




STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

ROY COOPER  
GOVERNOR

JAMES H. TROGDON, III  
SECRETARY

July 28, 2017

MEMORANDUM TO: Mr. Mike Mills, P.E.  
Division 7 Engineer

FROM: Philip S. Harris, III, P.E., Manager  
for Environmental Analysis Unit 

SUBJECT: Alamance County; Replacement of Bridge No. 44 on SR 1768 (Hughes Mill Road) over Jordan Creek;  
Federal Aid No. BRZ-1768(3); WBS 46064.1.1; **TIP B-5350.**

Attached is the N.C. Division of Water Resources Jordan Lake Watershed Buffer Authorization. All environmental permits have been received for the construction of this project.

A copy of this permit package will be posted on the NCDOT website at:

<https://connect.ncdot.gov/resources/Environmental/Pages/default.aspx>

**Quick Links>Permit Documents> Issued Permits.**

cc: w/o attachment (see website for attachments)

Mr. Ron Davenport, P.E. Contracts Management  
Ms. Jerry Parker, Division 7 Environmental Officer  
Dr. Majed Al-Ghandour, P.E., Programming and TIP  
Ms. Brenda Moore, P.E., Roadway Design  
Mr. Carl Barclay, P.E., Utilities Unit  
Mr. Stephen Morgan, P.E., Hydraulics  
Mr. Brian Hanks, P.E., Structure Design  
Mr. Mark Staley, Roadside Environmental  
Mr. Ron Hancock, P.E., State Roadway Construction Engineer  
Mr. Brian Yamamoto, P.E., Project Development

# PROJECT COMMITMENTS

T.I.P. Project No. B-5350  
Replacement of Bridge No. 44 over Jordan Creek on SR 1768  
(Hughes Mill Road)  
Alamance County  
Federal Aid Project No. BRZ – 1768 (3)  
WBS Element No. 46064.1.1

## COMMITMENTS FROM PROJECT DEVELOPMENT AND DESIGN

### **Division 7 Construction, Resident Engineer's Office – Offsite Detour**

In order to have time to adequately reroute school buses and address school bus stop concerns, Alamance-Burlington School System will be contacted at (336) 570-6480 at least one month prior to road closure.

Alamance County Emergency Medical Services (336) 570-6796, Fire Marshal (336) 227-1365, and Sheriff (336) 570-6300; Village of Alamance (336) 226-0033; and City of Burlington Office of Emergency Management (336) 229-3122 will be contacted at least one month prior to road closure to make the necessary temporary reassignments to primary response units.

In order to have time to adequately reroute and notify transit riders, the Alamance County Transportation Authority will be contacted at (336) 222-0565 at least one month prior to road closure.

### **Hydraulics Unit – FEMA Coordination**

The Hydraulics Unit will coordinate with the N.C. Floodplain Mapping Program to determine the status of the project with regard to applicability of NCDOT's Memorandum of Agreement or approval of a Conditional Letter of Map Revision (CLOMR) and subsequent final Letter of Map Revision (LOMR).

### **Hydraulics Unit/ Division 7 Construction – FEMA**

This project involves construction on or adjacent to a FEMA-regulated stream. Therefore, the Division Resident Engineer shall submit sealed as-built construction plans to the Hydraulics Unit upon project completion certifying the project was built as shown on the construction plans.

### **Division Construction/ Natural Environment Section/ Roadside Environmental Unit – High Quality Waters**

Jordan Creek is Class WS-II; HQW; NSW waters of the State. NCDWR recommends that the most protective sediment and erosion control BMPs be implemented to reduce the risk of nutrient runoff to Jordan Creek. Design Standards in Sensitive Watersheds will be implemented during construction. NCDOT will be required to obtain a State Stormwater Permit prior to construction.

**Hydraulics Unit, Natural Environment Section – Buffer Rules**

The Jordan Lake Watershed Riparian Buffer Rules apply to this project. A buffer mitigation plan must be provided to NCDWR prior to approval of the Water Quality Certification.

**Right of Way Branch, PDEA – Human Environment Section, Geotechnical Engineering Unit – Archaeological Site**

The proposed project is located adjacent to one known archaeological site that was recommended eligible for the National Register of Historic Places. Any ground disturbing activities within the environmentally sensitive area denoted on the design plans should be avoided. The PDEA – Archaeology Group Leader, Matt Wilkerson, should be contacted at (919) 707-6089 for any questions regarding the environmentally sensitive area.

**COMMITMENTS FROM PERMITTING**

No additional project commitments were added during permitting.



ROY COOPER  
Governor

MICHAEL S. REGAN  
Secretary

S. JAY ZIMMERMAN  
Director

May 22, 2017  
Alamance County  
NCDWR Project No. 20170564  
Bridge 44 on SR 1768  
BRZ-1768(3); TIP B-5350  
WBS 46064.1.1

**APPROVAL of JORDAN LAKE WATERSHED BUFFER AUTHORIZATION with ADDITIONAL CONDITIONS**

Mr. Philip S. Harris III  
NCDOT, Natural Environment Section Head  
1598 MSC  
Raleigh, NC 27699

Dear Mr. Harris:

You have our approval, in accordance with the conditions listed below, for the following impacts for replacing Bridge 44 with a new bridge over Jordan Creek on Hughes Mill Road (SR 1768) in Alamance County:

**Stream Impacts in the Cape Fear River Basin**

Site	Temporary Fill in Perennial Stream (linear ft)	Permanent Fill in Perennial Stream (linear ft)	Permanent Fill in Intermittent Stream (linear ft)	Temporary Fill in Intermittent Stream (linear ft)	Total Stream Impact (linear ft)	Stream Impacts Requiring Mitigation (linear ft)
-	-	-	-	-	-	-
<b>Totals</b>	-	-	-	-	-	-

**Total Stream Impact for Project: 0 linear feet.**

**Jordan Lake Watershed Riparian Buffer Impacts**

Site	Zone 1 Impact (sq ft)	minus Wetlands in Zone 1 (sq ft)	= Zone 1 Buffers (not wetlands) (sq ft)	Zone 1 Buffer Mitigation Required (using 3:1 ratio)	Zone 2 Impact (sq ft)	minus Wetlands in Zone 2 (sq ft)	= Zone 2 Buffers (not wetlands) (sq ft)	Zone 2 Buffer Mitigation Required (using 1.5:1 ratio)
1	2,440	-	-	-	1,232	-	-	-
<b>Totals</b>	<b>2,440</b>	-	-	-	<b>1,232</b>	-	-	-

**Total Buffer Impact for Project: 3,672 square feet.**



The project shall be constructed in accordance with your application dated received May 5, 2017. This approval is also valid for the Jordan Lake Watershed Riparian Buffer Rules (15A NCAC 2B.0267). In addition, you should acquire any other federal, state or local permits before you proceed with your project including (but not limited to) Sediment and Erosion Control, Non-Discharge and Water Supply Watershed regulations.

