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:*

Lenoir

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:

B-5619

WBS #*

45574.1.1

(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: 6 - Survey Activities

NWP Numbers (for multiple NWPS):

List all NW numbers you are applying for not on the drop dow n 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

FILE TYPE 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?*

NC Department of Transportation

1b. Primary Contact Email:*

ajames10@ncdot.gov

1c. Primary Contact Phone:*

(xxx)xxx-xxxx

(919)707-6129

1d. Who is applying for the permit?*

☑ Owner ☐ Applicant (other than owner)

(Check all that apply)

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

1000 Birch Ridge Dr.

Address Line 2

City

Raleigh

State / Province / Region

NC

Postal / Zip Code

27610

Country

USA

2e. Telephone Number:*

(xxx)xxx-xxxx

(919)707-6123

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:*

Geotechnical borings in the Neuse River and overflow channel (B-5619)

1b. Subdivision name:

(if appropriate)

1c. Nearest municipality / town:*

La Grange

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: *

35.224716

ex: 34.208504

Longitude: *

-77.766817

-77.796371

3. Surface Waters

3a. Name of the nearest body of water to proposed project: *

Neuse River

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

WS-IV; NSW

Surface Water Lookup

3c. What river basin(s) is your project located in? *

Neuse

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

030202020206

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: *

The immediate area surrounding the existing bridges is largely forested, with agricultural areas farther away from the river.

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:

12.43 acres

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

(intermittent and perennial)

1,901

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

Geotechnical soil borings will be advanced in the streambed of the Neuse River (bridge no. 52), as well as its overflow channel/floodplain (bridge no. 152) to determine what bent type to use in the replacement structures. Impacts associated with replacing these bridges are not authorized or included in this permit application.

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

Borings will be advanced from the bridge deck in the approximate red line locations shown on the attached bridge plans (proposed bent locations):

Neuse River overflow channel (bridge no. 152): 3 borings in the channel ,which may or may not be in standing water; and
Neuse River (bridge no. 52): 3 borings in the channel

Borings will be advanced using the mud rotary method; this method involves setting a piece of 4" to 6" diameter casing between the drill rig and the river bed/floodplain to contain the drilling fluid and cutting returns. All soil samples, drilling fluid, and cutting returns are disposed of off-site.

4j. Please upload project drawings for the proposed project.

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

530052_2019_B5619_NEUSERIVER_SR1389_HSR.pdf	3.79MB
530152_2019_B5619_NEUSERIVEROVERFLOW_SR1389_HSR.pdf	3.8MB

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:

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):

Agency/Consultant Company: Mead and Hunt

Other:

5d. List the dates of the Corp jurisdiction determination or State determination if a determination was made by the Corps or DWR.

A field JD visit was made with the Corps and NCDWR on March 25, 2019.

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.

Permitting for impacts associated with replacing the existing structures will be permitted separately. A GP 31 will likely be required, though final discretion as to what permit will be required lies with the Corps.

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

4. Open Water Impacts

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

4a. Site # * (?)	4a1. Impact Reason	4b. Impact type * (?)	4c. Name of waterbody (?)	4d. Activity type *	4e. Waterbody type *	4f. Impact area *
1	Soil borings	T	Neuse River	Other	Other	0.00 (acres)
2	Soil borings	T	Neuse River overflow channel	Other	Other	0.00 (acres)

4g. Total temporary open water Impacts:

0.00

4g. Total permanent open water impacts:

0.00

4g. Total open water impacts:

0.00

4h. Comments:

Actual impact is 0.52 square feet or 0.00001 acre for six borings, assuming that each boring has a diameter of 4 inches.

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: *

The drill will be encased and all soil, drill fluid, and cutting returns will be disposed of off-site.

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

N/A

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

2b. If this project DOES NOT require Compensatory Mitigation, explain why:

No permanent impacts to jurisdictional resources are anticipated for activities authorized by this permit.

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

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

1b. All buffer impacts and high ground impacts require diffuse flow or other form of stormwater treatment. If the project is subject to a state implemented riparian buffer protection program, include a plan that fully documents how diffuse flow will be maintained.

All Stormwater Control Measures (SCM)s must be designed in accordance with the NC Stormwater Design Manual. Associated supplement forms and other documentation shall be provided.

What type of SCM are you providing?

- ☐ Level Spreader
- ☐ Vegetated Conveyance (lower SHWT)
- ☐ Wetland Swale (higher SHWT)
- ☐ Other SCM that removes minimum 30% nitrogen
- ☑ Proposed project will not create concentrated stormwater flow through the buffer

(check all that apply)

For a list of options to meet the diffuse flow requirements, click here.

