STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J.R. "JOEY" HOPKINS
SECRETARY

November 21, 2024

MEMORANDUM TO: Division Environmental and Construction Units

FROM: Michael A. Turchy, ECAP Group Leader
Environmental Analysis Unit

SUBJECT: Environmental Permits for the proposed Widening of NC 24/27 from NC 740 in Albemarle in Stanly County to the Troy Bypass in Montgomery County, Divisions 8 & 10, **TIP Nos. R-2527, R-2530B, & B-4974.**

Please find enclosed the following permits for this project:

Agency	Permit Type	Permit Expiration
US Army Corps of Engineers Section 404 Clean Water Act Permit	Regional General Permit (RGP) 31 (for Final R-2527), November 13, 2024 • *Original RGP (for Final R-2530B & B-4974, Preliminary R-2527), May 2, 2019* • *RGP Renewal, May 20, 2021*	May 25, 2025
NC Division of Water Resources Section 401 Water Quality Certification	General Certification No. 4135 (for Final R-2527), November 4, 2024 • *Original Certification (for Final R-2530B & B-4974, Preliminary R-2527), April 3, 2019* • *Certification Renewal, June 8, 2021*	May 25, 2025

Work is authorized by the above referenced permit provided it is accomplished in strict accordance with the permitted plans. The Environmental Coordination and Permitting Group or the Division Environmental Office must be consulted if any deviation from the permit(s) is required.

The General Conditions and Certifications for Nationwide and Regional Permits can be referenced at: https://xfer.services.ncdot.gov/pdea/PermIssued/_General_Conditions_and_Certifications/

The Project Commitments "Greensheet" is located on the Preconstruction SharePoint Dashboard at: https://connect.ncdot.gov/site/preconstruction

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL ANALYSIS UNIT
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1598

Telephone: (919) 707-6000
Customer Service: 1-877-368-4968
Website: www.ncdot.gov

Location:
1000 BIRCH RIDGE DRIVE
RALEIGH NC 27610

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, WILMINGTON DISTRICT
WILMINGTON REGULATORY OFFICE
69 DARLINGTON AVENUE
WILMINGTON NORTH CAROLINA 28403

November 13, 2024

Regulatory Program/Division
SAW-2008-02315

Sent Via Email: ekcheely@ncdot.gov

Michael Turchy
Environmental Coordination & Permitting, Group Leader
North Carolina Department of Transportation,
1598 Mail Service Center
Raleigh, NC 27699-1598

Dear Mr. Turchy:

This letter is in response to the application you submitted to the Wilmington District, Charlotte Field Office on October 1, 2024 for a Department of the Army general permit verification. This project was assigned the file number SAW-2008-02315 and is known as R-2547 widening of NC 24/NC 27 from the Pee Dee River to the proposed Troy Bypass west of Troy in Montgomery County, North Carolina. This file number should be referenced in all correspondence concerning this project.

The R-2527 project is an 8.25-mile-long segment of NC 24/NC 27 and is the second and final phase of the NC 24/NC 27 widening project. Previous phases of the R-2527 project included the widening of a total of 14.6-mile-long segment of NC 24/NC 27 from the intersection of NC 740 and NC 24/NC 27 in Albemarle in Stanly County to Troy Bypass in Montgomery County. The recently completed first phase includes a 6.35-mile-long segment of NC 24/NC 27 that included both the R-2530B (road widening) and B-4979 (bridge maintenance) from the intersection of NC 24/NC 27 and NC 740 in Albemarle to NC 24/NC 27 bridge crossing of the Pee Dee River in Stanly County..

A review of the information provided indicates that the proposed work would include the widening of existing NC 24/NC 27 from a two-lane facility to a four-lane divided facility with a 46-foot depressed median from the Pee Dee River to the proposed Troy Bypass, west of Troy in Montgomery County. This project will include the permanent placement of fill/cut/structures in 0.63 acre of wetland, mechanical clearing of 0.37 acre of wetland, permanent placement of fill/structures/rock in 7,161 linear feet (lf) of streams, and the temporary placement of structures/materials in both 1,233 lf of streams and 0,01 acres of open water as part of the construction/dewatering activities associated with this project. The project area for this determination includes approximately 232 acres area as illustrated on the enclosed site plans/maps. The project/review area is located on and along an 8.25-mile-long segment of NC 24/NC 27 across several waterways including Pee Dee River, Rocky Creek, Cattail Creek, Dumas Creek, Clark Creek, Lick Fork, Smith Branch and the unnamed tributaries to these

waterways; from the NC 24/NC 27 crossing of the Pee Dee River to the intersection of NC 24/NC 27 and the Troy Bypass, at an approximate midpoint Latitude 35.313373 and Longitude -79.987111; near Troy, Montgomery County, North Carolina.

We have determined that the proposed work is authorized by Regional General Permit 31 (RGP-31) pursuant to authorities under Section 404 of the Clean Water Act (33 U.S.C § 1344). The proposed work must be accomplished in strict accordance with the enclosed general permit conditions, any regional conditions, the special conditions listed in this letter, the application materials, and the enclosed plans NCDOT R-2527, NC24-27 Widening, Montgomery County from NC 73 to Troy Bypass Sheets 1-91 of 91 and NCDOT R-2527 NC 24-27 Widening, Utilities Environmental Permit Plans, Montgomery County from NC 73 to Troy Bypass Sheets 1-5 of 5. If the extent of the project area and/or nature of the authorized impacts to waters are modified, a revised application must be submitted to this office for written approval before work is initiated. Any deviation from the terms and conditions of the permit, or your submitted plans, may subject the permittee to enforcement action.

This verification is valid until May 25, 2025, unless the subject general permit(s) is suspended, revoked, or is modified prior to that date such that the activity no longer complies with the terms and conditions of the general permit.

Project Specific Special Conditions:

1. **Work Limits:** All work authorized by this permit shall be performed in strict compliance with the attached permit plans, which are a part of this permit. The Permittee shall ensure that the construction design plans for this project do not deviate from the permit plans attached to this authorization. Any modification to the attached permit plans must be approved by the U.S. Army Corps of Engineers (Corps) prior to any active construction in waters or wetlands.

2. **Permit Distribution:** The Permittee shall require its contractors and/or agents to comply with the terms and conditions of this permit in the construction and maintenance of this project and shall provide each of its contractors and/or agents associated with the construction or maintenance of this project with a copy of this permit. A copy of this permit, including all conditions and drawings shall be available at the project site during construction and maintenance of this project.

3. **Pre-Construction Meeting:** The Permittee shall schedule and attend a preconstruction meeting between its representatives, the contractor's representatives, and the U.S. Army Corps of Engineers-NCDOT Regulatory Project Manager, prior to any work within jurisdictional waters and wetlands to ensure that there is a mutual understanding of all the terms and conditions contained with this Department of Army Permit. The Permittee shall provide the Corps-NCDOT Project Manager, with a copy of the final permit plans at least two weeks prior to the preconstruction meeting along with

a description of any changes that have been made to the project's design, construction methodology or construction timeframe. The Permittee shall schedule the preconstruction meeting for a timeframe when the Corps, NCDCM, and NCDWR Project Managers can attend. The Permittee shall invite the Corps, NCDCM, and NCDWR Project Managers a minimum of thirty (30) days in advance of the scheduled meeting in order to provide those individuals with ample opportunity to schedule and participate in the required meeting. The thirty (30) day requirement can be waived with the concurrence of the Corps.

4. **Sediment and Erosion Control:**

a. During the clearing phase of the project, heavy equipment shall not be operated in surface waters or stream channels. Temporary stream crossings will be used to access the opposite sides of stream channels. All temporary diversion channels and stream crossings will be constructed of non-erodible materials. Grubbing of riparian vegetation will not occur until immediately before construction begins on a given segment of stream channel.

b. No fill or excavation impacts for the purposes of sedimentation and erosion control shall occur within jurisdictional waters, including wetlands, unless the impacts are included on the plan drawings and specifically authorized by this permit. This includes, but is not limited to, sediment control fences and other barriers intended to catch sediment losses.

c. The Permittee shall remove all sediment and erosion control measures placed in waters and/or wetlands, and shall restore natural grades on those areas, prior to project completion.

d. The Permittee shall use appropriate sediment and erosion control practices which equal or exceed those outlined in the most recent version of the "North Carolina Sediment and Erosion Control Planning and Design Manual" to ensure compliance with the appropriate turbidity water quality standard. Erosion and sediment control practices shall be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to ensure compliance with the appropriate turbidity water quality standards. This shall include, but is not limited to, the immediate installation of silt fencing or similar appropriate devices around all areas subject to soil disturbance or the movement of earthen fill, and the immediate stabilization of all disturbed areas. Additionally, the project shall remain in full compliance with all aspects of the Sedimentation Pollution Control Act of 1973 (North Carolina General Statutes Chapter 113A Article 4). Adequate sedimentation and erosion control measures shall be implemented prior to any ground disturbing activities to minimize impacts to downstream aquatic resources. These measures shall be inspected and maintained regularly, especially following rainfall events. All fill material shall be adequately stabilized at the earliest practicable date to prevent sediment from entering into adjacent waters or wetlands.

5. **Clean Fill:** The Permittee shall use only clean fill material for this project. The fill material shall be free of items such as trash, construction debris, metal and plastic

products, and concrete block with exposed metal reinforcement bars. Soils used for fill shall not be contaminated with any toxic substance in concentrations governed by Section 307 of the Clean Water Act. Unless otherwise authorized by this permit, all fill material placed in waters or wetlands shall be generated from an upland source.

6. **Culverts:**

a. Unless otherwise requested in the application and depicted on the approved permit plans, culverts greater than 48 inches in diameter shall be buried at least one foot below the bed of the stream. Culverts 48 inches in diameter and less shall be buried or placed on the stream bed as practicable and appropriate to maintain aquatic passage, and every effort shall be made to maintain existing channel slope. The bottom of the culvert shall be placed at a depth below the natural stream bottom to provide for passage during drought or low flow conditions. Culverts shall be designed and constructed in a manner that minimizes destabilization and head cutting.

b. Measures shall be included in the culvert construction/installation that will promote the safe passage of fish and other aquatic organisms. The dimension, pattern, and profile of the stream above and below a culvert or pipe shall not be modified by widening the stream channel or by reducing the depth of the stream in connection with the construction activity. The width, height, and gradient of a proposed opening shall be such as to pass the average historical low flow and spring flow without adversely altering flow velocity. Spring flow should be determined from gauge data, if available. In the absence of such data, bankfull flow can be used as a comparable level.

c. The Permittee shall implement all reasonable and practicable measures to ensure that equipment, structures, fill pads, work, and operations associated with this project do not adversely affect upstream and/or downstream reaches. Adverse effects include, but are not limited to, channel instability, flooding, and/or stream bank erosion. The Permittee shall routinely monitor for these effects, cease all work when detected, take initial corrective measures to correct actively eroding areas, and notify this office immediately. Permanent corrective measures may require additional authorization by the U.S. Army Corps of Engineers.

d. Culverts placed within wetlands must be installed in a manner that does not restrict the flows and circulation patterns of waters of the United States. Culverts placed across wetland fills purely for the purposes of equalizing surface water shall not be buried, but the culverts must be of adequate size and/or number to ensure unrestricted transmission of water.

7. **Borrow and Waste:** To ensure that all borrow and waste activities occur on high ground and do not result in the degradation of adjacent waters and wetlands, except as authorized by this permit, the Permittee shall require its contractors and/or agents to identify all areas to be used as borrow and/or waste sites associated with this project. The Permittee shall provide the U.S. Army Corps of Engineers with appropriate maps indicating the locations of proposed borrow and/or waste sites as soon as such

information is available. The Permittee shall submit to the Corps site-specific information needed to ensure that borrow and/or waste sites comply with all applicable Federal requirements, to include compliance with the Endangered Species Act and the National Historic Preservation Act, such as surveys or correspondence with agencies (e.g., the USFWS, the NC-HPO, etc.). The required information shall also include the location of all aquatic features, if any, out to a distance of 400 feet beyond the nearest boundary of the site. The Permittee shall not approve any borrow and/or waste sites before receiving written confirmation from the Corps that the proposed site meets all Federal requirements, whether or not waters of the U.S., including wetlands, are located in the proposed borrow and/or waste site. All delineations of aquatic sites on borrow and/or waste sites shall be verified by the U.S. Army Corps of Engineers and shown on the approved reclamation plans. The Permittee shall ensure that all borrow and/or waste sites comply with **Special Condition 8** of this permit. Additionally, the Permittee shall produce and maintain documentation of all borrow and waste sites associated with this project. This documentation will include data regarding soils, vegetation, hydrology, any delineation(s) of aquatic sites, and any jurisdictional determinations made by the Corps to clearly demonstrate compliance with **Special Condition 8**. All information will be available to the U.S. Army Corps of Engineers upon request. The Permittee shall require its contractors to complete and execute reclamation plans for each borrow and/or waste site and provide written documentation that the reclamation plans have been implemented and all work is completed. This documentation will be provided to the U.S. Army Corps of Engineers within 30 days of the completion of the reclamation work.

8. Except as authorized by this permit or any U.S. Army Corps of Engineers approved modification to this permit, no excavation, fill, or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, within waters or wetlands, or shall any activities take place that cause the degradation of waters or wetlands. There shall be no excavation from, waste disposal into, or degradation of, jurisdictional wetlands or waters associated with this permit without appropriate modification of this permit, including appropriate compensatory mitigation. This prohibition applies to all borrow and waste activities connected with this project. In addition, except as specified in the plans attached to this permit, no excavation, fill or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, in such a manner as to impair normal flows and circulation patterns within, into, or out of waters or wetlands or to reduce the reach of waters or wetlands.

9. **Endangered Species Act:** The U.S. Fish and Wildlife Service's (USFWS's) Programmatic Conference Opinion (PCO) titled "NCDOT Program Effects on the Tricolored Bat in Divisions 1-8", dated November 20, 2023, contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that are specified in the PCO. Your authorization under this Corps permit is conditional upon your compliance with all the mandatory terms and conditions associated with incidental take of the PCO, which terms and conditions are incorporated by reference in this permit. Failure to comply with the terms and conditions associated with incidental take of the PCO, where a take of the listed species occurs, would

constitute an unauthorized take, and it would also constitute non-compliance with your Corps permit. The USFWS is the appropriate authority to determine compliance with the terms and conditions of its PCO, and with the ESA.

10. **Mitigation:** In order to compensate for impacts associated with this permit, mitigation shall be provided in accordance with the provisions outlined on the most recent version of the 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.

11. **Utility Installation/Relocations:**

a. Temporary Utility Impacts Restoration Measures**:** Within thirty (30) days of the date of completing the authorized work, the Permittee shall remove all temporary fills in waters of the United States and restore the affected areas to pre-construction contours and elevations. The affected areas shall be re-vegetated with native, non-invasive vegetation as necessary to minimize erosion and ensure site stability. In wetland areas where pipeline installation via trenching is authorized, wetland topsoil shall be segregated from the underlying subsoil, and the top 6 to 12 inches of the trench shall be backfilled with topsoil from the trench.

b. Cleared wetland areas shall be re-vegetated with a wetland seed mix or a mix of native woody species. Fescue grass or any invasive species such as *Lespedeza* spp., shall not be used within the wetland areas.

c. Prior to construction within any jurisdictional areas, the Permittee shall correctly install silt fencing (with or without safety fencing) parallel with the utility line corridor, on both sides of the jurisdictional crossing. This barrier is to serve both as an erosion control measure and a visual identifier of the limits of construction within any jurisdictional area. The Permittee shall maintain the fencing, at minimum, until the wetlands have re-vegetated and stabilized.

This general permit verification and any associated authorizations does not preclude the necessity to obtain any other Federal, State, or local permits, licenses, and/or certifications, which may be required.

If you have any questions related to this verification or have issues accessing documents referenced in this letter, please contact Stephen Brumagin, WRDA Project Manager of the Charlotte Field Office at (704) 798-6471, by mail at the above address, or by email at Stephen.a.brumagin@usace.army.mil. Please take a moment to complete our customer satisfaction survey located at https://regulatory.ops.usace.army.mil/customer-service-survey/.

Sincerely,

M. Scott Jones, PWS
WRDA / Transportation Branch Chief
USACE - Wilmington District

Enclosures

Cc (w/enclosures):

Jeffrey Hemphill, NCDOT (via jhemphill@ncdot.gov)
Erin Cheely, NCDOT (via ekcheely@ncdot.gov)

Compliance Certification Form

File Number: SAW-2008-02315 **County: Montgomery**

Permittee: North Carolina Department of Transportation, attn: Michael Turchy

Project Name: R-2547 widening of NC 24/NC 27 from the Pee Dee River to the proposed Troy Bypass west of Troy in Montgomery County, North Carolina

Date Verification Issued: 11/13/2024

Project Manager: Stephen Brumagin

Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification, and return it to the following address:

US ARMY CORPS OF ENGINEERS
Wilmington District
Attn: Stephen Brumagin
Charlotte Field Office
8430 University Executive Park Drive Suite 615
Charlotte, NC 28262
or
Stephen.a.brumagin@usace.army.mil

Please note that your permitted activity is subject to a compliance inspection by a U. S. Army Corps of Engineers representative. Failure to comply with any terms or conditions of this authorization may result in the Corps suspending, modifying, or revoking the authorization and/or issuing a Class I administrative penalty, or initiating other appropriate legal action.

I hereby certify that the work, and mitigation (if applicable), authorized by the above referenced permit has been completed in accordance with the terms and conditions of the said permit including any general or specific conditions.

Date Authorized Work Started: _____ **Completed: _____**

Describe any deviations from permit (attach drawing(s) depicting the deviations):

_____

_____

***Note: The description of any deviations on this form does not constitute approval by the Corps.**

_____ _____

Signature of Permittee **Date**

US Army Corps of Engineers – Wilmington District
Compensatory Mitigation Responsibility Transfer Form

Permittee: Michael Turchy **Action ID:** SAW-2008-02315
Project Name: R-2547 widening of NC 24/NC 27 from the Pee Dee River to the proposed Troy Bypass west of Troy in Montgomery County, North Carolina **County:** Montgomery

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 Division of Mitigation Services (NCDMS), 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 Wilmington District 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 verifies that the mitigation requirements (credits) shown below have been released and are available at the identified site. By signing below, the Sponsor is accepting full responsibility for the identified mitigation, regardless of whether they have received payment from the Permittee. Once the form is signed, the Sponsor must update the bank ledger and provide a copy of the signed form and the updated ledger to the Permittee, the Project Manager who issued the permit, the Bank Project Manager, and the District Mitigation Office (see contact information on page 2). 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: 03040104, Yadkin River Basin

Stream Impacts (linear feet)			Wetland Impacts (acres)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
7,161			1.0			

*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: 03040104, Yadkin River Basin

Stream Mitigation (credits)			Wetland Mitigation (credits)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
14,322			2.0			

Mitigation Site Debited: NCDMS

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 NCDMS), as approved by the Wilmington District, 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: NCDMS

Name of Sponsor's Authorized Representative: Beth Harmon

Elizabeth Harmon — 11/18/2024

Signature of Sponsor's Authorized Representative **Date of Signature**

Conditions for Transfer of Compensatory Mitigation Credit:

- Once this document has been signed by the Mitigation Sponsor and the District 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 District 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. When NCDMS provides mitigation 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 NCDMS must be provided to the District within 30 days of permit issuance. NCDOT remains fully responsible for the mitigation until the District 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 District 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 District, the Sponsor must obtain case-by-case approval from the District 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 District administrative records for both the permit and the Bank/ILF Instrument.

Comments/Additional Conditions:

NCDMS provided a letter dated September 12, 2024, indicating they would provide mitigation for 7,161 lf stream impacts and 1.0-acre wetland impacts.

This form is not valid unless signed below by the District Project Manager and by the Mitigation Sponsor on Page 1. ***Once signed, the Sponsor should provide copies of this form along with an updated bank ledger to: 1) the Permittee, 2) the District Project Manager at the address below, 3) the Bank Manager listed in RIBITS, and 4) the Wilmington District Mitigation Office, 3331 Heritage Trade Drive, Suite 105, Wake Forest, NC 27587 (or by email to SAWMIT@usace.army.mil)***. Questions regarding this form or any of the permit conditions may be directed to the District Mitigation Office.

USACE Project Manager: **Stephen Brumagin**
USACE Field Office: Charlotte Field Office
US Army Corps of Engineers
8430 University Executive Park Drive
Charlotte
Email: **Stephen.a.brumagin@usace.army.mil**

Digitally signed by
BRUMAGIN.STEPHEN.A.1283520737
Date: 2024.11.13 08:40:59 -05'00'

Wilmington District Project Manager Signature

November 13, 2024
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.

ROY COOPER
Governor
MARY PENNY KELLEY
Secretary
RICHARD E. ROGERS, JR.
Director

NORTH CAROLINA
Environmental Quality

November 4th, 2024
Stanley & Montgomery Counties
NCDWR Project No. 20181416.V4
NCDOT TIP Projects: R-2530B, B-4974, R-2527

APPROVAL of 401 WATER QUALITY CERTIFICATION with ADDITIONAL CONDITIONS

Mr. Jeffrey Hemphill
NCDOT Division 10- Environmental Coordinator
1598 Mail Service Center
Raleigh, NC 27699
jlhemphill@ncdot.gov

Dear Mr. Hemphill:
You have our approval, in accordance with the conditions listed below, for the following impacts regarding the widening of existing NC 24-27 between Albemarle and the Troy Bypass located in Stanley and Montgomery Counties.

R-2527 Stream Impacts in the Yadkin Pee-Dee River Basin

Site	Perm. Fill in Stream (linear ft)	Temp. Fill in Stream (linear ft)	Total Stream Impact (linear ft)	Stream Impacts Requiring Mitigation (linear ft)
	Fill	Fill		
4	267	31	298	
4A	8	57	65	
5	195	46	241	
6	74	0	74	
7	129	16	145	
7A	0	22	22	
10	160	22	182	
12	232	24	256	
15	0	17	17	
17	307	39	346	307
20	139	0	139	
22	211	23	234	

Site	Perm. Fill in Stream (linear ft)	Temp. Fill in Stream (linear ft)	Total Stream Impact (linear ft)	Stream Impacts Requiring Mitigation (linear ft)
23	294	40	334	
24	845	38	883	845
25	219	31	250	
28	240	0	240	
29	350	77	427	350
30	0	9	9	
32	208	48	256	
33	0	56	56	
34	27	11	38	
35	63	0	63	
36	31	9	40	
38	232	25	257	
39	301	54	355	301
44	259	42	301	
45	73	0	73	
47	213	93	306	
50	400	68	468	400
53	439	45	484	439
53A	559	97	656	559
54	328	106	434	328
57	13	53	66	
59	345	34	413	345
Totals	**7,161**	**1,233**	**8,394**	**3,874**

Total Stream Impacts: 8,394 linear feet.

R-2527 Wetland Impacts in the Yadkin Pee-Dee River Basin

Site	JD Site	Perm. Fill in wetlands (acres)	Excavation in Wetlands (acres)	Mechanized Clearing (acres)	Total Wetland Impact (acres)	Wetland Impacts Requiring Mitigation (acres)
1	WF	<0.01		<0.01	<0.01	<0.01
1A	WZZ			0.02	0.02	0.02
2	WYA	0.07		0.01	0.08	0.08
8	WH	<0.01			<0.01	<0.01
9	WJ	<0.01		<0.01	<0.03	<0.03
11	WR	0.03		0.03	0.03	0.03
13	WP	0.09			0.09	0.09
14	WM	<0.01		<0.01	<0.01	<0.01
16	WN	<0.01		<0.01	<0.01	<0.01
18	WV			0.02	0.02	0.02
19	WS	<0.01		0.03	0.03	0.03
21	WU	0.02			0.02	0.02
26	WT(N)	0.11			0.11	0.11
26	WT(S)	0.04		0.01	0.05	0.05
31	WU-2	0.10		0.03	0.13	0.13
35A	WYB	0.04	<0.01	0.02	0.06	0.06
35B	WYC	<0.01		<0.01	<0.01	<0.01
37	WZ-1	<0.01		<0.01	<0.01	<0.01
40	WKK	<0.01		<0.01	<0.01	<0.01
41	WMM	0.01		0.02	0.03	0.03
42	WLL			<0.01	<0.01	<0.01
45A	WYD	<0.01			<0.01	<0.01
46	WNN			<0.01	<0.01	<0.01
48	WHH	0.02			0.02	0.02
49	WFF			<0.01	<0.01	<0.01

Site	JD Site	Perm. Fill in wetlands (acres)	Excavation in Wetlands (acres)	Mechanized Clearing (acres)	Total Wetland Impact (acres)	Wetland Impacts Requiring Mitigation (acres)
49	WFF	<0.01		0.02	0.02	0.02
49	WFF			<0.01	<0.01	<0.01
49	WFF		<0.01	<0.01	<0.01	<0.01
51	WGG	<0.01		0.06	0.06	0.06
51	WGG	<0.01			<0.01	<0.01
52	WPP	<0.01		<0.01	<0.01	<0.01
52	WPP	<0.01		<0.01	<0.01	<0.01
55	WEE(N)	0.01		0.01	0.02	0.02
55	WEE(S)	0.02		0.01	0.03	0.03
58	WCC	0.02			0.02	0.02
60	WBB	<0.01		0.02	0.02	0.02
Totals		**0.62**	**<0.01**	**0.37**	**0.99**	**0.99**

Total Wetland Impacts: 0.99 acres

R-2527 Open Water Impacts in the Yadkin Pee-Dee River Basin

Site	Pond Size (acres)	Total Impact (acres)
27- Pond F -Dewatering	1.5	<0.01
Totals	1.5	**<0.01**

A Water Quality Certification was previously issued for this project on April 3, 2019 and all previous Project Specific Conditions still apply. The project shall be constructed in accordance with your application received on September 27, 2024. After reviewing your application, we have decided that these impacts are covered by General Water Quality Certification Number 4135. USACE Action ID, SAW 2008-02315. 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 will expire with the accompanying 404 permit.

This approval is valid solely for the purpose and design described in your application (unless modified below). Should your project change, you must notify the NCDWR and submit a new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter and is thereby responsible for complying with all the conditions. If total wetland fills for this project (now or in the future) exceed one acre, or of total impacts to perennial streams (now or in the future) exceed 300 linear feet, compensatory mitigation may be required as described

in 15A NCAC 2H .0506 (h) (6) and (7). 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. Fill slopes installed in wetland areas that are not complete takes will not have any part of the toe of the slope constructed in such a way that the remaining wetland is impacted, including but not limited to hydraulic impacts (draining). [15A NCAC 02H.0506(b)(2)].

2. Riprap will be the size that allows for maximum stability in, around, and discharging to jurisdictional areas. [15A NCAC 02H. 0506(b)(2)]

3. Hazardous spill basins constructed in rock will be lined with an impervious liner to prevent hazardous materials from discharging through the rock and cross- contaminating the groundwater. If clay accessed on site does not produce an impervious layer on the bottom of the basin, then,, bentonite clay, a material already used and approved for such liners by NC DWR, will be used. [15A NCAC 02H.0506(b)(3)]

4. Any stream reconstructed in the bottom of drained ponds may require additional impacts to establish stability. These will be determined in the field during construction as the new stream bed establishment occurs. [15A NCAC 02H. 0506(b)(2)]

5. Pond draining will occur with water levels being lowered approximately one foot a day and handled through adequate sediment and erosion control measures, so turbidity is not discharged downstream. [15A NCAC 02H.0506(b)(3)]

6. Temporary impacts in the mainstem of the Yadkin-PeeDee for the construction of a causeway must be completely removed at the end of construction. This should be confirmed with bottom elevations shot before installation and after removal to ensure the area' s return to its original depth and conditions. [15A NCAC 02H.0506(b)(2)]

7. Weirs on hazardous spill basins must be constructed with a structural fill material that will contain a spill. 15A NCAC 02H. 0506(b)(3)]

8. In accordance with commitments made in your application, clearing of vegetation for purpose of relocating utilities within jurisdictional wetlands shall be performed without the use of mechanized equipment. [15A NCAC 02H. 0506(b)(3)]

9. The NCDOT Division Environmental Officer or Environmental Assistant will conduct a pre-construction meeting with all appropriate staff to ensure that the project supervisor and essential staff understand the potential issues with stream and pipe alignment at the permitted site. NCDWR staff shall be invited to the pre- construction meeting. [15A NCAC 02H. 0506(b)(2) and (b)(3)

10. Channel relocations shall be completed and stabilized, and approved on site by NCDWR staff, prior to diverting water into the new channel. Stream banks shall be matted with coir-fiber matting. Vegetation used for bank stabilization shall be limited to native riparian vegetation, and should include establishment of a vegetated buffer on both sides of the relocated channel to the maximum extent practical. Also, rip- rap may be allowed if it is necessary to maintain the physical integrity of the stream, but the applicant must provide written justification and any calculations used to determine the extent of rip-rap coverage requested. Once the stream has been turned into the new channel, it may be necessary to relocate stranded fish to the new channel to prevent fish kills. [15A NCAC 02H .0506(b)(3).

11. At locations where ponds will be drained, proper measures will be taken to drain the pond with limited impact to upstream and downstream channel stability as well as to native aquatic species. Proper measures will be taken to avoid sediment release and/ or sediment accumulation downstream as a result of pond draining. If typical pond draining techniques will create significant disturbance to native aquatic species, additional

measures such as collection and relocation may be necessary to prevent a significant fish kill. NCDOT shall consult with NC Wildlife Resources staff to determine if there are any sensitive species, and the most appropriate measures to limit impacts to these species. The permittee shall observe any natural channel re-establishment, or use natural channel construction techniques, to ensure that the jurisdictional stream channel above and below the drained pond remains stable, and that no additional impacts occur within the natural stream channel as a result of draining the pond. [15A NCAC 2H.0506(b)(3).

12. All bridge construction shall be performed from the existing bridge, temporary work bridges, temporary causeways, or floating or sunken barges. If work conditions require barges, they shall be floated into position and then sunk. The barges shall not be sunk and then dragged into position. Under no circumstances should barges be dragged along the bottom of the surface water. [15A NCAC 02H. 0506(b)(3) 13. 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).

13. 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).

14. 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)].

15. Bridge deck drains shall not discharge directly into the stream. Stormwater shall be directed across the bridge and pre- treated through site- appropriate means (grassed swales, pre- formed scour holes, vegetated buffers, etc.) before entering the stream. To meet the requirements of NCDOT' s NPDES permit NCS000250, please refer to the most recent version of the North Carolina Department of Transportation Stormwater Best Management Practices Toolbox manual for approved measures. A waiver is granted as requested for the historical bridge being rehabilitated as part of the project. [15A NCAC 02H . 0507(d)(2) and 15A NCAC 02H . 0506(b)(5)]

16. 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 priar written approval from the NCDWR first. [15A NCAC 02H.0506(b)(2)]

17. 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)

18. A turbidity curtain will be installed in the stream if driving or drilling activities occur within the stream channel, on the stream bank, or within 5 feet of the top of bank, or during the removal of bents from an old bridge. This condition can be waived with prior approval from the NCDWR. [15A NCAC 02H. 0506(b)(3)

19. Due to the perched pipe conditions at Permit Sites 1, 2, 3, 4, 5, 7, 8, 9, 10, 11 , 12 , 13, 14, 15, 16, 18, 19, 20, 21, 23, 24, and 25, which would require the placement of the pipes on steep grade and/ or bedrock, NCDWQ will not require the burial of the culverts in the streambed in these locations. However, design and placement of the culvert and other structures shall be installed in such a manner that the original stream profiles are not altered (i.e., the depth of the channel must not be reduced by a widening of the streambed). Existing stream dimensions (including pattern and profile) are to be maintained above and below locations of each culvert. The structures shall be designed and installed to allow for fish and other wildlife movement as well as prevent head cutting of the stream. The applicant may be required to provide evidence that the equilibrium has been maintained if requested in writing by the NCDWR. [15A NCAC 02H. 0506(b)(2)]

20. 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 down stream of the above structures. The applicant is required to provide evidence that the equilibrium is being maintained if requested in writing by the NCDWR. If this condition is unable to be met due to bedrock or other limiting features encountered during construction, please contact the 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)]

21. If multiple pipes or barrels are required, they shall be designed to mimic natural stream cross section as closely as possible. including pipes or barrels at flood plain elevation and/ or sills where appropriate. Widening the stream channel should be avoided. Stream channel widening at the inlet or outlet end of structures typically decreases water velocity causing sediment deposition that requires increased maintenance and disrupts aquatic life passage. [15A NCAC 02H.0506(b)(2)]

22. Riprap shall not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures should be properly designed, sized and installed. [15A NCAC 02H. 0506(b)(2)]

23. For all 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. [15A NCAC 02H. 0506(b)(2)]

24. The stream channel shall be excavated no deeper than the natural bed material of the stream, to the maximum extent practicable. Efforts must be made to minimize impacts to the stream banks, as well as to vegetation responsible for maintaining the stream bank stability. Any applicable riparian buffer impact for access to stream channel shall be temporary and be revegetated with native riparian species. [15A NCAC 02H. 0506(b)(2)]

25. All portions of the proposed project draining to 303(d) listed watersheds that are impaired due to turbidity shall be designed, constructed, and operated with sediment and erosion control measures that meet Design Standards in Sensitive Watersheds (15A NCAC 4B . 0124). However, due to the size of the project, NC DOT shall not be required to meet 15A NCAC 4B . 0124(a) regarding the maximum amount of uncovered acres.

26. All portions of the proposed project draining to 303(d) listed watersheds that are impaired due to biological criteria exceedances shall not discharge stormwater directly to surface waters. Stormwater shall be treated using appropriate best management practices (e. g., vegetated conveyances, constructed wetlands, detention ponds, etc.) prior to discharging to surface waters.

27. Compensatory mitigation for 3,874 linear feet of impact to streams is required. We understand that you have chosen to perform compensatory mitigation for impacts to streams through the North Carolina Division of Mitigation Service (DMS) (formerly NCEEP), and that the DMS has agreed to implement the mitigation for the project. The DMS has indicated in a letter dated September 12, 2024 that they will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for the above- referenced project, in accordance with the DMS Mitigation Banking Instrument signed July 28, 2010.

28. Compensatory mitigation for impacts to 1.00 acre of wetlands is required. We understand that you have chosen to perform compensatory mitigation for impacts to wetlands through the North Carolina Division of Mitigation Services (DMS) (formerly NCEEP), and that the DMS has agreed to implement the mitigation for the project. DMS has indicated in a letter dated September 12, 2024, that they will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for the above- referenced project, in accordance with DMS' s Mitigation Banking Instrument signed July 28, 2010.

General Conditions

1. 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]

2. 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)]

3. 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)]

4. 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)]

5. 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)]

6. 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)]

7. 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)]

8. 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)]

9. 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)]

10. Discharging hydroseed mixtures and washing out hydro seeders and other equipment in or adjacent to surface waters is prohibited. [15A NCAC 02H.0506(b)(3)]

11. 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]

12. 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)]

13. 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]

14. 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.

15. 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)]

16. Upon completion of the project (including any impacts at associated borrow or waste sites), NCDOT project 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)]

17. 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)]

18. 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.

19. Sediment and erosion control measures shall not be placed in wetlands or waters unless otherwise approved by this Certification. [15A NCAC 02H.0506(b)(3) and (c)(3)]

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

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

The mailing address for the Office of Administrative Hearings is:

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

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

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

This letter completes the review of the Division of Water Resources under Section 401 of the Clean Water Act. If you have any questions, please contact Ryan Conchilla at ryan.conchilla@deq.nc.gov.

Sincerely,

Signed by:
Susan Locklear
04351F033762414...

Richard E. Rogers, Jr., Director
Division of Water Resources

Electronic copy only distribution:

Steve Brumagin, US Army Corps of Engineers, Charlotte Field Office
Erin Cheely, NCDOT Division 10
Beth Harmon, Division of Mitigation Services
David McHenry, NCWRC

09/08/99

TIP PROJECT: R-2527

CONTRACT:

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

MONTGOMERY COUNTY

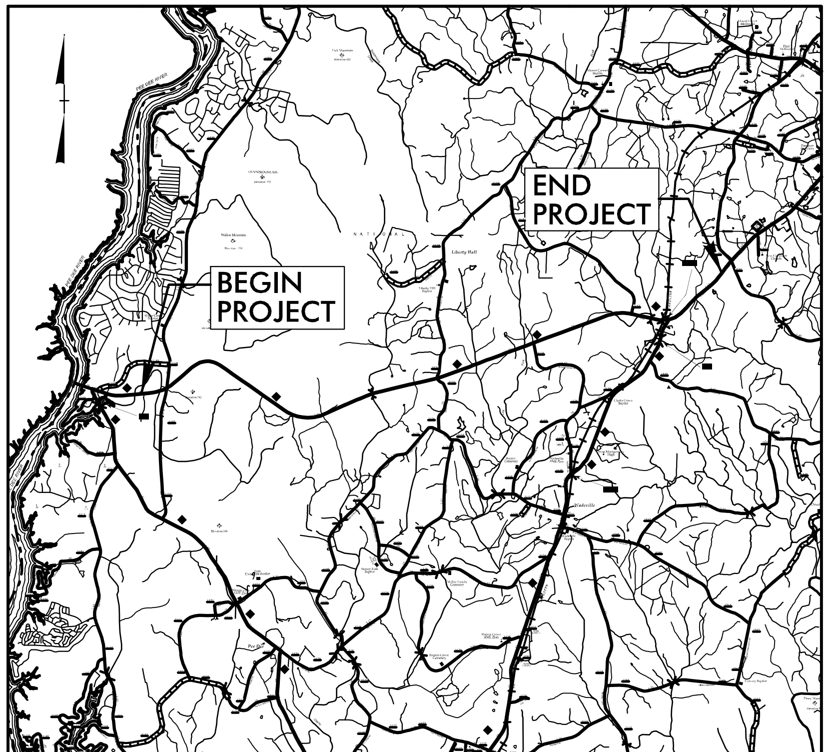
LOCATION: NC 24-27 FROM NC 73 TO THE TROY BYPASS

TYPE OF WORK: GRADING, PAVING, DRAINAGE, STRUCTURE, CULVERTS, AND RAILROAD TRACKWORK

STATE	STATE PROJECT REFERENCE NO.		SHEET NO.	TOTAL SHEETS
N.C.	R-2527		1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION		
35572.1.1	N/A	P.E.		
35572.2.1	N/A	RIGHT OF WAY		
35572.2.3	N/A	UTILITIES		

90% PLANS

PERMIT DRAWING
SHEET 1 OF 91

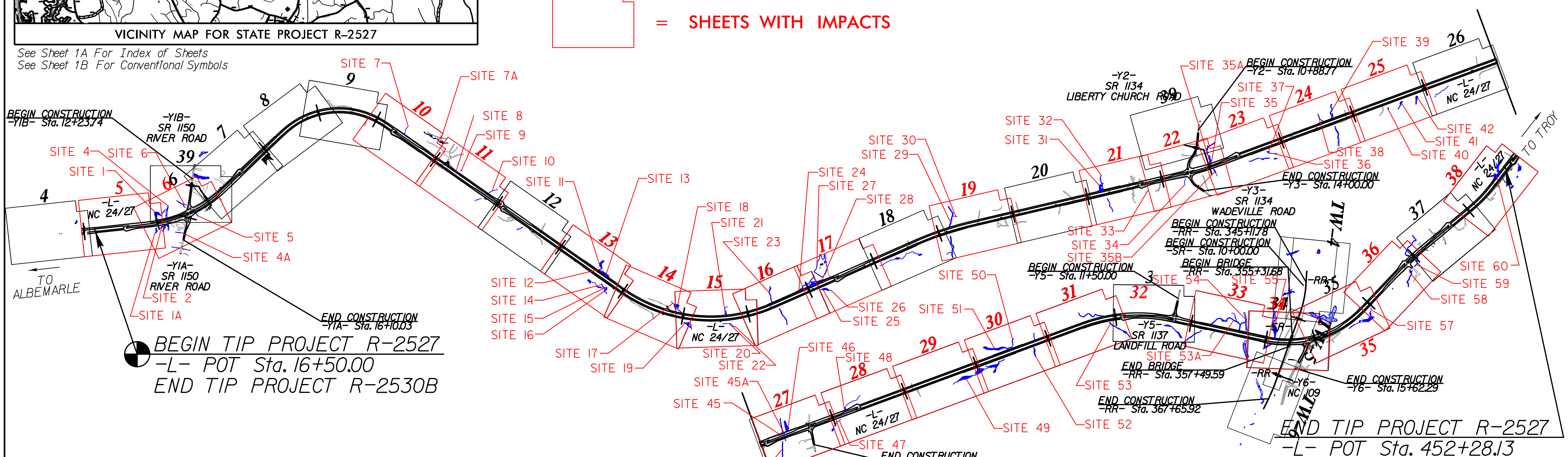


VICINITY MAP FOR STATE PROJECT R-2527

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

WETLAND AND SURFACE WATER IMPACTS PERMIT

▭ = SHEETS WITH IMPACTS



CLEARING ON THIS PROJECT SHALL BE TO LIMITS ESTABLISHED USING METHOD III.
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.
THIS IS A PARTIAL CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50' 25' 0 50' 100'
PLANS

50' 25' 0 50' 100'
PROFILE (HORIZONTAL)

10' 5' 0 10' 20'
PROFILE (VERTICAL)

DESIGN DATA

ADT 2021 = 11,839
ADT 2041 = 14,535
K = 9%
D = 55%
T = 14% *
V = 60 MPH
* TTST = 8% DUAL 6%
FUNC CLASS = RURAL MINOR ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2527	=	8.253 mi.
LENGTH STRUCTURES TIP PROJECT R-2527	=	0.000 mi.
TOTAL LENGTH TIP PROJECT R-2527	=	8.253 mi.

Prepared in the Offices of:

STEWART
223 S. WEST ST, STE 1100 RALEIGH, NC 27603 T 919.380.8750
Firm License #: C-1051 www.stewartinc.com PROJECT #:B15001.03

vhb
VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 27, 2019

LETTING DATE:
SEPTEMBER 15, 2026

ANDY YOUNG, PE
PROJECT ENGINEER

MICHAEL BURNS, PE
PROJECT DESIGN ENGINEER

PAMELA R. WILLIAMS
NCDOT CONTACT

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION

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jhunt

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2527	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

STEWART — firm License No. C-1851, 223 S. West St., Suite 1100, Raleigh, NC 27603, T: 919.380.8750, www.wbstewartPA.com

vhb — VHB Engineering NC, P.C. (C-3705), 940 Main Campus Drive, Suite 500, Raleigh, NC 27606

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 1A OF 91

NAD 83/NA 2011

DETAIL 3
BERM "V" DITCH
(Not to Scale)
Natural Ground, 2:1, D, b, RDWY, 2:1, Geotextile
Min. D=1.0 Ft.
b=5.0 Ft.
Type of Liner= CLASS B RIP RAP
FROM STA. 10+88 TO STA. 13+50 -L REV- RT

DETAIL 53
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground, 2:1, D, 4:1 or Flatter, Front Ditch Slope
Min. D=1.0 Ft.
FROM STA. 11+47 TO STA. 13+00 -L REV- RT

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

SITE 1

SITE 1A

WETLAND WZZ

MATCH TO SHEET 4 -L- STA. 14+50.00

MATCH TO SHEET 6 -L REV- STA. 16+00.00

R-2530B TO BE CONSTRUCTED BY OTHERS

UWHARRIE MARINE SALES & SERVICE LLC
DB 539 PG 035

UWHARRIE MARINE SALES & SERVICE LLC

(190) ALD L PARTRIDGE DB 568 PG 515

(191)

(001A) KENNETH R FURR BY WILL (193)

(2) SAMUEL HORACE MCcALL III DB 244 PG 695 (195)

(192) TOMMY A BLAKE
TOMMY A BLAKE DB 246 PG 036

(1) CHARLES R MANESS DB 285 PG 104 (194)

CHARLES R. MANESS AND WIFE BETTY L. MANESS

ARCHAEOLOGICAL SITE (TYP)

CLASS B RIP RAP EST 3 TONS EST 10 SY GEOTEXTILE

CLEAN OUT PIPE

COLLAR AND EXTEND EXIST 18" TO PROP 2GI

TIE TO TIP PROJECT R-2530B

TIE 2GI INTO EXIST 18"

SPECIAL CUT DITCH SEE DETAIL 53

BERM V DITCH W/CLASS B RIP RAP SEE DETAIL 3 EST 100 TONS EST 285 SY GEOTEXTILE

BEGIN SBG +46 LT

50′ 0′ 100′ GRAPHIC SCALE

16.7′ 0′ 33.3′ INSET GRAPHIC SCALE

FOR INTERSECTION DETAIL,SEE SHEET 2B-1

FOR -L- PROFILE,SEE SHEET 42

FOR -L_REV- PROFILE,SEE SHEET 65

ALL DRIVEWAY RADII 30' UNLESS OTHERWISE NOTED.

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gpowdrill

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2527	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

STEWART — firm License No. C-1851, 223 S. West St., Suite 1100, Raleigh, NC 27603, T. 919.380.8750, www.wbstewartPG.com

VHB Engineering NC, P.C. (C-3705), 940 Main Campus Drive, Suite 500, Raleigh, NC 27606

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 1B OF 91

NAD 83/NA 2011

DETAIL 3
BERM "V" DITCH
(Not to Scale)
Natural Ground, 2:1, D, b, 2:1, RDWY, Geotextile
Min. D=1.0 Ft.
b=5.0 Ft.
Type of Liner= CLASS B RIP RAP
FROM STA. 10+88 TO STA. 13+50 -L REV- RT

DETAIL 53
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground, 2:1, D, 4:1 or Flatter, Front Ditch Slope
Min. D=1.0 Ft.
FROM STA. 11+47 TO STA. 13+00 -L REV- RT

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

SITE 1

SITE 1A

WETLAND WZZ

MATCH TO SHEET 4 -L- STA 14+50.00

MATCH TO SHEET 6 -L REV- STA 16+00.00

R-2530B TO BE CONSTRUCTED BY OTHERS

TIE TO TIP PROJECT R-2530B

CONVERT DI TO JB w/MH

CLASS B RIP RAP EST 3 TONS EST 10 SY GEOTEXTILE

CLEAN OUT PIPE

COLLAR AND EXTEND EXIST 18" TO PROP 2GI

TIE 2GI INTO EXIST 18"

SPECIAL CUT DITCH SEE DETAIL 53

BERM V DITCH W/CLASS B RIP RAP SEE DETAIL 3 EST 100 TONS EST 285 SY GEOTEXTILE

N 83° 47' 33.4" E -L-

UWHARRIE MARINE SALES & SERVICE LLC
DB 539 PG 035

UWHARRIE MARINE SALES & SERVICE LLC

KENNETH R FURR BY WILL

SAMUEL HORACE MCCALL III
DB 244 PG 695

TOMMY A BLAKE
DB 246 PG 036

CHARLES R. MANESS AND WIFE BETTY L. MANESS
CHARLES R MANESS
DB 285 PG 104

50' 0' 100'
GRAPHIC SCALE

16.7' 0' 33.3'
INSET GRAPHIC SCALE

FOR INTERSECTION DETAIL,SEE SHEET 2B-1

FOR -L- PROFILE,SEE SHEET 42

FOR -L_REV- PROFILE,SEE SHEET 65

ALL DRIVEWAY RADII 30' UNLESS OTHERWISE NOTED.

