STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

JOSH STEIN
GOVERNOR

J.R. "JOEY" HOPKINS
SECRETARY

March 6, 2025

MEMORANDUM TO: Division Environmental and Construction Units

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

SUBJECT: Environmental Permits for the Replacement of Bridge 37 on NC 86 over New Hope Creek in Orange County, Division 7, **TIP: BR-0092.**

Please find enclosed the following permits for this project:

Agency	Permit Type	Permit Expiration
US Army Corps of Engineers Section 404 Clean Water Act Permit	Nationwide Permit 14	March 14, 2026
NC Division of Water Resources Section 401 Water Quality Certification	Individual Certification No. 007546	March 14, 2026
NC Division of Water Resources Buffer Certification	Jordan Lake Water Supply Riparian Buffer Certification	March 4, 2030

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

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

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

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

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

Location:
1000 BIRCH RIDGE DRIVE
RALEIGH NC 27610

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, WILMINGTON DISTRICT
RALEIGH FIELD OFFICE
3331 HERITAGE TRADE DRIVE SUITE 105
WAKE FOREST NC 27587

March 5, 2025

Regulatory Division
SAW-2025-00236

Sent Via email: jlhemphill@ncdot.gov

Jeff Hemphill
NCDOT, NEU
1598 Mail Service Center
Raleigh, NC 27699-1598

Dear Mr. Hemphill:

This letter is in response to the Pre-Construction Notification (PCN) you submitted to the Wilmington District, WRDA / Transportation Branch, on January 31, 2025, for a Department of the Army Nationwide permit (NWP) verification. This project has been assigned the file number SAW-2025-00236 and is known as NCDOT_BR-0092_NC 86_Br 37_Orange. 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 TIP BR-0092; bridge replacement impacting 0.39 acre of wetlands (permanent loss impact for false cut ditch, pipe, and roadway embankment construction), and 162 linear feet of tributary (100 linear feet of permanent riprap bank stabilization and embankment protection, 27 linear feet of temporary dewatering (15 linear feet concurrent with permanent impact), and 35 linear feet of temporary workpad/causeway impact). The project area for this determination illustrated on the enclosed permit drawings. The project/review area is located in ; at OR on the NSEW side of ROADWAY, XX miles/feet NSEW of the intersection of ROADWAY and ROADWAY, at Latitude 35.99509 and Longitude -79.07251; in Chapel Hill, Orange County, North Carolina.

We have determined that the proposed work is authorized by Nationwide Permit 14 - Linear transportation 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 March 14, 2026, unless prior to this date the subject NWP(s) is suspended, revoked, or is modified such that the activity no longer complies with the terms and conditions of this NWP. If you commence or are under contract to commence this activity before the date that the relevant NWP is modified or revoked, you will have 12 months from the date of the modification or revocation of the NWP to complete the activity under the present terms and conditions of this NWP.

Project Specific Special Conditions:

1. **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 authorization.

2. **Mussels**: The U.S. Fish and Wildlife Service's (USFWS's) Programmatic Biological Opinion (BO) titled `Bridge and Culvert Replacements/Repairs/Rehabilitations in Eastern North Carolina, NCDOT Divisions 1-8),' dated September 11, 2019, contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with `incidental take' that are specified in the BO. Your authorization under this Corps permit is conditional upon your compliance with all the mandatory terms and conditions associated with incidental take of the BO, 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 BO, 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 BO, and with the ESA.

3. **Northern long-eared bat**: The Wilmington District, Federal Highway Administration, U.S. Fish and Wildlife Service (USFWS), and the North Carolina Department of Transportation (NCDOT) have conducted programmatic Section 7(a)(2) consultation for the Northern long-eared bat (NLEB) for NCDOT projects located in Divisions 1-8. The result of this programmatic consultation is a Programmatic Biological Opinion (PBO) issued by the USFWS titled, "Programmatic Biological Opinion – Revised, NCDOT Program Effects on the Northern Long-eared Bat in Divisions 1-8", dated December 15, 2022. This PBO contains agreed upon conservation measures which would minimize take of NLEB. As noted in the PBO, applicability of these conservation measures varies depending on the location of the project. The USFWS has documented that no reasonable and prudent measures, nor terms and conditions, are necessary or appropriate to minimize the amount or extent of incidental take of NLEB caused by the Action; therefore, the incidental take statement does not provide reasonable and prudent measures for this species. Department of the Army (DA)

authorization under general permit or standard permit (Individual Permit) is conditional upon the permittee's compliance with applicable, agreed upon conservations measures of the PBO, which is incorporated by reference in this verification letter. Failure to comply with the applicable conservation measures, where a take of the NLEB occurs, would constitute an unauthorized take by the permittee, and would also constitute permittee non-compliance with this verification letter. The USFWS is the appropriate authority to determine compliance with the terms and conditions of its PBO and the ESA. All PBOs can be found on our website at: https://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Agency-Coordination/ESA/.

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 Eric Alsmeyer, Regulatory Project Manager of the Raleigh Field Office at 919.817.1570, by mail at the above address, or by email at eric.c.alsmeyer@usace.army.mil. Please take a moment to complete our customer satisfaction survey located at https://regulatory.ops.usace.army.mil/customer-service-survey/.

Sincerely,

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

Enclosures

Cc (w/enclosures)
Erin Cheely, NCDOT, NEU
(via ekcheely@ncdot.gov)

Compliance Certification Form

File Number: SAW-2025-00236 **County: Orange**

Permittee: NCDOT

Project Name: NCDOT_BR-0092_NC 86_Br 37_Orange

Date Verification Issued: 3/5/2025

Project Manager: Eric Alsmeyer

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

US ARMY CORPS OF ENGINEERS
Wilmington District
Attn: Eric Alsmeyer
Raleigh Field Office
3331 Heritage Trade Drive Suite 105
Wake Forest, NC 27587
or
eric.c.alsmeyer@usace.army.mil

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

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

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

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

_____

_____

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

_____ _____

Signature of Permittee **Date**

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

Permittee: NCDOT
Action ID: SAW-2025-00236
Project Name: TIP BR-0092_NC 86_Bridge 37
County: Orange

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:** 03030002, Cape Fear River Basin

Stream Impacts (linear feet)			Wetland Impacts (acres)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
				0.039		

*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:** 03030002, Cape Fear River Basin

Stream Mitigation (credits)			Wetland Mitigation (credits)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
				0.078		

Mitigation Site Debited: NCDMS
(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: NCDMS

Name of Sponsor's Authorized Representative: Beth Harmon

Elizabeth Harmon — 03/06/2025

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: Eric Alsmeyer
USACE Field Office: Raleigh Regulatory Field Office
US Army Corps of Engineers
3331 Heritage Trade Drive, Suite 105
Wake Forest, NC 27587
Email: eric.c.alsmeyer@usace.army.mil

Eric Alsmeyer

Wilmington District Project Manager Signature

February 11, 2025

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.

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JOSH STEIN
Governor
D. REID WILSON
Secretary
RICHARD E. ROGERS, JR.
Director

NORTH CAROLINA
Environmental Quality

March 4, 2025

Mr. Jeff Hemphill
NCDOT, Division 7
1598 Mail Service Center
Raleigh, NC 27699
jhemphill@ncdot.gov

Subject: 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with ADDITIONAL CONDITIONS for the proposed replacement of Bridge 37 over New Hope Creek on NC 86, Orange County. NCDWR Project No. 20250128. TIP: BR-0092

Dear Mr. Hemphill,

Attached hereto is a copy of Certification No. 007546 issued to the NCDOT dated March 4, 2025.

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

Sincerely,

Signed by:
Susan Locklear
375CAE2BB9F540C...

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

Electronic copy only distribution:

Eric Alsmeyer, US Army Corps of Engineers, Raleigh Field Office
Erin K. Cheely, DOT Division 7, Environmental Analysis Unit
Jamie Lancaster, DOT Division 7, Environmental Analysis Unit
Beth Harmon, Division of Mitigation Services

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401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with ADDITIONAL CONDITIONS.

THIS CERTIFICATION is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Resources (NCDWR) Regulations in 15 NCAC 2H .0500 and 0.267. This certification authorizes the NCDOT to impact 162 linear feet of jurisdictional streams and 0.039 acres of jurisdictional wetlands in Orange County. The project shall be constructed pursuant to the application dated received January 30, 2025. The authorized impacts are as described below:

Stream Impacts in the Cape Fear River Basin

Site	Perm. Fill to Perennial Stream (linear ft)	Temp. Fill to Perennial Stream (linear ft)	Total Stream Impact (linear ft)
S1- Site 2- Bank Stabilization	85		85
S2- Site 2- Rip Rap at Embankment	15		15
S3- Site 2- Rip Rap at Embankment		27	27
S4- Site 2- Causeway		35	35
Totals	**100**	**62**	**162**

Total Stream Impacts: 162 linear feet.

Wetland Impacts in the Cape Fear River Basin

Site	Perm. Wetland Fill (acreage)	Total Wetland Impact (acreage)
Site 1- False Cut Ditch- WC	0.021	0.021
Site 2- RCP - WA	0.001	0.001
Site 3- Roadway Embankment- WB	0.017	0.017
Totals	**0.039**	**0.039**

Total Wetland Impacts: 0.039 acres.
***There is 0.005 acres of Hand Clearing planned at Site 3.**

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

This approval is only valid for the purpose and design that you submitted in your application dated received January 31, 2025. Should your project change, you are required to notify the NCDWR and submit a new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter and is thereby responsible for complying with all the conditions. If any additional wetland impacts, or stream impacts, for this project (now or

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in the future) exceed one acre or 150 linear feet, respectively, additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7).

For this approval to remain valid, you are required to comply with all the conditions listed below. In addition, you should obtain all other federal, state or local permits before proceeding with your project including (but not limited to) Sediment and Erosion control, Coastal Stormwater, Non-discharge and Water Supply watershed regulations. This Certification shall expire on the same day as the expiration date of the corresponding Corps of Engineers Permit.

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 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 regardless of the quantity of the withdrawal or the date on which the withdrawal was initiated or expanded. Upon the presentation of proper credentials, the Division may inspect the property.

Condition(s) of Certification:

Project Specific Conditions

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

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

3. No drill slurry or water that has been in contact with uncured concrete shall be allowed to enter surface waters. This water shall be captured, treated, and disposed of properly. [15A NCAC 02H .0506(b)(3).

4. The post-construction removal of any temporary bridge structures must return the project site to its preconstruction contours and elevations. The impacted areas shall be revegetated with appropriate native species. [15A NCAC 02H .0506(b)(2)

5. As a condition of this 401 Water Quality Certification, the bridge demolition and construction must be accomplished in strict compliance with the most recent version of NCDOT's Best Management Practices for Construction and Maintenance Activities. [15A NCAC 02H .0507(d)(2) and 15A NCAC 02H .0506(b)(5)].

6. Bridge piles and bents shall be constructed using driven piles (hammer or vibratory) or drilled shaft construction methods. More specifically, jetting or other methods of pile driving are prohibited without prior written approval from the NCDWR first. [15A NCAC 02H.0506(b)(2)].

General Conditions

1. If concrete is used during construction, a dry work area shall be maintained to prevent direct contact between curing concrete and stream water. Water that inadvertently contacts uncured concrete shall not be discharged to surface waters due to the potential for elevated pH and possible aquatic life and fish kills. [15A NCAC 02B.0200]

2. During the construction of the project, no staging of equipment of any kind is permitted in waters of the U.S., or protected riparian buffers. [15A NCAC 02H.0506(b)(2)]

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3. The dimension, pattern and profile of the stream above and below the crossing shall not be modified. Disturbed floodplains and streams shall be restored to natural geomorphic conditions. [15A NCAC 02H.0506(b)(2)]

4. The use of rip-rap above the Normal High Water Mark shall be minimized. Any rip-rap placed for stream stabilization shall be placed in stream channels in such a manner that it does not impede aquatic life passage. [15A NCAC 02H.0506(b)(2)]

5. The Permittee shall ensure that the final design drawings adhere to the permit and to the permit drawings submitted for approval. [15A NCAC 02H .0507(c) and 15A NCAC 02H .0506 (b)(2) and (c)(2)]

6. All work in or adjacent to stream waters shall be conducted in a dry work area. Approved BMP measures from the most current version of NCDOT Construction and Maintenance Activities manual such as sandbags, rock berms, cofferdams and other diversion structures shall be used to prevent excavation in flowing water. [15A NCAC 02H.0506(b)(3) and (c)(3)]

7. Heavy equipment shall be operated from the banks rather than in the stream channel in order to minimize sedimentation and reduce the introduction of other pollutants into the stream. [15A NCAC 02H.0506(b)(3)]

8. All mechanized equipment operated near surface waters must be regularly inspected and maintained to prevent contamination of stream waters from fuels, lubricants, hydraulic fluids, or other toxic materials. [15A NCAC 02H.0506(b)(3)]

9. No rock, sand or other materials shall be dredged from the stream channel except where authorized by this certification. [15A NCAC 02H.0506(b)(3)]

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

11. The permittee and its authorized agents shall conduct its activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with §303(d) of the Clean Water Act) and any other appropriate requirements of State and Federal law. If the NCDWR determines that such standards or laws are not being met (including the failure to sustain a designated or achieved use) or that State or federal law is being violated, or that further conditions are necessary to assure compliance, the NCDWR may reevaluate and modify this certification. [15A NCAC 02B.0200]

12. All fill slopes located in jurisdictional wetlands shall be placed at slopes no flatter than 3:1, unless otherwise authorized by this certification. [15A NCAC 02H.0506(b)(2)]

13. A copy of this Water Quality Certification shall be maintained on the construction site at all times. In addition, the Water Quality Certification and all subsequent modifications, if any, shall be maintained with the Division Engineer and the on-site project manager. [15A NCAC 02H .0507(c) and 15A NCAC 02H .0506 (b)(2) and (c)(2)]

14. The outside buffer, wetland or water boundary located within the construction corridor approved by this authorization shall be clearly marked by highly visible fencing prior to any land disturbing activities. Impacts to areas within the fencing are prohibited unless otherwise authorized by this certification. [15A NCAC 02H.0501 and .0502]

15. The issuance of this certification does not exempt the Permittee from complying with any and all statutes, rules, regulations, or ordinances that may be imposed by other government agencies (i.e. local, state, and federal) having jurisdiction, including but not limited to applicable buffer rules, stormwater management rules, soil erosion and sedimentation control requirements, etc.

