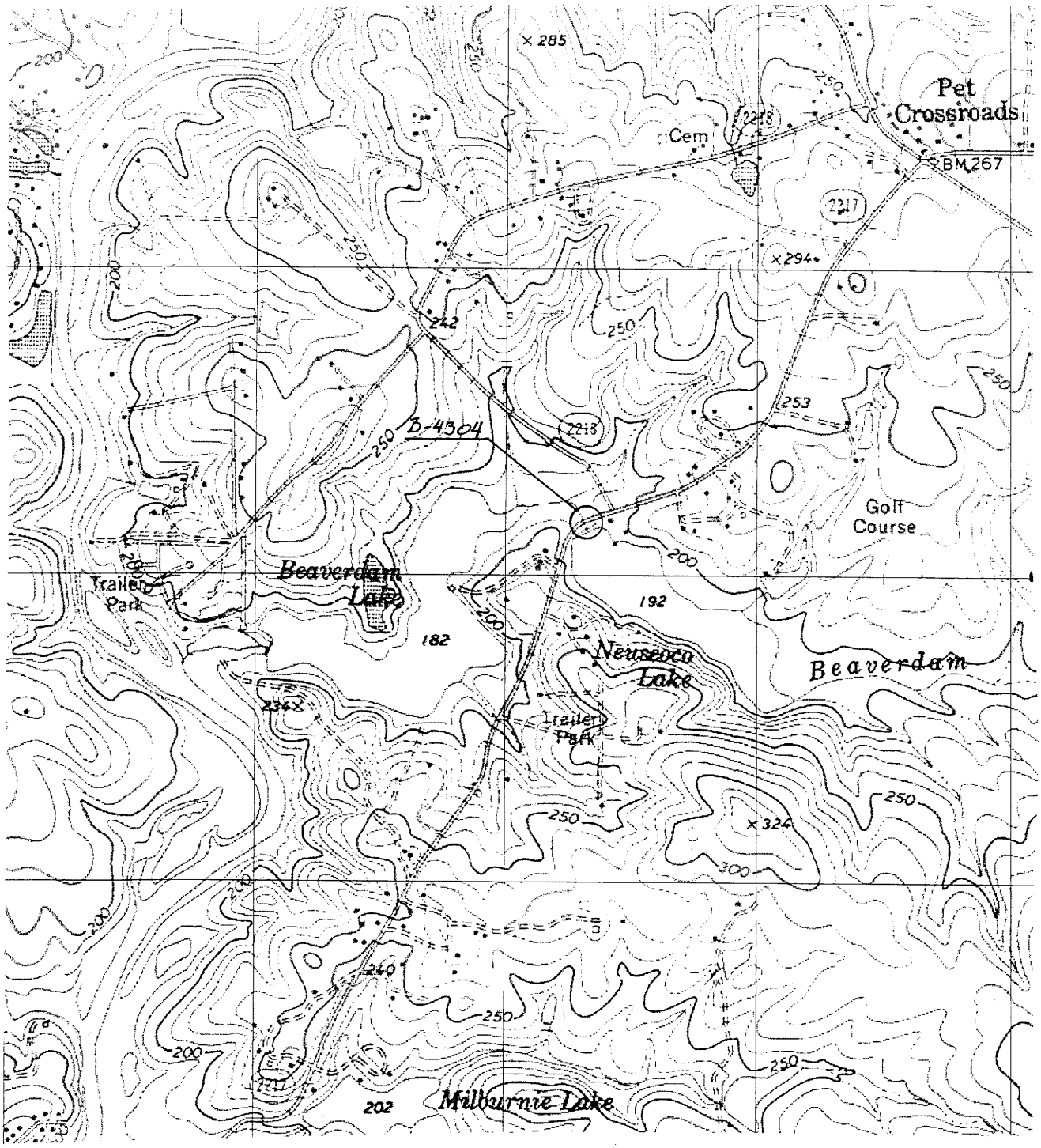
VICINITY MAPS

NCDOT

DIVISION OF HIGHWAYS
WAKE COUNTY
PROJECT: B-4304
BRIDGE NO. 143 OVER
BEAVER DAM CREEK
ON SR 2217
(OLD MILBURNIE RD.)

SHEET 1 OF 7

6/24/2008



TOPO MAP

SCALE: 1" : 1500'

NCDOT

DIVISION OF HIGHWAYS
WAKE COUNTY
PROJECT: B-4304
BRIDGE NO. 143 OVER
BEAVER DAM CREEK
ON SR 2217
(OLD MILBURNIE RD.)

SHEET 2 OF 7 1/14/2008

PROPERTY OWNERS

NAMES AND ADDRESSES

	NAMES	ADDRESSES
1	Eric Stephen Stroud	1832 Old Milburnie Road, Raleigh, NC 27604
2	Beaver Dam Lake, Inc.	1633 Glenwood Avenue, Raleigh, NC 27608

NCDOT

DIVISION OF HIGHWAYS
WAKE COUNTY
PROJECT: B-4304
BRIDGE NO. 143 OVER
BEAVER DAM CREEK
ON SR 2217
(OLD MILBURNIE RD.)

6/24/2008

BUFFER IMPACTS SUMMARY

			IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	ROAD CROSSING	BRIDGE	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	ROAD *	17+41 to 18+45 -L-	X						348	1565	1913		
1	BRIDGE	18+45 to 19+75 -L-		X		8066	1369	9435					
1	ROAD *	19+75 to 21+78 -L-	X							2007	2007		
1	ROAD	15+90 to 16+72 -L-			X				148	464	612		
2	ROAD	14+00 to 15+28 -Y1-	X			897	604	1501					
TOTAL:						8963	1973	10936	496	4036	4532		

* Linear impacts along Beaverdam Creek left of -L- are 55' and right of -L- are 103'.

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY
PROJECT: B-4304 (BRIDGE #143)

7/17/2008
SHEET 4 OF 7

Rev. May 2006

BUFFER IMPACTS SUMMARY

		WETLANDS IN BUFFER	
Site	Station	ZONE 1 (ft^2)	ZONE 2 (ft^2)
1 (Allowable)	18+07 TO 21+78 -L- LT/RT	3144.0	892.0
2 (Allowable)	14+00 to 15+28 -Y1- LT	891.0	408.0
1 (Mitigable)	18+07 TO 21+78 -L- LT/RT	239.0	2115.0
2 (Mitigable)	14+00 to 15+28 -Y1- LT	0.0	0.0
		4274.0	3415.0

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

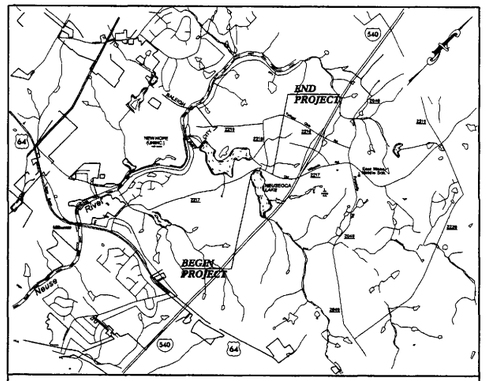
Wake County
PROJECT: B-4304 (Bridge #143)

7/8/2008
SHEET 5 OF 7

09/08/99

TIP PROJECT: B-4304

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



VICINITY MAP
(NOT TO SCALE)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

LOCATION: BRIDGE NO. 143 OVER BEAVER DAM CREEK ON SR 2217 (OLD MILBURNIE ROAD)

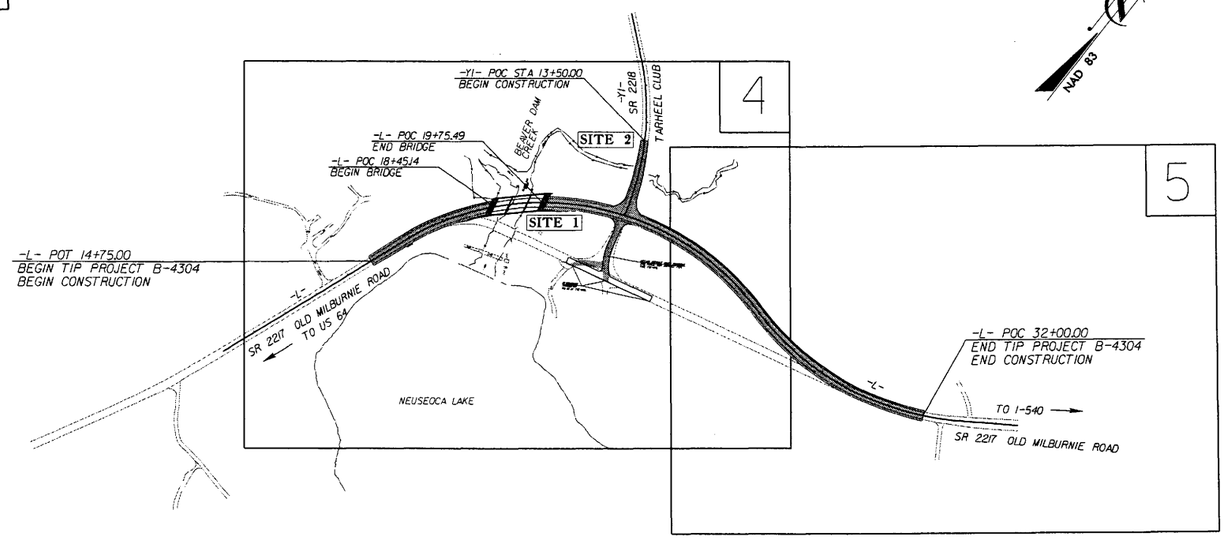
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4304	1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
33641.1.1	BRZ-2217(1)	P.E.	

Buffer Drawing
Sheet 6 of 7

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

BUFFER IMPACTS



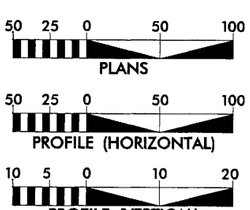
MULKEY
ENGINEERS & CONSULTANTS
PO Box 33127
RALEIGH, N.C. 27636
(919) 851-1912
(919) 851-1918 (FAX)
WWW.MULKEYINC.COM

NCDOT CONTACT : DOUG TAYLOR, PE
PROJECT ENGINEER – ROADWAY DESIGN

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

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

GRAPHIC SCALES



DESIGN DATA

ADT 2008 = 6,100
ADT 2030 = 11,400
DHV = 11 %
D = 60 %
T = 3% % *
V = 45 MPH
* (TTST 1%+DUALS 2%)
FUNCTIONAL = MINOR COLLECTOR
CLASS.
**DESIGN EXCEPTION– STOPPING SIGHT DISTANCE

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4304 = 0.302 MI
LENGTH STRUCTURE TIP PROJECT B-4304 = 0.025 MI
TOTAL LENGTH TIP PROJECT B-4304 = 0.327 MI

Prepared in the Office of:
MULKEY ENGINEERS & CONSULTANTS
FOR THE NORTH CAROLINA DEPT. OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 15, 2008

LETTING DATE:
FEBRUARY 17, 2009

TIM S. HAYES, PE
PROJECT ENGINEER

JOHNNY R. BANKS
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

ART McMILLAN, P.E.
STATE HIGHWAY DESIGN ENGINEER

CONTRACT:

7/7/2008
R:\Hydraulics\Permit\b4304_hyd_prm_buf_tsh.dgn
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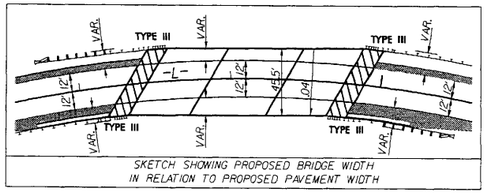
BUFFER IMPACTS



MITIGABLE IMPACTS ZONE 1 | ALLOWABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2 | ALLOWABLE IMPACTS ZONE 2

SITE 1 | SITE 2

BEAVER DAM LAKE, INC. (2) | GRACE D. RAMSEY (1) | E. STEPHEN STROUD & GRACIE D. RAMSEY (3)

-L- STA. 14+75 TO 15+75 LT.
SEE DETAIL 'A'

PROP. SPECIAL CUT DITCH
-L- STA. 15+75 TO 16+50 LT.
SEE PROFILE

CLASS 'B' RIP RAP PAD
EST. 1 TON
EST. 5 SY FF

TOE PROTECTION
-L- STA. 17+20 TO 18+05 LT.
SEE DETAIL 'A'

CLASS 'I' RIP RAP W/FF
EST. 260 TONS
EST. 280 SY FF

+67 BEG. SHLDR. BERM GUTTER – RT.
+00 END EXPRESSWAY GUTTER – RT.
LEVEL SPREADER
-L- STA. 17+50 RT.
SEE DETAIL 'C'

+75 BEGIN EXPRESSWAY GUTTER – RT.

CLASS 'B' RIP RAP
EST. 1 TON
EST. 5 SY FF

+23 END SHLDR. BERM GUTTER – RT.

TOE PROTECTION
-L- STA. 20+00 TO 21+50 RT.
SEE DETAIL 'B'

RIP RAP PAD
CLASS 'B'
EST. 1 TON
EST. 5 SY FF

DISSIPATOR PAD
-L- STA. 20+60 TO 20+78 RT.
SEE DETAIL 'D'

2' BASE DITCH
-L- STA. 20+60 TO 21+40 RT.
SEE DETAIL 'E'

6' DRIVEWAY TRANSITION TO 10' AT TIE-INS.

COLLAR & EXTEND 36" RCP 4 LF

CLASS 'B' RIP RAP PAD
EST. 5 TONS
EST. 14 SY FF

PROP. SPECIAL 2' BASE CUT DITCH
-L- STA. 23+75 TO 31+75 LT.
SEE DITCH DETAIL "F"
SEE PROFILE

PROP. SPECIAL CUT DITCH
-L- STA. 22+22 TO 25+00 RT.
SEE PROFILE
RETAIN ASPHALT WHEN POSSIBLE AND PLACE NEW ASPHALT FOR THE TIE-INS.

2' BASE DITCH
-L- STA. 22+40 TO 23+50 RT.
SEE DETAIL 'E'

ELIGIBLE TIMBER DOGLEG HISTORIC BOUNDARY

NEUSEOCA LAKE

N 15°14'36.6" E

MATCHLINE TO SHEET 5 STATION 26+00

NOTE:
FOR -Y1- PROFILE SEE SHEET 6

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PO Box 33127
Raleigh, N.C. 27636
(919) 851-1312
(919) 851-1516 (FAX)
WWW.MULKEYINC.COM

PROJECT REFERENCE NO.	SHEET NO.
B-4304	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

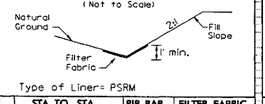
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Buffer Drawing
Sheet 7 of 7

NC NAD 83 GRID N

REVISIONS

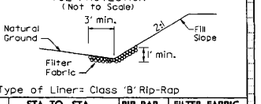
DETAIL 'A'
TOE PROTECTION
(Not to Scale)



Type of Liner= PSRM

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	14+75 – 15+75 LT.		
-L-	17+20 – 18+05 LT.		
-L-	20+50 – 21+65 LT.		

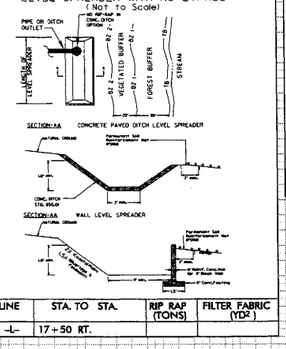
DETAIL 'B'
TOE PROTECTION
(Not to Scale)



Type of Liner= Class 'B' Rip-Rap

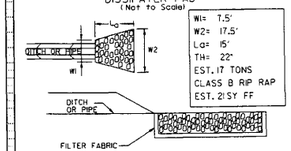
LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	20+00 – 21+50 RT.		

DETAIL 'C'
LEVEL SPREADER WITH NO BYPASS
(Not to Scale)



LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	17+50 RT.		

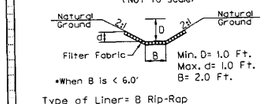
DETAIL 'D'
DISSIPATER PAD
(Not to Scale)



W1= 7.5'
W2= 17.5'
La= 15'
TH= 22"
EST. 17 TONS
CLASS B RIP RAP
EST. 21 SY FF

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	20+60 – 20+78 RT.		

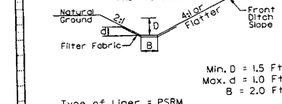
DETAIL 'E'
2' BASE DITCH
(Not to Scale)



Type of Liner= B Rip-Rap

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	20+60 – 21+40 RT.		
-L-	22+40 – 23+50 RT.		

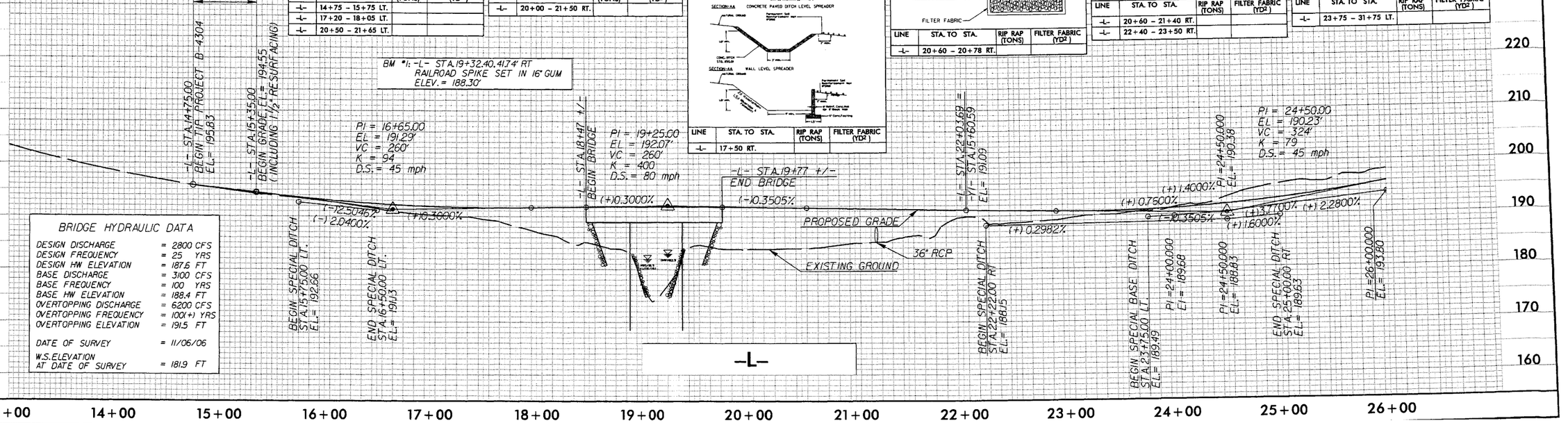
DETAIL 'F'
SPECIAL 2' BASE CUT DITCH
(Not to Scale)



Type of Liner = PSRM

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	23+75 – 31+75 LT.		

BM #1: -L- STA 19+32.40, 41.74' RT
RAILROAD SPIKE SET IN 16" GUM
ELEV. = 188.30'



BRIDGE HYDRAULIC DATA

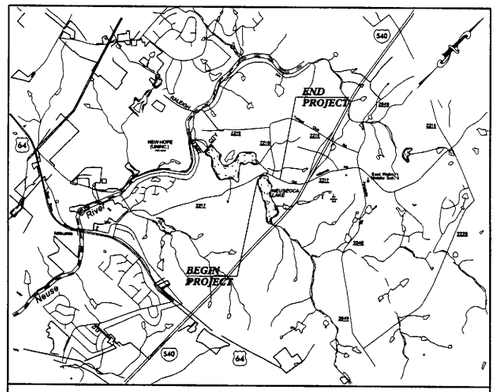
DESIGN DISCHARGE	= 2800 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 187.6 FT
BASE DISCHARGE	= 3100 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 188.4 FT
OVERTOPPING DISCHARGE	= 6200 CFS
OVERTOPPING FREQUENCY	= 100(+) YRS
OVERTOPPING ELEVATION	= 191.5 FT
DATE OF SURVEY	= 11/06/06
W.S.ELEVATION AT DATE OF SURVEY	= 181.9 FT

3:08:53 PM R:\Hydraulics\Permit\b4304_hyd_pre_buf_psh04.dgn
7/7/2008

05/08/99

TIP PROJECT: B-4304

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



VICINITY MAP
(NOT TO SCALE)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

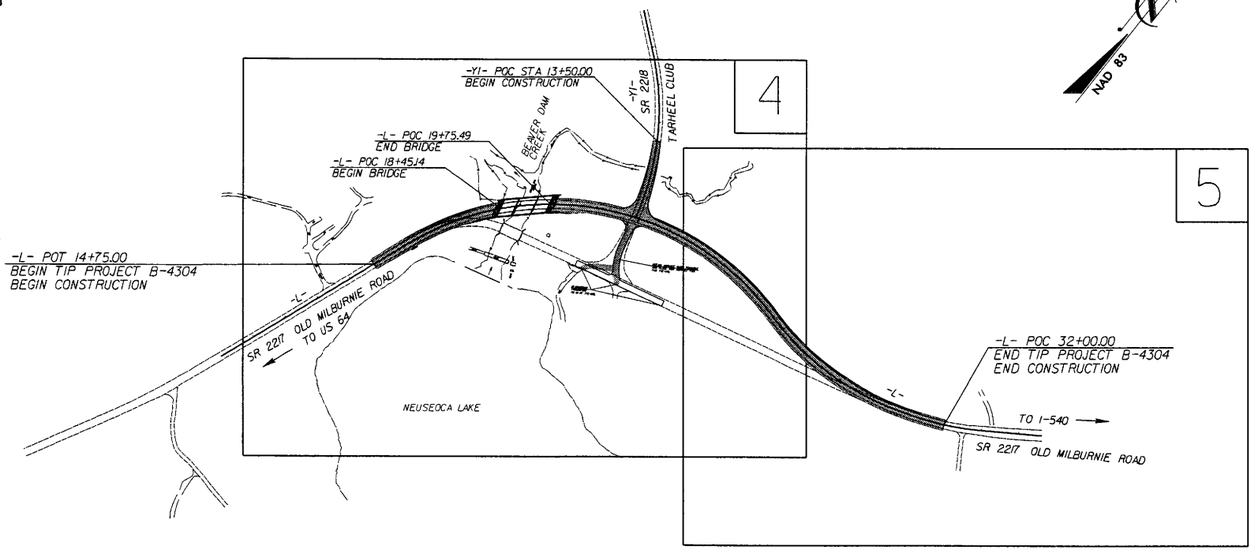
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4304	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33641.1.1	BRZ-2217(1)	P.E.
33641.2.1	BRZ-2217(1)	R/W / UTIL
33641.3.1	BRZ-2217(1)	CONST.

LOCATION: BRIDGE NO. 143 OVER BEAVER DAM CREEK ON SR 2217 (OLD MILBURNIE ROAD)

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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WWW.MULKEYINC.COM

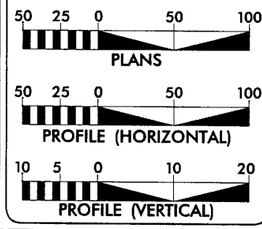
NCDOT CONTACT : DOUG TAYLOR, PE
PROJECT ENGINEER – ROADWAY DESIGN

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

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

CONTRACT:

GRAPHIC SCALES



DESIGN DATA

ADT 2008 = 6,100
ADT 2030 = 11,400
DHV = 11 %
D = 60 %
T = 3% % *
V = 45 MPH
* (TTST 1% + DUALS 2%)
FUNCTIONAL = MINOR
CLASS. COLLECTOR
**DESIGN EXCEPTION– STOPPING SIGHT DISTANCE

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4304 = 0.302 MI
LENGTH STRUCTURE TIP PROJECT B-4304 = 0.025 MI
TOTAL LENGTH TIP PROJECT B-4304 = 0.327 MI

Prepared in the Office of:
MULKEY ENGINEERS & CONSULTANTS
FOR THE NORTH CAROLINA DEPT. OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 15, 2008

LETTING DATE:
FEBRUARY 17, 2009

TIM S. HAYES, PE
PROJECT ENGINEER

JOHNNY R. BANKS
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

ART McMILLAN, P.E.
STATE HIGHWAY DESIGN ENGINEER

7/7/2008
R:\Roadway\Proj\b4304_rdy_tsh.dgn
3:31:50 PM

Note: Not to Scale

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

PROJECT REFERENCE NO.	SHEET NO.
B-4304	1-B
R/W SHEET NO.	

MULKEY ENGINEERS & CONSULTANTS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL 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 (23)
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary (WLB)
- Proposed Wetland Boundary (WLB)
- Existing Endangered Animal Boundary (EAB)
- Existing Endangered Plant Boundary (EPB)

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

- Gas Valve
- Gas Meter
- Recorded U/G Gas Line
- Designated U/G Gas Line (S.U.E.*)
- 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
- Utility Unknown U/G Line
- 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.

REVISIONS

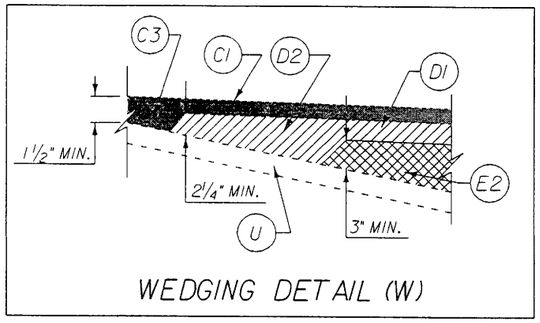
10/25/05

6/24/2008

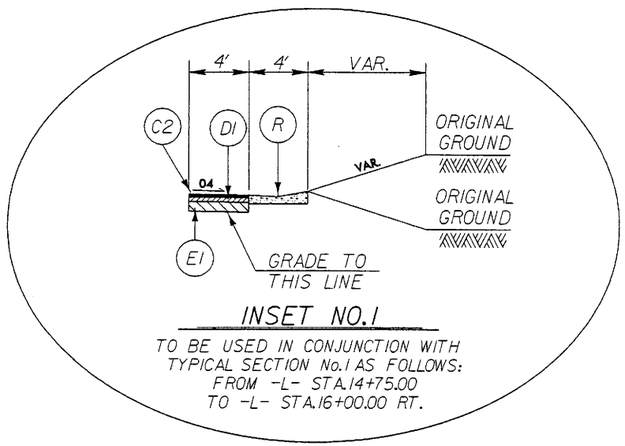
PAVEMENT SCHEDULE

C1	PROPOSED APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YARD
C2	PROPOSED APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YARD IN EACH OF TWO LAYERS.
C3	PROPOSED VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YARD, PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1 1/2" OR GREATER THAN 2" IN DEPTH.
D1	PROPOSED APPROX. 2 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 119.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YARD
D2	PROPOSED VARIABLE DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 119.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YARD, PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2 1/4" OR GREATER THAN 4" IN DEPTH.
E1	PROPOSED APPROXIMATE 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YARD.
E2	PROPOSED VARIABLE DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YARD, PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3" OR GREATER THAN 5 1/2" IN DEPTH.
J1	6" AGGREGATE BASE COURSE
R	EXPRESSWAY GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING DETAIL

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

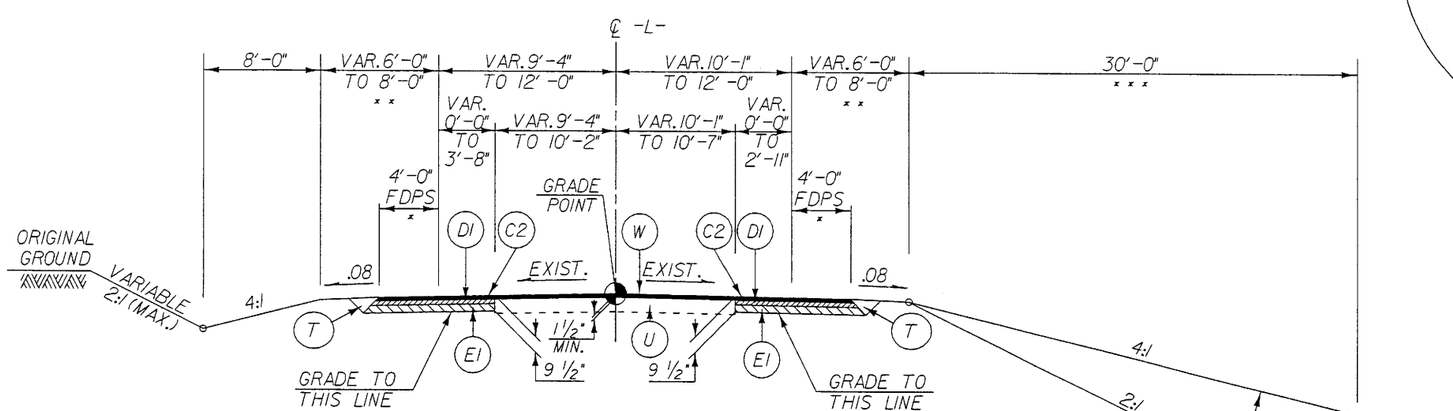


WEDGING DETAIL (W)



INSET NO.1

TO BE USED IN CONJUNCTION WITH TYPICAL SECTION No.1 AS FOLLOWS:
FROM -L- STA.14+75.00
TO -L- STA.16+00.00 RT.