This approval is valid solely for the purpose and design described in your application (unless modified below). Should your project change, you must notify the NCDWR and submit a new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter, and is thereby responsible for complying with all the conditions. If total wetland fills for this project (now or in the future) exceed one acre, or of total impacts to streams (now or in the future) exceed 300 linear feet, compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). Additional buffer impacts may require compensatory mitigation as described in 15A NCAC 2B .0267. For this approval to remain valid, you must adhere to the conditions listed in the attached certification(s) and any additional conditions listed below.

### **Condition(s) of Certification:**

#### **Project Specific Conditions**

1. As a condition of this 401 Water Quality Certification, the bridge demolition and construction must be accomplished in strict compliance with the most recent version of NCDOT's Best Management Practices for Construction and Maintenance Activities. [15A NCAC 02H .0507(d)(2) and 15A NCAC 02H .0506(b)(5)]
2. The post-construction removal of any temporary bridge structures must return the project site to its preconstruction contours and elevations. The impacted areas shall be revegetated with appropriate native species. [15A NCAC 02H .0506(b)(2)]
3. Bridge deck drains shall not discharge directly into the stream. Stormwater shall be directed across the bridge and pre-treated through site-appropriate means (grassed swales, pre-formed scour holes, vegetated buffers, etc.) before entering the stream. To meet the requirements of NCDOT's NPDES permit NCS000250 please refer to the most recent version of the North Carolina Department of Transportation Stormwater Best Management Practices Toolbox manual for approved measures. [15A NCAC 02H .0507(d)(2) and 15A NCAC 02H .0506(b)(5)]
4. All stormwater runoff shall be directed as sheetflow through stream buffers at non-erosive velocities, unless otherwise approved by this certification. (15A NCAC 2B.0267)
5. The permittee shall use Design Standards in Sensitive Watersheds (15A NCAC 4B.0124[a]-[e]) in areas draining to WS-II and HQW waters. NCDOT shall be in compliance with NCS0000250 issued to NCDOT, including the applicable requirements of NCG010000.
6. All riparian buffers impacted by the placement of temporary fill or clearing activities shall be restored to the preconstruction contours and revegetated. Maintained buffers shall be permanently revegetated with non-woody species by the end of the growing season following completion of construction. For the purpose of this condition, maintained buffer areas are defined as areas within the transportation corridor that will be subject to regular NCDOT maintenance activities including mowing. The area with non-maintained buffers shall be permanently revegetated with native woody species before the next growing season following completion of construction. (15A NCAC 2B.0267)
7. Pursuant to 15A NCAC 2B .0267, sediment and erosion control devices shall not be placed in Zone 1 of any Jordan Lake Buffer without prior approval by the NCDWR. At this time, the NCDWR has approved no sediment and erosion control devices in Zone 1, outside of the approved project impacts, anywhere on this project. Moreover, sediment and erosion control devices shall be allowed in Zone 2 of the buffers provided that Zone 1 is not compromised and that discharge is released as diffuse flow.

## General Conditions

1. Unless otherwise approved in this certification, placement of culverts and other structures in open waters and streams shall be placed below the elevation of the streambed by one foot for all culverts with a diameter greater than 48 inches, and 20 percent of the culvert diameter for culverts having a diameter less than 48 inches, to allow low flow passage of water and aquatic life. Design and placement of culverts and other structures including temporary erosion control measures shall not be conducted in a manner that may result in dis-equilibrium of wetlands or streambeds or banks, adjacent to or upstream and downstream of the above structures. The applicant is required to provide evidence that the equilibrium is being maintained if requested in writing by NCDWR. If this condition is unable to be met due to bedrock or other limiting features encountered during construction, please contact NCDWR for guidance on how to proceed and to determine whether or not a permit modification will be required. [15A NCAC 02H.0506(b)(2)]
2. If concrete is used during construction, a dry work area shall be maintained to prevent direct contact between curing concrete and stream water. Water that inadvertently contacts uncured concrete shall not be discharged to surface waters due to the potential for elevated pH and possible aquatic life and fish kills. [15A NCAC 02B.0200]
3. During the construction of the project, no staging of equipment of any kind is permitted in waters of the U.S., or protected riparian buffers. [15A NCAC 02H.0506(b)(2)]
4. The dimension, pattern and profile of the stream above and below the crossing shall not be modified. Disturbed floodplains and streams shall be restored to natural geomorphic conditions. [15A NCAC 02H.0506(b)(2)]
5. The use of rip-rap above the Normal High Water Mark shall be minimized. Any rip-rap placed for stream stabilization shall be placed in stream channels in such a manner that it does not impede aquatic life passage. [15A NCAC 02H.0506(b)(2)]
6. The Permittee shall ensure that the final design drawings adhere to the permit and to the permit drawings submitted for approval. [15A NCAC 02H .0507(c) and 15A NCAC 02H .0506 (b)(2) and (c)(2)]
7. All work in or adjacent to stream waters shall be conducted in a dry work area. Approved BMP measures from the most current version of NCDOT Construction and Maintenance Activities manual such as sandbags, rock berms, cofferdams and other diversion structures shall be used to prevent excavation in flowing water. [15A NCAC 02H.0506(b)(3) and (c)(3)]
8. Heavy equipment shall be operated from the banks rather than in the stream channel in order to minimize sedimentation and reduce the introduction of other pollutants into the stream. [15A NCAC 02H.0506(b)(3)]
9. All mechanized equipment operated near surface waters must be regularly inspected and maintained to prevent contamination of stream waters from fuels, lubricants, hydraulic fluids, or other toxic materials. [15A NCAC 02H.0506(b)(3)]
10. No rock, sand or other materials shall be dredged from the stream channel except where authorized by this certification. [15A NCAC 02H.0506(b)(3)]
11. Discharging hydroseed mixtures and washing out hydroseeders and other equipment in or adjacent to surface waters is prohibited. [15A NCAC 02H.0506(b)(3)]
12. The permittee and its authorized agents shall conduct its activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with §303(d) of the Clean Water Act) and any other appropriate requirements of State and Federal law. If the NCDWR determines that such standards or laws are not being met (including the failure to sustain a designated or achieved use) or that State or federal law is being violated, or that further conditions are necessary to assure compliance, the NCDWR may reevaluate and modify this certification. [15A NCAC 02B.0200]
13. All fill slopes located in jurisdictional wetlands shall be placed at slopes no flatter than 3:1, unless otherwise authorized by this certification. [15A NCAC 02H.0506(b)(2)]