16. The Permittee shall report any violations of this certification to the Division of Water Resources within 24 hours of discovery. [15A NCAC 02B.0506(b)(2)]

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17. Upon completion of the project (including any impacts at associated borrow or waste sites), NCDOT project engineer (or appointee) shall complete and return the enclosed "Certification of Completion Form" to notify the NCDWR when all work included in the 401 Certification has been completed. [15A NCAC 02H.0502(f)]

18. There shall be no excavation from, or waste disposal into, jurisdictional wetlands or waters associated with this permit without appropriate modification. Should waste or borrow sites, or access roads to waste or borrow sites, be located in wetlands or streams, compensatory mitigation will be required since that is a direct impact from road construction activities. [15A NCAC 02H.0506(b)(3) and (c)(3)]

19. Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to protect surface waters standards [15A NCAC 02H.0506(b)(3) and (c)(3]):

    a. The erosion and sediment control measures for the project must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Sediment and Erosion Control Planning and Design Manual*.
    b. The design, installation, operation, and maintenance of the sediment and erosion control measures must be such that they equal, or exceed, the requirements specified in the most recent version of the *North Carolina Sediment and Erosion Control Manual*. The devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) projects, including contractor-owned or leased borrow pits associated with the project.
    c. For borrow pit sites, the erosion and sediment control measures must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual*.
    d. The reclamation measures and implementation must comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act.

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

21. When applicable, all construction activities shall be performed and maintained in full compliance with G.S. Chapter 113A Article 4 (Sediment and Pollution Control Act of 1973). Regardless of applicability of the Sediment and 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. [15A NCAC 02H .0506{b)(3) and (c)(3) and 15A NCAC 02B .0200]

22. 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 Sediment and Erosion Control Manual,* or for linear transportation projects, the *NCDOT Sediment and Erosion Control Manual.* 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.

23. 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.

This Certification shall become null and void unless the above conditions are made conditions of the Federal 404 and/or Coastal Area Management Act Permit. This Certification shall expire upon the expiration of the 404 or CAMA permit. Please be aware that impacting waters without first applying for and securing the issuance of a 401 Water Quality Certification violates Title 15A of the North Carolina Administrative Code (NCAC) 2H .0500. Title 15A NCAC 2H .0500 requires certifications pursuant to Section 401 of the Clean Water Act whenever construction or operation of facilities will result in a discharge into navigable waters, including wetlands, as described in 33 Code of Federal Regulations (CFR) Part 323. It also states any person desiring issuance of the State certification or coverage under a general certification required by Section 401 of the Federal Water Pollution Control Act shall file with the Director of the North Carolina Division of Water Quality. Violations of any condition herein set forth may result in revocation of this Certification and may result in criminal and/or civil penalties. Pursuant to G.S. 143-215.6A, these

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violations and any future violations are subject to a civil penalty assessment of up to a maximum of $25,000.00 per day for each violation.

This approval and its conditions are final and binding unless contested [G.S. 143-215.5]. Please be aware that impacting waters without first applying for and securing the issuance of a 401 Water Quality Certification violates Title 15A of the North Carolina Administrative Code (NCAC) 2H .0500. Title 15A NCAC 2H .0500 requires certifications pursuant to Section 401 of the Clean Water Act whenever construction or operation of facilities will result in a discharge into navigable waters, including wetlands, as described in 33 Code of Federal Regulations (CFR) Part 323. It also states any person desiring issuance of the State certification or coverage under a general certification required by Section 401 of the Federal Water Pollution Control Act shall file with the Director of the North Carolina Division of Water Quality. Pursuant to G.S. 143-215.6A, these violations and any future violations are subject to a civil penalty assessment of up to a maximum of $25,000.00 per day for each violation.

This Certification can be contested as provided in Chapter 150B of the North Carolina General Statutes by filing a Petition for a Contested Case Hearing (Petition) with the North Carolina Office of Administrative Hearings (OAH) within sixty (60) calendar days. Requirements for filing a Petition are set forth in Chapter 150B of the North Carolina General Statutes and Title 26 of the North Carolina Administrative Code. Additional information regarding requirements for filing a Petition and Petition forms may be accessed at http://www.ncoah.com/ or by calling the OAH Clerk's Office at (919) 431-3000.

A party filing a Petition must serve a copy of the Petition on:

Dan Hirchman, General Counsel
Department of Environmental Quality
1601 Mail Service Center
Raleigh, NC 27699-1601

If the party filing the Petition is not the permittee, then the party must also serve the recipient of the Certification in accordance with N.C.G.S 150B-23(a).

This the 4th day of March, 2025

DIVISION OF WATER RESOURCES

Signed by:
Susan Locklear
375CAE2BB9F540C...

Richard E. Rogers, Jr., Director

WQC No. 007546

Docusign Envelope ID: 2107B549-2230-4095-9FBD-057D920EDD4C

ROY COOPER
Governor
ELIZABETH S. BISER
Secretary
RICHARD E. ROGERS, JR.
Director

NORTH CAROLINA
Environmental Quality

March 4, 2025
Orange County
NCDWR Project No. 20250128
NCDOT TIP Project BR-0092
Replace Bridge 37 on NC 86 over
New Hope Creek

APPROVAL of Jordan Lake Water Supply Riparian Buffer Impacts with Additional Conditions

New Hope Creek in the Cape Fear (CPF02); Index No. 16-41-1-(0.5); Water Supply (WS-V, NSW)

Dear Mr. Hemphill

You have our approval for the impacts listed below for the purpose described in your application dated January 30, 2025 received by the Division of Water Resources. These impacts are covered by Jordan Lake Water Supply Watershed Riparian Buffer Protection Rules and the Conditions listed below. Please note that you should get any other federal, state or local permits before proceeding with your project, including those required by (but not limited to) Sediment and Erosion Control, Non-Discharge, and Water Supply Watershed regulations.

The following impacts are hereby approved, provided that, all the conditions listed below, and all the conditions of the Jordan Lake Supply Watershed Riparian Buffer Rules are met. No other impacts are approved, including incidental impacts. (15A NCAC 02B .0267).

Jordan Lake Water Supply Watershed Riparian Buffer Impacts

Site	Zone 1 Impact (sq ft)	Zone 1 Buffer Mitigation Required (3:1 ratio)		Zone 2 Impact (sq ft)	Zone 2 Buffer Mitigation Required (1.5:1 ratio)
Bridge- Allowable	3,526			742	
Bridge- Allowable	1,947			98	
Bridge- Allowable	1,225			525	
Bridge- Allowable	1,308			534	
Roadway- Allowable with Mitigation	60	60		1,406	1,406
Roadway- Allowable with Mitigation	738	738		1,728	1,728
Roadway- Allowable with Mitigation	0			404	404
Roadway- Allowable with Mitigation	0			109	109
Parallel Impact - Allowable	3,502			3,649	
Totals	**12,306**	**798**		**9,195**	**3,647**

Total Buffer Impact for Project: 21,501 square feet.

Docusign Envelope ID: 2107B549-2230-4095-9FBD-057D920EDD4C

The project shall be constructed in accordance with your application dated January 30, 2025. After reviewing your application, we have decided that these impacts are covered by Individual Water Quality Certification Number. This certification corresponds to the Nationwide Permit 14 issued by the Corps of Engineers. This approval is also valid for the Jordan Lake Riparian Buffer Rules (15A NCAC 2B.0267).

This approval is for the purpose and design described in your application. The plans and specifications for this project are incorporated by reference as part of this Authorization Certificate. If you change your project, you must notify the Division and you may be required to submit a new application package. If the property is sold, the new owner must be given a copy of this Authorization Certificate and is responsible for complying with all conditions. 15A NCAC 02B .0611(b)(2). The permittee shall report any noncompliance with the conditions of this Authorization Certificate and/or any violation of state regulated riparian buffer rules (15A NCAC 02B .0267).

If you are unable to comply with any of the conditions below, you must notify Ryan Conchilla with the Transportation Permitting Branch at Ryan.Conchilla@deq.nc.gov within 24 hours (or the next business day if a weekend or holiday) from the time the permittee becomes aware of the circumstances.

Additional Conditions:

1. All stormwater runoff shall be directed as sheetflow through stream buffers at non-erosive velocities, unless otherwise approved by this Certification. (15A NCAC 02B .0267)

2. All riparian buffers impacted by the placement of temporary fill or clearing activities shall be restored to the preconstruction contours and revegetated. Maintained buffers shall be permanently revegetated with non-woody species by the end of the growing season following completion of construction. For this condition, maintained buffer areas are defined as areas within the transportation corridor that will be subject to regular NCDOT maintenance activities including mowing. The area with non-maintained buffers shall be permanently revegetated with native woody species before the next growing season following completion of construction. (15A NCAC 02B .0267)

3. Pursuant to 15A NCAC 2B.0267**,** sediment and erosion control devices shall not be placed in Zone 1 of any Jordan Lake Water Supply Watershed Riparian Buffer without prior approval by NCDWR. At this time, NCDWR has approved no sediment and erosion control devices in Zone 1, outside of the approved project impacts, anywhere on this project. Moreover, sediment and erosion control devices shall be allowed in Zone 2 of the buffers provided that Zone 1 is not compromised, and that discharge is released as diffuse flow. The stream in the project area is class WS-V, NSW waters of the State.

4. Compensatory mitigation for impacts to 798 square feet of protected riparian buffers in Zone 1 and 3,647 square feet in Zone 2 shall be required. We understand that you have chosen to perform compensatory mitigation for impacts to protected buffers through use of the North Carolina Division of Mitigation Services (DMS) (formerly NCEEP). Mitigation for unavoidable impacts to Jordan Lake Riparian Buffers shall be provided in the Cape Fear Jordan Upper New Hop Arm (CF002), in accordance with 15A NCAC .02B .0714. The DMS has indicated in a letter dated January 22, 2025 that they will assume responsibility for satisfying the compensatory mitigation requirements for the above-referenced project, in accordance with DMS's Mitigation Banking Instrument signed June 14, 2016.

Docusign Envelope ID: 2107B549-2230-4095-9FBD-057D920EDD4C

5. Tall fescue shall not be used in the establishment of temporary or permanent groundcover within riparian areas. For the establishment of permanent herbaceous cover, erosion control matting shall be used in conjunction with an appropriate native seed mix on disturbed soils within the riparian area and on disturbed steep slopes with the following exception. Erosion control matting is not necessary if the area is contained by perimeter erosion control devices such as silt fence, temporary sediment ditches, basins, etc. Matting should be secured in place with staples, stakes, or wherever possible, live stakes of native trees. Erosion control matting placed in riparian areas shall not contain a nylon mesh grid, which can impinge and entrap small animals. For the establishment of temporary groundcover within riparian areas, hydroseeding along with wood or cellulose based hydro mulch applied from a fertilizer- and limestone-free tank is allowable at the appropriate rate in conjunction with the erosion control measures. Discharging hydroseed mixtures and wood or cellulose mulch into surface waters in prohibited. Riparian areas are defined as a distance 25 feet landward from top of stream bank.

This approval and its conditions are final and binding unless contested. [G.S. 143-215.5]

This Authorization Certificate can be contested as provided in Chapter 150B of the North Carolina General Statutes by filing a Petition for a Contested Case Hearing (Petition) with the North Carolina Office of Administrative Hearings (OAH) **within sixty (60) calendar days**. Requirements for filing a Petition are set forth in Chapter 150B of the North Carolina General Statutes and Title 26 of the North Carolina Administrative Code. Additional information regarding requirements for filing a Petition and Petition forms may be accessed at http://www.ncoah.com/ or by calling the OAH Clerk's Office at (919) 431-3000.

One (1) copy of the Petition must also be served to the North Carolina Department of Environmental Quality:

Dan Hirchman, General Counsel
Department of Environmental Quality
1601 Mail Service Center
Raleigh, NC 27699-1601

This Authorization shall expire five (5) years from the date of this letter.

This letter completes the review of the Division under the Jordan Lake Water Supply Watershed Riparian Buffer Protection Rules as described in 15A NCAC 02B. 0267. Please contact Ryan Conchilla at Ryan.Conchilla@deq.nc.gov if you have any questions or concerns.

Sincerely,

Signed by:
Susan Locklear
375CAB2BB9E540C...

Richard E. Rogers, Director
Division of Water Resources

Cc:
Eric Alsmeyer, US Army Corps of Engineers, Raleigh Field Office
Erin K. Cheely, DOT Division 7, Environmental Analysis Unit
Jamie Lancaster, DOT Division 7, Environmental Analysis Unit
Beth Harmon, Division of Mitigation Services

North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR NCDOT PROJECTS

(Version 3.02; Released April 23, 2024)

General Project Information

WBS Element:	67092.1.1	**TIP Number:**	BR-0092	**Project Type:**	Bridge Replacement	**Date:**	10/23/2024
NCDOT Contact:	Bryan Key, PE			**Contractor / Designer:**	MI Engineering, PLLC		
Address:	Highway Division 7 PO Box 14996 Greensboro, 27415-4996 (Mailing)			**Address:**	1011 Schaub Drive, Ste 100 Raleigh, NC 27606		
Phone:	919-707-6263			**Phone:**	919-851-6606		
Email:	bckey@ncdot.gov			**Email:**	hturner@mi-engineers.com		
City/Town:	near Chapel Hill			**County(ies):**	Orange		
River Basin(s):	Cape Fear			**CAMA County?**	No		
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	0.28	**Surrounding Land Use:**	Woods, Wetlands, Railroad, Rural Business & Residential				
	Proposed Project			**Existing Site**			
Project Built-Upon Area (ac.)	1.4	ac.		1.0	ac.		
Typical Cross Section Description:	2-lane undivided highway, with 12' lanes and 8' open shoulders, 13' shoulder at areas w/ guardrail. 4' paved shoulder leading to shoulder berm gutter (SBG) at bridge approach each direction (East Side). Cross slope varies from normal crown at begin project to super elevation along the south approach, across bridge, and to end project.			2-lane undivided highway, with 10' lanes and open shoulders. Cross slope varies from normal crown at begin project to super elevation along the south approach near bridge, across bridge, and to end project.			
Annual Avg Daily Traffic (veh/hr/day):	Design/Future:	7900	Year: 2045	Existing:	6700	Year:	2025

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

SA: Roadway Runoff on South Side (Begin) Project limits to -L- 10+75 is sheet flow via grass shoulder and side slopes which drains to the existing 66" RPC and rip rap outfall channel that run to UT to New Hope Creek. NC-SELDM Catalog recommended use of Minimum Stormwater Control Measures.

SB: Proposed Bridge is 1 span (1@127') 54" Florida I-Beam with 4.0' End Bent Caps. Sloping abutments set back minimum 10' from New Hope Creek top of bank. South stream bank armored with rip rap bank stabilization. Existing interior bents set inside New Hope Creek channel to be removed. NC-SELDM Catalog recommended no Stormwater Control Measures needed.

SB: Runoff approaching South side (Begin) bridge and North side (End) bridge before roadway crest is collected by 2 inlet's set in Shoulder Berm Gutter on low side of super (East Side). This system runs West under proposed -L- alignment to Junction Box in roadway shoulder before dispersing into proposed roadside ditch that runs to New Hope Creek. NC-SELDM Catalog recommended no Stormwater Control Measures needed.

SB: Runoff after roadway crest on North side (End) bridge is collected by 1 inlet set in shoulder berm gutter on low side of super (east side). This system runs West under proposed -L- alignment to Junction Box in roadway shoulder before dispersing into proposed roadside ditch that runs to New Hope Creek. NC-SELDM Catalog recommended no Stormwater Control Measures needed.

