STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI
SECRETARY

March 7, 2011

NC Division of Water Quality
1650 Mail Service Center
Raleigh, NC 27699-1650

Attention: Ms. Coleen H. Sullins
Director

Dear Madam,

Subject: **NCDOT Response to NC Division of Water Quality (NCDWQ) Letter, EB-4993**

As you are aware, the NC Department of Transportation (NCDOT) submitted a permit application on February 22, 2011 for TIP Project No. EB-4993 to NCDWQ. This letter addresses each item in NCDWQ's February 24, 2011 On Hold Letter regarding the proposed construction of the Neuse River Greenway from the Wake/Johnston County Line to Sam's Branch Creek in Johnston County. Each question from the original letter is presented below in italics, with NCDOT's response immediately following. A copy of NCDWQ's letter is also provided for your convenience.

1. The amount of Neuse Riparian Buffer impacts proposed in the application is 102,227 square feet of Zone 1 and 154,986 square feet of Zone 2. While the Neuse Buffer Rules Table of Uses indicates that greenway impacts are "Allowable", they are still subject to review for avoidance and minimization. For a greenway that is 3.5 miles in length, the amount of buffer impact seems excessive. DWQ understands the need to locate the greenway along the Neuse River, but would prefer the path be pushed further back away from the banks. In addition, DWQ has indicated in Buffer Clarification Memo 2009-004 dated October 26, 2009 (attached) that trails should be outside of Zone 1 to protect streambank stability. If an applicant must encroach on Zone 1, specific written justification and documentation should be included in the application.

NCDOT and the Trail Designer, Stewart Engineering, have revised the proposed impacts to reflect what is actually needed for construction. The previous submission with 102,227 square feet of Zone 1 impacts and 154,986 square feet of Zone 2 impacts included buffer impacts out to temporary construction easements, per NCDOT protocol. This revision provides a significant reduction as shown below:

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
1548 MAIL SERVICE CENTER
RALEIGH NC 27699-1548

TELEPHONE: 919-431-2000
FAX: 919-431-2001
WEBSITE: WWW.NCDOT.ORG

LOCATION:
4701 ATLANTIC AVE.
SUITE 116
RALEIGH, NC 27604

- Original Impacts as previously submitted
  - Zone 1 102,227 sq ft 2.34 ac
  - Zone 2 154,986 sq ft 3.5 ac

- Impacts as Revised
  - Zone 1 81,891 sq ft 1.88 ac (20% reduction)
  - Zone 2 140,073 sq ft 3.22 ac (10% reduction)

Additionally, the Town of Clayton owns and maintains a sewer easement along the first half of this project (NCDWQ permit no. WQ0018329). There is a 25 foot- 40 foot wide cleared area through the woods that is associated with this easement. Our design attempts to use this easement and existing cleared area to the greatest extent possible, while still providing for the safe use of the trail. This design does require adjustments in the alignment to avoid manholes and to cross jurisdictional features in the best manner. Below is the amount of Buffer Impacts created by the need to be within the easement and cleared area, or to tie to the easement and cleared area:

- Zone 1 48,543 sq ft 1.11 ac 59% of total Zone 1 impacts
- Zone 2 99,723 sq ft 2.29 ac 71% of total Zone 2 impacts

Photos and aerials of the cleared sewer easement and the Final Engineering Certification Acknowledgement for the Town's sewer line are attached.

Following is the justification for the remaining buffer zone 1 impacts, by site:

Site 1 – The proposed trail is within the existing cleared area of the sewer easement as much as possible, except to avoid the existing manholes.

Site 1B – The proposed crossing of the Neuse River creates this impact. It is necessary to be within the Buffer Zone 1 to allow for this crossing. The trail is either a bridge, boardwalk, or within the existing sewer easement for Buffer Zone 1 at this site. This minimizes the final footprint of the trail to 10'. Additionally, this crossing location was chosen so that the trail wouldn't impact jurisdictional tributaries of the Neuse just upstream (western side) and downstream (eastern side). The impact shown allows for a large crane to be used to set the proposed bridge in place. There is also a Buffer Zone 1 impact north of the Neuse River crossing that is created because the trail is designed to run within the existing cleared area of the sewer easement, which happens to partially be within that Buffer Zone 1.

Site 2 - The Buffer Zone 1 impact at this site is associated with the tributary of the Neuse that the trail is crossing, not the Neuse River. This crossing is using a pipe, so the Buffer Impact is shown. This tributary also jogs to the north after our proposed crossing and runs parallel to the trail for about 175'. This extends the buffer impact because the trail is designed to run within the existing cleared area of the sewer easement, except to avoid the existing manholes.

Site 3 - The Buffer Zone 1 impact at this site is created because the trail shifts towards the river to avoid a sewer manhole. It is not feasible to shift away from the river because there is a large hill at this location.

Site 4 - The Buffer Zone 1 impact at this site is created by a cross pipe. The trail is designed within the existing cleared area of the sewer easement, except to avoid the existing manholes. At this location, the trail crosses an existing draw and a pipe is necessary to drain the area on the right side of the trail. Site 4 also includes the crossing of a tributary (L1 Sta. 93+25) of the Neuse River and impacts Buffer Zone 1 of this

tributary. This crossing uses a pipe, so the impact is shown. A second crossing of a tributary (L1 Sta. 96+75) of the Neuse creates the last Buffer Zone 1 impact at Site 4. The trail is shifted slightly towards the river because the tributary turns north just after the proposed crossing and runs parallel to the trail for approximately 500'.

Site 5 - The Buffer Zone 1 impact at this site is created by the crossing of Marks Creek. The amount of impact shown allows for a large crane to be used to set the proposed bridge in place.

Site 6 - The Buffer Zone 1 impact at this site is an impact to the buffer zone of a tributary of the Neuse River. The trail is crossing this tributary using a cross pipe which creates the buffer impact.

Site 7 - The Buffer Zone 1 impact at this site is an impact to the buffer zone of a tributary of the Neuse River. The trail is crossing this tributary using a cross pipe which creates the buffer impact.

Site 8 - The Buffer Zone 1 impact at this site is an impact to the buffer zone of the Neuse River and a jurisdictional tributary of the Neuse. The trail is crossing the jurisdictional tributary using a pipe. The tributary jogs to the west after the crossing and runs parallel to the trail for approximately 250'. The trail would impact this tributary more significantly than currently proposed if the trail was shifted away from the Neuse buffer zone.

Site 10 - The Buffer Zone 1 impact at this site is created by the need to tie the end of EB-4993 to a proposed greenway constructed by others. This proposed greenway constructed by others includes a stream crossing close to the end of EB-4993 and that crossing necessitates the trail to be partially within Buffer Zone 1. Additionally, this site is located on the side of a steep hill, and the trail is proposed in the flattest part of this hill.

2. The amount of permanent stream impacts proposed in the application is 409 linear feet, divided among nine stream crossings. A standard paved greenway width is 10 feet of asphalt plus 2 feet of grass along each side. DOT proposes piped stream crossings ranging from 3-4 times as wide. Please clarify the need for such long culverts on this greenway at these numerous crossings.

During the design phase of this project, boardwalks spanning many of the smaller stream crossings were considered. However, it was determined that maintenance of the boardwalk by the Town of Clayton would be impractical, both from a cost standpoint and the fact that the trail has limited access. In addition, future maintenance of isolated portions of the trail itself would be in jeopardy, as pavers and surfacing equipment could not travel over the boardwalk crossings. Therefore, piping these crossings was chosen as a more viable option. To that end, NCDOT and the trail designer reviewed the proposed stream impacts in detail. It was determined that at two crossings, proposed rip rap stabilization above the ordinary high water mark had been included in the impact totals. These impacts were removed from the summary and the total stream impact was reduced to 394 linear feet.

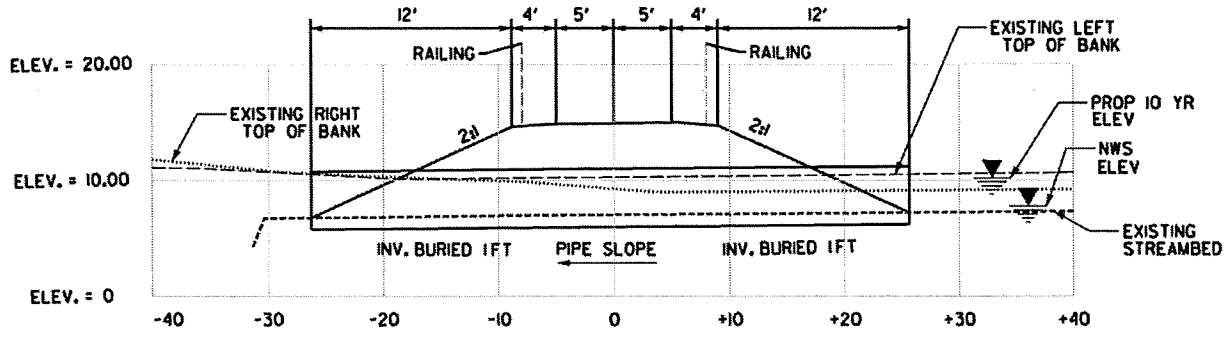
The total stream impact of 409 linear feet from the previous submission is also a little misleading. The proposed trail is 10' wide asphalt. However, AASHTO requires a 2' wide shoulder on either side. Additionally, if the side slope is steep enough, AASHTO recommends a 4' wide shoulder with a railing (3' from edge of trail to railing, 1' behind railing). In an effort to reduce the total length of stream impact, the trail designer has used steep side slopes with railing at the jurisdictional stream crossings. This means the trail cross-section is actually 18' wide at these locations. Additionally, the jurisdictional streams in the project typically have relatively steep banks. If the jurisdictional stream has 6' banks, which is very common in this area, the stream impact is increased form the 16' of the trail cross-section by the total height times 2 (each

side of the trail) and times 2 again (2:1 max fill slope). At the 6' high stream bank, this works out to be:

6' high stream bank * 2 for each side of the trail * 2 for the max fill slope = 24'

The trail cross-section of 18' is then added to this 24' for the total stream impact at one location of 42'. This length of impact only gets worse if the crossing is skewed.

This can more easily be depicted by the diagram below:



Additionally, an error was found in the buffer impact summary submitted with the original application. In the original, the zone 2 impacts for Site 10 were shown as 1,697 sq ft.; however, they should have been shown as 2,773 sq. ft. This error has been corrected in the revised buffer impact summary attached herein.

NCDOT hereby requests that NCDWQ remove the permit application from hold status to allow for processing to continue. A copy of this letter will be posted on the NCDOT website at:

http://www.ncdot.gov/doh/preconstruct/pe/neu/permit.html

If you have any further questions, please contact Amy James at (919) 707-6129 or aejames@ncdot.gov.

