STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

December 7, 2005

U. S. Army Corps of Engineers
Regulatory Field Office
151 Patton Avenue, Room 208
Asheville, NC 28801-5006

ATTENTION: Ms. Angie Pennock
NCDOT Coordinator

SUBJECT: **Nationwide Permit 23 Applications** for the proposed replacement of Bridge No. 57 on SR 1244 (Gwaltney Road) over Canoe Creek, in Burke County. Federal Aid Project No. BRZ-1244(1), State Project No. 82852901, TIP No. B-4041, WBS Element 33407.1.1, Division 13.

Dear Madam:

Please find enclosed three copies of the Categorical Exclusion (CE) Document, as well as, the Pre-construction Notification, permit drawings, and ½ size plans for the above referenced project completed by the North Carolina Department of Transportation (NCDOT). The agency proposes to replace Bridge No. 57, slightly east of the existing alignment, with a 160-foot, triple barrel, 12.0 x 8.0-foot reinforced concrete box culvert. Construction of the proposed project will result in a total of 160 feet of permanent impacts to the existing stream channel. There are no jurisdictional wetlands within the project study area.

The selected alternative will replace Bridge No. 57 with a triple-barrel reinforced concrete box culvert on a new alignment slightly east of the existing bridge. The culvert will be constructed in stages so that traffic can be maintained on the existing bridge during construction. If a bridge had been selected to replace the existing bridge, it would have required adding an on-site detour which would have higher environmental impacts to adjacent biotic communities. The total length of roadway approach work for this alternative is approximately 747 feet. The impacted stream, Canoe Creek, contains no trout, anadramous fish, federal or state listed species, restrictions on watershed development or restrictions on types of discharge for this stream. In 1991 and 1992, a benthic monitoring station was set up on Canoe Creek approximately 3.0 miles downstream from the project area. The water quality rating was found to be "good-fair". A culvert was selected for this particular location because of the fairly low water quality,

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

TELEPHONE: 919-715-1500
FAX: 919-715-1501
WEBSITE: WWW.NCDOT.ORG

LOCATION:
PARKER-LINCOLN BUILDING
CAPITAL BLVD
RALEIGH, NC

at least double the life expectancy of a bridge, lower maintenance costs, and lower initial installation costs. To replace a bridge with a bridge would cost approximately $60,000 more for initial installation.

Impacts to Waters of the United States

Canoe Creek is located within the upper portion of the Catawba River drainage basin, and is approximately 12 feet wide within the project study area. The project study area is designated as USGS Hydrologic Unit 03050101 and sub-basin 03-08-31. The NCDOT classifies Canoe Creek as Class "C". There are no High Quality Waters (HQW), Water Supplies (WS-I or WS-II), or Outstanding Resource Waters occuring within 0.6 mile of the project study area. No special restrictions are required for in-water work other than those outlined in the NCDOT guidelines, "Best Management Practices for Protection of Surface Waters". Canoe Creek is not designated as a National Wild and Scenic River or a State Natural and Scenic River.

Permanent Impacts: Construction of the proposed project will permanently impact a total of 160 feet of existing stream channel due to culvert installation.

There are no utility impacts associated with this project.

Bridge Demolition

The existing Bridge No. 57 was constructed in 1964. The overall length of the three-span structure is 57 feet. It has a clear roadway width of 19 feet which includes two travel lanes over the bridge. The superstructure consists of a timber floor on I-beams and the substructure consists of timber caps and piles. Neither the superstructure nor the substructure will create any temporary fill in the creek, however removal may create some disturbance in the streambed. If the removal of the substructure does create disturbance in the streambed, a turbidity curtain will be used to control sediment. Because no moratoriums apply and Canoe Creek is a class "C" water, this project falls under case 3 (no special restrictions) of the Best Management Practices for Bridge Demolition and Removal.

Culvert Construction

Bridge No. 57 will be replaced with a triple-barrel 12.0 x 8.0-foot reinforced concrete box culvert. The culvert will be silled on the first and third barrels to simulate normal stream width and depth in the center barrel. The culvert will be buried one foot to allow for the passage of aquatic life.

During construction, water will be diverted to one side or another of the existing streambed while the culvert is built one barrel at a time. As a result, there will be no temporary impacts due to a diversion channel.

Federally Protected Species

Plants and animals with federal classifications of Endangered, Threatened, Proposed Endangered, and Proposed Threatened are protected under provisions of Section 7 and

Section 9 of the Endangered Species Act of 1973, as amended. As of January 29, 2003, the Fish and Wildlife Service (FWS) lists seven federally protected species for Burke County.

Federally Protected Species for Burke County

Common Name	Scientific Name	Status	Biological Conclusion
Bog turtle	*Clemmys muhlenbergii*	T(S/A)*	No Effect
Bald eagle	*Haliaeetus leucocephalus*	T	No Effect
Spreading avens	*Geum radiatum*	E	No Effect
Dwarf-flowered heartleaf	*Hexastylis naniflora*	T	No Effect
Mountain golden heather	*Hudsonia montana*	T	No Effect
Small whorled pogonia	*Isotria medeoloides*	T	No Effect
Heller's blazing star	*Liatris helleri*	T	No Effect

E-denotes Endangered, T-denotes Threatened, T(S/A)-denotes Threatened due to Similarity of Appearance.
* On November 4, 1997, the northern population of bog turtles (from Maryland to New York) was listed as threatened. The southern population was listed as threatened due to similarity of appearance (T(S/A)).

A biological conclusion of "No Effect" was reached for all species with the exception of the bog turtle which requires no biological conclusion. The project area contained no suitable habitat for any of the above listed species due to disturbance and inadequate elevation.

Avoidance, Minimization, and Mitigation

Avoidance and Minimization: Avoidance examines all appropriate and practicable possibilities of averting impacts to "Waters of the United States." The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional stages; minimization measures were incorporated as part of the project design. The use of best management practices for construction should reduce impacts to plant communities.

- The triple barrel box culvert will be silled on the first and third barrels to simulate normal stream width and depth in the center barrel
- The culvert will be buried one foot to allow for the passage of aquatic life
- A culvert prevents adding an on-site detour which would have higher environmental impacts to adjacent biotic communities
- The culvert is being built in stages to avoid using a temporary diversion channel

Mitigation: Based upon the agreements stipulated in the "Memorandum of Agreement Among the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U.S. Army Corps of Engineers, Wilmington District (MOA)", it is understood that the North Carolina Department of Environment and Natural Resources Ecological Enhancement Program (EEP), will assume responsibility for satisfying the Section 404 compensatory mitigation requirements for NCDOT projects. EEP has agreed to mitigate for 160 feet of permanent

stream impacts to Canoe Creek within warm waters of the Catawba River Basin (see attached confirmation letter dated May 31, 2005).

Regulatory Approvals

Section 404 Permit: All other aspects of this project are being processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance with 23 CFR § 771.115(b). The NCDOT requests that these activities be authorized by a Nationwide Permit 23.

Section 401 Permit: We anticipate 401 General Certification number 3403 will apply to this project. In accordance with 15A NCAC 2H .0501(a) we are providing two copies of this application to the North Carolina Department of Environmental and Natural Resources, Division of Water Quality, for their records.

Thank you for your assistance with this project. If you have any questions or need additional information, please contact Megan Willis at mswillis@dot.state.nc.us or (919) 715-1341.

Sincerely,

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

cc:

w/attachment

Mr. John Hennessy, NCDWQ (2 Copies)
Ms. Marella Buncick, USFWS
Ms. Marla Chambers, NCWRC
Dr. David Chang, P.E., Hydraulics
Mr. Greg Perfetti, P.E., Structure Design
Mr. Mark Staley, Roadside Environmental
Mr. J.J. Swain, P.E., Division Engineer
Mr. Roger Bryan, DEO

w/o attachment

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. Beth Harmon, EEP
Mr. Todd Jones, NCDOT External Audit Branch
Mr. Vince Rhea, PDEA Engineer

Office Use Only: Form Version March 05

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

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

I. Processing

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

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

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

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

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

II. Applicant Information

1. Owner/Applicant Information
   Name: Gregory J. Thorpe, Ph.D., Environmental Management Director
   Mailing Address: 1598 Mail Service Center
   Telephone Number: (919) 733-3141 Fax Number: (919) 733-9794
   E-mail Address: mswillis@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: Replacement of Bridge No. 57 over Canoe Creek on SR 1244

2. T.I.P. Project Number or State Project Number (NCDOT Only): B-4041

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

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

5. Site coordinates (For linear projects, such as a road or utility line, attach a sheet that separately lists the coordinates for each crossing of a distinct waterbody.)
   Decimal Degrees (6 digits minimum): 81,48,00 °N 35,47,00 °W

6. Property size (acres): N/A

7. Name of nearest receiving body of water: Lake James

8. River Basin: Catawba
   (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: Agricultural fields, landscaped areas, early successional roadside, and piedmont bottomland forest.

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

11. Explain the purpose of the proposed work: Replacement of a structurally deficient bridge with a triple barrel box culvert.

IV. Prior Project History

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

V. Future Project Plans

Are any future permit requests anticipated for this project? If so, describe the anticipated work, and provide justification for the exclusion of this work from the current application.
No

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

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

1. Provide a written description of the proposed impacts: 160 feet of permanent impacts to the stream channel due to the placement of a triple barrel box culvert.

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)
Total Wetland Impact (acres)					

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

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

Stream Impact Number (indicate on map)	Stream Name	Type of Impact	Perennial or Intermittent?	Average Stream Width Before Impact	Impact Length (linear feet)	Area of Impact (acres)
Site 1	Canoe Creek	Permanent	Perennial	12 feet	160	0.059
Total Stream Impact (by length and acreage)					160	0.059

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

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

Total Open Water Impact (acres)				

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

Stream Impact (acres):	0.059
Wetland Impact (acres):	0
Open Water Impact (acres):	0
Total Impact to Waters of the U.S. (acres)	0.059
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.

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

VII. Impact Justification (Avoidance and Minimization)

Specifically describe measures taken to avoid the proposed impacts. It may be useful to provide information related to site constraints such as topography, building ordinances, accessibility, and financial viability of the project. The applicant may attach drawings of alternative, lower-impact site layouts, and explain why these design options were not feasible. Also discuss how impacts were minimized once the desired site plan was developed. If applicable, discuss construction techniques to be followed during construction to reduce impacts. A sill is being constructed on two of the three barrels of the box culvert to keep up the water depth for aquatic passage.

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.
   Ecosystem Enhancement Program (EEP) will mitigate for the 160 feet of warm stream impacts using a 2:1 ration.

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): 160
   Amount of buffer mitigation requested (square feet): 0

Amount of Riparian wetland mitigation requested (acres): 0
Amount of Non-riparian wetland mitigation requested (acres): 0
Amount of Coastal wetland mitigation requested (acres): 0

IX. Environmental Documentation (required by DWQ)

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

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

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

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

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

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

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

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

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

3. If buffer mitigation is required, please discuss what type of mitigation is proposed (i.e., Donation of Property, Riparian Buffer Restoration / Enhancement, or Payment into the

Riparian Buffer Restoration Fund). Please attach all appropriate information as identified within 15A NCAC 2B .0242 or .0244, or .0260.

XI. Stormwater (required by DWQ)

Describe impervious acreage (existing and proposed) versus total acreage on the site. Discuss stormwater controls proposed in order to protect surface waters and wetlands downstream from the property. If percent impervious surface exceeds 20%, please provide calculations demonstrating total proposed impervious level.Stormwater will be discharged into a vegetated buffer. The amount of impervious surface will not increase due to the project.

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:

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).

	12/6/05
Applicant/Agent's Signature	**Date**

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

Ecosystem Enhancement PROGRAM

May 31, 2005

Ms. Angie Pennock
US Army Corps of Engineers
Asheville Regulatory Field Office
151 Patton Avenue, Room 208
Asheville, North Carolina 28801-5006

Dear Ms. Pennock:

Subject: EEP Mitigation Acceptance Letter:

B-4041, Bridge 57 over Canoe Creek on SR 1244, Burke County; Catawba River Basin (Cataloging Unit 03050101); Northern Mountains Eco-Region

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the mitigation for the 160 feet of warm stream impact associated with the above referenced project.

The subject project is not listed in Exhibit 2 of the Memorandum of Agreement among the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U. S. Army Corps of Engineers, Wilmington District dated July 22, 2003. The EEP is only committed to provide the mitigation needs for projects listed on Exhibit 2 during the first two years of the program; however Amendment 1 details how non-Exhibit 2 projects may be swapped for an appropriate project included on the Exhibit 2 list. Specifically, Amendment 1 states that:

> "Exhibit 2 may be modified if requested jointly by NCDENR and NCDOT, and approved in writing by the USACE. In no event may the total projected impacts of projects per cataloging unit on Exhibit 2 exceed the total projected impacts of projects per cataloging unit on Exhibit 2 as it existed at the time of the original execution of the MOA, July, 2003."

In this case, the NCDOT has not proposed to swap this project for an appropriate project included on the Exhibit 2 list. However, EEP currently has surplus riverine wetland and stream mitigation with sufficient assets to cover this years projected mitigation requirements plus the mitigation for the above referenced project. Therefore, the EEP intends to provide compensatory stream mitigation up to a 2:1 ratio in

Ecosystem Enhancement PROGRAM

May 31, 2005

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

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

B-4041, Bridge 57 over Canoe Creek on SR 1244, Burke County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the stream mitigation for the subject project. Based on the information supplied by you in a letter dated April 19, 2005, the impacts are located in CU 03050101 of the Catawba River Basin in the Northern Mountains (NM) Eco-Region, and are as follows:

Stream Impacts (Warm): 160 feet

The subject project is not listed in Exhibit 2 of the Memorandum of Agreement among the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U. S. Army Corps of Engineers, Wilmington District dated July 22, 2003. The EEP is only committed to provide the mitigation needs for projects listed on Exhibit 2 during the first two years of the program; however Amendment 1 details how non-Exhibit 2 projects may be swapped for an appropriate project included on the Exhibit 2 list. Specifically, Amendment 1 states that:

> "Exhibit 2 may be modified if requested jointly by NCDENR and NCDOT, and approved in writing by the USACE. In no event may the total projected impacts of projects per cataloging unit on Exhibit 2 exceed the total projected impacts of projects per cataloging unit on Exhibit 2 as it existed at the time of the original execution of the MOA, July, 2003."

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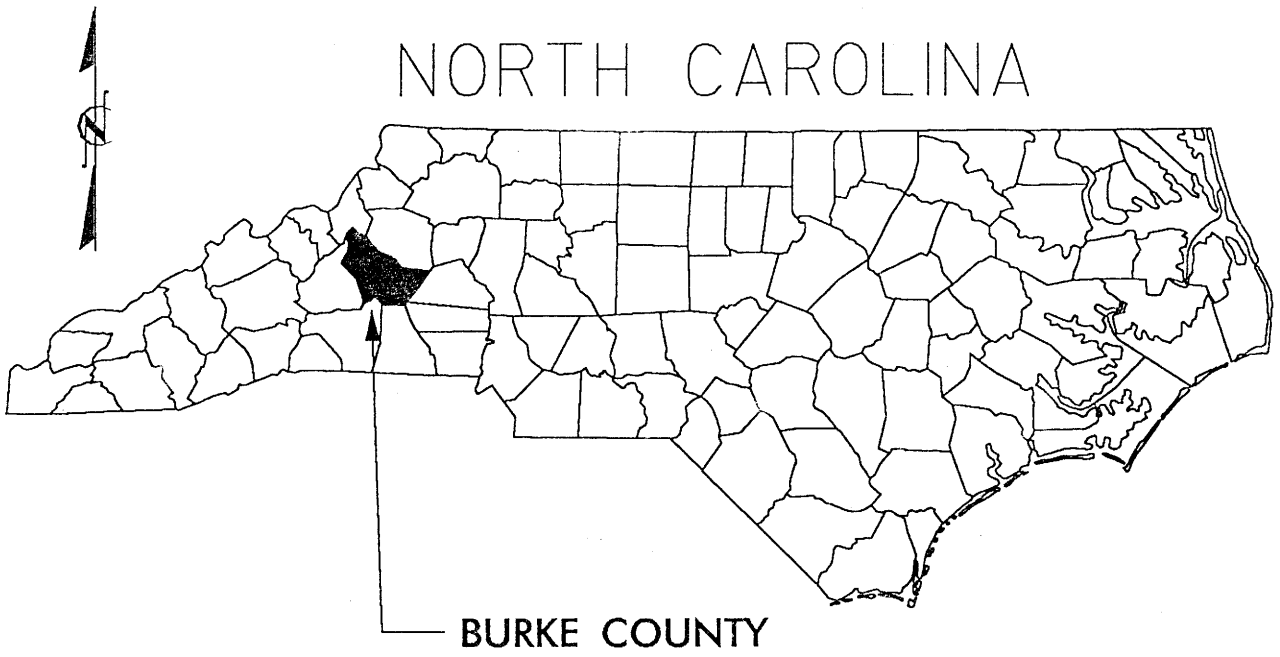
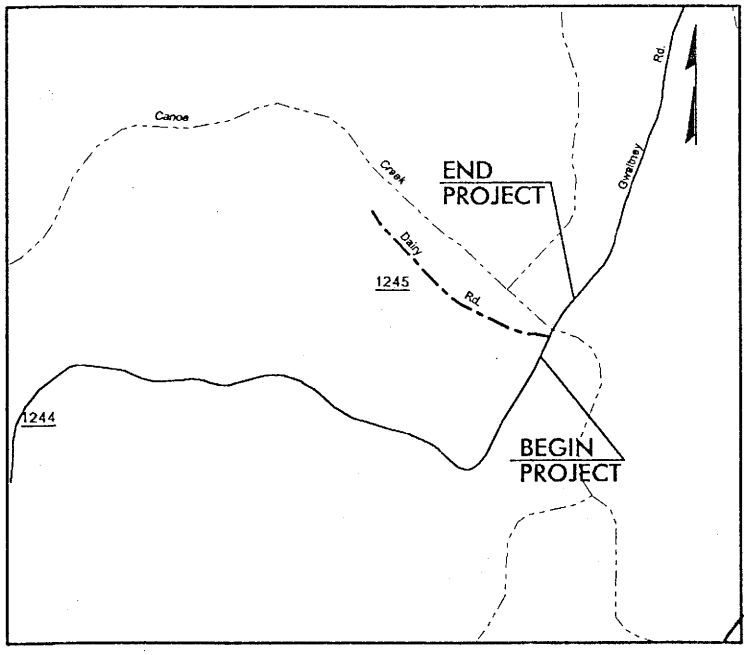




VICINITY MAPS

NCDOT

DIVISION OF HIGHWAYS
BURKE COUNTY
PROJECT: 33407.1.1 (B-4041)
BRIDGE NO. 57
ON SR 1244
OVER CANOE CREEK

SHEET 1 OF 8 3/17/05

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
PARCEL NO.	SONIA BRANDE	9201 8W 55TH STREET COOPER CITY, FL 33328
PARCEL NO.	CORA DRAUGHON	3595 GWALTNEY ROAD. MORGANTON, NC 28655
PARCEL NO.	DAVID OLLIS	3695 GWALTNEY ROAD MORGANTON, NC 28655
PARCEL NO.	JESSE PASCHALL SR.	1767 NORTH GREEN STREET MORGANTON, NC 28655

NCDOT

DIVISION OF HIGHWAYS

BURKE COUNTY

PROJECT: 33407.1.1 (B-4041)

BRIDGE NO. 57

ON SR 1244

OVER CANOE CREEK

WETLAND PERMIT IMPACT SUMMARY

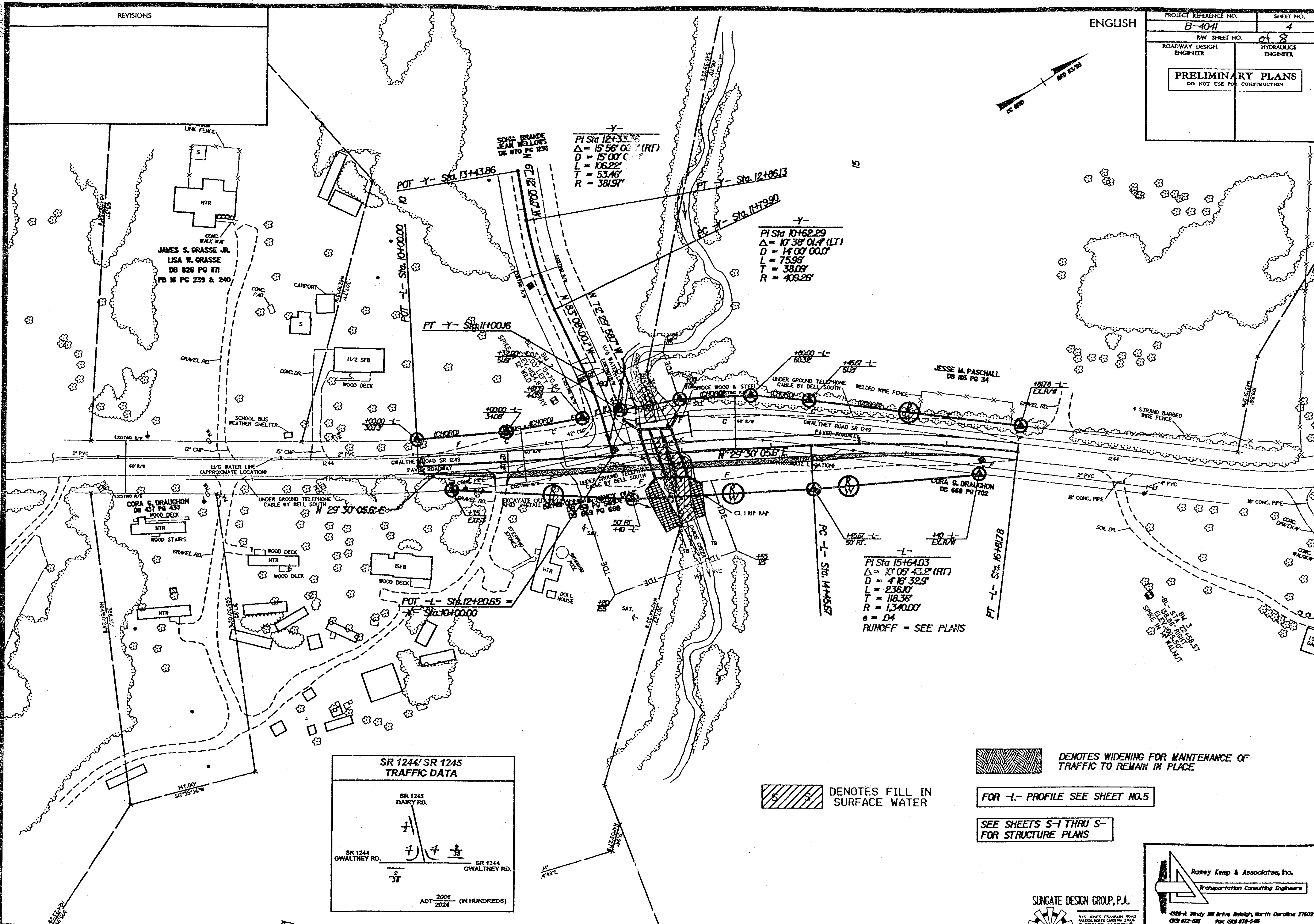
			WETLAND IMPACTS				SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation In Wetlands (ac)	Mechanized Clearing (Method III) (ac)	Fill In SW (Natural) (ac)	Fill In SW (Pond) (ac)	Temp. Fill In SW (ac)	Existing Channel Impacted (ft)	Natural Stream Design (ft)
1	20+85-LT-L-	3@12'X8' RCBC W/SILL					0.059			160	
2	23+80-LT-L-										
TOTALS:			0	0	0	0	0.059	0	0	160	0

