STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

JOSH STEIN
GOVERNOR

DANIEL H. JOHNSON
SECRETARY

October 15, 2026

MEMORANDUM TO: Division Environmental and Construction Units

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

SUBJECT: Environmental Permits for the permanent repairs to US 74 A (Gerton Highway) from Bearwallow Mountain Road to East of the NC 9 intersection in Bat Cave.
Henderson County, Division 14, WBS 18314.1045039,
Work Package 4.

Please find enclosed the following permits for this project:

Agency	Permit Type	Expiration
US Army Corps of Engineers Section 404 Clean Water Act Permit	Regional General Permit 50 Action ID: SAW-2025-01756 Dated October 15, 2026	May 25, 2030
NC Division of Water Resources Section 401 Water Quality Certification	Individual Water Quality Certification Project ID: 20251220 Dated October 14, 2026	expires with above Permit

Work is authorized by the above-referenced documents and must be accomplished in strict accordance with the permitted plans.

The Environmental Coordination and Permitting Group (ECAP) or the Division Environmental Office must be consulted if any deviation from the permit(s) or accompanying drawings is required.

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

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

404 Permit (USACE)

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

October 15, 2026

Regulatory Division
SAW-2025-01756

Sent Via email: maturchy@ncdot.gov

Mr. Michael Turchy
NC Department of Transportation
1598 Mail Service Center
Raleigh, NC 27699-1598

Dear Mr. Turchy:

This letter is in response to the Pre-Construction Notification (PCN) you submitted to the Wilmington District, WRDA on September 24, 2026, for a Department of the Army Nationwide Permit (NWP) verification. This project has been assigned the file number SAW-2025-01756 and is known as the US 74A repair project Package 4. This file number should be referenced in all correspondence concerning this project.

A review of the information provided indicates that the proposed work would include the post Helene repairs to US 74A for Work Package 4 and will result in the re-establishment of 4,048 lf of stream channel, permanent loss of 4,484 lf of stream channel, permanent impact to 189 lf of stream channel due to bank stabilization, and the temporary impact to 1,124 lf of stream channel, and the permanent impact to 0.02 acres of wetlands. A permit verification was issued for Work Package 2 on October 10, 2025, and for Work Package 3 on August 31,2026, and all impacts previously authorized under these permit authorizations and in work package 4 are cumulative. As such, this permit verification authorizes all impacts for work packages 2, 3 and 4 and includes all previously authorized special permit conditions and hereby replaces the verifications issued October 10, 2025 and August 31, 2026.

The project begins near Gerton along US 74A at the Buncombe/Henderson County line and extends 5.75 miles to terminate at the intersection of US 74A with NC 9 in Bat Cave, Henderson County, North Carolina, at Latitude 35.48386 and Longitude -82.35314.

We have determined that the proposed work is authorized by Regional General Permit (RGP) 50 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 general permit conditions, any regional conditions, the special conditions listed in this letter, the application materials, and the enclosed plans. If the extent of the project area

and/or nature of the authorized impacts to waters are modified, a revised PCN must be submitted to this office for written approval before work is initiated. Any violation of permit conditions or deviation from your submitted plans may subject the permittee to enforcement action.

This verification is valid until May 25, 2030, unless prior to this date the subject GP(s) is suspended, revoked, or is modified such that the activity no longer complies with the terms and conditions of this GP. If you commence or are under contract to commence this activity before the date that the relevant GP is modified or revoked, you will have 12 months from the date of the modification or revocation of the GP to complete the activity under the present terms and conditions of this GP.

Project Specific Special Conditions:

1. The U.S. Fish and Wildlife Service's (USFWS's) Programmatic Biological (PBO) and Conference Opinion (PCO) and Programmatic Conference Report titled "Five Imperiled Bat Species in Western North Carolina" dated April 1, 2025, contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that are specified in the PBO/PCO. The USFWS adopted the PBO/PCO as the Programmatic Biological Opinion (PBO) for the effects of this action on July 7, 2025. Your authorization under this Corps permit is conditional upon your compliance with all the mandatory terms and conditions associated with incidental take of the PBO, 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 PBO, 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 PBO, and with the ESA.
2. Compensatory 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.
3. Hickory Creek re-establishment/relocation: This project will result in relocation and realignment of Hickory Creek which was heavily impacted during the Helene Hurricane in the fall of 2024. The work sites along Hickory Creek will improve stream stability, reduce hazard mitigation to the roadway structure and create a functional uplift to the currently failed stream. The work on Hyatt Mill Creek will be constructed and monitored in accordance with the enclosed documents titled "Mitigation Plan Relocation of Hickory Creek Henderson County WBS#18314.1045039 September 21,2026 Area: Work Package 4" and "Work Package #4 RFC Stream Relocation Plans 05/26/2026."
4. Due to the trout survey information now available, and other factors, the NCWRC recommends that NCDOT avoid instream work with this project from the January

1 to April 15 during the trout spawning moratorium. Over time this may become increasingly important due to chronic disturbances to Hickory Creek that may further deteriorate spawning habitat conditions and reduce trout spawning success. However, since the moratorium was initially waived for emergency repairs of US 74A, the NCWRC does not object to instream work during the moratorium where necessary. If instream work is conducted during the moratorium, it is important that excavation in flowing water be minimized and erosion controlled with applicable NCDOT requirements.

This NWP verification 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 Crystal Amschler, Project Manager of the WRDA/Transportation Branch at 828-526-6013, by mail at the above address, or by email at crystal.c.amschler@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



North Carolina Wildlife Resources Commission

M. Kyle Briggs, Executive Director

October 2, 2026

Crystal Amschler
U.S. Army Corps of Engineers, Asheville Regulatory Field Office
151 Patton Avenue, Room 208
Asheville, NC 28801

Amy Annino
401 and Buffer Transportation Permitting Branch
North Carolina Department of Environmental Quality
2090 U.S. 70 Highway, Swannanoa, NC 28778-8211

SUBJECT: Comments on Application for permanent repairs to US 74 A (Gerton Highway) from Grant Mountain Road to East of NC 9 Intersection in Bat Cave. Work Package #4 (WP4) Henderson County. **WBS 18314.1045039**.

The North Carolina Department of Transportation (NCDOT) applied for a 404 Permit and 401 Certification for the subject sectioned project. The North Carolina Wildlife Resources Commission's (NCWRC) comments are offered to help conserve the wildlife resources affected by the project and to promote wildlife-based recreation in accordance with applicable provisions of the Clean Water Act of 1977 (33 U.S.C. 466 et seq.) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667d).

The NCWRC has reviewed right-of-way plans in the field. Due to limited grading above the road, it appears the project should not directly affect documented locations of NC endangered Hickory Nut Gorge Green Salamander (*Aneides caryaensis*). However, other suitable habitats near the roadway may be impacted, mostly due to the removal of shading vegetation. This salamander is only found in extreme eastern Henderson County, so its population was likely severely impacted by the hurricane damage in the Bat Cave area. The NCWRC appreciates the NCDOT's continued willingness to place concrete barriers and plant trees adjacent to one recorded green salamander habitat near the eastern end of the WP4 project area.

Mailing Address: Habitat Conservation • 1721 Mail Service Center • Raleigh, NC 27699-1721
Telephone: (919) 707-0220 • **Fax:** (919) 707-0028

Hickory Creek (C Tr) in the project area supports a wild Rainbow Trout (*Onchorynchus mykiss)* population. As noted in prior comments on US 74A repair work, sampling of Hickory Creek in January 2026 did not produce trout near its junction with Middle Fork, which is in the WP4 project area. However, both adult and juvenile trout were found in Hickory Creek near Gerton (see photos), which indicates that habitat conditions there are suitable for trout spawning. Trout spawning should be expected in the upper portion of the WP4 area as well.

Due to the trout survey information now available, and other factors, the NCWRC recommends that NCDOT avoid instream work with this project during the January 1 to April 15 trout spawning moratorium. Over time this may become increasingly important due to chronic disturbances to Hickory Creek that may further deteriorate spawning habitat conditions and reduce trout spawning success. However, since the moratorium was initially waived for emergency repairs of US 74A, the NCWRC does not object to instream work during the moratorium where necessary. If instream work is conducted during the moratorium, it is important that excavation in flowing water be minimized and erosion controlled with applicable NCDOT requirements (North Carolina Department of Transportation Erosion Control Manual).

The following are specific recommendations on the proposed design of work that the NCWRC would appreciate consideration of and include as construction revisions to help minimize adverse impacts of the project on trout habitat:

1) Site 1. The need relocate and armor the stream should be reevaluated since it was not impacted much by flooding. It may be possible to leave the last 100 feet or so undisturbed because the existing channel is beyond the fill for the shoulder widening. This would help avoid some riparian vegetation, which is a general effort the WRC would appreciate throughout the project to help conserve stream shading and reduce further stream warming in the Hickory Creek watershed. Rip rap lining of the channel should be avoided as well unless shear calculations indicate actual scour is expected. Related to this, the detail depicts rip rap only on the new stream banks but there is a note for native material over the rip rap. If the channel is relocated, native material should extend onto the streambed, as likely intended, and be approved by NCDOT staff.

2) Site 4 (stream site 5). The grading and clearing of the rhododendron and other stabilizing mature vegetation on the south side of the channel should be avoided (see photo 3). It appears that the channel would not be shifted much anyway, likely because the space needed here for construction will be relatively narrow due to wall construction.

3) Site 8 (stream site 6). The grading and clearing of mature vegetation on the south side of the channel should be avoided in the easement.

4) Grading and clearing of mature riparian vegetation on the south side of the channel should be avoided in the easements at other sites as well, particularly sites 9, 12, and 17. At site 12 it will likely be impractical to fully move the channel, as proposed, anyway due to boulders and likely exposed bedrock (see photo 4). The stream relocation at Site 17 from about 271+00 to about 290+00 does not appear necessary for road repairs. If the channel is realigned here as proposed,

then it is particularly important that clearing be avoided where not necessary (which is primarily in the middle portion of the site where mature trees remain).

5) Like at site 1, the need to armor the stream channel entirely should be reevaluated. Coir matting with a native bed only may suffice and would be better for stream habitat.

In addition to considering the preceding comments, the NCWRC would appreciate the incorporation of the following conditions into the project to help conserve trout habitat in Hickory Creek:

1. PGR (partially grouted rock) should contain voids as specified by standards from the NCDOT hydraulic unit. This would better allow for eventual tree colonization.
2. Native material and large rock material should remain or be replaced along the face of knee/toe walls that will be in or close to streams.
3. Culvert clean-outs and channel excavation, where necessary, should not create perched outlet conditions.
4. Riprap should only extend vertically to or near the ordinary high level and coir matting should be used above that elevation. Rip rap should be avoided on streambeds except where bed scour is a concern. Rip rap placed on the streambed should be embedded or "keyed-in" below grade and topped with native material to prevent stream flow burial.
5. The streambeds should be restored upstream and downstream of new culvert installations with well-compacted native material or native material/rip rap mix (as directed by environmental staff) to one foot above the culvert inverts.
6. Erosion control matting with nylon mesh should not be used along streams since it entangles and kills wildlife. Nylon mesh matting is prohibited from use in riparian areas by WQ conditions. Coir matting should be used where erosion control matting is needed along streams.
7. Streambanks on channel changes should be matted, seeded, and planted with native trees.
8. Applicable measures from the current NCDOT Erosion and Sediment Control Design and Construction Manual should be adhered to (North Carolina Department of Transportation Erosion Control Manual). *Design Standards in Sensitive Waters* should be incorporated into design and construction to help ensure protection of trout spawning and good quality habitats. Where basins are not practical, comparable 25-year performance should be accommodated with other measures (see part (d) of 15A NCAC 04B .0124).
9. Sandbags, rock berms, cofferdams, or other diversion structures should be used to isolate flowing water from in-channel construction wherever practical. Channel changes should be excavated in the dry to the extent possible by first excavating material outside of direct stream flow.
10. Channel changes should be directed by the NCDOT engineer or delegated environmental staff.
11. **Like a reforestation plan, a field constructability and clearing review and flagging of revised clearing limits should be implemented to ensure the contractors and NCDOT representatives**

have a verified plan for actual grading and clearing needs. I would be glad to assist with that effort.

Please contact me at david.mchenry@ncwildlife.gov or (828) 476-1966 if you have any questions about these comments. Thank you for the opportunity to review and comment on this project. The NCWRC looks forward to assisting as needed as the project develops further.

Sincerely,

Dave McHenry
NCWRC Western NCDOT Coordinator

Cc: Michael Turchy, NCDOT ECAP
Patrick Breedlove, NCDOT Division 14 PDEA
Kevin Mitchell, NCDOT Division 14 Environmental Specialist II
Mark Endries, USFWS




Photos 1 and 2. Rainbow Trout collected in Hickory Creek below temporary pipe at Henderson bridge 262, January 9, 2026.

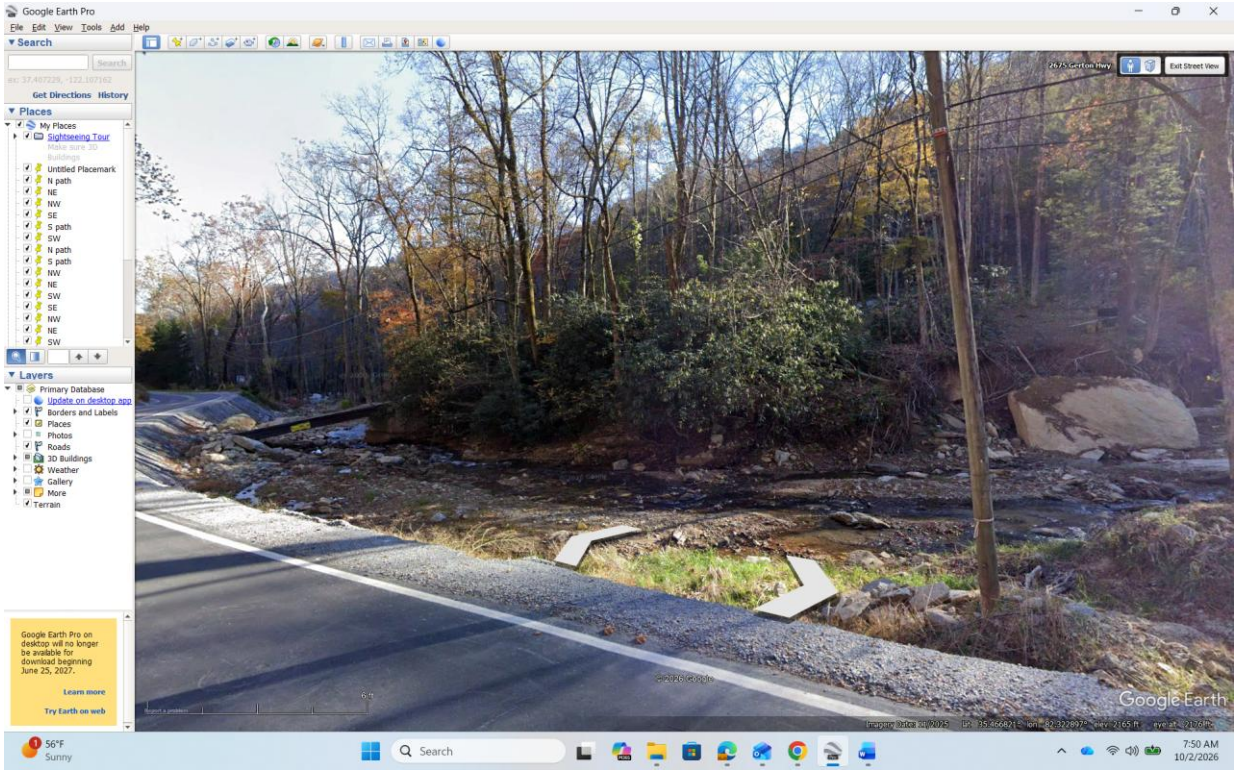


Photo 3. Site 4 (stream site 5) facing vegetated bank on south side of stream within proposed cut slope/clearing.

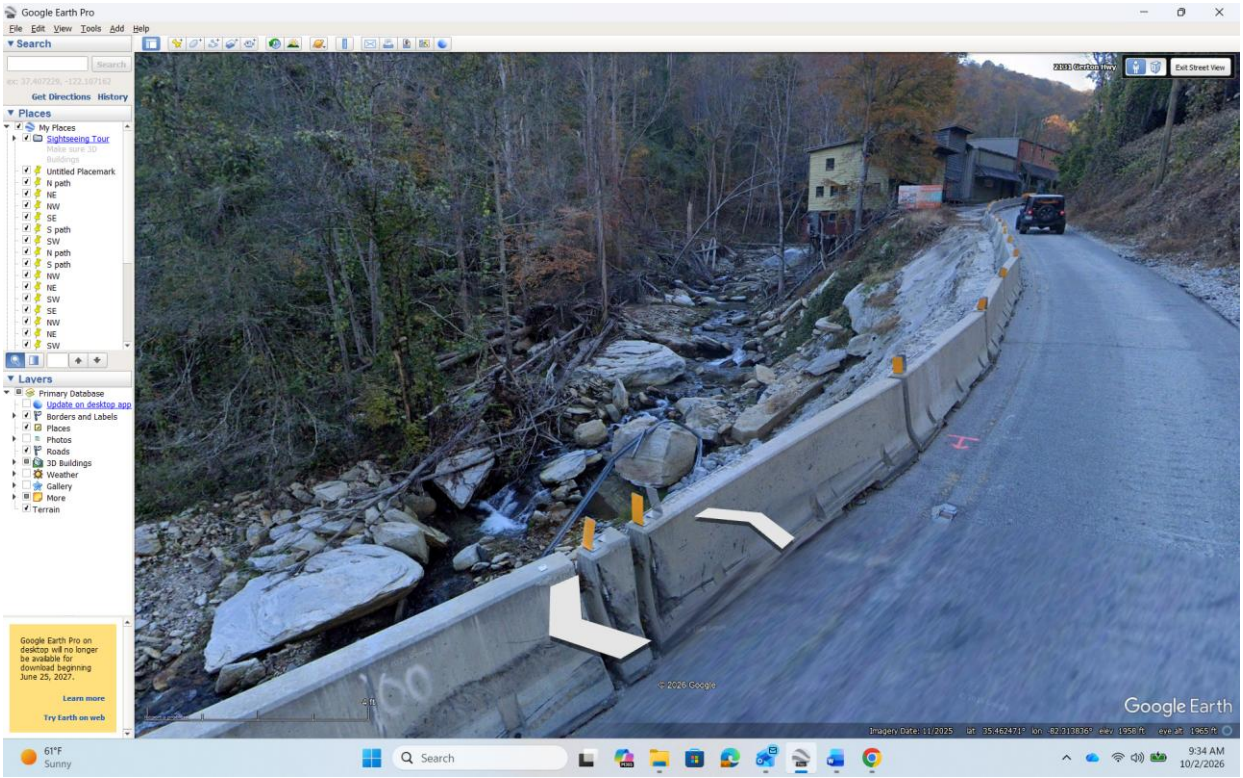


Photo 4. Site 12 facing upstream (note boulders and possible bedrock that will likely impede proposed channel realignment work).

U.S. Army Corps of Engineers (USACE)

CERTIFICATION OF COMPLIANCE WITH DEPARTMENT OF THE ARMY PERMIT

For use of this form, see Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act of 1899, and Section 103 of the Marine Protection, Research, and Sanctuaries Act; the proponent agency is CECW-COR.

Form Approved - OMB No. 0710-0003 Expires 2027-10-31

The Agency Disclosure Notice (ADN)

The Public reporting burden for this collection of information, 0710-0003, is estimated to average 10 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

PURPOSE: This form is used by recipients of U.S. Army Corps of Engineer Regulatory permits to certify compliance with the permit terms and conditions.

Your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with this permit, you are subject to permit suspension, modification, or revocation.

Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the U.S. Army Corps of Engineers, Wilmington District, Regulatory Office.

The certification can be submitted by email at crystal.c.amschler@usace.army.mil or by mail at the below address:

U.S. Army Corps of Engineers
Wilmington District Office
Street Address: 151 Patton Ave Rm 208
City: Asheville State: NC Zip Code: 28801

COMPLETED BY THE CORPS

Corps Action Number: SAW-2025-01756

Permit Type: General Permit

General Permit Number and Name (*if applicable*):

Name of Permittee: Michael Turchy

Project Name: the US 74A repair project Package 4

Project Location (*physical address*): US 74 in Gerton and Bat Cave, North Carolina

PERMITTEE'S CERTIFICATION

Date Work Started:

Date Work Completed:

Enclose photographs showing the completed project (*if available*).

I _____ hereby certify that the work authorized by the above referenced permit has been completed in accordance with all of the permit terms and conditions, and that any required compensatory mitigation has been completed in accordance with the permit conditions.

Name	Date	Signature

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

Permittee: NCDOT Division 14 **Action ID:** SAW-2025-01756
Project Name: post Helene repairs to US 74A work Package 4 **County:** Henderson

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:** 03050105, Broad River Basin

Stream Impacts (linear feet)			Wetland Impacts (acres)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
		4,455				

*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:** 03050105, Broad River Basin

Stream Mitigation (credits)			Wetland Mitigation (credits)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
		2,009				

Mitigation Site Debited: _____
(List the name of the bank to be debited. For umbrella banks, also list the specific site. For NCDMS, list NCDMS. If the NCDMS acceptance letter identifies a specific site, also list the specific site to be debited).

Section to be completed by the Mitigation Sponsor

Statement of Mitigation Liability Acceptance: I, the undersigned, verify that I am authorized to approve mitigation transactions for the Mitigation Sponsor shown below, and I certify that the Sponsor agrees to accept full responsibility for providing the mitigation identified in this document (see the table above), associated with the USACE Permittee and Action ID number shown. I also verify that released credits (and/or advance credits for 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: _____

Name of Sponsor's Authorized Representative: _____

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

USACE Wilmington District
Compensatory Mitigation Responsibility Transfer Form, Page 2

Conditions for Transfer of Compensatory Mitigation Credit:

- Once this document has been signed by the Mitigation Sponsor and the 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:

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: Crystal Amschler
USACE Field Office: WRDA Transportation Branch
US Army Corps of Engineers
151 Patton Avenue, Room 208
Asheville, NC 28801-5006
Email:

Crystal Amschler Digitally signed by Crystal Amschler
Date: 2026.10.15 11:54:35 -04'00'

Wilmington District Project Manager Signature | Click here to enter a date. **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.

Mitigation Plan

Relocation of Hickory Creek

Henderson County

WBS# 18314.1045039

September 21, 2026

Area: Work Package 4

1.0 Baseline:

The North Carolina Department of Transportation (NCDOT) will perform stream relocation efforts along Hickory Creek that parallels US-74A in Henderson County NC. The relocation project will take place along US-74A between Bearwallow Mountain Road and Grant Mountain Road, southeast of Asheville NC. This area along US-74 was heavily impacted during the Helene Hurricane in the fall of 2024. Hickory Creek is located within the USGS HUC 03050105 Broad River Basin. These relocation sites along Hickory Creek will improve stream stability, reduce hazard mitigation to the roadway structure and create a functional uplift to the currently failed stream.

2.0 Site Selection:

Hickory Creek runs at the toe of the existing roadway section of US-74A. Moving the stream away from US-74A will provide a long-term separation from the river and the established buffer from the existing roadway. These relocation efforts will facilitate a "jump start" to stream stability as well as prevent future destabilization of US-74A during high flow events such as Hellene.

3.0 Site Protection Instrument:

Due to the unique nature of this recovery project, including the presence of adjacent private property requiring access to US 74A, NCDOT will be unable to manage the proposed relocation site or prohibit any use inconsistent with its use as mitigation property.

At this time, NCDOT is aware of the need for potential driveway crossings throughout the project corridor, either by ford or by bridge. NCDOT has no involvement with these private undertakings with the exception of its legal responsibilities to grant driveway permits.

4.0 Objectives:

The goal of these relocation efforts is to relocate 4,048 ft of Hickory Creek to new location along the southeast side of US-74A. The functional relocation of these sections of stream will be accomplished through the engineered natural stream design, by Grant Ginn Consulting.

5.0 Mitigation Work Plan:

Due to the unique nature of this recovery project, the relocation sites will be constructed at the same time as the US-74A roadway reconstruction. Construction activities along US-74A will involve the permanent re-establishment of US 74A to modern highway standards, site grading, site planting, and natural stream design. Attached are the design plans of the areas that will be relocated.

6.0 Performance Standards:

Not applicable.

7.0 Monitoring Requirements:

The permittee shall monitor the restored channel for three years. To do this, the permittee shall establish three points along the restored reach (two within 50' on each end), take photographs at these points:
(1) immediately after restoration and stabilization activities have been completed, and
(2) every year after that for three years.
The permittee shall submit these photographs and a text description of observed channel stability within 60 days of completion of the project, then once a year for the next 3 years. If the restored channel is unstable for any reason during this three-year monitoring period (e.g., bank erosion, downcutting, etc.), or causes upstream or downstream bank erosion, the permittee shall immediately contact the USACE suggest corrective actions. Note that the required monitoring period may be extended if corrective actions are necessary.