14. A copy of this Certification shall be maintained on the construction site always. In addition, the Certification and all subsequent modifications, if any, shall be maintained with the Division Engineer and the on-site project manager. [15A NCAC 02H .0507(c) and 15A NCAC 02H .0506 (b)(2) and (c)(2)]
15. The outside buffer, wetland or water boundary located within the construction corridor approved by this authorization shall be clearly marked by highly visible fencing prior to any land disturbing activities. Impacts to areas within the fencing are prohibited unless otherwise authorized by this certification. [15A NCAC 02H.0501 and .0502]
16. The issuance of this certification does not exempt the Permittee from complying with all statutes, rules, regulations, or ordinances that may be imposed by other government agencies (i.e. local, state, and federal) having jurisdiction, including but not limited to applicable buffer rules, stormwater management rules, soil erosion and sedimentation control requirements, etc.
17. The Permittee shall report any violations of this certification to the Division of Water Resources within 24 hours of discovery. [15A NCAC 02B.0506(b)(2)]
18. Upon completion of the project (including any impacts at associated borrow or waste sites), the NCDOT Division Engineer (or appointee) shall complete and return the enclosed "Certification of Completion Form" to notify the NCDWR when all work included in the Certification has been completed. [15A NCAC 02H.0502(f)]
19. Native riparian vegetation must be reestablished in the riparian areas within the construction limits of the project by the end of the growing season following completion of construction. [15A NCAC 02B.0267(10)]
20. There shall be no excavation from, or waste disposal into, jurisdictional wetlands or waters associated with this permit without appropriate modification. Should waste or borrow sites, or access roads to waste or borrow sites, be located in wetlands or streams, compensatory mitigation will be required since that is a direct impact from road construction activities. [15A NCAC 02H.0506(b)(3) and (c)(3)]
21. Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to protect surface waters standards [15A NCAC 02H.0506(b)(3) and (c)(3)]:
  - a. The erosion and sediment control measures for the project must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Sediment and Erosion Control Planning and Design Manual*.
  - b. The design, installation, operation, and maintenance of the sediment and erosion control measures must be such that they equal, or exceed, the requirements specified in the most recent version of the *North Carolina Sediment and Erosion Control Manual*. The devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) projects, including contractor-owned or leased borrow pits associated with the project.
  - c. For borrow pit sites, the erosion and sediment control measures must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual*.
  - d. The reclamation measures and implementation must comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act.
22. Sediment and erosion control measures shall not be placed in wetlands or waters unless otherwise approved by this Certification. [15A NCAC 02H.0506(b)(3) and (c)(3)]

If you wish to contest any statement in the attached Certification you must file a petition for an administrative hearing. You may obtain the petition form from the office of Administrative hearings. You must file the petition with the office of Administrative Hearings within sixty (60) days of receipt of this notice. A petition is considered filed when it is received in the office of Administrative Hearings during normal office hours. The Office of Administrative Hearings accepts filings Monday through Friday between the hours of 8:00am and 5:00pm, except for official state holidays. The original and one (1) copy of the petition must be filed with the Office of Administrative Hearings.

The petition may be faxed-provided the original and one copy of the document is received by the Office of Administrative Hearings within five (5) business days following the faxed transmission.  
The mailing address for the Office of Administrative Hearings is:

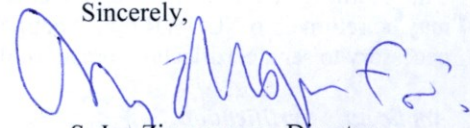
Office of Administrative Hearings  
6714 Mail Service Center  
Raleigh, NC 27699-6714  
Telephone: (919) 431-3000, Facsimile: (919) 431-3100

A copy of the petition must also be served on DEQ as follows:

Mr. Bill Lane, General Counsel  
Department of Environmental Quality  
1601 Mail Service Center

This letter completes the review of the Division of Water Resources under Section 401 of the Clean Water Act. If you have any questions, please contact April Norton at (919)707-9111 or [April.Norton@ncdenr.gov](mailto:April.Norton@ncdenr.gov).

Sincerely,



S. Jay Zimmerman, Director  
Division of Water Resources

Electronic copy only distribution:

Dave Bailey, US Army Corps of Engineers, Raleigh Field Office  
Jerry Parker, Division 7 Environmental Officer  
Nicole Thomson, Division 7 Environmental Assistant  
Travis Wilson, NC Wildlife Resources Commission  
James Mason, NCDOT  
April Norton, NCDWR  
File Copy





Environmental Quality

ROY COOPER  
Governor

MICHAEL S. REGAN  
Secretary

S. JAY ZIMMERMAN  
Director

NCDWR Project No.: \_\_\_\_\_

County: \_\_\_\_\_

Applicant: \_\_\_\_\_

Project Name: \_\_\_\_\_

Date of Issuance of Buffer Certification: \_\_\_\_\_

**Certificate of Completion**

Upon completion of all work approved within the Buffer Certification and applicable Buffer Rules, and any subsequent modifications, the applicant is required to return this certificate to the 401 Transportation Permitting Unit, North Carolina Division of Water Resources, 1617 Mail Service Center, Raleigh, NC, 27699-1617. This form may be returned to NCDWR by the applicant, the applicant's authorized agent, or the project engineer. It is not necessary to send certificates from all of these.