Diffuse Flow Documentation

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

File type must be PDF

2. Stormwater Management Plan

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

○ Yes ◉ No

2b. Does this project meet the requirements for low density projects as defined in 15A NCAC 02H .1003(2)? *

◉ Yes ○ No

To look up low density requirement click here 15A NCAC 02H .1003(2).

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: *

These activities are occurring in advance of the NEPA environmental document, which is scheduled for completion in July 2019.

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.

This application is for geotechnical borings only.

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

5d. Is another Federal agency involved? *

◉ Yes ○ No ○ Unknown

What Federal Agency is involved?

NOAA National Marine Fisheries Service

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? *

NC Natural Heritage Program data; rule in federal register (50 CFR 226) promulgating Atlantic sturgeon critical habitat, published on 9/18/2017.

Consultation Documentation Upload

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

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 EFH viewer

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? *

NCSHPO HPOWeb Mapping; a complete review of potential historic and archeological resources on B-5619 will be conducted for inclusion in the environmental document, which is anticipated to be a Categorical Exclusion. The document is scheduled for completion in July 2019.

7c. Historic or Prehistoric Information Upload

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

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:

NCDOT Hydraulics Unit coordination with FEMA. The activities authorized by this permit will take place in open water and/or will not effect base flood elevations.

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

FEMA mapping (Map number 3720356400J, effective 7/2/2004)

Miscellaneous

Comments

The Neuse River at this location is designated as a primary nursery area, and as such carries an in-water work moratorium between February 15 and September 30. Per the Wildlife Resources Commission, the activities authorized by this permit are allowed to be conducted during the in-water work moratorium (see attached email response).

Miscellaneous attachments not previously requested.

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

B-5619 WRC.pdf 168.6KB

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: *

Mack Christopher Rivenbark III

Signature

Mack C Rivenbark III

Date

5/20/2019

Rivenbark, Chris

From: Wilson, Travis W.
Sent: Friday, May 17, 2019 9:58 AM
To: Rivenbark, Chris
Cc: Riffey, Deanna; thomas.a.steffens@usace.army.mil
Subject: RE: B-5619 Neuse River and overflow geotechnical borings

WRC is ok with the proposed Geotech work.

From: Rivenbark, Chris
Sent: Wednesday, May 15, 2019 9:39 AM
To: Wilson, Travis W. <travis.wilson@ncwildlife.org>
Cc: Riffey, Deanna <driffey@ncdot.gov>; thomas.a.steffens@usace.army.mil
Subject: B-5619 Neuse River and overflow geotechnical borings

Travis,
We are planning to perform geotechnical borings in the Neuse River and it's overflow on Hardy Bridge Rd (SR 1389) in Lenoir County. This project is subject to the Inland PNA moratoria.

We plan to conduct the following borings:

- Neuse River overflow (bridge no. 152): 3 borings in the flood plain which may or may not be in standing water.
- Neuse River (bridge no. 52): 3 borings in the channel, 1 in the flood plain which may or may not be in standing water.