TYPICAL SECTION No. 1

USE TYPICAL SECTION No.1 AS FOLLOWS:
TRANSITION FROM EXISTING TO T.S.NO.1 FROM -L- STA.14+75.00 TO -L- STA.15+35.00
FROM -L- STA.15+35.00.00 TO -L- STA.18+00.00
FROM -L- STA.28+50.00.00 TO -L- STA.31+50+00.00
TRANSITION FROM T.S.NO.1 TO EXISTING FROM -L- STA.31+50.00 TO -L- STA.32+00.00

x FDPS = FULL DEPTH PAVED SHOULDER

xx ADD 3'-0" FOR GUARDRAIL

xxx WHEN THESE DISTANCES INDICATE SLOPES OUTSIDE THE LIMITS OF 6:1 TO 2:1 THE DISTANCE BECOMES VARIABLE AND THE MAXIMUM OR MINIMUM SLOPE MAINTAINED.

MULKEY
ENGINEERS & CONSULTANTS
PO Box 33127
Raleigh, NC 27636
(919) 851-1815
(919) 851-1918 (FAX)
www.mulkeyinc.com

PROJECT REFERENCE NO.	SHEET NO.
B-4304	2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

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MULKEY
ENGINEERS & CONSULTANTS
PO BOX 32137
RALEIGH, NC 27622
(919) 851-1212
(919) 851-1213 (FAX)
WWW.MULKEYINC.COM

PROJECT REFERENCE NO.	SHEET NO.
B-4304	2-A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

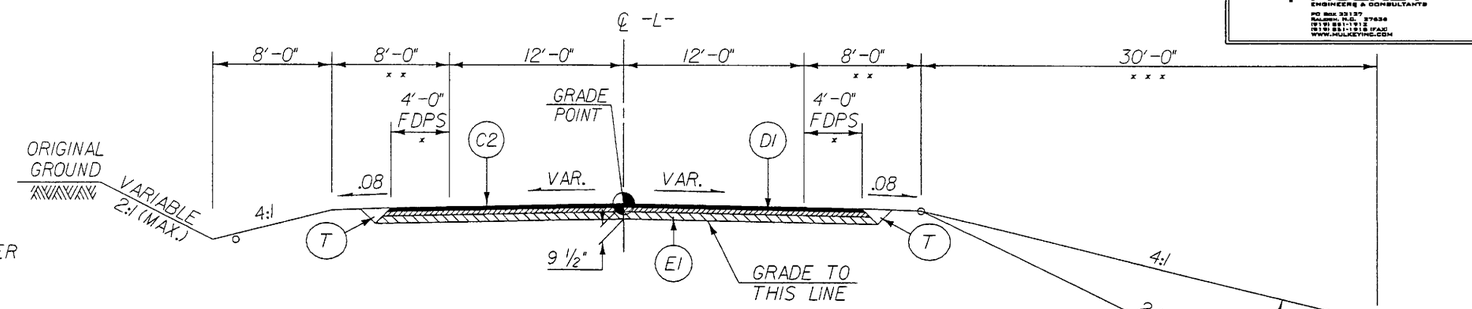
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

* FDPS = FULL DEPTH PAVED SHOULDER

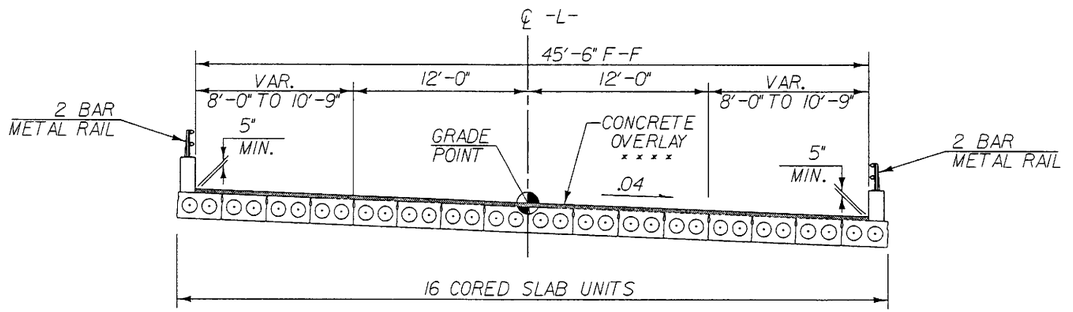
** ADD 3'-0" FOR GUARDRAIL

*** WHEN THESE DISTANCES INDICATE SLOPES OUTSIDE THE LIMITS OF 6:1 TO 2:1 THE DISTANCE BECOMES VARIABLE AND THE MAXIMUM OR MINIMUM SLOPE MAINTAINED.



TYPICAL SECTION No. 2

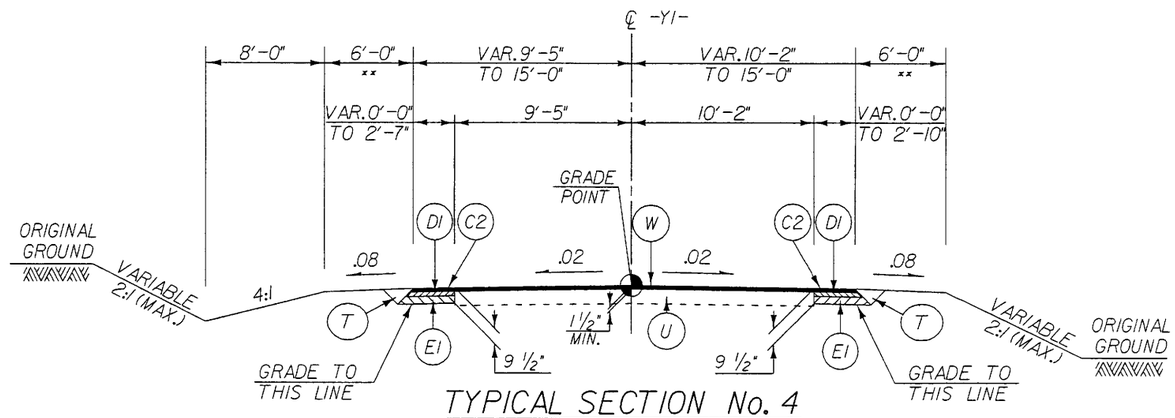
USE TYPICAL SECTION No.2 AS FOLLOWS:
FROM -L- STA.18+00.00 TO -L- STA.18+47 +/- (BEGIN BRIDGE)
FROM -L- STA.19+77 +/- (END BRIDGE) TO -L- STA.28+50.00



**** STRUCTURE PAY ITEM

TYPICAL SECTION No. 3

USE TYPICAL SECTION No.3 AS FOLLOWS:
FROM -L- STA.18+45.14 (BEGIN BRIDGE)
TO -L- STA.19+75.49 (END BRIDGE)



TYPICAL SECTION No. 4

USE TYPICAL SECTION No.4 AS FOLLOWS:
TRANSITION FROM EXISTING TO T.S.NO.4 FROM
-Y1- STA.13+50.00 TO STA.13+98.00
FROM -Y1- STA.13+98.00 TO STA.15+48.54

** ADD 3'-0" FOR GUARDRAIL

C1	1 1/2" S9.5B
C2	3" S9.5B
C3	VAR. DEPTH S9.5B
D1	2 1/2" I19.0B
D2	VAR. DEPTH I19.0B
E1	4" B25.0B
E2	VAR. DEPTH B25.0B
J1	6" ABC
R	EXPRESSWAY GUT.
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING

NOTE:
1. SEE SHEET 2 FOR DETAILED DESCRIPTION OF PAVEMENT SCHEDULE
2. ALL PAVEMENT EDGES ARE 1:1 UNLESS OTHERWISE NOTED

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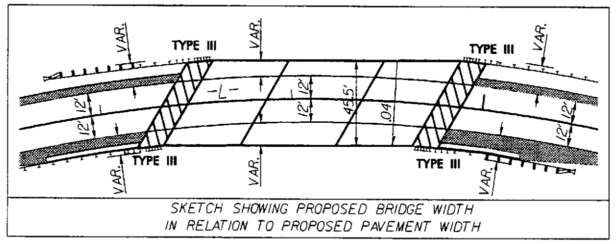

-L-
PI Sta 22+45.08
Δ = 84° 40' 17.0" (RT)
D = 7° 50' 55.5"
L = 1,078.79'
T = 665.08'
R = 730.00'
D.S.= 45 mph
SE= 0.06
RUNOFF= 135.0'
D.S.= 45 mph

-Y1-
PI Sta 13+45.79
Δ = 35° 58' 07.7" (RT)
D = 8° 05' 09.9"
L = 444.82'
T = 230.02'
R = 708.57'
D.S.= N/A (EXIST.)

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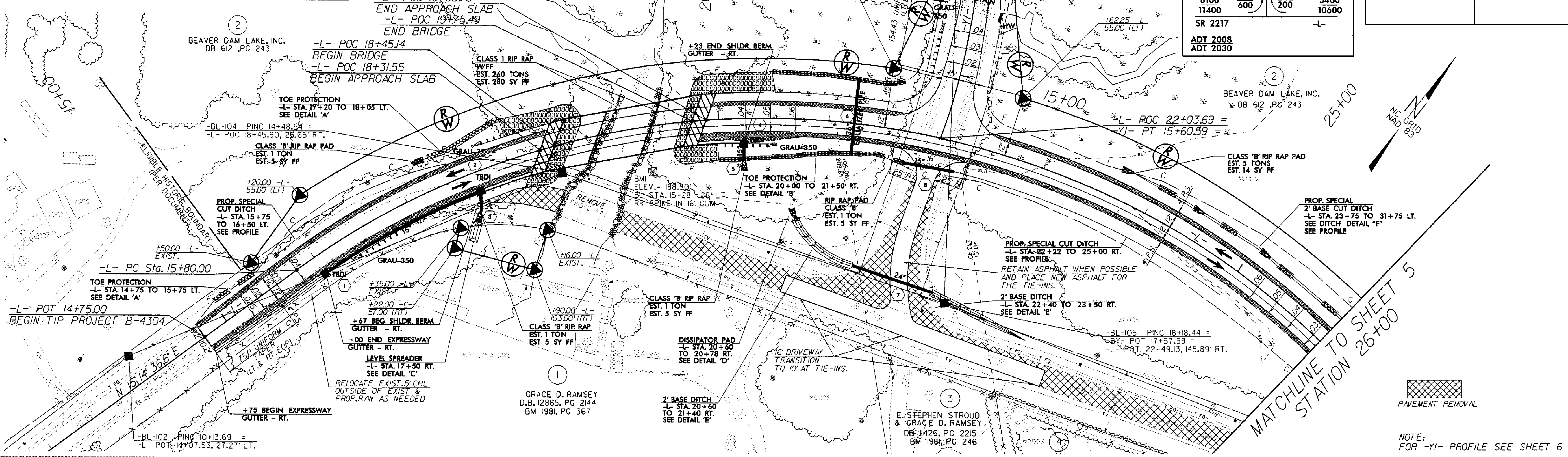
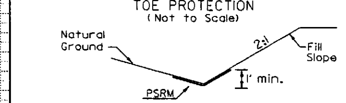
PROJECT REFERENCE NO.	SHEET NO.
B-4304	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

TRAFFIC DIAGRAM
-Y1- SR 2218: 1200 / 1700
6100 / 11400; 500 / 600; 100 / 200; 5400 / 10600
SR 2217 — -L-
ADT 2008
ADT 2030



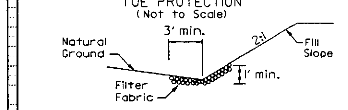
DETAIL 'A' TOE PROTECTION (Not to Scale)



Type of Liner: Permanent Soil Reinforcement Matting

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	14+75 - 15+75 LT.		
-L-	17+20 - 18+05 LT.		
-L-	20+50 - 21+65 LT.		

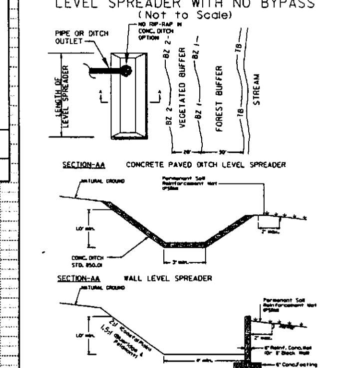
DETAIL 'B' TOE PROTECTION (Not to Scale)



Type of Liner: Class 'B' Rip-Rap

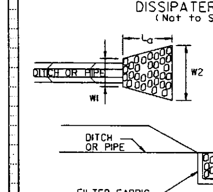
LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	20+00 - 21+50 RT.		

DETAIL 'C' LEVEL SPREADER WITH NO BYPASS (Not to Scale)



LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	17+50 RT.		

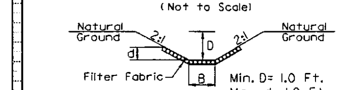
DETAIL 'D' DISSIPATER PAD (Not to Scale)



W1= 7.5'
W2= 17.5'
La= 15'
TH= 22"
EST. 17 TONS
CLASS B RIP RAP
EST. 21 SY FF

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	20+60 - 20+78 RT.		

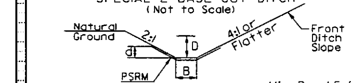
DETAIL 'E' 2' BASE DITCH (Not to Scale)



Min. D= 1.0 Ft.
Max. d= 1.0 Ft.
B= 2.0 Ft.
*When B is < 6.0'
Type of Liner= B Rip-Rap

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	20+60 - 21+40 RT.		
-L-	22+40 - 23+50 RT.		

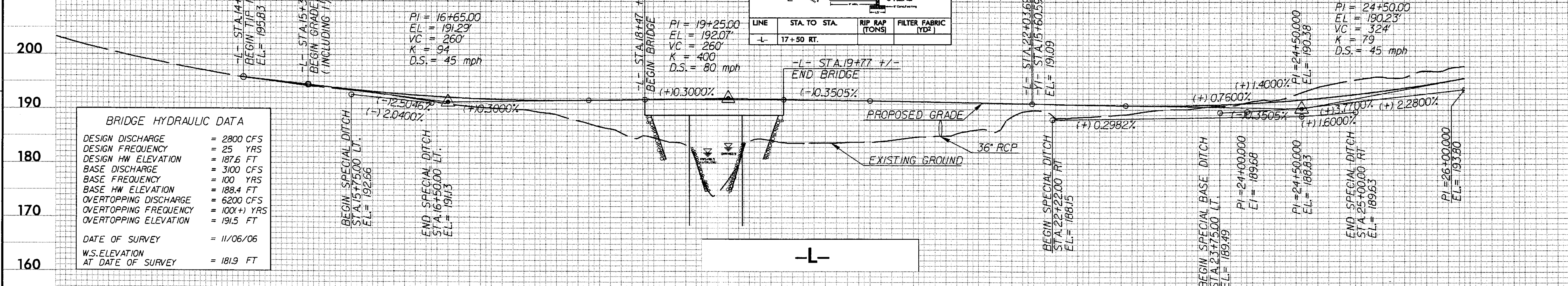
DETAIL 'F' SPECIAL 2' BASE CUT DITCH (Not to Scale)



Min. D = 1.5 Ft.
Max. d = 1.0 Ft.
B = 2.0 Ft.
Type of Liner= Permanent Soil Reinforcement Matting

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	23+75 - 31+75 LT.		

BM *1: -L- STA. 19+32.40, 41.74' RT
RAILROAD SPIKE SET IN 16" GUM
ELEV.= 188.30'



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 2800 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 187.6 FT
BASE DISCHARGE	= 3100 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 188.4 FT
OVERTOPPING DISCHARGE	= 6200 CFS
OVERTOPPING FREQUENCY	= 100(+) YRS
OVERTOPPING ELEVATION	= 191.5 FT
DATE OF SURVEY	= 11/06/06
W.S. ELEVATION AT DATE OF SURVEY	= 181.9 FT

REVISIONS

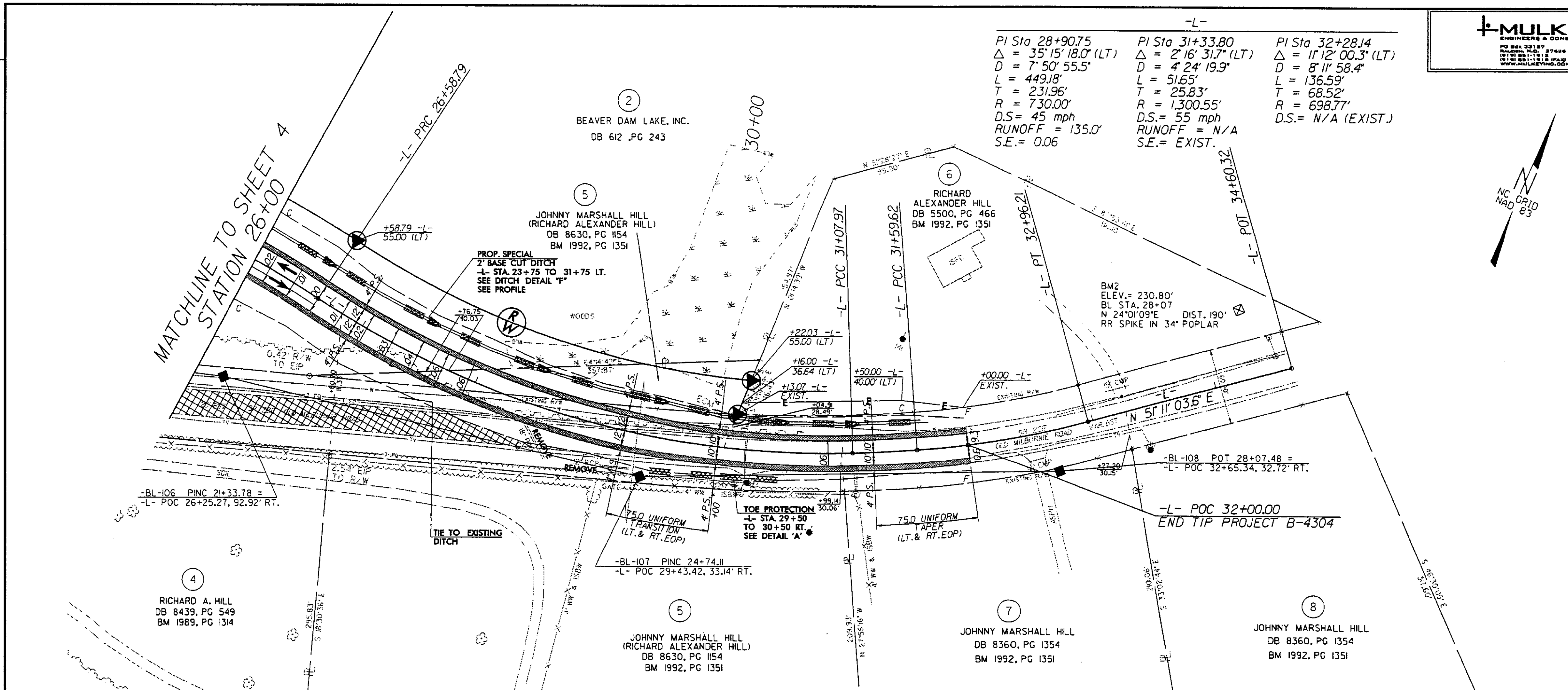
PROJECT REFERENCE NO.	SHEET NO.
B-4304	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

MULKEY ENGINEERS & CONSULTANTS

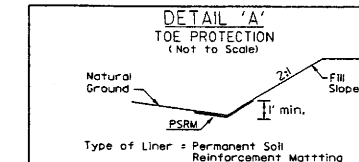
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ROW REVISION - PARCEL 4; PROVIDED DRIVEWAY - PARCEL 5; ADDED NAME
DATE:

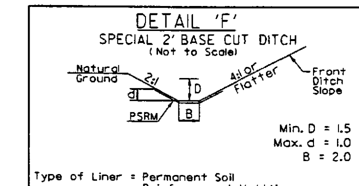
REVISIONS



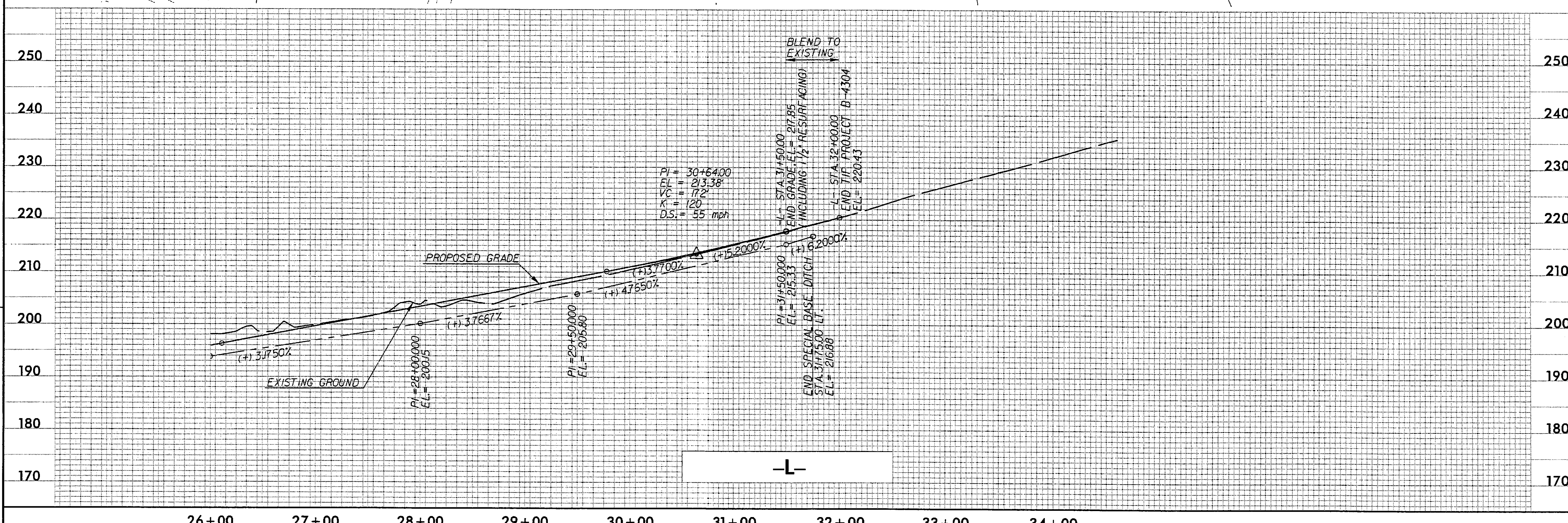
-L-
PI Sta 28+90.75
Δ = 35° 15' 18.0" (LT)
D = 7° 50' 55.5"
L = 449.18'
T = 231.96'
R = 730.00'
D.S.= 45 mph
RUNOFF = 135.0'
S.E.= 0.06
PI Sta 31+33.80
Δ = 2° 16' 31.7" (LT)
D = 4° 24' 19.9"
L = 51.65'
T = 25.83'
R = 1,300.55'
D.S.= 55 mph
RUNOFF = N/A
S.E.= EXIST.
PI Sta 32+28.14
Δ = 11° 12' 00.3" (LT)
D = 8° 11' 58.4"
L = 136.59'
T = 68.52'
R = 698.77'
D.S.= N/A (EXIST.)
MATCHLINE TO SHEET 4
STATION 26+00
-L- PRC 26+58.79
BEAVER DAM LAKE, INC.
DB 612 ,PG 243
JOHNNY MARSHALL HILL
(RICHARD ALEXANDER HILL)
DB 8630, PG 1154
BM 1992, PG 1351
RICHARD
ALEXANDER HILL
DB 5500, PG 466
BM 1992, PG 1351
-L- PCC 31+07.97
-L- PCC 31+59.62
-L- PT 32+96.21
-L- POT 34+60.32
PROP. SPECIAL
2' BASE CUT DITCH
-L- STA. 23+75 TO 31+75 LT.
SEE DITCH DETAIL "F"
SEE PROFILE
BM2
ELEV.= 230.80'
BL STA. 28+07
N 24°01'09"E DIST. 190'
RR SPIKE IN 34" POPLAR
N 51° 11' 03.6" E
-BL-108 POT 28+07.48 =
-L- POC 32+65.34, 32.72' RT.
-L- POC 32+00.00
END TIP PROJECT B-4304
-BL-106 PINC 21+33.78 =
-L- POC 26+25.27, 92.92' RT.
TIE TO EXISTING
DITCH
75.0 UNIFORM
TRANSITION
(LT.& RT.EOP)
TOE PROTECTION
-L- STA. 29+50
TO 30+50 RT.
SEE DETAIL 'A'
75.0 UNIFORM
TAPER
(LT.& RT.EOP)
-BL-107 PINC 24+74.11
-L- POC 29+43.42, 33.14' RT.
RICHARD A. HILL
DB 8439, PG 549
BM 1989, PG 1314
JOHNNY MARSHALL HILL
(RICHARD ALEXANDER HILL)
DB 8630, PG 1154
BM 1992, PG 1351
JOHNNY MARSHALL HILL
DB 8360, PG 1354
BM 1992, PG 1351
JOHNNY MARSHALL HILL
DB 8360, PG 1354
BM 1992, PG 1351
NC GRID
NAD 83



LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	29+50 - 30+50 RT.		



LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	23+75 - 31+75 LT.		



