STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

June 21, 2019

MEMORANDUM TO: Mr. Mark T. Gibbs, P.E.
Division 13 Engineer
Mr. Brian Burch
Division 14 Engineer

FROM: Philip S. Harris, III, P.E., Manager
for Environmental Analysis Unit
Carla Dagnino

SUBJECT: Buncombe County and Henderson Counties; Divisions 13 and 14; Widening 22.2 miles of the I-26 Corridor; **TIP I-4700** (Federal Aid No. IMNHF-026-1(86)9, WBS 36030.1.2) and **TIP I-4400** (Federal Aid No. NHF-26-1(62)23, WBS 34232.1.1)

Attached are the US Army Corps of Engineers (USACE) Phased Individual Permit and N.C. Division of Water Resources (NCDWR) Water Quality Certification for this project. All environmental permits have been received for the construction of the final design sections of this project.

A copy of this permit package is posted on the NCDOT website at:
https://xfer.services.ncdot.gov/pdea/PermIssued
Named: ***I-4400 I-4700 Buncombe Henderson June 21 2019***

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

Mr. Ron Davenport, P.E. Contracts Management
Mr. Roger Bryan, Division 13 Environmental Officer
Mr. David G. McHenry, Division 14 Environmental Officer
Dr. Majed Al-Ghandour, P.E., Programming and TIP
Mr. Carl Barclay, P.E., Utilities Unit
Mr. Matthew S. Lauffer, P.E., Hydraulics
Mr. Brian Hanks, P.E., Structures Management Unit
Mr. Mark Staley, Roadside Environmental
Mr. Lamar Sylvester, P.E., State Roadway Construction Engineer
Mr. Derrick Weaver, P.E., Environmental Policy Unit

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

Telephone: (919) 707-6000
Fax: (919) 212-5785
Customer Service: 1-877-368-4968
Website: www.ncdot.gov

Location:
1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610

PROJECT COMMITMENTS

T.I.P Project No. I-4400/I-4700
I-26 Widening
From US 25 (Exit 54) in Henderson County to I-40/I-240 in Buncombe County
Federal Aid Project No. NHF-26-1(62)23/IMNHF-026-1(86)9
WBS Element 34232.1.1/36030.1.2

COMMITMENTS FROM PROJECT DEVELOPMENT AND DESIGN

NCDOT Environmental Analysis Unit (EAU) – Human Environmental Section (HES)
The *Traffic Noise Report* (HNTB 2017) for State Transportation Improvement Project (STIP) Nos. I-4400/I-4700 preliminarily identifies six noise walls for abatement of noise impacts for the preferred alternative (Hybrid 6/8-Lane Widening Alternative). The *Design Noise Report* will verify the final number and location of noise walls for the preferred alternative based on the NCDOT *Traffic Noise Policy* (October 6, 2016).

A Design Noise Report, dated May 2019, has been completed. A total of twelve (12) noise walls were evaluated to provide abatement for traffic noise. Of these, three (3) noise walls meet feasibility and reasonableness criteria and are recommended for construction pending completion of the public involvement process. These are: (NW4.6) residences on Old Hendersonville Road, November Lane, and Hickory Flats; (NW5.3) residences on Hope Opal Land, South Thomas Street, and Jim Mils Drive; (NW6.1) residences in the Hunter's Trace neighborhood. The Design Noise Report is available on the NCDOT Connect site.

NCDOT EAU – HES
Because Limited English Proficiency (LEP) populations within the Demographic Study Area (DSA) exceed the Department of Justice's Safe Harbor thresholds, written translations of vital documents should be provided for Spanish-speaking populations, in addition to other measures assuring meaningful language access, as determined by NCDOT Public Involvement to satisfy the requirements of Executive Order 13166.

NCDOT EAU – HES
Because notable other Indo-European language-speaking populations requiring language assistance are located within the DSA, the Project Planning Engineer should consult with NCDOT Public Involvement to determine appropriate measures assuring meaningful public involvement to satisfy the requirements of Executive Order 12898.

NCDOT Division, EAU
Because the project includes construction on NPS land that might be within habitat that is suitable for the Northern long-eared bat, tree clearing shall be allowed between August 15 and May 15. If any NLEB roost trees are documented within 0.25 mile of the project area, regardless of the time of year, the NPS will seek consultation with the US Fish and Wildlife Service before work proceeds.

NCDOT Division, EAU - Biological Surveys Group (BSG)
Because the project includes construction on NPS land that might be within habitat that is suitable for the Indiana bat, emergent and/or acoustic surveys shall be conducted prior to removal of trees if the work would be conducted between April 1 and August 15. No significant tree removal within 5 miles of known hibernacula can occur between April 1 and November 15.

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

NCDOT Division, Hydraulics Unit
The Division shall submit sealed as-built construction plans to the Hydraulics Unit upon completion of project construction, certifying that the drainage structures and roadway embankments that are located within 100-year floodplains were built as shown in the construction plans, both horizontally and vertically.

NCDOT Utilities, Division, Roadway Design
NCDOT Roadway Design Unit will continue coordination with Duke Energy to avoid impacts to the dam and coal ash ponds located at the Asheville Plant.

NCDOT Division 13, Federal Highway Administration (FHW)-Eastern Federal Lands (EFL)
Coordination between the NCDOT, NPS, and FHWA-EFL will continue during the design and construction of the project to minimize impacts to Blue Ridge Parkway (BRP) operations and visitor experience as well as the Mountains-to-Sea Trail. These agencies will coordinate to ensure, to the extent possible, that temporary or nighttime closures necessary for construction of the Blue Ridge Parkway realignment and bridge replacement over I-26 will only be permitted from November 1 until April 31 and not during summer months. The NPS will provide detour signage to safely guide users of the Mountains-to-Sea Trail out of the construction area and into safe locations.

NCDOT Division 13, FHWA-EFL
Coordination between the NCDOT, NPS, and FHWA-EFL will continue during the design and construction of the project to minimize impacts to Blue Ridge Parkway operations and visitor experience as well as the Mountains-to-Sea Trail. These agencies will coordinate to ensure, to the extent possible, that nighttime work (between dusk and dawn) shall only be allowed during bridge removal activities and installation of new piers and segments on the Blue Ridge Parkway. If other nighttime work is needed, park natural resource staff shall be consulted to determine if further mitigations are necessary.

NCDOT Division 13, FHWA-EFL
Coordination between the NCDOT, NPS, and FHWA-EFL will continue during the design and construction of the project to minimize impacts to Blue Ridge Parkway operations and visitor experience as well as the Mountains-to-Sea Trail. These agencies will coordinate to ensure, to the extent possible, that a re-vegetation/landscaping plan shall be developed and implemented to

re-establish native vegetation and provide for a continuous visual experience for the trail and Blue Ridge Parkway user.

NCDOT Division 13, FHWA-EFL
Coordination between the NCDOT, NPS, and FHWA-EFL will continue during the design and construction of the project to minimize impacts to Blue Ridge Parkway operations and visitor experience as well as the Mountains-to-Sea Trail. These agencies will coordinate to ensure, to the extent possible, that the proposed demolition of the bridge shall include appropriate measures to avoid destroying active nests or killing birds that are protected by the Migratory Bird Treaty Act.

NCDOT Division 13
NCDOT will place signage at the Bent Creek River Park and along the French Broad River notifying users of construction. In addition, a safe passage lane under the French Broad River and I-26 bridge will be provided for the duration of construction. NCDOT will work with NC Division of Parks and Recreation (NCDPR) partner organizations to alert boaters of construction.

NCDOT Division 13, FHWA-EFL
Eastern Federal Lands (EFLHD) will provide 70 percent and 100 percent construction drawings for the Undertaking to BRP. BRP shall provide their comments to EFLHD staff within 30 calendar days of receipt. EFLHD shall revise drawings and plans to address the BRP comments and provide revised drawings to BRP within 30 calendar days after receiving comments. The revised drawings shall be submitted by BRP to the NC Historic Preservation Office (HPO). The HPO shall provide their comments to BRP within 15 calendar days of receipt. Comments provided by the HPO will be sent to EFLHD by BRP within 5 calendar days to be incorporated into the bridge design. If HPO does not respond within 15 days, concurrence is assumed.

NCDOT Division 13, FHW-EFL
EFLHD shall provide parking pull-off and re-vegetation/landscaping plans to BRP who will provide their comments to EFLHD staff within 30 calendar days of receipt. EFLHD shall revise the plan and design to address BRP comments and provide revised plans to BRP within 30 calendar days after receiving comments. These plans shall be submitted by BRP to the HPO. The HPO shall provide their comments to BRP within 15 calendar days of receipt. Comments provided by the HPO will be sent to EFLHD by BRP within 5 calendar days to be incorporated into the plans. If HPO does not respond within 15 days, concurrence is assumed.

NCDOT EAU – Historic Architecture, FHWA-EFL
Historic American Engineering Record (HAER) documentation will be submitted by NCDOT to BRP. BRP will within seven days forward to the NPS Southeast Regional Office who will provide their comments to BRP and NCDOT within 30 calendar days of receipt. NCDOT shall revise the documentation to address NPS comments and provide revised documentation to BRP within 60 calendar days after receiving comments. BRP shall forward revised documentation to the NPS Southeast Regional Office who will review for acceptance to the Heritage Documentation Program Collection of the Library of Congress. Upon acceptance of the HAER documentation by the NPS, the BRP shall notify NCDOT so that copies of all documents resulting from the HAER documentation, including pertinent field records, notes, site sketches, superintendent reports, and construction reports shall be provided to the HPO, the Library of

Congress and the permanent collection of BRP. The NCDOT shall provide all said copies to all parties within 45 calendar days of notification of acceptance.

NCDOT EAU – Cultural Resources, Division, FHW-EFL

If previously unknown cultural resources are discovered during construction, all work in the immediate vicinity (600 feet) of the discovery shall be halted and BRP Cultural Resources Manager shall be notified immediately. Work shall not resume until the NPS determines the resources have been identified and documented and an appropriate mitigation strategy developed, if necessary, in accordance with pertinent laws and regulations, including the stipulations of the "2008 Programmatic Agreement Among the National Park Service (U.S. Department of the Interior), the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers." THPOs will be consulted in the event cultural resources or human remains are discovered during the project.

COMMITMENTS FROM PERMITTING

Division Construction, Roadside Environmental Unit, EAU – BSG

404 Special Conditions:

WORK LIMITS/NOTIFCATION

1) The entire 22.2 mile project is identified as STIP I-4400/I-4700. This permit only authorizes work on Sections I-4700 A and B ("I-4700") of STIP I-4400/I-4700; also known as "Phase 1" for permitting purposes. Construction on the remaining sections (i.e., Section I-4400C, I-4400BB, I-4400BA, and I-4400A) of I-4400/I-4700 project shall not commence until: (a) final design for those sections/phases has been completed and submitted to the U.S. Army Corps of Engineers (Corps); (b) the Permittee has minimized impacts to waters and wetlands to the maximum extent practicable for those sections/phases and the Corps concurs with this assessment through standard Merger 4B and 4C meetings; (c) any modification(s) to the plans for those sections/phases have been approved by the Corps in writing; and (d) a final compensatory mitigation plan for those sections/phases has been submitted by the Permittee and approved by the Corps.

2) All work authorized by this permit shall be performed in strict compliance with the attached permit plans titled, "Wetland and Surface Water Impacts Permit, I-4700", permit drawing sheets 1-97, which are now part of this permit. The Permittee shall ensure that the construction design plans for this project do not deviate from the permit plans attached to this authorization. Any modification to the attached permit plans must be approved by the US Army Corps of Engineers prior to any active construction in waters or wetlands.

3) The permittee shall ensure that the project is implemented in strict accordance with all commitments in the attached document titled, **"I-26 Widening, STIP Project No. I-4400 & I-4700 Project Commitments", dated June 19, 2019 (Version 5).** This document is

38 pages long and was created to compile project commitments that NCDOT has agreed to in a number of other documents, to include commitments from:

- Combined Final Environmental Impact Statement (EIS), Final Section 4(f) Evaluation, and Record of Decision (ROD) (March 2019);
- Biological Assessment (September 2018);
- Biological Opinion (BO) (February 2019);
- I-26 Bridge Over the French Broad River Construction and Demolition (November 2018);
- River Safety Plan (September 2018)
- Strategic Communication Plan for the Construction of the I-26 Bridge over the French Broad River (September 2018)
- Section 106 Memorandum of Agreement (July 2018)

4) Unauthorized Dredge or Fill: Except as authorized by this permit or any U.S. Army Corps of Engineers approved modification to this permit, no excavation, fill, or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, within waters or wetlands, or shall any activities take place that cause the degradation of waters or wetlands. There shall be no excavation from, waste disposal into, or degradation of, jurisdictional wetlands or waters associated with this permit without appropriate modification of this permit, including appropriate compensatory mitigation. This prohibition applies to all borrow and waste activities connected with this project.

5) Maintain Flows and Circulation Patterns of Waters: Except as specified in the plans attached to this permit, no excavation, fill or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, in such a manner as to impair normal flows and circulation patterns within waters or wetlands or to reduce the reach of waters and/or wetlands

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

7) Pre-Construction Meeting: The Permittee shall schedule and attend a preconstruction meeting between its representatives, the contractors representatives, and the U.S. Army Corps of Engineers, Asheville Regulatory Field Office, NCDOT Regulatory Project Manager, prior to any work within jurisdictional waters and wetlands to ensure that there is a mutual understanding of all the terms and conditions contained with this Department of Army Permit. The Permittee shall provide the Corps, Asheville Regulatory Field Office, NCDOT Project Manager, with a copy of the final permit plans at least two weeks prior to the preconstruction meeting along with a description of any changes that have been made to the project's design, construction methodology or construction timeframe.

The Permittee shall schedule the preconstruction meeting for a time frame when the Corps and NCDWR Project Managers can attend. The Permittee shall invite the Corps and NCDWR Project Managers a minimum of thirty (30) days in advance of the scheduled meeting in order to provide those individuals with ample opportunity to schedule and participate in the required meeting. The thirty (30) day requirement can be waived with the concurrence of the Corps.

8) Notification of Construction Commencement and Completion: The Permittee shall notify the U.S. Army Corps of Engineers in writing prior to beginning the work authorized by this permit and again upon completion of the work authorized by this permit.

9) Reporting Address: All reports, documentation, and correspondence required by the conditions of this permit shall be submitted to the following: U.S. Army Corps of Engineers, Wilmington District Asheville Regulatory Field Office, Attn: Lori Beckwith, 151 Patton Ave., Room 208, Asheville, NC 28801-5006, or loretta.a.beckwith@usace.army.mil . The Permittee shall reference the following permit number, SAW-2013-01883, on all submittals.

10) Reporting Violations: Violation of these permit conditions or violation of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act shall be reported to the Corps in writing and by telephone at: 828-271-7980, ext. 4223, within 24 hours of the Permittee's discovery of the violation.

11) Permit Revocation: The Permittee, upon receipt of a notice of revocation of this permit or upon its expiration before completion of the work will, without expense to the United States and in such time and manner as the Secretary of the Army or his authorized representative may direct, restore the water or wetland to its pre-project condition.

RELATED LAWS

12) Clean Fill: The Permittee shall use only clean fill material for this project. The fill material shall be free from items such as trash, construction debris, metal and plastic products, and concrete block with exposed reinforcement bars. Soils used for fill shall not be contaminated with any toxic substance in concentrations governed by Section 307 of the Clean Water Act. Unless otherwise authorized by this permit, all fill material placed in waters or wetlands shall be generated from an upland source.

13) Water Contamination: All mechanized equipment shall be regularly inspected and maintained to prevent contamination of waters and wetlands from fuels, lubricants, hydraulic fluids, or other toxic materials. In the event of a spill of petroleum products or any other hazardous waste, the Permittee shall immediately report it to the N.C. Division of Water Resources at (919) 733-3300 or (800) 858-0368 and provisions of the North Carolina Oil Pollution and Hazardous Substances Control Act shall be followed.

14) Federally Listed Species/Biological Opinion: This Department of the Army permit does not authorize you to take a federally listed species, in particular the Appalachian elktoe (*Alasmidonta raveneliana*) or the gray bat (*Myotis grisescens*). In order to legally take a federally listed species, you must have separate authorization under the Endangered Species Act (ESA) (e.g., an ESA Section 10 permit, or a Biological Opinion (BO) under ESA Section 7, with "incidental take" provisions with which you must comply). The U.S. Fish and Wildlife Service issued a BO for this project titled, "I-26 Widening from US 25 Near Hendersonville to I-40/I-240 South of Asheville, Henderson and Buncombe Counties, North Carolina", on February 22, 2019. This BO contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that is also specified in the BO. Your authorization under this permit is conditional upon your compliance with all of the mandatory terms and conditions associated with incidental take of the attached BO; the terms and conditions of the BO are incorporated by reference in this permit. Failure to comply with the terms and conditions associated with incidental take of this BO, where a take of the federally listed species occurs, would constitute an unauthorized take, and it would also constitute non-compliance with your permit. The U.S. Fish and Wildlife Service is the appropriate authority to determine compliance with the terms and conditions of its BO, and with the ESA.

15) Endangered Species Act: The Permittee shall implement all necessary measures to ensure the authorized activity does not kill, injure, capture, harass, or otherwise harm any federally listed threatened or endangered species. While accomplishing the authorized work, if the Permittee discovers or observes an injured or dead threatened or endangered species, the U.S. Army Corps of Engineers, Wilmington District, Asheville Regulatory Field Office, Attn: Lori Beckwith at 828-271-7980, ext. 4223, or loretta.a.beckwith@usace.army.mil will be immediately notified.

16) NCDOT shall abide by all stipulations identified in the attached Memorandum of Agreement titled, "MEMORANDUM OF AGREEMENT AMONG THE FEDERAL HIGHWAY ADMINISTRATION, the NATIONAL PARK SERVICE, the NORTH CAROLINA DEPARTMENT OF TRANSPORTATION, and the NORTH CAROLINA STATE HISTORIC PRESERVATION OFFICE PURSUANT TO 36 CFR 800.6 regarding the REPLACEMENT OF BRIDGE 205 CARRYING THE BLUE RIDGE PARKWAY OVER INTERSTATE 26 BUNCOMBE COUNTY, NORTH CAROLINA NCDOT TIP ID I-4700b", dated May 30, 2018 (last signature). This MOA is incorporated herein by reference.

AQUATIC LIFE/CULVERTS

17) Prohibitions on Concrete: The Permittee shall take measures necessary to prevent live or fresh concrete, including bags of uncured concrete, from coming into contact with any water in or entering into waters of the United States. Water inside coffer dams or casings that has been in contact with concrete shall only be returned to waters of the United States when it no longer poses a threat to aquatic organisms (concrete is set and cured).

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

19) Measures shall be included in the construction/installation of culverts that will promote the safe passage of fish and other aquatic organisms. 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 opening shall be such as to pass the average historical low flow and spring flow without adversely altering flow velocity. Spring flow should be determined from gauge data, if available. In the absence of such data, bankfull flow can be used as a comparable level.

20) Aquatic Life Movement: Unless otherwise requested in the application and depicted on the approved permit plans, no activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area. All discharges of dredged or fill material within waters of the United States shall be designed and constructed to maintain low flows to sustain the movement of aquatic species.

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

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

SEDIMENT AND EROSION CONTROL

23) As noted on pages 34-38 of the attached document titled, "I-26 Widening, STIP Project No. I-4400 & I-4700 Project Commitments", dated June 19, 2019 (Version 5),

the permittee shall ensure that (2) the site specific sediment and erosion control measures, and (2) sediment and control measures for all other portions of the 22.2 mile corridor, are strictly implemented and maintained. This document is 38 pages long and was created to compile project commitments that NCDOT has agreed to in a number of other documents, to include commitments from:

- Combined Final Environmental Impact Statement (EIS), Final Section 4(f) Evaluation, and Record of Decision (ROD) (March 2019);
- Biological Assessment (September 2018);
- Biological Opinion (BO) (February 2019);
- I-26 Bridge Over the French Broad River Construction and Demolition (November 2018);
- River Safety Plan (September 2018)
- Strategic Communication Plan for the Construction of the I-26 Bridge over the French Broad River (September 2018)
- Section 106 Memorandum of Agreement (July 2018)

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

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

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

BORROW AND WASTE

27) To ensure that all borrow and waste activities occur on high ground and do not result in the degradation of adjacent waters and wetlands, except as authorized by this permit, the Permittee shall require its contractors and/or agents to identify all areas to be used as a borrow and/or waste site(s) associated with this project and provide this information to the U.S. Army Corps of Engineers, along with the following:

a) Borrow Sites: When any portion of an aquatic resource(s) (i.e., a stream, river, wetland, pond, seep, and/or spring) is located within the boundaries of the proposed borrow site(s), or within a distance of 400 feet from the nearest boundary of the proposed borrow site(s), the Permittee shall provide the U.S.

Army Corps of Engineers with appropriate maps indicating: the locations of the proposed borrow site(s); boundaries of the proposed borrow site(s), and; delineation(s) of all aquatic resources (as described above) within the site, and out to 400 feet from the boundary of the site, as soon as such information is available.

b) Waste Sites: When any portion of an aquatic resource(s) (i.e., a stream, river, wetland, pond, seep, and/or spring) is located within the boundaries of the proposed waste site(s), the Permittee shall provide the U.S. Army Corps of Engineers with appropriate maps indicating: the locations of the proposed waste site(s); boundaries of the proposed waste site(s), and; delineation(s) of all aquatic resources (as described above) within the site, as soon as such information is available.

For those areas proposed as waste sites that have any aquatic resources within the boundaries, or borrow sites that have any aquatic resources within the boundary or out to 400 feet beyond the boundaries, the Permittee shall not approve those borrow and/or waste sites until the U.S. Army Corps of Engineers issues written confirmation that an area does or does not contain potentially jurisdictional resources. All delineations of aquatic sites on borrow and/or waste sites shall be verified by the U.S. Army Corps of Engineers and shown on the approved reclamation plans. The Permittee shall ensure that all borrow and/or waste sites comply with Special Condition #4 of this permit. Additionally, the Permittee shall produce and maintain documentation of all borrow and waste sites associated with this project. When aquatic resources are located within these designated areas, this documentation will include data regarding soils, vegetation, hydrology, delineation(s) of aquatic sites, and any jurisdictional determinations made by the Corps to clearly demonstrate compliance with Special Condition #4. All information will be available to the U.S. Army Corps of Engineers upon request. The Permittee shall require its contractors to complete and execute reclamation plans for each borrow and/or waste site and provide written documentation that the reclamation plans have been implemented and all work is completed to the Permittee. For areas with aquatic resources that the Corps has determined are potentially jurisdictional (or jurisdictional), this documentation will be provided to the U.S. Army Corps of Engineers within 30 days of the completion of the reclamation work. The permittee shall ensure that (1) waste material placed in a project-related waste site(s) does not migrate into an aquatic resource, even if that resource is located outside the boundaries of the waste site, and (2) that any project-related activities in borrow sites does not adversely impact any off-site waters, to include dewatering (due to project-related excavation/borrow activities in the borrow site) of those off-site waters.

NAVIGATION/SECTION 10 WATERS (FRENCH BROAD RIVER)

28) This permit does not authorize the interference with any proposed Federal project, and the Permittee will not be entitled to compensation for damage or injury to the authorized structure or work which may be caused from future operations undertaken by the United States in the public interest. Except as authorized by this permit, or any

approved modification to this permit, no attempt will be made by the Permittee to prevent the full and free use by the public of all navigable waters at or adjacent to the authorized work. Except as authorized by this permit, or any approved modification to this permit, the permitted activity must not interfere with the public's right to free navigation on all navigable waters of the United States.

29) The Permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the Permittee will be required, upon due notice from the U.S. Army Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal, relocation, or alteration.

30) The Permittee, upon receipt of a notice of revocation of this permit or upon its expiration before completion of the work will, without expense to the United States and in such time and manner as the Secretary of the Army or his authorized representative may direct, restore the waterway to its former conditions. If the Permittee fails to comply with this direction, the Secretary or his representative may restore the waterway, by contract or otherwise, and recover the cost from the Permittee.

COMPENSATORY MITIGATION

31) 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.

Division Construction, Roadside Environmental Unit, EAU – BSG

401 WQC Conditions:

1. This 401 Water Quality Certification is being issued with only the I-4700A and I-4700B phases having finalized design and impacts. When final design plans are completed for I-4400 Sections A, BA, BB, and C, a modification to the 401 Water Quality Certification shall be submitted with fees to the NC Division of Water Resources. Final designs shall reflect all appropriate avoidance, minimization, and mitigation for impacts to wetlands, streams, and other surface waters, and buffers. No construction activities that impact any wetlands, streams, surface waters, or buffers located in I-4400 Sections A, BA, BB, and C, shall begin until after the permittee applies for, and receives a written modification of the 401 Water Quality Certification from the NC Division of Water Resources.

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

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

June 21, 2019

Regulatory Division

Action ID: SAW-2013-01833, STIP I-4400/I-4700

North Carolina Department of Transportation
Division of Highways
Attn: Mr. Philip S. Harris III, P.E., C.P.M.
Natural Environment Section Head
1598 Mail Service Center
Raleigh, NC 27699-1598

Dear Mr. Harris:

In accordance with the written request of December 3, 2018, and the ensuing administrative record, enclosed is a Department of the Army (DA) Permit to authorize the discharge fill material into streams and wetlands to construct STIP I-4400/I-4700. Construction of STIP I-4400/I-4700 will permanently impact 14,831 linear feet of stream, 2.91 acres of wetland, and <0.01 acre of open water along the 22.2 mile project corridor in Henderson and Buncombe Counties, North Carolina.

This is a phased permit authorization: This permit only authorizes work on Sections I-4700 A & B (Phase 1 for permitting) of the STIP I-4400/I-4700 project. The permittee is authorized to impact regulated waters along I-4700 A & B as follows: permanent discharge of fill material into 2,956 lf of streams and 1.56 acres of wetlands. The permittee is also authorized to temporarily impact 1,601 lf of streams during construction. Construction on the remaining sections of STIP I-4400/I-4700 shall not commence until final designs have been completed for these sections; the permittee has minimized impacts to waters and wetlands to the maximum extent practicable, and; any modifications to the plans, and the compensatory mitigation plans, have been approved by the US Army Corps of Engineers (the Corps).

Any deviation in the authorized work will likely require modification of this permit. If a change in the authorized work is necessary, you should promptly submit revised plans to the Corps showing the proposed changes. You may not undertake the proposed changes until the Corps notified you that your permit has been modified.

Carefully read your permit. The general and special conditions are important. Your failure to comply with these conditions could result in a violation of Federal law. Certain significant general conditions require that:

a. You must complete construction before December 31, 2029.

b. You must notify this office in advance as to when you intend to commence and complete work.

c. You must allow representatives from this office to make periodic visits to your worksite as deemed necessary to assure compliance with permit plans and conditions.

You should address all questions regarding this authorization to Ms. Lori Beckwith in the Asheville Regulatory Field Office, telephone number (828) 271-7980, extension 4223.

Thank you in advance for completing our Customer Survey Form. This can be accomplished by visiting our web-site at http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0 and completing the survey on-line. We value your comments and appreciate your taking the time to complete a survey each time you interact with our office.

FOR THE COMMANDER

Monte Matthews

for/ Robert J. Clark
Colonel, U.S. Army
District Commander

Enclosures

Copy Furnished (with enclosures):

Chief, Source Data Unit
NOAA/National Ocean Service
Attn: Sharon Tear N/CS261
1315 East-West Hwy., Rm 7316
Silver Spring, Maryland 20910-3282

Copies Furnished with special conditions and plans:

Mr. Kenneth Riley, Ph.D.
Habitat Conservation Division
National Marine Fisheries Service Southeast Region
101 Pivers Island Road
Beaufort, North Carolina 28516

Mr. Pete Benjamin
U.S. Fish and Wildlife Service
Raleigh Ecological Service Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

Mr. Todd Bowers
Oceans, Wetlands and Streams Protection Branch
Wetlands and Streams Regulatory Section
U.S. Environmental Protection Agency – Region 4
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, Georgia 30303-8931

Mr. Doug Huggett
Division Coastal Management
N.C. Department of Environment and Natural Resources
400Commerce Avenue
Morehead City, North Carolina 28557

Dr. Pace Wilber
Habitat Conservation Division – Atlantic Branch
NOAA Fisheries Service
219 Fort Johnston Road
Charleston, South Carolina 29412

DEPARTMENT OF THE ARMY PERMIT

Permittee **NORTH CAROLINA DEPARTMENT OF TRANSPORTATION**
ATTN: MR. PHILIP S. HARRIS III, P.E., C.P.M.

Permit No. **SAW-2013-01883**

Issuing Office **CESAW-RG-A**

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description: **To construct STIP I-4400/I-4700, the project involves the permanent discharge of fill material into 14,831 linear feet (lf) of streams, 2.91 acres of wetlands, and <0.01 acre of open waters (a pond) along the 22.2-mile project corridor/this section of I-26 in Henderson and Buncombe Counties, North Carolina.**

Project Location: **STIP Project I-4400 is 13.6 miles in length and begins at US 25 (Exit 54) near Hendersonville, and extends along I-26 west to NC 280 (Exit 40). STIP Project I-4700 is 8.6 miles in length and extends along I-26 from NC 280 west to the I-40/I-240 interchange. For permitting purposes, STIP I-4400 and STIP I-4700 are considered to be one project (i.e., STIP I-4400/I-4700). Center coordinates for the project are N 35.432347 W 82.530633.**

THIS IS A PHASED PERMIT AUTHORIZATION: This permit only authorizes work on Sections I-4700 A & B (Phase 1 for permitting) of the STIP I-4400/I-4700 project. The permittee is authorized to impact regulated waters along I-4700 A & B as follows: permanent discharge of fill material into 2,956 lf of streams and 1.56 acres of wetlands. The permittee is also authorized to temporarily impact 1,601 lf of streams during construction. Construction on the remaining sections of STIP I-4400/I-4700 shall not commence until final designs have been completed for these sections; the permittee has minimized impacts to waters and wetlands to the maximum extent practicable, and; any modifications to the plans, and the compensatory mitigation plans, have been approved by the US Army Corps of Engineers (the Corps).

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on **December 31, 2029.** If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination

required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

SEE ATTACHED SPECIAL CONDITIONS

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

(X) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit, Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

Carla Brim — 6/21/19

(PERMITTEE) **NC DEPARTMENT OF TRANSPORTATION** — *(DATE)*
for **ATTN: MR. PHILIP S. HARRIS III, P.E., C.P.M.**

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

Mark M. Ethen for/ — 21 June 2019

(DISTRICT COMMANDER) **ROBERT J. CLARK, COLONEL** — *(DATE)*

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE) — *(DATE)*

*U.S. GOVERNMENT PRINTING OFFICE: 1986 - 717-425

SPECIAL CONDITIONS
ACTION ID. SAW-2013-01883
NC DEPARTMENT OF TRANSPORATION
I-26 WIDENING, HENDERSON AND BUNCOMBE COUNTIES
STIP NO. I-4400/I-4700

WORK LIMITS/NOTIFCATION

1) The entire 22.2 mile project is identified as STIP I-4400/I-4700. This permit only authorizes work on Sections I-4700 A and B ("I-4700") of STIP I-4400/I-4700; also known as "Phase 1" for permitting purposes. Construction on the remaining sections (i.e., Section I-4400C, I-4400BB, I-4400BA, and I-4400A) of I-4400/I-4700 project shall not commence until: (a) final design for those sections/phases has been completed and submitted to the U.S. Army Corps of Engineers (Corps); (b) the Permittee has minimized impacts to waters and wetlands to the maximum extent practicable for those sections/phases and the Corps concurs with this assessment through standard Merger 4B and 4C meetings; (c) any modification(s) to the plans for those sections/phases have been approved by the Corps in writing; and (d) a final compensatory mitigation plan for those sections/phases has been submitted by the Permittee and approved by the Corps.

2) All work authorized by this permit shall be performed in strict compliance with the attached permit plans titled, "Wetland and Surface Water Impacts Permit, I-4700", permit drawing sheets 1-97, which are now part of this permit. The Permittee shall ensure that the construction design plans for this project do not deviate from the permit plans attached to this authorization. Any modification to the attached permit plans must be approved by the US Army Corps of Engineers prior to any active construction in waters or wetlands.

3) The permittee shall ensure that the project is implemented in strict accordance with all commitments in the attached document titled, "I-26 Widening, STIP Project Nos. I-4400 & I-4700 Project Commitments", dated June 19, 2019 (Version 5). This document is 38 pages long and was created to compile project commitments that NCDOT has agreed to in a number of other documents, to include commitments from the following:

- Combined Final Environmental Impact Statement (EIS), Final Section 4(f) Evaluation, and Record of Decision (ROD) (March 2019);
- Biological Assessment (September 2018);
- Biological Opinion (BO) (February 2019);
- I-26 Bridge Over the French Broad River Construction and Demolition (November 2018);
- River Safety Plan (September 2018)

- Strategic Communication Plan for the Construction of the I-26 Bridge over the French Broad River (September 2018)
- Section 106 Memorandum of Agreement (July 2018)

4) Unauthorized Dredge or Fill: Except as authorized by this permit or any U.S. Army Corps of Engineers approved modification to this permit, no excavation, fill, or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, within waters or wetlands, or shall any activities take place that cause the degradation of waters or wetlands. There shall be no excavation from, waste disposal into, or degradation of, jurisdictional wetlands or waters associated with this permit without appropriate modification of this permit, including appropriate compensatory mitigation. This prohibition applies to all borrow and waste activities connected with this project.

5) Maintain Flows and Circulation Patterns of Waters: Except as specified in the plans attached to this permit, no excavation, fill or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, in such a manner as to impair normal flows and circulation patterns within waters or wetlands or to reduce the reach of waters and/or wetlands

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

7) Pre-Construction Meeting: The Permittee shall schedule and attend a preconstruction meeting between its representatives, the contractors representatives, and the U.S. Army Corps of Engineers, Asheville Regulatory Field Office, NCDOT Regulatory Project Manager, prior to any work within jurisdictional waters and wetlands to ensure that there is a mutual understanding of all the terms and conditions contained with this Department of Army Permit.

SPECIAL CONDITIONS
ACTION ID. SAW-2013-01883
NC DEPARTMENT OF TRANSPORATION
I-26 WIDENING, HENDERSON AND BUNCOMBE COUNTIES
STIP NO. I-4400/I-4700

The Permittee shall provide the Corps, Asheville Regulatory Field Office, NCDOT Project Manager, with a copy of the final permit plans at least two weeks prior to the preconstruction meeting along with a description of any changes that have been made to the project's design, construction methodology or construction timeframe. The Permittee shall schedule the preconstruction meeting for a time frame when the Corps and NCDWR Project Managers can attend. The Permittee shall invite the Corps and NCDWR Project Managers a minimum of thirty (30) days in advance of the scheduled meeting in order to provide those individuals with ample opportunity to schedule and participate in the required meeting. The thirty (30) day requirement can be waived with the concurrence of the Corps.

8) Notification of Construction Commencement and Completion: The Permittee shall notify the U.S. Army Corps of Engineers in writing prior to beginning the work authorized by this permit and again upon completion of the work authorized by this permit.

9) Reporting Address: All reports, documentation, and correspondence required by the conditions of this permit shall be submitted to the following: U.S. Army Corps of Engineers, Wilmington District Asheville Regulatory Field Office, Attn: Lori Beckwith, 151 Patton Ave., Room 208, Asheville, NC 28801-5006, or loretta.a.beckwith@usace.army.mil . The Permittee shall reference the following permit number, SAW-2013-01883, on all submittals.

10) Reporting Violations: Violation of these permit conditions or violation of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act shall be reported to the Corps in writing and by telephone at: 828-271-7980, ext. 4223, within 24 hours of the Permittee's discovery of the violation.

11) Permit Revocation: The Permittee, upon receipt of a notice of revocation of this permit or upon its expiration before completion of the work will, without expense to the United States and in such time and manner as the Secretary of the Army or his authorized representative may direct, restore the water or wetland to its pre-project condition.

SPECIAL CONDITIONS
ACTION ID. SAW-2013-01883
NC DEPARTMENT OF TRANSPORATION
I-26 WIDENING, HENDERSON AND BUNCOMBE COUNTIES
STIP NO. I-4400/I-4700

RELATED LAWS

12) Clean Fill: The Permittee shall use only clean fill material for this project. The fill material shall be free from items such as trash, construction debris, metal and plastic products, and concrete block with exposed reinforcement bars. Soils used for fill shall not be contaminated with any toxic substance in concentrations governed by Section 307 of the Clean Water Act. Unless otherwise authorized by this permit, all fill material placed in waters or wetlands shall be generated from an upland source.

13) Water Contamination: All mechanized equipment shall be regularly inspected and maintained to prevent contamination of waters and wetlands from fuels, lubricants, hydraulic fluids, or other toxic materials. In the event of a spill of petroleum products or any other hazardous waste, the Permittee shall immediately report it to the N.C. Division of Water Resources at (919) 733-3300 or (800) 858-0368 and provisions of the North Carolina Oil Pollution and Hazardous Substances Control Act shall be followed.

14) Federally Listed Species/Biological Opinion: This Department of the Army permit does not authorize you to take a federally listed species, in particular the Appalachian elktoe (*Alasmidonta raveneliana*) or the gray bat (*Myotis grisescens*). In order to legally take a federally listed species, you must have separate authorization under the Endangered Species Act (ESA) (e.g., an ESA Section 10 permit, or a Biological Opinion (BO) under ESA Section 7, with "incidental take" provisions with which you must comply). The U.S. Fish and Wildlife Service issued a BO for this project titled, "I-26 Widening from US 25 near Hendersonville to I-40/I-240 South of Asheville, Henderson and Buncombe Counties, North Carolina", on February 22, 2019. This BO contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that is also specified in the BO. Your authorization under this permit is conditional upon your compliance with all of the mandatory terms and conditions associated with incidental take of the attached BO; the terms and conditions of the BO are incorporated by reference in this

permit. Failure to comply with the terms and conditions associated with incidental take of this BO, where a take of the federally listed species occurs, would constitute an unauthorized take, and it would also constitute non-compliance with your permit. The U.S. Fish and Wildlife Service is the appropriate authority to determine compliance with the terms and conditions of its BO, and with the ESA.

15) Endangered Species Act: The Permittee shall implement all necessary measures to ensure the authorized activity does not kill, injure, capture, harass, or otherwise harm any federally listed threatened or endangered species. While accomplishing the authorized work, if the Permittee discovers or observes an injured or dead threatened or endangered species, the U.S. Army Corps of Engineers, Wilmington District, Asheville Regulatory Field Office, Attn: Lori Beckwith at 828-271-7980, ext. 4223, or loretta.a.beckwith@usace.army.mil will be immediately notified.

16) NCDOT shall abide by all stipulations identified in the attached Memorandum of Agreement titled, "MEMORANDUM OF AGREEMENT AMONG THE FEDERAL HIGHWAY ADMINISTRATION, the NATIONAL PARK SERVICE, the NORTH CAROLINA DEPARTMENT OF TRANSPORTATION, and the NORTH CAROLINA STATE HISTORIC PRESERVATION OFFICE PURSUANT TO 36 CFR 800.6 regarding the REPLACEMENT OF BRIDGE 205 CARRYING THE BLUE RIDGE PARKWAY OVER INTERSTATE 26 BUNCOMBE COUNTY, NORTH CAROLINA NCDOT TIP ID I-4700b", dated May 30, 2018 (last signature). This MOA is incorporated herein by reference.

AQUATIC LIFE/CULVERTS

17) Prohibitions on Concrete: The Permittee shall take measures necessary to prevent live or fresh concrete, including bags of uncured concrete, from coming into contact with any water in or entering into waters of the United States. Water inside coffer dams or casings that has been in contact with concrete shall only be returned to waters of the United States when it no longer poses a threat to aquatic organisms (concrete is set and cured).

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

19) Measures shall be included in the construction/installation of culverts that will promote the safe passage of fish and other aquatic organisms. 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 opening shall be such as to pass the average historical low flow and spring flow without adversely altering flow velocity. Spring flow should be determined from gauge data, if available. In the absence of such data, bankfull flow can be used as a comparable level.

20) Aquatic Life Movement: Unless otherwise requested in the application and depicted on the approved permit plans, no activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area. All discharges of dredged or fill material within waters of the United States shall be designed and constructed to maintain low flows to sustain the movement of aquatic species.

21) The Permittee shall implement all reasonable and practicable measures to ensure that equipment, structures, fill pads, work, and operations associated with this project do not adversely affect upstream and/or downstream reaches.

Adverse effects include, but are not limited to, channel instability, flooding, and/or stream bank erosion. The Permittee shall routinely monitor for these effects, cease all work when detected, take initial corrective measures to correct actively eroding areas, and notify this office immediately. Permanent corrective measures may require additional authorization by the U.S. Army Corps of Engineers.

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

SEDIMENT AND EROSION CONTROL

23) As noted on pages 34-38 of the attached document titled, "I-26 Widening, STIP Project Nos. I-4400 & I-4700 Project Commitments", dated June 19, 2019 (Version 5), the permittee shall ensure that (2) the site specific sediment and erosion control measures, and (2) sediment and control measures for all other portions of the 22.2 mile corridor, are strictly implemented and maintained. This document is 38 pages long and was created to compile project commitments that NCDOT has agreed to in a number of other documents, to include commitments from the following:

- Combined Final Environmental Impact Statement (EIS), Final Section 4(f) Evaluation, and Record of Decision (ROD) (March 2019);
- Biological Assessment (September 2018);
- Biological Opinion (BO) (February 2019);
- I-26 Bridge Over the French Broad River Construction and Demolition (November 2018);
- River Safety Plan (September 2018)
- Strategic Communication Plan for the Construction of the I-26 Bridge over the French Broad River (September 2018)
- Section 106 Memorandum of Agreement (July 2018)

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

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

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

BORROW AND WASTE

27) To ensure that all borrow and waste activities occur on high ground and do not result in the degradation of adjacent waters and wetlands, except as authorized by this permit, the Permittee shall require its contractors and/or agents to identify all areas to be used as a borrow and/or waste site(s) associated with this project and provide this information to the U.S. Army Corps of Engineers, along with the following:

a) Borrow Sites: When any portion of an aquatic resource(s) (i.e., a stream, river, wetland, pond, seep, and/or spring) is located within the boundaries of the proposed borrow site(s), or within a distance of 400 feet from the nearest boundary of the proposed borrow site(s), the Permittee shall provide the U.S. Army Corps of Engineers with

appropriate maps indicating: the locations of the proposed borrow site(s); boundaries of the proposed borrow site(s), and; delineation(s) of all aquatic resources (as described above) within the site, and out to 400 feet from the boundary of the site, as soon as such information is available.

b) Waste Sites: When any portion of an aquatic resource(s) (i.e., a stream, river, wetland, pond, seep, and/or spring) is located within the boundaries of the proposed waste site(s), the Permittee shall provide the U.S. Army Corps of Engineers with appropriate maps indicating: the locations of the proposed waste site(s); boundaries of the proposed waste site(s), and; delineation(s) of all aquatic resources (as described above) within the site, as soon as such information is available.

For those areas proposed as waste sites that have any aquatic resources within the boundaries, or borrow sites that have any aquatic resources within the boundary or out to 400 feet beyond the boundaries, the Permittee shall not approve those borrow and/or waste sites until the U.S. Army Corps of Engineers issues written confirmation that an area does or does not contain potentially jurisdictional resources. All delineations of aquatic sites on borrow and/or waste sites shall be verified by the U.S. Army Corps of Engineers and shown on the approved reclamation plans. The Permittee shall ensure that all borrow and/or waste sites comply with Special Condition #4 of this permit. Additionally, the Permittee shall produce and maintain documentation of all borrow and waste sites associated with this project. When aquatic resources are located within these designated areas, this documentation will include data regarding soils, vegetation, hydrology, delineation(s) of aquatic sites, and any jurisdictional determinations made by the Corps to clearly demonstrate compliance with Special Condition #4. All information will be available to the U.S. Army Corps of Engineers upon request. The Permittee shall require its contractors to complete and execute reclamation plans for each borrow and/or waste site and provide written documentation that the reclamation plans have been implemented and all

work is completed to the Permittee. For areas with aquatic resources that the Corps has determined are potentially jurisdictional (or jurisdictional), this documentation will be provided to the U.S. Army Corps of Engineers within 30 days of the completion of the reclamation work. The permittee shall ensure that (1) waste material placed in a project-related waste site(s) does not migrate into an aquatic resource, even if that resource is located outside the boundaries of the waste site, and (2) that any project-related activities in borrow sites does not adversely impact any off-site waters, to include dewatering (due to project-related excavation/borrow activities in the borrow site) of those off-site waters.

