STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

July 20, 2012

U. S. Army Corps of Engineers
Regulatory Field Office
3331 Heritage Trade Drive, Suite 105
Wake Forest, NC 27587

ATTN: Mr. Eric Alsmeyer
NCDOT Coordinator

Dear Sir:

Subject: **Application for Section 404 Nationwide Permits 23, 33, and 13, Section 401 Water Quality Certification, and Tar-Pamlico Riparian Buffer Authorization** for the replacement of Bridge No. 83 over Tar River on SR 1138 (Culbreth Road) in Granville County, Federal Aid Project No. BRSTP-1138(10), Division 5, T.I.P No. B-3841.

Debit $240.00 from WBS No. 33289.1.1

The North Carolina Department of Transportation (NCDOT) proposes to replace bridge No. 83 over Tar River on SR 1138 (Culbreth Road) in Granville County. Impacts will consist of 127 linear feet of permanent stream impacts due to the placement of riprap bank stabilization along the Tar River and 0.06 acres of temporary stream impacts due to the placement of a temporary causeway into the Tar River. An offsite detour will be used during construction.

Please see the enclosed copies of the Pre-Construction Notification (PCN), U.S. Fish and Wildlife Service (USFWS) Biological Opinion (BO) regarding the dwarf wedgemussel (*Alasmidonta heteredon*), issued April 19, 2012, U.S. Army Corps of Engineers (USACE) Preliminary Jurisdictional Determination application, stormwater management plan, permit drawings, buffer impact drawings, and roadway design plans for the subject project. The Categorical Exclusion (CE) for this project was completed in August 2011. Additional copies are available upon request.

The let date for the project is May 21, 2013 with a review date of April 2, 2013. However, the let date may advance as additional funds become available.

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

TELEPHONE: 919-707-6000

FAX: 919-212-5785

WEBSITE: WWW.NCDOT.ORG

LOCATION:
Century Center Building B
1020 Birch Ridge Drive
Raleigh, NC 27610

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

Thank you for your assistance with this project. If you have any questions or need additional information, please contact Greg Price at gwprice@ncdot.gov or (919) 707-6148.

Sincerely,

E. L. Lusk

fcv Gregory J. Thorpe, Ph.D., Manager
Project Development and Environmental Analysis Unit

cc: NCDOT Permit Application Standard Distribution List

Office Use Only:
Corps action ID no. _____
DWQ project no. _____
Form Version 1.3 Dec 10 2008

Pre-Construction Notification (PCN) Form

A. Applicant Information

1. Processing

1a. Type(s) of approval sought from the Corps:	☒ Section 404 Permit	☐ Section 10 Permit
1b. Specify Nationwide Permit (NWP) number: 23, 33, 13 or General Permit (GP) number:		
1c. Has the NWP or GP number been verified by the Corps?	☐ Yes	☒ No

1d. Type(s) of approval sought from the DWQ (check all that apply):

☒ 401 Water Quality Certification – Regular ☐ Non-404 Jurisdictional General Permit

☐ 401 Water Quality Certification – Express ☒ Riparian Buffer Authorization

1e. Is this notification solely for the record because written approval is not required?	For the record only for DWQ 401 Certification: ☐ Yes ☒ No	For the record only for Corps Permit: ☐ Yes ☒ No
1f. Is payment into a mitigation bank or in-lieu fee program proposed for mitigation of impacts? If so, attach the acceptance letter from mitigation bank or in-lieu fee program.	☐ Yes	☒ No
1g. Is the project located in any of NC's twenty coastal counties. If yes, answer 1h below.	☐ Yes	☒ No
1h. Is the project located within a NC DCM Area of Environmental Concern (AEC)?	☐ Yes	☒ No

2. Project Information

2a. Name of project:	Replacement of Bridge 83 over the Tar River on SR 1138 (Culbreth Road)
2b. County:	Granville
2c. Nearest municipality / town:	Berea
2d. Subdivision name:	*not applicable*
2e. NCDOT only, T.I.P. or state project no:	B-3841

3. Owner Information

3a. Name(s) on Recorded Deed:	North Carolina Department of Transportation
3b. Deed Book and Page No.	*not applicable*
3c. Responsible Party (for LLC if applicable):	*not applicable*
3d. Street address:	1598 Mail Service Center
3e. City, state, zip:	Raleigh, NC 27699-1598
3f. Telephone no.:	(919) 707-6148
3g. Fax no.:	(919) 212-5785
3h. Email address:	gwprice@ncdot.gov

4. Applicant Information (if different from owner)	
4a. Applicant is:	☐ Agent ☐ Other, specify:
4b. Name:	*not applicable*
4c. Business name (if applicable):	
4d. Street address:	
4e. City, state, zip:	
4f. Telephone no.:	
4g. Fax no.:	
4h. Email address:	
5. Agent/Consultant Information (if applicable)	
5a. Name:	*not applicable*
5b. Business name (if applicable):	
5c. Street address:	
5d. City, state, zip:	
5e. Telephone no.:	
5f. Fax no.:	
5g. Email address:	

B. Project Information and Prior Project History		
1. Property Identification		
1a. Property identification no. (tax PIN or parcel ID):	*not applicable*	
1b. Site coordinates (in decimal degrees):	Latitude: 36.295214 (DD.DDDDDD)	Longitude: - 78.730894 (-DD.DDDDDD)
1c. Property size:	1.8 acres	
2. Surface Waters		
2a. Name of nearest body of water (stream, river, etc.) to proposed project:	Tar River	
2b. Water Quality Classification of nearest receiving water:	WS-IV; NSW	
2c. River basin:	Tar-Pamlico	
3. Project Description		
3a. Describe the existing conditions on the site and the general land use in the vicinity of the project at the time of this application: Land use in the project vicinity is primarily agriculture, interspersed with residential development and forestland.		
3b. List the total estimated acreage of all existing wetlands on the property: 0		
3c. List the total estimated linear feet of all existing streams (intermittent and perennial) on the property: 100		
3d. Explain the purpose of the proposed project: To replace a structurally deficient and functionally obsolete bridge.		
3e. Describe the overall project in detail, including the type of equipment to be used: The project involves replacing a 8-span 140-foot bridge with a 3-span 169-foot bridge on the existing bridge location with an offsite detour. The new bridge will be of sufficient width to provide for two 12-foot lanes with 3.4-foot offsets on each side. Standard road building equipment, such as trucks, dozers, and cranes will be used.		
4. Jurisdictional Determinations		
4a. Have jurisdictional wetland or stream determinations by the Corps or State been requested or obtained for this property / project (including all prior phases) in the past? Comments: perennial stream (Tar River) only	☐ Yes	☒ No ☐ Unknown
4b. If the Corps made the jurisdictional determination, what type of determination was made?	☐ Preliminary ☐ Final	
4c. If yes, who delineated the jurisdictional areas? Name (if known	Agency/Consultant Company: Other:	
4d. If yes, list the dates of the Corps jurisdictional determinations or State determinations and attach documentation.		
5. Project History		
5a. Have permits or certifications been requested or obtained for this project (including all prior phases) in the past?	☐ Yes	☒ No ☐ Unknown
5b. If yes, explain in detail according to "help file" instructions.		
6. Future Project Plans		
6a. Is this a phased project?	☐ Yes	☒ No
6b. If yes, explain.		

C. Proposed Impacts Inventory

1. Impacts Summary

1a. Which sections were completed below for your project (check all that apply):

☐ Wetlands ☒ Streams - tributaries ☒ Buffers

☐ Open Waters ☐ Pond Construction

2. Wetland Impacts

If there are wetland impacts proposed on the site, then complete this question for each wetland area impacted.

2a. Wetland impact number – Permanent (P) or Temporary (T)	2b. Type of impact	2c. Type of wetland (if known)	2d. Forested	2e. Type of jurisdiction (Corps - 404, 10 DWQ – non-404, other)	2f. Area of impact (acres)
☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
				2g. **Total wetland impacts**	

2h. Comments:

3. Stream Impacts

If there are perennial or intermittent stream impacts (including temporary impacts) proposed on the site, then complete this question for all stream sites impacted.

3a. Stream impact number - Permanent (P) or Temporary (T)	3b. Type of impact	3c. Stream name	3d. Perennial (PER) or intermittent (INT)?	3e. Type of jurisdiction (Corps - 404, 10 DWQ – non-404, other)	3f. Average stream width (feet)	3g. Impact length (linear feet)
Site 1 ☒ P ☐ T	Bank Stabilization	Tar River	☒ PER ☐ INT	☒ Corps ☐ DWQ	60	127
Site 1 ☐ P ☒ T	Temporary Causeway	Tar River	☒ PER ☐ INT	☒ Corps ☐ DWQ	60	70 (0.06 ac)
☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
☐ P ☐			☐ PER ☐ INT	☐ Corps ☐ DWQ		
				3h. **Total stream and tributary impacts**		127 Perm 0.06 ac Temp

3i. Comments: The 70 linear feet of impact from temporary causeway is within the same stream reach for bank stabilization. The temporary causeway will be built in stages.

4. Open Water Impacts

If there are proposed impacts to lakes, ponds, estuaries, tributaries, sounds, the Atlantic Ocean, or any other open water of the U.S. then individually list all open water impacts below.

4a. Open water impact number – Permanent (P) or Temporary (T)	4b. Name of waterbody (if applicable)	4c. Type of impact	4d. Waterbody type	4e. Area of impact (acres)
O1 ☐ P ☐ T				
O2 ☐ P ☐ T				
O3 ☐ P ☐ T				
O4 ☐ P ☐ T				
			4f. Total open water impacts	

4g. Comments:

5. Pond or Lake Construction

If pond or lake construction proposed, then complete the chart below.

5a. Pond ID number	5b. Proposed use or purpose of pond	5c. Wetland Impacts (acres)			5d. Stream Impacts (feet)			5e. Upland (acres)
		Flooded	Filled	Excavated	Flooded	Filled	Excavated	Flooded
P1								
P2								
	5f. Total							

5g. Comments:

5h. Is a dam high hazard permit required?	☐ Yes ☐ No If yes, permit ID no:
5i. Expected pond surface area (acres):	
5j. Size of pond watershed (acres):	
5k. Method of construction:	

6. Buffer Impacts (for DWQ)

If project will impact a protected riparian buffer, then complete the chart below. If yes, then individually list all buffer impacts below. If any impacts require mitigation, then you **MUST** fill out Section D of this form.

6a. Project is in which protected basin?	☐ Neuse ☐ Catawba	☒ Tar-Pamlico ☐ Randleman	☐ Other: Jordan

6b. Buffer impact number – Permanent (P) or Temporary (T)	6c. Reason for impact	6d. Stream name	6e. Buffer mitigation required?	6f. Zone 1 impact (square feet)	6g. Zone 2 impact (square feet)
B1 ☒ P ☐ T	Bridge	Tar River	☐ Yes ☒ No	5969	1754
B1 ☒ P ☐ T	Road crossing	Tar River	☐ Yes ☒ No		1475
☐ P ☐ T			☐ Yes ☐ No		
			6h. **Total buffer impacts**	5969	3229

6i. Comments: All buffer impacts are allowable.

D. Impact Justification and Mitigation

1. Avoidance and Minimization

1a. Specifically describe measures taken to avoid or minimize the proposed impacts in designing project.

The proposed bridge is 29 feet longer than the existing bridge; the number of bents within the creek will be reduced from three to zero; the proposed bridge will be at approximately the same grade and alignment as the existing structure; 2:1 or steeper fill slopes are used through the buffer zones to reduce impacts; existing concrete abutments will be removed and replaced with rip rap on the banks to prevent the erosion that currently exists; and ditch flow from the NW and SW quadrants that is currently concentrated flow through the buffers on the upstream side will be piped to the more stable ditches on the downstream side providing improvement in velocities and infiltration over the current gullies.

Per the USFWS Biological Opinion for the dwarf wedgemussel, dated April 19, 2012, the following conservation measures will also be employed: 1) In areas identified as Environmentally Sensitive Areas, the contractor may perform clearing operations, but not grubbing operations until immediately prior to beginning grading operations. 2) Once grading operations begin in identified Environmentally Sensitive Areas, work shall progress in a continuous manner until complete. 3) In areas identified as Environmentally Sensitive Areas, erosion control devices shall be installed immediately following the clearing operation. 4) In areas identified as Environmentally Sensitive Areas, seeding and mulching shall be performed on the areas disturbed by construction immediately following final grade establishment. 5) In areas identified as Environmentally Sensitive Areas, seeding and mulching shall be done in stages on cut and fill slopes that are greater than 20 feet in height measured along the slope, or greater than two acres in area, whichever is less. 6) No new bents will be constructed in the river. New bents will be constructed at or beyond the top of bank resulting in a complete span of the river channel. 7) Deck drains will not discharge directly into the stream. 8) Removal of the existing bents will take place when water flow level is at a minimum point allowable within the project schedule and will be done in such a manner to minimize disturbance to the river bed. 9) Standard silt fence and small sections of special sediment control fence will be installed along the top of the river bank and along the toe of the slope parallel to the river. The special control fence sections will be installed as drainage breaks in the silt fence and at low elevation points. Once the disturbed areas that drain to the silt fence and special sediment control fence have been stabilized, the silt fence and special sediment control fence and all accumulated sediment adjacent to the fence will be removed to natural ground and stabilized with a native grass mix. 10) All sedimentation and erosion control measures, throughout the project limits, will be maintained regularly to ensure proper function of the measures. 11) NCDOT will ensure that Roadside Environmental Unit staff maintains a level of oversight to ensure that all appropriate erosion control measures are fully implemented to avoid/minimize sedimentation of the stream. 12) A temporary access road for conveying construction equipment in the floodplain/buffer will be stabilized with rock underlain with filter fabric. Temporary Class II rip rap and filter fabric causeway work pads with fingers to individual bents will be utilized for removal of existing in-stream structures. The total length of causeway across the river at any one time will be less than or equal to the total length of the longest causeway in order to maintain hydraulic opening and minimize unnecessary constriction of the river channel. 13) Rip rap bank stabilization will be installed in conjunction with the temporary causeway, portions of which will remain to provide permanent bank stability. 14) The existing concrete waste in the river will be removed in conjunction with bent foundations. 15) Embankment construction and grading shall be managed in such a matter to prevent surface runoff/drainage from discharging untreated into the riparian buffer. Instead all interim surfaces will be graded to drain to temporary erosion control devices. Temporary berms, ditches, etc. will be incorporated, as necessary, to treat temporary runoff before discharging into the riparian buffer (As specified in NCDOT BMP Manual). 16) If possible, a gap will be left between proposed bank stabilization rip rap and proposed abutment rip rap to ease terrestrial wildlife passage under the bridge. 17) A preconstruction mussel survey will be conducted prior to the start of construction, with a pre-approved contingency plan in the event that DWM are found during this survey. 18) An off-site detour will be utilized for this project.

1b. Specifically describe measures taken to avoid or minimize the proposed impacts through construction techniques.

NCDOT will use Best Management Practices for Bridge Demolition and Removal as well as Best Management Practices for the Protection of Surface Waters. Design Standards in Sensitive Watersheds will also be used.

2. Compensatory Mitigation for Impacts to Waters of the U.S. or Waters of the State

2a. Does the project require Compensatory Mitigation for impacts to Waters of the U.S. or Waters of the State?	☐ Yes ☒ No If no, explain: Impacts are only bank stabilization (<150 feet) and temporary impacts that do not require compensatory mitigation.
2b. If yes, mitigation is required by (check all that apply):	☐ DWQ ☐ Corps

2c. If yes, which mitigation option will be used for this project?	☐ Mitigation bank ☐ Payment to in-lieu fee program ☐ Permittee Responsible Mitigation

3. Complete if Using a Mitigation Bank		
3a. Name of Mitigation Bank: not applicable		
3b. Credits Purchased (attach receipt and letter)	Type	Quantity
3c. Comments:		

4. Complete if Making a Payment to In-lieu Fee Program	
4a. Approval letter from in-lieu fee program is attached.	☐ Yes
4b. Stream mitigation requested:	linear feet
4c. If using stream mitigation, stream temperature:	☐ warm ☐ cool ☐ cold
4d. Buffer mitigation requested (DWQ only):	square feet
4e. Riparian wetland mitigation requested:	acres
4f. Non-riparian wetland mitigation requested:	acres
4g. Coastal (tidal) wetland mitigation requested:	acres
4h. Comments:	

5. Complete if Using a Permittee Responsible Mitigation Plan
5a. If using a permittee responsible mitigation plan, provide a description of the proposed mitigation plan.

6. Buffer Mitigation (State Regulated Riparian Buffer Rules) – required by DWQ	
6a. Will the project result in an impact within a protected riparian buffer that requires buffer mitigation?	☐ Yes ☒ No

6b. If yes, then identify the square feet of impact to each zone of the riparian buffer that requires mitigation. Calculate the amount of mitigation required.