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

BURKE COUNTY
PROJECT 33407.1.1 B-4041

3/17/2005

Form Revised 3/22/01



REVISIONS
ENGLISH
PROJECT REFERENCE NO.
SHEET NO.
B-4041
4
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
-Y-
PI Sta 12+33.36
Δ = 15°56' 00.0" (RT)
D = 15°00' 00.0"
L = 106.22'
T = 53.46'
R = 381.97'
POT -Y- Sta. 13+43.86
PT -Y- Sta. 12+86.13
PC -Y- Sta. 11+79.90
-Y-
PI Sta 10+62.29
Δ = 10°38' 01.4" (LT)
D = 14°00' 00.0"
L = 75.98'
T = 38.09'
R = 409.26'
PT -Y- Sta. 11+00.16
POT -L- Sta. 10+00.00
JAMES S. GRASSE JR.
LISA W. GRASSE
DB 826 PG 871
PB 16 PG 239 & 240
JESSE M. PASCHALL
DB 165 PG 34
CORA G. DRAUGHON
DB 437 PG 439
CORA G. DRAUGHON
DB 668 PG 702
GWALTNEY ROAD SR 1249
PAVED ROADWAY
UNDER GROUND TELEPHONE CABLE BY BELL SOUTH
U/G WATER LINE (APPROXIMATE LOCATION)
BRIDGE WOOD & STEEL
WELDED WIRE FENCE
4 STRAND BARBED WIRE FENCE
SCHOOL BUS WEATHER SHELTER
N 29°30' 05.6" E
POT -L- Sta. 12+20.65 = -Y- Sta. 10+00.00
PC -L- Sta. 14+45.67
PT -L- Sta. 16+81.78
-L-
PI Sta 15+64.03
Δ = 10°05' 43.2" (RT)
D = 4°16' 32.9"
L = 236.10'
T = 118.38'
R = 1,340.00'
e = .04
RUNOFF = SEE PLANS
CL I RIP RAP
SR 1244/ SR 1245
TRAFFIC DATA
SR 1245
DAIRY RD.
SR 1244
GWALTNEY RD.
SR 1244
GWALTNEY RD.
ADT 2006/2026 (IN HUNDREDS)
DENOTES FILL IN SURFACE WATER
DENOTES WIDENING FOR MAINTENANCE OF TRAFFIC TO REMAIN IN PLACE
FOR -L- PROFILE SEE SHEET NO.5
SEE SHEETS S-1 THRU S- FOR STRUCTURE PLANS
SUNGATE DESIGN GROUP, P.A.
Ramey Kemp & Associates, Inc.
Transportation Consulting Engineers

REVISIONS

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
B-4041	
R/W SHEET NO.	5 of 8
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y-
PI Sta 12+33.36
Δ = 15° 58' 00.0" (RT)
D = 15° 00' 00.0"
L = 106.22'
T = 53.46'
R = 381.97'

POT -Y- Sta 13+43.86

PT -Y- Sta 12+86.13

-Y- Sta 11+79.90

-Y-
PI Sta 10+62.29
Δ = 10° 38' 01.4" (LT)
D = 14° 00' 00.0"
L = 75.98'
T = 38.09'
R = 409.26'

POT -L- Sta 10+00.00

PT -Y- Sta 11+00.16

N 72° 29' 58.7" W

N 25° 30' 05.6" E

POT -L- Sta 12+20.65

-L-
PI Sta 15+64.03
Δ = 10° 05' 43.2" (RT)
D = 4° 18' 32.9"
L = 236.10'
T = 118.36'
R = 1,340.00'
e = 0.04
RUNOFF = SEE PLANS

PC -L- Sta 14+45.57

PT -L- Sta 16+81.78

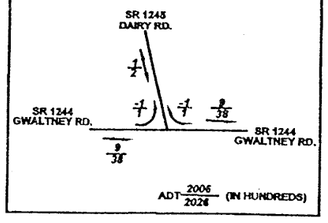
JAMES S. GRASSE JR.
LISA W. GRASSE
DB 828 PG 871
PB 18 PG 239 & 240

CORA G. DRAUGHON
DB 431 PG 438

CORA G. DRAUGHON
DB 869 PG 702

JESSE M. PASCHALL
DB 185 PG 34

SR 1244/ SR 1245
TRAFFIC DATA



ADT 2006 / 2026 (IN HUNDREDS)

DENOTES WORK ZONES FOR MAINTENANCE OF TRAFFIC TO REMAIN IN PLACE

DENOTES FILL IN SURFACE WATER

FOR -L- PROFILE SEE SHEET NO.5

SEE SHEETS S-1 THRU S- FOR STRUCTURE PLANS

SUNGATE DESIGN GROUP, P.A.

Rowey Keep & Associates, Inc.

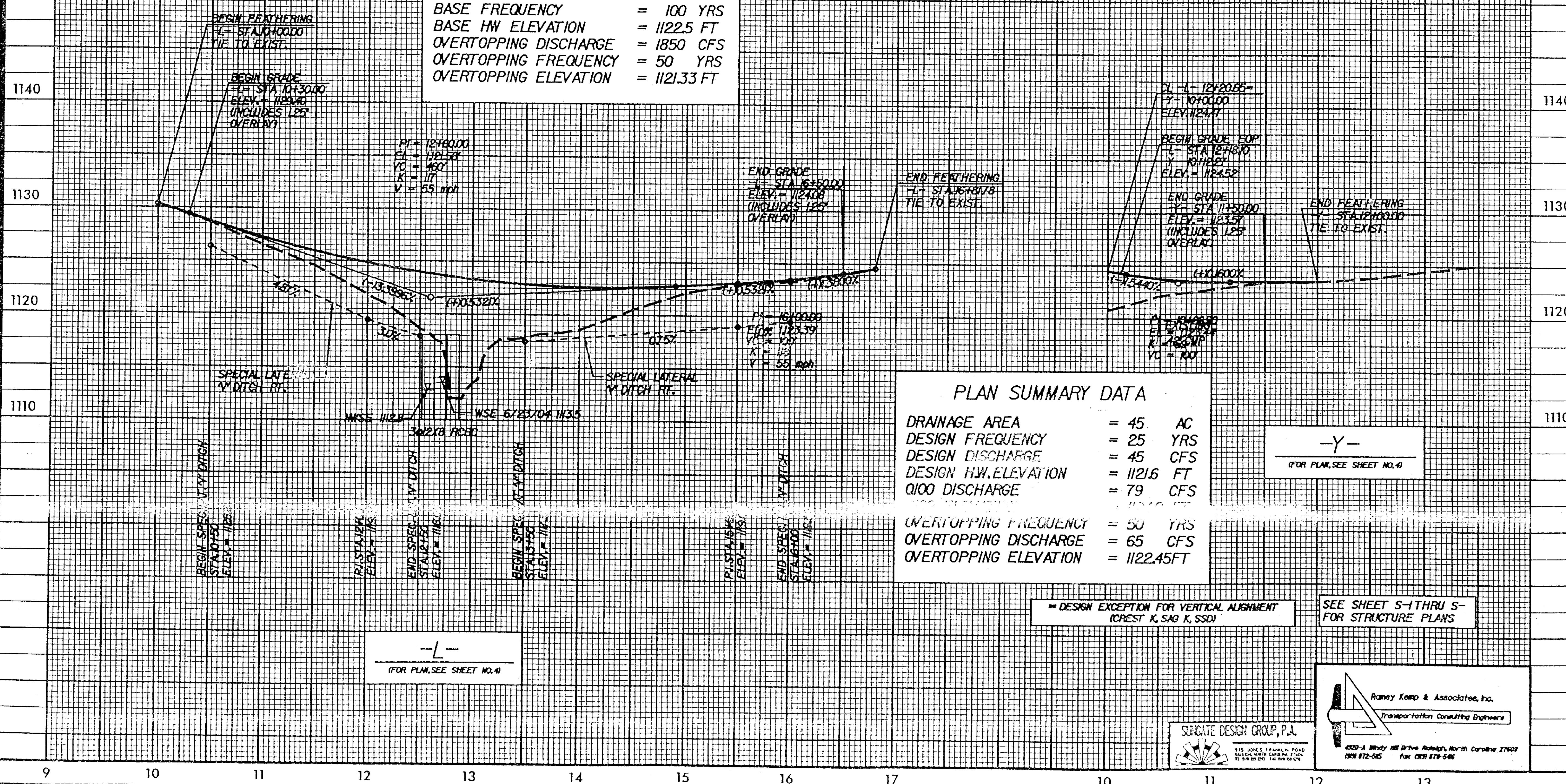
ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

B.M.#2 ELEV.= 1134.82
RR SPIKE IN BASE OF
12" WILD CHERRY
57.00' LT. OF -BL- STA. 15+71
66.46' LT. OF -L- STA. 11+56.37

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 1500 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 1121.2 FT
BASE DISCHARGE	= 2250 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 1122.5 FT
OVERTOPPING DISCHARGE	= 1850 CFS
OVERTOPPING FREQUENCY	= 50 YRS
OVERTOPPING ELEVATION	= 1121.33 FT



BEGIN FEATHERING -L- STA. 10+00.00 TIE TO EXIST.
BEGIN GRADE -L- STA. 10+30.00 ELEV.= 1129.40 (INCLUDES 1.25" OVERLAY)
PI = 12+60.00
EL = 1121.58'
VC = 460'
K = 117
V = 55 mph
(-)3.3996%
(+)0.5321%
4.87%
3.0%
0.75%
SPECIAL LATERAL "V" DITCH RT.
NWS= 1112.8
WSE 6/23/04 1113.5
3@12X8 RCBC
END GRADE -L- STA. 16+50.00 ELEV.= 1124.08 (INCLUDES 1.25" OVERLAY)
END FEATHERING -L- STA. 16+81.78 TIE TO EXIST.
(+)0.5394%
(+)1.3600%
PI = 16+00.00
VC = 100'
V = 55 mph
1140
1130
1120
1110
9
10
11
12
13
14
15
16
17
CL -L- 12+20.66= -Y- 10+00.00 ELEV. 1124.71
BEGIN GRADE, EOP -L- STA. 12+18.10 -Y- 10+12.55 ELEV.= 1124.52
END GRADE -Y- STA 11+50.00 ELEV.= 1123.57 (INCLUDES 1.25" OVERLAY)
END FEATHERING -Y- STA. 12+00.00 TIE TO EXIST.
(-)1.5440%
(+)0.1600%
VC = 100'
-L- (FOR PLAN, SEE SHEET NO. 4)
-Y- (FOR PLAN, SEE SHEET NO. 4)

PLAN SUMMARY DATA

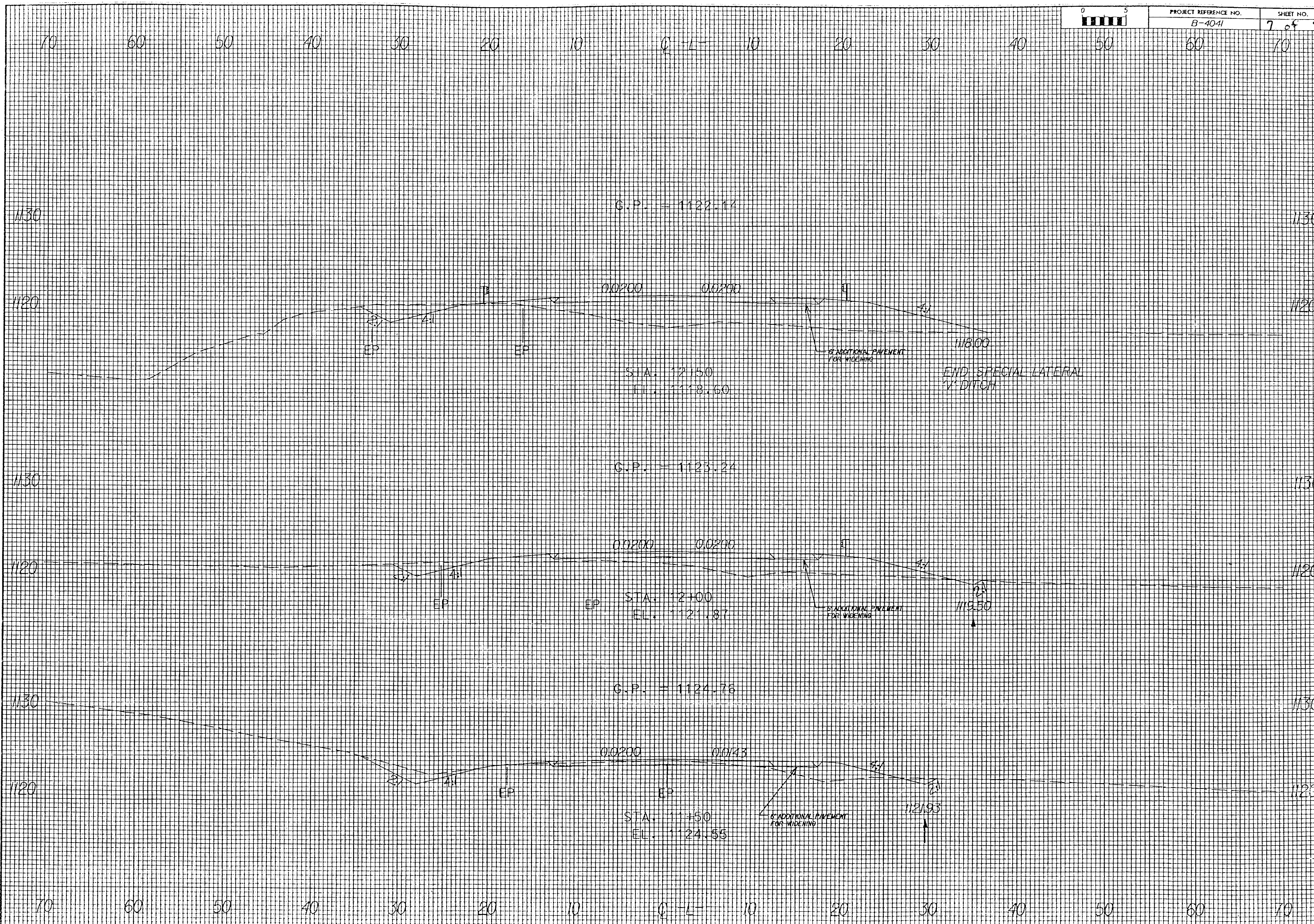
DRAINAGE AREA	= 45 AC
DESIGN FREQUENCY	= 25 YRS
DESIGN DISCHARGE	= 45 CFS
DESIGN H.W. ELEVATION	= 1121.6 FT
Q100 DISCHARGE	= 79 CFS
[illegible]	[illegible]
OVERTOPPING FREQUENCY	= 50 YRS
OVERTOPPING DISCHARGE	= 65 CFS
OVERTOPPING ELEVATION	= 1122.45 FT

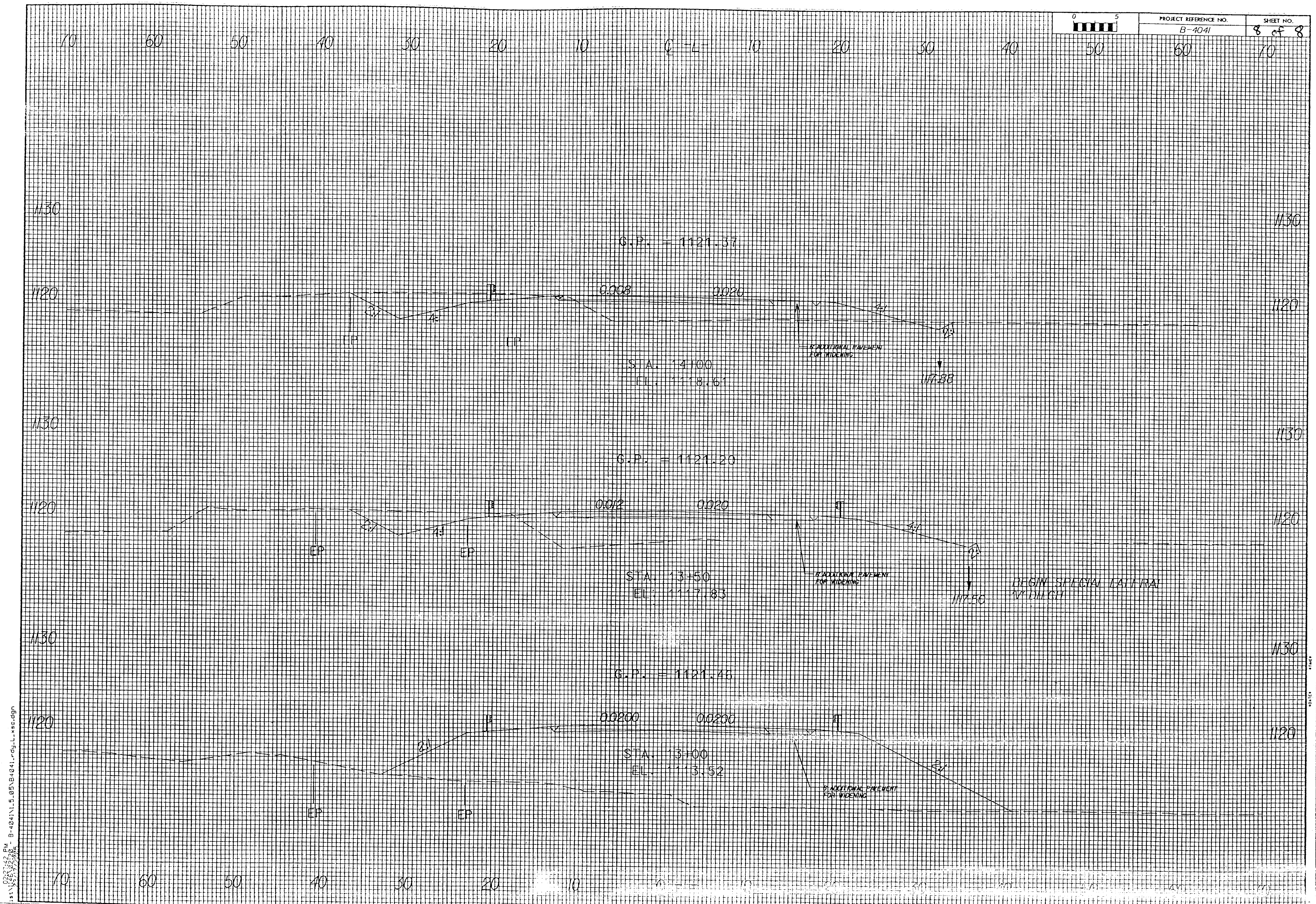
** DESIGN EXCEPTION FOR VERTICAL ALIGNMENT (CREST K, SAG K, SSD)

SEE SHEET S-1 THRU S- FOR STRUCTURE PLANS

SUNGATE DESIGN GROUP, P.A.

Ramey Kemp & Associates, Inc.
Transportation Consulting Engineers
4928-A Windy Hill Drive Raleigh, North Carolina 27609


PROJECT REFERENCE NO.
B-4041
SHEET NO.
7 of 8
G.P. = 1122.14
0.0200
0.0200
2:1
4:1
EP
EP
6" ADDITIONAL PAVEMENT FOR WIDENING
1118.00
STA. 12+50
EL. 1118.60
END SPECIAL LATERAL 'V' DITCH
G.P. = 1123.24
0.0200
0.0200
EP
EP
STA. 12+00
EL. 1121.87
6" ADDITIONAL PAVEMENT FOR WIDENING
1119.50
G.P. = 1124.76
0.0200
0.0143
EP
EP
STA. 11+50
EL. 1124.55
6" ADDITIONAL PAVEMENT FOR WIDENING
1121.93
1130
1120


G.P. = 1121.37
0.008
0.020
2:1
4:1
EP
8' ADDITIONAL PAVEMENT FOR WIDENING
STA. 14+00
EL. 1118.61
1117.88
G.P. = 1121.20
0.012
0.020
STA. 13+50
EL. 1117.83
1117.50
BEGIN SPECIAL LATERAL 'V' DITCH
G.P. = 1121.46
0.0200
STA. 13+00
EL. 1113.52
1130
1120
70
60
50
40
30
20
10

BURKE COUNTY
BRIDGE NO. 57 ON SR 1244 (GWALTNEY ROAD)
OVER CANOE CREEK

FEDERAL-AID PROJECT NO. BRZ-1244(1)
STATE PROJECT NO. 8.2852901
TIP NO. B-4041

CATEGORICAL EXCLUSION

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
AND
N.C. DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

APPROVED:

2/27/04
DATE

FOR Gregory J. Thorpe, Ph.D.
Environmental Management Director
Project Development & Environmental Analysis Branch
North Carolina Department of Transportation

2/27/04
DATE

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

BURKE COUNTY
BRIDGE NO. 57 ON SR 1244 (GWALTNEY ROAD)
OVER CANOE CREEK

FEDERAL-AID PROJECT NO. BRZ-1244(1)
STATE PROJECT NO. 8.2582901
TIP NO. B-4041

CATEGORICAL EXCLUSION

Document Prepared by
Ramey Kemp & Associates, Inc.
4928-A Windy Hill Drive
Raleigh, North Carolina 27609

Philip D. Edwards, P.E.
Ramey Kemp & Associates, Inc.

2/23/04
Date

For the North Carolina Department of Transportation

Vincent J. Rhea, P.E., Project Development Engineer
Project Development and Environmental Analysis Branch

PROJECT COMMITMENTS

BURKE COUNTY
BRIDGE NO. 57 ON SR 1244 (GWALTNEY ROAD)
OVER CANOE CREEK

FEDERAL-AID PROJECT NO. BRZ-1244(1)
STATE PROJECT NO. 8.2852901
TIP NO. B-4041

No other special commitments have been agreed to by NCDOT except for the standard Nationwide Permit #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, NCDOT's Guidelines for Best Management Practices for Bridge Demolition and Removal, General Certification Conditions, and Section 401 Conditions of Certification.

BURKE COUNTY
BRIDGE NO. 57 ON SR 1244 (GWALTNEY ROAD)
OVER CANOE CREEK

FEDERAL-AID PROJECT NO. BRZ-1244(1)
STATE PROJECT NO. 8.2852901
T.I.P. NO. B-4041

INTRODUCTION

The replacement of Bridge No. 57 located on SR 1244 (Gwaltney Road) over Canoe Creek is included in the North Carolina Department of Transportation (NCDOT) 2004-2010 Transportation Improvement Program (TIP) and in the Federal-Aid Bridge Replacement Program BRZ-1244(1). The location is shown in Figure 1.

No substantial impacts are anticipated. The project is classified as a Federal "Categorical Exclusion".

I. PURPOSE AND NEED

The NCDOT Bridge Maintenance Unit records indicate Bridge No. 57 has a sufficiency rating of 48.4 out of a possible 100 for a new structure. The bridge is considered structurally deficient and functionally obsolete. The replacement of this inadequate structure will result in safer and more efficient traffic operations.

II. EXISTING CONDITIONS

Bridge No. 57 is located on SR 1244 (Gwaltney Road) in rural Burke County. Refer to Figure 1 for the project location and Figures 2 and 3 for photos of the existing project study area.

Bridge No. 57 was constructed in 1964. The bridge is currently posted to restrict weight limits to 19 tons for single vehicles (SV) and 28 tons for truck-tractor semi-trailers (TTST).

The overall length of the three-span structure is 57 ft. It has a clear roadway width of 19.1 ft that includes two travel lanes over the bridge. The superstructure consists of a timber floor on I-beams. The substructure consists of timber caps and piles. The height from crown to streambed is 9 ft.

