

PAT McCrory  
Governor

NICHOLAS J. TENNYSON  
Secretary

January 29, 2016

MEMORANDUM TO: Mr. Mike Mills, PE  
Division 7 Engineer

FROM: *for* Philip S. Harris, III, P.E.  
Natural Environment Section  
Project Development and Environmental Analysis Unit 

SUBJECT: Guilford County; Replacement of Bridge No. 208 on SR 3051 Over an  
Unnamed Tributary of Little Alamance Creek; Federal Aid Project No.  
BRZ-3051(1); WBS No. 40152.1.1; **TIP B-4961.**

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

A copy of this permit package will be posted on the NCDOT website at:  
<https://connect.ncdot.gov/resources/Environmental>, under *Quick Links > Issued Permits*

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

Mr. Randy Garris, P.E. State Contract Officer  
Mr. Jerry Parker, Division Environmental Officer  
Dr. Majed Al-Ghandour, P. E., Program Dev. and TIP  
Mr. Roger Thomas, P.E., Roadway Design  
Mr. Matt Lauffer, P.E., Hydraulics  
Mr. Tom Koch, P.E., Structure Design  
Mr. Mark Staley, Roadside Environmental  
Mr. Robert Memory, Utilities Unit  
Mr. Ron Hancock, P.E., State Roadway Construction Engineer  
Mr. Kevin Bowen, P.E., State Bridge Construction Engineer  
Mr. Eric Midkiff, P.E., PDEA



# PROJECT COMMITMENTS

T.I.P. Project No. B-4961  
Replacement of Bridge No. 208 on SR 3051 (Knox Rd)  
over an Unnamed Tributary of Little Alamance Creek  
Guilford County  
Federal Aid Project No. BRZ-3051(1)  
WBS Element 40152.1.1

## 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, Guilford County Schools will be contacted at (336) 370-8920 at least one month prior to road closure.

In order to allow Emergency Management Services (EMS) time to prepare for road closure, the NCDOT Resident Engineer will notify the Director of the Guilford County EMS at (336) 641-2278 at least one month prior to road closure.

### **Hydraulic Unit – FEMA Coordination**

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

### **Division 7 Construction – FEMA**

This project involves construction activities on or adjacent to FEMA-regulated stream(s). Therefore, the Division shall submit sealed as-built construction plans to the Hydraulics Unit upon completion of project construction, certifying that the drainage structure(s) and roadway embankment that are located within the 100-year floodplain were built as shown in the construction plans, both horizontally and vertically.

### **Hydraulic Unit, Natural Environment Section – Buffer Rules**

The Jordan Lake Watershed Buffer Rules apply to this project.

### **Roadway Design – Future Greenway**

Allowance will be made for a future Type 3 (unpaved 10-12-foot) multi-use path under the new bridge on the north side of the Unnamed Tributary to Little Alamance Creek.

### **Natural Environment Section – Endangered Species**

NCDOT will continue to coordinate appropriately with the U.S. Fish and Wildlife Service (USFWS) to determine if this project will incur potential effects to the proposed listing of the northern long-eared bat (NLEB), and how to address these potential effects, if necessary.

*The USFWS has developed a programmatic biological opinion (PBO) in conjunction with the Federal Highway Administration (FHWA), the US Army Corps of Engineers (USACE), and NCDOT for the NLEB (*Myotis septentrionalis*) in eastern North Carolina. The PBO covers the entire NCDOT program in Divisions 1-8, including all NCDOT projects and activities. The programmatic determination for NLEB for the NCDOT program is **May Affect, Likely to Adversely Affect**. The PBO provides incidental take coverage for NLEB and will ensure compliance with Section 7 of the Endangered Species Act for five years for all NCDOT projects with a federal nexus in Divisions 1-8, which includes Guilford County, where B-4961 is located. This level of incidental take is authorized from the effective date of a final listing determination through April 30, 2020.*

### **COMMITMENTS FROM PERMITTING**

No additional commitments have been added through permitting.



PAT MCCRORY

Governor

DONALD R. VAN DER VAART

Secretary

S. JAY ZIMMERMAN

Director

December 17, 2015  
 Guilford County  
 NCDWR Project No. 20151179  
 Bridge 208 on SR 3051  
 TIP No. B-4961  
 BRZ-3051

**APPROVAL of Jordan Lake Watershed Buffer Authorization with Additional Conditions**







Mr. Richard Hancock, P.E., Manager  
 NCDOT, Project Development and Environmental Analysis Unit  
 1020 Birch Ridge Drive  
 Raleigh, NC 27610

Dear Mr. Hancock:

*RE: This Authorization (as dated above) replaces the original Authorization December 3, 2015 in order to correct a minor typographic error related to Zone 1 mitigation totals. No other Conditions have been changed.*

You have our approval, in accordance with the conditions listed below, for the following impacts for the purpose of replacing Bridge 208 over an UT to Little Alamance Creek with another bridge in Guilford County:

**Jordan Lake Watershed Riparian Buffer Impacts**

Site	Zone 1 Impact (sq ft)	Zone 1 Buffer Mitigation Required (using 3:1 ratio)		Zone 2 Impact (sq ft)	Zone 2 Buffer Mitigation Required (using 1.5:1 ratio)
1 (Bridge)	4656	-		839	-
1 (Road Crossing)	251	-		1723	-
2 (Road Crossing)	896	-		1050	-
1 (Utility Impacts)	1266	3,798		1280	-
<b>Totals</b>	<b>7,069</b>	<b>3,798</b>		<b>4,892</b>	-

**Total Buffer Impact for Project: 11,961 square feet.**

The project shall be constructed in accordance with your application dated received November 10, 2015. This approval is valid for the **Jordan Lake Riparian Buffer Rules (15A NCAC .02B .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 Authorization, 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 150 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 02B .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. 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]
2. 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]
3. Pursuant to 15A NCAC 2B .0267, sediment and erosion control devices shall not be placed in Zone 1 of any Jordan 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.
4. Any modifications to this 401 Water Quality Certification that propose additional stream impacts or increased impervious surface requiring additional stormwater management may be subject to the Jordan Water Supply Nutrient Strategy (15A NCAC 02B .0267). The NCDOT shall coordinate with the NCDWR prior to submitting a modification request to determine the applicability of the Jordan Water Supply Nutrient Strategy.
5. 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)]
6. 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)]
7. 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. Please refer to the most current version of Stormwater Best Management Practices. [15A NCAC 02H .0507(d)(2) and 15A NCAC 02H .0506(b)(5)]
8. Bridge piles and bents shall be constructed using driven piles (hammer or vibratory) or drilled shaft construction methods. More specifically, jetting or other methods of pile driving are prohibited without prior written approval from the NCDWR first. [15A NCAC 02H.0506(b)(2)]
9. No drill slurry or water that has been in contact with uncured concrete shall be allowed to enter surface waters. This water shall be captured, treated, and disposed of properly. [15A NCAC 02H .0506(b)(3)]
10. All bridge construction shall be performed from the existing bridge, temporary work bridges, temporary causeways, or floating or sunken barges. [15A NCAC 02H .0506(b)(3)]

***Off-Site Buffer Mitigation***

11. Compensatory mitigation for impacts to 1,266 square feet of protected riparian buffers in Zone 1 shall be required. We understand that you have chosen to perform compensatory mitigation for impacts to protected buffers through use of the North Carolina Division of Mitigation Services (DMS) (formerly NCEEP). Mitigation for unavoidable impacts to Jordan Riparian Buffers shall be provided in the Cape Fear River Basin and done in accordance with 15A NCAC .02B .0295. The DMS has indicated in a letter dated October 29, 2015 that they will assume responsibility for satisfying the compensatory mitigation requirements for the above-referenced project, in accordance with DMS's Mitigation Banking Instrument signed July 28, 2010.