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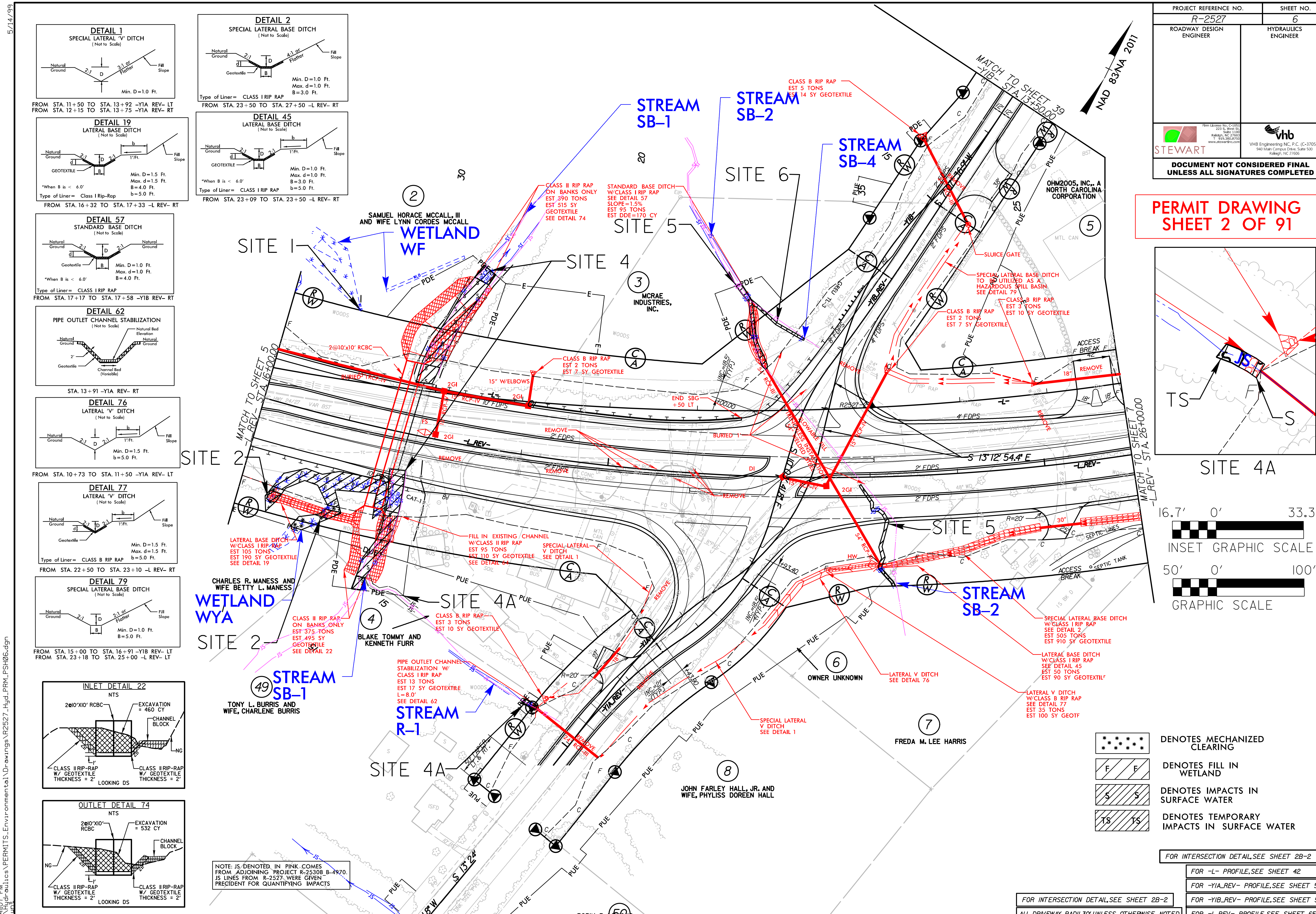
gpvarela

5/14/99



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lhunt

5/14/99

PERMIT DRAWING SHEET 3 OF 91

DENOTES MECHANIZED CLEARING

DENOTES IMPACTS IN SURFACE WATER

DENOTES FILL IN WETLAND

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

25' 0' 50'
GRAPHIC SCALE

PROJECT REFERENCE NO.	SHEET NO.
R-2527	6

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

STEWART
firm License No. C-1851
223 S. West St.
Suite 1100
Raleigh, NC 27603
P: 919.380.8750
www.stewartinc.com

vhb
VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

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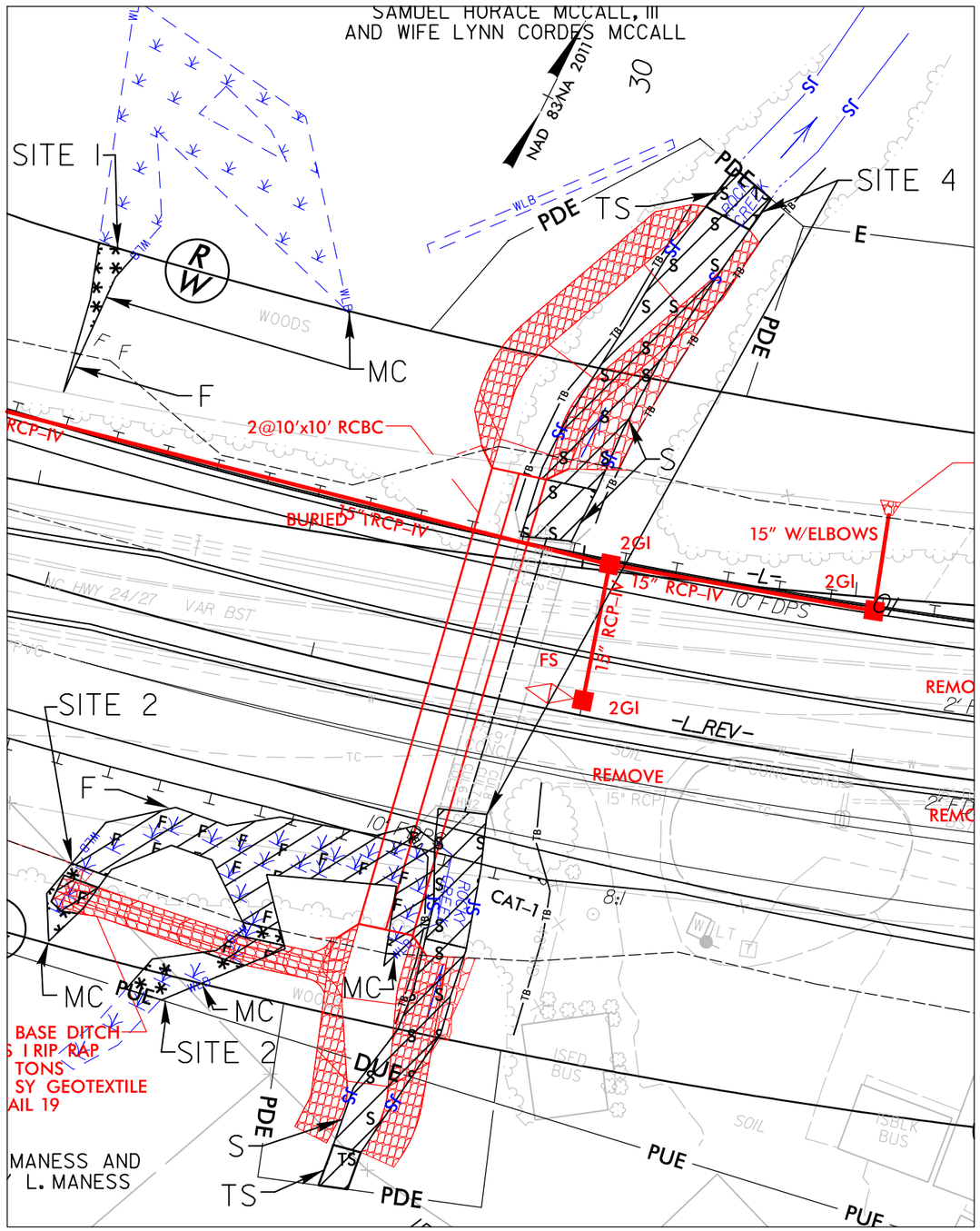
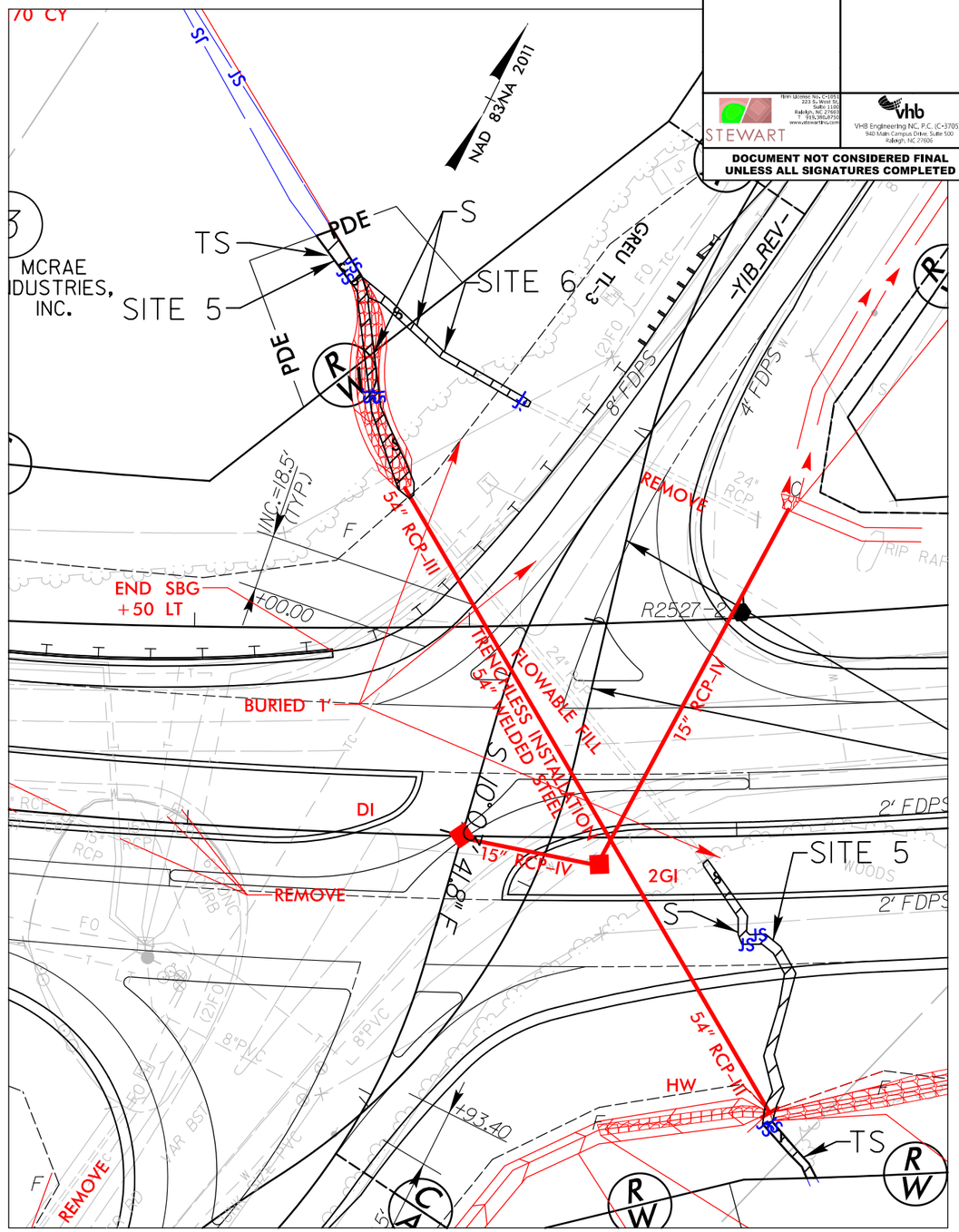


SITES 1-4



SITES 5-6

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2527	6
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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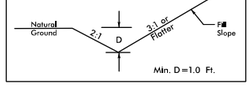
PERMIT DRAWING SHEET 4 OF 91

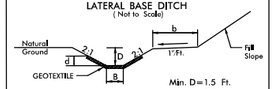
NAD 83/NA 2011

DETAIL 1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



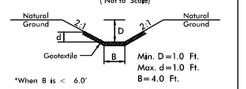
FROM STA. 11+50 TO STA. 13+92 –Y1A REV– LT
FROM STA. 12+15 TO STA. 13+75 –Y1A REV– RT

DETAIL 19
LATERAL BASE DITCH
(Not to Scale)



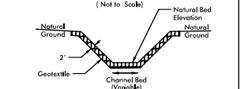
FROM STA. 16+32 TO STA. 17+33 –L REV– RT

DETAIL 57
STANDARD BASE DITCH
(Not to Scale)



FROM STA. 17+17 TO STA. 17+58 –Y1B REV– RT

DETAIL 62
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)

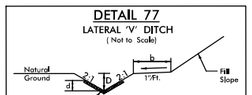


STA. 13+91 –Y1A REV– RT

DETAIL 76
LATERAL 'V' DITCH
(Not to Scale)

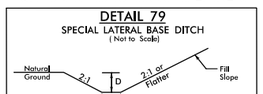
FROM STA. 10+73 TO STA. 11+50 –Y1A REV– LT

DETAIL 77
LATERAL 'V' DITCH
(Not to Scale)



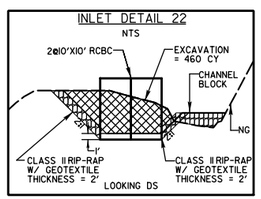
FROM STA. 22+50 TO STA. 23+10 –L REV– RT

DETAIL 79
SPECIAL LATERAL BASE DITCH
(Not to Scale)

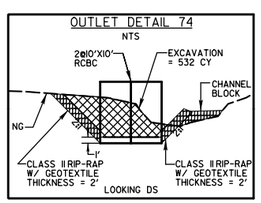


FROM STA. 15+00 TO STA. 16+91 –Y1B REV– LT
FROM STA. 23+18 TO STA. 25+00 –L REV– LT

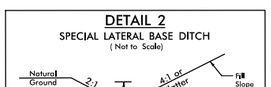
INLET DETAIL 22
NTS



OUTLET DETAIL 74
NTS

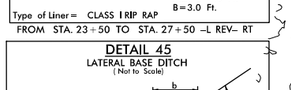


DETAIL 2
SPECIAL LATERAL BASE DITCH
(Not to Scale)

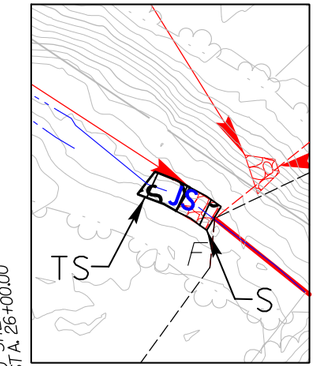


FROM STA. 23+50 TO STA. 27+50 –L REV– RT

DETAIL 45
LATERAL BASE DITCH
(Not to Scale)



FROM STA. 23+09 TO STA. 23+50 –L REV– RT



16.7' 0' 33.3'
INSET GRAPHIC SCALE

50' 0' 100'
GRAPHIC SCALE

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

FOR INTERSECTION DETAIL,SEE SHEET 2B-2
FOR -L- PROFILE,SEE SHEET 42
FOR -Y1A_REV- PROFILE,SEE SHEET 58
FOR -Y1B_REV- PROFILE,SEE SHEET 58
FOR -L_REV- PROFILE,SEE SHEET 65

ALL DRIVEWAY RADII 30' UNLESS OTHERWISE NOTED.

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jhuie

5/14/99

PERMIT DRAWING
SHEET 5 OF 91

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

25′ 0′ 50′
GRAPHIC SCALE

PROJECT REFERENCE NO.	SHEET NO.
R-2527	6

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

STEWART
firm License No. C-1851
223 S. West St.
Suite 1100
Raleigh, NC 27603
T 919.380.8750
www.stewartinc.com

vhb
VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

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SAMUEL HORACE MCCALL, III
AND WIFE LYNN CORDES MCCALL

SITE 1
SITE 2
SITE 4
SITE 5
SITE 6

NAD 83/NA 2011

2@10′x10′ RCBC
RCP-IV
BURIED 15" TRCP-IV
15" W/ELBOWS
2GI
15" RCP-IV 10' FDPS
15" RCP-IV
FS
-L_REV-
REMOVE
CAT-1
8:1
BASE DITCH
IRIP RAP
TONS
SY GEOTEXTILE
AIL 19
MANESS AND
L. MANESS
MCRAE INDUSTRIES, INC.
70 CY
END SBG
+50 LT
+00.00
IWC=18.5' (TYP.)
54" RCP-III
-Y1B_REV-
8" FDPS
4" FDPS
GREEN TL-3
R2527-2
TRENCHLESS INSTALLATION
54" WELDED STEEL
FLOWABLE FILL
15" RCP-IV
2" FDPS
DI
-15" RCP-IV 418' @ -0.01%-
2GI
54" RCP-III
HW
+93.40

SITES 1-4

SITES 5-6

PERMIT DRAWING
SHEET 6 OF 91

PROJECT REFERENCE NO.	SHEET NO.
_____	___
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

STEWART
Firm License No. C-0193
223 South West Street
Suite 1300
Raleigh, NC 27603
T 919.380.8750
www.stewartinc.com

vhb
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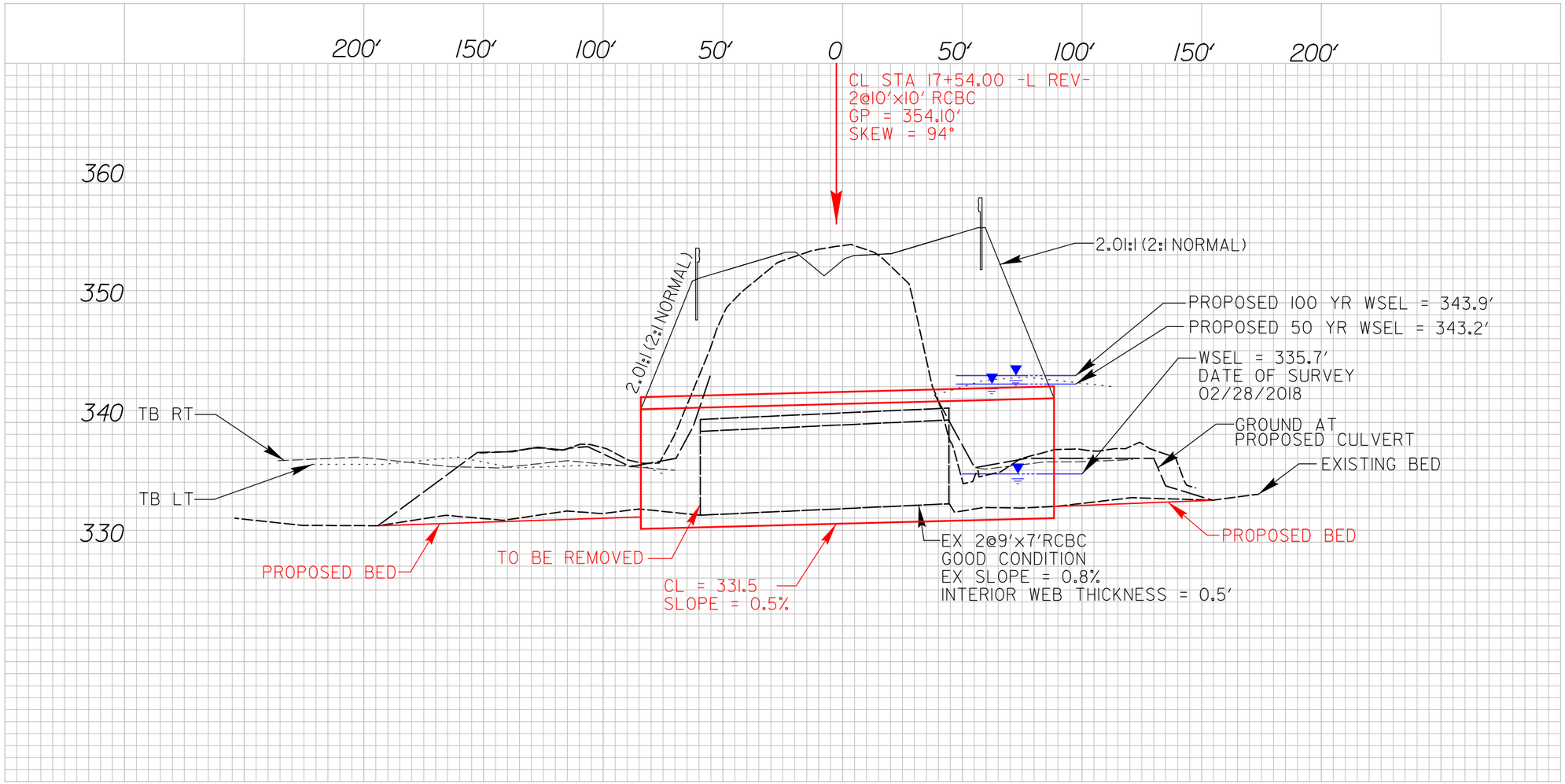
REVISIONS

8/17/99

SITE 4



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aaverette

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2527	X-8

PERMIT DRAWING
SHEET 7 OF 91

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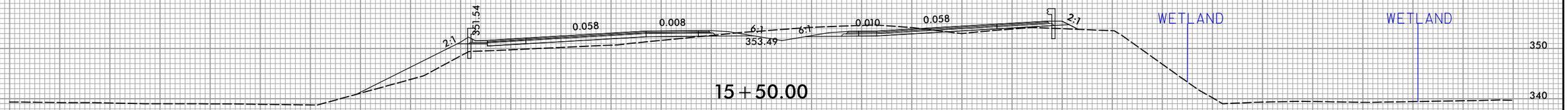
SITE 1A



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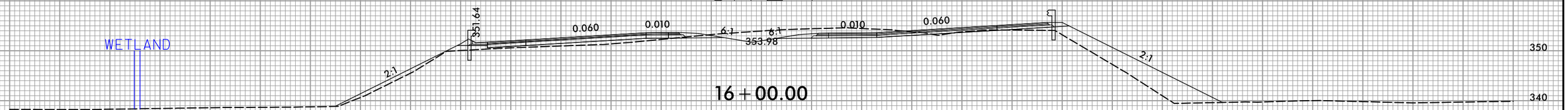

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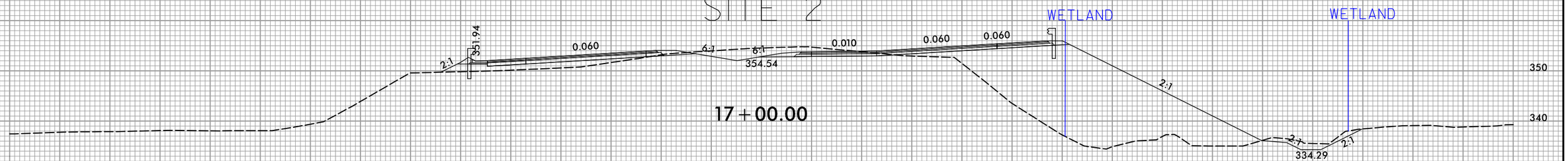

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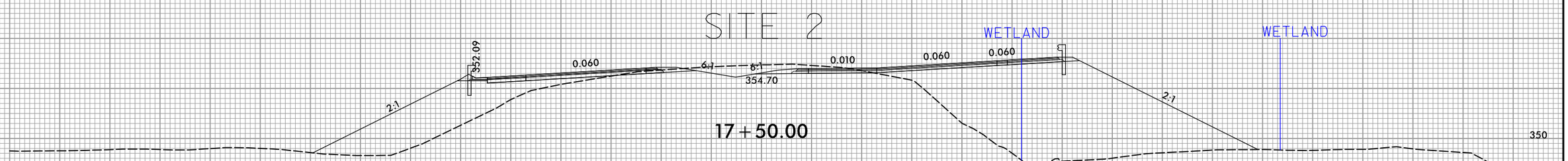
SITE 2



17+50.00

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jhunt

5/14/99

PERMIT DRAWING
SHEET 8 OF 91

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50′ 0′ 100′
GRAPHIC SCALE

25′ 0′ 50′
INSET GRAPHIC SCALE

PROJECT REFERENCE NO.	SHEET NO.
R-2527	10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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DETAIL 62
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)
STA. 80+41 –L– LT

DETAIL 7
TOE PROTECTION
(Not to Scale)
Type of Liner= CLASS B RIP RAP
FROM STA. 78+50 TO STA. 80+28 –L– RT
FROM STA. 79+50 TO STA. 80+35 –L– LT
FROM STA. 85+00 TO STA. 87+81 –L– LT

DETAIL 9
LATERAL BASE DITCH
(Not to Scale)
Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.
*When B is < 6.0'
Type of Liner= CLASS B RIP RAP
FROM STA. 80+25 TO STA. 82+40 –L– RT

DETAIL 10
LATERAL BASE DITCH
(Not to Scale)
Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.
*When B is < 6.0'
Type of Liner= CLASS II RIP RAP
FROM STA. 83+75 TO STA. 85+00 –L– LT

DETAIL 1
SPECIAL LATERAL "V" DITCH
(Not to Scale)
Min. D=1.0 Ft.
FROM STA. 10+50 TO STA. 12+00 –PL– RT

DETAIL 17
STANDARD BASE DITCH
(Not to Scale)
Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.
*When B is < 6.0'
Type of Liner= CLASS B RIP RAP
FROM STA. 86+10 TO STA. 86+70 –L– RT

DETAIL 81
TOE PROTECTION
(Not to Scale)
d=1.0 Ft.
Type of Liner= CLASS A RIP RAP
FROM STA. 10+25 TO STA. 13+32 –Y8– LT

STREAM SJ

SITE 7

PIPE OUTLET CHANNEL STABILIZATION W/ CLASS I RIP RAP
EST 12 TONS
EST 21 SY GEOTEXTILE
L= 12 FT
SEE DETAIL 62

CLASS B RIP RAP
EST 2 TONS
EST 7 SY GEOTEXTILE

TOE PROTECTION W/CLASS B RIP RAP
SEE DETAIL 7
EST 24 TONS
EST 73 SY GEOTEXTILE

BEGIN SBG +95 LT

INC.=40' (TYP.)

36" RCP-III

15" W/ELBOWS

15" RCP-IV

COLLAR

ADD CURB CUT

NOT BURIED

TRENCHLESS INSTALLATION STEEL CASING

FLOWABLE FILL

BEGIN SBG +25 RT

END SBG +94 RT

GREU TL-3

CAT-1

4' FDPS

2' FDPS

10' FDPS

2GI

FS

HW

TOE PROTECTION W/CLASS B RIP RAP
SEE DETAIL 7
EST 49 TONS
EST 153 SY GEOTEXTILE

LATERAL BASE DITCH W/CLASS B RIP RAP
SEE DETAIL 9
EST 97 TONS
EST 273 SY GEOTEXTILE

STANDARD BASE DITCH W/CLASS B RIP RAP
SLOPE= 1.6%
EST 35 TONS
EST 95 SY GEOTEXTILE
EST DDE = 20 CY
SEE DETAIL 17

(14) UNITED STATES FOREST SERVICE

(12) SCARBOROUGH PROPERTIES, LLC

ENVIRONMENTAL SENSITIVITY AREA

NOTE: SEE TMP SHEET No. XXX FOR CULVERT STAGING

MATCH TO SHEET 9 –L– STA 75+00.00

MATCH TO SHEET 11 –L– STA 88+00.00

S 54°55'09.7" E –L–

SITE 7A

STREAM SA

TOE PROTECTION W/CLASS A RIP RAP
SEE DETAIL 81

CLASS B RIP RAP
EST 2 TONS
EST 7 SY GEOTEXTILE

LATERAL BASE DITCH W/CLASS II RIP RAP
SEE DETAIL 10
EST 150 TONS
EST 228 SY GEOTEXTILE

SOIL AND GRAVEL ROAD

WOODS

SOIL WALKING TRAIL

UNHARRIE RECREATION TRAILHEAD

RANDOLPH ELECTRIC 40'R/W

EARTH MATERIAL BERM
SEE SPECIAL DETAIL XX

SPECIAL LATERAL V DITCH
SEE DETAIL 1

END SBG +10 LT

END SBG +25 LT

CLASS B RIP RAP
EST 3 TONS
EST 10 SY GEOTEXTILE

TOE PROTECTION SEE DETAIL 7

CLASS B RIP RAP
EST 2 TONS
EST 7 SY GEOTEXTILE

SITE 7

DUE PUE TS

15" W/ELBOWS

36" RCP-III

S

2GI

" RCP-IV

15" RC

FOR PARKING LOT DESIGN, SEE SHEET 2B-13

ENVIRONMENTALLY SENSITIVE AREA

FOR -L- PROFILE, SEE SHEET 44

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dwgrate

5/14/99

PERMIT DRAWING SHEET 9 OF 91

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50′ 0′ 100′
GRAPHIC SCALE

25′ 0′ 50′
INSET GRAPHIC SCALE

PROJECT REFERENCE NO.	SHEET NO.
R-2527	10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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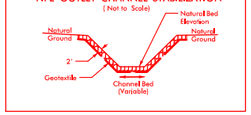
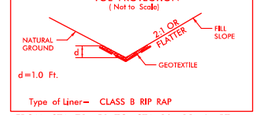
DETAIL 62
PIPE OUTLET CHANNEL STABILIZATION (Not to Scale)



STA. 80+41 –L– LT

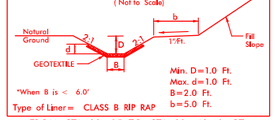
DETAIL 7
TOE PROTECTION (Not to Scale)



Type of Liner= CLASS B RIP RAP

FROM STA. 78+50 TO STA. 80+28 –L– RT
FROM STA. 79+50 TO STA. 80+35 –L– LT
FROM STA. 85+00 TO STA. 87+81 –L– LT

DETAIL 9
LATERAL BASE DITCH (Not to Scale)



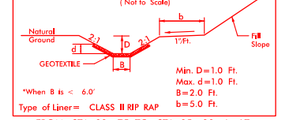
Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.

*When B is < 6.0'

Type of Liner= CLASS B RIP RAP

FROM STA. 80+25 TO STA. 82+40 –L– RT

DETAIL 10
LATERAL BASE DITCH (Not to Scale)



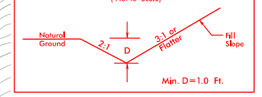
Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.

*When B is < 6.0'

Type of Liner= CLASS II RIP RAP

FROM STA. 83+75 TO STA. 85+00 –L– LT

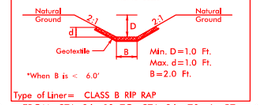
DETAIL 1
SPECIAL LATERAL "V" DITCH (Not to Scale)



Min. D=1.0 Ft.

FROM STA. 10+50 TO STA. 12+00 –PL– RT

DETAIL 17
STANDARD BASE DITCH (Not to Scale)



Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.

*When B is < 6.0'

Type of Liner= CLASS B RIP RAP

FROM STA. 86+10 TO STA. 86+70 –L– RT

DETAIL 81
TOE PROTECTION (Not to Scale)

Type of Liner= CLASS A RIP RAP

FROM STA. 10+25 TO STA. 13+32 –Y8– LT

SITE 7A

TOE PROTECTION W/CLASS A RIP RAP SEE DETAIL 81

CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE

LATERAL BASE DITCH W/CLASS II RIP RAP SEE DETAIL 10 EST 150 TONS EST 228 SY GEOTEXTILE

CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE

STREAM SJ

SITE 7

PIPE OUTLET CHANNEL STABILIZATION W/ CLASS I RIP RAP EST 12 TONS EST 21 SY GEOTEXTILE L= 12 FT SEE DETAIL 62

14 UNITED STATES FOREST SERVICE

STREAM SA

CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE

CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE

CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 24 TONS EST 73 SY GEOTEXTILE

TOE PROTECTION SEE DETAIL 7

CLASS B RIP RAP EST 3 TONS EST 10 SY GEOTEXTILE

SPECIAL LATERAL V DITCH SEE DETAIL 1

EARTH MATERIAL BERM SEE SPECIAL DETAIL XX

BEGIN SBG +95 LT

BEGIN SBG +10 LT

END SBG +25 LT

END SBG +30 LT

BEGIN SBG +25 RT

END SBG +94 RT

GREU TL-3

ADD CURB CUT

FLOWABLE FILL

NOT BURIED

TRENCHLESS PLASTIC STEEL

COLLAR

36" RCP-III

15" W/ELBOWS

15" RCP-IV

HW

STANDARD BASE DITCH W/CLASS B RIP RAP SLOPE= 1.6% EST 35 TONS EST 95 SY GEOTEXTILE EST DDE = 20 CY SEE DETAIL 17

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 49 TONS EST 153 SY GEOTEXTILE

LATERAL BASE DITCH W/CLASS B RIP RAP SEE DETAIL 9 EST 97 TONS EST 279 SY GEOTEXTILE

14 UNITED STATES FOREST SERVICE

NOTE: SEE TMP SHEET No. XXX FOR CULVERT STAGING

ENVIRONMENTAL SENSITIVITY AREA

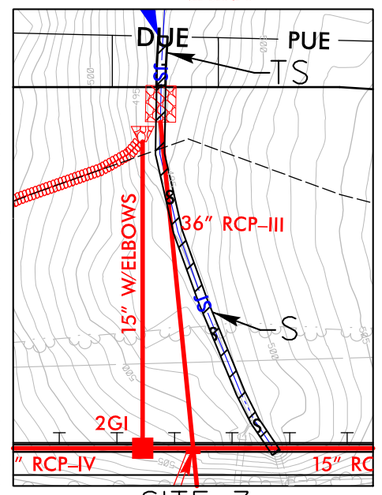
12 SCARBOROUGH PROPERTIES, LLC

MATCH TO SHEET 9 –L– STA. 75+00.00

MATCH TO SHEET 11 –L– STA. 88+00.00

S 54°55'09.7" E –L–

NC HWY 24/27 – 26 BST



SITE 7

FOR PARKING LOT DESIGN, SEE SHEET 2B-13

ENVIRONMENTALLY SENSITIVE AREA

FOR –L– PROFILE, SEE SHEET 44

7:55:05 AM
R:\Projects\PERMITS_Environmental\Drawings\R2527_Hyd_PRM_PSH10_con.dgn

5/14/99

PERMIT DRAWING SHEET 10 OF 91

PROJECT REFERENCE NO.	SHEET NO.
R-2527	11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

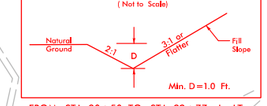
STEWART — firm license No. C-1851, 223 S. West St., Suite 1100, Raleigh, NC 27603, T: 919.380.8750, www.wbstewartPG.com

VHB Engineering NC, P.C. (C-3705), 940 Main Campus Drive, Suite 500, Raleigh, NC 27606

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

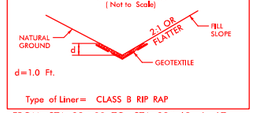
NAD 83/NA 2011

DETAIL 1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



FROM STA. 90+50 TO STA. 92+77 –L– LT
FROM STA. 93+50 TO STA. 94+00 –L– LT
FROM STA. 100+00 TO STA. 100+50 –L– RT

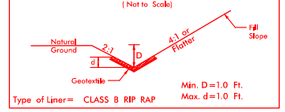
DETAIL 7
TOE PROTECTION
(Not to Scale)



Type of Liner= CLASS B RIP RAP

FROM STA. 99+00 TO STA. 99+68 –L– LT
FROM STA. 99+50 TO STA. 99+82 –L– RT

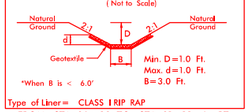
DETAIL 8
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Type of Liner= CLASS B RIP RAP

FROM STA. 101+85 TO STA. 103.+00 –L– LT

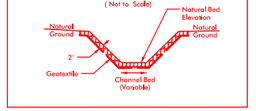
DETAIL 16
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= CLASS I RIP RAP

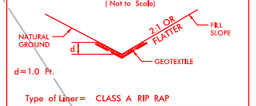
FROM STA. 90+89 TO STA. 91+13 –L– RT

DETAIL 62
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



STA. 98+78 –L– RT

DETAIL 81
TOE PROTECTION
(Not to Scale)



Type of Liner= CLASS A RIP RAP

FROM STA. 10+25 TO STA. 13+32 –Y8– LT

WETLAND WH

WETLAND WJ

STREAM SL–A

STREAM SL–A

SITE 8

SITE 9

SITE 10

(14) UNITED STATES FOREST SERVICE

(15) UNITED STATES OF AMERICA

(16) DAVID WAYNE JOYCE AND WIFE, DONNA JOYCE

(14) UNITED STATES FOREST SERVICE

MATCH TO SHEET 10 –L– STA. 88+00.00

MATCH TO SHEET 12 –L– STA. 102+00.00

CLASS B RIP RAP
EST 2 TONS
EST 7 SY GEOTEXTILE

SPECIAL LATERAL V DITCH
SEE DETAIL 1

SPECIAL LATERAL V DITCH
SEE DETAIL 1

TOE PROTECTION
W/CLASS B RIP RAP
SEE DETAIL 7
EST 19 TONS
EST 59 SY
GEOTEXTILE

SPECIAL LATERAL V DITCH
W/CLASS B RIP RAP
SEE DETAIL 8
EST 56 TONS
EST 168 SY GEOTEXTILE

15" W/ELBOWS

24" RCP-III

42" RCP-III

REMOVE +/– 17' OF 24" RCP

REMOVE +/– 7' OF 42" RCP

TIE 2GI INTO EXISTING 24" RCP

TIE JB W/MH INTO EXISTING 24" RCP

REMOVE +/– 6' OF 42" RCP

NOT BURIED

S 54° 55' 09.7" E
–L–

STANDARD BASE DITCH
W/CLASS I RIP RAP
SLOPE= 0.3%
EST 20 TONS
EST 40 SY GEOTEXTILE
EST DDE = 1 CY
SEE DETAIL 16

PIPE OUTLET CHANNEL STABILIZATION W/ CLASS I RIP RAP
EST 27 TONS
EST 38 SY GEOTEXTILE
L= 14 FT
SEE DETAIL 62

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 0' 100'
GRAPHIC SCALE

25 0' 50
INSET GRAPHIC SCALE

SITES 8 & 9

SITE 10 (DOWNSTREAM)

SITE 10 (UPSTREAM)

FOR INTERSECTION DETAIL, SEE SHEET 2B-3

FOR PARKING LOT DESIGN, SEE SHEET 2B-13

FOR –L– PROFILE, SEE SHEETS 44 & 45

ALL DRIVEWAY RADII 30' UNLESS OTHERWISE NOTED.

4:48:57 PM
Plotted By: Unknown
Drawing: C:\Projects\PERMITS_Environmental\Drawings\R2527_Hyd_PRM_PSH11.dgn

5/14/99

PERMIT DRAWING
SHEET 11 OF 91

PROJECT REFERENCE NO.	SHEET NO.
R-2527	11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

STEWART
firm License No. C-1851
223 S. West St.
Suite 1100
Raleigh, NC 27603
T: 919.380.8750
www.stewartinc.com

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

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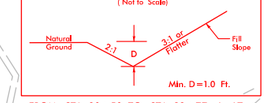
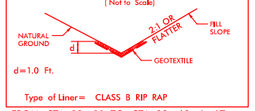
NAD 83/NA 2011

DETAIL 1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



FROM STA. 90+50 TO STA. 92+77 –L– LT
FROM STA. 93+50 TO STA. 94+00 –L– LT
FROM STA. 100+00 TO STA. 100+50 –L– RT

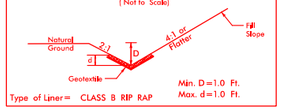
DETAIL 7
TOE PROTECTION
(Not to Scale)



Type of Liner= CLASS B RIP RAP

FROM STA. 99+00 TO STA. 99+68 –L– LT
FROM STA. 99+50 TO STA. 99+82 –L– RT

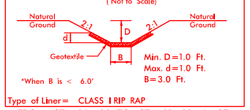
DETAIL 8
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Type of Liner= CLASS B RIP RAP

FROM STA. 101+85 TO STA. 103.+00 –L– LT

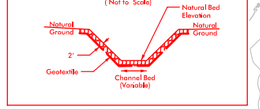
DETAIL 16
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= CLASS I RIP RAP

FROM STA. 90+89 TO STA. 91+13 –L– RT

DETAIL 62
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



STA. 98+78 –L– RT

DETAIL 81
TOE PROTECTION
(Not to Scale)

Type of Liner= CLASS A RIP RAP

FROM STA. 10+25 TO STA. 13+32 –Y8– LT

WETLAND WH

WETLAND WJ

STREAM SL–A

SITE 8

SITE 9

SITE 10

14 UNITED STATES FOREST SERVICE

15 UNITED STATES OF AMERICA

16 DAVID WAYNE JOYCE AND WIFE, DONNA JOYCE

SPECIAL LATERAL V DITCH SEE DETAIL 1

CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 19 TONS EST 59 SY GEOTEXTILE

SPECIAL LATERAL V DITCH W/CLASS B RIP RAP SEE DETAIL 8 EST 56 TONS EST 168 SY GEOTEXTILE

MATCH TO SHEET 10 –L– STA. 88+00.00

MATCH TO SHEET 12 –L– STA. 102+00.00

S 54°55'09" E –L–

24" RCP–III

42" RCP–III

15" W/ELBOWS

REMOVE +/– 17' OF 24" RCP

REMOVE +/– 7' OF 42" RCP

TIE 2GI INTO EXISTING 24" RCP

TIE JB W/MH INTO EXISTING 24" RCP

NOT BURIED

RETAIN

STANDARD BASE DITCH W/CLASS I RIP RAP SLOPE= 0.3% EST 20 TONS EST 40 SY GEOTEXTILE EST DDE = .1 CY SEE DETAIL 16

PIPE OUTLET CHANNEL STABILIZATION W/ CLASS I RIP RAP EST 27 TONS EST 38 SY GEOTEXTILE L= 14 FT SEE DETAIL 62

4' FDPS

2' FDPS

PUE

PDE

ACCESS BREAK

WOODS

NC HWY 24/27 26' BST

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 0' 100'
GRAPHIC SCALE

25' 0' 50'
INSET GRAPHIC SCALE

SITES 8 & 9

SITE 10 (DOWNSTREAM)

SITE 10 (UPSTREAM)

FOR INTERSECTION DETAIL, SEE SHEET 2B-3

FOR PARKING LOT DESIGN, SEE SHEET 2B-13

FOR –L– PROFILE, SEE SHEETS 44 & 45

ALL DRIVEWAY RADII 30' UNLESS OTHERWISE NOTED.

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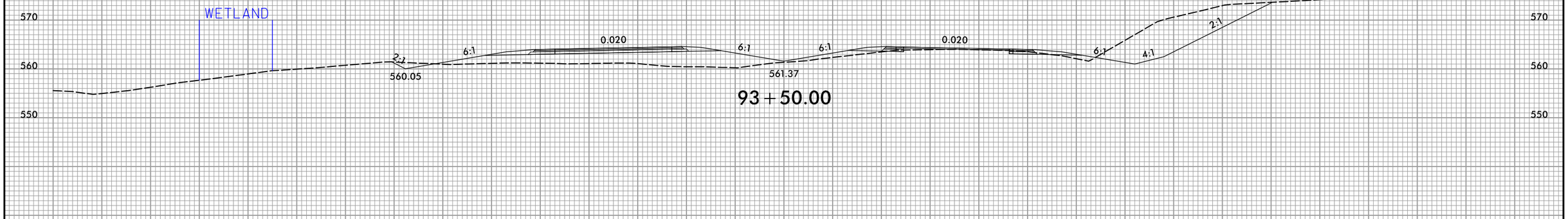
8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2527	X-56

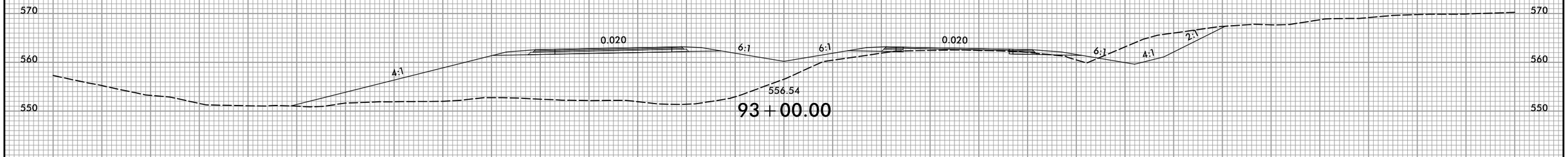
PERMIT DRAWING
SHEET 12 OF 91

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

SITE 9



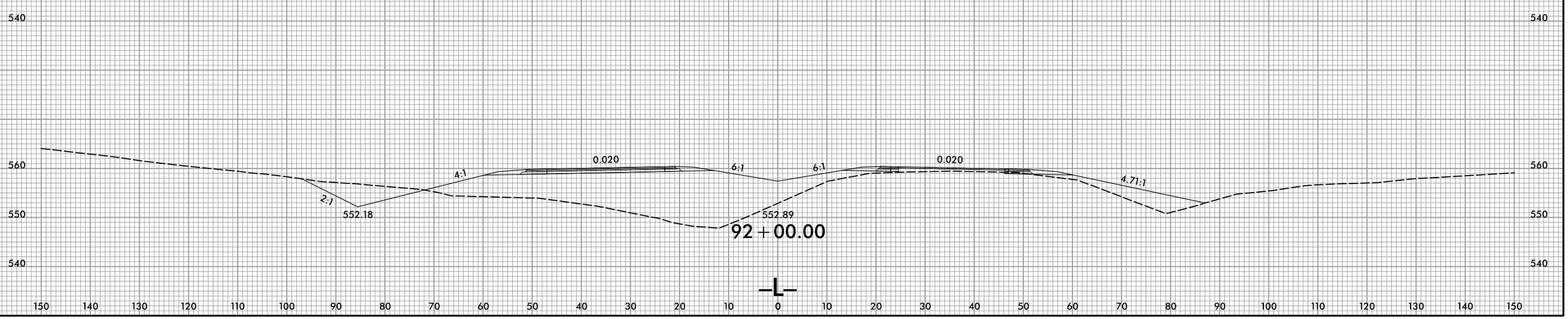
93 + 50.00



93 + 00.00

SITE 8

92 + 50.00



92 + 00.00

–L–

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8:01:41 AM
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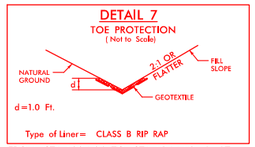
gaverette

5/14/99

PERMIT DRAWING SHEET 13 OF 91

- DENOTES MECHANIZED CLEARING
- F F — DENOTES FILL IN WETLAND
- S S — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DETAIL 7
TOE PROTECTION
(Not to Scale)

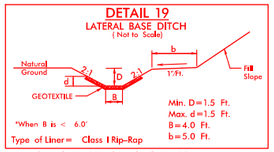


d=1.0 Ft.

Type of Liner= CLASS B RIP RAP

FROM STA. 123+86 TO STA. 124+58 -L- LT

DETAIL 19
LATERAL BASE DITCH
(Not to Scale)



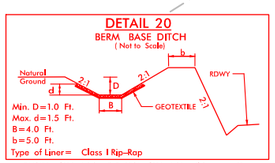
*When B is < 6.0'

Min. D=1.5 Ft.
Max. d=1.5 Ft.
B=4.0 Ft.
b=5.0 Ft.

Type of Liner= Class I Rip-Rap

FROM STA. 124+65 TO STA. 128+75 -L- LT

DETAIL 20
BERM BASE DITCH
(Not to Scale)

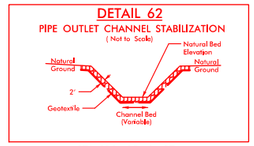


Min. D=1.0 Ft.
Max. d=1.5 Ft.
B=4.0 Ft.
b=5.0 Ft.

Type of Liner= Class I Rip-Rap

FROM STA. 128+75 TO STA. 131+63 -L- LT

DETAIL 62
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



STA. 126+85 -L- RT

NAD 83/NA 2011

PROJECT REFERENCE NO.	SHEET NO.
R-2527	13
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

STEWART
firm Licensed No. C-1851
223 S. West St.
Suite 1100
Raleigh, NC 27603
T: 919.380.8750
www.stewartENG.com

vhb
VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

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120

125

(15) UNITED STATES OF AMERICA

SITE 11

WETLAND WR

STREAM SM-1

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 20 TONS EST 62 SY GEOTEXTILE

LATERAL BASE DITCH W/CLASS I RIP RAP SEE DETAIL 19 EST 466 TONS EST 826 SY GEOTEXTILE

SITE 13

(12) SCARBOROUGH PROPERTIES, LLC

WETLAND WP

BERM BASE DITCH W/CLASS I RIP RAP SEE DETAIL 20 EST 327 TONS EST 580 SY GEOTEXTILE

BEGIN SBG +00

CAT-1

JB w/MH

24" W/ELBOWS

48" RCP-V

15" W/ ELBOWS

END SBG +30 LT

GREU TL-3

15" RCP-IV

24" RCP-IV

NOT BURIED

FILL W/ FLOWABLE FILL

TRENCHLESS INSTALLATION W/WELDED STEEL

COLLAR

MATCH TO SHEET 12 -L- STA. 116+00.00

MATCH TO SHEET 14 -L- STA. 130+00.00

S 54°55'09"E -L-

R2527-4

BEGIN SBG +50

ACCESS BREAK

SITE 12

SITE 16

WETLAND WK

(12) SCARBOROUGH PROPERTIES, LLC

CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE

PIPE OUTLET CHANNEL STABILIZATION W/ CLASS I RIP RAP EST 20 TONS EST 30 SY GEOTEXTILE L= 16 FT SEE DETAIL 62

WETLAND WN

STREAM SM-1

STREAM SM-2

SITE 15

WETLAND WL

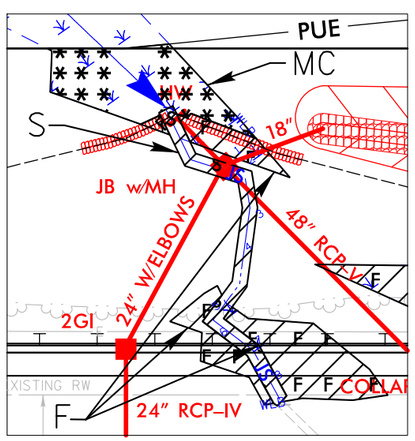
WETLAND WM

SITE 14

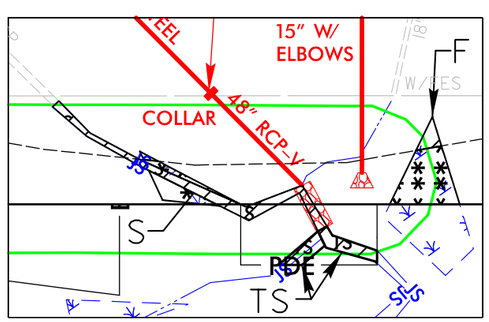
ENVIRONMENTAL SENSITIVITY AREA

50' 0' 100'
GRAPHIC SCALE

25' 0' 50'
INSET GRAPHIC SCALE



SITES 11 & 12



SITES 14, 15 & 16

ENVIRONMENTALLY SENSITIVE AREA

FOR -L- PROFILE, SEE SHEETS 45 & 46

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hwang

5/14/99

PERMIT DRAWING SHEET 14 OF 91

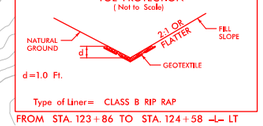
DENOTES MECHANIZED CLEARING

F F — DENOTES FILL IN WETLAND

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DETAIL 7
TOE PROTECTION
(Not to Scale)

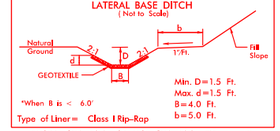


d=1.0 Ft.

Type of Liner= CLASS B RIP RAP

FROM STA. 123+86 TO STA. 124+58 -L- LT

DETAIL 19
LATERAL BASE DITCH
(Not to Scale)



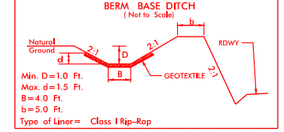
*When B is < 6.0'

Min. D=1.5 Ft.
Max. d=1.5 Ft.
B=4.0 Ft.
b=5.0 Ft.

Type of Liner= Class I Rip-Rap

FROM STA. 124+65 TO STA. 128+75 -L- LT

DETAIL 20
BERM BASE DITCH
(Not to Scale)

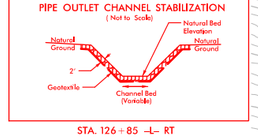


Min. D=1.0 Ft.
Max. d=1.5 Ft.
B=4.0 Ft.
b=5.0 Ft.