BLEND TO
EXISTING
PI = 30+64.00
EL = 213.38'
VC = 172'
K = 120
D.S. = 55 mph
-L- STA.31+50.00
END GRADE EL= 217.85
(INCLUDING 1 1/2" RESURFACING)
-L- STA.32+00.00
END TIP PROJECT B-4304
EL= 220.43
PROPOSED GRADE
(+)3.7700%
(+)5.2000%
(+)6.2000%
(+)4.7650%
(+)3.7667%
(+)3.1750%
EXISTING GROUND
PI =28+00.000
EL= 200.15
PI =29+50.000
EL= 205.80
PI =31+50.000
EL= 215.33
END SPECIAL BASE DITCH
STA.31+75.00 LT.
EL= 216.88
-L-
250
240
230
220
210
200
190
180
170
26+00
27+00
28+00
29+00
30+00
31+00
32+00
33+00
34+00

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PO Box 33127
Raleigh, N.C. 27636
(919) 851-1912
(919) 851-1918 (FAX)
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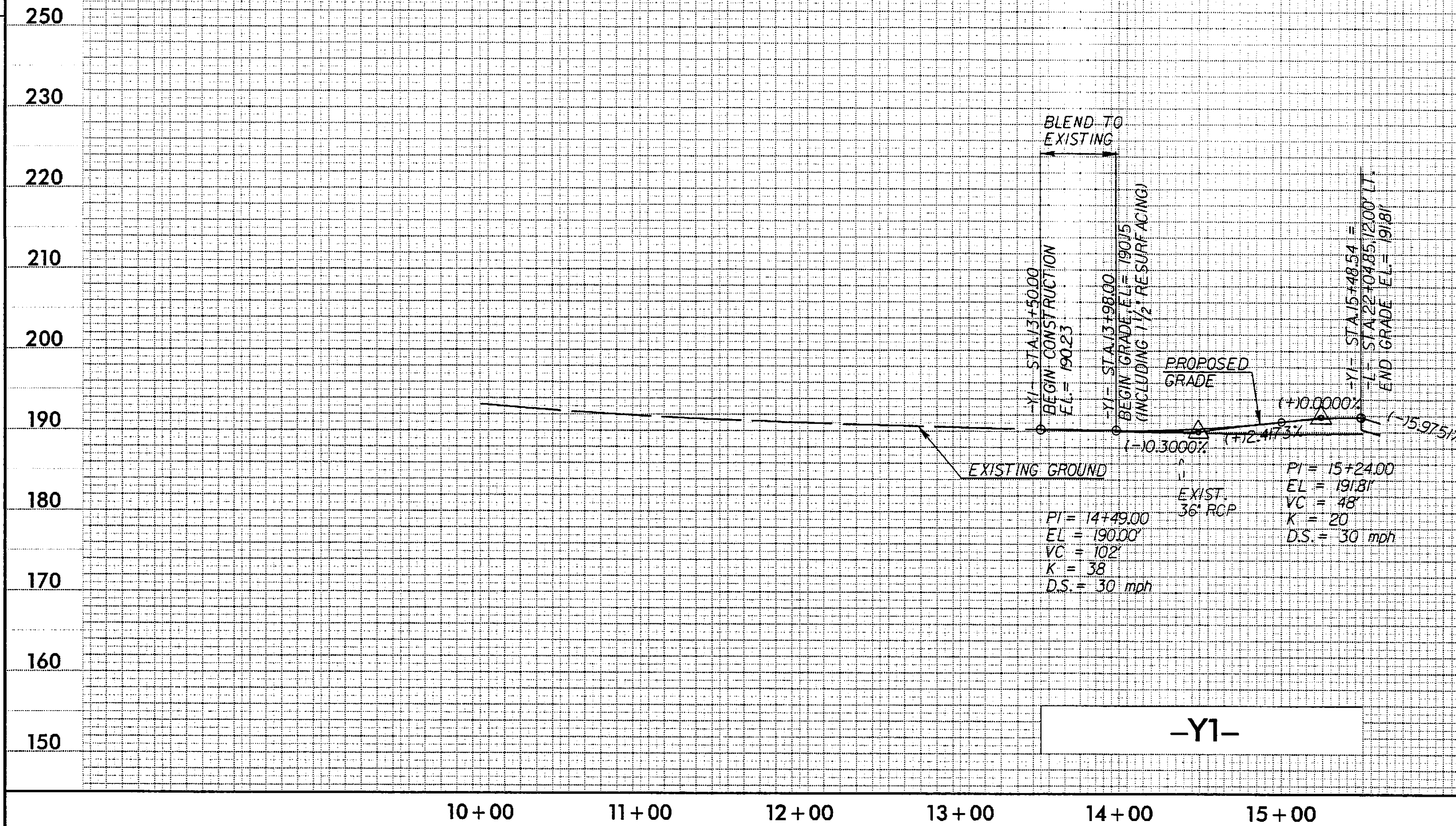
PROJECT REFERENCE NO.	SHEET NO.
B-4304	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



36" RCP W/ HEADWALL HYDRAULIC DATA

DESIGN DISCHARGE	= 37 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 186.8 FT
BASE DISCHARGE	= 62 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 188.3 FT
OVERTOPPING DISCHARGE	= 80 CFS
OVERTOPPING FREQUENCY	= 100(+) YRS
OVERTOPPING ELEVATION	= 190.7 FT
DATE OF SURVEY	= 11/6/06
W.S. ELEVATION AT DATE OF SURVEY	= 181.9 FT

210
200
190
180
170
160
150

REVISIONS

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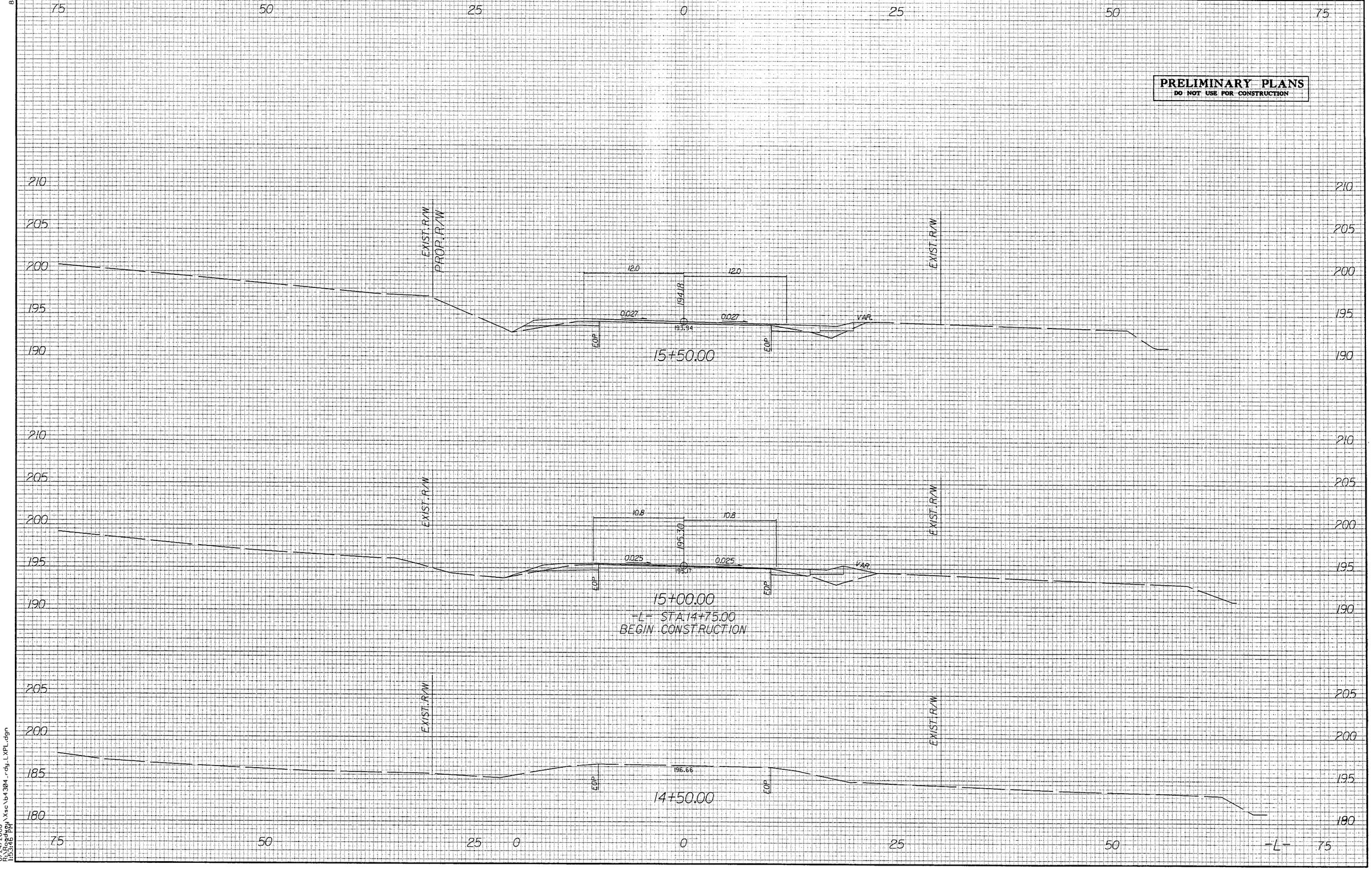
0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4304	X-1

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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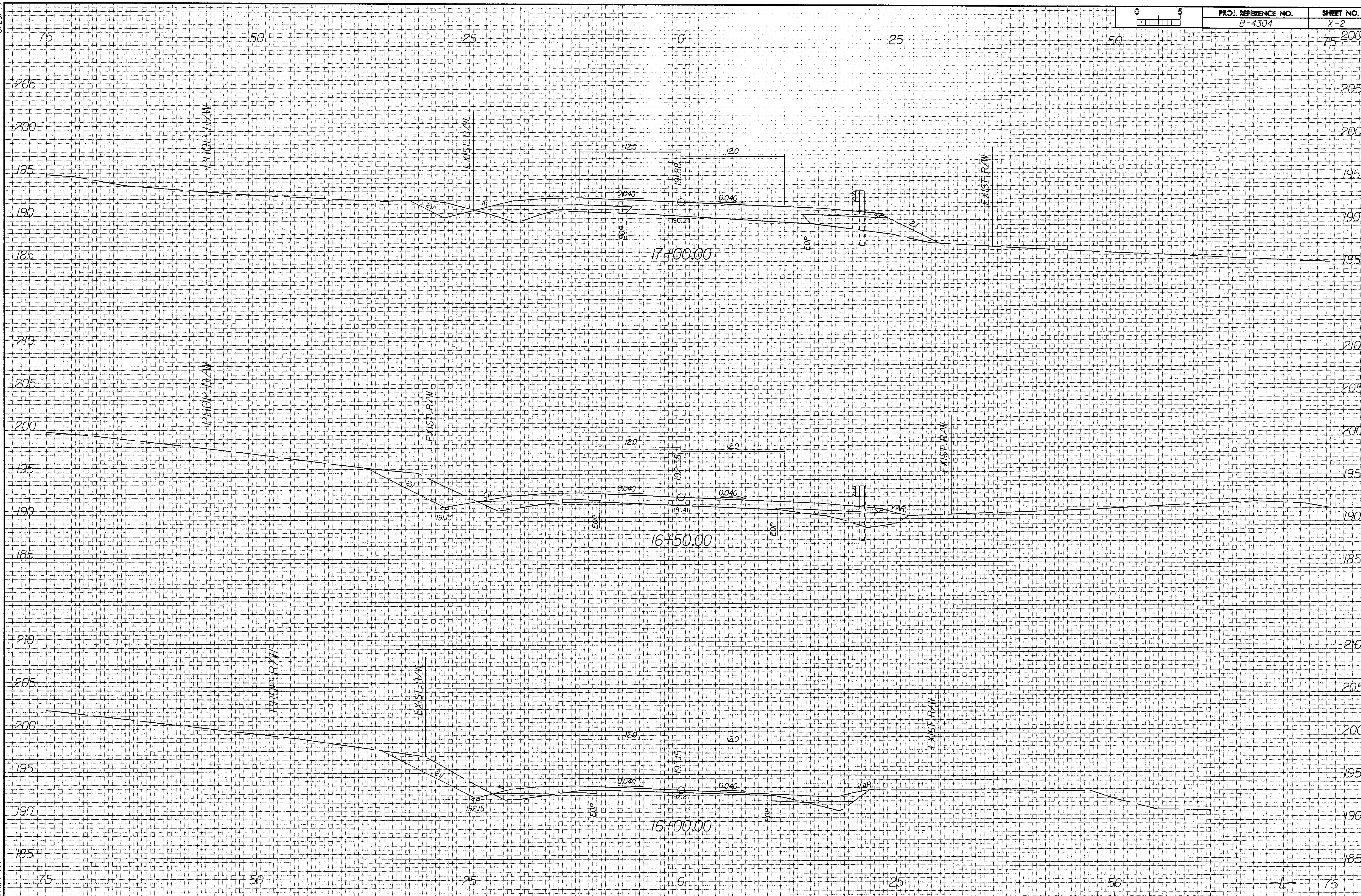
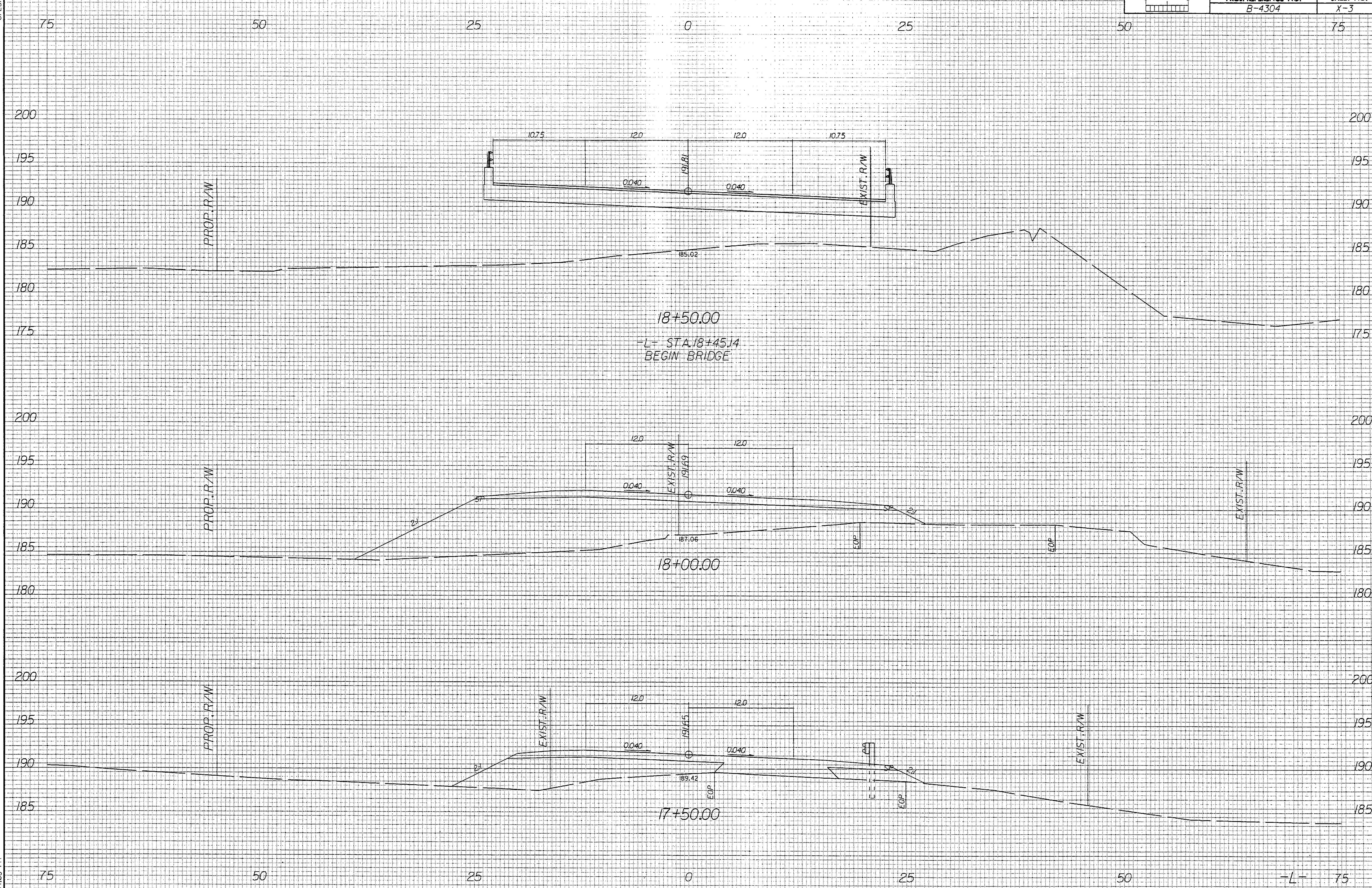
PROJ. REFERENCE NO.	SHEET NO.
B-4304	X-2



PROJ. REFERENCE NO.	SHEET NO.
B-4304	X-3



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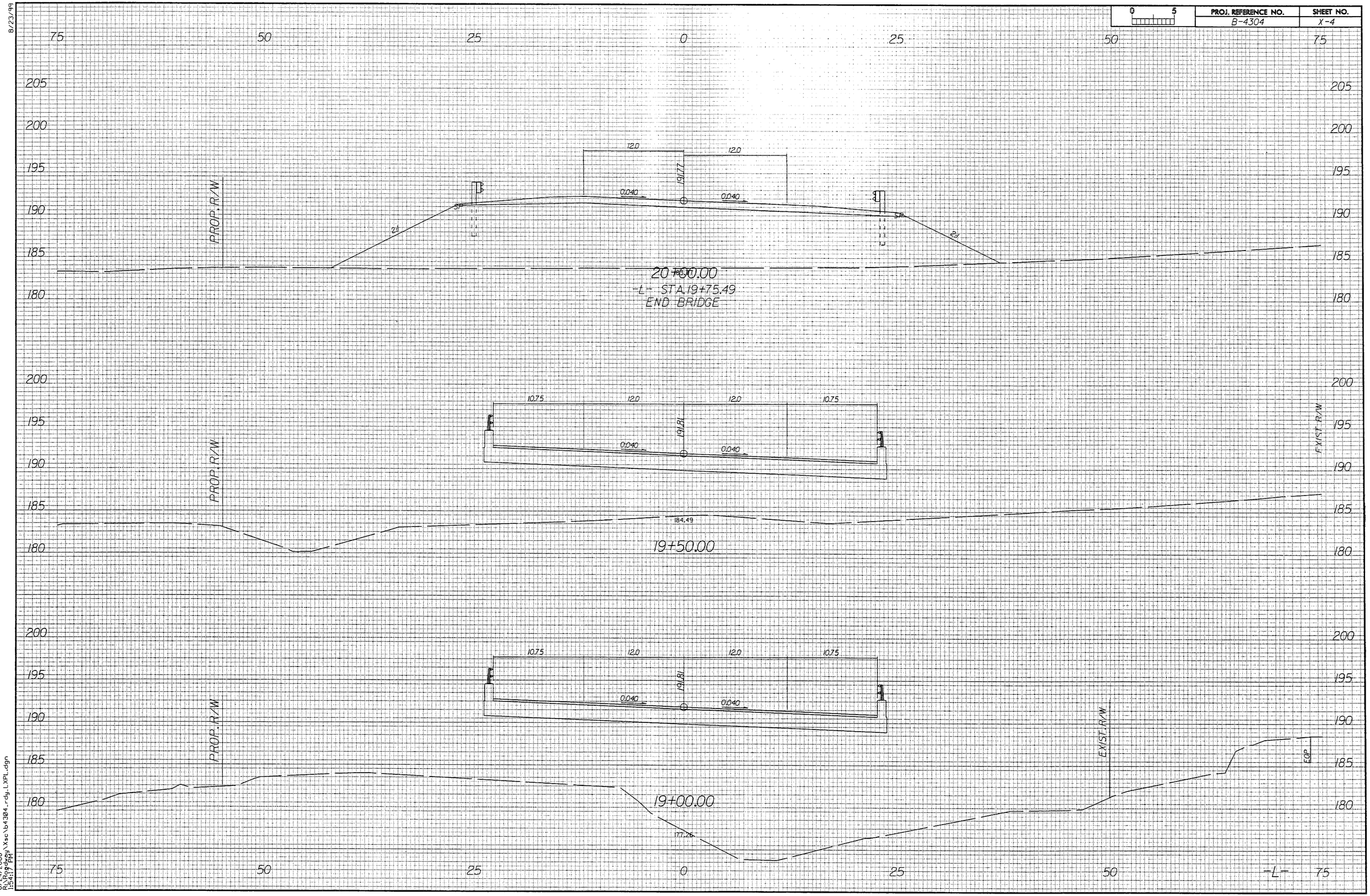
0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4304	X-4



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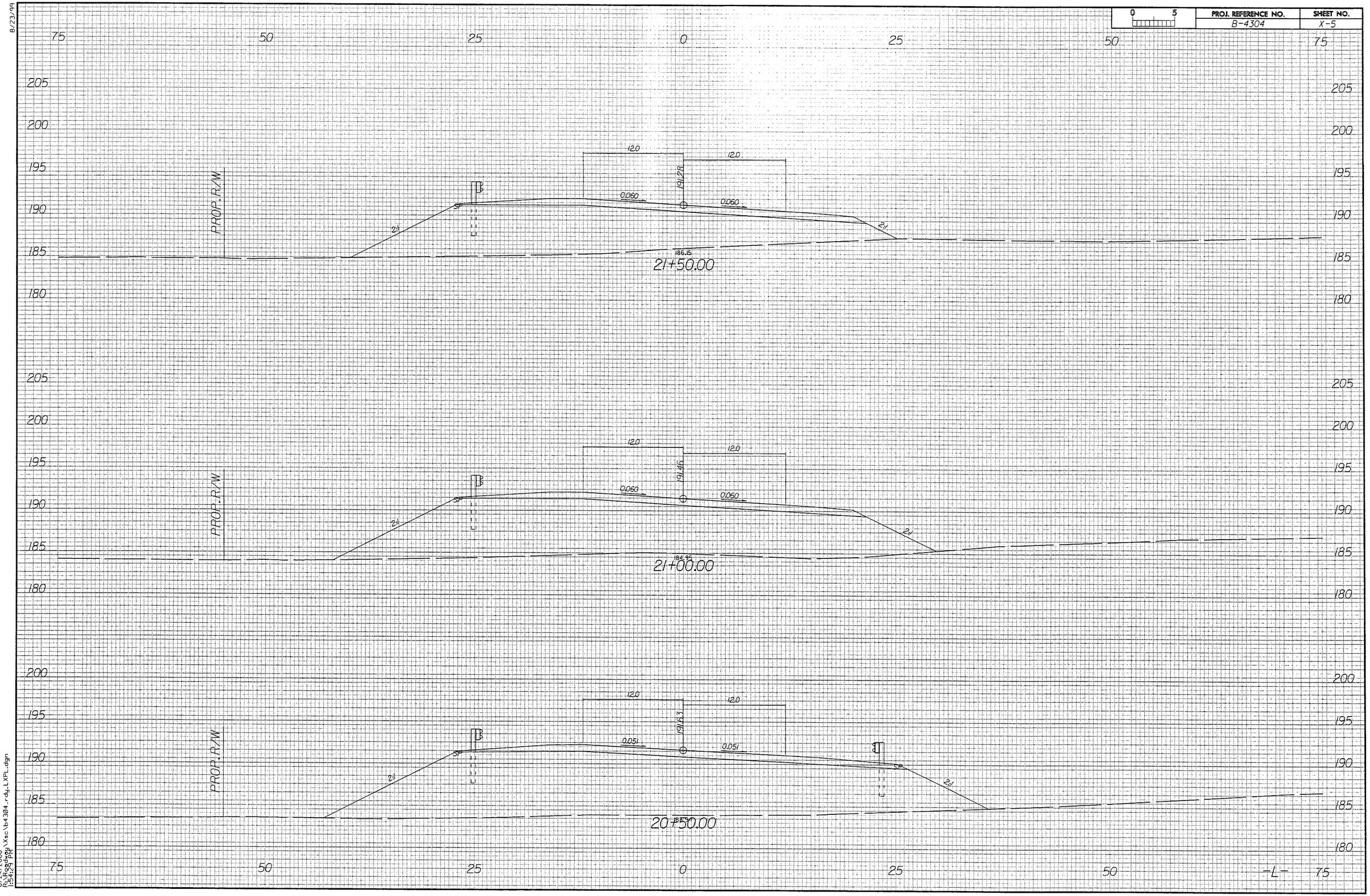
0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4304	X-5



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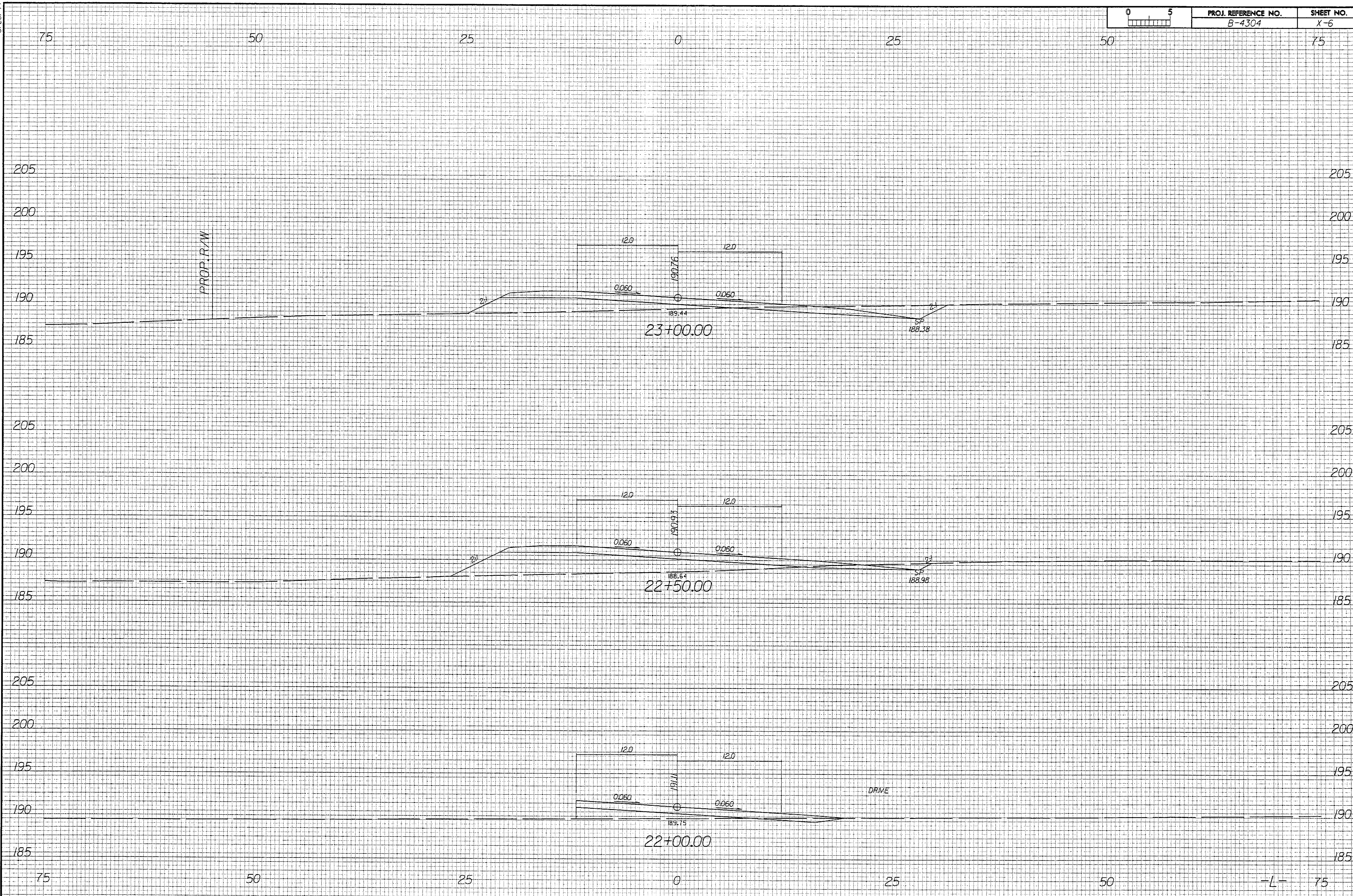

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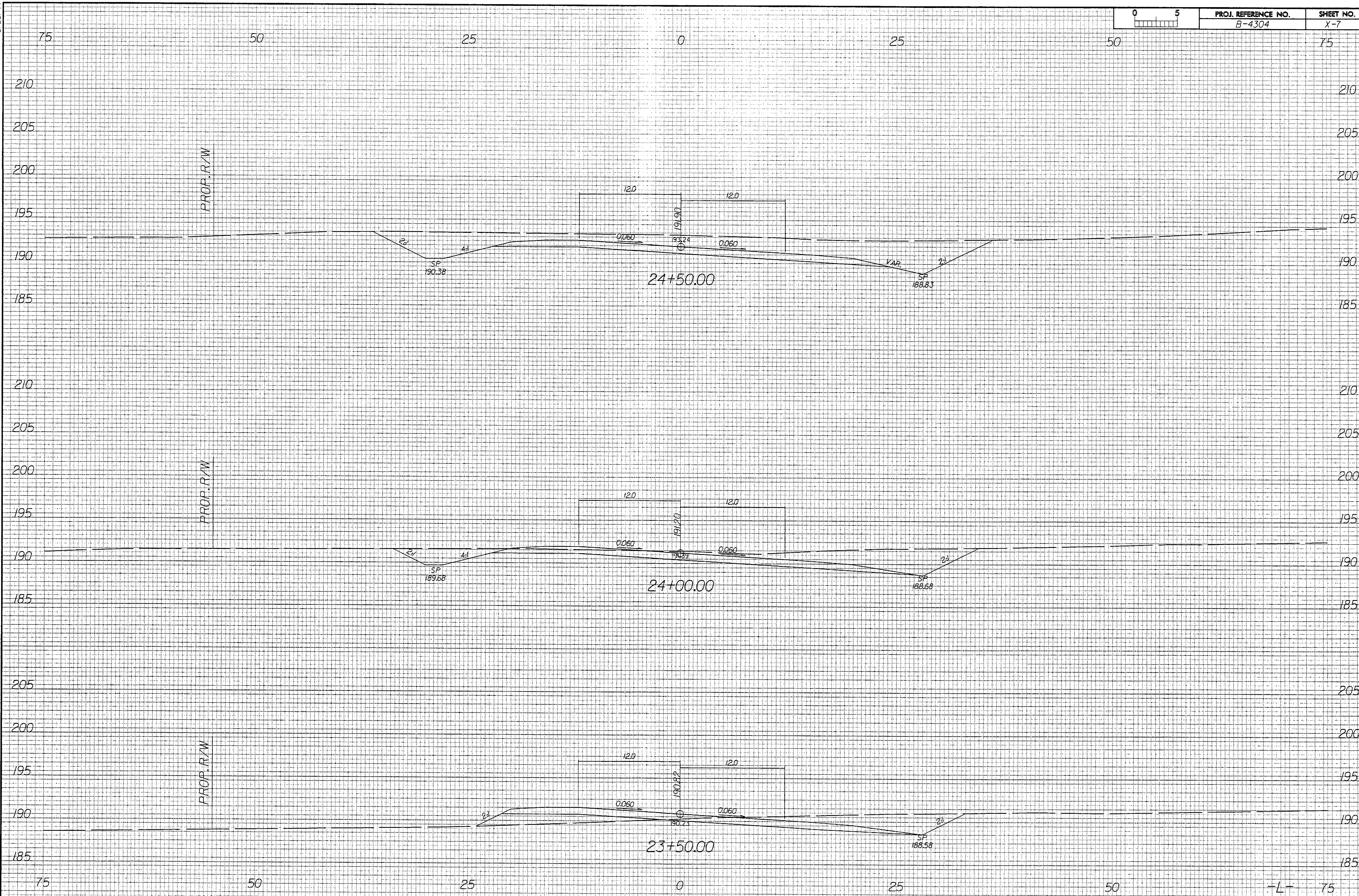

