



Transportation

PAT McCRORY  
Governor

NICHOLAS J. TENNYSON  
Secretary

March 18, 2016

Raleigh Regulatory Field Office  
US Army Corps of Engineers  
3331 Heritage Trade Drive, Suite 105  
Wake Forest, North Carolina 27587

ATTN: Mr. Eric Alsmeyer  
NCDOT Coordinator

**Subject: Application for Section 404 Nationwide Permits 23 and 33, Section 401 Water Quality Certification and Neuse River Riparian Buffer Authorization**  
for the Proposed Replacement of Bridge No. 20 over Moccasin Creek on NC 97 in Wake County, North Carolina; TIP No. B-4830; Federal Aid Project No. BRSTP-0097(34); Debit \$270 from WBS No. 38600.1.1

Dear Sir,

The North Carolina Department of Transportation (NCDOT) proposes to replace the existing 84-foot, two-span bridge no. 20 with a 105-foot, single-span bridge on existing alignment. Traffic will be maintained on an offsite detour. Permanent impacts to riparian wetlands total 0.36 acre. There will be 0.07 acre of temporary impact to Moccasin Creek due to a causeway. Riparian buffer impacts will total 3,372 square feet in Zone 1 and 2,548 square feet in Zone 2. Of this buffer impact, 1,444 square feet in Zone 1 and 1,483 square feet in Zone 2 will occur in riparian wetlands. All impacts to riparian buffers are considered allowable.

Please see enclosed copies of the Pre-Construction Notification (PCN), Preliminary Jurisdictional Determination, Wiggins Mill Mitigation Site debit summary, USFWS concurrence letter, stormwater management plan, permit drawings, and design plans for the above referenced project. The Programmatic Categorical Exclusion (PCE) was completed in April 2015 and distributed shortly after. Additional copies are available at the NCDOT website: <https://connect.ncdot.gov/resources/Environmental/>.

This project calls for a letting date of October 18, 2016 and a review date of August 30, 2016. The project schedule may be advanced if funding becomes available.

### Regulatory Approvals

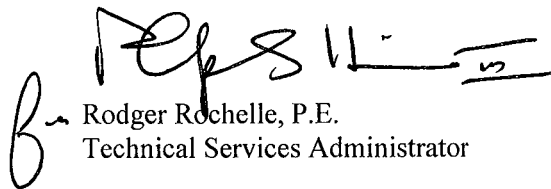
Section 404 Permit: We anticipate that the bridge replacement, including all approach work will be authorized under Section 404 Nationwide Permits (NWP) Nos. 23 and 33.

Section 401 Permit: We anticipate 401 Water Quality Certification numbers 3891 and 3893 will apply to this project. It is also anticipated that a Neuse River Riparian Buffer Authorization will be issued for this project. NCDOT is requesting written concurrence from the North Carolina Department of Environmental Quality, Division of Water Resources.



A copy of this permit application and its distribution list will be posted at the NCDOT website at <https://connect.ncdot.gov/resources/Environmental/>. Should you have any questions regarding this information, please contact Jason Dilday at (919) 707-6111 or [jldilday@ncdot.gov](mailto:jldilday@ncdot.gov)

Sincerely,



Rodger Rochelle, P.E.  
Technical Services Administrator

cc: NCDOT Permit Application Standard Distribution List



Office Use Only:  
 Corps action ID no. \_\_\_\_\_  
 DWQ project no. \_\_\_\_\_  
 Form Version 1.3 Dec 10 2008

## Pre-Construction Notification (PCN) Form

### A. Applicant Information

#### 1. Processing

1a. Type(s) of approval sought from the Corps:	<input checked="" type="checkbox"/> Section 404 Permit	<input type="checkbox"/> Section 10 Permit
1b. Specify Nationwide Permit (NWP) number: 23 33 or General Permit (GP) number:		
1c. Has the NWP or GP number been verified by the Corps?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
1d. Type(s) of approval sought from the DWQ (check all that apply):		
<input checked="" type="checkbox"/> 401 Water Quality Certification – Regular <span style="margin-left: 100px;"><input type="checkbox"/> Non-404 Jurisdictional General Permit</span> <input type="checkbox"/> 401 Water Quality Certification – Express <span style="margin-left: 100px;"><input checked="" type="checkbox"/> Riparian Buffer Authorization</span>		
1e. Is this notification solely for the record because written approval is not required?	For the record only for DWQ 401 Certification: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	For the record only for Corps Permit: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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.	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
1g. Is the project located in any of NC's twenty coastal counties. If yes, answer 1h below.	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
1h. Is the project located within a NC DCM Area of Environmental Concern (AEC)?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

#### 2. Project Information

2a. Name of project:	Replacement of Bridge No. 20 on NC 97 over Moccasin Creek
2b. County:	Wake
2c. Nearest municipality / town:	Zebulon
2d. Subdivision name:	<i>not applicable</i>
2e. NCDOT only, T.I.P. or state project no.:	B-4830

#### 3. Owner Information

3a. Name(s) on Recorded Deed:	North Carolina Department of Transportation
3b. Deed Book and Page No.	<i>not applicable</i>
3c. Responsible Party (for LLC if applicable):	<i>not applicable</i>
3d. Street address:	1598 Mail Service Center
3e. City, state, zip:	Raleigh, NC 27699-1598
3f. Telephone no.:	(919) 707-6111
3g. Fax no.:	(919) 212-5785
3h. Email address:	jldilday@ncdot.gov

<b>4. Applicant Information (if different from owner)</b>	
4a. Applicant is:	<input type="checkbox"/> Agent <input type="checkbox"/> Other, specify:
4b. Name:	<i>not applicable</i>
4c. Business name (if applicable):	
4d. Street address:	
4e. City, state, zip:	
4f. Telephone no.:	
4g. Fax no.:	
4h. Email address:	
<b>5. Agent/Consultant Information (if applicable)</b>	
5a. Name:	<i>not applicable</i>
5b. Business name (if applicable):	
5c. Street address:	
5d. City, state, zip:	
5e. Telephone no.:	
5f. Fax no.:	
5g. Email address:	

<b>B. Project Information and Prior Project History</b>	
<b>1. Property Identification</b>	
1a. Property identification no. (tax PIN or parcel ID):	<i>not applicable</i>
1b. Site coordinates (in decimal degrees):	Latitude: 35.8347 (DD.DDDDDD) Longitude: -78.2610 (-DD.DDDDDD)
1c. Property size:	0.4 acres
<b>2. Surface Waters</b>	
2a. Name of nearest body of water (stream, river, etc.) to proposed project:	Moccasin Creek
2b. Water Quality Classification of nearest receiving water:	C; NSW
2c. River basin:	Neuse
<b>3. Project Description</b>	
3a. Describe the existing conditions on the site and the general land use in the vicinity of the project at the time of this application: The land use is mostly forested with a few residential houses	
3b. List the total estimated acreage of all existing wetlands on the property: 1.9	
3c. List the total estimated linear feet of all existing streams (intermittent and perennial) on the property: 270	
3d. Explain the purpose of the proposed project: To replace a functionally obsolete bridge.	
3e. Describe the overall project in detail, including the type of equipment to be used: The project involves replacing a two span, 84-foot bridge with a single span, 105-foot bridge on the existing alignment with an off-site detour. Standard road building equipment, such as trucks, dozers, and cranes will be used. Duke Energy will be relocating an electrical transmission line within the project limits using hand clearing and timber matting. Duke Energy assumes that the relocation would be covered under a non-reporting NW12.	
<b>4. Jurisdictional Determinations</b>	
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:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown
4b. If the Corps made the jurisdictional determination, what type of determination was made?	<input checked="" type="checkbox"/> Preliminary <input type="checkbox"/> Final
4c. If yes, who delineated the jurisdictional areas? Name (if known): Amy James	Agency/Consultant Company: NCDOT Other:
4d. If yes, list the dates of the Corps jurisdictional determinations or State determinations and attach documentation. April 11, 2013	
<b>5. Project History</b>	
5a. Have permits or certifications been requested or obtained for this project (including all prior phases) in the past?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown
5b. If yes, explain in detail according to "help file" instructions.	
<b>6. Future Project Plans</b>	
6a. Is this a phased project?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
6b. If yes, explain.	

<b>C. Proposed Impacts Inventory</b>						
<b>1. Impacts Summary</b>						
1a. Which sections were completed below for your project (check all that apply):						
<input checked="" type="checkbox"/> Wetlands		<input checked="" type="checkbox"/> Streams - tributaries		<input checked="" type="checkbox"/> Buffers		
<input type="checkbox"/> Open Waters		<input type="checkbox"/> Pond Construction				
<b>2. Wetland Impacts</b>						
If there are wetland impacts proposed on the site, then complete this question for each wetland area impacted.						
2a. Wetland impact number – Permanent (P) or Temporary (T)	2b. Type of impact	2c. Type of wetland (if known)	2d. Forested	2e. Type of jurisdiction (Corps - 404, 10 DWQ – non-404, other)	2f. Area of impact (acres)	
Site 1 <input checked="" type="checkbox"/> P <input type="checkbox"/> T	Fill in Wetland	Riparian	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Corps <input type="checkbox"/> DWQ	0.09	
Site 1 <input checked="" type="checkbox"/> P <input type="checkbox"/> T	Mechanized Clearing	Riparian	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Corps <input type="checkbox"/> DWQ	0.27	
Site 1 <input type="checkbox"/> P <input type="checkbox"/> T			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ		
Site 1 <input type="checkbox"/> P <input type="checkbox"/> T			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ		
Site 1 <input type="checkbox"/> P <input type="checkbox"/> T			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ		
Site 1 <input type="checkbox"/> P <input type="checkbox"/> T			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ		
<b>2g. Total wetland impacts</b>					0.36 Permanent 0 Temporary	
2h. Comments: See Wetland Permit Impact Summary sheet for details.						
<b>3. Stream Impacts</b>						
If there are perennial or intermittent stream impacts (including temporary impacts) proposed on the site, then complete this question for all stream sites impacted.						
3a. Stream impact number - Permanent (P) or Temporary (T)	3b. Type of impact	3c. Stream name	3d. Perennial (PER) or intermittent (INT)?	3e. Type of jurisdiction (Corps - 404, 10 DWQ – non-404, other)	3f. Average stream width (feet)	3g. Impact length (linear feet)
Site 1 <input type="checkbox"/> P <input checked="" type="checkbox"/> T	Causeway	Moccasin Creek	<input checked="" type="checkbox"/> PER <input type="checkbox"/> INT	<input checked="" type="checkbox"/> Corps <input checked="" type="checkbox"/> DWQ	80	76 (0.07 ac)
Site 2 <input type="checkbox"/> P <input type="checkbox"/> T			<input type="checkbox"/> PER <input type="checkbox"/> INT	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ		
Site 3 <input type="checkbox"/> P <input type="checkbox"/> T			<input type="checkbox"/> PER <input type="checkbox"/> INT	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ		
Site 4 <input type="checkbox"/> P <input type="checkbox"/> T			<input type="checkbox"/> PER <input type="checkbox"/> INT	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ		
Site 5 <input type="checkbox"/> P <input type="checkbox"/> T			<input type="checkbox"/> PER <input type="checkbox"/> INT	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ		
Site 6 <input type="checkbox"/> P <input type="checkbox"/> T			<input type="checkbox"/> PER <input type="checkbox"/> INT	<input type="checkbox"/> Corps <input type="checkbox"/> DWQ		
<b>3h. Total stream and tributary impacts</b>					76 lf temporary (0.07 ac)	
3i. Comments: Causeway will extend slightly more than 50% of channel width, will be installed with equalizer pipes.						

**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 <input type="checkbox"/> P <input type="checkbox"/> T				
O2 <input type="checkbox"/> P <input type="checkbox"/> T				
O3 <input type="checkbox"/> P <input type="checkbox"/> T				
O4 <input type="checkbox"/> P <input type="checkbox"/> T				
<b>4f. Total open water impacts</b>				0 Permanent 0 Temporary

4g. Comments:

**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								
<b>5f. Total</b>								

5g. Comments:

5h. Is a dam high hazard permit required?	<input type="checkbox"/> Yes <input type="checkbox"/> 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?			<input checked="" type="checkbox"/> Neuse <input type="checkbox"/> Catawba	<input type="checkbox"/> Tar-Pamlico <input type="checkbox"/> Randleman	<input type="checkbox"/> Other: Jordan
6b. Buffer impact number – Permanent (P) or Temporary (T)	6c. Reason for impact	6d. Stream name	6e. Buffer mitigation required?	6f. Zone 1 impact (square feet)	6g. Zone 2 impact (square feet)
B1 <input checked="" type="checkbox"/> P <input type="checkbox"/> T	Bridge Impact	Moccasin Creek	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	618	0
B1 <input checked="" type="checkbox"/> P <input type="checkbox"/> T	Road Crossing Impact	Moccasin Creek	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	2,754	2,548
B3 <input type="checkbox"/> P <input type="checkbox"/> T			<input type="checkbox"/> Yes <input type="checkbox"/> No		
<b>6h. Total buffer impacts</b>				3,372	2,548
6i. Comments: Impacts to wetlands in buffers total 1,444 sq ft. in zone 1 and 1,483 sq ft in zone 2.					

**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 proposed bridge is 21 feet longer than the existing bridge; the replacement bridge will be a single span, so no bents in the water; the proposed bridge will be at approximately the same grade and alignment as the existing structure; the new bridge will have no deck drains or direct discharge to Moccasin Creek. An off-site detour will be used during construction. See Stormwater Management Plan for more measures.

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

NCDOT Best Management Practices for Bridge Demolition and Removal will be implemented during the removal of the existing bridge; Best Management Practices for the Protection of Surface Waters will be employed; Design Standards in Sensitive Watersheds will be employed.

**2. Compensatory Mitigation for Impacts to Waters of the U.S. or Waters of the State**

2a. Does the project require Compensatory Mitigation for impacts to Waters of the U.S. or Waters of the State?

Yes  No  
If no, explain

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

DWQ  Corps

2c. If yes, which mitigation option will be used for this project?

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

**3. Complete if Using a Mitigation Bank**

3a. Name of Mitigation Bank: not applicable

3b. Credits Purchased (attach receipt and letter)

Type

Quantity



3c. Comments:

---

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

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

4b. Stream mitigation requested: 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: 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.  
See attached Wiggins Mill Mitigation Site debit summary

---

**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	
<b>6f. Total buffer mitigation required:</b>				

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:

<b>E. Stormwater Management and Diffuse Flow Plan (required by DWQ)</b>	
<b>1. Diffuse Flow Plan</b>	
1a. Does the project include or is it adjacent to protected riparian buffers identified within one of the NC Riparian Buffer Protection Rules?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1b. If yes, then is a diffuse flow plan included? If no, explain why. Comments: See attached permit drawings.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>2. Stormwater Management Plan</b>	
2a. What is the overall percent imperviousness of this project?	N/A
2b. Does this project require a Stormwater Management Plan?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
2c. If this project DOES NOT require a Stormwater Management Plan, explain why:	
2d. If this project DOES require a Stormwater Management Plan, then provide a brief, narrative description of the plan: See attached permit drawings.	
2e. Who will be responsible for the review of the Stormwater Management Plan?	<input type="checkbox"/> Certified Local Government <input type="checkbox"/> DWQ Stormwater Program <input checked="" type="checkbox"/> DWQ 401 Unit
<b>3. Certified Local Government Stormwater Review</b>	
3a. In which local government's jurisdiction is this project?	not applicable
3b. Which of the following locally-implemented stormwater management programs apply (check all that apply):	<input type="checkbox"/> Phase II <input type="checkbox"/> NSW <input type="checkbox"/> USMP <input type="checkbox"/> Water Supply Watershed <input type="checkbox"/> Other:
3c. Has the approved Stormwater Management Plan with proof of approval been attached?	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>4. DWQ Stormwater Program Review</b>	
4a. Which of the following state-implemented stormwater management programs apply (check all that apply):	<input type="checkbox"/> Coastal counties <input type="checkbox"/> HQW <input type="checkbox"/> ORW <input type="checkbox"/> Session Law 2006-246 <input type="checkbox"/> Other:
4b. Has the approved Stormwater Management Plan with proof of approval been attached?	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>5. DWQ 401 Unit Stormwater Review</b>	
5a. Does the Stormwater Management Plan meet the appropriate requirements?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5b. Have all of the 401 Unit submittal requirements been met?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

<b>F. Supplementary Information</b>	
<b>1. Environmental Documentation (DWQ Requirement)</b>	
1a. Does the project involve an expenditure of public (federal/state/local) funds or the use of public (federal/state) land?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> 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)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> 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:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>2. Violations (DWQ Requirement)</b>	
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)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
2b. Is this an after-the-fact permit application?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
2c. If you answered "yes" to one or both of the above questions, provide an explanation of the violation(s):	
<b>3. Cumulative Impacts (DWQ Requirement)</b>	
3a. Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
3b. If you answered "yes" to the above, submit a qualitative or quantitative cumulative impact analysis in accordance with the most recent DWQ policy. If you answered "no," provide a short narrative description.  Due to the minimal transportation impact resulting from this bridge replacement, this project will neither influence nearby land uses nor stimulate growth. Therefore, a detailed indirect or cumulative effects study will not be necessary.	
<b>4. Sewage Disposal (DWQ Requirement)</b>	
4a. Clearly detail the ultimate treatment methods and disposition (non-discharge or discharge) of wastewater generated from the proposed project, or available capacity of the subject facility.  not applicable	

<b>5. Endangered Species and Designated Critical Habitat (Corps Requirement)</b>		
5a. Will this project occur in or near an area with federally protected species or habitat?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
5b. Have you checked with the USFWS concerning Endangered Species Act impacts?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
5c. If yes, indicate the USFWS Field Office you have contacted.	<input checked="" type="checkbox"/> Raleigh	<input type="checkbox"/> Asheville
5d. 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 Wake County, which includes red-cockaded woodpecker, Tar River spiny mussel and Michaux's sumac. The species received a Biological Conclusions of "No Effect". A biological conclusion of "May Affect, Not Likely to Adversely Affect" was rendered for dwarf wedgemussel. Concurrence from USFWS was received on 4/1/14 Habitat for Michaux's sumac is found within the study area. A survey for the species on 7/8/15 resulted in no specimens being found. Northern long-eared bat has been added to the species list for Wake County. A programmatic biological opinion (PBO) has been issued for the species. The PBO covers projects in Divisions 1-8. The programmatic determination for NLEB for this project is "May Affect, Likely to Adversely Affect".		
<b>6. Essential Fish Habitat (Corps Requirement)</b>		
6a. Will this project occur in or near an area designated as essential fish habitat?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
6b. What data sources did you use to determine whether your site would impact Essential Fish Habitat? NMFS County Index		
<b>7. Historic or Prehistoric Cultural Resources (Corps Requirement)</b>		
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)?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
7b. What data sources did you use to determine whether your site would impact historic or archeological resources? NEPA Documentation		
<b>8. Flood Zone Designation (Corps Requirement)</b>		
8a. Will this project occur in a FEMA-designated 100-year floodplain?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> 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		
 Rodger Rochelle, P.E. Applicant/Agent's Printed Name	 Applicant/Agent's Signature <small>(Agent's signature is valid only if an authorization letter from the applicant is provided.)</small>	3/18/2016 Date

U.S. ARMY CORPS OF ENGINEERS  
WILMINGTON DISTRICT

James

Action Id. SAW-2013-00608

County: Franklin U.S.G.S. Quad: NC-ZEBULON

**NOTIFICATION OF JURISDICTIONAL DETERMINATION**

**Property Owner:** NC Department of Transportation

Gregory Thorpe

**Address:** 1598 Mail Service Center

Raleigh, NC, 27699-1598

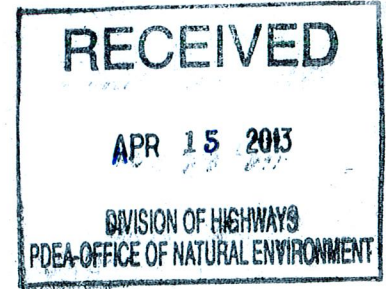
**Telephone:** 919.707.6129

Property description: TIP No. B-4830

Nearest Town Zebulon Nearest Waterway Moccasin Creek

River Basin Contentnea (Neuse) USGS HUC 03020203 Coordinates Latitude: 35.83475 Longitude: -78.26091

Location description: Bridge No. 20 over Moccasin Creek on NC 97, east of Zebulon, NC.



**Indicate Which of the Following Apply:**

**A. Preliminary Determination**

Based on preliminary information, there may be waters of the U.S. including wetlands on the above described project area. We strongly suggest you have this property inspected to determine the extent of Department of the Army (DA) jurisdiction. To be considered final, a jurisdictional determination must be verified by the Corps. This preliminary determination is not an appealable action under the Regulatory Program Administrative Appeal Process ( Reference 33 CFR Part 331). If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also, you may provide new information for further consideration by the Corps to reevaluate the JD.

**B. Approved Determination**

There are Navigable Waters of the United States within the above described property subject to the permit requirements of Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

There are waters of the U.S. including wetlands on the above described property subject to the permit requirements of Section 404 of the Clean Water Act (CWA)(33 USC § 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

We strongly suggest you have the wetlands on your property delineated. Due to the size of your property and/or our present workload, the Corps may not be able to accomplish this wetland delineation in a timely manner. For a more timely delineation, you may wish to obtain a consultant. To be considered final, any delineation must be verified by the Corps.

The waters of the U.S. including wetlands on your project area have been delineated and the delineation has been verified by the Corps. We strongly suggest you have this delineation surveyed. Upon completion, this survey should be reviewed and verified by the Corps. Once verified, this survey will provide an accurate depiction of all areas subject to CWA jurisdiction on your property which, provided there is no change in the law or our published regulations, may be relied upon for a period not to exceed five years.

The waters of the U.S. including wetlands have been delineated and surveyed and are accurately depicted on the plat signed by the Corps Regulatory Official identified below on \_\_\_\_. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

There are no waters of the U.S., to include wetlands, present on the above described project area which are subject to the permit requirements of Section 404 of the Clean Water Act (33 USC 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

Placement of dredged or fill material within waters of the US and/or wetlands without a Department of the Army permit may constitute a violation of Section 301 of the Clean Water Act (33 USC § 1311). If you have any questions regarding this determination and/or the Corps regulatory program, please contact Eric Alsmeyer at 919-554-4884 x23/Eric.C.Alsmeier@usace.army.mil.

**C. Basis For Determination: The impact area contains a stream channels of Moccasin Creek,, with indicators of ordinary high water marks, and abutting wetlands. Moccasin Creek is a tributary of Contentnea Creek and the Neuse River. The Neuse River is a Section 10 Navigable Water.**

**D. Remarks: This JD was confirmed by desktop evaluation. The drawing on the attached Figure, "Jurisdictional Resources, B-4830, Wake County", submitted by e-mail and FTP on 6/27/2012, generally depicts the jurisdictional waters of the US within the subject study area.**

**E. Attention USDA Program Participants**

This delineation/determination has been conducted to identify the limits of Corps' Clean Water Act jurisdiction for the particular site identified in this request. The delineation/determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA Program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

\*\*It is not necessary to submit an RFA form to the Division Office if you do not object to the determination in this correspondence.\*\*

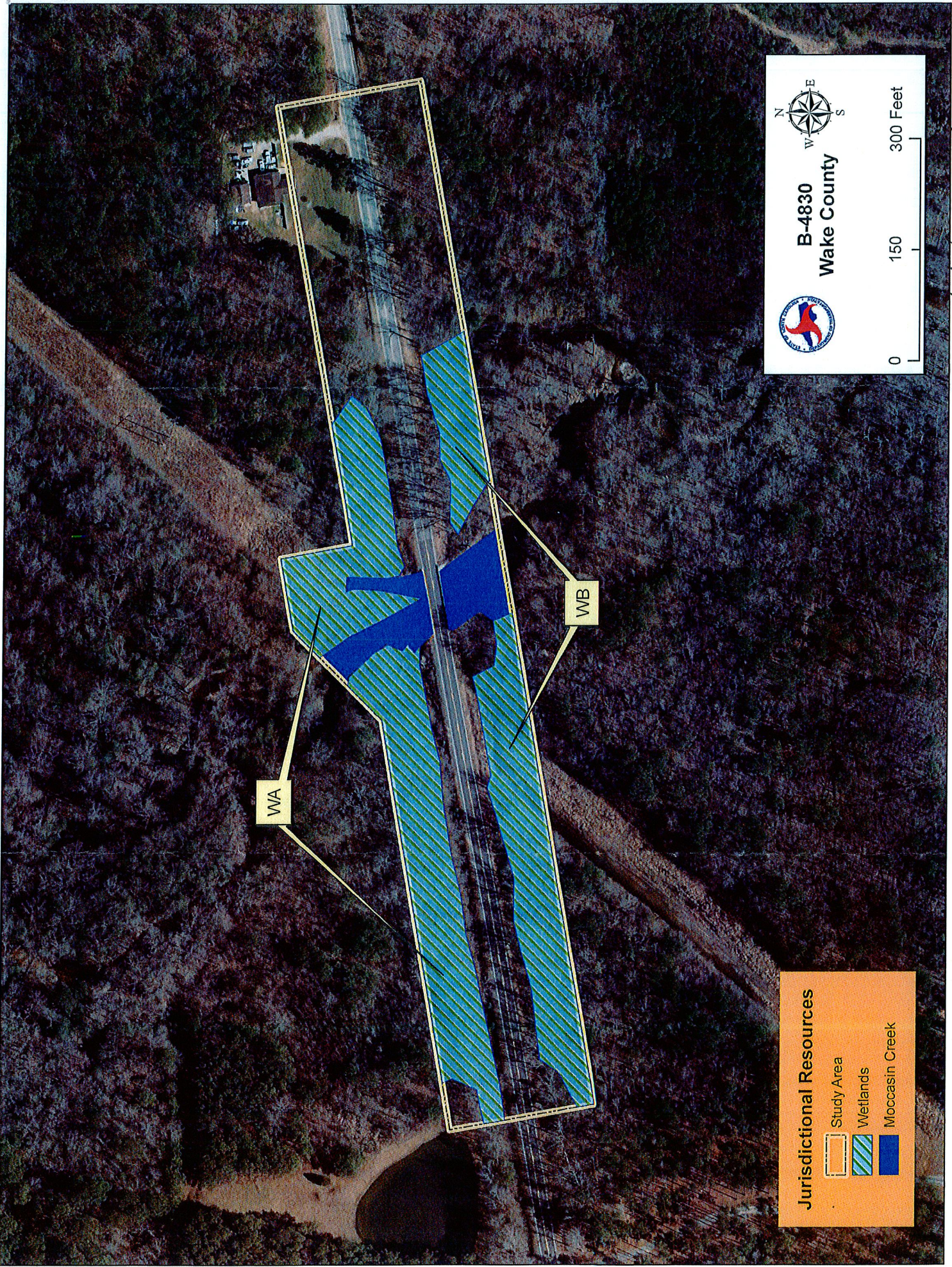
Corps Regulatory Official: \_\_\_\_\_



Date: 4/11/2013


Expiration Date: 4/11/2018

The Wilmington District is committed to providing the highest level of support to the public. To help us ensure we continue to do so, please complete the attached customer Satisfaction Survey or visit <http://per2.nwp.usace.army.mil/survey.html> to complete the survey online.