SB: Roadway Runoff on South Side (Begin) Project limits is collected by roadside ditches that run to New Hope Creek. Rip Rap lined ditches are utilized West Side to minimize shear stress. NC-SELDM Catalog recommended no Stormwater Control Measures needed.

SB: Roadway Runoff along -Y- is collected into roadside ditches that run to -L- line both sides. Left side ditches drain to 24" cross pipe underneath -Y-, and rigtht side ditches drain to rip rap lined ditches along -L- that disperse to New Hope Creek. NC-SELDM Catalog recommended no Stormwater Control Measures needed.

PA: Roadway Runoff on North Side (End) Project limits along -L- is collected by roadside ditches West Side that drain to an 18" cross pipe underneath NC-86 (-L-) to rip rap outlet pad before dispersing into existing pond East Side.

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 3.02; Released April 23, 2024)

General Project Information

Waterbody Information

Surface Water Body (1):	New Hope Creek		**NCDWR Stream Index No.:**	16-41-1-(0.5)		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Water Supply V (WS-V)			
		Supplemental Classification:	Nutrient Sensitive Waters (NSW)			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	Yes	Comments:	Cape Fear Shiner			
NRTR Stream ID:	SB (New Hope Creek)			**Buffer Rules in Effect:**	Jordan Lake	
Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	No	**Dissipator Pads Provided in Buffer?**	No	
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)						

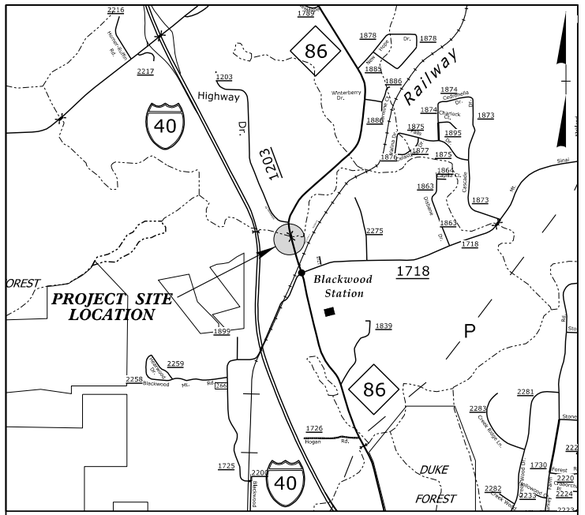
Surface Water Body (2):	SA		**NCDWR Stream Index No.:**	16-41-1-(0.5)		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Water Supply V (WS-V)			
		Supplemental Classification:	Nutrient Sensitive Waters (NSW)			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	Yes	Comments:	Cape Fear Shiner			
NRTR Stream ID:	SA			**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):	PA		**NCDWR Stream Index No.:**			
NCDWR Surface Water Classification for Water Body		**Primary Classification:**				
		Supplemental Classification:				
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?		Comments:				
NRTR Stream ID:	PA			**Buffer Rules in Effect:**		
Project Includes Bridge Spanning Water Body?		**Deck Drains Discharge Over Buffer?**		**Dissipator Pads Provided in Buffer?**		
Deck Drains Discharge Over Water Body?		(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)						

09/08/99

TIP PROJECT: BR-0092

See Sheet 1A For Index of Sheets



VICINITY MAP

THE PROJECT IS NOT WITHIN ANY MUNICIPAL LIMITS.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ORANGE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0092	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
67092.1.1		P.E.
		R/W & Utilities
		Construction

PERMIT DRAWING SHEET 1 OF 11

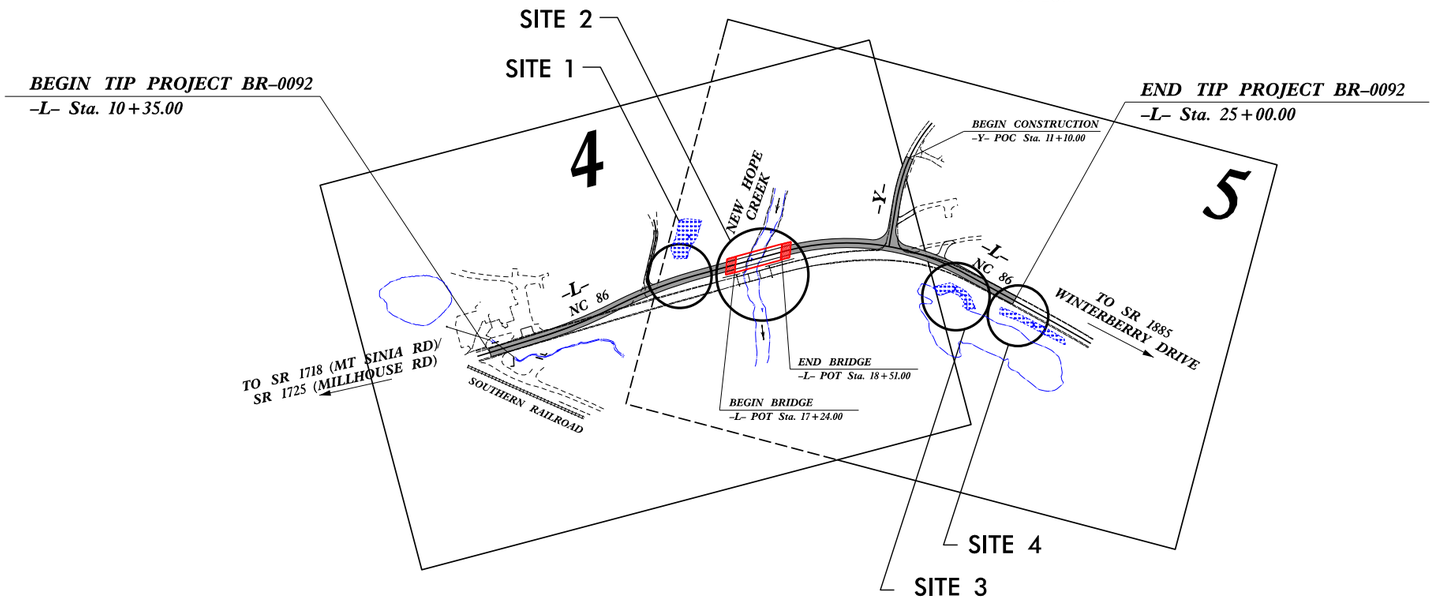
ENGLISH

LOCATION: BRIDGE 670037 ON NC 86 OVER NEW HOPE CREEK

TYPE OF WORK: GRADING, DRAINAGE, PAVING & STRUCTURE

WETLAND AND SURFACE WATER IMPACTS PERMIT

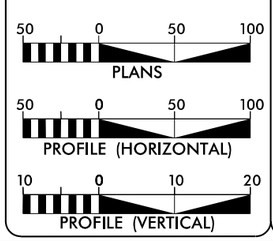
NAD 83/
NA 2011



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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



DESIGN DATA

ADT 2025 = 6,700
ADT 2045 = 7,900
K = 12 %
D = 70 %
T = 4 % *
V = 50 MPH
* TTST =1% DUAL 3%
FUNC CLASS =
MINOR ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT BR-0092 = 0.253 mi

LENGTH STRUCTURE TIP PROJECT BR-0092 = 0.024 mi

TOTAL LENGTH OF TIP PROJECT BR-0092 = 0.277 mi

PLANS PREPARED BY:

Pennoni

PENNONI ASSOCIATES INC
5430 WADE PARK BLVD., SUITE 100,
RALEIGH, NC 27607
(919) 926-1173 NC LICENSE #P-1267

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 19, 2024

LETTING DATE:
AUGUST 19, 2025

PLANS PREPARED FOR:

DIVISION OF HIGHWAYS
PROGRAM MANAGEMENT UNIT
1000 Brich Ridge Drive
Raleigh, NC 27610

BRIAN A. WILES, PE
PROJECT ENGINEER

BRYAN KEY, PE
NCDOT CONTACT
PROGRAM MANAGEMENT UNIT

HYDRAULICS ENGINEER

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 353-4505
FIRM PE NUMBER: P-0671

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

10232024
MI ENGINEERING
BR0092_Hyd_prm_wet_tsh.dgn

Pennoni
PENNONI ASSOCIATES INC.
5430 WADE PARK BLVD., SUITE 106,
RALEIGH, NC 27607
(919) 929-1173 NC LICENSE #F-1267

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 2 OF 11

ENGLISH

NAD 83/NA 2011

-DR-

POT Sta 9+18.98
N 75° 36' 01.9"
PC Sta 9+30.51
PT Sta 9+78.82
S 76° 43' 03.5"
PC Sta 10+75.04
PT Sta 10+90.38
N 68° 10' 28.5"
POT Sta 11+12.41

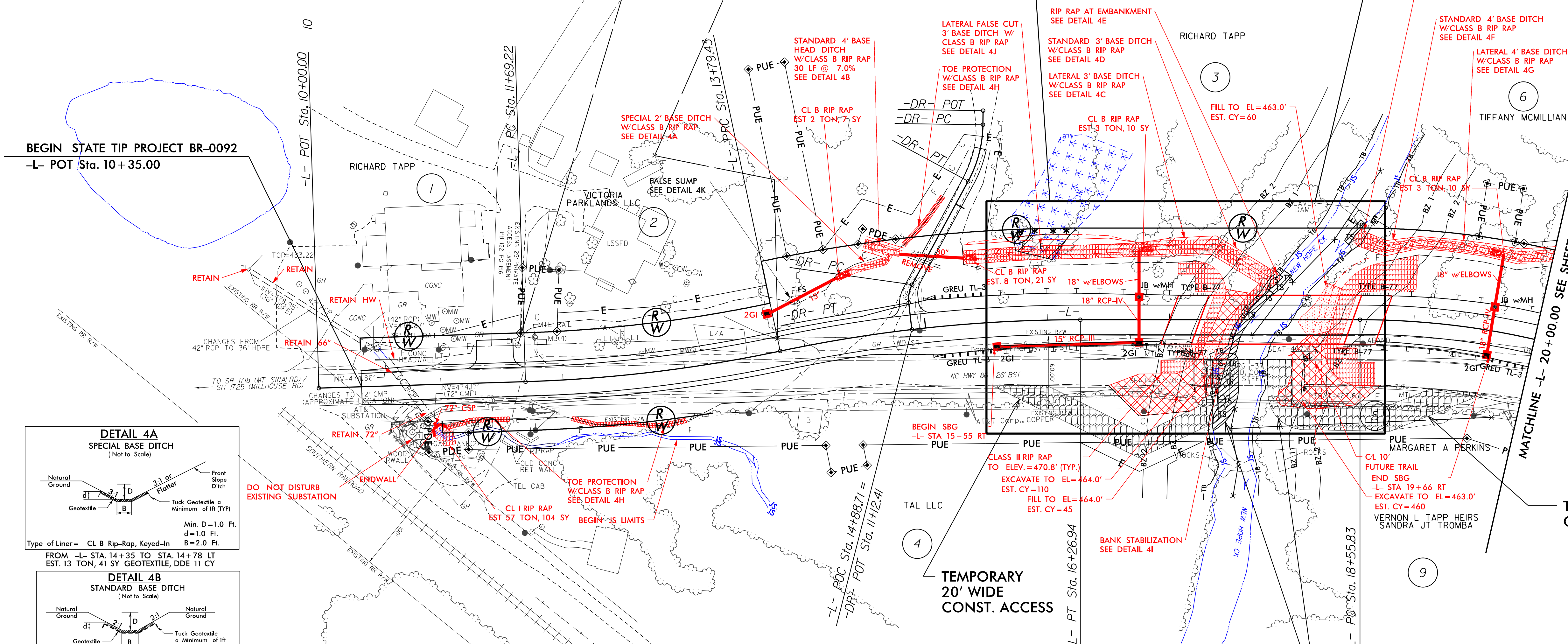
PI Sta 9+55.15
Δ = 27° 40' 54.6" (RT)
D = 57° 17' 44.8"
L = 48.31'
T = 24.64'
R = 100.00'

PI Sta 10+82.95
Δ = 35° 06' 28.0" (LT)
D = 229° 10' 59.2"
L = 15.32'
T = 7.91'
R = 25.00'

SITE 2 – SEE PERMIT DRAWING SHEET 4 OF 11 FOR ENLARGEMENT

SITE 1 – SEE PERMIT DRAWING SHEET 4 OF 11 FOR ENLARGEMENT

BEGIN STATE TIP PROJECT BR-0092
-L- POT Sta. 10+35.00



DETAIL 4G
LATERAL 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=1.5 Ft. d=1.0 Ft. B=4.0 Ft. b=5.0 Ft.
Type of Liner= CL B Rip-Rap, Keyed-In
FROM -L- STA. 18+75 TO STA. 20+00 LT
EST. 43 TON, 122 SY GEOTEXTILE, DDE 77 CY

DETAIL 4H
TOE PROTECTION (Not to Scale)
d=1.0 Ft. b=2.0 Ft.
Type of Liner= CL B Rip-Rap
FROM -L- STA. 11+03 TO STA. 11+55 RT
EST. 10 TON, 36 SY GEOTEXTILE
FROM -L- STA. 12+05 TO STA. 12+95 RT
EST. 19 TON, 64 SY GEOTEXTILE
FROM -DR- STA. 10+00 TO STA. 10+52 RT
EST. 10 TON, 35 SY GEOTEXTILE

DETAIL 4I
BANK STABILIZATION (Not to Scale)
Place Geotextile Under Riprap in Locations Directed by Engineer. Press Riprap into Channel Bottom Until Refusal.
Type of Liner= CL II Rip-Rap, Keyed-In
FROM -L- STA. 17+30 TO STA. 17+78
EST. 95 TONS, 118 SY GEOTEXTILE

DETAIL 4A
SPECIAL BASE DITCH (Not to Scale)
Min. D=1.0 Ft. d=1.0 Ft. B=2.0 Ft.
Type of Liner= CL B Rip-Rap, Keyed-In
FROM -L- STA. 14+35 TO STA. 14+78 LT
EST. 13 TON, 41 SY GEOTEXTILE, DDE 11 CY

DETAIL 4B
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=2.0 Ft. d=1.0 Ft. B=4.0 Ft.
Type of Liner= CL B Rip-Rap, Keyed-In
FROM -DR- STA. 10+58 (21.1') TO STA. 10+64 (50.4') RT
EST. 10 TON, 30 SY GEOTEXTILE, DDE 19 CY

DETAIL 4C
LATERAL 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=2.0 Ft. d=1.0 Ft. B=3.0 Ft. b=5.0 Ft.
Type of Liner= CL B Rip-Rap, Keyed-In
FROM -L- STA. 16+50 TO STA. 17+25 LT
EST. 28 TON, 75 SY GEOTEXTILE, DDE 57 CY

DETAIL 4D
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=2.0 Ft. d=2.0 Ft. B=3.0 Ft.
Type of Liner= CL B Rip-Rap, Keyed-In
FROM -L- STA. 17+25 (-59.9') TO STA. 17+85 (-31.4') LT
EST. 30 TON, 81 SY GEOTEXTILE, DDE 70 CY

