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:*

Cumberland

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-5703

WBS #*

45657.1.1

(for NCDOT use only)

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

[x] 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?*

[x] 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: 13 - Bank Stabilization

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

[x] 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? *

NCDOT

1b. Primary Contact Email: *

jldilday@ncdot.gov

1c. Primary Contact Phone: *

(xxx)xxx-xxxx

(919)707-6111

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: *

NCDOT

2b. Deed book and page no.:

2c. Responsible party:

(for Corporations)

2d. Address *

Street Address

1000 Birch Ridge Drive

Address Line 2

City

Raleigh

State / Province / Region

NC

Postal / Zip Code

27610

Country

USA

2e. Telephone Number: *

(xxx)xxx-xxxx

(919)707-6111

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: *

B-5703 (Bridge 60 over Lower Little River on US 401) Central

1b. Subdivision name:

(if appropriate)

1c. Nearest municipality / town: *

Linden

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: *

35.2631

ex: 34.208504

Longitude: *

-78.7766

-77.796371

3. Surface Waters

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

Lower Little River

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

C

Surface Water Lookup

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

Cape Fear

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

030300040409

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: *

Land use in the vicinity is rural, wooded, agriculture and light residential.

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

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

(intermittent and perennial)

200

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

The purpose of this project is to replace the structurally deficient Bridge No. 60 with a new bridge.

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

The project involves replacing the existing three span, 176-foot bridge with a three span, 190-foot bridge on the existing alignment. Traffic will be maintained on an off-site detour. Standard road building equipment, such as trucks, dozers, and cranes will be used.

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

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

B-5703 75 Percent roadway plans.pdf	2.8MB
B-5703_Permit_Plans_and_Impact_20190529.pdf	1.79MB

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

SAW-2016-00747

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

Name (if known): Kim Hamlin

Agency/Consultant Company: SEPI Engineering

Other:

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

Preliminary JD received May 4, 2016.

5d1. Jurisdictional determination upload

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

B-5703 Cumberland PJD.pdf 120.31KB

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 *	3h. Impact length *
S1	Riprap at ditch outfall	Permanent	Bank Stabilization	Little Lower River	Perennial	Corps	60 Average (feet)	14 (linear feet)
S2	Site2/3 Bridge riprap	Permanent	Bank Stabilization	Little Lower River	Perennial	Corps	60 Average (feet)	21 (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:

35

3i. Total temporary stream impacts:

0

3i. Total stream and ditch impacts:

35

3j. Comments:

All impacts are from bank stabilization. Interior bridge bents will be on the bank above the normal water level.

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: *

See stormwater management plan for minimization measures.

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

The new bridge will have no deck drains or direct discharge into Lower Little River. The bridge will be replaced on the existing alignment. An off-site detour will be used during construction.

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:

Impacts are not considered a loss of "waters of the United States"

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

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

If no, explain why:

This project is not located within one of the protected riparian buffer basins.

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

NEPA or SEPA Final Approval Letter

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

FILE TYPE MUST BE PDF

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.

Due to the minimal transportation impact resulting from this bridge replacement, this project will neither influence nearby land uses nor stimulate growth. Therefore, a detailed indirect or cumulative effects study will not be necessary.

4. Sewage Disposal (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? *

N.C. Natural Heritage Program database; USFWS-Raleigh Field Office website;biological surveys for protected species listed for Cumberland County, which include American alligator, Cape Fear shiner, red-cockaded woodpecker (RCW), Saint Francis satyr butterfly, American chaffseed, Michaux's sumac, pondberry and rough-leaved loosestrife. All species, except Cape Fear shiner received biological conclusions of "No Effect", due to no habitat being present. A biological conclusion for American alligator is not required due to its listing as Threatened Due to Similarity of Appearance. A survey for the Cape Fear shiner was conducted on June 21, 2018. A biological conclusion of May Affect, Not Likely to Adversely Affect was rendered due to the presence of suitable habitat and a known occurrence of the species approximately 10 miles downstream of the project. The Northern long-eared bat has a conclusion of May Affect, Likely to Adversely Affect and is covered under a Programmatic Biological Opinion. The Little Lower River was determined to be a water body large enough to be considered foraging habitat for the bald eagle. A visual survey for nest trees was conducted on March 9, 2016 within 660 feet of the study area. No eagles or nest trees were observed.

Consultation Documentation Upload

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

B-5703_Aquatic Species Survey Report.pdf 3.51MB

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? *

SEPA documentation

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

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

FEMA Maps

Miscellaneous

Comments

Miscellaneous attachments not previously requested.

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

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.

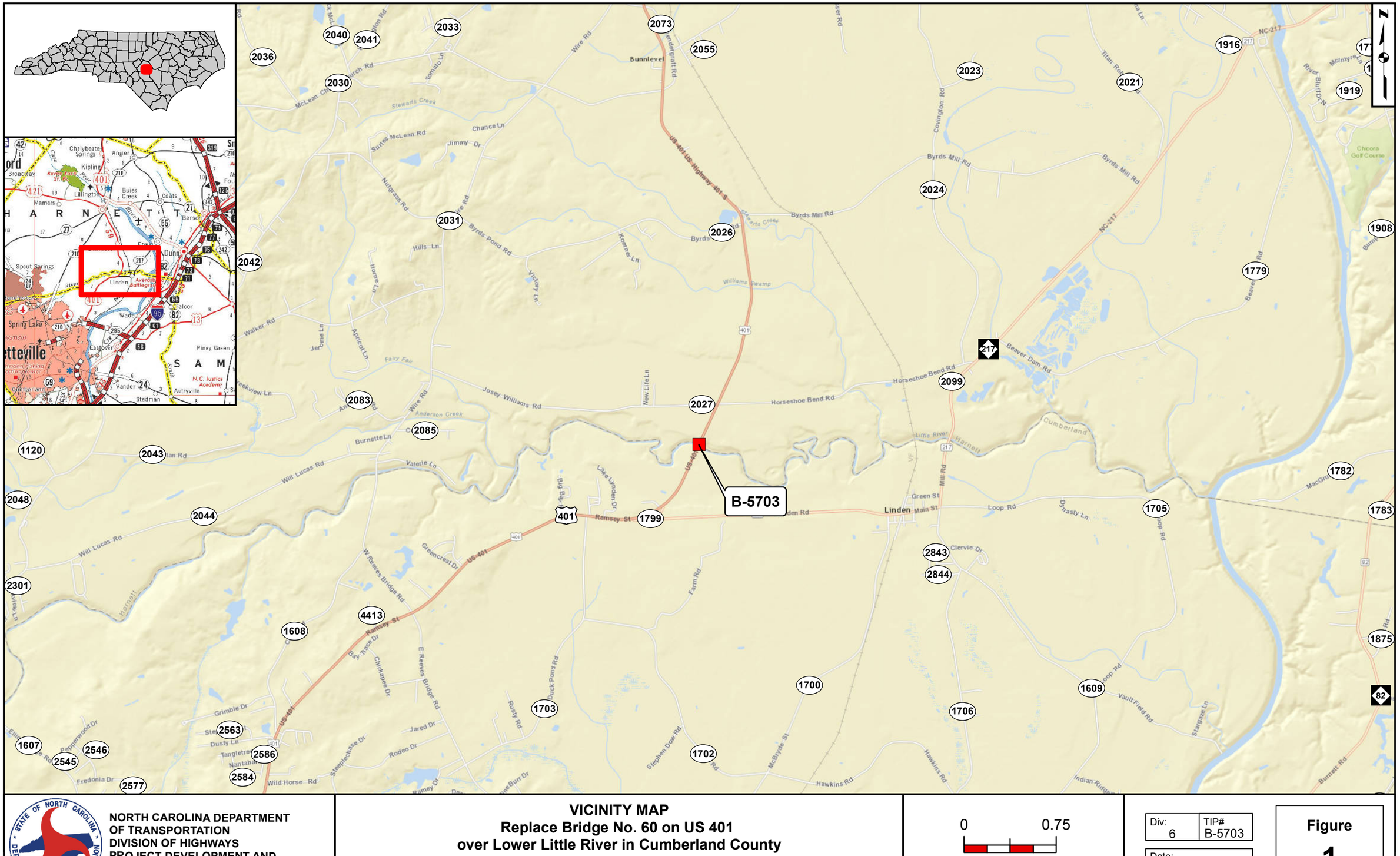
Full Name: *

Mack Christopher Rivenbark III

Signature

Date

8/9/2019



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS UNIT

VICINITY MAP
Replace Bridge No. 60 on US 401
over Lower Little River in Cumberland County

TIP Project B-5703

0 0.75
Miles

Div: 6	TIP# B-5703
Date: DECEMBER 2015	

Figure 1

This Exhibit is for planning purposes only and shown herein does not meet NC 47-30 Requirements and therefore is not for design, construction, or recording or transfer of title. The Exhibit was compiled from available information obtained from the sources listed below. Streams and Wetlands: All features located in the field were recorded using a survey grade TOPCON GRS-1 GPS with Glonass receiver with supposed sub-50 centimeter accuracy,

Sources: ESRI Base Mapping, NCDOT, SEPI

April 2016

1 inch = 200 feet

GRAPHIC SCALE

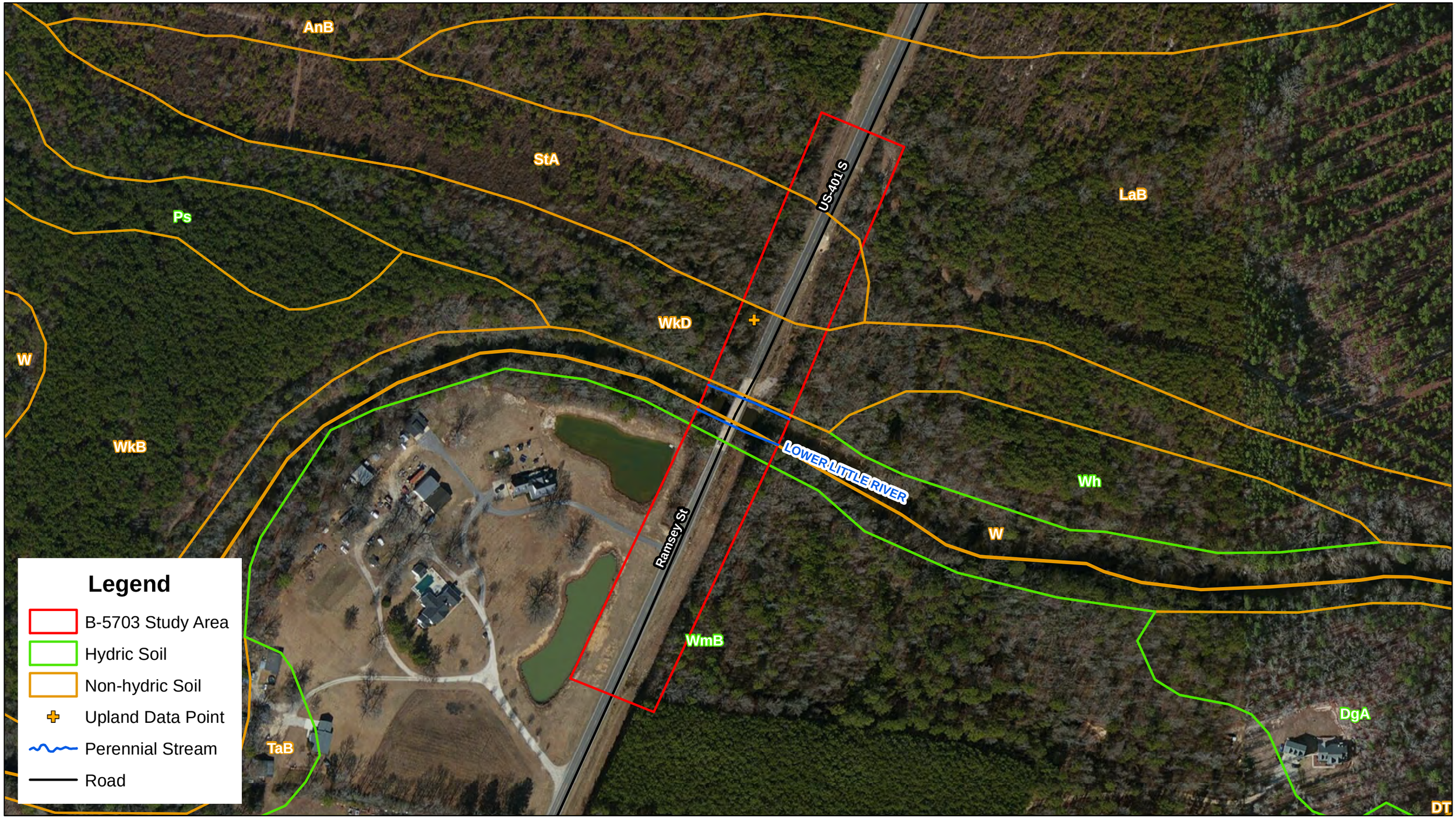
0 100 200 400 Feet

Figure 2: Jurisdictional Features

B-5703, Cumberland County

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

SEPI ENGINEERING & CONSTRUCTION



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Sources: ESRI Base Mapping, NCDOT, SEPI, Cumberland County Soil Survey, Harnett County Soil Survey

April 2016

1 inch = 200 feet

GRAPHIC SCALE

0 100 200 400 Feet

Figure 3: Soils

B-5703, Cumberland County

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

SEPI ENGINEERING & CONSTRUCTION

US-401 S

Ramsey St

LOWER LITTLE RIVER

Legend

- B-5703 Study Area
- Upland Data Point
- Perennial Stream
- Road

Elevation

Value

High : 175

Low : 80

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Sources: ESRI Base Mapping, NCDOT, SEPI

April 2016

1 inch = 200 feet

GRAPHIC SCALE

0 100 200 400

Feet

Figure 4: LiDAR

B-5703, Cumberland County

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

SEPI ENGINEERING & CONSTRUCTION

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Sources: ESRI Base Mapping, NCDOT, SEPI

April 2016

1 inch = 1,000 feet

GRAPHIC SCALE

0 500 1,000 2,000 Feet

Figure 5: USGS Topographic Quadrangle, Bunn Level, NC

B-5703, Cumberland County

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

SEPI ENGINEERING & CONSTRUCTION

SEPI ENGINEERING & CONSTRUCTION

STREAMS															
Map ID	**Linear (ft)**	**NCDWQ Score**	**Cowardin Code**	**HGM Code**	**Waters Type**	**Classification**	**Local Waterway**	**On Topo Map**	**On Soils Map**	**404 Jurisdiction**	**401 Jurisdiction**	**Subject to Buffers**	**Comments**	**JD Review Date**	**Reviewer**
LITTLE RIVER	~200	-	R3UB1-RIVERINE, UPPER PEREN, UNCONSOL BOT, COBBLE	RIVERINE	RPW	PERENNIAL	LITTLE RIVER	YES	YES	YES	YES	NO	NON-SECTION 10 NON-WETLAND		

ATTACHMENT A

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

BACKGROUND INFORMATION

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

B. NAME AND ADDRESS OF PERSON REQUESTING PRELIMINARY JD:
KIM HAMLIN
1025 WADE AVENUE, RALEIGH NC 27605

C. DISTRICT OFFICE, FILE NAME, AND NUMBER:
WILMINGTON DISTRICT OFFICE

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:
B-5703, BRIDGE #60, CUMBERLAND COUNTY

(USE THE ATTACHED TABLE TO DOCUMENT MULTIPLE WATERBODIES AT DIFFERENT SITES)

State: NC County/parish/borough: CUMBERLAND City: LINDEN

Center coordinates of site (lat/long in degree decimal format):
Lat. 35.2631 °N; Long. 78.7766 °W.

Universal Transverse Mercator: 17S 702256 3904493 UTM

Name of nearest waterbody: LITTLE RIVER

Identify (estimate) amount of waters in the review area:
Non-wetland waters:
200 linear feet: 70 width (ft) and/or _____ acres.

Cowardin Class: R3UB1-RIVERINE, UPPER PEREN, UNCONSOL BOT, COBBLE

Stream Flow: PERENNIAL

Wetlands: 0 acres.

Cowardin Class: NA

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

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☐ Office (Desk) Determination. Date: _____

☐ Field Determination. Date(s): _____

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

☑ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: _____

☑ Data sheets prepared/submitted by or on behalf of the applicant/consultant.

- ☐ Office concurs with data sheets/delineation report.
- ☐ Office does not concur with data sheets/delineation report.

☐ Data sheets prepared by the Corps: _____

☐ Corps navigable waters' study: _____

☐ U.S. Geological Survey Hydrologic Atlas: _____

☐ USGS NHD data

☐ USGS 8 and 12 digit HUC maps

☑ U.S. Geological Survey map(s). Cite scale & quad name: BUNN LEVEL, NC; 1:24K

☑ USDA Natural Resources Conservation Service Soil Survey. Citation: SOIL SURVEY OF CUMBERLAND AND HOKE COUNTIES, 1984

☐ National wetlands inventory map(s). Cite name: _____

☐ State/Local wetland inventory map(s): _____

☐ FEMA/FIRM maps: _____

☐ 100-year Floodplain Elevation is: _____ (National Geodectic Vertical Datum of 1929)

☑ Photographs: ☑ Aerial (Name & Date): ESRI AERIAL IMAGERY or ☐ Other (Name & Date): _____

☐ Previous determination(s). File no. and date of response letter: _____

☑ Other information (please specify): LiDAR

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

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

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

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

_____	_____ 03/31/16
Signature and date of Regulatory Project Manager (REQUIRED)	Signature and date of person requesting preliminary JD (REQUIRED, unless obtaining the signature is impracticable)

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: B-5703/Bridge 60 **City/County:** Cumberland **Sampling Date:** 12-Feb-16

Applicant/Owner: NCDOT **State:** NC **Sampling Point:** Upland DP

Investigator(s): K. Hamlin, W. Smith **Section, Township, Range:** S T R

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °

Subregion (LRR or MLRA): MLRA 133A in LRR P **Lat.:** 35.2637 **Long.:** -78.7764 **Datum:** NAD83

Soil Map Unit Name: WkD - Wickham fine sandy loam, 6 to 15 percent slopes **NWI classification:** None

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○ No ◉	
Wetland Hydrology Present?	Yes ○ No ◉	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) (LRR U)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of 2 required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (LRR T, U)

Field Observations:

Surface Water Present?	Yes ○	No ◉	Depth (inches):
Water Table Present?	Yes ○	No ◉	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ○	No ◉	Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Five/Four Strata) - Use scientific names of plants.

