STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAT L. MCCRORY
GOVERNOR

ANTHONY J. TATA
SECRETARY

August 26, 2013

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

ATTN: Ms. Loretta Beckwith
NCDOT Coordinator

Subject: **Application for Section 404 Nationwide Permit 23 and 33 and Section 401 Water Quality Certification** for the proposed replacement of Bridge No. 108 over Flat Creek on SR 2806 in Buncombe County, Federal Aid Project No. BRSTP-2806(1), Division 13, TIP No. B-5167, Debit $570 from WBS 42324.1.1.

Dear Madam:

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 108 over Flat Creek on SR 2806 with a 46' long, 12'x7' double-barrel reinforced concrete box culvert (RCBC) on the existing alignment. Traffic will be maintained on-site during construction via one lane staged construction of the new culvert utilizing temporary signals.

There will be 168 linear feet of permanent stream impacts due to the proposed RCBC and channel realignment into the baseflow cell, and <0.01 acre (13 linear feet) of temporary stream impacts resulting from the installation of the RCBC.

Please see enclosed copies of the Pre-Construction Notification (PCN), EEP acceptance letter, avoidance and minimization checklist, stormwater management plan, permit drawings and design plans for the above-referenced project. The Categorical Exclusion (CE) was completed in April 2012 and distributed shortly thereafter. Additional copies are available upon request.

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

TELEPHONE: 919-707-6000
FAX: 919-212-5785
WEBSITE:NCDOT.GOV

LOCATION:
CENTURY CENTER, BUILDING B
1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610

This project is located in a trout county, therefore comments from the NCWRC will be required prior to authorization by the Corps of Engineers. By copy of this letter and attachment, NCDOT hereby requests NCWRC Review. NCDOT requests that NCWRC forward their comments to the Corps of Engineers and the NCDOT within 30 calendar days of receipt of this application.

This project calls for a letting date of March 18, 2014 and a review date of January 28, 2013; however, the let date may advance as additional funding becomes available.

A copy of this permit application and its distribution list will be posted on the NCDOT Website at: http://connect.ncdot.gov/resources/Environmental. If you have any questions or need additional information, please call Erin Cheely at (919) 707-6108.

Sincerely,

E. L. Lusk

for Deborah M. Barbour, PE
Director of Preconstruction

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 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 108 over Flat Creek on SR 2806
2b. County:	Buncombe
2c. Nearest municipality / town:	Black Mountain
2d. Subdivision name:	*not applicable*
2e. NCDOT only, T.I.P. or state project no:	B-5167

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) 707-6108
3g. Fax no.:	(919) 212-5785
3h. Email address:	ekcheely@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:35.53001 (DD.DDDDDD)	Longitude: - 82.31066 (-DD.DDDDDD)
1c. Property size:	1.5 acres	
2. Surface Waters		
2a. Name of nearest body of water (stream, river, etc.) to proposed project:	Flat Creek	
2b. Water Quality Classification of nearest receiving water:	C; Tr	
2c. River basin:	Broad	
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: The land use within the vicinity of the project consists of about 75% forest land (including mixed hardwood forests), 15% developed or disturbed lands (roadsides and residential areas) and 10% cultivated land (agricultural fields and pastures).		
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: 320		
3d. Explain the purpose of the proposed project: The purpose of this project is to replace a structurally deficient (sufficiency rating of 14.9 of 100, structural evaluation of 2 of 9) and functionally obsolete (deck geometry 2 out of 9) bridge.		
3e. Describe the overall project in detail, including the type of equipment to be used: The project involves replacing a 26-foot single-span bridge with a 46' long, 2 @ 12'x7' reinforced concrete box culvert (RCBC) on the existing alignment, maintaining traffic on-site with one lane staged construction of the new culvert utilizing temporary signals during construction. 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: Only a perennial stream, no JD needed earlier	☐ 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): Erin Cheely	Agency/Consultant Company: NCDOT 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	
				2g. **Total wetland impacts**	0 Permanent 0 Temporary

2h. Comments: No wetlands within construction limits

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	Culvert (RCBC)	Flat Creek	☒ PER ☐ INT	☒ Corps ☐ DWQ	11	168
Site 1 ☐ P ☒ T	Culvert Installation	Flat Creek	☒ PER ☐ INT	☒ Corps ☐ DWQ	11	13 (<0.01ac)
Site 2 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
Site 3 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
Site 4 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
Site 5 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
					3h. **Total stream and tributary impacts**	168 Perm 13 Temp (<0.01ac)

3i. Comments: Replace bridge with 2@12'x7' RCBC. Permanent impacts resulting from new RCBC itself (48') and slight realignment/shifting of channel to baseflow cell including floodplain bench construction (120'). Temporary impacts are from installation of RCBC and construction of associated floodplain benches.

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	0 Permanent 0 Temporary

4g. Comments: No open water within construction limits.

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: This project is not located within a protected buffer area.					

D. Impact Justification and Mitigation

1. Avoidance and Minimization

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

Please see the attached 'Bridge to Culvert Avoidance and Minimization Summary Checklist' for a detailed summary of the avoidance and minimization measures. A culvert was chosen as the selected alternative due to the small stream size, small drainage area (4 sq mi), and cost of maintenance. The proposed culvert has been designed to maintain the existing stream slope, low flow channel dimensions, low flow velocities and provides a smooth transition from upstream to downstream with no sharp bends at the inlet or outlet. A bottomless culvert was investigated, but was not possible due to the lack of shallow enough bedrock at the site. The proposed RCBC will have low flow and high flow sills to maintain channel profile and velocities while facilitating fish passage. Multiple baffle configurations were investigated, but due to the stream width at this crossing, all would decrease the culvert width available to convey the stream flow (thus increasing the output velocities to higher than the natural velocity of the stream). The velocity increase caused by the installation of the baffles could impede fish passage.

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

Best Management Practices (BMPs) will be utilized during construction to attempt to reduce the stormwater impacts to the receiving stream due to erosion and runoff. Traffic will be maintained on-site during construction with one lane staged construction of the new culvert utilizing temporary signals. Design Standards in Sensitive Watersheds will be implemented during construction. A trout moratorium from January 1 – April 15 will be adhered to in order to protect reproducing trout.

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:
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:	168 linear feet
4c. If using stream mitigation, stream temperature:	☐ warm ☐ cool ☒ cold
4d. Buffer mitigation requested (DWQ only):	0 square feet
4e. Riparian wetland mitigation requested:	0 acres
4f. Non-riparian wetland mitigation requested:	0 acres
4g. Coastal (tidal) wetland mitigation requested:	0 acres

4h. Comments: The NCDOT does not propose mitigation for the 13 linear feet (<0.01ac) temporary impacts from RCBC installation. These temporary impacts do not require fill in the stream bed and, therefore, under Section 404 of the Clean Water Act, do not constitute Loss of Waters of the U.S. and are not subject to compensatory mitigation.

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: If required from 1a, see attached buffer 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 N/A
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: Categorical Exclusion (CE) approved 4/9/12	☒ 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? Of the thirteen federally listed species for Buncombe County (as of 12/26/12), only one species, Virginia spiraea, has marginal potential habitat located within the footprint of this project. The project area was surveyed by NCDOT biologists on 6/24/09, 7/6/11 and 6/27/13. No individuals of this species were found during any of these surveys. This project will have no effect on any Federally Threatened or Endangered species listed for Buncombe County.		
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		

Deborah M. Barbour, PE Applicant/Agent's Printed Name	E. L. Lush Applicant/Agent's Signature (Agent's signature is valid only if an authorization letter from the applicant is provided.)	8.26.13 Date

Ecosystem Enhancement PROGRAM

July 9, 2013

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

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

B-5167, Replace Bridge Number 108 over Flat Creek on SR 2806, Buncombe County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory stream mitigation for the subject project. Based on the information supplied by you on July 3, 2013, the impacts are located in CU 03050105 of the Broad River basin in the Southern Mountains (SM) Eco-Region, and are as follows:

Broad 03050105 SM	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	168.0	0	0	0	0	0	0	0

*Some of the stream and wetland impacts may be proposed to be mitigated at a 1:1 mitigation ratio. See permit application for details.

This impact and associated mitigation need were under projected by the NCDOT in the 2013 impact data. EEP will commit to implement sufficient compensatory stream mitigation credits to offset the impacts associated with this project as determined by the regulatory agencies using the delivery timeline listed in Section F.3.c.iii of the N.C. Department of Environment and Natural Resources' Ecosystem Enhancement Program In-Lieu Fee Instrument dated July 28, 2010. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from EEP.

If you have any questions or need additional information, please contact Ms. Beth Harmon at 919-707-8420.

Sincerely,

James B. Stanfill

James B. Stanfill
EEP Asset Management Supervisor

cc: Ms. Lori Beckwith, USACE – Asheville Regulatory Field Office
Ms. Amy Chapman, Division of Water Quality, Wetlands/401 Unit
Ms. Amy Euliss, Division of Water Quality – Winston-Salem Office
File: B-5167

Bridge to Culvert Avoidance and Minimization Summary Checklist

Project B-5167 Buncombe County

The following checklist should be reviewed and information provided for each item:

Proposed Structure Summary
Drainage Area- *4.0 Sq. Mi.*
DWQ Stream Classification- *C; Tr*
Culvert Size and Type- *2 @ 12' X 7' Reinforced Concrete Box Culvert*
Culvert Length- *48' +/-*
Minimization Efforts- *The proposed culvert will be buried 1 ft. The culvert maintains the existing stream slope, low flow channel dimensions, low flow velocities and provides a smooth transition from upstream to downstream with no sharp bends at the inlet or outlet.*

Stream Slope
Existing average stream slope- *1.1292%*
Proposed culvert slope- *1.2013%*

Fish and/or Aquatic life Passage
Existing low flow channel dimensions in the stream- *The existing low flow channel width upstream is approximately 11 ft. with an average depth of 0.4 ft. and downstream of the culvert is approximately 7 ft. with an average depth of 0.8 ft.*
Proposed low flow dimensions through the culvert- *The proposed low flow channel width is 12 ft. with an average depth of 0.4 ft.*
Existing low flow velocities in the stream- *1.9 ft/sec*
Proposed low flow velocities through the culvert- *1.7 ft/sec*
Alternating low flow sills/baffles- *The proposed box culvert width is similar to the existing channel riffle section width. As such, baffles are not required to facilitate fish passage.*

Culvert Burial
Existing streambed material- *Approximately 1 in. to 6 in. cobble with gravel.*
Proposed culvert burial- *1 ft.*
Proposed sills/baffles- *Low flow and high flow sills will be used. Culvert slope of 1.2% does not necessitate the use of baffles to hold bed material.*

Project B-5167 Buncombe County Cont'

Culvert/Stream Alignment

Stream patterns upstream and downstream of the culvert that could affect fish passage and bank stability- *Upstream of the existing crossing the stream takes a sharp bend before passing through the existing structure. The stream slope is fairly constant through the reach of the stream up and downstream of where the culvert will be placed.*

Bed forms impacted by culvert (riffles, pools glides etc.)- *There is an existing riffle at the upstream existing bridge face. At the downstream existing bridge face the stream is near the beginning of a pool.*

Establishment of a low flow floodplain bench required- *The leftmost barrel looking downstream will utilize a 1' tall flood plain bench.*

Culvert alignment with stream- *The culvert was placed in an orientation similar to existing stream orientation. With the proposed culvert orientation, the existing bend at the upstream existing bridge face will be lessened and consequently improved.*

Stream realignment necessary- *Yes*

Sharp bends at entrance and outlet- *(Existing conditions, Yes at inlet). Proposed channel work allow for gradual transition from the proposed box culvert to the existing channel.*

Bank stabilization- *Yes, Class I rip rap will be utilized on the improved channel banks.*

Outlet Velocities

Natural stream channel 2yr velocity- *4.6 ft/sec*

Proposed Culvert 2yr outlet velocity- *4.5 ft/sec*

Natural stream channel 10yr velocity- *8.8 ft/sec*

Proposed Culvert 10yr outlet velocity- *8.2 ft/sec*

Roadway Geometric Considerations

Evaluate/describe roadway geometric constraints- *N/A*

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR LINEAR ROADWAY PROJECTS

(Version 1.2; Released July 2012)

Project/TIP No.: B-5167 **County(ies):** Buncombe

General Project Information

Project No.:	B-5167	**Project Type:**	Bridge Replacement	**Date:**	4/15/2013
NCDOT Contact:	Marshall W. Clawson, PE	**Contractor / Designer:**	Wetherill Engineering, Inc./ Dustin D. Creech, PE		
Address:	1590 Mail Service Center Raleigh, NC 27699-1590	**Address:**	559 Jones Franklin Rd. Suite 164 Raleigh, NC 27606		
Phone:	919-707-6713	**Phone:**	919-851-8077		
Email:	mclawson@ncdot.gov	**Email:**	dcreech@wetherilleng.com		
City/Town:	Fairview, NC	**County(ies):**	Buncombe		
River Basin(s):	Broad	**CAMA County?**	No		
Primary Receiving Water:	Upper Flat Creek	**NCDWQ Stream Index No.:**	9-12		
NCDWQ Surface Water Classification for Primary Receiving Water	**Primary:**	Class C			
	Supplemental:	Trout Waters (Tr)			
Other Stream Classification:					
303(d) Impairments:	None				
Buffer Rules in Effect	N/A				

Project Description

Project Length (lin. Miles or feet):	0.09 Mi.	**Surrounding Land Use:**	RESIDENTIAL/WOODED/MOUNTAINS

	Proposed Project	**Existing Site**
Project Built-Upon Area (ac.)	0.81 ac.	0.23 ac.
Typical Cross Section Description:	(2) 10' Lanes, 2' full depth paved shoulders with 3' grassed shoulder sections or 2' full depth paved shoulders with approximately 4' grassed shoulders up to guardrail	(2) 9' +/- Lanes with grassed shoulder sections
Average Daily Traffic (veh/hr/day):	Design/Future: 250 (ADT 2030)	Existing: 150 (ADT 2013)
General Project Narrative:	REPLACE BRIDGE NO. 108 OVER UPPER FLAT CREEK ON SR 2806 (GARREN CREEK RD.) WITH A DOUBLE BARREL BOX CULVERT. USE 2 @ 12' X 7' RCBC (BURIED 1'; 2' SILL RIGHT BARREL LOOKING UPSTREAM; 1' SILL LEFT BARREL LOOKING UPSTREAM)	

References

North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR LINEAR ROADWAY PROJECTS

(Version 1.2; Released July 2012)

Project/TIP No.: B-5167 **County(ies):** Buncombe

Project Environmental Summary

Surface Water Impacts

Sheet No.	Station (From / To)	Feature Impacted	Water / Wetland / Buffer Type	Receiving Surface Water Name	NRTR Map ID	NCDWQ Stream Index	NCDWQ Surface Water Classification	303(d) Impairments	Type of Impact	Existing SCM	Proposed SCM
4	-L- 15+70.5 -L- 16+23	Stream	Perennial	Upper Flat Creek	---	9-12	C;Tr	None	Culvert	N/A	N/A

* List all stream and surface water impact locations regardless of jurisdiction or size.
Equalizer Pipes to be noted as a minimization of impacts.
All proposed SCMs listed must also be listed under Swales, Preformed Sour Holes and other Energy Dissipators, or Other Stormwater Control Measures.

Description of Minimization of Impacts or Mitigation

Existing drainage patterns were maintained to the extent practicable. Proposed culvert length was kept to a minimum with 2:1 roadway fill slopes. Channel realignment provides gradual transition from the proposed box culvert to the existing channel. Class I rip rap is used to stabilize the stream banks along inlet and outlet channel banks.