**Jurisdictional Resources**

-  Study Area
-  Wetlands
-  Moccasin Creek



**B-4830**  
**Wake County**

*D.S. 6/7/12 (A.T.O.M.S. PTD) - 1*

Rec'd 6/27/12  
(AJemaFTP) CA

**PRELIMINARY JURISDICTIONAL DETERMINATION FORM**

**BACKGROUND INFORMATION**

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

**B. NAME AND ADDRESS OF PERSON REQUESTING PRELIMINARY JD:**  
Amy James, NCDOT, 1598 Mail Service Center, Raleigh, NC 27699-1598

**C. DISTRICT OFFICE, FILE NAME, AND NUMBER:** CESAW-RG-R (Wilmington)  
NCDOT\_B-4830\_NC97\_BR-20, (SAW-2013-00608)

**D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:**  
TIP: B-4830 Description: Replacement of Bridge No. 20 over Moccasin Creek on NC 97

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

State: NC County/parish/borough: Wake/Franklin City: Zebulon  
Center coordinates of site (lat/long in degree decimal format):  
Lat. 35.834741 °N, Long. -78.260931 °W  
Universal Transverse Mercator:  
Name of nearest waterbody: Moccasin Creek

Identify (estimate) amount of waters in the review area:

Non-wetland waters: 270 linear feet: width (ft) and/or acres.  
Cowardin Class: RUB2  
Stream Flow: Perennial  
Wetlands: 1.9 acres.  
Cowardin Class: PFO1A and PEM1/2

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

Tidal: N/A  
Non-Tidal: N/A

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

Office (Desk) Determination Date: 4/11/2013  
 Field Determination Date(s):

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



**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: 1:24000; *Zebulon*
- USDA Natural Resources Conservation Service Soil Survey  
Citation: *Web Soil Survey*
- National wetlands inventory map(s). Cite name:
- State/Local wetland inventory map(s):
- FEMA/FIRM maps:
- 100-year Floodplain Elevation is: (National Geodetic Vertical Datum of 1929)
- Photographs:  Aerial (Name & Date): or  Other (Name & Date):
- Previous determination(s). File no. and date of response letter:
- Other information (please specify):

**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.**

*Eri Etz* 4/11/2013

Signature and date of  
Regulatory Project Manager  
(REQUIRED)

*Amy Tam* 6/27/12

Signature and date of  
person requesting preliminary JD  
(REQUIRED, unless obtaining  
the signature is impracticable)

Wiggins Mill Mitigation Site  
ONEID 098-001

The Wiggins Mill Mitigation Site is located in Wilson County within the USGS hydrologic unit 03020203 of the Neuse River. NCDOT acquired the 88.91 acre site to mitigate for unavoidable, jurisdictional impacts associated with TIP R-1030. Monitoring requirements were performed from 2001 to 2005 and the site was closed out in 2006. Table 1 shows the final mitigation quantities approved for the site. The site has been placed on the NCDOT On-site Debit Ledger for use within HUC 03020203. Tables 2-5 indicate all mitigation debits that have occurred per regulatory agency approval.

In order to offset 0.36 acres of impacts associated with B-4830, the Wiggins Mills mitigation site will be debited at a 2:1 ratio, totaling 0.72 acres of Riparian Wetland Restoration.

Table 1. Mitigation Quantities Approved

HUC	Mitigation Type	Starting Amount	Additional Notes
3020203	Stream Restoration	7020(Ln.Ft.)	
3020203	Riparian Wetland Restoration	84(Ac)	
3020203	Riparian Wetland Enhancement	5.3(Ac)	
3020203	Buffer Restoration	492663(Sq.Ft)	

Table 2. Mitigation Debts – Stream Restoration

Mitigation Type	Debit Amount (Ln.Ft)	Status	Site TIP	Action ID#	NOTES
Stream Restoration	1109	Close Out	U-3472	199820167,20012033,20012034	
Stream Restoration	1000	Close Out	R-1030AA	199202353	
Stream Restoration	2284	Close Out	R-1023AB&B		
Stream Restoration	2380	Close Out	R-1030AA	199202353	
Stream Restoration	125	Close Out	41665.5A (Pitt County)	2013-01151	

Table 3. Mitigation Debits – Riparian Wetland Restoration

Mitigation Type	Debit Amount (Ac)	Status	Site TIP	Action ID#	NOTES
Riparian Wetland Restoration	70.6	Close Out	R-1023AB&B		
Riparian Wetland Restoration	0.43	Close Out	U-3472	199820167,20012033,20012034	
Riparian Wetland Restoration	0.06	Close Out	U-3823A	200020569	
Riparian Wetland Restoration	0.17	Close Out	DIV 4 WBS 46794		
Riparian Wetland Restoration	2.14	Close Out	R-2547	200220819	
Riparian Wetland Restoration	0.12	Close Out	B-4672(Permit issued by Default (expiration of 45 day review)		
Riparian Wetland Restoration	0.72	Close Out	B-4830		0.36 ac impacts at 2:1 ratio

Table 4. Mitigation Debits – Riparian Wetland Enhancement

Mitigation Type	Debit Amount (Ac)	Status	Site TIP	Action ID#	NOTES
Riparian Wetland Enhancement	0.68	Close Out	DIV 4 WBS 46794		

Table 5. Mitigation Debits – Buffer Restoration

Mitigation Type	Debit Amount (Sq. Ft)	Status	Site TIP	Action ID#	NOTES
Buffer Restoration	206910	Close Out	U-3472	199820167,20012033,20012034	
Buffer Restoration	285753	Close Out	R-2814A&B	2008-01316	



## United States Department of the Interior

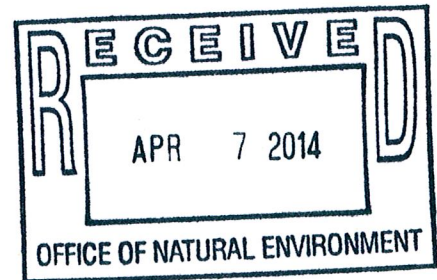
FISH AND WILDLIFE SERVICE

Raleigh Field Office

Post Office Box 33726

Raleigh, North Carolina 27636-3726

April 1, 2014



Richard W. Hancock, P.E.  
North Carolina Department of Transportation  
Project Development and Environmental Analysis  
1598 Mail Service Center  
Raleigh, North Carolina 27699-1598

Dear Mr. Hancock:

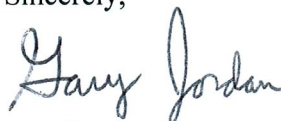
This letter is in response to your letter of March 28, 2014 which provided the U.S. Fish and Wildlife Service (Service) with the biological conclusion of the North Carolina Department of Transportation that the replacement of Bridge No. 20 on NC 97 over Moccasin Creek in Wake/Franklin County (TIP No. B-4830) may affect, but is not likely to adversely affect the federally endangered dwarf wedgemussel (*Alasmidonta heterodon*). These comments are provided in accordance with Section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

According to information provided, a mussel survey was conducted at the project site on May 1, 2012. The survey extended 100 meters upstream and 400 meters downstream of NC 97. No dwarf wedgemussels were observed and habitat quality for the species was poor. However, the dwarf wedgemussel has historically been found approximately five miles downstream.

Based on the mussel survey results and other available information, the Service concurs with your conclusion that the proposed bridge replacement may affect, but is not likely to adversely affect the dwarf wedgemussel. We believe that the requirements of Section 7(a)(2) of the ESA have been satisfied. We remind you that obligations under Section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered in this review; (2) this action is subsequently modified in a manner that was not considered in this review; or (3) a new species is listed or critical habitat determined that may be affected by this identified action.

The Service appreciates the opportunity to review this project. If you have any questions regarding our response, please contact Mr. Gary Jordan at (919) 856-4520 (Ext. 32).

Sincerely,

  
for Pete Benjamin  
Field Supervisor

Electronic copy: Eric Alsmeyer, USACE, Wake Forest, NC  
Travis Wilson, NCWRC, Creedmoor, NC  
Felix Davila, FHWA, Raleigh, NC



North Carolina Department of Transportation

Highway Stormwater Program  
**STORMWATER MANAGEMENT PLAN**  
 FOR NCDOT PROJECTS



(Version 2.03; Released October 2015)

WBS Element: 38600.1.1      TIP No.: B-4830      County(ies): Wake      Page 1 of 1

**General Project Information**

WBS Element:	38600.1.1	TIP Number:	B-4830	Project Type:	Bridge Replacement	Date:	11/18/2015
NCDOT Contact:	William H. Elam, Jr. PE		Contractor / Designer:		Reid Robol, EI - Ecological Engineering		
Address:	1000 Birch Ridge Drive Raleigh, NC 27610		Address:	1151 SE Cary Parkway Suite 101 Cary, NC 27518			
	Phone:	919-707-6718		Phone:	919-557-0929		
	Email:	belam@ncdot.gov		Email:	rrobol@ecologicaleng.com		
City/Town:	Zebulon		County(ies):	Wake			
River Basin(s):	Neuse		CAMA County?	No			
Wetlands within Project Limits?	Yes						

**Project Description**

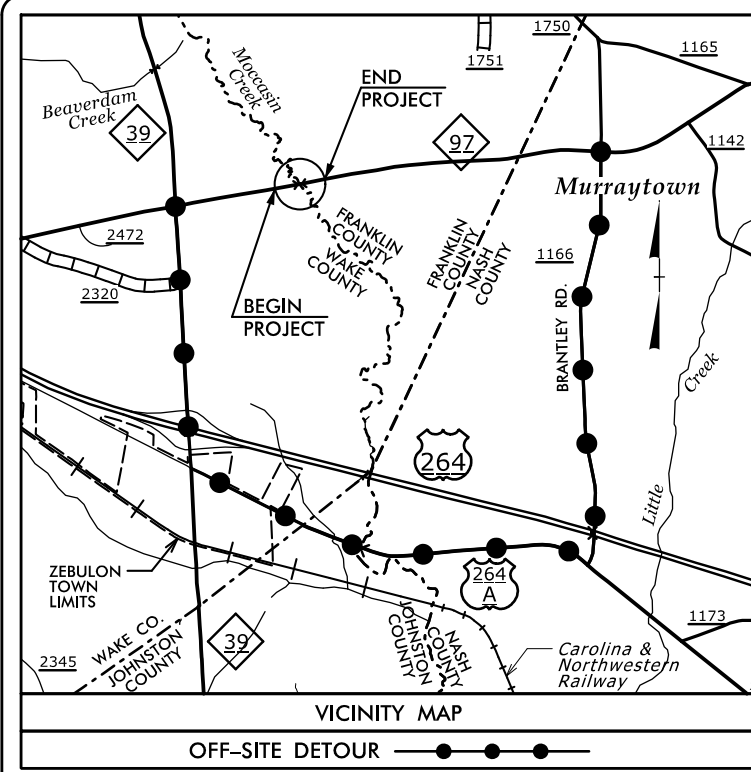
Project Length (lin. miles or feet):	0.105 Miles	Surrounding Land Use:	Rural area with forest and agricultural landuses					
	<b>Proposed Project</b>		<b>Existing Site</b>					
Project Built-Upon Area (ac.)	0.4	ac.	0.3	ac.				
Typical Cross Section Description:	2@ 11 ft lane, 4.4 ft shoulders and 1.1 ft rail, with total bridge width of 33.0 ft and total bridge length of 105 ft.			2@ 9.5 ft lane with total bridge width of 23 ft and total bridge length of 87.6 ft.				
Annual Avg Daily Traffic (veh/hr/day):	Design/Future:	600	Year:	2015	Existing:	570	Year:	2013
General Project Narrative: (Description of Minimization of Water Quality Impacts)	<p>State Project B-4830 involves the replacement of the existing NCDOT Bridge #910020 on SR 1636 over Moccasin Creek. Bridge #910020 consists of 1@42' - 0", 1@41' - 10"; RC deck girder bridge with RC full height abutments, round nose post and web pier. The proposed bridge at #910020 will be 1@105' 39" box beam with 4' caps. The existing concrete abutments will be retained. The interior concrete pier will be removed from the center of the stream. A rock causeway will be utilized to remove the pier. Rock plating and toe protection are being used to steepen and stabilize fill slopes which reduces permanent impacts to wetlands. The proposed bridge will provide more hydraulic opening than the existing bridge. No deck drains are proposed. Two stormwater outfalls are proposed which will be placed outside of the buffer zones. A Rip Rap pad will be utilized to dissipate the energy. Wetland Impacts were minimized by the addition of guardrail and 2:1 fill side slopes.</p>							

**Waterbody Information**

Surface Water Body (1):	Moccasin Creek		NCDWR Stream Index No.:	27-86-2				
NCDWR Surface Water Classification for Water Body	Primary Classification:		Class C					
	Supplemental Classification:		Nutrient Sensitive Waters (NSW)					
Other Stream Classification:	None							
Impairments:	None							
Aquatic T&E Species?	No	Comments:						
NRTR Stream ID:	Moccasin Creek		Buffer Rules in Effect:		Neuse			
Project Includes Bridge Spanning Water Body?	Yes	Deck Drains Discharge Over Buffer?	No	Dissipator Pads Provided in Buffer?				No
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)								

09/26/14

T.I.P. PROJECT: B-4830



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

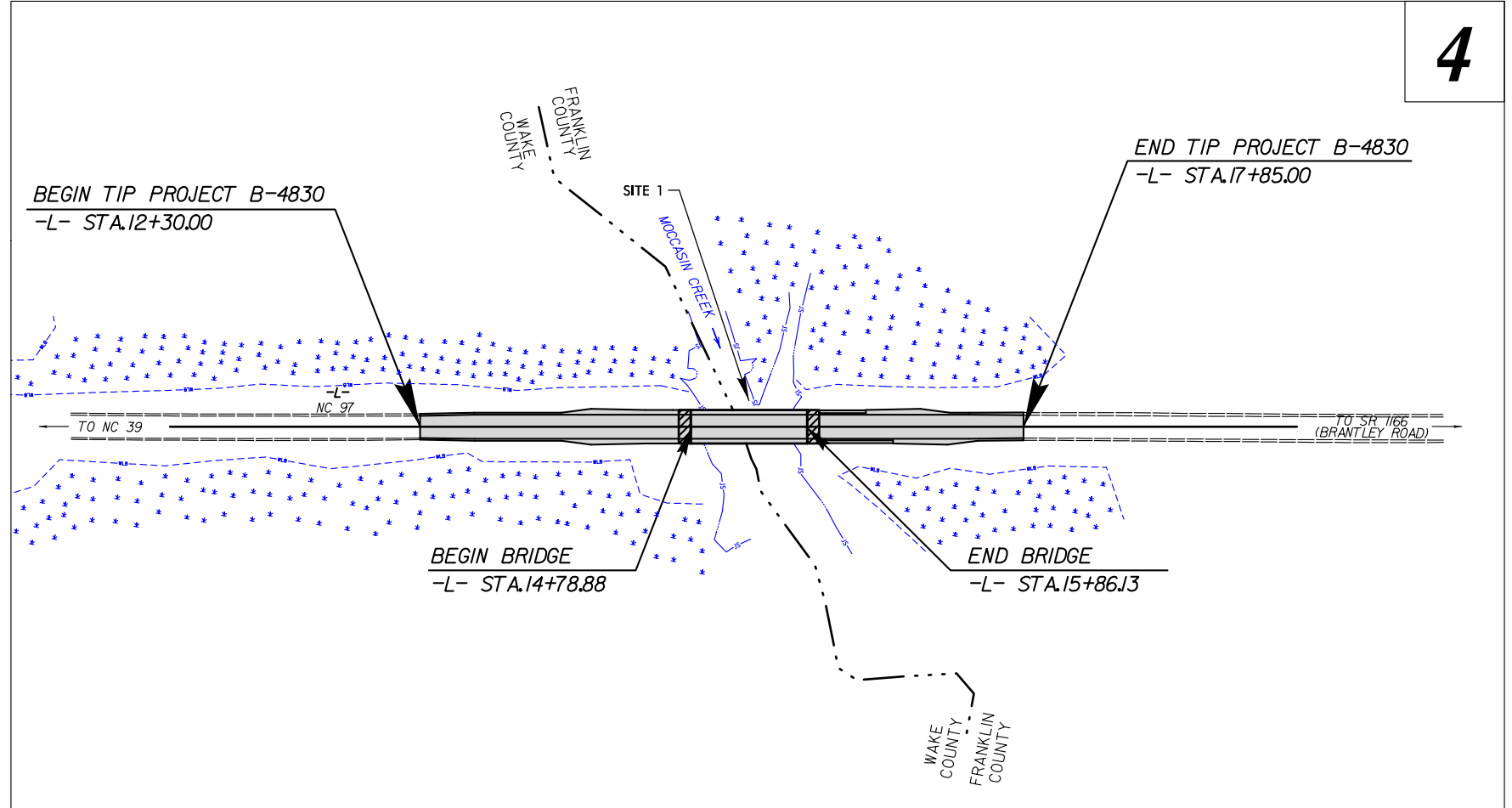
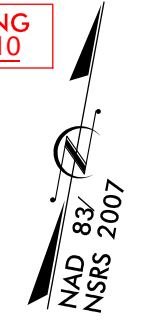
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**WAKE COUNTY**

LOCATION: BRIDGE NO. 20 OVER MOCCASIN CREEK  
ON NC 97  
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE

**WETLAND AND SURFACE WATER IMPACTS PERMIT**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4830	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
38600.1.1	BRSTP-0097(34)	PE	
38600.2.2		ROW & UTILITY	

PERMIT DRAWING  
SHEET 1 OF 10

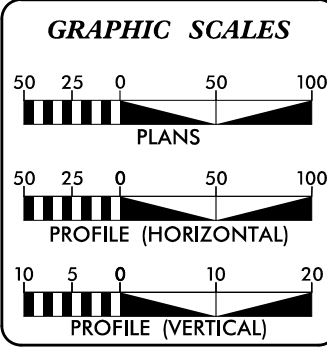


4

CLEARING ON THIS PROJECT SHALL BE TO LIMITS ESTABLISHED USING METHOD III.  
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION

CONTRACT:



DESIGN DATA

2016 ADT = 2,922 VPD  
2036 ADT = 3,530 VPD  
DHV = 12%  
D = 60%  
T = 4% \*  
V = 60 MPH  
\* (TTST 1% + DUAL 3%)  
FUNC. CLASS. = RURAL MAJOR COLLECTOR  
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4830 = 0.085 mi.  
LENGTH STRUCTURES TIP PROJECT B-4830 = 0.020 mi.  
TOTAL LENGTH TIP PROJECT B-4830 = 0.105 mi.

Prepared in the Offices of:

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: OCTOBER 22, 2015

LETTING DATE: OCTOBER 18, 2016

ANDY YOUNG, PE  
PROJECT ENGINEER

MICHAEL BURNS, EI  
PROJECT DESIGN ENGINEER

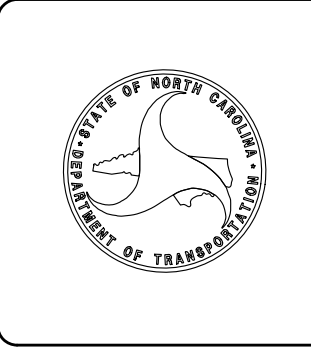
TONY HOUSER, P.E.  
NCDOT CONTACT

HYDRAULICS ENGINEER

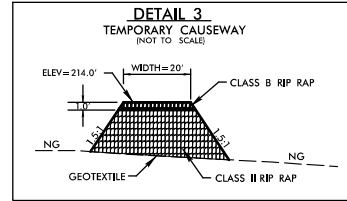
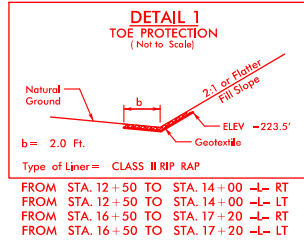
SIGNATURE: \_\_\_\_\_ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: \_\_\_\_\_ P.E.

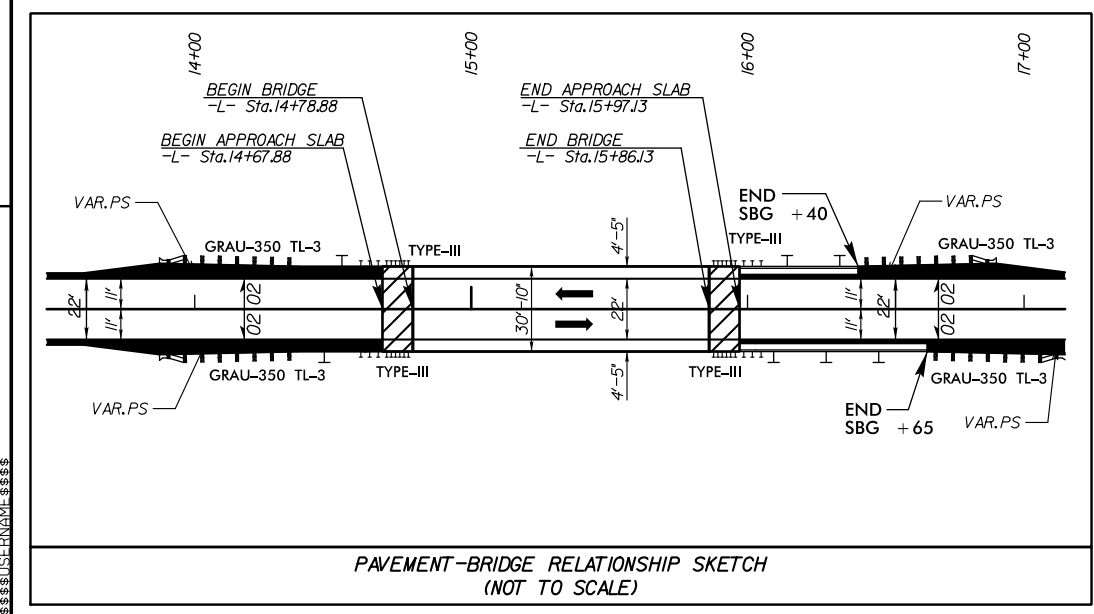
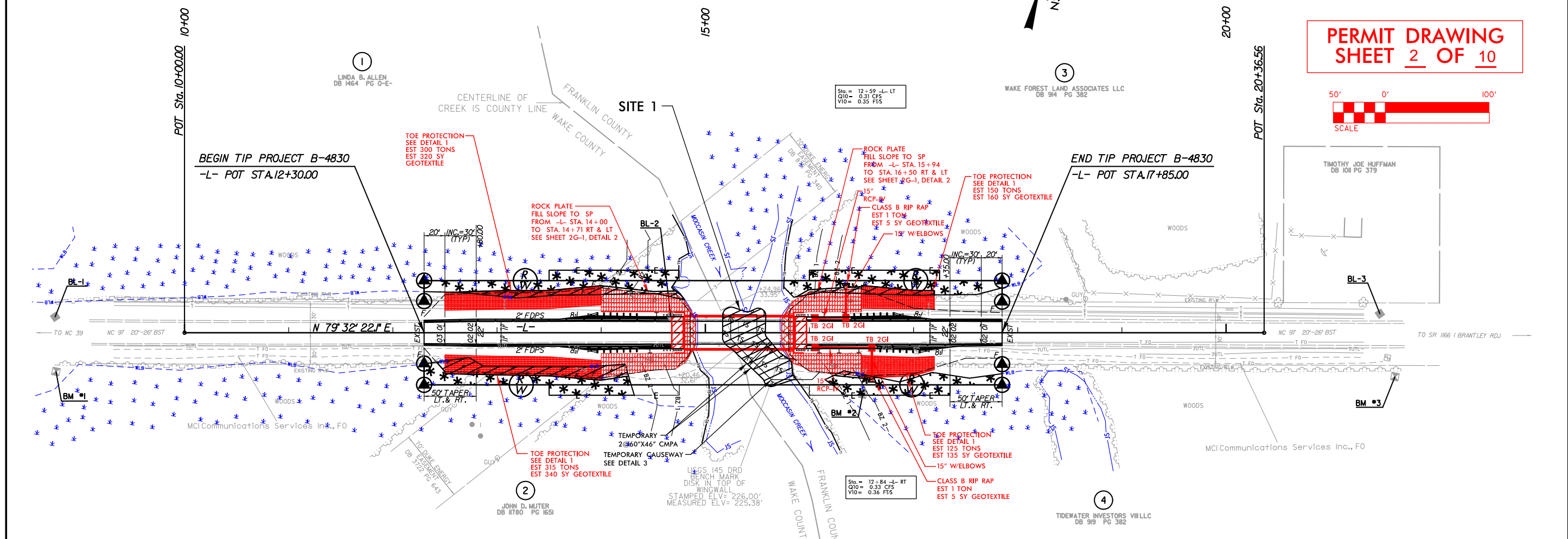


\$\$\$\$\$ SYSTEM TIME\$\$\$\$\$  
\$\$\$\$\$ DGN\$\$\$\$\$  
\$\$\$\$\$ USERNAME\$\$\$\$\$



REVISIONS

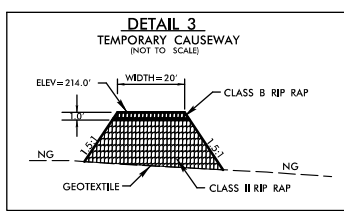
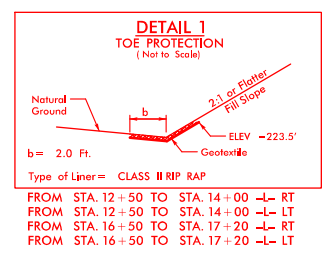
PERMIT DRAWING  
SHEET 2 OF 10



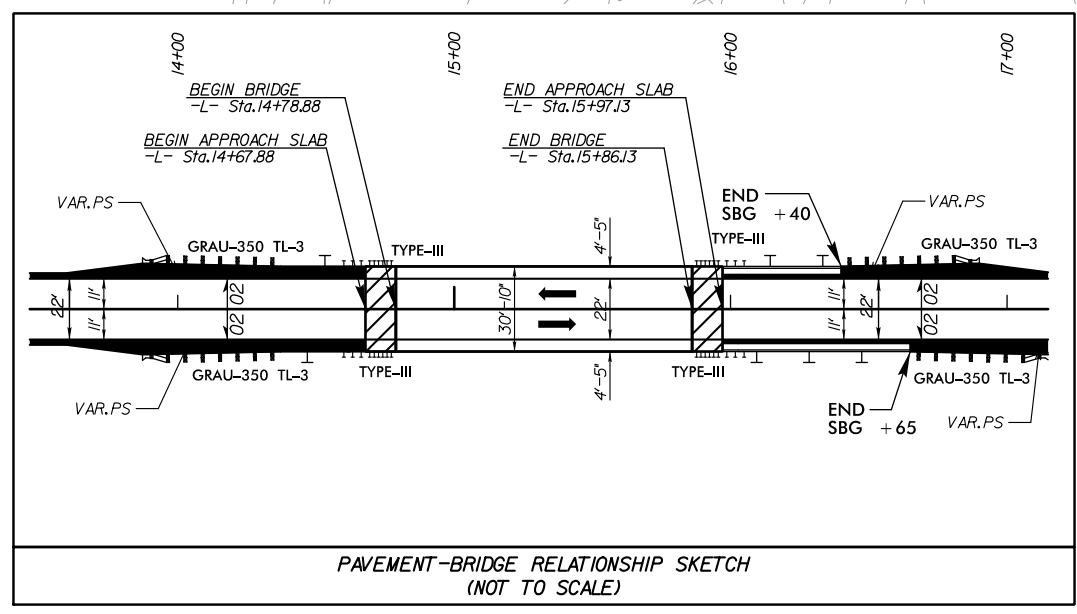
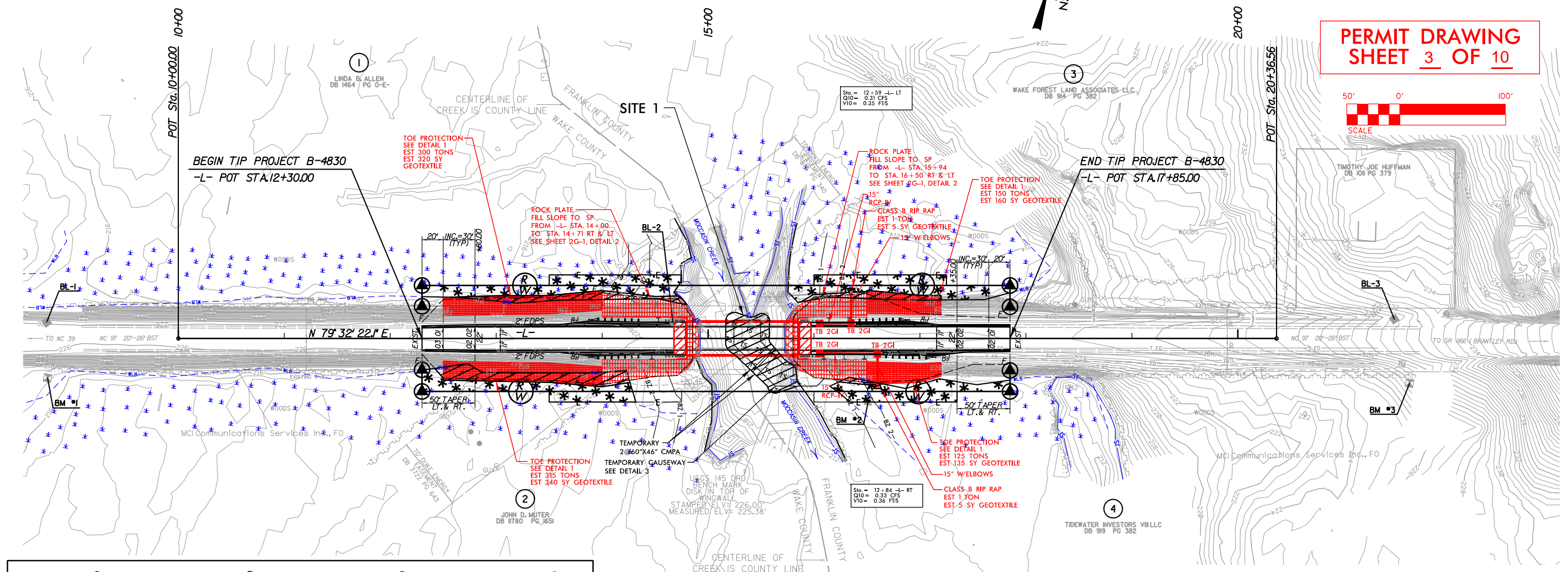
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- END BENT EXCAVATION SEE STRUCTURE PLANS (STRUCTURE PLAN ITEM)
- FOR -L- PROFILE, SEE SHEET 5
- PROPOSED PAVED SHOULDER
- FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-7