**Applicant's Certification**

I, \_\_\_\_\_, hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**Agent's Certification**

I, \_\_\_\_\_, hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**Engineer's Certification**

\_\_\_\_\_ Partial \_\_\_\_\_ Final

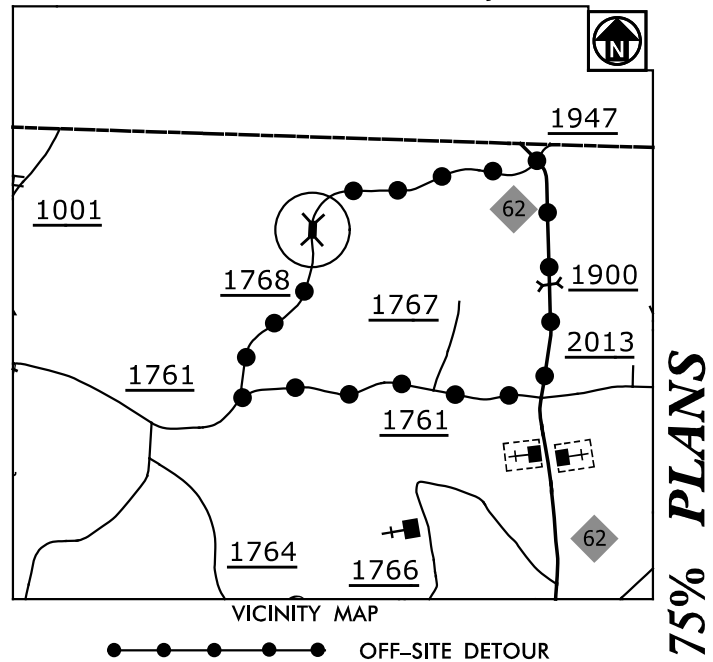
I, \_\_\_\_\_, as a duly registered Professional Engineer in the State of North Carolina, having been authorized to observe (periodically, weekly, full time) the construction of the project for the Permittee hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

Signature \_\_\_\_\_ Registration No. \_\_\_\_\_

Date \_\_\_\_\_

09/08/99

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



75% PLANS

VICINITY MAP  
●●●●● OFF-SITE DETOUR

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**ALAMANCE COUNTY**

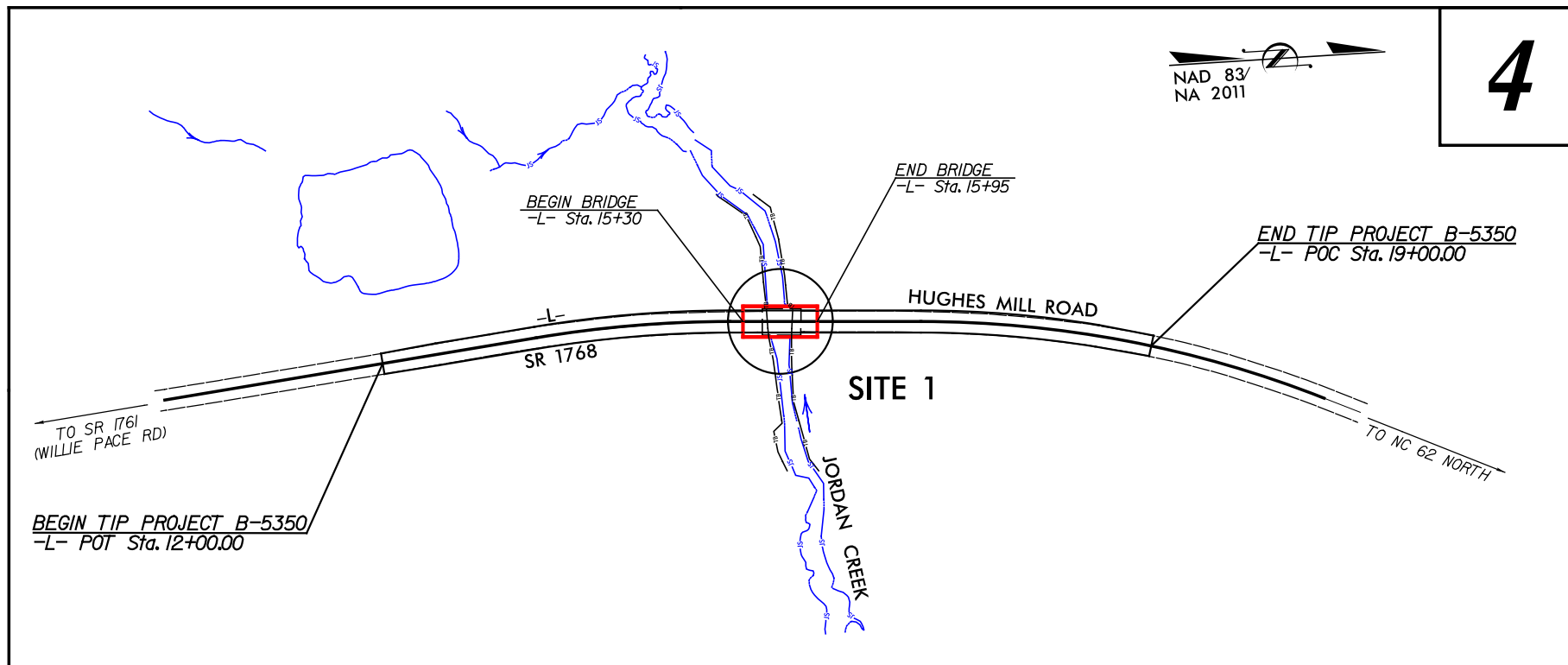
LOCATION: BRIDGE NO. 44 OVER JORDAN CREEK ON SR 1768  
(HUGHES MILL ROAD)

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

**BUFFER IMPACTS PERMIT**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5350	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
46064.1.1	BRZ-1768(3)	PE	

