



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

October 29, 2019

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

ATTN: Mr. David Bailey, NCDOT Regulatory Coordinator

Subject: **Application for Section 404 Nationwide Permit 14, Section 401 Water Quality Certification** for the Proposed Replacement of Bridge No. 168 on NC14/87 over the Smith River in Rockingham County; TIP BR-0044, Division 7, Debit \$570 from WBS Element 67044.1.1

Dear Mr. Bailey:


The North Carolina Department of Transportation (NCDOT) proposes to replace bridge number 168 on NC 14/87 over the Smith River in Rockingham County with a five span, 520 feet long bridge to the north of the current alignment with the existing bridge being utilized as an onsite detour during construction. This action will result in the following impacts: 80 linear feet of permanent stream impact, 10 linear feet of permanent impacts from bank stabilization, 0.47 acre of temporary impacts to surface waters for causeways for bridge construction/removal, and 10 linear feet temporary impacts.

Please see enclosed copies of the Pre-Construction Notification (PCN), DMS Acceptance Letter, Stormwater Management Plan, and Permit Drawings. A Minimum Criteria Determination Checklist (MCDC) was completed in February 2019 and distributed shortly thereafter. Additional copies are available upon request.

This project calls for a letting date of April 21, 2020 and a review date of March 2, 2020.

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 Jeff Hemphill at (919) 707-6126.

Sincerely,


for Philip S. Harris III, P.E., C.P.M.
Environmental Analysis Unit Head

cc:
NCDOT Permit Application Standard Distribution List

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL ANALYSIS UNIT
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1598

Telephone: (919) 707-6000
Customer Service: 1-877-368-4968
Website: www.ncdot.gov

Location:
1000 BIRCH RIDGE DRIVE
RALEIGH NC 27610



Pre-Construction Notification (PCN) Form

For Nationwide Permits and Regional General Permits
(along with corresponding Water Quality Certifications)

September 29, 2018 Ver 3

Please note: fields marked with a red asterisk * below are required. You will not be able to submit the form until all mandatory questions are answered.

Also, if at any point you wish to print a copy of the E-PCN, all you need to do is right-click on the document and you can print a copy of the form.

Below is a link to the online help file.

<https://edocs.deq.nc.gov/WaterResources/0/edoc/624704/PCN%20Help%20File%202018-1-30.pdf>

A. Processing Information

County (or Counties) where the project is located: *

Rockingham

Is this project a public transportation project? *

Yes No

This is any publicly funded by municipal, state or federal funds road, rail, airport transportation project.

Is this a NCDOT Project? *

Yes No

(NCDOT only) T.I.P. or state project number:

BR-0044

WBS # *

67044.1.1

(for NCDOT use only)

1a. Type(s) of approval sought from the Corps: *

- Section 404 Permit (wetlands, streams and waters, Clean Water Act)
 Section 10 Permit (navigable waters, tidal waters, Rivers and Harbors Act)

1b. What type(s) of permit(s) do you wish to seek authorization? *

- Nationwide Permit (NWP)
 Regional General Permit (RGP)
 Standard (IP)

This form may be used to initiate the standard/individual permit process with the Corps. Please contact your Corps representative concerning submittals for standard permits. All required items that are not provided in the E-PCN can be added to the miscellaneous upload area located at the bottom of this form.

1c. Has the NWP or GP number been verified by the Corps? *

Yes No

Nationwide Permit (NWP) Number:

14 - Linear transportation

NWP Numbers (for multiple NWPS):

List all NW numbers you are applying for not on the drop down list.

1d. Type(s) of approval sought from the DWR: *

check all that apply

- 401 Water Quality Certification - Regular
 Non-404 Jurisdictional General Permit
 Individual 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 DWR 401 Certification:

Yes No

For the record only for Corps Permit:

Yes No

1f. Is this an after-the-fact permit application? *

Yes No

1g. 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

Acceptance Letter Attachment

Click the upload button or drag and drop files here to attach document

FILETYPE MUST BE PDF

1h. Is the project located in any of NC's twenty coastal counties? *

Yes No

1j. Is the project located in a designated trout watershed? *

Yes No

Link to trout information: <http://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Agency-Coordination/Trout.aspx>

B. Applicant Information

1a. Who is the Primary Contact? *

NCDOT

1b. Primary Contact Email: *

jhemphill@ncdot.gov

1c. Primary Contact Phone: *

(xxx)xxx-xxxx
(919)707-6126

1d. Who is applying for the permit? *

Owner (Check all that apply) Applicant (other than owner)

1e. Is there an Agent/Consultant for this project? *

Yes No

2. Owner Information

2a. Name(s) on recorded deed: *

N/A

2b. Deed book and page no.:

2c. Responsible party:

(for Corporations)

2d. Address *

Street Address

1598 Mail Service Center

Address Line 2

City

Raleigh

Postal / Zip Code

27699-1598

State / Province / Region

NC

Country

US

2e. Telephone Number: *

(xxx)xxx-xxxx

(919)707-6126

2f. Fax Number:

(xxx)xxx-xxxx

2g. Email Address: *

pharris@ncdot.gov

C. Project Information and Prior Project History

1. Project Information

1a. Name of project: *

Replace bridge 780168 on NC 14/87 over the Smith River

1b. Subdivision name:

(if appropriate)

1c. Nearest municipality / town: *

Eden

2. Project Identification

2a. Property Identification Number:

(tax PIN or parcel ID)

2b. Property size:

(in acres)

2c. Project Address

Street Address

Address Line 2

City

State / Province / Region

Postal / Zip Code

Country

2d. Site coordinates in decimal degrees

Please collect site coordinates in decimal degrees. Use between 4-6 digits (unless you are using a survey-grade GPS device) after the decimal place as appropriate, based on how the location was determined. (For example, most mobile phones with GPS provide locational precision in decimal degrees to map coordinates to 5 or 6 digits after the decimal place.)

Latitude: *36.528054
ex: 34.208504**Longitude: ***-79.767988
-77.796371**3. Surface Waters****3a. Name of the nearest body of water to proposed project: ***

Smith River

3b. Water Resources Classification of nearest receiving water: *

WS-IV

[Surface Water Lookup](#)**3c. What river basin(s) is your project located in? ***

Roanoke

3d. Please provide the 12-digit HUC in which the project is located. *

030101030807

[River Basin Lookup](#)**4. Project Description and History****4a. Describe the existing conditions on the site and the general land use in the vicinity of the project at the time of this application: ***

Undeveloped woodlands, pastureland, and some residences. A private park is on the west side of the river south of the highway.

4b. Have Corps permits or DWR certifications been obtained for this project (including all prior phases) in the past? * Yes No Unknown**4d. Attach an 8 1/2 X 11 excerpt from the most recent version of the USGS topographic map indicating the location of the project site. (for DWR)**[Click the upload button or drag and drop files here to attach document](#)

File type must be pdf

4e. Attach an 8 1/2 X 11 excerpt from the most recent version of the published County NRCS Soil Survey map depicting the project site. (for DWR)[Click the upload button or drag and drop files here to attach document](#)

File type must be pdf

4f. List the total estimated acreage of all existing wetlands on the property:

0.02

4g. List the total estimated linear feet of all existing streams on the property:

(intermittent and perennial)

785

4h. Explain the purpose of the proposed project: *

The purpose of the proposed project is to replace a deficient bridge. Bridge No. 168 is considered structurally deficient with a sufficiency rating of 69.08 out of 100. Being structurally deficient does not mean that the bridge is unsafe, but does mean the bridge is in need of repair or replacement. As a bridge ages, the cost of repairs and continued maintenance eventually necessitate the need for replacement. The current bridge was constructed in 1966 and is reaching the end of its useful life.

4i. Describe the overall project in detail, including indirect impacts and the type of equipment to be used: *

A new bridge will be constructed to the north of the existing bridge, and traffic will be maintained on the existing bridge during construction. Following construction of the new bridge, the existing bridge would be removed. The proposed replacement bridge would be constructed approximately 10 feet north of the existing bridge and will be approximately 520 feet in length with two, 12-foot lanes and 4-foot paved shoulders. Project construction will extend approximately 1,000 feet to the west and 1,000 feet to the east from the replacement bridge along NC 14/87. Typical road building equipment such as trucks, dozers, and cranes will be used to construct the bridge.

4j. Please upload project drawings for the proposed project.[Click the upload button or drag and drop files here to attach document](#)

BR-0044_Permit Drawings.pdf

6.61MB

BR-0044 DMS Mitigation Letter.pdf

68.46KB

BR-0044 Cover Letter.pdf

183.03KB

File type must be pdf

5. Jurisdictional Determinations

5a. Have the wetlands or streams been delineated on the property or proposed impact areas? *

Yes No Unknown

Comments:

Fieldwork by NCDOT consultant: April 19 and June 6, 2018.

5b. If the Corps made a jurisdictional determination, what type of determination was made? *

Preliminary Approved Not Verified Unknown N/A

Corps AID Number:

Example: SAW-2017-99999

5c. If 5a is yes, who delineated the jurisdictional areas?

Name (if known): Chris Inscore, Paul Masten

Agency/Consultant Company: AECOM

Other:

5d1. Jurisdictional determination upload

Click the upload button or drag and drop files here to attach document

File type must be PDF

6. Future Project Plans

6a. Is this a phased project? *

Yes No

Are any other NWP(s), regional general permit(s), or individual permits(s) used, or intended to be used, to authorize any part of the proposed project or related activity? This includes other separate and distant crossing for linear projects that require Department of the Army authorization but don't require pre-construction notification.

D. Proposed Impacts Inventory

1. Impacts Summary

1a. Where are the impacts associated with your project? (check all that apply):

Wetlands Streams-tributaries Buffers
 Open Waters Pond Construction

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.

"S." will be used in the table below to represent the word "stream".

	3a. Reason for impact * (?)	3b. Impact type *	3c. Type of impact *	3d. S. name *	3e. Stream Type * (?)	3f. Type of Jurisdiction *	3g. S. width * Average (feet)	3h. Impact length * (linear feet)
S1	Pipe Extension	Permanent	Relocation	SA - UT to Smith River	Perennial	Both	3 Average (feet)	80 (linear feet)
S2	Pipe Extension	Temporary	Dewatering	SA - UT to Smith River	Perennial	Both	3 Average (feet)	10 (linear feet)
S3	Stream Bank Stabilization	Permanent	Bank Stabilization	SA - UT to Smith River	Perennial	Both	3 Average (feet)	10 (linear feet)
S4	Bridge Construction	Temporary	Workpad/Causeway	Smith River	Perennial	Both	150 Average (feet)	280 (linear feet)

** All Perennial or Intermittent streams must be verified by DWR or delegated local government.

3i. Total jurisdictional ditch impact in square feet:

0

3i. Total permanent stream impacts:

90

3i. Total temporary stream impacts:

290

3i. Total stream and ditch impacts:

380

3j. Comments:

E. Impact Justification and Mitigation



1. Avoidance and Minimization

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

Impacts to a small wetland was avoided in the design process. The proposed bridge deck drainage is collected by 6" diameter deck drains @ 12' spacings over the floodplain. No deck drains discharge directly over Smith River. Roadway drainage on the east and west sides of the bridge is collected by a system of grated inlets discharging into a riprap pad, which then dissipates into Smith River floodplain. Away from the bridge, surface runoff is collected in grass and rip-rap lined ditches and conveyed to natural outfalls. NCDOT will adhere to Design Standards in Sensitive Watersheds.

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

Best Management Practices will be adhered to. Temporary work pads will be used for construction and demolition but will not impede more than 50% of the Smith River.

Proposed Conservation Measures from the BA to avoid and minimize impacts to the Smith River: • Clearing and Grubbing

• Clearing and Grubbing

In areas identified as Environmentally Sensitive Areas, the Contractor may perform clearing operations, but not grubbing operations until immediately prior to beginning grading operations as described in Article 200-1 of the Standard Specifications. Only clearing operations (not grubbing) shall be allowed in this buffer zone until immediately prior to beginning grading operations. Erosion control devices shall be installed immediately following the clearing operation.

• Grading

Once grading operations begin in identified Environmentally Sensitive Areas, work shall progress in a continuous manner until complete. All construction within these areas shall progress in a continuous manner such that each phase is complete and areas are permanently stabilized prior to beginning of next phase. Failure on the part of the contractor to complete any phase of construction in a continuous manner in Environmentally Sensitive Areas will be just cause for the Engineer to direct the suspension of work in accordance with Article 108-7 of the Standard Specifications.

• Seeding and Mulching

Seeding and mulching shall be performed in accordance with Section 1660 of the Standard Specifications and vegetative cover sufficient to restrain erosion shall be installed immediately following grade establishment. Seeding and mulching shall be performed on the areas disturbed by construction immediately following final grade establishment. No appreciable time shall lapse into the contract time without stabilization of slopes, ditches and other areas within the Environmentally Sensitive Areas.

• Stage Seeding

The work covered by this section shall consist of the establishment of a vegetative cover on cut and fill slopes as grading progresses. Seeding and mulching shall be done in stages on cut and fill slopes that are greater than 20 feet in height measured along the slope, or greater than 2 acres in area. Each stage shall not exceed the limits stated above.

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

2c. If yes, mitigation is required by (check all that apply):

DWR Corps

2d. If yes, which mitigation option(s) will be used for this project?

Mitigation bank Payment to in-lieu fee program Permittee Responsible Mitigation

4. Complete if Making a Payment to In-lieu Fee Program

4a. Approval letter from in-lieu fee program is attached.

Yes No

4b. Stream mitigation requested:

(linear feet)

80

4c. If using stream mitigation, what is the stream temperature:

warm

NC Stream Temperature Classification Maps can be found under the Mitigation Concepts tab on the Wilmington District's RIBITS website.

4d. Buffer mitigation requested (DWR only):

(square feet)

4e. Riparian wetland mitigation requested:

(acres)

4f. Non-riparian wetland mitigation requested:

(acres)

4g. Coastal (tidal) wetland mitigation requested:

(acres)

4h. Comments

The 10' of bank stabilization does not require mitigation therefore 80' of mitigation is requested

F. Stormwater Management and Diffuse Flow Plan (required by DWR)



*** Recent changes to the stormwater rules have required updates to this section .***

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

For a list of options to meet the diffuse flow requirements, click [here](#).

If no, explain why:

2. Stormwater Management Plan

2a. Is this a NCDOT project subject to compliance with NCDOT's Individual NPDES permit NCS000250? *

Yes No

Comments:

G. Supplementary Information



1. Environmental Documentation

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.) *

Yes No

Comments: *

2. Violations (DWR Requirement)

2a. Is the site in violation of DWR Water Quality Certification Rules (15A NCAC 2H .0500), Isolated Wetland Rules (15A NCAC 2H .1300), or DWR Surface Water or Wetland Standards or Riparian Buffer Rules (15A NCAC 2B .0200)? *

Yes No

3. Cumulative Impacts (DWR 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 "no," provide a short narrative description.

4. Sewage Disposal (DWR Requirement)

4a. Is sewage disposal required by DWR for this project? *

Yes No N/A

5. Endangered Species and Designated Critical Habitat (Corps Requirement)

5a. Will this project occur in or near an area with federally protected species or habitat? *

Yes No

5b. Have you checked with the USFWS concerning Endangered Species Act impacts? *

Yes No

5c. If yes, indicate the USFWS Field Office you have contacted.

Raleigh

5d. Is another Federal agency involved? *

Yes No Unknown

5e. Is this a DOT project located within Division's 1-8? *

Yes No

5j. What data sources did you use to determine whether your site would impact Endangered Species or Designated Critical Habitat? *

As of February 22, 2019 the USFWS lists three protected species for Rockingham County - Roanoke logperch, James spiny mussel and smooth coneflower. Smooth coneflower habitat is present within the project area, however, surveys of suitable habitat in June 2018 did not find any populations or plants. Informal Concurrence was submitted to the USFWS on 10/29/2019.

[Consultation Documentation Upload](#)

Click the upload button or drag and drop files here to attach document

BR-0044 Section 7 Concurrence Request.pdf

3.1MB

File type must be PDF

6. Essential Fish Habitat (Corps Requirement)

6a. Will this project occur in or near an area designated as an Essential Fish Habitat? *

Yes No

6b. What data sources did you use to determine whether your site would impact an Essential Fish Habitat? *

NMFS County Index

7. Historic or Prehistoric Cultural Resources (Corps Requirement)

Link to the State Historic Preservation Office Historic Properties Map (does not include archaeological data: <http://gis.ncdcr.gov/hpoweb/>)

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? *

See attached BR-0044 MCDC

7c. Historic or Prehistoric Information Upload

Click the upload button or drag and drop files here to attach document

2018-01-16 Historic Architecture No Survey Required.pdf	2.05MB
2018-01-24 Archaeology Survey Required Form.pdf	1.99MB
2018-08-14 Archaeology No Sites Present Form.pdf	7.15MB
2018-11-15 Historic Architecture No Survey Required - Expanded Area.pdf	2.94MB
2018-11-26 Archaeology No Survey - Expanded Study Area.pdf	8.1MB

File must be PDF

8. Flood Zone Designation (Corps Requirement)

Link to the FEMA Floodplain Maps: <https://msc.fema.gov/portal/search>

8a. Will this project occur in a FEMA-designated 100-year floodplain? *

Yes No

8b. If yes, explain how project meets FEMA requirements:

8c. What source(s) did you use to make the floodplain determination? *

FEMA Flood maps

Miscellaneous

Comments

Miscellaneous attachments not previously requested.

Click the upload button or drag and drop files here to attach document

BR-0044 MCDC.pdf

5.11MB

File must be PDF or KMZ

Signature

*

By checking the box and signing below, I certify that:

- I have given true, accurate, and complete information on this form;
- I agree that submission of this PCN form is a "transaction" subject to Chapter 66, Article 40 of the NC General Statutes (the "Uniform Electronic Transactions Act");
- I agree to conduct this transaction by electronic means pursuant to Chapter 66, Article 40 of the NC General Statutes (the "Uniform Electronic Transactions Act");
- I understand that an electronic signature has the same legal effect and can be enforced in the same way as a written signature; AND
- I intend to electronically sign and submit the PCN form.