B.17/99  
 C:\Users\jshelton\Desktop\B-4830\Drawings\DWG\02-17-2013\02-17-2013.dwg  
 02-17-2013 10:02:13 AM





PERMIT DRAWING  
SHEET 3 OF 10





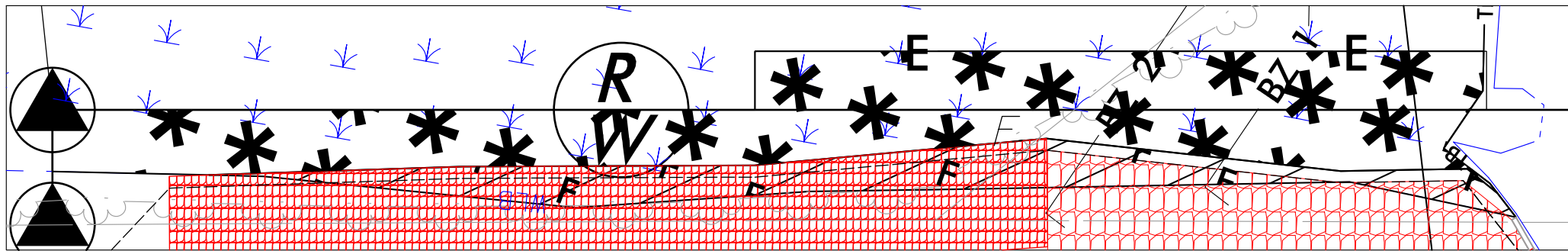
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- END BENT EXCAVATION SEE STRUCTURE PLANS (STRUCTURE PA ITEM)
- FOR -L- PROFILE, SEE SHEET 5
- PROPOSED PAVED SHOULDER
- FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-7

REVISIONS

8.17.99  
 1.0  
 2.0  
 3.0  
 4.0  
 5.0  
 6.0  
 7.0  
 8.0  
 9.0  
 10.0  
 11.0  
 12.0  
 13.0  
 14.0  
 15.0  
 16.0  
 17.0  
 18.0  
 19.0  
 20.0  
 21.0  
 22.0  
 23.0  
 24.0  
 25.0  
 26.0  
 27.0  
 28.0  
 29.0  
 30.0  
 31.0  
 32.0  
 33.0  
 34.0  
 35.0  
 36.0  
 37.0  
 38.0  
 39.0  
 40.0  
 41.0  
 42.0  
 43.0  
 44.0  
 45.0  
 46.0  
 47.0  
 48.0  
 49.0  
 50.0  
 51.0  
 52.0  
 53.0  
 54.0  
 55.0  
 56.0  
 57.0  
 58.0  
 59.0  
 60.0  
 61.0  
 62.0  
 63.0  
 64.0  
 65.0  
 66.0  
 67.0  
 68.0  
 69.0  
 70.0  
 71.0  
 72.0  
 73.0  
 74.0  
 75.0  
 76.0  
 77.0  
 78.0  
 79.0  
 80.0  
 81.0  
 82.0  
 83.0  
 84.0  
 85.0  
 86.0  
 87.0  
 88.0  
 89.0  
 90.0  
 91.0  
 92.0  
 93.0  
 94.0  
 95.0  
 96.0  
 97.0  
 98.0  
 99.0  
 100.0

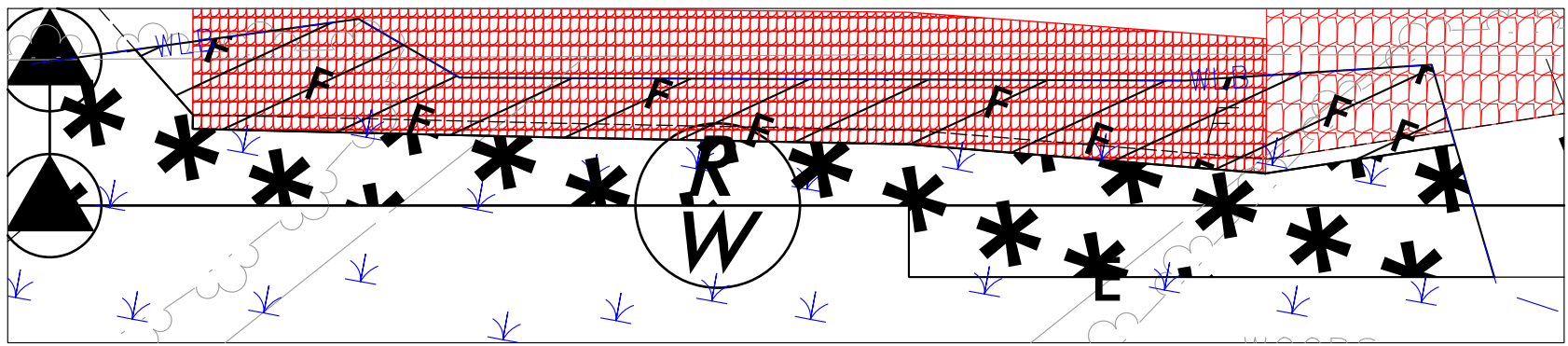
8/17/99

PROJECT REFERENCE NO. B-4830	SHEET NO. 5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
 STEWART	 ECOLOGICAL ENGINEERING

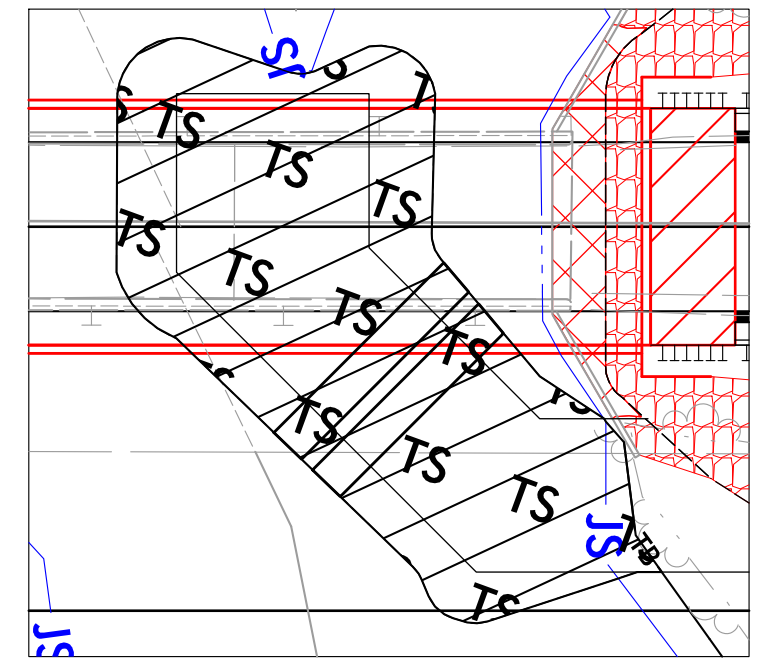


SITE I (12+30 TO 14+80 -L- LT)

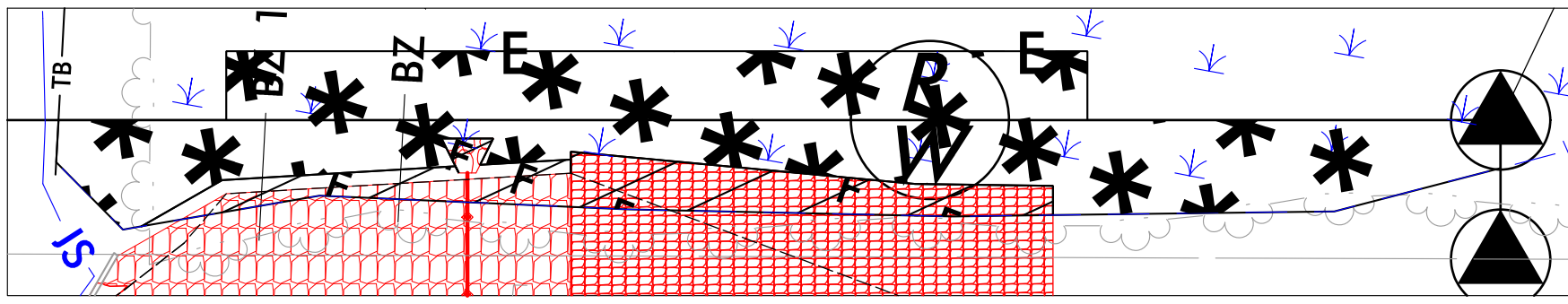
**PERMIT DRAWING**  
**SHEET 4 OF 10**





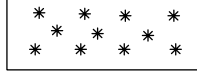
SITE I (12+30 TO 14+32 -L- RT)

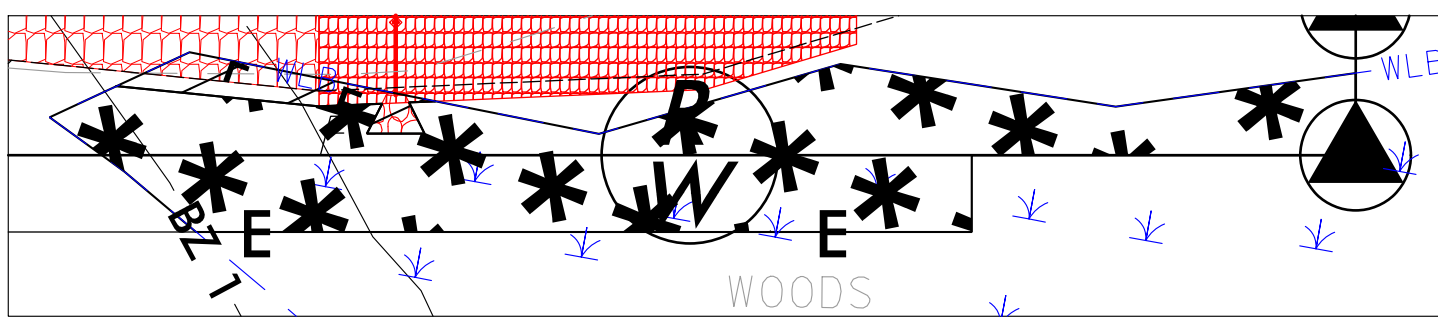


SITE I  
(15+10 TO 15+80 -L-)



SITE I (15+75 TO 17+85 -L- LT)



-  DENOTES TEMPORARY IMPACTS IN SURFACE WATER
-  DENOTES FILL IN WETLAND
-  DENOTES MECHANIZED CLEARING

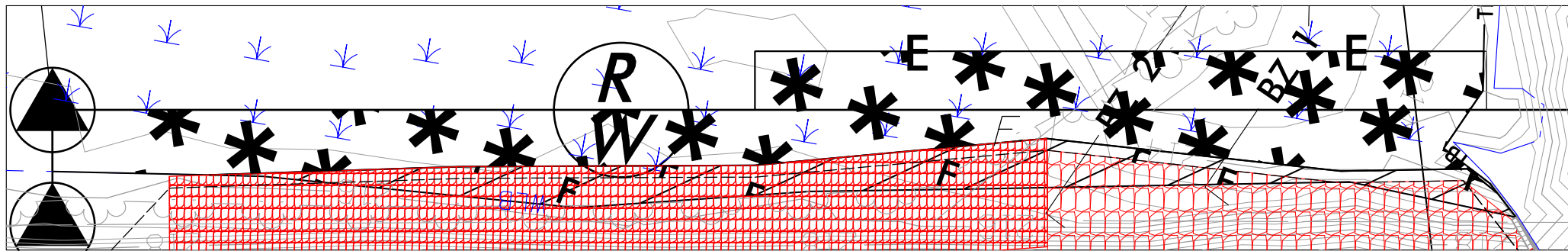


SITE I (16+15 TO 17+85 -L- RT)

REVISIONS  
 1. 11/15/00  
 2. 11/15/00  
 3. 11/15/00  
 4. 11/15/00  
 5. 11/15/00  
 6. 11/15/00  
 7. 11/15/00  
 8. 11/15/00  
 9. 11/15/00  
 10. 11/15/00  
 11. 11/15/00  
 12. 11/15/00  
 13. 11/15/00  
 14. 11/15/00  
 15. 11/15/00  
 16. 11/15/00  
 17. 11/15/00  
 18. 11/15/00  
 19. 11/15/00  
 20. 11/15/00  
 21. 11/15/00  
 22. 11/15/00  
 23. 11/15/00  
 24. 11/15/00  
 25. 11/15/00  
 26. 11/15/00  
 27. 11/15/00  
 28. 11/15/00  
 29. 11/15/00  
 30. 11/15/00  
 31. 11/15/00  
 32. 11/15/00  
 33. 11/15/00  
 34. 11/15/00  
 35. 11/15/00  
 36. 11/15/00  
 37. 11/15/00  
 38. 11/15/00  
 39. 11/15/00  
 40. 11/15/00  
 41. 11/15/00  
 42. 11/15/00  
 43. 11/15/00  
 44. 11/15/00  
 45. 11/15/00  
 46. 11/15/00  
 47. 11/15/00  
 48. 11/15/00  
 49. 11/15/00  
 50. 11/15/00  
 51. 11/15/00  
 52. 11/15/00  
 53. 11/15/00  
 54. 11/15/00  
 55. 11/15/00  
 56. 11/15/00  
 57. 11/15/00  
 58. 11/15/00  
 59. 11/15/00  
 60. 11/15/00  
 61. 11/15/00  
 62. 11/15/00  
 63. 11/15/00  
 64. 11/15/00  
 65. 11/15/00  
 66. 11/15/00  
 67. 11/15/00  
 68. 11/15/00  
 69. 11/15/00  
 70. 11/15/00  
 71. 11/15/00  
 72. 11/15/00  
 73. 11/15/00  
 74. 11/15/00  
 75. 11/15/00  
 76. 11/15/00  
 77. 11/15/00  
 78. 11/15/00  
 79. 11/15/00  
 80. 11/15/00  
 81. 11/15/00  
 82. 11/15/00  
 83. 11/15/00  
 84. 11/15/00  
 85. 11/15/00  
 86. 11/15/00  
 87. 11/15/00  
 88. 11/15/00  
 89. 11/15/00  
 90. 11/15/00  
 91. 11/15/00  
 92. 11/15/00  
 93. 11/15/00  
 94. 11/15/00  
 95. 11/15/00  
 96. 11/15/00  
 97. 11/15/00  
 98. 11/15/00  
 99. 11/15/00  
 100. 11/15/00

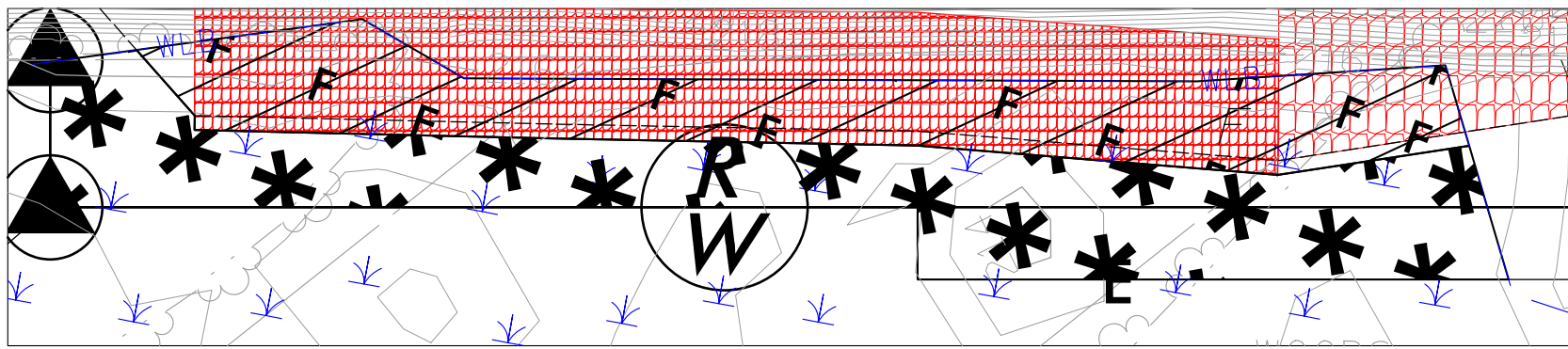
8.17/99

PROJECT REFERENCE NO. B-4830	SHEET NO. 5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
 STEWART	 ECOLOGICAL ENGINEERING

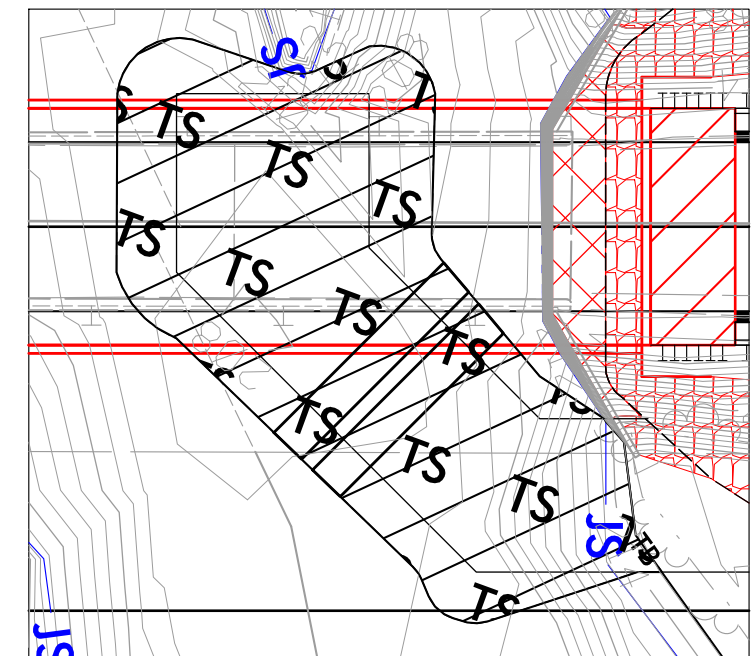


SITE 1 (12+30 TO 14+80 -L- LT)

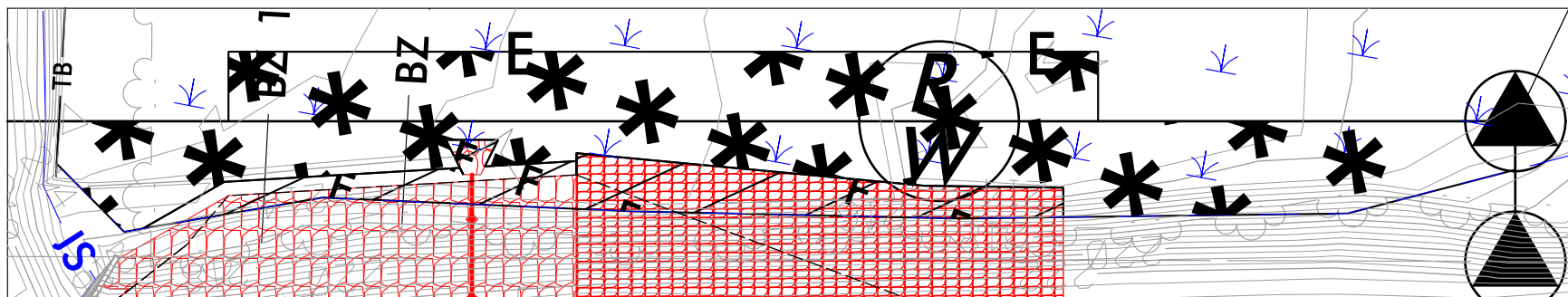
**PERMIT DRAWING**  
**SHEET 5 OF 10**





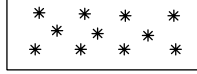
SITE 1 (12+30 TO 14+32 -L- RT)

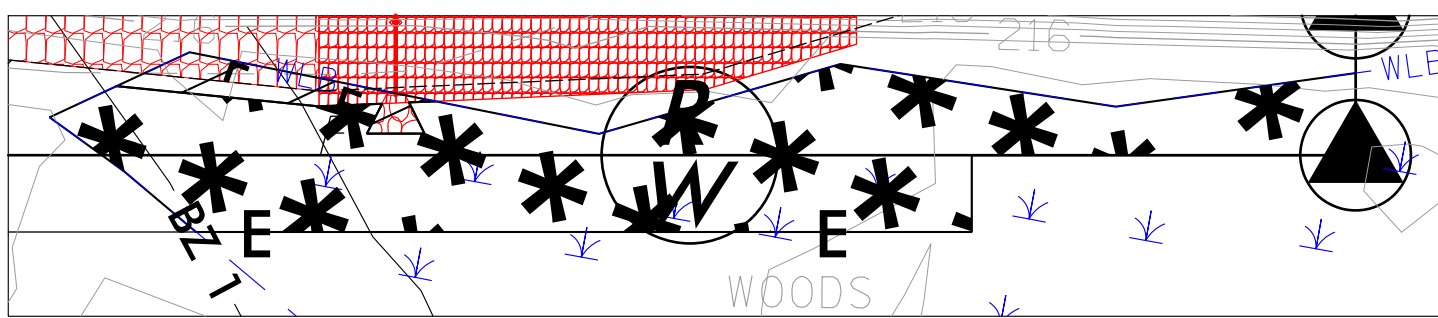


SITE 1  
(15+10 TO 15+80 -L-)



SITE 1 (15+75 TO 17+85 -L- LT)

-  DENOTES TEMPORARY IMPACTS IN SURFACE WATER
-  DENOTES FILL IN WETLAND
-  DENOTES MECHANIZED CLEARING



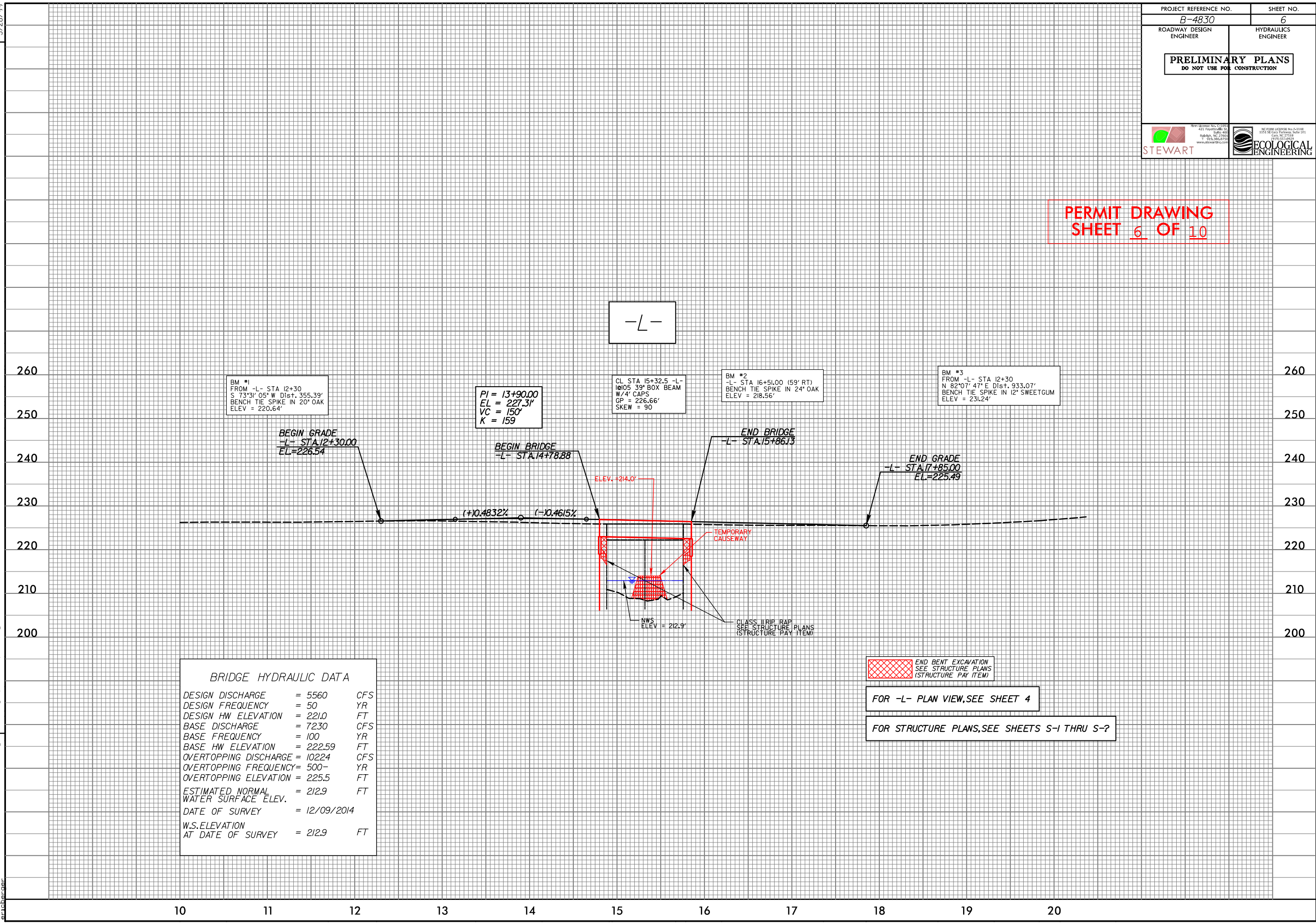
SITE 1 (16+15 TO 17+85 -L- RT)

REVISIONS


1  
 2  
 3  
 4  
 5  
 6  
 7  
 8  
 9  
 10  
 11  
 12  
 13  
 14  
 15  
 16  
 17  
 18  
 19  
 20  
 21  
 22  
 23  
 24  
 25  
 26  
 27  
 28  
 29  
 30  
 31  
 32  
 33  
 34  
 35  
 36  
 37  
 38  
 39  
 40  
 41  
 42  
 43  
 44  
 45  
 46  
 47  
 48  
 49  
 50

PERMIT DRAWING  
SHEET 6 OF 10

REVISIONS

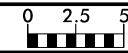


BRIDGE HYDRAULIC DATA		
DESIGN DISCHARGE	= 5560	CFS
DESIGN FREQUENCY	= 50	YR
DESIGN HW ELEVATION	= 221.0	FT
BASE DISCHARGE	= 7230	CFS
BASE FREQUENCY	= 100	YR
BASE HW ELEVATION	= 222.59	FT
OVERTOPPING DISCHARGE	= 10224	CFS
OVERTOPPING FREQUENCY	= 500-	YR
OVERTOPPING ELEVATION	= 225.5	FT
ESTIMATED NORMAL WATER SURFACE ELEV.	= 212.9	FT
DATE OF SURVEY	= 12/09/2014	
W.S.ELEVATION AT DATE OF SURVEY	= 212.9	FT

 END BENT EXCAVATION  
SEE STRUCTURE PLANS  
(STRUCTURE PAY ITEM)  
  
 FOR -L- PLAN VIEW, SEE SHEET 4  
  
 FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-?