Zone	6c. Reason for impact	6d. Total impact (square feet)	Multiplier	6e. Required mitigation (square feet)
Zone 1			3 (2 for Catawba)	
Zone 2			1.5	
	6f. **Total buffer mitigation required:**			

6g. If buffer mitigation is required, discuss what type of mitigation is proposed (e.g., payment to private mitigation bank, permittee responsible riparian buffer restoration, payment into an approved in-lieu fee fund).
6h. Comments:

E. Stormwater Management and Diffuse Flow Plan (required by DWQ)	
1. Diffuse Flow Plan	
1a. Does the project include or is it adjacent to protected riparian buffers identified within one of the NC Riparian Buffer Protection Rules?	☒ Yes ☐ No
1b. If yes, then is a diffuse flow plan included? If not, explain why. Comments:	☒ Yes ☐ No
2. Stormwater Management Plan	
2a. What is the overall percent imperviousness of this project?	N/A
2b. Does this project require a Stormwater Management Plan?	☒ Yes ☐ No
2c. If this project DOES NOT require a Stormwater Management Plan, explain why:	
2d. If this project DOES require a Stormwater Management Plan, then provide a brief, narrative description of the plan: See attached permit drawings.	
2e. Who will be responsible for the review of the Stormwater Management Plan?	☐ Certified Local Government ☐ DWQ Stormwater Program ☒ DWQ 401 Unit
3. Certified Local Government Stormwater Review	
3a. In which local government's jurisdiction is this project?	not applicable
3b. Which of the following locally-implemented stormwater management programs apply (check all that apply):	☐ Phase II ☐ NSW ☐ USMP ☐ Water Supply Watershed ☐ Other:
3c. Has the approved Stormwater Management Plan with proof of approval been attached?	☐ Yes ☐ No
4. DWQ Stormwater Program Review	
4a. Which of the following state-implemented stormwater management programs apply (check all that apply):	☐ Coastal counties ☐ HQW ☐ ORW ☐ Session Law 2006-246 ☐ Other:
4b. Has the approved Stormwater Management Plan with proof of approval been attached?	☐ Yes ☒ No
5. DWQ 401 Unit Stormwater Review	
5a. Does the Stormwater Management Plan meet the appropriate requirements?	☐ Yes ☐ No N/A
5b. Have all of the 401 Unit submittal requirements been met?	☐ Yes ☐ No N/A

F. Supplementary Information		
1. Environmental Documentation (DWQ Requirement)		
1a. Does the project involve an expenditure of public (federal/state/local) funds or the use of public (federal/state) land?	☒ Yes	☐ No
1b. If you answered "yes" to the above, does the project require preparation of an environmental document pursuant to the requirements of the National or State (North Carolina) Environmental Policy Act (NEPA/SEPA)?	☒ Yes	☐ No
1c. If you answered "yes" to the above, has the document review been finalized by the State Clearing House? (If so, attach a copy of the NEPA or SEPA final approval letter.) Comments:	☒ Yes	☐ No
2. Violations (DWQ Requirement)		
2a. Is the site in violation of DWQ Wetland Rules (15A NCAC 2H .0500), Isolated Wetland Rules (15A NCAC 2H .1300), DWQ Surface Water or Wetland Standards, or Riparian Buffer Rules (15A NCAC 2B .0200)?	☐ Yes	☒ No
2b. Is this an after-the-fact permit application?	☐ Yes	☒ No
2c. If you answered "yes" to one or both of the above questions, provide an explanation of the violation(s):		
3. Cumulative Impacts (DWQ Requirement)		
3a. Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality?	☐ Yes ☒ No	
3b. If you answered "yes" to the above, submit a qualitative or quantitative cumulative impact analysis in accordance with the most recent DWQ policy. If you answered "no," provide a short narrative description. Due to the minimal transportation impact resulting from this bridge replacement, this project will neither influence nearby land uses nor stimulate growth. Therefore, a detailed indirect or cumulative effects study will not be necessary.		
4. Sewage Disposal (DWQ Requirement)		
4a. 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. not applicable		

5. Endangered Species and Designated Critical Habitat (Corps Requirement)		
5a. Will this project occur in or near an area with federally protected species or habitat?	☒ Yes	☐ No
5b. Have you checked with the USFWS concerning Endangered Species Act impacts?	☒ Yes	☒ No
5c. If yes, indicate the USFWS Field Office you have contacted.	☒ Raleigh ☐ Asheville	
5d. What data sources did you use to determine whether your site would impact Endangered Species or Designated Critical Habitat? N.C. Natural Heritage Heritage Program database; USFWS-Raleigh Field Office website; biological surveys for protected species listed for Granville County, which include smooth coneflower, harperella, and dwarf wedgemussel. Harperella and smooth coneflower were last surveyed on September 12 and 15, 2011, respectively, and have a Biological Conclusion of "No Effect". Dwarf wedgemussel was last surveyed on September 12, 2011 and has a Biological Conclusion of "May Affect, Likely to Adversely Affect". A Biological Assessment was completed for the dwarf wedgemussel in February 2012. A Biological Opinion was issued by the USFWS in April 2012 which is enclosed with this permit application package.		
6. Essential Fish Habitat (Corps Requirement)		
6a. Will this project occur in or near an area designated as essential fish habitat?	☐ Yes	☒ No
6b. What data sources did you use to determine whether your site would impact Essential Fish Habitat? NMFS County Index		
7. Historic or Prehistoric Cultural Resources (Corps Requirement)		
7a. Will this project occur in or near an area that the state, federal or tribal governments have designated as having historic or cultural preservation status (e.g., National Historic Trust designation or properties significant in North Carolina history and archaeology)?	☐ Yes	☒ No
7b. What data sources did you use to determine whether your site would impact historic or archeological resources? NEPA Documentation		
8. Flood Zone Designation (Corps Requirement)		
8a. Will this project occur in a FEMA-designated 100-year floodplain?	☐ Yes	☒ No
8b. If yes, explain how project meets FEMA requirements: NCDOT Hydraulics Unit coordination with FEMA		
8c. What source(s) did you use to make the floodplain determination? FEMA Maps		

Dr. Gregory J. Thorpe, Ph D Applicant/Agent's Printed Name	E. P. Lusk for Applicant/Agent's Signature (Agent's signature is valid only if an authorization letter from the applicant is provided.)	July 20, 2012 Date

United States Department of the Interior

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

April 19, 2012

John F. Sullivan III, PE
Federal Highway Administration
310 New Bern Avenue, Suite 410
Raleigh, North Carolina 27601

Dear Mr. Sullivan:

This document transmits the U.S. Fish and Wildlife Service's (Service) Biological Opinion based on our review of the proposed replacement of Bridge No. 83 over Tar River on SR 1138, located in Granville County, North Carolina (TIP No. B-3841), and its effects on the federally endangered dwarf wedgemussel (*Alasmidonta heterodon*, DWM) in accordance with Section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543). Your April 10, 2012 request for formal consultation was received on April 11, 2012. If you have any questions concerning this biological opinion, please contact Mr. Gary Jordan at (919) 856-4520 (Ext. 32).

Sincerely,

Pete Benjamin
Field Supervisor

cc: Greg Thorpe, NCDOT, Raleigh, NC

electronic copy: Ken Graham, USFWS, Atlanta, GA
Brett Hillman, USFWS, Concord, NH
Eric Alsmeyer, USACE, Raleigh, NC
Jared Gray, NCDOT, Raleigh, NC
Greg Price, NCDOT, Raleigh, NC
Logan Williams, NCDOT, Raleigh, NC
Chris Murray, NCDOT, Durham, NC
Chris Militscher, USEPA, Atlanta, GA
Travis Wilson, NCWRC, Creedmoor, NC
Rob Ridings, NCDWQ, Raleigh, NC

This Biological Opinion (BO) is based on information provided in the submitted Biological Assessment (BA) prepared by the North Carolina Department of Transportation (NCDOT), telephone conversations, emails, field investigations and other sources of information. A complete administrative record of this consultation is on file at this office.

CONSULTATION HISTORY

November 13, 2002 – Service staff attends an on-site field meeting with NCDOT staff to discuss the potential effects to the DWM.

June 6, 2007 – Service staff attends an on-site field meeting with NCDOT staff to discuss the potential effects to the DWM.

June/July 2007 – Service staff and NCDOT staff have several discussions and email exchanges regarding the need for formal Section 7 consultation.

August 5, 2010 – Service staff assist NCDOT staff in conducting mussel survey.

September 12, 2011 – Service staff attends an on-site field meeting with NCDOT staff to discuss potential conservation measures to minimize effects to the DWM.

January 24, 2012 – The Service provides comments on a draft BA from NCDOT.

April 11, 2012 – The Service receives a letter from the Federal Highway Administration (FHWA), dated April 10, 2012, with the attached final BA, requesting formal Section 7 consultation on the proposed replacement of Bridge No. 83 over the Tar River.

BIOLOGICAL OPINION

I. DESCRIPTION OF THE PROPOSED ACTION

The B-3841 project is located at the SR 1138 (Culbreth Road) crossing of the Tar River in Granville County, North Carolina, approximately seven miles west of Oxford. The existing eight-span, 140 feet long and 21.9 feet wide bridge will be replaced with a three-span, approximately 169 feet long (1@32', 1@100', 1@37') and 30.8 feet wide bridge. The new bridge will be placed in the same horizontal alignment, but the roadway grade will be raised approximately four feet. The new bridge will completely span the channel of the Tar River. A small amount of existing approach fill will be removed from the floodplain. Reconstruction of the approach road will extend approximately 370 feet south of the new bridge and 160 feet north of the new bridge. Traffic will be detoured onto other roads during construction.

After removing the existing bridge superstructure, the removal of bents in the stream channel will require the construction of two temporary rock causeways in the stream channel. Installation of the Stage 2 causeway will not begin until removal of the Stage 1 causeway has begun. The Stage 2 causeway, the longer of the two, is expected to exceed slightly more than

50% of the channel width. The temporary causeways will consist of rip rap underlain with filter fabric. The temporary causeways will allow access of heavy equipment to remove the existing concrete footings of bents in the channel, to remove existing concrete slope protection. to excavate the banks, and to construct the new bridge. The Stage 1 causeway is expected to be in place less than one month, and the Stage 2 causeway is expected to be in place up to four months. Upon removal of each causeway, a portion of the rip rap will be allowed to remain as bank stabilization.

Action Area

The action area is defined as the SR 1138 project right-of-way (ROW) of B-3841, beginning 370 feet south of the bridge and extending 160 feet north of the bridge, plus the Tar River for a distance of 1,312 feet (400 meters) downstream and 328 feet (100 meters) upstream of the bridge. The action area consists mainly of a maintained/disturbed roadside vegetative community, the SR 1138 pavement and bridge structure, and the Tar River channel. The action area occurs in Tar River Sub-basin 03-03-01, as assigned by the North Carolina Department of Environment and Natural Resources, Division of Water Quality Section. At the project site, the Tar River is approximately 70 feet wide. Riparian hardwood forest borders along each bank within the action area.

Conservation Measures

Conservation measures represent actions, pledged in the project description, that the action agency will implement to minimize the effects of the proposed action and further the recovery of the species under review. Such measures should be closely related to the action and should be achievable within the authority of the action agency. Since conservation measures are part of the proposed action, their implementation is required under the terms of the consultation. The FHWA and NCDOT have proposed the following conservation measures.

- In areas identified as Environmentally Sensitive Areas, the contractor may perform clearing operations, but not grubbing operations until immediately prior to beginning grading operations.
- Once grading operations begin in identified Environmentally Sensitive Areas, work shall progress in a continuous manner until complete.
- In areas identified as Environmentally Sensitive Areas, erosion control devices shall be installed immediately following the clearing operation.
- In areas identified as Environmentally Sensitive Areas, seeding and mulching shall be performed on the areas disturbed by construction immediately following final grade establishment.
- In areas identified as Environmentally Sensitive Areas, seeding and mulching shall be done in stages on cut and fill slopes that are greater than 20 feet in height measured along the slope, or greater than two acres in area, whichever is less.
- No new bents will be constructed in the river. New bents will be constructed at or beyond the top of bank resulting in a complete span of the river channel.
- Deck drains will not discharge directly into the stream.

- Removal of the existing bents will take place when water flow level is at a minimum point allowable within the project schedule and will be done in such a manner to minimize disturbance to the river bed.
- Standard silt fence and small sections of special sediment control fence will be installed along the top of the river bank and along the toe of slope parallel to the river. The special sediment control fence sections will be installed as drainage breaks in the silt fence and at low elevation points. Once the disturbed areas that drain to the silt fence and special sediment control fence have been stabilized, the silt fence and special sediment control fence and all accumulated sediment adjacent to the fence will be removed to natural ground and stabilized with a native grass mix.
- All sedimentation and erosion control measures, throughout the project limits, will be maintained regularly to ensure proper function of the measures.
- NCDOT will ensure that Roadside Environmental Unit staff maintains a level of oversight to ensure that all appropriate erosion control measures are fully implemented to avoid/minimize sedimentation of the stream.
- Temporary access road for conveying construction equipment in the floodplain/buffer will be stabilized with rock underlain with filter fabric. Temporary Class II rip rap and filter fabric causeway work pads with fingers to individual bents will be utilized for removal of existing in-stream structures. The total length of causeway across the river at any one time will be less than or equal to the total length of the longest causeway in order to maintain hydraulic opening and minimize unnecessary constriction of the river channel.
- Rip rap bank stabilization will be installed in conjunction with the temporary causeway, portions of which will remain to provide permanent bank stability.
- The existing concrete waste in the river will be removed in conjunction with bent foundations.
- Embankment construction and grading shall be managed in such a manner to prevent surface runoff/drainage from discharging untreated into the riparian buffer. Instead all interim surfaces will be graded to drain to temporary erosion control devices. Temporary berms, ditches, etc. will be incorporated, as necessary, to treat temporary runoff before discharging into the riparian buffer (As specified in NCDOT BMP Manual).
- If possible, a gap will be left between proposed bank stabilization rip rap and proposed abutment rip rap to ease terrestrial wildlife passage under the bridge.
- A preconstruction mussel survey will be conducted prior to the start of construction, with a pre-approved contingency plan in the event that DWM are found during this survey.
- An off-site detour will be utilized for this project.

II. STATUS OF THE SPECIES

The DWM was federally listed as endangered on March 14, 1990. The DWM is found solely in Atlantic Coast drainage streams and rivers of various sizes and moderate current. It ranges from New Hampshire to North Carolina, in small creeks to deep rivers in stable habitat with substrates ranging from mixed sand, pebble and gravel, to clay and silty sand. In the southern portion of its range, it is often found buried under logs or root mats in shallow water (USFWS 1993); whereas in the northern portion of its range, it may be found in firm substrates of mixed sand, gravel or

cobble, or embedded in clay banks in water depths of a few inches to greater than 20 feet (Fichtel and Smith 1995; Gabriel 1995; Gabriel 1996; Nedeau and Werle 2003; Nedeau 2004a, 2004b, 2006a).

The DWM's reproductive cycle is typical of other freshwater mussels, requiring a host fish on which its larvae (glochidia) parasitize and metamorphose into juvenile mussels. The DWM is not a long-lived species as compared to other freshwater mussels; life expectancy is estimated at 10 to 12 years (Michaelson and Neves 1995).

Human activity has significantly degraded DWM habitat causing a general decline in populations and a reduction in distribution of the species. Primary factors responsible for the decline of the DWM include: 1) impoundment of river systems, 2) pollution, 3) alteration of riverbanks, and 4) siltation (USFWS 1993).

Damming and channelization of rivers throughout the DWM's range have resulted in the elimination or alteration of much of its formerly occupied habitat (Watters 2001). Domestic and industrial pollution was the primary cause for mussel extirpation at many historic sites. Mussels are known to be sensitive to a wide variety of heavy metals and pesticides, and to excessive nutrients and chlorine (Havlik and Marking 1987). Mussel die-offs have been attributed to chemical spills, agricultural waste run-off and low dissolved oxygen levels.

Because freshwater mussels are relatively sedentary and cannot move quickly or for long distances, they cannot easily escape when silt is deposited over their habitat. Siltation has been documented to be extremely detrimental to mussel populations by degrading substrate and water quality, increasing exposure to other pollutants and by direct smothering of mussels (Ellis 1936, Markings and Bills 1979). In Massachusetts, a bridge construction project decimated a population of DWM by accelerated sedimentation and erosion (Smith 1981).

Most DWM populations are small and geographically isolated from each. This isolation restricts exchange of genetic material among populations and reduces genetic variability within populations (USFWS 1993).

At one time, DWM was recorded from 70 localities in 15 major drainages ranging from North Carolina to New Brunswick, Canada. Since the 1993 Recovery Plan, a number of new locations have been discovered and a number of known locations are possibly no longer extant. Based on preliminary information, the dwarf wedgemussel is currently found in 15 major drainages (Table 1), comprising approximately 70 "sites" (one site may have multiple occurrences). At least 45 of these sites are based on less than five individuals or solely on spent shells (USFWS 2007).

Table 1. Dwarf wedgemussel major drainages.

State	Major Drainage	County
NH	Upper Connecticut River	Coos, Grafton, Sullivan, Cheshire
VT	Upper Connecticut River	Essex, Orange, Windsor, Windham
MA	Middle Connecticut River	Hampshire, Hampden

CT	Lower Connecticut River	Hartford
NY	Middle Delaware	Orange, Sullivan, Delaware
NJ	Middle Delaware	Warren, Sussex
PA	Upper Delaware River	Wayne
MD	Choptank River	Queen Anne's, Caroline
MD	Lower Potomac River	St. Mary's, Charles
MD	Upper Chesapeake Bay	Queen Anne's
VA	Middle Potomac River	Stafford
VA	York River	Louisa, Spotsylvania
VA	Chowan River	Sussex, Nottoway, Lunenburg
NC	Upper Tar River	Granville, Vance, Franklin, Nash
NC	Fishing Creek	Warren, Franklin, Halifax
NC	Contentnea	Wilson, Nash
NC	Upper Neuse	Johnson, Wake, Orange

* The 15 major drainages identified in Table 1 do not necessarily correspond to the original drainages identified in the 1993 Recovery Plan although there is considerable overlap.

The main stem of the Connecticut River in New Hampshire and Vermont is considered to have the largest remaining DWM population, consisting of three distinct stretches of sporadically occupied habitat segmented by hydroelectric dams. It is estimated that there are hundreds of thousands of DWM scattered within an approximate 75-mile stretch of the Connecticut River. The Ashuelot River in New Hampshire, the Farmington River in Connecticut, and the Neversink River in New York harbor large populations, but these number in the thousands only. The remaining populations from New Jersey south to North Carolina are estimated at a few individuals to a few hundred individuals (USFWS 2007).

In summary, it appears that the populations in North Carolina, Virginia, and Maryland are declining as evidenced by low densities, lack of reproduction, or inability to relocate any DWM in follow-up surveys. Populations in New Hampshire, Massachusetts, and Connecticut appear to be stable, while the status of populations in the Delaware River watershed affected by the recent floods of 2005 is uncertain at this time (USFWS 2007).

III. ENVIRONMENTAL BASELINE

Under section 7(a)(2) of the Act, when considering the "effects of the action" on federally listed species, the Service is required to take into consideration the environmental baseline. The environmental baseline includes past and ongoing natural factors and the past and present impacts of all federal, state, or private actions and other activities in the action area (50 CFR 402.02), including federal actions in the area that have already undergone section 7 consultation, and the impacts of state or private actions which are contemporaneous with the consultation in process.

Status of the Species Within the Action Area

The action area occurs within the Upper Tar River Basin. Records maintained by the North Carolina Natural Heritage Program (NCNHP) show DWM to have been present in the Tar River main stem between SR 1150 (Gooches Mill Road) and US 158. Additionally, the following tributaries have been known to support DWM in the recent past: Cub Creek, Shelton Creek, Fox Creek and North Fork Tar River. All of the element occurrences in the Upper Tar River Basin are designated as NHP Element Occurrence No. 89, representing them as a single population of DWM.

Observations (G. Jordan, Service biologist, personal observations) of the Upper Tar River Basin suggest that the DWM in the Upper Tar River Basin are genetically isolated and may not be represented as a single population. Shelton Creek and Fox Creek are a contiguous unit, separated from the Tar River main stem by Gooches Mill Dam. The dam is located approximately 200 meters downstream of the mouth of Shelton Creek and impounds the Tar River and Shelton Creek approximately 100 meters upstream of the SR 1150 bridge crossing. The habitat at their junction is not suitable for DWM or their host species and likely represents a complete barrier to movement between the two areas. Cub Creek is isolated by another mill dam at its mouth. This mill dam is partially breached and the impoundment behind it represents less of an obstacle; however the habitat at the mouth of Cub Creek is poor to marginal for DWM and its host species and may represent a genetic barrier (J. Mays, NCDOT biologist, personal communication). North Fork Tar River flows into the Tar River below Gooches Mill Dam, and the habitat at its mouth is heavily degraded by agricultural influences, primarily heavy erosion caused by unfenced cattle. North Fork Tar River could provide connectivity to the Tar River main stem, but not to the population upstream of the mill dam.