NAVIGATION/SECTION 10 WATERS (FRENCH BROAD RIVER)

28) This permit does not authorize the interference with any proposed Federal project, and the Permittee will not be entitled to compensation for damage or injury to the authorized structure or work which may be caused from future operations undertaken by the United States in the public interest. Except as authorized by this permit, or any approved modification to this permit, no attempt will be made by the Permittee to prevent the full and free use by the public of all navigable waters at or adjacent to the authorized work. Except as authorized by this permit, or any approved modification to this permit, the permitted activity must not interfere with the public's right to free navigation on all navigable waters of the United States.

29) The Permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the Permittee will be required, upon due notice from the U.S. Army Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal, relocation, or alteration.

30) The Permittee, upon receipt of a notice of revocation of this permit or upon its expiration before completion of the work will, without expense to the United States and in such time and manner as the Secretary of the Army or his authorized representative may direct, restore the waterway to its former conditions. If the Permittee fails to comply with this direction, the Secretary or his representative may restore the waterway, by contract or otherwise, and recover the cost from the Permittee.

COMPENSATORY MITIGATION

31) 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.

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

Permittee: North Carolina Department of Transportation **Action ID: SAW-2013-01883**
Project Name: PHASE 1 (I-4700 A&B) of STIP I-4400/I-4700, Buncombe and Henderson Cos.

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 to the U.S. Army Corps of Engineers (USACE) Project Manager identified on page two is in receipt of a signed copy of this form before conducting authorized impacts, unless otherwise specified below. If more than one mitigation Sponsor will be used to provide the mitigation associated with the permit, or if the impacts and/or the mitigation will occur in more than one 8-digit Hydrologic Unit Code (HUC), multiple forms will be attached to the permit, and the separate forms for each Sponsor and/or HUC must be provided to the appropriate mitigation Sponsors.

Instructions to Sponsor: The Sponsor must verify that the mitigation requirements (credits) shown below are available at the identified site. By signing below, the Sponsor is accepting full responsibility for the identified mitigation, regardless of whether or not they have received payment from the Permittee. Once the form is signed, the Sponsor must update the bank ledger and provide a copy of the signed form and the updated bank ledger to the Permittee, the USACE Project Manager, and the Wilmington 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:** 06010105, French Broad River Basin

Stream Impacts (linear feet)			Wetland Impacts (acres)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
		2,674	1.56			

*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:** 06010105, French Broad River Basin

Stream Mitigation (credits)			Wetland Mitigation (credits)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
		3,812	3.12			

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 USACE, are currently available at the mitigation site identified above. Further, I understand that if the Sponsor fails to provide the required compensatory mitigation, the USACE Wilmington District Engineer may pursue measures against the Sponsor to ensure compliance associated with the mitigation requirements.

Mitigation Sponsor Name:_____

Name of Sponsor's Authorized Representative:_____

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

USACE Wilmington District
Compensatory Mitigation Responsibility Transfer Form, Page 2

Conditions for Transfer of Compensatory Mitigation Credit:

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

Comments/Additional Conditions:

1) Compensatory mitigation amounts reflected on this form reflect only the requirements for Sections I-4700 A and B ("I-4700") of STIP I-4400/I-4700; also known as "Phase 1" for permitting purposes. Additional mitigation (for future phases) will be required at the time of permit modification. This follows standard phased permitting requirements.

This form is not valid unless signed below by the USACE 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 USACE Project Manager at the address below, and 3) the Wilmington District Mitigation Office, Attn: Todd Tugwell, 3331 Heritage Trade Drive, Suite 105, Wake Forest, NC 27587 (email: todd.tugwell@usace.army.mil)***. Questions regarding this form or any of the permit conditions may be directed to the USACE Project Manager below.

USACE Project Manager: Lori Beckwith
USACE Field Office: Wilmington Regulatory Field Office
US Army Corps of Engineers
151 Patton Avenue, Room 208
Asheville, NC 28801-5006
Email: loretta.a.beckwith@usace.army.mil

Loretta Beckwith
USACE Project Manager Signature

June 17, 2019
Date of Signature

The Wilmington District is committed to providing the highest level of support to the public. To help us ensure we continue to do so, please complete the Customer Satisfaction Survey located at our website at http://regulatory.usacesurvey.com/ to complete the survey online.

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NORTH CAROLINA
Environmental Quality

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Director

June 19, 2019

Mr. Philip S. Harris, III, P.E., CPM
Natural Environment Section Head
Project Development and Environmental Analysis
North Carolina Department of Transportation
1598 Mail Service Center
Raleigh, North Carolina, 27699-1598

Subject: 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water with ADDITIONAL CONDITIONS for Proposed improvements to Interstate 26 in Buncombe and Henderson Counties,
WBS No. 36030.1.2, TIP I4400 / I4700.
NCDWR Project No. 20181645 Modification 2

Dear Mr. Harris:

Attached hereto is a copy of Certification No. 20181645, modified to correct the proposed impacts and DWR required mitigation, issued to The North Carolina Department of Transportation (NCDOT) dated June 19, 2019. This modified Certification shall replace the Certification issued June 18, 2019.

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

Sincerely,
DocuSigned by:
Amy Chapman
9C9886312DCD474...
Linda Culpepper, Director
Division of Water Resources

Attachments

Electronic copy only distribution:
Lori Beckwith, US Army Corps of Engineers, Asheville Field Office
Roger D. Bryan, Division 13 Environmental Officer
David G. McHenry, Division 14 Environmental Officer
Colin Mellor, NC Department of Transportation
Carla Dagnino, NC Department of Transportation
Dr. Cynthia Van Der Wiele, US Environmental Protection Agency
Claire Ellwanger, US Fish and Wildlife Service
Marla Chambers, NC Wildlife Resources Commission
Beth Harmon, Division of Mitigation Services
Kevin Barnett, NC Division of Water Resources Asheville Regional Office
File Copy

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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 15A NCAC 2B. This certification authorizes the NCDOT to impact 2.91 acres of jurisdictional wetlands, 14,831 linear feet of jurisdictional in Buncombe and Henderson Counties. The project shall be constructed pursuant to the application dated received December 4, 2018. The authorized impacts for I-4700 A & B are as described below:

Stream Impacts in the French Broad River Basin

Site	Permanent Fill in Intermittant Streams (linear ft)	Temporary Fill in Intermittant Streams (linear ft)	Permanent Fill in Perennial Stream (linear ft)	Temporary Fill in Perennial Stream (linear ft)	Total Stream Impact (linear feet)	Stream Impacts Requiring Mitigation (linear ft)
I4700A			328	121	449	0
I4700B	911	40	1,717	1,480	3,197	401
TOTAL:	911	40	2,045	1,601	3,646	401

Total Stream Impact for Roadway Improvements: 4,557 linear feet

Riverine Wetland Impacts in the French Broad River Basin

Site	Fill (ac)	Total Wetland Impact (ac)	Impacts Requiring Mitigation (ac)
I4700A	0.74	0.74	0.74
I4700B	0.82	0.82	0.82
Total	**1.56**	**1.56**	**1.56**

Total Wetland Impact for Roadway Improvements: 1.56 acres.

Approximate Preliminary I-4400A Impacts (to be finalized in future certification version)
Wetlands: 0.54 acres
Streams: 5,068 linear feet
Open Waters (pond): <0.01 acres

Approximate Preliminary I-4400BA Impacts (to be finalized in future certification version)
Wetlands: 0.0 acres
Streams: 185 linear feet
Open Waters (pond): 0.0 acres

Approximate Preliminary I-4400BB Impacts (to be finalized in future certification version)
Wetlands: 0.04 acres
Streams: 2,354 linear feet
Open Waters (pond): 0.0 acres

Approximate Preliminary I-4400C Impacts (to be finalized in future certification version)
Wetlands: 0.77 acres
Streams: 4,268 linear feet
Open Waters (pond): 0.0 acres

The application provides adequate assurance that the discharge of fill material into the waters of the **French Broad 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

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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 December 4, 2018, and phone comments provided in June, 2019. Should your project change, you are required to notify the NCDWR and submit a new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter, and is thereby responsible for complying with all the conditions. If any additional wetland impacts, or stream impacts, for this project (now or in the future) exceed one acre or 150 linear feet, respectively, additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). For this approval to remain valid, you are required to comply with all the conditions listed below. In addition, you should obtain all other federal, state or local permits before proceeding with your project including (but not limited to) Sediment and Erosion control, Coastal Stormwater, Non-discharge and Water Supply watershed regulations. This Certification shall expire on the same day as the expiration date of the corresponding Corps of Engineers Permit.

Condition(s) of Certification:

Additional Conditions:

1. This 401 Water Quality Certification is being issued with <u>only</u> the I-4700A and I-4700B phases having finalized design and impacts. When final design plans are completed for I-4400 Sections A, BA, BB, and C, a modification to the 401 Water Quality Certification shall be submitted with fees to the NC Division of Water Resources. Final designs shall reflect all appropriate avoidance, minimization, and mitigation for impacts to wetlands, streams, and other surface waters, and buffers. No construction activities that impact any wetlands, streams, surface waters, or buffers located in I-4400 Sections A, BA, BB, and C, shall begin until after the permittee applies for, and receives a written modification of the 401 Water Quality Certification from the NC Division of Water Resources.

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

3. Compensatory mitigation for 401 linear feet of impact to streams and for 1.56 acres of wetlands is required. We understand that you have chosen to perform compensatory mitigation for impacts to streams through the North Carolina Division of Mitigation Service (DMS) (formerly NCEEP), and that the DMS has agreed to implement the mitigation for the project. The DMS has indicated in a letter dated December 3, 2018 that they will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for the above-referenced project, in accordance with the DMS Mitigation Banking Instrument signed July 28, 2010.

General Conditions

1. Unless otherwise approved in this certification, placement of culverts and other structures in open waters and streams shall be placed below the elevation of the streambed by one foot for all culverts with a diameter greater than 48 inches, and 20 percent of the culvert diameter for culverts having a diameter less than 48 inches, to allow low flow passage of water and aquatic life. Design and placement of culverts and other structures including temporary erosion control measures shall not be conducted in a manner that may result in dis-equilibrium of wetlands or streambeds or banks, adjacent to or upstream and downstream of the above structures. The applicant is required to provide evidence that the equilibrium is being maintained if requested in writing by NCDWR. If this condition is unable to be met due to bedrock or other limiting features encountered during construction, please contact NCDWR for guidance on how to proceed and to determine whether or not a permit modification will be required. [15A NCAC 02H.0506(b)(2)]

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

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

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

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

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

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

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

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

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

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

12. 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]

13. 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.*

14. 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.

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Sufficient materials required for stabilization and/or repair of erosion control measures and stormwater routing and treatment shall be on site at all times.

15. 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.

16. If the project occurs in waters or watersheds classified as Primary Nursery Areas (PNAs), SA, WS-1, WS-11, High Quality Waters (HQW), or Outstanding Resource Waters (ORW), then the sedimentation and erosion control designs shall comply with the requirements set forth in 15A NCAC 04B .0124, *Design Standards in Sensitive Watershed.* [15A NCAC 02H.0506(b)(3) and (c)(3); GC 4135]

17. 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]

18. 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)]

19. 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)]

20. The outside buffer, wetland or water boundary located within the construction corridor approved by this authorization, including all non-commercial borrow and waste sites associated with the project, 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]

21. 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.

22. 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)]

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

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24. 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)

25. 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):

26. 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*.
    a. 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.
    b. 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*.
    c. The reclamation measures and implementation must comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act.

27. Sediment and erosion control measures shall not be placed in wetlands or surface waters, or within 5 feet of the top of bank, without prior approval from DWR. [15A NCAC 02H.0506(b)(3) and (c)(3)]

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

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

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

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

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

Mr. Bill F. Lane, General Counsel

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Department of Environmental Quality
1601 Mail Service Center

This the 19th day of June, 2019
DIVISION OF WATER RESOURCES

DocuSigned by:
Amy Chapman
9C9886312DCD474...

Linda Culpepper, Director

WQC No. 20180645

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NORTH CAROLINA
Environmental Quality

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Director

NCDWR Project No.: _____ **County:** _____

Applicant: _____

Project Name: _____

Date of Issuance of 401 Water Quality Certification: _____

Certificate of Completion
Upon completion of all work approved within the 401 Water Quality Certification or applicable Buffer Rules, and any subsequent modifications, the applicant is required to return this certificate to the 401 Transportation Permitting Unit, North Carolina Division of Water Resources, 1617 Mail Service Center, Raleigh, NC, 27699-1617. This form may be returned to NCDWR by the applicant, the applicant's authorized agent, **or** the project engineer. It is not necessary to send certificates from all of these.

Applicant's Certification

I, _____, hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the 401 Water Quality Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

Signature: _____ Date: _____

Agent's Certification

I, _____, hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the 401 Water Quality Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

Signature: _____ Date:_____

Engineer's Certification

_____ Partial _____ Final

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

Signature _____ Registration No. _____
Date _____

I-26 Widening

STIP Project Nos. I-4400 & I-4700

US 25 (exit 54) in Henderson County to I-40/I-240 in Buncombe County, including the Blue Ridge Parkway Bridge over I-26

Project Commitments

For ease of use, this document contains commitments from the following NCDOT State Transportation Improvement Program (STIP) Project Nos I-4400/I-4700, I-26 Widening, decision documents:

- Combined Final Environmental Impact Statement (EIS), Final Section 4(f) Evaluation, and Record of Decision (ROD) (March 2019)
- Biological Assessment (September 2018)
- Biological Opinion (BO) (February 2019)
- I-26 Bridge Over the French Broad River Construction and Demolition (November 2018)
- River Safety Plan (September 2018)
- Strategic Communication Plan for the Construction of the I-26 Bridge over the French Broad River (September 2018)
- Section 106 Memorandum of Agreement (July 2018)

From the *Final EIS/Final Section 4(f)/ROD/BO*

Item	Resource	Agency	Project Commitment
1	Noise	NCDOT Environmental Analysis Unit (EAU) – Human Environment Section (HES)	The *Traffic Noise Report* (HNTB 2017) for State Transportation Improvement Project (STIP) Nos. I-4400/I-4700 preliminarily identifies six noise walls for abatement of noise impacts for the preferred alternative (Hybrid 6/8-Lane Widening Alternative). The *Design Noise Report* will verify the final number and location of noise walls for the preferred alternative based on the NCDOT *Traffic Noise Policy* (October 6, 2016).

2	Limited English Proficiency (LEP)	NCDOT EAU – HES	Because LEP populations within the Demographic Study Area (DSA) exceed the Department of Justice's Safe Harbor thresholds, written translations of vital documents should be provided for Spanish-speaking populations, in addition to other measures assuring meaningful language access, as determined by NCDOT Public Involvement to satisfy the requirements of Executive Order 13166.
3	LEP	NCDOT EAU – HES	Because notable other Indo-European language-speaking populations requiring language assistance are located within the DSA, the Project Planning Engineer should consult with NCDOT Public Involvement to determine appropriate measures assuring meaningful public involvement to satisfy the requirements of Executive Order 12898.
4	Protected Species	NCDOT EAU – NES, U.S. Fish and Wildlife Service (USFWS), Blue Ridge Parkway (BRP), and National Park Service (NPS)	~~Because the project includes construction on NPS land that might be within habitat that is suitable for the Northern long-eared bat, tree clearing shall be allowed between August 15 and May 15.~~ **From the BO**: No tree cutting will be allowed on National Park Service land from **May 15** through **August 15** of any year. Emergence and/or acoustic surveys are required by the Department prior to any tree clearing on the Blue Ridge Parkway that must occur between **April 1** and **May 15** or **August 15** and **November 15** of any year. If any NLEB roost trees are documented within 0.25 mile of the project area, regardless of the time of year, the NPS will seek consultation with the US Fish and Wildlife Service before work proceeds.
5	Protected Species	NCDOT EAU – NES, USFWS, BRP, and NPS	~~Because the project includes construction on NPS land that might be within habitat that is suitable for the Indiana bat, emergent and/or acoustic surveys shall be conducted prior to removal of trees if the work would be conducted between April 1 and August 15.~~ **From the BO**: No tree cutting will be allowed on National Park Service land from **May 15** through **August 15** of any year. Emergence and/or acoustic surveys are required by the Department prior to any tree clearing on the Blue Ridge Parkway that must occur between **April 1** and **May 15** or **August 15** and **November 15** of any year.

			No significant tree removal within 5 miles of known hibernacula can occur between April 1 and November 15.
6	Hydraulics	NCDOT Hydraulics	The NCDOT Hydraulics Unit will coordinate with the NC Floodplain Mapping Program to determine the status of the project with regard to the applicability of NCDOT's Memorandum of Agreement or approval of a Conditional Letter of Map Revision (CLOMR) and subsequent final Letter of Map Revision (LOMR).
7	Hydraulics	NCDOT Hydraulics	The Division shall submit sealed as-built construction plans to the Hydraulics Unit upon completion of project construction, certifying that the drainage structures and roadway embankments that are located within 100-year floodplains were built as shown in the construction plans, both horizontally and vertically.
8	Utilities	NCDOT Division 13 and Roadway Design	NCDOT Roadway Design Unit will continue coordination with Duke Energy to avoid impacts to the dam and coal ash ponds located at the Asheville Plant.
9	Blue Ridge Parkway and Mountains-to-Sea Trail	NCDOT Division 13, National Park Service (NPS), and Federal Highway Administration (FHWA)-Eastern Federal Lands (EFL)	Coordination between the NCDOT, NPS, and FHWA-EFL will continue during the design and construction of the project to minimize impacts to Blue Ridge Parkway operations and visitor experience as well as the Mountains-to-Sea Trail. **These agencies will coordinate to ensure, to the extent possible, that temporary or nighttime closures necessary for construction of the Blue Ridge Parkway realignment and bridge replacement over I-26 will only be permitted from November 1 until April 31 and not during summer months.** The NPS will provide detour signage to safely guide users of the Mountains-to-Sea Trail out of the construction area and into safe locations.
10	Blue Ridge Parkway and Mountains-to-Sea Trail	NCDOT Division 13, NPS, and FHWA- EFL	Coordination between the NCDOT, NPS, and FHWA-EFL will continue during the design and construction of the project to minimize impacts to Blue Ridge Parkway operations and visitor experience as well as the Mountains-to-Sea Trail. These agencies will coordinate to ensure, to the extent possible, that nighttime work (between dusk and dawn) shall only be allowed during bridge removal activities and installation of new piers and segments on the Blue Ridge Parkway. If other nighttime work is needed, park natural resource staff shall be consulted to determine if further mitigations are necessary.

11	Blue Ridge Parkway and Mountains-to-Sea Trail	NCDOT Division 13, NPS, and FHWA- EFL	Coordination between the NCDOT, NPS, and FHWA-EFL will continue during the design and construction of the project to minimize impacts to Blue Ridge Parkway operations and visitor experience as well as the Mountains-to-Sea Trail. These agencies will coordinate to ensure, to the extent possible, that a re-vegetation/landscaping plan shall be developed and implemented to re-establish native vegetation and provide for a continuous visual experience for the trail and Blue Ridge Parkway user.
12	Blue Ridge Parkway and Mountains-to-Sea Trail	NCDOT Division 13, NPS, and FHWA- EFL	Coordination between the NCDOT, NPS, and FHWA-EFL will continue during the design and construction of the project to minimize impacts to Blue Ridge Parkway operations and visitor experience as well as the Mountains-to-Sea Trail. These agencies will coordinate to ensure, to the extent possible, that the proposed demolition of the bridge shall include appropriate measures to avoid destroying active nests or killing birds that are protected by the Migratory Bird Treaty Act.
13	French Broad River Paddle Trail	NCDOT Division 13, NC Department of Parks and Recreation (NCDPR), and USACE	NCDOT will place signage at the Bent Creek River Park and along the French Broad River notifying users of construction. In addition, a safe passage lane under the French Broad River and I-26 bridge will be provided for the duration of construction. NCDOT will work with NCDPR partner organizations to alert boaters of construction.
14	Blue Ridge Parkway	NCDOT Division 13, FHWA NC Division, NPS, and FHWA- EFL	Eastern Federal Lands (EFLHD) will provide 70 percent and 100 percent construction drawings for the Undertaking to BRP. BRP shall provide their comments to EFLHD staff within 30 calendar days of receipt. EFLHD shall revise drawings and plans to address the BRP comments and provide revised drawings to BRP within 30 calendar days after receiving comments. The revised drawings shall be submitted by BRP to the NC Historic Preservation Office (HPO). The HPO shall provide their comments to BRP within 15 calendar days of receipt. Comments provided by the HPO will be sent to EFLHD by BRP within 5 calendar days to be incorporated into the bridge design. If HPO does not respond within 15 days, concurrence is assumed.
15	Blue Ridge Parkway	NCDOT Division 13, FHWA NC Division, NPS, and FHWA- EFL	EFLHD shall provide parking pull-off and re-vegetation/landscaping plans to BRP who will provide their comments to EFLHD staff within 30 calendar days of receipt. EFLHD shall revise the plan and design to address BRP comments and provide revised plans to

			BRP within 30 calendar days after receiving comments. These plans shall be submitted by BRP to the HPO. The HPO shall provide their comments to BRP within 15 calendar days of receipt. Comments provided by the HPO will be sent to EFLHD by BRP within 5 calendar days to be incorporated into the plans. If HPO does not respond within 15 days, concurrence is assumed.
16	Blue Ridge Parkway	NCDOT EAU –Historic Architecture, FHWA NC Division, NPS, and FHWA- EFL	Historic American Engineering Record (HAER) documentation will be submitted by NCDOT to BRP. BRP will within seven days forward to the NPS Southeast Regional Office who will provide their comments to BRP and NCDOT within 30 calendar days of receipt. NCDOT shall revise the documentation to address NPS comments and provide revised documentation to BRP within 60 calendar days after receiving comments. BRP shall forward revised documentation to the NPS Southeast Regional Office who will review for acceptance to the Heritage Documentation Program Collection of the Library of Congress. Upon acceptance of the HAER documentation by the NPS, the BRP shall notify NCDOT so that copies of all documents resulting from the HAER documentation, including pertinent field records, notes, site sketches, superintendent reports, and construction reports shall be provided to the HPO, the Library of Congress and the permanent collection of BRP. The NCDOT shall provide all said copies to all parties within 45 calendar days of notification of acceptance.
17	Blue Ridge Parkway	NCDOT Division 13, FHWA NC Division	If previously unknown cultural resources are discovered during construction, all work in the immediate vicinity (600 feet) of the discovery shall be halted and BRP Cultural Resources Manager shall be notified immediately. Work shall not resume until the NPS determines the resources have been identified and documented and an appropriate mitigation strategy developed, if necessary, in accordance with pertinent laws and regulations, including the stipulations of the "2008 Programmatic Agreement Among the National Park Service (U.S. Department of the Interior), the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers." THPOs will be consulted in the event cultural resources or human remains are discovered during the project.
18	Protected Species	NCDOT, NCDOT Divisions 13 and 14	NCDOT will carry out all activities for which it has been assigned responsibility in the Biological Opinion I-26

			Widening from US 25 Near Hendersonville to I-40/I-240 South of Asheville (January 2019).

From the *Biological Assessment*

1. Tree Clearing
    a. Tree clearing between the Blue Ridge Parkway and Brevard Road (NC 191) will be minimized to every practicable extent to preserve as much of the mature woody vegetation as possible in this area.
    b. No trees will be cleared beyond what will be necessary to establish the permanent project footprint, to temporarily pipe streams SEE and SFG and establish associated SEC devices, and to create the access roads at the Blue Ridge Parkway.
2. Lighting
    ~~a. NCDOT will limit all construction-related lighting to whatever is necessary to maintain safety in active work areas closest to the French Broad River between April 15 and August 15.~~ ***See Biological Opinion section below.***
    b. Construction-related lighting will be indirect in nature and will not project into adjacent wooded areas or over the water surface of the river whenever practicable.
    c. This restriction will apply to locations between Brevard Road (NC 191) and Glenn Bridge Road (SR 3495) with the exceptions of the construction area associated with the access roads at the Blue Ridge Parkway and the existing brightly lit area associated with the Long Shoals Road (NC 146) interchange.
    d. NCDOT has determined that minimal additional permanent lighting will be required for this project. Lighting at interchanges may be relocated, to allow for reconfiguration or expansion of the interchanges, but new lighting will only be required at the US 25 interchange and the rest areas.
3. I-26 Bridge Replacement at the French Broad River
    a. Construction Activities – Access Roads
        i. NCDOT will install temporary retaining walls on the outer edges of the access roads to reduce impacts to adjacent forested land and jurisdictional features.
        ii. The footprint for the access roads will not extend beyond the permanent project footprint.
        iii. Streams SEE and SFG will be temporarily piped for the duration of construction. A revegetation and monitoring plan shall be developed for streams SEE and SFG for when the project is complete and the pipe is removed. Monitoring for stream stability and vegetative success will take place for a minimum of 3 years after construction.
    b. Construction Activities – Causeways
        i. Causeways will be used instead of multiple work bridges.
        ii. Causeways will have 1:1 slopes to minimize their size.
        iii. NCDOT will require the contractor to use clean rock (free of debris and pollutants) for the construction of the causeways to minimize unnecessary sediment input into the river.
        iv. Causeway material will be removed to the extent practicable and either disposed of off-site or used in areas that require permanent stone protection after project completion. NCDOT will also require that concrete barriers (barrier rail) be placed

along the downstream edge of each causeway to limit the downstream movement of causeway material during high flow events.

v. Causeway material will be added/removed as needed for each stage to minimize the causeway footprint over the length of the project.

vi. The Stage 4 causeway extension will be sloped to allow water to flow over the top, reducing overall impact to channel flow (see the *I-26 Bridge Over the French Broad River Proposed Construction and Demolition* document).

vii. To minimize disturbance to the riverbed, all readily detectible causeway material will be removed, to the extent practicable, while removing as little of the original riverbed as possible.

viii. Construction fabric will not be used under the causeway material, as it has a tendency to tear into tiny pieces and float downstream during removal.

ix. Any equipment that is placed on the causeways will be removed any time throughout a work day when the water level rises, or is expected to rise overnight, to a point where the equipment could be flooded, or during periods of inactivity (two or more consecutive days). The only exception to this measure is that the drill rig and crane may be left in place for periods of inactivity; however, they must also be removed if the water rises, or is expected to rise, to a point where the drill rig and crane could be flooded.

x. NCDOT will require the contractor to use new or steam-cleaned equipment to access causeways that are under water if these causeways are utilized for removal of existing bents in under-water conditions.

xi. NCDOT will commit to requiring its contractor to have clean, non-leaking equipment, diapers on-site for each causeway, and spill kits located at each causeway.

c. Construction Activities - Bridge

i. Activities in the floodplain will be limited to those needed to construct the proposed bridge and remove the existing bridges.

ii. With the exceptions noted below for the drill rig and crane, all construction equipment shall be refueled outside the 100-year floodplain or at least 200 feet from all water bodies (whichever distance is greater) and be protected with secondary containment. During crucial periods of construction and demolition, when the drill rig and crane cannot be moved, the drill rig and crane can be refueled while inside the 100-year floodplain provided that spill response materials (such as spill blankets and fueling diapers) are used during the refueling. Hazardous materials, fuel, lubricating oils, or other chemicals will be stored outside the 100-year floodplain or at least 200 feet from all water bodies (whichever distance is greater), not in a Water of the U.S. Areas used for borrow or construction by-products will not be located within wetlands or the 100-year floodplain.

iii. When constructing drilled piers for the French Broad River bridge, a containment system will be developed so that material does not enter the river. Material by-product will be pumped out of the shaft to an upland disposal area to the extent practicable and treated through a proper stilling basin or silt bag.

iv. Construction of the new bridge will be accomplished in a manner that prevents uncured concrete from coming into contact with water entering or flowing in the river.

v. Removal of the existing bridge shall be performed so as not to allow debris to fall into the water. If debris is dropped in river, it will be immediately removed.

vi. The current barrier on the bridge is a one bar metal rail on concrete parapet with retrofitted guardrail. It will be replaced with concrete barrier rail, a 42-in. solid, concrete "Jersey barrier" style guard wall.

d. Night Time Construction Activities

~~***i.*** Between June 1 and August 1, NCDOT will commit to restrict the construction contractor to no more than 28 total nights of work, and no more than four consecutive nights within a two-week period.~~ ***See Biological Opinion section below.***

ii. Lighting used for construction will be limited to whatever is necessary to maintain safety standards, and will only be directed toward active work areas.

e. Red Safety Lighting

i. NCDOT will place solar-powered, steady-state red lights on the causeways to alert river users to their locations.

ii. Generators will not be used to provide power.

f. Erosion Control Measures

i. A Sediment and Erosion Control (SEC) plan will be in place prior to any ground disturbance.

ii. Implementation of NCDOT's Best Management Practices for the Protection of Surface Waters (BMPs) will minimize impacts to water resources during the pre-construction, construction, maintenance, and repair situations.

iii. Incorporating the Design Standards in Sensitive Watersheds (DSSW) [15A NCAC 04B .0124 (a) – (e)], regardless of the NCDWR stream classification:

- Uncovered areas shall be limited to a maximum total area of 20 ac.
- Erosion and sedimentation control measures shall be designed and constructed to provide protection from the runoff of the 25-year storm event, instead of a 10-year storm.
- Sediment basins will have a settling efficiency of at least 70 percent for the 40-micron (0.04mm) size soil particle transported into the basin by the runoff of a two-year storm.
- Newly constructed open channels shall be constructed with side slopes no steeper than two horizontal to one (2:1) vertical if a vegetative cover is used for stabilization. The angle for side slopes shall be sufficient to restrain accelerated erosion.
- Ground cover sufficient to restrain erosion must be provided within 15 working days or 60 calendar days following completion of construction, whichever period is shorter.

iv. The sedimentation and erosion control plans shall adhere to the DSSW where practicable within the existing and proposed right of way for the following areas:

- From the Blue Ridge Parkway bridge to the northern terminus of the project.
- For portions of the project within 1 mi. and draining directly to streams that are identified as NCDEQ and/or NCWRC designated trout streams.

- For portions of the project within 1 mi. and draining directly to streams where aquatic threatened or endangered species are present.

v. Environmentally Sensitive Areas will be demarcated within the Action Area. The Environmentally Sensitive Areas will be defined by a 50-ft. buffer zone on both sides of jurisdictional streams measured from top of streambank, in which the following shall apply:
    - The Contractor may perform clearing operations, but not grubbing operations until immediately prior to beginning grading operations.
    - Once grading operations begin, work shall progress in a continuous manner until complete.
    - Erosion control devices shall be installed immediately following the clearing operation.
    - Seeding and mulching shall be performed on the areas disturbed by construction immediately following final grade establishment.
    - Seeding and mulching shall be done in stages on cut and fill slopes that are greater than 20 ft. in height measured along the slope, or greater than 2 ac. in area, whichever is less.
    - All sedimentation and erosion control measures, throughout the project limits, must be cleaned out when half full of sediment, to ensure proper function of the measures.

vi. NCDOT will temporarily pipe streams SEE and SFG during bridge construction and demolition.

vii. USFWS and USACE will have the opportunity to review the design of the SEC measures for streams SEE and SFG.

viii. A revegetation and stream monitoring plan shall be developed for streams SEE and SFG, to observe vegetation success and stream stability. The revegetation and stream monitoring plan shall be approved by the USACE and will commence once the bridge construction and demolition are complete and the pipe is removed.

ix. Contract language regarding erosion control will include the following, or similar language as appropriate:
    - "The Contractor will be required to prosecute the work in a continuous and uninterrupted manner from the time work begins until completion of each phase of structure construction, demolition, and completion. The Contractor will not be permitted to suspend operations except for reasons beyond their control or except where the Engineer has authorized a suspension of the Contractor's operations in writing."
    - "In the event that the Contractor's operations are suspended in violation of the above provisions or it is determined the Contractor is not deemed to be pursuing the work in a continuous manner in accordance with his submitted and approved schedule, the sum of $1,000.00 per day will be charged the Contractor for each and every calendar day that such suspension takes place. The said amount is hereby agreed upon as liquidated damages due to extra engineering and maintenance costs and due to increased public hazard resulting from a suspension of the work. Liquidated damages chargeable due to suspension of the work will be

additional to any liquidated damages that may become chargeable due to failure to complete the work on time."

g. Monitoring of Effectiveness of Sediment and Erosion Control Devices
    i. Two Construction Project Inspectors, one for I-4400 and one for I-4700, will monitor SEC devices for the life of the project.
    ii. Inspections of erosion control devices will be done daily for construction associated with the French Broad River bridge replacement.
    iii. For the remainder of the project, the standard inspection schedule (weekly, or after a rainfall event of one-half in. or greater) will apply.
    iv. The Roadside Environmental Unit of NCDOT also has Field Operations Engineers that perform compliance inspections of the erosion control devices a minimum of twice a month during the life of any project. These inspections are generally more frequent on projects within an endangered species habitat.
    v. NCDOT will also commit to the following:
        - NCDOT will install a rainfall data logger at the river to continuously monitor and record rainfall events.
        - NCDOT will self-report to USFWS any sediment/erosion control device failures that result from excessive rainfall events (exceeding a 25-year storm event). The NCDOT inspector will report any failures to the Division Environmental Officer, who will contact the agency within 24 hours. If there are any failures in SEC measures, NCDOT will meet with resource agencies and work to adaptively manage SEC devices for future storm events while construction continues.

h. Agency Coordination
    i. NCDOT will continue to identify avoidance and minimization measures to all Waters of the U.S. and ensure that major hydraulic structures associated with the project are designed and installed to minimize negative impacts to stream stability (and therefore, water quality) to the greatest extent practicable.
    ii. As part of this process, NCDOT will continue to coordinate with the Merger Team to identify avoidance and minimization measures and ensure that project impacts are minimized to every practicable extent, including impacts to federally protected species.
    iii. NCDOT will invite representatives from USFWS, USACE, and NCWRC to the pre-construction meeting for the proposed project, as well as to all subsequent field inspections prior to construction, to insure compliance with all special project commitments.
    iv. NCDOT will provide USFWS with the SEC plan and allow 15 days for review.
    v. NCDOT will provide USFWS with the French Broad River bridge demolition plan and allow 15 days for review.
    vi. NCDOT will invite all resource agencies to review the demolition plan and will be notified prior to start of demolition so they may have a representative on site.
    vii. NCDOT will invite USFWS and USACE to review the design of the SEC measures for streams SEE and SFG, as well as the revegetation and monitoring plan.
    viii. NCDOT will contact USFWS if new information about MYGR is discovered, as it relates to the project.
    ix. NCDOT will report any dead bats found on the construction sites to USFWS.

4. Stormwater Control

a. NCDOT has developed stormwater commitment guidance, which will apply at crossings of the French Broad River and any portion of the NCDOT stormwater conveyance system draining to an outfall discharging to the river within the NCDOT right-of-way.
b. NCDOT will prepare a stormwater management plan (SMP) that implements structural and non-structural post-construction stormwater BMPs to the maximum extent practical (MEP), which is consistent with the Department's NPDES Post-Construction Stormwater Program
c. When preparing the SMP, NCDOT commits to using a hierarchical BMP selection process, which is optimized to treat silt, nutrients and heavy metals. At each discharge location outside of the 100-year floodplain, the hydraulics engineer will evaluate the feasibility of installing either an infiltration basin or a media filter as described in NCDOT's BMP Toolbox. If one of these BMP types is a feasible option, then NCDOT commits to including it in the SMP. If an infiltration basin or a media filter is not feasible because it would either affect forested habitat for MYGR or because of site constraints (e.g. topography, high water table, etc.), then NCDOT commits to providing a description of these constraints in the SMP as supporting information for selecting a BMP. In such cases the hydraulics engineer will select another BMP type from NCDOT's Toolbox that is feasible. Preference will be given to water quality swales, vegetative conveyances, vegetated filter strips, and preformed scour holes (PSHs). In flat, bottomland terrain, PSHs will be used to the maximum extent practical to eliminate outfalls by converting concentrated flow into distributed flow, thus maximizing infiltration and evapotranspiration of the runoff.
d. NCDOT will commit to evaluating the use of emerging BMP technologies that the Department has not yet published in its BMP Toolbox. These emerging BMP technologies are: bioswales, bioembankments, biofiltration conveyances, and soil improvement to maximize infiltration. Because these design standards have not yet been formally approved by NCDEQ for inclusion in the BMP Toolbox, the hydraulics engineer will be required to consult with the State Hydraulics Engineer and obtain prior approval before proposing one of these BMP technologies in the SMP.

5. Conservation Measures
   a. Monitoring Gray Bat Activity
      i. NCDOT will perform acoustic monitoring at the French Broad River bridge beginning in early spring 2018 to try and determine the timing of increased MYGR activity at this location (presumably after the bats cease winter hibernation).
      ii. NCDOT will leave an acoustic detector in place through the fall of 2018 when MYGR activity trails off for the season.
      iii. NCDOT will share this information with USFWS and NCWRC, because it should be helpful in understanding MYGR activity in construction areas for use on future projects.
      iv. NCDOT will also conduct acoustic monitoring for MYGR immediately prior to and during construction at the French Broad River bridge.
      v. NCDOT will investigate the use of night-vision video recordings, or other methods, in an attempt to monitor bat activity at the bridge while active night time construction is underway.
   b. NCDOT Sponsored Gray Bat Research Project
      i. In 2017, NCDOT, with the cooperation of the USFWS and NCWRC, committed to a three-year study on MYGR within the French Broad River Basin. This study will serve as a conservation measure for NCDOT projects within Divisions 13 and 14 for a limited time. NCDOT will provide $900,000 in funding to Indiana State University to conduct the research project, which will aid in the recovery and conservation of MYGR. The

end goal is to gather the information needed to allow NCDOT and USFWS to enter into a programmatic consultation to cover MYGR for NCDOT Divisions 13 and 14, as well as help to develop species specific avoidance and minimization measures. Within this study NCDOT will incorporate all data previously collected from the French Broad River watershed associated with NCDOT projects I-4400/4700 and I-2513, as well as data collected by NCWRC. Also, using the NCDOT-developed standard operating procedure for bat habitat assessments, NCDOT will collect data on the extent of bridge/culvert use in western North Carolina, defining characteristics of bat bridges and the surrounding landscape (e.g., bridge type, surrounding land use, bridge characteristics), as well as how the bridge is being used (night roost, day roost or both) and data on the timing of use by bats. This information will be merged with the existing data NCDOT has collected at more than 600 bridges from 1996 to 2017. This study will put radio tracking devices on MYGR to determine summer foraging habitat and distribution and locations of additional roosts, including possible winter roosts, which have not been found in North Carolina.

c. French Broad River Conservation Funding
    i. NCDOT will provide $500,000 in funding to the North Carolina Nongame Aquatic Projects Fund for the French Broad River Conservation Plan proposed by USFWS, which will aid in the recovery and conservation of Appalachian elktoe. The funding will be held by the NCWRC. A multi-agency/organization group of mussel species experts, including USFWS and NCDOT, will determine how to expend the funds.

d. French Broad River Geomorphology Monitoring
    i. To ensure bridge construction at the French Broad River crossing will not result in substantial changes to channel stability (scour, erosion, etc.), NCDOT will conduct river channel and bank monitoring at the I-26 bridge construction site.
    ii. Monitoring will consist of surveying the French Broad River channel bathymetry and riverbanks before and during the construction of the I-26 crossing (approximately 3.5 years).
    iii. Mapping will occur before construction and then every quarter during construction, with one final survey after the causeways are all removed.
    iv. The survey will provide a complete digital terrain model (DTM) of the stream bed and banks from each survey conducted.
    v. NCDOT will retain an experienced firm or staff members to analyze the DTM and compile a final report to be submitted to USFWS.
    vi. Mapping of Channel Bed Topography: the DTM survey of the stream channel bed will be conducted 100 ft. upstream and 250 ft. downstream of the footprint of the temporary causeways, including the area underneath the bridge. Special attention will be given to any scour areas that may result from bridge supports. The surveys will collect points from left top of bank to right top of bank and will map the locations of bridge supports. The survey will be conducted such that an accurate three-dimensional representation of the stream bed can be produced from the collected data. The DTM can produce cross sectional representation every 20 ft. Photos or videos will be taken of stream banks, streambed, and bridge structures to visually document the condition of the sites.
    i. The survey information collected above will be processed into graphs and base mapping. The graphs and maps produced will be included in the Appendix of the report, described below. NCDOT and resource agencies will be supplied with electronic copies of all data. Survey data will be provided in MicroStation format.

ii. A summary report will be provided to NCDOT and the resource agencies describing the purpose of the project, methodology used in collecting the data, and hard copies of graphs and mapping that are produced from the surveys.

iii. If monitoring at the French Broad River reveals excessive bank erosion, bank instability, and sedimentation associated with the bridge replacement, NCDOT will work to identify the cause and will make improvements to address the problems in a timely manner.

e. Reforestation and Monitoring Plan

i. Coordination between the NCDOT, NPS, and FHWA will continue during the design and construction of the project to minimize impacts to Blue Ridge Parkway operations and visitor experience as well as the Mountains-to-Sea Trail. These agencies, as well as the North Carolina State Historic Preservation Office (SHPO) signed a memorandum of agreement that requires the Eastern Federal Lands Highway Division (EFLHD) of FHWA to develop a re-vegetation/landscaping plan to re-establish native vegetation and provide for a continuous visual experience for the trail and Blue Ridge Parkway user.

ii. For the portion of the project from the Blue Ridge Parkway overpass to the northern terminus of the project, NCDOT will develop a revegetation plan that incorporates native woody and/or shrubby vegetation, as appropriate, for areas outside of the final slope stake limits disturbed during construction. The revegetation areas will be visually monitored following planting by NCDOT. The monitoring shall be conducted annually for a minimum of three years after final planting. Photo documentation shall be utilized to document the success of the vegetation and a report shall be submitted to the USFWS within sixty (60 days) post monitoring. The revegetation shall include some or all of the following proposed species:

- White oak (*Quercus alba*)
- Yellow poplar (*Liriodendron tulipifera*)
- American sycamore (*Platanus occidentalis*)
- River birch (*Betula nigra*)
- Tag alder (*Alnus serrulata*)
- Black willow (*Salix nigra*)

iii. Plantings associated with the rest area will include re-establishment of vegetative buffers, and the development of site landscaping that will include landscape trees (1:1 in-kind replacement with native species), turf, and recreational/sitting areas (for the traveling public). Once the facility is complete, it will have continued maintenance to monitor the sustained growth of the vegetative buffers, and matured development of the landscape.

iv. Streams SEE and SFG will be temporarily piped for the duration of construction. USFWS and USACE will have the opportunity to review the design of the SEC measures associated with streams SEE and SFG. A revegetation and monitoring plan shall be developed for Streams SEE and SFG to commence once the bridge construction and demolition are complete and the temporary pipes are removed, which will likely be similar to the structure presented above for the area between the Blue Ridge Parkway overpass and the northern terminus of the project.

From the *Biological Opinion:*

2.3 Conservation Measures

Time of Year Restriction for Tree Clearing on the Blue Ridge Parkway:

● No tree clearing will occur on NPS land between May 15 and August 15.

● Emergence and/or acoustic surveys are required prior to any tree clearing that must occur between April 1 and May 1 or August 15 and November 15.

● No significant tree removal within 5 mi. of known hibernacula can occur between April 1 and November 15.

● In the event that any roost trees are documented within 0.25 mi. of the project area, regardless of the time of year, the NPS will seek consultation with the USFWS before work proceeds.

Minimization of Tree Clearing:

● In the area between the Blue Ridge Parkway and NC 191 (Brevard Road), trees will only be cleared to establish the permanent project footprint, temporary piping of streams SEE and SFG (as identified in Table 15 of the BA), establish associated SEC devices, and to create temporary construction access roads at the Blue Ridge Parkway.

Roadway Construction Lighting:

● Due to gray bat activity on the landscape between April 15 and October 15, NCDOT will limit all construction-related lighting to whatever is necessary to maintain safety in active work areas closest to the FBR during this time. Therefore, construction-related lighting will not project into adjacent wooded areas or over the water surface of the river. This restriction will apply to locations between Brevard Road (NC 191) and Glenn Bridge Road (SR 3495) with the exceptions of the construction area associated with the access roads at the Blue Ridge Parkway and the existing brightly lit area associated with the Long Shoals Road (NC 146) interchange.

● During construction, lighting will only be used in areas where active construction is occurring. Otherwise, no additional lighting is needed. For paving operations, specifically, which will more than likely be at night, the area typically lit is directly adjacent to the paving machine.

