




STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAT L. MCCRORY
GOVERNOR

ANTHONY J. TATA
SECRETARY

January 13, 2015

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: SR 1003 (North Main Street) – SR 1820 (Skeet Club Road)
US 311 to NC 68 (Eastchester Drive); Guilford County;
Federal Project No. STP-1802(2) WBS No. 34962.1.1
TIP U-3615

Attached are the modification to the U.S. Army Corps of Engineers Section 404 Individual Permit and the N.C. Division of Water Resources (NCDWR) Section 401 Water Quality Certification. 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>, 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 Environ. Officer
Dr. Majed Al-Ghandour, P. E., Program Dev. and TIP
Mr. Glenn Mumford, 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
Ms. LeiLani Paugh, Natural Environment Section
Mr. Randy Griffin, Natural Environment Section
Ms. Beth Harmon, NCEEP
Ms. Karen Capps, PE, Transportation Program Management

PROJECT COMMITMENTS

T.I.P. Project No. U-3615
SR 1003 (North Main Street) – SR 1820 (Skeet Club Road)
US 311 to NC 68 (Eastchester Drive), Guilford County
Federal Project No. STP-1802(2)
State Project No.8.2494701
WBS Element No.34962.1.1

COMMITMENTS FROM PROJECT DEVELOPMENT AND DESIGN

Structure Design Unit / Roadside Environmental Unit / Division Construction Engineer

For the removal of bridge No.65 over Oak Hollow Lake, Best Management Practices will be employed to minimize sediment distribution downstream in the lake. Care will be taken in the removal of the bridge and the removal of erosion control or sediment control devices so that sediment is not released downstream in the lake.

This is a standard operating procedure.

Roadway Design Unit

The Elihu Mendenhall property, a 4(f) resource, will be impacted with temporary easements. These easements will be needed only during the construction of the project. The easements will not cause permanent or adverse physical impacts, or interfere with the activities or purposes of the Farmstead. A note will be added to the roadway design plans and/or project special provisions instructing the contractor to fully restore each easement area to a condition equal to or better than what existed prior to the project. As specified in 23 CFR 771.135, the temporary easements will not constitute a use of property from the Farmstead within the meaning of Section 4(f), and a Section 4(f) Evaluation is not required. However, if modifications during final design result in any of the above conditions not being met, then a 4(f) evaluation will be required.

A note instructing the contractor to fully restore each easement in the area of Elihu Mendenhall property to a condition equal to or greater than what existed prior to the project was not included on the Right of Way Plans or in the Project Special Provisions. Roadway agreed the note will be added to the plans.

The note has been added to roadway plans.

Hydraulics Unit and Project Development and Environmental Analysis Unit

Any impacts to wetlands, streams, and buffers must comply with the Randleman Buffer Rules, 404/401 regulations, water supply regulations (15A NCAC 2B .0216), and any other required federal, state, and local regulations.

This is a standard operating procedure.

Geotechnical Unit

It is anticipated that the proposed widening of Skeet Club Road will encroach on one property identified as an underground storage tank (UST) site. This impacted site will be further evaluated prior to right of way acquisition.

There are three (3) UST sites identified by NCDOT Geotechnical Unit that may be impacted by the proposed widening. 1) Bizzy Bee Grocery II at 3802 North Main Street 2) Dixon Produce at 3300 North Main Street 3) Former Tan Safeway at 3301 North Main Street. All three sites will be evaluated prior to acquisition.

Hydraulics Unit

Hazardous spill basins will be required on any part of the project that falls within a 0.5 mile of the Critical Area of the Water Supply Watershed.

Hazardous spill basins have been included in the Right of Way Plans as needed.

Hydraulics Unit and Structure Design Unit

In association with the replacement of Bridge #65, no deck drains will be allowed to discharge directly into Oak Hollow Lake.

Bridge design of Bridge No. 65 is complete and does not have deck drains.

Project Development and Environmental Analysis Unit

The noise analysis in this report assumed a worst-case scenario of a 4-lane median divided typical section. It is anticipated that the final recommendation on the typical section may reduce the number of impacted noise receptors. Once the typical section recommendation has been determined, the number of impacted noise receptors will be re-calculated and reported in the final environmental document.

A revised noise report has been completed and is summarized in Section V of the FONSI.

In the area of the Historic Spring House, in order to accommodate for the widening of the road and avoid impacts to the Spring House ruins, two avoidance alternatives have been developed. Until final designs are complete, it cannot be determined at this time which alternate will be used. The State Historic Preservation Officer issued a determination of "No effect" for Alternative 1 (1:1 slope), and a determination of "adverse effect" for Alternative 2 (retaining wall) (see pages B-1 and B-2 in Appendix B for concurrence forms). Once more detailed survey and soils information is obtained, an alternative will be selected, and the project's impact on this 4(f) resource will be re-evaluated. If the "adverse effect" alternative is selected, a Memorandum of Agreement (MOA) will have to be issued. Impacts associated with the selected alternative will be included in the final environmental document.

After investigating the soils in the area of the Spring House Ruins, it was determined that

a 2:1 slope could be utilized. After presenting this information to the SHPO, it was determined that the slope alternative would result in "no adverse effect" on the historic property, and the retaining wall alternative (which includes a handrail and guardrail) would result in an "adverse effect". Although the slope would impact the site, it would act as a protective covering for the Spring House. This decision was made with the condition that archaeological monitoring be provided during fill and construction of the project (see Appendix Bin the FONSL pages B-1 and B-2 for concurrence form). The retaining wall alternative was seen as a least desirable alternative due to the fact that the guardrail, handrail, and size and appearance of the retaining wall would not be consistent with the historic and rural nature of the National Register Property.

Right of Way Unit

Properties owned by the City of High Point at Oak Hollow Lake were purchased with grants from the US Department of Interior. That property is protected by Section 6(f)(3) of the Land and Water Conservation Fund (LWCF) Act of 1965. Rights of way needs of this property for this project are a LWCF Conversion. NC Department of Environment and Natural Resources, Division of Parks and Recreation, and the US Department of Interior have approved of the mitigation by replacement with property of equal value.

See the City of High Point Conversion attachment to the Consultation for U-3615 of February 2009.

The above referenced properties of Oak Hollow Lake are protected by Section 4(f). They are qualified as Deminimus.

See the City of High Point Letter of March 15, 2007 and the published Public Notice of January 2, 2009 attached to the Consultation of February 2009.

COMMITMENTS DEVELOPED FROM PERMITTING

Roadside Environmental and Division 7 Construction

401 condition 7

For the 150 linear feet of streams being impacted due to site dewatering activities, the site shall be graded to its preconstruction contours and revegetated with appropriate native species.

Division 7 Construction

401 condition 12

A turbidity curtain will be installed in Oak Hollow Lake if driving or drilling activities occur within the lake, on the bank, or within 5 feet of the top of bank. This condition can be waived with prior approval from DWR.

Project Development and Environmental Analysis Unit – Natural Environment Section

404 condition f

Compensatory mitigation requirements for U-3615B are summarized in Table 1 (see Permit). Due to the status of Section U-3615A being unfunded and letting more than 5 years out, NCDOT is

not proposing mitigation for Section U-3615A at this time. The U-3615B section will permanently impact a total of 2,099 feet of warm water streams. Of these 2,099 feet, there are 111 feet of stream impacts requiring mitigation.

The Corps is requiring 2:1 mitigation for 452 feet of perennial stream impacts and 1:1 mitigation for 1,536 feet of intermittent stream impacts. NCDOT is providing onsite mitigation of 760 feet of warm water stream by relocating a section of UT at site 3-3. The remaining mitigation requirement of 1,680 feet of permanent warm water stream impacts will be provided by the North Carolina Ecosystem Enhancement Program (NCEEP), as outlined in the letter dated April 23, 2013, from James B. Stanfill, NCEEP Asst. Management Supervisor. In order to compensate for this wetland impact associated with this permit, mitigation shall be provided in accordance with the provisions outlined on the most recent attached Compensatory Mitigation Responsibility Transfer Form. The requirements of this form, including any special conditions listed on this form, are hereby incorporated as special conditions of this permit authorization. NCEEP will also provide mitigation for 0.82 acres (2:1 ratio) of permanent riparian wetland impacts resulting from roadway fill, excavation, and mechanized clearing. The on-site mitigation will be constructed and in compliance with the attached U-3615B Stream Mitigation Plan dated January 12, 2013 (see Permit - Identified as Exhibit C).

401 condition 20

Compensatory mitigation for impacts to 1,580 linear feet of streams at a replacement ration of 1:1 is required for U-3615B. Compensatory mitigation for impacts to jurisdictional streams shall be provided by onsite stream relocations of 760 linear feet of UT 3-3 West Fork of Deep River. The onsite stream relocation shall be constructed in accordance with the design submitted by your May 2, 2013 application. All on-site mitigation sites shall be protected in perpetuity by a conservation easement or through NCDOT fee simple acquisition and recorded in the NCDOT Natural Environment Unit mitigation geodatabase. Please be reminded that as-builts for the completed streams shall be submitted to the North Carolina Division of Water Resources 401 Wetland Unit with the as-builts for the rest of the project. If the parameters of this condition are not met, then the permittee shall supply additional stream mitigation for the 760 linear feet of impacts. All channel relocation will be constructed in a dry work area, will be completed and stabilized and must be approved on site by NCDWR staff, prior to diverting water into the new channel. Whenever possible, channel relocations shall be allowed to stabilize for an entire growing season. All stream relocations shall have a 50-foot wide native wooded buffer planted on both sides of the stream unless otherwise authorized by this Certification. A transitional phase incorporating rolled erosion control product (RECP) and appropriate temporary cover is allowable.

401 condition 23

Compensatory mitigation for impacts to 101,023 square feet of protected riparian buffers in Zone 1 (303,069 square feet of mitigation) and 70,419 square feet of protected riparian buffers in Zone 2 (105,629 square feet of mitigation) shall be required for U3615B. In accordance with 15A NCAC 02B.0252, riparian vegetation reestablishment shall include a minimum of at least 2 native hardwood tree species planted at a density sufficient to provide 320 trees per acre at maturity. All on-site mitigation sites shall be protected in perpetuity by a conservation easement or through NCDOT fee simple acquisition and recorded in the NCDOT Natural Environment Unit mitigation geodatabase.

401 condition 24

The permittee shall monitor the buffer mitigation site. Monitoring shall consist of stem counts. An annual report shall be submitted to NCDWR for a period of 5 years showing monitoring results, survival rate/ success of tree and vegetation establishment, and that diffuse flow through the riparian buffer has been maintained. The first annual report shall be submitted within one year of final planting. Failure to achieve a buffer density of 320 trees per acre after 5 years will require the annual report to provide appropriate remedial actions to be implemented and a schedule for implementation. Approval of the final annual report, and a formal “close out” of the mitigation site by NCDWR is required.

401 condition 25

Compensatory mitigation for 303,069 square feet of riparian buffers in Zone 1 and 105,629 square feet in riparian buffer Zone 2 shall be required for U3615B. We understand that 45,810 square feet of protected riparian buffer in Zone 1 and 29,829 square feet of protected riparian buffer in Zone 2 are being performed on-site. We understand that you have chosen to perform compensatory mitigation for the remaining 257,259 square feet of riparian buffer in Zone 1 and 75,800 square feet of riparian buffer in Zone 2 to protected buffers through use of the North Carolina Ecosystem Enhancement Program (NCEEP). Mitigation for unavoidable impacts to Randleman Riparian Buffers shall be provided in the Cape Fear River Basin and done in accordance with 15A NCAC2B.0252. NCEEP has indicated in a letter dated August 20, 2013 that they will assume responsibility for satisfying the compensatory mitigation requirements for the above-referenced project, in accordance with NCEEP’s Mitigation Banking Instrument signed July 28, 2010.

Permit Modification:

No new special conditions were added.



DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

REPLY TO
ATTENTION OF

December 15, 2014

Regulatory Division/1200A

Action ID: SAW-1999-21179 TIP U-3615

Mr. Richard W. Hancock, P.E.
Environmental Management Director, PDEA
NC Department of Transportation
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Dear Mr. Hancock:

Reference is made to your Department of the Army (DA) permit issued on September 20, 2013, that authorized permanent discharge of fill impacts to 2538 linear feet of jurisdictional stream channels, an additional 150 linear feet of temporary stream channel impact, permanently impact 0.82 acre of jurisdictional wetlands, and 0.04 acre of open water adjacent to tributaries of West Fork Deep River, associated with the proposed widening of SR 1003 (North Main Street) & SR 1820 (Skeet Club Road) from US 311 to NC 68 in Guilford County, North Carolina.

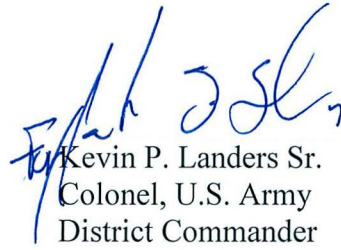
Reference also your written request of November 20, 2014, for a modification to your DA permit to authorize changes to impacts to jurisdictional waters as defined by plans included in your request associated with proposed construction changes for Site 2a, 5a, and 6. These changes include reducing open water fill impacts at 2a and 5a from 0.04 acre to 0.01 acre and reducing mechanized clearing of wetlands impacts at site 6 by 0.01 acre. (New permanent impact, 0.81 acre of jurisdictional wetlands and 0.01 acre of open water)

We have determined that the proposed changes/modifications to the construction plans including temporary/permanent impacts to jurisdictional waters are minor. Therefore, a supplemental public notice is not necessary. The permit is hereby modified to include the change in impacts to jurisdictional waters as described in the referenced provided construction plans included with your November 20, 2014, modification request. It is understood that all other conditions of the original permit and previous modifications remain applicable, including the permit expiration date of December 31, 2023.

If the permitted work is not completed on or before the date herein specified, the authorization, if not previously revoked or specifically further extended, will cease and become null and void. If additional time is required to complete the project, you should contact this office with a request for an additional time extension.

Should you have questions, please contact Mr. John Thomas, Raleigh Regulatory Field Office, telephone (919) 554-4884 extension 25.

Sincerely,


Kevin P. Landers Sr.
Colonel, U.S. Army
District Commander

U.S. ARMY CORPS OF ENGINEERS
Wilmington District
Compensatory Mitigation Responsibility Transfer Form

Permittee: North Carolina Department of Transportation

Action ID: SAW- 199921179

Project Name: SR 1003 (North Main St) & SR 1820 (Skeet Club Road) from US 311 to NC 68 TIP U-3615b

County: Guilford

Instructions to Permittee: The Permittee must provide a copy of this form to the Mitigation Sponsor, either an approved Mitigation Bank or the North Carolina Ecosystem Enhancement Program (NCEEP), who will then sign the form to verify the transfer of the mitigation responsibility. Once the Sponsor has signed this form, it is the Permittee's responsibility to ensure that to the U.S. Army Corps of Engineers (USACE) Project Manager identified on page two is in receipt of a signed copy of this form before conducting authorized impacts, unless otherwise specified below. If more than one mitigation Sponsor will be used to provide the mitigation associated with the permit, or if the impacts and/or the mitigation will occur in more than one 8-digit Hydrologic Unit Code (HUC), multiple forms will be attached to the permit, and the separate forms for each Sponsor and/or HUC must be provided to the appropriate mitigation Sponsors.

Instructions to Sponsor: The Sponsor must verify that the mitigation requirements shown below are available at the identified site. By signing below, the Sponsor is accepting full responsibility for the identified mitigation, regardless of whether or not they have received payment from the Permittee. Once the form is signed, the Sponsor must update the appropriate ledger and provide a copy of the signed form to the Permittee and to the USACE Bank/In-Lieu Fee Program Manager. The Sponsor must also comply with all reporting requirements established in their authorizing instrument.

Permitted Impacts and Compensatory Mitigation Requirements:

Permitted Impacts Requiring Mitigation* 8-digit HUC and Basin: 03030003, Cape Fear River Basin

Stream Impacts (linear feet)			Wetland Impacts (acres)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-riverine	Non-Riparian	Coastal
1228				0.81		

*If more than one mitigation sponsor will be used for the permit, only include impacts to be mitigated by this sponsor.

Compensatory Mitigation Requirements: 8-digit HUC and Basin: 03030003 Cape Fear River Basin

Stream Mitigation (credits)			Wetland Mitigation (credits)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-riverine	Non-Riparian	Coastal
1680				1.62		

Mitigation Site Debited: NCEEP

(List the name of the bank to be debited. For umbrella banks, also list the specific site. For NCEEP, list NCEEP. If the NCEEP acceptance letter identifies a specific site, also list the specific site to be debited).

Section to be completed by the Mitigation Sponsor

Statement of Mitigation Liability Acceptance: I, the undersigned, verify that I am authorized to approve mitigation transactions for the Mitigation Sponsor shown below, and I certify that the Sponsor agrees to accept full responsibility for providing the mitigation identified in this document (see the table above), associated with the USACE Permittee and Action ID number shown. I also verify that released credits (and/or advance credits for NCEEP), as approved by the USACE, are currently available at the mitigation site identified above. Further, I understand that if the Sponsor fails to provide the required compensatory mitigation, the USACE Wilmington District Engineer may pursue measures against the Sponsor to ensure compliance associated with the mitigation requirements.

Mitigation Sponsor Name: _____

Name of Sponsor's Authorized Representative: _____

Signature of Sponsor's Authorized Representative

Date of Signature

**USACE Wilmington District
Compensatory Mitigation Responsibility Transfer Form, Page 2**

Conditions for Transfer of Compensatory Mitigation Credit:

- Once this document has been signed by the Mitigation Sponsor and the USACE is in receipt of the signed form, the Permittee is no longer responsible for providing the mitigation identified in this form, though the Permittee remains responsible for any other mitigation requirements stated in the permit conditions.
- Construction within jurisdictional areas authorized by the permit identified on page one of this form can begin only after the USACE is in receipt of a copy of this document signed by the Sponsor, confirming that the Sponsor has accepted responsibility for providing the mitigation requirements listed herein. For authorized impacts conducted by the North Carolina Department of Transportation (NCDOT), construction within jurisdictional areas may proceed upon permit issuance; however, a copy of this form signed by the Sponsor must be provided to the USACE within 30 days of permit issuance. NCDOT remains fully responsible for the mitigation until the USACE has received this form, confirming that the Sponsor has accepted responsibility for providing the mitigation requirements listed herein.
- Signed copies of this document must be retained by the Permittee, Mitigation Sponsor, and in the USACE administrative records for both the permit and the Bank/ILF Instrument. It is the Permittee's responsibility to ensure that the USACE Project Manager (address below) is provided with a signed copy of this form.
- If changes are proposed to the type, amount, or location of mitigation after this form has been signed and returned to the USACE, the Sponsor must obtain case-by-case approval from the USACE Project Manager and/or North Carolina Interagency Review Team (NCIRT). If approved, higher mitigation ratios may be applied, as per current District guidance and a new version of this form must be completed and included in the USACE administrative records for both the permit and the Bank/ILF Instrument.

Comments/Additional Conditions:

This form is not valid unless signed by the mitigation Sponsor and USACE Project Manager. For questions regarding this form or any of the conditions of the permit authorization, contact the Project Manager at the address below.

USACE Project Manager: John Thomas
USACE Field Office: Raleigh Regulatory Field Office
US Army Corps of Engineers
3331 Heritage Trade Drive, Suite 105
Wake Forest, North Carolina 27587
Email: john.t.thomas.jr@saw02.usace.army.mil



USACE Project Manager Signature

January 5, 2015
Date of Signature

Current Wilmington District mitigation guidance, including information on mitigation ratios, functional assessments, and mitigation bank location and availability, and credit classifications (including stream temperature and wetland groupings) is available at <http://ribits.usace.army.mil>.



North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

John E. Skvarla, III
Secretary

December 8, 2014

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

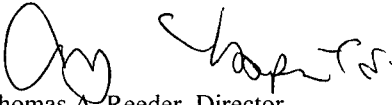
Subject: Modification to the 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act and Randleman Lake Watershed Buffer Rules, with Additional Conditions for proposed improvements and widening from SR 1003 (North Main Street) and SR 1820 (Skeet Club Road) to NC 68 in High Point, Guilford County, Division 7; Federal Aid Project No. STP-1820(2), TIP No. U-3615B. NCDWR Project No. 2013-0477 v.3

Dear Mr. Hancock:

Attached hereto is a modification of Certification No. 3966 issued to The North Carolina Department of Transportation (NCDOT) originally dated June 28, 2013 and subsequently modified and dated August 29, 2013.

If we can be of further assistance, do not hesitate to contact us.

Sincerely,


Thomas A. Reeder, Director
Division of Water Resources

Attachments

Electronic copy only distribution:

Dave Bailey, US Army Corps of Engineers, Raleigh Field Office
Jerry Parker, Division 7 Environmental Officer
Colin Mellor, NC Department of Transportation
Rachelle Beauregard, NC Department of Transportation
Dr. Cynthia Van Der Wiele, US Environmental Protection Agency
Gary Jordan, US Fish and Wildlife Service
Travis Wilson, NC Wildlife Resources Commission
Jason Elliott, NCDOT, Natural Environment Section
Beth Harmon, Ecosystem Enhancement Program
Dave Wanucha, NC Division of Water Resources Winston Salem Regional Office
File Copy

1617 Mail Service Center, Raleigh, North Carolina 27699-1617
Phone: 919-807-6300 \ Internet: www.ncdenr.gov

An Equal Opportunity \ Affirmative Action Employer

**Modification to the 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act
and RANDLEMAN BUFFER RULES with ADDITIONAL CONDITIONS**

THIS CERTIFICATION is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Resources (NCDWR) Regulations in 15 NCAC 2H .0500 and 15A NCAC 2B .0250 for Randleman. This certification authorizes the NCDOT to modify impacts to jurisdictional wetlands, open waters and protected riparian buffers in Guilford County. The project shall be constructed pursuant to the modification dated November 20, 2014. The authorized impact modifications are as described below for U-3615B.

Table 1. Modified Wetland Impacts in the Cape Fear River Basin for U-3615B.

Site	Fill (ac)	Fill (temporary) (ac)	Excavation (ac)	Mechanized Clearing (ac)	Hand Clearing (ac)	Total Wetland Impact (ac)
Original approved impacts at Site 5	<0.01	-	-	0.01	-	0.01
Modified impacts with this approval at Site 5	<0.01	-	-	0.01	-	0.01
Original approved impacts at Site 6	<0.01	-	-	<0.01	-	<0.01
Modified impacts with this approval at Site 6	0.00	-	-	0.00	-	0.00

Total Wetland Impact for all Sites plus Modification: 0.81 acres (originally 0.82 acres).

Table 2. Modified Open Water Impacts in the Cape Fear River Basin for U-3615B.

Site	Permanent Fill in Open Waters (ac)	Temporary Fill in Open Waters (ac)	Total Fill in Open Waters (ac)
Original approved impacts at Site 5A	0.02	-	0.02
New additional impacts with this approval at Site 5A	0.01	-	0.01
Total	0.03	-	0.03

Total Open Water Impact for all Sites plus Modification: 0.03 acres (originally 0.04 acres).

Table 3. Modified Randleman Riparian Buffer Impacts for U-3615B.