Full Name: *

Michael Turchy

Signature

Michael Turchy

Date

10/29/2019



NORTH CAROLINA
Environmental Quality

ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

TIM BAUMGARTNER
Director

September 4, 2019

Mr. Philip S. Harris, III, P.E.
Environmental Analysis Unit
North Carolina Department of Transportation
1598 Mail Service Center
Raleigh, North Carolina 27699-1598

Dear Mr. Harris:

Subject: Mitigation Acceptance Letter:

BR-0044, Replace Bridge 780168 over the Smith River on NC 14 / NC 87, Rockingham County

The purpose of this letter is to notify you that the Division of Mitigation Services (DMS) will provide the compensatory stream mitigation for the subject project. Based on the information supplied by you on September 4, 2019, the impacts are located in CU 03010103 of the Roanoke River basin in the Central Piedmont (CP) Eco-Region, and are as follows:

Roanoke 03010103 CP	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	0	0	80.0	0	0	0	0	0

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

The impacts and associated mitigation needs were under projected by the NCDOT in the 2019 impact data. DMS 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 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 DMS.

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

Sincerely,

James B. Stanfill
DMS Asset Management Supervisor

cc: Mr. Monte Matthews, USACE – Raleigh Regulatory Field Office
Ms. Amy Chapman, NCDWR
File: BR-0044





North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS



(Version 2.08; Released April 2018)

WBS Element: 67044.1.1 TIP No.: BR-0044 County(ies): Rockingham Page 1 of 2

General Project Information

WBS Element:	67044.1.1	TIP Number:	BR-0044	Project Type:	Bridge Replacement	Date:	6/14/2019
NCDOT Contact:	David Stutts, PE (Structures Mgmt Unit)		Contractor / Designer:	AECOM/Gregory Cols, PE			
Address:	NCDOT Century Center 1000 Birch Ridge Dr Raleigh NC 27610		Address:	701 Corporate Center Drive Raleigh, NC 27607 Suite 475			
	Phone: 919-707-6442			Phone: 9198546200			
	Email: dstutts@ncdot.gov			Email: gregory.cols@aecom.com			
City/Town:	Eden		County(ies):	Rockingham			
River Basin(s):	Roanoke		CAMA County?	No			
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	0.427 mi	Surrounding Land Use:	Wooded, Rural					
	Proposed Project			Existing Site				
Project Built-Up Area (ac.)	1.7	ac.			1.7	ac.		
Typical Cross Section Description:	2 lanes of undivided highway with 12' lanes. Shoulder Berm Gutter with storm systems and roadside ditches.			2 lanes of undivided highway with 12' lanes. All shoulder section. Roadside ditches.				
Annual Avg Daily Traffic (veh/hr/day):	Design/Future:	8400	Year:	2040	Existing:	8080	Year:	2020

General Project Narrative:
(Description of Minimization of Water Quality Impacts)

The existing 7 span (7@75') bridge on N Van Buren rd (NC 14/87) spans Smith River. The existing bridge was constructed in 1966 and consists of a reinforced concrete deck on steel I-beams. Several of the existing beams have considerable section loss as well as overall deterioration of various components of the bridge. The status of the bridge is observed to be structurally deficient with a sufficiency rating of 69.06/100. The replacement bridge to be constructed slightly more north, is a 5 span (1@106', 3@113', 1@75') prestressed concrete girder bridge with 4' deep end bent caps. The proposed bridge deck drainage is collected by 6" diameter deck drains @ 12' spacings over the floodplain. No deck drains discharge directly over Smith River. Roadway drainage on the east and west sides of the bridge is collected by a system of TB 2GI's discharging into a riprap pad, which then dissipates into Smith River floodplain. Away from the bridge, surface runoff is collected in grass and rip-rap lined ditches and conveyed to natural outfalls. Construction of the bridge will be accomplished using causeways, as no other practical option exists to minimize disturbance to the river. Causeways will be constructed in phases to minimize the total concurrent impact to the river and limit total blockage of channel to 50% maximum. A shallow rockline precludes the use of temporary work bridges.

One unnamed tributary to the Smith River crosses the project to the west of the bridge. This UT is currently piped under the existing roadway. The pipe will be extended to accommodate the relocated roadway with wider shoulders. Maximum steepest slopes are proposed to limit the amount of fill.

Wetlands exist within the project limits but are not disturbed by construction activities.

Waterbody Information

Surface Water Body (1):	Smith River		NCDWR Stream Index No.:	22-40-(1)				
NCDWR Surface Water Classification for Water Body	Primary Classification:		Water Supply IV (WS-IV)					
	Supplemental Classification:		None					
Other Stream Classification:								
Impairments:	Benthos							
Aquatic T&E Species?	Yes	Comments: Roanoke logperch is an endangered freshwater fish found in the Smith River within the study area						
NRTR Stream ID:	Smith River		Buffer Rules in Effect:	N/A				
Project Includes Bridge Spanning Water Body?	Yes	Deck Drains Discharge Over Buffer?	N/A	Dissipator Pads Provided in Buffer?				N/A
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)			(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)			
(If yes, provide justification in the General Project Narrative)								



North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
 FOR NCDOT PROJECTS



(Version 2.08; Released April 2018)

WBS Element: 67044.1.1 TIP No.: BR-0044 County(ies): Rockingham Page 2 of 2

Additional Waterbody Information

Surface Water Body (2):	UT to Smith River		NCDWR Stream Index No.:	22-40-(1)	
NCDWR Surface Water Classification for Water Body	Primary Classification:	Water Supply IV (WS-IV)			
	Supplemental Classification:	None			
Other Stream Classification:					
Impairments:	Benthos				
Aquatic T&E Species?	Yes	Comments: Roanoke logperch is an endangered freshwater fish found in the Smith River within the study area			
NRTR Stream ID:	SA		Buffer Rules in Effect:	N/A	
Project Includes Bridge Spanning Water Body?	Yes	Deck Drains Discharge Over Buffer?	N/A	Dissipator Pads Provided in Buffer?	N/A
Deck Drains Discharge Over Water Body?	Yes	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

09.08/99

TIP PROJECT: BR-0044

CONTRACT: C204393

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

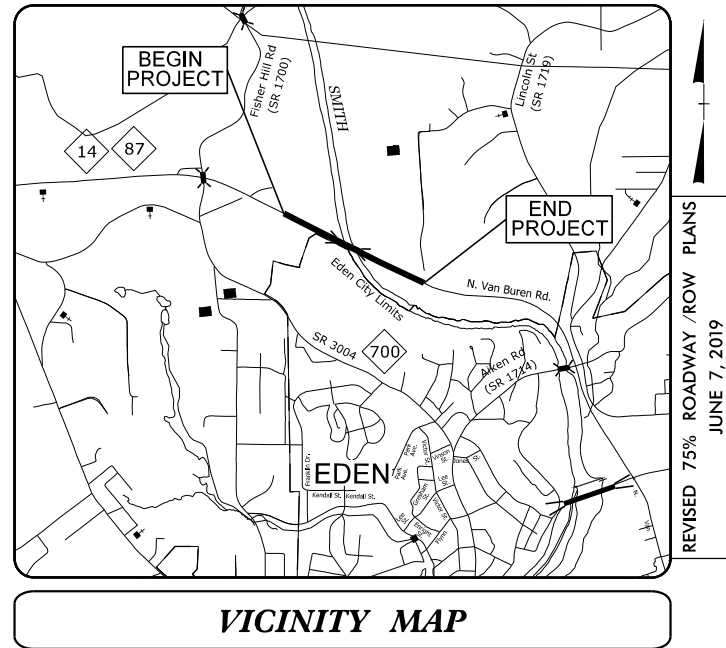
ROCKINGHAM COUNTY

LOCATION: BRIDGE NO. 168 ON NC 14/NC 87
(N. VAN BUREN RD) OVER
SMITH RIVER

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0044	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
67044.1.1		PE	

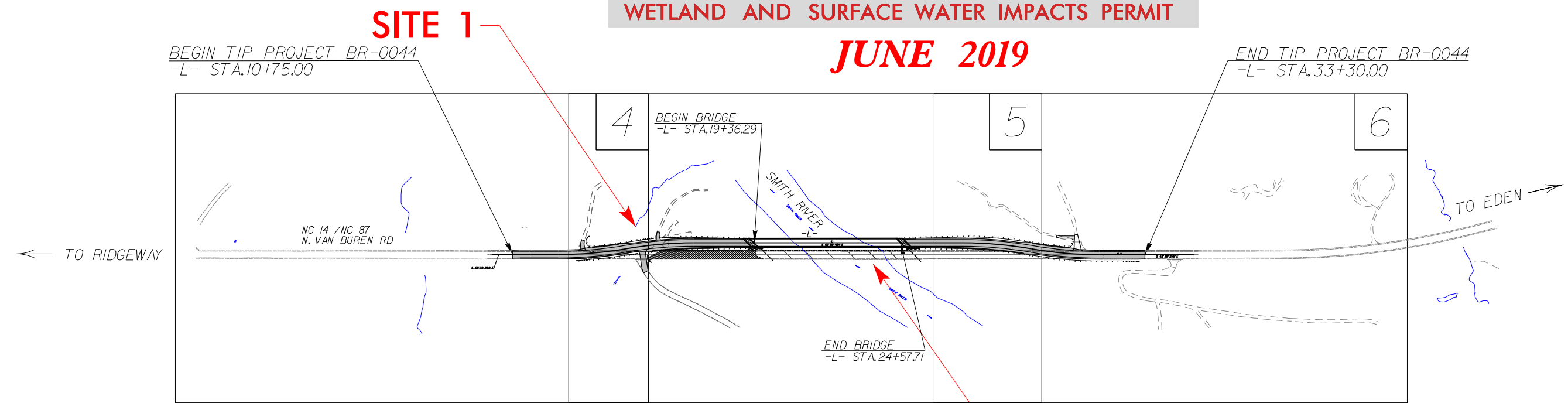
PERMIT DRAWING
SHEET 01 OF 15



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

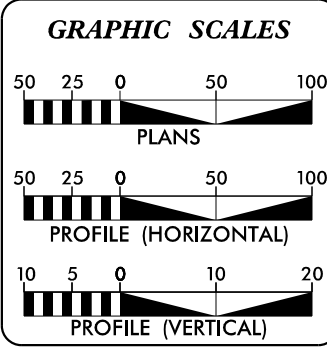
WETLAND AND SURFACE WATER IMPACTS PERMIT

JUNE 2019



THERE IS NO CONTROL OF ACCESS ON THIS PROJECT.
CLEARING ON THE PROJECT SHALL BE TO THE LIMITS
ESTABLISHED USING METHOD II
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



DESIGN DATA

ADT 2020 =	8,080
ADT 2040 =	8,400
K =	9 %
D =	55 %
T =	12 % *
V =	60 MPH
* (TTST 10%+DUAL 2%)	
FUNC CLASS =	PRINCIPAL ARTERIAL
REGIONAL TIER	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT BR-0044 =	0.328 MI
LENGTH STRUCTURE TIP PROJECT BR-0044 =	0.099 MI
TOTAL LENGTH TIP PROJECT BR-0044 =	0.427 MI

AECOM
NC FIRM LICENSE No: F-0342
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JUNE 14, 2019

LETTING DATE:
JANUARY 21, 2020

NEIL J. DEAN, P.E.
PROJECT ENGINEER

RADHA ATTALURI, P.E.
PROJECT DESIGN ENGINEER

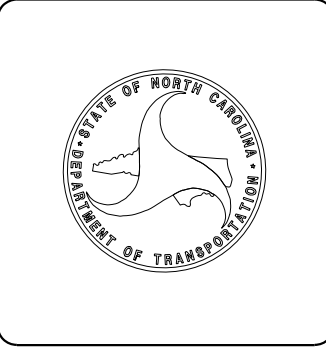
DAVID STUTTS, P.E.
NCDOT PROJECT MANAGER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

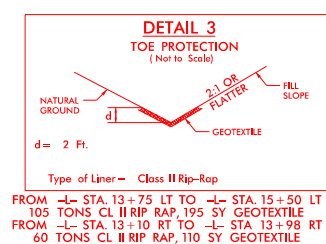
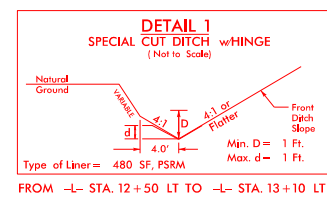
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6/27/2019 R:\Hydraulics\PERMITS_Environmental\Drawings\BR-0044_Hyd-prm_wet_TSH.dgn catterm

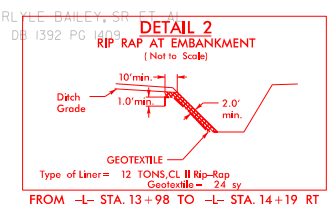
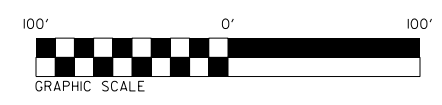
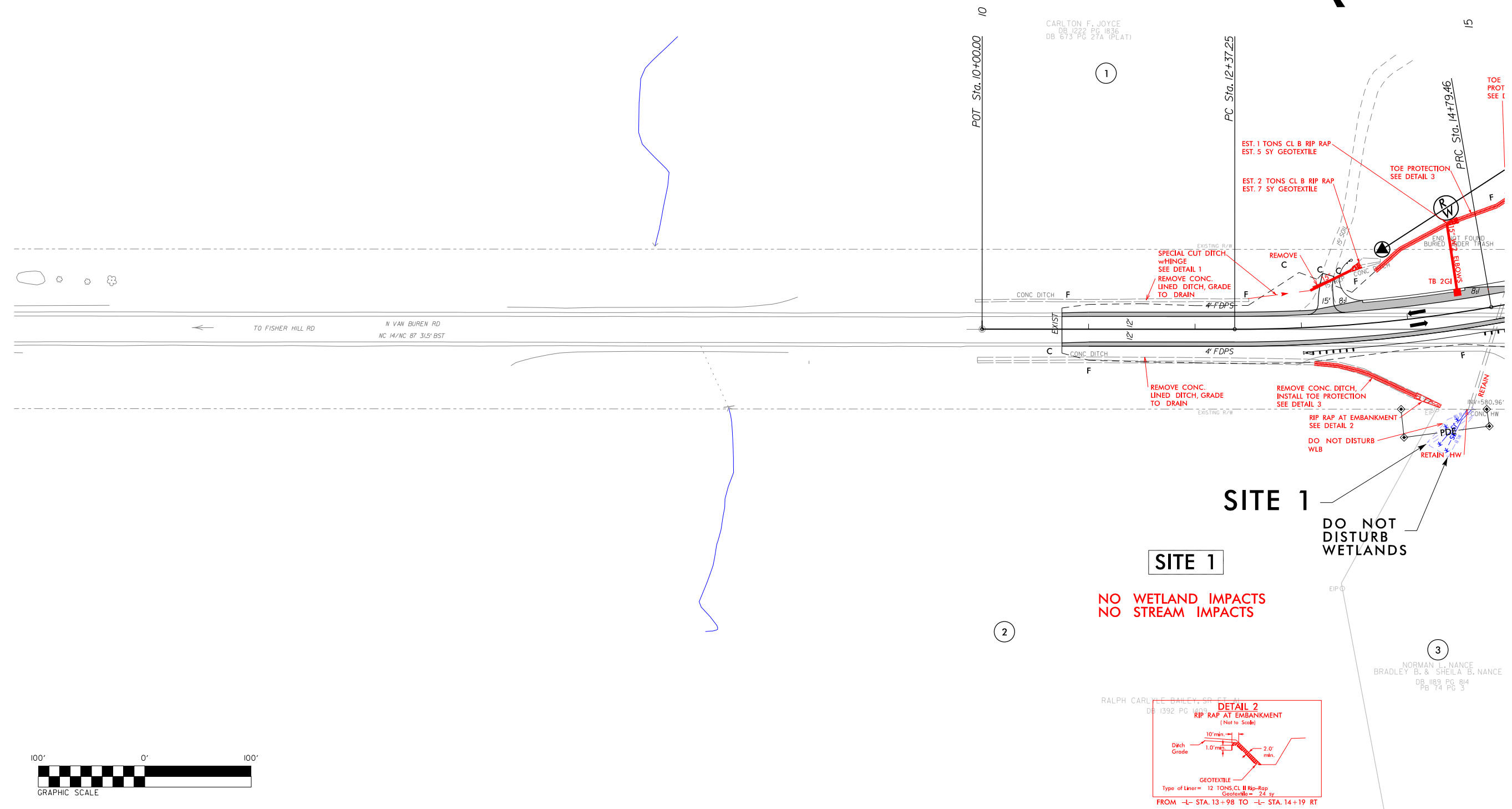
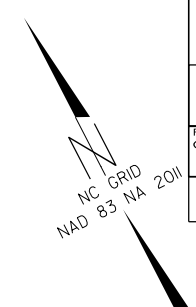
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RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
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Prepared in the Office of: AECOM <small>101 Corporate Center Drive, Suite 415 Raleigh, NC 27607 (919) 854-6200 • (919) 854-6259(FAX)</small>	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

PERMIT DRAWING
SHEET 02 OF 15



-L-

<i>PI Sta 13+58.66</i> $\Delta = 9^{\circ} 54' 44.5''$ (LT) $D = 4' 05' 33.2''$ $L = 242.20'$ $T = 121.41'$ $R = 1,400.00'$ $e = 0.06$ FT/FT $R.O. = 162.00'$	<i>PI Sta 16+00.61</i> $\Delta = 9^{\circ} 53' 29.9''$ (RT) $D = 4' 05' 33.2''$ $L = 241.70'$ $T = 121.15'$ $R = 1,400.00'$ $e = 0.06$ FT/FT $R.O. = 162.00'$
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REVISIONS

5/14/99
6/27/2018
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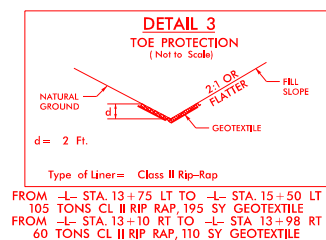
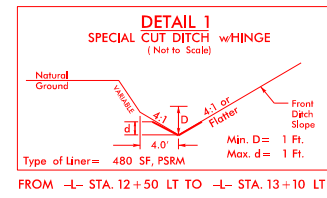
CARLTON F. JOYCE
DB 1222 PG 1836
DB 673 PG 27A (PLAT)

NORMAN L. NANCE
BRADLEY B. & SHEILA B. NANCE
DB 1189 PG 814
PB 74 PG 3

RALPH CARL L. BAILEY, SR.
DB 1392 PG 1839

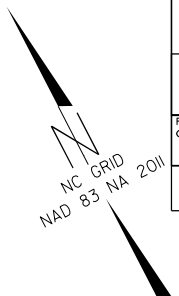
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RW SHEET NO.	
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Prepared in the Office of: AECOM 70 Corporate Center Drive, Suite 475 Raleigh, NC 27607 (919) 854-6200 • (919) 854-6259(FAX)	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