Erosion Control Measures:

When projects occur in watersheds that contain protected aquatic species, NCDOT implements erosion control measures that exceed the standard BMPs. For this project a combination of Design Standards in Sensitive Watersheds (DSSW, 15A NCAC 04B .0124), Environmentally Sensitive Areas and the NC Division of Water Quality (NCDWQ) Construction General Permit (NCG01) terms and conditions that allow for stormwater discharge under the National Pollutant Discharge Elimination System (NPDES) apply and NCDOT will default to the most-restrictive SEC measure requirement. A table comparing these methods

can be found in Appendix II. The sedimentation and erosion control plan (SECP) will be in place prior to any ground disturbance for all bridge replacements and construction. When needed, combinations of erosion control measures (such as silt bags in conjunction with a stilling basin) will be used to ensure that the most protective measures are being implemented.

● The sedimentation and erosion control plans shall adhere to the DSSW, where practicable, within the existing and proposed right of way for the following areas:

o From the Blue Ridge Parkway bridge to the northern project terminus.

o For portions of the project within 1 mi. and draining directly to streams that are identified as NCDEQ and/or NCWRC designated trout streams.

o For portions of the project within 1 mi. and draining directly to streams where aquatic threatened or endangered species are present.

● Environmentally Sensitive Areas will be demarcated within the Action Area and will be defined by a 50-foot buffer zone on both sides of jurisdictional streams measured from top of streambank, in which the following shall apply:

o The Contractor may perform clearing operations, but not grubbing operations until immediately prior to beginning grading operations.

o Once grading operations begin, work shall progress in a continuous manner until complete. o Erosion control devices shall be installed immediately following the clearing operation.

o Seeding and mulching shall be performed on the areas disturbed by construction immediately following final grade establishment.

o Seeding and mulching shall be done in stages on cut and fill slopes that are greater than 20 ft. in height measured along the slope, or greater than 2 ac. in area, whichever is less.

o All SEC measures, throughout the project limits, must be cleaned out when half full of sediment, when applicable, to ensure proper function of the measures.

Streams Designated as Environmentally Sensitive Areas

Stream Name	NRTR Map ID	Distance to French Broad River (mi.)	Stream Effects (ft.) (2:1 SS+25 ft.) *	Stream Effects (ft.) (2:1 SS)**
UT to Dellwood Lake^	SFG	0.00	2010.0	662.3
Powell Creek (Lake Julian)***	SDN	0.03	111.1	53.0
UT to French Broad***	SDU	0.05	86.9	34.4

UT to French Broad***	SDK	0.05	75.1	48.9
UT to French Broad ***	SDF	0.06	91.0	61.9
UT to French Broad***	SFX	0.06	72.6	47.3
UT to French Broad***	SEQ	0.07	74.5	24.2
UT to French Broad***	SDG	0.07	68.9	43.0
UT to French Broad***	SDX	0.08	1043.2	399.6
UT to French Broad***	SDW	0.09	60.0	25.3
UT to French Broad***	SFO	0.10	56.7	55.0
UT to French Broad***	SDE	0.10	99.1	47.6
UT to French Broad^	SEE	0.15	383.0	106.3
UT to French Broad***	SEF	0.15	505.3	368.1
UT to Dellwood Lake***	SFI	0.19	7.3	0.0
UT to French Broad***	SDY	0.41	22.5	2.3
UT to French Broad***	SED	0.43	66.7	9.4
UT to French Broad***	SEV	0.47	43.7	16.8
UT to French Broad***	SDC	0.50	102.5	44.2
UT to French Broad***	SEW	0.55	37.9	12.8
UT to French Broad***	SEU	0.55	18.3	10.6
UT to Dellwood Lake***	SFR	0.67	46.0	27.8
UT to Dellwood Lake***	SFQ	1.09	96.8	43.7
UT to Long Valley Branch***	SFM	1.86	382.0	29.0
UT to Long Valley Branch***	SFP	1.90	50.0	22.7
Long Valley Branch***	SFN	2.19	43.8	24.9

*Effects calculated based on current design proposed 2:1 slope stake (SS) limits plus 25 ft. (SS+25).
**Effects calculated based on current design proposed 2:1 slope stake (SS) limits. Effects for Streams SFG, SFO, and SEE calculated based on access road footprint.
***Streams subject to DSSW and designated as Environmentally Sensitive Areas.
^Stream to be temporarily piped for construction of access road (access road is too close to allow for 50-ft buffer).

● Contract language regarding erosion control will include the following, or similar language as appropriate:

o “The Contractor will be required to prosecute the work in a continuous and uninterrupted manner from the time work begins until completion of each phase of structure construction, demolition, and completion. The Contractor will not be permitted to suspend operations except for reasons beyond their control or except where the Engineer has authorized a suspension of the Contractor’s operations in writing.”

o “In the event that the Contractor’s operations are suspended in violation of the above provisions or it is determined the Contractor is not deemed to be pursuing the work in a continuous manner in accordance with his submitted and approved schedule, the sum of $1000.00 per day will be charged to the Contractor for each and every calendar day that such suspension takes place. The said amount is hereby agreed upon as liquidated damages due to extra engineering and maintenance costs and due to increased public hazard resulting from a suspension of the work. Liquidated damages chargeable due to suspension of the work will be additional to any liquidated damages that may become chargeable due to failure to complete the work on time.”

Monitoring of Effectiveness of SEC Devices:

● Two Construction Project Inspectors, one for I-4400 and one for I-4700, will monitor SEC devices for the life of the project.

● Inspections of erosion control devices will be done daily for construction associated with the FBR bridge replacement. For the remainder of the project, the standard inspection schedule (weekly, or after a rainfall event of one-half inch or greater) will apply.

● NCDOT will install a rainfall data logger at the river to continuously monitor and record rainfall events.

● NCDOT will self-report to USFWS any SEC device failures that result from excessive rainfall events (exceeding a 25-year storm event). The NCDOT inspector will report any failures to the Division Environmental Officer, who will contact the agency within 24 hours. If there are any failures in SEC measures, NCDOT will meet with resource agencies and work to adaptively manage SEC devices for further storm events while construction continues.

Agency Coordination:

● NCDOT will invite representatives from USFWS, USACE, and the NCWRC to the preconstruction meeting for the proposed project, as well as to all subsequent field inspections prior to construction, to insure compliance with all special project commitments.

● NCDOT shall provide USFWS with the SECP and allow 15 days for review.

● NCDOT shall provide USFWS with the FBR bridge demolition plan and allow 15 days for review.

● All resource agencies will be invited to review the demolition plan and will be notified prior to start of demolition so they may have a representative on site.

● NCDOT will invite USFWS and USACE to review the design of the SEC measures for streams SEE and SFG, as well as the revegetation and monitoring plan.

● NCDOT will contact USFWS if new information about gray bats is discovered, as it relates to the project.

● NCDOT will report any injured or dead bats found on the construction sites to USFWS.

Night Time Construction Activities at FBR:

At the FBR bridge, the use of lights after sunset may be necessary to improve safety for work crews during construction. These are not operations that occur on a regular schedule.

● To minimize potential impacts to lactating females and their pups, between June 1 and June 14, NCDOT shall commit to restrict the construction contractor to no night work. During June 15 through August 1, NCDOT will also commit to restrict the construction contractor to no more than 28 total nights of work, with no more than four consecutive nights. Lighting used for construction will be limited to what is necessary to maintain safety standards and will only be directed toward active work areas.

Red Safety Lighting:

● NCDOT shall place solar-powered, steady-state, red, safety lights on the causeways for river user safety. Generators will not be used to provide power, so as to avoid additional noise that may disturb bats flying through the work zone. Gray Bats and Appalachian Elktoe.

FBR Bridge Replacement:

● NCDOT may install temporary retaining walls on the outer edges of the access roads to reduce impacts to adjacent forested land and jurisdictional features.

● The footprint for the access roads will not extend beyond the permanent project footprint.

● Activities in the floodplain will be limited to those needed to construct the proposed bridge and remove the existing bridges.

● Streams SEE and SFG will be temporarily piped during bridge construction and demolition. A revegetation and stream monitoring plan shall be developed for Streams SEE and SFG. The revegetation and stream monitoring plan shall be approved by the USACE and USFWS and will commence once the bridge construction and demolition are complete and the pipe is removed. Monitoring, to observe vegetation success and stream stability and detect and control invasive exotic plants, will take place for a minimum of three years after construction.

● Causeways will be used instead of multiple work bridges which would require drilled piles and take longer to install. The use of causeways also means that work bridge support piers will not be present, thereby eliminating obstacles in the flight path of bats foraging and commuting through the work zone.

● Causeways will have 1:1 slopes to minimize their size.

● NCDOT will require the contractor to use clean rock (free of debris and pollutants) for the construction of the causeways to minimize unnecessary sediment input into the river.

● Causeway material will be removed to the extent practicable and either disposed of offsite or used in areas that require permanent stone protection after project completion. NCDOT will also require that concrete barriers (barrier rail) be placed along the downstream edge of each causeway to limit the downstream movement of causeway material during high flow events.

● Causeway material will be added/removed as needed for each stage to minimize the causeway footprint over the length of the project.

● The Stage 4 causeway extension will be sloped to allow water to flow over the top, reducing overall impact to channel flow (See NCDOT I-26 Bridge over the French Broad River Proposed Construction and Demolition document for details).

● To minimize disturbance to the riverbed, all readily detectable causeway material will be removed to the extent practicable, while removing as little of the original riverbed as possible.

● Construction fabric will not be used under the causeway material, as it has a tendency to tear into tiny pieces and float downstream during removal.

● Any equipment that is placed on the causeways will be removed any time throughout a workday when the water level rises, or is expected to rise overnight, to a point where the equipment could be flooded, or during periods of inactivity (two or more consecutive days). The only exception to this measure is that the drill rig and crane may be left in place for periods of inactivity; however, they must also be removed if the water rises, or is expected to rise, to a point where the drill rig and crane could be flooded.

● NCDOT will require the contractor to use new or steam-cleaned equipment to access causeways that are under water if these causeways are utilized for removal of existing bents in underwater conditions.

● NCDOT will require the contractor to have clean, non-leaking equipment, diapers on-site for each causeway, and spill kits located at each causeway.

● With the exceptions noted below for the drill rig and crane, all construction equipment shall be refueled outside the 100-year floodplain or at least 200 ft. from all water bodies (whichever distance is greater) and be protected with secondary containment. During crucial periods of construction and demolition, when the drill rig and crane cannot be moved, the drill rig and crane can be refueled while inside the 100-year floodplain provided that spill response materials (such as spill blankets and fueling diapers) are used during the refueling. Hazardous materials, fuel, lubricating oils, or other chemicals will be stored outside the 100-year floodplain or at least 200 ft. from all water bodies (whichever distance is greater), and not in a Water of the U.S. Areas used for borrow or construction by-products will not be located within wetlands or the 100-year floodplain.

● When constructing drilled piers for the FBR bridge, a containment system will be developed so that material does not enter the river. Material by-product will be pumped out of the shaft to an upland disposal area to the extent practicable and treated through a proper stilling basin or silt bag.

● The erosion-control plan will be in place prior to any ground disturbance for the FBR bridge replacement. When needed, combinations of erosion-control measures (such as silt bags in conjunction with a stilling basin) will be used to ensure that the most protective measures are being implemented.

● Construction of the new bridge will be accomplished in a manner that prevents uncured concrete from coming into contact with water entering or flowing in the river.

● The causeway design has been refined to allow for a maximum free flow area of the FBR. The original design provided for only a 28 percent free flow area of the river at the causeway's largest size. The design was refined and now allows a 51 percent minimum free flow area when the causeway is at its greatest extent.

● Removal of the existing bridge shall be performed so as not to allow debris to fall into the water. If debris is dropped in the river, it will be immediately removed.

● The current barrier on the bridge is a one bar metal rail on concrete parapet with retrofitted guardrail. It will be replaced with concrete barrier rail, a 42-in. solid, concrete "Jersey barrier" style guard wall.

2.3.3 Roadway Operation

Gray Bat

2.3.3.1 Minimal Additional Roadway Lighting:

● NCDOT will add minimal additional permanent lighting. Lighting at interchanges may be relocated, to allow for reconfiguration or expansion of the interchanges, but new 17 lighting will only be required at the US 25 (Asheville Highway) interchange and the rest areas. Gray Bat and Appalachian Elktoe

Stormwater Control Measures:

● NCDOT has developed stormwater commitment guidance, which will apply at crossings of the FBR and any portion of the NCDOT stormwater conveyance system draining to an outfall discharging to the river within the NCDOT right of way.

● NCDOT will prepare a stormwater management plan (SMP) that implements structural and non-structural post-construction stormwater best management practices (BMPs) to the maximum extent practical, which is consistent with the Department's National Pollutant Discharge Elimination System (NPDES) Post-Construction Stormwater Program.

● When preparing the SMP, NCDOT commits to using a hierarchical BMP selection process, which is optimized to treat silt, nutrients, and heavy metals.

● NCDOT will commit to evaluating the use of emerging BMP technologies that the Department has not yet published in its BMP Toolbox. These emerging BMP technologies are as follows:

- o Bioswales
- o Bioembankments
- o Biofiltration conveyances
- o Soil improvement to maximize infiltration

Reforestation and Monitoring Plan:

● Eastern Federal Lands Highway Division (EFLHD) of FHWA will develop a re- vegetation/landscaping plan to re-establish native vegetation and provide for a continuous visual experience for Blue Ridge Parkway and Mountains to Sea Trail users.

● For the portion of the project from the Blue Ridge Parkway overpass to the northern terminus of the project, NCDOT will develop a revegetation plan that incorporates native woody and/or shrubby vegetation, as appropriate, for areas outside of the final slope stake limits disturbed during construction. The monitoring shall be conducted annually for a minimum of three years after final planting. Photo documentation shall be utilized to document the success of the vegetation and a report shall be submitted to the USFWS within sixty (60 days) post monitoring.

● NCDOT will develop a revegetation and monitoring plan for Streams SEE and SFG to commence once the bridge construction and demolition are complete and the temporary pipes are removed, which will likely be similar to the revegetation plan presented above for the area between the Blue Ridge Parkway overpass and the northern project terminus.

Habitat Conservation Measures

Conservation Measures to Benefit Gray Bats

NCDOT-Sponsored gray bat Research Project:

● NCDOT, with the cooperation of the USFWS and NCWRC, committed to a three year study on gray bats within the FBR Basin. This study will serve as a conservation measure for NCDOT projects within the Divisions 13 and 14 for a limited time. NCDOT will provide $900,000 in funding to Indiana State University to conduct the research project, which will aid in the recovery and conservation of the gray bat. The end goal is to gather the information needed to allow NCDOT and USFWS to enter into a programmatic consultation to cover the gray bat for NCDOT Divisions 13 and 14, as well as help to develop species-specific avoidance and minimization measures.

Conservation Measures to Benefit Appalachian Elktoe

FBR Conservation Funding:

● NCDOT will provide $500,000 in funding to the North Carolina Nongame Aquatic Projects Fund for the FBR Conservation Plan (FBRCP) proposed by USFWS, which will aid in the recovery and conservation of Appalachian elktoe. The funding will be held by the NCWRC. A multi-agency/organization group of mussel species experts, including USFWS and NCDOT, will determine how to expend the funds, which may include the following: species reintroduction, early warning and emergency production capacity, genetic management program, and other appropriate activities as described in the FBRCP.

Erosion and Sediment Control Performance Monitoring

● NCDOT will implement a video surveillance system that will target critical areas identified along the project corridor for the purposes of monitoring the performance of erosion and sediment control practices. The surveillance equipment will be comprised of video equipment capable of monitoring target areas. The intent of the active surveillance will be to provide assurance that the necessary erosion and sediment control practices are being implemented and maintained as practical to protect the identified resource.

● NCDOT will document the performance through images extracted from the video surveillance system. Due to the complexity of utilizing sensitive video equipment in a construction area, the Department may experience technical difficulties which will have to be resolved or a supplemental monitoring system will need to be deployed.

● NCDOT will provide the monitoring images to USFWS at their request, and/or when there has been an event that resulted in a failed erosion and sediment control measure and will also identify the actions taken to correct the situation.

● NCDOT will identify target areas that have significant risk to the resource due to failed erosion and sediment control devices while land disturbance would be occurring. Once the area is stabilized then the surveillance equipment can move to the next target area. Special attention will be given to those streams identified by the USFWS.

Monitoring for Gray Bat Return and Activity:

● NCDOT will conduct acoustic monitoring for gray bats immediately prior to and during construction at the FBR bridge. Acoustic data may provide valuable information on bat activity in general, and gray bat activity, in particular, as it relates to project construction.

● To determine whether gray bats avoid the active construction zone, NCDOT will investigate the use of night-vision video recordings, or other methods, in an attempt to monitor bat activity at the bridge while active night time construction is underway.

FBR Geomorphology Monitoring:

● To ensure bridge construction at the FBR crossing will not result in substantial changes to channel stability (scour, erosion, etc.), NCDOT will conduct river channel monitoring at the I-26 bridge construction site to document the morphological condition at the FBR bridge site and to evaluate the

impacts of construction and temporary causeways on river habitat. Monitoring activities will consist of the following: o Surveying the FBR channel bathymetry and riverbanks before and during the construction of the I-26 crossing (approximately 3.5 years). Mapping will occur before construction and then every quarter during construction, with one final survey after the causeways are all removed and will cover at least 100 ft. upstream and 250 ft. downstream of the causeway locations. o A complete digital terrain model (DTM) of the stream bed and banks from each survey conducted will be prepared. NCDOT will retain an experienced firm or staff members to analyze the DTM and compile a final report to be submitted to USFWS. o If monitoring at the FBR reveals excessive bank erosion, bank instability, or sedimentation associated with the bridge replacement, NCDOT will work to identify the cause and will make improvements to address the problems in a timely manner.

9. REASONABLE AND PRUDENT MEASURES

The USFWS believes the following reasonable and prudent measures are necessary and appropriate to minimize take of the gray bat and Appalachian elktoe. These non-discretionary measures include, but are not limited to, **the commitments in the BA and the terms and conditions outlined in this Opinion.**

1. The USFWS must be notified of any project modifications.

10. TERMS AND CONDITIONS

In order for the exemption from the take prohibitions of section 9(a)(1) of the ESA, the NCDOT must comply with the following terms and conditions, which implement the reasonable and prudent measures described previously and outline required reporting and/or monitoring requirements. These terms and conditions are non-discretionary. As necessary and appropriate to fulfill this responsibility, the NCDOT must require any permittee, contractor, or grantee implement these Terms and Conditions through enforceable terms that are added to the permit, contract, or grant document.

1. NCDOT will adhere to all measures listed in the Conservation Measures section of this Opinion and in the BA.

2. NCDOT will simultaneously notify USACE and USFWS of any permit modification requests.

3. A USFWS biologist will be invited (at least seven days prior) to the preconstruction meeting(s) to review permit conditions and discuss any questions the contractor has regarding implementation of the project. After the contractor submits plans for various stages of the project, a USFWS biologist will review and provide comments on the plans and will be invited to attend any meetings to discuss implementation of the plans.

4. During construction, culvert inlets and outlets will be evaluated by the resident engineer with regard to stream stability immediately following installation and quarterly for a period of 1 year at each location. Indicators of instability, such as head cutting, scour, aggradation, or degradation, will be used to determine the need for corrective actions.

5. A final field inspection will be held with the contractor to evaluate culvert placement and stream stability before the project is considered complete. If instability is detected during any of these reviews, corrective actions will be performed when deemed necessary by the engineer or 48 by the conditions of any federal and state permits required by Section 404/401 of the Clean Water Act.

6. USFWS can call for a site meeting with NCDOT at any time to evaluate and discuss erosion control effectiveness.

7. To minimize impacts to gray bat, NCDOT will not install the causeway material at night in the French Broad River between April 15th and October 1st.

8. Modern bat modular roost panels or comparable structures will be installed on three bridges over the French Broad River and/or tributaries within or close to the Action Area. Panels should be constructed of fiber reinforced concrete with additives to mimic thermal mass and should be mounted using metal. Bridge selection and panel placement/design should be informed by work currently being conducted by Indiana State University. Panels should be checked for bat use once in early summer and once in late fall for three years following placement. The details of bat box location and installation will be decided by a committee to include USFWS, NCWRC, and NCDOT.

9. NCDOT will monitor bat activity post construction for up to three years. NCDOT has committed to conduct acoustic monitoring for gray bats at the FBR bridge after construction of the bridge and after work ceases in the area surrounding the bridge (see consultation history). Monitoring should occur for a minimum of one season and maximum of three seasons. Monitoring can cease when activity levels resume to pre-construction levels (see 2017 and 2018 acoustic data) or after three seasons. NCDOT will also conduct three years of emergence counts at the BRP bridge, Marshall bridge, and the culvert roost using the same methods as counts conducted by Indiana State University so data can be compared. Partners including NCWRC and USFWS can assist with these counts. The details of post construction monitoring will be decided by a committee of USFWS, NCWRC, and NCDOT staff. Information gathered will help assess impacts from the project and will inform future consultation and conservation efforts. Information will also help establish a baseline for the connector project.

10. A special area will be designated from project Station 1078+00 to Station 1230+67 (Brevard Road to the Blue Ridge Parkway) where the following requirements will apply:

● The contractor will submit a comprehensive grading plan before starting any cut or fill work in this section for the approval of the division construction engineer. The plan shall include:

a. The number and makeup of the crews working in this area;

b. A narrative outlining a systematic approach to removing cut and placing fill including a proposed time for each operation.

● No more than 10 acres of cut and or fill open in this area without prior approval by the engineer.

● All access roads will be covered with railroad ballast or larger stone to prevent the loss of material.

● The contractor shall submit an access road construction plan for the Blue Ridge Parkway access road for review and approval by the division construction engineer.

● All cut and fill slopes are to be matted in this section of the project.

11. Energy dissipators will be installed at the following 18 sites to reduce post construction stormwater. Location of Concrete Energy Dissipators

Location of Concrete Energy Dissipators

Station Location	Permit Drawing Site Number	Outfall Stream or Wetland ID
EBL between 940 and 941	Site 11	WBV
EBL between 951 and 952	Site 11	WBV
EBL approximately 1030		Near WCH
EBL between 1037 and 1038		Near WCH
EBL between 1044 and 1045		Near WCH
EBL approximately 1047		Near WCH
WBL between 1090 and 1091	Site 23	SDK
WBL approximately 1105	Site 28	SDY
WBL between 1115 and 1116 (in median)	Site 30	SDX
WBL between 1117 and 1118 (in median)	Site 30	SDX
WBL between 1118 and 1119 (in median)	Site 30	SDX
WBL between 1131 and 1132	Site 32	SEQ
WBL approximately 1135		Near WCW
WBL approximately 1138		Near WCW
WBL between 1148 and 1149	Site 37	SEF
WBL between 1155 and 1156	Site 38	SEE
WBL between 1157 and 1158	Site 38	SEE
WBL approximately 1173	Site 41	SFG

11. MONITORING AND REPORTING REQUIREMENTS

In order to monitor the impacts of incidental take, the NCDOT must report the progress of the Action and its impacts on the species to the USFWS as specified in the Incidental Take Statement. This section provides the specific instructions for such monitoring and reporting. As necessary and appropriate to fulfill this responsibility, the NCDOT must require any permittee, contractor, or grantee implement these

Terms and Conditions through enforceable terms that are added to the permit, contract, or grant document. Such enforceable terms must include a requirement to immediately notify the NCDOT and USFWS if the amount or extent of incidental take specified in this Incidental Take Statement is exceeded during action implementation. USGS geomorphology and surface water condition Erosion Control Monitoring A final project report will be produced to describe the methodology and results from monitoring streamflow, precipitation, continuous and discrete water-quality, and geomorphology in Focus Areas 1 and 2. The report will summarize conditions before, during, and after NCDOT construction activities and will be provided to the Service. 50 Bat Activity Monitoring NCDOT will provide a final report and yearly monitoring summaries starting at the end of the first monitoring season.

From the *I-26 Bridge Over French Broad River Construction and Demolition*

Topic	**Measure**
Bridge Design: Three-span bridge type	**Avoidance** • Choosing the three-span bridge avoids the existing substructure foundations, including the center bent. • Choosing the three-span bridge reduces the number of spans and, therefore, one additional bent in the center of the river. • No direct discharge of bridge deck drainage, design will direct discharge to stormwater structures. **Minimization** • Requires fewer bents. • Maximizes the hydraulic opening with smaller causeways. • Reduced time to construct. • With the exception of streams SEE and SFG, Design Standards in Sensitive Watersheds [15A NCAC 04B .0124 (b) – (e)] will be used for streams that drain directly to the French Broad River.
Access roads	**Minimization** • Temporary retaining walls will be used on the outer edges of the access roads to reduce impacts to adjacent forested land and jurisdictional features. • Footprint for access roads will not extend beyond permanent project footprint. • To reduce potential sediment and erosion caused by southeast and northeast access roads NCDOT shall temporarily pipe streams SEE and SFG, respectively, during bridge construction and demolition. USFWS and USACE will have the opportunity to review the design of the SEC measures for Streams SEE and SFG. A revegetation and stream monitoring plan shall be developed for Streams SEE and SFG. The revegetation and stream monitoring plan shall be approved by the USACE and will commence once the bridge construction and demolition are complete and the pipe is removed. Monitoring to

Topic	Measure
	observe vegetation success and stream stability will take place for a minimum of three years after construction.
Causeways	**Avoidance** • Causeways will be used instead of multiple work bridges that would require drilled piles, be time intensive, and add an additional obstacle in the air. **Minimization** • The design of the causeways has been refined to allow for a maximum free flow area of the French Broad River. The first causeway concept allowed for only a 28 percent free flow area of the river at its largest size. The design was refined and at its largest size the causeways will allow a 51 percent free flow area. • Causeway material will be added/removed as needed for each stage to minimize footprint over the length of the project. • To minimize disturbance to the riverbed, all readily detectable causeway material will be removed to the extent practicable, while removing as little of the original riverbed as possible. • Causeway extension (Stage 4) will be sloped to allow water to flow over top; reducing overall impact to channel flow • NCDOT shall require the contractor to use clean stone for the construction of the causeways. This will minimize unnecessary sediment input into the river. • All of the stone will be removed and disposed of off-site, or the stone can be used in areas that require permanent stone protection after project completion. NCDOT shall also require that concrete barriers (barrier rail) be placed along the downstream edge of each causeway to limit the downstream movement of causeway material during high flow events. • Construction fabric will not be used under the causeway material, because it tends to tear into pieces and float downstream during removal. • With the exceptions noted for the drill rig and crane, all construction equipment will be refueled outside the 100-year floodplain or at least 200 feet from all water bodies (whichever distance is greater) and be protected with secondary containment. During crucial periods of construction and demolition, when the drill rig and crane cannot be moved, the drill rig and crane can be refueled while inside the 100-year floodplain provided that spill response materials (such as spill blankets and fueling diapers) are used during the refueling. Hazardous materials, fuel, lubricating oils, or other chemicals will be stored outside the 100-year floodplain or at least 200 feet from all water bodies (whichever distance is greater), not in a Water of the U.S., and preferably at an upland site. Areas used for borrow or construction

Topic	Measure
	by-products will not be located in wetlands or in the 100-year floodplain. • Equipment that is placed on the causeways will be removed any time throughout a work day when the water level rises, or is expected to rise overnight, to a point where the equipment could be flooded, or during periods of inactivity (two or more consecutive days). The only exception to this measure is that the drill rig and crane may be left in place for periods of inactivity; however, it must also be removed if the water rises, or is expected to rise, to a point where the drill rig and crane could be flooded. • NCDOT shall require the contractor to use brand new or steam cleaned equipment to access causeways that are underwater if these causeways are utilized for removal of existing bents in underwater conditions. • NCDOT shall commit to channel morphology monitoring.
Demolition	**Avoidance** • After removal of existing bents, natural substrate will not be used as backfill. **Minimization** • Removal of the existing bridge shall be performed so as not to allow debris to fall into the water. If debris is dropped in the river, it will be immediately removed. • All resource agencies will be invited to review the demolition plan and will be notified prior to start of demolition so they may have a representative on site. • NCDOT shall provide USFWS with the French Broad River bridge demolition plan and allow 15 days for review.
Construction	**Minimization** • NCDOT shall include language outlining the staged construction/ demolition in the construction contract. • NCDOT shall provide USFWS with the Sediment and Erosion Control plan and allow 15 days for review. • The Sediment and Erosion Control plan shall be in place prior to any ground disturbance. When needed, combinations of erosion control measures (such as silt bags in conjunction with a stilling basin) will be used to ensure that the most protective measures are being implemented. • NCDOT has developed erosion control measures for the project, specifically to protect the Appalachian elktoe and its habitat. NCDOT shall commit to retain one dedicated inspector for each project section (I-4400, I-4700) to perform SEC inspections. Inspections of erosion control devices adjacent to the bridge will be completed on a daily basis by the Construction Project Inspector.

Topic	Measure
	• When constructing drilled bents, a containment system will be developed so that substrate material does not enter the river. Any material by-product will be pumped out of the shaft to an upland disposal area and treated through a proper stilling basin or silt bag. • Construction of new bridges will be accomplished in a manner that prevents uncured concrete from coming into contact with water entering or flowing in the river. • NCDOT shall commit to requiring its contractor to have clean, non-leaking equipment; diapers on-site for each causeway; and spill kits located at each causeway. • Activities in the floodplain shall be limited to those needed to construct the proposed bridge and remove the existing bridges. • All construction equipment will be refueled outside the 100-year floodplain or at least 200 feet from all water bodies (whichever distance is greater) and be protected with secondary containment. During crucial periods of construction and demolition, when the drill rig and crane cannot be moved, the drill rig and crane can be refueled while inside the 100-year floodplain provided that spill response materials (such as spill blankets and fueling diapers) are used during the refueling. Hazardous materials, fuel, lubricating oils, or other chemicals will be stored outside the 100-year floodplain or at least 200 feet from all water bodies (whichever distance is greater), not in a Water of the U.S., and preferably at an upland site. Areas used for borrow or construction by-products will not be located in wetlands or in the 100-year floodplain. • The Contractor shall be required to prosecute the work in a continuous and uninterrupted manner from the time they begin the work until completion of each phase of structure construction, demolition and completion. The Contractor will not be permitted to suspend his operations except for reasons beyond his control or except where the Engineer has authorized a suspension of the Contractor's operations in writing. • In the event that the Contractor's operations are suspended in violation of the above provisions or it is determined the Contractor is not deemed to be pursuing the work in a continuous manner in accordance with his submitted and approved schedule, the sum of $1,000 per day will be charged the Contractor for each and every calendar day that such suspension takes place. The said amount is hereby agreed upon as liquidated damaged due to extra engineering and maintenance costs and due to increased public hazard resulting from a suspension of the work. Liquidated damages chargeable due to suspension of the work will be additional to any liquidated damages that may become chargeable due to failure to complete the work on time. • NCDOT shall install a rainfall data logger at the French Broad River and other sensitive locations to continuously monitor and record rainfall events.

Topic	Measure
	• NCDOT shall commit to self-reporting SEC device failures to USFWS that result from excessive rainfall events (intensity that exceeds 25-year storm event).
Construction: Night Work	**Minimization** • Between June 1 and August 1, NCDOT shall commit to restrict the construction contractor to no more than 28 total nights of work, and no more than four consecutive nights within a two-week period. • Lighting used for construction will be limited to whatever is necessary to maintain safety standards, and will only be directed toward active work areas. • NCDOT shall place steady-state, solar-powered red lights on the causeway to alert river users to its location. Generators will not be used to provide power.
River Users	**Minimization** • Development of a Communication Plan to inform stakeholders of bridge construction/ demolition. • Use of a catchment system to avoid having construction/demolition debris fall on river users and equestrians and bicyclists using Old River Road. NCDOT shall specify that the contractor use a rigid, non-drooping system placed approximately 1 to 2 feet below the structure wherever construction/demolition is occurring. • NCDOT shall use a floating navigational aid to direct river users to the "safe zone" of the river, away from construction. • NCDOT shall place steady-state, solar-powered red lights on the causeway to alert river users to its location. Generators will not be used to provide power. • NCDOT shall place signs at upstream and downstream of the construction areas and at river inputs to alert river users of the I-26 bridge construction.

From the *River Safety Plan*

1. Use of a floating navigational aide to mark the safe passage lane.
2. NCDOT shall commit to including a rigid, non-drooping, catchment device on the overhead structure from south of Old River Road to the opposite side of the river to prevent material from falling on river users, equestrians, bicyclists, or in the water.
3. NCDOT shall place steady-state red lights that are solar-powered on the causeway to alert river user to its location. Generators will not be used to provide power. These lights will be atop permanent structures, such as a pole, on each causeway for the duration of the project. The contractor will be responsible for maintaining these lights at all times during construction, replacing them as necessary.
4. NCDOT shall require the contractor to develop a river traffic plan to include below items:

a. Provide one or more flaggers upstream as needed to stop river use at limited times when working over the river (e.g. setting beams, demolition of the structure)
b. Training of construction staff to teach skills in aiding a distressed boater – This is meant as an extra precaution for both staff and river users. It does NOT imply that the contractor will provide "lifeguard" type services.
c. Must have a life vest and/or boat on site.

From the *Strategic Communication Plan for the Construction of the I-26 Bridge over the French Broad River*

1. Develop a construction safety plan for river users that includes signage and river markers to alert river users to the safe passage lane.
2. Identify specific stakeholders and partner with RiverLink in contacting the parties.
3. Provide opportunities for small group meetings with identified stakeholders. The meetings will include a brief, targeted presentation tailored to the NCDOT identified concerns of the group and provide an opportunity for questions and answers.
4. Update and maintain the comprehensive project website, https://www.ncdot.gov/projects/i26Widening/
5. Issue news releases as needed, regarding project schedule, progress, impacts, and milestones.
6. Provide a station regarding the Bridge Construction at the Design Public Meeting to be held April 16, 2018. River businesses and property owners along the river were included in the mailing list.
7. Place notification signs at public input locations upstream of the I-26 bridge beginning at the headwaters of the French Broad River in Rosman, Transylvania County. Identified locations include:
    a. Headwaters Outfitters – 25 Parkway Road, Rosman
    b. Champion Park River Access (Transylvania County Parks and Recreation) – Old Turnpike Road, Rosman
    c. Hannah Ford Campground - Headwaters Outfitters* - Green Road (SR 1127), Rosman
    d. Island Ford River Access (Transylvania County Parks and Recreation) – Island Ford Road, Brevard
    e. Hap Simpson Park (Brevard Parks and Recreation) – 968 Greenville Hwy, Brevard
    f. Wilson Road River Access (Transylvania County Parks and Recreation) – Wilson Road, Pisgah Forest
    g. Penrose Boat Ramp (NC Wildlife Resources Commission) – 170 Apac Drive, Penrose
    h. Blantyre Park (Henderson County Parks and Recreation) – 500 Cliff Road, Penrose
    i. Horse Shoe River Access Park (Henderson County Parks and Recreation) – Horse Shoe
    j. Westfeldt Park (Henderson County Parks and Recreation) – 83 Old Fanning Bridge Road, Fletcher
    k. Glen Bridge River Park (Buncombe County Parks and Recreation) – 77 Pinners Road, Arden
    l. Corcoran Paige River Park (Buncombe County Parks and Recreation) – 9 Pinners Road, Arden
    m. Bent Creek River Park (Buncombe County Parks and Recreation) – 1592 Brevard Road, Asheville

n. Hominy Creek River Park (Buncombe County Parks and Recreation) – 194 Hominy Creek Road, Asheville
o. Mills River Park (Town of Mills River) – 124 Town Center Drive, Mills River *(This park is near the confluence of Mills River and French Broad River and a common starting point for paddlers of the French Broad River.)*

All locations are public with the exception of the privately owned launches marked with an asterisk (*).

8. Coordinate with NCWRC (http://www.ncwildlife.org/Boating/Where-to-Boat) and NCDPR to update their website.
9. Provide notification information to identified stakeholders.
10. Coordinate strategic social media campaigns.
    a. Use an established Twitter feed (e.g. @NCDOT_i26) for the project to keep the public informed of project progress, construction activities and project-related events. The tweets will consist of specific information about the project, information about alternative routes, photos and videos of crews working efficiently, and any good news about the project.
        i. It is the responsibility of the Project Engineer in charge of the project to update the Transportation Information Management System (TIMS) on all parts of the project that will affect motorists, such as a lane or road closures, temporary detours, etc. as they come up on the project schedule. This is posted on the NCDOT website in the Traveler Information section (where it remains until that closure or detour is over), and automatically generates a feed for the NCDOT twitter account that covers this area of the state, as well as for our 511 travel phone system.
    b. Collaborate with project field personnel to document the progress of the project by posting photos to the Department's Instagram, Pinterest and Flickr accounts. Links to the photos will be posted on Twitter, Facebook and used in news releases.

Stipulations from the *Section 106 MOA*

1. Aesthetic Design of the [Blue Ridge Parkway] Bridge [over I-26]
    a. The sidewalk will extend to the end of the approach slab and have rounded edges and the guardwalls will flair out and transition in height to account for the visual difference of the single sidewalk. The guardwalls will be faced with stone masonry in a manner that will harmonize with the rest of BRP.
    b. Eastern Federal Lands will provide 70 percent and 100 percent construction drawings for the Undertaking to BRP. BRP shall provide their comments to EFLHD staff within 30 calendar days of receipt. EFLHD shall revise drawings and plans to address the BRP comments and provide revised drawings to BRP within 30 calendar days after receiving comments. The revised drawings shall be submitted by BRP to the SHPO. The SHPO shall provide their comments to BRP within 15 calendar days of receipt. Comments provided by the SHPO will be sent to EFLHD by BRP within 5 calendar days to be incorporated into the bridge design. If SHPO does not respond within 15 days, concurrence is assumed.
2. Cultural Landscape and Aesthetics
    a. EFLHD shall design a parking pull-off at milepost 392.1 with access to the Mountains to Sea Trail. The design shall incorporate features that match the visual character of the BRP and are consistent with other parking pull-offs along the motor-road (see Visual Character of the Blue Ridge Parkway, 1997).

b. EFLHD shall develop a re-vegetation/landscaping plan for the realignment area of the BRP to re-establish native vegetation and provide for a continuous visual experience for the BRP user.
c. EFLHD shall provide parking pull-off and re-vegetation/landscaping plans to BRP who will provide their comments to EFLHD staff within 30 calendar days of receipt. EFLHD shall revise the plan and design to address BRP comments and provide revised plans to BRP within 30 calendar days after receiving comments. These plans shall be submitted by BRP to the SHPO. The SHPO shall provide their comments to BRP within 15 calendar days of receipt. Comments provided by the SHPO will be sent to EFLHD by BRP within 5 calendar days to be incorporated into the plans. If SHPO does not respond within 15 days, concurrence is assumed.

3. Archival Documentation
   a. Prior to demolition of the existing bridge and any construction activities, Historic American Engineering Record (HAER) Level II documentation of the bridge will be completed by NCDOT.
   b. All documentation activities will be performed or directly supervised by architects, historians, photographers, and/or other professionals meeting the qualification standards in the Secretary of Interior's Professional Qualification Standards (36 CFR 61, Appendix A).
   c. HAER documentation will be submitted by NCDOT to BRP. BRP will within seven days forward to the NPS Southeast Regional Office will provide their comments to BRP and NCDOT within 30 calendar days of receipt. NCDOT shall revise the documentation to address NPS comments and provide revised documentation to BRP within 60 calendar days after receiving comments. BRP shall forward revised documentation to the NPS Southeast Regional Office who will review for acceptance to the Heritage Documentation Program Collection of the Library of Congress. Upon acceptance of the HAER documentation by the NPS, the BRP shall notify NCDOT so that copies of all documents resulting from the HAER documentation, including pertinent field records, notes, site sketches, superintendent reports, and construction reports shall be provided to the SHPO, the Library of Congress and the permanent collection of BRP. The NCDOT shall provide all said copies to all parties within 45 calendar days of notification of acceptance.
   d. Documentation will include, but is not limited to:
      i. The written historical and descriptive data prepared in accordance with outline format guidelines containing:
         - A general history of BRP
         - A construction history of the bridge including the history of the bridge type
         - An architectural description of the resource including alterations
         - A description of the site and changes
         - Any historical photographs in the supplementary materials section (these may be subject to copyright release if not held by BRP)
         - A site plan
      ii. Reproduction of as built drawings
      iii. Large-format (4" x 5" or larger negative size) photographs processed for archival permanence in accordance with HABS photographic specifications (www.nps.gov/hdp/standards/photoguidelines.pdf). Views will include:
         - At least one view that shows the resource in context.
         - One photograph of both faces.
         - Photographs of the substructure.
         - Views of any detail unique to the resource including railings or date stamps/plaques.

iv. At least one color digital photograph of each resource and its setting. The digital format shall meet the NPS NRHP's 75-year permanence standard and higher resolution digital files (www.nps.gov/NR/PUBLICATIONS/bulletins/photopolicy/index.htm).

v. Photo locations keyed to the site plan and included with the "Index to Photographs."

4. Unanticipated Discoveries
   a. If previously unknown cultural resources are discovered during construction, all work in the immediate vicinity (600 feet) of the discovery shall be halted and BRP Cultural Resources Manager shall be notified immediately. Work shall not resume until the NPS determines the resources have been identified and documented and an appropriate mitigation strategy developed, if necessary, in accordance with pertinent laws and regulations, including the stipulations of the "2008 Programmatic Agreement Among the National Park Service (U.S. Department of the Interior), the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers." THPOs will be consulted in the event cultural resources or human remains are discovered during the project.

Sediment and Erosion Control Measures by Location

To help facilitate compliance and understanding of where particular Sediment and Erosion Control (SEC) measures apply, the following list is a compilation of the SEC measures that have been previously identified in separate areas in this document.

1. SEC for Blue Ridge Parkway to northern project terminus

- Sedimentation and erosion control plans shall adhere to the DSSW where practicable within the existing and proposed right of way.
- Coordination between the NCDOT, NPS, and FHWA will continue during the design and construction of the project to minimize impacts to Blue Ridge Parkway operations and visitor experience as well as the Mountains-to-Sea Trail. These agencies, as well as the North Carolina State Historic Preservation Office (SHPO) signed a memorandum of agreement that requires the Eastern Federal Lands Highway Division (EFLHD) of FHWA to develop a re-vegetation/landscaping plan to re-establish native vegetation and provide for a continuous visual experience for the trail and Blue Ridge Parkway user.
- For the portion of the project from the Blue Ridge Parkway overpass to the northern terminus of the project, NCDOT will develop a revegetation plan that incorporates native woody and/or shrubby vegetation, as appropriate, for areas outside of the final slope stake limits disturbed during construction. The revegetation areas will be visually monitored following planting by NCDOT. The monitoring shall be conducted annually for a minimum of three years after final planting. Photo documentation shall be utilized to document the success of the vegetation and a report shall be submitted to the USFWS within sixty (60 days) post monitoring. The revegetation shall include some or all of the following proposed species:
    - White oak (*Quercus alba*)
    - Yellow poplar (*Liriodendron tulipifera*)
    - American sycamore (*Platanus occidentalis*)
    - River birch (*Betula nigra*)
    - Tag alder (*Alnus serrulata*)
    - Black willow (*Salix nigra*)

2. SEC for portions of the project within 1 mile and draining directly to streams identified by DEQ and/or NCWRC as trout streams

- Sedimentation and erosion control plans shall adhere to the DSSW where practicable within the existing and proposed right of way.

3. SEC for portions of the project within 1 mile and draining directly to streams where aquatic threatened or endangered species are present

- Sedimentation and erosion control plans shall adhere to the DSSW where practicable within the existing and proposed right of way.

4. SEC for Environmentally Sensitive Areas

- Environmentally Sensitive Areas will be defined by a 50-ft. buffer zone on both sides of jurisdictional streams measured from top of streambank, in which the following shall apply:
    - The Contractor may perform clearing operations, but not grubbing operations until immediately prior to beginning grading operations.
    - Once grading operations begin, work shall progress in a continuous manner until complete.
    - Erosion control devices shall be installed immediately following the clearing operation.
    - Seeding and mulching shall be performed on the areas disturbed by construction immediately following final grade establishment.
    - Seeding and mulching shall be done in stages on cut and fill slopes that are greater than 20 ft. in height measured along the slope, or greater than 2 ac. in area, whichever is less.
    - All sedimentation and erosion control measures, throughout the project limits, must be cleaned out when half full of sediment, to ensure proper function of the measures.