PERMIT DRAWING  
SHEET 1 OF 6



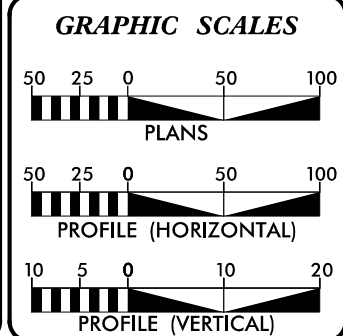
**4**

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

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

**CONTRACT:**



**DESIGN DATA**

ADT 2018 =	123
ADT 2038 =	212
K =	10 %
D =	60 %
T =	5 % *
V =	55 MPH
* TTST =	2% DUAL 3%
FUNC CLASS =	LOCAL
SUBREGIONAL TIER	

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-5350 =	0.120 MILES
LENGTH STRUCTURE TIP PROJECT B-5350 =	0.013 MILES
TOTAL LENGTH OF TIP PROJECT B-5350 =	0.133 MILES

PLANS PREPARED FOR THE NCDOT BY:

**M M**  
MOTT  
MACDONALD  
2012 STANDARD SPECIFICATIONS

PO Box 700  
Fuquay-Varina, NC 27526  
(919) 552-2253  
(919) 552-2254 (Fax)  
www.mottmac.com/americas  
LICENSE NO. F-0669

**ICA**  
Engineering  
3121 Kingdom Way, Suite 100  
Raleigh, NC 27607  
NC License No. PE0607

**DAVID WALLER, PE**  
PROJECT ENGINEER  
PEF ENGINEER

**JORDAN WOODARD, PE**  
PROJECT DESIGN ENGINEER  
PEF ENGINEER

**GARY R. LOVERING, PE**  
PROJECT ENGINEER  
NCDOT ROADWAY DESIGN

**RIGHT OF WAY DATE:**  
FEBRUARY 17, 2017

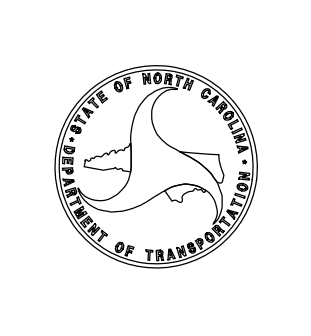
**LETTING DATE:**  
FEBRUARY 20, 2018

**HYDRAULICS ENGINEER**

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

**ROADWAY DESIGN ENGINEER**

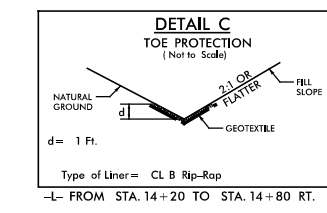
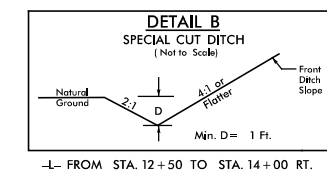
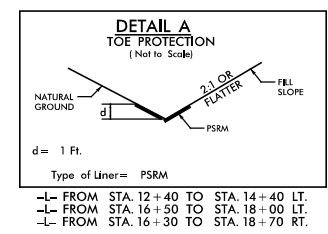
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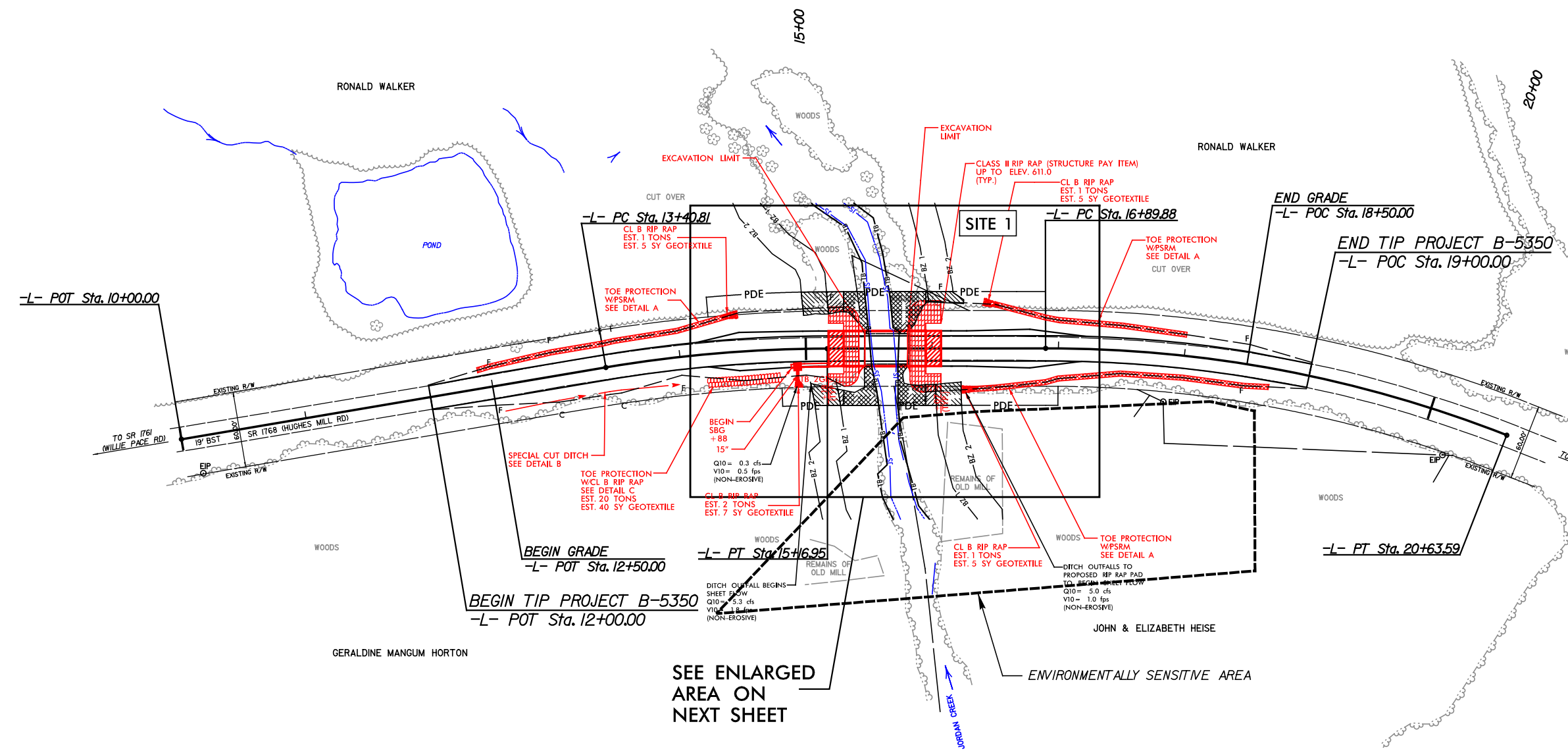
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8/17/99

