



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

April 22, 2004

US Army Corps of Engineers  
Regulatory Field Office  
151 Patton Ave.  
Room 208  
Asheville, NC 28801-5006

ATTENTION: Mr. Steve Lund  
NCDOT Coordinator

Dear Sir:

Subject: **Nationwide 23 and 33 Permit Application** for the Replacement of Bridge No. 145 over Dillingham Creek on SR 2173, Buncombe County, Federal Aid Project No. BRZ-2173(1), State Project No. 8.2843601, TIP B-3310, Division 13.

Please find enclosed three copies of the project planning report for the above referenced project. Replacement of Bridge No. 145 will be to the south of the existing location with a new bridge approximately 140 feet in length. The new bridge will have a 35-foot clear roadway width with a three-foot shoulder to the north and an eight-foot shoulder to the south. The bridge will have two 12-foot travel lanes. The new approach roadway will match the bridge width. The new bridge will have a design speed of 60 mph.

Jurisdictional wetlands will be impacted by the construction of the bridge in the amount of 0.615 acres and mitigation is required. These impacts will consist of fill, mechanized clearing, and excavation.

Slopes of 3:1 will be used in the wetland due to guardrail constraints.

During construction, traffic will be maintained by the existing bridge.

**Bridge Demolition**

Bridge No. 145 is composed of a wooden plank floor on steel I-beam girders supported by reinforced concrete abutments and one pier. The existing structure is 71.8 feet long with a 24.1-foot clear roadway width. The crown of the bridge is 12 feet above the streambed. The maximum, potential, temporary fill that could be dropped into the "Waters of the United States" is 129 cubic yards. However, due to its structural components, the bridge can be removed without dropping any components into surface waters.

As noted in the project's CE document, NCDOT will observe an in-stream construction moratorium from November 1 to April 15 to avoid impacts to trout reproduction.

### **Mitigation**

The necessary compensatory mitigation to offset unavoidable impacts to waters that are jurisdictional under the federal Clean Water Act will be provided by the Ecosystem Enhancement Program (EEP). The offsetting mitigation will derive from an inventory of assets already in existence within the same 8-digit cataloguing unit. The NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent possible. The remaining, unavoidable impacts to 0.615 acres of jurisdictional wetlands will be offset by compensatory mitigation provided by the EEP program.

### **Temporary Workpad**

There will be 0.069 ac. temporary stream impacts from the construction of temporary rock workpad in Dillingham Creek for the construction of Bridge No. 145. A workpad will be required for the construction of the interior bents in order to provide for construction access. The workpad will consist of Class II riprap and is detailed on permit drawing sheets 6, 7, & 8 of 19.

Restoration Plan: No permanent fill will result from the subject activity. The materials used as temporary fill in the construction of the workpad will be removed. The temporary fill areas will be graded back to the original contours. Elevations and contours in the vicinity of the proposed workpad are available from the field survey notes.

Schedule for Construction of Workpad: It is assumed that the contractor will begin construction of the proposed workpad shortly after the date of availability for the project. The Let date is August 17, 2004 with a date of availability of September 20, 2004.

Removal and Disposal: The workpad will be removed within 90 days of the completion of the deck slab for the bridge using excavating equipment. All materials placed in the stream by the contractor will be removed. The Class II riprap that is removed may be used on end slopes where Class II riprap is required at the discretion of the engineer. All other materials removed by the contractor will be disposed of at an off-site location.

### **Federally Protected Species**

Some populations of fauna and flora have been in, or are in, the process of decline either due to natural forces or their inability to co-exist with human activities. Federal law (under the provisions of the Endangered Species Act (ESA) of 1973, as amended) requires that any action likely to adversely affect a species classified as federally protected be subject to review by the United States Fish and Wildlife Service (USFWS). Other species may receive additional protection under separate state laws. Plants and animals with federal classifications of Endangered (E), Threatened (T), Proposed Endangered (PE) and Proposed Threatened (PT) are protected under provisions of ESA §§7 and 9, as amended.

As of January 29, 2003, the USFWS lists 13 federally protected species for Buncombe County. Table 1 depicts these species. The biological conclusion for all the protected species, except Virginia spirea, is "**No Effect**". The biological conclusion for Virginia spirea is "**May Affect, Not Likely To Adversely Affect**". A letter seeking concurrence for this conclusion from the USFWS was sent on March 30, 2004. A copy of the letter is attached for your convenience.

**Table 1. Federally Protected Species for Buncombe County**

Scientific Name	Common Name	Status
<i>Felis (Puma) concolor couguar</i>	Eastern Cougar	Endangered
<i>Glaucomys sabrinus cloratus</i>	Carolina Northern Flying Squirrel	Endangered
<i>Myotis grisescens</i>	Gray Bat	Endangered
<i>Clemmys muhlenbergii</i>	Bog Turtle	Threatened (S/A)
<i>Hybopsis monacha</i>	Spotfin Chub	Threatened
<i>Alasmidonta raveneliana</i>	Appalachian Elktoe	Endangered
<i>Epioblasma capsaeformis</i>	Oyster Mussel	Endangered
<i>Epioblasma florentia walkeri</i>	Tan Riffleshell	Endangered
<i>Geum radiatum</i>	Spreading Avens	Endangered
<i>Sagittaria fasciculata</i>	Bunched Arrowhead	Endangered
<i>Sarracenia jonesii</i>	Mountain Sweet Pitcher Plant	Endangered
<i>Spiraea virginiana</i>	Virginia Spiraea	Threatened
<i>Gymnoderma lineare</i>	Rock Gnome Lichen	Endangered
<p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• “Endangered” denotes a species in danger of extinction throughout all or a significant portion of its range.</li> <li>• “Threatened” denotes a species likely to become endangered in the foreseeable future throughout all or a significant portion of its range.</li> <li>• “Threatened (S/A)” denotes a species that is treated as threatened due to its similarity of appearance to another endangered or threatened species that is listed for protection. Threatened (S/A) species are not biologically endangered or threatened and are not subject to Section 7 consultation.</li> </ul>		

### Regulatory Approvals

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

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

We anticipate that comments from the North Carolina Wildlife Resources Commission (NCWRC) will be required prior to authorization by the Corps of Engineers. By copy of this letter and attachment, NCDOT hereby requests NCWRC review. NCDOT requests that NCWRC forward their comments to the Corps of Engineers.

A copy of this permit application will be posted on the DOT website at: <http://www.ncdot.org/planning/pe/naturalunit/Permit.html>.

If you have any questions or need additional information, please contact Mr. Chris Underwood at (919) 715-1541.

Sincerely,

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

cc:

Mr. John Hennessy, Division of Water Quality (7 copies)  
Ms. Marella Buncick, USFWS  
Ms. Marla Chambers, NCWRC  
Mr. Harold Draper, TVA  
Mr. Jay Bennett, P.E., Roadway Design  
Mr. Omar Sultan, Programming and TIP  
Mr. Art McMillan, P.E., Highway Design  
Mr. David Chang, P.E., Hydraulics  
Mr. Greg Perfetti, P.E., Structure Design  
Mr. Mark Staley, Roadside Environmental  
Mr. John F. Sullivan III, P. E., FHWA  
Mr. J. J. Swain, P.E, Division Engineer  
Mr. Roger Bryan, DEO  
Mr. David Franklin, USACE, Wilmington (Cover Letter only)



STATE OF NORTH CAROLINA  
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SECRETARY

March 26, 2004

Mr. Brian Cole  
US Fish and Wildlife Service  
160 Zillicoa Street  
Asheville, NC 28801

Dear Mr. Cole:

This letter is in reference to NCDOT's proposed the replacement of Bridge No. 145 on SR 2173 (Dillingham Road) over Dillingham Creek (TIP # B-3310) in Buncombe County. The project plans call for the replacement of Bridge No. 145 with a 142-foot long structure south (downstream) of the existing structure. Traffic will be maintained on the existing bridge during construction. The purpose of this letter is to summarize federally protected species surveys to date and to request concurrence from the U.S. Fish and Wildlife Service (Service) pursuant to Section 7 of the Endangered Species Act, as amended (16 U.S.C. 1531 *et seq.*) (ESA).

The Categorical Exclusion (CE) for this project was completed in July 2002. At this time, a Biological Conclusion of "No Effect" was determined for Virginia spiraea (*Spiraea virginiana*). However, as suitable habitat is present in the project area, the biological conclusions have been updated to "May Affect – Not Likely to Adversely Affect". The Biological Conclusions of "No Effect" determined in the original CE document remain valid for the other Federally listed species. There have been no changes made to the list of federally protected species since the CE was written. The USFWS list of protected species for Buncombe County (last updated January 2004) and updated Biological Conclusions are listed in the following table.

Common Name	Scientific Name	Status	Biological Conclusion
Spotfin chub	<i>Cyprinella monacha</i>	T	No Effect
Bog turtle	<i>Glyptemys muhlenbergii</i>	T (S/A)	No Effect
Carolina northern flying squirrel	<i>Glaucomys sabrinus coloratus</i>	E	No Effect
Eastern cougar	<i>Puma concolor cougar</i>	E	No Effect
Gray bat	<i>Myotis grisescens</i>	E	No Effect
Appalachian elktoe	<i>Alasmidonta raveneliana</i>	E	No Effect
Oyster mussel	<i>Epioblasma capsaeformis</i>	E	No Effect
Spreading avens	<i>Geum radiatum</i>	E	No Effect
Bunched arrowhead	<i>Sagittaria fasciculata</i>	E	No Effect
Mountain sweet pitcher plant	<i>Sarracenia jonesii</i>	E	No Effect
Virginia spiraea	<i>Spiraea virginiana</i>	T	May Affect – Not Likely to Adversely Affect
Rock gnome lichen	<i>Gymnoderma lineare</i>	E	No Effect

KEY:

Status Definition

T (S/A) Threatened (Similarity of Appearance) - A taxon that is "threatened due to similarity of appearance with other rare species."

T Threatened – A taxon "likely to become endangered within the foreseeable future throughout all or a significant portion of its range."

E Endangered – A taxon "in danger of extinction throughout all or a significant portion of its range."

### Virginia spiraea

Suitable habitat exists for Virginia spiraea (*S. virginiana*) within the project boundaries. A survey was conducted by NCDOT biologists Chris Manley, Michael Turchy, and Chris Underwood on July 30, 2003. No Virginia spiraea specimens were identified in approximately 3 man-hours of survey time.

### Qualifications of Principal Investigators

Investigator: Chris Manley

Education: BS Fisheries and Wildlife Sciences, Minor in Botany,  
North Carolina State University, 1996.

Experience: Wildlife Technician, North Carolina Wildlife Resources Commission,  
January 1996- February 1998.

Agricultural Consultant, East Coast Agri-Technologies, March 1998- Dec  
1999.

Environmental Specialist, NCDOT, June 2003- Present

Investigator: Michael Turchy

Education: BA Geology, Western Carolina University, 2001

Experience: Environmental Specialist, NCDOT, May 2002- Present.

Investigator: Chris Underwood  
Education: BS Wildlife and Fisheries Science, University of Tennessee at Knoxville,  
1989  
Experience: Biologist, Tennessee Valley Authority, 1991- 2003  
Environmental Biologist, NCDOT, May 2003- Present

Based on our surveys, NCDOT concludes that the proposed project warrants a Biological Conclusion of "May Affect, Not Likely to Adversely Affect" for Virginia spiraea. We believe that the requirements of Section 7(a)(2) of the ESA have been satisfied and hereby request your concurrence.

Thank you for your assistance with this project. If you have any questions or need additional information please call Chris Manley at (919) 715-1487 or via e-mail at [cdmanley@dot.state.nc.us](mailto:cdmanley@dot.state.nc.us)

Sincerely,



Phil Harris, PE, Manager  
PDEA-Office of Natural Environment

cc: **Steve Lund, USACE**  
Stacy Baldwin, P.E., Project Development Engineer  
File: B-3310

**Office Use Only:**

Form Version May 2002

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

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

**I. Processing**

1. Check all of the approval(s) requested for this project:  
 Section 404 Permit  Riparian or Watershed Buffer Rules  
 Section 10 Permit  Isolated Wetland Permit from DWQ  
 401 Water Quality Certification
2. Nationwide, Regional or General Permit Number(s) Requested: **NWPs 23 and 33**
3. If this notification is solely a courtesy copy because written approval for the 401 Certification is not required, check here:
4. If payment into the North Carolina Wetlands Restoration Program (NCWRP) is proposed for mitigation of impacts (verify availability with NCWRP prior to submittal of PCN), complete section VIII and check here:
5. If your project is located in any of North Carolina's twenty coastal counties (listed on page 4), and the project is within a North Carolina Division of Coastal Management Area of Environmental Concern (see the top of page 2 for further details), check here:

**II. Applicant Information**

1. Owner/Applicant Information  
Name: **NC DOT/Project Development & Environmental Analysis Branch/ Greg Thorpe**  
Mailing Address: **1548 Mail Service Center, Raleigh, NC 27699-1548**  
\_\_\_\_\_  
\_\_\_\_\_  
Telephone Number: **919-733-3141** Fax Number: **919-733-9794**  
E-mail Address: \_\_\_\_\_
2. Agent/Consultant Information (A signed and dated copy of the Agent Authorization letter must be attached if the Agent has signatory authority for the owner/applicant.)  
Name: \_\_\_\_\_  
Company Affiliation: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
Telephone Number: \_\_\_\_\_ Fax Number: \_\_\_\_\_  
E-mail Address: \_\_\_\_\_

### III. Project Information

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

1. Name of project: Replacement of Bridge No. 145 over Dillingham Creek on SR 2173
2. T.I.P. Project Number or State Project Number (NCDOT Only): B-3310
3. Property Identification Number (Tax PIN): \_\_\_\_\_
4. Location  
County: Buncombe Nearest Town: Barnardsville  
Subdivision name (include phase/lot number): \_\_\_\_\_  
Directions to site (include road numbers, landmarks, etc.): I-40 W from Raleigh to Asheville to US 19/23 to NC 197 to SR 2173 crossing
5. Site coordinates, if available (UTM or Lat/Long): 35°46.13'N, 82°26.17'W  
(Note – If project is linear, such as a road or utility line, attach a sheet that separately lists the coordinates for each crossing of a distinct waterbody.)
6. Property size (acres): \_\_\_\_\_
7. Nearest body of water (stream/river/sound/ocean/lake): Dillingham Creek (Class C)
8. River Basin: French Broad  
(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: Highway corridor with roadway shoulders  
\_\_\_\_\_  
\_\_\_\_\_

10. Describe the overall project in detail, including the type of equipment to be used: \_\_\_\_\_  
**Replace Bridge No. 145 with a bridge to the south. Heavy duty excavation equipment such as trucks, dozers, cranes, and other equipment necessary for roadway equipment.**  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

11. Explain the purpose of the proposed work: **Public Transportation**  
\_\_\_\_\_  
\_\_\_\_\_

**IV. Prior Project History**

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

\_\_\_\_\_  
\_\_\_\_\_

**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. The applicant must also provide justification for these impacts in Section VII below. All proposed impacts, permanent and temporary, must be listed herein, and must be clearly identifiable on an accompanying site plan. All wetlands and waters, and all streams (intermittent and perennial) must be shown on a delineation map, whether or not impacts are proposed to these systems. Wetland and stream evaluation and delineation forms should be included as appropriate. Photographs may be included at the applicant's discretion. If this proposed impact is strictly for wetland or stream mitigation, list and describe the impact in Section VIII below. If additional space is needed for listing or description, please attach a separate sheet.

1. Provide a written description of the proposed impacts:

Wetland impacts will consist of fill, excavation in wetland, and mechanized clearing.

2. Individually list wetland impacts below:

Wetland Impact Site Number (indicate on map)	Type of Impact*	Area of Impact (acres)	Located within 100-year Floodplain** (yes/no)	Distance to Nearest Stream (linear feet)	Type of Wetland***
20+93-26+39-L-RT	Fill	0.6	Y		Forested
22+40-L-RT	Evcavation	0.005	Y		Forested
22+40-L-RT	Mech. Clearing	0.01	Y		Forested

- \* List each impact separately and identify temporary impacts. Impacts include, but are not limited to: mechanized clearing, grading, fill, excavation, flooding, ditching/drainage, etc. For dams, separately list impacts due to both structure and flooding.
- \*\* 100-Year floodplains are identified through the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps (FIRM), or FEMA-approved local floodplain maps. Maps are available through the FEMA Map Service Center at 1-800-358-9616, or online at <http://www.fema.gov>.
- \*\*\* List a wetland type that best describes wetland to be impacted (e.g., freshwater/saltwater marsh, forested wetland, beaver pond, Carolina Bay, bog, etc.) Indicate if wetland is isolated (determination of isolation to be made by USACE only).

List the total acreage (estimated) of all existing wetlands on the property: 0  
 Total area of wetland impact proposed: 0.615

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

Stream Impact Site Number (indicate on map)	Type of Impact*	Length of Impact (linear feet)	Stream Name**	Average Width of Stream Before Impact	Perennial or Intermittent? (please specify)
19+80-L-	workpad	39	Dillingham Cr.	12 ft	Perennial

- \* List each impact separately and identify temporary impacts. Impacts include, but are not limited to: culverts and associated rip-rap, dams (separately list impacts due to both structure and flooding), relocation (include linear feet before and after, and net loss/gain), stabilization activities (cement wall, rip-rap, crib wall, gabions, etc.), excavation, ditching/straightening, etc. If stream relocation is proposed, plans and profiles showing the linear footprint for both the original and relocated streams must be included.
- \*\* Stream names can be found on USGS topographic maps. If a stream has no name, list as UT (unnamed tributary) to the nearest downstream named stream into which it flows. USGS maps are available through the USGS at 1-800-358-9616, or online at [www.usgs.gov](http://www.usgs.gov). Several internet sites also allow direct download and printing of USGS maps (e.g., [www.topozone.com](http://www.topozone.com), [www.mapquest.com](http://www.mapquest.com), etc.).

Cumulative impacts (linear distance in feet) to all streams on site: 39

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

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

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

### 5. Pond Creation

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

Pond to be created in (check all that apply):  uplands  stream  wetlands  
 Describe the method of construction (e.g., dam/embankment, excavation, installation of draw-down valve or spillway, etc.): N/A

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

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.

### Standard NCDOT Construction Practices

## VIII. Mitigation

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

USACE – In accordance with the Final Notice of Issuance and Modification of Nationwide Permits, published in the Federal Register on March 9, 2000, mitigation will be required when

necessary to ensure that adverse effects to the aquatic environment are minimal. Factors including size and type of proposed impact and function and relative value of the impacted aquatic resource will be considered in determining acceptability of appropriate and practicable mitigation as proposed. Examples of mitigation that may be appropriate and practicable include, but are not limited to: reducing the size of the project; establishing and maintaining wetland and/or upland vegetated buffers to protect open waters such as streams; and replacing losses of aquatic resource functions and values by creating, restoring, enhancing, or preserving similar functions and values, preferable in the same watershed.

If mitigation is required for this project, a copy of the mitigation plan must be attached in order for USACE or DWQ to consider the application complete for processing. Any application lacking a required mitigation plan or NCWRP concurrence shall be placed on hold as incomplete. An applicant may also choose to review the current guidelines for stream restoration in DWQ's Draft Technical Guide for Stream Work in North Carolina, available at <http://h2o.enr.state.nc.us/ncwetlands/strmgide.html>.

1. Provide a brief description of the proposed mitigation plan. The description should provide as much information as possible, including, but not limited to: site location (attach directions and/or map, if offsite), affected stream and river basin, type and amount (acreage/linear feet) of mitigation proposed (restoration, enhancement, creation, or preservation), a plan view, preservation mechanism (e.g., deed restrictions, conservation easement, etc.), and a description of the current site conditions and proposed method of construction. Please attach a separate sheet if more space is needed.

**Stream mitigation is not proposed for this project. No stream impacts exceed 150 ft of a single crossing or multiple crossings of the same stream. Wetland mitigation is being provided by EEP.**

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

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

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

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

Yes  No

If yes, does the project require preparation of an environmental document pursuant to the requirements of the National or North Carolina Environmental Policy Act (NEPA/SEPA)?  
 Note: If you are not sure whether a NEPA/SEPA document is required, call the SEPA coordinator at (919) 733-5083 to review current thresholds for environmental documentation.

Yes  No

If yes, has the document review been finalized by the State Clearinghouse? If so, please attach a copy of the NEPA or SEPA final approval letter.

Yes  No

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

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

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

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

Identify the square feet and acreage of impact to each zone of the riparian buffers. If buffer mitigation is required calculate the required amount of mitigation by applying the buffer multipliers.

Zone*	Impact (square feet)	Multiplier	Required Mitigation
1		3	

2		1.5	
Total			

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

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

N/A

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

Describe impervious acreage (both existing and proposed) versus total acreage on the site. Discuss stormwater controls proposed in order to protect surface waters and wetlands downstream from the property.

N/A

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**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

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**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 NoX

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

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

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*Rep. St. H. n.*

4/20/04

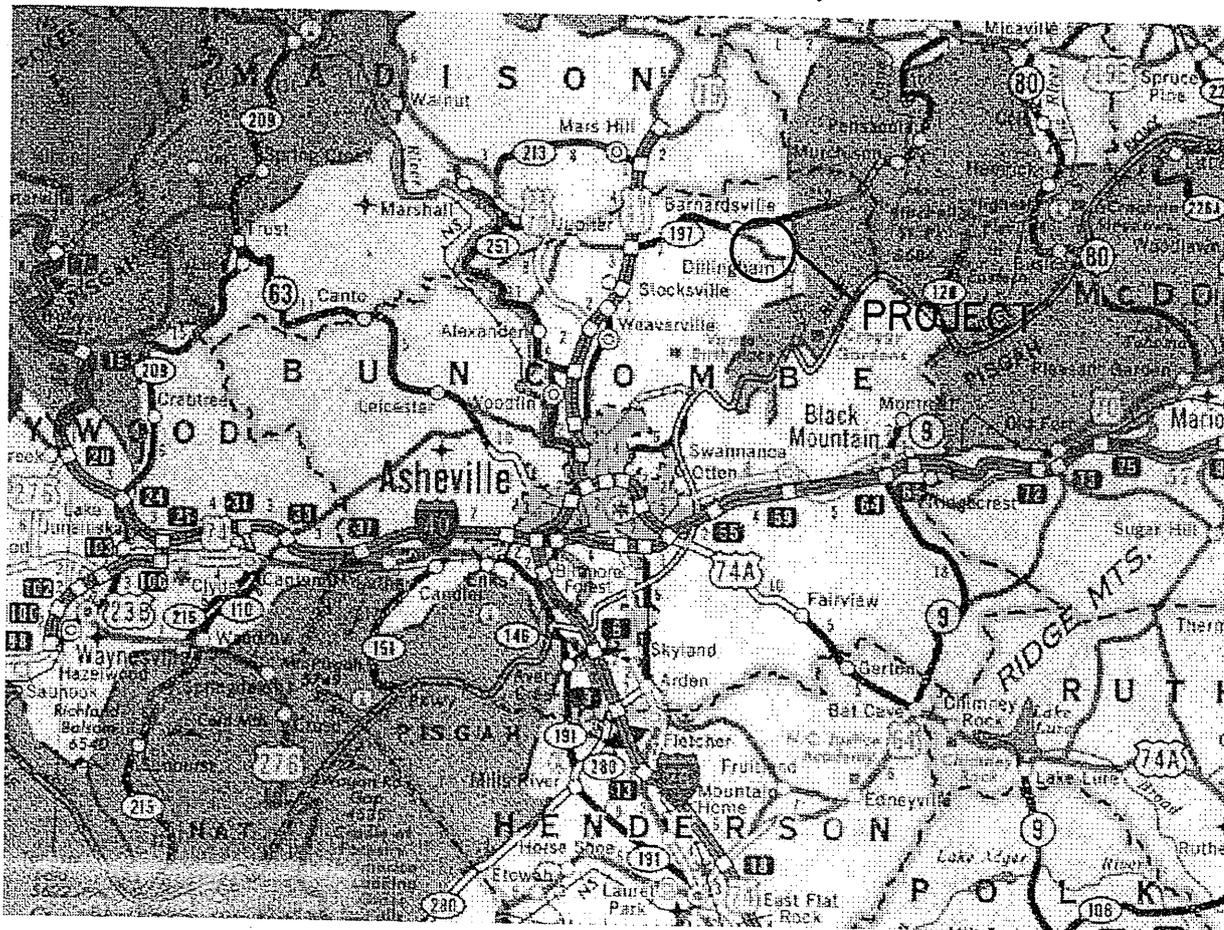
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**Applicant/Agent's Signature**

**Date**

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

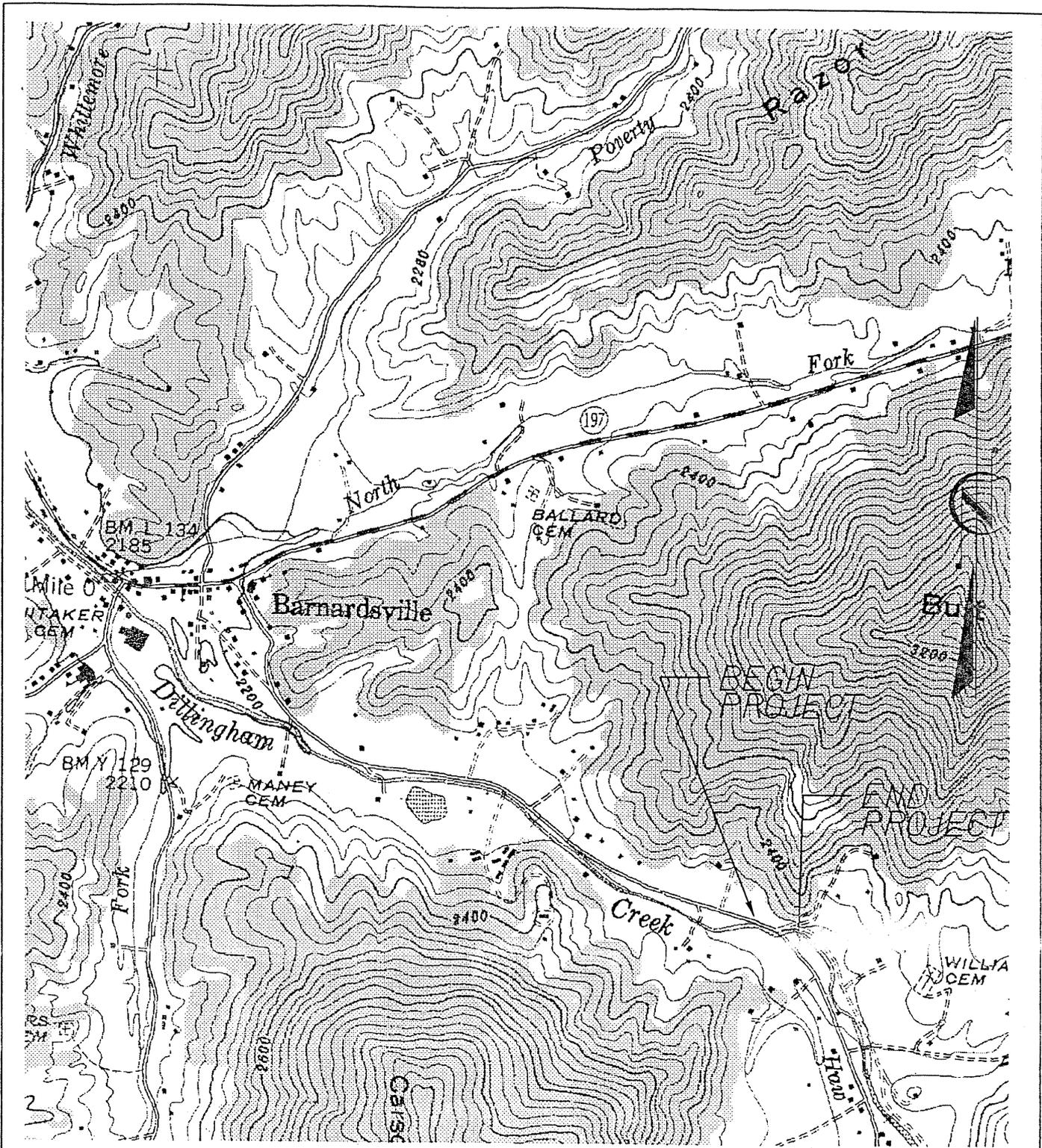
# NORTH CAROLINA



NOT TO SCALE

## VICINITY MAPS

N. C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
BUNCOMBE COUNTY  
PROJECT: 8.2843601 (B-3310)  
BRIDGE NO. 145 OVER  
DILLINGHAM CREEK  
ON SR 2173 (DILLINGHAM RD.)

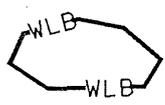
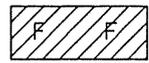
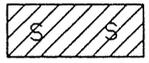
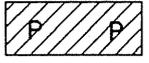
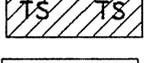
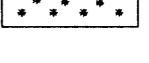
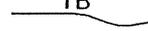
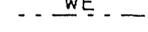
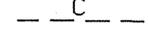
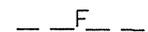
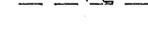
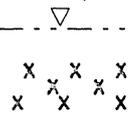
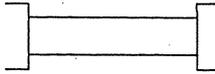
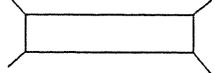
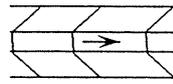


NOT TO SCALE

# TOPOGRAPHIC MAP

N. C. DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 BUNCOMBE COUNTY  
 PROJECT: 8.2843601 (B-3310)  
 BRIDGE NO. 145 OVER  
 DILLINGHAM CREEK  
 ON SR 2173 (DILLINGHAM RD.)

# WETLAND LEGEND

-  WLB WETLAND BOUNDARY
-  WETLAND
-  DENOTES FILL IN WETLAND
-  DENOTES FILL IN SURFACE WATER
-  DENOTES FILL IN SURFACE WATER (POND)
-  DENOTES TEMPORARY FILL IN WETLAND
-  DENOTES EXCAVATION IN WETLAND
-  DENOTES TEMPORARY FILL IN SURFACE WATER
-  DENOTES MECHANIZED CLEARING
-  FLOW DIRECTION
-  TOP OF BANK
-  EDGE OF WATER
-  PROP. LIMIT OF CUT
-  PROP. LIMIT OF FILL
-  PROP. RIGHT OF WAY
-  NATURAL GROUND
-  PROPERTY LINE
-  TEMP. DRAINAGE EASEMENT
-  PERMANENT DRAINAGE EASEMENT
-  EXIST. ENDANGERED ANIMAL BOUNDARY
-  EXIST. ENDANGERED PLANT BOUNDARY
-  WATER SURFACE
-  LIVE STAKES
-  BOULDER
-  CORE FIBER ROLLS
-  PROPOSED BRIDGE
-  PROPOSED BOX CULVERT
-  PROPOSED PIPE CULVERT  
12"-48" PIPES  
54" PIPES & ABOVE
-  (DASHED LINES DENOTE EXISTING STRUCTURES)
-  SINGLE TREE
-  WOODS LINE
-  DRAINAGE INLET
-  ROOTWAD
-  RIP RAP
-  ADJACENT PROPERTY OWNER OR PARCEL NUMBER IF AVAILABLE
-  PREFORMED SCOUR HOLE (PSH)
-  LEVEL SPREADER (LS)
-  GRASS SWALE

**N. C. DEPT. OF TRANSPORTATION**  
**DIVISION OF HIGHWAYS**  
**BUNCOMBE COUNTY**  
**PROJECT: 8.2843601 (B-3310)**  
**BRIDGE NO. 143 OVER**  
**DILLINGHAM CREEK**  
**ON SR 2173 (DILLINGHAM RD.)**  
**SHEET 3 OF 19**

# PROPERTY OWNERS

## NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
3	GLORIA GARRISON	310 DILLINGHAM RD. BARNARDSVILLE, N.C. 28709
4	JOHN E. WILSON	1384 BARNARDSVILLE HWY. BARNARDSVILLE, N.C. 28709
5	BOYD AND BARBARA HOLCOMBE	65 RAMSEY RD. LEICESTER, N.C. 28806
6	BOYD AND BARBARA HOLCOMBE	65 RAMSEY RD. LEICESTER, N.C. 28806
7	ALEXANDER STEVENS	361 DILLINGHAM RD. BARNARDSVILLE, N.C. 28709
8	BOYD R. AND JENNIFER HOLCOMBE	RT. 4, BOX 81A ASHEVILLE, N.C. 28806
9	C. DAVID HARRIS HEIR OF CHARLES HARRIS DECEASED	5, WILLIAMS BRANCH RD BARNARDSVILLE, N.C. 28709

**NCDOT**

**DIVISION OF HIGHWAYS  
BUNCOMBE COUNTY**

**PROJECT: 8.2843601 (B-3310)**

**BRIDGE NO. 145 OVER  
DILLINGHAM CREEK  
ON SR 2173 (DILLINGHAM RD.)**

**WETLAND PERMIT IMPACT SUMMARY**

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS						SURFACE WATER IMPACTS				
			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	19+80 -L-	BRIDGE	0	0	0	0	0	0	0	0.043	0	0	
2	20+93 TO 26+39 -L- RT	NONE	0.60	0	0	0	0	0	0	0	0	0	
3	22+40 -L- RT	PSH	0	0	0.005	0.01	0	0	0	0	0	0	
4	20+00 -L- LT	EXISTING BRIDGE	0	0	0	0	0	0	0	0.026	0	0	
TOTALS:			0.60	0	0.005	0.01	0	0	0	0.069	0	0	

METHOD II CLEARING

NC DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 BUNCOMBE COUNTY  
 PROJECT 8.2843601 B-3310  
 SHEET 5 OF 19

**BEGIN BRIDGE 19+00**

**-L- STA 19+10.00 +/-**

USE CLASS 'B' RIP RAP  
TO A DEPTH OF 1' TO COVER  
THE TOP OF THE WORK PAD

2,280

**20+00**

**END BRIDGE**  
**-L- STA 20+50.00 +/-**

CL STA. 19+80 -L-  
2 @ 70' 45" PPC GIRDERS  
CL ELEV. = 2275.0  
SKEW = 130'

2,280

C/L LOW STEEL

(+/-) 2.5522%

EXCAVATION

D/S LOW STEEL

2,270

NG

2,260

18

19

20

O.H.W.  
ELEV. = 2263.3

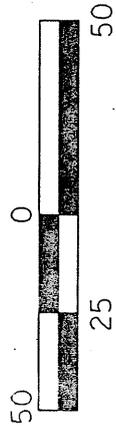
1.5:1 SIDE SLOPES

WORK PAD  
(TEMPORARY CLASS '11' RIP RAP)  
MIN. TOP ELEV. = 2265



### PROFILE

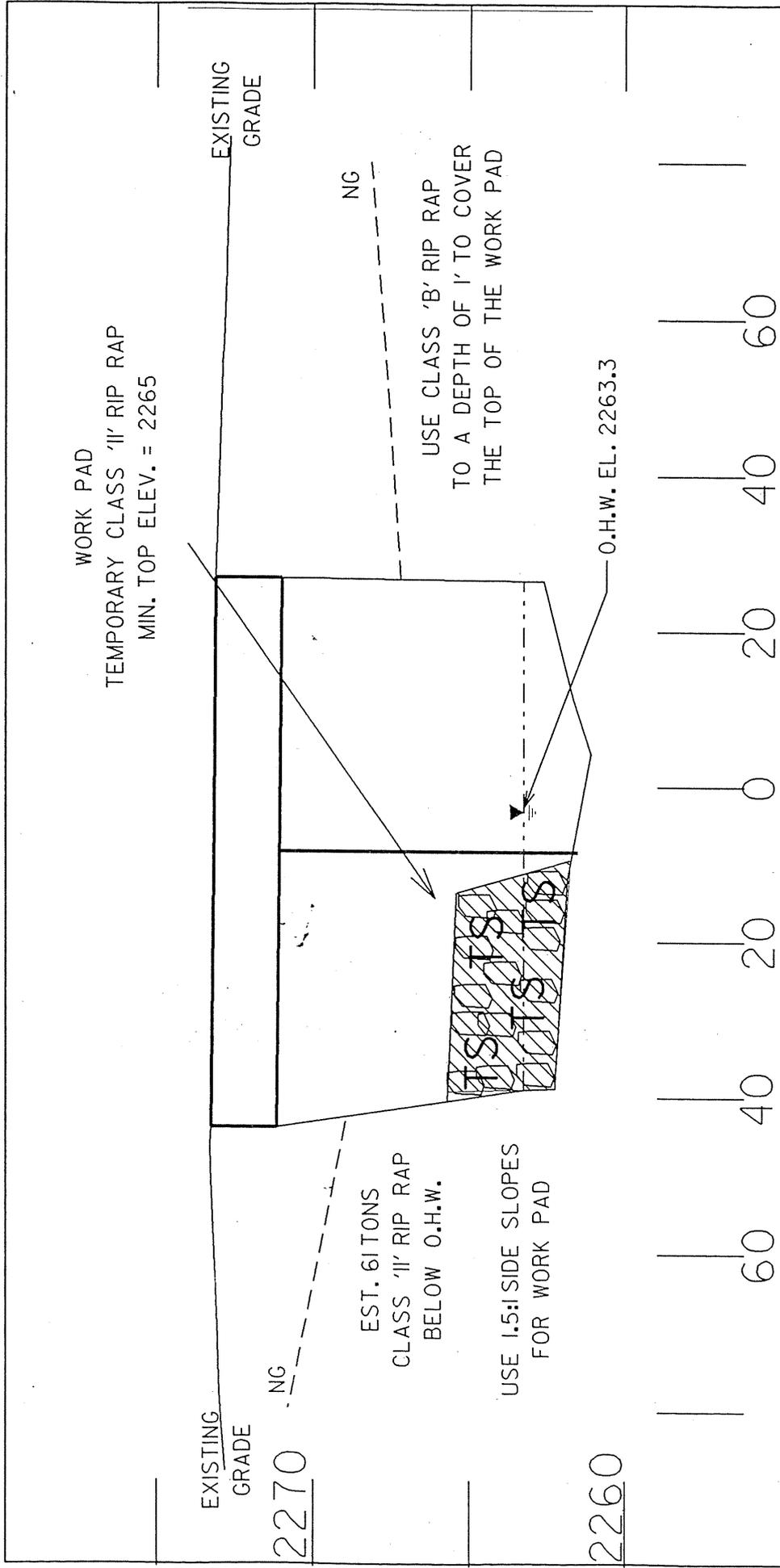
NOTE: 311 TONS OF  
CLASS '11' RIP RAP  
BELOW ORDINARY HIGH WATER



## NCDOT

DIVISION OF HIGHWAYS  
BUNCOMBE COUNTY  
PROJECT: 8.28.43601 (B-5310)

BRIDGE NO. 145 OVER  
DILLINGHAM CREEK ON SR 2173  
(DILLINGHAM RD.)