5. SEC for the French Broad River

- This includes measures under #3 above.
- NCDOT will install a rainfall data logger at the river to continuously monitor and record rainfall events.
- NCDOT has developed stormwater commitment guidance, which will apply at crossings of the French Broad River and any portion of the NCDOT stormwater conveyance system draining to an outfall discharging to the river within the NCDOT right-of-way.
- NCDOT will install temporary retaining walls on the outer edges of the access roads to reduce impacts to adjacent forested land and jurisdictional features.
- When constructing drilled piers for the French Broad River bridge, a containment system will be developed so that material does not enter the river. Material by-product will be pumped out of the shaft to an upland disposal area to the extent practicable and treated through a proper stilling basin or silt bag.
- No direct discharge of bridge deck drainage, design will direct discharge to stormwater structures.
- Inspections of erosion control devices will be done daily for construction associated with the French Broad River bridge replacement.
- Streams SEE and SFG
    - Streams SEE and SFG will be temporarily piped for the duration of construction. A revegetation and monitoring plan shall be developed for streams SEE and SFG for when the project is complete and the pipe is removed. Monitoring for stream stability and vegetative success will take place for a minimum of 3 years after construction.
    - USFWS and USACE will have the opportunity to review the design of the SEC measures for streams SEE and SFG.

- Streams SEE and SFG will be temporarily piped for the duration of construction. USFWS and USACE will have the opportunity to review the design of the SEC measures associated with streams SEE and SFG. A revegetation and monitoring plan shall be developed for Streams SEE and SFG to commence once the bridge construction and demolition are complete and the temporary pipes are removed, which will likely be similar to the structure presented above for the area between the Blue Ridge Parkway overpass and the northern terminus of the project.

6. SEC for the I-26 Rest Areas

- Plantings associated with the rest area will include re-establishment of vegetative buffers, and the development of site landscaping that will include landscape trees (1:1 in-kind replacement with native species), turf, and recreational/sitting areas (for the traveling public). Once the facility is complete, it will have continued maintenance to monitor the sustained growth of the vegetative buffers, and matured development of the landscape.

7. Entire STIP Projects I-4400/I-4700, I-26 Widening Project, 22.2-mile corridor

In addition to the SEC measures noted at the specific locations above (1-6), the following measures also apply to the specific locations (1-6) and to all other areas along the 22.2-mile corridor.

Stormwater Control

- NCDOT has developed stormwater commitment guidance, which will apply at crossings of the French Broad River and any portion of the NCDOT stormwater conveyance system draining to an outfall discharging to the river within the NCDOT right-of-way.
- NCDOT will prepare a stormwater management plan (SMP) that implements structural and non-structural post-construction stormwater BMPs to the maximum extent practical (MEP), which is consistent with the Department's NPDES Post-Construction Stormwater Program
- When preparing the SMP, NCDOT commits to using a hierarchical BMP selection process, which is optimized to treat silt, nutrients and heavy metals. At each discharge location outside of the 100-year floodplain, the hydraulics engineer will evaluate the feasibility of installing either an infiltration basin or a media filter as described in NCDOT's BMP Toolbox. If one of these BMP types is a feasible option, then NCDOT commits to including it in the SMP. If an infiltration basin or a media filter is not feasible because it would either affect forested habitat for MYGR or because of site constraints (e.g. topography, high water table, etc.), then NCDOT commits to providing a description of these constraints in the SMP as supporting information for selecting a BMP. In such cases the hydraulics engineer will select another BMP type from NCDOT's Toolbox that is feasible. Preference will be given to water quality swales, vegetative conveyances, vegetated filter strips, and preformed scour holes (PSHs). In flat, bottomland terrain, PSHs will be used to the maximum extent practical to eliminate outfalls by converting concentrated flow into distributed flow, thus maximizing infiltration and evapotranspiration of the runoff.
- NCDOT will commit to evaluating the use of emerging BMP technologies that the Department has not yet published in its BMP Toolbox. These emerging BMP technologies are: bioswales, bioembankments, biofiltration conveyances, and soil improvement to maximize infiltration. Because these design standards have not yet been formally approved by NCDEQ for inclusion in the BMP Toolbox, the hydraulics engineer will be required to consult with the State Hydraulics Engineer and obtain prior approval before proposing one of these BMP technologies in the SMP.

Sediment and Erosion Control Measures

- A Sediment and Erosion Control (SEC) plan will be in place prior to any ground disturbance.
- Implementation of NCDOT's Best Management Practices for the Protection of Surface Waters (BMPs) will minimize impacts to water resources during the pre-construction, construction, maintenance, and repair situations.
- Incorporating the Design Standards in Sensitive Watersheds (DSSW) [15A NCAC 04B .0124 (a) – (e)], regardless of the NCDWR stream classification:
    - Uncovered areas shall be limited to a maximum total area of 20 ac.
    - Erosion and sedimentation control measures shall be designed and constructed to provide protection from the runoff of the 25-year storm event, instead of a 10-year storm.
    - Sediment basins will have a settling efficiency of at least 70 percent for the 40-micron (0.04mm) size soil particle transported into the basin by the runoff of a two-year storm.
    - Newly constructed open channels shall be constructed with side slopes no steeper than two horizontal to one (2:1) vertical if a vegetative cover is used for stabilization. The angle for side slopes shall be sufficient to restrain accelerated erosion.
    - Ground cover sufficient to restrain erosion must be provided within 15 working days or 60 calendar days following completion of construction, whichever period is shorter.
- Two Construction Project Inspectors, one for I-4400 and one for I-4700, will monitor SEC devices for the life of the project.
- The standard inspection schedule (weekly, or after a rainfall event of one-half in. or greater) of erosion control devices will apply to the entire project EXCEPT at the French Broad River bridge (see SEC – French Broad River, Bridge).
- The Roadside Environmental Unit of NCDOT also has Field Operations Engineers that perform compliance inspections of the erosion control devices a minimum of twice a month during the life of any project. These inspections are generally more frequent on projects within an endangered species habitat.
- NCDOT will self-report to USFWS any sediment/erosion control device failures that result from excessive rainfall events (exceeding a 25-year storm event). The NCDOT inspector will report any failures to the Division Environmental Officer, who will contact the agency within 24 hours. If there are any failures in SEC measures, NCDOT will meet with resource agencies and work to adaptively manage SEC devices for future storm events while construction continues.
- NCDOT will continue to identify avoidance and minimization measures to all Waters of the U.S. and ensure that major hydraulic structures associated with the project are designed and installed to minimize negative impacts to stream stability (and therefore, water quality) to the greatest extent practicable.
- As part of this process, NCDOT will continue to coordinate with the Merger Team to identify avoidance and minimization measures and ensure that project impacts are minimized to every practicable extent, including impacts to federally protected species.
- NCDOT will invite representatives from USFWS, USACE, and NCWRC to the pre-construction meeting for the proposed project, as well as to all subsequent field inspections prior to construction, to insure compliance with all special project commitments.
- NCDOT will provide USFWS with the SEC plan and allow 15 days for review.
- NCDOT will provide USFWS with the French Broad River bridge demolition plan and allow 15 days for review.
- NCDOT will invite all resource agencies to review the demolition plan and will be notified prior to start of demolition so they may have a representative on site.
- NCDOT shall use appropriate sediment and erosion control practices which equal or exceed those outlined in the most recent version of the "North Carolina Sediment and Erosion Control Planning

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

FINAL BIOLOGICAL OPINION

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Asheville Field Office
160 Zillicoa Street Suite #B
Asheville, North Carolina 28801

February 22, 2019

Mr. John F. Sullivan, III, P.E.
Division Administrator
Federal Highway Administration
310 New Bern Avenue, Suite 410
Raleigh, North Carolina 27601

Subject: Proposed Widening of I-26 From US 25 Near Hendersonville to I-40/I-240 South of Asheville, Henderson and Buncombe Counties, North Carolina. Federal Aid Project No. NHF-26-1(62)23/IMNHF-026-1(86)9/WBS No. 34232.1.1/36030.1.1/S.T.I.P. No. I-4400/I-4700

Dear Mr. Sullivan:

This document transmits the U.S. Fish and Wildlife Service's (USFWS) biological opinion (Opinion), based on our review of the proposed widening of I-26, and its effects on the federally endangered Appalachian elktoe (*Alasmidonta raveneliana*) and gray bat (*Myotis grisescens*), and is in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (Act).

This Opinion is based on information provided in a Biological Assessment (BA) submitted to the Service and received on August 20, 2018, field investigations, personal communications with experts on the affected species, and other sources of information. A complete administrative record of this consultation is on file at this office.

In the BA, the North Carolina Department of Transportation (NCDOT), in association with the Federal Highway Administration (FHWA), determined that the following federally listed species were Not Likely to be Adversely Affected by the proposed action: Indiana bat (*Myotis sodalis*) and northern long-eared bat (*Myotis septentrionalis*). The USFWS concurs with this determination. Additionally, the NCDOT and FHWY's concluded that the following species would not be affected by the proposed bridge replacement project: bog turtle (*Glyptemys muhlenbergii*), Blue Ridge Goldenrod (*Solidago spithamaea*), Bunched Arrowhead (*Sagittaria fasciculata*), Carolina northern flying squirrel (*Glaucomys sabrinus coloratus*), mountain sweet pitcherplant (*Sarracenia rubra ssp. jonesii*), rock gnome lichen (*Gymnoderma lineare*), rusty patched bumblebee (*Bombus affinis*), small whorled pogonia (*Isotria medeoloides*), spotfin chub

(*Erimonax monachus*), spreading avens (*Geum radiatum*), Spruce-fir moss spider (*Microhexura monitvaga*), swamp pink (*Helonias bullata*), tan riffleshell (*Epioblasma florentina walkeri*), Virginia spiraea (*Spiraea virginiana*), white fringeless orchid (*Platanthera integrilabia*), and white irisette (*Sisyrinchium dichotomum*). After review of the information provided, we concur with your effects determinations for the above species.

This fulfills the requirements under section 7 of the Act have been fulfilled for these species. Requirements under section 7 of the Act must be reconsidered if: (1) new information reveals effects of this identified action that may affect listed species or critical habitat in a manner not previously considered, (2) this action is subsequently modified in a manner that was not considered in this review, or (3) a new species is listed or critical habitat is determined that may be affected by the identified action.

Sincerely,

Janet Mizzi
Field Supervisor

Biological Opinion
I-26 Widening from US 25 Near Hendersonville to I-40/I-240 South of Asheville
Henderson and Buncombe Counties, North Carolina

FWS Log # 01-206

Prepared by:
U.S. Fish and Wildlife Service
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Janet Mizzi, Field Supervisor

2-22-19
Date

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CONSULTATION HISTORY

- May 3, 2001 – United States Fish and Wildlife Services (USFWS) concurred with a "No Effect" determination for all listed species associated with project I-4400.
- May 18, 2006 – USFWS provided scoping comments for the newly combined I-4400/4700 project. USFWS recommended a reevaluation for all listed species since more than five years had passed since surveys were conducted and the project scope had changed.
- July 19, 2016 – Gray bat discovered by NCWRC and USFWS in a bridge roost near Action Area.
- October 5, 2016 – Letter from USFWS to NCDOT providing comments on the Draft Environmental Impact Statement (DEIS, NCDOT, 2016). USFWS recommended additional surveys for bats.
- October 20, 2016 – Letter from United States National Park Service (NPS) to NCDOT providing comments on the DEIS. NPS stated they did not agree with the "No Effect" finding for gray bat since the species had recently been discovered near the project. The letter also mentioned that results of recent acoustic surveys along the Blue Ridge Parkway recorded calls consistent with those of Indiana bat. The letter recommended additional surveys for gray bat and Indiana bat, as well as protection of known, occupied habitat for bog turtle, which occurs adjacent to the existing interstate.
- November 30, 2016 – Coordination meeting with NCDOT, USFWS, NPS, NCWRC, FHWA to discuss needed surveys for gray bat.
- December 20, 2016 – On-site coordination meeting with NCDOT, USFWS, NPS, NCWRC, and FHWA to visit areas of concern and discuss needed bat surveys.
- January 30, 2017 – Meeting in Asheville with NCDOT, USFWS, NCWRC, and NPS to discuss bat survey specifics.
- March 23, 2017 – USFWS and NCWRC provide comments on proposed scope of work for gray bat surveys.
- May -August 2017 – Updates on progress of ongoing gray bat surveys.
- September 12, 2017 – Draft acoustic survey report submitted to USFWS, NCWRC, and NCDOT for review.
- September 29, 2017 – Surveys conducted downstream of the I-26 crossing over the French Broad River found a previously undocumented occurrence of Appalachian elktoe.
- October 11, 2017 – Merger Team Concurrence Point 4A Meeting. Potential stormwater and sediment and erosion control measures specific to minimizing impacts to gray bat and Appalachian elktoe were discussed. USFWS suggested additional conservation measures including a revegetation plan, minimization of impacts to surface waters, and minimization of tree clearing, particularly around the bridge over the French Broad River.
- October - December 2017 – A series of conference calls regarding information and structure of the BA including Action Area, conservation measures for federally listed species - including gray bat research project and conservation for Appalachian elktoe - in the French Broad River basin, the use of Design Standards for Sensitive Watersheds

(DSSW), the use of (and commitment to, where feasible and practical) post-construction stormwater controls for any streams draining directly to the French Broad River.

- February 1, 2018 – Coordination call/meeting with USFWS, FHWA, and NCDOT to discuss USFWS and FHWA comments on draft version of BA.
- February 7, 2018 – Call/meeting between USFWS, FHWA, NCDOT, North Carolina Division of Water Resources (NCDWR), and USACE to discuss bridge replacement over the French Broad River. USFWS, NCDWR, and USACE expressed concern over safety of river users, size of causeways, length of time causeways will be in place, and size of river channel opening while causeways are in place.
- March 5, 2018 – Revised plan for replacement of bridges over the French Broad River.
- June-July 2018 – NCDOT submitted draft BA to USFWS, USACE, NPS, FHWA, and NCDWR for review and comment. A series of calls to discuss aspects of the BA and revisions.
- August 20, 2018 – Final BA submitted to USFWS
- August 29, 2018 – Initiation of Formal Consultation.
- November 20, 2018 – Section 404/NEPA Merger Meeting Concurrence Point 4C
- November 27, 2018 – USFWS notified FHWA and NCDOT of outstanding information requested for the BO.
- December 17, 2018 – USFWS received all information requested from FHWA and NCDOT.
- December 22, 2018 – January 25, 2019 - federal government shutdown, USFWS employees on furlough
- February 1, 2019 - Phone conversation between USFWS and Marissa Cox, NCDOT Biological Surveys Group Supervisor, where NCDOT committed to three years of post construction monitoring for gray bats.
- February 8, 2019 – Phone conversation with Division 13 Construction Engineer concerning lighted night operations on the I-26 bridge (BO Section 2.3.2.1). The Engineer agreed to include a two week period with no lighting to facilitate migration during a critical period.
- February 11, 2019 - USFWS submitted a Draft Biological Opinion to FHWA and NCDOT for review.

BIOLOGICAL OPINION

1. INTRODUCTION

The Federal Highway Administration (FHWA) and the North Carolina Department of Transportation (NCDOT) are proposing highway improvements to a 22.2-mile (mi.) segment of Interstate 26 (I-26) in Henderson and Buncombe Counties, NC. The current interstate is a four-lane median divided highway. The highway will be widened to six lanes for about 13.6 miles from US 25 (Exit 54) in Henderson County northward to the US 25 (Asheville Highway; Exit 44) interchange and to eight lanes for about 8.6 miles to the I-40/I-240 interchange in Buncombe County just west of Asheville. In addition to widening the roadway, the bridges that carry the Blue Ridge Parkway over I-26 and the existing bridge that crosses the French Broad River (FBR) will be replaced and the pair of existing rest areas in Henderson County, south of Fanning Bridge Road (SR 3539) will be reconstructed. Project construction is anticipated to begin approximately 2 months after the contract is let (finalized), and will continue for approximately 60 months (5 years). This Biological Opinion considers the effects of the Action on the Appalachian elktoe and the gray bat.

2. DESCRIPTION OF THE PROPOSED ACTION

2.1 Action Area

For purposes of consultation under Section 7 of the Act, the Action Area is defined as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action" (50 CFR §402.02). The I-4400/I-4700 Action Area (Figure 1) includes the I-4400/I-4700 study area (as defined in the DEIS; NCDOT 2016), which extends 22.2 mi. and consists generally of a 1,400 ft.-wide corridor that follows I-26 from US 25 in Henderson County north to I-40/I-240 in Buncombe County, with expanded areas at interchanges, rest areas, and the Blue Ridge Parkway bridge. In addition, the Action Area incorporates some tributaries and portions of the FBR including:

- Sections of the FBR within 0.5 mi. (downstream) of tributary impacts,
- FBR tributaries impacted within 0.5 mi. of occupied Appalachian elktoe habitat, and
- The FBR from the I-26 crossing downstream (north) to I-40, specifically to the I-26 Connector (I-2513) study area (Appendix I).

2.2 Proposed Action

The following describes the major activities involved in the proposed project that will have an impact on gray bats and Appalachian elktoe. Replacement of the existing bridges over the FBR, widening existing I-26 and ongoing operations of I-26 after the construction is completed are described in detail. In addition, NCDOT through project design and up-front implementation

planning, has committed to a number of conservation measures to avoid and minimize impacts to gray bats and Appalachian elktoe and these specific measures also are detailed.

2.2.1 Bridge Replacement over the French Broad River

The existing pair of two-lane bridges that carry I-26 over the FBR will be replaced with one new structure that will provide a total of eight travel lanes. Demolition of the existing bridges and construction of the new bridge is anticipated to take approximately three to four years.

The proposed new bridge structure will have three spans with lengths of approximately 151 ft., 170 ft., and 143 ft. from east to west, and will require two bents (foundation supports) in the river. Each bent will require ten drilled shafts. Assuming ten, 5-foot diameter shafts for each bent, the drilled shaft area is approximately 200 square feet (sq. ft.), per bent, for a total of 400 sq. ft. for both bents. Currently, drainage from the deck of the existing structure flows directly into the river. The new structures include shoulders sufficient to convey runoff into adjacent stormwater control devices and eliminate direct discharge into the river.

Bridge construction and demolition will require temporary access roads adjacent to existing I-26 to reach the river and temporary stone construction causeways in the FBR to construct the bridge. The access roads will be built parallel to I-26 in all four quadrants of the existing bridge. Vegetation clearing at the FBR will be minimized as much as practicable to build the access roads. Access roads will require approximately 3.75 ac. beyond the current slope stake limits for the project. However, these areas would need to be cleared as part of the typical construction process for this project.

Some work would likely need to be completed at night. The amount and type of lighting for all activities will be minimized to the maximum extent possible. Because the FBR is regularly used for recreation, it cannot be closed to navigation for the duration of construction. As part of providing a safe passage lane for river users, NCDOT will install steady-state, solar-powered red lighting on the construction causeways.

2.2.2 Highway Widening

Existing I-26 will be widened from four lanes to eight lanes for about 8.6 miles and to six lanes for about 13.6 miles. The highway will be widened primarily within the existing right-of-way and to the middle of the current roadway. Construction activities associated with the proposed widening project include clearing and grubbing vegetation, grading, paving, culvert extensions and replacements, bridge replacements, striping, signs, and lighting.

The project includes limited clearing of woody vegetation to accommodate additional travel lanes and interchange expansions. Clearing will likely begin almost immediately after the project is let for construction, and may continue for a period of up to two years. Clearing may occur at different locations along the length of the project, depending on construction timing/phasing. Clearing activities will take place during daylight hours, but may occur during any time of year, with the exception of the area on Blue Ridge Parkway property where tree clearing will occur between August 15 and May 15.

The 3.3-mi. long section of the project that extends from just north of the Blue Ridge Parkway to NC 191 (Brevard Road) is heavily wooded. For this reason, because of its proximity to the FBR, and because it is the largest contiguously forested area within the Action Area, clearing in this section will be minimized. Clearing will not extend beyond areas that will become part of the permanent project footprint. NCDOT developed a preliminary design that utilizes retaining walls whenever practicable for this section of the project. Based on the slope stake limits associated with preliminary design and the tree line presented in the final survey, approximately 3.8 ac. of trees will be cleared along this section of the project.

2.2.3 Highway Operation

Once the highway is widened and in operation, the additional capacity will increase the number of vehicles that travel the roadway in the Action Area. Increases in traffic will increase noise and nighttime lighting from headlights. The majority of the corridor will remain unlit except at existing interchanges. Two locations will require additional permanent lighting: the I-26 and US 25 (Asheville Highway) interchange and the reconstructed rest areas. The additional pavement will increase the amount of impervious surface and post-construction stormwater.

2.3 Conservation Measures

Conservation measures represent actions, pledged in the project description, that the action agency will implement to minimize the effects of the proposed action and further the recovery of the species under review. Such measures should be closely related to the action and should be achievable within the authority of the action agency. The beneficial effects of conservation measures are taken into consideration in the USFWS's determination of a jeopardy versus a non-jeopardy opinion and in the analysis of incidental take.

The NCDOT proposes to offset project related impacts by implementing a number of conservation measures. Included in the overall proposal are measures that will help aid recovery by conserving or restoring habitat and measures intended to minimize direct impacts through project design, construction practices, and monitoring and remediation. Some of these measures directly benefit gray bats or Appalachian elktoe, but many are beneficial to both species. Where appropriate, the measures are further categorized by the species that may derive the most benefit.

2.3.1 Highway Widening

Indiana, Northern long-eared and gray bats

2.3.1.1 Time of Year Restriction for Tree Clearing on the Blue Ridge Parkway:

- No tree clearing will occur on NPS land between May 15 and August 15.
- Emergence and/or acoustic surveys are required prior to any tree clearing that must occur between April 1 and May 1 or August 15 and November 15.
- No significant tree removal within 5 mi. of known hibernacula can occur between April 1 and November 15.

- In the event that any roost trees are documented within 0.25 mi. of the project area, regardless of the time of year, the NPS will seek consultation with the USFWS before work proceeds.

Gray bats

2.3.1.2 Minimization of Tree Clearing:

- In the area between the Blue Ridge Parkway and NC 191 (Brevard Road), trees will only be cleared to establish the permanent project footprint, temporary piping of streams SEE and SFG (as identified in Table 15 of the BA), establish associated SEC devices, and to create temporary construction access roads at the Blue Ridge Parkway.

2.3.1.3 Roadway Construction Lighting:

- Due to gray bat activity on the landscape between April 15 and October 15, NCDOT will limit all construction-related lighting to whatever is necessary to maintain safety in active work areas closest to the FBR during this time. Therefore, construction-related lighting will not project into adjacent wooded areas or over the water surface of the river. This restriction will apply to locations between Brevard Road (NC 191) and Glenn Bridge Road (SR 3495) with the exceptions of the construction area associated with the access roads at the Blue Ridge Parkway and the existing brightly lit area associated with the Long Shoals Road (NC 146) interchange.

- During construction, lighting will only be used in areas where active construction is occurring. Otherwise, no additional lighting is needed. For paving operations, specifically, which will more than likely be at night, the area typically lit is directly adjacent to the paving machine.

Gray Bats and Appalachian Elktoe

2.3.1.4 Erosion Control Measures:

When projects occur in watersheds that contain protected aquatic species, NCDOT implements erosion control measures that exceed the standard BMPs. For this project a combination of Design Standards in Sensitive Watersheds (DSSW, 15A NCAC 04B .0124), Environmentally Sensitive Areas and the NC Division of Water Quality (NCDWQ) Construction General Permit (NCG01) terms and conditions that allow for stormwater discharge under the National Pollutant Discharge Elimination System (NPDES) apply and NCDOT will default to the most-restrictive SEC measure requirement. A table comparing these methods can be found in Appendix II.

The sedimentation and erosion control plan (SECP) will be in place prior to any ground disturbance for all bridge replacements and construction. When needed, combinations of erosion control measures (such as silt bags in conjunction with a stilling basin) will be used to ensure that the most protective measures are being implemented.

- The sedimentation and erosion control plans shall adhere to the DSSW, where practicable, within the existing and proposed right of way for the following areas:
    - From the Blue Ridge Parkway bridge to the northern project terminus.
    - For portions of the project within 1 mi. and draining directly to streams that are identified as NCDEQ and/or NCWRC designated trout streams.
    - For portions of the project within 1 mi. and draining directly to streams where aquatic threatened or endangered species are present.

- Environmentally Sensitive Areas will be demarcated within the Action Area and will be defined by a 50-foot buffer zone on both sides of jurisdictional streams measured from top of streambank, in which the following shall apply:
    - The Contractor may perform clearing operations, but not grubbing operations until immediately prior to beginning grading operations.
    - Once grading operations begin, work shall progress in a continuous manner until complete.
    - Erosion control devices shall be installed immediately following the clearing operation.
    - Seeding and mulching shall be performed on the areas disturbed by construction immediately following final grade establishment.
    - Seeding and mulching shall be done in stages on cut and fill slopes that are greater than 20 ft. in height measured along the slope, or greater than 2 ac. in area, whichever is less.
    - All SEC measures, throughout the project limits, must be cleaned out when half full of sediment, when applicable, to ensure proper function of the measures.

2.3.1.4.1 Streams Designated as Environmentally Sensitive Areas

Stream Name	NRTR Map ID	Distance to French Broad River (mi.)	Stream Effects (ft.) (2:1 SS+25 ft.)*	Stream Effects (ft.) (2:1 SS)**
UT to Dellwood Lake^	SFG	0.00	2010.0	662.3
Powell Creek (Lake Julian)***	SDN	0.03	111.1	53.0
UT to French Broad***	SDU	0.05	86.9	34.4
UT to French Broad***	SDK	0.05	75.1	48.9
UT to French Broad ***	SDF	0.06	91.0	61.9
UT to French Broad***	SFX	0.06	72.6	47.3
UT to French Broad***	SEQ	0.07	74.5	24.2
UT to French Broad***	SDG	0.07	68.9	43.0
UT to French Broad***	SDX	0.08	1043.2	399.6
UT to French Broad***	SDW	0.09	60.0	25.3
UT to French Broad***	SFO	0.10	56.7	55.0
UT to French Broad***	SDE	0.10	99.1	47.6
UT to French Broad^	SEE	0.15	383.0	106.3
UT to French Broad***	SEF	0.15	505.3	368.1
UT to Dellwood Lake***	SFI	0.19	7.3	0.0

UT to French Broad***	SDY	0.41	22.5	2.3
UT to French Broad***	SED	0.43	66.7	9.4
UT to French Broad***	SEV	0.47	43.7	16.8
UT to French Broad***	SDC	0.50	102.5	44.2
UT to French Broad***	SEW	0.55	37.9	12.8
UT to French Broad***	SEU	0.55	18.3	10.6
UT to Dellwood Lake***	SFR	0.67	46.0	27.8
UT to Dellwood Lake***	SFQ	1.09	96.8	43.7
UT to Long Valley Branch***	SFM	1.86	382.0	29.0
UT to Long Valley Branch***	SFP	1.90	50.0	22.7
Long Valley Branch***	SFN	2.19	43.8	24.9

*Effects calculated based on current design proposed 2:1 slope stake (SS) limits plus 25 ft. (SS+25).
**Effects calculated based on current design proposed 2:1 slope stake (SS) limits. Effects for Streams SFG, SFO, and SEE calculated based on access road footprint.
***Streams subject to DSSW and designated as Environmentally Sensitive Areas.
^Stream to be temporarily piped for construction of access road (access road is too close to allow for 50-ft buffer).

- Contract language regarding erosion control will include the following, or similar language as appropriate:
    - "The Contractor will be required to prosecute the work in a continuous and uninterrupted manner from the time work begins until completion of each phase of structure construction, demolition, and completion. The Contractor will not be permitted to suspend operations except for reasons beyond their control or except where the Engineer has authorized a suspension of the Contractor's operations in writing."
    - "In the event that the Contractor's operations are suspended in violation of the above provisions or it is determined the Contractor is not deemed to be pursuing the work in a continuous manner in accordance with his submitted and approved schedule, the sum of $1000.00 per day will be charged to the Contractor for each and every calendar day that such suspension takes place. The said amount is hereby agreed upon as liquidated damages due to extra engineering and maintenance costs and due to increased public hazard resulting from a suspension of the work. Liquidated damages chargeable due to suspension of the work will be additional to any liquidated damages that may become chargeable due to failure to complete the work on time."

2.3.1.4.2 Monitoring of Effectiveness of SEC Devices:

- Two Construction Project Inspectors, one for I-4400 and one for I-4700, will monitor SEC devices for the life of the project.

- Inspections of erosion control devices will be done daily for construction associated with the FBR bridge replacement. For the remainder of the project, the standard inspection schedule (weekly, or after a rainfall event of one-half inch or greater) will apply.
- NCDOT will install a rainfall data logger at the river to continuously monitor and record rainfall events.
- NCDOT will self-report to USFWS any SEC device failures that result from excessive rainfall events (exceeding a 25-year storm event). The NCDOT inspector will report any failures to the Division Environmental Officer, who will contact the agency within 24 hours. If there are any failures in SEC measures, NCDOT will meet with resource agencies and work to adaptively manage SEC devices for further storm events while construction continues.

2.3.1.4.3 Agency Coordination:

- NCDOT will invite representatives from USFWS, USACE, and the NCWRC to the pre-construction meeting for the proposed project, as well as to all subsequent field inspections prior to construction, to insure compliance with all special project commitments.
- NCDOT shall provide USFWS with the SECP and allow 15 days for review.
- NCDOT shall provide USFWS with the FBR bridge demolition plan and allow 15 days for review.
- All resource agencies will be invited to review the demolition plan and will be notified prior to start of demolition so they may have a representative on site.
- NCDOT will invite USFWS and USACE to review the design of the SEC measures for streams SEE and SFG, as well as the revegetation and monitoring plan.
- NCDOT will contact USFWS if new information about gray bats is discovered, as it relates to the project.
- NCDOT will report any injured or dead bats found on the construction sites to USFWS.

2.3.2 Bridge Construction

Gray Bats

2.3.2.1 Night Time Construction Activities at FBR:

At the FBR bridge, the use of lights after sunset may be necessary to improve safety for work crews during construction. These are not operations that occur on a regular schedule.

- To minimize potential impacts to lactating females and their pups, between June 1 and June 14, NCDOT shall commit to restrict the construction contractor to no night work. During June 15 through August 1, NCDOT will also commit to restrict the construction contractor to no more than 28 total nights of work, with no more than four consecutive nights. Lighting used for construction will be limited to what is necessary to maintain safety standards, and will only be directed toward active work areas.

2.3.2.2 Red Safety Lighting:

- NCDOT shall place solar-powered, steady-state, red, safety lights on the causeways for river user safety. Generators will not be used to provide power, so as to avoid additional noise that may disturb bats flying through the work zone.

<u>Gray Bats and Appalachian Elktoe</u>

2.3.2.3 FBR Bridge Replacement:

- NCDOT may install temporary retaining walls on the outer edges of the access roads to reduce impacts to adjacent forested land and jurisdictional features.
- The footprint for the access roads will not extend beyond the permanent project footprint.
- Activities in the floodplain will be limited to those needed to construct the proposed bridge and remove the existing bridges.
- Streams SEE and SFG will be temporarily piped during bridge construction and demolition. A revegetation and stream monitoring plan shall be developed for Streams SEE and SFG. The revegetation and stream monitoring plan shall be approved by the USACE and USFWS and will commence once the bridge construction and demolition are complete and the pipe is removed. Monitoring, to observe vegetation success and stream stability and detect and control invasive exotic plants, will take place for a minimum of three years after construction.
- Causeways will be used instead of multiple work bridges which would require drilled piles and take longer to install. The use of causeways also means that work bridge support piers will not be present, thereby eliminating obstacles in the flight path of bats foraging and commuting through the work zone.
- Causeways will have 1:1 slopes to minimize their size.
- NCDOT will require the contractor to use clean rock (free of debris and pollutants) for the construction of the causeways to minimize unnecessary sediment input into the river.
- Causeway material will be removed to the extent practicable and either disposed of off-site or used in areas that require permanent stone protection after project completion. NCDOT will also require that concrete barriers (barrier rail) be placed along the downstream edge of each causeway to limit the downstream movement of causeway material during high flow events.
- Causeway material will be added/removed as needed for each stage to minimize the causeway footprint over the length of the project.
- The Stage 4 causeway extension will be sloped to allow water to flow over the top, reducing overall impact to channel flow (See NCDOT I-26 Bridge over the French Broad River Proposed Construction and Demolition document for details).
- To minimize disturbance to the riverbed, all readily detectable causeway material will be removed to the extent practicable, while removing as little of the original riverbed as possible.
- Construction fabric will not be used under the causeway material, as it has a tendency to tear into tiny pieces and float downstream during removal.
- Any equipment that is placed on the causeways will be removed any time throughout a work day when the water level rises, or is expected to rise overnight, to a point where the equipment could be flooded, or during periods of inactivity (two or more consecutive

days). The only exception to this measure is that the drill rig and crane may be left in place for periods of inactivity; however, they must also be removed if the water rises, or is expected to rise, to a point where the drill rig and crane could be flooded.

- NCDOT will require the contractor to use new or steam-cleaned equipment to access causeways that are under water if these causeways are utilized for removal of existing bents in underwater conditions.
- NCDOT will require the contractor to have clean, non-leaking equipment, diapers on-site for each causeway, and spill kits located at each causeway.
- With the exceptions noted below for the drill rig and crane, all construction equipment shall be refueled outside the 100-year floodplain or at least 200 ft. from all water bodies (whichever distance is greater) and be protected with secondary containment. During crucial periods of construction and demolition, when the drill rig and crane cannot be moved, the drill rig and crane can be refueled while inside the 100-year floodplain provided that spill response materials (such as spill blankets and fueling diapers) are used during the refueling. Hazardous materials, fuel, lubricating oils, or other chemicals will be stored outside the 100-year floodplain or at least 200 ft. from all water bodies (whichever distance is greater), and not in a Water of the U.S. Areas used for borrow or construction by-products will not be located within wetlands or the 100-year floodplain.
- When constructing drilled piers for the FBR bridge, a containment system will be developed so that material does not enter the river. Material by-product will be pumped out of the shaft to an upland disposal area to the extent practicable and treated through a proper stilling basin or silt bag.
- The erosion-control plan will be in place prior to any ground disturbance for the FBR bridge replacement. When needed, combinations of erosion-control measures (such as silt bags in conjunction with a stilling basin) will be used to ensure that the most protective measures are being implemented.
- Construction of the new bridge will be accomplished in a manner that prevents uncured concrete from coming into contact with water entering or flowing in the river.
- The causeway design has been refined to allow for a maximum free flow area of the FBR. The original design provided for only a 28 percent free flow area of the river at the causeway's largest size. The design was refined and now allows a 51 percent minimum free flow area when the causeway is at its greatest extent.
- Removal of the existing bridge shall be performed so as not to allow debris to fall into the water. If debris is dropped in the river, it will be immediately removed.
- The current barrier on the bridge is a one bar metal rail on concrete parapet with retrofitted guardrail. It will be replaced with concrete barrier rail, a 42-in. solid, concrete "Jersey barrier" style guard wall.

2.3.3 Roadway Operation

Gray Bat

2.3.3.1 Minimal Additional Roadway Lighting:

- NCDOT will add minimal additional permanent lighting. Lighting at interchanges may be relocated, to allow for reconfiguration or expansion of the interchanges, but new

lighting will only be required at the US 25 (Asheville Highway) interchange and the rest areas.

Gray Bat and Appalachian Elktoe

2.3.3.2 Stormwater Control Measures:

- NCDOT has developed stormwater commitment guidance, which will apply at crossings of the FBR and any portion of the NCDOT stormwater conveyance system draining to an outfall discharging to the river within the NCDOT right of way.
- NCDOT will prepare a stormwater management plan (SMP) that implements structural and non-structural post-construction stormwater best management practices (BMPs) to the maximum extent practical, which is consistent with the Department's National Pollutant Discharge Elimination System (NPDES) Post-Construction Stormwater Program.
- When preparing the SMP, NCDOT commits to using a hierarchical BMP selection process, which is optimized to treat silt, nutrients, and heavy metals.
- NCDOT will commit to evaluating the use of emerging BMP technologies that the Department has not yet published in its BMP Toolbox. These emerging BMP technologies are as follows:
    - Bioswales
    - Bioembankments
    - Biofiltration conveyances
    - Soil improvement to maximize infiltration

2.3.3.3 Reforestation and Monitoring Plan:

- Eastern Federal Lands Highway Division (EFLHD) of FHWA will develop a re-vegetation/landscaping plan to re-establish native vegetation and provide for a continuous visual experience for Blue Ridge Parkway and Mountains to Sea Trail users.
- For the portion of the project from the Blue Ridge Parkway overpass to the northern terminus of the project, NCDOT will develop a revegetation plan that incorporates native woody and/or shrubby vegetation, as appropriate, for areas outside of the final slope stake limits disturbed during construction. The monitoring shall be conducted annually for a minimum of three years after final planting. Photo documentation shall be utilized to document the success of the vegetation and a report shall be submitted to the USFWS within sixty (60 days) post monitoring.
- NCDOT will develop a revegetation and monitoring plan for Streams SEE and SFG to commence once the bridge construction and demolition are complete and the temporary pipes are removed, which will likely be similar to the revegetation plan presented above for the area between the Blue Ridge Parkway overpass and the northern project terminus.

2.3.4 Habitat Conservation Measures

2.3.4.1 Conservation Measures to Benefit Gray Bats

NCDOT-Sponsored gray bat Research Project:

- NCDOT, with the cooperation of the USFWS and NCWRC, committed to a three year study on gray bats within the FBR Basin. This study will serve as a conservation measure for NCDOT projects within the Divisions 13 and 14 for a limited time. NCDOT will provide $900,000 in funding to Indiana State University to conduct the research project, which will aid in the recovery and conservation of the gray bat. The end goal is to gather the information needed to allow NCDOT and USFWS to enter into a programmatic consultation to cover the gray bat for NCDOT Divisions 13 and 14, as well as help to develop species-specific avoidance and minimization measures.

2.3.4.2 Conservation Measures to Benefit Appalachian Elktoe

FBR Conservation Funding:

- NCDOT will provide $500,000 in funding to the North Carolina Nongame Aquatic Projects Fund for the FBR Conservation Plan (FBRCP) proposed by USFWS, which will aid in the recovery and conservation of Appalachian elktoe. The funding will be held by the NCWRC. A multi-agency/organization group of mussel species experts, including USFWS and NCDOT, will determine how to expend the funds, which may include the following: species reintroduction, early warning and emergency production capacity, genetic management program, and other appropriate activities as described in the FBRCP.

2.3.5. Monitoring

2.3.5.1 Erosion and Sediment Control Performance Monitoring

- NCDOT will implement a video surveillance system that will target critical areas identified along the project corridor for the purposes of monitoring the performance of erosion and sediment control practices. The surveillance equipment will be comprised of video equipment capable of monitoring target areas. The intent of the active surveillance will be to provide assurance that the necessary erosion and sediment control practices are being implemented and maintained as practical to protect the identified resource.

- NCDOT will document the performance through images extracted from the video surveillance system. Due to the complexity of utilizing sensitive video equipment in a construction area, the Department may experience technical difficulties which will have to be resolved or a supplemental monitoring system will need to be deployed.

- NCDOT will provide the monitoring images to USFWS at their request, and/or when there has been an event that resulted in a failed erosion and sediment control measure, and will also identify the actions taken to correct the situation.

- NCDOT will identify target areas that have significant risk to the resource due to failed erosion and sediment control devices while land disturbance would be occurring. Once the area is stabilized then the surveillance equipment can move to the next target area. Special attention will be given to those streams identified by the USFWS.

2.3.5.2 Monitoring for Gray Bat Return and Activity:

- NCDOT will conduct acoustic monitoring for gray bats immediately prior to and during construction at the FBR bridge. Acoustic data may provide valuable information on bat activity in general, and gray bat activity, in particular, as it relates to project construction.
- To determine whether gray bats avoid the active construction zone, NCDOT will investigate the use of night-vision video recordings, or other methods, in an attempt to monitor bat activity at the bridge while active night time construction is underway.

2.3.5.3 FBR Geomorphology Monitoring:

- To ensure bridge construction at the FBR crossing will not result in substantial changes to channel stability (scour, erosion, etc.), NCDOT will conduct river channel monitoring at the I-26 bridge construction site to document the morphological condition at the FBR bridge site and to evaluate the impacts of construction and temporary causeways on river habitat. Monitoring activities will consist of the following:

    - Surveying the FBR channel bathymetry and riverbanks before and during the construction of the I-26 crossing (approximately 3.5 years). Mapping will occur before construction and then every quarter during construction, with one final survey after the causeways are all removed, and will cover at least 100 ft. upstream and 250 ft. downstream of the causeway locations.
    - A complete digital terrain model (DTM) of the stream bed and banks from each survey conducted will be prepared. NCDOT will retain an experienced firm or staff members to analyze the DTM and compile a final report to be submitted to USFWS.
    - If monitoring at the FBR reveals excessive bank erosion, bank instability, or sedimentation associated with the bridge replacement, NCDOT will work to identify the cause and will make improvements to address the problems in a timely manner.

3. STATUS OF THE SPECIES

3.1 GRAY BAT

This section summarizes best available data about the biology and current condition of the gray bat (*Myotis grisescens* - gray bat) throughout its range that are relevant to formulating an opinion about the Action. The USFWS published its decision to list the gray bat as endangered on April 28, 1976. There is no designated critical habitat for this species.

3.1.1 Species Description and Life History

The gray bat is one of the largest species in the genus *Myotis* in eastern North America, with a forearm length of 40 to 46 millimeters, a weight of 7 to 16 grams (usually 8 to 11 grams), and a wingspan of 27.4 to 30 centimeters (Barbour and Davis 1969). Gray bats can most readily be distinguished from other *Myotis* by their wooly, unicolored dorsal fur, which may seem paler on

the bats' belly. The fur appears gray after the mid-summer molt, becoming chestnut brown or bright russet leading to the next molt (Gore 1992). Another important characteristic is the wing membrane, which is also gray, connects to the foot at the ankle rather than the base of the toes (Barbour and Davis 1969, Gore 1992). The nails on the feet are notched and the calcar is unkeeled (Harvey *et al.* 1981, Sealander 1979).

The primary range of the gray bat is concentrated in the cave regions of Alabama, Arkansas, Kentucky, Missouri and Tennessee, with smaller populations found in adjacent states, including a growing population in a quarry in Clark County, Indiana (Harvey *et al*. 1981, Brack *et al*. 1984, Harvey 1992, Harvey 1994, Mitchell 1998). Gray bats are one of the few species of bats in North America inhabiting caves year-round. The species occupies cold caves or mines in winter and warmer caves during summer (Tuttle 1976a, Harvey *et al*. 1981, Harvey 1994, Martin 2007). In winter, gray bats hibernate in deep vertical caves that trap large volumes of cold air and the species typically forms large clusters with some aggregations numbering in the hundreds of thousands of individuals (Harvey 1994, Tuttle and Kennedy 2005). The species chooses hibernation sites where there are often multiple entrances, good air flow (Martin 2007) and where temperatures are approximately 5°-9° C, though 1°-4° C appears to be preferred (Tuttle and Kennedy 2005). Tuttle (1979) noted that an estimated 95% of the range-wide population was confined to only nine caves.

There are a few exceptions to this cave-specific roosting strategy. Many bat species use bridges as roost sites (Keeley and Tuttle 1999) and the gray bat is no exception. Bridges provide a warm thermal refuge for individuals foraging far from their primary daytime roosts and have been documented as night roosts for gray bats in northwest Georgia (Johnson *et al*. 2002). Gray bat maternity colonies have been found in storm drains (i.e., culverts) in Arkansas (Harvey and McDaniel 1988, Timmerman and McDaniel 1992), Kentucky (Hays and Bingham 1964), and Kansas (Decher and Choate 1988). Culvert conditions can mimic those found in natural caves in terms of high levels of humidity and clear running water. Maternity colonies have also turned up in more unusual places, such as a barn in Missouri (Gunier and Elder 1971) and the gate room of a large dam in Tennessee (Lamb 2000).

Gray bats show strong philopatry to both summering and wintering sites (Tuttle 1976a, Tuttle 1979, Tuttle and Kennedy 2005, Martin 2007). Because of their highly specific roost and habitat requirements, only about 5% of available caves are suitable for occupancy by gray bats (Tuttle 1979, Harvey 1994). At all seasons, males and yearling females seem less restricted to specific cave and roost types (Tuttle 1976b). Bachelor males segregate in separate aggregations within a colony home range that usually includes several caves that may extend up to 70 kilometers along a particular river valley (Tuttle and Kennedy 2005).

Gray bat hibernacula are often comprised of individuals from large areas of summer range. Based on band recovery data, Hall and Wilson (1966) calculated that a gray bat hibernaculum in Edmonson, County Kentucky attracted individuals from an area encompassing 27,195 square kilometers in Kentucky, southern Illinois, and northern Tennessee (Hall and Wilson 1966). Gray bats are documented to regularly migrate from 17 to 437 kilometers between summer maternity sites and winter hibernacula (Tuttle 1976b, Hall and Wilson 1966), with some individuals moving as much as 689 to 775 kilometers (Tuttle 1976b, Tuttle and Kennedy 2005).