2:08:55 PM  
 C:\Users\pmlucis\PERMITS\Environmental\Drawings\B4830\_hyd.prm\_xet\_psh06.dgn  
 BRIDGE

8/23/99

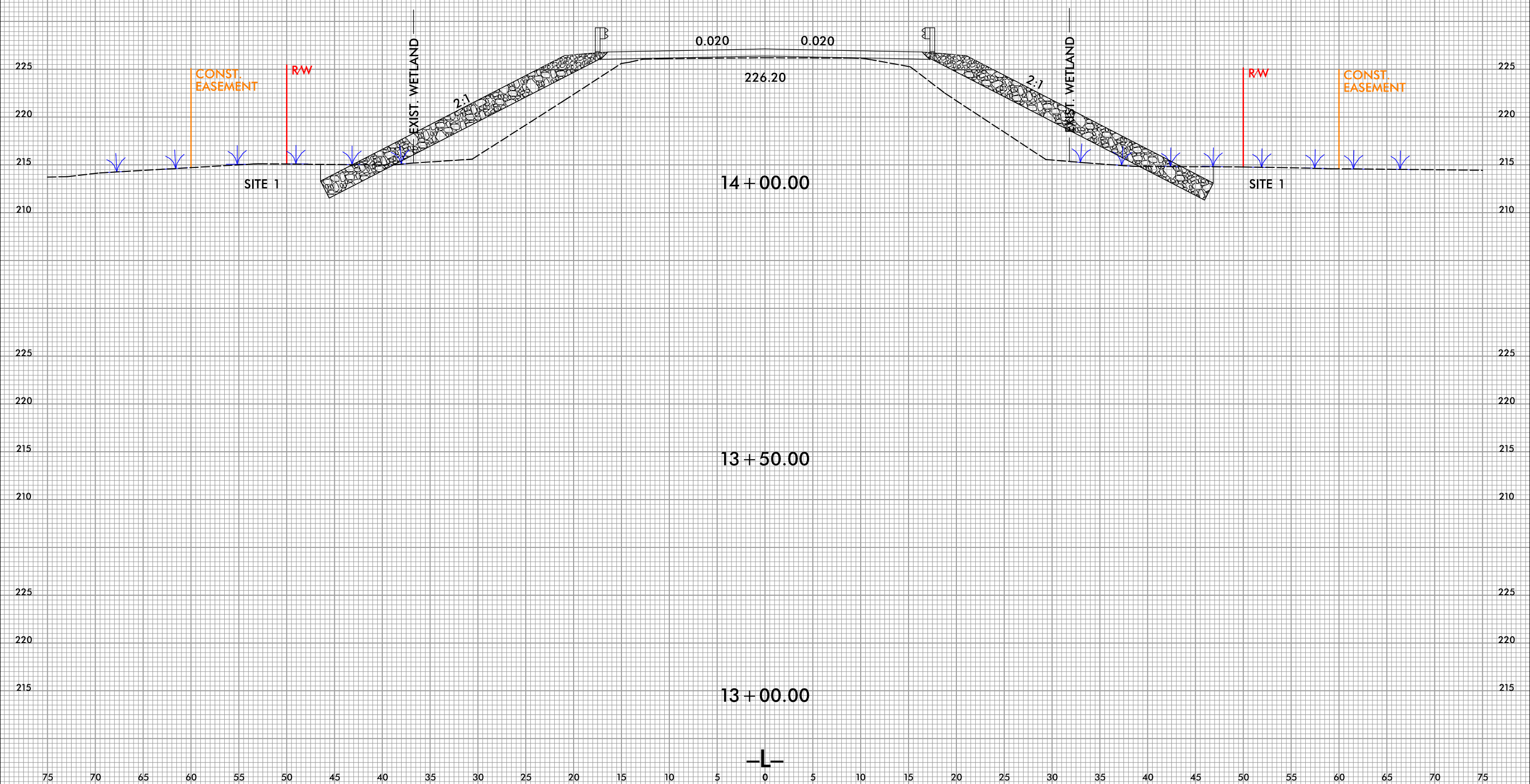


PROJ. REFERENCE NO.  
B-4830

SHEET NO.  
X-2

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

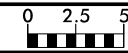
PERMIT DRAWING  
SHEET 7 OF 10



SYSTEMS TIME: 8/23/99 10:00 AM  
C:\PROJECTS\B-4830\DRAWING\DWG\X-2.DWG  
PLOT DATE: 8/23/99 10:00 AM

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

8/23/99

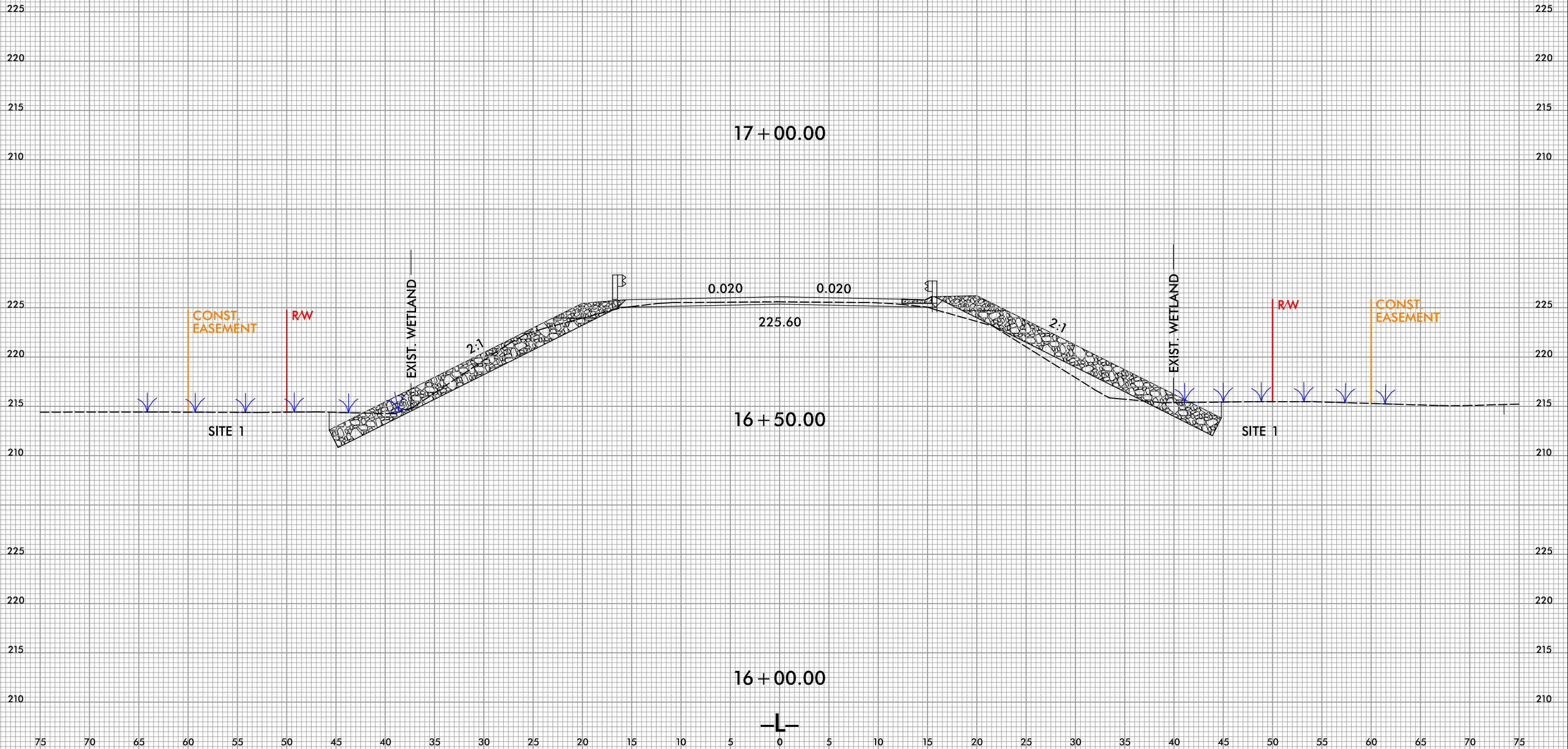


PROJ. REFERENCE NO.  
B-4830

SHEET NO.  
X-4

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

PERMIT DRAWING  
SHEET 8 OF 10



SYSTEMS TIME: 8/23/99 10:00 AM  
DRAWN BY: J. W. BROWN  
CHECKED BY: J. W. BROWN  
DATE: 8/23/99

**WETLAND PERMIT IMPACT SUMMARY**

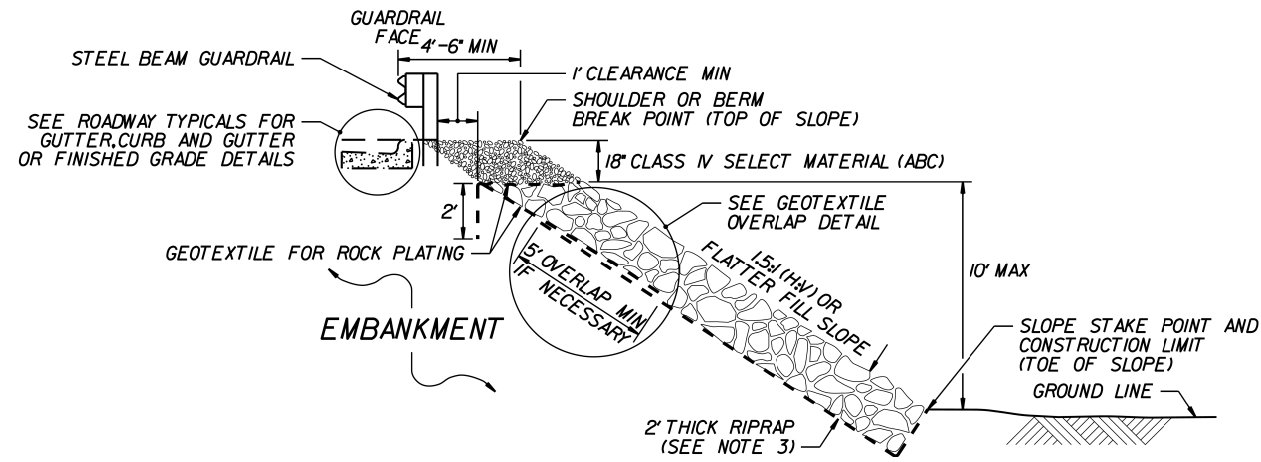
Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	12+30 TO 14+80 -L- LT	1@105'; 39" Box Beam w/ 4.0' Caps	0.03			0.08						
1	12+30 TO 14+32 -L- RT	1@105'; 39" Box Beam w/ 4.0' Caps	0.04			0.06						
1	15+10 TO 15+80 -L-	Temporary Causeway							0.07		76	
1	15+75 TO 17+85 -L- LT	1@105'; 39" Box Beam w/ 4.0' Caps	0.02			0.07						
1	16+15 TO 17+85 -L- RT	1@105'; 39" Box Beam w/ 4.0' Caps	< 0.01			0.05						
<b>TOTALS*:</b>			<b>0.09</b>			<b>0.27</b>			<b>0.07</b>	<b>0</b>	<b>76</b>	<b>0</b>

\*Rounded totals are sum of actual impacts

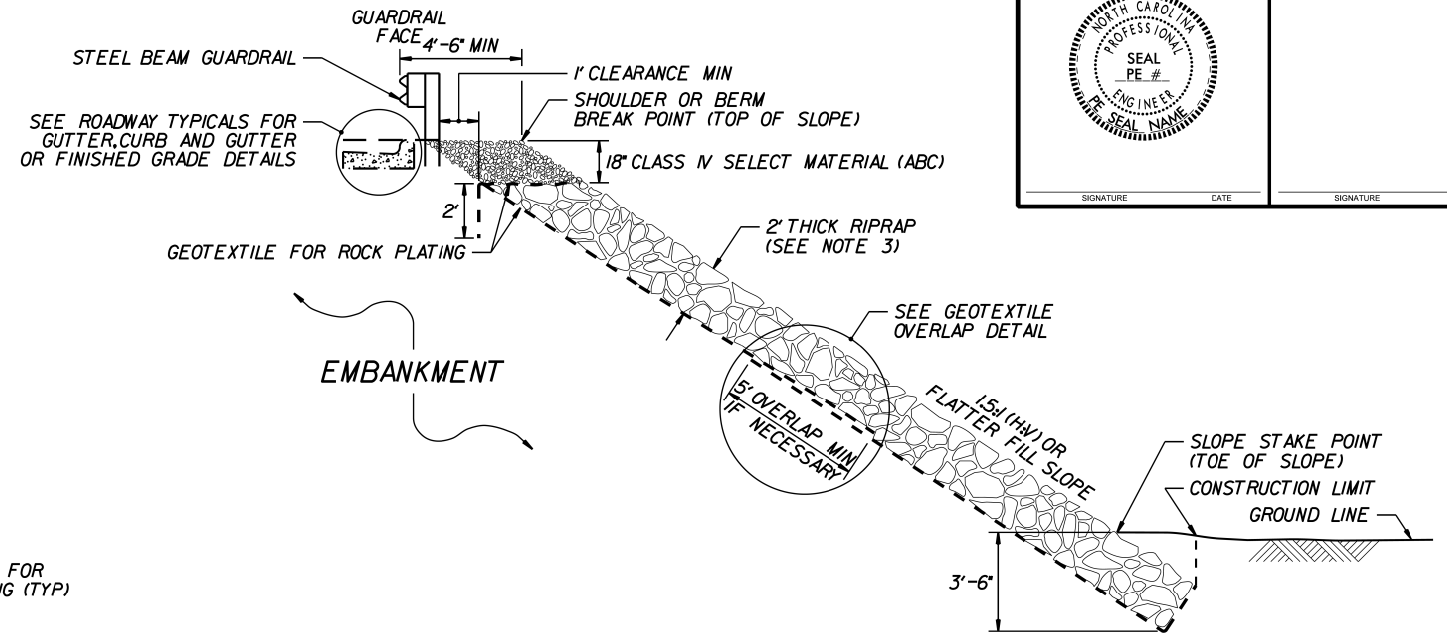
NOTES:

NC DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 1/14/2016  
 WAKE COUNTY  
 B-4830  
 38600.1.1  
 SHEET **9** OF **10**

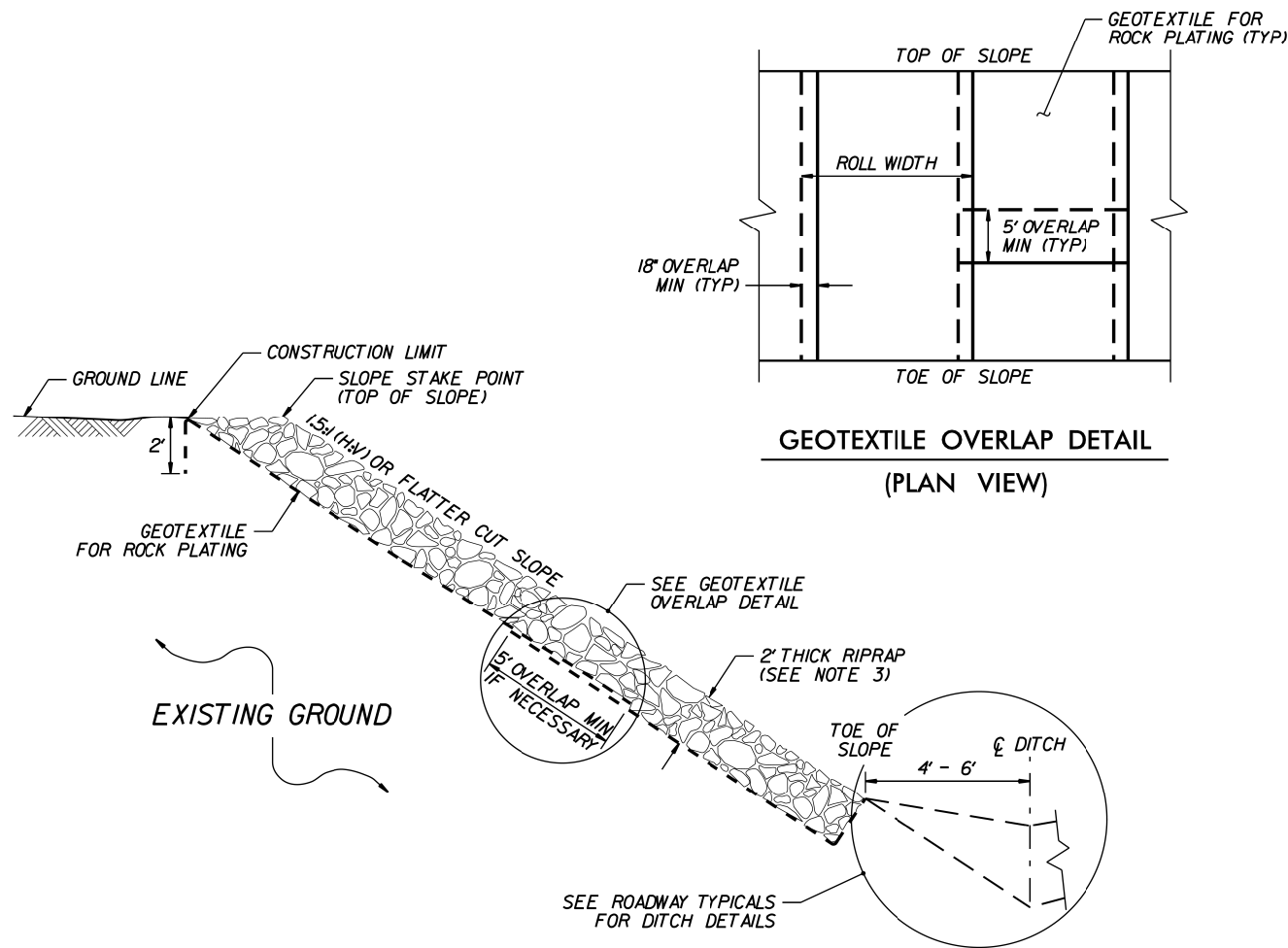
PERMIT DRAWING  
SHEET 10 OF 10



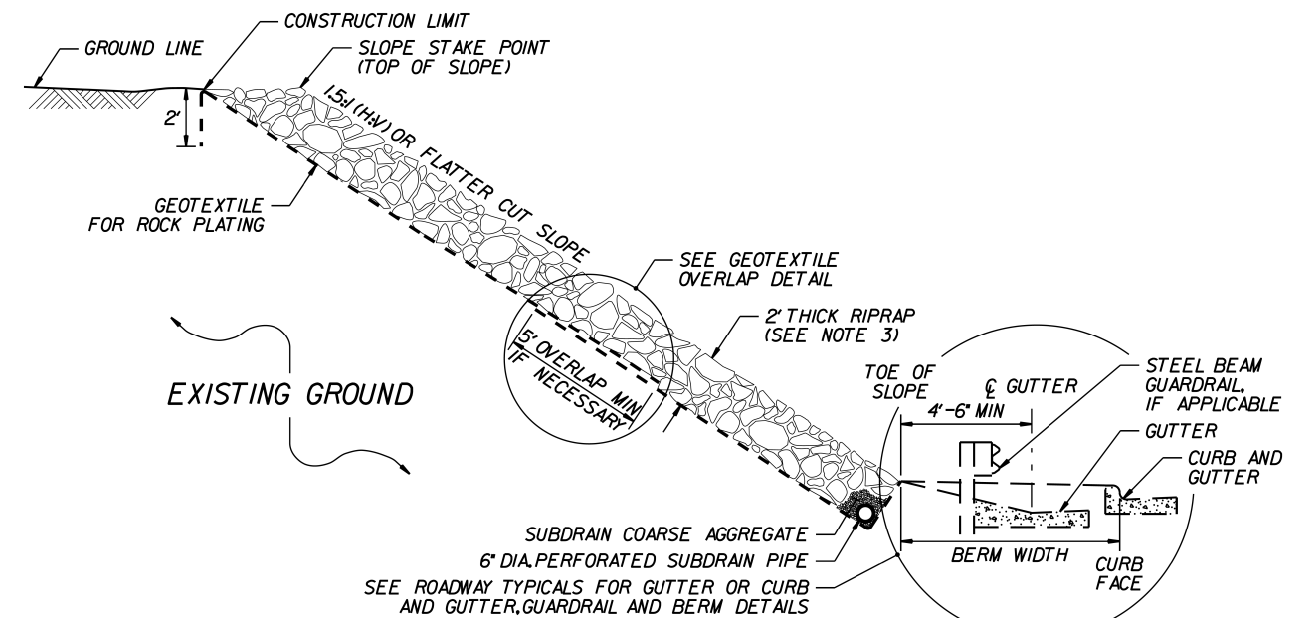
**ROCK PLATING DETAIL NO. 1 – TYPICAL SECTION**



**ROCK PLATING DETAIL NO. 2 – TYPICAL SECTION**



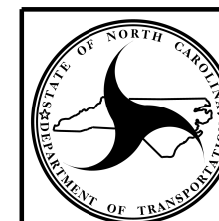
**ROCK PLATING DETAIL NO. 3 – TYPICAL SECTION**



**ROCK PLATING DETAIL NO. 4 – TYPICAL SECTION**

**NOTES:**

1. SEE ROADWAY PLANS AND SUMMARY SHEETS FOR ROCK PLATING LOCATIONS.
2. FOR STANDARD ROCK PLATING, SEE SECTION 275 OF THE STANDARD SPECIFICATIONS.
3. USE CLASS 1, 2 OR B RIPRAP UNLESS REQUIRED OTHERWISE IN THE ROADWAY SUMMARY SHEETS.



NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
  
**GEOTECHNICAL  
ENGINEERING UNIT**

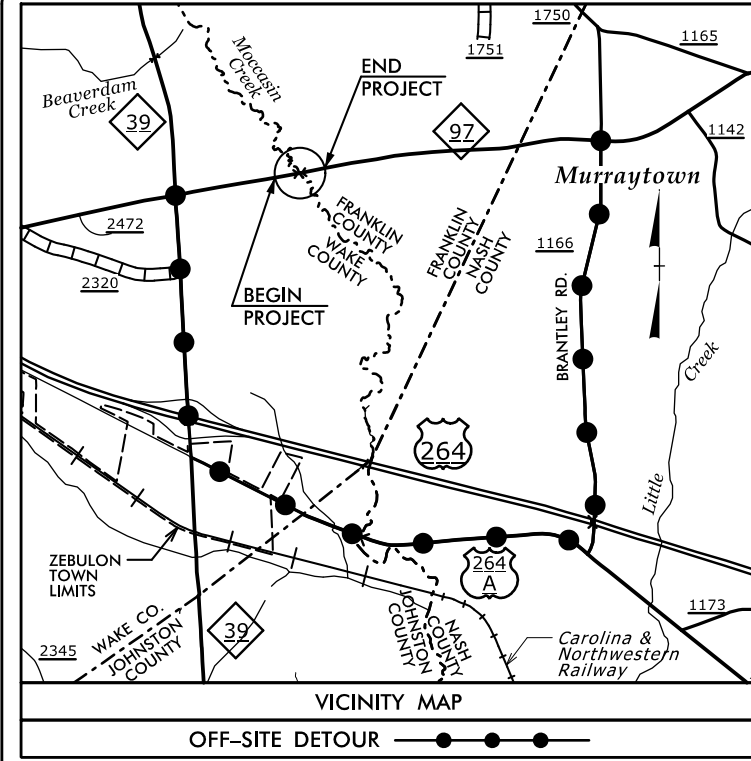
STANDARD DETAIL NO. 1802.01

STANDARD  
ROCK PLATING



09/26/14

**T.I.P. PROJECT: B-4830**



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

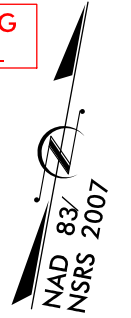
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**WAKE COUNTY**

**LOCATION:** BRIDGE NO. 20 OVER MOCCASIN CREEK  
ON NC 97  
**TYPE OF WORK:** GRADING, DRAINAGE, PAVING, AND STRUCTURE

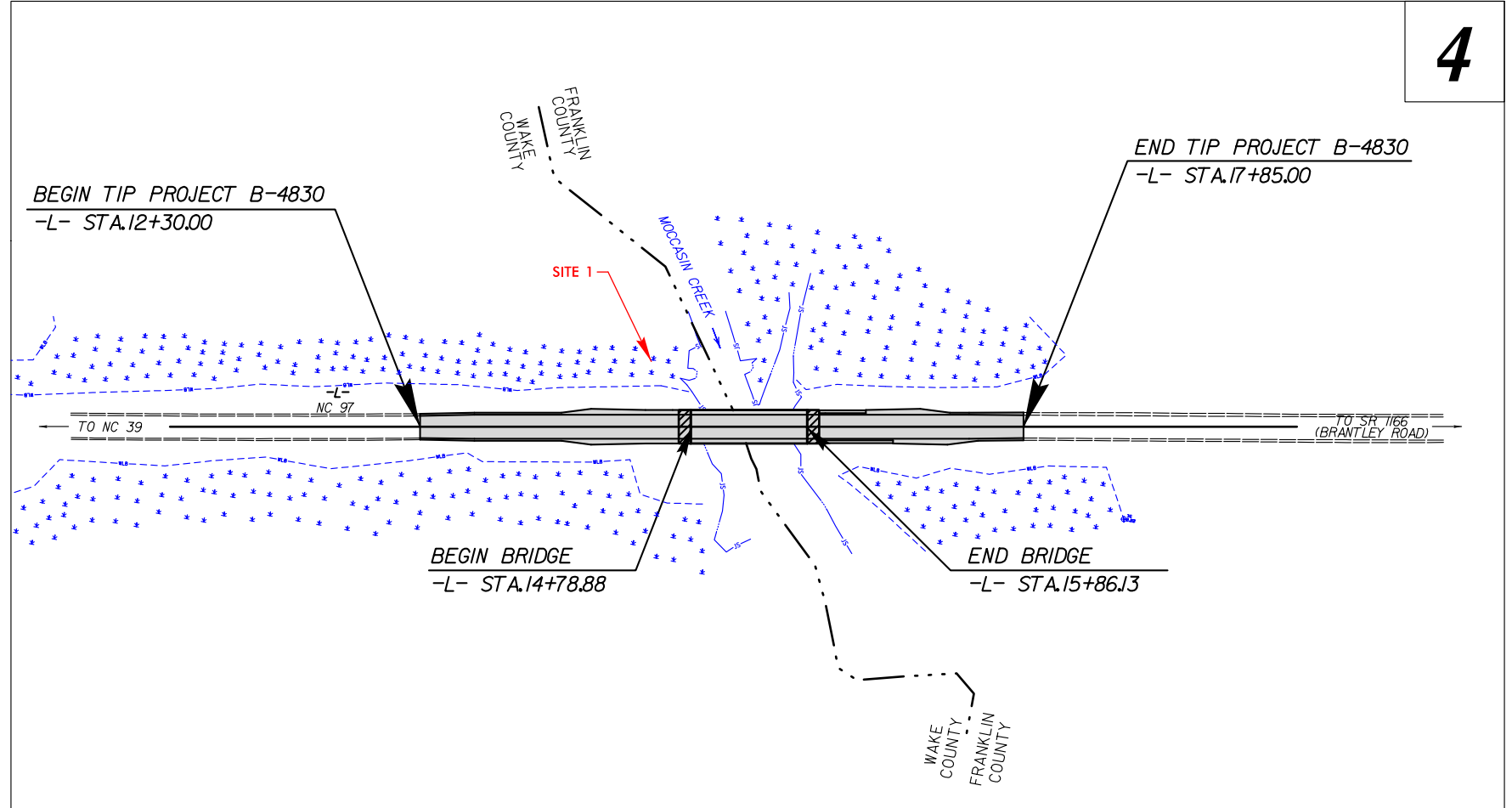
**BUFFER IMPACTS PERMIT**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4830	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
38600.1.1	BRSTP-0097(34)	PE	
38600.2.2		ROW & UTILITY	

**BUFFER DRAWING SHEET 1 OF 5**



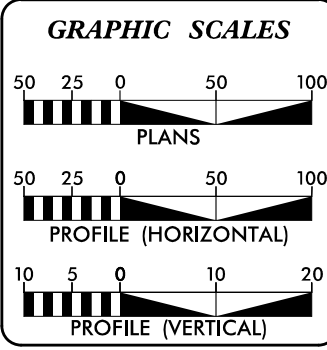
**4**



CLEARING ON THIS PROJECT SHALL BE TO LIMITS ESTABLISHED USING METHOD III.  
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

**PRELIMINARY PLANS**  
DO NOT USE FOR CONSTRUCTION

**CONTRACT:**



**DESIGN DATA**

2016 ADT = 2,922 VPD  
2036 ADT = 3,530 VPD  
DHV = 12%  
D = 60%  
T = 4% \*  
V = 60 MPH  
\* (TTST 1% + DUAL 3%)  
FUNC. CLASS. = RURAL MAJOR COLLECTOR  
SUBREGIONAL TIER

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-4830 = 0.085 mi.  
LENGTH STRUCTURES TIP PROJECT B-4830 = 0.020 mi.  
TOTAL LENGTH TIP PROJECT B-4830 = 0.105 mi.