DETAIL 4E
RIP RAP AT EMBANKMENT (Not to Scale)
Place Geotextile Under Riprap in Locations Directed by Engineer. Press Riprap into Channel Bottom Until Refusal.
Type of Liner= CL I Rip-Rap, Keyed-In
FROM -L- STA. 17+69 TO STA. 17+92 LT
EST. 12 TON, 35 SY GEOTEXTILE
FROM -L- STA. 18+50 TO STA. 18+70 LT
EST. 16 TON, 29 SY GEOTEXTILE

DETAIL 4F
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=1.5 Ft. d=1.0 Ft. B=4.0 Ft.
Type of Liner= CL B Rip-Rap, Keyed-In
FROM -L- STA. 18+58 (-65.4') TO STA. 18+75 LT (-58.7')
EST. 14 TON, 40 SY GEOTEXTILE, DDE 70 CY

DETAIL 4J
LATERAL FALSE CUT BASE DITCH (Not to Scale)
W=5' Min.
Detail Applies When B is < 6.0' for Class I and II Rip-Rap; And All Widths for Class B Rip-Rap. Min. D=2.0 Ft. d=2.0 Ft. B=3.0 Ft. b=5.0 Ft.
Type of Liner= CL B Rip-Rap, Keyed-In
FROM -L- STA. 15+35 TO STA. 16+50 LT
EST. 79 TON, 211 SY GEOTEXTILE, DDE 5 CY

-L-

PI Sta 12+74.60	PI Sta 15+03.63	PI Sta 21+14.95
Δ = 10° 07' 16.3" (LT)	Δ = 11° 55' 02.0" (RT)	Δ = 43° 53' 50.6" (RT)
D = 4° 48' 53.2"	D = 4° 48' 53.2"	D = 8° 54' 38.5"
L = 210.21'	L = 247.51'	L = 492.64'
T = 105.38'	T = 124.20'	T = 259.12'
R = 1,190.00'	R = 1,190.00'	R = 643.00'
e = 0.05	e = 0.05	e = 0.06
RO = 120'	RO = 120'	RO = 144'
DS = 45 mph	DS = 45 mph	DS = 45 mph

DETAIL 4K
FALSE SUMP (Not to Scale)
S=Ditch Slope

Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

FROM -L- STA. 13+75 TO STA. 14+35 LT

PLAN VIEW
SITES 1 & 2

LEGEND
- TS — TEMPORARY SURFACE WATER IMPACTS
- S — SURFACE WATER IMPACTS
- F — FILL IN WETLAND
- * — MECHANIZED CLEARING (GRUBBING)

100 0 50 100
SCALE: 1" = 100' HORIZ.

FOR PROFILE, SEE SHEET 6

REVISIONS

10/23/2024
MI ENGINEERING
BR0092_Hyd_prm_wet_psh_04.dgn

PROJECT REFERENCE NO. BR-0092 | SHEET NO. 4 | RW SHEET NO. 4

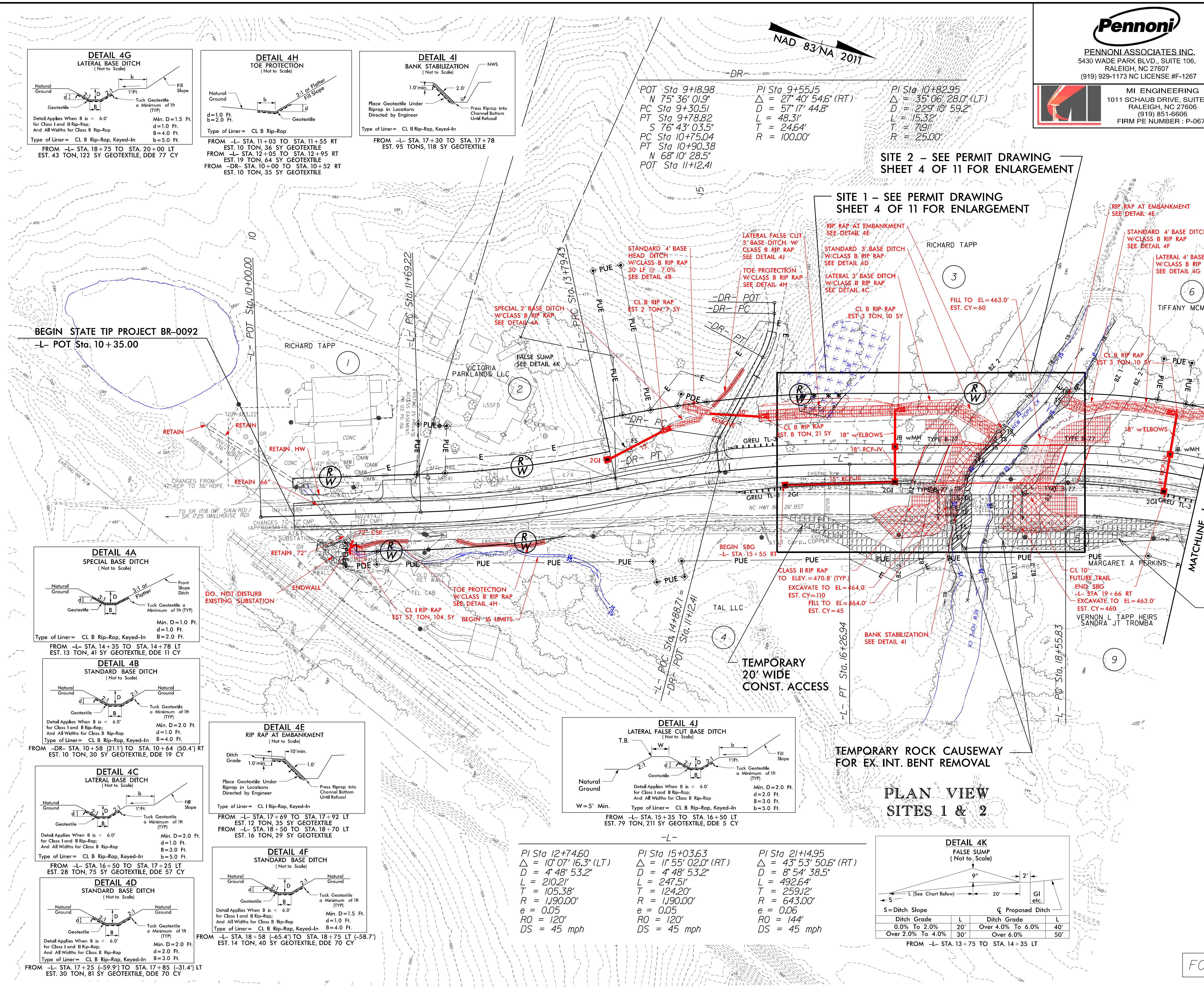
ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

Pennoni
PENNONI ASSOCIATES INC.
5430 WADE PARK BLVD., SUITE 106,
RALEIGH, NC 27607
(919) 929-1173 NC LICENSE #F-1267

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 3 OF 11



-L-

PI Sta 12+74.60	PI Sta 15+03.63	PI Sta 21+14.95
Δ = 10° 07' 16.3" (LT)	Δ = 11° 55' 02.0" (RT)	Δ = 43° 53' 50.6" (RT)
D = 4° 48' 53.2"	D = 4° 48' 53.2"	D = 8° 54' 38.5"
L = 210.21'	L = 247.51'	L = 492.64'
T = 105.38'	T = 124.20'	T = 259.12'
R = 1,190.00'	R = 1,190.00'	R = 643.00'
e = 0.05	e = 0.05	e = 0.06
RO = 120'	RO = 120'	RO = 144'
DS = 45 mph	DS = 45 mph	DS = 45 mph

FOR PROFILE, SEE SHEET 6

REVISIONS

10/23/2024
MI ENGINEERING

Pennoni
PENNONI ASSOCIATES INC.
5430 WADE PARK BLVD., SUITE 106,
RALEIGH, NC 27607
(919) 929-1173 NC LICENSE #F-1267

1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

PROJECT REFERENCE NO.	SHEET NO.
BR-0092	4
ORANGE COUNTY BRIDGE #37	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

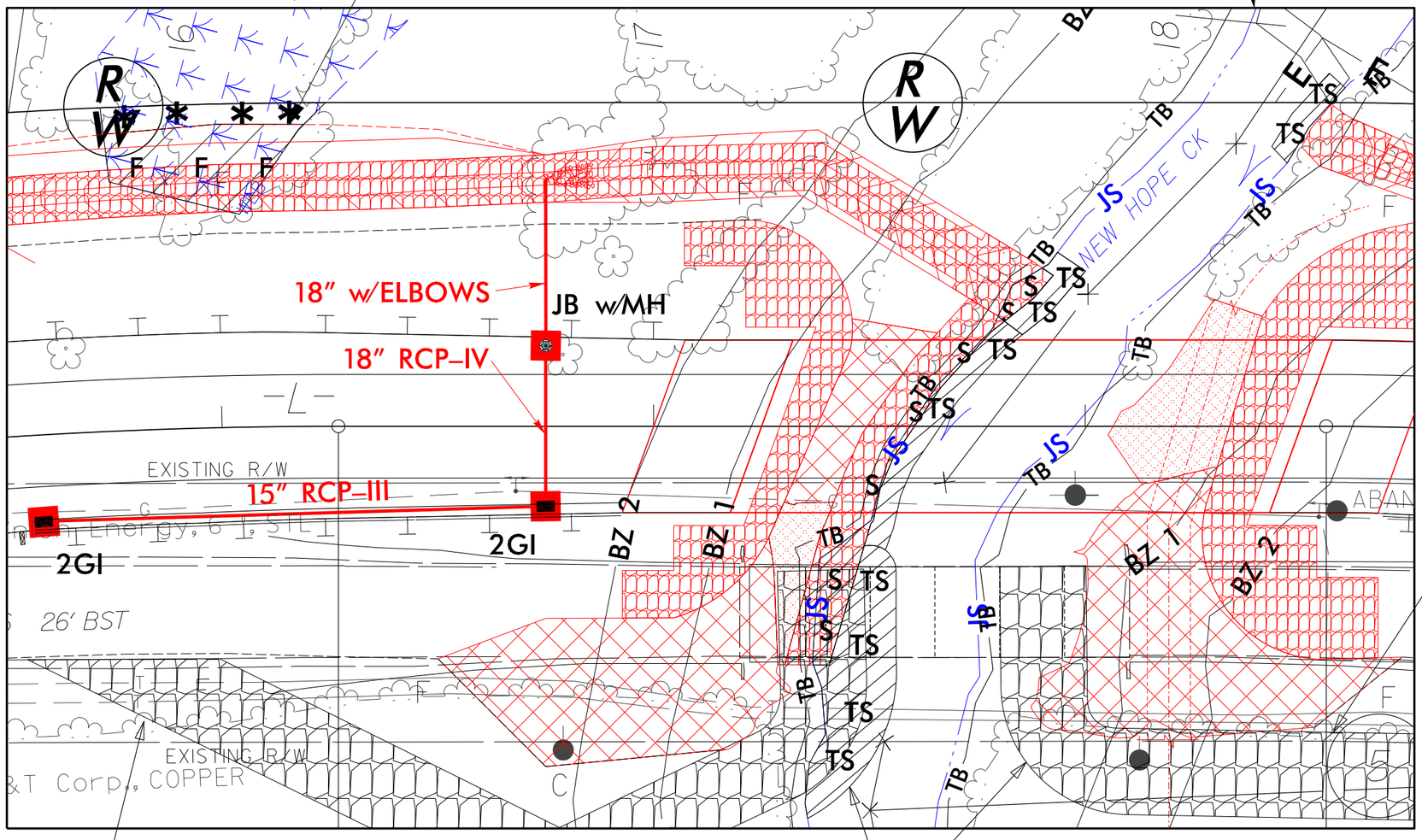
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 4 OF 11

ENGLISH

REVISIONS

NAD 83/NA 2011



ENLARGEMENT PLAN
SITES 1 & 2

LEGEND

- S S — SURFACE WATER IMPACTS
- TS TS — TEMPORARY SURFACE WATER IMPACTS
- F F — FILL IN WETLAND
- * * * — MECHANIZED CLEARING (GRUBBING)

30 0 15 30
SCALE: 1"= 30' HORIZ.

10/23/2024
M1 ENGINEERING
BR0092_Hyd_prm_wet_psh_04a.dgn

5/14/99

Pennoni

PENNONI ASSOCIATES INC.
5430 WADE PARK BLVD., SUITE 106,
RALEIGH, NC 27607
(919) 929-1173 NC LICENSE #F-1267

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

PROJECT REFERENCE NO.	SHEET NO.
BR-0092	6
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 5 OF 11

ENGLISH

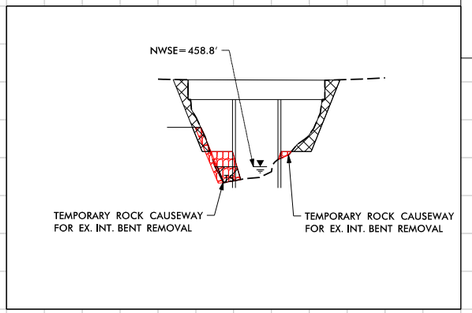
PIPE HYDRAULIC DATA

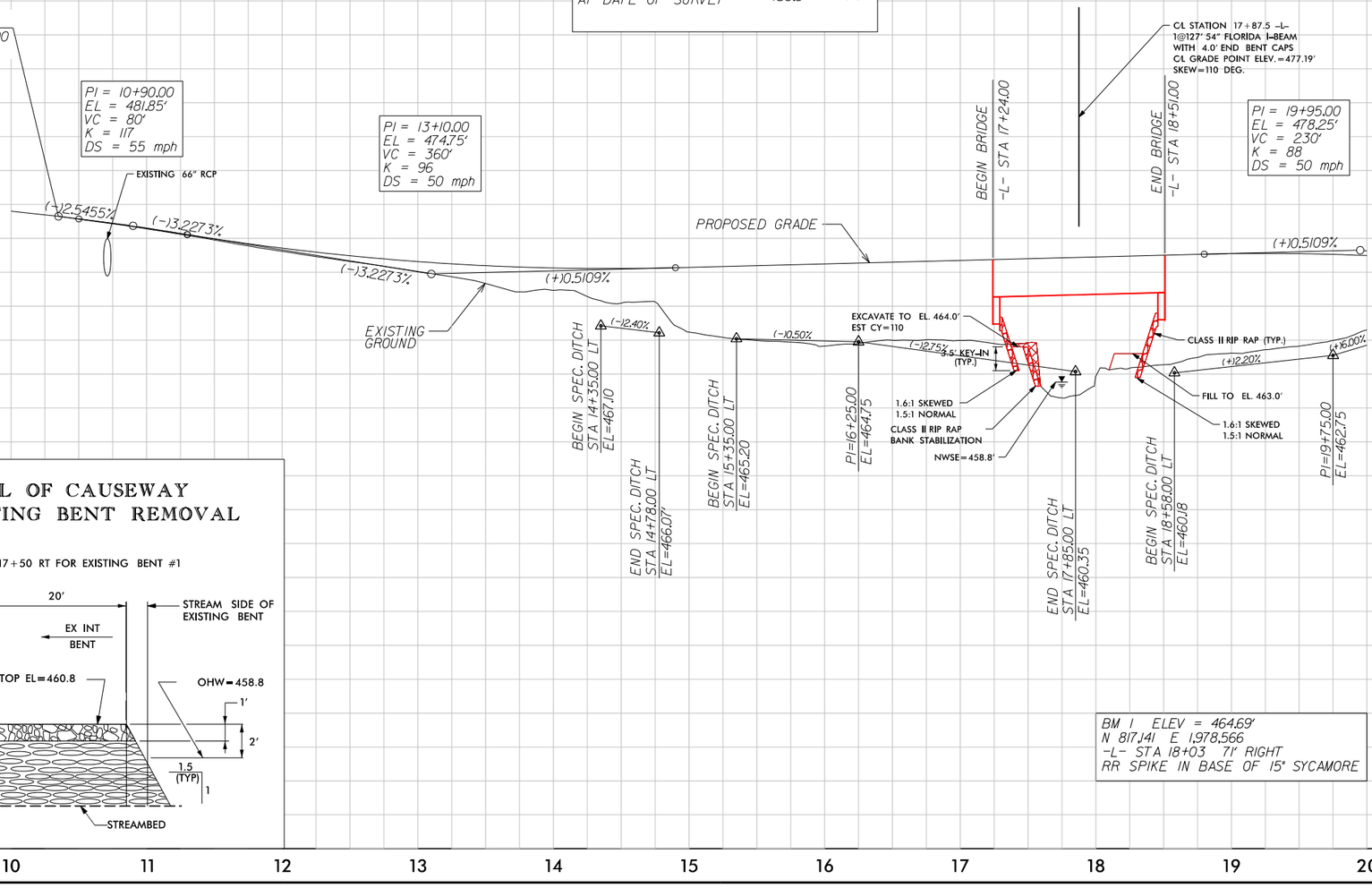
66" RCP w/ 72" CSP EXTENSION
-L- Sta.10+71