Gray bats are reproductively mature at two years of age (Miller 1939, Tuttle 1976a) and mate between September and October. Copulation occurs upon arrival at hibernating caves, whereupon females immediately enter hibernation. Mating males may take a few weeks to replenish fat stores, but are typically in hibernation by early November (Tuttle 1976b, Tuttle and Stevenson 1978). Adult females store sperm throughout hibernation, a strategy known as delayed fertilization, and pregnancy begins following their spring emergence (Krulin and Sealander 1972). After a gestation period of 60 to 70 days (Saugey 1978), females give birth to one pup between late May and early June. Newborn young weigh approximately one-third of their mother's weight and are volant within 21-33 days (Tuttle 1976b, Harvey 1994, Tuttle and Kennedy 2005).

In summer, female gray bats form maternity colonies of a few hundred to many thousands of individuals. Nursery colonies typically form on domed ceilings of caves that are capable of trapping the combined body heat from clustered individuals and where the temperature ranges between 14° and 25° C (Harvey 1992, Harvey 1994, Tuttle and Kennedy 2005, Martin 2007). All other individuals not actively mating, both male and female, occupy caves on the outlying edge of the home range (Tuttle 1976b).

Gray bats feed exclusively on insects, with flies (Diptera), beetles (Coleoptera), caddisflies (Trichoptera), moths (Lepidoptera), wasps (Hymenoptera), stoneflies (Plecoptera), leafhoppers (Homoptera), and mayflies (Ephemeroptera) being the most important orders of insect prey (Rabinowitz and Turtle 1982, Clawson 1984, Brack 1985, Lacki *et al*. 1995, Best *et al*. 1997). Diet has been found to coincide most directly with the predominantly available prey species in the foraging area (Clawson 1984, Barclay and Bingham 1994), including both terrestrial and aquatic species (Clawson 1984). A study examining fecal remains conducted by Brack and LaVal (2006) indicates that gray bat diets fluctuate to a minor degree depending upon varying factors such as age, sex, and location.

Gray bat summer foraging is strongly correlated with open water of rivers, streams, lakes or reservoirs, where insects are abundant (Tuttle 1976b, LeVal *et al*. 1977). Results of surveys conducted in Tennessee indicate that wetland depressions are also important foraging sites for gray bats (Lamb 2000). Although the species may travel up to 35 kilometers between prime feeding areas over lakes and rivers and occupied caves, (LaVal *et al*. 1977, Tuttle and Kennedy 2005, Moore *et al*. 2017), most maternity colonies are usually located between 1-4 kilometers from foraging locations (Tuttle 1976b). Newly volant gray bats travel 0.0 – 6.6 kilometers between roost caves and foraging areas (Tuttle 1976a, Tuttle 1976b). At foraging sites, Tuttle (1976b) estimated that gray bats forage within roughly three meters of the water's surface. Abbreviated instances of bad weather in early spring and late fall are generally the only times gray bats deviate from primarily feeding along local bodies of water, and then they are found foraging in forest canopies (LaVal *et al*. 1977, Stevenson and Tuttle 1981).

Gray bats are known to establish foraging territories as insect numbers drop after dusk. Territories are controlled by reproductive females, which annually return to preferred territories (Brady *et al*. 1982, Goebel 1996). Gray bats tend to have large home ranges. Thomas and Best (2000) reported non-reproductive gray bats (males and females) from one northern Alabama cave foraged over areas of approximately 97 square kilometers. Moore *et al.* (2017) found reproductive female gray bats in Arkansas had a larger home range than previously thought, with

an average of 159 square kilometers, and they depend on water for foraging and traveling. The home range for reproductive females may change depending on reproductive status, but could also change based on colony size, insect abundance, habitat continuity, land use, or a combination of these factors (Moore *et al.* 2017). During times of limited food resources, males and pre-reproductive females may be excluded from foraging territories (Stevenson and Tuttle 1981).

Forested areas along the banks of streams and lakes serve as corridors for travel and as protective feeding cover for newly volant young (Tuttle 1979, Brady *et al*. 1982, Moore *et al.* 2017). Whenever possible, gray bats of all ages fly in the protection of forest canopy between roosts and feeding areas (USFWS 1982). In addition, young often feed and take shelter in forest areas near the entrance to cave roosts (Tuttle 1979). Individuals may also fly overland from relatively land-locked roost sites to reach the main river channel or tributary systems that lead to open-water foraging sites (Thomas 1994, Best and Hudson 1996). Gray bats do not feed in areas along rivers or reservoirs where the forest has been cleared (LaVal *et al.* 1977).

Young, non-volant gray bats experience healthy growth rates because their energy expenditure for thermoregulation is reduced by the roosting colony (Herreid 1963, 1967). In undisturbed colonies, young may take flight within 20 to 25 days after birth. However, young may not become volant for 30 to 35 days if disturbed (Tuttle 1975). Hunting is primarily learned by young on their own after learning to fly (Stevenson and Tuttle 1981), though lactating females will continue to nurse their offspring for a short time after they become volant. Survival and growth of volant young is inversely proportional to the distance travelled for shelter and food (Tuttle 1976a). Roosts are cool during this period of lactation and females are often required to feed continuously to sustain the high body temperatures required to nurse (Tuttle and Stevenson 1977). Distance traveled to feeding areas may also be correlated with adult mortality (Martin 2007).

Gray bats have been recorded as living up to 17 years (Harvey 1992, Tuttle and Kennedy 2005), with a mean annual survival rate of 70 percent in males and 73 percent in females (Gunier and Elder 1971). While survivorship among juveniles is relatively high (Saugey 1978), only 50 percent of gray bats reach maturity (USFWS 1980). Therefore, approximately five years are required for a female gray bat to produce two surviving offspring. Mortality rates are higher during the spring migration when fat stores have been expended and food resources can be scarce (Tuttle and Stevenson 1977).

3.1.2. Status and Distribution

The gray bat largely occupies a limited geographic range in karst areas of the southeastern United States. They are mainly found in Alabama, northern Arkansas, Kentucky, Missouri, and Tennessee. A few can be found in northwestern Florida, western Georgia, southeastern Kansas, southern Indiana, southern and southwestern Illinois, northeastern Oklahoma, northeastern Mississippi, western Virginia, and western North Carolina.

In the late 1970s, Tuttle (1979) estimated the total population to be approximately 2.25 million. The population was estimated at only 1.6 million in the early 1980s (Brady *et al*. 1982) and fell to 1.5 million within the next 10 years (Harvey 1992). By 2001, the population increased to 2.3

million (Mitchell and Martin 2002), and again to 2.5 million in 2003 (Harvey *et al.* 2004). This is a net increase in population size of approximately 10 percent between the 1970's and 2003, and an increase of 40 percent from the smallest population estimate. The status of hibernating populations of gray bats was further reviewed in 2006 (Harvey and Currie 2007). At that time, the population was estimated at 3,377,100 – an estimated increase of 104 percent from 1982 (Harvey and Currie 2007).

As defined in the Gray Bat Recovery Plan, Priority 1(P1) hibernacula include caves occupied now or in the past by more than 50,000 gray bats in northern Alabama and Tennessee, and 25,000 elsewhere (USFWS 1982). Most of the 17 current P1 caves were designated in the recovery plan, but several additional caves have been identified as having significant winter populations in more recent times. From 2013 -2015 many of the 17 P1 hibernacula were surveyed, however not all caves were surveyed in the same winter. In 2017, winter surveys of all P1s were conducted, including the largest hibernaculum, Fern Cave in Alabama. This coordinated, rangewide effort provided the best opportunity in decades to estimate the gray bat population, now estimated at approximately 4,358,263 (Shauna Marquardt pers. comm.).

3.1.3 Threats

The primary cause of gray bat population decline is human disturbance of their natural habitat (Barbour and Davis 1969, Mohr 1972, Harvey 1975, Tuttle 1979, USFWS 1982, USFWS 2009b), with wintering sites and maternity roosts being especially susceptible to disruption. Commercialization of caves that allows for public access, spelunking, and looting for archaeological artifacts are activities that most commonly result in disturbance to roosting bats (USFWS 1982, USFWS 2009b). Disturbance in the hibernacula occurs when a human enters the cave and bats wake from hibernation, using vital energy stores that cannot be recovered before emerging in the spring (Tuttle 1976b). Approximately 20 to 30 days of stored energy is depleted with each arousal (Daan 1973). Losing these fat stores can cause bats to leave the roost prematurely in search of food during unsuitable circumstances, which may result in high mortality rates. During the first hour of arousal, individuals may lose up to 0.48 g of body weight; a significant amount when contrasted with the typical hibernation losses of 0.01 g per day (Brady *et al*. 1982). When this human interference occurs in maternity caves it is typically most devastating in late spring and early summer (May to July), as non-volant offspring are in the roost. Thousands of bats may die from a single disruption (USFWS 1982). In addition, Stevenson and Tuttle (1981) found that banded gray bats tended to avoid roosts where they had been handled by researchers.

Humans are also impacting the environment in other ways that can negatively impact bats. Deforestation close to cave entrances, at foraging sites, and along commuting routes is likely to have negative effects due to the removal of prey abundance and reduced cover from natural predators (Tuttle 1979). Recently-volant young are especially susceptible to the effects of deforestation, as they require the protection of forest cover while becoming proficient fliers.

Insecticide use historically had a detrimental impact on gray bat populations (Clark *et al.* 1978, Clark *et al.* 1988), though many of the toxic substances are now banned from the market. The longevity, high metabolic rate, and insectivorous diet of bats increases their likelihood of exposure to bioaccumulating chemicals in the environment. While modern pesticides (e.g.,

organophosphates, neonicotinoids, pyrethroids, carbonates) aren't expected to bioaccumulate in tissues, they are still a concern, are highly toxic, and may kill bats from direct exposure (Shapiro and Hohmann 2005). The presence of other contaminants of concern that can bioaccumulate (e.g., pharmaceuticals, flame retardants) has been documented in bats (Secord *et al.* 2015), though additional research is needed to understand impacts. Additionally, pesticides and other pollutants could indirectly impact bats by reducing insect populations.

Siltation and nutrient loading of waterways where bats forage and drink may negatively affect the species. As previously stated, a large portion of the gray bat diet is comprised of adult aquatic insects such as mayflies, stoneflies, and caddisflies. These groups of aquatic insects are especially susceptible to degraded water quality. Any substantial declines in the populations of these insects may have a detrimental effect on gray bat populations as well (USFWS 1982). Tuttle (1979) presented a correlation between a decline in gray bat numbers and an increase in sedimentation in several Alabama and Tennessee waterways.

Tied to increased waterway siltation is impoundment of streams and rivers to create reservoirs. While it was originally suspected that this practice would increase suitable foraging habitat for gray bats, it was ultimately found that the opposite is true (USFWS 1982). Disturbance to roosting bats using caves adjacent to these impoundments has also been observed. Noise from passing watercraft increased, as did access to cave roosts previously far from population centers and roads (USFWS 1982).

Gray bat populations could also be impacted by temperature and precipitation changes due to climate change. Climate change will likely affect the distribution of suitable hibernacula for bats (Humphries *et al.* 2002). Since gray bats are a cave-obligate species, requiring highly specific hibernacula and maternity caves, they are acutely at risk from fluctuating climate conditions. As temperatures rise, conditions within gray bat hibernacula and maternity caves could change, making them less suitable. In addition, the increase in overall temperatures may lead to earlier arousal from hibernation, resulting in higher energy expenditure and potentially premature parturition (Sherwin *et al.* 2013). Changes in precipitation is also of concern. Under drought conditions, bats have to travel further distances for food and more rainfall could inhibit insect flight and decrease prey availability. These changes could have particularly adverse effects on nursing females, as the energy costs associated with traveling longer distances for food and water result in longer lactation times, slowing overall juvenile development (Tuttle 1976b, Adams 2010). Furthermore, increased frequency of severe storms could lead to flooding of important roost sites.

Another potential threat to gray bat populations is the fungal disease white-nose syndrome (WNS). The disease is caused by the fungus *Pseudogymnoascus destructans*, which grows on the wings, ears, and muzzle of hibernating bats (Cryan *et al.* 2013). Since its discovery in New York in 2006, WNS has had an overwhelmingly negative effect on North American hibernating bats, eradicating millions of individuals. Mortality rates in afflicted bats often exceed 90 percent (Thogmartin *et al.* 2013). Bats that have been infected with WNS display erratic changes in behavior including day-time flying and increased frequency of arousal during hibernation (Cryan *et al.* 2013).

In 2012, USFWS confirmed the first instance of WNS in gray bats (USFWS 2012b). The full impact of WNS on overall gray bat populations is still being determined. It seems plausible that WNS would pose a serious threat to a species like the gray bat, where individuals overwinter in few high-density hibernacula, should it infect those colonies. However, some studies have found that *P. destructans* may not spread through gray bat colonies as quickly as once expected, nor be as substantial a threat to the species as initially suspected (Flock 2014, USFWS 2014b). As of spring 2017, the species has yet to experience any WNS-related declines and their populations appear to have remained stable within Tennessee (Bernard *et al.* 2017) and Virginia (Powers *et al.* 2016). Several behavioral traits, such as preferred microclimates within hibernacula and sustained activity and foraging throughout winter (Bernard and McCracken 2017) may enable this species to prevent or minimize the colonization of *P. destructans* during torpor.

3.2 APPALACHIAN ELKTOE

This section summarizes best available data about the biology and current condition of Appalachian elktoe (*Alasmidonta raveneliana*) throughout its range that are relevant to formulating an opinion about the Action. The USFWS published its decision to list Appalachian elktoe as endangered on September 3, 1993. There is no designated critical habitat for this species in the Action Area.

3.2.1 Species Description and Life History

Lea (1834) described the Appalachian elktoe from the French Broad River system in North Carolina. Its shell is thin but not fragile, oblong, and somewhat kidney-shaped, with a sharply rounded anterior margin and a broadly rounded posterior margin. Parmalee and Bogan (1998) cite a maximum length of 8 cm. However, individuals from the Little River (French Broad River basin) in Transylvania County and West Fork Pigeon River (French Broad River Basin) in Haywood County measured more than 9.9 cm in length (USFWS 2009b). The periostracum (outer shell) of the Appalachian elktoe varies in color from dark brown to yellowish-brown in color. Rays may be prominent in some individuals, usually on the posterior slope, and nearly obscure in other specimens. The nacre (inside shell surface) is a shiny bluish white, changing to salmon color in the beak cavity portion of the shell. A detailed description of the shell characteristics is contained in Clarke (1981). Ortmann (1921) provides descriptions of the soft anatomy.

The reproductive cycle of the Appalachian elktoe is similar to that of other native freshwater mussels. Males release sperm into the water column, and the sperm are then taken in by the female through their siphons during feeding and respiration. The females retain the fertilized eggs in their gills until the larvae (glochidia) fully develop. The mussel glochidia are released into the water, and within a few days they must attach to the appropriate species of fish, which they parasitize for a short time while they develop into juvenile mussels. They then detach from their fish host and sink to the stream bottom where they continue to develop, provided they land in a suitable substrate with the correct water conditions (USFWS 2002). The Appalachian elktoe is a bradytictic (long-term) breeder, with the females retaining glochidia in their gills from late August to mid-June (USFWS 2009). Glochidia are released in mid-June, attaching to either the gills or fins of a suitable fish host species. Transformation time for the Appalachian elktoe occurs within 18 to 22 days at a mean temperature of l 8°C. The Appalachian elktoe can use a variety of

common fish hosts but appears to specialize on darters and sculpins, which are common in the action area

3.2.2 Status and Distribution

The Appalachian elktoe is known only from the mountain streams of western North Carolina and eastern Tennessee. It is found in gravelly substrates often mixed with cobble and boulders, in cracks of bedrock, and in relatively silt-free, coarse sandy substrates (USFWS 1996).

Although the complete historic range of the Appalachian elktoe is unknown, available information suggests that the species once lived in the majority of the rivers and larger creeks of the upper Tennessee River system in North Carolina, with the possible exception of the Hiwassee and Watauga River systems (the species has not been recorded from either of these river systems). In Tennessee, the species is known only from its present range in the main stem of the Nolichucky River. At the time of listing, two known populations of the Appalachian elktoe existed--the Nolichucky River, including its tributaries (the Cane River and the North Toe River), and the Little Tennessee River and its tributaries. The record in the Cane River was represented by one specimen found just above its confluence with the North Toe River (USFWS 1996). Since listing, the Appalachian elktoe has been found in additional areas. These occurrences include extensions of the known ranges in the Nolichucky River (North Toe River, South Toe River, and Cane River) and the Little Tennessee River (Tuckasegee River and Cheoah River) as well as a rediscovery in the French Broad River basin (Pigeon River, Little River, Mills River, and the main stem of the French Broad River). Many of these newly discovered populations are relatively small in size and range.

The Appalachian elktoe has experienced declines in two populations across its range. A sudden die-off in the Little Tennessee River, once considered the largest and most secure population, began in 2005 and continued through 2015, when periodic monitoring efforts failed to find any live individuals. In 2017 and 2018, several individual Appalachian elktoe were found in the Little Tennessee River, indicating a remnant population, but the population is limited and only a tiny fraction of its previous size. Appalachian elktoe also have declined in the lower portion of the South Toe River, a tributary of the Nolichucky River. Appalachian elktoe are still present in the South Toe River, but at reduced densities. The other populations of Appalachian elktoe appear to be stable (Tuckasegee, Cheoah, and Pigeon Rivers) or expanding (French Broad River). A remnant population known in the Cheoah River since the early 2000's is presently being augmented by the NCWRC with hatchery-propagated individuals sourced from the Tuckasegee River. This effort appears to be successful in bringing this population back to a viable state. Prior to 2004, the French Broad River population appeared to be confined to two tributary streams (Little River, Mills River), but over the last few years the known range of Appalachian elktoe in the main stem of the French Broad River has expanded and now appears to be well established, albeit at low density, over a broad area.

3.2.3 Threats

The decline of the Appalachian elktoe throughout its historic range has been attributed to a variety of factors, including sedimentation, point and nonpoint-source pollution, and habitat

modification (impoundments, channelization etc.). The low numbers of individuals and the restricted range of most of the surviving populations make them extremely vulnerable to extirpation from a single catastrophic event or activity. Catastrophic events may consist of natural events, such as flooding or drought, as well as human influenced events, such as toxic spills associated with highways or railroads.

Natural flooding events combined with alteration of watersheds can lead to large fluctuations in abundance observed in Appalachian elktoe populations. Portions of the French Broad River basin and most of western North Carolina experienced catastrophic flooding in late summer 2004 as a result of Tropical Storms Francis, Ivan, and Jeanne. Numerous dead mussels, including the Appalachian elktoe, were observed in over-wash areas along the Little Tennessee River after the flood events. Additionally, surveys conducted in the Little Tennessee River after the flooding yielded noticeably lower catch per unit effort of live mussels, including the Appalachian elktoe, compared to past survey efforts in this section of the river (USFWS 2009).

Siltation resulting from improper erosion control of various types of land usage, including agriculture, forestry, road construction, and development, has been recognized as a major contributing factor to the degradation of mussel populations (USFWS 1996). Siltation has been documented to be extremely detrimental to mussel populations by degrading substrate and water quality, increasing potential exposure to other pollutants, and direct smothering of mussels (Ellis 1936, Marking and Bills 1979). Sediment accumulations of less than an inch have been shown to cause high mortality in most mussel species (Ellis 1936). The abrasive action of sediment on mussel shells has been shown to cause erosion of the outer shell, which allows acids to reach and corrode underlying layers (Harman 1974).

Sewage treatment effluent has been documented to significantly affect the diversity and abundance of mussel fauna (Goudreau *et al*. 1988). Goudreau *et al*. (1988) found that recovery of mussel populations might not occur for up to 2 RM (3.22 km) below points of chlorinated sewage effluent. Most of the water bodies where Appalachian elktoe still exist have relatively few point source discharges within the watershed and are rated as having "good" to "excellent" water quality (NCDWR 2012**,** USFWS 1996).

The introduction of exotic species, such as the Asian clam and zebra mussel (*Dreissena polymorpha*), has also been shown to pose significant threats to native freshwater mussels. The Asian clam is now established in most of the major river systems in the United States (Fuller and Powell 1973). At the time the Appalachian elktoe was listed, the Asian clam was not known from the stretch of the Little Tennessee River that it occupies; however, it has been observed in the Little Tennessee River in recent years and, as mentioned earlier, may be a contributing factor to the decline of that population. Concern has been raised over competitive interactions for space, food, and oxygen between this species and native mussels, possibly at the juvenile stages (Neves and Widlak 1987). When the Appalachian elktoe was listed, it was speculated that, due to its restricted distribution, it "may not be able to withstand vigorous competition" (USFWS 1996).

Another exotic species that has the potential to adversely impact aquatic species, including Appalachian elktoe, is the Japanese knotweed (*Fallopia japonica*). The plant is considered to be an invasive species that can reproduce from its seed or from its long, stout rhizomes. It can tolerate a variety of conditions, such as full shade, high temperatures, high salinity, and drought.

It can be spread by wind, water, and soil movement to an area where it quickly forms dense thickets that exclude native vegetation and greatly alter the natural ecosystem. This species has become established in riparian habitats throughout western North Carolina. The species has a very shallow root system; because of this shallow root system and its preclusion of other vegetation, areas where this species has been established may be susceptible to erosion during flood events.

4. ENVIRONMENTAL BASELINE

Under section 7(a)(2) of the Act, when considering the effects of an action on federally listed species, we are required to take into consideration the environmental baseline. The environmental baseline includes past and ongoing natural factors and past and present impacts from all Federal, state, or private actions and other activities in the action area (50 CFR 402.02), including Federal actions in the area that have already undergone section 7 consultation and the impacts from state or private actions that are contemporaneous with the consultation in progress. The environmental baseline for this Opinion considers all projects approved prior to the initiation of formal consultation.

4.1 GRAY BAT

4.1.1 Species Status and Distribution in the Action Area

Acoustic data and bridge checks indicate gray bats are present in the Action Area between mid-March and late-October. Gray bats were also present in lower numbers into early November. Although no roosts were found in the Action Area, maternity, bachelor, and transient roosts were identified near the Action Area on or directly adjacent to the FBR. Gray bat calls detected in the Action Area and bats equipped with transmitters and tracked in and through the Action Area are from these nearby roost sites. The acoustic data indicate gray bats are primarily foraging and commuting along the FBR. Fewer gray bat calls were identified at the six detectors located in non-riparian areas and along smaller streams. Emergence count data from known roosts in 2018 suggest at least 1,300 gray bats in the area. Of the 488 gray bats captured in 2018 as part of the Indiana State University research project, approximately 82% were adult males, 13% were adult females, 4% were juveniles and 1% unknown age. The sex ratio of the juveniles was roughly 27% female and 73% male.

In order to determine the presence and distribution of gray bats in the Action Area, 13 acoustic detectors were located along the length of the project (Appendix I). Since gray bats are known to use large rivers for foraging and commuting, the detectors were deployed primarily along the FBR or its larger tributaries in the I-26 corridor. On the southern end of the project, Detectors 1-4 were located on larger tributaries to the FBR and adjacent to existing I-26. Detectors 5-13 were located at sites adjacent to the project and the FBR.

4.1.1.1 Acoustic Surveys

Acoustic detectors 1- 4 were located on large tributaries to the FBR that are crossed by I-26. These detectors recorded low numbers of gray bat calls, indicating gray bats are present to the

southern terminus of the project. Detector site 5, the southernmost detector site adjacent to the river, produced a substantial number of gray bat calls.

Detector site 8 at the Blue Ridge Parkway overpass recorded 11 calls attributable to gray bats during three weeks of deployment. The acoustic detector located between the French Broad River and the Blue Ridge Parkway (Site 9), recorded very few bat calls, and no *Myotis* calls. Although these sites are located in one of the most heavily wooded portions of the Action Area, no sizable water features are present here which is the likely explanation for low gray bat activity.

Detector site 11, the I-26 crossing of the French Broad River, had a particularly high level of gray bat activity throughout the survey season, and consistently recorded more gray bat calls than any other detectors deployed during the same time frame. Furthermore, gray bats were active throughout the night, with pulses of activity just after dusk and just before dawn, especially after pups became volant.

Gray bats are very active at the I-26 crossing relative to other detector locations along the FBR. Bats were observed flying under the bridges, rather than over them, likely to avoid the light from passing cars, avoid the possibility of predation by crossing open areas over the highway, and/or because bats were foraging on emerging aquatic insects associated with the highly oxygenated water created by the rocky riverbed in this area. The two detectors that bracket Site 11 upstream and downstream did not exhibit the high numbers of gray bat calls observed at detector site 11. Given the concentration of calls at Site 11, gray bats aren't just passing through but appear to be choosing to spend time there and making multiple passes in front of the detector.

The NPS conducted separate acoustic surveys for bats during 2016 and recorded what they believe to be Indiana bats on Blue Ridge Parkway property near I-26. In a letter to NCDOT dated November 2, 2017 USFWS states their position that acoustic surveys conducted by NPS in 2016 were not conclusive for Indiana bats. During the process of vetting matching *Myotis* calls for the acoustic survey report associated with this project, none of the high-quality calls examined had call characteristics consistent with Indiana bats.

4.1.1.2 Structure Surveys

Twenty-four (24) bridges and 18 culverts in the Action Area were inspected between April 26, 2017 and July 27, 2017 for the presence of bats or evidence of bat use (guano, staining, and/or urine). Minimal bat use was noted on the Long Shoals Road bridge over the FBR. It is likely that the structure is used infrequently for night roosting bats and while it is located in the Action Area, is not scheduled for any work as part of the subject project.

4.1.1.3 Telemetry Surveys

Limited telemetry data indicate gray bats are flying through and foraging in the Action Area. NCWRC staff attached transmitters to two gray bats from the nearby maternity roost during 2016 and 2017. In 2016, two bats were tracked for 12 days and the bats returned to the roost each night. Bat A foraged along Hominy Creek in the area near Pond Road. Bat B foraged along the French Broad River just north of the I-40 crossing.

In 2017, three individuals were captured at the maternity roost and tracked for 13 days. On most nights, the bats returned to the maternity roost, however, one bat traveled over 20 mi. to a roost in Madison County on three nights. On seven nights, bat roost locations could not be found. Unlike the bats tracked in 2016, bats tracked in 2017 did not consistently return to the same foraging areas. One bat travelled south to forage along the French Broad River just north of Long Shoals Road. The other bats flew north from the roost and foraged along Hominy Creek, Bent Creek, Long Valley Lake, and various locations on the French Broad River.

In 2018, transmitters were placed on 90 bats as part of the Indiana State University Research Project, in part to collect information on foraging and commuting areas. Six bats were tracked via car from two roosts near the project area and were found foraging in areas south and north of the primary roost. Three of these bats foraged south of the primary roost, mostly along the FBR, but also in the Sandy Bottom area. Three bats foraged north of the primary roost and the project area around Hominy Creek and along the river south of Amboy Rd. Bats appear to forage mainly over water, usually the French Broad River and associated tributaries. Towers were also set up throughout the French Broad watershed to collect additional data on transmittered bats. Three of these towers were located within or very close to the project area and tagged bats were detected at all three.

4.1.2 Factors Affecting the Species' Environment in the Action Area

Development directly adjacent to the FBR has fragmented gray bat habitat by removing vegetation and creating more artificially lighted areas that the bats must avoid as they commute from roost areas to forage areas. In contrast, improvements in water quality in the FBR have likely increased the prey base and improved the overall ability of bats to feed over the river.

4.2 APPALACHIAN ELKTOE

4.2.1 Species Status and Distribution in the Action Area

In 2017, mussel surveys were conducted at 20 sites in the mainstem FBR. The sites were selected by the consultants, Three Oaks Engineering, based on habitat characteristics and were surveyed by methods suited to water depth, including using view buckets, snorkel and scuba gear. Appalachian elktoe were located at four sites in the FBR in the Action Area. Given the size and variability of habitats in the FBR, Appalachian elktoe could occur in low numbers throughout the Action Area. Any adults or juveniles present will occur in the riverbed, while glochidia may be attached to host fish that reside in or move through the Action Area in the FBR.

4.2.2 Factors Affecting the Species' Environment in the Action Area

French Broad River water quality in the Action Area historically suffered from industrial and agricultural pollution. Beginning in the 1970's, efforts were begun to reduce pollution and sediment entering the River. While the FBR is much cleaner today than in the past century, there are still threats from ongoing development. Portions of the FBR and several of the larger

tributaries are on the 303d list of impaired waters. There have been no previous formal sec.7 consultations for Appalachian elktoe in the FBR in the Action Area.

5. EFFECTS OF THE ACTION

Under section 7(a)(2) of the Act, "effects of the action" refers to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action. Direct effects are actions that may result in immediate effects to the species, including lighting construction areas, increased noise, the placement of temporary causeways in the FBR, land-clearing, and changes in water quality. Indirect effects are those caused by the proposed action that occur later in time but that are still reasonably certain to occur.

5.1 GRAY BAT

5.1.1 Factors to Be Considered

5.1.1.1 Proximity of the Action

Based on acoustic and telemetry surveys within the Action Area, the gray bat occurs throughout the Action Area from mid-March through October. Although measures to avoid and minimize impacts to gray bats are included in the project plans, implementation of the project will result in unavoidable impacts to habitat and individual bats.

5.1.1.2 Nature of the Effect

Commuting and foraging habitat along the FBR in the Action Area will be affected for the duration of the construction project. At the bridge replacement on the FBR, additional lighting and noise from construction equipment located on causeways at the river level will repel some bats from the river, causing them to find other areas to forage or forcing them to fly over the highway making them more susceptible to being hit by cars or predation. Riparian vegetation at the FBR that is removed during construction will allow more light and noise from traffic to reach the river, potentially repelling foraging bats. Pregnant or lactating females repelled from their forage areas may experience lower fitness and be more likely to lose pups due to longer flight distances to forage. In-stream habitat for aquatic insects in the footprint of the bridge construction will be impacted by the construction, and for some time after the construction is completed. Additionally, water quality impacts from construction and increased impervious surface runoff may decrease the FBR food and drinking water source quality, potentially impacting gray bat fitness.

5.1.1.3 Disturbance Duration, Frequency and Intensity

Gray bats will be affected by the construction from mid-March through October when they are present in the action area. Disturbance from increases in nighttime lighting and noise will exist until construction is complete. After the construction causeways are removed from the FBR, the

substrate and its invertebrate population will continue to recover for some period of time as the river has bankfull flows that resort the riverbed and reestablish the riffle section. The widened highway is likely to result in more permanent impacts from increased noise and lighting from an increase in vehicles, which may impact foraging and commuting bats. The clearing will further fragment habitat and may act as a barrier in certain locations since *Myotis* are reluctant to cross wide, open areas and some species of bats avoid large roads (Berthinussen and Altringham 2012a).

5.1.2 Analysis of Effects of the Action

5.1.2.1 Potential Beneficial Effects

Reduction of direct stormwater runoff at bridge locations.

Storm water from the existing bridge over the FBR and at Cane and Clear Creeks currently enters the streams directly from the bridge decks. The new bridges will collect and direct storm water to the ends of the bridges and discharge the deck drainage into vegetated buffers before entering the river. Stormwater coming off the approaching roadways at the bridge locations will be managed in a similar manner. The elimination of direct roadway discharge should result in localized improvement of water quality and potentially a beneficial effect on gray bat forage.

Reduction in Permanent Fill at French Broad River Crossing

Permanent fill in the form of bridge bents will be reduced upon completion of the new bridge. The existing bridges have five interior bents each, arranged on spread footings, with only one of these bents situated on land. The proposed bridge will have two bents, both in the water. This means more of the river bed will be available for colonization of aquatic fauna, including aquatic insects, which are the main food source for gray bats. Furthermore, gray bats will have fewer vertical impediments to navigate as they fly near the water surface while foraging and commuting.

5.1.3.2 Direct and Indirect Effects

5.1.3.2.1 Bridge Construction at the French Broad River

The FBR in the location where I-26 crosses is relatively narrow and the riparian corridor is densely wooded. The bridge serves as an underpass for bats, funneling them under the existing roadway as they commute and forage along the surface of the river (uses of underpasses by bats is discussed by Berthinussen and Altringham 2012b). Night construction activities in this area will affect gray bat foraging and commuting along the FBR. In addition, this river reach is a long riffle section, providings high quality habitat for aquatic insects and an excellent forage area for the gray bats. The effects to gray bats are described in detail below.

5.1.3.2.1.1 Light and Noise

The use of lighting after sunset will be necessary to complete some aspects of construction. Bats currently use this area and are accustomed to traffic noise and some night lighting from car

headlights as cars pass over the bridge but there is little traffic noise or light that reaches the surface of the river.

In order to prepare the construction site, and for the duration of construction of the new bridges, the night work that must be done at the river level and from the causeways that are located roughly at river level will increase lighting and noise that will likely repel bats from this area while at the same time drawing insects from the adjacent areas to the light. Activities that may require night lighting during the active season include access road construction, causeway construction and phasing, drilling new shafts, concrete pours, and setting new bridge beams.

Myotis sp. are light averse (Voigt 2018) and the addition of night lighting and construction noise at the water level and in the riparian corridor will repel some bats from the river in this location. If gray bats avoid areas that are brighter and noisier than they are accustomed to, this could lead to increased travel time/distance between their roosts and foraging areas and result in diminished fitness of adults and/or reduced survivorship of pups at nearby maternity roosts. Furthermore, some bats could be lost to predation and/or vehicle strike if they attempt to cross over the highway rather than using the underpass.

5.1.3.2.1.2 Construction Causeways

Fill associated with the temporary causeways placed in the FBR will affect both the area available for forage and the quality of the river corridor for commuting bats. Construction activities in the river are expected to take at least three years, and causeways will be in place for the duration of the bridge construction. The fill material used for the causeways may temporarily reduce habitat for aquatic insects, narrow the river through this reach, and create changes in river flows at normal and flood flows. Although the causeways have been designed to cover as little of the river as possible and remain in place as short a duration as possible, they will alter flows for the duration of the construction. Bats may be deterred from commuting under the bridge while causeways are in place and construction is ongoing.

5.1.3.2.1.3 Removal of Vegetation

Limited tree clearing will be necessary for construction at the FBR. Four temporary access roads will be constructed to reach the construction area of the bridge. Although retaining walls will be used to minimize the amount of necessary clearing, the access roads will require about 3.75 acres of clearing. On the northwest bank of the river, there is currently a gap in the canopy that spans roughly 134 ft. Clearing necessary to widen the roadway will result in an additional 175 ft. of open space. On the southeast side of the river, the riparian vegetation is somewhat fragmented by the one-lane Old River Road. The current break in the canopy is 195 ft. and an additional 45 ft. of clearing will be necessary. Gray bats often avoid large open spaces and could be deterred from commuting and foraging in this area until the planted trees mature.

5.1.3.2.2 Highway Widening Construction

The project closely parallels the FBR for about 2.5 miles. Gray bat calls were recorded at all the detector sites adjacent to the river. Therefore, we assume gray bats are using the entire length of the river within the Action Area for foraging and commuting at night and may be affected by construction activities occurring after dark and temporary habitat changes occurring during construction. Construction activities associated with the proposed widening project include

clearing, grubbing, grading, installation of pavement, culvert extensions and replacements, bridge replacements, striping, signs, and lighting. The effects to gray bats are described in detail below.

5.1.3.2.2.1 Light and Noise

For construction work that must take place at night, the lighting likely will be brighter than ambient light generated by headlights or nearby overhead lighting around interchanges or near developed areas. Night construction could take place at any time throughout the life of the project. The portion of the roadway roughly located between the Long Shoals Road (NC 146) interchange and the Brevard Road (NC 191) interchange currently has no overhead lighting, so all ambient light is generated by automobile headlights. Additional construction lighting will elevate the amount of ambient light.

Within the Action Area, gray bat activity is highest along the French Broad River which may limit their exposure to construction lighting and noise for the highway widening, particularly in the sections south of the airport where the river shifts to the west away from the interstate. At the Blue Ridge Parkway, more nighttime construction activities may occur, but based on the results of acoustic surveys, as well as NCWRC telemetry studies, gray bats do not appear to be very active here. Construction lighting and noise may exacerbate the barrier effect of roads, causing gray bats to modify their preferred foraging and commuting areas due to increased light and noise associated with construction activities.

5.1.3.2.2.2 Removal of Woody Vegetation

Removal of trees and clearing will likely have the most impact in the project section from the northern terminus to about Long Shoals Road. From that point south, most of the project will widen to the already-cleared area between the existing lanes of I-26. Clearing will begin almost immediately after the project is let for construction and may continue for a period of up to two years. Clearing may occur at different locations and at different times along the length of the project, depending on construction timing/phasing. Clearing activities will take place during daylight hours, but may occur during any time of year, with the exception of Blue Ridge Parkway property where tree clearing will occur between August 15 and May 15.

To avoid flying through active construction areas, gray bats with foraging areas or travel corridors within the Action Area will have to expend an increased amount of energy to establish new foraging areas or travel corridors. Additionally, they may be subject to increased inter- and intra-specific competition. These impacts could extend beyond the widening project if some individuals continue to alter foraging and commuting routes because of permanent increased fragmentation from the project. Bats remaining loyal to certain foraging areas may continue crossing newly-cleared areas, potentially increasing their risk of mortality from predation and vehicle strikes. It is unclear whether gray bats that regularly forage in the Action Area will experience difficulty in establishing new foraging areas due to the availability of suitable foraging habitat in the surrounding landscape.

5.1.3.2.2.3 Changes in Water Quality

NCDOT has implemented design changes to minimize impacts to surface waters and wetlands. However, not all impacts could be eliminated, NCDOT activities may negatively affect water

quality within the Action Area. These effects are anticipated to be short term in nature, and may include:

- Temporary sedimentation from land-clearing and earth moving activities such as preparation, installation of drainage features, utility installation, culvert installation/extension, and grading activities;
- Temporary sedimentation from in-water work associated with bridge demolition and construction activities such as investigative drilling for bridge footings, installation and removal of temporary causeways, removal of existing bents, and shaft drilling.

Eighty-six streams, in addition to the French Broad River, will be impacted in some way by the project. Most of them are small streams, which gray bats do not typically use for foraging and commuting, but activities associated with these streams may contribute to diminished water quality within the Action Area. Insects associated with aquatic habitats make up a large portion of the diet of gray bats (Rabinowitz and Turtle 1982, Clawson 1984, Brack 1985, Lacki *et al.* 1995, Best *et al.* 1997), and many species of aquatic insects can be negatively affected by a decrease in water quality (Hilsenhoff 1982, Lenat 1993, and Ramezani *et al.* 2014). Therefore, a decrease in water quality may adversely affect a portion of the prey base of the species.

Although water quality impacts may result in a reduction in specific portions of the prey base and drinking water quality for gray bats, adverse effects are likely to be undetectable due to other inputs into the FBR watershed. Therefore, we do not anticipate any measurable effect on gray bats due to potentially diminished water quality.

5.1.3.2.3 Highway Operation

Traffic is projected to increase along I-26 because of the capacity expansion (NCDOT 2014b). With this increase in traffic will come associated increases in light and noise from more cars and the greater potential for bat-vehicle collisions, predation and for bats to abandon formerly used foraging and commuting areas. The removal of vegetation will further fragment habitat and the widened road could act as a travel barrier since *Myotis* are reluctant to cross wide, open areas. Gray bats may avoid flying over a road of this size, and have to fly longer distances along foraging or migration routes, thus resulting in lowered fitness.

5.1.3.2.3.1 Lighting

Once the proposed roadway is in operation and traffic volume increases, the amount of light generated by headlights will increase. Gray bats travelling across or adjacent to the roadway, particularly in areas near the river, would be most susceptible to increased light, and may avoid these areas in the future, potentially altering their migration routes and lowering their fitness. At the I-26 crossing of the FBR, the current guardrail is concrete parapet with a retrofitted metal rail on top, and a metal guardrail addition on the side facing traffic. These features allow automobile headlights to shine through the railing and over adjacent airspace above the French Broad River. The replacement bridge will have a solid concrete “Jersey barrier” guard wall. This guardrail/wall type will be more effective in controlling the amount of light generated by passing vehicles that reaches the surrounding airspace.

5.1.3.2.3.2 Noise

Noise will increase with increased traffic volume. Volume between Long Shoals Road and Brevard Road is projected to increase the peak hour bidirectional traffic from 4,952 vehicles to 9,904 vehicles after construction is completed. Per the 2016 NCDOT Traffic Noise Manual, a 3 dB(A) increase in traffic noise is expected whenever the traffic volume is doubled.

Given the amount of gray bat activity at the French Broad River crossing, noise levels were further analyzed at this location. Using FHWA's Traffic Noise Model (TNM), version 2.5, 2011 base year noise levels on I-26 at the French Broad River are estimated to be 78 decibels (dB(A)). The 2040 design year noise levels with the project in place are predicted to be 76 db(A), a decrease of 2 dB(A). The reasons for the decrease in noise levels of 2 dB(A) are: 1) the existing dual bridges are being replaced with a single bridge, eliminating the potential for noise to pass through the gap (and under) the two existing bridges; and 2) the new bridge will feature concrete Jersey barriers in the median and as guardrails on the bridge shoulders, which, based on the TNM model, reduce traffic noise levels at nearby human receptors.

Given that gray bat activity is high at the I-26 crossing over the French Broad River, bats are not noticeably deterred by the noise from the current traffic volume at this location. There are no studies focused specifically on gray bats and noise effects. However, some studies suggest that Indiana bats (a congener) may be able to tolerate disturbance from vehicular traffic noise at a roost near a large airport (Sparks *et al.* 2009). Therefore, at this time we do not anticipate noise levels will adversely affect bats.

5.1.3.2.3.3 Vehicle Collisions and Increased Predation

Bats attempting to cross the interstate in the heavily wooded area between the Blue Ridge Parkway and Brevard Road will encounter a wider opening in the forest. Gray bats that attempt to cross over the roadway could be struck and injured or killed by passing vehicles. Bat mortality caused by impacts with passing vehicles is widely documented (Kiefer *et al.* 1995, Lesiński 2007, Gaisler *et al.* 2009, Russell *et al.* 2009, Lesinski *et al.* 2010, Medinas *et al.* 2013). Bat injury and mortality from vehicle strikes may increase within the Action Area from increased traffic.

5.2 APPALACHIAN ELKTOE

Under section 7(a)(2) of the Act, "effects of the action" refers to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action. The federal agency is responsible for analyzing these effects. The effects of the proposed action are added to the environmental baseline to determine the future baseline, which serves as the basis for the determination in this Opinion. Should the effects of the federal action result in a situation that jeopardizes the continued existence of the species, we may propose reasonable and prudent alternatives the federal agency can take to avoid a violation of section 7(a)(2).

The discussion that follows is our evaluation of the anticipated direct, indirect, and cumulative effects of implementing the proposed action. Direct effects are actions that may result in immediate effects to the species, including the placement of temporary causeways in the FBR, permanent impacts of new bridge bents in the FBR, land-clearing, and changes in water quality.

Indirect effects are those caused by the proposed action that occur later in time but that are still reasonably certain to occur. Cumulative effects are those effects of future state or private activities, not involving Federal activities, which are reasonably certain to occur within the action area of the proposed Federal action (50 CFR 402.02).

5.2.1 Factors to Be Considered

5.2.1.1 Proximity of the Action

Based on surveys of the FBR in the Action Area, the Appalachian elktoe occurs in the very low numbers patchily distributed through the Action Area. Although measures to avoid and minimize impacts to Appalachian elktoe are included in the project plans, implementation of the project will result in unavoidable impacts to habitat and may result in impacts to individual mussels.

5.2.1.2 Nature of the Effect

In-stream habitat in the FBR will be permanently affected by new bents in the river. About 400 sq feet of riverbed will be permanently lost. Temporary construction causeways also will affect habitat in the immediate vicinity of the I-26 crossing of the FBR.

Highway widening will impact about 86 jurisdictional streams in the Action Area primarily through culvert extensions, including 26 FBR tributaries directly crossed by the project. Bridges over Clear Creek and Cane Creek will be replaced.

5.2.1.3 Disturbance Duration, Frequency, and Intensity

The highway widening will create disturbance to tributaries and downstream resources that will be ongoing in different segments of the project for years. With appropriate sediment and erosion control measures, large inputs of sediment should be avoided during construction. After the project is completed and the roadway opens to traffic, there will be increases in stormwater runoff volume and pollutants, some of which may reach areas occupied by the Appalachian elktoe.