Type of Liner= Class I Rip-Rap

FROM STA. 128+75 TO STA. 131+63 -L- LT

DETAIL 62
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



STA. 126+85 -L- RT

NAD 83/NA 2011

PROJECT REFERENCE NO.	SHEET NO.
R-2527	13
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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vhb
VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

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WETLAND WR

STREAM SM-1

SITE 11

(15) UNITED STATES OF AMERICA

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 20 TONS EST 62 SY GEOTEXTILE

LATERAL BASE DITCH W/CLASS I RIP RAP SEE DETAIL 19 EST 466 TONS EST 826 SY GEOTEXTILE

SITE 13

(12) SCARBOROUGH PROPERTIES, LLC

WETLAND WP

BERM BASE DITCH W/CLASS I RIP RAP SEE DETAIL 20 EST 327 TONS EST 580 SY GEOTEXTILE

MATCH TO SHEET 12 -L- STA. 116+00.00

MATCH TO SHEET 14 -L- STA. 130+00.00

BEGIN SBG +00

CAT-1

END SBG +30 LT

GREU TL-3

BEGIN SBG +50

END SBG +30 LT

ACCESS BREAK

S 54° 55' 09.7" E -L-

R2527-4

NC HWY 24/27 24" BST

WETLAND WK

SITE 12

WETLAND WN

STREAM SM-1

SITE 16

SCARBOROUGH PROPERTIES, LLC

STREAM SM-2

WETLAND WL

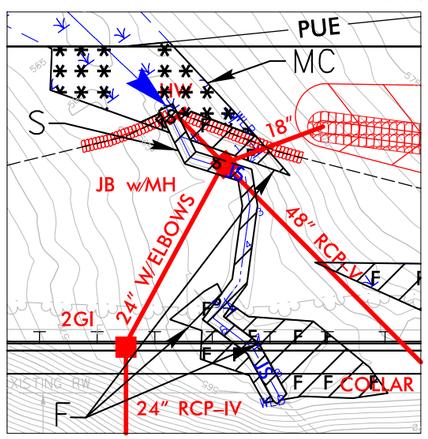
SITE 15

WETLAND WM

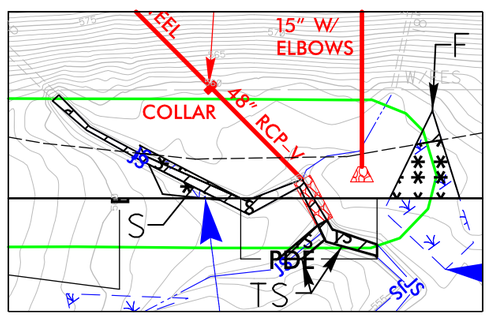
SITE 14

CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE

PIPE OUTLET CHANNEL STABILIZATION W/ CLASS I RIP RAP EST 20 TONS EST 30 SY GEOTEXTILE L= 16 FT SEE DETAIL 62



SITES 11 & 12



SITES 14, 15 & 16

ENVIRONMENTAL SENSITIVITY AREA

50' 0' 100'
GRAPHIC SCALE

25' 0' 50'
INSET GRAPHIC SCALE

ENVIRONMENTALLY SENSITIVE AREA

FOR -L- PROFILE, SEE SHEETS 45 & 46

4/4/24 4:34 PM
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bunt

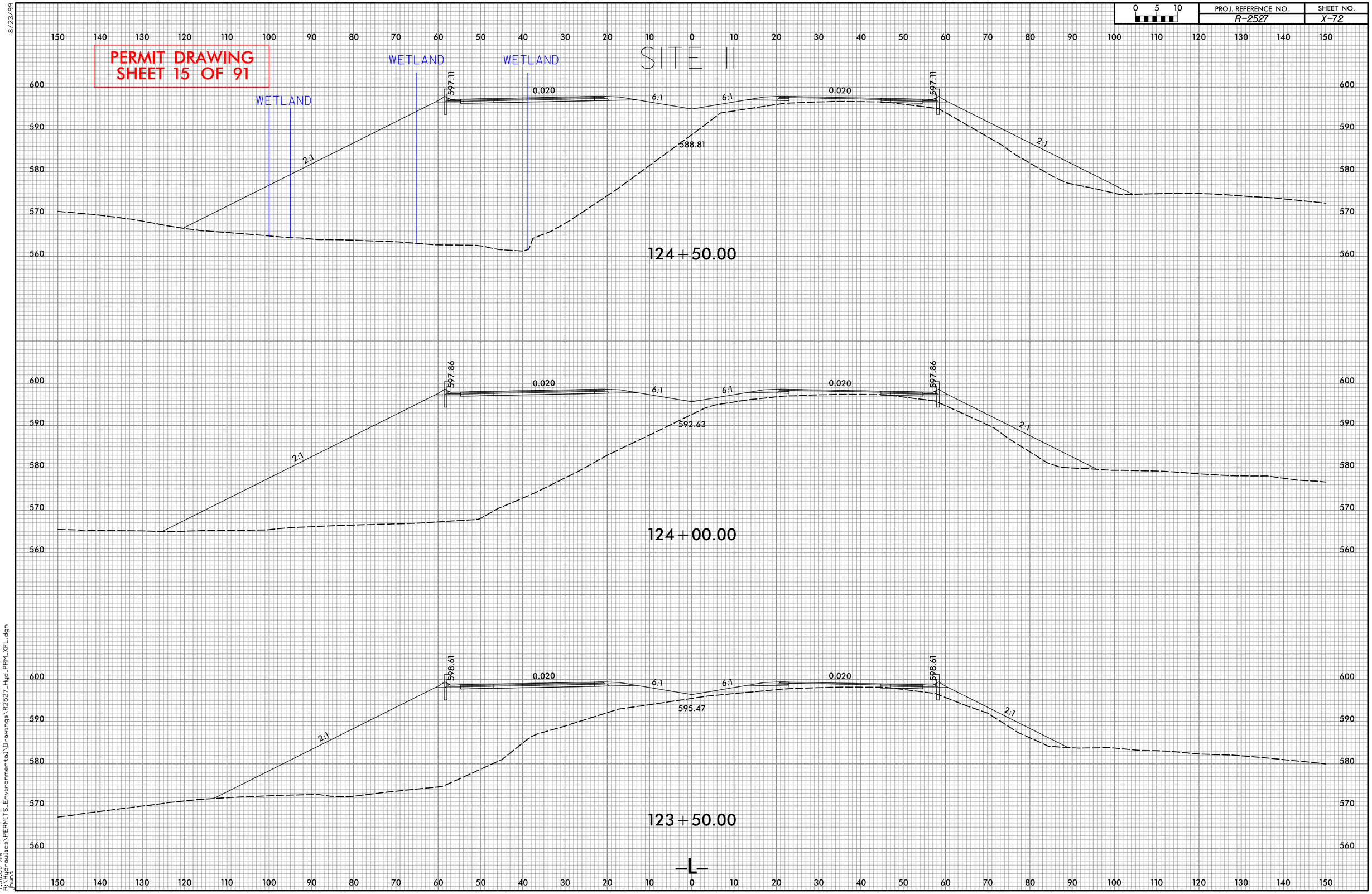
8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2527	X-72

PERMIT DRAWING
SHEET 15 OF 91

SITE II

WETLAND WETLAND WETLAND



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jhunt

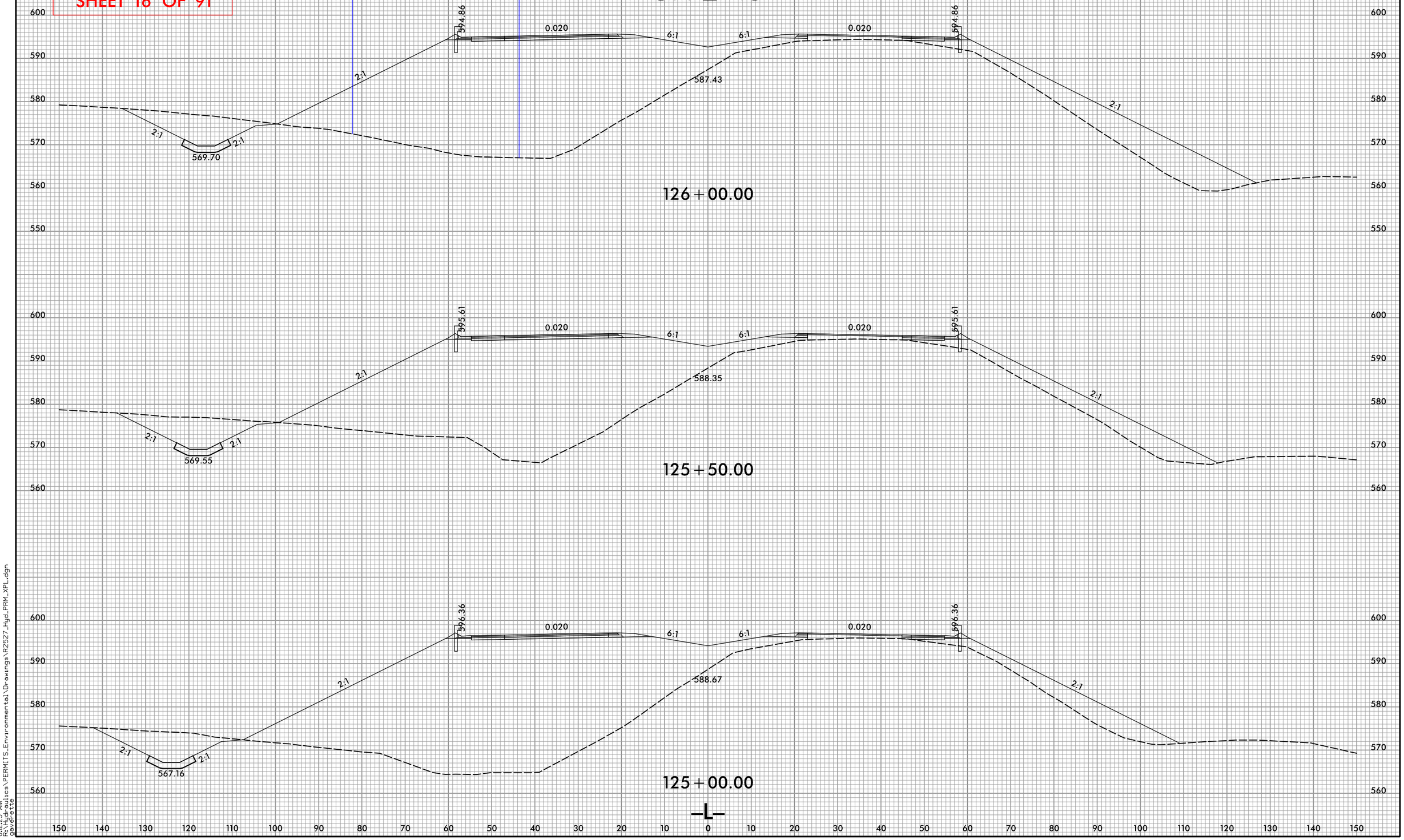
8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2527	X-73

PERMIT DRAWING
SHEET 16 OF 91

WETLAND WETLAND

SITE 13



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gaverette

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PROJ. REFERENCE NO.	SHEET NO.
R-2527	X-74

0 5 10

PERMIT DRAWING
SHEET 17 OF 91

SITE 16

WETLAND CONTINUES OFF SHEET

WELAND

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

590 580 570 560 550

592.61 0.020 6:1 6:1 0.020 592.61

2:1 2:1 2:1 2:1 2:1

584.03

574.10

127+50.00

600 590 580 570 560 550

593.36 0.020 6:1 6:1 0.020 593.36

2:1 2:1 2:1 2:1 2:1

586.43

571.97

127+00.00

600 590 580 570 560 550

594.11 0.020 6:1 6:1 0.020 594.11

2:1 2:1 2:1 2:1 2:1

586.64

569.85

126+50.00

–L–

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

8/25/25 AM
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Hydraulics
gaverette

5/14/99

PERMIT DRAWING
SHEET 18 OF 91

50' 0' 100'

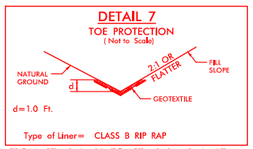
GRAPHIC SCALE

DENOTES MECHANIZED CLEARING

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DETAIL 7
TOE PROTECTION
(Not to Scale)

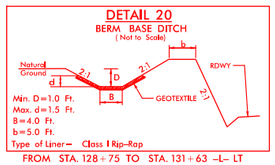


d=1.0 Ft.

Type of Liner= CLASS B RIP RAP

FROM STA. 140+10 TO STA. 142+41 -L- LT

DETAIL 20
BERM BASE DITCH
(Not to Scale)



Min. D=1.0 Ft.
Max. d=1.5 Ft.
B=4.0 Ft.
b=5.0 Ft.
Type of Liner= Class I Rip-Rap

FROM STA. 128+75 TO STA. 131+63 -L- LT

PROJECT REFERENCE NO.	SHEET NO.
R-2527	14
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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firm License No. C-1851
223 S. West St.
Suite 1100
Raleigh, NC 27603
T: 919.380.8750
www.stewartinc.com

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VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
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2011 ANN38 DAN

SITE 17

STREAM SN

WETLAND WV

SITE 18

140

135

(12) SCARBOROUGH PROPERTIES, LLC

(17) UNITED STATE FOREST SERVICE

MATCH TO SHEET 13 -L- STA. 130+00.00

MATCH TO SHEET 15 -L- STA. 142+00.00

BERM BASE DITCH W/CLASS I RIP RAP SEE DETAIL 20 EST 327 TONS EST 580 SY GEOTEXTILE

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 68 TONS EST 213 SY GEOTEXTILE

CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE

CHORD

ACCESS BREAK

INC=4% (TYP.)

REMOVE

NOT BURIED TRENCHLESS INSTALLATION 42" WELDED STEEL

COLLAR

GREU TL-3

FOR -L- PROFILE, SEE SHEET 46

ALL DRIVEWAY RADII 30' UNLESS OTHERWISE NOTED.

8:32:22 AM
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dwerstle

5/14/99

PERMIT DRAWING
SHEET 19 OF 91

50' 0' 100'

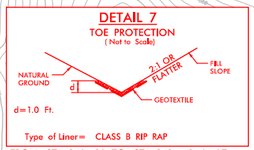
GRAPHIC SCALE

DENOTES MECHANIZED CLEARING

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DETAIL 7
TOE PROTECTION
(Not to Scale)

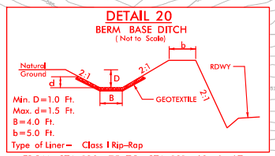


d=1.0 Ft.

Type of Liner= CLASS B RIP RAP

FROM STA. 140+10 TO STA. 142+41 -L- LT

DETAIL 20
BERM BASE DITCH
(Not to Scale)



Min. D=1.0 Ft.
Max. d=1.5 Ft.
B=4.0 Ft.
b=5.0 Ft.
Type of Liner= Class I Rip-Rap

FROM STA. 128+75 TO STA. 131+63 -L- LT

PROJECT REFERENCE NO.	SHEET NO.
R-2527	14
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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firm License No. C-1851
223 S. West St.
Suite 1100
Raleigh, NC 27603
T: 919.380.8750
www.stewartinc.com

vhb
VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
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FOR -L- PROFILE, SEE SHEET 46

ALL DRIVEWAY RADII 30' UNLESS OTHERWISE NOTED.

8:17:16 AM
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0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2527	X-83

PERMIT DRAWING
SHEET 20 OF 91

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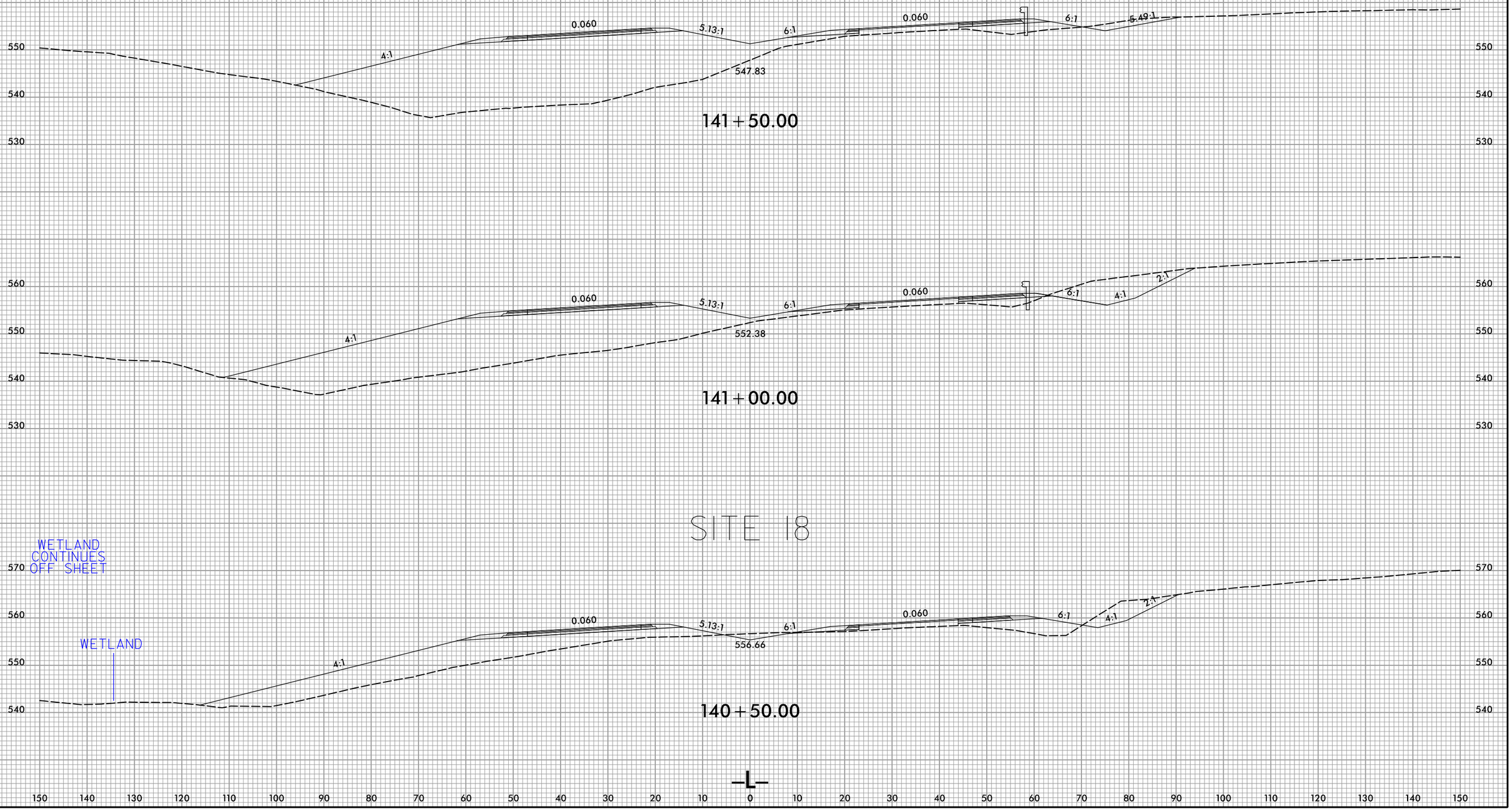

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gaverette

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PERMIT DRAWING SHEET 21 OF 91

50′ 0′ 100′

GRAPHIC SCALE

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DETAIL 57
STANDARD BASE DITCH
(Not to Scale)

Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=4.0 Ft.
*When B is < 6.0'

Type of Liner= CLASS I RIP RAP
AT STA. 150+80 –L– RT

DETAIL 7
TOE PROTECTION
(Not to Scale)

Type of Liner= Class B Rip-Rap
FROM STA. 140+10 TO STA. 142+41 –L– LT
FROM STA. 148+00 TO STA. 151+50 –L– LT

DETAIL 63
BANKS ONLY PIPE OUTLET CHANNEL
(Not to Scale)

STA. 143+33 –L– RT

DETAIL 12
BERM BASE DITCH
(Not to Scale)

Min. D=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.
FROM STA. 143+50 TO STA. 147+75 –L– LT

DETAIL 21
LATERAL BASE DITCH
(Not to Scale)

Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.
*When B is < 6.0'
Type of Liner= CLASS I RIP RAP
FROM STA. 145+00 TO STA. 150+84 –L– RT

NAD 83/NA 2011

PROJECT REFERENCE NO.	SHEET NO.
R-2527	15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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Raleigh, NC 27603
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STREAM SN

SITE 17

WETLAND WU

SITE 21

STREAM SO

SITE 22 (18) ROBERT ANTHONY MORRIS AND WIFE, JACKIE MORRIS

145

150

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 68 TONS EST 213 SY GEOTEXTILE

ACCESS BREAK

BERM BASE DITCH SEE DETAIL 12

(17) UNITED STATE FOREST SERVICE

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 96 TONS EST 300 SY GEOTEXTILE

TOE PROTECTION SEE DETAIL 7

HW/D10=0.3

18" W/ELBOWS

BDO

2GI FS

18" RCP-III

42" RCP-IV

COLLAR

FILL W/ FLOWABLE FILL

NOT BURIED

BURIED 0.7'

15" RCP-III

15" W/ ELBOWS

JB w/MH

4' FDPS

2' FDPS

10' FDPS

CAT-1

MATCH TO SHEET 14 L STA 142+00.00

MATCH TO SHEET 16 L STA 154+00.00

SPRING

MC

SITE 17

SITE 19

BANKS ONLY PIPE OUTLET CHANNEL W/ CLASS I RIP RAP EST 19 TONS EST 31 SY GEOTEXTILE L= 14 FT SEE DETAIL 63

STREAM SN

WETLAND WS

LATERAL BASE DITCH W/CLASS I RIP RAP SEE DETAIL 21 EST 469 TONS EST 902 SY GEOTEXTILE

(17) UNITED STATE FOREST SERVICE

STREAM SO-1

SITE 20

STANDARD BASE DITCH W/CLASS I RIP RAP SLOPE= 0.3% EST 25 TONS EST 50 SY GEOTEXTILE EST DDE =9 CY SEE DETAIL 57

(18) ROBERT ANTHONY MORRIS AND WIFE, JACKIE MORRIS

STREAM SO

FOR –L– PROFILE, SEE SHEETS 46 & 47

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bunt

5/14/99

PERMIT DRAWING SHEET 22 OF 91

50' 0' 100'
GRAPHIC SCALE

DENOTES MECHANIZED CLEARING

F F DENOTES FILL IN WETLAND

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DETAIL 57
STANDARD BASE DITCH
(Not to Scale)

Natural Ground, 2:1, d, D, 2:1, Natural Ground, Geotextile, B
Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=4.0 Ft.
*When B is < 6.0'
Type of Liner= CLASS I RIP RAP
AT STA. 150+80 -L- RT

DETAIL 7
TOE PROTECTION
(Not to Scale)

NATURAL GROUND, d, 2:1 OR FLATTER, FILL SLOPE, GEOTEXTILE
d=1.0 Ft.
Type of Liner= Class B Rip-Rap
FROM STA. 140+10 TO STA. 142+41 -L- LT
FROM STA. 148+00 TO STA. 151+50 -L- LT

DETAIL 63
BANKS ONLY PIPE OUTLET CHANNEL
(Not to Scale)

Natural Ground, Natural Bed Elevation, Min. 2' Below Natural Bed, Min. 2' Below Natural Bed, Natural Ground, 2', CHANNEL BED (Variable), Geotextile
STA. 143+33 -L- RT

DETAIL 12
BERM BASE DITCH
(Not to Scale)

Natural Ground, 2:1, D, 2:1, RDWY, B, 2:1
Min. D=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.
FROM STA. 143+50 TO STA. 147+75 -L- LT

DETAIL 21
LATERAL BASE DITCH
(Not to Scale)

Natural Ground, 2:1, b, D, 2:1, 1'Ft., Fill Slope, GEOTEXTILE, d, B
Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.
*When B is < 6.0'
Type of Liner= CLASS I RIP RAP
FROM STA. 145+00 TO STA. 150+84 -L- RT

NAD 83/NA 2011

PROJECT REFERENCE NO.	SHEET NO.
R-2527	15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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Suite 1100
Raleigh, NC 27603
T: 919.380.8750
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STREAM SN
SITE 17
TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 68 TONS EST 213 SY GEOTEXTILE
ACCESS BREAK
BERM BASE DITCH SEE DETAIL 12
MATCH TO SHEET 14 -L- STA. 142+00.00
4" FDPS
2" FDPS
2GI
FS
FILL W/ FLOWABLE FILL
NOT BURIED
10' FDPS
42" RCP-III WELDED STEEL
JB w/MH
SPRING
MC
BANKS ONLY PIPE OUTLET CHANNEL W/ CLASS I RIP RAP EST 19 TONS EST 31 SY GEOTEXTILE L= 14 FT SEE DETAIL 63
SITE 19
STREAM SN
WETLAND WS

WETLAND WU
SITE 21
TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 96 TONS EST 300 SY GEOTEXTILE
17 UNITED STATE FOREST SERVICE
HWD10=0.3
18" W/ELBOWS
BDO
18" RCP-III
BURIED 0.7'
JB w/MH
SITE 17
LATERAL BASE DITCH W/CLASS I RIP RAP SEE DETAIL 21 EST 469 TONS EST 902 SY GEOTEXTILE
17 UNITED STATE FOREST SERVICE
STREAM SO-1
SITE 20

STREAM SO
SITE 22
18 ROBERT ANTHONY MORRIS AND WIFE, JACKIE MORRIS
TOE PROTECTION SEE DETAIL 7
PUE
MATCH TO SHEET 16 -L- STA. 154+00.00
4" FDPS
2" FDPS
COLLAR
42" RCP-IV
15" RCP-III
15" W/ELBOWS
FILL W/ FLOWABLE FILL
JB w/MH
CAT-I
STANDARD BASE DITCH W/CLASS I RIP RAP SLOPE= 0.3% EST 25 TONS EST 50 SY GEOTEXTILE EST DDE =9 CY SEE DETAIL 57
18 ROBERT ANTHONY MORRIS AND WIFE, JACKIE MORRIS
STREAM SO

FOR -L- PROFILE, SEE SHEETS 46 & 47

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bunt

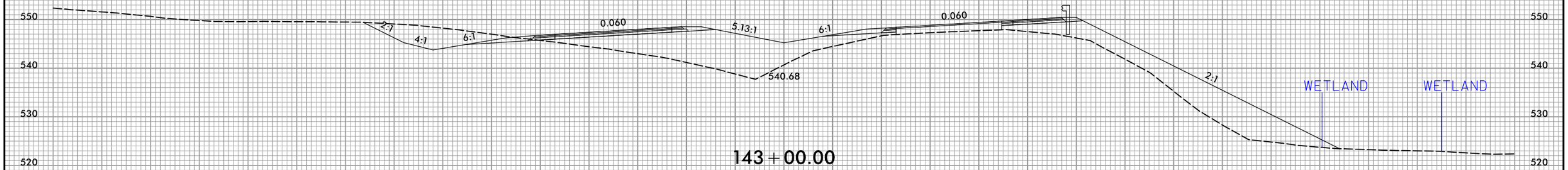
8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2527	X-84

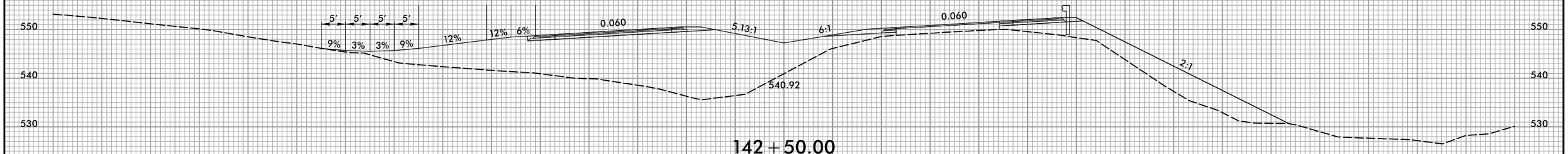
PERMIT DRAWING
SHEET 23 OF 91

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

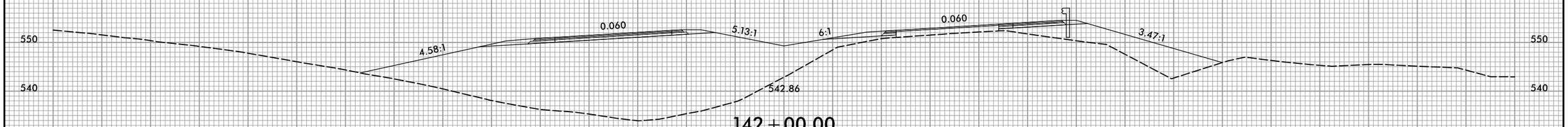
SITE 19



143 + 00.00



142 + 50.00



142 + 00.00

–L–

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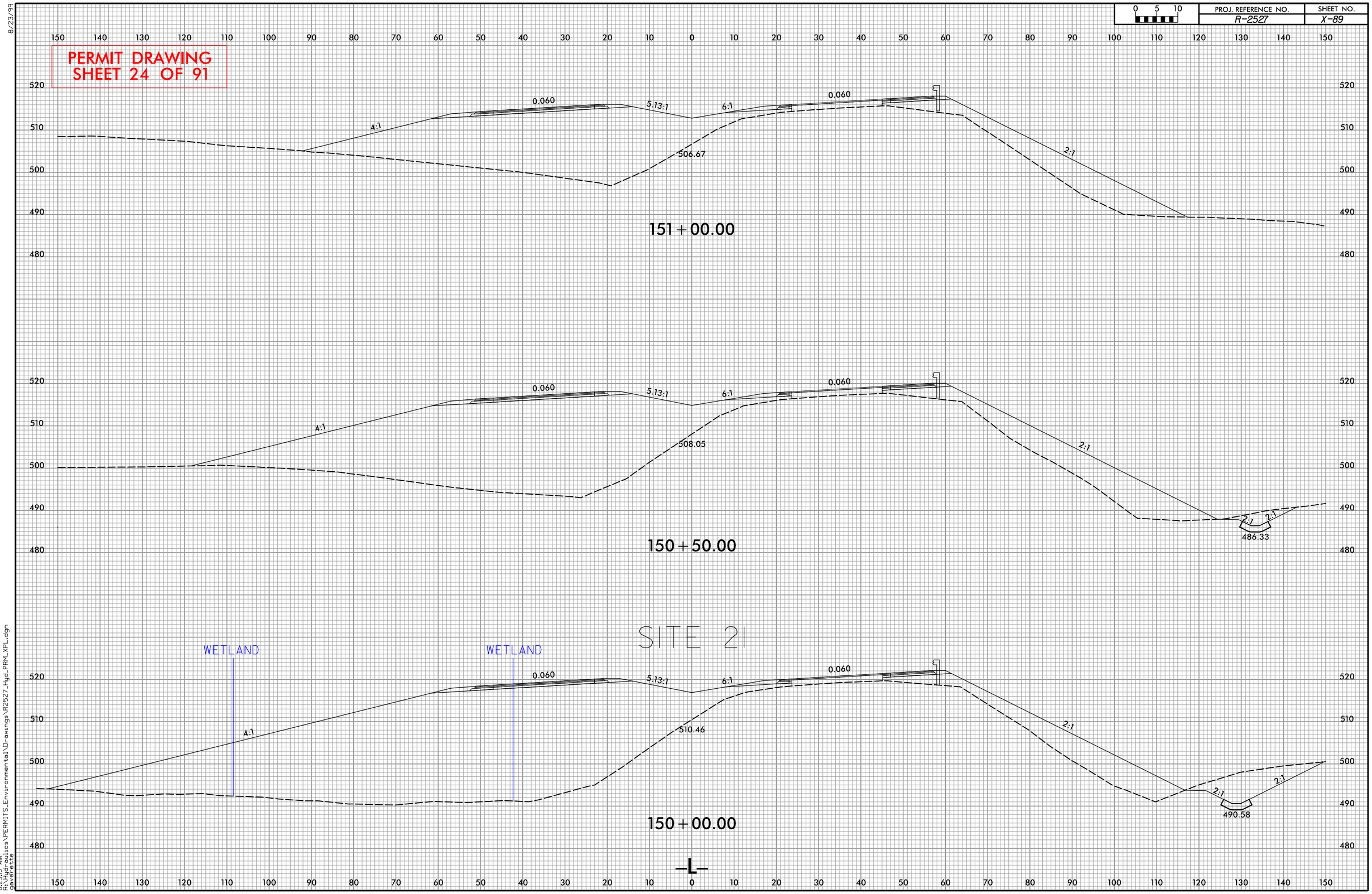
7:58:41 AM
R:\Hydraulics\PERMITS_Environmental\Drawings\R2527_Hyd_PRM_XPL.dgn
jhunt

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2527	X-89

PERMIT DRAWING
SHEET 24 OF 91



8:20a AM
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gaverette

5/14/99

PERMIT DRAWING SHEET 25 OF 91

50′ 0′ 100′
GRAPHIC SCALE

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-2527	16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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firm License No. C-1851
223 S. West St.
Suite 1100
Raleigh, NC 27603
T: 919.380.8750
www.wbstewartPE.com

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940 Main Campus Drive, Suite 500
Raleigh, NC 27606

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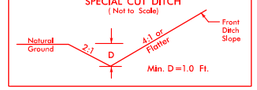
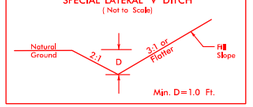
NAD 83/NA 2011

DETAIL 53
SPECIAL CUT DITCH
(Not to Scale)



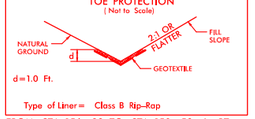
FROM STA. 154+00 TO STA. 156+50 -L- RT

DETAIL 1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



FROM STA. 165+00 TO STA. 166+50 -L- RT

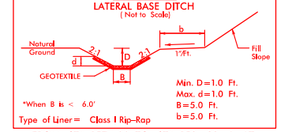
DETAIL 7
TOE PROTECTION
(Not to Scale)



Type of Liner= Class B Rip-Rap

FROM STA. 156+90 TO STA. 158+50 -L- RT

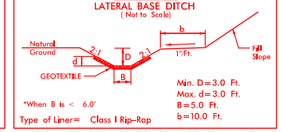
DETAIL 13
LATERAL BASE DITCH
(Not to Scale)



Type of Liner= Class I Rip-Rap

FROM STA. 157+00 TO STA. 159+32 -L- LT
FROM STA. 160+00 TO STA. 165+00 -L- RT

DETAIL 14
LATERAL BASE DITCH
(Not to Scale)



Type of Liner= Class I Rip-Rap

FROM STA. 159+39 TO STA. 166+75 -L- LT

155

160

165

STREAM SC

TS

FILL IN EXISTING CHANNEL W/CLASS I RIP RAP
EST 70 TONS
EST 105 SY GEOTEXTILE
SEE DETAIL 64

CLASS II RIP RAP
SEE DETAIL 23
EST 200 TONS
EST 320 SY
GEOTEXTILE
SEE DETAIL 23

7.0′ BASE CHANNEL

SIDMS CREEK

SITE 23

LATERAL BASE DITCH
W/CLASS I RIP RAP
SEE DETAIL 13
EST 241 TONS
EST 436 SY GEOTEXTILE

(18)
ROBERT ANTHONY MORRIS
AND WIFE, JACKIE MORRIS

STREAM SC-1

SITE 24

LATERAL BASE DITCH
W/CLASS I RIP RAP
SEE DETAIL 14
EST 1283 TONS
EST 2113 SY GEOTEXTILE

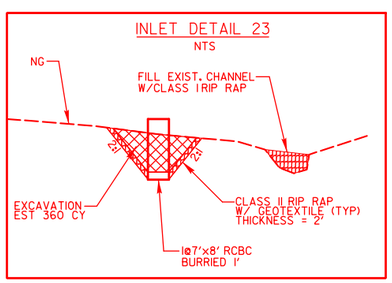
MATCH TO SHEET 15
-L- STA. 154+00.00

MATCH TO SHEET 17
-L- STA. 166+00.00

ACCESS BREAK
WOODS
4′ FDPS
2′ FDPS
10′ FDPS
24′
46′
8d
CAT-1
GREU TL-3
RANDOLPH ELECTRIC 40'RW
R=2940.00′
PUE
PDE
DUE
CHORD
E
F
C
2GI
FS
18″ W/ ELBOWS
15″ W/ELBOWS
18″ RCP-IV
15″ RCP-III
BEGIN SBG +00
(NC=40′ (TYP.)
+/-100
1@7′x8′ RCBC (BURIED 1.0′) W/BEVELED HW
N 66°14′17.2″ E
-L-
NC HWY 24/27
24′ BST
FILL W/ FLOWABLE FILL
SPECIAL CUT DITCH
SEE DETAIL 53
TOE PROTECTION
W/CLASS B RIP RAP
SEE DETAIL 7
EST 44 TONS
EST 138 SY GEOTEXTILE
FILL IN EXISTING CHANNEL
W/CLASS I RIP RAP
EST 165 TONS
EST 190 SY GEOTEXTILE
SEE DETAIL 64
LATERAL BASE DITCH
W/CLASS I RIP RAP
SEE DETAIL 13
EST 519 TONS
EST 939 SY GEOTEXTILE
SPECIAL LATERAL 'V' DITCH
SEE DETAIL 1
CLASS II RIP RAP
SEE DETAIL 24
EST 255 TONS
EST 395 SY
GEOTEXTILE
SEE DETAIL 24
7.0′ BASE
OUTLET CHANNEL
CLASS I RIP RAP
EMBEDDED INTO
STREAM BED
EST 40 TONS
EST 75 SY
GEOTEXTILE

NOTE: SEE TMP SHEET No. XXX FOR CULVERT STAGING

INLET DETAIL 23
NTS



OUTLET DETAIL 24
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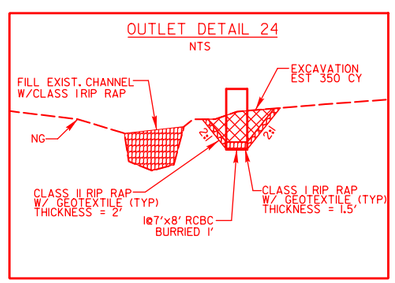

FOR -L- PROFILE, SEE SHEET 47

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PERMIT DRAWING SHEET 26 OF 91

50′ 0′ 100′
GRAPHIC SCALE

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-2527	16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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NAD 83/NA 2011

DETAIL 53
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground, 2:1, D, 4:1 or Flatter, Front Ditch Slope
Min. D=1.0 Ft.
FROM STA. 154+00 TO STA. 156+50 -L- RT

DETAIL 1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground, 2:1, D, 3:1 or Flatter, Fill Slope
Min. D=1.0 Ft.
FROM STA. 165+00 TO STA. 166+50 -L- RT

DETAIL 7
TOE PROTECTION
(Not to Scale)
NATURAL GROUND, d, 2:1 OR FLATTER, FILL SLOPE, GEOTEXTILE
d=1.0 Ft.
Type of Liner= Class B Rip-Rap
FROM STA. 156+90 TO STA. 158+50 -L- RT

DETAIL 13
LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 2:1, d, D, 2:1, 1'Ft., b, B, GEOTEXTILE, Fill Slope
*When B is < 6.0'
Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=5.0 Ft.
b=5.0 Ft.
Type of Liner= Class I Rip-Rap
FROM STA. 157+00 TO STA. 159+32 -L- LT
FROM STA. 160+00 TO STA. 165+00 -L- RT

DETAIL 14
LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 2:1, d, D, 2:1, 1'Ft., b, B, GEOTEXTILE, Fill Slope
*When B is < 6.0'
Min. D=3.0 Ft.
Max. d=3.0 Ft.
B=5.0 Ft.
b=10.0 Ft.
Type of Liner= Class I Rip-Rap
FROM STA. 159+39 TO STA. 166+75 -L- LT

STREAM SC
CLASS II RIP RAP
SEE DETAIL 23
EST 200 TONS
EST 320 SY
GEOTEXTILE
SEE DETAIL 23

FILL IN EXISTING CHANNEL W/CLASS I RIP RAP
EST 70 TONS
EST 105 SY GEOTEXTILE
SEE DETAIL 64

TS
51' DUNS CREEK 51'
7.0' BASE CHANNEL

SITE 23

LATERAL BASE DITCH W/CLASS I RIP RAP
SEE DETAIL 13
EST 241 TONS
EST 436 SY GEOTEXTILE

18 ROBERT ANTHONY MORRIS AND WIFE, JACKIE MORRIS

STREAM SC-1

SITE 24

LATERAL BASE DITCH W/CLASS I RIP RAP
SEE DETAIL 14
EST 1283 TONS
EST 2113 SY GEOTEXTILE

MATCH TO SHEET 15 -L- STA. 154+00.00

ACCESS BREAK
WOODS
4' FDPS
2' FDPS
24"
46"
15" RCP-III
2GI
FS
18" W/ ELBOWS
CAT-1
10' FDPS
BEGIN SBG +00
18" RCP-IV
[NC=40' (TYP.)
H=100
15" W/ELBOWS
N 66°14'17.2" E -L-
1@7'x8' RCBC (BURIED 1.0') W/BEVELED HW
GREU TL-3
FILL W/ FLOWABLE FILL
NC HWY/24/27
24" BST
MATCH TO SHEET 17 -L- STA. 166+00.00

SPECIAL CUT DITCH SEE DETAIL 53

TOE PROTECTION W/CLASS B RIP RAP
SEE DETAIL 7
EST 44 TONS
EST 138 SY GEOTEXTILE

PUE
DUE
PDE
RANDOLPH ELECTRIC 400kW

FILL IN EXISTING CHANNEL W/CLASS I RIP RAP
EST 165 TONS
EST 190 SY GEOTEXTILE
SEE DETAIL 64

CLASS II RIP RAP
SEE DETAIL 24
EST 255 TONS
EST 395 SY
GEOTEXTILE
SEE DETAIL 24

7.0' BASE OUTLET CHANNEL

CLASS I RIP RAP EMBEDDED INTO STREAM BED
EST 40 TONS
EST 75 SY
GEOTEXTILE

LATERAL BASE DITCH W/CLASS I RIP RAP
SEE DETAIL 13
EST 519 TONS
EST 939 SY GEOTEXTILE

SPECIAL LATERAL 'V' DITCH
SEE DETAIL 1

NOTE: SEE TMP SHEET No. XXX FOR CULVERT STAGING

INLET DETAIL 23
NTS
NG, FILL EXIST. CHANNEL W/CLASS I RIP RAP, 1:1, 2:1, EXCAVATION EST 360 CY, CLASS II RIP RAP W/ GEOTEXTILE (TYP) THICKNESS = 2', I@7'x8' RCBC BURRIED 1'

OUTLET DETAIL 24
NTS
FILL EXIST. CHANNEL W/CLASS I RIP RAP, NG, EXCAVATION EST 350 CY, 2:1, 2', CLASS II RIP RAP W/ GEOTEXTILE (TYP) THICKNESS = 2', I@7'x8' RCBC BURRIED 1', CLASS I RIP RAP W/ GEOTEXTILE (TYP) THICKNESS = 1.5'

FOR -L- PROFILE, SEE SHEET 47

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overdale

PERMIT DRAWING
SHEET 27 OF 91

PROJECT REFERENCE NO.	
R-2527	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

STEWART
Firm License No. C-0101
223 South West St.
Suite 1150
Raleigh, NC 27603
T: 919.380.8750
www.stewartinc.com

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

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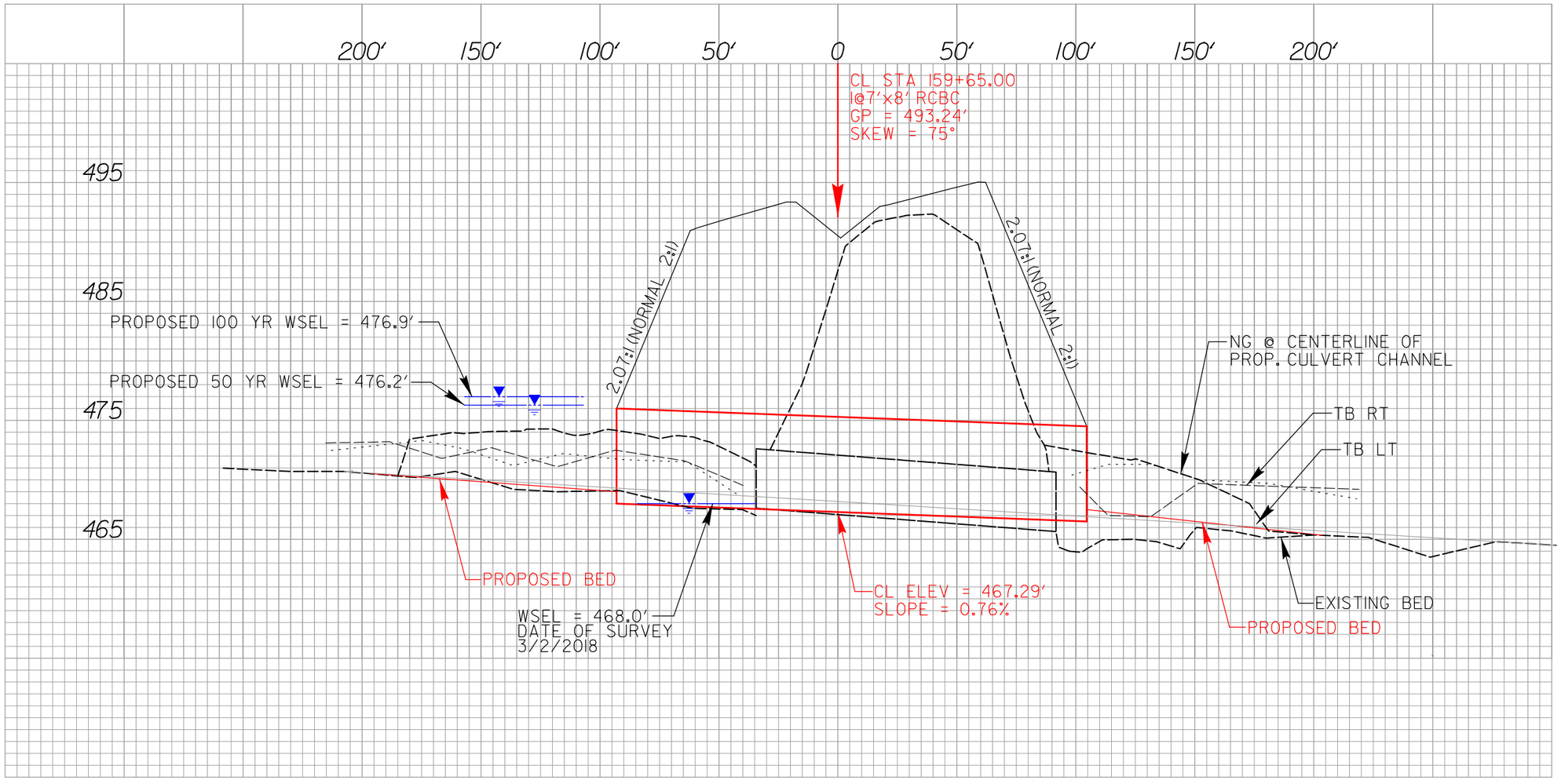
SITES 23 & 24



REVISIONS
8/17/99

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5/14/99

PERMIT DRAWING SHEET 28 OF 91

50′ 0′ 100′

GRAPHIC SCALE

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-2527	17
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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vhb — VHB Engineering NC, P.C. (C-3705), 940 Main Campus Drive, Suite 500, Raleigh, NC 27606

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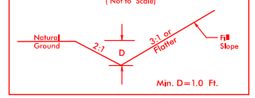
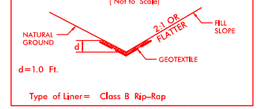
NAD 83/NA 2011

DETAIL 1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



FROM STA. 165+00 TO STA. 170+50 -L- RT

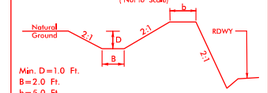
DETAIL 7
TOE PROTECTION
(Not to Scale)



Type of Liner= Class B Rip-Rap

FROM STA. 167+50 TO STA. 171+00 -L- RT

DETAIL 12
BERM BASE DITCH
(Not to Scale)



FROM STA. 178+00 TO STA. 185+96 -L- LT

DETAIL 14
LATERAL BASE DITCH
(Not to Scale)

Type of Liner= Class I Rip-Rap

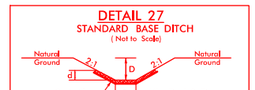
FROM STA. 159+39 TO STA. 166+75 -L- LT

DETAIL 15
LATERAL BASE DITCH
(Not to Scale)

Type of Liner= Class I Rip-Rap

FROM STA. 166+75 TO STA. 169+25 -L- LT

DETAIL 27
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= Class I Rip-Rap

FROM STA. 166+55 TO STA. 167+04 -L- LT

DETAIL 82
STANDARD 'V' DITCH
(Not to Scale)

FROM STA. 178+92 TO STA. 179+12 -L- RT

(19) UNITED STATES FOREST SERVICE

(18) T ANTHONY MORRIS IFE, JACKIE MORRIS

SITE 24

SITE 25

SITE 26

SITE 27

SITE 28

WETLAND WT

POND

STREAM SC-1

STREAM SC-2

STREAM SC-3

LATERAL BASE DITCH W/CLASS I RIP RAP SEE DETAIL 14 EST 1283 TONS EST 2113 SY GEOTEXTILE

STANDARD BASE DITCH W/CLASS I RIP RAP SLOPE= 4.3% EST 105 TONS EST 175 SY GEOTEXTILE EST DDE = 30 CY SEE DETAIL 27

CONSTRUCT BERM W/CLASS I RIP RAP IN EXISTING CHANNEL VOID FROM STA. 165+20 TO 167+50 L LT EST 150 TONS EST 210 SY GEOTEXTILE

CLASS I RIP RAP EMBEDDED IN EMERGENCY SPILLWAY EST 25 TONS EST 12 SY GEOTEXTILE

USE 1.5:1 ROCK PLATED FILL SLOPE STA 167+50 -L- LT TO STA 169+50 -L- LT

LATERAL BASE DITCH W/CLASS I RIP RAP SEE DETAIL 15 EST 260 TONS EST 470 SY GEOTEXTILE

BERM BASE DITCH SEE DETAIL 12

SPECIAL LATERAL 'V' DITCH SEE DETAIL 1

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 39 TONS EST 121 SY GEOTEXTILE

STANDARD V DITCH DDE= 2 CY SEE DETAIL 82

24" RCP-III

18" RCP-III

15" RCP-III

4' FDPS

2' FDPS

2GI

FS

COLLAR

NOT BURIED

TRENCHLESS INSTALLATION 5/8" WELDED STEEL FLOWABLE FILL

REMOVE

DESTROYED/ ABANDONED

END SBG +17

N 66°14'17.2" E

MATCH TO SHEET 16 -L- STA. 166+00.00

MATCH TO SHEET 18 -L- STA. 179+00.00

WOODS

ACCESS BREAK

PUE

SITES 25 & 26 (UPSTREAM)

25′ 0′ 50′

INSET GRAPHIC SCALE

FOR -L- PROFILE, SEE SHEET 47

ALL DRIVEWAY RADII 30' UNLESS OTHERWISE NOTED.

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5/14/99

PERMIT DRAWING SHEET 29 OF 91

50′ 0′ 100′

GRAPHIC SCALE

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-2527	17
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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NAD 83/NA 2011

DETAIL 1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

FROM STA. 165+00 TO STA. 170+50 -L- RT

DETAIL 7
TOE PROTECTION
(Not to Scale)

d=1.0 Ft.

Type of Liner= Class B Rip-Rap

FROM STA. 167+50 TO STA. 171+00 -L- RT

DETAIL 12
BERM BASE DITCH
(Not to Scale)

Min. D=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.

FROM STA. 178+00 TO STA. 185+96 -L- LT

DETAIL 14
LATERAL BASE DITCH
(Not to Scale)

*When B is < 6.0'

Min. D=3.0 Ft.
Max. d=3.0 Ft.
B=5.0 Ft.
b=10.0 Ft.

Type of Liner= Class I Rip-Rap

FROM STA. 159+39 TO STA. 166+75 -L- LT

DETAIL 15
LATERAL BASE DITCH
(Not to Scale)

*When B is < 6.0'

Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=5.0 Ft.
b=5.0 Ft.

Type of Liner= Class I Rip-Rap

FROM STA. 166+75 TO STA. 169+25 -L- LT

DETAIL 27
STANDARD BASE DITCH
(Not to Scale)

*When B is < 6.0'

Min. D=1.0 Ft.
Max. d=3.0 Ft.
B=4.0 Ft.

Type of Liner= Class I Rip-Rap

FROM STA. 166+55 TO STA. 167+04 -L- LT

DETAIL 82
STANDARD 'V' DITCH
(Not to Scale)

Min. D=1.0 Ft.

FROM STA. 178+92 TO STA. 179+12 -L- RT

SITE 24

SITE 25

SITE 26

SITE 27

SITE 28

WETLAND WT

STREAM SC-1

STREAM SC-2

STREAM SC-3

SITE 25 WETLAND WT

LATERAL BASE DITCH W/CLASS I RIP RAP SEE DETAIL 14 EST 1283 TONS EST 2113 SY GEOTEXTILE

STANDARD BASE DITCH W/CLASS I RIP RAP SLOPE= 4.3% EST 105 TONS EST 175 SY GEOTEXTILE EST DDE = 30 CY SEE DETAIL 27

CONSTRUCT BERM W/CLASS I RIP RAP IN EXISTING CHANNEL VOID FROM STA. 165+20 TO 167+50 L LT EST 150 TONS EST 210 SY GEOTEXTILE

CLASS I RIP RAP EMBEDDED IN EMERGENCY SPILLWAY EST 25 TONS EST 12 SY GEOTEXTILE

USE 1.5:1 ROCK PLATED FILL SLOPE STA 167+50 -L- LT TO STA 169+50 -L- LT

LATERAL BASE DITCH W/CLASS I RIP RAP SEE DETAIL 15 EST 260 TONS EST 470 SY GEOTEXTILE

BERM BASE DITCH SEE DETAIL 12

SPECIAL LATERAL 'V' DITCH SEE DETAIL 1

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 39 TONS EST 121 SY GEOTEXTILE

STANDARD 'V' DITCH DDE= 2 CY SEE DETAIL 82

MATCH TO SHEET 16 -L- STA. 166+00.00

MATCH TO SHEET 18 -L- STA. 179+00.00

24" RCP-III

18" RCP-III

15" RCP-III

2' FDPS

4' FDPS

NOT BURIED

COLLAR

TRENCH CLASS INSTALLATION 3' WELDED STEEL FLOWABLE FILL

END SBG +17

REMOVE

DESTROYED/ ABANDONED

N 66°14'17.22" E

ACCESS BREAK

PUE

WOODS

INSET GRAPHIC SCALE

SITES 25 & 26 (UPSTREAM)

FOR -L- PROFILE, SEE SHEET 47

ALL DRIVEWAY RADII 30' UNLESS OTHERWISE NOTED.