DRAINAGE AREA	= 65.8	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 110	CFS
DESIGN HW ELEVATION	= 479.1	FT
100 YEAR DISCHARGE	= 120	CFS
100 YEAR HW ELEVATION	= 479.4	FT
OVERTOPPING FREQUENCY	= +100	YRS
OVERTOPPING DISCHARGE	= 170	CFS
OVERTOPPING ELEVATION	= 480.6	FT

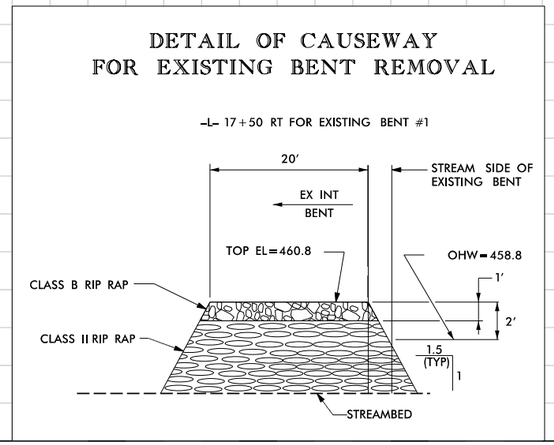
BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 4880	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 469.8	FT
BASE DISCHARGE	= 5990	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 470.8	FT
OVERTOPPING DISCHARGE	= 12000	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 475.8	FT
DRAINAGE AREA	= 15.3	SQ.MI.
DATE OF SURVEY	= 12-01-2021	
W.S.ELEVATION AT DATE OF SURVEY	= 458.8	FT





DETAIL OF CAUSEWAY FOR EXISTING BENT REMOVAL



BM 1 ELEV = 464.69'
N 817,141 E 1,978,566
-L- STA 18+03 71' RIGHT
RR SPIKE IN BASE OF 15" SYCAMORE

LEFT DITCH ----------
RIGHT DITCH ----------

FOR PLAN, SEE SHEET 4

10/23/2024
MI ENGINEERING
BR0092_hyd_prm_wet_pfl.dgn

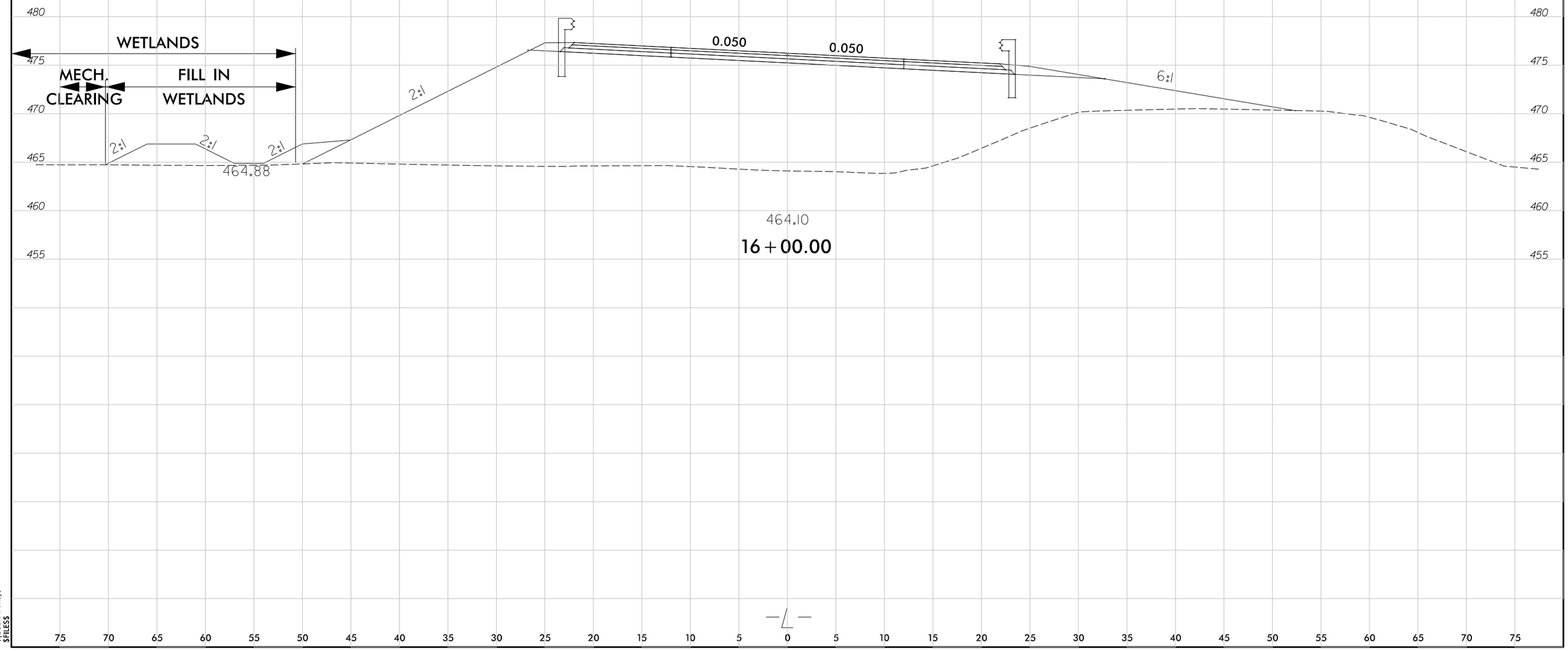
6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	BR-0092	X-8

PERMIT DRAWING
SHEET 6 OF 11

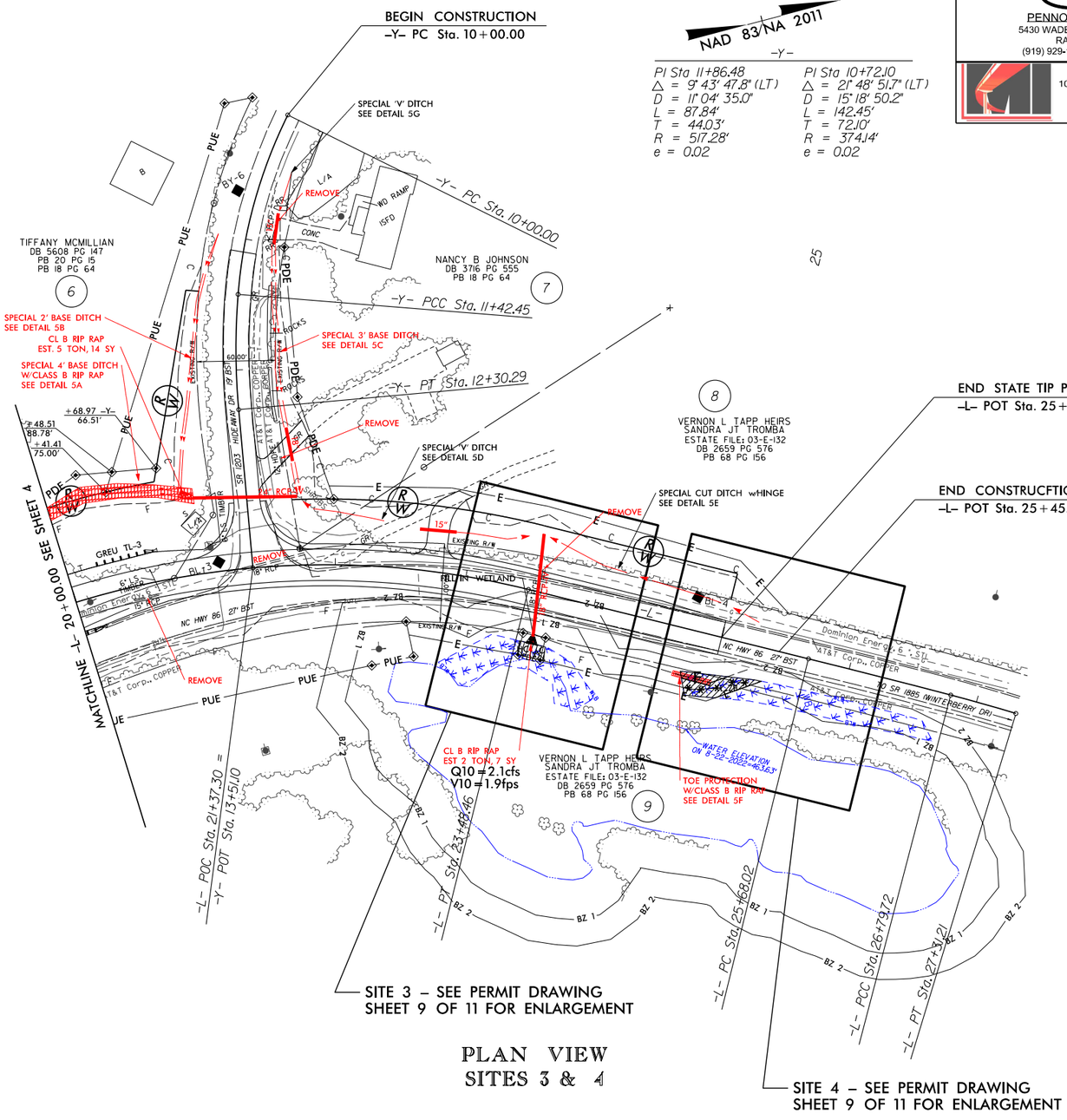
ENGLISH

SITE 1



$DATES
$USERNAME$
$FILE$

REVISIONS



PLAN VIEW
SITES 3 & 4

–L–

PI Sta 21+14.95	PI Sta 26+23.87	PI Sta 27+05.47
△ = 43° 53' 50.6" (RT)	△ = 0° 48' 42.7" (RT)	△ = 2° 11' 25.3" (RT)
D = 8° 54' 38.5"	D = 0° 43' 36.5"	D = 4° 15' 14.6"
L = 492.64'	L = 111.70'	L = 51.49'
T = 259.12'	T = 55.85'	T = 25.75'
R = 643.00'	R = 7,883.29'	R = 1,346.85'
e = 0.06		
RO = 144'		
DS = 45 mph		

LEGEND

- FILL IN WETLAND
- MECHANIZED CLEARING (GRUBBING)
- HAND CLEARING (NON-GRUBBING)

100 0 50 100
SCALE: 1"= 100' HORIZ.

10/23/2024
M:\ENGINEERING\BR0092_Hyd_prm_wet_psh_05.dgn

Pennoni
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RALEIGH, NC 27607
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MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

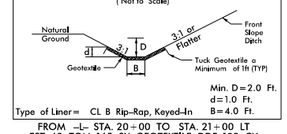
PROJECT REFERENCE NO.	SHEET NO.
BR-0092	5
R/W SHEET NO.	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 7 OF 11

ENGLISH

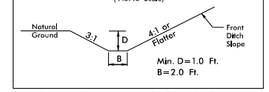
DETAIL 5A
SPECIAL BASE DITCH
(Not to Scale)



Min. D=2.0 Ft.
d=1.0 Ft.
B=4.0 Ft.
Type of Liner= CL B Rip-Rap, Keyed-In

FROM –L– STA. 20+00 TO STA. 21+00 LT
EST. 62 TON, 165 SY GEOTEXTILE, DDE 108 CY

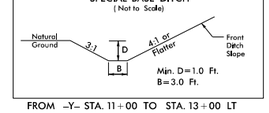
DETAIL 5B
SPECIAL BASE DITCH
(Not to Scale)



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

FROM –Y– STA. 11+00 TO STA. 13+00 RT

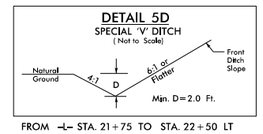
DETAIL 5C
SPECIAL BASE DITCH
(Not to Scale)



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

FROM –Y– STA. 11+00 TO STA. 13+00 LT

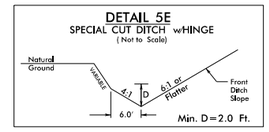
DETAIL 5D
SPECIAL 'V' DITCH
(Not to Scale)



Min. D=2.0 Ft.

FROM –L– STA. 21+75 TO STA. 22+50 LT

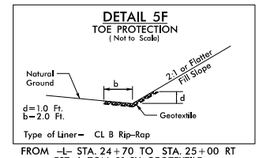
DETAIL 5E
SPECIAL CUT DITCH wHINGE
(Not to Scale)



Min. D=2.0 Ft.