Site	Zone 1 Buffer Impacts (sq ft)	Zone 1 Buffer Mitigation Required (using 3:1 ratio)	Zone 2 Buffer Impacts (sq ft)	Zone 2 Buffer Mitigation Required (using 1.5:1 ratio)
Site 1, Originally approved impacts	3,854	0	1,931	0
Site 1, Modified impacts	5,869	0	1,671	0
Site 2, Originally approved impacts	4,787	0	2,292	0
Site 2, Modified impacts	3,975	0	2,546	0
Site 2 (parallel), Originally approved impacts	36,705	110,115	22,604	33,906
Site 2 (parallel), Modified impacts	31,061	93,183	13,632	20,448
Site 2A, Originally approved impacts	1,369	4,107	9,662	14,493
Site 2A, Modified impacts	2,456	7,368	5,717	8,575.5
Site 5, Originally approved impacts	8,784	0	5,141	0
Site 5, Modified impacts	8,562	0	4,228	0
Site 5 (parallel), Originally approved impacts	175	525	877	1,315.5
Site 5 (parallel), Modified impacts	0	0	0	0
Totals for Modification (change from original)	-3,751	-14,196	-14,713	-20,691
Totals for all sites plus this Modification	134,594	-	78,899	-

Total Buffer Impact for U-3615B for all Sites plus Modification: 213,493 square feet.

Table 4. Total Modified Mitigable Buffer Impacts for U-3615B.

All sites including this modification	Zone 1 Buffer (sq ft)	Zone 2 Buffer (sq ft)
	96,291	56,625

The application provides adequate assurance that the discharge of fill material into the waters of the Cape River Basin in conjunction with the proposed development will not result in a violation of applicable Water Quality Standards and discharge guidelines. Therefore, the State of North Carolina certifies that this activity will not violate the applicable portions of Sections 301, 302, 303, 306, 307 of PL 92-500 and PL 95-217 if conducted in accordance with the application and conditions hereinafter set forth.

This approval is only valid for the purpose and design that you submitted in your modified application dated received November 20, 2014. All the authorized activities and conditions of certification associated with the original Water Quality Certification dated June 28, 2013 and August 29, 2013 still apply except where superseded by this certification. Should your project change, you are required to 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 any additional wetland impacts, or stream impacts, for this project (now or in the future) exceed one acre or 150 linear feet, respectively, additional 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 .0248. For this approval to remain valid, you are required to comply with all the conditions listed below. In addition, you should obtain all other federal, state or local permits before proceeding with your project including (but not limited to) Sediment and Erosion control, Coastal Stormwater, Non-discharge and Water Supply watershed regulations. This Certification shall expire on the same day as the expiration date of the corresponding Corps of Engineers Permit.

Condition(s) of Certification:

1. This modification is applicable only to the additional proposed activities. All of the authorized activities and conditions of certification associated with the original Water Quality Certification dated June 28, 2013 and subsequent modification dated August 29, 2013 still apply except where superseded by this certification.

Violations of any condition herein set forth may result in revocation of this Certification and may result in criminal and/or civil penalties. This Certification shall become null and void unless the above conditions are made conditions of the Federal 404 and/or Coastal Area Management Act Permit. This Certification shall expire upon the expiration of the 404 or CAMA permit.

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 DENR as follows:

Mr. John Evans, General Counsel
Department of Environment and Natural Resources
1601 Mail Service Center

This the 8th day of December, 2014

DIVISION OF WATER RESOURCES



Thomas A. Reeder, Director
Division of Water Resources



North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

John E. Skvarla, III
Secretary

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, 1650 Mail Service Center, Raleigh, NC, 27699-1650. 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 _____

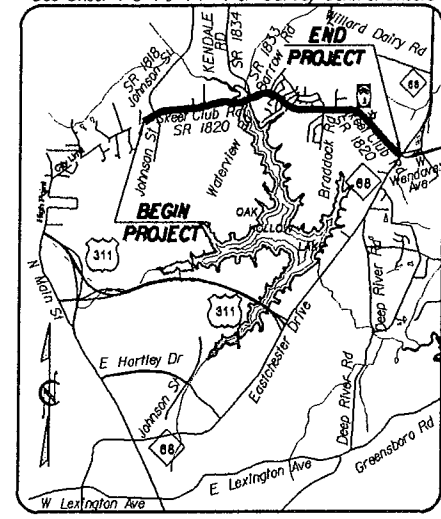
See Sheet 1-A For Index of Sheets
 See Sheet 1-B For Conventional Symbols
 See Sheet 1-C To 1-F For Survey Control Sheets

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

GUILFORD COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3615B	1	
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
34962.1.1	STP-1820(2)	P.E.	
34962.2.3	STP-1820(5)	RAW, UTL.	
34962.3.FD1	STP-1820(5)	CONST.	

TIP PROJECT: U-3615B



VICINITY MAP

LOCATION: HIGH POINT - SR 1820 (SKEET CLUB ROAD) FROM EAST OF SR 1818 (JOHNSON STREET) TO WEST OF NC 68 (EASTCHESTER DRIVE).

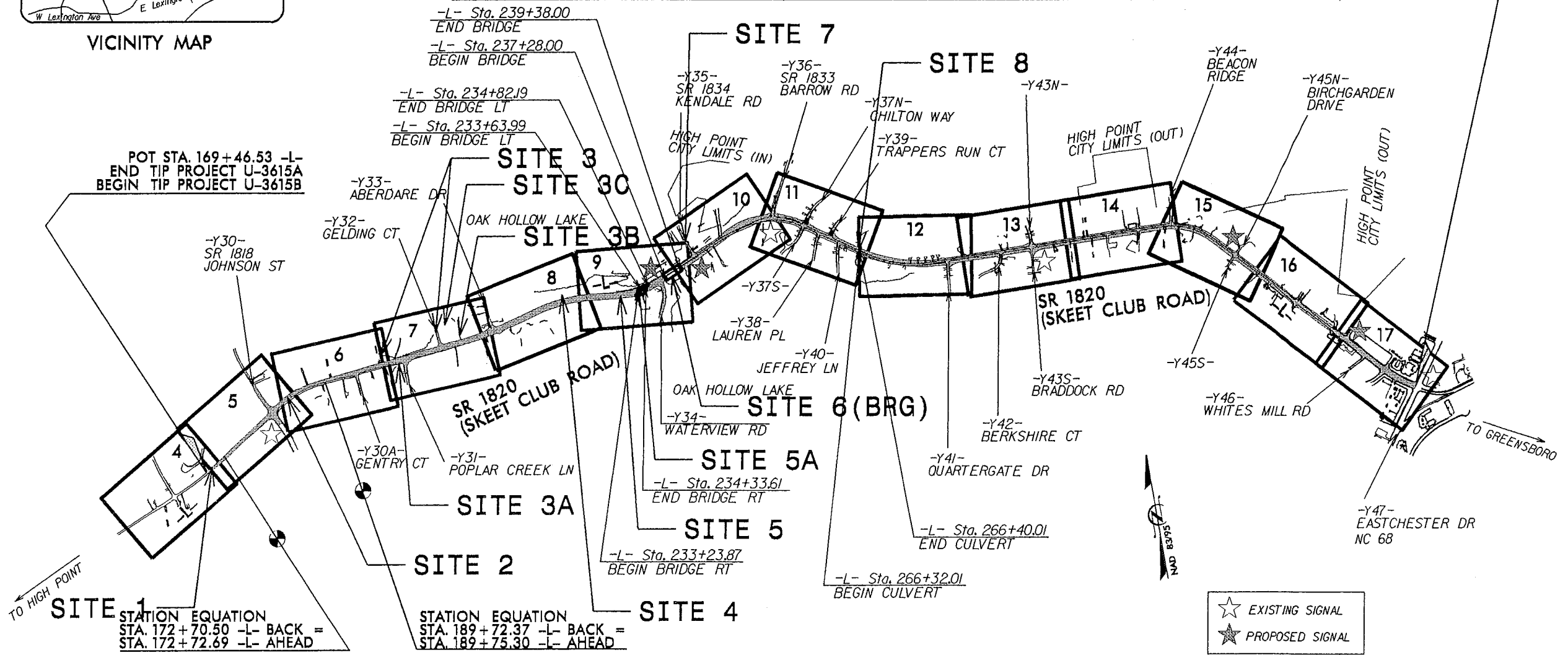
TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNALS, STRUCTURES, CULVERT, RETAINING WALLS

Permit Drawing
 Sheet 1 of 27

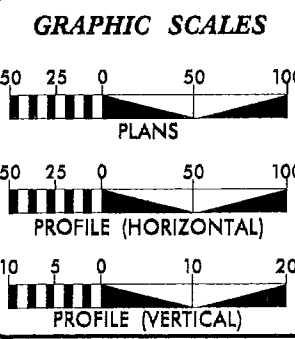
Revised 10/29/14

WETLAND AND SURFACE WATER IMPACTS PERMIT

STA. 348+41.04 -L- END TIP PROJECT U-3615B



CONTRACT: C203256



DESIGN DATA

ADT 2015 = 24540
ADT 2035 = 34700
K = 10 %
D = 60 %
T = 5 % *
V = 50 MPH
* (TTST = 2% + DUAL 3%)
FUNC CLASS =
URBAN MINOR ARTERIAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-3615B = 3.326 MI
LENGTH STRUCTURE TIP PROJECT U-3615B = 0.062 MI
TOTAL LENGTH OF TIP PROJECT U-3615B = 3.388 MI

Prepared for the North Carolina Department of Transportation in the Office of:
 259 JONES FARMWAY ROAD
 SUITE 104
 WELLSVILLE, N.C. 27668
 Phone: 919 858 8077
 Fax: 919 851 8107

