STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

September 9, 2010

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

ATTN: Ms. Loretta Beckwith
NCDOT Coordinator

Subject: **Application for Section 404 Nationwide Permits 13, 23, & 33 and Section 401 Water Quality Certifications** for the proposed replacement of Bridge No. 419 over Pigeon River on US 13/23/74 in Haywood County, Federal Aid Project No. BRSTP-0019(3); Division 14; TIP No. B-3656
$240.00 debit WBS 33202.1.2

Dear Ms. Beckwith:

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 419 over the Pigeon River on US 13/23/74 in downtown Canton. There will be 85 linear feet of permanent impact to the Pigeon River due to bank stabilization and shoring up under the bridge. There will also be 0.42 acres of temporary stream impacts due to the use of causeways throughout the construction sequence. Please see the attached permit drawings and sequence of construction activities narrative for a more detailed explanation. Lastly, the newly constructed bridge will contain two piers in the water, one fewer than the existing structure, and will yield a total permanent impact area of 126 square feet for the construction of bents in the water.

Please see enclosed copies of the Pre-Construction Notification (PCN), Rapanos jurisdictional determination form, stormwater management plan, addendum to stormwater management plan B-3656 Narrative for Sequence of Construction, permit drawings, and roadway design plans for the above mentioned project. The Natural Resources Technical Report (NRTR) was completed in July 2009 and a Programmatic Categorical Exclusion (PCE) was completed in March 2009. Additional copies are available upon request. A Biological Opinion (BO) is in the final stages of completion by the United States Fish and Wildlife Services (USFWS). When NCDOT receives the final BO from the USFWS, the document will be forwarded under separate cover.

Comments from the North Carolina Wildlife Resources Commission (NCWRC) will be required prior to authorization by the Corps of Engineers. By copy of this letter and attachments, NCDOT hereby requests NCWRC review. NCDOT requests that NCWRC forward their comments to the Corps of Engineers and the NCDOT within 30 calendar days of receipt of this application.

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

TELEPHONE: 919-431-2000
FAX: 919-431-2002
WEBSITE: WWW.NCDOT.ORG

LOCATION:
4701 ATLANTIC AVENUE
SUITE 116
RALEIGH NC 27604

This project calls for a letting date of December 21, 2010 and a review date of November 2, 2010.

A copy of this permit application will be posted on the NCDOT Website at: http://www.ncdot.org/doh/preconstruct/pe/. If you have any questions or need additional information, please call Kris Dramby at (919) 431-6687.

Sincerely,

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

W/attachment

Mr. Brian Wrenn, NCDWQ (5 Copies)
Ms. Marella Buncick, USFWS
Ms. Marla Chambers, NCWRC
Dr. Charles Nicholson, TVA

W/o attachment (see website for attachments)

Dr. David Chang, P.E., Hydraulics
Mr. Dewayne Sykes, P.E., Utilities Unit
Mr. Victor Barbour, P.E., Project Services Unit
Mr. Greg Perfetti, P.E., Structure Design
Mr. Mark Staley, Roadside Environmental
Mr. J. B. Setzer, P.E. (Div. 14), Division Engineer
Mr. Mark Davis (Div. 14), DEO
Mr. Jay Bennett, P.E., Roadway Design
Mr. Majed Alghandour, P. E., Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. Scott McLendon, USACE, Wilmington
Ms. Natalie Lockhart, Project Development Engineer

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: 13, 23 & 33 or General Permit (GP) number:		
1c. Has the N WP 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:	Replacment of Bridge 419 Over Pigeon River on US 19/23/74.
2b. County:	Haywood
2c. Nearest municipality / town:	Canton
2d. Subdivision name:	*not applicable*
2e. NCDOT only, T.I.P. or state project no:	B-3656

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 i f applicable):	*not applicable*
3d. Street address:	1598 Mail Service Center
3e. City, state, zip:	Raleigh, NC 27699-1598
3f. Telephone no.:	(919) 431-6687
3g. Fax no.:	(919) 431-2002
3h. Email address:	kjdramby@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: 35.53175 (DD.DDDDDD) Longitude: - 82.84224 (-DD.DDDDDD)
1c. Property size:	3.5 acres within the Project Study Area
2. Surface Waters	
2a. Name of nearest body of water (stream, river, etc.) to proposed project:	Pigeon River
2b. Water Quality Classification of nearest receiving water:	C
2c. River basin:	French Broad River

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: TIP NO. B-3656's project study area is located in downtown Canton in an urban section of Haywood County primarily surrounded by commercial, industrial, and forested land. The topography in the project study area is comprised of a nearly level floodplain of Pigeon River. Elevation within the project study area measures approximately 2600 feet above mean sea level.
3b. List the total estimated acreage of all existing wetlands on the property: NA
3c. List the total estimated linear feet of all existing streams (intermittent and perennial) on the property: 140
3d. Explain the purpose of the proposed project: To replace a structurally deficient bridge.

3e. Describe the overall project in detail, including the type of equipment to be used:

Bridge No. 419 is 189 feet long. The replacement structure will be a bridge approximately 220 feet long providing a minimum 53.5-foot clear deck width. The bridge will include three 11-foot travel lanes. The proposed bridge will accommodate bicycle traffic on the north side on the structure. On each side of the bridge, 5.5-foot sidewalks will be provided. The bridge length is based on preliminary design information and is set by hydraulic requirements. The roadway grade of the new structure will be approximately the same as the existing structure.

The approach roadway will extend approximately 490 feet from the west end of the new bridge and 340 feet from the east end of the new bridge to accommodate parallel parking. The approaches will be widened to include three 11-foot lanes that will include 2-foot extra widening for the outside lanes, 2-6 inch concrete curb and gutter with 5.5-foot sidewalks and a 10-foot berm will be provided on each side of the roadway. The roadway will be designed as a Major Collector using 2004 AASHTO policy with a 30 mile per hour design speed.

Traffic will be detoured off-site during construction.

The existing bridge on US 19 over the Pigeon River in Canton consists of concrete deck girders atop masonry abutments and reinforced concrete web bents with reinforced concrete footings founded on timber piles.

Removing the existing bridge and constructing the proposed bridge will require temporary stone workpads in the Pigeon River. Plan sheets showing each phase and stage are included in the permit drawings. The removal and construction is proposed to begin from the east side of the river and is shown as Phase I, which has 3 stages. The work from the west is shown as Phase II, which also has 3 stages. Removal of the existing superstructure does not propose significant logistical concerns and, therefore, is not addressed in any of the following discussion. The removal may take place before or during any of the early stages. Twice during the removal and construction more than 50% of the Pigeon River will be blocked by the workpads. The slopes on both the east and west side of the river in the area of construction will be stabilized using Class II Riprap with filter fabric.

Phase I Stage 1 workpad will block 56% of the Pigeon River. This Phase and Stage are required for the removal of existing Bent 2 which is in the center of the river. The critical need is for removing the footing and pulling or cutting the piles. The footing is estimated to be 6 feet thick and must be broken apart before removal. The piles may be removed or cut off at the river bed. To keep debris from the river, the Bent 2 footing and piles need to be surrounded by the workpad. Existing Bent 3 may be removed at this stage or the next. When Bent 2 is removed, the workpad must be reduced to stage 2. Phase I stage 1 workpad will be in place no more than 14 calendar days.

Phase I stage 2 will block 34% of the river. This workpad is required for constructing the drilled pier foundations of proposed Bent 2. This workpad allows access to the drilled pier locations, but more importantly protects the river from drilling muds and spoil coming from the drilled hole. When the bent construction is completed, the workpad will be reduced to Stage 3 behind the mudflat.

Phase I Stage 3 will block 21% of the river. This workpad stage is requested for cranes to set box beams in Spans B and C. The setting of Span B box beams is described below. Phase I Stage 3 remains in place until all box beams are set in Spans B and C.

Phase II Stage 1 workpad will block 27% of the river, however it is in place along with Phase I Stage 3 workpad. These two workpads will block 48% of the river. This Phase and Stage are required for the removal of existing Bent 1. The requirements here are described above for the removal of Bent 2. After the bent is removed, the workpad will be increased for Phase II Stage 2.

Phase II Stage 2 will block 34% of the river, being in concurrently with Phase I Stage 3 will cause 55% of the river to be blocked. This workpad is required for the construction of the drilled pier foundations of proposed Bent 1. The above described need for constructing Bent 2 is the same for Bent 1. This stage will be in place approximately 60 calendar days.

Phase II Stage 3 reduces the workpad to the limits of Stage 1 for the setting of box beams and blocks 48% of the river. For Span B, trucks will deliver box beams to the west end of the bridge. A crane located on the workpad will pick up box beams from the trucks and set them in Span A. The crane will reposition to pick up only the west end of the box beam and the crane in the Phase I Stage 3 position will reach over Bent 2 to Bent 1, picking up the east end of the box beam, and together the two cranes will lift then set the box beams in Span B. The workpad remains in place until all box beams are set in Spans A and B. After the box beams are set, the temporary workpads will be removed.

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: Please consider this application and Rapanos form attached, the request for final JD.	☐ 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)
Site 1 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 2 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 3 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 4 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 5 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
Site 6 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
				2g. **Total wetland impacts**	X Permanent X Temporary

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	Riprap Pads and Slope Protection	Pigeon River	☒ PER ☐ INT	☒ Corps ☐ DWQ	165	85
Site 2 ☐ P ☒ T	Temporary Causeway: All Construction Scenarios Combined	Pigeon River	☒ PER ☐ INT	☒ Corps ☐ DWQ	165	170
Site 3 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
				3h. **Total stream and tributary impacts**		85 LF Perm (.02 Acre) 170 LF Temp (.42 Acre)

3i. Comments: 170 linear feet of temporary surface water impacts includes all construction phases combined. See project description for details.

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	X Permanent X Temporary

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:

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			☐ Yes ☐ No		
B2 ☐ P ☐ T			☐ Yes ☐ No		
B3 ☐ P ☐ T			☐ Yes ☐ No		
		6h. **Total buffer impacts**			
6i. Comments:					

D. Impact Justification and Mitigation

1. Avoidance and Minimization

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

Best management practices will be followed as outlined in "NCDOT's Best Management Practices for Construction and Maintenance Activities", Design Standards for Sensitive Watersheds will be used for protection of downstream waters and known A. Elktoe populations, new bridge has one fewer pier (bent) in the river thus increasing habitat availability within the water column and along the streambed, and traffic will be detoured offiste during construction to minimize temporary impacts to the river and reduce the overall time of construction disturbance.

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

3:1 fill slopes will be used where practicable, no deck drains discharging directly into river, existing road fill and vertical concrete abutments will be removed, new bridge will have increased waterway opening that will improve bridge conveyance and reduce flow velocity and erosion potential, rip-rap slope protection on banks beneath bridge will stabilize the embankment and reduce potential for erosion, and outfall pipe for storm drain system northeast of bridge will be constructed at shallow slope consistent with that of existing system to minimize flow velocity at outlet. New rip-rap pad at outlet will further reduce velocity.

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: Total impacts are below thresholds that would require mitigation. Only permanent impacts are due to bank stabilization measures and construction of bents in water. Overall, minimal if any net loss of waters.
2b. If yes, mitigation is required by (check all that apply):	☐ DWQ ☐ Corps
2c. If yes, which mitigat ion 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 no, explain why. Comments: if yes, see attached permit drawings.	☐ 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
5b. Have all of the 401 Unit submittal requirements been met?	☒ Yes ☐ No

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, ind icate 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? NHP GIS Element Occurences, USFWS website, and NCDOT field surveys.Based on NCDOT mussel survey results yielding Appalachian elktoe found within the project study area; a Biological Assessment was completed and submitted to the Asheville USFWS office on May 25, 2010 and formal Section 7 Consultation was activated on May 27, 2010. The biological opinion from USFWS is included in this permit application.		
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 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. L. Lyerly Applicant/Agent's Signature (Agent's signature is valid only if an authorization letter from the applicant is provided.)	9.9.10 Date

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

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

B. DISTRICT OFFICE, FILE NAME, AND NUMBER:

C. PROJECT LOCATION AND BACKGROUND INFORMATION:
State: NC County/parish/borough: Haywood City: Canton
Center coordinates of site (lat/long in degree decimal format): Lat. 35.53167° N, Long. 82.84228° W.
Universal Transverse Mercator:
Name of nearest waterbody: Pigeon River
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Pigeon River
Name of watershed or Hydrologic Unit Code (HUC): 06010106
☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

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

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Pick List** *"navigable waters of the U.S."* within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]
☐ Waters subject to the ebb and flow of the tide.
☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
Explain: .

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Pick List** *"waters of the U.S."* within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
      ☒ TNWs, including territorial seas
      ☐ Wetlands adjacent to TNWs
      ☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
      ☐ Non-RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
      ☐ Impoundments of jurisdictional waters
      ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
      Non-wetland waters: 180linear feet: 165width (ft) and/or acres.
      Wetlands: acres.

   c. **Limits (boundaries) of jurisdiction** based on: **1987 Delineation Manual**
      Elevation of established OHWM (if known): .

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   ☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.
   Explain: .

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[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**
   Identify TNW: **Pigeon River**.

   Summarize rationale supporting determination: Large River Complex.

2. **Wetland adjacent to TNW**
   Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

   (i) General Area Conditions:
   Watershed size: **Pick List**
   Drainage area: **Pick List**
   Average annual rainfall: inches
   Average annual snowfall: inches

   (ii) Physical Characteristics:
   (a) Relationship with TNW:
   ☐ Tributary flows directly into TNW.
   ☐ Tributary flows through **Pick List** tributaries before entering TNW.

   Project waters are **Pick List** river miles from TNW.
   Project waters are **Pick List** river miles from RPW.
   Project waters are **Pick List** aerial (straight) miles from TNW.
   Project waters are **Pick List** aerial (straight) miles from RPW.
   Project waters cross or serve as state boundaries. Explain:

   Identify flow route to TNW[5]:
   Tributary stream order, if known:

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.
[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☐ Natural
☐ Artificial (man-made). Explain: .
☐ Manipulated (man-altered). Explain: .

Tributary properties with respect to top of bank (estimate):
Average width: feet
Average depth: feet
Average side slopes: **Pick List.**

Primary tributary substrate composition (check all that apply):

☐ Silts	☐ Sands	☐ Concrete
☐ Cobbles	☐ Gravel	☐ Muck
☐ Bedrock	☐ Vegetation. Type/% cover:	
☐ Other. Explain: .		

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: .
Presence of run/riffle/pool complexes. Explain: .
Tributary geometry: **Pick List**
Tributary gradient (approximate average slope): %

(c) Flow:
Tributary provides for: **Pick List**
Estimate average number of flow events in review area/year: **Pick List**
Describe flow regime: .
Other information on duration and volume: .

Surface flow is: **Pick List.** Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .
☐ Dye (or other) test performed: .

Tributary has (check all that apply):
☐ Bed and banks
☐ OHWM[6] (check all indicators that apply):

☐ clear, natural line impressed on the bank	☐ the presence of litter and debris
☐ changes in the character of soil	☐ destruction of terrestrial vegetation
☐ shelving	☐ the presence of wrack line
☐ vegetation matted down, bent, or absent	☐ sediment sorting
☐ leaf litter disturbed or washed away	☐ scour
☐ sediment deposition	☐ multiple observed or predicted flow events
☐ water staining	☐ abrupt change in plant community
☐ other (list):	

☐ Discontinuous OHWM.[7] Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

☐ High Tide Line indicated by:	☐ Mean High Water Mark indicated by:
☐ oil or scum line along shore objects	☐ survey to available datum;
☐ fine shell or debris deposits (foreshore)	☐ physical markings;
☐ physical markings/characteristics	☐ vegetation lines/changes in vegetation types.
☐ tidal gauges	
☐ other (list):	

(iii) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: .
Identify specific pollutants, if known: .

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[6]A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7]Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- ☐ Riparian corridor. Characteristics (type, average width):
- ☐ Wetland fringe. Characteristics:
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings:
  - ☐ Fish/spawn areas. Explain findings:
  - ☐ Other environmentally-sensitive species. Explain findings:
  - ☐ Aquatic/wildlife diversity. Explain findings:

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size: acres

Wetland type. Explain:

Wetland quality. Explain:

Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:

Flow is: **Pick List**. Explain:

Surface flow is: **Pick List**

Characteristics:

Subsurface flow: **Pick List**. Explain findings:

- ☐ Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

- ☐ Directly abutting
- ☐ Not directly abutting
  - ☐ Discrete wetland hydrologic connection. Explain:
  - ☐ Ecological connection. Explain:
  - ☐ Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW

Project wetlands are **Pick List** river miles from TNW.

Project waters are **Pick List** aerial (straight) miles from TNW.

Flow is from: **Pick List.**

Estimate approximate location of wetland as within the **Pick List** floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

- ☐ Riparian buffer. Characteristics (type, average width):
- ☐ Vegetation type/percent cover. Explain:
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings:
  - ☐ Fish/spawn areas. Explain findings:
  - ☐ Other environmentally-sensitive species. Explain findings:
  - ☐ Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: **Pick List**

Approximately ( ) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☒ TNWs: 180linear feet165width (ft), Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:
   - ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):
- ☐ Tributary waters: linear feet width (ft).
- ☐ Other non-wetland waters: acres.
  Identify type(s) of waters: .

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
   ☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional waters within the review area (check all that apply):
   - ☐ Tributary waters: linear feet width (ft).
   - ☐ Other non-wetland waters: acres.
     Identify type(s) of waters: .

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
   ☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
   - ☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

   - ☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
   ☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
   ☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.[9]**
   As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
   - ☐ Demonstrate that impoundment was created from "waters of the U.S.," or
   - ☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
   - ☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]
- ☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
- ☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
- ☐ which are or could be used for industrial purposes by industries in interstate commerce.
- ☐ Interstate isolated waters. Explain: .
- ☐ Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

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[8] See Footnote # 3.
[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
[10] **Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.***

Provide estimates for jurisdictional waters in the review area (check all that apply):
☒ Tributary waters: linear feet width (ft).
☒ Other non-wetland waters: acres.
Identify type(s) of waters: .
☒ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
☒ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☒ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☒ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
☒ Other: (explain, if not covered above): .

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
☒ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☒ Lakes/ponds: acres.
☒ Other non-wetland waters: acres. List type of aquatic resource: .
☒ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
☒ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☒ Lakes/ponds: acres.
☒ Other non-wetland waters: acres. List type of aquatic resource: .
☒ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall 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: .
☒ 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: .
☒ Applicable/supporting case law: .
☒ Applicable/supporting scientific literature: .
☒ Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD: .