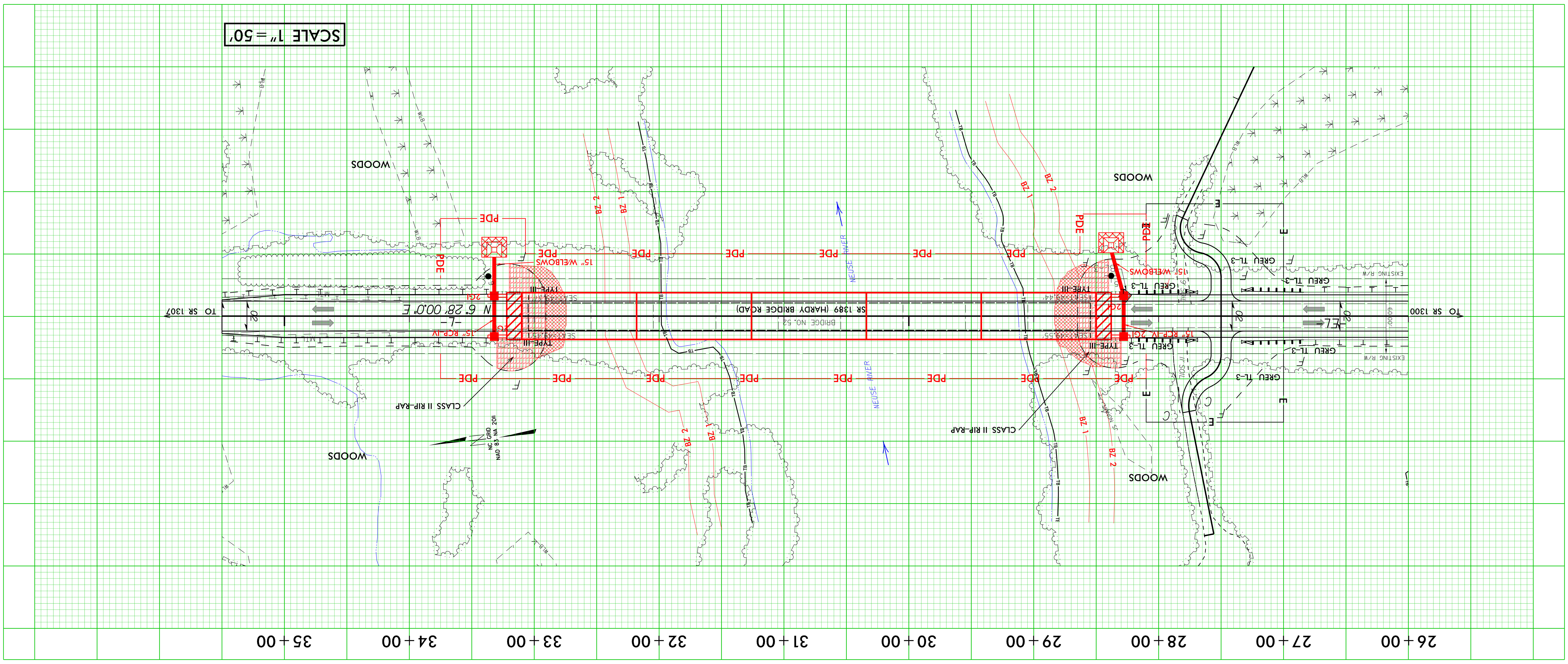
I know you've approved borings during moratoria for other projects but I still like to confirm.

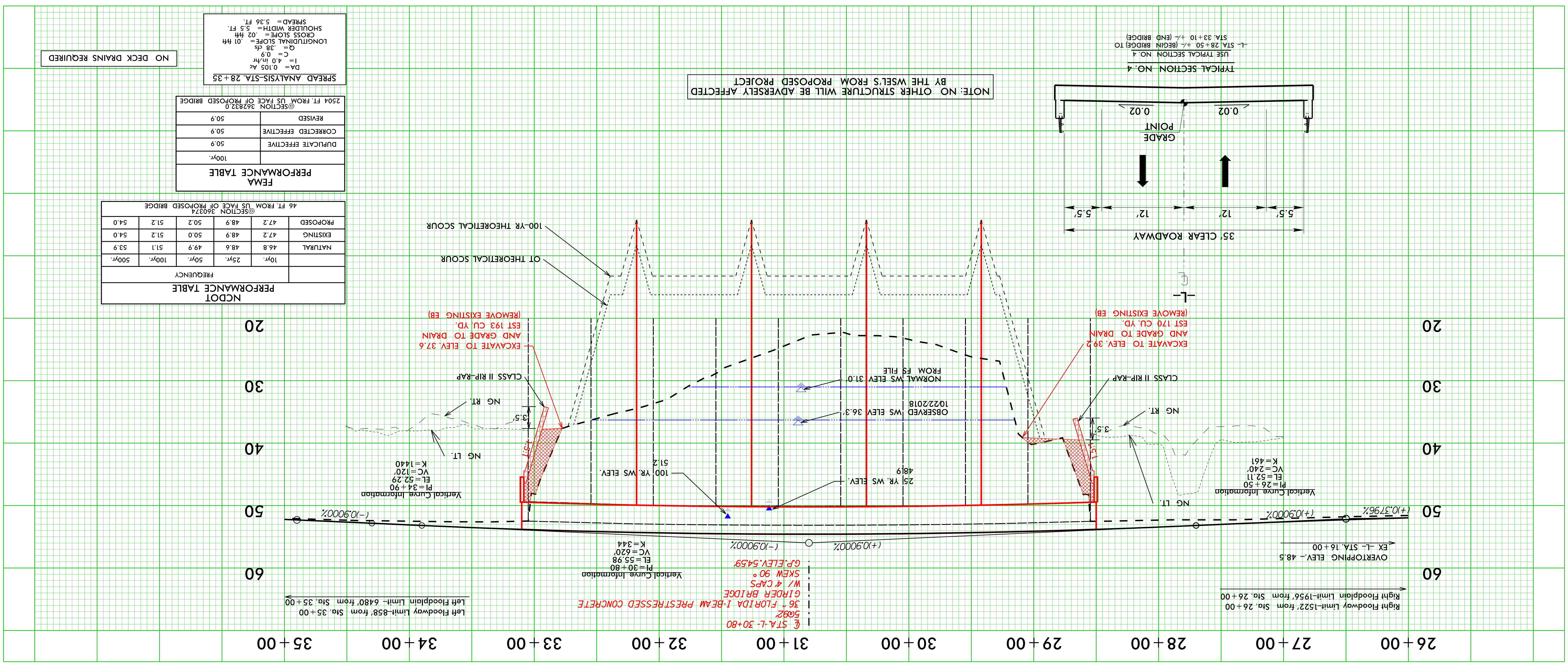
Chris Rivenbark
Environmental Analysis Unit
North Carolina Department of Transportation