8.0 Other Information:

Not applicable.

9.0 Determination of Credits:

The success of the relocation area and determination of final credits will be based upon successful completion of the relocation and closeout of the monitoring period to determine the use of this site to offset impacts associated with US-74A.

9.1 Credit Release Schedule:

NCDOT proposes to offset the impacts to the relocated portion of stream at varying stream ratios as noted in the Mitigation Summary document.

10.0 Geographic Service Area:

The proposed Geographic Service Area (GSA) for the relocations is composed of the Hydrologic Cataloging Unit (HUC) (03050105). All stream credits generated during these relocations will be used to offset impacts associated with US-74A (WBS# 18314.1045039)

11.0 Maintenance Plan:

Once monitoring is completed and the site is closed out, the need for long-term maintenance is not anticipated for the relocated sections of stream. Should destabilization or repair be required, NCDOT, in consultation with the appropriate environmental agencies, will propose a plan to re-stabilize an area of stream, if necessary.

12.0 Long Term Adaptative Management Plan

The site will be monitored by NCDOT according to the relocation plan. In the event that unforeseen issues arise that affect the management of the site, any remediation will be addressed by NCDOT, in consultation with the environmental agencies.

401 Certification (NCDWR)

Docusign Envelope ID: 979A8B02-DFFD-8AD1-810C-52D5A21646EA

JOSH STEIN
Governor
D. REID WILSON
Secretary
MICHAEL PJETRAJ
Director

NORTH CAROLINA
Environmental Quality

October 14, 2026

DWR #20251220 v4
Henderson County

North Carolina Department of Transportation
Attn: Michael Turchy
1598 Mail Service Center
Raleigh, NC 27606

Delivered via email to: maturchy@ncdot.gov

Subject: **Approval of Individual 401 Water Quality Certification**
Permanent Repairs to US 74A (Gerton Highway) from Grant Mountain Road to NC 9; WBS 18314.1045039
USACE Action ID. No. SAW-2025-01756

Location: 35.48386, -82.35314

Dear Mr. Michael Turchy:

Attached hereto is a copy of Certification No. WQC008282 issued to Mr. Michael Turchy and the North Carolina Department of Transportation (NCDOT), dated October 14, 2026. This Certification is being issued pursuant to a modification request submitted on September 24, 2026, with fee received on September 25, 2026, to complete permanent repairs to US 74A from Grant Mountain Road to NC 9. All of the authorized activities and conditions of certification associated with the Water Quality Certification No. WQC008282 dated September 26, 2025, and August 31, 2026, still apply except where superseded by this certification.

This Water Quality Certification does not relieve the recipient of the certificate (or the Permittee) of the responsibility to obtain all other required Federal, State, or Local approvals before proceeding with the project, including those required by, but not limited to, Sediment and Erosion Control, Non-Discharge, Water Supply Watershed, and Trout Buffer regulations.

Upon the presentation of proper credentials, the Division of Water Resources (Division or DWR) may inspect the property.

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This Water Quality Certification shall expire on the same day as the expiration date of the corresponding Section 404 Permit that is current at the time this Certification is issued. The conditions shall remain in effect for the life of the project, regardless of the expiration date of this Water Quality Certification.

Non-compliance with or violation of the conditions herein set forth may result in revocation of this Water Quality Certification for the project and may also result in criminal and/or civil penalties.

Notice regarding the right to contest this 401 Water Quality Certification decision is attached to this letter.

This letter completes the DWR's review under Section 401 of the Clean Water Act and 15A NCAC 02H .0500. Please contact Amy Annino at 828-296-4668 or amy.annino@deq.nc.gov if you have any questions or concerns.

Sincerely,

Signed by:
Faith Hardin
3185423002EA45E...
Faith Hardin, Supervisor
401 & Buffer Transportation Permitting Branch
Division of Water Resources, NCDEQ

Electronic cc: Crystal Amschler, USACE Asheville Regulatory Field Office
Holland Youngman, USFWS Asheville Field Office
Dave McHenry, NCWRC
Chad Plemmons, NCDOT Division 14 Environmental Officer
Kevin Mitchell, NCDOT Division 14 Environmental Specialist
Beth Harmon, DMS
DWR 401 & Buffer Permitting Branch Electronic file

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NOTICE REGARDING THE RIGHT TO CONTEST A DWR 401 WATER QUALITY CERTIFICATION AND/OR BUFFER AUTHORIZATION

Right of Persons Aggrieved to File a Contested Case for the Decision on a 401 Water Quality Certification and/or Buffer Authorization:
The Division's decision is subject to review under NCGS 150B-23.

Rights of Persons Aggrieved to File a Contested Case: Pursuant to NCGS 150B, Article 3, a party or person aggrieved may commence a contested case by filing a petition under NCGS 150B-23 in the Office of Administrative Hearings within 60 days after the Division provides notice of its decision on an application, as provided in NCGS 150B-23(f). If no contested case is commenced within the required time, the Division's decision is final and is not subject to review.

General Filing Instructions: A petition for contested case hearing must be in the form of a written petition, conforming to NCGS 150B-23, and filed with the Office of Administrative Hearings, 1711 New Hope Church Road, Raleigh NC, 27609, along with a fee in an amount provided in NCGS 150B-23.2. A petition for contested case hearing form may be obtained upon request from the Office of Administrative Hearings or on its website at https://www.oah.nc.gov/hearings-division/filing/hearing-forms. Additional specific instructions for filing a petition are set forth at 26 NCAC Chapter 03.

Service Instructions: A party filing a contested case is required to serve a copy of the petition, by any means authorized under 26 NCAC 03 .0102, on the process agent for the Department of Environmental Quality:

Daniel Hirschman, General Counsel
North Carolina Department of Environmental Quality
1601 Mail Service Center
Raleigh, North Carolina 27699-1601

If the party filing the petition is a person aggrieved other than the recipient of the certificate (the "Permittee"), the party must also serve the Permittee in accordance with NCGS 150B-23(a).

Be aware that other rules or laws may apply to the filing of a petition for a contested case. Additional information is available at https://www.oah.nc.gov/hearings-division/hearing-process/filing-contested-case. Please contact the Office of Administrative Hearings at (984) 236-1850 with all questions regarding the filing fee and/or the details of the filing process.

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NORTH CAROLINA 401 WATER QUALITY CERTIFICATION

CERTIFICATION #WQC008282 is issued in conformity with the requirements of Section 401, Public Laws 92-500 and 95-217 of the United States and subject to North Carolina's Regulations in 15 NCAC 02H .0500 and 15A NCAC 02B .0200, to Mr. Michael Turchy and NCDOT, who have authorization for the impacts listed below, as described within your application received by the N.C. Division of Water Resources (DWR) on September 24, 2026, with fee received on September 25, 2026, and additional information received on October 8, 2026, and by Public Notice issued by the DWR on April 30, 2026, and within the *Reasonable Period of Time* pursuant to 40 CFR Part 121.6.

Type of Impact	Stream Re-Establishment to Pre-Helene Location	Amount Approved Permanent Fill (loss)	Amount Approved Permanent Bank Stabilization	Amount Approved Temporary	Mitigation Amount Required
Perennial Streams					
Site 3 / Hickory Creek / Bank Stabilization	0	0	50 linear feet	0	0 credits
Site 4 / Hickory Creek / Stream Realignment	0	450 linear feet	0	47 linear feet	113 credits
Site 6 / UT Hickory Creek / Debris removal and stabilization	0	29 linear feet	0	18 linear feet	0 credits
Site 8 / Hickory Creek / Stream realignment	213 linear feet	265 linear feet	0	48 linear feet	66 credits
Site 9 / Hickory Creek / Stream realignment	169 linear feet	0	0	14 linear feet	0 credits
Site 11 / Hickory Creek / Bank stabilization and PGR easement impacts	0	0	94 linear feet	327 linear feet	0 credits
Site 12 / Hickory Creek / Stream realignment	139 linear feet	282 linear feet	0	0	71 credits
Site 13 / Hickory Creek / Bank Stabilization and PGR easement impacts	0	0	25 linear feet	195 linear feet	0 credits
Site 14 / Hickory Creek / Stream realignment	178 linear feet	325 linear feet	0 linear feet	72 linear feet	81 credits
Site 15 / Hickory Creek / Stream realignment	291 linear feet	240 linear feet	20 linear feet	152 linear feet	60 credits
Site 16 / Hickory Creek / Stream realignment	227 linear feet	0	0	53 linear feet	0 credits
Site 17 / Hickory Creek / Stream realignment	2,831 linear feet	1,634 linear feet	0	52 linear feet	409 credits
Site 18 / Hickory Creek / Stream realignment	0	449 linear feet	0	0	449 credits

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Type of Impact	Stream Re-Establishment to Pre-Helene Location	Amount Approved Permanent Fill (loss)	Amount Approved Permanent Bank Stabilization	Amount Approved Temporary	Mitigation Amount Required
Site 20 / UT Hickory Creek / Culvert replacement and retaining wall	0	13	0	12 linear feet	0 credits
Totals:	*4,048 linear feet*	*4,484 linear feet*	*189 linear feet*	*990 linear feet*	**1,296 credits*

** Reflects approved reduction in mitigation ratio*

Intermittent Streams					
Type of Impact	**Stream Re-Establishment to Pre-Helene Location**	**Amount Approved Permanent Fill (loss)**	**Amount Approved Permanent Bank Stabilization**	**Amount Approved Temporary**	**Mitigation Amount Required**
Site 1 / UT Hickory Creek / Stream Realignment	0	217 linear feet	0	0 linear feet	0 credits
Site 2 / UT Hickory Creek / Stream Realignment and culvert extension	0	209 linear feet	0	21 linear feet	0 credits
Site 5 / UT Hickory Creek / Replace RCP culvert & channel stabilization	0	32 linear feet	0	39 linear feet	0 credits
Site 7 / UT Hickory Creek / New RCP culvert	0	160 linear feet	0	20 linear feet	0 credits
Site 19 / UT Hickory Creek / New RCP culvert for fill slope and retaining wall	0	124 linear feet	0	20 linear feet	0 credits
Site 21 / UT Hickory Creek / Replace RCP culvert	0	25 linear feet	0	9 linear feet	0 credits
Site 22 / UT Hickory Creek / Debris removal and dewatering	0	0	0	25 linear feet	0 credits
Totals:	*0*	*767 linear feet*	*0*	*134 linear feet*	*0 credits*

Type of Impact	Amount Approved Permanent Excavation (loss)	Amount Approved Temporary	Amount Approved Temporary Hand Clearing	Mitigation Amount Required
Riparian Wetlands				
Site 10 / Wetland 1 / Excavation for cut slope	0.02 acres	0	0	*0 credits*
Totals:	*0.02 acres*	*0*	*0*	*0 credits*

The State of North Carolina certifies that this activity will comply with water quality requirements and the applicable portions of Sections 301, 302, 303, 306, 307 of the Public Laws 92-500 and PL 95-217 if

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conducted in accordance with the application, the supporting documentation, and conditions hereinafter set forth.

The following impacts are hereby approved. No other impacts are approved, including incidental impacts. [15A NCAC 02H .0506(b)]

This approval requires you to follow the conditions listed in the Certification below.

CONDITIONS OF CERTIFICATION [15A NCAC 02H .0507(c)]:

1. Mitigation must be provided for the proposed impacts as specified in the table below. The attached Compensatory Mitigation Responsibility Transfer Form (Form) shall be completed and provided to the Division prior to *any* impacts occurring. If the Mitigation Provider specified on the attached Form(s) for the proposed impacts changes after issuance of this Certificate, then the Permittee shall request a revised Compensatory Mitigation Responsibility Transfer Form from the Division prior to conducting any impacts.

	Compensatory Mitigation Required	**River Basin & HUC Number**
Perennial Stream	1,296 linear feet (credits)	Broad River Basin HUC 03050105

Citation: 15A NCAC 02H .0506(c); 15A NCAC 02H .0507(c)

2. The plans and specifications for this project are incorporated by reference as part of this Water Quality Certification. Any final construction plans for a project must include or reference the application and plans submitted to the DWR. The Permittee must evaluate all other acquired permits to ensure that they are consistent with the plans submitted to the DWR, and all relative impacts are accounted for and shown on the final construction plans. Any modifications or additional impacts to streams and/or wetlands and/or waters within the project require the permittee to notify the DWR and may require submission of a new application package with the appropriate fee.

   Citation: 15A NCAC 02H .0506(b)(2) and (3); 15A NCAC 02H .0507(c)

3. If the property is sold, the Permittee shall provide the new owner with a copy of this Certification and all plans and specifications incorporated by reference. The Permittee may transfer a Certification to the new owner by submitting a letter to the Division with the following statement: *"At the time the property is transferred, the terms and conditions of this 401 Individual Water Quality Certification, including the responsibility to ensure compliance, are binding on the new owner(s) of the property."* The letter shall be signed and dated by both the transferee and the new owner.

   Citation: 15A NCAC 02H .0507(d)(2)

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4. 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.

   Citation: 15A NCAC 02H.0506(b)(2) and (b)(3)

5. The stream channel relocation area shall be constructed to ensure that the stream channel will be substantially similar in width and water depth as the existing channel. The channel shall be constructed such that the tie-in with the natural channel at each end shall ensure that upstream and downstream stream beds and stream banks are protected from erosion. The permittee shall provide on-site supervision of the relocation work by an appropriately trained individual. Visual monitoring of the relocated channel tie-in locations shall be conducted at a minimum of quarterly for the first year or two bankfull events (whichever is longer), to confirm the site remains stable.

   Citation: 15A NCAC 02H .0506(b)(1) and (2)

6. All stream channel relocations will be constructed in a dry work area and stabilized before stream flows are diverted. Channel relocations will be completed and stabilized, and must be approved by NCDWR staff, prior to diverting water into the new channel. 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 practicable. All stream banks shall be matted with coir fiber matting. 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.

   Citation: 15A NCAC 02H .0506(b)(3)

7. The permittee shall provide on-site supervision of stability work including, but not limited to bank re-sloping, channel re-establishment and relocation, in-stream structure placement, and riparian zone re-establishment, by an appropriately trained individual.

   Citation: 15A NCAC 02H .0506(b)(1) and (2)

8. Visual monitoring of the channel re-establishment and relocation project shall be conducted at a minimum of quarterly for the first year or two bankfull events (whichever is longer), and then annually until the site is stable (particularly after storm events) and vegetation is successful. Any failures of structures, stream banks, or vegetation may require future repairs or replacement, which requires coordination with the Asheville Regional Office to ensure the stability and water quality of the stream and downstream waters.

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Citation: 15A NCAC 02H .0506(b)(1), (2) and/or (3)

9. In-stream structures installed to mimic natural channel geomorphology such as step-pool structures, etc. shall be designed and installed in such a manner that allow for continued aquatic life movement.

   Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c)

10. The permittee shall avoid the removal of existing trees within the Temporary Easement Area adjacent to the stream as much as practicable. The permittee shall provide a Reforestation Plan for areas where trees within an established Riparian buffer are removed to re-establish and relocate the stream channel. The Reforestation Plan shall include riparian tree species native to the North Carolina mountain region and should be submitted to DWR for review and approval. Vegetation must be reestablished in the riparian areas within the construction limits of the project by the end of the growing season following completion of construction.

    Citation: 15A NCAC 02B.0506(b)(2)

11. The permittee shall use *Design Standards in Sensitive Watersheds* (15A NCAC 4B.0124[a]-[e]) in areas draining to Trout (Tr) waters.

12. For projects impacting waters classified by the NC Environmental Management Commission as Trout (Tr), stormwater shall be directed to vegetated buffer areas, grass-lined ditches or other means appropriate to the site for the purpose of pre-treating storm water runoff prior to discharging directly into streams. Mowing of existing vegetated buffers is strongly discouraged.

    Citation: 15A NCAC 02H .0506(b)(2) and 15A NCAC 04B.0125

13. If the project is covered by NPDES Construction Stormwater Permit Number NCG010000 or NPDES Construction Stormwater Permit Number NCG250000, full compliance with permit conditions including the erosion and sedimentation control plan, inspections and maintenance, self-monitoring, record keeping and reporting requirements is required. Please note the extra protections for the sensitive watersheds.

    Citation: 15A NCAC 02H .0506(b) and (c); 15A NCAC 02H .0507(c)

14. The Permittee shall allow the Director, or an authorized representative (including an authorized contractor acting as a representative of the Director), upon the presentation of credentials and other documents as may be required by law, to: *Citation: 15A NCAC 02H .0502(e); 15A NCAC 02H .0507(c)*

    a. Enter, at reasonable times, upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this certificate;

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b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this certificate;
c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this certificate; and
d. Sample or monitor at reasonable times, for the purposes of assuring certificate compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location

15. All wetlands, streams, and surface waters located within the limits of disturbance and within 50 feet of the limits of disturbance/construction area on the project site shall be clearly marked (example- orange fabric fencing) prior to any land disturbing activities. The marking/fencing shall be maintained until the project or project phase is completed. Impacts to areas within the marked area/fencing are prohibited unless otherwise authorized by this certification.

    Citation: 15A NCAC 02H .0506(b)(2); 15A NCAC 02H .0507(c)

16. When requested by DWR, the Permittee and/or authorized agent shall schedule a pre-construction meeting with DWR, shall contact the appropriate DWR Regional Office upon project commencement of construction, shall submit a Certificate of Completion and/or shall provide as-built documentation.

    Citation: 15A NCAC 02H .0502(e); 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c)

17. The permittee shall report to the appropriate DWR Regional Office any noncompliance with, and/or any violation of, stream or wetland standards [15A NCAC 02B .0200], including but not limited to sediment impacts to streams or wetlands. Information shall be provided orally within 24 hours (or the next business day if a weekend or holiday) from the time the permittee became aware of the non-compliance circumstances.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c)

18. No additional temporary or permanent impacts from waste, spoil, solids, fill, excavation, or staging of equipment, shall occur in wetlands or waters beyond the footprint of the impacts (including temporary impacts) identified in this Certification.

    Citation: 15A NCAC 02H .0506; 15A NCAC 02H .0507(c)

19. When applicable, all construction activities shall be performed and maintained in full compliance with G.S. Chapter 113A Article 4 (Sedimentation Pollution Control Act of 1973). Regardless of applicability of the Sedimentation Pollution Control Act, all projects shall incorporate appropriate Best Management Practices for the control of sediment and erosion so that no violations of state water quality standards, statutes, or rules occur.

    Design, installation, operation, and maintenance of all sediment and erosion control measures shall be equal to or exceed the requirements specified in the most recent version of the *North Carolina Erosion and Sediment Control Planning and Design Manual*, or the *North Carolina Department of Transportation Erosion and Sediment Control Design and Construction Manual*.

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Appropriate measures should be installed prior to any land clearing activities to protect wetlands, streams, and/or buffers from turbidity and/or sedimentation. These measures should be routinely inspected and properly maintained, and excavated materials should be contained outside wetland, stream, and/or buffer boundaries.

For installation of bridges that involve driving or drilling activities within stream channels, open waters, or along streambanks turbidity curtains shall be installed within the surface water.

All devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) sites, including contractor-owned or leased borrow pits associated with the project. Sufficient materials required for stabilization and/or repair of erosion control measures and stormwater routing and treatment shall be on site at all times.

For borrow pit sites, the erosion and sediment control measures shall be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual*. Reclamation measures and implementation shall comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act and the Mining Act of 1971.

If the project occurs in waters or watersheds classified as Primary Nursery Areas (PNAs), SA, WS-I, WS-II, High Quality Waters (HQW), Outstanding Resource Waters (ORW), Trout (Tr) or 303(d) then the sedimentation and erosion control designs shall comply with the requirements set forth in 15A NCAC 04B .0124, *Design Standards in Sensitive Watersheds*.

Citation: 15A NCAC 02H .0506(b)(2); 15A NCAC 02H .0507(c); 15A NCAC 02B .0200; 15A NCAC 02B .0231

20. Sediment and Erosion Control Measures (S&EC) in wetlands or waters should be avoided to the maximum extent possible and any S&EC occurring in wetlands or waters shall be restored to pre-existing conditions upon completion of the project. The Permittee shall utilize sediment and erosion control measures that avoid and minimize the need for the placement of silt fence along streams at the normal water level. Where measures are placed within authorized impact areas then placement of such measures shall not be conducted in a manner that results in a loss of function of any wetlands, streambeds, or streambanks. Any erosion control measures, including silt fence, installed within wetlands shall be removed from wetlands and the natural grade restored and revegetated within two (2) months of the date the appropriate sediment and erosion control program has released the specific area within the project to ensure wetland standards are maintained upon completion of the project.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c); 15A NCAC 02B .0200; 15A NCAC 02B .0231

21. Erosion control matting shall not be placed within a stream bed. Erosion control matting that incorporates plastic mesh and/or plastic twine shall not be used along streambanks or within wetlands.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c)

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22. The North Carolina Department of Transportation (NCDOT) shall maintain full compliance with the conditions related to construction activities and post construction stormwater design, construction and maintenance, within the most recent version of their Individual NPDES Stormwater Permit Number NCS000250.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c); 15A NCAC 02B .0200; 15A NCAC 02B .0231

23. All work in or adjacent to streams, ponds, lakes, and reservoirs shall be conducted so that the work area is isolated from surface waters. Approved best management practices from the most current version of the DEMLR *NC Erosion and Sediment Control Planning and Design Manual*, or the *NC Department of Transportation Best Management Practices For Construction and Maintenance Activities Manual*, such as sandbags, rock berms, cofferdams, pump-arounds, and other diversion structures shall be used to minimize excavation in flowing water. Water that comes in contact with the work area shall be treated through an appropriate sediment/erosion control measure (sediment basin, filter bag, etc) prior to discharging to a surface water. All temporarily disturbed areas for the purpose of isolation/dewatering shall be restored to original grade, including each stream's original cross-sectional dimensions, planform pattern, and longitudinal bed profile. All temporarily impacted sites shall be restored and stabilized with native vegetation as practicable. *Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c); 15A NCAC 02B .0200*

24. Work within a designated trout watershed as identified by the Wilmington District of the US Army Corps of Engineers or work within identified state or federal endangered or threatened species habitat shall be coordinated with NCWRC and/or DMF prior to initiating of project activities.

    The Permittee shall adhere to NCWRC and/or DMF recommended moratoria. Exceptions to this condition require written approval by the resource agency responsible for the given moratorium. If activities must occur during periods of high biological activity of aquatic species (e.g. sea turtle nesting, fish spawning, or bird nesting) all biological surveys, relocations, and/or monitoring requested by the state agency must be conducted.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c); 15A NCAC 04B .0125

25. Demolition of existing structures, such as culvert or bridge removal, shall be conducted to ensure water quality standards are maintained. NCDOT activities shall adhere to NCDOT's *Best Management Practices for Construction and Maintenance Activities*.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c); 15A NCAC 02B .0200

26. Rip-rap groins proposed in accordance with 15A NCAC 07H .1401 (NC Division of Coastal Management General Permit for construction of Wooden and Rip-rap Groins in Estuarine and Public Trust Waters) shall meet all the specific conditions for design and construction specified in 15A NCAC 07H .1405.

    Citation: 15A NCAC 02H .0507(c); 15A NCAC 07H .1400

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27. Culverts shall be designed and installed in such a manner that the original stream profiles are not altered and allows for aquatic life movement during low flows. The dimension, pattern, and profile of the stream above and below a pipe or culvert 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 culvert shall be such as to pass the average historical low flow and spring flow without adversely altering flow velocity. If the width of the culvert is wider than the stream channel, the culvert shall include multiple boxes/pipes, baffles, benches and/or sills to maintain the natural width of the stream channel. If multiple culverts/pipes/barrels are used, low flows shall be accommodated in one culvert/pipe and additional culverts/pipes shall be installed such that they receive only flows above bankfull.

    Placement of culverts and other structures in streams shall also meet one of the following requirements:

    a. For structures less than 72” in diameter/width and in area where topographic constraints dictate culvert slopes will be greater than 2.5%, culverts shall be installed “at grade” such that low flow conditions in the stream are maintained provided that all alternative options for flattening the slope have been investigated and aquatic life movement/connectivity has been provided when possible (e.g. rock ladders, cross-vanes, sills, baffles etc.); or
    b. When bedrock is present in culvert locations, culvert burial is not required, provided that there is documentation of the presence of bedrock.
    c. For all other culverts:
        i. Culverts with a diameter greater than 48 inches shall be below the elevation of the streambed by one foot
        ii. Culverts with diameter less than or equal to 48 inches shall be below the streambed by 20% of the culvert diameter

    If a culvert outlet is submerged within a pool or scour hole and designed to provide for aquatic passage, then culvert burial into the streambed is not required.

    Documentation such as a location map of the culvert, culvert profile drawings, slope calculations, geotechnical reports, photographs, etc. shall be provided to DWR upon written request.

    For culvert replacements within the same location/footprint, and of similar length, culverts shall be designed and installed to meet the above requirements of this Condition unless prohibited by existing conditions on site, such as existing infrastructure or topographic constraints.