WETHERILL ENGINEERING

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: APRIL 27, 2009

LETTING DATE: JANUARY 20, 2015

NC DOT CONTACT: BRENDA L. MOORE, PE
 ROADWAY DESIGN ENGINEERING
 COORDINATION SECTION PROJECT ENGINEER

HYDRAULICS ENGINEER

EDWARD G. WETHERILL, PE
 PROJECT ENGINEER

GREG S. PURVIS, PE
 PROJECT DESIGN ENGINEER

BRENDA L. MOORE, PE
 ROADWAY DESIGN ENGINEERING
 COORDINATION SECTION PROJECT ENGINEER

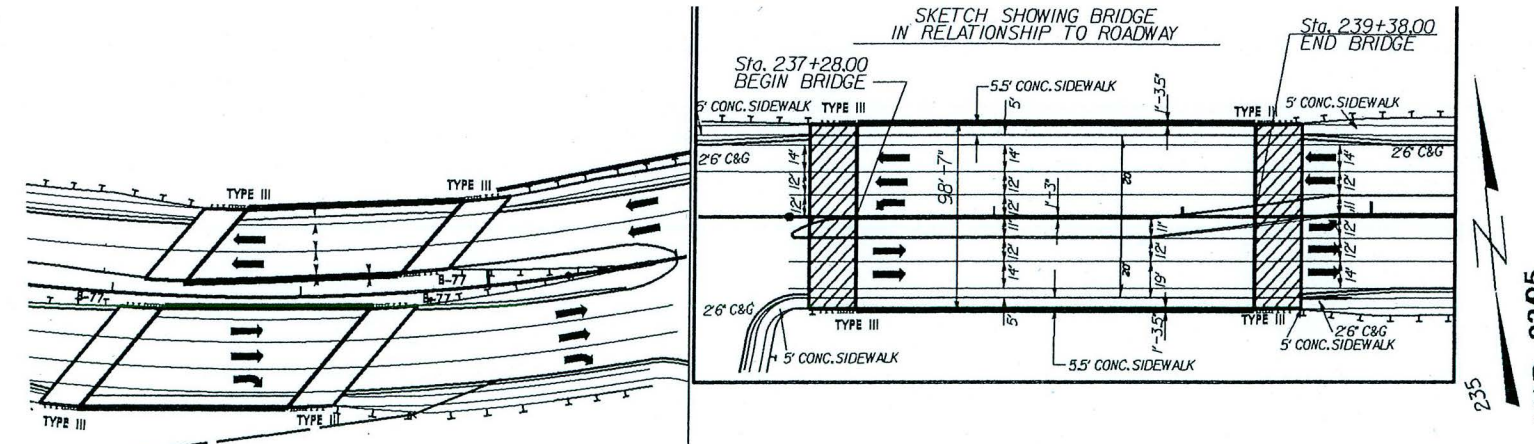
ROADWAY DESIGN ENGINEER

GREG S. PURVIS, PE

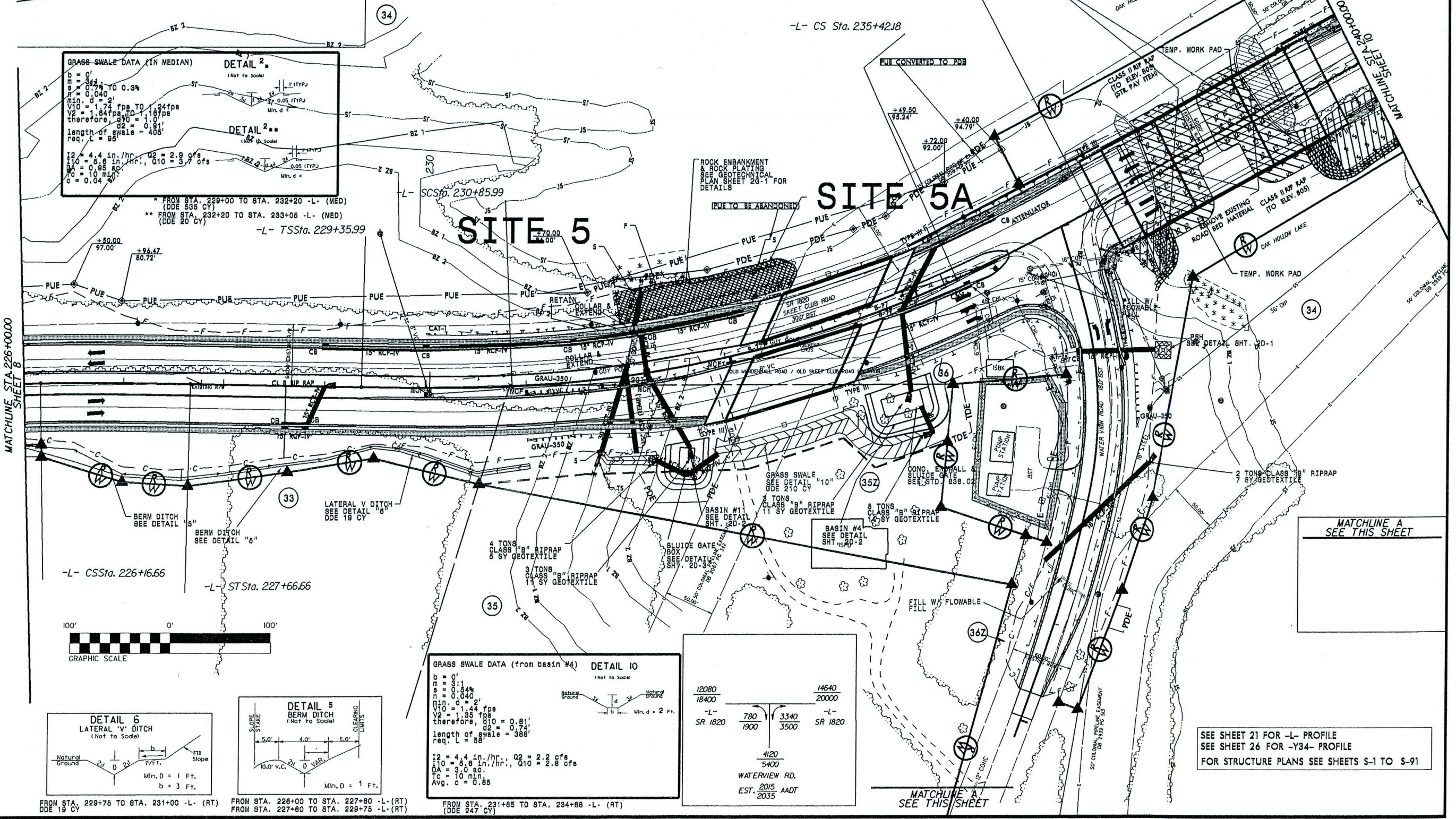
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 \$\$\$DESIGN\$\$\$\$\$
 \$\$\$USERNAME\$\$\$\$\$

Revised 10/28/14
 Permit Drawing
 Sheet 16 of 27

U-3615B
 RW SHEET NO. 9
 ROADWAY DESIGN ENGINEER
 HYDRAULICS ENGINEER
PRELIMINARY PLANS
 DO NOT USE FOR CONSTRUCTION
 WETHERILL ENGINEERING
 559 Jones Franklin Rd., Suite 164
 Raleigh, N.C. 27604
 License No. 7-0377
 Tel: 919 851 8077
 Fax: 919 851 8107
 TRANSPORTATION PLANNING/DESIGN
 BRIDGE/STRUCTURE DESIGN
 CIVIL/SITE DESIGN
 GS/GPS
 CONSTRUCTION OBSERVATION



SITE 6



GRASS SWALE DATA (IN MEDIAN) DETAIL 2
 (Not to Scale)
 $b = 0'$
 $s = 0.34$
 $c = 0.040$
 $V10 = 1.74 \text{ fps TO } 2.4 \text{ fps}$
 $V2 = 1.84 \text{ fps TO } 1.87 \text{ fps}$
 therefore $Q2 = 0.81'$
 length of swale = 406'
 req. L = 88'

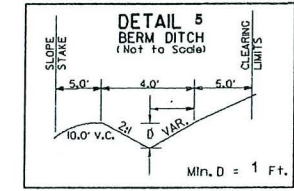
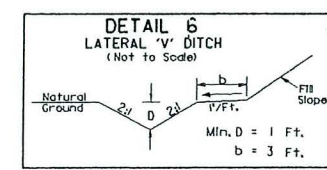
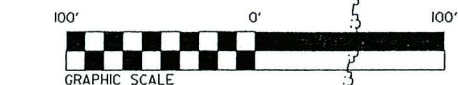
DETAIL 2**
 (Not to Scale)
 $i2 = 4.4 \text{ in./hr.}$, $Q2 = 2.8 \text{ cfs}$
 $i10 = 5.6 \text{ in./hr.}$, $Q10 = 3.7 \text{ cfs}$
 $DA = 0.85 \text{ ac.}$
 $TC = 10 \text{ min.}$
 $c = 0.04$

* FROM STA. 229+00 TO STA. 232+20 -L- (MED)
 (DDE 836 CY)
 ** FROM STA. 232+20 TO STA. 233+05 -L- (MED)
 (DDE 20 CY)
 -L- TSS Sta. 229+35.99

GRASS SWALE DATA (from basin #4) DETAIL 10
 (Not to Scale)
 $b = 0'$
 $s = 0.34$
 $c = 0.040$
 $V10 = 1.74 \text{ fps}$
 $V2 = 1.83 \text{ fps}$
 therefore $Q2 = 0.81'$
 length of swale = 388'
 req. L = 88'

$i2 = 4.4 \text{ in./hr.}$, $Q2 = 2.2 \text{ cfs}$
 $i10 = 5.6 \text{ in./hr.}$, $Q10 = 2.8 \text{ cfs}$
 $DA = 3.0 \text{ ac.}$
 $TC = 10 \text{ min.}$
 $c = 0.05$

12080	14640
18400	20000
-L-	-L-
SR 1820	SR 1820
780	3340
1900	3500
4120	
5400	
WATERVIEW RD.	
EST. 2015 AADT	
2035	



FROM STA. 229+75 TO STA. 231+00 -L- (RT)
 DDE 18 CY
 FROM STA. 226+00 TO STA. 227+80 -L- (RT)
 FROM STA. 227+80 TO STA. 228+75 -L- (RT)

FROM STA. 231+85 TO STA. 234+68 -L- (RT)
 (DDE 247 CY)

SEE SHEET 21 FOR -L- PROFILE
 SEE SHEET 26 FOR -Y34- PROFILE
 FOR STRUCTURE PLANS SEE SHEETS S-1 TO S-91

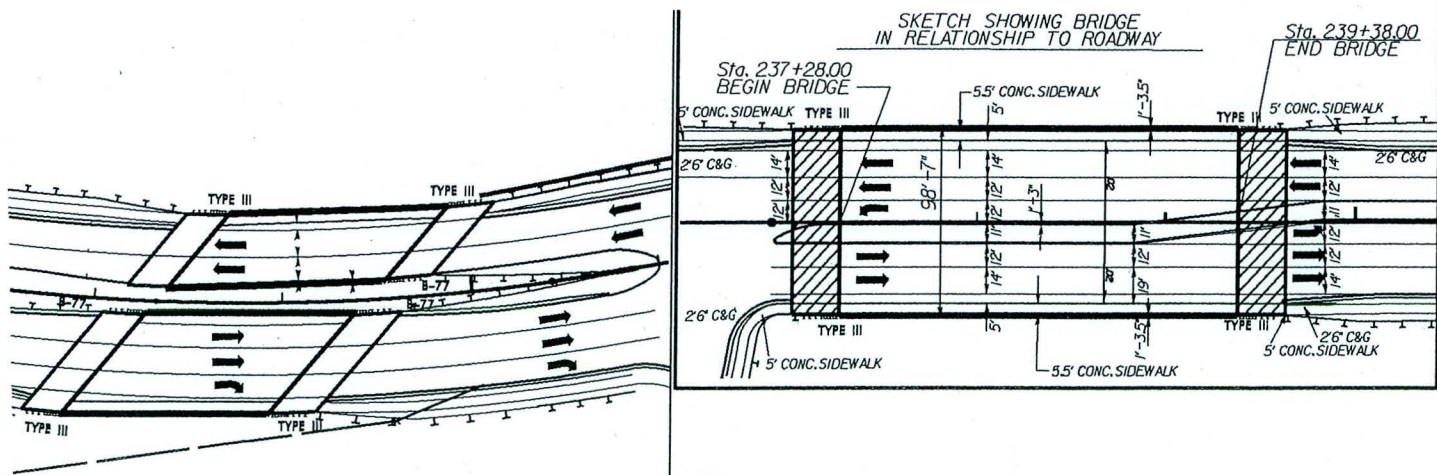
REVISIONS

8/17/14
 SYSTEMS
 DESIGN
 GROUP

8/17/14

Permit Drawing
Sheet 17 of 27
Revised 10/20/14

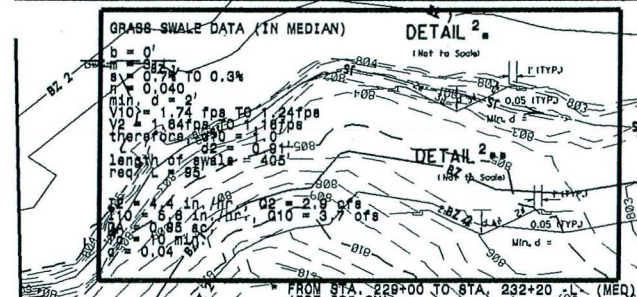
PROJECT REFERENCE NO. U-3615B		SHEET NO. 9
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
		559 Jones Franklin Rd. Suite 164 Raleigh, N.C. 27604 License No. A-2377 Bus: 919 851 8077 Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN BRIDGE STRUCTURE DESIGN CIVIL/SITE DESIGN GS/GPS CONSTRUCTION OBSERVATION		



NAD 83/95

-L- STSta. 236+92.18
SITE 6

-L- CS Sta. 235+42.18



SITE 5

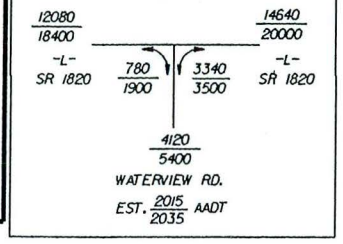
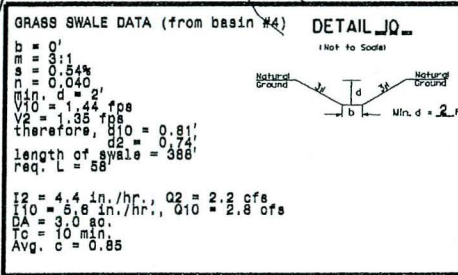
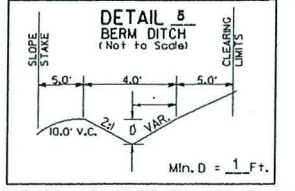
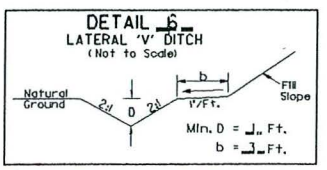
SITE 5A