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lburg

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2527	X-99

PERMIT DRAWING
SHEET 30 OF 91

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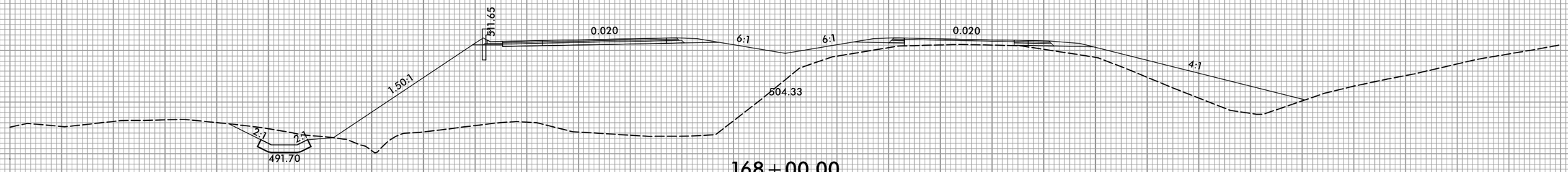
500
490
480



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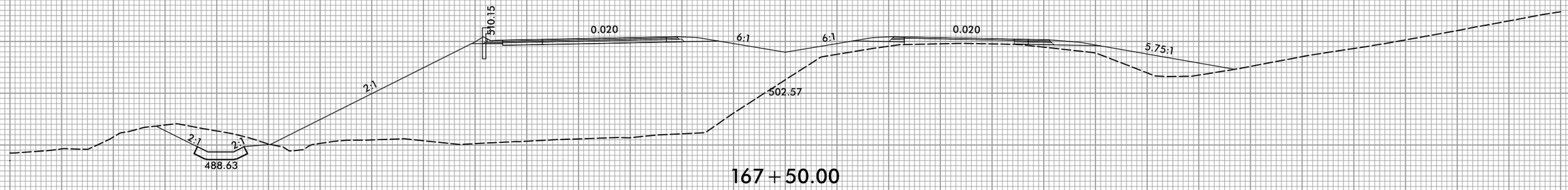
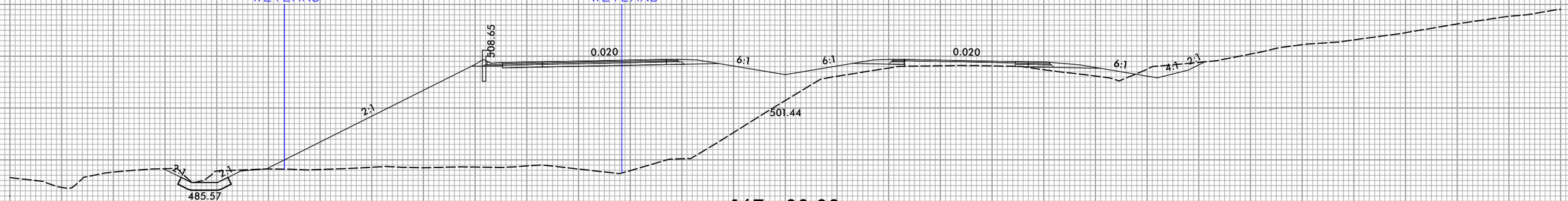


167+50.00

SITE 26

WETLAND
WETLAND



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—L—

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gaverette

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2527	X-100

PERMIT DRAWING
SHEET 31 OF 91

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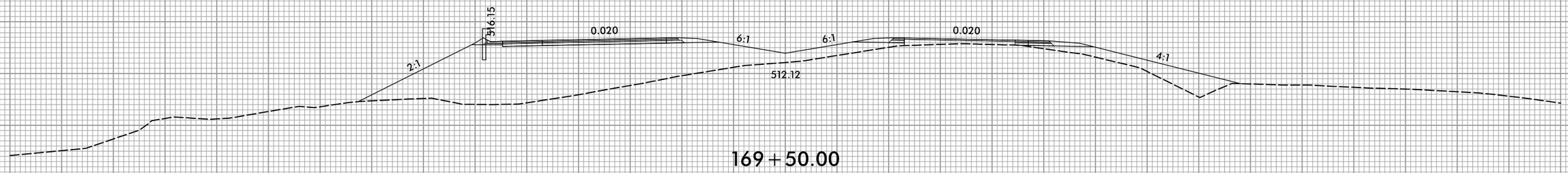
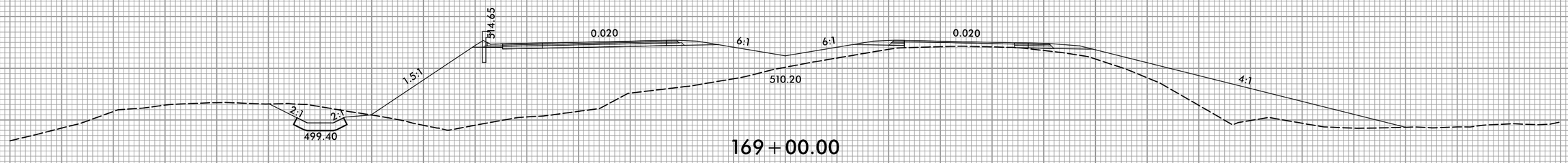
520 510 500 490

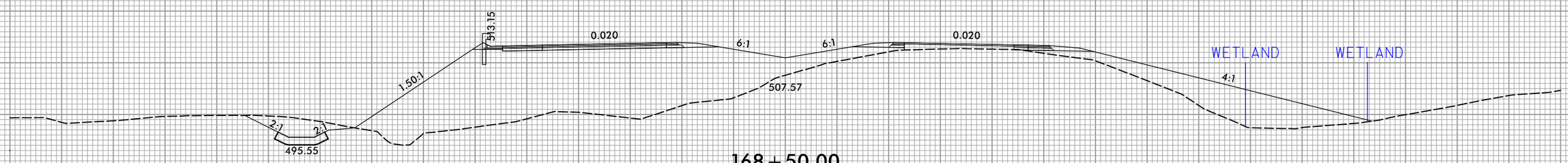


169+50.00



169+00.00

SITE 26



168+50.00

–L–

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Hydraulics
gaverette

5/14/99

PERMIT DRAWING SHEET 32 OF 91

PROJECT REFERENCE NO.	SHEET NO.
R-2527	19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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vhb — VHB Engineering NC, P.C. (C-3705), 940 Main Campus Drive, Suite 500, Raleigh, NC 27606

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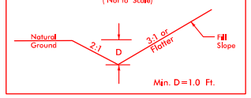
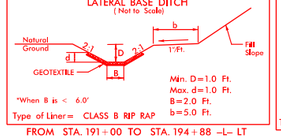
NAD 83/NA 2011

DETAIL 1
SPECIAL LATERAL "V" DITCH
(Not to Scale)



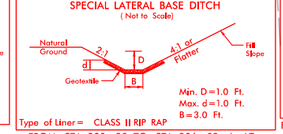
FROM STA. 198+50 TO STA. 199+00 -L- RT

DETAIL 9
LATERAL BASE DITCH
(Not to Scale)



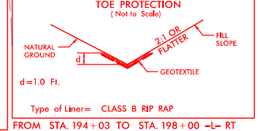
FROM STA. 191+00 TO STA. 194+88 -L- LT

DETAIL 70
SPECIAL LATERAL BASE DITCH
(Not to Scale)



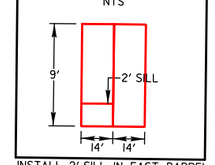
FROM STA. 200+28 TO STA. 206+82 -L- LT

DETAIL 7
TOE PROTECTION
(Not to Scale)



FROM STA. 194+03 TO STA. 198+00 -L- RT

SILL DETAIL FOR INLET AND OUTLET
NTS



INSTALL 2' SILL IN EAST BARREL AT A 2' OFFSET AT INLET AND OUTLET. BACKFILL WITH 15' OF CLASS I RIP RAP TOPPED WITH 0.5' OF NATIVE MATERIAL TO SILL HEIGHT. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING THE CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

INLET DETAIL 25
NTS

OUTLET DETAIL 26
NTS

SITES 29 & 30 (UPSTREAM)

50' 0' 100'
GRAPHIC SCALE

25' 0' 50'
INSET GRAPHIC SCALE

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

FOR -L- PROFILE, SEE SHEET 48

ALL DRIVEWAY RADII 30' UNLESS OTHERWISE NOTED.

$$$$USERNAME$$$$ $$$$SYSTIME$$$$ $$$$DGN$$$$

5/14/99

PERMIT DRAWING
SHEET 33 OF 91

PROJECT REFERENCE NO.	SHEET NO.
R-2527	19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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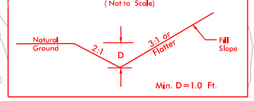
vhb — VHB Engineering NC, P.C. (C-3705), 940 Main Campus Drive, Suite 500, Raleigh, NC 27606

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NA 2011

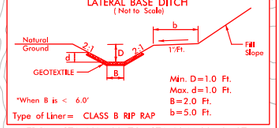
DETAIL 1
SPECIAL LATERAL "V" DITCH
(Not to Scale)



Min. D=1.0 Ft.

FROM STA. 198+50 TO STA. 199+00 -L- RT

DETAIL 9
LATERAL BASE DITCH
(Not to Scale)



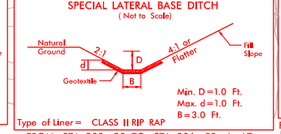
Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.

*When B is < 6.0'

Type of Liner= CLASS B RIP RAP

FROM STA. 191+00 TO STA. 194+88 -L- LT

DETAIL 70
SPECIAL LATERAL BASE DITCH
(Not to Scale)

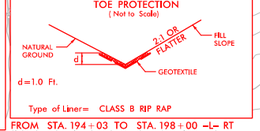


Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=3.0 Ft.

Type of Liner= CLASS II RIP RAP

FROM STA. 200+28 TO STA. 206+82 -L- LT

DETAIL 7
TOE PROTECTION
(Not to Scale)

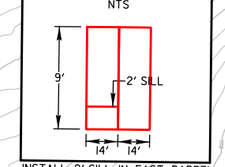


d=1.0 Ft.

Type of Liner= CLASS B RIP RAP

FROM STA. 194+03 TO STA. 198+00 -L- RT

SILL DETAIL FOR INLET AND OUTLET
NTS



INSTALL 2' SILL IN EAST BARREL AT A 2' OFFSET AT INLET AND OUTLET. BACKFILL WITH 15' OF CLASS I RIP RAP TOPPED WITH 0.5' OF NATIVE MATERIAL TO SILL HEIGHT. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING THE CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

STREAM SD

SITE 30

STREAM SD-1

NOTE: SEE TMP SHEET No. XXX FOR CULVERT STAGING

FILL IN EXISTING CHANNEL W/CLASS II RIP RAP EST 170 TONS EST 205 SY GEOTEXTILE SEE DETAIL 64

(19) UNITED STATES FOREST SERVICE

SITE 29

CLASS II RIP RAP ON BANKS ONLY EST 185 TONS CLASS II EST 25 TONS CLASS I EST 35 CY ENGINEER APPROVED MATERIAL TO FILL VOIDS AND PROMOTE VEGETATION EST 200 SY GEOTEXTILE SEE DETAIL 25

(20) BILLY ANDREW GOOCH

(21) GARY A. SOWARDS AND WIFE ROMA RASNAKE SOWARDS

CLASS II RIP RAP EST 11 TONS EST 28 SY GEOTEXTILE

SPECIAL LATERAL BASE DITCH W/CLASS II RIP RAP SEE DETAIL 70 EST 742 TONS EST 1413 SY GEOTEXTILE

LATERAL BASE DITCH W/CLASS B RIP RAP SEE DETAIL 9 EST 159 TONS EST 451 SY GEOTEXTILE

2@14'x9' RCBC BURIED 2.0' IN LEFT BARREL BURIED 1.0' IN RIGHT BARREL

15" RCP-III

18" RCP-III

N 76° 43' 33.3" E -L-

R2527-5

R2527-6

END SBG +93 RT

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 109 TONS EST 341 SY GEOTEXTILE

(19) UNITED STATES FOREST SERVICE

SPECIAL LATERAL 'V' DITCH SEE DETAIL 1

CLASS B RIP RAP EST 3 TONS EST 10 SY GEOTEXTILE

FILL IN EXISTING CHANNEL W/CLASS II RIP RAP EST 270 TONS EST 300 SY GEOTEXTILE SEE DETAIL 64

CLASS II RIP RAP ON BANKS ONLY EST 200 TONS CLASS II EST 25 TONS CLASS I EST 15 CY ENGINEER APPROVED MATERIAL TO FILL VOIDS AND PROMOTE VEGETATION EST 283 SY GEOTEXTILE SEE DETAIL 26

STREAM SD

SITE 29

TS

CLARKS CREEK

(25) M. DOUGLAS HALL AND WIFE, NORMA M. HALL

(22) JAMES ALLEN HENRY

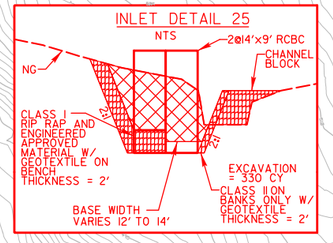
ACCESS BREAK

REMOVE

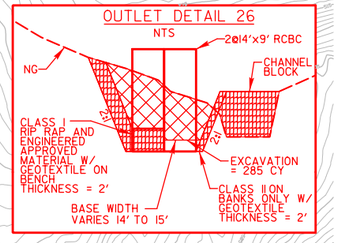
MATCH TO SHEET 18 -L- STA.192+00.00

MATCH TO SHEET 20 -L- STA.206+00.00

INLET DETAIL 25
NTS



OUTLET DETAIL 26
NTS



SITES 29 & 30 (UPSTREAM)

50' 0' 100'
GRAPHIC SCALE

25' 0' 50'
INSET GRAPHIC SCALE

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

FOR -L- PROFILE, SEE SHEET 48

ALL DRIVEWAY RADII 30' UNLESS OTHERWISE NOTED.

$$$$SYSTEMFILE$$$$
$$$$CONS$$$$
$$$$USERNAME$$$$

8/17/99

REVISIONS

PERMIT DRAWING
SHEET 34 OF 91

PROJECT REFERENCE NO.	SHEET NO.
R-2527	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

STEWART
Firm License No. C-0101
223 South West St.
Suite 1150
Raleigh, NC 27603
T: 919.380.8750
www.stewartinc.com

vhb
VHB Engineering NC, P.C. (C-3705)
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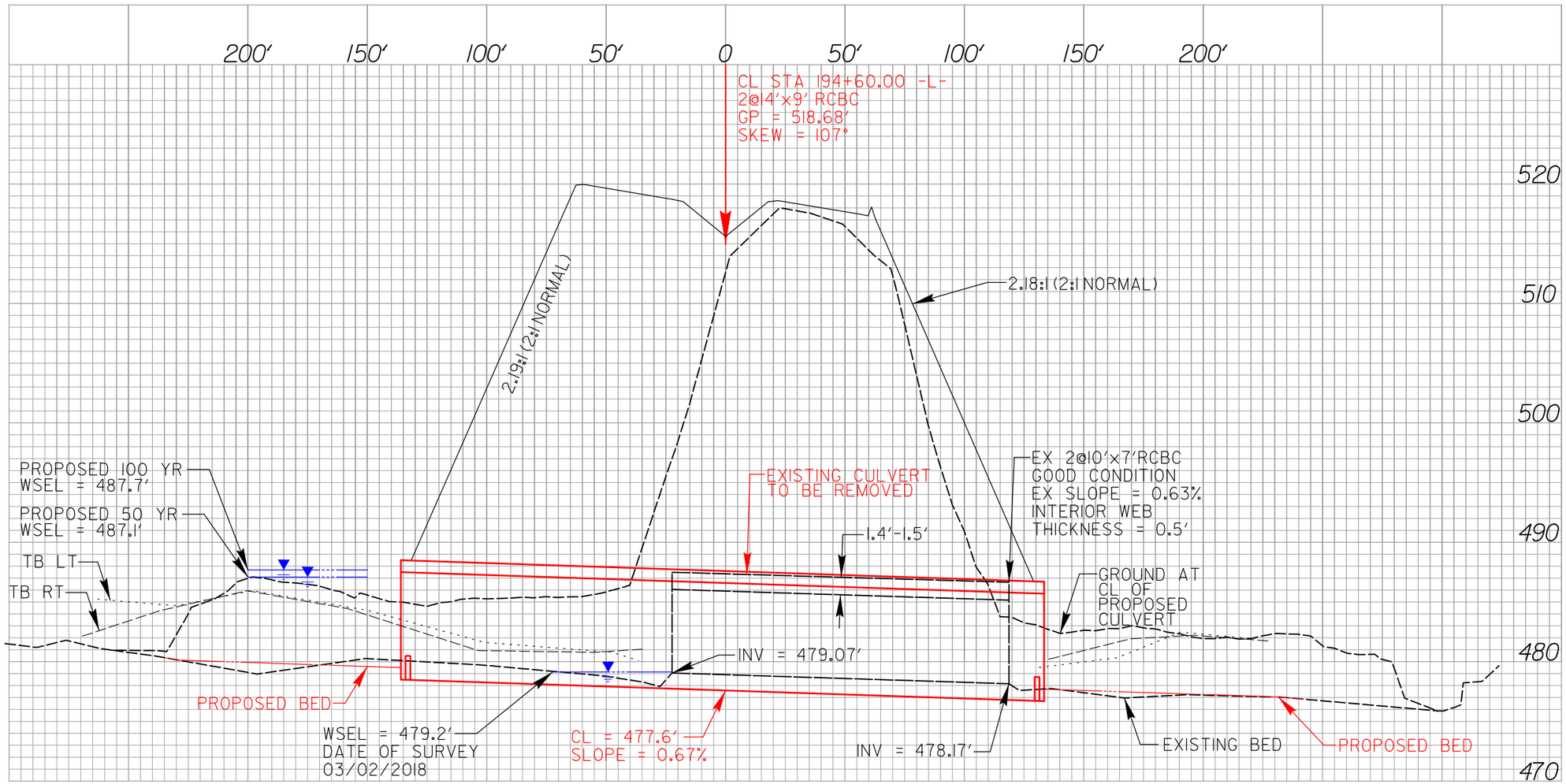
SITES 29 & 30



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5/14/99

PERMIT DRAWING SHEET 35 OF 91

50' 0' 100'
GRAPHIC SCALE

F F DENOTES FILL IN WETLAND
S S DENOTES IMPACTS IN SURFACE WATER
DENOTES MECHANIZED CLEARING
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83/NA 2011

PROJECT REFERENCE NO.	SHEET NO.
R-2527	21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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VHB Engineering NC, P.C. (C-3705), 940 Main Campus Drive, Suite 500, Raleigh, NC 27606

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DETAIL 7
TOE PROTECTION
(Not to Scale)
NATURAL GROUND, 2:1 OR FLATTER, FILL SLOPE, GEOTEXTILE, d=1.0 Ft.
Type of Liner = Class B Rip-Rap
FROM STA. 222+50 TO STA. 223+10 -L- RT
FROM STA. 223+56 TO STA. 228+00 -L- RT

DETAIL 5
BERM BASE DITCH
(Not to Scale)
Natural Ground, 2:1, d, D, B, 2:1, RDWY, GEOTEXTILE
Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.
Type of Liner = CLASS B RIP RAP
FROM STA. 233+50 TO STA. 238+00 -L- LT

DETAIL 7I
STANDARD BASE DITCH
(Not to Scale)
Natural Ground, 2:1, d, D, 2:1, Natural Ground, Geotextile, B
Min. D=3.0 Ft.
Max. d=3.0 Ft.
B=4.0 Ft.
*When B is < 6.0'
Type of Liner = CLASS I RIP RAP
AT STA. 222+84 -L- LT
AT STA. 223+34 -L- RT

STREAM SP

STANDARD BASE DITCH
W/CLASS I RIP RAP
SLOPE= 0.9%
EST 180 TONS
EST 280 SY GEOTEXTILE
EST DDE = 86 CY
SEE DETAIL 71

26Z

26 WILLIAM C. BLUE AND WIFE, JO ANN BLUE

WETLAND WU-2

FILL IN EXISTING CHANNEL
W/CLASS I RIP RAP
EST 105 TONS
EST 175 SY GEOTEXTILE
SEE DETAIL 64

225

230

27 RICHARD E. GREENE AND WIFE, LORI G. GREENE

28 JOHN W. DAVIS AND WIFE, DIANA R. DAVIS

24 ANGES LINDSEY HEIRS

SITE 31

TOE PROTECTION
W/CLASS B RIP RAP
SEE DETAIL 7
EST 17 TONS
EST 52 SY GEOTEXTILE

SITE 32

BERM BASE DITCH
W/CLASS B RIP RAP
SEE DETAIL 5
EST 202 TONS
EST 571 SY GEOTEXTILE

BEGIN SBG +06 LT
END SBG +25 LT
END SBG +44 RT

MATCH TO SHEET 20 -L- STA. 220+00.00

MATCH TO SHEET 22 -L- STA. 234+00.00

N 76° 43' 33.3" E -L-

TRENCHLESS INSTALLATION 66" WELDED STEEL

COLLAR

NOT BURIED

REMOVE

SLOPE TO BE GRADED TO 3:1 OR FLATTER

CLASS B RIP RAP
EST 5 TONS
EST 14 SY GEOTEXTILE

STANDARD BASE DITCH
W/CLASS I RIP RAP
SLOPE= 0.3%
EST 108 TONS
EST 170 SY GEOTEXTILE
EST DDE = .52 CY
SEE DETAIL 71

FILL IN EXISTING CHANNEL
W/CLASS I RIP RAP
EST 40 TONS
EST 55 SY GEOTEXTILE
SEE DETAIL 64

TOE PROTECTION
W/CLASS B RIP RAP
SEE DETAIL 7
EST 122 TONS
EST 381 SY GEOTEXTILE

CLASS B RIP RAP
EST 2 TONS
EST 7 SY GEOTEXTILE

CLASS B RIP RAP
EST 3 TONS
EST 10 SY GEOTEXTILE

TOE PROTECTION
W/CLASS B RIP RAP
SEE DETAIL 7
EST 30 TONS
EST 381 SY GEOTEXTILE

25 M. DOUGLAS HALL AND WIFE, NORMA M. HALL

29Z

29 CHAD L. WINFREE AND WIFE, NATALIE C. WINFREE

27A RICHARD E. GREENE AND WIFE, LORI G. GREENE

30 JOHN W. DAVIS AND WIFE, DIANA R. DAVIS

SITE 33

STREAM WX

STREAM SP

WILLIAM D. BRALEY AND WIFE, LIDIE M. BRALEY

FOR INTERSECTION DETAIL, SEE SHEET 2B-4

FOR -L- PROFILE, SEE SHEET 49

ALL DRIVEWAY RADII 30' UNLESS OTHERWISE NOTED.

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dwvette

5/14/99

PERMIT DRAWING SHEET 36 OF 91

50' 0' 100'
GRAPHIC SCALE

F F DENOTES FILL IN WETLAND
S S DENOTES IMPACTS IN SURFACE WATER
DENOTES MECHANIZED CLEARING
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-2527	21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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vhb — VHB Engineering NC, P.C. (C-3705), 940 Main Campus Drive, Suite 500, Raleigh, NC 27606

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NAD 83/NA 2011

DETAIL 7
TOE PROTECTION
(Not to Scale)
NATURAL GROUND, 2:1 OR FLATTER, FILL SLOPE, GEOTEXTILE, d=1.0 Ft.
Type of Liner = Class B Rip-Rap
FROM STA. 222+50 TO STA. 223+10 -L- RT
FROM STA. 223+56 TO STA. 228+00 -L- LT

DETAIL 5
BERM BASE DITCH
(Not to Scale)
Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.
Type of Liner = CLASS B RIP RAP
FROM STA. 233+50 TO STA. 238+00 -L- LT

DETAIL 7I
STANDARD BASE DITCH
(Not to Scale)
Min. D=3.0 Ft.
Max. d=3.0 Ft.
B=4.0 Ft.
*When B is < 6.0'
Type of Liner = CLASS I RIP RAP
AT STA. 222+84 -L- LT
AT STA. 223+34 -L- RT

STREAM SP

STANDARD BASE DITCH W/CLASS I RIP RAP SLOPE= 0.9% EST 180 TONS EST 280 SY GEOTEXTILE EST DDE = 86 CY SEE DETAIL 7I

26Z

26 WILLIAM C. BLUE AND WIFE, JO ANN BLUE

WETLAND WU-2

FILL IN EXISTING CHANNEL W/CLASS I RIP RAP EST 105 TONS EST 175 SY GEOTEXTILE SEE DETAIL 64

27 RICHARD E. GREENE AND WIFE, LORI G. GREENE

28 JOHN W. DAVIS AND WIFE, DIANA R. DAVIS

24 ANGES LINDSEY HEIRS

SITE 31

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 17 TONS EST 52 SY GEOTEXTILE

BEGIN SBG +06 LT

SITE 32

END SBG +25 LT

BERM BASE DITCH W/CLASS B RIP RAP SEE DETAIL 5 EST 202 TONS EST 571 SY GEOTEXTILE

ACCESS BREAK

COLLAR

NOT BURIED

TRENCHLESS INSTALLATION 66" WELDED STEEL

N 76° 43' 33.3" E

END SBG +44 RT

REMOVE

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 122 TONS EST 381 SY GEOTEXTILE

FILL IN EXISTING CHANNEL W/CLASS I RIP RAP EST 40 TONS EST 59 SY GEOTEXTILE SEE DETAIL 64

25 M. DOUGLAS HALL AND WIFE, NORMA M. HALL

CLASS B RIP RAP EST 5 TONS EST 14 SY GEOTEXTILE

STANDARD BASE DITCH W/CLASS I RIP RAP SLOPE= 0.3% EST 108 TONS EST 170 SY GEOTEXTILE EST DDE = 52 CY SEE DETAIL 7I

29Z

29 CHAD L. WINFREE AND WIFE, NATALIE C. WINFREE

STREAM SP

CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE

CLASS B RIP RAP EST 3 TONS EST 10 SY GEOTEXTILE

27A RICHARD E. GREENE AND WIFE, LORI G. GREENE

30 JOHN W. DAVIS AND WIFE, DIANA R. DAVIS

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 30 TONS EST 381 SY GEOTEXTILE

SITE 33

STREAM WX

WILLIAM D. BRALEY AND WIFE, LIDIE M. BRALEY

MATCH TO SHEET 20 -L- STA. 220+00.00

MATCH TO SHEET 22 -L- STA. 234+00.00

FOR INTERSECTION DETAIL, SEE SHEET 2B-4

FOR -L- PROFILE, SEE SHEET 49

ALL DRIVEWAY RADII 30' UNLESS OTHERWISE NOTED.

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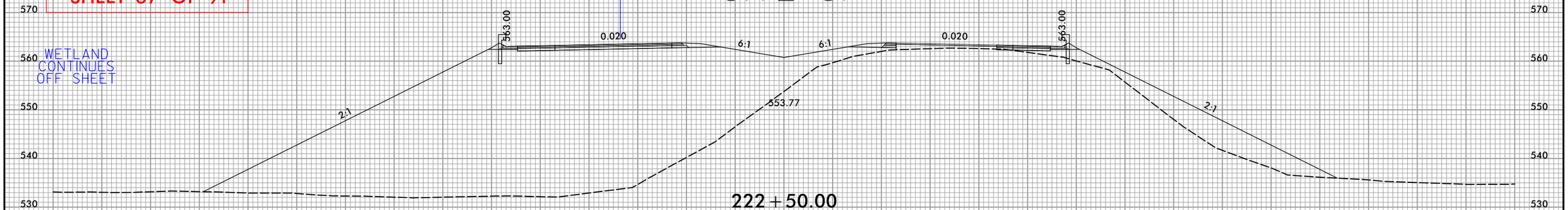
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2527	X-132

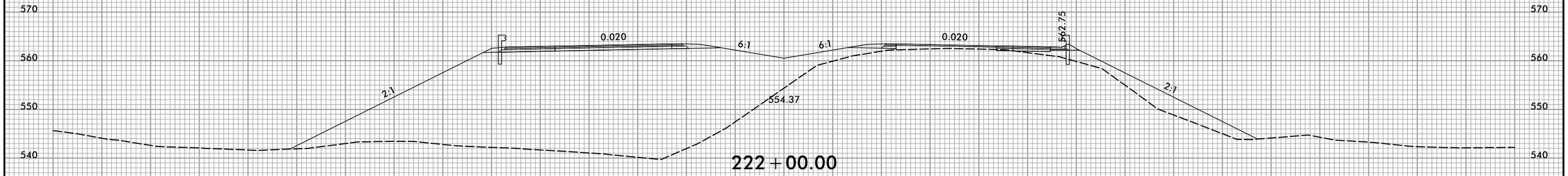
PERMIT DRAWING
SHEET 37 OF 91

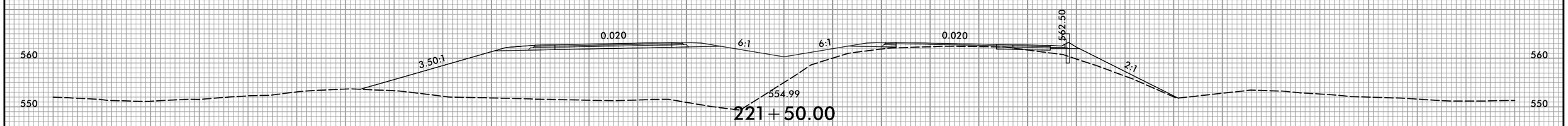
WETLAND

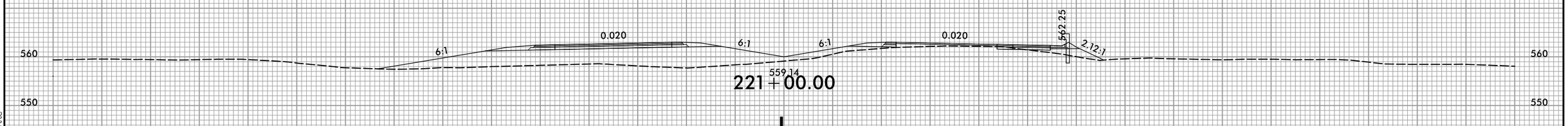
SITE 31

WETLAND CONTINUES OFF SHEET









–L–

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gaverette

5/14/99

PERMIT DRAWING
SHEET 38 OF 91

50′ 0′ 100′
GRAPHIC SCALE

10′ 0′ 20′
INSET GRAPHIC SCALE

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-2527	22
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

STEWART
firm License No. C-1851
223 S. West St.
Suite 1100
Raleigh, NC 27603
T: 919.380.8750
www.stewartinc.com

vhb
VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

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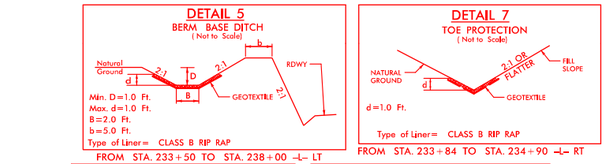
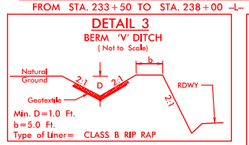
NAD 83/NA 2011

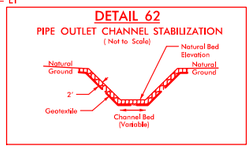


FROM STA. 233+50 TO STA. 238+00 -L- LT

FROM STA. 233+84 TO STA. 234+90 -L- RT



FROM STA. 13+66 TO STA. 16+25 -Y2- RT
FROM STA. 16+75 TO STA. 18+07 -Y2- RT
FROM STA. 10+50 TO STA. 10+00 -DR2- LT



STA. 238+18 -L- RT

235

28
JOHN W. DAVIS AND WIFE, DIANA R. DAVIS

30
JORDAN THREE, LLC

BERM BASE DITCH W/CLASS B RIP RAP SEE DETAIL 6 EST 202 TONS EST 571 SY GEOTEXTILE

BERM V DITCH W/CLASS B RIP RAP SEE DETAIL 3 EST 20 TONS EST 60 SY GEOTEXTILE

BERM V DITCH W/CLASS B RIP RAP SEE DETAIL 3 EST 80 TONS EST 240 SY GEOTEXTILE

BERM V DITCH W/CLASS B RIP RAP SEE DETAIL 3 EST 65 TONS EST 200 SY GEOTEXTILE

MATCH TO SHEET 39 -Y2- STA. 14+25.00

MATCH TO SHEET 21 -L- STA. 234+00.00

MATCH TO SHEET 23 -L- STA. 243+00.00

N 76° 43' 33.3" E

S 14° 24' 31.3" E

S 56° 09' 54.1" E

S 44° 47' 16.0" E

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 30 TONS EST 381 SY GEOTEXTILE

PIPE OUTLET CHANNEL STABILIZATION W/ CLASS B RIP RAP EST 8 TONS EST 12 SY GEOTEXTILE L= 8 FT SEE DETAIL 62

CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE

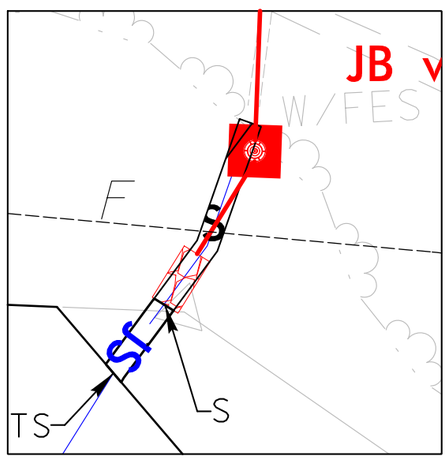
SPECIAL LATERAL V DITCH SEE DETAIL 1

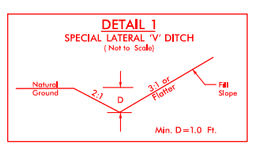
SITE 34

STREAM SQ

WILLIAM D. BRALEY AND WIFE, LIDIE M. BRALEY

ORK, LLC





FROM STA. 11+24 TO STA. 14+50 -Y3- LT

FOR INTERSECTION DETAIL, SEE SHEETS 2B-5
FOR -L- PROFILE, SEE SHEETS 49 & 50
FOR -Y2- PROFILE, SEE SHEET 59
FOR -Y3- PROFILE, SEE SHEET 59

15

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PERMIT DRAWING
SHEET 39 OF 91

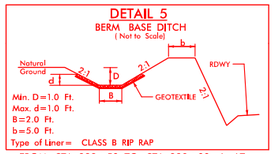
50′ 0′ 100′
GRAPHIC SCALE

10′ 0′ 20′
INSET GRAPHIC SCALE

S S DENOTES IMPACTS IN SURFACE WATER

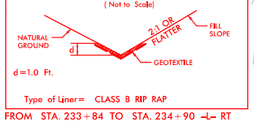
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DETAIL 5
BERM BASE DITCH
(Not to Scale)



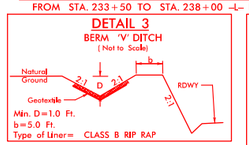
Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.
Type of Liner= CLASS B RIP RAP
FROM STA. 233+50 TO STA. 238+00 -L- LT

DETAIL 7
TOE PROTECTION
(Not to Scale)



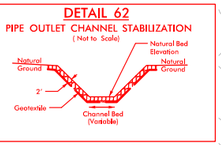
d=1.0 Ft.
Type of Liner= CLASS B RIP RAP
FROM STA. 233+84 TO STA. 234+90 -L- RT

DETAIL 3
BERM 'V' DITCH
(Not to Scale)



Min. D=1.0 Ft.
b=5.0 Ft.
Type of Liner= CLASS B RIP RAP
FROM STA. 13+66 TO STA. 16+25 -Y2- RT
FROM STA. 16+75 TO STA. 18+07 -Y2- RT
FROM STA. 10+50 TO STA. 10+00 -DR2- LT

DETAIL 62
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



STA. 238+18 -L- RT

PROJECT REFERENCE NO.	SHEET NO.
R-2527	22
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83/NA 2011

STEWART
firm License No. C-1851
223 S. West St.
Suite 1100
Raleigh, NC 27603
T: 919.380.8750
www.stewartinc.com

vhb
VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

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MATCH TO SHEET 39
-Y2- STA. 14+25.00

MATCH TO SHEET 21
-L- STA. 234+00.00

MATCH TO SHEET 23
-L- STA. 243+00.00

28
JOHN W. DAVIS AND WIFE, DIANA R. DAVIS

30
JORDAN THREE, LLC

30
JORDAN THREE, LLC

30
JORDAN THREE, LLC

WILLIAM D. BRALEY AND WIFE, LIDIE M. BRALEY

ORK, LLC

BERM V DITCH W/CLASS B RIP RAP SEE DETAIL 3 EST 20 TONS EST 60 SY GEOTEXTILE

BERM V DITCH W/CLASS B RIP RAP SEE DETAIL 3 EST 80 TONS EST 240 SY GEOTEXTILE

BERM V DITCH W/CLASS B RIP RAP SEE DETAIL 3 EST 65 TONS EST 200 SY GEOTEXTILE

BERM BASE DITCH W/CLASS B RIP RAP SEE DETAIL 5 EST 202 TONS EST 571 SY GEOTEXTILE

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 30 TONS EST 381 SY GEOTEXTILE

PIPE OUTLET CHANNEL STABILIZATION W/ CLASS B RIP RAP EST 8 TONS EST 12 SY GEOTEXTILE L= 8 FT SEE DETAIL 62

CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE

SPECIAL LATERAL V DITCH SEE DETAIL 1

STREAM SQ

SITE 34

SITE 34

JB w/MH

24" RCP-III

18" RCP-III

15" RCP-III

REMOVE

BDO

GTD

FS

2GI

PUE

N 76° 43' 33.3" E

S 14° 24' 31.3" E

S 56° 09' 54.1" E

S 44° 47' 16.0" E

+93.86

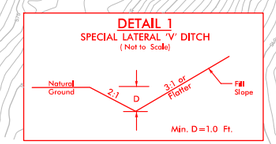
+01.57

+30.00

+46.00

+02.00

DETAIL 1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D=1.0 Ft.
FROM STA. 11+24 TO STA. 14+50 -Y3- LT

FOR INTERSECTION DETAIL, SEE SHEETS 2B-5

FOR -L- PROFILE, SEE SHEETS 49 & 50

FOR -Y2- PROFILE, SEE SHEET 59

FOR -Y3- PROFILE, SEE SHEET 59

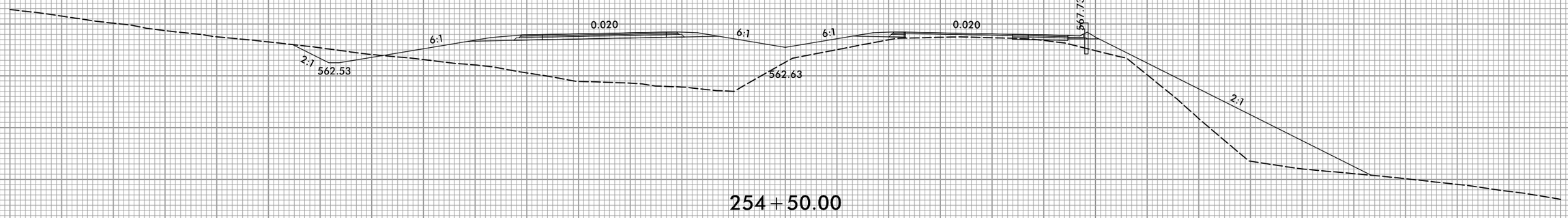
8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2527	X-154

PERMIT DRAWING
SHEET 40 OF 91

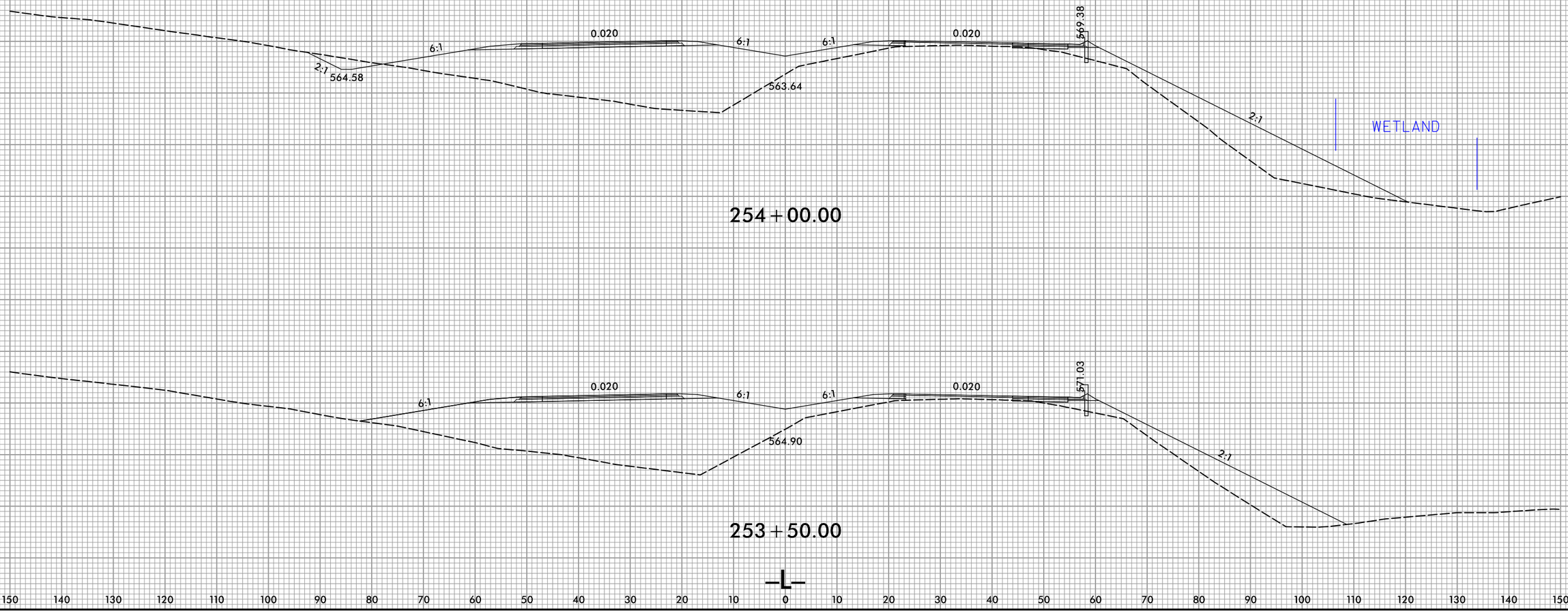
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

570 560 550 540 530



254+50.00

SITE 36



254+00.00

253+50.00

–L–

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

570 560 550 540

9/2/55 AM
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gaverette

5/14/99

PERMIT DRAWING
SHEET 41 OF 91

F F DENOTES FILL IN WETLAND

E E WETLAND EXCAVATION

DENOTES MECHANIZED CLEARING

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-2527	23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

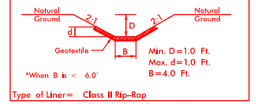
STEWART — firm License No. C-1851, 223 S. West St., Suite 1100, Raleigh, NC 27603, T: 919.380.8750, www.stewartinc.com

vhb — VHB Engineering NC, P.C. (C-3705), 940 Main Campus Drive, Suite 500, Raleigh, NC 27606

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NA 2011

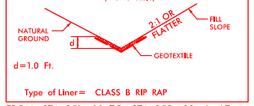
DETAIL 27
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= Class II Rip-Rap

AT STA. 243+55 –L– LT

DETAIL 7
TOE PROTECTION
(Not to Scale)

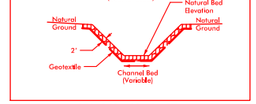


d=1.0 Ft.

Type of Liner= CLASS B RIP RAP

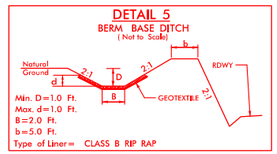
FROM STA. 251+00 TO STA. 253+32 –L– LT
FROM STA. 253+48 TO STA. 253+78 –L– LT
FROM STA. 252+20 TO STA. 253+93 –R– RT

DETAIL 62
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



STA. 243+68 –L– RT

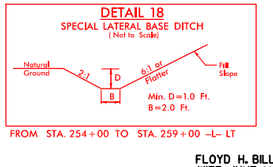
DETAIL 5
BERM BASE DITCH
(Not to Scale)



Type of Liner= CLASS B RIP RAP

FROM STA. 243+25 TO STA. 243+81 –L– LT

DETAIL 18
SPECIAL LATERAL BASE DITCH
(Not to Scale)



FROM STA. 254+00 TO STA. 259+00 –L– LT

DETAIL 63
BANKS ONLY PIPE OUTLET CHANNEL
(Not to Scale)

STA. 243+97 –L– RT

245

250

255

MC

E

F

SITE 35A

SITE 35

WETLAND WYB

STREAM SR

STANDARD BASE DITCH W/CLASS II RIP RAP SLOPE= 8.5% EST 103 TONS EST 135 SY GEOTEXTILE EST DDE= 43 CY SEE DETAIL 27

30 JORDAN THREE, LLC

TIE TO EXISTING CHANNEL

BERM BASE DITCH W/CLASS B RIP RAP SEE DETAIL 5 EST 26 TONS EST 72 SY GEOTEXTILE

CLASS B RIP RAP TO BE PLACED IN DRIVEWAY DITCH EST 55 TONS EST 165 SY GEOTEXTILE

31 ORK, LLC

32 FLOYD H. BILLINGS AND WIFE, JUNE M. BILLINGS

33 JORDAN TIMBERLANDS, INC. A NORTH CAROLINA CORPORATION

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 83 TONS EST 257 SY GEOTEXTILE

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST XX TONS EST XX SY GEOTEXTILE

SPECIAL LATERAL BASE DITCH SEE DETAIL 18

ACCESS BREAK

JB w/MH

24" RCP-III

15" RCP-III

30" RCP-IV

15" RCP-IV

36" RCP-III

NOT BURIED

INC.=40' (TYP.)

2GI

FS

4' FDPS

2' FDPS

FILL W/ FLOWABLE FILL

REMOVE

6"PVC

GREU TL-3 BEGIN SBG +75

N 69° 43' 18.2" E -L-

MATCH TO SHEET 22 -L- STA.243+00.00

MATCH TO SHEET 24 -L- STA.257+00.00

WETLAND WZ-1

30" W/ ELBOWS

15" W/ ELBOWS

SITE 36

SITE 37

SITE 35B

CHORD

CLASS B RIP RAP EST 3 TONS EST 10 SY GEOTEXTILE

PIPE OUTLET CHANNEL STABILIZATION W/ CLASS I RIP RAP EST 16 TONS EST 23 SY GEOTEXTILE L= 12 FT SEE DETAIL 62

CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE

WETLAND WYC

STREAM SR

WETLAND WZ

WETLAND WZ

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 48 TONS EST 149 SY GEOTEXTILE

BANKS ONLY PIPE OUTLET CHANNEL W/ CLASS I RIP RAP EST 20 TONS EST 28 SY GEOTEXTILE L= 10 FT SEE DETAIL 63

CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE

STREAM SS-1

JB w/MH ELBOWS 30" S F F F F F MC TS MC

SITE 36 & 37

50' 0' 100'
GRAPHIC SCALE

16.7' 0' 33.3'
INSET GRAPHIC SCALE

FOR INTERSECTION DETAIL,SEE SHEET 2B-4

FOR -L- PROFILE,SEE SHEET 50

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Date/Time: 4/27/2016 11:16:16 AM

5/14/99

PERMIT DRAWING
SHEET 42 OF 91

F F — DENOTES FILL IN WETLAND

E E — WETLAND EXCAVATION

MECHANIZED CLEARING — DENOTES MECHANIZED CLEARING

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-2527	23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

STEWART — firm License No. C-1851, 223 S. West St., Suite 1100, Raleigh, NC 27603, T: 919.380.8750, www.wbstewartfirm.com

vhb — VHB Engineering NC, P.C. (C-3705), 940 Main Campus Drive, Suite 500, Raleigh, NC 27606

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NAD 83/NA 2011

DETAIL 27
STANDARD BASE DITCH
(Not to Scale)

Natural Ground, 2:1, d, D, 2:1, Natural Ground, Geotextile, B

Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=4.0 Ft.
*When B is < 6.0'

Type of Liner= Class II Rip-Rap

AT STA. 243+55 -L- LT

DETAIL 7
TOE PROTECTION
(Not to Scale)

NATURAL GROUND, d, 2:1 OR FLATTER, FILL SLOPE, GEOTEXTILE

d=1.0 Ft.

Type of Liner= CLASS B RIP RAP

FROM STA. 251+00 TO STA. 253+32 -L- LT
FROM STA. 253+48 TO STA. 253+78 -L- LT
FROM STA. 252+20 TO STA. 253+93 -L- RT

DETAIL 62
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)

Natural Ground, Natural Bed Elevation, Natural Ground, 2', Geotextile, Channel Bed (Variable)

STA. 243+68 -L- RT

DETAIL 5
BERM BASE DITCH
(Not to Scale)

Natural Ground, 2:1, d, D, 2:1, b, RDWY, B, GEOTEXTILE, 2:1

Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.

Type of Liner= CLASS B RIP RAP

FROM STA. 243+25 TO STA. 243+81 -L- LT

DETAIL 18
SPECIAL LATERAL BASE DITCH
(Not to Scale)

Natural Ground, 2:1, D, 6:1 or Flatter, Fill Slope, B

Min. D=1.0 Ft.
B=2.0 Ft.

FROM STA. 254+00 TO STA. 259+00 -L- LT

DETAIL 63
BANKS ONLY PIPE OUTLET CHANNEL
(Not to Scale)

Natural Ground, Natural Bed Elevation, Natural Ground, 2', CHANNEL BED (Variable), Geotextile

STA. 243+97 -L- RT

245 — 250 — 255

(30) JORDAN THREE, LLC

(31) ORK, LLC

(32) FLOYD H. BILLINGS AND WIFE, JUNE M. BILLINGS

(33) JORDAN TIMBERLANDS, INC. A NORTH CAROLINA CORPORATION

SITE 35A

SITE 35

SITE 35B

SITE 36

SITE 37

WETLAND WYB

STREAM SR

WETLAND WYC

STREAM SR

WETLAND WZ

WETLAND WZ

WETLAND WZ-1

STREAM SS-1

STANDARD BASE DITCH W/CLASS II RIP RAP
SLOPE= 8.5%
EST 103 TONS
EST 135 SY GEOTEXTILE
EST DDE= 43 CY
SEE DETAIL 27

TIE TO EXISTING CHANNEL

BERM BASE DITCH W/CLASS B RIP RAP
SEE DETAIL 5
EST 24 TONS
EST 72 SY GEOTEXTILE

CLASS B RIP RAP TO BE PLACED IN DRIVEWAY DITCH
EST 55 TONS
EST 165 SY GEOTEXTILE

TOE PROTECTION W/CLASS B RIP RAP
SEE DETAIL 7
EST 83 TONS
EST 257 SY GEOTEXTILE

TOE PROTECTION W/CLASS B RIP RAP
SEE DETAIL 7
EST XX TONS
EST XX SY GEOTEXTILE

SPECIAL LATERAL BASE DITCH
SEE DETAIL 18

36" RCP-III
15" RCP-III
15" RCP-IV
30" RCP-IV
24" RCP-III
4' FDPS
2' FDPS
2GI
2GI-A
FS
JB w/MH
30" W/ ELBOWS
NOT BURIED
FILL W/ FLOWABLE FILL
REMOVE
ACCESS BREAK
GREU TL-3 BEGIN SBG +75
N 69° 43' 18.2" E -L-

MATCH TO SHEET 22 -L- STA.243+00.00

MATCH TO SHEET 24 -L- STA.257+00.00

CLASS B RIP RAP
EST 2 TONS
EST 7 SY GEOTEXTILE

PIPE OUTLET CHANNEL STABILIZATION W/ CLASS I RIP RAP
EST 16 TONS
EST 23 SY GEOTEXTILE
L= 12 FT
SEE DETAIL 62

CLASS B RIP RAP
EST 3 TONS
EST 10 SY GEOTEXTILE

TOE PROTECTION W/CLASS B RIP RAP
SEE DETAIL 7
EST 48 TONS
EST 149 SY GEOTEXTILE

BANKS ONLY PIPE OUTLET CHANNEL W/ CLASS I RIP RAP
EST 20 TONS
EST 28 SY GEOTEXTILE
L= 10 FT
SEE DETAIL 63

CLASS B RIP RAP
EST 2 TONS
EST 7 SY GEOTEXTILE

JB w/MH ELBOWS 30" S F F F F F MC TS MC

SITE 36 & 37

50' 0' 100'
GRAPHIC SCALE

16.7' 0' 33.3'
INSET GRAPHIC SCALE

FOR INTERSECTION DETAIL, SEE SHEET 2B-4

FOR -L- PROFILE, SEE SHEET 50

I:\27134.AM\Hydraulics\PERMITS_Environmental\Drawings\R2527_Hyd_PRM_PSH23_con.dgn
8/27/2014 AM
Plotted By: bunt

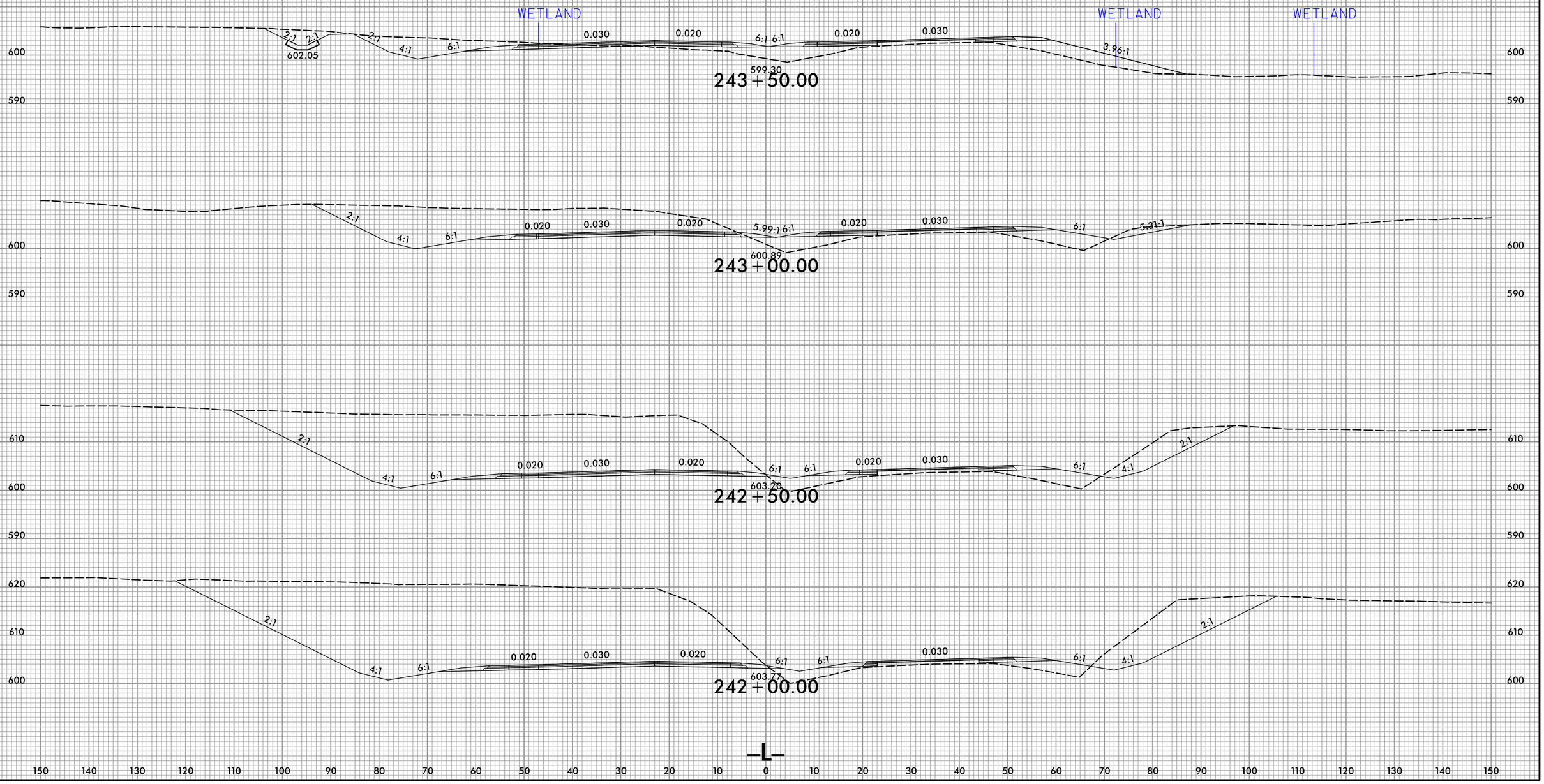
8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2527	X-143

PERMIT DRAWING
SHEET 42A OF 91

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

SITE 35A & 35B



—L—

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7:59:17 AM
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jhunt

5/14/99

PERMIT DRAWING
SHEET 43 OF 91

50′ 0′ 100′

GRAPHIC SCALE

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-2527	24
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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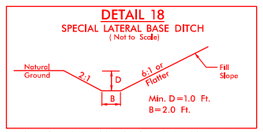
vhb — VHB Engineering NC, P.C. (C-3705), 940 Main Campus Drive, Suite 500, Raleigh, NC 27606

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

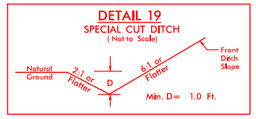
NAD 83/NA 2011

DETAIL 18
SPECIAL LATERAL BASE DITCH
(Not to Scale)



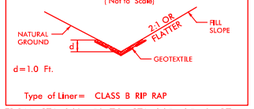
FROM STA. 254+00 TO STA. 259+00 -L- LT

DETAIL 19
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 263+00 TO STA. 263+50 -L- LT

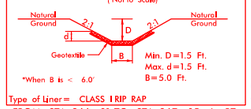
DETAIL 7
TOE PROTECTION
(Not to Scale)



Type of Liner= CLASS B RIP RAP

FROM STA. 263+50 TO STA. 265+25 -L- RT
FROM STA. 265+08 TO STA. 266+98 -L- LT

DETAIL 38
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= CLASS I RIP RAP

FROM STA. 266+31 TO STA. 267+05 -L- RT

260 265 270

STREAM SE

STREAM SU

SITE 38

33

JORDAN TIMBERLANDS, INC.
A NORTH CAROLINA CORPORATION

SITE 39

TS
S

SPECIAL LATERAL BASE DITCH SEE DETAIL 18

SPECIAL CUT DITCH SEE DETAIL 19

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 52 TONS EST 163 SY GEOTEXTILE

CLASS II RIP RAP EST 245 TONS EST 320 SY GEOTEXTILE SEE DETAIL 28

FILL IN EXISTING CHANNEL W/CLASS I RIP RAP EST 65 TONS EST 80 SY GEOTEXTILE SEE DETAIL 64

CLASS I RIP RAP EST 7 TONS EST 15 SY GEOTEXTILE

MATCH TO SHEET 23 -L- STA. 257+00.00

MATCH TO SHEET 25 -L- STA. 271+00.00

24" RCP-III
15" RCP-IV
18" RCP-IV
60" RCP-IV
18" RCP-III
15" RCP-III
2GI
FS
CAT-1
GREU TL-3
BEGIN SBG +50
END SBG +05
END SBG +50
24" W/ ELBOWS
18" W/ ELBOWS
FILL W/ FLOWABLE FILL
2@7'x9' RCBC BURIED 1.0'
COLLAR
N 69° 43' 18.2" E
-L-
WOODS
6"PVC
ACCESS BREAK
BM #16
RANDOLPH ELECTRIC 40'R/W
NC HWY 24/27 26' BST
LICK FORK THOROUGHFARE
PDE
LOW BANK
HW
RW
CA
E
F
C

CLASS B RIP RAP EST 5 TONS EST 14 SY GEOTEXTILE

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 48 TONS EST 150 SY GEOTEXTILE

CLASS B RIP RAP EST 3 TONS EST 10 SY GEOTEXTILE

CLASS I RIP RAP EST 40 TONS EST 75 SY GEOTEXTILE

STANDARD BASE DITCH W/CLASS I RIP RAP SLOPE= 2.6% EST 110 TONS EST 190 SY GEOTEXTILE EST DDE= 25 CY SEE DETAIL 38

CLASS I RIP RAP IN STREAM BED EST 145 TONS EST 220 SY GEOTEXTILE

CLASS II RIP RAP EST 180 TONS EST 240 SY GEOTEXTILE SEE DETAIL 29

FILL IN EXISTING CHANNEL W/CLASS I RIP RAP EST 130 TONS EST 150 SY GEOTEXTILE SEE DETAIL 64

NOTE: SEE TMP SHEET No. XXX FOR CULVERT STAGING

33

JORDAN TIMBERLANDS, INC.
A NORTH CAROLINA CORPORATION

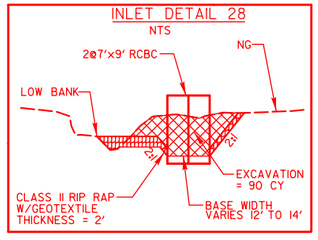
SITE 39

S

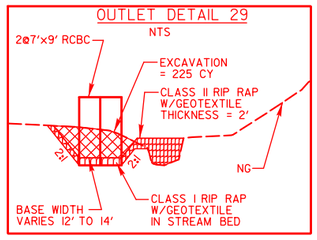
TS

STREAM SE

INLET DETAIL 28
NTS



OUTLET DETAIL 29
NTS



FOR -L- PROFILE, SEE SHEETS 50 & 51

ALL DRIVEWAY RADII 30' UNLESS OTHERWISE NOTED.