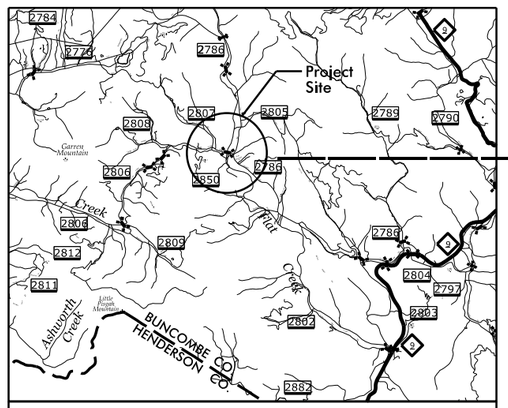
References

09/08/99

TIP PROJECT: B-5167

CONTRACT: _____

See Sheet 1-A For Index of Sheets



VICINITY MAP

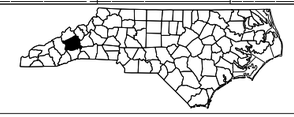
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BUNCOMBE COUNTY

ENGLISH

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5167	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
42324.1.1	BRSTP-2806(1)	PE

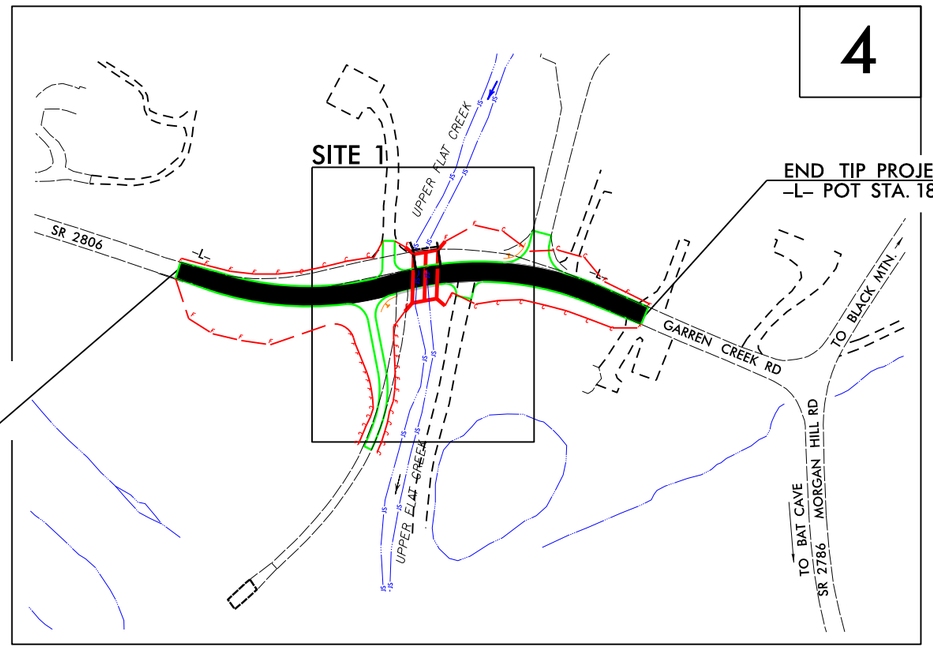


PERMIT DRAWING
SHEET 1 OF 7

LOCATION: BRIDGE 108 OVER UPPER FLAT CREEK ON SR 2806 (GARREN CREEK ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

WETLAND AND SURFACE WATER IMPACTS PERMIT



INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

30 15 0 30 60
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2013 = 150
ADT 2030 = 250
DHV = 10 %
DIR = 60 %
T = 5 % *
V = 30 MPH
*TTST =2% DUAL 3%
FUNC CLASS = RURAL LOCAL
SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-5167 =

LENGTH STRUCTURE TIP PROJECT B-5167 =

TOTAL LENGTH TIP PROJECT B-5167 = 0.090 MILES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: SEPTEMBER 21, 2012

LETTING DATE: MARCH 2013

G. E. BREW, PE
PROJECT ENGINEER

I. T. YOUNIS
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

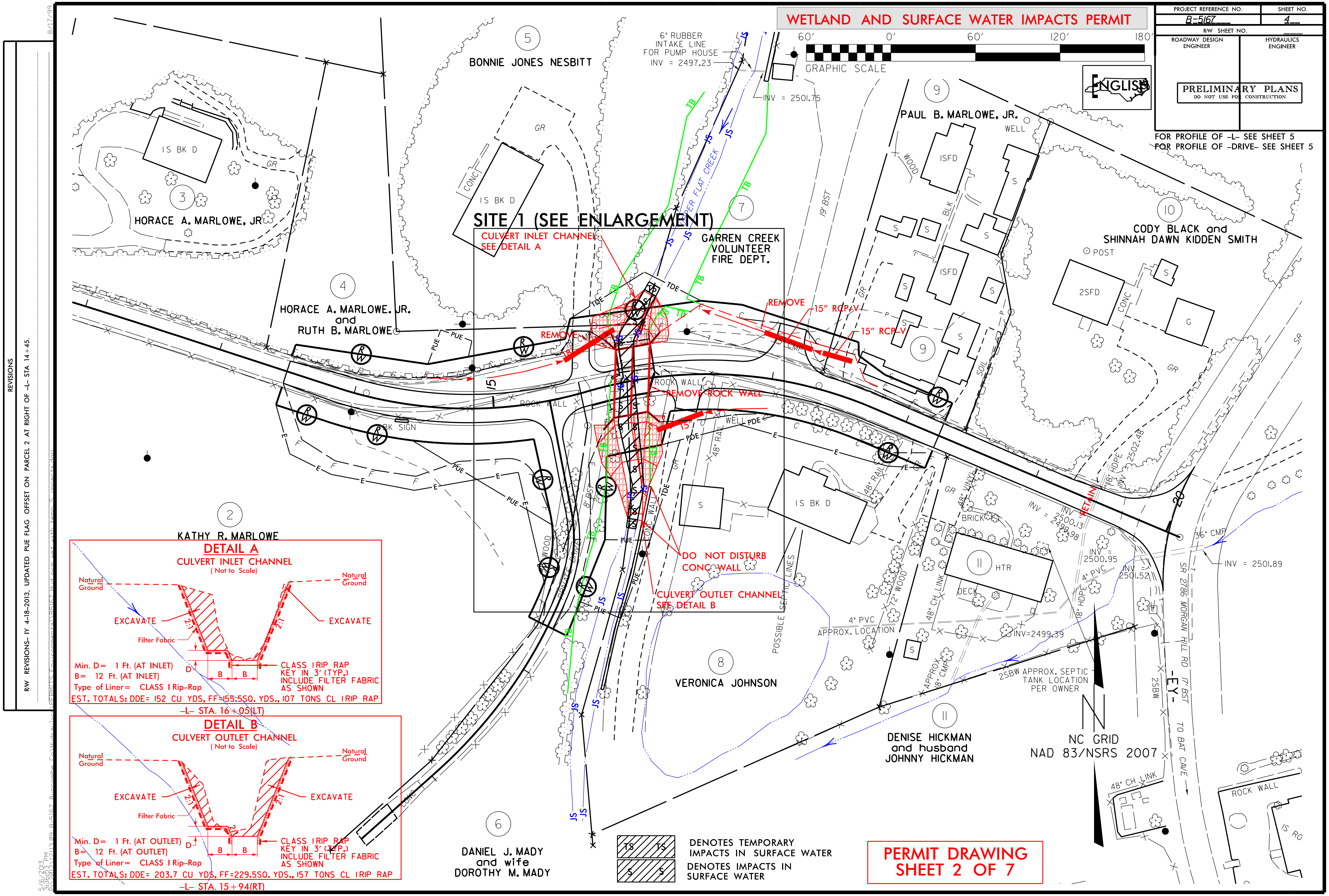
ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

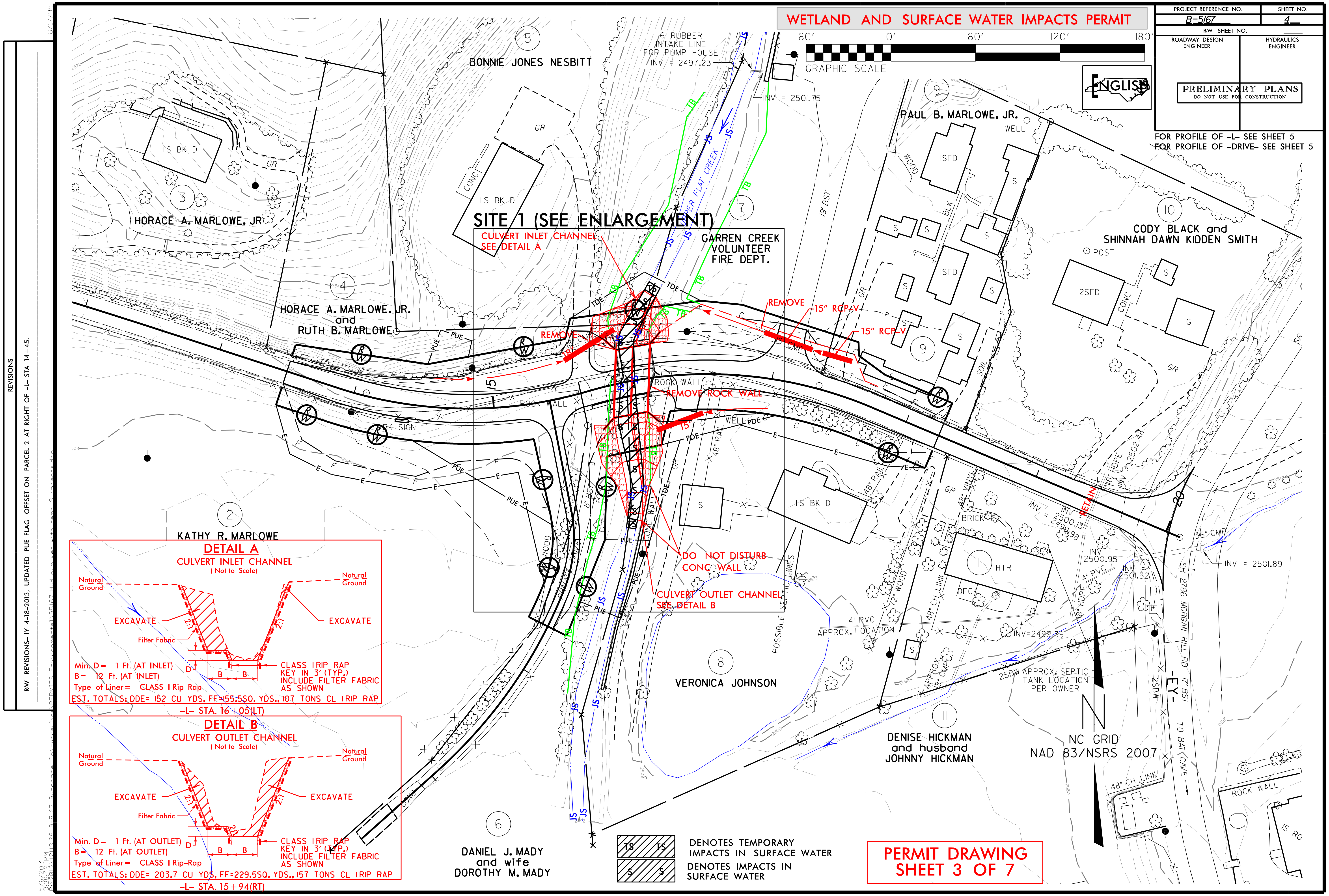
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

4/18/2013
3:17:06 PM
P:\2012\2113.09 B-5167 Buncombe Co\Hydraulics\PERMITS_Environmental\B5167_Hyd_prm_wet.dgn

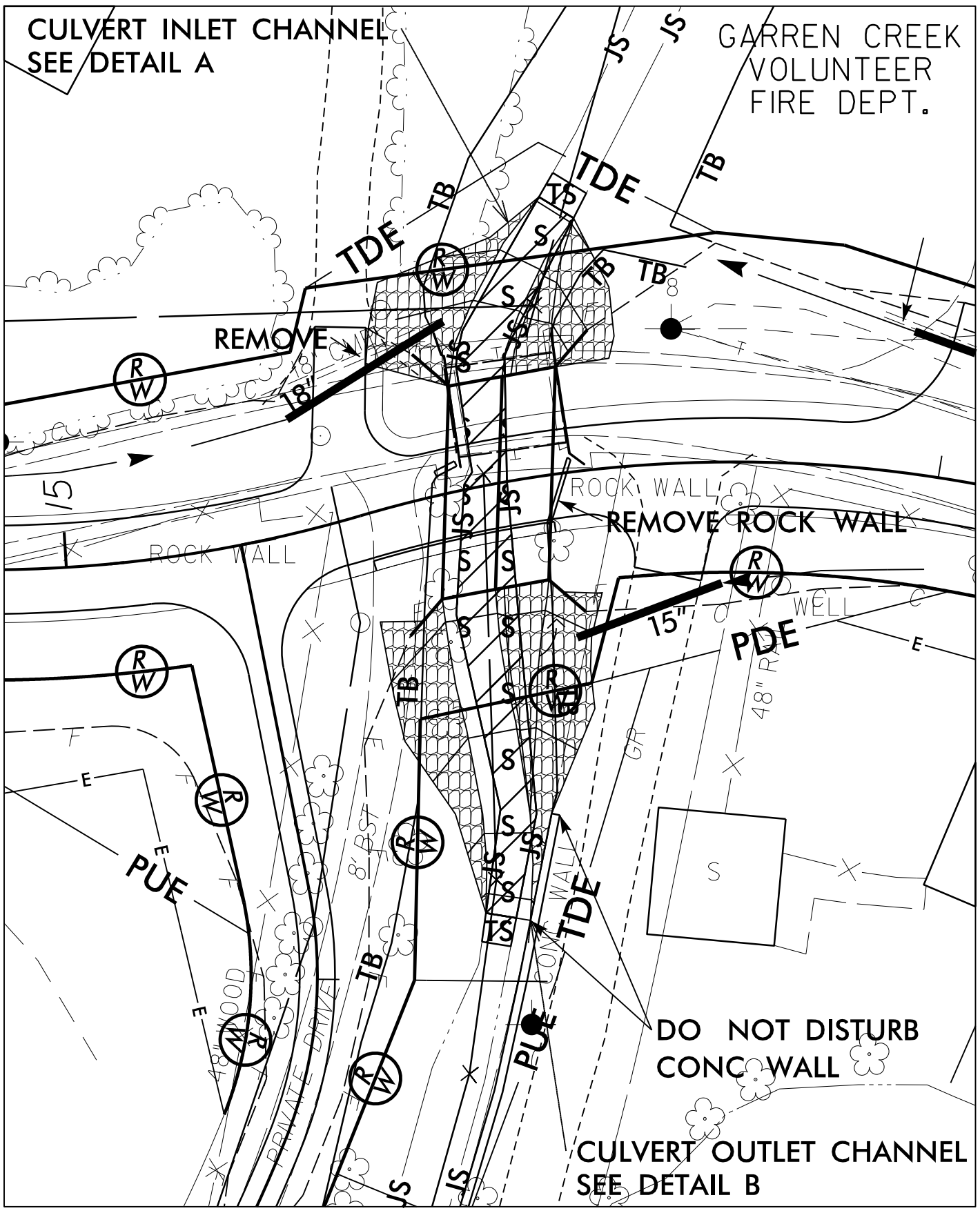


WETLAND AND SURFACE WATER IMPACTS PERMIT
PROJECT REFERENCE NO. B-5167
SHEET NO. 4
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
FOR PROFILE OF -L- SEE SHEET 5
FOR PROFILE OF -DRIVE- SEE SHEET 5
REVISIONS
R/W REVISIONS- IY 4-18-2013, UPDATED PUE FLAG OFFSET ON PARCEL 2 AT RIGHT OF -L- STA 14+45.
GRAPHIC SCALE
60' 0' 60' 120' 180'
6" RUBBER INTAKE LINE FOR PUMP HOUSE INV = 2497.23
INV = 2501.75
BONNIE JONES NESBITT
HORACE A. MARLOWE, JR
HORACE A. MARLOWE, JR. and RUTH B. MARLOWE
PAUL B. MARLOWE, JR.
CODY BLACK and SHINNAH DAWN KIDDEN SMITH
GARREN CREEK VOLUNTEER FIRE DEPT.
KATHY R. MARLOWE
VERONICA JOHNSON
DENISE HICKMAN and husband JOHNNY HICKMAN
DANIEL J. MADY and wife DOROTHY M. MADY
SITE 1 (SEE ENLARGEMENT)
CULVERT INLET CHANNEL SEE DETAIL A
CULVERT OUTLET CHANNEL SEE DETAIL B
REMOVE
REMOVE ROCK WALL
15" RCP-V
DO NOT DISTURB CONC. WALL
RETAIN
INV = 2501.89
36" CMP
INV=2499.39
4" PVC APPROX. LOCATION
APPROX. SEPTIC TANK LOCATION PER OWNER
SR 2786 MORGAN HILL RD
TO BAT CAVE
NC GRID NAD 83/NSRS 2007
DETAIL A
CULVERT INLET CHANNEL
(Not to Scale)
Natural Ground
EXCAVATE
Filter Fabric
Min. D= 1 Ft. (AT INLET)
B= 12 Ft. (AT INLET)
Type of Liner= CLASS I Rip-Rap
CLASS I RIP RAP KEY IN 3' (TYP.) INCLUDE FILTER FABRIC AS SHOWN
EST. TOTALS: DDE= 152 CU YDS, FF=155.5SQ. YDS., 107 TONS CL I RIP RAP
-L- STA. 16+05(LT)
DETAIL B
CULVERT OUTLET CHANNEL
(Not to Scale)
Natural Ground
EXCAVATE
Filter Fabric
Min. D= 1 Ft. (AT OUTLET)
B= 12 Ft. (AT OUTLET)
Type of Liner= CLASS I Rip-Rap
CLASS I RIP RAP KEY IN 3' (TYP.) INCLUDE FILTER FABRIC AS SHOWN
EST. TOTALS: DDE= 203.7 CU YDS, FF=229.5SQ. YDS., 157 TONS CL I RIP RAP
-L- STA. 15+94(RT)
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES IMPACTS IN SURFACE WATER
PERMIT DRAWING SHEET 2 OF 7



WETLAND AND SURFACE WATER IMPACTS PERMIT
PROJECT REFERENCE NO. B-5167
SHEET NO. 4
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
ENGLISH
GRAPHIC SCALE
60' 0' 60' 120' 180'
FOR PROFILE OF -L- SEE SHEET 5
FOR PROFILE OF -DRIVE- SEE SHEET 5
REVISIONS
R/W REVISIONS- IY 4-18-2013, UPDATED PUE FLAG OFFSET ON PARCEL 2 AT RIGHT OF -L- STA 14+45.
BONNIE JONES NESBITT
6" RUBBER INTAKE LINE FOR PUMP HOUSE INV = 2497.23
INV = 2501.75
HORACE A. MARLOWE, JR
HORACE A. MARLOWE, JR. and RUTH B. MARLOWE
SITE 1 (SEE ENLARGEMENT)
CULVERT INLET CHANNEL SEE DETAIL A
GARREN CREEK VOLUNTEER FIRE DEPT.
PAUL B. MARLOWE, JR.
CODY BLACK and SHINNAH DAWN KIDDEN SMITH
REMOVE 15" RCP-V
15" RCP-V
REMOVE ROCK WALL
DO NOT DISTURB CONC. WALL
CULVERT OUTLET CHANNEL SEE DETAIL B
RETAIN
KATHY R. MARLOWE
VERONICA JOHNSON
DENISE HICKMAN and husband JOHNNY HICKMAN
DANIEL J. MADY and wife DOROTHY M. MADY
APPROX. SEPTIC TANK LOCATION PER OWNER
4" PVC APPROX. LOCATION
INV = 2501.89
36" CMP
SR 2786 MORGAN HILL RD
TO BAT CAVE
NC GRID NAD 83/NSRS 2007
DETAIL A
CULVERT INLET CHANNEL
(Not to Scale)
Natural Ground
EXCAVATE
Filter Fabric
Min. D= 1 Ft. (AT INLET)
B= 12 Ft. (AT INLET)
Type of Liner= CLASS I Rip-Rap
CLASS I RIP RAP KEY IN 3' (TYP.) INCLUDE FILTER FABRIC AS SHOWN
EST. TOTALS: DDE= 152 CU YDS, FF=155.5SQ. YDS., 107 TONS CL I RIP RAP
-L- STA. 16+05(LT)
DETAIL B
CULVERT OUTLET CHANNEL
(Not to Scale)
Natural Ground
EXCAVATE
Filter Fabric
Min. D= 1 Ft. (AT OUTLET)
B= 12 Ft. (AT OUTLET)
Type of Liner= CLASS I Rip-Rap
CLASS I RIP RAP KEY IN 3' (TYP.) INCLUDE FILTER FABRIC AS SHOWN
EST. TOTALS: DDE= 203.7 CU YDS, FF=229.5SQ. YDS., 157 TONS CL I RIP RAP
-L- STA. 15+94(RT)
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES IMPACTS IN SURFACE WATER
PERMIT DRAWING SHEET 3 OF 7