Prepared in the Offices of:

**STEWART**  
421 FAYETTEVILLE ST., STE. 400  
RALEIGH, NC 27611  
T 919.380.9758

NC FIRM LICENSE No. P-1148  
1151 SE Cary Parkway, Suite 101  
Cary, NC 27518  
(919) 527-4929

**ECOLOGICAL ENGINEERING**

2012 STANDARD SPECIFICATIONS

**RIGHT OF WAY DATE:**  
OCTOBER 22, 2015

**LETTING DATE:**  
OCTOBER 18, 2016

**ANDY YOUNG, PE**  
PROJECT ENGINEER

**MICHAEL BURNS, EI**  
PROJECT DESIGN ENGINEER

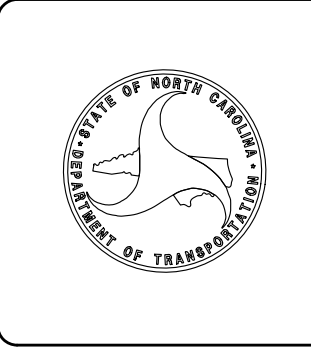
**TONY HOUSER, P.E.**  
NCDOT CONTACT

**HYDRAULICS ENGINEER**

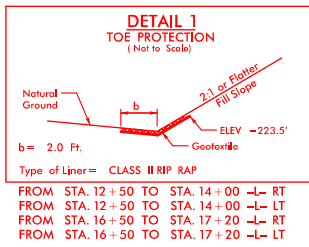
SIGNATURE: \_\_\_\_\_ P.E.

**ROADWAY DESIGN ENGINEER**

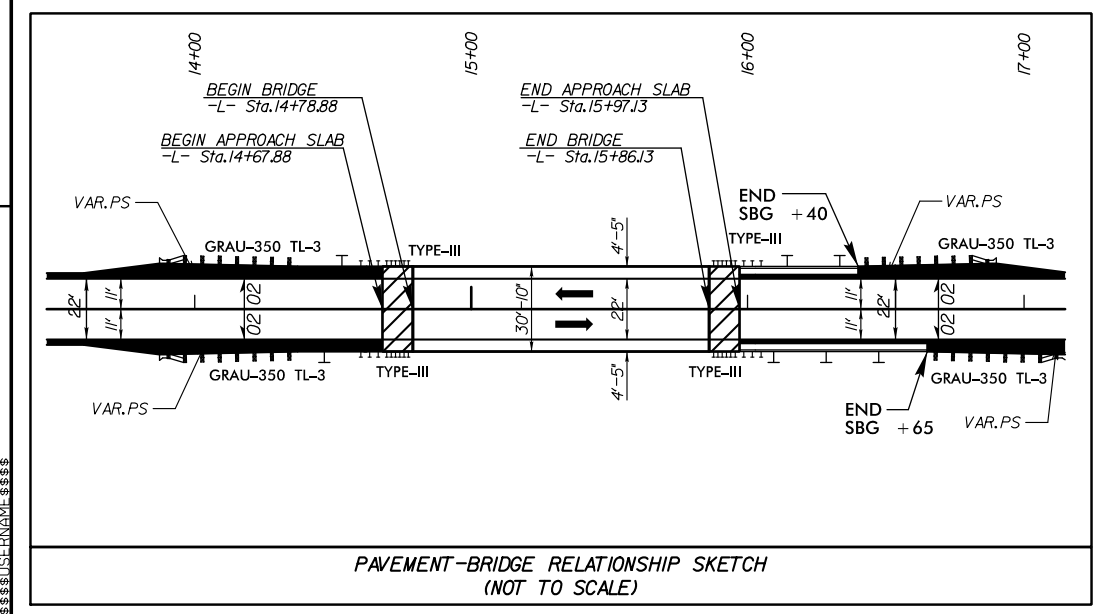
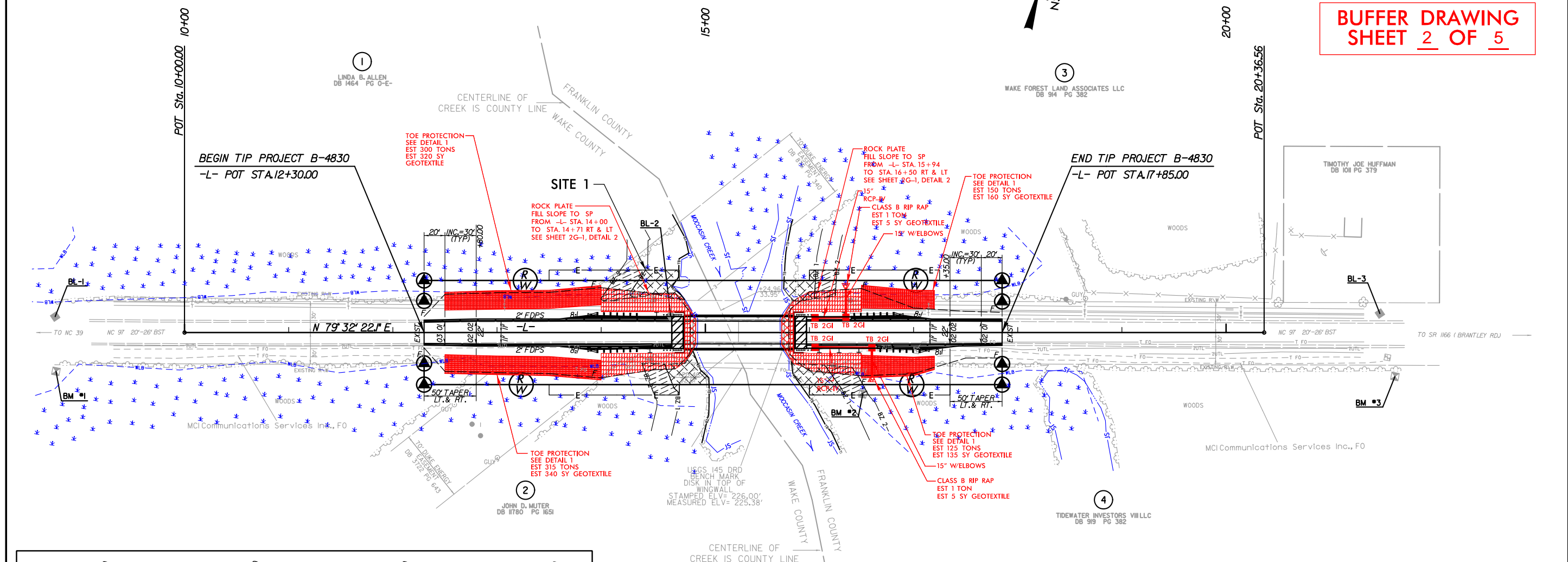
SIGNATURE: \_\_\_\_\_ P.E.


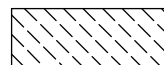






\$\$\$\$\$SYTIME\$\$\$\$\$  
\$\$\$\$\$DGN\$\$\$\$\$  
\$\$\$\$\$SERNAME\$\$\$\$\$



**BUFFER DRAWING**  
**SHEET 2 OF 5**



	ALLOWABLE IMPACTS ZONE 1
	ALLOWABLE IMPACTS ZONE 2
	END BENT EXCAVATION SEE STRUCTURE PLANS (STRUCTURE PLAN ITEM)
	FOR -L- PROFILE, SEE SHEET 5
	PROPOSED PAVED SHOULDER
	FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-7

REVISIONS

8.17.99  
C:\PROJECTS\B-4830\DRAWINGS\PLAN\B-4830-4.DWG  
DATE PLOTTED: 11/17/2009 10:00 AM  
PLOTTER: HP DesignJet 5000PS  
SCALE: AS SHOWN  
SHEET: 4 OF 5  
PROJECT: B-4830



## BUFFER IMPACTS SUMMARY

SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE			ZONE 1 (ft <sup>2</sup> )	ZONE 2 (ft <sup>2</sup> )
			ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft <sup>2</sup> )	ZONE 2 (ft <sup>2</sup> )	TOTAL (ft <sup>2</sup> )	ZONE 1 (ft <sup>2</sup> )	ZONE 2 (ft <sup>2</sup> )	TOTAL (ft <sup>2</sup> )		
1	1@105' 39" BOX BEAM W/ 4'-0"	14+00 -L- TO 14+80 -L- LT	X			987	709	1696					
1	1@105' 39" BOX BEAM W/ 4'-0"	14+39 -L- TO 14+80 -L- RT	X			340	656	996					
1	1@105' 39" BOX BEAM W/ 4'-0"	14+80-L- TO 15+04 -L-RT		X		461	0	461					
1	1@105' 39" BOX BEAM W/ 4'-0"	15+75-L- TO 15+85 -L- LT		X		140	0	140					
1	1@105' 39" BOX BEAM W/ 4'-0"	15+85-L- TO 16+25 -L- LT	X			440	524	964					
1	1@105' 39" BOX BEAM W/ 4'-0"	15+82-L- TO 16+57 -L- RT	X			987	659	1646					
1	1@105' 39" BOX BEAM W/ 4'-0"	15+82-L- TO 15+85 -L- RT		X		17	0	17					
<b>TOTAL:</b>						3372	2548	5920					

N.C. DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
  
 WAKE COUNTY  
 PROJECT: 38600.1.1 (B-4830)  
  
 1/14/2016  
 SHEET 4 OF 5

## WETLANDS IN BUFFER IMPACTS SUMMARY

SITE NO.	STATION (FROM/TO)	WETLANDS IN BUFFERS	
		ZONE 1 (ft <sup>2</sup> )	ZONE 2 (ft <sup>2</sup> )
1	14+03 -L- TO 14+78 -L- LT	903	555
1	15+75 -L- TO 16+26 -L- LT	454	430
1	15+83 -L- TO 16+57 -L- RT	87	498
<b>TOTAL:</b>		1444	1483

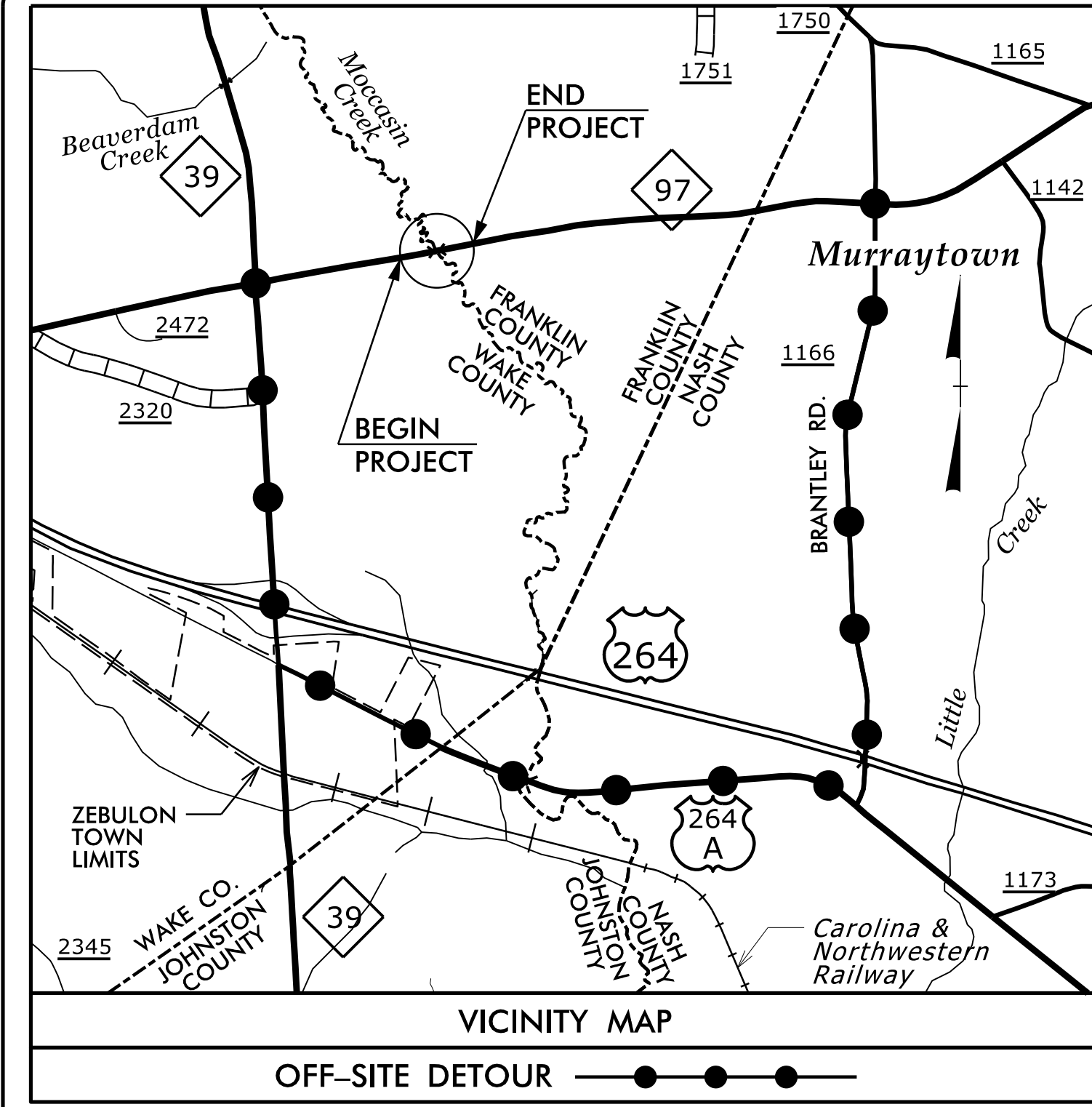
N.C. DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS

WAKE COUNTY  
 PROJECT: 38600.1.1 (B-4830)

1/14/2016  
 SHEET 5 OF 5

09.08/99

**T.I.P. PROJECT: B-4830**



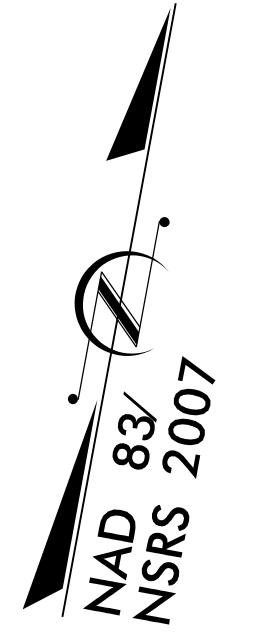
See Sheet 1-A For Index of Sheets  
See Sheet 1-B For Conventional Symbols

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

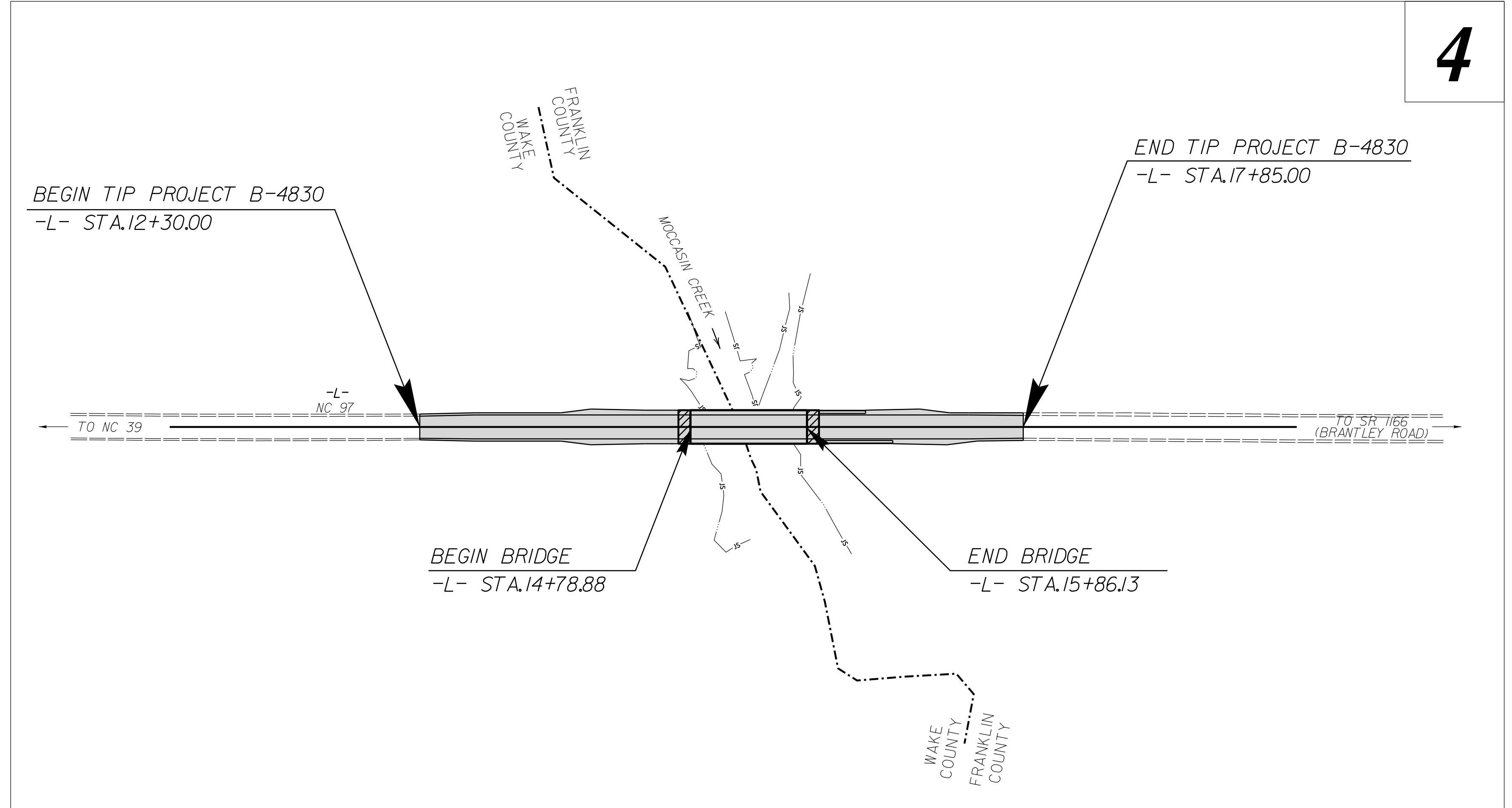
**WAKE COUNTY**

**LOCATION: BRIDGE NO. 20 OVER MOCCASIN CREEK  
ON NC 97**  
**TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	<b>B-4830</b>	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
38600.1.1	BRSTP-0097(34)	PE	
38600.2.2		ROW & UTILITY	



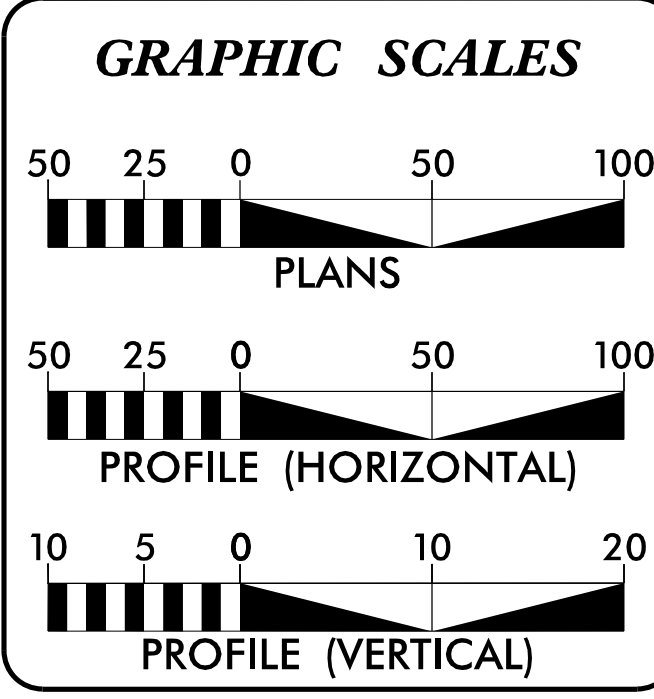
**4**



**CONTRACT:**

CLEARING ON THIS PROJECT SHALL BE TO LIMITS ESTABLISHED USING METHOD III.  
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION



**DESIGN DATA**  
2016 ADT = 2,922 VPD  
2036 ADT = 3,530 VPD  
DHV = 12%  
D = 60%  
T = 4% \*  
V = 60 MPH  
\* (TTST 1% + DUAL 3%)  
FUNC. CLASS. = RURAL MAJOR COLLECTOR  
SUBREGIONAL TIER

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-4830	= 0.085 mi.
LENGTH STRUCTURES TIP PROJECT B-4830	= 0.020 mi.
TOTAL LENGTH TIP PROJECT B-4830	= 0.105 mi.

Prepared in the Offices of:

**STEWART**  
421 FAYETTEVILLE ST., STE. 400  
RALEIGH, NC 27601  
T 919.380.8750

**ECOLOGICAL ENGINEERING**  
NC FIRM LICENSE No. P-1148  
1151 SE Cary Parkway, Suite 101  
Cary, NC 27513  
(919) 557-4029

2012 STANDARD SPECIFICATIONS

**RIGHT OF WAY DATE:**  
OCTOBER 22, 2015

**LETTING DATE:**  
OCTOBER 18, 2016

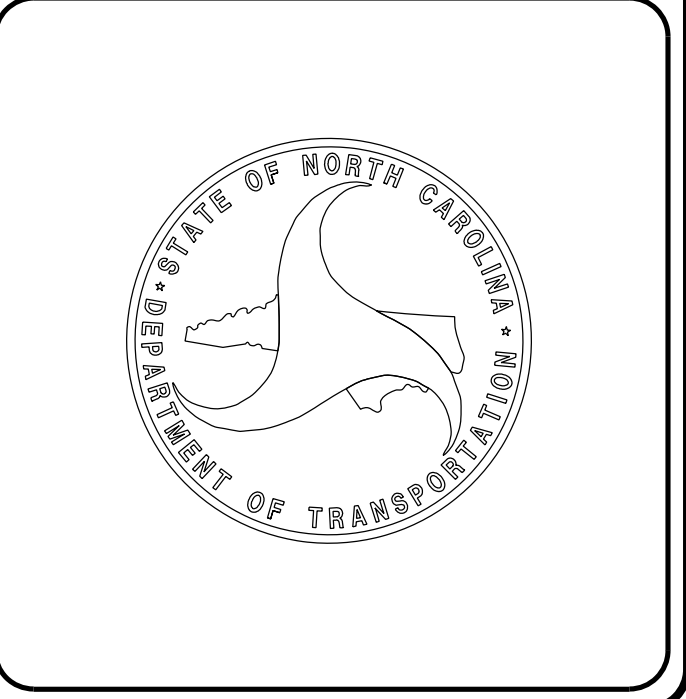
<b>ANDY YOUNG, PE</b> PROJECT ENGINEER
<b>MICHAEL BURNS, EI</b> PROJECT DESIGN ENGINEER
<b>TONY HOUSER, P.E.</b> NCDOT CONTACT

**HYDRAULICS ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.

**ROADWAY DESIGN ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.



10/22/2015  
I:\Roadway\Proj\B4830\RDY\_TSH.dgn  
USERS\ayoung

# 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	○ EP
Property Corner	-----
Property Monument	□ ECM
Parcel/Sequence Number	①23
Existing Fence Line	-x-x-x-
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	☠
Potential Contamination Area: Soil	?
Known Contamination Area: Water	☠
Potential Contamination Area: Water	?
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	-----
False Sump	▽

### RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○ MILEPOST 35
Switch	□ SWITCH
RR Abandoned	-----
RR Dismantled	-----

### RIGHT OF WAY:

Baseline Control Point	△
Existing Right of Way Marker	△
Existing Right of Way Line	-----
Proposed Right of Way Line	-----
Proposed Right of Way Line with Iron Pin and Cap Marker	-----
Proposed Right of Way Line with Concrete or Granite RW Marker	-----
Proposed Control of Access Line with Concrete C/A Marker	-----
Existing Control of Access	-----
Proposed Control of Access	-----
Existing Easement Line	-----
Proposed Temporary Construction Easement	-----
Proposed Temporary Drainage Easement	-----
Proposed Permanent Drainage Easement	-----
Proposed Permanent Drainage / Utility Easement	-----
Proposed Permanent Utility Easement	-----
Proposed Temporary Utility Easement	-----
Proposed Aerial Utility Easement	-----
Proposed Permanent Easement with Iron Pin and Cap Marker	-----

### ROADS AND RELATED FEATURES:

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

### VEGETATION:

Single Tree	☼
Single Shrub	☼
Hedge	-----
Woods Line	-----

Orchard	☼ ☼ ☼ ☼
Vineyard	□ Vineyard

### EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	----- CONC
Bridge Wing Wall, Head Wall and End Wall	--- CONC WW ---
MINOR:	
Head and End Wall	--- CONC HW ---
Pipe Culvert	-----
Footbridge	-----
Drainage Box: Catch Basin, DI or JB	□ CB
Paved Ditch Gutter	-----
Storm Sewer Manhole	○ S
Storm Sewer	----- S

### UTILITIES:

POWER:	
Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	⊕
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	⊕
Telephone Pedestal	⊕
Telephone Cell Tower	⊕
U/G Telephone Cable Hand Hole	□
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	⊕
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	⊕
TV Tower	⊗
U/G TV Cable Hand Hole	□
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:

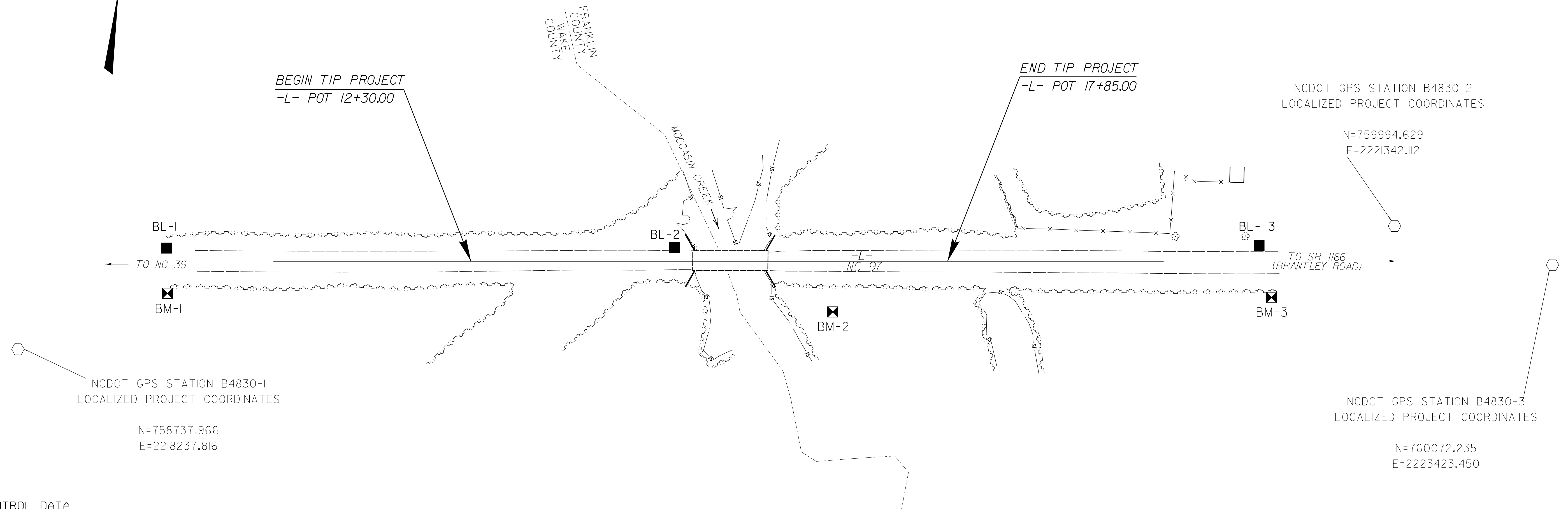
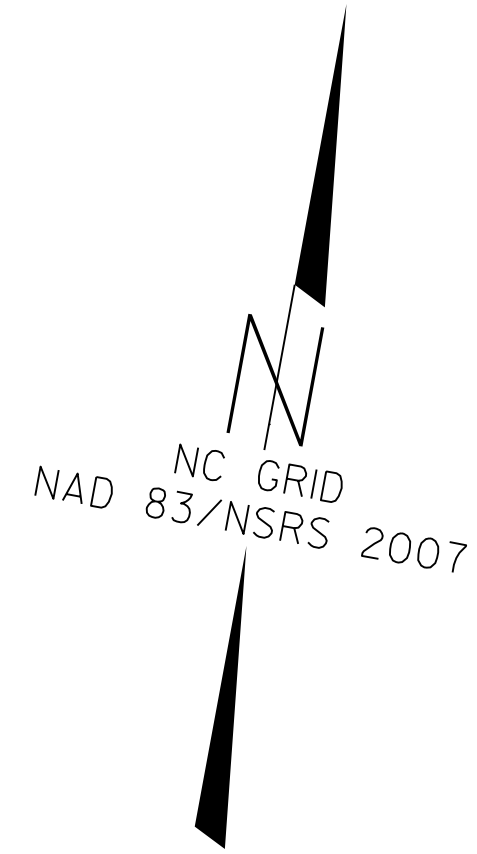
Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	----- SS
Above Ground Sanitary Sewer	----- A/G Sanitary Sewer
SS Forced Main Line LOS B (S.U.E.*)	----- FSS
SS Forced Main Line LOS C (S.U.E.*)	----- FSS
SS Forced Main Line LOS D (S.U.E.*)	----- FSS

### MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊕
Utility Unknown U/G Line LOS B (S.U.E.*)	----- ?UTL
U/G Tank; Water, Gas, Oil	□
Underground Storage Tank, Approx. Loc.	⊕
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.