FROM –L– STA. 22+75 TO STA. 25+25 LT

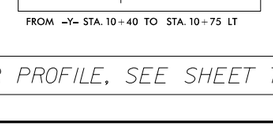
DETAIL 5F
TOE PROTECTION
(Not to Scale)



d=1.0 Ft.
b=2.0 Ft.
Type of Liner– CL B Rip-Rap

FROM –L– STA. 24+70 TO STA. 25+00 RT
EST. 6 TON, 21 SY GEOTEXTILE

DETAIL 5G
SPECIAL 'V' DITCH
(Not to Scale)

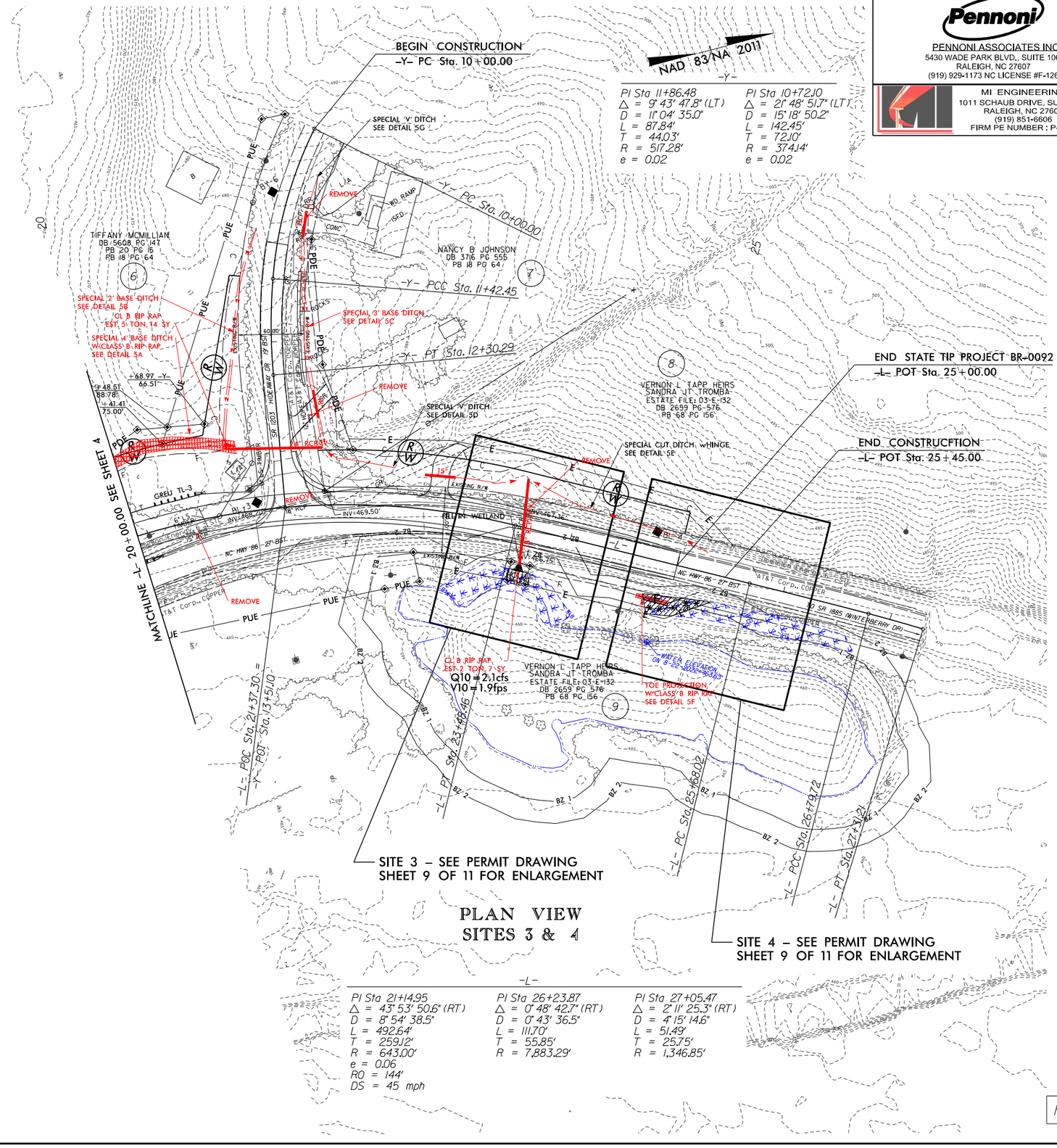


Min. D=1.0 Ft.

FROM –Y– STA. 10+40 TO STA. 10+75 LT

FOR PROFILE, SEE SHEET 7

REVISIONS



LEGEND

- FILL IN WETLAND
- MECHANIZED CLEARING (GRUBBING)
- HAND CLEARING (NON-GRUBBING)

100 0 50 100

SCALE: 1"= 100' HORIZ.

10/22/2024
M.I. ENGINEERING
BR0092_Hyd_prm_wet_psh_05_con.dgn

Pennoni
PENNONI ASSOCIATES INC.
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RALEIGH, NC 27607
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MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

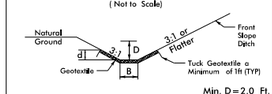
PROJECT REFERENCE NO.	SHEET NO.
BR-0092	5
R/W SHEET NO.	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 8 OF 11

ENGLISH

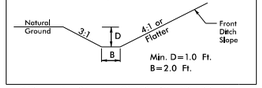
DETAIL 5A
SPECIAL BASE DITCH
(Not to Scale)



Min. D=2.0 Ft.
d=1.0 Ft.
B=4.0 Ft.
Type of Liner= CL B Rip-Rap, Keyed-In

FROM -L- STA. 20+00 TO STA. 21+00 LT
EST. 62 TON, 165 SY GEOTEXTILE, DDE 108 CY

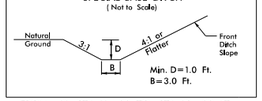
DETAIL 5B
SPECIAL BASE DITCH
(Not to Scale)



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

FROM -Y- STA. 11+00 TO STA. 13+00 RT

DETAIL 5C
SPECIAL BASE DITCH
(Not to Scale)



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

FROM -Y- STA. 11+00 TO STA. 13+00 LT

DETAIL 5D
SPECIAL 'V' DITCH
(Not to Scale)

Min. D=2.0 Ft.

FROM -L- STA. 21+75 TO STA. 22+50 LT

DETAIL 5E
SPECIAL CUT DITCH w/HINGE
(Not to Scale)

Min. D=2.0 Ft.

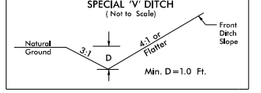
FROM -L- STA. 22+75 TO STA. 25+25 LT

DETAIL 5F
TOE PROTECTION
(Not to Scale)

d=1.0 Ft.
b=2.0 Ft.
Type of Liner= CL B Rip-Rap

FROM -L- STA. 24+70 TO STA. 25+00 RT
EST. 6 TON, 21 SY GEOTEXTILE

DETAIL 5G
SPECIAL 'V' DITCH
(Not to Scale)



Min. D=1.0 Ft.

FROM -Y- STA. 10+40 TO STA. 10+75 LT

NAD 83/NA 2011

Pennoni

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MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
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FIRM PE NUMBER : P-0671

PROJECT REFERENCE NO.	SHEET NO.
BR-0092	4
ORANGE COUNTY BRIDGE #37	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

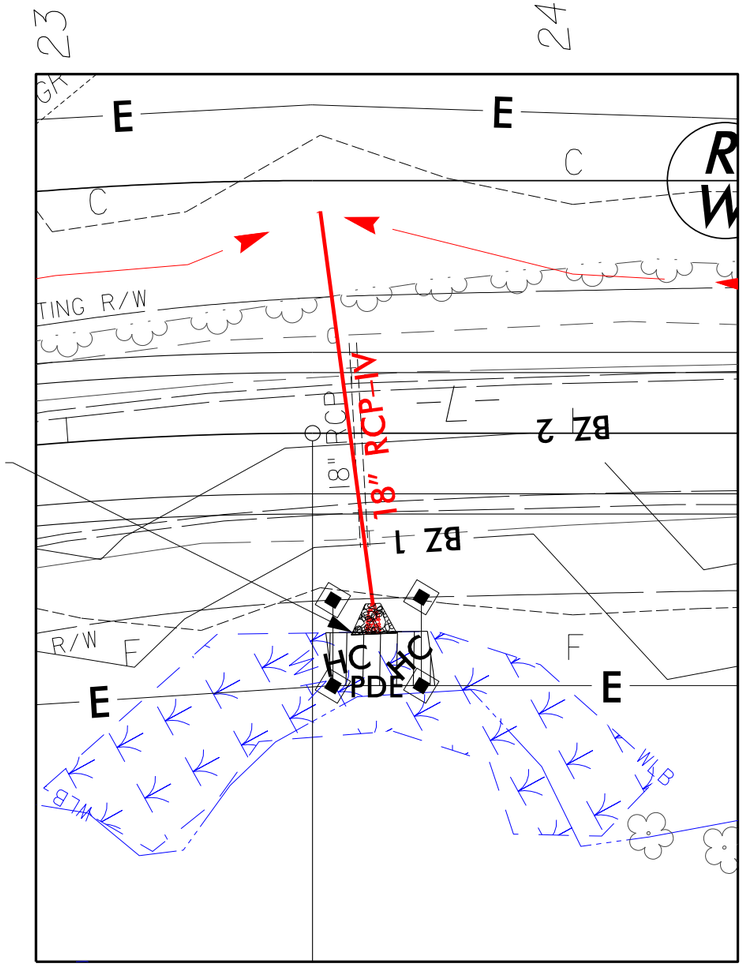
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 9 OF 11

ENGLISH

REVISIONS

10/23/2024
MI ENGINEERING
BR0092_hyd_prm_wet_psh_05a.dgn



ENLARGEMENT PLAN SITE 3

ENLARGEMENT PLAN SITE 4

LEGEND

- F / F — FILL IN WETLAND
- * * * — MECHANIZED CLEARING (GRUBBING)
- HC / HC — HAND CLEARING (NON-GRUBBING)

30 0 15 30

SCALE: 1"= 30' HORIZ.

6/23/16

2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	BR-0092	X-24

PERMIT DRAWING
SHEET 10 OF 11

ENGLISH

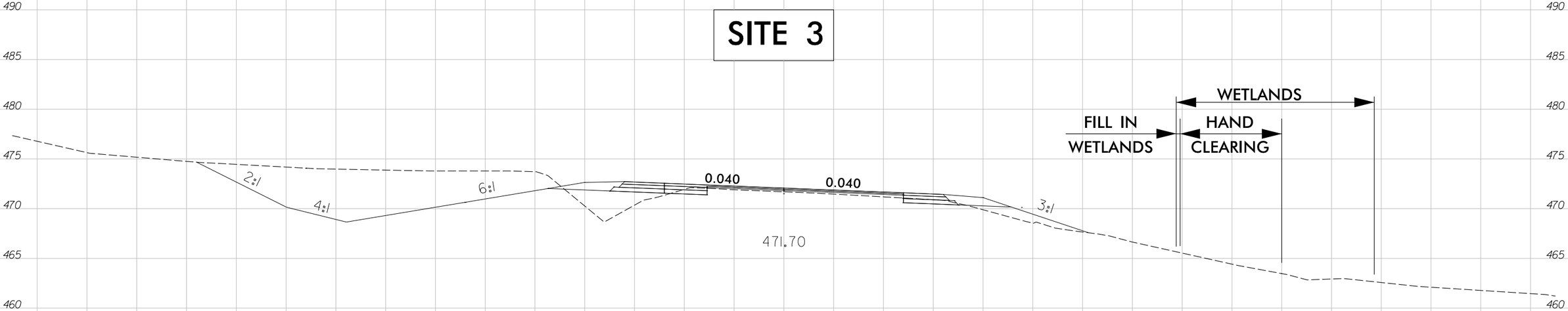
75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

495 490 485 480 475 470 465 460 455

SITE 4

25+00.00

SITE 3



23+60.00

10/23/2024
MJ ENGINEERING
BR0092_Hyd_prm_wet_XPL_L_Sites_3-4.dgn

WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	15+76 TO 16+24 LT.	FALSE CUT DITCH	0.02			< 0.01						
2	17+37 TO 17+85	BANK STABILIZATION						< 0.01	< 0.01	85		
2	17+80 TO 18+00 LT	RIP RAP AT EMBANKMENT						< 0.01	< 0.01	15	5	
2	18+43 TO 18+60 LT.	RIP RAP AT EMBANKMENT							< 0.01		22	
2	17+32 TO 17+49	CAUSEWAY for EX BT REMOVAL							0.02		35	
3	23+50 TO 23+73 RT.	18" RCP	< 0.01				< 0.01					
4	24+75 TO 25+37 RT.	Roadway Embankment	< 0.01			0.01						
TOTALS*:			0.02			0.02	< 0.01	< 0.01	0.03	100	62	0

*Rounded totals are sum of actual impacts

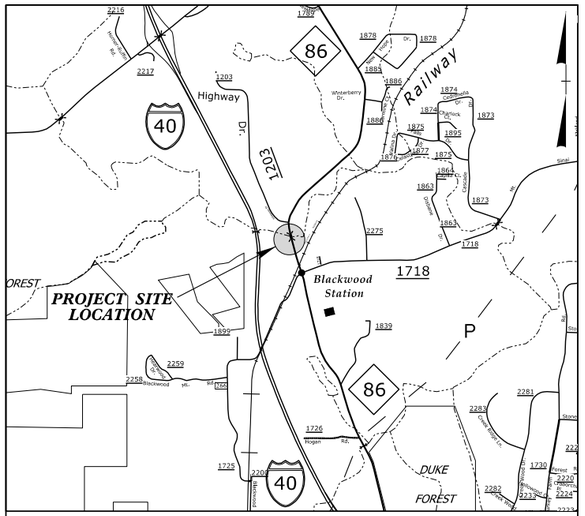
NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
10/23/2024
ORANGE COUNTY
TIP # BR-0092
WBS # 67092.1.1
SHEET 11 OF 11

09/08/99

TIP PROJECT: BR–0092

See Sheet 1A For Index of Sheets



VICINITY MAP

N.T.S.

THE PROJECT IS NOT WITHIN ANY MUNICIPAL LIMITS.