Sampling Point: Upland DP

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 50')				
1. Liquidambar styraciflua	10	☑	33.3%	FAC
2. Celtis laevigata	5	☑	16.7%	FACW
3. Carya tomentosa	5	☑	16.7%	UPL
4. Quercus alba	5	☑	16.7%	FACU
5. Acer rubrum	5	☑	16.7%	FAC
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
50% of Total Cover: 15 20% of Total Cover: 6	30	= Total Cover		
Sapling or Sapling/Shrub Stratum (Plot size: 30')				
1. Celtis laevigata	15	☑	50.0%	FACW
2. Ilex opaca	10	☑	33.3%	FAC
3.	5	☐	16.7%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
50% of Total Cover: 15 20% of Total Cover: 6	30	= Total Cover		
Shrub Stratum (Plot size: 30')				
1. Ligustrum sinense	10	☑	100.0%	FAC
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
50% of Total Cover: 5 20% of Total Cover: 2	10	= Total Cover		
Herb Stratum (Plot size:)				
1.	0	☐	0.0%	
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
11.	0	☐	0.0%	
12.	0	☐	0.0%	
50% of Total Cover: 0 20% of Total Cover: 0	0	= Total Cover		
Woody Vine Stratum (Plot size: 30')				
1. Smilax rotundifolia	15	☑	60.0%	FAC
2. Rosa multiflora	10	☑	40.0%	FACU
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
50% of Total Cover: 12.5 20% of Total Cover: 5	25	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 10 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 70.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:		
OBL species	0	x 1 =	0	
FACW species	20	x 2 =	40	
FAC species	50	x 3 =	150	
FACU species	15	x 4 =	60	
UPL species	5	x 5 =	25	
Column Totals:	90 (A)		275	(B)

Prevalence Index = B/A = 3.056

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Definition of Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1m) tall.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks: (If observed, list morphological adaptations below).

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

SOIL

Sampling Point: Upland DP

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)	%	Type [1]	Loc²	Texture	Remarks
0-2	10YR	2/2	100					Sand	
2-12+	10YR	5/6	100					Sand	

[1] Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains ²Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) (LRR P, T, U)
- ☐ 5 cm Mucky Mineral (A7) (LRR P, T, U)
- ☐ Muck Presence (A8) (LRR U)
- ☐ 1 cm Muck (A9) (LRR P, T)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) (MLRA 150A)
- ☐ Sandy Muck Mineral (S1) (LRR O, S)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (LRR P, S, T, U)
- ☐ Polyvalue Below Surface (S8) (LRR S, T, U)
- ☐ Thin Dark Surface (S9) (LRR S, T, U)
- ☐ Loamy Mucky Mineral (F1) (LRR O)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) (LRR U)
- ☐ Depleted Ochric (F11) (MLRA 151)
- ☐ Iron-Manganese Masses (F12) (LRR O, P, T)
- ☐ Umbric Surface (F13) (LRR P, T, U)
- ☐ Delta Ochric (F17) (MLRA 151)
- ☐ Reduced Vertic (F18) (MLRA 150A, 150B)
- ☐ Piedmont Floodplain Soils (F19) (MLRA 149A)
- ☐ Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (LRR O)
- ☐ 2 cm Muck (A10) (LRR S)
- ☐ Reduced Vertic (F18) (outside MLRA 150A,B)
- ☐ Piedmont Floodplain Soils (F19) (LRR P, S, T)
- ☐ Anomalous Bright Loamy Soils (F20) (MLRA 153B)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

Aquatic Species Survey Report

Replacement of Bridge No. 60 on US 401
Over Lower Little River
Cumberland and Harnett Counties, North Carolina

TIP B-5703
WBS Element # 45657.1.1

Prepared For:

NC Department of Transportation
Raleigh, North Carolina

Contact Person:

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May 30, 2019

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Table of Contents

1.0 Introduction

The North Carolina Department of Transportation (NCDOT) proposes the replacement of Bridge No. 60 over Lower Little River on US 401 in Cumberland and Harnett counties (Appendix A, Figure 1). The Lower Little River is located in the Cape Fear River Basin. The Cape Fear Shiner (*Notropis mekistocholas*) is currently listed for both Cumberland and Harnett Counties by the U.S. Fish and Wildlife Service (USFWS) as protected species under the Endangered Species Act (ESA). The Atlantic Pigtoe (*Fusconaia masoni*), was proposed to be listing as Threatened under the ESA on October 11, 2018. Two additional species were proposed to be listed under ESA on May 22, 2019, the Neuse River Waterdog (*Necturus lewisi*) and the Carolina Madtom (*Noturus furiosus*), are both noted for Harnett County but are not know from the Cape Fear Basin and are not evaluated further in this report.

A review of the NC Natural Heritage Program (NCNHP) records, last accessed on May 04, 2018, indicated that no element occurrence (EO) exists for a target species within a 5-mile buffer of the project location (Figure 2). The closest occurrence for Cape Fear Shiner (EO ID 27861) is approximately 10.3 stream miles upstream on the Cape Fear River. This EO was first and last observed on July 23, 2007. The closest occurrence for Atlantic Pigtoe (EO ID 24770) is approximately 18.5 stream miles downstream on the Cape Fear River. The only observation date listed for this historical EO is Pre-1972.

As part of the federal permitting process that requires an evaluation of potential project related impacts to federally protected species, Rummel, Klepper, and Kahl (RK&K) was contracted by NCDOT to conduct the freshwater mussel and fish surveys targeting the Atlantic Pigtoe and Cape Fear Shiner.

2.0 Waters Affected

The Lower Little River is located in the Cape Fear River Basin (HUC# 03030004). From the project location, the Lower Little River flows approximately 6.5 stream miles to the Cape Fear River.

2.1 NPDES Dischargers

There are no NPDES permitted dischargers located such that they could affect the water quality in the Lower Little River at the project site.

2.2 303(d) Classification

The Lower Little River is not on the North Carolina Department of Environmental Quality (NCDEQ) - Division of Water Resources 2016 303(d) list of impaired streams or the 2018 draft list.

3.0 Target Species Description

3.1 Atlantic Pigtoe (*Fusconaia masoni*)

3.1.1 Characteristics

The Atlantic Pigtoe (*Fusconaia masoni* (Conrad 1834)) is a small, freshwater mussel that rarely exceeds 60 mm in length. The shells are usually compressed and have a sub-rhomboid outline; however, specimens from headwater streams tend to be more elongate than those found in larger waterways. The umbo extends well above the dorsal margin and the posterior ridge is angular and very distinct. The periostracum is yellowish brown or greenish brown with a parchment-like texture. The nacre is somewhat shiny and can be white, salmon, orange or iridescent blue.

Maximum age for the Atlantic Pigtoe is approximately 58 years and it is a short-term brooding (tachytictic) species. Specifically, the species becomes gravid and releases glochidia multiple times between late June through early July. Identified fish hosts for this species include the Bluegill (*Lepomis macrochirus*) and Shield Darter (*Percina peltata*).

3.1.2 Distribution and Habitat Requirements

The Atlantic Pigtoe is a southern Atlantic Slope species that is found from the James River basin in Virginia south to the Altamaha River basin in Georgia. Within North Carolina, the Atlantic Pigtoe historically inhabited the Roanoke, Tar-Pamlico, Neuse, Cape Fear, Yadkin-Pee Dee, and Catawba river basins. It appears that this mussel may be extirpated from the North Carolina portion of the Catawba River basin and potentially some areas within all river basins.

The Atlantic Pigtoe occupies riffles and runs in medium to large streams. Specifically, it typically inhabits moderately fast velocity areas that contain stable gravel, or sand and gravel substrate.

3.2 Cape Fear Shiner (*Notropis mekistocholas*)

3.2.1 Characteristics

The Cape Fear Shiner (*Notropis mekistocholas* (Snelson 1971)) is a small (approximately 50 mm long), yellowish minnow with a black band along the lateral line. The shiner also has yellow fins, a black upper lip, and a lower lip that bears a thin black bar. The Cape Fear Shiner forages primarily on plant and animal material. In addition, the digestive tract of the Cape Fear Shiner is long and coiled, unlike most other minnows within the genus *Notropis*.

3.2.2 Distribution and Habitat Requirements

The Cape Fear Shiner is endemic to the upper Cape Fear River Basin in the Central Piedmont of North Carolina. The species is known from tributaries and mainstreams of the Cape Fear, Deep, Haw and Rocky Rivers in Chatham, Harnett, Lee, Moore and Randolph counties.

This shiner is generally associated with gravel, cobble, and boulder substrates, and has been observed in slow pools, riffles, and slow runs. These areas occasionally support Water Willow (*Justicia americana*), which may be used as cover or protection from predators (e.g. Flathead Catfish (*Pylodictis olivaris*), bass (*Micropterus* spp.) and crappie (*Pomoxis* spp.)). The Cape Fear Shiner can be found swimming in schools of other minnow species but is never the most abundant species.

4.0 Survey Efforts

Freshwater mussel and fish surveys were conducted in association with this project by RK&K personnel Neil Medlin (Permit # 18-ES00030), Matt Martin and Hal Bain on June 21, 2018. The survey location was moved from the project site downstream to NC 217. The NC 217 crossing was selected due to the presence of extended reaches of shallow water which allowed for more effective survey efforts. The NC 217 location also increased the potential for colonization of the survey reach by the target species from Cape Fear River populations.

4.1 Stream Conditions at Time of Survey: Lower Little River at NC 217

The Lower Little River at NC 217 was twenty-seven meters wide and exhibited run and riffle flow regimes. The banks were approximately two meters high with some erosion/undercutting present. The maximum depth was 1.5 meters with an average depth of 0.5 meter. The substrate was primarily sand and gravel with clay, cobble and boulder also present. No beaver activity was observed at the survey location. A moderate width, forested buffer is present within the survey location.

4.2 Methodology

4.2.1 Mussels

A mussel survey was conducted from approximately 400 meters downstream of the bridge crossing to approximately 100 meters upstream of the crossing for a total of approximately 500 meters. Areas of appropriate habitat were searched, concentrating on the stable habitats preferred by the target species. Visual surveys were conducted with view buckets (bathyscopes) along with tactile methods that were employed where appropriate. All freshwater bivalves were recorded and returned to the substrate. Timed survey efforts typically provide Catch Per Unit Effort (CPUE) data for each species.

4.2.2 Fish

A fish survey was conducted from approximately 400 meters downstream of the bridge crossing to approximately 100 meters upstream of the crossing for a total of approximately 500 meters. The survey was conducted using a Smith-Root Model LR-24 backpack electrofishing unit and dip nets. The stream was sampled with one biologist operating the electrofishing unit while the other biologists collected the stunned fish with dip nets. All stunned fish were collected and temporarily placed in a 5-gallon bucket. All fish were identified and released onsite.

5.0 Results

5.1 Mussels

A total of 2.25-person hours of survey time were spent in the survey reach with three freshwater mussel species and one freshwater clam observed. No Atlantic Pigtoe were observed during the survey.

Table 1. CPUE for Freshwater Mussels in the Lower Little River, June 21, 2018

Scientific Name	Common Name	# live	#shells	Abundance/ CPUE
Freshwater Mussels				CPUE
Elliptio complanata	Eastern Elliptio	8	0	3.56/hr.
Elliptio congaraea	Carolina Slabshell	4	0	1.78/hr.
Elliptio roanokensis	Roanoke Slabshell	7	0	3.1/hr.
Freshwater Clams				
Corbicula fluminea	Asian Clam			R-C*

* R=Rare, C=Common

5.2 Fish

Fifteen fish species were identified during the survey with a total of 474 individuals observed (Table 2). No Cape Fear Shiners were collected. A total of 1202 shocking seconds were utilized during this survey.

Table 2. Fish Species in the Lower Little River, June 21, 2018

Scientific Name	Common Name	No. Individuals
Cyprinella analostana	Satinfin Shiner	45
Lepomis macrochirus	Bluegill	4
Cyprinella nivea	Whitefin Shiner	362
Luxilus albeolus	White Shiner	8
Percina crassa	Piedmont Darter	8
Etheostoma flabellare	Fantail Darter	2
Anguilla rostrata	American Eel	1
Noturus insignis	Tessellated Darter	5
Notropis scepticus	Sandbar Shiner	15
Lepomis auritus	Redbreast Sunfish	9
Hybopsis zanema	Santee Chub	6
Fundulus lineolatus	Lined Topminnow	1
Acantharchus pomotis	Mud Sunfish	1
Notropis hudsonius	Spottail Shiner	5
Micropterus sp.	Bass	2

Scientific Name	Common Name	No. Individuals
Total Number of Individuals		474
Total Number of Species		15
Electrofishing Seconds		1202

6.0 Discussion/Conclusions

The mussel and fish surveys did not document either of the target species. Based the survey results and the distance from the project site to closest NCHNP EO (over 18 stream miles to a historical EO), completion of the project will not affect the Atlantic Pigtoe.

Biological Conclusion for Altantic Pigtoe: No Effect

Although no Cape Fear Shiners were collected during the fish survey, an NCNHP EO (located on the Cape Fear River) is slightly over 10 stream miles from the project site. Given the mobility of the species and the relative proximity of the known occurrence, the presence of the Cape Fear Shiner at the project location cannot be completely discounted.

Biological Conclusion for Cape Fear Shiner: May Affect; Not Likely to Adversely Affect

7.0 References

North Carolina Department of Environmental Quality - Division of Water Resources. 2018 North Carolina 2016 303(d) list and draft 2018 list. Available: https://files.nc.gov/ncdeq/Water%Quality/Planning/TMDL/303d/2016/2016_NC_Category_5_303d_list.pdf (August 2018).

North Carolina Department of Environmental Quality. NPDES Wastewater Treatment Facility Permits. Available: http://data-ncdenr.opendata.arcgis.com/datasets/a86af4f7549343419b4c8177cedb3e4b_0 (August 2018).

North Carolina Natural Heritage Program (NCNHP). 2018. nheo-2018-10. Natural Heritage Element Occurrence polygon shapefile. (October 2018).

North Carolina Wildlife Resources Commission. 2019. Unpublished Aquatics Database.

North Carolina Wildlife Resources Commission. 2019. Atlantic Pigtoe Species Profile. Available: http://www.ncwildlife.org/Learning/Species/Mollusks/Atlantic-Pigtoe. (February 2019).

North Carolina Wildlife Resources Commission. 2019. Cape Fear Shiner (*Notropis mekistocholas*) Species Profile. Available: https://www.ncwildlife.org/Learning/Species/Fish/Cape-Fear-Shiner#2513695-overview. (February 2019).

U.S. Fish and Wildlife Service. 1988. Cape Fear Shiner Recovery Plan. Atlanta, GA.

U.S. Fish and Wildlife Service. 2017. Species status assessment report for the Atlantic Pigtoe (Fusconaia masoni). Version 1.2. Atlanta, GA.

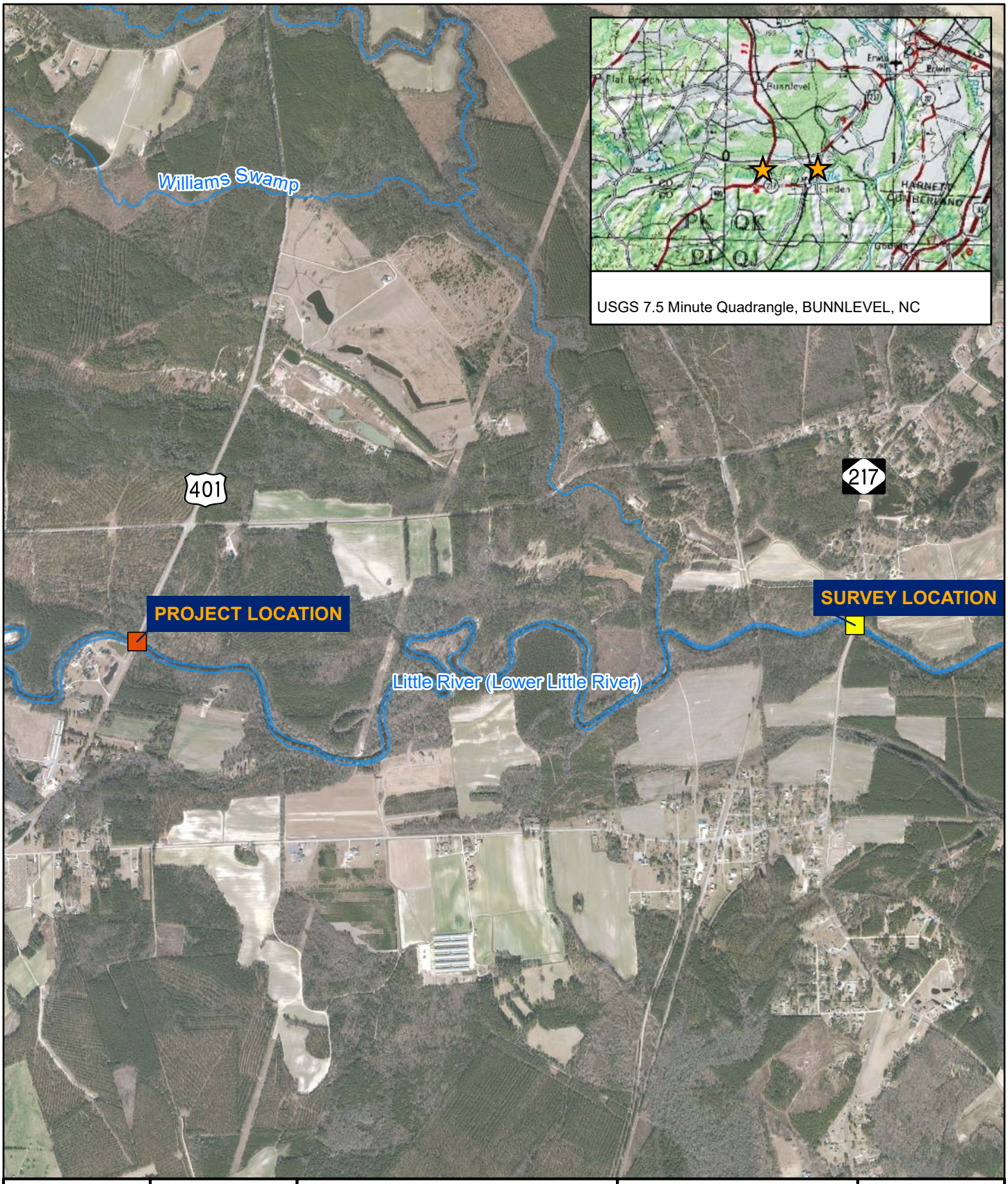
U.S. Fish and Wildlife Service. 2019. Atlantic pigtoe (*Fusconaia masoni*) Species Profile, Environmental Online System (ECOS). Available: https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=F03K. (February 2019).