SITE 1 ENLARGEMENT



PLAN VIEW

30′ 0′ 30′ 60′ 90′

GRAPHIC SCALE

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 4 OF 7

NCDOT

DIVISION OF HIGHWAYS

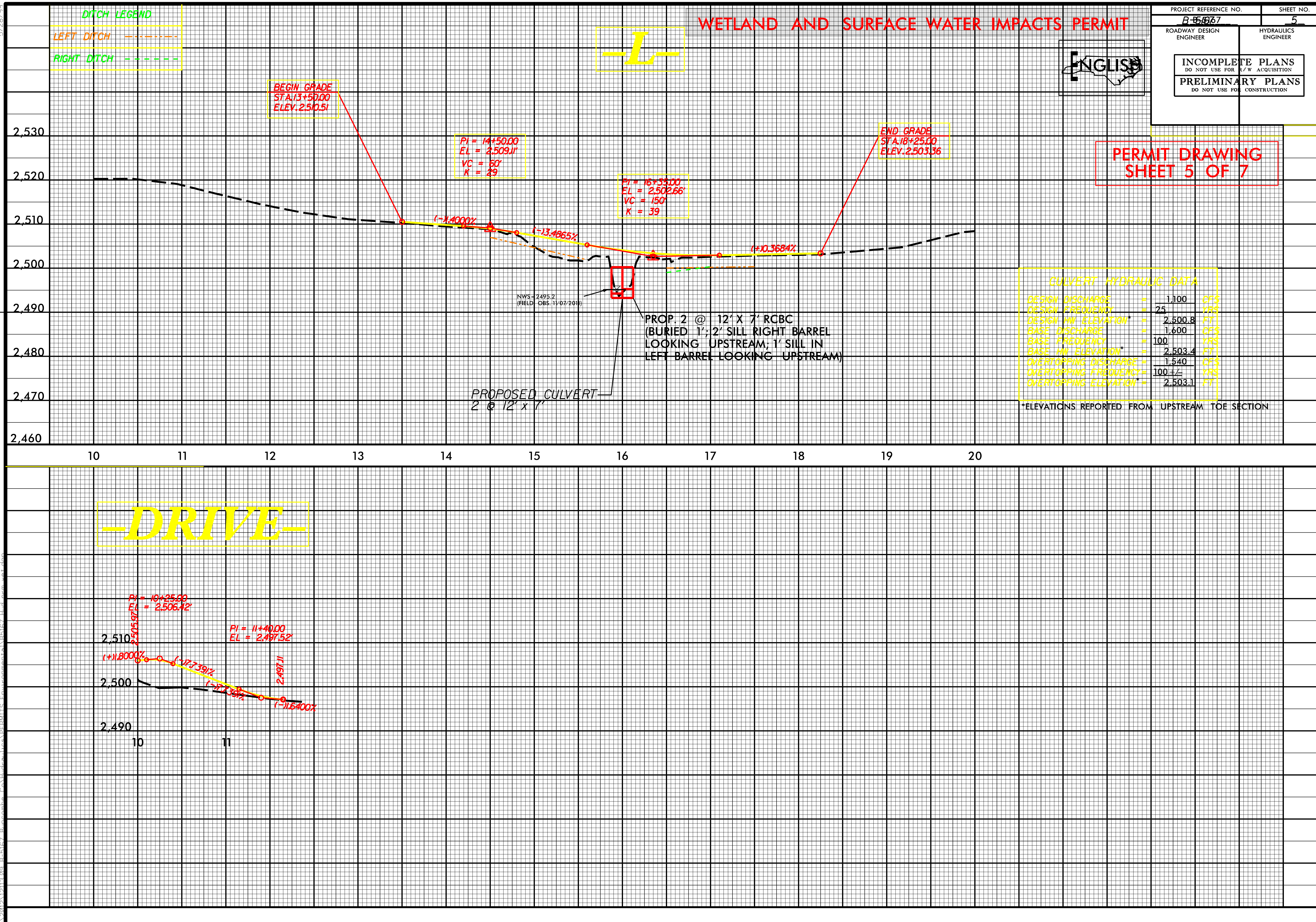
BUNCOMBE COUNTY

PROJECT: WBS - 42324.1.1 (B-5167)

BRG #108 OVER UPPER FLAT CREEK

ON SR2806 (GARREN CREEK RD.)

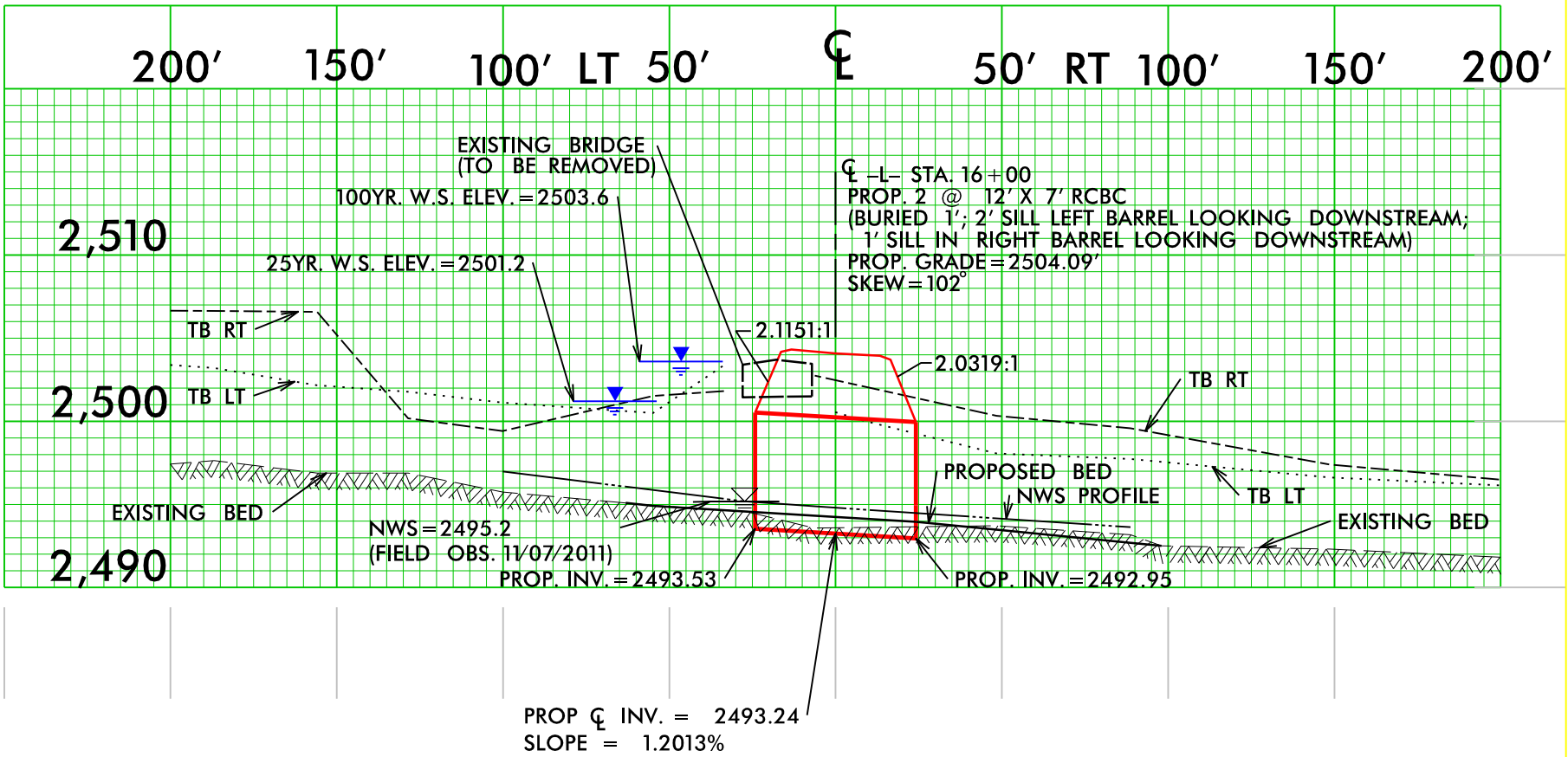
4 // 15 // 13



CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	=	1,100	CFS
DESIGN FREQUENCY	=	25	YRS
DESIGN HW ELEVATION*	=	2,500.8	FT
BASE DISCHARGE	=	1,600	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION*	=	2,503.4	FT
OVERTOPPING DISCHARGE	=	1,540	CFS
OVERTOPPING FREQUENCY	=	100 +/-	YRS
OVERTOPPING ELEVATION*	=	2,503.1	FT

*ELEVATIONS REPORTED FROM UPSTREAM TOE SECTION



PROFILE ALONG THE STRUCTURE (INSET)

PERMIT DRAWING
SHEET 6 OF 7

WETLAND AND SURFACE WATER IMPACTS PERMIT

SCALES:
1″ = 50′ HORIZ.
1″ = 10′ VERT.

NCDOT
DIVISION OF HIGHWAYS
BUNCOMBE COUNTY
PROJECT: WBS - 42324.1.1 (B-5167)
BRG #108 OVER UPPER FLAT CREEK
ON SR2806 (GARREN CREEK RD.)

4 / 15 / 13

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	-L- 15+70 to 16+23	RDWY/CULVERT						0.04	<0.01	168	13	
TOTALS:			0.00	0.00	0.00	0.00	0.00	0.04	<0.01	168	13	0

Additional Impacts Notes:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

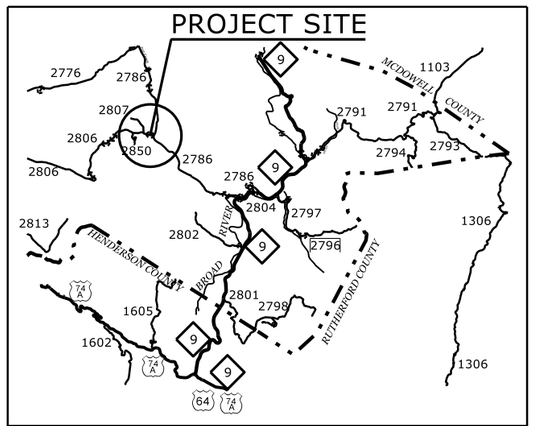
BUNCOMBE COUNTY
WBS - 42324.1.1 (B-5167)

09/08/99

TIP PROJECT: B-5167

CONTRACT:

See Sheet 1-A For Index of Sheets



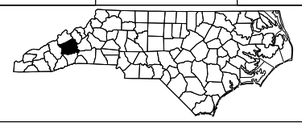
VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BUNCOMBE COUNTY

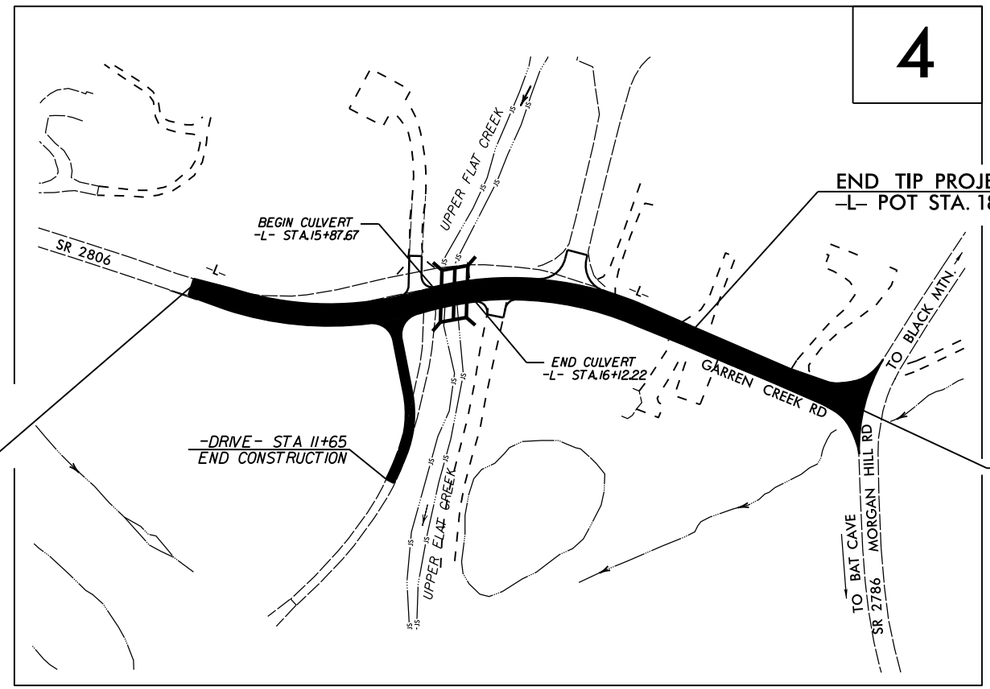
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5167	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
42324.1.1	BRSTP-2806(1)	PE
42324.2.1	BRSTP-2806(1)	R/W & UTIL



LOCATION: BRIDGE 108 OVER UPPER FLAT CREEK ON SR 2806 (GARREN CREEK ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, CULVERT, AND TEMPORARY SIGNALS.



NAD 83/
NSRS 2007

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDRIES

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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 2013 = 150
ADT 2030 = 250
DHV = 10 %
DIR = 60 %
T = 5 % *
V = 30 MPH
*TTST = 2% DUAL 3%
FUNC CLASS =
RURAL LOCAL
SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-5167 = 0.085 MILES

LENGTH STRUCTURE TIP PROJECT B-5167 = 0.005 MILES

TOTAL LENGTH TIP PROJECT B-5167 = 0.090 MILES

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

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MARCH 11, 2013

LETTING DATE: MARCH 18, 2014

G. E. BREW, PE
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

11-MAR-2013 11:38
R:\Roadway\Proj\B5167_Rdy_tsh.dgn
$$$$USERNAME$$$$

04/16/11

PROJECT REFERENCE NO.	SHEET NO.
B-5167	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 — ECM
- Parcel/Sequence Number — 123
- 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 Marker — RW
- 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

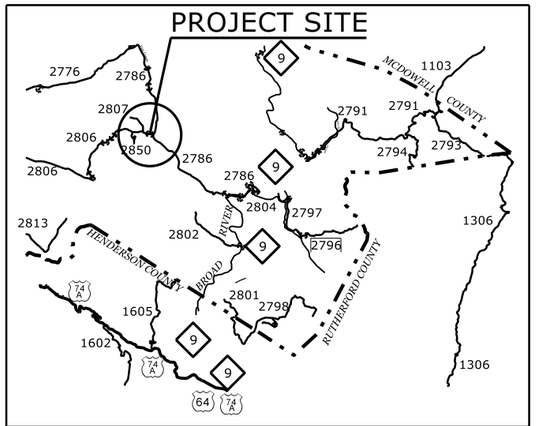
MISCELLANEOUS:

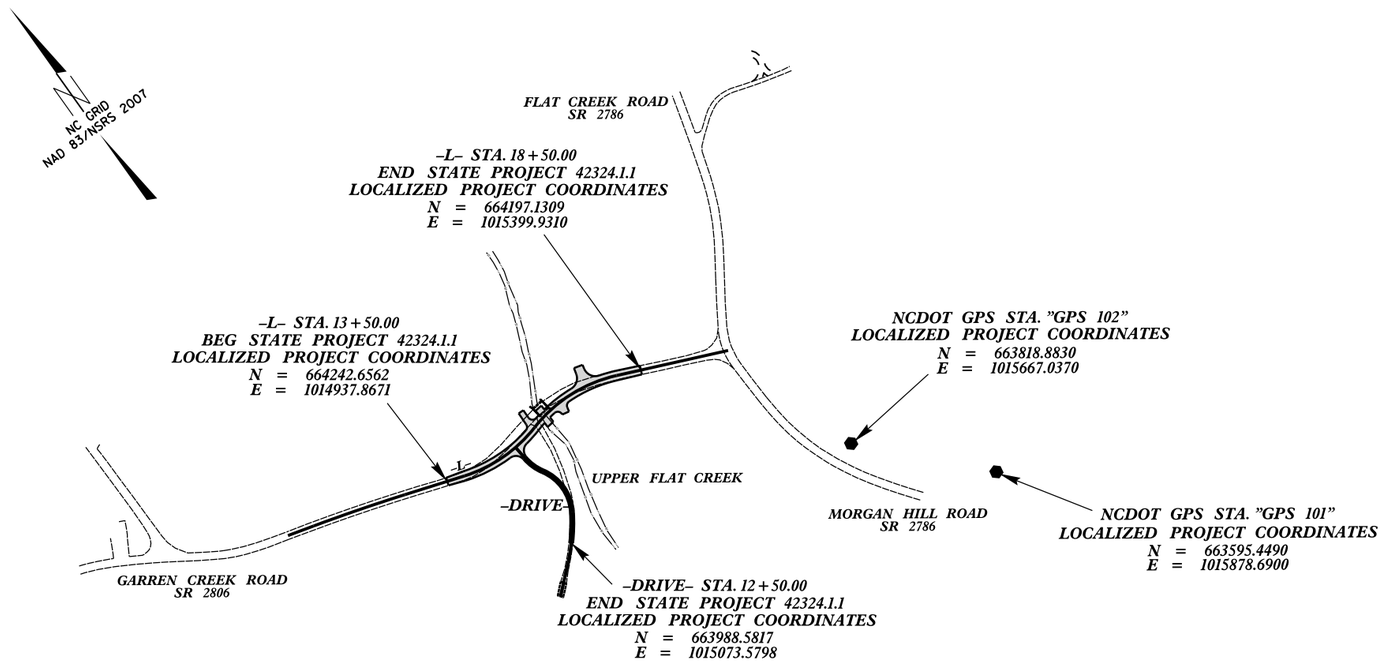
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole (S.U.E.*)
- Abandoned According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