04/06/15

**SURVEY CONTROL SHEET B-4830**  
**WAKE COUNTY**  
**LOCATION: BRIDGE NO. 20 OVER MOCCASIN CREEK**  
**AND APPROACHES ON NC 97**



**CONTROL DATA**

**BASELINE**

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
BL1	BL-1	759454.6037	2218420.8155	225.46	OUTSIDE PROJECT LIMITS	
BL2	BL-2	759562.7968	2219001.8838	224.77	14+66.78	16.18 LT
BL3	BL-3	759688.4014	2219671.0935	230.47	OUTSIDE PROJECT LIMITS	

**BENCHMARK DATA**

```

*****
BM1      ELEVATION = 220.64'
N 759403      E 2218431
L STATION 12+30.00
S 73°31'05" W DIST 355.39'
BENCH TIE SPIKE IN 20" OAK
*****
BM2      ELEVATION = 218.56'
N 759522      E 2219197
L STATION 16+51.00 59' RIGHT
BENCH TIE SPIKE IN 24" OAK
*****
BM3      ELEVATION = 231.24'
N 759632      E 2219696
L STATION 12+30.00
N 82°07'47" E DIST 933.07'
BENCH TIE SPIKE IN 12" SWEETGUM
*****

```

**DATUM DESCRIPTION**

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4830-1" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 758737.966(ft) EASTING: 2218237.816(ft) ELEVATION: 239.318(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99991638

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4830-1" TO -L- STATION 12+30.00 IS  
N 34°53'31" E 933.80'

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES  
VERTICAL DATUM USED IS NAVD 88

**NOTE: DRAWING NOT TO SCALE**

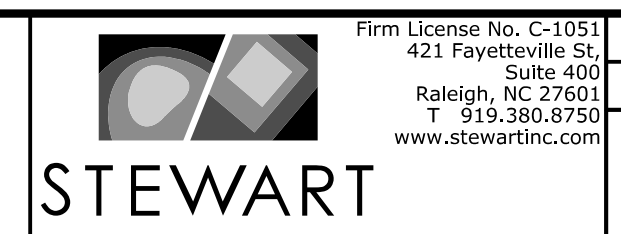
**NOTES:**

1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:  
[HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/](https://connect.ncdot.gov/resources/location/)  
THE FILES TO BE FOUND ARE AS FOLLOWS:  
B4830\_ls\_control.txt  
SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.  
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

10/14/2015 10:55:00 AM Proj: B4830-1s-1c.dgn



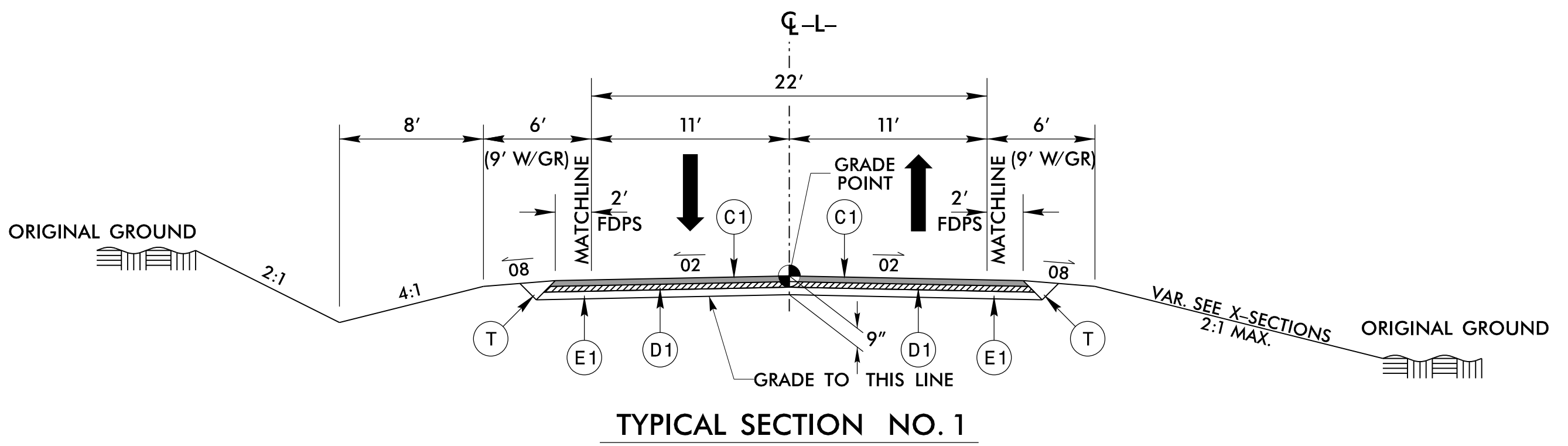
B417/99



PROJECT REFERENCE NO. <b>B-4830</b>	SHEET NO. <b>2A-1</b>
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

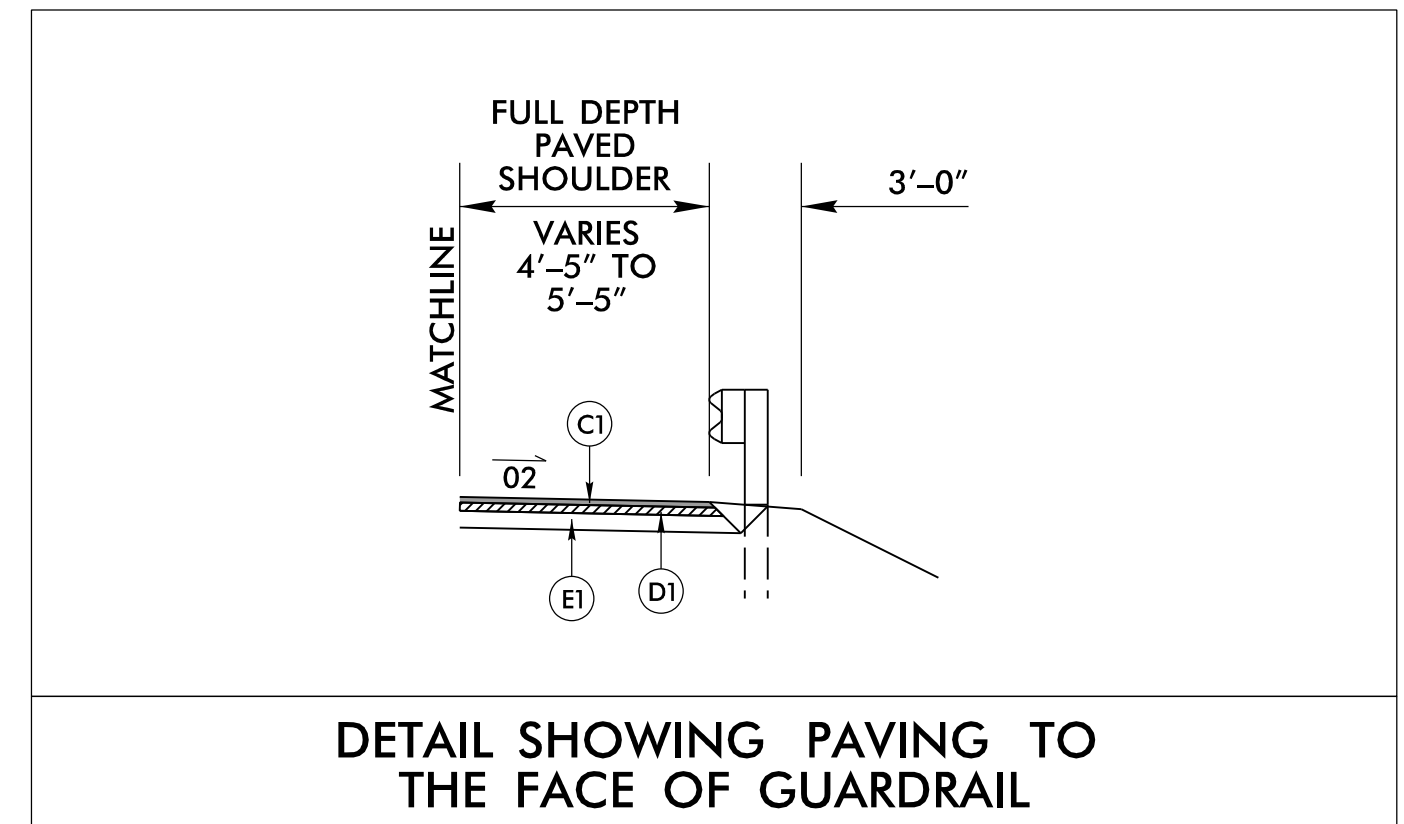
PAVEMENT SCHEDULE <i>(FINAL PAVEMENT DESIGN)</i>	
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
D1	PROP. APPROX. 3½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, 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 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
R	SHOULDER BERM GUTTER
T	EARTH MATERIAL
W	ASPHALT WEDGING (SEE DETAIL)

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

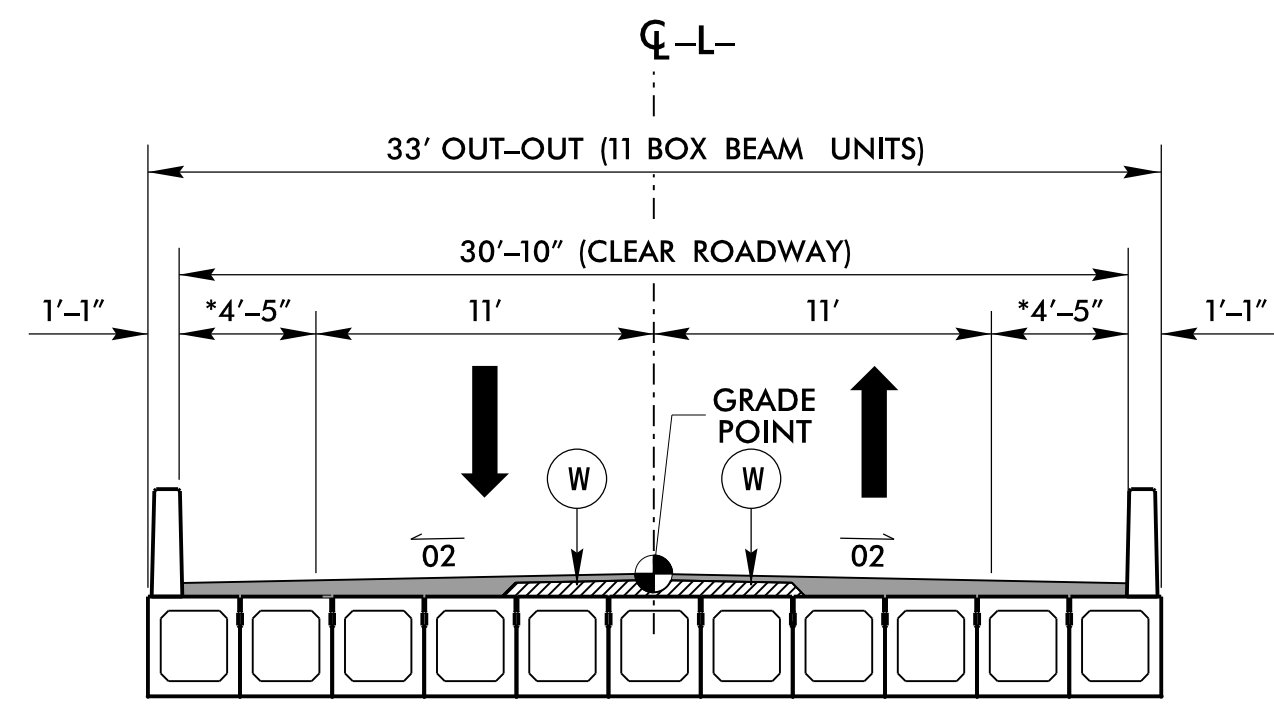


TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1:  
 -L- STA. 12+30.00 TO -L- STA. 14+78.88 (BEGIN BRIDGE)  
 -L- STA. 15+86.13 (END BRIDGE) TO -L- STA. 17+85.00



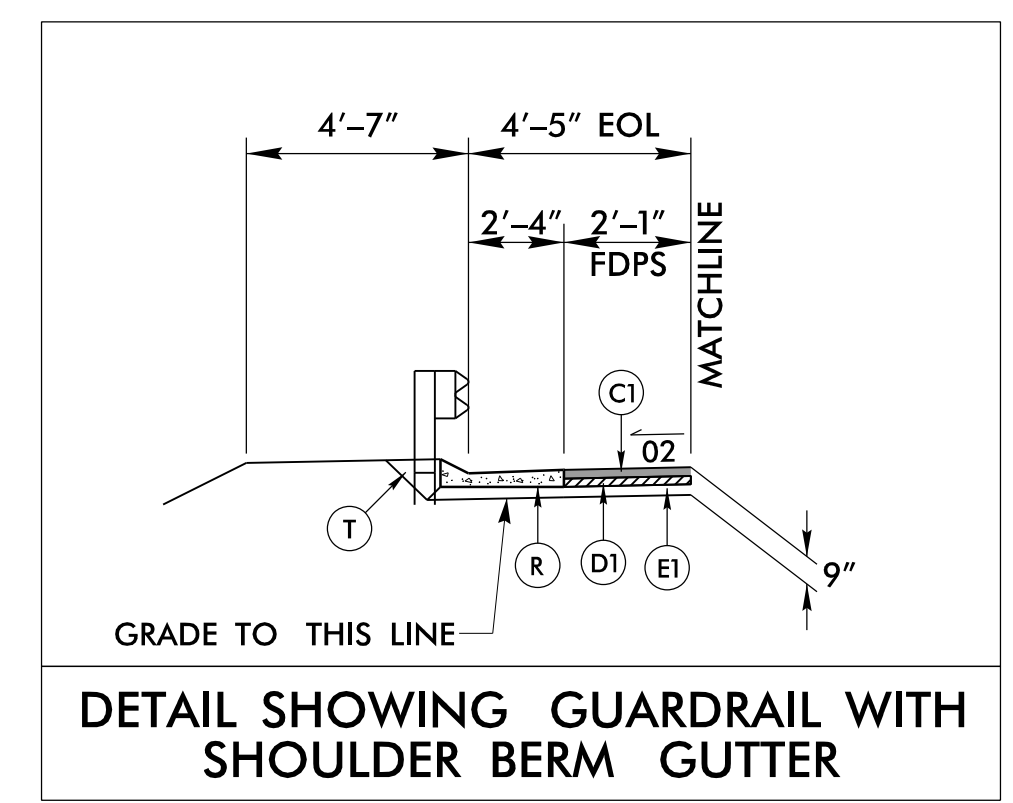
DETAIL SHOWING PAVING TO THE FACE OF GUARDRAIL



TYPICAL SECTION NO. 2  
BOX BEAM BRIDGE

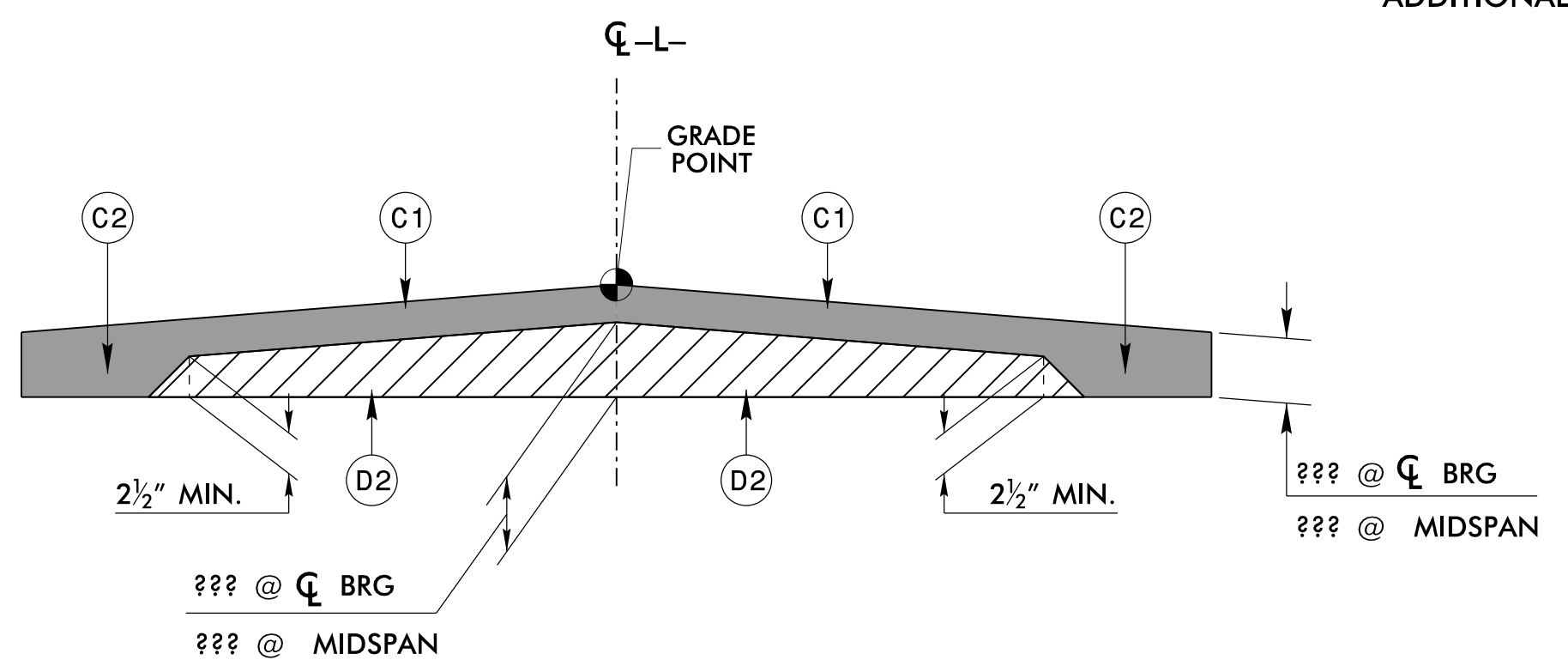
USE TYPICAL SECTION NO. 2:  
 -L- STA. 14+78.88 (BEGIN BRIDGE) TO -L- STA. 15+86.13 (END BRIDGE)

\* ADDITIONAL BRIDGE OFFSET WIDTH REQUIRED FOR HYDRAULIC DESIGN



DETAIL SHOWING GUARDRAIL WITH SHOULDER BERM GUTTER

USE SHOULDER BERM GUTTER AT THE FOLLOWING LOCATIONS:  
 -L- STA. 15+97.13 (END APPROACH SLAB) TO -L- STA. 16+40.00 (LEFT)  
 -L- STA. 15+97.13 (END APPROACH SLAB) TO -L- STA. 16+65.00 (RIGHT)



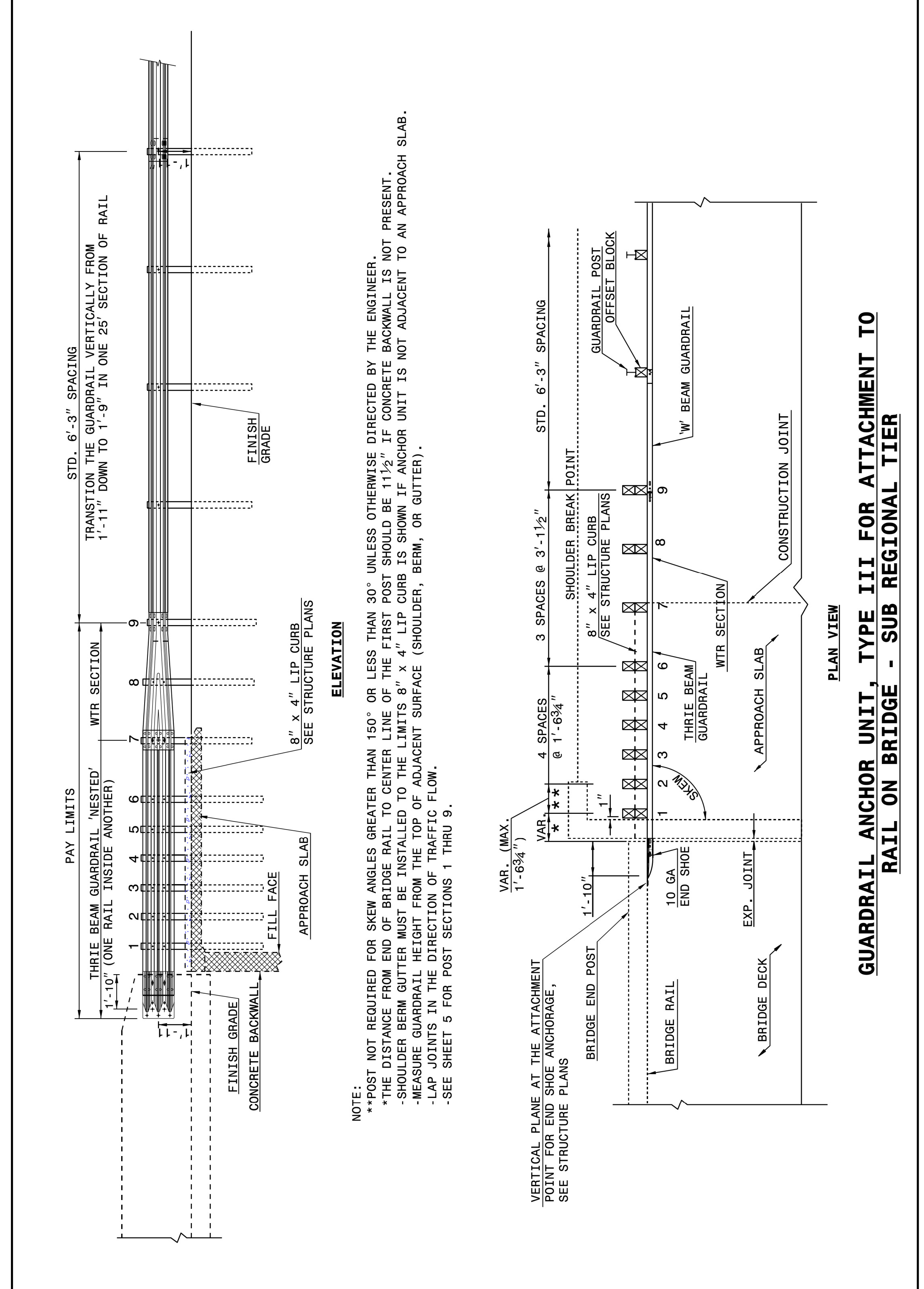
DETAIL SHOWING METHOD OF WEDGING ON BRIDGE  
 USE IN CONJUNCTION WITH TYPICAL SECTION NO. 2

10/14/2015 10:54:54 AM P:\Projects\B4830\RDY\_TYP.dgn

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 2 OF 7 **862d03**



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

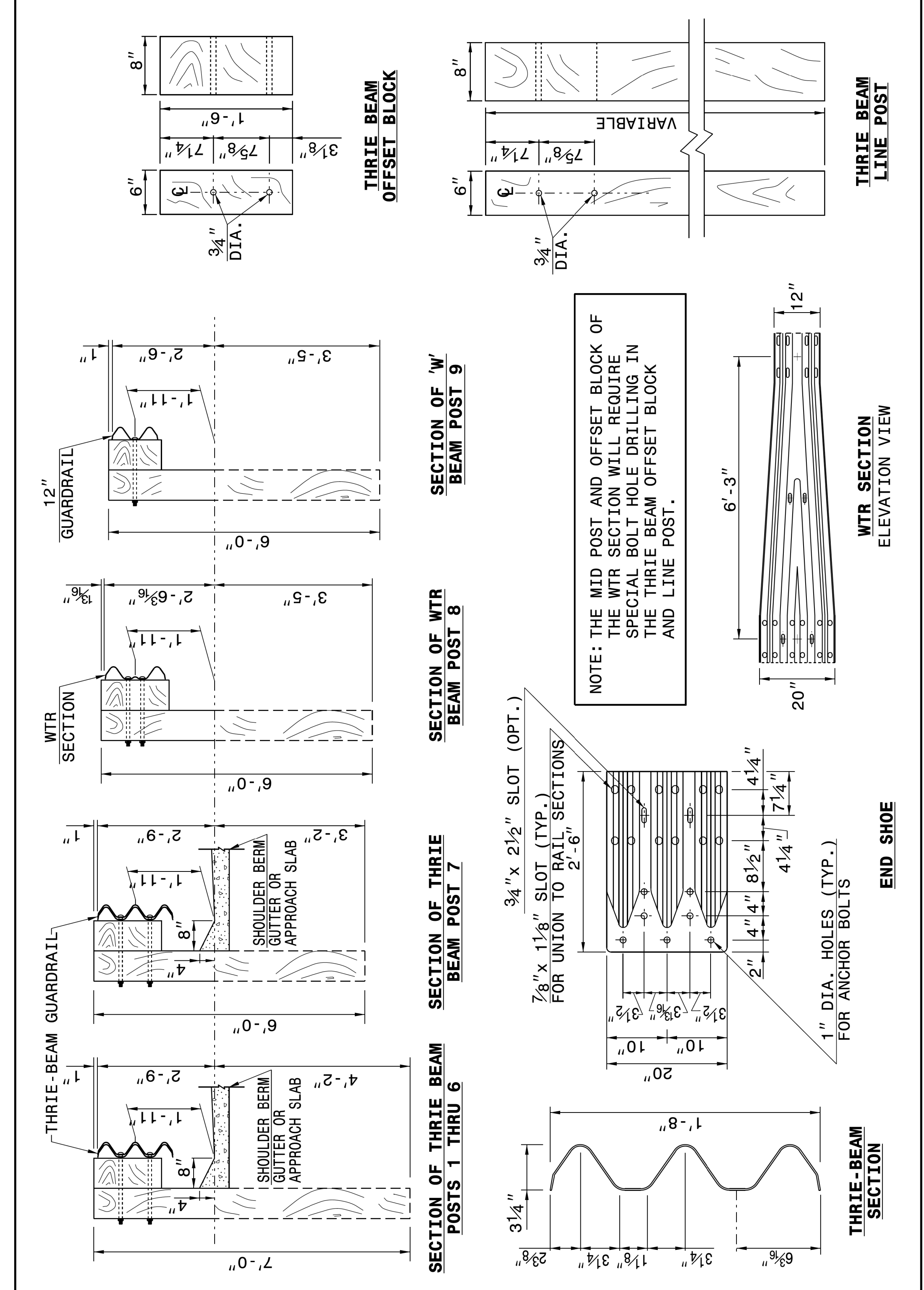
ENGLISH DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 2 OF 7 **862d03**