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ORANGE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR–0092	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
67092.1.1		P.E.
		R/W & Utilities
		Construction

BUFFER DRAWING
SHEET 1 OF 7

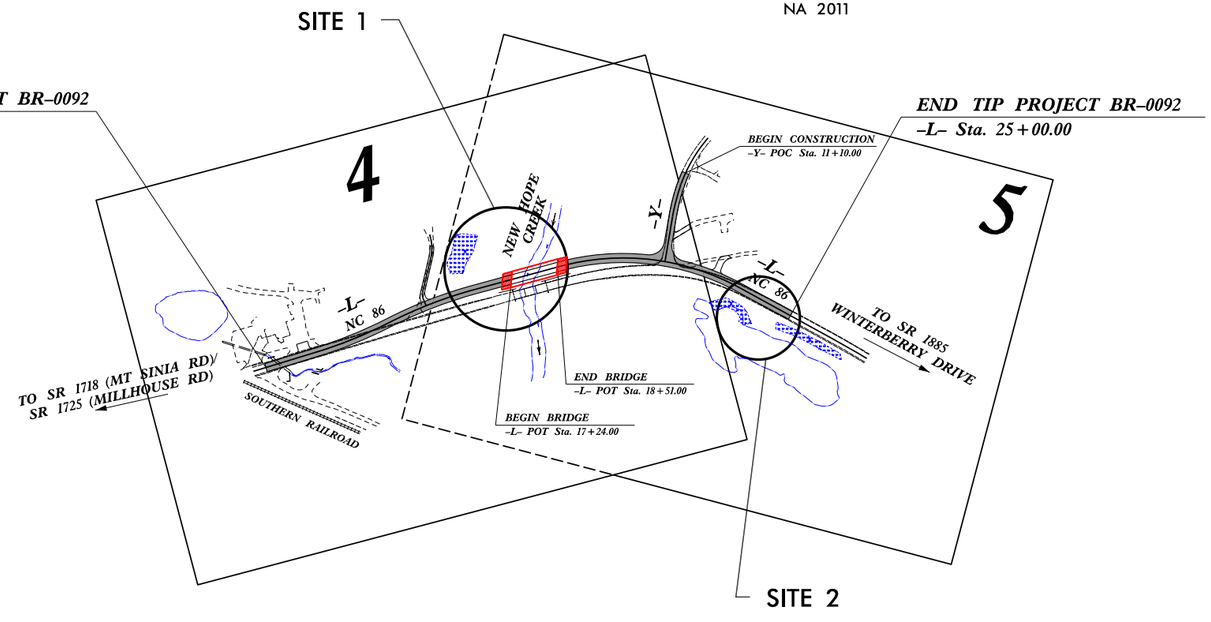
ENGLISH

LOCATION: BRIDGE 670037 ON NC 86 OVER NEW HOPE CREEK

TYPE OF WORK: GRADING, DRAINAGE, PAVING & STRUCTURE

BUFFER IMPACTS PERMIT

NAD 83/
NA 2011



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

PLANS: 50 0 50 100

PROFILE (HORIZONTAL): 50 0 50 100

PROFILE (VERTICAL): 10 0 10 20

DESIGN DATA

ADT 2025 = 6,700
ADT 2045 = 7,900
K = 12 %
D = 70 %
T = 4 % *
V = 50 MPH
* TTST =1% DUAL 3%
FUNC CLASS =
MINOR ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT BR–0092	=	0.253 mi
LENGTH STRUCTURE TIP PROJECT BR–0092	=	0.024 mi
TOTAL LENGTH OF TIP PROJECT BR–0092	=	0.277 mi

PLANS PREPARED BY:

Pennoni
PENNONI ASSOCIATES INC
5430 WADE PARK BLVD., SUITE 100,
RALEIGH, NC 27607
(919) 926-1173 NC LICENSE #P-1267

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 19, 2024

LETTING DATE:
AUGUST 19, 2025

PLANS PREPARED FOR:

DIVISION OF HIGHWAYS
PROGRAM MANAGEMENT UNIT
1000 Brich Ridge Drive
Raleigh, NC 27610

BRIAN A. WILES, PE
PROJECT ENGINEER

BRYAN KEY, PE
NCDOT CONTACT
PROGRAM MANAGEMENT UNIT

HYDRAULICS ENGINEER

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 553-4626
FIRM PE NUMBER: P-0671

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

10/23/2024
MI ENGINEERING
BR0092_Hyd_prm_buffer_tsh.dgn

PENNONI ASSOCIATES INC.
5430 WADE PARK BLVD,. SUITE 106,
RALEIGH, NC 27607
(919) 929-1173 NC LICENSE #F-1267

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

PROJECT REFERENCE NO.	SHEET NO.
BR-0092	4
R/W SHEET NO.	4
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BUFFER DRAWING SHEET 2 OF 7

ENGLISH

REVISIONS

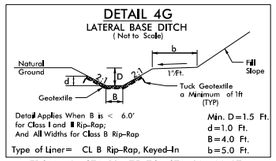
NAD 83/NA 2011

-DR-
POT Sta 9+18.98
N 75° 36' 01.9"
PC Sta 9+30.51
PT Sta 9+78.82
S 76° 43' 03.5"
PC Sta 10+75.04
PT Sta 10+90.38
N 68° 10' 28.5"
POT Sta 11+12.41

PI Sta 9+55.15
△ = 27° 40' 54.6" (RT)
D = 57° 17' 44.8"
L = 48.31'
T = 24.64'
R = 100.00'

PI Sta 10+82.95
△ = 35° 06' 28.0" (LT)
D = 229° 10' 59.2"
L = 15.32'
T = 7.91'
R = 25.00'

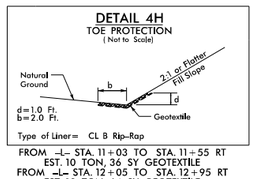
DETAIL 4G
LATERAL BASE DITCH
(Not to Scale)



Type of Liner= CL B Rip-Rap, Keyed-In

FROM –L– STA. 18+75 TO STA. 20+00 LT
EST. 43 TON, 122 SY GEOTEXTILE, DDE 77 CY

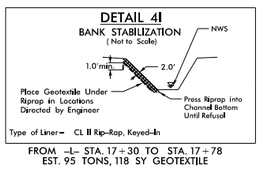
DETAIL 4H
TOE PROTECTION
(Not to Scale)



Type of Liner= CL B Rip-Rap

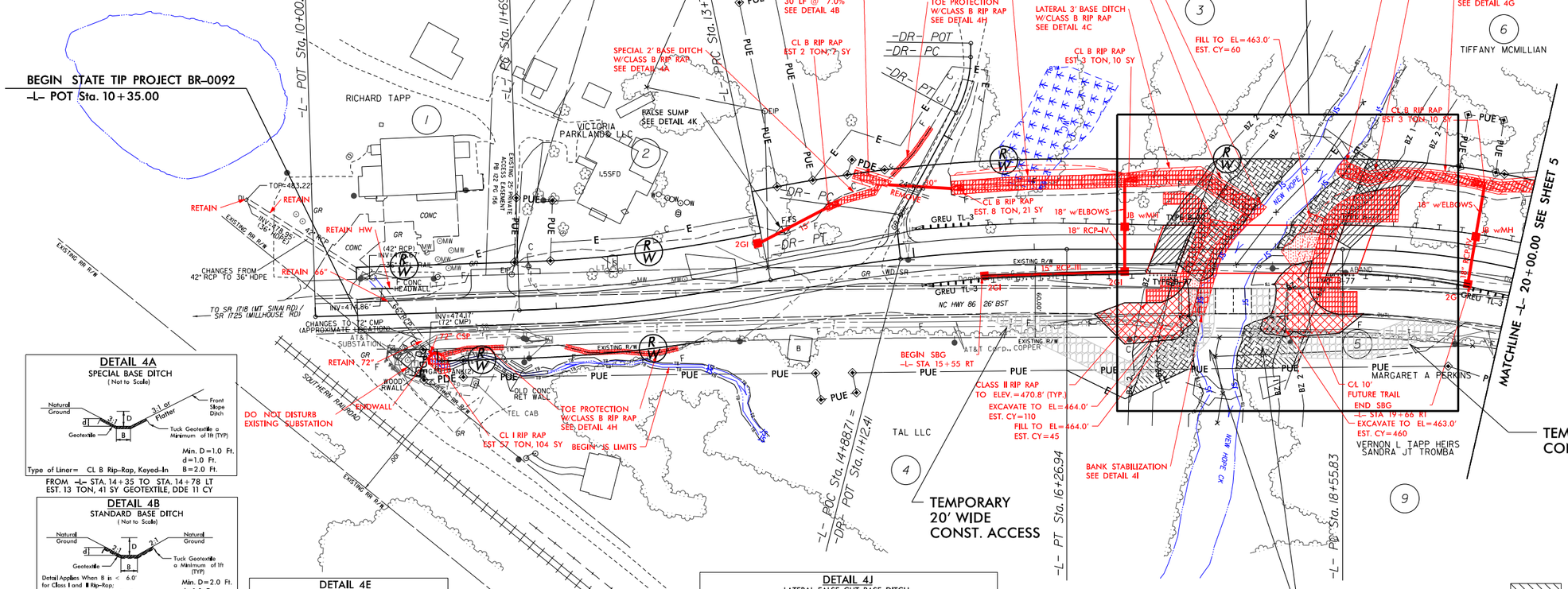
FROM –L– STA. 11+03 TO STA. 11+55 RT
EST. 10 TON, 36 SY GEOTEXTILE
FROM –L– STA. 12+05 TO STA. 12+95 RT
EST. 19 TON, 64 SY GEOTEXTILE
FROM –DR– STA. 10+00 TO STA. 10+52 RT
EST. 10 TON, 35 SY GEOTEXTILE

DETAIL 4I
BANK STABILIZATION
(Not to Scale)



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

FROM –L– STA. 17+30 TO STA. 17+78
EST. 95 TONS, 118 SY GEOTEXTILE

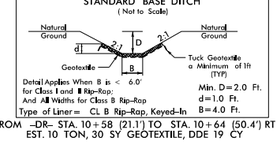


DETAIL 4A
SPECIAL BASE DITCH
(Not to Scale)

Type of Liner= CL B Rip-Rap, Keyed-In

FROM –L– STA. 14+35 TO STA. 14+78 LT
EST. 13 TON, 41 SY GEOTEXTILE, DDE 11 CY

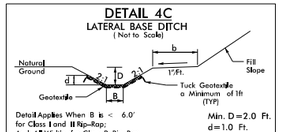
DETAIL 4B
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= CL B Rip-Rap, Keyed-In

FROM –DR– STA. 10+58 (21.1') TO STA. 10+64 (50.4') RT
EST. 10 TON, 30 SY GEOTEXTILE, DDE 19 CY

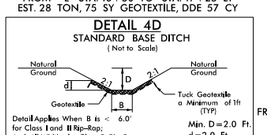
DETAIL 4C
LATERAL BASE DITCH
(Not to Scale)



Type of Liner= CL B Rip-Rap, Keyed-In

FROM –L– STA. 16+50 TO STA. 17+25 LT
EST. 28 TON, 75 SY GEOTEXTILE, DDE 57 CY

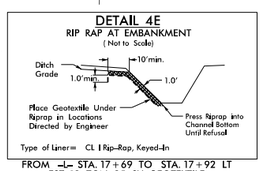
DETAIL 4D
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= CL B Rip-Rap, Keyed-In

FROM –L– STA. 17+25 (–59.9') TO STA. 17+85 (–31.4') LT
EST. 30 TON, 81 SY GEOTEXTILE, DDE 70 CY

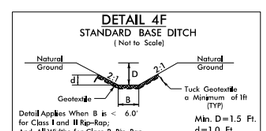
DETAIL 4E
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner= CL I Rip-Rap, Keyed-In

FROM –L– STA. 17+69 TO STA. 17+92 LT
EST. 12 TON, 35 SY GEOTEXTILE
FROM –L– STA. 18+50 TO STA. 18+70 LT
EST. 16 TON, 29 SY GEOTEXTILE

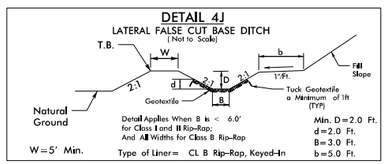
DETAIL 4F
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= CL B Rip-Rap, Keyed-In

FROM –L– STA. 18+58 (–65.4') TO STA. 18+75 LT (–58.7')
EST. 14 TON, 40 SY GEOTEXTILE, DDE 70 CY

DETAIL 4J
LATERAL FALSE CUT BASE DITCH
(Not to Scale)



Type of Liner= CL B Rip-Rap, Keyed-In

FROM –L– STA. 15+35 TO STA. 16+50 LT
EST. 79 TON, 211 SY GEOTEXTILE, DDE 5 CY

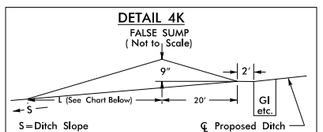
–L–

PI Sta 12+74.60
△ = 10° 07' 16.3" (LT)
D = 4° 48' 53.2"
L = 210.21'
T = 105.38'
R = 1,190.00'
e = 0.05
RO = 120'
DS = 45 mph

PI Sta 15+03.63
△ = 11° 55' 02.0" (RT)
D = 4° 48' 53.2"
L = 247.51'
T = 124.20'
R = 1,190.00'
e = 0.05
RO = 120'
DS = 45 mph

PI Sta 21+14.95
△ = 43° 53' 50.6" (RT)
D = 8° 54' 38.5"
L = 492.64'
T = 259.12'
R = 643.00'
e = 0.06
RO = 144'
DS = 45 mph

DETAIL 4K
FALSE SUMP
(Not to Scale)



S=Ditch Slope

Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

FROM –L– STA. 13+75 TO STA. 14+35 LT

LEGEND

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

100 0 50 100
SCALE: 1"= 100' HORIZ.

FOR PROFILE, SEE SHEET 6

10/23/2024
M1 ENGINEERING
BR0092_Hyd-prm_buffer-psh_04.dgn

Pennoni
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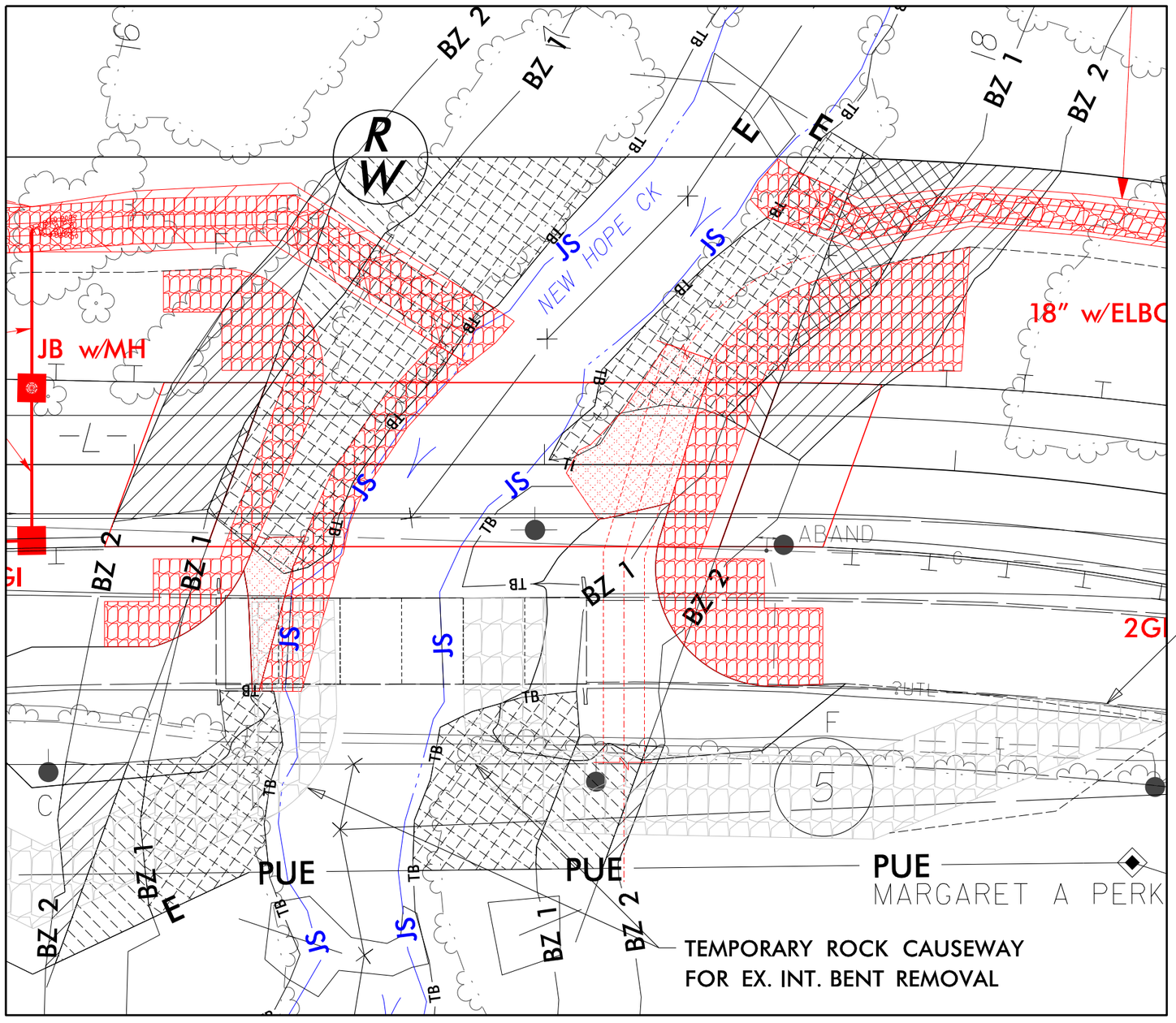
(919) 851-6606
FIRM PE NUMBER : P-0671