### **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 Water Quality Certification shall be maintained on the construction site at all times. In addition, the Water Quality 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 any and 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 401 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. Sam M. Hayes, 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 Dave Wanucha at (336) 776-9703 or [Dave.Wanucha@ncdenr.gov](mailto:Dave.Wanucha@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 Thompson, Division 7 Environmental Assistant  
James Mason, NCDOT PDEA ([jmason@ncdot.gov](mailto:jmason@ncdot.gov))  
Colin Mellor, NC Department of Transportation  
Carla Dagnino, NC Department of Transportation  
Travis Wilson, NC Wildlife Resources Commission  
Beth Harmon, Division of Mitigation Services  
File Copy





Water Resources  
ENVIRONMENTAL QUALITY

PAT MCCRORY

Governor

DONALD R. VAN DER VAART

Secretary

S. JAY ZIMMERMAN

Director

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

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

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

Date of Issuance of 401 Water Quality Certification: \_\_\_\_\_

**Certificate of Completion**

Upon completion of all work approved within the 401 Water Quality Certification or 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 401 Water Quality 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 401 Water Quality Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

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

**Engineer's Certification**

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

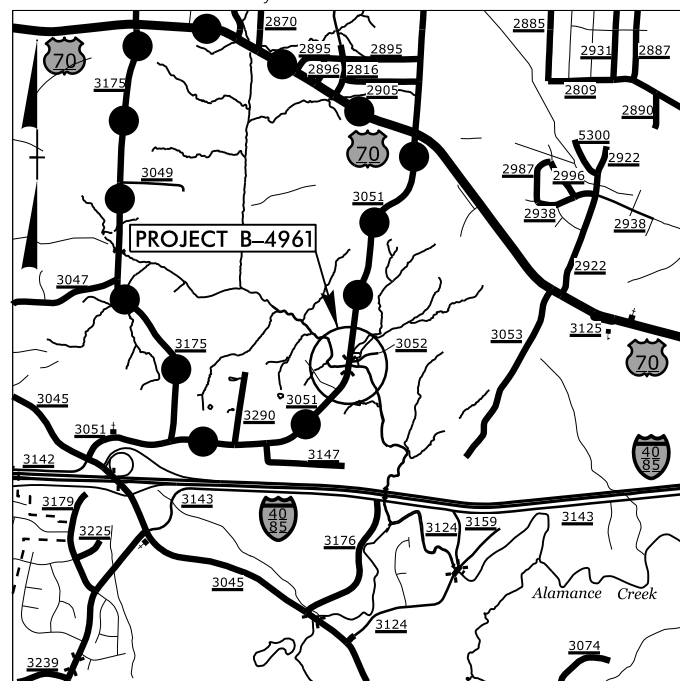
I, \_\_\_\_\_, as a duly registered Professional Engineer in the State of North Carolina, having been authorized to observe (periodically, weekly, full time) the construction of the project for the Permittee hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the 401 Water Quality Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

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

Date \_\_\_\_\_

09/28/15

See Sheet 1A For Index of Sheets  
See Sheet 1B For Conventional Plan Sheet Symbols  
See Sheet 1C-1 For Survey Control Sheet



### VICINITY MAP

● ● ● OFFSITE DETOUR

# STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

**BUFFER DRAWING  
SHEET 1 OF 7**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4961	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
40152.1.1	BRZ-3051(I)	PE	

## GUILFORD COUNTY

**LOCATION: BRIDGE NO. 208 ON SR 3051 (KNOX ROAD)  
OVER LITTLE ALAMANCE CREEK (TRIBUTARY 5)**

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

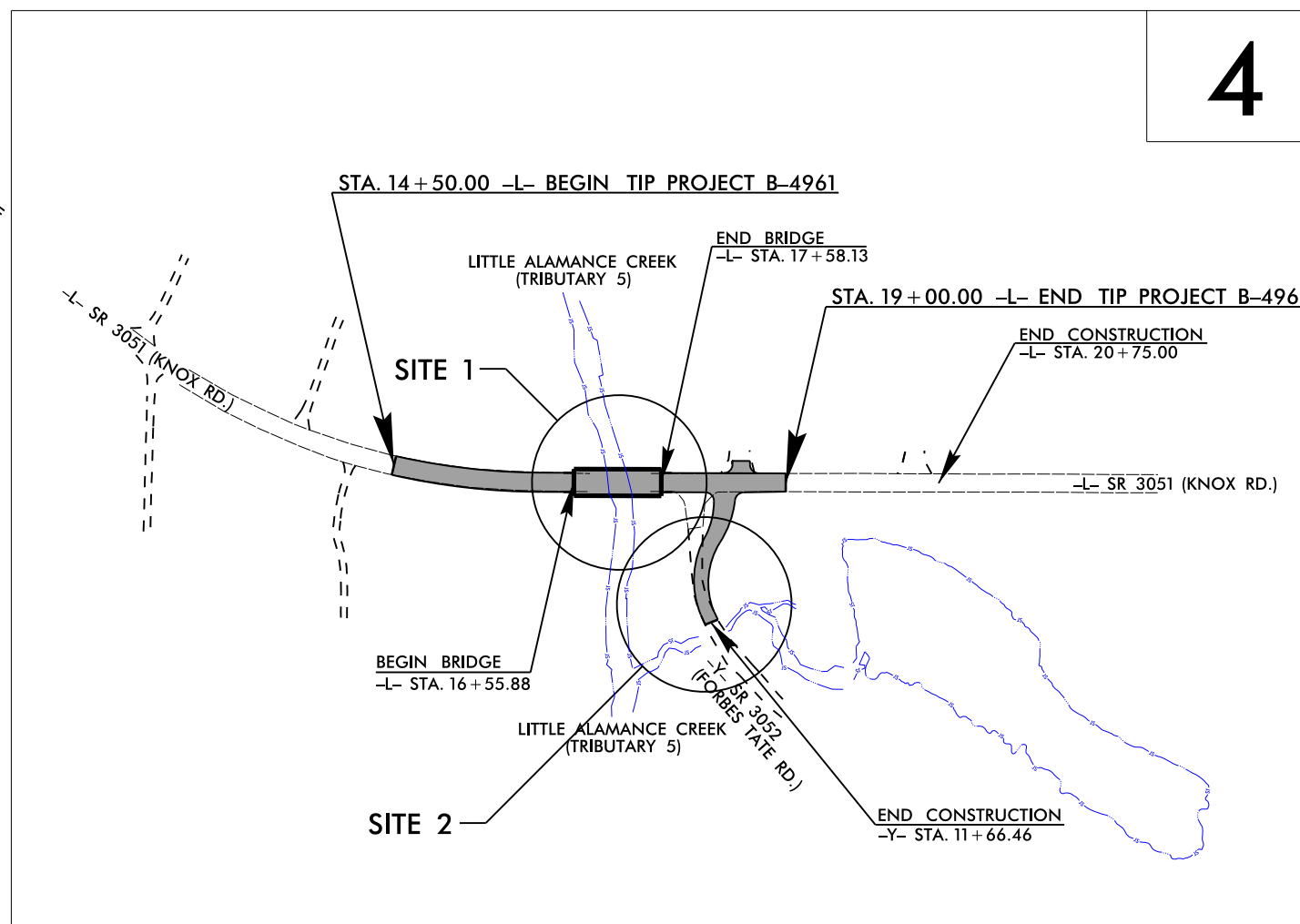
**BUFFER IMPACTS PERMIT**



**TIP PROJECT: B-4961**

**4**

TO MT. HOPE  
CHURCH ROAD



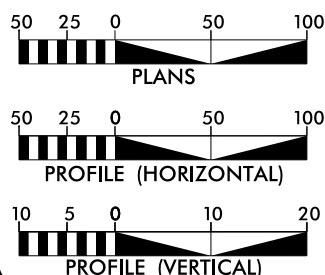
TO BURLINGTON RD.  
(HWY 70)