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III

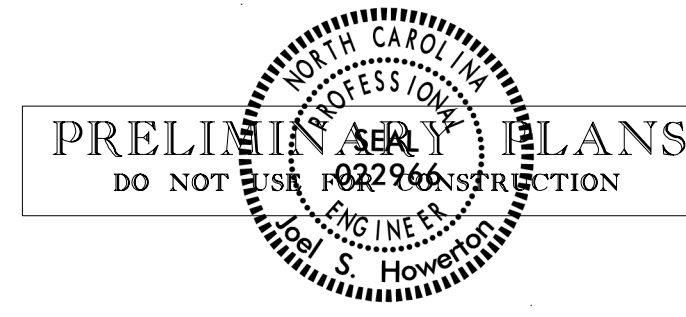
SHEET 3 OF 7 **862d03**



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III

SHEET 3 OF 7 **862d03**

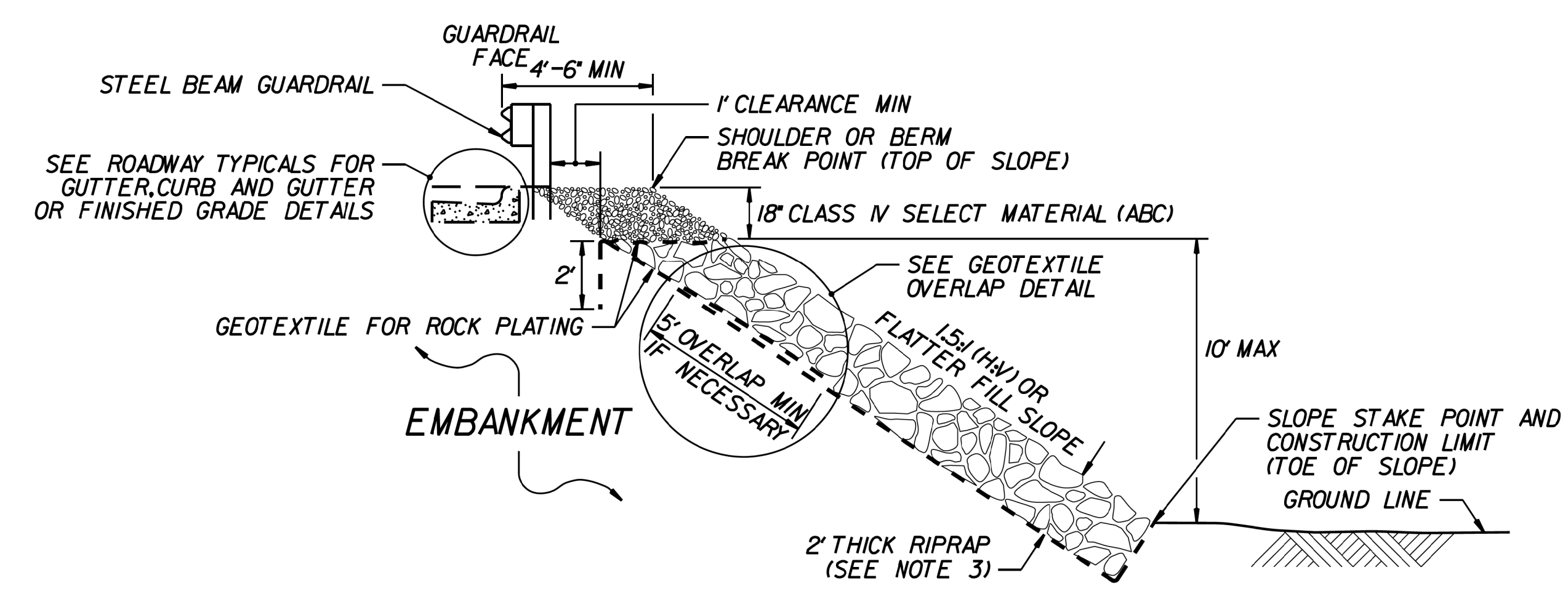


CONTRACT STANDARDS AND DEVELOPMENT UNIT  
 Office 919-707-6950 FAX 919-250-4119

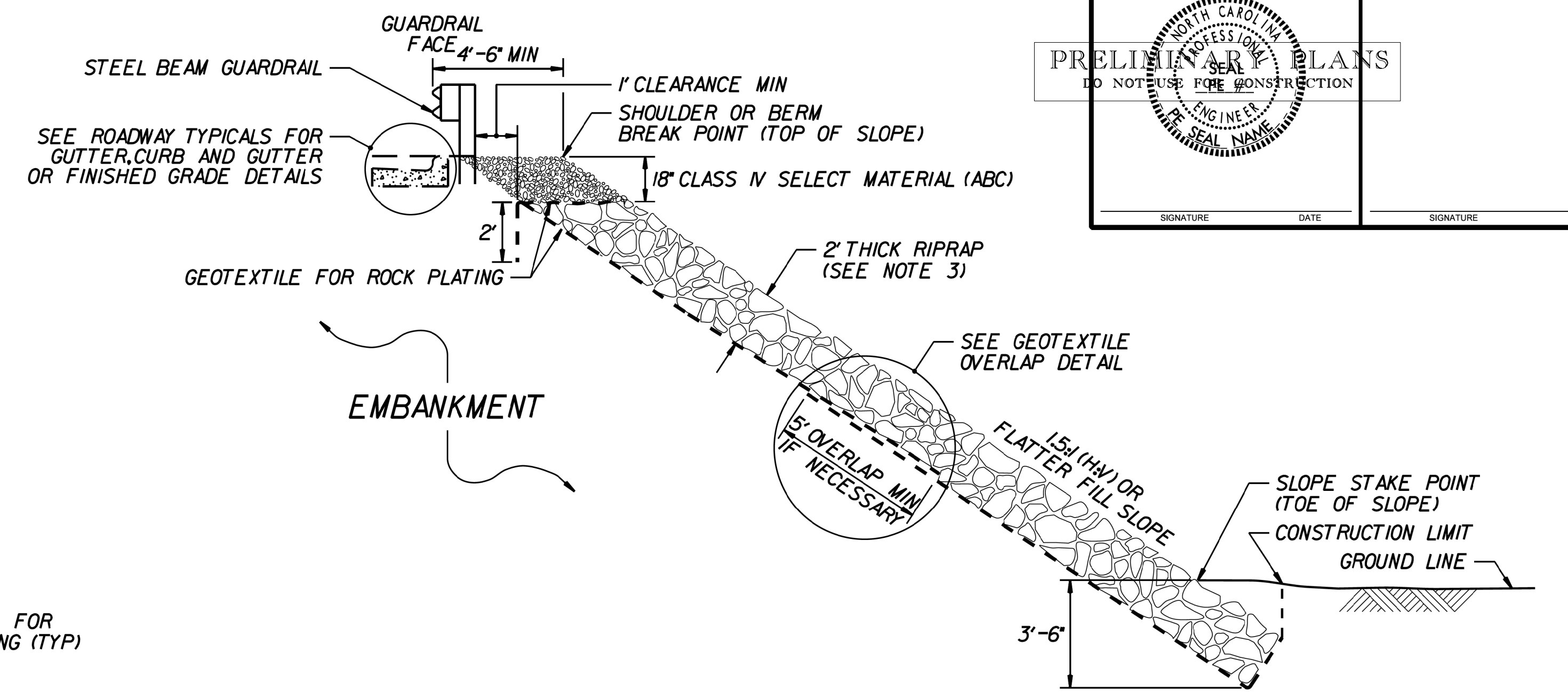
**SEE TITLE BLOCK**

ORIGINAL BY: J. HOWERTON DATE: 06-22-12  
 MODIFIED BY: DATE:  
 CHECKED BY: DATE:  
 FILE SPEC.:

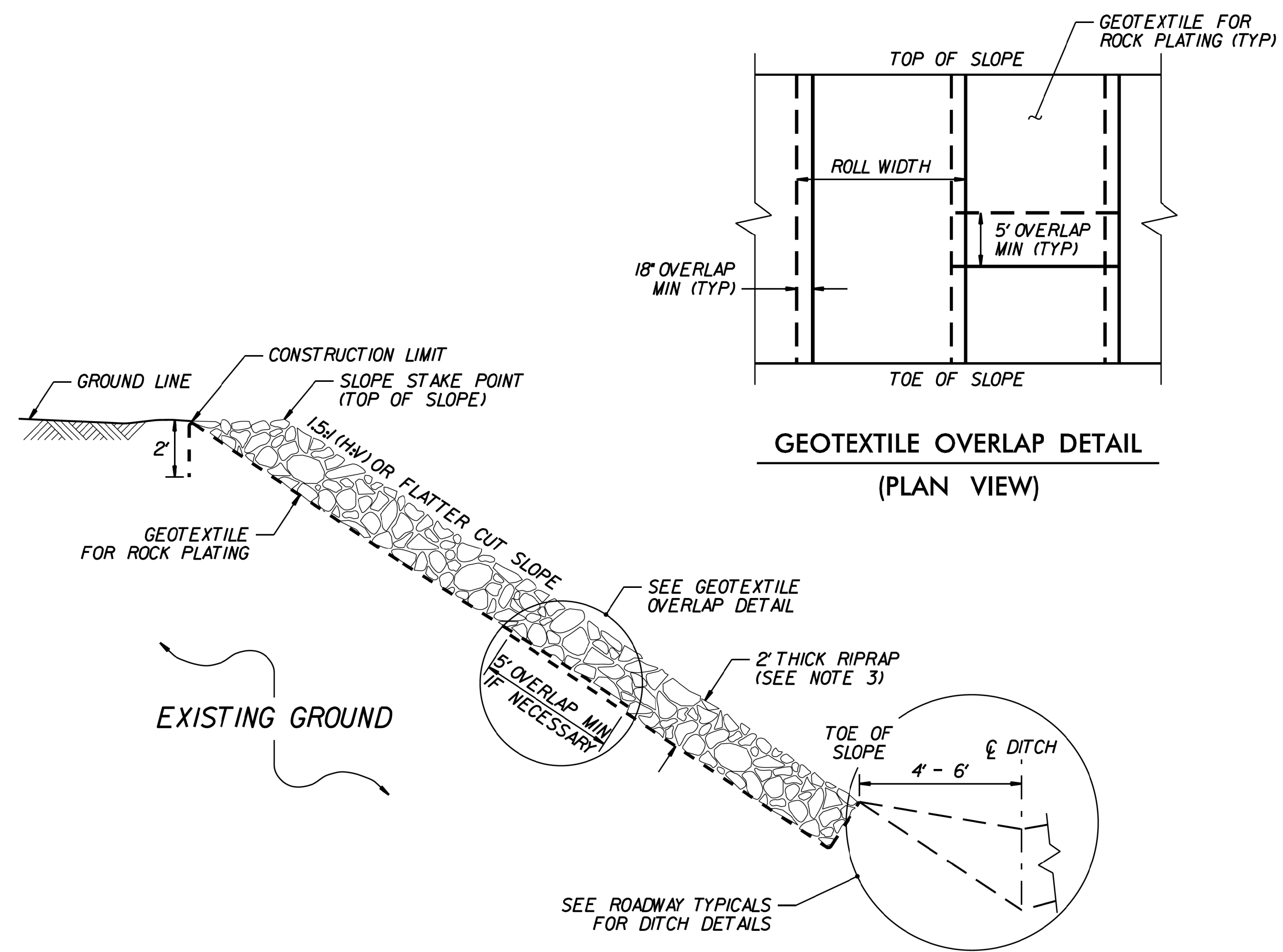
\*\*\*\*\*SYTIME\*\*\*\*\*  
 \*\*\*\*\*CUSTOMER\*\*\*\*\*  
 \*\*\*\*\*CUSTOMER\*\*\*\*\*



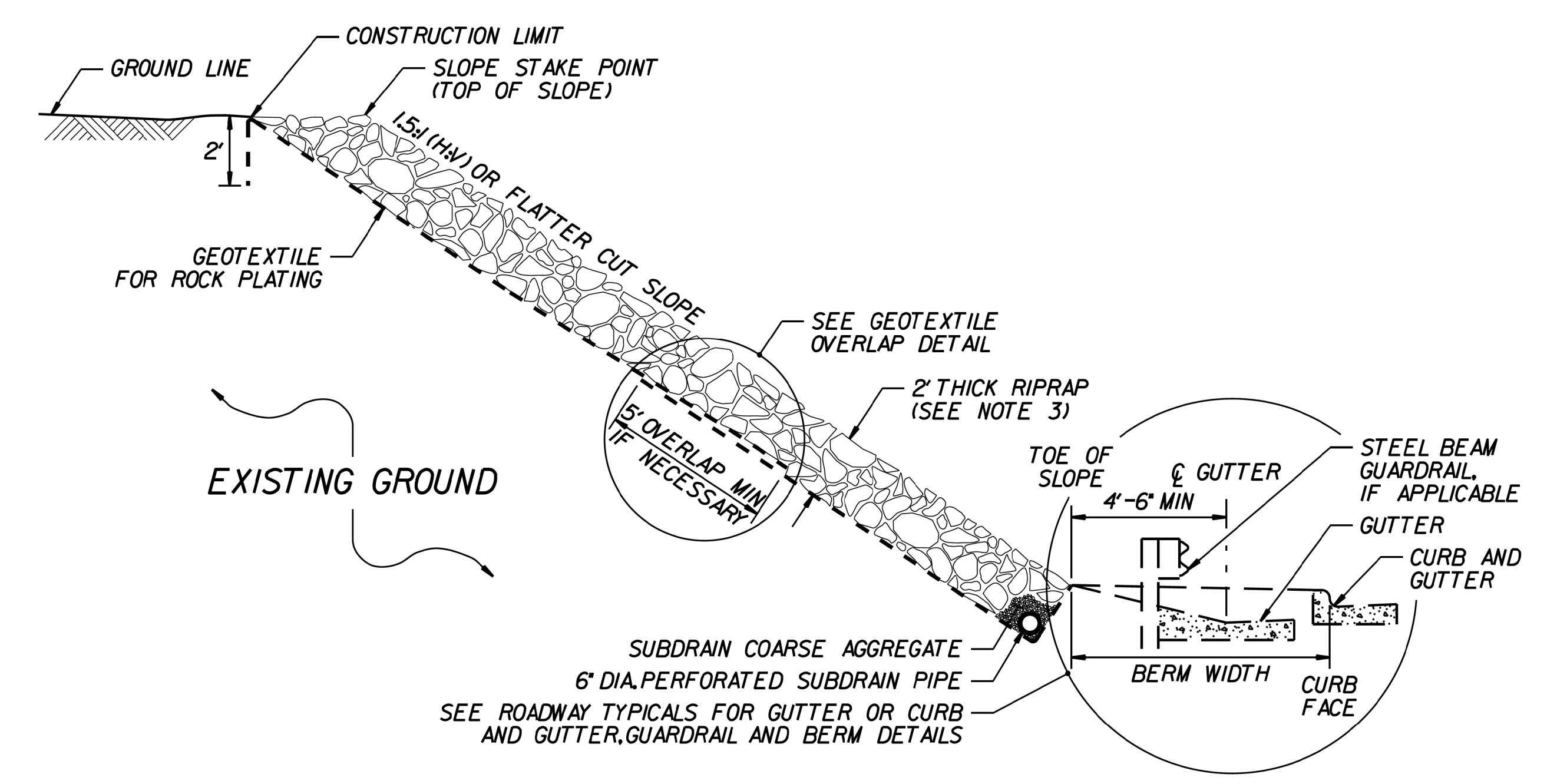
**ROCK PLATING DETAIL NO. 1 – TYPICAL SECTION**



**ROCK PLATING DETAIL NO. 2 – TYPICAL SECTION**



**ROCK PLATING DETAIL NO. 3 – TYPICAL SECTION**



**ROCK PLATING DETAIL NO. 4 – TYPICAL SECTION**

- NOTES:**
- SEE ROADWAY PLANS AND SUMMARY SHEETS FOR ROCK PLATING LOCATIONS.
  - FOR STANDARD ROCK PLATING, SEE SECTION 275 OF THE STANDARD SPECIFICATIONS.
  - USE CLASS I, 2 OR B RIPRAP UNLESS REQUIRED OTHERWISE IN THE ROADWAY SUMMARY SHEETS.

PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION

### ★ SUMMARY OF EARTHWORK

IN CUBIC YARDS

Station	Station	Uncl. Excav. +%	Embank. +%	Borrow	Waste
-L- STA. 12+30.00	-L- STA. 14+78.88 (BR)	157	1090	933	
<b>SUBTOTAL:</b>		157	1090	933	
-L- STA. 15+86.13 (BR)	-L- STA. 17+85.00	216	192		24
<b>SUBTOTAL:</b>		216	192		
<b>WASTE IN LIEU OF BORROW</b>				-24	-24
<b>PROJECT TOTALS:</b>		373	1282	909	0
<b>EST 5% TO REPLACE TOP SOIL ON BORROW PIT</b>				45	
<b>GRAND TOTALS:</b>		373		954	
<b>SAY:</b>		400		1000	

ESTIMATED UNDERCUT EXCAVATION = 400 C.Y.  
ESTIMATED SELECT GRANULAR MATERIAL = 400 C.Y.

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.

### ★ PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT REMOVAL	ASPHALT BREAKUP	CONCRETE REMOVAL	CONCRETE BREAKUP
-L-	12+30.00	14+88.23	EXIST. ROAD	661			
-L-	15+75.81	17+85.00	EXIST. ROAD	568			
<b>TOTAL:</b>				1,229			
<b>SAY:</b>				1,250			

### SHOULDER BERM GUTTER SUMMARY

IN LINEAR FEET

LINE	Station	Station	LENGTH
-L (LT)	15+97.13	16+40.00	42.87
-L (RT)	15+97.13	16+65.00	67.87
<b>TOTAL:</b>			110.74
<b>SAY:</b>			115

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

### GUARDRAIL SUMMARY

G = GATING IMPACT ATTENUATOR TYPE 350  
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL  
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT  
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

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350		SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE & STOCKPILE EXISTING GUARDRAIL	REMARKS				
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	TYPE III	GRAU 350	M-350	XIII	CAT-1	VI MOD	BIC	G	NG								
-L-	13+78.88	14+78.88 (BR)	LT	100				14+78.88	4'-5"	9'		50		1		1	1															TL-3
-L-	13+78.88	14+78.88 (BR)	RT	100				14+78.88	4'-5"	9'		50		1		1	1														TL-3	
-L-	15+86.13 (BR)	16+98.63	LT	112.5				15+86.13	4'-5"	9'		50		1		1	1														TL-3	
-L-	15+86.13 (BR)	17+23.63	RT	137.5				15+86.13	4'-5"	9'		50		1		1	1														TL-3	
<b>SUBTOTAL:</b>				450																												
<b>LESS ANCHOR DEDUCTIONS:</b>																																
TYPE III (4 @ 18.75')				-75																												
GRAU-350 TL-3 (4 @ 50')				-200																												
<b>TOTAL:</b>				175												4	4															
<b>SAY:</b>				200																												
<b>ADDITIONAL GUARDRAIL POSTS = 5 EA</b>																																

REVISIONS

B.17/99

10/14/2015 8:48:30 PM PDY\_SUM\_3B-1.dgn  
USER:DLB

8/17/99

COMPUTED BY: RBR  
CHECKED BY: ECOLOGICAL ENG, LLP

DATE: 5/7/2015  
DATE: 5/7/2015

PROJECT REFERENCE NO. B-4830  
SHEET NO. 30-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
SUBREGIONAL

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)

PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION

Table with columns for STATION, SIZE, THICKNESS OR GAUGE, LOCATION, STRUCTURE NO., TOP ELEVATION, INVERT ELEVATION, SLOPE CRITICAL, DRAINAGE PIPE, C.S. PIPE, R.C. PIPE CLASS III, R.C. PIPE CLASS IV, ENDWALLS, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD STANDARD, CONCRETE TRANSITIONAL SECTION, DRAINAGE PIPE ELBOWS NO. & SIZE, CONC. & BRICK PIPE PLUG, C.Y. STD., CONC. COLLARS CL. "B" C.Y. STD., PIPE REMOVAL LIN. FT., and REMARKS.

REVISIONS

10/14/2015  
B-4830\_PDX\_SUM\_30-1.dgn

COMPUTED BY: TTZ DATE: 6-15-2015  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

(4-21-15)

PROJECT REFERENCE NO.	SHEET NO.
B-4830	36-1

**STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS**

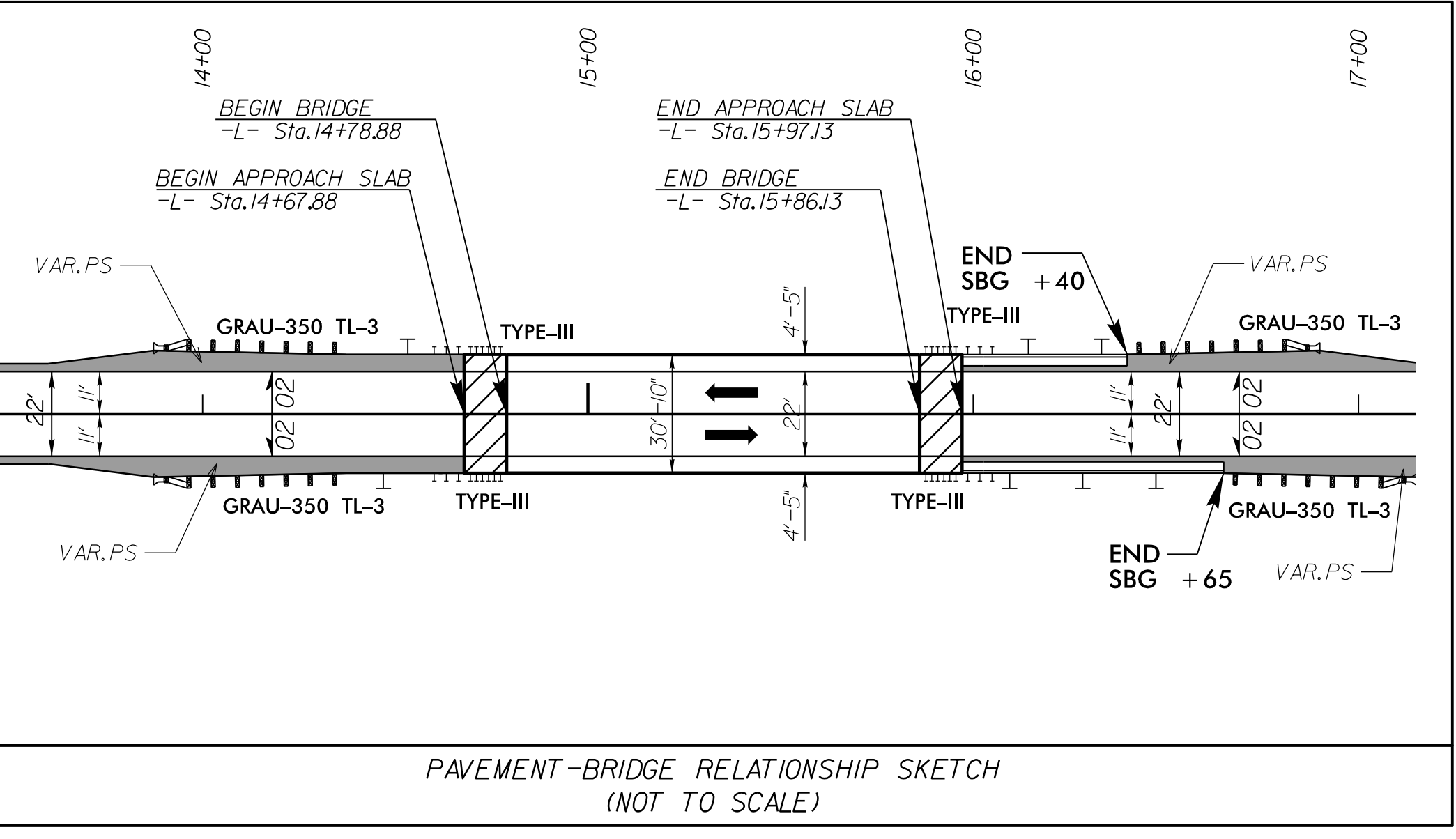
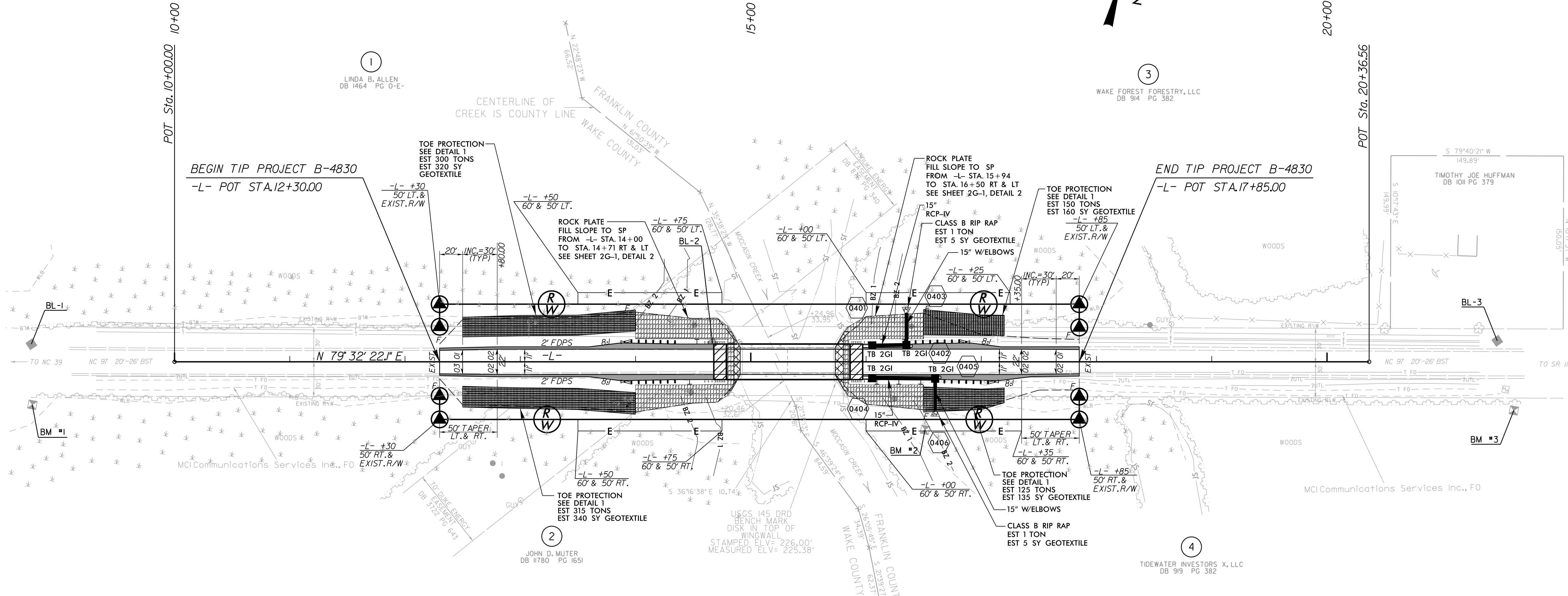
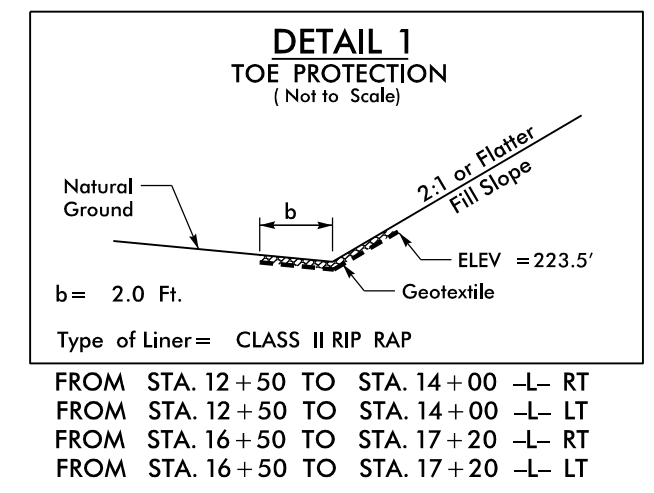
PRELIMINARY PLANS  
 DO NOT USE FOR CONSTRUCTION