PROJECT REFERENCE NO.		SHEET NO.	
B-5350		4	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<b>INCOMPLETE PLANS</b> DO NOT USE FOR A/W ACQUISITION			
MOTT MACDONALD & E. LLC LICENSE NO. F-0669			
<b>DOCUMENT NOT CONSIDERED FINAL</b> UNLESS ALL SIGNATURES COMPLETED			
Prepared in the Office of:		<b>M</b> PO Box 700 Fuquay-Varina, NC 27526 www.mottmac.com/america	
<b>ICA</b> Engineering 1212 Kingston Way, Suite 100 Raleigh, NC 27607 100 Linn St. - 3rd Fl.		<b>ENGLISH</b>	
		<b>PERMIT DRAWING</b> <b>SHEET 2 OF 6</b>	

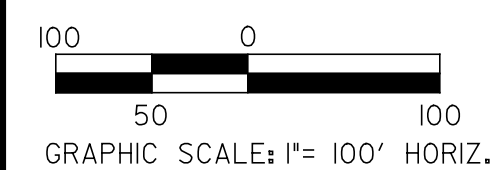


NAD 83/NA 2011



SEE ENLARGED AREA ON NEXT SHEET

### PLAN VIEW SITE 1



**LEGEND**

	RIPARIAN BUFFER ZONE 1 (30')
	RIPARIAN BUFFER ZONE 2 (20')
	ALLOWABLE IMPACTS ZONE 1 (BRIDGE)
	ALLOWABLE IMPACTS ZONE 1 (ROAD CROSSING)
	ALLOWABLE IMPACTS ZONE 2 (ROAD CROSSING)

3/29/2017 11:41:17 AM C:\Users\jfeeringa\Documents\Projects\Hydraulics\PERMITS\_Environment\1\Drawings\Hydraulics\B5350\_hud\_prm\_buf\_psh\_4.dgn



PROJECT REFERENCE NO.	SHEET NO.
B-5350	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR A/W ACQUISITION	
MOTT MACDONALD P.E. LLC LICENSE NO. F-0869	

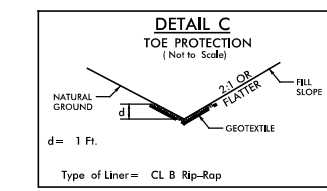
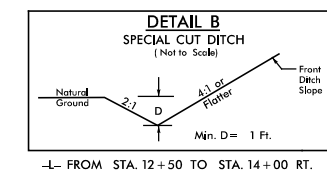
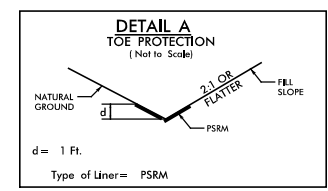
**DOCUMENT NOT CONSIDERED FINAL**  
UNLESS ALL SIGNATURES COMPLETED

Prepared in the Office of:

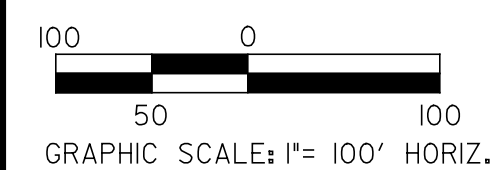
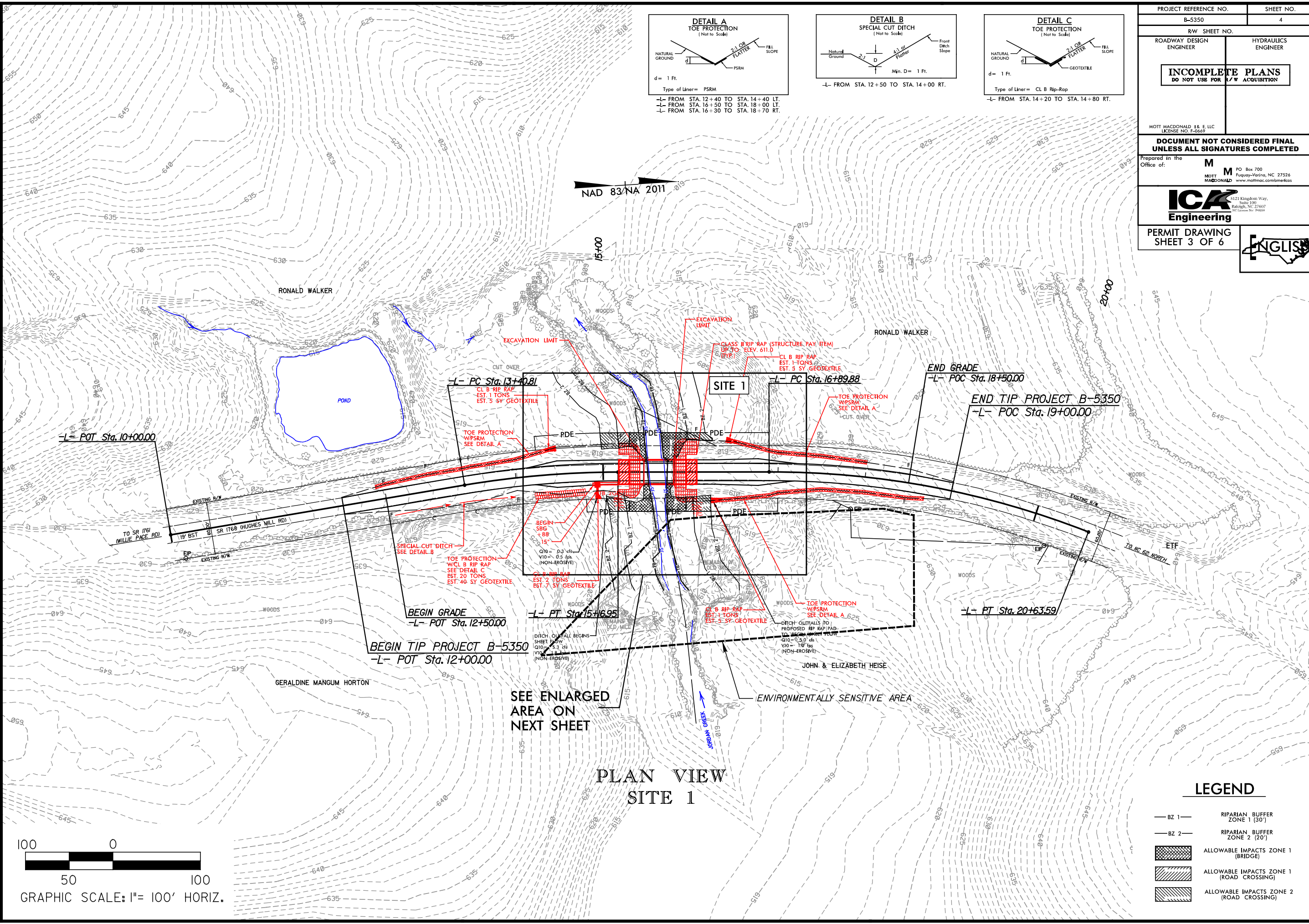
**M**  
MOTT MACDONALD  
PO Box 700  
Fuquay-Varina, NC 27526  
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PERMIT DRAWING  
SHEET 3 OF 6