WORK PAD  
 TEMPORARY CLASS '1/2' RIP RAP  
 MIN. TOP ELEV. = 2265

EXISTING  
 GRADE

NG

USE CLASS 'B' RIP RAP  
 TO A DEPTH OF 1' TO COVER  
 THE TOP OF THE WORK PAD

O.H.W. EL. 2263.3

EST. 6 TONS  
 CLASS '1/2' RIP RAP  
 BELOW O.H.W.

USE 1.5:1 SIDE SLOPES  
 FOR WORK PAD

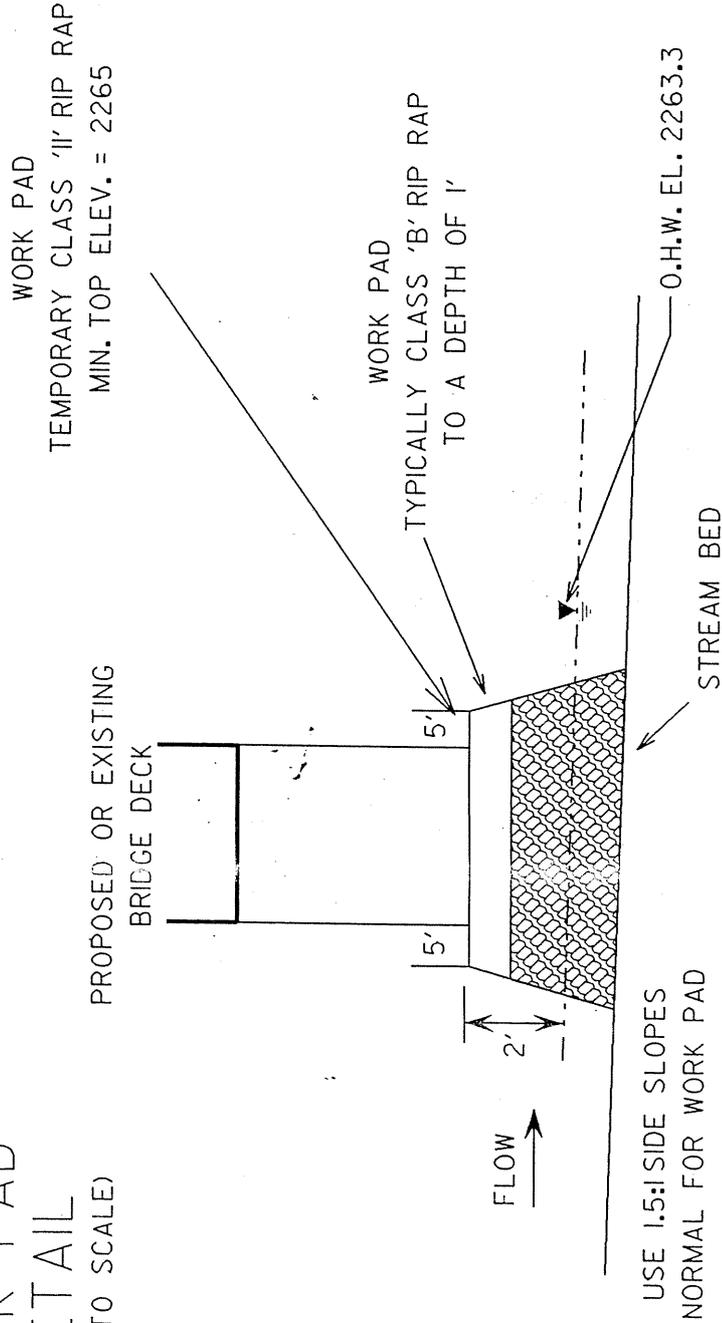
PROFILE  
 EXISTING BRIDGE  
 WORK PAD

 DENOTES TEMPORARY  
 FILL IN SURFACE  
 WATER

**NCDOT**  
 DIVISION OF HIGHWAYS  
 BUNCOMBE COUNTY  
 PROJECT: 8.2843601 (B-3310)  
 BRIDGE NO. 145 OVER  
 DILLINGHAM CREEK  
 ON SR 2173 (DILLINGHAM RD.)

# WORK PAD DETAIL

(NOT TO SCALE)



USE 1.5:1 SIDE SLOPES  
NORMAL FOR WORK PAD

## ESTIMATES OF QUANTITIES

PROPOSED BRIDGE	VOLUME OF CLASS '1\' RIP RAP = 618 YD. <sup>3</sup>
	AREA OF CLASS '1\' RIP RAP = 0.043 AC.
	EST. 522 TONS OF CLASS '1\' RIP RAP
EXISTING BRIDGE	VOLUME OF CLASS '1\' RIP RAP = 431 YD. <sup>3</sup>
	AREA OF CLASS '1\' RIP RAP = 0.026 AC.
	EST. 233 TONS OF CLASS '1\' RIP RAP

**NC**DOT

DIVISION OF HIGHWAYS  
BUNCOMBE COUNTY  
PROJECT: 8.2843601 (B-3310)

BRIDGE NO. 145 OVER  
DILLINGHAM CREEK  
ON SR 2173 (DILLINGHAM RD.)



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

April 22, 2004

Mr. William D. Gilmore, P.E.  
EEP Transition Manager  
Ecosystem Enhancement Program  
1652 Mail Service Center  
Raleigh, NC 24699-1652

Dear Sir:

Subject: The Replacement of Bridge No. 145 over Dillingham Creek on SR 2173, Buncombe County, Federal Aid Project No. BRZ-2173(1), State Project No. 8.2843601, TIP B-3310, Division 13.

NCDOT requests that the North Carolina Ecosystem Enhancement Program (EEP) provide confirmation that we are willing to provide compensatory mitigation for the above-mentioned project in accordance with the Memorandum of Agreement (MOA) signed July 22, 2003 by the USACE, the NCDENR, and the NCDOT. Bridge No. 145 will be replaced to the south of the existing location with a new bridge approximately 140 feet in length with a 35-foot clear roadway width. The bridge will have two 12-foot travel lanes. The new approach roadway will match the bridge width. The new bridge will have a design speed of 60 mph.

There are jurisdictional wetlands associated with this project with impacts totaling 0.615 acres and mitigation is required. Surface waters will not be permanently impacted by the construction of the bridge.

We have avoided and minimized the impacts to jurisdictional resources to the greatest extent possible as described in the permit application. A copy of the permit application can be found at <http://www.ncdot.org/planning/pe/naturalunit/Applications.html>. The remaining impacts to jurisdictional resources will be compensated for by mitigation provided by the EEP program. We estimate that 0.615 acres of riverine wetlands will be impacted.

The project is located in the blue ridge Physiographic Province in Buncombe County in the French Broad River basin in Hydrological Cataloguing Unit 06010105.

Please send the letter of confirmation to Steve Lund at U. S. Army Corps of Engineers Asheville Regulatory Field Office, 151 Patton Ave. Room 208, Asheville, NC 28801-5006. Mr. Lund's FAX number is (828) 271-7950. The current let date for the project is August 17, 2004 for which the let review date is September 20, 2004.

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

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

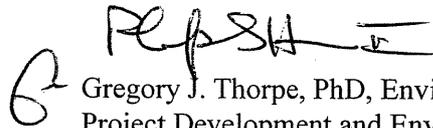
WEBSITE: [WWW.NCDOT.ORG](http://WWW.NCDOT.ORG)

**LOCATION:**  
TRANSPORTATION BUILDING  
1 SOUTH WILMINGTON STREET  
RALEIGH NC

In order to satisfy regulatory assurances that mitigation will be performed, the NCDWQ requires a formal letter from EEP indicating their willingness and ability to provide the mitigation work requested by NCDOT. The NCDOT requests such a letter of confirmation be addressed to Mr. John Hennessy of NCDWQ with copies submitted to NCDOT.

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

Sincerely,

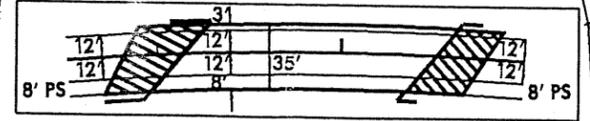


Gregory J. Thorpe, PhD, Environmental Management Director  
Project Development and Environmental Analysis Branch

cc: Mr. John Hennessy, Division of Water Quality (7 copies)  
Ms. Marella Buncick, USFWS  
Ms. Marla Chambers, NCWRC  
Mr. Harold Draper, TVA  
Mr. Jay Bennett, P.E., Roadway Design  
Mr. Omar Sultan, Programming and TIP  
Mr. Art McMillan, P.E., Highway Design  
Mr. David Chang, P.E., Hydraulics  
Mr. Greg Perfetti, P.E., Structure Design  
Mr. Mark Staley, Roadside Environmental  
Mr. John F. Sullivan III, P. E., FHWA  
Mr. J. J. Swain, P.E., Division Engineer  
Mr. Roger Bryan, DEO  
Mr. David Franklin, USACE, Wilmington (Cover Letter only)

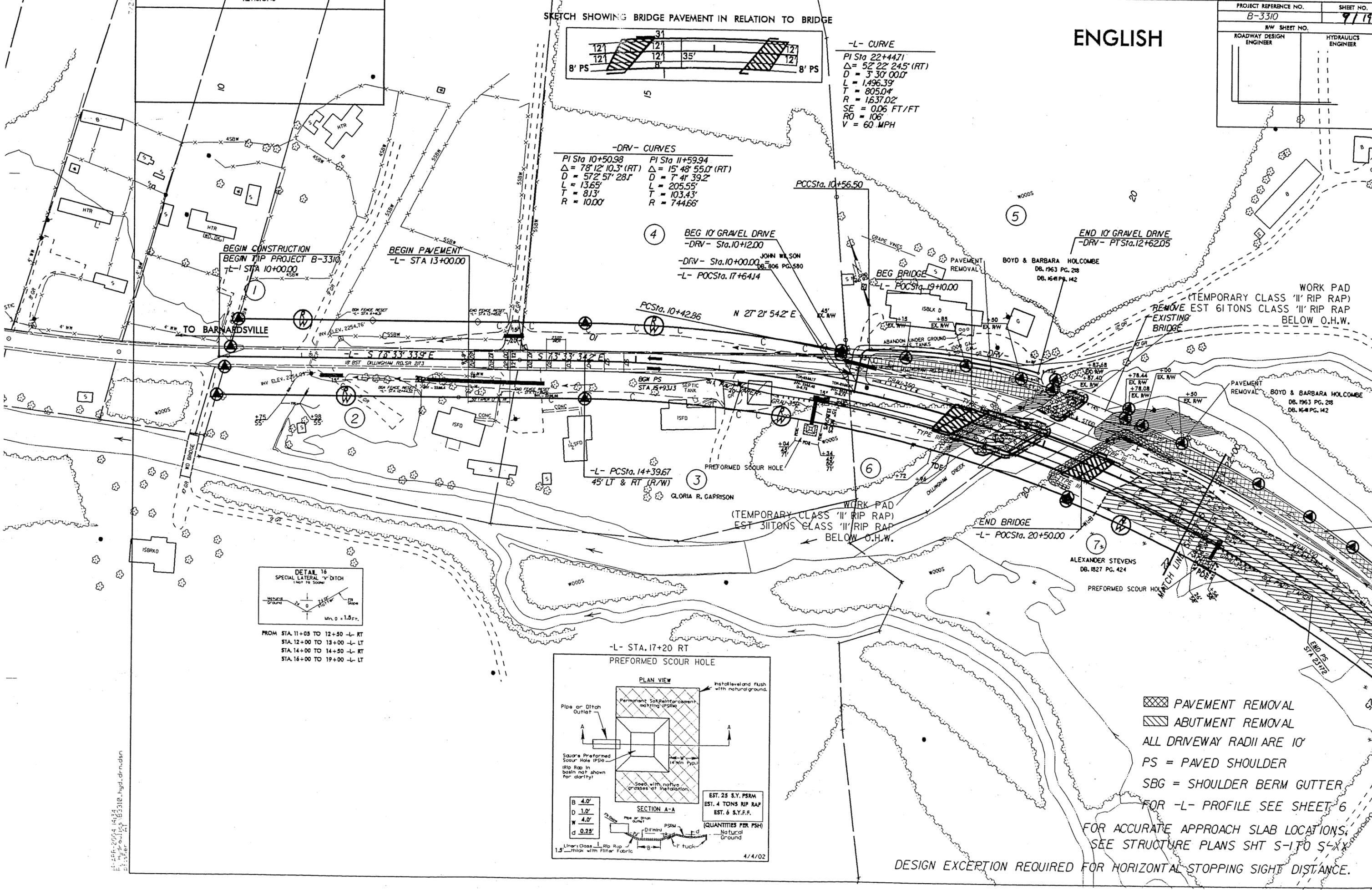
# ENGLISH

SKETCH SHOWING BRIDGE PAVEMENT IN RELATION TO BRIDGE



-L- CURVE  
 PI Sta 22+44.71  
 $\Delta = 52^\circ 22' 24.5''$  (RT)  
 $D = 3' 30' 00.0''$   
 $L = 1,496.39'$   
 $T = 805.04'$   
 $R = 1637.02'$   
 $SE = 0.06$  FT/FT  
 $RO = 106'$   
 $V = 60$  MPH

-DRV- CURVES  
 PI Sta 10+50.98    PI Sta 11+59.94  
 $\Delta = 78^\circ 12' 10.3''$  (RT)     $\Delta = 15^\circ 48' 55.0''$  (RT)  
 $D = 572.57' 28.5''$      $D = 7' 4' 39.2''$   
 $L = 13.65'$      $L = 205.55'$   
 $T = 8.13'$      $T = 103.43'$   
 $R = 10.00'$      $R = 744.66'$



BEGIN CONSTRUCTION  
 BEGIN TIP PROJECT B-3310  
 -L- STA 10+00.00

BEGIN PAVEMENT  
 -L- STA 13+00.00

4. BEG 10' GRAVEL DRIVE  
 -DRV- Sta.10+12.00  
 -DRV- Sta.10+00.00  
 -L- POCSta. 17+64.14

END 10' GRAVEL DRIVE  
 -DRV- POCSta.12+62.05

BEG BRIDGE  
 -L- POCSta. 19+10.00

BOYD & BARBARA HOLCOMBE  
 DB. 1963 PG. 288  
 DB. 1641 PG. 142

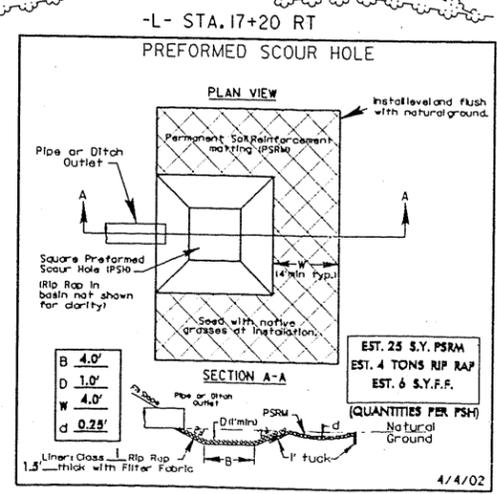
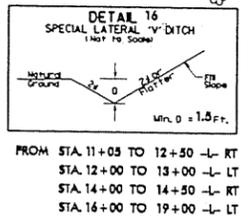
WORK PAD  
 (TEMPORARY CLASS 'II' RIP RAP)  
 REMOVE EST 6 TONS CLASS 'II' RIP RAP  
 BELOW O.H.W.

3. PREFORMED SCOUR HOLE  
 -L- PCSta. 14+39.67  
 45' LT & RT (R/W)  
 GLORIA R. GARRISON

WORK PAD  
 (TEMPORARY CLASS 'II' RIP RAP)  
 EST 3 TONS CLASS 'II' RIP RAP  
 BELOW O.H.W.

END BRIDGE  
 -L- POCSta. 20+50.00

ALEXANDER STEVENS  
 DB. 1827 PG. 424



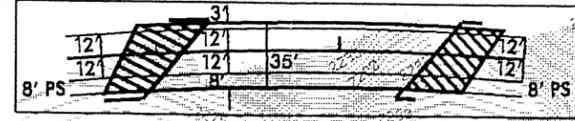
- PAVEMENT REMOVAL
- ABUTMENT REMOVAL
- ALL DRIVEWAY RADII ARE 10'
- PS = PAVED SHOULDER
- SBG = SHOULDER BERM GUTTER
- FOR -L- PROFILE SEE SHEET 6

FOR ACCURATE APPROACH SLAB LOCATIONS,  
 SEE STRUCTURE PLANS SHT S-1 TO S-XX

DESIGN EXCERPTION REQUIRED FOR HORIZONTAL STOPPING SIGHT DISTANCE.

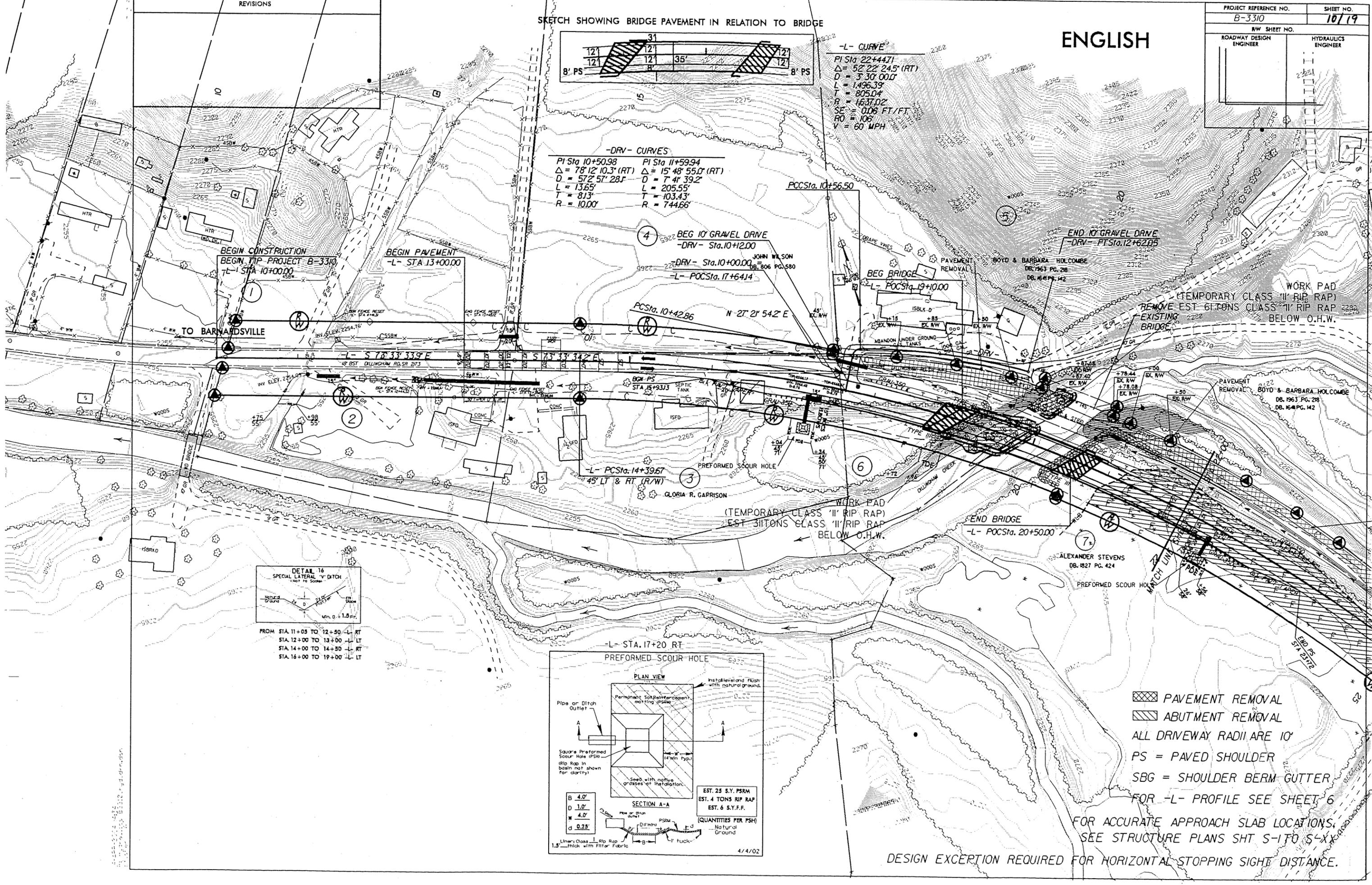
15 APR 2004 14:34  
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 1:1 SHT 9

PROJECT REFERENCE NO. B-3310	SHEET NO. 10/19
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



-L- CURVE  
 PI Sta 22+44.71  
 $\Delta = 52^\circ 22' 24.5''$  (RT)  
 $D = 330.00'$   
 $L = 1496.39'$   
 $T = 805.04'$   
 $R = 1637.02'$   
 $SE = 0.06$  FT/FT  
 $RO = 106'$   
 $V = 60$  MPH

-DRV- CURVES  
 PI Sta 10+50.98    PI Sta 11+59.94  
 $\Delta = 78^\circ 12' 10.3''$  (RT)     $\Delta = 15^\circ 48' 55.0''$  (RT)  
 $D = 572.57' 28''$      $D = 741' 39.2''$   
 $L = 13.65'$      $L = 205.55'$   
 $T = 81.3'$      $T = 103.43'$   
 $R = 10.00'$      $R = 744.66'$



BEGIN CONSTRUCTION  
 BEGIN TIP PROJECT - B-3310  
 -L- STA 10+00.00

BEGIN PAVEMENT  
 -L- STA 13+00.00

BEG 10' GRAVEL DRIVE  
 -DRV- Sta. 10+12.00

-L- POCSta. 17+64.14

POCSta. 10+56.50

BEG BRIDGE  
 -L- POCSta. 19+10.00

END 10' GRAVEL DRIVE  
 -DRV- PTSSta. 12+62.05

WORK PAD  
 (TEMPORARY CLASS 'II' RIP RAP)  
 REMOVE EST 6 TONS CLASS 'II' RIP RAP  
 EXISTING BRIDGE BELOW O.H.W.

TO BARNARDSVILLE

PCSta. 10+42.86    N 27° 21' 54.2" E

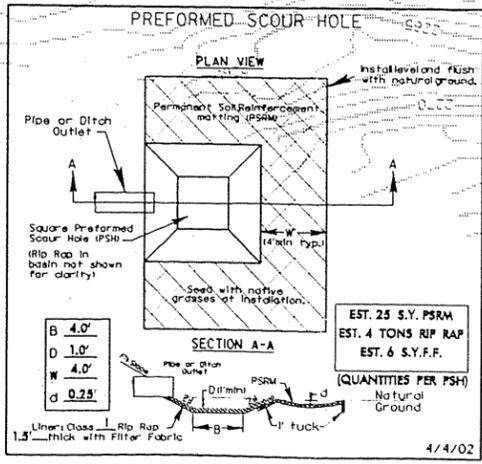
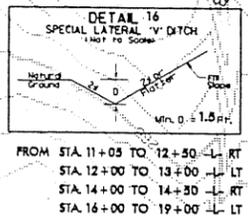
-L- S 78° 33' 33.9" E

-L- PCSSta. 14+39.67  
 45' LT & RT (R/W)

WORK PAD  
 (TEMPORARY CLASS 'II' RIP RAP)  
 EST 3 TONS CLASS 'II' RIP RAP  
 BELOW O.H.W.

END BRIDGE  
 -L- POCSta. 20+50.00

ALEXANDER STEVENS  
 DB. 1827 PG. 424

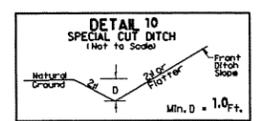


- ▨ PAVEMENT REMOVAL
- ▨ ABUTMENT REMOVAL
- ALL DRIVEWAY RADII ARE 10'
- PS = PAVED SHOULDER
- SBG = SHOULDER BERM GUTTER
- FOR -L- PROFILE SEE SHEET 6

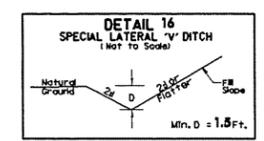
FOR ACCURATE APPROACH SLAB LOCATIONS,  
 SEE STRUCTURE PLANS SHT S-1 TO S-XX

DESIGN EXCERPTION REQUIRED FOR HORIZONTAL STOPPING SIGHT DISTANCE.

ENGLISH



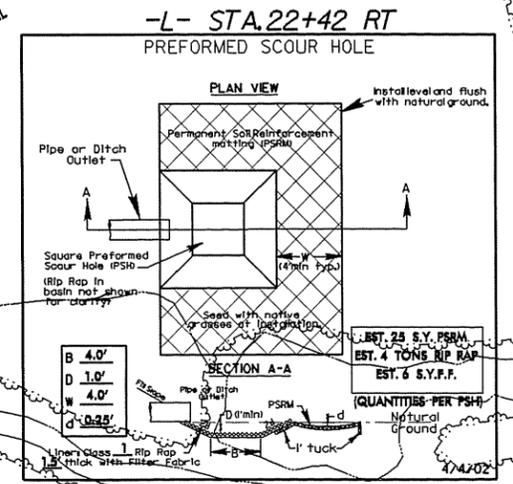
FROM STA. 28+83 TO 29+50 -L- LT  
STA. 29+50 TO 31+00 -L- RT



FROM STA. 21+00 TO 25+00 -L- LT

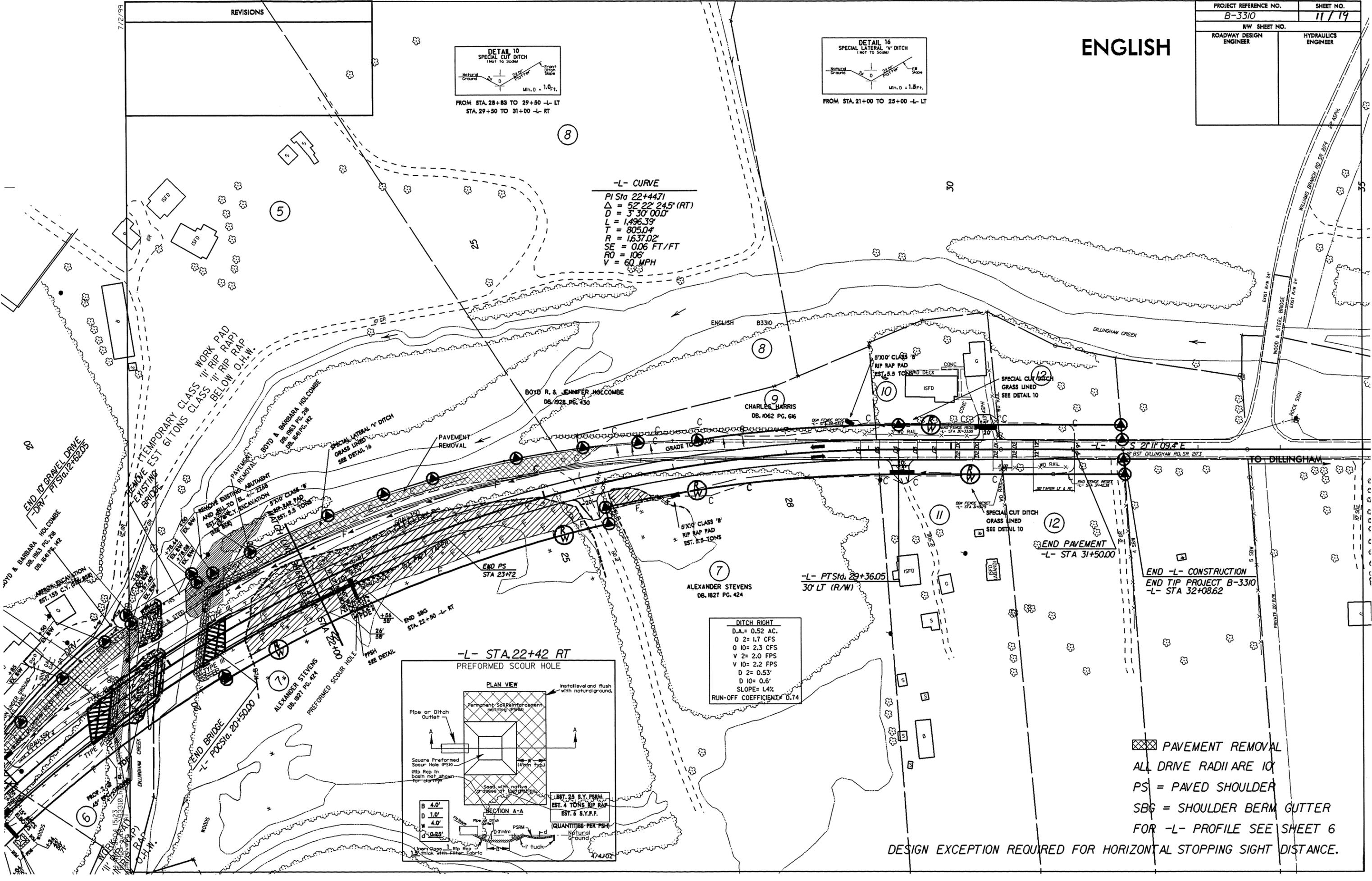
**-L- CURVE**  
 PI Sta 22+44.71  
 $\Delta = 52^\circ 22' 24.5''$  (RT)  
 $D = 3^\circ 30' 00.0''$   
 $L = 1,496.39'$   
 $T = 805.04'$   
 $R = 1637.02'$   
 $SE = 0.06$  FT/FT  
 $RO = 106'$   
 $V = 60$  MPH

**DITCH RIGHT**  
 D.A. = 0.52 AC.  
 $Q = 2 = 1.7$  CFS  
 $Q = 10 = 2.3$  CFS  
 $V = 2 = 2.0$  FPS  
 $V = 10 = 2.2$  FPS  
 $D = 2 = 0.53'$   
 $D = 10 = 0.6'$   
 SLOPE = 1.4%  
 RUN-OFF COEFFICIENT = 0.74



PAVEMENT REMOVAL  
 ALL DRIVE RADII ARE 10'  
 PS = PAVED SHOULDER  
 SBG = SHOULDER BERM GUTTER  
 FOR -L- PROFILE SEE SHEET 6

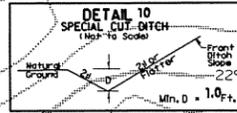
DESIGN EXCEPTION REQUIRED FOR HORIZONTAL STOPPING SIGHT DISTANCE.



REVISIONS

PROJECT REFERENCE NO. B-3310	SHEET NO. 12/19
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ENGLISH



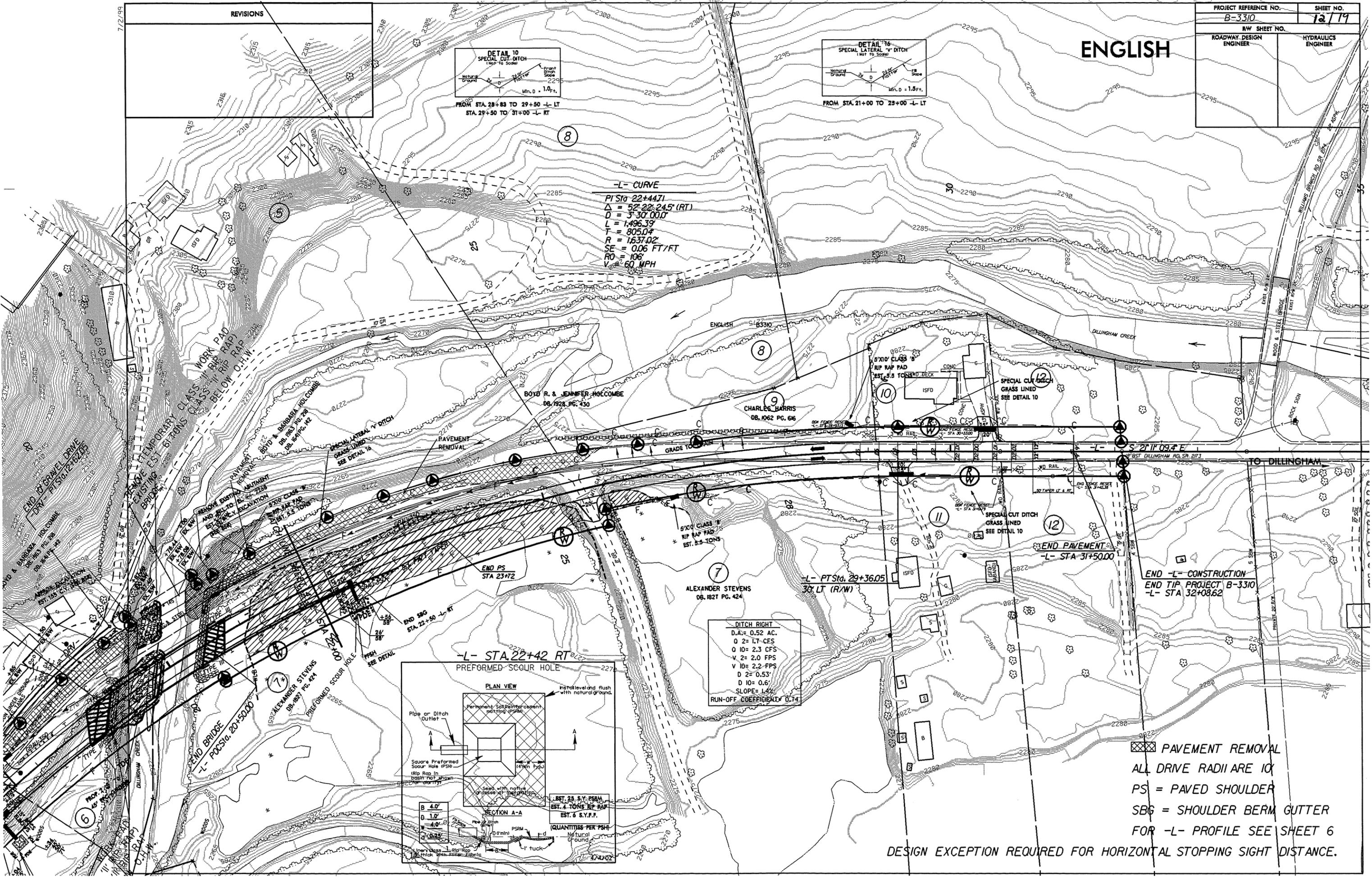
FROM STA. 28+83 TO 29+50 -L- LT  
STA. 29+50 TO 31+00 -L- RT



FROM STA. 21+00 TO 23+00 -L- LT

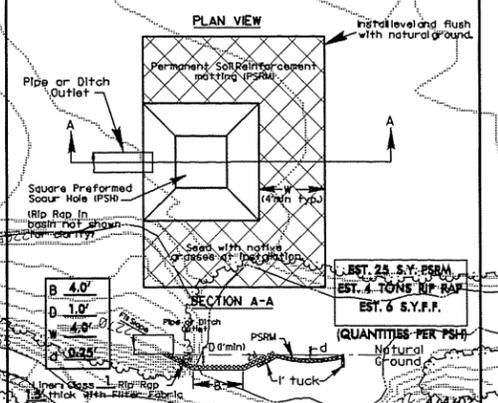
-L- CURVE

PI Sta. 22+44.71  
 $\Delta = 52^\circ 22' 24.5''$  (RT)  
 $D = 3^\circ 30' 00.0''$   
 $L = 1,496.39'$   
 $T = 805.04'$   
 $R = 1637.02'$   
 $SE = 0.06$  FT/FT  
 $RO = 106'$   
 $V = 60$  MPH



-L- STA. 22+42 RT

PREFORMED SCOUR HOLE

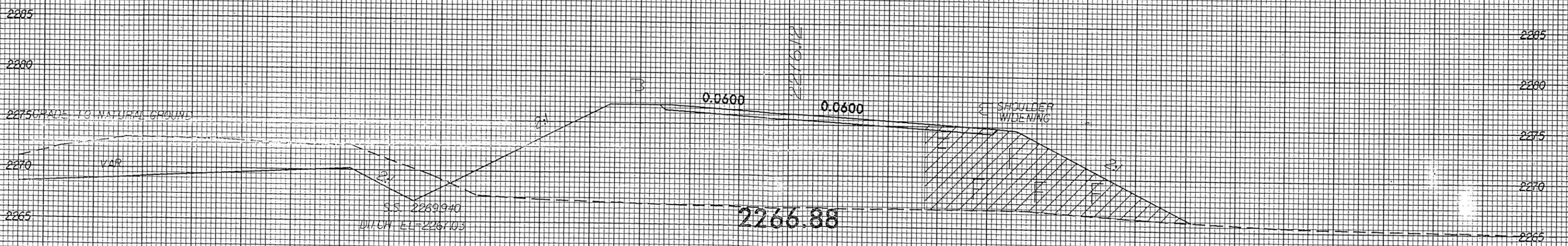
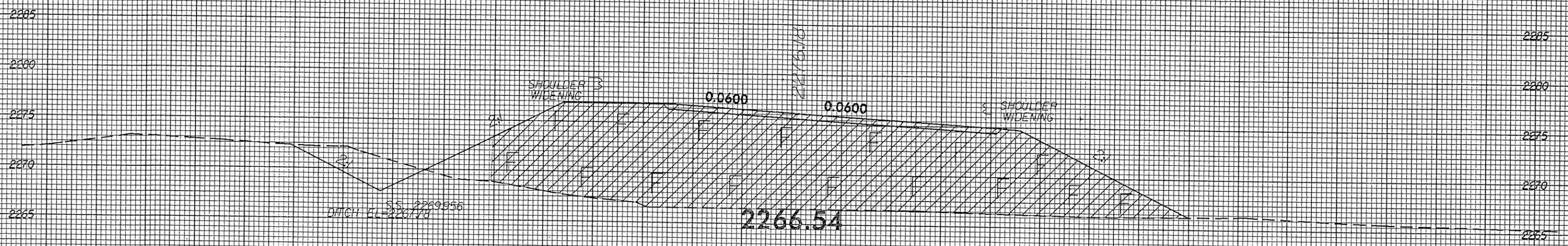


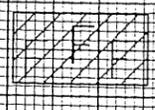
DITCH RIGHT  
 $D.A. = 0.52$  AC.  
 $Q = 2 = 1.7$  CFS  
 $Q = 10 = 2.3$  CFS  
 $V = 2 = 2.0$  FPS  
 $V = 10 = 2.2$  FPS  
 $D = 2 = 0.53'$   
 $D = 10 = 0.6'$   
 $SLOPE = 1.4\%$   
 $RUN-OFF COEFFICIENT = 0.74$

END -L- CONSTRUCTION  
 END TIP PROJECT B-3310  
 -L- STA 32+08.62

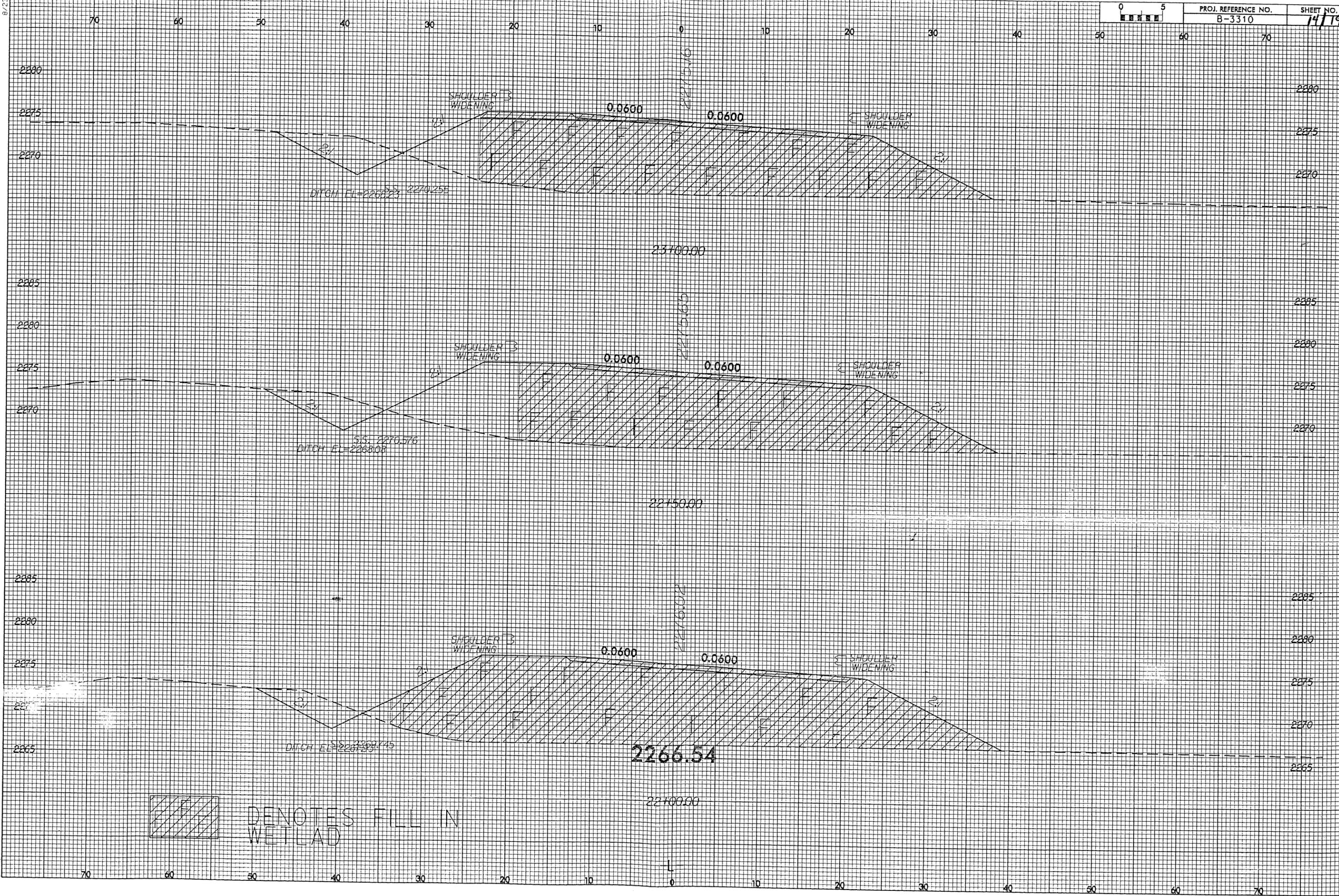
PAVEMENT REMOVAL  
 ALL DRIVE RADII ARE 10'  
 PS = PAVED SHOULDER  
 SBG = SHOULDER BERM GUTTER  
 FOR -L- PROFILE SEE SHEET 6

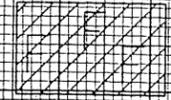
DESIGN EXCEPTION REQUIRED FOR HORIZONTAL STOPPING SIGHT DISTANCE.