5/28/99

SURVEY CONTROL SHEET B–5167

PROJECT REFERENCE NO.	SHEET NO.
B–5167	1–C
Location and Surveys	






```
****************************************
BM1       ELEVATION = 2500.28
N 664114       E 1015189
BL STATION 10+43.00 113 RIGHT
RR SPIKE IN POWER POLE
****************************************
BM2       ELEVATION = 2504.73
N 664206       E 1015429
BL STATION 12+73.00 19 LEFT
RR SPIKE IN 8" MAPLE
****************************************
```

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	BL 1	664311.4380	1014667.7440	2519.67	10+71.11	13.83 RT
2	BL 2	664214.6900	1014990.9760	2509.74	14+08.41	10.89 RT
3	BL-3	664229.4900	1015149.2760	2502.45	15+66.31	1.42 LT
4	BL 4	664216.4610	1015389.8040	2502.80	18+08.16	13.88 LT
5	BL 5	664058.1030	1015556.4030	2507.57	OUTSIDE PROJECT LIMITS	

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "GPS-102"
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF
NORTHING: 663818.883(ft) EASTING: 1015667.037(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99976864
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS-102" TO -L- STATION 13+50.00 IS N 63° 46' 12" W 1,186.49'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTES:

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

   THE FILES TO BE FOUND ARE AS FOLLOWS:
   B5167_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)

NOTE: DRAWING NOT TO SCALE

11-MAR-2013 11:38
r:\Roadway\Proj\B5167_ls_lc.dgn
$$$$USERNAME$$$$

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
B-5167 WBS Element 42324.1.1	1 – D
Location and Surveys	

SURVEY CONTROL SHEET B–5167

PRELIMINARY

(DESIGN ALIGNMENTS)

–L–

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	664343.2812	1014602.7202
PC	10+57.06	664328.4582	1014657.8183
PT	12+57.74	664271.2636	1014850.1549
PC	13+87.27	664231.0989	1014973.3026
PRC	15+67.76	664228.5281	1015151.0611
PT	17+73.28	664217.2095	1015352.2727
POT	20+10.78	664124.9994	1015571.1415

–DRIVE–

DRIVE

TYPE	STATION	NORTH	EAST
POT	10+00.00	664221.9297	1015124.1075
PC	10+79.64	664143.7803	1015139.4469
PCC	11+37.13	664087.3242	1015134.1444
PT	12+94.37	663959.6517	1015044.7546
POT	13+67.36	663910.9648	1014990.3790

(ROW MARKERS)

–L–

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	13+50.00	25.00	664218.8884	1014930.1152
L	13+50.00	-20.00	664261.6705	1014944.0686
L	13+50.00	-11.50	664253.5894	1014941.4329
L	13+50.00	11.50	664231.7231	1014934.3012
L	13+87.27	25.00	664207.3311	1014965.5507
L	14+50.00	-30.00	664247.8331	1015037.7102
L	15+10.00	25.00	664192.7417	1015096.7716
L	15+62.39	-40.00	664265.6250	1015135.2878
L	15+67.76	48.00	664182.4826	1015164.6188
L	15+70.00	-53.00	664280.1052	1015138.6230
L	16+15.00	48.00	664190.6537	1015203.4086
L	16+25.00	25.00	664214.4894	1015209.5612
L	16+50.00	-52.00	664292.7174	1015231.4975
L	16+75.00	-50.00	664289.8589	1015260.6675
L	17+50.00	-40.00	664263.3638	1015343.1105
L	17+53.00	-31.00	664253.7635	1015343.4054
L	17+73.28	25.00	664194.1707	1015342.5664
L	17+73.28	-25.00	664240.2483	1015361.9790
L	18+25.00	-25.00	664220.1698	1015409.6373
L	18+25.00	-11.50	664207.7288	1015404.3959
L	18+25.00	25.00	664174.0921	1015390.2246
L	18+25.00	11.50	664186.5331	1015395.4661

–DRIVE–

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
DRIVE	11+00.00	-22.00	664123.3270	1015163.3134
DRIVE	11+37.13	15.00	664092.9035	1015120.2206
DRIVE	11+64.80	-15.00	664055.2143	1015136.1622
DRIVE	11+65.00	15.00	664068.6009	1015109.3145

(PERMANENT EASEMENTS)

–L–

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	17+07.00	25.00	664211.4090	1015284.4307

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "GPS-102"
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF
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N 63° 46' 12" W 1,186.49'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

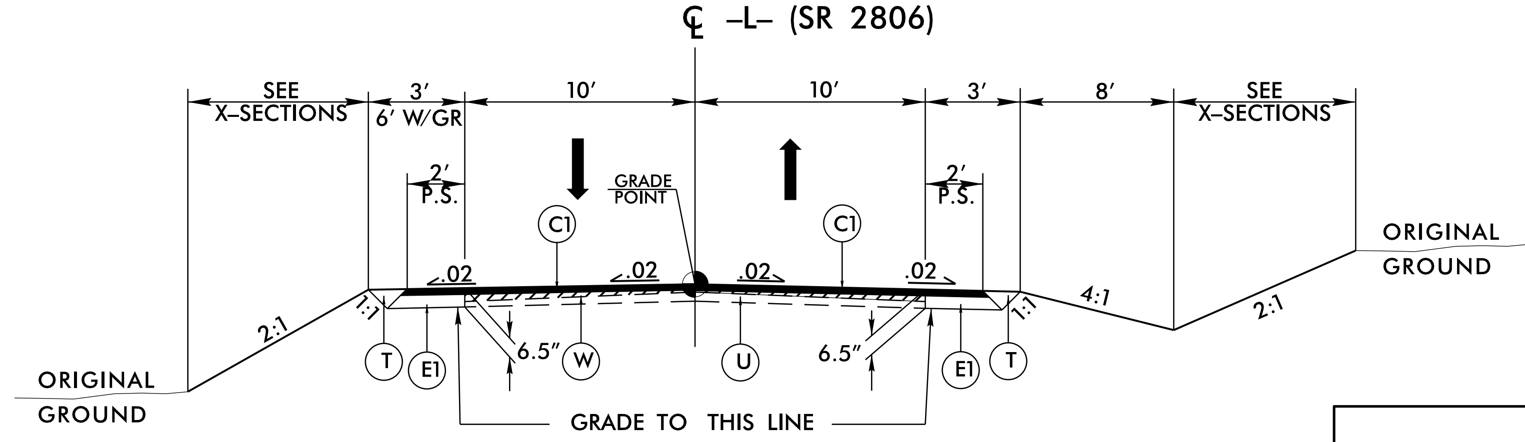
PROJECT REFERENCE NO.	SHEET NO.
B-5167	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

FINAL PAVEMENT SCHEDULE

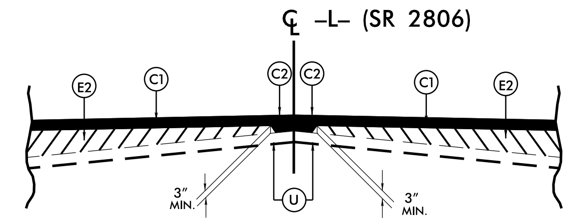
C1	PROP. APPROX. 2½" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
J	PROP. 6" AGGREGATE BASE COURSE.
P	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YD.
R	CONCRETE SHOULDER BERM GUTTER.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT.

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

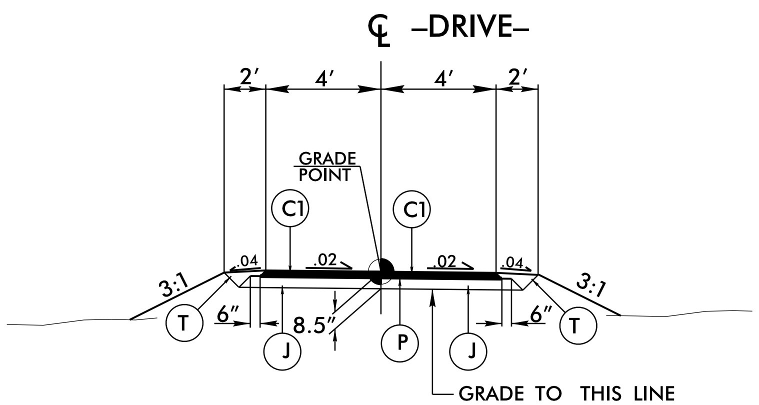


TYPICAL SECTION NO. 1

TRANSITION FROM EXISTING TO T.S. 1
-L- STA 13+50.00 TO 14+50.00
-L- STA 16+25.00 TO 18+25.00
TRANSITION FROM T.S. 1 TO EXISTING

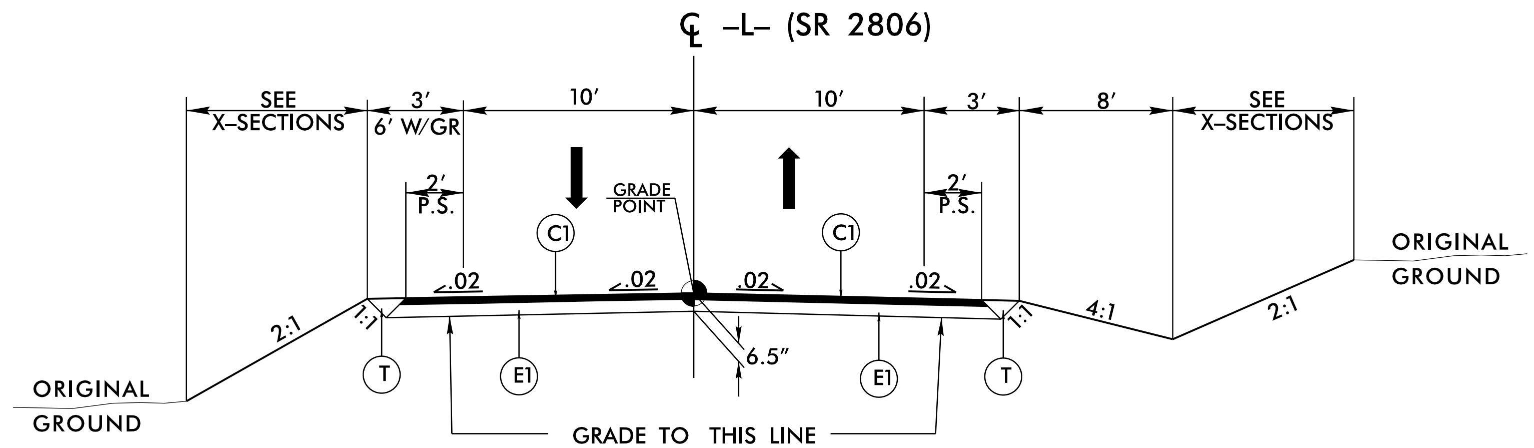


Detail Showing Method of Wedging



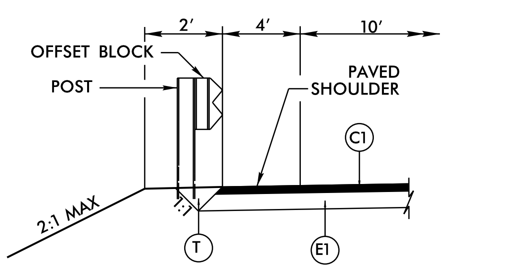
TYPICAL SECTION NO. 4

-DRIVE- STA 10+16.43 TO 11+65.00



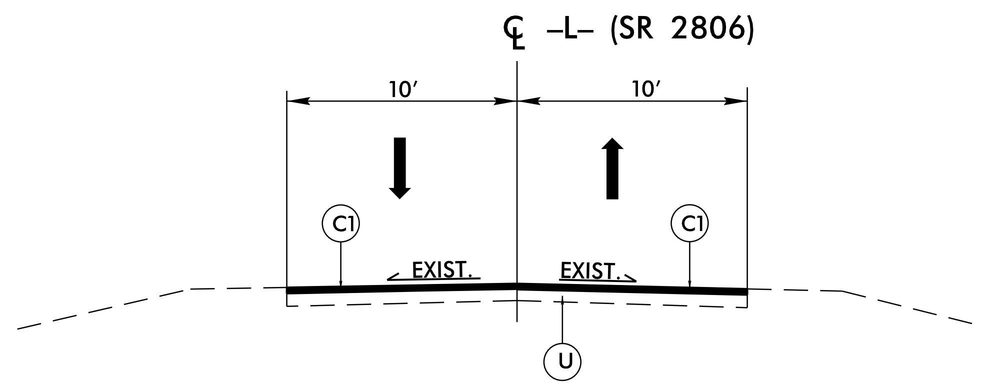
TYPICAL SECTION NO. 2

-L- STA 14+50.00 TO 16+25.00



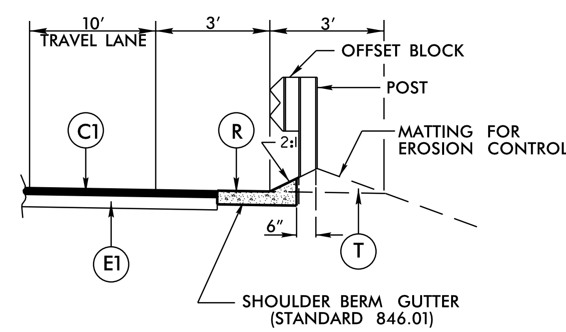
DETAIL OF PAVED SHOULDER AT PROPOSED GUARDRAIL

USE WITH TYPICAL SECTION NO. 2
(SEE PLANS FOR LOCATION)



TYPICAL SECTION NO. 3

-L- STA 18+25.00 TO 20+02.02



DETAIL SHOWING SHOULDER BERM GUTTER

USE WITH TYPICAL SECTION NO. 2
-L- STA 15+67.76 TO 16+11.00 RIGHT

6/2/99

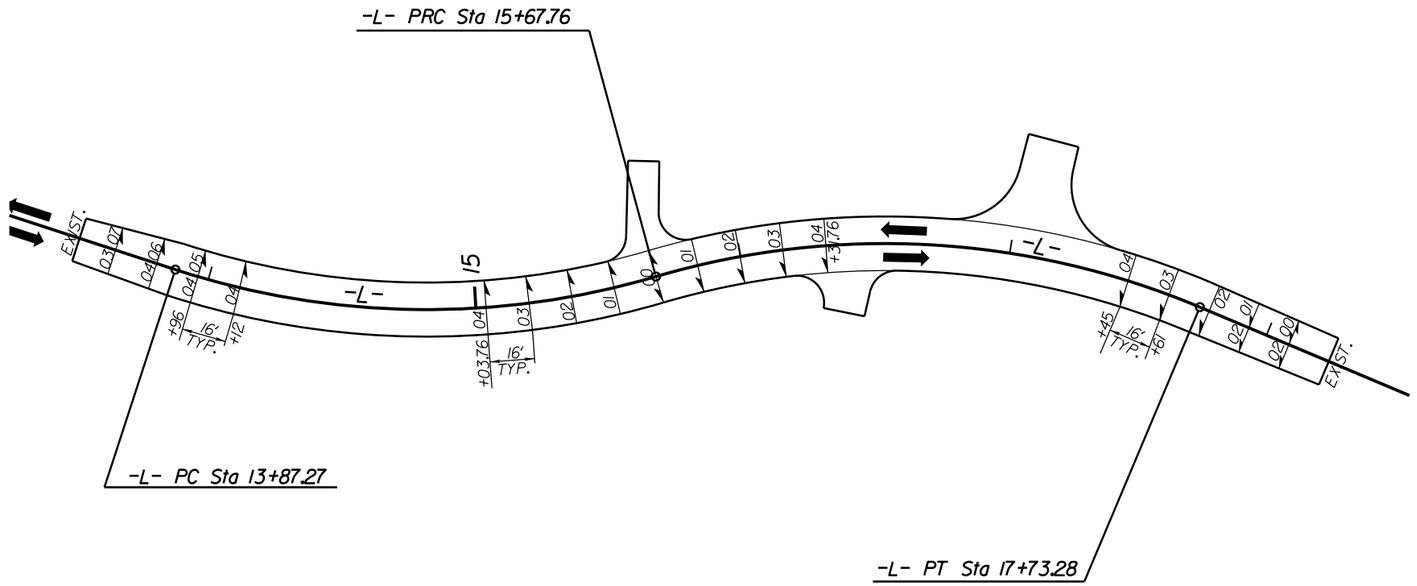
PROJECT REFERENCE NO.	SHEET NO.
B-5167	2-A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DETAIL OF SUPERELEVATION LAYOUT

NOT TO SCALE

FOR PLANS SEE SHEET 4



NAD 83/NSRS 2007

8/17/99

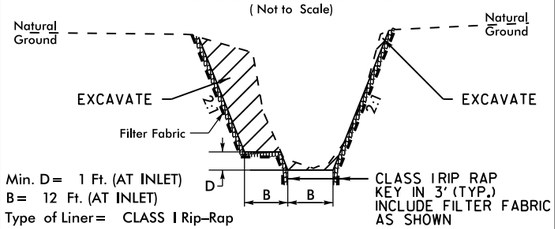
REVISIONS

DRAINAGE DITCH & CHANNEL DETAILS

PROJECT REFERENCE NO.	SHEET NO.
B-5167	2-B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

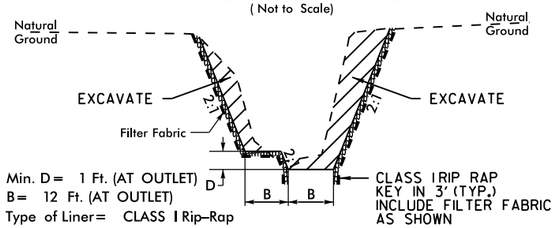
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DETAIL A
CULVERT INLET CHANNEL
(Not to Scale)



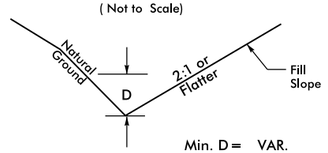
Min. D= 1 Ft. (AT INLET)
B= 12 Ft. (AT INLET)
Type of Liner= CLASS I Rip-Rap
EST. TOTALS: DDE= 152 CU YDS, FF=155.5SQ. YDS., 107 TONS CL I RIP RAP
-L- STA. 16+05(LT)

DETAIL B
CULVERT OUTLET CHANNEL
(Not to Scale)



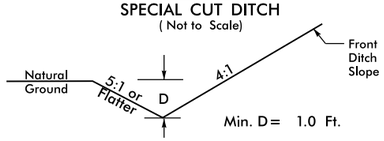
Min. D= 1 Ft. (AT OUTLET)
B= 12 Ft. (AT OUTLET)
Type of Liner= CLASS I Rip-Rap
EST. TOTALS: DDE= 203.7 CU YDS, FF=229.5SQ. YDS., 157 TONS CL I RIP RAP
-L- STA. 15+94(RT)

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



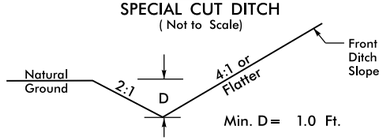
Min. D= VAR.
-L- STA. 13+50 TO STA. 14+50(LT)

DETAIL D
SPECIAL CUT DITCH
(Not to Scale)



Min. D= 1.0 Ft.
-L- STA. 14+50 TO STA. 15+57(LT)

DETAIL E
SPECIAL CUT DITCH
(Not to Scale)



Min. D= 1.0 Ft.
-L- STA. 16+50 TO STA. 17+50(LT)
-L- STA. 16+50 TO STA. 17+00(RT)

DETAIL F
(NOT TO SCALE)
SKEWED MULTI-BARREL LOW FLOW CHANNEL,SILLS AND FLOOD PLAIN

*NOTES:

1) BED MATERIAL BETWEEN SILLS/BAFFLES IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. THE MATERIAL SHALL BE NATURAL STONE WITH A GRADATION SIZE SIMILAR TO THAT OF CLASS A RIP RAP. STONES LARGER THAN 4 INCHES SHALL NOT BE PLACED WITHIN THE LOW FLOW CHANNEL. BED MATERIALS SUBJECT TO APPROVAL BY THE ENGINEER.