    Installation of culverts in wetlands shall ensure continuity of water movement and be designed to adequately accommodate high water or flood conditions. When roadways, causeways, or other fill projects are constructed across FEMA-designated floodways or wetlands, openings such as culverts or bridges shall be provided to maintain the natural hydrology of the system as well as prevent constriction of the floodway that may result in destabilization of streams or wetlands.

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The establishment of native woody vegetation and other soft stream bank stabilization techniques shall be used where practicable instead of rip-rap or other bank hardening methods.

Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c)

28. Application of fertilizer to establish planted/seeded vegetation within disturbed riparian areas and/or wetlands shall be conducted at agronomic rates and shall comply with all other Federal, State and Local regulations. Fertilizer application shall be accomplished in a manner that minimizes the risk of contact between the fertilizer and surface waters.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c); 15A NCAC 02B .0231

29. Discharging hydroseed mixtures and washing out hydroseeders and other equipment in, or adjacent to, surface waters is prohibited.

    Citation: 15A NCAC 02H.0506(b)

30. If concrete is used during construction (including bulkhead components, such as deadman anchors, tie-back systems and concrete caps), then all necessary measures shall be taken to isolate the concrete from waters of the state by maintaining a dry work area to prevent direct contact between curing concrete and surface waters. Drill slurry and water that inadvertently contacts uncured concrete shall not be discharged to waters of the state. 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. Any water that contacts uncured concrete shall be captured, treated, and disposed of properly.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c); 15A NCAC 02B .0200; 15A NCAC 02B .0231

31. All temporary pipes, culverts, rip-rap pads etc. in streams shall be installed so as not to restrict stream flow or installed in such a manner that restricts aquatic life movement during low flow conditions. All temporary pipes and/or culverts shall be installed as outlined in the most recent edition of the *North Carolina Erosion and Sediment Control Planning and Design Manual* or the *North Carolina Surface Mining Manual* or the *North Carolina Department of Transportation Best Management Practices for Construction and Maintenance Activities*.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c)

Docusign Envelope ID: 979A8B02-DFFD-8AD1-810C-52D5A21646EA

32. All temporary fill and temporary culverts shall be removed, and the impacted area shall be returned to natural conditions, within 60 calendar days after the temporary impact is no longer necessary. The impacted areas shall be restored to original grade, including each stream's original cross-sectional dimensions, planform pattern, and longitudinal bed profile. All temporarily impacted sites shall be restored and stabilized with native vegetation when practicable. For all areas where wetlands are impacted by temporary roads constructed by temporary fill material, the Permittee shall remove the fill material and conduct activities necessary to restore preconstruction hydrology by addressing soil compaction. When temporary fill has been added to wetlands, or heavy equipment has been placed within a wetland, the Permittee shall ensure restoration of preconstruction soil conditions when restoring wetland areas. Upon restoration of the wetland, the Permittee shall inspect the area quarterly for a minimum of two years to document successful restoration. The Permittee shall provide documentation of inspections to DWR when requested. The monitoring requirement can be relieved with review and written approval by DWR. If the area is not restored to preconstruction conditions the impacts shall be considered permanent, and the Permittee shall request a modified Certification from DWR. With prior written approval from DWR, removal of temporary fill and temporary culverts and restoration of the impacted area may be postponed to accommodate moratorium periods.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c)

33. Any rip-rap or other armoring materials required for proper culvert placement, stream stabilization, or restoration of temporarily disturbed areas shall be restricted to the area directly impacted by the construction activity covered by this Certification. All rip-rap or other non-natural armoring material placed in streams shall be placed such that the original streambed elevation and streambank contours are restored, and that the finished elevation of the rip rap shall not exceed that of the original stream bed. All rip-rap or other armoring materials shall consist of clean rock or masonry material free of debris or toxic pollutants. Placement of rip-rap or other armoring materials shall not result in de-stabilization of the stream bed or banks upstream or downstream of the area or be installed in a manner that precludes aquatic life passage.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c)

34. Any rip-rap or other non-natural armoring material (i.e. gabion baskets, revetments, bulkheads, seawalls, retaining walls) used for stream or shoreline stabilization shall be of a size and density to prevent movement by wave, current action, or stream flows, and shall consist of clean rock or masonry material free of debris or toxic pollutants. Rip-rap or other armoring materials shall not be installed in the streambed except in specific areas required for velocity control and to ensure structural integrity of bank stabilization measures. Any rip-rap or other armoring materials placed in the streambed shall be such that the finished elevation of the rip rap or other armoring materials shall not exceed that of the original stream bed.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c); 15A NCAC 02B .0201

Docusign Envelope ID: 979A8B02-DFFD-8AD1-810C-52D5A21646EA

35. All mechanized equipment operated near surface waters shall be inspected and maintained regularly to prevent contamination of surface waters from fuels, lubricants, hydraulic fluids, or other toxic materials. Construction shall be staged in order to minimize the exposure of equipment to surface waters to the maximum extent practicable. Fueling, lubrication, and general equipment maintenance shall be performed in a manner to prevent, to the maximum extent practicable, contamination of surface waters by fuels and oils.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c); 15A NCAC 02B .0200; 15A NCAC 02B .0231

36. Heavy equipment working in wetlands shall be placed on mats or non-impact equipment shall be used to ensure no disturbance and/or compaction of soil from equipment except within the footprint of the impacts covered by this Certification. Heavy equipment necessary for in stream activities shall be operated from the banks to the maximum extent practical and in no cases shall cause unstable stream banks or a violation of water quality standards.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c); 15A NCAC 02B .0231

37. In accordance with G.S. 143-215.85(b), the Permittee shall report any petroleum spill of 25 gallons or more; any spill regardless of amount that causes a sheen on surface waters; any petroleum spill regardless of amount occurring within 100 feet of surface waters; and any petroleum spill less than 25 gallons that cannot be cleaned up within 24 hours.

    Citation: 15A NCAC 02H .0507(c); N.C.G.S 143-215.85(b)

38. The Permittee and their authorized agents shall conduct all 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.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c)

39. A copy of this Certification shall be retained on site during the construction and maintenance of this project, or with the project manager, and be available for inspection at all times. The Permittee shall require its contractors and/or agents to comply with the terms and conditions of this Certification 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 Certification. If the Permittee becomes aware of any inability to comply with any of the conditions of this Certification, they must notify the appropriate Regional Office within 24 hours (or the next business day if a weekend or holiday) from the time the Permittee becomes aware of the circumstances.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c)

40. This Water Quality Certification neither grants nor affirms any property right, license, or privilege in any lands or waters, or any right of use in any waters. This Water Quality Certification does not authorize any person to interfere with the riparian rights, littoral rights, or

Docusign Envelope ID: 979A8B02-DFFD-8AD1-810C-52D5A21646EA

water use rights of any other person and does not create any prescriptive right or any right of priority regarding any usage of water. This Water Quality Certification shall not be interposed as a defense in any action respecting the determination of riparian or littoral rights or other rights to water use. No consumptive user is deemed by virtue of this Water Quality Certification to possess any prescriptive or other right of priority with respect to any other consumptive user.

Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c)

This Water Quality Certification shall expire on the same day as the expiration date of the corresponding Section 404 Permit that is current at the time this Certification is issued. The conditions shall remain in effect for the life of the project, regardless of the expiration date of this Water Quality Certification.

Upon completion of the proposed project, the applicant shall submit a Certificate of Completion and/or shall provide as-built documentation. Certificates of Completion and/or as-built documentation can be submitted via the DWR website: https://edocs.deq.nc.gov/Forms/Certificate-of-Completion.

This, the 14th day of October 2026

Signed by:
Faith Hardin
3185423002EA45E...

Faith Hardin, Supervisor
401 & Buffer Transportation Permitting Branch
Division of Water Resources, NCDEQ

Docusign Envelope ID: 979A8B02-DFFD-8AD1-810C-52D5A21646EA

JOSH STEIN
Governor
D. REID WILSON
Secretary
MICHAEL PJETRAJ
Director

NORTH CAROLINA
Environmental Quality

COMPENSATORY MITIGATION RESPONSIBILITY TRANSFER FORM

October 14, 2026

Permittee: North Caroliana Department of Transportation

Project # 20251220 V4

Project Name: Permanent Repairs to US 74A (Gerton Highway) from Bearwallow Mountain Road to Grant Mountain Road; WBS 18314.1045039

County: Henderson

The Division has received an acceptance letter from the NC Division of Mitigation Services (DMS) to satisfy the mitigation requirements set forth in 401 Individual Certification No. WQC008282 issued to the North Caroliana Department of Transportation, dated August 25, 2026, as provided in the table below.

	Compensatory Mitigation	River Basin & HUC Number
Perennial Stream	1,296 linear feet (credits)	Broad River Basin / 03050105

The Permittee must provide a copy of this form to DMS, who will then sign the form to verify receipt of payment and the transfer of the mitigation responsibility. Once DMS has signed this form, it is the Permittee's responsibility to ensure that a signed copy of this form is submitted to DEQ.WR.401MRT@deq.nc.gov ***before*** conducting any of the authorized impacts.

The Division of Mitigation Services verifies that the mitigation requirements (credits) shown above will be debited using approved released or advance credits, and for all stream or wetland credits is in accordance with the signed/approved In-Lieu Fee Instrument dated July 28, 2010. By signing below, DMS is accepting full responsibility for the identified mitigation. As a reminder to the Mitigation Provider, no more than 25 percent of the total mitigation required by Division can be met through preservation, unless requested and approved by the Division Director (15A NCAC 02H. 0506(c)(7)).

Signature Authority Name (print): _____

Signature: _____ Date: _____

Permitted Drawings

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 3.02; Released April 23, 2024)

WBS Element:		TIP/Proj No:	18314.1045039	County(ies):	Henderson

General Project Information

WBS Element:		**TIP Number:**	18314.1045039	**Project Type:**	Other	**Date:**	9/24/2025
NCDOT Contact:	Nathan Tanner, PE			**Contractor / Designer:**	Davin Morrison, PE		
	Address:	NCDOT Highway Division 14 253 Webster Road Sylva, NC 28779			**Address:**	440 South Church Street Suite 1200 Charlotte, NC 28202-2075	
	Phone:	828 331-5213			**Phone:**	980 337-5181	
	Email:	nrtanner@ncdot.gov			**Email:**	davin.morrison@hdrinc.com	
City/Town:	Gerton & Bat Cave			**County(ies):**	Henderson		
River Basin(s):	Broad			**CAMA County?**	No		
Wetlands within Project Limits?	No						

Project Description

Project Length (lin. miles or feet):	3.00	**Surrounding Land Use:**	Forested, Low Density Residential, Commercial, and Transportation		
	Proposed Project			**Existing Site**	
Project Built-Upon Area (ac.)	7.0	ac.		7.0	ac.
Typical Cross Section Description:	Maintain existing two lane highway with 10' wide travel lanes, shoulders, and roadside ditches where Hurricane Helene storm damage to the roadway was minimal or did not occur. Where damage has occurred, roadway will be reconstructed with two 11' wide travel lanes, 3' wide shoulders (6' wide with guardrail), expressway gutter, and roadside ditches.			Pre-Hurricane Helene, US 74A was a two lane highway with 10' wide travel lanes with narrow shoulders and roadside ditches. Post-Hurricane Helene, the road was heavily damaged at several locations.	

Annual Avg Daily Traffic (veh/hr/day):	Design/Future:	3000	Year: 2040	Existing:	1500	Year:	2017

General Project Narrative: (Description of Minimization of Water Quality Impacts)

This SMP is for Work Package 4 from Grant Mountain Road to NC 9. Retaining walls and/or 1.25:1 grouted rip rap embankments will be used to repair severely damaged roadway fill slopes adjacent to Hickory Creek. The stream will be relocated to its pre-storm location where needed to protect the roadway. Stream impacts will be kept to a minimum by only relocating the stream where needed, installing retaining walls to keep fill slopes out of the stream, and armoring the roadway embankment with a 1.25:1 grouted rip rap to reduce the impacts that may be caused by a standard 2:1 fill slope. Rip rap aprons and standard base ditches will be used to capture flow from culverts that pass under the roadway to help reduce outlet velocities and erosion.

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 3.02; Released April 23, 2024)

WBS Element:	TIP/Proj No.: 18314.1045039	County(ies): Henderson	Page 2 of 3

General Project Information

Waterbody Information

Surface Water Body (1):	Hickory Creek		**NCDWR Stream Index No.:**	9-14		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	Trout Waters (Tr)			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?		Comments:				
NRTR Stream ID:				**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	No	**Dissipator Pads Provided in Buffer?**		
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (2):	Middle Fork Hickory Creek		**NCDWR Stream Index No.:**	9-14-1-(2)		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	Trout Waters (Tr)			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?		Comments:				
NRTR Stream ID:				**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (3):	Broad River		**NCDWR Stream Index No.:**	9-(1)		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	Trout Waters (Tr)			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?		Comments:				
NRTR Stream ID:				**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	No	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 3.02; Released April 23, 2024)

WBS Element:	TIP No.:	18314.1045039	County(ies):	Henderson	Page	3	of	3

Additional Waterbody Information

Surface Water Body (4):	UT to Hickory Creek		**NCDWR Stream Index No.:**	9-14		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	Trout Waters (Tr)			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?		Comments:				
NRTR Stream ID:				**Buffer Rules in Effect:**		
Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	No	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

CONTRACT: TIP PROJECT: 18314.1045999.3.4

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PERMIT DRAWING
SHEET 1 OF 29

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	18314.1045999.3.4	1	

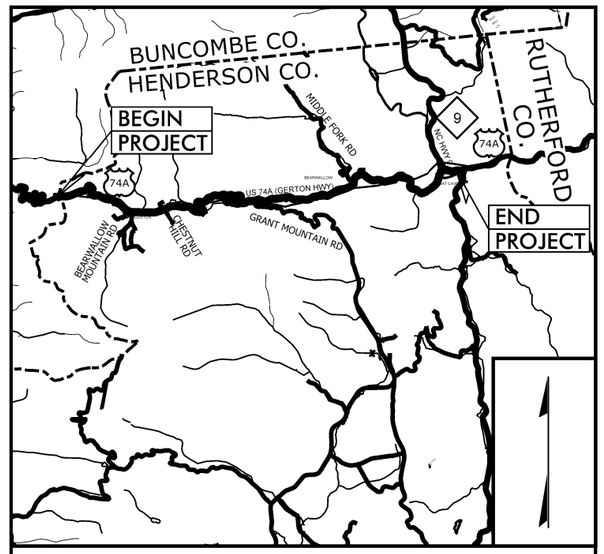
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
- - - - - -	N/A	P.E.
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18314.1045999.3.4	N/A	CONST

HENDERSON COUNTY

LOCATION: US 74A (GERTON HWY) FROM WEST OF SR 1693 (BEARWALLOW MOUNTAIN RD) TO US 64 (CHIMNEY ROCK RD)

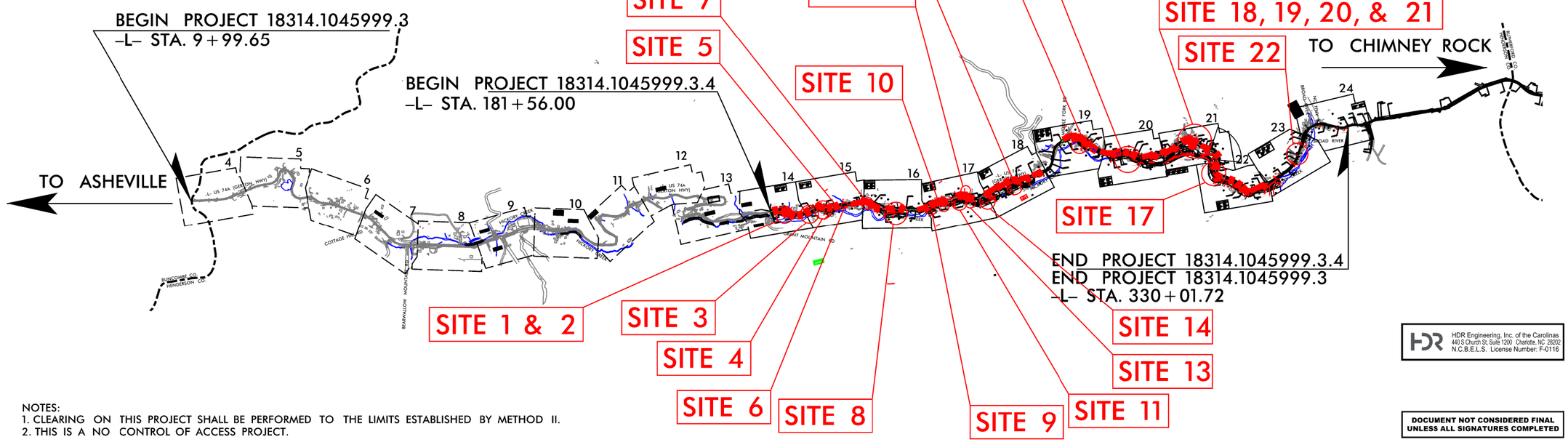
TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND STRUCTURES

WORK PACKAGE #4: SR 1602 (GRANT MOUNTAIN ROAD) TO US 64 (CHIMNEY ROCK RD)



VICINITY MAP
(NOT TO SCALE)





NOTES:
1. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.
2. THIS IS A NO CONTROL OF ACCESS PROJECT.

HDR Engineering, Inc. of the Carolinas
440 S Church St, Suite 1200 Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

PLANS: 50 25 0 50 100
PROFILE (HORIZONTAL): 50 25 0 50 100
PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

2022 = 1,500
ADT 2040 = 3,000
T = 8 %
V = 40 MPH

FUNC CLASS = MINOR ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY WORK PACKAGE #4 = 2.815 MILES

TOTAL LENGTH TIP PROJECT US-74A = 6.064 MILES

Prepared In the Office of:
HDR Engineering, Inc. of the Carolinas
440 S Church St, Suite 1200 Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: –

LETTING DATE: –

PHILLIP E. ROGERS, PE
PROJECT ENGINEER

MATTHEW J. WERDER, PE
PROJECT DESIGN ENGINEER

NATHAN R. TANNER, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

09/08/99
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6/2/99

PROJECT REFERENCE NO.	SHEET NO.
18314.1045039 (WP4)	14
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

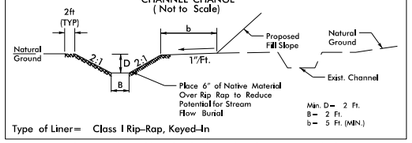
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GRAPHIC SCALE

LEGEND

SLOPE EMBANKMENT
PGR
STABILIZED FILL

NAD 83 NA 2011

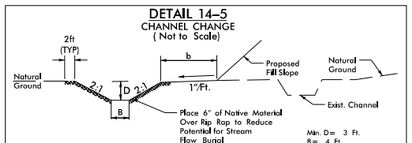
DETAIL 14–4
CHANNEL CHANGE
(Not to Scale)



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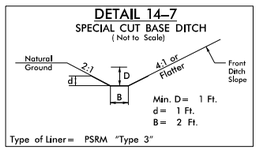
DETAIL 14–5
CHANNEL CHANGE
(Not to Scale)



Type of Liner= Class I Rip–Rap, Keyed–In

FROM –L– STA. 184+91 TO STA. 186+75 RT; DDE=230CY

DETAIL 14–7
SPECIAL CUT BASE DITCH
(Not to Scale)



Type of Liner= PSRM "Type 3"

FROM –L– STA. 188+25 TO STA. 189+65 LT

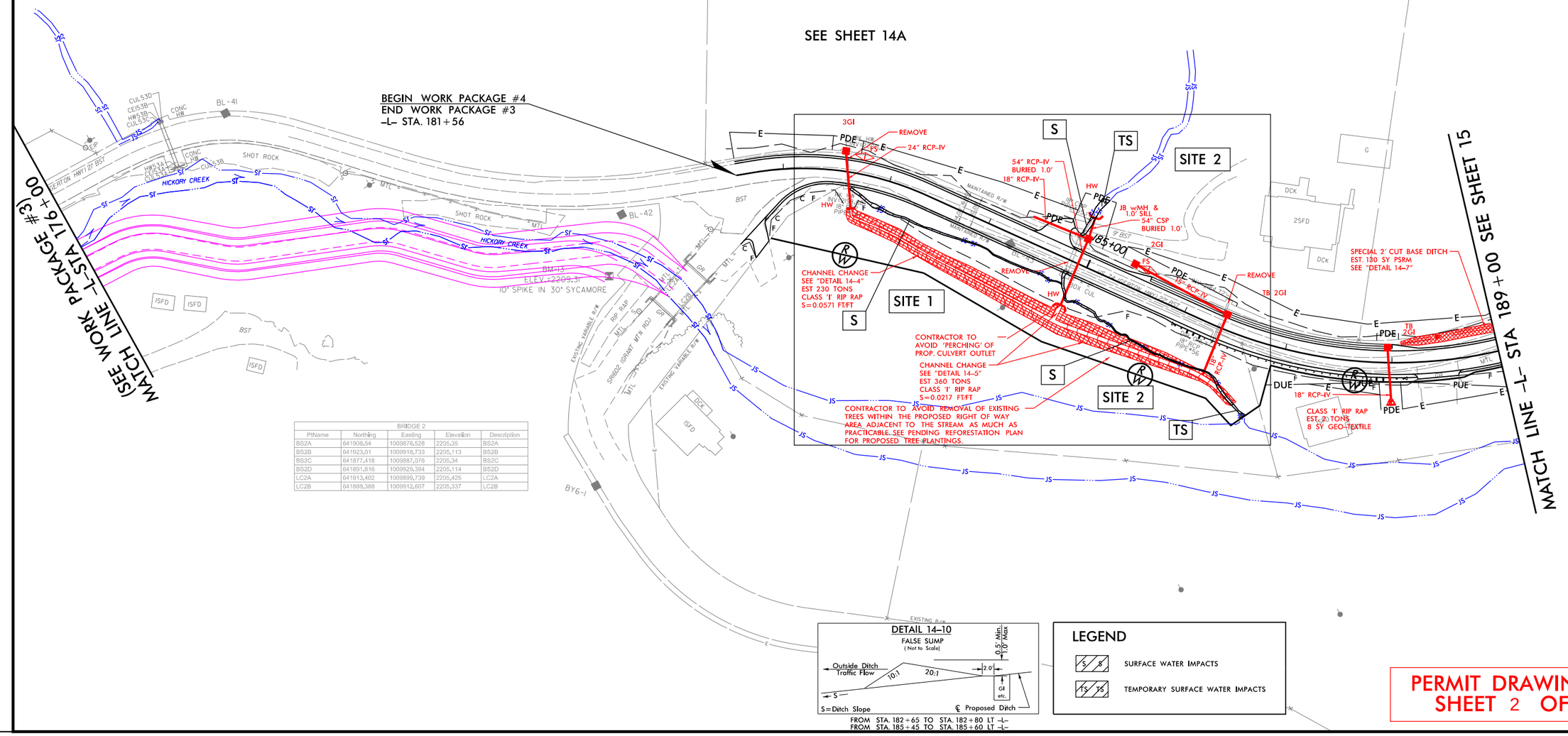
SINGLE BARREL CONC BOX CULVERT 3' W X 3' H				
POINT	NORTH	EAST	ELEVATION	DESC
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CEI53B	642269.743	1009554.571	2235.031	CEI53B
CUL53A	642225.025	1009546.909	2222.536	CUL53A
CUL53B	642224.544	1009549.976	2222.516	CUL53B
CUL53C	642269.898	1009553.076	2232.018	CUL53C
CUL53D	642269.685	1009556.046	2232.014	CUL53D
HW53A	642224.693	1009548.449	2226.818	HW53A
HW53B	642269.925	1009554.498	2236.621	HW53B

SEE SHEET 14A

BEGIN WORK PACKAGE #4
END WORK PACKAGE #3
–L– STA. 181+56

MATCH LINE –L– STA 176+00 (SEE WORK PACKAGE #3)

MATCH LINE –L– STA 189+00 SEE SHEET 15



BRIDGE 2				
PtName	Northing	Easting	Elevation	Description
BS2A	641908.54	1009876.528	2205.35	BS2A
BS2B	641923.01	1009918.733	2205.113	BS2B
BS2C	641877.418	1009887.076	2205.34	BS2C
BS2D	641891.816	1009929.394	2205.114	BS2D
LC2A	641913.402	1009899.739	2205.425	LC2A
LC2B	641889.388	1009912.607	2205.337	LC2B

DETAIL 14–10
FALSE SUMP
(Not to Scale)

FROM STA. 182+65 TO STA. 182+80 LT –L–
FROM STA. 185+45 TO STA. 185+60 LT –L–

LEGEND

S S SURFACE WATER IMPACTS

TS TS TEMPORARY SURFACE WATER IMPACTS

PERMIT DRAWING SHEET 2 OF 29

REVISIONS

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6/2/99

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
18314.1045039 (WP4)	14
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

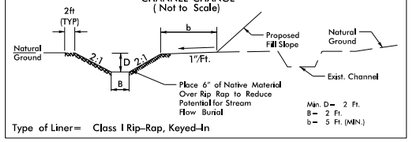
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GRAPHIC SCALE