Recent efforts to locate DWM individuals in the Tar River have been unsuccessful. These efforts were sufficient enough to make the assertion that the population of DWM in the Tar River is not abundant. The apparent isolation of the DWM in the Tar River from the DWM in any of the populated tributaries increases the chances of extirpation from a series of single events and prevents the recolonization of areas affected by natural or anthropogenic disturbances.

Survey records maintained by the North Carolina Wildlife Resources Commission (NCWRC) Aquatic Database for the SR 1138 crossing site indicate that two DWM were found in a 1998 survey. No DWM were encountered during NCWRC survey efforts in 1986, 1995, 1999, 2010 or 2011 despite the presence of good quality habitat. The survey records at this site are sufficient to demonstrate that the population of DWM at this site is not, and has not historically been comparable to other DWM locations such as in Shelton Creek, where catch per unit effort has been recorded as high as 19 DWM per search hour.

Severe droughts affecting the Tar River in recent years (2002 and 2007) appear to have had a drastic effect on DWM within the river basin. Mussel fauna, already stressed by combinations of human induced factors as well as environmental fluctuation, appear to have been reduced within the action area. While drought conditions persisted during the summer/fall of 2007 and early winter 2008, the entire watershed upstream of the action area was observed to have completely stopped flowing and was reduced to a series of small stagnant pools for a period greater than

three months (G. Jordan, Service biologist, personal observations). Surveys conducted in Upper Tar River Basin following the return of flow within the system have demonstrated severe reduction of DWM as well as other mussel species in the area. DWM catch per unit effort (CPUE) within a well known area in Shelton Creek dropped from a high of 19 DWM/hour in 2005 to 0 DWM/hour in three 2009 surveys. Subsequently, three separate survey efforts in Shelton Creek in 2010 located DWM in very low numbers with a CPUE of <1. It is unknown if any DWM survived the drought within the action area.

Factors Affecting the Species Environment Within the Action Area

The existing bridge, especially the bents in the channel, may have affected DWM habitat within the action area. DWM, like all mussels, are sensitive to changes within their watershed, particularly deforestation, urbanization and major construction activities. Presently the action area and surrounding areas are primarily rural and do not appear to be experiencing deforestation, urbanization or any other major construction activities. The most prevalent current factors affecting the species in and near the action area are the lingering effects of the 2002 and 2007 droughts and the lack of genetic connectivity with nearby, but isolated populations.

IV. EFFECTS OF THE ACTION

Under section 7(a)(2) of the Act, "effects of the action" refers to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action. The federal agency is responsible for analyzing these effects. The effects of the proposed action are added to the environmental baseline to determine the future baseline, which serves as the basis for the determination in this BO. Should the effects of the federal action result in a situation that would jeopardize the continued existence of the species, we may propose reasonable and prudent alternatives that the federal agency can take to avoid a violation of section 7(a)(2). The discussion that follows is our evaluation of the anticipated direct and indirect effects of the proposed project. Indirect effects are those caused by the proposed action that occur later in time but are still reasonably certain to occur (50 CFR 402.02).

Factors to be Considered

Since recent efforts to locate the DWM in the Tar River have been unsuccessful, it is uncertain that any DWM still occur within the action area. If the species does occur within the action area, the minimal amount of work within the channel is expected to have negative effects for only a short duration. The long term and overall effect of the project may be beneficial if there is significant recovery of the species in the Upper Tar Basin.

Analysis for Effects of the Action

Beneficial Effects: The removal of the existing bridge bents in the channel and the commitment to completely span the channel will have beneficial effects. Given that in-channel bents can trap debris during high flows and can change stream hydraulics in the immediate vicinity of the

structure (causing scour and deposition), the elimination of the in-channel bents is expected to reduce the bridge's effects on stream-flow patterns. Also, given that large debris piles must often be removed from in-channel bents (creating additional channel disturbance and downstream sedimentation), the elimination of the in-channel bents will thus preclude future disturbance for debris removal. The lengthening of the bridge from approximately 140 feet to approximately 169 feet and the removal of some existing approach fill within the floodplain will allow the stream to access more of its floodplain, thus potentially reducing downstream bank scouring and sedimentation.

Direct Effects: The construction of temporary, rock causeways within the channel could crush any DWM within their footprint. The temporary causeways may cause temporary compaction of the underlying substrate, thus degrading DWM habitat. If a high water event occurs during the time a work pad is in place, the constricted flow could cause erosion of the substrate and the opposite bank. Temporary causeways also create areas where debris can collect on, thus increasing the possibility of adjacent scouring and bank erosion. However, having only one causeway present at a time minimizes the chances of the negative effects occurring. Once removed, the negative effects of the causeways will likely be short-lived.

Removal of the in-channel bents may disturb sediment which will redeposit downstream, potentially on DWM or within DWM habitat. However, the small amount of sedimentation is likely sub-lethal. Of greater concern is prolonged erosion of the disturbed area on and along the banks of the river within the action area during the construction of the bridge and approach road. A major storm event could erode soil from within the disturbed construction area and wash it into the stream, thus smothering mussels, interfering with respiration and feeding, and degrading habitat. To avoid or minimize the potential for this effect, NCDOT has developed stringent erosion control measures and other conservation measures (see "Conservation Measures" section of this BO) which greatly reduce the likelihood of sediment entering the stream.

Indirect Effects: Since the project involves replacing an existing two-lane bridge with a new two-lane bridge, it is unlikely that the project will promote any secondary development or land use changes. Also, since no new bents will be placed in the channel, no negative indirect effects to stream flow are anticipated. Overall, the project is not likely to have any measurable indirect effect on DWM or its habitat.

Interrelated and Interdependent Actions: None known

V. CUMMULATIVE EFFECTS

Cumulative effects include the effects of future state, tribal, local or private actions that are reasonably certain to occur in the action area considered in this BO. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA. At this time there are no known future local, state or private actions, not requiring federal actions that are reasonably certain to occur within the action area.

VI. CONCLUSION

After reviewing the current status of the DWM, the environmental baseline for the action area, all effects of the proposed project, and the conservation measures identified in the BA, it is the Service's biological opinion that the proposed replacement of Bridge No. 83 over the Tar River on SR 1138 (TIP No. B-3841), as proposed, is not likely to jeopardize the continued existence of this species. No critical habitat has been designated for this species; therefore, none will be affected.

This non-jeopardy opinion is based, in part, on the following facts: It is not known if the DWM still exists within the action area. The project has significant long-term beneficial effects. Several conservation measures will greatly reduce the potential for negative effects. In-channel work will be minimal, thus limiting the potential for negative effects.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and federal regulations pursuant to Section 4(d) of the ESA prohibit the taking of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns such as breeding, feeding or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of Section 7(b)(4) and Section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the FHWA so that they may become binding conditions of any grant or permit issued to the NCDOT, as appropriate, for the exemption in section 7(o)(2) to apply. The FHWA has a continuing duty to regulate the activity covered by this Incidental Take Statement. If the FHWA (1) fails to assume and implement the terms and conditions or (2) fails to require the NCDOT to adhere to the terms and conditions of the Incidental Take Statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the FHWA or the NCDOT must report the progress of the action and its impact on the species to the Service as specified in the Incidental Take Statement [50 CFR §402.14(I)(3)].

Amount or Extent of Take Anticipated

The Service anticipates that incidental take of the DWM may occur as a result of the bridge replacement. During demolition of the existing bridge and construction of the new bridge, individual mussels may be crushed, harmed by siltation or other water quality degradation, or dislocated because of physical changes in their habitat.

Because there are no reliable data on the number of DWM buried in the substrate compared to those on the surface (and even those on the surface are difficult to detect), it is not possible to base the amount of incidental take on numbers of individual mussels. Additionally, incidental take will likely be difficult to detect and monitor. Although spent shells may be collected, attributing the cause of mortality may be difficult. Glochidia and juvenile mussels are also extremely difficult to sample, therefore it is difficult to document take of either of these life stages.

The level of incidental take of the DWM can be defined as all DWM that may be harmed, harassed, collected or killed within the action area (400 meters downstream and 100 meters upstream of the existing bridge). If incidental take is exceeded, all work should stop, and the Service should be contacted immediately.

Effect of the Take

In the accompanying BO, the Service has determined that the level of anticipated take is not likely to result in jeopardy to the DWM. Since critical habitat has not been designated for this species, the proposed project will not result in the destruction or adverse modification of critical habitat.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of the DWM. These nondiscretionary measures include, but are not limited to, the terms and conditions outlined in this BO.

1. All Conservation Measures previously described in this BO must be implemented.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the NCDOT must comply with the following terms and conditions, which implement the reasonable and prudent measures described previously and outline required reporting requirements. These terms and conditions are nondiscretionary.

1. NCDOT will ensure that the contractor and on-site NCDOT staff understand and follow the measures listed in the "Conservation Measures" section of this BO.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. The following conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. Conduct periodic DWM status surveys in the Upper Tar Basin and submit results to the Service.

2. Contribute funding and/or staff to any future DWM reintroduction or population augmentation efforts conducted by others.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

REINITIATION/CLOSING STATEMENT

This concludes formal consultation on the action outlined in your April 10, 2012 request for formal consultation. As provided in 50 CFR section 402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (2) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (3) a new species is listed or critical habitat designated that may be affected by the action.

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PRELIMINARY JURISDICTIONAL DETERMINATION FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PRELIMINARY JURISDICTIONAL DETERMINATION (JD):

B. NAME AND ADDRESS OF PERSON REQUESTING PRELIMINARY JD:
Greg Price, NCDOT, 1598 Mail Service Center, Raleigh, NC 27699-1598

C. DISTRICT OFFICE, FILE NAME, AND NUMBER: CESAW-RG-R

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:
TIP: B-3841 Description: Replace Bridge No. 83 over Tar River on SR 1138 (Culbreth Road)
(USE THE ATTACHED TABLE TO DOCUMENT MULTIPLE WATERBODIES AT DIFFERENT SITES)
State: NC County/parish/borough: Granville City: Berea
Center coordinates of site (lat/long in degree decimal format):
Lat. 36.295214°**N**, Long. -78.730894° **W**
Universal Transverse Mercator:
Name of nearest waterbody: Tar River

Identify (estimate) amount of waters in the review area:
Non-wetland waters: 130 linear feet: 60 width (ft) and/or acres.
Cowardin Class: Riverine
Stream Flow: Perennial
Wetlands: acres.
Cowardin Class:

Name of any water bodies on the site that have been identified as Section 10 waters:
Tidal: N/A
Non-Tidal: N/A

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):
☐ Office (Desk) Determination Date:
☐ Field Determination Date(s):

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this

preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable. This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA: Data reviewed for preliminary JD (check all that apply - checked items should be included in case file and, where checked and requested, appropriately reference sources below):

- ☐ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant
- ☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant
  - ☐ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps:
- ☐ Corps navigable waters' study:
- ☐ U.S. Geological Survey Hydrologic Atlas:
  - ☐ USGS NHD data.
  - ☐ USGS 8 and 12 digit HUC maps
- ☐ U.S. Geological Survey map(s). Cite scale & quad name: 1:24000;
- ☐ USDA Natural Resources Conservation Service Soil Survey Citation:
- ☐ National wetlands inventory map(s). Cite name:
- ☐ State/Local wetland inventory map(s):
- ☐ FEMA/FIRM maps:
- ☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- ☐ Photographs: ☐ Aerial (Name & Date): or ☐ Other (Name & Date):
- ☐ Previous determination(s). File no. and date of response letter:
- ☒ Other information (please specify):Permit drawings

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

_____	Gregory W Price 6/27/12
Signature and date of Regulatory Project Manager (REQUIRED)	Signature and date of person requesting preliminary JD (REQUIRED, unless obtaining the signature is impracticable)

STORMWATER MANAGEMENT PLAN
FOR B-3841, GRANVILLE CO.

Prepared by Paul Atkinson
April 6, 2006

ROADWAY DESCRIPTION
The project involves the replacement of Br. No. 83 on SR 1138 over Tar River. The overall length of the project is 0.14 mi. (760').

ENVIRONMENTAL DESCRIPTION
The project is located in the Tar-Pamlico River Basin, with a stream classification of WS-IV, NSW. Tar-Pam allowable buffer impacts will occur at this stream crossing. There are no wetlands. This is a Section 7 (Threatened & Endangered Species) project due to the likelihood of mussels.

BEST MANAGEMENT PRACTICES AND MAJOR STRUCTURES
Best Management Practices (BMPs) and measures used on the project to reduce stormwater impacts are listed below. All stormwater being discharged through the buffers is diffuse flow.

BRIDGE
The existing bridge is 8 spans, 140' total length, with sloping concrete abutments. There are problems with scour under the concrete abutment, vertical scoured banks, and an ongoing debris problem. The proposed bridge is 3 spans (1@30', 1@100', 1@35'), 165' total length, with 2 12' lanes and 3' shoulders for a total clear roadway width of 30' on the bridge. The proposed bridge will span the channel. Deck drains will be omitted over the channel, and will be placed in the overbank areas only. Approximately 23' of additional floodplain width will be provided under the bridge by removal of existing embankment. This additional width will also increase the current buffer width under the bridge.

The existing conc. abutments extend into the channel, which has scoured out under the abutment at Sta. 16+85 –L-; rip rap currently stabilizes the abutment at Sta. 16+05 –L-. The existing conc. abutments will be removed and replaced with rip rap on the banks to prevent the erosion that currently exists.

MISCELLANEOUS
2:1 or steeper fill slopes are used through the buffer zones to reduce impacts.

There are currently two points of concentrated flow into the buffers, which are small gullies on the upstream side (NW & SW quadrants). The flow into the buffers on the dowstream side is essentially sheet flow. In the SE quadrant there is an existing swale that terminates just inside the buffers with a berm and some rip rap, where it turns to sheet flow. In the NE quadrant there is a poorly defined ditch that turns to sheet flow

after passing through an existing rip rap check dam prior to reaching the buffers. There are no signs of erosion in either of these downstream quadrants. The proposed design pipes the ditch flow from the upstream quadrants (removing it from the gullies) to the respective downstream quadrants, where existing conditions are stable. The existing swale in the SE quadrant will be retained, and a new rock check dam will be installed in the NE quadrant to replace the existing one that is under the proposed fill. Although this represents an increase of flow in the downstream quadrants, it will provide an improvement in velocities and infiltration over the current gullies.

TIP PROJECT: B-3841

CONTRACT:

09/08/99

$$$$$SYSTIME$$$$
$$$$$DGN$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

See Sheet 1-A For Index of Sheets

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3841	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33289.1.1	BRSTP-1138(10)	PE
33289.2.2	BRSTP-1138(10)	RW,UTIL.
33289.3.1	BRSTP-1138(10)	CONST.

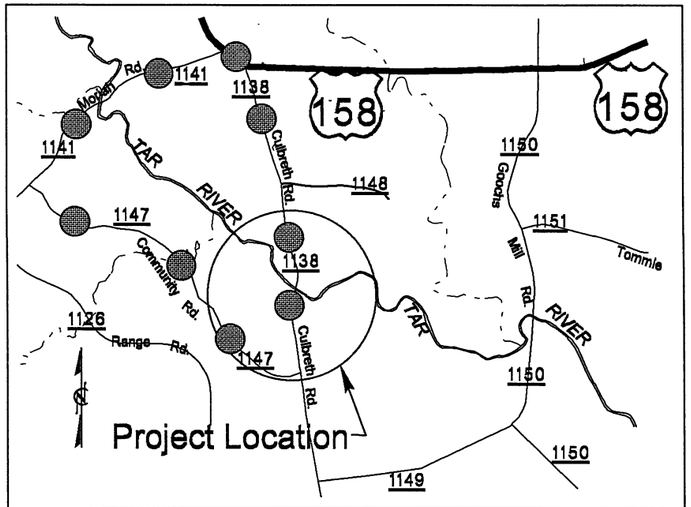
Permit Drawing
Sheet 1 of 6

GRANVILLE COUNTY

LOCATION:* *Bridge # 83 over Tar River and Approaches on SR 1138 (Culbreth Rd)

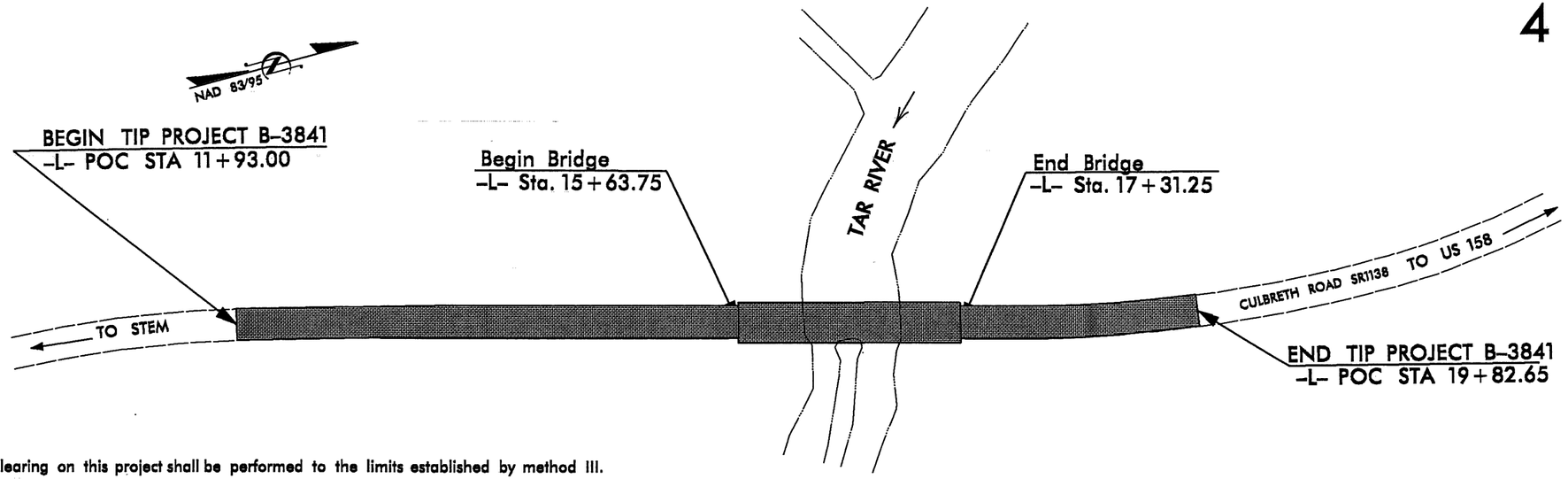
TYPE OF WORK:* *Grading, Drainage, Paving, and Structure

WETLAND/SURFACE WATER PERMIT DWG.