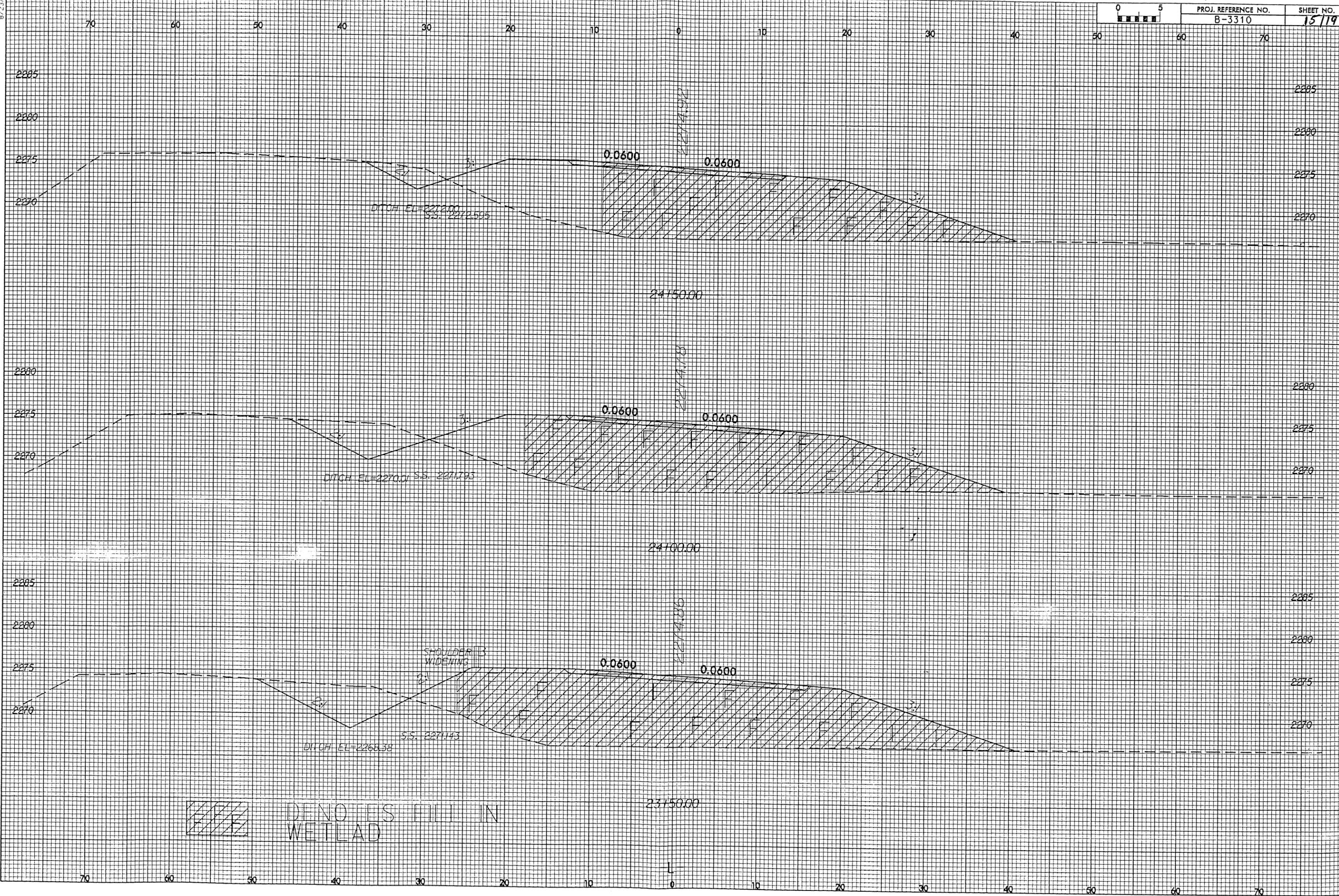
 DENOTES FILL IN  
 WETLAND

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



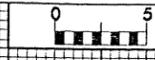
 DENOTES FILL IN WETLAND

8/23/99



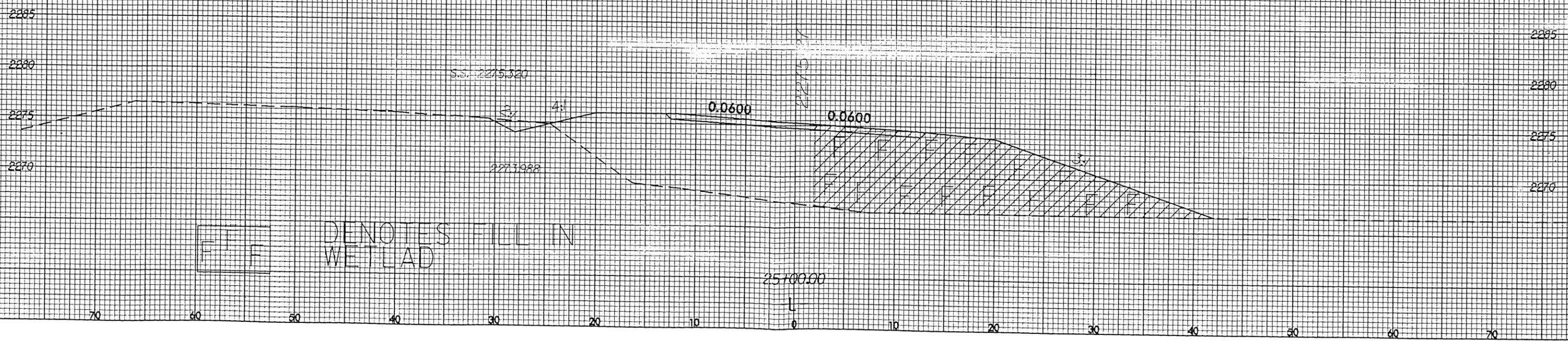
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pshed@rd

8/22/94



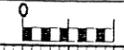
PROJ. REFERENCE NO.	SHEET NO.
B-3310	16719

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70



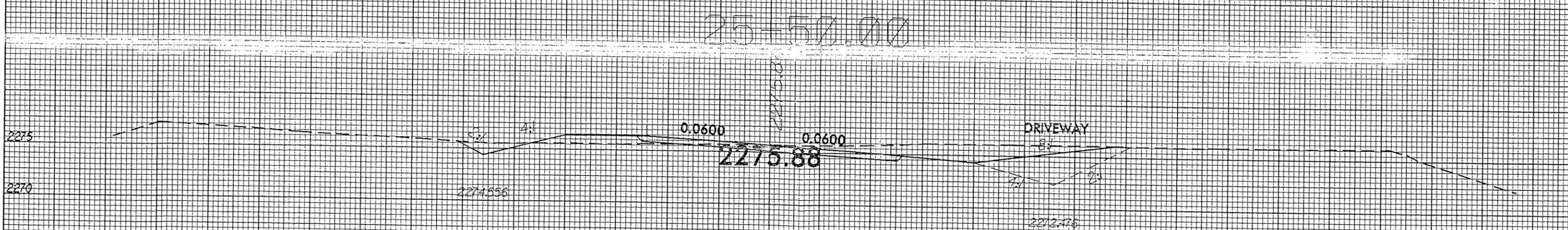
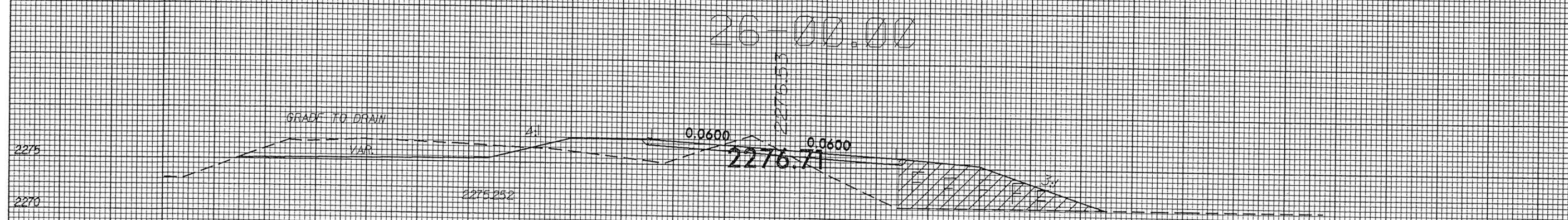
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pshepard A

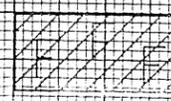
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PROJ. REFERENCE NO.  
B-3310

SHEET NO.  
17/19

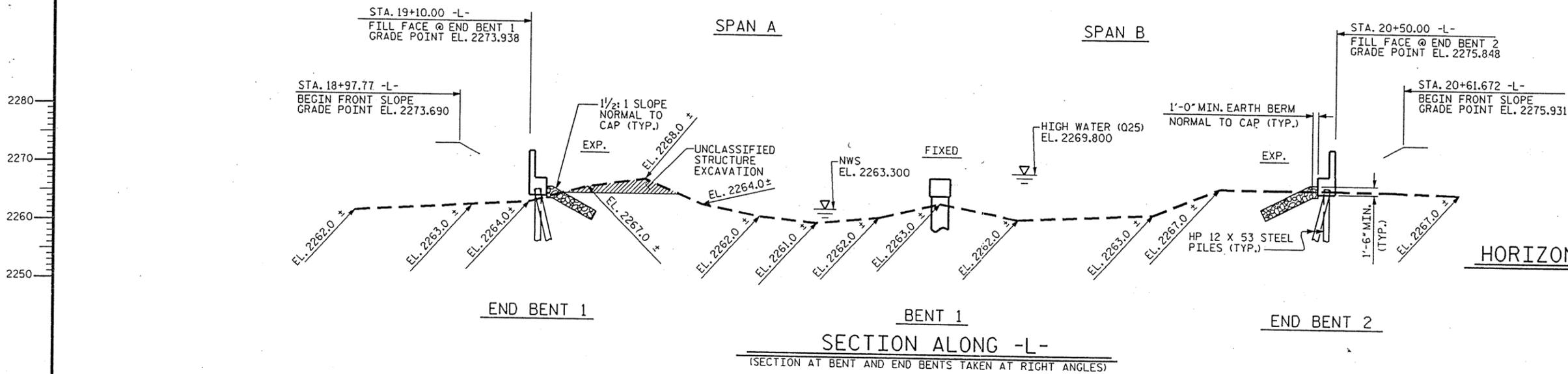


 DENOTES FILL IN  
 WETLAND

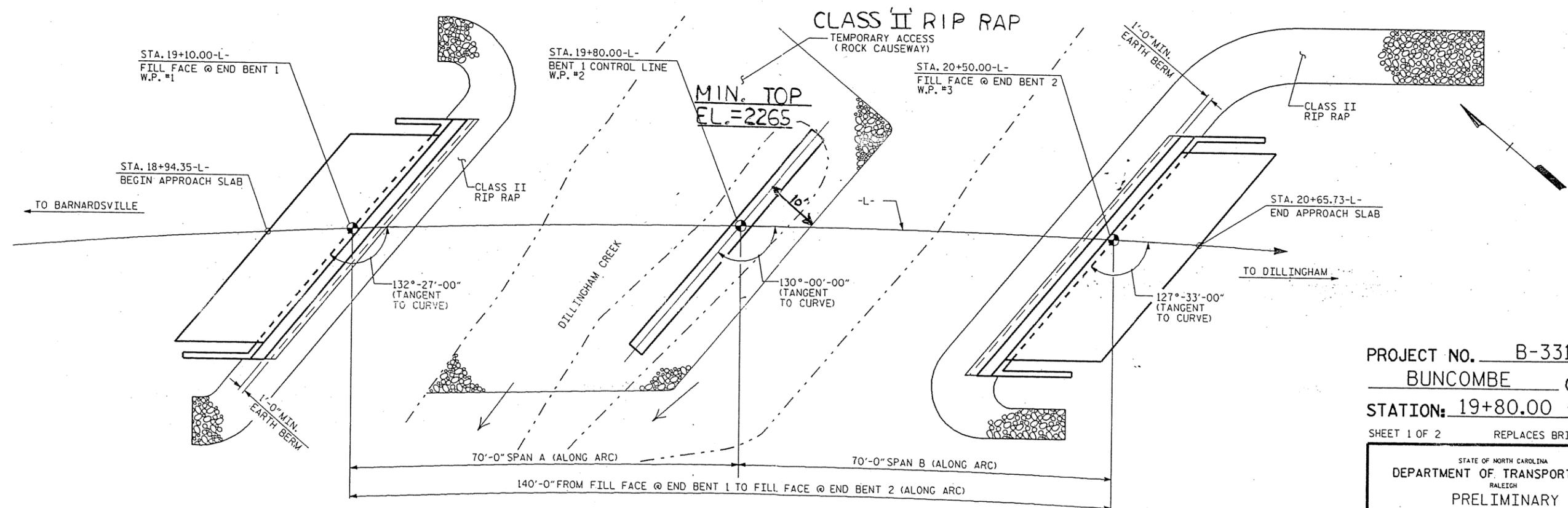
30 20 10 0 10 20 30

19-NOV-2003 08:27  
 P:\Hydrolics\perm\1.tasc.dgn  
 pshpord

+ 2.5522 %    - 1.0295 %  
 PI STA. 20+50.00 -L-  
 EL. 2277.71  
 V.C. 416'  
**GRADE DATA**



PI Sta 22+44.71  
 Δ = 52°-22'-24.5" (RT)  
 D = 3°-30'-00.0"  
 L = 1,496.39'  
 T = 805.04'  
 R = 1,637.02'  
 SE = 0.06 FT/FT  
**HORIZONTAL CURVE DATA**



PROJECT NO. B-3310  
BUNCOMBE COUNTY  
 STATION: 19+80.00 -L-  
 SHEET 1 OF 2      REPLACES BRIDGE No. 145

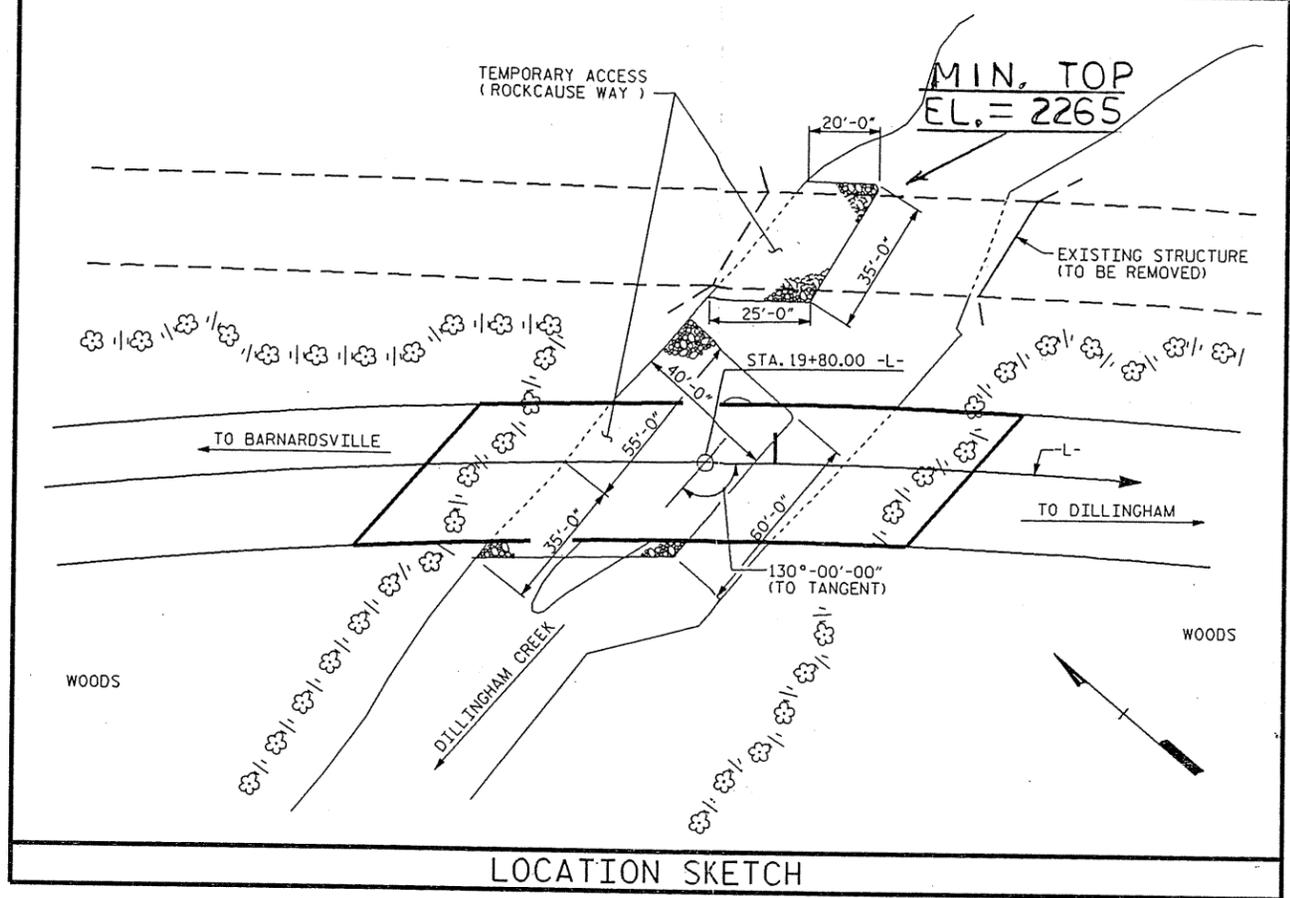
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**PRELIMINARY  
 GENERAL DRAWING**  
 FOR BRIDGE ON SR 2173  
 OVER DILLINGHAM CREEK  
 BETWEEN DILLINGHAM  
 AND BARNARDSVILLE



DRAWN BY : A.R.CHESSON      DATE : 6-03  
 CHECKED BY : H.A.LOCKLEAR      DATE : 6-30-03

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			18
2			4			19

BENCH MARK : BM2 SPIKE SET IN BASE OF 24" POPLAR -L- STA. 19+19.12 ± 108' LT ELEV. 2267.61



**NOTES :**

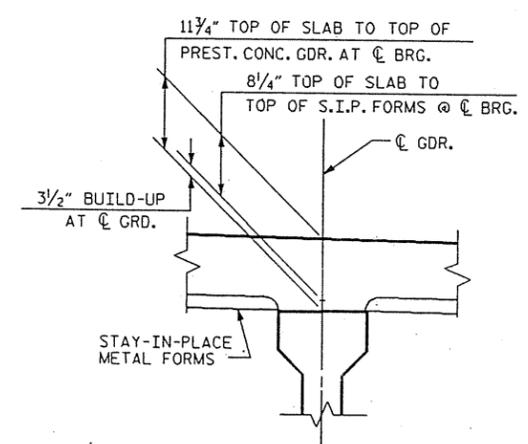
ASSUMED LIVE LOAD = HS 20 OR ALTERNATE LOADING.  
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO STANDARD SPECIFICATIONS FOR SEISMIC DESIGN OF HIGHWAY BRIDGES FOR SEISMIC PERFORMANCE CATEGORY B.

**HYDRAULIC DATA**

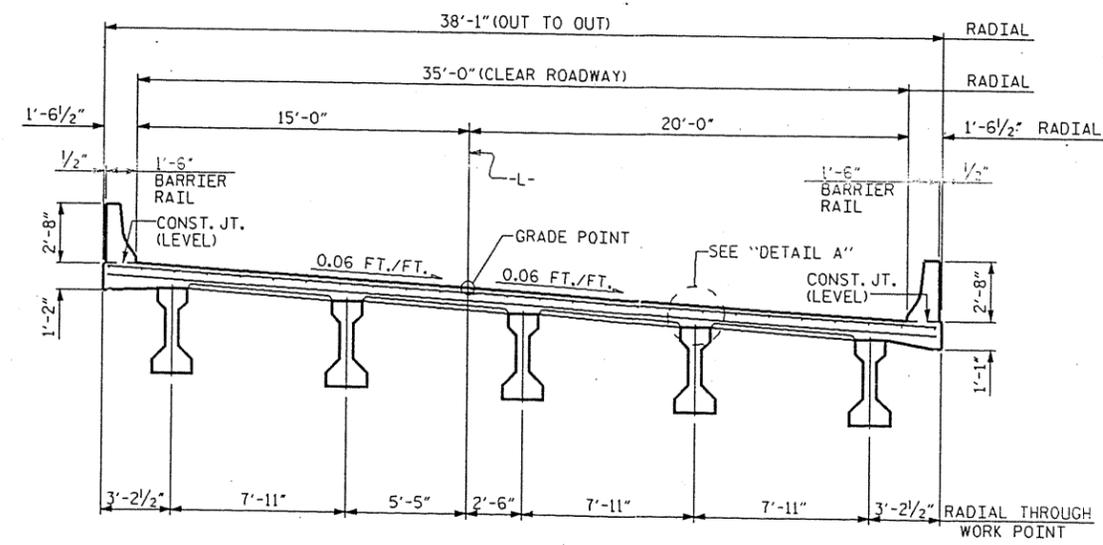
DESIGN DISCHARGE----- 3700 C. F. S.  
 FREQUENCY OF DESIGN FLOOD----- 25 YR.  
 DESIGN HIGH WATER EL.----- 2269.780  
 DRAINAGE AREA----- 24.5 SQ. MI.  
 BASIC DISCHARGE (Q100)----- 5100 C. F. S.  
 BASIC HIGH WATER EL.----- 2270.770

**OVERTOPPING FLOOD DATA**

OVERTOPPING DISCHARGE----- 5100+ C. F. S.  
 FREQUENCY OF OVERTOPPING FLOOD--- 100+ YR.  
 OVERTOPPING FLOOD EL.----- 2274.780



**DETAIL A**



**TYPICAL SECTION**

ALL SPANS ARE AASHTO TYPE III PRESTRESSED CONCRETE GIRDERS CONTINUOUS FOR LIVE LOAD

PROJECT NO. B-3310  
BUNCOMBE COUNTY  
 STATION: 19+80.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 PRELIMINARY  
 GENERAL DRAWING  
 FOR BRIDGE ON SR 2173  
 OVER DILLINGHAM CREEK  
 BETWEEN DILLINGHAM  
 AND BARNARDSVILLE



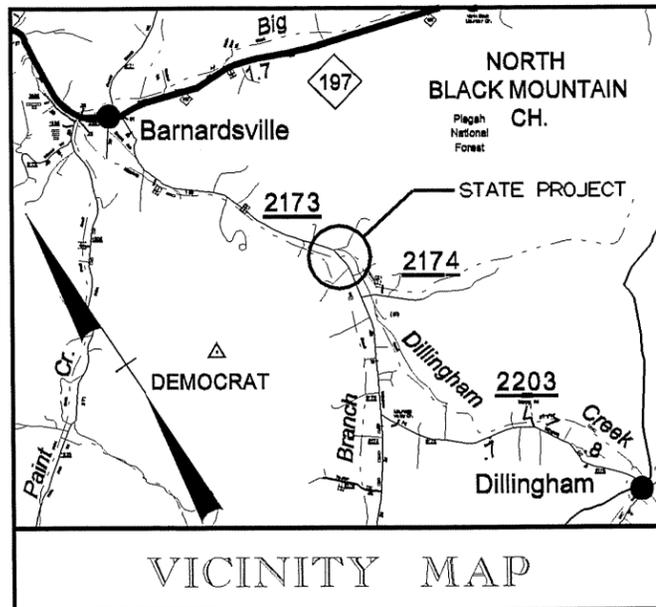
DRAWN BY : A.R.CHESSON DATE : 6-23-03  
 CHECKED BY : H.A.LOCKLEAR DATE : 6-23-03

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	19
1			3			TOTAL SHEETS
2			4			19

9/10/99

**CONTRACT: C200906 TIP PROJECT: B-3310**

See Sheet 1-A For Index of Sheets

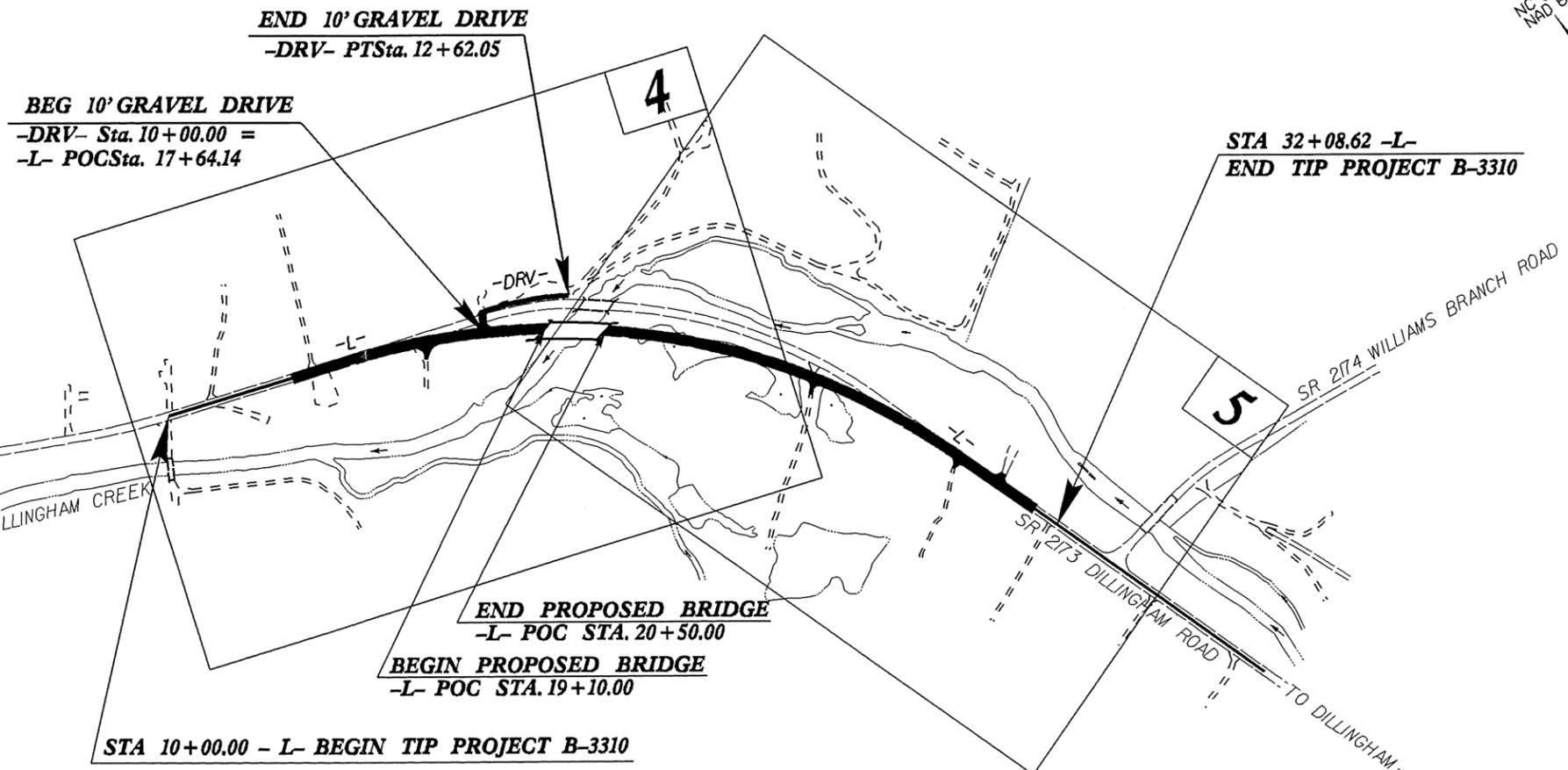


STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**BUNCOMBE COUNTY**

**LOCATION: BRIDGE NO. 145 OVER DILLINGHAM CREEK  
ON SR 2173 (DILLINGHAM ROAD)**

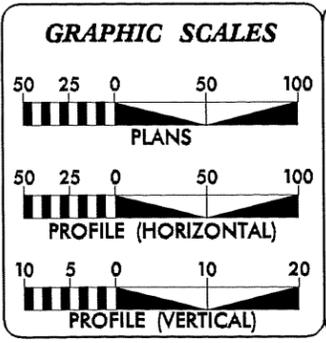
**TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	<b>B-3310</b>	<b>1</b>	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
32984.1.1	BRZ-2173 (1)	P.E.	



\*\* DESIGN EXCEPTION REQUIRED FOR HORIZONTAL STOPPING SIGHT DISTANCE.  
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES  
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

**PRELIMINARY PLANS**  
DO NOT USE FOR CONSTRUCTION



**DESIGN DATA**

ADT 2004 =	2240
ADT 2024 =	3350
DHV =	15 %
D =	65 %
T =	3 % *
V =	60 MPH **
* TTST 1% + DUAL 2%	

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-3310 =	0.380 MI
LENGTH STRUCTURE TIP PROJECT B-3310 =	0.027 MI
TOTAL LENGTH TIP PROJECT B-3310 =	0.407 MI

Prepared In the Office of:

**DIVISION OF HIGHWAYS**  
1000 Birch Ridge Dr., Raleigh, NC 27610

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: AUGUST 29, 2003	GARY LOVERING, PE PROJECT ENGINEER
LETTING DATE: AUGUST 17, 2004	ANTHONY C. WEST PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

\_\_\_\_\_  
SIGNATURE: P.E.

**ROADWAY DESIGN ENGINEER**

\_\_\_\_\_  
SIGNATURE: P.E.