Sincerely,

for Gregory J. Thorpe, Ph.D, Manager
Project Development & Environmental Analysis Branch

cc:
W/attachment
Tom Steffens, US Army Corps of Engineers, Washington Field Office
W/o attachment (see website for attachments)
Chad Coggins, Division 4 Environmental Officer
Travis Wilson, NC Wildlife Resources Commission

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Water Quality
Coleen H. Sullins
Director

Beverly Eaves Perdue
Governor

Dee Freeman
Secretary

February 24, 2011

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Dr. Greg Thorpe, PhD., Manager
Planning and Environmental Branch
North Carolina Department of Transportation
1595 Mail Service Center
Raleigh, North Carolina, 27699-1595

Subject: Proposed Neuse River Greenway in Johnston County, TIP No. EB-4993
DWQ Project # 20110175

Dear Dr. Thorpe:

The NC Division of Water Quality has reviewed your submittal for a 401 Water Quality Certification and Neuse Buffer Rules Authorization for the aforementioned project. Review of your application revealed it lacking necessary information required for making an informed permit decision. The permit application was deficient in the following areas:

1. The amount of Neuse Riparian Buffer impacts proposed in the application is 102,227 square feet of Zone 1 and 154,986 square feet of Zone 2. While the Neuse Buffer Rules Table of Uses indicates that greenway impacts are "Allowable", they are still subject to review for avoidance and minimization. For a greenway that is 3.5 miles in length, the amount of buffer impact seems excessive. DWQ understands the need to locate the greenway along the Neuse River, but would prefer the path be pushed further back away from the banks. In addition, DWQ has indicated in Buffer Clarification Memo 2009-004 dated October 26, 2009 (attached) that trails should be outside of Zone 1 to protect streambank stability. If an applicant must encroach on Zone 1, specific written justification and documentation should be included in the application.

2. The amount of permanent stream impacts proposed in the application is 409 linear feet, divided among nine stream crossings. A standard paved greenway width is 10 feet of asphalt plus 2 feet of grass along each side. DOT proposes piped stream crossings ranging from 3-4 times as wide. Please clarify the need for such long culverts on this greenway at these numerous crossings.

Therefore, pursuant to 15A NCAC 2H .0507(a)(5), we will have to place the permit application on hold until we are supplied the necessary information. You have 21 days to respond in writing with the requested information or notification to this office that the information is forthcoming. If, at the end of the 21 days, this office has not received this information in writing, we will assume you are withdrawing your application and it will be returned. Furthermore, until the information is received by the NC Division of Water Quality, we request (by copy of this letter) that the US Army Corps of Engineers place the permit application on hold.

Transportation Permitting Unit
1650 Mail Service Center, Raleigh, North Carolina 27699-1650
Phone: 919-807-6301 \ FAX: 919-807-6494
Internet: http://h2o.enr.state.nc.us/ncwetlands/

Please send your response to the Division of Water Quality, Transportation Permitting Unit and send a copy to the US Corps of Engineers, Washington Field Office. Also, please indicate on the response DWQ Project Number 20110175 for swift processing.

If you have any questions or require additional information, please contact Rob Ridings at 919-807-6403.

Sincerely,

Coleen H. Sullins
Director

CC:
W/attachments
Amy James, NCDOT Natural Environment Unit
W/O attachments
Tom Steffens, US Army Corps of Engineers, Washington Field Office
Chad Coggins, Division 4 Environmental Officer
Travis Wilson, NC Wildlife Resources Commission
File Copy

Clayton Sewer Line and Maintained Easement

Office Use Only:
Corps action ID no. _____
DWQ project no. **10-0525**
Form Version 1.4 January 2009

Pre-Construction Notification (PCN) Form

A. Applicant Information

1. Processing		
1a. Type(s) of approval sought from the Corps:	☒ Section 404 Permit ☐ Section 10 Permit	
1b. Specify Nationwide Permit (NWP) number: 23	or General Permit (GP) number:	
1c. Has the NWP or GP number been verified by the Corps?	☒ Yes	☐ No
1d. Type(s) of approval sought from the DWQ (check all that apply): ☒ 401 Water Quality Certification – Regular ☐ Non-404 Jurisdictional General Permit ☐ 401 Water Quality Certification – Express ☒ Riparian Buffer Authorization		
1e. Is this notification solely for the record because written approval is not required?	For the record only for DWQ 401 Certification: ☐ Yes ☒ No	For the record only for Corps Permit: ☐ Yes ☒ No
1f. Is payment into a mitigation bank or in-lieu fee program proposed for mitigation of impacts? If so, attach the acceptance letter from mitigation bank or in-lieu fee program.	☒ Yes	☐ No
1g. Is the project located in any of NC's twenty coastal counties. If yes, answer 1h below.	☐ Yes	☒ No
1h. Is the project located within a NC DCM Area of Environmental Concern (AEC)?	☐ Yes	☒ No

2. Project Information	
2a. Name of project:	EB-4993
2b. County:	Johnston
2c. Nearest municipality / town:	Clayton
2d. Subdivision name:	N/A
2e. NCDOT only, T.I.P. or state project no:	N/A
3. Owner Information	
3a. Name(s) on Recorded Deed:	Multiple, Please see attached
3b. Deed Book and Page No.	Multiple, Please see attached
3c. Responsible Party (for LLC if applicable):	Gregory J. Thorpe, PhD, PD&EA Branch Manager
3d. Street address:	1 South Wilmington Street
3e. City, state, zip:	Raleigh, NC 27601
3f. Telephone no.:	919-733-3141
3g. Fax no.:	919-733-9794
3h. Email address:	gthorpe@ncdot.gov

4. Applicant Information (if different from owner)	
4a. Applicant is:	☒ Agent ☐ Other, specify:
4b. Name:	
4c. Business name (if applicable):	
4d. Street address:	
4e. City, state, zip:	
4f. Telephone no.:	
4g. Fax no.:	
4h. Email address:	
5. Agent/Consultant Information (if applicable)	
5a. Name:	Benjamin Crawford, PE
5b. Business name (if applicable):	Stewart Engineering, Inc.
5c. Street address:	421 Fayetteville, Ste. 400
5d. City, state, zip:	Raleigh, NC 27601
5e. Telephone no.:	919-866-4735
5f. Fax no.:	919-380-8752
5g. Email address:	bcrawford@stewart-eng.com

B. Project Information and Prior Project History	
1. Property Identification	
1a. Property identification no. (tax PIN or parcel ID):	Multiple, see attached
1b. Site coordinates (in decimal degrees):	Latitude: 35.7008 (DD.DDDDDD) Longitude: - 78.4506 (-DD.DDDDDD)
1c. Property size:	Multiple Parcels = 779.92 acres
2. Surface Waters	
2a. Name of nearest body of water (stream, river, etc.) to proposed project:	Neuse River
2b. Water Quality Classification of nearest receiving water:	WS-IV
2c. River basin:	Neuse
3. Project Description	
3a. Describe the existing conditions on the site and the general land use in the vicinity of the project at the time of this application: Project runs parallel to the Neuse River. The trail alignment follows an existing sewer easement south of the Riverwood Subdivision and runs through forest (about 1.7 miles) north of Riverwood Subdivision. The land use along the project corridor is predominantly residential.	
3b. List the total estimated acreage of all existing wetlands on the property: 1.3 AC delineated per the attached NRTR	
3c. List the total estimated linear feet of all existing streams (intermittent and perennial) on the property: 5,974 LF of Perennial Streams, 1,502 LF of Intermittent Streams – delineated per NRTR and supplemented by ESI	
3d. Explain the purpose of the proposed project: EB-4993 is a greenway project that will connect to the future Neuse River Trail at the Wake/Johnston County line to the west and continues along the Neuse River to connect to the Sam's Branch Greenway trail (under construction). In addition to acting as a link in the Mountains-to-Sea Trail, locally the trail will connect recreational and residential nodes providing an alternative mode of transportation and increasing recreational opportunities. The major areas being connected with this trail are the Riverwood Subdivision and the Town of Clayton.	
3e. Describe the overall project in detail, including the type of equipment to be used: The project involves constructing a 10' paved greenway trail from the Sam's Branch Greenway (under construction) to the Wake/Johnston county line. The proposed greenway will also connect to an existing greenway in the Riverwood Subdivision. The project includes two pedestrian bridges, one over the Neuse River and the other over Marks Creek. The contractor will determine the equipment used on the project. However, given the nature of the project there are limited requirements for additional clearing. Trail contractors generally use small paving machines and earth moving equipment which have lower impacts to the project area than traditional highway construction equipment. Multiple construction entrances have been identified to minimize trip distances of equipment. Nationwide Permit 14 General Conditions will be included in construction documents to direct contractor operations in and around wetlands.	

4. Jurisdictional Determinations	
4a. Have jurisdictional wetland or stream determinations by the Corps or State been requested or obtained for this property / project (including all prior phases) in the past? Comments:	☒ Yes ☐ No ☐ Unknown
4b. If the Corps made the jurisdictional determination, what type of determination was made?	☒ Preliminary ☐ Final
4c. If yes, who delineated the jurisdictional areas? Name (if known): NCDOT NEU Gail Tyner (ESI) Tim Savidge (The Catena Group)	Agency/Consultant Company: NCDOT/NEU Environmental Services Inc, 524 S. New Hope Road Raleigh, NC The Catena Group 410-B Millstone Drive Hillsborough, NC 27278
4d. If yes, list the dates of the Corps jurisdictional determinations or State determinations and attach documentation. A JD field visit with the USACE was conducted on 2/17/2010 with The Catena Group; however, no hardcopy JD was received.	
5. Project History	
5a. Have permits or certifications been requested or obtained for this project (including all prior phases) in the past?	☐ Yes ☒ No ☐ Unknown
5b. If yes, explain in detail according to "help file" instructions.	
6. Future Project Plans	
6a. Is this a phased project?	☐ Yes ☒ No
6b. If yes, explain.	

C. Proposed Impacts Inventory
1. Impacts Summary
1a. Which sections were completed below for your project (check all that apply): ☒ Wetlands ☒ Streams - tributaries ☒ Buffers ☐ Open Waters ☐ Pond Construction

2. Wetland Impacts

If there are wetland impacts proposed on the site, then complete this question for each wetland area impacted.

2a. Wetland impact number – Permanent (P) or Temporary (T)	2b. Type of impact	2c. Type of wetland (if known)	2d. Forested	2e. Type of jurisdiction (Corps - 404, 10 DWQ – non-404, other)	2f. Area of impact (acres)
1 ☒ P ☐ T (NRTR c-wd)	Fill, Mechanized Clearing	PFO	☒ Yes ☐ No	☒ Corps ☐ DWQ	<0.01
4 ☒ P ☐ T (NRTR c-we)	Fill	PFO	☒ Yes ☐ No	☒ Corps ☐ DWQ	0.11
8 ☒ P ☐ T (ESI)	Excavation, Mechanized Clearing	PFO	☒ Yes ☐ No	☒ Corps ☐ DWQ	.04
9 ☒ P ☐ T (ESI)	Fill, Mechanized Clearing	PFO	☒ Yes ☐ No	☒ Corps ☐ DWQ	0.01
2g. **Total wetland impacts**					0.16

2h. Comments: There is a total of 0.11 acres of Hand Clearing on the project at sites 2, 4, 5, & 8. See Attached Wetland Permit Impact Summary and Wetland / Stream Permit Drawings

3. Stream Impacts

If there are perennial or intermittent stream impacts (including temporary impacts) proposed on the site, then complete this question for all stream sites impacted.