MATCHLINE STA. 226+00.00
SHEET 8

MATCHLINE A
SEE THIS SHEET

-L- CSSta. 226+16.66

-L- STSta. 227+66.66



MATCHLINE A
SEE THIS SHEET

SEE SHEET 21 FOR -L- PROFILE
SEE SHEET 26 FOR -Y34- PROFILE
FOR STRUCTURE PLANS SEE SHEETS S-1 TO S-91

RW SHEET NO. U-3615B

ROADWAY DESIGN ENGINEER
Permit Drawing
Sheet 19 of 27

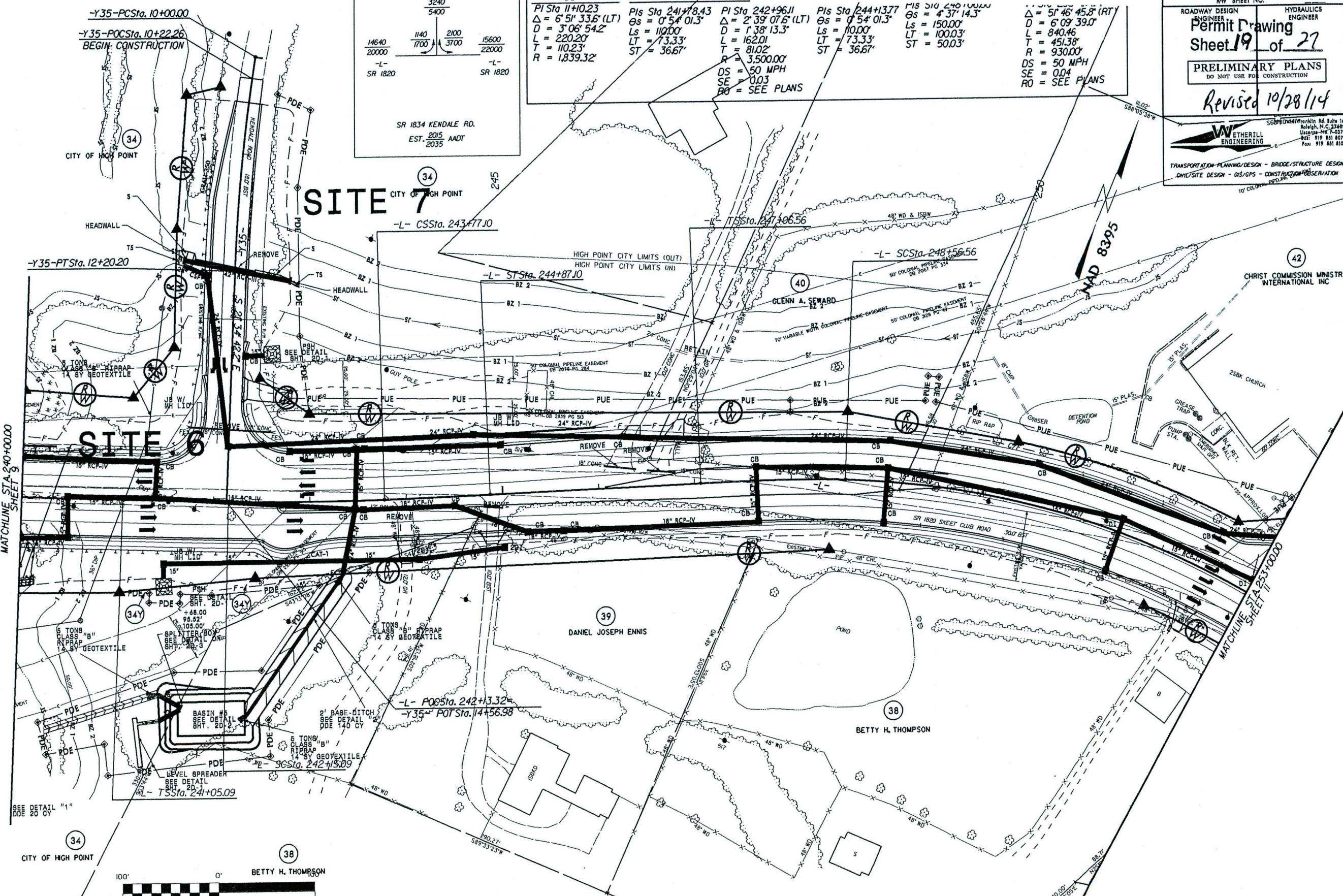
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Revised 10/28/14

ETHERILL ENGINEERING
14011 Franklin Rd. Suite 144
Raleigh, N.C. 27616
Phone: 919.831.8077
Fax: 919.831.8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
GULF/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

$\Delta = 6' 51'' 33.6'' (LT)$ $D = 3' 06'' 54.2''$ $L = 220.20'$ $T = 110.23'$ $R = 1,839.32'$	$\Delta = 2' 39'' 07.6'' (LT)$ $D = 1' 38'' 13.3''$ $L = 162.01'$ $T = 81.02'$ $R = 3,500.00'$	$\Delta = 2' 39'' 07.6'' (LT)$ $D = 1' 38'' 13.3''$ $L = 162.01'$ $T = 81.02'$ $R = 3,500.00'$	$\Delta = 4' 37'' 14.3''$ $L = 150.00'$ $T = 75.00'$ $R = 500.00'$
---	--	--	---

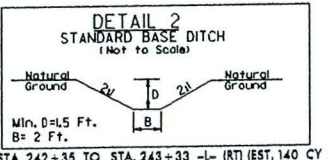
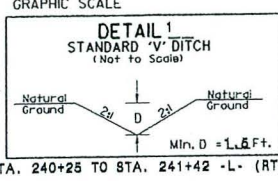


REVISIONS

8/17/14

MATCHLINE STA 240+00.00 SHEET 9

MATCHLINE STA 253+00.00 SHEET 11



S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SEE SHEET 21 FOR -L- PROFILE
SEE SHEET 26 FOR -Y35- PROFILE
SEE SHEET 2B-5 FOR SCENARIOS ALIGNMENT 2 DETAIL

FROM STA. 240+25 TO STA. 241+42 -L- (RT) (DDE 20 CY)

FROM STA. 242+35 TO STA. 243+33 -L- (RT) (EST. 140 CY EXC.)

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	170+67 -L-	2@66" RCP						0.01	<0.01	119	16	
2	180+59/188+46 -L-	RELOCATE CHANNEL						2.20		594	10	
2A	487+00/488+46 -L-	ROCK FILL IN POND						0.02				
3	197+50/204+26-L-	NAT. STREAM DESIGN								699	10	760
3A	199+27/199+95 -L-	2@54" RCP						<0.01	<0.01	38	10	
3B	208+63 -L-	48" RCP BANK STABILIZATION						<0.01	<0.01	109	4	
3C	201+27/204+76 -L-	NAT. STREAM DESIGN			0.67			<0.01		63		
4	218+72/219+72 -L-	2@30" RCP	0.13		<0.01							
5	231+60/232+27-L-	30" RCP	<0.01			0.01		<0.01		131	16	
5A	232+87/236+40 -L-	ROCK FILL IN LAKE						0.01				
6	237+28/239+38 -L-	BRIDGE						0.19	0.29			
SUBTOTALS:			0.13		0.67	0.01		2.45	0.30	1763	66	760

Note: Site 2A has been eliminated due to Roadway Design eliminating two travel lanes and median.

Revised 1/23/14

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GUILDFORD COUNTY

WBS - 34962.1.1 (U-3615B)
SHEET *26 of 27* Rev'd 10/28/14

4/9/2013

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)
7	12+20 -Y35-	42" RCP						<0.01	<0.01	49	19	
8	266+36 -L-	8'X8' RCBC						0.03	<0.01	186	32	
		BANK STABILIZATION								101		
SHEET 1 SUBTOTALS:			0.13		0.67	0.01		2.45	0.30	1763	66	760
SHEET 2 SUBTOTALS:								0.03	<0.01	336	51	
TOTALS:			0.13		0.67	0.01		2.48	0.31	2099	117	760

BRIDGE SURFACE WATER TEMPORARY IMPACTS = 0.29 a.c. (Work Pads)

Revised 10/28/14

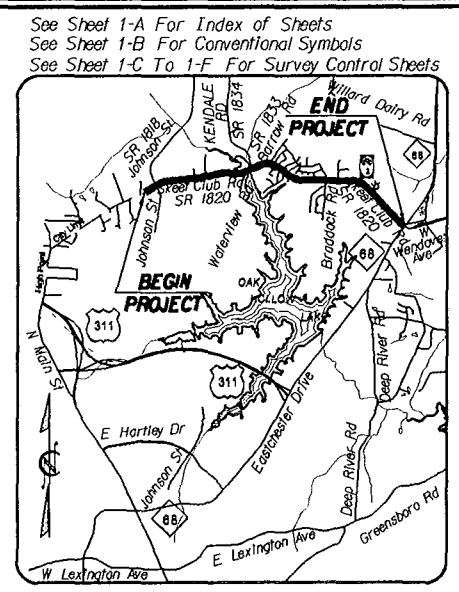
NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GUILDFORD COUNTY

WBS - 34962.1.1 (U-3615B)

TIP PROJECT: U-3615B

CONTRACT: C203256



VICINITY MAP
 SITE 2B
 SITE 2A
 POT STA. 169+46.53 -L-
 END TIP PROJECT U-3615A
 BEGIN TIP PROJECT U-3615B

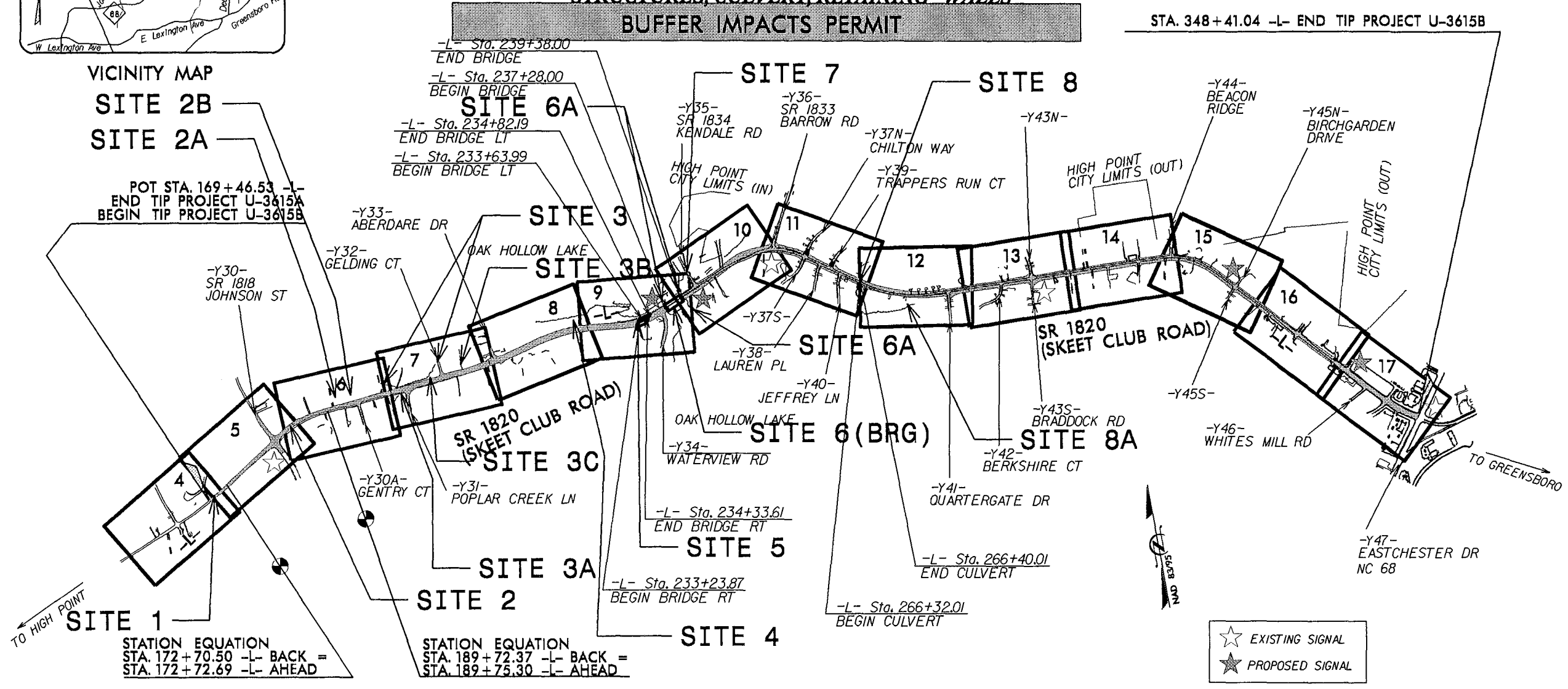
STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS
GUILFORD COUNTY

Revised
 10/28/14
 Buffer Drawing
 Sheet 1 of 13

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3615B	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34962.1.1	STP-1820(2)	P.E.	
34962.2.3	STP-1820(5)	RW, UTL.	
34962.3.FD1	STP-1820(5)	CONST.	