North Carolina Department of Transportation
Highway Stormwater Program
STORMWATER MANAGEMENT PLAN

Version 1

Page of

General Project Information

Project No.:	B-3656 (WBS 33202.1.2)		Date:	6/7/2010			
City/Town:	Canton		Designer:	JMS			
County(ies):	Haywood County		Project Manager:				
River Basin(s):	French Broad		CAMA County?	no	TVA County?	yes	
Primary Receiving Water:	Pigeon River		NCDWQ Stream Index:	5-(7)			
NCDWQ Surface Water Classification for Primary Receiving Water		Primary:	Class C				
		Supplemental:					
Other Stream Classification:							
303(d) Stream?:	no	Type(s) of Impairment:					
State Stormwater Permit Required?	no	If yes, why?:					
Could the Project Impact Threatened or Endangered Species?			yes				
Description:	Appalachian Elktoe Mussels (present approx. 50 ft. upstream of bridge)						
Anadromous Fish Present?	no						
Description:							
Buffer Rules in Effect?	no		Buffer Rules:				

Existing Site

Description of Existing Project Area:	Existing bridge is structurally deficient. Currently serves two lanes of one-way (westbound) traffic in downtown Canton.
Average Daily Traffic:	4450 VPD
Existing Cross Section:	Two-lane (one-way) with 2-5' sidewalks
Surrounding Land Use:	Urban (downtown area)
General Comments:	Overtops at less than 20 yr frequency. Road grade is at floodplain elevation.

Project Project

Description of Proposed Project:	Replacement of Bridge #419 over Pigeon River on US10-23-74		
Average Daily Traffic:	8900 VPD (2025)		
Proposed Cross-Section:	3-lanes (one way) with 5.5 ft. sidewalk and 2 ft. bike lanes each side.		
Interchange Modification:	no	Median Type:	n/a
Terminus:			
Terminus:			
Project Length (lin. miles/feet):		Added Impervious Area (ac.):	
General Comments:	Replacement will be "in-kind". Grade will be maintained. Vertical abutment on West end to be replaced with sloping abutment. Vertical abutment on east end to be replaced with new vertical abutment, providing accommodation for future greenway trail with 8 ft. vertical clearance under bridge.(See Stormwater Management Plan Narrative and Addendum for additional information.)		

STORMWATER MANAGEMENT PLAN NARRATIVE

TIP No. B-3656 (33202.1.2)
Haywood County
June 2010

Project Description

This project consists of approach roadway work and the replacement of Bridge #419 over Pigeon River on US 19-23-74 (Park Street) in downtown Canton. The existing two-lane facility serves westbound traffic, and it has 11 ft. lanes with 5 ft. wide sidewalks on either side across the bridge. The proposed bridge will be wider, comprised of three lanes with 12 ft. lanes and 4 ft. paved shoulders plus 5.5 ft. wide sidewalks on either side. The existing 188 ft. bridge (four spans at 47 ft. ea.) will be replaced with a 225 ft. long (three spans at 75 ft. ea.) bridge supported by 33-inch reinforced concrete box-beam girders on drilled-shaft reinforced concrete piers. The existing bridge has vertical concrete abutments. These will be removed, and the new bridge will have sloping "spill-through" type abutments; hence, the need for the longer bridge length. Sorrels Street, which intersects with Park Street immediately at the east end of the existing bridge will need to be realigned approximately 40 ft. to the east of its present location in order to accommodate the proposed bridge and meet current roadway design standards. The existing roadway grade is at essentially the same elevation as the adjacent properties' ground level, as there are numerous driveways and side parking areas to access adjacent businesses along this street in downtown Canton. Therefore, the existing roadway grade is being maintained. The roadway vertical alignment crests on the existing bridge, as it will also on the proposed replacement bridge. Pursuant to a recent decision by Town of Canton in April 2010, NCDOT has agreed to design the bridge to accommodate a future greenway crossing under the east end of the bridge. This will be accomplished with a vertical abutment on the east end, and excavation of the east river bank underneath the bridge to provide 8 ft. vertical clearance for the future trail.

Project Involvement

The project will require only minimal widening of the existing roadway approaches. Guardrail will be added on the south side of the east end of the bridge, turning onto the west side of the realigned Sorrells Street. There are existing closed storm drain systems east and west of the existing bridge which outfall on the downstream (north) side of the bridge onto the banks of Pigeon River. Stormwater runoff west of the bridge will be collected and conveyed in the existing storm drain system. Stormwater runoff east of the bridge will be partially be collected in the existing system; however, a portion of the existing storm drain system will be replaced to remove the system from being underneath the travelway. The existing outfall location on the east side will be utilized, and the slope of the replacement system will be consistent with that of the exisitng system in order to minimize the outfall flow velocity, and a rip-rap pad will be provided at the outlet to prevent erosion.

At this location, Pigeon River has a Best Usage Classification of Class C - suitable for aquatic life, secondary recreation, and as a source of fresh water (source: DWQ BIMS). Pigeon River is in the French Broad River watershed, which is also is subject to Tennessee Valley Authority regulations. This location on Pigeon River is not a designated trout stream. A recent survey of the Pigeon River at the site of B-3656 turned up the federally endangered Appalachian elktoe (mussel species). As a result, a formal Biological Assessment consultation was held on the project site on October 22, 2009. At this consultation, it was noted that there

are Appalachian elktoe approximately 50 ft. upstream of the edge of the existing bridge; however, the presence of a dam downstream of the bridge prevents migration of the mussels further downstream. Therefore, it was recommended that any utility relocations, bridge construction work, etc. be carried out primarily on the downstream side of the existing bridge. Temporary causeways will be needed for bridge demolition and replacement construction. It was recommended that no more than half the existing waterway be blocked by the temporary causeways at any given time during construction; however, upon further review, it will be necessary briefly during the demolition stage to block more than half of the waterway. A provision will be specified in the construction sequence that this stage of construction shall not exceed 14 days. (See attached Addendum for details regarding the construction sequence.)

Best Management Practices

Best Management Practices (BMPs) utilized on the project are as follows:

-No deck drains on bridge
-Traffic will be detoured offsite during construction to minimize temporary impacts to the river and reduce the time of construction disturbance.
-Existing road fill and vertical concrete abutments will be removed, and new bridge will have increased waterway opening, which will improve bridge conveyance and reduce flow velocity and erosion potential.
- Outfall pipe for storm drain system northeast of bridge will be constructed at shallow slope consistent with that of existing system to minimize flow velocity at outlet. New rip-rap pad at outlet will further reduce velocity.
-New bridge has one less pier (bent) in the river than the exisitng bridge.
-Rip-rap slope protection on banks beneath bridge will stabilize the embankment and reduce potential for erosion.

Addendum to Stormwater Management Plan

B-3656 NARRATIVE FOR SEQUENCE OF CONSTRUCTION

The existing bridge on US 19 over the Pigeon River in Canton, NC consists of concrete deck girders atop masonry abutments and reinforced concrete web bents with reinforced concrete footings founded on timber piles.

Removing the existing bridge and constructing the proposed bridge will require temporary stone workpads in the Pigeon River. The removal and construction is proposed to begin from the east side of the river and is shown as Phase I. Phase I has 3 stages. The work from the west is shown as Phase II, and Phase II has 3 stages. Removal of the existing superstructure does not propose significant logistical concerns and therefore is not addressed in any of the following discussion, but the removal may take place before or during any of the early stages. Twice during the removal and construction more than 50% of the Pigeon River will be blocked by the workpads. (See attached drawings.)

Phase I Stage 1 workpad will block 56% of the Pigeon River. This Phase and Stage are required for the removal of Existing Bent 2 which is in the center of the river. The critical need is for removing the footing and pulling or cutting the piles. The footing is estimated to be 6' thick and must be broken apart before removal. The piles may be removed or cut off at the river bed. To keep debris from the river, the Bent 2 footing and piles need to be surrounded by the workpad. Existing Bent 3 may be removed at this stage or the next. When Bent 2 is removed, the workpad must be reduced to Stage 2. Phase I Stage 1 workpad will be in place no more than 14 calendar days.

Phase I Stage 2 will block 34% of the river. This workpad is required for constructing the drilled pier foundations of proposed Bent 2. This workpad allows access to the drilled pier locations, but more importantly protects the river from drilling muds and spoil coming from the drilled hole. When the bent construction is completed, the workpad will be reduced to Stage 3 behind the mudflat.

Phase I Stage 3 will block 21% of the river. This workpad stage is requested for cranes to set box beams in Spans B and C. The setting of Span B box beams is described below. Phase I Stage 3 remains in place until all box beams are set in Spans B and C.

Phase II Stage 1 workpad will block 27% of the river, however it is in place along with Phase I Stage 3 workpad. These two workpads will block 48% of the river. This Phase and Stage are required for the removal of Existing Bent 1. The needs here are described above for the removal of Bent 2. After the Bent is removed, the workpad will be increased for Phase II Stage 2.

Phase II Stage 2 will block 34% of the river, being in concurrently with Phase I Stage 3 will cause 55% of the river to be blocked. This workpad is required for the construction of the drilled pier foundations of proposed Bent 1. The above described need for constructing Bent 2 is the same for Bent 1. This stage will be in place approximately 60 calendar days.

Phase II Stage3 reduces the workpad to the limits of Stage 1 for the setting of box beams and blocking 48% of the river. For Span B, trucks will deliver box beams to the west end of the bridge. A crane located on the workpad will pick up box beams from the trucks and set them in Span A. The crane will reposition to pick up only the west end of the box beam and the crane in the Phase I Stage 3 position will reach over Bent 2 to Bent 1, picking up the east end of the box beam, and together the two cranes will lift then set the box beams in Span B. The workpad remains in place until all box beams are set in Spans A and B.

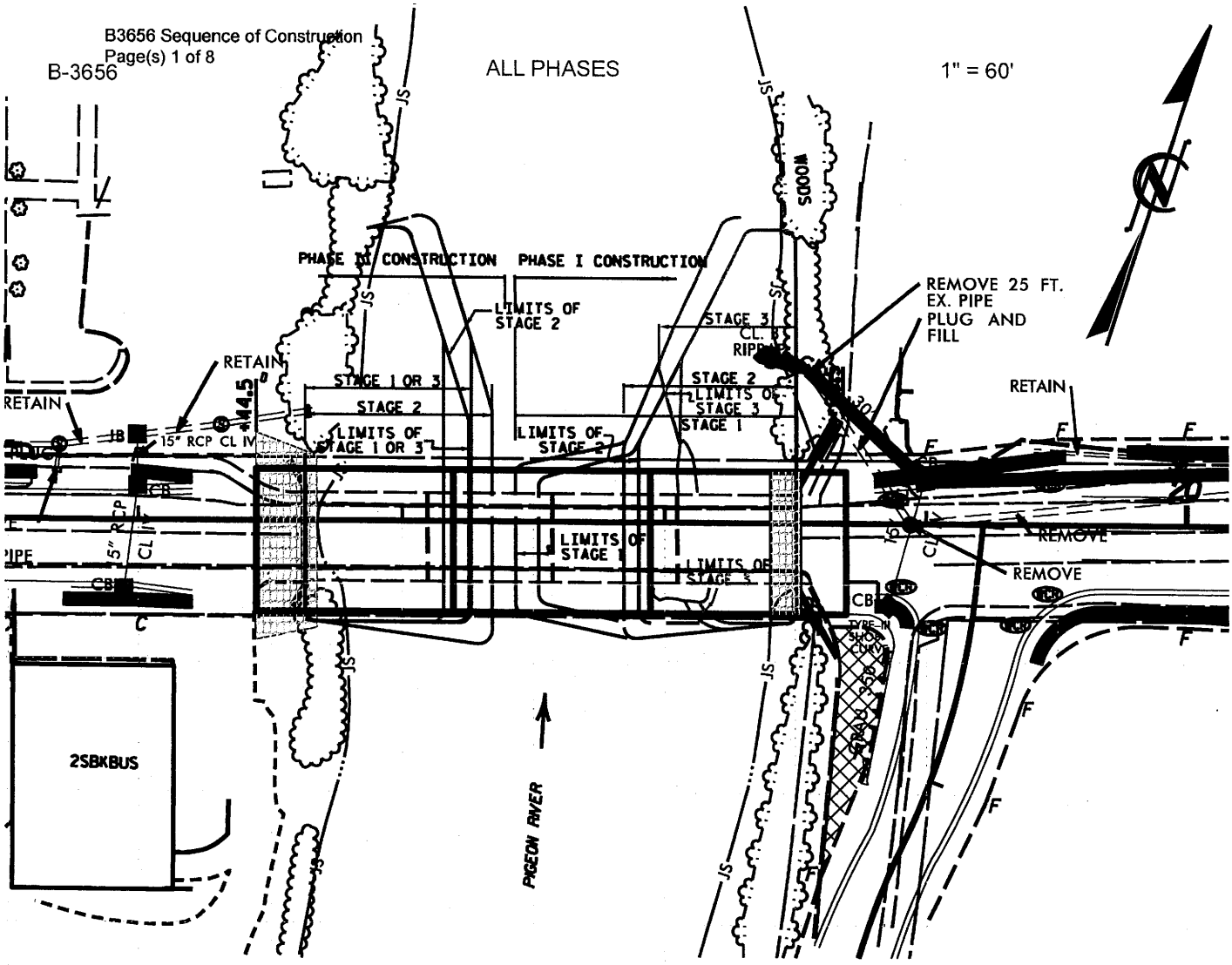
After the box beams are set, the temporary workpads will be removed.

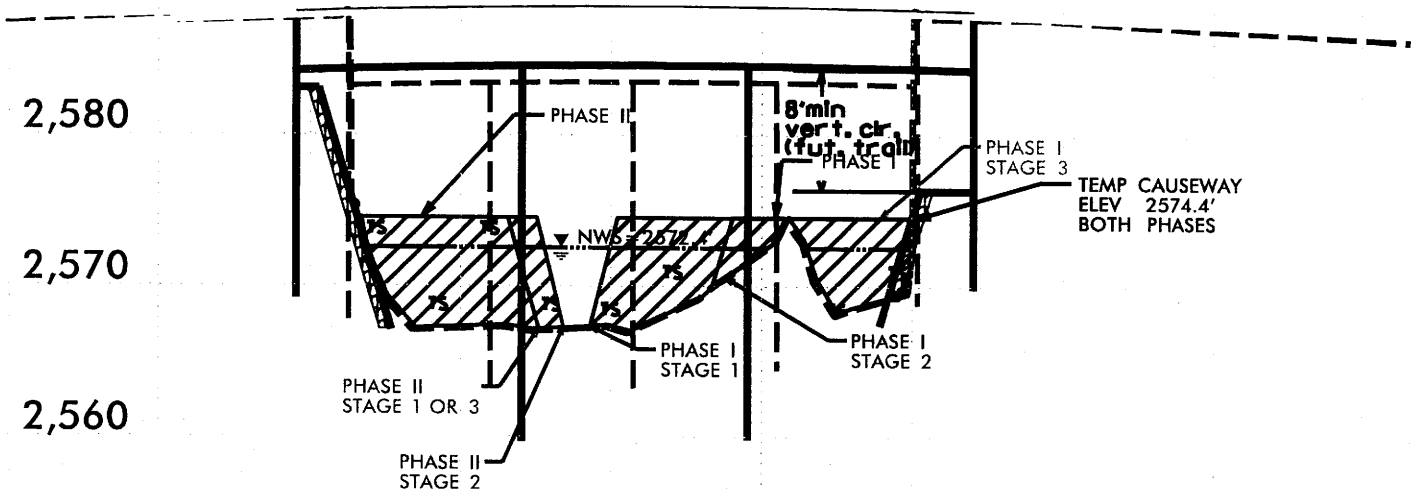
B3656 Sequence of Construction
Page(s) 1 of 8

B-3656

ALL PHASES

1" = 60'