3a. Stream impact number - Permanent (P) or Temporary (T)	3b. Type of impact	3c. Stream name	3d. Perennial (PER) or intermittent (INT)?	3e. Type of jurisdiction (Corps - 404, 10 DWQ – non-404, other)	3f. Average stream width (feet)	3g. Impact length (linear feet)
3 ☒ P ☐ T (NRTR c-sg)	Installation of 30" HDPE and Rip Rap Energy Dissipator	UT to Neuse	☐ PER ☒ INT	☒ Corps ☐ DWQ	2-4	33 LF
3 ☐ P ☒ T (NRTR c-sg)	Installation of 30" HDPE and Rip Rap Energy Dissipator	UT to Neuse	☐ PER ☒ INT	☒ Corps ☐ DWQ	2-4	20 LF
6 ☒ P ☐ T (NRTR t-sb)	Installation of 42" HDPE and Rip Rap Energy Dissipator	UT to Neuse	☒ PER ☐ INT	☒ Corps ☐ DWQ	2-4	45 LF
6 ☐ P ☒ T (NRTR t-sb)	Installation of 42" HDPE and Rip Rap Energy Dissipator	UT to Neuse	☒ PER ☐ INT	☒ Corps ☐ DWQ	2-4	42 LF
7 ☒ P ☐ T (NRTR t-sc)	Installation of 60" HDPE and Rip Rap Energy Dissipator	UT to Neuse	☒ PER ☐ INT	☒ Corps ☐ DWQ	2-4	55 LF
7 ☐ P ☒ T (NRTR t-sc)	Installation of 60" HDPE and Rip Rap Energy Dissipator	UT to Neuse	☒ PER ☐ INT	☒ Corps ☐ DWQ	2-4	40 LF
8 ☐ P ☒ T (NRTR Marks Creek)	Installation of 102' bridge over Marks Creek	Marks Creek	☒ PER ☐ INT	☒ Corps ☐ DWQ	34	66 LF
10 ☒ P ☐ T (NRTR t-sa)	Installation of 24" HDPE and Rip	UT to Neuse	☒ PER ☐ INT	☒ Corps ☐ DWQ	4-6	40 LF

	Rap Energy Dissipator					
10 ☐ P ☒ T (NRTR t-sa)	Installation of 24" HDPE and Rip Rap Energy Dissipator	UT to Neuse	☒ PER ☐ INT	☒ Corps ☐ DWQ	4-6	20 LF
11 ☒ P ☐ T (NRTR c-sd)	Installation of 18" HDPE and Rip Rap Energy Dissipator	UT to Neuse	☐ PER ☒ INT	☒ Corps ☐ DWQ	1-3	32 LF
11 ☐ P ☒ T (NRTR c-sd)	Installation of 18" HDPE and Rip Rap Energy Dissipator	UT to Neuse	☐ PER ☒ INT	☒ Corps ☐ DWQ	1-3	20 LF
12 ☒ P ☐ T (NRTR c-sc)	Installation of 48" HDPE and Rip Rap Energy Dissipator	UT to Neuse	☒ PER ☐ INT	☒ Corps ☒ DWQ	8-10	36 LF
12 ☐ P ☒ T (NRTR c-sc)	Installation of 48" HDPE and Rip Rap Energy Dissipator	UT to Neuse	☒ PER ☐ INT	☒ Corps ☒ DWQ	8-10	20 LF
13 ☒ P ☐ T (NRTR c-sb)	Installation of 24" HDPE and Rip Rap Energy Dissipator	UT to Neuse	☐ PER ☒ INT	☒ Corps ☒ DWQ	1-3	50 LF
13 ☐ P ☒ T (NRTR c-sb)	Installation of 24" HDPE and Rip Rap Energy Dissipator	UT to Neuse	☐ PER ☒ INT	☒ Corps ☒ DWQ	1-3	20 LF
14 ☒ P ☐ T (NRTR c-sa)	Installation of 66" HDPE and Rip Rap Energy Dissipator	UT to Neuse	☒ PER ☐ INT	☒ Corps ☒ DWQ	14-16	42 LF
14 ☐ P ☒ T (NRTR c-sa)	Installation of 66" HDPE and Rip Rap Energy Dissipator	UT to Neuse	☒ PER ☐ INT	☒ Corps ☒ DWQ	14-16	30 LF
15 ☒ P ☐ T (NRTR c-se)	Installation of dual 66" HDPE and Rip Rap Energy Dissipator	UT to Neuse	☒ PER ☐ INT	☒ Corps ☒ DWQ	8-10	61 LF
15 ☐ P ☒ T (NRTR c-se)	Installation of dual 66" HDPE and Rip Rap Energy Dissipator	UT to Neuse	☒ PER ☐ INT	☒ Corps ☒ DWQ	8-10	30 LF
3h. **Total stream and tributary impacts**						394 LF Perm. 308 LF Temp.
3i. Comments: See attached Wetland Permit Impact Summary and Wetland / Stream Permit Drawings						

4. Open Water Impacts

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

4a. Open water impact number – Permanent (P) or Temporary (T)	4b. Name of waterbody (if applicable)	4c. Type of impact	4d. Waterbody type	4e. Area of impact (acres)
O1 ☐ P ☐ T				
O2 ☐ P ☐ T				
O3 ☐ P ☐ T				
O4 ☐ P ☐ T				
4f. Total open water impacts				

4g. Comments: There are no Open Water impacts

5. Pond or Lake Construction

If pond or lake construction proposed, then complete the chart below.

5a. Pond ID number	5b. Proposed use or purpose of pond	5c. Wetland Impacts (acres)			5d. Stream Impacts (feet)			5e. Upland (acres)
		Flooded	Filled	Excavated	Flooded	Filled	Excavated	Flooded
P1								
P2								
5f. Total								

5g. Comments:

5h. Is a dam high hazard permit required?	☐ Yes ☒ No If yes, permit ID no:
5i. Expected pond surface area (acres):	
5j. Size of pond watershed (acres):	
5k. Method of construction:	

6. Buffer Impacts (for DWQ)

If project will impact a protected riparian buffer, then complete the chart below. If yes, then individually list all buffer impacts below. If any impacts require mitigation, then you **MUST** fill out Section D of this form.

6a. Project is in which protected basin?	☒ Neuse ☐ Tar-Pamlico ☐ Other: ☐ Catawba ☐ Randleman				
6b. Buffer impact number – Permanent (P) or Temporary (T)	6c. Reason for impact	6d. Stream name	6e. Buffer mitigation required?	6f. Zone 1 impact (square feet)	6g. Zone 2 impact (square feet)
1 ☒ P ☐ T	Cut/Fill	Neuse River/Unnamed Tributary to Neuse	☐ Yes ☒ No	6,638	26,909
1A ☒ P ☐ T	Cut/Fill	Neuse River/Unnamed Tributary to Neuse	☐ Yes ☒ No	0	327
1B ☒ P ☐ T	Cut/Fill	Neuse River/Unnamed Tributary to Neuse	☐ Yes ☒ No	27,954	43,045
2 ☒ P ☐ T	Cut/Fill	Neuse River/Unnamed Tributary to Neuse	☐ Yes ☒ No	6,689	4,606
3 ☒ P ☐ T	Cut/Fill	Neuse River	☐ Yes ☒ No	929	7,423
4 ☒ P ☐ T	Cut/Fill	Neuse River/Unnamed Tributary to Neuse	☐ Yes ☒ No	6,333	17,413
5 ☒ P ☐ T	Cut/Fill	Marks Creek	☐ Yes ☒ No	8,282	4,884
6 ☒ P ☐ T	Cut/Fill	Unnamed Tributary to Neuse	☐ Yes ☒ No	3,788	2,678
7 ☒ P ☐ T	Cut/Fill	Neuse River/Unnamed Tributary to Neuse	☐ Yes ☒ No	3,649	7,738
8 ☒ P ☐ T	Cut/Fill	Neuse River/Unnamed Tributary to Neuse	☐ Yes ☒ No	10,983	12,127
9 ☒ P ☐ T	Cut/Fill	Neuse River	☐ Yes ☒ No	0	93
10 ☒ P ☐ T	Cut/Fill	Neuse River/Unnamed Tributary to Neuse	☐ Yes ☒ No	4,429	2,773
11 ☒ P ☐ T	Cut/Fill	Neuse River/Unnamed Tributary to Neuse	☐ Yes ☒ No	2,217	10,057
			6h. **Total buffer impacts**	*81,891*	*140,073*

6i. Comments: Greenway Trails are an allowable use within buffer zones. The rip rap encroaching into the Buffer Zones 1 and 2 are NCDOT specified culvert velocity dissipator pads for the drainage culverts beneath the proposed Greenway Trail.

D. Impact Justification and Mitigation

1. Avoidance and Minimization

1a. Specifically describe measures taken to avoid or minimize the proposed impacts in designing project.
The horizontal alignment adjusts accordingly to avoid or minimize impacts as much as possible. The trail itself matches existing grade as to minimize the amount of cut and fill, therefore avoiding or minimizing impacts. Double headwalls have been used at culvert locations to further reduce impacts.

1b. Specifically describe measures taken to avoid or minimize the proposed impacts through construction techniques.
The contractor shall be responsible for minimizing the impacts through construction techniques. The bid specification will call for hand clearing where possible, use of construction mats in sensitive areas, small paving machines and generally low impact machines to be used on the project in sensitive areas. Multiple construction entrances have been provided to minimize trip distances of heavy equipment. Nationwide 23 General Conditions will be included in construction specifications.

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 yes, mitigation is required by (check all that apply):	☐ DWQ ☒ Corps	
2c. If yes, which mitigation option will be used for this project?	☐ Mitigation bank ☒ Payment to in-lieu fee program ☐ Permittee Responsible Mitigation	
3. Complete if Using a Mitigation Bank		
3a. Name of Mitigation Bank:		
3b. Credits Purchased (attach receipt and letter)	Type	Quantity
3c. Comments:		
4. Complete if Making a Payment to In-lieu Fee Program		
4a. Approval letter from in-lieu fee program is attached.	☒ Yes	
4b. Stream mitigation requested:	linear feet	
4c. If using stream mitigation, stream temperature:	☐ warm ☐ cool ☐ cold	
4d. Buffer mitigation requested (DWQ only):	square feet	
4e. Riparian wetland mitigation requested:	0.16 acres	
4f. Non-riparian wetland mitigation requested:	acres	
4g. Coastal (tidal) wetland mitigation requested:	acres	
4h. Comments:		

5. **Complete if Using a Permittee Responsible Mitigation Plan**				
5a. If using a permittee responsible mitigation plan, provide a description of the proposed mitigation plan.				
6. Buffer Mitigation (State Regulated Riparian Buffer Rules) – required by DWQ				
6a. Will the project result in an impact within a protected riparian buffer that requires buffer mitigation?			☐ Yes	☒ No
6b. If yes, then identify the square feet of impact to each zone of the riparian buffer that requires mitigation. Calculate the amount of mitigation required.				
Zone	6c. Reason for impact	6d. Total impact (square feet)	Multiplier	6e. Required mitigation (square feet)
Zone 1			3 (2 for Catawba)	
Zone 2			1.5	
	6f. **Total buffer mitigation required:**			
6g. If buffer mitigation is required, discuss what type of mitigation is proposed (e.g., payment to private mitigation bank, permittee responsible riparian buffer restoration, payment into an approved in-lieu fee fund).				
6h. Comments:				