VICINITY MAP

●——●——●——● OFF SITE DETOUR



Clearing on this project shall be performed to the limits established by method III.

NOTE: Design Exception Required for K Factors on Sag Curves & Nightime Stopping Sight Distance

NOTE: This Project is not within the limits of any municipality

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2011 = 1200 vpd
ADT 2035 = 2200 vpd
DHV = 13 %
D = 65 %
T = 9 % *
V = 55 MPH
* TTST 4% *DUAL 5%
Sub Regional Tier

PROJECT LENGTH

Length Roadway TIP Project B-3841 = 0.118 Miles
Length Structure TIP Project B-3841 = 0.032 Miles
Total Length TIP Project B-3841 = 0.150 miles

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

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
May 1, 2012

LETTING DATE:
May 21, 2013

James Speer, PE
PROJECT ENGINEER

John Lansford, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

PROJECT REFERENCE NO.	SHEET NO.
B-3841	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 2 of 6

8/17/99

REVISIONS

5-15-12 R/W REVISION: REVISED OFFSETS FOR R/W MARKER AND TEMPORARY DRAINAGE EASEMENT ON PARCEL NO.4

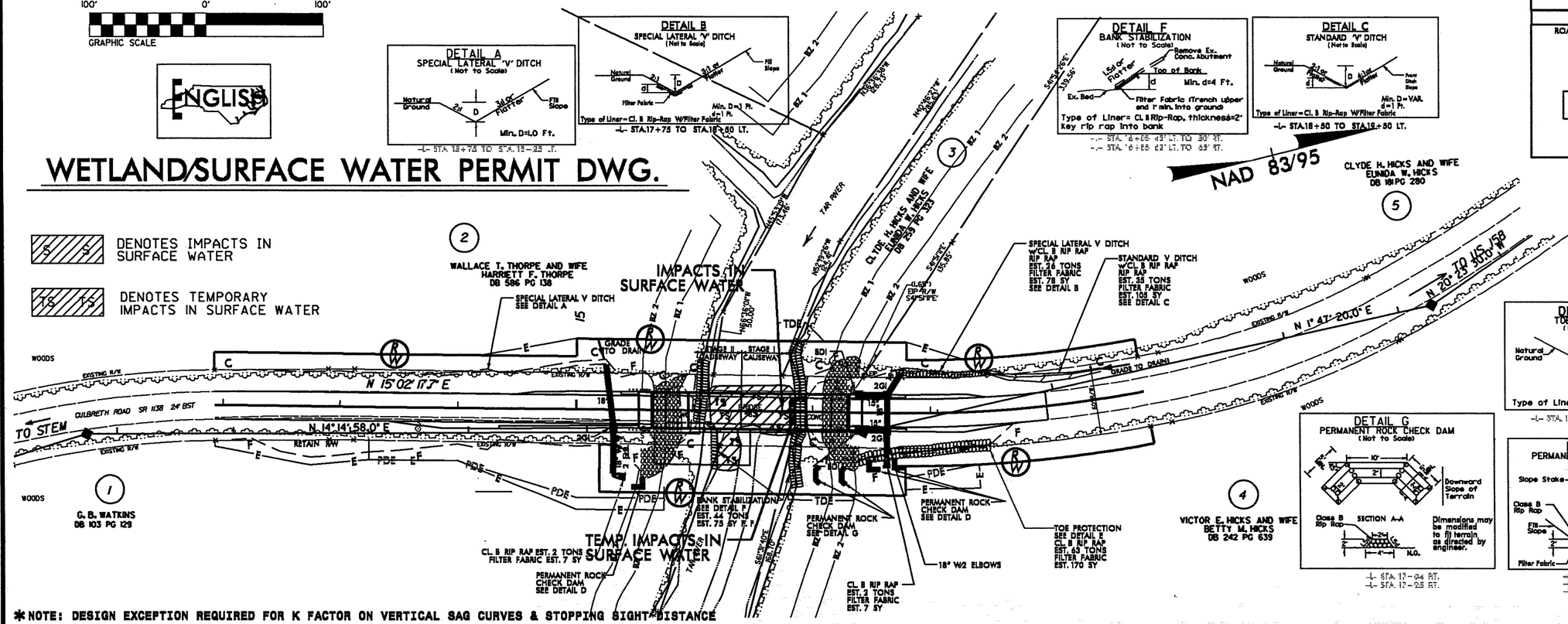
100' 0' 100'
GRAPHIC SCALE

ENGLISH

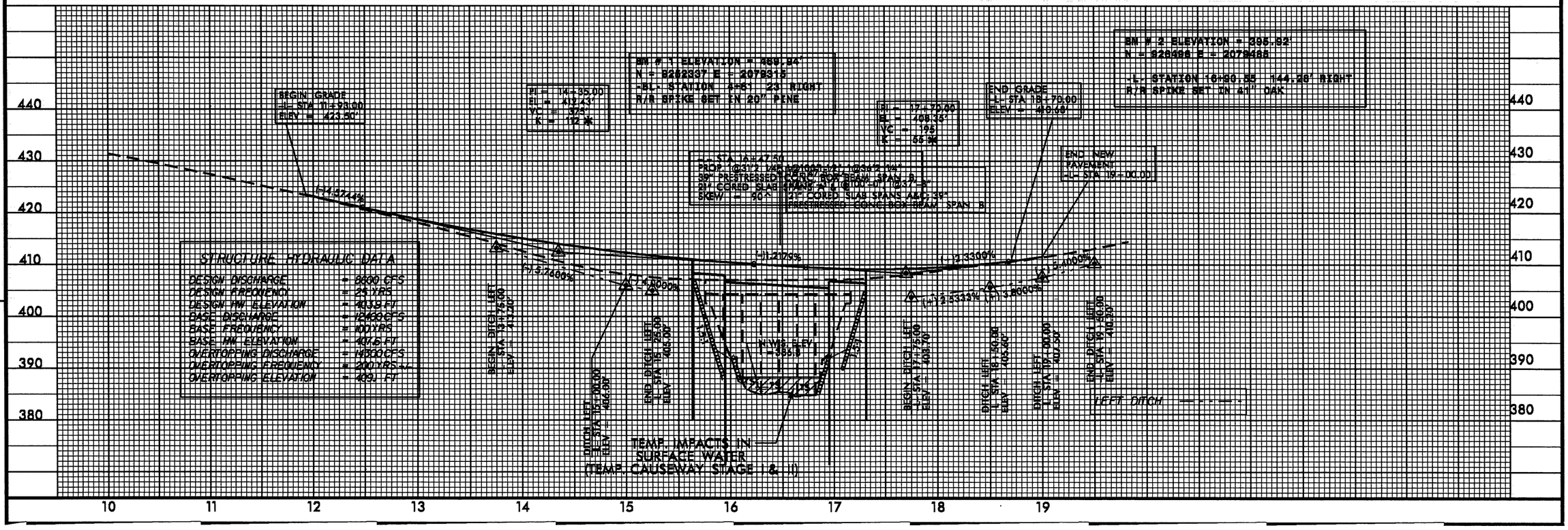
WETLAND/SURFACE WATER PERMIT DWG.

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER



*NOTE: DESIGN EXCEPTION REQUIRED FOR K FACTOR ON VERTICAL SAG CURVES & STOPPING SIGHT DISTANCE



PROJECT REFERENCE NO.	SHEET NO.
B-3841	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

REVISIONS

5-15-12 R/W REVISION: REVISED OFFSETS FOR R/W MARKER AND TEMPORARY DRAINAGE EASEMENT ON PARCEL NO.4

100' 0' 100'
GRAPHIC SCALE

ENGLISH

WETLAND/SURFACE WATER PERMIT DWG.

NAD 83/95

Permit Drawing Sheet 3 of 6

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER

TEMP. IMPACTS IN SURFACE WATER

TEMP. IMPACTS IN SURFACE WATER (TEMP. CAUSEWAY STAGE I & II)

DETAIL A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

Natural Ground, 2d, D, 2d or Flatter, Fill Slope
Min. D=1.0 Ft.

-L- STA. 18+75 TO STA. 19+35 LT.

DETAIL B
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

Natural Ground, 2d, d1, D, 2d or Flatter, Fill Slope, Filter Fabric
Min. D=1 Ft. d=1 Ft.
Type of Liner= Cl. B Rip-Rap W/Filter Fabric

-L- STA. 17+75 TO STA. 18+50 LT.

DETAIL F
BANK STABILIZATION
(Not to Scale)

Remove Ex. Conc. Abutment
1.5d or Flatter
Top of Bank
d
Min. d=4 Ft.
Ex. Bed
Filter Fabric (Trench Upper and Min. into ground.
Type of Liner= CL B Rip-Rap, thickness=2'
Key rip rap into bank

-L- STA. 18+50 TO STA. 19+00 LT.
-L- STA. 19+00 TO STA. 19+35 LT.
-L- STA. 16+75 TO STA. 17+25 RT.
-L- STA. 16+75 TO STA. 17+25 RT.

DETAIL C
STANDARD 'V' DITCH
(Not to Scale)

Natural Ground, 2d, d1, D, 2d or Flatter, Fill Slope, Pipe
Min. D=VAR. d=1 Ft.
Type of Liner=CL B Rip-Rap W/Filter Fabric

-L- STA. 18+50 TO STA. 19+00 LT.

DETAIL E
TOE PROTECTION
(Not to Scale)

Natural Ground, 2d or Flatter, Fill Slope, d, w, Filter Fabric
d=2 Ft. w=5 Ft.
Type of Liner= CL B Rip-Rap

-L- STA. 17+45 TO STA. 18+50 RT.

DETAIL G
PERMANENT ROCK CHECK DAM
(Not to Scale)

Class B Rip Rap, Downward Slope of Terrain
SECTION A-A
Dimensions may be modified to fit terrain as directed by engineer.

-L- STA. 17+24 RT.
-L- STA. 17+25 RT.

DETAIL D
PERMANENT ROCK CHECK DAM
(Not to Scale)

Slope Stake, Class B Rip Rap, Fill Slope, Filter Fabric, Downward Slope of Terrain

-L- STA. 18+58 RT.
-L- STA. 19+49 RT.
-L- STA. 19+76 RT.

WALLACE T. THORPE AND WIFE HARRIETT H. THORPE DB 586 PG 138

SPECIAL LATERAL V DITCH SEE DETAIL A

CLYDE H. HICKS AND WIFE EUNIDA W. HICKS DB 181 PG 280

CLYDE H. HICKS AND WIFE EUNIDA W. HICKS DB 253 PG 123

C. B. WATKINS DB 103 PG 129

VICTOR E. HICKS AND WIFE BETTY M. HICKS DB 242 PG 639

TAR RIVER

CULBRETH ROAD SR 1138 (24' BST.)

TO STEM

GRADE TO DRAIN

STAGE I CAUSEWAY

STAGE II CAUSEWAY

BANK STABILIZATION SEE DETAIL F EST. 44 TONS EST. 75 SY

PERMANENT ROCK CHECK DAM SEE DETAIL G

PERMANENT ROCK CHECK DAM SEE DETAIL D

CL. B RIP RAP EST. 2 TONS FILTER FABRIC EST. 7 SY

CL. B RIP RAP EST. 2 TONS FILTER FABRIC EST. 7 SY

SPECIAL LATERAL V DITCH w/CL. B RIP RAP RIP RAP EST. 24 TONS FILTER FABRIC EST. 78 SY SEE DETAIL B

STANDARD V DITCH w/CL. B RIP RAP RIP RAP EST. 25 TONS FILTER FABRIC EST. 102 SY SEE DETAIL C

TOE PROTECTION SEE DETAIL E CL. B RIP RAP EST. 63 TONS FILTER FABRIC EST. 170 SY

18" W2 ELBOWS

*NOTE: DESIGN EXCEPTION REQUIRED FOR K FACTOR ON VERTICAL SAG CURVES & STOPPING SIGHT DISTANCE

BM # 1 ELEVATION = 469.94'
N = 8282337 E = 2078318
-BL- STATION 4+61 23' RIGHT
R/R SPIKE SET IN 20" PINE

BM # 2 ELEVATION = 395.82'
N = 828466 E = 2079485
-L- STATION 16+90.55 144.26' RIGHT
R/R SPIKE SET IN 41" OAK

PI = 14+35.00
EL = 413.21'
VC = 370'
K = 112 *

PI = 17+70.00
EL = 408.15'
VC = 195'
K = 55 *

BEGIN GRADE -L- STA 11+93.00 ELEV = 423.50'

END GRADE -L- STA 18+70.00 ELEV = 409.60'

END NEW PAVEMENT -L- STA 19+00.00

-L- STA. 14+50.00 PROP 1@31'2 LWR BM1000 36" 1@54'2 LWR BM1000 36" PRESTRESSED CONCRETE BOX BEAM SPAN A 24" CORED SLAB SPANS @ 0.00° & 180.00° SKEW = 90° 42" CORED SLAB SPANS ABT. 38° SKEW = 90° PRESTRESSED CONCRETE BOX BEAM SPAN B

-L- STA. 14+47.50

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 8800 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 403.9 FT
BASE DISCHARGE	= 12600 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 407.6 FT
OVERTOPPING DISCHARGE	= 14300 CFS
OVERTOPPING FREQUENCY	= 200 YRS
OVERTOPPING ELEVATION	= 409.2 FT

-L- 4.5744%
-L- 5.7600%
-L- 11.2179%
-L- 2.3300%
-L- 5.4000%
-L- 5.4000%
-L- 2.5333%
-L- 5.2600%

BEGIN DITCH LEFT -L- STA 13+76.00 ELEV = 413.20'
END DITCH LEFT -L- STA 15+26.00 ELEV = 408.00'
DITCH LEFT -L- STA 15+76.00 ELEV = 408.00'
DITCH LEFT -L- STA 16+26.00 ELEV = 408.20'
BEGIN DITCH LEFT -L- STA 17+76.00 ELEV = 408.20'
DITCH LEFT -L- STA 18+26.00 ELEV = 408.20'
DITCH LEFT -L- STA 19+00.00 ELEV = 407.30'
END DITCH LEFT -L- STA 19+26.00 ELEV = 410.20'

LEFT DITCH

440 430 420 410 400 390 380

10 11 12 13 14 15 16 17 18 19

Permit Drawing
Sheet 4 of 6

SPAN "A" SPAN "B" SPAN "C"

FILL FACE @ END BENT 1
STA. 15+63.75 -L-
GRADE POINT EL. 411.02

BEGIN FRONT SLOPE
STA. 15+59.21 -L-
GRADE POINT EL. 411.10

1'-0" MIN. EARTH BERM
1'-7" MIN. BERM
FIX.
EL. 407.1±
EL. 402.5±
1'-6" MIN. (TYP.)
CLASS II RIP RAP
1½:1 SLOPE (TYP.)
EL. 392.2±
100 YR. EL. 407.6±
50 YR. EL. 405.8±
N.W.S. EL. 386.3±
EL. 385.1±
TOP OF CAUSEWAY E.L. 388.3±
EXISTING STRUCTURE (TYP.)
EL. 384.6±
CAUSEWAY
2'-6" Ø (TYP.)
EL. 391.6±
3'-0" Ø (TYP.)
BANK STABILIZATION WITH CLASS II RIP RAP (TYP.)
EL. 407.2±
EL. 402.5±
HP12X53 STEEL PILES (TYP.)
FILL FACE @ END BENT 2
STA. 17+31.25 -L-
GRADE POINT EL. 409.14
BEGIN FRONT SLOPE
STA. 17+35.61 -L-
GRADE POINT EL. 409.13
APPROXIMATE GROUND LINE

END BENT 1 BENT 1 BENT 2 END BENT 2

SECTION ALONG -L-

STAGE I CAUSEWAY SHOWN, STAGE II SIMILAR

(-)4.5744% (-)1.2179%
P.I. = 14+35.00 -L-
ELEV. = 412.43
VC = 375'

VERTICAL GRADE DATA -L-

(-)1.2179% (+)2.3300%
P.I. = 17+70.00 -L-
ELEV. = 408.35
VC = 195'

VERTICAL GRADE DATA -L-

TAR RIVER
STAGE II CAUSEWAY
STAGE I CAUSEWAY
℄ BRIDGE
STA. 16+47.50 -L-
1'-0" MIN. EARTH BERM EL. 405.57 (LEVEL)
1'-7" MIN. BERM EL. 407.57 (LEVEL)
BANK STABILIZATION WITH CLASS II RIP RAP (TYP.)
1'-0" MIN. EARTH BERM EL. 403.72 (LEVEL)
1'-7" MIN. BERM EL. 405.72 (LEVEL)
TO SR 1147
TO SR 1148
W.P. #1 STA. 15+63.75 -L-
W.P. #2 STA. 15+94.94 -L-
W.P. #3 STA. 16+95.06 -L-
W.P. #4 STA. 17+31.25 -L-
BEGIN APPROACH SLAB STA. 15+52.75 -L-
END APPROACH SLAB STA. 17+42.25 -L-
BEGIN FRONT SLOPE STA. 15+59.21 -L-
BEGIN FRONT SLOPE STA. 17+35.61 -L-
19'-6"
17'-9"
5'-0"
90°00'00" (TYP.)
EXISTING STRUCTURE (TYP.)
BENT 1 CONTROL LINE
BENT 2 CONTROL LINE
30'-0"
52'-6¾"
47'-6¾"
31'-2¼"
100'-1½"
36'-2¼"
TOTAL BRIDGE LENGTH = 167'-6"
(FILL FACE TO FILL FACE)

PLAN

PILES & DRILLED PIERS NOT SHOWN IN PLAN VIEW FOR CLARITY

NORTH

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROJECT NO. B-3841
GRANVILLE COUNT
STATION: 16+47.50 -L-
SHEET 1 OF 2 REPLACES BRIDGE NO.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRELIMINARY GENERAL DRAWING
BRIDGE OVER TAR RIVER ON SR 1138 BETWEEN SR 1147 AND SR 1148

REVISIONS						SHEET
NO.	BY:	DATE:	NO.	BY:	DATE:	S-
1			3			TOTAL SHEE
2			4			2

DRAWN BY : G. M. GILLAND DATE : 4/12
CHECKED BY : J. E. MONDOLFI DATE : 4/12

Florence & Hutcheson
CONSULTING ENGINEERS
NC License No: P-0288

6/1/2012
K:\Projects\structure_design\Yig\b-3841 granville 83\plans\pod submittal\final submittal 4.5.12\B-3841_Granville_83_00.dgn
Florence & Hutcheson, An ICA Company

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
1	G. B. Watkins	P.O. Box 1227, Oxford, NC 27565
2	Thorpe Wallace and Harriett	2554 Smith Rd. Oxford, NC 27565
3	Hicks Clyde & Eunida	5169 Culbreth Rd. Oxford, NC 27565
4	Hicks Victor & Betty	24815 Mt. Pleasant St. Petersburg, VA 23803
5	Hicks Clyde & Eunida	5169 Culbreth Rd. Oxford, NC 27565

NCDOT

DIVISION OF HIGHWAYS

GRANVILLE COUNTY

PROJECT: 33289.1.1 (B-3841)

BRIDGE NO. 83 OVER TAR RIVER AND APPROACHES ON SR 1138 (CULBRETH RD.)