LEGEND

SLOPE EMBANKMENT
PGR
STABILIZED FILL

NAD 83 NA 2011

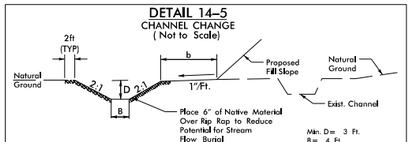
DETAIL 14–4
CHANNEL CHANGE
(Not to Scale)



Type of Liner= Class I Rip–Rap, Keyed–In

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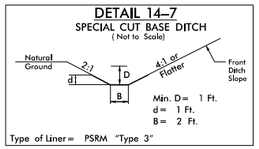
DETAIL 14–5
CHANNEL CHANGE
(Not to Scale)



Type of Liner= Class I Rip–Rap, Keyed–In

FROM –L– STA. 184+91 TO STA. 186+75 RT; DDE=230CY

DETAIL 14–7
SPECIAL CUT BASE DITCH
(Not to Scale)



Type of Liner= PSRM "Type 3"

FROM –L– STA. 188+25 TO STA. 189+65 LT

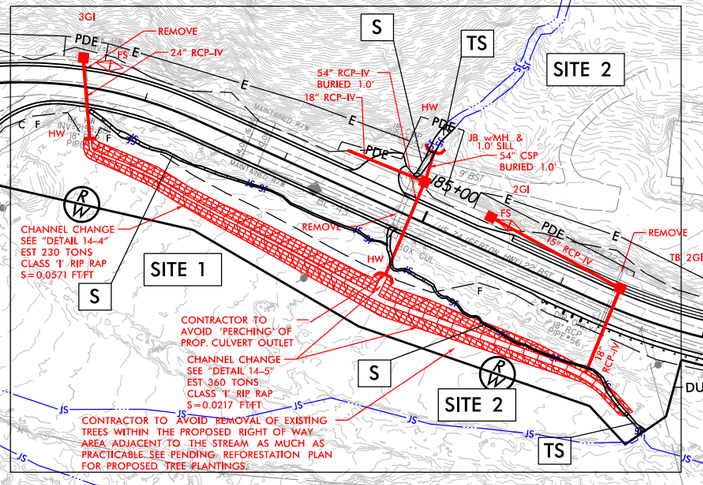
SINGLE BARREL CONC BOX CULVERT 3 W X 3 H				
POINT	NORTH	EAST	ELEVATION	DESC
CE53A	642224.763	1009548.464	2225.517	CE53A
CE53B	642268.743	1009554.571	2238.031	CE53B
CUL53A	642295.025	1009546.009	2222.538	CUL53A
CUL53B	642224.544	1009549.976	2222.516	CUL53B
CUL53C	642260.898	1009553.076	2237.018	CUL53C
CUL53D	642269.586	1009566.046	2232.014	CUL53D
HW53A	642224.682	1009548.419	2236.846	HW53A
HW63B	642269.925	1009554.898	2235.621	HW53B

SEE SHEET 14A

BEGIN WORK PACKAGE #4
END WORK PACKAGE #3
–L– STA. 181+56

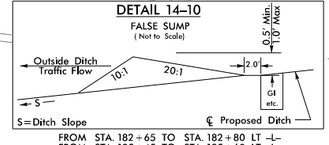
MATCH LINE –L– STA 176+00 (SEE WORK PACKAGE #3)

MATCH LINE –L– STA 189+00 SEE SHEET 15



BRIDGE 2				
PtName	Northing	Easting	Elevation	Description
BS2A	641908.54	1009876.528	2296.35	BS2A
BS2B	641923.07	1009918.733	2205.113	BS2B
BS2C	641877.418	1009887.078	2296.34	BS2C
BS2D	641891.816	1009928.394	2205.114	BS2D
LC2A	641913.402	1009899.739	2205.435	LC2A
LC2B	641889.388	1009912.607	2205.337	LC2B

DETAIL 14–10
FALSE SUMP
(Not to Scale)



FROM STA. 182+65 TO STA. 182+80 LT –L–
FROM STA. 185+45 TO STA. 185+60 LT –L–

LEGEND

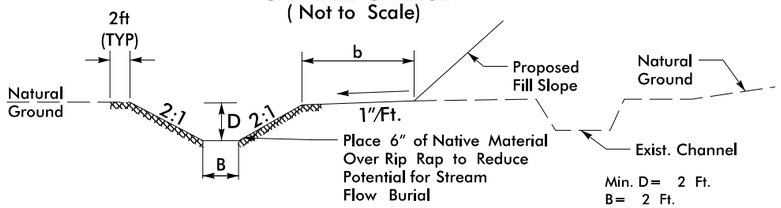
S/S SURFACE WATER IMPACTS

TS/TS TEMPORARY SURFACE WATER IMPACTS

PERMIT DRAWING SHEET 3 OF 29

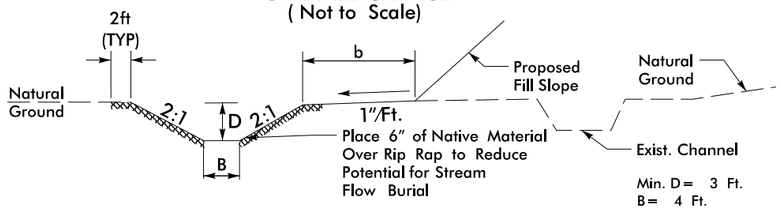
6/2/99

DETAIL 14–4
CHANNEL CHANGE
(Not to Scale)

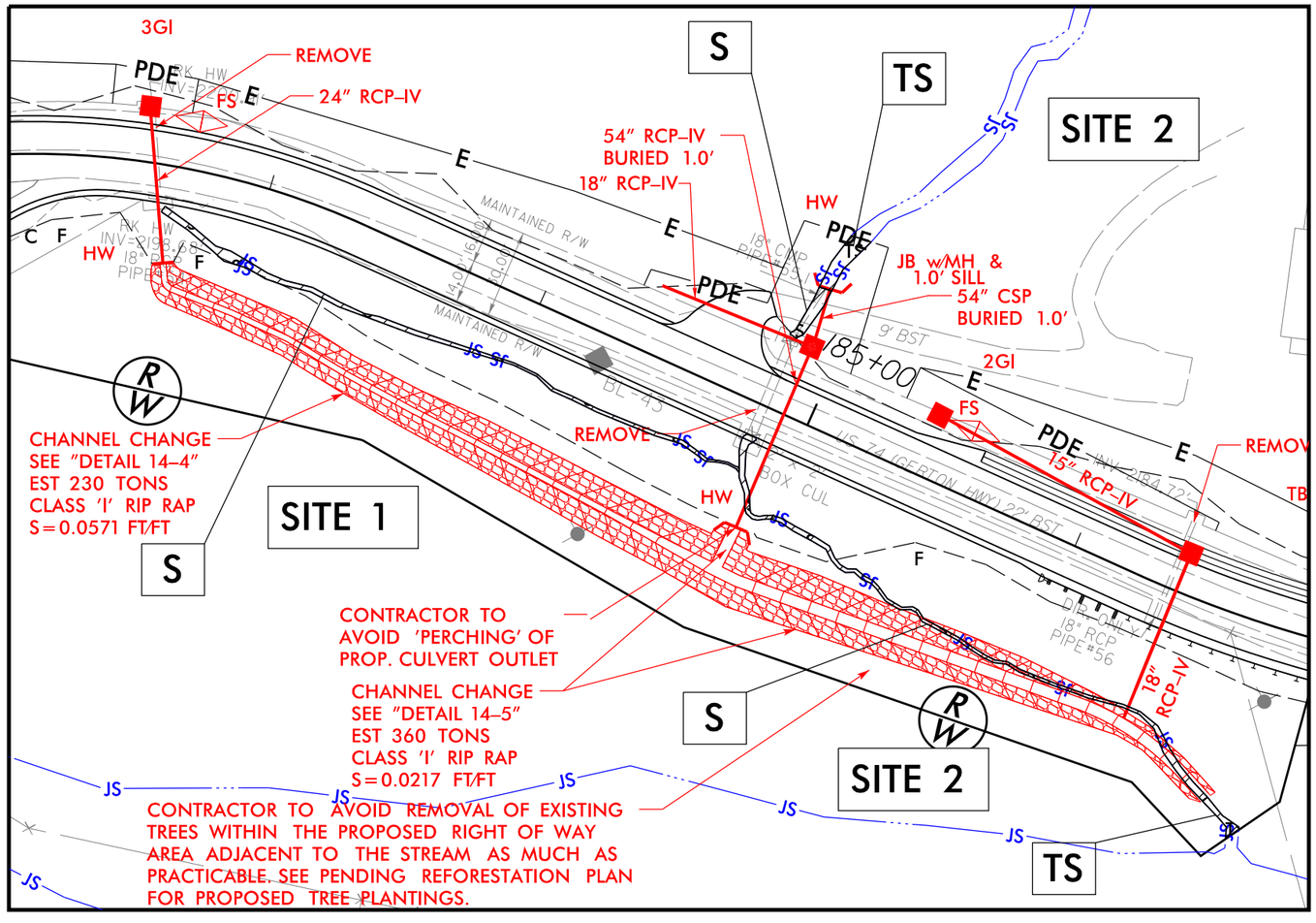


Type of Liner= Class I Rip–Rap, Keyed–In

DETAIL 14–5
CHANNEL CHANGE
(Not to Scale)



Type of Liner= Class I Rip–Rap, Keyed–In



LEGEND

- S / S — SURFACE WATER IMPACTS
- TS / TS — TEMPORARY SURFACE WATER IMPACTS

PROJECT REFERENCE NO.	SHEET NO.
18314.1045039 (WP4)	14A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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25 12.5 0 25 50
GRAPHIC SCALE

NAD 83 / NA 2011

REVISIONS

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USER: DAMORRISON DATE: 6/23/2026 TIME: 7:48:07 AM
FILE: \

PERMIT DRAWING
SHEET 4 OF 29

6/2/99

REVISIONS

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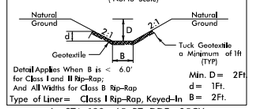
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DATE: 6/23/2026
TIME: 7:48:12 AM

DETAIL 15–1
SPECIAL 'V' DITCH
(Not to Scale)



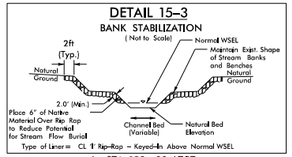
FROM –L– STA. 189+65 TO STA. 190+25 LT
FROM –L– STA. 190+50 TO STA. 191+00 LT
FROM –L– STA. 198+75 TO STA. 200+00 RT

DETAIL 15–2
STANDARD BASE DITCH
(Not to Scale)



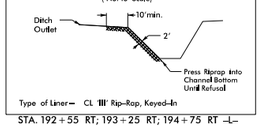
Type of Liner= Class I Rip-Rap, Keyed-In
–L– STA. 189+65 RT; DDE=25CY

DETAIL 15–3
BANK STABILIZATION
(Not to Scale)



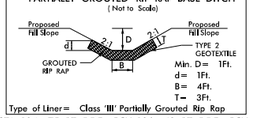
Type of Liner= CL 'I' Rip-Rap – Keyed-In Above Normal WSEL
–L– STA. 198+00 LT/RT

DETAIL 15–4
RIP RAP AT EMBANKMENT
(Not to Scale)



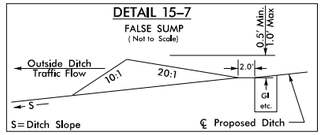
Type of Liner= CL 'III' Rip-Rap, Keyed-In
STA. 192+55 RT; 193+25 RT; 194+75 RT –L–

DETAIL 15–5
PARTIALLY GROUTED RIP RAP BASE DITCH
(Not to Scale)



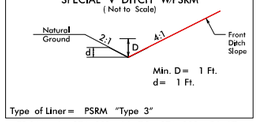
Type of Liner= Class 'III' Partially Grouted Rip Rap
STA. 194+75 RT; DDE=5CY, 196+42 RT; DDE=5CY –L–

DETAIL 15–7
FALSE SUMP
(Not to Scale)



S=Ditch Slope
FROM STA. 192+50 TO STA. 192+65 LT –L–

DETAIL 15–8
SPECIAL 'V' DITCH W/PSRM
(Not to Scale)



Type of Liner= PSRM "Type 3"
FROM –L– STA. 191+00 TO STA. 192+50 LT

NAD 83 / NA 2011

PROJECT REFERENCE NO.	SHEET NO.
18314.1045039 (WP4)	15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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50 25 0 50 100
GRAPHIC SCALE

LEGEND

SLOPE EMBANKMENT
PGR
STABILIZED FILL

MATCH LINE –L– STA 189+00 SEE SHEET 14

MATCH LINE –L– STA 202+00 SEE SHEET 16

SEE SHEET 15A

SPECIAL 'V' DITCH W/PSRM
EST. 105 SY PSRM
SEE DETAIL 15–8

SPECIAL 2' CUT BASE DITCH SEE "DETAIL 14–6" ON PSH 14

SPECIAL 'V' DITCH SEE "DETAIL 15–1"

REMOVE

24" CSP

REMOVE

TB 2GI

15" RCP–III

CONTRACTOR TO AVOID REMOVAL OF EXISTING TREES WITHIN THE TEMPORARY EASEMENT AREA ADJACENT TO THE STREAM AS MUCH AS PRACTICABLE. SEE PENDING REFORESTATION PLAN FOR PROPOSED TREE PLANTINGS.

BANK STABILIZATION CLASS 'I' RIP RAP EST. 20 TONS SEE DETAIL 15–3

HUMMINGBIRD HILL RD 8.5' GR

190+00

195+00

200+00

BL–48

24" RCP–IV

18" RCP–IV

15" RCP–IV

REMOVE EXIST. BRIDGE & ABUTMENTS

RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 40 TONS SEE DETAIL 15–4

STD. 2' BASE DITCH EST. 55 TONS CLASS 'I' RIP RAP 70 SY GEOTEXTILE SEE DETAIL 15–2 S=0.0700 FT/FT

4' PARTIALLY GROUTED RIP RAP BASE DITCH EST. 40 TONS CLASS 'III' RIP RAP 30 SY GEOTEXTILE, 5 CY CONCRETE S=0.6485 FT/FT, SEE DETAIL 15–5

RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 85 TONS SEE DETAIL 15–4

PROPOSED STREAM RELOCATION (SEE WORK PACKAGE #4 STREAM RELOCATION PLANS)

CONTRACTOR TO AVOID REMOVAL OF EXISTING TREES WITHIN THE TEMPORARY EASEMENT AREA ADJACENT TO THE STREAM AS MUCH AS PRACTICABLE. SEE PENDING REFORESTATION PLAN FOR PROPOSED TREE PLANTINGS.

4' PARTIALLY GROUTED JSRIP RAP BASE DITCH EST. 50 TONS CLASS 'III' RIP RAP 40 SY GEOTEXTILE, 5 JSY CONCRETE JS–5=0.4753 FT/FT, SEE DETAIL 15–5

BANK STABILIZATION CLASS 'I' RIP RAP EST. 20 TONS SEE DETAIL 15–3

CONTRACTOR TO AVOID 'PERCHING' OF EXIST. CULVERT OUTLET WITH CONSTRUCTION OF STREAM BANK STABILIZATION

RETAIN & CLEAN OUT STORM DEBRIS ONLY. MAINTAIN A MIN. OF 1' OF NATIVE BED MATERIAL IN CULVERT.

SPECIAL 'V' DITCH SEE "DETAIL 15–1"

REMOVE

TB JB w/MH

SITE 3

SITE 4

SITE 5

SITE 6

LEGEND

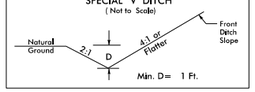
SURFACE WATER IMPACTS

TEMPORARY SURFACE WATER IMPACTS

PERMIT DRAWING SHEET 5 OF 29

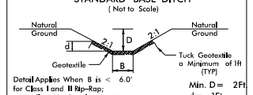
6/2/99

DETAIL 15–1
SPECIAL 'V' DITCH
(Not to Scale)



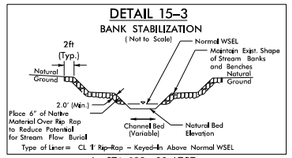
FROM –L– STA. 189+65 TO STA. 190+25 LT
FROM –L– STA. 190+50 TO STA. 191+00 LT
FROM –L– STA. 198+75 TO STA. 200+00 RT

DETAIL 15–2
STANDARD BASE DITCH
(Not to Scale)



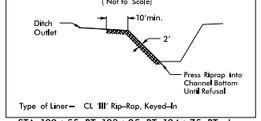
Type of Liner= Class I Rip-Rap, Keyed-In
–L– STA. 189+65 RT; DDE=25CY

DETAIL 15–3
BANK STABILIZATION
(Not to Scale)



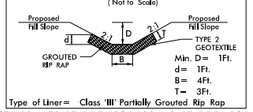
Type of Liner= CL 'I' Rip-Rap – Keyed-In Above Normal WSEL
–L– STA. 198+00 LT/RT

DETAIL 15–4
RIP RAP AT EMBANKMENT
(Not to Scale)



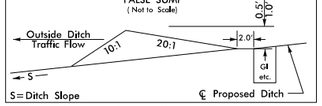
Type of Liner= CL 'III' Rip-Rap, Keyed-In
STA. 192+55 RT; 193+25 RT; 194+75 RT –L–

DETAIL 15–5
PARTIALLY GROUTED RIP RAP BASE DITCH
(Not to Scale)



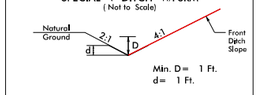
Type of Liner= Class 'III' Partially Grouted Rip Rap
STA. 194+75 RT; DDE=5CY, 196+42 RT; DDE=5CY –L–

DETAIL 15–7
FALSE SUMP
(Not to Scale)



FROM STA. 192+50 TO STA. 192+65 LT –L–

DETAIL 15–8
SPECIAL 'V' DITCH W/PSRM
(Not to Scale)



Type of Liner= PSRM "Type 3"
FROM –L– STA. 191+00 TO STA. 192+50 LT

NAD 83 / NA 2011

PROJECT REFERENCE NO.	SHEET NO.
18314.1045039 (WP4)	15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

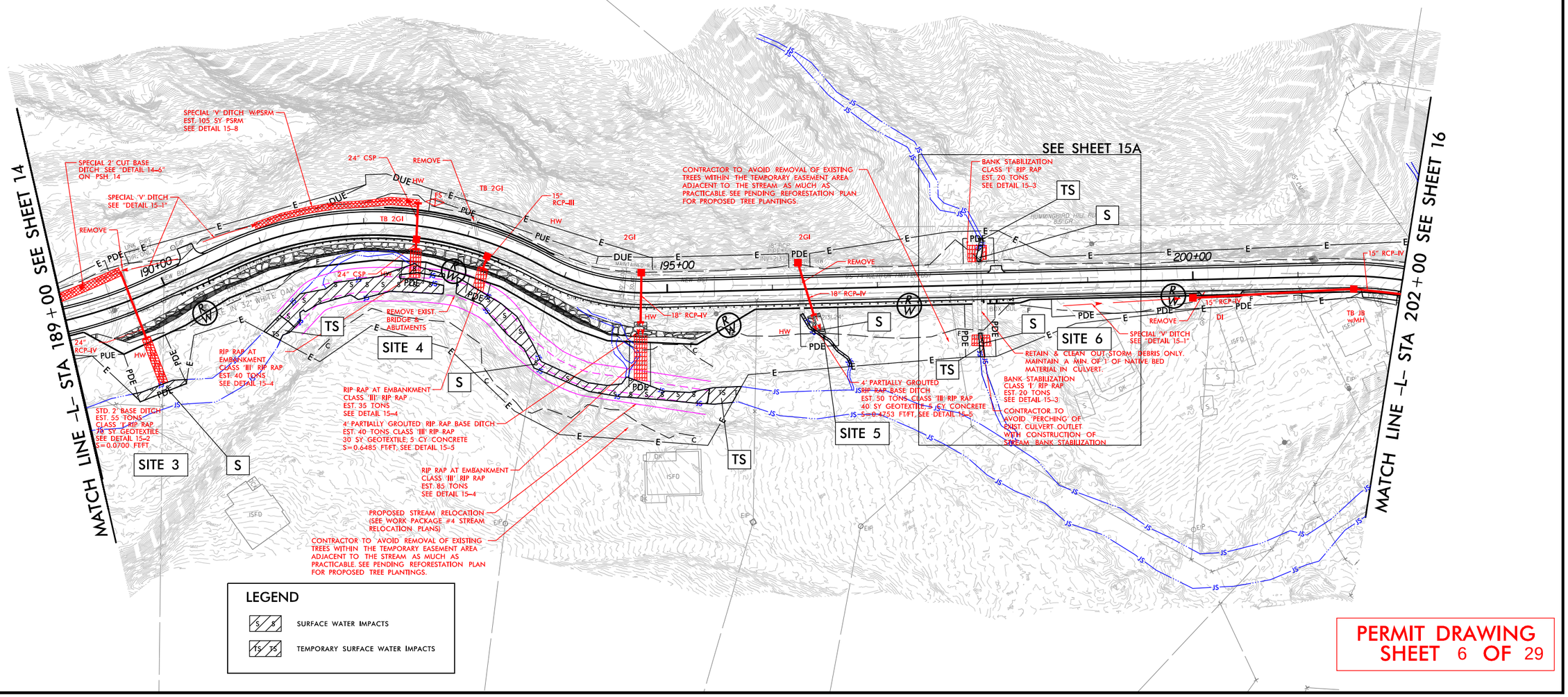
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50 25 0 50 100
GRAPHIC SCALE

LEGEND

SLOPE EMBANKMENT
PGR
STABILIZED FILL



PERMIT DRAWING
SHEET 6 OF 29

REVISIONS

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USER: DAMORRISON
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TIME: 7:48:17 AM
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6/2/99

REVISIONS

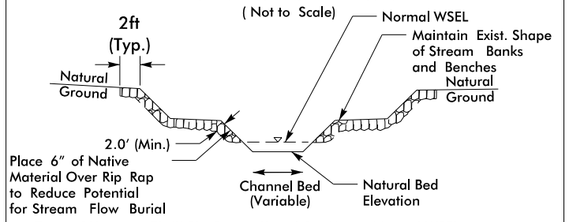
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PENTABLE: NCDOT_permits_NOCON_WP*4.tbl
DATE: 6/23/2026
TIME: 7:48:23 AM

DETAIL 15–3

BANK STABILIZATION

(Not to Scale)



Type of Liner = CL 'I' Rip–Rap – Keyed–In Above Normal WSEL

–L– STA. 198 + 00 LT/RT

NAD 83 / NA 2011

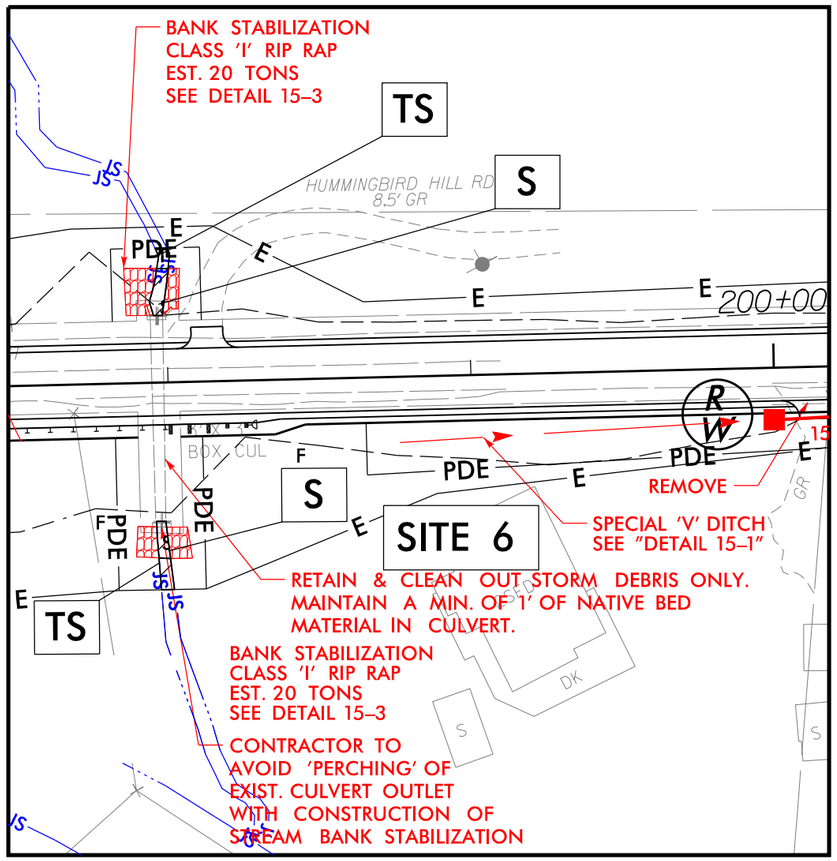
PROJECT REFERENCE NO.	SHEET NO.
18314.1045039 (WP4)	15A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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25 0 25 50