Disturbance to the riverbed from bridge construction will occur over a relatively short period of time from the construction of the bridge piers at the FBR crossing. The causeways for construction and demolition will be in place for the length of time needed to construct and demolish the bridges. Although there will be direct impacts to the riverbed associated with the causeways, the construction of the causeways will be phased to limit the amount of causeway in the river at any one time, and only the causeways needed for an activity will be in place during that activity and will be removed when the action is completed. There will be temporary impacts to river hydrology both upstream and downstream of the causeways.

5.2.3 Analysis of Effects of the Action

5.2.3.1 Potential Beneficial Effects

Reduction of direct stormwater runoff at bridge locations. Storm water from the existing bridge over the FBR and at Cane and Clear Creeks enters the streams directly from the bridge decks. The new bridges will collect and direct storm water to the ends of the bridges and discharge the deck drainage into vegetated buffers before entering the river. Storm water coming off the approaching roadways at the bridge locations will be managed in a similar manner. The elimination of direct roadway discharge should result in localized improvement of water quality due to pollutant filtration and sequestration on the upland. Reduced pollutant load should have some beneficial effect on the Appalachian elktoe.

Elimination of bents in the main river channel. The existing crossing of the FBR has three sets of double piers in the river channel that will be eliminated with a new spanning structure. The elimination of these piers in the FBR is expected to reduce the bridge's effects on stream flow patterns at the bridge site and may result in less chance of catching woody debris which can cause bed instability.

5.2.3.2 Direct and Indirect Effects

5.2.3.2.1 Construction Effects

5.2.3.2.1.1 Investigative Drilling

Investigative drilling for the I-26 Bridge footings will be conducted from the existing bridge deck and will require three 4-in diameter borings within each of the two bent locations: one at each edge for a total of six. Each boring will reach a depth of 25 to 30 ft. This work will be completed before the causeways are put in the FBR. Investigative drilling will be conducted during nighttime hours, drilling four holes per day and take one week to complete the work. The borings will cover about 75 sq. in. in total.

5.2.3.2.1.2 Temporary Access Roads

Temporary access roads will be constructed to transport materials and construction equipment to the bridge worksite. The access roads will be built parallel to I-26, one in each quadrant. The access roads will require approximately 3.75 acres to be cleared of trees and other vegetation. The temporary access roads, if not maintained properly, could transport sediment into the river until disturbed slopes become stabilized with riprap, matting, or other measures. Since the roads slope down toward the river, they could channel sediment directly into Appalachian elktoe habitat. Special sediment and erosion control measures have been developed for the bridge construction site to minimize negative effects.

5.2.3.2.1.3 Causeway Construction and Use

To construct the new bridges that carry I-26 over the FBR and demolish the existing structures, it is necessary to build temporary stone causeways adjacent to and in the FBR. Causeway size will be minimized as much as possible during each stage of construction to maximize the free flow area of the river. Causeway area will vary with the stages of construction, but are projected to

temporarily affect a total area of 1.01-acres. The total time causeways will be in place is about 3.6 years (186 weeks). With the primary causeways in place, the river free flow will be constricted to a maximum 58 percent of the normal cross-sectional area.

The long duration of causeway operation needed to construct this project creates an opportunity for related effects to Appalachian elktoe and the habitat near the construction area. The BA acknowledges that it is possible the rock causeway material may be washed away during high flow events, where it could have a negative effect on the species by crushing individuals or fouling of habitat. Additionally, the disruption of approximately 1.0 acres of stream bottom affected by the installation and removal of the causeways may cause temporary negative effects to the habitat. The BA concludes that the probability of this causing direct mortality is low, due to the low density of Appalachian elktoe in the area downstream of the project crossing. Also, because the habitat is bedrock dominant, the USFWS believes this habitat will likely revert back to its present suitability within a few years post construction and the probability of direct mortality is low.

The operation of causeways can also increase stream bed and bank scour near the project area. The hydraulic effects of placing causeways in the river were modeled by NCDOT to determine the effect of high flows on the river. The causeways will restrict river flow and can result in upstream pooling with an increase in water level, depending on the size of the causeways in place at a given time and the magnitude of the increased flow. This is not expected to cause negative effects to the Appalachian elktoe. The area downstream of the causeway will experience higher velocities while causeways are in place, and may experience higher rates of scour as a result. Scouring could affect any mussels in the riverbed, washing them downstream and/or causing shell erosion. Most of the riverbed where the causeways will be placed and immediately downstream is bedrock, so adverse effects to mussels from channel instability or scour are not anticipated as a result of increased river velocity. NCDOT proposes to avoid disturbance to the area downstream of the causeways to the extent possible and to monitor the area for scour. Monitoring for channel stability during construction will extend 100 ft. upstream and 250 ft. downstream of the causeway locations (USGS Monitoring plan). Should significant scour be detected, NCDOT has committed to making improvements to the causeway to prevent scour. The USFWS believes that the area most likely to be affected, being largely dominated by bedrock, may be affected temporarily, but is likely to return to suitability within a few years post construction.

In addition to the potential changes in hydrology as a result of the causeways, there is the potential for the causeways to act as velocity barriers to fish movement. The disruption of fish movement could impact the Appalachian elktoe if fish hosts for the elktoe are unable to move freely in the river. These temporary disruptions to fish movement may cause some loss in recruitment to upstream or downstream areas for the period of time the causeways are in place. The USFWS believes the direction of disruption of fish host travel is primarily in the upstream direction. Downstream migration of fish is unlikely to be affected as strongly due to the nature of the causeways and associated flow disruptions. Since the distribution of the bulk of the Appalachian elktoe population is upstream of the project, and host fish directional movement downstream is the most important direction of movement in this case, the USFWS believes this effect will be minimal.

5.2.3.2.1.4 Spills and Pollutant Discharge

The inadvertent spill or discharge of toxic pollutants, such as diesel fuel and hydraulic oil, into the river could result in mortality of Appalachian elktoe. Spills of construction fluids are not uncommon, and the long duration of heavy equipment use adjacent to waterways increases the possibility that a spill or discharge could occur, adversely impacting the river water quality. However, NCDOT has committed to conservation measures to refuel the equipment away from the water and to have spill kits near the equipment on the causeways, reducing the likelihood of a spill or discharge reaching the river. Spills could also take place near any other waterway and subsequently have an effect further downstream, but we believe normal spill response is capable of avoiding effects from minor spills. Major spills resulting from negligent operation are still possible, but unlikely.

5.2.3.2.1.5 Bridge Demolition and Construction

The replacement of the existing I-26 bridge will be on similar alignment to the existing bridge. The new bridge will be slightly larger than the existing structure, but due to longer spans will only have two bents in the river where the existing bridge had three. Due to the near exact replacement of the existing structure we do not expect significant stream alteration due to the placement of the existing bridge itself. There will be minor changes in the permanent fill. The new bridge will require an additional 400 ft^2. of river bottom habitat that will be permanently affected by fill for bridge bents; however, removal of most of the existing bridge foundations will offset most of this change. The changes in bent number and construction of causeways will likely cause some localized scour during and after construction. Given the prevalence of bedrock at the bridge crossing, the degree of riverbed scouring due to presence of bridge bents is not expected to increase from the present conditions.

During demolition NCDOT will remove the existing bridge using methods that minimize the amount of construction debris in the river, and due to the unknown nature of the existing foundation construction and condition, many decisions about removal will have to be made on site. Small amounts of bridge debris may fall into the river. However, it will be removed and we do not believe that small amounts of construction debris temporarily in the river will have any effect on Appalachian elktoe.

The drilling of support shafts for the new bridge involves a drilling fluid of bentonite clay and water. This mixture is typically recycled. The loss of large amounts of clay into the river could have a negative effect to water quality; however, our understanding of this process is that leaks of drilling fluid, though possible, would be quickly detected and remedied. We do not believe that this activity will have a negative effect unless there is a negligent discharge of drilling fluid.

5.2.3.2.1.6 Erosion and Sedimentation from Construction

Highway construction projects require significant earth moving activity. This includes clearing and grubbing, cut and fill, grading operations, etc. This project will also require the replacement of a large number of culverts and two bridges over Clear and Cane creeks. All activities that expose soil create an opportunity for runoff from the project into the river. This type of runoff from construction can negatively impact aquatic species, including the Appalachain elktoe. With a duration of five years or more and effects to 86 streams draining to the FBR, this project has significant potential to cause long duration widespread negative effects to Appalachian

elktoe and its habitat. Two previous population declines in this species coincided with erosive events. In the Little Tennessee River, hurricanes Frances and Ivan in 2004 caused major flooding resulting in landslides and chronically unstable banks throughout the watershed. Over the next few years, the population of Appalachian elktoe declined precipitously and is now critically imperiled. On the South Toe River, starting in 2013 a major road widening project began affecting dozens of tributaries of the South Toe River. Subsequently, the Appalachian elktoe population immediately downstream of this disturbance declined. Investigations into the mechanism that caused the decline are ongoing, but the proximity to potential erosive sources begs caution that this species is particularly sensitive to elevated levels of fine sediment.

The distribution of Appalachian elktoe in the FBR is currently in the upper portions of the river. As previously described in the species baseline, the Appalachian elktoe appears to be currently expanding in the FBR and the known downstream extent of this species has expanded further every year since 2005. The known downstream range of the Appalachian elktoe is presently just upstream of the mouth of Hominy Creek, around 5 miles downstream of the I-26 crossing of the FBR. The presence of two other species of mussel downstream of this record and extending all the way into Tennessee gives us reason to believe that the downstream expansion of the Appalachian elktoe will continue unless external factors halt the population expansion. Due to the above mentioned losses in two other populations, the long term stability of the FBR population is a key factor in recovering this species.

The erosion control measures incorporated into the proposed action will reduce the levels of sedimentation into the FBR, but these measures have a design limit based on the amount of rainfall received at the project area. Rainfall events that are greater than the erosion control design limits will result in sediment loss into the river. The baseline levels of suspended sediment in the FBR are already elevated due to cumulative activity in the watershed. However, this baseline suspended sediment has allowed for recent population expansion. In 2018 the Asheville region experienced the highest level of rainfall on record. The previous record year was 2013. The five year duration of this project makes it possible that periods of significant rainfall will occur during the construction. In order to reduce the number and likelihood of sedimentation events from rainfall resulting in water quality impacts, the NCDOT has proposed several conservation measures to improve erosion control efficacy, monitor effectiveness and to fund resource agencies to plan for species recovery in case of unforeseen circumstances. However; if conditions are atypical or if effects to the species are greater than anticipated, NCDOT and USFWS have agreed to collaborate to seek solutions. Accordingly, we have included a Term and Condition that the USFWS can request an onsite meeting to discuss the project at any time. This will allow for adaptive improvements and ensure that problems are addressed early and impacts minimized.

5.2.3.2.2 Operation Effects

The construction of this project will lead to additional road surface drainage to the French Broad River indefinitely. The operation of roads is known to increase the rate of runoff into the river, causing potential destabilization of sensitive habitat within. Roadway runoff contains pollutants that may affect aquatic species at high concentration. Roadways are also a primary threat for toxic spills that could affect the river habitat.

5.2.3.2.2.1 *Impervious Surfaces*

Widening I-26 will increase impervious surface in the Action Area. There is an estimated increase of roadway pavement of 117.9 acres with additional increases associated with interchanges and rest areas. The increased impervious surfaces will cause an increase in stormwater runoff. NCDOT has committed to implementing stormwater control measures throughout the project where they are practical. We believe that proper stormwater controls will reduce the effects of stormwater on the receiving streams, but not entirely eliminate stormwater effects on the river, especially when rainfall rates are high. The increased stream velocities may have adverse erosive effects on tributary channels resulting in additional sedimentation in the river habitat. The NCDOT has committed to fixing erosion problems at culverts in tributary channels during construction. Proper outfall conditions should further reduce some erosion within the tributary channels. Therefore, based on the present conditions in the action area, as well as the conservation measures proposed we do not believe that the increase in impervious surface will significantly impact the suitability of the habitat in the future.

5.2.3.2.2.2 *Roadway Runoff*

NCDOT has committed to funneling runoff from the FBR bridge off the bridge to a vegetated buffer, thereby reducing runoff from the current baseline. However, there will be additional runoff due to the additional impervious surface. Numerous pollutants have been identified in highway runoff, including various metals (e.g., lead, zinc, iron), sediment, pesticides, de-icing salts, nutrients (nitrogen, phosphorus), and petroleum hydrocarbons and many of these.can be harmful to mussels. Mussels present in the Action Area may experience locally increased exposure to runoff from the I-4400/I-4700 widening project and the resulting increase in impervious surface from the highway. The effects from roadway runoff will be long-lasting, spanning the life of the highway but will likely be sporatic and site specific. The long term effects of chronic exposure to roadway pollutants to mussels are poorly understood. The conservation funding provided by the NCDOT for activities aiding in the conservation of Appalachian elktoe will be expended to further study the health of the watershed, as well as the elktoe to aid in recovery of the species.

5.2.3.2.2.3 *Toxic Spills*

Toxic spills on roadways are a concern for aquatic species. This will be true any time large quantities of material are transported near waterways. Due to the large amount of existing roadway and train transport in the FBR basin, the widening of I-26 will not appreciably increase the probability of a spill.

5.2.3.2.2.4 *Induced Land Development*

Qualitative analyses of the probable development patterns in the FLUSA suggested that Project I-4400/I-4700 would not have a notable indirect effect on land use in the FLUSA (NCDOT 2016), so land use effects within the smaller Action Area should not be notable either. Potential land use effects as a result of the I-26 widening are limited because the project does not provide any new access or opportunities for traffic exposure to properties and will generate marginal travel time savings (NCDOT 2016).

5.2.3.2.2.5 *Interrelated/Interdependent Effects*

Interrelated actions are those that are part of the larger action and depend on the larger action for their justification. Similarly, interdependent actions are those that have no independent utility apart from the action under consideration (50 CFR §402.02).

Highway projects can induce changes in surrounding land use when they shorten commuting times or provide access to areas previously poorly served. These changes can be interdependent if they would not occur without construction of the project. The NCDOT studied the potential for changes in land use surrounding the Action Area (NCDOT 2016) and found that the nature of this project, as an upgrade to an existing roadway, without additional access along its length, would not induce significant amounts of additional development.

Another source of interrelated effects common to roadway projects is the siting of waste and borrow areas necessary for the temporary holding of construction materials. On large projects, the area necessary for waste, borrow and staging operations can be large and under certain conditions could create additional negative effects for aquatic species. NCDOT allows the contractor to manage placement and operation of the waste and borrow sites after the contract is awarded and does not consider effects of the waste and borrow sites to be part of the authorized action, however, NCDOT does provide standard guidance for borrow/fill sites that are intended to regulate the environmental effects of these areas and requires consultation with the Division Engineer if their placement could affect a federally listed species. If not for the proposed action, the waste and borrow sites would not be necessary. Therefore, we consider them interdependent to the proposed action. However, if NCDOTs standard guidelines are followed, we believe they will effectively minimize additional effects associated with these sites.

6. CUMULATIVE EFFECTS

<u>Gray bat and Appalachian elktoe</u>

Cumulative effects are defined under the ESA as "those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the Action Area of the Federal action subject to consultation" (50 CFR 402.02). Future federal actions unrelated to the proposed action are not considered because they require separate consultation pursuant to Section 7 of the ESA.

The Indirect Screening Report (NCDOT 2013a), the associated update (NCDOT 2017a), and the Asheville Regional Cumulative Effects Study (NCDOT 2014c) indicate the I-26 widening project will result in few indirect impacts and minimal cumulative effects. The majority of activities identified in these reports will likely require federal authorization requiring their own ESA Section 7 consultation, and would not be considered a cumulative effect under the ESA. However, since publication of these reports, a large residential development within the action area has received approval from the Asheville City Council. The planned Riverwoods residential development, a mix of approximately 167 single family residences with additional commercial space, is planned for property adjacent to the French Broad River near the I-26 crossing of the river. We anticipate that this development will require Section 7 consultation due to impacts to waterways, but at this stage it is not certain.

Considering the existing level of development within the French Broad watershed, coupled with large areas of forested habitat nearby (Biltmore, Pisgah Forest, Bent Creek), these cumulative effects are unlikely to alter the species baselines in a manner easily distinguished from the background disturbance of other activities within the Action Area. We are not aware of additional state, local or private actions that are reasonably certain to occur within the Action Area that would not be subject to section 7 review. Therefore, cumulative effects to gray bat and Appalachian elktoe are not expected to reach a measurable level, and are not addressed further in the Opinion.

7. CONCLUSION

7.1 GRAY BAT

After reviewing the current status of the gray bat; the environmental baseline for the action area; the effects of bridge construction, demolition, and highway widening; conservation measures incorporated into the proposed action; any potential interrelated and interdependent actions associated with the proposed action; and any cumulative effects, it is the USFWS's opinion that implementing this project is not likely to jeopardize the continued existence of the gray bat. No critical habitat for gray bat exists within the Action Area, therefore, non will be affected.

7.2 APPALACHIAN ELKTOE

After reviewing the current status of the Appalachian elktoe; the environmental baseline for the action area; the effects of bridge construction, demolition, and highway widening; measures identified in the NCDOT's BA to help minimize the potential impacts of the proposed project and assist in the protection, management, and recovery of the species; any potential interrelated and interdependent actions associated with the proposed action; and any potential cumulative effects, it is the USFWS's opinion that implementing this project is not likely to jeopardize the continued existence of the Appalachian elktoe. No critical habitat for Appalachian elktoe exists within the Action Area, therefore, non will be affected.

8. INCIDENTAL TAKE STATEMENT

Section 9 of the Act and federal regulations pursuant to section 4(d) of the Act prohibit the taking of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. Harm is further defined by the USFWS to include significant habitat modification or degradation resulting in death or injury to listed species by significantly impairing essential behavioral patterns, such as breeding, feeding, or sheltering. Harass is defined by the USFWS as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns that include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not for the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), incidental take is not prohibited under the Act, provided it is in compliance with the terms and conditions of this incidental take statement.

8.1 GRAY BAT

The USFWS anticipates incidental take of gray bats may occur as a result of the replacement of the I-26 bridge over the FBR and the widening of I-26. During construction, individual bats may be repelled from forage areas in the bridge footprint and along the river, reducing adult and juvenile fitness and affecting pup birth and health before they are able to fly and forage on their own. Additionally, more bats may be killed due to predation and car strikes if they are repelled from areas of active construction and forced to fly over the highway or more open areas.
No evidence of bat roosting was observed on any bridges or in any culverts to be included in project construction activities, therefore impacts to gray bats due to modification or elimination of summer roosts are not expected. The number of gray bats using the FBR within and near the action area is estimated at a minimum of 1300 individuals. An unknown number of these will be affected by the construction activities (including: temporary lighting, noise, causeways, decrease in water quality, and loss of woody vegetation). Most of the take associated with this project will be in the form of harm and harassment, but some mortality of adult bats, newly-volant juveniles, and non-volant pups is possible. Additionally, some loss of recruitment is expected due to stress on pregnant and lactating females and subsequent loss of pups. This harm is not expected to cause mortality of all individuals with in the Action Area, but could reduce fecundity and recruitment within the Action Area temporarily.

Data used to determine the number of gray bats in the Action Area is a conservative estimate, and gray bat populations are known to fluctuate seasonally and annually in a given area, therefore it is not possible to base the amount of incidental take on numbers of individual bats. Due to the difficulty of detecting take of gray bats resulting from the action, the amount of incidental take will be monitored using the duration of construction activities over and adjacent to the river, the most disruptive aspect of the project, as a surrogate measure of take. In order to limit the duration of this disruption, we believe that bridge construction activities extending beyond 5 years should be limited to work only during daylight hours so that the bats using the Action Area can resume normal behavior and return to the baseline condition. Therefore, the amount of incidental take will be exceeded if the night operations at the FBR bridge exceed five years.. If construction operations at the I-26 bridge cannot be completed in five years from the start of causeway construction without night operations, all work should stop, and the USFWS should be contacted immediately to reinitiate consultation.

In this Opinion, the USFWS has determined that this level of take is not likely to result in jeopardy to the gray bat. In addition to the subsequent measures listed in the Reasonable and Prudent Measures and Terms and Conditions sections of this Opinion, the measures listed in the Conservation Measures section of this opinion must be implemented for this determination to remain valid.

8.2 APPALACHIAN ELKTOE

The USFWS anticipates incidental take of the Appalachian elktoe may occur as a result of the construction of the bridge at the FBR. During construction, individual mussels may be crushed, harmed by siltation or other water quality degradation, or dislocated because of physical changes in their habitat. Appalachian elktoe were only found in the Action Area during 2017 surveys for this project.. Our knowledge of the density and distribution of Appalachian elktoe in the Action

Area is based on a small number of documented occurrences. Surveys for this project identified five individual Appalachian elktoe at four total sites.

The survey data is not sufficient to populate a robust population model, but in an effort to estimate potential take, the USFWS applied a simple model incorporating survey effort and catch rates to estimate a baseline density for Appalachian elktoe in the Action Area. We estimated an experienced surveyor could reasonably cover 400 square meters in an hour of surveying. The mussels are not always at the surface, and due to difficulty seeing the small aperatures in the substrate, surveyors are not likely to find every mussel. To compensate for this we estimated that a capture efficiency of 25% was reasonable based on previous experience with mussel survey techniques, i.e. the number of mussels found reflect 25% of the total mussels in a given area. Therefore, the model estimates an Appalachian elktoe density of of 0.0005 mussels per square meter in the Action Area.

This project proposes to directly affect around 1.04 acres of habitat that will be covered by rock causeways. Based on the estimated density, we expect around 2 Appalachian elktoe to be in the area buried by causeway installation. This area has been surveyed on at least two occasions and no Appalachian elktoe have been seen in the area to be affected by the causeway. Therefore we expect take from this activity to result in mortal take of two or fewer individuals.

Due to the large extent and duration of this project, it is possible Appalachian elktoe in the Action Area will be affected by indirect habitat degradation from sediment eroded from the project and from the degradation of channels receiving additional stormwater from the project. Applying the model density to the area of habitat in the Action Area returns an estimated population of 821 adult Appalachian elktoe in the Action Area. In order for the population to remain stable, recruitment in the action area needs to equal natural mortality in the population. Appalachian are estimated to live about 12 years with about 10 years of reproductive lifespan. That requires a recruitment rate of 0.10 annually, in this case 82 new recruits per year that could be affected by project related effects.

Conservation measures outlined in the BA are intended to minimize indirect effects due to sedimentation in the FBR. Even under standard construction conditions, we expect Appalachian elktoe within the Action Area may be harmed by the presence of turbidity or settling of sediment in depositional portions of its habitat. We expect this effect to be non-lethal harm to adults that could result in temporarily reduced recruitment throughout the duration of the project. The effects of sediment pollution within the Action Area should not reach a level prevents recolonization of the Action Area after construction. Prolonged increases in sediment transport in Appalachian elktoe habitat could cause habitat alteration that would prevent future population growth even after construction is finished. Due to the difficulty of measuring these effects directly, the NCDOT proposes monitoring project erosion control with a study conducted by the USGS. USGS proposes to use existing water quality data available from the NCDEQ and combine it with pre-construction data collected from USGS monitoring stations to measure a baseline turbidity. If the monitoring stations record an increase in turbidity greater than normal variation in the flow-corrected pre-construction monitoring data, the USFWS will reinitiate consultation with the FHWA to address the causes of the additional turbidity.

We believe the conservation measures and monitoring included in the BA are sufficient to reduce the effects of construction such that the population of Appalachian elktoe in the French Broad is likely to remain healthy and viable into the future. Therefore, in this Opinion, the USFWS has determined that this level of take is not likely to result in jeopardy to the Appalachian elktoe. In addition to the subsequent measures listed in the Reasonable and Prudent Measures and Terms and Conditions sections of this Opinion, the measures listed in the Conservation Measures section of this opinion must be implemented for this determination to remain valid.

9. REASONABLE AND PRUDENT MEASURES

The USFWS believes the following reasonable and prudent measures are necessary and appropriate to minimize take of the gray bat and Appalachian elktoe. These non-discretionary measures include, but are not limited to, the commitments in the BA and the terms and conditions outlined in this Opinion.

1. The USFWS must be notified of any project modifications.

10. TERMS AND CONDITIONS

In order for the exemption from the take prohibitions of section 9(a)(1) of the ESA, the NCDOT must comply with the following terms and conditions, which implement the reasonable and prudent measures described previously and outline required reporting and/or monitoring requirements. These terms and conditions are non-discretionary. As necessary and appropriate to fulfill this responsibility, the NCDOT must require any permittee, contractor, or grantee implement these Terms and Conditions through enforceable terms that are added to the permit, contract, or grant document.

1. NCDOT will adhere to all measures listed in the Conservation Measures section of this Opinion and in the BA.

2. NCDOT will simultaneously notify USACE and USFWS of any permit modification requests.

3. A USFWS biologist will be invited (at least seven days prior) to the preconstruction meeting(s) to review permit conditions and discuss any questions the contractor has regarding implementation of the project. After the contractor submits plans for various stages of the project, a USFWS biologist will review and provide comments on the plans and will be invited to attend any meetings to discuss implementation of the plans.

4. During construction, culvert inlets and outlets will be evaluated by the resident engineer with regard to stream stability immediately following installation and quarterly for a period of 1 year at each location. Indicators of instability, such as head cutting, scour, aggradation, or degradation, will be used to determine the need for corrective actions.

5. A final field inspection will be held with the contractor to evaluate culvert placement and stream stability before the project is considered complete. If instability is detected during any of these reviews, corrective actions will be performed when deemed necessary by the engineer or

by the conditions of any federal and state permits required by Section 404/401 of the Clean Water Act.

6. USFWS can call for a site meeting with NCDOT at any time to evaluate and discuss erosion control effectiveness.

7. To minimize impacts to gray bat, NCDOT will not install the causeway material at night in the French Broad River between April 15th and October 1st.

8. Modern bat modular roost panels or comparable structures will be installed on three bridges over the French Broad River and/or tributaries within or close to the Action Area. Panels should be constructed of fiber reinforced concrete with additives to mimic thermal mass and should be mounted using metal. Bridge selection and panel placement/design should be informed by work currently being conducted by Indiana State University. Panels should be checked for bat use once in early summer and once in late fall for three years following placement. The details of bat box location and installation will be decided by a committee to include USFWS, NCWRC, and NCDOT.

9. NCDOT will monitor bat activity post construction for up to three years.

NCDOT has committed to conduct acoustic monitoring for gray bats at the FBR bridge after construction of the bridge and after work ceases in the area surrounding the bridge (see consultation history). Monitoring should occur for a minimum of one season and maximum of three seasons. Monitoring can cease when activity levels resume to pre-construction levels (see 2017 and 2018 acoustic data) or after three seasons. NCDOT will also conduct three years of emergence counts at the BRP bridge, Marshall bridge, and the culvert roost using the same methods as counts conducted by Indiana State University so data can be compared. Partners including NCWRC and USFWS can assist with these counts. The details of post construction monitoring will be decided by a committee of USFWS, NCWRC, and NCDOT staff. Information gathered will help assess impacts from the project and will inform future consultation and conservation efforts. Information will also help establish a baseline for the connector project.

10. A special area will be designated from project Station 1078+00 to Station 1230+67 (Brevard Road to the Blue Ridge Parkway) where the following requirements will apply:

- The contractor will submit a comprehensive grading plan before starting any cut or fill work in this section for the approval of the division construction engineer. The plan shall include:

    a. The number and makeup of the crews working in this area;

    b. A narrative outlining a systematic approach to removing cut and placing fill including a proposed time for each operation.

- No more than 10 acres of cut and or fill open in this area without prior approval by the engineer.
- All access roads will be covered with railroad ballast or larger stone to prevent the loss of material.

- The contractor shall submit an access road construction plan for the Blue Ridge Parkway access road for review and approval by the division construction engineer.
- All cut and fill slopes are to be matted in this section of the project.

11. Energy dissipators will be installed at the following 18 sites to reduce post construction stormwater.

Location of Concrete Energy Dissipators

Station Location	Permit Drawing Site Number	Outfall Stream or Wetland ID
EBL between 940 and 941	Site 11	WBV
EBL between 951 and 952	Site 11	WBV
EBL approximately 1030		Near WCH
EBL between 1037 and 1038		Near WCH
EBL between 1044 and 1045		Near WCH
EBL approximately 1047		Near WCH
WBL between 1090 and 1091	Site 23	SDK
WBL approximately 1105	Site 28	SDY
WBL between 1115 and 1116 (in median)	Site 30	SDX
WBL between 1117 and 1118 (in median)	Site 30	SDX
WBL between 1118 and 1119 (in median)	Site 30	SDX
WBL between 1131 and 1132	Site 32	SEQ
WBL approximately 1135		Near WCW
WBL approximately 1138		Near WCW
WBL between 1148 and 1149	Site 37	SEF
WBL between 1155 and 1156	Site 38	SEE
WBL between 1157 and 1158	Site 38	SEE
WBL approximately 1173	Site 41	SFG

11. MONITORING AND REPORTING REQUIREMENTS

In order to monitor the impacts of incidental take, the NCDOT must report the progress of the Action and its impacts on the species to the USFWS as specified in the Incidental Take Statement. This section provides the specific instructions for such monitoring and reporting. As necessary and appropriate to fulfill this responsibility, the NCDOT must require any permittee, contractor, or grantee implement these Terms and Conditions through enforceable terms that are added to the permit, contract, or grant document. Such enforceable terms must include a requirement to immediately notify the NCDOT and USFWS if the amount or extent of incidental take specified in this Incidental Take Statement is exceeded during action implementation.

USGS geomorphology and surface water condition Erosion Control Monitoring

A final project report will be produced to describe the methodology and results from monitoring streamflow, precipitation, continuous and discrete water-quality, and geomorphology in Focus Areas 1 and 2. The report will summarize conditions before, during, and after NCDOT construction activities and will be provided to the Service.

Bat Activity Monitoring

NCDOT will provide a final report and yearly monitoring summaries starting at the end of the first monitoring season.

12. REINITIATION NOTICE

Formal consultation for the I-26 Widening project is concluded. Reinitiation of consultation is required by law if:

a. the amount or extent of incidental take is exceeded;
b. new information reveals that the Action may affect listed species or designated critical habitat in a manner or to an extend not considered in this BO;
c. the Action is modified in a manner that causes effects to listed species or designated critical habitat not considered in this BO; or
d. a new species is listed or critical habitat designated that the action may affect.

LITERATURE CITED

Abbott, I. M. 2012. Assessment of the effectiveness of mitigation measures employed on Irish national road schemes for the conservation of bats. Ph.D. thesis, University College Cork, Ireland.

Abbott, I. M., F. Butler, and S. Harrison. 2012a. When flyways meet highways – The relative permeability of different motorway crossing sites to functionally diverse bat species. *Landscape and Urban Planning*. 106(4):293-302.

Abbott, I. M., S. Harrison, and F. Butler. 2012b. Clutter-adaptation of bat species predicts their use of under-motorway passageways of contrasting sizes—a natural experiment. *Journal of Zoology*. 287:124–132.

Adams, R. A. 2010. Bat reproduction declines when conditions mimic climate change projections for western North America. *Ecology*. 91(8):2437–2445.

Bach L., P. Burkhard, and Limpens H. J. G. A. 2004. Tunnels as a possibility to connect bat habitats. *Mammalia.* 68:411–420.

Barbour, R. W., and W. H. Davis. 1969. *Bats of America*. The University of Kentucky Press, Lexington, Kentucky.

Barclay, R. M. R. and R. M. Bingham. 1994. Constraints on optimal foraging: A field test of prey discrimination by echolocating insectivorous bats. *Animal Behavior*. 48:1013-1021.

Bernard R.F. and G.F. McCracken. 2017. Winter behavior of bats and the progression of white-nose syndrome in the southeastern United States. *Ecol Evol*. 7:1487–1496.

Bernard, R. F., E. V. Willcox, K. L. Parise, J. T. Foster, and G. F. McCracken. 2017. White-nose syndrome fungus, Pseudogymnoascus destructans, on bats captured emerging from caves during winter in the southeastern United States. *BMC Zoology*, 2(1):12.

Berthinussen A. and Altringham, J. 2012a. The effect of a major road on bat activity and diversity. Journal of Applied Ecology, 49: 82-89.

Berthinussen A. and J. Altringham. 2012b. Do Bat Gantries and Underpasses Help Bats Cross Roads Safely? *PLoS ONE*. 7(6):e38775.

Best, T. L. and M. K. Hudson. 1996. Movements of gray bats (*Myotis grisescens*) between roost sites and foraging areas. *The Journal of the Alabama Academy of Science*. 67:6-14.

Best, T. L., B. A. Milam, T. D. Haas, W. S. Cvilikas, and L. R. Saidak. 1997. Variation in diet of the gray bat (Myotis grisescens). *Journal of Mammalogy*. 78:569-583.

Boonman, M. 2011. Factors determining the use of culverts underneath highways and railway tracks by bats in lowland areas. *Lutra*. 54:3–16.

Brack, V., Jr., R. E. Mumford, and W. R. Holmes. 1984. The gray bat (*Myotis grisescens*) in Indiana. *American Midland Naturalist*. 111:205.

Brack, V., Jr. 1985. The foraging ecology of some bats in Indiana. *Indiana Academy of Sciences*. 94:231-237.

Brack, V., Jr. and R. K. LaVal. 2006. Diet of the gray myotis (*Myotis grisescens*): Variability and consistency, opportunism, and selectivity. *Journal of Mammalogy*. 87:7-18.

Brady, J. T., T. H. Kunz, M. D. Tuttle, and D. E. Wilson. 1982. Gray bat recovery plan. U.S. Fish and Wildlife Service, Denver, CO.

Clark, D. R., Jr., R. K. LaVal, and D. M. Swineford. 1978. Dieldrin-induced mortality in an endangered species, the gray bat (*Myotis grisescens*). *Science*. 199(4335):1357-1359.

Clark, D. R., Bagley, F.M., and Waynon Johnson, W. W., 1988. Northern Alabama colonies of the endangered grey bat *Myotis grisescens*: organochlorine contamination and mortality,
Biological Conservation. 43(3): 213-225.

Clarke, A. H. 1981. The tribe Alasmidontini (Unionidae: Anodontinae), Part I: Pegias, Alasmidonta, and Arcidens. *Smithsonian Contributions to Zoology*. 326:101

Clawson, R. L. 1984. Investigations of endangered Indiana bat and gray bat summer ecology, distribution and status. Missouri Department of Conservation Surveys and Investigation Projects, Study Number 66.

Cryan, P. M., C. U. Meteyer, J. G. Boyles, and D. Blehert. 2013. White-nose syndrome in bats: illuminating the darkness. *BMC Biology*. 11:47.

Daan, S. 1973. Activity during natural hibernation in three specie of vespertilionid bats. *Netherlands Journal of Zoology.* 23:1-77.

Decher, J. and J.R. Choate. 1988. Critical habitat of the gray bat *Myotis grisescens* in Kansas. (Abstract). *Bat Research News*. 29(4):45.

Ellis, M. M. 1936. Erosion silt as a factor in aquatic environments. *Ecology*. 17:29-42.

Flock, B. 2014. Bat Population Monitoring and White-Nose Syndrome Surveillance. Tennessee Wildlife Resources Agency. TWRA Wildlife Technical Report 14-07.

Accessed on October 17, 2017.
http://www.tnbwg.org/Files/1407%202014%20Bat%20Hibernacula
%20Surveys%20and%20WNS%20Monitoring.pdf.

Fuller, S. L. H. and C. E. Powell. 1973. Range extensions of *Corbicula manilensis* (Philippi) in the Atlantic drainage of the United States. *Natilus*. 87(2):59.

Gaisler, J., Z. Řehák, and T. Bartonička. 2009. Bat casualties by road traffic (Brno-Vienna). *Acta Theriologica*. 54 (2):147.

Goebel, A. B. 1996. Temporal variation in movement patterns of adult female *Myotis grisescens* (Chiroptera: Vespertilionidae). M.S. thesis, Auburn University, Alabama.

Gore, J. A. 1992. Gray bat. Pages 63-70 *in* S. R. Humphrey and A. E. Ashton, Jr. (eds.) *Rare and Endangered Biota of Florida, Vol. 1, Mammals*. University Press of Florida, Gainesville.

Goudreau, S. E., R. J. Neves, and R. J. Sheehan. 1988. Effects of sewage treatment effluents on mollusks and fish of the Clinch River in Tazewell County, Virginia. Final Rep., U.S. Fish and Wildl. Serv. 128 pp.

Gunier, W. J., and W. H. Elder. 1971. Experimental homing of gray bats to a maternity colony in a Missouri barn. *American Midland Naturalist*. 86:502-506.

Hall, J. S., and N. Wilson. 1966. Season population movements of the gray bat in the Kentucky area. *American Midlands Naturalist*. 75:317-324.

Harman, W. N. 1974. The effects of reservoir construction and channelization on the mollusks of the upper Delaware watershed. *American Malacological Union.* 1973:12-14.

Harvey, M. J. 1975. Endangered Chiroptera of the southeastern United States. *Southeastern Association of Game and Fish Commissioners*. 29:429-433.

Harvey, M. J., J. J. Cassidy, and G. G. O'Hagan. 1981. *Endangered bats of Arkansas: distribution, status, ecology, and management: report to Arkansas Game and Fish Commission, US Forest Service, Ozark National Forest, [and] National Park Service, Buffalo National River*. Ecological Research Center, Department of Biology, Memphis State University, Memphis, Tennessee, 137pp.

Harvey, M. J. and V. R. McDaniel. 1988. Non-cave roosting sites of the endangered gray bat, *Myotis grisescens*, in Arkansas. (Abstract). *Bat Research News*. 29(4):47.

Harvey, M. J. 1992. *Bats of the eastern United States*. Arkansas Game and Fish Commission, Little Rock.

Harvey, Michael J. 1994. Status of the Endangered Gray Bat (*Myotis grisescens*) Hibernating Populations in Arkansas. Journal of the Arkansas Academy of Science: Vol. 48: 52.

Harvey, M. J., R. K. Redman, and C. S. Chaney. 2004. Endangered Bats of Arkansas: Distribution, Status and Ecology (2003-2004). Annual Report to Arkansas Game and Fish Commission, Project Number W-56-R.

Harvey, M. J., and R. R. Currie. 2007. Gray bat (*Myotis grisescens*) status review. Unpublished working paper, U.S. Fish and Wildlife Service, Asheville, NC. March 2007.

Hays, H. A. and D. C. Bingman. 1964. A colony of gray bats in southeastern Kansas. *Journal of Mammalogy*. 45:150.

Herreid, C. F., II. 1963. Temperature regulation of Mexican free-tailed bats in cave habitats. *Journal of Mammalogy*. 44:560-573.

Herreid, C. F., II. 1967. Temperature regulation, temperature preferences and tolerance, and metabolism of young and adult free-tailed bats. *Physiological Zoology*. 40:1-22

Hilsenhoff, W. L. 1982. Using a biotic index to evaluate water quality in streams: Wisconsin Department of Natural Resources Technical Bulletin no. 132. 22 p.

Humphries, M. M., D. W. Thomas , and J. R. Speakman. 2002. Climate-mediated energetic constraints on the distribution of hibernating mammals. *Nature* 418: 313–316.

Johnson, J. B., M. A. Menzel, J. W. Edwards, and W. M. Ford. 2002. Gray bat night-roosting under bridges. *Journal of the Tennessee Academy of Science*. 77:91-93.

Keeley, B. W. and M. D. Tuttle. 1999. Bats in American bridges. *Bat Conservation International,* Inc., Resource Publication No. 4, 40 pp.

Kiefer, A., H. Merz, W. Rackow, H. Roer, and D. Schlegel. 1995. Bats as traffic casualties in Germany. *Myotis*. *32*(33):215-220.

Kerth, G. and Melber, M. 2009. Species-specific barrier effects of a motorway on the habitat use of two threatened forest-living bat species. *Biological Conservation*. 142: 270–279.

Krulin, G. S. and J. A. Sealander. 1972. Annual lipid cycle of the gray bat, *Myotis grisescens*. *Comparative Biochemistry and Physiology*. 42 A:537-549.

LaVal, R. K., R. L. Clawson, M. L. La Val, and W. Caire. 1977. Foraging behavior and nocturnal activity patterns of Missouri bats, with emphasis on the endangered species *Myotis grisescens* and *Myotis sodalis*. *Journal of Mammalogy*. 58:592-599.

Lacki, M. J., L. S. Burford, and J. O. Whittaker, Jr. 1995. Food habits of gray bats in Kentucky. *Journal of Mammalogy*. 76:1256-1259.

Lamb, J. W. 2000. Section 10 permit number SA 97-34 annual report for *Myotis grisescens* and *Myotis sodalis* on Arnold Air Force Base/Arnold Engineering Development Center (AEDC), Unpublished Report, ASC Environmental Services, Conservation, Arnold Air Force Base, TN.

Lea, I. 1834. Observations on the naiads and descriptions of new species of that and other families. *Transactions of the American Philosophical Society*. 5: 23-119, plates 1-19.

Lenat, D. R. 1993. A biotic index for the southeastern Unities States: derivation and list of tolerance values, with criteria for assigning water-quality ratings. *Journal of the North American Benthological Society*. 12(3):279-290.

Lesiński, G. 2007. Bat road casualties and factors determining their number. *Mammalia*. 71(3): 138-142.

Lesinski G., A. Sikora, and A. Olszewski. 2010. Bat casualties on a road crossing a mosaic landscape. *European Journal of Wildlife Research.* 57:217–223.

Marking, L. L., and T. D. Bills. 1979. Acute effects of silt and sand sedimentation on freshwater mussels. Pp. 204-211 in J.L. Rasmussen, ed. Proc. of the UMRCC symposium on the Upper Mississippi River bivalve mollusks. UMRCC. Rock Island IL. 270 pp.

Martin, C. O. 2007. Assessment of the population status of the gray bat (*Myotis grisescens*). Status review, DoD initiatives, and results of a multi-agency effort to survey wintering populations at major hibernacula, 2005-2007. Environmental Laboratory, U.S. Army Corps of Engineers, Engineer Research and Development Center Final Report ERDC/EL TR-07-22. Vicksburg, Mississippi. 97pp.

Medinas, D., J. T. Marques, and A. Mira. 2013. Assessing road effects on bats: the role of landscape, road features, and bat activity on road-kills. *Ecological Research*. 28:227.

Miller, R. E. (1939), The reproductive cycle in male bats of the species *Myotis lucifugus* lucifugus and *Myotis grisescens*. J. Morphol., 64: 267-295.

Mitchell, W. A. 1998. Species profile: gray bat (*Myotis grisescens*) on military installations in the southeastern United States. U.S. Army Corps of Strategic Environmental Research and Development Program Technical Rep- SERDP-98-6, U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, MS. 25pp.

Mitchell, W. A. and C. O. Martin. 2002. Cave- and Crevice-Dwelling Bats on USACE Projects: Gray Bat. *ERDC TN-EMRRP-SI-25*, 11 pp.

Mohr, C. E. 1972. The status of threatened species of cave-dwelling bats. Bulletin of the National Speleological Society. 34:33-37.

Moore, Patrick R., T.S. Risch, D.K. Morris, and V. Rolland. 2017. Habitat use of female gray bats assessed using aerial telemetry. Journal of Wildlife Management 81(7):1242-1253.

Mulligan, P. M. and A. J. Horowitz. 1986. Expert panel method of forecasting land use impacts of highway projects. No 1079.

Neves, R. J. and J. C. Widlak. 1987. Habitat ecology of juvenile freshwater mussels (Bivalvia: Unionidae) in a headwater stream in Virginia. American Malacological Bulletin. 1(5):1-7.

North Carolina Department of Environment and Natural Resources (NCDENR). 2011. French Broad River Basinwide Water Quality Plan. https://deq.nc.gov/about/divisions/water-resources/planning/basin-planning/waterresource-plans/french-broad-2011

North Carolina Department of Transportation (NCDOT). 2013a. Indirect Screening Report STIP Project I-4400 / I-4700 Widening of I-26 from US 25 to I-40 Henderson and Buncombe Counties. 55 pp.

North Carolina Department of Transportation (NCDOT). 2014b. I-4400/I-4700 Purpose and Need Traffic Analysis Addendum, I-26 Widening Buncombe and Henderson Counties. Raleigh, North Carolina. 494 pp.

North Carolina Department of Transportation (NCDOT). 2014c. Asheville Regional Cumulative Effects Study – Final. 96 pp.

North Carolina Department of Transportation (NCDOT). 2016. STIP Project I-4400/I-4700 I-26 Widening Draft Environmental Impact Statement and Draft Section 4(f) Evaluation, 1-26.

North Carolina Department of Transportation (NCDOT). 2017a. I-4400/I-4700 Indirect Effects Screening Report Update.

Ortmann, A. E. 1921. The anatomy of certain mussels from the Upper Tennessee. *The Nautilus*. 34(3):81-91.