SR 1244 is classified as a rural local in the Statewide Functional Classification System. The 2002 average daily traffic volume (ADT) is estimated to be 300 vehicles per day (vpd). The percentages of truck traffic are 1 percent TTST vehicles and 2 percent dual-tired vehicles. The projected 2025 ADT is 3,600 vpd.

The two-lane facility measures approximately 18 ft in width and has variable 4-8 ft grassed shoulders on each side of the roadway in the vicinity of the bridge. The horizontal alignment of SR 1244 is poor adjacent to the bridge. There are curves on each end of the bridge and a street adjacent to the southern end of the bridge. The vertical alignment is good within the project study area. There is no posted speed limit in the immediate vicinity of the bridge. Therefore, the statutory speed limit is 55 miles per hour (mph). Existing right-of-way is approximately 60 ft in width.

There are overhead power lines on the east side of the bridge which cross SR 1244 on the north and south sides of the bridge. An underground phone line is also located approximately 20' downstream. Utility impacts are expected to be low.

This section of SR 1244 is not part of a designated bicycle route nor is it listed in the Transportation Improvement Program as needing incidental bicycle accommodations. There is no indication that an unusual number of bicyclists use this roadway.

Land use within the project study area is a mixture of cultivated land, rural residential properties, and forest land.

According to Burke County school officials, three buses cross this bridge for a total of six bus trips per day.

Crash records maintained by the NCDOT indicate there have been no crashes reported in the vicinity of Bridge No. 57 during a recent three year period.

III. ALTERNATIVES

A. Project Description

Based upon the preliminary hydraulic report, the proposed replacement structure for Bridge No. 57 will consist of a triple (3) 12 ft x 8 ft reinforced concrete box culvert (RCBC).

The length and opening size of the proposed structure may increase or decrease as necessary to accommodate peak flows, as determined by a more detailed hydraulic analysis to be performed during the final design phase of the project.

The roadway approaches will provide two 12 ft travel lanes with 8 ft grassed shoulders. The grade will be approximately the same as the existing roadway. The design speed varies for each alternative.

B. Build Alternatives

Two (2) build alternatives studied for replacing the existing bridge are described below:

Alternative A

Alternative A consists of replacing the bridge in-place with a RCBC. During construction, traffic will be maintained by an on-site detour east of SR 1244. The total length of roadway approach work for this alternative is approximately 460 ft. Refer to Figure 4 for illustration of alternative.

The on-site detour will be located approximately 10 ft east of the proposed RCBC. The temporary structure will consist of three 72 inch CMP's. The detour roadway approaches will provide two 10 ft travel lanes and 8 ft wide shoulders on each side. The length of the temporary detour will be approximately 747 ft.

Alternative A was not selected as the preferred because of the higher construction costs and environmental impacts associated with the temporary detour.

Alternative B (Preferred)
Alternative B consists of replacing the bridge with a RCBC on new alignment east of SR 1244. During construction, the existing bridge will be used to maintain traffic. The total length of roadway approach work for this alternative is approximately 747 ft. Refer to Figure 5 for illustration of this alternative.

C. Alternatives Eliminated From Further Consideration

The "Do-Nothing" alternative will eventually necessitate closure of the bridge due to its poor condition. This is not desirable due to the traffic service provided by SR 1244.

Investigation of the existing structure by the NCDOT Bridge Maintenance Unit indicates that rehabilitation of the old bridge is not feasible due to its age and deteriorated condition.

An off-site detour was considered for this project but is not feasible due to the detour length.

D. Preferred Alternative (Alternative B)

Alternative B consists of replacing the bridge with a RCBC on new alignment east of SR 1244. During construction, the existing bridge will be used to maintain traffic. Alternative B was selected as the preferred because it has the lowest construction costs and least environmental impacts.

The Division Engineer concurs with Alternative B as the Preferred Alternative.

E. Anticipated Design Exception

The speed limit is not posted on SR 1244; therefore, a statutory speed limit of 55 mph applies. Due to the existing road conditions, Alternative A will require a design exception for both the horizontal and vertical alignment.

IV. ESTIMATED COSTS

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

Table 1
Estimated Project Costs

	Alternative A	Alternative B (Preferred)
Structure Removal (Existing)	$11,200	$11,200
Structure Proposed	$168,000	$168,000
Detour Structure and Approaches	$147,694	$0
Roadway Approaches	$74,707	$141,554
Miscellaneous and Mobilization	$119,537	$90,652
Engineering and Contingencies	$103,862	$63,594
Right-of-Way/Easement and Utilities	$53,500	$58,000
Total Project Cost	**$678,500**	**$533,000**

The estimated cost of the project, as shown in the 2004-2010 NCDOT Transportation Improvement Program is $650,000 including $100,000 spent in prior years, $50,000 for right-of-way and $500,000 for construction.

V. NATURAL RESOURCES

Natural resources within the project study area were evaluated to provide: 1) an assessment of existing vegetation, wildlife, protected species, streams, wetlands, and water quality; 2) an evaluation of probable impacts resulting from construction; and 3) a preliminary determination of permit needs.

A. Methodology

Research was conducted prior to the field investigations. Published resource information pertaining to the project study area was collected and reviewed. Resources utilized in this preliminary investigation of the project study area include:

- U.S. Geological Survey (USGS) Oak Hill 7.5–minute topographic quadrangle map.
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) map for Oak Hill 7.5–minute quadrangle (1995).
- North Carolina Department of Transportation (NCDOT) aerial photographs of the project study area (1:1,200 scale).
- U.S. Department of Agriculture, Natural Resources Conservation Service provisional soil survey of Burke County, North Carolina (unpublished).
- U.S. Environmental Protection Agency Water Discharges and RCRA Map accessed via EPA's EnviroMapper Program (September 2001).

Water research information was obtained from publications of the North Carolina Department of Environment, and Natural Resources (NCDENR, 1999; 2000, 2001). Information concerning the occurrence of federal and state protected species in the project study area was obtained from the U.S. Fish and Wildlife Service list of protected and candidate species (March 3, 2001) and from the North Carolina Natural Heritage Program (NCNHP) database of rare species and unique habitats (NCNHP, January 2001). NCNHP files were reviewed for documented occurrences of state and federal listed species. USFWS Recovery Plans for federal listed species were reviewed, where applicable.

A field investigation of natural resources was conducted within the project study area on July 13, 2001. Water resources were identified and categorized, and their physical characteristics were documented while in the field. Plant communities and their associated wildlife were also identified and documented. The *Classification of Natural Communities of North Carolina, Third Approximation* (Schafale and Weakley, 1990) was used to classify plant communities, where possible. Plant taxonomy was based primarily upon the *Manual of the Vascular Flora of the Carolinas* (Radford, et al., 1968). Animal taxonomy was based primarily upon *Amphibians and Reptiles of the Carolinas and Virginia* (Martof, et al., 1980), *The Freshwater Fishes of North Carolinas, Virginia, Maryland, and Delaware* (Rohde, et al., 1994), *Birds of the Carolinas* (Potter, et al., 1980), and *Mammals of the Carolinas, Virginia, and Maryland* (Webster, et al., 1985).

Approximate boundaries of major vegetation communities were mapped while in the field utilizing aerial photography of the project study area. Wildlife identification involved active searching of known or suspected species, incidental visual observations, incidental auditory indicators (such as birdsong and other sounds), and secondary indicators of species presence or site utilization (such as scat, tracks, and burrows). Predictions regarding wildlife community composition were supplemented utilizing a general qualitative habitat assessment based on existing vegetation communities and aquatic habitat.

Wetlands subject to regulation by the Corps of Engineers under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899 were identified and delineated according to methods prescribed in the 1987 *Corps of Engineers Wetlands Delineation Manual (Technical Report Y-87-1)* and the Corps' March 6, 1992 guidance document titled *Clarification and Interpretation of the 1987 Manual.* Values of wetlands delineated were assessed utilizing the *Guidance for Rating the Values of Wetlands in North Carolina* (NCDEHNR, 1995). Wetland types were classified based on the U.S. Fish and Wildlife Service *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin, et al., 1979). Wetland boundaries were surveyed and recorded in the field using Global Positioning Satellite (GPS) survey methods.

B. Physiography and Soils

Burke County lies in the Blue Ridge (Southern Appalachian Mountains) Physiographic Province of western North Carolina. The county encompasses 511 square miles and is primarily rural. The county ranges in elevation from approximately 935 ft mean sea level (msl) where the Catawba River flows into Catawba County to 4,350 ft msl. Elevations within the project study area range from approximately 1,116 to 1,160 ft msl, with the stream bed near the bridge lying at approximately 1,116 ft msl.

The portion of Burke County within which the project study area lies (NRCS map panel C-6) has been mapped by NRCS under the currently provisional (unpublished) soil survey. Official soil series descriptions were also obtained by the NRCS (USDA: http://www.statlab.iastate.edu/soils/osd). A brief description of unofficial soil types observed during field investigation is as follows:

- Fluvaquents-Udifluvents complex along the stream bed.

- Unison fine sandy loam, 2 to 8 percent slopes (UnB). This unit is a very deep and well-drained soil found on mountain footslopes and stream terraces. Unison fine sandy loam has a moderate permeability and medium to rapid surface runoff. Unison fine sandy loam is classified as a hydric soil of Burke County (USDA, 1999).

- Colvard sandy loam, 0-3 percent slopes (CvA). This is a very deep, well-drained, and occasionally flooded soil formed in flood plains in southern Appalachian Mountains. Colvard sandy loam has a slow surface runoff and moderately rapid permeability. This soil unit is not listed as a hydric soil of Burke County; however, it is listed as a soil unit that typically contains inclusions of Hatboro hydric soils (USDA, 1999).

- Fairview sandy clay loam, 8 to 15 and 15 to 25 percent slopes (FaC2, FaD2). This is a very deep, well-drained, and eroded soil found on ridges and back slopes at 300 to 1,400 ft. Fairview sandy clay loam has a medium to very rapid surface runoff and moderate permeability. Fairview sandy clay loam is not listed as a hydric soil of Burke County (USDA, 1999).

- Rhodhiss sandy loam, 15 to 25 percent slopes (RhD). This is a very deep and well-drained soil found on hills or ridges. Rhodhiss sandy loam has a low to high surface runoff and moderate permeability. Rhodhiss sandy loam is not listed as a hydric soil of Burke County (USDA, 1999).

- Ashe-Chestnut-Buladean complex, 30 to 50 percent slopes (AbE). This is a moderately deep to deep, moderately permeable, and well-drained soil complex found on very steep ridges and side slopes of the Blue Ridge Mountains. This complex has slow runoff on gentle slopes, medium to strong runoff on moderately steep slopes, and high runoff on steeper slopes. None of the soils comprising this complex are listed as a hydric soil of Burke County (USDA, 1999).

C. Water Resources

C.1. Waters Impacted

A perennial stream, Canoe Creek, comprises the single water resource within the project study area. Canoe Creek is located within the upper portion of the Catawba River drainage basin. The Catawba River basin is the eighth largest river basin in North Carolina, encompassing 3,279 square miles. Canoe Creek is approximately 12 ft wide within the project study area, with observed depths ranging from 0.25 to 1.5 ft at the time of field investigation. Water levels appeared to be at or near the ordinarily high water level at the time of investigation.

The substrate of Canoe Creek in the project study area is comprised of sediments ranging in size from fine sand to coarse gravel, except under the existing bridge where sediments range in size from fine sand to cobbles. Looking upstream, the stream within the project study area makes two gentle to moderate bends to the left. The stream channel exhibits a relatively simple trapezoidal cross-section. The stream within the project study area is primarily run, with one distinct riffle/run complex existing at the northernmost limits of the project study area. No sand bars or major channel meanders were observed.

The left and right stream banks (both upstream and downstream of the bridge), although steep, are well vegetated and exhibit indicators of low erosion. Vertical bridge abutments confine the stream below the existing bridge. Localized bank erosion was observed in the vicinity if the bridge abutments at the time of field

investigation. The stream banks are comprised of unconsolidated poorly sorted sediments of primarily alluvial origin and, to a lesser degree, colluvial origin.

Under the federal system for cataloging drainage basins, the drainage basin containing the project study area is designated as USGS Hydrologic Unit 03050101 (the Upper Catawba drainage basin). Under the North Carolina DWQ system for cataloging drainage basins, the drainage basin containing the project study area is designated as Subbasin 03-08-31 (the Warrior Fork, Johns River, and Rhodhiss Lake Subbasin). Canoe Creek has been assigned Stream Index Number (SIN) 11-33-(1).

Canoe Creek has been assigned a best usage classification of **C**. The **C** designation indicates waters that are protected for secondary recreation, fishing, wildlife, fish and aquatic life propagation and survival, agriculture, and other uses found suitable for Class **C** waters. Secondary recreation includes wading, boating, and other uses involving human body contact with water where such activities take place in an infrequent, unorganized, or incidental manner. There are no restrictions on watershed development or types of discharges in Class **C** waters.

No surface waters classified as High Quality Water (**HQW**), Water Supplies (**WS-I**, or **WS-II**), or Outstanding Resource Waters (**ORW**) occur within 0.6 mile of the project study area.

One method used by DWQ to monitor water quality is through long-term monitoring of macroinvertebrates. No previously monitored or presently monitored benthic monitoring stations exist on Canoe Creek within the project study area or upstream of the project within the project study area. Catawba River Basin benthic monitoring station "B-2" is, however, located where SR 1250 crosses Canoe Creek approximately 3.0 miles downstream of the project study area. Sampled in 1992 and 1991, water quality ratings for Canoe Creek based on bioclassification of station B-2 was found to be "good-fair" on both occasions (NCDENR, 1999).

Discharges that enter surface waters through a pipe, ditch or other well-defined point of discharge are broadly referred to as "point sources". No registered point source discharges are located within 1.0 mile of the project study area.

C.2. Anticipated Impacts to Water Resources

Impacts to water resources in the project study area are likely to result from activities associated with project construction. Activities likely to result in impacts consist of clearing and grubbing along stream banks, removal of riparian canopy, instream construction, use of fertilizers and pesticides as part of revegetation operations, and installation of pavement. The following impacts to surface water resources are likely to result from the aforementioned construction activities:

- Short-term increases in sedimentation and siltation downstream of the crossing associated with increased erosion potential in the project study area during and immediately following construction.
- Short-term changes in incident light levels and turbidity due to increased sedimentation rates and vegetation removal.
- Short-term alteration of water levels and flows due to interruptions and/or additions of surface water and groundwater during construction.
- Short-term increases in nutrient loading during construction via runoff from temporarily exposed land surfaces.

- A short-term increase in the potential for the release of toxic compounds (such as petroleum products) from construction equipment and other vehicles.
- Changes in and possible destabilization of water temperature regimes due to removal of vegetation within or overhanging the watercourse.
- Increased concentrations of pollutants typically associated within roadway runoff.

To minimize potential impacts to water resources in and downstream of the project study area, NCDOT's *Best Management Practices for the Protection of Surface Waters* (NCDOT, 1997) will be strictly enforced during the construction phase of the project. Impacts will be minimized to the fullest degree practicable by limiting instream activities and by revegetating stream banks immediately following the completion of grading.

C.3. Impacts Related to Bridge Demolition and Removal

In order to protect the water quality and aquatic life in the area affected by this project, the NCDOT and all potential contractors will follow appropriate guidelines for bridge demolition and removal. These guidelines are presented in three NCDOT documents entitled: *Pre-Construction Guidelines for Bridge Demolition and Removal, Policy: Bridge Demolition and Removal in Waters of the United States,* and *Best Management Practices for Bridge Demolition and Removal.*

The superstructure for Bridge No. 57 consists of a timber floor on I-beams. The substructure is consists of timber caps and piles. Neither the superstructure nor the substructure will create any temporary fill in the creek. However, the removal of the substructure may create some disturbance in the streambed. If the removal of the substructure will create disturbance in the streambed, a turbidity curtain should be used due to sediment concerns.

Because no moratoriums apply and Canoe Creek is a Class C water, this project falls under Case 3 (no special restrictions) of the *Best Management Practices for Bridge Demolition and Removal.*

D. Biotic Resources

Living systems described in the following sections include communities of associated plants and animals observed within the project study area. These descriptions refer to the flora and fauna in each community and the relationship of these biotic components. Biotic resources assessed as part of this investigation include discernable terrestrial and aquatic communities. The composition and distribution of biotic communities within the project study area are a function of topography, soils, hydrology, and past and present land uses.

Terrestrial systems are discussed primarily from the perspective of dominant plant communities and are classified in accordance with the *Classification of Natural Communities of North Carolina: Third Approximation* (Schafale and Weakley, 1990) where applicable. Representative animal species likely to inhabit or utilize biotic communities of the project study area (based on published range distributions) are also discussed. Species observed during field investigation are listed.

D.1. Plant Communities

Boundaries between contiguous biotic communities are gradational in certain portions of the project study area, making boundaries sometimes difficult to delineate. Six discernable terrestrial communities are located within the project study area. Five of these communities have been altered to the extent that they cannot be classified as a natural vegetation community under the *Classification of Natural Communities of North Carolina.* These altered

communities consist of: (1) altered right-of-way communities, (2) landscaped areas, (3) cropland, (4) open field, and (5) successional sapling and scrub/shrub communities. The remaining community with in the project study area retains enough of its natural characteristics as to be classifiable under the *Classification of Natural Communities of North Carolina* as a Piedmont/Mountain Bottomland Forest. In addition to the aforementioned terrestrial components, the aquatic community associated with Canoe Creek was assessed within the project study area.

Altered Right-of-Way Communities – These communities are located along the right-of-way bordering on SR 1244 and several farm roads. Vegetation within these areas has been maintained in an early succession through mechanical and possibly chemical vegetation management practices.

No woody plant species were observed at the time of site investigation within altered rights-of-way communities of the project study area. Dominant herbaceous species observed at the time of site investigation include butterfly weed (*Asclepias tuberosa*), bitter nightshade (*Solanum dulcamara*), common plantain (*Plantago major*), Curtis' goldenrod (*Solidago curtisii*), dandelion (*Taraxacum officinale*), common ragweed (*Ambrosia artemisiifolia*), white clover (*Trifolium repens*), and unidentified grasses (Poaceae).

Landscaped Areas – This community consist of cleared, landscaped, and vegetatively managed areas around residential dwellings located in the southeast and southwest quadrants of the project study area.

Dominant plant species observed at the time of site investigation include scrub pine (*Pinus virginiana*), black locust (*Robinia pseudo-acacia*), southern magnolia (*Magnolia grandiflora*), eastern red cedar (*Juniperus virginiana*), assorted cultivars, crabgrass (*Digitaria sanguinalis*), unidentified grasses (Poaceae), common chickweed (*Stellaria media*), dandelion (*Taraxacum officinale*), common plantain (*Plantago major*), and common ragweed (*Ambrosia artemisiifolia*).

Croplands -- These communities consist of a recently harvested hay field in the northeast quadrant and a cornfield in the southwest quadrant of the project study area. These communities occur on gently to moderately sloping land surfaces adjacent to a very narrow floodplain terrace, which separates the croplands from Canoe Creek.

The hay field appears to have been planted with tall fescue (*Festuca* sp.) and possibly red clover (*Trifolium pratense*). Other pioneer or opportunistic species observed in and around the edges of the croplands at the time of field investigation include blackberry (*Rubus* sp.), Queen Anne's lace (*Daucus carota*), common plantain (*Plantago major*), common milkweed (*Asclepias syriaca*), common ragweed (*Ambrosia artemisiifolia*), bitter nightshade (*Solanum dulcamara*), white clover (*Trifolium repens*), curly dock (*Rumex crispus*), foxtail grass (*Setaria* sp.), unidentified grasses (Poaceae), and poison ivy (*Toxicodendron radicans*).

Open Field Community -- This community occur outside the state right-of-way on moderately to gently sloping land surfaces underlain by moderately well-drained soils in the northwest quadrant of the project study area. No mature trees occur within this community. The successional nature of the vegetation community suggests that the open field was once pastureland that has lain fallow for several or more growing seasons.

Woody vegetation observed within the open field at the time of field investigation includes eastern red cedar (*Juniperus virginiana*) and blackberries (*Rubus* sp.). Herbaceous plant species observed include unidentified

grasses (Poaceae), curly dock (*Rumex crispus*), common milkweed (*Asclepias syriaca*), Queen Anne's lace (*Daucus carota*), Joe-pye-weed (*Eupatorium fistulosum*), bitter nightshade (*Solanum dulcamara*), red clover (*Trifolium pratense*), New York ironweed (*Vernonia noveboracensis*), Curtis' goldenrod (*Solidago curtisii*), pokeweed (*Phytolacca americana*), common chickweed (*Stellaria media*), and bush clover (*Lespedeza* sp.).

Successional sapling and Scrub/Shrub Communities -- These communities occur in the northwest and southwest quadrants of the project study area, outside the state right-of-way and the floodplain of Canoe Creek. The community in the northwest quadrant appears to be a succession stage of fallow pasturelands, while the community in the southwest quadrant appears to be a highly altered remnant of a once-larger natural forested community. These communities are underlain by moderately well-drained silty sands exhibiting relatively high chromas.

The successional sapling and scrub/shrub communities, as mapped, support only several mature trees. Tree species occurring within this community include black walnut (*Juglans nigra*), Indian cigar tree (*Catalpa* sp.), sweetgum (*Liquidambar styraciflua*), eastern red cedar (*Juniperus virginiana*), black locust (*Robinia pseudo-acacia*), southern magnolia (*Magnolia grandiflora*), silver maple (*Acer saccharinum*), scrub pine saplings (*Pinus virginiana*), tulip tree saplings (*Liriodendron tulipifera*), and red maple saplings (*Acer rubrum*). Shrub species occurring within this community include winged sumac (*Rhus copallina*) and blackberry (*Rubus* sp.). Dominant herbaceous species observed at the time of site investigation include butterfly weed (*Asclepias tuberosa*), common ragweed (*Ambrosia artemisiifolia*), Curtis' goldenrod (*Solidago curtisii*), agrimonia (*Agrimonia parviflora*), pokeweed (*Phytolacca americana*), asters (*Aster* sp.), bitter nightshade (*Solanum dulcamara*), and unidentified grasses (Poaceae). Dominant vine species observed at the time of site investigation include poison ivy (*Toxicodendron radicans*) and Japanese honeysuckle (*Lonicera japonica*).

Piedmont/Mountain Bottomland Forest -- This community occurs along the banks and floodplain of Canoe Creek in all four quadrants of the project study area. It is estimated that 0.5 acre of this community exists within the project study area. The Piedmont/Mountain Bottomland Forest occurs upon a gently sloping floodplain terrace perched approximately 3.5 to 5.5 ft above the stream bed. The terrace is largely underlain by moderately drained silty soils exhibiting relatively high chromas; however, where poorly drained conditions or semi-permanent flooding prevail, hydric soil inclusions are observed.

Dominant tree species observed within the Piedmont/Mountain Bottomland Forest at the time of site investigation include river birch (*Betula nigra*), tulip tree (*Liriodendron tulipifera*), black willow (*Salix nigra*), black walnut (*Juglans nigra*), and hornbeam (*Ostrya virginiana*). Dominant sapling and shrub species observed at the time of site investigation include multiflora rose (*Rosa multiflora*), flowering dogwood (*Cornus florida*), fire cherry (*Prunus pennsylvanica*), winged sumac (*Rhus copallina*), privet (*Ligustrum* sp.), and blackberry (*Rubus* sp.). Dominant herbaceous species observed at the time of site investigation include joint head (*Arthraxon hispidus*), Curtis' goldenrod (*Solidago curtisii*), Joe-pye-weed (*Eupatorium fistulosum*), goldenrod (*Solidago* sp.), bracken (*Pteridium aquilinum*), and agrimonia (*Agrimonia parviflora*). Dominant vine species observed at the time of site investigation include kudzu (*Pueraria lobata*), Japanese honeysuckle (*Lonicera japonica*), grape (*Vitis* sp.), poison ivy (*Toxicodendron radicans*), common greenbrier (*Smilax rotundifolia*), and Virginia creeper (*Parthenocissus quinquefolia*).