GRAPHIC SCALE



LEGEND

S S	SURFACE WATER IMPACTS
TS TS	TEMPORARY SURFACE WATER IMPACTS

PERMIT DRAWING
SHEET 7 OF 29

6/2/99

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
18314.1045039 (WP4)	16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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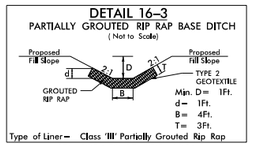
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GRAPHIC SCALE

LEGEND

SLOPE EMBANKMENT
PGR
STABILIZED FILL

NAD 83 NA 2011

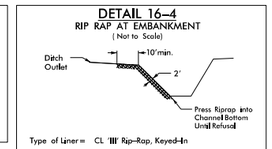
DETAIL 16–3
PARTIALLY GROUTED RIP RAP BASE DITCH
(Not to Scale)



Min. D= 1Ft.
d= 1Ft.
B= 4Ft.
T= 3Ft.
Type of Liner= Class 'III' Partially Grouted Rip Rap

STA. 205+70 RT; DDE=10CY,
208+89 RT; DDE=10CY,
210+93 RT; DDE=15CY –L–

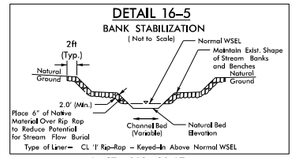
DETAIL 16–4
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner= CL 'III' Rip–Rap, Keyed–In

STA. 209+00 RT; 210+70 RT –L–

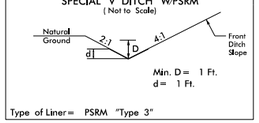
DETAIL 16–5
BANK STABILIZATION
(Not to Scale)



Type of Liner= CL 'I' Rip–Rap – Keyed–In Above Normal WSEL

–L– STA. 202+20 LT

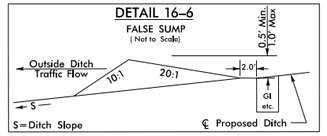
DETAIL 16–2
SPECIAL 'V' DITCH W/PSRM
(Not to Scale)



Min. D= 1 Ft.
d= 1 Ft.
Type of Liner= PSRM "Type 3"

FROM –L– STA. 206+75 TO STA. 208+30 LT

DETAIL 16–6
FALSE SUMP
(Not to Scale)



FROM STA. 203+85 TO STA. 204+00 LT –L–
FROM STA. 205+10 TO STA. 205+25 LT –L–
FROM STA. 205+60 TO STA. 205+75 LT –L–
FROM STA. 208+35 TO STA. 208+50 LT –L–
FROM STA. 208+85 TO STA. 209+00 LT –L–
FROM STA. 211+15 TO STA. 211+30 LT –L–
FROM STA. 215+05 TO STA. 215+20 LT –L–

MATCH LINE –L– STA 202+00 SEE SHEET 15

SEE SHEET 16A

SITE 7

TS

BANK STABILIZATION CLASS 'I' RIP RAP EST. 10 TONS SEE DETAIL 16–5

CLASS 'I' RIP RAP EST. 10 TONS 23 SY GEO–TEXTILE

CLASS 'II' RIP RAP EST. 15 TONS 20 SY GEO–TEXTILE

*NOTE: CONTRACTOR TO AVOID 'PERCHING' OF PROP. CULVERT OUTLET CARRYING JURISDICTIONAL STREAM AT HW 1606

4' PARTIALLY GROUTED RIP RAP BASE DITCH EST. 65 TONS CLASS 'III' RIP RAP 50 SY GEOTEXTILE, 10 CY CONCRETE S=0.4778 FT/FT, SEE DETAIL 16–3

SPECIAL 'V' DITCH W/PSRM EST. 110 SY PSRM SEE DETAIL 16–2

RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 45 TONS SEE DETAIL 16–4

FILL IN EXISTING STREAMBED WITH NATIVE MATERIAL (SEE STREAM RELOCATION PLANS, TYP.)

SITE 8

4' PARTIALLY GROUTED RIP RAP BASE DITCH EST. 100 TONS CLASS 'II' RIP RAP 80 SY GEOTEXTILE, 10 CY CONCRETE S=0.8373 FT/FT, SEE DETAIL 16–3

CONTRACTOR TO AVOID REMOVAL OF EXISTING TREES WITHIN THE TEMPORARY EASEMENT AREA ADJACENT TO THE STREAM AS MUCH AS PRACTICABLE. SEE PENDING REFORESTATION PLAN FOR PROPOSED TREE PLANTINGS.

RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 40 TONS SEE DETAIL 16–4

PROPOSED STREAM RELOCATION (SEE WORK PACKAGE #4 STREAM RELOCATION PLANS)

4' PARTIALLY GROUTED RIP RAP BASE DITCH EST. 150 TONS CLASS 'III' RIP RAP 120 SY GEOTEXTILE, 15 CY CONCRETE S=0.5253 FT/FT, SEE DETAIL 16–3

MATCH LINE –L– STA 216+00 SEE SHEET 17

LEGEND
S S SURFACE WATER IMPACTS
TS TS TEMPORARY SURFACE WATER IMPACTS

PERMIT DRAWING SHEET 8 OF 29

6/2/99

REVISIONS

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FILE: \
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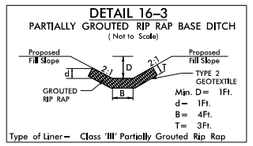
MATCH LINE –L– STA 202+00 SEE SHEET 15

MATCH LINE –L– STA 216+00 SEE SHEET 17

SEE SHEET 16A

NAD 83 NA 2011

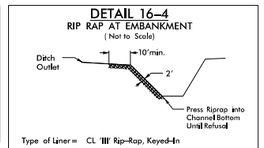
DETAIL 16–3
PARTIALLY GROUTED RIP RAP BASE DITCH
(Not to Scale)



Type of Liner = Class 'III' Partially Grouted Rip Rap

STA. 205+70 RT; DDE=10CY,
208+89 RT; DDE=10CY,
210+93 RT; DDE=15CY –L–

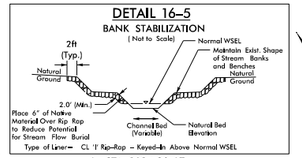
DETAIL 16–4
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner = CL 'III' Rip–Rap, Keyed–In

STA. 209+00 RT; 210+70 RT –L–

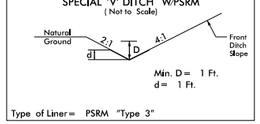
DETAIL 16–5
BANK STABILIZATION
(Not to Scale)



Type of Liner = CL 'I' Rip–Rap – Keyed–In Above Normal WSEL

–L– STA. 202+20 LT

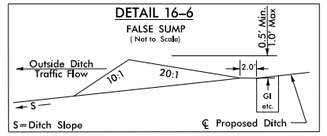
DETAIL 16–2
SPECIAL 'V' DITCH W/PSRM
(Not to Scale)



Type of Liner = PSRM "Type 3"

FROM –L– STA. 206+75 TO STA. 208+30 LT

DETAIL 16–6
FALSE SUMP
(Not to Scale)



FROM STA. 203+85 TO STA. 204+00 LT –L–
FROM STA. 205+10 TO STA. 205+25 LT –L–
FROM STA. 205+60 TO STA. 205+75 LT –L–
FROM STA. 208+35 TO STA. 208+50 LT –L–
FROM STA. 208+85 TO STA. 209+00 LT –L–
FROM STA. 211+15 TO STA. 211+30 LT –L–
FROM STA. 215+05 TO STA. 215+20 LT –L–

PROJECT REFERENCE NO.	SHEET NO.
18314.1045039 (WP4)	16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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50 25 0 50 100
GRAPHIC SCALE

LEGEND

SLOPE EMBANKMENT
PGR
STABILIZED FILL

TS
BANK STABILIZATION CLASS 'I' RIP RAP EST. 10 TONS SEE DETAIL 16–5
HW
PDE
30" CSP
24" RCP–IV
TB JB w/MH
30" RCP–IV
15" RCP–IV
18" RCP–III
36" RCP–IV
4GI
2GI
FS
TB 2GI
REMOVE
CLASS 'I' RIP RAP EST. 10 TONS 23 SY GEO–TEXTILE
SITE 7
S
205+00
SPECIAL 'V' DITCH W/PSRM EST. 110 SY PSRM SEE DETAIL 16–2
210+00
215+00
3GI
CLASS 'II' RIP RAP EST. 15 TONS 20 SY GEO–TEXTILE
*NOTE: CONTRACTOR TO AVOID 'PERCHING' OF PROP. CULVERT OUTLET CARRYING JURISDICTIONAL STREAM AT HW 1606
4' PARTIALLY GROUTED RIP RAP BASE DITCH EST. 65 TONS CLASS 'III' RIP RAP 50 SY GEOTEXTILE, 10 CY CONCRETE S=0.4778 FT/FT, SEE DETAIL 16–3
RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 45 TONS SEE DETAIL 16–4
FILL IN EXISTING STREAMBED WITH NATIVE MATERIAL (SEE STREAM RELOCATION PLANS, TYP.)
SITE 8
4' PARTIALLY GROUTED RIP RAP BASE DITCH EST. 100 TONS CLASS 'II' RIP RAP 80 SY GEOTEXTILE, 10 CY CONCRETE S=0.8373 FT/FT, SEE DETAIL 16–3
CONTRACTOR TO AVOID REMOVAL OF EXISTING TREES WITHIN THE TEMPORARY EASEMENT AREA ADJACENT TO THE STREAM AS MUCH AS PRACTICABLE. SEE PENDING REFORESTATION PLAN FOR PROPOSED TREE PLANTINGS.
RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 40 TONS SEE DETAIL 16–4
PROPOSED STREAM RELOCATION (SEE WORK PACKAGE #4 STREAM RELOCATION PLANS)
4' PARTIALLY GROUTED RIP RAP BASE DITCH EST. 150 TONS CLASS 'III' RIP RAP 120 SY GEOTEXTILE, 15 CY CONCRETE S=0.5253 FT/FT, SEE DETAIL 16–3
JS
SURFACE WATER IMPACTS
TEMPORARY SURFACE WATER IMPACTS

PERMIT DRAWING
SHEET 9 OF 29

6/2/99

LEGEND

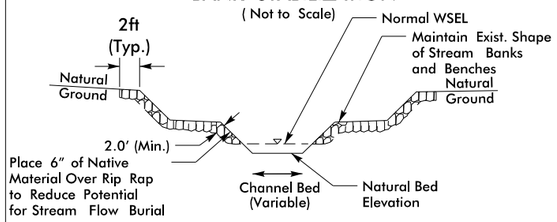
S / S — SURFACE WATER IMPACTS

TS / TS — TEMPORARY SURFACE WATER IMPACTS

DETAIL 16–5

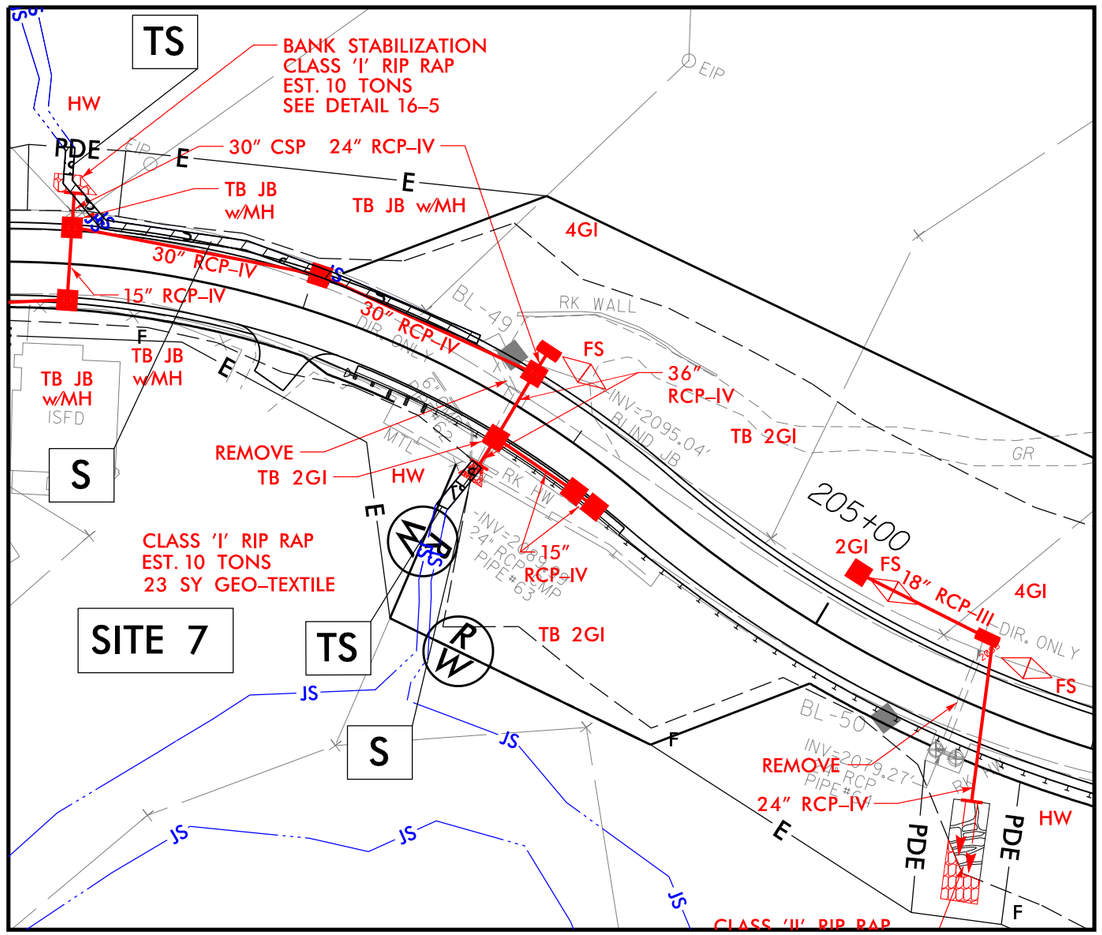
BANK STABILIZATION

(Not to Scale)



Type of Liner= CL 'I' Rip–Rap – Keyed–In Above Normal WSEL

–L– STA. 202 + 20 LT



PROJECT REFERENCE NO.	SHEET NO.
18314.1045039 (WP4)	16A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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50 0 25 50

GRAPHIC SCALE

NAD 83 / NA 2011

REVISIONS

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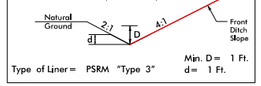
PERMIT DRAWING
SHEET 10 OF 29

6/2/99

REVISIONS

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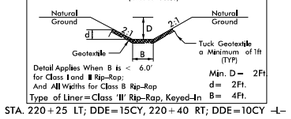
DETAIL 17–1
SPECIAL 'V' DITCH W/PSRM
(Not to Scale)



Type of Liner = PSRM "Type 3"

FROM –L– STA. 223+25 TO STA. 224+25 LT

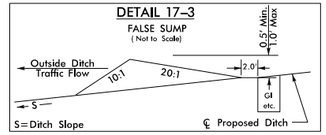
DETAIL 17–2
STANDARD BASE DITCH
(Not to Scale)



Type of Liner = Class 'II' Rip-Rap, Keyed-In

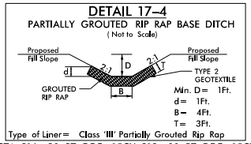
STA. 220+25 LT; DDE=15CY, 220+40 RT; DDE=10CY –L–

DETAIL 17–3
FALSE SUMP
(Not to Scale)



FROM STA. 216+30 TO STA. 216+45 LT –L–
FROM STA. 218+00 TO STA. 218+15 LT –L–
FROM STA. 219+15 TO STA. 219+30 LT –L–
FROM STA. 224+25 TO STA. 224+40 LT –L–
FROM STA. 225+40 TO STA. 225+55 LT –L–
FROM STA. 226+85 TO STA. 227+00 LT –L–

DETAIL 17–4
PARTIALLY GROUTED RIP RAP BASE DITCH
(Not to Scale)



Type of Liner = Class 'III' Partially Grouted Rip Rap

STA. 216+30 RT; DDE=15CY, 218+00 RT; DDE=15CY, 219+17 RT; DDE=15CY, 224+23 RT; DDE=15CY, 225+25 LT; DDE=5CY, 225+31 RT; DDE=15CY, 226+84 RT; DDE=15CY –L–

NAD 83 – NA 2011

PROJECT REFERENCE NO.	SHEET NO.
18314.1045039 (WP4)	17
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

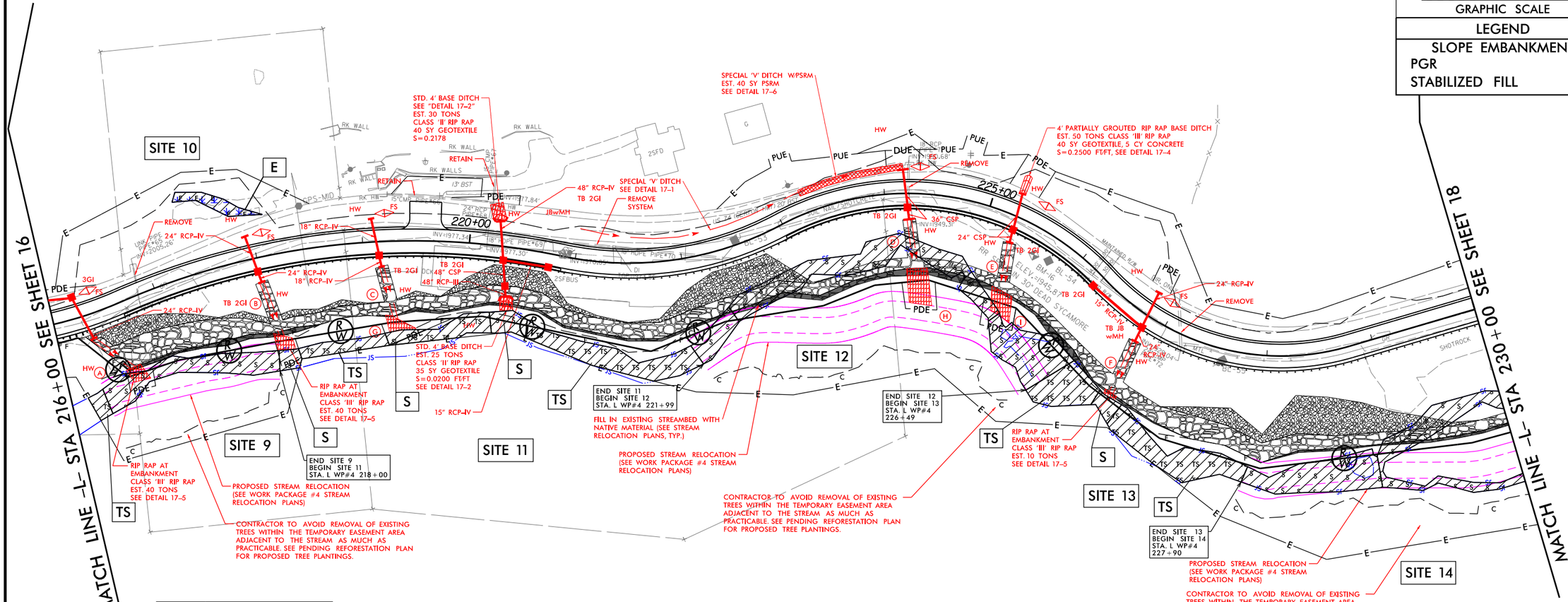
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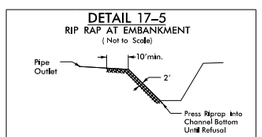
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GRAPHIC SCALE

LEGEND

SLOPE EMBANKMENT
PGR
STABILIZED FILL



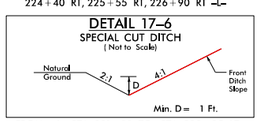
DETAIL 17–5
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner = CL 'III' Rip-Rap, Keyed-In

STA. 216+55 RT, 218+10 RT, 219+30 RT, 224+40 RT, 225+55 RT, 226+90 RT –L–

DETAIL 17–6
SPECIAL CUT DITCH
(Not to Scale)



FROM –L– STA. 221+00 TO STA. 223+25 LT

(A) 4' PATIALLY GROUTED RIP RAP BASE DITCH EST. 125 TONS CLASS 'II' RIP RAP 100 SY GEOTEXTILE, 15 CY CONCRETE S=0.8426 FT/FT, SEE DETAIL 17–4

(B) 4' PATIALLY GROUTED RIP RAP BASE DITCH EST. 140 TONS CLASS 'III' RIP RAP 110 SY GEOTEXTILE, 15 CY CONCRETE S=0.6144 FT/FT, SEE DETAIL 17–4

(C) 4' PARTIALLY GROUTED RIP RAP BASE DITCH EST. 140 TONS CLASS 'III' RIP RAP 110 SY GEOTEXTILE, 15 CY CONCRETE S=0.5963 FT/FT, SEE DETAIL 17–4

(D) 4' PARTIALLY GROUTED RIP RAP BASE DITCH EST. 125 TONS CLASS 'III' RIP RAP 100 SY GEOTEXTILE, 15 CY CONCRETE S=0.4483 FT/FT, SEE DETAIL 17–4

(E) 4' PARTIALLY GROUTED RIP RAP BASE DITCH EST. 125 TONS CLASS 'III' RIP RAP 100 SY GEOTEXTILE, 15 CY CONCRETE S=0.5204 FT/FT, SEE DETAIL 17–4

(F) 4' PATIALLY GROUTED RIP RAP BASE DITCH EST. 140 TONS CLASS 'III' RIP RAP 110 SY GEOTEXTILE, 15 CY CONCRETE S=0.4798 FT/FT, SEE DETAIL 17–4

(G) RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 40 TONS SEE DETAIL 17–5

(H) RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 115 TONS SEE DETAIL 17–5

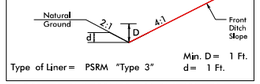
(I) RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 75 TONS SEE DETAIL 17–5

LEGEND

- E E — WETLAND EXCAVATION
- S S — SURFACE WATER IMPACTS
- TS TS — TEMPORARY SURFACE WATER IMPACTS

PERMIT DRAWING SHEET 11 OF 29

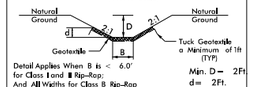
DETAIL 17–1
SPECIAL 'V' DITCH W/PSRM
(Not to Scale)



Min. D = 1 Ft.
Type of Liner = PSRM "Type 3" d = 1 Ft.