U.S. Fish and Wildlife Service. 2019. Cape Fear Shiner (*Notropis mekistocholas*) Species Profile. Available: https://www.fws.gov/southeast/wildlife/fishes/cape-fear-shiner/. (February 2019).

Wolf, E. D. 2012. Propagation, Culture, and Recovery of Species at Risk Atlantic pigtoe. Department of Defense Legacy Resource Management Program, Project No. 11-108.

Appendix A

Figures



Prepared By:

RK&K

Prepared For:

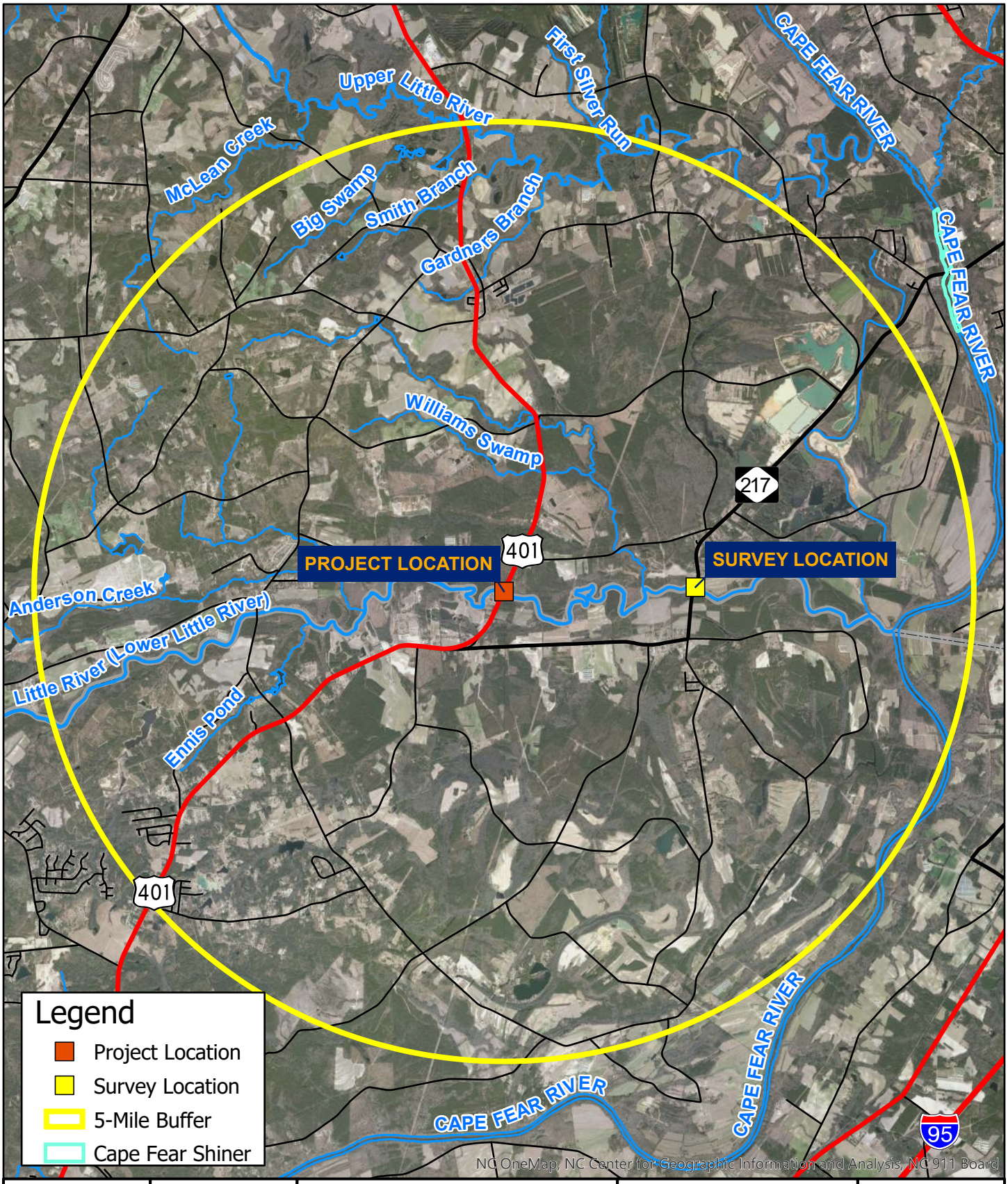
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

Freshwater Mussel Survey
BRIDGE # 60 ON US 401
OVER LOWER LITTLE RIVER
B-5703

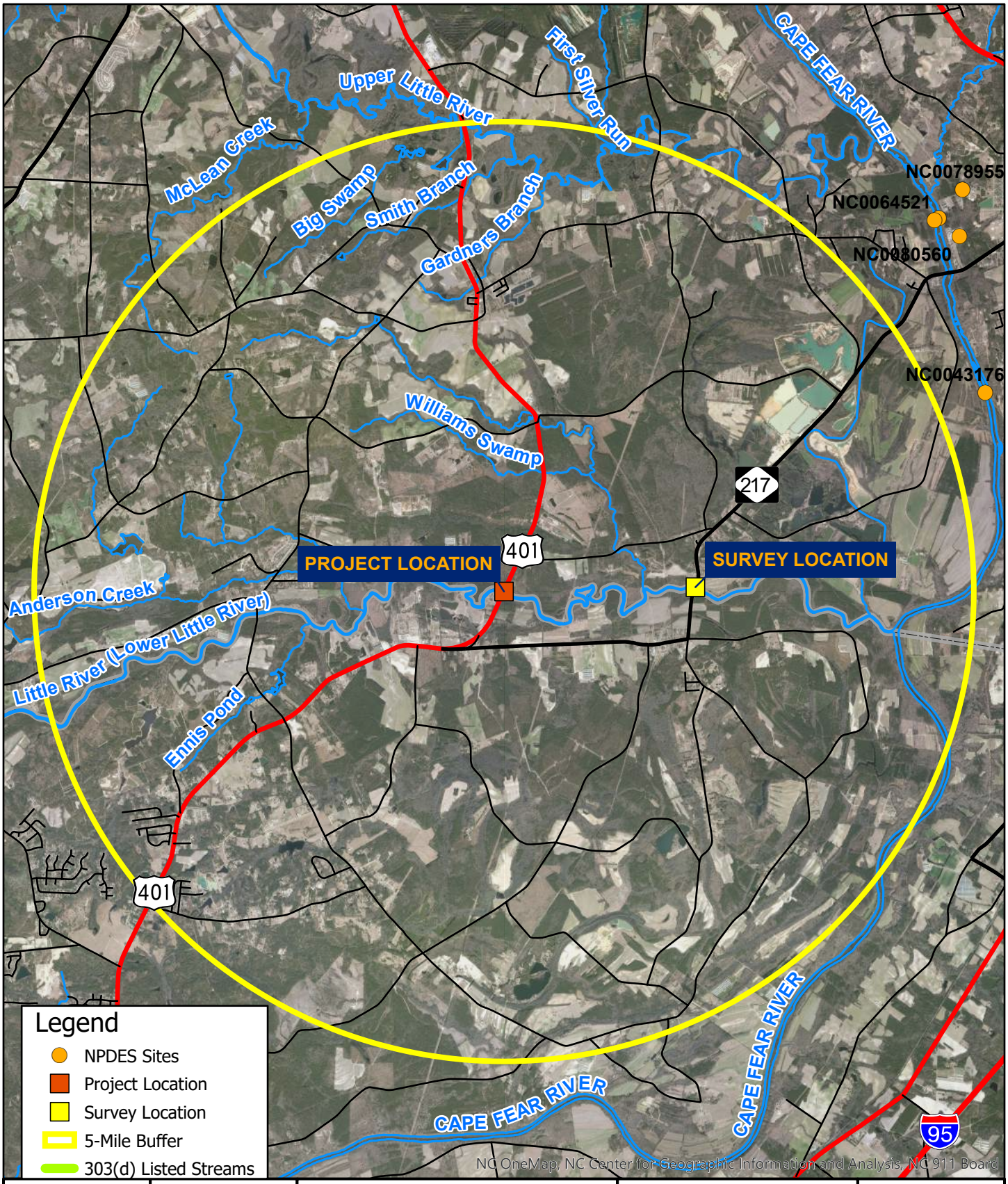
CUMBERLAND COUNTY

Date:	May 2019
Scale	0 — 1,500 US Feet
Job No.	B-5703
Drawn by:	GSM
Checked by:	KNM

Figure 1



Prepared By: RK&K	Prepared For: State of North Carolina Department of Transportation	**NC NHP Element Occurrence** BRIDGE # 60 ON US 401 OVER LOWER LITTLE RIVER B-5703 CUMBERLAND COUNTY	Date: May 2019 Scale: 0 1 Miles Job No. B-5703 Drawn by: GSM Checked by: KNM	**Figure 2**



Prepared By:

Prepared For:

NPDES Dischargers and 303(d) Listed Streams

BRIDGE # 60 ON US 401
OVER LOWER LITTLE RIVER
B-5703

CUMBERLAND COUNTY

Date:	May 2019
Scale	0 1 Miles
Job No.	B-5703
Drawn by:	GSM
Checked by:	KNM

Figure 3

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

General Project Information

WBS Element:	45657.1.1	**TIP Number:**	B-5703	**Project Type:**	Bridge Replacement	**Date:**	4/25/2019
NCDOT Contact:	Frank Fleming			**Contractor / Designer:**	Leah Young, PE		
Address:	940 Main Campus Drive Suite 500 Raleigh, NC 27606			**Address:**	4505 Falls of Neuse Road Suite 400 Raleigh, NC 27609		
Phone:	(919) 829-0328			**Phone:**	(919) 783-9214		
Email:	ffleming@vhb.com			**Email:**	Leah.Young@kci.com		
City/Town:	Fayetteville, NC			**County(ies):**	Cumberland		
River Basin(s):	Cape Fear			**CAMA County?**	No		
Wetlands within Project Limits?	No						

Project Description

Project Length (lin. miles or feet):	0.176 miles	**Surrounding Land Use:**	Residential/Forest

	Proposed Project	**Existing Site**
Project Built-Upon Area (ac.)	1.5 ac.	1.2 ac.
Typical Cross Section Description:	-L- STA. 14+00.00 TO STA. 15+70.00 and -L- STA. 18+41.00 TO STA. 20+57.00 have 12' lanes and 8' shoulders (2' FDPS). -L- STA. 12+26.00 TO 14+00.00, STA. 15+70.00 TO STA. 15+94 +/-, STA. 17+91 +/- TO STA. 18+41.00, and STA. 20+57.00 TO STA. 21+57.00 will also have 12' lanes and 8' shoulders (4' FDPS). The bridge section (-L- STA. 15+94 +/- TO STA. 17+91 +/- has 12' lanes with 4' shoulders. -L- STA. 13+58.60 TO -L- STA 15+94.20 and -L- STA. 17+91.20 TO -L- STA. 21+01.58 on the left will have guardrail. -L- STA. 12+83.83 TO -L- STA. 15+94.20 and -L- STA. 17+91.20 TO -L- STA. 19+39.08 on the right will also have guardrail.	24' roadway with 2' paved shoulder
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 9100 Year: 2040	Existing: 5700 Year: 2016
General Project Narrative: (Description of Minimization of Water Quality Impacts)	The project will replace Cumberland County Bridge #69 and its approaches. The proposed replacement is 197' long with a clear roadway of 32'. This structure provides 2-12' travel lanes with 4' shoulders. The proposed bridge will have 1.5:1 abutments and 4' caps at the end bents. Placement and construction of the proposed bridge, end bents, caps, and associated roadway fill will not result in any wetland or similar environmental impacts. There will be no permanent channel changes. STORMWATER CONTROLS: The proposed bridge does utilize deck drains, but no water discharging from these drains is discharging over open water. The discharge on the left side of the bridge discharges through an inlet/pipe system outside of the jurisdictional stream at non-erosive velocities. Additionally, the entire length of the existing ditch on the right side of the bridge will have a proposed special cut ditch with 3:1 or flatter side slopes. This ditch becomes a lateral base ditch that discharges to rip rap at the embankment of Little River at non-erosive velocities. The entire length of this proposed ditch is listed in the "Swales" summary sheet. Roadway runoff is treated via vegetated roadway shoulders and existing/proposed vegetated swales prior to entering the stream. Class II riprap will be placed under the bridge on either side of the channel at a minimum elevation of one foot above the natural water surface to provide bank stabilization and prevent impacts to the stream.	

Surface Water Body (1):	Little River (Lower Little River)		**NCDWR Stream Index No.:**	18-23-(24)	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	N/A			**Buffer Rules in Effect:**	N/A
Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	No	**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)					

(Version 2.08; Released April 2018)

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

WBS Element: 45657.1.1 **TIP No.:** B-5703 **County(ies):** Cumberland

Swales

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
4	-L- 17+91.30 LT -L- 18+50.00 LT	(1)Little River (Lower Little	2.0	3.0	3.0	1.6	160	68	9.10%	N/A	N/A	4.2	3.2	No	No
4	-L- 18+50.00 LT -L- 19+50.00 LT	(1)Little River (Lower Little	2.0	3.0	3.0	1.6	160	98	0.96%	N/A	N/A	4.2	2.1	No	No
4	-L- 19+50.00 LT -L- 21+00.00 LT	(1)Little River (Lower Little	2.0	3.0	3.0	1.6	160	186	0.76%	N/A	N/A	4.2	1.9	No	No

Additional Comments

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element: **TIP No.:** B-5703 **County(ies):** Cumberland

Preformed Scour Holes and Energy Dissipators

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Energy Dissipator Type	Riprap Type	Drainage Area (ac)	Conveyance Structure	Pipe/Structure Dimensions (in)	Q10 (cfs)	V10 (fps)	BMP Associated w/ Buffer Rules?
4	-L- STA 15+65 LT	(1)Little River (Lower Little	Rip Rap Pad at Outlet	Class 'B'	0.0	Pipe	15	0.1	0.9	N/A

Additional Comments

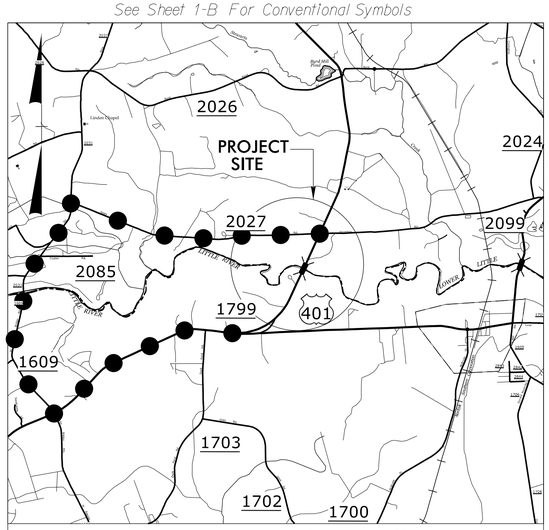
* Refer to the NCDOT Best Management Practices Toolbox (2014), NCDOT Standards, the Federal Highway Administration (FHWA) Hydraulic Engineering Circular No. 14 (HEC-14), Third Edition, Hydraulic Design of Energy Dissipators for Culverts and Channels (July 2006), as applicable, for design guidance and criteria.

09/08/09

TIP PROJECT: B-5703

CONTRACT:

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



25% PRELIMINARY PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PERMIT DRAWING
SHEET 1 OF 12

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5703	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
45657.1.1		P.E.

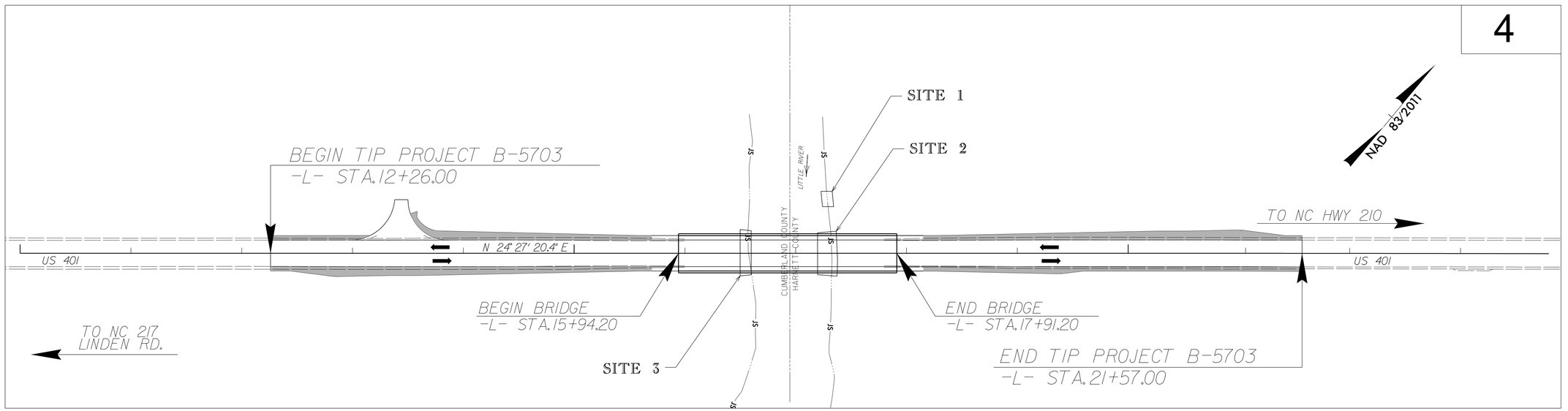
CUMBERLAND COUNTY

LOCATION: REPLACE BRIDGE NO. 60 OVER LOWER LITTLE RIVER ON US 401

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

WETLAND AND SURFACE WATER IMPACTS PERMIT

4



INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITON

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

THIS PROJECT IS NOT WITHIN MUNICIPAL BOUNDARIES.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD _.