PERMIT DRAWING SHEET 03 OF 15

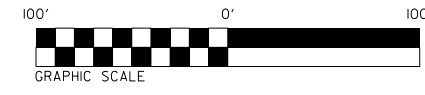
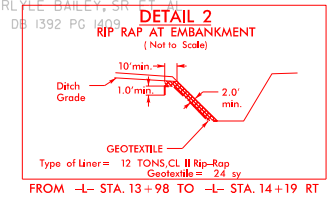
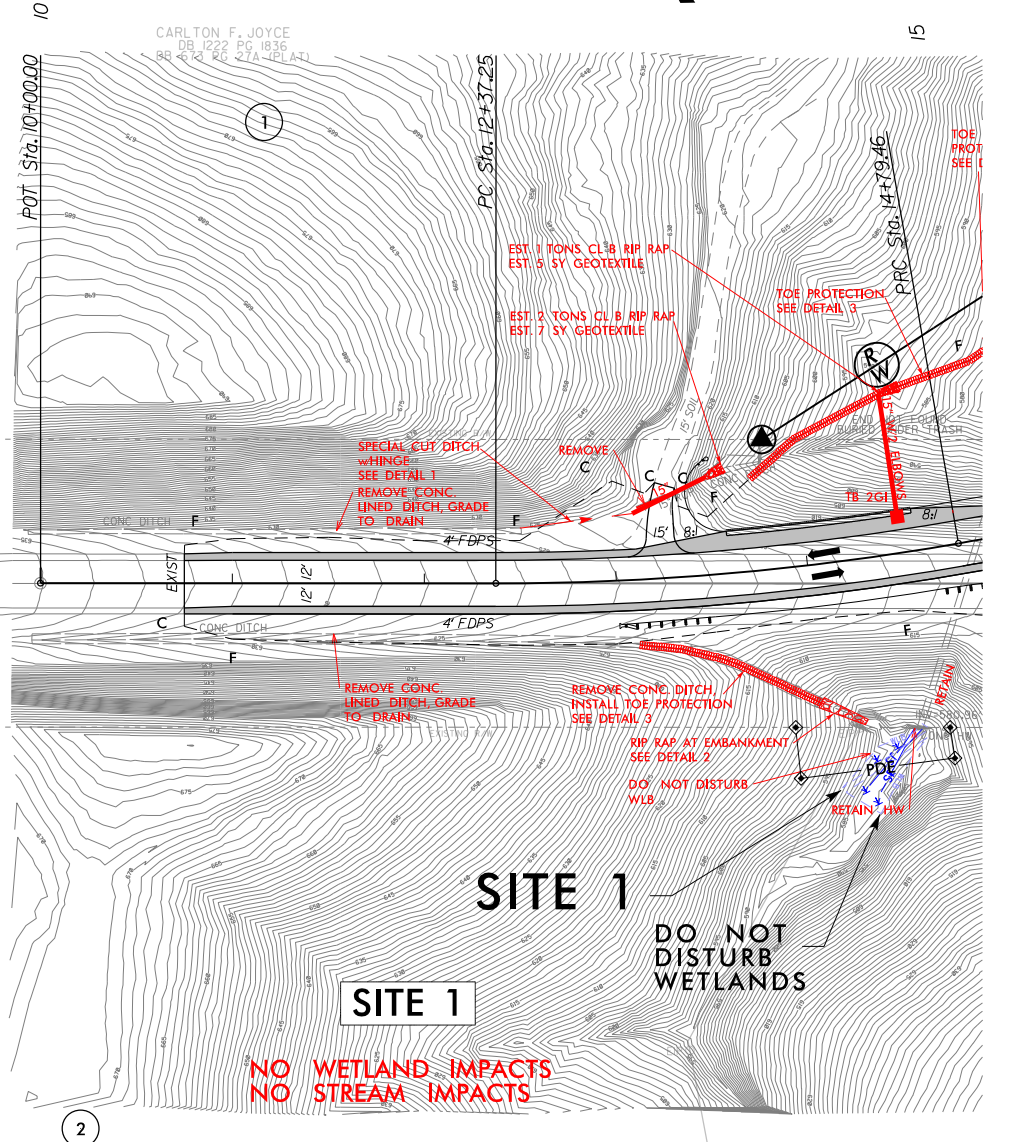
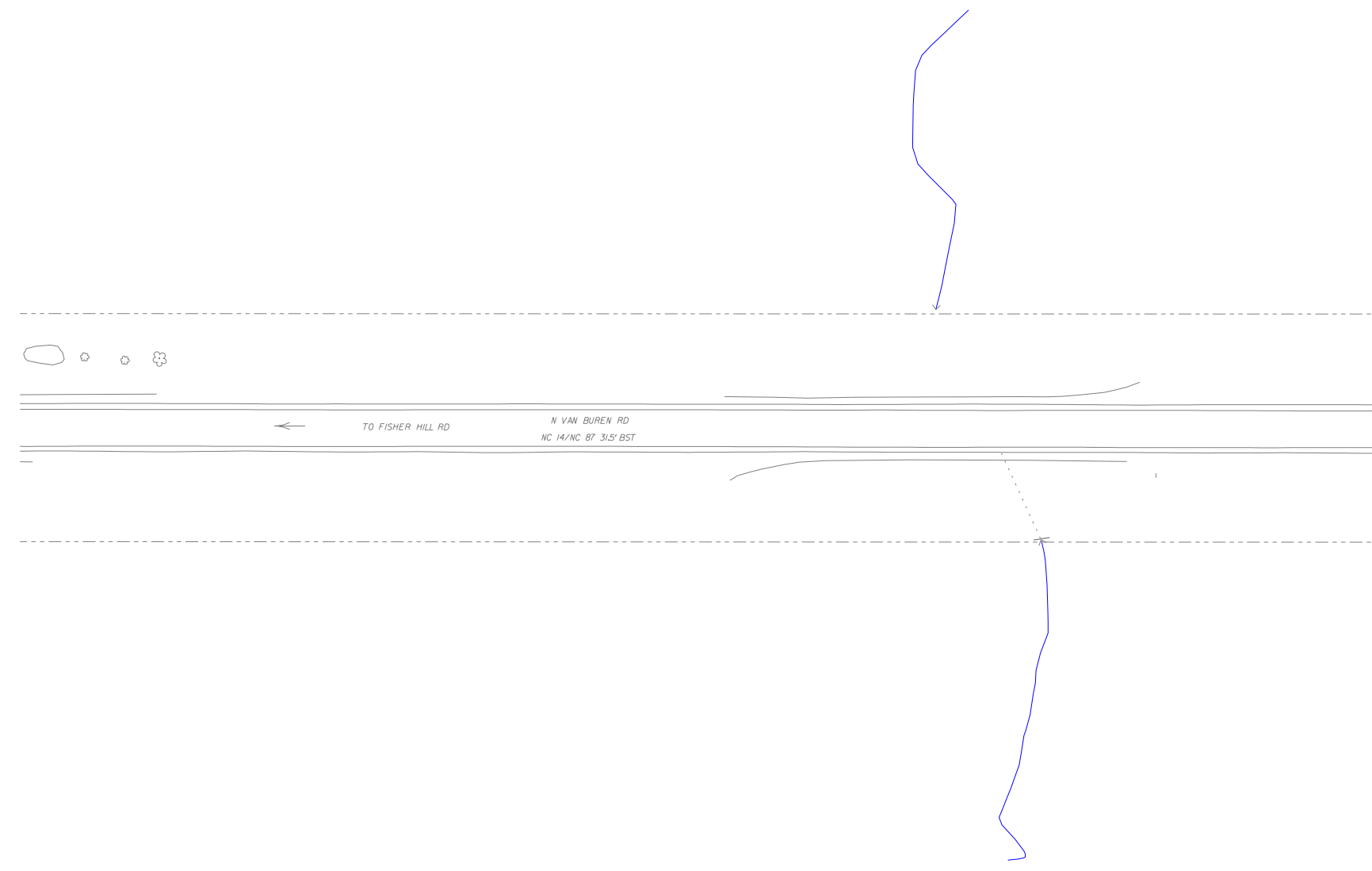


-L-

<i>PI Sta 13+58.66</i> $\Delta = 9' 54' 44.5''$ (LT) <i>D = 4' 05' 33.2''</i> <i>L = 242.20'</i> <i>T = 121.41'</i> <i>R = 1,400.00'</i> <i>e = 0.06 FT/FT</i> <i>R.O. = 162.00'</i>	<i>PI Sta 16+00.61</i> $\Delta = 9' 53' 29.9''$ (RT) <i>D = 4' 05' 33.2''</i> <i>L = 241.70'</i> <i>T = 121.5'</i> <i>R = 1,400.00'</i> <i>e = 0.06 FT/FT</i> <i>R.O. = 162.00'</i>
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REVISIONS



NORMAN L. NANCE
BRADLEY B. & SHEILA B. NANCE
DB 1189 PG 814
PB 74 PG 3

RALPH CARL LE BAILEY, SR.
DB 1392 PG 1163

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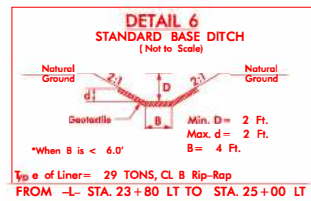
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RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
Prepared in the Office of: AECOM	
<small>NC FIRM LICENSE No. F-0342 70 Corporate Center Drive, Suite 475 Raleigh, NC 27607 (919) 854-6200 • (919) 854-6298 FAX</small>	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

PERMIT DRAWING
SHEET 04 OF 15
Revised 11/18/2019



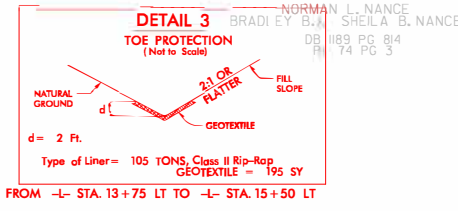
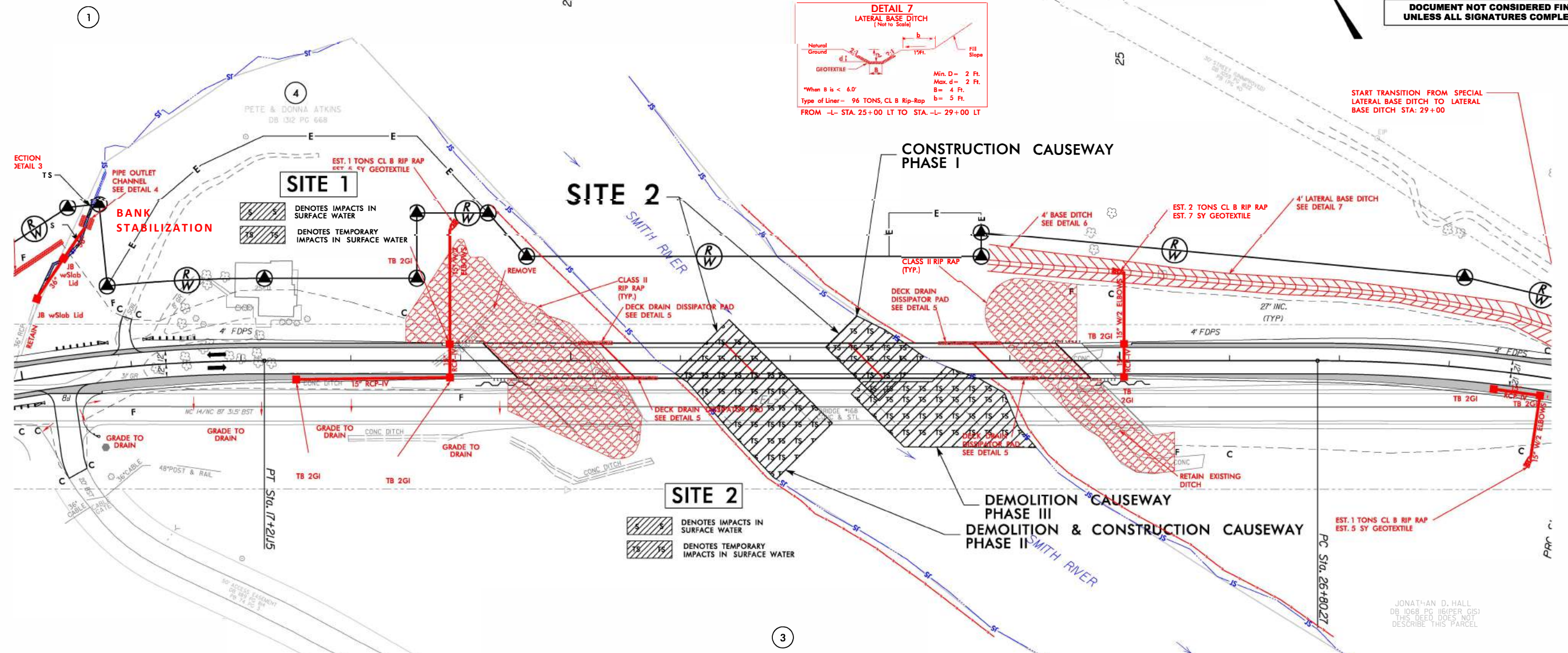
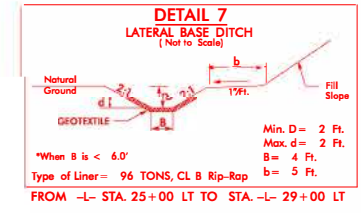
-L-

PI Sta 16+00.61 Δ = 9° 53' 29.9" (RT) D = 4 05' 33.2" L = 241.70' T = 121.15' R = 1,400.00' e = 0.06 FT/FT R.O. = 162.00'	PI Sta 28+02.44 Δ = 9° 58' 27.2" (RT) D = 4 05' 33.2" L = 243.72' T = 122.17' R = 1,400.00' e = 0.06 FT/FT R.O. = 162.00'
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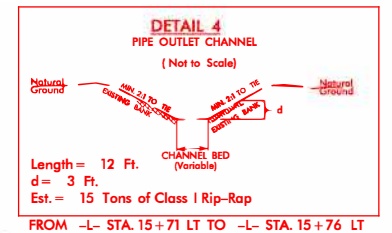
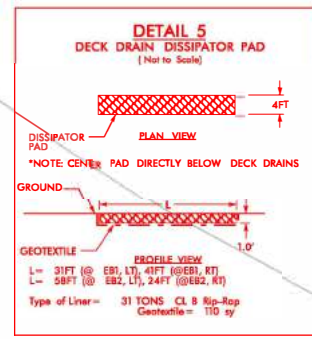
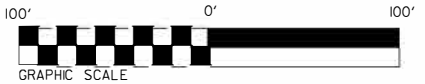


5
JONATHAN D. HALL
DB 1068 PG 186(PER GIS)
THIS DEED DOES NOT
DESCRIBE THIS PARCEL

6
GREATLAND RETRIEVERS, L.L.C.
DB 1523 PG 2994



***NOTE: CAUSEWAY WILL ONLY BLOCK 12 OF THE STREAM PER PHASE**



JONATHAN D. HALL
DB 1068 PG 186(PER GIS)
THIS DEED DOES NOT
DESCRIBE THIS PARCEL

REVISIONS

5/14/1999
6/27/2019 Environmental Drawings BR-0044_Hyd_prr_wet_Ste 1_Pnd 2.A.1_Phases.dgn

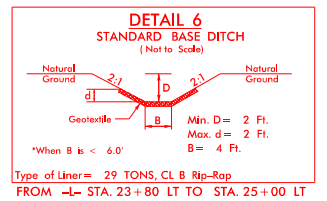
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PERMIT DRAWING SHEET 05 OF 15 Revised 11/18/2019

PROJECT REFERENCE NO. BR-0044	SHEET NO. 5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
Prepared in the Office of: AECOM	
NC FIRM LICENSE No. F-0342 701 Corporate Center Drive, Suite 475 Raleigh, NC 27607 (919) 854-6200 • (919) 854-6259 FAX	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

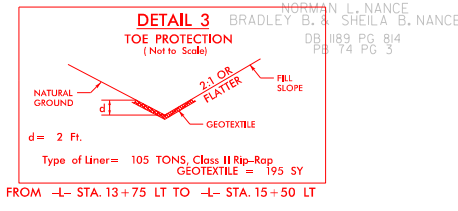
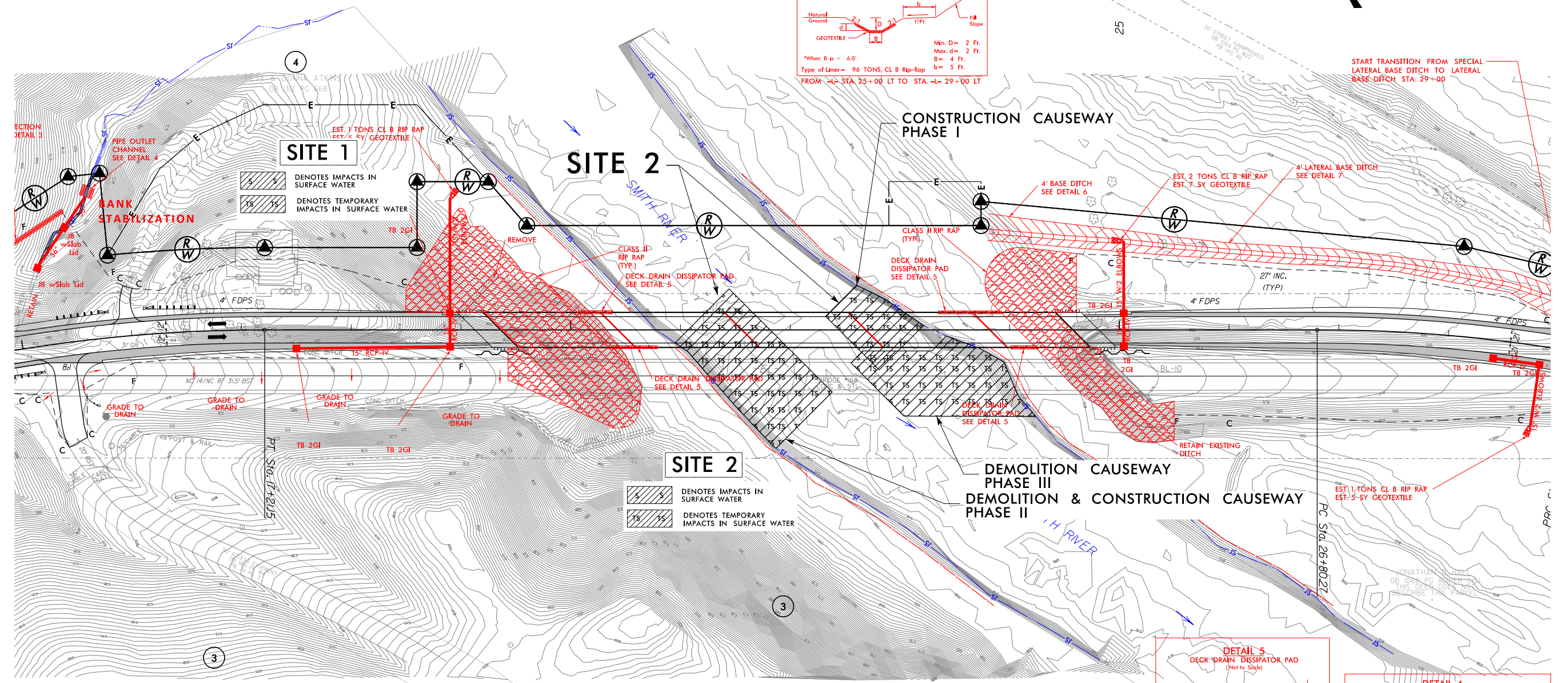
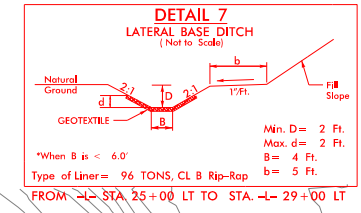
-L-