4:59:17 PM
R:\Projects\PERMITS_Environmental\Drawings\R2527_Hyd_PRM_PSH24.dgn
Revised

5/14/99

PERMIT DRAWING SHEET 44 OF 91

50' 0' 100'

GRAPHIC SCALE

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-2527	24
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

firm License No. C-1851
223 S. West St.
Suite 1100
Raleigh, NC 27603
T: 919.380.8750
www.stewartINC.com
STEWART

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
vhb

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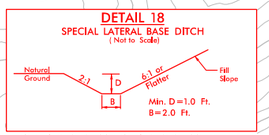
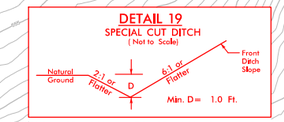
NAD 83/NA 2011

DETAIL 18
SPECIAL LATERAL BASE DITCH
(Not to Scale)



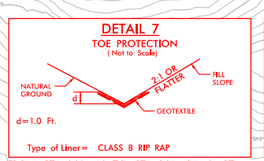
FROM STA. 254+00 TO STA. 259+00 -L- LT

DETAIL 19
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 263+00 TO STA. 263+50 -L- LT

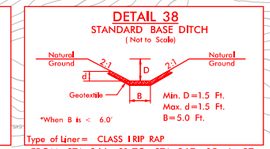
DETAIL 7
TOE PROTECTION
(Not to Scale)



Type of Liner= CLASS B RIP RAP

FROM STA. 263+50 TO STA. 265+25 -L- RT
FROM STA. 265+08 TO STA. 266+98 -L- LT

DETAIL 38
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= CLASS I RIP RAP

FROM STA. 266+31 TO STA. 267+05 -L- RT

260 265 270

STREAM SE

STREAM SU

SITE 38

SITE 39

33 JORDAN TIMBERLANDS, INC. A NORTH CAROLINA CORPORATION

TS S

SPECIAL LATERAL BASE DITCH SEE DETAIL 18

SPECIAL CUT DITCH SEE DETAIL 19

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 52 TONS EST 163 SY GEOTEXTILE

CLASS B RIP RAP EST 245 TONS EST 320 SY GEOTEXTILE SEE DETAIL 28

FILL IN EXISTING CHANNEL W/CLASS I RIP RAP EST 65 TONS EST 80 SY GEOTEXTILE SEE DETAIL 64

CLASS I RIP RAP EST 7 TONS EST 15 SY GEOTEXTILE

24" W/ ELBOWS

END SBG +25

BEGIN SBG +50

60" RCP-IV

15" RCP-IV

2@7'x9' RCBC BURIED 1.0'

COLLAR

18" RCP-III

15" RCP-III

24" RCP-III

N 69° 43' 18.2" E -L-

FILL W/ FLOWABLE FILL

END SBG +05

24" W/ ELBOWS

MATCH TO SHEET 23 -L- STA. 257+00.00

MATCH TO SHEET 25 -L- STA. 271+00.00

ACCESS BREAK

BM #16

CLASS B RIP RAP EST 5 TONS EST 14 SY GEOTEXTILE

NOTE: SEE TMP SHEET No. XXX FOR CULVERT STAGING

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 48 TONS EST 150 SY GEOTEXTILE

CLASS B RIP RAP EST 3 TONS EST 10 SY GEOTEXTILE

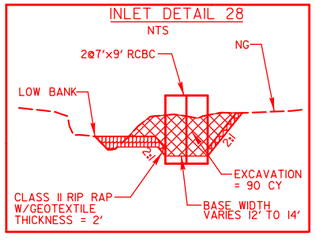
CLASS I RIP RAP EST 40 TONS EST 75 SY GEOTEXTILE

STANDARD BASE DITCH W/CLASS I RIP RAP SLOPE= 2.6% EST 110 TONS EST 190 SY GEOTEXTILE EST DDE= 25 CY SEE DETAIL 38

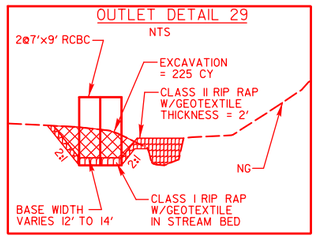
CLASS II RIP RAP EST 180 TONS EST 240 SY GEOTEXTILE SEE DETAIL 29

CLASS I RIP RAP IN STREAM BED EST 145 TONS EST 220 SY GEOTEXTILE

INLET DETAIL 28
NTS



OUTLET DETAIL 29
NTS



FOR -L- PROFILE, SEE SHEETS 50 & 51

ALL DRIVEWAY RADII 30' UNLESS OTHERWISE NOTED.

5/02/28 PM
R:\Projects\PERMITS_Environmental\Drawings\R2527_Hyd_PRM_PSH24_con.dgn

PERMIT DRAWING
SHEET 45 OF 91

PROJECT REFERENCE NO.	SHEET NO.
R-2527	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

STEWART
Firm License No. C-0101
223 South West St.
Suite 1100
Raleigh, NC 27603
T. 919.380.8750
www.stewartinc.com

vhb
VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

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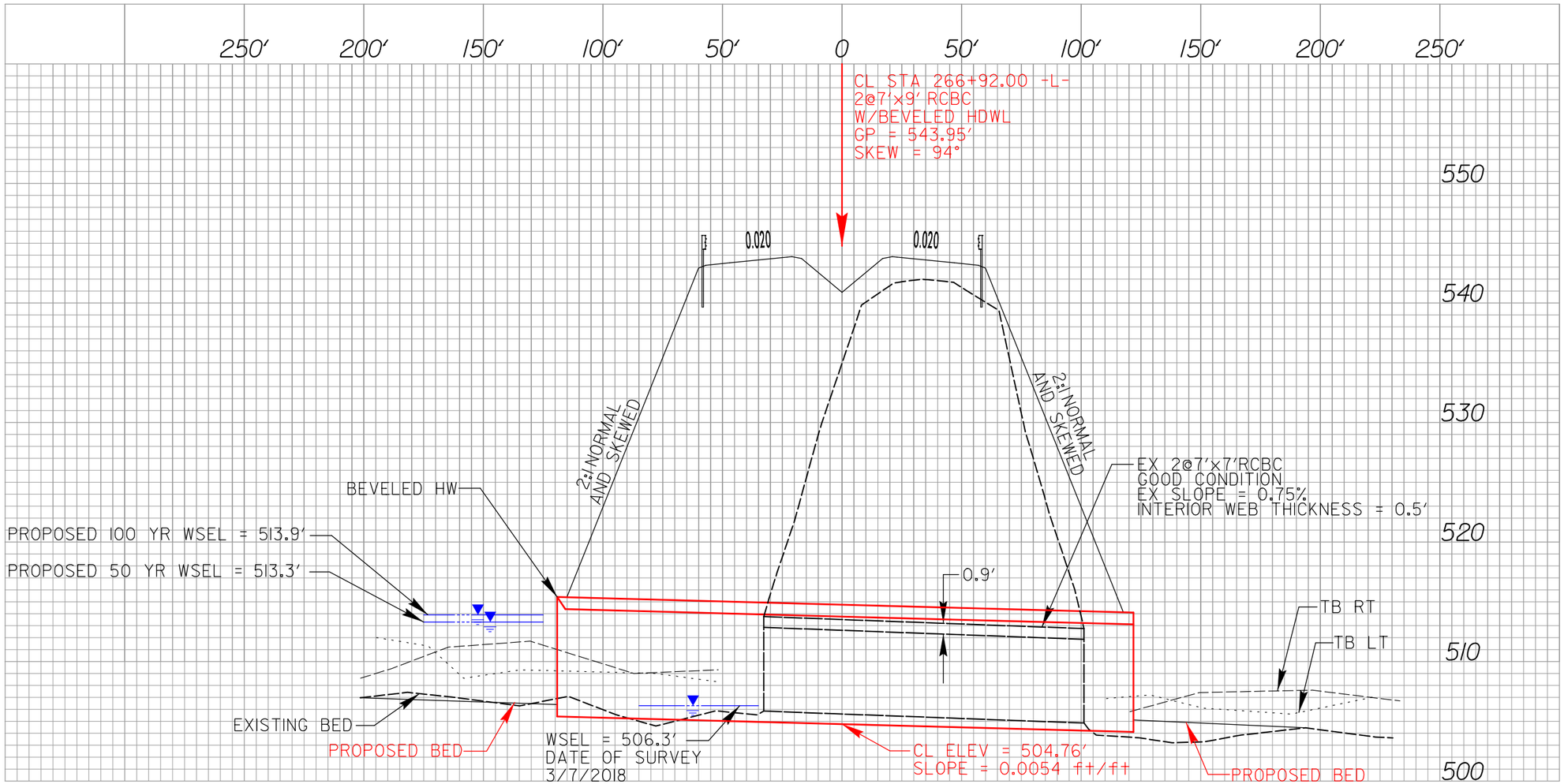
SITE 39



REVISIONS
8/17/99

10:30:33 AM
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5/14/99

PERMIT DRAWING
SHEET 46 OF 91

PROJECT REFERENCE NO.	SHEET NO.
R-2527	25
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

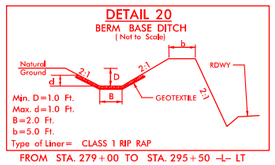
NAD 83/NA 2011

STEWART
firm License No. C-1851
223 S. West St.
Suite 1100
Raleigh, NC 27603
T: 919.380.8750
www.stewartENG.com

vhb
VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

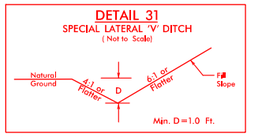
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL 20
BERM BASE DITCH
(Not to Scale)



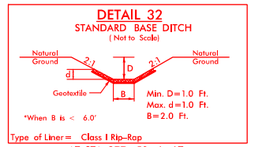
Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.
Type of Liner= CLASS 1 RIP RAP
FROM STA. 279+00 TO STA. 295+50 -L- LT

DETAIL 31
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D=1.0 Ft.
FROM STA. 283+50 TO STA. 284+00 -L- RT

DETAIL 32
STANDARD BASE DITCH
(Not to Scale)

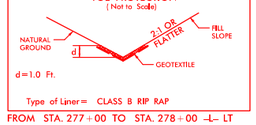


Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.
*When B is < 6.0'
Type of Liner= Class I Rip-Rap
AT STA. 277+50 -L- LT

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

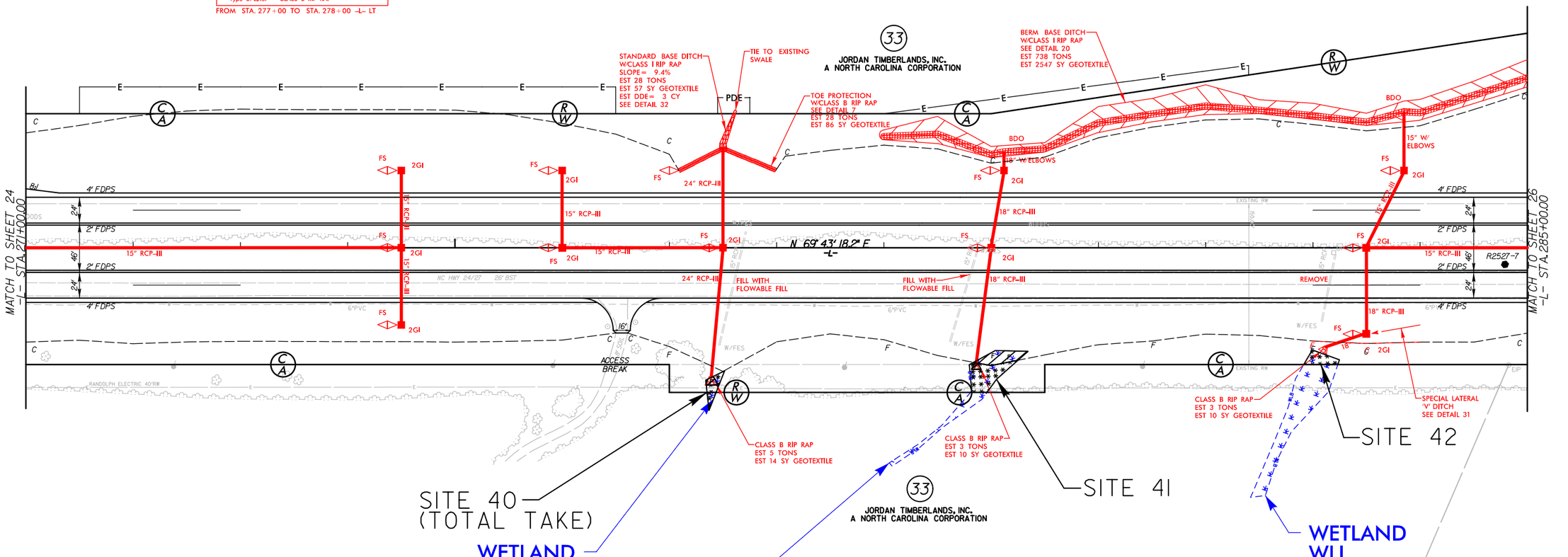
DETAIL 7
TOE PROTECTION
(Not to Scale)

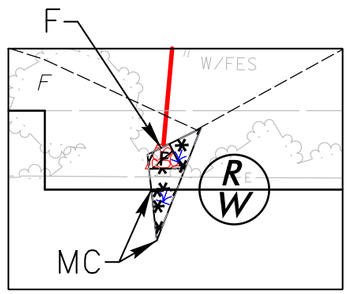


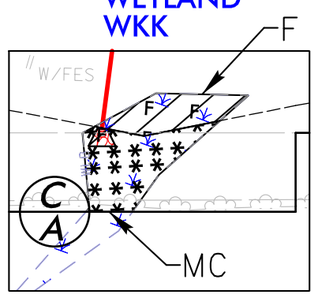
d=1.0 Ft.
Type of Liner= CLASS B RIP RAP
FROM STA. 277+00 TO STA. 278+00 -L- LT

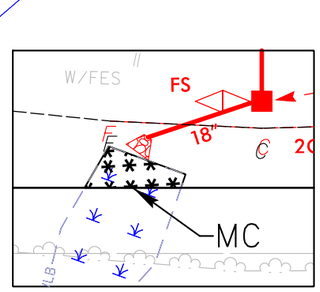
275

280









50' 0' 100'
GRAPHIC SCALE

25' 0' 50'
INSET GRAPHIC SCALE

34
WILLIAM JAMES SKIDMORE

FOR -L- PROFILE, SEE SHEET 51

ALL DRIVEWAY RADII 30' UNLESS OTHERWISE NOTED.

5:02:43 PM
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Revised Plans
overlay

5/14/99

PERMIT DRAWING
SHEET 47 OF 91

PROJECT REFERENCE NO.	SHEET NO.
R-2527	25
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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vhb — VHB Engineering NC, P.C. (C-3705), 940 Main Campus Drive, Suite 500, Raleigh, NC 27606

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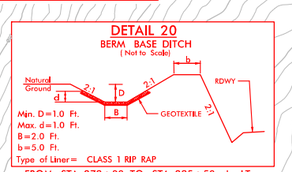
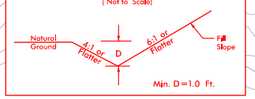
NAD 83/NA 2011

DETAIL 20
BERM BASE DITCH
(Not to Scale)



Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.
Type of Liner= CLASS 1 RIP RAP
FROM STA. 279+00 TO STA. 295+50 -L- LT

DETAIL 31
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D=1.0 Ft.
FROM STA. 283+50 TO STA. 284+00 -L- RT

DETAIL 32
STANDARD BASE DITCH
(Not to Scale)

Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.
*When B is < 6.0'
Type of Liner= Class I Rip-Rap
AT STA. 277+50 -L- LT

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

DETAIL 7
TOE PROTECTION
(Not to Scale)

d=1.0 Ft.
Type of Liner= CLASS B RIP RAP
FROM STA. 277+00 TO STA. 278+00 -L- LT

275

280

33
JORDAN TIMBERLANDS, INC.
A NORTH CAROLINA CORPORATION

STANDARD BASE DITCH W/CLASS I RIP RAP
SLOPE= 9.4%
EST 28 TONS
EST 57 SY GEOTEXTILE
EST DDF= 3 CY
SEE DETAIL 32

TIE TO EXISTING SWALE

TOE PROTECTION W/CLASS B RIP RAP
SEE DETAIL 7
EST 28 TONS
EST 86 SY GEOTEXTILE

BERM BASE DITCH W/CLASS I RIP RAP
SEE DETAIL 20
EST 738 TONS
EST 2547 SY GEOTEXTILE

MATCH TO SHEET 24 -L- STA.271+00.00

MATCH TO SHEET 26 -L- STA.285+00.00

4' FDPS
2' FDPS
24"
46"
15" RCP-III
18" RCP-III
24" RCP-III
2GI
FS
PDE
BDO
15" W ELBOWS
N 69°43'18.2" E -L-
FILL WITH FLOWABLE FILL
REMOVE
R2527-7
6"PVC
W/FES
16'
ACCESS BREAK
RANDOLPH ELECTRIC 40'R/W
EXISTING RR

CLASS B RIP RAP
EST 5 TONS
EST 14 SY GEOTEXTILE

CLASS B RIP RAP
EST 3 TONS
EST 10 SY GEOTEXTILE

CLASS B RIP RAP
EST 3 TONS
EST 10 SY GEOTEXTILE

SPECIAL LATERAL 'V' DITCH
SEE DETAIL 31

SITE 40
(TOTAL TAKE)

SITE 41

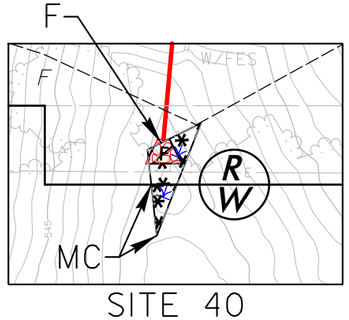
SITE 42

33
JORDAN TIMBERLANDS, INC.
A NORTH CAROLINA CORPORATION

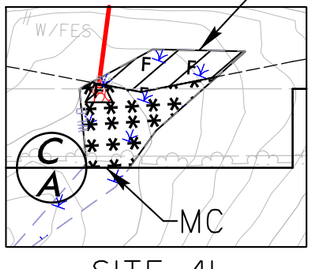
WETLAND WKK

WETLAND WMM

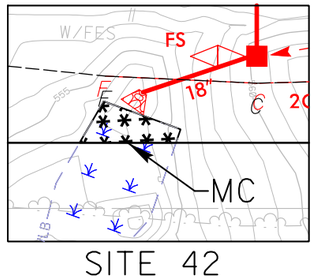
WETLAND WLL



SITE 40
(TOTAL TAKE)



SITE 41



SITE 42

50' 0' 100'
GRAPHIC SCALE

25' 0' 50'
INSET GRAPHIC SCALE

34
WILLIAM JAMES SKIDMORE

FOR -L- PROFILE, SEE SHEET 5I

ALL DRIVEWAY RADII 30' UNLESS OTHERWISE NOTED.

5/20/56 PM
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RPVerdate

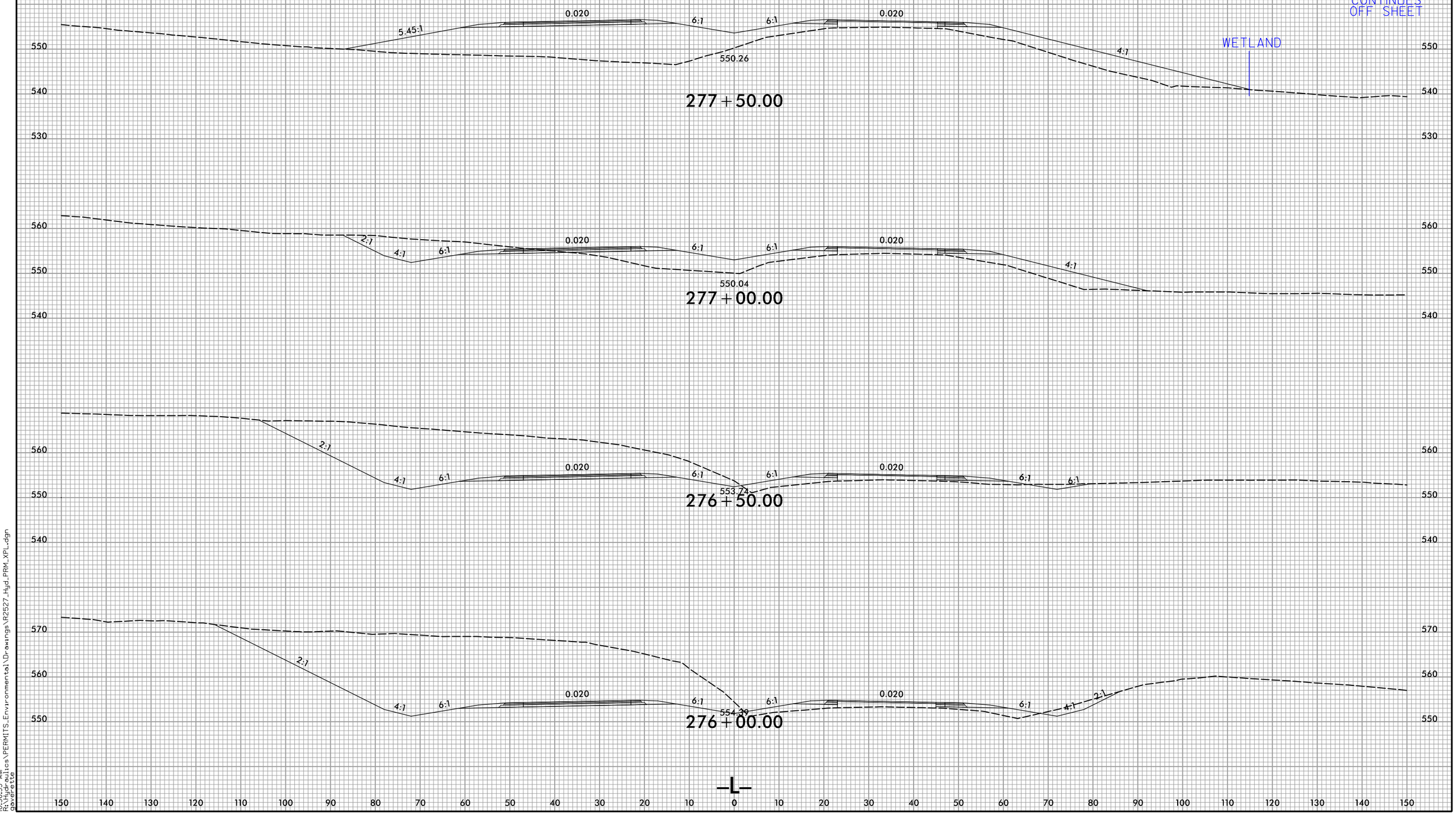
8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2527	X-167

PERMIT DRAWING
SHEET 48 OF 91

SITE 40

WETLAND CONTINUES OFF SHEET



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gaverette

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2527	X-169

PERMIT DRAWING
SHEET 49 OF 91

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

570 560 550 540

2:1 2:1 560.20 2:1 4:1 6:1 0.020 6:1 556.08 6:1 0.020 4:1

280+50.00

SITE 41

570 560 550 540

WETLAND CONTINUES OFF SHEET

2:1 2:1 556.13 6:1 6:1 0.020 6:1 553.56 6:1 0.020 4:1

WETLAND

280+00.00

570 560 550 540

2:1 2:1 560.12 2:1 4:1 6:1 0.020 6:1 553.64 6:1 0.020 4:1

279+50.00

–L–

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

10:36:57 AM
R:\Projects\PERMITS_Environmental\Drawings\R2527_Hyd_PRM_XPL.dgn
Arthur Collins
gaverette

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2527	X-171

PERMIT DRAWING
SHEET 50 OF 91

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

580
570
560
550

2:1 2:1 576.15 2:1 4:1 6:1 0.020 6:1 564.25 6:1 0.020 6:1 6:1

283+50.00

SITE 42

2:1 2:1 578.33 2:1 4:1 6:1 0.020 6:1 561.83 6:1 0.020 4.02:1

WETLAND WETLAND

283+00.00

2:1 2:1 580.52 2:1 4:1 6:1 0.020 6:1 560.54 6:1 0.020 6:1

282+50.00

–L–

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

10:36:59 AM
R:\Highways\PERMITS_Environmental\Drawings\R2527_Hgd_PRM_XPL.dgn
gaverette

5/14/99

PERMIT DRAWING
SHEET 51 OF 91

50' 0' 100'
GRAPHIC SCALE

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83/NA 2011

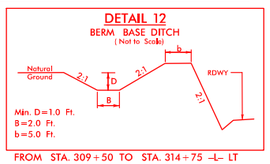
PROJECT REFERENCE NO.	SHEET NO.
R-2527	27
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

STEWART — firm license No. C-1851, 223 S. West St., Suite 1100, Raleigh, NC 27603, T: 919.380.8750, www.wbstewartNC.com

vhb — VHB Engineering NC, P.C. (C-3705), 940 Main Campus Drive, Suite 500, Raleigh, NC 27606

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

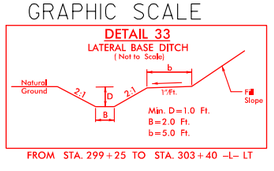
DETAIL 12
BERM BASE DITCH (Not to Scale)



Min. D=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.

FROM STA. 309+50 TO STA. 314+75 –L– LT

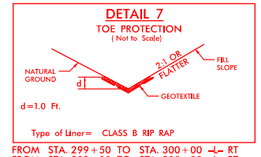
DETAIL 33
LATERAL BASE DITCH (Not to Scale)



Min. D=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.

FROM STA. 299+25 TO STA. 303+40 –L– LT

DETAIL 7
TOE PROTECTION (Not to Scale)

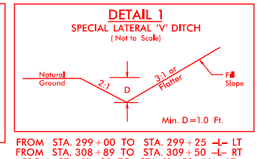


d=1.0 Ft.

Type of Liner= CLASS B RIP RAP

FROM STA. 299+50 TO STA. 300+00 –L– RT
FROM STA. 303+00 TO STA. 305+00 –L– RT

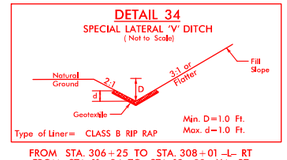
DETAIL 1
SPECIAL LATERAL 'V' DITCH (Not to Scale)



Min. D=1.0 Ft.

FROM STA. 299+00 TO STA. 299+25 –L– LT
FROM STA. 308+89 TO STA. 309+50 –L– RT
FROM STA. 11+00 TO STA. 11+50 –Y4– LT

DETAIL 34
SPECIAL LATERAL 'V' DITCH (Not to Scale)

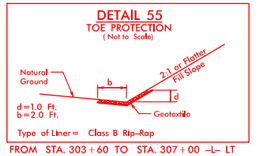


Type of Liner= CLASS B RIP RAP

Min. D=1.0 Ft.
Max. d=1.0 Ft.

FROM STA. 306+25 TO STA. 308+01 –L– RT
FROM STA. 11+34 TO STA. 12+00 –Y4– RT

DETAIL 55
TOE PROTECTION (Not to Scale)

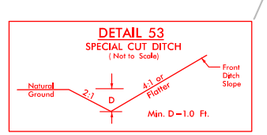


d=1.0 Ft.
b=2.0 Ft.

Type of Liner= Class B Rip-Rap

FROM STA. 303+60 TO STA. 307+00 –L– LT

DETAIL 53
SPECIAL CUT DITCH (Not to Scale)



Min. D=1.0 Ft.

FROM STA. 305+50 TO STA. 306+25 –L– RT

NOTE: SEE TMP SHEET No. XXX FOR CULVERT STAGING

300

310

STREAM SF–A1

STREAM SF–A

WETLAND WNN

WETLAND WYD

WETLAND WOO

STREAM SW–B

SITE 45

SITE 45A

SITE 46

SITE 47

SITE 44

TS

S

MC

PI

PDE

PUE

CLASS B RIP RAP
EST 2 TONS
EST 7 SY
GEOTEXTILE

LATERAL BASE DITCH
SEE DETAIL 33

CLASS II RIP RAP
EST 385 TONS
EST 500 SY GEOTEXTILE
SEE DETAIL 53

TOE PROTECTION
W/CLASS B RIP RAP
SEE DETAIL 55
EST 128 TONS
EST 36 SY GEOTEXTILE

BERM BASE DITCH
SEE DETAIL 12

ACCESS BREAK

BEGIN SBG +46

END SBG +12

BEGIN SBG +50

END SBG +00

15" W/ ELBOWS

24" W/ ELBOWS

CAT-1

GREU TL-3

10' FDPS

4' FDPS

15" RCP-IV

18" RCP-IV

24" RCP-IV

15" RCP-III

1@8'x10' RCBC

2GI

2GI-A

FS

DI

REMOVE

FILL WITH FLOWABLE FILL

N 69°43'18.2" E

S 11°05'43.6" E

R=10'

50' TAPER LT & RT

NC HWY 24/27

26' BST

WOODS

TOE PROTECTION
W/CLASS B RIP RAP
SEE DETAIL 7
EST 14 TONS
EST 43 SY GEOTEXTILE

CLASS B RIP RAP
EST 2 TONS
EST 7 SY GEOTEXTILE

CLASS B RIP RAP
EST 5 TONS
EST 14 SY GEOTEXTILE

TOE PROTECTION
W/CLASS B RIP RAP
SEE DETAIL 7
EST 55 TONS
EST 72 SY GEOTEXTILE

CLASS II RIP RAP
EST 300 TONS
EST 420 SY GEOTEXTILE
SEE DETAIL 36

FILL IN EXISTING CHANNEL
W/CLASS II RIP RAP
EST 180 TONS
EST 195 SY GEOTEXTILE
SEE DETAIL 64

SPECIAL CUT 'V' DITCH
SEE DETAIL 53

SPECIAL LATERAL 'V' DITCH
W/CLASS B RIP RAP
SEE DETAIL 34
EST 102 TONS
EST 276 SY GEOTEXTILE

SPECIAL LATERAL 'V' DITCH
SEE DETAIL 1

(36) EDWARDS TIMBER COMPANY, INC.

(37) CONNIE A. GRAHAM AND HUSBAND, WILLIAM E. GRAHAM

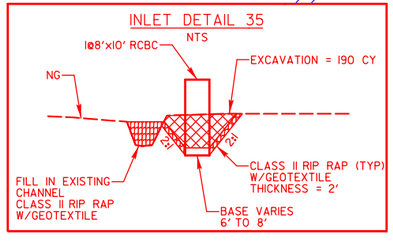
(38) STATE OF NORTH CAROLINA

(39) UNITED STATES FOREST SERVICE

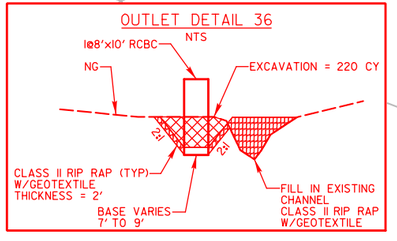
(39) UNITED STATES FOREST SERVICE

JACK C. STARNES, UNMARRIED

INLET DETAIL 35



OUTLET DETAIL 36



MATCH TO SHEET 26 –L– STA.299+00.00

MATCH TO SHEET 28 –L– STA.313+00.00

FOR –L– PROFILE, SEE SHEET 52

FOR –Y4– PROFILE, SEE SHEET 60

ALL DRIVEWAY RADII 30' UNLESS OTHERWISE NOTED.

2B-6 & 2B-7

7:59:25 AM
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dunn

5/14/99

PERMIT DRAWING
SHEET 52 OF 91

50' 0' 100'
GRAPHIC SCALE

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83/NA 2011

PROJECT REFERENCE NO.	SHEET NO.
R-2527	27
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

STEWART — firm license No. C-1851, 223 S. West St., Suite 1100, Raleigh, NC 27603, P: 919.380.8750, www.stewartinc.com

vhb — VHB Engineering NC, P.C. (C-3705), 940 Main Campus Drive, Suite 500, Raleigh, NC 27606

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DETAIL 12
BERM BASE DITCH (Not to Scale)

Min. D=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.

FROM STA. 309+50 TO STA. 314+75 –L– LT

DETAIL 33
LATERAL BASE DITCH (Not to Scale)

Min. D=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.

FROM STA. 299+25 TO STA. 303+40 –L– LT

DETAIL 7
TOE PROTECTION (Not to Scale)

d=1.0 Ft.

Type of Liner= CLASS B RIP RAP

FROM STA. 299+50 TO STA. 300+00 –L– RT
FROM STA. 303+00 TO STA. 305+00 –L– RT

DETAIL 1
SPECIAL LATERAL 'V' DITCH (Not to Scale)

Min. D=1.0 Ft.

FROM STA. 299+00 TO STA. 299+25 –L– LT
FROM STA. 308+89 TO STA. 309+50 –L– RT
FROM STA. 11+00 TO STA. 11+50 –Y4– LT

DETAIL 34
SPECIAL LATERAL 'V' DITCH (Not to Scale)

Type of Liner= CLASS B RIP RAP

Min. D=1.0 Ft.
Max. d=1.0 Ft.

FROM STA. 306+25 TO STA. 308+01 –L– RT
FROM STA. 11+34 TO STA. 12+00 –Y4– RT

DETAIL 55
TOE PROTECTION (Not to Scale)

d=1.0 Ft.
b=2.0 Ft.

Type of Liner= Class B Rip-Rap

FROM STA. 303+60 TO STA. 307+00 –L– LT

DETAIL 53
SPECIAL CUT DITCH (Not to Scale)

Min. D=1.0 Ft.

FROM STA. 305+50 TO STA. 306+25 –L– RT

NOTE: SEE TMP SHEET No. XXX FOR CULVERT STAGING

STREAM SF–A1

CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE

STREAM SF–A

36 EDWARDS TIMBER COMPANY, INC.

CLASS II RIP RAP EST 385 TONS EST 500 SY GEOTEXTILE SEE DETAIL 64

WETLAND WNN

SITE 45

SITE 46

SITE 46

LATERAL BASE DITCH SEE DETAIL 33

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 55 EST 128 TONS EST 36 SY GEOTEXTILE

WETLAND WYD

39 UNITED STATES FOREST SERVICE

BERM BASE DITCH SEE DETAIL 12

ACCESS BREAK

BEGIN SBG +46

CAT-1 10' FDPS 4' FDPS

15" W/ ELBOWS

15" RCP–IV

END SBG +12

GREU TL-3

15" RCP–III

MATCH TO SHEET 26 –L– STA 299+00.00

MATCH TO SHEET 28 –L– STA 313+00.00

N 69° 43' 18.2" E

1@8'x10' RCBC

24" RCP–IV

18" RCP–IV

FILL WITH FLOWABLE FILL

BURIED 1.0'

24" W/ ELBOWS

END SBG +00

BEGIN SBG +50

CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 14 TONS EST 43 SY GEOTEXTILE

37 CONNIE A. GRAHAM AND HUSBAND, WILLIAM E. GRAHAM

SITE 44

CLASS B RIP RAP EST 5 TONS EST 14 SY GEOTEXTILE

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 155 TONS EST 72 SY GEOTEXTILE

FILL IN EXISTING CHANNEL W/CLASS II RIP RAP EST 180 TONS EST 195 SY GEOTEXTILE SEE DETAIL 64

CLASS II RIP RAP EST 300 TONS EST 420 SY GEOTEXTILE SEE DETAIL 36

SPECIAL CUT 'V' DITCH SEE DETAIL 53

SPECIAL LATERAL 'V' DITCH W/CLASS B RIP RAP SEE DETAIL 34 EST 102 TONS EST 276 SY GEOTEXTILE

SPECIAL LATERAL 'V' DITCH SEE DETAIL 1

38 STATE OF NORTH CAROLINA

JACK C. STARNES, UNMARRIED

STREAM SF–A

SITE 47

39 UNITED STATES FOREST SERVICE

WETLAND WOO

STREAM SW–B

S 11° 05' 43.6" E

50' TAPER LT & RT

R=10'

REMOVE

INLET DETAIL 35
NTS

@8'x10' RCBC
NG
EXCAVATION = 190 CY
FILL IN EXISTING CHANNEL CLASS II RIP RAP W/GEOTEXTILE
CLASS II RIP RAP (TYP) W/GEOTEXTILE THICKNESS = 2'
BASE VARIES 6' TO 8'

OUTLET DETAIL 36
NTS

@8'x10' RCBC
NG
EXCAVATION = 220 CY
CLASS II RIP RAP (TYP) W/GEOTEXTILE THICKNESS = 2'
BASE VARIES 7' TO 9'
FILL IN EXISTING CHANNEL CLASS II RIP RAP W/GEOTEXTILE

2B-6 & 2B-7

FOR –L– PROFILE, SEE SHEET 52

FOR –Y4– PROFILE, SEE SHEET 60

ALL DRIVEWAY RADII 30' UNLESS OTHERWISE NOTED.

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bunt

8/17/99

REVISIONS

PERMIT DRAWING
SHEET 53 OF 91

PROJECT REFERENCE NO.	SHEET NO.
R-2527	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Firm License No. C-0501
223 South West St.
Suite 1100
Raleigh, NC 27603
T: 919.380.8750
www.stewartinc.com
STEWART

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

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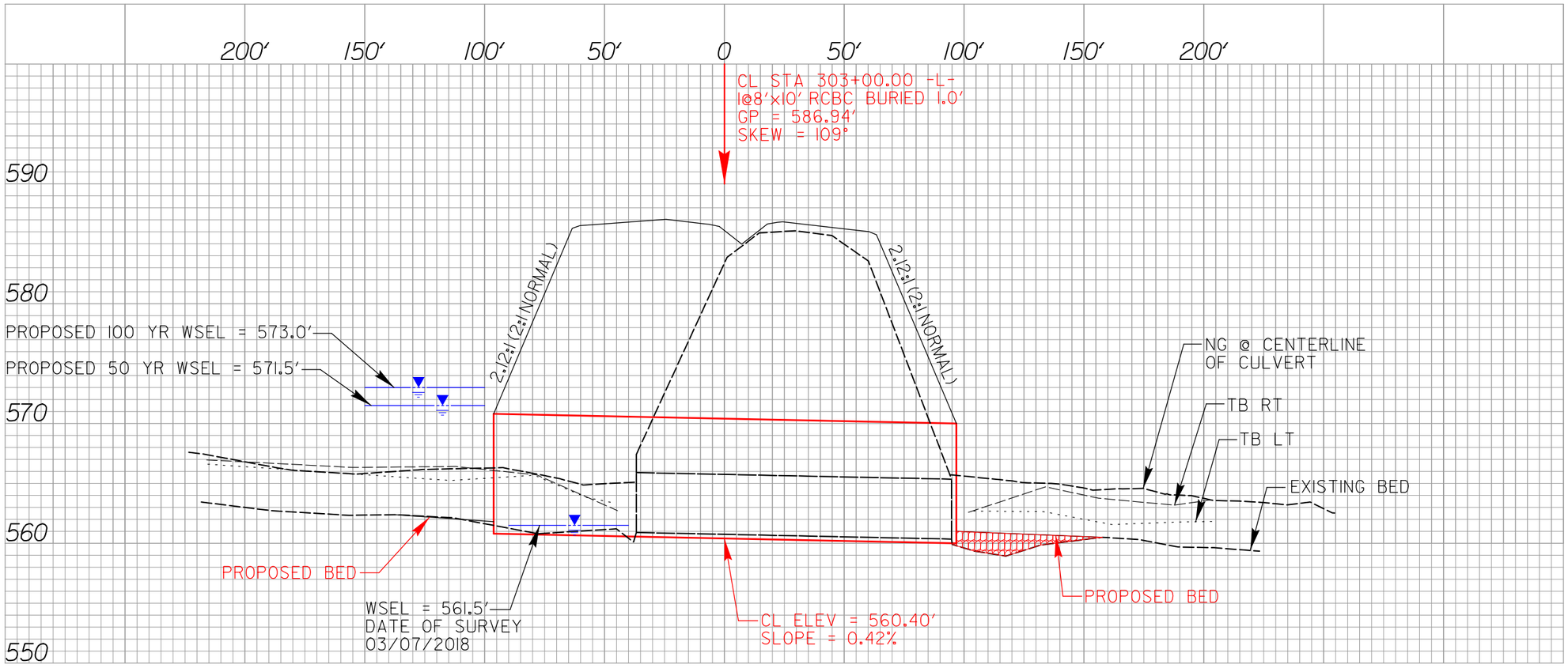
SITES 44, 45, & 46



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8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2527	X-185

PERMIT DRAWING
SHEET 54 OF 91

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

589.76
0.020 0.020 6:1 6:1 0.020 0.020
2:1
3.88:1
582.89
590 580 570

305+00.00

SITE 46

WETLAND

WETLAND
CONTINUES
OFF SHEET

588.70
0.020 0.020 6:1 6:1 0.020
2:1
3.04:1
582.13
590 580 570 560

304+50.00

587.75
0.020 0.020 6:1 6:1 0.020 587.75
2:1
2:1
581.30
590 580 570 560

304+00.00

–L–

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

7:59:53 AM
R:\Roadcuts\PERMITS_Environmental\Drawings\R2527_Hyd_PRM_XPL.dgn
jhunt

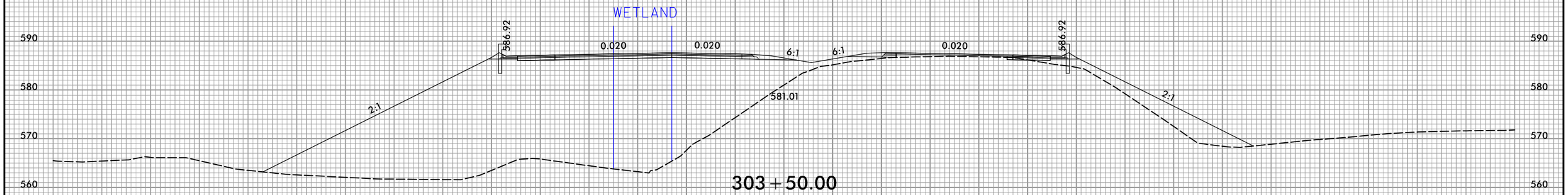
8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2527	X-184

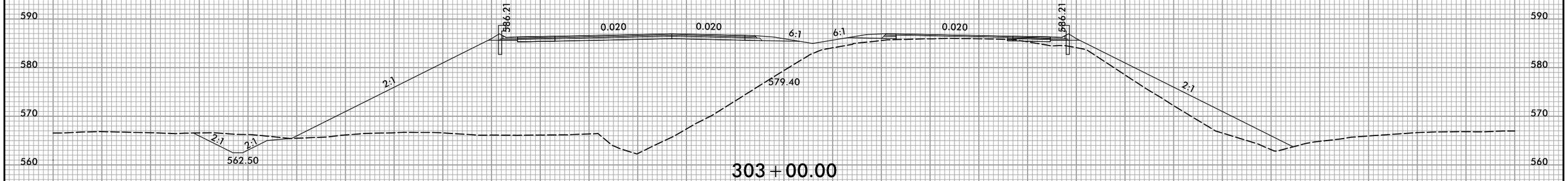
PERMIT DRAWING
SHEET 54A OF 91

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

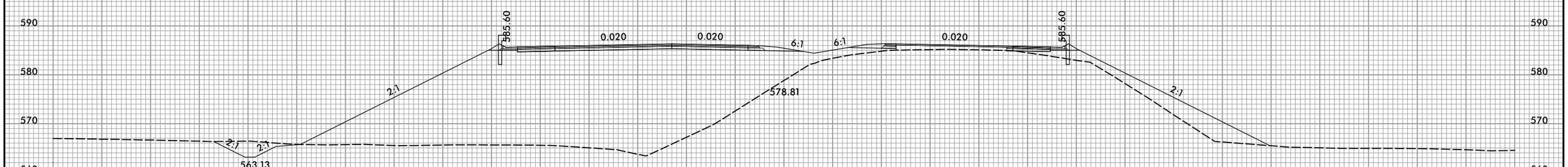
SITE 45A



303 + 50.00



303 + 00.00



302 + 50.00

–L–

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

7:59:51 AM
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jhunt

5/14/99

PERMIT DRAWING
SHEET 55 OF 91

50′ 0′ 100′
GRAPHIC SCALE

F F DENOTES FILL IN WETLAND

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83/NA 2011

PROJECT REFERENCE NO.	SHEET NO.
R-2527	28
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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vhb — VHB Engineering NC, P.C. (C-3705), 940 Main Campus Drive, Suite 500, Raleigh, NC 27606

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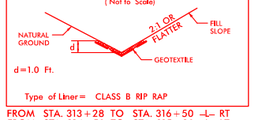
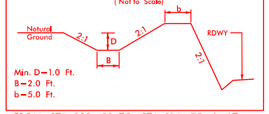
DETAIL 7
TOE PROTECTION
(Not to Scale)



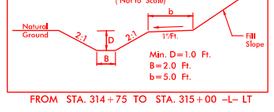
Type of Liner= CLASS B RIP RAP
FROM STA. 313+28 TO STA. 316+50 –L– RT
FROM STA. 314+50 TO STA. 315+80 –L– LT

DETAIL 12
BERM BASE DITCH
(Not to Scale)



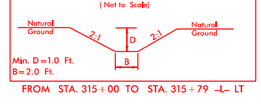
FROM STA. 309+50 TO STA. 314+75 –L– LT

DETAIL 33
LATERAL BASE DITCH
(Not to Scale)



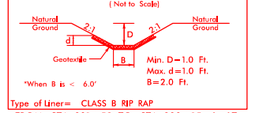
FROM STA. 314+75 TO STA. 315+00 –L– LT

DETAIL 30
STANDARD BASE DITCH
(Not to Scale)



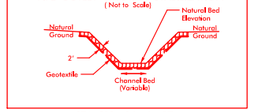
FROM STA. 315+00 TO STA. 315+79 –L– LT

DETAIL 17
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= CLASS B RIP RAP
FROM STA. 321+58 TO STA. 322+15 –L– LT

DETAIL 62
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



STA. 313+26 –L– RT

315 320 325

WETLAND WHH

SITE 48

STREAM SW–B

DAYLIGHT TO NATURAL GROUND

BERM BASE DITCH SEE DETAIL 12

LATERAL BASE DITCH SEE DETAIL 33

STANDARD BASE DITCH SLOPE= 4.9% EST DDE= 20 CY SEE DETAIL 30

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 36 TONS EST 112 SY GEOTEXTILE

STANDARD BASE DITCH W/CLASS B RIP RAP SLOPE= 5.3% EST 30 TONS EST 80 SY GEOTEXTILE EST DDE=15 CY SEE DETAIL 17

39 UNITED STATES FOREST SERVICE

CLASS B RIP RAP EST 3 TONS EST 10 SY GEOTEXTILE

MATCH TO SHEET 27 –L– STA. 313+00.00

MATCH TO SHEET 29 –L– STA. 327+00.00

HW

BURIED 0.7′

42" RCP-III

COLLAR

15" RCP-IV

18" RCP-IV

TB JB w/MH

15" W. ELBOWS

TRENCHLESS INSTALLATION 30" WELDED STEEL

FILL WITH FLOWABLE FILL

REMOVE

N 69°43′18.2" E –L–

4' FDPS

2' FDPS

WOODS

EXISTING RW

NC HWY 24/27 24' BST

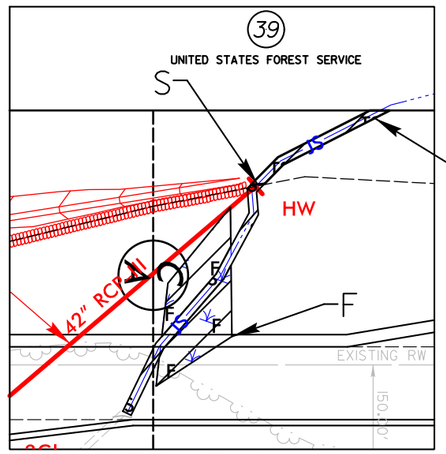
TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 89 TONS EST 276 SY GEOTEXTILE

CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE

PIPE OUTLET CHANNEL STABILIZATION W/ CLASS I RIP RAP EST 17 TONS EST 25 SY GEOTEXTILE L= 14 FT SEE DETAIL 62

SITE 47

25′ 0′ 50′
INSET GRAPHIC SCALE



SITE 47 & 48

ENVIRONMENTAL SENSITIVITY AREA

ENVIRONMENTALLY SENSITIVE AREA

FOR INTERSECTION DETAIL, SEE SHEET 2B-6

FOR –L– PROFILE, SEE SHEETS 52 & 53

10:46:47 AM
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gavarrette

5/14/99

PERMIT DRAWING
SHEET 56 OF 91

50′ 0′ 100′
GRAPHIC SCALE

F F DENOTES FILL IN WETLAND

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-2527	28
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