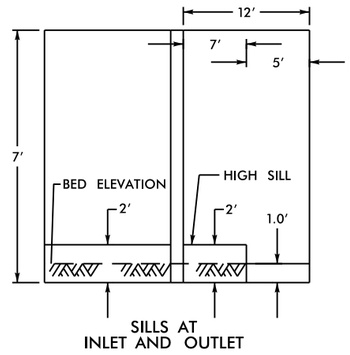
2) SILLS/BAFFLES ARE TO BE 1.0 FT. WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

3) TOP OF LOW FLOW SILLS/BAFFLES SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

4) CLASS A RIP RAP MAY BE USED TO SUPPLEMENT NATURAL BED MATERIAL.

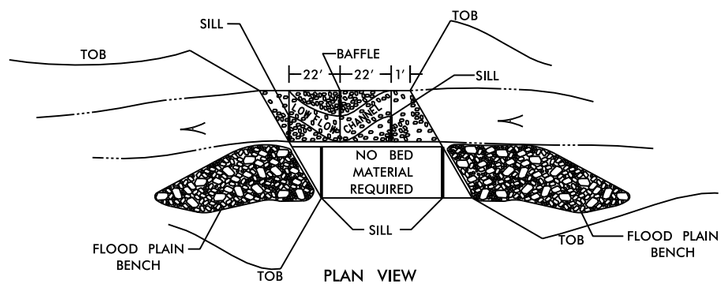
5) DO NOT SET ELEVATION OF HIGH SILL/BAFFLES ABOVE BANK FULL.

6) NUMER OF SILL/BAFFLES DETERMINED BY THE ENGINEER.



SILLS AT
INLET AND OUTLET

PROFILE VIEW



PLAN VIEW

11-MAR-2013 12:02
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$$$$LEVEL$$$$

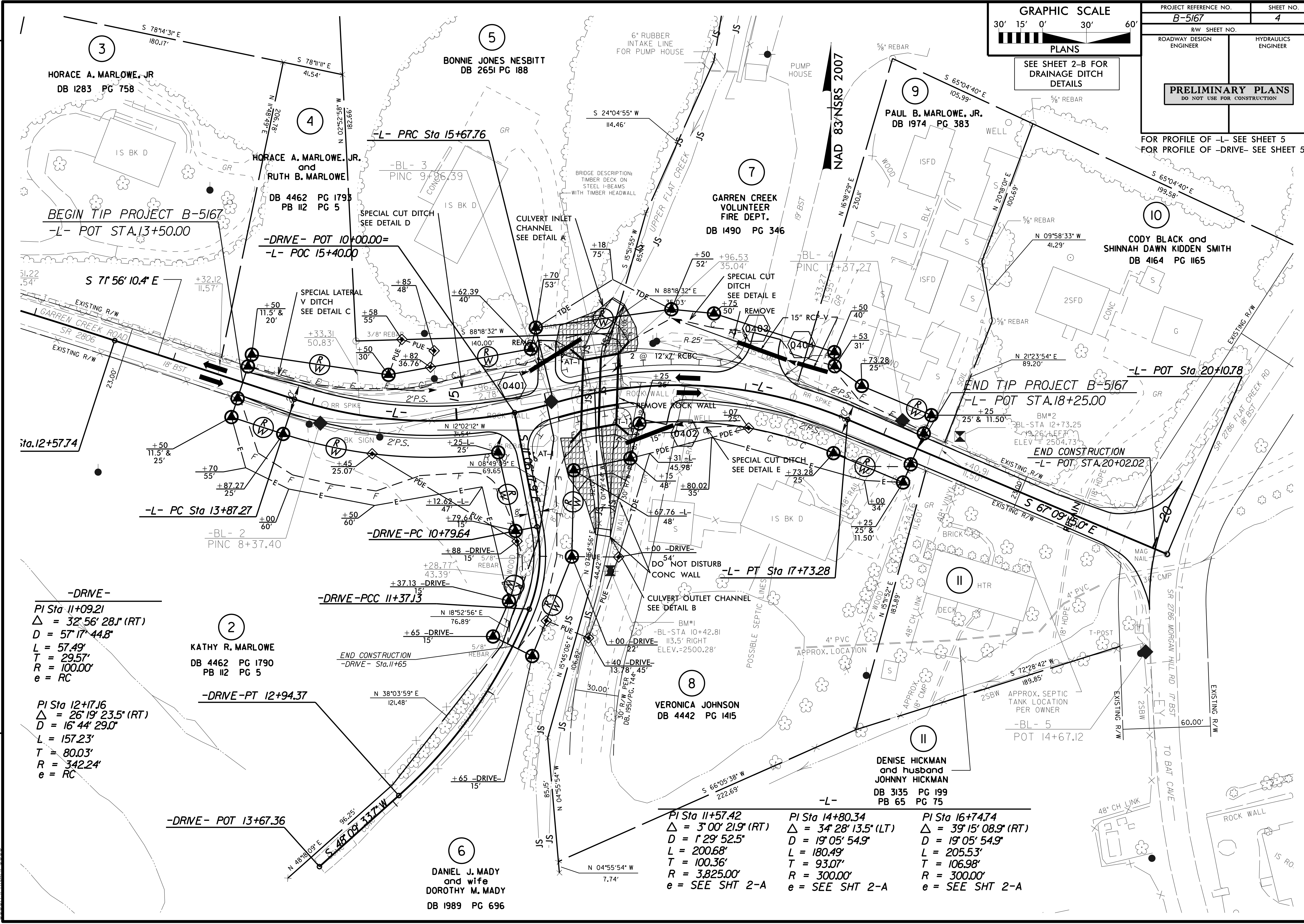
PROJECT REFERENCE NO.	SHEET NO.
B-5167	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALE
30' 15' 0' 30' 60'
PLANS

SEE SHEET 2-B FOR DRAINAGE DITCH DETAILS

FOR PROFILE OF -L- SEE SHEET 5
FOR PROFILE OF -DRIVE- SEE SHEET 5



-DRIVE-

PI Sta 11+09.21
Δ = 32° 56' 28.1" (RT)
D = 57° 17' 44.8"
L = 57.49'
T = 29.57'
R = 100.00'
e = RC

PI Sta 12+17.16
Δ = 26° 19' 23.5" (RT)
D = 16° 44' 29.0"
L = 157.23'
T = 80.03'
R = 342.24'
e = RC

-L-

PI Sta 11+57.42	PI Sta 14+80.34	PI Sta 16+74.74
Δ = 3° 00' 21.9" (RT)	Δ = 34° 28' 13.5" (LT)	Δ = 39° 15' 08.9" (RT)
D = 1° 29' 52.5"	D = 19° 05' 54.9"	D = 19° 05' 54.9"
L = 200.68'	L = 180.49'	L = 205.53'
T = 100.36'	T = 93.07'	T = 106.98'
R = 3,825.00'	R = 300.00'	R = 300.00'
e = SEE SHT 2-A	e = SEE SHT 2-A	e = SEE SHT 2-A

REVISIONS

8/17/99

5/28/99

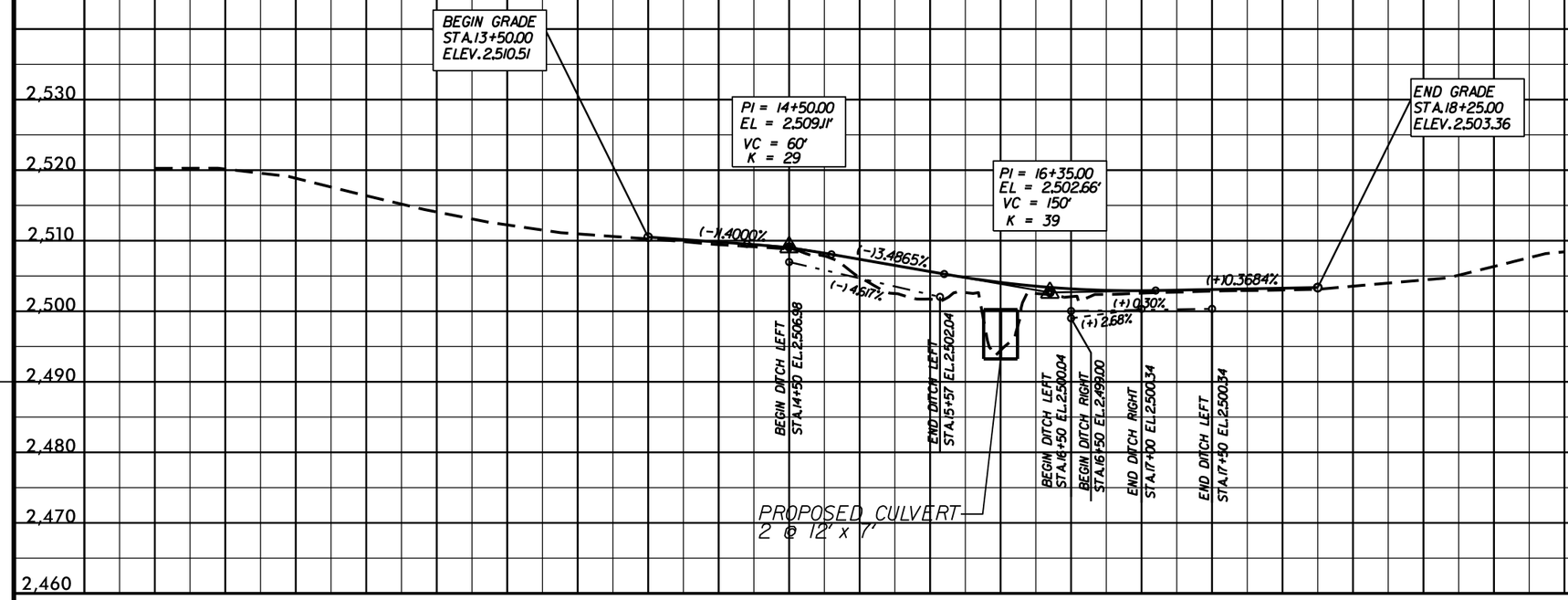
PROJECT REFERENCE NO.	SHEET NO.
B-5167	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

FOR PLAN OF –L– SEE SHEET 4

DITCH LEGEND
LEFT DITCH — - - — -
RIGHT DITCH - - - - - - -

–L–

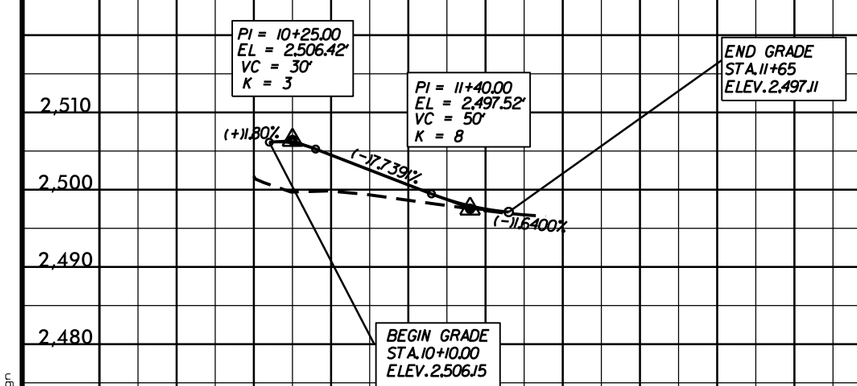


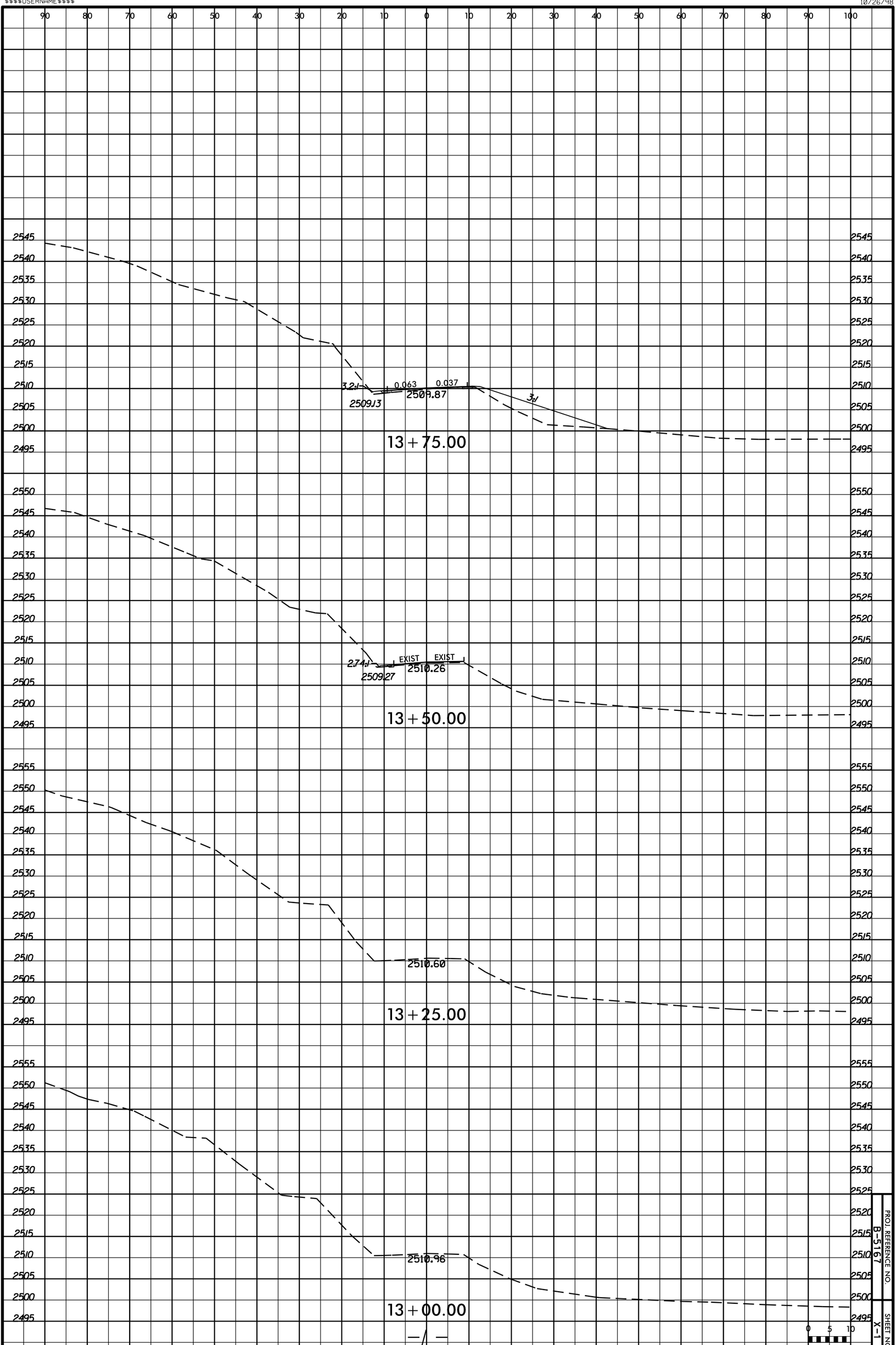
CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 1,100	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 2,501.2	FT
BASE DISCHARGE	= 1,600	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 2,503.6	FT
OVERTOPPING DISCHARGE	= 1,440	CFS
OVERTOPPING FREQUENCY	= 50+	YRS
OVERTOPPING ELEVATION	= 2,503.1	FT