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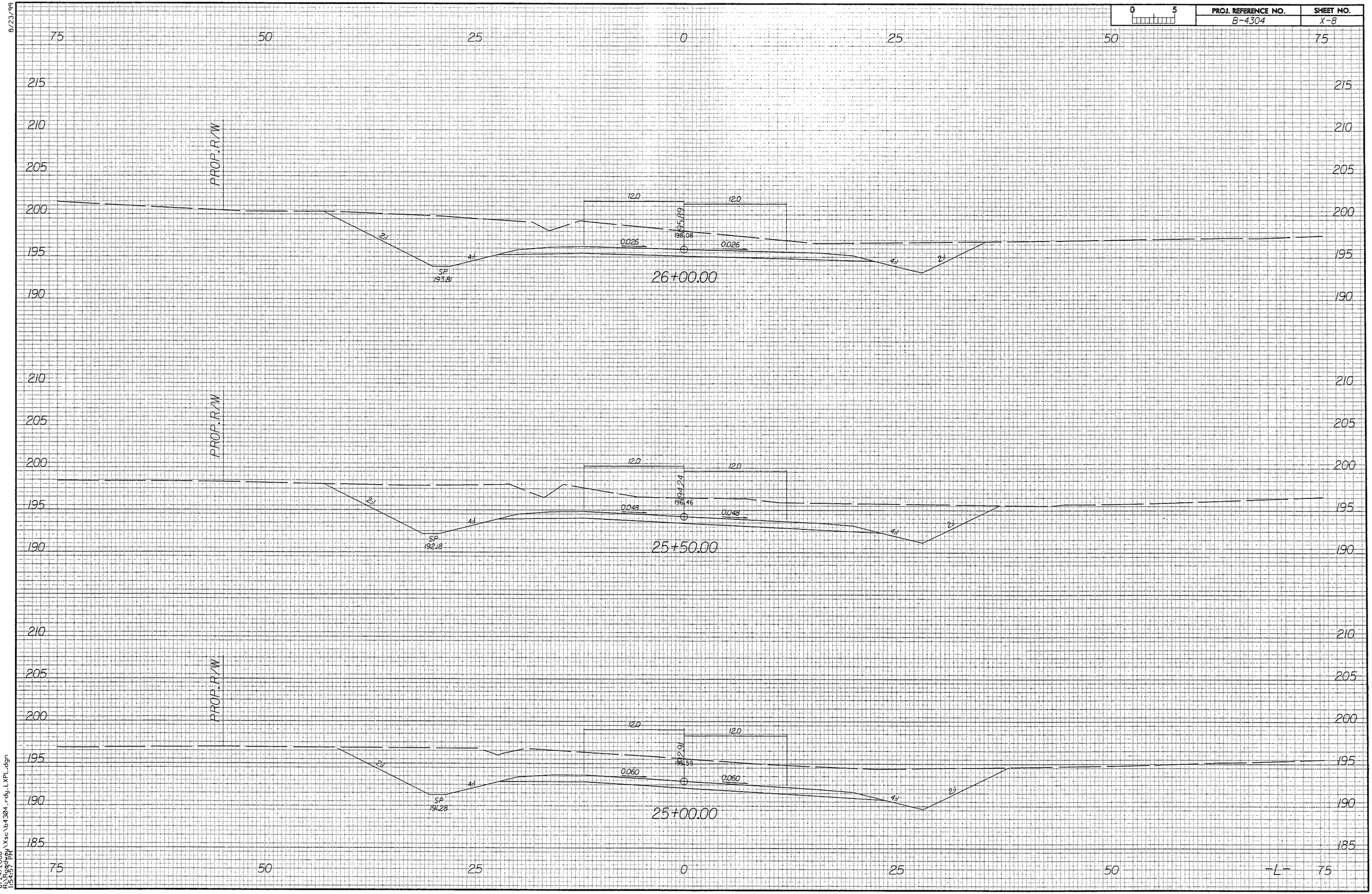

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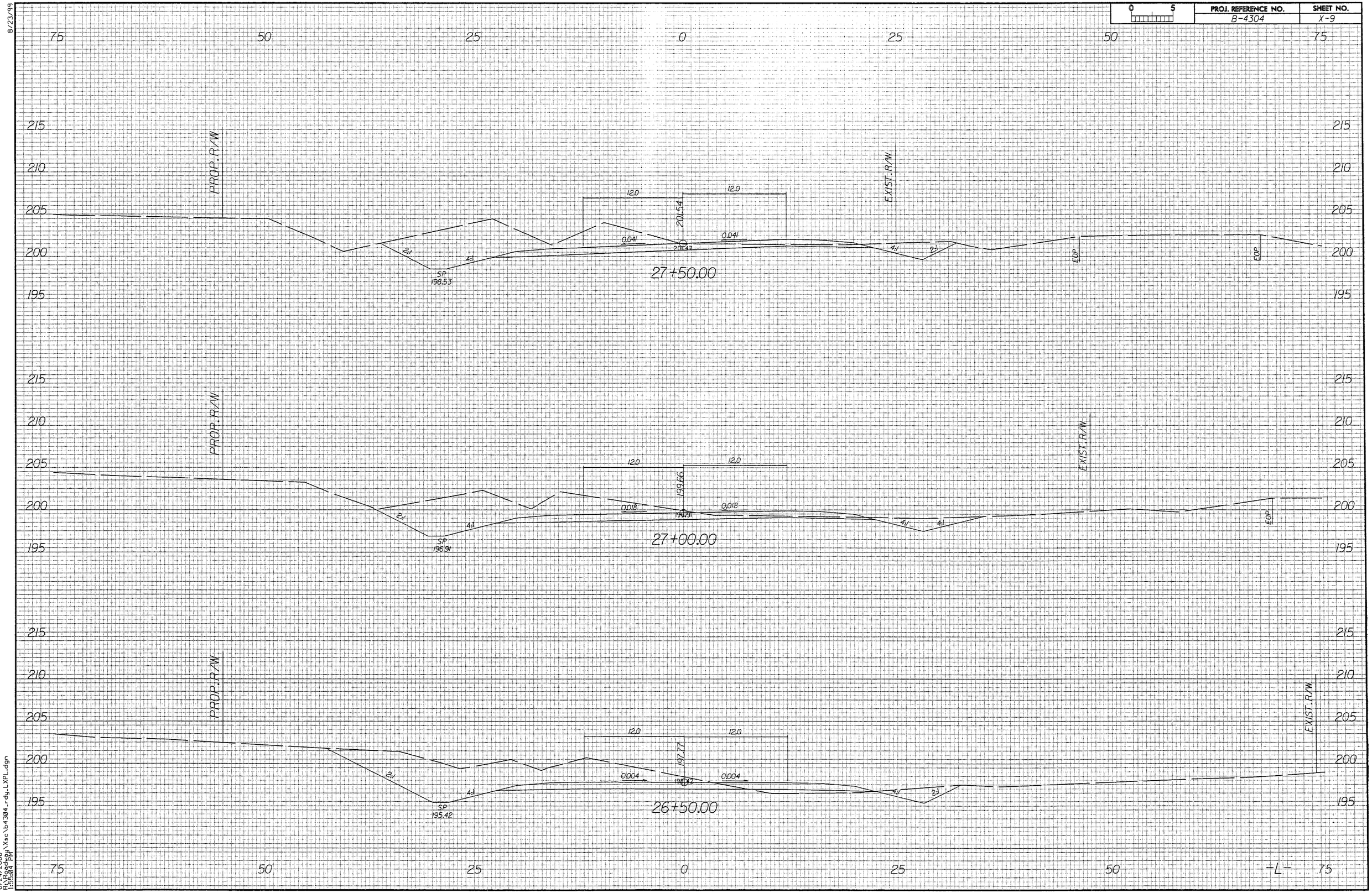

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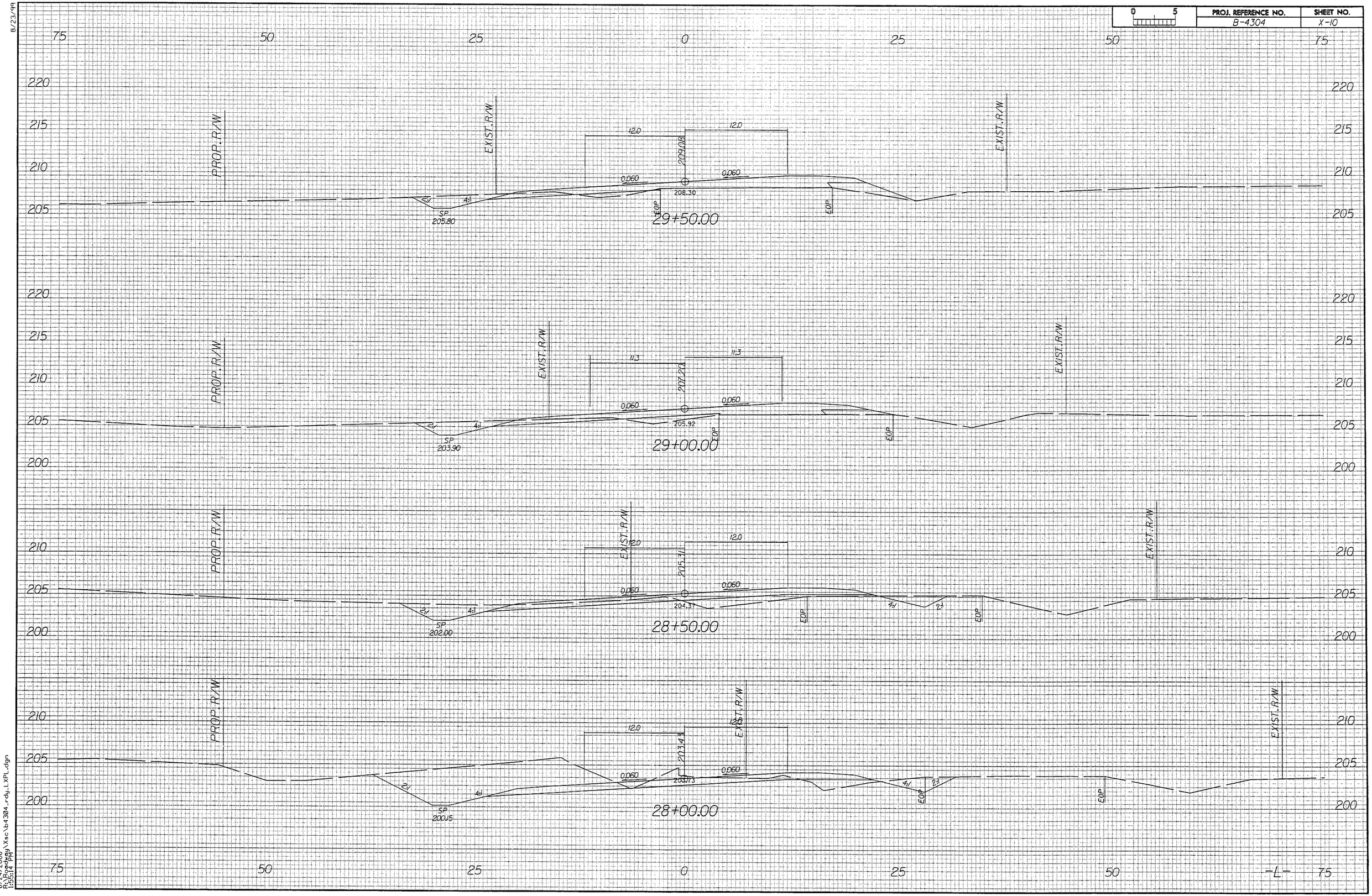

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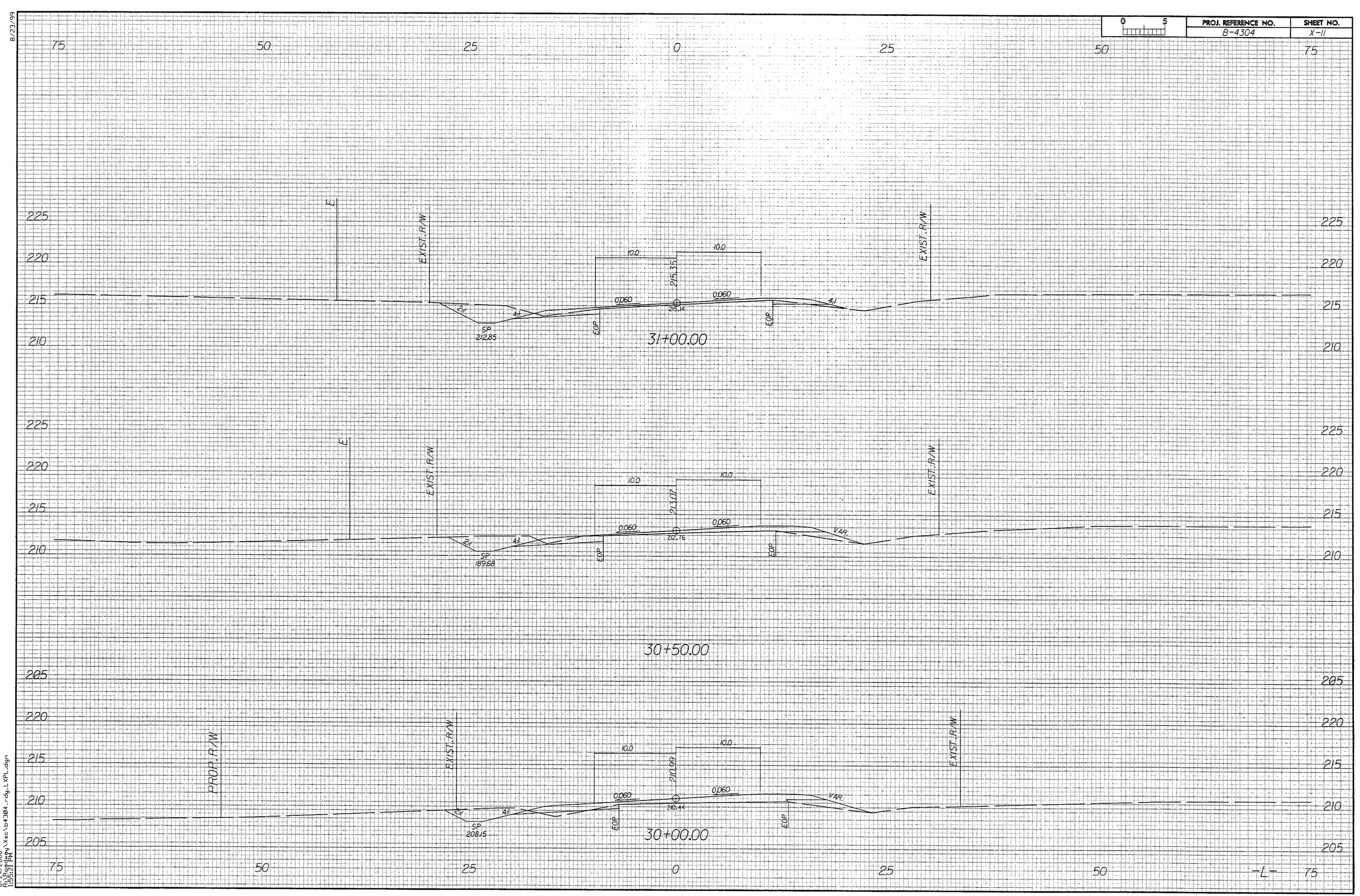

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END CONSTRUCTION

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EXIST. R/W
EXIST. R/W

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WAKE COUNTY
BRIDGE NO. 143 ON SR 2217 (OLD MILBURNIE ROAD)
OVER BEAVER DAM CREEK
FEDERAL-AID PROJECT NO. BRZ-2217(1)
STATE PROJECT NO. 8.2409501
WBS NO. 33641.1.1
T.I.P. NO. B-4304

CATEGORICAL EXCLUSION

AND

PROGRAMMATIC SECTION 4(F) EVALUATION

UNITED STATES DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

AND

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

APPROVED:

12/21/06
Date

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

12/27/06
Date

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

WAKE COUNTY
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CATEGORICAL EXCLUSION

AND

PROGRAMMATIC SECTION 4(F) EVALUATION

DECEMBER 2006

DOCUMENT PREPARED BY:
MULKEY ENGINEERS & CONSULTANTS
CARY, NORTH CAROLINA

12/20/06
Date

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12/20/06
Date

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FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

12/21/06
Date

Theresa Ellerby
Project Manager
Consultant Engineering Unit, Western Region

Project Commitments

Wake County
Bridge No. 143 on SR 2217 (Old Milburnie Road)
Over Beaver Dam Creek
Federal-Aid Project No. BRZ-2217(1)
State Project No. 8.2409501
WBS No. 33641.1.1
T.I.P. No. B-4304

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

Hydraulics Unit

Bridge deck drains will not be allowed to discharge directly into surface waters. All direct discharges will be outside Neuse River Riparian Buffers. All runoff will be diffused within the riparian buffer by dispersing concentrated flow before entering Zone 2.

Structures

Two-bar metal bicycle safe railing will be provided on the bridge.

WAKE COUNTY
BRIDGE NO. 143 ON SR 2217 (OLD MILBURNIE ROAD)
OVER BEAVER DAM CREEK
FEDERAL-AID PROJECT NO. BRZ-2217(1)
STATE PROJECT NO. 8.2409501
WBS NO. 33641.1.1
T.I.P. NO. B-4304

INTRODUCTION: The replacement of Bridge No. 143 is included in the 2006-2012 North Carolina Department of Transportation (NCDOT) Transportation Improvement Program (T.I.P.) and in the Federal-Aid Bridge Replacement Program. The location is shown in Figure 1. No substantial environmental impacts are anticipated. The project is classified as a Federal "Categorical Exclusion."

I. PURPOSE AND NEED STATEMENT

Bridge Maintenance Unit records indicate that Bridge No. 143 has a sufficiency rating of 4.0 out of a possible 100 for a new structure. The bridge is considered functionally obsolete and structurally deficient. The replacement of this inadequate structure will result in safer, more efficient traffic operations.

II. EXISTING CONDITIONS

Bridge No. 143 is located on SR 2217 (Old Milburnie Road) in Wake County, just outside of the Raleigh City limits. SR 2217 is classified as a Rural Minor Collector by the statewide functional classification system, and as a Major Thoroughfare by the City of Raleigh. The City of Raleigh Thoroughfare Plan proposes a five-lane roadway with sidewalks on both sides. This area is identified as a greenway corridor on the Capital Area Greenway Master Plan.

Bridge No. 143 is located just north of the dam for Neuseoca Lake (Figure 2). The dam is constructed of concrete and stone. A chain-link fence separates SR 2217 from the lake premises and restricts access to the south side of Bridge No. 143. Land use in the project area is a mixture of housing with horse ranches, wooded areas and open fields. The alignment of I-540 is located south of Neuseoca Lake and will have a grade separation over SR 2217. The Beaver Dam Lake Fish Camp is located to the west of Bridge No. 143 and is eligible for the National Register of Historic Places.

The 2006 estimated average daily traffic (ADT) volume is 5,600 vehicles per day (vpd). The projected ADT is 11,400 vpd by the design year 2030. The percentages of truck traffic are two percent dual tired vehicles (DUALS) and one percent truck-tractor semi trailer (TTST). The posted speed limit on SR 2217 in the vicinity of Bridge No. 143 is 45 miles per hour (mph). There is a 25 mph caution sign posted on the western approach for the 250-foot radius curve.

Bridge No. 143 was built in 1948. It is a tangent two-lane facility with a clear roadway width of 24 feet. The bridge has three spans and totals 55 feet in length. The deck consists of a reinforced concrete floor with asphalt overlay on steel girders. The railings are concrete. The substructure is composed of reinforced concrete caps on timber piles and concrete abutments with steel crutch bents. Height from crown to streambed is 13 feet. Bridge No. 143 is posted at 17 tons for single

vehicle (SV) and 24 tons for TTST. North Carolina Geodetic Survey benchmark "wk-6" (1970) is located in the northeast wingwall of Bridge No. 143.

SR 2217 in the project area is a two-lane facility with 10-foot travel lanes and 5-foot grass shoulders. The eastern approach is tangent. The western approach has a sharp horizontal curve that abuts Bridge No. 143. The curve has a radius of 250 feet and a posted speed of 25 mph. The intersection of SR 2217 and SR 2218 (Tarheel Club Road) is located approximately 250 feet east of Bridge No. 143.

There are overhead utility lines on the north side of SR 2217. Telephone lines cross the waterway on poles. Markers indicate underground fiber optics on the south side of SR 2217. Utility impacts are expected to be low.

There are approximately 34 school bus crossings on Bridge No. 143 each day.

Three crashes were reported in the project area during the period from October 2002 to September 2005. One crash involved injuries. There were no fatalities.

This section of SR 2217 does not correspond to a bicycle TIP request. It is located in proximity to the Wilmar Country Club, East Wake Middle School, and the Neuseoca Lake Recreation Area, and it is within the Urban Area Boundary.

III. ALTERNATIVES

A. PROJECT DESCRIPTION

Based on preliminary hydraulic analysis, the recommended replacement structure is a new 42-foot wide bridge ranging between 96 feet and 110 feet in length. The bridge will have two-bar metal, bicycle safe railing. A minimum 0.3 percent grade is recommended to facilitate bridge deck drainage. The proposed bridge will provide two 12-foot lanes with 8-foot shoulders to accommodate future bicycle and pedestrian use (Figure 3). The length of the new structure may increase or decrease as necessary to accommodate peak flows as determined by further hydrologic studies during the final design phase of the project.

The approach roadway will provide two 12-foot lanes with 8-foot shoulders, including 4-foot paved shoulders (Figure 3).

B. BUILD ALTERNATIVES

Four build alternatives were studied for this project (Figures 4A-4D). They are described below.

Alternative A replaces the bridge at the existing location. The proposed structure would be 96 feet long. There will be no adverse effect on the historic property.

During construction, traffic will be maintained with an off-site detour approximately six miles in length. The detour will follow SR 2049 (Forestville Road), SR 2233 (Smithfield Road), and US 64 Business (New Bern Avenue). The detour has a road user cost of approximately $12,600 per day.

This alternative is not recommended because it does not improve the horizontal alignment on the western approach.

Alternative B replaces the bridge at the existing location. The proposed structure would be approximately 96 feet long. There will be no adverse effect on the historic property.

During construction, traffic will be maintained with an on-site detour north (downstream) of the existing bridge. The detour bridge will be approximately 85 feet in length and provide for two 12-foot travel lanes with 2-foot shoulders. The detour approach roadway will provide two 12-foot travel lanes with 8-foot grass shoulders, and a design speed of 30 mph.

This alternative is not recommended because it does not improve the horizontal alignment on the western approach.

Alternative C (Preferred) replaces the bridge on new alignment north (downstream) of the existing bridge. During construction, traffic will be maintained on the existing bridge. There will be no adverse effect on the historic property.

The proposed structure would have a constant six percent super elevation across the curved bridge, with a radius of 660 feet. The new bridge will be approximately 110 feet in length and 42 feet in width. The proposed design speed is 45 mph.

The length and width of the proposed bridge may be increased or decreased as determined by hydraulic spread analysis during the design phase of the project.

Alternative D replaces the bridge on new alignment north (downstream) of the existing bridge. During construction, traffic will be maintained on the existing structure. There will be an adverse effect on the historic property.

The proposed structure would have a constant six percent super elevation across the curved bridge, with a radius of 660 feet. The new bridge will be approximately 110 feet in length and 42 feet in width. The proposed design speed is 45 mph.

This alternative is not recommended because it will adversely impact the historic property.

C. ALTERNATIVES ELIMINATED FROM FURTHER STUDY

The No-Build alternative will eventually necessitate closure of the bridge. This is not desirable because of the traffic service provided by SR 2217 and Bridge No. 143.

Investigation of the existing structure by the Bridge Maintenance Unit indicates that "rehabilitation" of this bridge is not feasible because of its age and deteriorated condition.

Alternatives south of the bridge (upstream) were not considered because of impacts to Neuseoca Lake and the dam.

D. PREFERRED ALTERNATIVE

Alternative C, replacing the bridge on new alignment north of the existing bridge while maintaining traffic on the existing structure, is the preferred alternative. Alternative C was selected because it improves horizontal curvature, improves safety, maintains traffic onsite, and is more economical than Alternatives A and D.

The Division Engineer concurs with Alternative C as the preferred alternative.

IV. ESTIMATED COST

Table 1 shows estimated costs based on current prices.

Table 1. Estimated Costs

	Alternative A	Alternative B	Alternative C (preferred)	Alternative D
Structure Removal (Existing)	$ 28,000	$ 28,000	$ 28,000	$ 28,000
Proposed Structure	$ 403,200	$ 403,200	$ 457,800	$ 462,000
Roadway Approaches	$ 140,720	$ 283,245	$ 489,910	$ 556,834
Temporary Detour Bridge	0	$ 154,700	0	0
Detour User Cost	$3,024,000	0	0	0
Miscellaneous and Mobilization	$ 138,080	$ 215,855	$ 324,290	$ 343,166
Engineering Contingencies	$ 115,000	$ 165,000	$ 200,000	$ 210,000
ROW/Const. Easements/Utilities	$ 5,000	$ 115,000	$ 190,000	$ 200,000
Total	$3,854,000	$1,365,000	$1,690,000	$1,800,000

Notes: Alternative A road user cost assumes $12,600 per day for eight-month month road closure.

The estimated cost of the project as shown in the Draft 2007-2013 Transportation Improvement Program is $1,609,000, including $150,000 for right-of-way, $1,300,000 for construction, $9,000 for mitigation, and $150,000 prior years cost.

V. NATURAL RESOURCES

A. METHODOLOGY

Field investigations along the study area were conducted by qualified biologists in January and February 2004. Field surveys were undertaken to determine natural resource conditions and to document natural communities, wildlife, Waters of the U.S., and the presence of protected species or their habitats.

Published information about the study area and region, water resources, and protected species was derived from a number of resources including:

- National Wetlands Inventory (NWI) maps
- USGS 7.5-minute topographical quadrangle maps (Knightdale and Raleigh East, North Carolina)
- Natural Resources Conservation Service (NRCS) soil survey maps of Wake County
- North Carolina Division of Water Quality (NCDWQ)
- United States Fish and Wildlife Service (USFWS) list of protected species
- North Carolina Natural Heritage Program (NCNHP) database of rare species and unique habitats
- North Carolina Department of Transportation (NCDOT) aerial photography and Geographic Information Systems Data/ Maps Distribution

Dominant plant species were identified in each stratum for all natural communities encountered. Plant community descriptions are based on those classified in Schafale and Weakley (1990), where applicable. Names and descriptions of plant species generally follow Radford *et al.* (1968), unless more current information is available. Animal names and descriptions follow Rohde *et al.* (1994), USFWS (2003), Martof *et al.* (1980), Parmalee and Bogan (1998), Webster *et al.* (1985), Russo (2000), Stokes and Stokes (1996), and UNC (2003). Scientific nomenclature and common names (when applicable) are provided for each plant and animal listed. Subsequent references to the same organism include the common name only.

During field surveys, wildlife identification involved a variety of observation techniques, which included active searching and capture, visual observations (both with and without the use of binoculars), and observing the characteristic signs of wildlife (sounds, scat, tracks, and burrows). Any organisms that may have been captured during these searches were identified and released without injury. Quantitative aquatic sampling was not undertaken.

Jurisdictional wetland delineations were performed using the three-parameter approach as prescribed in the *Corps of Engineers Wetlands Delineation Manual.* Supplementary technical literature describing the parameters of hydrophytic vegetation, hydric soils, and hydrological indicators were also utilized. Wetland functions were evaluated according to the NCDWQ's rating system, fourth version. Surface waters in the study area were evaluated using NCDWQ's *Stream Classification Method*, second version, and the United States Army Corps of Engineers Stream Quality Assessment Worksheet.