05/22/12

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS						SURFACE WATER IMPACTS				
			CAMA Permanent Fill In Wetlands (ac)	404 Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	16+82 -L-	Bank Stabilization							<0.01		127		
1	16+12 -L- TO 16+86 -L-	Temp. Causeway								0.06			
TOTALS:			0.00	0.00	0.00	0.00	0.00	0.00	<0.01	0.06	127	0.00	0.00

N.C.D.O.T.
DIVISION OF HIGHWAYS
GRANVILLE COUNTY
PROJECT: 33289.1.1 (B-3841)
BRIDGE #83 OVER TAR RIVER
AND APPROACHES ON
SR 1138 (CULBRETH RD.)

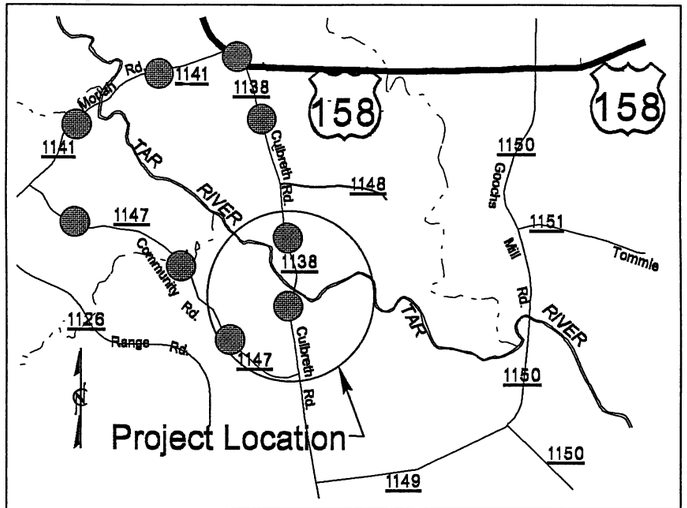
ATN Revised 3/31/05

(05/23/2012)

09/08/95

TIP PROJECT: B-3841

See Sheet 1-A For Index of Sheets



VICINITY MAP

OFF SITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GRANVILLE COUNTY

LOCATION: Bridge # 83 over Tar River and Approaches on SR 1138 (Culbreth Rd)

TYPE OF WORK: Grading, Drainage, Paving, and Structure

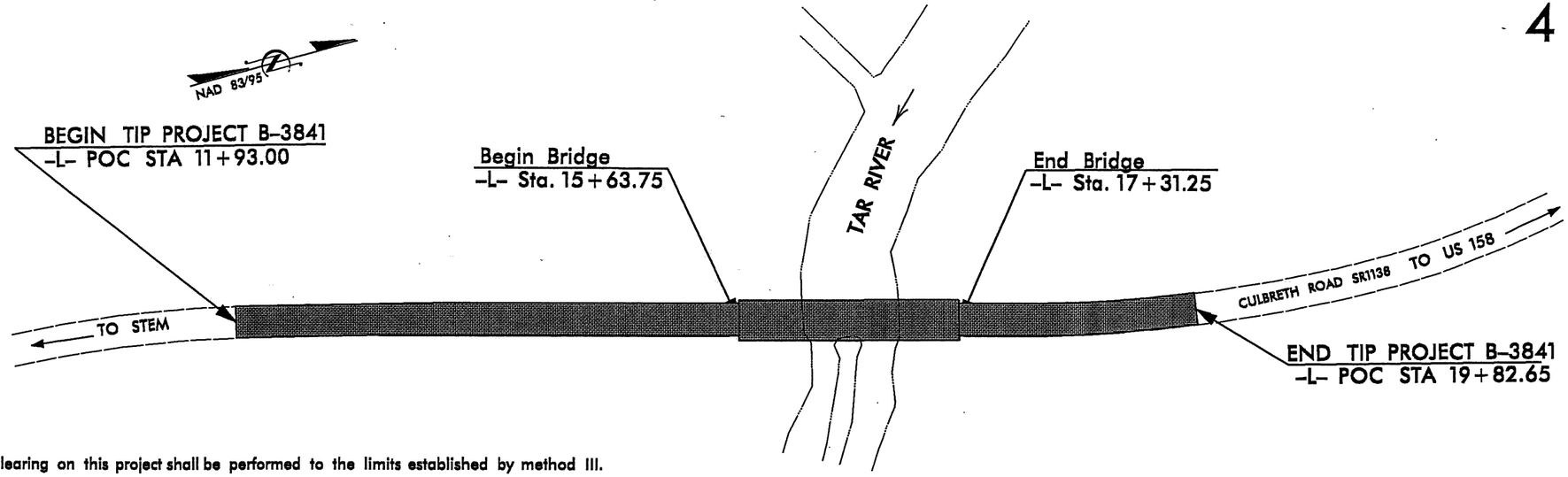
BUFFER PERMIT DWG.

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3841	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33289.1.1	BRSTP-1138(10)	PE
33289.2.2	BRSTP-1138(10)	RW,UTIL.
33289.3.1	BRSTP-1138(10)	CONST.

Buffer Drawing
Sheet 1 of 3

4



Clearing on this project shall be performed to the limits established by method III.
NOTE: Design Exception Required for K Factors on Sag Curves & Nightime Stopping Sight Distance
NOTE: This Project is not within the limits of any municipality

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONTRACT:

$$$$$$$$SYSTIME$$$$$$
$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$$

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2011 = 1200 vpd
ADT 2035 = 2200 vpd
DHV = 13 %
D = 65 %
T = 9 % *
V = 55 MPH
* TTST 4% *DUAL 5%
Sub Regional Tier

PROJECT LENGTH

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Length Structure TIP Project B-3841 = 0.032 Miles

Total Length TIP Project B-3841 = 0.150 miles

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

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: May 1, 2012

LETTING DATE: May 21, 2013

James Speer, PE
PROJECT ENGINEER

John Lansford, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

BUFFER PERMIT DWG.

PROJECT REFERENCE NO.	SHEET NO.
B-3841	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Buffer Drawing
Sheet 2 of 3

100' 0' 100'
GRAPHIC SCALE

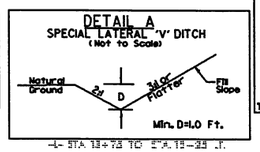
ENGLISH

NAD 83/95

ALLOWABLE IMPACTS ZONE 1

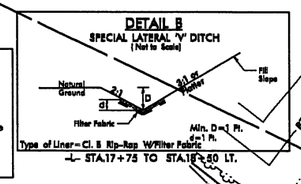
ALLOWABLE IMPACTS ZONE 2

DETAIL A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



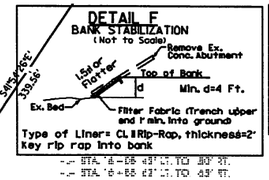
-L- STA 13+75 TO STA 15+25 LT.

DETAIL B
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



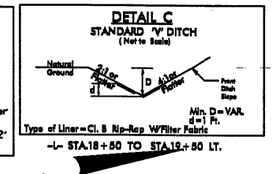
Type of Liner= Cl. B Rip-Rap W/Filter Fabric
-L- STA.17+75 TO STA.18+50 LT.

DETAIL F
BANK STABILIZATION
(Not to Scale)



Type of Liner= Cl. B Rip-Rap, thickness=2'
Key rip rap into bank
-L- STA. 18+05 43' LT. TO 30' RT.
-L- STA. 18+55 62' LT. TO 43' RT.

DETAIL C
STANDARD 'V' DITCH
(Not to Scale)



Type of Liner= Cl. B Rip-Rap W/Filter Fabric
-L- STA.18+50 TO STA.19+50 LT.

ALLOWABLE IMPACTS ZONE 2
ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2

TAR RIVER

TO STEM

TO US 158

CULBRETH ROAD SR 1138 24' BST

N 15° 02' 17" E

WOODS

EXISTING R/W

GRADE TO DRAIN

BRIDGE #83

TOE

1. G. B. WATKINS
DB 103 PG 129

2. WALLACE T. THORPE AND WIFE HARRIETT F. THORPE
DB 586 PG 138

3. CLYDE H. HICKS AND WIFE EUNICE W. HICKS
DB 1895 PG 323

4. VICTOR E. HICKS AND WIFE BETTY M. HICKS
DB 242 PG 639

5. CLYDE H. HICKS AND WIFE EUNICE W. HICKS
DB 1895 PG 290

BEGIN SBG
STA. 18+38 -L- LT.

SPECIAL LATERAL V DITCH
SEE DETAIL A

BEGIN SBG
STA. 14+35 -L- RT.

RETAIN R/W

BANK STABILIZATION
SEE DETAIL F
EST. 44 TONS
EST. 75 SY F. F.

CL. B RIP RAP EST. 2 TONS
FILTER FABRIC EST. 7 SY

PERMANENT ROCK CHECK DAM
SEE DETAIL D

PERMANENT ROCK CHECK DAM
SEE DETAIL G

PERMANENT ROCK CHECK DAM
SEE DETAIL D

CL. B RIP RAP
EST. 2 TONS
FILTER FABRIC
EST. 7 SY

END SBG
-L- STA.
17+80 RT.

18" W2 ELBOWS

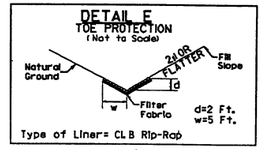
TOE PROTECTION
SEE DETAIL E
CL. B RIP RAP
EST. 63 TONS
FILTER FABRIC
EST. 170 SY

END SBG
STA. 17+79 -L- LT.

SPECIAL LATERAL V DITCH
W/CL. B RIP RAP
RIP RAP
EST. 26 TONS
FILTER FABRIC
EST. 78 SY
SEE DETAIL B

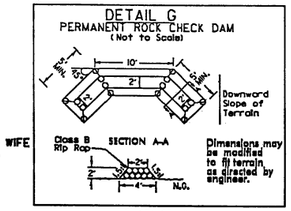
STANDARD V DITCH
W/CL. B RIP RAP
RIP RAP
EST. 35 TONS
FILTER FABRIC
EST. 105 SY
SEE DETAIL C

DETAIL E
TOE PROTECTION
(Not to Scale)



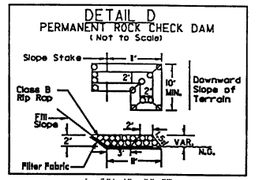
Type of Liner= CL B Rip-Rap
-L- STA. 17+45 TO STA. 18+50 RT.

DETAIL G
PERMANENT ROCK CHECK DAM
(Not to Scale)



-L- STA. 17+04 RT.
-L- STA. 17+25 RT.

DETAIL D
PERMANENT ROCK CHECK DAM
(Not to Scale)



-L- STA. 15+58 RT.
-L- STA. 15+85 RT.
-L- STA. 17+58 RT.
-L- STA. 17+85 RT.

***NOTE: DESIGN EXCEPTION REQUIRED FOR K FACTOR ON VERTICAL SAG CURVES & STOPPING SIGHT DISTANCE**

BM # 1 ELEVATION = 469.84'
N = 926237 E = 2078316
-BL- STATION 4+61 23' RIGHT
R/R SPIKE SET IN 20" PINE

BM # 2 ELEVATION = 395.82'
N = 926496 E = 2079485
-L- STATION 16+90.55 144.28' RIGHT
R/R SPIKE SET IN 41" OAK

BEGIN GRADE
-L- STA 10+93.00
ELEV = 423.50'

PI = 14+35.00
EL = 412.43'
VC = 375'
K = 112 *

PI = 17+70.00
EL = 408.15'
VC = 195
K = 55 *

END GRADE
-L- STA 18+70.00
ELEV = 410.68'

-L- STA 16+47.50
PROP. (@3 1/2 1/4" @100'-0" @37'-8"
39" PRESTRESSED CONC. BOX BEAM SPAN B
21" CORED SLAB SPANS A & C @100'-0" @37'-8"
SKEW = 90° 21" CORED SLAB SPANS A&C 39"
PRESTRESSED CONC. BOX BEAM SPAN B

END NEW PAVEMENT
-L- STA 19+00.00

-L- 7.57%
-L- 11.21%
-L- 13.00%
-L- 15.00%
-L- 12.53%
-L- 13.00%
-L- 15.00%

BEGIN DITCH LEFT
-L- STA 13+73.00
ELEV = 413.20'

END DITCH LEFT
-L- STA 15+25.00
ELEV = 405.08'

DITCH LEFT
-L- STA 15+00.00
ELEV = 406.08'

BEGIN DITCH LEFT
-L- STA 17+73.00
ELEV = 409.30'

DITCH LEFT
-L- STA 18+60.00
ELEV = 408.20'

DITCH LEFT
-L- STA 19+00.00
ELEV = 407.50'

END DITCH LEFT
-L- STA 19+46.00
ELEV = 410.20'

NWS ELEV = 386.3

LEFT DITCH

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 8600 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 403.9 FT
BASE DISCHARGE	= 12400 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 407.6 FT
OVERTOPPING DISCHARGE	= 14300 CFS
OVERTOPPING FREQUENCY	= 200 YRS +/-
OVERTOPPING ELEVATION	= 409 FT

440 430 420 410 400 390 380

10 11 12 13 14 15 16 17 18 19

REVISIONS

5-15-12 R/W REVISION, REVISED OFFSETS FOR R/W MARKER AND TEMPORARY DRAINAGE EASEMENT ON PARCEL NO.4

8/17/99

BUFFER IMPACTS SUMMARY

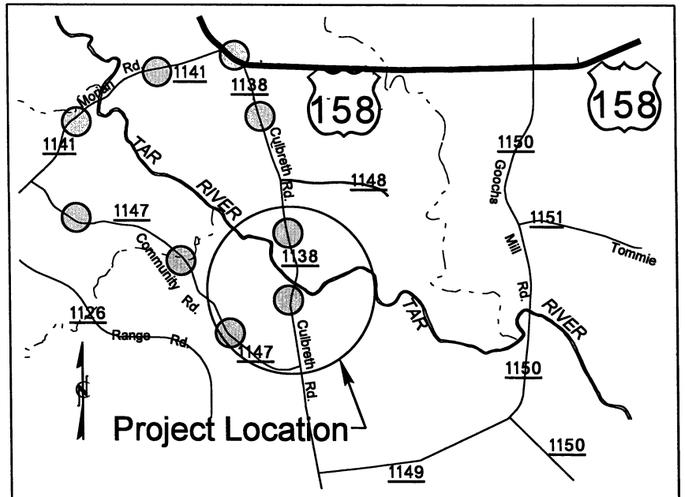
			IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
1	BRIDGE	15+65 -L- TO 17+30 -L-		X		5969	1754	7723					
1	ROAD	15+45 -L- TO 17+44 -L-	X				1475	1475					
TOTAL:						5969	3229	9198	0	0	0		

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
GRANVILLE COUNTY
PROJECT: 33289.1.1 (B-3841)
BRIDGE #83 OVER TAR RIVER
AND APPROACHES ON
SR 1138 (CULBRETH RD.)

TIP PROJECT: B-3841

CONTRACT: C203149

See Sheet 1-A For Index of Sheets



VICINITY MAP

OFF SITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GRANVILLE COUNTY

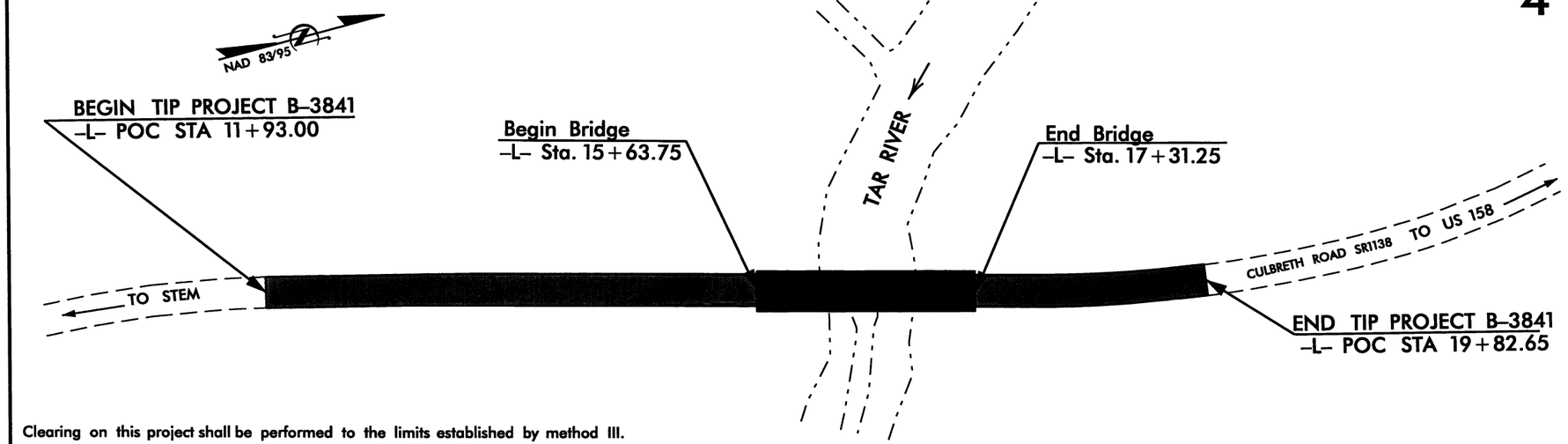
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3841	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
33289.1.1	BRSTP-1138(10)	PE
33289.2.2	BRSTP-1138(10)	RW,UTIL.
33289.3.1	BRSTP-1138(10)	CONST.