NAD 83/NA 2011



**LEGEND**

— BZ 1 —	RIPARIAN BUFFER ZONE 1 (30')
— BZ 2 —	RIPARIAN BUFFER ZONE 2 (20')
[Hatched Box]	ALLOWABLE IMPACTS ZONE 1 (BRIDGE)
[Hatched Box]	ALLOWABLE IMPACTS ZONE 1 (ROAD CROSSING)
[Hatched Box]	ALLOWABLE IMPACTS ZONE 2 (ROAD CROSSING)

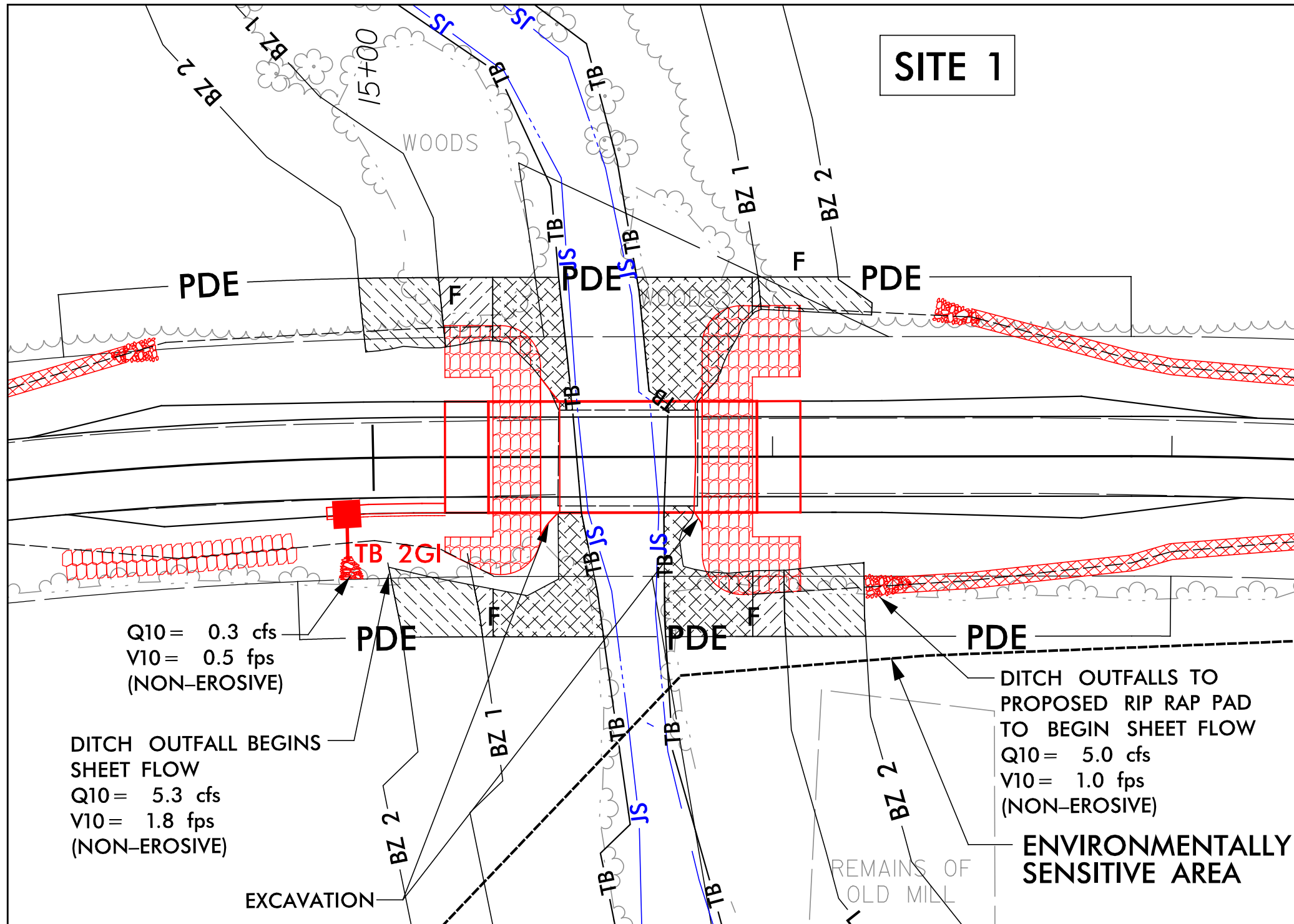
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8/17/99