E. Stormwater Management and Diffuse Flow Plan (required by DWQ)	
1. Diffuse Flow Plan	
1a. Does the project include or is it adjacent to protected riparian buffers identified within one of the NC Riparian Buffer Protection Rules?	☒ Yes ☐ No
1b. If yes, then is a diffuse flow plan included? If no, explain why. Comments: The runoff directed into the Riparian Buffers occur at culverts that flow under the proposed greenway trail. All outlets of these culverts have been provided with NCDOT standard sized rip rap velocity dissipater pads. All other runoff shall sheet flow across the trail and be of an adequately diffuse flow.	☐ Yes ☒ No
2. Stormwater Management Plan	
2a. What is the overall percent imperviousness of this project?	0.012%
2b. Does this project require a Stormwater Management Plan?	☒ Yes ☐ No
2c. If this project DOES NOT require a Stormwater Management Plan, explain why:	
2d. If this project DOES require a Stormwater Management Plan, then provide a brief, narrative description of the plan: See attached NCDOT Highway Stormwater Program Stormwater Management Plan	
2e. Who will be responsible for the review of the Stormwater Management Plan?	☐ Certified Local Government ☐ DWQ Stormwater Program ☒ DWQ 401 Unit
3. Certified Local Government Stormwater Review	
3a. In which local government's jurisdiction is this project?	Town of Clayton
3b. Which of the following locally-implemented stormwater management programs apply (check all that apply):	☐ Phase II ☐ NSW ☐ USMP ☐ Water Supply Watershed ☐ Other:
3c. Has the approved Stormwater Management Plan with proof of approval been attached?	☐ Yes ☐ No
4. DWQ Stormwater Program Review	
4a. Which of the following state-implemented stormwater management programs apply (check all that apply):	☐ Coastal counties ☐ HQW ☐ ORW ☐ Session Law 2006-246 ☐ Other:
4b. Has the approved Stormwater Management Plan with proof of approval been attached?	☐ Yes ☐ No
5. DWQ 401 Unit Stormwater Review	
5a. Does the Stormwater Management Plan meet the appropriate requirements?	☐ Yes ☐ No
5b. Have all of the 401 Unit submittal requirements been met?	☐ Yes ☐ No

F. Supplementary Information		
1. Environmental Documentation (DWQ Requirement)		
1a. Does the project involve an expenditure of public (federal/state/local) funds or the use of public (federal/state) land?	☒ Yes	☐ No
1b. If you answered "yes" to the above, does the project require preparation of an environmental document pursuant to the requirements of the National or State (North Carolina) Environmental Policy Act (NEPA/SEPA)?	☒ Yes	☐ No
1c. If you answered "yes" to the above, has the document review been finalized by the State Clearing House? (If so, attach a copy of the NEPA or SEPA final approval letter.) Comments: See attached PCE	☒ Yes	☐ No
2. Violations (DWQ Requirement)		
2a. Is the site in violation of DWQ Wetland Rules (15A NCAC 2H .0500), Isolated Wetland Rules (15A NCAC 2H .1300), DWQ Surface Water or Wetland Standards, or Riparian Buffer Rules (15A NCAC 2B .0200)?	☐ Yes	☒ No
2b. Is this an after-the-fact permit application?	☐ Yes	☒ No
2c. If you answered "yes" to one or both of the above questions, provide an explanation of the violation(s):		
3. Cumulative Impacts (DWQ Requirement)		
3a. Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality?	☐ Yes	☒ No
3b. If you answered "yes" to the above, submit a qualitative or quantitative cumulative impact analysis in accordance with the most recent DWQ policy. If you answered "no," provide a short narrative description. The project is a greenway and will therefore not affect development.		
4. Sewage Disposal (DWQ Requirement)		
4a. Clearly detail the ultimate treatment methods and disposition (non-discharge or discharge) of wastewater generated from the proposed project, or available capacity of the subject facility. 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 ☐ Asheville	
5d. What data sources did you use to determine whether your site would impact Endangered Species or Designated Critical Habitat? NCNHP – See attached NRTR		
6. Essential Fish Habitat (Corps Requirement)		
6a. Will this project occur in or near an area designated as essential fish habitat?	☐ Yes	☒ No
6b. What data sources did you use to determine whether your site would impact Essential Fish Habitat? NMFS – See attached NRTR		
7. Historic or Prehistoric Cultural Resources (Corps Requirement)		
7a. Will this project occur in or near an area that the state, federal or tribal governments have designated as having historic or cultural preservation status (e.g., National Historic Trust designation or properties significant in North Carolina history and archaeology)?	☐ Yes	☒ No
7b. What data sources did you use to determine whether your site would impact historic or archeological resources? SHPO, see NEPA Documentation		
8. Flood Zone Designation (Corps Requirement)		
8a. Will this project occur in a FEMA-designated 100-year floodplain?	☒ Yes	☐ No
8b. If yes, explain how project meets FEMA requirements: A flood study was conducted as a part of this project and a "MOA" has been secured for this project.		
8c. What source(s) did you use to make the floodplain determination? NC Floodmaps		

Applicant/Agent's Printed Name	Applicant/Agent's Signature (Agent's signature is valid only if an authorization letter from the applicant is provided.)	

BUFFER IMPACTS SUMMARY

			IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
1	N/A	14+00 to 34+75 L1			X	6638	26909	33547					
1A	30" HDPE	37+85 to 38+50 L1	X				327	327					
1B	1@195' PreFab	41+90 to 69+70 L1	X	X	X	27954	43045	70999					
2	42" HDPE	71+04 to 74+90 L1	X		X	6689	4606	11295					
3	N/A	77+14 to 83+44 L1			X	929	7423	8352					
4	60" HDPE	84+76 to 102+18 L1	X		X	6333	17413	23746					
5	1@102' PreFab	12+66 to 14+23 L2	X			8282	4884	13166					
6	24" HDPE	37+36 L1R to 38+95 L1	X			3788	2678	6466					
7	48" HDPE	44+56 to 52+04 L2	X		X	3649	7738	11387					
8	66" HDPE	56+74 to 94+34 L2	X		X	10983	12127	23110					
TOTAL:						75245	127150	202395	0.0	0.0	0.0		

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

JOHNSTON COUNTY
PROJECT: 40892.3.ST1 (EB-4993)

3/3/2011
SHEET 3 OF 32

revised 3/3/'11

Rev. May 2006

BUFFER IMPACTS SUMMARY

			IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
9	15" HDPE	73+85 L2	X			0	93	93					
10	2 - 66" HDPE	92+75 to 94+73 L2	X			4429	2773	7202					
11	N/A	98+02 to 103+92 L2			X	2217	10057	12274					
TOTAL:						81891	140073	221964	0.0	0.0	0.0		

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

JOHNSTON COUNTY
PROJECT: 40892.3.ST1 (EB-4993)

3/3/2011
SHEET 4 OF 32

Rev. May 2006

revised 3/3/11

Buffer Drawing
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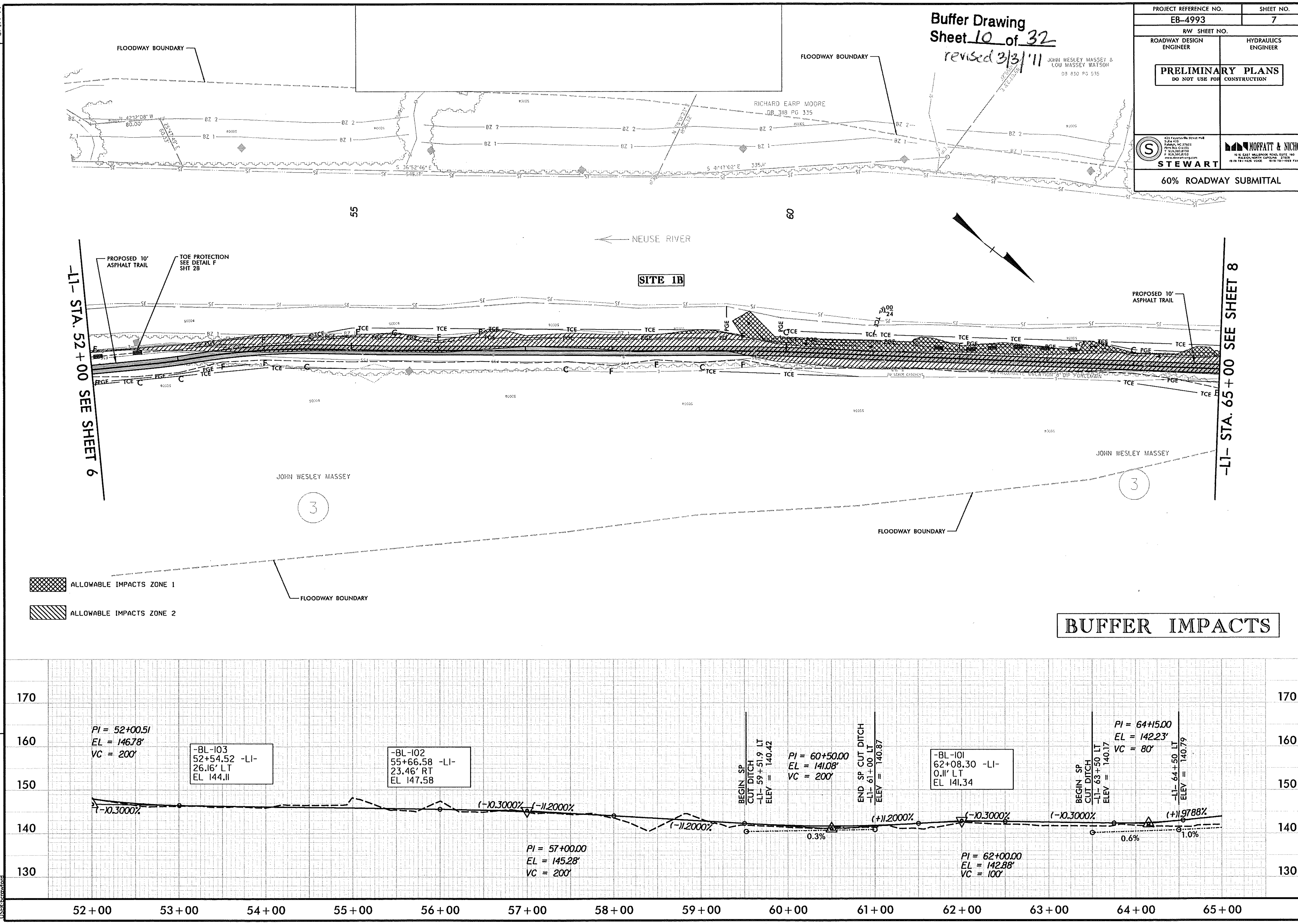
revised 3/3/'11

PROJECT REFERENCE NO.	SHEET NO.
EB-4993	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

STEWART
MOFFATT & NICHOL

60% ROADWAY SUBMITTAL



FLOODWAY BOUNDARY
JOHN WESLEY MASSEY & LOU MASSEY WATSON
RICHARD EARP MOORE
DB 318 PG 335
NEUSE RIVER
SITE 1B
PROPOSED 10' ASPHALT TRAIL
TOE PROTECTION SEE DETAIL F SHT 2B
-L1- STA. 52+00 SEE SHEET 6
-L1- STA. 65+00 SEE SHEET 8
JOHN WESLEY MASSEY
ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
BUFFER IMPACTS
PI = 52+00.51
EL = 146.78'
VC = 200'
-BL-103
52+54.52 -L1-
26.16' LT
EL 144.11
-BL-102
55+66.58 -L1-
23.46' RT
EL 147.58
PI = 57+00.00
EL = 145.28'
VC = 200'
BEGIN SP CUT DITCH -L1- 59+51.9 LT ELEV = 140.42
PI = 60+50.00
EL = 141.08'
VC = 200'
END SP CUT DITCH -L1- 61+00 LT ELEV = 140.87
-BL-101
62+08.30 -L1-
0.11' LT
EL 141.34
PI = 62+00.00
EL = 142.88'
VC = 100'
BEGIN SP CUT DITCH -L1- 63+50 LT ELEV = 140.17
PI = 64+15.00
EL = 142.23'
VC = 80'
-L1- 64+50 LT ELEV = 140.79
(-)0.3000%
(-)1.2000%
(+)1.2000%
(+)1.9788%
0.3%
0.6%
1.0%
170
160
150
140
130
52+00
53+00
54+00
55+00
56+00
57+00
58+00
59+00
60+00
61+00
62+00
63+00
64+00
65+00

REVISIONS

8/17/99

3/3/2011
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8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
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R/W SHEET NO.	