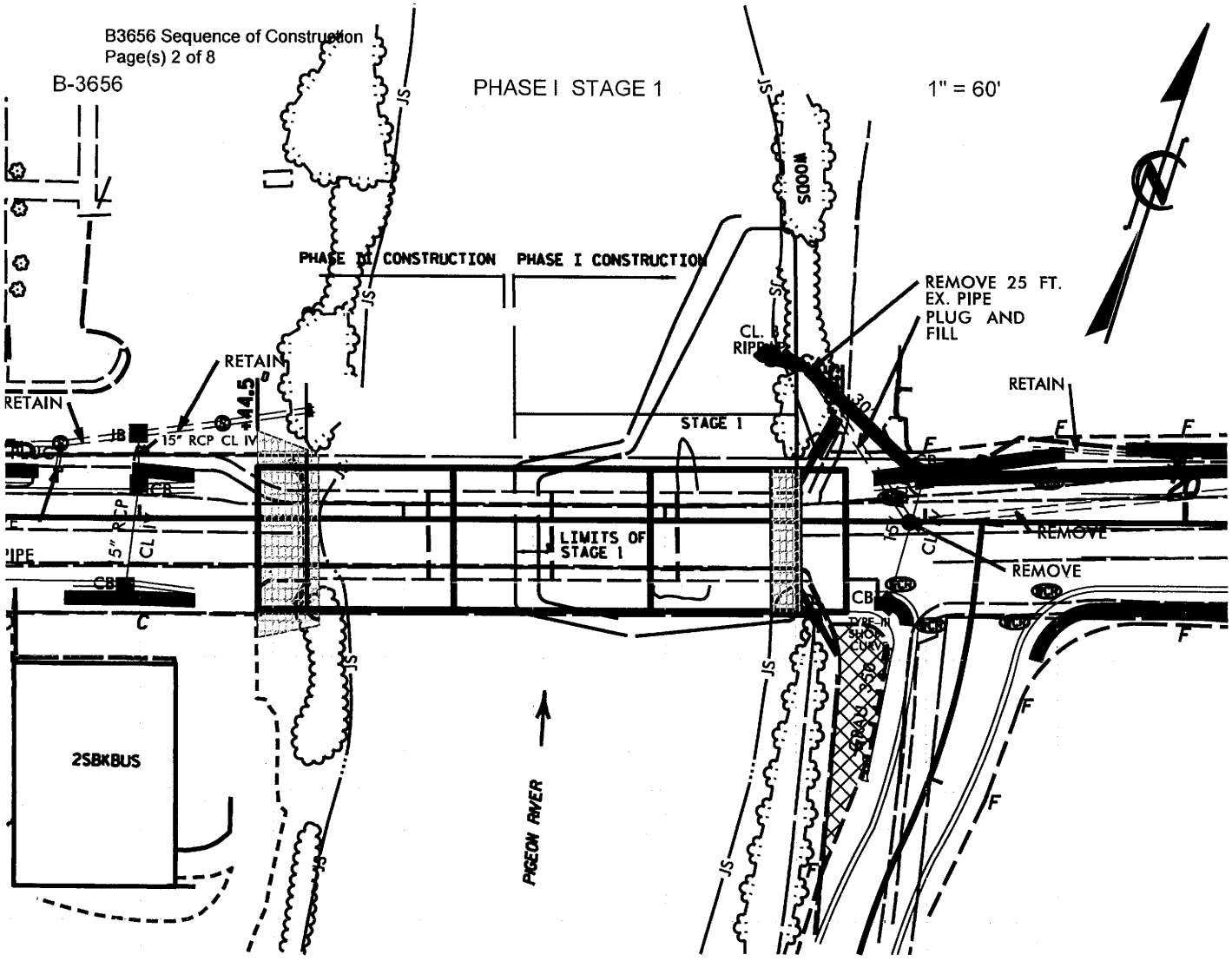


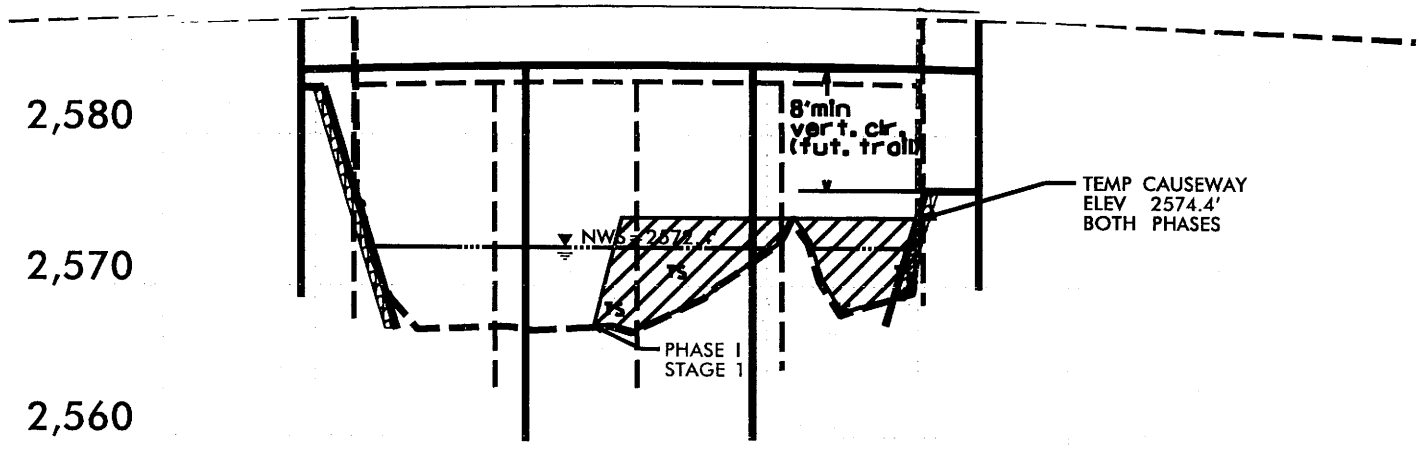


B-3656

PHASE I STAGE 1

1" = 60'





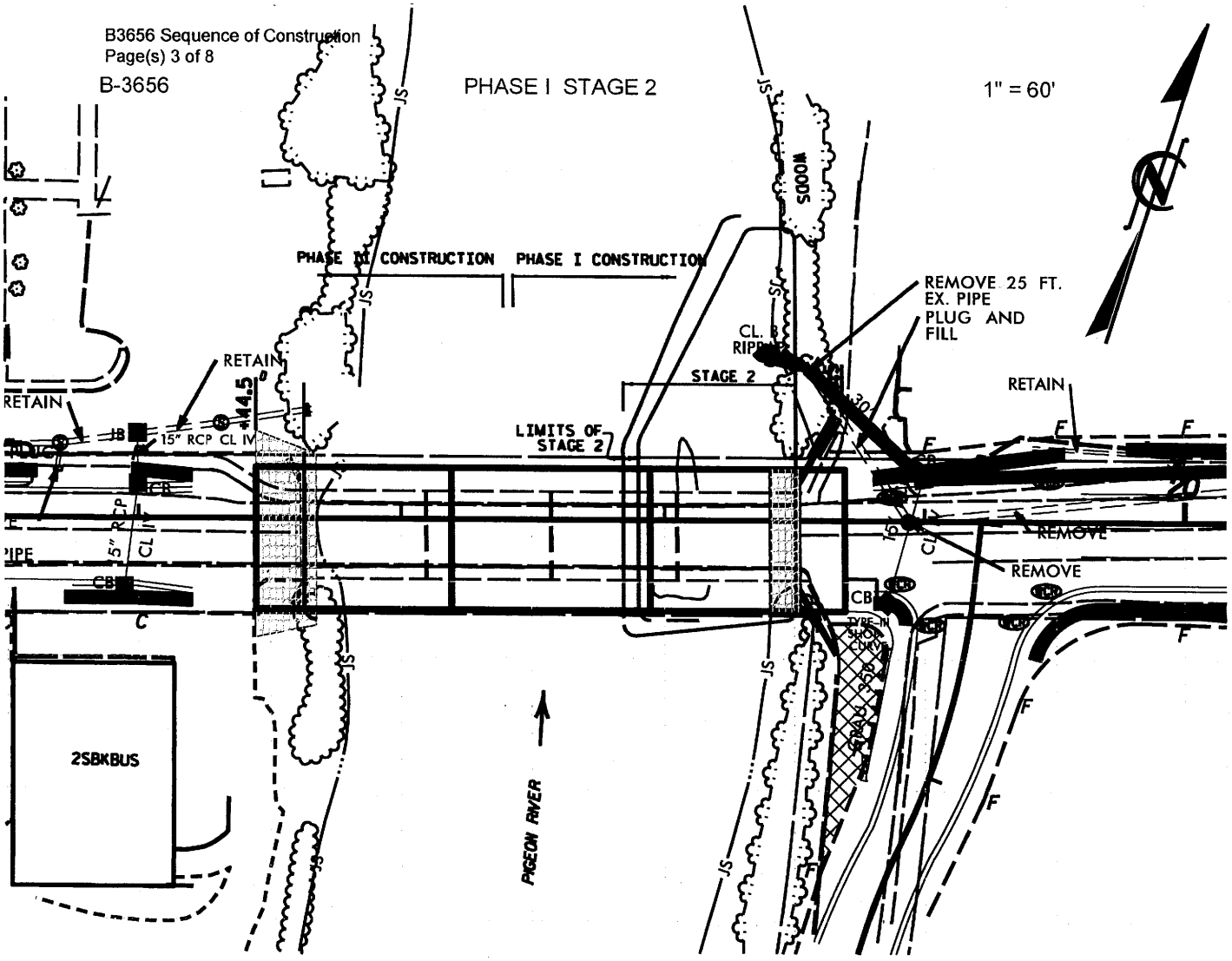
16 17 18 19 20

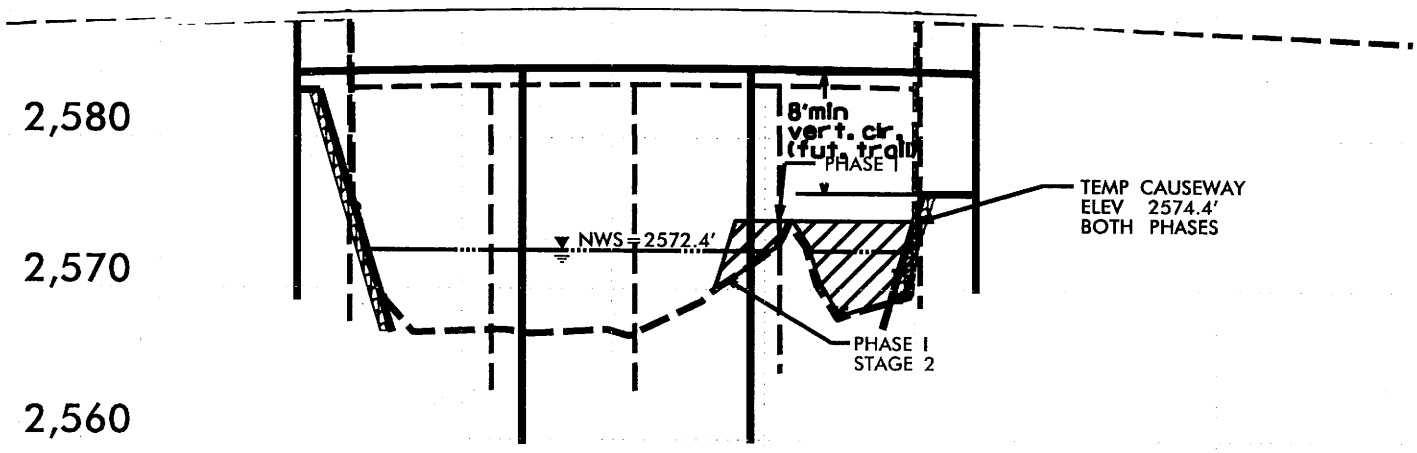
B3656 Sequence of Construction
Page(s) 3 of 8

B-3656

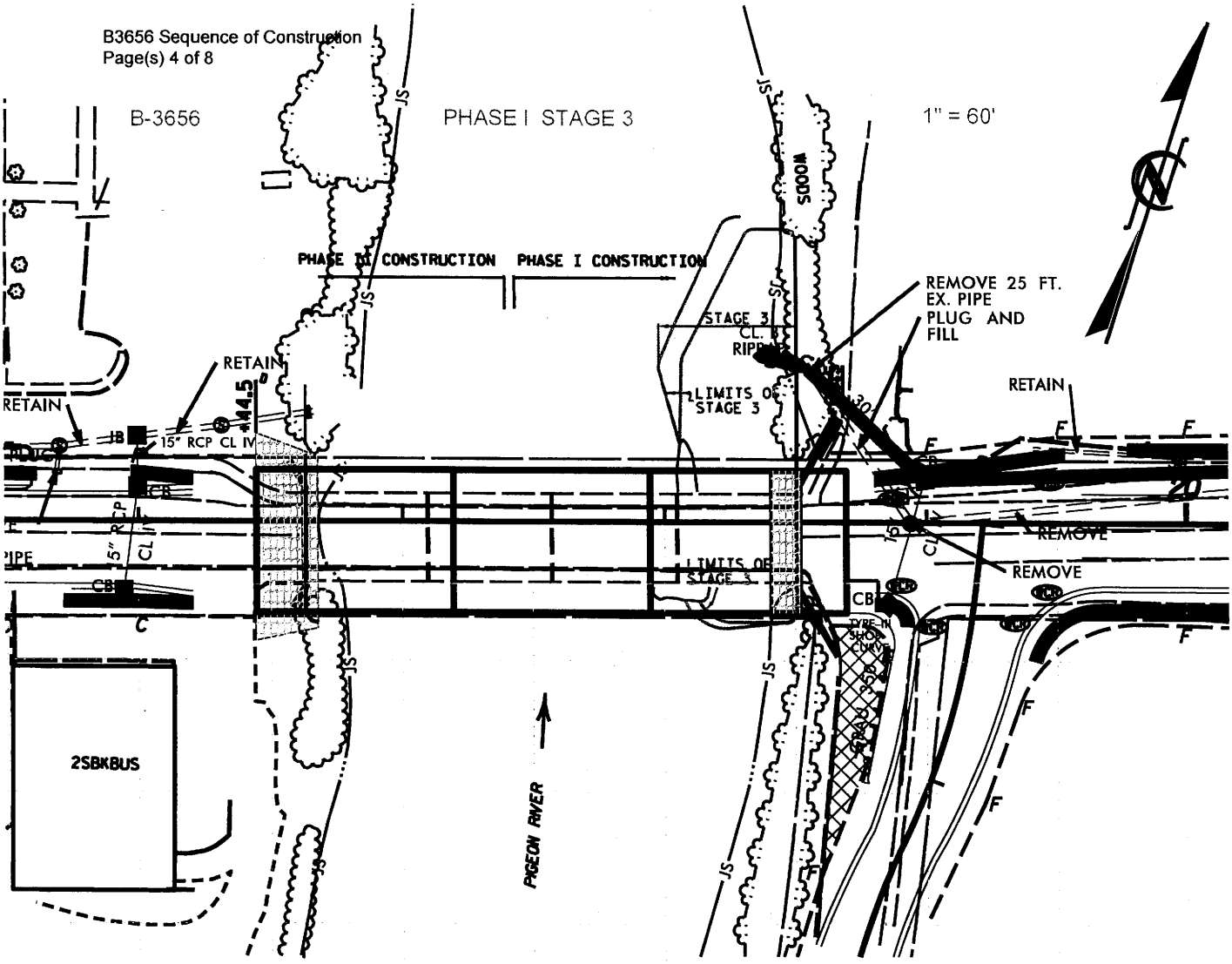
PHASE I STAGE 2

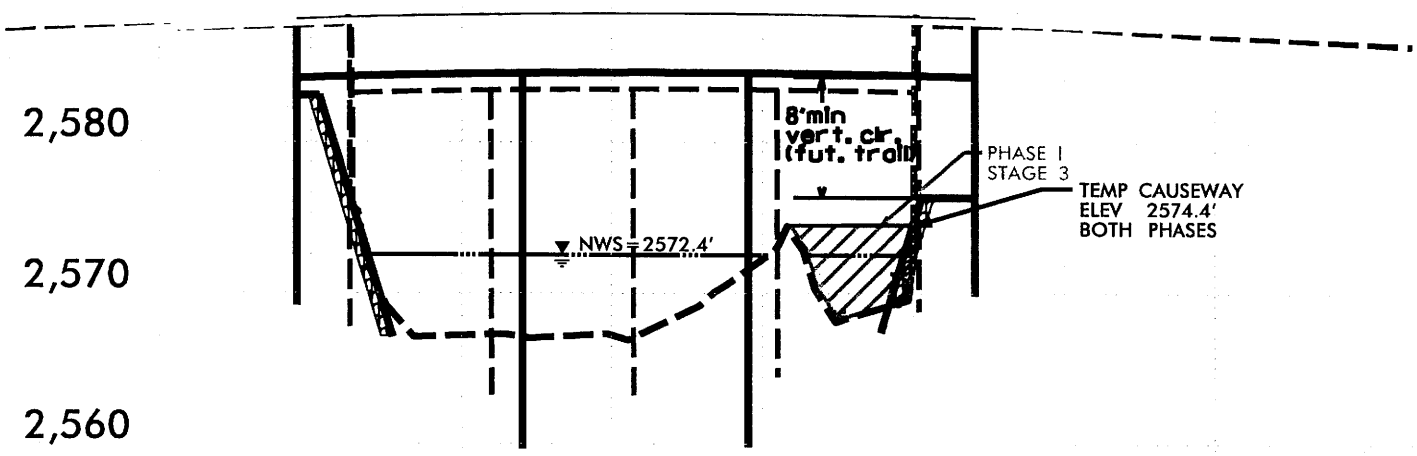
1" = 60'