D.2. Wildlife

Most of the communities within the project study area have been altered or affected by man's activities to varying degrees. Due to forest tract fragmentation common to the project region, species that require large contiguous tracts of forests are not likely to utilize the site on a normal basis. Certain opportunistic wildlife species, such as the eastern cottontail rabbit (*Sylvilagus floridanus*), can be expected to utilize edge habitat present within the project study area. Due to the relatively small size of the project study area and the fact that many wildlife species are capable of moving between and/or utilizing adjoining communities, no distinct terrestrial wildlife habitat can be assigned to any one terrestrial plant community within the project study area.

A woodchuck (*Marmota monax*) was the only mammal observed in the project study area at the time of field investigation; however, tracks of raccoon (*Procyon lotor*) and white-tailed deer (*Odocoileus virginianus*) were observed. Other mammals common to the project region which can be expected to periodically utilize habitat of the project study area include: Virginia opossum (*Didelphis virginiana*), shrews and moles (*Insectivora*), gray squirrel (*Sciurus carolinensis*), beaver (*Castor canadensis*), eastern harvest mouse (*Reithrodontomys humulis*), white-footed mouse (*Peromyscus leucopus*), golden mouse (*Ochrotomys nuttalli*), hispid cotton rat (*Sigmodon hispidus*), eastern woodrat (*Neotoma floridana*), meadow vole (*Microtus pennsylvanicus*), woodland vole (*Microtus pinetorum*), muskrat (*Ondatra zibethicus*), black rat (*Rattus rattus*), Norway rat (*Rattus norvegicus*), house mouse (*Mus musculus*), meadow jumping mouse (*Zapus hudsonius*), woodland jumping mouse (*Napaeozapus insignis*), red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), black bear (*Ursus americanus*), long-tailed weasel (*Mustela frenata*), eastern spotted skunk (*Spilogale putorius*), striped skunk (*Mephitis mephitis*), and bobcat (*Felis rufus*).

The scrub/shrub community within the project study area provides limited but suitable habitat and forage areas for a variety of birds. Birds observed at the time of field investigation include the ruby-throated hummingbird (*Archilochus colubris*), American robin (*Turdus migratorius*), mockingbird (*Mimus polyglottos*), starling (*Sturnus vulgaris*), cardinal (*Cardinalis cardinalis*), and mourning dove (*Zenaida macroura*). Songs and/or calls of the following birds were also noted within the project study area at the time of field investigation: bobwhite (*Colinus virginianus*), Carolina chickadee (*Parus carolinensis*), tufted titmouse (*Parus bicolor*), and red-eyed vireo (*Vireo olivaceus*). A wide variety of resident and migratory songbirds can be expected to periodically utilize forested tracts immediately to the east of the project study area. The open landscaped areas and the croplands within the project study area provide probable hunting grounds for birds of prey, such as hawks and owls.

No reptiles were observed on the project study area at the time of field investigation. A variety of reptile species may, however, use the communities located in the project study area. These animals include the rat snake (*Elaphe obsoleta*), eastern box turtle (*Terrapene carolina*), and five-lined skink (*Eumeces fasciatus*). Several adult green frogs (*Rana clamitans*) were observed along Canoe Creek.

Terrestrial insects observed in the project study area include organpipe mud daubers (*Tryploxylon* sp.), cloudless sulfur butterfly (*Phoebis sennae*), and West Virginia white butterflies (*Lycaena phlaeas*).

D.3. Aquatic Communities

The aquatic community of the project study area consists of Canoe Creek below the ordinary high water line. Dominant aquatic habitats within this section of Canoe Creek include cobble/boulder substrate, sticks and leaf packs, snags, and root mats. The stream within the project study area is primarily run, with one distinct riffle/run

complex existing at the northernmost limits of the project study area. The riparian area is less than 20 ft wide along both banks and eroded areas are present.

No aquatic vegetation was observed below the ordinary high water line of Canoe Creek at the time of field investigation. A narrow band (generally less than 10 ft) of hydrophytic vegetation occurs along the lower to middle portions of the stream banks.

Aquatic or water-dependent vertebrates observed within the project study area at the time of field investigation include the following: green frogs (*Rana clamitans*), numerous unidentified juvenile finfish, and a small number of unidentified minnows (*Cyprinidae*). Aquatic or water-dependent invertebrates observed within the project study area at the time of field investigation include the following: crayfish (*Cambaridae*), gilled snails (*Pleuroceridae*), six-spotted fishing spiders (*Dolomedes triton*), case-making caddisflies (*Trichoptera*), mayfly larvae (*Heptageniidae*), water striders (*Gerridae*), hellgrammites (*Corydalidae*), aquatic beetles (*Coleoptera*), and adult damselflies (*Zygoptera*).

D.4. Anticipated Impacts to Biotic Communities

D.4.a. Terrestrial Communities Impacts

Potential impacts to plant communities are estimated based on the approximate area of each plant community present within both the proposed right-of-way and the temporary construction limits of any on-site detour or easement that falls outside the estimated permanent right-of-way limit. A summary of potential plant community impacts is presented in Table 2. All plant community impacts are based on aerial photograph base mapping. A portion of the permanent plant community impact amount will consist of proposed right-of-way for the road after the bridge replacement is complete. Impervious surface and open water areas are not included in this analysis.

Table 2
Potential Impacts to Plant Communities

PLANT COMMUNITY	POTENTIAL IMPACTS Acres		
	ALT A		ALT B (Preferred)
	Impacts	Temp. Impacts*	Impacts
Altered Right-of-Way Communities	0.00	0.00	0.00
Landscaped Areas	0.00	0.14	0.14
Croplands	0.00	0.25	0.25
Open Field Community	0.00	0.00	0.00
Successional Sapling and Scrub/Shrub Communities	0.00	0.00	0.00
Piedmont/Mountain Bottomland Forest	0.03	0.05	0.05
Total (acre)	0.03	0.05	0.05
TOTAL FOR ALT (acre)	**0.08**		**0.05**

* Note: Temporary construction impacts are based on the portion of the impacts that fall outside the estimated right-of-way limit or impacts of temporary on-site detours.

Permanent community impacts for Alternative B represent the least amount of the two alternatives when the potential temporary impacts are included. The plant community with the largest amount of potential permanent and temporary impacts for all proposed alternatives is the Cropland community.

D.4.b. Aquatic Communities Impacts

The replacement of Bridge No. 57 over Canoe Creek will result in certain unavoidable impacts to the aquatic community. Probable impacts will be associated with the physical disturbance of the benthic aquatic habitat and water column habitat disturbances resulting from changes in water quantity and quality. Significant disturbance of stream segments can have an adverse effect on aquatic community composition by reducing species diversity and the overall quality of aquatic habitats. Physical alterations to aquatic habitats can result in the following impacts to aquatic communities:

- Inhibition of plant growth.
- Resuspension of organic detritus and removal of aquatic vegetation, which can lead to increased nutrient loading. Nutrient loading can, in turn, lead to algal blooms and ensuing depletion of dissolved oxygen levels.
- Increases in suspended and settleable solids that can, in turn, lead to clogging of feeding structures of filter-feeding organisms and the gills of fish.
- Loss of benthic macroinvertebrates through increased scouring and sediment loading.
- Loss of fish shelter through removal of overhanging stream banks and snags.
- Increases in seasonal water temperatures resulting from removal of riparian canopy.
- Burial of benthic organisms and associated habitat.

Unavoidable impacts to aquatic communities within and immediately downstream of the project study area will be minimized to the fullest degree practicable through strict adherence to NCDOT's *Best Management Practices for the Protection of Surface Waters* (NCDOT, 1997) and other applicable guidelines pertaining to best management practices. Means to minimize impacts will include (1) utilizing construction methods that will limit instream activities as much as practicable, (2) restoring streambeds, as needed, and (3) revegetating stream banks immediately following the completion of grading.

E. Special Topics

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

Surface waters within the embankments of Canoe Creek are subject to jurisdictional consideration under Section 404 of the Clean Water Act as "Waters of the United States" (33 CFR 328.3). Wetlands subject to review under Section 404 of the Clean Water Act (33 U.S.C. 1344) are defined by the presence of three primary criteria: hydric soils, hydrophytic vegetation, and evidence of hydrology within 12 inches of the soil surface for a portion (12.5 percent) of the growing season (DOA 1987). No wetlands have been mapped within the project study area under the National Wetlands Inventory (NWI) program.

The surface waters within Canoe Creek exhibit characteristics of a permanently flooded, lower perennial riverine habitat with an unconsolidated bottom (R2UBH). Canoe Creek is a jurisdictional surface water.

E.2. Anticipated Impacts to Waters of the United States

Temporary and permanent impacts to surface waters and wetlands are estimated based on the amount of each jurisdictional area within the project limits. Temporary impacts include those impacts that will result from temporary construction activities outside of permanent right-of-way and/or those associated with temporary on-site detours. Temporary impact areas will be restored to their original condition after the project has been completed. Permanent impacts are those areas that will be in the construction limits and/or the proposed right-of-way of the new structure and approaches. Portions of those areas that are considered temporary impact areas often end up being within the final right-of-way. Potential wetland and surface water impacts are included in Table 3.

Table 3
Anticipated Impacts to Surface Waters

JURISDICTIONAL AREAS	ALT A		ALT B (Preferred)
	Impacts	Temp. Impacts*	Impacts
Perennial Stream Channel Impacts ft	70.0	50.0	70.0
TOTAL FOR ALT feet	**120.0**		**70.0**

*Note: Temporary construction impacts are based on the portion of the impacts not included in the construction limits for the permanent structure.

No jurisdictional wetlands were found within the project study area. The preferred alternative, Alternative B, incurs the least amount of jurisdictional impacts when the potential temporary impacts are included. Alternative B may impact 70 ft of perennial stream channel. Alternative A incurs the highest amount of jurisdictional impacts. Alternative A may impact 120 ft of perennial stream channel.

E.2. Permits

Section 404 of the Clean Water Act - In accordance with Section 404 of the Clean Water Act (33 U.S.C. 1344), a permit is required from the USACE for projects of this type for the discharge of dredge or fill material in "Waters of the United States". The USACE issues two types of permits for these activities. A general permit may be issued on a nationwide or regional basis for a category, or categories, of activities when: those activities are substantially similar in nature and cause only minimal individual or cumulative environmental impacts, or when the general permit would result in avoiding unnecessary duplication of regulatory control exercised by another Federal, state, or local agency provided that the environmental consequences of the action are individually and cumulatively minimal. If a general permit is not appropriate for a particular activity, then an individual permit must be utilized. Individual permits are authorized on a case-by-case evaluation of a specific project involving the proposed discharges.

It is anticipated that this project will fall under Nationwide Permit 23, which is a type of general permit. Nationwide Permit 23 is relevant to approved Categorical Exclusions. This permit authorizes any activities, work, and discharges undertaken, assisted, authorized, regulated, funded, or financed, in whole or in part, by another federal agency and that the activity is "categorically excluded" from environmental documentation because it is included within a category of actions which neither individually nor cumulatively have a significant effect on the environment. Activities authorized under nationwide permits must satisfy all terms and conditions of the particular

permit. However, final permit decisions are left to the discretionary authority of the USACE. Since the proposed project is located in a designated "Trout" county, the authorization of a nationwide permit by the USACE is conditioned upon the concurrence of the NCWRC.

Section 401 Water Quality Certification - A 401 Water Quality Certification, administered through the DWQ, will also be required. This certification is issued for any activity which may result in a discharge into waters for which a federal permit is required. According to the DWQ, on condition of the permit is that the appropriate sediment and erosion control practices must be utilized to prevent exceedences of the appropriate turbidity water quality standard.

E.3. Mitigation

The USACE has adopted, through the Council on Environmental Quality (CEQ), a wetland mitigation policy which embraces the concept of "no net loss of wetlands" and sequencing. The purpose of this policy is to restore and maintain the chemical, biological, and physical integrity of the waters of the United States, specifically wetlands. Mitigation of wetland impacts has been defined by the CEQ to include: avoiding impacts, minimizing impacts, rectifying impacts, reducing impacts over time, and compensating for impacts (40 CFR 1508.20). Each of these three aspects (avoidance, minimization, and compensatory mitigation) must be considered sequentially.

Avoidance – Mitigation by avoidance examines appropriate and practicable measures for averting impact to waters of the United States. A 1990 Memorandum of Agreement between the Environmental Protection Agency (EPA) and the USACE, states that in determining appropriate and practicable measures to offset unavoidable impacts; such measures should be appropriate to the scope and degree of those impacts and practicable in terms of cost, existing technology, and logistics in light of overall project purposes.

The project purpose necessitates traversing Canoe Creek; therefore, totally avoiding surface water impacts is impossible.

Minimization – Minimization of adverse impact to waters of the United States includes examination of appropriate and practicable measures to reduce such impacts. Implementation of these steps will be required through project modifications and permit conditions. Adverse impacts are typically minimized by decreasing the proposed project footprint through reduction of median widths, right-of-way widths, and/or fill slopes.

Other practical mechanisms to minimize impacts to waters of the United States include strict enforcement of sedimentation control BMPs for protection of surface waters during the entire life of the project; reduction of clearing and grubbing activity; reduction/elimination of direct discharge into streams; reduction of runoff velocity; reestablishment of vegetation on exposed areas, with judicious pesticide and herbicide management; minimization of instream activity; and litter/debris control.

No measures are proposed for this project because there are no jurisdictional wetlands within the project study area.

Compensatory Mitigation – Compensatory mitigation, including restoration, creation and enhancement of waters of the United States, is typically not considered unless anticipated impacts to waters of the United States have been avoided and minimized to the maximum extent practicable. Further, it is recognized that "no net loss of wetlands" may not be achievable in every permit action. Therefore, compensatory mitigation is required for

unavoidable adverse impacts which remain after all appropriate and practicable minimization measures have been required.

Compensatory mitigation is not expected to be required for this project. A final determination regarding mitigation requirements rest with the USACE.

F. Protected Species

F.1. Federally Protected Species

Species with the federal classification of Endangered (E) or Threatened (T), Proposed Endangered (PE), and Proposed Threatened (PT) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Table 4 lists the federal protected species for Burke County (USFWS list dated February 5, 2003).

Bald Eagle – The bald eagle is a large raptor. The characteristic adult plumage consists of a white head and tail with a dark brown body. Juvenile eagles are completely dark brown and do not fully develop the white head and tail until the fifth or sixth year. Fish are the primary food source, but bald eagles will also take a variety of birds, mammals, and turtles (both live and as carrion) when fish are not readily available. Adults average about 3.0 ft from head to tail, weigh approximately 10.0 to 12.0 pounds and have a wingspan that can reach 7.0 ft. Generally, female bald eagles are somewhat larger than the males.

Table 4
Federally Protected Species Listed for Burke County

Common Name	Scientific Name	Status	Biological Conclusion
Bald Eagle	*Haliaeetus leucocephalus*	T	No Effect
Bog Turtle	*Clemmys muhlenbergii*	T (S/A)	N/A
Dwarf-flowered Heartleaf	*Hexastylis naniflora*	T	No Effect
Heller's Blazing Star	*Liatris helleri*	T	No Effect
Mountain Golden Heather	*Hudsonia Montana*	T	No Effect
Small-whorled Pogonia	*Isotria medeoloides*	T	No Effect
Spreading Avens	*Geum radiatum*	E	No Effect

Endangered – any native or once-native species in danger of extinction throughout all or a significant portion of its range.
Threatened - any native or once-native species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.
Threatened (S/A) – a species carrying the threatened status due to having a similar appearance to another listed species.

Habitat includes quiet costal areas, rivers or lakeshores with large, tall trees. Man-made reservoirs have also provided habitat.

The North Carolina Natural Heritage Program's database of rare species and unique habitats was reviewed in September of 2001. No populations of the species have been recorded in the project vicinity. The project study area was investigated on July 13, 2001. No individual organisms, populations, or suitable habitat were observed within the project study area.

BIOLOGICAL CONCLUSION: NO EFFECT

Dwarf-flowered Heartleaf - The dwarf-flowered heartleaf is a small, spicy-smelling, rhizomatous perennial herb. The long-stalked evergreen leaves (to about 6 inches long) are leathery, heart-shaped, and mottled with white (Kral 1983). The solitary purplish flower is jug-shaped, fleshy and firm, and has three triangular lobes. Flower and fruits appear in April and early May, usually under leaf litter (Cooper et al. 1977).

Preferred habitat is north-facing slopes of rich deciduous forest, usually associated with mountain laurel in acidic, sandy loam soils. Suitable soils in this region of the state are Pacolet sandy loam, Madison gravelly sandy loam, and Musella fine sandy loam. Dwarf-flowered heartleaf is known from the Piedmont of North and South Carolina (Kral 1983).

No suitable habitat was identified for dwarf-flowered heartleaf within the project study area due to extensive clearing and maintenance of roadside areas. Limited streamside and fencerow habitat was characterized by overgrowth of shrubs and trees. The project study area contains no boggy areas of north-facing slopes. NHP records document no dwarf-flowered heartleaf occurrences within 2.0 miles of the project study area.

BIOLOGICAL CONCLUSION: NO EFFECT

Heller's Blazing Star - Heller's blazing star is a perennial herb that has one or more erect or arching stems arising from a tuft of narrow pale green basal leaves. Its stems reach up to 1.3 ft in height and are topped by a showy spike of lavender flowers, which are 2.8 to 7.9 inches long (Porter, 1891). Its flowering season lasts from July through September, and its fruits are present from September through October (Kral, 1983; Radford et al., 1964). This plant is differentiated from other similar high altitude *Liatris* species by a much shorter pappus, ciliate petioles, internally pilose corolla tubes, and a lower, stockier habit (Cronquist, 1980; Gaiser, 1946). Work is being conducted on populations in two locations, which may result in their being reclassified as a new taxon (Sutter, in preparation). If so, these plants will remain protected under the Endangered Species Act.

The plant exists on high elevation ledges of rock outcrops in shallow, acid soils, which are exposed to full sunlight.

The North Carolina Natural Heritage Program's database of rare species and unique habitats was reviewed in September of 2001. No populations of the species have been recorded in the project vicinity. The project study area was investigated on July 13, 2001. Heller's Blazing Star is reported to occur at elevations ranging from 3,500 to 6,000 ft (msl). The maximum elevation of 1,160 ft (msl) within the project study area is considered too low to serve as suitable habitat. No individual organisms or suitable habitat were observed within the project study area.

BIOLOGICAL CONCLUSION: NO EFFECT

Mountain Golden Heather – Mountain golden heather is a low, needle-leaved shrub with yellow flowers and long-stalked fruit capsules. It usually grows in clumps of 4.0 to 8.0 inches across and about 6.0 inches high, and sometimes is seen in larger patches of 1.0 to 2.0 ft across. The plants have the general aspect of a big moss or a low juniper, but their branching is more open; their leaves are about 0.25 inch long; and the plant is often somewhat yellow-green in color, especially in shade. The leaves from previous years appear scale-like and persist on the older branches. The flowers appear in early or mid-June, and are yellow, nearly 1.0 inch across, with five blunt-tipped petals and 20 to 30 stamens. The fruit capsules are on 0.5 inch stalks, and are roundish

with three projecting points at the tips. These fruits often persist after opening, and may be seen at any time of the year.

Mountain golden heather grows on exposed quartzite ledges in an ecotone between bare rock and Leiophyllum dominated heath balds that merge into pine/oak forest. The plant persists for some time in the partial shade of pines, but it appears less healthy than in open areas.

The North Carolina Natural Heritage Program's database of rare species and unique habitats was reviewed in September of 2001. No populations of the species have been recorded in the project vicinity. The project study area was investigated on July 13, 2001. Mountain Golden Heather is reported to occur at elevations ranging from 2,800 to 4,000 feet (msl). The maximum elevation of 1,160 feet (msl) within the project study area is considered too low to serve as suitable habitat. No individual organisms or suitable habitat were observed within the project study area.

BIOLOGICAL CONCLUSION: NO EFFECT

Small-whorled Pogonia - The small-whorled pogonia is a terrestrial orchid growing to about 10 inches in height. Five or six drooping, pale, dusty green, widely rounded leaves with pointed tips are arranged in a whorl at the apex of the green or purple, hollow stem. Typically a single, yellowish-green, nearly stalkless flower is produced just above the leaves; a second flower rarely may be present. Flowers consist of three petals, which may reach lengths of 0.7 inch, surrounded by three narrow sepals up to 1.0 inch in length. Flower production, which occurs from May to July, is followed by the formation of an erect ellipsoidal capsule 0.7 to 1.2 inches in length (Massey et al. 1983). This species may remain dormant for periods up to 10 years between blooming periods (Newcomb 1977).

The small-whorled pogonia is widespread, occurring from southern Maine to northern Georgia, but is very local in distribution. In North Carolina, this species is found scattered locations in the Mountains, Piedmont, and Sandhills (Amoroso 2002). Small-whorled pogonia is found in open, dry deciduous or mixed pine-deciduous forest, or along stream banks. Examples of areas providing suitable conditions (open canopy and shrub layer with a sparse herb layer) where small whorled pogonia has been found include old fields, pastures, windthrow areas, cutover forests, old orchards, and semi-permanent canopy breaks along roads, streams, lakes, and cliffs (Massey et al. 1983). In the Mountains and Piedmont of North Carolina, this species is usually found in association with white pine (Weakley 1993).

Habitat for small whorled pogonia is marginal within the project study area. Although open areas are common within the project study area, these areas are generally fragmented, disturbed, and maintained. Wooded streambanks and fencerows are densely vegetated. A thorough search of the project study area on June 11, 2003 failed to identify specimens of this orchid. NHP records document no occurrences of small-whorled pogonia within 2.0 miles of the project study area.

BIOLOGICAL CONCLUSION: NO EFFECT

Spreading Avens - Spreading avens is a perennial herb. Spreading avens is topped with an indefinite cyme of large, bright yellow flowers. Its leaves are mostly basal with large terminal lobes and small laterals, and they

arise from horizontal rhizomes. Plant stems grow 8 to 19 inches tall. Flowering occurs from June through September, and the fruits (achenes) are produced from August through October.

The species inhabits high elevation cliffs, outcrops, and steep slopes that are exposed to full sun. The adjacent spruce/fir forests are dominated by red spruce (*Picea rubens*) and a federal candidate species, Fraser fir (*Abies fraseri*). Heller's blazing star (*Liatris helleri*) and/or Blue Ridge goldenrod (*Solidago spithamaea*), both federally-listed as threatened species, are also present at some sites. The substrate at all the population sites is composed of various igneous, metamorphic, and metasedimentary rocks (Massey et al, 1980; Morgan, 1980; Kral, 1983; Department of the Interior, 1990).

The North Carolina Natural Heritage Program's database of rare species and unique habitats was reviewed in September of 2001. No populations of the species have been recorded in the project vicinity. The project study area was investigated on July 13, 2001. Spreading avens is reported to occur at elevations ranging from 4,200 to 6,300 ft (msl). The maximum elevation of 1,160 ft (msl) within the project study area is considered too low to serve as suitable habitat. No individual organisms or suitable habitat were observed within the project study area.