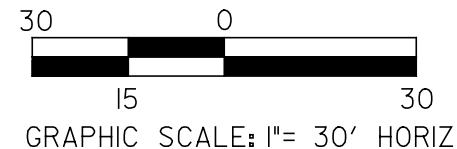
NAD 83/NA 2011

PROJECT REFERENCE NO. B-5350	SHEET NO. 4A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	
MOTT MACDONALD I & E LLC LICENSE NO. F-0669	
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<b>ICA</b> Engineering 121 Kingdom Suite 10 Raleigh, NC 100 Lines for Peace	
PERMIT DRAWING SHEET 4 OF 6	<b>ENGLISS</b>



### LEGEND

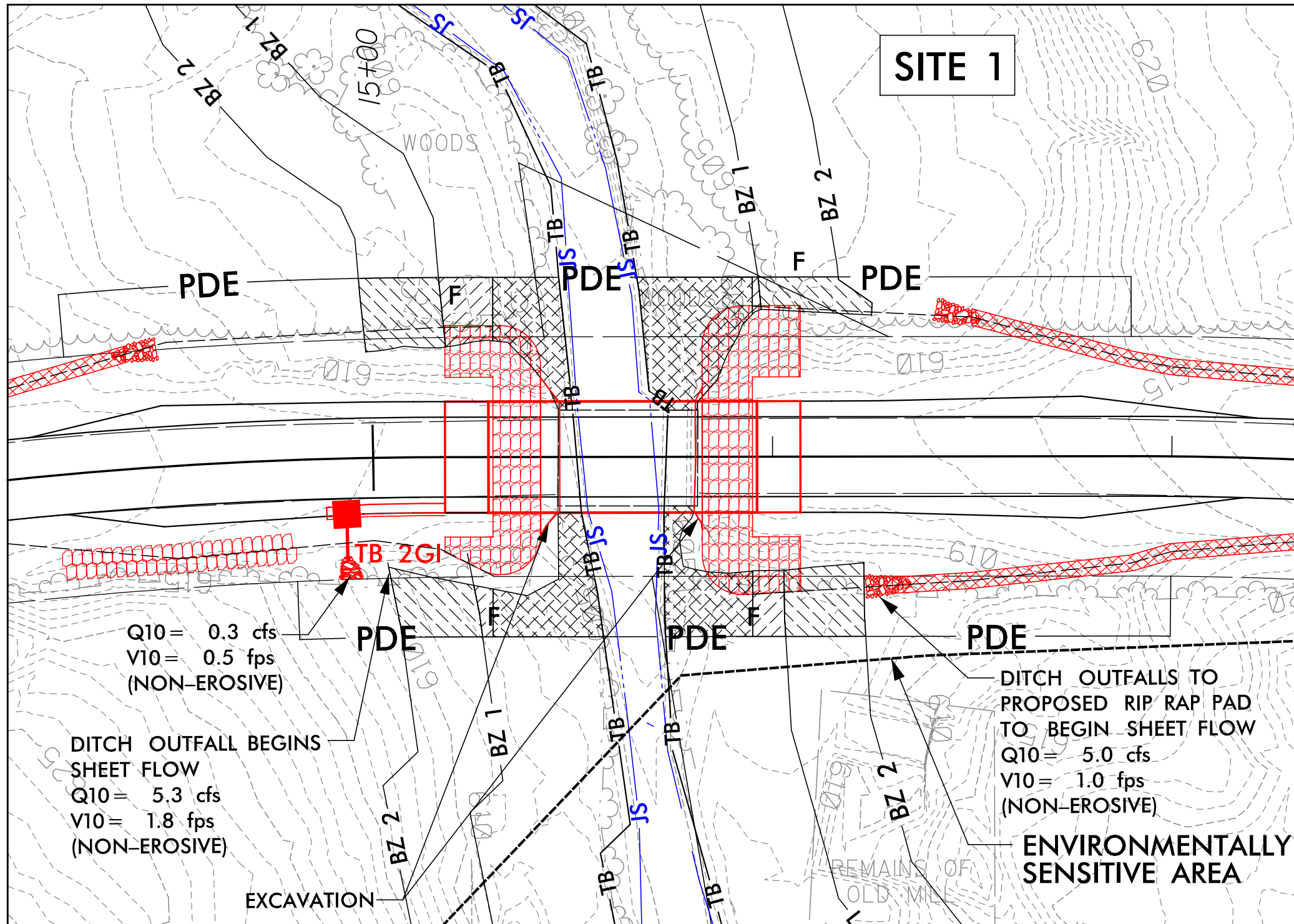
- BZ 1 — RIPARIAN BUFFER ZONE 1 (30')
- BZ 2 — RIPARIAN BUFFER ZONE 2 (20')
- ALLOWABLE IMPACTS ZONE 1 (BRIDGE)
- ALLOWABLE IMPACTS ZONE 1 (ROAD CROSSING)
- ALLOWABLE IMPACTS ZONE 2 (ROAD CROSSING)



ENLARGED PLAN VIEW SITE 1

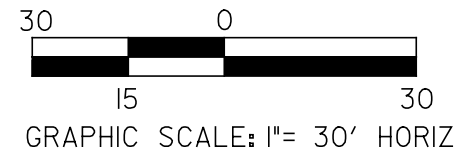
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PROJECT REFERENCE NO. B-5350	SHEET NO. 4A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
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<b>ICA</b> Engineering 121 Kingdom Suite 10 Raleigh, NC 100 Lines for People	
PERMIT DRAWING SHEET 5 OF 6	<b>ENGLISS</b>



### LEGEND

- BZ 1 — RIPARIAN BUFFER ZONE 1 (30')
- BZ 2 — RIPARIAN BUFFER ZONE 2 (20')
- [Cross-hatched box] ALLOWABLE IMPACTS ZONE 1 (BRIDGE)
- [Diagonal lines box] ALLOWABLE IMPACTS ZONE 1 (ROAD CROSSING)
- [Diagonal lines box] ALLOWABLE IMPACTS ZONE 2 (ROAD CROSSING)



ENLARGED PLAN VIEW SITE 1

## 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	SINGLE SPAN 24" CORED SLAB W/ 4.0' DEEP CAPS, 1@65'	-L- 14+97 to 16+25		X		2038		2038					
			X			402	1232	1633					
<b>TOTAL:</b>						2440	1232	3671					

N.C. DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
  
 GUILFORD COUNTY  
 PROJECT: B-5350  
  
 3/23/2017  
 SHEET 6 OF 6