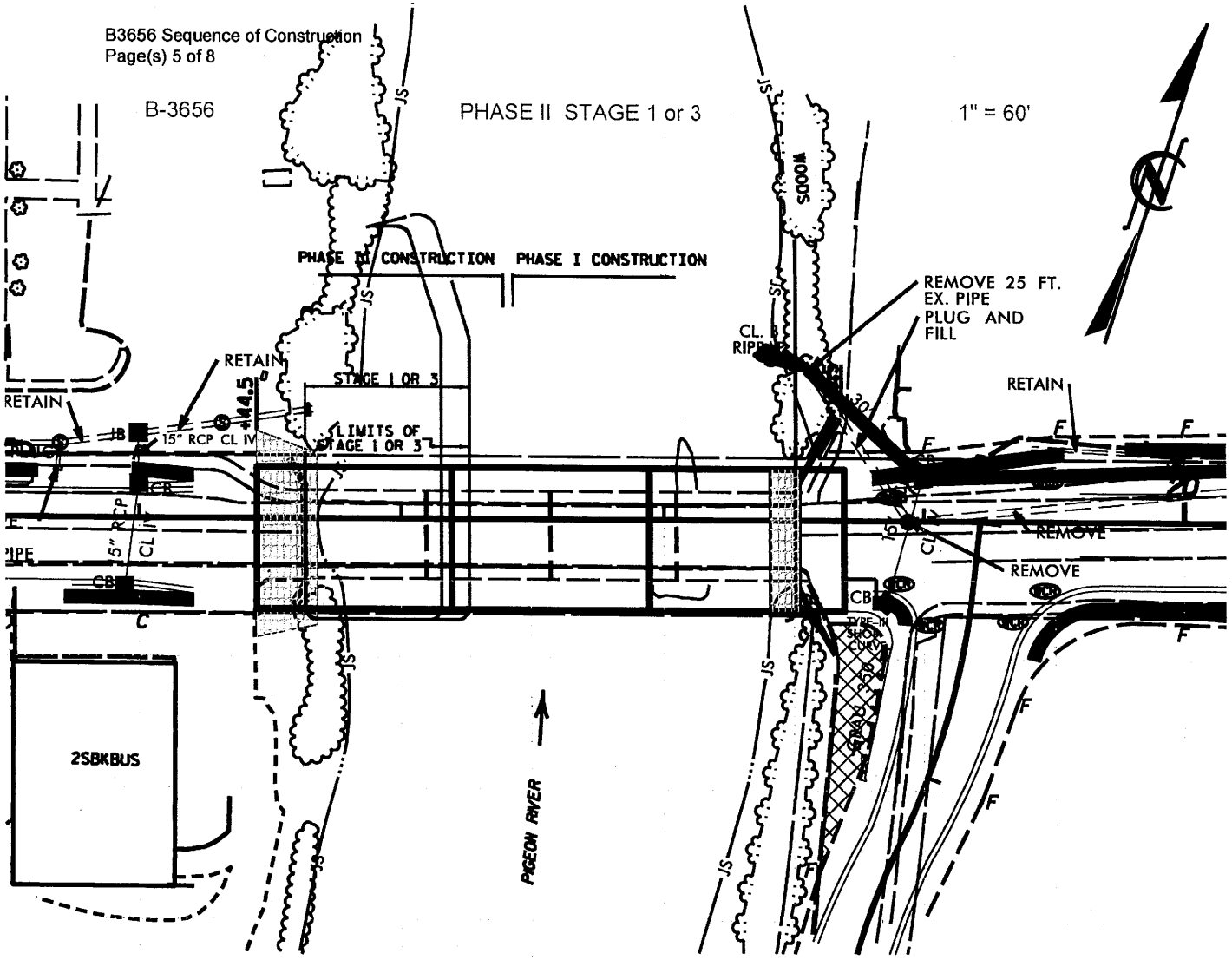


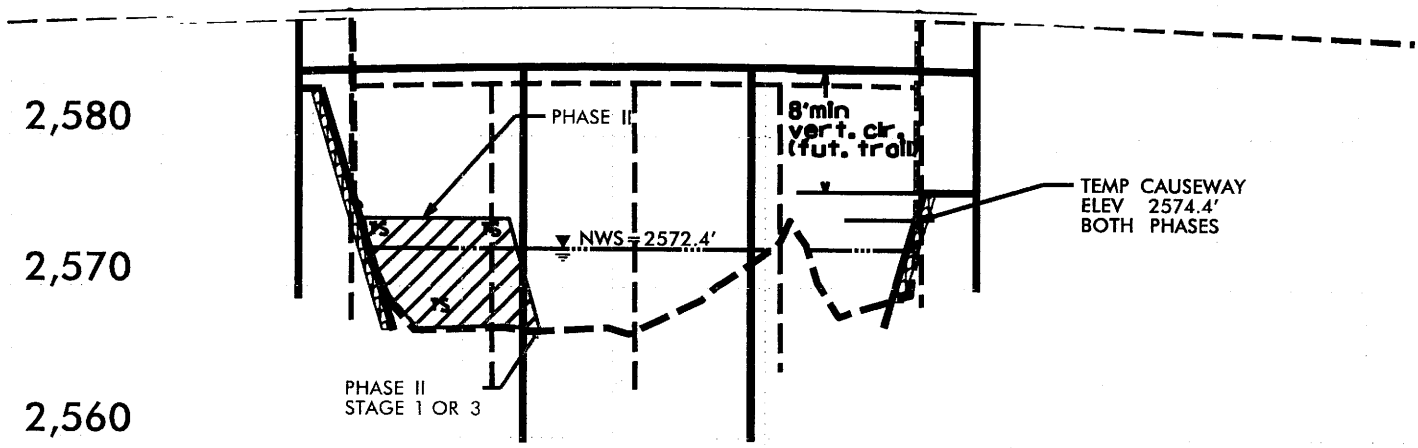


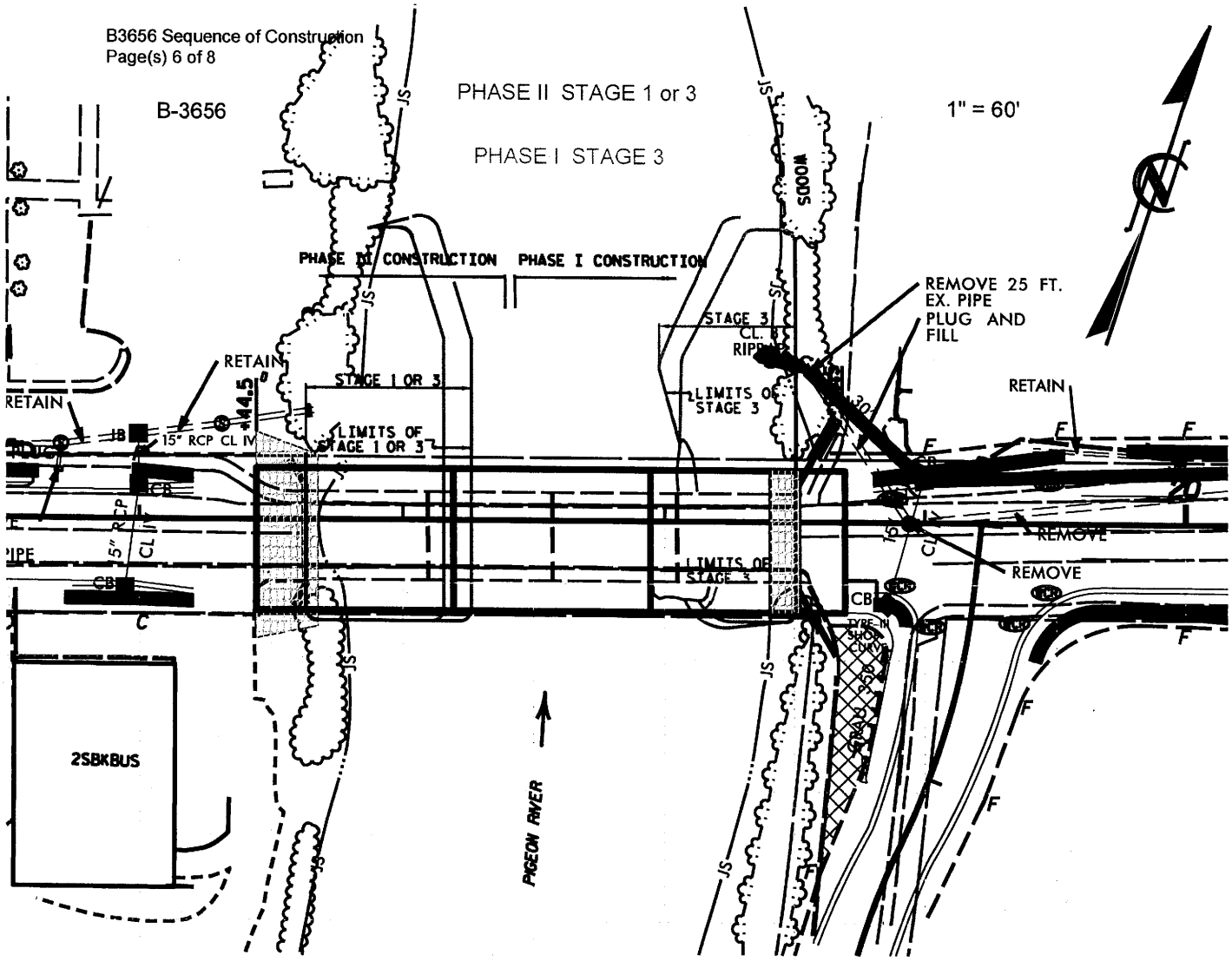
16 17 18 19 20

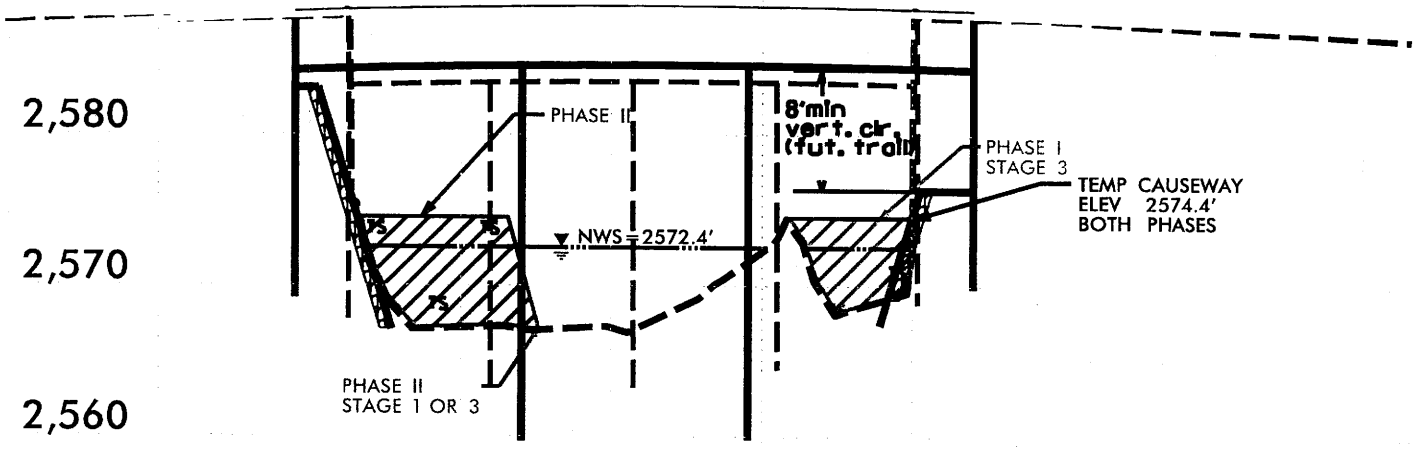

B-3656
PHASE I STAGE 3
1" = 60'
PHASE II CONSTRUCTION
PHASE I CONSTRUCTION
STAGE 3
CL. B
RIPRAP
LIMITS OF STAGE 3
REMOVE 25 FT. EX. PIPE PLUG AND FILL
RETAIN
RETAIN
RETAIN
15" RCP CL IV
15" RCP CL IV
REMOVE
REMOVE
CB
CB
CB
TYPE IN SHOULDER CURB
2SBKBUS
PIGEON RIVER
WOODS
JS
F
20


2,600
2,590
2,580
2,570
2,560
8'min vert. clr. (fut. trail)
PHASE I STAGE 3
TEMP CAUSEWAY ELEV 2574.4' BOTH PHASES
NWS = 2572.4'
16
17
18
19
20


B-3656
PHASE II STAGE 1 or 3
1" = 60'
PHASE II CONSTRUCTION
PHASE I CONSTRUCTION
RETAIN
RETAIN
STAGE 1 OR 3
LIMITS OF STAGE 1 OR 3
15" RCP CL IV
CB
CB
CB
REMOVE 25 FT. EX. PIPE PLUG AND FILL
RETAIN
REMOVE
REMOVE
2SBKBUS
PIGEON RIVER
WOODS
TYPE M SHOR CURVE
JS
F


2,600
2,590
2,580
2,570
2,560
PHASE II
8'min vert. clr. (fut. trail)
TEMP CAUSEWAY ELEV 2574.4' BOTH PHASES
NWS=2572.4'
PHASE II STAGE 1 OR 3
16
17
18
19
20


B-3656
PHASE II STAGE 1 or 3
PHASE I STAGE 3
1" = 60'
PHASE II CONSTRUCTION
PHASE I CONSTRUCTION
RETAIN
STAGE 1 OR 3
LIMITS OF STAGE 1 OR 3
15" RCP CL IV
STAGE 3 CL. B RIPRAP
LIMITS OF STAGE 3
REMOVE 25 FT. EX. PIPE PLUG AND FILL
REMOVE
2SBKBUS
PIGEON RIVER
WOODS
CB
JS
F

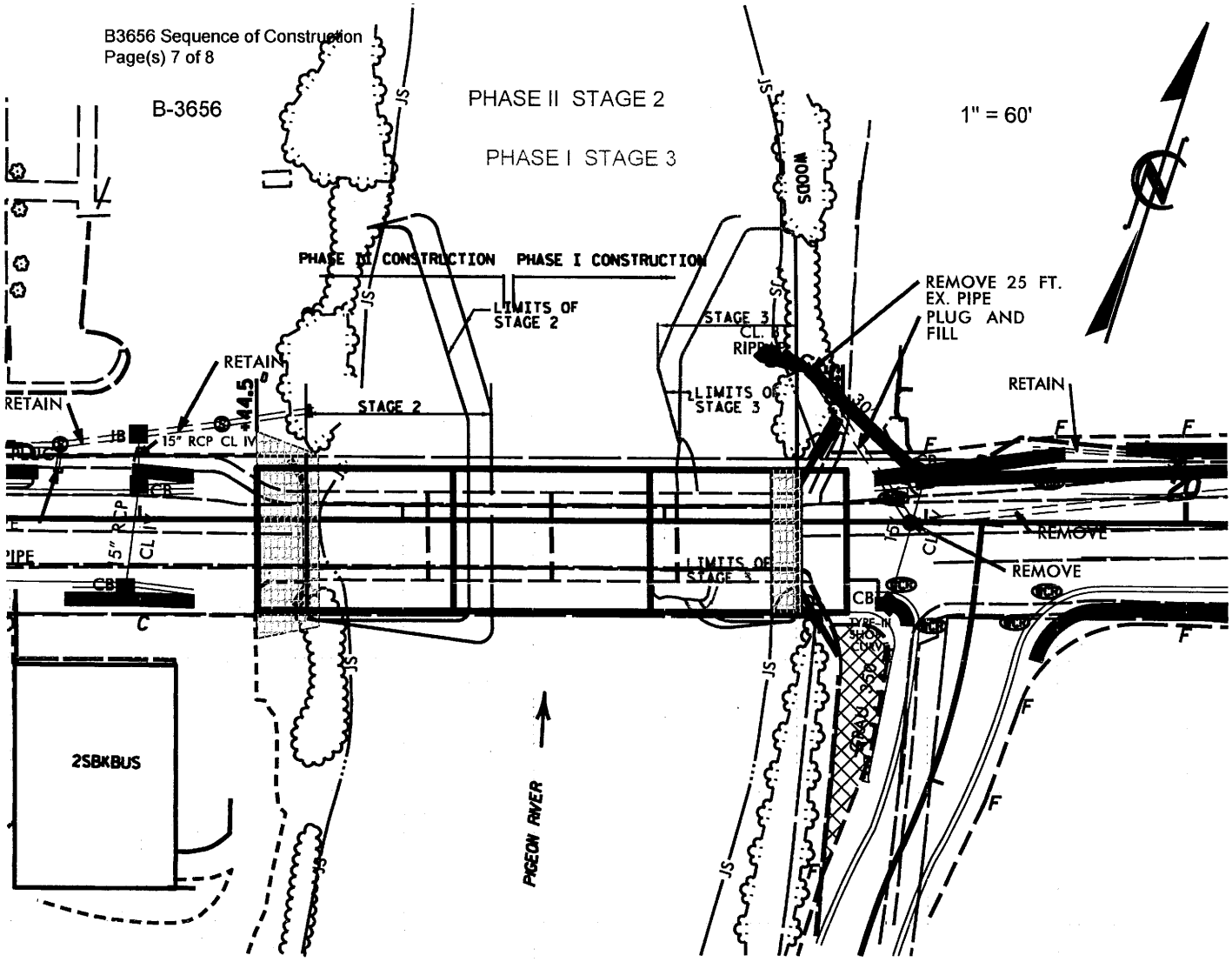

2,600
2,590
2,580
2,570
2,560
PHASE II
8'min vert. clr (fut. trail)
PHASE I STAGE 3
TEMP CAUSEWAY ELEV 2574.4' BOTH PHASES
NWS=2572.4'
PHASE II STAGE 1 OR 3
16
17
18
19
20