PI Sta 16+00.61 Δ = 9° 53' 29.9" (RT) D = 4' 05" 33.2" L = 241.70' T = 121.15' R = 1,400.00' e = 0.06 FT/FT R.O. = 162.00'	PI Sta 28+02.44 Δ = 9° 58' 27.2" (RT) D = 4' 05" 33.2" L = 243.72' T = 122.17' R = 1,400.00' e = 0.06 FT/FT R.O. = 162.00'
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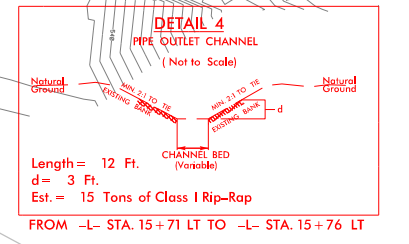
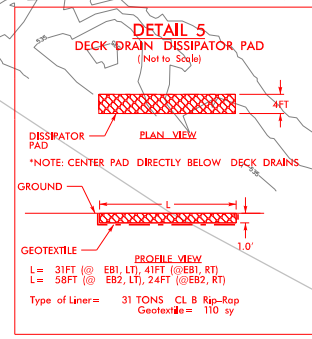
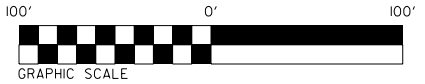


5
JONATHAN D. HALL
DB 1068 PG 16(PER GIS)
THIS DEED DOES NOT
DESCRIBE THIS PARCEL

6
GREATLAND RETRIEVERS, LLC
DB 1523 PG 2994



***NOTE: CAUSEWAY WILL ONLY BLOCK 1/2 OF THE STREAM PER PHASE**

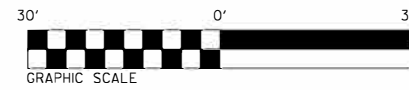


REVISIONS

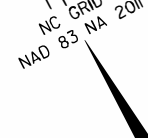
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PERMIT DRAWING
SHEET 06 OF 15

Revised 11/18/2019



DB 1312 PG 668



PROJECT REFERENCE NO. BR-0044	SHEET NO. 5
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
<small>Prepared in the Office of:</small> AECOM <small>NC FIRM LICENSE No. F-0342 10 Corporate Center Drive, Suite 475 1991 854-6200 • 1991 854-6298 FAX1</small>	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

TOE PROTECTION
SEE DETAIL 3

PIPE OUTLET CHANNEL
SEE DETAIL 4

EST. 1 TONS
EST. 5 SY C

SITE 1

BANK STABILIZATION



DENOTES IMPACTS IN SURFACE WATER



DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SITE 1

LINE - L - SHEET 5
SEE SHEET 5
STATION 15+00.00

JB w/Slab Lid
36" w/Slab Lid

TB 2GI

CONC DITCH 15" RCP-IV

NC 14/NC 87 31.5' BST

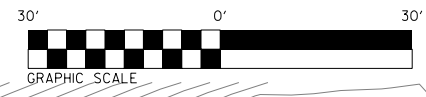
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REVISIONS

5/14/99

PERMIT DRAWING
SHEET 07 OF 15

Revised 11/18/2019



PROJECT REFERENCE NO. BR-0044	SHEET NO. 5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
<small>Prepared in the Office of:</small> AECOM <small>NC FIRM LICENSE No: F-0342 701 Corporate Center Drive, Suite 475 Raleigh, NC 27607 (919) 854-6200 • (919) 854-6259 FAX</small>	
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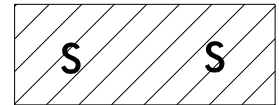
TOE PROTECTION
SEE DETAIL 3

PIPE OUTLET CHANNEL
SEE DETAIL 4

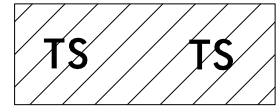
EST. 1 TONS
EST 5 SY C

SITE 1

BANK STABILIZATION



DENOTES IMPACTS IN SURFACE WATER



DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SITE 1

LINE - L-SHEET
SEE SHEET
STA 15+00.00

JB wSlab Lid
36" wSlab Lid

TB 2GI

4' FDPS

CONC DITCH 15" RCP-IV

NC 14/NC 8' 31.5' BS

6/27/2019
C:\Users\br-0044\Hyd-prm-wet-Site 1\room-contour-ST1.dgn

REVISIONS

PROJECT REFERENCE NO. BR-0044	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
<small>Prepared in the Office of:</small> AECOM	
<small>NC FIRM LICENSE No F-0342 701 Corporate Center Drive, Suite 415 Raleigh, NC 27607 (919) 854-6200 • (919) 854-6259 (FAX)</small>	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

***NOTE: CAUSEWAY WILL ONLY BLOCK 1/2 OF THE STREAM PER PHASE**

SMITH RIVER

R
W

SITE 2

CLASS II
RIP RAP
(TYP.)

DECK DRAIN DISSIPATOR PAD
SEE DETAIL 5

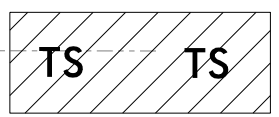
CLASS II RIP RAP
(TYP.)

DECK DRAIN
DISSIPATOR PAD
SEE DETAIL 5

DECK DRAIN DISSIPATOR PAD
SEE DETAIL 5

DECK DRAIN
DISSIPATOR PAD
SEE DETAIL 5

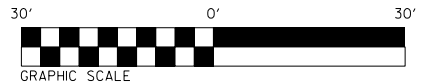
SITE 2



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER

BRIDGE #168
CONC & STL

CONSTRUCTION CAUSEWAY
PHASE I



PERMIT DRAWING
SHEET 08 OF 15
Revised 11/18/2019

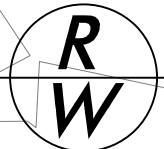
REVISIONS

6/27/2018 Drawings\BR-0044_Hyd-prm-wet_Site 2_zoom_ST1.dgn

PROJECT REFERENCE NO. BR-0044	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
<small>Prepared in the Office of:</small> AECOM	
<small>NC FIRM LICENSE No. F-0342 701 Corporate Center Drive, Suite 415 Raleigh, NC 27607 (919) 854-6200 • (919) 854-6259(FAX)</small>	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

***NOTE: CAUSEWAY WILL ONLY BLOCK 1/2 OF THE STREAM PER PHASE**

SMITH RIVER



SITE 2

CLASS II RIP RAP (TYP.)

DECK DRAIN DISSIPATOR PAD SEE DETAIL 5

CLASS II RIP RAP (TYP.)

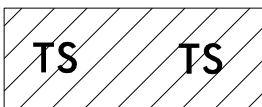
DECK DRAIN DISSIPATOR PAD SEE DETAIL 5

DECK DRAIN DISSIPATOR PAD SEE DETAIL 5

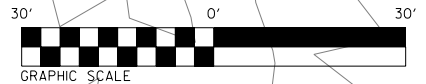
DECK DRAIN DISSIPATOR PAD SEE DETAIL 5

CONSTRUCTION CAUSEWAY PHASE I

SITE 2



TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER



PERMIT DRAWING SHEET 09 OF 15

Revised 11/18/2019

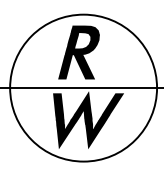
REVISIONS

6/27/2019 Environment\Drawings\BR-0044_Hyd.prm_wet.Site 2_room.contour_S11.dgn

PROJECT REFERENCE NO. BR-0044	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
<small>Prepared in the Office of:</small> AECOM	
<small>NC FIRM LICENSE No: F-0342 70 Corporate Center Dr., Suite 475 Raleigh, NC 27607 (919) 854-6200 • (919) 854-6259(FAX)</small>	
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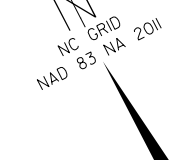
SMITH RIVER

*NOTE: CAUSEWAY WILL ONLY BLOCK 1/2 OF THE STREAM PER PHASE



SITE 2

CLASS II RIP RAP (TYP.)



CLASS II RIP RAP (TYP.)

DECK DRAIN DISSIPATOR PAD
SEE DETAIL 5

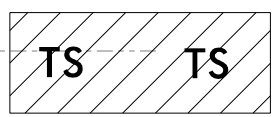
DECK DRAIN DISSIPATOR PAD
SEE DETAIL 5

DECK DRAIN DISSIPATOR PAD
SEE DETAIL 5

DECK DRAIN DISSIPATOR PAD
SEE DETAIL 5

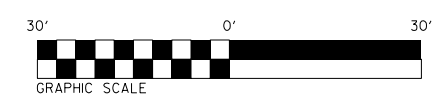
SITE 2

DEMOLITION & CONSTRUCTION CAUSEWAY
PHASE II



DENOTES TEMPORARY IMPACTS IN SURFACE WATER

BRIDGE #168
CONC & STL



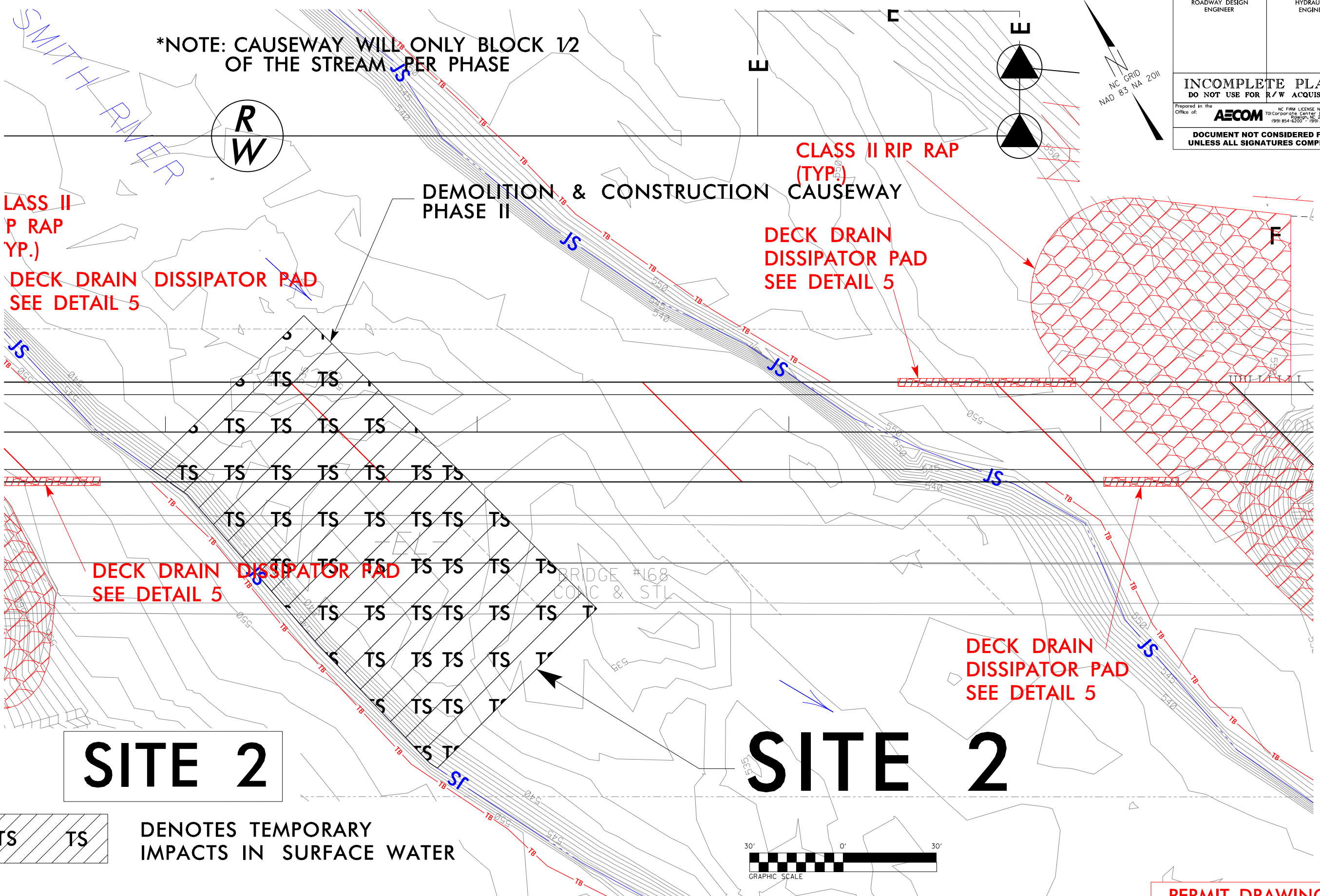
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SHEET 10 OF 15
Revised 11/18/2019

REVISIONS

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PROJECT REFERENCE NO. BR-0044	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
<small>Prepared in the Office of:</small> AECOM	
<small>NC FIRM LICENSE No. F-0342 701 Corporate Center Drive, Suite 415 Raleigh, NC 27607 (919) 854-6200 • (919) 854-6259 (Fax)</small>	
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***NOTE: CAUSEWAY WILL ONLY BLOCK 1/2 OF THE STREAM PER PHASE**



CLASS II RIP RAP (TYP.)

DECK DRAIN DISSIPATOR PAD SEE DETAIL 5

DEMOLITION & CONSTRUCTION CAUSEWAY PHASE II

CLASS II RIP RAP (TYP.)

DECK DRAIN DISSIPATOR PAD SEE DETAIL 5

DECK DRAIN DISSIPATOR PAD SEE DETAIL 5

DECK DRAIN DISSIPATOR PAD SEE DETAIL 5

SITE 2

SITE 2

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

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PROJECT REFERENCE NO. BR-0044	SHEET NO. 5
RW SHEET NO.	
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***NOTE: CAUSEWAY WILL ONLY BLOCK 1/2 OF THE STREAM PER PHASE**

SMITH RIVER

R
W

SITE 2

CLASS II
RIP RAP
(TYP.)

DECK DRAIN DISSIPATOR PAD
SEE DETAIL 5

CLASS II RIP RAP
(TYP.)

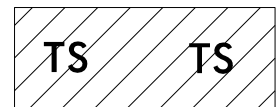
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DISSIPATOR PAD
SEE DETAIL 5

DECK DRAIN DISSIPATOR PAD
SEE DETAIL 5

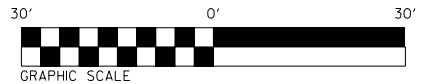
BRIDGE #168
CONC & STL

DEMOLITION CAUSEWAY
PHASE III

SITE 2



DENOTES TEMPORARY
IMPACTS IN SURFACE WATER



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SHEET 12 OF 15
Revised 11/18/2019

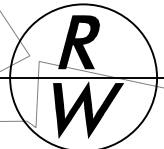
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***NOTE: CAUSEWAY WILL ONLY BLOCK 1/2 OF THE STREAM PER PHASE**

SMITH RIVER



SITE 2

CLASS II
P RAP
(TYP.)

DECK DRAIN DISSIPATOR PAD
SEE DETAIL 5

CLASS II RIP RAP
(TYP.)