B. PHYSIOGRAPHY AND SOILS

The project lies in Wake County, which is situated in the east-central portion of North Carolina and is primarily located in the lower Piedmont ecoregion. The geography of the county consists predominantly of rolling to gently sloping terrain. Floodplains occur in nearly level bands along most of the streams in the area and larger streams have wide terracing floodplains. Wake County is densely populated with a large portion of the county in commercial or residential development.

Elevations in the study area range from approximately 180 feet above mean sea level (msl) at Neuseoca Lake east of Bridge No. 143 to approximately 219 feet above msl at the northern end of the study area along Old Milburnie Road.

The study area lies within the Raleigh Belt geological region. This section of the Raleigh Belt is comprised of foliated to massive granitic rock. It commonly contains Rolesvile suite, Wise, and

Lemon Springs intrusives. The soils in the study area developed from the felsic crystalline system that is part of the Piedmont soil region.

The Appling-Louisburg-Wedowee soil association occurs across the study area. This soil association is described below, and the local soil units are summarized in Table 2. Appling is the most abundant series mapped in the study area.

The Appling-Louisburg-Wedowee soil association consists of gently sloping to steep, deep and moderately deep, well-drained and somewhat excessively drained soils that have a subsoil of very friable coarse sandy loam to firm clay. This association is found on broad ridges in the uplands and on sloping to steep soils on the sides of ridges near drainageways and streams. Appling soils occupy about 20 percent of the association, while Louisburg soils make up about 20 percent, and Wedowee soils occupy about 18 percent. The rest of the association is made up of Wake, Durham, Vance, Colfax, Worsham, Chewacla, Wehadkee, and Bibb series.

Table 2. Soils in the Project Area

Series	Taxonomy (Subgroup)	Slope (%)	Permeability	Water Capacity	Water Table	Swell Potential	Index Productivity[A]
Appling sandy loam, eroded	Typic Hapludults	2-6	Moderate	Medium	10+	Moderate	65-85
Appling sandy loam, eroded	Typic Hapludults	6-10	Moderate	Medium	10+	Moderate	65-85
Louisburg loamy sand	Ruptic-Utic Dystrochrepts	6-10	Moderate to Moderately Rapid	Medium	10+	Moderate	60-80
Louisburg loamy sand	Ruptic-Utic Dystrochrepts	10-15	Moderate to Moderately Rapid	Medium	10+	Moderate	60-80
Wake soils	Lithic Udipsamments	2-10	Moderate to Moderately Rapid	Medium	10+	Moderate	60-80
Wake soils	Lithic Udipsamments	10-25	Moderate to Moderately Rapid	Medium	10+	Moderate	60-80
Wehadkee and Bibb soils	Fluventic Haplaquepts and Typic Haplaquents	-	Moderate to Moderately Rapid	Medium	0	Low	85-100

[A] Site Index: Based on a base age of 50 years; the range presented covers the species listed by the USDA-NRCS.
All soils listed are well-drained, except Wehadkee and Bill Soils, which are poorly-drained.

Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation. Soils referred to as "Hydric A" are generally completely hydric throughout the mapped soil unit. "Hydric B" soils are non-hydric soils that contain inclusions of hydric soils, usually in depressional areas or along the border with other soil units. One Hydric A soil map unit occurs in the study area: Wehadkee and Bibb soils.

C. WATER RESOURCES

1. Waters Impacted

The project is located within the Neuse River Basin, the third largest basin in the state, covering approximately 6,235 square miles. The project study area is located within Neuse River subbasin 03-04-02. Beaver Dam Creek, an unnamed tributary (UT) to Beaver Dam Creek, and four areas of riparian wetlands make up Waters of the U.S. in the study area. The NCDWQ stream index number for Beaver Dam Creek is ~~27-33-15~~ 27-29 and the USGS hydrologic unit 03020201.

2. Water Resource Characteristics

The Beaver Dam Creek UT is shown on the USGS quad map and the USGS Wake County soils map as an intermittent stream. It is approximately two feet wide with bank heights up to one foot. This stream received a score of 26 on the NCDWQ Stream Classification Form, and a score of 63 out of 100 on the USACE Stream Quality Assessment Worksheet.

Beaver Dam Creek is depicted on the USGS quad map as a perennial stream through the study area, converging with the Neuse River approximately 1.5 miles downstream of the project site. Beaver Dam Creek is murky and slow-flowing, with a sand-silt-clay substrate. The creek received a score of 78 out of 100 on the USACE Stream Quality Assessment Worksheet.

A classification system for stream channels based on fluvial geomorphologic principles and landscape position was used for stream analysis. Based on this classification method and field observations, the stream appears to be a Type C5 channel that is slightly entrenched but stable. Specific channel information relating to Beaver Dam Creek is presented in Table 3.

Table 3. Stream Dimensions

	Approximate Dimensions of Beaver Dam Creek
Bankfull width	40 ft
Channel width	35 ft
Water depth	2 to 8 ft
Bank height	0 to 1 ft

The NCDWQ classifies surface waters of the state based on their intended best uses. Beaver Dam Creek is currently classified as "C NSW." Nutrient Sensitive Waters (NSW) are waters needing additional protection because they are subject to excessive microscopic and macroscopic vegetation growth. Class "C" waters are protected in accordance with their usage for aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture.

Neither high quality waters (HQW), outstanding resource waters (ORW), trout waters (Tr), 303(d) listed waters, nor water supply watershed waters (WS) occur within one mile of the study area. Beaver Dam Creek is not designated as an anadromous fish spawning area.

The Ambient Monitoring System (AMS) is a network of stream, lake, and estuarine water-quality monitoring stations strategically located for the collection of physical and chemical water-quality data. There are no AMS monitoring stations along Beaver Dam Creek in the project vicinity. AMS monitoring station A-11 is located on the Neuse River, approximately 1.5 miles downstream of the project study area at the Milburnie Dam. This section of the Neuse River has no noted parameters on water quality.

The nearest benthic macroinvertebrate sampling site is located on the Neuse River, approximately two miles downstream of the mouth of Beaver Dam Creek, at US 64. Site B-2 was last sampled in 2000, and given a bioclassification rating of good-fair.

The North Carolina Index of Biotic Integrity (NCIBI) is used to assess the biological integrity of streams by examining the structure and health of the fish community. As of April 2000, Beaver Dam Creek had not been given an NCIBI rating.

Point source dischargers throughout North Carolina are regulated through the National Pollutant Discharge Elimination System (NPDES) program. Dischargers are required by law to register for a permit. There are 52 permitted dischargers in this subbasin of the Neuse River. Two mobile home parks located on Beaver Dam Creek hold minor NPDES discharge permits. None of these discharges are located upstream of the project area.

3. Anticipated Impacts to Water Resources

a. General Impacts

Short-term impacts to water quality from construction-related activities include loss of aesthetic values, increased sedimentation, and turbidity. Long-term construction related impacts to water resources include substrate destabilization, bank erosion, increased turbidity, altered flow rates, and possible temperature fluctuations within the channel due to removal of streamside vegetation.

4. Impacts Related to Bridge Demolition and Removal

The rails of Bridge No. 143 can be removed without dropping any components into Waters of the U.S. There is potential for components of the concrete deck and concrete portions of the substructure to be dropped into Waters of the U.S. during demolition. The resulting temporary fill associated with the concrete deck and caps is approximately 29.9 cubic yards.

D. Biotic Resources

Three plant communities were observed in the project study area: mixed pine-hardwood forest, bottomland hardwood forest, and urban/disturbed community. Descriptions are provided in the following sections.

1. Plant Communities

a. Mixed Pine-Hardwood Forest

Mixed pine-hardwood forest community is present in the upland area of the study area and is typically characterized by a variety of hardwood species in the canopy, a moderate understory, and a sparse herbaceous layer. This forested community is best classified as a variation of Schafale and Weakley's Dry Mesic Oak-Hickory Forest. The Dry Mesic Oak-Hickory Forest community is dominated by a mixture of oak (*Quercus* spp.) and hickory (*Carya* spp.) species. In forests with a frequent disturbance regime, loblolly pine (*Pinus taeda*), red maple (*Acer rubrum*), and sweetgum (*Liquidambar styraciflua*) may become dominant canopy species. In the study area, dominant canopy species are loblolly pine, sweetgum (*Liquidambar styraciflua*), tulip poplar (*Liriodendron tulipifera*), northern red oak (*Quercus rubra*), southern red oak (*Q. falcata*) and white oak (*Q. alba*). Understory species include dogwood (*Cornus florida*), hickory saplings (*Carya* spp.), American holly (*Ilex opaca*), and red cedar (*Juniperus virginiana*). The vine layer includes greenbriar (*Smilax rotundifolia*), poison ivy (*Toxicodendron radicans*), and Japanese honeysuckle (*Lonicera japonica*). A young pine stand is located in the northeast quadrant of the study area.

b. Bottomland Hardwood Forest

The bottomland forest community is situated along the banks and adjacent floodplain of Beaver Dam Creek and its unnamed tributary. Linear wetlands exist in close association with ditched areas next to the pine stand in the northeast corner of the study area. This forested community is best classified as a variation of Schafale and Weakley's Piedmont/Mountain Bottomland Forest. This community is characterized by plant species which are tolerant of occasional flooding and often contains a dense understory and herbaceous layer. Dominant species observed in the mature canopy are red maple, loblolly pine, river birch (*Betula nigra*), water oak (*Q. nigra*), sycamore (*Platanus occidentalis*), and sweetgum. The understory tree and shrub layer includes sweetgum and red maple saplings, American holly, tag alder (*Alnus serrulata*), musclewood (*Carpinus caroliniana*), Chinese privet (*Ligustrum sinense*), and sweetbay (*Magnolia virginiana*). The vine layer includes greenbriar, Japanese honeysuckle, crossvine (*Bignonia capreolata*), and poison ivy. The herbaceous community includes Japanese stilt grass (*Microstegium vimineum*), Christmas fern (*Polystichum acrostichoides*), giant cane (*Arundinaria gigantea*), soft rush (*Juncus effusus*), seedbox (*Ludwigia alternifolia*), broom sedge (*Andropogon virginicus*), and various grasses (family Poaceae).

c. Urban/Disturbed Community

Urban/Disturbed communities represent areas that are periodically maintained by human influences, such as roadside and power line rights-of-way, regularly mowed lawns, fields, and open areas. This community comprises a majority of the study area and includes roadside maintained areas and residential lawns. The urban/disturbed community is primarily covered with herbaceous vegetation that includes various types of grasses and common weedy species such as plantain (*Plantago* sp.), dog fennel (*Eupatorium capillifolium*), chickweed (*Cerastium* sp.), and Indian strawberry (*Duchesnea indica*). Various grasses and ornamental shrubs are the dominant vegetation in the residential and commercial lawns. Chinese privet, loblolly pine, and red maple were also found in residential yards.

2. Wildlife

Terrestrial communities in the study area offer a moderate diversity of foraging, nesting, and cover habitat for many species of amphibians, reptiles, birds, and mammals that have adapted to highly impacted and fragmented landscapes. Species that may be associated with these types of communities are described below. An asterisk (*) indicates the species that were directly observed or that evidence was noted during field reconnaissance.

Reptile species associated with the study area may include the Eastern box turtle (*Terrapene carolina*), five-lined skink (*Eumeces fasciatus*), rough green snake (*Opheodrys aestivus*), Eastern milk snake (*Lampropeltis triangulum triangulum*), black racer snake (*Coluber constrictor*), and brown snake (*Storeria dekayi*). These reptiles inhabit fields, woodlands, streams, wood piles, and old buildings of the Piedmont and lower mountains in North Carolina.

Many bird species may inhabit or migrate through the study area. Common inhabitants include red-bellied woodpecker (*Melanerpes carolinus*), hairy woodpecker (*Picoides villosus*), downy woodpecker (*P. pubescens*), blue jay (*Cyanocitta cristata*), Carolina chickadee (*Parus carolinensis*), tufted titmouse (*Baeolophus bicolor*), white-breasted nuthatch (*Sitta carolinensis*), American robin (*Turdus migratorius*), Northern cardinal (*Cardinalis cardinalis*), Northern mockingbird (*Mimus polyglottos*), house finch (*Carpodacus mexicanus*), Carolina wren (*Thryothorus ludovicianus*), dark-eyed junco (*Junco hyemalis*), American goldfinch (*Carduelis tristis*), American crow (*Corvus brachyrhynchos*), and brown-headed cowbird (*Molothrus ater*). Predatory species may include red-tailed hawk (*Buteo jamaicensis*), turkey vulture* (*Cathartes aura*), Eastern screech owl (*Otus asio*), and barred owl (*Strix varia*). A common wetland species likely to frequent the area is the woodcock* (*Scolopax minor*).

A wide variety of mammals are expected to inhabit the study area and surrounding landscape. Virginia opossum (*Didelphis virginiana*), woodchuck (*Marmota monax*), gray squirrel (*Sciurus carolinensis*), Eastern harvest mouse (*Reithrodontomys humulis*), raccoon (*Procyon lotor*), beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), and white-tailed deer* (*Odocoileus virginianus*) are species most likely to be found. The marsh rabbit* (Sylvilagus palustris), whose habitat includes marshes, bottomlands, and swamps, was seen in the project area. In addition, bats such as the Eastern red (*Lasiurus borealis*) and big brown bat (*Eptesicus fuscus*) may also be present in the project study area.

3. Aquatic Communities

The aquatic habitat of Beaver Dam Creek is expected to be fair based on observed conditions during the field visits and the existing NCDWQ water quality assessment. The stream has a muddy bottom, which is not extremely beneficial to benthic macroinvertebrates.

The study area likely exhibits an amphibian population of frogs and toads. Spring peepers (*Hyla crucifer*), pickerel frogs (*Rana palustris*), and green frogs (*R. clamitans*) are most likely to be present in the study area.

Reptiles that spend the vast majority of their lives in aquatic communities and are somewhat common throughout this portion of North Carolina include the snapping turtle (*Chelydra serpentina*), eastern musk turtle (*Sternotherus odoratus*), yellowbelly slider (*Chrysemys scripta*), and northern water snake (*Nerodia sipedon*).

Fish that are likely to utilize Beaver Dam Creek include yellow bullhead (*Ameiurus natalis*), largemouth bass (*Micropterus salmoides*), american eel (*Anguilla rostrata*), rosyside dace (*Clinostomus funduloides*), and creek chub (*Semotilus atromaculatus*).

4. Anticipated Impacts to Biotic Communities

a. Terrestrial Communities

Impacts to biotic communities are estimated based on preliminary alternative designs (Table 4). Actual impacts depend on final roadway design.

Table 4. Anticipated Impacts to Vegetative Communities

Vegetative Community	Alternative A Permanent (acres)	Alternative B Permanent (acres)	Alternative B Temporary (acres)	Alternative C (preferred) Permanent (acres)	Alternative D Permanent (acres)
Bottomland Hardwood Forest	0.01	0.01	0.11	0.77	0.29
Mixed Pine – Hardwood Forest	0.01	0.01	0.004	0.07	0.23
Urban/ Disturbed	0.25	0.25	0.30	0.32	0.85

b. Wetland Communities

Four wetland areas were delineated within project limits, one of which is considered a "High Quality Resource." Some of the proposed alternatives will impact wetlands. Wetland descriptions and details on impacts are provided in Section E.

c. Aquatic Communities

Aquatic organisms are very sensitive to the discharges and inputs resulting from construction activities. Appropriate measures must be taken to avoid spillage and control runoff. Such measures will include an erosion and sedimentation control plan, provisions for waste materials and storage, stormwater management measures, and appropriate road maintenance measures. NCDOT's *Best Management Practices for Protection of Surface Waters* (BMPs - PSW) and Sedimentation Control guidelines will be enforced during the construction stages of the project. Long-term impacts to water resources may include permanent changes to the stream banks and temperature increases caused by the removal of stream-side vegetation.

The removal of stream-side vegetation and placement of fill material during construction contributes to erosion and possible sedimentation. Quick revegetation of these areas helps to reduce the impacts by supporting the underlying soils. Erosion and sedimentation may carry soils, toxic compounds,

trash, and other materials into the aquatic communities at the construction site. As a result, sand bars may be formed both at the site and downstream.

Impacts usually associated with in-stream construction include increased channelization and scouring of the streambed. In-stream construction alters the substrate and impacts adjacent stream-side vegetation. Such disturbances within the substrate lead to increased siltation, which can clog the gills and feeding mechanisms of benthic organisms, fish, and amphibian species.

E. SPECIAL TOPICS

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

Section 404 of the Clean Water Act (CWA) requires regulation of discharges into "Waters of the United States." The U.S. Environmental Protection Agency (USEPA) is the principal administrative agency of the Clean Water Act; however, the USACE has the responsibility for implementation, permitting, and enforcement of the provisions of the Act. The USACE regulatory program is defined in 33 CFR 320-330.

Section 401 of the Clean Water Act grants authority to individual States for regulation of discharges into "Waters of the United States." Under North Carolina General Statutes, 113A "Pollution Control and Environment" and codified in NCAC 15A, the NCDWQ has the responsibility for implementation, permitting, and enforcement of the provisions of the CWA.

Wetlands, defined in 33 CFR 328.3, are those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetland delineations for the project study area were conducted in January and February 2004. Four wetlands were delineated during field surveys. A jurisdictional determination dated July 1, 2004 was received from the USACE (see Appendix).

Two wetland/water body types are mapped by the National Wetlands Inventory along Beaver Dam Creek in the project study area: palustrine, forested, broad-leaved deciduous, seasonally flooded, diked/impounded (PFO1Ch) wetlands downstream of the bridge, and a lacustrine, limnetic, unconsolidated bottom, permanently flooded, diked/impounded water body upstream of the bridge at Neuseoca Lake. Wetlands A, B, C, and D are PFO1Ch wetland types.

Wetland A is situated in the northwest quadrant of the project corridor in the floodplain of Beaver Dam Creek. The wetland vegetation consists primarily of red maple, sweetgum, musclewood, water oak, giant cane, greenbriar, Japanese honeysuckle, soft rush, seedbox, and Japanese stilt grass. Wetland A received a rating of 63 out of a possible 100 on NCDWQ's Wetland Rating Form. This wetland should be considered a potential "High Quality Resource" due to the superior wetland functions it performs.

Wetland B is located in the northeast quadrant of the project corridor in the floodplain of the unnamed tributary to Beaver Dam Creek. The wetland vegetation consists primarily of red maple, sweetgum, river birch, sycamore, sweet bay, giant cane, greenbriar, and Japanese stilt grass. Wetland B received a rating of 56 out of a possible 100 on the NCDWQ Wetland Rating Form.

Wetland C is a linear wetland located in the northeast quadrant of the project corridor in the headwaters of the Beaver Dam Creek UT. The wetland vegetation consists primarily of red maple, water oak, loblolly pine, thorny eleagnus (*Eleagnus pungens*), Christmas fern, greenbriar, and Japanese honeysuckle. Wetland C received a rating of 33 out of a possible 100 on NCDWQ's Wetland Rating Form.

Wetland D is situated in the northeast quadrant of the project corridor, between a mixed pine-hardwood stand and a residential house. The wetland vegetation consists primarily of red maple, sweetgum, American holly, giant cane, Chinese privet, greenbriar, Japanese honeysuckle, and soft rush. Wetland D received a rating of 40 out of a possible 100 on the NCDWQ Wetland Rating Form.

The NCDWQ defines a perennial stream as a clearly defined channel that contains water for the majority of the year. These channels usually have some or all of the following characteristics: distinctive stream bed and bank, aquatic life, and groundwater flow or discharge. One perennial stream was identified in the project area: Beaver Dam Creek. An unnamed tributary to Beaver Dam Creek is classified as an intermittent stream. Detailed stream characteristics are presented in Section C.2. of this report.

Table 5 depicts the anticipated impacts to Waters of the U.S. for the proposed alternatives. Mechanized clearing is generally considered a *permanent* impact. New road alignment leading to the new bridge described in Alternatives C and D will result in *permanent* wetland impacts. Wetland impacts resulting from the *temporary* detour bridge proposed in Alternative B will likely be considered temporary because of the mineral soil type present and the impact taking place on the outer edge of the wetland.

Table 5. Anticipated Impacts to Waters of the U.S.

Proposed Alternatives	Wetland (acres)	Wetland In Buffers (acres)	Mechanized Clearing (acres)
Alternative A or B	0	0	0
Alternative B detour	0.10	0.09	0.06
Alternative C (preferred)	0.41	0.12	0.17
Alternative D	0.19	0.06	0.10

2. Permits

Permits may be required for roadway encroachment into jurisdictional wetlands and surface waters. The USACE issues Section 404 Nationwide 23 permits for activities that are categorically excluded from environmental documentation because they are included within a category of actions that do not have a significant effect on the environment.

The USACE issues Nationwide Permit (NWP) 33 when construction activities necessitate the use of temporary structures, placement of access fill material, or dewatering of the construction site.

A Section 401 General Water Quality Certification is necessary for projects that require Section 404 permits. The state has General Certifications which will match the permit type authorized by the USACE. The NCDWQ must issue the 401 Certification before the USACE will issue the 404 Permit. Compensatory mitigation may be required when more than 150 linear feet of perennial stream and/or more than one acre of wetland impacts occur. Written concurrence from the NCDWQ is not required.

3. Buffer Rules

The Neuse River Riparian Buffer Rule applies to 50-foot wide riparian buffers directly adjacent to perennial and intermittent surface waters in the Neuse River Basin. This rule does not apply to portions of the riparian buffer where a use is existing and ongoing. The Nutrient Sensitive Waters Management Strategy for the Protection and Maintenance of Riparian Buffers (15 A NCAC 2B .0233) provides a designation for uses that cause impacts to riparian buffers within the Neuse Basin. The buffer is divided into two areas. Zone 1 includes the first 30 feet out from the water and essentially must remain undisturbed. Zone 2 consists of the landward 20 feet which must be vegetated, but allows for certain land uses. Grading and replanting in Zone 2 is allowed provided that the health of the vegetation in Zone 1 is not compromised.

Simple perpendicular bridge crossings are designated Allowable within the riparian buffer. The Allowable designation means that the intended uses may proceed within the riparian buffer provided that there are no practical alternatives, and that written authorization from the Division of Water Quality is obtained prior to project development. Allowable and allowable with mitigation buffer impacts require written authorization. Table 6 depicts the estimated impacts to the riparian buffer.

Table 6. Estimated Buffer Impacts

Alternatives	Allowable (acres)		Allowable with Mitigation (acres)		Total Impacts
	Zone 1	Zone 2	Zone 1	Zone 2	
Alternative A	0.09	0.10	0	0	0.19
Alternative B	0.09	0.09	0.13	0.13	0.44
Alternative C (preferred)	0.13	0.13	0	0	0.26
Alternative D	0.08	0.12	0	0	0.20

4. Mitigation

Mitigation of wetland impacts has been defined by the Council on Environmental Quality to include avoidance, minimization, and compensation. These activities must be considered in sequential order.

Avoidance examines all appropriate and practicable possibilities of averting impacts to Waters of the U.S. Given the condition of Bridge No. 143, it is reasonable to conclude that avoidance is not a feasible option.

Minimization includes the examination of appropriate and practicable steps to reduce adverse impacts to Waters of the U.S. All alternatives minimize the amount of in-stream activity due to the use of a bridge as opposed to a culvert. The new bridge will be approximately 40 feet longer than the current bridge, pushing end bents further away from the waters edge.

Compensatory mitigation includes restoration, enhancement, creation, or preservation of wetland and stream functions and values that are lost when these systems are converted to other uses. The USACE usually requires compensatory mitigation for activities authorized under Section 404 of the Clean Water Act when unavoidable impacts total more than 150 linear feet of perennial or intermittent streams. The NCDWQ may require compensatory mitigation for activities authorized under Section 401 of the Clean Water Act for unavoidable impacts to more than 150 linear feet of perennial streams.

Compensatory wetland mitigation will likely be required for Alternatives C and D due to the proposed amount of wetland fill.

F. RARE AND PROTECTED SPECIES

Federal law (under the provisions of Section 7 of the Endangered Species Act of 1973, as amended) requires that any action likely to adversely affect a species classified as federally protected be subject to review by the USFWS. Other species may receive additional protection under separate laws.

The April 27, 2006 Wake County species list, compiled from the USFWS species list and the August 2006 NCNHP list, included one Federally Threatened (T), and three Federally Endangered (E) species. Section F.1 provides a detailed description of each federally threatened and federally endangered species listed for Wake County.

1. Federal Protected Species

A pedestrian field survey was conducted in January 2004 to determine if suitable habitat is available at the project site for any threatened or endangered species. Table 7 summarizes the status of each threatened or endangered species, and species descriptions follow.

Table 7. Threatened & Endangered Species Listed for Wake County, North Carolina

Common Name	Scientific Name	Federal Listing	State Listing
Bald eagle	*Haliaeetus leucocephalus*	Threatened (Proposed for delisting)	Threatened
Red-cockaded woodpecker	*Picoides borealis*	Endangered	Endangered
Dwarf wedge mussel	*Alasmidonta heterodon*	Endangered	Endangered
Michaux's sumac	*Rhus michauxii*	Endangered	Endangered-Special concern

Bald eagle (*Haliaeetus leucocephalus*)
Federal Status: Threatened (Proposed for delisting)
State Status: Threatened
Date Listed: March 11, 1967

The bald eagle is a large raptor that ranges in size from 32 to 43 inches tall and has a wingspan averaging 6 feet. These predators weigh an average of 10 to 12 pounds. Adult body plumage is dark brown to chocolate brown with a white head and tail, while juveniles are brown and irregularly marked with white until their fourth year. They are primarily associated with large bodies of water where food is plentiful and suitable nesting sites are typically found within 0.5 miles of the water. Nests are made in the largest living tree within the area, with an open view of surrounding land and a clear flight path to water. Nests can be as large as 6 feet across and are made of sticks and vegetation. These platform nests may be used by the same breeding pair for many years. Breeding begins in December or January and the young remain in the nest at least ten weeks after hatching. Bald eagles eat mostly fish robbed from ospreys or picked up dead along shorelines, and other carrion. They may also capture small animals such as rabbits, some birds, and wounded ducks.

Biological Conclusion: *May Affect, Not Likely to Adversely Affect*
Bald eagles are year-round but transient species in North Carolina. Suitable habitat for the bald eagle was not found in the study area. However, a survey was recommended by the NCWRC due to three large bodies of water existing within a one-mile radius of the study area (Neuse River, Beaver Dam Lake, and Neuseoca Lake). Beaver Dam Creek itself is too small to support and sustain a family of bald eagles. A helicopter survey covering a one-mile radius around Bridge No. 143 took place on April 2, 2004. The surrounding area was scientifically observed by traveling north to south, traversing east to west. The pilot was experienced in surveying for bald eagle nests. In addition to the pilot, there were three observers in the aircraft. No bald eagle nests or bald eagle individuals were observed; therefore, this species will not likely be impacted as a result of project construction. A letter from the USFWS dated April 15, 2004 concurred with this biological conclusion (Appendix).

Red-cockaded woodpecker (*Picoides borealis*)
Federal Status: Endangered
State Status: Endangered
Date Listed: October 13, 1970

This bird is a small, seven to eight-inch tall woodpecker with a black and white barred back and conspicuous large white cheek surrounded by a black cap, nape, and throat. Males have a very small red mark at the upper edge of the white cheek and just behind the eye. The red-cockaded woodpecker (RCW) is found in open pine forests in the southeastern United States. The RCW uses open old growth stands of southern pines, particularly longleaf pine (*Pinus palustris*), for foraging and nesting habitat. A forested stand optimally should contain at least 50 percent pine and lack a thick understory. The RCW is unique among woodpeckers because it nests exclusively in living pine trees. These birds excavate nests in pines greater than 60 years old that are contiguous with open, pine dominated, foraging habitat. The foraging range of the RCW may extend 500 acres and must be contiguous with suitable nesting sites.

Living pines infected with red-heart disease (*Formes pini*) are often selected for cavity excavation. Cavities are located from 12 to 100 feet above ground level and below live branches. These trees can be identified by "candles," a large encrustation of running sap that surrounds the tree. Colonies consist of one to many of these candle trees. The RCW lays its eggs in April, May, and June; the eggs hatch approximately 10 to 12 days later.

Biological Conclusion: *No Effect*
Suitable habitat for RCW does not exist within the study area. The size and quantity of the pine stands within the study area are not suitable for sustaining the red-cockaded woodpecker for nesting or foraging. Based upon this consideration, the project will have **NO EFFECT** on the RCW.