DESIGN EXCEPTION REQUIRED FOR SAG VERTICAL CURVES AND ASSOCIATED NIGHTTIME STOPPING SIGHT DISTANCES.  
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.  
CLEARING ON THIS PROJECT SHALL BE PREPARED TO THE LIMITS ESTABLISHED BY METHOD II.

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

**CONTRACT:**

#### GRAPHIC SCALES



#### DESIGN DATA

ADT 2016 = 2,080  
 ADT 2035 = 3,600  
 K = 14 %  
 D = 55 %  
 T = 5 % \*  
 V = 55 MPH  
 \* TTST=1% DUAL=4%  
 FUNC CLASS = COLLECTOR  
 "SUBREGIONAL TIER"

#### PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4961 = 0.066 MILES  
 LENGTH STRUCTURE TIP PROJECT B-4961 = 0.019 MILES  
 TOTAL LENGTH OF TIP PROJECT B-4961 = 0.085 MILES

Prepared in the Office of:  
**DIVISION OF HIGHWAYS**  
 1000 Birch Ridge Dr., Raleigh NC, 27610

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:  
 OCTOBER 16, 2015

LETTING DATE:  
 JUNE 21, 2016

JAMES A. SPEER, PE  
 PROJECT ENGINEER

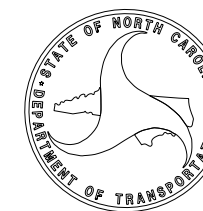
DANIEL W. GARDNER, JR., PE  
 PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

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

ROADWAY DESIGN ENGINEER

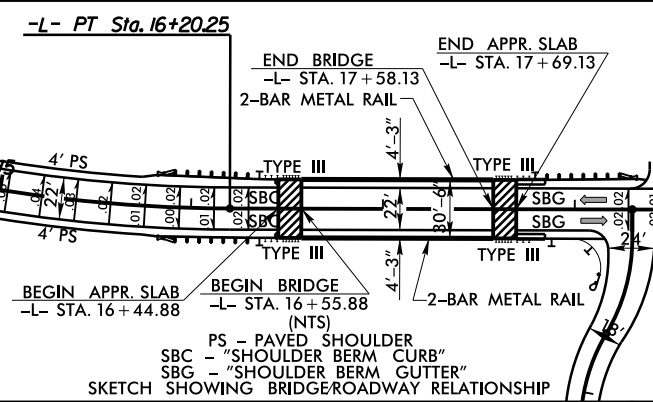
SIGNATURE: \_\_\_\_\_ P.E.



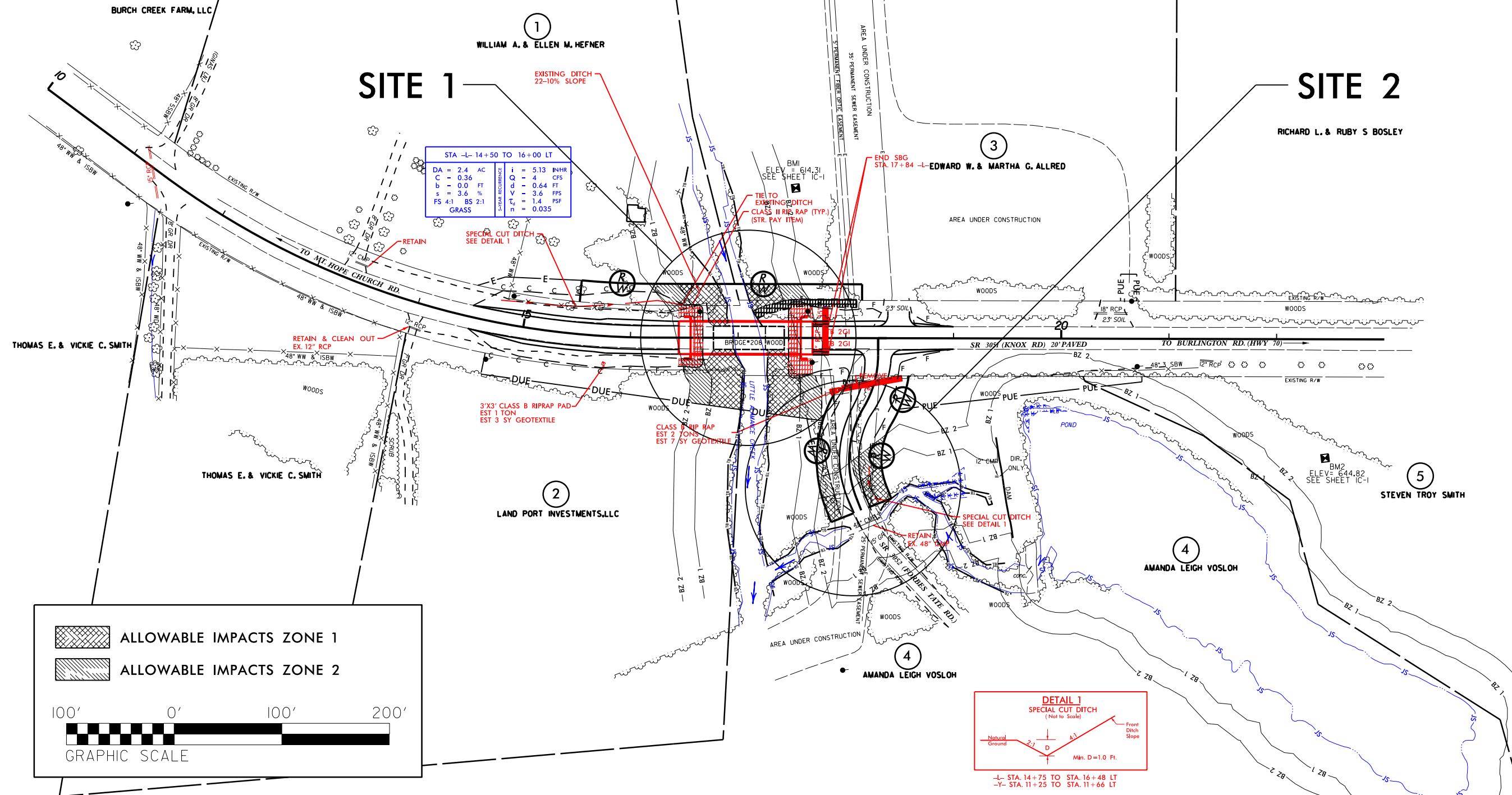
10/12/2015  
 ejhahn  
 R:\Hydraulics\PERMITS Environmental\Drawings\B4961\_Hyd\_prm\_buf\_01\_tsh.dgn  
 \$\$\$\$\$\$SYTIME\$\$\$\$\$\$  
 \$\$\$\$\$\$DCN\$\$\$\$\$\$  
 \$\$\$\$\$\$USE\$\$\$\$\$\$