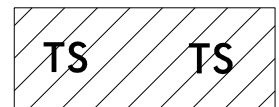
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DECK DRAIN DISSIPATOR PAD
SEE DETAIL 5

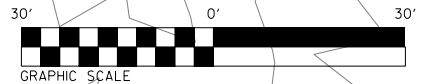
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CONC & STL

DEMOLITION CAUSEWAY
PHASE III

SITE 2



DENOTES TEMPORARY IMPACTS IN SURFACE WATER



**PERMIT DRAWING
SHEET 13 OF 15
Revised 11/18/2019**

REVISIONS

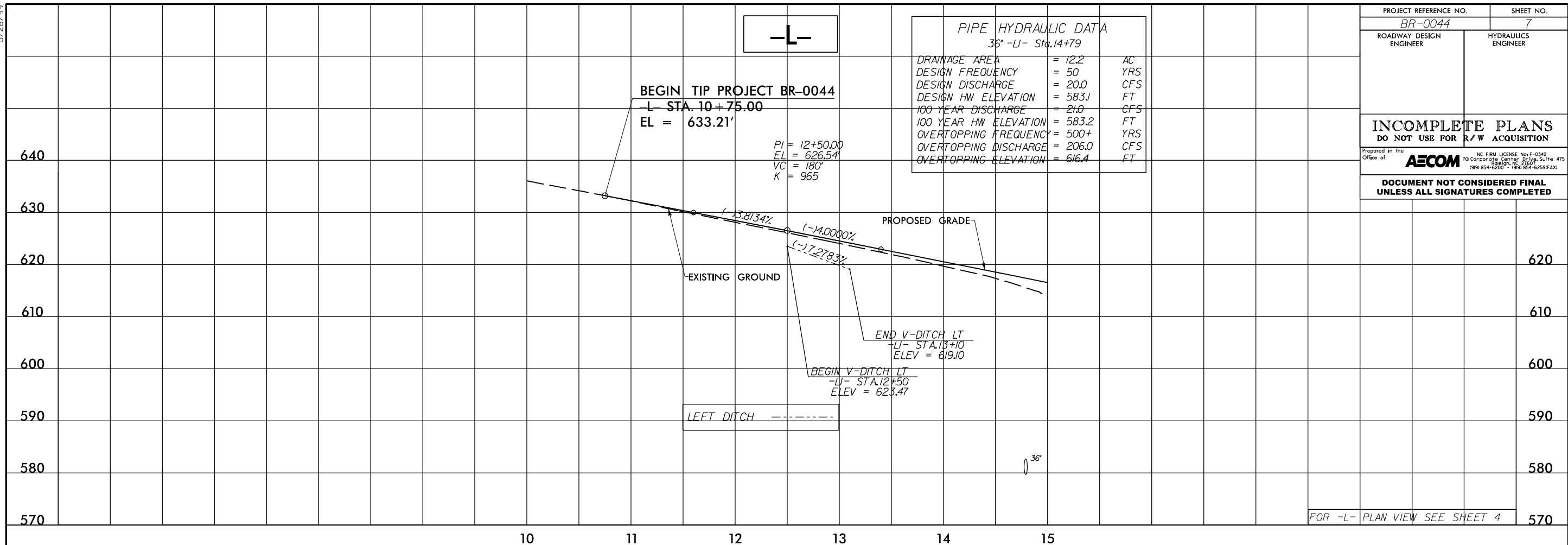
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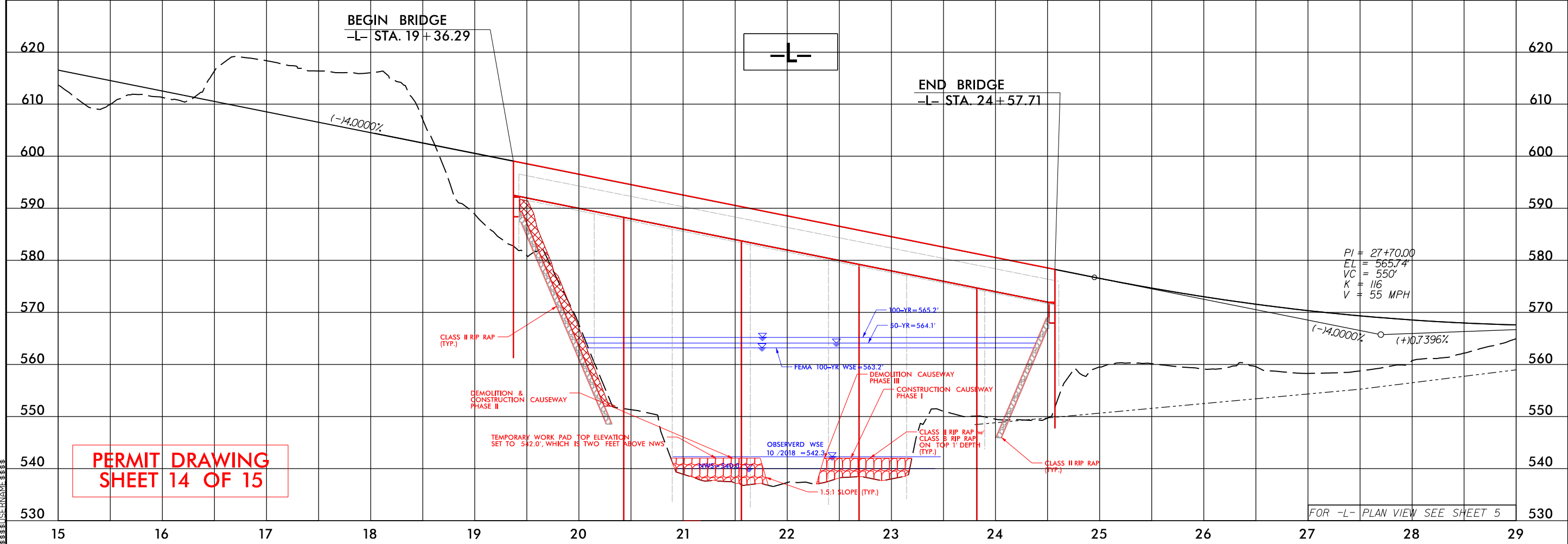
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PROJECT REFERENCE NO. BR-0044	SHEET NO. 7
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
<small>Prepared in the Office of:</small> AECOM	
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PIPE HYDRAULIC DATA	
36" -LI- Sta. 14+79	
DRAINAGE AREA	= 12.2 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 20.0 CFS
DESIGN HW ELEVATION	= 583.1 FT
100 YEAR DISCHARGE	= 21.0 CFS
100 YEAR HW ELEVATION	= 583.2 FT
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING DISCHARGE	= 206.0 CFS
OVERTOPPING ELEVATION	= 616.4 FT



FOR -L- PLAN VIEW SEE SHEET 4



PERMIT DRAWING
SHEET 14 OF 15

FOR -L- PLAN VIEW SEE SHEET 5

5/28/99

WETLAND AND SURFACE WATER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS						
			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)	Stabilization Channel Impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Stabilization (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L- 15+24 to 15+73	36" ALT Pipe						< 0.01		< 0.01	80		10	
1	-L- 15+73 to 15+80	Bank Stabilization							< 0.01			10		
2	-L- 20+93 to 24+00	Bridge (all phases)								0.47			280	
TOTALS*:								< 0.01	< 0.01	0.47	80	10	290	0

*Rounded totals are sum of actual impacts

NOTES:
Stream Temporary impacts due to causeways are the net total when all 3 phases are considered together.

Bridge Pier Permanent Impact Area (Not included in above quantities) = 118sf (Three 60" dia piers x 2 bents)

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
6/14/2019
ROCKINGHAM COUNTY
BR-0044
67044.1.1

Revised 11/18/2019



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

October 29, 2019

Mr. Pete Benjamin
Field Supervisor
US Fish and Wildlife Service
Post Office Box 33726
Raleigh, North Carolina 27636-3726

Subject: Section 7 Concurrence Request for the Proposed Bridge Replacement of Bridge No. 168 on NC 14/87 over the Smith River in Rockingham County, Division 7; TIP: BR-0044; WBS No. 67044.1.1.

REFERENCE: Biological Assessment for BR-0044, dated September 27, 2019 (attached).

Mr. Benjamin,

The purpose of this letter is to request concurrence from the U.S. Fish and Wildlife Service (USFWS) pursuant to Section 7 of the Endangered Species Act, as amended (16 U.S.C. 1531 et seq.) (ESA).

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge 168 on NC 14/87 over the Smith River in Rockingham County with a five span, 520 feet long bridge to the north of the current alignment with the existing bridge being utilized as an onsite detour during construction. This action will result in the following impacts: 80 linear feet of permanent stream impact, 10 linear feet of permanent impacts from bank stabilization, 0.47 acre of temporary impacts to surface waters for causeways for bridge construction/removal, and 10 linear feet temporary impacts for bank stabilization. The project is slated to Let in April 2020.

As of June 27, 2019, the USFWS lists three (3) federally protected species for Rockingham County

Common Name	Scientific Name	Status	Habitat Presence	Biological Conclusion
Roanoke logperch	<i>Percina rex</i>	E	Yes	MANLTAA
Smooth coneflower	<i>Echinacea laevigata</i>	E	Yes	No Effect
James spiny mussel	<i>Parvaspina collina</i>	E	Yes	MANLTAA**

**MAY AFFECT, NOT LIKELY TO ADVERSELY AFFECT
E-Endangered

Roanoke logperch - The Roanoke logperch has been documented in in the past from the Smith River above the Martinsville Dam in Virginia (Roberts et al 2013), upstream from the project location, and from the Smith River in North Carolina slightly over one stream mile downstream of the project location. However,

due to the highly regulated flow conditions within the Smith River in the Action Area as outlined in Section 3.0 of the attached assessment, and the isolation of the Action Area from downstream populations by a dam, it is not reasonably certain that the species occurs within the Action Area. Given that the species is not reasonably certain to occur within the Action Area combined with the implementation of the conservation measures outlined in Section 4.2, potential project related effects to the Roanoke logperch will be discountable.

BIOLOGICAL CONCLUSION: MAY AFFECT, NOT LIKELY TO ADVERSELY AFFECT

Smooth coneflower A visual survey conducted for smooth oneflower on June 6, 2018 did not observe the species in the project study area. A review of the NCNHP records on April 16, 2018 indicated no known occurrences within 1.0 miles of the Action Area. Completion of this project will not affect Smooth Coneflower.

BIOLOGICAL CONCLUSION: NO EFFECT

James spinymussel – A mussel survey on November 14, 2001 indicated that instream habitat for the species was present in the project Action Area. However, no evidence of any species of freshwater mussels was observed. In addition, the highly variable and controlled flow pattern of the Smith River through the project creates an inhospitable (as detailed in Section 3.0) setting for native mussel species. Although the presence of the species in the Action Area cannot be completely ruled out, the distances to current, known records for the species and the highly variable flow conditions in the Smith River within the Action Area, suggest the likelihood of the species presence in the Action Area is very low, and therefore the potential effects to the species are discountable.

BIOLOGICAL CONCLUSION: MAY AFFECT, NOT LIKELY TO ADVERSELY AFFECT

No Proposed Project Commitments

Based on the information presented and, in the attachments, NCDOT believes that the requirements of Section 7(a)(2) of the ESA have been satisfied and hereby request your concurrence. If you have any questions, please contact Jeff Hemphill at jhemphill@ncdot.gov.

Sincerely,


for Philip S. Harris III, P.E., C.P.M.

Environmental Analysis Unit Head
North Carolina Department of Transportation

Enclosures: Biological Assessment for BR-0044, dated September 27, 2019

Cc: Gary Jordan, USFWS
Marissa Cox, NCDOT BSG-EAU
David Bailey, USACOE
Kevin Fischer, NCDOT Structures
File: BR-0044

Biological Assessment
For
Replacement of Bridge No. 168 on NC 14/87
Over the Smith River
Rockingham County, North Carolina
TIP number BR-0044
WBS Element # 67044.1.1

Prepared For:



NC Department of Transportation
Raleigh, North Carolina

Contact Person:

Matt Haney
Biological Surveys Group
North Carolina Department of Transportation
mmhaney@ncdot.gov
1598 Mail Service Center
Raleigh NC 27699-1598

September 27, 2019

Prepared by:



900 Ridgefield Drive, Suite 350
Raleigh, NC 27609

Contact Person:

Neil Medlin
Manager, Natural Resources
nmedlin@rkk.com
919-878-9560

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Appendix A. Figures:

Figure 1: Project Vicinity & Survey Locations

Figure 2: Smith River CFS

Figure 3: Smith River 2-Month CFS

Figure 4: NPDES Dischargers and 303(d) Listed Streams

Figure 5: NCNHP Element Occurrences

Appendix B. Design Plans

Appendix C. Detailed Species Information

1.0 Project Overview

1.1 Federal Nexus

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 168 on NC 14/87 over the Smith River in Rockingham County (Appendix A, Figure 1). This project is funded by the state of North Carolina and will require a United States Army Corps of Engineers (USACE) permit. USACE will serve as the lead federal agency. NCDOT derives their statutory authority via North Carolina General Statutes (NCGS) 143B – 345 and 346. USACE derives their statutory authority via Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403) and Section 404 of the Clean Water Act (33 USC 1344).

1.2 Project Description

The action proposed by NCDOT is to replace Bridge No. 168 on NC 14/87 over the Smith River. The bridge has a general northwest to southeast orientation. The action includes all activities required for the bridge replacement project. Demolition of the existing bridge, construction of the new bridge, approach work, etc. are described later in Section 4.1.

1.3 Project Area and Setting

This project is located in the EPA Piedmont Ecoregion in central North Carolina. The project area is generally rural and is located adjacent to the north side of the town of Eden. The Smith River flows approximately 44 miles through Virginia and North Carolina. It begins in Henry County, Virginia at Philpott Lake and crosses into Rockingham County in North Carolina. It eventually ends at its confluence with the Dan River near the town of Eden. The proposed bridge replacement project on the Smith River is located in the Roanoke River Basin (HUC# 03010103). From the project area, the Smith River flows approximately 4 river miles to the Dan River.

1.4 Project Action Area

The project Action Area is defined as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action [50 CFR §402.02]. The Action Area for this project includes not only the footprint of the fill in waters of the U.S., but also those areas of the waters downstream of the proposed fill that might reasonably be affected by the placement of that fill, as well as those segments of the proposed road whose alignment is dictated by the proposed fill, and those segments of the road that would have no independent utility apart from the proposed fill. As such, the ESA Action Area for this project is within the footprint of the regulated activities in the delineated waters, in uplands immediately adjacent to those waters that would be affected due to the authorized work in waters of the U.S., in waters downstream that would be expected to be affected by the proposed activities in waters of the U.S. and the uplands noted above.

For this bridge replacement, the limits of the effects are considered to include the limits of construction of the approaches (approximately 862 feet from the northwest end of the bridge and

approximately 848 feet from the southeast end of the bridge), and any areas receiving the runoff from the construction activity including the Smith River extending 400 m (1,314 ft.) downstream and 100 m (328 ft.) upstream of the structure. The stream bank stabilization activities would be included within this stream segment.

1.5 Consultation History

The preparation of this Biological Assessment is the beginning the of the consultation for this project.

2.0 Federally Proposed and Listed Species and Designated Critical Habitat

As of August 30, 2019, the U.S. Fish and Wildlife Service (USFWS) indicated three federally listed species for Rockingham County (Table 1). No proposed species were noted for Rockingham County.

Table 1. Federally Listed Species for Rockingham County, North Carolina

Common Name	Scientific Name	Status
Roanoke Logperch	<i>Percina rex</i>	Endangered
James Spiny mussel	<i>Parvaspina collina</i>	Endangered
Smooth Coneflower	<i>Echinacea laevigata</i>	Endangered

The primary focus of this Biological Assessment is on the Roanoke Logperch and James Spiny mussel. The Smooth Coneflower is not discussed further until Section 6.0.

No Critical Habitat has been designated for any of these species.

3.0 Environmental Baseline

The Smith River at the project site is a highly regulated stream with extreme ranges in flows (Figures 2 and 3). Philpott dam was constructed on the Smith River in 1953 and is used to control flooding and provide peak power generation. Fluctuating releases generated by Philpott dam have substantially altered the downstream ecosystem, impacts include highly modified flows, coldwater thermal regime, modified or altered aquatic community, and reduced productivity (Orth 2004). In addition to the Martinsville and Philpott dams above the reach of the river where the project is located, the project reach itself is above another dam separating it from the lower portions of the Smith River as well as the Dan River.

There are no NPDES permitted dischargers in North Carolina at locations that could affect water quality at the project site (Figure 4). Dischargers downstream on the Dan River could potentially affect the Dan River downstream of the confluence with the Smith River, potentially affecting aquatic species recruitment to the lower Smith River. There are no permitted dischargers in Virginia within 7 stream miles of the project location.

The Smith River in the project area is on the North Carolina Department of Environmental Quality (NCDEQ) - Division of Water Resources 2018 303(d) list of impaired streams (Figure 4). The stream is on the list for exceeding the criteria for a Fair benthic macroinvertebrate rating.

A review of NC Natural Heritage Program (NCNHP) records, last accessed August 30, 2019, indicated there is an element occurrence (EO) for one of the target species within a 5-mile buffer of the project bridge (Figure 5). This occurrence is for the Roanoke Logperch (EO ID 25404) and begins approximately 1.3 stream miles downstream from Bridge No. 168. This occurrence was first observed on July 24, 2007 and last observed on July 28, 2016. The closest occurrence for the James Spiny mussel (EO ID 37056) approximately 9 stream miles downstream from the project bridge, is on the Dan River. The only observation date for this EO was November 18, 2016. There is no recent survey information for either of these species within the project reach of the Smith River. This is largely due to the flow ranges referenced above being unpredictable and presenting significant challenges to safely accessing the river to conduct effective aquatic surveys.

Although the Roanoke Logperch has not been documented from the project reach, the species has been documented above and below the project location. The species was first detected in the Smith River in North Carolina in September 2007. A genetics study of the species indicated that the Smith River population, including those individuals from above and below the project reach, was genetically similar (Roberts et al 2013). This suggests the source of the first Roanoke Logperch individuals collected in North Carolina was likely to have been the Smith River. For this to be the case, the species would have to have passed through the project reach as larvae or adults sometime in the past. However, in the Smith River in Virginia, the Roanoke Logperch population downstream of Philpot dam has been considered limited due to cold summer temperatures, fluctuating flows during spawning, and excessive silt and sand in pool habitats (Orth 2004). In addition, Roanoke Logperch populations have been estimated to be more robust when flows are moderate and constant, not highly variable discharges which are presumed to displace or kill individuals (Anderson et al 2013). Although the presence of Roanoke Logperch at the project location at any given time cannot be ruled out, it is not reasonably certain that the species occurs within the Action Area given the highly regulated conditions.

No mussels have been collected within the project reach. A survey on November 14, 2001 at the project location reported no mussels detected.

4.0 Project Details

4.1 Construction

Bridge No. 168 is currently a 525-foot long structure, with a reinforced concrete deck on steel beams, and a reinforced concrete substructure. The bridge has 7, 75-foot spans, with 4 bents in the Smith River channel. NCDOT Bridge Management Unit records indicate Bridge No. 168 has a sufficiency rating of 69.08 out of a possible 100 for a new structure. The bridge was constructed in 1966 and is considered structurally deficient according to the latest NCDOT bridge inspection report. Existing interior bents catch large amounts of debris, including logs, during significant rain events.

The current bridge will remain in place to carry traffic until the new bridge is constructed. When the new bridge is complete, traffic will be shifted onto it and the old bridge will be taken down. The superstructure of the current bridge will be removed by cutting it up and lifting out the pieces by crane. The substructure will be cut and removed by crane. The current bridge has 4 bents in the Smith River channel. Bridge removal work will progress from a causeway. Demolition will occur after construction of the new bridge is complete. Rock causeways will be used during demolition. It is anticipated these causeways will be in place for two months since there are three bents that will need to be removed using the causeways to position the equipment. The fourth bent in the Smith River channel should be able to be removed from land. Partial removal of rip rap associated with the current bridge may be needed.

The new bridge will have 5 spans, with 1 at 105 feet, 3 at 115 feet, and 1 at 85 feet. This arrangement calls for 2 bents to be placed in the waters of the Smith River. Causeways are anticipated to be installed for 6 weeks for each bent that is in the water during construction. This timeframe includes construction of the causeways. Causeways will be installed to block no more than 50 % of the channel. Rip rap will be used along both banks for stabilization. Earthwork will be required at each end of the bridge to achieve the desired road grade. This work will generally consist of excavation at the northwest end of the bridge and fill at the southeast end. The 100-year Water Surface Elevation will be approximately 18 feet above the causeway.