REVISIONS

**SUMMARY OF ROCK PLATING**

LINE	Beginning Slope	Approx. Station	Ending Slope	Approx. Station	Location LT/RT	Rock Plating Detail No.	Riprap Class	SY
-L-	2:1 (H:V)	14+00	1.5:1 (H:V)	14+71	LT & RT	2	II	380
-L-	1.5:1 (H:V)	15+94	2:1 (H:V)	16+50	LT & RT	2	II	270
							<b>TOTAL SY:</b>	650

See Sheet 2G-1 for Rock Plating Detail



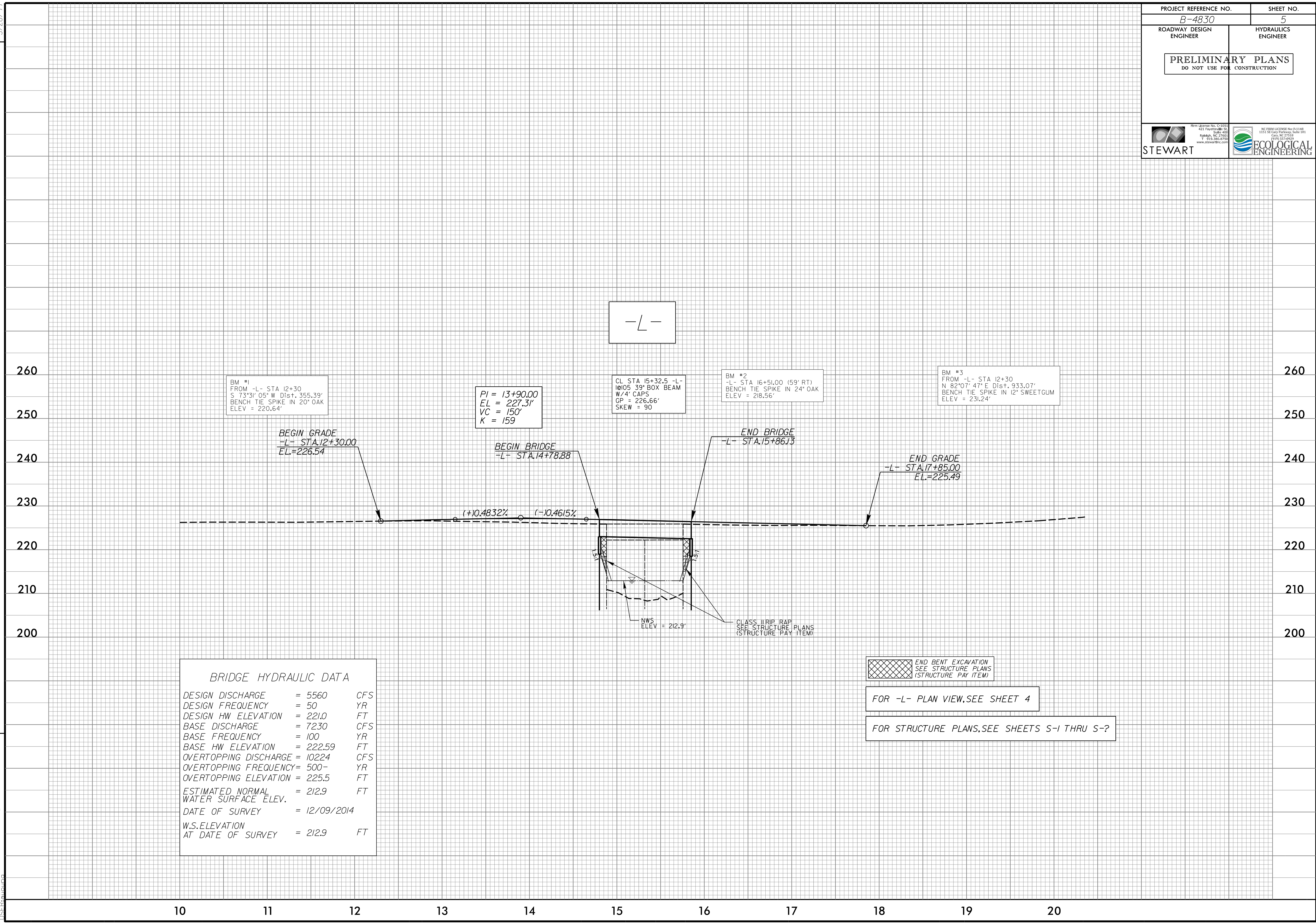
END BENT EXCAVATION SEE STRUCTURE PLANS (STRUCTURE PAY ITEM)  
 FOR -L- PROFILE, SEE SHEET 5  
 PROPOSED PAVED SHOULDER  
 FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-2

REVISIONS  
 ROW REV. - FEBRUARY 23, 2016 - REVISED PROPERTY OWNER NAMES FOR PARCELS 3 AND 4. (MSB)

2/22/2016 8:48:30 PM PSH\_04.dgn  
 US:R:\burburns


REVISIONS

5/28/99



**BRIDGE HYDRAULIC DATA**

DESIGN DISCHARGE	= 5560	CFS
DESIGN FREQUENCY	= 50	YR
DESIGN HW ELEVATION	= 221.0	FT
BASE DISCHARGE	= 7230	CFS
BASE FREQUENCY	= 100	YR
BASE HW ELEVATION	= 222.59	FT
OVERTOPPING DISCHARGE	= 10224	CFS
OVERTOPPING FREQUENCY	= 500-	YR
OVERTOPPING ELEVATION	= 225.5	FT
ESTIMATED NORMAL WATER SURFACE ELEV.	= 212.9	FT
DATE OF SURVEY	= 12/09/2014	
W.S.ELEVATION AT DATE OF SURVEY	= 212.9	FT

 END BENT EXCAVATION  
SEE STRUCTURE PLANS  
(STRUCTURE PAY ITEM)

FOR -L- PLAN VIEW, SEE SHEET 4

FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-?

10/14/2015 B:\B4830.PDX\_PSH\_05.dgn



**STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS**

PROJ. REFERENCE NO.

B-4830

SHEET NO.

X-1A

**PRELIMINARY PLANS**  
DO NOT USE FOR CONSTRUCTION

**CROSS-SECTION SUMMARY**

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
12+30.00	0	0
12+50.00	14	37
13+00.00	29	199
13+50.00	15	230
14+00.00	30	239
14+50.00	53	161
14+78.88	16	42

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
15+86.13	0	0
16+00.00	11	14
16+50.00	87	48
17+00.00	67	51
17+50.00	27	42
17+85.00	24	5

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

REVISIONS

10/14/2015 10:46:55 AM \\XSC\B4830.XP1.X1B.dgn  
 8/17/99

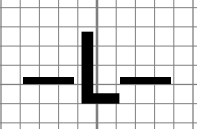
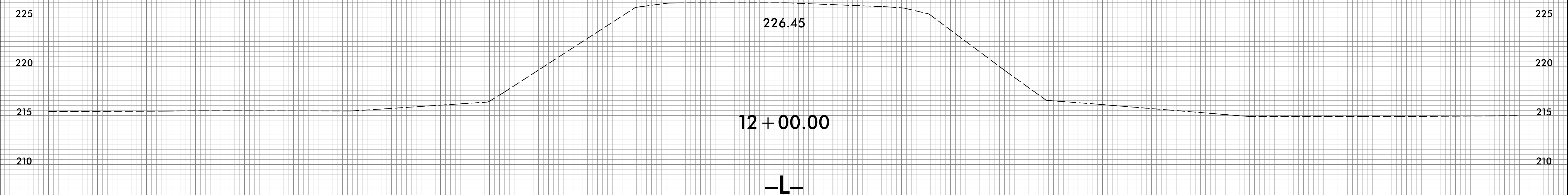
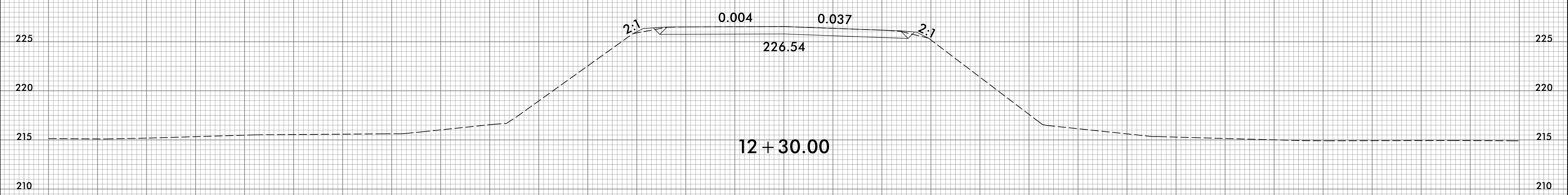
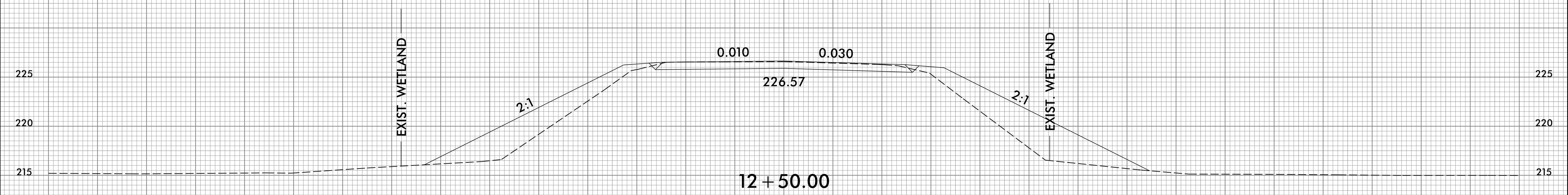
8/23/99



PROJ. REFERENCE NO.	SHEET NO.
B-4830	X-1

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

**PRELIMINARY PLANS**  
DO NOT USE FOR CONSTRUCTION

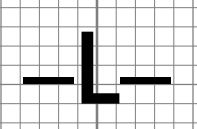
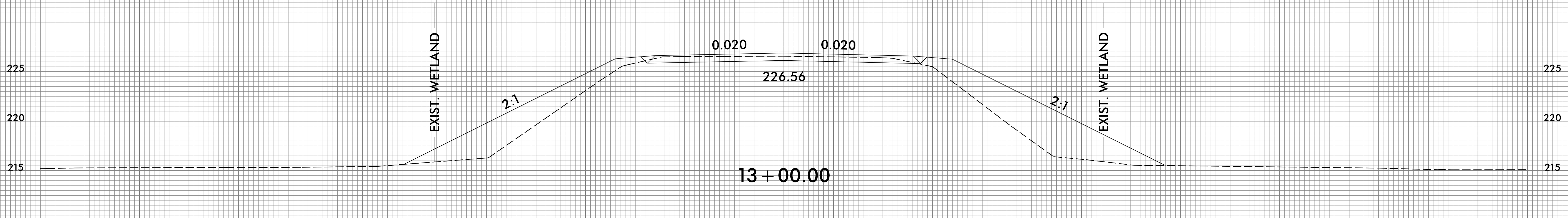
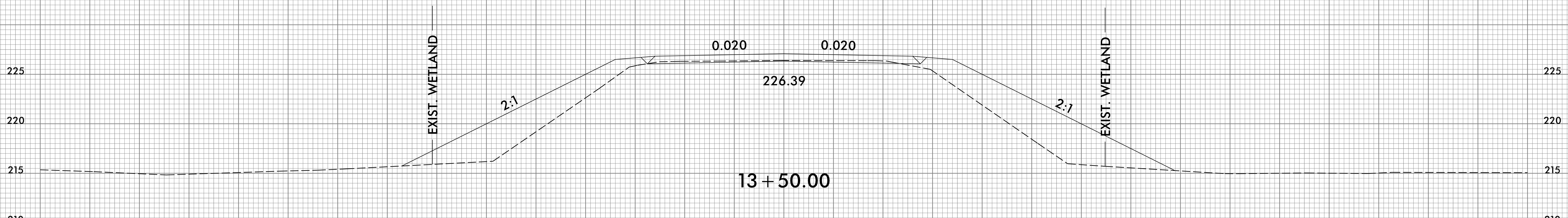
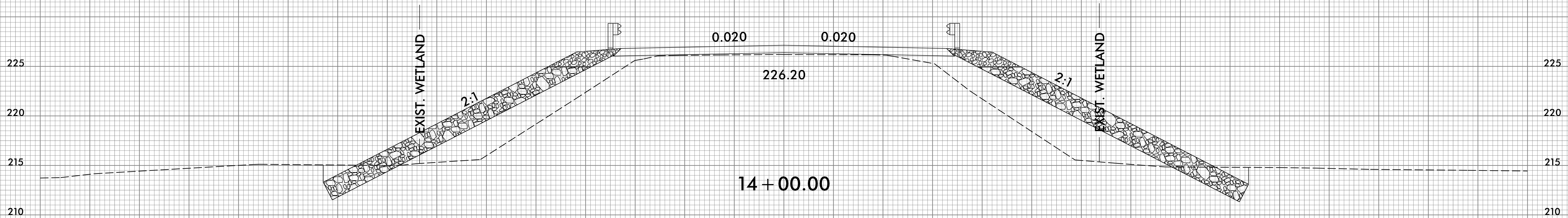


75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

10/14/2015  
J:\Projects\B4830\XSC\B4830\_xp1.L.dgn  
J:\Projects\B4830



75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75



75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

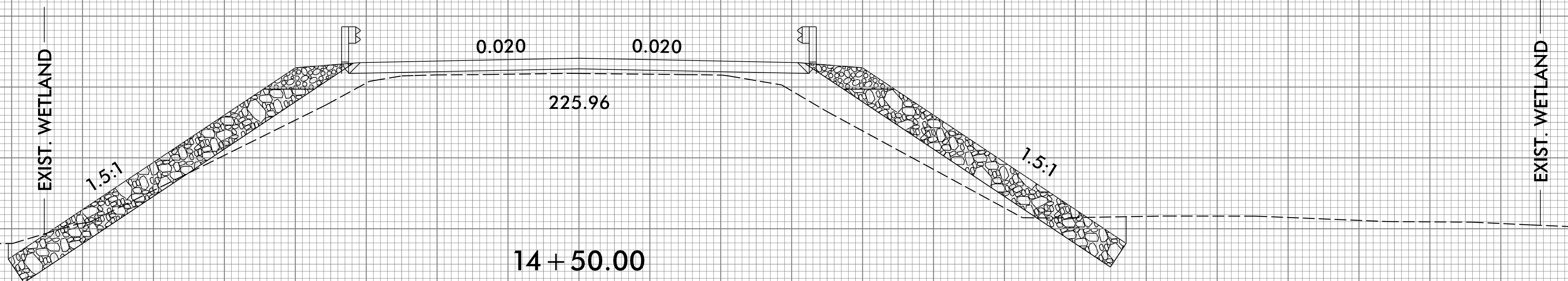
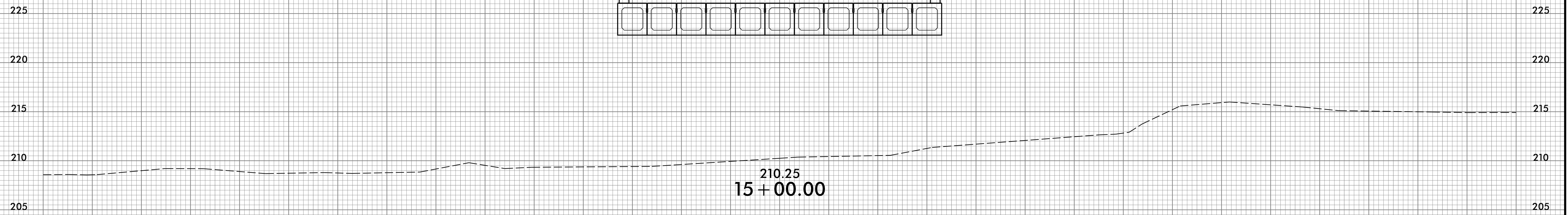
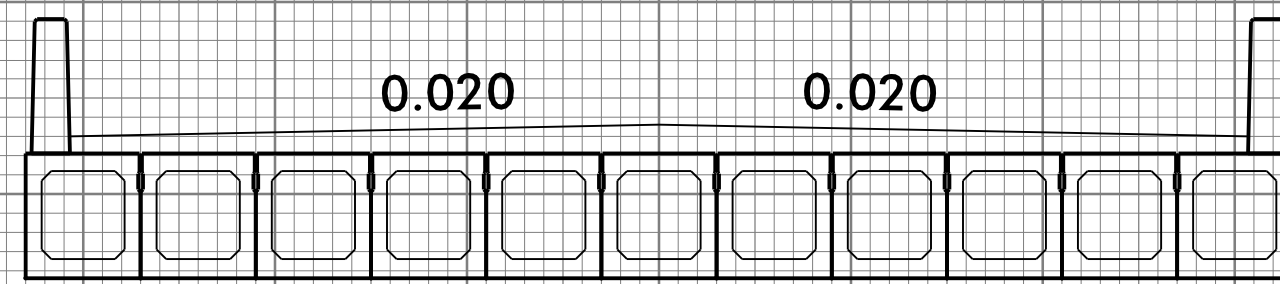
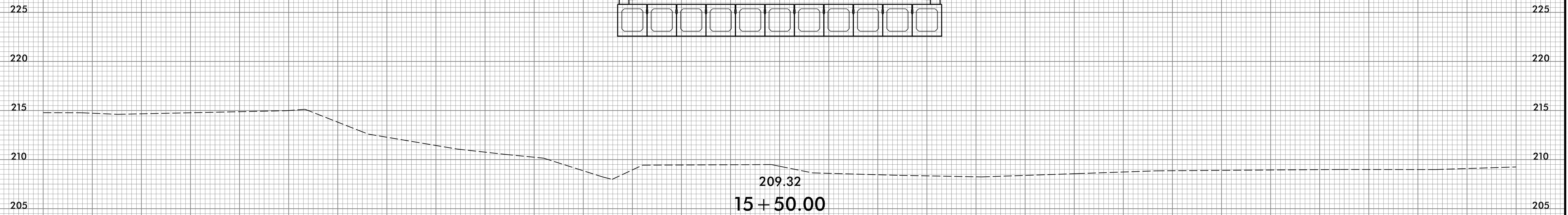
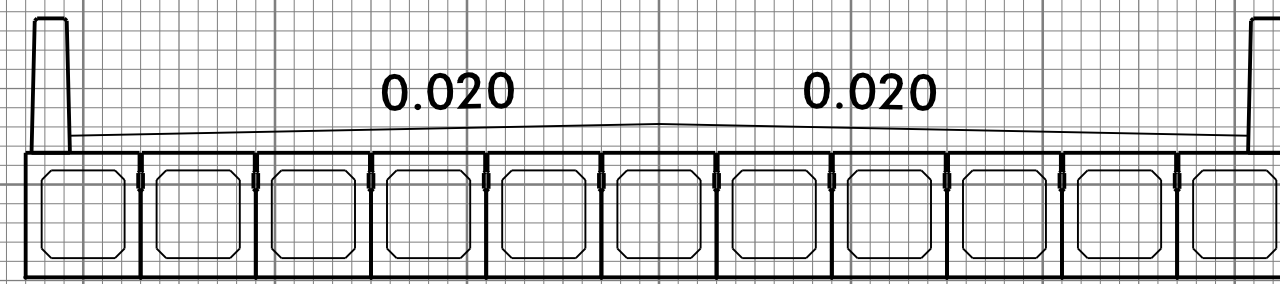
8/23/99



PROJ. REFERENCE NO.  
B-4830

SHEET NO.  
X-3

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75



75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

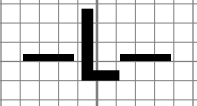
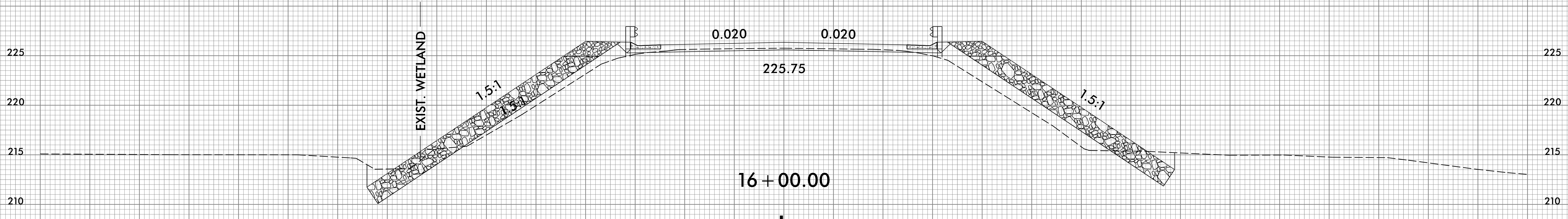
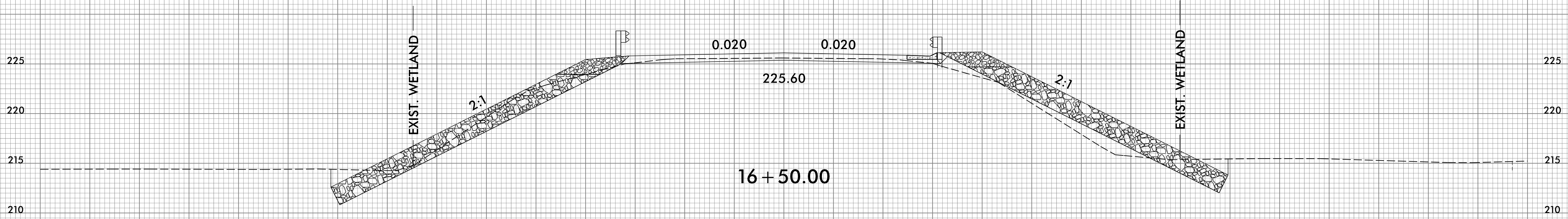
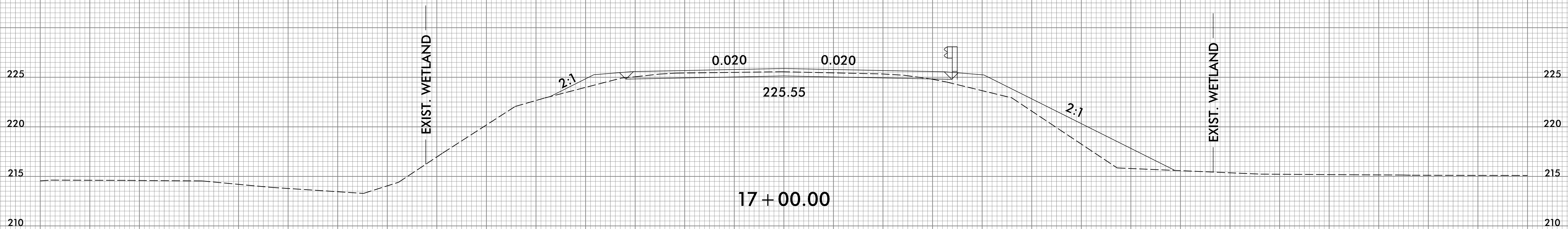
10/14/2015  
I:\Projects\B4830\XSC\B4830\_xp1.L.dgn  
TJ:ET:RJB

8/23/99



PROJ. REFERENCE NO.	SHEET NO.
B-4830	X-4

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75



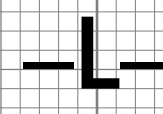
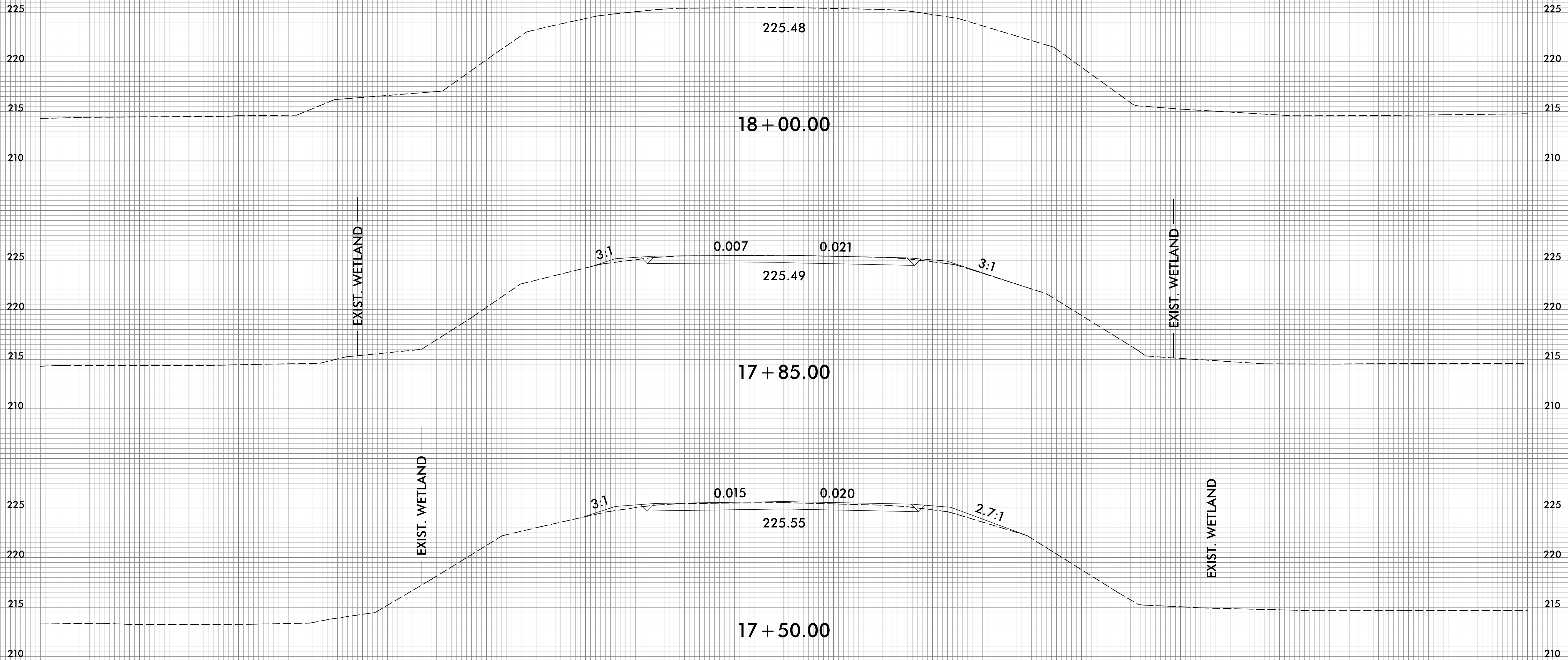
10/14/2015  
 J:\Projects\B4830\XSC\B4830\_xp1.L.dgn  
 J:\Projects\B4830

8/23/99



PROJ. REFERENCE NO.	SHEET NO.
B-4830	X-5

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75



75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

10/14/2015  
 J:\Projects\B4830\XSC\B4830\_xp1.L.dgn  
 J:\Projects\B4830