PROJECT REFERENCE NO.	SHEET NO.
B-4961	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**BUFFER DRAWING SHEET 2 OF 7**

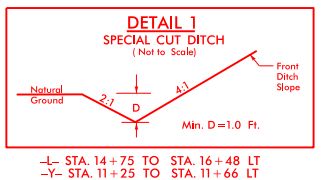
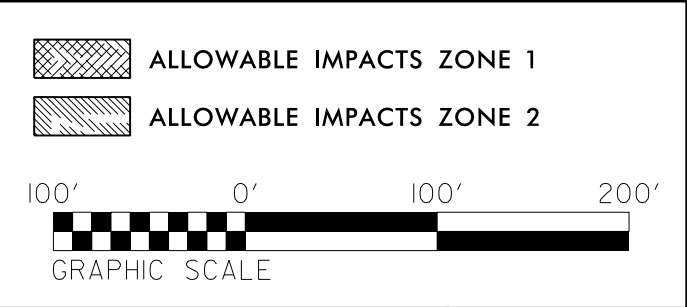


NAD 83/NSRS 2007



STA -L- 14+50 TO 16+00 LT	
DA = 2.4 AC	i = 5.13 IN/HR
C = 0.36	Q = 4 CFS
b = 0.0 FT	d = 0.64 FT
s = 3.6 %	V = 3.6 FPS
FS 4:1 BS 2:1	n = 1.4 PSF
GRASS	n = 0.035

REVISIONS



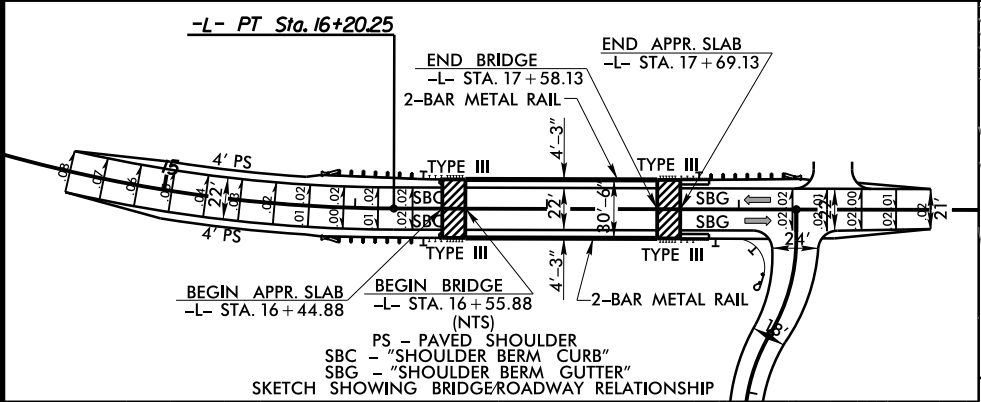
NOTE: PAVED SHOULDER TRANSITION FROM -L- STA. 14+50.00 TO 15+00.00 AND -L- STA. 18+50.00 TO 19+00.00

SEE SHEET 5 FOR -L- AND -Y- PROFILE AND SHEETS S-1 THRU S-2 FOR STRUCTURE PLANS

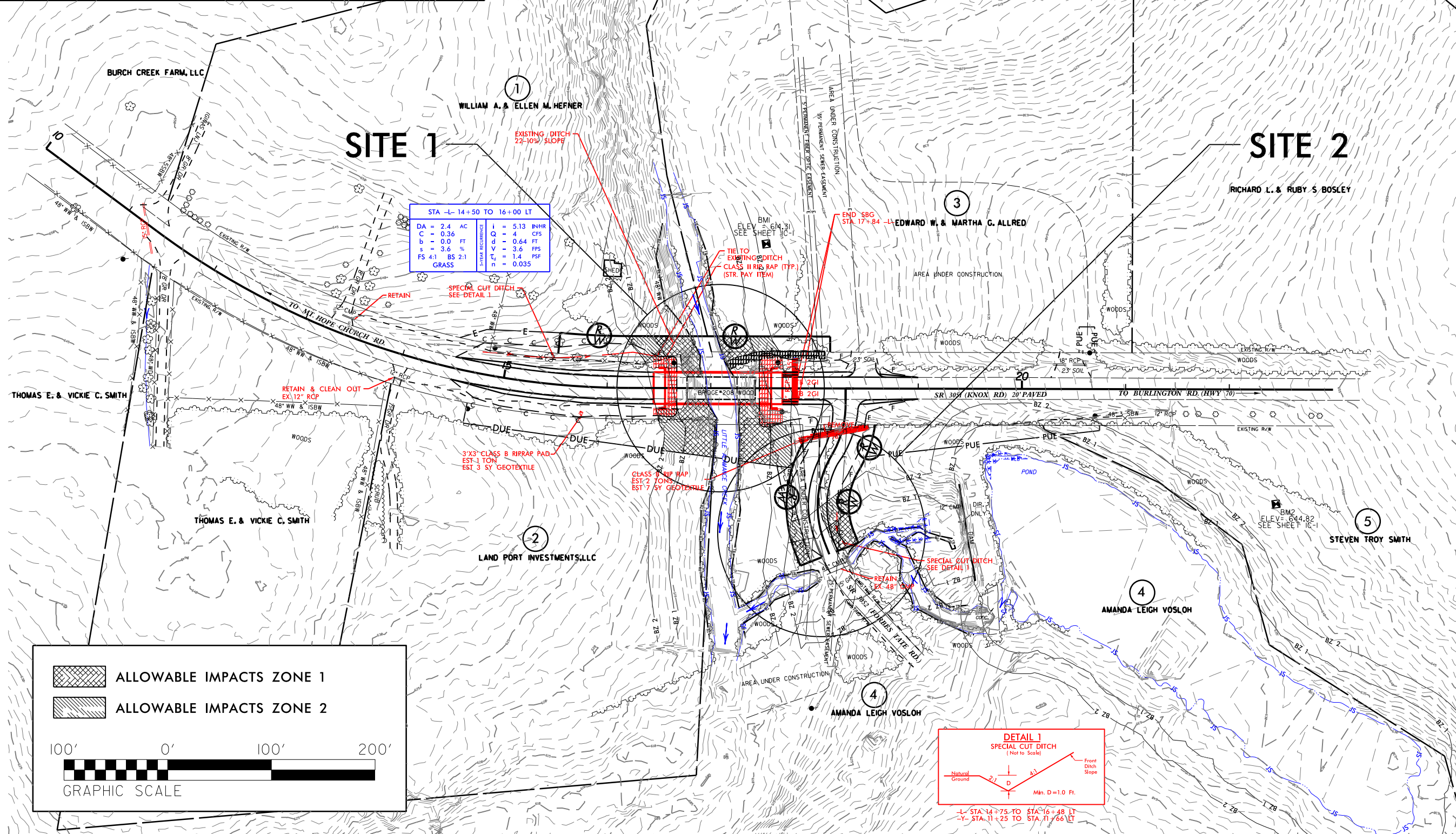
10/2015  
 R:\Hydraulics\PERMITS Environmental Drawings\B4961\_Hyd\_perm\_buf\_02\_psh.dgn