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
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STEWART — 433 Fayetteville Street Mall, Suite 600, Raleigh, NC 27601, Firm No. C-1752, T 919.380.8750, F 919.380.8751, www.stewartengineering.com

MOFFATT & NICHOL — 1616 EAST MILLBROOK ROAD, SUITE 160, RALEIGH, NORTH CAROLINA 27609, (919) 781-4626 VOICE, (919) 781-4983 FAX

60% ROADWAY SUBMITTAL

SEE SHEET 18 FOR -Y2- PROFILE

JOHN WESLEY MASSEY & LOU MASSEY WATSON
DB 830 PG 535

NEUSE RIVER

SITE 1B

SITE 2

SITE 3

PROPOSED SIGN AND MILE MARKER

FLOODWAY BOUNDARY

PROPOSED 10' ASPHALT TRAIL

TOE PROTECTION SEE DETAIL F SHT 2B

SAFETY RAILING (TYP.)

42" HDPE

15" HDPE

-L1- STA. 65+00 SEE SHEET 7

-L1R- STA. 13+10.61 SEE SHEET 9

DAVID M. SORRELL, ET UX
DB 959, PG 116

MAVIS C. HOUSE
DB 705, PG 629

JOHN WESLEY MASSEY
DB 1778 PG 679

COVERED ROAD BRIDGE STRUCTURE

TOWN OF CLAYTON SEWER EASEMENT

ABANDONED LOCATION OF NC WATERLINE

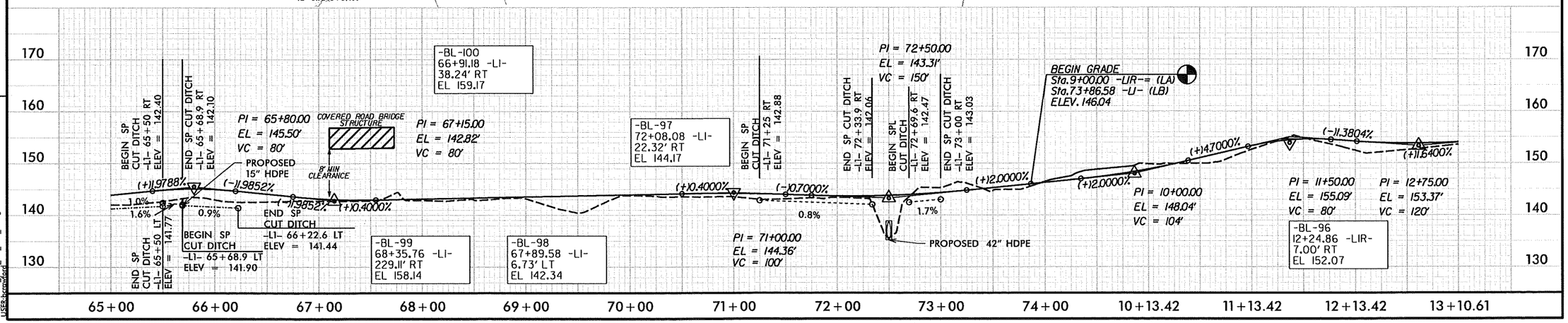
SAFETY RAILING (TYP.)

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

END CONSTRUCTION
-Y2- STA. 13+89.00

BUFFER IMPACTS



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REVISIONS

Buffer Drawing
Sheet 12 of 32
Revised 3/3/11

PROJECT REFERENCE NO.	SHEET NO.
EB-4993	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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433 Fayetteville Street Mall
Suite 600
Raleigh, NC 27601
Firm No. C-1232
T 919.361.2700
F 919.361.2752
www.stewartnc.com
STEWART

HOFFATT & NICHOL
416 EAST MILLBROOK ROAD, SUITE 110
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4628 FAX

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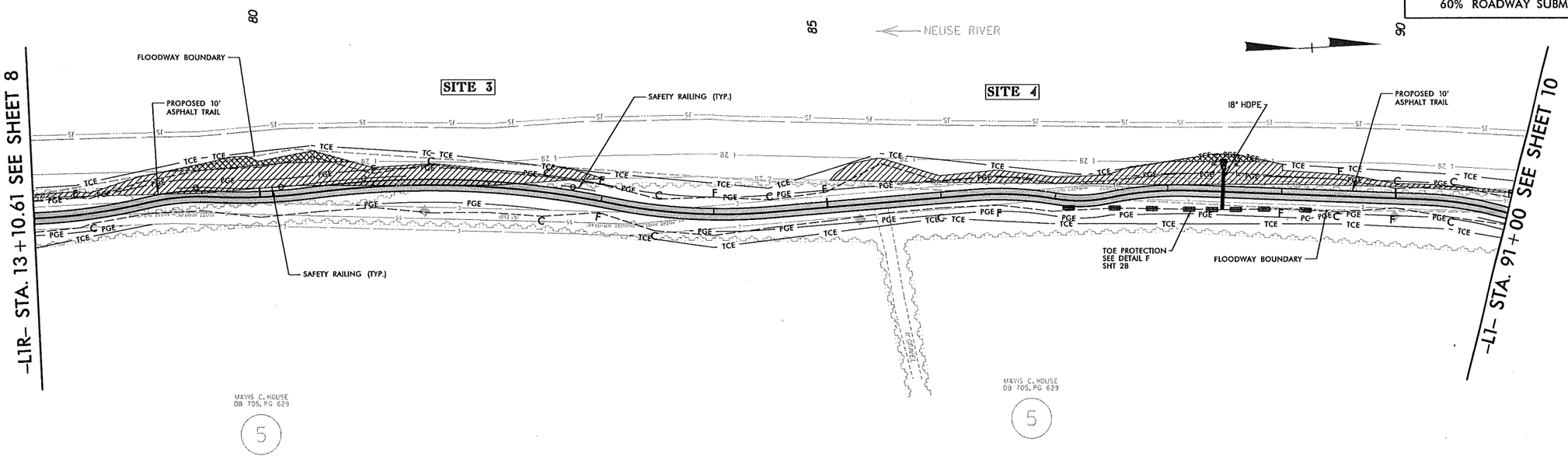

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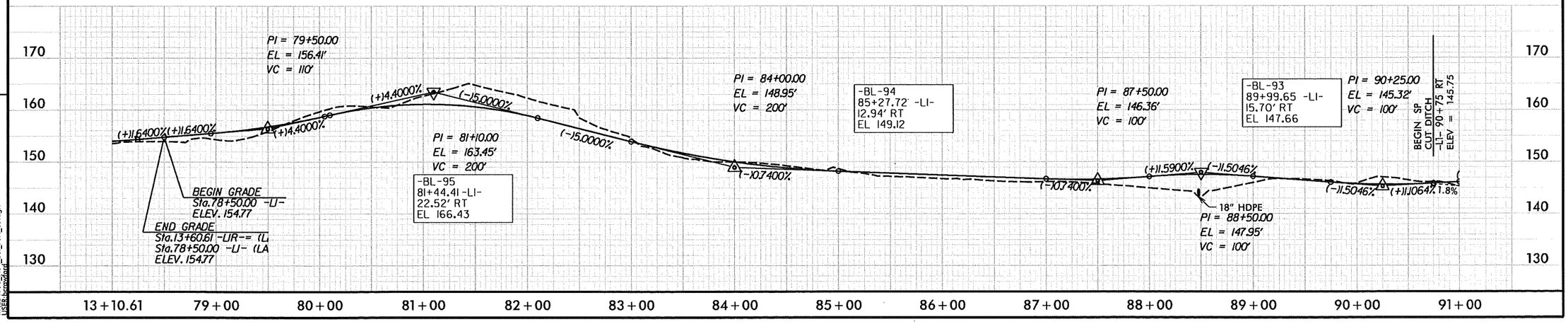

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REVISIONS

Buffer Drawing
Sheet 13 of 32
revised 3/3/11

PROJECT REFERENCE NO.	SHEET NO.
EB-4993	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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STEWART
433 Fayetteville Street Mall
Suite 600
Raleigh, NC 27601
Firm No. C-0781
T 919.380.8750
F 919.380.8752
www.stewartengineering.com

MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4982 FAX

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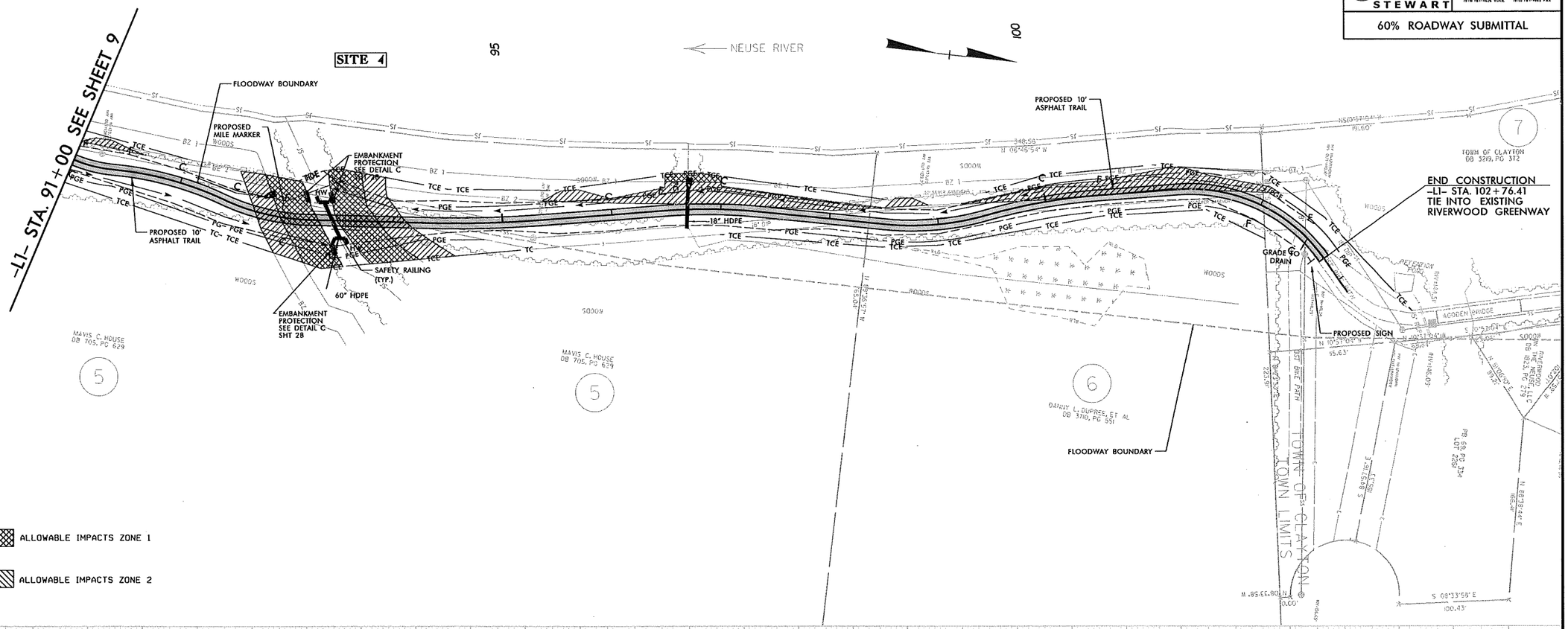