BIOLOGICAL CONCLUSION: NO EFFECT

F.2. Federal Species of Concern

Federal Species of Concern (FSC) are not afforded federal protection under the Endangered Species Act and are not subject to any of the provisions included in Section 7 until they are formally proposed or listed as Threatened or Endangered. In addition to the federal program, organisms that are listed as Endangered (E), Threatened (T), or Special Concern (SC) by the North Carolina Natural Heritage Program (NCNHP) on its list of Rare Plant and Animal Species are afforded state protection under the N.C. State Endangered Species Act and the N.C. Plant Protection and Conservation Act of 1979. Table 5 lists the Federal Species of Concern for Burke County, the state status of these species, and the potential for suitable habitat in the project study area. The NCNHP database shows no occurrences of FSC within 0.6 mile of the project study area as of January 2001.

F.3. Summary of Anticipated Impacts

The proposed project is not anticipated to impact any threatened or endangered species.

Table 5
Federal Species of Concern (FSC) listed for Burke County

Common Name	Scientific Name	Habitat Present	State Status
Southern Appalachian Woodrat	*Neotoma floridana haematoreia*	No	--
Allegheny Woodrat	*Neotoma magister*	No	--
Rafinesque's big-eared bat	*Corynorhinus (=Plecotus) rafinesquii*	Yes	T
Brook Floater	*Alasmidonta varicosa*	Yes	T
Edmund's Snaketail Dragonfly	*Ophiogomphus edmundo*	Yes	SR
Pygmy Snaketail Dragonfly	*Ophiogomphus howei*	Yes	SR
Diana Fritillary Butterfly	*Speyeria diana*	Yes	SR
Butternut	*Juglans cinerea*	No	---
Sweet Pinesap	*Monotropsis odorata*	No	C
Carolina saxifrage	*Saxifraga caroliniana*	No	C
Cuthbert's turtlehead	*Chelone cuthbertii*	No	SR
A Liverwort	*Cephaloziella obtusilobula*	No	C
A Liverwort	*Plagiochila sullivantii var. spinigera*	No	C
A Liverwort	*Plagiochila sullivantii var. sullivantii*	No	C
A Liverwort	*Porella wataugensis*	No	SR

Threatened (T) - any native or once-native species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Candidate(C) – a species for which USFWS has enough information on file to support proposals for listing as endangered or threatened.

Significantly Rare(SR) – species which are very rare, generally with 1-20 populations in the state, and generally reduced in numbers by habitat destruction.

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, 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 inclusion in the National Register of Historic Places and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings. This project has been coordinated with the North Carolina State Historic Preservation Officer (SHPO) in accordance with the Advisory Council's regulations and FHWA procedures.

B. Historic Architecture

The SHPO, in a memorandum dated January 23, 2002, stated "We have conducted a search of our files and are aware of no structures of historical or architectural importance located within the planning area." A copy of the SHPO memorandum is included in the Appendix.

C. Archaeology

The SHPO, in a memorandum dated January 23, 2002 recommended that "no archaeological investigation be conducted in connection with this project." A copy of the SHPO memorandum is included in the Appendix.

VII. ENVIRONMENTAL EFFECTS

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

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

Replacement of Bridge No. 57 will not have an adverse effect on the quality of the human or natural environment with the use of the current North Carolina Department of Transportation standards and specifications.

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

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

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

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 and environmental impacts as a result of this project. The investigation determined the project would not disproportionately impact any minority or low-income populations.

The studied route does not contain any bicycle accommodations, nor is it a designated bicycle route; therefore, no bicycle accommodations have been included as part of this project.

This project has been coordinated with the United States Department of Agriculture, Natural Resources Conservation Service. The Farmland Protection Policy Act requires all federal agencies or their representatives to consider the potential impact to prime farmland for all land acquisition and construction projects. The proposed project will not involve the direct conversion of farmland acreage within these classifications.

No publicly owned parks or recreational facilities, wildlife and waterfowl refuges, or historic sites of national, state or local significance in the immediate vicinity of the project will be impacted.

The proposed project will not require right-of-way acquisition or easement from any land protected under Section 4(f) of the Department of Transportation Act of 1966.

No adverse effects to air quality are anticipated from this project. This project is an air quality "neutral" project, so it is not required to be included in the regional emissions analysis and a project level CO analysis is not required. Since the project is located in an attainment area, 40 CFR Part 51 is not applicable. If vegetation or wood debris is disposed of by open burning, it shall be done in accordance with applicable local laws and regulations of the North Carolina State Implementation Plan (SIP) for air quality in compliance with 15 NCAC 2D.0520 and 1990 Clean Air Act Amendments and the National Environmental Policy Act. This evaluation completes the assessment requirements for air quality, and no additional reports are required.

Ambient noise levels may increase during the construction of this project; however this increase will be only temporary and usually confined to daylight hours. There should be no notable change in traffic volumes after this project is complete. Therefore, this project will have no adverse effect on existing noise levels. Noise receptors in the project study area will not be impacted by this project. This evaluation completes the assessment requirements for highway noise set forth in 23 CFR Part 772. No additional reports are required.

The NCDOT Geotechnical Unit determined that no underground storage tanks or areas of other contamination were present at or near the project study area.

Burke County is a participant in the Federal Flood Insurance Program. The project is not located within an Approximate or Detailed Study area. Since the proposed replacement for Bridge Number 57 will be a structure similar in waterway opening size, it is not anticipated that it will have any significant adverse impact on the existing floodplain and floodway. The approximate 100-year floodplain in the project study area is shown in Figure 6.

Geotechnical borings for the bridge foundation will be necessary.

Based on the above discussion, it is concluded that no substantial adverse environmental impact will result from the replacement of Bridge No. 57.

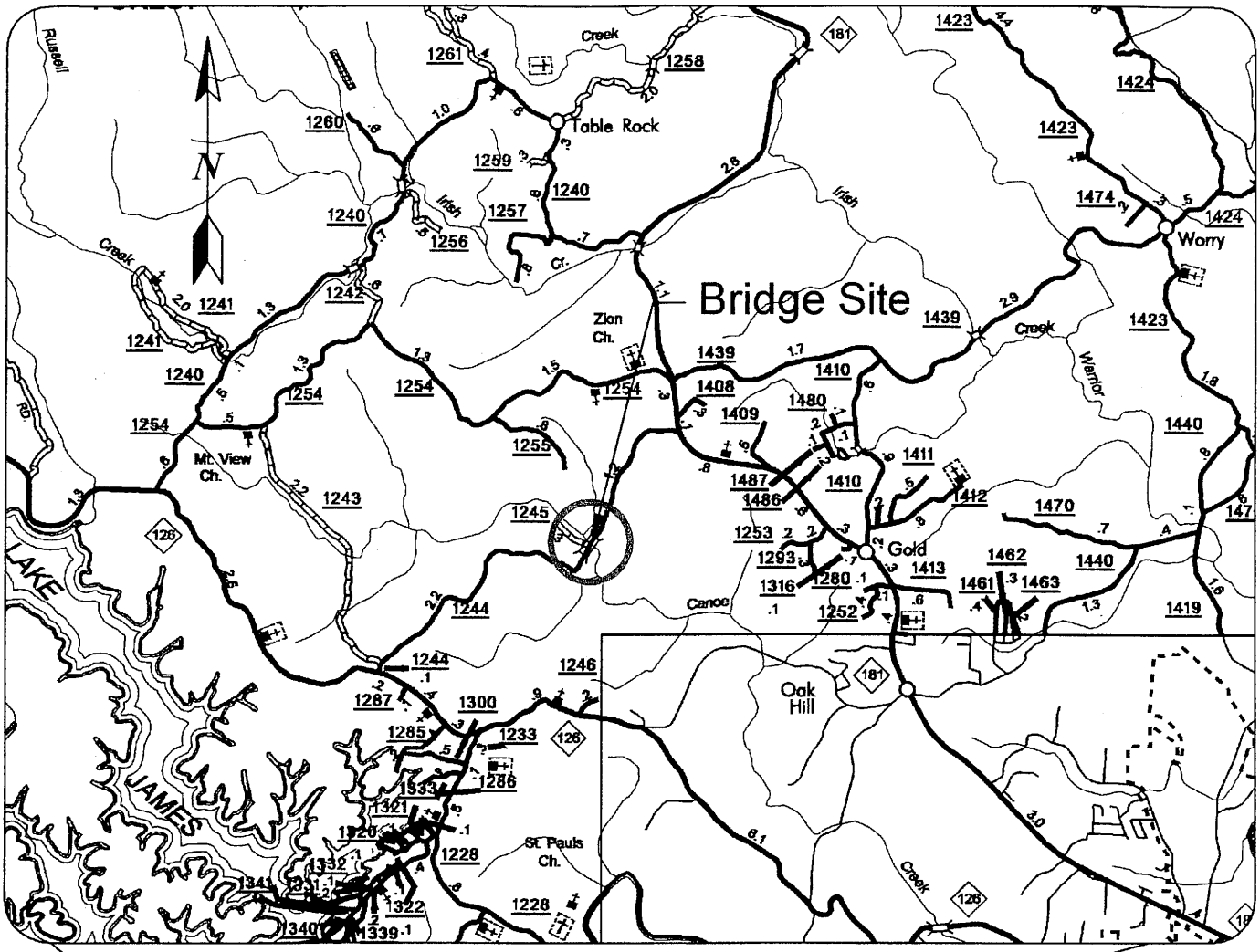
VIII. PUBLIC INVOLVEMENT

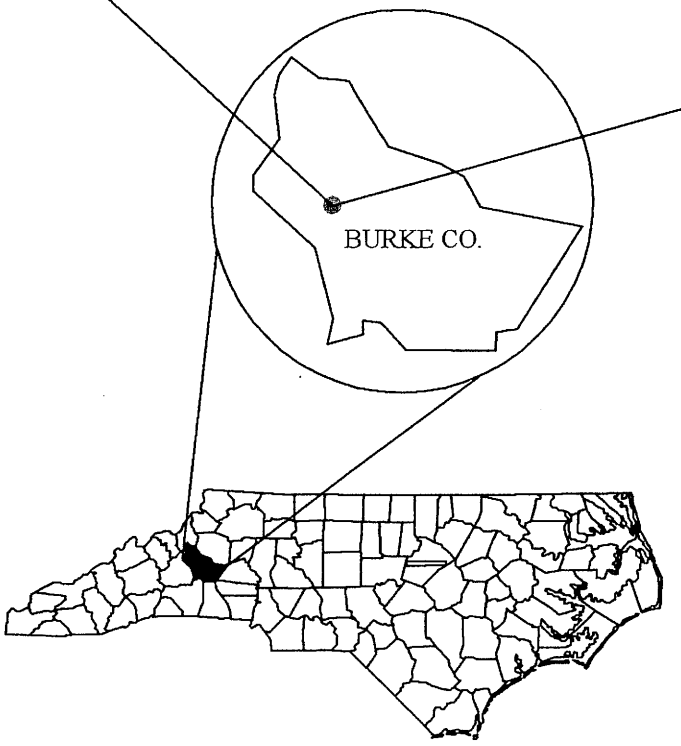
Due to the isolated nature of this bridge replacement project, no formal public involvement program was initiated. Efforts were undertaken early in the planning process to contact local officials to involve them in the project development with a scoping letter.

XI. AGENCY COMMENTS

Agencies have commented on the proposed bridge replacement (see letters in the Appendix). These comments were noted and considered during the environmental and design processes.

FIGURES





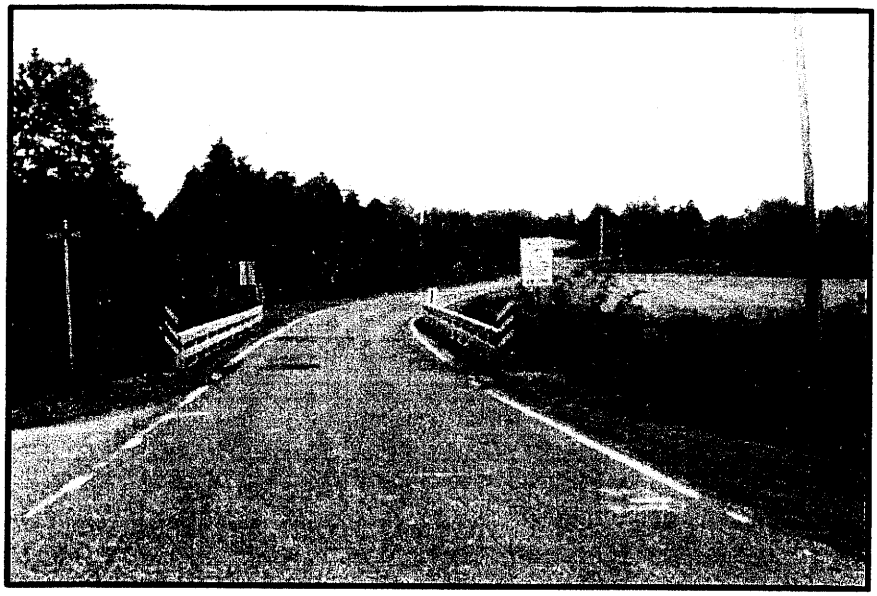
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

SR 1244
Replace Bridge No. 57 over
Canoe Creek
Burke County, North Carolina

TIP NO. B-4041
PROJECT VICINITY MAP

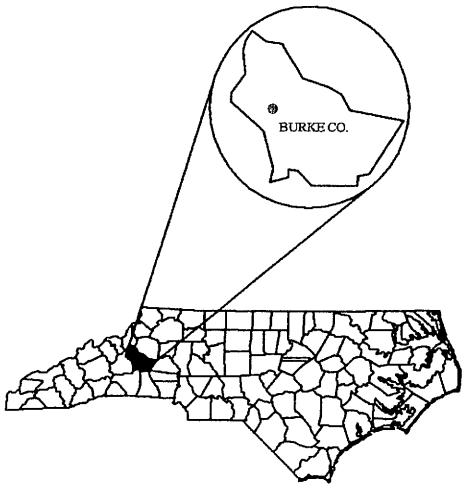
Not to Scale

FIGURE 1



Looking North across Bridge No. 57

Looking South across Bridge No. 57



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

SR 1244
Replace Bridge No. 57 over
Canoe Creek
Burke County, North Carolina

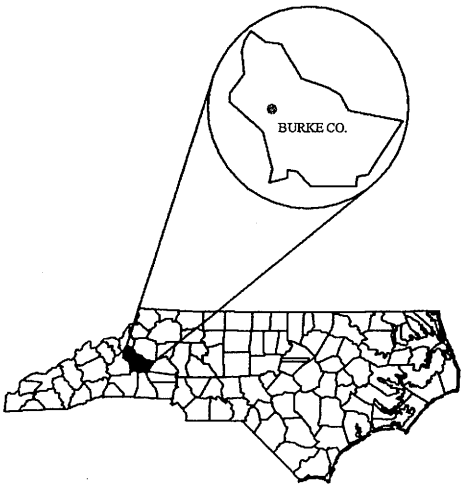
TIP NO. B-4041

Not to Scale

FIGURE 2

Looking North at Bridge No. 57

Looking West at Bridge No. 57



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

SR 1244
Replace Bridge No. 57 over
Canoe Creek
Burke County, North Carolina

TIP NO. B-4041

Not to Scale

FIGURE 3

(ALTERNATIVE A)
(REPLACE IN – PLACE WITH ON-SITE DETOUR EAST SIDE)

PROJECT REFERENCE NO.	SHEET NO.
B-4041	4
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

BEGIN PROJECT B-4041
-L- STA. 18+00.00

PC -DET- Sta. 16+63.59

POT -DET- Sta. 10+00.00

-L-
PI Sta 18+02.62
Δ = 15° 13' 34.9" (LT)
D = 4° 46' 28.7"
L = 277.01'
T = 139.12'
R = 1200.00'
DS = 55 mph

PT -L- Sta. 19+40.51

PC -L- Sta. 19+91.73

3 @ 12' x 8' RCBC

PDE

PT -L- Sta. 21+56.70

-L-
PI Sta 20+75.05
Δ = 19° 53' 58.5" (RT)
D = 12° 03' 44.2"
L = 164.97'
T = 83.33'
R = 475.00'
DS = 40 mph

N 32° 55' 25.3" E

N 33° 16' 13.9" E

N 19° 34' 50.4" E

N 26° 19' 13.4" E

N 39° 35' 48.8" E

N 15° 41' 31.0" E

END PROJECT B-4041
-L- STA. 22+60.00

3 @ 72" CMP (DETOUR STRUCTURE)

PC -DET- Sta. 15+23.39

-DET-
PI Sta 16+35.70
Δ = 13° 16' 35.4" (RT)
D = 5° 56' 14.6"
L = 223.61'
T = 112.31'
R = 965.00'
DS = 55 mph

PT -DET- Sta. 17+47.00

PC -DET- Sta. 12+11.66

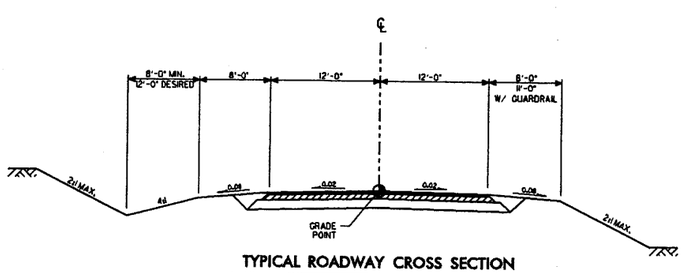
-DET-
PI Sta 13+00.27
Δ = 6° 57' 06.4" (LT)
D = 5° 56' 14.6"
L = 117.09'
T = 58.61'
R = 965.00'
DS = 55 mph

PC -DET- Sta. 13+58.74

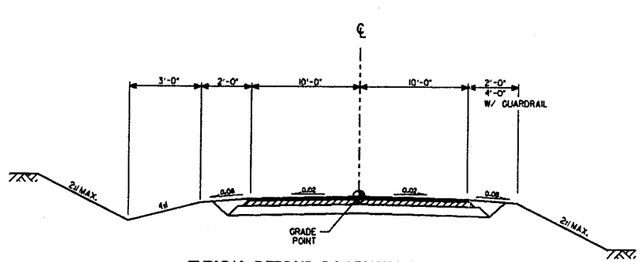
PC -L- Sta. 26+61.83

-L-
PI Sta 27+51.80
Δ = 23° 54' 17.8" (LT)
D = 13° 28' 52.9"
L = 177.32'
T = 89.97'
R = 425.00'

PT -L- Sta. 28+39.15



TYPICAL ROADWAY CROSS SECTION



TYPICAL DETOUR ROADWAY CROSS SECTION

DETOUR DESIGN DATA

DESIGN SPEED	55 mph
MIN. RADIUS	965 ft.
MAXIMUM GRADE	8%
SUPERELEVATION RATE	Se = 0.06

DESIGN DATA

DESIGN SPEED	60 mph *
POSTED SPEED	55 mph
CURRENT YEAR ADT (2001)	300 vpd
DESIGN YEAR ADT (2025)	3,600 vpd
% TTST ,% DUALS	1% ,2%
FUNCTIONAL CLASSIFICATION	Rural Local
TERRAIN	Rolling
MAX RADIUS	1205 ft
MAXIMUM GRADE	10%
SUPERELEVATION RATE	Se = 0.08

* DESIGN EXCEPTION REQUIRED

SCALE
50 0 50 100

FIGURE 4

(ALTERNATIVE B)
(NEW LOCATION EAST SIDE)

PROJECT REFERENCE NO.	SHEET NO.
B-4041	4
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

15

10

POT -L2- Sta.10+00.00

BEGIN PROJECT B-4041
-L2- STA. 10+00.00

3 @ 12' x 8' RCBC

N 29° 30' 05.5" E

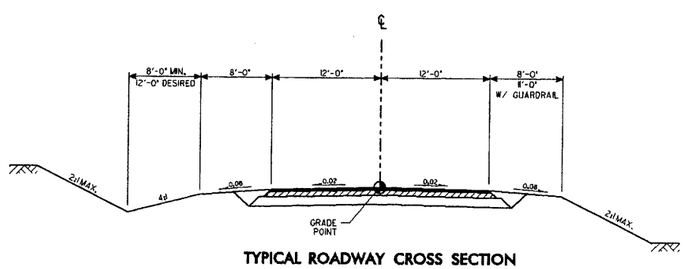
12'
12'

END PROJECT B-4041
-L2- STA. 16+69.91

-L2-
PI Sta 15+64.03
Δ = 10° 05' 43.3" (RT)
D = 4° 45' 17.4"
L = 212.32'
T = 106.43'
R = 1,205.00'

PC -L2- Sta.14+57.60

PT -L2- Sta.16+69.91



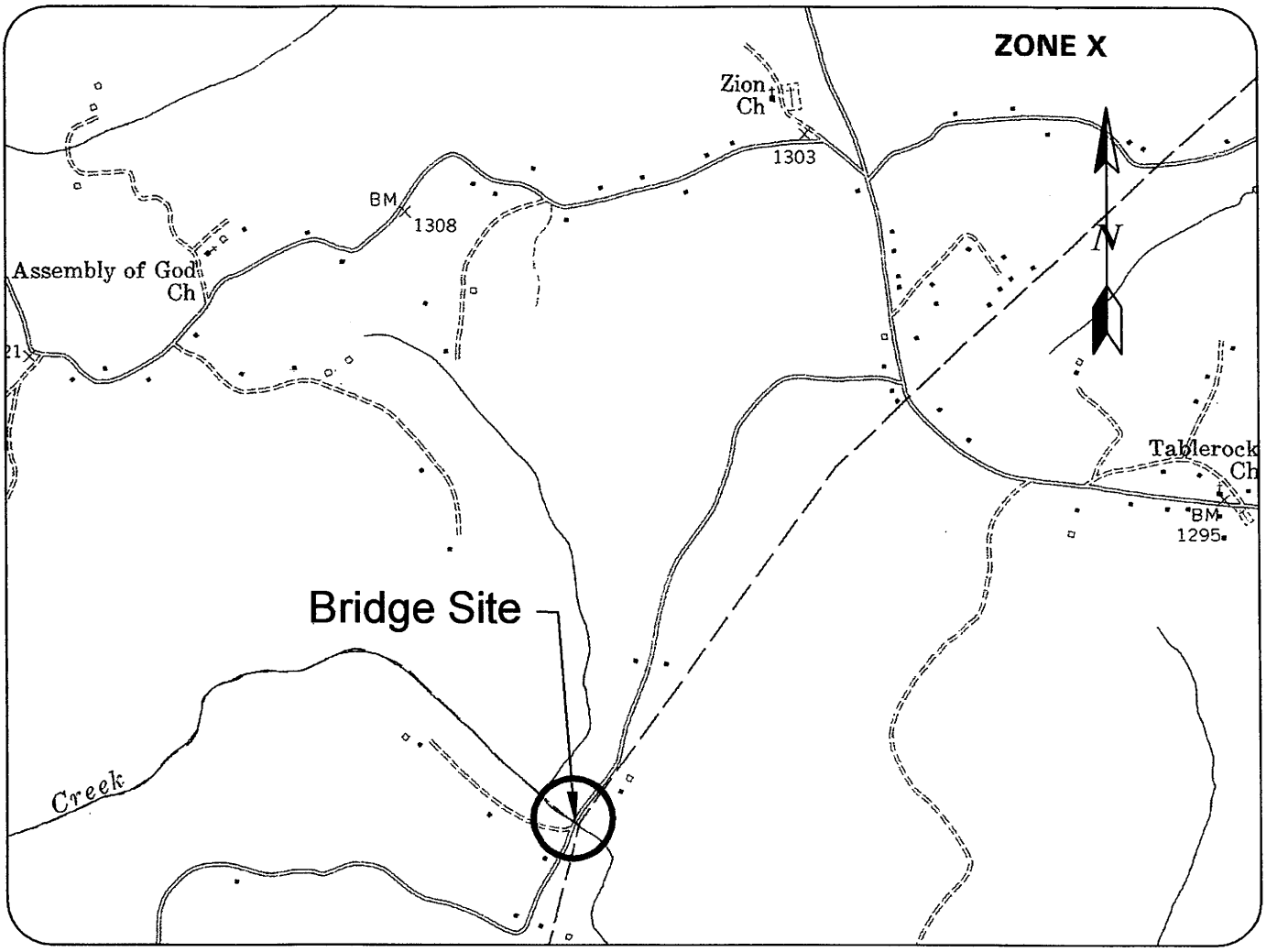
TYPICAL ROADWAY CROSS SECTION

DESIGN DATA

DESIGN SPEED	60 mph
POSTED SPEED	55 mph
CURRENT YEAR ADT (2001)	300 vpd
DESIGN YEAR ADT (2025)	3,600 vpd
% TTST ,% DUALS	1% ,2%
FUNCTIONAL CLASSIFICATION	Rural Local
TERRAIN	Rolling
MAX RADIUS	1205 ft
MAXIMUM GRADE	10%
SUPERELEVATION RATE	Se = 0.08

SCALE
50 0 50 100

FIGURE 5

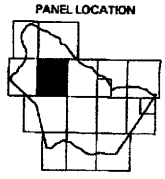


FLOOD INSURANCE RATE MAP

BURKE COUNTY,
NORTH CAROLINA
(UNINCORPORATED AREAS)

PANEL 100 OF 350
(SEE MAP INDEX FOR PANELS NOT PRINTED)

PANEL LOCATION



COMMUNITY–PANEL NUMBER:
370034 0100 C
EFFECTIVE DATE:
JUNE 17, 1991

Federal Emergency Management Agency

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

SR 1244
Replace Bridge No. 57 over
Canoe Creek
Burke County, North Carolina

TIP NO. B-4041
FEMA 100-YEAR FLOOD PLAIN MAP

Not to Scale

FIGURE 6

APPENDIX

US Fish and Wildlife Service

160 Zillicoa Street
Asheville, NC 28801
Phone 828-258-3939 Ext 237, Fax 828-258-5330

MEMO FOR: William T. Goodwin, P.E. **DATE:** June 27, 2002

FROM: Marella Buncick

SUBJECT: Review of NCDOT 2005 Bridge Program

I have completed initial review of the approximately 70 proposed bridge replacements for NCDOT Divisions 9-14 for the year 2005. I would like to commend NCDOT for obtaining the natural resource information up front and allowing the agencies to review the proposals and provide comments so early in the process. It was a large volume of work for everyone involved but I feel that the input will be much more meaningful at this early planning stage.