PROJECT REFERENCE NO.	SHEET NO.
BR-0092	4
ORANGE COUNTY BRIDGE #37	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BUFFER DRAWING
SHEET 3 OF 7

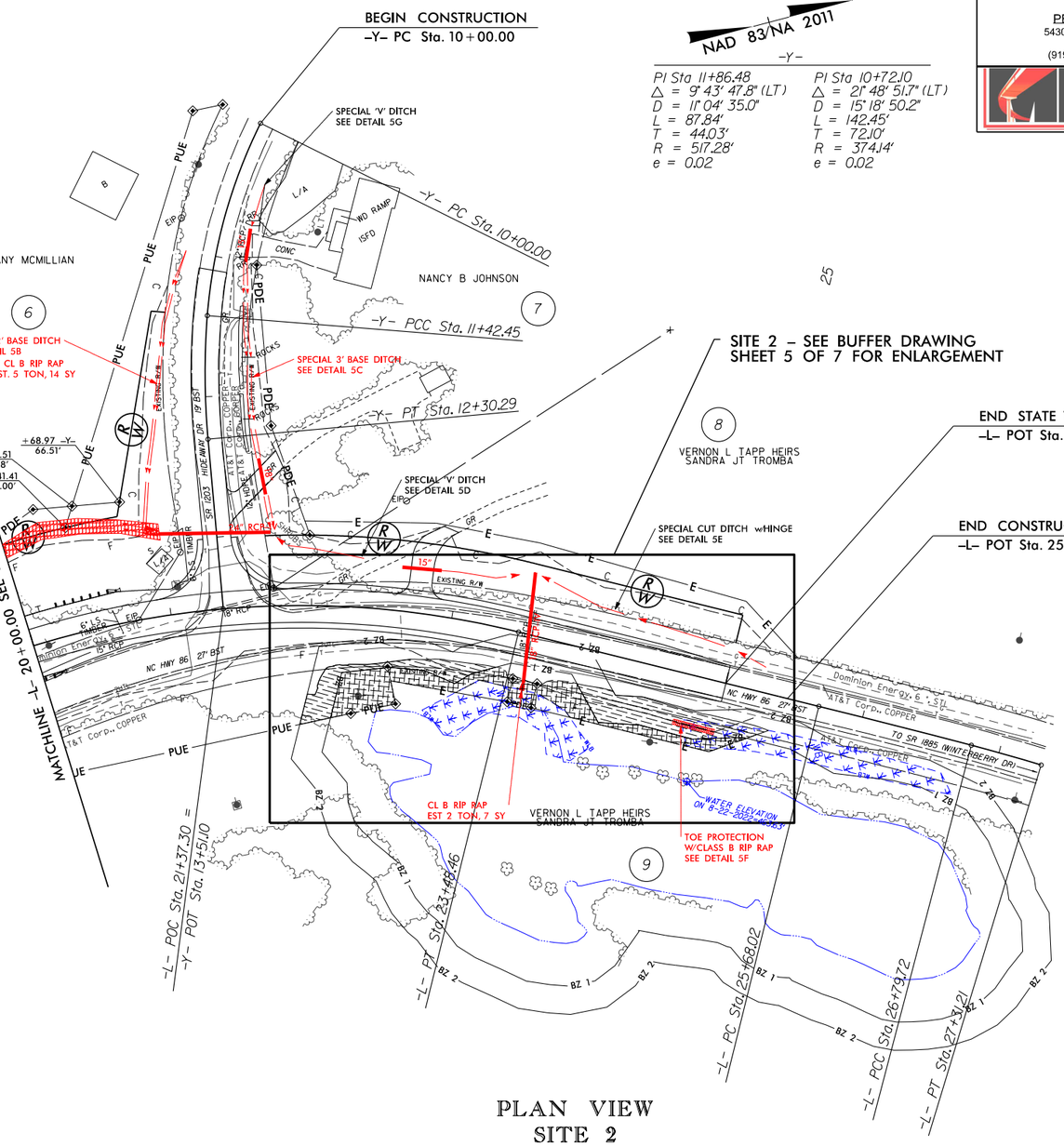
NAD 83/NA 2011



ENLARGEMENT PLAN
SITE 1

10/23/2024
MI ENGINEERING
BR0092_Hyd_prm_buffer_psh_04a.dgn

REVISIONS



PLAN VIEW
SITE 2

–L–

PI Sta 21+14.95	PI Sta 26+23.87	PI Sta 27+05.47
Δ = 43° 53' 50.6" (RT)	Δ = 0° 48' 42.7" (RT)	Δ = 2° 11' 25.3" (RT)
D = 8° 54' 38.5"	D = 0° 43' 36.5"	D = 4° 15' 14.6"
L = 492.64'	L = 111.70'	L = 51.49'
T = 259.12'	T = 55.85'	T = 25.75'
R = 643.00'	R = 7,883.29'	R = 1,346.85'
e = 0.06		
RO = 144'		
DS = 45 mph		

LEGEND

ALLOWABLE IMPACTS ZONE 2

ALLOWABLE IMPACTS ZONE 1

100 0 50 100

SCALE: 1"= 100' HORIZ.

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(919) 851-6606
FIRM PE NUMBER : P-0671

PROJECT REFERENCE NO.	SHEET NO.
BR-0092	5
R/W SHEET NO.	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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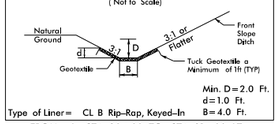
BUFFER DRAWING
SHEET 4 OF 7

ENGLISH

DETAIL 5A
SPECIAL BASE DITCH
(Not to Scale)



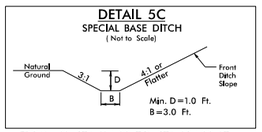
Type of Liner= CL B Rip-Rap, Keyed-In

FROM –L– STA. 20+00 TO STA. 21+00 LT
EST. 62 TON, 165 SY GEOTEXTILE, DDE 108 CY

DETAIL 5B
SPECIAL BASE DITCH
(Not to Scale)

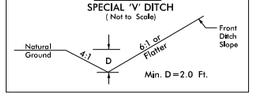
FROM –Y– STA. 11+00 TO STA. 13+00 RT

DETAIL 5C
SPECIAL BASE DITCH
(Not to Scale)



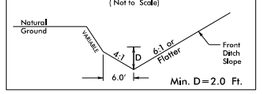
FROM –Y– STA. 11+00 TO STA. 13+00 LT

DETAIL 5D
SPECIAL 'V' DITCH
(Not to Scale)



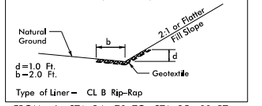
FROM –L– STA. 21+75 TO STA. 22+50 LT

DETAIL 5E
SPECIAL CUT DITCH w/HINGE
(Not to Scale)



FROM –L– STA. 22+75 TO STA. 25+25 LT

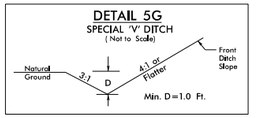
DETAIL 5F
TOE PROTECTION
(Not to Scale)



Type of Liner– CL B Rip-Rap

FROM –L– STA. 24+70 TO STA. 25+00 RT
EST. 6 TON, 21 SY GEOTEXTILE

DETAIL 5G
SPECIAL 'V' DITCH
(Not to Scale)



FROM –Y– STA. 10+40 TO STA. 10+75 LT

FOR PROFILE, SEE SHEET 7

10/23/2024
MI ENGINEERING
BR0092_Hyd_prm_buffer_psh_05.dgn

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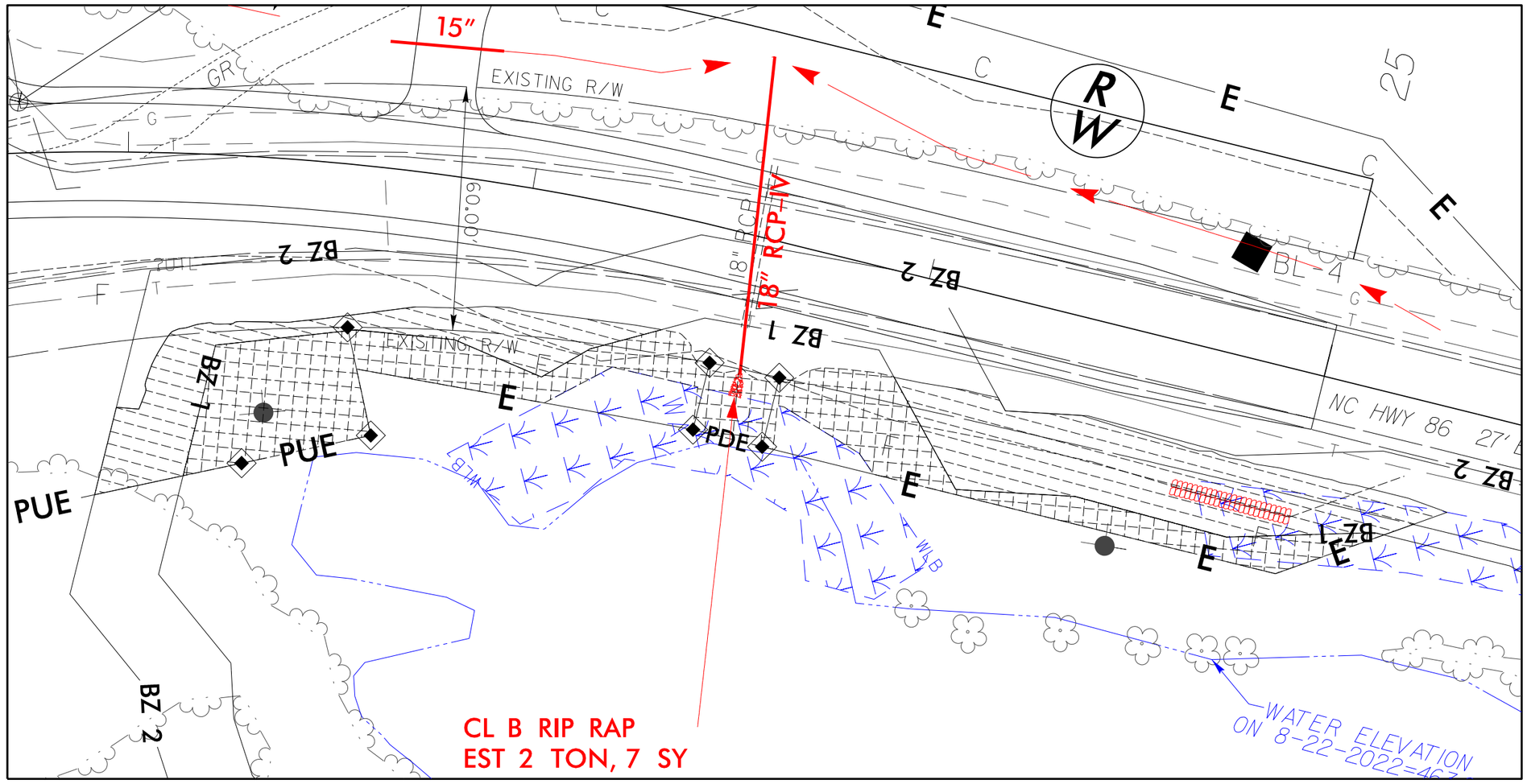
BUFFER DRAWING
SHEET 5 OF 7

ENGLISH

NAD 83/NA 2011



ENLARGEMENT PLAN
SITE 2

LEGEND

- ALLOWABLE IMPACTS ZONE 2
- ALLOWABLE IMPACTS ZONE 1

30 0 15 30

SCALE: 1"= 30' HORIZ.

10/23/2024
MI ENGINEERING
BR0092_Hyd_prm_buffer_psh_05a.dgn

RIPARIAN BUFFER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	IMPACTS									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
			ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
1	16+95 TO 18+20 LT.	1 @ 127'-0", 54" FLORIDA I-BEAM (SW Quad)		X		3526	742	4268					
			X						60	1406	1466		
1	18+14 TO 19+19 LT.	1 @ 127'-0", 54" FLORIDA I-BEAM (NW Quad)		X		1947	98	2045					
			X						738	1728	2466		
1	16+79 TO 17+36 RT.	1 @ 127'-0", 54" FLORIDA I-BEAM (SE Quad)		X		1225	525	1750					
			X						0	404	404		
1	17+68 TO 18+29 RT.	1 @ 127'-0", 54" FLORIDA I-BEAM (NE Quad)		X		1308	534	1842					
			X						0	109	109		
2	21+92 TO 25+30 RT.	ROADWAY			X	3502	3649	7151					
TOTALS*:						**11508**	**5548**	**17056**	**798**	**3647**	**4445**	**0**	**0**

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
10/23/24
ORANGE COUNTY
TIP # BR-0092
WBS # 67092.1.1
SHEET 6 OF 7

WETLANDS IN BUFFER IMPACTS SUMMARY

SITE NO.	STATION (FROM/TO)		WETLANDS IN BUFFERS ZONE 1 (ft^2)	WETLANDS IN BUFFERS ZONE 2 (ft^2)
2	23+14 TO 23+98 RT.		215	0
2	24+75 T0 25+30 RT.		216	534
TOTAL:			**431**	**534**

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
10/23/24
ORANGE COUNTY
TIP# BR-0092
WBS # 67092.1.1
SHEET 7 OF 7

Revised 2018 Feb

Rev. Jan 2009