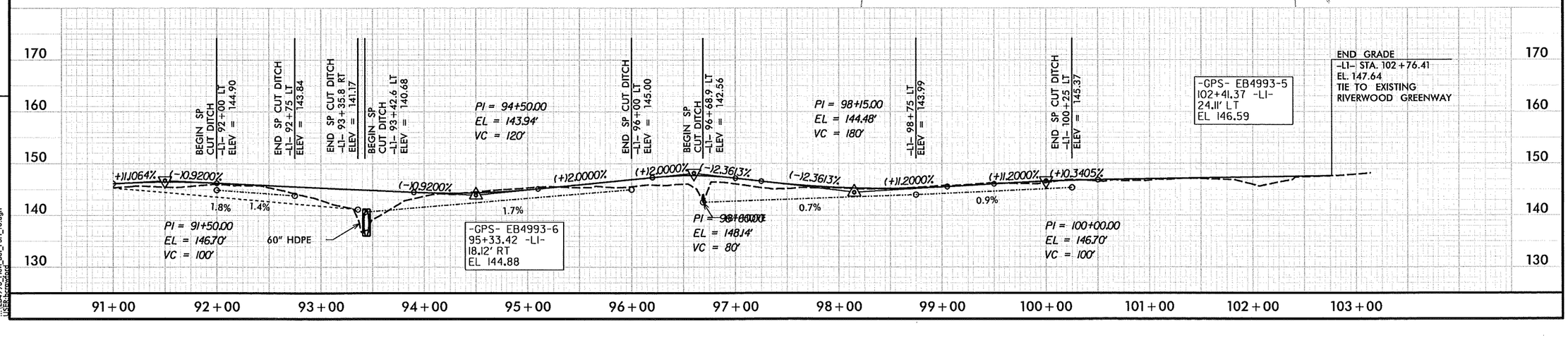

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PROJECT REFERENCE NO.	SHEET NO.
EB-4993	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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STEWART

MOFFATT & NICHOL

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Buffer Drawing
Sheet 15 of 32
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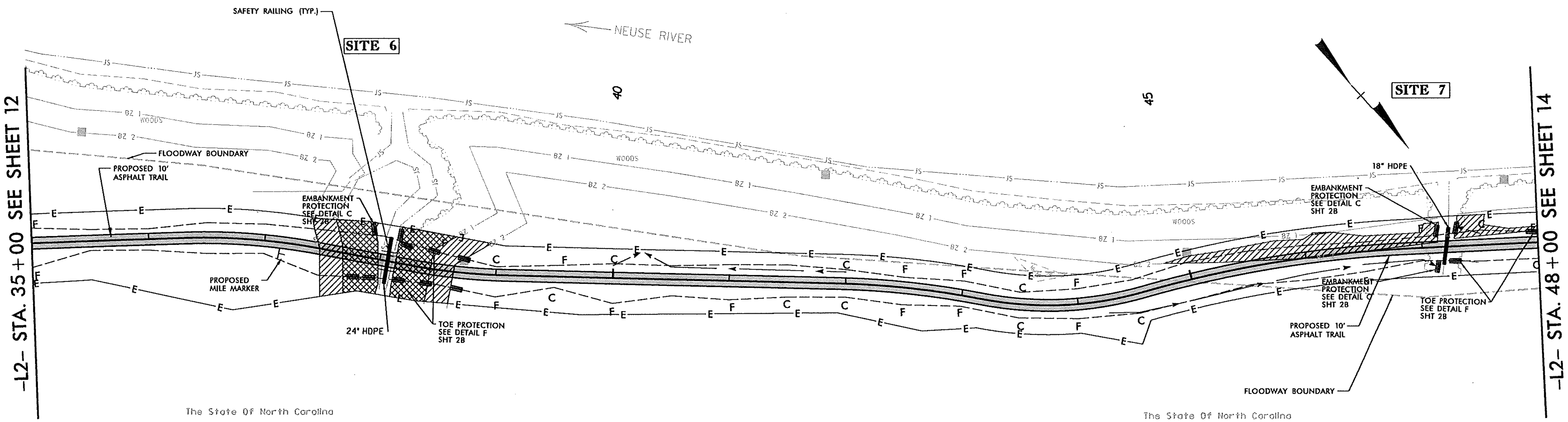
8/17/99

REVISIONS

FLOODWAY BOUNDARY

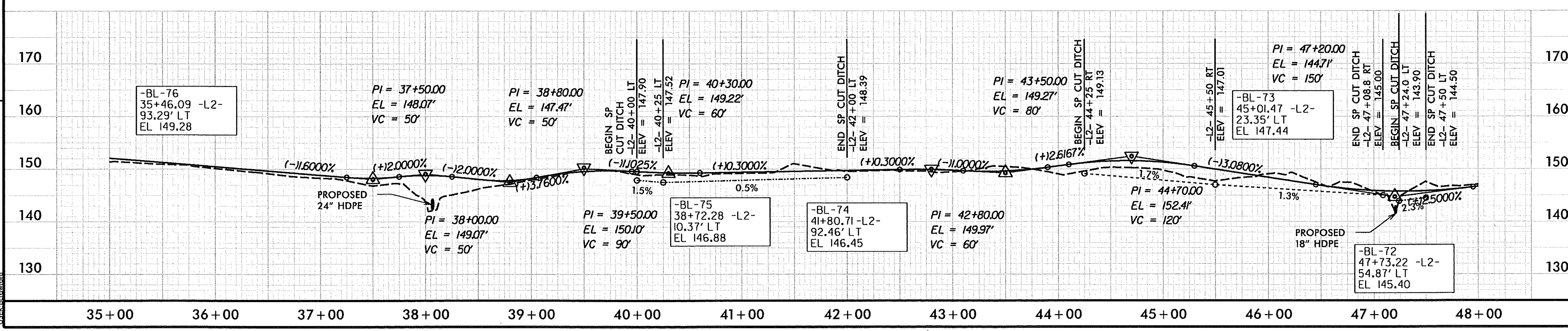
FLOODWAY BOUNDARY

BUFFER IMPACTS



ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2



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REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
EB-4993	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

STEWART — 421 Fayetteville Street Mall, Suite 400, Raleigh, NC 27601, PBN No. C-1235, P 919.380.8750, F 919.380.8752, www.stewart-eng.com

MOFFATT & NICHOL — 910 EAST HILLSBORO ROAD, SUITE 160, RALEIGH, NORTH CAROLINA 27609, (919) 781-4626 VOICE, (919) 781-4628 FAX

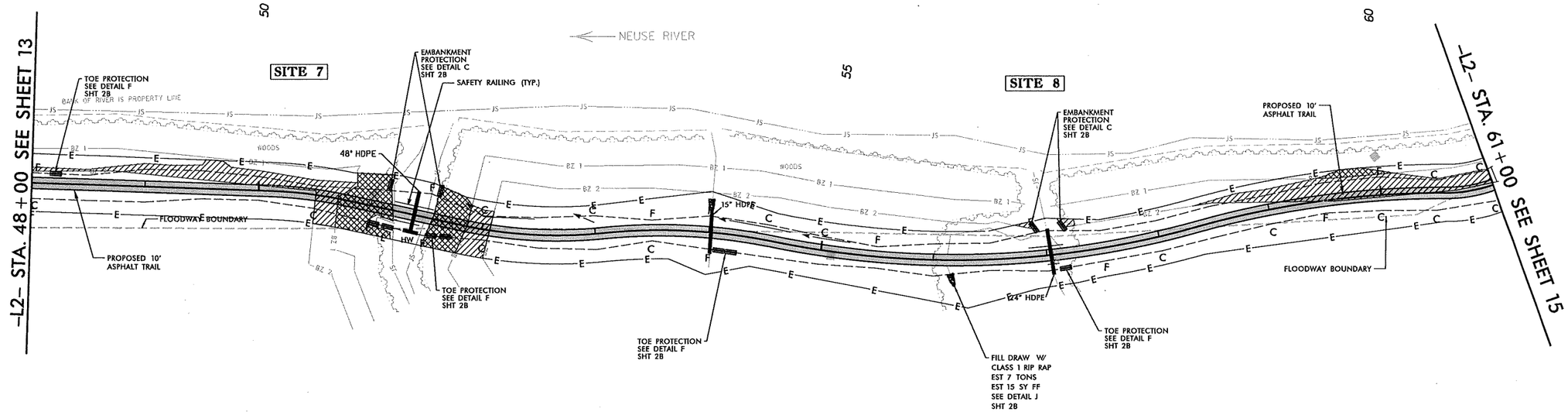
60% ROADWAY SUBMITTAL

FLOODWAY BOUNDARY

BUFFER IMPACTS

FLOODWAY BOUNDARY

Buffer Drawing
Sheet 16 of 32
revised 3/31/11



The State Of North Carolina

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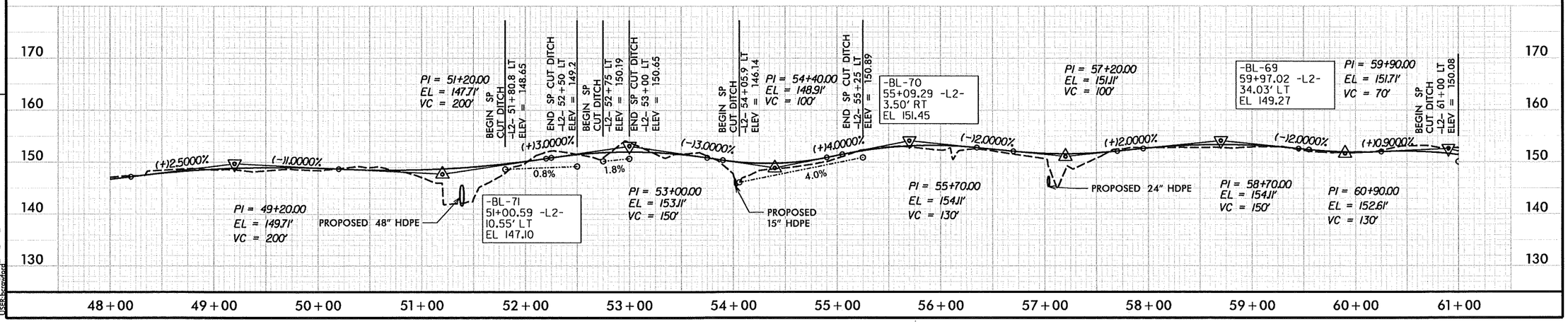
ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2



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8/17/99

REVISIONS

Buffer Drawing
Sheet 17 of 32
revised 3/3/11

PROJECT REFERENCE NO.	SHEET NO.
EB-4993	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

STEWART

MOFFATT & NICHOL

60% ROADWAY SUBMITTAL

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

FLOODWAY BOUNDARY

NEUSE RIVER

BANK OF RIVER IS PROPERTY LINE

SITE 8

SITE 9

-L2- STA. 61+00 SEE SHEET 14

-L2- STA. 74+00 SEE SHEET 16

EMBANKMENT PROTECTION SEE DETAIL C SHT 28

PROPOSED 10' ASPHALT TRAIL

TOE PROTECTION SEE DETAIL F SHT 28

66" HDPE

15" HDPE

15" HDPE EQUALIZER PIPE

SAFETY RAILING (TYP.)