**DIVISION OF HIGHWAYS**  
STATE OF NORTH CAROLINA

\_\_\_\_\_  
STATE DESIGN ENGINEER

**DEPARTMENT OF TRANSPORTATION**  
FEDERAL HIGHWAY ADMINISTRATION

APPROVED: \_\_\_\_\_  
DIVISION ADMINISTRATOR

DATE: \_\_\_\_\_

02-FEB-2004 10:08 b3310\_rdy\_tsh.dgn

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# CONVENTIONAL SYMBOLS

\*S.U.E = SUBSURFACE UTILITY ENGINEER

## ROADS & RELATED ITEMS

Edge of Pavement	-----
Curb	-----
Prop. Slope Stakes Cut	----- C
Prop. Slope Stakes Fill	----- F
Prop. Woven Wire Fence	-----
Prop. Chain Link Fence	-----
Prop. Barbed Wire Fence	-----
Prop. Wheelchair Ramp	----- WCR
Curb Cut for Future Wheelchair Ramp	----- CCFR
Exist. Guardrail	-----
Prop. Guardrail	-----
Exist. Cable Guiderail	-----
Prop. Cable Guiderail	-----
Equality Symbol	-----
Pavement Removal	-----

## RIGHT OF WAY

Baseline Control Point	-----
Existing Right of Way Marker	-----
Exist. Right of Way Line w/Marker	-----
Prop. Right of Way Line with Proposed R/W Marker (Iron Pin & Cap)	-----
Prop. Right of Way Line with Proposed (Concrete or Granite) R/W Marker	-----
Exist. Control of Access Line	-----
Prop. Control of Access Line	-----
Exist. Easement Line	-----
Prop. Temp. Construction Easement Line	-----
Prop. Temp. Drainage Easement Line	-----
Prop. Perm. Drainage Easement Line	-----

## HYDROLOGY

Stream or Body of Water	-----
River Basin Buffer	-----
Flow Arrow	-----
Disappearing Stream	-----
Spring	-----
Swamp Marsh	-----
Shoreline	-----
Falls, Rapids	-----
Prop Lateral, Tail, Head Ditches	-----

## STRUCTURES

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

## MINOR

Head & End Wall	----- CONC HW
Pipe Culvert	-----
Footbridge	-----
Drainage Boxes	----- CB
Paved Ditch Gutter	-----

## UTILITIES

Exist. Pole	-----
Exist. Power Pole	-----
Prop. Power Pole	-----
Exist. Telephone Pole	-----
Prop. Telephone Pole	-----
Exist. Joint Use Pole	-----
Prop. Joint Use Pole	-----
Telephone Pedestal	-----
Cable TV Pedestal	-----
Hydrant	-----
Satellite Dish	-----
Exist. Water Valve	-----
Sewer Clean Out	-----
Power Manhole	-----
Telephone Booth	-----
Water Manhole	-----
Light Pole	-----
H-Frame Pole	-----
Power Line Tower	-----
Pole with Base	-----
Gas Valve	-----
Gas Meter	-----
Telephone Manhole	-----
Power Transformer	-----
Sanitary Sewer Manhole	-----
Storm Sewer Manhole	-----
Tank; Water, Gas, Oil	-----
Water Tank With Legs	-----
Traffic Signal Junction Box	-----
Fiber Optic Splice Box	-----
Television or Radio Tower	-----
Utility Power Line Connects to Traffic Signal Lines Cut Into the Pavement	-----

Recorded Water Line	-----
Designated Water Line (S.U.E.*)	-----
Sanitary Sewer	-----
Recorded Sanitary Sewer Force Main	-----
Designated Sanitary Sewer Force Main(S.U.E.*)	-----
Recorded Gas Line	-----
Designated Gas Line (S.U.E.*)	-----
Storm Sewer	-----
Recorded Power Line	-----
Designated Power Line (S.U.E.*)	-----
Recorded Telephone Cable	-----
Designated Telephone Cable (S.U.E.*)	-----
Recorded U/G Telephone Conduit	-----
Designated U/G Telephone Conduit (S.U.E.*)	-----
Unknown Utility (S.U.E.*)	-----
Recorded Television Cable	-----
Designated Television Cable (S.U.E.*)	-----
Recorded Fiber Optics Cable	-----
Designated Fiber Optics Cable (S.U.E.*)	-----
Exist. Water Meter	-----
U/G Test Hole (S.U.E.*)	-----
Abandoned According to U/G Record	-----
End of Information	-----

## BOUNDARIES & PROPERTIES

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Property Line Symbol	-----
Exist. Iron Pin	-----
Property Corner	-----
Property Monument	-----
Property Number	-----
Parcel Number	-----
Fence Line	-----
Existing Wetland Boundaries	-----
Proposed Wetland Boundaries	-----
Existing Endangered Animal Boundaries	-----
Existing Endangered Plant Boundaries	-----

## BUILDINGS & OTHER CULTURE

Buildings	-----
Foundations	-----
Area Outline	-----
Gate	-----
Gas Pump Vent or U/G Tank Cap	-----
Church	-----
School	-----
Park	-----
Cemetery	-----
Dam	-----
Sign	-----
Well	-----
Small Mine	-----
Swimming Pool	-----

## TOPOGRAPHY

Loose Surface	-----
Hard Surface	-----
Change in Road Surface	-----
Curb	-----
Right of Way Symbol	-----
Guard Post	-----
Paved Walk	-----
Bridge	-----
Box Culvert or Tunnel	-----
Ferry	-----
Culvert	-----
Footbridge	-----
Trail, Footpath	-----
Light House	-----

## VEGETATION

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

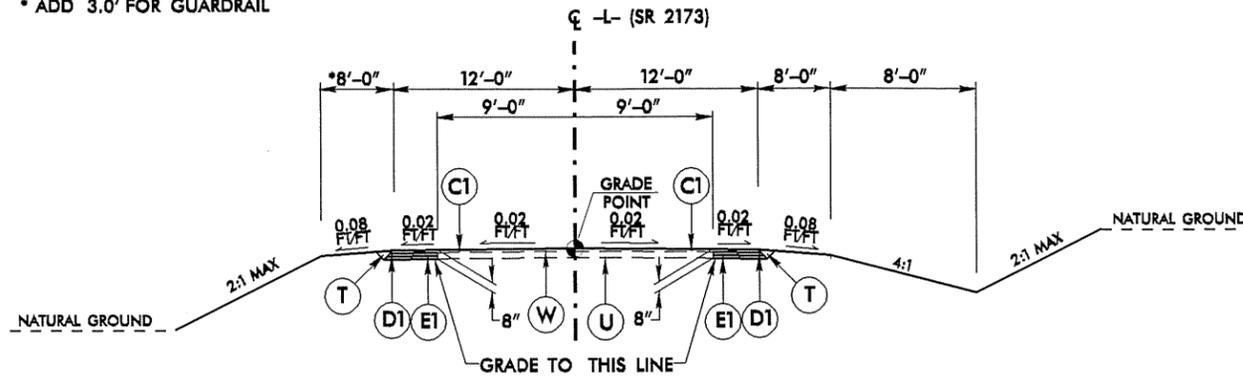
## RAILROADS

Standard Gauge	-----
RR Signal Milepost	-----
Switch	-----

5/28/99

09-FEB-2004 10:49  
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C:\msd31

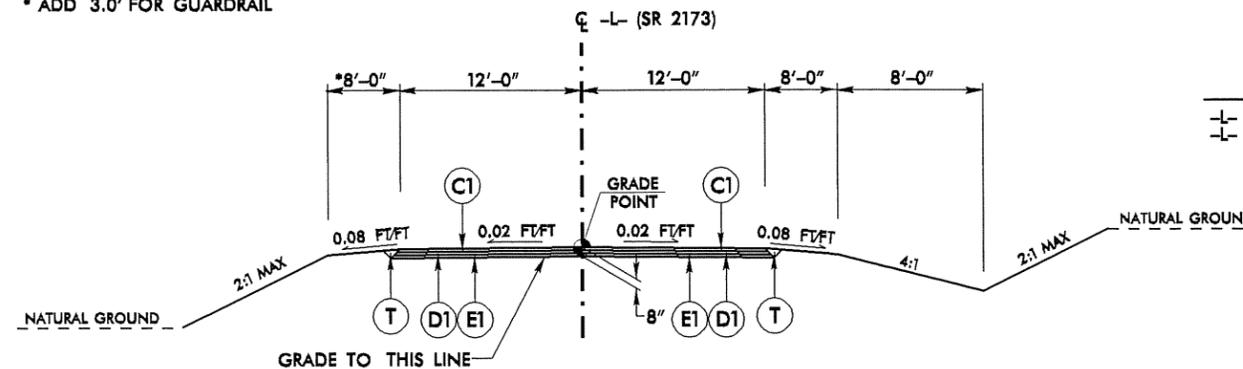
NOTE: PAVE RIGHT SHOULDER OUT TO GUARDRAIL:  
STA 15+92 TO 18+72 (APPR SLAB) &  
STA 20+52 (APPR SLAB) TO 23+72  
\* ADD 3.0' FOR GUARDRAIL



USE TYPICAL SECTION NO. 1  
-L- STA. 13+00.00 TO 17+00.00  
-L- STA. 26+75.00 TO 31+50.00

TYPICAL SECTION NO.1

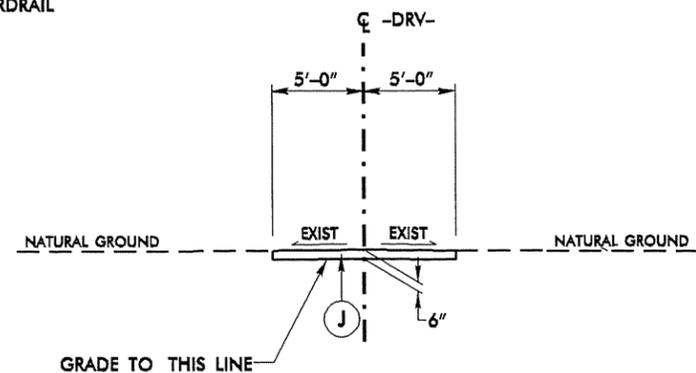
NOTE: PAVE RIGHT SHOULDER OUT TO GUARDRAIL:  
STA 15+92 TO 18+72 (APPR SLAB) &  
STA 20+52 (APPR SLAB) TO 23+72  
\* ADD 3.0' FOR GUARDRAIL



USE TYPICAL SECTION NO. 2  
-L- STA. 17+00.00 TO STA. 19+10.00 (BGN BRG)  
-L- STA. 20+50.00 (END BRG) TO 26+75.00

TYPICAL SECTION NO.2

NOTE: PAVE RIGHT SHOULDER OUT TO GUARDRAIL:  
STA 15+92 TO 18+72 (APPR SLAB) &  
STA 20+52 (APPR SLAB) TO 23+72  
\* ADD 3.0' FOR GUARDRAIL

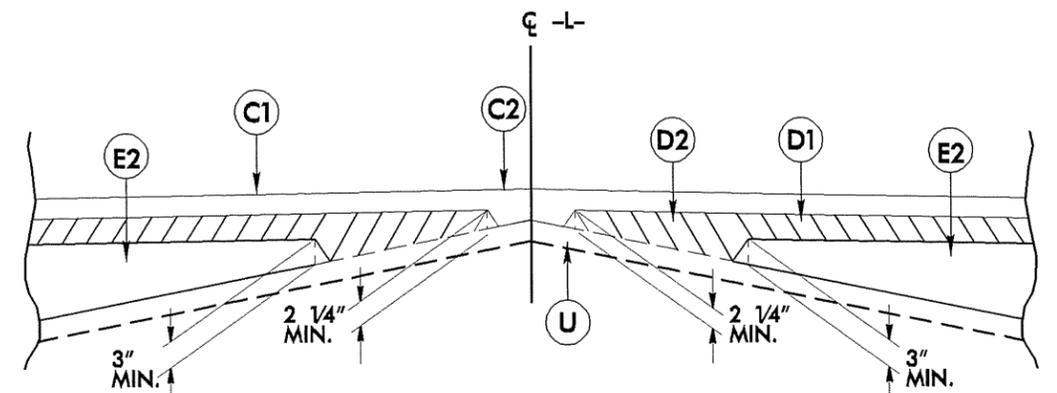


USE TYPICAL SECTION NO. 3  
-DRY- STA. 10+12.00 TO STA. 12+62.05

TYPICAL SECTION NO.3

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 2.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5A, AT AN AVERAGE RATE OF 280 LBS. PER SQ. YD.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5A, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1 1/2" IN DEPTH.
D1	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2 1/4" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 3" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 6 1/2" IN DEPTH.
J	PROP. 6" AGGREGATE BASE COURSE.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT. (SEE WEDGING DETAIL)

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



Detail Showing Method of Wedging

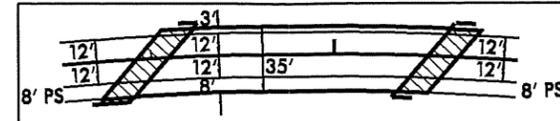
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7/2/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-3310	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

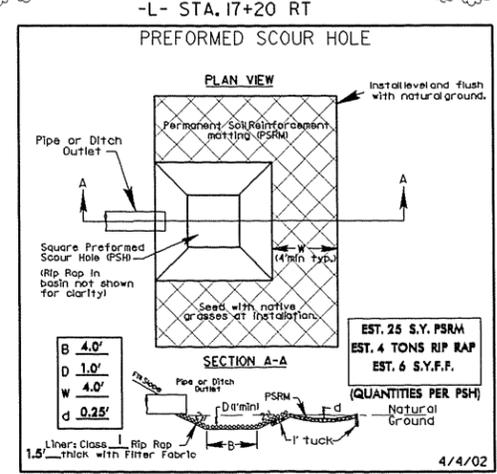
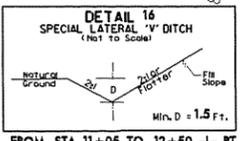
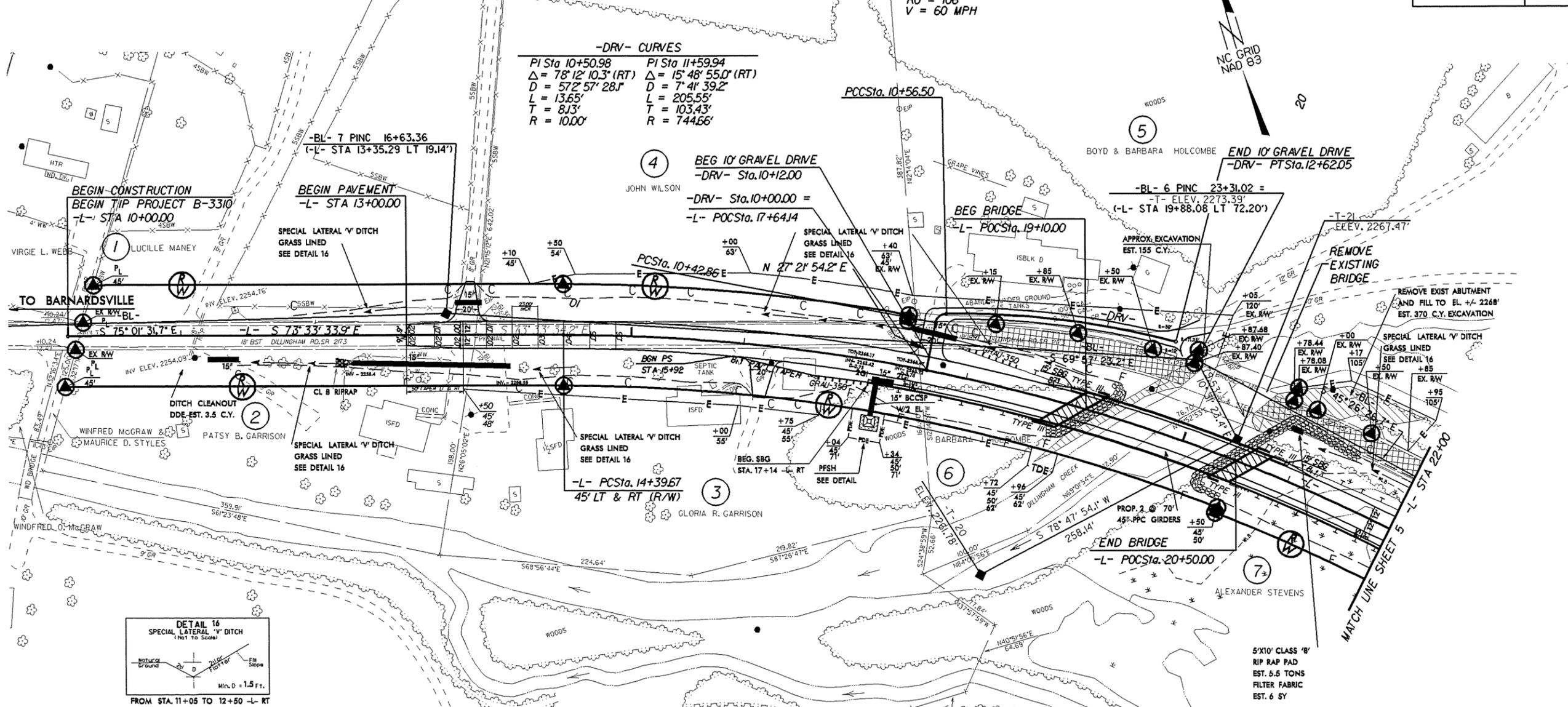
SKETCH SHOWING BRIDGE PAVEMENT IN RELATION TO BRIDGE



**-L- CURVE**  
 PI Sta 22+44.71  
 $\Delta = 52^\circ 22' 24.5''$  (RT)  
 $D = 3^\circ 30' 00.0''$   
 $L = 1,496.39'$   
 $T = 805.04'$   
 $R = 1,637.02'$   
 $SE = 0.06$  FT/FT  
 $RO = 106'$   
 $V = 60$  MPH

**-DRV- CURVES**

PI Sta 10+50.98 $\Delta = 78^\circ 12' 10.3''$ (RT) $D = 57^\circ 57' 28.1''$ $L = 13.65'$ $T = 8.13'$ $R = 10.00'$	PI Sta 11+59.94 $\Delta = 15^\circ 48' 55.0''$ (RT) $D = 7^\circ 41' 39.2''$ $L = 205.55'$ $T = 103.43'$ $R = 744.66'$
--	---



- PAVEMENT REMOVAL
- ABUTMENT REMOVAL
- ALL DRIVEWAY RADII ARE 10'
- PS = PAVED SHOULDER
- SBG = SHOULDER BERM GUTTER
- FOR -L- PROFILE SEE SHEET 6

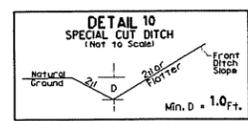
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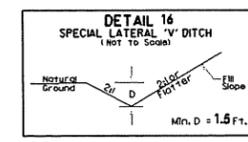
7/2/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-3310	5
R/W SHEET NO.	
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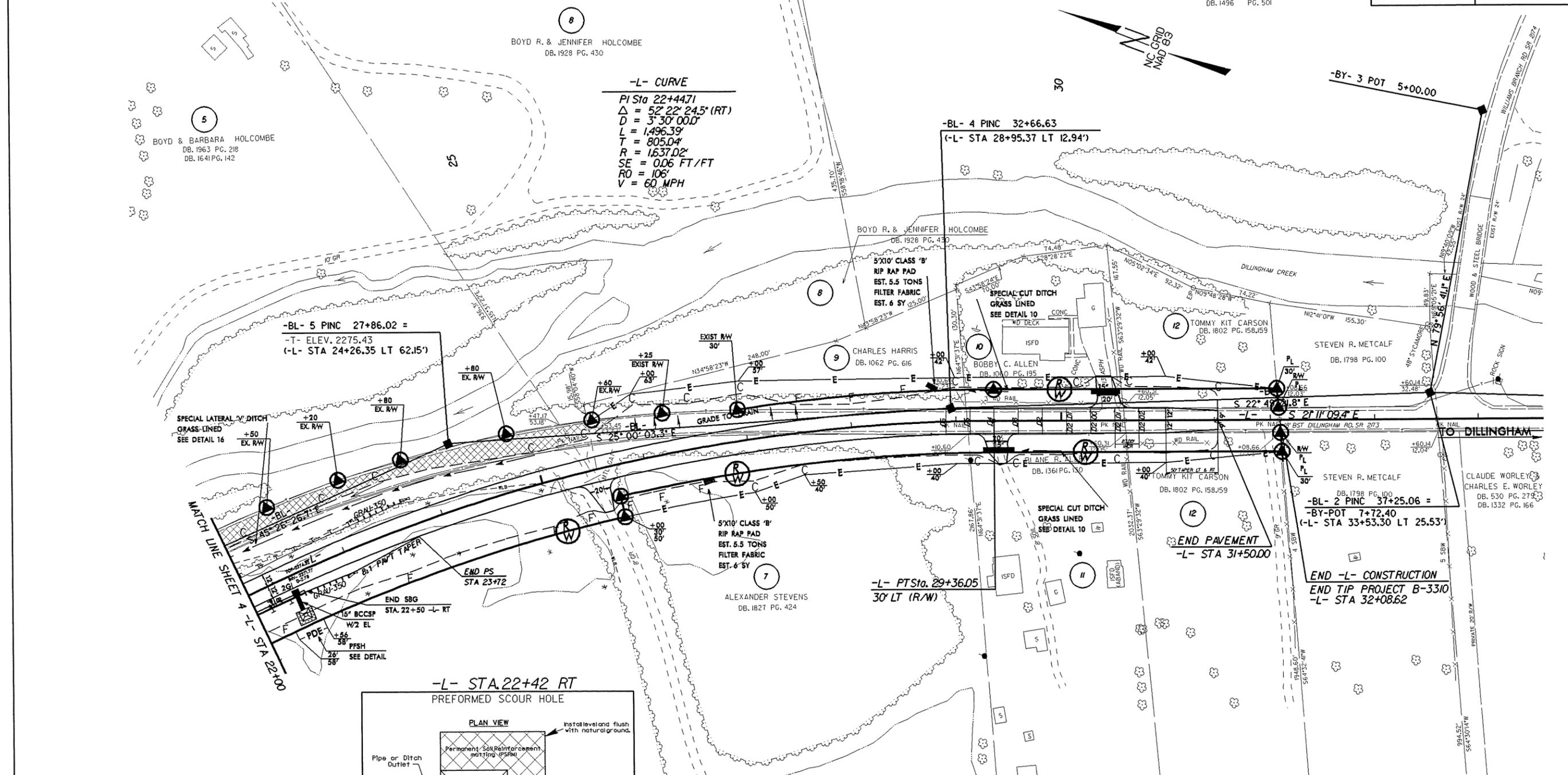


FROM STA. 28+83 TO 29+50 -L- LT  
STA. 29+50 TO 31+00 -L- RT



FROM STA. 21+00 TO 25+00 -L- LT

CHARLES DAVID HARRIS  
WANDA JOANNE EVANS &  
BRENDA GAIL LEDFORD  
DB. 1496 PG. 501



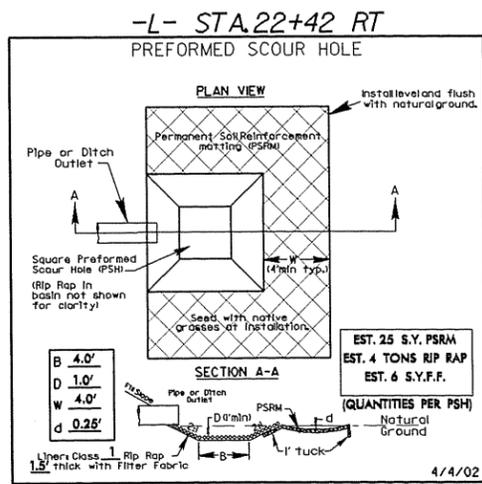
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D = 3' 30' 00.0"  
L = 1,496.39'  
T = 805.04'  
R = 1637.02'  
SE = 0.06 FT/FT  
RO = 106'  
V = 60 MPH

**-BL- 5 PINC 27+86.02 =**  
-T- ELEV. 2275.43  
(-L- STA 24+26.35 LT 62.15')

**-BL- 4 PINC 32+66.63**  
(-L- STA 28+95.37 LT 12.94')

**-BY- 3 POT 5+00.00**

**-BL- 2 PINC 37+25.06 =**  
-BY-POT 7+72.40  
(-L- STA 33+53.30 LT 25.53')



PAVEMENT REMOVAL  
ALL DRIVE RADII ARE 10'  
PS = PAVED SHOULDER  
SBG = SHOULDER BERM GUTTER  
FOR -L- PROFILE SEE SHEET 6

DESIGN EXCEPTION REQUIRED FOR HORIZONTAL STOPPING SIGHT DISTANCE.

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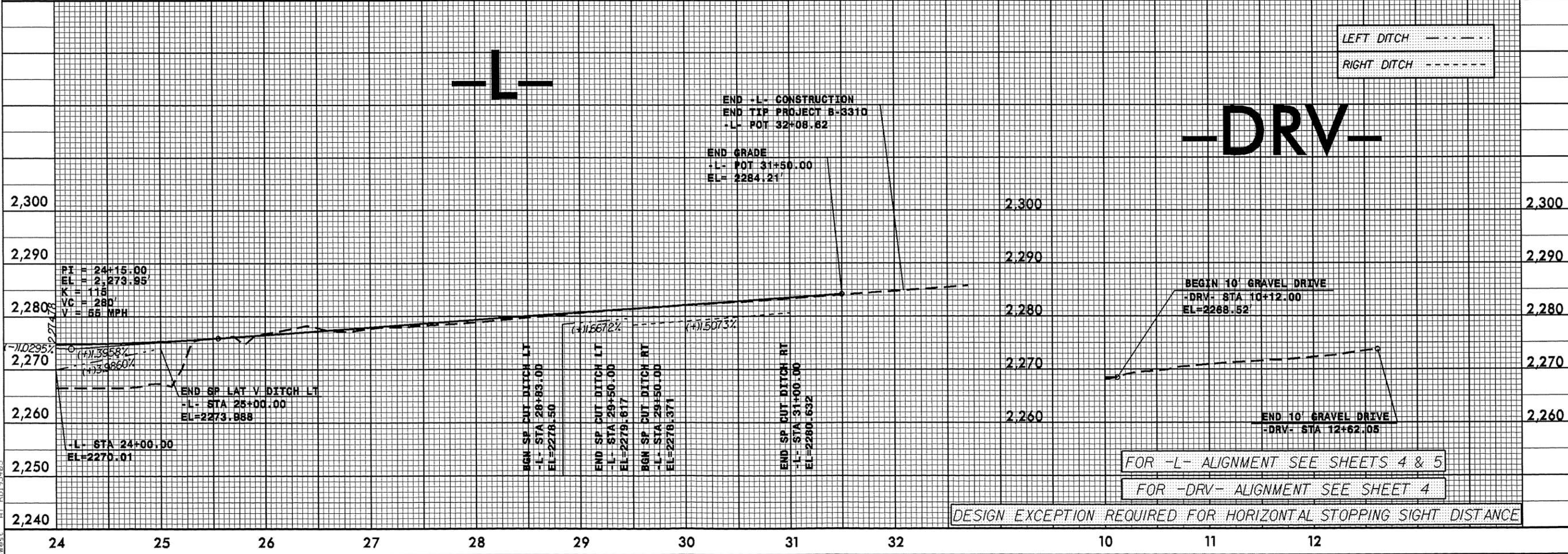
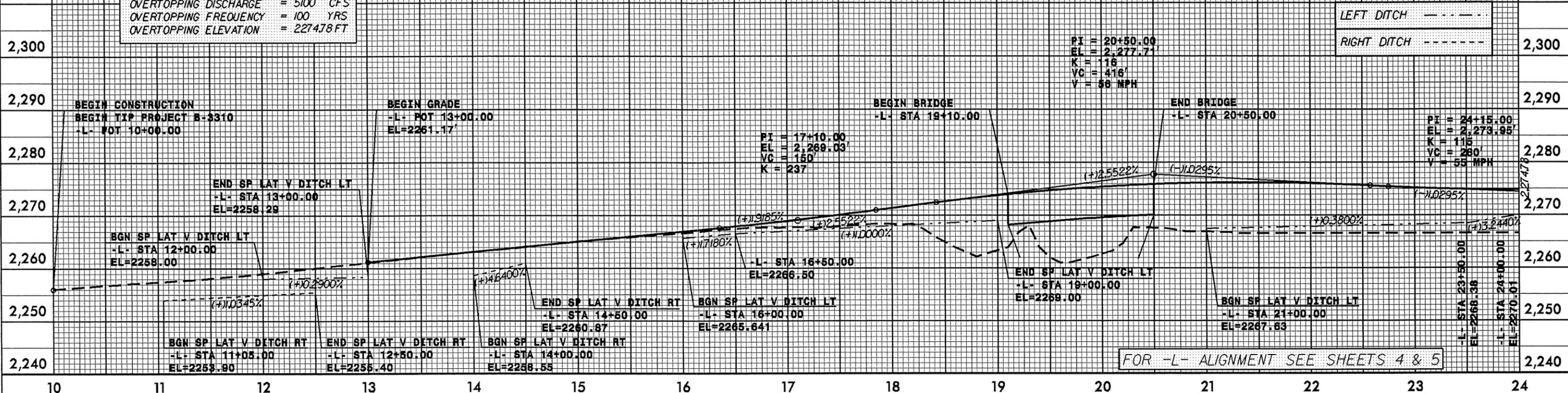
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PROJECT REFERENCE NO. B-3310	SHEET NO. 6
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

**STRUCTURE HYDRAULIC DATA**

DESIGN DISCHARGE	= 3700 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 2269.78 FT
BASE DISCHARGE	= 5100 CFS
BASE YEAR FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 2270.77 FT
OVERTOPPING DISCHARGE	= 5100 CFS
OVERTOPPING FREQUENCY	= 100 YRS
OVERTOPPING ELEVATION	= 2274.78 FT

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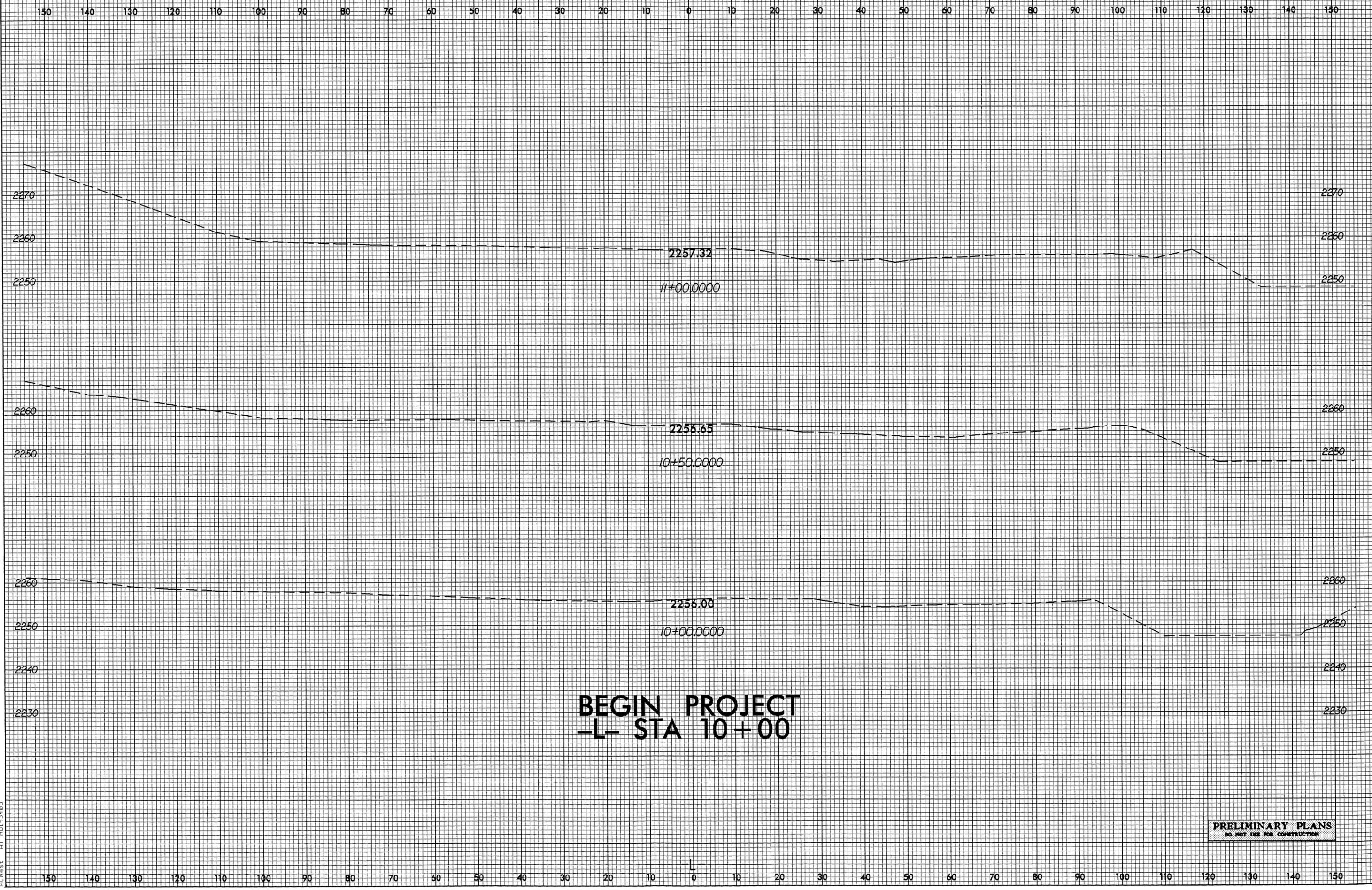


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8/23/99



PROJ. REFERENCE NO. B-3310	SHEET NO. X-1
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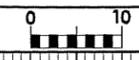


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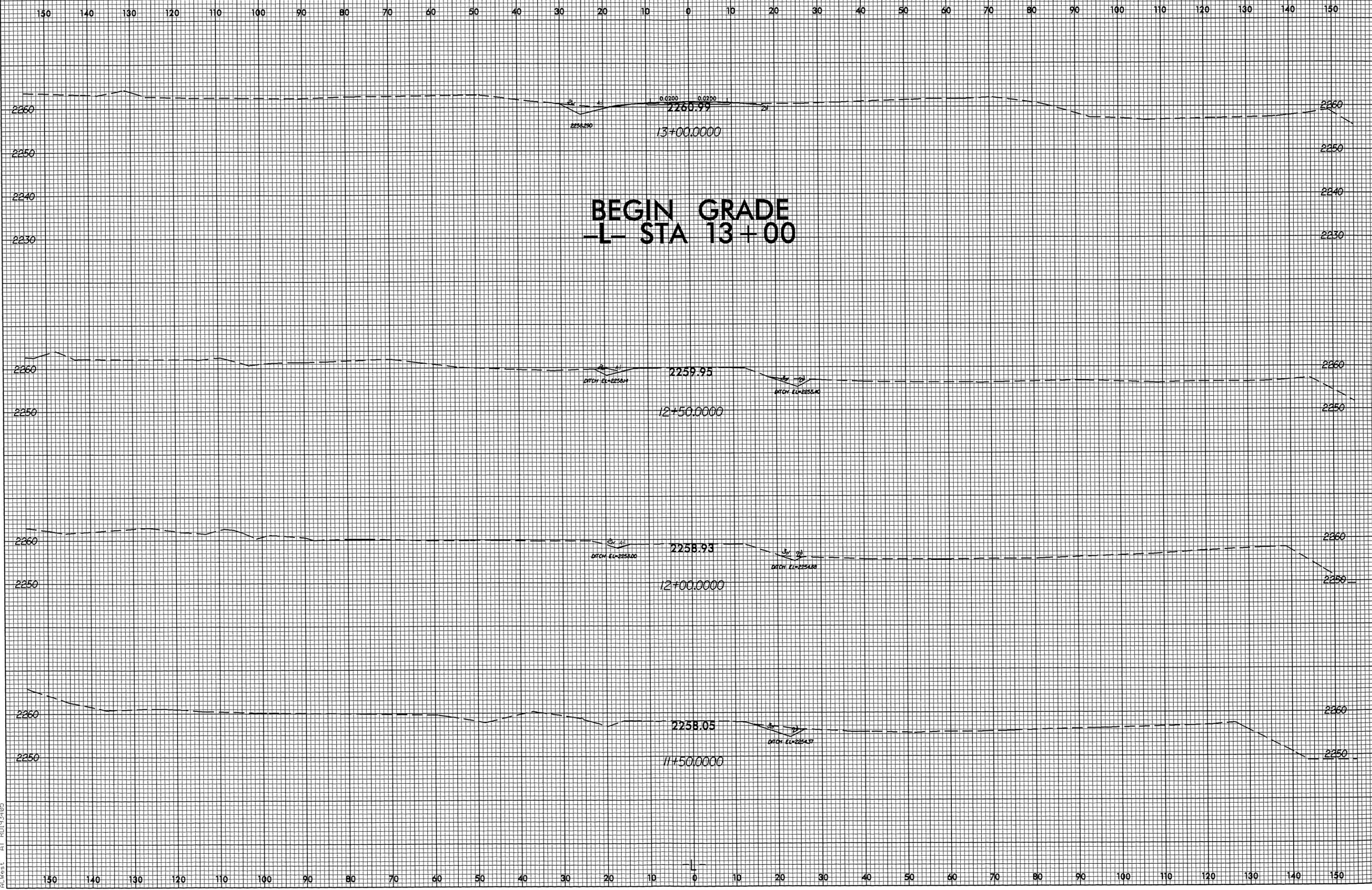
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8/23/99