The staging area for equipment and materials used during project construction will likely be in the northeast quadrant of the Action Area.

4.2 Conservation Measures

The conservation measures outlined below will be incorporated into the design and construction of this structure. These measures will help to avoid and minimize effects to the Smith River and the Roanoke Logperch and James Spiny mussel.

NCDOT will adhere to Design Standards in Sensitive Watersheds described in 15A NCAC 04B.0124.

Special procedures will also be used for clearing and grubbing, grading operations, seeding and mulching, and staged seeding within the project.

- **Clearing and Grubbing**
In areas identified as Environmentally Sensitive Areas, the Contractor may perform clearing operations, but not grubbing operations until immediately prior to beginning grading operations as described in Article 200-1 of the Standard Specifications. Only clearing operations (not grubbing) shall be allowed in this buffer zone until immediately prior to beginning grading operations. Erosion control devices shall be installed immediately following the clearing operation.

- **Grading**
Once grading operations begin in identified Environmentally Sensitive Areas, work shall progress in a continuous manner until complete. All construction within these areas shall progress in a continuous manner such that each phase is complete and areas are permanently stabilized prior to beginning of next phase. Failure on the part of the contractor to complete any phase of construction in a continuous manner in Environmentally Sensitive Areas will be just cause for the Engineer to direct the suspension of work in accordance with Article 108-7 of the Standard Specifications.
- **Seeding and Mulching**
Seeding and mulching shall be performed in accordance with Section 1660 of the Standard Specifications and vegetative cover sufficient to restrain erosion shall be installed immediately following grade establishment. Seeding and mulching shall be performed on the areas disturbed by construction immediately following final grade establishment. No appreciable time shall lapse into the contract time without stabilization of slopes, ditches and other areas within the Environmentally Sensitive Areas.
- **Stage Seeding**
The work covered by this section shall consist of the establishment of a vegetative cover on cut and fill slopes as grading progresses. Seeding and mulching shall be done in stages on cut and fill slopes that are greater than 20 feet in height measured along the slope, or greater than 2 acres in area. Each stage shall not exceed the limits stated above.

All applicable practices from the following documents will be used during project design and construction: Erosion and Sediment Control Design and Construction Manual (NCDOT 2015); Stormwater Best Management Practices Toolbox (NCDOT 2014); and Best Management Practices for Construction and Maintenance Activities (NCDOT 2003).

No direct discharge of deck drains over water will be allowed. Discharge from the deck drains will be directed to dissipator pads located between the toe of the rip rap stabilization and the water's edge.

Project design calls for a reduction in the number of bents within the Smith River channel to be reduced from 4 to 2 bents.

5.0 Effects Analysis

Project-related threats to the Roanoke Logperch and James Spiny mussel can be separated into direct, indirect, and cumulative effects. Direct effects refer to consequences that are directly attributed to the construction of the project, such as land clearing, stream channelization, and erosion. Indirect effects are those effects that are caused by, or will result from, the proposed action and are later in time, but are still reasonably certain to occur. Cumulative effects are those effects of future State or private activities, not involving federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation [50 CFR

§402.02]. Potential direct, indirect, and cumulative effects to the Roanoke Logperch and James Spiny mussel which may result from the project are discussed here.

Project construction such as bridge replacement can also result in beneficial species effects. Removal of existing instream bents and concrete slope protection can stabilize and improve habitats that were previously unsuitable.

5.1 Direct Effects

While instream surveys have not documented the presence of Roanoke Logperch or James Spiny mussels at the project location, their presence at the project site cannot be ruled out. Direct effects on the Roanoke Logperch may be caused by increased sedimentation due to erosion during and immediately after construction. Increased sedimentation can affect the species by clogging gills, interfering with feeding, and burying eggs. However, implementation of the conservation measures outlined in Section 4.2 will significantly decrease the potential for sedimentation and its potential effects on the Roanoke Logperch. Proper installation and maintenance of the erosion control measures will reduce the potential sedimentation effects to an insignificant level.

The placement of rock causeways in the Smith River and the placement of rip rap along the stream banks for bank stabilization has the potential to crush Roanoke Logperch individuals, crush eggs of the species, and bury prey items such as aquatic insects. Due to the high mobility of individuals, the potential for an individual Roanoke Logperch to be crushed by construction related activities is very low and therefore discountable.

The sources of potential direct effects on the James Spiny mussel are the same as those discussed above for the Roanoke Logperch. Increased sedimentation can clog mussel siphons and completely bury individuals if enough sediment accumulation occurs. Individual mussels lack the mobility of fish and are at greater risk of being crushed by the installation of rock causeways or rip rap if they are present at the time of these activities. In addition to the potential direct effects on the mussels themselves, the increased sedimentation and rock placement may have an effect on the host fish of James Spiny mussel in the same manner as described for the Roanoke Logperch. Based on stream flow conditions, a 2001 mussel survey, and distances to known James Spiny mussel records, the potential for this species to be present in the project construction area is very low. Therefore, the likelihood of any direct effect on the James Spiny mussel is discountable.

5.2 Indirect Effects

Indirect effects of the bridge replacement are likely to be minor and temporary. Flow patterns may be altered during construction and could cause a change in erosion and sedimentation levels in the Smith River. However, given the already highly regulated flow conditions in the Action Area, any minor alterations in flow patterns would be insignificant.

The reduction of the number of bridge bents currently in the Smith River will have a long-term beneficial effect on the Roanoke Logperch and James Spiny mussel. By reducing the number of

bents in the stream, the potential for the bridge to collect debris is reduced. Debris accumulation can cause disruptions in flow patterns which have the potential to redirect flow onto stream banks resulting in bank erosion and increased sedimentation. The size and amount of debris accumulation may necessitate the use of heavy equipment to remove it and depending on where the equipment is operated from, there is potential for erosion and runoff from the equipment location. Decreasing debris accumulation reduces the need for and the frequency of such removal activities.

5.3 Cumulative Effects

NCDOT is not aware of any other projects planned in the action area. There should be no cumulative effects of this project.

6.0 Effect Determinations

6.1 Effect Determination for Listed Species

6.1.1 No Effect Determinations for Listed Species

A visual survey conducted for Smooth Coneflower on June 6, 2018 did not detect the species in the project Action Area. A review of the NCNHP records on April 16, 2018 indicated no known occurrences within 1.0 miles of the Action Area. Completion of this project will not affect Smooth Coneflower.

6.1.2 May Affect; Not Likely to Adversely Affect Determinations for Listed Species

Records for the James Spiny mussel in North Carolina exist from the Smith River approximately 9 stream miles downstream of the Action Area in the Dan River. A mussel survey on November 14, 2001 indicated that instream habitat for the species was present in the project Action Area. However, no evidence of any species of freshwater mussels was observed. In addition, the highly variable and controlled flow pattern of the Smith River through the Action Area creates an inhospitable (as detailed in Section 3.0) setting for native mussel species. Although the presence of the species in the Action Area cannot be completely ruled out, the distances to current, known records for the species and the highly variable flow conditions in the Smith River within the Action Area, suggest the likelihood of the species presence in the Action Area is very low, and therefore the potential effects to the species are discountable.

The Roanoke Logperch has been documented in the past from the Smith River above the Martinsville Dam in Virginia (Roberts et al 2013), upstream from the project location, and from the Smith River in North Carolina slightly over one stream mile downstream of the project location. However, due to the highly regulated flow conditions within the Smith River in the Action Area as outlined in Section 3.0 of this assessment, and the isolation of the Action Area from downstream populations by a dam, it is not reasonably certain that the species occurs within the Action Area. Given that the species is not reasonably certain to occur within the Action Area combined with the implementation of the conservation measures outlined in Section 4.2, potential project related effects to the Roanoke Logperch will be discountable.

6.2 Effect Determination for Critical Habitat

The project location is not within Critical Habitat for the Roanoke Logperch, James Spiny mussel, or Smooth Coneflower. Therefore, Critical Habitat will not be affected by completion of the proposed project.

7.0 References

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- Orth, Donald. 2004. Influences of Fluctuating Releases on Stream Fishes and Habitat in the Smith River, below Philpott Dam. Final Report. Virginia Department of Game and Inland Fisheries, Richmond, VA.
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Appendix A

Figures



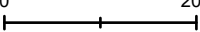


USGS 7.5 Minute Quadrangle, NORTHWEST EDEN, NC

14

Smith River

87

Prepared By: 	Prepared For: 	BRIDGE # 168 ON NC14, NC 87 OVER SMITH RIVER BR-0044 ROCKINGHAM COUNTY	Date: September 2019		Figure 1
			Scale 0 200 Feet 		
Job No. BR-0044					
Drawn by: GSM	KNM				

USGS 02074000 SMITH RIVER AT EDEN, NC

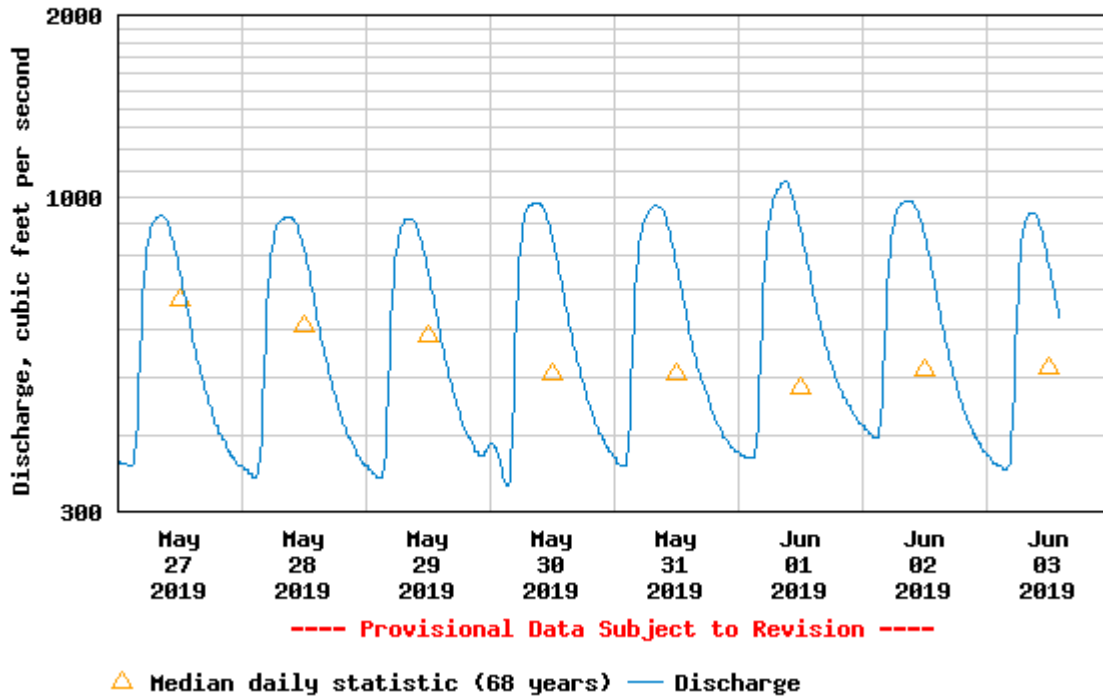


Figure 2

USGS 02074000 SMITH RIVER AT EDEN, NC

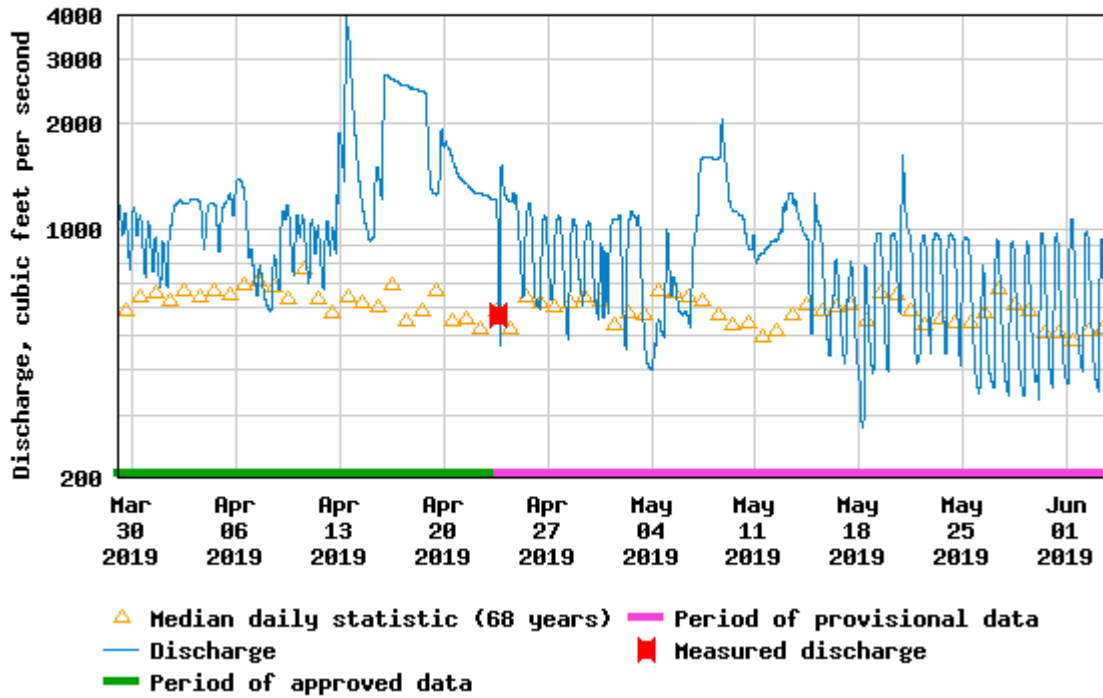
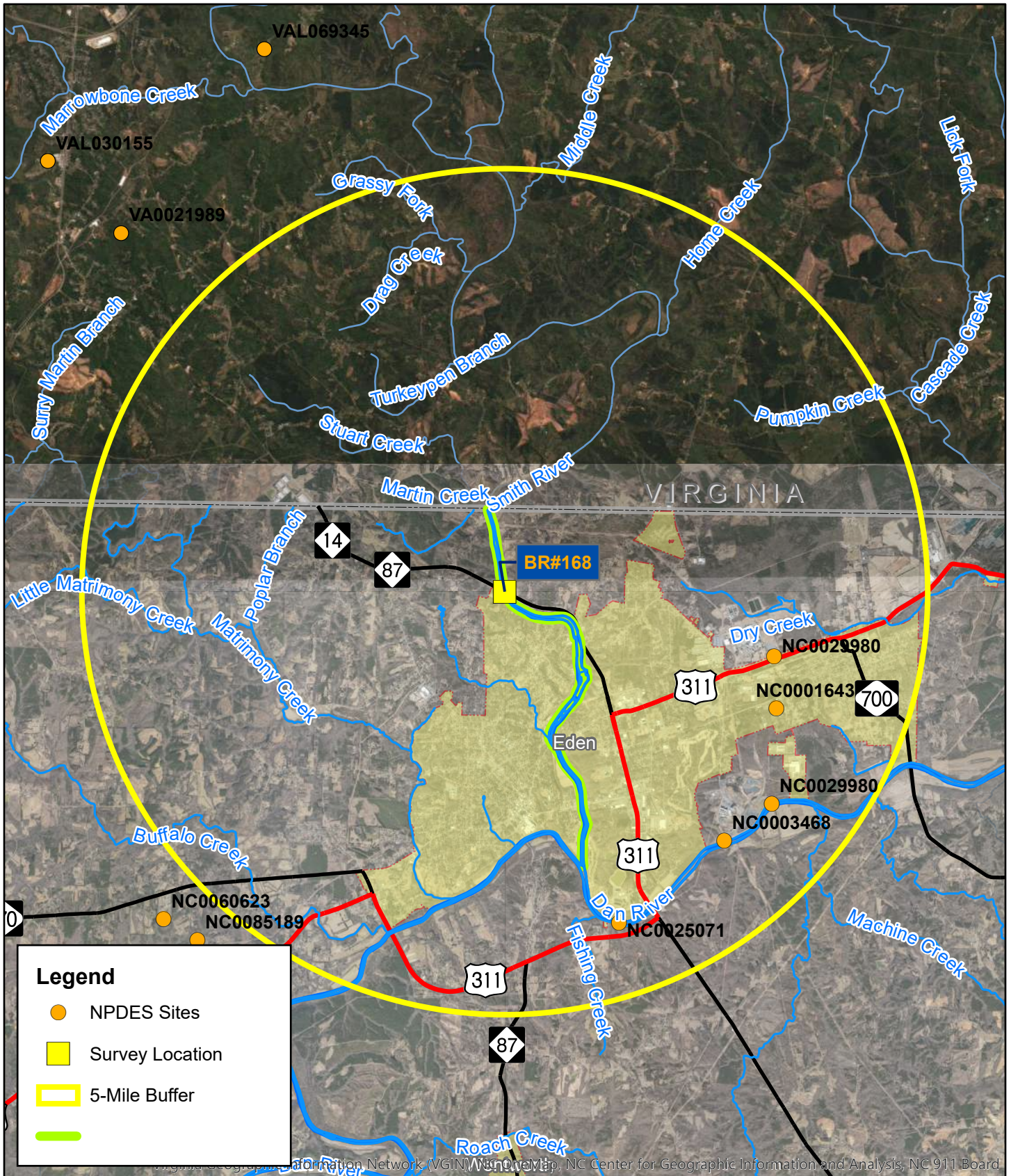