PROJECT REFERENCE NO.	SHEET NO.
B-4961	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**BUFFER DRAWING SHEET 3 OF 7**

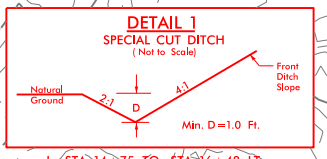


NAD 83/NSRS 2007



STA -L- 14+50 TO 16+00 LT	
DA = 2.4 AC	i = 5.13 IN/HR
C = 0.36	Q = 4 CFS
b = 0.0 FT	d = 0.64 FT
s = 3.6 %	V = 3.6 FPS
FS 4:1 BS 2:1	C <sub>1</sub> = 1.4 PSF
GRASS	n = 0.035

ALLOWABLE IMPACTS ZONE 1  
 ALLOWABLE IMPACTS ZONE 2  
 GRAPHIC SCALE  
 100' 0' 100' 200'



NOTE: PAVED SHOULDER TRANSITION FROM -L- STA. 14+50.00 TO 15+00.00 AND -L- STA. 18+50.00 TO 19+00.00

SEE SHEET 5 FOR -L- AND -Y- PROFILE SEE SHEETS S-1 THRU S-2 FOR STRUCTURE PLANS

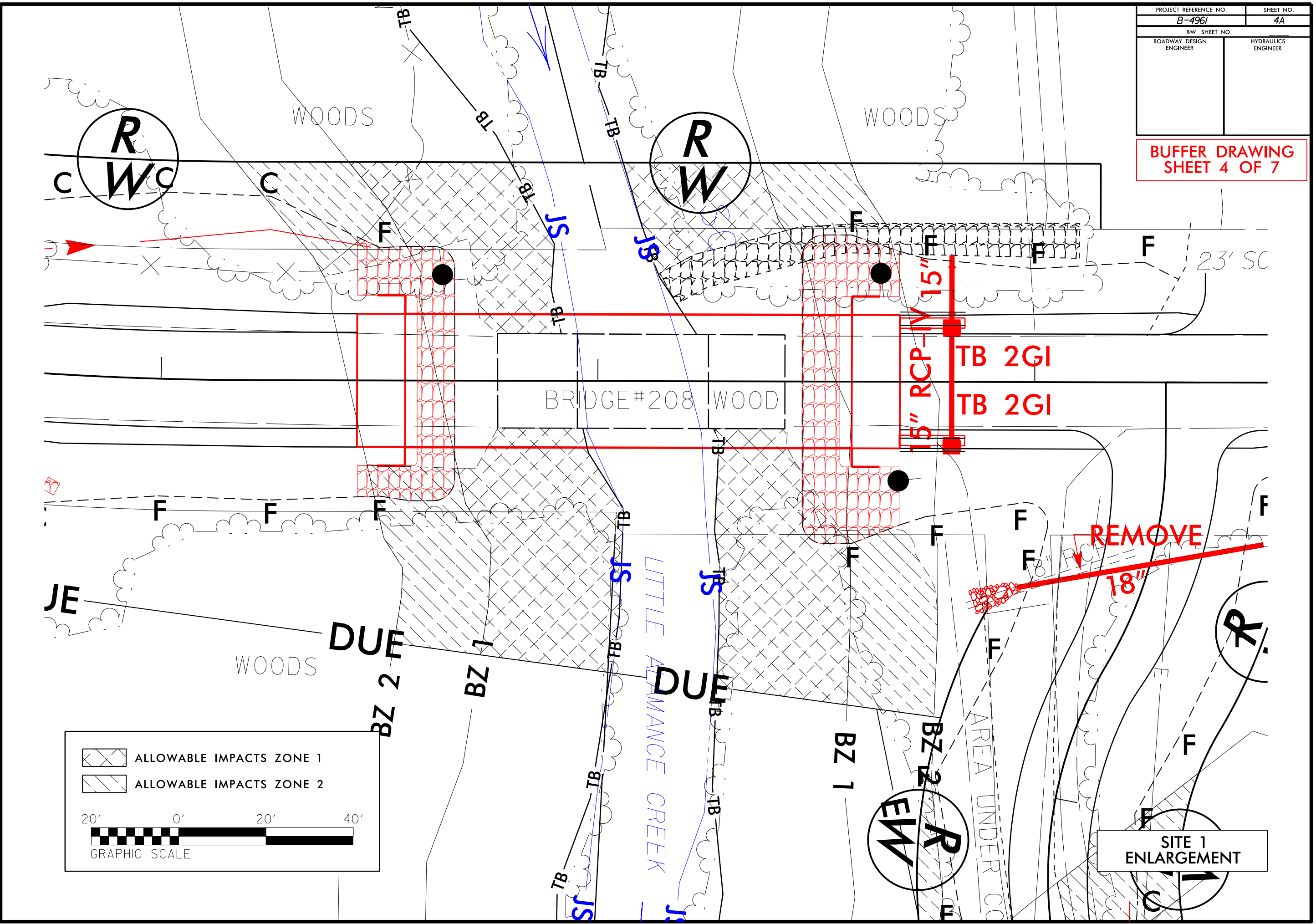
REVISIONS

10/2/2015  
 R:\Hydraulics\PERMITS\Drawings\B4961\_Hyd\_perm\_buf\_03\_psh.dgn  
 \*\*\*\*\*  
 \*\*\*\*\*  
 \*\*\*\*\*  
 \*\*\*\*\*  
 \*\*\*\*\*

PROJECT REFERENCE NO. <i>B-4961</i>	SHEET NO. <i>4A</i>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**BUFFER DRAWING  
SHEET 4 OF 7**

10/2015  
 R:\Hydraulics\PERMITS Environmental Drawings\B4961\_Hyd\_prm\_buf\_04\_psh.dgn  
 \$\$\$\$\$\$SYTIME\$\$\$\$\$\$  
 \$\$\$\$\$\$LSDGN\$\$\$\$\$\$  
 \$\$\$\$\$\$DATE\$\$\$\$\$\$