Attached is a spreadsheet with specific comments for each project reviewed. All of the projects have been assigned a Green, Yellow, or Red ranking depending on the resources affected and the need for future consultation. As you will note, the majority of the projects received a Yellow ranking. This is due in large part to the fact that there are unresolved issues related to listed species. Many of these projects likely will become Green projects after further field review. However, obligations under Section 7 of the Act 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, (2) actions are subsequently modified in a manner that was not considered in this review, or (3) a new species is listed or critical habitat is determined that may be affected by the identified action.

I also have general comments regarding the process and reports. My general comments follow.

Report Content and Organization

1. The reports would be more easily handled if they were not spiral or otherwise bound.
2. Maps need to be much better. Without a significant landmark-- highway, larger town, other feature – it sometimes took a long time to figure out the location of the project within a county.
3. The reports were organized somewhat similarly, but more consistency would aid in the review process. Perhaps a table that has the significant features ---stream width, depth, DWQ class, etc.--also would help.

4. For listed species, it often was difficult to tell whether field surveys had been conducted or whether the information was limited to a database search.
5. In the future, I would appreciate having the Rosgen stream classification included as part of the information.

Listed Species Surveys

Projects currently ranked as Yellow will need to be reviewed in the future after the stated issues are resolved. For those reports with unresolved issues related to listed species, I would recommend that NCDOT wait until closer to implementation time to conduct final surveys. In general, after three to five years we need updated information regarding the project and listed species. Additionally, when aquatic species are involved (particularly mussels) several surveys may be required to adequately determine presence or absence.

The three projects receiving a Red ranking will need to be followed very closely to determine future consultation requirements. These include B-4287 (actually 2 bridge replacements), B-4286, and B-4282. These projects were ranked as Red because of the significance of the number of listed resources potentially affected and the river (either main stem or tributary) involved.

I would encourage NCDOT to require consultants to at least assess habitat for the bog turtle. While the bog turtle technically does not require Section 7 consultation, it is a species of concern and NCDOT is actively managing mitigation sites or parts of sites for this species. Additionally, the Wildlife Resources Commission considers this animal rare in NC and participates actively in surveys and conservation efforts on its behalf.

Bridge Design and Construction Practices

I am assuming that FWS comments/recommendations in the past regarding bridge design, demolition, and construction practices will be folded into each of these projects. Since NCDOT is also working on a BMP manual that covers these practices, I think it would be redundant to state them again. However, if any questions arise, please let me know. I would like to emphasize that we prefer off-site detours wherever possible, to minimize effects to resources.

Each of these projects has been assigned a log number. Please refer to these numbers in future requests regarding the subject projects. Thank you again for the opportunity to provide these comments. If you have questions, please let me know.

PDE	TIP	County	Rank	Reason for Rank	FWS Log Number
SH	B-2988	Haywood	Y	unresolved for listed species, FWS requests review of bridge design	4-2-02-391
MD	B-4011	Ashe	Y	FWS requests resurvey for spiraea, assessment for bog turtle and green floater, review bridge plans	4-2-02-405
MD	B-4012	Ashe	Y	FWS requests resurvey for spiraea and habitat assessment for bog turtle	4-2-02-404
MD	B-4013	Ashe	Y	FWS requests resurvey for spiraea and habitat assessment for bog turtle, review bridge design	4-2-02-403
MD	B-4015	Ashe	Y	FWS requests resurvey for spiraea and habitat assessment for bog turtle, review bridge design	4-2-02-402
MD	B-4016	Ashe	Y	FWS requests resurvey for spiraea and habitat assessment for bog turtle, review bridge design	4-2-02-401
SH	B-4032	Buncombe	G	FWS requests review of bridge design	4-2-02-387
SH	B-4036	Buncombe	Y	unresolved for mussels, FWS requests review of bridge design	4-2-02-395
SH	B-4037	Buncombe	Y	unresolved for mussels, FWS requests review of bridge design	4-2-02-396
DW	B-4038	Burke	Y	unresolved for listed species, be careful of downstream effects	4-2-02-379
DW	B-4039	Burke	Y	unresolved for heartleaf	4-2-02-380
RY	B-4040	Burke	Y	FWS requests resurvey for heartleaf	4-2-02-381
DW	B-4041	Burke	Y	FWS requests resurvey for heartleaf	4-2-02-382
RY	B-4043	Burke	Y	FWS requests mussel survey, requests bridge to bridge and review of bridge design	4-2-02-383
RY	B-4044	Burke	Y	FWS requests resurvey for heartleaf and pogonia, bridge to bridge	4-2-02-384
RY	B-4045	Burke	Y	FWS requests resurvey for heartleaf, new occurrence w/in 1 mile	4-2-02-385
RY	B-4046	Burke	Y	unresolved for pogonia, FWS requests resurvey for heartleaf, request bridge for high quality stream	4-2-02-408
RY	B-4047	Burke	Y	unresolved for heartleaf	4-2-02-386
MD	B-4052	Caldwell	Y	unresolved for heartleaf, be careful of the USGS gaging station at this location	4-2-02-407
JJ	B-4059	Cawtaba	Y	Need survey for heartleaf--habitat assessment inadequate	4-2-02-409
DW	B-4060	Cawtaba	Y	Need survey for heartleaf--habitat assessment inadequate	4-2-02-410
RY	B-4067	Cherokee	Y	unresolved for listed species, close coordination w/USFS, high quality stream	4-2-02-394
DW	B-4070	Cherokee	Y	all listed species unresolved, FWS requests special consideration here for sicklefin redhorse	4-2-02-371
JJ	B-4076	Cleveland	Y	Need survey for heartleaf--habitat assessment inadequate	4-2-02-413
SH	B-4103	Davidson	Y	FWS requests mussel survey, requests bridge to bridge because of stream quality	4-2-02-370
JJ	B-4116	Gaston	Y	Need resurvey for heartleaf	4-2-02-416
DW	B-4123	Graham	Y	unresolved for listed species, Indiana Bat, close coordination w/USFS, high quality stream	4-2-02-393
SH	B-4144	Haywood	Y	unresolved for listed species, FWS requests review of bridge design	4-2-02-392
DP	B-4155	Iredell	G	FWS requests survey for bog turtle	4-2-02-412
DP	B-4158	Iredell	G	FWS requests survey for bog turtle, contractor suggested survey for heartleaf, FWS requests bridge	4-2-02-411
DW	B-4161	Jackson	Y	unresolved for listed species, FWS requests review of bridge design	4-2-02-388
JJ	B-4177	Lincoln	Y	Need resurvey for heartleaf	4-2-02-414
DW	B-4178	Lincoln	Y	Need resurvey for heartleaf	4-2-02-415
DW	B-4179	Macon	Y	unresolved for listed species, FWS requests review of bridge design	4-2-02-389
RY	B-4180	Macon	Y	unresolved for listed species, FWS requests bridge to bridge, consideration for green salamander	4-2-02-390
RY	B-4183	Madison	These 2 bridge replacements are part of R-2518 and 2519 merger process, review by merger team		

PDE	TIP	County	Rank	Reason for Rank	FWS Log Number
DW	B-4192	McDowell	Y	Need to assess pogonia	4-2-02-418
JJ	B-4194	McDowell	Y	Need to assess pogonia	4-2-02-419
JJ	B-4195	McDowell	Y	Need to assess pogonia	4-2-02-420
JJ	B-4196	McDowell	Y	Need to assess pogonia	4-2-02-421
DW	B-4197	McDowell	Y	Need to assess pogonia, FWS requests mussel surveys, bridge to bridge for high quality stream	4-2-02-422
JJ	B-4198	McDowell	Y	Need to assess pogonia	4-2-02-423
DW	B-4199	McDowell	Y	Need to assess pogonia	4-2-02-424
DW	B-4202	Mitchell	Y	Unresolved for Elktoe, FWS requests bridge to bridge, NO SURVEY NEEDED FOR INDIANA BAT	4-2-02-417
DW	B-4239	Polk	Y	unresolved for small-whorled pogonia and heartleaf	4-2-02-369
DW	B-4240	Polk	Y	unresolved for small-whorled pogonia and heartleaf	4-2-02-361
SH	B-4255	Rowan	G	may need resurvey for Schweinitz's sunflower	4-2-02-375
SH	B-4258	Rutherford	Y	unresolved for small-whorled pogonia	4-2-02-362
RY	B-4259	Rutherford	Y	unresolved for small-whorled pogonia, FWS requests another heartleaf survey	4-2-02-363
RY	B-4260	Rutherford	Y	unresolved for small-whorled pogonia	4-2-02-364
SH	B-4261	Rutherford	Y	unresolved for small-whorled pogonia and heartleaf	4-2-02-365
RY	B-4264	Rutherford	Y	unresolved for small-whorled pogonia, FWS requests another survey for heartleaf	4-2-02-368
RY	B-4265	Rutherford	Y	unresolved for small-whorled pogonia, FWS requests another survey for heartleaf and irisette	4-2-02-366
RY	B-4266	Rutherford	Y	unresolved for small-whorled pogonia, FWS requests another survey for heartleaf	4-2-02-367
	note for Rutherford Co projects--No survey is required for Indiana bat because the record is a winter record.				
SH	B-4282	Stokes	R	unresolved for cardamine and James spiny mussel, FWS concerned about bridge design	4-2-02-376
DP	B-4284	Surry	Y	unresolved for pogonia, FWS requests assessment for bog turtle and brook floater, bridge to bridge	4-2-02-426
DP	B-4285	Surry	Y	unresolved for pogonia, FWS requests assessment for bog turtle and brook floater	4-2-02-425
RY	B-4286	Swain	R	unresolved for listed species, esp. Indiana bat, FWS concerned with bridge design	4-2-02-378
DW	B-4287	Swain	R	unresolved for listed species, esp. Indiana bat, FWS concerned with bridge design	4-2-02-377
RY	B-4288	Transylvania	Y	unresolved for listed species, FWS requests survey for bunched arrowhead	4-2-02-374
SH	B-4290	Transylvania	Y	unresolved for listed species	4-2-02-373
SH	B-4291	Transylvania	Y	need mussel surveys	4-2-02-372
MD	B-4316	Watauga	Y	FWS requests bridge to bridge for high quality stream, FWS requests survey for green floater	4-2-02-398
JJ	B-4317	Watauga	G	FWS requests bridge to bridge for high quality stream	4-2-02-399
MD	B-4318	Watauga	G	FWS requests bridge to bridge for high quality stream, FWS requests survey for green floater	4-2-02-400
MD	B-4322	Wilkes	G	FWS requests bridge to bridge for high quality stream, assessment for bog turtle	4-2-02-406
DW	B-4330	Yancey	Y	unresolved for elktoe, FWS requests resurvey for Spiraea, be careful of downstream effects	4-2-02-397

State of North Carolina
Department of Environment
and Natural Resources
Division of Water Quality

Michael Easley, Governor
Bill Ross, Secretary
Alan Klimack, Director

June 3, 2002

Memorandum To: William T. Goodwin, Jr., PE, Unit Head
Bridge Replacement Planning Unit
Project Development and Environmental Analysis Branch

Through: John Dorney
NC Division of Water Quality

From: Robert Ridings
NC Division of Water Quality

Subject: Review of Natural Systems Technical Reports for bridge replacement projects scheduled for construction in CFY 2005: "Green Light" Projects: B-4040, B-4041, B-4043.

In future reports, an Executive Summary Paragraph would be helpful. This should include a brief description of the work intended (i.e., replace bridge with another bridge or with a culvert), the amount of impact to wetlands and streams, and types of possible permits needed.

On all projects, use of proper sediment and erosion control will be needed. Sediment and erosion control measures should not be placed in wetlands. Sediment should be removed from any water pumped from behind a cofferdam before the water is returned to the stream.

This office would prefer bridges to be replaced with new bridges. However if the bridge must be replaced by a culvert and 150 linear feet or more of stream is impacted, a stream mitigation plan will be needed prior to the issuance of a 401 Water Quality Certification. While the NCDWQ realizes that this may not always be practical, it should be noted that for projects requiring mitigation, appropriate mitigation plans will be required prior to issuance of a 401 Water Quality Certification

For permitting, any project that falls under the Corps of Engineers' Nationwide Permits 23 or 33 do not require written concurrence by the NC Division of Water Quality. Notification and courtesy copies of materials sent to the Corps, including mitigation plans, are required. For projects that fall under the Corps of Engineers Nationwide Permit 14 or Regional General Bridge Permit 31, the formal 401 application process will be required including appropriate fees and mitigation plans.

Any proposed culverts shall be installed in such a manner that the original stream profile is not altered (i.e. the depth of the channel must not be reduced by a widening of the streambed).

Existing stream dimensions are to be maintained above and below locations of culvert extensions.

Do not use any machinery in the stream channels unless absolutely necessary. Additionally, vegetation should not be removed from the stream bank unless it is absolutely necessary. NCDOT should especially avoid removing large trees and undercut banks. If large, undercut trees must be removed, then the trunks should be cut and the stumps and root systems left in place to minimize damage to stream banks.

Thank you for requesting our input at this time. The DOT is reminded that issuance of a 401 Water Quality Certification requires that appropriate measures be instituted to ensure that water quality standards are met and designated uses are not degraded or lost.

North Carolina Wildlife Resources Commission

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

TO: William T. Goodwin, Jr., PE, Unit Head
Bridge Replacement & Environmental Analysis Branch

FROM: Ron Linville, Habitat Conservation Coordinator
Habitat Conservation Program

DATE: May 10, 2002

SUBJECT: NCDOT Bridge Replacements in Burke County:
Bridge No. 26, NC183, Linville River, B-4038
Bridge No. 51, SR1424, Parks Creek, B-4043
Bridge No. 251, SR1128, Hall Creek, B-4040
Bridge No. 4, SR1515, Smoky Creek, B-4044
Bridge No. 57, SR1244, Canoe Creek, B-4041
Bridge No. 94, SR1972, East Prong Hunting Creek, B-4047
Bridge No. 19, SR1736, Camp Creek, B-4045
Bridge No. 91, SR1127, Silver Creek, B-4039

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

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

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

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

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

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

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

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

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

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

1. The culvert must be designed to allow for 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. Bridge No. 26, NC183, Linville River, B-4038, RED LIGHT, Significant & historic resource, Proposed Critical Habitats, Game Lands, Trout clubs, National Park Service, Blue Ridge Parkway, Moratoriums proposed (15 Feb. – 30 May, Walleye and White Bass; 15 Oct – 31 March, Brown Trout), Brook floater (*Alasmidonta varicosa*) populations. NEW Spanning Bridge.

2. Bridge No. 51, SR1424, Parks Creek, B-4043 – YELLOW LIGHT, Santee Chub in John's River, No sport fish concerns indicated.

3. Bridge No. 251, SR1128, Hall Creek, B-4040 - GREEN LIGHT, No concerns indicated. Standard requirements.

4. Bridge No. 4, SR1515, Smoky Creek, B-4044 - YELLOW LIGHT, Moratorium for warm water fish species.

5. Bridge No. 57, SR1244, Canoe Creek, B-4041 - GREEN LIGHT, No concerns indicated. Standard requirements.

6. Bridge No. 94, SR1972, East Prong Hunting Creek, B-4047 - GREEN LIGHT, No concerns indicated. Standard requirements.

7. Bridge No. 19, SR1736, Camp Creek, B-4045 - GREEN LIGHT, No concerns indicated. Standard requirements.

8. Bridge No. 91, SR1127, Silver Creek, B-4039 - GREEN LIGHT, No concerns indicated. Standard requirements.

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 (336) 769-9453. Thank you for the opportunity to review and comment on these projects.

Cc: David Cox, WRC

North Carolina Department of Cultural Resources

State Historic Preservation Office

David L. S. Brook, Administrator

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

Division of Historical Resources
David J. Olson, Director

January 23, 2002

MEMORANDUM

TO: William D. Gilmore, Manager
Project Development and Environmental Analysis Branch
Division of Highways
Department of Transportation

FROM: David Brook David Brook 11/06/01

SUBJECT: Replace Bridge No. 57 on SR 1244 over Canoe Creek, B-4041, Burke County, ER 02-8502

Thank you for your letter of September 25, 2001, concerning the above project.

We have conducted a search of our files and are aware of no structures of historical or architectural importance located within the planning area.

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

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

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

DB:kgc

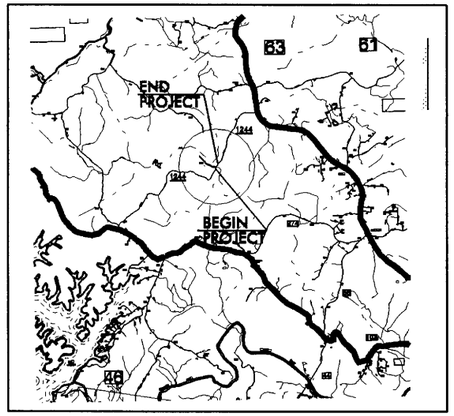
cc: Mary Pope Furr, NCDOT
Matt Wilkerson, NCDOT

	Location	Mailing Address	Telephone/Fax
Administration	507 N. Blount St, Raleigh, NC	4617 Mail Service Center, Raleigh 27699-4617	(919) 733-4763 •733-8653
Restoration	515 N. Blount St, Raleigh , NC	4613 Mail Service Center, Raleigh 27699-4613	(919) 733-6547 •715-4801
Survey & Planning	515 N. Blount St, Raleigh, NC	4618 Mail Service Center, Raleigh 27699-4618	(919) 733-4763 •715-4801

09/08/59

CONTRACT: TIP PROJECT: B-4041

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BURKE COUNTY

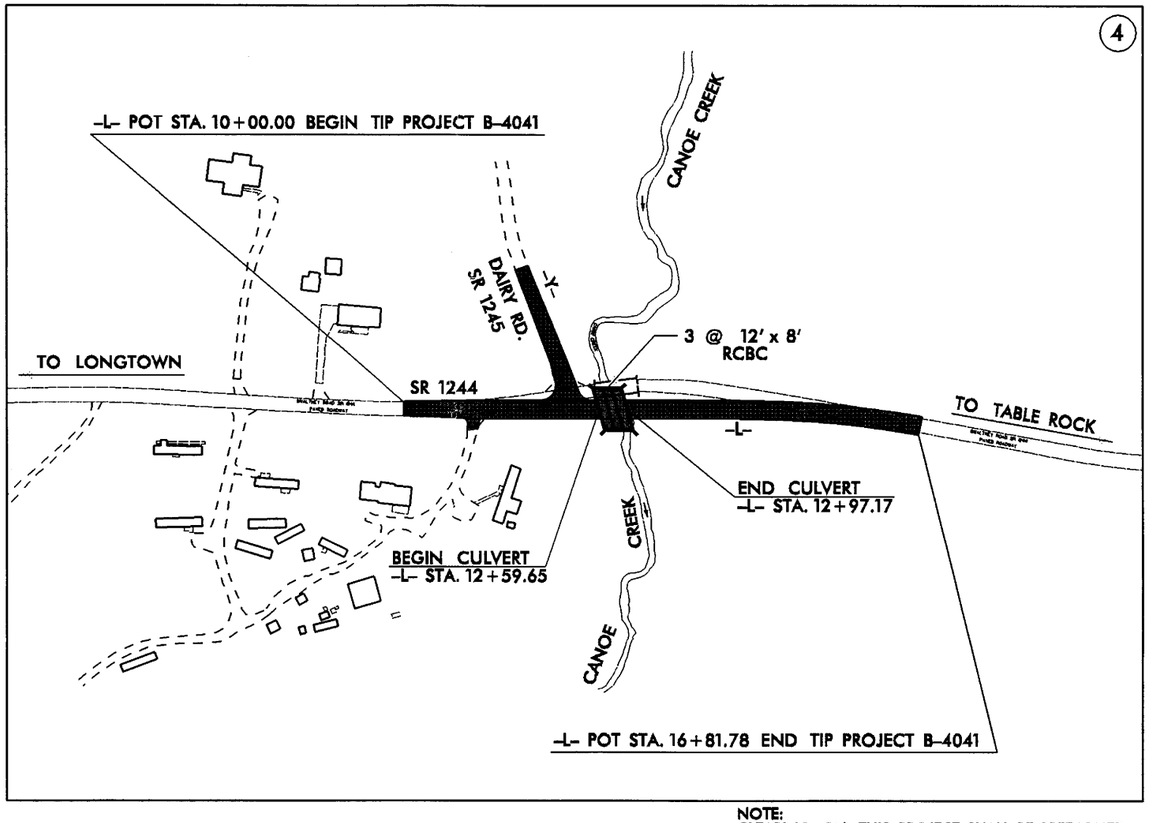
LOCATION: BRIDGE NO. 57 ON SR 1244 OVER CANOE CREEK

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND CULVERT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4041	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33407.1.1	BRZ-1244(1)	P.E.
33407.1.	BRZ-1244( )	R/W

SUBMITTAL: R/W PLANS



NC GRID
NAD 83

** DESIGN EXCEPTION FOR VERTICAL ALIGNMENT (CREST K, SAG K, SSD)

NOTE:
CLEARING ON THIS PROJECT SHALL BE PREFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

NOTE:
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SUNGATE DESIGN GROUP, P.A.
915 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL 919/851-2620 FAX 919/851-4426

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 2006 = 943
ADT 2025 = 3,600
DHV = 12 %
D = 55 %
T = 3 % *
** V = 60 MPH

* TTST 1% DUAL 2%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4041 = 0.122 mi
LENGTH STRUCTURE TIP PROJECT B-4041 = 0.007 mi
TOTAL LENGTH TIP PROJECT B-4041 = 0.129 mi

Plans prepared in the office of:
Ramey Kemp & Associates, Inc.
Transportation Consulting Engineers
4928-A Windy Hill Drive
Raleigh, North Carolina 27609
(919) 872-5462 fax (919) 878-5462
for the North Carolina Department of Transportation

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 18, 2005

LETTING DATE:
FEBRUARY 21, 2006

N.C.D.O.T. CONTACT:
CATHY S. HOUSER, PE
PROJECT ENGINEER
ROADWAY DESIGN

HYDRAULICS ENGINEER

P.E.
W. HENRY WELLS, JR.