Parmalee, P. W. and A. E. Bogan. 1998. Freshwater Mussels of Tennessee. University of Tennessee Press, Knoxville.

Powers, K. E., R. J. Reynolds, W. Orndorff, B. A. Hyzy, C. S. Hobson, W. M. and Ford. 2016. Monitoring the Status of Gray Bats (*Myotis grisescens*) in Virginia, 2009–2014, and Potential Impacts of White-Nose Syndrome. *Southeastern Naturalist.* 15(1):127-137.

Rabinowitz, A. R. and M. D. Tuttle. 1982. A test of the validity of two currently used methods of determining bat prey preferences. *ACTA TheriologicaI. 27*. 21:283-293.

Ramezani, J., L. Rennebeck, G. P. Closs, and C. D. Matthaei. 2014. Effects of fine sediment addition and removal on stream invertebrates and fish: a reach-scale experiment. *Freshwater Biology.* 59:2584–2604.

Russell A. L., C. M. Butchkoski, L. Saidak, and G. F. McCracken. 2009. Road-killed bats, highway design, and the commuting ecology of bats. *Endangered Species Research.* 8:49–60.

Saugey, D. A. 1978. Reproductive biology of the gray bat, *Myotis grisescens*, in north-central Arkansas. M.S. Thesis, Arkansas State University, Jonesboro.

Sealander, J. A. 1979. *A guide to Arkansas mammals*. River Road Press, Conway. 313 pp.

Secord, A. L.; K.A. Patnode, C. Carter, E. Redman, D.J. Gefell, A.R. Major, and D.W. Sparks. 2015. Contaminants of emerging concern in bats from the Northeastern United States, Arch. Environ. Contam. Toxicol.

Shapiro, A., and M. G. Hohmann. 2005. Summary of threatened and endangered bat related restrictions on military training, testing, and land management. U.S. Army Engineer Research and Development Center Construction Engineering Research Laboratory ERDC/CERL Technical Report TR-05-13, ADA443510.

Shauna Marquardt, USFWS Gay bat species lead biologist. Columbia Missouri Field Office. Phone conversation 11 February, 2019.

Sherwin, H. A., W. I. Montgomery, and M. G. Lundy. 2013. The impact and implications of climate change for bats. *Mammal Review*. 43:171-182. doi: 10.1111/j.1365-2907.2012.00214.x.

Sparks, D. W., V. Brack, Jr., J. O. Whitaker, Jr., and R. Lotspeich. 2009. Reconciliation ecology and the Indiana Bat at Indianapolis International Airport, Chapter 3. in Airports: Performance, Risks, and Problems, (P. B. Larauge and M. E. Castille, eds.) Nova Science Publishers, Inc., Hauppauge, New York.

Stevenson, D. E. and M. D. Tuttle. 1981. Survivorship in the endangered gray bat (*Myotis grisescens*). *Journal of Mammalogy*. 62(2):244-257.

Thogmartin, W. E., C. Sanders-Reed, J. A. Szymanski, R. A. King, L. Pruitt, P. C. McKann, M. C. Runge, and R. E. Russell. 2013. White-nose syndrome is likely to extirpate the endangered Indiana bat over large parts of its range. *Biological Conservation*. 160:162-172.

Thomas, D. P. 1994. A radiotelemetric assessment of the foraging ecology of the gray bat (*Myotis grisescens*) at Guntersville Reservoir, Alabama. M.S. Thesis, Auburn University, AL.

Thomas, D.P., and T.L. Best. 2000. Radiotelemetric assessment of movement patterns of the gray bat (*Myotis grisiscens*) at Guntersville Reservoir, Alabama. Pages 27-39 in B.R. Chapman and J. Laerm, editors. Fourth Colloquium on Conservation of Mammals in the Southeastern U.S. Occasional Papers of the NC Museum of Natural Sciences and the NC Biological Survey, No. 12, Raleigh, NC, USA.

Timmerman, L. and V. R. McDaniel. 1992. "Maternity Colony of Gray Bats in a Non-Cave Site," *Journal of the Arkansas Academy of Science*: 46:108-109.

Tuttle, M. D. 1975. Population ecology of the gray bat (*Myotis grisescens*): factors influencing early growth and development. *Occasional Papers of the Museum of Natural History, University of Kansas*. 36:1-24.

Tuttle, M. D. 1976a. Population ecology of the gray bat (*Myotis grisescens*): philopatry, timing, and patterns of movement, weight loss during migration, and seasonal adaptive strategies. *Occasional Papers of the Museum of Natural History University of Kansas*. 54:1-38.

Tuttle, M. D. 1976b. Population ecology of the gray bat (*Myotis grisescens*): Factors influencing growth and survival of newly volant young. *Ecology*. 57:587-595.

Tuttle, M. D. 1979. Status, causes of decline and management of endangered gray bats. *Journal of Wildlife Management*. 43: 1-17.

Tuttle, M.D. and D.E. Stevenson. 1977. An analysis of migration as a mortality factor in the gray bat based on public recoveries of banded bats. *American Midland Naturalist*. 91(1):235-240.

Tuttle, M. D. and D. E. Stevenson. 1978. Variation in the cave environment and its biological implications. Pages 108-21 *in* R. Zuber (ed). National cave management symposium proceedings, 1977, Big Sky, Montana.

Tuttle, M. D. and J. Kennedy. 2005. Field guide to eastern cave bats. Bat Conservation International, Inc., Austin, TX. 41 pp.

United States Fish and Wildlife Service (USFWS). 1980. Selected vertebrate endangered species of the seacoast of the United States - the gray bat. FWS/OBS-80/01.42, U.S. Fish and Wildlife Service, Slidell, LA.

United States Fish and Wildlife Service (USFWS). 1982. Gray Bat Recovery Plan. Minneapolis, MN, 26 pp.

United States Fish and Wildlife Service (USFWS). 1996. Appalachian Elktoe (*Alasmidonta raveneliana*) Recovery Plan. Atlanta, Georgia, 30 pp.

United States Fish and Wildlife Service (USFWS). 2002. Endangered and Threatened Wildlife and Plants: Designation of Critical Habitat for the Appalachian Elktoe. CFR, Vol. 67, No. 188.

United States Fish and Wildlife Service (USFWS). 2009a. Gray bat (*Myotis grisescens*) 5-year Review. US Fish and Wildlife Service, Columbia, MO. 23 pp. + appendices.

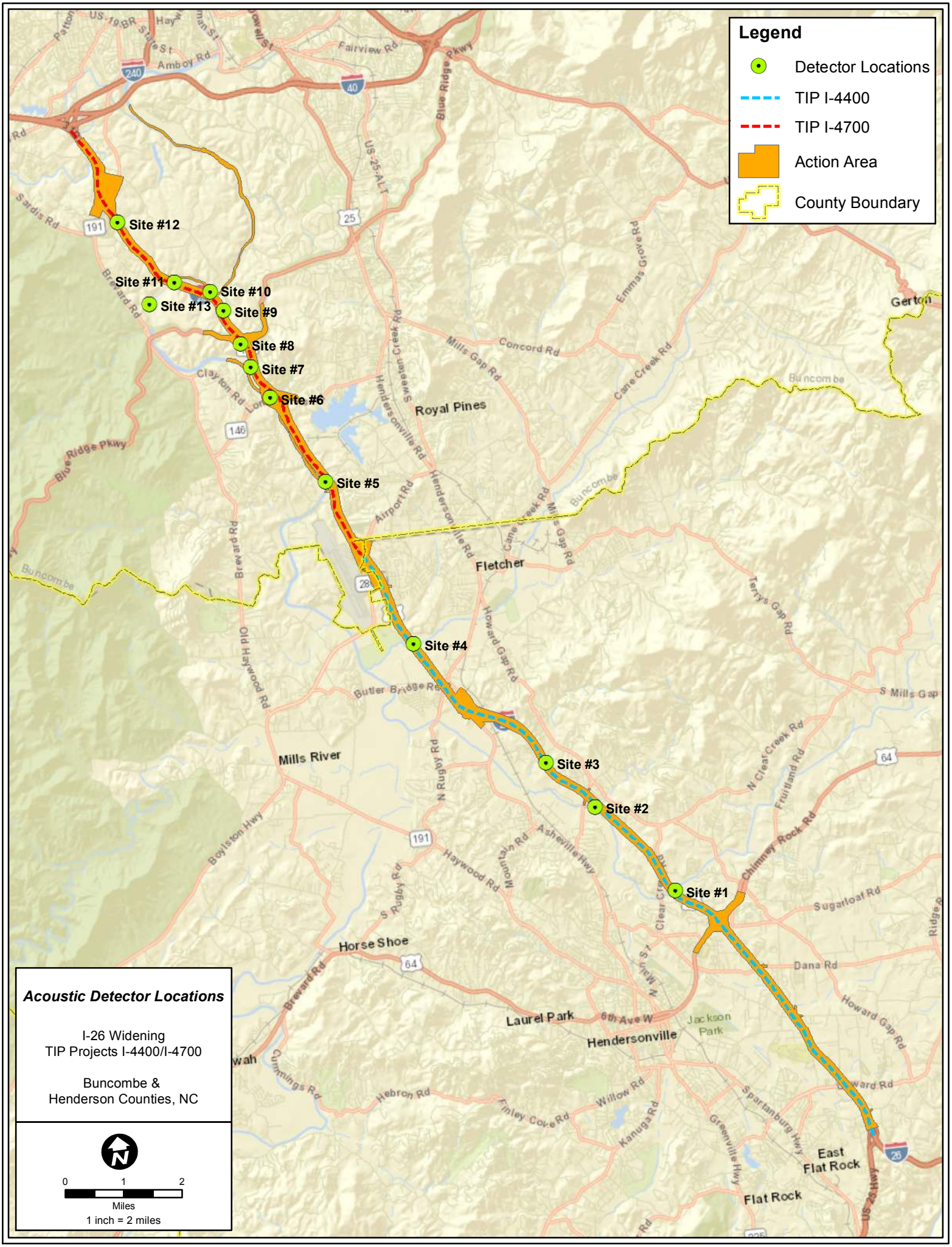
United States Fish and Wildlife Service (USFWS). 2009b. Appalachian Elktoe (*Alasmidonta raveneliana*) 5-Year Review. Asheville, North Carolina, 22 pp

United States Fish and Wildlife Service (USFWS). 2012b. White-nose Syndrome Confirmed in Federally Endangered Gray Bats. Accessed on September 12, 2017. https://www.fws.gov/external-affairs/public-affairs/.

United States Fish and Wildlife Service (USFWS). 2014b. Bunched Arrowhead Recovery Plan. U.S. Fish and Wildlife Service, Atlanta, Georgia. 37 pp.

Voigt, C C, A. C, Dekker, J, Ferguson, J, Fritze, M, Gazaryan, S, Hölker, F, Jones, G, Leader, N, Lewanzik, D, Limpens, H J G A, Mathews, F, Rydell, J, Schofield, H, Spoelstra, K and Zagmajster, M (2018) *Guidelines for consideration of bats in lighting projects.* Technical Report. UN Environment, UNEP/EUROBATS Secretariat, Bonn, Germany.

Appendix I – Action area and detector locations map


Legend
Detector Locations
TIP I-4400
TIP I-4700
Action Area
County Boundary
Site #12
Site #11
Site #10
Site #13
Site #9
Site #8
Site #7
Site #6
Site #5
Site #4
Site #3
Site #2
Site #1
Royal Pines
Fletcher
Mills River
Horse Shoe
Laurel Park
Hendersonville
Jackson Park
East Flat Rock
Flat Rock
Gerton
Buncombe
Acoustic Detector Locations
I-26 Widening
TIP Projects I-4400/I-4700
Buncombe &
Henderson Counties, NC
0
1
2
Miles
1 inch = 2 miles

Appendix II – Erosion control standards comparison table

Guidelines & when they're applicable	**Environmentally Sensitive Areas** Effective area within 50' of T&E stream	**Design Standards in Sensitive Watersheds**	**NPDES - NCG01 (Must also follow DSSW in areas where project is w/in a mile of T&E aquatics)**	**NPDES - NCG01 II.B.2.b (for HQW)**	**I-4400/I-4700 CMs**
Limits on disturbance	No grubbing until just before grading. Grading work shall progress in continuous manner and permanently stabilized^ before starting next phase	20 ac limit for uncovered areas in HQW zones or w/in 1 mile of and draining to waters where T&E species are present (per NCG01)	20 ac limit for uncovered areas w/in a mile of T&E aquatic spp.		SEC plans shall adhere to the DSSW, where practicable, within the existing and proposed right of way for the following areas: For portions of the project within 1 mi. and draining directly to streams where aquatic threatened or endangered species are present.
S&EC design		S&EC designed for 25 yr. storm event within HQW zones or w/in 1 mile of and draining to waters where T&E species are present (per NCG01)	See DSSW		
S&EC structures	Sed & erosion control structures cleaned out when half full	Sed basins with 70% efficiency for 2 yr. storm within HQW zones or w/in 1 mile of and draining to waters where T&E species are present (per NCG01)	See DSSW (and bottom row, below)		Within ESA: Erosion control devices shall be installed immediately following the clearing operation. All SEC measures, throughout the project limits, must be cleaned out when half full of sediment, when applicable, to ensure proper function of the measures.
Slopes		2:1 max channel slope in HQW zones or w/in 1 mile of and draining to waters where T&E species are present (per NCG01)	See DSSW		

Guidelines & when they're applicable	**Environmentally Sensitive Areas** Effective area within 50' of T&E stream	**Design Standards in Sensitive Watersheds**	**NPDES - NCG01 (Must also follow DSSW in areas where project is w/in a mile of T&E aquatics)**	**NPDES - NCG01 II.B.2.b (for HQW)**	**I-4400/I-4700 CMs**
Ground stabilization	Seeding/mulching immediately after final grade Seeding/mulching done in stages on 20' high slopes or if >2 ac	Ground cover^^ sufficient to restrain erosion within 15 working days or 60 calendar days following completion of construction, whichever period is shorter in HQW zones or w/in 1 mile of and draining to waters where T&E species are present (per NCG01)	Permanent stabilization^ w/in 7 calendar days on >3:1 slope, ditches, swales, perimeter dikes & HQW. Stabilization w/in 14 calendar days on all other disturbed areas*	For portions of projects within the High Quality Water Zone**, stabilization shall be achieved as soon as practicable but in any event within 7 calendar days from last land-disturbing act.	Within ESA: Once grading operations begin, work shall progress in a continuous manner until complete. Seeding and mulching shall be performed on the areas disturbed by construction immediately following final grade establishment. Seeding and mulching shall be done in stages on cut and fill slopes that are greater than 20 ft. in height measured along the slope, or greater than 2 ac. in area, whichever is less.
Sediment reporting			The permittee shall report to DWQ any visible sediment being deposited in any stream or wetland w/in 24 hrs. Written submission w/in 5 days.		NCDOT will self-report to USFWS any SEC device failures that result from excessive rainfall events (exceeding a 25-year storm event). The NCDOT inspector will report any failures to the Division Environmental Officer, who will contact the agency within 24 hours. If there are any failures in SEC measures, NCDOT will meet with resource agencies and work to adaptively manage SEC devices for further storm events while construction continues.
S&EC inspections			All S&EC must be inspected at least once every 7 calendar days and must be inspected within 24 hours after storm event of > 0.50 inches of rain per 24-hour period.		Inspections of erosion control devices will be done daily for construction associated with the French Broad River bridge replacement. For the remainder of the project, the standard inspection schedule (weekly, or after a rainfall event of one-half in. or greater) will apply.

Guidelines & when they're applicable	**Environmentally Sensitive Areas** Effective area within 50' of T&E stream	**Design Standards in Sensitive Watersheds**	N**PDES - NCG01 (Must also follow DSSW in areas where project is w/in a mile of T&E aquatics)**	N**PDES - NCG01 II.B.2.b (for HQW)**	**I-4400/I-4700 CMs**
Piles of dirt			Earthen-material stockpiles must be located 50' from storm drains and streams		
Sediment basins			Sed. basin outlet structures must withdraw from surface unless drainage area < 1 acre. Discharges must meet the requirements of the Sediment Pollution Control Act and provisions of Section 6.74 of the Erosion and Sediment Control Planning and Design Manual to assure that buffers and vegetated areas will be used to reduce the potential for visible siltation outside of the 25% buffer zone nearest the land-disturbing activity.		

^ Permanent Stabilization - When all soil disturbing activity is completed, and exposed soils have been stabilized with a vegetative cover with a density of at least 80% or covered with a structural stabilization method. Permanent perennial vegetation may include the use of sod, shrubs and ground cover plants mixed with mulching, aggregate or other landscaping techniques. Structural methods include concrete, asphalt, retaining wall or other stabilization techniques.

^^ Ground cover is defined in15A NCAC 04A .0105 as "any natural vegetative growth or other material which renders the soil surface stable against accelerated erosion."

*conditions and exemptions apply
** areas that are within one mile of and drain to HQW's

ESAs are used for the following: streams, including HQWs and 303(d)s, wetlands, ORWs, critical areas, regulated riparian buffers, CAMA areas of environmental concern, T&E species habitat, and trout waters

Section 106 MOA Package

SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT MEMORANDUM OF AGREEMENT

MEMORANDUM OF AGREEMENT

AMONG THE

FEDERAL HIGHWAY ADMINISTRATION,

the
NATIONAL PARK SERVICE,

the
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION,

and the
NORTH CAROLINA STATE HISTORIC PRESERVATION OFFICE

PURSUANT TO 36 CFR § 800.6
regarding the
REPLACEMENT OF BRIDGE 205 CARRYING THE BLUE RIDGE PARKWAY OVER INTERSTATE 26
BUNCOMBE COUNTY, NORTH CAROLINA
NCDOT TIP ID I-4700b

WHEREAS, the North Carolina Division of the Federal Highway Administration, (herein "FHWA"), serves as the lead Federal agency for the National Environmental Policy Act (herein "NEPA") and for National Historic Preservation Act (54 U.S.C. 306108); herein "NHPA") Section 106 compliance for the replacement of bridge 205 and carrying the BLRI over I-26 in Buncombe County, NC (I-4700b); and,

WHEREAS, the I-26 widening project includes the demolition of the existing bridge carrying Blue Ridge Parkway (herein "BRP") over I-26 and construction of a bridge on a new alignment to the south (herein "Undertaking"), for which FHWA has designated NPS as the lead Federal agency to fulfill its Federal responsibilities under NHPA Section 106 and the terms of this Memorandum of Agreement; and,

WHEREAS, FHWA, the North Carolina Department of Transportation (herein "NCDOT"), the BRP unit of the National Park Service, as signatories to this Memorandum of Agreement (herein "MOA"), have also drafted the separate Project Memorandum of Agreement (herein "Project MOA") (**Attachment A**) detailing the obligations and responsibilities of each party, including Eastern Federal Lands Highway Division (EFLHD) in relation to the funding, preliminary engineering, environmental compliance, and construction of the Undertaking; and,

WHEREAS, the Undertaking does not qualify as a minor project as outlined in the NCDOT Minor Projects Programmatic Agreement (signed in October 2015) (**Attachment B**) and so the Section 106 Federal Aid Highway Programmatic Agreement (signed in 2000) (**Attachment C**) remains in effect; and,

WHEREAS, the following Tribal Historic Preservation Offices (THPO) were consulted regarding this project: Absentee Shawnee Tribe of Oklahoma, Catawba Indian Nation, Cherokee Nation, Eastern Band of Cherokee Indians, Eastern Shawnee Tribe of Oklahoma, Shawnee Tribe, Tuscarora Nation, and the United Keetoowah Band of Cherokee Indians.

WHEREAS, the Cherokee Nation requested and was granted consulting party status to this project,

WHEREAS, the Area of Potential Effects (herein "APE") has been established in consultation with the State Historic Preservation Officer (herein "SHPO") and other Signatories for the Undertaking within properties eligible or potentially eligible for listing in the National Register of Historic Places (herein "NRHP") were identified; and,

WHEREAS, the BRP bridge carrying the BRP over I-26 is a contributing resource to the BRP which is eligible for listing on the NRHP and a proposed National Historic Landmark historic district; and,

WHEREAS, FHWA, in consultation with the SHPO and other parties to the MOA, and the SHPO concurs, that the Undertaking will result in an adverse effect to BRP under NHPA Section 106, and is the only finding of adverse effect associated with the I-26 widening project on BRP; and,

WHEREAS, NPS notified the ACHP of the Undertaking's adverse effect on historic properties, and has invited, in accordance with 36 CFR § 800.6(a)(1), the ACHP to participate in consultation *and the ACHP declined to participate in the consultation* ; and,

NOW THEREFORE, NPS, FHWA, NCDOT and the SHPO agree that the Undertaking shall be implemented in accordance with the following stipulations in order to take into account the effects of the Undertaking on historic properties.

STIPULATIONS

FHWA NC Division shall ensure that the following measures are implemented:

I. Aesthetic Design of the Bridge

In order to reduce asymmetry on the replacement bridge, the sidewalk will extend to the end of the approach slab and have rounded edges and the guardwalls will flair out and transition in height to account for the visual difference of the single sidewalk. The guardwalls will be faced with stone masonry in a manner that will harmonize with the rest of BRP.

Eastern Federal Lands will provide 70 percent and 100 percent construction drawings for the Undertaking to BRP. BRP shall provide their comments to EFLHD staff within 30 calendar days of receipt. EFLHD shall revise drawings and plans to address the BRP comments and provide revised drawings to BRP within 30 calendar days after receiving comments. The revised drawings shall be submitted by BRP to the SHPO. The SHPO shall provide their comments to BRP within 15 calendar days of receipt. Comments provided by the SHPO will be sent to EFLHD by BRP within 5 calendar days to be incorporated into the bridge design. If SHPO does not respond within 15 days, concurrence is assumed.

II. Cultural Landscape and Aesthetics

EFLHD shall design a parking pull-off at milepost 392.1 with access to the Mountains to Sea Trail. The design shall incorporate features that match the visual character of the BRP and are consistent with other parking pull-offs along the motor-road (see Visual Character of the Blue Ridge Parkway, 1997).

EFLHD shall develop a re-vegetation/landscaping plan for the realignment area of the BRP to re-establish native vegetation and provide for a continuous visual experience for the BRP user.

EFLHD shall provide parking pull-off and re-vegetation/landscaping plans to BRP who will provide their comments to EFLHD staff within 30 calendar days of receipt. EFLHD shall revise the plan and design to address BRP comments and provide revised plans to BRP within 30 calendar days after receiving comments. These plans shall be submitted by BRP to the SHPO. The SHPO shall provide their comments to BRP within 15 calendar days of receipt. Comments provided by the SHPO will be sent to EFLHD by BRP within 5 calendar days to be incorporated into the plans. If SHPO does not respond within 15 days, concurrence is assumed.

III. Archival Documentation

Prior to demolition of the existing bridge and any construction activities, Historic American Engineering Record (HAER) Level II documentation of the bridge will be completed by NCDOT.

All documentation activities will be performed or directly supervised by architects, historians, photographers, and/or other professionals meeting the qualification standards in the Secretary of Interior's Professional Qualification Standards (36 CFR 61, Appendix A).

HAER documentation will be submitted by NCDOT to BRP. BRP will within seven days forward to the NPS Southeast Regional Office will provide their comments to BRP and NCDOT within 30 calendar days of receipt. NCDOT shall revise the documentation to address NPS comments and provide revised documentation to BRP within 60 calendar days after receiving comments. BRP shall forward revised documentation to the NPS

Southeast Regional Office who will review for acceptance to the Heritage Documentation Program Collection of the Library of Congress. Upon acceptance of the HAER documentation by the NPS, the BRP shall notify NCDOT so that copies of all documents resulting from the HAER documentation, including pertinent field records, notes, site sketches, superintendent reports, and construction reports shall be provided to the SHPO, the Library of Congress and the permanent collection of BRP. The NCDOT shall provide all said copies to all parties within 45 calendar days of notification of acceptance.

Documentation will include, but is not limited to:

1. The written historical and descriptive data prepared in accordance with outline format guidelines containing:
    a. A general history of BRP
    b. A construction history of the bridge including the history of the bridge type
    c. An architectural description of the resource including alterations
    d. A description of the site and changes
    e. Any historical photographs in the supplementary materials section (these may be subject to copyright release if not held by BRP)
    f. A site plan
2. Reproduction of as built drawings
3. Large-format (4" x 5" or larger negative size) photographs processed for archival permanence in accordance with HABS photographic specifications (www.nps.gov/hdp/standards/photoguidelines.pdf). Views will include:
    a. At least one view that shows the resource in context.
    b. One photograph of both faces.
    c. Photographs of the substructure.
    d. Views of any detail unique to the resource including railings or date stamps/plaques.
4. At least one color digital photograph of each resource and its setting. The digital format shall meet the NPS NRHP's 75-year permanence standard and higher resolution digital files (www.nps.gov/NR/PUBLICATIONS/bulletins/photopolicy/index.htm).
5. Photo locations keyed to the site plan and included with the "Index to Photographs."

IV. Unanticipated Discoveries

If previously unknown cultural resources are discovered during construction, all work in the immediate vicinity (600 feet) of the discovery shall be halted and BRP Cultural Resources Manager shall be notified immediately. Work shall not resume until the NPS determines the resources have been identified and documented and an appropriate mitigation strategy developed, if necessary, in accordance with pertinent laws and regulations, including the stipulations of the "2008 Programmatic Agreement Among the National Park Service (U.S. Department of the Interior), the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers." THPOs will be consulted in the event cultural resources or human remains are discovered during the project.

V. DISPUTE RESOLUTION

Should any signatory to this MOA object within 30 days to actions or plans for review pursuant to this MOA, or dispute the completion of the terms of this agreement, NPS and FHWA shall consult with the objecting party to resolve the objections. If NPS determines that the objection cannot be resolved, NPS shall forward all documentation relevant to the objection to the ACHP and request the ACHP's comments pursuant to 36 CFR 800.2(b)(2).

FHWA comments provided in response to such a request shall be taken into account by the NPS before NPS reaches a final decision on the dispute. If ACHP does not provide comments regarding the dispute within thirty days after receipt of a request for assistance pursuant to 36 CFR 800.2(b)(2), NPS may implement its proposed resolution or render a decision regarding the dispute.

VI. AMENDMENT

A. In the event that EFLHD must make substantive changes to the agreed-upon treatments and design plans during implementation of the Undertaking, EFLHD shall notify and request the comments of NPS, NCDOT and the SHPO regarding the modifications to the Undertaking.

B. Any signatory to this MOA may request that the MOA be amended, whereupon the signatories will consult to develop an amendment.

C. Any resulting amendments shall be developed and executed among the FHWA, NPS, NCDOT, the SHPO, and the ACHP, when applicable, in the same manner as the original MOA.

VII. TERMINATION

FHWA, NPS, NCDOT, and the SHPO may terminate this MOA by providing 30 days notice to the other parties, provided that the parties shall consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination.

VIII. DURATION

This MOA shall expire if its terms are not carried out within one year of receiving a Letter of Acceptance signed by the BRP Superintendent for the completion of the structure and realignment of the BRP, unless the signatories agree in writing to an extension for carrying out its terms.

EXECUTION

Execution of this MOA between FHWA, NPS, NCDOT, and SHPO, and implementation of its terms is evidence that NPS has taken into account the effects of this Undertaking on historic properties and afforded the ACHP an opportunity to comment.

U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION, NORTH CAROLINA DIVISION

By: Clarence W Coble, Jr. Date 5/7/18
for John Sullivan, PE, Division Administrator

U.S. DEPARTMENT OF THE INTERIOR, NATIONAL PARK SERVICE, BLUE RIDGE PARKWAY

By: J.D. Lee Date 5/30/18
J.D. Lee, Superintendent

STATE OF NORTH CAROLINA, DEPARTMENT OF TRANSPORTATION

By: Christopher M Werner Date 4/4/18
Christopher M. Werner, P.E., Director of Technical Services

NORTH CAROLINA STATE HISTORIC PRESERVATION OFFICE

By: Kevin Cherry Date 4/23/18
Kevin Cherry, PhD, State Historic Preservation Officer

Agreement No. DTFH71-15-X-50014

Memorandum of Agreement

among the

North Carolina
Department of Transportation

the

U.S. Department of the Interior
National Park Service

and the

U.S. Department of Transportation
Federal Highway Administration
North Carolina and Eastern Federal Lands Highway Divisions

for the

Preliminary Design of the
Blue Ridge Parkway Bridge over Interstate 26

in

Buncombe County, NC

PURPOSE

The purpose of this Memorandum of Agreement (Agreement) is to establish the roles, responsibilities, funding, and procedures by which the North Carolina Department of Transportation (NCDOT); the U.S. Department of the Interior, National Park Service (NPS); the U.S. Department of Transportation, Federal Highway Administration's North Carolina Division (FHWA-NC) and Eastern Federal Lands Highway Division (EFLHD), collectively agreed to as the "Parties", will jointly participate in engineering services to complete preliminary design sufficient to obtain NPS Design Advisory Board approval as well as National Environmental Policy Act (NEPA) documentation and National Historic Preservation Act (NHPA) compliance, hereinafter referred to as the "Work", for replacement of the Blue Ridge Parkway Bridge over Interstate 26 (I-26) (hereinafter called the Project) in Buncombe County, NC, as part of the NCDOT's State Transportation Improvement Program (STIP) project I-4700B.

AUTHORITIES

WHEREAS, NCGS 136-18(12) authorizes the NCDOT to enter into this Agreement with the federal government and cooperating agencies to provide funding for the Project and associated Work; and,

WHEREAS, the NPS is authorized to enter into this Agreement pursuant to authority contained in 16 U.S.C. § 1-3 and 31 U.S.C § 1535; and,

WHEREAS, 23 U.S.C. 308(a) authorizes the FHWA to perform engineering and other services in connection with the survey, design, construction, and improvements of highways for other Federal or State cooperating agencies; and,

WHEREAS, the FHWA-NC is the Federal agency with administrative, financial and project implementation, and management oversight of the NCDOT's Federal-aid Highway Program; and,

WHEREAS, the NCDOT and NPS have requested that FHWA provide engineering services for the proposed Project; and,

WHEREAS, the NCDOT proposes to multi-lane widen I-26 from NC 146, Long Shoals Road, (Exit 37) to I-40 in Buncombe County (8.6 miles) under STIP project I-4700B to reduce congestion along the I-26 corridor. Because of the proximity of the existing interior bents to the existing travel lanes, this widening requires the replacement of the Blue Ridge Parkway Bridge over I-26, near Milepost 36, in Buncombe County, NC; and,

WHEREAS, funds for engineering and compliance services will be provided to the EFLHD by the NCDOT for the Work; and,

WHEREAS the NCDOT, NPS and FHWA have agreed to pursue the necessary Work to obtain necessary NEPA documentation and compliance, and before the completion of NEPA the parties will meet to determine the final delivery method for construction of the project; and,

WHEREAS, although this Agreement is subject to the provisions of the Anti-Deficiency Act (31 U.S.C. §1341(a)(1)), the Parties understand, recognize and agree that the EFLHD is not responsible for any percentage part of the cost of this Work; and,

WHEREAS, 23 U.S.C. §104(f)(3) provides that a State may transfer funds apportioned or allocated under Title 23 to the FHWA to finance a project eligible for assistance under such title; and,

WHEREAS, 23 U.S.C. 132 allows the State to make a deposit or payment to the EFLHD for work performed under an agreement and seek reimbursement for the federal share of the amounts deposited or paid with Federal-aid highway funds.

NOW THEREFORE, the NCDOT, NPS, FHWA-NC, and EFLHD do hereby mutually agree as follows:

ARTICLE I: SCOPE OF WORK (Obligations, Responsibilities, and Funding)

A. The NCDOT agrees to:

1. Assign and designate a point of contact so that all communication regarding the Work will be coordinated and managed through such person; and,

2. Review any documentation provided by the EFLHD; and,

3. Participate in the general coordination of all field reviews, progress meetings, and other Project development activities and milestones as applicable to this Work; and,

4. Provide survey and mapping to EFLHD required for the Work along the Parkway; and,

5. Amend the previously prepared Natural Resources Technical Report (including field investigations and feature delineations) to encompass the expanded study area for the bridge replacement and required roadway approach work; and,

6. Provide the required funding for the Work; and,

7. Incorporate the needs and requirements of the NPS to ensure acceptance and NPS adoption of the NCDOT/FHWA's environmental document for their I-26 widening project including appropriate NPS NEPA documentation and NPS NEPA decision for actions on NPS lands; and,

8. Assist EFLHD with activities necessary to provide the required final environmental clearances and coordination of the Work; and,

9. Prepare Federal easement survey and/or right-of-way plans and legal descriptions (for both Federal and non-Federal lands, as applicable) for any right-of-way or easement for the NCDOT widening of I-26 across NPS Parkway right-of-way boundary;

B. The NPS agrees to:

1. Act as a cooperating agency for preparation of the NCDOT/FHWA NEPA document for the replacement of the Blue Ridge Parkway Bridge over I-26; and,

2. In accordance with the schedule included in Attachment B, provide applicable NPS information and direction (including but not limited to written text) for inclusion in the NEPA document so the NPS can adopt and utilize the NCDOT/FHWA lead NEPA document for issuing a NPS NEPA decision for those project actions on NPS lands as well as be responsible for guiding the decisions associated with improvements and actions on NPS lands, or where NPS interests are involved; and,

3. Assign and designate a project point of contact so that all communication regarding the Work will be coordinated and managed through such person; and,

4. In accordance with the schedule included in Attachment B, perform required archaeological surveys/field investigations along Parkway property within the project study area and upon completion will prepare a Management Summary detailing the results of the investigations. A final report detailing the analysis and findings will be completed by the NPS. NPS will coordinate with NCDOT during this process and supply NCDOT with copies of any summaries, reports, and correspondence to/from the Historic Preservation Office; and

5. Draft and coordinate Section 106, Historic Preservation documentation for NPS, to incorporate requirements of the Historic Preservation Office, for approval of the preferred bridge design immediately after said design is selected; and,

6. Participate in all design field reviews, progress meetings, and other Project development activities and milestones as applicable; and,

7. Approve, in writing, the final design standards for all improvements related to NPS-owned right-of-way; and,

8. Facilitate a Value Analysis (VA) and Choosing by Advantage (CBA) study for the Parkway realignment and final design of the Parkway bridge over I-26, with involvement of all partners and draft a final analysis report for review and approval of NPS, NCDOT and EFLHD; and,

9. Assist EFLHD with activities necessary to provide the required final environmental clearances and coordination for STIP project I-4700B; and,

10. Grant right-of-entry and permits as required to the FHWA, authorized contractors, NCDOT, and other parties as required for the purposes of environmental studies, design, and other Project-related activities;

C. The FHWA-NC agrees to:

1. Be responsible for guiding decisions associated with the Federal-aid Highway Program, or where Federal-aid interests are involved; and,

2. Participate in the project development process as applicable.

D. The EFLHD agrees to:

1. Be the lead agency for and provide for overall coordination of the Work and designate a Project Manager; and,

2. Accept funding from the NCDOT for the Work; and,

3. Coordinate and develop a scope and budget for the Work and obtain NCDOT concurrence; and,

4. Coordinate a schedule to complete the Work with the parties to this Agreement as included in Attachment B, incorporated and made a part of this Agreement as included herein; and,

5. Conduct and assist the NPS and the NCDOT with alternatives development and evaluation for those actions impacting the project design and the use of NPS lands and assist in incorporating applicable recommendations into the NCDOT/FHWA environmental document for the I-4700B STIP project; and,

6. In accordance with the schedule included in Attachment B, conduct necessary geotechnical investigations as part of the Work and supply the investigations to NCDOT for review (including the subsurface inventory report, foundation recommendations with notes, boring plans and boring logs; and,

7. Coordinate and incorporate requirements of NPS, Historic Preservation Office, NCDOT, other applicable federal, state and local agencies, utilities, and interested public and private parties; and,

8. Prepare preliminary 30% bridge replacement design plans (including design assumptions, typical sections, horizontal and vertical alignments, cross sections, slope stakes, and if necessary utility plans for all alternatives), construction schedules, and Estimates and other Project documents sufficient to obtain NPS DAB approval and complete NPS NEPA and NHPA documentation up to and including the Record of Decision; and,

9. Proceed with design (of the preferred alternative) beyond 30% to the maximum extent practical prior to a decision for the final delivery method for construction of the Parkway Bridge; and,

10. Draft a legal right-of-way description, from survey plans provided by NCDOT, for widening and constructing the Parkway Bridge over I-26 (for both Federal and non-Federal lands, as applicable) for any easements or right-of-way between NCDOT and the NPS. The approved document will be filed by all partners; and,

11. In accordance with Attachment A, provide digital design files to the Parties; and,

12. Hold regular meetings with all Parties regarding the status of the Work; and,

13. Allow the Parties to participate in field reviews, onsite inspections, and records reviews and to monitor the Work; and,

14. Provide technical assistance to the NPS as necessary through completion of design of the Parkway bridge in coordination with the NCDOT; and,

15. Maintain records of all actions, contracts and expenditures on the Work in sufficient level of detail to allow identification of the nature of the expenditures made. The FHWA will retain these records for a period of six (6) years after the Project records are closed out to provide complete information in response to an audit of either its own records or of NCDOT's records of the Project; and

16. Promptly initiate design Work close-out and return unexpended funds to all parties as soon as final costs are known.

ARTICLE II: DISBURSEMENT OF FUNDS

A. Upon execution of this Agreement, the NCDOT will reimburse funds based on the EFLHD's estimated costs as included herein.

B. All costs associated, directly or indirectly, with any and all Work performed under this Agreement including, but not limited to EFL engineering services and NPS NEPA documentation and compliance shall be paid for by the NCDOT.

C. The estimated costs for the Work (based on the Scope of Work and Schedule described in Attachments A and B) are as follows:

Activity	Estimated Cost
Estimated EFLHD Engineering Services cost:	$285,000.00
Estimated NPS NEPA documentation/compliance cost:	$40,000.00
Contingency:	$25,000.00
Total Estimated Cost:	$350,000.00

The costs above are estimated only and will be adjusted during the design process to include the actual costs of such services limited to a maximum of $350,000.00. Any costs above the

maximum amount must be approved in writing by all Parties in a Supplemental Agreement prior to the work being performed.

D. It is the understanding and agreement of all Parties that the costs associated with this Work will be paid for entirely by NCDOT in accordance with this Agreement. The funds will be provided by NCDOT in accordance with current EFLHD and NCDOT policies. Nothing in this Agreement will prevent NCDOT from seeking reimbursement for applicable costs for this Work from the FHWA-NC in the future. The schedule for this Project is hereto attached, marked as Attachment A and made a part of this Agreement.

E. Before any expenses are incurred or funds are expended by EFLHD for the Work, EFLHD and NCDOT will enter into a reimbursable agreement. After execution of the reimbursable agreement, EFLHD will obtain authority to expend reimbursable funds for the completion of the Work. EFLHD will submit monthly invoices to NCDOT which include all necessary documentation as agreed to by the parties to reimburse EFLHD for eligible Work expenditures as outlined in this Agreement. Within 30 days of receipt of the monthly invoices, NCDOT will review and, if acceptable, NCDOT will make payment. The EFLHD will not perform the Work until the reimbursable agreement is executed.

F. The EFLHD and NPS will execute a separate interagency agreement to reimburse the NPS for NEPA documentation and compliance costs. EFLHD will provide NCDOT copies of NPS billing documentation to support such expenditures for the Work.

G. If the EFLHD or NPS's costs are anticipated to exceed the funds thus made available to the EFLHD in the reimbursable agreement, the EFLHD will request additional funds in time to have the additional funds in place before funds are exhausted in accordance with Article II.C. All Work will cease until additional funds are received by the EFLHD. If costs are less than anticipated for the Work, the reimbursable agreement will be amended during the closeout process.

H. EFLHD will maintain separate financial records for this Work and will track and monitor all funds provided to it.

I. Upon completion of the Work or as soon as the financial records for the Work are closed, the EFLHD will initiate closure of the reimbursable agreement with the NCDOT within 60 days.

J. This Agreement may be terminated by mutual written consent of all parties with 30 days written notice of the termination to the Points of Contact included herein. This Agreement may also be terminated if either the NEPA process or funding availability requires a change and the Parties are not able to agree to the change. Any termination of this Agreement shall not prejudice any rights or obligations accrued to the parties prior to termination. Any costs incurred by EFLHD and NPS up to the point of termination will be considered allowable and will be paid for by NCDOT. Costs generated after the termination date will not be allowable. All funds remaining after termination will be returned to the appropriate Parties as included in Article II.I.

ARTICLE III: GENERAL TERMS AND CONDITIONS

A. This Agreement contains the entire agreement and understanding of the Parties, and may not be amended, modified, or discharged nor may any of its terms be waived except by a Supplemental Agreement in writing signed by all of the Parties.

B. The failure of a Party to insist in any instance upon strict performance of any of the terms, conditions, or covenants contained, referenced, or incorporated into this Agreement shall not be construed as a waiver or a relinquishment of the Party's rights to the future performance of such terms, conditions, or covenants.

C. The headings and captions herein are inserted for convenient reference only and the same shall not limit or construe the Articles, paragraphs, sections, or subsections to which they apply or otherwise affect the interpretation thereof.

D. If any term or provision of this Agreement or the application thereof to any person or circumstance shall, to any extent, be invalid or unenforceable, the remainder of this Agreement, or the application of such term or provision to persons or circumstances other than those as to which it is held invalid or unenforceable, shall not be affected thereby, and each such term and provision of the Agreement shall be valid and be enforced to the fullest extent permitted by applicable law.

E. Nothing set out in this Agreement shall constitute a waiver of the Parties' rights to seek any and all damages to the extent authorized by law, nor shall anything in this Agreement limit any defenses that the Parties may have with respect to such claims for damages.

F. Nothing in this Agreement shall be construed as creating any rights of enforcement by any person or entity that is not a Party hereto, nor any rights, interest, or third party beneficiary status for any entity or person other than the Parties hereto.

G. This Agreement has been drafted jointly by the Parties hereto. As a result, the language used in this Agreement shall be deemed to be the language chosen by the Parties to express their mutual intent and no rule of strict construction shall be applied against any Party.

H. All parties to the Agreement will be afforded the opportunity to inspect, review and comment on, at any time, work in progress, the financial records, and any other supporting documentation related to this Agreement; and to participate in all meetings and field reviews.

I. This Agreement is assignable; however, no transfer or assignment of this Agreement, or any part thereof or interest therein, directly or indirectly, voluntarily or involuntarily, shall be made unless such transfer or assignment is first approved in writing by all Parties, which approval shall not be unreasonably withheld.

J. The Parties accept full responsibility for any property damage, injury, or death caused by the acts or omissions of their respective employees, acting within the scope of their employment, or their contractors' scope of work, to the extent allowed by the law. All claims shall be processed pursuant to applicable governing law.

K. Any claim filed alleging an injury during the performance of this Agreement, which may be traced to a party, shall be received and processed by the party having responsibility for the particular injury-causing condition, under the law that governs such party.

L. Nothing in this Agreement shall be construed as limiting or affecting the legal authorities of the Parties, or as requiring the Parties to perform beyond their respective authorities. Nothing in this Agreement shall be deemed to bind any Party to expend funds in excess of available appropriations.

M. The Parties shall not discriminate in the selection of employees or participants for any employment or other activities undertaken pursuant to this Agreement on the grounds of race, creed, color, sex, or national origin, and shall observe all of the provisions of Titles VI and VII of the Civil Rights Act of 1964 (78 Stat. 252; 42 U.S.C. §2000(d) et. seq.). The Parties shall take positive action to ensure that all applicants for employment or participation in any activities pursuant to this Agreement shall be employed or involved without regard to race, creed, color, sex, or national origin.

N. No member of, or Delegate to, or Resident Commissioner in Congress shall be admitted to any share or part of this Agreement, or to any benefits that may arise therefrom, unless the share or part or benefit is for the general benefit of a corporation or company.

O. The Parties will abide by the provisions of 18 U.S.C. §1913 (Lobbying with Appropriated Monies).

P. Contracts entered into by any Federal Agency pursuant to this Agreement are subject to all laws governing federal procurement and to all regulations and rules promulgated there under, whether now in force or hereafter enacted or promulgated, except as specified in this Agreement.

Q. Nothing in this Agreement shall be construed as in any way impairing the general powers of the parties for supervision, regulation, and control of its property under such applicable laws, regulations, and rules.

R. This Agreement shall be in force and effect and shall remain in effect until the work, including payment, has been completed to the mutual satisfaction of all Parties. This Agreement will terminate when all transfers of funds are completed and all work associated with this Agreement has been approved by the Parties in writing.

S. The Parties hereby acknowledge that the individual executing the Agreement on their behalf is authorized to execute this Agreement on their behalf and to bind the respective entities to the terms contained herein and that he has read this Agreement, conferred with his attorney, and fully understands its contents.