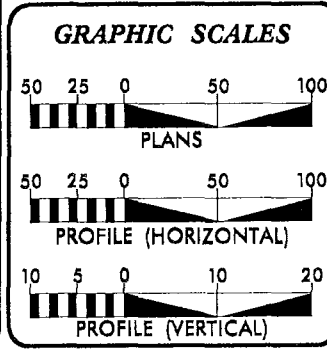
LOCATION: HIGH POINT - SR 1820 (SKEET CLUB ROAD) FROM EAST OF SR 1818 (JOHNSON STREET) TO WEST OF NC 68 (EASTCHESTER DRIVE).

TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNALS, STRUCTURES, CULVERT, RETAINING WALLS
BUFFER IMPACTS PERMIT



STATION EQUATION
 STA. 172+70.50 -L- BACK =
 STA. 172+72.69 -L- AHEAD

STATION EQUATION
 STA. 189+72.37 -L- BACK =
 STA. 189+75.30 -L- AHEAD



DESIGN DATA

ADT 2015 = 24540
 ADT 2035 = 34700

K = 10 %
 D = 60 %
 T = 5 % *
 V = 50 MPH

* (TTST = 2% + DUAL 3%)
 FUNC CLASS =
 URBAN MINOR ARTERIAL
 SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-3615B = 3.326 MI
 LENGTH STRUCTURE TIP PROJECT U-3615B = 0.062 MI
 TOTAL LENGTH OF TIP PROJECT U-3615B = 3.388 MI

WETHERILL ENGINEERING
 Prepared for the North Carolina Department of Transportation in the Office of:
 889 JONES FUNKIN ROAD
 SUITE 204
 WASHINGTON, NC 27686
 License No. A-0377
 Tel: 919 881 8077
 Fax: 919 881 8107

2012 STANDARD SPECIFICATIONS
 RIGHT OF WAY DATE: APRIL 27, 2009
 LETTING DATE: JANUARY 20, 2015
 NCDOT CONTACT:

EDWARD G. WETHERILL, PE
 PROJECT ENGINEER

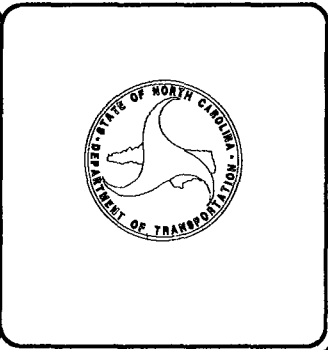
GREG S. PURVIS, PE
 PROJECT DESIGN ENGINEER

BRENDA L. MOORE, PE
 ROADWAY DESIGN ENGINEERING
 COORDINATION SECTION PROJECT ENGINEER

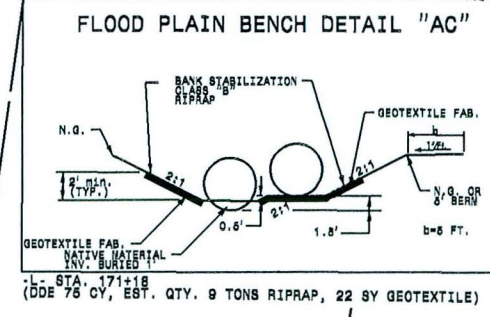
HYDRAULICS ENGINEER

ROADWAY DESIGN ENGINEER

Professional Engineer Seals for Edward G. Wetherill, PE (012575) and Greg S. Purvis, PE (022999).



PROJECT REFERENCE NO. U-3615B		SHEET NO. 4	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
		559 Jones Franklin Rd. Suite 164 Raleigh, N.C. 27605 Licenses No. P-0377 Bus. 919 831 8077 Fax. 919 831 8107	
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION			



-L- PI Sta 158+44.07 Es = 0' 22' 00" Ls = 96.00' LT = 64.00' ST = 32.00'	-L- PI Sta 163+70.31 Es = 0' 33' 00" Ls = 96.00' LT = 64.00' ST = 32.00'	-L- PI Sta 167+89.17 Δ = 8' 50' 54.9" (LT) D = 1' 08' 45.3" L = 772.19' T = 386.86' R = 5,000.00' DS = 50 MPH SE = 0.02 RO = SEE PLANS	-L- TEMP PI Sta 171+59.42 Δ = 6' 27' 19.5" (LT) D = 1' 31' 04" L = 425.31' T = 212.89' R = 3,775.00' DS = 50 MPH SE = 0.02 RO = SEE PLANS
---	---	---	--



Buffer Drawing
Sheet 2 of 13
Revised 10/29/14

-L- STA. 169+46.53 POC
END TIP PROJECT U-3615A
BEGIN TIP PROJECT U-3615B

ZONE 1
ALLOWABLE

ZONE 2
ALLOWABLE

BEGIN CONSTRUCTION SITE 1
-L- TEMP POC STA. 169+46.53
OFFSET = 21.07' RT.

ZONE 2
ALLOWABLE

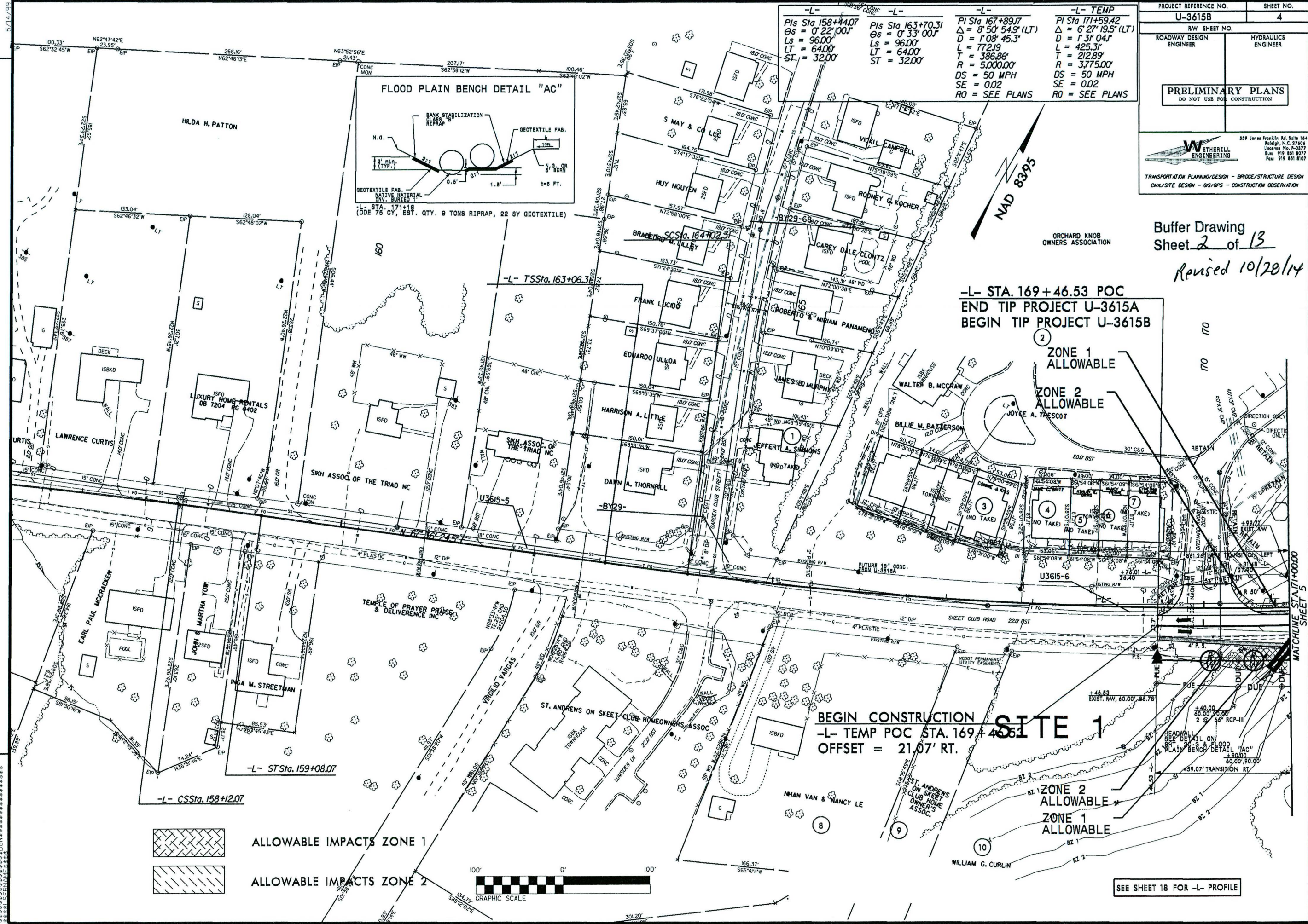
ZONE 1
ALLOWABLE

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2



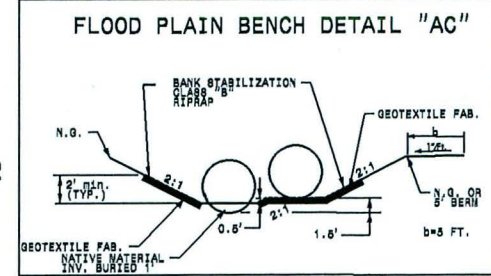
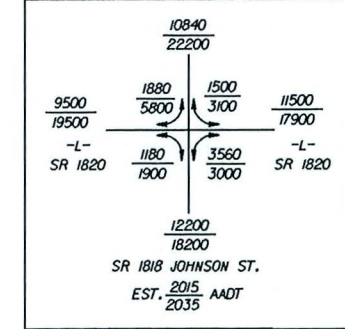
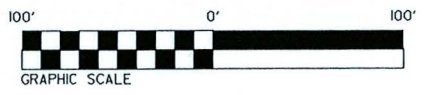
SEE SHEET 18 FOR -L- PROFILE

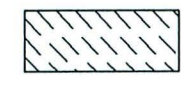
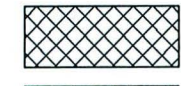