ROADWAY DESIGN ENGINEER

P.E.
MATTHEW B. COPPLE

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR DATE

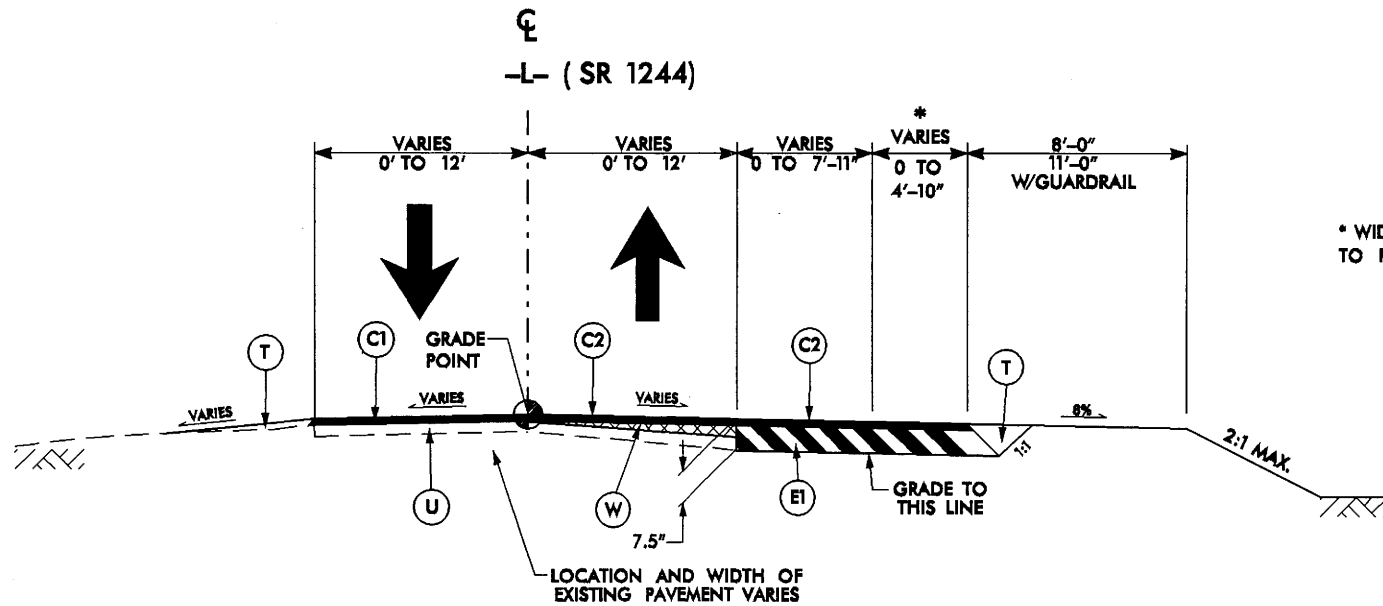
15-MAR-2005 14:31
r:\roadway\prj\b4041_rdy_tsh.dgn
mpatson
AT RD21218

PROJECT REFERENCE NO.	SHEET NO.
B-4041	2

ROADWAY DESIGN ENGINEER

PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



* WIDENING FOR MAINTENANCE OF TRAFFIC TO REMAIN IN PLACE

USE TYPICAL SECTION NO. 1

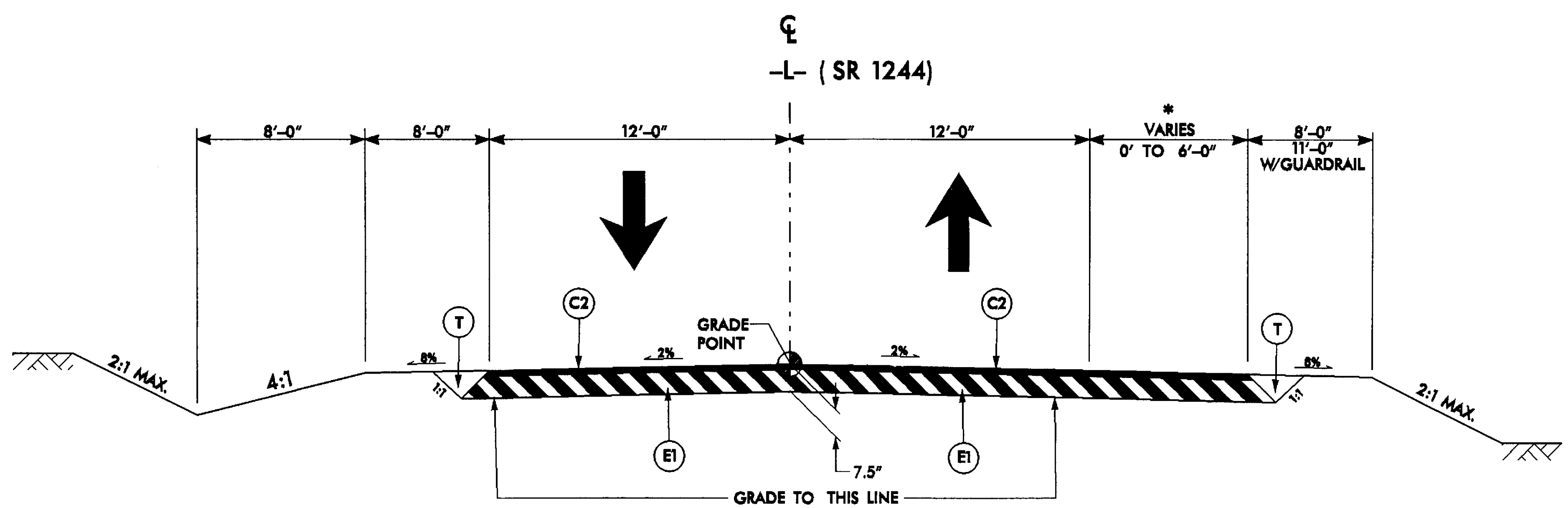
-L- STA. 10+30.00 TO STA. 11+00.00
-L- STA. 15+50.00 TO STA. 16+50.00

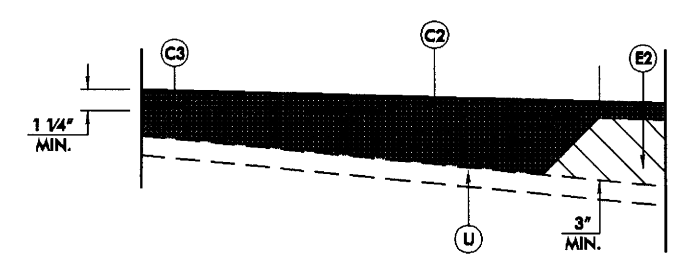
TYPICAL SECTION NO. 1

NOTE:
FEATHER TO EXISTING PAVEMENT FROM -L- STA. 10+00.00 TO STA. 10+30.00 AND FROM -L- STA. 16+50.00 TO STA. 16+81.78

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1 1/4" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD.
C2	PROP. APPROX. 2 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH TO PLACED IN LAYERS NOT TO EXCEED 1 1/2" IN DEPTH.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL THIS SHEET)

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





Detail Showing Method of Wedging

USE TYPICAL SECTION NO. 2

-L- STA. 11+50.00 TO STA. 15+50.00

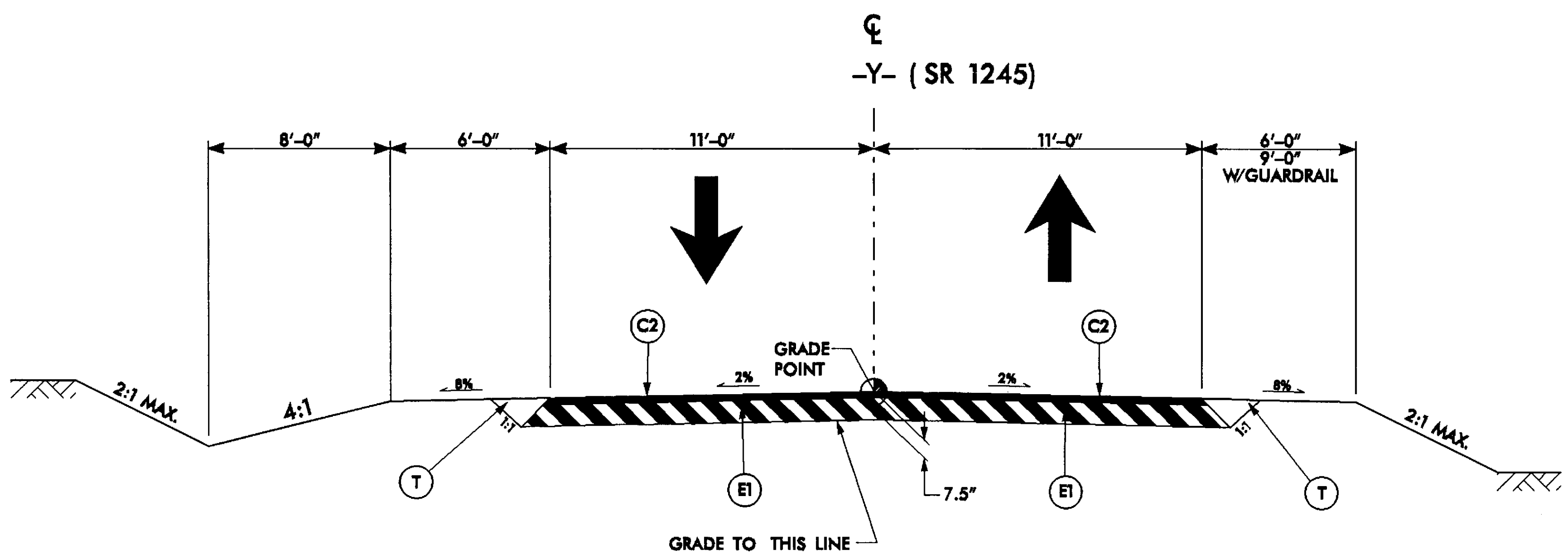
* WIDENING FOR MAINTENANCE OF TRAFFIC TO REMAIN IN PLACE

TYPICAL SECTION NO. 2

Ramey Kemp & Associates, Inc.
Transportation Consulting Engineers
4928-A Windy Hill Drive Raleigh, North Carolina 27609
(919) 872-5115 fax (919) 878-5416

PROJECT REFERENCE NO.	SHEET NO.
B-4041	2-A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



USE TYPICAL SECTION NO. 3

-Y- STA. 10+00.00 TO STA. 11+00.00

TYPICAL SECTION NO. 3

NOTE:
FEATHER TO EXISTING PAVEMENT FROM
-Y- STA. 11+00.00 TO STA. 11+15.00

PAVEMENT SCHEDULE	
C2	PROP. APPROX. 2 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
T	EARTH MATERIAL.

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

Ramey Kemp & Associates, Inc.
Transportation Consulting Engineers
4928-A Windy Hill Drive Raleigh, North Carolina 27609
(919) 872-5115 Fax (919) 878-5416

15-MAR-2005 14:32
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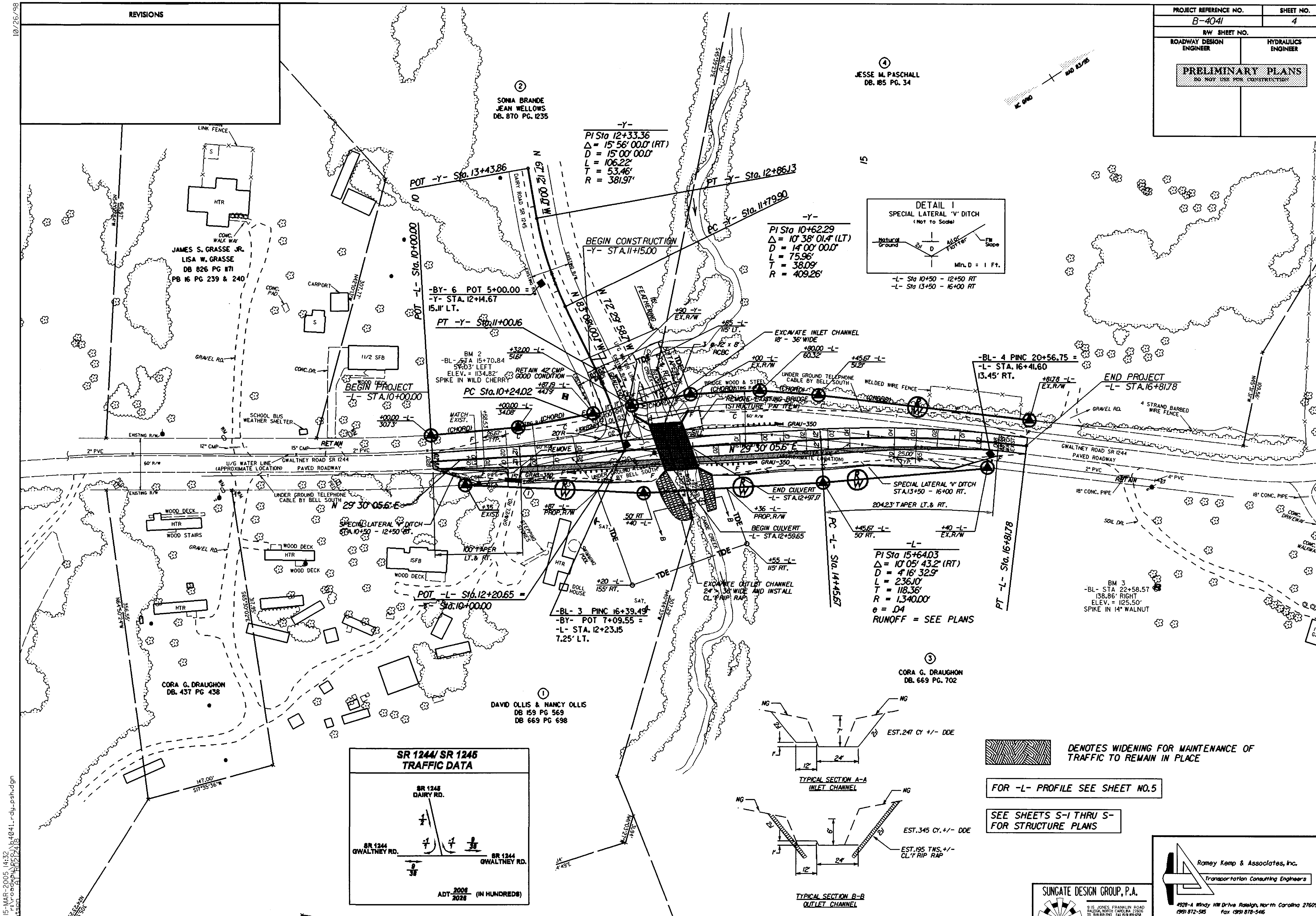
watson AT RD212418


REVISIONS
PROJECT REFERENCE NO.
B-4041
SHEET NO.
4
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
10/26/98
SONIA BRANDE
JEAN WELLOWS
DB. 870 PG. 1235
JESSE M. PASCHALL
DB. 185 PG. 34
JAMES S. GRASSE JR.
LISA W. GRASSE
DB 826 PG 1171
PB 16 PG 239 & 240
-Y-
PI Sta 12+33.36
Δ = 15° 56' 00.0" (RT)
D = 15° 00' 00.0"
L = 106.22'
T = 53.46'
R = 381.97'
POT -Y- Sta. 13+43.86
PT -Y- Sta. 12+86.13
PC -Y- Sta. 11+79.90
BEGIN CONSTRUCTION
-Y- STA. 11+15.00
-Y-
PI Sta 10+62.29
Δ = 10° 38' 01.4" (LT)
D = 14° 00' 00.0"
L = 75.96'
T = 38.09'
R = 409.26'
DETAIL I
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground
Fill Slope
Min. D = 1 Ft.
-L- Sta 10+50 - 12+50 RT
-L- Sta 13+50 - 16+00 RT
-BY- 6 POT 5+00.00 =
-Y- STA. 12+14.67
15.11' LT.
PT -Y- Sta. 11+00.16
POT -L- Sta. 10+00.00
BM 2
-BL- STA 15+70.84
57.03' LEFT
ELEV. = 1134.82'
SPIKE IN WILD CHERRY
RETAIN 42" CMP GOOD CONDITION
PC Sta. 10+24.02
BEGIN PROJECT
-L- STA. 10+00.00
EXCAVATE INLET CHANNEL
18' - 36' WIDE
3 @ 12' x 8' RCBC
BRIDGE WOOD & STEEL
REMOVE EXISTING BRIDGE
UNDER GROUND TELEPHONE CABLE BY BELL SOUTH
WELDED WIRE FENCE
-BL- 4 PINC 20+56.75 =
-L- STA. 16+41.60
13.45' RT.
END PROJECT
-L- STA. 16+81.78
4 STRAND BARBED WIRE FENCE
GWALTNEY ROAD SR 1244
PAVED ROADWAY
U/G WATER LINE (APPROXIMATE LOCATION)
UNDER GROUND TELEPHONE CABLE BY BELL SOUTH
N 29° 30' 05.6" E
SPECIAL LATERAL 'V' DITCH
STA. 10+50 - 12+50 RT.
SPECIAL LATERAL 'V' DITCH
STA. 13+50 - 16+00 RT.
204.23' TAPER LT. & RT.
END CULVERT
-L- STA 12+97.17
BEGIN CULVERT
-L- STA 12+59.65
100' TAPER LT. & RT.
POT -L- Sta. 12+20.65 =
-Sta. 10+00.00
-BL- 3 PINC 16+39.49 =
-BY- POT 7+09.55 =
-L- STA. 12+23.15
7.25' LT.
EXCAVATE OUTLET CHANNEL
24' - 36' WIDE AND INSTALL
CL.'I' RIP RAP
PC -L- Sta. 14+45.67
PT -L- Sta. 16+81.78
-L-
PI Sta 15+64.03
Δ = 10° 05' 43.2" (RT)
D = 4° 16' 32.9"
L = 236.10'
T = 118.36'
R = 1,340.00'
e = .04
RUNOFF = SEE PLANS
BM 3
-BL- STA 22+58.57
138.86' RIGHT
ELEV. = 1125.50'
SPIKE IN 14" WALNUT
CORA G. DRAUGHON
DB. 437 PG 438
DAVID OLLIS & NANCY OLLIS
DB 159 PG 569
DB 669 PG 698
CORA G. DRAUGHON
DB. 669 PG. 702
SR 1244/ SR 1245
TRAFFIC DATA
SR 1245 DAIRY RD.
SR 1244 GWALTNEY RD.
ADT 2006/2026 (IN HUNDREDS)
TYPICAL SECTION A-A
INLET CHANNEL
EST. 247 CY +/- DDE
TYPICAL SECTION B-B
OUTLET CHANNEL
EST. 345 CY. +/- DDE
EST. 195 TNS. +/- CL.'I' RIP RAP
DENOTES WIDENING FOR MAINTENANCE OF TRAFFIC TO REMAIN IN PLACE
FOR -L- PROFILE SEE SHEET NO.5
SEE SHEETS S-1 THRU S- FOR STRUCTURE PLANS
SUNGATE DESIGN GROUP, P.A.
Ramey Kemp & Associates, Inc.
Transportation Consulting Engineers
4928-A Windy Hill Drive Raleigh, North Carolina 27609
(919) 872-5115 Fax (919) 878-5416
15-MAR-2005 14:32

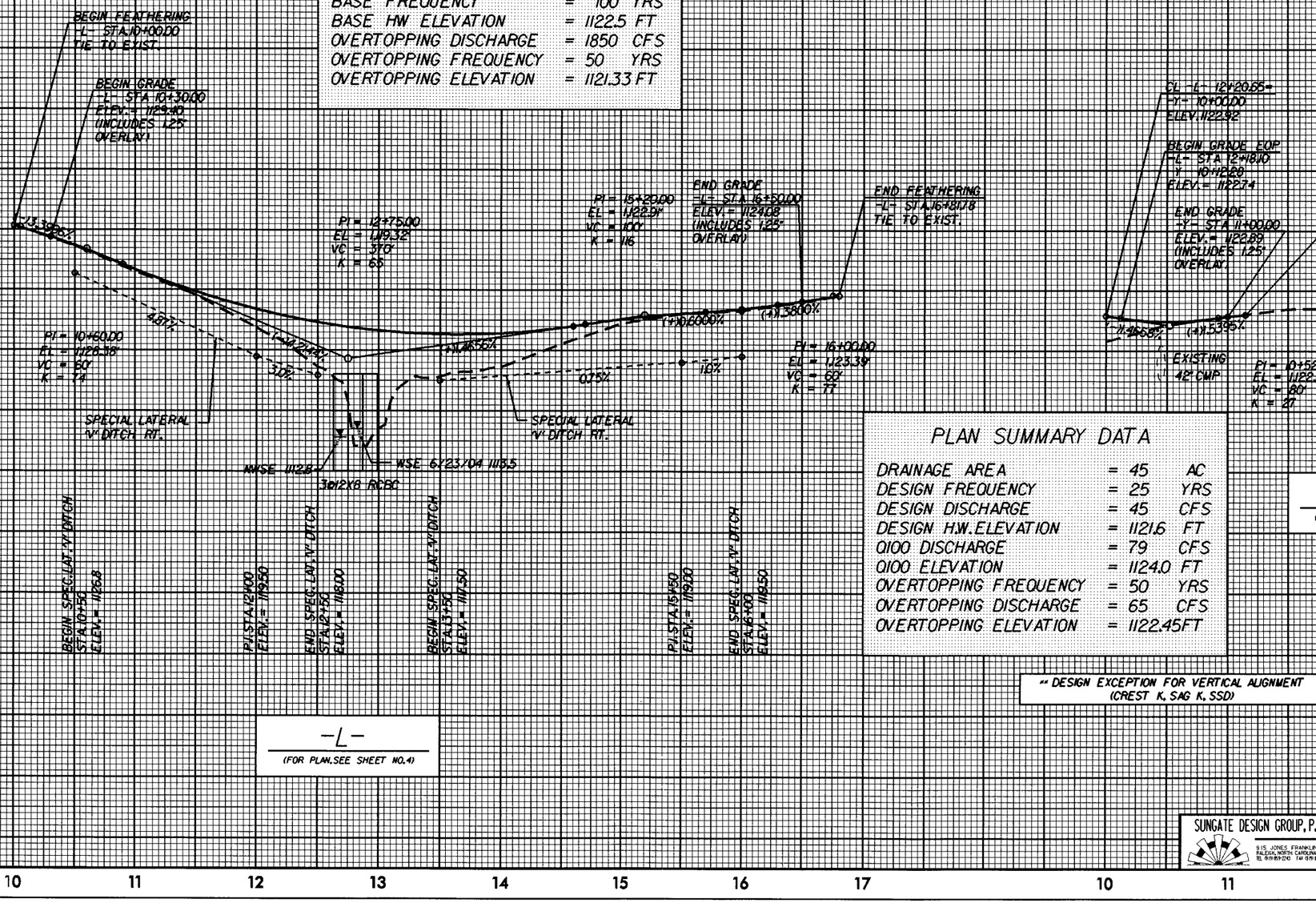
B-4041	5

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

B.M.#2 ELEV.= 1134.82
RR SPIKE IN BASE OF
12" WILD CHERRY
57.00' LT. OF -BL- STA. 15+71
66.46' LT. OF -L- STA. 11+56.37

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 1500	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 1121.2	FT
BASE DISCHARGE	= 2250	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 1122.5	FT
OVERTOPPING DISCHARGE	= 1850	CFS
OVERTOPPING FREQUENCY	= 50	YRS
OVERTOPPING ELEVATION	= 1121.33	FT