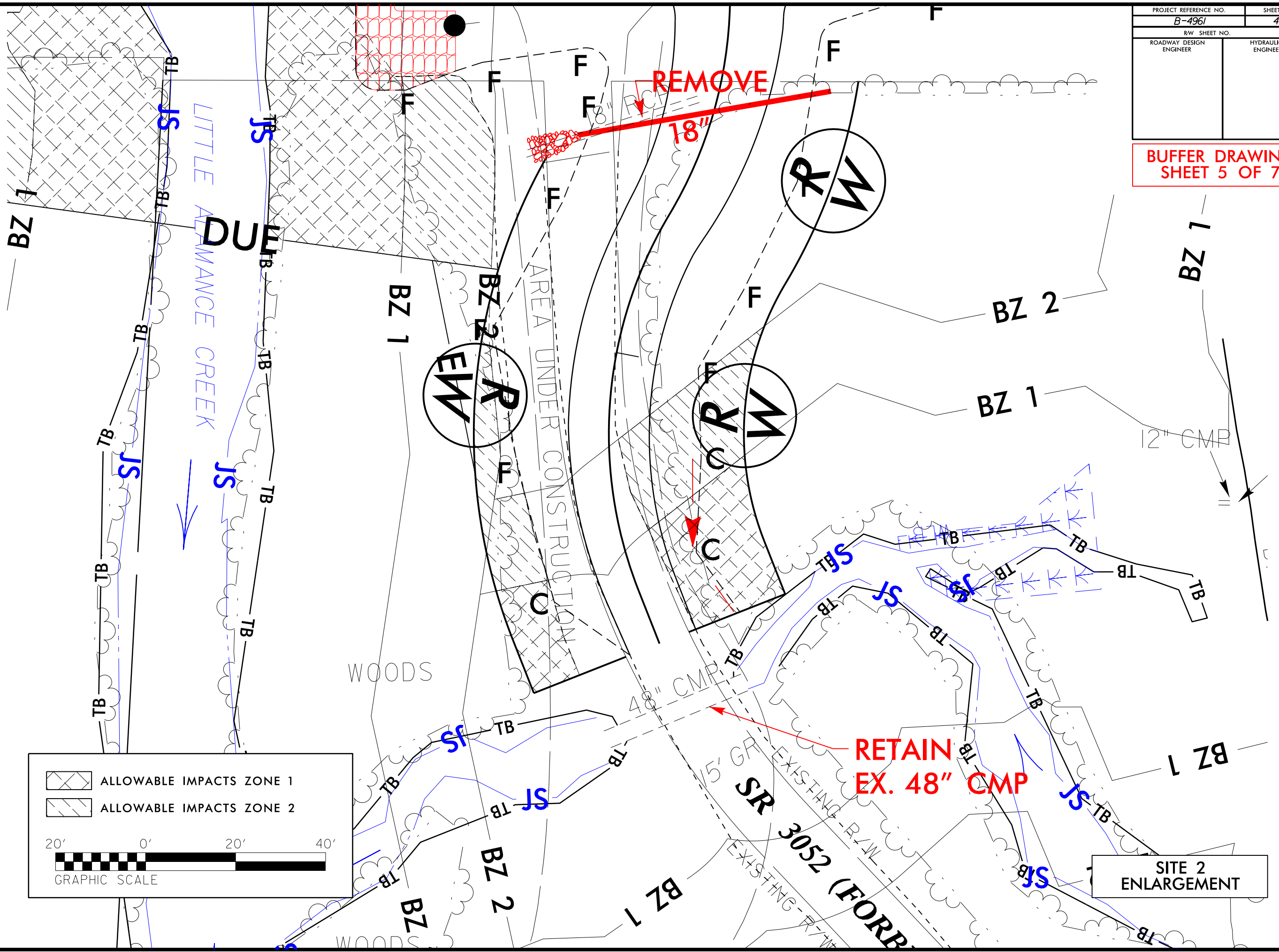
	ALLOWABLE IMPACTS ZONE 1
	ALLOWABLE IMPACTS ZONE 2



20' 0' 20' 40'  
 GRAPHIC SCALE


**SITE 1  
ENLARGEMENT**

PROJECT REFERENCE NO. <i>B-4961</i>	SHEET NO. <i>4B</i>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**BUFFER DRAWING  
SHEET 5 OF 7**



 ALLOWABLE IMPACTS ZONE 1  
 ALLOWABLE IMPACTS ZONE 2

  
 GRAPHIC SCALE

REVISIONS

10/2015  
 R:\Hydraulics\PERMITS Environmental Drawings\B4961\_Hyd\_perm\_buf\_05\_psh.dgn  
 \$\$\$\$\$\$SYTIME\$\$\$\$\$\$  
 \$\$\$\$\$\$DGN\$\$\$\$\$\$

5/28/99

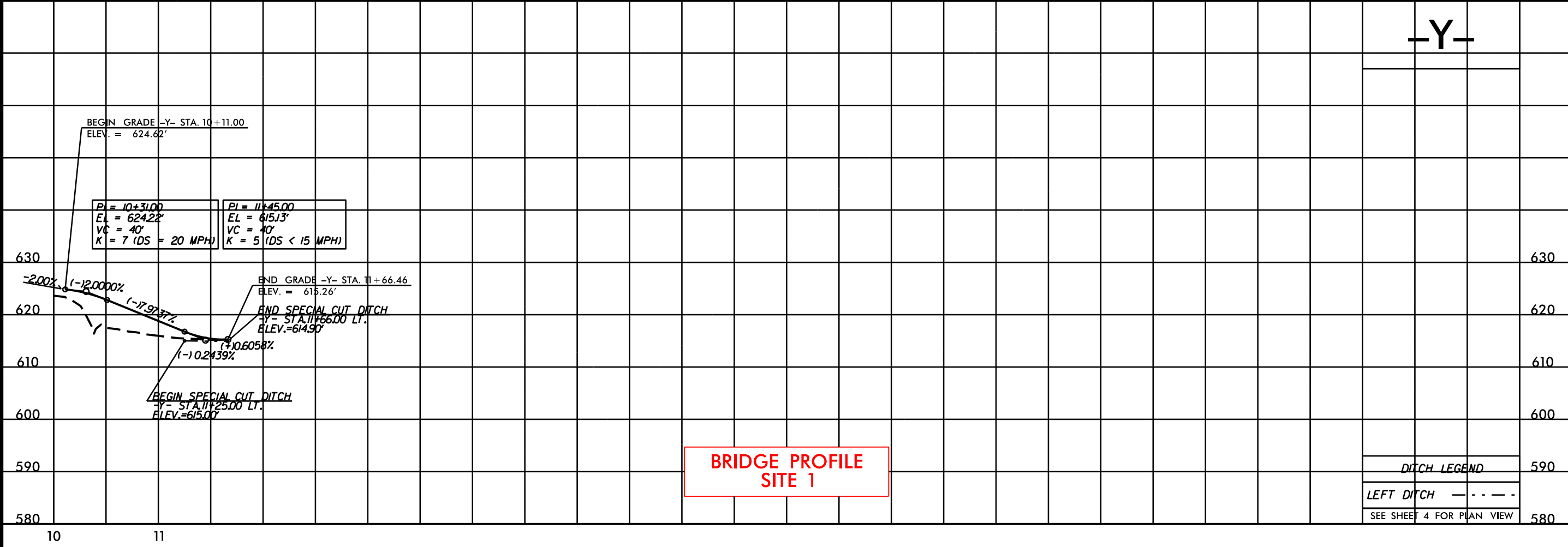
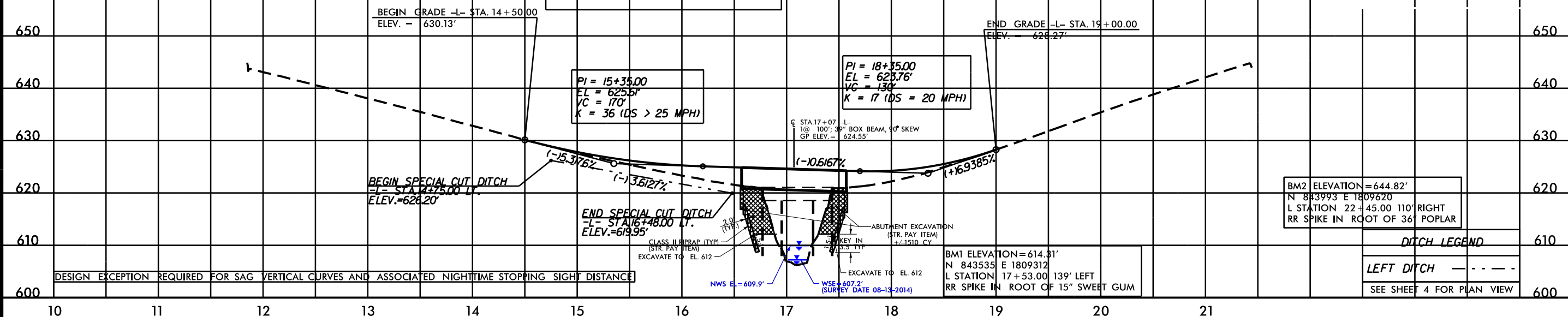
### BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE = 1704 CFS  
 DESIGN FREQUENCY = 25 YRS  
 DESIGN HW ELEVATION = 615.1 FT  
 BASE DISCHARGE = 2408 CFS  
 BASE FREQUENCY = 100 YRS  
 BASE HW ELEVATION = 616.21 FT  
 OVERTOPPING DISCHARGE = 3255+ CFS  
 OVERTOPPING FREQUENCY = 500+ YRS  
 OVERTOPPING ELEVATION = 624.1 FT