Dwarf wedge mussel (*Alasmidonta heterodon*)
Federal Status: Endangered
State Status: Endangered
Date Listed: March 14, 1990

The dwarf wedge mussel is small, rarely exceeding 1.5 inches in length. The shell's outer surface (periostracum) is usually olive brown or yellowish brown in color, with light green rays that are more noticeable in juveniles. The nacre (inner shell surface) is bluish to silvery white. The shell shape is subtrapezoidal. A unique characteristic of this mussel is its dentition pattern; the right valve possesses two lateral teeth, while the left valve has only one. This trait is opposite of all other North American species having lateral teeth. Three potential fish host species for the glochidia of the dwarf-wedge mussel are the tessellated darter (*Etheostoma olmstedi*), Johnny darter (*Etheostoma nigrum*), and mottled sculpin (*Cottus bairdi*).

The dwarf wedge mussel inhabits creek and river areas with a slow to moderate current and a sandy, gravelly, or muddy bottom. In North Carolina, this mussel is documented in the Neuse and Tar River systems. The dwarf wedge mussel population declines are attributed to industrial, domestic, and agricultural pollution. Loss of habitat due to siltation of streams and chemical pollution,

especially in the highly developed Wake and Johnston County sites, threaten the survival of this mussel.

Biological Conclusion: ***No Effect***
Beaver Dam Creek drains to the Neuse River, where confirmed populations of the dwarf wedge mussel have been found. A survey for the dwarf wedge mussel was conducted by NCDOT Environmental Specialists on November 4, 2004. A search was performed from approximately 1,300 feet downstream of Bridge No. 143 to the base of Neuseoca Lake Dam. No specimens of dwarf wedge mussel were located, and surveyors determined that habitat in the surveyed area was unsuitable for this species. The proposed project will have **NO EFFECT** on the dwarf wedge mussel.

Michaux's sumac (*Rhus michauxii*)
Federal Status: Endangered
State Status: Endangered – Special Concern
Date Listed: September 28, 1989

Michaux's sumac is a rhizomatous, densely hairy shrub, with erect stems from 1 to 3 feet in height. The compound leaves contain evenly serrated, oblong to lanceolate, acuminate leaflets. Most plants are unisexual; however, more recent observations have revealed plants with both male and female flowers on one plant. The flowers are small, borne in a terminal, erect, dense cluster, and colored greenish yellow to white. Flowering usually occurs from June to July; while the fruit, a red drupe, is produced through the months of August to October. Only 36 extant populations are known, with 31 in North Carolina, three in Virginia, and two populations in Georgia.

Michaux's sumac grows in sandy or rocky open woods in association with basic soils. It spreads by producing cloning shoots from the roots of mature plants. Apparently, this plant survives best in areas where some form of periodic disturbance provides open areas. At least 12 of the plant's populations in North Carolina are on highway rights-of-way, roadsides, or on the edges of artificially maintained clearings.

Biological Conclusion: ***No Effect***
Suitable habitat for Michaux's sumac is not present in the project area. Disturbed areas that may have provided habitat at one time are maintained as residential and commercial lawns. Based upon this consideration, it is reasonable to conclude that the project will have **NO EFFECT** on Michaux's sumac.

2. Federal Species of Concern

Federal Species of Concern (FSC) are not legally protected under the Endangered Species Act and are not subject to any of its provisions, including Section 7, until they are formally proposed or listed as Threatened or Endangered. Species designated as FSC are defined as taxa which may or may not be listed in the future. These species were formerly Candidate 2 (C2) species or species under consideration for listing for which there is insufficient information to support listing. FSC species per the August 2006 NCNHP database, their state status, and the existence of suitable habitat within the study area are shown in Table 8.

Some of these species are listed as Endangered, Threatened, or Special Concern by the NCNHP list of rare plant and animal species and are afforded state protection under the State Endangered Species Act of 1987 and the North Carolina Plant Protection and Conservation Act of 1979.

Table 8. Federal Species of Concern, State Status, and Potential Habitat

Common Name	Scientific Name	State Status	Potential Habitat
Southeastern myotis	*Myotis austroriparius*	SC	Yes
Bachman's sparrow	*Aimophila aestivalis*	SC	No
Roanoke Bass	*Ambloplites cavifrons*	SR	No
Southern hognose snake*	*Heterodon simus*	SC	No
Atlantic pigtoe	*Fusconaia masoni*	E	Yes
Green floater	*Lasmigona subviridis*	E	Yes
Yellow lance	*Elliptio lanceolata*	E	Yes
Bog spicebush	*Lindera subcoriacea*	T	No
Virginia least trillium	*Trillium pusillum* var. *virginianum*	E	No
Sweet pinesap	*Monotropsis odorata*	SR-T	No
Grassleaf Arrowhead	*Sagittaria weatherbiana*	SR-T	Yes
Carolina Madtom	*Noturus furiosus*	SC (PT)	Yes

Notes:
SC-Special Concern, PT-Proposed Threatened, SR-Significantly Rare, E-Endangered, -T-Throughout, *-Historic Record, T-Threatened

NCNHP maps were reviewed on January 13, 2004, in March 2005, and in August 2006 to determine if any state or federal protected species have been identified near the study area. This map review revealed one state protected species within one mile of the project site. Veined skullcap (*scutellaria nervosa*) is a vascular plant listed as an SR-P species in Wake County.

3. Summary of Anticipated Impacts

According to the NCNHP, no known populations of federal protected species occur within the study area. A search for the dwarf wedge mussel was performed, and no specimens were located. In addition, a survey was performed for the bald eagle, and no nests or individual bald eagles were found.

Impacts to Waters of the U. S. may include temporary fill due to the potential for components of the deck and substructure to be dropped into Waters of the U.S. during construction. The preferred alternative will impact 0.7 acre of wetlands (including 0.12 acres in buffers and 0.17 acres due to mechanized clearing). Nationwide Permit No. 23 and a Section 401 General Water Quality Certification will be required for this project.

Alternative A proposes no wetland impacts. The only impacts resulting from this alternative are Neuse River Riparian Buffer impacts, which are considered Allowable. Additionally, the end bents are proposed to move approximately 18 feet farther away from the stream as a result of the proposed bridge being longer than the current bridge.

Alternative B proposes to impact jurisdictional wetlands with a temporary on-site detour to the north of Bridge No. 143. These impacts will likely be considered temporary. Neuse River Riparian Buffer impacts considered both Allowable and Allowable with Mitigation will result from this alternative. Additionally, the end bents are proposed to move approximately 18 feet farther away from the stream as a result of the proposed bridge being longer than the current bridge.

Alternative C (preferred) proposes to impact jurisdictional wetlands with the bridge shifted approximately 100 feet north of Bridge No. 143 on new alignment, extending curvature of the road northeast of the existing bridge location. These impacts are considered permanent.

Alternative D proposes to impact jurisdictional wetlands with the bridge shifted approximately 60 feet north of Bridge No. 143 on new alignment, extending curvature of the road starting approximately 800 feet south of the bridge location. These impacts are considered permanent. Neuse River Riparian Buffer impacts considered both Allowable and Allowable with Mitigation will result from this alternative.

VI. CULTURAL RESOURCES

A. COMPLIANCE GUIDELINES

This project is subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, and implemented by the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106, codified at 36 CFR Part 800. Section 106 requires federal agencies to take into account the effect of their undertakings (federally funded, licensed, or permitted) on properties listed in or eligible for the National Register of Historic Places, and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings.

B. HISTORIC ARCHITECTURE

A field survey of the Area of Potential Effects (APE) was conducted on July 22, 2003. All structures within the APE were photographed, and later reviewed by NCDOT architectural historians and staff at the State Historic Preservation Office (HPO).

In a memorandum dated August 5, 2004, the HPO concurred that the Beaver Dam Lake Fishing Camp, located on the west side of SR 2217 (Old Milburnie Road), is eligible for the National Register under Criterion B: Person. The property, shown in Figure 6, is associated with Senator Josiah Bailey, North Carolina United States Senator from 1931-1946. In a concurrence form dated August 30, 2004, the HPO concurred that there is an effect on the National Register-eligible property. A copy of the concurrence form is included in the Appendix. Alternatives A, B, and C will have no adverse effect with conditions of using two-bar metal railing for desirable view of the dam and lake. Alternative D will have an adverse effect.

In a memorandum dated June 17, 2004, the HPO concurred that the Neuseoca Lake Dam is not eligible for the National Register because it no longer retains enough integrity to convey its significance.

C. ARCHAEOLOGY

The HPO, in a memorandum dated March 4, 2004, recommended that "no archaeological investigation be conducted in connection with this project." A copy of the memorandum is included in the Appendix.

VII. ENVIRONMENTAL EFFECTS

The project is expected to have an overall positive impact. Replacement of the functionally obsolete bridge and structurally deficient bridge will result in safer traffic operations.

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

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

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

No adverse impact on families or communities is anticipated. Right-of-way acquisition will be limited. No relocations of residents or businesses are expected with implementation of the proposed alternative.

In compliance with Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations) a review was conducted to determine whether minority or low-income populations were receiving disproportionately high and adverse human health or environmental impacts as a result of this project. The investigation determined the project would not disproportionately impact any minority or low-income populations.

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

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

The Farmland Protection Policy Act requires all federal agencies or their representatives to consider the potential impacts to prime and important farmland soils by all land acquisition and construction projects. Prime and important farmland soils are defined by the Natural Resources Conservation Service (NRCS). A completed form for this project is included in the Appendix.

According to the NRCS, the proposed project will impact 0.50 acres of soils defined as prime and statewide or local important farmland soils. This accounts for very little of the 440,508 acres of prime or important soils found in the county. The impact rating determined through completion of

Form AD-1006, Farmland Conversion Impact Rating, indicates that the site's assessment and relative value score is 70 out of a possible 260. A score higher than 160 would indicate that mitigation should be considered.

The project is located in Wake County, which is within the Raleigh-Durham-Chapel Hill non-attainment area for ozone (O_3) and the Raleigh-Durham non-attainment area for carbon monoxide (CO) as defined by EPA. The 1990 Clean Air Act Amendments (CAAA) designated these areas as moderate non-attainment areas for CO. However, due to improved monitoring data, these areas were redesignated as maintenance for CO on September 18, 1995. The area was designated non-attainment for O_3 under the eight-hour ozone standard effective June 15, 2004. Section 176(c) of the CAAA requires that transportation plans, programs, and projects conform to the intent of the state air quality implementation plan (SIP). The current SIP does not contain any transportation control measures for Wake County. The Capital Area Metropolitan Planning Organization (CAMPO) *2030 Long Range Transportation Plan* (LRTP) and the *2006-2012 Metropolitan Transportation Improvement Program* (MTIP) conform to the intent of the SIP. The USDOT made a conformity determination on the LRTP on 6/15/05 and the MTIP on 11/14/05. The current conformity determination is consistent with the final conformity rule found in 40 CFR Parts 51 and 93. There are no significant changes in the project's design concept or scope, as used in the conformity analysis.

The purpose of this project is to replace Bridge No. 143 by constructing a new structure. This project will not result in any meaningful changes in traffic volumes, vehicle mix, location of the existing facility, or any other factor that would cause an increase in emissions impacts relative to the No-Build Alternative. As such, FHWA has determined that this project will generate minimal air quality impacts for Clean Air Act criteria pollutants and has not been linked with any special Mobile Source Air Toxics (MSAT) concerns. Consequently, this effort is exempt from analysis for MSATs.

EPA regulations for vehicle engines and fuels will cause overall MSATs to decline significantly over the next 20 years. FHWA predicts MSATs will decline in the range of 57 percent to 87 percent, from 2000 to 2020, based on regulations now in effect, even with a projected 64 percent increase in vehicle miles traveled (VMT). Therefore, both the background level of MSATs and the possibility of even minor MSAT emissions from this project will be reduced.

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

Noise levels could increase during construction but will be temporary. This evaluation completes the assessment requirements for highway traffic noise (23 CFR Part 772) and for air quality (1990 CAAA and NEPA) and no additional reports are required.

An examination of records at the North Carolina Department of Environment and Natural Resources, Division of Water Quality, Groundwater Section and the North Carolina Division of Solid Waste Management revealed no hazardous waste sites in the project area. A field reconnaissance survey was performed and no underground storage tank (UST) sites were found within the project area. If any unregulated USTs or any potential source of contamination is discovered during right-of-way initial contacts with impacted property owners, then an assessment

will be conducted to determine the extent of any contamination at that time.

The drainage area of Beaver Dam Creek at the proposed crossing is 7.0 square miles. Wake County is currently participating in the National Flood Insurance Program. This crossing of Beaver Dam Creek is located in Zone AE, a FEMA Special Flood Hazard Zone (Figure 5). It appears that the published 100-year base flood does not overtop the existing roadway. Proposed encroachments in the floodplain and floodway could result in a Floodway Modification if a "No Impact" certification cannot be obtained. Further detailed analysis during final design will be required to adequately address all the impacts associated with the floodplain.

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

VIII. Public Involvement

Efforts were undertaken early in the planning process to contact local officials to involve them in the project development with scoping letters. Scoping letters were sent to various agencies in February 2004.

IX. Agency Comments

The NC Wildlife Resource Commission, in a standardized letter, stated that they prefer the bridge be replaced with a bridge.

Response: The preferred alternative is a bridge.

The NC Department of Environment and Natural Resources Division of Parks and Recreation stated that there were potential mussel impacts.

Response: A survey of the dwarf wedge mussel was conducted on November 4, 2004. No specimens were located, and surveyors determined that habitat in the surveyed area was unsuitable for this species.

All other agency comments were addressed elsewhere in this document. Letters are included in the Appendix.

X. Section 4(f) of the Department of Transportation Act of 1966

Part 23 CFR 771.135 Section 4(f) (49 U.S.C. 303) states that "The Administrator may not approve the use of land from a significant publicly owned public park, recreation area, or wildlife and waterfowl refuge, or any significant historic site unless a determination is made that:

(i) There is no feasible and prudent alternative to the use of land from the property; and
(ii) The action includes all possible planning to minimize harm to the property resulting from such use."

Four build alternatives were studied for this project. They are described below.

Alternative A replaces the bridge at the existing location. There will be no adverse effect on the historic property. During construction, traffic will be maintained with an off-site detour approximately six miles in length. The detour will follow SR 2049 (Forestville Road), SR 2233 (Smithfield Road), and US 264/64 (New Bern Avenue). This alternative is not recommended because it does not improve safety.

Alternative B replaces the bridge at the existing location. There will be no adverse effect on the historic property. During construction, traffic will be maintained with an on-site detour north (downstream) of the existing bridge. This alternative is not recommended because it does not improve safety.

Alternative C (Preferred) replaces the bridge on new alignment north (downstream) of the existing bridge. During construction, traffic will be maintained on the existing bridge. There will be no adverse effect on the historic property.

Alternative D replaces the bridge on new alignment north (downstream) of the existing bridge. During construction, traffic will be maintained on the existing structure. There will be an adverse effect on the historic property. This alternative is not recommended because of the adverse impacts to the historic property.

Additional alternatives that were not considered feasible include the following:

- The No-Build alternative will eventually necessitate closure of the bridge. This is not desirable because of the traffic service provided by SR 2217 and Bridge No. 143.

- Investigation of the existing structure by the Bridge Maintenance Unit indicates that "rehabilitation" of this bridge is not feasible because of its age and deteriorated condition.

In accordance with the criteria set forth in the Federal Register December 23, 1986, the following Programmatic Section 4(f) for Minor Involvements with Historic Sites evaluation was prepared:

> In a memorandum dated August 5, 2004, the HPO concurred that the Beaver Dam Lake Fishing Camp, located on the west side of SR 2217 (Old Milburnie Road), is eligible for the National Register under Criterion B: Person. The property is associated with Senator Josiah Bailey, North Carolina United States Senator from 1931-1946. In a concurrence form dated August 30, 2004, the HPO concurred that there is an effect on the National Register-eligible property.

Since the project meets the criteria set forth in the Federal Register (December 23, 1986), a programmatic Section 4(f) evaluation satisfies the requirements of Section 4(f).

The following alternatives, which avoid use of the historic site, have been fully evaluated: (1) No-Build (or "do nothing"); (2) rehabilitation of the existing bridge. These alternatives were not found to be feasible and prudent.

All possible planning to minimize harm to the historic site has been performed as an integral part of

this project. In a concurrence form dated August 30, 2004, the HPO concurred that there is an effect on the National Register-eligible property. A copy of the concurrence form is included in the Appendix. Alternatives A, B, and C will have no adverse effect with conditions of using two-bar metal railing for desirable view of the dam and lake. The approved Final Nationwide Section 4(f) Evaluation and Approval for Federally-Aided Highway Projects with Minor Involvement with Historic Sites follows.

NORTH CAROLINA DIVISION

FINAL NATIONWIDE SECTION 4(f) EVALUATION AND APPROVAL FOR FEDERALLY-AIDED HIGHWAY PROJECTS WITH MINOR INVOLVEMENTS WITH HISTORIC SITES

F. A. Project BRZ-2217(1)

State Project 8.2409501

T. I. P. No. B-4304

DESCRIPTION:

Replace Bridge No. 143 on SR 2217 (Old Milburnie Road) over Beaver Dam Creek in Wake County.

		YES	NO
1.	Is the proposed project designed to improve the operational characteristics, safety, and/or physical condition of the existing highway facility on essentially the same alignment?	X	
2.	Is the project on new location?		X
3.	Is the historic site adjacent to the existing highway?	X	
4.	Does the project require the removal or alteration of historic buildings, structures, or objects?		X
5.	Does the project disturb or remove archaeological resources which are important to preserve in place rather than to recover for archaeological research?		X
6.	a. Is the impact on the Section 4(f) site considered minor (i.e. no effect, no adverse effect)?	X	
	b. If the project is determined to have "no adverse effect" on the historic site, does the Advisory Council on Historic Preservation object to the determination of "no adverse effect"?		X
7.	Has the SHPO agreed, in writing, with the assessment of impacts and the proposed mitigation?	X	

8. Does the project require the preparation of an EIS? ☐ X

ALTERNATIVES CONSIDERED AND FOUND NOT TO BE FEASIBLE AND PRUDENT

The following alternatives were evaluated and found not to be feasible and prudent:

		YES	NO
1.	Do nothing		
	Does the "do nothing" alternative:		
	(a) correct capacity deficiencies?	☐	X
or	(b) correct existing safety hazards?	☐	X
or	(c) correct deteriorated conditions?	☐	X
and	(d) create a cost or impact of extraordinary measure	☐	X
2.	Improve the highway without using the adjacent historic site.		
	(a) Have minor alignment shifts, changes in standards, use of retaining walls, etc., or traffic management measures been evaluated?	X	☐

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

(i) substantial adverse environmental impacts

or (ii) substantial increased costs

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

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

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

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

	Yes	No
3. Build an improved facility on new location without using the historic site.	X	☐

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

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

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

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

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

MINIMIZATION OF HARM

	Yes	No
1. The project includes all possible planning to minimize harm necessary to preserve the historic integrity of the site.	X	☐
2. Measures to minimize harm have been agreed to, in accordance with 36 CFR Part 800, by the FHWA, the SHPO, and as appropriate, the ACHP.	X	☐

3. Specific measures to minimize harm are described as follows:

Replacing the bridge on new alignment north of the existing bridge while maintaining traffic on the existing structure.

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

COORDINATION

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

a. State Historic Preservation Officer	X
b. Advisory Council on Historic Preservation	___
c. Property owner	X
d. Local/State/Federal Agencies	X
e. US Coast Guard (for bridges requiring bridge permits)	___

SUMMARY AND APPROVAL

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

All required alternatives have been evaluated and the findings made are clearly applicable to this project. There are no feasible and prudent alternatives to the use of the historic site.

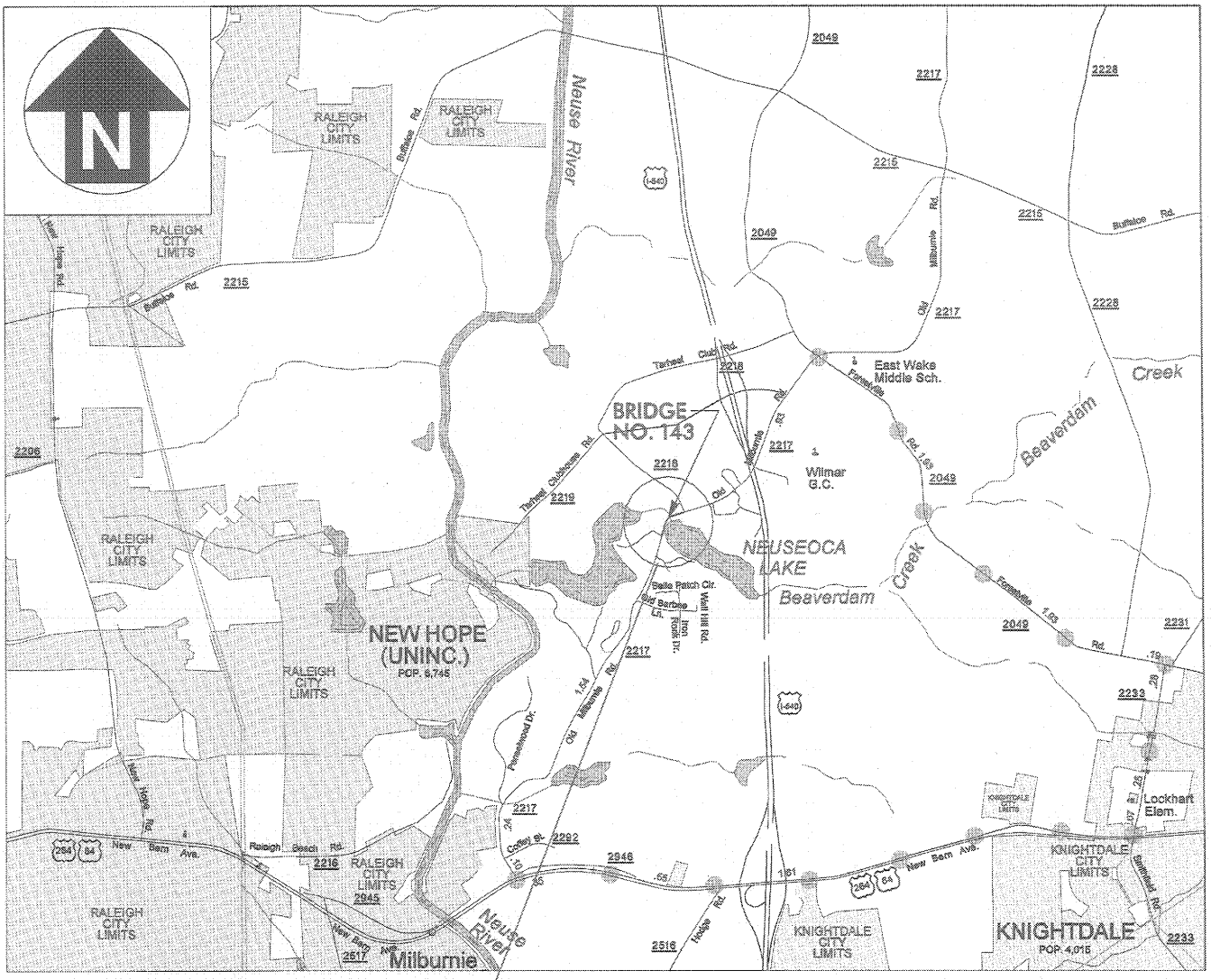
The project includes all possible planning to minimize harm, and the measures to minimize harm will be incorporated in the project.

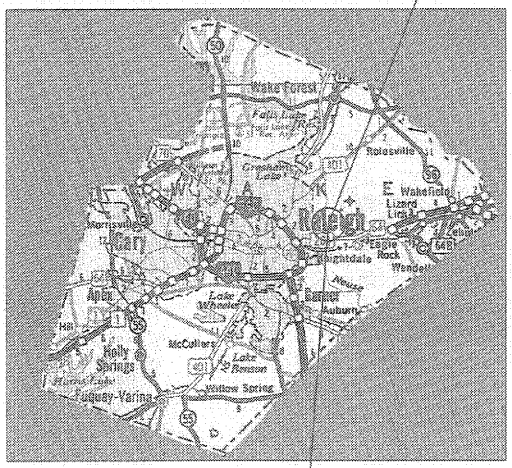
All appropriate coordination has been successfully completed with local and state agencies.

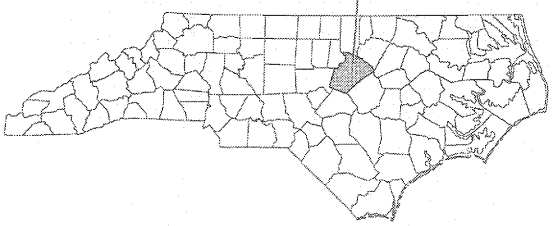
Approved:

12/21/06 Stacy Oberhauser
Date Environmental Management Director
Project Development and Environmental Analysis Branch, NCDOT

12/27/06 Thomas D. Rigsbee
Date for Division Administrator
FHWA





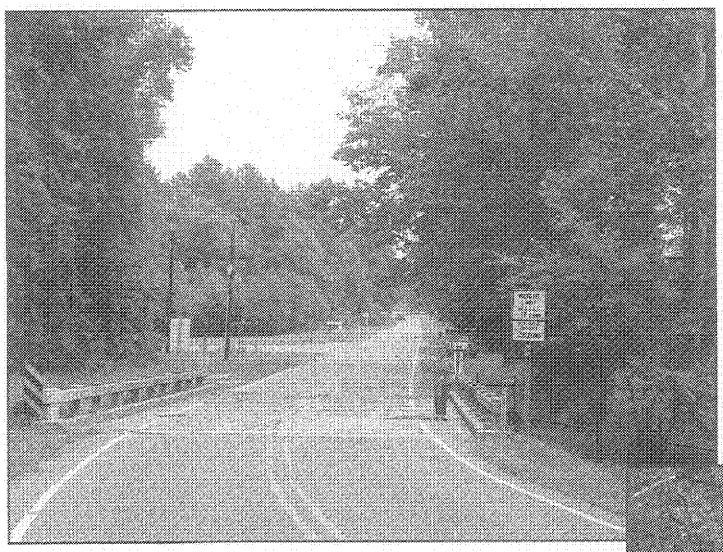


DETOUR ROUTE

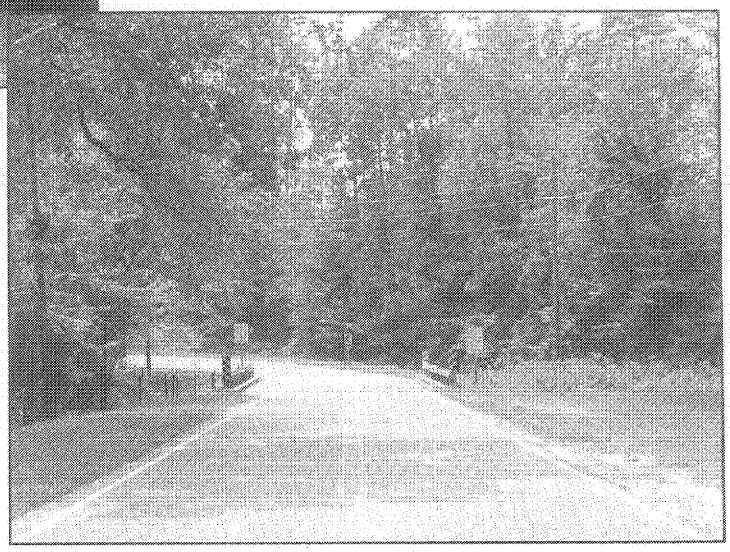
North Carolina Department of Transportation
Project Development & Environmental Analysis

WAKE COUNTY
BRIDGE NO. 143 ON SR 2217
OVER BEAVER DAM CREEK
B-4304

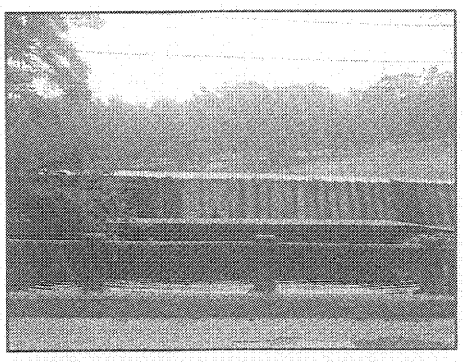
FIGURE 1



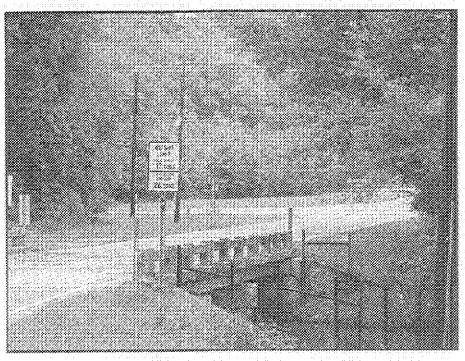
View of east approach from Bridge No. 143.