LOCATION: *Bridge # 83 over Tar River and Approaches on SR 1138 (Culbreth Rd)*

TYPE OF WORK: *Grading, Drainage, Paving, and Structure*

4



Clearing on this project shall be performed to the limits established by method III.
NOTE: Design Exception Required for K Factors on Sag Curves & Nightime Stopping Sight Distance
NOTE: This Project is not within the limits of any municipality

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

PLANS: 50 25 0 50 100

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2011 = 1200 vpd
ADT 2035 = 2200 vpd
DHV = 13 %
D = 65 %
T = 9 % *
V = 55 MPH
* TTST 4% *DUAL 5%
Sub Regional Tier

PROJECT LENGTH

Length Roadway TIP Project B-3841 = 0.118 Miles

Length Structure TIP Project B-3841 = 0.032 Miles

Total Length TIP Project B-3841 = 0.150 miles

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

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: May 1, 2012

LETTING DATE: May 21, 2013

James Speer, PE
PROJECT ENGINEER

John Lansford, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

11/19/10

PROJECT REFERENCE NO.	SHEET NO.
B-3841	1-B

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — EPM
- Parcel/Sequence Number — 23
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Known Soil Contamination: Area or Site
- Potential Soil Contamination: Area or Site

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite R/W Marker — RW
- Proposed Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage / Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
B-3841	TC
Location and Surveys	

SURVEY CONTROL SHEET B-3841

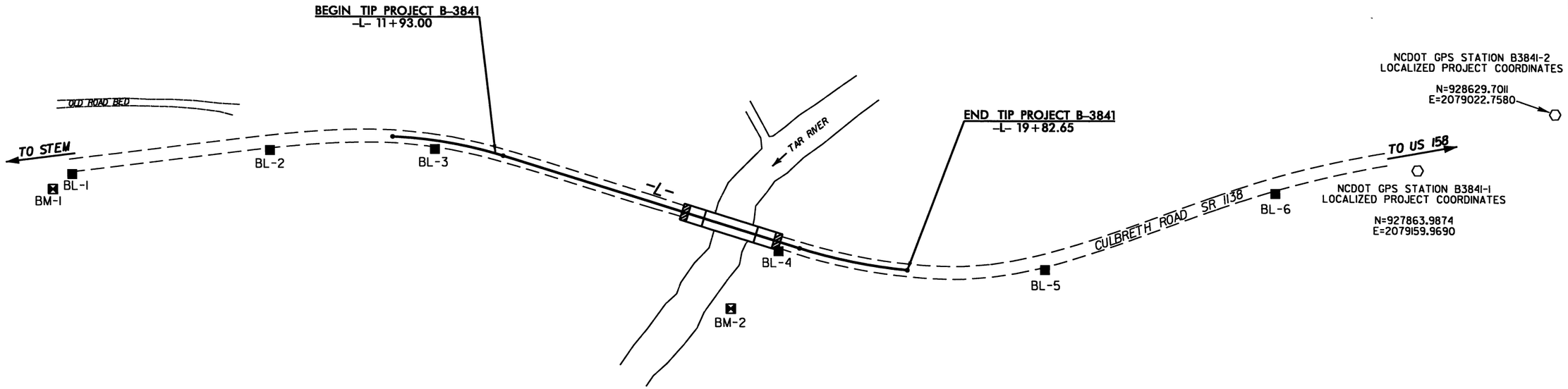
NC GRID NAD 83

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	925859.1636	2079192.8228
PC	10+10.33	925869.4914	2079192.9852
PT	12+07.73	926064.4856	2079220.2841
PC	17+79.41	926616.5904	2079368.6154
PT	19+82.65	926816.8675	2079401.1095

ROW MARKER BRIDGE SPIKE

ALIGN	STATION	OFFSET	NORTH	EAST
L	11+93.00	-45.00	926061.1043	2079172.9281
L	12+07.73	-45.00	926076.1615	2079176.8253
L	11+93.00	-30.00	926057.4796	2079187.4836
L	11+93.00	30.00	926042.9810	2079245.7055
L	12+07.73	29.88	926056.7341	2079249.1362
L	15+00.00	-60.00	926362.3186	2079238.1737
L	15+00.00	-45.00	926358.4266	2079252.6600
L	15+20.00	65.00	926349.2007	2079364.0821
L	15+20.00	29.02	926358.5365	2079329.3332
L	17+79.39	45.00	926604.8969	2079412.0695
L	17+80.53	65.00	926600.8794	2079431.6994
L	17+79.41	-60.00	926632.1603	2079310.6707
L	17+79.41	-45.00	926628.2663	2079325.1565
L	19+82.65	30.00	926815.0917	2079431.0569
L	19+82.65	45.00	926814.2038	2079446.0313
L	19+82.65	-30.00	926818.6431	2079371.1620
L	19+82.65	-45.00	926819.5309	2079356.1884



CONTROL DATA

BASELINE

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	BL-1	925268.7360	2079286.3670	463.85	OUTSIDE PROJECT LIMITS	
2	BL-2	925633.0689	2079227.2093	439.88	OUTSIDE PROJECT LIMITS	
3	BL-3	925938.0853	2079212.8902	426.83	10+80.71	15.79 RT
4	BL-4	926577.8568	2079375.3648	406.23	17+43.75	16.57 RT
5	BL-5	927071.5480	2079390.7837	426.91	OUTSIDE PROJECT LIMITS	
6	BL-6	927492.5494	2079234.2843	436.42	OUTSIDE PROJECT LIMITS	
7	B3841-1	927863.9874	2079159.9690	449.67	OUTSIDE PROJECT LIMITS	

BENCHMARK DATA

```
**************************************
BM-1       ELEVATION = 469.94'
N 925234       E 2079315
FROM -L- STATION 10+00.00
 S 11°05'34.20" E  DIST    637.37'
R/R SPIKE SET IN 20" PINE
**************************************
**************************************
BM-2       ELEVATION = 395.92'
N 926493       E 2079485
L STATION 16+91.00 144' RIGHT
R/R SPIKE SET IN 41" OAK
**************************************
```

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B3841-1" WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 927863.9874(ft) EASTING: 2079159.9690(ft) ELEVATION: 449.67(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.00002329
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B3841-1" TO -L- STATION 11+93.00 IS S 01°47'17.5" E 1814.6408'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

NOTES:

1. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT: HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/*

   THE FILES TO BE FOUND ARE AS FOLLOWS: B3841_ls_control.txt

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

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

28-JUN-2012 15:48
R:\Roadway\Design\b3841_ls_tc.dgn
$$$$USERNAME$$$$

5/14/99

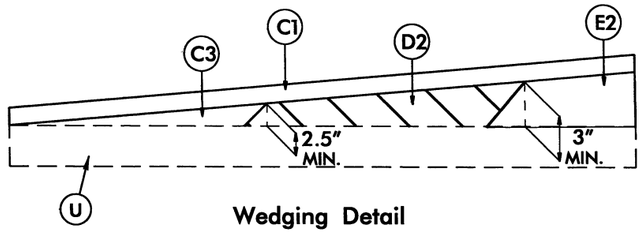
PAVEMENT SCHEDULE

C1	PROP. APPROX. 1.25" ASPHALT CONC. SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS PER SQ. YD.
C2	PROP. APPROX. 2.5" ASPHALT CONC. SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS PER SQ. YD. IN EACH OF TWO LAYERS
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT GREATER THAN 1 1/2" IN DEPTH
D1	PROP. APPROX. 2.5" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285.0 LBS PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONC. 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 1/2" IN DEPTH OR GREATER THAN 4" IN DEPTH
E1	PROP. APPROX. 4.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456.0 LBS PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
T	EARTH MATERIAL
R	SHOULDER BERM GUTTER
U	EXISTING PAVEMENT
W	ASPHALT WEDGING (SEE DETAIL)

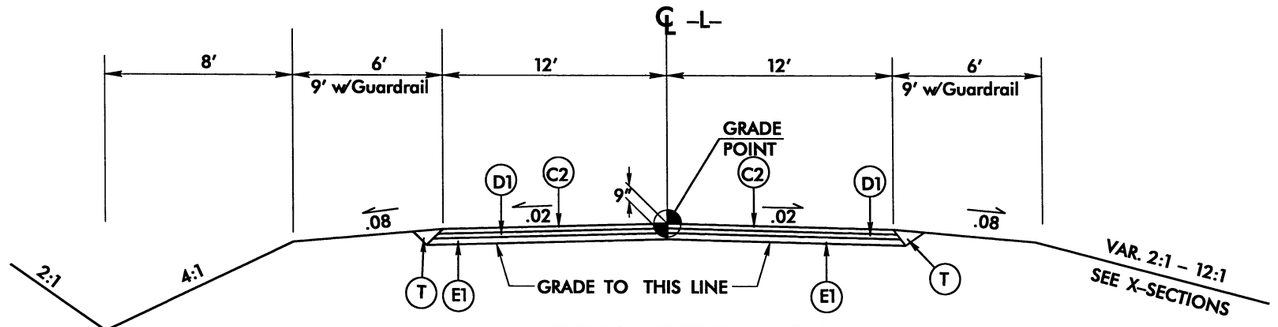
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

PROJECT REFERENCE NO.	SHEET NO.
B-3841	2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



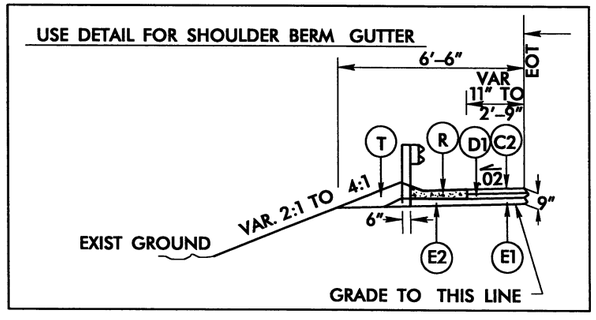
Wedging Detail



TYPICAL SECTION NO. 1

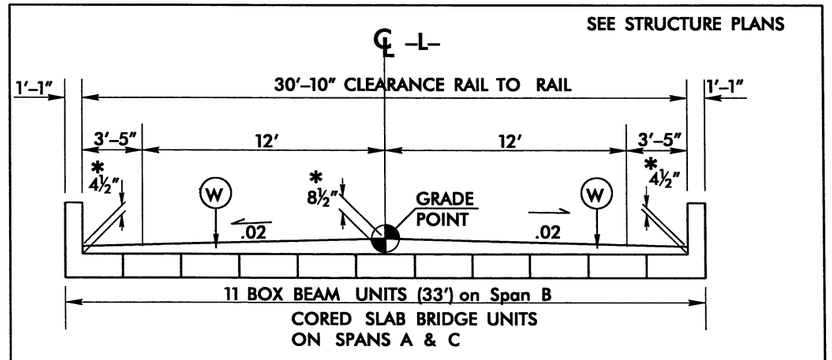
USE TYPICAL SECTION NO. 1
–L– STA 11+93.00 TO (Begin Bridge) 15+63.75
–L– (End Bridge) 17+31.25 TO 18+70.00
Note : Replace Existing Pavement with Proposed Full Depth from 18+70.00 To 19+00.00

USE DETAIL FOR SHOULDER BERM GUTTER



USE SHOULDER BERM GUTTER
–L– STA. 15+38.00 TO 15+52.75 LT.
–L– STA. 14+35.00 TO 15+52.75 RT.
–L– STA. 17+42.25 TO 17+79.00 LT.
–L– STA. 17+42.25 TO 17+80.00 RT.

BRIDGE TYPICAL SECTION



* SPAN 'B' PAVEMENT DEPTHS
FOR SPANS 'A' & 'C' USE PAVEMENT DEPTHS OF 3¼" @ RAILS & 7" @ GRADE POINT

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CHECKED BY: _____ DATE: _____

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
SUB-REGIONAL & REGIONAL
LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & UNDER)

PROJECT REFERENCE NO.	SHEET NO.
B-3841	3-A

NOTE: Invert Elevations are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300-5".

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

STATION	SIZE / THICKNESS OR GAUGE	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE
-L- 15+29.8		CL	0401	0402		405.0	404.86				56'							X	X	
-L- 15+31.6		RT	0402		411.3															
-L- 15+31.6		RT	0402	0403		404.6	394.1													
-L- 17+39.5		LT	0404		408.8															
-L- 17+63.4		LT	0404	0405		406.0	405.7			24'								X	X	
-L- 17+63.4		LT	0405		408.9															
-L- 17+63.4		LT	0405	0406		403.7	403.5				28'							X	X	
-L- 17+39.5		RT	0407		408.8															
-L- 17+63.4		RT	0407	0408		406.0	405.7			24'								X	X	
-L- 17+63.4		CL	0405	0408		403.5	403.3				32'							X	X	
-L- 17+63.4		RT	0408		408.9															
-L- 17+63.4		RT	0408	0409		403.3	400.0													
TOTAL										48'	116'									

STATION	SIZE / THICKNESS OR GAUGE	C.S. PIPE 12"	15"	18"	24"	36"	42"	48"	.064	.064	.064	.064	.079	.109	.109
-L- 15+29.8															
-L- 15+31.6															
-L- 15+31.6											40'				
-L- 17+39.5															
-L- 17+63.4															
-L- 17+63.4															
-L- 17+63.4															
-L- 17+63.4															
-L- 17+63.4															
-L- 17+63.4															
-L- 17+63.4											24'				
TOTAL											64'				

STATION	SIZE / THICKNESS OR GAUGE	R.C. PIPE (CLASS III) 15"	18"	24"	30"	36"	42"	48"
-L- 15+29.8								
-L- 15+31.6								
-L- 15+31.6								
-L- 17+39.5								
-L- 17+63.4								
-L- 17+63.4								
-L- 17+63.4								
-L- 17+63.4								
-L- 17+63.4								
-L- 17+63.4								
-L- 17+63.4								
TOTAL								

STATION	SIZE / THICKNESS OR GAUGE	R.C. PIPE (CLASS IV) 12"	15"	18"	24"	30"	36"	42"	48"
-L- 15+29.8									
-L- 15+31.6									
-L- 15+31.6									
-L- 17+39.5									
-L- 17+63.4									
-L- 17+63.4									
-L- 17+63.4									
-L- 17+63.4									
-L- 17+63.4									
-L- 17+63.4									
-L- 17+63.4									
TOTAL									

STATION	SIZE / THICKNESS OR GAUGE	*** R.C. PIPE (CLASS V)	*** R.C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	*** R.C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	CU. YDS. C.S.P.
-L- 15+29.8								
-L- 15+31.6								
-L- 15+31.6								
-L- 17+39.5								
-L- 17+63.4								
-L- 17+63.4								
-L- 17+63.4								
-L- 17+63.4								
-L- 17+63.4								
-L- 17+63.4								
-L- 17+63.4								
TOTAL								

STATION	SIZE / THICKNESS OR GAUGE	QUANTITIES FOR DRAINAGE STRUCTURES * TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B') LIN. FT. A	B	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET
-L- 15+29.8									
-L- 15+31.6									
-L- 15+31.6									
-L- 17+39.5									
-L- 17+63.4									
-L- 17+63.4									
-L- 17+63.4									
-L- 17+63.4									
-L- 17+63.4									
-L- 17+63.4									
-L- 17+63.4									
TOTAL									

STATION	SIZE / THICKNESS OR GAUGE	PER EACH (0' THRU 5.0')	5.0' THRU 10.0'	10.0' AND ABOVE	G.D.I. TYPE "S" STD. 840.18 OR 840.27	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	BRIDGE DROP INLET - STD. 840.13	BIT. COATED CS ELBOWS NO. & SIZE	CONC. COLLARS CL "B" C.Y. STD 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN.FT.	REMARKS
-L- 15+29.8															
-L- 15+31.6		1			1				1						
-L- 15+31.6											2@18"				
-L- 17+39.5		1							1	1					
-L- 17+63.4															
-L- 17+63.4		1			1				1						
-L- 17+63.4															
-L- 17+39.5		1							1	1					
-L- 17+63.4															
-L- 17+63.4															
-L- 17+63.4		1			1				1						
-L- 17+63.4											2@18"				
TOTAL		5			3				5	2	4@18"				

ABBREVIATIONS

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

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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-3841	3-B

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

SUMMARY OF EARTHWORK

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
11+93.00	15+62.75	148	1574	1441	15
SUBTOTALS:		148	1574	1441	15
17+32.25	19+50.00	52	452	405	5
SUBTOTALS:		52	452	405	5
TOTALS:		200	2026	1846	20
PROJECT TOTALS:		200	2026	1846	20
EST. 5% TO REPLACE				92	
TOPSOIL ON					
BORROW PITS					
GRAND TOTALS:		200		1938	20
SAY:		225		1940	

Contingency Undercut 200 CY

REMOVAL OF EXISTING PAVEMENT
IN SQUARE YARDS

STATION - STATION	LOCATION	ASPHALT REMOVAL	ASPHALT BREAKUP	CONCRETE REMOVAL	CONCRETE BREAKUP
11+93.00 - 13+83	CL	488.20			
15+48.75 - 15+76	CL	65.34			
17+15.60 - 18+70	CL	394.89			
18+70.00 - 19+00	CL	78.67			
13+83.00 - 15+48.75	CL		424.14		
TOTAL:		1027.10	424.14		
SAY:		1030	430		

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH
-L- RT	14+35	15+48.75	113.8
-L- LT	15+38	15+48.75	10.8
-L- RT	17+46.25	17+80	33.8
-L- LT	17+46.25	17+79	32.8
		TOTAL:	191.0
		SAY:	191

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH: STRAIGHT	LENGTH: SHOP CURVED	LENGTH: DOUBLE FACED	WARRANT POINT: APPROACH END	WARRANT POINT: TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH: APPROACH END	FLARE LENGTH: TRAILING END	W: APPROACH END	W: TRAILING END	ANCHORS: XI MOD	ANCHORS: XI	ANCHORS: GRAU 350	ANCHORS: M-350	ANCHORS: III	ANCHORS: CAT-1		IMPACT ATTENUATOR TYPE 350: EA	IMPACT ATTENUATOR TYPE 350: G	IMPACT ATTENUATOR TYPE 350: NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
-L-	13+85.85	15+62.75 (BRIDGE)	RT	176.90'			15+62.75		5' - 3.4'	9'	162.5'		5.06'-3.4'				1		1							174.35'		
-L-	14+65.43	15+63.75 (BRIDGE)	LT	98.32'				15+63.75	3.4' - 2.7'	9'		87.5'					1		1							98.64'		
-L-	17+32.25 (BRIDGE)	18+31.43	RT	99.18'			17+32.25		3.4' - 4.9'	9'		87.5'					1		1							174.86'		
-L-	17+33.25 (BRIDGE)	18+33.35	LT	100.10'				17+33.25	4.5' - 3.4'	9'	87.5'						1		1							171.42'		
			TOTAL	474.50'													4		4									
		DEDUCTIONS: 4 TYPE 350 @ 18.75'		-75.00'																								
		4 TYPE III @ 50'		-200.00'																								
		PROJECT TOTAL		199.50'													4		4							619.27'		
		SAY		200.00'													4		4		ADDITIONAL GUARDRAIL POSTS: 5 EACH					625.00'		

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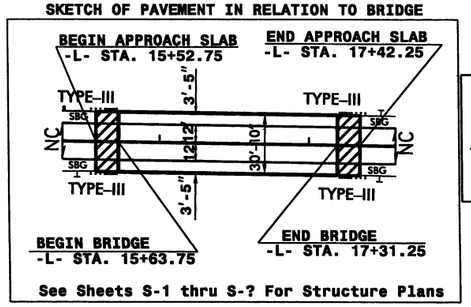
REVISIONS

5-15-12 R/W REVISION: REVISED OFFSETS FOR R/W MARKER AND TEMPORARY DRAINAGE EASEMENT ON PARCEL NO.4

PROJECT REFERENCE NO.	SHEET NO.
B-3841	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

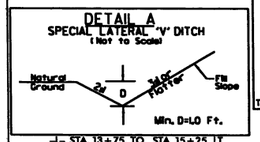
SKETCH OF PAVEMENT IN RELATION TO BRIDGE



See Sheets S-1 thru S-? For Structure Plans

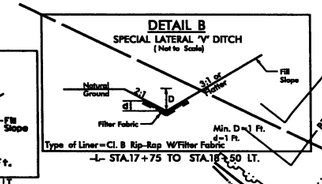
PROP APPROACH SLAB

DETAIL A
SPECIAL LATERAL "V" DITCH
(Not to Scale)



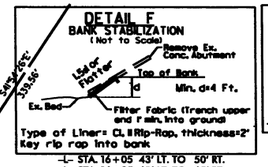
-L- STA. 13+75 TO STA. 15+25 LT.