PROPOSED MILE MARKER

WOODS

BZ 1

BZ 2

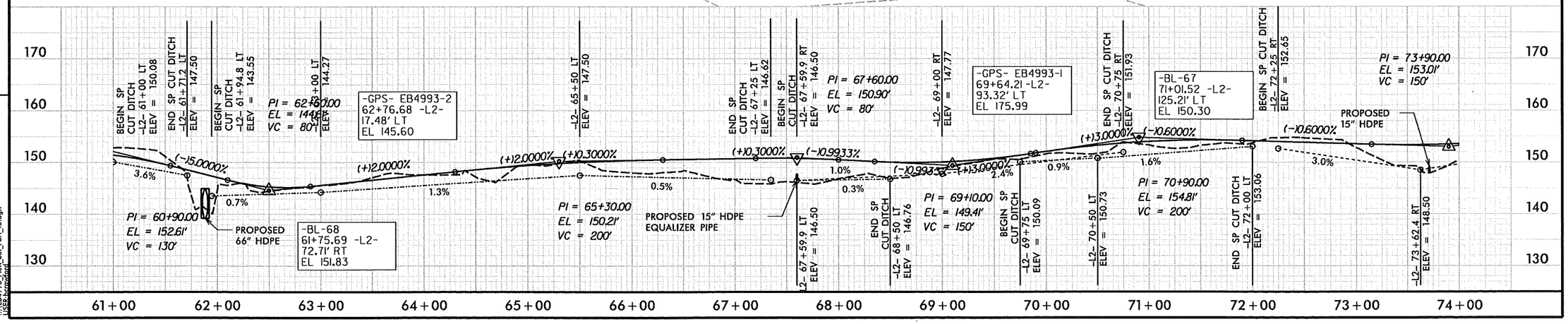
JS

The State Of North Carolina

10

FLOODWAY BOUNDARY

BUFFER IMPACTS



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8/17/99

REVISIONS

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

Buffer Drawing
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revised 3/3/11

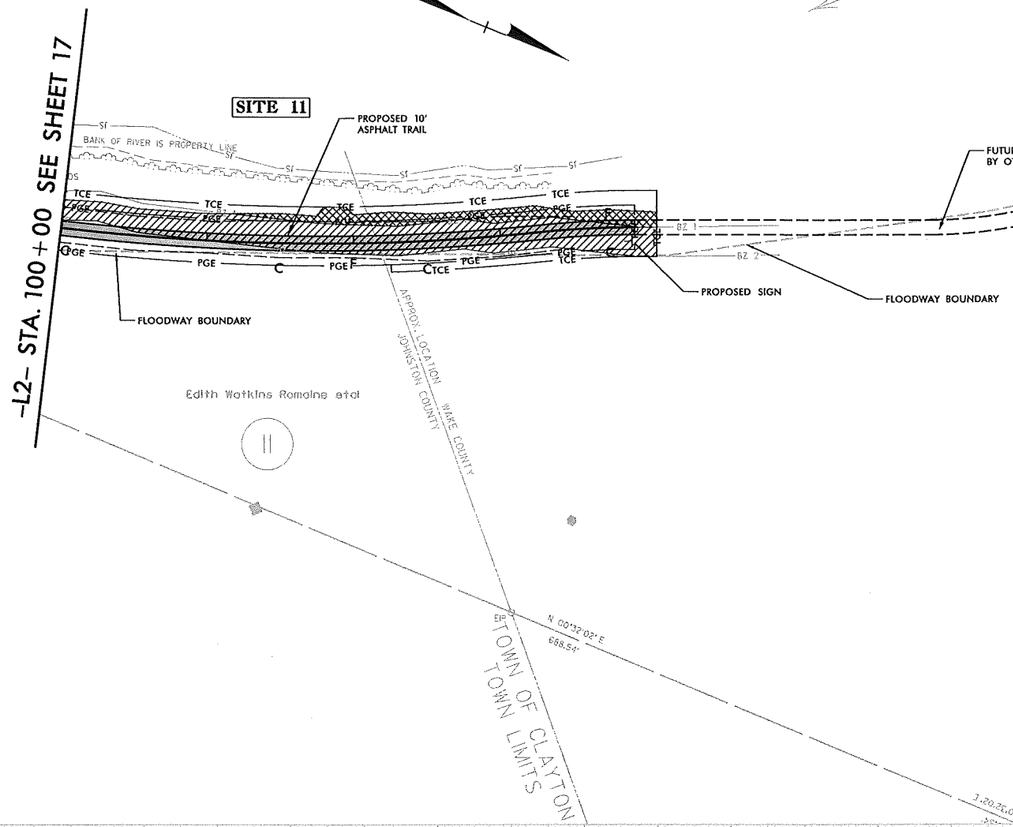
PROJECT REFERENCE NO.	SHEET NO.
EB-4993	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

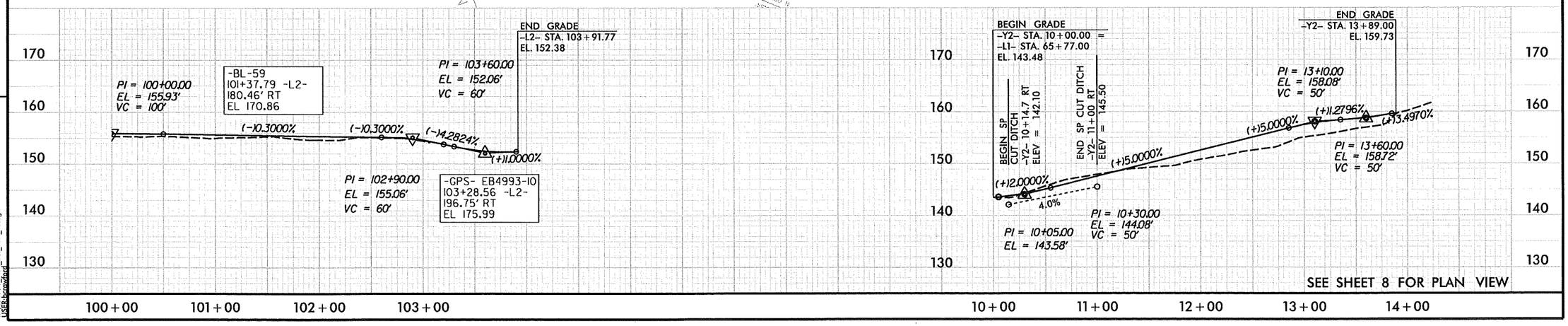
STEWART
423 Fayetteville Street Mall
Suite 400
Raleigh, NC 27601
Firm No.: C-0195
T 919.380.8750
F 919.380.8752
www.stewartnc.com

MOFFATT & NICHOL
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-1628 FAX

60% ROADWAY SUBMITTAL



BUFFER IMPACTS



SEE SHEET 8 FOR PLAN VIEW

3/2/2011
...\EB4993_PRM_buf_PSH_18.dgn
USER:hcrawford

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	25+17 L1	42" HDPE	<0.01			<0.01						
2	31+27	N/A					0.02					
3	38+23 L1	30" HDPE						0.01	0.01	33	20	
4	42+55 to 44+40 L1	15" HDPE	0.11				0.07					
5	55+40	N/A					<0.01					
6	72+50 L1	42" HDPE						0.01	0.01	45	42	
7	93+44 L1	60" HDPE						0.01	0.01	55	40	
8	13+06 to 14+08 L2	1@102' PreFab			0.02	<0.01	0.02		0.02		66	
9	30+71 L2	18" HDPE	0.01			<0.01						
10	38+07 L2	24" HDPE						0.01	<0.01	40	20	
11	47+21 L2	18" HDPE						<0.01	<0.01	32	20	
TOTALS:			0.13		0.02	0.01	0.11	0.04	0.04	205	208	

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

COUNTY
WBS - 40892.3.ST1 (EB-4993)

SHEET 4 of 34 3/3/2011
revised 3/3/11

ATN Revised 3/31/05

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)
12	51+39 L2	48" HDPE						0.02	0.01	36	20	
13	57+04 L2	24" HDPE						<0.01	<0.01	50	20	
14	61+88 L2	66" HDPE						0.02	0.01	42	30	
15	93+89 L2	2 - 66' HDPE						0.01	0.01	61	30	
TOTALS:			0.13		0.02	0.01	0.11	0.09	0.07	394	308	

Existing Channel Impacts Temporary include Bank Stabilization above the Ordinary High Water.

Area impacts are calculated to the thousandth and rounded to the hundredth

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

COUNTY

WBS - 40892.3.ST1 (EB-4993)

SHEET 5 of 36 3/3/2011

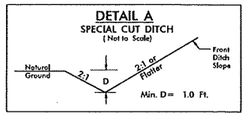
revised 3/3/11

ATN Revised 3/31/05

8/17/99

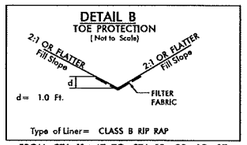
REVISIONS

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 25+28.5 TO STA. 27+25 –L1– LT
FROM STA. 63+50 TO STA. 65+50 –L1– LT
FROM STA. 65+50 TO STA. 65+68.9 –L1– RT
FROM STA. 65+68.9 TO STA. 66+22.6 –L1– LT
FROM STA. 71+25 TO STA. 72+33.9 –L1– RT
FROM STA. 92+00 TO STA. 92+75 –L1– LT
FROM STA. 93+42.6 TO STA. 96+00 –L1– LT
FROM STA. 96+68.9 TO STA. 100+25 –L1– LT
FROM STA. 15+50 TO STA. 16+92.2 –L2– RT
FROM STA. 23+50 TO STA. 24+01.7 –L2– RT
FROM STA. 24+01.7 TO STA. 24+75 –L2– RT
FROM STA. 40+00 TO STA. 40+25 –L2– LT
FROM STA. 40+25 TO STA. 42+00 –L2– LT
FROM STA. 47+24 TO STA. 47+50 –L2– LT
FROM STA. 52+75 TO STA. 53+00 –L2– LT
FROM STA. 54+05.9 TO STA. 55+25 –L2– LT
FROM STA. 61+00 TO STA. 61+71.2 –L2– LT
FROM STA. 61+94.8 TO STA. 65+50 –L2– LT
FROM STA. 65+50 TO STA. 67+25 –L2– LT
FROM STA. 67+59.9 TO STA. 68+50 –L2– LT
FROM STA. 67+59.9 TO STA. 70+75 –L2– RT
FROM STA. 69+75 TO STA. 72+00 –L2– LT
FROM STA. 72+25 TO STA. 73+62.4 –L2– RT
FROM STA. 73+62.4 TO STA. 75+50 –L2– RT
FROM STA. 77+72.3 TO STA. 78+25 –L2– LT
FROM STA. 79+25 TO STA. 80+17.4 –L2– LT

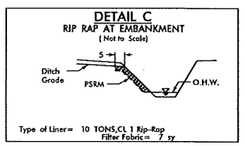
DETAIL B
TOE PROTECTION
(Not to Scale)



Type of Liner= CLASS B RIP RAP

FROM STA. 11+47 TO STA. 12+00 –L2– RT

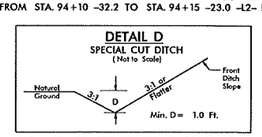
DETAIL C
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner= 10 TONS,CL 1 Rip-Rap
Filter Fabric= 7 sy