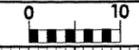


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B-3310	X-2



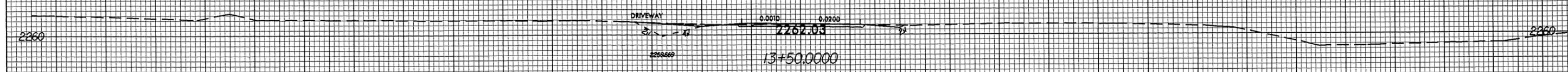
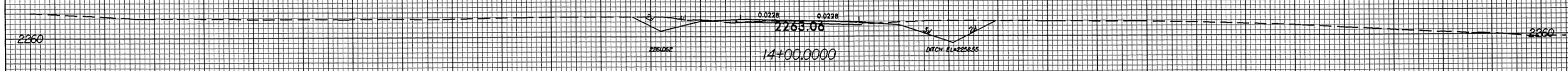
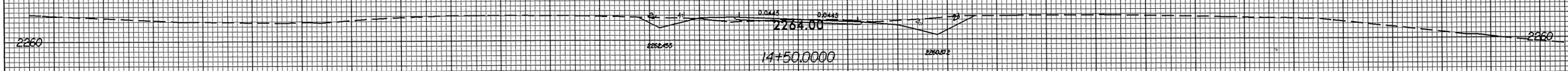
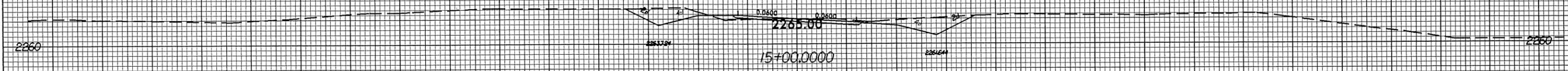
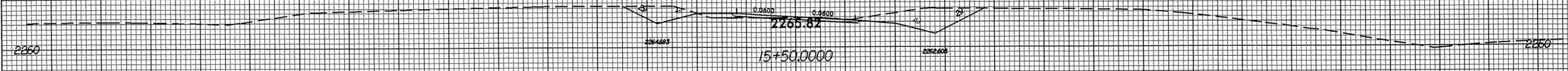
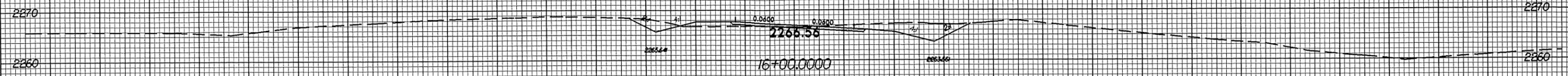
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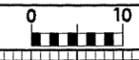
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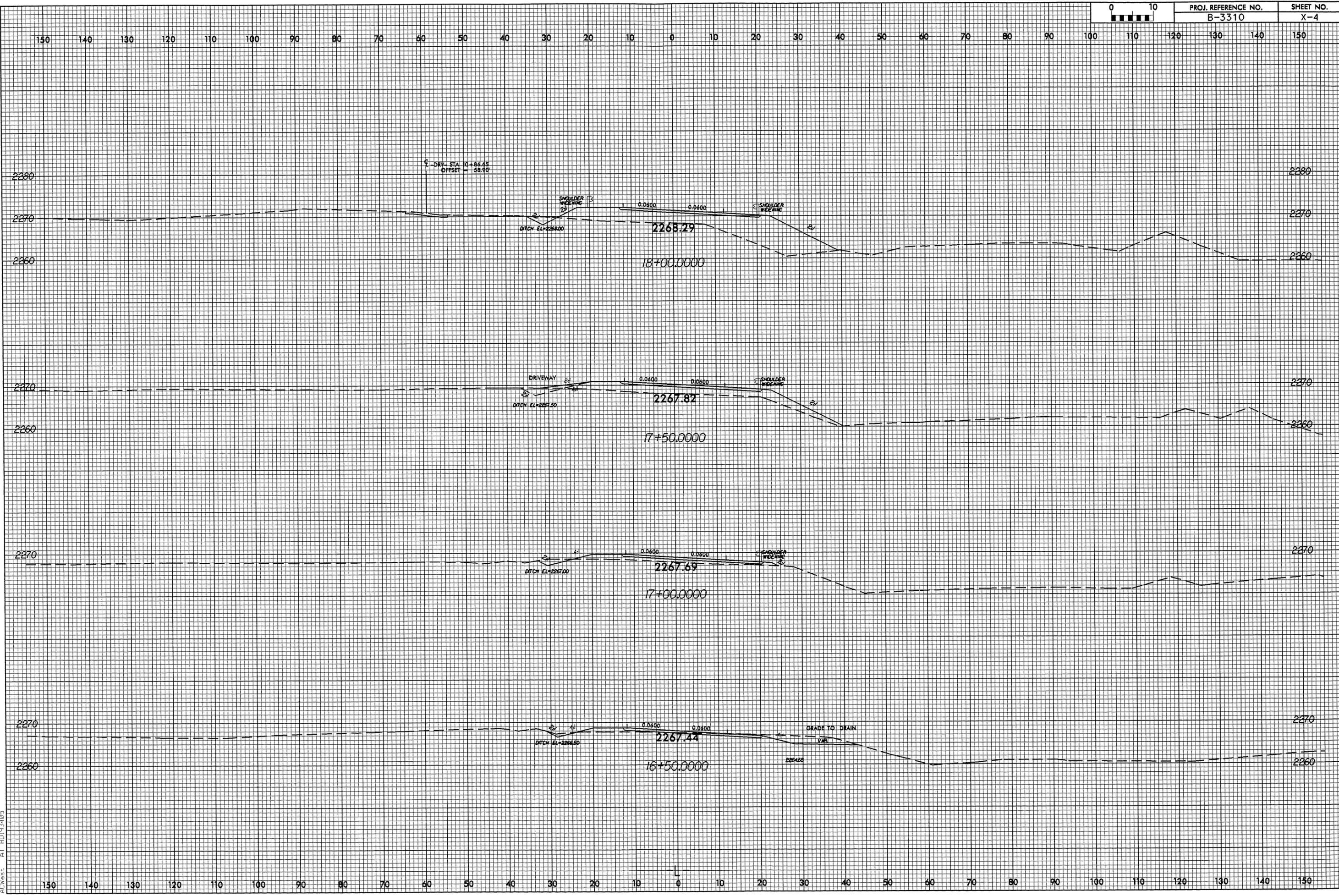
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PROJ. REFERENCE NO. B-3310	SHEET NO. X-4
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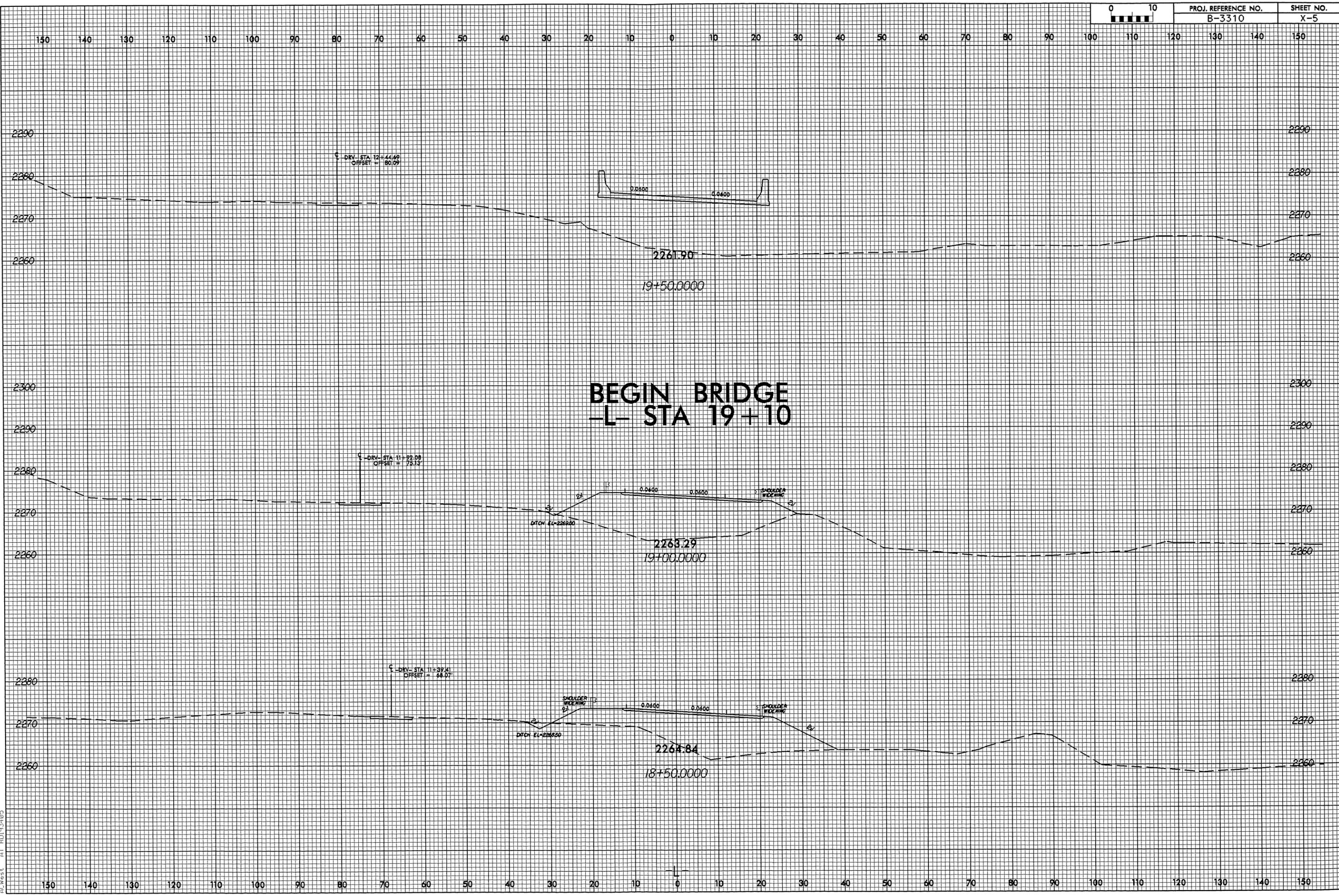
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8/23/99



PROJ. REFERENCE NO.	SHEET NO.
B-3310	X-5



**BEGIN BRIDGE**  
**-L- STA 19+10**

C - DRV - STA 12+44.69  
 OFFSET = 80.09

C - DRV - STA 11+92.08  
 OFFSET = 79.13

C - DRV - STA 11+37.41  
 OFFSET = 68.07

0.0500 0.4400

2261.90  
 19+50.0000

DITCH EL=2269.00

2263.29  
 19+00.0000

SHOULDER WIDENING

DITCH EL=2268.50

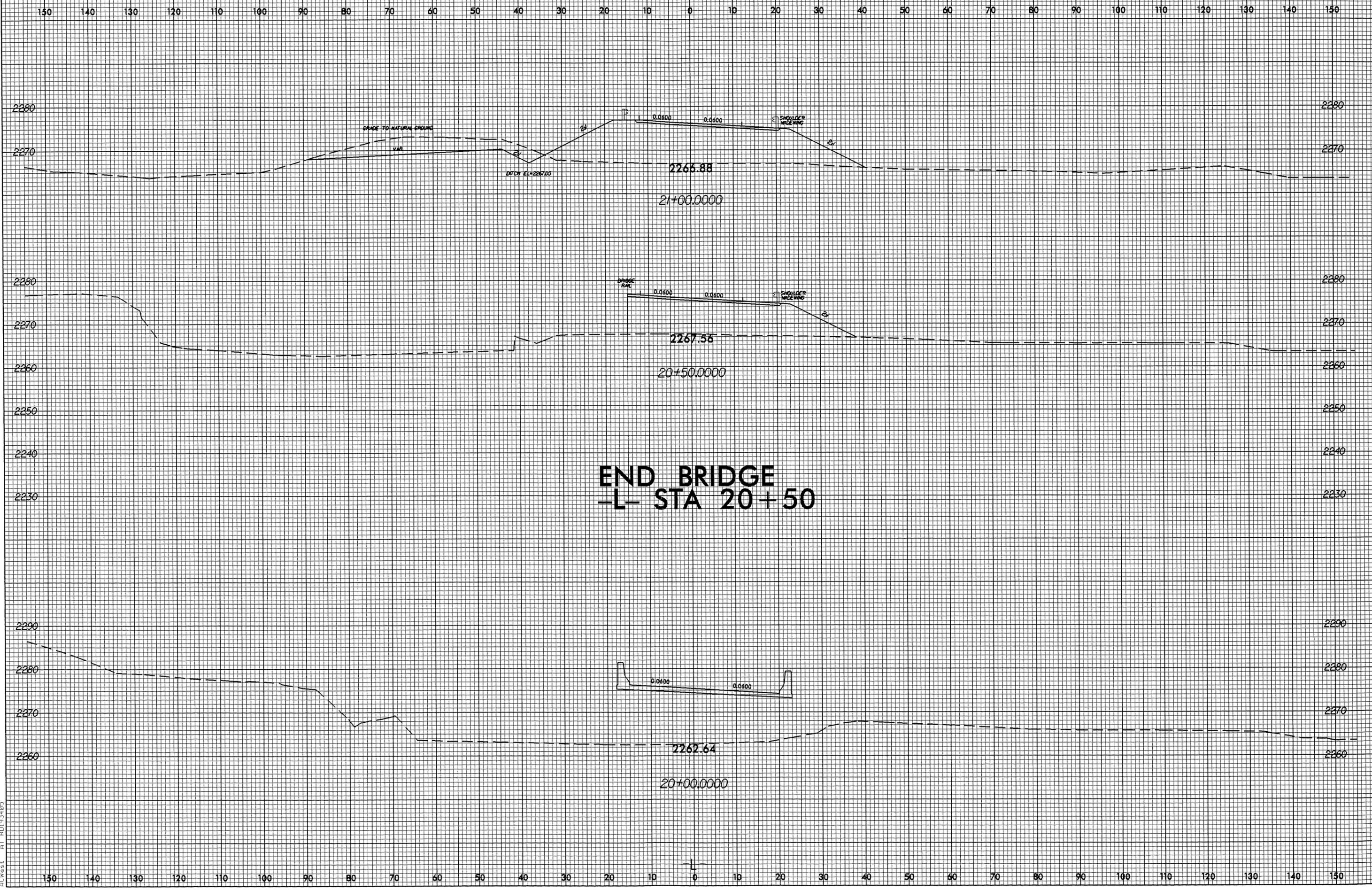
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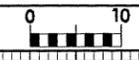


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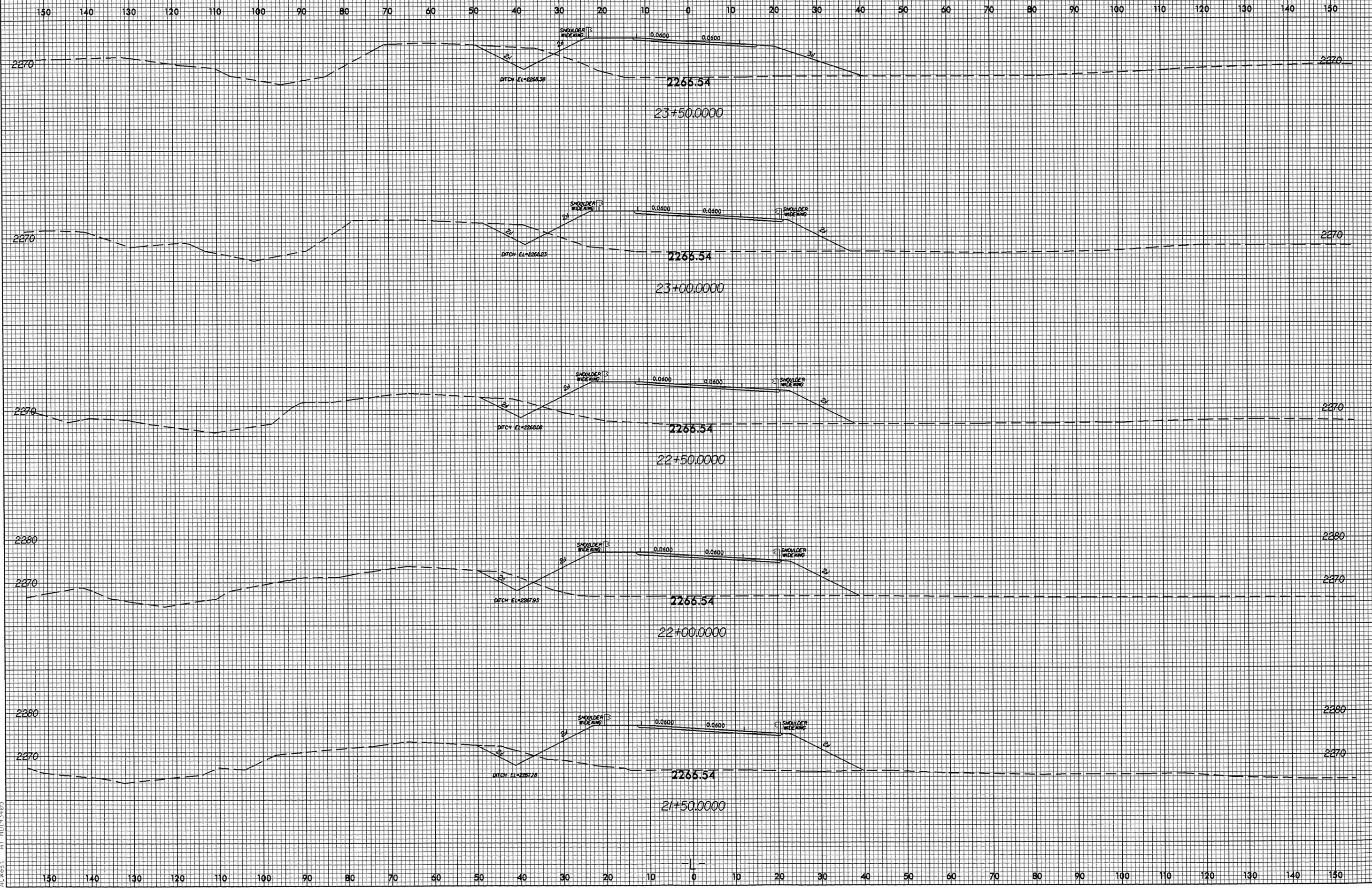


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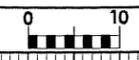


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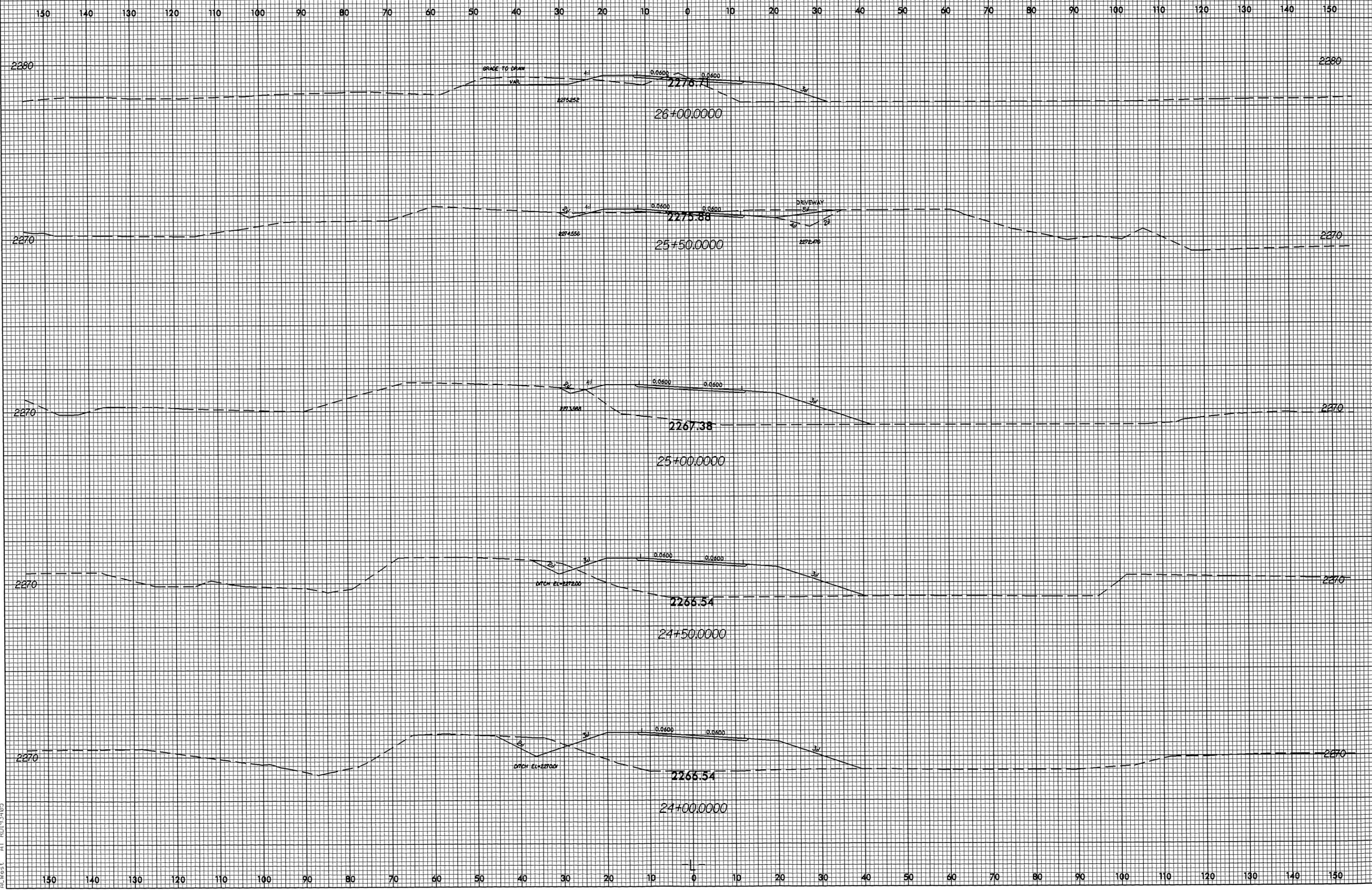


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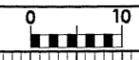


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B-3310	X-8



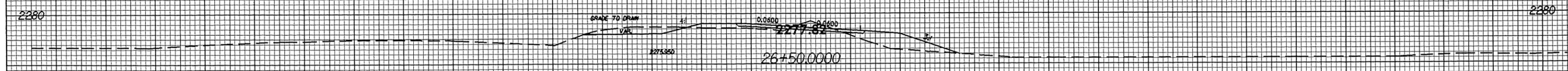
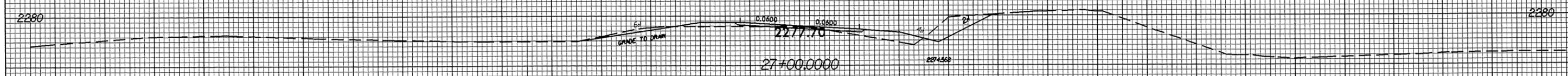
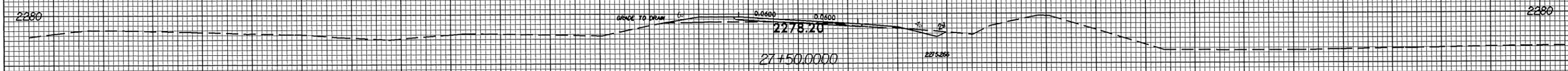
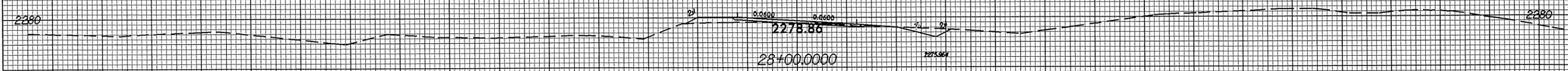
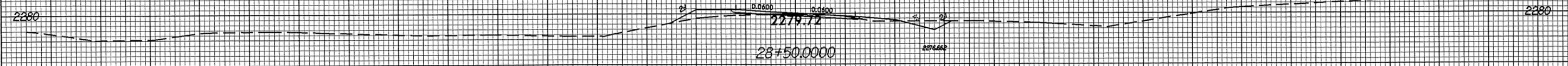
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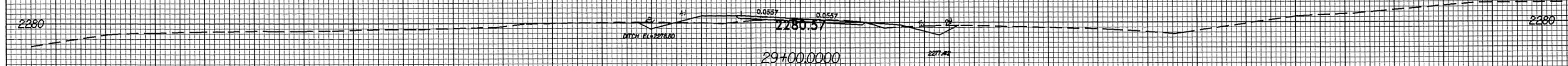
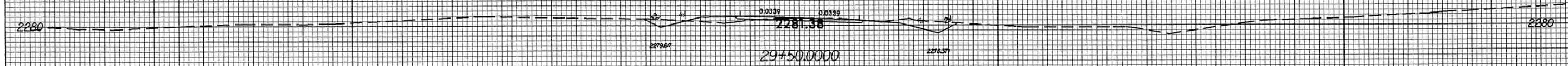
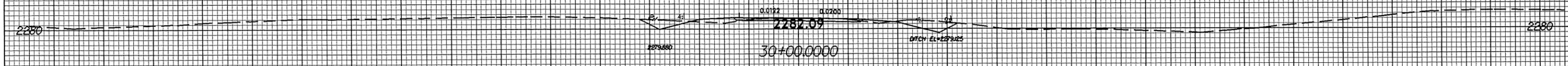
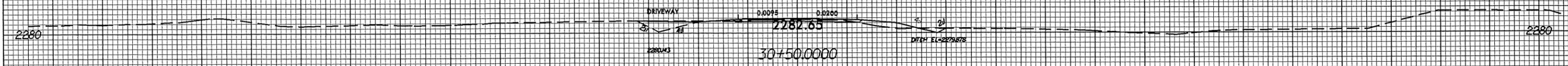
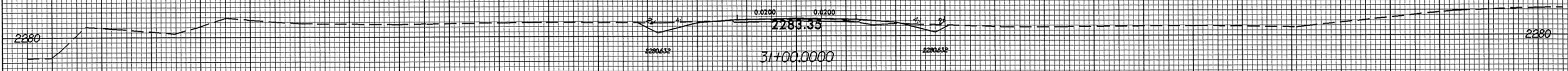


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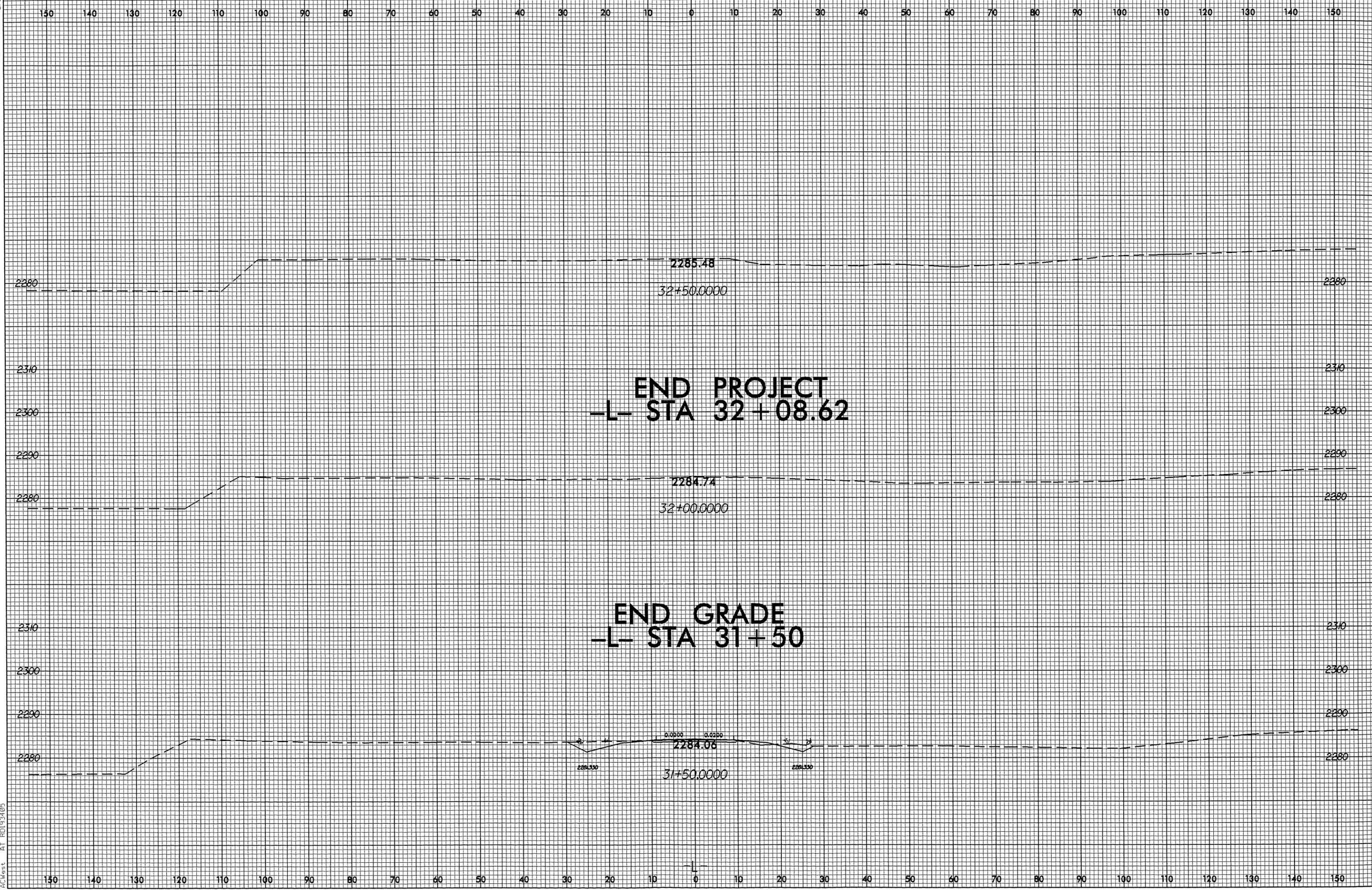
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Harney

SR 2173

Buncombe County

Bridge No. 145 Over Dillingham Creek

Federal Aid Project No. BRZ-2173 (1)

State Project 8.2843601

TIP Project No. B-3310

CATEGORICAL EXCLUSION

US DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

AND

NC DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

APPROVED:

07.18.02  
DATE

Stanley B. Harris  
for L. Gail Grimes, P.E., Assistant Manager  
Project Development and Environmental Analysis  
Branch, NCDOT

7/18/02  
DATE

Clarence W. Coleman Jr.  
for Nicholas L. Graf, P.E.  
Division Administrator, FHWA



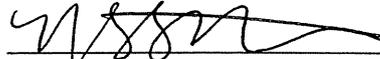
SR 2173  
Buncombe County  
Bridge No. 145 Over Dillingham Creek  
Federal Aid Project No. BRZ-2173 (1)  
State Project 8.2843601  
TIP Project No. B-3310

CATEGORICAL EXCLUSION

July 2002

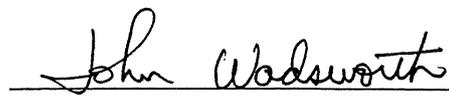
Document Prepared by



  
Yvonne G.G. Howell, P.E.  
Project Manager  
Earth Tech



For the North Carolina Department of Transportation

  
John Wadsworth, P.E., Project Manager  
Consultant Engineering Unit



**PROJECT COMMITMENTS**  
**SR 2173**  
**Buncombe County**  
**Bridge No. 145 Over Dillingham Creek**  
**Federal Aid Project No. BRZ-2173 (1)**  
**State Project 8.2843601**  
**TIP Project No. B-3310**

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

***Division 13***

Dillingham Creek is classified as a mountain trout stream, therefore "Guidelines for Construction Adjacent to or Crossing Trout Waters" as incorporated in to *Erosion and Sediment Control Guidelines* will be implemented and adhered to throughout the project. In-stream work and land disturbance within the 25-foot (7.6-m) wide trout stream buffer zone is prohibited during the trout spawning season of November 1 through April 15 to protect the egg and fry stages of trout from off-site sedimentation during construction.

***Hydraulics Unit, Structure Design***

Approval under Section 26a of the Tennessee Valley Authority (TVA) Act will be required for the bridge replacement project. A copy of this document will be forwarded to TVA.



**SR 2173**  
**Buncombe County**  
**Bridge No. 145 Over Dillingham Creek**  
**Federal Aid Project No. BRZ-2173 (1)**  
**State Project 8.2843601**  
**TIP Project No. B-3310**

**INTRODUCTION:** The replacement of Bridge No. 145 is included in the 2002–2008 North Carolina Department of Transportation (NCDOT) Transportation Improvement Program (TIP) and in the Federal-aid Bridge Replacement Program. The location is shown in **Figure 1**. No substantial environmental impacts are anticipated. The project is classified as a Federal “Categorical Exclusion.”

**I. PURPOSE AND NEED**

Bridge Maintenance Unit records indicate that the bridge has a sufficiency rating of 27.2 out of a possible of 100 for a new structure. The bridge is considered functionally obsolete and structurally deficient. The replacement of this inadequate structure will result in safer and more efficient traffic operations.

**II. EXISTING CONDITIONS**

SR 2173 (Dillingham Road) in Buncombe County is classified as “Rural Minor Collector” in the Statewide Functional Classification System.

Throughout the project area, SR 2173 carries two lanes on an 18-foot (5.4-meter [m]) clear roadway width and a 24-foot (7.2-m) wide right-of-way. The horizontal and vertical alignments currently meet design standards.

There is no posted speed limit in the project area, therefore the statutory speed limit of 55 mph (90 kph) applies.

The existing bridge was constructed in 1956. The superstructure consists of steel planks on I-beams. The substructure consists of reinforced concrete abutments and mass piers. The abutments are vertical. The existing bridge consists of two spans, one of 36 feet (10.8 m) and one of 35.8 feet (10.9 m) for a total length of 71.8 feet (21.9 m). The clear roadway width on the existing bridge is 24.1 feet (7.3 m). The crown of the roadway is situated approximately 12 feet (3.6 m) over the bed of Dillingham Creek. Presently, the posted weight limit is

31/38 tons (28/34 metric tons) single axle trucks and tractor trailer/semi-trailers, respectively.

The bridge is located in a curve section of SR 2173 and crosses Dillingham Creek at approximately 130 degrees. Photographs of the approaches to the existing bridge are shown in **Figures 4a and 4b**.

The average daily traffic volume on SR 2173 at Bridge No. 145 will be 2230 vehicles per day at scheduled construction, in 2004. By the design year, 2025, the average daily traffic volume is expected to increase to 3400 vehicles per day. The projected traffic volume includes two percent dual-tired vehicles and one percent truck-tractor/semi-trailers.

Four school buses cross this bridge twice each day as part of a regular route.

SR 2173 is not a designated bicycle route.

No accidents were reported at Bridge No. 145 in the period between February 1, 1999 and January 31, 2002.

### **III. ALTERNATIVES**

#### **A. Project Description**

The proposed structure is a bridge with a clear roadway width of 39 feet (11.9 m) and an approach roadway width of 24 feet (7.2 m) to accommodate two lanes of traffic. The typical section for the approaches and bridge are shown in **Figure 3**.

#### **B. Build Alternatives**

Two build alternatives have been developed for this project.

**Alternative 1 (preferred)** will realign the roadway and construct a new bridge to the south (downstream) of the existing structure. The new bridge will be approximately 142 feet (43.3 m) long and maintain the existing low steel elevation. This alternative maintains a 55 mph (90 kph) design speed. Traffic would be maintained on the existing structure during construction. This alternative would relocate one residence (see **Appendix B** for Relocation Reports). **Alternative 1** is shown in **Figure 2a**.

**Alternative 3** will replace Bridge No. 145 at its existing location with an on-site detour to the north. This alternative would require a retaining wall beginning at

the northeastern quadrant of the proposed bridge, approximately 300 feet (91.4 m) long. The new bridge would be approximately 138 feet (42.1 m) long and maintain the existing low steel elevation. The retaining wall would minimize stream impacts north of the existing road. The temporary on-site detour would extend north of Dillingham Creek and all its tributaries to avoid extensive stream impacts, resulting in a detour length of 2130 feet (649 m). The detour would tie into SR 2174 (Williams Branch Road), which intersects with Dillingham Road south of Bridge No. 145. This detour crosses Bridge No. 413 on SR 2174. This three-span timber bridge has a posted weight limit of 22/27 tons (20/24 metric tons) and a sufficiency rating of 66.9. The permanent alignment maintains a 55 mph (90 kph) design speed while the detour maintains a 50 mph (80 kph) design speed. This alternative would relocate two residences (see **Appendix B** for Relocation Reports). **Alternative 3** is shown in **Figure 2b**.

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

**Alternative 2** would realign the roadway and construct two new bridges north (upstream) of the existing bridge; two curved bridges would be required due to the meandering nature of Dillingham Creek north of Dillingham Road. **Alternative 2** would impact leaking underground storage tanks located in the northwest quadrant of the existing bridge, and require the relocation of a residence located east of the existing bridge. This alternative would result in high costs, due to the construction of two structures, and high environmental impacts due to the new location alignment. **Alternative 2** would fill approximately 610 feet (186 m) of a small channel located upstream of the existing bridge. Therefore, this new location alternative was eliminated from further consideration.

Replacement of the bridge at the existing location while maintaining traffic on a temporary on-site detour to the south was also reviewed. A temporary, one-lane, on-site detour to the south would be long (approximately 1500 feet [457 m]) due to required changes in the existing grade to maintain the existing low steel elevation under the proposed structure. The footprint of this detour would approximate that of **Alternative 1**. The costs and impacts associated with this detour render this alternative not feasible.

The '**Do-Nothing**' alternative will eventually necessitate removal of the bridge. This is not desirable due to the traffic service provided by SR 2173.

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

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

**Alternative 1 (recommended)**, replacing Bridge No. 145 just south (downstream) of the existing structure, is the preferred alternative. The recommended bridge length is 142 feet (43.3 m). This bridge would provide a 609 square foot (56.6 square meter) hydraulic opening. To reduce scour caused by the proximity to the bend in Dillingham Creek, the bridge will be located downstream of the existing location, further from the bend. Relocating the bridge downstream will also move the roadway embankment farther from the portion of Dillingham Creek that runs parallel to the existing road, minimizing impacts to the stream. This alternative successfully minimizes residential impacts, stream impacts (to the branch of Dillingham Creek located north of existing Dillingham Road), and underground storage tank disturbance. This alternative also provides the shortest structure while amply spanning Dillingham Creek. Traffic will be maintained on the existing bridge during construction.

#### **E. Anticipated Design Exceptions**

The preferred alternative (**Alternative 1**) will require a design exception for horizontal sight distance on the bridge.

### **IV. ESTIMATED COSTS**

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

**Table 1: Estimated Costs**

	<b>Alternative 1 (Preferred)</b>	<b>Alternative 3</b>
Structure Removal	\$13,824	\$17,280
Structure	\$359,970	\$403,650
Roadway and Approaches	\$497,247	\$359,130
Temporary Detour	N/A	\$1,100,000
Miscellaneous and Mobilization	\$389,956	\$350,940
Engineering and Contingencies	\$189,000	\$169,000
Right-of-way / Utilities / Relocations	\$257,000	\$347,000
Number of Relocations	1	2
<b>Total Cost of Alternative</b>	<b>\$1,707,000</b>	<b>\$2,747,000</b>

The estimated cost of the preferred alternative, based on current prices, is \$1,707,000 including \$257,000 for right of way, relocation, and utilities, and \$1,450,000 for construction. The estimated cost of the right of way and construction for the project, as shown in the 2002-2008 NCDOT Transportation Improvement Program, is \$540,000, including \$40,000 for right-of-way and \$430,000 for construction. Right-of-way acquisition is scheduled for Federal Fiscal Year 2003, with construction to follow in Federal Fiscal Year 2004.

## **V. NATURAL RESOURCES**

The proposed project is in a rural area of Buncombe County approximately 1.3 miles (2.1 km) southeast of Barnardsville, NC. Land uses in the vicinity of the proposed project are low-density residential and agricultural. Buncombe County's major economic resources are tourism and manufacturing. Forestry, health care, and electronics also contribute substantially to the local economy. The population of Buncombe County in 2000 was estimated at 206,330 (U.S. Census Bureau, 2002).

### **A. Methodology**

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

- U.S. Geological Survey (USGS) quadrangle map (Barnardsville, 1978)
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) Map (Barnardsville, 1995)
- NCDOT aerial photograph of project area (1:1200)
- Draft soil survey maps of Buncombe County (Natural Resources Conservation Service [NRCS], 1980)
- N.C. Department of Environment and Natural Resources (NCDENR) basin-wide assessment information (NCDENR, 2000)
- USFWS list of protected and candidate species
- N.C. Natural Heritage Program (NHP) files of rare species and unique habitats

Water resource information was obtained from publications posted on the World Wide Web by NCDENR Division of Water Quality (DWQ). Information concerning the occurrence of federally protected species in the study area was obtained from the USFWS list of protected and candidate species (March 2001).

Information about species under state protection was obtained from the NHP database of rare species and unique habitats. NHP files were reviewed for documented sightings of species on State or Federal lists and locations of significant natural areas.

A general field survey was conducted along the proposed project route on April 19, 2000 and June 7, 2000. Water resources were identified and their physical characteristics were recorded. For the purposes of this study, a brief habitat assessment was performed within the project area of Dillingham Creek. Plant communities and their associated wildlife were identified using a variety of observation techniques, including active searching, visual observations, and identifying characteristic signs of wildlife (sounds, tracks, scats, and burrows). Terrestrial community classifications generally follow Schafale and Weakley (1990), where appropriate, and plant taxonomy follows Radford *et al.* (1968). Vertebrate taxonomy follows Potter *et al.* (1980), Martof *et al.* (1980), and Webster *et al.* (1985). Vegetative communities were mapped using aerial photography of the project site. Predictions regarding wildlife community composition involved general qualitative habitat assessment based on existing vegetative communities.

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

## **B. Physiography and Soils**

The project area lies in the western portion of North Carolina within the Blue Ridge physiographic province. Elevations in the project area are approximately 2320 feet (707 m) (National Geodetic Vertical Datum, 1929). The topography of the project vicinity is mountainous. Several tributaries join Dillingham Creek in a broad floodplain that narrows as Dillingham Creek passes between low mountains just downstream of the project area.

The following information about soils in the project area was taken from a draft soil survey map provided by the Buncombe County Natural Resources Conservation Service (NRCS, 1980). Three soil types are mapped in the project area:

- Tate-French loams (121C), two to 15 percent slopes, are mapped on both banks of Dillingham Creek downstream of Bridge No. 145. This soil unit is

a complex of Tate and French loams, with French loam inclusions occupying up to 25 percent of the mapping unit. These soils are deep, well-drained soils on alluvial fans, footslopes, and benches. Flooding is absent, and the seasonal high water table is greater than six feet (1.8 m) deep. This unit may have random areas of seeps and springs.