DATE OF SURVEY = 08-13-2014  
 W.S. ELEVATION AT DATE OF SURVEY = 607.2 FT

PROJECT REFERENCE NO. <b>B-4961</b>	SHEET NO. <b>5</b>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**BUFFER DRAWING SHEET 6 OF 7**



10/2015  
 ephain  
 R:\Hydraulics\PERMITS Environmental Drawings\B4961\_Hyd\_prm\_buf\_07\_pfl.dgn  
 \*\*\*\*\*  
 \*\*\*\*\*  
 \*\*\*\*\*

## BUFFER IMPACTS SUMMARY

			IMPACT									BUFFER REPLACEMENT	
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	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	BRIDGE #208	-L- 16+15 / 17+80		X		4656	839	5496					
			X			251	1723	1973					
2	48-IN CMP	-Y- 10+80 / 11+66.5	X			896	1050	1946					
<b>TOTAL:</b>						5802	3612	9414					

N.C. DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
  
 GUILFORD COUNTY  
 PROJECT: 40152.1.1 (B-4961)  
  
 10/1/2015  
 SHEET 7 OF 7



09/08/15

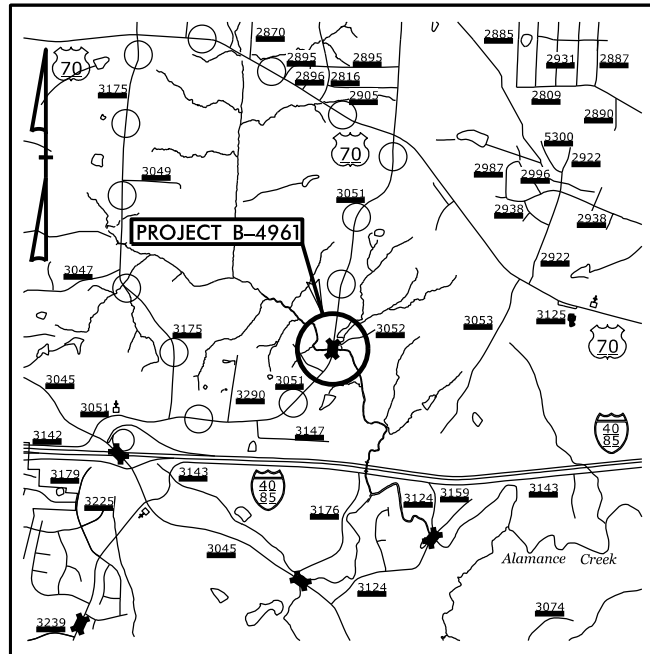
TIP PROJECT: B-4961

T.I.P. NO.	SHEET NO.
B-4961	UE-1

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**UTILITIES PERMIT DRAWING**  
**GUILFORD COUNTY**

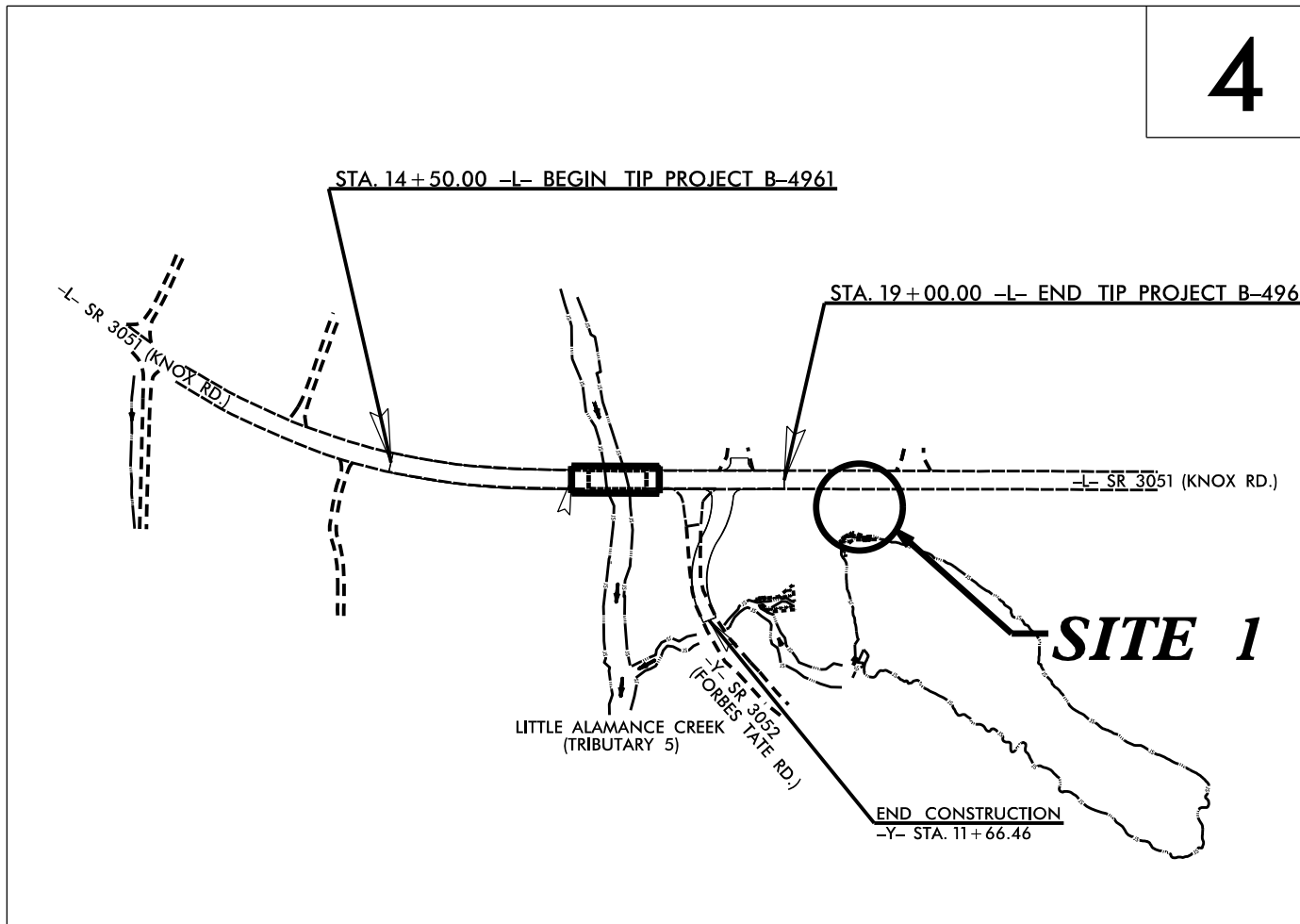
UTILITY PERMIT DRAWING  
SHEET 1 OF 3  
OCTOBER 08, 2015