REVISIONS

MATCHLINE STA. 171+00.00
SHEET 5

8/17/99



-  ALLOWABLE IMPACTS ZONE 2
-  MITIGABLE IMPACTS ZONE 1
-  MITIGABLE IMPACTS ZONE 2
-  ALLOWABLE IMPACTS ZONE 1

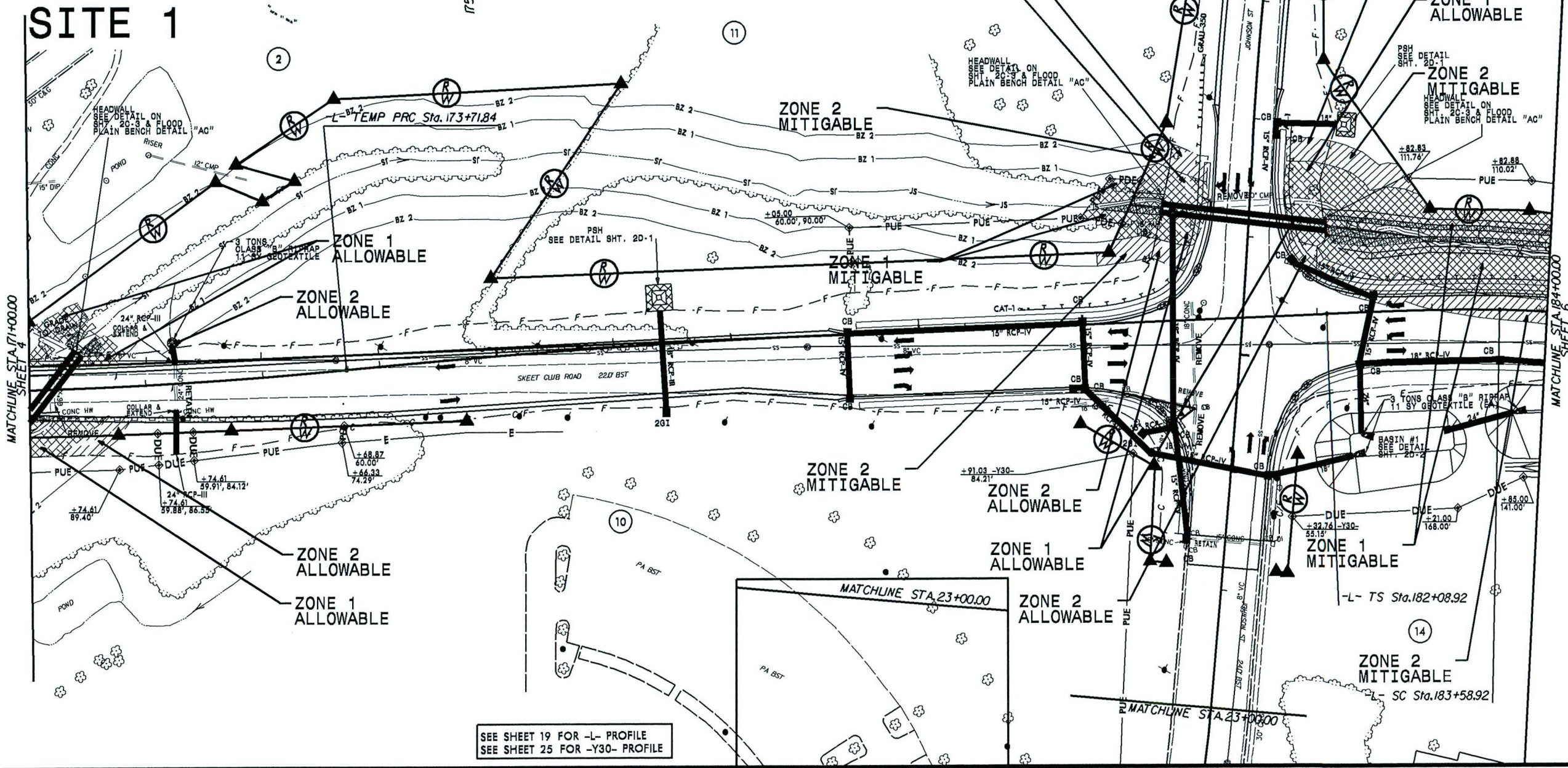
L- STA. 171+18 (DDE 78 CV, EST. QTY. 9 TONS RIPRAP, 22 SY GEOTEXTILE)
 -Y30- STA. 18+83 (DDE 85 CV, EST. QTY. 16 TONS RIPRAP, 39 SY GEOTEXTILE)

Revised 11/17/14

PROJECT REFERENCE NO.	U-3615B	5
RDW SHEET NO.		
ROADWAY DESIGN ENGINEER	Buffer Drawing	HYDRAULICS ENGINEER
	Sheet 3 of 13	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		

ETHERILL ENGINEERING
 559 Jones Franklin Rd, Suite 164
 Raleigh, N.C. 27604
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 Fax: 919 881 8107

REVISIONS



SEE SHEET 19 FOR -L- PROFILE
 SEE SHEET 25 FOR -Y30- PROFILE

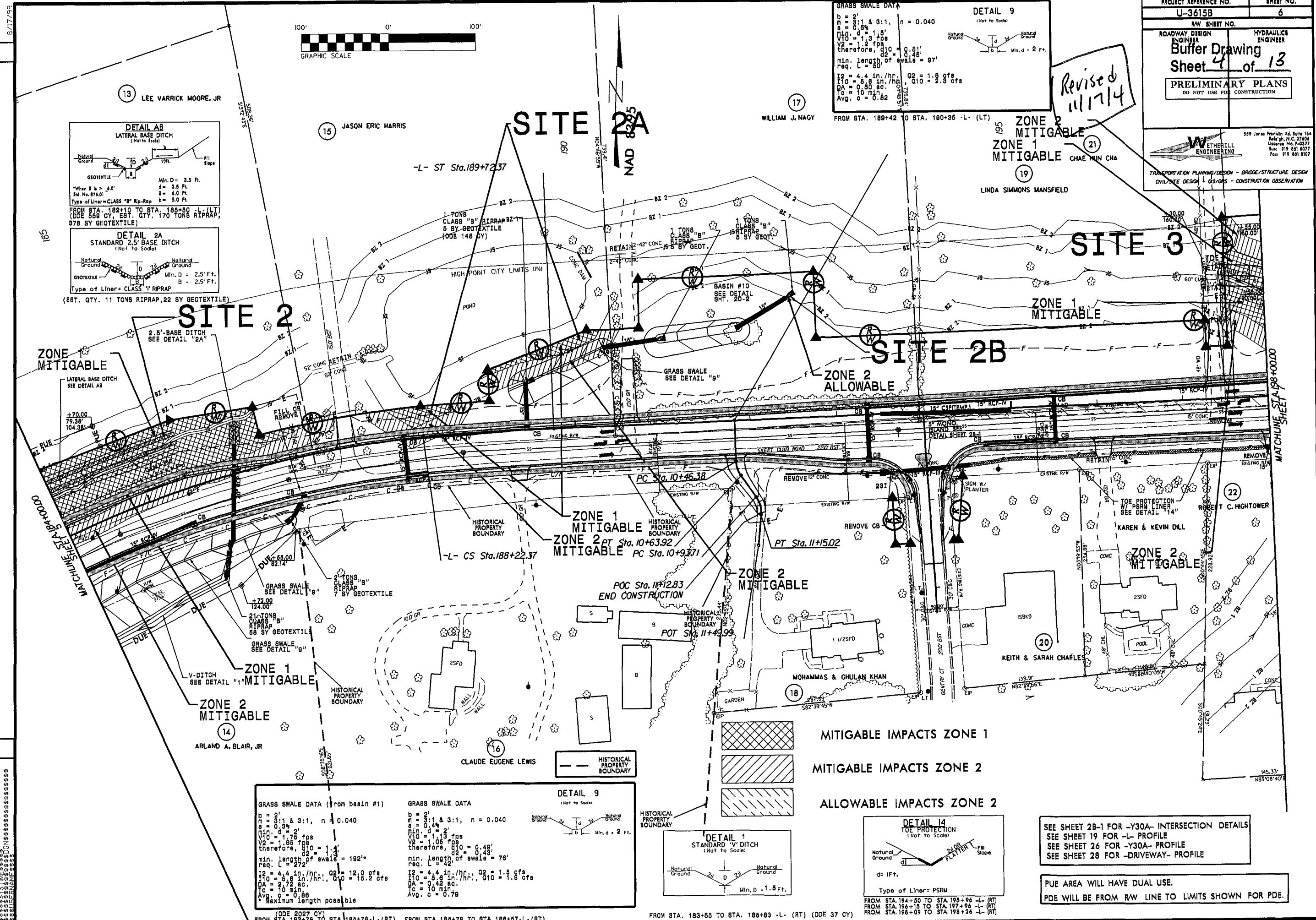
DETAIL 9
 (Not to Scale)

GRASS SWALE DATA
 $b = 2'$
 $m = 3:1$ & $3:1$, $n = 0.040$
 $a = 0.8'$
 $V10 = 1.2$ fps
 $V2 = 1.2$ fps
 therefore, $Q10 = 0.51'$
 $Q2 = 0.48'$
 min. length of swale = 97'
 req. L = 97'

$Q2 = 1.8$ cfs
 $Q10 = 2.3$ cfs

$I2 = 4.4$ in./hr., $Q2 = 1.8$ cfs
 $I10 = 6.8$ in./hr., $Q10 = 2.3$ cfs
 $DA = 0.60$ ac.
 $Tc = 10$ min.
 Avg. $c = 0.82$

Revised
11/17/14



DETAIL AB
 LATERAL BASE DITCH
 (Not to Scale)

Min. D = 3.5 Ft.
 $d = 3.5$ Ft.
 $B = 6.0$ Ft.
 $b = 5.0$ Ft.

FROM STA. 182+10 TO STA. 185+80 -L- (LT)
 (DDE 558 CY, EST. QTY. 170 TONS RIPRAP,
 378 SY GEOTEXTILE)

DETAIL 2A
 STANDARD 2.5' BASE DITCH
 (Not to Scale)

Min. D = 2.5' Ft.
 $B = 2.5'$ Ft.

(EST. QTY. 11 TONS RIPRAP, 22 SY GEOTEXTILE)

GRASS SWALE DATA (from basin #1)

$b = 2'$
 $m = 3:1$ & $3:1$, $n = 0.040$
 $a = 0.8'$
 $V10 = 1.2$ fps
 $V2 = 1.2$ fps
 therefore, $Q10 = 1.4'$
 $Q2 = 0.48'$
 min. length of swale = 192'
 req. L = 192'

$I2 = 4.4$ in./hr., $Q2 = 1.2$ cfs
 $I10 = 6.8$ in./hr., $Q10 = 1.6$ cfs
 $DA = 2.72$ ac.
 $Tc = 10$ min.
 Avg. $c = 0.88$
 * Maximum length possible

(DDE 2027 CY)
 FROM STA. 185+78 TO STA. 186+78 -L- (RT) FROM STA. 186+78 TO STA. 186+67 -L- (RT)

DETAIL 9
 (Not to Scale)

GRASS SWALE DATA

$b = 2'$
 $m = 3:1$ & $3:1$, $n = 0.040$
 $a = 0.8'$
 $V10 = 1.2$ fps
 $V2 = 1.2$ fps
 therefore, $Q10 = 0.48'$
 $Q2 = 0.43'$
 min. length of swale = 78'
 req. L = 42'

$I2 = 4.4$ in./hr., $Q2 = 1.5$ cfs
 $I10 = 6.8$ in./hr., $Q10 = 1.8$ cfs
 $DA = 0.42$ ac.
 $Tc = 10$ min.
 Avg. $c = 0.79$

DETAIL 1
 STANDARD 'V' DITCH
 (Not to Scale)

Min. D = 1.5 Ft.

DETAIL 14
 TOE PROTECTION
 (Not to Scale)

d = 1 FT.

Type of Liner = PSM

FROM STA. 194+50 TO STA. 195+96 -L- (RT)
 FROM STA. 196+15 TO STA. 197+96 -L- (RT)
 FROM STA. 198+09 TO STA. 198+26 -L- (RT)

SEE SHEET 2B-1 FOR -Y30A- INTERSECTION DETAILS
 SEE SHEET 19 FOR -L- PROFILE
 SEE SHEET 26 FOR -Y30A- PROFILE
 SEE SHEET 28 FOR -DRIVEWAY- PROFILE

PUE AREA WILL HAVE DUAL USE.
 PDE WILL BE FROM RW LINE TO LIMITS SHOWN FOR PDE.