- Comus fine sandy loam (13) is mapped on both banks of Dillingham Creek upstream of Bridge No. 145. This is a well-drained, nearly level soil on slightly elevated positions adjacent to streams in wide floodplains. It is subject to frequent flooding of very brief duration. The depth to the seasonal high water table is about 30 inches (0.76 m).
- Toxaway silt loam (53), zero to 15 percent slopes, is mapped on the left bank of Dillingham Creek south of SR 2173. This soil is very deep, poorly or very poorly drained, and was formed in loamy alluvial deposits on nearly level flood plains of mountain valleys. It is subject to common, very brief flooding. The seasonal high water table is zero to one foot (zero to 0.3 m) deep. Toxaway silt loam is classified as hydric.

Site index is a measure of soil quality and productivity. The index is the average height, in feet, that dominant and co-dominant trees of a given species attain in a specified number of years (typically 50). The site index applies to fully-stocked, even-aged, unmanaged stands. Comus soils have a site index of 80 for shortleaf pine (*Pinus echinata*), 100 for Eastern white pine (*Pinus strobus*), and 90 for red oaks (*Quercus* spp.). Site index information was not available for Tate-French loams or Toxaway silt loam.

### **C. Water Resources**

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

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

The project is located in the French Broad basin (FBR04 sub-basin). One surface water resource, Dillingham Creek, will be directly impacted by the proposed project. Dillingham Creek originates about 3.4 miles (5.5 km) southeast of the project area. From the project area, the creek flows northwest about 1.6 miles (2.5 km) to its confluence with Ivy Creek.

## 2. Water Resource Characteristics

Dillingham Creek is approximately 70 feet (21.3 m) wide in the study area. Upstream of Bridge No. 145, Dillingham Creek runs parallel to SR 2173 on the north side. The stream splits and forms a small channel that runs along the right bank around a large forested island and rejoins the main channel just upstream of the bridge. The stream then passes under SR 2173 and continues parallel to SR 2173 on the south side. The stream flows swiftly west in the project area, forming small rapids over cobbles and boulders. The substrate of Dillingham Creek at this point consists of about 60 percent bedrock and about 40 percent small boulders and cobbles. The water was clear the day of the site visit. The depth ranged from about four feet (1.2 m) in pools to one-foot (0.3 m) in the rapids.

The right bank is nearly vertical and is stabilized with a rock berm to a height of eight feet (2.4 m). The left bank is gently sloping and forms a small terrace downstream of the bridge.

The creek is about 40 percent shaded by scattered trees behind the bank tops. The banks are covered almost completely by multiflora rose.

Surface waters in North Carolina are assigned a classification by the DWQ that is designed to maintain, protect, and enhance water quality within the state. Dillingham Creek [Index # 6-96-1-(6)] is classified as a *Class WS II Tr* waterbody (NCDENR, 2000). *Class WS II* water resources are used for drinking, culinary, or food processing purposes for those users desiring maximum protection for their water supply where a *WS-I* classification is not feasible. Wastewater discharge and stormwater management requirements apply to these waters. The supplemental *Tr* classification refers to trout waters, which are fresh waters protected for natural trout propagation and survival of stocked trout.

Haw Branch (Index # 6-96-1-8) flows westward into Dillingham Creek about 500 feet (152.4 m) downstream of the proposed bridge replacement. Williams Branch (Index # 6-96-1-7) flows westward into Dillingham Creek about 1000 feet (304.8 m) upstream of the project. Haw Branch and Williams Branch are also classified as *WS-II* water bodies.

Non-point source runoff from roadways, lawns, and cultivated fields is likely to be the primary source of water quality degradation to the water resources located within the project vicinity. There are gravel and paved roads and an agricultural field in the project area. Nutrient loading from fertilizers, contaminants, and

sediment from roadway runoff could affect water quality. A two-inch (5.1-cm) diameter PVC pipe was observed protruding from rip-rap about three feet (0.9 m) from the top of the left bank of Dillingham Creek upstream from the bridge in the vicinity of an old home site. No signs of recent discharge were observed.

Basin-wide water quality assessments are conducted by the Environmental Sciences Branch, Water Quality Section of the DWQ. The program has established monitoring stations for sampling selected benthic macroinvertebrates, which are known to have varying levels of tolerance to water pollution. An index of water quality can be derived from the number of taxa present and the ratio of tolerant to intolerant taxa. Streams can then be given a bioclassification ranging from Poor to Excellent.

There are two monitoring stations on Dillingham Creek. One station is located about 2.3 miles (3.7 km) downstream of the project area. It was sampled in August 1993 and classified as Good. Another station is located about 1.3 miles (two km) upstream of the project area. It was sampled in August 1993 and classified as Good.

Point source discharges in North Carolina are permitted through the National Pollutant Discharge Elimination System (NPDES) program administered by the DWQ. As of July 1999, there were no permits issued to discharge in Dillingham Creek.

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

#### **a) General Impacts**

WS-II Waters occur in the project area and within one mile (1.6 km) of the project study area.

Any action that affects water quality can adversely affect aquatic organisms. Temporary impacts during the construction phases may result in long-term impacts to the aquatic community. In general, replacing an existing structure in the same location with an off-site detour is the preferred environmental approach. Bridge replacement at a new location results in more severe impacts, and physical impacts are incurred at the point of bridge replacement.

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

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

Construction impacts may not be restricted to the communities in which the construction activity occurs, but may also affect downstream communities. Efforts will be made to ensure that no sediment leaves the construction site. NCDOT's Best Management Practices for the Protection of Surface Waters will be implemented, as applicable, during the construction phase of the project to ensure that no sediment leaves the construction site. In addition, "Guidelines for Construction Adjacent to or Crossing Trout Waters" as incorporated into *Erosion and Sediment Control Guidelines* will be implemented and adhered to throughout the project.

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

Dillingham Creek in the vicinity of the proposed project is a Class WS-II water, which is by definition a High Quality Water. It is not known to provide habitat for aquatic species on the Federal list of threatened and endangered species. It is classified as a Public Mountain Trout Water by the WRC, and carries the DWQ supplemental *Tr* classification.

The superstructure consists of a steel plank floor on steel I-beams. The substructure consists of reinforced concrete abutments and one pier. One reinforced concrete abutment and one pier are in the water. The maximum potential fill is 129 cubic yards (98.6 cubic meters).

The streambed in the project area is nearly all bedrock and cobbles. Therefore, conditions in the stream do not raise sediment concerns and a turbidity curtain is not recommended.

## **D. Biotic Resources**

The composition of plant communities in the project area reflects landscape-level variations in topography, soils, moisture, and past or present land use practices. This section describes these communities of flora and fauna, including the dominant plants and animals in each community and their relationships with each other. Scientific nomenclature and common names, where applicable, are used for the initial species reference. Subsequent references to the same species are by the common name only.

### **1. Plant Communities**

Several terrestrial communities occur in the fragmented landscape surrounding Bridge No. 145 and Dillingham Creek (**Figure 2a and 2b**). All have been affected heavily by human activity. Dominant faunal components associated with these terrestrial areas are discussed in the following community description.

#### **Roadside Community**

The roadside community covers a narrow strip on both sides of SR 2173 in the project area. Species include fescue (*Festuca* sp.), multiflora rose (*Rosa multiflora*), japanese honeysuckle (*Lonicera japonica*), ragweed (*Ambrosia artemisiifolia*), wild onion (*Allium canadense*), wingstem (*Verbesina occidentalis*), grape (*Vitis rotundifolia*), and dewberry (*Rubus hispidus*).

#### **Stream Bank Community**

Vegetation in the stream bank community is found along both banks of Dillingham Creek and on the island in the middle of the split channel, either above the rip-rap or along the natural banks. Species include yellow poplar (*Liriodendron tulipifera*), sycamore (*Platanus occidentalis*), flowering dogwood (*Cornus florida*), buckeye (*Aesculus sylvatica*), black willow (*Salix nigra*), spice bush (*Lindera benzoin*), hazelnut (*Corylus americana*), multiflora rose, flowering raspberry (*Rubus odoratus*), spotted jewelweed (*Impatiens capensis*), and goldenrod (*Solidago* sp.). This community represents a highly disturbed remnant of a Low Mountain Alluvial Forest or Mountain Alluvial Forest as described in Schafale and Weakley (1990). The TNC classification (The Nature Conservancy) is most likely I.B.2.N.d.150 *Platanus occidentalis*-(*Liquidambar styraciflua*, *Liriodendron tulipifera*) Temporarily Flooded Forest Alliance.

## **Maintained Landscape Community**

The maintained landscape community covers the area around the residences in the proposed project area. It consists of regularly mowed grassy areas surrounding dwellings and sheds. The dominant species in this community is fescue (*Festuca* sp.). Henbit (*Lamium amplexicaule*), nodding onion (*Allium cernuum*), dandelion (*Taraxacum officinale*), and violet (*Viola* sp.) are also present.

## **Forested Slope Community**

The proposed project area crosses the foot of a steep forested slope rising from the left bank of Dillingham Creek northwest of the bridge. This constitutes the forested slope community. Dry, rocky conditions on this southeast-facing slope are indicated by the dominance of Virginia pine (*Pinus virginiana*). Other species on the lower slope include yellow poplar, black locust (*Robinia pseudoacacia*), black cherry (*Prunus serotina*), white oak (*Quercus alba*), multiflora rose, grape, shining sumac (*Rhus copallina*), and poison ivy (*Toxicodendron radicans*). The species composition of this community suggests past disturbance, from either clearing or erosion of the shallow soils. There is no equivalent in Schafale and Weakley (1990) for a successional community such as this one. The TNC classification that fits best is the *Pinus virginiana* Successional Forest Association in the I.A.8.N.b.190. *Pinus virginiana* Forest Alliance.

## **Man-Dominated Wetland Community**

According to a local resident, the developed wetland area found south of SR 2173 between the road and Haw Branch, a tributary of Dillingham Creek, was formerly a gravel quarry that was abandoned about 30 years ago. The current vegetation and hydrology are indicative of a scrub/shrub wetland (See **Appendix C** for wetland rating sheets). The soils in this developing wetland are 10 YR 3/2 silty or gravelly sandy loams with some organic matter accumulation, but redoximorphic features are nearly absent as yet. Water is ponded on the surface in several places and within six inches (15.2 centimeters) of the surface elsewhere. Beaver activity appears to be influencing the hydrology of the area.

The microtopography of the developing wetland is irregular as a result of the mining activities, with berms and mounds interspersed among the ponds and wet areas. The dominant vegetation on the drier areas is yellow poplar, buckeye, poison ivy, and multiflora rose. Vegetation in the wet areas includes ironwood

(*Carpinus caroliniana*), spice bush, tag alder (*Alnus serrulata*), black willow, spotted jewelweed, cattail (*Typha latifolia*), sedges (*Carex* spp.), and violets. There is no Schafale and Weakley equivalent for this wetland community. The hydrology and physiognomy place it in the TNC category of III.B.2.N.g saturated cold-deciduous shrubland, but an appropriate alliance has not been developed.

## **Agricultural Areas**

There are two agricultural areas that may be impacted by the proposed project. The first is a 0.5 acre (0.2 ha) area located on the north bank of the split channel on Dillingham Creek, upstream of Bridge No. 145. At the time of the site visit, it was plowed but not planted. Another two-acre (0.8-ha) area is located downstream of the bridge on the north side of SR 2173. It is apparently a hayfield planted in fescue or orchard grass (*Dactylis glomerata*).

## **2. Wildlife**

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

Wildlife use of the streamside community may be marginal because of the extensive rip-rap. Raccoon (*Procyon lotor*) may be expected here, along with belted kingfisher (*Megaceryle alcyon*), rufous-sided towhee (*Pipilo erythrophthalmus*), and Carolina wren (*Thryothorus ludovicianus*). Eastern phoebe (*Sayornis phoebe*), northern cardinal (*Cardinalis cardinalis*), northern parula (*Parula americana*), and myrtle warbler (*Dendroica coronata*) were identified by sight or call. Fowler's toad (*Bufo woodhousei*), eastern box turtle (*Terrapene carolina*), and northern water snake (*Nerodia sipedon*) may also utilize this community. In addition to the streamside community, similar species can be expected in the maintained landscape community.

Tufted titmouse (*Parus bicolor*), Carolina chickadee (*Parus carolinensis*), ruby-crowned kinglet (*Regulus calendula*), blue jay (*Cyanocitta cristata*), hermit thrush (*Catharus guttatus*), and myrtle are likely to be found in the forested slope community. Other inhabitants may include eastern chipmunk (*Tamias striatus*),

gray squirrel (*Sciurus carolinensis*), eastern spotted skunk (*Spilogale putorius*), smoky shrew (*Sorex fumeus*), black racer (*Coluber constrictor*), and timber rattlesnake (*Crotalus horridus*).

Bullfrog tadpoles (*Rana catesbeiana*) were observed in the field, along with raccoon tracks, salamander egg masses, and trees gnawed by beavers (*Castor canadensis*). The Wildlife Resources Commission visited the site and reported finding a snapping turtle (*Chelydra serpentina*) and signs of various amphibians and wetland birds. The WRC also reported a tiny patch of peat moss (*Sphagnum* sp.). A local resident reported trapping various fur-bearing mammals in the developing wetland.

Cultivated fields are used by wildlife mainly for foraging, although some reptiles and small rodents may burrow in them including black racer (*Coluber constrictor*) and the short-tailed race of deer mouse (*Peromyscus maniculatus*).

### **3. Aquatic Communities**

Within the project area, Dillingham Creek is a mid-gradient, third-order stream. The bed material consists of bedrock, boulders, and cobbles. On the day of the site visit, the water was clear with no suspended sediment. The riparian community is composed of scattered large trees and dense shrubs (see section V.D.1. Plant Communities for further description).

Buncombe County is designated a “trout” county by the North Carolina Wildlife Resources Commission (WRC) and Dillingham Creek is a designated Public Mountain Trout Water. At this location, the creek is a hatchery-supported trout water and also supports a wild trout population.

### **4. Anticipated Impacts to Biotic Communities**

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

**a) Terrestrial Communities**

Terrestrial communities in the project area will be impacted permanently by project construction from clearing and paving. Estimated impacts are based on the length of the alternative and the entire study corridor width. **Alternative 1** is 75 feet (23 m) wide and 2000 feet (610 m) long. **Alternative 3**, along the permanent alignment, is 75 feet (23 m) wide and 1500 feet (457 m) long. **Alternative 3**, along the temporary detour, is up to 400 feet (122 m) wide and 2130 feet (649 m) long. **Table 2** describes the potential impacts to terrestrial communities by habitat type. Because impacts are based on the entire study corridor width, the actual loss of habitat will likely be less than the estimate.

**Table 2. Estimated Areas of Impact to Terrestrial Communities**

Community	Impacted Area in Acres (Hectares)		
	Alternative 1 (Preferred)	Alternative 3	
		Temp.	Perm.
Roadside	0.37 (0.15)	0.00 (0.00)	0.70 (0.28)
Streambank	0.38 (0.15)	0.05 (0.02)	0.14 (0.06)
Maintained	0.48 (0.19)	0.50 (0.20)	0.08 (0.03)
Forested Slope	0.00 (0.00)	2.24 (0.91)	0.00 (0.00)
Developing Wetland	0.50 (0.20)	0.00 (0.00)	0.04 (0.01)
Cultivated	0.27 (0.11)	1.42 (0.58)	0.09 (0.04)
<b>Total Impact</b>	<b>2.0 (0.80)</b>	<b>4.21 (1.71)</b>	<b>1.05 (0.42)</b>

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

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

### b) Wetland Communities

The Barnardsville, NC NWI map shows a PSS1A (palustrine/scrub-shrub/broad-leaved deciduous/temporarily flooded) wetland in the project area. This scrub-shrub wetland was observed as mapped and will be impacted by project construction; **Alternative 1** impacts approximately 0.5 acres (0.2 ha) and **Alternative 3**, permanent alignment, impacts approximately 0.04 acres (0.01 ha). The wetland is described as a 'developing wetland,' with ambiguous soils. Dillingham Creek meets the definition of surface waters, and is therefore classified as Waters of the United States. The channel is 70 feet (21.3 m) wide within the project area.

Wetland communities could be impacted similarly to terrestrial communities. **Table 2** describes the potential impacts to wetland communities. Because impacts are based on the entire study corridor width, the actual loss of habitat will likely be less than the estimate.

### c) Aquatic Communities

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

Temporary and permanent impacts to aquatic organisms may result from increased sedimentation. Aquatic invertebrates may drift downstream during construction and re-colonize the disturbed area once it has been stabilized. Sediments have the potential to affect fish and other aquatic life in several ways, including the clogging and abrading of gills and other respiratory surfaces, affecting the habitat by scouring and filling of pools and riffles, altering water chemistry, and smothering different life stages. Increased sedimentation may cause decreased light penetration through an increase in turbidity. Trout populations are particularly sensitive to water-quality degradation.

Wet concrete should not come into contact with surface water during bridge construction. Potential adverse effects will be minimized through the implementation of NCDOT *Best Management Practices for Protection of Surface Waters*. In addition, "Guidelines for Construction Adjacent to and Crossing Trout Waters" as incorporated into *Erosion and Sediment Control Guidelines* will be implemented and followed throughout the project. In-stream work and land

disturbance within the 25-foot (7.6-m) wide trout stream buffer zone will be prohibited during the trout spawning season of November 1 through April 15 to protect the egg and fry stages of trout from off-site sedimentation during construction. Because the proposed stream is designated as a WS-II water, erosion control methods for high quality waters will be implemented as included in *NCDOT's Best Management Practices for Protection of Surface Waters and Erosion and Sediment Control Guidelines*.

## **E. Special Topics**

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

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

The Barnardsville, NC NWI map shows a PSS1A (palustrine/scrub-shrub/broad-leaved deciduous/temporarily flooded) wetland in the project area. This scrub-shrub wetland was observed as mapped and will be impacted by project construction of the preferred alternative. The wetland is described in section V.D.1. Plant Communities. It is anticipated that approximately 0.5 acres (0.2 ha) of this wetland will be impacted by **Alternative 1**. Dillingham Creek meets the definition of surface waters, and is therefore classified as Waters of the United States. The channel is 70 feet (21.3 m) wide within the project area.

### **2. Permits**

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

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

Under Section 404 of the Clean Water Act, construction is likely to be authorized by Nationwide Permit (NWP) No. 23, as promulgated under 61 FR 65874, 65916; December 13, 1996. This permit authorizes activities undertaken, assisted, authorized, regulated, funded, or financed in whole or in part, by another Federal agency or department where that agency or department has determined that, pursuant to the Council on Environmental Quality Regulations

for Implementing the Procedural Provisions of the National Environmental Policy Act:

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

**b) Section 401 Water Quality Certification**

This project will also require a 401 Water Quality Certification or waiver thereof, from the North Carolina Department of Environment and Natural Resources prior to issuance of the NWP 23. Section 401 of the Clean Water Act requires that the state issue or deny water certification for any Federally permitted or licensed activity that results in a discharge into Waters of the United States. In addition, the project is located in a designated "trout" county, where NCDOT must obtain a letter of approval from the NC Wildlife Resources Commission. The final permit decision rests with the USACE.

**c) Bridge Demolition and Removal**

Demolition and removal of a highway bridge over Waters of the United States requires a permit from the USACE if dropping components of the bridge into the water is the only practical means of demolition. Effective September 20, 1999, this permit is included with the permit for bridge reconstruction.

Section 402-2 "Removal of Existing Structures" of NCDOT's Standard Specifications for Roads and Structures stipulates that "excavated materials shall not be deposited in rivers, streams, or impoundments," and "the dropping of parts or components of structures into any body of water will not be permitted unless there is no other practical method of removal. The removal from the water of any part or component of a structure shall be done so as to keep any resulting siltation to a minimum." To meet these specifications, NCDOT shall adhere to Best Management Practices for the Protection of Surface Waters, as supplemented with Best Management Practices for Bridge Demolition and Removal.

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

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

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

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

Dillingham Creek in the vicinity of the proposed project is a Class WS-II water, which is by definition a High Quality Water. It is not known to provide habitat for aquatic species on the federal list of threatened and endangered species. It is classified as 'Public Mountain Trout Water' by the WRC, and carries the DWQ supplemental *Tr* classification. Therefore, Cases 1 and 2 apply to the proposed replacement of Bridge No. 145 over Dillingham Creek.

The superstructure consists of a steel plank floor on steel I-beams. The substructure consists of reinforced concrete abutments and one pier. One reinforced concrete abutment and one pier are in the water. The maximum potential fill is 129 cubic yards (98.6 cubic meters).

The streambed in the project area is nearly all bedrock and cobbles. Therefore, conditions in the stream do not raise sediment concerns and a turbidity curtain is not recommended.

**d) Tennessee Valley Authority**

Buncombe County is a participant in the Tennessee Valley Authority Act. Approval under Section 26a of the Tennessee Valley Authority (TVA) Act will be required for the bridge replacement project. A copy of this document will be forwarded to TVA.

**3. Mitigation**

Because this project will likely be authorized under a Nationwide Permit, mitigation for impacts to surface waters may or may not be required by the

USACE. In accordance with the Division of Water Quality Wetland Rules [15A NCAC 211 .0506 (h)] "Fill or alteration of more than one acre (0.4 ha) of wetlands will require compensatory mitigation; and fill or alteration of more than 150 linear feet (45.6 m) of streams may require compensatory mitigation." Wetland impacts are not anticipated to exceed one acre (0.4 ha). Up to 610 linear feet (186 m) of Dillingham Creek is located within the study corridor for the proposed project. The actual stream impacts associated with **Alternative 1** will likely be lower than the 150 linear feet (45.6 m) threshold, depending on final design plans.

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

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

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

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

The USFWS lists thirteen species under Federal protection for Buncombe County as of March 31, 2002 (USFWS, 2002). These species are listed in **Table 3**.

**Table 3. Species Under Federal Protection for Buncombe County**

Common Name	Scientific Name	Status
<b>Vertebrates</b>		
Bog turtle	<i>Clemmys muhlenbergii</i>	T(S/A)
Carolina northern flying squirrel	<i>Glaucomys sabrinus coloratus</i>	E
Eastern cougar	<i>Felis concolor cougar</i>	E
Gray bat***	<i>Myotis grisescens</i>	E
Spotfin chub*	<i>Hybopsis monacha</i>	T
<b>Invertebrates</b>		
Appalachian elktoe	<i>Alasmidonta raveneliana</i>	E
Oyster mussel	<i>Epioblasma capsaeformis</i>	E
Tan riffleshell	<i>Epioblasma florentina walkeri</i>	E
<b>Vascular Plants</b>		
Bunched arrowhead*	<i>Sagittaria fasciculata</i>	E
Mountain sweet pitcher plant*	<i>Sarracenia jonesii</i>	E
Spreading avens	<i>Geum radiatum</i>	E
Virginia spiraea	<i>Spiraea virginiana</i>	T
<b>Nonvascular Plants</b>		
Rock gnome lichen	<i>Gymnoderma lineare</i>	E
Notes:	E Endangered-A species that is threatened with extinction throughout all or a significant portion of its range. T Threatened-A species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. T S/A Similarity of Appearance-A species that is listed as threatened due to similarity of appearance with other rare species.	
*Historic record - the species was last observed in the county more than 50 years ago.		
**Obscure record - the date and/or location of observation is uncertain.		
***Incidental/migrant record - the species was observed outside of its normal range or habitat.		

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

***Clemmys muhlenbergii* (Bog turtle) Threatened due to Similarity of Appearance**

Vertebrate Family: Emydidae  
 Federally Listed: 1997

The bog turtle is a small freshwater turtle reaching a maximum carapace length of 4.5 inches (11.4 cm). These turtles have a domed carapace that is weakly keeled and is light brown to ebony in color. The scutes have a lighter-colored starburst pattern. The plastron is brownish-black with contrasting yellow or cream areas along the midline. This species is distinguished by a conspicuous orange, yellow, or red blotch on each side of the head.

The bog turtle is semi-aquatic and is typically found in freshwater wetlands characterized by open fields, meadows, or marshes with slow moving

streams, ditches, and boggy areas. The bog turtle is also found in wetlands in agricultural areas subject to light to moderate livestock grazing, which helps to maintain an intermediate stage of succession. During the winter, this species hibernates just below the upper surface of mud. Mating occurs in May and June, and the female deposits two to six eggs in sphagnum moss or sedge tussocks in May, June or July. The diet of the bog turtle is varied, consisting of beetles, lepidopteran and caddisfly larvae, snails, millipedes, pondweed and sedge seeds, and carrion.

The southern population of the bog turtle is listed as Threatened due to Similarity of Appearance to the northern population; therefore, the southern population is not afforded protection under Section 7 or Section 9 of the Endangered Species Act. A survey and subsequent biological conclusion are not required, but if the WRC is of the opinion that bog turtles may inhabit the wetland, NCDOT will conduct a survey. A wetland that may be suitable habitat is developing in an abandoned gravel quarry adjacent to the bridge. The WRC visited the site and confirmed that the wetland could possibly support bog turtles, but he did not conduct a thorough search of the site.

***Glaucomys sabrinus coloratus* (Carolina northern flying squirrel) Endangered**

Vertebrate Family: Sciuridae  
Federally Listed: 1985

The Carolina northern flying squirrel is a small mammal weighing about three to five ounces (95 to 140 grams [g]). The adult squirrel is gray with a reddish or brownish wash on the back, and a grayish white to white underside. It has a large flap of skin along either side of its body from wrist to ankle. The skin flaps and its broad flattened tail allow the northern flying squirrel to glide from tree to tree. It is a strictly nocturnal animal with large dark eyes.

There are several isolated populations of the northern flying squirrel in the western part of North Carolina along the Tennessee border. This squirrel is found above 5000 feet (1524 m) in the vegetation transition zone between hardwood and coniferous forests. Both forest types are used to search for food and the hardwood forest is used for nesting sites. The squirrel can subsist on lichens and fungi throughout much of its range; however, the diet can also include seeds, buds, fruits, cones, and insects.

**Biological Conclusion:**

**No Effect**

No habitat exists in the project area for the Carolina northern flying squirrel. The project area is at an elevation of 2320 feet (707 m) with no hardwood or coniferous forests. A search of the NHP database found no occurrence of this animal within the project vicinity. It can be concluded that the project will not impact this endangered species.

***Felis concolor couguar* (eastern cougar)**

**Endangered**

Family: Felidae

Federally Listed: 1973

The eastern cougar is a large, unspotted, long-tailed cat. It ranges from seven to nine feet (2.1 to 2.7 m) in length and from 150 to 200 pounds (68 to 90.7 kilograms) in weight as an adult. Its coloring is tawny over the body and legs, with black on the muzzle, behind the ears, and the tip of the tail. The cougar's diet consists mainly of deer, but includes small mammals, wild turkeys, and occasionally domestic livestock.

Once found from Canada to South Carolina, the current distribution of the eastern cougar is limited to a few scattered areas. There have been numerous sightings, but a small permanent population apparently inhabits the Great Smoky Mountains National Park. In North Carolina, other sightings have been made in the Nantahala National Forest, the northern part of the Uwharrie National Forest, and some southeastern counties. The eastern cougar has no apparent habitat preference, as it occurs in mountain forests as well as coastal plain swamps. It does seem to need a large undisturbed wilderness area with adequate food supply. The eastern cougar's endangered status is largely a result of habitat loss through deforestation, as well as hunting and trapping.

**Biological Conclusion:**

**No Effect**

The project area is characterized by agricultural and residential areas; there are no extensive wilderness areas. A search of the NHP database found no occurrences of the eastern cougar in the project vicinity. It can be concluded that the project will not impact this endangered species.

***Myotis grisescens* (gray bat)**

**Endangered**

Family: Vespertilionidae

Federally Listed: 1976

The gray bat is easily distinguished from other bats by its large size and uniform fur color. It weighs 0.2 to 0.5 ounces (seven to 16 g) and the forearm measures 1.5 to 1.8 inches (40 to 46 millimeters [mm]) in length. The dorsal fur is uniformly gray or russet, as opposed to bi- or tri-colored as in other bats. In all other species of *Myotis*, the wing membrane connects to the base of the first toe, whereas in the gray bat it connects at the ankle.

The gray bat is found mainly in the cave regions of Arkansas, Missouri, Kentucky, Tennessee, and Alabama, although colonies and individuals are occasionally found in neighboring states. Gray bats live in caves all year, but move between summer and winter caves. The sexes separate in summer to form maternity and bachelor colonies, with the females specifically occupying caves that trap warm air.

**Biological Conclusion****No Effect**

A search of the NHP database showed no occurrences of the gray bat in the proposed project vicinity, nor are there any caves in the project area. No bats were observed at the time of the site visit. Therefore, it is concluded that the proposed project will have no impact on the gray bat.

***Cyprinella monacha* (spotfin chub)****Threatened**

Vertebrate Family: Cyprinidae  
Federally Listed: 1977

This small, elongate fish is recognized by the large black spot in the caudal region. The spotfin chub grows to a length of 3.6 in (9.2 cm). The mouth is inferior, with a tiny pair of terminal labial barbels. Breeding males are brilliant turquoise on the back and sides and have white-tipped fins. Juveniles and adult females have olive-colored backs, silvery sides, and white undersides. The spotfin chub is believed to spawn in June. It apparently is a sight feeder, and its diet consists mainly of dipterans.

The habitat of the spotfin chub is moderate to large streams with alternating riffles and pools and clear, cool to warm, fast-flowing water. It is restricted to the Tennessee River drainage area. In North Carolina, it is known only from the Little Tennessee River in Macon and Swain Counties, and has never been found in streams with significantly silted substrates.

**Biological Conclusion:****No Effect**

A search of the NHP files found no occurrences of the spotfin chub in the project vicinity. NCDOT biologists surveyed the site for the spotfin chub on September 21, 2000 and found there was no suitable habitat for this species in the project area. Therefore, it is concluded that the proposed project will have no impact on the spotfin chub.

***Alasmidonta raveneliana* (Appalachian elktoe)****Endangered**

Family: Unionidae  
Federally Listed: 1994

The Appalachian elktoe is recognized by a thin, kidney-shaped shell about 3.2 inches (8.1 cm) long, 1.4 inches (3.5 cm) high, and one inch (2.5 cm) wide. The outer shell surface of juvenile mussels is yellowish-brown whereas the adult shell is dark brown to greenish-black in color. Rays may be prominent to obscure. The inside shell surface is shiny white to bluish-white, changing to a salmon, pinkish, or brownish color in the central and beak cavity portions of the shell.

The Federal Register lists two known surviving populations of the Appalachian elktoe. One is in the Little Tennessee River between Emory Lake in Macon County and Fontana Reservoir in Swain County. The other is

in the Nolichucky River system in Yancey and Mitchell Counties. The habitat in these locations can be described as relatively shallow, medium-sized creeks and rivers with cool, well-oxygenated, moderate- to fast-flowing water. Substrates are gravelly mixed with cobble and boulders, or occasionally coarse and sandy.

Two additional occurrences were found in the files of the North Carolina NHP. One is a finding of a single specimen in Yancey County in the Cane River, a major tributary of the Nolichucky River. The other finding was a single dead specimen in the Tuckasegee River in Swain County. Additional information from the USFWS Asheville Field Office indicates that the extant range has recently been expanded in both the Little Tennessee and French Broad basins.

Major factors contributing to the endangered status of this species include water quality and habitat degradation resulting from impoundments, stream channelization projects, and point and non-point sources of pollution and siltation.

**Biological Conclusion:**

**No Effect**

A search of the NHP files found no occurrences of the Appalachian elktoe in the project vicinity. NCDOT biologists surveyed the site for the Appalachian Elktoe on September 21, 2000 and found there was no suitable habitat for this species in the project area. Therefore, it is concluded that the proposed project will have no impact on the Appalachian elktoe.

***Epioblasma capsaeformis* (oyster mussel)**

**Endangered**

Invertebrate Family: Unionidae

Federally Listed: 1997

The shell of the oyster mussel is a dull to sub-shiny, yellowish to green color with numerous narrow dark green rays. The inside of the shell is white to bluish-white. Shells of females are slightly inflated and very thin toward the posterior margin of the shell.

The oyster mussel historically occurred throughout much of the Cumberlandian region of the Tennessee and Cumberland River drainages in Alabama, Kentucky, Tennessee, and Virginia. It is now considered endangered in Kentucky and Virginia, and is known to survive in small populations in only a few locations in Kentucky, Tennessee, and Virginia. Recent research uncovered a record of a collection of this species in Madison County in 1918 and from the French Broad River at Asheville.

**Biological Conclusion:**

**No Effect**

NCDOT biologists surveyed the project area for the oyster mussel on September 21, 2000 to determine its occurrence in the region. No mussels

were found in Dillingham Creek and suitable habitat for these species was not found. Therefore, it is concluded that the proposed project will have no impact on the oyster mussel.

***Epioblasma florentina walkeri* (tan riffleshell)**

**Endangered**

Family: Unionidae  
Federally Listed: 1977

The tan riffleshell is a small, irregularly elliptical or obovate mussel that reaches about 2.4 inches (60 mm) in length. The periostracum is a dull brownish-green with evenly distributed faint green rays. The nacre is bluish-white. Female shells are thin and iridescent at the posterior end and have a pronounced marsupial swelling. Male shells have a double elliptical ridge and a wide, shallow radial depression.

The tan riffleshell is the headwaters form of *Epioblasma florentina*, which was formerly distributed throughout the Tennessee and Cumberland River drainages. Extant populations of tan riffleshell are known from the Clinch and Hiwassee Rivers. They occur in flowing streams less than three feet (one m) deep with a substrate of coarse sand, gravel, and some silt.

**Biological Conclusion:**

**No Effect**

NCDOT biologists surveyed the site for the tan riffleshell on September 21, 2000 and found no suitable habitat for the species. Therefore, it is concluded that the proposed project will have no impact on the tan riffleshell.

***Sagittaria fasciculata* (bunched arrowhead)**

**Endangered**

Family: Alismataceae  
Federally Listed: 1979

The emergent aquatic perennial bunched arrowhead has spatulate leaves that reach 12 inches (30.5 cm) in length and 0.75 inches (two cm) in width. The long-petiolate leaves are basal about an erect scape. The scape bears three-petaled white flowers in whorls of three, with male flowers above and female flowers below. Fruits ascend from the stalks of the lowest whorl of flowers. The fruit is a head of achenes. Flowering and fruiting occurs from May to July.

Bunched arrowhead is known in North Carolina from only one location in Henderson County. There is a questionable historic record from Buncombe County. The plant is found in non-stagnant seepage areas that have very low or no net flow and sandy loam soils with a thick muck layer.

**Biological Conclusion:**

**No Effect**

There are no seepage areas or soils with a thick muck layer in the vicinity of the proposed project. No plants were observed at the time of the site visit.

Therefore, it is concluded that the proposed project will have no effect on bunched arrowhead.

***Sarracenia jonesii* (mountain sweet pitcher plant)**

**Endangered**

Family: Sarraceniaceae  
Federally Listed: 1989

The mountain sweet pitcher plant is a perennial herb with numerous tubular leaves growing in clusters. The leaves grow from 21 to 73 inches (53 to 185 cm) tall and have a heart-shaped hood. The waxy dull green of the leaves is criss-crossed with maroon-purple veins. The erect scape bears one maroon flower with five recurved petals.

Populations of mountain sweet pitcher plant are known from ten locations in North and South Carolina. The four North Carolina populations occur in Henderson and Transylvania counties in the French Broad River drainage basin. The plant is restricted to bogs and streamsides and is usually found in level depressions on floodplains, but has also been found on granite rock faces beside waterfalls. Soils supporting the plant are deep, poorly drained acidic soils with a high organic matter content.

**Biological Conclusion**

**No Effect**

Although a floodplain depression with wetland characteristics is present in the project area, the organic matter content of the soil is low and the heavy cover of woody species would shade out the mountain sweet pitcher plant. No plants were observed at the time of the site visit, and a search of the NHP files showed no occurrences in the area. Therefore, it is concluded that the proposed project will have no effect on the mountain sweet pitcher plant.

***Geum radiatum* (spreading avens)**

**Endangered**

Plant Family: Rosaceae  
Federally Listed: 1990

Spreading avens is a perennial herb having stems with an indefinite cyme of bright yellow, radially symmetrical flowers. Flowers of spreading avens are present from June to early July. Spreading avens has basal leaves which are odd-pinnately compound; terminal leaflets are kidney shaped and much larger than the lateral leaflets, which are reduced or absent.

Spreading avens is found only in the North Carolina and Tennessee section of the Southern Appalachian Mountains. Spreading avens occurs on scarps, bluffs, cliffs and escarpments on mountains, hills and ridges. Known populations of this plant have been found to occur at elevations from 1535 to 1759 m (5060 to 5800 ft). Other habitat requirements for this species include full sunlight and shallow acidic soils. These soils are composed of sand,

pebbles, humus, sandy loam and clay loam. Most populations are pioneers on rocky outcrops.

**Biological Conclusion:**

**No Effect**

A search of the NHP files found no occurrence of spreading avens in the project vicinity. The project area is characterized by agricultural and residential areas; rocky outcrops, scarps, bluffs, cliffs and escarpments on mountains, hills and ridges are not common to this area. The heavy cover of woody species would also shade out the spreading avens. Because habitat does not exist within the project area for this species, it may be concluded that the proposed project will have no effect on this threatened species.

***Spiraea virginiana* (Virginia spiraea)**

**Threatened**

Family: Rosaceae  
Federally Listed: 1990

Virginia spiraea is a perennial shrub with arching, upright stems. Its growth form is described as "plastic" and varies depending upon age and environmental conditions. The roots are a complex system of horizontal rootstock with mats of small fibrous roots. If exposed, the horizontal rootstock gives rise to upright stems. Virginia spiraea typically has a diffuse branching pattern and grows to three to ten feet (one to three m) in height. Leaves are simple, ovate to lanceolate, with an acute base. The leaf margins range from entire to completely serrate. Virginia spiraea flowers from late May to late July, with bright to creamy white flowers forming a corymb.

Virginia spiraea is typically found in disturbed sites along rivers and streams. It forms dense clumps around boulders and in rock crevices, and apparently depends on flood scour to eliminate woody competitors and create suitable early successional habitats. Typical habitat includes scoured banks of high gradient streams or on meander scrolls, point bars, natural levees, and braided features of lower stream reaches. In North Carolina, extant populations are known from Ashe, Macon, Mitchell, and Yancey counties. In Graham County, there is an historic record of an extirpated population. This species may occur in similar habitats in other counties.