View of west approach from Bridge No. 143.



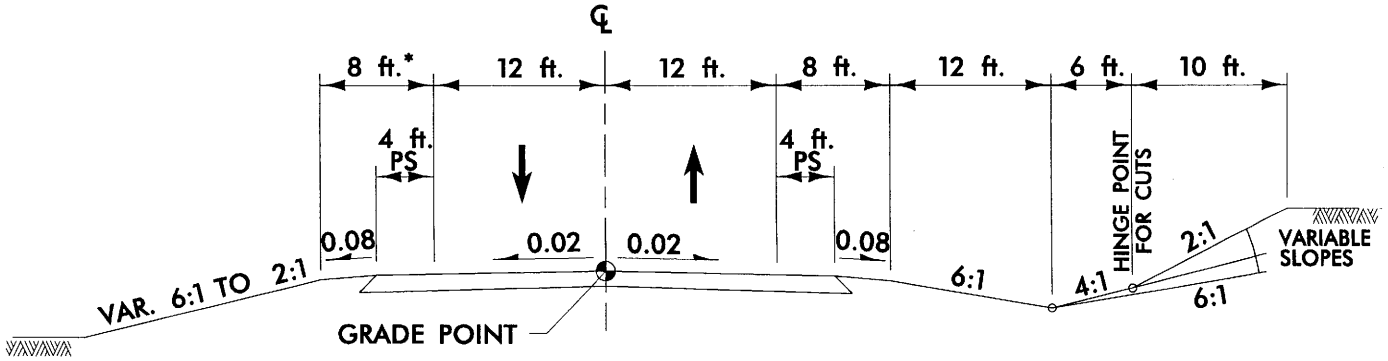
Looking south (upstream) at dam from Bridge No. 143.



North side (downstream side) of Bridge No. 143.

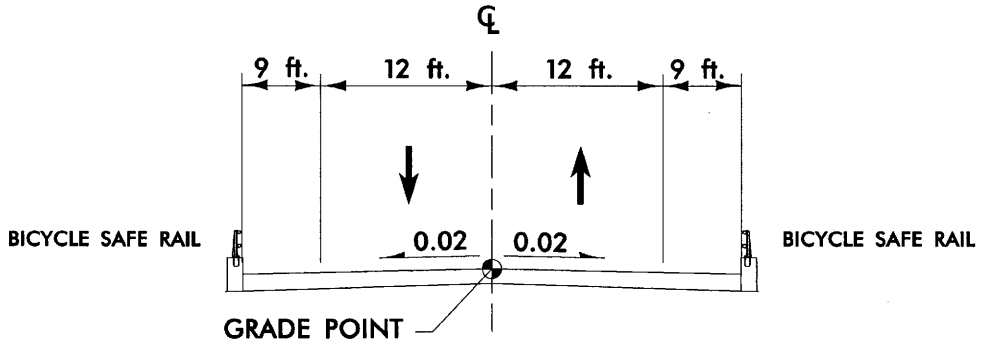
Figure 2

B-4304 Bridge No. 143 on SR 2217 over Beaver Dam Creek



TYPICAL APPROACH SECTION
(PROPOSED)

* 11 ft. WITH GUARDRAIL IS WARRANTED



TYPICAL BRIDGE SECTION
(PROPOSED)

TRAFFIC DATA

(CONST. YR.) 2006 ADT = 5,600
(DESIGN YR.) 2030 ADT = 11,400
DUAL 2%
TTST 1%

EXISTING BRIDGE LENGTH = 55 ft.

FUNCTIONAL CLASSIFICATION :
LOCAL – RURAL

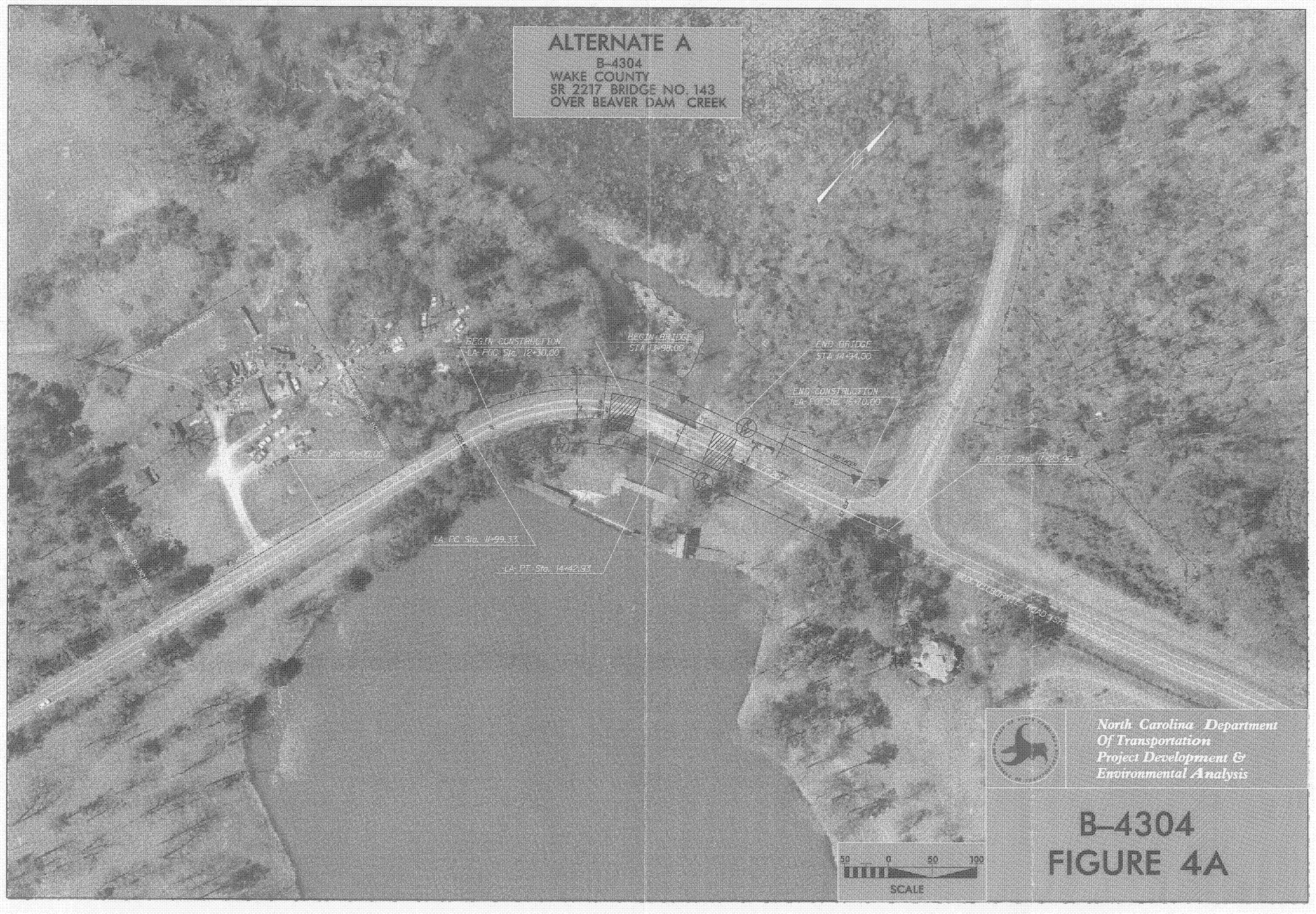
North Carolina Department Of Transportation
Project Development & Environmental Analysis

WAKE COUNTY
BRIDGE NO. 143 ON SR 2217
(OLD MILBURNIE RD)
OVER BEAVER DAM CREEK
TIP NO: B-4304

FIGURE 3

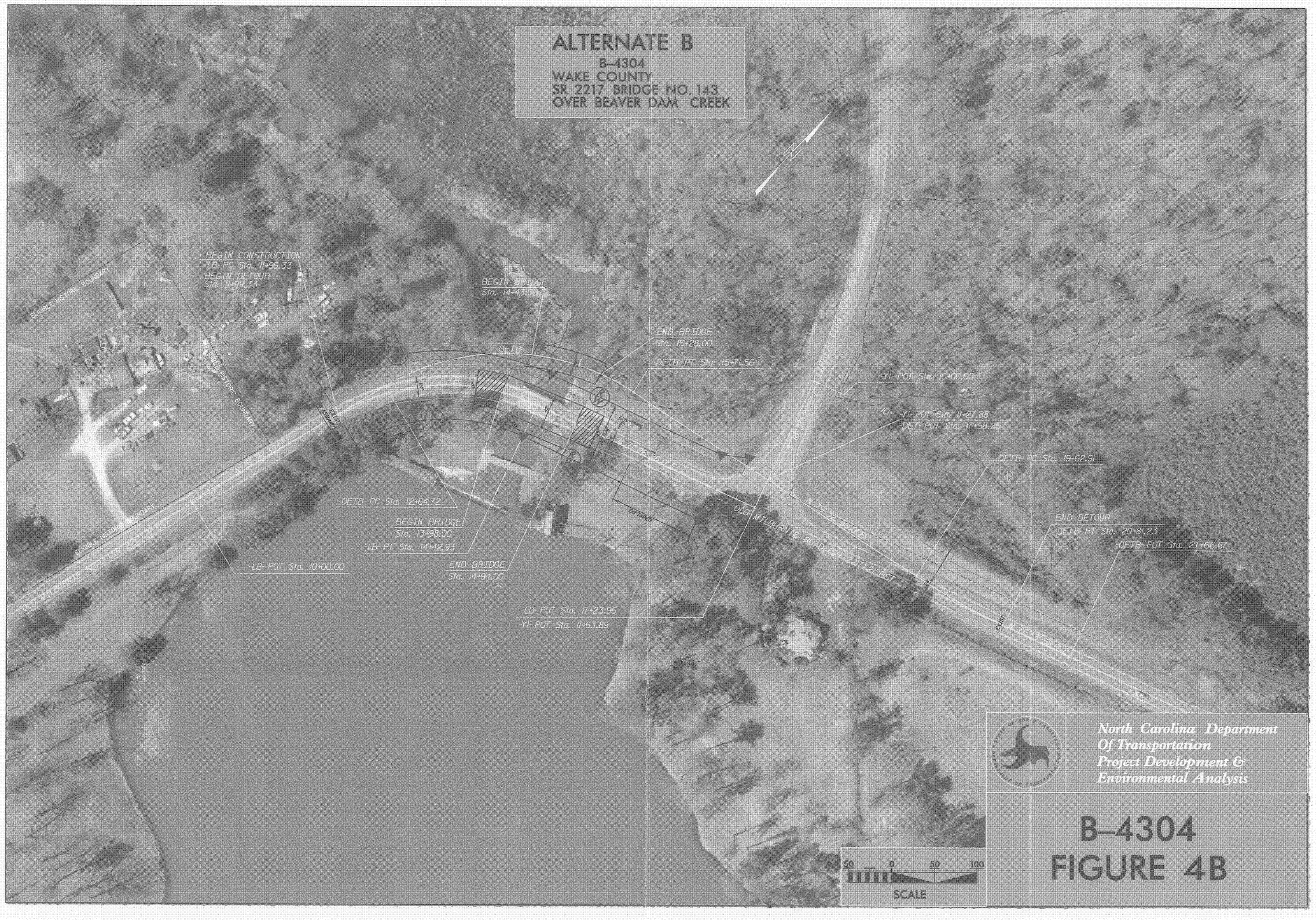
ALTERNATE A

B-4304
WAKE COUNTY
SR 2217 BRIDGE NO. 143
OVER BEAVER DAM CREEK



North Carolina Department Of Transportation
Project Development & Environmental Analysis

B-4304
FIGURE 4A


ALTERNATE B

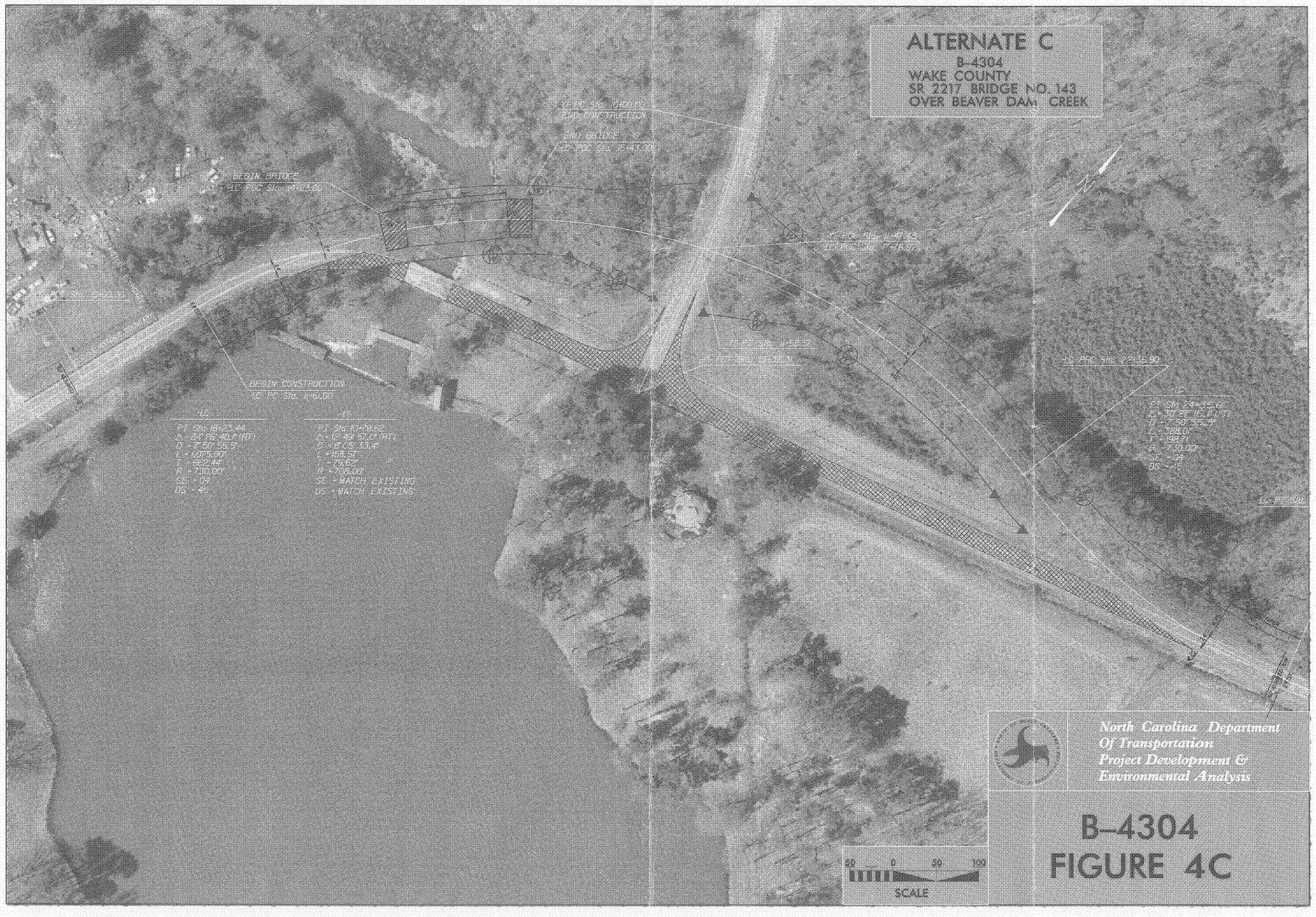
B-4304
WAKE COUNTY
SR 2217 BRIDGE NO. 143
OVER BEAVER DAM CREEK

North Carolina Department
Of Transportation
Project Development &
Environmental Analysis

B-4304
FIGURE 4B

ALTERNATE C

B-4304
WAKE COUNTY
SR 2217 BRIDGE NO. 143
OVER BEAVER DAM CREEK

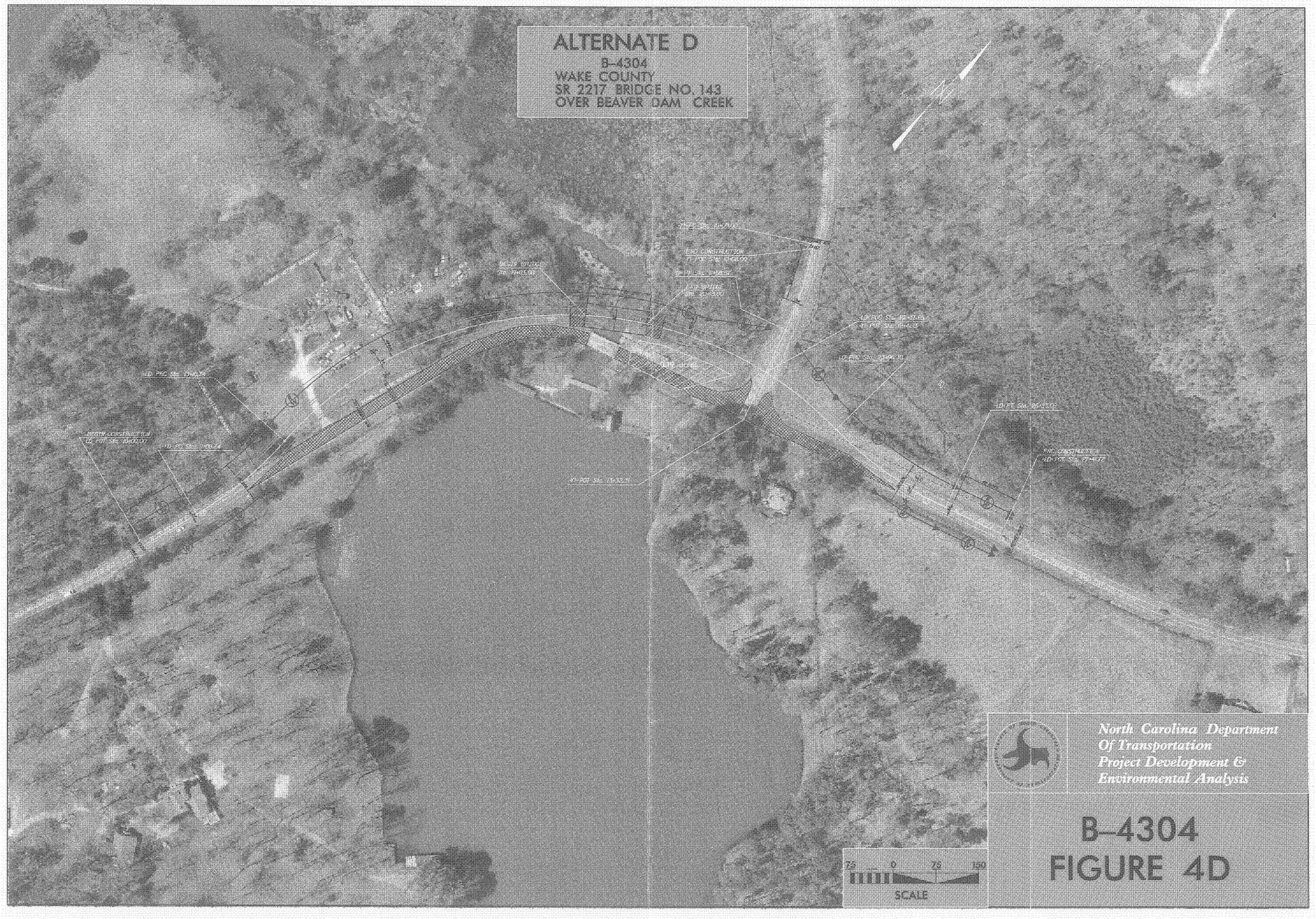


North Carolina Department Of Transportation
Project Development & Environmental Analysis

B-4304
FIGURE 4C

ALTERNATE D

B-4304
WAKE COUNTY
SR 2217 BRIDGE NO. 143
OVER BEAVER DAM CREEK



North Carolina Department Of Transportation
Project Development & Environmental Analysis

B-4304
FIGURE 4D

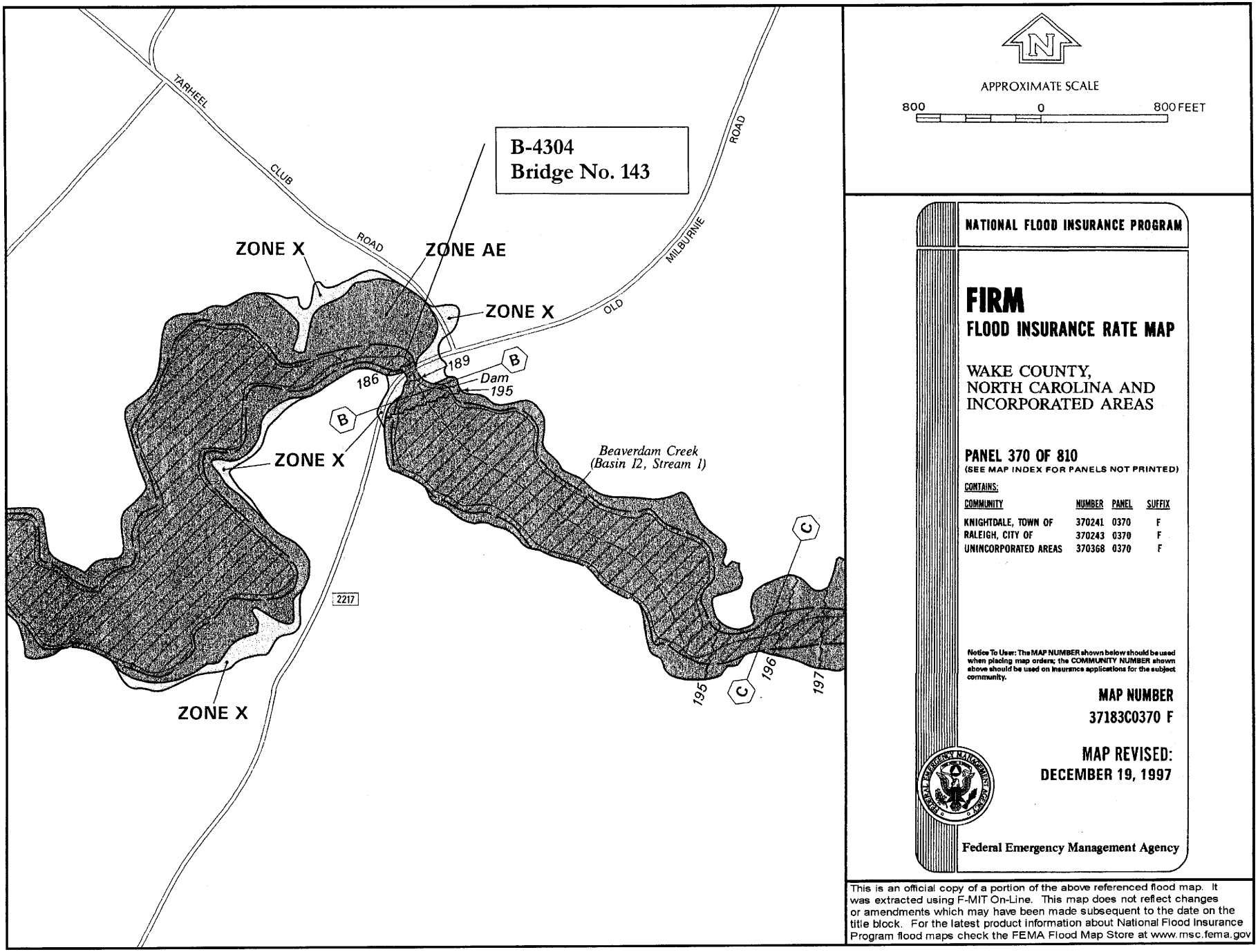
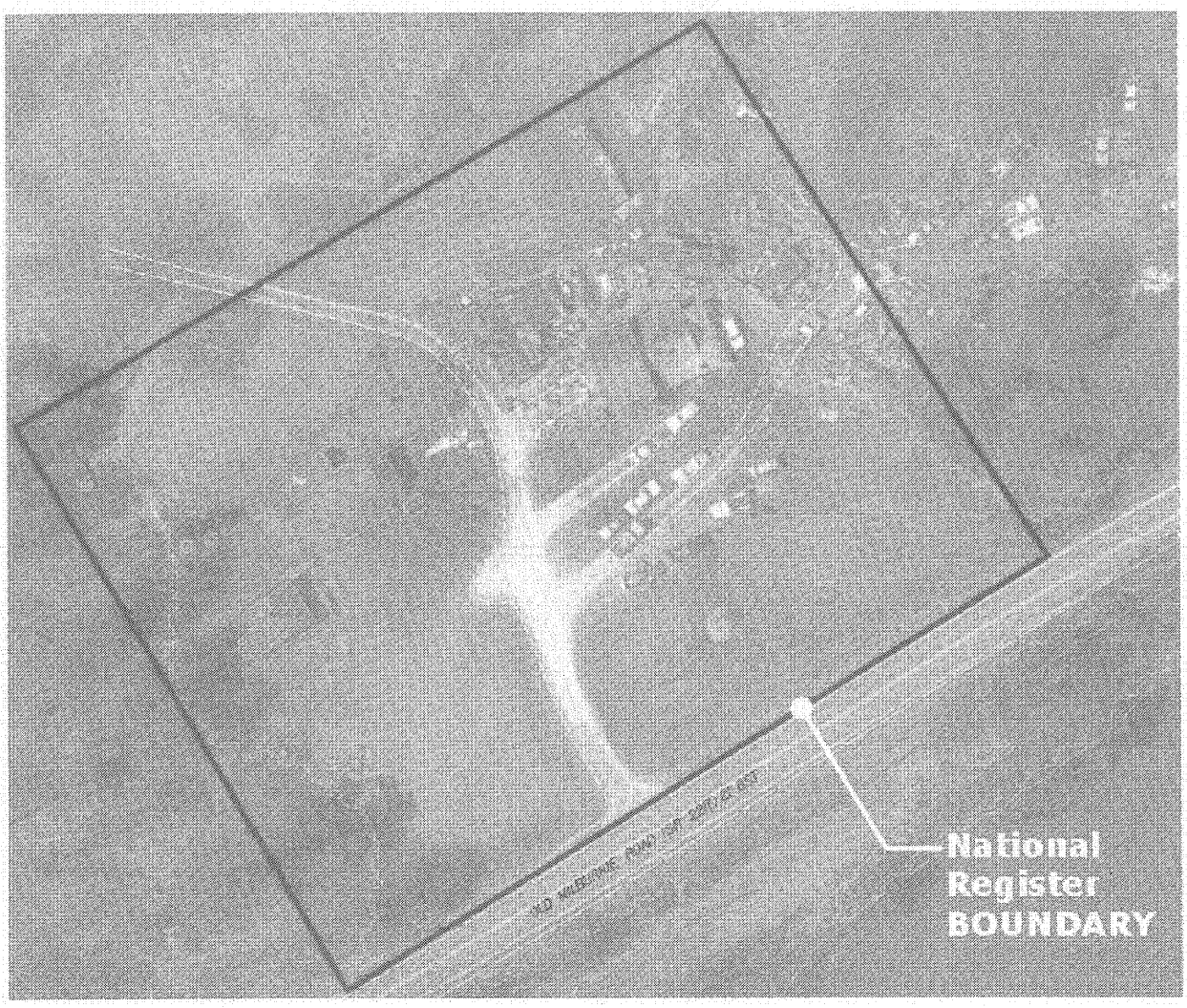

B-4304
Bridge No. 143
TARHEEL
CLUB
ROAD
OLD
MILBURNIE
ROAD
ZONE X
ZONE AE
ZONE X
ZONE X
ZONE X
189
186
B
Dam
195
Beaverdam Creek
(Basin I2, Stream 1)
2217
C
195
196
197
N
APPROXIMATE SCALE
800
0
800 FEET
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
WAKE COUNTY,
NORTH CAROLINA AND
INCORPORATED AREAS
PANEL 370 OF 810
(SEE MAP INDEX FOR PANELS NOT PRINTED)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
KNIGHTDALE, TOWN OF 370241 0370 F
RALEIGH, CITY OF 370243 0370 F
UNINCORPORATED AREAS 370368 0370 F
Notice To User: The MAP NUMBER shown below should be used when placing map orders; the COMMUNITY NUMBER shown above should be used on insurance applications for the subject community.
MAP NUMBER
37183C0370 F
MAP REVISED:
DECEMBER 19, 1997
Federal Emergency Management Agency
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Figure 5



BEAVER DAM LAKE FISHING CAMP
NATIONAL REGISTER BOUNDARY

Boundary Justification: The NR boundary is drawn to include all known historic architectural resources of the Beaver Dam Lake Fishing Camp associated with Senator Josiah W. Bailey. Structures are keyed in the original B-4304 Phase 2 Report.