STEWART — firm License No. C-1851, 223 S. West St., Suite 1100, Raleigh, NC 27603, P: 919.380.8750, www.stewartinc.com

vhb — VHB Engineering NC, P.C. (C-3705), 940 Main Campus Drive, Suite 500, Raleigh, NC 27606

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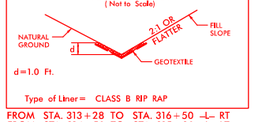
NAD 83/NA 2011

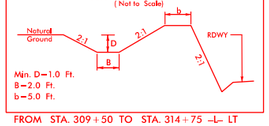
DETAIL 7
TOE PROTECTION (Not to Scale)



Type of Liner= CLASS B RIP RAP

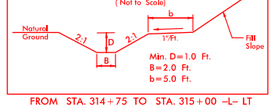
FROM STA. 313+28 TO STA. 316+50 –L– RT
FROM STA. 314+50 TO STA. 315+80 –L– LT

DETAIL 12
BERM BASE DITCH (Not to Scale)



FROM STA. 309+50 TO STA. 314+75 –L– LT

DETAIL 33
LATERAL BASE DITCH (Not to Scale)

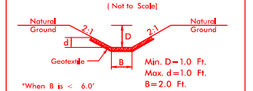


FROM STA. 314+75 TO STA. 315+00 –L– LT

DETAIL 30
STANDARD BASE DITCH (Not to Scale)

FROM STA. 315+00 TO STA. 315+79 –L– LT

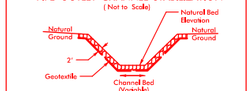
DETAIL 17
STANDARD BASE DITCH (Not to Scale)



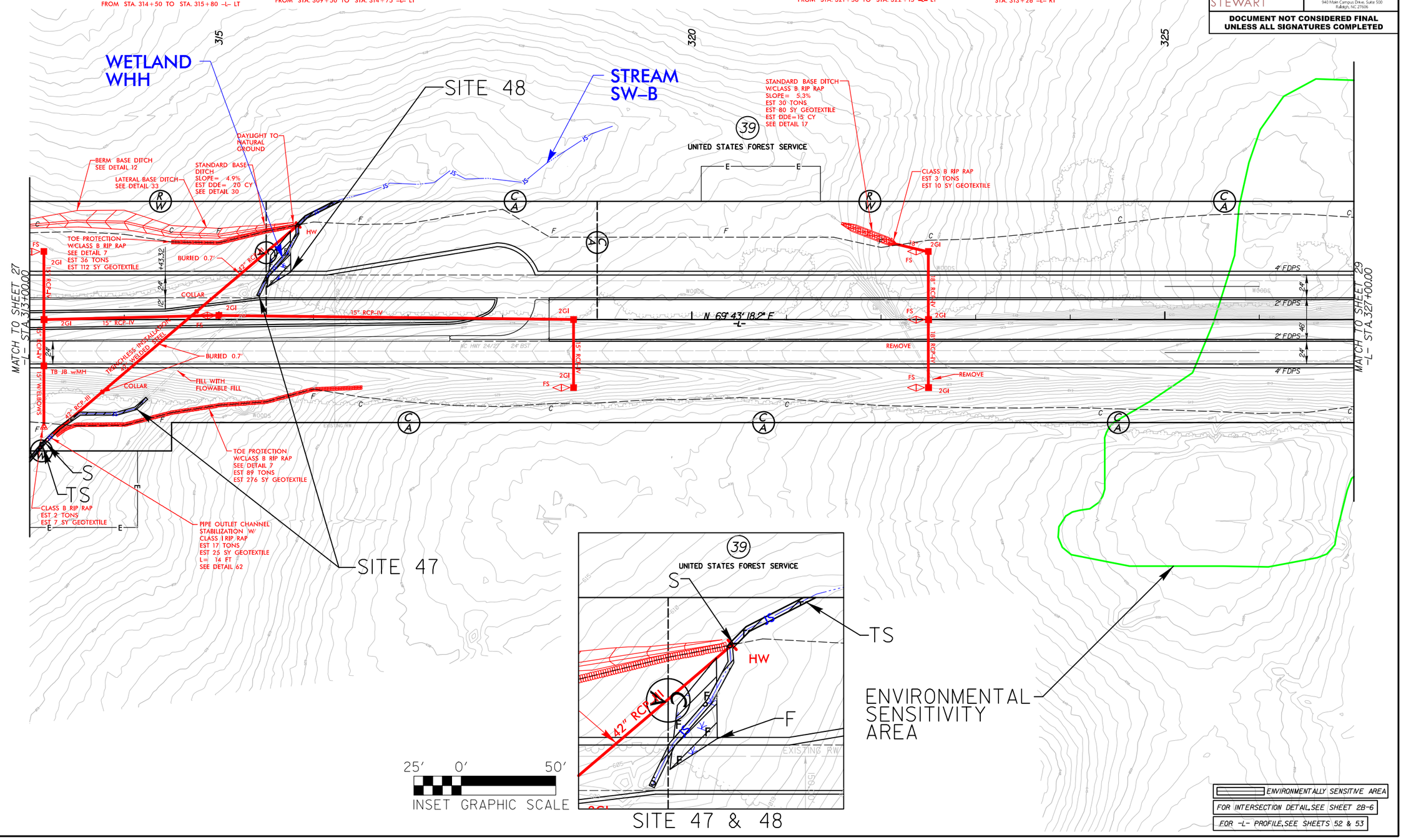
Type of Liner= CLASS B RIP RAP

FROM STA. 321+58 TO STA. 322+15 –L– LT

DETAIL 62
PIPE OUTLET CHANNEL STABILIZATION (Not to Scale)



STA. 313+26 –L– RT



25′ 0′ 50′
INSET GRAPHIC SCALE

SITE 47 & 48

ENVIRONMENTAL SENSITIVITY AREA

ENVIRONMENTALLY SENSITIVE AREA

FOR INTERSECTION DETAIL, SEE SHEET 2B-6

FOR -L- PROFILE, SEE SHEETS 52 & 53

I:\2504\4 AW Planning\Graphics\PERMITS_Environmental\Drawings\R2527_Hyd_PRM_PSH28_con.dgn
gavarrete

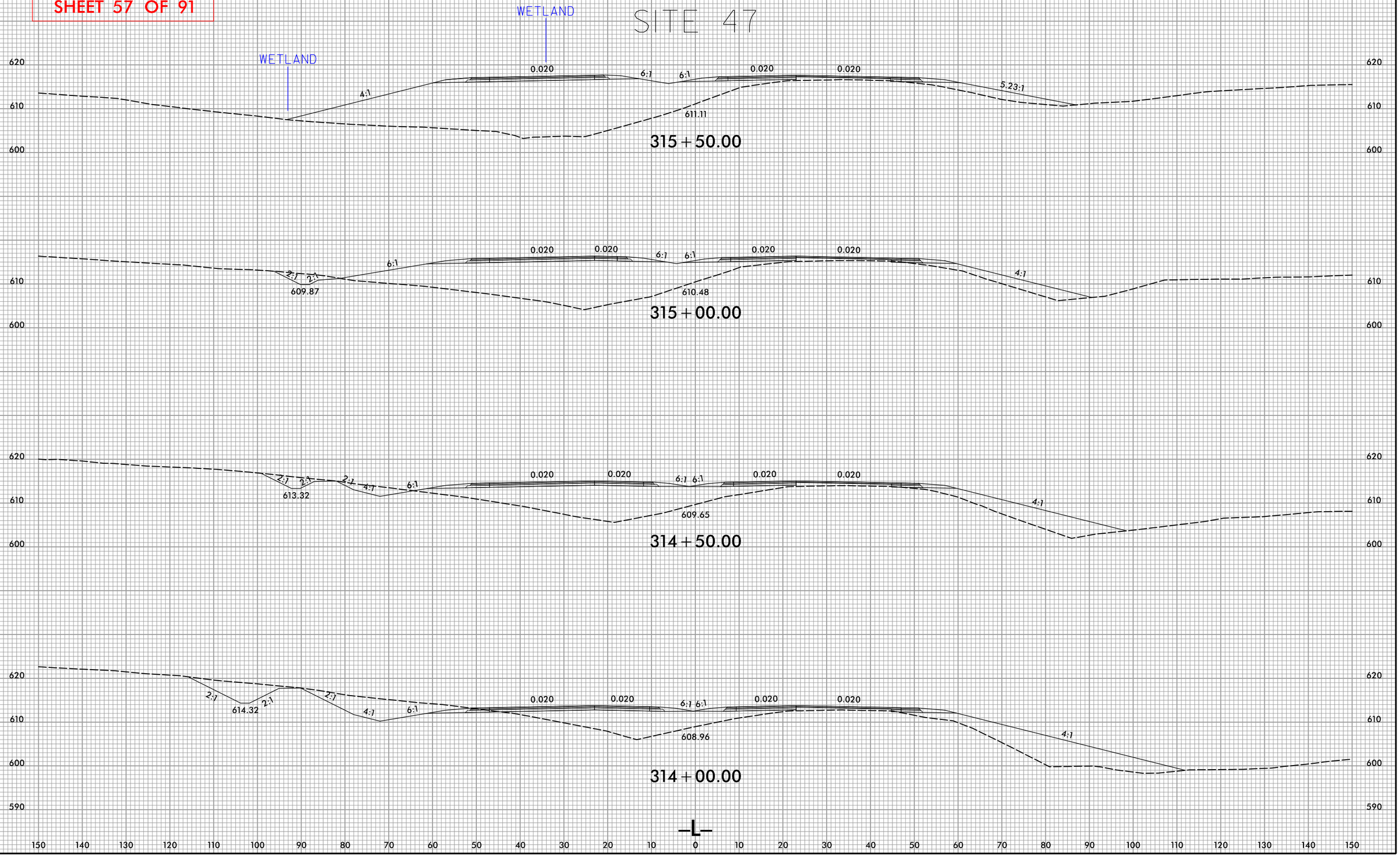
8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2527	X-190

PERMIT DRAWING
SHEET 57 OF 91

SITE 47

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



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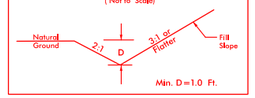
R:\Highways\PERMITS_Environmental\Drawings\R2527_Hyd_PRM_XPL.dgn
gaverette

5/14/99

PERMIT DRAWING
SHEET 58 OF 91

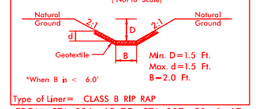
DENOTES MECHANIZED CLEARING

DETAIL 1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



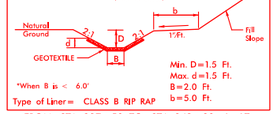
FROM STA. 328+00 TO STA. 328+50 -L- RT
FROM STA. 334+50 TO STA. 335+00 -L- LT

DETAIL 40
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= CLASS B RIP RAP
FROM STA. 336+65 TO STA. 337+50 -L- LT

DETAIL 37
LATERAL BASE DITCH
(Not to Scale)



Type of Liner= CLASS B RIP RAP
FROM STA. 337+50 TO STA. 342+00 -L- LT

50' 0' 100'
GRAPHIC SCALE

16.7' 0' 33.3'
INSET GRAPHIC SCALE

NAD 83/NA 2011

PROJECT REFERENCE NO.	SHEET NO.
R-2527	29
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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firm License No. C-1851
223 S. West St.
Suite 1100
Raleigh, NC 27603
T: 919.380.8750
www.stewartENG.com

vhb
VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

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330 335 340

39 UNITED STATES FOREST SERVICE

STANDARD BASE DITCH
W/CLASS B RIP RAP
SLOPE= 5.6%
EST 55 TONS
EST 140 SY GEOTEXTILE
EST DDE = 25 CY
SEE DETAIL 40

LATERAL BASE DITCH
W/CLASS B RIP RAP
SEE DETAIL 37
EST 252 TONS
EST 683 SY GEOTEXTILE

PDE

ACCESS BREAK

SPECIAL LATERAL V DITCH
SEE DETAIL 1

MATCH TO SHEET 28
-L- STA. 327+00.00

MATCH TO SHEET 30
-L- STA. 341+00.00

4' FDPS
2' FDPS
24"
46"
WOODS
2GI
FS
15" RCP-III
N 69° 43' 18.2" E
-L-
NC HWY 24/27
24' BS
REMOVE 15" RCP
GRADE TO DRAIN REMOVE
16'
ACCESS BREAK
8sl
GREU TL-3
BEGIN SBG +25 RT
10' FDPS
15" W/ELBOWS
18" RCP-III
CLASS B RIP RAP
EST 3 TONS
EST 10 SY GEOTEXTILE
SPECIAL LATERAL V DITCH
SEE DETAIL 1

SITE 49

CLASS B RIP RAP
EST 2 TONS
EST 7 SY GEOTEXTILE

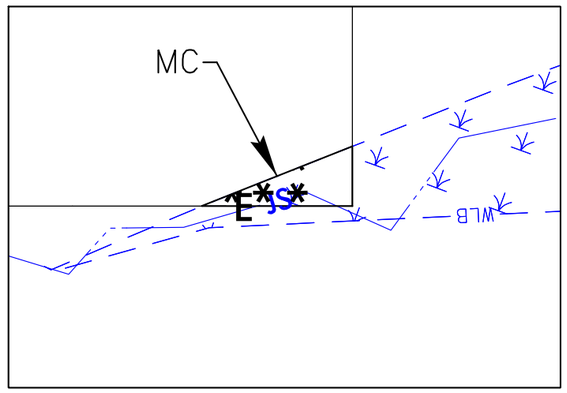
39 UNITED STATES FOREST SERVICE

WETLAND
WFF

STREAM
SX

SITE 49

WETLAND
WFF



SITE 49

ENVIRONMENTAL SENSITIVITY AREA

ENVIRONMENTALLY SENSITIVE AREA

FOR -L- PROFILE, SEE SHEET 53

ALL DRIVEWAY RADII 30' UNLESS OTHERWISE NOTED.

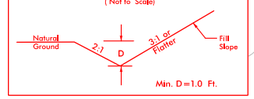
5/6/2019 2:09:11 PM
R:\Projects\Roadway\Design Units\PERMITS_Environmental\Drawings\R2527_Hyd_PRM_PSH29.dgn
dgnsetup

5/14/99

PERMIT DRAWING
SHEET 59 OF 91

DENOTES MECHANIZED CLEARING

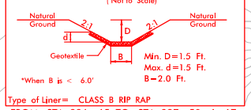
DETAIL 1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D=1.0 Ft.

FROM STA. 328+00 TO STA. 328+50 -L- RT
FROM STA. 334+50 TO STA. 335+00 -L- LT

DETAIL 40
STANDARD BASE DITCH
(Not to Scale)



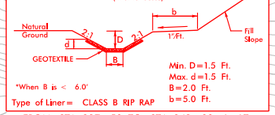
Min. D=1.5 Ft.
Max. d=1.5 Ft.
B=2.0 Ft.

*When B is < 6.0'

Type of Liner= CLASS B RIP RAP

FROM STA. 336+65 TO STA. 337+50 -L- LT

DETAIL 37
LATERAL BASE DITCH
(Not to Scale)



Min. D=1.5 Ft.
Max. d=1.5 Ft.
B=2.0 Ft.
b=5.0 Ft.

*When B is < 6.0'

Type of Liner= CLASS B RIP RAP

FROM STA. 337+50 TO STA. 342+00 -L- LT

50' 0' 100'
GRAPHIC SCALE

16.7' 0' 33.3'
INSET GRAPHIC SCALE

NAD 83/NA 2011

PROJECT REFERENCE NO.	SHEET NO.
R-2527	29
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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firm License No. C-1851
223 S. West St.
Suite 1100
Raleigh, NC 27603
T: 919.380.8750
www.stewartinc.com

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VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
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330

335

340

39
UNITED STATES FOREST SERVICE

STANDARD BASE DITCH
W/CLASS B RIP RAP
SLOPE= 5.6%
EST 55 TONS
EST 140 SY GEOTEXTILE
EST DDE = 25 CY
SEE DETAIL 40

LATERAL BASE DITCH
W/CLASS B RIP RAP
SEE DETAIL 37
EST 252 TONS
EST 683 SY GEOTEXTILE

PDE

ACCESS BREAK

SPECIAL LATERAL V DITCH
SEE DETAIL 1

MATCH TO SHEET 28
-L- STA. 327+00.00

MATCH TO SHEET 30
-L- STA. 341+00.00

4' FDPS
2' FDPS
24"
46"

15" RCP-III
18" RCP-III
2GI
FS
REMOVE
GRADE TO DRAIN REMOVE
16'
WOODS

N 69° 43' 18.2" E -L-

NC HWY 24/27 24' BS

8d

GREU TL-3

10' FDPS

15" W/ELBOWS

BEGIN SBG +25 RT

CLASS B RIP RAP
EST 3 TONS
EST 10 SY GEOTEXTILE

CLASS B RIP RAP
EST 2 TONS
EST 7 SY GEOTEXTILE

SITE 49

MC

E*JS*

WLB

605

609

SITE 49

39
UNITED STATES FOREST SERVICE

WETLAND
WFF

STREAM
SX

SITE 49

WETLAND
WFF

ENVIRONMENTAL SENSITIVITY AREA

ENVIRONMENTALLY SENSITIVE AREA

FOR -L- PROFILE, SEE SHEET 53

ALL DRIVEWAY RADII 30' UNLESS OTHERWISE NOTED.

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8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2527	X-203

PERMIT DRAWING
SHEET 60 OF 91

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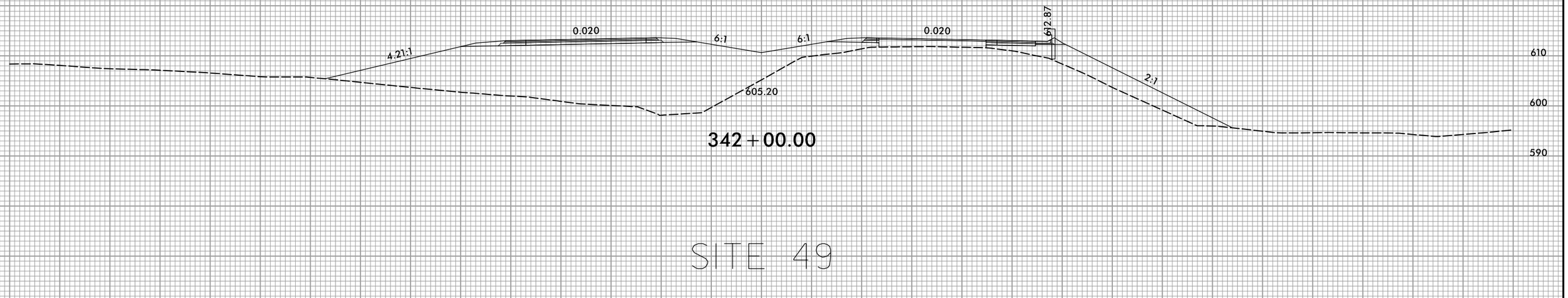
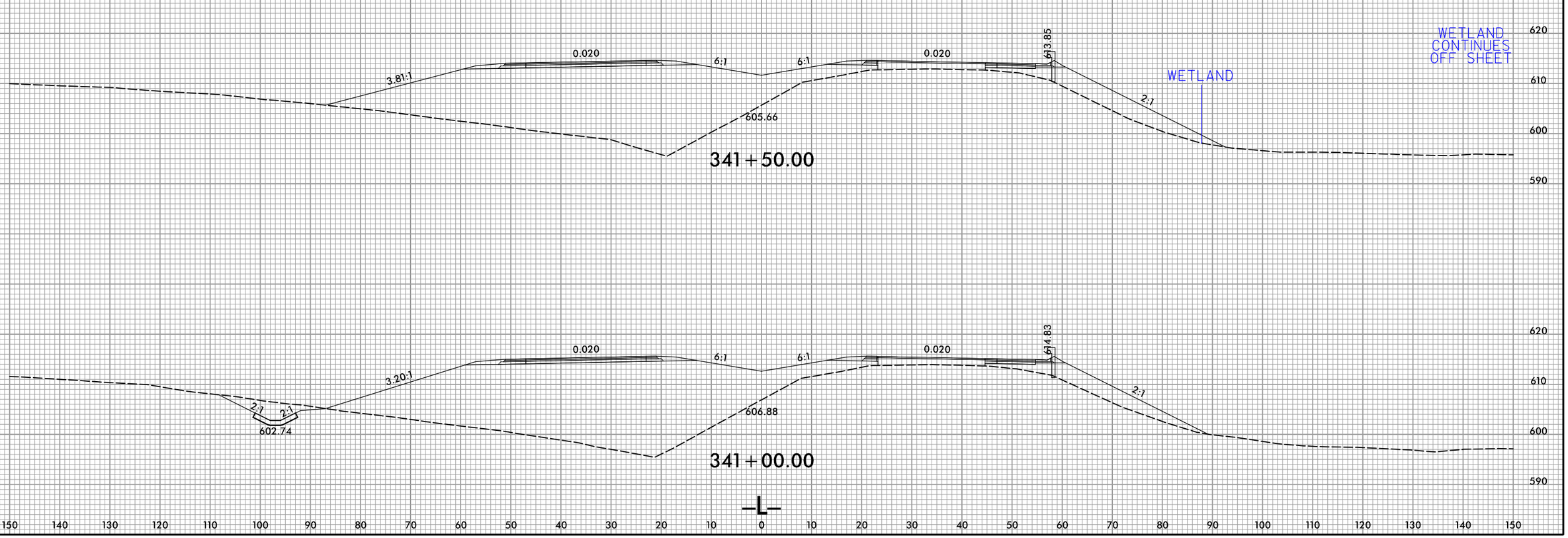


342+00.00

SITE 49



341+50.00

341+00.00

–L–

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gaverette

5/14/99

PERMIT DRAWING SHEET 61 OF 91

50′ 0′ 100′

GRAPHIC SCALE

E E DENOTES EXCAVATION IN WETLAND

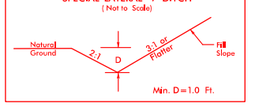
F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

S S DENOTES IMPACTS IN SURFACE WATER

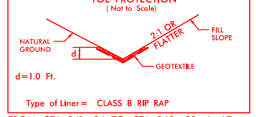
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DETAIL 1
SPECIAL LATERAL "V" DITCH
(Not to Scale)



FROM STA. 353+28 TO STA. 354+00 -L- LT

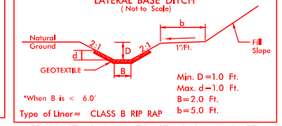
DETAIL 7
TOE PROTECTION
(Not to Scale)



Type of Liner= CLASS B RIP RAP

FROM STA. 341+04 TO STA. 343+53 -L- LT
FROM STA. 347+00 TO STA. 348+38 -L- LT
FROM STA. 351+50 TO STA. 353+00 -L- RT

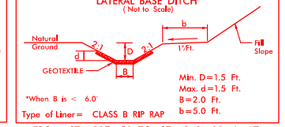
DETAIL 9
LATERAL BASE DITCH
(Not to Scale)



Type of Liner= CLASS B RIP RAP

FROM STA. 346+00 TO STA. 348+40 -L- RT

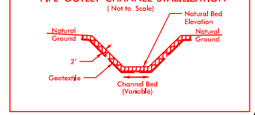
DETAIL 37
LATERAL BASE DITCH
(Not to Scale)



Type of Liner= CLASS B RIP RAP

FROM STA. 337+50 TO STA. 342+00 -L- LT

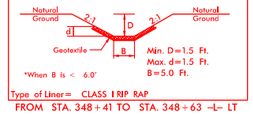
DETAIL 62
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



STA. 342+69 -L- RT

NAD 83/NA 2011

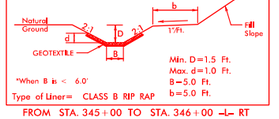
DETAIL 38
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= CLASS I RIP RAP

FROM STA. 348+41 TO STA. 348+63 -L- LT

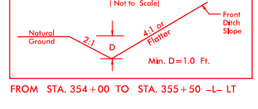
DETAIL 39
LATERAL BASE DITCH
(Not to Scale)



Type of Liner= CLASS B RIP RAP

FROM STA. 345+00 TO STA. 346+00 -L- RT

DETAIL 53
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 354+00 TO STA. 355+50 -L- LT

PROJECT REFERENCE NO.	SHEET NO.
R-2527	30
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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VHB — VHB Engineering NC, P.C. (C-3705), 940 Main Campus Drive, Suite 500, Raleigh, NC 27606

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WETLAND WGG

WETLAND WGG SITE 51

345

STREAM SX

350

STREAM SX

SITE 50

WETLAND WPP

LATERAL BASE DITCH W/CLASS B RIP RAP SEE DETAIL 37 EST 252 TONS EST 683 SY GEOTEXTILE

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 69 TONS EST 214 SY GEOTEXTILE

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 38 TONS EST 119 SY GEOTEXTILE

STANDARD BASE DITCH W/CLASS I RIP RAP SLOPE= 0.9% EST 40 TONS EST 70 SY GEOTEXTILE EST DDE = 15 CY SEE DETAIL 38

39 UNITED STATES FOREST SERVICE

FILL IN CHANNEL CLASS I RIP RAP EST 25 TONS EST 40 SY GEOTEXTILE

CLASS I RIP RAP EST 11 TONS EST 22 SY GEOTEXTILE

CLASS B RIP RAP EST 3 TONS EST 10 SY GEOTEXTILE

SPECIAL CUT DITCH SEE DETAIL 53

SPECIAL LATERAL V DITCH SEE DETAIL 1

CLASS B RIP RAP EST 3 TONS EST 10 SY GEOTEXTILE

BEGIN SBG +56 LT

GRADE TO MAIN

END SBG +29 LT

CAT-1

GREU TL-3

18" W/ELBOWS

15" RCP-IV

20" RCP-IV

30" RCP-III

36" RCP-III

COLLAR

BURIED 1.0'

N 69° 43' 18.2" E

-L-

FLOWABLE FILL

TRENCHLESS INSTALLATION 10' WELDED STEEL

REMOVE

JB w/MH

NOT BURIED

15" W/ELBOWS

FILL IN CHANNEL CLASS I RIP RAP EST 8 TONS EST 11 SY GEOTEXTILE

END SBG +52 RT

ACCESS BREAK

PIPE OUTLET CHANNEL STABILIZATION W/ CLASS I RIP RAP EST 13 TONS EST 20 SY GEOTEXTILE L= 12 FT SEE DETAIL 62

CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE

LATERAL BASE DITCH W/CLASS B RIP RAP SEE DETAIL 39 EST 60 TONS EST 161 SY GEOTEXTILE

LATERAL BASE DITCH W/CLASS B RIP RAP SEE DETAIL 9 EST 108 TONS EST 305 SY GEOTEXTILE

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 42 TONS EST 129 SY GEOTEXTILE

STREAM SX

WETLAND WFF

39 UNITED STATES FOREST SERVICE

WETLAND WPP

SITE 49

SITE 50

SITE 52

MATCH TO SHEET 29 -L- STA 341+00.00

MATCH TO SHEET 31 -L- STA 355+00.00

FOR -L- PROFILE, SEE SHEETS 53 & 54

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Date: 5/14/2021 11:40:41 AM

PERMIT DRAWING
SHEET 62 OF 91

PROJECT REFERENCE NO.	SHEET NO.
R-2527	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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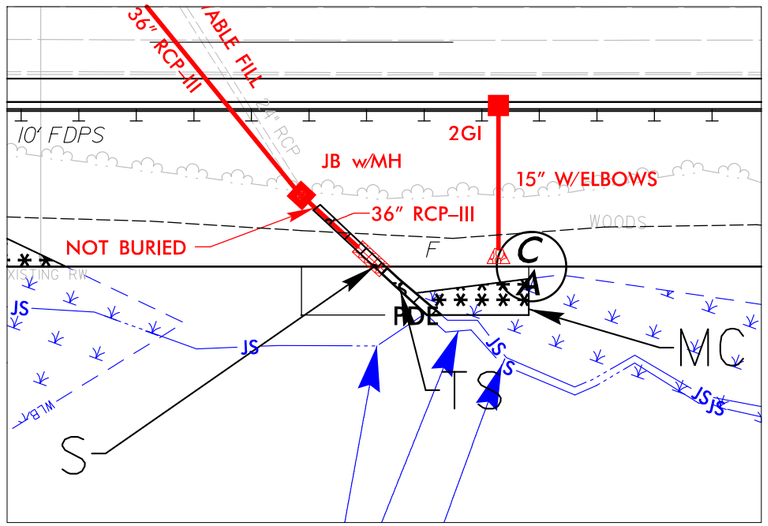
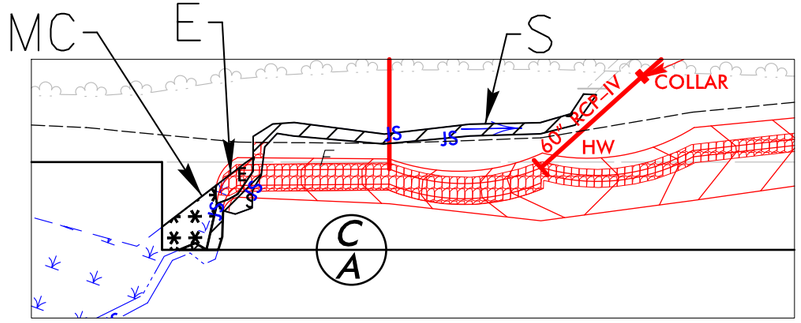
vhb — VHB Engineering NC, P.C. (C-3705), 940 Main Campus Drive, Suite 500, Raleigh, NC 27606

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

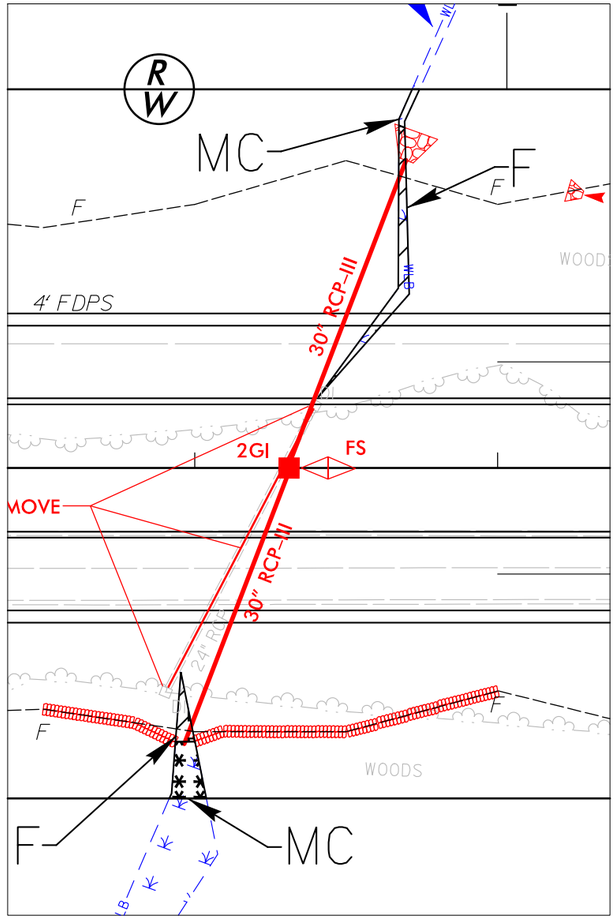
25′ 0′ 50′
INSET GRAPHIC SCALE



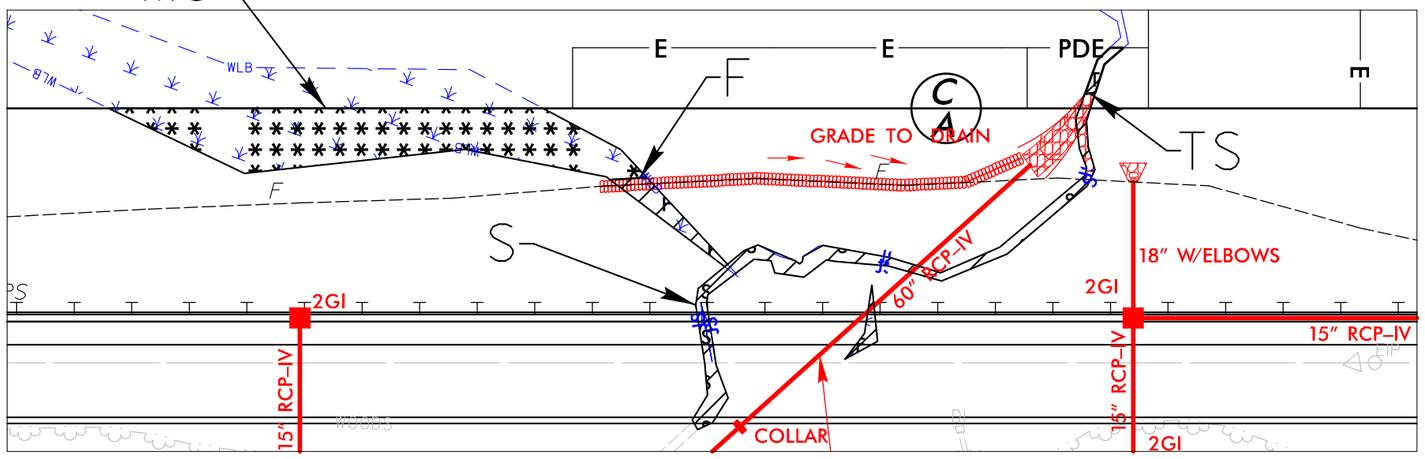
SITES 49 & 50



SITES 49 & 50



SITE 52



SITES 50 & 51

5/14/99

PERMIT DRAWING SHEET 63 OF 91

50′ 0′ 100′

GRAPHIC SCALE

E E DENOTES EXCAVATION IN WETLAND

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-2527	30
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

STEWART — firm License No. C-1851, 223 S. West St., Suite 1100, Raleigh, NC 27603, T: 919.380.8750, www.stewartinc.com

vhb — VHB Engineering NC, P.C. (C-3705), 940 Main Campus Drive, Suite 500, Raleigh, NC 27606

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NAD 83/NA 2011

DETAIL 1
SPECIAL LATERAL "V" DITCH (Not to Scale)

Natural Ground, 2:1, D, 3:1 or Flatter, Fill Slope, Min. D=1.0 Ft.

FROM STA. 353+28 TO STA. 354+00 –L– LT

DETAIL 7
TOE PROTECTION (Not to Scale)

NATURAL GROUND, d, 2:1 OR FLATTER, FILL SLOPE, GEOTEXTILE, d=1.0 Ft.

Type of Liner = CLASS B RIP RAP

FROM STA. 341+04 TO STA. 343+53 –L– LT
FROM STA. 347+00 TO STA. 348+38 –L– LT
FROM STA. 351+50 TO STA. 353+00 –L– RT

DETAIL 9
LATERAL BASE DITCH (Not to Scale)

Natural Ground, 2:1, d, D, B, b, 1':Ft., Fill Slope, GEOTEXTILE, Min. D=1.0 Ft., Max. d=1.0 Ft., B=2.0 Ft., b=5.0 Ft.

*When B is < 6.0'

Type of Liner = CLASS B RIP RAP

FROM STA. 346+00 TO STA. 348+40 –L– RT

DETAIL 37
LATERAL BASE DITCH (Not to Scale)

Natural Ground, 2:1, d, D, B, b, 1':Ft., Fill Slope, GEOTEXTILE, Min. D=1.5 Ft., Max. d=1.5 Ft., B=2.0 Ft., b=5.0 Ft.

*When B is < 6.0'

Type of Liner = CLASS B RIP RAP

FROM STA. 337+50 TO STA. 342+00 –L– LT

DETAIL 62
PIPE OUTLET CHANNEL STABILIZATION (Not to Scale)

Natural Ground, Natural Bed Elevation, 2', Geotextile, Channel Bed (Varies)

STA. 342+69 –L– RT

DETAIL 38
STANDARD DITCH (Not to Scale)

Natural Ground, 2:1, d, D, B, Geotextile, Min. D=1.5 Ft., Max. d=1.5 Ft., B=5.0 Ft.

*When B is < 6.0'

Type of Liner = CLASS I RIP RAP

FROM STA. 348+41 TO STA. 348+63 –L– LT

DETAIL 39
LATERAL BASE DITCH (Not to Scale)

Natural Ground, 2:1, d, D, B, b, 1':Ft., Fill Slope, GEOTEXTILE, Min. D=1.5 Ft., Max. d=1.0 Ft., B=5.0 Ft., b=5.0 Ft.

*When B is < 6.0'

Type of Liner = CLASS B RIP RAP

FROM STA. 345+00 TO STA. 346+00 –L– RT

DETAIL 53
SPECIAL CUT DITCH (Not to Scale)

Natural Ground, 2:1, D, 4:1 or Flatter, Front Ditch Slope, Min. D=1.0 Ft.

FROM STA. 354+00 TO STA. 355+50 –L– LT

WETLAND WGG

WETLAND WGG SITE 51

345

STANDARD BASE DITCH W/CLASS I RIP RAP SLOPE= 0.9% EST 40 TONS EST 70 SY GEOTEXTILE EST DDE = 15 CY SEE DETAIL 38

FILL IN CHANNEL CLASS I RIP RAP EST 25 TONS EST 40 SY GEOTEXTILE

39 UNITED STATES FOREST SERVICE

STREAM SX

SITE 50

350

WETLAND WPP

LATERAL BASE DITCH W/CLASS B RIP RAP SEE DETAIL 37 EST 252 TONS EST 683 SY GEOTEXTILE

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 69 TONS EST 214 SY GEOTEXTILE

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 38 TONS EST 119 SY GEOTEXTILE

CLASS B RIP RAP EST 3 TONS EST 10 SY GEOTEXTILE

CLASS I RIP RAP EST 11 TONS EST 22 SY GEOTEXTILE

CLASS B RIP RAP EST 3 TONS EST 10 SY GEOTEXTILE

SPECIAL CUT DITCH SEE DETAIL 53

SPECIAL LATERAL V DITCH SEE DETAIL 1

BEGIN SBG +56 LT

END SBG +29 LT

GRADE TO MAIN

MATCH TO SHEET 29 –L– STA 341+00.00

MATCH TO SHEET 31 –L– STA 355+00.00

36" RCP-III, 15" RCP-IV, 18" RCP-IV, 30" RCP-III, 18" W/ELBOWS, 15" W/ELBOWS, 10' FDPS, 4' FDPS, 2' FDPS, CAT-1, GREU TL-3, 2GI, FS, HW, COLLAR, BURIED 1.0', FLOWABLE FILL, N 69° 43' 18.2" E –L–, NC HWY 24/27 24' BST, REMOVE, ACCESS BREAK, WOODS

JB w/MH, NOT BURIED

FILL IN CHANNEL CLASS I RIP RAP EST 8 TONS EST 11 SY GEOTEXTILE

CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE

PIPE OUTLET CHANNEL STABILIZATION W/ CLASS I RIP RAP EST 13 TONS EST 20 SY GEOTEXTILE L= 12 FT SEE DETAIL 62

LATERAL BASE DITCH W/CLASS B RIP RAP SEE DETAIL 39 EST 60 TONS EST 161 SY GEOTEXTILE

LATERAL BASE DITCH W/CLASS B RIP RAP SEE DETAIL 9 EST 108 TONS EST 305 SY GEOTEXTILE

END SBG +52 RT

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 42 TONS EST 129 SY GEOTEXTILE

STREAM SX

STREAM SX

39 UNITED STATES FOREST SERVICE

WETLAND WFF

WETLAND WPP

SITE 49

SITE 50

SITE 52

FOR –L– PROFILE, SEE SHEETS 53 & 54

PERMIT DRAWING
SHEET 64 OF 91

PROJECT REFERENCE NO.	SHEET NO.
R-2527	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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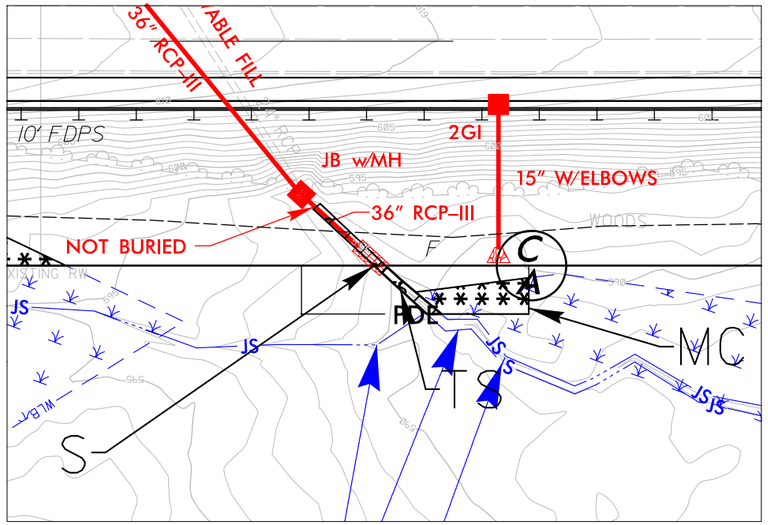
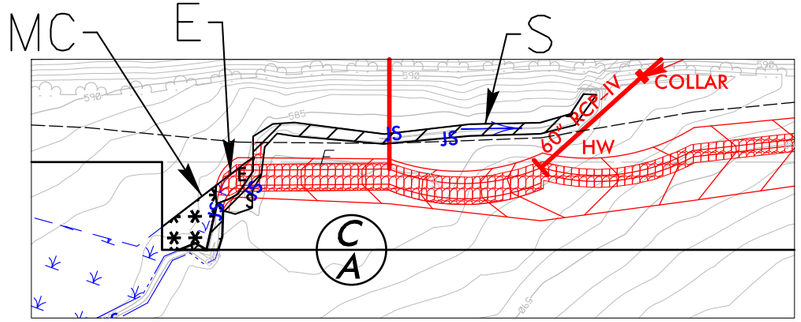
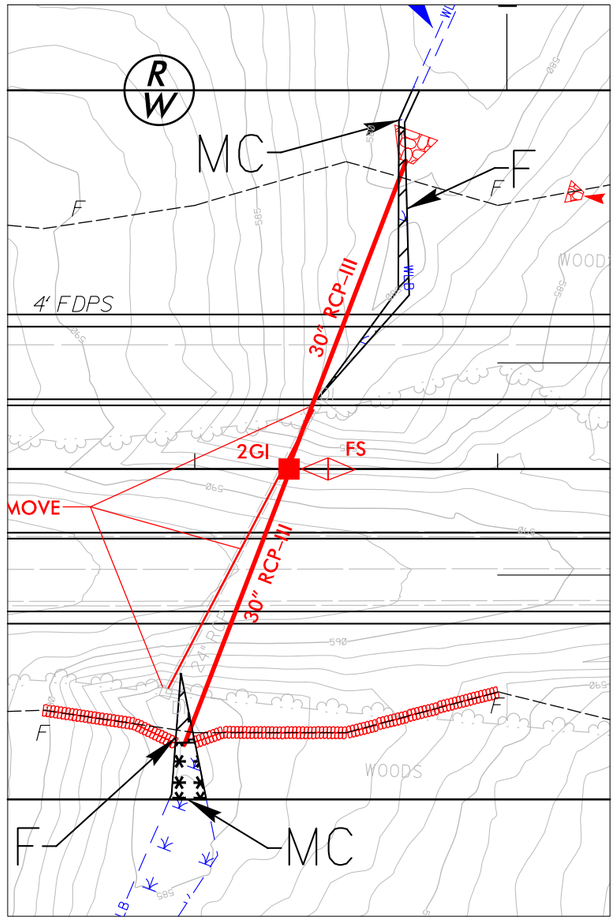
25′ 0′ 50′
INSET GRAPHIC SCALE



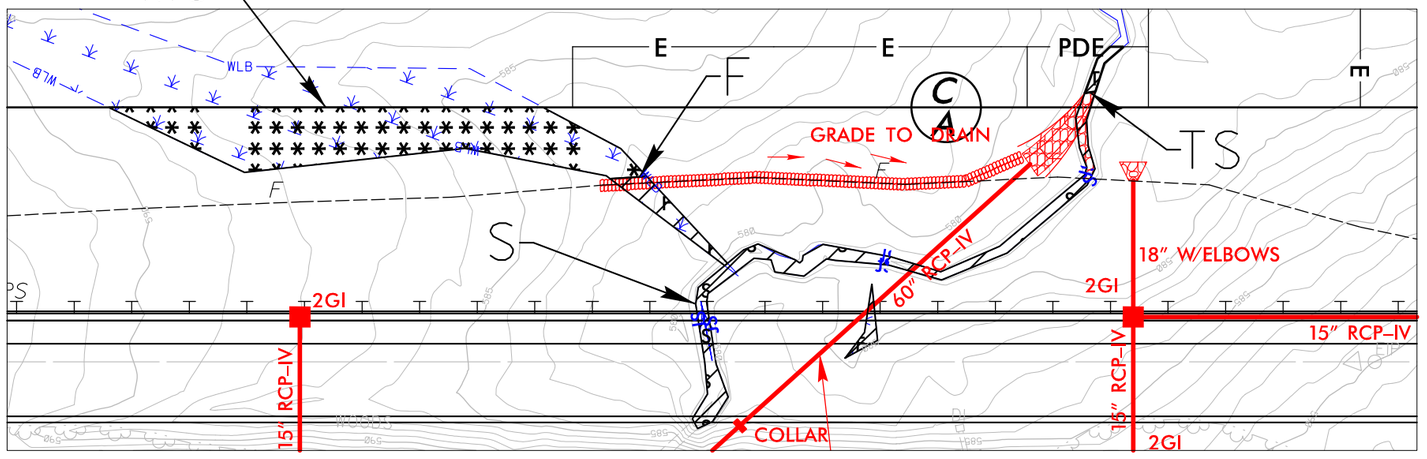
SITES 49 & 50



SITES 49 & 50



SITE 52



SITES 50 & 51

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2527	X-204

PERMIT DRAWING
SHEET 65 OF 91

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

610
600
590
580

0.020 6:1 6:1 0.020

3.33:1

609.93

601.88

2:1

343+50.00

SITE 49

3.63:1

610.91

602.85

WETLAND

343+00.00

3.89:1

611.89

604.48

342+50.00

–L–

8/23/99

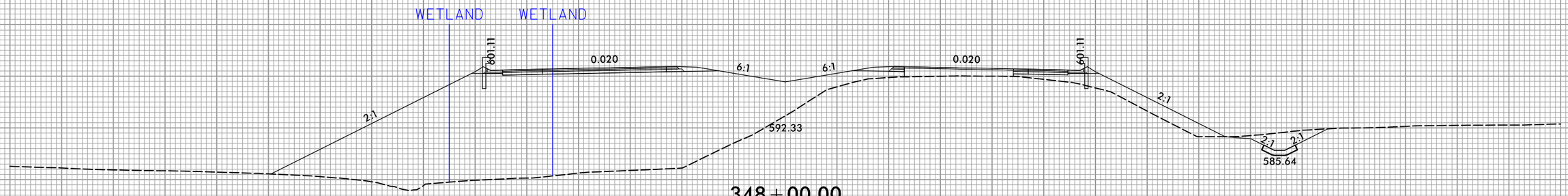
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2527	X-207

PERMIT DRAWING
SHEET 66 OF 91

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

SITE 51

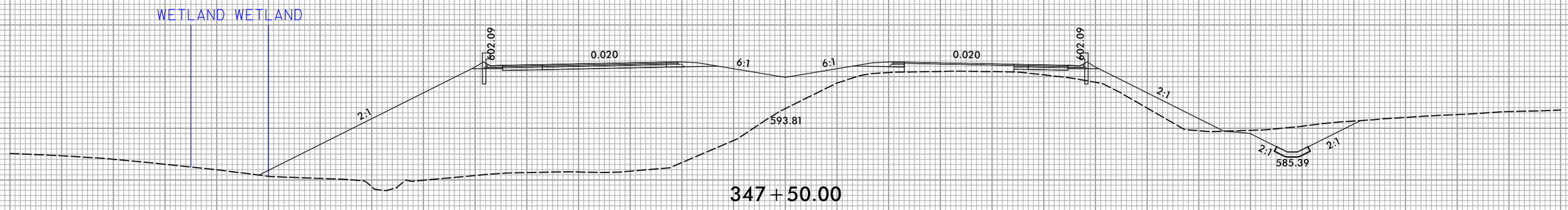
WETLAND WETLAND



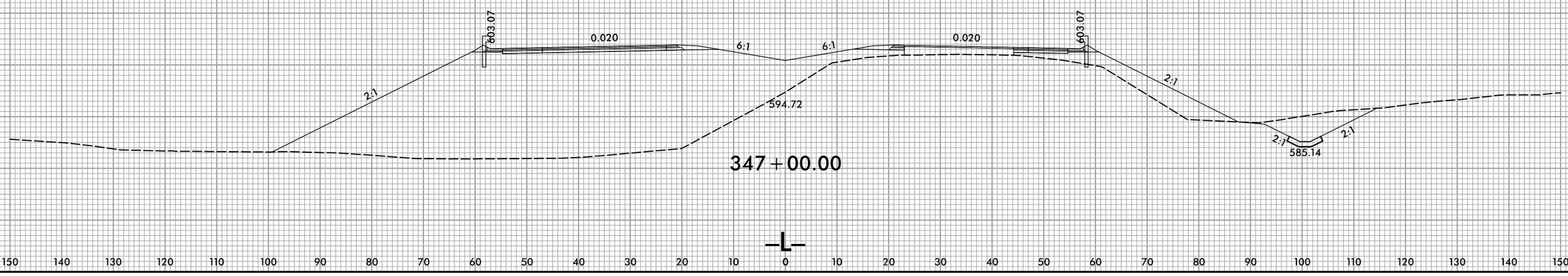
348+00.00

SITE 51

WETLAND WETLAND



347+50.00



347+00.00

–L–

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

lh4o7 AM
R:\Hydraulics\PERMITS_Environmental\Drawings\R2527_Hyd_PRM_XPL.dgn
gaverette

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2527	X-209

PERMIT DRAWING
SHEET 67 OF 91

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

WETLAND WETLAND

SITE 52

0.020 6:1 6:1 0.020

4:1 5.17:1

587.40

352+50.00

590 580

SITE 52

WETLAND WETLAND

0.020 6:1 6:1 0.020

5.49:1 3.29:1

589.31

352+00.00

590 580

0.020 6:1 6:1 0.020

6:1 6:1

590.44

351+50.00

590 580

0.020 6:1 6:1 0.020

6:1 6:1 6:1 6:1

591.59

351+00.00

590 580

600 590 580

0.020 6:1 6:1 0.020

4.88:1 6:1 5.39:1

592.54

350+50.00

–L–

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

5/14/99

PERMIT DRAWING SHEET 68 OF 91

50′ 0′ 100′

GRAPHIC SCALE

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-2527	31
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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DETAIL 3
BERM 'V' DITCH (Not to Scale)

Min. D=1.0 Ft.
b=5.0 Ft.
Type of Liner= CLASS B RIP RAP

FROM STA. 356+00 TO STA. 359+25 –L– RT

DETAIL 4
SPECIAL LATERAL BASE DITCH (Not to Scale)

Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.

Type of Liner= CLASS B RIP RAP

FROM STA. 361+50 TO STA. 362+50 –L– RT

DETAIL 7
TOE PROTECTION (Not to Scale)

d=1.0 Ft.

Type of Liner= CLASS B RIP RAP

FROM STA. 363+50 TO STA. 364+66 –L– LT
FROM STA. 365+00 TO STA. 367+00 –L– LT

DETAIL 9
LATERAL BASE DITCH (Not to Scale)

*When B is < 6.0'

Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.

Type of Liner= CLASS B RIP RAP

FROM STA. 362+50 TO STA. 363+50 –L– RT

DETAIL 41
LATERAL BASE DITCH (Not to Scale)

*When B is < 6.0'

Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=5.0 Ft.
b=5.0 Ft.

Type of Liner= CLASS I RIP RAP

FROM STA. 363+50 TO STA. 366+73 –L– RT

STREAM SY–A

360

365

39 UNITED STATES FOREST SERVICE

SITE 53

CLASS B RIP RAP
EST 3 TONS
EST 10 SY GEOTEXTILE

SPECIAL CUT DITCH
SEE DETAIL 53

18" RCP–III

INC.=40' (TYP.)