**Biological Conclusion:**

**No Effect**

A search of the NHP files found no occurrence of Virginia spiraea in the project vicinity. Because habitat may exist along the banks of Dillingham Creek within the project area for this species, the project area was surveyed for Virginia spiraea in June. No plants were found. Therefore, it may be concluded that the proposed project will have no effect on this threatened species.

## **Gymnoderma lineare (rock gnome lichen)**

**Endangered**

Family: Cladoniaceae

Federally Listed: 1994

The rock gnome lichen is a squamose lichen in the reindeer moss family. The lichen can be identified by its fruiting bodies, which are born singly or in clusters, black in color, and are found at the tips of the squamules. The fruiting season of the rock gnome lichen occurs from July through September.

The rock gnome lichen is a narrow endemic, restricted to areas of high humidity. These high humidity environments occur on high elevation (4000 feet or 1220 m) mountaintops and cliff faces that are frequently bathed in fog or lower elevation (2500 feet or 762 m) deep gorges in the Southern Appalachians. The rock gnome lichen primarily occurs on vertical rock faces where seepage water from forest soils above flows only at very wet times. The rock gnome lichen is almost always found growing with the moss *Adreaea* in these vertical intermittent seeps. The major threat of extinction to the rock gnome lichen relates directly to habitat alteration and loss of high-elevation coniferous forests. These coniferous forests usually lie adjacent to the habitat occupied by the rock gnome lichen. The high elevation habitat occurs in Ashe, Avery, Buncombe, Graham, Haywood, Mitchell, Swain, and Yancey Counties. The lower elevation habitat of the rock gnome lichen can be found in Jackson, Rutherford, and Transylvania Counties.

### **Biological Conclusion:**

**No Effect**

No habitat exists in the project area for the rock gnome lichen. The elevation of the project area is approximately 2320 feet (707 m) and there are no vertical rock faces present. In Buncombe County, this species occurs on mountaintops and cliff faces at elevations above 4000 feet (1220 m). A search of the NHP database found no occurrence of rock gnome lichen in the project vicinity. It can be concluded that the project will not impact this threatened species.

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

Federal Species of Concern (FSC) are not legally protected under the Endangered Species Act and are not subject to any of its provisions, including Section 7, until they are formally proposed or listed as Threatened or Endangered. **Table 4** includes FSC species listed for Buncombe County and their state classifications. Organisms which are listed as Endangered (E), Threatened (T), or Special Concern (SC) on the North Carolina Natural Heritage Program list of Rare Plant and Animal Species are afforded State protection under the State Endangered Species Act and the North Carolina Plant Protection and Conservation Act of 1979. However, the level of protection given to state-listed species does not apply to NCDOT activities.

**Table 4. Federal Species of Concern in Buncombe County**

Common Name	Scientific Name	State Status	Habitat Present
<b>Vertebrates</b>			
Appalachian Bewick's Wren*	<i>Thryomanes bewickii altus</i>	E	No
Appalachian Yellow-bellied Sapsucker	<i>Sphyrapicus varius appalachiensis</i>	SR	No
Bachman's Sparrow*	<i>Aimophila aestivalis</i>	SC	No
Cerulean Warbler	<i>Dendroica cerulea</i>	SR	No
Eastern Small-footed Bat*	<i>Myotis leibii</i>	SC	No
Eastern Woodrat /Southern Appalachian Woodrat)	<i>Neotoma floridana haematorea</i>	SC	No
Hellbender**	<i>Cryptobranchus alleganiensis</i>	SC	Yes
Longhead Darter*	<i>Percina macrocephala</i>	SC	No
Paddlefish*	<i>Polyodon spathula</i>	E	No
Rafinesque's Big-eared Bat*	<i>Corynorhinus rafinesquii</i>	SC	Yes
Southern Appalachian Black-capped Chickadee*	<i>Poecile atricapillus praticus</i>	SC	No
Southern Appalachian Northern Saw-whet Owl	<i>Aegolius acadicus pop 1</i>	SC	No
Southern Appalachian Red Crossbill	<i>Loxia curvirostra pop 1</i>	SR	No
Southern Water Shrew	<i>Sorex palustris punctulatus</i>	SC	No
<b>Invertebrates</b>			
Diana Fritillary**	<i>Speyeria diana</i>	SR	No
French Broad Crayfish	<i>Cambarus reburus</i>	W2	Yes
Tawny Crescent*	<i>Phyciodes batesii maconensis</i>	SR	No
<b>Vascular Plants</b>			
Butternut	<i>Juglans cinerea</i>	W5	No
Cain's Reedgrass	<i>Calamagrostis cainii</i>	E	No
Carolina Saxifrage	<i>Saxifraga caroliniana</i>	C	No
Divided-leaf Ragwort	<i>Senecio millefolium</i>	T	No
Fraser Fir	<i>Abies fraseri</i>	C	No
Fraser's Loosestrife*	<i>Lysimachia fraseri</i>	E	Yes
French Broad Heartleaf	<i>Hexastylis rhombiformis</i>	C	No
Glade Spurge /Darlington's Spurge	<i>Euphorbia purpurea</i>	C	No
Gray's Lily	<i>Lilium grayi</i>	T-SC	No
Mountain Catchfly	<i>Silene ovata</i>	C	No
Mountain Heartleaf	<i>Hexastylis contracta</i>	E	No
Pinnate-lobed Black-eyed Susan	<i>Rudbeckia triloba var pinnatiloba</i>	C	No
Piratebush	<i>Buckleya distichophylla</i>	E	No
Sweet Pinesap	<i>Monotropis odorata</i>	C	No
Sources: USFWS, 1998; Amoroso, ed., 1997; LeGrand and Hall, eds., 1997			
Key: T = Threatened, E = Endangered, SC = Special Concern, C = Candidate, SR = Significantly Rare, W2 = Rare, but taxonomically questionable, W5 = Rare because of severe decline			
** = Obscure record, date uncertain.			
* = Historic record. The species was last observed in the county > 50 years ago			

No FSC species were observed during the site visit. According to NHP records, none of these species occur within two miles (3.2 km) of the project area.

### **3. Summary of Anticipated Impacts**

Of the thirteen species listed by the USFWS for Federal protection in Buncombe County, none are expected to be affected by the proposed bridge replacement. With respect to the bog turtle, listed Threatened due to Similarity of Appearance, a survey and subsequent biological conclusion are not required, but if the WRC is of the opinion that bog turtles may inhabit the wetland, NCDOT will conduct a survey. Of the 31 species listed as Federal Species of Concern in Buncombe County, four have habitat present in the project area, however no Federal Species of Concern were observed in the area and there are no NHP records of these species occurring within two miles (3.2 km) of the project area.

## **VI. CULTURAL RESOURCES**

### **A. Compliance Guidelines**

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

### **B. Historic Architectural Resources**

On October 21, 1999, representatives of the North Carolina Department of Transportation and North Carolina State Historic Preservation Office (HPO) reviewed photographs of the project Area of Potential Effects (APE). In a concurrence form dated October 29, 1999, the State Historic Preservation Officer (SHPO) concurred that there are no historic architectural resources either listed in or eligible for listing in the National Register of Historic Places within the APE. A copy of the concurrence form is located in **Appendix A**.

### **C. Archaeological Resources**

The SHPO, in a comment memorandum dated May 7, 2001, concurred with the NCDOT that no archaeological sites are located within the project area and that the project will not involve significant archaeological resources. These 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. A copy of this memorandum is included in **Appendix A**.

### **VII. ENVIRONMENTAL EFFECTS**

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

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

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

No adverse effect on families or communities is anticipated. Right-of-way acquisition will be limited. One residence will be relocated as part of the proposed project. No businesses will be relocated.

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

The Barnardsville, NC NWI map shows a PSS1A (palustrine/scrub-shrub/broad-leaved deciduous/temporarily flooded) wetland in the project area. It is anticipated that this wetland will be impacted (0.5 acres or 0.2 ha) by the preferred alternative.

Construction is likely to be authorized by Nationwide Permit (NWP) No. 23. This project will also require a 401 Water Quality Certification or waiver thereof, from

the North Carolina Department of Environment and Natural Resources prior to issuance of the NWP 23.

The project is located in a designated "trout" county, where NCDOT must obtain a letter of approval from the NC Wildlife Resources Commission. Final permit decision rests with the USACE. In-stream work and land disturbance within the 25-foot (7.6-m) wide trout stream buffer zone is prohibited during the trout spawning season of November 1 through April 15 to protect the egg and fry stages of trout from off-site sedimentation during construction.

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

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

This project is an air quality "neutral" project, so it is not required to be included in the regional emission analysis (if applicable) and a project level carbon monoxide analysis is not required. The project is located in Buncombe County, which has been determined to be in compliance with the National Ambient Air Quality Standards. 40 CFR part 51 is not applicable because the proposed project is located in an attainment area. This project is not anticipated to create any adverse effects on the air quality of this attainment area.

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

If vegetation is disposed of by burning, all burning shall be done in accordance with applicable local laws and regulations of the North Carolina State Implementation Plan for air quality in compliance with 15 NAACO 2D.0520.

Noise levels could increase during construction but will be temporary. This evaluation completes the assessment requirements for highway traffic noise (23

CFR Part 772) and for air quality (1990 CAAA and NEPA), and no additional reports are required.

An examination of records at the North Carolina Department of Environment and Natural Resources, Division of Water Quality, Groundwater Section and the Division of Waste Management revealed leaking underground storage tanks in the northwest quadrant of the existing bridge (See **Figures 2a and 2b** for location). These tanks hold gasoline and testing in the project area confirmed groundwater contamination. No other hazardous waste sites, regulated or unregulated landfills, nor dump sites were located in the project area.

Buncombe County is a participant in the National Flood Insurance Program (NFIP). Flood Insurance Study maps for Buncombe County show that Bridge No. 145 is located in a FEMA 100-year floodplain (see **Figure 5**). Replacement of this bridge is not expected to affect the 100-year floodplain.

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

#### **VIII. PUBLIC INVOLVEMENT**

The following agencies have been contacted for input on the subject project:

- Federal Highway Administration
- U.S. Army Corps of Engineers
- U.S. Department of Agriculture: Natural Resource Conservation Service
- U.S. Fish and Wildlife Service
- U.S. Geological Survey
- N.C. Board of Transportation
- N.C. Department of Environment and Natural Resource: Division of Water Quality
- N.C. Department of Public Instruction
- N.C. Division of Cultural Resource
- N.C. Division of Parks and Recreation
- N.C. Wildlife Resources Commission
- Buncombe County School Superintendent
- Buncombe County Manager and Commissioners
- Tennessee Valley Authority

Agency responses have been summarized in the following section (IX. Agency Comments).

## **IX. AGENCY COMMENTS**

**United States Army Corps of Engineers (email comment):** The Corps defers to the North Carolina Wildlife Resources Commission to determine the precise time period of any moratoriums associated with trout spawning seasons in the associated stream. Because this stream is in a trout water county, a pre-construction notification (PCN) will be required for any and all nationwide permits requested.

**United States Department of Agriculture:** The Natural Resources Conservation Service does not have any comments at this time.

**United States Department of the Interior- Fish and Wildlife Service:** Federal List of Endangered and Threatened Wildlife and Plants as well as species of Federal concern were sent for Buncombe County. A survey was recommended of the project area for species prior to further planning or on-the-ground activities to ensure no adverse impacts occur to these species.

**North Carolina Wildlife Resources Commission:** Dillingham Creek is a designated Public Mountain Trout Water and is classified as Hatchery Supported. Another spanning structure is recommended to replace the existing structure. No in water work should be performed between November 1 and April 15 to protect trout egg and fry stages from sedimentation.

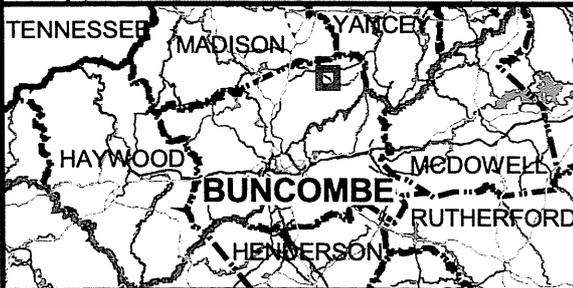
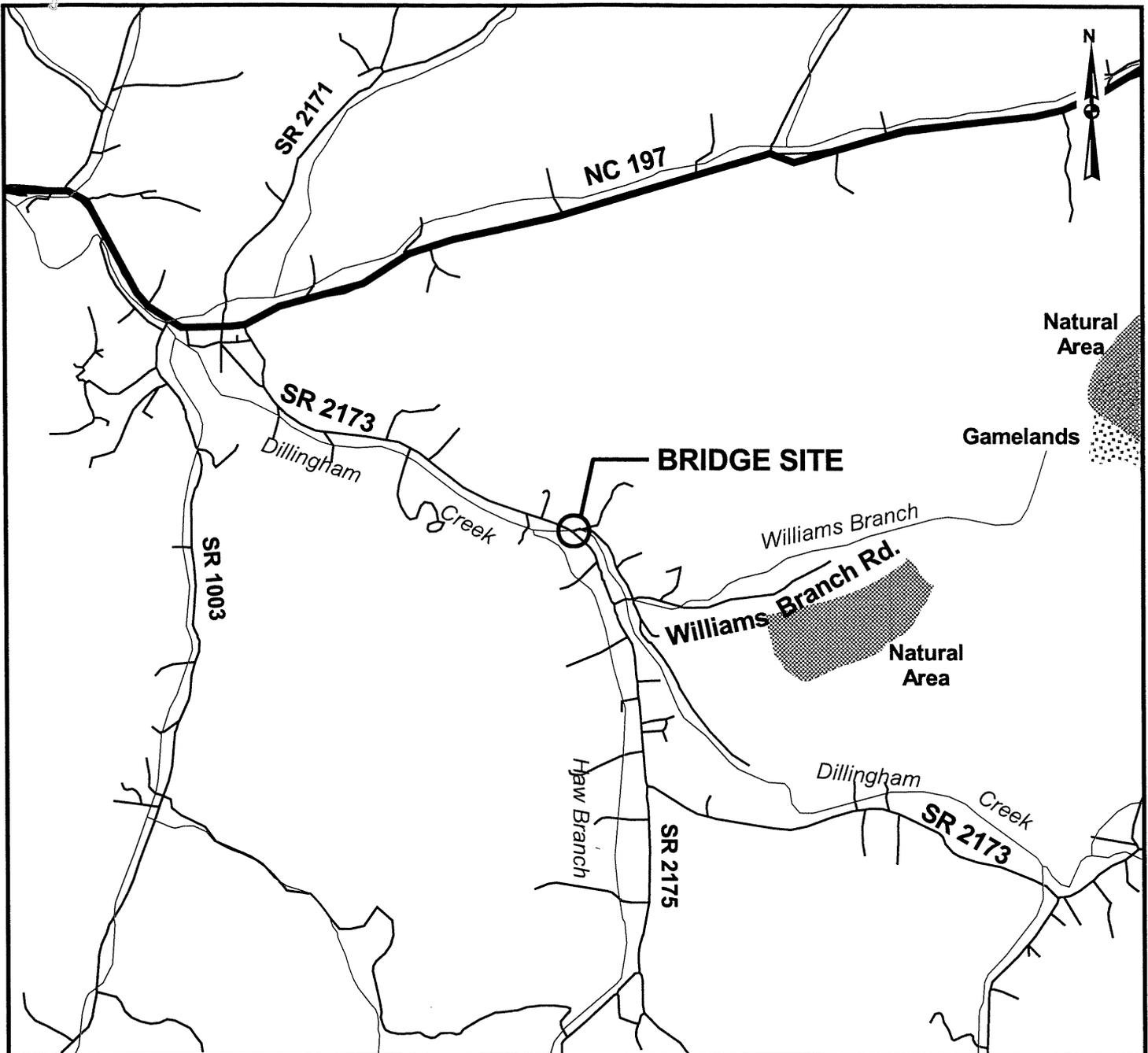
**Public Schools of North Carolina- Buncombe County Public Schools:** No adverse impacts expected if traffic is maintained during construction and service to the project area is not interrupted.

**Tennessee Valley Authority:** The categorical exclusion document prepared for these projects should note that approvals under Section 26a of the TVA Act would be required for the bridge replacement. At this time, no known environmental concerns are present at the bridge replacement site.



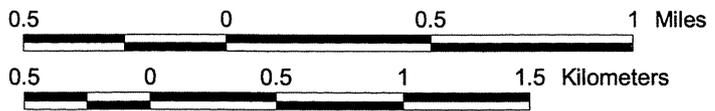
## FIGURES



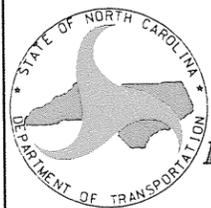


North Carolina - Department of Transportation  
 Division of Highways  
 Project Development and Environmental Analysis Branch

**FIGURE 1**  
**VICINITY MAP**  
 REPLACEMENT OF BRIDGE NUMBER 145  
 ON SR 2173 OVER DILLINGHAM CREEK  
 BUNCOMBE COUNTY  
 TIP NO. B-3310







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

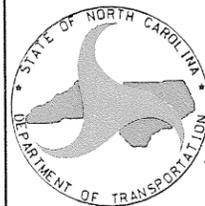
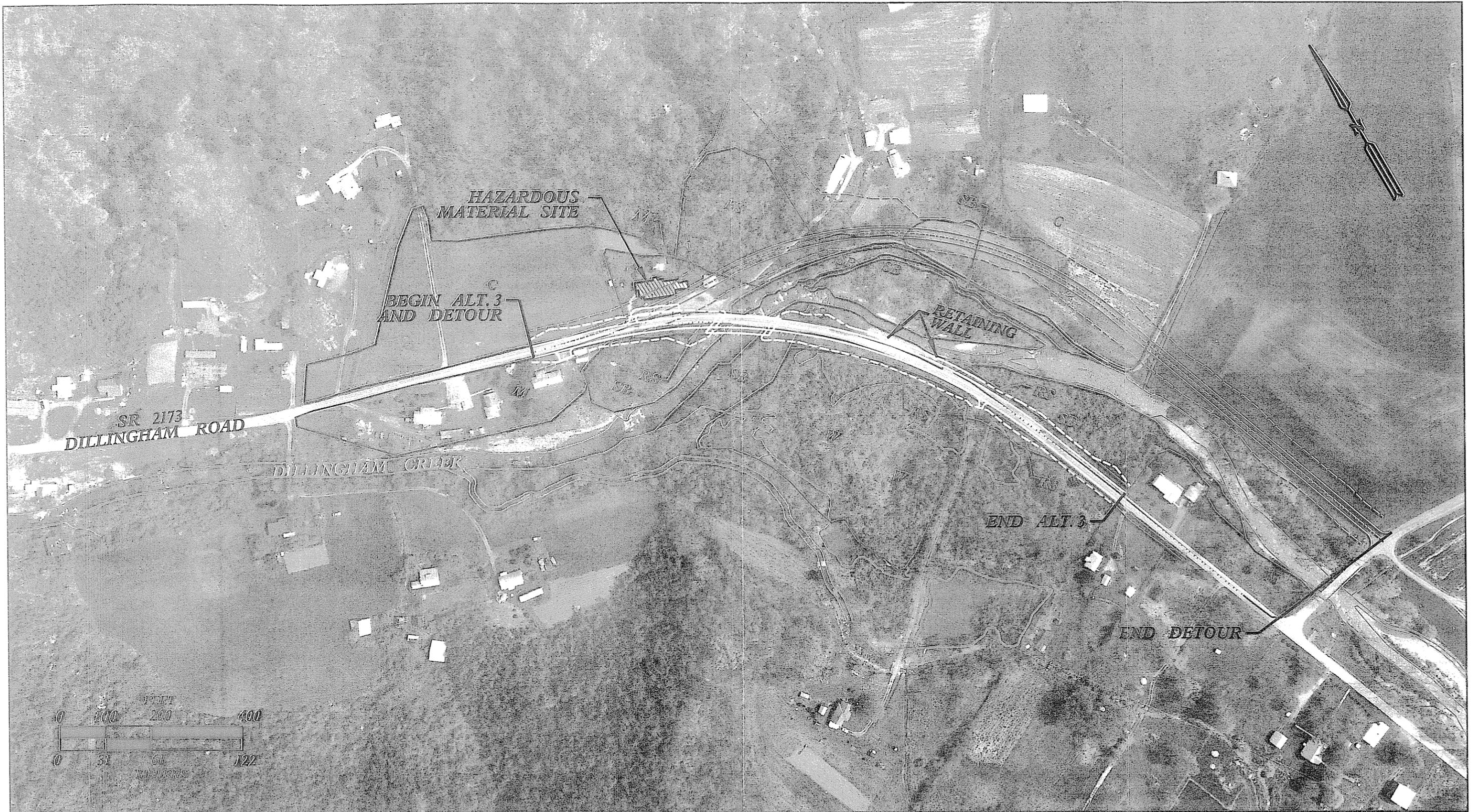
**NATURAL COMMUNITIES  
 LEGEND**

- Surface Water
- Limits of Natural Communities
- RS - Roadside
- SB - Streambank
- M - Maintained
- FS - Forested Slope
- W - Developed Wetland
- C - Cultivated

**FUNCTIONAL DESIGN  
 LEGEND**

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

**FIGURE 2a  
 ALTERNATIVE 1 (PREFERRED)  
 REPLACEMENT OF BRIDGE NO. 145  
 ON SR 2173 OVER  
 DILLINGHAM CREEK  
 BUNCOMBE COUNTY  
 TIP NO. B-3310**



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

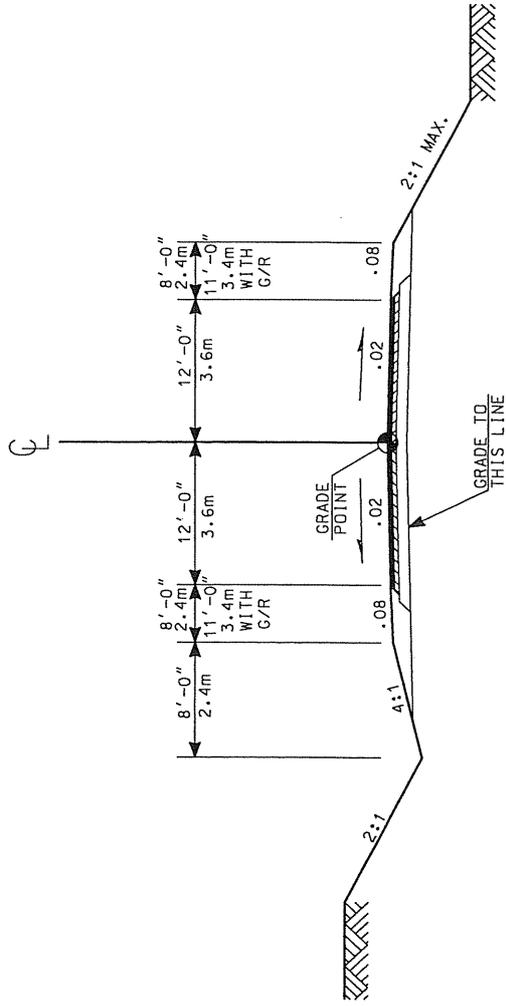
**NATURAL COMMUNITIES  
 LEGEND**

- Surface Water
- Limits of Natural Communities
- RS - Roadside
- SB - Streambank
- M - Maintained
- FS - Forested Slope
- W - Developed Wetland
- C - Cultivated

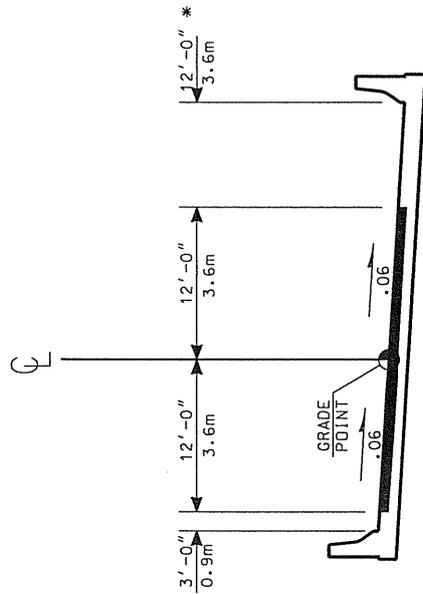
**FUNCTIONAL DESIGN  
 LEGEND**

- Alt. 3, Centerline
- Alt. 3, Edge of Pavement
- Alt. 3, Construction Limits
- Detour for Alt. 3, Centerline
- Detour for Alt. 3, Edge of Pavement
- Detour for Alt. 3, Construction Limits

**FIGURE 2b  
 ALTERNATIVE 3  
 REPLACEMENT OF BRIDGE NO. 145  
 ON SR 2173 OVER  
 DILLINGHAM CREEK  
 BUNCOMBE COUNTY  
 TIP NO. B-3310**



TYPICAL ROADWAY APPROACH SECTION



TYPICAL SECTION ON STRUCTURE

TRAFFIC DATA

ADT 2002	2020
ADT 2025	3400
DUAL	2%
TTST	1%

FUNCTIONAL CLASSIFICATION: RURAL LOCAL



NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
PROJECT DEVELOPMENT AND  
ENVIRONMENTAL ANALYSIS BRANCH

FIGURE 3  
BUNCOMBE COUNTY  
BRIDGE NO. 145 ON SR 2173  
OVER DILLINGHAM CREEK

TIP B-3310

TYPICAL SECTION





Looking North at the Bridge from SR 2173



Center of Bridge facing West



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

FIGURE 4a  
NORTH AND WEST VIEWS OF BRIDGE  
REPLACEMENT OF BRIDGE NUMBER 145  
ON SR 2173 OVER DILLINGHAM CREEK  
BUNCOMBE COUNTY  
TIP NO. B-3310





Center of Bridge facing East



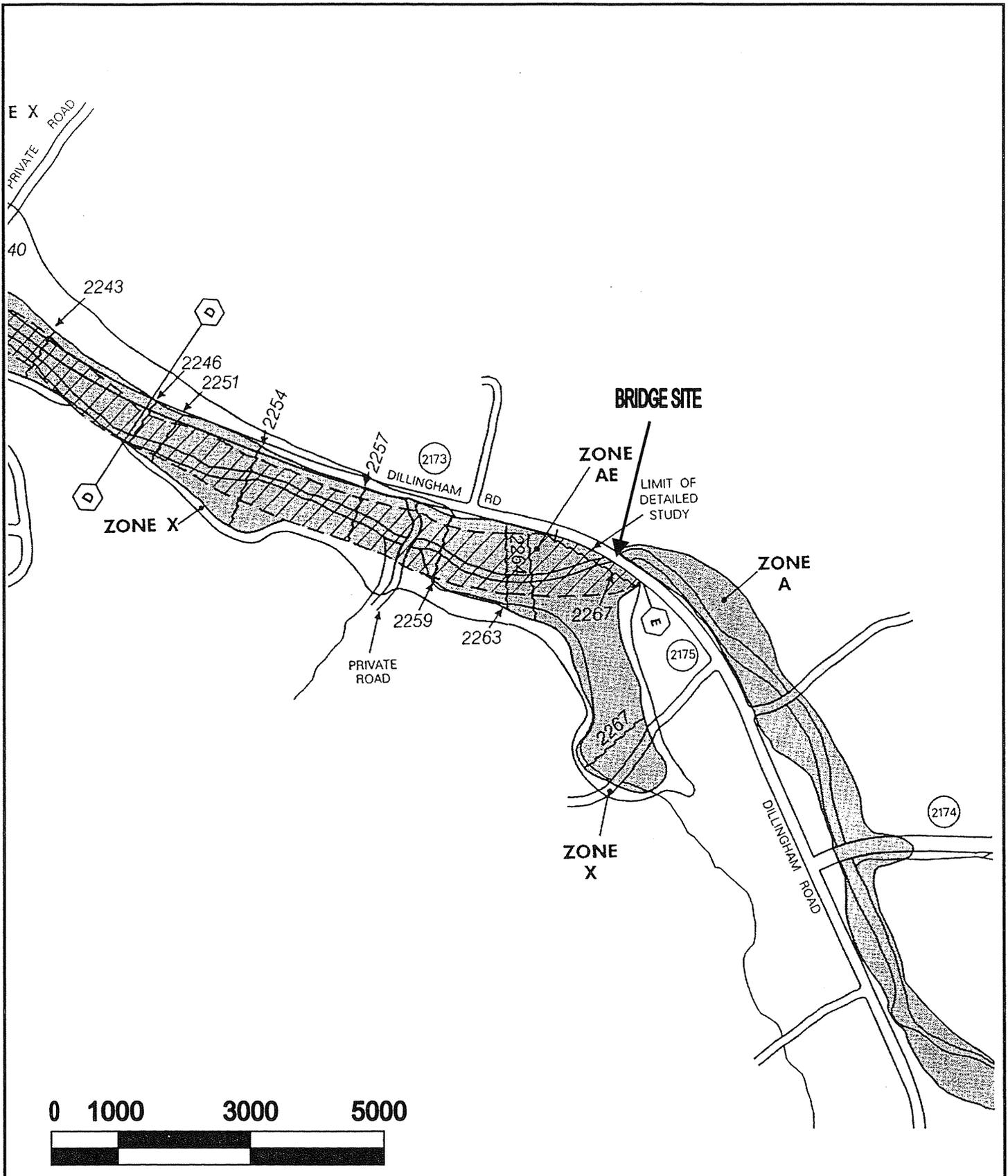
Center of Bridge facing North



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

FIGURE 4b  
EAST AND NORTH VIEWS OF BRIDGE  
REPLACEMENT OF BRIDGE NUMBER 145  
ON SR 2173 OVER DILLINGHAM CREEK  
BUNCOMBE COUNTY  
TIP NO. B-3310





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

FIGURE 5  
 FEMA 100 – YEAR FLOODPLAIN MAP  
 REPLACEMENT OF BRIDGE NUMBER 145  
 ON SR 2173 OVER DILLINGHAM CREEK  
 BUNCOMBE COUNTY  
 TIP NO. B-3310



**APPENDIX A**

**Correspondence**





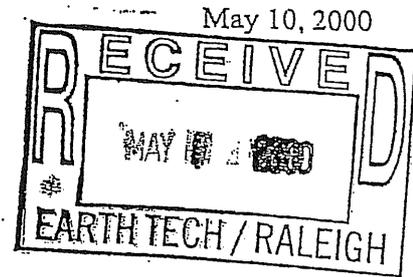
United States  
Department of  
Agriculture

Natural  
Resources  
Conservation  
Service

1415 Bland Rd.  
Raleigh, NC 27609

Phone: 919/873-2134

Ms. Stacy Harris, P. E.  
Project Development & Environmental Analysis Branch  
NC Department of Transportation  
P. O. Box 25201  
Raleigh, NC 27611-5201



Dear Ms. Harris:

Thank you for the opportunity to provide comments on the following:

1. B-3419, Burke County, North Carolina, Replace Bridge No. 46 on SR 1223 over the Catawba River;
2. B-3343, Haywood County, North Carolina, Replace Bridge No. 48 on SR 1318 OVER Hemphill Creek;
3. B-3310, Buncombe County, North Carolina, Replace Bridge No. 145 on SR 2173 over Dillingham Creek.

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

Sincerely,

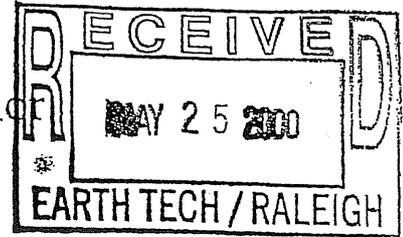
Mary T. Kollstedt  
State Conservationist

B3310



United States Department of the Interior

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



May 17, 2000

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

Dear Mr. Gilmore:

According to your letter of April 18, 2000 (received April 28, 2000), the North Carolina Department of Transportation is proposing the following three bridge replacement projects:

- B-3419; replacement of Bridge No. 46 on SR 1223 over the Catawba River, Burke County, North Carolina (our Log Number 4-2-00-180)
- B-3343; replacement of Bridge No. 48 on SR 1318 over Hemphill Creek, Haywood County (our Log Number 4-2-00-181)
- B-3310; replacement of Bridge No. 145 on SR 2173 over Dillingham Creek, Buncombe County (our Log Number 4-2-00-182)

As requested, we have reviewed the proposed projects and are providing the following comments in accordance with the provisions of Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (Act), and the Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-667e). The legal responsibilities of a Federal agency or its designated non-Federal representative under Section 7 of the Act are on file with the Federal Highway Administration.

Enclosed is a list of species from Burke, Haywood, and Buncombe Counties that are on the Federal List of Endangered and Threatened Wildlife and Plants, as well as species of Federal concern. Although our records for Haywood and Buncombe Counties indicate no known locations of these species in the project areas, we recommend surveying each of the project areas for these species prior to any further planning or on-the-ground activities to ensure no adverse impacts occur to these species. Our records for Burke County indicate there is a known location

of the federally threatened dwarf-flowered heartleaf (*Hexastylis naniflora*) in the immediate vicinity of Bridge No. 46. The plant occurs on the upland just to the north of the river. If this species occurs in the project area, additional consultation will be required. Additionally, there is a historic record for a species of Federal concern--the brook floater (*Alasmidonta varicosa*)--from a site nearby in the Catawba River. The project area for Bridge No. 46 should be surveyed for these species to ensure they are protected from impacts.

Species of Federal concern are not legally protected under the Act and are not subject to any of its provisions, including Section 7, unless they are formally proposed or listed as endangered or threatened. We are including these species in our response to give you advance notification and to request your assistance in protecting them if any are found in the vicinity of your projects.

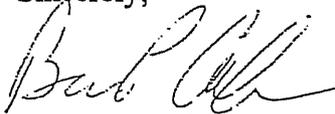
The information that accompanied your letter concerning these projects related only to the removal of the existing bridges. According to this information, there will be temporary fill associated with two of the three projects. We recommend that this fill be minimized to the extent possible and that no heavy equipment be operated in the stream channel. To maintain bank stability, any cutting and removal of woody vegetation along the stream banks should be avoided to the maximum extent possible. We also recommend removing any fill in the flood plain associated with the existing structures. These areas should be returned to the natural elevation of the flood plain to restore its natural function. This will minimize the potential for stream-bank and channel scouring that may occur during storm flows as a result of any constriction of the flood plain or stream channel associated with the existing structures.

As stated above, the information you provided addressed only the removal of the existing bridges; no information was provided concerning the types of structures that will replace the existing bridges or what measures will be implemented to minimize the potential effects associated with the new structures and their construction. We recommend that the existing structures be replaced with bridges. We recommend that each new bridge design include provisions for the roadbed and deck drainage to flow through a vegetated buffer prior to reaching the affected stream. This buffer should be large enough to alleviate any potential effects from the run-off of storm water and pollutants. The bridge designs should not alter the natural stream and stream-bank morphology or impede fish passage. Any piers or bents should be placed outside the bank-full width of the streams. The bridges and approaches should be designed to avoid any fill that will result in damming or constriction of the channel or flood plain. If spanning the flood plain is not feasible, culverts should be installed in the flood plain portion of the approaches in order to restore some of the hydrological functions of the flood plain and reduce high velocities of flood waters within the affected areas. We recommend that erosion- and sedimentation-control measures be in place prior to any ground-disturbing activities. Wet concrete should never be allowed to come into contact with the stream.

We appreciate the opportunity to provide these comments. If you have any questions or concerns, please contact Ms. Marella Buncick of our staff at 828/258-3939, Ext. 237. We have

assigned each of these projects a separate log number; please reference these numbers in any future correspondence concerning these projects.

Sincerely,

A handwritten signature in black ink, appearing to read "Brian P. Cole". The signature is fluid and cursive, with the first name "Brian" being the most prominent.

Brian P. Cole  
State Supervisor

Enclosure

cc:

Mr. Mark Davis, Mountain Region Coordinator, North Carolina Wildlife Resources  
Commission, 20830 Great Smoky Mtn. Expressway, Waynesville, NC 28786

Mr. Bob Johnson, U.S. Army Corps of Engineers, Asheville Regulatory Field Office, 151 Patton  
Avenue, Room 143, Asheville, NC 28801-5006

Mr. Roger Bryan, Division 13 Environmental Officer, North Carolina Department of  
Transportation, P.O. Box 3279, Asheville, NC 28802

**ENDANGERED, THREATENED, AND CANDIDATE SPECIES  
AND FEDERAL SPECIES OF CONCERN  
BUNCOMBE, BURKE, AND HAYWOOD COUNTIES, NORTH CAROLINA**

This list was adapted from the North Carolina Natural Heritage Program's County Species List. It is a listing, for Buncombe, Burke, and Haywood Counties, of North Carolina's federally listed and proposed endangered, threatened, and candidate species and Federal species of concern (for a complete list of rare species in the state, please contact the North Carolina Natural Heritage Program). The information in this list is compiled from a variety of sources, including field surveys, museums and herbariums, literature, and personal communications. The North Carolina Natural Heritage Program's database is dynamic, with new records being added and old records being revised as new information is received. Please note that this list cannot be considered a definitive record of listed species and Federal species of concern, and it should not be considered a substitute for field surveys.

**Critical habitat:** Critical habitat is noted, with a description, for the counties where it is designated.

**Aquatic species:** Fishes and aquatic invertebrates are noted for counties where they are known to occur. However, projects may have effects on downstream aquatic systems in adjacent counties.