N

Wake County GIS Aerial Map
-No Scale-

NCDOT Historic Architecture
1583 Mail Service Center
Raleigh, NC 27699-1583

T 919-715-1333
F 919-715-1501
www.ncdot.org

Project: Replace Bridge No. 14 on SR 2217 (Old Milburnie Rd.) Wake County	Drawn By: Silverman	TIP No.	B-4304
	Issue Date: 07-06-04	Scale	NTS
Sheet Title: Beaver Dam Lake Fishing Camp NATIONAL REGISTER BOUNDARY	File Name: NR_1.ppt	Sheet No.	NR-1

FIGURE 6

APPENDIX

U.S. ARMY CORPS OF ENGINEERS
WILMINGTON DISTRICT

COPY

Action ID: 200420510: TIP B-4304 County: Wake U.S.G.S. Quad: Raleigh East

NOTIFICATION OF JURISDICTIONAL DETERMINATION

Project Proponent:	NCDOT	Consultant:	Mulkey Engineers & Consultants
Address:	ATTN: Gregory J. Thorpe, Ph.D. Environmental Mgmt. Director, PDEA 1548 Mail Service Center Raleigh, NC 27699-1548		ATTN: Ms. Julie Gibson Post Office Box 33127 Raleigh, North Carolina 27636
Telephone No.:	(919) 733-7844, x237 (B. Goodwin)		(919) 858-1807

Location of Property (waterbody, Highway name/number, town, etc.): Study area for replacement of Bridge No. 143 (TIP No. B-4304), on SR 2217 (Old Milburnie Road) over Beaver Dam Creek, northeast of Raleigh, North Carolina.

Indicate Which of the Following Apply:

____ Based on preliminary information, there may be wetlands, on the above-described property. We strongly suggest you have this property inspected to determine the extent of Department of the Army (DA) jurisdiction. To be considered final, a jurisdictional determination must be verified by the Corps.

____ There are wetlands in the above described study area subject to the permit requirements of Section 404 of the Clean Water Act (CWA)(33 USC § 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

____ We strongly suggest you have the wetlands in your study area delineated. Due to the size of your property and/or our present workload, the Corps may not be able to accomplish this wetland delineation in a timely manner. For a more timely delineation, you may wish to obtain a consultant. To be considered final, any delineation must be verified by the Corps.

X On July 1, 2004, the undersigned reviewed the information submitted in support of the delineation of Section 404 jurisdiction by your consultants for the subject NCDOT project study area. The Corps verifies that this jurisdictional delineation, as depicted in the delineation information dated March 29, 2004 provided by Mulkey Engineers, as shown in the attached drawing (Figure No. 3b), can be relied on for planning purposes and impact assessment, for a period not to exceed five years from the date of this notification.

____ There are no waters of the U.S., to include wetlands, present in the above described study area which are subject to the permit requirements of Section 404 of the Clean Water Act (33 USC 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

Remarks: _____

Corps Regulatory Official: Eric Alsmeyer

Date July 1, 2004 Expiration Date July 1, 2009

Placement of dredged or fill material within waters of the US and/or wetlands without a Department of the Army permit may constitute a violation of Section 301 of the Clean Water Act (33 USC § 1311). If you have any questions regarding the Corps of Engineers regulatory program, please contact Eric Alsmeyer at telephone number (919) 876 - 8441 extension 23.

Basis for Determination: The site contains stream channels of Beaver Dam Creek and unnamed tributaries, tributaries of the Neuse River, with indicators of ordinary high water marks, and wetlands adjacent to the streams.

Corps Regulatory Official (Initial): EA

FOR OFFICE USE ONLY:

- A plat or sketch of the property and the wetland data form must be attached to the file copy of this form.
- A copy of the "Notification Of Administrative Appeal Options And Process And Request For Appeal" form must be transmitted with the property owner/agent copy of this form.
- If the property contains isolated wetlands/waters, please indicate in "Remarks" section and attach the "Isolated Determination Information Sheet" to the file copy of this form.

CF: Consultant – Mulkey Engineers

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: **NCDOT, Division of Highways**	File Number: **200420510/B-4304**	Date: **July 1, 2004**
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
X	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact: Mr. Eric C. Alsmeyer, Regulatory Project Manager U.S. Army Corps of Engineers, Wilmington District Raleigh Regulatory Field Office 6508 Falls of Neuse Road, Suite 120 Raleigh, North Carolina 27615-6814	If you only have questions regarding the appeal process you may also contact: Mr. Arthur Middleton, Administrative Appeal Review Officer CESAD-ET-CO-R U.S. Army Corps of Engineers, South Atlantic Division 60 Forsyth Street, Room 9M15 Atlanta, Georgia 30303-8801

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

_____ Signature of appellant or agent.	Date:	Telephone number:

DIVISION ENGINEER:
Commander
U.S. Army Engineer Division, South Atlantic
60 Forsyth Street, Room 9M15
Atlanta, Georgia 30303-3490

United States Department of the Interior

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

April 15, 2004

Julie Gibson
Mulkey Engineers & Consultants
P.O. Box 33127
Raleigh, NC 27636

Dear Ms. Gibson:

This letter is in response to your letter of April 7, 2004 which provided the U.S. Fish and Wildlife Service (Service) with the biological conclusion of the North Carolina Department of Transportation that the replacement of Bridge No. 143 on SR 2217 over Beaverdam Creek in Wake County may affect, but is not likely to adversely affect the federally threatened bald eagle (*Haliaeetus leucocephalus*). These comments are provided in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531- 1543).

According to the information you submitted, a helicopter survey was conducted within a one mile radius of the project site on April 2, 2004. No eagles or eagle nests were observed. Based on the information provided and other available information, the Service concurs with the conclusion that the proposed bridge replacement may affect, but is not likely to adversely affect the bald eagle. We believe that the requirements of section 7(a)(2) of the ESA have been satisfied for this species. We remind you that obligations under section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered in this review; (2) this action is subsequently modified in a manner that was not considered in this review; or (3) a new species is listed or critical habitat determined that may be affected by this identified action.

The Service appreciates the opportunity to review this project. If you have any questions regarding our response, please contact Mr. Gary Jordan at (919) 856-4520 (Ext. 32).

Sincerely,

Garland B. Pardue

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

cc: Eric Alsmeyer, USACE, Raleigh, NC
John Hennessy, NCDWQ, Raleigh, NC
Travis Wilson, NCWRC, Creedmoor, NC
Chris Militscher, USEPA, Raleigh, NC

United States Department of the Interior

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

February 18, 2004

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

Dear Dr. Thorpe:

This letter is in response to your request for comments from the U.S. Fish and Wildlife Service (Service) on the potential environmental impacts of the proposed replacement of the following ten bridges:

- B-4002, Alamance County, Bridge No. 96 on SR 2116 over Meadow Creek
- B-4063, Chatham County, Bridge No. 20 on NC 902 over Sandy Branch
- B-4109, Durham County, Bridge No. 120 on SR 1303 over Mud Creek
- B-4216, Orange County, Bridge No. 66 on SR 1002 over Strouds Creek
- B-4300, Wake County, Bridge No. 29 on SR 1007 over Clarks Creek
- B-4301, Wake County, Bridge No. 229 on SR 1007 over Poplar Creek
- B-4302, Wake County, Bridge No. 336 on SR 1301 over Terrible Creek
- B-4303, Wake County, Bridge No. 102 on SR 1844 over Lower Bartons Creek
- B-4304, Wake County, Bridge No. 143 on SR 2217 over Beaver Dam Creek
- B-4592, Orange County, Bridge No. 64 on SR 1561 over Eno River

These comments provide scoping information in accordance with provisions of the Fish and Wildlife Coordination Act (16 U.S.C. 661-667d) and section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

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

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

2. If unavoidable wetland impacts are proposed, every effort should be made to identify compensatory mitigation sites in advance. Project planning should include a detailed compensatory mitigation plan for offsetting unavoidable wetland impacts. Opportunities

to protect mitigation areas in perpetuity via conservation easements, land trusts or by other means should be explored at the outset;

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

4. Wherever appropriate, construction in sensitive areas should occur outside fish spawning and migratory bird nesting seasons. In waterways that may serve as travel corridors for fish, in-water work should be avoided during moratorium periods associated with migration, spawning and sensitive pre-adult life stages. The general moratorium period for anadromous fish is February 15 - June 30;

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

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

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

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

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

A list of federally protected species for each county in North Carolina can be found at http://nc-es.fws.gov/es/countyfr.html . Additional information about the habitats in which each species is often found can also be found at http://endangered.fws.gov . Please note, the use of the North Carolina Natural Heritage Program data should not be substituted for actual field surveys if suitable habitat occurs near the project site. If suitable habitat exists in the project area, we recommend that biological surveys for the listed species be conducted and submitted to us for review. All survey documentation must include survey methodologies and results.

We reserve the right to review any federal permits that may be required for these projects, at the public notice stage. Therefore, it is important that resource agency coordination occur early in

the planning process in order to resolve any conflicts that may arise and minimize delays in project implementation. In addition to the above guidance, we recommend that the environmental documentation for these projects include the following in sufficient detail to facilitate a thorough review of the action:

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

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

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

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

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

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

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

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

Sincerely,

John E. Ellis

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

cc: Eric Alsmeyer, USACE, Raleigh, NC
John Thomas, USACE, Raleigh, NC
Richard Spencer, USACE, Wilmington, NC
John Hennessy, NCDWQ, Raleigh, NC
Travis Wilson, NCWRC, Creedmoor, NC
Chris Militscher, USEPA, Raleigh, NC

Federal Aid # **BRZ-2217(1)** *TIP #* **B-4304** *County:* **Wake**

CONCURRENCE FORM FOR ASSESSMENT OF EFFECTS

Project Description: **Replace Bridge No. 143 on SR 2217 over Beaver Dam Creek**

On **Aug. 30, 2004** representatives of

- ☒ North Carolina Department of Transportation (NCDOT)
- ☒ Federal Highway Administration (FHWA)
- ☒ North Carolina State Historic Preservation Office (HPO)
- ☐ Other

Reviewed the subject project and agreed

- ☐ There are no effects on the National Register-listed property/properties located within the project's area of potential effect and listed on the reverse.
- ☐ There are no effects on the National Register-eligible property/properties located within the project's area of potential effect and listed on the reverse.
- ☐ There is an effect on the National Register-listed property/properties located within the project's area of potential effect. The property/properties and the effect(s) are listed on the reverse.
- ☑ There is an effect on the National Register-eligible property/properties located within the project's area of potential effect. The property/properties and effect(s) are listed on the reverse.

Signed:

R Scruggs — 08/30/2004
Representative, NCDOT — Date

Robert Hanson — 8/30/04
FHWA, for the Division Administrator, or other Federal Agency — Date

Erin O. Kane — 8/30/04
Representative, HPO — Date

Renee Gledhill-Earley — 8/30/04
State Historic Preservation Officer — Date

Federal Aid # **BRZ-2217(1)** *TIP #* **B-4304** *County:* **Wake**

Properties within the area of potential effect for which there is no effect. Indicate if property is National Register-listed (NR) or determined eligible (DE).

Properties within the area of potential effect for which there is an effect. Indicate property status (NR or DE) and describe the effect.

Beaver Dam Lake Fish Camp (DE)

ALT-A
ALT-B
ALT-C
} NO ADVERSE EFFECT

(2 Bike RAE RHA
AT BAR RAIL
SUGGESTED TO R
TO DESIRABLE
VIEW)

ALT-D - ADVERSE EFFECT

Reason(s) why the effect is not adverse (if applicable).

Initialed: NCDOT RLS FHWA RHA HPO EOK

North Carolina Department of Cultural Resources

State Historic Preservation Office

Peter B. Sandbeck, Administrator

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

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

August 5, 2004

MEMORANDUM

TO: Gregory Thorpe, Ph.D., Director
Project Development and Environmental Analysis Branch
NCDOT Division of Highways

FROM: Peter B. Sandbeck RSE for Peter Sandbeck

SUBJECT: Addendum, Historic/Architectural Survey Report, Replace Bridge No. 143, on SR 2217 (Old Milburnie Road) over Beaver Dam, B-4304, Wake County, ER 04-0397

Thank you for your letter of July 6, 2004, concerning the above project.

Your Determination of Eligibility concurrence letter for the Beaver Dam Lake Fishing Camp will be placed in the 2004 Phase II survey report along with the proposed National Register boundary and boundary justification for the property.

For purposes of compliance with Section 106 of the National Historic Preservation Act, we concur that the Beaver Dam Lake Fishing Camp, west side of SR 2217 (Old Milburnie Road) 0.2 miles southwest of SR 2218 (Tarheel Club Road), Raleigh vicinity, is eligible for the National Register under Criterion B: Person. The property is associated with Senator Josiah Bailey, North Carolina United States Senator from 1931-1946.

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.

PBS:w

cc: Mary Pope Furr

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

North Carolina Department of Cultural Resources
State Historic Preservation Office

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

Division of Historical Resources
David J. Brook, Director

June 17, 2004

MEMORANDUM

TO: Greg Thorpe, Ph.D., Director
Project Development and Environmental Analysis Branch
NCDOT Division of Highways

FROM: David Brook for David Brook

SUBJECT: Historic Architectural Resources Survey Report, Bridge No. 143 on SR 2217 (Old Milburnie Road) over Beaver Dam Creek, B-4304, Wake County, ER04-0397

Thank you for your letter of April 13, 2004, transmitting the survey report by Richard Silverman.

For purposes of compliance with Section 106 of the National Historic Preservation Act, we concur that the following property is not eligible for the National Register:

> Neuseoca Lake Dam, southeast side of SR 2217 (Old Milburnie Road), at Neuseoca Lake, near Bridge No.143, Raleigh vicinity, is not eligible for the National Register because it no longer retains enough integrity to convey its significance.

We do not concur with your evaluation of the Beaver Dam Lake Fishing Camp, located west side of SR 2217 (Old Milburnie Road), 0.2 mile southwest of SR 2218 (Tarheel Club Road), Raleigh vicinity. We think that the property is eligible under Criterion B (Person), for its association with Senator Josiah W. Bailey, North Carolina US Senator from 1931-1946.

Josiah Bailey was one of three founders of Beaver Dam Lake, Inc. and the Beaver Dam Lake Camp. The camp was initiated during Bailey's political career, primarily as a senator. Bailey was one of North Carolina's important senators, a reformer, and prohibition crusader. He was the chairman of the Senate Commerce Commission during the New Deal era. Bailey established the fishing camp during his productive life. He and his partners founded the camp to "avoid the raucous activities that went on at many of the private clubs to which they had formally belonged." We believe the camp to be the last remaining buildings associated with Josiah Bailey. His home in Raleigh, once located on Blount Street is no longer extant.

The property has undergone some changes since the initial saddlebag log building was constructed in the late 19th century. Most of the changes occurred during the property's transformation to a fishing camp. While the camp's integrity has been somewhat comprised by the large addition to the rear of Building C, we feel that the entire complex still retains its essential features and would be recognizable to Bailey were he to view the property today. The proposed National Register boundaries should include the property and buildings associated with Bailey.

Since we have determined that the Beaver Dam Lake Fishing Camp is eligible for the National Register, we would like to request from your office a proposed National Register Boundary map and boundary justification in an addendum to this report.

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

North Carolina Department of Cultural Resources
State Historic Preservation Office

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

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

March 4, 2004

MEMORANDUM

TO: Stacey Baldwin
Project Development and Environmental Analysis Branch
NCDOT Division of Highways

FROM: David Brook for David Brook

SUBJECT: Request for comments on Bridge Replacement projects
B-4002, Alamance County
B-4063, Chatham County
B-4109, Durham County
B-4216, Orange County
B-4300, Wake County
B-4301, Wake County
B-4302, Wake County
B-4303, Wake County
B-4304, Wake County
B-4592, Orange County
ER03-0389 through ER03-0398

Thank you for your letters of February 5, 2004, concerning the above projects.

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

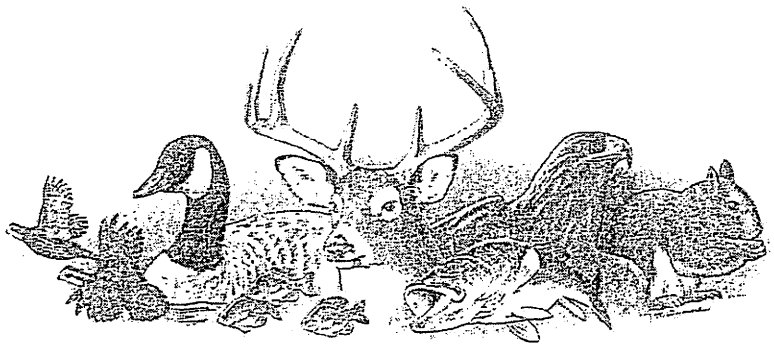
Please forward a labeled 7.5 minute USGS quadrangle map for each of the above projects clearly indicating the project vicinity, location, and termini. In addition, please include the name of the quadrangle map.

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, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763. In all future communication concerning this project, please cite the above-referenced tracking number.

cc: Mary Pope Furr, NCDOT
Matt Wilkerson, NCDOT



North Carolina Wildlife Resources Commission

Richard B. Hamilton, Executive Director

MEMORANDUM

TO: Gregory J. Thorpe
Environmental Management Director, PDEA

FROM: Travis Wilson, Highway Project Coordinator
Habitat Conservation Program

DATE: February 27, 2004

SUBJECT: NCDOT Bridge Replacements in Alamance, Chatham, Durham, Orange, and Wake counties. TIP Nos. B-4002, B-4063, B-4109, B-4216, B-4300, B-4301, B-4302, B-4303, B-4304, and B-4592.

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

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

1. We generally prefer spanning structures. Spanning structures usually do not require work within the stream and do not require stream channel realignment. The horizontal and vertical clearances provided by bridges allows for human and wildlife passage beneath the structure, does not block fish passage, and does not block navigation by canoeists and boaters.
2. Bridge deck drains should not discharge directly into the stream.
3. Live concrete should not be allowed to contact the water in or entering into the stream.
4. If possible, bridge supports (bents) should not be placed in the stream.

5. If temporary access roads or detours are constructed, they should be removed back to original ground elevations immediately upon the completion of the project. Disturbed areas should be seeded or mulched to stabilize the soil and native tree species should be planted with a spacing of not more than 10'x10'. If possible, when using temporary structures the area should be cleared but not grubbed. Clearing the area with chain saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact, allows the area to revegetate naturally and minimizes disturbed soil.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Project specific comments:

1. B-4002, Alamance County, Bridge No. 96 over Meadow Creek on SR 2116. We recommend replacing this bridge with a bridge. Standard recommendations apply.

2. B-4063, Chatham County, Bridge No. 20 over Sandy Branch on NC 902. We recommend replacing this bridge with a bridge. Standard recommendations apply.

3. B-4109, Durham County, Bridge No. 120 over Mud Creek on SR 1303. We recommend replacing this bridge with a bridge. Standard recommendations apply.

4. B-4216, Orange County, Bridge No. 66 over Strouds Creek on SR 1002. We recommend replacing this bridge with a bridge. Due to the close proximity of the Eno River we request conducting a survey for the following state endangered and federal species of concern mussels: Yellow lampmussel and Atlantic pigtoe. Also, a significant fishery for sunfish exists at this site, therefore we request an in-water work moratorium for sunfish from April 1 to June 30. Standard recommendations apply.

5. B-4300, Wake County, Bridge No. 29 over Clarks Creek on SR 1007. We recommend replacing this bridge with a bridge. NCDOT should follow all stream crossing guidelines for anadromous fish passage, including an in-water work moratorium from February 15 to June 15. Standard recommendations apply.

6. B-4301, Wake County, Bridge No. 229 over Poplar Creek on SR 1007. We recommend replacing this bridge with a bridge. NCDOT should follow all stream crossing guidelines for anadromous fish passage, including an in-water work moratorium from February 15 to June 15. Standard recommendations apply.

7. B-4302, Wake County, Bridge No. 336 over Terrible Creek on SR 1301. We recommend replacing this bridge with a bridge. Standard recommendations apply.

8. B-4303, Wake County, Bridge No. 102 over Lower Bartons Creek on SR 1844. We recommend replacing this bridge with a bridge. Standard recommendations apply.

9. B-4304, Wake County, Bridge No. 143 over Beaver Dam Creek on SR 2217. We recommend replacing this bridge with a bridge. Standard recommendations apply.

10. B-4592, Orange County, Bridge No. 64 over the Eno River on SR 1561. We recommend replacing this bridge with a bridge. We request conducting a survey for the following state endangered and federal species of concern mussels: Yellow lampmussel and Atlantic pigtoe. Also, a significant fishery for sunfish exists at this site, therefore we request an in-water work moratorium for sunfish from April 1 to June 30. Standard recommendations apply.

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

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

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

NCDENR

North Carolina Department of Environment and Natural Resources
Division of Parks and Recreation

Michael F. Easley, Governor William G. Ross, Jr., Secretary Philip K. McKnelly, Director

MEMORANDUM

TO: William T. Goodwin, Jr., PE, Bridge Replacement Unit
Department of Transportation

FROM: Brian Strong, Environmental Review Coordinator 321
DENR, Division of Parks and Recreation

DATE: September 6, 2002

SUBJECT: Review of Department of Transportation Bridge Replacement Projects

The purpose of this memorandum is to transmit comments prepared by the Division of Parks and Recreation (Division) on a number of proposed bridge replacement projects. These projects were received from Mr. William T. Goodwin (dated April 24, 2002) and John Williams (received June 25, 2002).

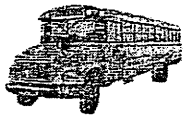
Prior to discussing individual comments on specific projects I would like to make one general comment. A number of projects are listed as replacement of bridges with culverts. The Division would like to express concern with this type of replacement. As you know, culverts are often beset by a number of persistent problems associated with their installation and maintenance. Culverts are frequently the focus of restoration projects as either culvert removal or mitigation efforts designed to remediate their destabilizing influence. Since culverts are often used in lieu of bridges as a cost savings alternative, the proper design of the culvert is often not factored into the cost of the project. Impacts of improper design and installation include the angle of insertion (too high or too low), sizing of culverts, culvert placement (too low or too high), and lack of culvert maintenance resulting in degradation of streams. In addition, culvert are often insufficiently designed to handle fish passage due to inadequate depth of water at time of passage, inappropriate water velocity, inadequate resting places above and below the stream structure, and physical obstructions to passage. Culverts have been identified as one of the greatest sources of stream morphology change in the United States. In general, the Division recommends that bridges be used in all instances where practical.

Enclosure 1 presents the bridge replacement projects were potential environmental impacts were identified. The majority of the impacts involve impacts to significant natural heritage areas, rare plant and animal species. Other impacts include proximity to state trails, state parks, and natural heritage aquatic habitats. Enclosure 2 presents the accompanying maps discussed in Enclosure 1.

Please let me know if there is any further information you need or if you have any questions regarding the enclosed material, my telephone number is (919) 715-8711.

1615 Mail Service Center, Raleigh, North Carolina 27699-1615
Phone: 919-733-4181 Fax: 919-715-3085 Internet: www.ncparks.net

Bridge Replacement Project	Potential Impact
Stokes County Replace Bridge No. 60 on NC 8-89 over the Dan River B-4281 PEF	Impacts to SNHA: National significance, rare mussels and fish
Wake County Replace Bridge No. 102 on SR 1844 over Lower Bartons Creek B-4303 Goodwin PEF	Impacts to SNHA: Local significance
Wake County Replace Bridge No. 143 on SR 2217 over Beaver Dam Creek B-4304 Goodwin PEF	Impacts to rare mussel
Warren County Replace Bridge No. 4 on US 401 over Shocco Creek B-4307 Goodwin PEF	Impacts to rare sedge



WAKE COUNTY PUBLIC SCHOOL SYSTEM

Transportation
Vernon W. Hatley, *Senior Director*

September 24, 2002

William T. Goodwin, Jr.
North Carolina Department of Transportation
Project Development and Environmental Analysis
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Dear Mr. Goodwin:

Listed below are total bus crossings per day for the bridges scheduled for construction in 2006. Please understand that all bridge closures will severely impact our ability to safely deliver children on time. Due to the location of each of these bridges, it would create unworkable situations if total closure were effected.

1. Bridge #29 on SR 1007 over Clarks Creek - 40 bus crossings B-4300
2. Bridge #102 on SR1844 over Lower Barons Creek - 38 bus crossings B-4303
3. Bridge #143 on SR 2217 over Beaver Dam Creek - 34 bus crossings B-4304
4. Bridge#229 on SR1007 over Poplar Creek - 34 bus crossings B-4301
5. Bridge #336 on SR1301 over Terrible Creek - 26 bus crossings B-4302

Please call us at (919) 856-8056 if you have questions.

Sincerely,

Vernon W. Hatley

VWH/as

1551 Rock Quarry Road • P.O. Box 28041 • Raleigh, North Carolina 27610
Telephone: (919) 856-8050 • Fax: (919) 856-7773 • E-mail: vhatley@wcpss.net

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONVERSION SERVICE

SCS-CPA-106

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

I *(To be Completed by Federal Agency)*	3. Date of Land Evaluation Request 6/22/06	4. Sheet 1 of 1
1. Names of Project B-4304, Bridge No. 143 on SR 2217 over Beaver Dam Creek	5. Federal Agency Involved NCDOT, FHWA	
2. Type of Project BRIDGE REPLACEMENT	6. County and State Wake County, NC	
PART II *(To be completed by SCS)*	1. Date Request Received by SCS. 6/27/2006	2. Person Completing Form Milton Carter ASSS

3. Does the corridor contain prime unique statewide or local important farmland? Yes X (If no the FPPA does not apply – Do not complete additional parts of this form No ____	4. Acres Irrigated ____	Average Farm Size 128
5. Major Crop(s) Corn	6. Farmable Land in Government Jurisdiction: 454,792	7. Amount of Farmland As Defined in FPPA 440,508
8. Name of Land Evaluation System Used Wake	9. Name of Local Site Assessment System N/A	10. Date Land Evaluation Returned by SCS 6/30/2006

PART III *(To be completed by Federal Agency)*	Alternative Corridor for Segment			
	Corridor A	Corridor B	Corridor C	Corridor D
A. Total Acres to be Converted Directly	0.21	0.21	2.03	1.91
B. Total Acres to be Converted Indirectly or to Receive Services	0	0	0	0
C. Total Acres in Corridor	0.21	0.21	2.03	1.91
PART IV *(To be completed by SCS)* Land Evaluation Information				
A. Total Acres Prime and Unique Farmland	0.10	0.10	0.50	1.00
B. Total Acres Statewide and Local Important Farmland	0.10	0.10	0.50	0.50
C. Percentage of Farmland in County or Local Govt. Unit to be Converted	<1%	<1%	<1%	<1%
D. Percentage of Farmland in Govt. Jurisdiction with Same or Higher Relative Value	40%	40%	82%	63%
PART V *(To be completed by SCS)* Land Evaluation Criterion Relative Value of Farmland to be Serviced or Converted (Scale of 0-100 Points)	77	77	40	63

I PART VI *(To be completed by Federal Agency)* Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))	Maximum Points				
1. Area in Nonurban Use	15	15	15	15	15
2. Perimeter in Nonurban Use	10	10	10	10	10
3. Percent of Corridor Being Farmed	20	0	0	0	0
4. Protection Provided by State and Local Government	20	0	0	0	0
5. Size of Present Farm Unit Compared to Average	10	0	0	0	0
6. Creation of Nonfarmable Farmland	25	0	0	0	0
7. Availability of Farm Support Services	5	0	0	1	1
8. On-Farm Investments	20	2	2	3	3
9. Effects of Conversion On Farm Support Services	25	0	0	0	0
10. Compatibility with Existing Agricultural Use	10	0	0	1	1
TOTAL CORRIDOR ASSESSMENT POINTS	160	27	27	30	30
PART VII *(To be completed by Federal Agency)*					
Relative Value of Farmland (From Part V)	100	77	77	40	63
Total Corridor Assessment (Form Part VI above or a local site assessment)	160	27	27	30	30
TOTAL POINTS (Total of above 2 lines)	260	104	104	70	93

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date of Selection:	4. Was a Local Site Assessment Used?
C	2.03	7-5-2005	Yes ____ No X

5. Reason for Selection:

no impact to historic property, improved alignment

Signature of Person Completing this Part: Nicole H. Bennett

Date 8-23-2006

NOTE: Complete a form for each segment with more than one Alternative Corridor