15" RCP–III

N 69°43'18.2" E
–L–

REMOVE

BEGIN SBG
+75 RT

FS GREU TL–3

15" W/ELBOWS

BDO

MATCH TO SHEET 30
–L– STA. 355+00.00

MATCH TO SHEET 32
–L– STA. 368+00.00

NC HWY 24/27 24' BST

4' FDPS
2' FDPS
10' FDPS

CAT–1

EXISTING RW

FLOWABLE FILL

WOODS

GREU TL–3

TS
S
PDE

FILL IN EXISTING CHANNEL
W/CLASS II RIP RAP
EST 80 TONS
EST 95 SY GEOTEXTILE
SEE DETAIL 64

CLASS II RIP RAP
EST 250 TONS
EST 400 SY GEOTEXTILE
SEE DETAIL 42

TOE PROTECTION
W/CLASS B RIP RAP
SEE DETAIL 7
EST 32 TONS
EST 100 SY GEOTEXTILE

TOE PROTECTION
W/CLASS B RIP RAP
SEE DETAIL 7
EST 55 TONS
EST 170 SY GEOTEXTILE

REMOVE EXISTING STRUCTURE

1@8'x10' RCBC W/SILLS

BURIED 1.0

15" RCP–IV

FILL IN EXISTING CHANNEL
W/CLASS I RIP RAP
EST 75 TONS
EST 90 SY GEOTEXTILE
SEE DETAIL 64

BERM V DITCH
W/CLASS B RIP RAP
SEE DETAIL 3
EST 113 TONS
EST 341 SY GEOTEXTILE

SPECIAL LATERAL BASE DITCH
W/CLASS B RIP RAP
SEE DETAIL 4
EST 59 TONS
EST 168 SY GEOTEXTILE

LATERAL BASE DITCH
W/CLASS B RIP RAP
SEE DETAIL 9
EST 45 TONS
EST 127 SY GEOTEXTILE

LATERAL BASE DITCH
W/CLASS I RIP RAP
SEE DETAIL 41
EST 193 TONS
EST 518 SY GEOTEXTILE

CLASS I RIP RAP
EMBEDDED INTO STREAM BED
EST 28 TONS
EST 40 SY GEOTEXTILE

CLASS II RIP RAP
EST 300 TONS
EST 420 SY GEOTEXTILE
SEE DETAIL 43

39 UNITED STATES FOREST SERVICE

NOTE: SEE TMP SHEET No. XXX FOR CULVERT STAGING

INLET DETAIL 42
NTS

1@8'x10' RCBC
EXCAVATION=21CY
NG
2H
2H
CLASS II RIP RAP W/GEOTEXTILE THICKNESS = 2'
BASE WIDTH VARIES 5' TO 7'

OUTLET DETAIL 43
NTS

1@8'x10' RCBC
2H
2H
CLASS II RIP RAP W/GEOTEXTILE THICKNESS = 2'
NG
EXCAVATION=230 CY
BASE WIDTH VARIES 7' TO 9'

FOR –L– PROFILE, SEE SHEET 54

5/14/99

PERMIT DRAWING SHEET 69 OF 91

50' 0' 100'

GRAPHIC SCALE

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-2527	31
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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vhb — VHB Engineering NC, P.C. (C-3705), 940 Main Campus Drive, Suite 500, Raleigh, NC 27606

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DETAIL 3
BERM 'V' DITCH
(Not to Scale)

Natural Ground, 2:1, D, 2:1, b, RDWY, Geotextile

Min. D=1.0 Ft.
b=5.0 Ft.
Type of Liner= CLASS B RIP RAP

FROM STA. 356+00 TO STA. 359+25 -L- RT

DETAIL 4
SPECIAL LATERAL BASE DITCH
(Not to Scale)

Natural Ground, 2:1, d, D, 4:1 or Flatter, Fill Slope, Geotextile, B

Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.
Type of Liner= CLASS B RIP RAP

FROM STA. 361+50 TO STA. 362+50 -L- RT

DETAIL 7
TOE PROTECTION
(Not to Scale)

NATURAL GROUND, d, 2:1 OR FLATTER, FILL SLOPE, GEOTEXTILE

d=1.0 Ft.
Type of Liner= CLASS B RIP RAP

FROM STA. 363+50 TO STA. 364+66 -L- LT
FROM STA. 365+00 TO STA. 367+00 -L- LT

DETAIL 9
LATERAL BASE DITCH
(Not to Scale)

Natural Ground, 2:1, d, D, 2:1, b, 1':Ft., Fill Slope, GEOTEXTILE, B

*When B is < 6.0'
Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.
Type of Liner= CLASS B RIP RAP

FROM STA. 362+50 TO STA. 363+50 -L- RT

DETAIL 41
LATERAL BASE DITCH
(Not to Scale)

Natural Ground, 2:1, d, D, 2:1, b, 1':Ft., Fill Slope, GEOTEXTILE, B

*When B is < 6.0'
Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=5.0 Ft.
b=5.0 Ft.
Type of Liner= CLASS I RIP RAP

FROM STA. 363+50 TO STA. 366+73 -L- RT

STREAM SY-A

360

365

TS

S

SITE 53

UNITED STATES FOREST SERVICE

39

CLASS B RIP RAP
EST 5 TONS
EST 10 SY GEOTEXTILE

SPECIAL CUT DITCH
SEE DETAIL 53

FS

4' FDPS

2' FDPS

2GI

15" RCP-III

18" RCP-III

N 69°43'18.2" E

-L-

REMOVE

15" W/ELBOWS

BDO

INC.=40' (TYP.)

WOODS

CAT-1

8H

NC HWY 24/27 24' BST

BEGIN SBG +75 RT

FS GREU TL-3

FILL IN EXISTING CHANNEL W/CLASS II RIP RAP
EST 80 TONS
EST 95 SY GEOTEXTILE
SEE DETAIL 64

CLASS II RIP RAP
EST 250 TONS
EST 400 SY GEOTEXTILE
SEE DETAIL 42

TOE PROTECTION W/CLASS B RIP RAP
SEE DETAIL 7
EST 32 TONS
EST 100 SY GEOTEXTILE

PDE

10' FDPS

1@8'x10' RCBC W/SILLS

BURIED 1.0

TOE PROTECTION W/CLASS B RIP RAP
SEE DETAIL 7
EST 55 TONS
EST 170 SY GEOTEXTILE

REMOVE EXISTING STRUCTURE

GREU TL-3

EXISTING RW

FLOWABLE FILL

CONC. RW

FILL IN EXISTING CHANNEL W/CLASS I RIP RAP
EST 75 TONS
EST 90 SY GEOTEXTILE
SEE DETAIL 64

CLASS I RIP RAP EMBEDDED INTO STREAM BED
EST 28 TONS
EST 40 SY GEOTEXTILE

CLASS II RIP RAP
EST 300 TONS
EST 420 SY GEOTEXTILE
SEE DETAIL 43

BERM V DITCH W/CLASS B RIP RAP
SEE DETAIL 3
EST 113 TONS
EST 241 SY GEOTEXTILE

SPECIAL LATERAL BASE DITCH W/CLASS B RIP RAP
SEE DETAIL 4
EST 59 TONS
EST 168 SY GEOTEXTILE

LATERAL BASE DITCH W/CLASS B RIP RAP
SEE DETAIL 9
EST 45 TONS
EST 127 SY GEOTEXTILE

LATERAL BASE DITCH W/CLASS I RIP RAP
SEE DETAIL 41
EST 193 TONS
EST 518 SY GEOTEXTILE

NOTE: SEE TMP SHEET No. XXX FOR CULVERT STAGING

STREAM SY-A

MATCH TO SHEET 30 -L- STA. 355+00.00

MATCH TO SHEET 32 -L- STA. 368+00.00

INLET DETAIL 42
NTS

I@8'x10' RCBC
EXCAVATION=21CY
NG
2:1
CLASS II RIP RAP W/GEOTEXTILE THICKNESS = 2'
BASE WIDTH VARIES 5' TO 7'

OUTLET DETAIL 43
NTS

I@8'x10' RCBC
2:1
CLASS II RIP RAP W/GEOTEXTILE THICKNESS = 2'
NG
EXCAVATION=230 CY
BASE WIDTH VARIES 7' TO 9'

FOR -L- PROFILE, SEE SHEET 54

PERMIT DRAWING
SHEET 70 OF 91

PROJECT REFERENCE NO.	SHEET NO.
R-2527	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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Suite 1150
Raleigh, NC 27603
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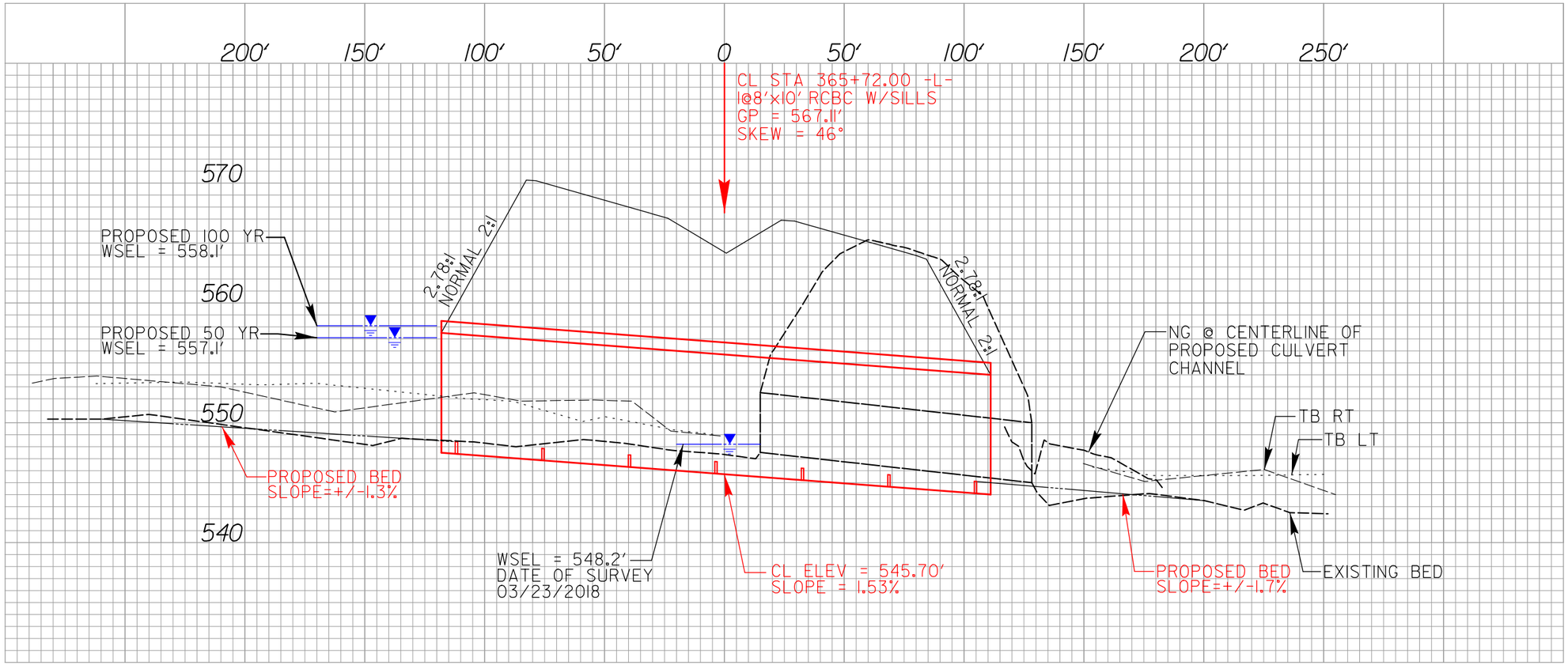
SITE 53



REVISIONS
8/17/99

I:\Hydraulics\PERMITS_Environmental\Drawings\R2527_Hyd_PRM_PSH31_PFL.dgn
9:04 AM

5/14/99

PERMIT DRAWING SHEET 71 OF 91

50′ 0′ 100′

GRAPHIC SCALE

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-2527	33
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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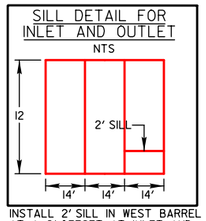
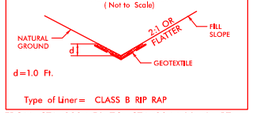
SILL DETAIL FOR INLET AND OUTLET

NTS



INSTALL 2′ SILL IN WEST BARREL AT A 2′ OFFSET AT INLET AND OUTLET. BACKFILL WITH 15′ OF CLASS I RIP RAP TOPPED WITH 0.5′ OF NATIVE MATERIAL TO SILL HEIGHT. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING THE CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

DETAIL 7
TOE PROTECTION
(Not to Scale)

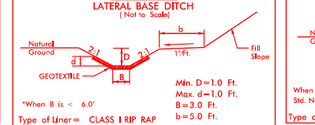


d=1.0 Ft.

Type of Liner= CLASS B RIP RAP

FROM STA. 383+50 TO STA. 384+00 -L- RT
FROM STA. 384+45 TO STA. 386+00 -L- RT
FROM STA. 389+90 TO STA. 390+50 -L- RT
FROM STA. 390+00 TO STA. 391+71 -L- LT
FROM STA. 392+25 TO STA. 394+50 -L- LT

DETAIL 45
LATERAL BASE DITCH
(Not to Scale)



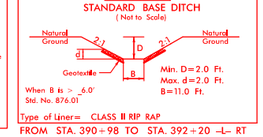
*When B is < 6.0′

Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=3.0 Ft.
b=5.0 Ft.

Type of Liner= CLASS I RIP RAP

FROM STA. 383+79 TO STA. 385+92 -L- RT

DETAIL 46
STANDARD BASE DITCH
(Not to Scale)



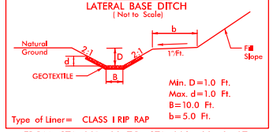
When B is > 6.0′
Std. No. 876.01

Min. D=2.0 Ft.
Max. d=2.0 Ft.
B=11.0 Ft.

Type of Liner= CLASS II RIP RAP

FROM STA. 390+98 TO STA. 392+20 -L- RT

DETAIL 56
LATERAL BASE DITCH
(Not to Scale)

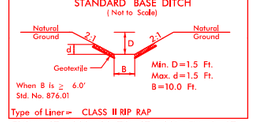


Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=10.0 Ft.
b=5.0 Ft.

Type of Liner= CLASS I RIP RAP

FROM STA. 391+00 TO STA. 392+00 -L- LT

DETAIL 73
STANDARD BASE DITCH
(Not to Scale)



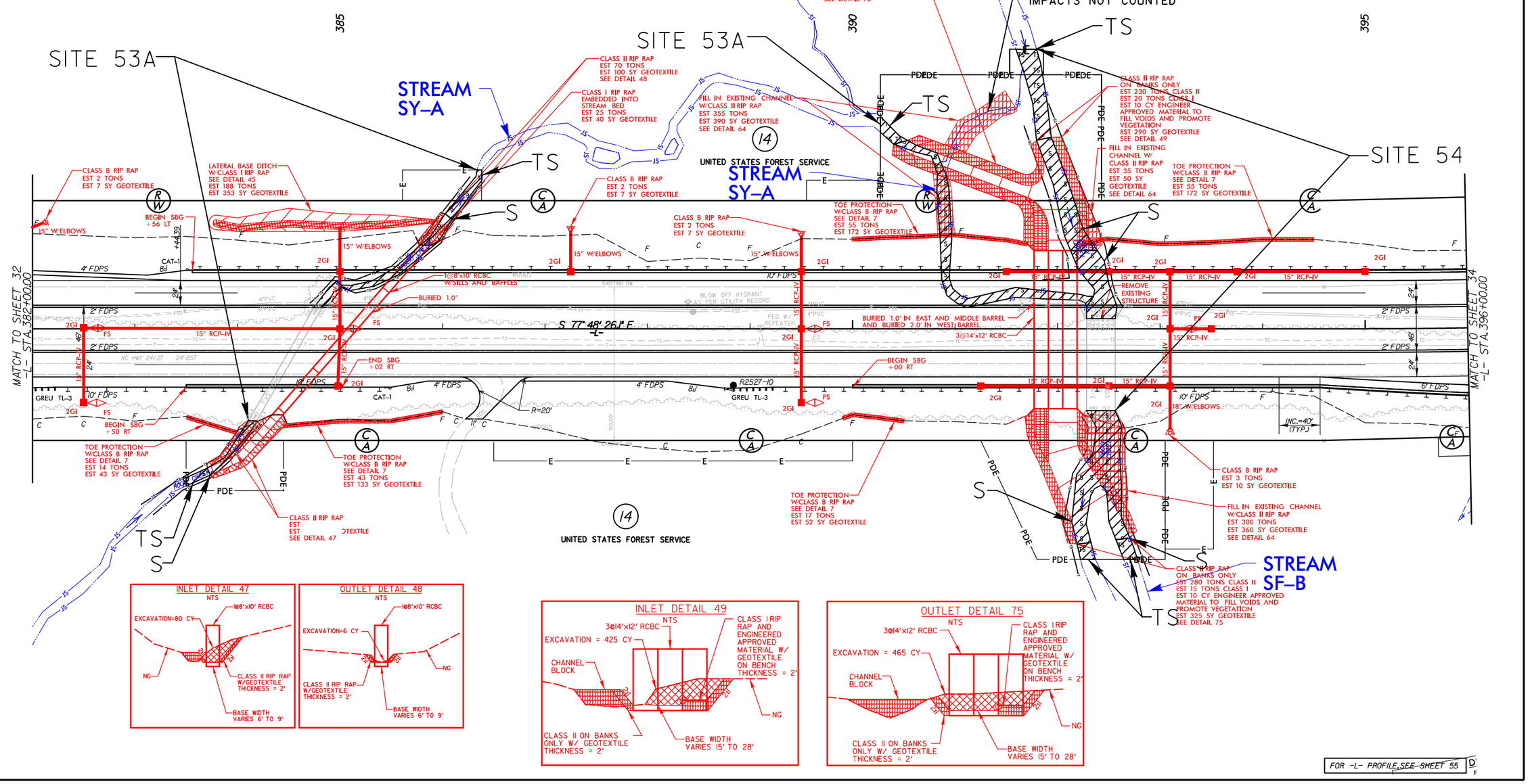
When B is ≥ 6.0′
Std. No. 876.01

Min. D=1.5 Ft.
Max. d=1.5 Ft.
B=10.0 Ft.

Type of Liner= CLASS II RIP RAP

FROM STA. 390+39 TO STA. 391+74 -L- LT

NAD 83/NA 2011



INLET DETAIL 47
NTS

OUTLET DETAIL 48
NTS

INLET DETAIL 49
NTS

OUTLET DETAIL 75
NTS

FOR -L- PROFILE SEE SHEET 55

D

4:50:45 PM
R:\Structures\PERMITS_Environmental\Drawings\R2527_Hyd_PRM_PSH33.dgn
Plotted

5/14/99

PERMIT DRAWING SHEET 72 OF 91

50′ 0′ 100′

GRAPHIC SCALE

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-2527	33
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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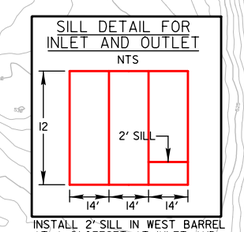
NAD 83/NA 2011

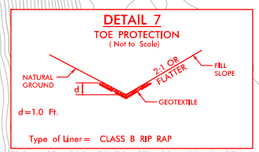
SILL DETAIL FOR INLET AND OUTLET

NTS



INSTALL 2′ SILL IN WEST BARREL AT A 2′ OFFSET AT INLET AND OUTLET. BACKFILL WITH 1.5′ OF CLASS I RIP RAP TOPPED WITH 0.5′ OF NATIVE MATERIAL TO SILL HEIGHT. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING THE CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

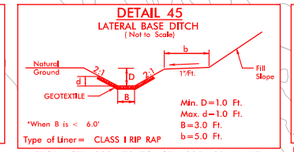
DETAIL 7
TOE PROTECTION
(Not to Scale)



Type of Liner= CLASS B RIP RAP

FROM STA. 383+50 TO STA. 384+00 -L- RT
FROM STA. 384+45 TO STA. 386+00 -L- RT
FROM STA. 389+90 TO STA. 390+50 -L- RT
FROM STA. 390+00 TO STA. 391+71 -L- LT
FROM STA. 392+25 TO STA. 394+50 -L- LT

DETAIL 45
LATERAL BASE DITCH
(Not to Scale)

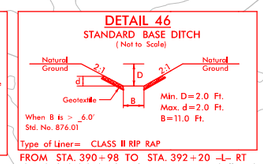


*When B is < 6.0′

Type of Liner= CLASS I RIP RAP

FROM STA. 383+79 TO STA. 385+92 -L- LT

DETAIL 46
STANDARD BASE DITCH
(Not to Scale)

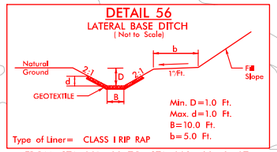


When B is ≥ 6.0′
Std. No. 876.01

Type of Liner= CLASS II RIP RAP

FROM STA. 390+98 TO STA. 392+20 -L- RT

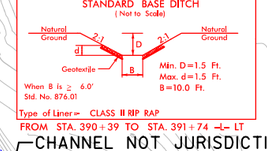
DETAIL 56
LATERAL BASE DITCH
(Not to Scale)



Type of Liner= CLASS I RIP RAP

FROM STA. 391+00 TO STA. 392+00 -L- LT

DETAIL 73
STANDARD BASE DITCH
(Not to Scale)



When B is ≥ 6.0′
Std. No. 876.01

Type of Liner= CLASS II RIP RAP

FROM STA. 390+39 TO STA. 391+74 -L- LT

CHANNEL NOT JURISDICTIONAL PER WET FILE
IMPACTS NOT COUNTED

STANDARD BASE DITCH W/CLASS II RIP RAP ON BANKS ONLY SLOPE=1.6% EST 320 TONS EST 430 SY GEOTEXTILE EST DDE=215 CY SEE DETAIL 73

SITE 53A

SITE 54

STREAM SY-A

STREAM SF-B

CLASS II RIP RAP EST 70 TONS EST 100 SY GEOTEXTILE SEE DETAIL 48

CLASS I RIP RAP EMBEDDED INTO STREAM BED EST 25 TONS EST 40 SY GEOTEXTILE

FILL IN EXISTING CHANNEL W/CLASS II RIP RAP SEE DETAIL 45 EST 188 TONS EST 353 SY GEOTEXTILE

FILL IN EXISTING CHANNEL W/CLASS II RIP RAP EST 355 TONS EST 390 SY GEOTEXTILE SEE DETAIL 64

CLASS II RIP RAP ON BANKS ONLY EST 230 TONS CLASS II EST 20 TONS CLASS I EST 10 CY ENGINEER APPROVED MATERIAL TO FILL VOIDS AND PROMOTE VEGETATION EST 290 SY GEOTEXTILE SEE DETAIL 49

FILL IN EXISTING CHANNEL W/ CLASS II RIP RAP EST 35 TONS EST 50 SY GEOTEXTILE SEE DETAIL 64

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 55 TONS EST 172 SY GEOTEXTILE

CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 14 TONS EST 43 SY GEOTEXTILE

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 42 TONS EST 133 SY GEOTEXTILE

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 17 TONS EST 52 SY GEOTEXTILE

CLASS II RIP RAP EST EST SEE DETAIL 47

CLASS B RIP RAP EST 3 TONS EST 10 SY GEOTEXTILE

FILL IN EXISTING CHANNEL W/CLASS II RIP RAP EST 300 TONS EST 360 SY GEOTEXTILE SEE DETAIL 64

CLASS II RIP RAP ON BANKS ONLY EST 280 TONS CLASS II EST 15 TONS CLASS I EST 10 CY ENGINEER APPROVED MATERIAL TO FILL VOIDS AND PROMOTE VEGETATION EST 325 SY GEOTEXTILE SEE DETAIL 75

LATERAL BASE DITCH W/CLASS I RIP RAP SEE DETAIL 45 EST 188 TONS EST 353 SY GEOTEXTILE

CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE

BEGIN SBG +56 LT

END SBG +02 RT

BEGIN SBG +50 RT

BEGIN SBG +00 RT

15" W/ELBOWS

10'-8"x10' RCBC W/SILLS AND BAFFLES

BURIED 1.0'

BURIED 1.0' IN EAST AND MIDDLE BARREL AND BURIED 2.0' IN WEST BARREL

3@14'x12' RCBC

REMOVE EXISTING STRUCTURE

15" RCP-IV

4' FDPS

2' FDPS

10' FDPS

6' FDPS

18" W/ELBOWS

S 77° 48' 26.1" E

R=20'

R2527-10

GREU TL-3

CAT-1 8d

2GI

FS

PDE

TS

S

E

MATCH TO SHEET 32 -L- STA. 382+00.00

MATCH TO SHEET 34 -L- STA. 396+00.00

385

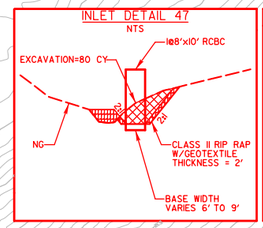
390

395

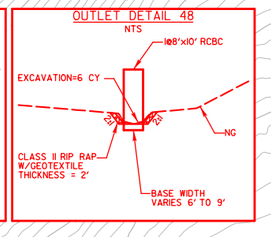
14

UNITED STATES FOREST SERVICE

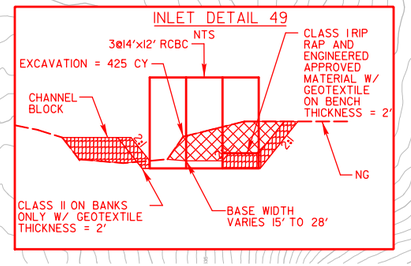
INLET DETAIL 47
NTS



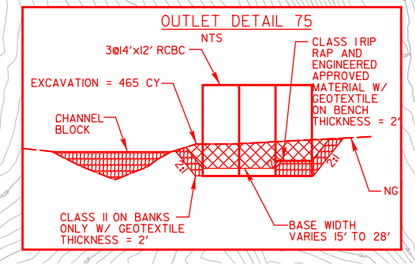
OUTLET DETAIL 48
NTS



INLET DETAIL 49
NTS



OUTLET DETAIL 75
NTS



FOR -L- PROFILE SEE SHEET 55

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Plotted By:

PERMIT DRAWING
SHEET 73 OF 91

PROJECT REFERENCE NO.	SHEET NO.
R-2527	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

STEWART
Firm License No. C-0101
223 South West St.
Suite 1100
Raleigh, NC 27603
T: 919.380.8750
www.stewartinc.com

vhb
VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

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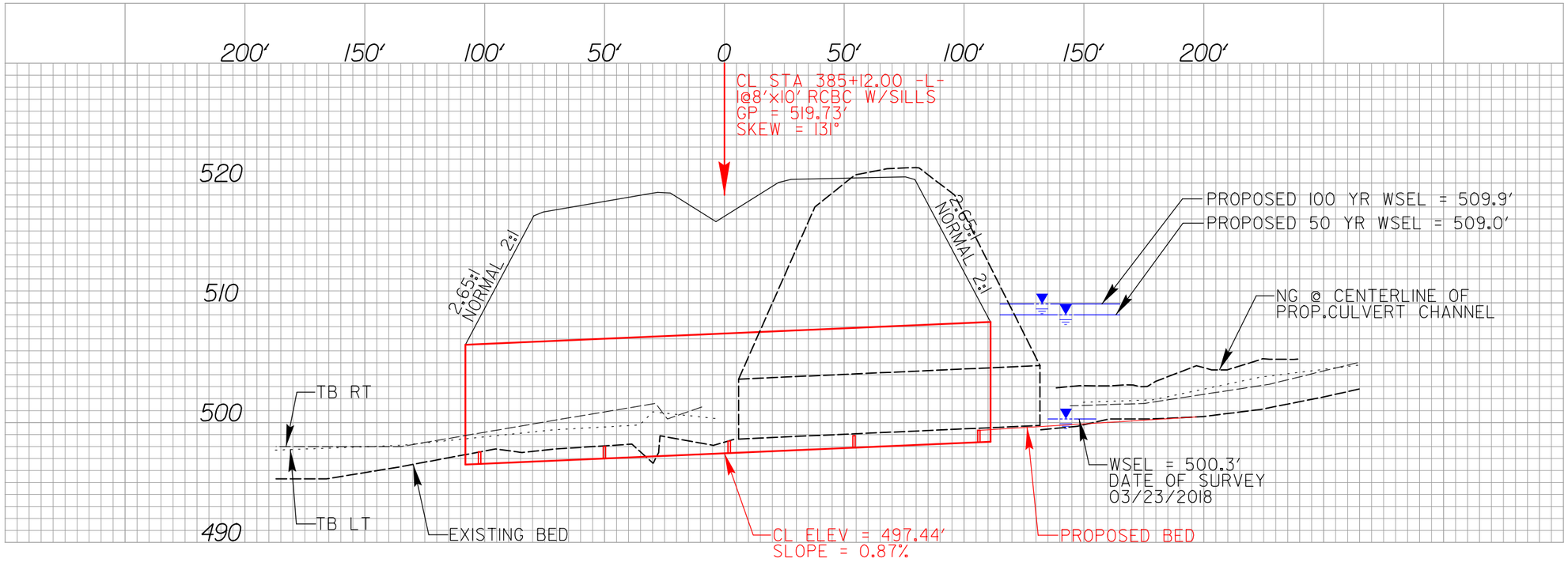
SITE 53A



8/17/99

REVISIONS

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R:\Hydraulics\PERMITS_Environmental\Drawings\R2527_Hyd_PRM_PSH33_PFL.dgn
8/17/99

PERMIT DRAWING
SHEET 74 OF 91

PROJECT REFERENCE NO.	SHEET NO.
R-2527	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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Firm License No. C-0519
223 South West St.
Suite 1150
Raleigh, NC 27603
T. 919.380.8750
www.stewartinc.com

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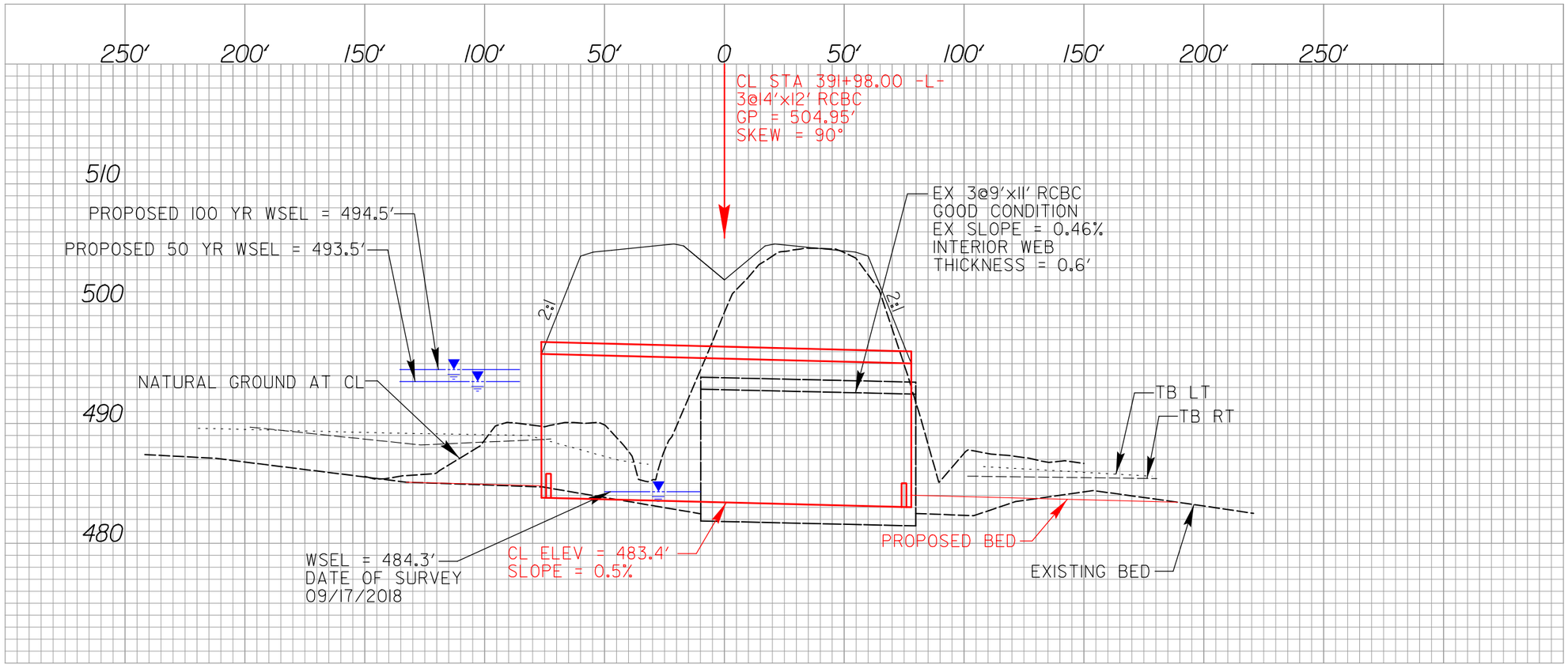
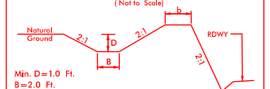
SITE 54



REVISIONS
8/17/99

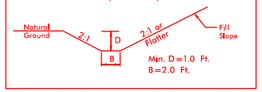
5/14/99

DETAIL 12
BERM BASE DITCH
(Not to Scale)



FROM STA. 401+51 TO STA. 408+94 –L– LT

DETAIL 66
SPECIAL LATERAL BASE DITCH
(Not to Scale)



FROM STA. 352+50 TO STA. 354+50 –RR– LT

DETAIL 68
SPECIAL CUT DITCH
(Not to Scale)

FROM STA. 19+50 TO STA. 20+16 –SR– LT

DETAIL 69
SPECIAL CUT BASE DITCH
(Not to Scale)

FROM STA. 352+50 TO STA. 353+00 –RR– RT
FROM STA. 361+00 TO STA. 362+75 –RR– LT

PERMIT DRAWING SHEET 75 OF 91

NAD 83NA 2011

PROJECT REFERENCE NO.	SHEET NO.
R-2527	34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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223 S. West St.
Suite 1100
Raleigh, NC 27603
T 919.380.8750
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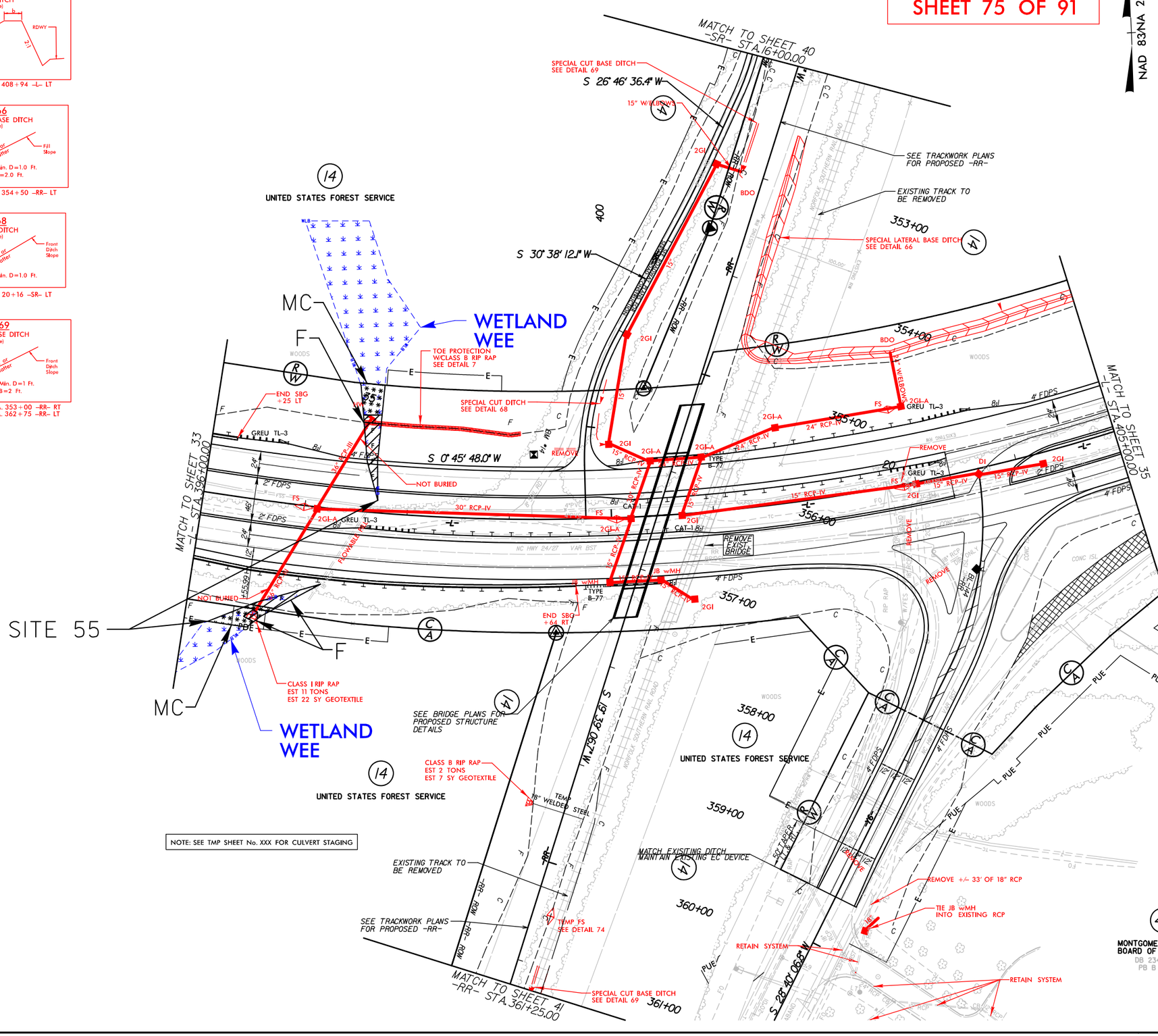
50′ 0′ 100′
GRAPHIC SCALE

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING



FOR INTERSECTION DETAIL, SEE SHEET 2B-10
FOR –L– PROFILE, SEE SHEETS 55 & 56
FOR –Y6– PROFILE, SEE SHEET 61
FOR –SR– PROFILE, SEE SHEET 62

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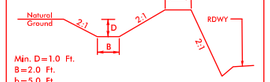
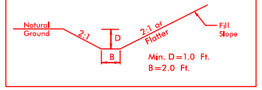
5/14/99

DETAIL 12
BERM BASE DITCH
(Not to Scale)



FROM STA. 401+51 TO STA. 408+94 –L– LT

DETAIL 66
SPECIAL LATERAL BASE DITCH
(Not to Scale)

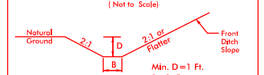


FROM STA. 352+50 TO STA. 354+50 –RR– LT

DETAIL 68
SPECIAL CUT DITCH
(Not to Scale)

FROM STA. 19+50 TO STA. 20+16 –SR– LT

DETAIL 69
SPECIAL CUT BASE DITCH
(Not to Scale)



FROM STA. 352+50 TO STA. 353+00 –RR– RT
FROM STA. 361+00 TO STA. 362+75 –RR– LT

PERMIT DRAWING
SHEET 76 OF 91

NAD 83/NA 2011

PROJECT REFERENCE NO.	SHEET NO.
R-2527	34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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Suite 1100
Raleigh, NC 27603
T 919.380.8750
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940 Main Campus Drive, Suite 500
Raleigh, NC 27606

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50' 0' 100'
GRAPHIC SCALE

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

MATCH TO SHEET 40 –SR– STA. 16+00.00

SPECIAL CUT BASE DITCH SEE DETAIL 69

S 26° 46' 36.4" W

15" W/ BURLAP

2GI

SEE TRACKWORK PLANS FOR PROPOSED –RR–

EXISTING TRACK TO BE REMOVED

353+00

SPECIAL LATERAL BASE DITCH SEE DETAIL 66

14

UNITED STATES FOREST SERVICE

S 30° 38' 12.1" W

400

BDO

354+00

MC

F

WETLAND WEE

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7

END SBO +25 LT

SPECIAL CUT DITCH SEE DETAIL 68

S 0° 45' 48.0" W

GREU TL-3

2GI-A

24" RCP-IV

4" FDPS

REMOVE

TYPE B-77

NOT BURIED

30" RCP-IV

15" RCP-IV

CAT-1

395+00

MATCH TO SHEET 35 –L– STA. 405+00.00

MATCH TO SHEET 33 –L– STA. 396+00.00

SITE 55

CLASS I RIP RAP EST 11 TONS EST 22 SY GEOTEXTILE

WETLAND WEE

SEE BRIDGE PLANS FOR PROPOSED STRUCTURE DETAILS

CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE

18" TEMP WELDED STEEL

N 39° 90' 16" W

356+00

357+00

358+00

359+00

360+00

361+00

NOTE: SEE TMP SHEET No. XXX FOR CULVERT STAGING

EXISTING TRACK TO BE REMOVED

SEE TRACKWORK PLANS FOR PROPOSED –RR–

TEMP FS SEE DETAIL 74

MATCH EXISTING DITCH MAINTAIN EXISTING EC DEVICE

REMOVE +/- 33' OF 18" RCP

TIE JB W/MH INTO EXISTING RCP

RETAIN SYSTEM

SPECIAL CUT BASE DITCH SEE DETAIL 69

MATCH TO SHEET 41 –RR– STA. 361+25.00

S 28° 40' 06.3" W

40

MONTGOMERY COUNTY BOARD OF EDUCATION
DB 234 PG 555
PB B PG 366

FOR INTERSECTION DETAIL, SEE SHEET 2B-10
FOR –L– PROFILE, SEE SHEETS 55 & 56
FOR –Y6– PROFILE, SEE SHEET 61
FOR –SR– PROFILE, SEE SHEET 62

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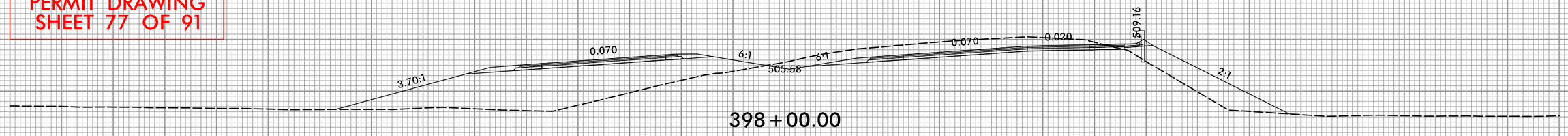
8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2527	X-234

PERMIT DRAWING
SHEET 77 OF 91

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

510
500
490

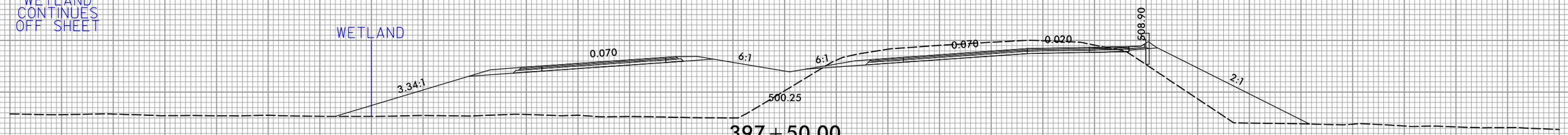


398 + 00.00

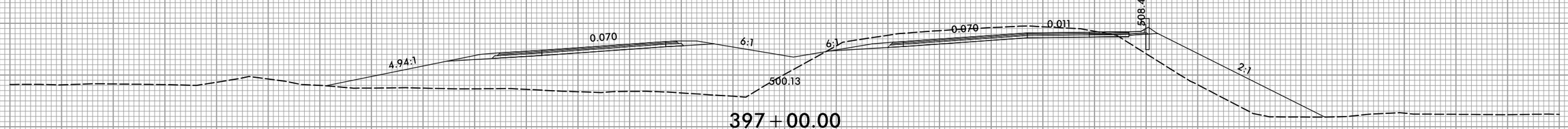
SITE 55

WETLAND CONTINUES OFF SHEET

WETLAND

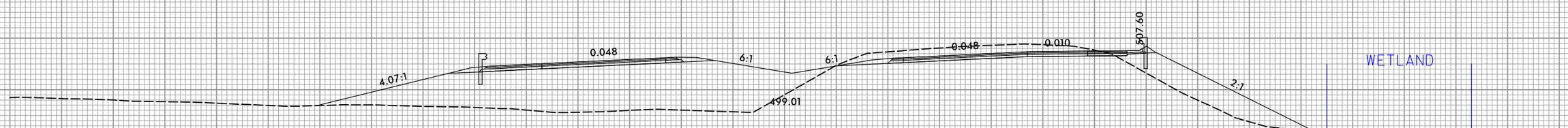


397 + 50.00



397 + 00.00

SITE 55



396 + 50.00

–L–

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

11:58:00 AM
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gaverette

5/14/99

PERMIT DRAWING
SHEET 78 OF 91

50′ 0′ 100′
GRAPHIC SCALE

PROJECT REFERENCE NO.	SHEET NO.
R-2527	35
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83/NA 2011

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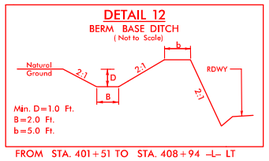
S S — DENOTES IMPACTS IN SURFACE WATER

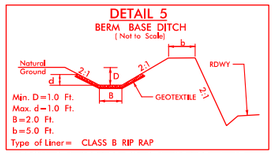
TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DETAIL 12
BERM BASE DITCH
(Not to Scale)



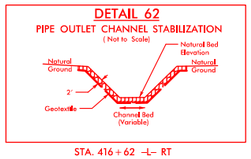
FROM STA. 401+51 TO STA. 408+94 -L- LT

DETAIL 5
BERM BASE DITCH
(Not to Scale)



FROM STA. 409+50 TO STA. 415+50 -L- LT

DETAIL 62
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



STA. 416+62 -L- RT

WETLAND NEW1

STREAM SZ

CLASS B RIP RAP
EST 3 TONS
EST 10 SY GEOTEXTILE

UNITED STATES FOREST SERVICE (14)

BERM BASE DITCH
SEE DETAIL 12

BERM BASE DITCH
SEE DETAIL 12

CLASS B RIP RAP
EST 2 TONS
EST 7 SY GEOTEXTILE

BERM BASE DITCH
W/CLASS B RIP RAP
SEE DETAIL 5
EST 269 TONS
EST 762 SY GEOTEXTILE

MATCH TO SHEET 34
-L- STA. 405+00.00

MATCH TO SHEET 36
-L- STA. 417+00.00

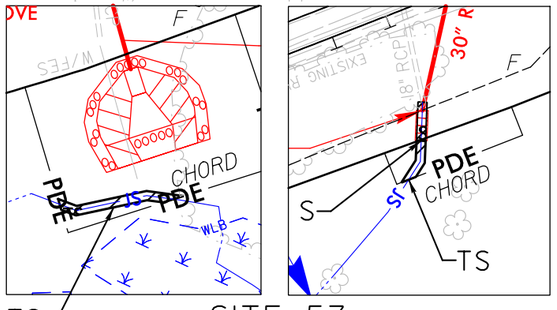
4' FDPS
2' FDPS
24"
46"
2GI
FS
15" RCP-III
30" RCP-III
36" RCP-III
GREU TL-3
8d
16'
ACCESS BREAK
CHORD
PUE
WOODS
BDO
30" W/ ELBOWS
15" W/ ELBOWS
REMOVE
NOT BURIED
2GI-A
JB w/MH
FILL WITH FLOWABLE FILL
36" W/ ELBOWS
PDE
CHORD
10' FDPS
CHORD INC.=40' (TYP.)
PIPE OUTLET CHANNEL STABILIZATION W/ CLASS I RIP RAP
EST 11 TONS
EST 20 SY GEOTEXTILE
L= 10 FT
SEE DETAIL 62
ENERGY DISSIPATOR BASIN
SEE DETAIL 52 ON
SHEET 2D-1
SITE 57

WETLAND WYY

WETLAND WXX

STREAM SZ

(41) BECKY W WALLACE



25′ 0′ 50′
INSET GRAPHIC SCALE

FOR -L- PROFILE, SEE SHEET 56

ALL DRIVEWAY RADII 30' UNLESS OTHERWISE NOTED.

11:58:44 AM
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DGN File

5/14/99

PERMIT DRAWING
SHEET 79 OF 91

50′ 0′ 100′
GRAPHIC SCALE

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-2527	35
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

STEWART — firm License No. C-1851, 223 S. West St., Suite 1100, Raleigh, NC 27603, T: 919.380.8750, www.wbstewartNC.com

vhb — VHB Engineering NC, P.C. (C-3705), 940 Main Campus Drive, Suite 500, Raleigh, NC 27606

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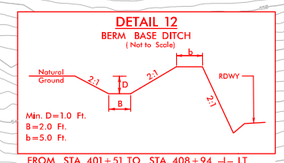
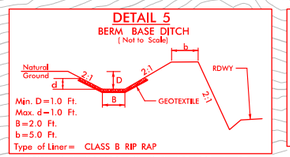
NAD 83/NA 2011

DETAIL 12
BERM BASE DITCH
(Not to Scale)



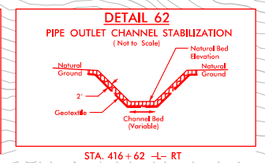
FROM STA. 401+51 TO STA. 408+94 -L- LT

DETAIL 5
BERM BASE DITCH
(Not to Scale)



FROM STA. 409+50 TO STA. 415+50 -L- LT

DETAIL 62
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



STA. 416+62 -L- RT

WETLAND NEW1

STREAM SZ

CLASS B RIP RAP
EST 3 TONS
EST 10 SY GEOTEXTILE

UNITED STATES FOREST SERVICE

BERM BASE DITCH
SEE DETAIL 12

BERM BASE DITCH
SEE DETAIL 12

CLASS B RIP RAP
EST 2 TONS
EST 2 SY GEOTEXTILE

BERM BASE DITCH
W/CLASS B RIP RAP
SEE DETAIL 5
EST 269 TONS
EST 762 SY GEOTEXTILE

MATCH TO SHEET 34 -L- STA 405+00

MATCH TO SHEET 36 -L- STA 417+00

SITE 57

WETLAND WYY

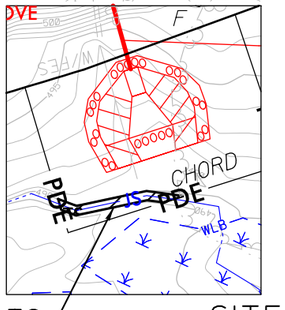
WETLAND WXX

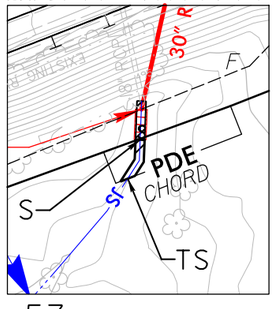
STREAM SZ

41 BECKY W WALLACE

ENERGY DISSIPATOR BASIN SEE DETAIL 52 ON SHEET 2D

PIPE OUTLET CHANNEL STABILIZATION W/ CLASS I RIP RAP EST 11 TONS EST 20 SY GEOTEXTILE L= 10 FT SEE DETAIL 62





SITE 57

25′ 0′ 50′
INSET GRAPHIC SCALE

FOR -L- PROFILE, SEE SHEET 56

ALL DRIVEWAY RADII 30' UNLESS OTHERWISE NOTED.