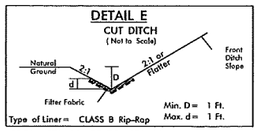
FROM STA. 37+95 +18 TO STA. 37+95 +28 –L1– RT
FROM STA. 38+10 +20 TO STA. 38+10 +32 –L1– RT
FROM STA. 72+30 –17 TO STA. 72+30 –27 –L1– LT
FROM STA. 72+30 +20 TO STA. 72+30 +30 –L1– RT
FROM STA. 72+60 –30 TO STA. 72+60 –40 –L1– LT
FROM STA. 72+60 +13 TO STA. 72+60 +23 –L1– RT
FROM STA. 37+90 –26.9 TO STA. 37+95 –18.5 –L2– LT
FROM STA. 38+15 –18.5 TO STA. 38+15 –28.5 –L2– LT
FROM STA. 47+12 +21.3 TO STA. 47+14 +11.5 –L2– RT
FROM STA. 47+15 –15.7 TO STA. 47+15 –24.9 –L2– LT
FROM STA. 47+30 –14.9 TO STA. 47+30 –24.3 –L2– LT
FROM STA. 51+15 – 20.3 TO STA. 51+15 –30.3 –L2– LT
FROM STA. 51+60 –20.6 TO STA. 51+55 –20.6 –L2– LT
FROM STA. 56+90 –31.8 TO STA. 56+90 –23.7 –L2– LT
FROM STA. 57+10 –33.6 TO STA. 57+15 –24.4 –L2– LT
FROM STA. 61+70 –21.8 TO STA. 61+65 –31.8 –L2– LT
FROM STA. 61+80 +16.6 TO STA. 61+80 +24.4 –L2– RT
FROM STA. 61+90 –23.7 TO STA. 61+95 –14.6 –L2– LT
FROM STA. 62+10 +19.8 TO STA. 62+15 +28.6 –L2– RT
FROM STA. 93+44 +22 TO STA. 93+48 +31 –L1– RT
FROM STA. 93+20 –16 TO STA. 93+48 –26 –L1– LT
FROM STA. 93+47 –16 TO STA. 93+48 –26 –L1– LT
FROM STA. 93+30 –27.1 TO STA. 93+40 –19.4 –L2– LT
FROM STA. 93+55 +26.7 TO STA. 93+60 +17.4 –L2– RT
FROM STA. 94+05 +30.3 TO STA. 94+10 +20.9 –L2– RT
FROM STA. 94+10 –32.2 TO STA. 94+15 –23.0 –L2– LT

DETAIL D
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 59+51.9 TO STA. 61+00 –L1– LT
FROM STA. 72+62.9 TO STA. 73+00 –L1– RT
FROM STA. 44+25 TO STA. 47+08.8 –L2– RT
FROM STA. 51+80.8 TO STA. 52+50 –L2– LT
FROM STA. 91+75 TO STA. 93+60.4 –L2– LT
FROM STA. 94+13.8 TO STA. 96+00 –L2– LT

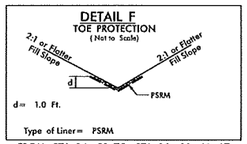
DETAIL E
CUT DITCH
(Not to Scale)



Type of Liner= CLASS B Rip-Rap

FROM STA. 90+75 TO STA. 93+35.8 –L1– RT
FROM STA. 10+14.7 TO STA. 11+00 –Y2– RT

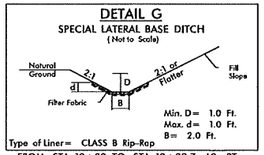
DETAIL F
TOE PROTECTION
(Not to Scale)



Type of Liner= PSRM

FROM STA. 24+50 TO STA. 25+00 –L1– LT
FROM STA. 37+75 TO STA. 37+92 –L1– RT
FROM STA. 38+14.6 TO STA. 39+00 –L1– RT
FROM STA. 41+00 TO STA. 45+07 –L1– RT
FROM STA. 50+66 TO STA. 52+60 –L1– LT
FROM STA. 61+50 TO STA. 63+50 –L1– LT
FROM STA. 70+75 TO STA. 72+00 –L1– LT
FROM STA. 87+00 TO STA. 88+47.7 –L1– RT
FROM STA. 88+47.7 TO STA. 89+50 –L1– RT
FROM STA. 14+24 TO STA. 14+88 –L2– RT
FROM STA. 30+15 TO STA. 31+27 –L2– RT
FROM STA. 37+73.5 TO STA. 37+97.5 –L2– RT
FROM STA. 38+14.4 TO STA. 38+73.4 –L2– RT
FROM STA. 38+14.4 TO STA. 38+73.4 –L2– LT
FROM STA. 47+23 TO STA. 47+34 –L2– RT
FROM STA. 47+75 TO STA. 48+25 –L2– LT
FROM STA. 51+00 TO STA. 51+24 –L2– RT
FROM STA. 51+50 TO STA. 51+75 –L2– RT
FROM STA. 54+02 TO STA. 54+25 –L2– RT
FROM STA. 57+10 TO STA. 57+25 –L2– RT
FROM STA. 65+50 TO STA. 67+50 –L2– RT
FROM STA. 67+25 TO STA. 67+50 –L2– LT
FROM STA. 81+25 TO STA. 82+50 –L2– RT

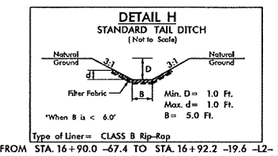
DETAIL G
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Type of Liner= CLASS B Rip-Rap

FROM STA. 12+00 TO STA. 12+39.7 –L2– RT

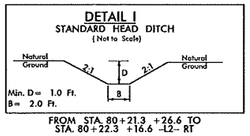
DETAIL H
STANDARD TAIL DITCH
(Not to Scale)



Type of Liner= CLASS B Rip-Rap

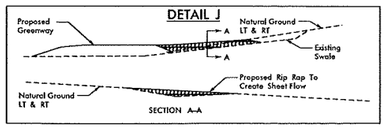
FROM STA. 16+90.0 –67.4 TO STA. 16+92.2 –19.6 –L2– LT
FROM STA. 24+03 –20.5 TO STA. 24+03 –44.8 –L2– LT

DETAIL I
STANDARD HEAD DITCH
(Not to Scale)

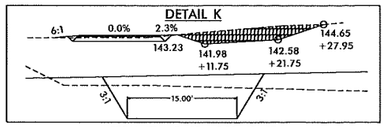


FROM STA. 80+21.3 +26.6 TO STA. 80+22.3 +16.6 –L2– RT

DETAIL J

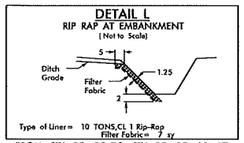


DETAIL K



FROM STA. 68+00 +8.00 –L1– RT

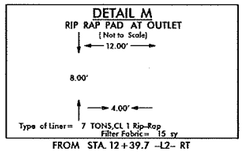
DETAIL L
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner= 10 TONS,CL 1 Rip-Rap
Filter Fabric= 7 sy

FROM STA. 25+25 TO STA. 25+35 –L2– LT

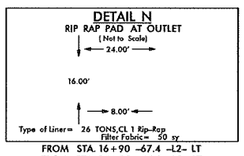
DETAIL M
RIP RAP PAD AT OUTLET
(Not to Scale)



Type of Liner= 7 TONS,CL 1 Rip-Rap
Filter Fabric= 15 sy

FROM STA. 12+39.7 –L2– RT

DETAIL N
RIP RAP PAD AT OUTLET
(Not to Scale)



Type of Liner= 26 TONS,CL 1 Rip-Rap
Filter Fabric= 50 sy

FROM STA. 16+90 –67.4 –L2– LT
FROM STA. 24+03 –44.8 –L2– LT

Permit Drawing
Sheet 6 of 36
revised 3/3/11

PROJECT REFERENCE NO.	SHEET NO.
EB–4993	2B
R/W SHEET NO.	

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60% ROADWAY SUBMITTAL

STREAM & WETLAND IMPACTS

Permit Drawing
Sheet 12 of 36
revised 3/3/11

PROJECT REFERENCE NO.	SHEET NO.
EB-4993	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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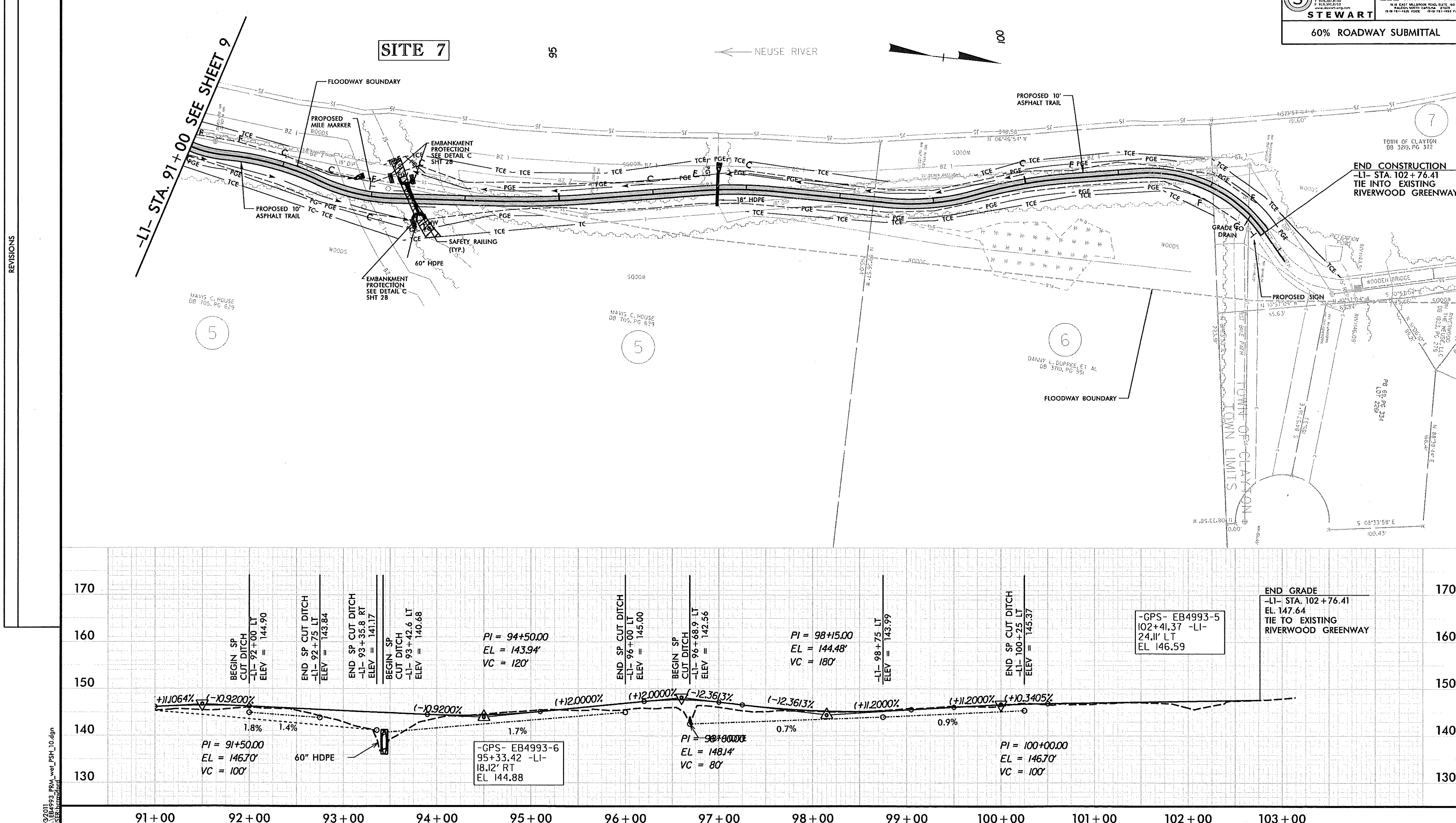
DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER



PROJECT REFERENCE NO.	SHEET NO.
EB-4993	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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Permit Drawing
Sheet 18 of 36
revised 3/3/11

STREAM & WETLAND IMPACTS

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SITE 14