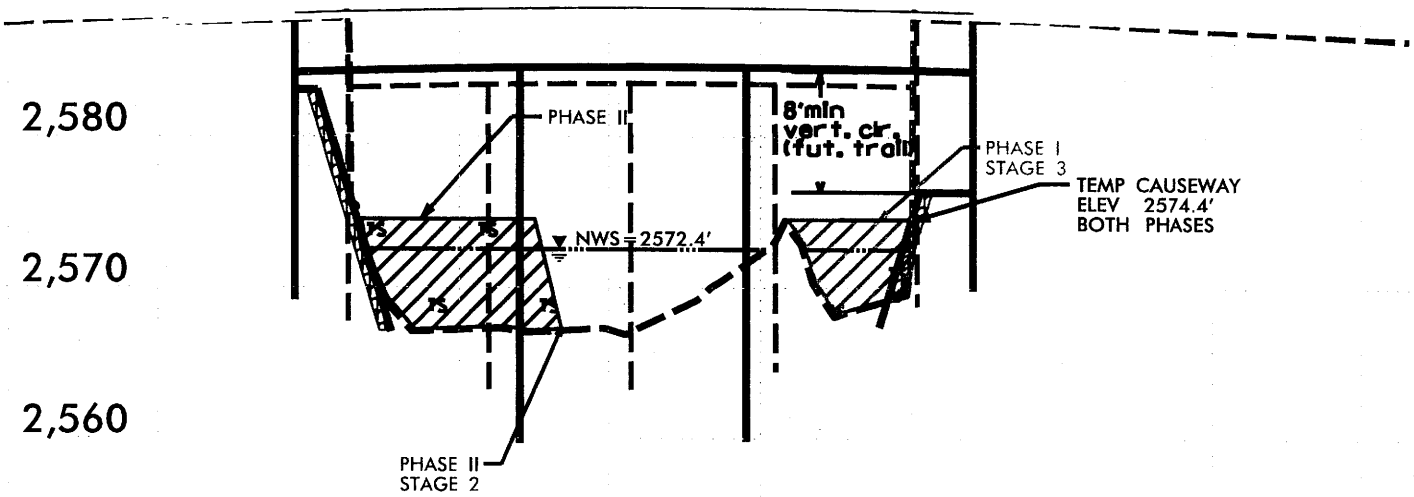
B-3656

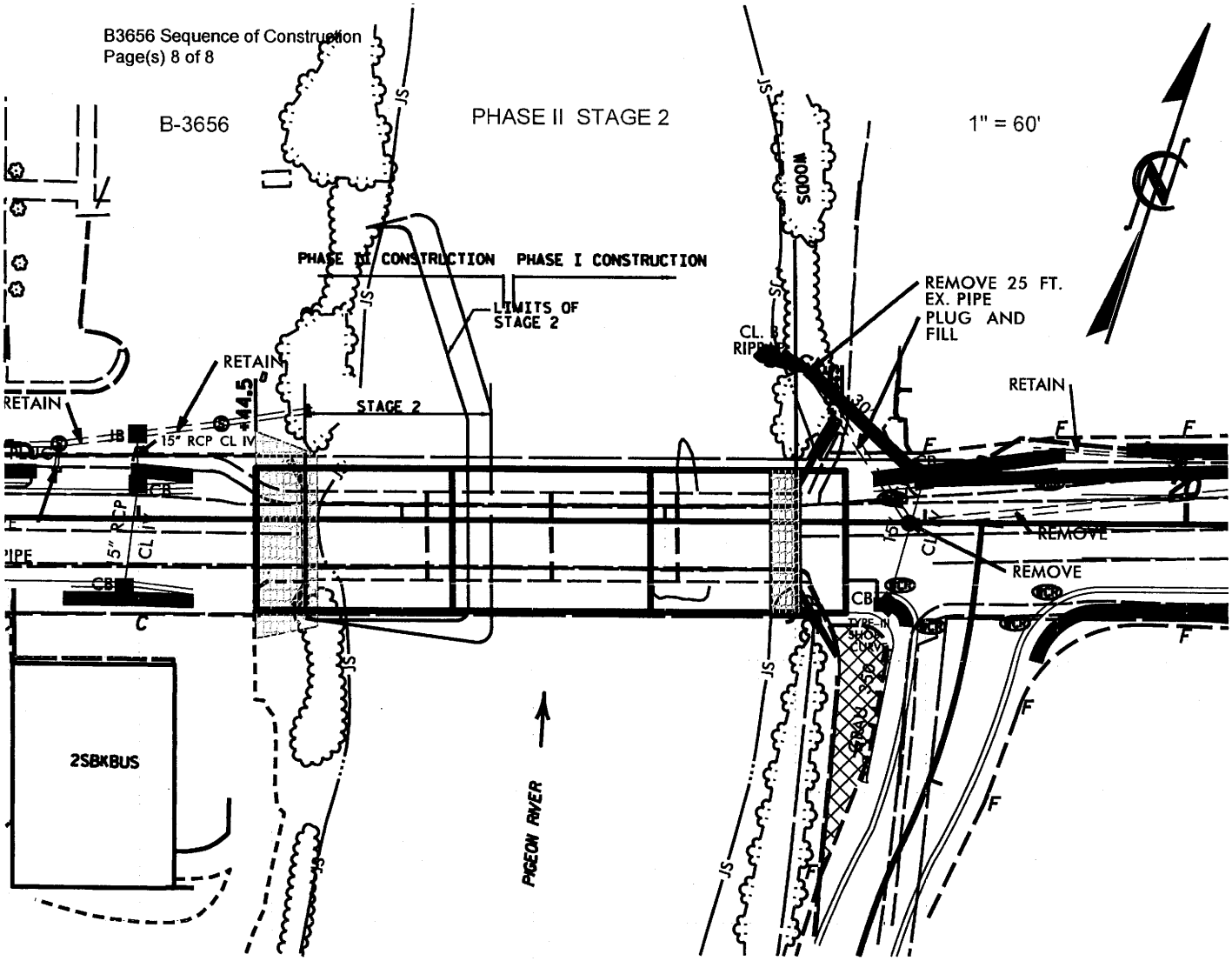
PHASE II STAGE 2

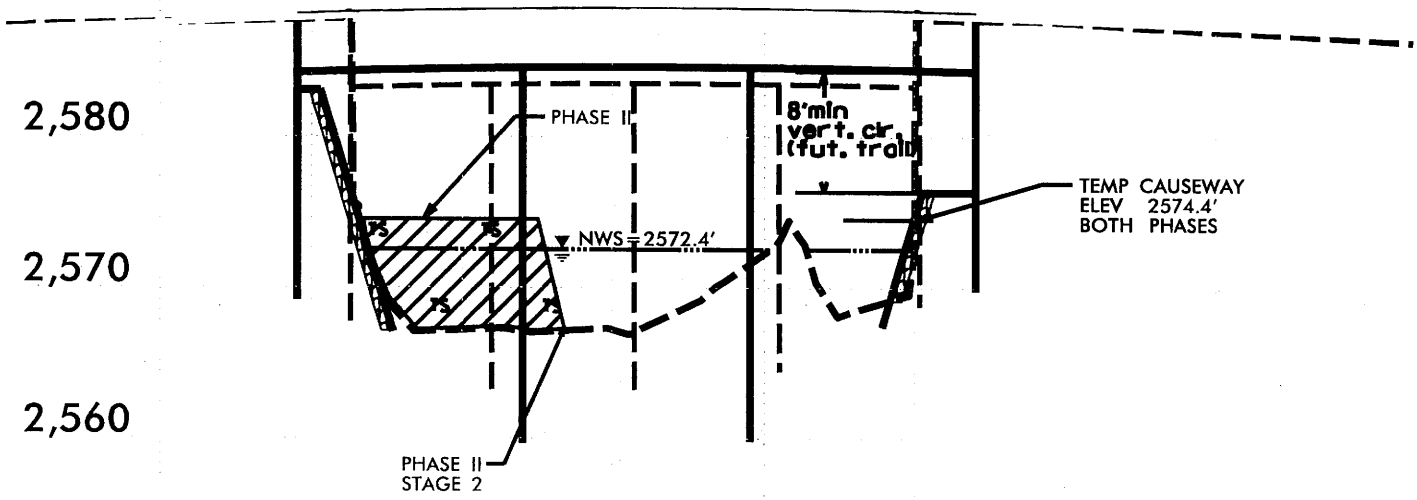
PHASE I STAGE 3

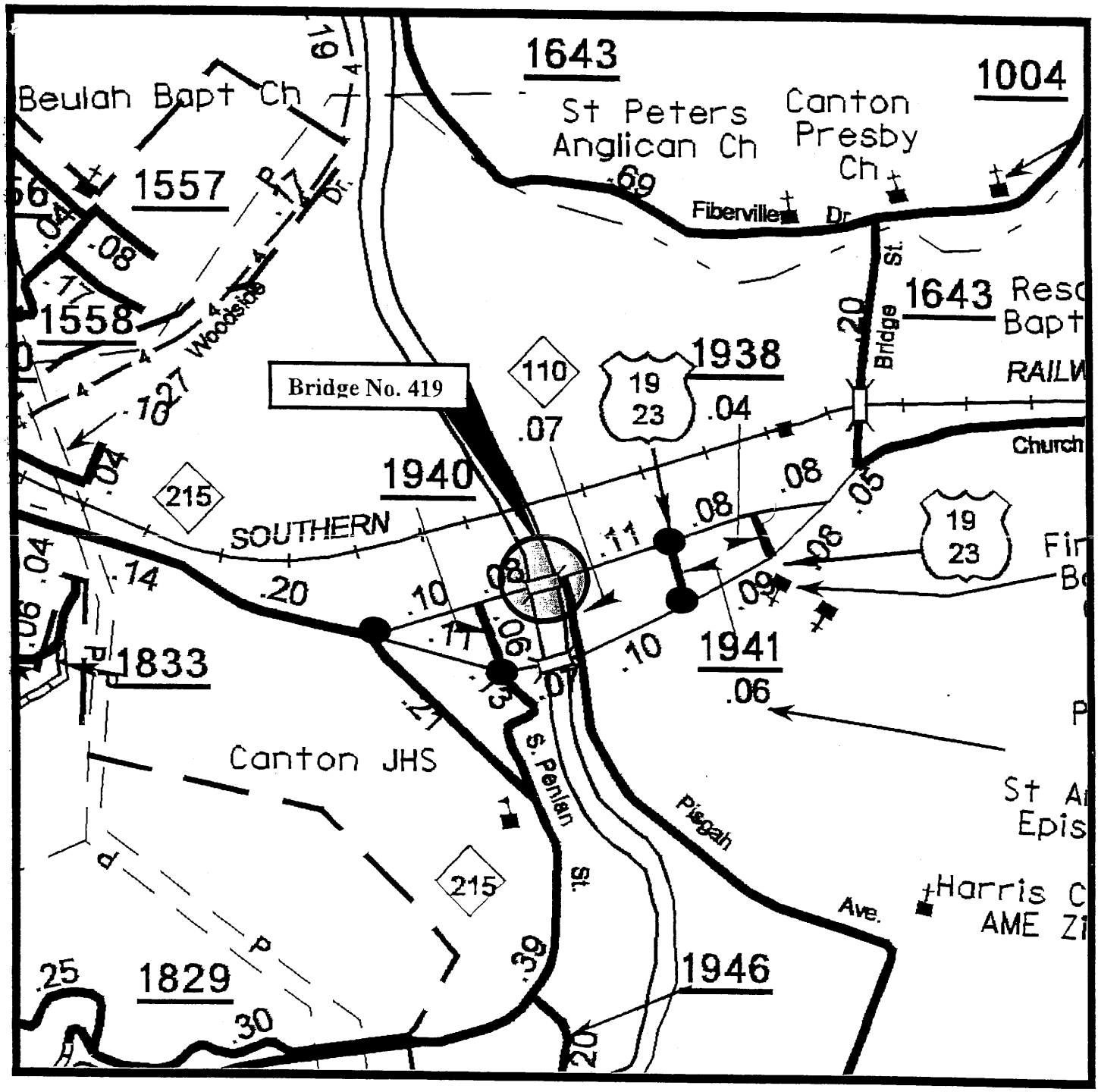
1" = 60'

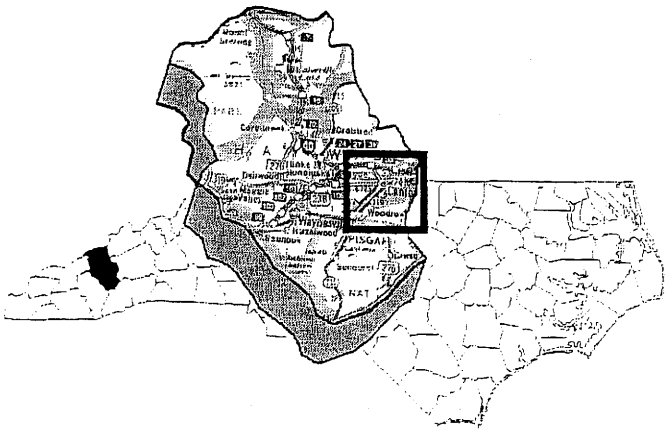





B-3656
PHASE II STAGE 2
1" = 60'
PHASE II CONSTRUCTION
PHASE I CONSTRUCTION
LIMITS OF STAGE 2
REMOVE 25 FT. EX. PIPE PLUG AND FILL
RETAIN
STAGE 2
15" RCP CL IV
REMOVE
2SBKBUS
PIGEON RIVER
WOODS
CB
JS


2,600
2,590
2,580
2,570
2,560
PHASE II
8'min vert. clr. (fut. trail)
TEMP CAUSEWAY ELEV 2574.4' BOTH PHASES
NWS = 2572.4'
PHASE II STAGE 2
16
17
18
19
20





STUDIED DETOUR ROUTE

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

HAYWOOD COUNTY
REPLACE BRIDGE NO. 419 ON US 19-23-74
OVER PIGEON RIVER
B-3656

Permit Drawing
Sheet 1 of 1

Figure 1

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	16+70 TO 17+36 -L-	CAUSEWAY							0.19		170	
	17+45 TO 18+35 -L-	CAUSEWAY							0.23			
	18+35 TO 18+46 -L- LT	RIPRAP PAD @						<0.01		10		
		30" RCP (OUT)										
	18+40 TO 18+50 -L-	RIPRAP SLOPE						0.02		75		
		PROTECTION										
	16+63 TO 16+70 -L-	RIPRAP SLOPE						<0.01				
		PROTECTION										
TOTALS:								0.02	0.42	85	170	

BRIDGE BENTS IMPACT AREA: 126 sq. ft. (estimated)

TOTAL BRIDGE BENTS IMPACT AREA WILL NOT EXCEED 0.01 ACRE OF FILL

Permit Drawing
Sheet 2 of 9

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

HAYWOOD COUNTY
WBS - 33202.1.2 (B-3656)

June 11, 2010

ATN Revised 3/31/05

PROPERTY OWNERS

NAMES AND ADDRESSES

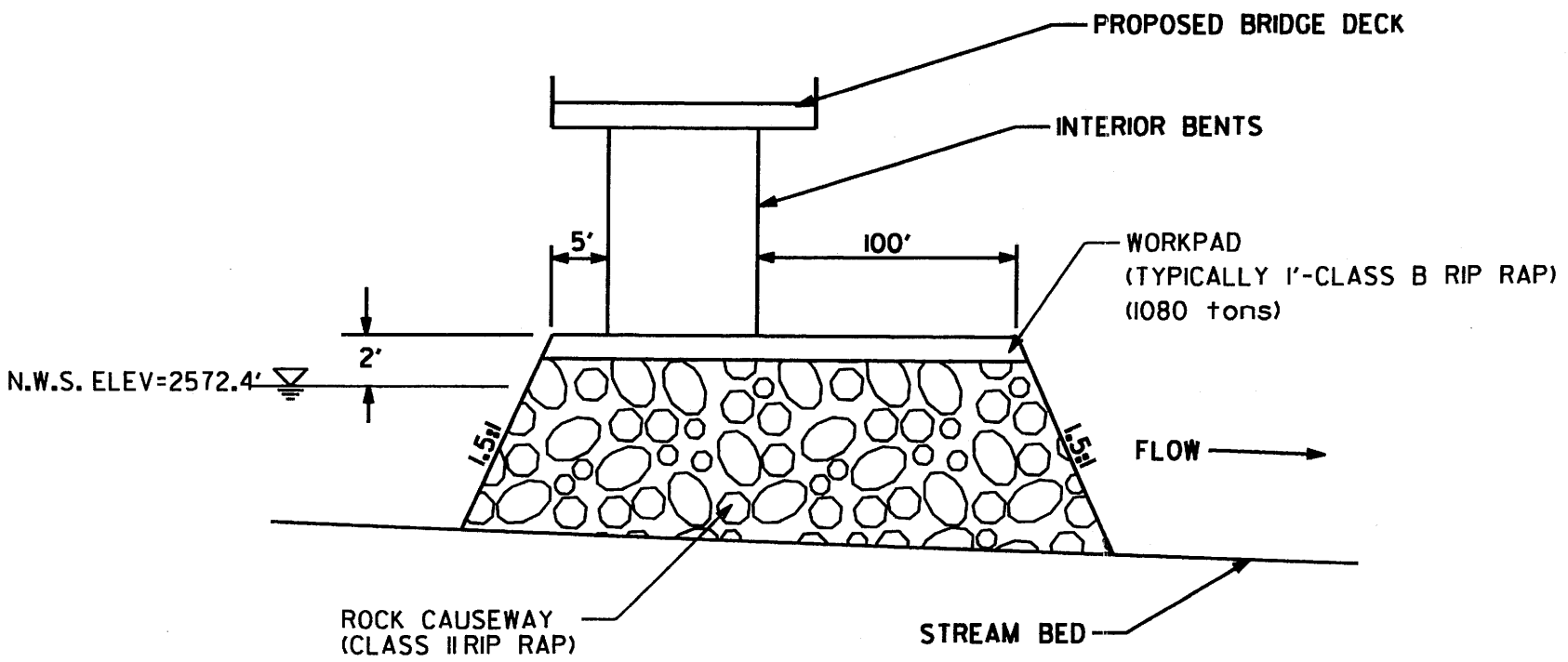
PARCEL NO.	NAMES	ADDRESSES
1	BETHEL MISSIONARY BAPTIST CHURCH	5868 PIGEON RD CANTON, NC 28716
4	CARLENE GREENE CRISP	36951 MARTIN DR. GLADE SPRING, VA 24340
5	BLUE RIDGE PAPER PRODUCTS, INC.	P.O. BOX 4000 CANTON, NC 28716
6	BLUE RIDGE PAPER PRODUCTS, INC.	P.O. BOX 4000 CANTON, NC 28716
7	TOWN OF CANTON	P.O. BOX 4000 CANTON, NC 28716

Permit Drawing
Sheet 6 of 9

NCDOT
DIVISION OF HIGHWAYS
HAYWOOD COUNTY
PROJECT: 33202.1.2 (B-3646)
CANTON
BRIDGE #419 ON US 19-23
OVER PIGEON RIVER

6/10

WORKPAD DETAIL
(NOT TO SCALE)



QUANTITIES OF ESTIMATES

VOLUME OF CLASS II RIP RAP= 4270 cy
AREA OF CLASS II RIP RAP= 0.48 ac
ESTIMATE 7210 TONS CLASS II RIP RAP

Permit Drawing
Sheet 1 of 9

NCDOT

DIVISION OF HIGHWAYS
HAYWOOD COUNTY
PROJECT: 5320112 (B-3686)
CANTON
BRG. #419 ON US 19-23
OVER PIGEON RIVER

6/10

05/08/09

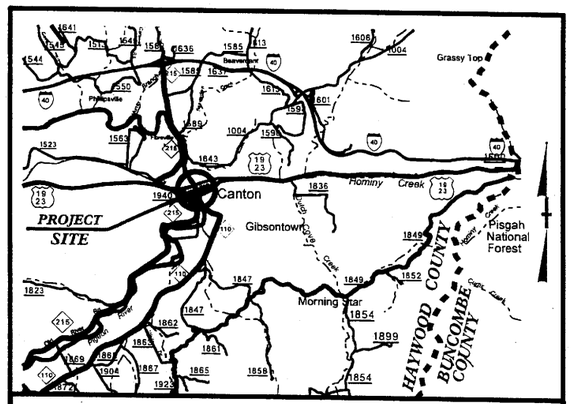
TIP PROJECT: B-3656

CONTRACT: C202566

$$$$$SYSTIME$$$$$

$$$$$USERNAME$$$$$

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HAYWOOD COUNTY

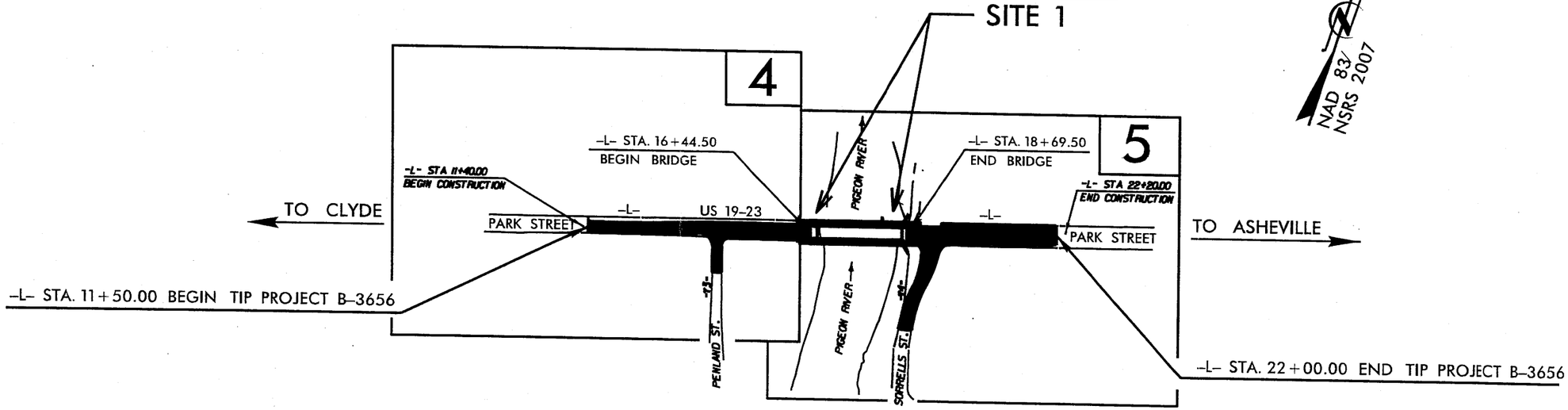
LOCATION: BRIDGE 419 ON US 19-23 OVER PIGEON RIVER IN CANTON

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURE, RETAINING WALL AND SIGNALS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3656	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
33202.1.2	BRSTP-0019(28)	PE
33202.2.1	BRSTP-0019(28)	R/W & UTIL
33202.3.1	BRSTP-0019(36)	CONST.