FOR PLAN OF –DRIVE– SEE SHEET 4

–DRIVE–





PROJ. REFERENCE NO. B-5167

SHEET NO. X-1

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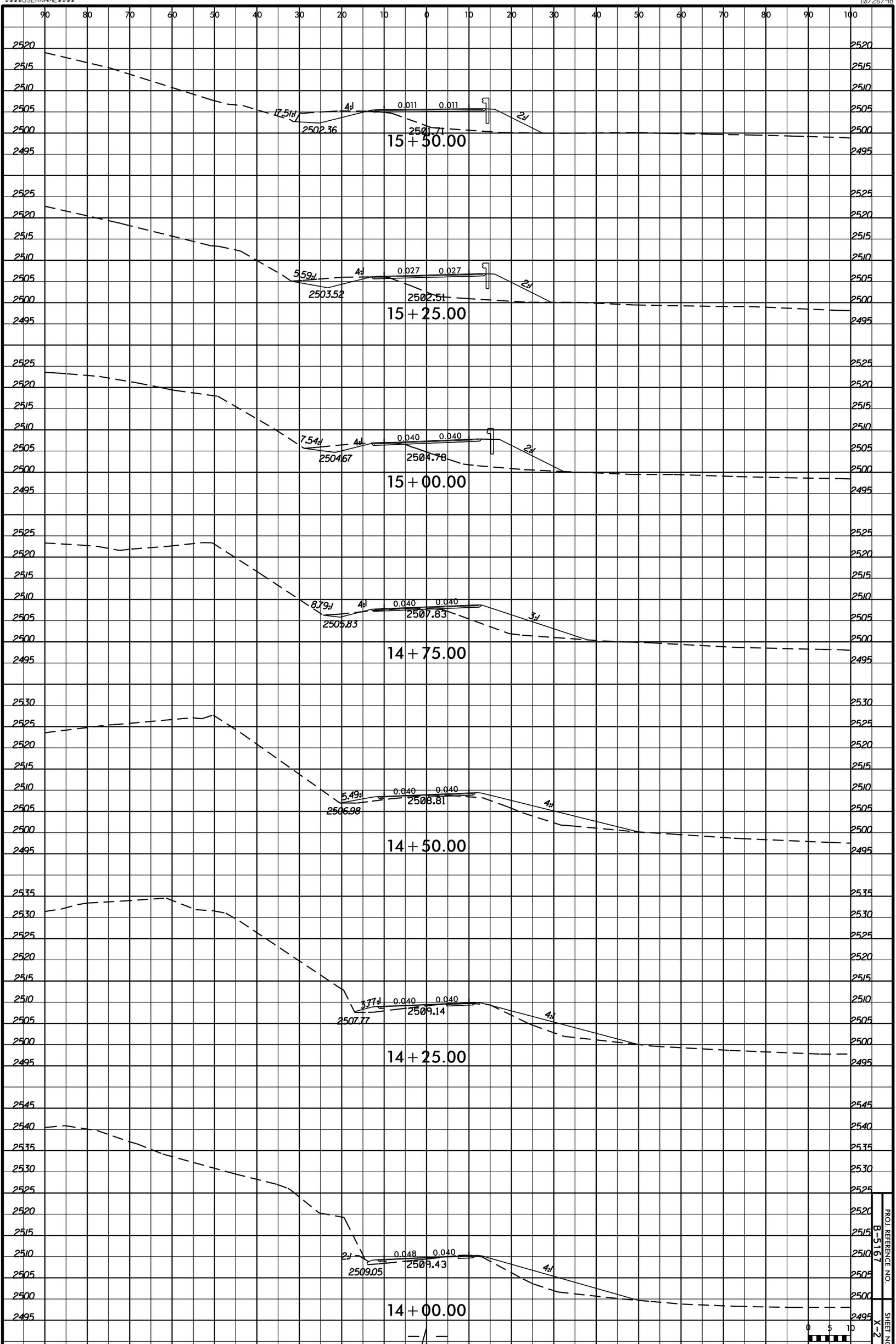
10/26/98



PROJ. REFERENCE NO.
B-5167

SHEET NO.
X-2

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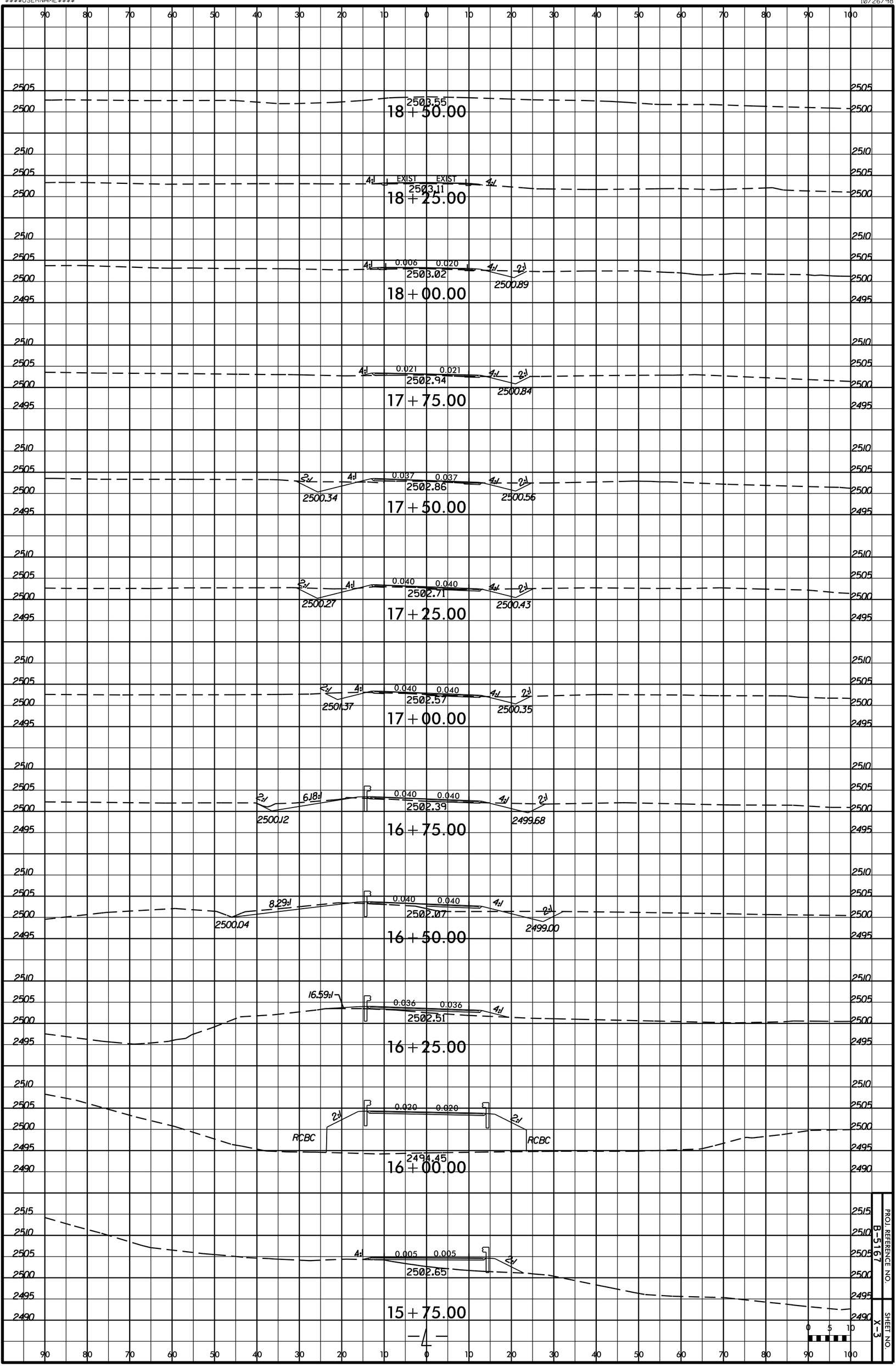
10/26/98



PROJ. REFERENCE NO.
B-5167

SHEET NO.
X-3

10/26/98

PROJ. REFERENCE NO.	SHEET NO.
B-5167	X-4

2505

2500

0 5 10

18+75.00

2503.99

—4—

11-MAR-2013 12:19
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8/23/99

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
B-5167	X-5

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

2510
2500
2490

2496.72
11+75.00

EXIST.
2497.27
11+50.00

3:1 0.02 0.02 3:1
2497.94
11+25.00

3:1 0.02 0.02 3:1
2498.63
11+00.00

3:1 0.02 0.02 3:1
2499.33
10+75.00

3:1 0.02 0.02 3:1
2499.84
10+50.00

-DRIVE-

11-MAR-2013 12:19
R:\Roadway\XSC\Xp1\B5167_Rdy_xp1_DRIVE.dgn
$$$$USERNAME$$$$

Buncombe County
Bridge No. 108 on SR 2806 (Garren Creek Rd.)
over Flat Creek
Federal Aid Project No. BRSTP-2806 (1)
W.B.S. No. 42324.1.1
T.I.P. No. B-5167

CATEGORICAL EXCLUSION

UNITED STATES DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

AND

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

4/9/12
DATE

For Gregory J. Thorpe, PhD,
Manager, Project Development & Environmental Analysis Unit

4-9-12
DATE

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

Buncombe County
Bridge No. 108 on SR 2806(Garren Creek Rd.)
over Flat Creek
Federal Aid Project No. BRSTP-2806 (1)
W.B.S. No. 42324.1.1
T.I.P. No. B-5167

CATEGORICAL EXCLUSION

Documentation Prepared in
Project Development and Environmental Analysis Unit By:

4-5-12
DATE

Natalie Lockhart
Natalie Lockhart
Project Planning Engineer
Bridge Project Development Section

4-05-12
DATE

John L Williams
John L. Williams, PE
Project Engineer
Bridge Project Development Section

NORTH CAROLINA PROFESSIONAL SEAL 022552 ENGINEER JOHN L. WILLIAMS
4-05-12

PROJECT COMMITMENTS:

Buncombe County
Bridge No. 108 on SR 2806
Over Flat Creek
Federal Aid Project No. BRSTP-2806(1)
W.B.S. No. 42324.1.1
T.I.P. No. B-5167

Roadside Environmental Unit, Division Resident Engineer – Sensitive Watersheds
NCWRC identify these waters as trout waters. NCDWQ will require that NCDOT strictly adhere to North Carolina regulations entitled "Design Standards in Sensitive Watersheds" throughout design and construction of the project.

All Design Groups/Division Resident Construction Engineer – Trout Issues
NCWRC has identified Flat Creek as supporting a trout population. Therefore a moratorium on all in water work will be in place from January 1 to April 15 of any given year.

Roadway Design, Structure Design, Bike & Ped. Division- Bicycle Accommodations
SR 2806 (Garren Creek Rd) is identified in the Asheville and Buncombe County Bicycle Transportation Map as Level 1 route. It is recommended that 4 ft. wide paved shoulders on both sides for shoulder sections and a 4ft. offset on the bridge or 14 ft. wide outside lanes in curb and gutter sections should continue for at least 100 ft. on either side of the approach roadway. Due to the mountainous terrain there are physical constraints associated with this project the 4 ft. paved shoulders will be in front of the guardrail to accommodate bicycles. Bicycle safe rails will not be included because the replacement structure is a box culvert.

Structure Design – TVA Permit
The proposed project is located in the Tennessee Valley Authority's (TVA) Land Management District. The project will require approval under Section 26a of the TVA Act.

Buncombe County
Bridge No. 108 on SR 2806 (Garren Creek Rd.)
over Flat Creek
Federal Aid Project No. BRSTP-2806(1)
W.B.S. No.42324.1.1
T.I.P. No. B-5167

INTRODUCTION: Bridge No. 108 is included in the latest approved North Carolina Department of Transportation (NCDOT) Transportation Improvement Program and is eligible for the Federal-Aid Highway Bridge Program. The location is shown in Figure 1. No substantial environmental impacts are anticipated. The project is classified as a Federal "Categorical Exclusion".

I. PURPOSE AND NEED STATEMENT

NCDOT Bridge Management Unit records indicate Bridge No. 108 has a sufficiency rating of 14.9 out of a possible 100 for a new structure. The bridge is considered structurally deficient due to the structural evaluation of 2 out of 9 according to Federal Highway Administration (FHWA) standards. It is also considered functionally obsolete due to the deck geometry of 2 out of 9 and therefore eligible for FHWA's Highway Bridge Program.

Bridge No. 108 has a forty-eight year old timber substructure and a typical life expectancy between 40 to 50 years due to the natural deterioration rate of wood. Rehabilitation of a timber structure is generally practical only when a few members are damaged or prematurely deteriorated. However, past a certain degree of deterioration, timber structures become impractical to maintain and upon eligibility are programmed for replacement. Bridge No. 108 is approaching the end of its useful life.

II. EXISTING CONDITIONS

The project is located in a rural area in the mountains of Buncombe County, just south of Black Mountain and approximately 16 miles southeast of Asheville (see Figure 1). Development in the area is residential and agricultural in nature.

SR 2806 is classified as a minor collector in the Statewide Functional Classification System and it is not a National Highway System Route.

In the vicinity of the bridge, SR 2806 has an 18-foot pavement width with 2-foot grass shoulders (see Figures 3A and 3B). The roadway grade is in a vertical tangent with a slight crest curve through the project area. The existing bridge is in the middle of S shaped horizontal curve. The roadway is situated approximately 10 feet above the creek bed.

Bridge No. 108 is a one-span structure that consists of timber floor on I-beam supported by timber caps/timber posts and sills at various centers. The existing bridge (see Figure 3A) was constructed in 1964. The overall length of the structure is 26 feet. The clear roadway width is

20 feet. The posted weight limit on this bridge is 16 tons for single vehicles and 20 tons for truck-tractor semi-trailers.

There are no utilities attached to the existing structure, but AT&T has underground fiber-optic and /or copper cables along the north side of SR 2806 crossing Flat Creek upstream of bridge aerially from a pole in the northeast quadrant to a pole further up the western approach, and then returning underground. Service lines run from both poles crossing SR 2806 in the bridge vicinity. Progress Energy has underground transmission lines in similar locations as AT&T, using the same poles to aerially cross the bridge and provide service lines. Utility impacts are anticipated to be low.

The current traffic volume of 150 vehicles per day (VPD) is expected to increase to 250 VPD by the year 2035. The projected volume includes two percent truck-tractor semi-trailer (TTST) and three percent dual-tired vehicles (DT). The posted speed limit is 35 miles per hour in the project area. Three school buses cross the bridge daily on their morning and afternoon routes.

There were two accidents reported in the vicinity of Bridge No. 108 during a recent three-year period. Both crashes were "Ran off Road" type crashes on eastbound SR 2806 prior to the bridge.

This section of SR 2806 is designated as a bicycle route identified in the Asheville and Buncombe County Bicycle Transportation Map. The route traversing the bridge along SR 2806 is listed as a "level 1" route on the map. The Division of Bicycle and Pedestrian Transportation recommend 4 ft. wide paved shoulders on both sides for shoulder sections (and a four-foot offset on the bridge) or 14 ft. wide outside lanes in curb and gutter sections continued for at least 100 ft. on either side of the approach roadway. Due to the mountainous terrain and physical constraints associated with this project, bicycle accommodations could not be fully incorporated. The shoulders will be paved at guardrail locations providing 3 ft. additional width. With the short length of the project and the low traffic volumes, there is the opportunity for bicycles traffic to share the roadway at this location. Sidewalks do not exist on the existing bridge and there is no indication of pedestrian usage on or near the bridge. Neither permanent nor temporary bicycle or pedestrian accommodations are required for this project.

III. ALTERNATIVES

A. Preferred Alternative

Bridge No. 108 will be replaced on new alignment south of the existing using staged construction as shown by Alternate 1 in Figure 2. The replacement structure will consist of a double barrel, 12-foot wide by 7-foot high reinforced concrete box culvert. The culvert size is based on preliminary design information and is set by hydraulic requirements. The new roadway grade will be approximately the same as the existing grade.

Improvements to the approach roadways will be required for a distance of approximately 231 feet to the west and 210 feet to the east of the new structure. The existing roadway will be

widened to a 20-foot pavement width to provide two 10-foot lanes. Three feet shoulders, six foot at guardrail locations will be provided in accordance with Sub-Regional Tier Design Guidelines. In order to provide better tracking 2 ft. to 3 ft. of the shoulders will be paved. This roadway will be designed as a minor collector using Sub-Regional guidelines with a design speed of 30 miles per hour. Traffic will be maintained with one lane staged construction of the new culvert during the construction period utilizing temporary signals.

NCDOT Division 13 concurs with the selection of Alternate 1 as the preferred alternate.

B. Alternatives Eliminated From Further Consideration

The "do-nothing" alternative will eventually necessitate closure of the bridge. This is not acceptable due to the traffic service provided by SR 2806.

The offsite detour is not feasible based on the guidelines; the criteria indicate that a 12 mile detour is unacceptable in mountainous terrain. Buncombe County Emergency Services has also indicated that an offsite detour is unacceptable. There may be some delays for the Garren Creek Volunteer Fire Department which is located in the northeast bridge quadrant. There may be delays during construction for firefighters traveling to the Garren Creek Volunteer Fire Department. While project costs and environmental impacts will be higher, maintenance of traffic onsite during construction is mandatory.

"Rehabilitation" of the old bridge is not practical due to its age and deteriorated condition. Timber components have a typical life expectancy between 40 to 50 years due to the natural deterioration rate of wood. Rehabilitation of a timber structure is generally practical only when a few elements are damaged or prematurely deteriorated. However, past a certain degree of deterioration, most timber elements become impractical to maintain and upon eligibility are programmed for replacement. Timber components of Bridge No. 108 are experiencing an increasing degree of deterioration that can no longer be addressed by reasonable maintenance activities; therefore the bridge is approaching the end of its useful life.

The replacement structure will be a culvert instead of a bridge. A culvert was chosen because the width of the creek is very small. A reinforced concrete box culvert will be used instead of a bottomless culvert because of the depth of the bedrock.

IV. ESTIMATED COSTS

The estimated costs, based on 2011 prices, are as follows:

	Alternate 1 Preferred
Structure (RCBC)	$ 109,000
Roadway Approaches	$ 139,000
Structure Removal	$ 10,000
Misc. & Mob.	$ 72,000
Eng. & Contingencies	$ 45,000
Total Construction Cost	$ 375,000
Right-of-way Costs	$ 65,000
Right-of-way Utility Costs	$ 26,000
Total Project Cost	$ 466,000

V. NATURAL ENVIRONMENT

Physical Characteristics

Water Resources

Water resources in the study area are part of the Broad River Basin (U.S. Geological Survey [USGS] Hydrologic Unit 03050105). One stream was identified in the study area (Table 1). The physical characteristics of this stream are provided in Table 2.

Table 1. Water resources in the study area.

Stream Name	Map ID	NCDWQ Index Number	Best Usage Classification
Flat Creek	Flat Creek	9-12	C; Tr

Table 2. Physical characteristics of water resources in the study area.