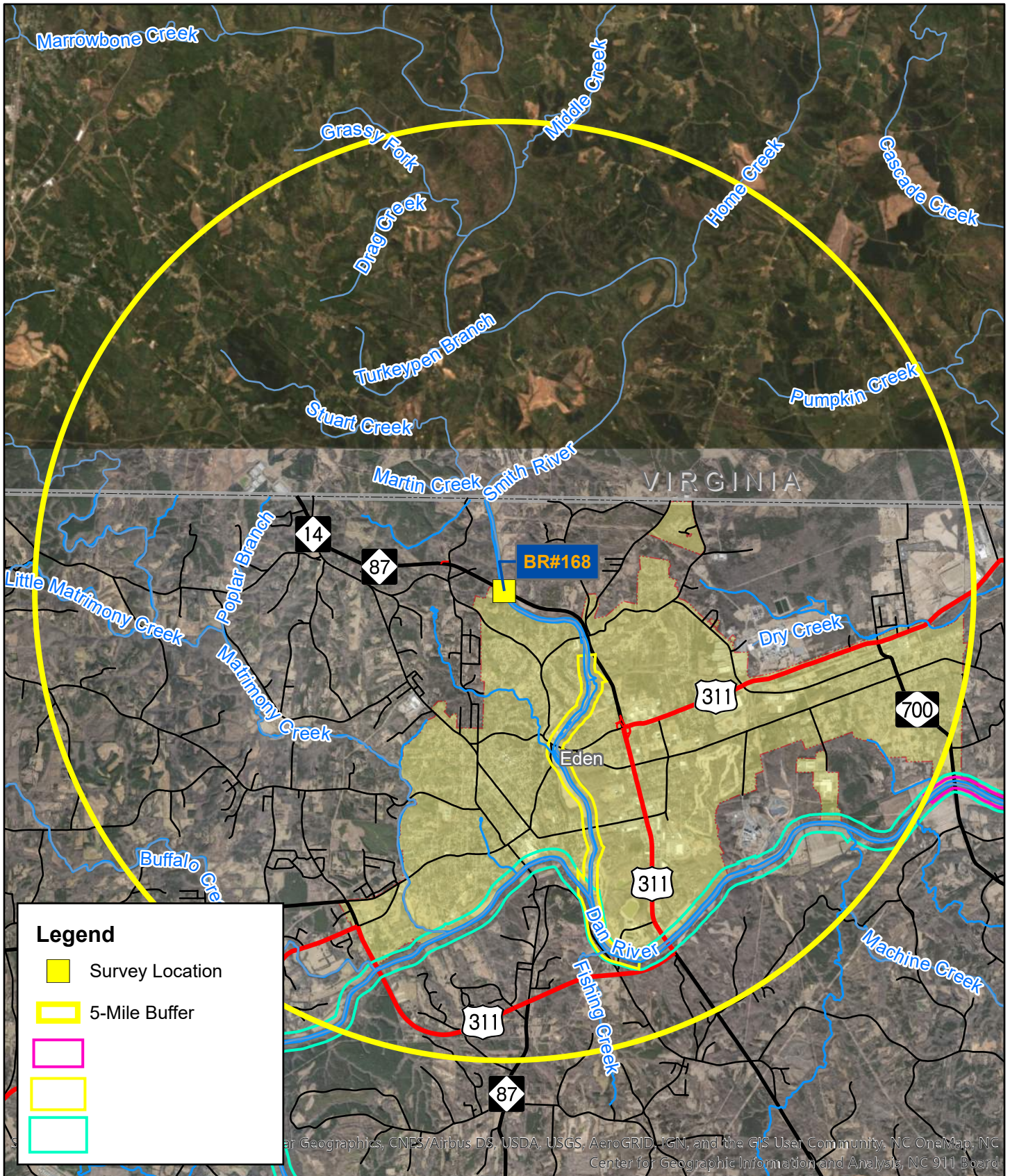


Figure 3



Original Geospatial Information Network (VGIN) Map. NC Center for Geographic Information and Analysis, NC911 Board

Prepared By: 	Prepared For: 	NPDES Dischargers and 303(d) Listed Streams BRIDGE # 168 ON NC14, NC 87 OVER SMITH RIVER BR-0044 ROCKINGHAM COUNTY		Date: September 2019	Figure 4
				Scale: 0 1 Miles	
				Job No. BR-0044	
		Drawn by: GSM	KNM		



Prepared By:


Prepared For:


NC NHP
Element Occurrence
 BRIDGE # 168 ON NC14, NC 87
 OVER SMITH RIVER
 BR-0044
 ROCKINGHAM COUNTY

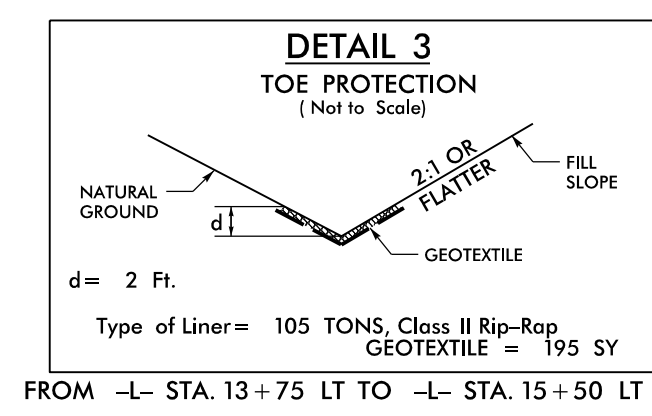
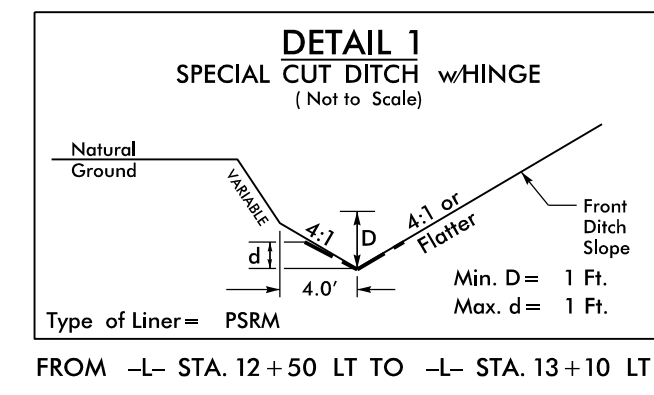
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Figure
5

Appendix B

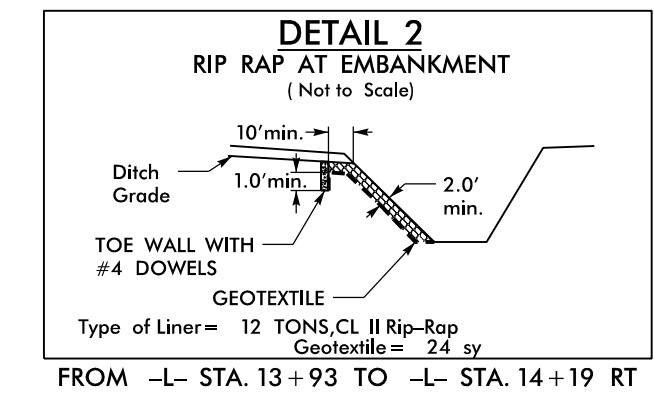
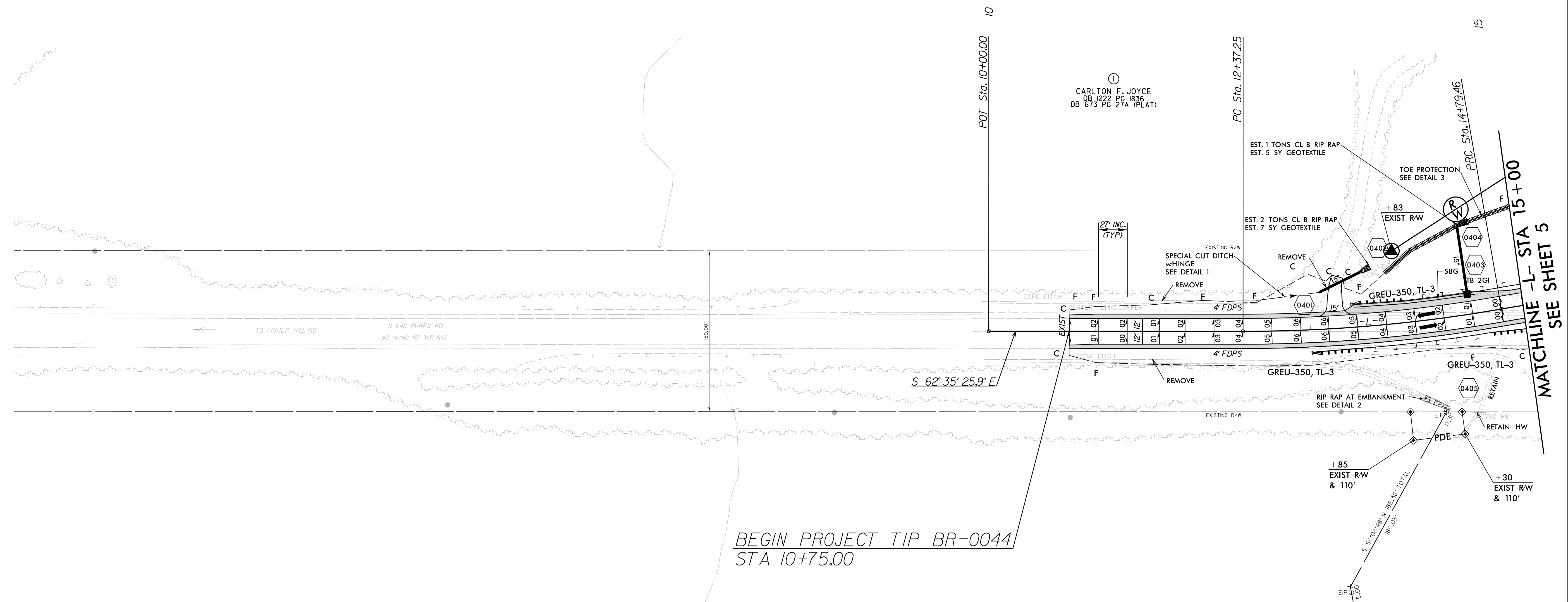
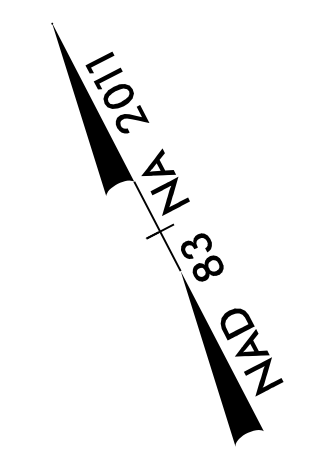
Design Plans

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Prepared in the Office of: AECOM	
<small>NC FIRM LICENSE No. F-0342 701 Corporate Center Bldg., Suite 415 Raleigh, NC 27607 (919) 854-6200 • (919) 854-6259(FAX)</small>	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



-L-

<i>PI Sta 13+58.66</i>	<i>PI Sta 16+00.61</i>
$\Delta = 9^{\circ} 54' 44.5''$ (LT)	$\Delta = 9^{\circ} 53' 29.9''$ (RT)
$D = 4' 05' 33.2''$	$D = 4' 05' 33.2''$
$L = 242.20'$	$L = 241.70'$
$T = 121.41'$	$T = 121.15'$
$R = 1,400.00'$	$R = 1,400.00'$
$e = 0.06$ FT/FT	$e = 0.06$ FT/FT
$R.O. = 162.00'$	$R.O. = 162.00'$



FOR -L- PROFILE SEE SHEET 7

Appendix B: Plan Sheet 1

RALPH CARLYLE BAILEY, SR ET AL
DB 1392 PG 1409

NORMAN L. NANCE
BRADLEY B. & SHEILA B. NANCE
DB 1189 PG 814
PB 74 PG 3

REVISIONS

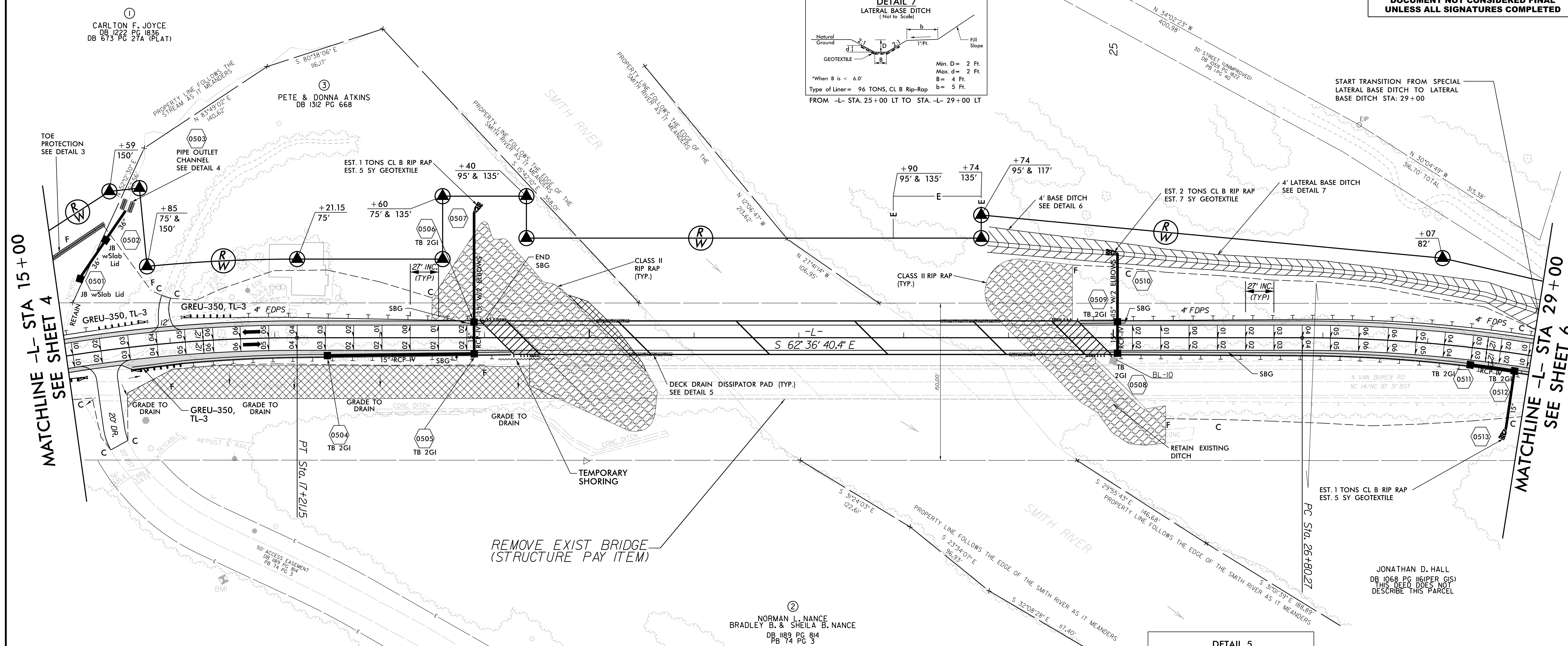
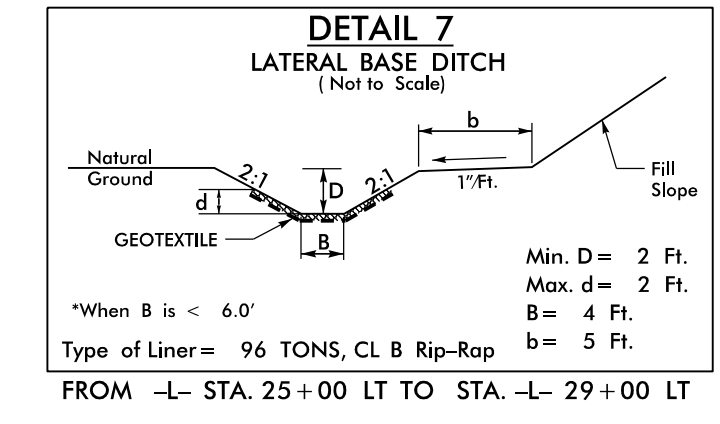
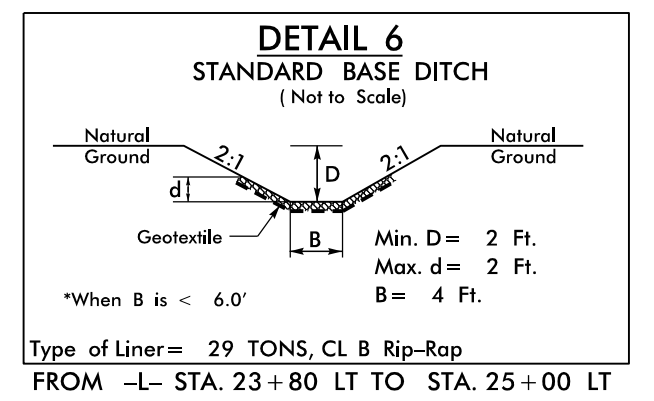
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Appendix B: Plan Sheet 2