FROM –L– STA. 223+25 TO STA. 224+25 LT

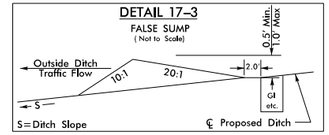
DETAIL 17–2
STANDARD BASE DITCH
(Not to Scale)



Detail Applies When B is < 6.0'
for Class I and II Rip-Rap;
And All Widths for Class B Rip-Rap
Min. D = 2Ft.
d = 2Ft.
B = 4Ft.
Type of Liner = Class 'II' Rip-Rap, Keyed-In

STA. 220+25 LT; DDE=15CY, 220+40 RT; DDE=10CY –L–

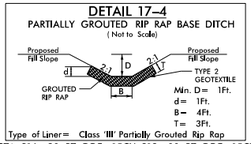
DETAIL 17–3
FALSE SUMP
(Not to Scale)



S = Ditch Slope ℄ Proposed Ditch

FROM STA. 216+30 TO STA. 216+45 LT –L–
FROM STA. 218+00 TO STA. 218+15 LT –L–
FROM STA. 219+15 TO STA. 219+30 LT –L–
FROM STA. 224+25 TO STA. 224+40 LT –L–
FROM STA. 225+40 TO STA. 225+55 LT –L–
FROM STA. 226+85 TO STA. 227+00 LT –L–

DETAIL 17–4
PARTIALLY GROUTED RIP RAP BASE DITCH
(Not to Scale)



Min. D = 1Ft.
d = 1Ft.
B = 4Ft.
T = 3Ft.
Type of Liner = Class 'III' Partially Grouted Rip Rap

STA. 216+30 RT; DDE=15CY, 218+00 RT; DDE=15CY,
219+17 RT; DDE=15CY, 224+23 RT; DDE=15CY,
225+25 LT; DDE=5CY, 225+31 RT; DDE=15CY,
226+84 RT; DDE=15CY –L–

NAD 83 – NA 2011

PROJECT REFERENCE NO.	SHEET NO.
18314.1045039 (WP4)	17
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

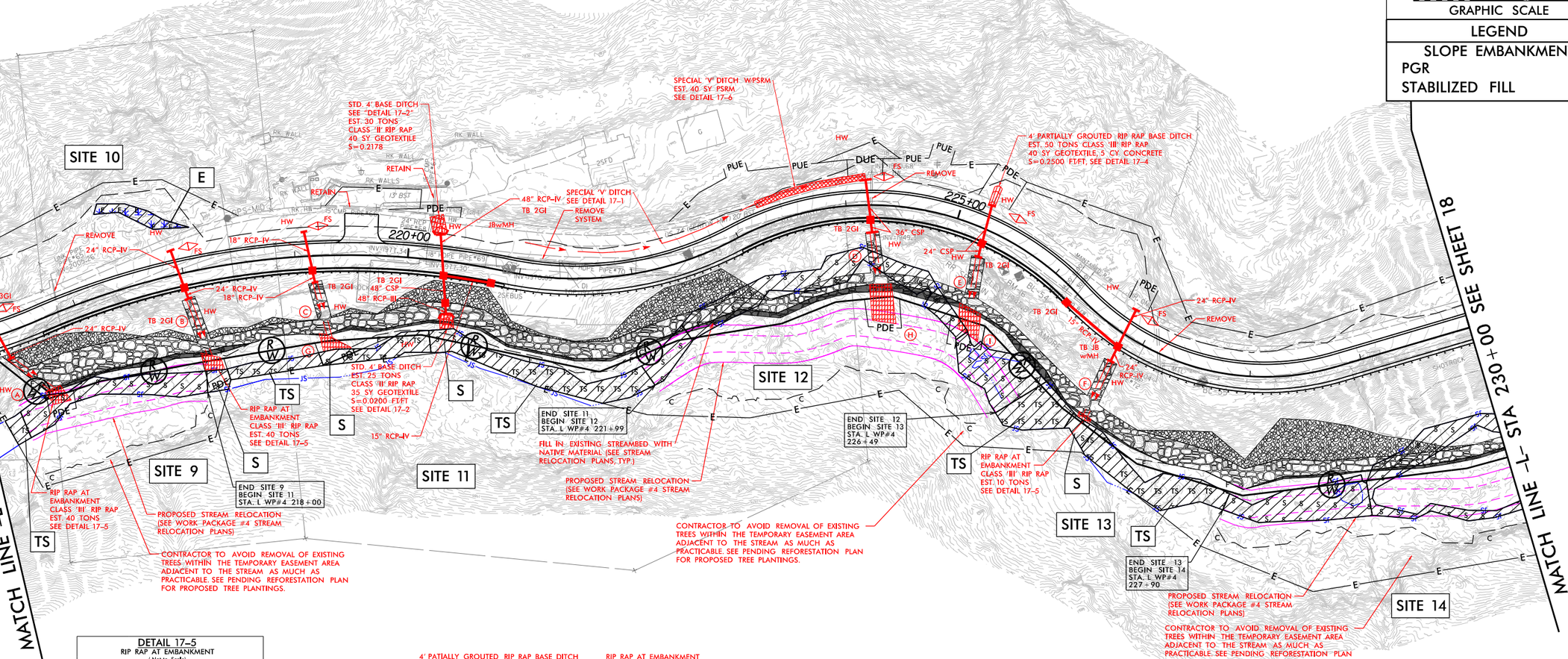
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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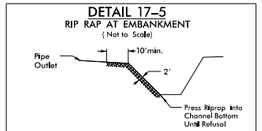
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GRAPHIC SCALE

LEGEND

SLOPE EMBANKMENT
PGR
STABILIZED FILL



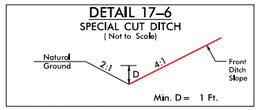
DETAIL 17–5
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner = CL 'III' Rip-Rap, Keyed-In

STA. 216+55 RT, 218+10 RT, 219+30 RT,
224+40 RT, 225+55 RT, 226+90 RT –L–

DETAIL 17–6
SPECIAL CUT DITCH
(Not to Scale)



Min. D = 1 Ft.

FROM –L– STA. 221+00 TO STA. 223+25 LT

(A) 4' PATIALLY GROUTED RIP RAP BASE DITCH
EST. 125 TONS CLASS 'II' RIP RAP
100 SY GEOTEXTILE, 15 CY CONCRETE
S=0.8426 FT/FT, SEE DETAIL 17–4

(B) 4' PATIALLY GROUTED RIP RAP BASE DITCH
EST. 140 TONS CLASS 'III' RIP RAP
110 SY GEOTEXTILE, 15 CY CONCRETE
S=0.6144 FT/FT, SEE DETAIL 17–4

(C) 4' PARTIALLY GROUTED RIP RAP BASE DITCH
EST. 140 TONS CLASS 'III' RIP RAP
110 SY GEOTEXTILE, 15 CY CONCRETE
S=0.5963 FT/FT, SEE DETAIL 17–4

(D) 4' PARTIALLY GROUTED RIP RAP BASE DITCH
EST. 125 TONS CLASS 'III' RIP RAP
100 SY GEOTEXTILE, 15 CY CONCRETE
S=0.4483 FT/FT, SEE DETAIL 17–4

(E) 4' PARTIALLY GROUTED RIP RAP BASE DITCH
EST. 125 TONS CLASS 'III' RIP RAP
100 SY GEOTEXTILE, 15 CY CONCRETE
S=0.5204 FT/FT, SEE DETAIL 17–4

(F) 4' PATIALLY GROUTED RIP RAP BASE DITCH
EST. 140 TONS CLASS 'III' RIP RAP
110 SY GEOTEXTILE, 15 CY CONCRETE
S=0.4798 FT/FT, SEE DETAIL 17–4

(G) RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 40 TONS
SEE DETAIL 17–5

(H) RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 115 TONS
SEE DETAIL 17–5

(I) RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 75 TONS
SEE DETAIL 17–5

LEGEND

E E WETLAND EXCAVATION
S S SURFACE WATER IMPACTS
TS TS TEMPORARY SURFACE WATER IMPACTS

PERMIT DRAWING SHEET 12 OF 29

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
18314.1045039 (WP4)	18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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50 25 0 50 100
GRAPHIC SCALE

LEGEND

SLOPE EMBANKMENT
PGR
STABILIZED FILL

NAD 83 + NA 2011

MATCH LINE –L– STA 230+00 SEE SHEET 17

MATCH LINE –L– STA 244+00 SEE SHEET 19

SITE 14

SITE 15

4' PARTIALLY GROUTED RIP RAP BASE DITCH
EST. 225 TONS CLASS 'III' RIP RAP
180 SY GEOTEXTILE, 20 CY CONCRETE
S=0.5349 FT/FT, SEE DETAIL 18–1

PROPOSED STREAM RELOCATION (SEE WORK PACKAGE #4 STREAM RELOCATION PLANS)

CONTRACTOR TO AVOID REMOVAL OF EXISTING TREES WITHIN THE TEMPORARY EASEMENT AREA ADJACENT TO THE STREAM AS MUCH AS PRACTICABLE. SEE PENDING REFORESTATION PLAN FOR PROPOSED TREE PLANTINGS.

4' PARTIALLY GROUTED RIP RAP BASE DITCH
EST. 250 TONS CLASS 'III' RIP RAP
200 SY GEOTEXTILE,
25 CY CONCRETE
S=0.5680 FT/FT, SEE DETAIL 18–1

FILL IN EXISTING STREAMBED WITH NATIVE MATERIAL (SEE STREAM RELOCATION PLANS, TYP.)

PROPOSED STREAM RELOCATION (SEE WORK PACKAGE #4 STREAM RELOCATION PLANS)

CONTRACTOR TO AVOID REMOVAL OF EXISTING TREES WITHIN THE TEMPORARY EASEMENT AREA ADJACENT TO THE STREAM AS MUCH AS PRACTICABLE. SEE PENDING REFORESTATION PLAN FOR PROPOSED TREE PLANTINGS.

4' PARTIALLY GROUTED RIP RAP BASE DITCH
EST. 225 TONS CLASS 'III' RIP RAP
180 SY GEOTEXTILE, 20 CY CONCRETE
S=0.4794 FT/FT, SEE DETAIL 18–1

RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 140 TONS
SEE DETAIL 18–2

STD. 'V' DITCH
S=0.0165 FT/FT
SEE DETAIL 18–4

SPECIAL ROCK CHECK DAM
SEE DETAIL 18–5

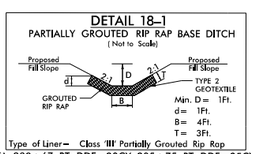
(J) RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 60 TONS
SEE DETAIL 18–2

(A1) RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 25 TONS
SEE DETAIL 18–2

(K) RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 50 TONS
SEE DETAIL 18–2

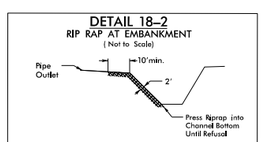
(Z) 4' PARTIALLY GROUTED RIP RAP BASE DITCH
EST. 225 TONS CLASS 'III' RIP RAP
180 SY GEOTEXTILE, 20 CY CONCRETE
S=0.7060, SEE DETAIL 18–1

DETAIL 18–1
PARTIALLY GROUTED RIP RAP BASE DITCH
(Not to Scale)



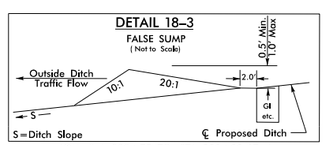
Type of Liner– Class 'III' Partially Grouted Rip Rap
STA. 230+67 RT; DDE=20CY, 235+75 RT; DDE=25CY, 237+23 RT; DDE=20CY, 240+11 RT; DDE=20CY –L–

DETAIL 18–2
RIP RAP AT EMBANKMENT
(Not to Scale)



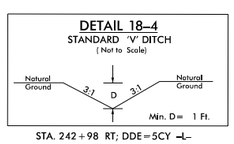
Type of Liner= CL 'III' Rip-Rap, Keyed-In
STA. 230+71 RT, 236+00 RT, 237+90 RT, 240+20 RT –L–

DETAIL 18–3
FALSE SUMP
(Not to Scale)



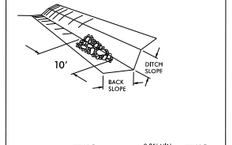
FROM STA. 230+75 TO STA. 230+90 LT –L–
FROM STA. 233+55 TO STA. 233+70 LT –L–
FROM STA. 243+00 TO STA. 243+15 LT –L–

DETAIL 18–4
STANDARD 'V' DITCH
(Not to Scale)



STA. 242+98 RT; DDE=5CY –L–

DETAIL 18–5
SPECIAL ROCK CHECK DAM
(Not to Scale)



8 TONS CLASS 'I' RIP RAP
STA. 243+00 RT –L–

LEGEND

S S SURFACE WATER IMPACTS

TS TS TEMPORARY SURFACE WATER IMPACTS

SLOPE STABILIZATION

PERMIT DRAWING SHEET 13 OF 29

REVISIONS

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6/2/99

PROJECT REFERENCE NO.	SHEET NO.
18314.1045039 (WP4)	18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

50 25 0 50 100
GRAPHIC SCALE

LEGEND

SLOPE EMBANKMENT
PGR
STABILIZED FILL

NAD 83 + NA 2011

MATCH LINE –L– STA 230+00 SEE SHEET 17

MATCH LINE –L– STA 244+00 SEE SHEET 19

SITE 14

SITE 15

235+00

PROPOSED STREAM RELOCATION (SEE WORK PACKAGE #4 STREAM RELOCATION PLANS)

4' PARTIALLY GROUTED RIP RAP BASE DITCH
EST. 225 TONS CLASS 'III' RIP RAP
180 SY GEOTEXTILE, 20 CY CONCRETE
S=0.5349 FT/FT, SEE DETAIL 18–1

(J) RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 60 TONS
SEE DETAIL 18–2

(A1) RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 25 TONS
SEE DETAIL 18–2

(K) RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 50 TONS
SEE DETAIL 18–2

(Z) 4' PARTIALLY GROUTED RIP RAP BASE DITCH
EST. 225 TONS CLASS 'III' RIP RAP
180 SY GEOTEXTILE, 20 CY CONCRETE
S=0.7060, SEE DETAIL 18–1

CONTRACTOR TO AVOID REMOVAL OF EXISTING TREES WITHIN THE TEMPORARY EASEMENT AREA ADJACENT TO THE STREAM AS MUCH AS PRACTICABLE. SEE PENDING REFORESTATION PLAN FOR PROPOSED TREE PLANTINGS.

4' PARTIALLY GROUTED RIP RAP BASE DITCH
EST. 250 TONS CLASS 'III' RIP RAP
200 SY GEOTEXTILE,
25 CY CONCRETE
S=0.5680 FT/FT, SEE DETAIL 18–1

FILL IN EXISTING STREAMBED WITH NATIVE MATERIAL (SEE STREAM RELOCATION PLANS, TYP.)

PROPOSED STREAM RELOCATION (SEE WORK PACKAGE #4 STREAM RELOCATION PLANS)

CONTRACTOR TO AVOID REMOVAL OF EXISTING TREES WITHIN THE TEMPORARY EASEMENT AREA ADJACENT TO THE STREAM AS MUCH AS PRACTICABLE. SEE PENDING REFORESTATION PLAN FOR PROPOSED TREE PLANTINGS.

STD. 'V' DITCH
S=0.0165 FT/FT
SEE DETAIL 18–4

SPECIAL ROCK CHECK DAM
SEE DETAIL 18–5

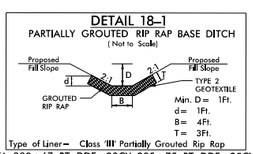
4' PARTIALLY GROUTED RIP RAP BASE DITCH
EST. 225 TONS CLASS 'III' RIP RAP
180 SY GEOTEXTILE, 20 CY CONCRETE
S=0.4794 FT/FT, SEE DETAIL 18–1

RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 140 TONS
SEE DETAIL 18–2

S

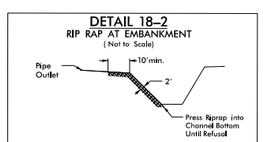
TS

DETAIL 18–1
PARTIALLY GROUTED RIP RAP BASE DITCH
(Not to Scale)



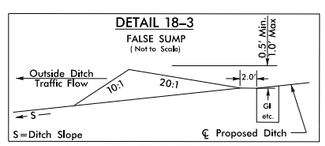
Type of Liner– Class 'III' Partially Grouted Rip Rap
STA. 230+67 RT; DDE=20CY, 235+75 RT; DDE=25CY, 237+23 RT; DDE=20CY, 240+11 RT; DDE=20CY –L–

DETAIL 18–2
RIP RAP AT EMBANKMENT
(Not to Scale)



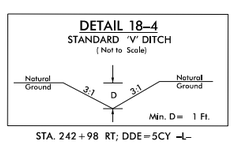
Type of Liner= CL 'III' Rip-Rap, Keyed-In
STA. 230+71 RT, 236+00 RT, 237+90 RT, 240+20 RT –L–

DETAIL 18–3
FALSE SUMP
(Not to Scale)



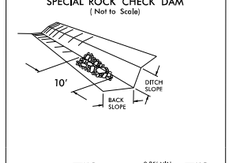
FROM STA. 230+75 TO STA. 230+90 LT –L–
FROM STA. 233+55 TO STA. 233+70 LT –L–
FROM STA. 243+00 TO STA. 243+15 LT –L–

DETAIL 18–4
STANDARD 'V' DITCH
(Not to Scale)



STA. 242+98 RT; DDE=5CY –L–

DETAIL 18–5
SPECIAL ROCK CHECK DAM
(Not to Scale)



STA. 243+00 RT –L–

LEGEND

S S SURFACE WATER IMPACTS
TS TS TEMPORARY SURFACE WATER IMPACTS
SLOPE STABILIZATION

PERMIT DRAWING SHEET 14 OF 29

REVISIONS

6/2/99

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TIME: 7:50:09 AM

REVISIONS

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
18314.1045039 (WP4)	19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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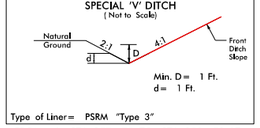
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555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

50 25 0 50 100
GRAPHIC SCALE

LEGEND

SLOPE EMBANKMENT
PGR
STABILIZED FILL

DETAIL 19–6
SPECIAL 'V' DITCH
(Not to Scale)



Min. D = 1 Ft.
d = 1 Ft.

Type of Liner = PSRM "Type 3"
FROM –L– STA. 257+75 TO STA. 258+50 LT

LEGEND

S S — SURFACE WATER IMPACTS
TS TS — TEMPORARY SURFACE WATER IMPACTS

NAD 83 – NA 2011

MATCH LINE –L– STA 244+00 SEE SHEET 18

MATCH LINE –L– STA 262+00 SEE SHEET 20

250+00 245+00 255+00 260+00

CLASS 'I' RIP RAP
EST. 20 TONS
30 SY GEO–TEXTILE
SEE DETAIL 19–1

18" RCP–III
REMOVE

RETAIN AND CLEAN OUT STORM DEBRIS ONLY. MAINTAIN A MIN. OF 1' OF NATIVE BED MATERIAL INSIDE CULVERT.

SPECIAL 'V' DITCH
SEE "DETAIL 19–4"

18" RCP–IV
REMOVE
2GI
TB 2GI

24" RCP–IV

CLASS 'I' RIP RAP
EST. 4 TONS
12 SY GEO–TEXTILE

SPECIAL 'V' DITCH
W/PSRM
EST. 55 SY PSRM
SEE DETAIL 19–6

3GI

15" RCP–III

CLASS 'I' RIP RAP
EST. 7 TONS
17 SY GEO–TEXTILE

30" RCP–IV

RETAIN

SITE 16

TS

FILL IN EXISTING STREAMBED WITH NATIVE MATERIAL (SEE STREAM RELOCATION PLANS, TYP.)

CONTRACTOR TO AVOID REMOVAL OF EXISTING TREES WITHIN THE TEMPORARY EASEMENT AREA ADJACENT TO THE STREAM AS MUCH AS PRACTICABLE SEE PENDING REFORESTATION PLAN FOR PROPOSED TREE PLANTINGS.

PROPOSED STREAM RELOCATION (SEE WORK PACKAGE #4 STREAM RELOCATION PLANS)

(L) 4' PARTIALLY GROUTED RIP RAP BASE DITCH
EST. 100 TONS CLASS 'III' RIP RAP
80 SY GEOTEXTILE, 10 CY CONCRETE
S=0.7693 FT/FT, SEE DETAIL 19–2

(M) RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 40 TONS
SEE DETAIL 19–3

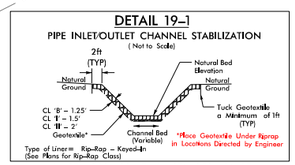
(N) 4' PARTIALLY GROUTED RIP RAP BASE DITCH
EST. 90 TONS CLASS 'III' RIP RAP
70 SY GEOTEXTILE, 10 CY CONCRETE
S=0.8003 FT/FT, SEE DETAIL 19–2

(O) RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 50 TONS
SEE DETAIL 19–3

(A2) 4' PARTIALLY GROUTED RIP RAP BASE DITCH
EST. 65 TONS CLASS 'III' RIP RAP
50 SY GEOTEXTILE, 10 CY CONCRETE
S=0.7353, SEE DETAIL 19–2

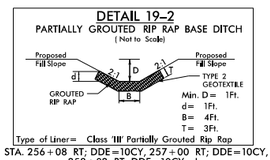
(A3) RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 60 TONS
SEE DETAIL 19–3

DETAIL 19–1
PIPE INLET/OUTLET CHANNEL STABILIZATION
(Not to Scale)



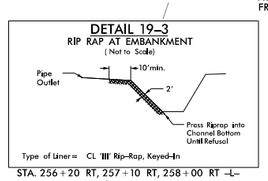
Type of Liner = Rip–Rap – Keyed–In (See Plans for Rip–Rap Class)
–L– STA. 253+83 LT, –L– STA. 253+54 RT

DETAIL 19–2
PARTIALLY GROUTED RIP RAP BASE DITCH
(Not to Scale)



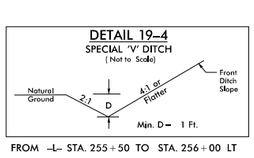
Min. D = 1Ft.
d = 1Ft.
B = 4Ft.
T = 3Ft.
Type of Liner = Class 'III' Partially Grouted Rip Rap
STA. 256+08 RT; DDE=10CY, 257+00 RT; DDE=10CY, 258+02 RT; DDE=10CY –L–

DETAIL 19–3
RIP RAP AT EMBANKMENT
(Not to Scale)



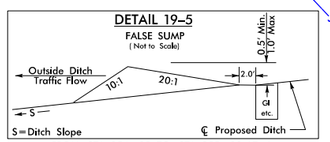
Type of Liner = CL 'III' Rip–Rap, Keyed–In
STA. 256+20 RT, 257+10 RT, 258+00 RT –L–

DETAIL 19–4
SPECIAL 'V' DITCH
(Not to Scale)



Min. D = 1 Ft.
FROM –L– STA. 255+50 TO STA. 256+00 LT

DETAIL 19–5
FALSE SUMP
(Not to Scale)



FROM STA. 254+85 TO STA. 255+00 LT –L–
FROM STA. 256+05 TO STA. 256+20 LT –L–
FROM STA. 257+00 TO STA. 257+15 LT –L–

PERMIT DRAWING SHEET 15 OF 29

PROJECT REFERENCE NO.	SHEET NO.
18314.1045039 (WP4)	19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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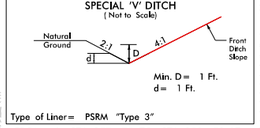
HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

50 25 0 50 100
GRAPHIC SCALE

LEGEND

SLOPE EMBANKMENT
PGR
STABILIZED FILL

DETAIL 19–6
SPECIAL 'V' DITCH
(Not to Scale)



Min. D = 1 Ft.
d = 1 Ft.

Type of Liner = PSRM "Type 3"
FROM –L– STA. 257+75 TO STA. 258+50 LT

LEGEND
S/S SURFACE WATER IMPACTS
TS/TS TEMPORARY SURFACE WATER IMPACTS

NAD 83 – NA 2011

CLASS 'I' RIP RAP
EST. 20 TONS
30 SY GEO–TEXTILE
SEE DETAIL 19–1

18" RCP–III
REMOVE

RETAIN AND CLEAN OUT STORM DEBRIS ONLY. MAINTAIN A MIN. OF 1' OF NATIVE BED MATERIAL INSIDE CULVERT.

SPECIAL 'V' DITCH
SEE "DETAIL 19–4"

255+00

18" RCP–IV

24" RCP–IV

CLASS 'I' RIP RAP
EST. 20 TONS
30 SY GEO–TEXTILE
SEE DETAIL 19–1

CLASS 'I' RIP RAP
EST. 14 TONS
12 SY GEO–TEXTILE

250+00

RETAIN

TS

SITE 16

SPECIAL 'V' DITCH
W/PSRM
EST. 55 SY PSRM
SEE DETAIL 19–6

15" RCP–III

24" RCP–IV

260+00

FILL IN EXISTING STREAMBED WITH NATIVE MATERIAL (SEE STREAM RELOCATION PLANS, TYP.)

CONTRACTOR TO AVOID REMOVAL OF EXISTING TREES WITHIN THE TEMPORARY EASEMENT AREA ADJACENT TO THE STREAM AS MUCH AS PRACTICABLE SEE PENDING REFORESTATION PLAN FOR PROPOSED TREE PLANTINGS.