919 707 6152 office
crivenbark@ncdot.gov

1598 Mail Service Center
Raleigh, NC 27699-1598

1000 Birch Ridge Drive
Raleigh, NC 27610





NCDOT PERFORMANCE TABLE

	FREQUENCY				
	10yr.	25yr.	50yr.	100yr.	500yr.
NATURAL	46.8	48.6	49.9	51.1	53.9
EXISTING	47.2	48.9	50.0	51.2	54.0
PROPOSED	47.2	48.9	50.2	51.2	54.0

@SECTION 360374
46 FT. FROM US FACE OF PROPOSED BRIDGE

FEMA PERFORMANCE TABLE

	100yr.
DUPLICATE EFFECTIVE	50.9
CORRECTED EFFECTIVE	50.9
REVISED	50.9

@SECTION 362832.0
2504 FT. FROM US FACE OF PROPOSED BRIDGE

INFORMATION TO BE SHOWN ON PLANS

WS EL. Taken @ River Station 360374

Design: Discharge 32,400 c.f.s. Frequency 25 yr. Elev. 48.9 ft.
Base Flood: Discharge 44,000 c.f.s. Frequency 100 yr. Elev. 50.1 ft.
Overtopping: Discharge 30,500 c.f.s. Frequency 25– yr. Elev. 48.5 ft.

ADDITIONAL INFORMATION AND COMPUTATIONS

FEMA FLOOD STUDY DISCHARGES	USING USGS EQN. 2009–5158, REGION 1–57.5%, REGION 4–42.5%	
	ADJUSTED UNGAGED ESTIMATE BASED ON NEARBY GAUGE 02089500	
Q10=22,600	Q10=25,580	USE Q10=25,600
Q25=34,700	Q25=32,393	Q25=32,400
Q50=38,100	Q50=38,092	Q50=38,100
Q100=40,500	Q100=43,956	Q100=44,000
Q500=59,200	Q500=59,163	Q500=59,200

BED MATERIAL: MOSTLY SILT

*NOTE: NCDOT 25 YR. DISCHARGE USED FOR NCDOT DESIGN. NCDOT 100 YR. USED FOR SCOUR CALCULATIONS
*NOTE: CHANNEL TOP WIDTHS FROM CROSS–SECTION OUTPUT TABLE IN HEC–RAS USED FOR SCOUR CALCULATIONS

CONTRACTION SCOUR: (OT)

$Y_2 = Y_1 [Q_2/Q_1]^{6/7} [W_1/W_2]^{K1}$ $Y_2 = 21.1 [17678/20376]^{6/7} [361.2/256.1]^{0.69}$
$Ys = Y_2 - Yo$ $Ys = 23.7 - 17.9 = 5.8$ SAY 6.0'

OT Contraction Scour = 6.0'

LOCAL SCOUR: (CSU EQUATION)(OT)

$Ys = 2.0(K_1)(K_2)(K_3)(a)^{0.65} (Y_1)^{0.35} (Fr_1)^{0.43}$ $Ys = 2.0(1.1)(1.5)(1.1)(3.0)^{0.65} (26.3)^{0.35} (0.08)^{0.43}$
$Fr_1 = V_1/(gy_1)^{(1/2)}$ $Fr_1 = 2.2/(32.2*26.3)^{(1/2)}$ $Fr_1 = 0.08$ $Ys = 7.68'$

OT Local Scour = Ys = 8.0'

CONTRACTION SCOUR: (100 YR)

$Y_2 = Y_1 [Q_2/Q_1]^{6/7} [W_1/W_2]^{K1}$ $Y_2 = 23.7 [27949/22122]^{6/7} [361.2/256.1]^{0.69}$
$Ys = Y_2 - Yo$ $Ys = 36.7 - 28 = 8.71$ SAY 9.0'

100–YR. Contraction Scour = 9.0'

LOCAL SCOUR: (CSU EQUATION)(100 YR.)