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2527	X-241

PERMIT DRAWING
SHEET 80 OF 91

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

520
510
500

2:1 2:1 513.44 6:1 6:1 0.070 0.020 6:1 6:1 0.070 2.78:1 511.90

410+50.00

WETLAND CONTINUES OFF SHEET

SITE 56 (REMOVED)

WETLAND

2:1 2:1 513.83 6:1 6:1 0.070 0.020 6:1 6:1 0.070 6:1 5.98:1 512.39

410+00.00

2:1 2:1 2:1 4:1 6:1 0.070 0.020 6:1 6:1 0.070 6:1 6:1 515.88 515.89

409+50.00

2:1 4:1 6:1 0.070 0.020 6:1 6:1 0.070 6:1 6:1 516.88

409+00.00

–L–

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

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gaverette

5/14/99

PERMIT DRAWING SHEET 81 OF 91

50′ 0′ 100′
GRAPHIC SCALE

25′ 0′ 50′
INSET GRAPHIC SCALE

DENOTES MECHANIZED CLEARING

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

(14) UNITED STATES FOREST SERVICE

PROJECT REFERENCE NO.	SHEET NO.
R-2527	36
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Firm License No. C-1851
223 S. West St.
Suite 1100
Raleigh, NC 27603
T: 919.380.8750
www.stewartENG.com
STEWART

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

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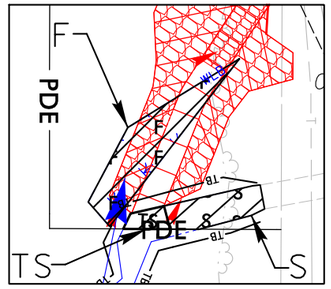
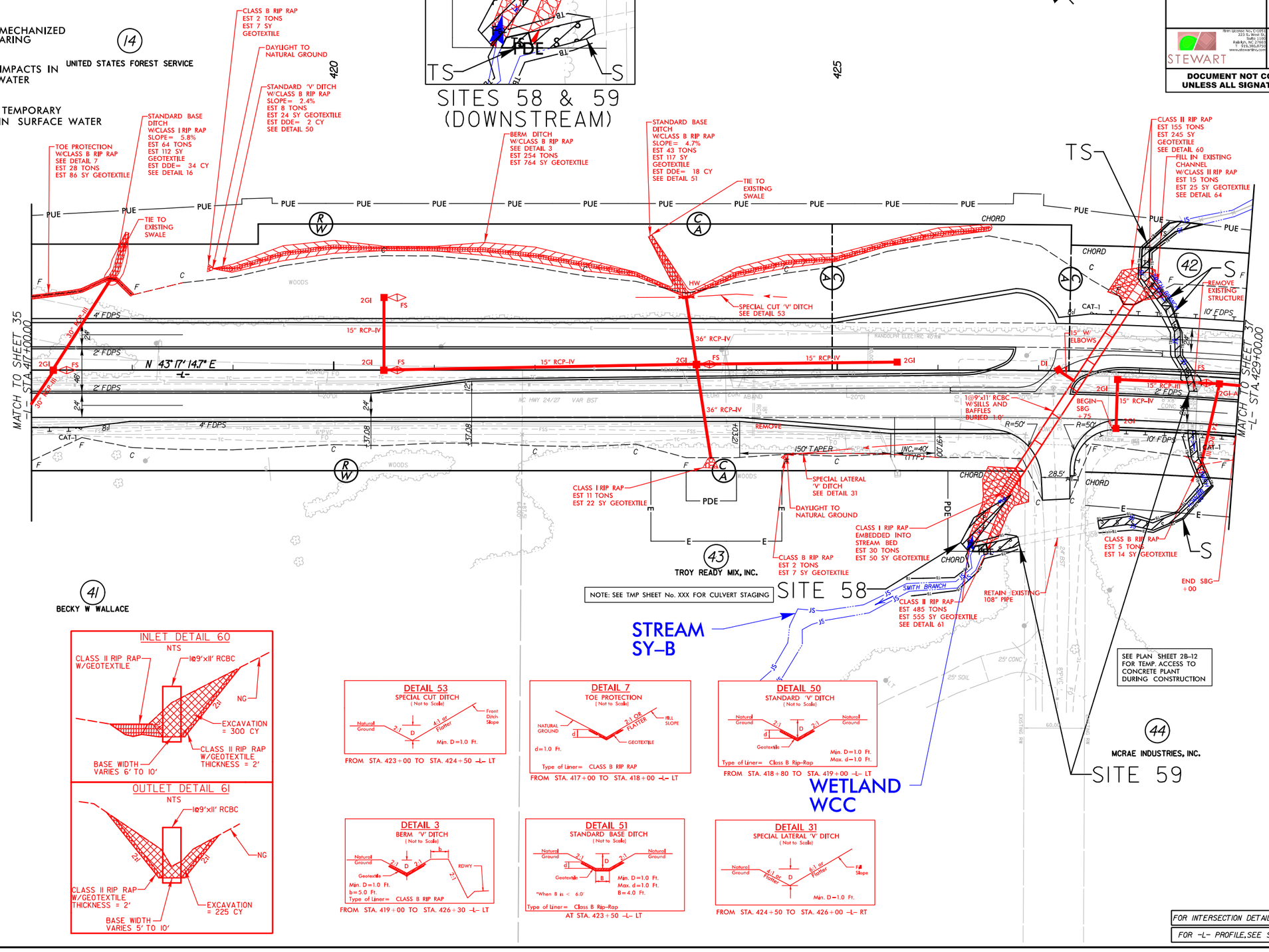


SITES 58 & 59 (DOWNSTREAM)



(41) BECKY W WALLACE

INLET DETAIL 60
NTS

OUTLET DETAIL 61
NTS

DETAIL 53
SPECIAL CUT DITCH
(Not to Scale)

FROM STA. 423+00 TO STA. 424+50 -L- LT

DETAIL 7
TOE PROTECTION
(Not to Scale)

Type of Liner= CLASS B RIP RAP
FROM STA. 417+00 TO STA. 418+00 -L- LT

DETAIL 50
STANDARD 'V' DITCH
(Not to Scale)

Type of Liner= Class B Rip-Rap
FROM STA. 418+80 TO STA. 419+00 -L- LT

DETAIL 3
BERM 'V' DITCH
(Not to Scale)

FROM STA. 419+00 TO STA. 426+30 -L- LT

DETAIL 51
STANDARD BASE DITCH
(Not to Scale)

Type of Liner= Class B Rip-Rap
AT STA. 423+50 -L- LT

DETAIL 31
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

FROM STA. 424+50 TO STA. 426+00 -L- RT

FOR INTERSECTION DETAIL, SEE SHEET 2B-11

FOR -L- PROFILE, SEE SHEET 56

5/14/99

PERMIT DRAWING SHEET 82 OF 91

50′ 0′ 100′

GRAPHIC SCALE

DENOTES MECHANIZED CLEARING

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

25′ 0′ 50′

INSET GRAPHIC SCALE

PROJECT REFERENCE NO.	SHEET NO.
R-2527	36
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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NAD 83/NA 2011

SITES 58 & 59 (DOWNSTREAM)

14 UNITED STATES FOREST SERVICE

41 BECKY W WALLACE

43 TROY READY MIX, INC.

42 S

44 MCRAE INDUSTRIES, INC.

SITE 58

SITE 59

MATCH TO SHEET 35 -L- STA 417+00.00

MATCH TO SHEET 37 -L- STA 429+00.00

N 43° 17′ 14.7″ E

CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE

DAYLIGHT TO NATURAL GROUND

STANDARD 'V' DITCH W/CLASS B RIP RAP SLOPE= 2.4% EST 8 TONS EST 24 SY GEOTEXTILE EST DDE= 2 CY SEE DETAIL 50

TOE PROTECTION W/CLASS B RIP RAP SEE DETAIL 7 EST 28 TONS EST 86 SY GEOTEXTILE

STANDARD BASE DITCH W/CLASS I RIP RAP SLOPE= 5.8% EST 64 TONS EST 112 SY GEOTEXTILE EST DDE= 34 CY SEE DETAIL 16

TIE TO EXISTING SWALE

BERM DITCH W/CLASS B RIP RAP SEE DETAIL 3 EST 254 TONS EST 764 SY GEOTEXTILE

STANDARD BASE DITCH W/CLASS B RIP RAP SLOPE= 4.7% EST 43 TONS EST 117 SY GEOTEXTILE EST DDE= 18 CY SEE DETAIL 51

TIE TO EXISTING SWALE

SPECIAL CUT 'V' DITCH SEE DETAIL 53

CLASS II RIP RAP EST 155 TONS EST 245 SY GEOTEXTILE SEE DETAIL 60

FILL IN EXISTING CHANNEL W/CLASS II RIP RAP EST 15 TONS EST 25 SY GEOTEXTILE SEE DETAIL 64

REMOVE EXISTING STRUCTURE

15" RCP-IV

36" RCP-IV

15" W/ ELBOWS

1@9'x11' RCBC W/SILLS AND BAFFLES BURIED 1.0'

BEGIN SBG +75

END SBG +00

CLASS I RIP RAP EST 11 TONS EST 22 SY GEOTEXTILE

SPECIAL LATERAL 'V' DITCH SEE DETAIL 31

DAYLIGHT TO NATURAL GROUND

CLASS I RIP RAP EMBEDDED INTO STREAM BED EST 30 TONS EST 50 SY GEOTEXTILE

CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE

CLASS B RIP RAP EST 5 TONS EST 14 SY GEOTEXTILE

CLASS II RIP RAP EST 485 TONS EST 535 SY GEOTEXTILE SEE DETAIL 61

RETAIN EXISTING 108" PIPE

NOTE: SEE TMP SHEET No. XXX FOR CULVERT STAGING

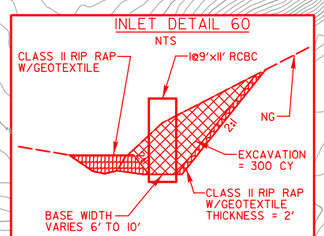
SEE PLAN SHEET 2B-12 FOR TEMP. ACCESS TO CONCRETE PLANT DURING CONSTRUCTION

STREAM SY-B

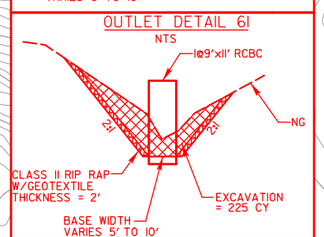
WETLAND WCC

SMITH BRANCH

INLET DETAIL 60
NTS



OUTLET DETAIL 61
NTS



DETAIL 53
SPECIAL CUT DITCH
(Not to Scale)

FROM STA. 423+00 TO STA. 424+50 -L- LT

DETAIL 7
TOE PROTECTION
(Not to Scale)

Type of Liner= CLASS B RIP RAP

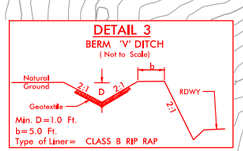
FROM STA. 417+00 TO STA. 418+00 -L- LT

DETAIL 50
STANDARD 'V' DITCH
(Not to Scale)

Type of Liner= Class B Rip-Rap

FROM STA. 418+80 TO STA. 419+00 -L- LT

DETAIL 3
BERM 'V' DITCH
(Not to Scale)



Type of Liner= CLASS B RIP RAP

FROM STA. 419+00 TO STA. 426+30 -L- LT

DETAIL 51
STANDARD BASE DITCH
(Not to Scale)

Type of Liner= Class B Rip-Rap

AT STA. 423+50 -L- LT

DETAIL 31
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

FROM STA. 424+50 TO STA. 426+00 -L- RT

FOR INTERSECTION DETAIL, SEE SHEET 2B-11

FOR -L- PROFILE, SEE SHEET 56

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gwyatte

PERMIT DRAWING
SHEET 83 OF 91

PROJECT REFERENCE NO.	SHEET NO.
R-2527	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

STEWART
Firm License No. C-0101
223 South West St.
Suite 1100
Raleigh, NC 27603
T. 919.380.8750
www.stewartinc.com

vhb
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Raleigh, NC 27606

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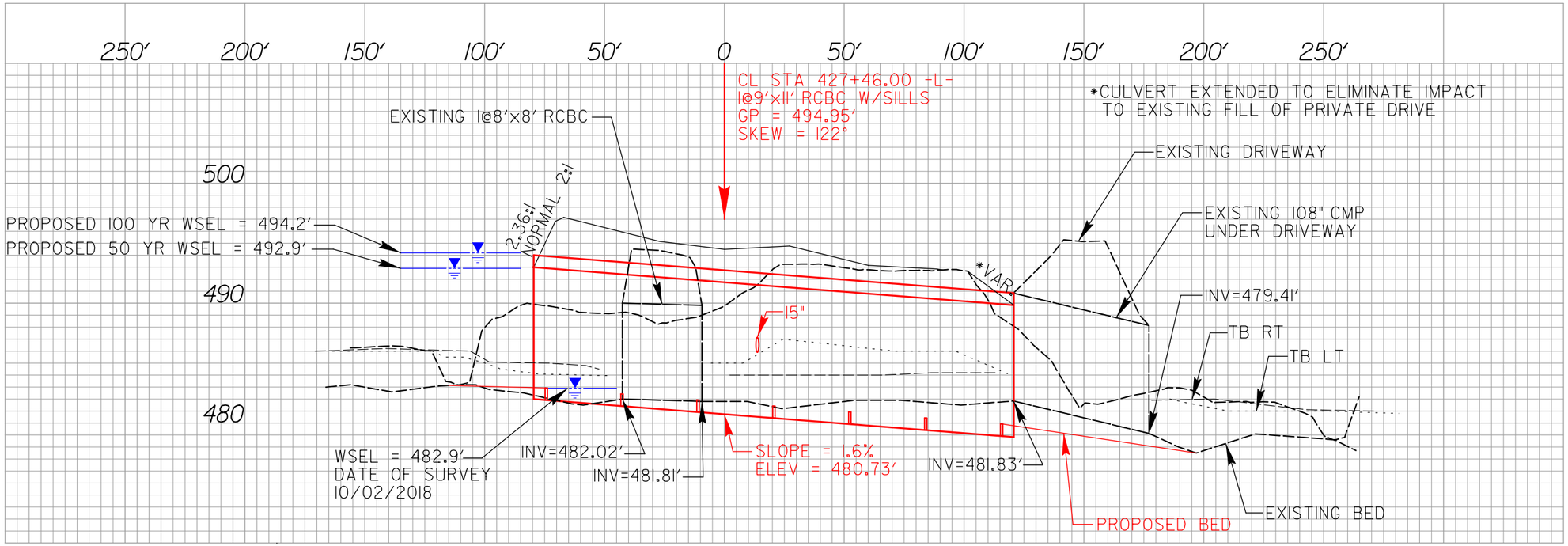
SITES 58 & 59



REVISIONS
8/17/99

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0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2527	X-250

PERMIT DRAWING
SHEET 84 OF 91

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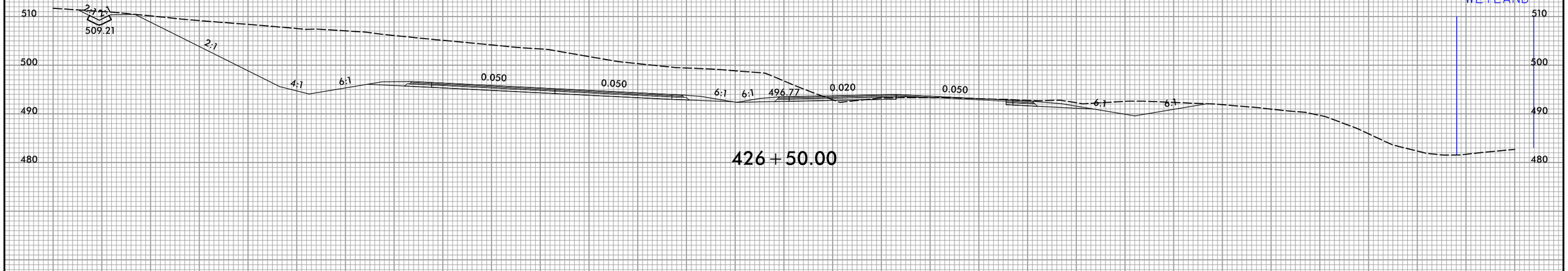
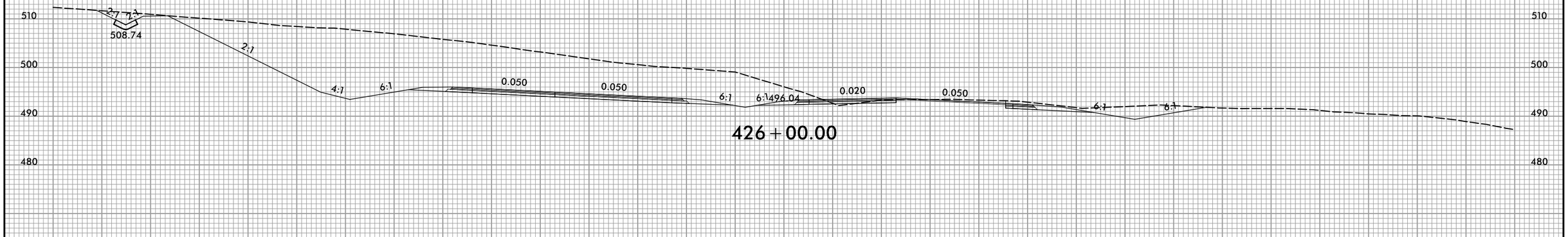
SITE 58



426+50.00



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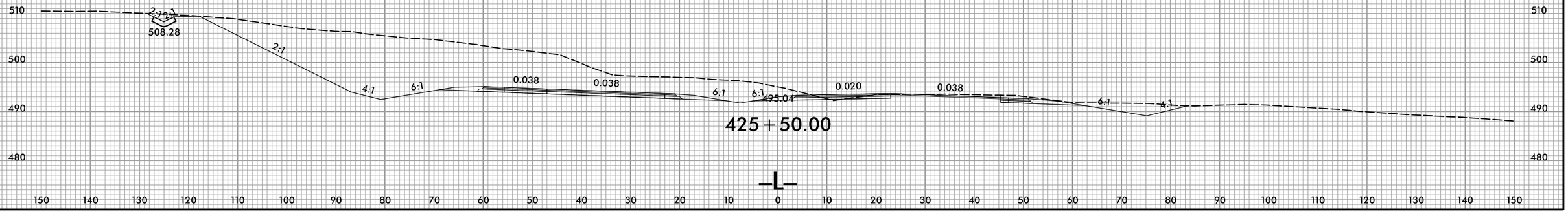

425+50.00

—L—

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gaverette

5/14/99

PERMIT DRAWING SHEET 84A OF 91

50′ 0′ 100′

GRAPHIC SCALE

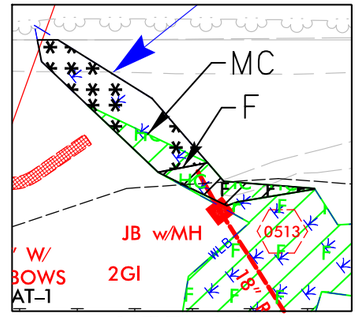
DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

PERMITTED IN PROJECT R-0623

25′ 0′ 50′

INSET GRAPHIC SCALE



NAD 83/NA 2011

PROJECT REFERENCE NO.	SHEET NO.
R-2527	38
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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445

450

KATIE K. DEATON

WETLAND WBB

STREAM SW-C

SITE 60

CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE

MATCH TO SHEET 37 -L- STA 442+00.000

WOODS

EXISTING R/W

20'DI

4" FDPS

2' FDPS

24"

46'

REMOVE (0407)

FS

2GI

15" RCP-IV

(INC.=40' (TYP.)

RETAIN 15" RCP-III (0409)

18" RCP-IV

HW (0514)

JB w/MH (0513)

15" W/ ELBOWS CAT-1

END SBG +50

TIE TO EXISTING

RETAIN SYSTEM (R-0623)

10' FDPS

BEGIN SBG +00

REMOVE (0405)

DI

REMOVE (0404)

REMOVE (0403)

BEGIN SBG +23

JB w/Slab Lid (0515)

N 37° 41' 59.5" E -L-

UNDER CONSTRUCTION

FS (0502)

2GI-A

24" RCP-III

SPECIAL DI (0510)

R-0623 TO BE CONSTRUCTED BY OTHERS

TIE TO EXISTING SBG (0502)

REMOVE (0402)

15" RCP-IV

15" RCP-III

JB w/MH (0408)

JB w/Slab Lid (0516)

RETAIN SYSTEM (R-0623)

TIE TO EXISTING

R2527-11

SPRING BOX (0518)

(0511)

(0509)

(0517)

CLASS B RIP RAP EST 3 TONS EST 10 SY GEOTEXTILE

MAINTAIN DITCH FROM R-0623

BANK STABILIZATION

STREAM SW-C

WETLAND WAA

WETLAND WWW

JAMIE L. KURTZ, DIVORCED

GUS SCHAD

JOE HURLY AND WIFE, HELEN HURLEY

FOR -L- PROFILE, SEE SHEET 57

ALL DRIVEWAY RADII 30' UNLESS OTHERWISE NOTED.

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pavedate

5/14/99

PERMIT DRAWING SHEET 84B OF 91

50′ 0′ 100′

GRAPHIC SCALE

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

PERMITTED IN PROJECT R-0623

25′ 0′ 50′

INSET GRAPHIC SCALE

PROJECT REFERENCE NO.	SHEET NO.
R-2527	38
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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vhb — VHB Engineering NC, P.C. (C-3705), 940 Main Campus Drive, Suite 500, Raleigh, NC 27606

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NA 2011

SITE 60

MC

F

JB w/MH

(0513)

2GI

445

450

KATIE K. DEATON

WETLAND WBB

STREAM SW-C

SITE 60

CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE

MATCH TO SHEET 37 -L- STA 442+00.00

4" FDPS

2" FDPS

24"

16'

REMOVE (0407)

FS

2GI

15" RCP-IV

(INC.=40' (TYP.))

RETAIN (0409)

15" RCP-III

18" RCP-IV

HW (0514)

JB w/MH

15" W' BELOWS CAT-1

BEGIN SBG +00

END SBG +50

TIE TO EXISTING

10' FDPS

RETAIN SYSTEM (R-0623)

R-0623 TO BE CONSTRUCTED BY OTHERS

N 37° 41' 59.5" E -L-

JB w/Slab Lid (0515)

SPECIAL DI (0510)

24" RCP-III

2GI-A

TIE TO EXISTING SBG (0502)

24" RCP-II

R2527-II

SPRING BOX (0518)

DI (0509)

HC

CSAP

(0511)

(0501)

(0516)

(0517)

BANK STABILIZATION

JAMIE L. KURTZ, DIVORCED

GUS SCHAD

WETLAND WWW

STREAM SW-C

WETLAND WAA

JOE HURLY AND WIFE, HELEN HURLEY

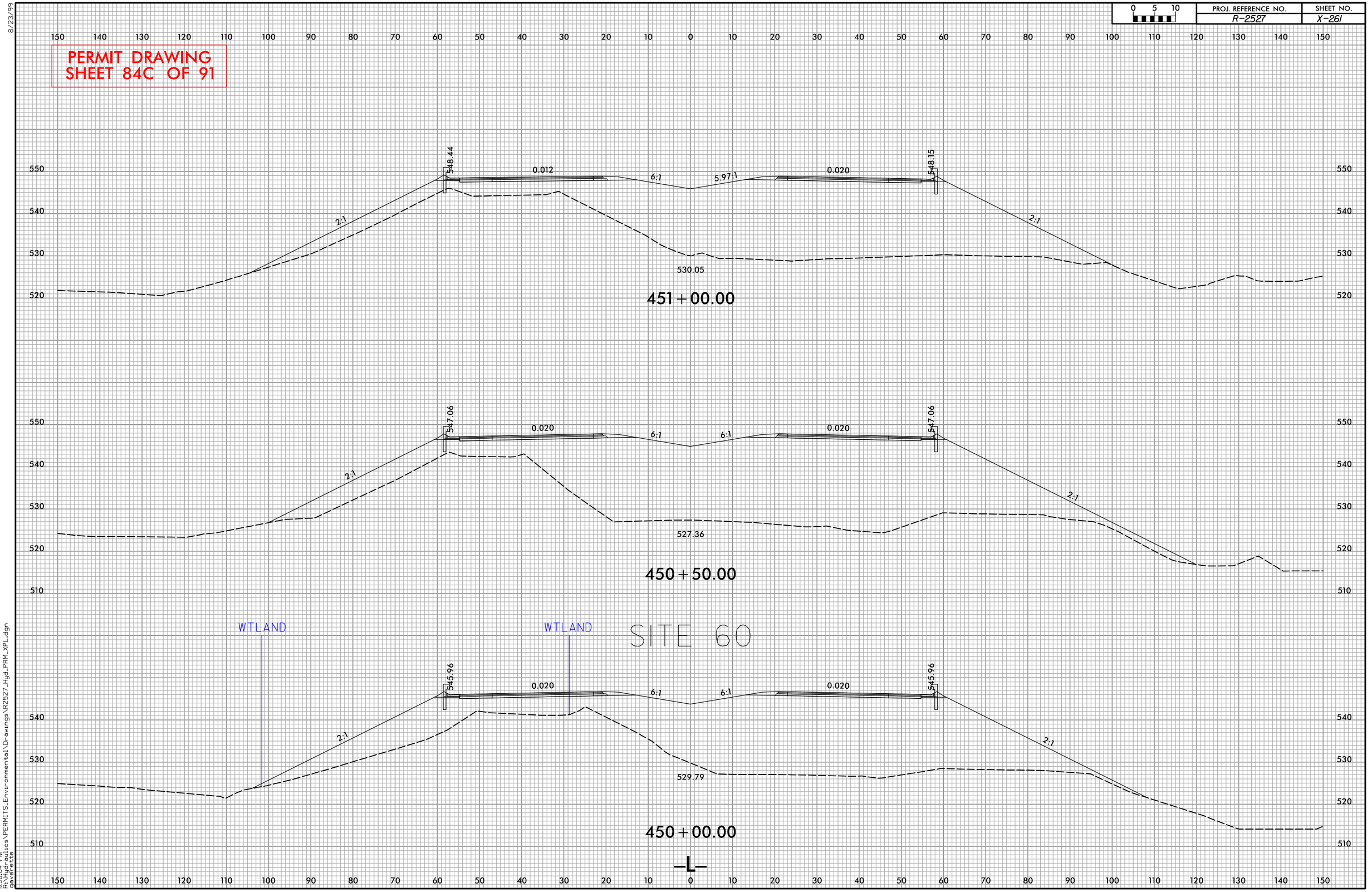
FOR -L- PROFILE, SEE SHEET 57

ALL DRIVEWAY RADII 30' UNLESS OTHERWISE NOTED.

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2527	X-261

PERMIT DRAWING
SHEET 84C OF 91



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Roadways
gaverette

WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	28+03/29+02 -L- LT	Fill; Mechanized Clearing	< 0.01			< 0.01						
1A	27+38/27+57 -L- RT	Mechanized Clearing				0.02						
2	28+24/29+60 -L- RT	Fill; Mechanized Clearing	0.07			0.01						
2A	28+68/29+08 -L- RT	Channel Improvements										
4	29+37/29+76 -L- RT	Channel Improvements						0.03	< 0.01	84	15	
4	29+60 -L- RT/30+02 -L- LT	2 @ 10' x 10' RCBC						0.03		70		
4	29+80/30+55 -L- LT	Channel Improvements						0.05	< 0.01	113	16	
4A	31+25/31+42 -L- RT	Channel Improvements						< 0.01	< 0.01	8	9	
4A	29+49/29+92 -L- RT	Channel Improvements							< 0.01		48	
5	33+44/33+80 -L- LT	54" WS & Channel Improvements						< 0.01	< 0.01	83	20	
5	34+81/35+15 -L- RT	54" Welded Steel						< 0.01	< 0.01	112	26	
6	33+64/34+24 -L- LT	Channel Improvements						< 0.01		74		
7	80+40/80+80 -L- LT	36" RCP-III						< 0.01	< 0.01	129	16	
7A	86+75/86+98	15" Alt Pipe EC							< 0.01		22	
8	92+24/92+50 -L- LT	24" RCP-III; Fill	< 0.01									
9	93+05/93+19 -L- LT	15" w/ Elbows	< 0.01			< 0.01						
10	98+50/98+99 -L- RT	42" RCP-III						< 0.01	< 0.01	54	10	
10	99+26/100+01 -L- LT	42" RCP-III						< 0.01	< 0.01	106	12	
TOTALS*:			0.08	0.00	0.00	0.04	0.00	0.15	0.03	833	194	0

*Rounded totals are sum of actual impacts

NOTES:
Site 2A & 3 has been removed

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
7/12/2024
MONTGOMERY
R-2527
355721.1.1

Revised 2018 Feb

WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
11	123+75/124+86 -L- LT	Fill	0.03			0.03						
12	124+11/124+53 -L- LT	48" RCP-IV						< 0.01		123		
12	126+03/127+17 -L- RT	48" RCP-IV						0.01	< 0.01	109	24	
13	124+63/126+35 -L- LT	Fill	0.09									
14	126+32/126+65 -L- RT	Fill; Mechanized Clearing	< 0.01			< 0.01						
15	126+78/126+93 -L- RT	48" RCP-IV							< 0.01		17	
16	127+14/127+37 -L- RT	Fill; Mechanized Clearing	< 0.01			< 0.01						
17	139+95/142+31 -L- LT	42" RCP-IV						0.02	< 0.01	264	20	
17	143+12/143+62 -L- RT	42" RCP-IV						< 0.01	< 0.01	43	19	
18	139+99/140+86 -L- LT	Mechanized Clearing				0.02						
19	142+51/143+25 -L- RT	Fill; Mechanized Clearing	< 0.01			0.03						
20	149+20/150+54 -L- RT	Fill						< 0.01		139		
21	149+49/150+06 -L- LT	Fill	0.02									
TOTALS*:			0.14			0.08		0.05	< 0.01	678	80	0

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
7/12/2024
MONTGOMERY
R-2527
355721.1.1

WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
22	149+81/150+15 -L- LT	42" RCP-IV						0.01	< 0.01	152	17	
22	150+53/150+93 -L- RT	42" RCP-IV						< 0.01	< 0.01	59	6	
23	158+89/159+19 -L- LT	Channel Improvements						0.01	< 0.01	105	20	
23	158+85 -L- LT/159+67 -L- RT	1 @ 7' x 8' RCBC						0.01		78		
23	159+59/159+79 -L- RT	Channel Improvements						0.02	<0.01	111	20	
24	159+11/167+33 -L- LT	Ditch Excavation; Fill						0.07	< 0.01	845	38	
25	166+00/167+31 -L- LT	Fill						0.01		180		
25	168+61/169+06 -L- RT	36" RCP-III						< 0.01	< 0.01	39	31	
26	166+70/167+85 -L- LT	Fill	0.11									
26	168+05/169+29 -L- RT	Fill; Mechanized Clearing	0.04			0.01						
27	169+07/169+53 -L- LT	Pond Spillway Stabilization							< 0.01		34	
28	166+73/171+82 -L- LT	Ditch Excavation; Fill						0.02		240		
29	193+48/193+92 -L- RT	Channel Improvements						0.04	0.02	100	54	
29	193+81 -L- RT/194+26 -L- LT	2 @ 14' x 9' RCBC						0.04		137		
29	194+03/195+36 -L- LT	Channel Improvements						0.04	< 0.01	113	23	
30	195+27/195+36 -L- LT	Channel Improvements							< 0.01		9	
TOTALS*:			0.15			0.01		0.28	0.04	2159	252	0

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
7/12/2024
MONTGOMERY
R-2527
355721.1.1

WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
31	222+35/223+13 -L- LT	Fill; Mechanized Clearing	0.10			0.03						
32	223+04/223+38 -L- LT	66" RCP-IV						0.01	< 0.01	155	32	
32	223+44/223+68 -L- RT	66" RCP-IV						< 0.01	< 0.01	53	16	
33	230+75/231+26 -L- RT	EC Basin/ Const. Access							< 0.01		56	
34	238+07/238+26 -L- RT	24" RCP-III						< 0.01	< 0.01	27	11	
35	243+34/243+58 -L- LT	30" w/ Elbows; 36" RCP-III						< 0.01		63		
35A	243+27/243+68	30" w/ Elbows; 36" RCP-III	0.04		< 0.01	0.02						
35B	243+52/243+77 -L- RT	36" RCP-III	< 0.01			< 0.01						
36	253+83/254+10 -L- RT	30" w/ Elbows						< 0.01	< 0.01	31	9	
37	253+84/254+22 -L- RT	Fill	< 0.01			< 0.01						
38	264+93/267+04 -L- LT	60" RCP-IV; Fill						0.02	< 0.01	232	25	
39	267+03/267+32 -L- RT	Channel Improvements						0.03	< 0.01	91	11	
39	67+05 -L- RT/267+35 -L- LT	2 @ 7' x 9' RCBC						0.03		122		
39	267+12/267+85 -L- LT	Channel Improvements						0.02	0.01	88	43	
40	277+34/277+52 -L- RT	24" RCP-III	< 0.01			< 0.01						
TOTALS*:			0.15		< 0.01	0.06		0.12	0.03	862	203	0

*Rounded totals are sum of actual impacts

NOTES:
Site 40 represents a total take of Wetland WKK.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
7/12/2024
MONTGOMERY
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355721.1.1

WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
41	279+80/280+34 -L- RT	18" RCP-III; Fill	0.01			0.02						
42	282+92/283+225 -L- RT	18" Pipe				< 0.01						
44	302+39/302+89 -L- RT	Channel Improvements						0.02	< 0.01	104	33	
44	303+29/303+56 -L- LT	1 @ 8' x 10' RCBC						0.01		69		
44	302+36/302+89 -L- LT	Channel Improvements						0.01	< 0.01	86	9	
45	302+58/303+31 -L- LT	Fill						< 0.01		73		
45A	303+42/303+74 -L- LT	Fill	< 0.01									
46	304+36/304+56 -L- LT	Mechanized Clearing				< 0.01						
47	312+83/314+25 -L- RT	42" Welded Steel						< 0.01	< 0.01	124	45	
47	315+40/316+28 -L- LT	42" Welded Steel						< 0.01	< 0.01	89	48	
48	315+51/315+76 -L- LT	Fill	0.02									
49	336+84/337+17 -L RT	Easement				< 0.01						
49	340+90/341+72 -L- RT	Fill	< 0.01			0.02						
49	342+88/343+25 -L- RT	Easement				< 0.01						
49	344+75/345+05 -L- RT	Ditch Excavation			< 0.01	< 0.01						
TOTALS*:			0.03		< 0.01	0.06		0.07	0.01	545	135	0

*Rounded totals are sum of actual impacts

NOTES:
Site 43 has been removed.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
7/12/2024
MONTGOMERY
R-2527
355721.1.1
SHEET 89 OF 91

WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
50	342+54/342+96 -L- RT	36" RCP-III						< 0.01	< 0.01	30	24	
50	344+81/346+18 -L- RT	60" RCP-IV						0.01	< 0.01	143	26	
50	347+30/348+72 -L- LT	60" RCP-IV						0.02	< 0.01	227	18	
51	345+37/347+40 -L- LT	60" RCP-IV	< 0.01			0.06						
51	347+80/347+91 -L- LT	60" RCP-IV	< 0.01									
52	351+92/352+04 -L- RT	30" RCP-III	< 0.01			< 0.01						
52	352+41/352+74 -L- LT	30" RCP-III	< 0.01			< 0.01						
53	363+49/364+98 -L- LT	Channel Improvements						0.03	< 0.01	193	16	
53	364+88/366+19 -L- LT	1 @ 8' x 10' RCBC						0.02		152		
53	366+70/367+50 -L- RT	Channel Improvements						0.02	< 0.01	94	29	
53A	383+50/384+19 -L- RT	Channel Improvements						< 0.01	< 0.01	70	26	
53A	384+11 -L- RT/385+92 -L- LT	1 @ 8' x 10' RCBC						0.02		129		
53A	385+78/386+38 -L- LT	Channel Improvements						< 0.01	< 0.01	39	54	
53A	390+27/392+35 -L- LT	Channel Improvements						0.06	< 0.01	321	17	
TOTALS*:			0.01			0.06		0.21	0.03	1398	210	0

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
7/12/2024
MONTGOMERY
R-2527
355721.1.1

WETLAND AND SURACE WATER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND 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)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
54	391+60/392+58 -L- LT	Channel Improvements						0.04	0.03	113	91	
54	92+28 -L- LT/392+56 -L- RT	3 @ 14' x 12' RCBC						0.04		76		
54	392+14/392+62 -L- RT	Channel Improvements						0.09	0.01	139	15	
55	396+23/397+23 -L- RT	36 RCP-III; Fill	0.01			0.01						
55	397+42/397+71 -L- LT	36 RCP-III; Fill	0.02			0.01						
57	413+90/414+27 -L- RT	Dissipator Basin							< 0.01		39	
57	416+67/416+64 -L- RT	30" RCP-III						< 0.01	< 0.01	13	14	
58	426+23/426+74 -L- RT	1 @ 9' x 11' RCBC	0.02									
59	426+35/426+82 -L- RT	Channel Improvements						< 0.01	< 0.01	33	17	
59	427+63/428+79 -L- RT	1 @ 9' x 11' RCBC						0.04		279		
59	427+98/428+54 -L- LT	Channel Improvements						0.02	0.01	33	17	
60	449+21/450+12 -L- LT	18 RCP-IV; Fill	< 0.01			0.02						
SHEET 85 TOTALS*			0.08			0.04		0.15	0.03	833	194	
SHEET 86 TOTALS*			0.14			0.08		0.05	< 0.01	678	80	
SHEET 87 TOTALS*			0.15			0.01		0.28	0.04	2159	252	
SHEET 88 TOTALS*			0.15		< 0.01	0.06		0.12	0.03	862	203	
SHEET 89 TOTALS*			0.03		< 0.01	0.06		0.07	0.01	545	135	
SHEET 90 TOTALS*			0.01			0.06		0.21	0.03	1398	210	
SHEET 91 TOTALS*			0.05			0.05		0.24	0.06	686	193	
PROJECT TOTALS*:			**0.62**		**< 0.01**	**0.37**		**1.11**	**0.21**	**7161**	**1267**	

*Rounded totals are sum of actual impacts

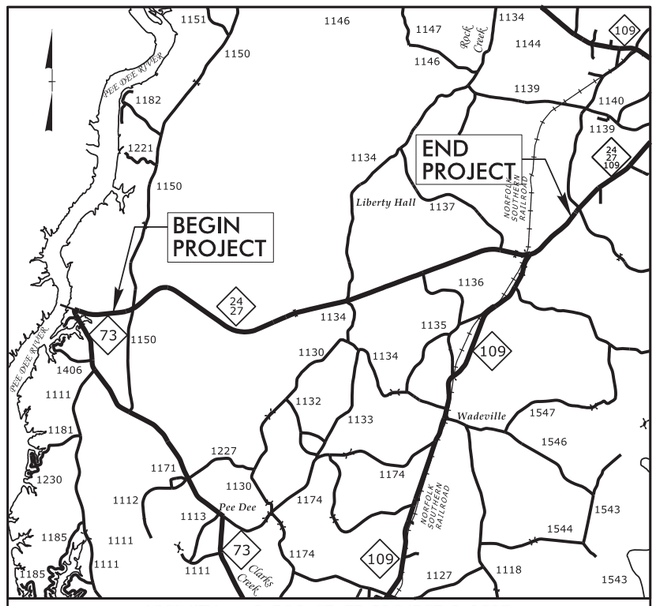
NOTES:
Additional impacts on Sheet 38 covered under R-0623 permits.
Site 56 has been removed.

Utility Impacts are addressed on attached Utility Permit Drawings

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
7/12/2024
MONTGOMERY
R-2527
355721.1.1
SHEET 91 OF 91

09/08/99

TIP PROJECT: R-2527



VICINITY MAP FOR STATE PROJECT R-2527

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

T.I.P. NO.	SHEET NO.
R-2527	UE-1

UTILITIES ENVIRONMENTAL PERMIT PLANS
MONTGOMERY COUNTY

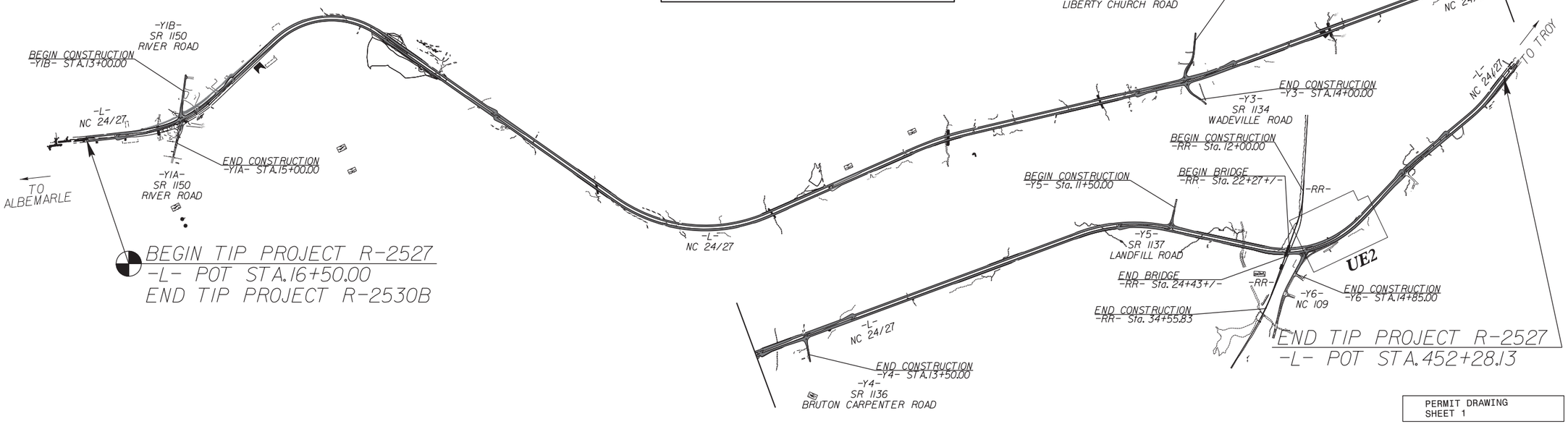
WETLAND AND SURFACE WATER IMPACTS

LOCATION: NC 24-27 FROM NC 73 TO THE TROY BYPASS

TYPE OF WORK: UTILITIES BY OTHERS

NAD 83/NA 2011

PERMIT DRAWING
SHEET 1 OF 5



PERMIT DRAWING
SHEET 1

GRAPHIC SCALES

PLANS: 50 25 0 50 100

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

INDEX OF SHEETS

UTILITY OWNERS WITH CONFLICTS

(A) POWER - RANDOLPH EMC
(B) TELEPHONE - CENTURYLINK
(C) COMMUNICATIONS - SPECTRUM

PREPARED IN THE OFFICE OF:

PENNONI ASSOCIATES INC.
5430 WADE PARK BLVD., SUITE 106,
RALEIGH, NC 27607 PHONE: 919.929.1173
FAX: 919.493.6548 NC LICENSE #F-1267

ERIC TWEED, PE *PROJECT UTILITY COORDINATOR*

DIVISION OF HIGHWAYS
UTILITIES UNIT
1555 MAIL SERVICES CENTER
RALEIGH NC 27699-1555
PHONE (919) 707-6690
FAX (919) 250-4151

ALI KOUCHEKI, PE *REGIONAL UTILITIES ENGINEER*
TRAVIS MORGAN, PE *DIV. 8 UTILITIES ENGINEER*
TRENT CAVINESS *DIV. 8 UTILITIES COORDINATOR*
DAYTON MARTIN *REG. UTILITIES COORDINATOR*

5/9/2024
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USERNAME

PROJECT REFERENCE NO.	SHEET NO.
R-2527	UE2
THIS SHEET CORRESPONDS TO RDY-5	

UTILITIES BY OTHERS

PENNONI ASSOCIATES INC.
5430 WADE PARK BLVD,. SUITE 106,
RALEIGH, NC 27607 PHONE: 919.929.1173
FAX: 919.493.6548 NC LICENSE #F-1267

PERMIT DRAWING
SHEET 2 OF 5

SITE 1

NAD 83/NA 2011

PROPOSED WATER LINE
MECHANIZED CLEARING

Open Cut
30 sq ft

UWHARRIE MARINE SALES & SERVICE LLC

ALD L PARTRIDGE

(001A) KENNETH R FURR

(2) SAMUEL HORACE McCALL III

CHARLES R MANESS

TOMMY A BLAKE

TOMMY A BLAKE

-L- TS Sta. 22+13.04=
L REV POT Sta. 10+00.00

-L- SC Sta. 24+13.04

MATCH TO SHEET OU-2
-L- STA. 14+50.00

MATCH TO SHEET UO-4
-LREV- STA. 16+00.00

L REV TS Sta. 13+16.56

L REV SC Sta. 15+56.56

P PROJECT R-2527
PROJECT R-2530B
Sta. 16+50.00

CENTURYLINK TO SPLICE TO EXISTING

NEW GUY ANCHOR BY REMC (TYP)

NEW OHP BY REMC (TYP)

NEW POLE BY REMC (TYP)

CENTURYLINK TO BORE LINE TO AVOID WETLAND

PERMANENT OHP BY REMC

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.

5/14/99

8/28/2024
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USERNAME

PROJECT REFERENCE NO.	SHEET NO.
R-2527	UE3
THIS SHEET CORRESPONDS TO RDY-6	

UTILITIES BY OTHERS

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.

Pennoni

PENNONI ASSOCIATES INC.
5430 WADE PARK BLVD., SUITE 106,
RALEIGH, NC 27607 PHONE: 919.929.1173
FAX: 919.493.6548 NC LICENSE #F-1267

NAD 83/NA 2011

PERMIT DRAWING
SHEET 3 OF 5

CENTURYLINK TO INSTALL NEW LINE.

CENTURYLINK TO INSTALL NEW HAND HOLE.

CENTURYLINK TO ABANDON EXISTING LINES

CENTURYLINK TO BORE DEEP TO AVOID IMPERVIOUS DIKE

CENTURYLINK TO SPLICE INTO EXISTING.

PERMANENT POLE BY REMC (TYP)

PERMANENT OHP BY REMC

NEW POLE BY REMC (TYP)

NEW OHP BY REMC (TYP)

NEW GUY ANCHOR BY REMC (TYP)

CENTURYLINK TO ABANDON EXISTING LINES

CENTURYLINK TO INSTALL NEW HAND HOLE.

MECHANIZED CLEARING

567 sq ft

67 sq ft

SAMUEL HORACE MCCALL, III AND WIFE LYNN CORDES MCCALL

MCRAE INDUSTRIES, INC.

CHARLES R. MANESS AND WIFE BETTY L. MANESS

TONY L. BURRIS AND WIFE, CHARLENE BURRIS

TOMICA FULLER

ROBIN P. LEMONS

JOHN FARLEY HALL, JR. AND WIFE, PHYLISS DOREEN HALL

FREDA M. LEE HARRIS

OWNER UNKNOWN

OHM2005, INC., A NORTH CAROLINA CORPORATION

-YIB_REV- POT Sta. 13+77.63

-YIB- PRC Sta. 15+14.02

-YIB_REV- PC Sta. 15+55.74

-YIB_REV- PRC Sta. 17+22.39

-YIB_REV- PT Sta. 18+12.18

-L_REV- POC Sta. 22+00.00

-YIA_REV- POT Sta. 10+00.00

-YIB_REV- POT Sta. 18+60.81

-YIA_REV- PT Sta. 16+32.97

-YIA_REV- PT Sta. 15+36.81

-YIA_REV- PC Sta. 16+03.14

-YIA_REV- POT Sta. 17+29.28

-YIA_REV- PT Sta. 16+

-YIA_REV- PRC Sta. 12+29.90

-YIA_REV- PRC Sta. 13+93.15

-YIA_REV- PC Sta. 10+48.62

END CONSTRUCTION -YIA_REV- POC

MATCH TO SHEET UO-3 -L_REV- STA. 16+00.00

MATCH TO SHEET UO-30 -YIB_REV- STA. 13+50.00

MATCH TO SHEET UO-5 -L_REV- STA. 26+00.00

SPECIAL LATERAL BASE DITCH TO BE UTILIZED AS A HAZARDOUS SPILL BASIN SEE DETAIL 79

STANDARD BASE DITCH W/CLASS I RIP RAP SEE DETAIL 57 SLOPE=1.5% EST 95 TONS EST DDE=170 CY

2@10'x10' RCBC

15" W/ELBOWS

END SBG +50 LT

SLUICE GATE

-R2527- 2

5/14/99

5/9/2024
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USERNAME

PROJECT REFERENCE NO.	SHEET NO.
R-2527	UE4
THIS SHEET CORRESPONDS TO RDY-33	

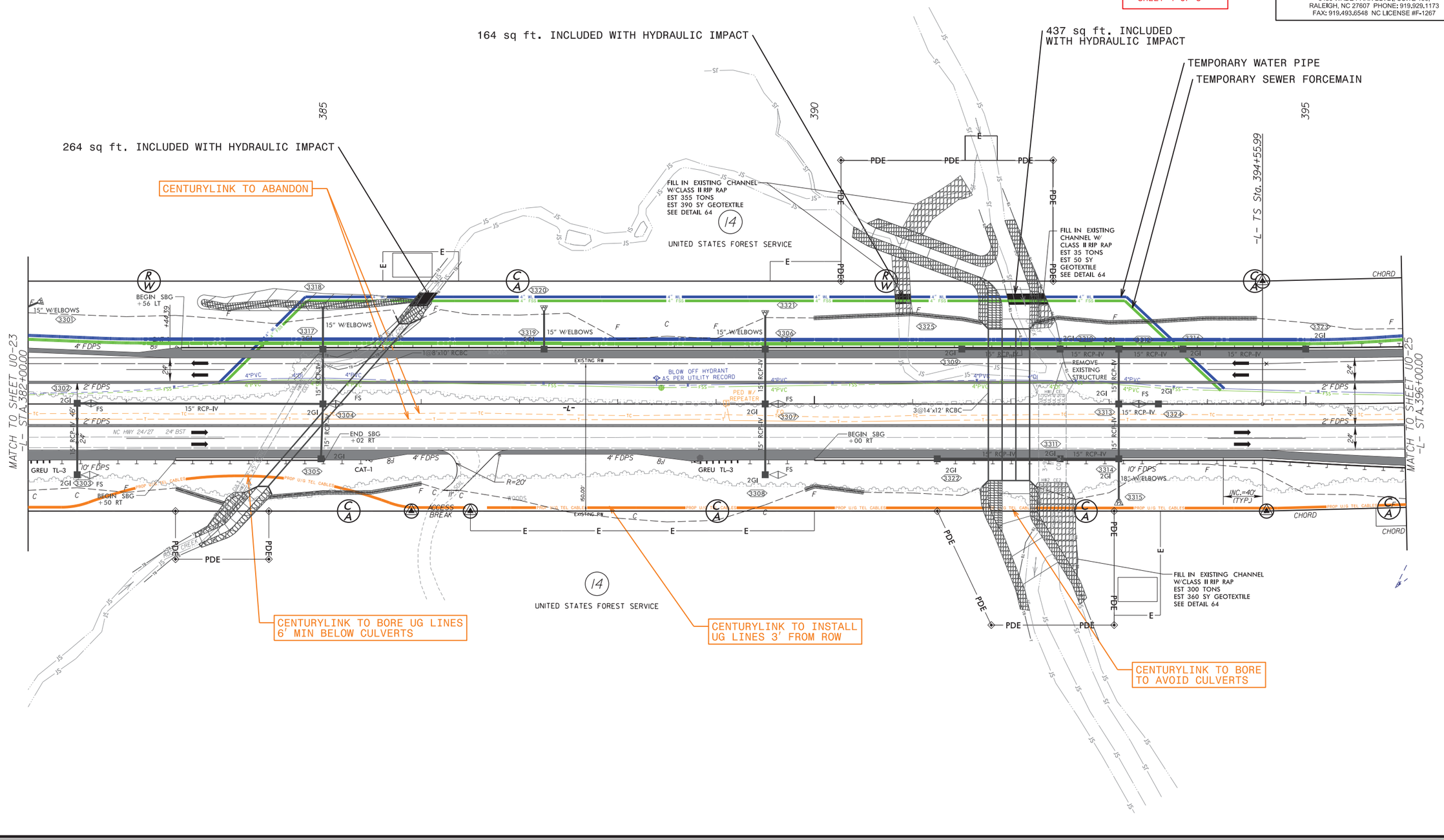
UTILITIES BY OTHERS

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.

NAD 83\NA 2011

PERMIT DRAWING
SHEET 4 OF 5

Pennoni
PENNONI ASSOCIATES INC.
5430 WADE PARK BLVD., SUITE 106,
RALEIGH, NC 27607 PHONE: 919.929.1173
FAX: 919.493.6548 NC LICENSE #F-1267



5/14/99

7/9/2024
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PROJECT REFERENCE NO.	SHEET NO.
R-2527	UE5
THIS SHEET CORRESPONDS TO RDY-35	

UTILITIES BY OTHERS

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.

Pennoni

5430 WADE PARK BLVD., SUITE 106,
RALEIGH, NC 27607 PHONE: 919.929.1173
FAX: 919.493.6548 NC LICENSE #P-0189

PERMIT DRAWING
SHEET 5 OF 5

NAD 83/NA 2011

Site 2

HAND CLEARING.024 ACRES
STA -L- 409+66-410+33

UNITED STATES FOREST SERVICE (14)

REMC TO USE HAND CLEARING METHODS IN WETLAND AREAS (TYP)

NEW OHP BY REMC (TYP)

CENTURYLINK TO ABANDON

CENTURYLINK TO INSTALL UG LINES 3' FROM ROW

NEW POLE BY REMC (TYP)

NEW GUY ANCHOR BY REMC (TYP)

BECKY W WALLACE (41)
UNKNOWN DB

MATCH TO SHEET UO-25
-L- STA 405+00.00

MATCH TO SHEET UO-27
-L- STA 417+00.00

-L- STA 414+08.36

-L- STA 416+89.36

REM

REMOVE

5/14/99

5/9/2024
...\UB_Project_Environmental Plans\R2527_ut_RDY35_UO26_env.dgn
USERNAME

WETLAND AND SURFACE WATER IMPACTS SUMMARY

	Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	WETLAND IMPACTS: Temp. Fill In Wetlands (ac)	WETLAND IMPACTS: Excavation in Wetlands (ac)	WETLAND IMPACTS: Mechanized Clearing in Wetlands (ac)	WETLAND IMPACTS: Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	SURFACE WATER IMPACTS: Temp. SW impacts (ac)	SURFACE WATER IMPACTS: Existing Channel Impacts Permanent (ft)	SURFACE WATER IMPACTS: Existing Channel Impacts Temp. (ft)	SURFACE WATER IMPACTS: Natural Stream Design (ft)
	Site 1	LREV 15+95	Open Cut Water Line			0.001	0.001						
#	Stream SB-1	LREV 17+75	Open Cut Water Line						0.013				
#	Stream SB-2	Y1B REV 17+45	Open Cut Water Line						0.001				
#	Stream SYA	L 386+00	Temporary Water & Sewer							0.006			
#	Stream SYA	L 391+00	Temporary Water & Sewer							0.004			
#	Stream SFB	L 392+00	Temporary Water & Sewer							0.010			
	Site 2	L 409+66/410+30	OH Power Line					0.024					
TOTALS*:				**0.00**	**0.00**	**0.00**	**0.00**	**0.02**	**0.01**	**0.02**	**0**	**0**	**0**

*Rounded totals are sum of actual impacts

NOTES:

Utility impacts contained within Hydro Permit Site impacts.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
5/9/2024
MONTGOMERY
R2527