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2016 = 5700
ADT 2040 = 9100
K = 8 %
D = 55 %
T = 6 % *
V = 60 MPH
* TTST = 4% DUAL 2%
FUNC CLASS = COLLECTOR
REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-5703 = .139 MILES
LENGTH OF STRUCTURE TIP PROJECT B-5703 = .037 MILES
TOTAL LENGTH OF TIP PROJECT B-5703 = .176 MILES

Prepared In the Office of:
KCI Associates of N.C., P.A.
4505 Falls of Neuse Road, Suite 400
Raleigh, NC 27609
Phone (919) 783-9214
Fax (919) 783-9266
http://www.kci.com

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MARCH 3, 2019

LETTING DATE:
FEB. 2, 2020

NCDOT CONTACT: DAVID STUTTS, PE
STRUCTURES MANAGEMENT UNIT

Plans Prepared For:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr.
Raleigh NC, 27610

DEWAYNE L. SYKES, P.E.
PROJECT ENGINEER

BRYAN E. HOUGH, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

STATE OF NORTH CAROLINA * DEPARTMENT OF TRANSPORTATION *

4/25/2019
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Elizabeth.Sheldon

8/17/99

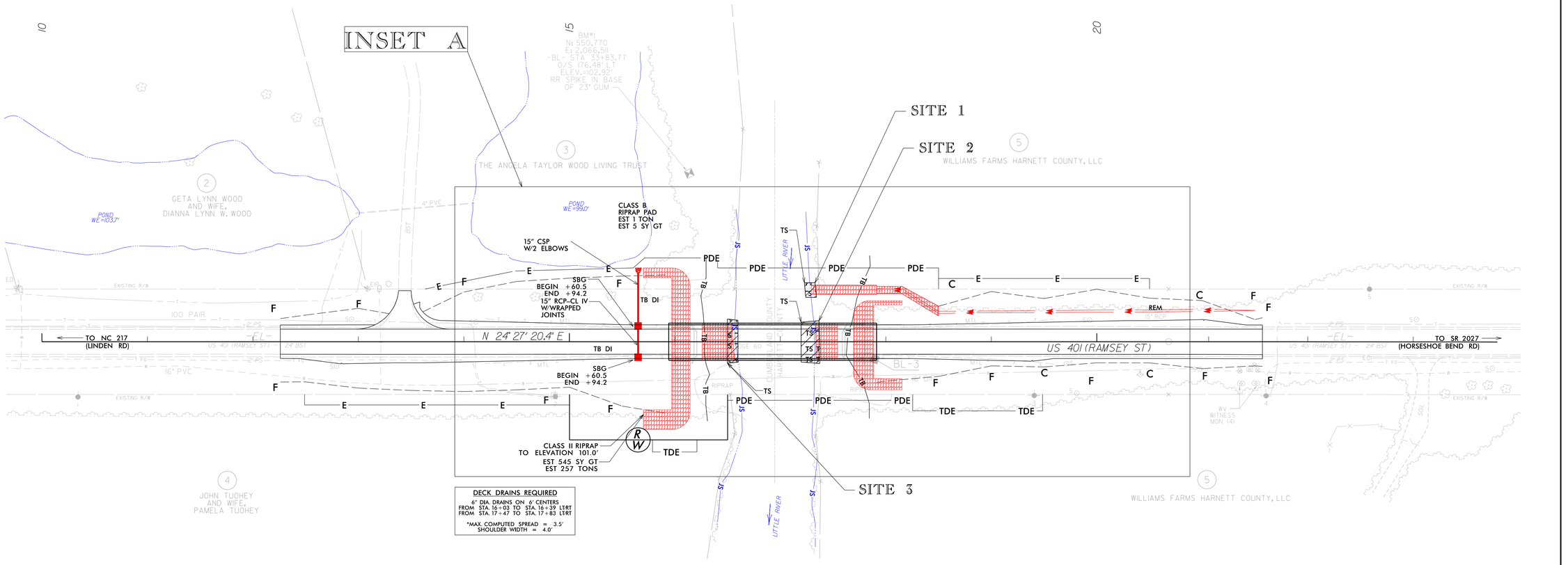
PROJECT REFERENCE NO.	SHEET NO.
B-5703	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

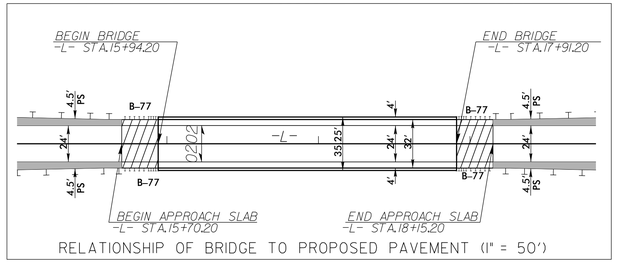
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

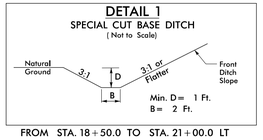
PERMIT DRAWING SHEET 2 OF 12

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER



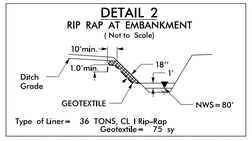


DETAIL 1
SPECIAL CUT BASE DITCH
(Not to Scale)



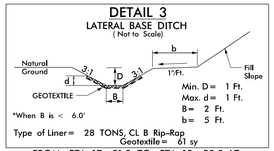
FROM STA. 18+50.0 TO STA. 21+00.0 LT

DETAIL 2
RIP RAP AT EMBANKMENT
(Not to Scale)



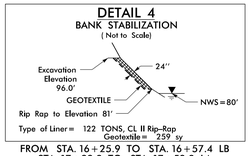
FROM STA. 17+28.0 TO STA. 17+91.30 LT

DETAIL 3
LATERAL BASE DITCH
(Not to Scale)



FROM STA. 17+91.3 TO STA. 18+50.0 LT

DETAIL 4
BANK STABILIZATION
(Not to Scale)



FROM STA. 16+25.9 TO STA. 16+57.4 LB
STA. 17+33.9 TO STA. 17+53.9 LA

50' 0' 50' 100'
25'

FOR -L- PROFILE SEE SHEET 5

4/25/2018
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Elizabeth Sheldon

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-5703	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 3 OF 12

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

INSET A

SITE 1

SITE 2

SITE 3

BM#1
N: 550,770
E: 2,086,511
-BL- STA 13+83.77
O/S 176.48' LT
ELEV. 102.92'
RR SPIKE IN BASE OF 23" GUM

THE ANGELA TAYLOR WOOD LIVING TRUST

GETA LYNN WOOD AND WIFE, DIANNA LYNN H. WOOD

JOHN TUOHEY AND WIFE, PAMELA TUOHEY

WILLIAMS FARMS HARNETT COUNTY, LLC

POND WE=390'

POND WE=403.7'

CLASS B RIPRAP PAD
EST 1 TON
EST .5 SY GT

15" CSP W/2 ELBOWS

SBG
BEGIN +60.5
END +94.2
15" RCP-CL IV W/WRAPPED JOINTS

TB DI

N 24° 27' 20.4" E

TO NC 217 (LINDEN RD)

TO SR 2027 (HORSESHOE BEND RD)

US 401 (RAMSEY ST)

LITTLE RIVER

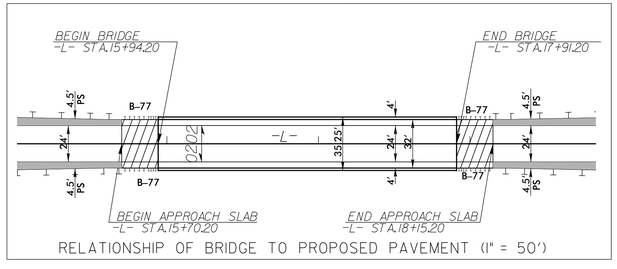
REM

WV WITNESS MON (4)

CLASS II RIPRAP TO ELEVATION 101.0'
EST 545 SY GT
EST 257 TONS

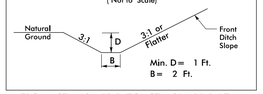
DECK DRAINS REQUIRED
6" DIA. DRAINS ON 6' CENTERS
FROM STA. 16+03 TO STA. 16+39 LTRT
FROM STA. 17+47 TO STA. 17+83 LTRT

*MAX. COMPUTED SPREAD = 3.5'
SHOULDER WIDTH = 4.0'



RELATIONSHIP OF BRIDGE TO PROPOSED PAVEMENT (1" = 50')

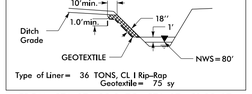
DETAIL 1
SPECIAL CUT BASE DITCH
(Not to Scale)



Min. D = 1 Ft.
B = 2 Ft.

FROM STA. 18+50.0 TO STA. 21+00.0 LT

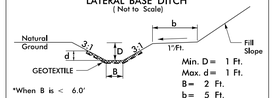
DETAIL 2
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner = 36 TONS, CL I Rip-Rap
Geotextile = 75 sy

FROM STA. 17+28.0 TO STA. 17+91.30 LT

DETAIL 3
LATERAL BASE DITCH
(Not to Scale)



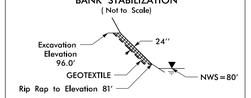
Min. D = 1 Ft.
Max. d = 1 Ft.
B = 2 Ft.
b = 5 Ft.

*When B is < 6.0'

Type of Liner = 28 TONS, CL B Rip-Rap
Geotextile = 61 sy

FROM STA. 17+91.3 TO STA. 18+50.0 LT

DETAIL 4
BANK STABILIZATION
(Not to Scale)



Type of Liner = 122 TONS, CL II Rip-Rap
Geotextile = 259 sy

FROM STA. 16+25.9 TO STA. 16+57.4 LB
STA. 17+33.9 TO STA. 17+53.9 LA

50' 0' 50' 100'
25'

FOR -L- PROFILE SEE SHEET 5

4/25/2018
M:\26018\25180194513 B-5703\Hydraulics\PERMITS_Environmental\Drawings\B-5703_prm_psh_con.dgn
Elizabeth Sheldon

PROJECT REFERENCE NO.	SHEET NO.
B-5703	PRM-4

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

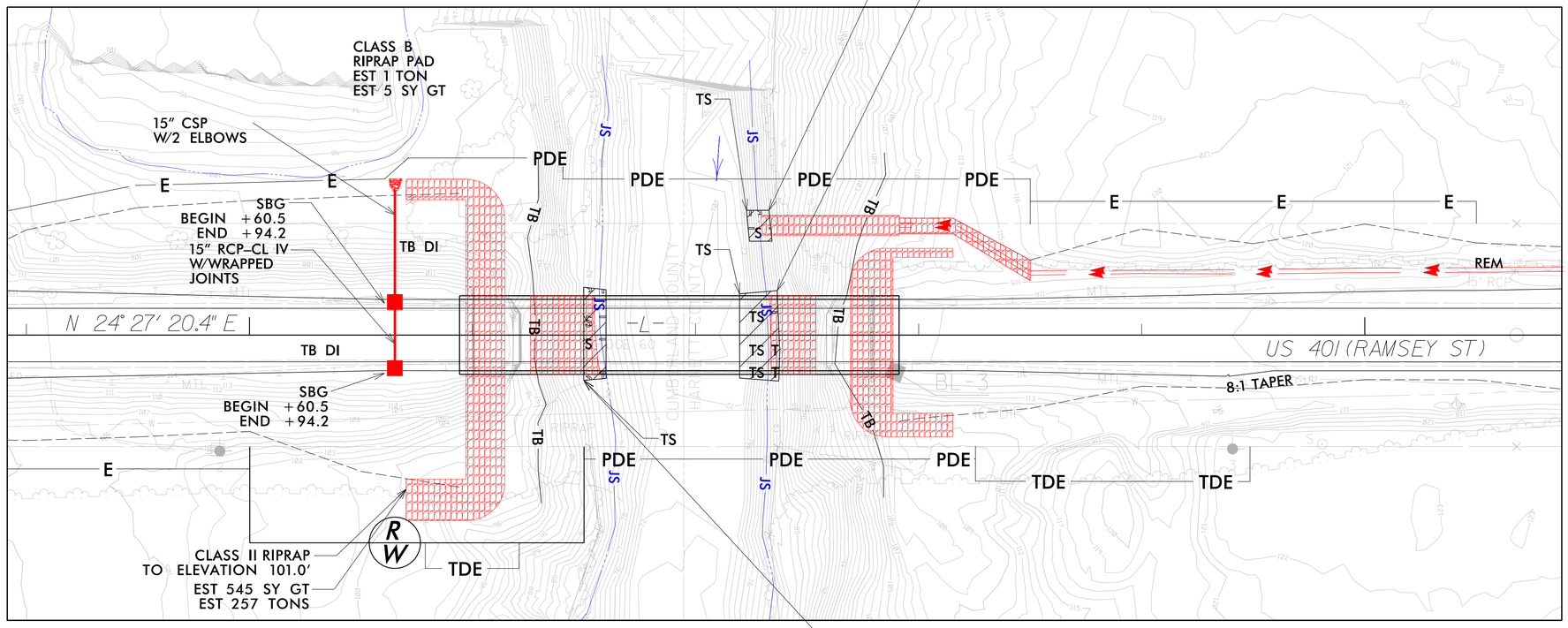
PERMIT DRAWING SHEET 4 OF 12

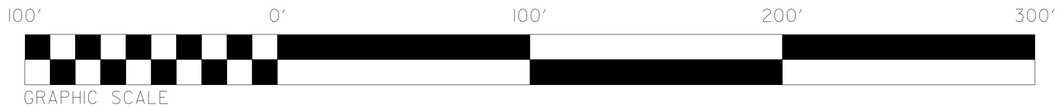
INSET A

SITE 1

SITE 2

SITE 3





IMPACTS LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

5/14/99

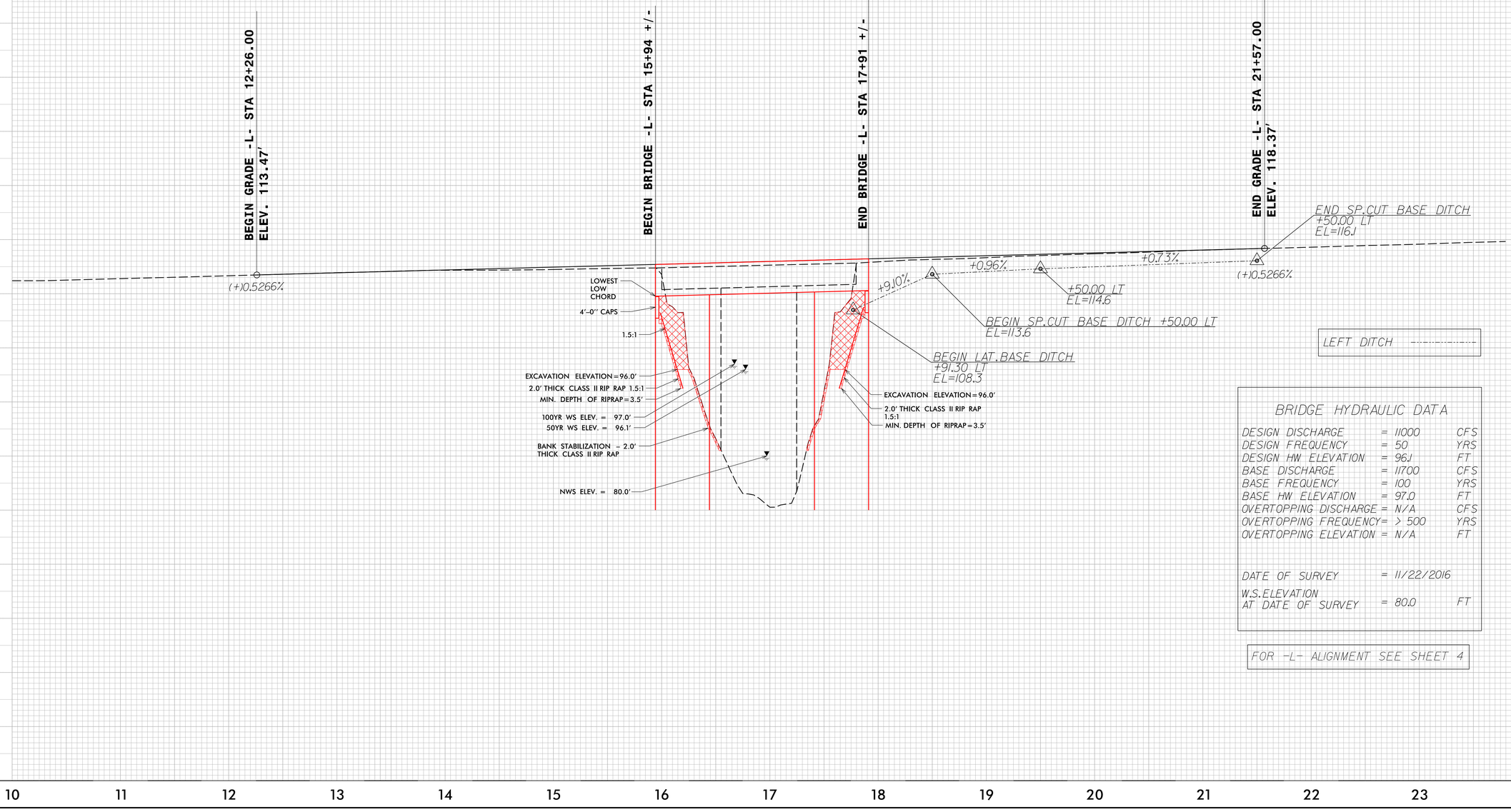
PROJECT REFERENCE NO.	SHEET NO.
B-5703	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 5 OF 12