DETAIL B
SPECIAL LATERAL "V" DITCH
(Not to Scale)



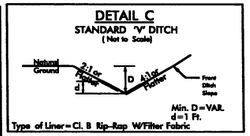
Type of Liner= Cl. B Rip-Rap W/Filter Fabric
-L- STA.17+75 TO STA.18+50 LT.

DETAIL F
BANK STABILIZATION
(Not to Scale)



Type of Liner= Cl. B Rip-Rap, thickness=2'
Key rip rap into bank
-L- STA. 16+05 43' LT. TO 50' RT.
-L- STA. 16+85 62' LT. TO 65' RT.

DETAIL C
STANDARD "V" DITCH
(Not to Scale)



Type of Liner= Cl. B Rip-Rap W/Filter Fabric
-L- STA.18+50 TO STA.19+50 LT.

NAD 83/95

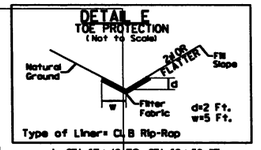
CLYDE H. HICKS AND WIFE
EUNIDA W. HICKS
DB 151 PG 280

END TIP PROJECT B-3841
-L- PT STA 19+82.65

5

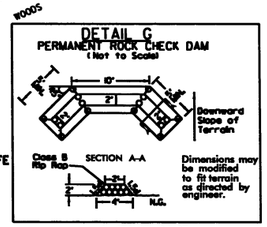
-BL-5 PINC

DETAIL E
TOE PROTECTION
(Not to Scale)



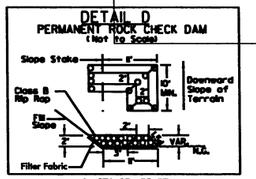
Type of Liner= Cl. B Rip-Rap
-L- STA. 17+40 TO STA. 18+50 RT.

DETAIL G
PERMANENT ROCK CHECK DAM
(Not to Scale)



-L- STA. 17+04 RT.
-L- STA. 17+25 RT.

DETAIL D
PERMANENT ROCK CHECK DAM
(Not to Scale)



-L- STA. 15+55 RT.
-L- STA. 17+49 RT.
-L- STA. 17+70 RT.

BEGIN TIP PROJECT B-3841
-L- POC STA 11+93.00

-L- PT STA 12+07.73

2

WALLACE T. THORPE AND WIFE
HARRIETT F. THORPE
DB 586 PG 138

BEGIN SBG
STA. 15+38 -L- LT.

SPECIAL LATERAL V DITCH
SEE DETAIL A

REMOVE EXIST BRIDGE

REMOVE EXIST GUARDRAIL

CULBRETH ROAD SR 1138 24' BST

TO STEM

N 15°02'17.7" E

S 15°02'17.7" W

WOODS

1

G. B. WATKINS
DB 103 PG 129

-BL-3 PINC

-L-

PI Sta 11+09.53
Δ = 14° 08' 14.9" (RT)
D = 7° 09' 43.1"
L = 197.40'
T = 99.20'
R = 800.00'
SE = Exist.

PI Sta 18+81.38
Δ = 11° 38' 42.4" (LT)
D = 5° 43' 46.5"
L = 203.25'
T = 101.97'
R = 1,000.00'
SE = See Plan View

CL B RIP RAP EST. 2 TONS
FILTER FABRIC EST. 7 SY

PERMANENT ROCK CHECK DAM
SEE DETAIL D

BANK STABILIZATION
SEE DETAIL F
EST. 44 TONS
EST. 75 SY E.F.

PERMANENT ROCK CHECK DAM
SEE DETAIL C

CL B RIP RAP
EST. 2 TONS
FILTER FABRIC
EST. 7 SY

SEE SHEET 1-C

3

-BL-4 PINC

END SBG
STA. 17+79 -L- LT.

-L- PC STA 17+79.41

SPECIAL LATERAL V DITCH
w/CL B RIP RAP
RIP RAP
EST. 26 TONS
FILTER FABRIC
EST. 78 SY
SEE DETAIL B

STANDARD V DITCH
w/CL B RIP RAP
RIP RAP
EST. 35 TONS
FILTER FABRIC
EST. 105 SY
SEE DETAIL C

REMOVE EXIST GUARDRAIL

END GRADE
-L- POC
STA 18+70.00

TOE PROTECTION
SEE DETAIL E
CL B RIP RAP
EST. 63 TONS
FILTER FABRIC
EST. 170 SY

END SBG
-L- STA.
17+80 RT.

18" W2 ELBOWS

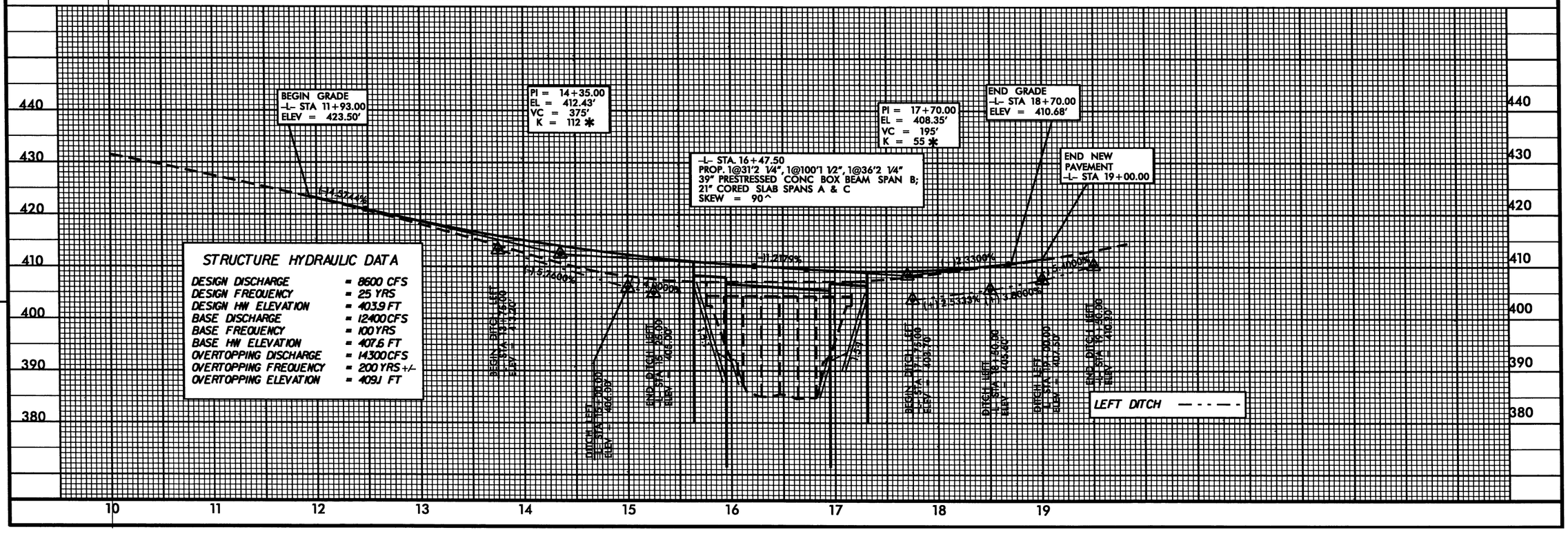
End Paving
-L- Sta.19+00.00

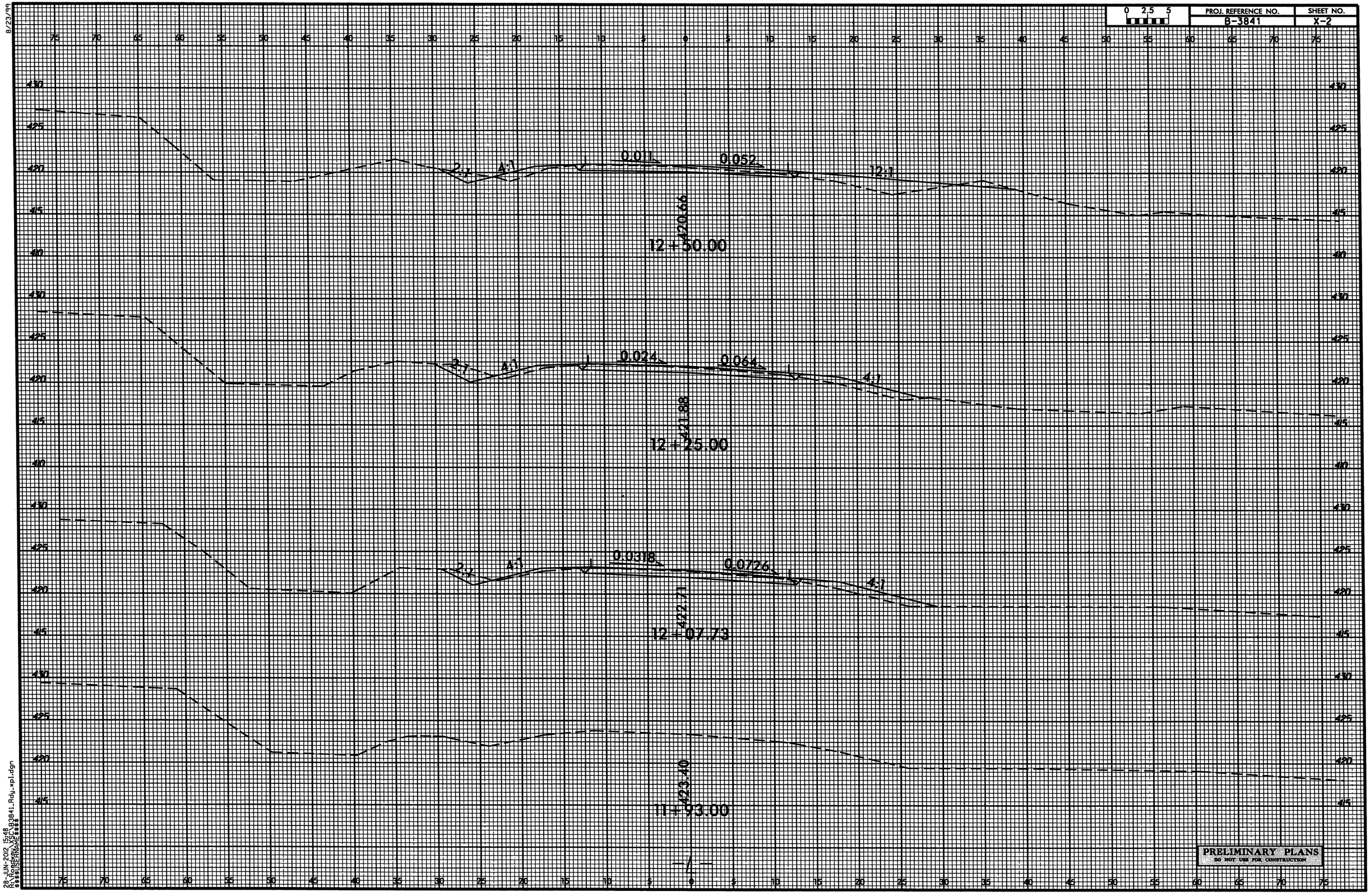
4

VICTOR E. HICKS AND WIFE
BETTY W. HICKS
DB 242 PG 639

See Sheet 3-B for SBG Summary
See Sheets S-1 thru S-? For Structure Plans

✱NOTE: DESIGN EXCEPTION REQUIRED FOR K FACTOR ON VERTICAL SAG CURVES & STOPPING SIGHT DISTANCE





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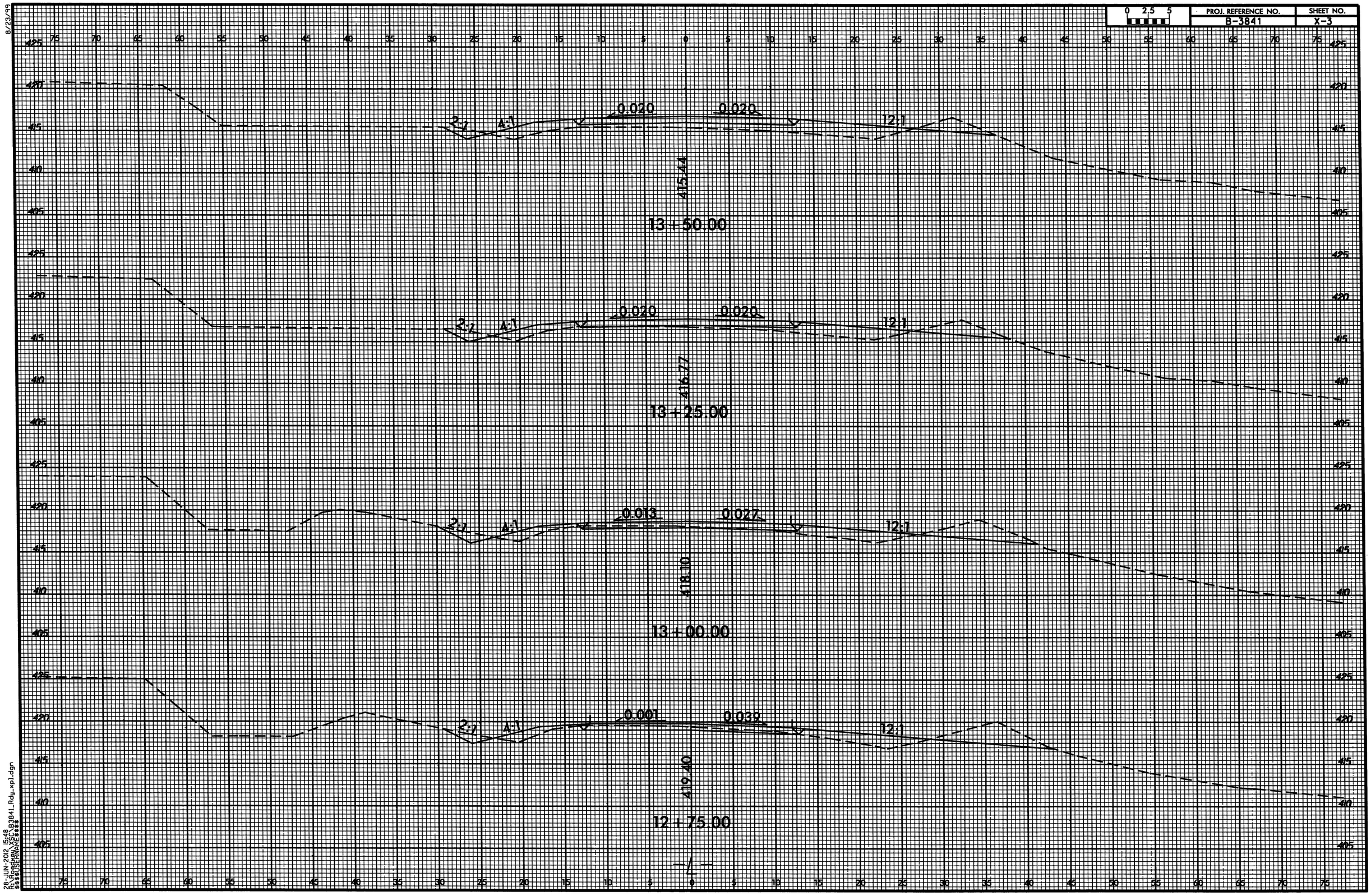
	B-3841	X-3



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	B-3841	X-4

14 + 35.00

410.71

14 + 25.00

411.25

14 + 00.00

412.65

13 + 75.00

414.07

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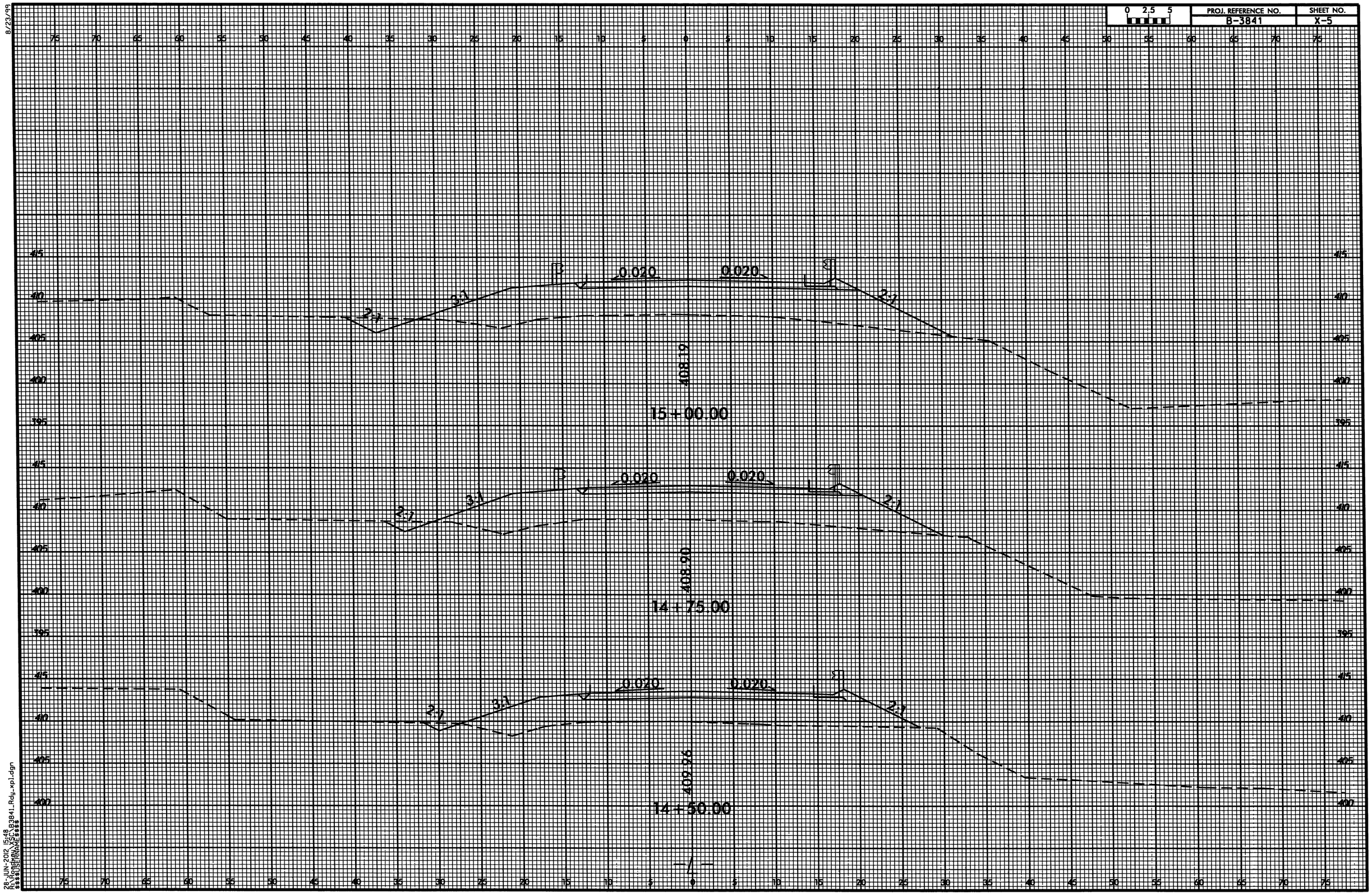
	B-3841	X-5