$Ys = 2.0(K_1)(K_2)(K_3)(a)^{0.65} (Y_1)^{0.35} (Fr_1)^{0.43}$ $Ys = 2.0(1.1)(1.5)(1.1)(3.0)^{0.65} (26.6)^{0.35} (0.06)^{0.43}$
$Fr_1 = V_1/(gy_1)^{(1/2)}$ $Fr_1 = 3.3/(32.2*28.0)^{(1/2)}$ $Fr_1 = 0.11$ $Ys = 9.21'$

100–YR. Local Scour = Ys = 9.0'

SITE DATA

Drainage Area 2600 SQ. MI. Source USGS STREAMSTATS
River Basin NEUSE Character 4–COASTAL
Stream Classification (Such as Trout, High Quality Water, etc.) WS–IV, NSW, CA
Data on Existing Structure 1@50'3, 7@50', 1@50'3, OAL=451, RC DECK/I BEAMS, STEEL PILES
Total Waterway Opening 8359 s.f.
Waterway Opening Below 100yr. WS EL. 8359 s.f.
Debris Potential: Low Moderate High X
Data on Structures Up and Down Stream UPSTREAM: NC 903, RC DECK, 1@40.8;2@40.3;1@40.1;1@54.9; 1@45.1;1@39.8;1@48.9, #530045, OAL=350', DOWNSTREAM: US 70 EBL & US 258 SL, 1@45'5.5;7@45';1@45'5.5 OAL=406', #530060
Design Control Elev. 50.5 ft. @ RIVER STATION 360374 (MAINTAIN OR REDUCE FEMA CORR EFF 100 YR WSEL)
Gage Station No. N/A Period of Records N/A yrs.
Max. Discharge N/A c.f.s. Date N/A Frequency N/A

Historical Flood Information:

Date 09/2018 Elev. 50.1 ft. Est. Freq. 100+/– yr. Source JESSE "JAY" GRADY, NCDOT BRIDGE MAINTENANCE Period of Knowledge 31 yrs.
Date Elev. ft. Est. Freq. yr. Source Period of Knowledge yrs.
Date Elev. ft. Est. Freq. yr. Source Period of Knowledge yrs.

Historical Scour Info. : General NONE ft. Contraction NONE ft. Local NONE ft.
Channel Slope 0.000038 ft/ft Source USGS Quad Map Normal Water Surface Elev. 31.0 ft.
Manning's n: Left O.B. 0.18 Channel 0.054 Right O.B. 0.18 Source FLOOD STUDY
Flood Study /Status DETAILED Flood Study–FIS DATE 04/16/2013 Floodway Established? YES
Flood Study 100yr. Discharge 40,500 c.f.s. WS Elev.: With Floodway 51.9 ft. Without Floodway 50.9 ft. @ River Station 362832

DESIGN DATA

Hydrological Method USING USGS EQN. 2009–5158, REGION 1–57.5%, REGION 4–42.5%
Hydraulic Design Method HEC RAS 5.0.3

Floods Evaluated: @ River Station 360374

Freq. (yr.)	Q (c.f.s)	Elev. (ft.)	Backwater (ft.)	Bridge Opening Velocity (f.p.s.)
10	25,600	47.2	0.4	2.5
25	32,400	48.9	0.3	1.7
100	44,000	51.2	0.1	3.3
100(FEMA)	40,500	50.5	0.1	2.7
500	59,200	54.0	0.1	2.5

Waterway Opening Provided Below:Design W.S. Elev. 8086 s.f., 100yr W.S. Elev. 8576 s.f.,Total 8576 s.f.,
Average Channel Velocity (Design) 2.8 f.p.s. Average Overbank Velocity (Design) 0.5 f.p.s.
Computed Scour : General N/A ft. Contraction 9.0 (100 YR.) ft. Local 9.0 (100 YR) ft.
Is a Floodway Revision Required? MOA TYPE 1 (MAX DECREASE 0.01' @ RS 360446)

Stream NEUSE RIVER Struc. Inv. No. 0052 I.D. No. B–5619 Project No. 45574.1.1 PDF File 530052_2019_B–5619_NEUSERIVER_SR1389_HSR.PDF