COMMON NAME	SCIENTIFIC NAME	STATUS
-------------	-----------------	--------

**BUNCOMBE COUNTY**

**Vertebrates**

Southern Appalachian saw-whet owl	<i>Aegolius acadicus</i>	FSC
Bachman's sparrow	<i>Aimophila aestivalis</i>	FSC*
Bog turtle	<i>Clemmys muhlenbergii</i>	T(S/A) <sup>1</sup>
Rafinesque's big-eared bat	<i>Corynorhinus (=Plecotus) rafinesquii</i>	FSC*
Hellbender	<i>Cryptobranchus alleganiensis</i>	FSC
Cerulean warbler	<i>Dendroica cerulea</i>	FSC
Eastern cougar	<i>Felis concolor cougar</i>	Endangered*
Carolina northern flying squirrel	<i>Glaucomys sabrinus coloratus</i>	Endangered
Spotfin chub	<i>Hybopsis monacha</i>	Threatened*
Southern Appalachian red crossbill	<i>Loxia curvirostra</i>	FSC
Gray bat	<i>Myotis grisescens</i>	Endangered***
Eastern small-footed myotis	<i>Myotis leibii</i>	FSC
Southern Appalachian woodrat	<i>Neotoma floridana haematoreia</i>	FSC
Southern Appalachian black-capped chickadee	<i>Parus atricapillus praticus</i>	FSC
Longhead darter	<i>Percina macrocephala</i>	FSC*
Paddlefish	<i>Polyodon spathula</i>	FSC*
Southern water shrew	<i>Sorex palustris punctulatus</i>	FSC
Southern Appalachian yellow-bellied sapsucker	<i>Sphyrapicus varius appalaciensis</i>	FSC
Appalachian Bewick's wren	<i>Thryomanes bewickii altus</i>	FSC*

**Invertebrates**

Appalachian elktoe	<i>Alasmidonta raveneliana</i>	Endangered
French Broad crayfish	<i>Cambarus reburus</i>	FSC

COMMON NAME	SCIENTIFIC NAME	STATUS
Tawny crescent butterfly	<i>Phycoides batesii</i>	FSC*
Diana fritillary butterfly	<i>Speyeria diana</i>	FSC*
<b>Vascular Plants</b>		
Fraser fir	<i>Abies fraseri</i>	FSC
Piratebush	<i>Buckleya distichophylla</i>	FSC
Cain's reedgrass	<i>Calamagrostis cainii</i>	FSC
Glade spurge	<i>Euphorbia purpurea</i>	FSC
Spreading avens	<i>Geum radiatum</i>	Endangered
Mountain heartleaf	<i>Hexastylis contracta</i>	FSC
French Broad heartleaf	<i>Hexastylis rhombiformis</i>	FSC
Butternut	<i>Juglans cinerea</i>	FSC
Gray's lily	<i>Lilium grayi</i>	FSC
Fraser's loosestrife	<i>Lysimachia fraseri</i>	FSC*
Sweet pinesap	<i>Monotropsis odorata</i>	FSC
Pinnate-lobed black-eyed susan	<i>Rudbeckia triloba</i> var. <i>pinnatoloba</i>	FSC
Bunched arrowhead	<i>Sagittaria fasciculata</i>	Endangered*
Mountain sweet pitcher plant	<i>Sarracenia jonesii</i>	Endangered*
Carolina saxifrage	<i>Saxifraga caroliniana</i>	FSC
Divided-leaf ragwort	<i>Senecio millefolium</i>	FSC
Mountain catchfly	<i>Silene ovata</i>	FSC
Virginia spiraea	<i>Spiraea virginiana</i>	Threatened
<b>Nonvascular Plants</b>		
Rock gnome lichen	<i>Gymnoderma lineare</i>	Endangered

## BURKE COUNTY

### Critical Habitat Designation:

Mountain golden heather, *Hudsonia montana* - The area bounded by the following: on the west by the 2200' contour; on the east by the Linville Gorge Wilderness Boundary north from the intersection of the 2200' contour and the Shortoff Mountain Trail to where it intersects the 3400' contour at "The Chimneys"--then follow the 3400' contour north until it reintersects the Wilderness Boundary--then follow the Wilderness Boundary again northward until it intersects the 3200' contour extending west from its intersection with the Wilderness Boundary until it begins to turn south--at this point the Boundary extends due east until it intersects the 2200' contour.

### Vertebrates

Bald eagle	<i>Haliaeetus leucocephalus</i>	Threatened
Alleghany woodrat	<i>Neotoma magister</i>	FSC

### Invertebrates

Brook floater	<i>Alasmidonta varicosa</i>	FSC
Edmund's snaketail dragonfly	<i>Ophiogomphus edmundo</i>	FSC*
Pygmy snaketail dragonfly	<i>Ophiogomphus howei</i>	FSC
Diana fritillary butterfly	<i>Speyeria diana</i>	FSC

COMMON NAME	SCIENTIFIC NAME	STATUS
<b>Vascular Plants</b>		
Spreading avens	<i>Geum radiatum</i>	Endangered
Dwarf-flowered heartleaf	<i>Hexastylis naniflora</i>	Threatened
Mountain golden heather	<i>Hudsonia montana</i>	Threatened
Small-whorled pogonia	<i>Isotria medeoloides</i>	Threatened
Butternut	<i>Juglans cinerea</i>	FSC
Heller's blazing star	<i>Liatris helleri</i>	Threatened
Sweet pinesap	<i>Monotropis odorata</i>	FSC
Carolina saxifrage	<i>Saxifraga caroliniana</i>	FSC
<b>Nonvascular Plants</b>		
A liverwort	<i>Cephaloziella obtusilobula</i>	FSC*
A liverwort	<i>Plagiochila sullivanii</i> var. <i>spinigera</i>	FSC
A liverwort	<i>Plagiochila sullivanii</i> var. <i>sullivanii</i>	FSC
<b>HAYWOOD COUNTY</b>		
<b>Vertebrates</b>		
Southern Appalachian saw-whet owl	<i>Aegolius acadicus</i>	FSC
Bog turtle	<i>Clemmys muhlenbergii</i>	T(S/A) <sup>1</sup>
Olive-sided flycatcher	<i>Contopus borealis</i>	FSC
Hellbender	<i>Cryptobranchus alleganiensis</i>	FSC
Cerulean warbler	<i>Dendroica cerulea</i>	FSC
Eastern cougar	<i>Felis concolor cougar</i>	Endangered*
Carolina northern flying squirrel	<i>Glaucomys sabrinus coloratus</i>	Endangered
Bald eagle	<i>Haliaeetus leucocephalus</i>	Threatened
Southern Appalachian red crossbill	<i>Loxia curvirostra</i>	FSC
Southern rock vole	<i>Microtus chrotorrhinus carolinensis</i>	FSC
Southern Appalachian woodrat	<i>Neotoma floridana haematoxia</i>	FSC
Alleghany woodrat	<i>Neotoma magister</i>	FSC
Southern Appalachian black-capped chickadee	<i>Parus atricapillus praticus</i>	FSC
Southern water shrew	<i>Sorex palustris punctulatus</i>	FSC
Southern Appalachian yellow-bellied sapsucker	<i>Sphyrapicus varius appalaciensis</i>	FSC
Appalachian cottontail	<i>Sylvilagus obscurus</i>	FSC
Appalachian Bewick's wren	<i>Thryomanes bewickii altus</i>	FSC
<b>Invertebrates</b>		
Appalachian elktoe	<i>Alasmidonta raveneliana</i>	Endangered
Tawny crescent butterfly	<i>Phyciodes batesii maconensis</i>	FSC*
Diana fritillary butterfly	<i>Speyeria diana</i>	FSC
<b>Vascular Plants</b>		
Fraser fir	<i>Abies fraseri</i>	FSC
Piratebush	<i>Buckleya disticophylla</i>	FSC
Mountain bittercress	<i>Cardamine clematitidis</i>	FSC
Manhart's sedge	<i>Carex manhartii</i>	FSC
Tall larkspur	<i>Delphinium exaltatum</i>	FSC*

COMMON NAME	SCIENTIFIC NAME	STATUS
Glade spurge	<i>Euphorbia purpurea</i>	FSC
Smoky Mountain manna grass	<i>Glyceria nubigena</i>	FSC
Small-whorled pogonia	<i>Isotria medeoloides</i>	Threatened
Butternut	<i>Juglans cinerea</i>	FSC
Fraser's loosestrife	<i>Lysimachia fraseri</i>	FSC
Rugel's ragwort	<i>Rugelia nudicaulis</i>	FSC
Carolina saxifrage	<i>Saxifraga caroliniana</i>	FSC
Mountain catchfly	<i>Silene ovata</i>	FSC
Alabama least trillium	<i>Trillium pusillum</i> var. 1	FSC
<b>Nonvascular Plants</b>		
Rock gnome lichen	<i>Gymnoderma lineare</i>	Endangered
A liverwort	<i>Plagiochila sharpii</i>	FSC
A liverwort	<i>Plagiochila sullivanii</i> var. <i>sullivanii</i>	FSC
A liverwort	<i>Sphenolobopsis pearsonii</i>	FSC

**KEY:**

Status	Definition
Endangered	A taxon "in danger of extinction throughout all or a significant portion of its range."
Threatened	A taxon "likely to become endangered within the foreseeable future throughout all or a significant portion of its range."
FSC	A Federal species of concern--a species that may or may not be listed in the future (formerly C2 candidate species or species under consideration for listing for which there is insufficient information to support listing).
T(S/A)	Threatened due to similarity of appearance (e.g., American alligator)--a species that is threatened due to similarity of appearance with other rare species and is listed for its protection. These species are not biologically endangered or threatened and are not subject to Section 7 consultation.

Species with 1, 2, 3, or 4 asterisks behind them indicate historic, obscure, or incidental records.

\*Historic record - the species was last observed in the county more than 50 years ago.

\*\*Obscure record - the date and/or location of observation is uncertain.

\*\*\*Incidental/migrant record - the species was observed outside of its normal range or habitat,

\*\*\*\*Historic record - obscure and incidental record.

<sup>1</sup>In the November 4, 1997, *Federal Register* (55822-55825), the northern population of the bog turtle (from New York south to Maryland) was listed as T (threatened), and the southern population (from Virginia south to Georgia) was listed as T(S/A) (threatened due to similarity of appearance). The T(S/A) designation bans the collection and interstate and international commercial trade of bog turtles from the southern population. The T(S/A) designation has no effect on land-management activities by private landowners in North Carolina, part of the southern population of the species. In addition to its official status as T(S/A), the U.S. Fish and Wildlife Service considers the southern population of the bog turtle as a Federal species of concern due to habitat loss.



North Carolina Department of Cultural Resources  
State Historic Preservation Office

David L. S. Brook, Administrator

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

Division of Archives and History  
Jeffrey J. Crow, Director

May 7, 2001

MEMORANDUM

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

From: David Brook *for David Brook*  
Deputy State Historic Preservation Officer

Re: Bridge #145 on SR 2173 over Dillingham Creek, B-3310, Buncombe County, ER 00-9684

Thank you for your letter of February 12, 2001, transmitting the archaeological survey report by Gerald Glover concerning the above project.

During the course of the survey no sites were located within the project area. The author has recommended that no further archaeological investigation be conducted in connection with this project. We concur with this recommendation since this project will not involve significant archaeological resources.

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

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, Environmental Review Coordinator, at 919/733-4763.

DB:kgc

cc: Gerold Glover, NCDOT  
Thomas Padgett, 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



North Carolina Department of Cultural Resources

State Historic Preservation Office

David L. S. Brook, Administrator

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

Division of Archives and History  
Jeffrey J. Crow, Director

June 9, 2000

MEMORANDUM

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

FROM: David Brook *David Brook*  
Deputy State Historic Preservation Officer

SUBJECT: Replacement of Bridge No. 145 on SR 2173 over Dillingham Creek, TIP No. B-3310,  
Buncombe County, ER 00-9684

On May 24, 2000, our office requested an architectural survey concerning the above project. However, on October 21, 1999, Jennifer Martin of our office signed a concurrence form stating that there were no eligible properties located within the area of potential effect for this property. We stand by our October 21, 1999 determination.

Please disregard our May 24, 2000 letter. We apologize for any inconvenience this may have caused. The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763.

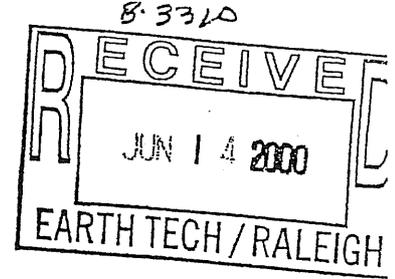
Sincerely,

David Brook  
Deputy State Historic Preservation Officer

DB:scb

cc: B. Church

	Location	Mailing Address	Telephone/Fax
ADMINISTRATION	507 N. Blount St., Raleigh NC	4617 Mail Service Center, Raleigh NC 27699-4617	(919) 733-4763 • 733-86
ARCHAEOLOGY	421 N. Blount St., Raleigh NC	4619 Mail Service Center, Raleigh NC 27699-4619	(919) 733-7342 • 715-26
RESTORATION	515 N. Blount St., Raleigh NC	4613 Mail Service Center, Raleigh NC 27699-4613	(919) 733-6347 • 715-28



North Carolina Department of Cultural Resources

State Historic Preservation Office

David L. S. Brook, Administrator

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

Division of Archives and History  
Jeffrey J. Crow, Director

May 24, 2000

MEMORANDUM

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

FROM: David Brook *David Brook*  
Deputy State Historic Preservation Officer

SUBJECT: Bridge No. 145 on SR 2173 over Dillingham Creek, B-3310, Buncombe County, ER 00-9684

Thank you for your letter of April 18, 2000, 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. However, since a comprehensive historical architectural inventory of has never been conducted, there may be structures of which we are unaware located within the planning area.

Several recorded sites are located within 0.5 mile of the existing bridge.

We recommend that a comprehensive survey be conducted by an experienced archaeologist to identify the presence and significance of archaeological remains that may be damaged or destroyed by the proposed project. Potential effects on unknown resources should be assessed prior to the initiation of construction activities.

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

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763.

DB: scb

cc: B. Church  
T. Padgett

	Location	Mailing Address	Telephone/Fax
ADMINISTRATION	507 N. Blount St., Raleigh NC	4617 Mail Service Center, Raleigh NC 27699-4617	(919) 733-4763 • 733-8653
ARCHAEOLOGY	421 N. Blount St., Raleigh NC	4619 Mail Service Center, Raleigh NC 27699-4619	(919) 733-7342 • 715-2671
RESTORATION	515 N. Blount St., Raleigh NC	4613 Mail Service Center, Raleigh NC 27699-4613	(919) 733-6347 • 715-4801
SURVEY & PLANNING	515 N. Blount St., Raleigh NC	4618 Mail Service Center, Raleigh NC 27699-4618	(919) 733-6345 • 715-4801

complete  
S. Harris

Federal Aid #BRZ-2173(1)

TIP #B-3310

County: Buncombe

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

Project Description: Replace Bridge No. 145 on SR 2173 over Dillingham Creek

On October 21, 1999, representatives of the

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

Reviewed the subject project at

- a scoping meeting
- photograph review session/consultation
- other

All parties present agreed

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

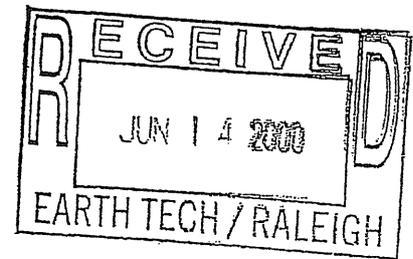
Signed:

Mary Pope 10/21/99  
 Representative, NCDOT Date

Ray C. Shelton 10/25/99  
 FHWA, or the Division Administrator, or other Federal Agency Date

J. F. M. 10/21/99  
 Representative, SHPO Date

W. A. Wood 10/29/99  
 State Historic Preservation Officer Deputy SHPO Date



☒ North Carolina Wildlife Resources Commission ☒

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

TO: Stacy Harris, PE  
Project Engineer, NCDOT

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

DATE: May 25, 2000

SUBJECT: NCDOT Bridge Replacements in Buncombe, Burke, and Haywood counties of  
North Carolina. TIP Nos. B-3310, B-3419, and B-3343.

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

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

1. We generally prefer spanning structures. Spanning structures usually do not require work within the stream and do not require stream channel realignment. The horizontal and vertical clearances provided by bridges allows for human and wildlife passage beneath the structure, does not block fish passage, and does not block navigation by canoeists and boaters.
2. Bridge deck drains should not discharge directly into the stream.
3. Live concrete should not be allowed to contact the water in or entering into the stream.
4. If possible, bridge supports (bents) should not be placed in the stream.
5. If temporary access roads or detours are constructed, they should be removed back to original ground elevations immediately upon the completion of the project. Disturbed

areas should be seeded or mulched to stabilize the soil and native tree species should be planted with a spacing of not more than 10'x10'. If possible, when using temporary structures the area should be cleared but not grubbed. Clearing the area with chain saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact, allows the area to revegetate naturally and minimizes disturbed soil.

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

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

1. The culvert must be designed to allow for fish passage. Generally, this means that the culvert or pipe invert is buried at least 1 foot below the natural stream bed. If multiple cells are required the second and/or third cells should be placed so that their bottoms are at stream bankfull stage (similar to Lyonsfield design). This could be accomplished by constructing a low sill on the upstream end of the other cells that will divert low flows to another cell. This will allow sufficient water depth in the culvert or pipe during normal flows to accommodate fish movements. If culverts are long, notched baffles should be placed in reinforced concrete box culverts at 15 foot intervals to allow for the collection of sediments in the culvert, to reduce flow velocities, and to provide resting places for fish and other aquatic organisms moving through the structure.
2. If multiple pipes or cells are used, at least one pipe or box should be designed to remain dry during normal flows to allow for wildlife passage.
3. Culverts or pipes should be situated so that no channel realignment or widening is required. Widening of the stream channel at the inlet or outlet of structures usually causes a decrease in water velocity causing sediment deposition that will require future maintenance.
4. Riprap should not be placed on the stream bed.

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

Project specific comments:

1. B-3310 – Buncombe County – Bridge No. 145 over Dillingham Creek. Dillingham Creek is Designated Public Mountain Trout Water and is classified as Hatchery Supported. There is also a high probability of wild trout in this location due to the close proximity of tributaries that contain wild trout. No in-water work should be performed between November 1 and April 15 to protect trout egg and fry stages from sedimentation.
2. B-3419 – Burke County – Bridge No. 46 over the Catawba River. Bridge No. 46 crosses the Catawba River in the Lake James tailwater and is Designated Public Mountain Trout Water and is classified as Hatchery Supported. The river at this location is stocked with catchable trout from March 1 through July 31 annually and supports wild brown and brook trout. Efforts should be made to minimize in-water disturbance during the stocking season from March 1 through July 31. No in-water work should be performed between November 1 and April 15 to protect trout egg and fry stages from sedimentation. In addition to trout, there are spring runs of striped bass, v-lip redhorse, yellow perch and walleye from Lake Rhodhiss that travel up to this location attempting to spawn. There also are records of a rare mussel, the brook floater (*Alasmidonta varicosa*), in this section of the river. NCDOT should perform any necessary surveys to determine the status of this species.

3. B-3343 – Haywood County – Bridge No. 48 over Hemphill Creek. Hemphill Creek is Designated Public Mountain Trout Water and is classified as Hatchery Supported. The headwaters of Hemphill Creek border the Great Smoky Mountains National Park; thus the occurrence of wild trout and in particular brook trout is very likely. No in-water work should be performed between November 1 and April 15 to protect trout egg and fry stages from sedimentation.

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

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



## ☒ North Carolina Wildlife Resources Commission ☒

Charles R. Fullwood, Executive Director

### MEMORANDUM

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

FROM: Mark S. Davis, Mountain Region Coordinator *Mark S. Davis*  
Habitat Conservation Program

DATE: May 8, 2000

SUBJECT: Comments on Group XX Bridge Replacement Projects in Buncombe, Burke, and Haywood Counties, North Carolina.

This memorandum responds to your request for our concerns regarding impacts on fish and wildlife resources resulting from the subject projects. The North Carolina Wildlife Resources Commission (NCWRC) has reviewed the proposed projects, and 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).

The proposed work involves 3 bridge replacement/demolition projects in western North Carolina (listed below). Construction impacts on wildlife and fisheries resources will depend on the extent of disturbance in the streambed and surrounding floodplain areas. We prefer bridge designs that do not alter the natural stream morphology or impede fish passage. Bridge designs should also include provisions for the deck drainage to flow through a vegetated upland buffer prior to reaching the subject surface waters. Demolition plans for the existing bridge structures should be addressed in the environmental documents prepared for these projects, as well as any proposed causeways, temporary access roads or detours. We are also concerned about impacts to Designated Public Mountain Trout Waters (DPMTW) and environmental documentation for these projects should include a description of any streams or wetlands on the project site and surveys for any threatened or endangered species that may be affected by construction.

#### B-3310 - Buncombe County, Bridge No. 145 on SR 2173 over Dillingham Creek

Dillingham Creek is managed by the NCWRC as Hatchery Supported trout water and also supports wild trout populations in the project area. We recommend that the existing bridge be replaced with another spanning structure. We recommend that instream work be prohibited during the trout spawning period of November 1 through April 15 to protect the egg and fry stages from off-site sedimentation.

**B-3419 - Burke County, Bridge No. 46 on SR 1223 over Catawba River**

The Catawba River is managed by the NCWRC as Hatchery Supported trout water in the project area. The river also supports a small spawning run of striped bass moving out of Lake Rhodhiss in the spring. We recommend that the existing bridge be replaced with another spanning structure.

**B-3343 - Haywood County, Bridge No. 48 on SR 1318 over Hemphill Creek**

Hemphill Creek is managed by the NCWRC as Hatchery Supported trout water and also supports wild trout populations in the project area. We recommend that the existing bridge be replaced with another spanning structure. We recommend that instream work be prohibited during the trout spawning period of November 1 through April 15 to protect the egg and fry stages from off-site sedimentation.

Because the Corps of Engineers (COE) recognizes all of the above counties as "trout water counties", the NCWRC will review any nationwide or general 404 permits for the proposed projects. The following conditions are likely to be placed on the subject 404 permits:

1. Adequate sedimentation and erosion control measures must be implemented prior to any ground disturbing activities to minimize impacts to downstream aquatic resources. Structures should be inspected and maintained regularly, especially following rainfall events.
2. 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.
3. 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.
4. If concrete is used during construction, a dry work area must be maintained to prevent direct contact between curing concrete and stream water. Uncured concrete affects water quality and is highly toxic to fish and other aquatic organisms.
5. Grading and backfilling should be minimized, and tree and shrub growth should be retained if possible to ensure long term availability of shoreline cover for gamefish and wildlife.
6. In trout waters, instream construction is prohibited during the trout spawning period of November 1 to April 15 to avoid impacts on trout reproduction.
7. 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.
8. If multi-celled reinforced concrete box culverts are utilized, they should be designed so that all water flows through a single cell (or two if necessary) during low flow conditions. This could be accomplished by constructing a low sill on the upstream end of the other cells that will divert low flows to another cell. This will facilitate fish passage at low flows.
9. Notched baffles should be placed in reinforced concrete box culverts at 15 foot intervals to allow for the collection of sediments in the culvert, reduce flow velocities, and to provide resting places for fish moving through the structure.

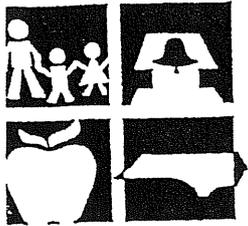
May 8, 2000

10. 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.
11. 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.

Thank you for the opportunity to review and comment during the early stages of these projects. If you have any questions regarding these comments, please contact me at (828) 452-2546.

cc: Mr. Steve Lund, NCDOT Coordinator, COE, Asheville  
Ms. Stacy Harris, P.E., PD & EA Branch, NCDOT, Raleigh  
Mr. Ron Linville, Western Piedmont Region Coordinator, NCWRC, Kernersville

39644

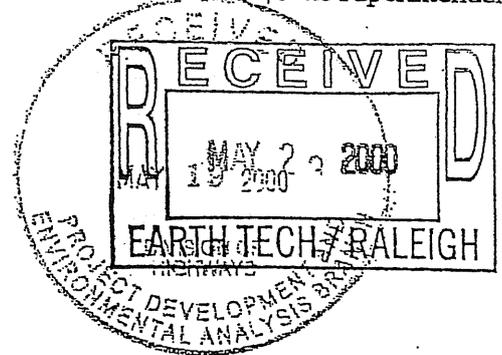


# Public Schools of North Carolina

State Board of Education  
Phillip J. Kirk, Jr., Chairman

<http://www.dpi.state.nc.us>

Department of Public Instruction,  
Michael E. Ward, State Superintendent



May 16, 2000

## MEMORANDUM

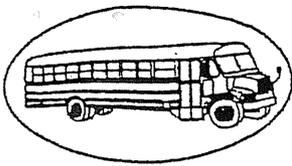
TO: William Gilmore, NC Department of Transportation

FROM: Gerald H. Knott, Section Chief, School Planning *G. Knott*

SUBJECT: Requests for Comments for Bridge Group XX Bridge Replacement Projects

Enclosed is the response from Buncombe County Schools to our impact inquiry.

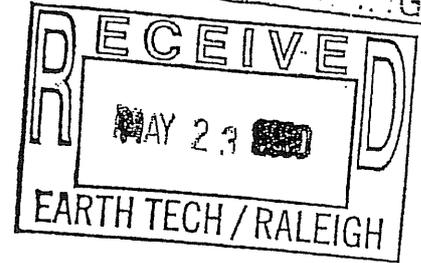
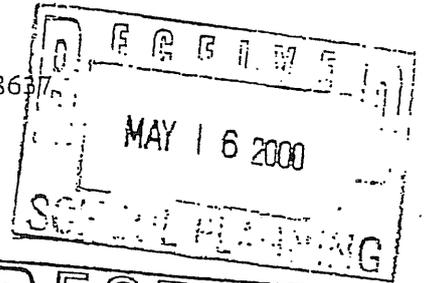
/ed  
Enclosure



# Buncombe County Public Schools

39644

Transportation Department  
74 Washington Avenue  
Asheville, North Carolina 28804  
Phone: (828) 232-4240 — Fax: (828) 252-8637



May 11, 2000

Mr. Gerald H. Knott, AIA  
Section Chief, School Planning  
North Carolina Department of Public Instruction  
301 North Wilmington Street  
Raleigh, NC 27601

RE: Proposed Replacement of Bridge Number 145  
on SR 2173 over Dillingham Creek

Dear Mr. Knott:

I am writing in response to your letter to our school system regarding the proposed replacement of bridge number 145 on SR 2173 over Dillingham Creek. In your letter, you asked our school system to review the proposal, and to indicate if the project will have any impact on a proposed or existing school site or school bus route.

A member of my staff contacted Mr. Eddie McFalls, P.E., EarthTech, Inc. on May 5, 2000, regarding this project. It is our understanding after talking with Mr. McFalls that a new bridge will be built and traffic routed onto it before the old one is torn down. If this process is followed, I do not foresee this project causing an adverse impact to a proposed or existing school site or school bus route.

Thank you for your assistance in transferring this information to the North Carolina Department of Transportation. If you need additional information, please contact me at the address or telephone number listed above.

Sincerely,

Harold F. Laflin  
Director of Transportation

pc: Dr. Stephen L. Page  
Mr. Marshall Roberts

B-3310



Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, Tennessee 37902-7499  
June 5, 2000



Mr. William D. Gilmore, P.E., Manager  
Project Development and Environmental Analysis Branch  
North Carolina Department of Transportation  
Post Office Box 25201  
Raleigh, North Carolina 27611-5201

Dear Mr. Gilmore:

**GROUP XX BRIDGE REPLACEMENT PROJECTS, FRENCH BROAD RIVER WATERSHED,  
BUNCOMBE AND HAYWOOD COUNTIES, NORTH CAROLINA**

TVA has reviewed the April 18, 2000 request for comments on the following proposed bridge replacements in western North Carolina:

- B-3310, SR 2173 over Dillingham Creek, Buncombe County
- B-3343, SR 1318 over Hemphill Creek, Haywood County

The categorical exclusion document prepared for these projects should note that approvals under Section 26a of the TVA Act would be required for the bridge replacements. At this time, we are not aware of any environmental concerns present at the bridge replacement sites.

When Section 26a applications are filed, TVA may wish to review the categorical exclusion documents during its environmental review of the same actions. Therefore, the inclusion of information related to wetlands and potential mitigation, Floodplain Management Executive Order, National Historic Preservation Act compliance, and Endangered Species Act compliance would lower TVA's review costs and greatly facilitate TVA's eventual approval of the projects. Other issues to be discussed would vary according to project location and impacts but may include, as appropriate, state-listed species (biodiversity impacts) and visual impacts.

Please invite TVA to any interagency meetings, if any are found to be necessary. Please send a copy of the completed environmental documents to TVA.

Should you have any questions, please contact Harold M. Draper at (865) 632-6889 or [hmdraper@tva.gov](mailto:hmdraper@tva.gov).

Sincerely,

Jon M. Loney, Manager  
NEPA Administration  
Environmental Policy and Planning

**APPENDIX B**  
**Relocation Report**



# RELOCATION REPORT

North Carolina Department of Transportation  
AREA RELOCATION OFFICE

E.I.S.     CORRIDOR     DESIGN

PROJECT:	8.2843601	COUNTY:	Buncombe	Alternate 1 of 3* Alternate
.D. NO.:	B-3310	F.A. PROJECT	BRZ-2173(1)	<b>THERE ARE NO RELOCATEES ON ALTERNATE 2</b>
DESCRIPTION OF PROJECT:	Replacement of Bridge No. 145 on SR 2173 over Dillingham Creek			

ESTIMATED DISPLACED					INCOME LEVEL								
Type of Displacees	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP				
Residential	1	0	1	0	0	0	0	1	0				
Businesses	0	0	0	0	VALUE OF DWELLING				DSS DWELLING AVAILABLE				
Farms	0	0	0	0	Owners		Tenants		For Sale		For Rent		
Non-Profit	0	0	0	0	0-20M	0	\$ 0-150	0	0-20M	0	\$ 0-150	0	
					20-40M	0	150-250	0	20-40M	2	150-250	1	
					40-70M	1	250-400	0	40-70M	4	250-400	3	
					70-100M	0	400-600	0	70-100M	2	400-600	0	
					100 UP	0	600 UP	0	100 UP	2	600 UP	0	
					<b>TOTAL</b>	<b>1</b>		<b>0</b>		<b>10</b>		<b>4</b>	

ANSWER ALL QUESTIONS		
Yes	No	Explain all "YES" answers.
	X	1. Will special relocation services be necessary?
	X	2. Will schools or churches be affect by displacement?
X		3. Will business services still be available after project?
	X	4. Will any business be displaced? If so, indicate size, type, estimated number of employees, minorities, etc.
	X	5. Will relocation cause a housing shortage?
		6. Source for available housing (list).
	X	7. Will additional housing programs be needed?
X		8. Should Last Resort Housing be considered?
	X	9. Are there large, disabled, elderly, etc. families?
	X	10. Will public housing be needed for project?
X		11. Is public housing available?
X		12. Is it felt there will be adequate DSS housing available during relocation period?
	X	13. Will there be a problem of housing within financial means?
X		14. Are suitable business sites available (list source).
		15. Number months estimated to complete RELOCATION? <span style="float: right; border: 1px solid black; padding: 2px;">12 MONTHS</span>

**REMARKS (Respond by Number)**

3. There are no business structures within the proposed acquisition.

6. Century 21 Northland Properties, Hwy 25-70, Weaverville  
*Homes and Land of Buncombe County*  
*Local newspaper and Real Estate Weekly*

8. As necessary in accordance with State law.

12. According to Buncombe County Housing Authority, housing will be available during relocation period.

14. There are no displaced businesses on this project.

MANAGER OF  
RIGHT OF WAY BRANCH

JUN 18 2002

N.C. DEPT. OF TRANSPORTATION  
*Ann Simpson*      6-18-02

<div style="display: flex; justify-content: space-between;"> <div style="text-align: center;">               Janice Rogers Right of Way Agent           </div> <div style="text-align: center;">             June 11, 2002 Date           </div> </div>		<div style="display: flex; justify-content: space-between;"> <div style="text-align: center;">               Approved by           </div> <div style="text-align: center;">             6-14-02 Date           </div> </div>
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# RELOCATION REPORT

JUN 18 2002

North Carolina Department of Transportation  
N.C. DEPT. OF TRANSPORTATION  
AREA RELOCATION OFFICE

E.I.S.     CORRIDOR     DESIGN

PROJECT:	8.2843601	COUNTY:	Buncombe	Alternate	3	of	3*	Alternate
I.D. NO.:	B-3310	F.A. PROJECT	BRZ-2173(1)	THERE ARE NO RELOCATEES ON ALTERNATE 2				
DESCRIPTION OF PROJECT:	Replacement of Bridge No. 145 on SR 2173 over Dillingham Creek							

ESTIMATED DISPLACED					INCOME LEVEL							
Type of Displacees	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP			
Residential	1	1	2	0	0	0	1	1	0			
Businesses	0	0	0	0	VALUE OF DWELLING		DSS DWELLING AVAILABLE					
Farms	0	0	0	0	Owners	Tenants	For Sale	For Rent				
Non-Profit	0	0	0	0	0-20M	0	\$ 0-150	0	0-20M	0	\$ 0-150	0
					20-40M	0	150-250	0	20-40M	2	150-250	1
					40-70M	1	250-400	1	40-70M	4	250-400	3
					70-100M	0	400-600	0	70-100M	2	400-600	0
					100 UP	0	600 UP	0	100 UP	2	600 UP	0
					<b>TOTAL</b>	<b>1</b>		<b>1</b>		<b>10</b>		<b>4</b>

**ANSWER ALL QUESTIONS**

Yes	No	Explain all "YES" answers.
	X	1. Will special relocation services be necessary?
	X	2. Will schools or churches be affected by displacement?
X		3. Will business services still be available after project?
	X	4. Will any business be displaced? If so, indicate size, type, estimated number of employees, minorities, etc.
	X	5. Will relocation cause a housing shortage?
		6. Source for available housing (list).
	X	7. Will additional housing programs be needed?
X		8. Should Last Resort Housing be considered?
	X	9. Are there large, disabled, elderly, etc. families?
	X	10. Will public housing be needed for project?
X		11. Is public housing available?
X		12. Is it felt there will be adequate DSS housing available during relocation period?
	X	13. Will there be a problem of housing within financial means?
X		14. Are suitable business sites available (list source).
		15. Number months estimated to complete RELOCATION? <b>12 MONTHS</b>

**REMARKS (Respond by Number)**

3. There are no business structures within the proposed acquisition.

6. Century 21 Northland Properties, Hwy 25-70, Weaverville  
*Homes and Land of Buncombe County*  
Local newspaper and *Real Estate Weekly*

8. As necessary in accordance with State law.

12. According to Buncombe County Housing Authority, housing will be available during relocation period.

14. There are no displaced businesses on this project.

Note: There appears to be underground tanks involved with this alternate. The one-story block structure is an old service station which has been partially converted to a tenent dwg.

*Janice Rogers*      June 11, 2002      *Ann Simpson*      6-18-02  
 Janice Rogers      Date      Approved by      Date  
 Right of Way Agent

**APPENDIX C**  
**Wetland Rating Sheet**



# WETLAND RATING WORKSHEET Fourth Version

Project Name B-3310 Nearest Road SR 2173  
 County Buncombe Wetland Area \_\_\_\_\_ acres Wetland Width 400 feet  
 Name of evaluator Jane Almon Date 5/23/02

<p><b>Wetland Location</b></p> <p><input type="checkbox"/> on pond or lake  <input checked="" type="checkbox"/> on perennial stream  <input type="checkbox"/> on intermittent stream  <input type="checkbox"/> within interstream divide  <input type="checkbox"/> other _____</p> <p>Soil series <u>Toxaway</u></p> <p><input type="checkbox"/> predominantly organic - humus, muck, or peat  <input checked="" type="checkbox"/> predominantly mineral - non-sandy  <input type="checkbox"/> predominantly sandy</p> <p><b>Hydraulic factors</b></p> <p><input type="checkbox"/> steep topography  <input type="checkbox"/> ditched or channelized  <input checked="" type="checkbox"/> total wetland width <math>\geq 100</math> feet</p>	<p><b>Adjacent land use</b>                  (within 1/2 mile upstream, upslope, or radius)</p> <p><input checked="" type="checkbox"/> forested/natural vegetation <u>60</u> %  <input checked="" type="checkbox"/> agriculture, urban/suburban <u>40</u> %  <input type="checkbox"/> impervious surface _____ %</p> <p><b>Dominant vegetation</b></p> <p>(1) <u>Carpinus caroliniana</u>                  (2) <u>Lindera benzoin</u>                  (3) <u>Alnus serrulata</u></p> <p><b>Flooding and wetness</b></p> <p><input checked="" type="checkbox"/> semipermanently to permanently flooded or inundated  <input type="checkbox"/> seasonally flooded or inundated  <input type="checkbox"/> intermittently flooded or temporary surface water  <input type="checkbox"/> no evidence of flooding or surface water</p>
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**Wetland type (select one)\***

- |   |   |
|---|---|
| <input type="checkbox"/> Bottomland hardwood forest | <input type="checkbox"/> Pine savanna                             |
| <input type="checkbox"/> Headwater forest           | <input type="checkbox"/> Freshwater marsh                         |
| <input type="checkbox"/> Swamp forest               | <input type="checkbox"/> Bog/fen                                  |
| <input type="checkbox"/> Wet flat                   | <input type="checkbox"/> Ephemeral wetland                        |
| <input type="checkbox"/> Pocosin                    | <input type="checkbox"/> Carolina Bay                             |
| <input type="checkbox"/> Bog forest                 | <input checked="" type="checkbox"/> Other <u>post-disturbance</u> |

\*the rating system cannot be applied to salt or brackish marshes or stream channels

		weight			
R	Water storage	<u>2</u>	x 4.00 =	<span style="border: 1px solid black; padding: 2px;">8</span>	Wetland Rating <span style="border: 1px solid black; padding: 10px; display: inline-block; width: 40px; height: 40px; text-align: center; vertical-align: middle;">52</span>
A	Bank/Shoreline stabilization	<u>4</u>	x 4.00 =	<span style="border: 1px solid black; padding: 2px;">16</span>	
T	Pollutant removal	<u>2</u>	* x 5.00 =	<span style="border: 1px solid black; padding: 2px;">10</span>	
I	Wildlife habitat	<u>4</u>	x 2.00 =	<span style="border: 1px solid black; padding: 2px;">8</span>	
N	Aquatic life value	<u>2</u>	x 4.00 =	<span style="border: 1px solid black; padding: 2px;">8</span>	
G	Recreation/Education	<u>2</u>	x 1.00 =	<span style="border: 1px solid black; padding: 2px;">2</span>	

\*Add 1 point if in sensitive watershed and >10% nonpoint disturbance within 1/2 mile upstream, upslope, or radius