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Prepared in the Office of: AECOM NC FIRM LICENSE No. F-0342 701 Corporate Center Bldg., Suite 415 Raleigh, NC 27607 (919) 854-6200 • (919) 854-6259 FAX	
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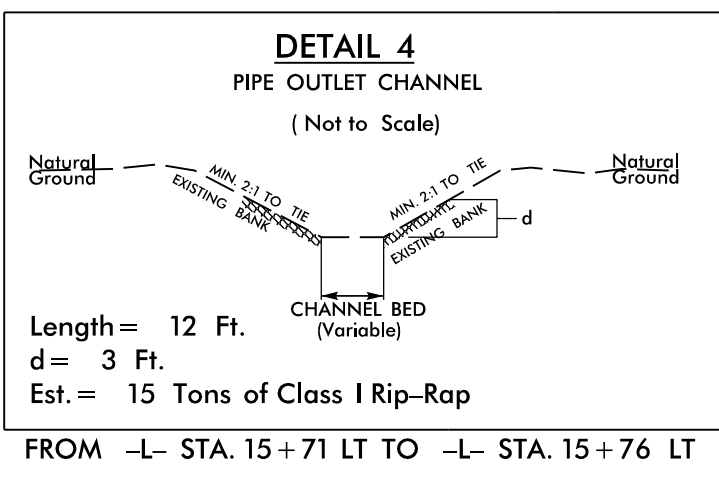
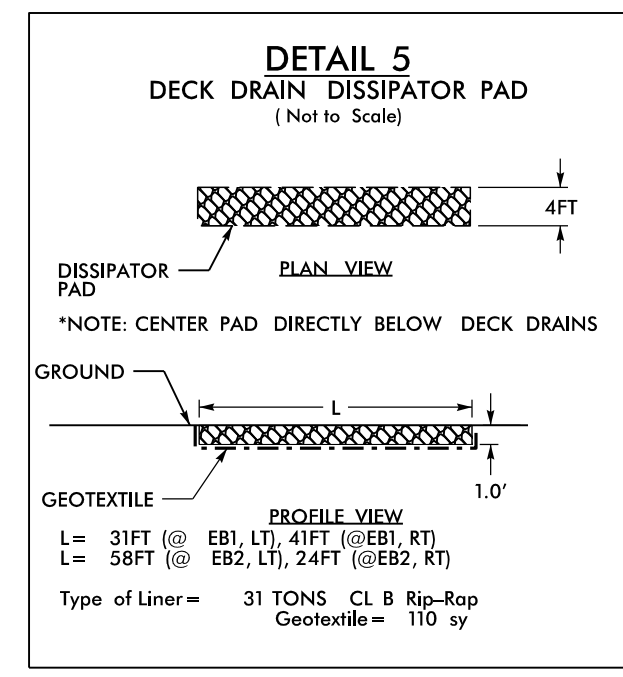
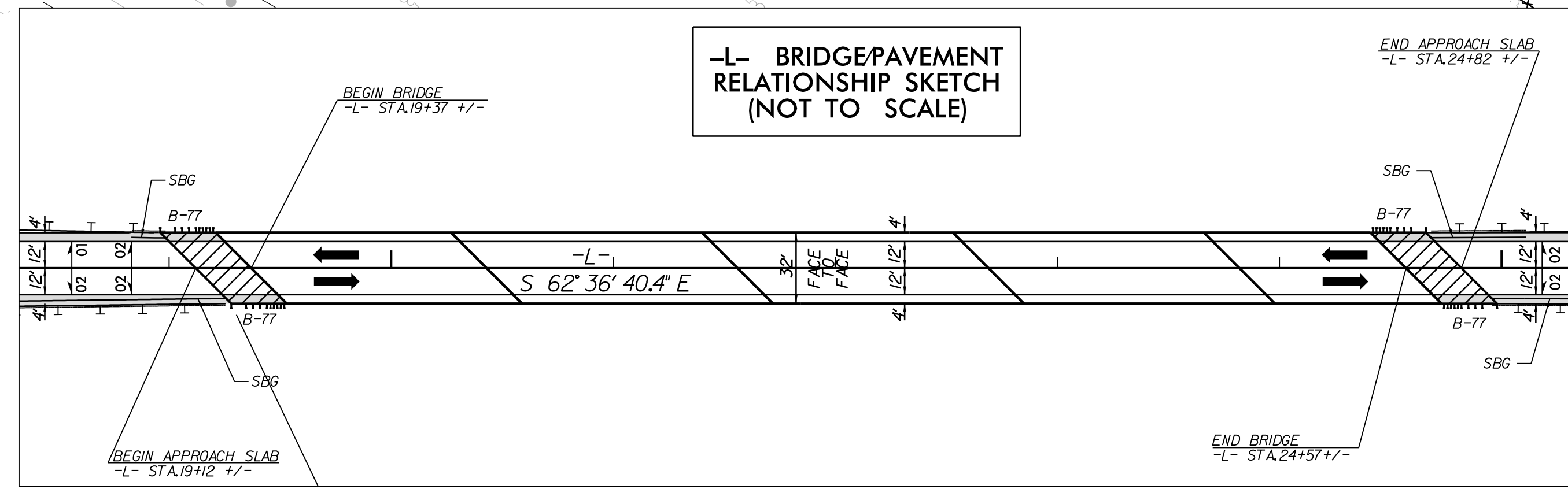
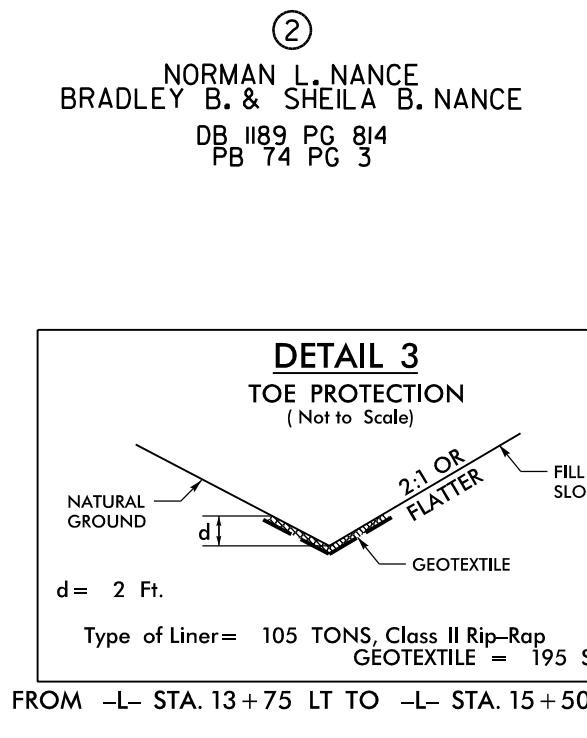
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SEE SHEET 4

MATCHLINE -L- STA 29+00
SEE SHEET 6



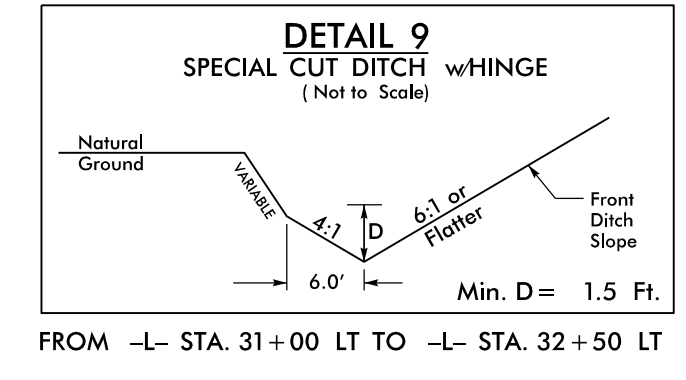
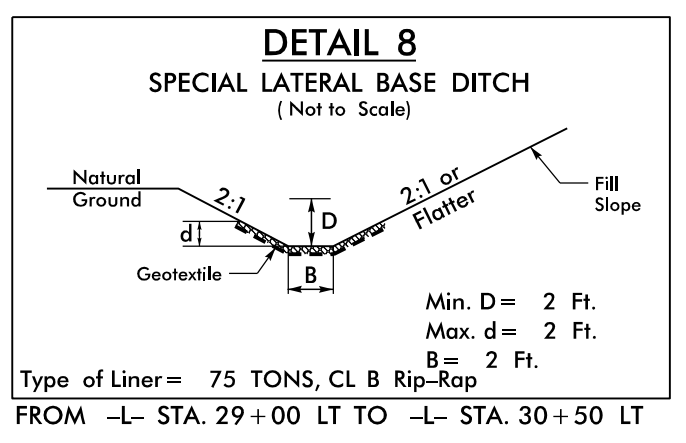
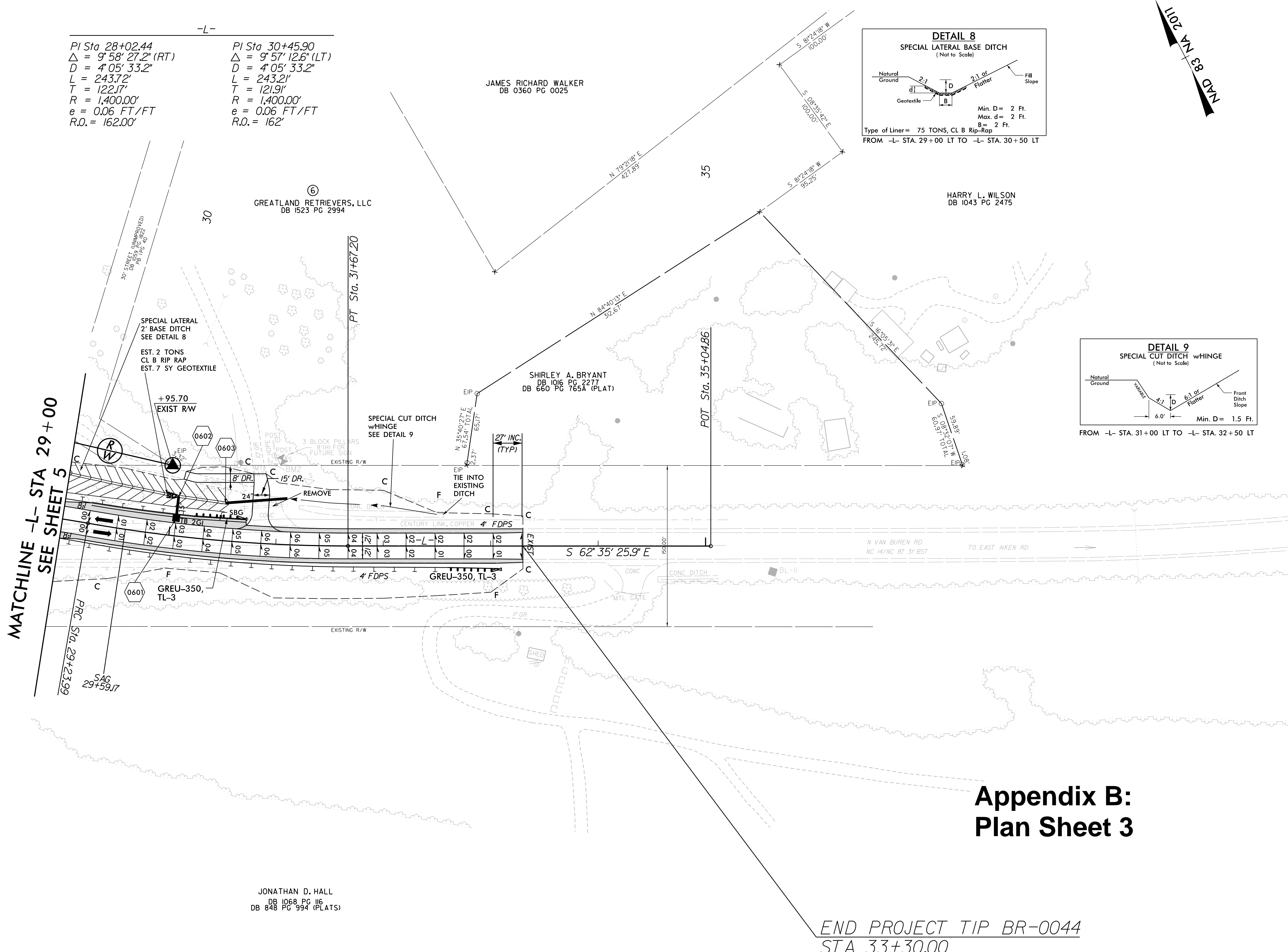
FOR -L- PROFILE SEE SHEET 7

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 (STRUCTURE PAY ITEM)

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Prepared in the Office of: AECOM	
<small>NC FIRM LICENSE No F-0342 701 Corporate Center Blvd, Suite 415 Raleigh, NC 27607 (919) 854-6200 • (919) 854-6259(FAX)</small>	
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**Appendix B:
Plan Sheet 3**

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FOR -L- PROFILE SEE SHEET 8

REVISIONS

Appendix C

Detailed Species Information

Detailed Listed Species Information for BR-0044; The Replacement of Bridge 168 over the Smith River in Rockingham County, North Carolina

1.0 Roanoke Logperch (*Percina rex*)

1.1 Characteristics

The Roanoke Logperch is a large darter, growing to a maximum length of 165 mm. The lateral portions of the fish are covered with vertically elongate blotches (8-11) and dark vermiculations are interspersed between dorsal saddles. Its' snout is elongate and conical. The fins are strongly speckled, and the first dorsal fin contains an orange band, particularly vivid in males. Spawning occurs during April-May in deep runs underlain by gravel. As with other *Percina* species, larval drift probably represents an essential dispersal and recolonization mechanism. This species matures at 2-3 years old and has a lifespan of approximately 6.5 years.

1.2 Distribution and Habitat Requirements

The Roanoke Logperch is found in the Roanoke River Basin: Rockingham County (Dan River, Mayo River, Smith River, and Big Beaver Island Creek) and potentially portions of the Dan River and tributaries within Stokes, Caswell, and Forsyth Counties. Adult Roanoke Logperch typically inhabit medium to large sized, warm, clear streams and occupy riffles, runs, and pools containing sand, gravel, or boulder. Young-of-year congregate in mixed-species schools in shallow, margin habitat underlain by sand and gravel. Roanoke Logperch utilize their snout to overturn gravel to forage on benthic aquatic macroinvertebrates.

1.3 Threats to Roanoke Logperch

Roanoke Logperch populations are threatened by dams and reservoirs, stream channelization, woody debris loss, non-point source pollution caused by urbanization, agricultural, and silvicultural activities, toxic spills and toxic point source discharges, and water withdrawals. These threats are present throughout the historic range of the species.

Construction of large impoundments in the Roanoke River Basin in the 1950's and 1960's (Roanoke Rapids, Gaston, Kerr, Leesville, Smith Mountain, and Philpott Reservoirs) may have been the cause of significant declines of Roanoke Logperch due to the massive habitat loss for the species associated with the construction of these reservoirs. These impoundments disrupted the fish's ability to move within its historic range resulting in smaller, isolated (physically and genetically) populations. Small, isolated populations are more at risk of being eliminated by single events. These events could be natural, such as flooding or drought, or anthropogenically influenced such as toxic spills. One such toxic spill occurred in Virginia in 2009 in Cascade Creek less than one mile from the North Carolina state line. Approximately 10,000 fish were killed including 2 Roanoke Logperch.

Non-point sources of pollution and siltation can impact aquatic species, including the Roanoke Logperch. Stormwater runoff from lawns, parking lots, streets and other impervious surfaces

carry nutrients, oil, metals, and other pollutants into the upper Roanoke River Basin (USFWS 1992a). Siltation is a threat to the species throughout its historic range. Heavy silt deposition reduces habitat heterogeneity and primary productivity and increases egg and larval mortality. It may also impact the macrobenthic communities upon which the Roanoke Logperch rely. Excessive siltation triggered by poor agricultural and logging practices has been problematic in the Nottoway River watershed in the past (USFWS 1992).

2.0 James Spinemussel (*Parvaspina collina*)

2.1 Characteristics

The James Spinemussel was first described in 1837. This species is a small freshwater mussel that is slightly less than three inches in length. Young mussels can have three spines found on their shells and are shiny and yellow in color. The shells of young mussels are subrhomboid with an obliquely subtruncated posterior. Older mussels are dark brown, and exhibit pronounced growth rings and the spines are typically absent or reduced to small bumps. As the shell grows, it also becomes more elliptical in shape, and develops a rounded posterior. The left valve has two thick pseudocardinal and two thin lateral teeth where the right valve contains one of each. Shells have a thicker anterior end and thin toward the posterior. The foot and mantle of adults are noticeably orange, and nacre is peach to salmon colored towards the anterior end.

2.2 Distribution and Habitat Requirements

It was once found throughout the main stem of the James River and all of its major tributaries upstream of Richmond, Virginia. The species has experienced a precipitous decline over the past two decades and now exists only in small, headwater tributaries of the upper James River Basin in Virginia and West Virginia and the upper Roanoke River drainage of Virginia and North Carolina. These sites include the Craig Creek drainage - Craig Creek, Johns Creek, Dicks Creek and Patterson Creek in Craig and Botetourt Counties, VA. The other sites are Potts Creek - Monroe County, WV and Craig and Alleghany Counties, VA, Pedlar River - Amherst County, VA, Mechums River - Albemarle County, VA, Moormans River - Albemarle County, VA, Rocky Run (Moormans River) - Albemarle County, VA, and Catawba Creek - Botetourt County, VA.

The James Spinemussel is found in waters with slow to moderate current and relatively hard water on sand and mixed sand-gravel substrates that are free from silt. Current stream width at these sites varies from 10 to 75 feet with a water depth of 0.5 to three feet. Historic sites on the James River were much wider, up to 165 feet across.

2.3 Threats to James Spinemussel

The primary reason for its decline is habitat loss and modification. Threats to this species include siltation, invasion of the non-native Asian Clam (*Corbicula fluminea*), impoundment of waterways, water pollution, stream channelization, sewage discharge, agricultural runoff

including pesticides and fertilizers, poor logging and road/bridge construction practices, and discharge of chlorine.

Siltation from agricultural and forestry operations and road construction is significant in contributing to water quality problems. Since mussels are sedentary, they are unable to move long distances to more suitable areas in response to heavy siltation. Human activities often create excessively heavy silt loads that can have severe effects on mussels. Suspended sediment can also clog the gills of filter feeding mussels and suffocate them—therefore mussels respond by closing their valves. Overall, siltation can severely stress mussels and lead to chronic effects.

The invasion of the Asian Clam also poses a serious threat to James Spiny mussels. The Asian Clam, which can achieve high densities and expand rapidly, can increase competition with James Spiny mussels and decrease food supply for native bivalves. Disturbance of watersheds also plays a role in the expansion of the Asian Clam. Since the Asian Clam is hermaphroditic, requires no fish host, and spawns twice a year, it may be competitively superior to native mussels in disturbed habitats.

Impoundments on rivers in the Southeast have also been responsible for the decline of many mussel populations. Closure of dams changes habitat—depth increases, flow decreases, and silt accumulates on the bottom. Fish communities exchange and host fish species may be eliminated. Mussel communities also change as species requiring clean gravel and sand substrate are replaced by silt-tolerant species.

Pollution of inland waters also affects the James Spiny mussel. Municipal, industrial, and agricultural pollution have all contributed to reducing various mussel populations in several locations in the Southeast. Some populations have even been extirpated by pollutants including effluent from chlor-alkali plants, fly ash and sulfuric acid spills, acid mine drainage, and organic wastes. It was found that insecticides also have significant effects on mussels and chlorinated effluent from sewage treatment plants can affect the diversity and abundance of mollusks. Acid rain may also pose a threat to Atlantic drainage mussel populations, especially those inhabiting poorly buffered systems.

3.0 Smooth Coneflower

3.1 Characteristics

Smooth Coneflower is a perennial herb that grows up to 1.5 meters tall from a vertical root stock. The stems are typically smooth, with few leaves. The basal leaves are the largest, reaching 20 cm long and are elliptical to broadly lanceolate shaped. The flower heads are typically solitary, roughly 5 to 8 cm long, drooping, with light pink to purplish ray flowers. Disk flowers are approximately 5 mm long and have tubular purple corollas with generally erect short, triangular teeth. Flowering occurs from May through July.

3.2 Distribution and Habitat Requirements

Smooth Coneflower is endemic to the Piedmont or Mountain physiographic provinces. It is typically found in meadows, open woodlands, the ecotonal regions between meadows and woodlands, cedar barrens, dry limestone bluffs, clear cuts, and roadside and utility rights-of-way (ROW). In North Carolina, the species normally grows in magnesium- and calcium- rich soils associated with gabbro and diabase parent material, and typically occurs in Iredell, Misenheimer, and Picture soil series. It grows best where there is abundant sunlight, little competition in the herbaceous layer, and periodic disturbances (e.g., regular fire regime, well-timed mowing, careful clearing) that prevents encroachment of shade-producing woody shrubs and trees.

3.3 Threats to Species

Smooth Coneflower is threatened throughout its range by the suppression of fire and by the ecological succession that occurs in areas not burned on a regular basis. Additional threats include timber operations, intensive utility ROW maintenance, and residential, commercial, and industrial development.

References

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