BM #1 - RR SPIKE IN BASE OF 23" GUM
-L- STA. 16+13.70, 159.64' LT
EL = 102.92'



LEFT DITCH ----------

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 11000	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 96.1	FT
BASE DISCHARGE	= 11700	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 97.0	FT
OVERTOPPING DISCHARGE	= N/A	CFS
OVERTOPPING FREQUENCY	= > 500	YRS
OVERTOPPING ELEVATION	= N/A	FT
DATE OF SURVEY	= 11/22/2016	
W.S.ELEVATION AT DATE OF SURVEY	= 80.0	FT

FOR -L- ALIGNMENT SEE SHEET 4

4/25/2018
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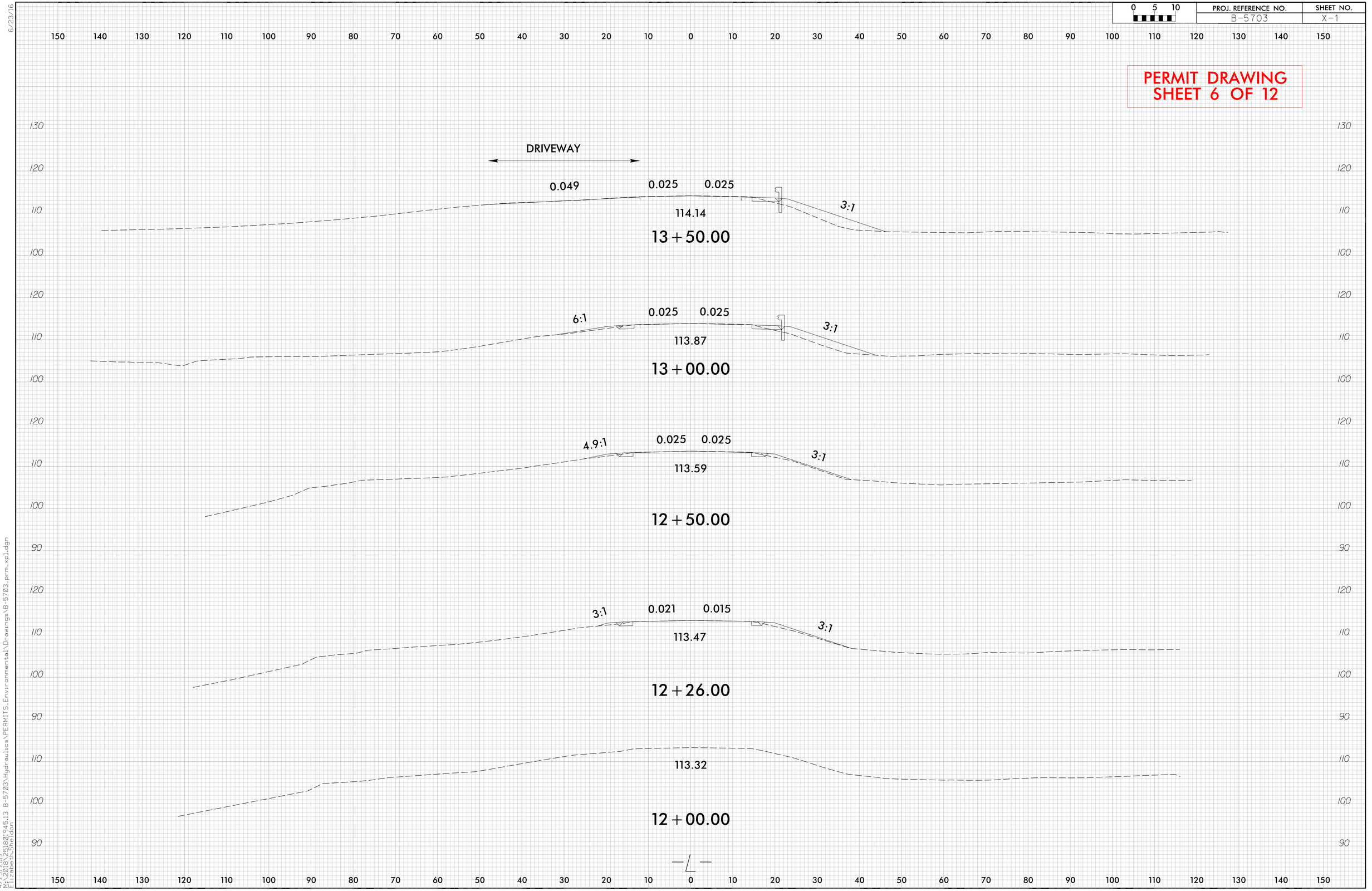
Elizabeth Sheldon

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-5703	X-1

PERMIT DRAWING
SHEET 6 OF 12



4/23/2019
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Elizabeth.Sheldon

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-5703	X-2

PERMIT DRAWING
SHEET 7 OF 12

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

130 120 110 100 90

0.025 0.025
114.66
3:1 3:1

15+50.00

120 110 100 90

0.025 0.025
114.47
3:1 3.2:1

15+00.00

120 110 100 90

0.025 0.025
114.37
3:1 3:1

14+50.00

120 110 100

0.025 0.025
114.34
3:1 3:1

14+00.00

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

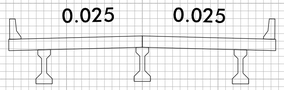
6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-5703	X-3

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

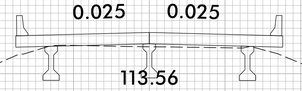
PERMIT DRAWING
SHEET 8 OF 12

130
120
110
100
90
80
70
120
110
100
90
120
110
100
90

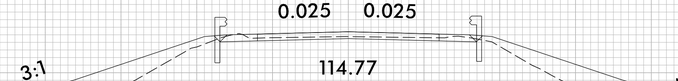


83.20

16 + 50.00



16 + 00.00



15 + 94.00

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

4/23/2019
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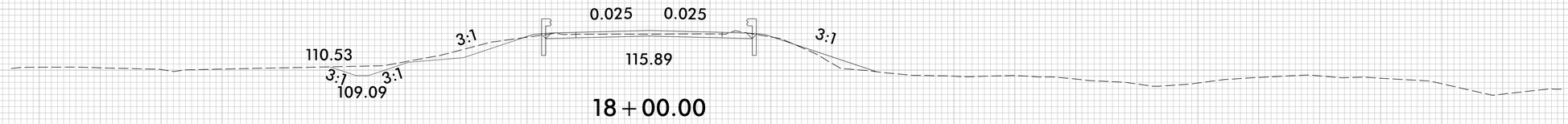
Elizabeth.Sheldon

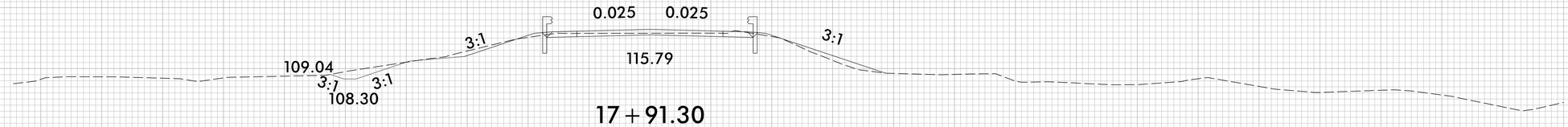
6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-5703	X-4

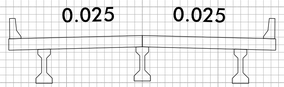
PERMIT DRAWING
SHEET 9 OF 12

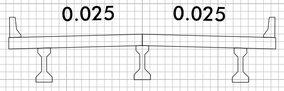


18 + 00.00



17 + 91.30





92.01
17 + 50.00

70.54
17 + 00.00

4/21/2019
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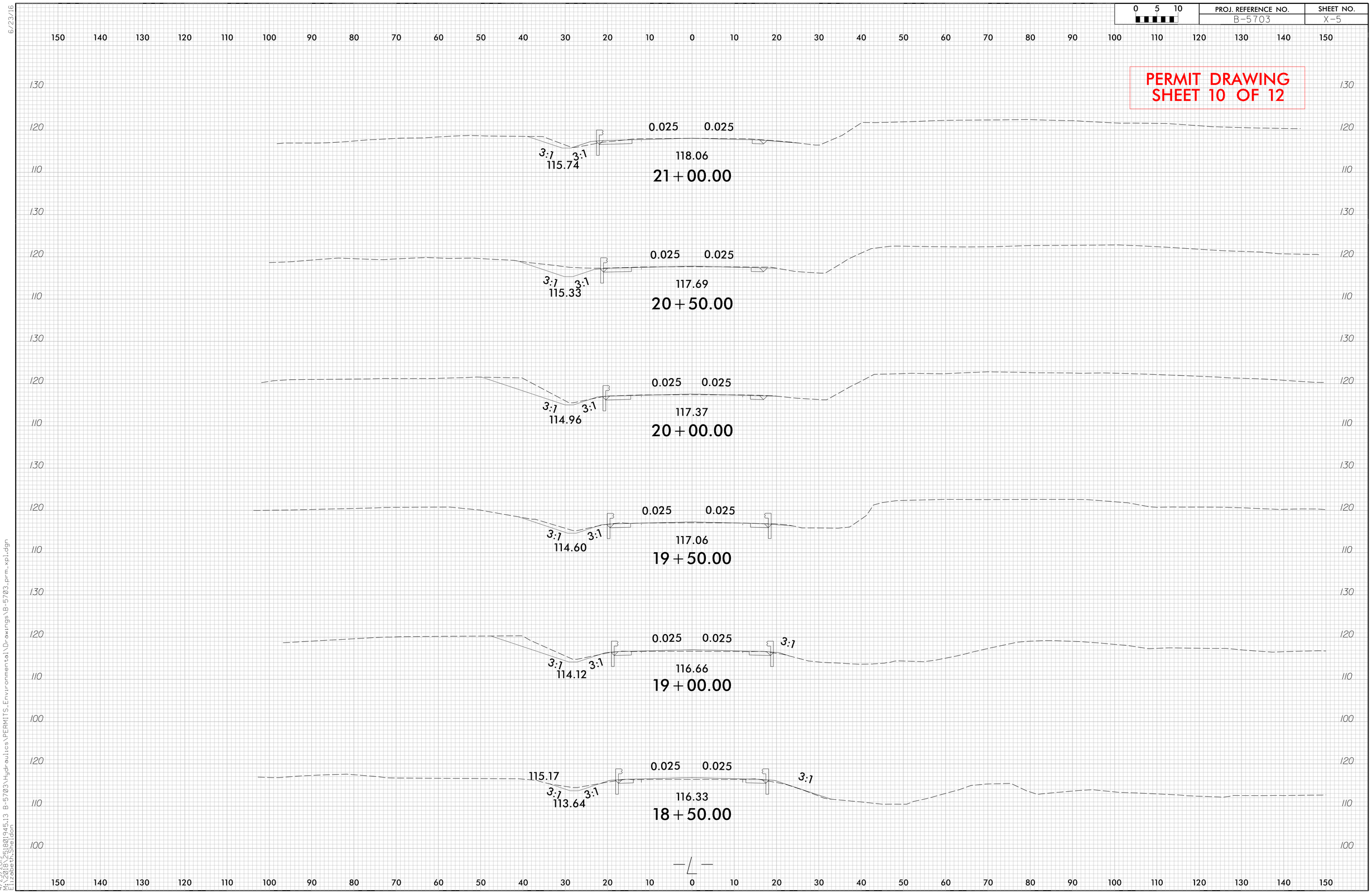
Elizabeth.Sheldon

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-5703	X-5

PERMIT DRAWING
SHEET 10 OF 12



6/23/16

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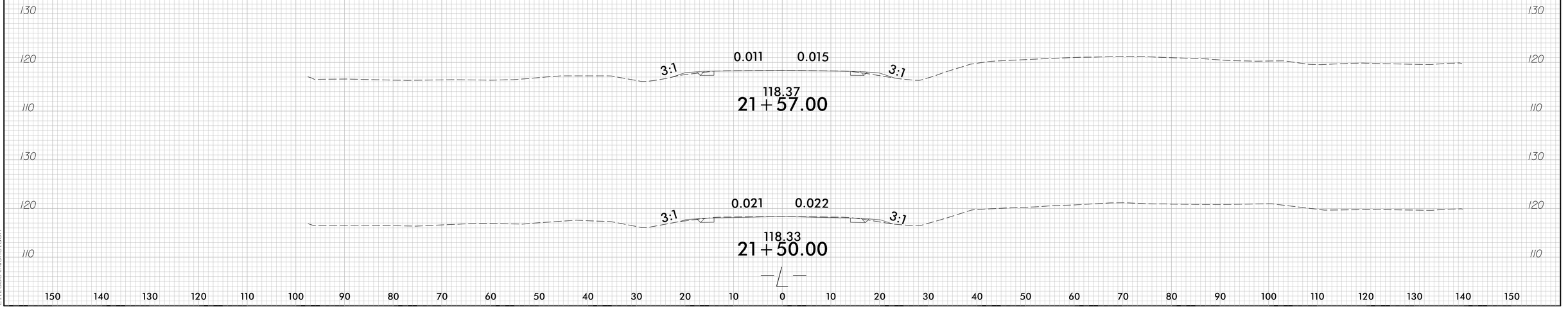
	B-5703	X-6

PERMIT DRAWING
SHEET 11 OF 12



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Elizabeth.Sheldon

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L- 17+23 LT	BANK STABILIZATION							< 0.01		14	
	TO 17+34 LT											
2	-L- 17+20 LT/RT	BANK STABILIZATION							< 0.01		21	
	TO 17+37 LT/RT											
3	-L- 16+50 LT/RT	BANK STABILIZATION							< 0.01			
	TO 16+60 LT/RT											
TOTALS*:									0.01	0	35	0

*Rounded totals are sum of actual impacts

NOTES:

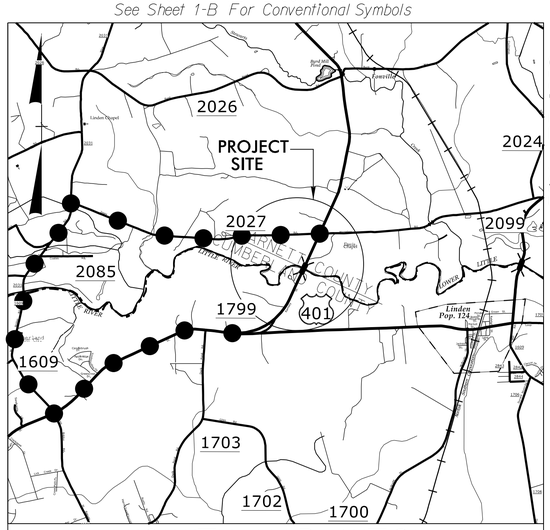
NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
May 2019
Cumberland
B-5703
45657.1.1
SHEET 12 OF 12

09/08/99

TIP PROJECT: B-5703

CONTRACT:

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



VICINITY MAP (NTS)

75% PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

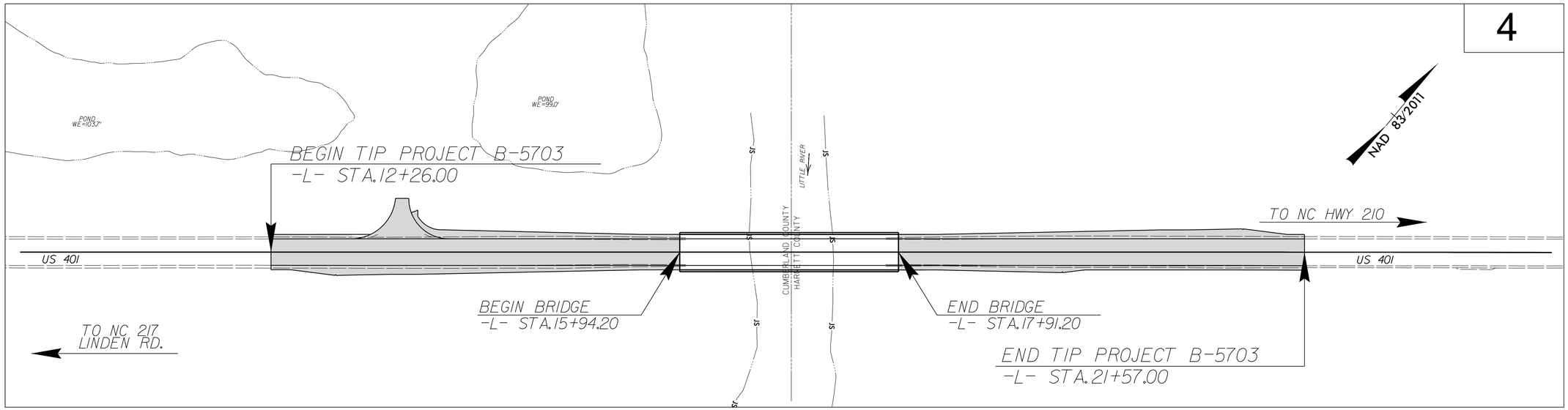
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5703	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
45657.1.1		P.E.
45657.2.1		R/W & UTIL.