PROPOSED STREAM RELOCATION (SEE WORK PACKAGE #4 STREAM RELOCATION PLANS)

CLASS 'I' RIP RAP
EST. 7 TONS
17 SY GEO–TEXTILE

30" RCP–IV

MATCH LINE –L– STA 244+00 SEE SHEET 18

MATCH LINE –L– STA 262+00 SEE SHEET 20

Ⓛ 4' PARTIALLY GROUTED RIP RAP BASE DITCH
EST. 100 TONS CLASS 'III' RIP RAP
80 SY GEOTEXTILE, 10 CY CONCRETE
S=0.7693 FT/FT, SEE DETAIL 19–2

Ⓜ RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 40 TONS
SEE DETAIL 19–3

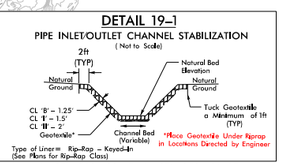
Ⓝ 4' PARTIALLY GROUTED RIP RAP BASE DITCH
EST. 90 TONS CLASS 'III' RIP RAP
70 SY GEOTEXTILE, 10 CY CONCRETE
S=0.8003 FT/FT, SEE DETAIL 19–2

Ⓞ RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 50 TONS
SEE DETAIL 19–3

Ⓐ2 4' PARTIALLY GROUTED RIP RAP BASE DITCH
EST. 65 TONS CLASS 'III' RIP RAP
50 SY GEOTEXTILE, 10 CY CONCRETE
S=0.7353, SEE DETAIL 19–2

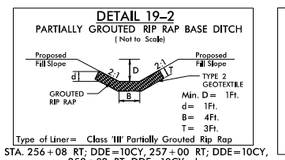
Ⓐ3 RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 60 TONS
SEE DETAIL 19–3

DETAIL 19–1
PIPE INLET/OUTLET CHANNEL STABILIZATION
(Not to Scale)



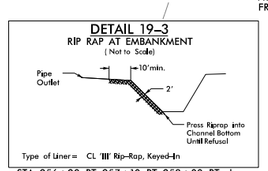
Type of Liner = Rip–Rap – Keyed–In (See Plans for Rip–Rap Class)
–L– STA. 253+83 LT, –L– STA. 253+54 RT

DETAIL 19–2
PARTIALLY GROUTED RIP RAP BASE DITCH
(Not to Scale)



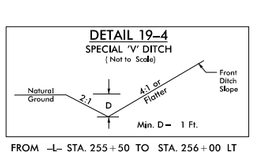
Min. D = 1Ft.
d = 1Ft.
B = 4Ft.
T = 3Ft.
Type of Liner = Class 'III' Partially Grouted Rip Rap
STA. 256+08 RT; DDE=10CY, 257+00 RT; DDE=10CY, 258+02 RT; DDE=10CY –L–

DETAIL 19–3
RIP RAP AT EMBANKMENT
(Not to Scale)



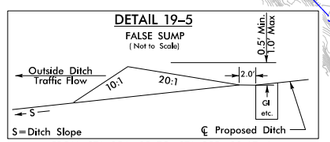
Type of Liner = CL 'III' Rip–Rap, Keyed–In
STA. 256+20 RT, 257+10 RT, 258+00 RT –L–

DETAIL 19–4
SPECIAL 'V' DITCH
(Not to Scale)



Min. D = 1 Ft.
FROM –L– STA. 255+50 TO STA. 256+00 LT

DETAIL 19–5
FALSE SUMP
(Not to Scale)



FROM STA. 254+85 TO STA. 255+00 LT –L–
FROM STA. 256+05 TO STA. 256+20 LT –L–
FROM STA. 257+00 TO STA. 257+15 LT –L–

PERMIT DRAWING SHEET 16 OF 29

REVISIONS

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6/2/99

PROJECT REFERENCE NO.	SHEET NO.
18314.1045039 (WP4)	20
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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50 25 0 50 100
GRAPHIC SCALE

LEGEND

SLOPE EMBANKMENT
PGR
STABILIZED FILL

LEGEND

SURFACE WATER IMPACTS
TEMPORARY SURFACE WATER IMPACTS

NAD 83 / NA 2011

MATCH LINE –L– STA 262+00 SEE SHEET 19

MATCH LINE –L– STA 275+00 SEE SHEET 21

TS

PROPOSED STREAM RELOCATION (SEE WORK PACKAGE #4 STREAM RELOCATION PLANS)

CONTRACTOR TO AVOID REMOVAL OF EXISTING TREES WITHIN THE TEMPORARY EASEMENT AREA ADJACENT TO THE STREAM AS MUCH AS PRACTICABLE. SEE PENDING REFORESTATION PLAN FOR PROPOSED TREE PLANTINGS.

SITE 17

FILL IN EXISTING STREAMBED WITH NATIVE MATERIAL (SEE STREAM RELOCATION PLANS, TYP.)

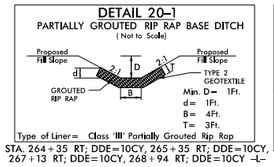
CONTRACTOR TO AVOID REMOVAL OF EXISTING TREES WITHIN THE TEMPORARY EASEMENT AREA ADJACENT TO THE STREAM AS MUCH AS PRACTICABLE SEE PENDING REFORESTATION PLAN FOR PROPOSED TREE PLANTINGS.

265+00

270+00

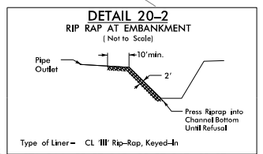
275+00

DETAIL 20–1
PARTIALLY GROUTED RIP RAP BASE DITCH
(Not to Scale)



Type of Liner= Class 'III' Partially Grouted Rip Rap
STA. 264+35 RT; DDE=10CY, 265+35 RT; DDE=10CY, 267+13 RT; DDE=10CY, 268+94 RT; DDE=10CY –L–

DETAIL 20–2
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner– CL 'III' Rip–Rap, Keyed–In
STA. 264+59 RT, 265+38 RT, 267+13 RT, 268+94 RT –L–

(P) 4' PARTIALLY GROUTED RIP RAP BASE DITCH
EST. 100 TONS CLASS 'III' RIP RAP
80 SY GEOTEXTILE, 10 CY CONCRETE
S=0.6146 FT/FT, SEE DETAIL 20–1

(Q) RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 50 TONS
SEE DETAIL 20–2

(R) 4' PARTIALLY GROUTED RIP RAP BASE DITCH
EST. 90 TONS CLASS 'III' RIP RAP
70 SY GEOTEXTILE, 10 CY CONCRETE
S=0.6165 FT/FT, SEE DETAIL 20–1

(S) RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 55 TONS
SEE DETAIL 20–2

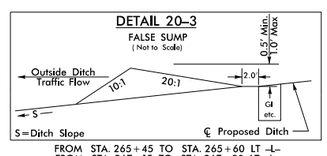
(T) 4' PARTIALLY GROUTED RIP RAP BASE DITCH
EST. 50 TONS CLASS 'III' RIP RAP
40 SY GEOTEXTILE, 5 CY CONCRETE
S=0.8125 FT/FT, SEE DETAIL 20–1

(U) RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 45 TONS
SEE DETAIL 20–2

(V) 4' PARTIALLY GROUTED RIP RAP BASE DITCH
EST. 65 TONS CLASS 'III' RIP RAP
50 SY GEOTEXTILE, 10 CY CONCRETE
S=0.7514 FT/FT, SEE DETAIL 20–1

(W) RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 40 TONS
SEE DETAIL 20–2

DETAIL 20–3
FALSE SUMP
(Not to Scale)



FROM STA. 265+45 TO STA. 265+60 LT –L–
FROM STA. 267+15 TO STA. 267+30 LT –L–
FROM STA. 269+00 TO STA. 269+15 LT –L–
FROM STA. 272+80 TO STA. 272+95 LT –L–

PERMIT DRAWING
SHEET 17 OF 29

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
18314.1045039 (WP4)	20
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

50 25 0 50 100
GRAPHIC SCALE

LEGEND

SLOPE EMBANKMENT
PGR
STABILIZED FILL

LEGEND
SURFACE WATER IMPACTS
TEMPORARY SURFACE WATER IMPACTS

NAD 83 / NA 2011

MATCH LINE –L– STA 262+00 SEE SHEET 19

MATCH LINE –L– STA 275+00 SEE SHEET 21

265+00 210+00

TS

SITE 17

PROPOSED STREAM RELOCATION (SEE WORK PACKAGE #4 STREAM RELOCATION PLANS)

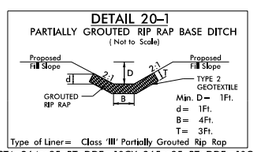
CONTRACTOR TO AVOID REMOVAL OF EXISTING TREES WITHIN THE TEMPORARY EASEMENT AREA ADJACENT TO THE STREAM AS MUCH AS PRACTICABLE. SEE PENDING REFORESTATION PLAN FOR PROPOSED TREE PLANTINGS.

FILL IN EXISTING STREAMBED WITH NATIVE MATERIAL (SEE STREAM RELOCATION PLANS, TYP.)

CONTRACTOR TO AVOID REMOVAL OF EXISTING TREES WITHIN THE TEMPORARY EASEMENT AREA ADJACENT TO THE STREAM AS MUCH AS PRACTICABLE. SEE PENDING REFORESTATION PLAN FOR PROPOSED TREE PLANTINGS.

CLASS "I" RIP RAP
EST. 4 TONS
12 SY GEO-TEXTILE

DETAIL 20–1
PARTIALLY GROUTED RIP RAP BASE DITCH
(Not to Scale)

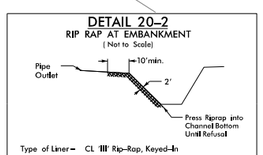


Min. D= 1Ft.
d= 1Ft.
B= 4Ft.
T= 3Ft.

Type of Liner= Class 'III' Partially Grouted Rip Rap

STA. 264+35 RT; DDE=10CY, 265+35 RT; DDE=10CY, 267+13 RT; DDE=10CY, 268+94 RT; DDE=10CY –L–

DETAIL 20–2
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner= CL 'III' Rip-Rap, Keyed-In

STA. 264+59 RT, 265+38 RT, 267+13 RT, 268+94 RT –L–

(P) 4' PARTIALLY GROUTED RIP RAP BASE DITCH
EST. 100 TONS CLASS 'III' RIP RAP
80 SY GEOTEXTILE, 10 CY CONCRETE
S=0.6146 FT/FT, SEE DETAIL 20–1

(Q) RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 50 TONS
SEE DETAIL 20–2

(R) 4' PARTIALLY GROUTED RIP RAP BASE DITCH
EST. 90 TONS CLASS 'III' RIP RAP
70 SY GEOTEXTILE, 10 CY CONCRETE
S=0.6165 FT/FT, SEE DETAIL 20–1

(S) RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 55 TONS
SEE DETAIL 20–2

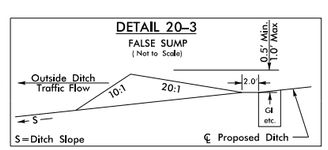
(T) 4' PARTIALLY GROUTED RIP RAP BASE DITCH
EST. 50 TONS CLASS 'III' RIP RAP
40 SY GEOTEXTILE, 5 CY CONCRETE
S=0.8125 FT/FT, SEE DETAIL 20–1

(U) RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 45 TONS
SEE DETAIL 20–2

(V) 4' PARTIALLY GROUTED RIP RAP BASE DITCH
EST. 65 TONS CLASS 'III' RIP RAP
50 SY GEOTEXTILE, 10 CY CONCRETE
S=0.7514 FT/FT, SEE DETAIL 20–1

(W) RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 40 TONS
SEE DETAIL 20–2

DETAIL 20–3
FALSE SUMP
(Not to Scale)



FROM STA. 265+45 TO STA. 265+60 LT –L–
FROM STA. 267+15 TO STA. 267+30 LT –L–
FROM STA. 269+00 TO STA. 269+15 LT –L–
FROM STA. 272+80 TO STA. 272+95 LT –L–

PERMIT DRAWING SHEET 18 OF 29

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
18314.1045039 (WP4)	21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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N.C.B.E.L.S. License Number: F-0116

NAD 83 / NA 2011

LEGEND

- S S — SURFACE WATER IMPACTS
- TS TS — TEMPORARY SURFACE WATER IMPACTS

LEGEND

- SLOPE EMBANKMENT
- PGR
- STABILIZED FILL

MATCH LINE –L– STA 275+00 SEE SHEET 20

MATCH LINE –L– STA 291+00 SEE SHEET 22

SEE SHEET 21A

SITE 17

SITE 18

SITE 19

SITE 20

SITE 21

STD. 4' BASE DITCH SEE DETAIL 21–1 EST 30 TONS CLASS 'II' RIP RAP S=0.1538 FT/FT

STD. 'V' DITCH SEE DETAIL 21–7 EST 5 TONS CLASS 'I' RIP RAP S=0.3709 FT/FT

STD. 'V' DITCH SEE DETAIL 21–7 EST 5 TONS CLASS 'I' RIP RAP S=0.8271 FT/FT

STD. 4' BASE DITCH SEE DETAIL 21–1 EST 30 TONS CLASS 'II' RIP RAP S=0.2125 FT/FT

STD. 4' BASE DITCH SEE DETAIL 21–1 EST. 30 TONS CLASS 'II' RIP RAP S=0.2967 FT/FT

STD. 4' BASE DITCH SEE DETAIL 21–1 EST 150 TONS CLASS 'I' RIP RAP S=0.0812 FT/FT

30" RCP–IV

18" RCP–IV

24" RCP–IV

54" RCP–IV BURIED 1.0'

48" RCP–IV BURIED 1.0'

15" RCP–III

TB 2GI

TB 2GI W/1.0' SILL

REMOVE

REMOVE SYSTEM/

POTENTIAL FORD LOCATION PENDING CONSTRUCTION REVISION

RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 50 TONS SEE DETAIL 21–4

RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 30 TONS SEE DETAIL 21–4

RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 35 TONS SEE DETAIL 21–4

RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 25 TONS SEE DETAIL 21–4

4' STD. BASE DITCH EST. 165 TONS CLASS 'II' RIP RAP 235 SY GEOTEXTILE S=0.0534 FT/FT SEE DETAIL 21–1

2' STD. BASE DITCH EST. 205 TONS CLASS 'I' RIP RAP 250 SY GEOTEXTILE S=0.0391 FT/FT SEE DETAIL 21–1

TOE PROTECTION W/PSRM EST. 150 SY PSRM SEE DETAIL 21–2

PROPOSED STREAM RELOCATION (SEE WORK PACKAGE #4 STREAM RELOCATION PLANS)

FILL IN EXISTING STREAMBED WITH NATIVE MATERIAL (SEE STREAM RELOCATION PLANS, TYP.)

FILL IN EXISTING STREAMBED WITH NATIVE MATERIAL (SEE STREAM RELOCATION PLANS, TYP.)

CONTRACTOR TO AVOID REMOVAL OF EXISTING TREES WITHIN THE TEMPORARY EASEMENT AREA ADJACENT TO THE STREAM AS MUCH AS PRACTICABLE. SEE PENDING REFORESTATION PLAN FOR PROPOSED TREE PLANTINGS.

*NOTE: CONTRACTOR TO AVOID 'PERCHING' OF PROP. CULVERT OUTLETS CARRYING JURISDICTIONAL STREAMS AT HWs 2109, 2110, 2112, 2131, 2132

(X) 4' PARTIALLY GROUTED RIP RAP BASE DITCH EST. 210 TONS CLASS 'III' RIP RAP 140 SY GEOTEXTILE, 20 CY CONCRETE S=0.5295 FT/FT, SEE DETAIL 21–3

(Y) STD. 6' BASE DITCH W/CLASS 'II' RIP RAP EST. 60 TONS S=0.0632 FT/FT SEE DETAIL 21–1

(Z) STD. 6' BASE DITCH W/CLASS 'II' RIP RAP EST. 200 TONS S=0.0569 FT/FT SEE DETAIL 21–1

(A1) CLASS 'B' RIP RAP EST. 2 TONS 7 SY GEO–TEXTILE

(B1) STD. 6' BASE DITCH W/CLASS 'I' RIP RAP EST. 70 TONS S=0.0269 FT/FT SEE DETAIL 21–1

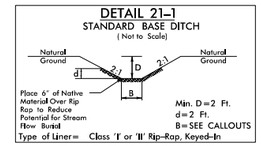
(C1) STD. 4' BASE DITCH W/CLASS 'I' RIP RAP EST. 105 TONS S=0.0302 FT/FT SEE DETAIL 21–1

(D1) STD. 4' BASE DITCH W/CLASS 'I' RIP RAP EST. 90 TONS S=0.0305 FT/FT SEE DETAIL 21–1

(E1) STD. 6' BASE DITCH W/CLASS 'I' RIP RAP EST. 115 TONS S=0.0100 FT/FT SEE DETAIL 21–1

(F1) RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 25 TONS SEE DETAIL 21–4

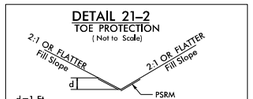
DETAIL 21–1
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= Class 'I' or 'II' Rip–Rap, Keyed–In

STA. 280+78 LT –L–; DDE=15CY
STA. 280+25 LT –L–; DDE=10CY
STA. 283+25 LT –L–; DDE=15CY
STA. 281+21, 23' TO STA. 282+01, 44' RT; DDE=45CY –L–
STA. 281+94, 24' TO STA. 282+97, 92' RT; DDE=80CY –L– Y&Z
STA. 283+23, 112' TO STA. 283+52, 138' RT; DDE=35CY –L– B1
STA. 283+30, 27' TO STA. 283+34, 64' RT; DDE=25CY –L– C1
STA. 283+43, 96' TO STA. 283+54, 138' RT; DDE=30CY –L– D1
STA. 283+54, 138' TO STA. 283+64, 175' RT; DDE=30CY –L– E1
STA. 288+95, 24' TO STA. 289+97, 130' RT; DDE=75CY –L–
STA. 286+30, 31' TO STA. 286+44, 150' RT; DDE=60CY –L–

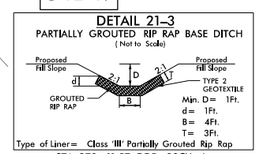
DETAIL 21–2
TOE PROTECTION
(Not to Scale)



Type of Liner= PSRM "Type 3"

FROM STA. 286+50 TO STA. 289+50 LT –L–

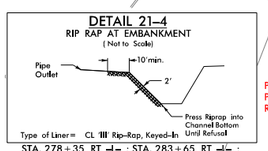
DETAIL 21–3
PARTIALLY GROUTED RIP RAP BASE DITCH
(Not to Scale)



Type of Liner= Class 'III' Partially Grouted Rip Rap

STA. 278+11 RT; DDE=20CY –L–

DETAIL 21–4
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner= CL 'III' Rip–Rap, Keyed–In

STA. 278+35 RT –L– ; STA. 283+65 RT –L– ;
STA. 289+97 RT –L– ; STA. 286+45 RT –L–

50 25 0 50 100
GRAPHIC SCALE

PERMIT DRAWING
SHEET 19 OF 29

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
18314.1045039 (WP4)	21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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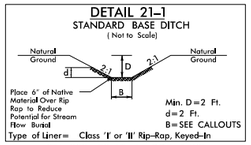
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555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
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NAD 83 / NA 2011

LEGEND

- SURFACE WATER IMPACTS (S / S)
- TEMPORARY SURFACE WATER IMPACTS (TS / TS)

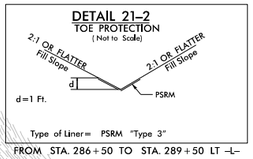
DETAIL 21–1
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= Class 'I' or 'II' Rip-Rap, Keyed-In

STA. 280+78 LT –L–; DDE=15CY
STA. 280+25 LT –L–; DDE=10CY
STA. 283+25 LT –L–; DDE=15CY
STA. 281+21, 23' TO STA. 282+01, 44' RT; DDE=45CY –L–
STA. 281+94, 24' TO STA. 282+97, 92' RT; DDE=80CY –L– Y&Z
STA. 283+23, 112' TO STA. 283+52, 138' RT; DDE=35CY –L– B1
STA. 283+30, 27' TO STA. 283+34, 64' RT; DDE=25CY –L– C1
STA. 283+43, 96' TO STA. 283+54, 138' RT; DDE=30CY –L– D1
STA. 283+54, 138' TO STA. 283+64, 175' RT; DDE=30CY –L– E1
STA. 288+95, 24' TO STA. 289+97, 130' RT; DDE=75CY –L–
STA. 286+30, 31' TO STA. 286+44, 150' RT; DDE=60CY –L–

DETAIL 21–2
TOE PROTECTION
(Not to Scale)



Type of Liner= PSRM "Type 3"
FROM STA. 286+50 TO STA. 289+50 LT –L–

LEGEND
SLOPE EMBANKMENT
PGR
STABILIZED FILL

SEE SHEET 21A

SITE 17
SITE 18
SITE 19
SITE 20
SITE 21

STD. 'V' DITCH
SEE DETAIL 21–7
EST 5 TONS
CLASS 'I' RIP RAP
S=0.3709 FT/FT

STD. 'V' DITCH
SEE DETAIL 21–7
EST 5 TONS
CLASS 'I' RIP RAP
S=0.8271 FT/FT

STD. 4' BASE DITCH
SEE DETAIL 21–1
EST 30 TONS
CLASS 'II' RIP RAP
S=0.1238 FT/FT

STD. 4' BASE DITCH
SEE DETAIL 21–1
EST 30 TONS
CLASS 'II' RIP RAP
S=0.2125 FT/FT

STD. 4' BASE DITCH
SEE DETAIL 21–1
EST 30 TONS
CLASS 'II' RIP RAP
S=0.2967 FT/FT

STD. 4' BASE DITCH
SEE DETAIL 21–1
EST 150 TONS
CLASS 'I' RIP RAP
S=0.0812 FT/FT

POTENTIAL FORD LOCATION PENDING CONSTRUCTION REVISION

RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 30 TONS
SEE DETAIL 21–4

RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 50 TONS
SEE DETAIL 21–4

4' STD. BASE DITCH
EST. 165 TONS
CLASS 'II' RIP RAP
235 SY GEOTEXTILE
S=0.0534 FT/FT.
SEE DETAIL 21–1

2' STD. BASE DITCH
EST. 205 TONS
CLASS 'II' RIP RAP
250 SY GEOTEXTILE
S=0.0391 FT/FT
SEE DETAIL 21–1

RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 35 TONS
SEE DETAIL 21–4

TOE PROTECTION W/PSRM
EST. 150 SY PSRM
SEE DETAIL 21–2

PROPOSED STREAM RELOCATION (SEE WORK PACKAGE #4 STREAM RELOCATION PLANS)

FILL IN EXISTING STREAMBED WITH NATIVE MATERIAL (SEE STREAM RELOCATION PLANS, TYP.)

FILL IN EXISTING STREAMBED WITH NATIVE MATERIAL (SEE STREAM RELOCATION PLANS, TYP.)

CONTRACTOR TO AVOID REMOVAL OF EXISTING TREES WITHIN THE TEMPORARY EASEMENT AREA ADJACENT TO THE STREAM AS MUCH AS PRACTICABLE SEE PENDING REFORESTATION PLAN FOR PROPOSED TREE PLANTINGS.

*NOTE: CONTRACTOR TO AVOID 'PERCHING' OF PROP. CULVERT OUTLETS CARRYING JURISDICTIONAL STREAMS AT HWs 2109, 2110, 2112, 2131, 2132

(X) 4' PARTIALLY GROUTED RIP RAP BASE DITCH
EST. 210 TONS CLASS 'III' RIP RAP
140 SY GEOTEXTILE, 20 CY CONCRETE
S=0.5295 FT/FT, SEE DETAIL 21–3

(Y) STD. 6' BASE DITCH W/CLASS 'II' RIP RAP
EST. 60 TONS
S=0.0632 FT/FT
SEE DETAIL 21–1

(Z) STD. 6' BASE DITCH W/CLASS 'II' RIP RAP
EST. 200 TONS
S=0.0569 FT/FT
SEE DETAIL 21–1

(A1) CLASS 'B' RIP RAP
EST. 2 TONS
7 SY GEO–TEXTILE

(B1) STD. 6' BASE DITCH W/CLASS 'I' RIP RAP
EST. 70 TONS
S=0.0269 FT/FT
SEE DETAIL 21–1

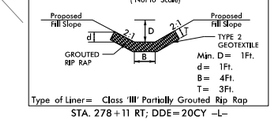
(C1) STD. 4' BASE DITCH W/CLASS 'I' RIP RAP
EST. 105 TONS
S=0.0302 FT/FT
SEE DETAIL 21–1

(D1) STD. 4' BASE DITCH W/CLASS 'I' RIP RAP
EST. 90 TONS
S=0.0305 FT/FT
SEE DETAIL 21–1

(E1) STD. 6' BASE DITCH W/CLASS 'I' RIP RAP
EST. 115 TONS
S=0.0100 FT/FT
SEE DETAIL 21–1

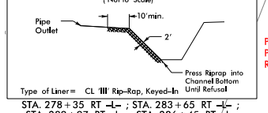
(F1) RIP RAP AT EMBANKMENT
CLASS 'III' RIP RAP
EST. 25 TONS
SEE DETAIL 21–4

DETAIL 21–3
PARTIALLY GROUTED RIP RAP BASE DITCH
(Not to Scale)



Type of Liner= Class 'III' Partially Grouted Rip Rap
STA. 278+11 RT; DDE=20CY –L–

DETAIL 21–4
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner= CL 'III' Rip-Rap, Keyed-In
STA. 278+35 RT –L– ; STA. 283+65 RT –L– ;
STA. 289+97 RT –L– ; STA. 286+45 RT –L–

MATCH LINE –L– STA 275+00 SEE SHEET 20

MATCH LINE –L– STA 291+00 SEE SHEET 22

50 25 0 50 100
GRAPHIC SCALE

PERMIT DRAWING SHEET 20 OF 29

REVISIONS

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6/2/99

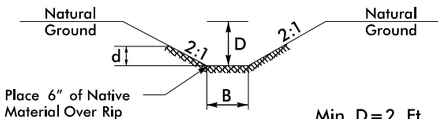
6/2/99

LEGEND

S / S — SURFACE WATER IMPACTS

TS / TS — TEMPORARY SURFACE WATER IMPACTS

DETAIL 21–1
STANDARD BASE DITCH
(Not to Scale)

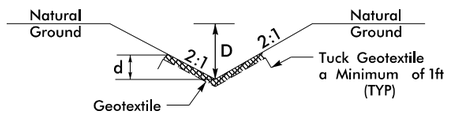


Place 6" of Native Material Over Rip Rap to Reduce Potential for Stream Flow Burial

Min. D = 2 Ft.
d = 2 Ft.
B = SEE CALLOUTS

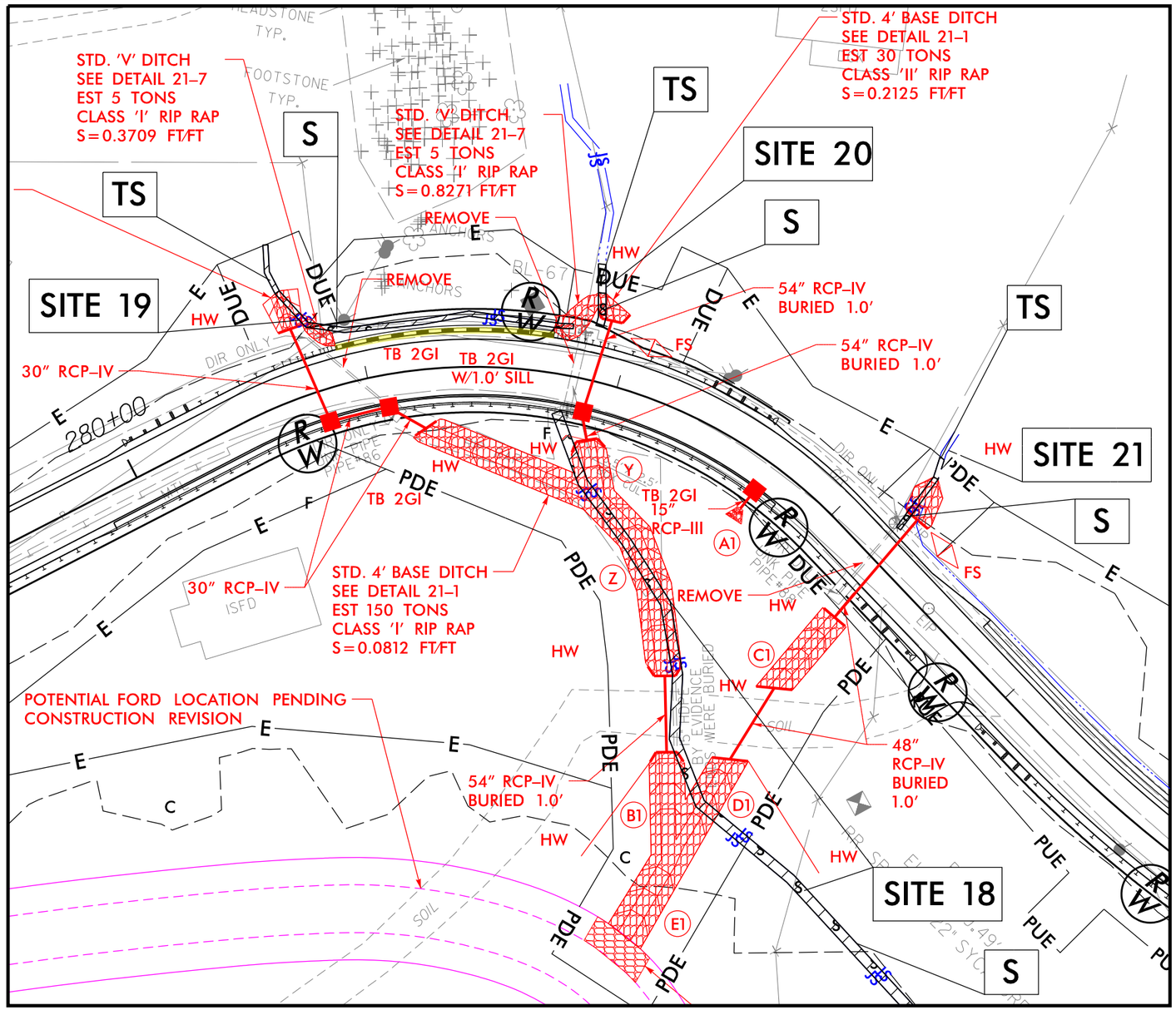
Type of Liner = Class 'I' or 'II' Rip–Rap, Keyed–In

DETAIL 21–7
STANDARD 'V' DITCH
(Not to Scale)



Min. D = 1 Ft.