Map ID	Bank Height (ft)	Bankful Width (ft)	Water Depth (in)	Channel Substrate	Velocity	Clarity
Flat Creek	6	8	6	Cobble	Fast	Clear

The NCDWQ and the North Carolina Wildlife Resources Commission (NCWRC) have identified Flat Creek as trout waters. There are no designated High Quality Waters (HQW), Outstanding Resource Waters (ORW) or water supply watersheds (WS-I or WS-II) within 1.0 mile downstream of the study area. There are no 303(d) streams within 1.0 mile of the study area per the North Carolina 2010 Final 303(d) list and the 2012 Draft 303(d) of impaired waters.

No recent fish or benthic surveys have been conducted within 1.0 mile of the study area.

Biotic Resources

Terrestrial communities in the study area may be impacted by project construction as a result of grading and paving of portions of the study area. At this time, decisions regarding the final location and design of the proposed bridge replacement have not been made. Therefore, community data are presented in the context of total coverage of each type within the study area (Table 3).

Table 3. Coverage of terrestrial communities in the study area.

Community	Coverage (ac.)
Maintained/ Disturbed	4.4
Acidic Cove Forest	0.5
Total	4.9

Jurisdictional Topics

Surface Waters and Wetlands

No jurisdictional wetlands were identified within the study area.

Permits

The proposed project has been designated as a Categorical Exclusion (CE) for the purposes of NEPA documentation. As a result, a Nationwide Permit 23 will likely be applicable. Other permits that may apply include a NWP No. 33 for temporary construction activities such as stream dewatering, work bridges, or temporary causeways that are often used during bridge construction or rehabilitation. The USACE holds the final discretion as to what permit will be required to authorize project construction.

In addition to the 404 permit, other required authorizations include the corresponding Section 401 Water Quality Certification (WQC) from the NCDWQ. A NCDWQ Section 401 Water Quality General certification for a Categorical Exclusion may be required prior to the issuance of a Section 404 Permit. Other required 401 certifications may include a GC 3688 for temporary construction access and dewatering.

The NCWRC has identified Flat Creek in the study area as trout waters, as per their letter dated February 26, 2010. Wild rainbow trout occur in the project area. Based on the NCWRC's designation as trout waters, a mandatory trout moratorium prohibiting in-stream work and land disturbance within the 25-foot buffer will be present from January 1 to April 15 for Flat Creek.

Federally Protected Species

As of January 5, 2012 the USFWS lists thirteen federally protected species for Buncombe County (Table 4). One species was removed and two were added since the NRTR was written in 2010. Habitat requirements for each species are based on the current best available information as per referenced literature and USFWS correspondence.

Table 4. Federally protected species listed for Buncombe County.

Scientific Name	Common Name	Federal Status	Habitat Present	Biological Conclusion
Glyptemys muhlenbergii	Bog turtle	T(S/A)	No	Not Required
Glaucomys sabrinus coloratus	Carolina northern flying squirrel	E	No	No Effect
Myotis grisescens	Gray bat	E	No	No Effect
Erimonax monachus	Spotfin chub	T	No	No Effect
Alasmidonta raveneliana	Appalachian elktoe	E	No	No Effect
Microhexura montivaga	Spruce-fir moss spider	E	No	No Effect
Epioblasma florentina walkeri	Tan riffleshell	E	No	No Effect
Solidago spithamaea	Blue Ridge goldenrod	T	No	No Effect
Sagittaria fasciculata	Bunched arrowhead	E	No	No Effect
Sarracenia rubra ssp. *jonesii*	Mountain sweet pitcherplant	E	No	No Effect
Geum radiatum	Spreading avens	E	No	No Effect
Spiraea virginiana	Virginia spiraea	T	Yes	No Effect
Gymnoderma lineare	Rock gnome lichen	E	No	No Effect

T(S/A) - Threatened due to similarity of appearance
T - Threatened
E - Endangered

Within the last year, the Eastern cougar has been removed from the USFWS list for Buncombe County. Additionally, two new species have been added to the list for this county: the spruce-fir moss spider and Blue Ridge goldenrod. Both of these species are typically only found at elevations higher than 4,600 ft. above sea level. Elevations within the project area range from 2,495 to 2,585 ft. above sea level, therefore there is no suitable habitat for either of these species located within the project area.

Bald Eagle and Golden Eagle Protection Act

Habitat for the bald eagle primarily consists of mature forest in proximity to large bodies of open water for foraging. Large, dominant trees are utilized for nesting sites, typically within 1.0 mile of open water. There are no large bodies of open water within 1.0 mile of the project study area. Suitable habitat for bald eagle does not exist within the project study area.

VI. HUMAN ENVIRONMENT

Section 106 Compliance Guidelines

This project is subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, and implemented by the Advisory Council on Historic

Preservation's Regulations for Compliance with Section 106, codified at Title 36 CFR Part 800. Section 106 requires Federal agencies to take into account the effect of their undertakings (federally funded, licensed, or permitted) on properties included in or eligible for inclusion in the National Register of Historic Places and afford the Advisory Council a reasonable opportunity to comment on such undertakings.

Historic Architecture
NCDOT – Human Environment Unit, under the provisions of a Programmatic Agreement with FHWA, NCDOT, HPO, OSA and the Advisory Council on Historic Preservation (effective July 1, 2009), reviewed the proposed project and determined that no surveys are required (see form dated December 28, 2009).

Archaeology
NCDOT – Human Environment Unit, under the provisions of a Programmatic Agreement with FHWA, NCDOT, HPO, OSA and the Advisory Council on Historic Preservation (effective July 1, 2009), reviewed the proposed project and determined that no surveys are required (see form dated December 11, 2009).

Community Impacts

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

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

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

The Farmland Protection Policy Act requires all federal agencies or their representatives to consider the potential impact to prime farmland of all land acquisition and construction projects. All construction will take place along existing alignment. While there is prime farmland in the vicinity, there are no soils classified as prime, unique, or having state or local importance in the project footprint. Therefore, the project will not involve the direct conversion of farmland acreage within these classifications.

The project will not have a disproportionately high and adverse human health and environmental effect on any minority or low-income population.

Noise & Air Quality

The project is located in Buncombe County, which has been determined to comply with the National Air Quality Standards. The proposed project is located in an attainment area; therefore, 40 CFR Parts 51 and 93 are not applicable. This project is not anticipated to create any adverse effects on the air quality of this attainment area.

This project will not result in any meaningful changes in traffic volume, vehicle mix, location of the existing facility, or any other factor that would cause an increase in emissions impacts relative to the no-build alternative. As such FHWA has determined that this project will generate minimal air quality impacts for Clean Air Act criteria pollutants and has not been linked with any special MSAT concerns. Consequently this effort is exempt from analysis for MSAT's.

Noise levels may increase during project construction; however, these impacts are not expected to be substantial considering the relatively short-term nature of construction noise and the limitation of construction to daytime hours. The transmission loss characteristics of nearby natural elements and man-made structures are believed to be sufficient to moderate the effects of intrusive construction noise.

VII. GENERAL ENVIRONMENTAL EFFECTS

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

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

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

An examination of records at the North Carolina Department of Environment and Natural Resources, Division of Environmental Management, Groundwater Section and the North Carolina Department of Human Resources, Solid Waste Management Section revealed no underground storage tanks or hazardous waste sites in the project area.

Buncombe County is a participant in the National Flood Insurance Program. There are no practical alternatives to crossing the floodplain area. Any shift in alignment will result in an impact area of about the same magnitude. The proposed project is not anticipated to increase the level or extent of upstream flood potential.

VIII. COORDINATION & AGENCY COMMENTS

NCDOT has sought input from the following agencies as a part of the project development: U.S. Army Corps of Engineers, NC Department of Environmental and Natural Resources, U.S. Fish & Wildlife Service, N.C Wildlife Resource Commission and North Carolina State Historic Preservation Office.

The **N.C. Wildlife Resource Commission** states that wild rainbow trout occur in the project area. A moratorium prohibiting in-stream work and land disturbance within the 25-foot trout buffer is recommended from January 1-April 15 to protect the egg and fry stages of rainbow

trout. Sediment and erosion control measures should adhere to the Design Standards in Sensitive Watersheds.

> **Response**: Design Standards for Sensitive Watersheds will be implemented during construction. The replacement structure will be a culvert instead of a bridge. A culvert was chosen because the width of the creek is very small. Based on the drainage area and design discharges, a 2 @ 12 foot wide by 7 foot high reinforced concrete box culvert was determined to be adequate from a hydraulics standpoint. The culvert will be buried below the streambed and will be designed with alternating sills and low flow channel in one barrel and with a 2 foot high sill on the other barrel with floodplain benches at the entrance and outlet of the culvert to maintain normal channel flow. The culvert will be designed such that the slope, low flow velocities and low flow channel designs are consistent with the existing stream. Because culverts generally cost less, require less maintenance throughout their service life and last longer than bridges, a culvert is the preferred structure type.

The **N.C. Department of Environmental and Natural Resources** states that Flat Creek is class C; Tr waters of the State. NCDWQ recommends that the most protective sediment and erosion control BMPs be implemented to reduce the risk of turbidity violations in trout waters. In addition, all disturbances within trout buffers shall be conducted in accordance with NC Division of Land Resources and NC Wildlife Resources Commission requirements.

> **Response**: NCDOT will adhere to Design Standards in Sensitive Watersheds throughout the design and construction of the project.

The **Army Corps of Engineers** had no special concerns for this project.

IX. PUBLIC INVOLVEMENT

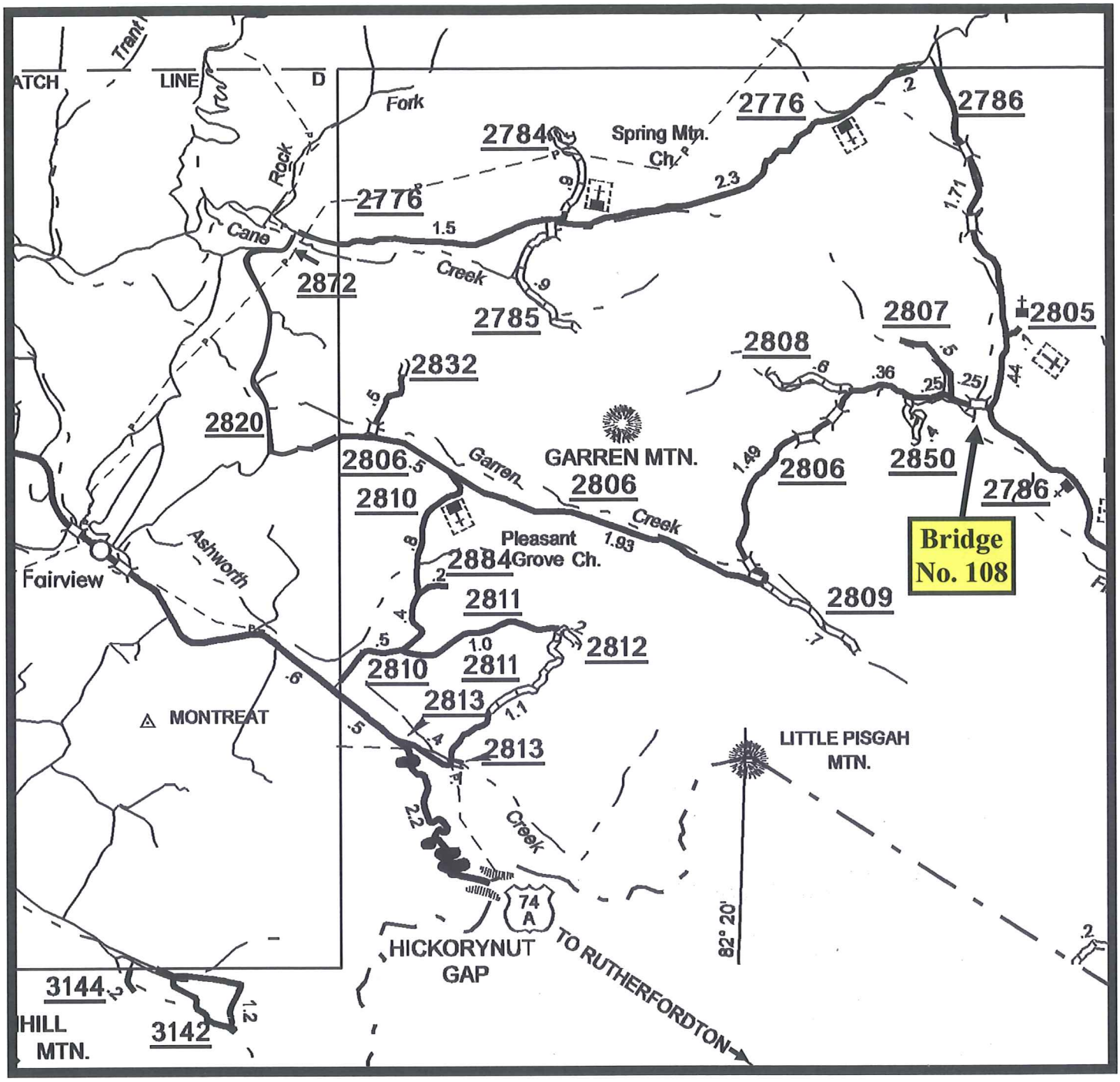
A newsletter has been sent to all those living along SR 2806. No comments have been received to date.

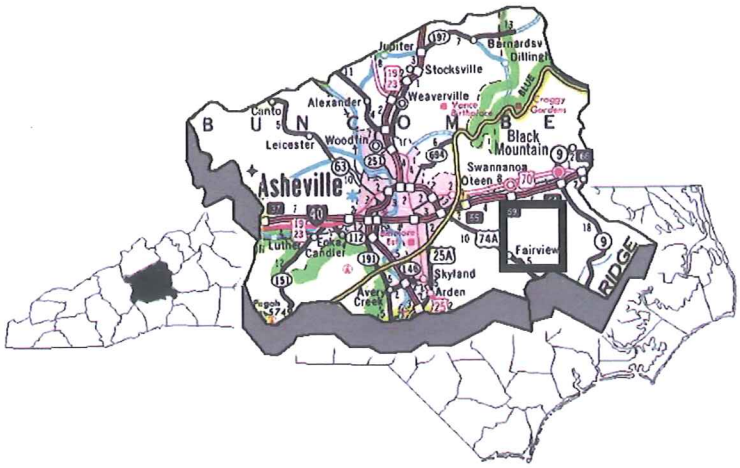
Based on the lack of responses to the newsletter, a Citizen's Informational Workshop was determined unnecessary.

There is not substantial controversy on social, economic, or environmental grounds concerning the project.

X. CONCLUSION

On the basis of the above discussion, it is concluded that no substantial adverse environmental impacts will result from implementation of the project. The project is therefore considered to be a federal "Categorical Exclusion" due to its limited scope and lack of substantial environmental consequences.





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

BUNCOMBE COUNTY
REPLACE BRIDGE NO. 108 ON SR 2806
OVER UPPER FLAT CREEK
B-5167

Figure 1

NAD 83 NSRS 2007

BEGIN TIP PROJECT B-5167
-L- POT STA.13+50.00

END TIP PROJECT B-5167
-L- POT STA.18+25.00

BM#2
-BL-STA 12+73.25
25.26-LEFT
ELEV = 2504.73

BM#1
-BL-STA 10+42.81
83.5' RIGHT
ELEV.=2500.28

-DRIVE- Sta.12+50
END CONSTRUCTION

6" RUBBER INTAKE LINE FOR PUMP HOUSE

PUMP HOUSE

BRIDGE DESCRIPTION: TIMBER DECK ON STEEL I-BEAMS WITH TIMBER HEADWALL

UPPER FLAT CREEK

SR 2806 FLAT CREEK RD

TO BLACK MTN.

SR 2806 MORGAN HILL RD

TO BAT CAVE

GREEN CREEK ROAD

POWER DRIVE

ROCK WALL

BK SIGN

POSSIBLE SEPTIC LINES

4" PVC APPROX. LOCATION

25BW APPROX. SEPTIC TANK LOCATION PER OWNER

SCALE 50 0 100

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS BRANCH

GPS-102

BUNCOMBE COUNTY

BRIDGE NO. 108 ON SR 2806 OVER UPPER FLAT CREEK
B-5167

FIGURE 2

Bridge No. 108 on SR 2806 over Upper Flat Creek

B-5167 Figure 3A

Bridge No. 108 Looking West

Bridge No. 108 Looking East

Figure 3B

Downstream Side of Bridge No. 108

Garren Creek Volunteer Firestation

Project Tracking No. (Internal Use)

09-11-0029

NO SURVEY REQUIRED FORM

PROJECT INFORMATION

Project No:	B-5167	*County:*	Buncombe
WBS No:	42324	*Document:*	CE/PCE
F.A. No:	BRSTP-2806(1)	*Funding:*	☐ State ☒ Federal

Federal (USACE) Permit Required? ☐ Yes ☐ No *Permit Type:*

Project Description: Replace Bridge No. 108 over Upper Flat Creek on SR 2806 in Buncombe County

SUMMARY OF CULTURAL RESOURCES REVIEW

Brief description of review activities, results of review, and conclusions:

Review of HPO quad maps, historic designations roster, and indexes was undertaken on 23 December 2009. Based on this review, there are no existing NR, SL, LD, DE, or SS properties in the Area of Potential Effects. The CRS also reviewed the Buncombe County GIS website and concluded that there are no structures older than 50 years of age within the APE.

Brief Explanation of why the available information provides a reliable basis for reasonably predicting that there are no unidentified historic properties in the APE:

There are no properties over 50 years of age within the APE. The built environment consists of new construction.

FINDING BY NCDOT CULTURAL RESOURCES PROFESSIONAL

NO SURVEY REQUIRED

Courtney Tolen — 28 DECEMBER 2009

NCDOT Cultural Resources Specialist — Date

Project Tracking No. (Internal Use)

09-11-0029

NO SURVEY REQUIRED FORM

PROJECT INFORMATION

Project No:	**B-5167**	*County:*	Buncombe
WBS No:	42324	*Document:*	Minimum Criteria Sheet
F.A. No:	BRSTP-2806(1)	*Funding:*	☐ State ☒ Federal

Federal (USACE) Permit Required? ☐ Yes ☐ No *Permit Type:* Nationwide

Project Description:Replace Bridge No. 108 over Upper Flat Creek on SR2806 in Buncombe County, North Carolina. The archaeological APE for the project encompasses the construction footprint and measures 250ft. in length (125ft. east & west from the bridge center-point) by 80ft. in width (proposed right-of-way).