LOCATION: REPLACE BRIDGE NO. 60 OVER LOWER LITTLE RIVER ON US 401

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

4



THIS PROJECT IS NOT WITHIN MUNICIPAL BOUNDARIES.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2019 = 6125
ADT 2040 = 9100
K = 8 %
D = 55 %
T = 6 % *
V = 60 MPH
* TTST = 4% DUAL 2%
FUNC CLASS = COLLECTOR
REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-5703 = .139 MILES
LENGTH OF STRUCTURE TIP PROJECT B-5703 = .037 MILES
TOTAL LENGTH OF TIP PROJECT B-5703 = .176 MILES

Prepared In the Office of:
KCI Associates of N.C., P.A.
4505 Falls of Neuse Road, Suite 400
Raleigh, NC 27609
Phone (919) 783-9214
Fax (919) 783-9266
http://www.kci.com

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
APRIL 17, 2019

LETTING DATE:
MARCH 20, 2020

NCDOT CONTACT: DAVID STUTTS, PE
STRUCTURES MANAGEMENT UNIT

Plans Prepared For:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr.
Raleigh NC, 27610

DEWAYNE L. SYKES, P.E.
PROJECT ENGINEER

BRYAN E. HOUGH, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER
P.E.
SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

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$$$$USERNAME$$$$

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12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
B-5703	1-B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale **S.U.E. = Subsurface Utility Engineering*

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin (EIP)
- Computed Property Corner
- Property Monument (ECM)
- Parcel/Sequence Number (123)
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary (WLB)
- Proposed Wetland Boundary (WLB)
- Existing Endangered Animal Boundary (EAB)
- Existing Endangered Plant Boundary (EPB)
- Existing Historic Property Boundary (HPB)
- Known Contamination Area: Soil (S)
- Potential Contamination Area: Soil (S)
- Known Contamination Area: Water (W)
- Potential Contamination Area: Water (W)
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

- Secondary Horiz and Vert Control Point
- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Exist Permanent Easement Pin and Cap
- New Permanent Easement Pin and Cap
- Vertical Benchmark
- Existing Right of Way Marker
- Existing Right of Way Line
- New Right of Way Line (RW)
- New Right of Way Line with Pin and Cap (RW)
- New Right of Way Line with Concrete or Granite R/W Marker (RW)
- New Control of Access Line with Concrete C/A Marker (CA)
- Existing Control of Access (CA)
- New Control of Access (CA)
- Existing Easement Line (E)
- New Temporary Construction Easement (E)
- New Temporary Drainage Easement (TDE)
- New Permanent Drainage Easement (PDE)
- New Permanent Drainage / Utility Easement (DUE)
- New Permanent Utility Easement (PUE)
- New Temporary Utility Easement (TUE)
- New Aerial Utility Easement (AUE)

ROADS AND RELATED FEATURES:

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

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard (Vineyard)

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole (P)
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H-Frame Pole
- U/G Power Line LOS B (S.U.E.*) (P)
- U/G Power Line LOS C (S.U.E.*) (P)
- U/G Power Line LOS D (S.U.E.*) (P)

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole (T)
- Telephone Pedestal (T)
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole (HH)
- U/G Telephone Cable LOS B (S.U.E.*) (T)
- U/G Telephone Cable LOS C (S.U.E.*) (T)
- U/G Telephone Cable LOS D (S.U.E.*) (T)
- U/G Telephone Conduit LOS B (S.U.E.*) (TC)
- U/G Telephone Conduit LOS C (S.U.E.*) (TC)
- U/G Telephone Conduit LOS D (S.U.E.*) (TC)
- U/G Fiber Optics Cable LOS B (S.U.E.*) (T FO)
- U/G Fiber Optics Cable LOS C (S.U.E.*) (T FO)
- U/G Fiber Optics Cable LOS D (S.U.E.*) (T FO)

WATER:

- Water Manhole (W)
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line LOS B (S.U.E*) (W)
- U/G Water Line LOS C (S.U.E*) (W)
- U/G Water Line LOS D (S.U.E*) (W)
- Above Ground Water Line (A/G Water)

TV:

- TV Pedestal (C)
- TV Tower
- U/G TV Cable Hand Hole (HH)
- U/G TV Cable LOS B (S.U.E.*) (TV)
- U/G TV Cable LOS C (S.U.E.*) (TV)
- U/G TV Cable LOS D (S.U.E.*) (TV)
- U/G Fiber Optic Cable LOS B (S.U.E.*) (TV FO)
- U/G Fiber Optic Cable LOS C (S.U.E.*) (TV FO)
- U/G Fiber Optic Cable LOS D (S.U.E.*) (TV FO)

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line LOS B (S.U.E.*) (G)
- U/G Gas Line LOS C (S.U.E.*) (G)
- U/G Gas Line LOS D (S.U.E.*) (G)
- Above Ground Gas Line (A/G Gas)

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line (SS)
- Above Ground Sanitary Sewer (A/G Sanitary Sewer)
- SS Forced Main Line LOS B (S.U.E.*) (FSS)
- SS Forced Main Line LOS C (S.U.E.*) (FSS)
- SS Forced Main Line LOS D (S.U.E.*) (FSS)

MISCELLANEOUS:

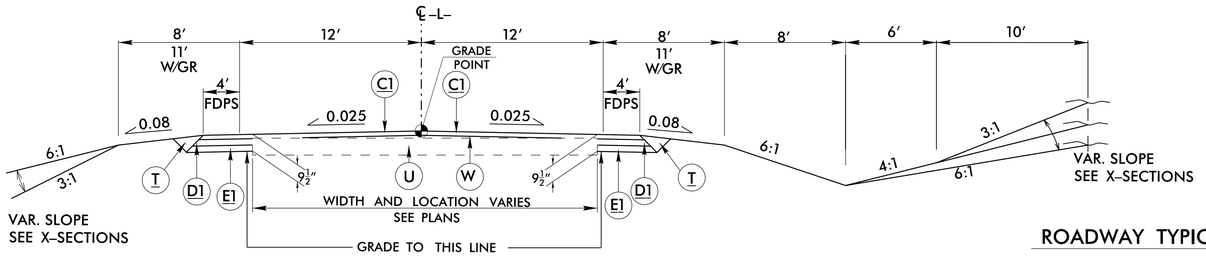
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box (S)
- Utility Unknown U/G Line LOS B (S.U.E.*) (?UTL)
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. (UST)
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole LOS A (S.U.E.*)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

6/2/99

PRELIMINARY PAVEMENT SCHEDULE

ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.
FINAL PAVEMENT INFORMATION HAS NOT BEEN RECEIVED.

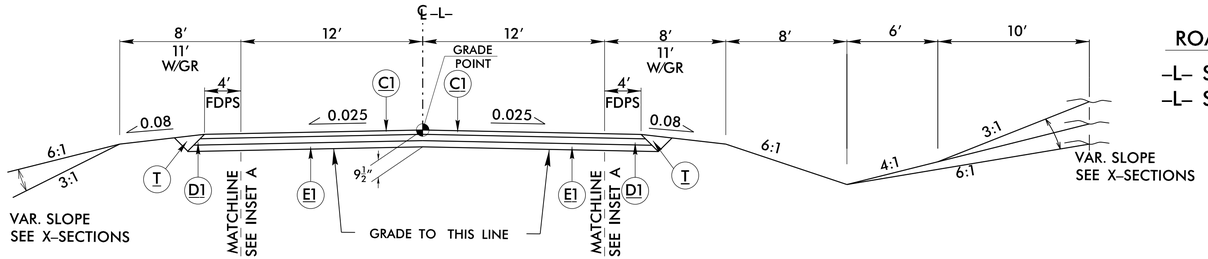
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165.0 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHAULT CONCRETE SURFACE COURSE,TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 1.5" IN DEPTH.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 3" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 4" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
R1	SHOULDER BERM GUTTER.
T_	EARTH MATERIAL.
U_	EXISTING PAVEMENT.
W_	VARIABLE DEPTH ASPHALT PAVEMENT (SEE DETAIL SHOWING METHOD OF WEDGING).



ROADWAY TYPICAL SECTION NO. 1

ROADWAY TYPICAL SECTION NO. 1

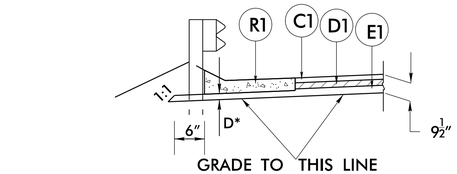
–L– STA. 12+26.00 TO STA. 15+45.20
–L– STA. 18+40.20 TO STA. 21+57.00



ROADWAY TYPICAL SECTION NO. 2

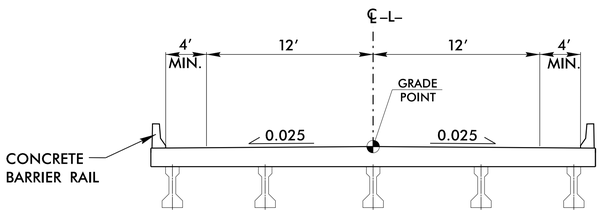
ROADWAY TYPICAL SECTION NO. 2

–L– STA. 15+45.20 TO STA. 15+94.20
–L– STA. 17+91.20 TO STA. 18+40.20



* WHEN D IS LESS THAN 3" THE CURB & GUTTER WILL BE PLACED ON THE SUBGRADE.

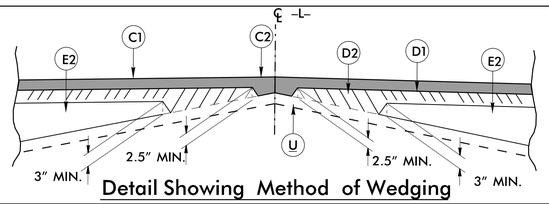
DETAIL SHOWING SHOULDER BERM GUTTER (SBG) ON TOP OF SUBGRADE



BRIDGE TYPICAL SECTION

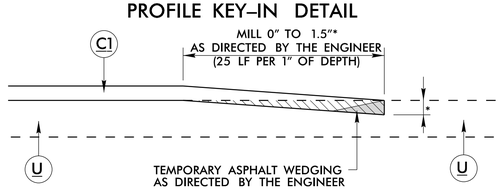
–L– BRIDGE TYPICAL SECTION

–L– STA. 15+94.20 TO STA. 17+91.20



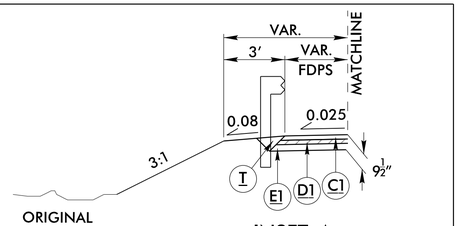
Detail Showing Method of Wedging

PROFILE KEY–IN DETAIL



* MILL DEPTH AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER

** SEE TYPICALS FOR MIX TYPE



INSET A
USE IN GUARDRAIL LOCATIONS

PROJECT REFERENCE NO.	SHEET NO.
B-5703	2A-1
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

KCI http://www.kci.com
Engineers • Planners • Scientists • Construction Managers
4505 Falls of Neuse Road, Suite 400
Raleigh, NC 27609
Phone (919) 783-9214 • Fax (919) 783-9266

COMPUTED BY: TTC	DATE: 4/11/2019
CHECKED BY: TLK	DATE: 4/11/2019

PROJECT REFERENCE NO.	SHEET NO.
B-5703	3B-1

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SUMMARY OF EARTHWORK IN CUBIC YARDS

STATION	STATION	UNCL. EXCAV.	UNDERCUT EXCAV.	EMBANK. +%	BORROW	WASTE
-L- 12+26.00	15+94.20	120		1,583	1,463	
-L- 17+91.20	21+57.00	353		54		299
SUBTOTAL:		473		1,636	1,463	299
TOTALS:		473		1,636	1,463	299
ADDITIONAL UNDERCUT						
WASTE IN LEIU OF BORROW					-299	-299
SELECT GRANULAR MATERIAL IN LIEU OF BORROW						
PROJECT TOTAL:		473		1,636	1,164	
EST 5% TO REPLACE TOP SOIL ON BORROW PIT					58	
GRAND TOTAL:		473		1,636	1,222	
SAY:		480		1,640	1,230	

EST. DDE = 37 CY
PER GEOTECH RECOMMENDATION: EST. SELECT GRANULAR MATERIAL: XXX CY
PER GEOTECH RECOMMENDATION: EST. SHALLOW UNDERCUT = XXX CY

NOTE:
APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, FINE GRADING, CLEARING AND GRUBBING, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE LUMP SUM PRICE FOR "GRADING".

EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.

SHOULDER BERM GUTTER

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	LF
-L-	15+60.50	15+94.20	LT	33.7
-L-	15+60.50	15+94.20	RT	33.7
			TOTAL:	67.4
			SAY:	75

REMOVAL OF EXISTING ASPHALT PAVEMENT

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD^2
-L-	15+45.20	15+94.20	CL	1,441.63
-L-	17+91.20	18+40.20	CL	1,268.47
			TOTAL:	2,710.10
			SAY:	2,981

NOTE:
APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, FINE GRADING, CLEARING AND GRUBBING, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE LUMP SUM PRICE FOR "GRADING".

RIGHT OF WAY AREA DATA

PARCEL NO.	PROPERTY OWNERS NAMES	TYPE NEEDED (ACRES) ROW	TCE	TDE	PDE	PUE
1	GETA LYNN WOOD					
2	THE ANGELA TAYLOR WOOD LIVING TRUST		.087		.065	
3	JOHN/PAMELA TUOHEY	.103	.058	.011	.045	
4	WILLIAM FARMS HARNETT COUNTY, LLC		.046	.044	.064	

FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH: STRAIGHT	LENGTH: SHOP CURVED	LENGTH: DOUBLE FACED	WARRANT POINT: APPROACH END	WARRANT POINT: TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH: APPROACH END	FLARE LENGTH: TRAILING END	W: APPROACH END	W: TRAILING END	ANCHORS: XI MOD	B-77	GREU 350	M-350	TEMP. W-BEAM RETROFIT	TYPE III	VI MOD	GREU TL-3	AT-1	TEMP. CRASH CUSHIONS: EA	G	NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
-L-	13+58.60	15+94.20 (BR.)	LEFT	247.000′	25′			15+94.20 (BR.)	8.00′	11.00′		50′		1.0′		1							1					180.23′		
-L-	12+83.83	15+94.20 (BR.)	RIGHT	310.375′			15+94.20 (BR.)		8.00′	11.00′	50′		1.0′			1						1						180.76′		
-L-	17+91.20 (BR.)	19+39.08	RIGHT	147.875′				17+91.20 (BR.)	8.00′	11.00′		50′		1.0′		1						1						180.09′		
-L-	17+91.20 (BR.)	21+01.58	LEFT	310.375′			17+91.20 (BR.)		8.00′	11.00′	50′		1.0′			1						1						179.79′		
			SUBTOTAL	1,015.625′	25′																							720.87′		
		LESS ANCHOR DEDUCTIONS:																												
		GREU TL-3	3 @ 50.00′ =	-150.00′																										
		B-77	4 @ 22.875′ =	-91.50′																										
		AT-1	1 @ 6.25′ =	-6.25′																										
		ANCHOR DEDUCTION TOTAL:		-247.75′																										
			PROJECT TOTAL	767.875′												4						3	1					629.67		
			SAY	775′												4						3	1					630.00		
		ADDITIONAL GUARDRAIL POST =		5 EA																										

4/04/06

17-APR-2019 14:05
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12-CQF21N2

COMPUTED BY: EAS **DATE:** 04/09/2019

CHECKED BY: LMY **DATE:** 04/09/2019

PROJECT NO.	SHEET NO.
B-5703	3D-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

LINE & STATION / SIZE	OFFSET	STRUCTURE NUMBER FROM	TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	C. S. PIPE 12	15	18	24		30			36			42	48	54	60	66	72	78	84			
THICKNESS OR GAUGE								.064	.064	.064	.064		.079			.079			.109	.109									
L 15+65	16 RT	0401		114.9																									
		0401	0402		111.7	111.5																							
L 15+65	16 LT	0402		114.9																									
		0402	0403		111.5	100.2			52																				
SHEET TOTALS									52																				
PROJECT TOTALS									52																				

LINE & STATION	OFFSET	STRUCTURE NUMBER FROM	TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	54	60	66	72	78	84	
L 15+65	16 RT	0401		114.9																		
		0401	0402		111.7	111.5			36													
L 15+65	16 LT	0402		114.9																		
		0402	0403		111.5	100.2																
SHEET TOTALS									36													
PROJECT TOTALS									36													

LINE & STATION	OFFSET	FROM	TO	##" R.C. PIPE CULVERTS, CONTRACTOR DESIGN	##" R.C. PIPE CULVERTS, CONTRACTOR DESIGN	##" R.C. PIPE CULVERTS, CONTRACTOR DESIGN		##" x ##" C.S. PIPE ARCH CULVERTS, ##" THICK	##" x ##" C.S. STRUCTURAL PLATE PIPE ARCH, ## GAUGE	##" WELDED STEEL PIPE ##" THICK, GRADE ## IN SOIL	##" WELDED STEEL PIPE ##" THICK, GRADE ## NOT IN SOIL	##" WELDED STEEL PIPE ##" THICK, GRADE B (UNDER RR)	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	TEMP STEEL PLATE COVER MASONRY DRAINAGE	##" SPRING BOX PIPE	SPRING BOX STD. 840.41		M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54		##" x ##" x ##" PERF. C.S.P. TEE RISER ##" THICK	##" x ##" x ##" PERF. C.S.P. TEE RISER ##" THICK	CONVERT EXISTING C.B. TO J.B.	CONVERT EXISTING C.B. TO D.I.	CONVERT EXISTING D.I. TO J.B.	CONVERT EXISTING J.B. TO D.I.	ADJUST C.B.	ADJUST D.I.	15" C.S. ELBOW	##" SLUICE GATE (##" SIZE SLUICE GATE)		MODIFIED CONC. FLUME	PREFORMED SCOUR HOLE (PER EACH)	ENERGY DISSIPATION BASIN	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
L 15+65	16 RT	0401												1						1																												
		0401	0402																																													
L 15+65	16 LT	0402												1						1																												
		0402	0403																																			2										Wrapped joints.
																																															25	15" RCP Pipe Removal
SHEET TOTALS														2						2																		2									25	
PROJECT TOTALS														2						2																		2									25	

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

PROJECT REFERENCE NO.	SHEET NO.
B-5703	4
R/W SHEET NO.	