STREAM IMPACTS



NAD 83/ NSRS 2007

Permit Drawing
Sheet 5 of 9

GRAPHIC SCALES

PLANS: 30 15 0 30 60

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2010 =	12,100
ADT 2030 =	19,800
DHV =	12 %
D =	100 %
T =	4 % *
V =	30 MPH
* TTST 3%	DUAL 1%

FUNC CLASS = ARTERIAL
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-3656 =	0.157 MILES
LENGTH STRUCTURE TIP PROJECT B-3656 =	0.042 MILES
TOTAL LENGTH TIP PROJECT B-3656 =	0.199 MILES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: NOVEMBER 30, 2009

LETTING DATE: DECEMBER 21, 2010

G.E. BREW, P.E.
PROJECT ENGINEER

I.T. YOUNIS
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

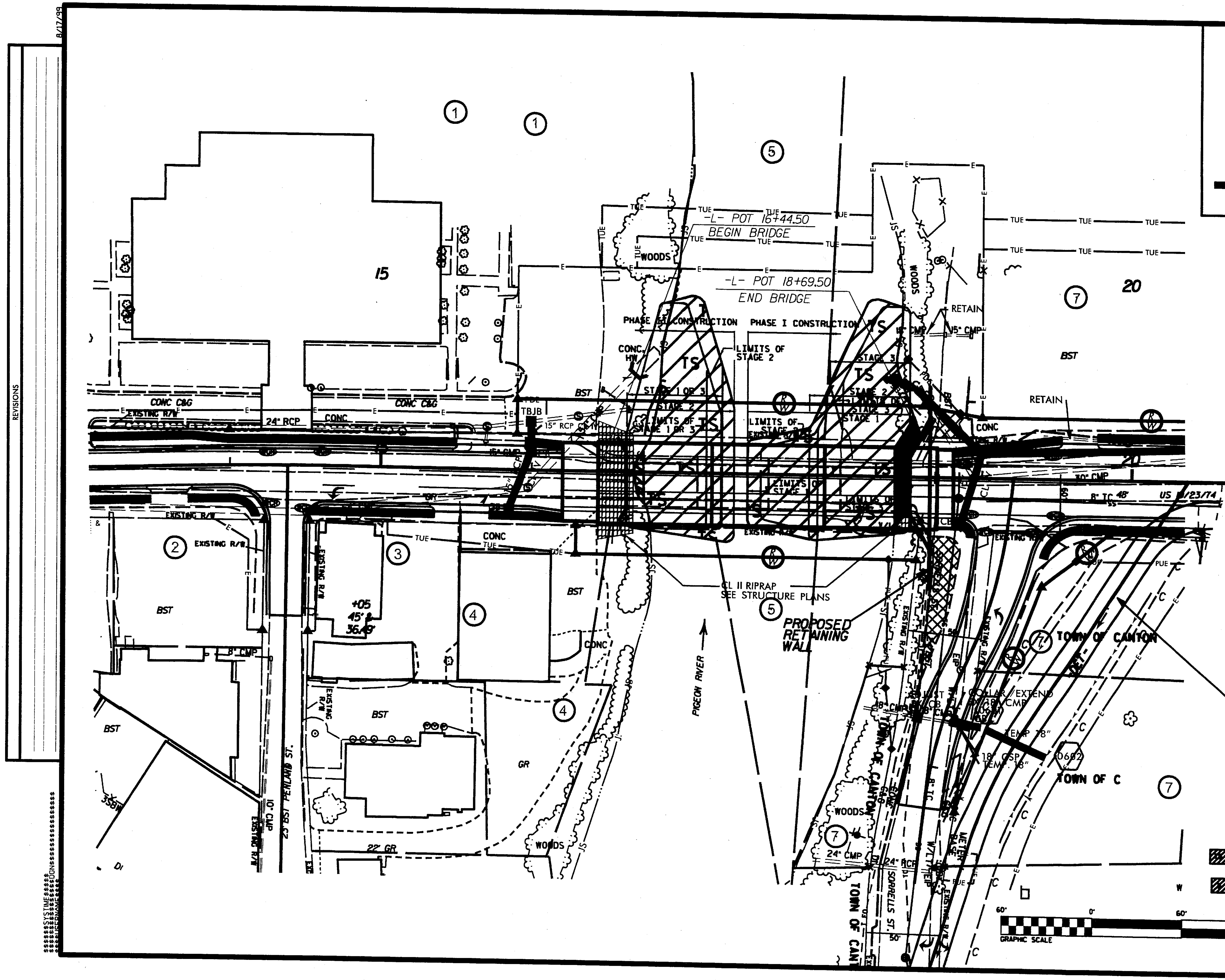
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

PROJECT REFERENCE NO.	SHEET NO.
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-L- POT 16+44.50
BEGIN BRIDGE
-L- POT 18+69.50
END BRIDGE
PHASE III CONSTRUCTION
PHASE I CONSTRUCTION
LIMITS OF STAGE 2
LIMITS OF STAGE 3
STAGE 1 OF 3
STAGE 2
STAGE 3
WOODS
15
20
BST
CONC C&G
EXISTING R/W
24" RCP
CONC
15" RCP
TBJB
RETAIN
15" CMP
30" CMP
US 19/23/74
CL II RIPRAP
SEE STRUCTURE PLANS
PROPOSED RETAINING WALL
PIGEON RIVER
TOWN OF CANTON
TEMPORARY DETOUR
18" GSP
TEMP. 18"
0682
TOWN OF C
GR
22" GR
24" CMP
10" CMP
PENLAND ST.
SORRELLS ST.
+05
45' ±
36.48'
8" CMP
REVISIONS
8/17/99

Permit Drawing
Sheet 6 of 9

[hatch]	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
[hatch]	DENOTES IMPACTS IN SURFACE WATER

GRAPHIC SCALE: 60' 0' 60' 120' 180'

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 7 of [illegible]

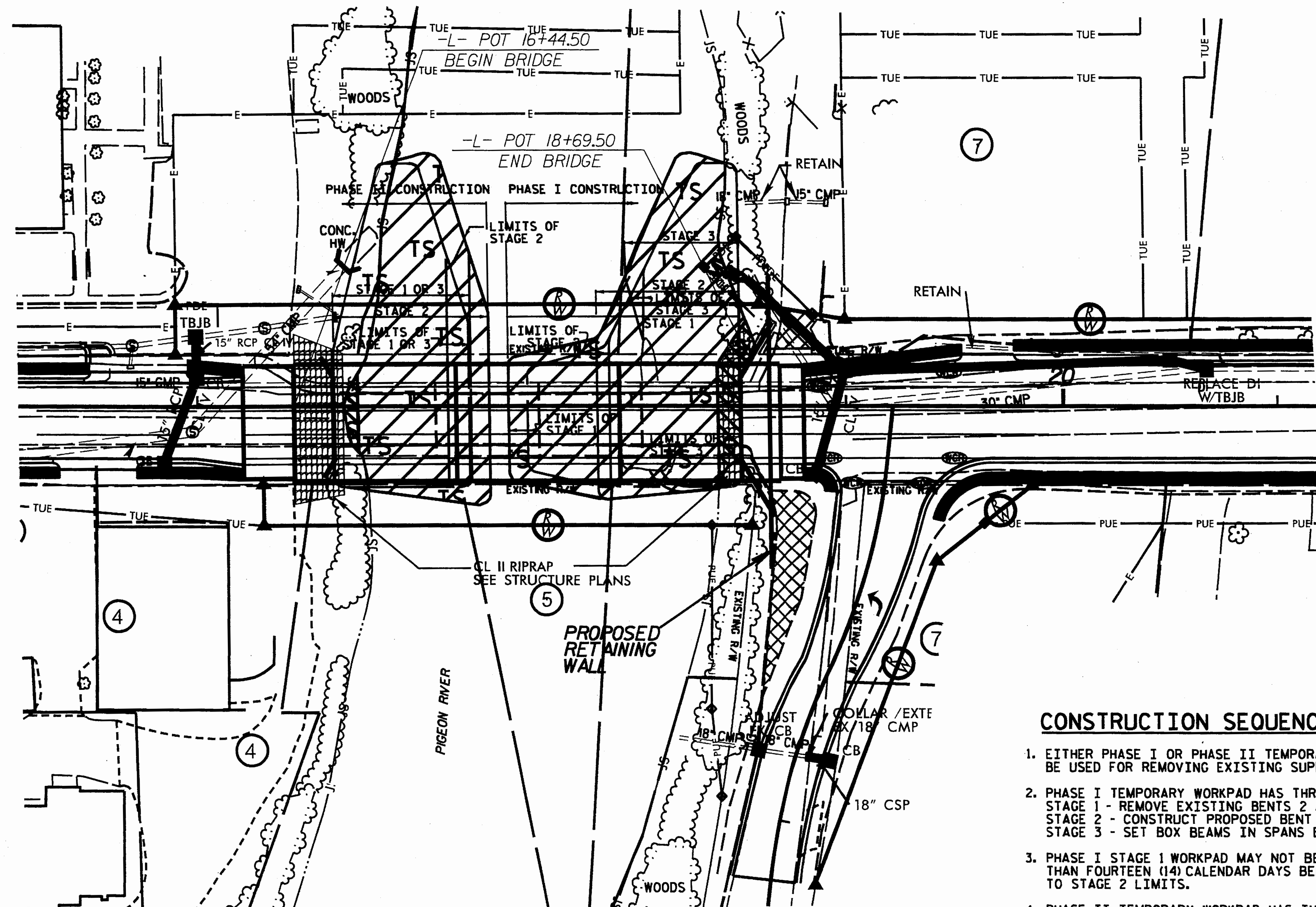
▨ DENOTES TEMPORARY IMPACTS IN SURFACE WATER

▨ DENOTES IMPACTS IN SURFACE WATER

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

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



PLAN VIEW

DENOTES TEMPORARY IMPACTS IN SURFACE WATER (TS)

DENOTES IMPACTS IN SURFACE WATER (S)

50' 0' 50' 100' 150'

GRAPHIC SCALE

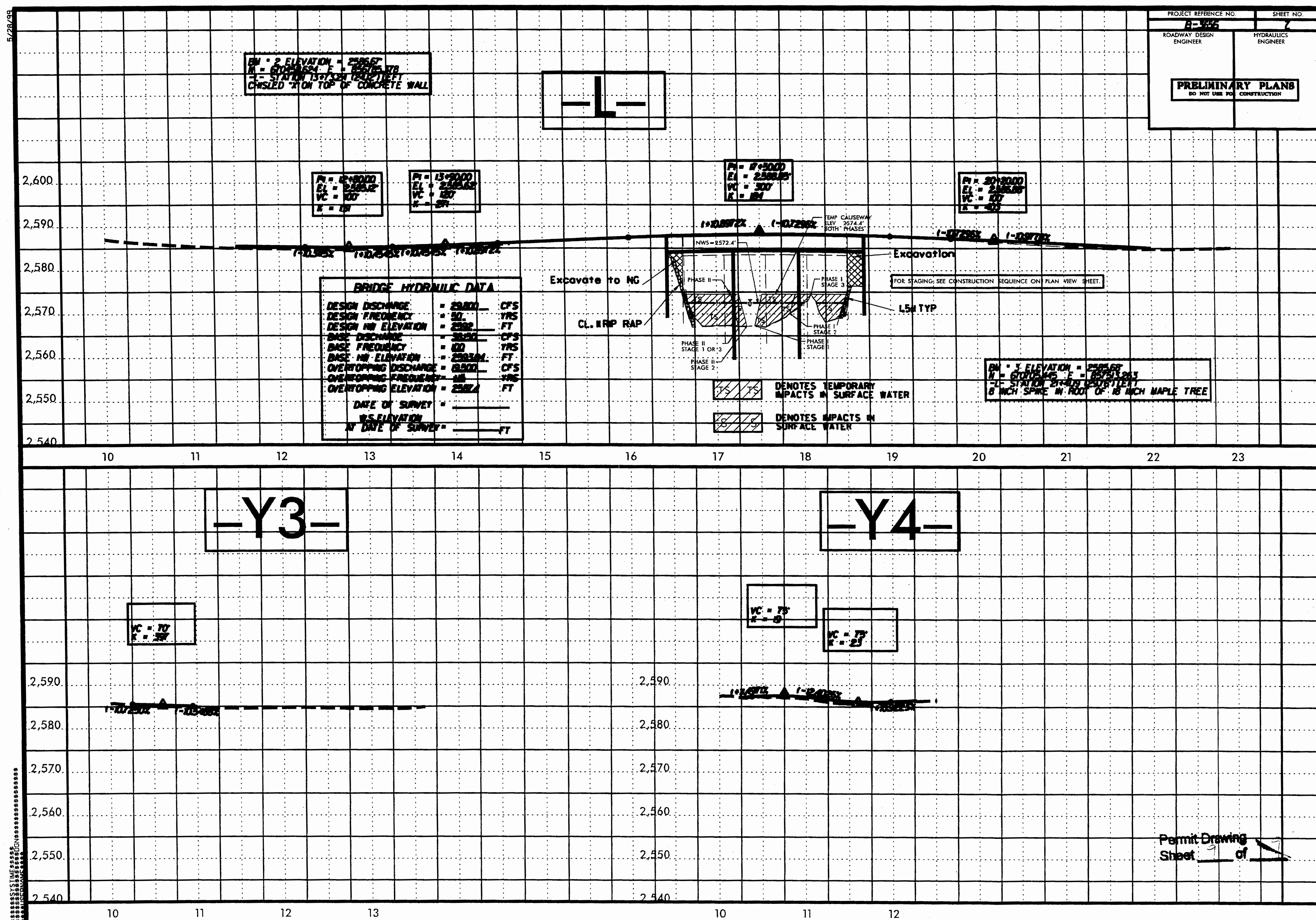
CONSTRUCTION SEQUENCE

1. EITHER PHASE I OR PHASE II TEMPORARY WORKPADS MAY BE USED FOR REMOVING EXISTING SUPERSTRUCTURE.
2. PHASE I TEMPORARY WORKPAD HAS THREE STAGES:
   STAGE 1 - REMOVE EXISTING BENTS 2 AND 3.
   STAGE 2 - CONSTRUCT PROPOSED BENT 2.
   STAGE 3 - SET BOX BEAMS IN SPANS B AND C.
3. PHASE I STAGE 1 WORKPAD MAY NOT BE IN PLACE MORE THAN FOURTEEN (14) CALENDAR DAYS BEFORE IT IS REDUCED TO STAGE 2 LIMITS.
4. PHASE II TEMPORARY WORKPAD HAS THREE STAGES:
   STAGE 1 - REMOVE EXISTING BENT 1.
   STAGE 2 - CONSTRUCT PROPOSED BENT 1.
   STAGE 3 - SET BOX BEAMS IN SPANS A AND B.
5. DO NOT CONSTRUCT PHASE II WORKPAD UNTIL AFTER PHASE I WORKPAD IS REDUCED TO STAGE 3 OR REMOVED.

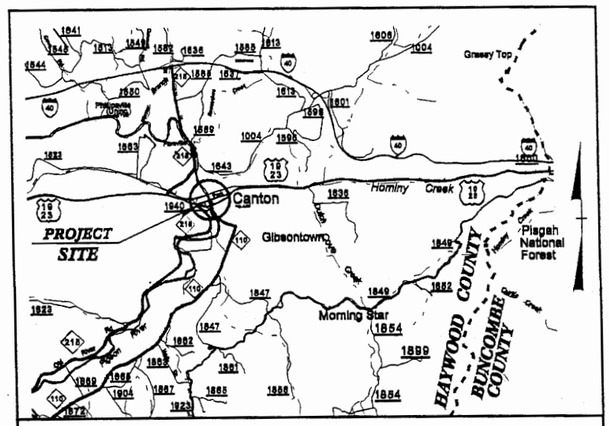
Permit Drawing
Sheet 3 of 9

REVISIONS

8/17/99



5/28/99
PROJECT REFERENCE NO.
SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
-L-
BM # 2 ELEVATION = 2586.67'
CHISLED "X" ON TOP OF CONCRETE WALL
PI = 12+80.00
VC = 100'
PI = 13+90.00
VC = 120'
PI = 17+50.00
VC = 300'
PI = 20+20.00
VC = 100'
TEMP CAUSEWAY ELEV 2574.4' BOTH PHASES
NWS=2572.4'
Excavation
Excavate to NG
CL. II RIP RAP
L5# TYP
FOR STAGING; SEE CONSTRUCTION SEQUENCE ON PLAN VIEW SHEET.
PHASE II
PHASE I STAGE 3
PHASE I STAGE 2
PHASE I STAGE 1
PHASE II STAGE 1 OR 3
PHASE II STAGE 2
BRIDGE HYDRAULIC DATA
DESIGN DISCHARGE = 29,800 CFS
DESIGN FREQUENCY = 50 YRS
DESIGN HW ELEVATION = 2592 FT
BASE FREQUENCY = 100 YRS
OVERTOPPING DISCHARGE = 19,500 CFS
DATE OF SURVEY =
W.S. ELEVATION AT DATE OF SURVEY = FT
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES IMPACTS IN SURFACE WATER
BM # 3 ELEVATION = 2585.68'
8 INCH SPIKE IN ROOT OF 18 INCH MAPLE TREE
2,600
2,590
2,580
2,570
2,560
2,550
2,540
10
11
12
13
14
15
16
17
18
19
20
21
22
23
-Y3-
VC = 70'
-Y4-
VC = 75'
VC = 75'
Permit Drawing
Sheet of



VICINITY MAP

THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE TOWN OF CANTON

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

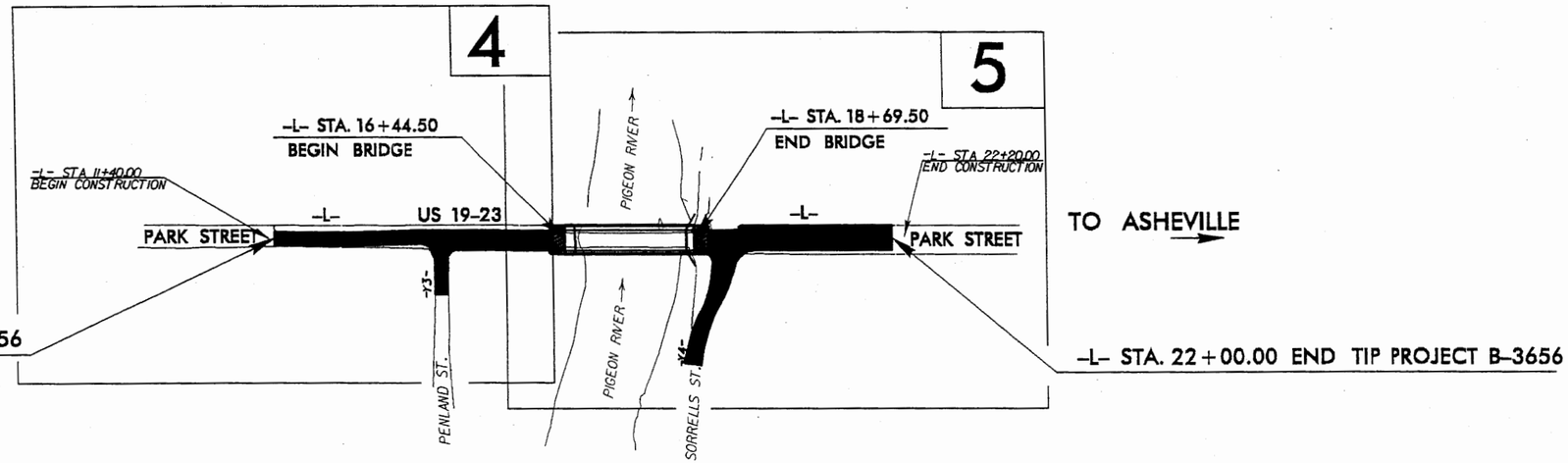
HAYWOOD COUNTY

LOCATION: BRIDGE 419 ON US 19-23 OVER PIGEON RIVER IN CANTON

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3656	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
33202.1.2	BRSTP-0019(28)	PE
33202.2.1	BRSTP-0019(28)	R/W & UTIL