SUMMARY OF CULTURAL RESOURCES REVIEW

Brief description of review activities, results of review, and conclusions:
A map review and site file search was conducted at the Office of State Archaeology on Monday, December 7, 2009. No previously recorded archaeological sites are situated within the currently defined APE, immediately adjacent to the APE, or within the general project vicinity (5 mile radius or more). A review of Buncombe County NRHP listed properties/districts was completed and identified no such resources within or adjacent to the project area. In addition, topographic maps and aerial photographs were inspected by the cultural resource specialist to gauge environmental factors that may have contributed to historic or prehistoric settlement within the APE, and the level of modern and residential disturbances contained more recently. Furthermore, a review of North Carolina and Buncombe County historic maps returned no evidence of extraordinary events, people, or structures/features within the general area.
Brief Explanation of why the available information provides a reliable basis for reasonably predicting that there are no unidentified historic properties in the APE:
The lack of existing archaeological or historical resources, the diminutive and restricted nature of the APE and construction effort (likely in-place replacement w/ off-site detour), and the largely residential nature (90%) of the APE and surrounding area make it highly unlikely that any significant cultural resources would be contained within the construction footprint of the proposed bridge replacement project. No further archaeological work is recommended.

SUPPORT DOCUMENTATION

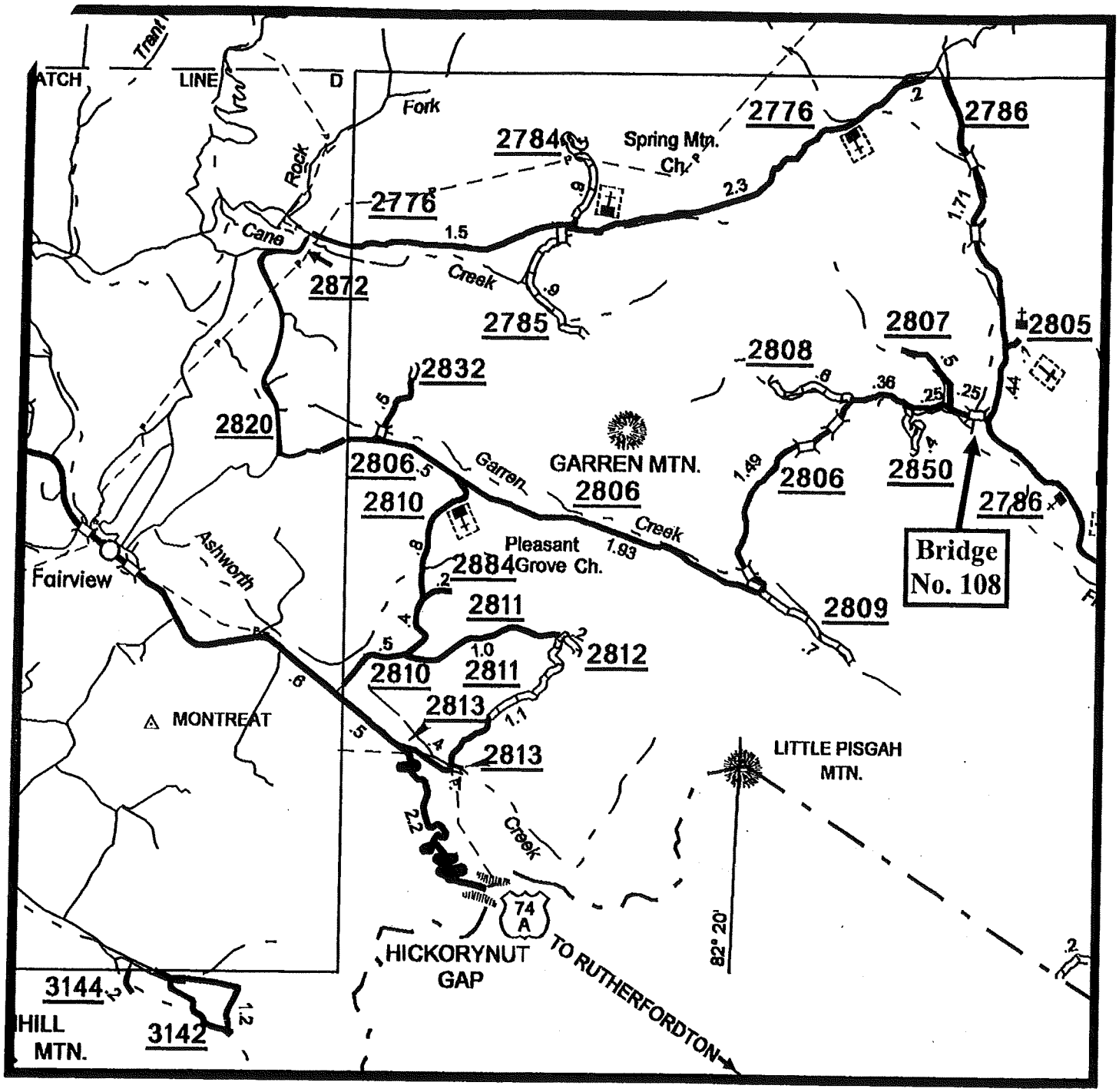
See attached: ☒ Map(s) ☒ Previous Survey Info ☒ Photos ☐ Correspondence
☐ Photocopy of County Survey Notes

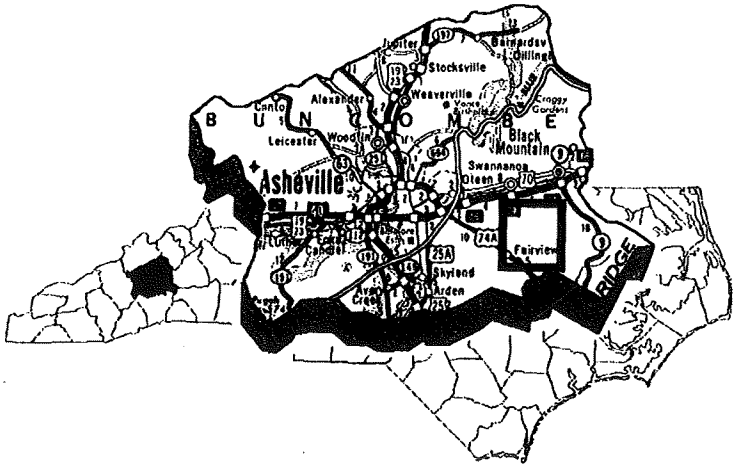
FINDING BY NCDOT CULTURAL RESOURCES PROFESSIONAL

NO SURVEY REQUIRED

Scott Holwerda 12/11/2009

NCDOT Cultural Resources Specialist Date

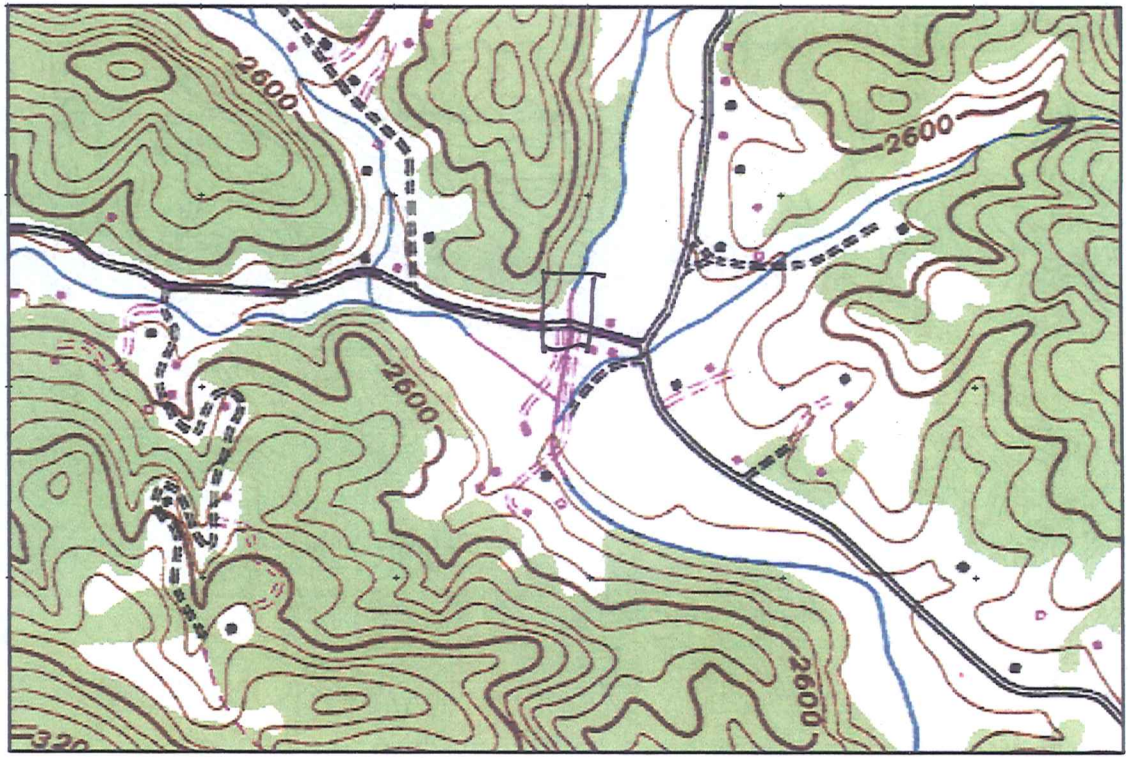


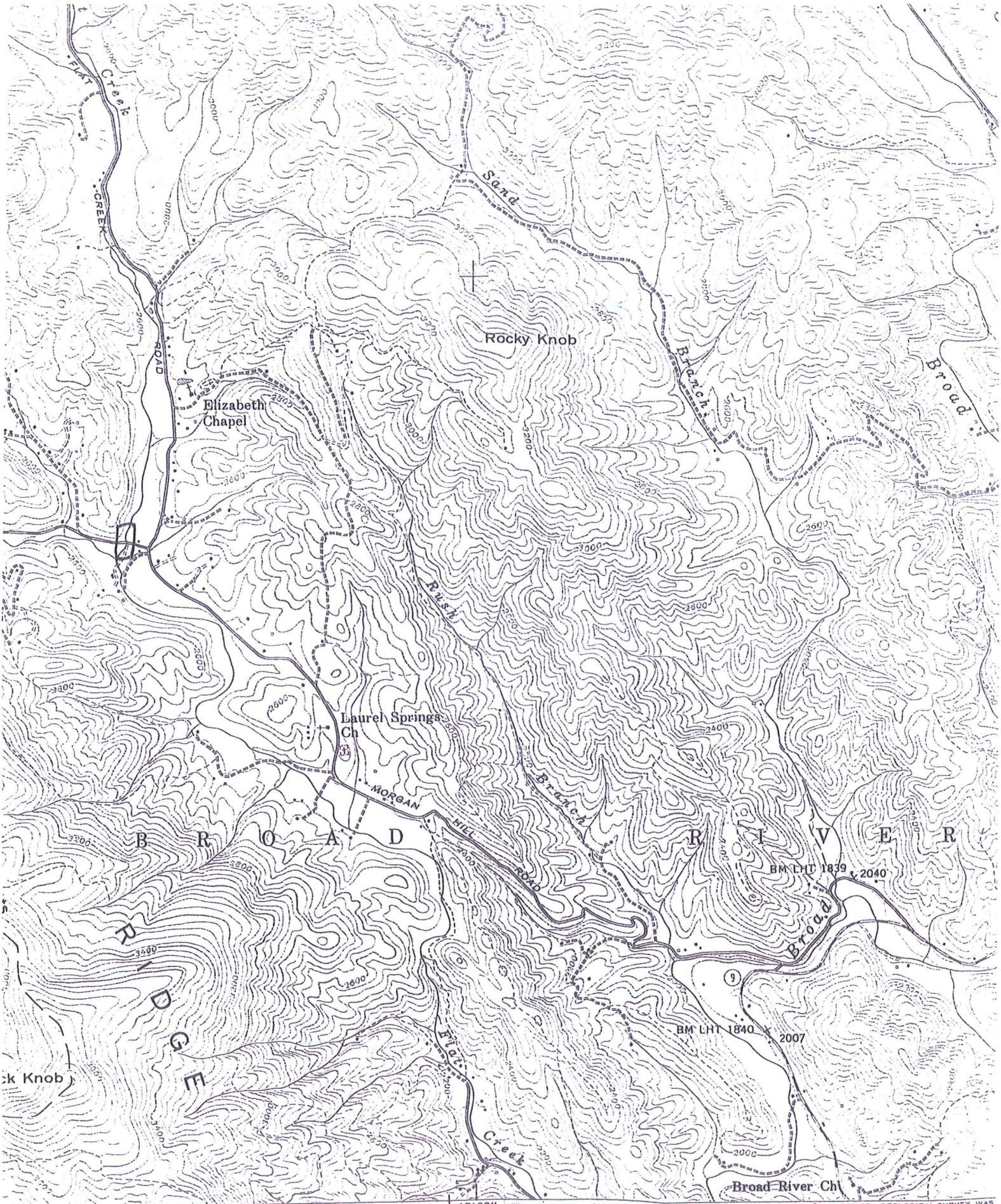


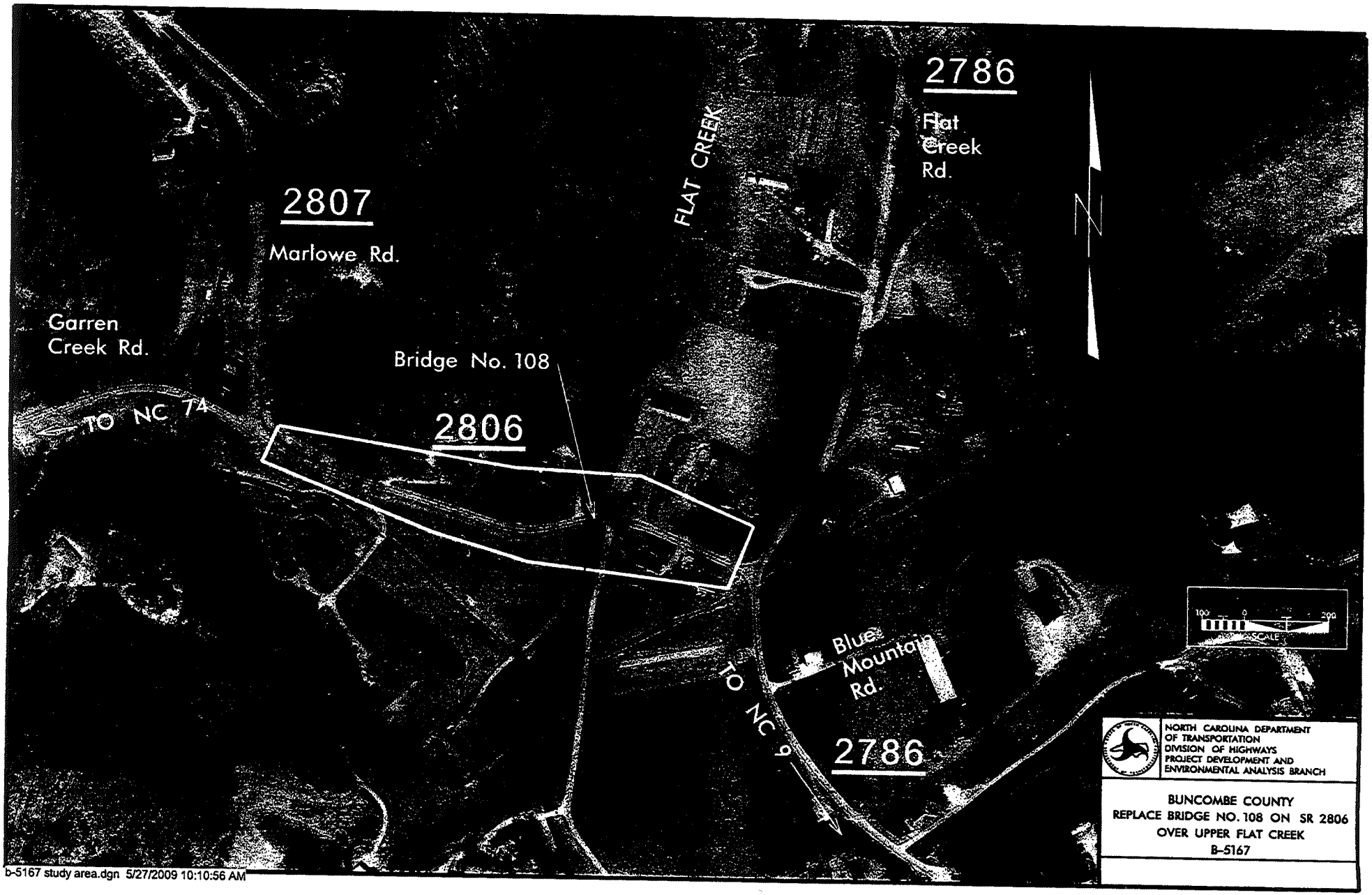
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT & ENVIRONMENTAL ANALYSIS BRANCH

BUNCOMBE COUNTY
REPLACE BRIDGE NO. 108 ON SR 2806
OVER UPPER FLAT CREEK
B-5167

Figure 1




Flat Creek
Creek
Road
Sand
Rocky Knob
Branch
Broad
Elizabeth Chapel
Rush
Laurel Springs Ch
Morgan
Hill
Road
Branch
B R O A D
R I V E R
BM LHT 1839
2040
Broad
BM LHT 1840
2007
Flat
Creek
Broad River Ch
(Bat Cave 202-NE)
4554 IV NE
382
17' 30"
383
No sites.
BAT CAVE 4 MI.
HENDERSONVILLE 20 MI
INTERIOR—GEOLOGICAL SURVEY, WAS
SCALE 1:24000
1 MILE
0
2000 3000 4000 5000 6000 7000 FEET
ROAD C
Heavy-duty
Medium-duty


2786
Flat Creek Rd.
FLAT CREEK
2807
Marlowe Rd.
Garren Creek Rd.
Bridge No. 108
2806
TO NC 74
Blue Mountain Rd.
TO NC 9
2786
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH
BUNCOMBE COUNTY
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OVER UPPER FLAT CREEK
B-5167
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