BRIDGE SURVEY & HYDRAULIC DESIGN REPORT

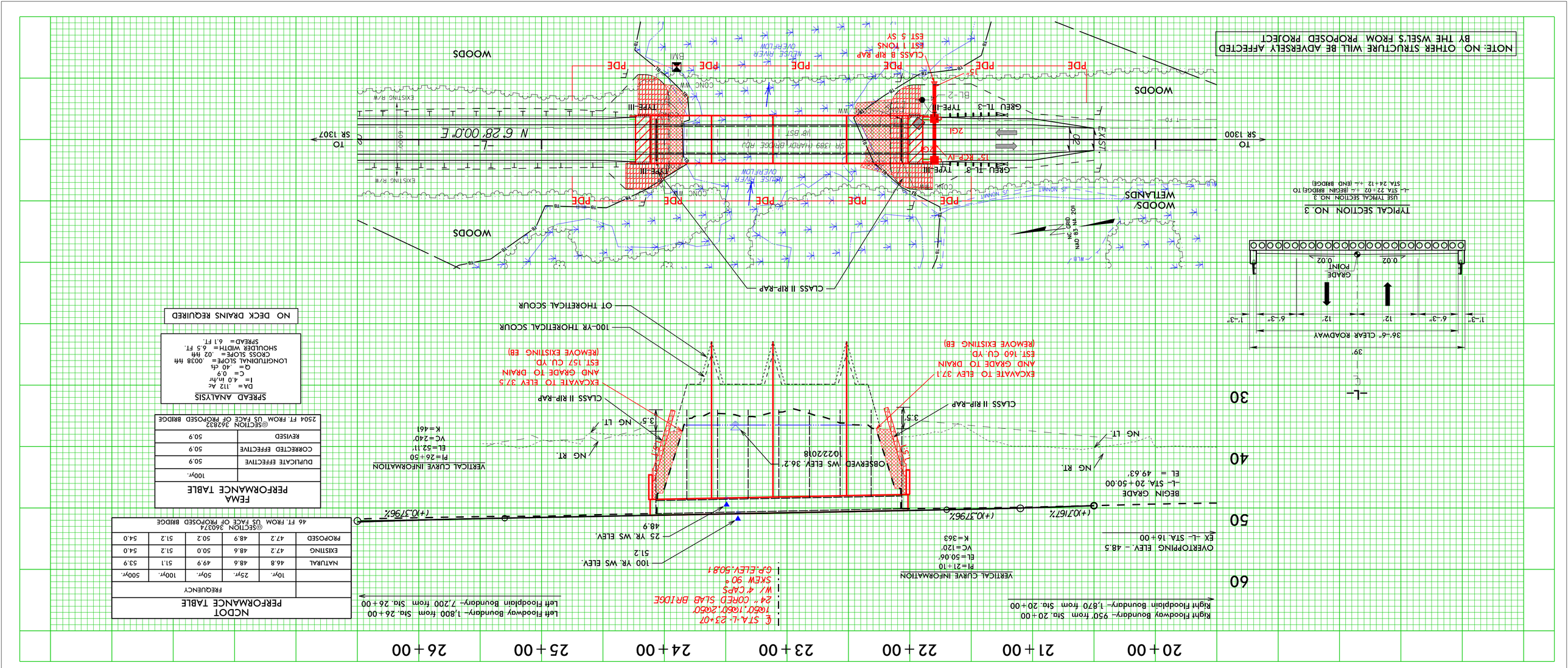
N. C. DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
HYDRAULICS UNIT
RALEIGH, N. C.

I.D. No. B–5619 Project No. 45574.1.1 Proj. Station -L- 30+80
County LENOIR Bridge Over NEUSE RIVER Bridge Inv. No. 0052
On Highway SR 1389 (HARDY BRIDGE RD.) Between SR 1307 (PINE BUSH RD.) and SR 1300 (DAVIS–HARDY RD.)
Recommended Structure 5@92', 36" FLORIDA I–BEAM PRESTRESSED CONCRETE BRIDGE W/4.0' CAPS
Recommended Width of Roadway 35' CLEAR ROADWAY Skew 90 DEGREES
Recommended Location is (Up, (At) Down) Stream from Existing Crossing.
Latitude 35.26104 Longitude 77.82089
Statewide Tier ☐ Regional Tier ☐ Sub–Regional Tier ☒
Bench Mark is BM1, -L- Sta. 23+90 59' RIGHT, RAILROAD SPIKE SET IN 18" GUM TREE
Northing 538246 Easting 2368265 Elev. 38.64 ft. Datum: NAVD 88
Temporary Crossing OFF–SITE DETOUR

Designed by: R.H. HINTON, EI
Assisted by: C.R. SHARPLESS, PE
Project Engineer : R.S. WEADON, PE
Reviewed by:
Date

NORTH CAROLINA PROFESSIONAL SEAL 21656 ENGINEER ROGER S. WEADON

Mead & Hunt



NCDOT PERFORMANCE TABLE						
	FREQUENCY					
	10yr.	25yr.	50yr.	100yr.	500yr.	
NATURAL	46.8	48.6	49.9	51.1	53.9	
EXISTING	47.2	48.6	50.0	51.2	54.0	
PROPOSED	47.2	48.9	50.2	51.2	54.0	