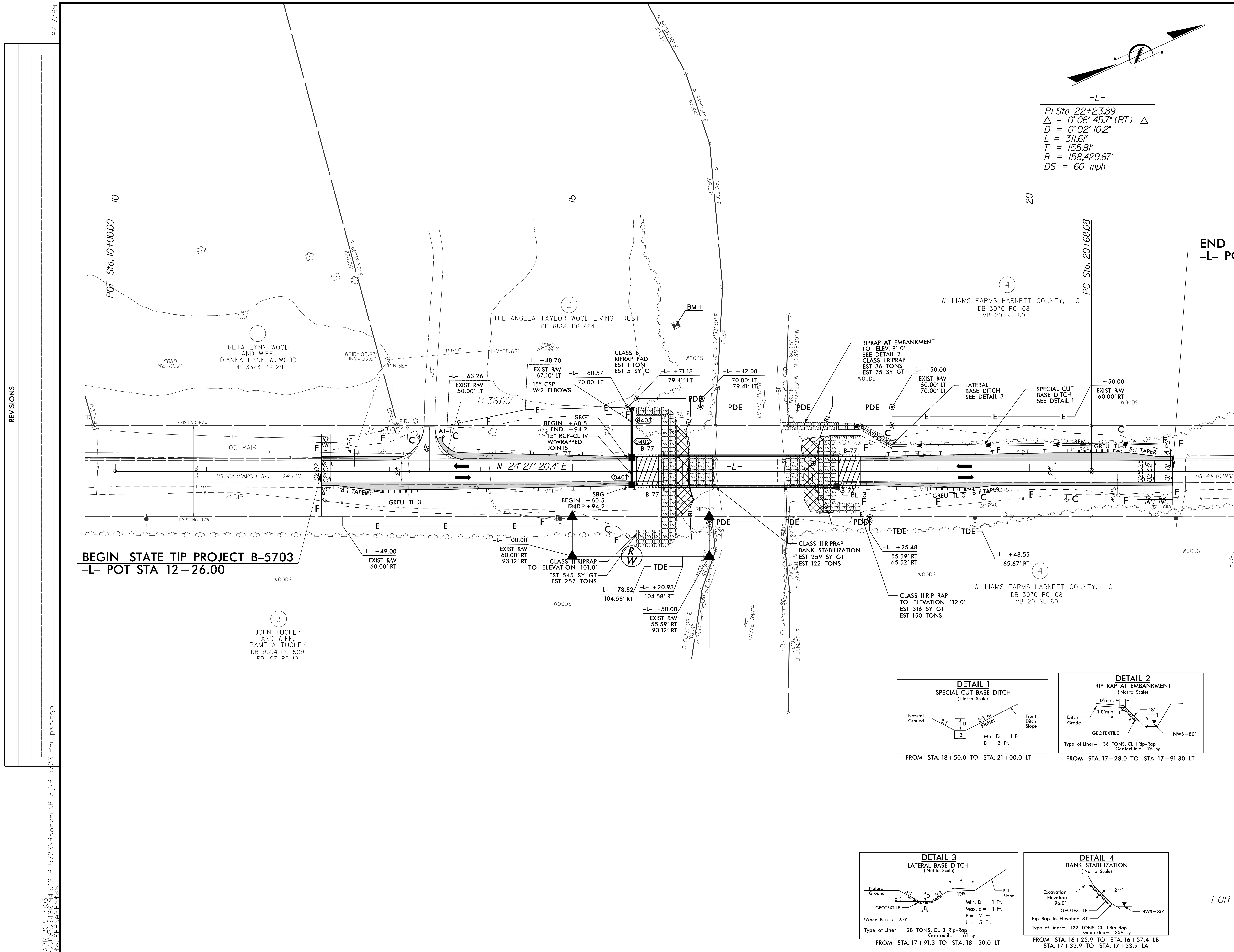
ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

KCI Engineers • Planners • Scientists • Construction Managers
4505 Falls of Neuse Road, Suite 400
Raleigh, NC 27609
Phone (919) 783-9214 • Fax (919) 783-9266
http://www.kci.com

-L-
PI Sta 22+23.89
Δ = 0° 06' 45.7" (RT)
D = 0° 02' 10.2"
L = 311.61'
T = 155.81'
R = 158,429.67'
DS = 60 mph


REVISIONS
POT Sta. 10+00.00
BEGIN STATE TIP PROJECT B-5703
-L- POT STA 12+26.00
END STATE TIP PROJECT B-5703
-L- POT STA 21+57.00
PC Sta. 20+68.08
PT Sta. 23+79.70
GETA LYNN WOOD AND WIFE, DIANNA LYNN W. WOOD DB 3323 PG 291
THE ANGELA TAYLOR WOOD LIVING TRUST DB 6866 PG 484
WILLIAMS FARMS HARNETT COUNTY, LLC DB 3070 PG 108 MB 20 SL 80
JOHN TUOHEY AND WIFE, PAMELA TUOHEY DB 9694 PG 509
N 24° 27' 20.4" E
US 401 (RAMSEY ST.) - 24' BST
LITTLE RIVER
BM-1
WOODS
CLASS B RIPRAP PAD EST 1 TON EST 5 SY GT
15" CSP W/2 ELBOWS
BEGIN +60.5 END +94.2 15" RCP-CL IV W/WRAPPED JOINTS
RIPRAP AT EMBANKMENT TO ELEV. 81.0' SEE DETAIL 2 CLASS I RIPRAP EST 36 TONS EST 75 SY GT
LATERAL BASE DITCH SEE DETAIL 3
SPECIAL CUT BASE DITCH SEE DETAIL 1
CLASS II RIPRAP TO ELEVATION 101.0' EST 545 SY GT EST 257 TONS
CLASS II RIPRAP BANK STABILIZATION EST 259 SY GT EST 122 TONS
CLASS II RIP RAP TO ELEVATION 112.0' EST 316 SY GT EST 150 TONS
DETAIL 1 SPECIAL CUT BASE DITCH (Not to Scale)
FROM STA. 18+50.0 TO STA. 21+00.0 LT
DETAIL 2 RIP RAP AT EMBANKMENT (Not to Scale)
Type of Liner= 36 TONS, CL I Rip-Rap Geotextile= 75 sy
FROM STA. 17+28.0 TO STA. 17+91.30 LT
DETAIL 3 LATERAL BASE DITCH (Not to Scale)
Type of Liner= 28 TONS, CL B Rip-Rap Geotextile= 61 sy
FROM STA. 17+91.3 TO STA. 18+50.0 LT
DETAIL 4 BANK STABILIZATION (Not to Scale)
Type of Liner= 122 TONS, CL II Rip-Rap Geotextile= 259 sy
FROM STA. 16+25.9 TO STA. 16+57.4 LB
STA. 17+33.9 TO STA. 17+53.9 LA

FOR -L- PROFILE SEE SHEET 5

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PROJECT REFERENCE NO.	SHEET NO.
B-5703	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

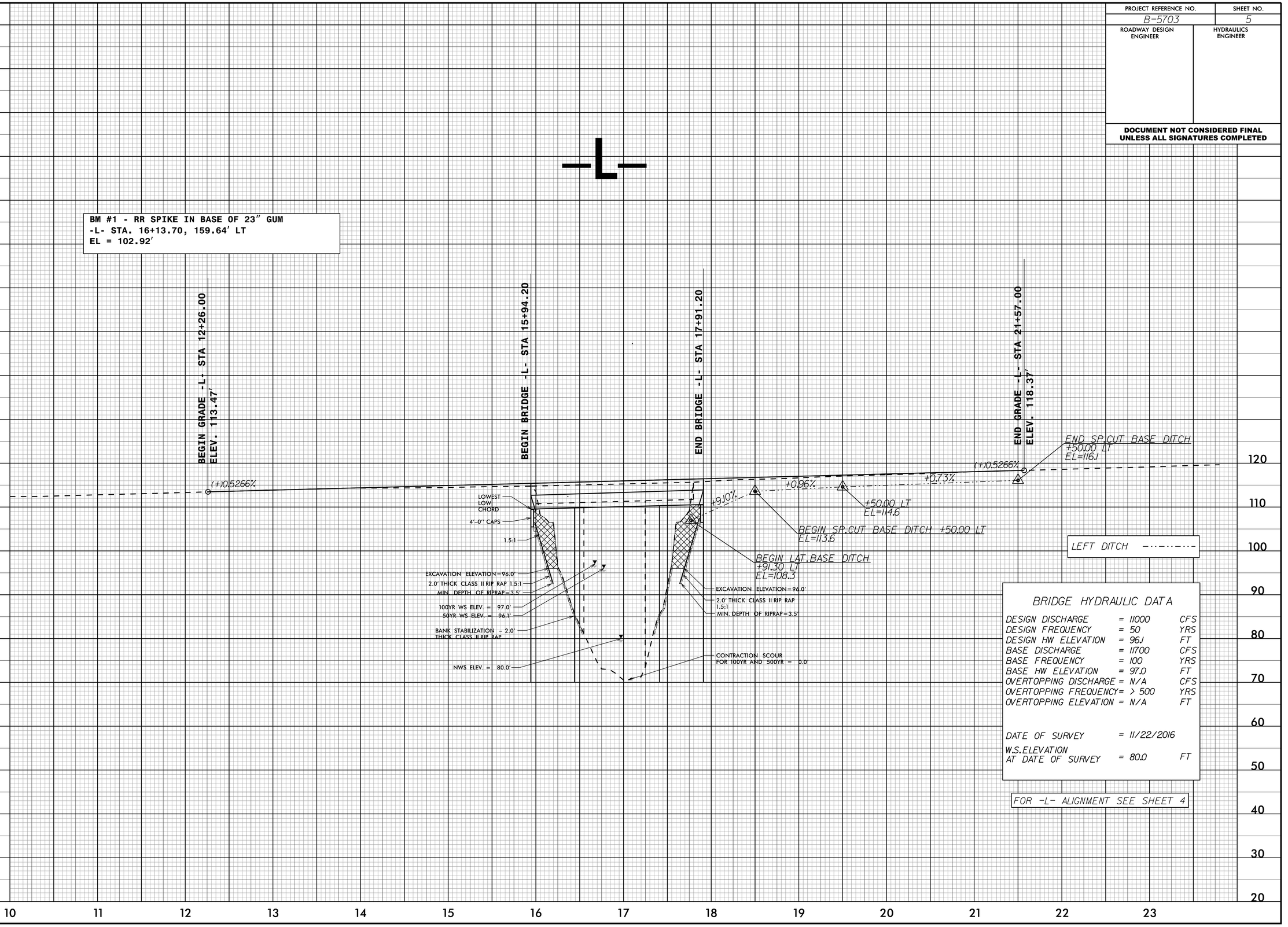
BM #1 - RR SPIKE IN BASE OF 23" GUM
-L- STA. 16+13.70, 159.64' LT
EL = 102.92'

BEGIN GRADE -L- STA 12+26.00
ELEV. 113.47'

BEGIN BRIDGE -L- STA 15+94.20

END BRIDGE -L- STA 17+91.20

END GRADE -L- STA 21+57.00
ELEV. 118.37'

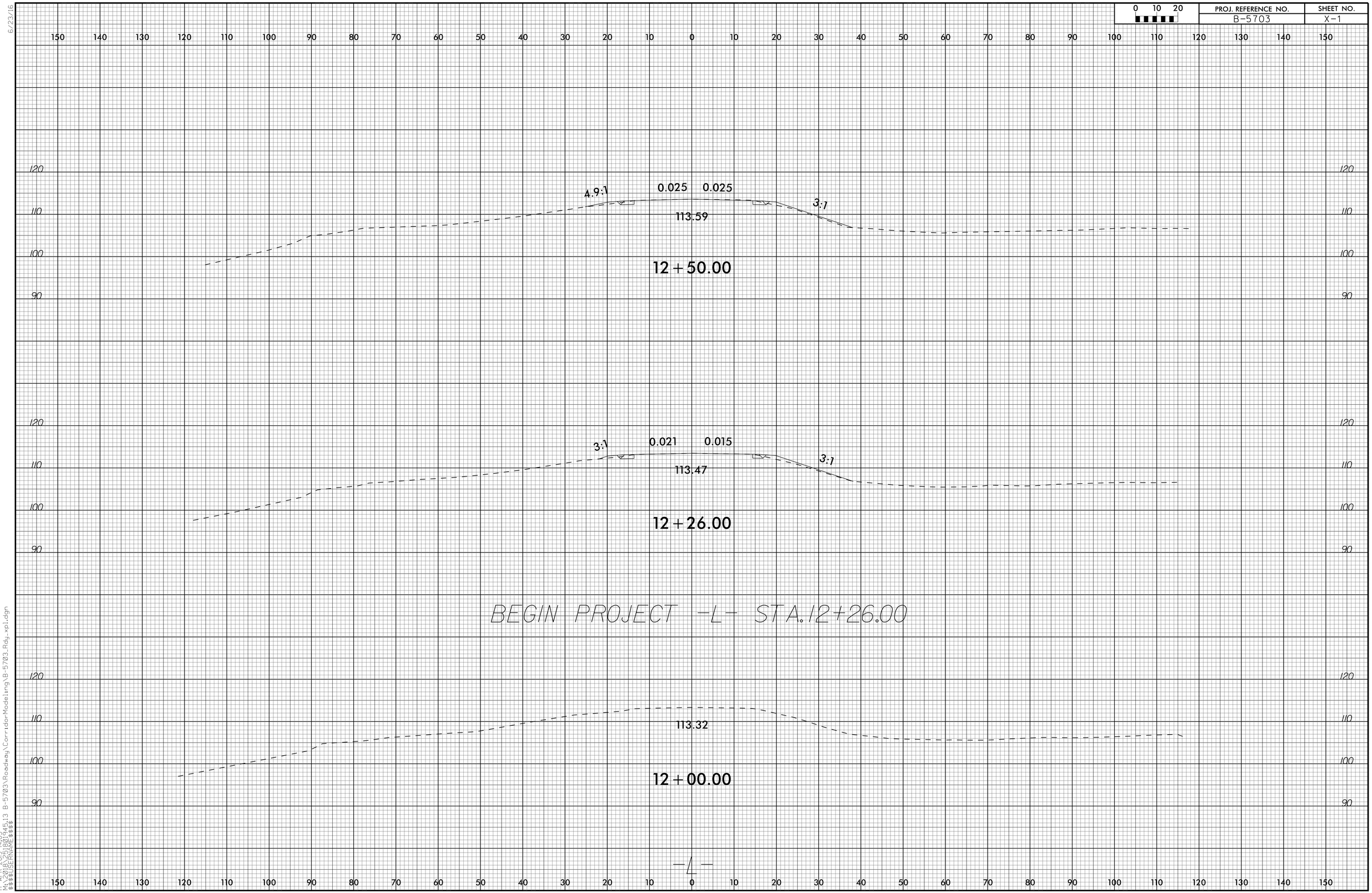


BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 11000	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 96.1	FT
BASE DISCHARGE	= 11700	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 97.0	FT
OVERTOPPING DISCHARGE	= N/A	CFS
OVERTOPPING FREQUENCY	= > 500	YRS
OVERTOPPING ELEVATION	= N/A	FT
DATE OF SURVEY	= 11/22/2016	
W.S. ELEVATION AT DATE OF SURVEY	= 80.0	FT

FOR -L- ALIGNMENT SEE SHEET 4

0 10 20	PROJ. REFERENCE NO.	SHEET NO.
	B-5703	X-1



6/23/16

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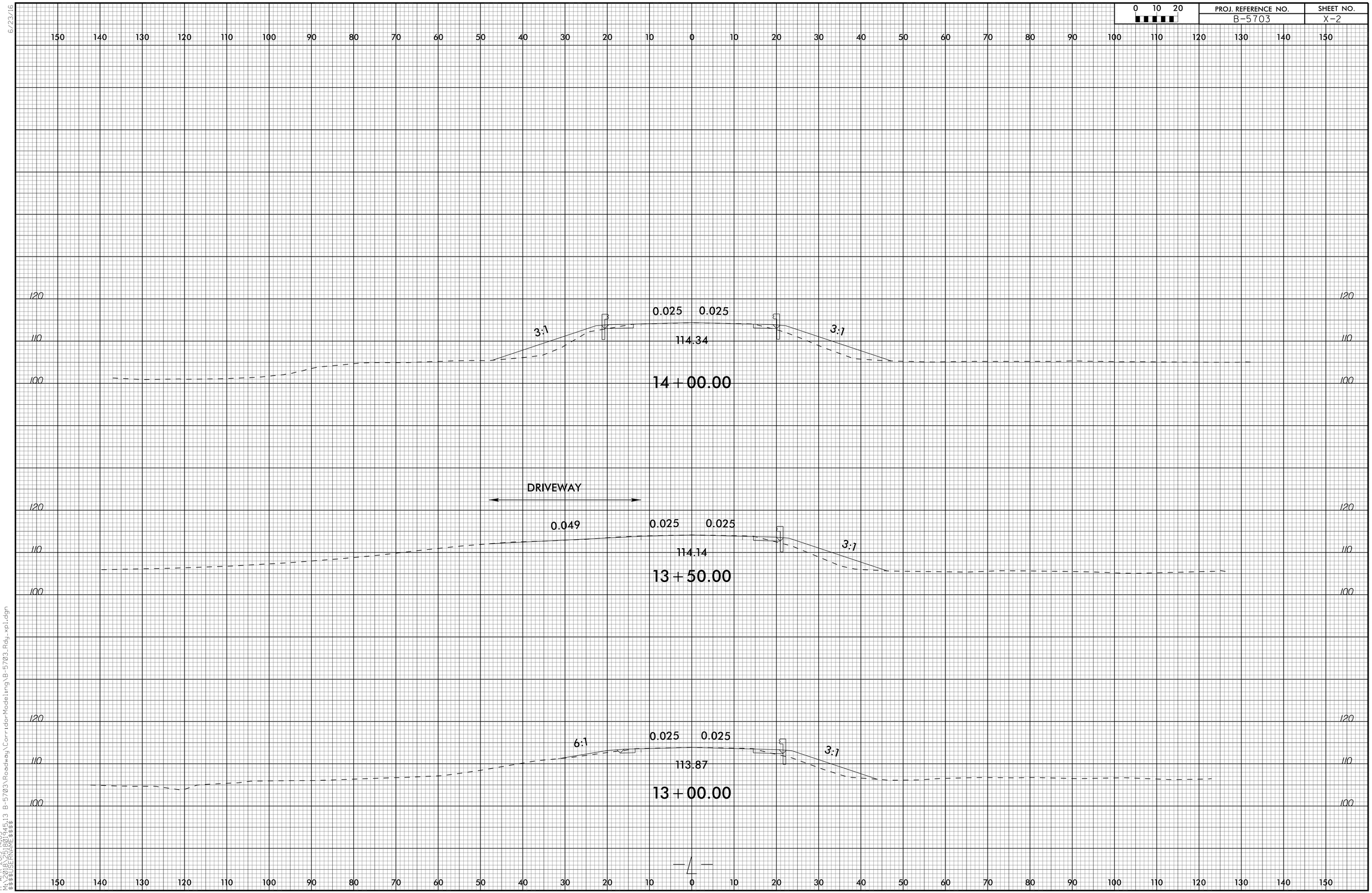