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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONTRACT:

TIP PROJECT: B-3656

GRAPHIC SCALES

PLANS 0 30 60

PROFILE (HORIZONTAL) 0 50 100

PROFILE (VERTICAL) 0 10 20

DESIGN DATA

ADT 2009 = 11,700
ADT 2030 = 19800
DHV = 12 %
D = 100 %
T = 4 % *
V = 30 MPH
* TTST 3% DUAL 1%

FUNCTIONAL CLASSIFICATION
ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-3656 = 0.157 MILES

LENGTH STRUCTURE TIP PROJECT B-3656 = 0.042 MILES

TOTAL LENGTH TIP PROJECT B-3656 = 0.199 MILES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: NOVEMBER 30, 2009

LETTING DATE: DECEMBER 21, 2010

G.E. BREW, P.E.
PROJECT ENGINEER

I.T. YOUNIS
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

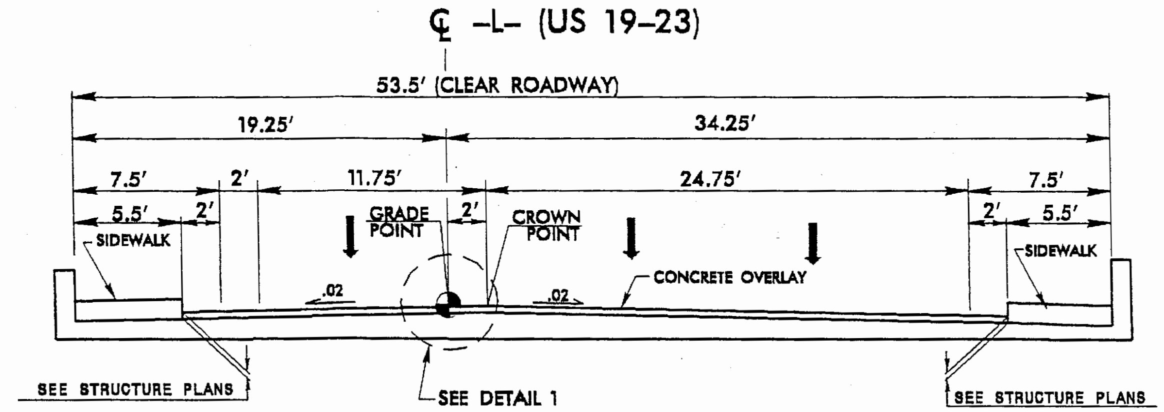
PROJECT REFERENCE NO.	SHEET NO.
B-3656	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

FINAL PAVEMENT SCHEDULE

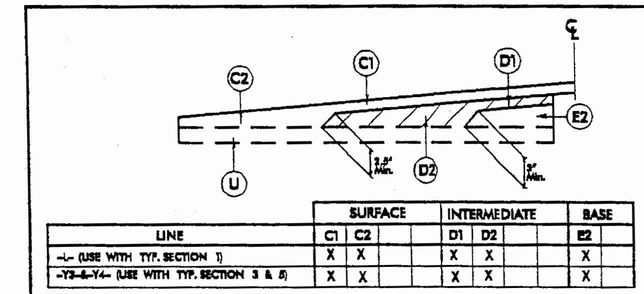
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 7" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, 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.
J1	10" AGGREGATE BASE COURSE
P	PRIME COAT AT THE RATE OF 0.35 GAL. PER SQ. YARD
R1	2'-6" CONCRETE CURB AND GUTTER.
S	4" CONCRETE SIDEWALK.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT.

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

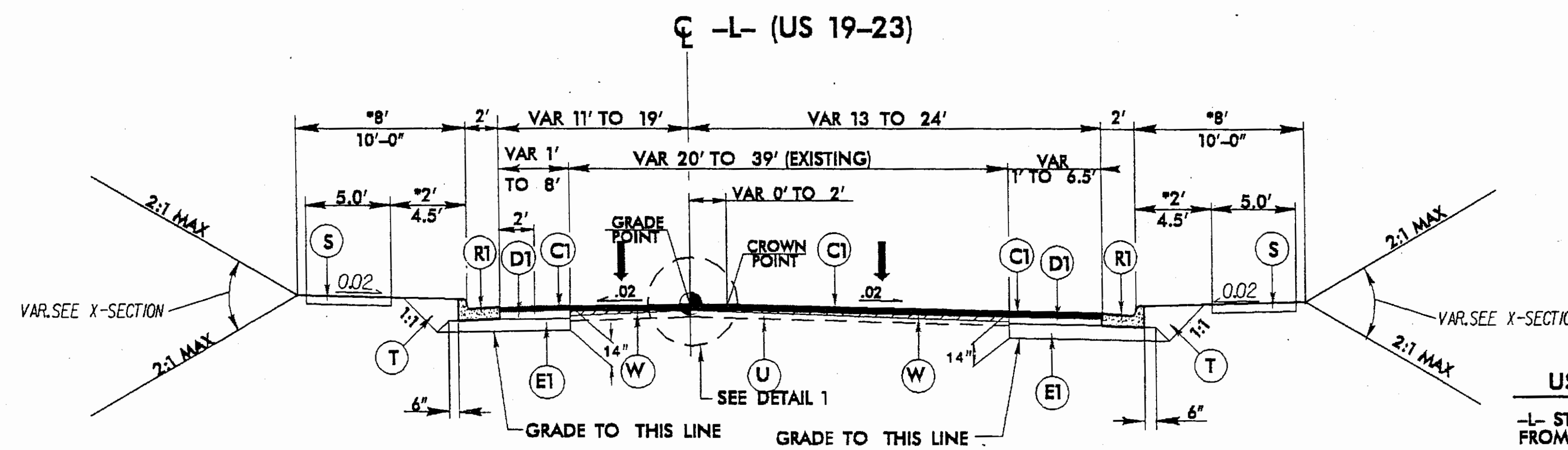


TYPICAL SECTION ON STRUCTURE

-L- STA. 16+44.50 TO 18+69.50



DETAIL SHOWING METHOD OF WEDGING

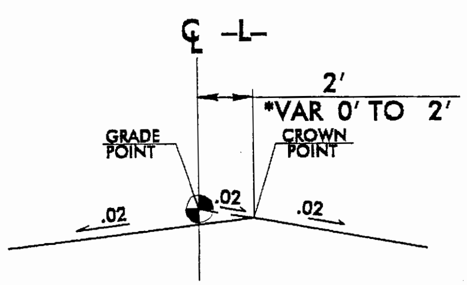


TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

-L- STA 11+50.00 TO 12+00.00, TRANSITION FROM EXIST TO T.S. 1

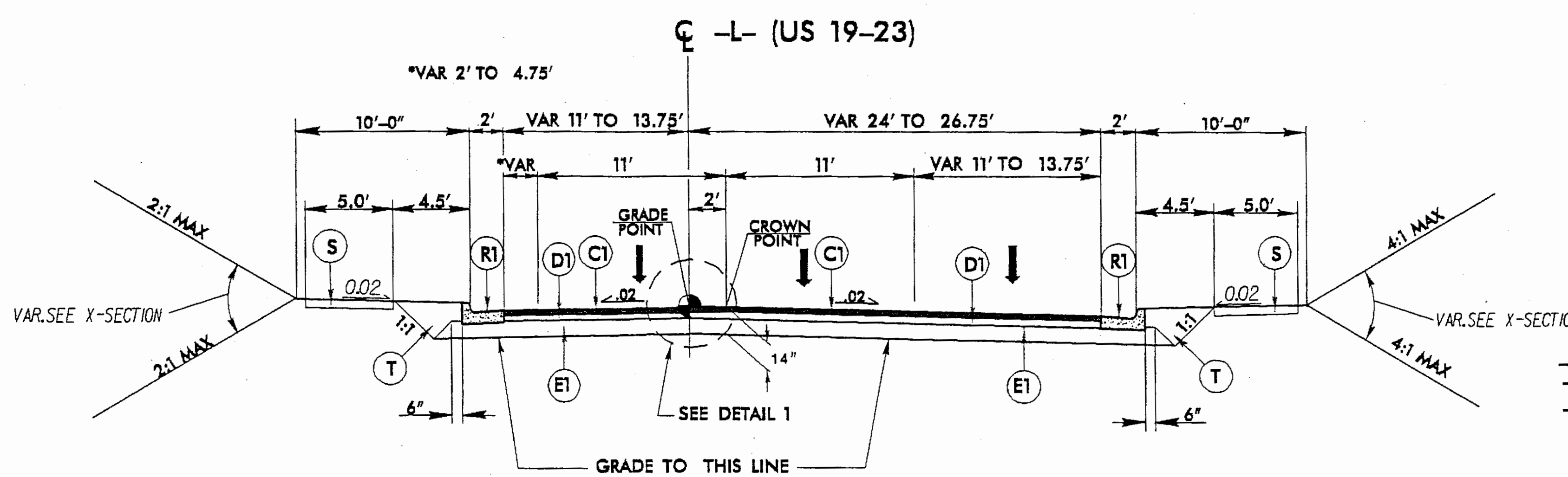
-L- STA 12+00.00 TO 14+00.00
* -L- STA 14+00.00 TO 15+00.00
-L- STA 15+00.00 TO 15+96.00
-L- STA 19+20.00 TO 22+00.00



DETAIL 1

DETAIL FOR RELATIONSHIP BETWEEN GRADE POINT & CROWN POINT

*-L- STA 11+50.00 TO 12+00.00
-L- STA 12+00.00 TO 21+50.00
*-L- STA 21+50.00 TO 22+00.00



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

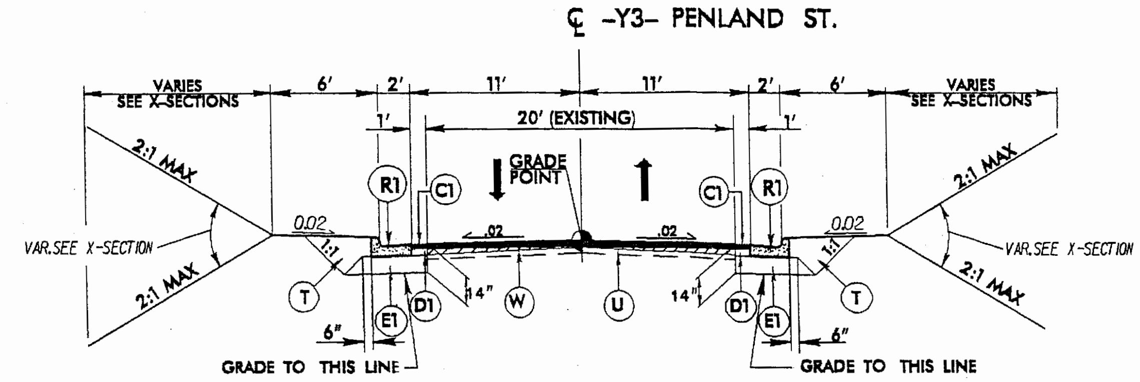
-L- STA 15+96.00 TO 16+44.50 (BEGIN BRIDGE)
-L- STA 18+69.50 (END BRIDGE) TO 19+20.00

12-JAN-2010 11:57
R:\Roadway\Proj\b3656_rdy_typ.dgn

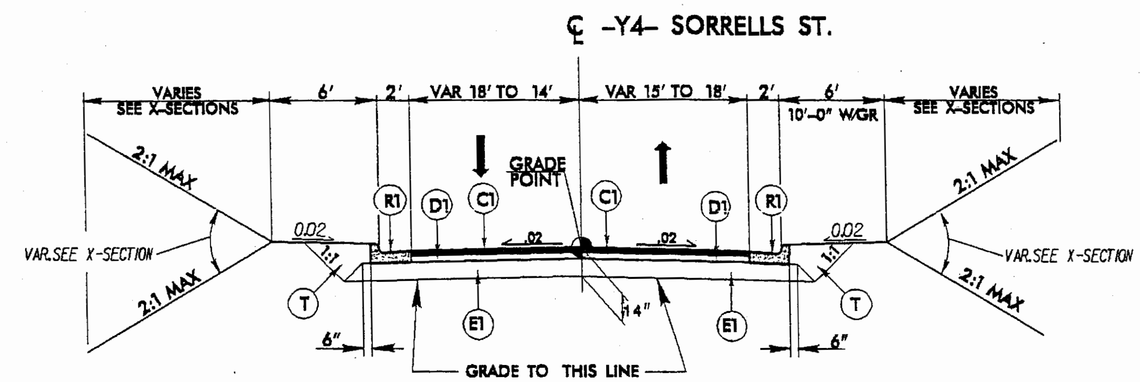
PROJECT REFERENCE NO.	SHEET NO.
B-3656	2-A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

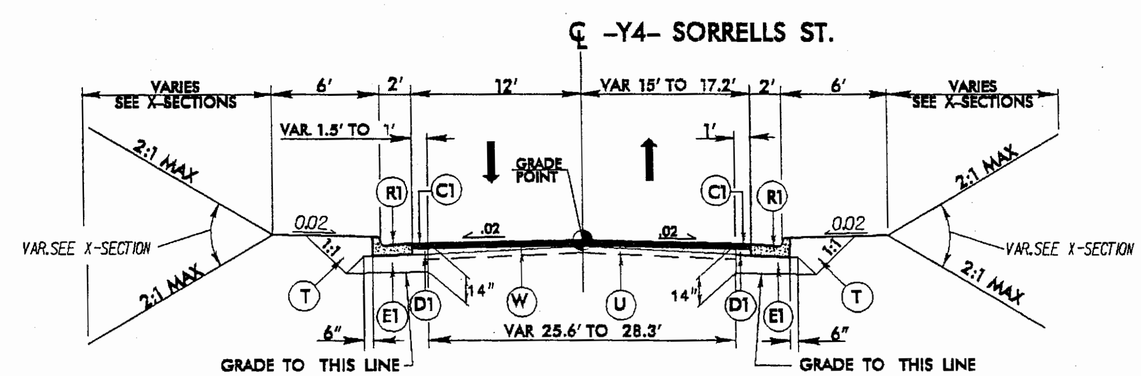
C1	3" S9.5C
D1	4" I19.0C
E1	7" B25.0C
J	10" ABC
P	PRIME COAT
R1	2'-6" CURB AND GUTTER
T	EARTH MATERIAL
U	EXISTING PAV'T.
W	WEDGING



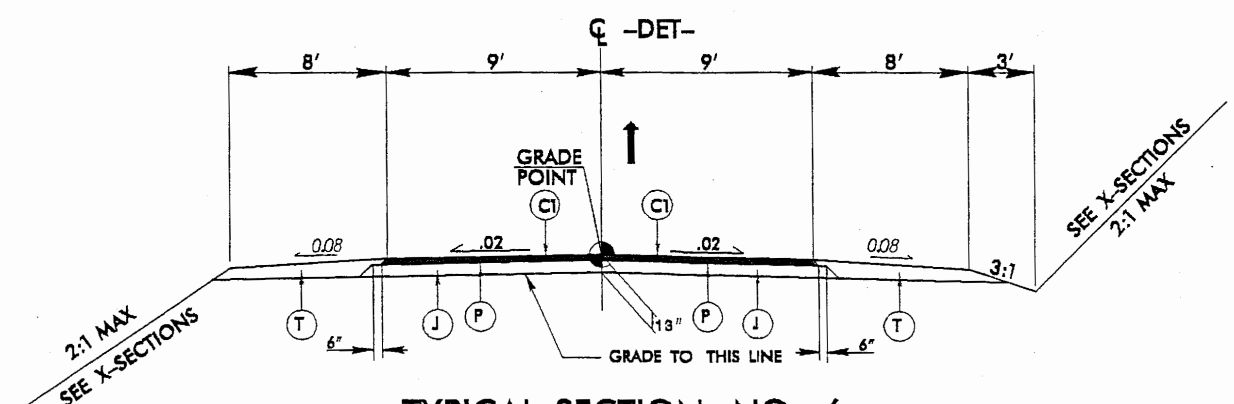
TYPICAL SECTION NO. 3



TYPICAL SECTION NO. 4



TYPICAL SECTION NO. 5



TYPICAL SECTION NO. 6

USE TYPICAL SECTION NO. 3

-Y3- STA 10+36.75 TO 11+00.00

USE TYPICAL SECTION NO. 4

-Y4- STA 10+48.77 TO 11+00.00

USE TYPICAL SECTION NO. 5

-Y4- STA 11+00.00 TO 12+00.00, TRANSITION FROM T.S. 4 TO T.S. 5

-Y4- STA 12+00.00 TO 12+27.97

USE TYPICAL SECTION NO. 6

-DET- STA 10+15.00 TO 13+71.78

-DET- STA 13+71.78 TO 14+00, TRANSITION FROM T.S. 6 TO EXISTING

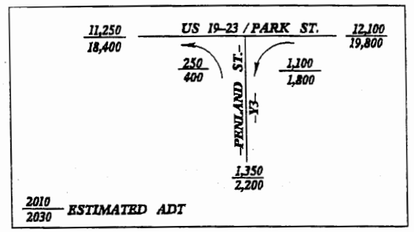
12-JAN-2010 11:58

PROJECT REFERENCE NO.	SHEET NO.
B-3656	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

FOR PROFILE OF -L- & -Y3- SEE SHEET 6

SCALE
30 15 0 30 60



NC GRID
NAD 83/NSRS 2007

-L-

PI Sta 12+80.33
△ = 2° 27' 12.4" (LT)
D = 1° 54' 35.5"
L = 128.46'
T = 64.24'
R = 3,000.00'
e = NC

PI Sta 14+08.79
△ = 2° 27' 12.4" (RT)
D = 1° 54' 35.5"
L = 128.46'
T = 64.24'
R = 3,000.00'
e = NC

SHEET 5
MATCHLINE -L- STA. 15+85.00 SEE SHEET 5

REVISIONS

DB 472 PG 1073

-BL-3 10+40.32 PINC=
-BY2- 5+00.00 POT
-BY6- 5+00.00 POT

-L- POT STA 11+50.00
BEGIN TIP PROJECT B-3656

-BL-4 12+92.35 PINC
-L-POT 11+05.67
O/S 29.08' LT.