REVISIONS

DATE: 11/17/14
 TIME: 10:00 AM
 DRAWN BY: JAC
 CHECKED BY: JAC
 APPROVED BY: JAC

8/17/99

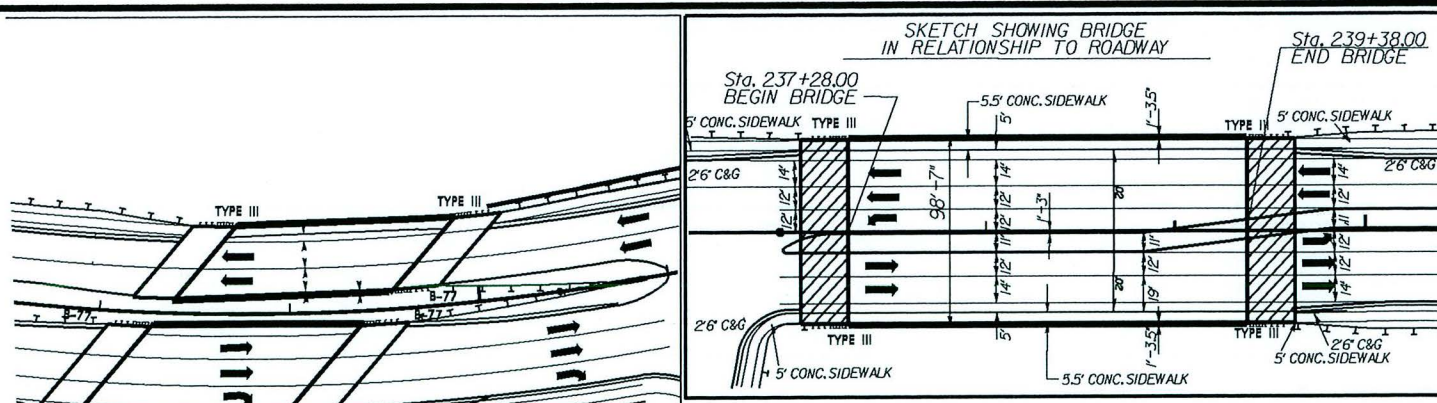
PROJECT REFERENCE NO.		SHEET NO.	
U-3415B		9	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS			
DO NOT USE FOR CONSTRUCTION			
WETHERILL ENGINEERING		559 Jones Franklin Rd. Suite 144 Raleigh, N.C. 27606 License No. F-0377 Bus. 919 851 8077 Fax: 919 851 8107	
TRANSPORTATION PLANNING/DESIGN BRIDGE/STRUCTURE DESIGN CIVIL/SITE DESIGN GIS/GPS CONSTRUCTION OBSERVATION			

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

Buffer Drawing
Sheet 8 of 13
Revised 11/17/14

SITE 6



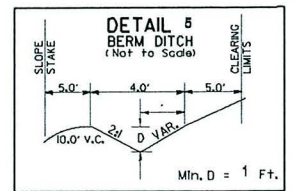
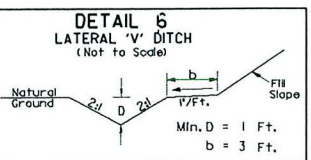
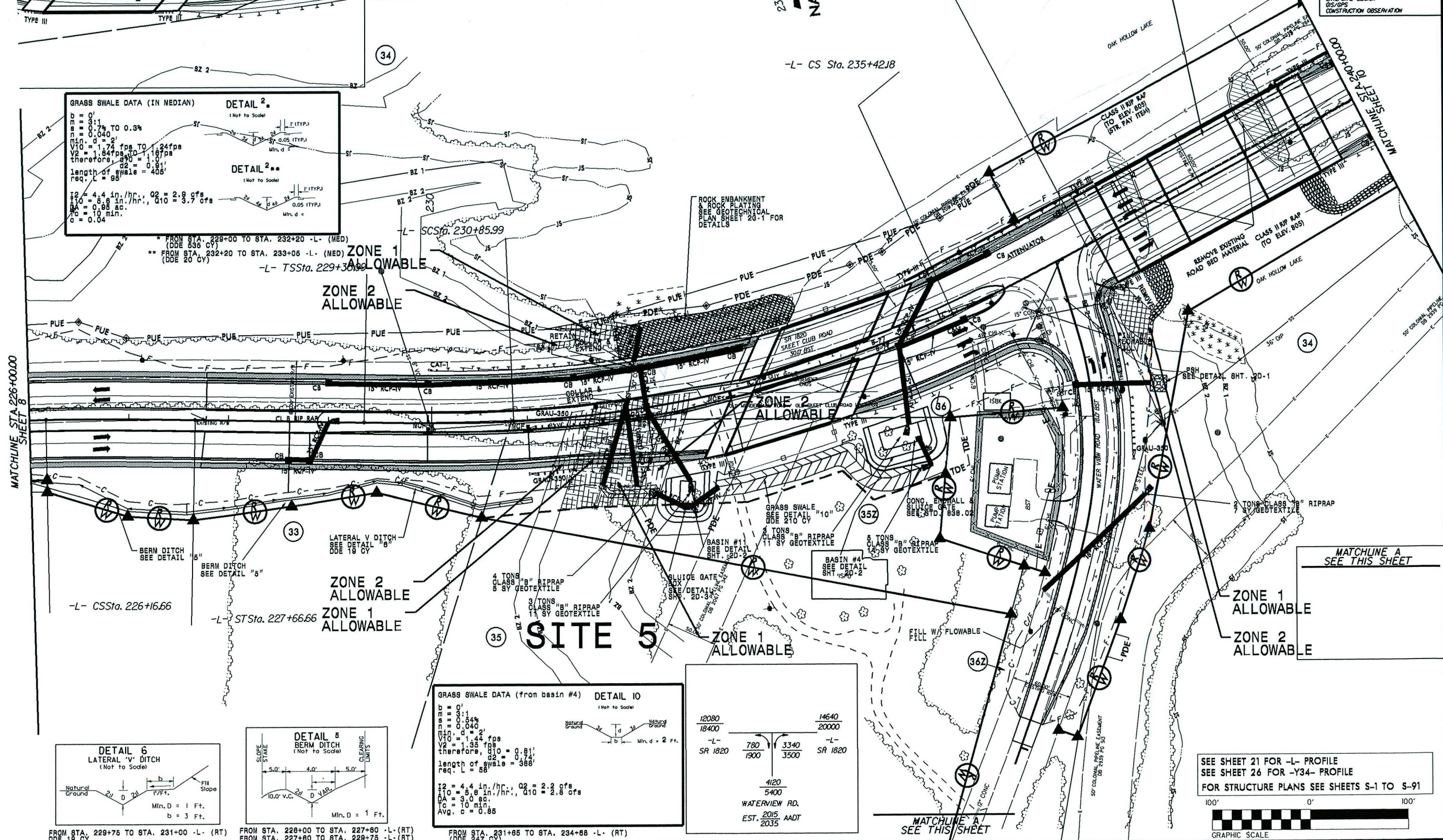
GRASS SWALE DATA (IN MEDIAN) DETAIL 2
(Not to Scale)

$b = 0'$
 $m = 0.7\%$ TO 0.3%
 $n = 0.040$
 $V10 = 1.74$ fps TO 24 fps
 $V2 = 1.84$ fps TO 1.87 fps
therefore, $Q2 = 0.81$
length of swale = $408'$
req. $L = 98'$

$I2 = 4.4$ in./hr., $Q2 = 2.9$ cfs
 $V10 = 5.8$ in./hr., $Q10 = 3.7$ cfs
 $DA = 0.98$ ac.
 $TA = 10$ min.
 $c = 0.04$

* FROM STA. 229+00 TO STA. 232+20 -L- (MED)
(DDE 536 CY)

** FROM STA. 232+20 TO STA. 233+05 -L- (MED)
(DDE 20 CY)



GRASS SWALE DATA (from basin #4) DETAIL 10
(Not to Scale)

$b = 0'$
 $m = 0.84\%$
 $n = 0.040$
 $V10 = 1.44$ fps
 $V2 = 1.35$ fps
therefore, $Q2 = 0.81$
length of swale = $388'$
req. $L = 58'$

$I2 = 4.4$ in./hr., $Q2 = 2.2$ cfs
 $V10 = 5.8$ in./hr., $Q10 = 2.8$ cfs
 $DA = 3.0$ ac.
 $TA = 10$ min.
 $c = 0.85$

12080	14640
18400	20000
-L- SR 1820	-L- SR 1820
780	3340
1900	3500
4120	
5400	
WATERVIEW RD.	
EST. 2015 AADT	
2035	

SEE SHEET 21 FOR -L- PROFILE
SEE SHEET 26 FOR -Y34- PROFILE
FOR STRUCTURE PLANS SEE SHEETS S-1 TO S-91

GRAPHIC SCALE

REVISIONS

DATE: 11/17/14
BY: [Signature]

BUFFER IMPACTS SUMMARY

SITE NO.	STATION (FROM/TO)	STRUCTURE SIZE / TYPE	IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE			ZONE 1 (ft ²)	ZONE 2 (ft ²)
			ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft ²)	ZONE 2 (ft ²)	TOTAL (ft ²)	ZONE 1 (ft ²)	ZONE 2 (ft ²)	TOTAL (ft ²)		
1	170+02/172+39 -L-	2 @66" RCP & 24"RCP	X			5869	1671						
2	180+10/187+26 -L-(LT)	RELOCATE CHANNEL	X		X	3975	2546		31061	13632			
2A	187+61/190+55-L-(LT)	ROADWAY FILL & GRASS SWALE			X				2456	5717			
2B	192+48 -L-(LT)	RIPRAP PAD			X		51						
3	197+50/205+22-L-(LT)	NAT. STREAM DESIGN			X				52487	31125		45810	29829
3A	198+75/200+23 -L-(RT)	2@54" RCP	X			2216	623						
3B	208+02/209+14 -L-(LT)	48" RCP	X			6967	4638						
3C	202+96-L-(LT)	LEVEL SPREADER			X		64						
4	221+87 /223+01-L-(LT)	2' BASE DITCH(BYPASS)			X	1166	998						
5	231+05/232+65-L-(LT&RT)	30" RCP	X			8562	4228						
SUBTOTALS=:						28755	14819		86004	50474		45810	29829

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

GUILFORD COUNTY
PROJECT: 34962.1.1 (U-3615B)

6/6/2013
Revised 11/17/2014
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BUFFER IMPACTS SUMMARY

SITE NO.	STATION (FROM/TO)	STRUCTURE SIZE / TYPE	IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE			ZONE 1 (ft ²)	ZONE 2 (ft ²)
			ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft ²)	ZONE 2 (ft ²)	TOTAL (ft ²)	ZONE 1 (ft ²)	ZONE 2 (ft ²)	TOTAL (ft ²)		
6	237+28 /239+38-L-	BRIDGE APPROACH	X			3478	1674						
6A	240+18/240+81 -L-(RT)	"V" DITCH (BYPASS)			X	1271	834						
7	11+52/12+86-L-(LT&RT)	42" RCP	X			3933	2411						
8	265+24/266+91-L-(LT&RT)	8'X8' RCBC	X						8902	4658			
8A	271+16/273+92 -L-(RT)	30" & 24" RCP	X			1226	2536		1385	1493			
SUBTOTALS=:	THIS SHEET					9908	7455		10287	6151			
SUBTOTALS=:	SHEET 1					28755	14819		86004	50474		45810	29829
TOTALS=:						38663	22274		96291	56625		45810	29829

N.C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS

 GUILFORD COUNTY
 PROJECT: 34962.1.1 (U-3615B)

 6/6/2013
 Revised 11/17/2014
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