PLAN SUMMARY DATA

DRAINAGE AREA	= 45	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 45	CFS
DESIGN H.W. ELEVATION	= 1121.6	FT
Q100 DISCHARGE	= 79	CFS
Q100 ELEVATION	= 1124.0	FT
OVERTOPPING FREQUENCY	= 50	YRS
OVERTOPPING DISCHARGE	= 65	CFS
OVERTOPPING ELEVATION	= 1122.45	FT

-L-
(FOR PLAN SEE SHEET NO. 4)

-Y-
(FOR PLAN SEE SHEET NO. 4)

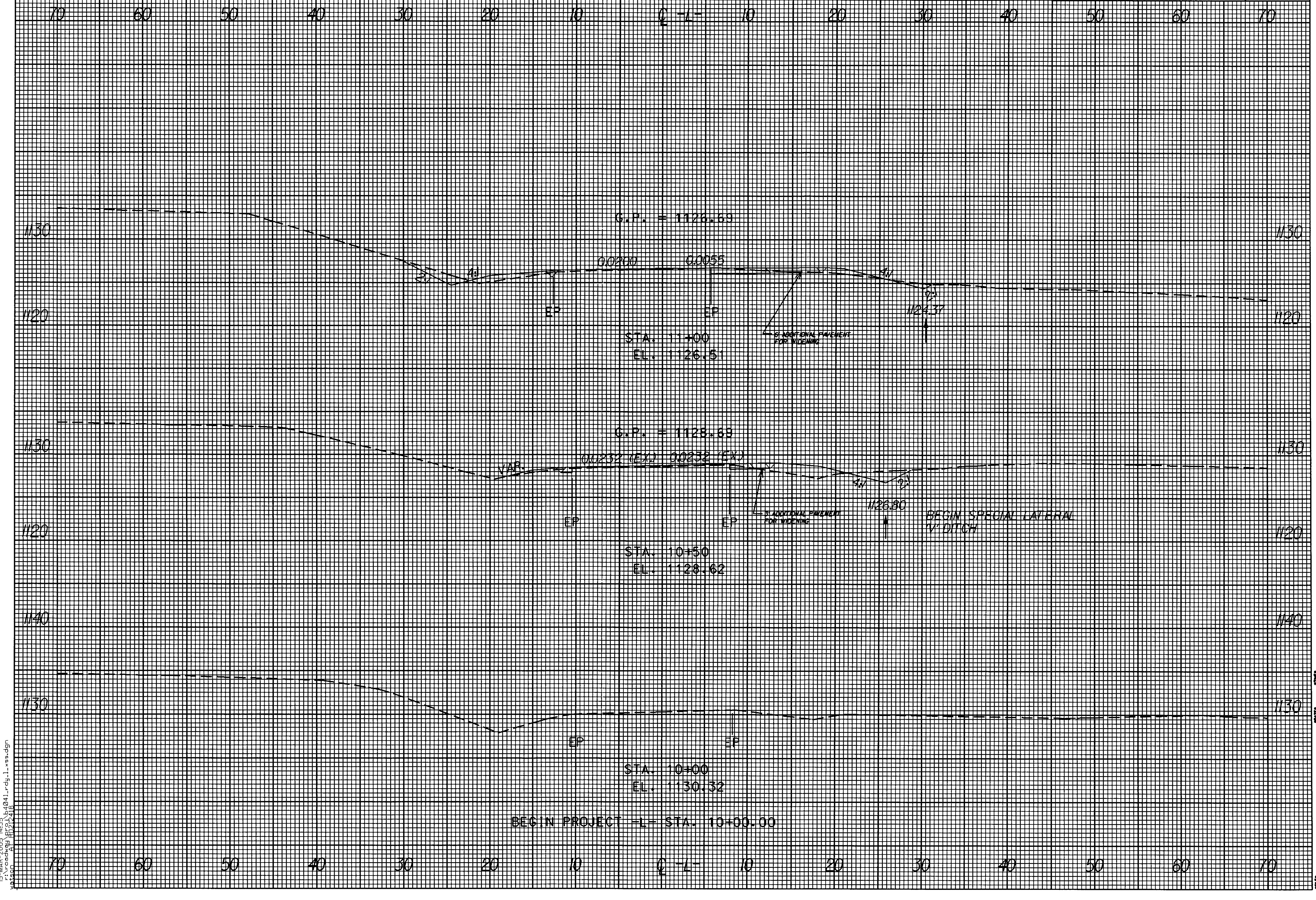
** DESIGN EXCEPTION FOR VERTICAL ALIGNMENT
(CREST K, SAG K, SSD)

SEE SHEET S-1 THRU S-
FOR STRUCTURE PLANS

SUNGATE DESIGN GROUP, P.A.
915 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 FAX (919) 851-4258

Ramey Kemp & Associates, Inc.
Transportation Consulting Engineers
4928-A Windy Hill Drive Raleigh, North Carolina 27609
(919) 872-5185 fax (919) 878-5486

PROJECT REFERENCE NO.	SHEET NO.
B-4041	X-2



0 5
70 60 50 40 30 20 10 ℄ -L- 10 20 30 40 50 60 70
1130
1120
G.P. = 1126.69
0.0200
0.0055
2:1
4:1
4:1
2:1
EP
EP
1124.37
5' ADDITIONAL PAVEMENT FOR WIDENING
STA. 11+00
EL. 1126.51
1130
1120
G.P. = 1128.69
VAR.
0.0232 (EX.)
0.0232 (EX.)
4:1
2:1
EP
EP
5' ADDITIONAL PAVEMENT FOR WIDENING
1126.80
BEGIN SPECIAL LATERAL
'V' DITCH
STA. 10+50
EL. 1128.62
1140
1130
EP
EP
STA. 10+00
EL. 1130.32
BEGIN PROJECT -L- STA. 10+00.00
70 60 50 40 30 20 10 ℄ -L- 10 20 30 40 50 60 70

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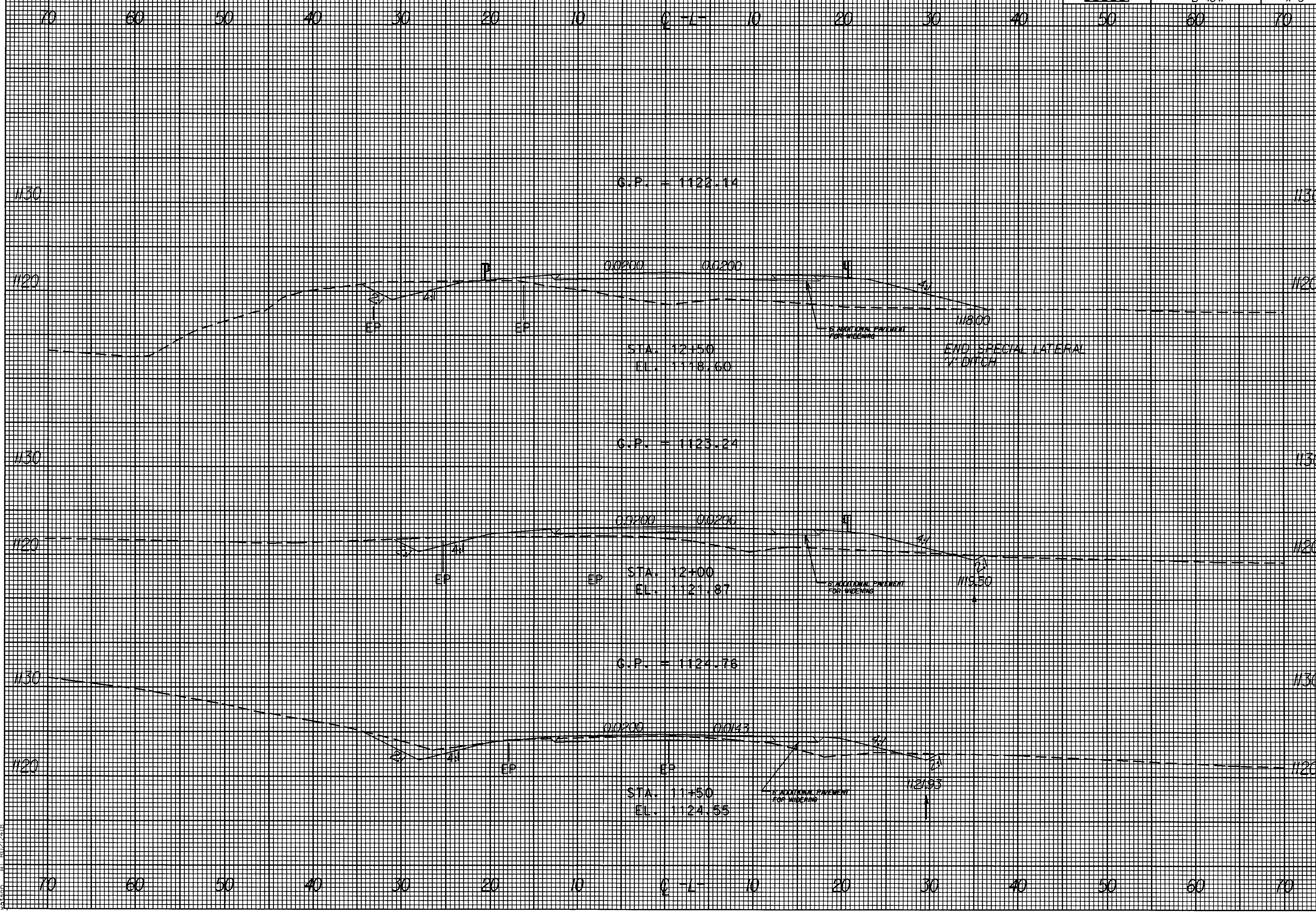
watson AT RD212418

PROJECT REFERENCE NO.	SHEET NO.
B-4041	X-3



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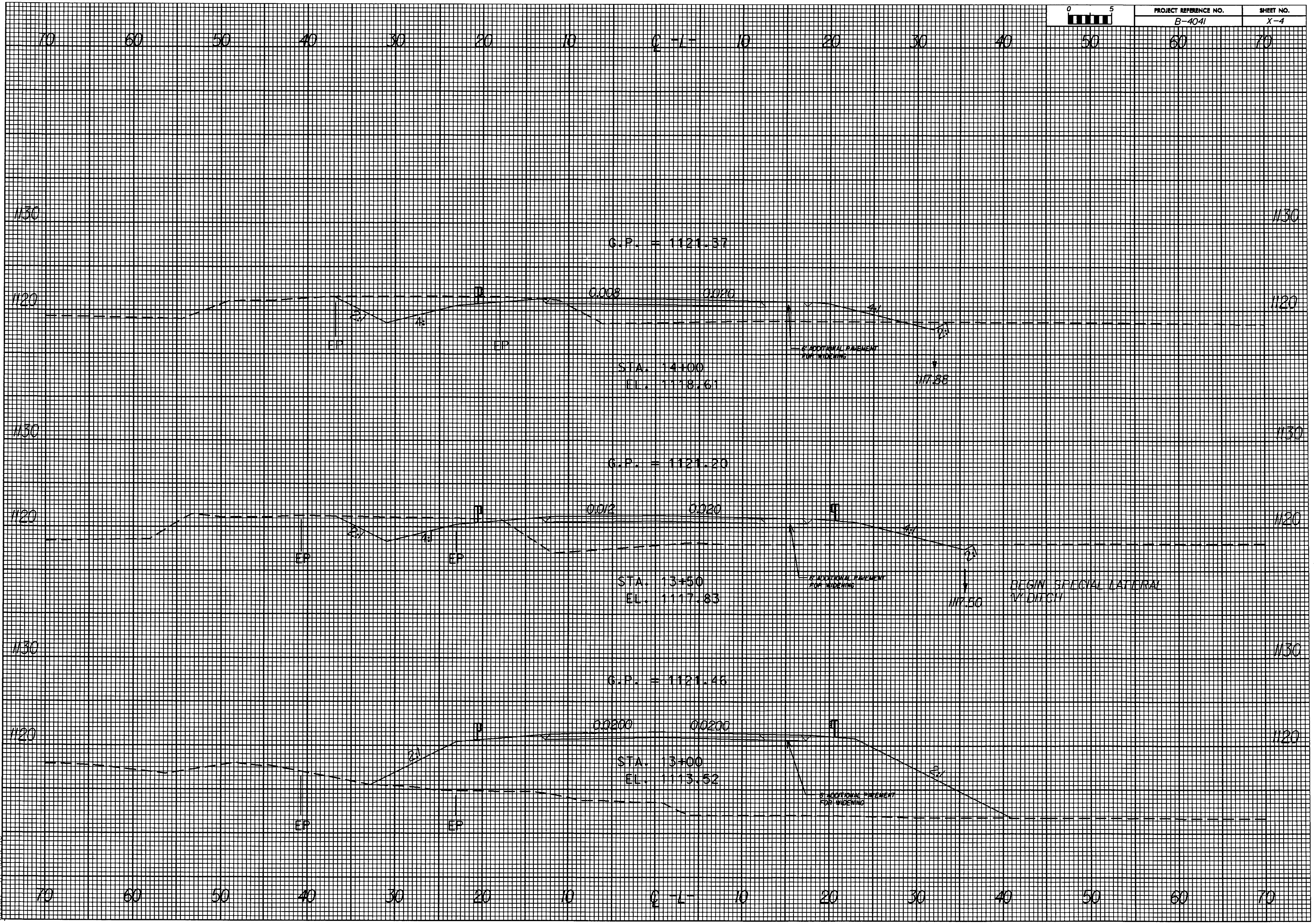
PROJECT REFERENCE NO.	SHEET NO.
B-4041	X-4



0 5
70 60 50 40 30 20 10 ℄ -L- 10 20 30 40 50 60 70
1130
G.P. = 1121.37
1120
0.008
0.020
2:1
4:1
EP
EP
4:1
2:1
6' ADDITIONAL PAVEMENT FOR WIDENING
STA. 14+00
EL. 1118.61
1117.88
1130
G.P. = 1121.20
1120
0.012
0.020
2:1
4:1
EP
EP
4:1
2:1
6' ADDITIONAL PAVEMENT FOR WIDENING
STA. 13+50
EL. 1117.83
1117.50
BEGIN SPECIAL LATERAL 'V' DITCH
1130
G.P. = 1121.46
1120
0.0200
0.0200
2:1
2:1
STA. 13+00
EL. 1113.52
6' ADDITIONAL PAVEMENT FOR WIDENING
EP
EP
70 60 50 40 30 20 10 ℄ -L- 10 20 30 40 50 60 70

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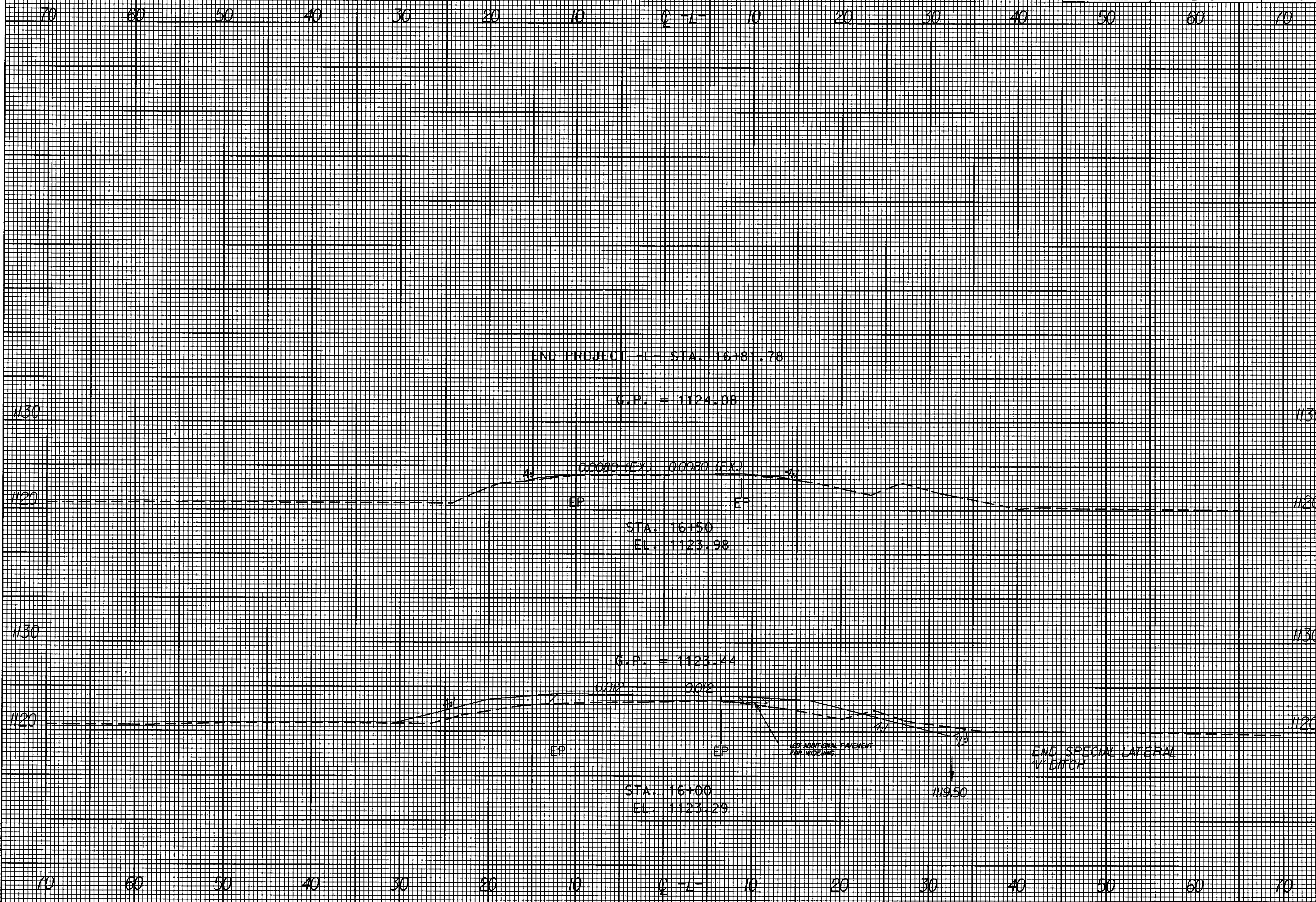
PROJECT REFERENCE NO.	SHEET NO.
B-4041	X-6



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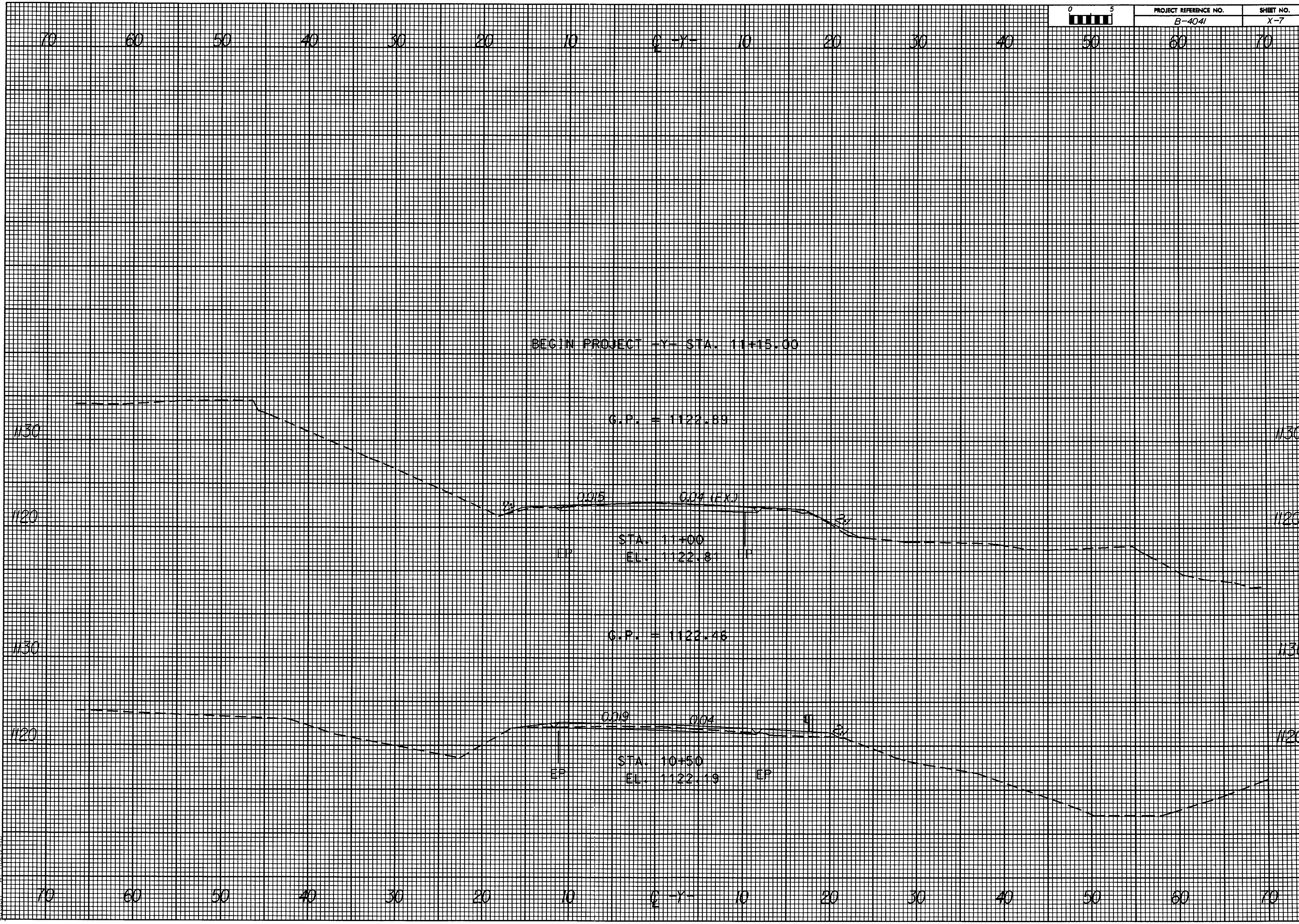
watson AT RD212418

PROJECT REFERENCE NO.	SHEET NO.
B-4041	X-7



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watson AT R02T2418