-L- POT 10+00.00

-L- PC 12+16.09

-L- PRC 13+44.55

-BL-5 16+49.95 PINC=
-BY3- 5+00.00 POT
-L-POT 14+58.59
O/S 33.49' RT.

-Y3- POT 10+00.00
-L- POC 14+37.84

-L- PT 14+73.01

(1) BETHEL MISSIONARY BAPTIST CHURCH
DB 543 PG 500

(1) BETHEL MISSIONARY BAPTIST CHURCH
DB 543 PG 500

BETHEL MISSIONARY CHRISTIAN ACADEMY
2SBK

+40
37' &
26.62'

+16.09
37'

+44.55
37'

+73.01
37'

+50
26.93'

+00
23.79'

+90
36.03'

+50
33.07'

+10
25' &
15'

+05
45' &
EX.R/W

+10
19.99' &BST
15'

BM #2
-BL- STA 15+56
41' LEFT
ELEV. 2,586.67'

DO NOT DISTURB CANOPY

DO NOT DISTURB BUILDINGS

DO NOT DISTURB BUILDINGS

CONVERT PI TO IB

REPLACE CMP

REMOVE & REPLACE EX. CB

REMOVE EX. DI AND PIPE

RETAIN

RETAIN

END PAVING
-Y3- 11+00.00

END CONSTR.
-Y3- STA 11+10.00

REG. CONSTR.
-L- STA 11+40.00

-BY2-10 9+05.75 PINC

N 72° 05' 49.0" E

N 60° 16' 21.3" E

S 81° 01' 21.3" E

S 54° 34' 21.9" E

N 23° 55' 38" E 241.72'

N 10° 18' 39" W 187.09'

S 01° 06' 16" E 98.79'

S 18° 40' 37" E 85.03'

S 18° 26' 44" E 19.00'

S 71° 45' 37" W 97.78'

S 71° 02' 21" E

S 15° 57' 33" W 68.27'

N 72° 02' 47" E 18.13'

S 17° 44' 43" E 150.96'

S 13° 59' 28" E 115.90'

N 70° 27' 55" W 7.60'

N 70° 27' 55" W 86.27'

S 13° 59' 49" E 100.74'

S 76° 03' 46" E 36.36'

S 72° 05' 49.0" W 36.5'

72" CHL & 3SBW

24" RCP

18" RCP

15" RCP

48" CHL

36" CONC WALL

10' B. PLASTIC

4' CONC WALK

5' CONC STEPS

5' SIDEWALK

2'-6" C & G

5' CONC

3' CONC

CONC

CONC C&G

4" PVC

4" CONC WALK

WATER & OIL SEPERATORS

MONITOR WELL

MTL DRAIN

MTL CANOPY

MTL STEPS

MTL WALK

OIL TANK

17,000 GAL

15,000 GAL

7,000 GAL

3,000 GAL

4,000 GAL

SMATHERS OIL COMPANY
DB 552 PG 2122

SHERRY ANN STAMEY
DB 463 PG

ANDY KATSIGIANIS
DB 483 PG 2221

CANTON MEDICAL CENTER, LLC
ISMBUS
DB 479 PG 581

TOWN OF CANTON
DB RB 741 PG 1788

THOMAS PARHAM
DB 498 PG 2405

ARLENE GREENE CRISP
DB 155 PG 497
DB 125 PG 138
DB 125 PG 139

T.W. WILSON
DB 594 PG 2897

PIERRE PEPIN
DB 701 PG

LOYAL ORDER OF MOOSE #515
PG 542
DB 123

NORFOLK SOUTHERN CORPORATION
RAILROAD R/W
"CLOSED"
WOODS

"DEAD END" STREET
MAINTAINED R/W
20' BST-BY6-1
28' BST

2SBK APT

ISMTLBUS

ISBLKBUS

ISFBUS
GREASE PIT COVERS

BLK DUGOUT

PRESS BOX

WD DECK

BLK PLANTER W/LT

72" WD RAIL

PK NAIL

COTTON SPIKE

EXISTING R/W

MATCH EXIST

WOODS

GR

BST

EIP

DI

CB

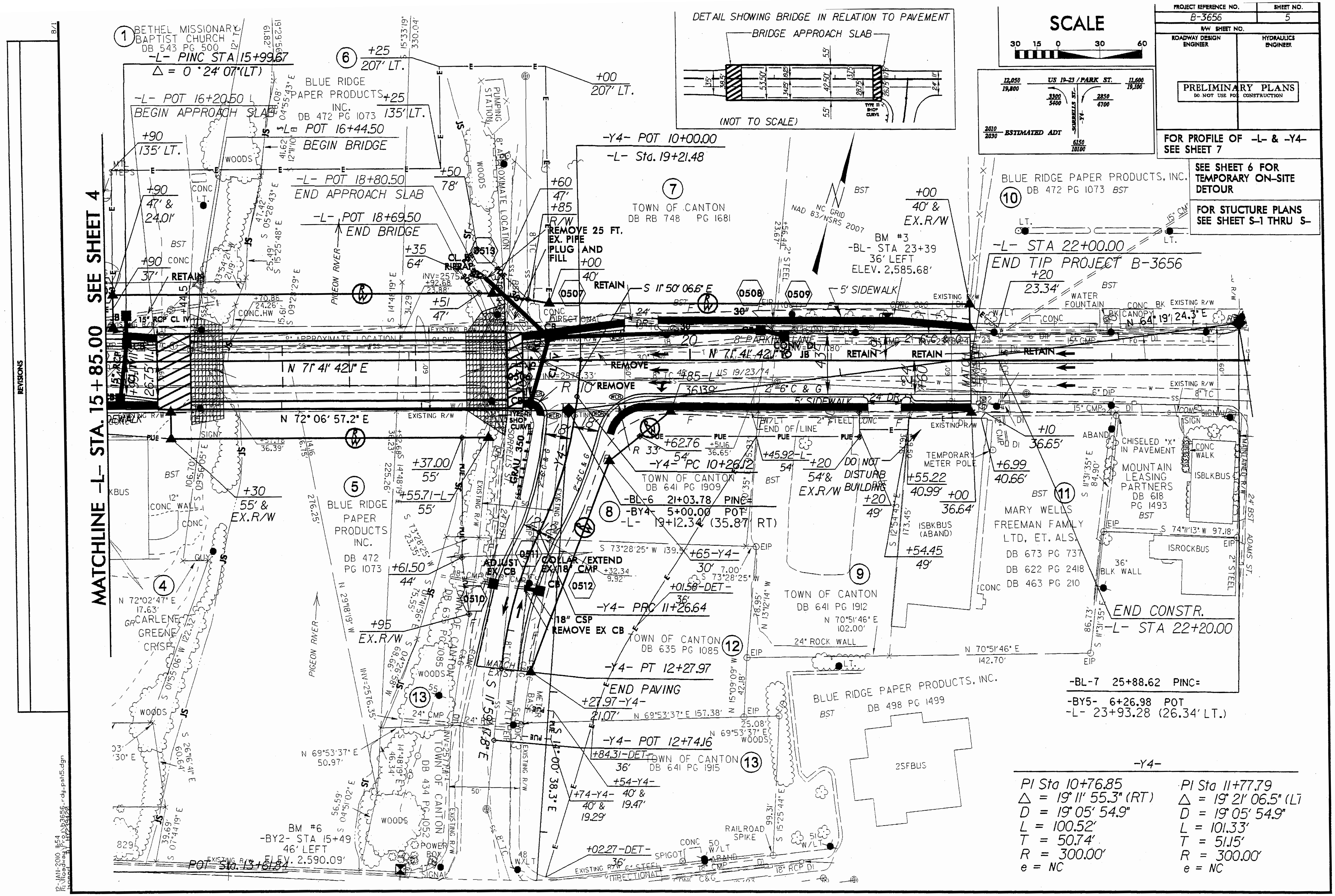
SS

JCB

WELL BASE

VENT

TOP-MH 385.87'

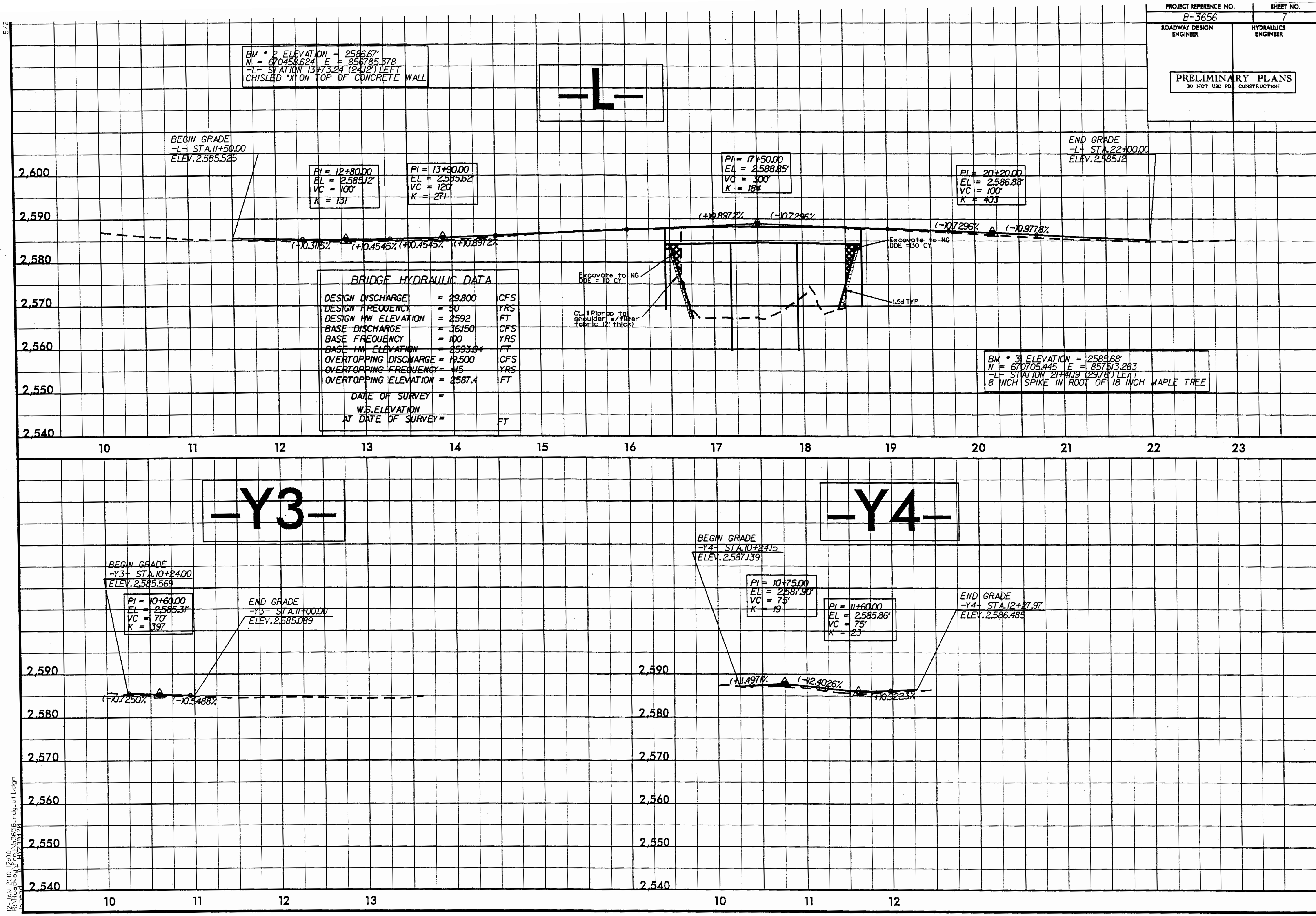

PROJECT REFERENCE NO. B-3656
SHEET NO. 5
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SCALE
30 15 0 30 60
US 19-23 / PARK ST.
SORRELLS ST. -Y4-
2010/2030 ESTIMATED ADT
FOR PROFILE OF -L- & -Y4- SEE SHEET 7
SEE SHEET 6 FOR TEMPORARY ON-SITE DETOUR
FOR STUCTURE PLANS SEE SHEET S-1 THRU S-
DETAIL SHOWING BRIDGE IN RELATION TO PAVEMENT
BRIDGE APPROACH SLAB
(NOT TO SCALE)
MATCHLINE -L- STA. 15+85.00 SEE SHEET 4
BETHEL MISSIONARY BAPTIST CHURCH DB 543 PG 500
-L- PINC STA 15+99.67
Δ = 0° 24' 07" (LT)
-L- POT 16+20.50 BEGIN APPROACH SLAB
-L- POT 16+44.50 BEGIN BRIDGE
-L- POT 18+80.50 END APPROACH SLAB
-L- POT 18+69.50 END BRIDGE
BLUE RIDGE PAPER PRODUCTS INC. DB 472 PG 1073
-Y4- POT 10+00.00
-L- Sta. 19+21.48
TOWN OF CANTON DB RB 748 PG 1681
NC GRID NAD 83/NSRS 2007
BM #3 -BL- STA 23+39 36' LEFT ELEV. 2,585.68'
BLUE RIDGE PAPER PRODUCTS, INC. DB 472 PG 1073
-L- STA 22+00.00
END TIP PROJECT B-3656
REMOVE 25 FT. EX. PIPE PLUG AND FILL
N 71° 41' 42.1" E
N 72° 06' 57.2" E
S 11° 50' 06.6" E
5' SIDEWALK
8' PARKING LANE
RETAIN
REMOVE
PIGEON RIVER
APPROXIMATE LOCATION
PUMPING STATION
WOODS
CARLENE GREENE CRISP
BLUE RIDGE PAPER PRODUCTS INC. DB 472 PG 1073
-BL-6 21+03.78 PINC=
-BY4- 5+00.00 POT=
-L- 19+12.34 (35.87' RT)
-Y4- PC 10+26.12
TOWN OF CANTON DB 641 PG 1909
TOWN OF CANTON DB 641 PG 1912
TOWN OF CANTON DB 635 PG 1085
-Y4- PRC 11+26.64
-Y4- PT 12+27.97
END PAVING
-Y4- POT 12+74.16
TOWN OF CANTON DB 641 PG 1915
ADJUST EX. CB
COLLAR / EXTEND EX. 18" CMP
18" CSP REMOVE EX CB
DO NOT DISTURB BUILDING
TEMPORARY METER POLE
MARY WELLS FREEMAN FAMILY LTD, ET. ALS. DB 673 PG 737 DB 622 PG 2418 DB 463 PG 210
MOUNTAIN LEASING PARTNERS DB 618 PG 1493
CHISELED "X" IN PAVEMENT
END CONSTR. -L- STA 22+20.00
-BL-7 25+88.62 PINC=
-BY5- 6+26.98 POT
-L- 23+93.28 (26.34' LT.)
BLUE RIDGE PAPER PRODUCTS, INC. DB 498 PG 1499
BM #6 -BY2- STA 15+49 46' LEFT ELEV. 2,590.09'
POT Sta. 13+61.84
RAILROAD SPIKE
-Y4-
PI Sta 10+76.85
Δ = 19° 11' 55.3" (RT)
D = 19° 05' 54.9"
L = 100.52'
T = 50.74'
R = 300.00'
e = NC
PI Sta 11+77.79
Δ = 19° 21' 06.5" (LT)
D = 19° 05' 54.9"
L = 101.33'
T = 51.15'
R = 300.00'
e = NC
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-3656	7

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-L-
BM # 2 ELEVATION = 2586.67'
N = 670458.624 E = 856785.378
-L- STATION 13+73.24 (24.12') LEFT
CHISLED "X" ON TOP OF CONCRETE WALL
BEGIN GRADE
-L- STA.11+50.00
ELEV.2,585.525
PI = 12+80.00
EL = 2,585.12'
VC = 100'
K = 131
PI = 13+90.00
EL = 2,585.52'
VC = 120'
K = 271
PI = 17+50.00
EL = 2,588.85'
VC = 300'
K = 184
PI = 20+20.00
EL = 2,586.88'
VC = 100'
K = 405
END GRADE
-L- STA.22+00.00
ELEV.2,585.12
(-)0.3115%
(+)0.4545%
(+)0.4545%
(+)0.8972%
(+)0.8972%
(-)0.7296%
(-)0.7296%
(-)0.9778%
Excavate to NG
DDE = 110 CY
Excavate to NG
DDE = 130 CY
CL.II Riprap to shoulder w/filter fabric (2' thick)
1.5:1 TYP
BM # 3 ELEVATION = 2585.68'
N = 670705.445 E = 857513.263
-L- STATION 21+41.19 (29.78') LEFT
8 INCH SPIKE IN ROOT OF 18 INCH MAPLE TREE
2,600
2,590
2,580
2,570
2,560
2,550
2,540
10 11 12 13 14 15 16 17 18 19 20 21 22 23
-Y3-
BEGIN GRADE
-Y3- STA.10+24.00
ELEV.2,585.569
PI = 10+60.00
EL = 2,585.31'
VC = 70'
K = 397
END GRADE
-Y3- STA.11+00.00
ELEV.2,585.089
(-)0.7250%
(-)0.5488%
-Y4-
BEGIN GRADE
-Y4- STA.10+24.15
ELEV.2,587.139
PI = 10+75.00
EL = 2,587.90'
VC = 75'
K = 19
PI = 11+60.00
EL = 2,585.86'
VC = 75'
K = 23
END GRADE
-Y4- STA.12+27.97
ELEV.2,586.485
(+)1.4971%
(-)2.4026%
(+)0.3223%
2,590
2,580
2,570
2,560
2,550
2,540
10 11 12 13
10 11 12
12-JAN-2010 12:00
R:\Roadway\Proj\b3656_rdy_pfl.dgn
AT HY239420

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	29,800	CFS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	2592	FT
BASE DISCHARGE	=	36,150	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	2593.04	FT
OVERTOPPING DISCHARGE	=	19,500	CFS
OVERTOPPING FREQUENCY	=	±15	YRS
OVERTOPPING ELEVATION	=	2587.4	FT
DATE OF SURVEY	=		
W.S. ELEVATION AT DATE OF SURVEY	=		FT