46 FT. FROM US FACE OF PROPOSED BRIDGE @SECTION 360374

FEMA PERFORMANCE TABLE	
	100yr.
DUPLICATE EFFECTIVE	50.9
CORRECTED EFFECTIVE	50.9
REVISED	50.9

2504 FT. FROM US FACE OF PROPOSED BRIDGE

SPREAD ANALYSIS
DA= .112 Ac
I= 4.0 in/hr
Q= .40 cfs
C= 0.9
LONGITUDINAL SLOPE= .0038 ft/ft
CROSS SLOPE= .02 ft/ft
SHOULDER WIDTH= 6.5 Ft.
SPREAD= 6.1 FT.

NO DECK DRAINS REQUIRED

INFORMATION TO BE SHOWN ON PLANS

WS EL. Taken @ River Station 360374

Design: Discharge 32,400 c.f.s. Frequency 25 yr. Elev. 48.9 ft.

Base Flood: Discharge 44,000 c.f.s. Frequency 100 yr. Elev. 51.2 ft.

Overtopping: Discharge 30,500 c.f.s. Frequency 25- yr. Elev. 48.5 ft.

ADDITIONAL INFORMATION AND COMPUTATIONS

FEMA FLOOD STUDY DISCHARGES	USING USGS EQN. 2009–5158, REGION 1–57.5%, REGION 4–42.5%	
Q10 = 22,600	ADJUSTED UNGAGED ESTIMATE BASED ON NEARBY GAUGE 02089500	
Q25 = 34,700	Q10 = 25,580	USE Q10 = 25,600
Q50 = 38,100	Q25 = 32,393	Q25 = 32,400
Q100 = 40,500	Q50 = 38,092	Q50 = 38,100
Q500 = 59,200	Q100 = 43,956	Q100 = 44,000
	Q500 = 59,163	Q500 = 59,200

BED MATERIAL: MOSTLY SILT

*NOTE: NCDOT 25 YR. DISCHARGE USED FOR NCDOT DESIGN. NCDOT OT USED FOR SCOUR CALCULATIONS

*NOTE: CHANNEL TOP WIDTHS FROM CROSS-SECTION OUTPUT TABLE IN HEC-RAS USED FOR SCOUR CALCULATIONS

CONTRACTION SCOUR: (OT)

$Y_2 = Y_1 [Q_2/Q_1]^{.67}\,[W_1/W_2]^{K1}$ $Y_2 = 10.4\,[4685/3776]^{.67}\,[269.6/158.7]^{0.89}$

Ys = Y_2 – Yo Ys = 18.04–14.4 = 3.64 SAY 4.0'

OT Contraction Scour = 4.0'

LOCAL SCOUR: (CSU EQUATION)(OT)

$Ys = 2.0(K_1)(K_2)(a)^{0.65}\,(Y_1)^{0.35}\,(Fr_1)^{0.43}$ $Ys = 2.0(1.1)(1.5)(1.1)(3.0)^{0.65}\,(14.40)^{0.35}\,(0.09)^{0.43}$

$Fr_1 = V_1/(gy_1)^{(1/2)}$ $Fr_1 = 2.0/(32.2*14.40)^{(1/2)}$ $Fr_1 = 0.10$ Ys = 6.94'

OT Local Scour = 7.0'

CONTRACTION SCOUR: (100 YR)

$Y_2 = Y_1 [Q_2/Q_1]^{.67}\,[W_1/W_2]^{K1}$ $Y_2 = 15.8\,[2899/11354]^{.67}\,[269.6/158.7]^{0.89}$

Ys = Y_2 – Yo Ys = 7.07–2.6 = 4.47 SAY 4.0'

100–YR. Contraction Scour = 4.0'

LOCAL SCOUR: (CSU EQUATION)(100 YR.)

$Ys = 2.0(K_1)(K_2)(a)^{0.65}\,(Y_1)^{0.35}\,(Fr_1)^{0.43}$ $Ys = 2.0(1.1)(1.5)(1.1)(3.0)^{0.65}\,(15.2)^{0.35}\,(0.05)^{0.43}$

$Fr_1 = V_1/(gy_1)^{(1/2)}$ $Fr_1 = 1.20/(32.2*15.2)^{(1/2)}$ $Fr_1 = 0.05$ Ys = 5.49'

100–YR. Local Scour = 5.0'

SITE DATA

Drainage Area 2600 SQ. MI. Source USGS STREAMSTATS

River Basin NEUSE Character 4-COASTAL

Stream Classification (Such as Trout, High Quality Water, etc.) WS-IV, NSW, CA

Data on Existing Structure 8@25', OAL = 200', RC DECK/I BEAMS, TIMBER PILES

Total Waterway Opening 2185 s.f.
Waterway Opening Below 100yr. WS EL. 2185 s.f.