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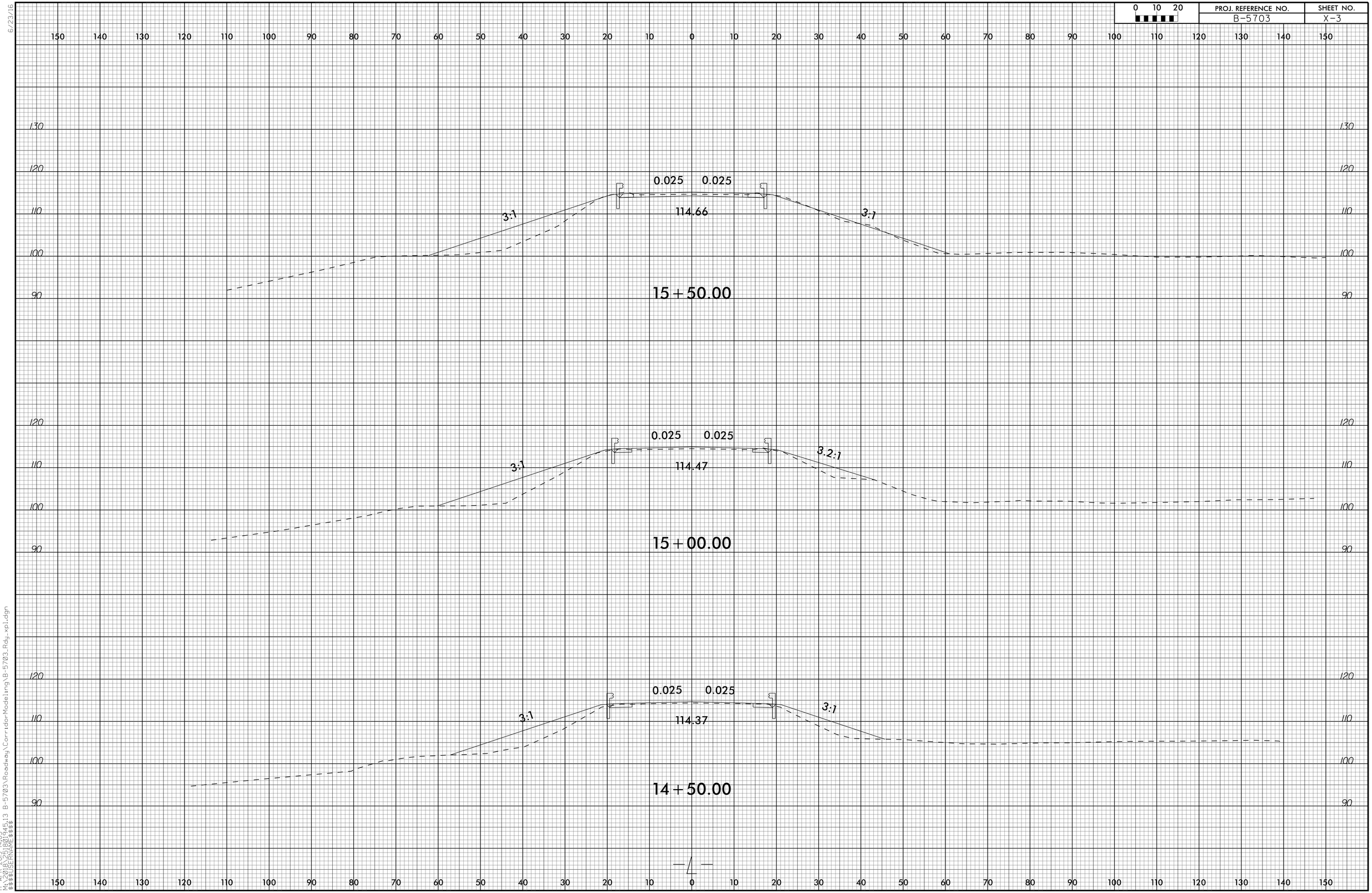
	B-5703	X-3



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6/23/16

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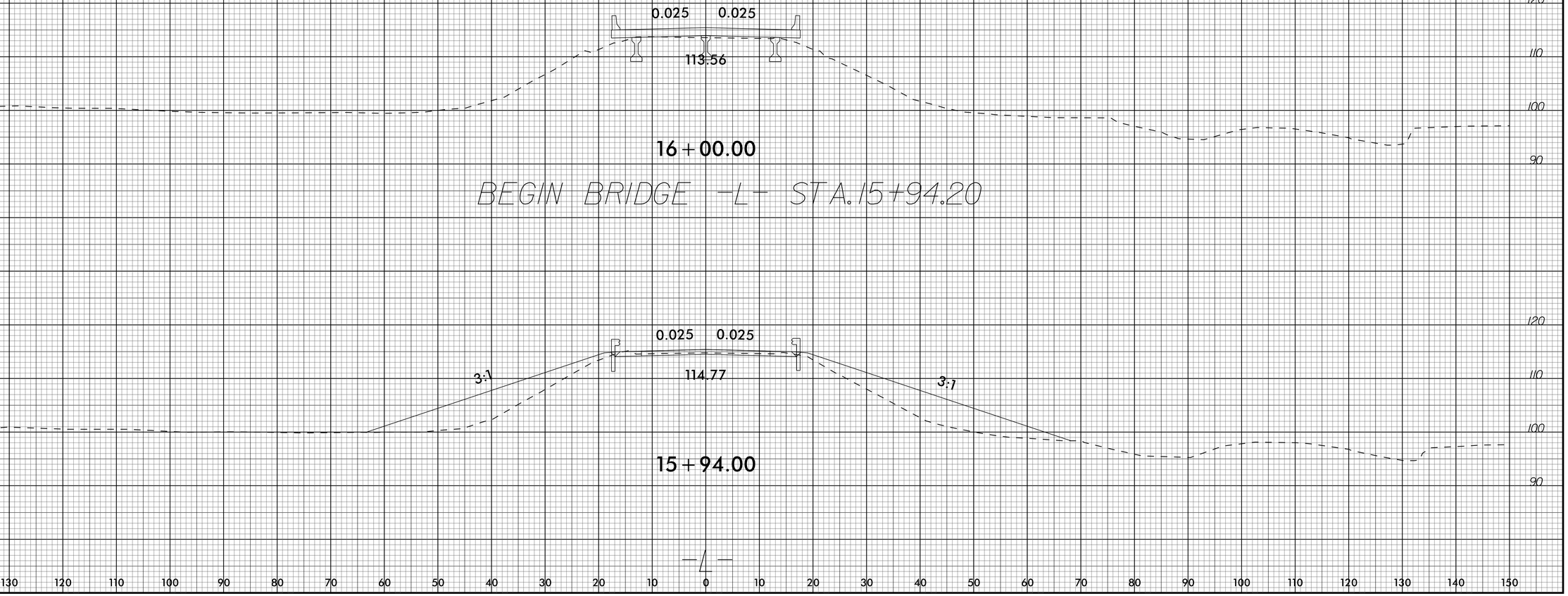
130 120 110 100 90



130 120 110 100 90

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

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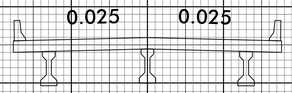
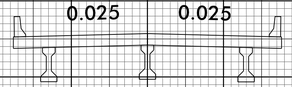
0 10 20	PROJ. REFERENCE NO.	SHEET NO.
	B-5703	X-5



70.54
17+00.00



83.20
16+50.00

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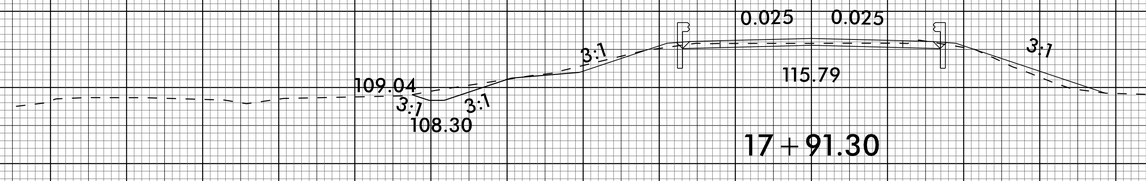
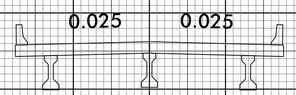
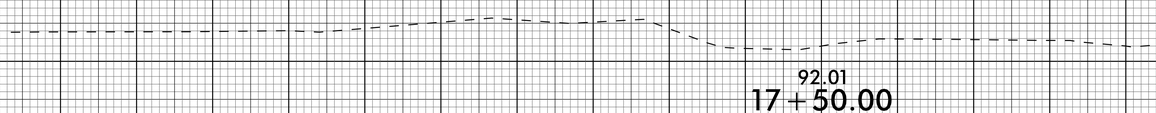
	B-5703	X-6



17+91.30

END BRIDGE -L- STA. 17+91.20





17+50.00

-L-

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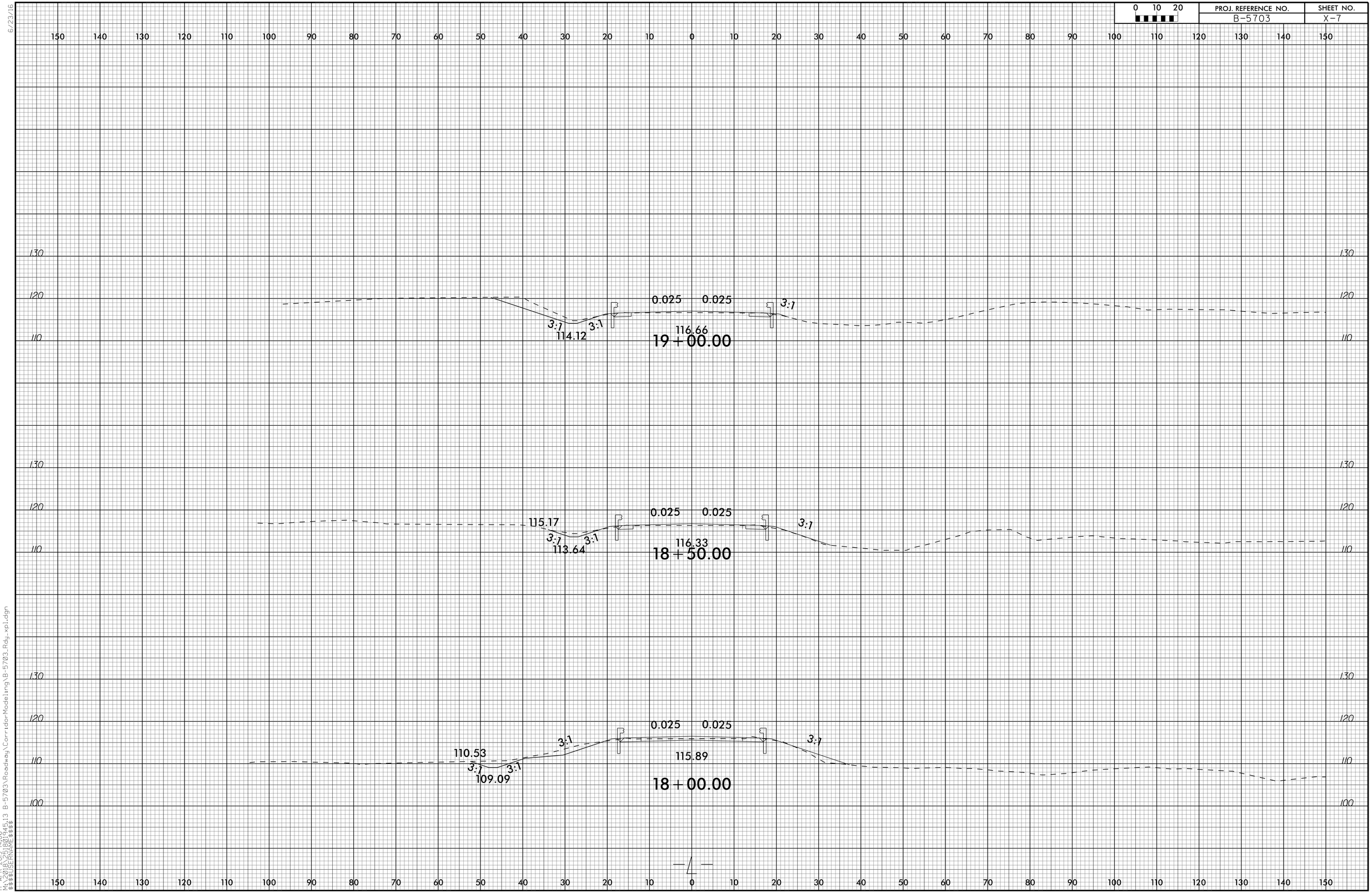
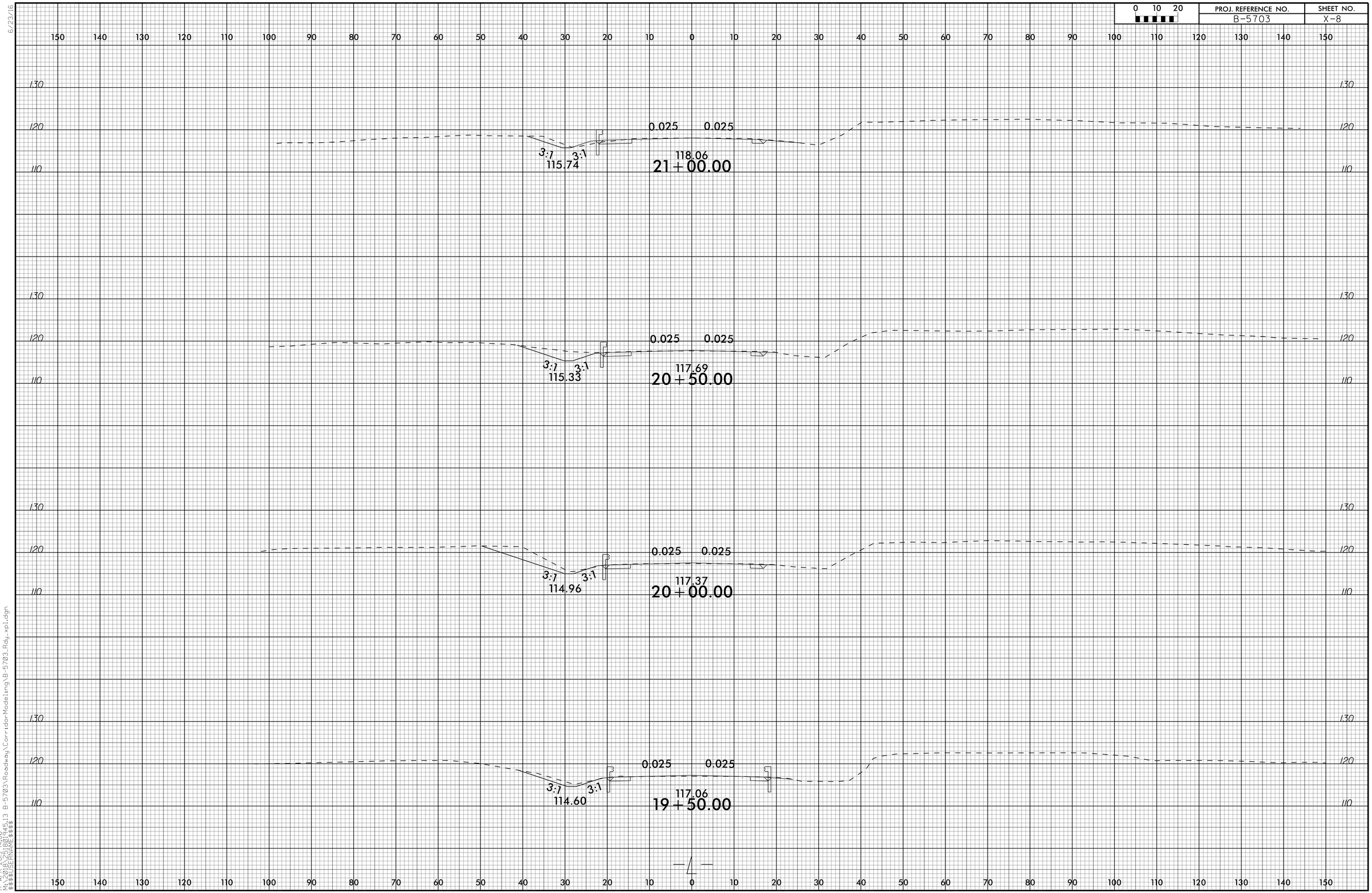
	B-5703	X-7





6/23/16

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	B-5703	X-9

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

END PROJECT -L- STA. 21+57.00

130 120 110

0.011 0.015

3:1 3:1

118.37

21+57.00

130 120 110

0.021 0.022

3:1 3:1

118.33

21+50.00

-L-

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

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