VICINITY MAP

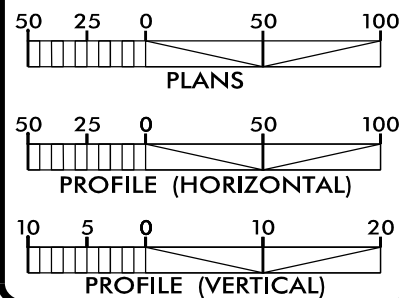
**LOCATION: BRIDGE NO.208 ON SR 3051 (KNOX ROAD)  
OVER LITTLE ALAMANCE CREEK (TRIBUTARY 5)**

**TYPE OF WORK: POWER POLE RELOCATION**



**INCOMPLETE PLANS**  
DO NOT USE FOR R/W ACQUISITION  
**PRELIMINARY PLANS**  
DO NOT USE FOR CONSTRUCTION

**GRAPHIC SCALES**



**INDEX OF SHEETS**

SHEET NO.	DESCRIPTION
UE-1	TITLE SHEET
UE-2	UTILITY PERMIT PLAN SHEETS

**UTILITY OWNERS ON PROJECT**

(A) POWER ; DUKE ENERGY



PREPARED IN THE OFFICE OF:  
DIVISION OF HIGHWAYS  
UTILITIES UNIT  
UTILITIES ENGINEERING

1555 MAIL SERVICES CENTER  
RALEIGH, NC 27699-1555  
PHONE (919) 707-6690  
FAX (919) 250-4151

**Roger Worthington, P.E.** UTILITIES SECTION ENGINEER  
**Steve Mckee, P.E.** UTILITIES SQUAD LEADER PROJECT ENGINEER  
**J.T. Yoon, P.E.** UTILITIES PROJECT DESIGNER

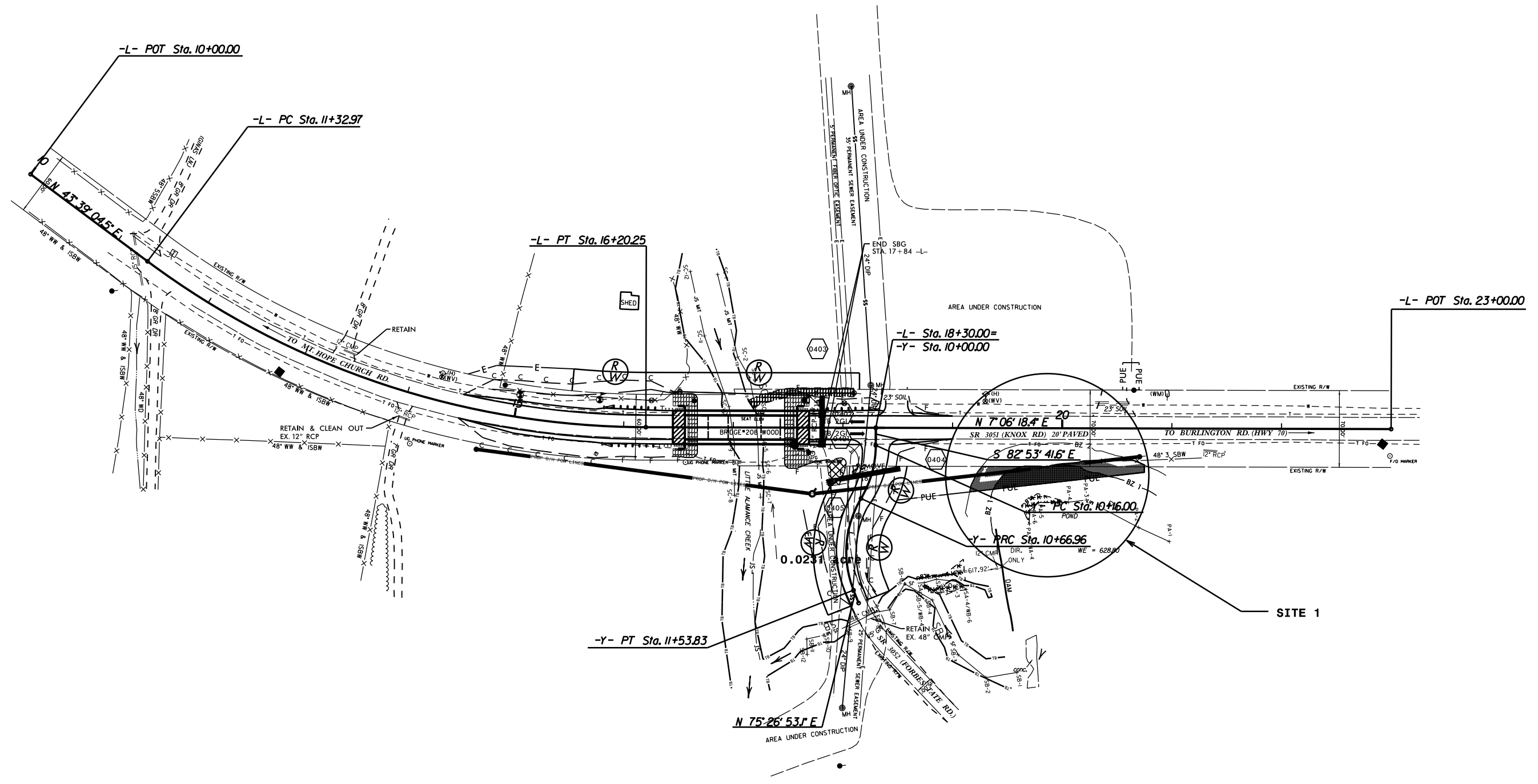
\$\$\$\$\$SYTIME\$\$\$\$\$  
\$\$\$\$\$DON\$\$\$\$\$  
\$\$\$\$\$USERNAME\$\$\$\$\$

### UTILITIES BY OTHERS

NOTE:  
 ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.

UTILITY PERMIT DRAWING  
 SHEET 2 OF 3  
 OCTOBER 08, 2015

NAD 83/NSRS 2007



	MITIGABLE IMPACTS ZONE 1	1,266 SQLF
	ALLOWABLE IMPACTS ZONE 2	1,280 SQLF

EXISTING POWER POLE CONFLICTS WITH PROPOSED FILL SLOPE. IT HAS TO BE RELOCATED TO THE EAST SIDE OF THE ROAD

08-OCT-2015 16:44  
 J:\Users\jg\Engineering\NEUNB4961.Ut\_4\_LUE2.psh.dgn  
 5/14/99

## 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	Aerial line	-L- 19+15 / 20+75				0	1280	1280	1266	0	1266		
<b>TOTAL:</b>						0	1280	1280	1266	0	1266		

N.C. DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
  
 GUILFORD COUNTY  
 PROJECT: 40152.1.1 (B-4961)  
  
 10/8/2015  
 SHEET 3 OF 3