Debris Potential: Low ____ Moderate ____ High X

Data on Structures Up and Down Stream UPSTREAM: NC 903, CORED SLAB, 1@51;2@50.3;1@51; #530139, OAL = 202', DOWNSTREAM: US 70 WB & US 258 NB, 1@45.208';7@45';1@45.208' OAL = 405', #530062

Design Control Elev. 50.4 ft. (MAINTAIN OR REDUCE FEMA CORR EFF 100 YR WSEL) @ RIVER STATION 360374

Gage Station No. N/A Period of Records N/A yrs.

Max. Discharge N/A c.f.s. Date N/A Frequency N/A

Historical Flood Information:

Date 09/2018 Elev. 50.1 ft. Est. Freq. 100 +/- yr. Source JESSE "JAY" GRADY, NCDOT BRIDGE MAINTENANCE Period of Knowledge 31 yrs.

Date ____ Elev. ____ ft. Est. Freq. ____ yr. Source ____ Period of Knowledge ____ yrs.

Date ____ Elev. ____ ft. Est. Freq. ____ yr. Source ____ Period of Knowledge ____ yrs.

Historical Scour Info. : General NONE ft. Contraction NONE ft. Local NONE ft.

Channel Slope 0.000038 ft/ft Source USGS Quad Map Normal Water Surface Elev. 36.2 ft.

Manning's n: Left O.B. 0.18 Channel 0.054 Right O.B. 0.18 Source FLOOD STUDY

Flood Study /Status DETAILED FLOOD STUDY-FIS DATE 04/16/2013 Floodway Established? YES

Flood Study 100yr. Discharge 40500 c.f.s. WS Elev.: With Floodway 51.9 ft. Without Floodway 50.9 ft. @ River Station 362832

DESIGN DATA

Hydrological Method USING USGS EQN. 2009–5158, REGION 1–57.5%, REGION 4–42.5%

Hydraulic Design Method HEC RAS 5.0.3

Floods Evaluated:

@ River Station 360374	Freq. (yr.)	Q (c.f.s)	Elev. (ft.)	Backwater (ft.)	Bridge Opening Velocity (f.p.s.)
	10	25,580	47.2	0.4	1.9
	25	32,400	48.9	0.3	3.5
	100	44,000	51.2	0.1	1.2
	100(FEMA)	40,500	50.5	0.1	2.3
	500	59,200	54.0	0.1	1.1

Waterway Opening Provided Below: Design W.S. Elev. 2334 s.f., 100yr W.S. Elev. 2334 s.f., Total 2334 s.f.,

Average Channel Velocity (Design) 2.8 f.p.s. Average Overbank Velocity (Design) 0.5 f.p.s.

Computed Scour : General N/A ft. Contraction 4.0 (OT) ft. Local 7.0 (OT) ft.

Is a Floodway Revision Required? MOA TYPE 1 (MAX DECREASE 0.01' @ RS 360446

Stream NEUSE RIVER (OVERFLOW) Struc. Inv. No. 0152 I.D. No. B-5619 Project No. 45574.1.1 PDF File 530152_2019_B-5619_NEUSERIVEROVERFLOW_SR1389_HSR.PDF

BRIDGE SURVEY & HYDRAULIC DESIGN REPORT

N. C. DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
HYDRAULICS UNIT
RALEIGH, N. C.

I.D. No. B-5619 Project No. 45574.1.1 Proj. Station -L- 23+07

County LENOIR Bridge Over NEUSE RIVER (OVERFLOW) Bridge Inv. No. 0152

On Highway SR 1389 (HARDY BRIDGE RD.) Between SR 1307 (PINE BUSH RD.) and SR 1300 (DAVIS-HARDY RD.)

Recommended Structure 1@50', 1@60', 2@50', 24" CORED SLAB, W/4.0' CAPS

Recommended Width of Roadway 36.5' CLEAR ROADWAY Skew 90 DEGREES

Recommended Location is (Up, (At) Down) Stream from Existing Crossing

Latitude 35.22243 Longitude 77.76703

Statewide Tier ☐ Regional Tier ☐ Sub-Regional Tier ☐

Bench Mark is BM1, -L- STA 23+90, 59' RIGHT, RAILROAD SPIKE SET IN 18" GUM TREE

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