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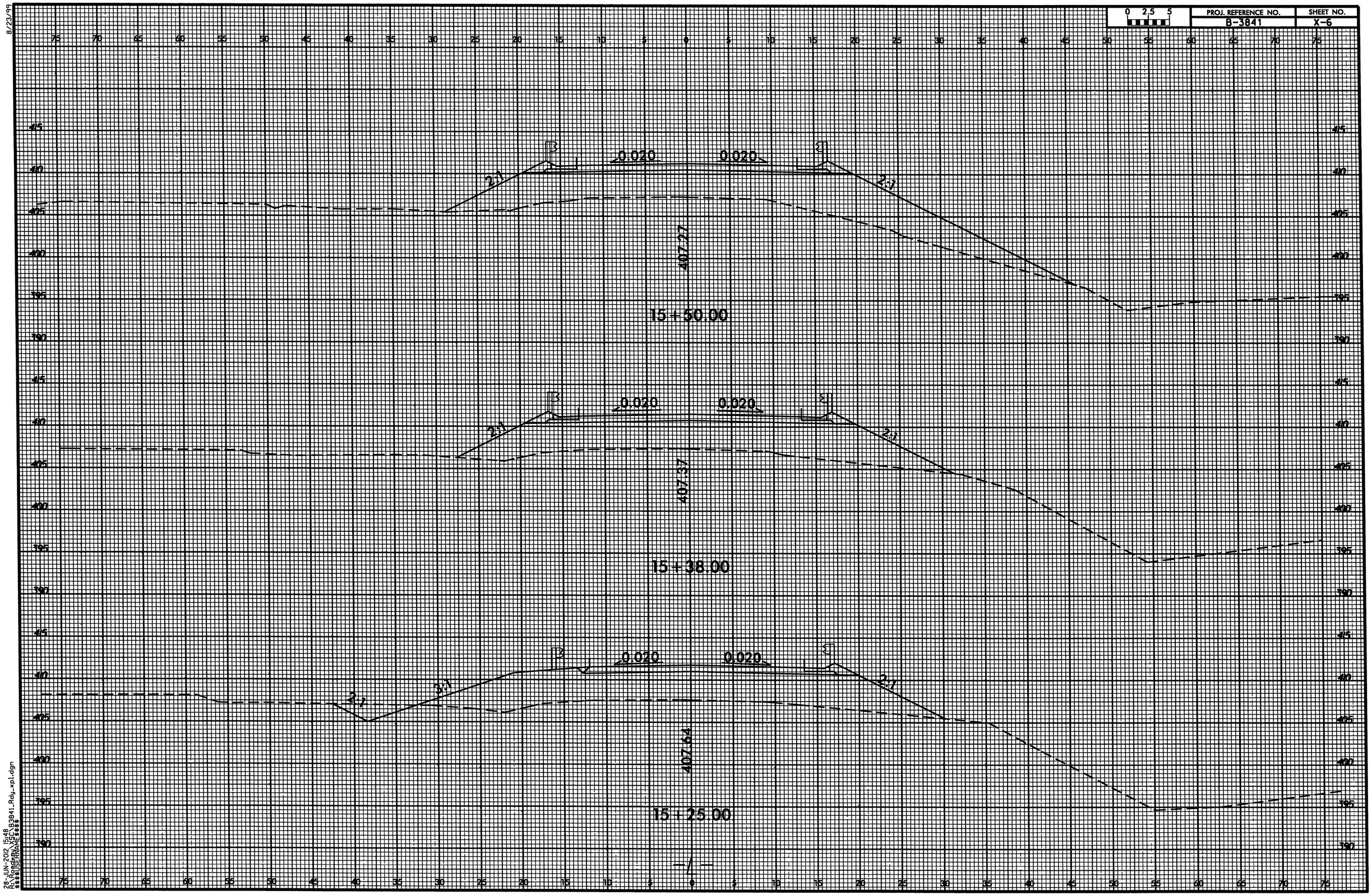
	B-3841	X-6



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	B-3841	X-7

BRIDGE

0.020 0.020

16+00.00

BRIDGE

0.020 0.020

15+75.00

0.020 0.020

2:1 2:1

407.24

15+53.00

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	B-3841	X-8

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

415
410
405
400
395
390
385
380

BRIDGE
0.020 0.020

16+50.00

BRIDGE
0.020 0.020

16+25.00

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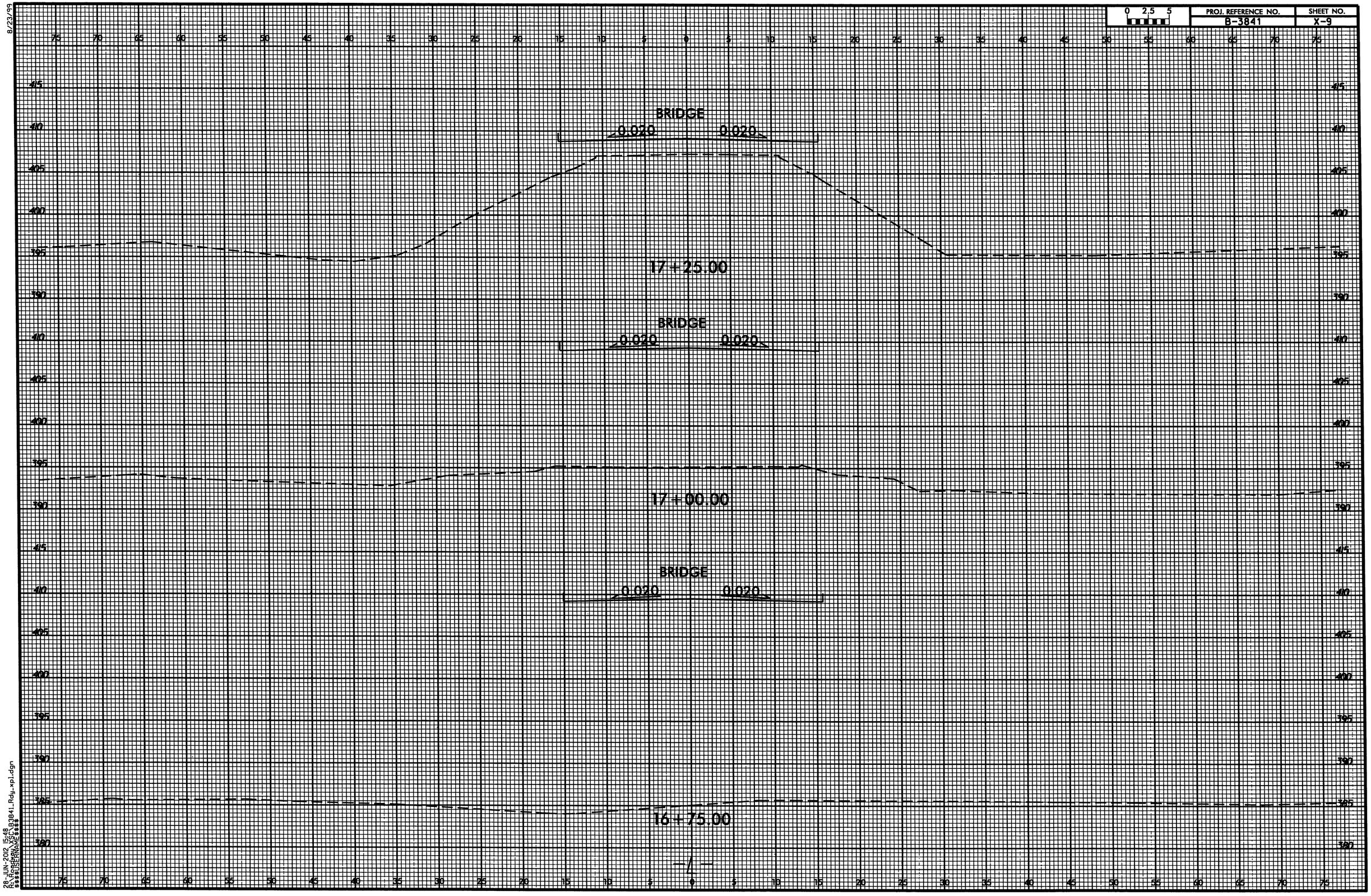
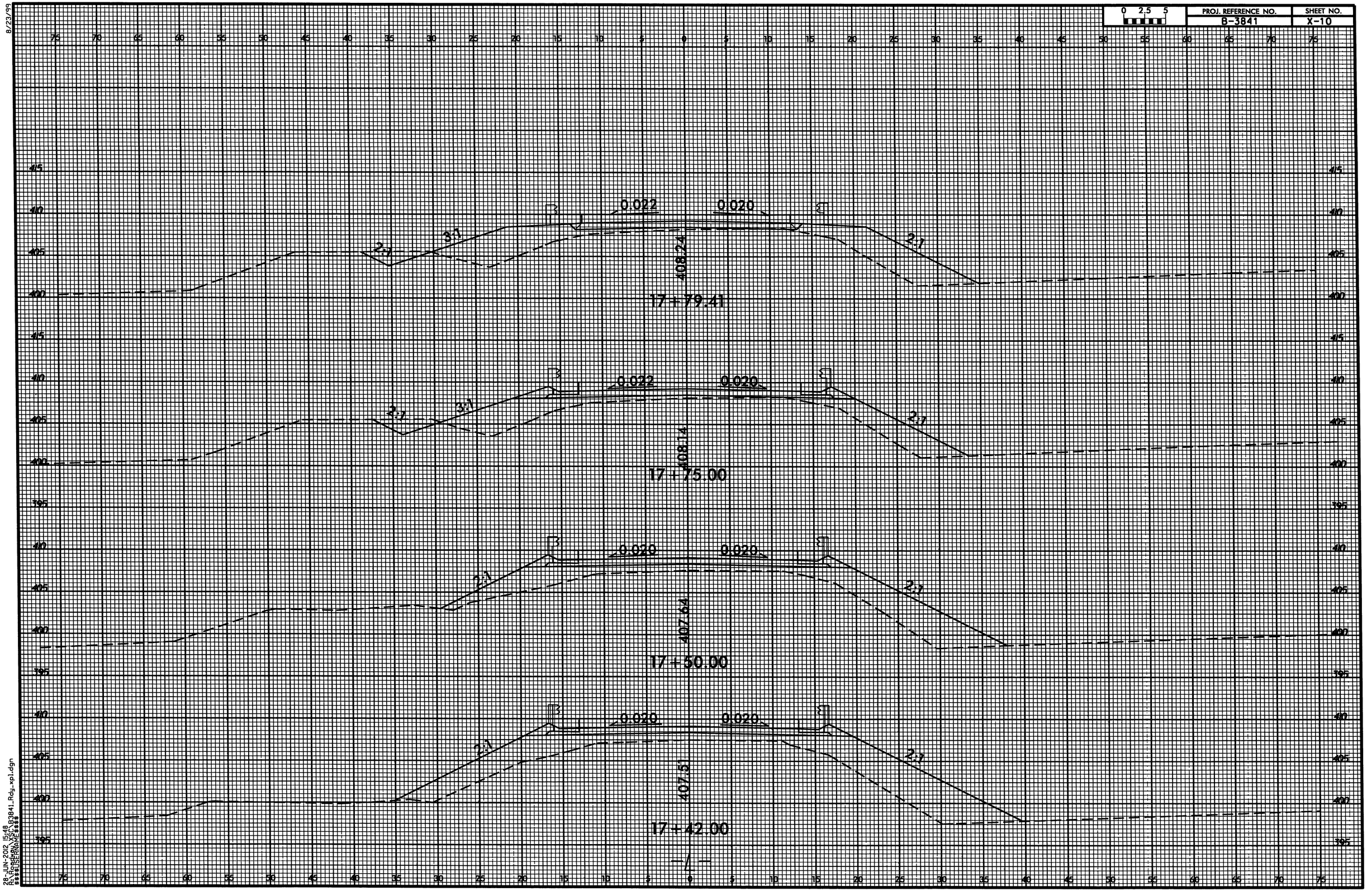


8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-3841	X-10



8/23/99

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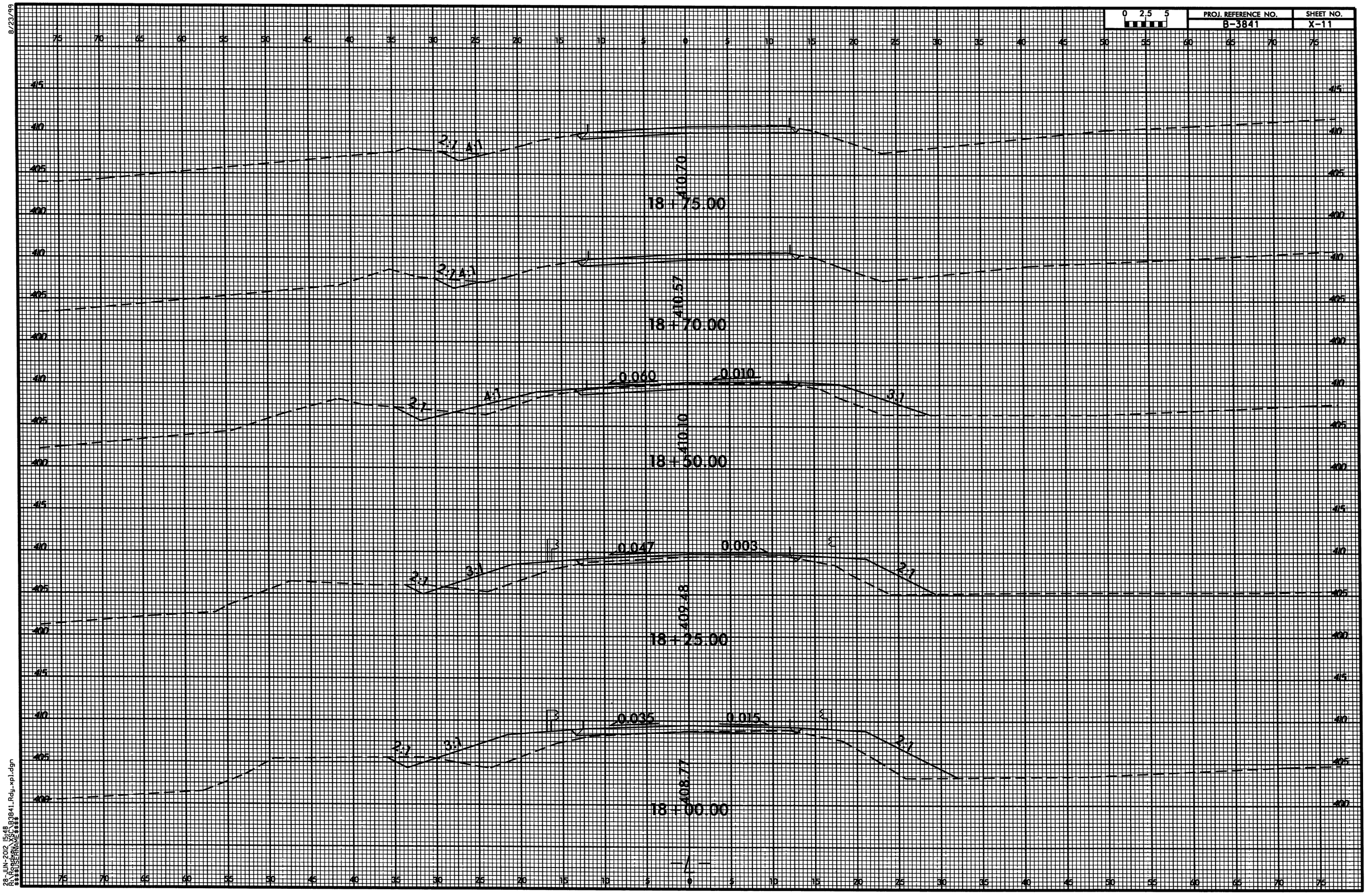

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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-3841	X-12

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

420
415
410
405
420
415
410
405
420
415
410
405
400
405
400

19+75.00

2.7 A:1

19+50.00

2.7 A:1

19+25.00

2.7 A:1

19+00.00

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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-3841	1510
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

BEGIN GRADE
-L- STA 11+93.00
ELEV = 423.50'

PI = 14+35.00
EL = 412.43'
VC = 375'
K = 112

PI = 17+70.00
EL = 408.35'
VC = 195'
K = 55

END GRADE
-L- STA 18+70.00
ELEV = 410.68'

-L- STA. 16+47.50
PROP. 1@31'2 1/4", 1@100'1 1/2", 1@36'2 1/4"
39" PRESTRESSED CONC BOX BEAM SPAN B;
21" CORED SLAB SPANS A & C
SKEW = 90^

END NEW
PAVEMENT
-L- STA 19+00.00

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 8600 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 403.9 FT
BASE DISCHARGE	= 12400 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 407.6 FT
OVERTOPPING DISCHARGE	= 14300 CFS
OVERTOPPING FREQUENCY	= 200 YRS +/-
OVERTOPPING ELEVATION	= 409.1 FT

LEFT DITCH

510 500 490 480 470 460 450 440 430 420 410 400 390 380 370 360 350 340 330 320 310

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00

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