Type of Liner = Class 'I' Rip–Rap, Keyed–In d = 1 Ft.



NAD 83 / NA 2011

PROJECT REFERENCE NO.	SHEET NO.
18314.1045039 (WP4)	21A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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N.C.B.E.L.S. License Number: F-0116

25 0 25 50
GRAPHIC SCALE

REVISIONS

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PERMIT DRAWING
SHEET 21 OF 29

PROJECT REFERENCE NO.	SHEET NO.
18314.1045039 (WP4)	22
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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50 25 0 50 100
GRAPHIC SCALE

LEGEND

SLOPE EMBANKMENT
PGR
STABILIZED FILL

NAD 83 - NA 2011

MATCH LINE –L– STA 291+00 SEE SHEET 21

MATCH LINE –L– STA 307+00 SEE SHEET 23

SITE 17

RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 130 TONS SEE DETAIL 22–1

CONTRACTOR TO AVOID REMOVAL OF EXISTING TREES WITHIN THE TEMPORARY EASEMENT AREA ADJACENT TO THE STREAM AS MUCH AS PRACTICABLE. SEE PENDING REFORESTATION PLAN FOR PROPOSED TREE PLANTINGS.

TB 3GI
15" RCP–III 3GI
18" RCP–IV
RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 90 TONS SEE DETAIL 22–1

TB 2GI
18" RCP–IV
REMOVE
24" RCP–IV
295+00
2GI
18" RCP–IV
REMOVE
FS
18" RCP–IV
RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 40 TONS SEE DETAIL 22–1
TB 2GI
18" CSP
REMOVE
FS
2GI
300+00
TB 2GI
REMOVE
18" RCP–IV
TB 2GI
18" RCP–III
30" RCP–IV 4GI
305+00
TB JB w/MH
REMOVE
30" RCP–IV

RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 30 TONS SEE DETAIL 22–1

POTENTIAL FORD LOCATION PENDING CONSTRUCTION REVISION

PROPOSED STREAM RELOCATION (SEE WORK PACKAGE #4 STREAM RELOCATION PLANS)

RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 30 TONS SEE DETAIL 22–1

RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 20 TONS SEE DETAIL 22–1

RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 20 TONS SEE DETAIL 22–1

RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 20 TONS SEE DETAIL 22–1

CONTRACTOR TO AVOID REMOVAL OF EXISTING TREES WITHIN THE TEMPORARY EASEMENT AREA ADJACENT, TO THE STREAM AS MUCH AS PRACTICABLE. SEE PENDING REFORESTATION PLAN FOR PROPOSED TREE PLANTINGS.

4' PARTIALLY GROUTED RIP RAP BASE EST. 75 TONS CLASS 'III' RIP RAP 60 SY GEOTEXTILE, 10 CY CONCRETE DITCH S=0.6232 FT/FT, SEE DETAIL 22–2

RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 50 TONS SEE DETAIL 22–1

FILL IN EXISTING STREAMBED WITH NATIVE MATERIAL (SEE STREAM RELOCATION PLANS, TYP.)

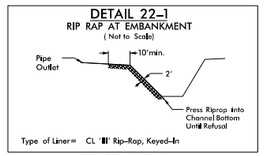
PROPOSED STREAM RELOCATION (SEE WORK PACKAGE #4 STREAM RELOCATION PLANS)

LEGEND

SURFACE WATER IMPACTS

TEMPORARY SURFACE WATER IMPACTS

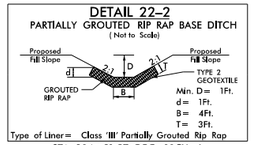
DETAIL 22–1
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner= CL 'II' Rip-Rap, Keyed-In

STA. 291+11 RT –L–
STA. 291+74 RT –L–
STA. 293+94 RT –L–
STA. 296+77 RT –L–
STA. 297+95 RT –L–
STA. 298+63 RT –L–
STA. 299+97 RT –L–
STA. 301+03 RT –L–
STA. 304+91 RT –L–

DETAIL 22–2
PARTIALLY GROUTED RIP RAP BASE DITCH
(Not to Scale)

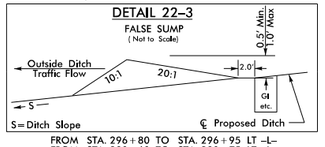


Min. D= 1Ft.
d= 1Ft.
B= 4Ft.
T= 3Ft.

Type of Liner= Class 'III' Partially Grouted Rip Rap

STA. 304+91 RT; DDE=10CY –L–

DETAIL 22–3
FALSE SUMP
(Not to Scale)



FROM STA. 296+80 TO STA. 296+95 LT –L–
FROM STA. 298+60 TO STA. 298+75 LT –L–

PERMIT DRAWING SHEET 22 OF 29

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
18314.1045039 (WP4)	22
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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50 25 0 50 100
GRAPHIC SCALE

LEGEND

SLOPE EMBANKMENT
PGR
STABILIZED FILL

MATCH LINE –L– STA 291+00 SEE SHEET 21

MATCH LINE –L– STA 307+00 SEE SHEET 23

NAD 83 – NA 2011

SITE 17

RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 130 TONS SEE DETAIL 22–1

TB 3GI
15" RCP–III
3GI
18" RCP–IV
RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 90 TONS SEE DETAIL 22–1

CONTRACTOR TO AVOID REMOVAL OF EXISTING TREES WITHIN THE TEMPORARY EASEMENT AREA ADJACENT TO THE STREAM AS MUCH AS PRACTICABLE. SEE PENDING REFORESTATION PLAN FOR PROPOSED TREE PLANTINGS.

TB 2GI
18" RCP–IV
REMOVE
295+00
24" RCP–IV
2GI
18" RCP–IV
FS
REMOVE
18" CSP
RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 40 TONS SEE DETAIL 22–1
TB 2GI

RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 30 TONS SEE DETAIL 22–1

POTENTIAL FORD LOCATION PENDING CONSTRUCTION REVISION

PROPOSED STREAM RELOCATION (SEE WORK PACKAGE #4 STREAM RELOCATION PLANS)

RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 30 TONS SEE DETAIL 22–1

RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 20 TONS SEE DETAIL 22–1

TS

RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 20 TONS SEE DETAIL 22–1

2GI
300+00
TB 2GI
REMOVE
18" RCP–IV
TB 2GI
18" RCP–IV

RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 20 TONS SEE DETAIL 22–1

CONTRACTOR TO AVOID REMOVAL OF EXISTING TREES WITHIN THE TEMPORARY EASEMENT AREA ADJACENT TO THE STREAM AS MUCH AS PRACTICABLE. SEE PENDING REFORESTATION PLAN FOR PROPOSED TREE PLANTINGS.

18" RCP–III
30" RCP–IV
4GI
305+00
18" RCP–III
2GI
TB JB w/MH
REMOVE
30" RCP–IV

S

4' PARTIALLY GROUTED RIP RAP BASE EST. 75 TONS CLASS 'III' RIP RAP
60 SY GEOTEXTILE, 10 CY CONCRETE
DITCH S=0.6232 FT/FT, SEE DETAIL 22–2

RIP RAP AT EMBANKMENT CLASS 'III' RIP RAP EST. 50 TONS SEE DETAIL 22–1

FILL IN EXISTING STREAMBED WITH NATIVE MATERIAL (SEE STREAM RELOCATION PLANS, TYP.)

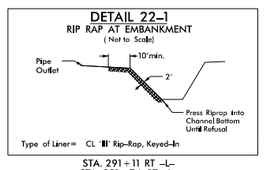
PROPOSED STREAM RELOCATION (SEE WORK PACKAGE #4 STREAM RELOCATION PLANS)

LEGEND

S S SURFACE WATER IMPACTS

TS TS TEMPORARY SURFACE WATER IMPACTS

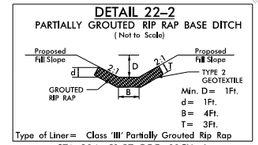
DETAIL 22–1
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner= CL 'III' Rip–Rap, Keyed–In

STA. 291+11 RT –L–
STA. 291+74 RT –L–
STA. 293+94 RT –L–
STA. 296+77 RT –L–
STA. 297+95 RT –L–
STA. 298+63 RT –L–
STA. 299+97 RT –L–
STA. 301+03 RT –L–
STA. 304+91 RT –L–

DETAIL 22–2
PARTIALLY GROUTED RIP RAP BASE DITCH
(Not to Scale)

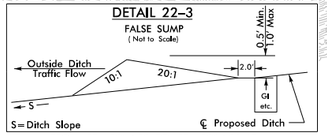


Min. D= 1Ft.
d= 1Ft.
B= 4Ft.
T= 3Ft.

Type of Liner= Class 'III' Partially Grouted Rip Rap

STA. 304+91 RT; DDE=10CY –L–

DETAIL 22–3
FALSE SUMP
(Not to Scale)



FROM STA. 296+80 TO STA. 296+95 LT –L–
FROM STA. 298+60 TO STA. 298+75 LT –L–

PERMIT DRAWING SHEET 23 OF 29

REVISIONS

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6/2/99

PROJECT REFERENCE NO.	SHEET NO.
18314.1045039 (WP4)	23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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50 25 0 50 100
GRAPHIC SCALE

LEGEND

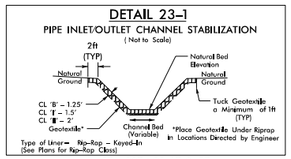
SLOPE EMBANKMENT
PGR
STABILIZED FILL

LEGEND

S/S SURFACE WATER IMPACTS

TS/TS TEMPORARY SURFACE WATER IMPACTS

DETAIL 23–1
PIPE INLET/OUTLET CHANNEL STABILIZATION
(Not to Scale)



–L– STA. 307+80 LT & RT
–L– STA. 313+05 LT & RT
–L– STA. 317+80 LT & RT

NAD 83 – NA 2011

MATCH LINE –L– STA 320+00 SEE SHEET 24

MATCH LINE –L– STA 307+00 SEE SHEET 22

SEE SHEET 23A

SITE 17

SITE 22

RETAIN SYSTEM

RETAIN & CLEAN OUT

CLASS 'B' RIP RAP
EST. 3 TONS
10 SY GEO–TEXTILE
SEE DETAIL 23–1

RETAIN & CLEAN OUT STORM DEBRIS ONLY. MAINTAIN 1' MIN. OF NATIVE BED MATERIAL IN CULVERT.

PROPOSED STREAM RELOCATION (SEE WORK PACKAGE #4 STREAM RELOCATION PLANS)

FILL IN EXISTING STREAMBED WITH NATIVE MATERIAL (SEE STREAM RELOCATION PLANS, TYP.)

CONTRACTOR TO AVOID REMOVAL OF EXISTING TREES WITHIN THE TEMPORARY EASEMENT AREA ADJACENT TO THE STREAM AS MUCH AS PRACTICABLE. SEE PENDING REFORESTATION PLAN FOR PROPOSED TREE PLANTINGS.

BM-22 ELEV.=498.95' RR SPIKE IN 24" MAPLE

BM-21 ELEV.=1505.92' RR SPIKE IN 30" POPLAR

BL-74

US 74 (GERTON HWY) 20.5' BST

BROAD RIVER

PERMIT DRAWING
SHEET 24 OF 29

REVISIONS

6/2/99

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PROJECT REFERENCE NO.	SHEET NO.
18314.1045039 (WP4)	23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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50 25 0 50 100
GRAPHIC SCALE

LEGEND

SLOPE EMBANKMENT
PGR
STABILIZED FILL

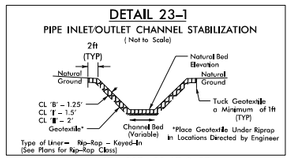
LEGEND

S/S SURFACE WATER IMPACTS

TS/TS TEMPORARY SURFACE WATER IMPACTS

NAD 83 NA 2011

DETAIL 23–1
PIPE INLET/OUTLET CHANNEL STABILIZATION
(Not to Scale)



–L– STA. 307+80 LT & RT
–L– STA. 313+05 LT & RT
–L– STA. 317+80 LT & RT

MATCH LINE –L– STA 307+00 SEE SHEET 22

MATCH LINE –L– STA 320+00 SEE SHEET 24

SEE SHEET 23A

SITE 17

SITE 22

CLASS 'B' RIP RAP
EST. 3 TONS
10 SY GEO–TEXTILE
SEE DETAIL 23–1

RETAIN & CLEAN OUT

RETAIN SYSTEM

PROPOSED STREAM RELOCATION (SEE WORK PACKAGE #4 STREAM RELOCATION PLANS)

FILL IN EXISTING STREAMBED WITH NATIVE MATERIAL (SEE STREAM RELOCATION PLANS, TYP.)

CONTRACTOR TO AVOID REMOVAL OF EXISTING TREES WITHIN THE TEMPORARY EASEMENT AREA ADJACENT TO THE STREAM AS MUCH AS PRACTICABLE. SEE PENDING REFORESTATION PLAN FOR PROPOSED TREE PLANTINGS.

RETAIN & CLEAN OUT STORM DEBRIS ONLY. MAINTAIN 1' MIN. OF NATIVE BED MATERIAL IN CULVERT.

BROAD RIVER

US 74 (GERTON, HWY) 20.5' BST

BM-21 ELEV.=1505.92' RR SPIKE IN 30" POPLAR

BM-22 ELEV.=1498.95' RR SPIKE IN 36" MAPLE

PERMIT DRAWING
SHEET 25 OF 29

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
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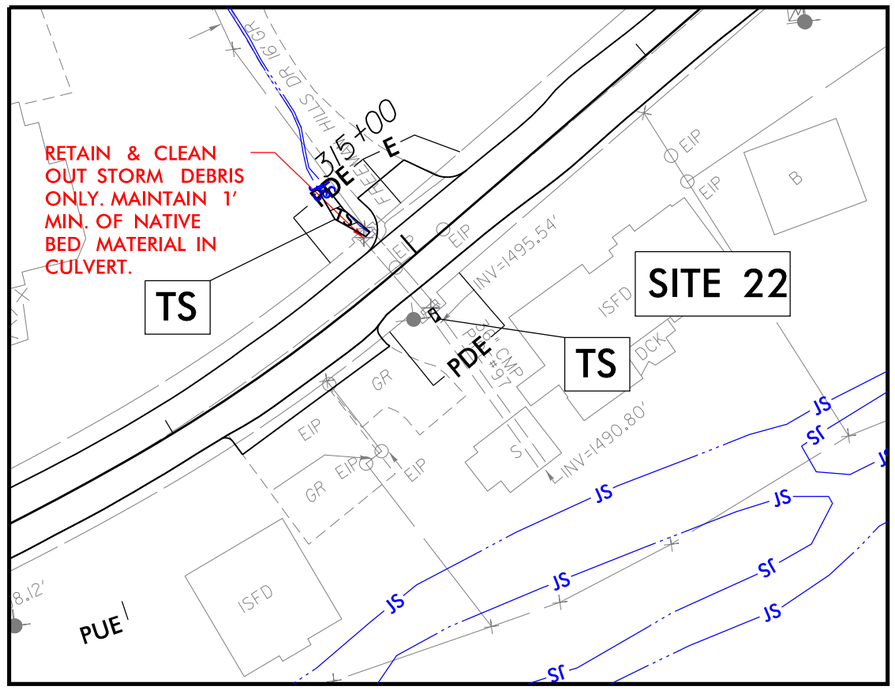
REVISIONS
6/2/99

6/2/99

LEGEND

S S — SURFACE WATER IMPACTS

TS TS — TEMPORARY SURFACE WATER IMPACTS



PROJECT REFERENCE NO.	SHEET NO.
18314.1045039 (WP4)	23A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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12.5 0 12.5 25
GRAPHIC SCALE

NAD 83 NA 2011

REVISIONS

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PERMIT DRAWING
SHEET 26 OF 29

PROJECT REFERENCE NO.	SHEET NO.
18314.1045039 (WP4)	24
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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N.C.B.E.L.S. License Number: F-0116

50 25 0 50 100
GRAPHIC SCALE

LEGEND

SLOPE EMBANKMENT
PGR
STABILIZED FILL

NAD 83 NA 2011

MATCH LINE -L- STA 320+00 SEE SHEET 23

325+00

330+00

BROAD RIVER

RETAIN

RETAIN & CLEAN OUT

RETAIN & CLEAN OUT

RETAIN & CLEAN OUT

BM-23
ELEV.=1487.57'
RR SPIKE IN 15" ASH

EX BL-101

EX BL-102

EX BL-103

EX BL-104

EX BL-105

BY-91

BY-101

BY11-1

BY11-2

WR-GPS-1

15" RCP PIPE*104 INV=1481.79'

15" CMP PIPE*105 INV=1494.89'

18" RCP PIPE*106 INV=1472.53'

18" RCP PIPE*107 INV=1480.38'

24" CMP PIPE*108 INV=1473.66'

INV=1485.21'

INV=1494.28'

INV=1483.86'

INV=1487.26'

INV=1476.26'

INV=1475.40'

EXISTING R/W

MAINTAINED R/W

US 74A (GERTON HWY.)

RED ANDERSON RD.

CEMETERY

ISFD

2SFD

G

GR

BST

DIR ONLY

RIP RAP

UNDER CONSTRUCTION

PERMIT DRAWING
SHEET 27 OF 29

REVISIONS

6/2/99

PLOT DRIVER: NCDOT_pdf_color_eng.100.plt
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PROJECT REFERENCE NO.	SHEET NO.
18314.1045039 (WP4)	24
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N.C.B.E.L.S. License Number: F-0116

50 25 0 50 100
GRAPHIC SCALE

LEGEND

SLOPE EMBANKMENT
PGR
STABILIZED FILL

NAD 83 NA 2011

MATCH LINE -L- STA 320+00 SEE SHEET 23

325+00

330+00

RETAIN

RETAIN & CLEAN OUT

RETAIN & CLEAN OUT

RETAIN & CLEAN OUT

BM-23
ELEV.=1487.57'
RR SPIKE IN 15" ASH

BROAD RIVER

US 74A (GERTON HWY.)

RED ANDERSON RD.

EX BL-101

EX BL-102

EX BL-103

EX BL-104

EX BL-105

BY-91

BY-101

BY11-1

BY11-2

WR-GPS-1

PERMIT DRAWING
SHEET 28 OF 29

REVISIONS

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FILE: \
DATE: 6/23/2026
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6/2/99

WETLAND AND SURFACE 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	-L- 182+65 - 184+85	Channel Change						< 0.01		217		
2	-L- 184+91	54" RCP						< 0.01	< 0.01	56	21	
2	-L- 185+01 - 186+80	Channel Change						< 0.01	< 0.01	183	15	
3	-L- 189+53 - 189+76	Bank Stabilization						< 0.01		50		
4	-L- 190+86 - 195+68	Hickory Creek Reestablishing						0.13	0.02	450	47	
5	-L- 196+26	18" RCP						< 0.01	< 0.01	32	39	
6	-L- 197+99 - 198+00	Bank Stabilization						< 0.01	< 0.01	29	18	
7	-L- 202+22 - 204+23	30" CSP/RCP-IV and 36" RCP-IV						0.01	< 0.01	160	20	
8	-L- 207+31 - 212+24	Hickory Creek Relocation						0.11		265		
8	-L- 207+31 - 212+24	Hickory Creek Reestablishing						0.10	0.03	213	48	
9	-L- 216+19 - 218+25	Hickory Creek Reestablishing						0.07	< 0.01	169	14	
10	-L- 217+40 - 218+12	Cut Slope			0.02							
11	-L- 218+00 - 221+99	Bank Stabilization						0.03		94		
11	-L- 218+00 - 221+99	Partially Grouted Rip Rap							0.12		327	
12	-L- 221+99 - 226+49	Hickory Creek Relocation						0.12		282		
12	-L- 221+99 - 226+49	Hickory Creek Reestablishing						0.09		139		
13	-L- 226+49 - 227+90	Bank Stabilization						< 0.01		25		
13	-L- 226+49 - 227+90	Partially Grouted Rip Rap							0.11		195	
14	-L- 227+90 - 232+32	Hickory Creek Relocation						0.19		325		
14	-L- 227+90 - 232+32	Hickory Creek Reestablishing						0.10	0.04	178	72	
15	-L- 233+98 - 240+54	Hickory Creek Relocation						0.10		240		
15	-L- 233+98 - 240+54	Hickory Creek Reestablishing						0.15	0.04	291	152	
15	-L- 233+98 - 240+54	Bank Stabilization						< 0.01		20		
16	-L- 255+85 - 258+72	Hickory Creek Reestablishing						0.13	0.02	227	53	
17	-L- 263+44 - 308+38	Hickory Creek Relocation						1.04		1634		
17	-L- 263+44 - 308+38	Hickory Creek Reestablishing						1.66	0.02	2831	52	
18	-L- 281+76 - 285+49	Standard 2' Base Ditch/Channel Change						0.04		449		
19	-L- 280+76 - 281+79	30" RCP-IV						< 0.01	< 0.01	124	20	
20	-L- 281+84 - 281+89	54" RCP-IV						< 0.01	< 0.01	13	12	
21	-L- 283+21 - 283+17	48" RCP						< 0.01	< 0.01	25	9	
22	-L- 314+89 - 314+92	Pipe cleanout/Dewatering							< 0.01		25	
TOTALS*:					0.02			4.12	0.42	8721	1139	0

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
JULY 2025
HENDERSON COUNTY
18314.1045039
GERTON HWY - US 74

Stream Plans