T. It is the policy of the NCDOT not to enter into any agreements with parties that have been debarred by any government agency (Federal or State). By execution of this Agreement, the Parties confirm that their contractors are not excluded from participation in this transaction by any Federal or State Agency or Department and that it will not enter into agreements with any

entity that is debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from participation in this transaction.

U. The Parties agree to comply with the provisions of the Americans with Disabilities Act of 1990 (ADA) and Section 504 of the Rehabilitation Act of 1973, P.L. 93-112, and other applicable Federal regulations relating hereto, issued by the U.S. Department of Transportation.

V. The Parties, and all agents, will ensure that all contractors, sub-contractors, or sub-recipients agree to comply with Title 49 CFR Part 32.400, Drug-Free Workplace requirements and/or Federal Acquisition Regulation (FAR) Subpart 23.5, Drug Free Workplace.

W. By Executive Order 24 and NCGS 133-32, it is unlawful for any vendor or contractor (i.e. architect, bidder, contractor, construction manager, design professional, engineer, landlord, offeror, seller, subcontractor, supplier, or vendor), to make gifts or to give favors to any State employee of the Governor's Cabinet Agencies (i.e. Administration, Commerce, Correction, Crime Control and Public Safety, Cultural Resources, Environment and Natural Resources, Health and Human Services, Juvenile Justice and Delinquency Prevention, Revenue, Transportation , and the Office of the Governor).

ARTICLE IV: KEY OFFICIALS AND CONTACTS

Designated points of contact for the coordination of this project are as follows:

A. For the NCDOT:

Key Official	**Point of Contact**
Mr. Michael L. Holder, PE Chief Engineer North Carolina Department of Transportation Transportation Building 1 S. Wilmington St. Raleigh, NC 27601 Phone: (919) 707-2500 Email: mholder@ncdot.gov	Mr. Richard W. Hancock, PE Project Development Unit Head North Carolina Department of Transportation Transportation Building 1548 Mail Service Center Raleigh, NC 27699-1548 Phone: (919) 707-6000 Email: rwhancock@ncdot.gov

Mr. Rodger Rochelle, PE
Administrator of the Technical Services Division
North Carolina
Department of Transportation
Transportation Building
1 S. Wilmington St.
Raleigh, NC 27601
Phone: (919) 707-2900
Email: rdrochelle@ncdot.gov

B. For the NPS:

Mr. Mark H. Woods
Superintendent
Blue Ridge Parkway
U.S. Dept. of the Interior
National Park Service
199 Hemphill Knob Road
Asheville, NC 28803
Phone: (606) 248-1050
Email: mark_woods@nps.gov

Mr. Larry Hultquist
Project Manager DSC-T
Blue Ridge Parkway
U.S. Dept. of the Interior
National Park Service
199 Hemphill Knob Road
Asheville, NC 28803
Phone: (828) 348-3482
Email: larry_hultquist@nps.gov

C. For the FHWA-NC Division:

Mr. John Sullivan, PE
Division Administrator
Federal Highway Administration
North Carolina Division
310 New Bern Avenue, Suite 410
Raleigh, NC 27601
Phone: (919) 747-7000
Email: John.Sullivan@dot.gov

Mr. Michael Batuzich
Environmental Specialist
Federal Highway Administration
North Carolina Division
310 New Bern Avenue, Suite 410
Raleigh, NC 27601
Phone: (919) 747-7033
Email: Michael.Batuzich@dot.gov

D. For the EFLHD:

Ms. Karen Schmidt
Director, Program Administration
Federal Highway Administration
Eastern Federal Lands Highway Division
21400 Ridgetop Circle
Sterling, VA 20166
Phone: (703) 404-6276
Email: Karen.Schmidt@dot.gov

Ms. Yanina Kirtley, PE, PMP
Project Manager
Federal Highway Administration
Eastern Federal Lands Highway Division
21400 Ridgetop Circle
Sterling, VA 20166
Phone: (571) 434-1556
Email: Yanina.Kirtley@dot.gov

ARTICLE V: FUNDING LIMITATIONS

Nothing in this Agreement shall be interpreted to require obligations or payments in violation of the Anti-Deficiency Act, 31 U.S.C. 1341.

All terms and conditions of this Agreement are dependent upon, and subject to, the allocation of funds for the purpose set forth in the Agreement and the Agreement shall terminate if funds cease to be available. The NCDOT will immediately notify all parties in writing if funds cease to be available and the Agreement will terminate in accordance with Article II.J.

ARTICLE VI: STANDARDS

EFLHD shall complete the Work (design) in accordance with the current applicable American Association of State Highway Transportation Officials (AASHTO), FHWA, Manual of Uniform Traffic Devices Control (MUTCD) and NCDOT standards and guides in cooperation with NCDOT.

ARTICLE VII: DISPUTE RESOLUTION

Disputes should be resolved at the lowest level possible. The dispute should be clearly defined in writing and understood by all Parties. Any dispute between the Parties that cannot be resolved by the Project points of contact shall be formally presented in writing to the Chief Engineer of NCDOT, the Superintendent of the Blue Ridge Parkway, and the Division Director for EFLHD for review and resolution. Any resolution of the dispute shall be reduced to writing signed by the reviewers.

If the dispute cannot be resolved by the second level of review, then the matter may be presented to the Administrator of the Technical Services Division of the NCDOT, the NPS Regional Director, Southeast Region, and the Administrator of the FHWA.

IN WITNESS THEREOF, the Parties hereto have caused this Agreement to be executed by their duly authorized representatives.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

7/22/15

Mr. Michael L. Holder, PE — Date
Chief Engineer

Approved By the Board of Transportation:

APRIL 2, 2015

Date

U.S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
BLUE RIDGE PARKWAY

6/30/15

Mr. Mark H. Woods
Superintendent

Date

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
NORTH CAROLINA DIVISION

7/23/15

Mr. John Sullivan, PE — Date
Division Administrator

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
EASTERN FEDERAL LANDS HIGHWAY DIVISION

Karen A Schmidt 15 JUL 2015

Ms. Karen A. Schmidt Date
Director, Program Administration

ATTACHMENT A
Scope of Work

The Scope of Work and estimated engineering costs under this Memorandum of Agreement are based on, but not limited to, the following activities:

Project Management – Necessary communication and coordination of various preliminary design activities within the EFL, NPS and NCDOT, and manage schedule and budget (12 man-days).

Alignment Alternatives – The projection of at least three alternative horizontal and vertical alignments that satisfy the purpose and need of the project. Develop typical sections, preliminary earthwork, and prepare construction schedules and engineer's estimates for design alternatives (21 man-days).

Bridges Alternatives – Type size and location drawings for various bridge alternatives including a retrofit/modification of the existing bridge, steel girder bridge alternative, and concrete bridge alternatives based on various alignment alternatives (120 man-days).

Design Visualization – 3D renderings of each alternative alignment and bridge for use as part of Public Meetings, NPS Value Analysis and Design Board approvals (10 man-days).

Geotechnical Analysis – Evaluation of existing geotechnical information, field borings (and appropriate material lab testing) at each abutment/pier location for foundation assessment and preliminary design recommendations (62 man-days).

Environment – Assistance to the NPS to prepare necessary NEPA documentation to meet both NPS and FHWA NEPA requirements. Participation with NPS in necessary activities to complete NEPA compliance; including to fully prepare and analyze NEPA alternatives, and work with NCDOT staff to appropriately coordinate and incorporate NPS documentation into the Draft and Final EIS (77 man-days).

NPS Activities - NPS work necessary to complete the NEPA compliance including coordination with SHPO, Value Analysis (VA) and Choosing by Advantages (CBA) facilitation and documentation, and approval through the NPS Design Advisory Board ($40,000).

ATTACHMENT B

Work Schedule

Activity	Estimated Completion
Develop Draft Alignment/Bridge Alternatives for Draft EIS for submittal to NCDOT	*Completed*
Submit MOA to NPS Solicitor's Office for review	*Completed*
Distribute Agreement for Signature	June 2015
Coordinate Funds Transfer between NCDOT and EFL	July 2015
Complete Alignment/Bridge Alternatives for NPS Value Analysis	October 2015
NPS Value Analysis	November 2015
Publish Draft EIS (NCDOT)	November 2015
NPS Design Advisory Board Review	November 2015
Prepare Final EIS Documentation for Submittal to NCDOT	February 2016
Publish Final EIS/ROD (NCDOT)	June 2016
NPS Adoption of Final EIS and NPS ROD	July 2016

Agreement No. DTFH71-15-X-50014
Amendment 1

Memorandum of Agreement

among the

North Carolina
Department of Transportation

the

U.S. Department of the Interior
National Park Service

and the

U.S. Department of Transportation
Federal Highway Administration
North Carolina and Eastern Federal Lands Highway Divisions

for the

Engineering and Design Support for the
Blue Ridge Parkway Bridge over Interstate 26

in

Buncombe County, NC

REASON FOR THIS AMENDMENT

The purpose for this amendment to Memorandum of Agreement DTFH71-15-X-50014 (Agreement) is to increase the scope of services for the design of the Blue Ridge Parkway Bridge over Interstate 26 by Eastern Federal Lands Highway Division and the U.S. Department of the Interior, National Park Service. The following sections in the Agreement have been updated:

- Purpose;
- Authorities;
- Scope of Work (Obligations, Responsibilities, and Funding);
- Disbursement of Funds (including the estimated cost of work);
- Key Officials and Contacts;
- Dispute Resolution
- Attachment A (Scope of Work); and
- Attachment B (Work Schedule).

PURPOSE

The purpose of this Memorandum of Agreement is to establish the roles, responsibilities, funding, and procedures by which the North Carolina Department of Transportation (NCDOT); the U.S. Department of the Interior, National Park Service (NPS); the U.S. Department of Transportation, Federal Highway Administration's North Carolina Division (FHWA-NC) and Eastern Federal Lands Highway Division (EFLHD), collectively agreed to as the "Parties", will jointly participate in engineering services to complete preliminary design sufficient to obtain NPS Design Advisory Board approval, National Environmental Policy Act (NEPA) documentation, and National Historic Preservation Act (NHPA) compliance: to complete the design through 100% (also known as "final design," see Appendix A for details) and provide design support during construction, hereinafter referred to as the "Work", for replacement of the Blue Ridge Parkway Bridge over Interstate 26 (I-26) (hereinafter called the Project) in Buncombe County, NC, as part of the NCDOT's State Transportation Improvement Program (STIP) project I-4700B. This Agreement will need to be amended in the future to detail roles and responsibilities during construction.

AUTHORITIES

WHEREAS, NCGS 136-18(12) authorizes the NCDOT to enter into this Agreement with the federal government and cooperating agencies to provide funding for the Project and associated Work; and,

WHEREAS, the NPS is authorized to enter into this Agreement pursuant to authority contained in 16 U.S.C. § 1-3 and 31 U.S.C § 1535; and,

WHEREAS, 23 U.S.C. 308(a) authorizes the FHWA to perform engineering and other services in connection with the survey, design, construction, and improvements of highways for other Federal or State cooperating agencies; and,

WHEREAS, the FHWA-NC is the Federal agency with administrative, financial and project implementation, and management oversight of the NCDOT's Federal-aid Highway Program; and,

WHEREAS, the NCDOT and NPS have requested that EFLHD provide engineering services for the proposed Project; and,

WHEREAS, the NCDOT proposes to multi-lane widen I-26 from NC 146, Long Shoals Road, (Exit 37) to I-40 in Buncombe County (8.6 miles) under STIP project I-4700B to reduce congestion along the I-26 corridor. Because of the proximity of the existing interior bents to the existing travel lanes, this widening requires the replacement of the Blue Ridge Parkway Bridge over I-26, near Milepost 36, in Buncombe County, NC; and,

WHEREAS, funds for engineering, design NEPA documentation, NHPA compliance, and design support services during construction will be provided to the EFLHD by the NCDOT for the Work; and,

WHEREAS the NCDOT, NPS and FHWA have agreed to pursue the Work as follows:

- to obtain necessary NEPA documentation and compliance;
- to determine the final delivery method for construction of the project before the completion of NEPA;
- to identify the preferred roadway and bridge alternative;
- to have EFLHD provide engineering services to design the Project through 100% final design in conjunction with NPS;
- for NPS to provide design and review support for the final EFLHD design;
- to provide design support as appropriate during construction; and
- for EFLHD and the NPS to participate in milestone inspections of the constructed project for acceptance.

WHEREAS, although this Agreement is subject to the provisions of the Anti-Deficiency Act (31 U.S.C. §1341(a)(1)), the Parties understand, recognize and agree that the EFLHD and the NPS are not responsible for any percentage part of the cost of this Work; and,

WHEREAS, 23 U.S.C. §104(f)(3) provides that a State may transfer funds apportioned or allocated under Title 23 to the FHWA to finance a project eligible for assistance under such title; and,

WHEREAS, 23 U.S.C. 132 allows the State to make a deposit or payment to the EFLHD for work performed under an agreement and seek reimbursement for the federal share of the amounts deposited or paid with Federal-aid highway funds.

NOW THEREFORE, the NCDOT, NPS, FHWA-NC, and EFLHD do hereby mutually agree as follows:

ARTICLE I: SCOPE OF WORK (Obligations, Responsibilities, and Funding)

A. The NCDOT agrees to:

1. Assign and designate a point of contact so that all communication regarding the Work will be coordinated and managed through such person; and,

2. Review any documentation provided by the EFLHD; and,

3. Participate in the general coordination of all field reviews, progress meetings, and other Project development activities and milestones as applicable to this Work; and,

4. Review EFLHD design deliverables and provide comments or other feedback within twenty-one (21) calendar days from the receipt of each deliverable; and,

5. Provide survey and mapping to EFLHD required for the Work along the Parkway; and,

6. Amend the previously prepared Natural Resources Technical Report (including field investigations and feature delineations) to encompass the expanded study area for the bridge replacement and required roadway approach work; and,

7. Provide the required funding for the Work; and,

8. Incorporate the needs and requirements of the NPS to ensure acceptance and NPS adoption of the NCDOT/FHWA's environmental document for their I-26 widening project including appropriate NPS NEPA documentation and NPS NEPA decision for actions on NPS lands; and,

9. Assist EFLHD with activities necessary to provide the required final environmental clearances, the 30% design submittal, 70% design submittal, the 100% design submittal, and coordination of the Work; and,

10. Incorporate the EFLHD-delivered 100% final bridge and approach plans into project I-4700B or other construction delivery vehicle as appropriate. This work may include, but is not limited to, incorporating roadway and bridge plans, specifications, estimates and other project documents for the bridge replacement and approaches in accordance with the latest version of the NCDOT Standard Specifications and project-specific specifications submitted by EFLHD as part of the 100% distribution; and,

11. Prepare draft bid package and distribute to EFLHD and NPS for review and comments; and,

12. Participate in milestone inspections, including the final inspection, with EFLHD and NPS of the constructed project for acceptance; and,

13. Prepare Federal easement survey and/or right-of-way plans and legal descriptions (for both Federal and non-Federal lands, as applicable) for any right-of-way or easement for the NCDOT widening of I-26 across NPS Parkway right-of-way boundary; and,

14. Provide as-built plans, all design calculations, and the bridge load rating once construction is completed to EFLHD and the NPS.

B. The NPS agrees to:

1. Act as a cooperating agency for preparation of the NCDOT/FHWA NEPA document for the replacement of the Blue Ridge Parkway Bridge over I-26; and,

2. In accordance with the schedule included in Attachment B, provide applicable NPS information and direction (including but not limited to written text) for inclusion in the NEPA document so the NPS can adopt and utilize the NCDOT/FHWA lead NEPA document for issuing a NPS NEPA decision for those project actions on NPS lands as well as be responsible for guiding the decisions associated with improvements and actions on NPS lands, or where NPS interests are involved; and,

3. Assign and designate a project point of contact so that all communication regarding the Work will be coordinated and managed through such person; and,

4. In accordance with the schedule included in Attachment B, perform required archaeological surveys/field investigations along Parkway property within the project study area and upon completion will prepare a Management Summary detailing the results of the investigations. A final report detailing the analysis and findings will be completed by the NPS. NPS will coordinate with NCDOT during this process and supply NCDOT with copies of any summaries, reports, and correspondence to/from the Historic Preservation Office; and

5. Draft and coordinate Section 106, Historic Preservation documentation for NPS, to incorporate requirements of the Historic Preservation Office, for approval of the preferred bridge design immediately after said design is selected; and,

6. Participate in all design field reviews, progress meetings, and other Project development activities and milestones as applicable; and,

7. Review EFLHD design deliverables and provide comments or other feedback within twenty-one (21) calendar days from the receipt of each deliverable; and,

8. Review NCDOT draft bid package and provide written approval to ensure compliance with original design intent and environmental documents; and,

9. Approve, in writing, the final design for all improvements related to NPS-owned right-of-way; and,

10. Facilitate a Value Analysis (VA) and Choosing by Advantage (CBA) study for the Parkway realignment and final design of the Parkway bridge over I-26, with involvement of all partners and draft a final analysis report for review and approval of NPS, NCDOT and EFLHD; and,

11. Assist EFLHD with activities necessary to provide the required final environmental clearances and coordination for STIP project I-4700B; and,

12. Grant right-of-entry and permits as required to the FHWA, authorized contractors, NCDOT, and other parties as required for the purposes of environmental studies, design, construction, and other Project-related activities; and,

13. Participate in milestone inspections, including final inspection, of the constructed project for acceptance and provide documentation of milestone acceptance if applicable; and,

14. Provide written acceptance of ownership of the improvements.

C. The FHWA-NC agrees to:

1. Be responsible for guiding decisions associated with the Federal-aid Highway Program, or where Federal-aid interests are involved; and,

2. Participate in the project development process as applicable.

D. The EFLHD agrees to:

1. Be the lead agency for and provide for overall coordination of the Work and designate a Project Manager; and,

2. Accept funding from the NCDOT for the Work; and,

3. Coordinate and develop a scope and budget for the Work and obtain NCDOT concurrence; and,

4. Coordinate a schedule to complete the Work with the parties to this Agreement as included in Attachment B, incorporated and made a part of this Agreement as included herein; and,

5. Conduct and assist the NPS and the NCDOT with alternatives development and evaluation for those actions impacting the project design and the use of NPS lands and assist in incorporating applicable recommendations into the NCDOT/FHWA environmental document for the I-4700B STIP project; and,

6. In accordance with the schedule included in Attachment B, conduct necessary geotechnical investigations as part of the Work and supply the investigations to NCDOT

for review (including the subsurface inventory report, foundation recommendations with notes, boring plans and boring logs; and,

7. Lead and participate in field review meetings, progress meetings, and other Project development activities and milestones as applicable; and,

8. Coordinate and incorporate requirements of NPS, Historic Preservation Office, NCDOT, other applicable federal, state and local agencies, utilities, and interested public and private parties; and,

9. Prepare and submit preliminary 30% bridge replacement design plans (including design assumptions, typical sections, horizontal and vertical alignments, cross sections, slope stakes, and if necessary utility plans for all alternatives), construction schedules, and Estimates and other Project documents sufficient to obtain NPS DAB approval and complete NPS NEPA and NHPA documentation up to and including the Record of Decision to the NPS and NCDOT; and,

10. Perform supplemental survey, location survey, geotechnical investigations, and other field work necessary to design project through 100%; and,

11. Prepare and submit conceptual bridge plans, preliminary construction sequencing plans, and preliminary demolition plans; and,

12. Prepare and submit preliminary 30% roadway and bridge deliverable package, including plans, estimates and other project documents for the bridge replacement and approaches to the NPS and NCDOT (see Attachment A for details); and,

13. Prepare and submit intermediate 70% roadway and bridge plans, specifications, estimates and other project documents for the bridge replacement and approaches to the NPS and NCDOT (see Attachment A for details); and,

14. Prepare and submit final 100% signed and sealed roadway and bridge plans, specifications, estimates and other project documents for the bridge replacement and approaches to the NPS and NCDOT (see Attachment A for details); and,

15. Lead on-site and/or remote comment resolution meetings for the 30%, 70%, and 100% deliverables or as appropriate; and,

16. Review NCDOT draft bid package to ensure compliance with original design intent and environmental documents; and,

17. Provide design support during construction on an as-needed basis; and,

18. Participate in milestone inspections of the constructed project and recommend acceptance of bridge to NPS; and,

19. Draft a legal right-of-way description, from survey plans provided by NCDOT, for widening and constructing the Parkway Bridge over I-26 (for both Federal and non-Federal lands, as applicable) for any easements or right-of-way between NCDOT and the NPS. The approved document will be filed by all partners; and,

20. In accordance with Attachment A, provide digital design files to the Parties; and,

21. Hold regular meetings with all Parties regarding the status of the Work; and,

22. Allow the Parties to participate in field reviews, onsite inspections, and records reviews and to monitor the Work; and,

23. Provide technical assistance to the NPS as necessary through completion of design of the Parkway bridge in coordination with the NCDOT; and,

24. Maintain records of all actions, contracts and expenditures on the Work in sufficient level of detail to allow identification of the nature of the expenditures made. The EFLHD will retain these records for a period of six (6) years after the Project records are closed out to provide complete information in response to an audit of either its own records or of NCDOT's records of the Project; and

25. Promptly initiate design Work close-out and return unexpended funds to all parties as soon as final costs are known.

ARTICLE II: DISBURSEMENT OF FUNDS

A. Upon execution of this Agreement, the NCDOT will reimburse funds based on the EFLHD's estimated costs as included herein.

B. All costs associated, directly or indirectly, with any and all Work performed under this Agreement including, but not limited to EFL engineering services and NPS NEPA documentation and compliance shall be paid for by the NCDOT.

C. The estimated costs for the Work (based on the Scope of Work and Schedule described in Attachments A and B) are as follows:

Activity	Estimated Cost
Original MOA to complete preliminary design sufficient to obtain NPS Design Advisory Board approval, NEPA documentation and NHPA compliance:	$350,000
Original MOA agreement amount increased on 6/6/17, per Reimbursable Agreement DTFH71-15-X-50030, Amendment No. 2	$300,000
Estimated additional EFLHD Engineering Services cost to design the project through 100% and provide signed/sealed package:	$1,350,000
Estimated EFLHD Engineering Services cost for efforts during construction, review/approve shop drawings as appropriate, and participate in final inspection of the project:	$200,000
Estimated NPS design review cost through 100%, project review during construction, and final inspection of the project:	$75,000
Total Estimated Cost:	$2,275,000

The costs above are estimated only and will be adjusted during the design process to include the actual costs of such services limited to a maximum of $2,275,000. Any costs above the maximum amount must be approved in writing by all Parties in a Supplemental Agreement prior to the work being performed.

D. It is the understanding and agreement of all Parties that the costs associated with this Work will be paid for entirely by NCDOT in accordance with this Agreement. The funds will be provided by NCDOT in accordance with current EFLHD and NCDOT policies. Nothing in this Agreement will prevent NCDOT from seeking reimbursement for applicable costs for this Work from the FHWA-NC in the future. The schedule for this Project is hereto attached, marked as Attachment A and made a part of this Agreement.

E. Before any expenses are incurred or funds are expended by EFLHD for the Work, EFLHD and NCDOT will enter into a reimbursable agreement. After execution of the reimbursable agreement, EFLHD will obtain authority to expend reimbursable funds for the completion of the Work. EFLHD will submit monthly invoices to NCDOT which include all necessary documentation as agreed to by the parties to reimburse EFLHD for eligible Work expenditures as outlined in this Agreement. Within 30 days of receipt of the monthly invoices, NCDOT will review and, if acceptable, NCDOT will make payment. The EFLHD will not perform the Work until the reimbursable agreement is executed.

F. The EFLHD and NPS will execute a separate interagency agreement to provide funding to complete tasks that are performed by NPS per this Agreement. EFLHD will provide NCDOT copies of NPS billing documentation to support such expenditures for the Work.

G. If the EFLHD or NPS's costs are anticipated to exceed the funds thus made available to the EFLHD in the reimbursable agreement, the EFLHD will request additional funds in time to have the additional funds in place before funds are exhausted in accordance with Article II.C. All

Work will cease until additional funds are received by the EFLHD. If costs are less than anticipated for the Work, the reimbursable agreement will be amended during the closeout process.

H. EFLHD will maintain separate financial records for this Work and will track and monitor all funds provided to it.

I. Upon completion of the Work or as soon as the financial records for the Work are closed, the EFLHD will initiate closure of the reimbursable agreement with the NCDOT within 60 days.

J. This Agreement may be terminated by mutual written consent of all parties with 30 days written notice of the termination to the Points of Contact included herein. This Agreement may also be terminated if either the NEPA process or funding availability requires a change and the Parties are not able to agree to the change. Any termination of this Agreement shall not prejudice any rights or obligations accrued to the parties prior to termination. Any costs incurred by EFLHD and NPS up to the point of termination will be considered allowable and will be paid for by NCDOT. Costs generated after the termination date will not be allowable. All funds remaining after termination will be returned to the appropriate Parties as included in Article II. Section I.

ARTICLE III: GENERAL TERMS AND CONDITIONS

A. This Agreement contains the entire agreement and understanding of the Parties, and may not be amended, modified, or discharged nor may any of its terms be waived except by a Supplemental Agreement in writing signed by all of the Parties.

B. The failure of a Party to insist in any instance upon strict performance of any of the terms, conditions, or covenants contained, referenced, or incorporated into this Agreement shall not be construed as a waiver or a relinquishment of the Party's rights to the future performance of such terms, conditions, or covenants.

C. The headings and captions herein are inserted for convenient reference only and the same shall not limit or construe the Articles, paragraphs, sections, or subsections to which they apply or otherwise affect the interpretation thereof.

D. If any term or provision of this Agreement or the application thereof to any person or circumstance shall, to any extent, be invalid or unenforceable, the remainder of this Agreement, or the application of such term or provision to persons or circumstances other than those as to which it is held invalid or unenforceable, shall not be affected thereby, and each such term and provision of the Agreement shall be valid and be enforced to the fullest extent permitted by applicable law.

E. Nothing set out in this Agreement shall constitute a waiver of the Parties' rights to seek any and all damages to the extent authorized by law, nor shall anything in this Agreement limit any defenses that the Parties may have with respect to such claims for damages.

F. Nothing in this Agreement shall be construed as creating any rights of enforcement by any person or entity that is not a Party hereto, nor any rights, interest, or third party beneficiary status for any entity or person other than the Parties hereto.

G. This Agreement has been drafted jointly by the Parties hereto. As a result, the language used in this Agreement shall be deemed to be the language chosen by the Parties to express their mutual intent and no rule of strict construction shall be applied against any Party.

H. All parties to the Agreement will be afforded the opportunity to inspect, review and comment on, at any time, work in progress, the financial records, and any other supporting documentation related to this Agreement; and to participate in all meetings and field reviews.

I. This Agreement is assignable; however, no transfer or assignment of this Agreement, or any part thereof or interest therein, directly or indirectly, voluntarily or involuntarily, shall be made unless such transfer or assignment is first approved in writing by all Parties, which approval shall not be unreasonably withheld.

J. The Parties accept full responsibility for any property damage, injury, or death caused by the acts or omissions of their respective employees, acting within the scope of their employment, or their contractors' scope of work, to the extent allowed by the law. All claims shall be processed pursuant to applicable governing law

K. Any claim filed alleging an injury during the performance of this Agreement, which may be traced to a party, shall be received and processed by the party having responsibility for the particular injury-causing condition, under the law that governs such party.

L. Nothing in this Agreement shall be construed as limiting or affecting the legal authorities of the Parties, or as requiring the Parties to perform beyond their respective authorities. Nothing in this Agreement shall be deemed to bind any Party to expend funds in excess of available appropriations.

M. The Parties shall not discriminate in the selection of employees or participants for any employment or other activities undertaken pursuant to this Agreement on the grounds of race, creed, color, sex, or national origin, and shall observe all of the provisions of Titles VI and VII of the Civil Rights Act of 1964 (78 Stat. 252; 42 U.S.C. §2000(d) et. seq.). The Parties shall take positive action to ensure that all applicants for employment or participation in any activities pursuant to this Agreement shall be employed or involved without regard to race, creed, color, sex, or national origin.

N. No member of, or Delegate to, or Resident Commissioner in Congress shall be admitted to any share or part of this Agreement, or to any benefits that may arise therefrom, unless the share or part or benefit is for the general benefit of a corporation or company.

O. The Parties will abide by the provisions of 18 U.S.C. §1913 (Lobbying with Appropriated Monies).

P. Contracts entered into by any Federal Agency pursuant to this Agreement are subject to all laws governing federal procurement and to all regulations and rules promulgated there under, whether now in force or hereafter enacted or promulgated, except as specified in this Agreement.

Q. Nothing in this Agreement shall be construed as in any way impairing the general powers of the parties for supervision, regulation, and control of its property under such applicable laws, regulations, and rules.

R. This Agreement shall be in force and effect and shall remain in effect until the work, including payment, has been completed to the mutual satisfaction of all Parties. This Agreement will terminate when all transfers of funds are completed and all work associated with this Agreement has been approved by the Parties in writing.

S. The Parties hereby acknowledge that the individual executing the Agreement on their behalf is authorized to execute this Agreement on their behalf and to bind the respective entities to the terms contained herein and that he has read this Agreement, conferred with his attorney, and fully understands its contents.

T. It is the policy of the NCDOT not to enter into any agreements with parties that have been debarred by any government agency (Federal or State). By execution of this Agreement, the Parties confirm that their contractors are not excluded from participation in this transaction by any Federal or State Agency or Department and that it will not enter into agreements with any entity that is debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from participation in this transaction.

U. The Parties agree to comply with the provisions of the Americans with Disabilities Act of 1990 (ADA) and Section 504 of the Rehabilitation Act of 1973, P.L. 93-112, and other applicable Federal regulations relating hereto, issued by the U.S. Department of Transportation.

V. The Parties, and all agents, will ensure that all contractors, sub-contractors, or sub-recipients agree to comply with Title 49 CFR Part 32.400, Drug-Free Workplace requirements and/or Federal Acquisition Regulation (FAR) Subpart 23.5, Drug Free Workplace.

W. By Executive Order 24 and NCGS 133-32, it is unlawful for any vendor or contractor (i.e. architect, bidder, contractor, construction manager, design professional, engineer, landlord, offeror, seller, subcontractor, supplier, or vendor), to make gifts or to give favors to any State employee of the Governor's Cabinet Agencies (i.e. Administration, Commerce, Correction, Crime Control and Public Safety, Cultural Resources, Environment and Natural Resources, Health and Human Services, Juvenile Justice and Delinquency Prevention, Revenue, Transportation , and the Office of the Governor).

ARTICLE IV: KEY OFFICIALS AND CONTACTS

Designated points of contact for the coordination of this project are as follows:

A. For the NCDOT:

Key Official

Mr. Michael L. Holder, PE
Chief Engineer
North Carolina
Department of Transportation
Transportation Building
1 S. Wilmington St.
Raleigh, NC 27601
Phone: (919) 707-2500
Email: mholder@ncdot.gov

Point of Contact

Mr. Glenn Mumford, PE
State Roadway Design Engineer
North Carolina
Department of Transportation
Transportation Building
1582 Mail Service Center
Raleigh, NC 27699-1582
Phone: (919) 707-6200
Email: gmumford@ncdot.gov

Mr. Bobby Lewis, PE
Chief Operating Officer
Interim Administrator of the Technical Services Division
North Carolina
Department of Transportation
Transportation Building
1 S. Wilmington St.
Raleigh, NC 27601
Phone: (919) 707-2800
Email: rlewis1@ncdot.gov

B. For the NPS:

Mr. John Slaughter
Superintendent
Blue Ridge Parkway

U.S. Dept. of the Interior
National Park Service
199 Hemphill Knob Road
Asheville, NC 28803
Phone:
Email: john_slaughter@nps.gov

Mr. Andy Otten
Project Specialist
Denver Service Center
Blue Ridge Parkway
U.S. Dept. of the Interior
National Park Service
199 Hemphill Knob Road
Asheville, NC 28803
Phone: (828) 776-0067
Email: Andy_Otten@nps.gov

C. For the FHWA-NC Division:

Mr. John Sullivan, PE
Division Administrator
Federal Highway Administration
North Carolina Division
310 New Bern Avenue, Suite 410
Raleigh, NC 27601
Phone: (919) 747-7000
Email: John.Sullivan@dot.gov

Mr. James Martin, PE
Major Projects Engineer
Federal Highway Administration
North Carolina Division
310 New Bern Avenue, Suite 410
Raleigh, NC 27601
Phone: (919) 747-7008
Email: James.Martin@dot.gov

D. For the EFLHD:

Mr. Kurt Dowden
Chief of Business Operations
Federal Highway Administration
Eastern Federal Lands Highway Division
21400 Ridgetop Circle
Sterling, VA 20166
Phone: (571) 434-1598
Email: Kurt.Dowden@dot.gov

Mr. Michael Tessitore, PE
Project Manager
Federal Highway Administration
Eastern Federal Lands Highway Division
21400 Ridgetop Circle
Sterling, VA 20166
Phone: (703) 948-1404
Email: michael.tessitore@dot.gov

ARTICLE V: FUNDING LIMITATIONS

Nothing in this Agreement shall be interpreted to require obligations or payments in violation of the Anti-Deficiency Act, 31 U.S.C. 1341.

All terms and conditions of this Agreement are dependent upon, and subject to, the allocation of funds for the purpose set forth in the Agreement and the Agreement shall terminate if funds cease to be available. The NCDOT will immediately notify all parties in writing if funds cease to be available and the Agreement will terminate in accordance with Article II.J.

ARTICLE VI: STANDARDS

EFLHD shall complete the Work (design) in accordance with the current applicable American Association of State Highway Transportation Officials (AASHTO), FHWA, Manual of Uniform Traffic Devices Control (MUTCD) and NCDOT standards and guides in cooperation with NCDOT.

ARTICLE VII: DISPUTE RESOLUTION

Disputes should be resolved at the lowest level possible. The dispute should be clearly defined in writing and understood by all Parties. Any dispute between the Parties that cannot be resolved by the Project points of contact shall be formally presented in writing to the Chief Engineer of NCDOT, the

Superintendent of the Blue Ridge Parkway, and the Chief of Engineering for EFLHD for review and resolution. Any resolution of the dispute shall be reduced to writing signed by the reviewers.

If the dispute cannot be resolved by the second level of review, then the matter may be presented to the Administrator of the Technical Services Division of the NCDOT, the NPS Regional Director, Southeast Region, and the Division Director for EFLHD.

IN WITNESS THEREOF, the Parties hereto have caused this Agreement to be executed by their duly authorized representatives.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

Mr. Michael L. Holder, PE Date
Chief Engineer

Approved By the Board of Transportation:

6/29/17
Date

U.S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
BLUE RIDGE PARKWAY

8/8/17

Mr. John Slaughter — Date
Superintendent

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
NORTH CAROLINA DIVISION

8/4/17

Mr. John Sullivan, PE — Date
Division Administrator

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
EASTERN FEDERAL LANDS HIGHWAY DIVISION

Holly E Bell 8/24/2017

for Mr. Kurt Dowden Date
Chief of Business Operations

ATTACHMENT A
Scope of Work

The Scope of Work and estimated engineering costs under this Memorandum of Agreement are based on, but not limited to, the following activities:

Project Management – Necessary communication and coordination of various preliminary, intermediate, and final design activities within the EFL, NPS and NCDOT, coordination of EFLHD and NPS participation of design and/or construction inspection support during construction, and manage schedule and budget (57 staff-days).

Alignment Alternatives – The projection of at least three alternative horizontal and vertical alignments that satisfy the purpose and need of the project. Develop typical sections, preliminary earthwork, and prepare construction schedules and engineer's estimates for design alternatives (21 staff-days).

Bridges Alternatives – Type size and location drawings for various bridge alternatives including a retrofit/modification of the existing bridge, steel girder bridge alternative, and concrete bridge alternatives based on various alignment alternatives (120 staff-days).

Design Visualization – 3D renderings of each alternative alignment and bridge for use as part of Public Meetings, NPS Value Analysis and Design Board approvals (10 staff days).

Environment – Assistance to the NPS to prepare necessary NEPA documentation to meet both NPS and FHWA NEPA requirements. Participation with NPS in necessary activities to complete NEPA compliance; including to fully prepare and analyze NEPA alternatives, and work with NCDOT staff to appropriately coordinate and incorporate NPS documentation into the Draft and Final EIS (77 staff-days).

Supplemental Survey – Additional survey to supplement NCDOT provided survey as necessary for final design (37 staff-days).

Geotechnical Analysis – Evaluation of existing geotechnical information, field borings (and appropriate material lab testing) at each abutment/pier location for foundation assessment and design recommendations (136 staff-days).

Bridge and Roadway Approach Design – Design bridge and bridge approaches through the 100% final design. The following deliverables are anticipated:

- **Deliverable #1** – This deliverable includes preliminary/conceptual bridge plans, conceptual construction sequencing plans, and conceptual demolition plans.
- **Deliverable #2** – Preliminary (30%) design submittal. The deliverable will include updated preliminary/conceptual bridge plans, conceptual construction sequencing plans, conceptual demolition plans, a title sheet, survey control sheets, location map(s), typical sections, plan sheets which include horizontal and vertical alignment for the realigned roadway, and a construction estimate as applicable.

- **Deliverable #3** - Intermediate (70%) design submittal. The deliverable will include bridge plan sheets, typical sections, a construction sequencing plan, a demolition plan for the existing bridge, geotechnical information, a title sheet, survey control sheets, location map(s), typical sections, summary of quantities, plan sheets which include horizontal and vertical alignment for the realigned roadway and ancillary drainage design associated with the new roadway alignment (roadside ditches and culverts), erosion control narrative and erosion control plans, temporary traffic control plans for the Parkway, pavement marking and signing plans for the Parkway as appropriate, roadway cross sections, project-specific specifications to supplement NCDOT specifications as appropriate, and an Engineer's Estimate construction cost estimate, as applicable. Design calculations can be provided upon request.
- **Deliverable #4** - Final (100%) design submittal. The deliverable will include updated bridge plan sheets, design calculations, typical sections, a construction sequencing plan, a demolition plan for the existing bridge, geotechnical information, a title sheet, survey control sheets, location map(s), typical sections, summary of quantities, plan sheets which include horizontal and vertical alignment for the realigned roadway and ancillary drainage design associated with the new roadway alignment (roadside ditches and culverts), erosion control narrative and erosion control plans, temporary traffic control plans for the Parkway, pavement marking and signing plans for the Parkway as appropriate, roadway cross sections, project-specific specifications to supplement NCDOT specifications as appropriate, and an Engineer's Estimate construction cost estimate, as applicable.
- **Deliverable #5** – Deliver updated and signed and sealed final (100%) plans to NCDOT for incorporation into project I-4700B or as appropriate. Plans will be signed and sealed with a single global seal intended to cover all disciplines.
- Five 11" x 17" plan set hard copies will be provided with each deliverable. All deliverables will also be provided electronically in PDF format. Microstation CADD files will be provided upon request.

(1,375 staff-days).

Multi-discipline EFLHD Internal Reviews – Geotech, Pavements, Hydraulics, Traffic, Construction, and other relevant EFLHD sections review each distribution concurrently with external partner review periods (105 staff-days).

Field Review Design Coordination Meetings – Travel to site and meet with NPS and NCDOT partners to review and discuss major deliverables (42 staff-days).

Support During Construction – Provide design assistance during construction as appropriate. Review/approve shop drawings as necessary. Inspector services are not included in the estimated cost and will need to be evaluated at a later date (208 staff-days).

Final Inspection –Participate in final inspection of the constructed project and provide recommendation to NPS to accept the bridge (10 staff-days).

NPS Activities - NPS work necessary to complete the NEPA compliance including coordination with SHPO, Value Analysis (VA) and Choosing by Advantages (CBA) facilitation and

documentation, and approval through the NPS Design Advisory Board. Design reviews of EFLHD and NCDOT design submittals, participate in field reviews, support during construction, participate in final inspection, and final acceptance ($75,000).

ATTACHMENT B

Work Schedule

Activity	Estimated Completion
Develop draft alignment/bridge alternatives for draft EIS for submittal to NCDOT	*Completed*
Complete alignment/bridge alternatives for NPS Value Analysis	*Completed*
NPS Value Analysis and Choosing by Advantage Study	*Completed*
Complete Archeological Report and updated Natural Resources Technical Report	*Completed*
Publish draft EIS (NCDOT)	*Completed*
Submit MOA amendment to NPS solicitor's office for review	August 2017
Distribute agreement for signature	August 2017
Coordinate funds transfer between NCDOT and EFL	August 2017
Distribute updated 30% preliminary bridge plans, construction sequencing, and demolition plans for review and discussion	*Completed*
NPS Design Advisory Board review and approval	*Completed*
Distribute 30% preliminary roadway and bridge design package for review	August 2017
30% review and resolution meeting	September 2017
Prepare final EIS documentation for submittal to FHWA-NC	August 2017
Final Section 106 MOA (signed and sent to ACHP)	April 2018
Distribute 70% intermediate roadway and bridge design package for review	April 2018
70% on-site resolution and plan-in-hand review	May 2018
Publish final EIS/ROD (NCDOT)	May 2018
NPS adoption of final EIS and NPS ROD	June 2018
Distribute 100% final roadway and bridge design package for review	November 2018
100% review and resolution meeting	December 2018
Deliver updated and signed and sealed final plans to NCDOT for incorporation into project I-4700B2700B or as appropriate	February 2019

AMENDED PROGRAMMATIC AGREEMENT
AMONG
THE FEDERAL HIGHWAY ADMINISTRATION,
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION,
ADVISORY COUNCIL ON HISTORIC PRESERVATION
AND
NORTH CAROLINA STATE HISTORIC PRESERVATION OFFICER,
FOR
MINOR TRANSPORTATION PROJECTS IN NORTH CAROLINA

WHEREAS, the Federal Highway Administration (FHWA) administers the Federal Aid Highway Program in North Carolina, authorized by (23 U.S.C. 101 et seq.), through the North Carolina Department of Transportation (NCDOT) (23 U.S.C. 315); and,

WHEREAS, the Division Administrator, FHWA, is the "Agency Official" responsible for compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (54 USC 300101 et seq.) and its implementing regulations (36 CFR Part 800, as amended) for Federal Aid Highway Programs; and

WHEREAS, the FHWA and NCDOT desire to streamline consultation for Section 106 of the NHPA on Federally funded and/or permitted minor transportation projects in North Carolina that may affect properties included in or eligible for inclusion in the National Register of Historic Places ("historic properties"); and

WHEREAS, FHWA and NCDOT have consulted with the North Carolina State Historic Preservation Officer (SHPO), including the Office of State Archaeology (OSA), and the Advisory Council on Historic Preservation (ACHP) to develop and execute this Programmatic Agreement (PA) pursuant to 36 CFR 800.14(b) to establish an efficient and effective program alternative for taking into account the effects of minor transportation projects on historic properties in North Carolina and afford the ACHP a reasonable opportunity to comment on undertakings covered by the PA; and

WHEREAS, FHWA, Council, SHPO, and NCDOT executed a PA for Administration of the Federal Aid Highway Program on March 20, 2000 (Federal Aid Highway PA) that allows NCDOT's qualified Cultural Resource Specialists (CR Specialists) to perform the work and consultation with the SHPO described in specific sections of 36 CRF 800.3 through 800.5 on behalf of the FHWA; and

WHEREAS, the Section 106 Federal Aid Highway PA (signed in 2000 and included in Appendix D) remains in force for FHWA undertakings, except for those defined herein as minor transportation projects; and

WHEREAS, the US Army Corps of Engineers (USACE), Tennessee Valley Authority (TVA), United States Forest Service (USFS), United States Coast Guard (USCG), and National Park Service (NPS), may manage Federal lands affected by or be responsible for issuing permits or licenses related to the construction of minor transportation projects by NCDOT, and have been invited to participate in the development of and to be a concurring party to this PA; and

WHEREAS, FHWA notified the Eastern Band of the Cherokee Indians, the Cherokee Nation of Oklahoma, the United Keetoowah Band of Cherokee Indians in Oklahoma, the Catawba Indian Nation, and the Tuscarora Nation, and these tribes have been invited to participate in the development of and to be a concurring party to this PA; and

WHEREAS, the definitions contained in 36 CFR 800.16 shall be used in this PA; and

WHEREAS, NCDOT has a staff of CR Specialists and employs consultants, who meet the professional qualifications defined in the *Secretary of the Interior's Professional Qualifications Standards* at 36 CFR Part 61; and 48 FR 44716 in the fields of archaeology, architectural history, or historical architecture, to carry out NCDOT's historic preservation programs and responsibilities; and

WHEREAS, this PA applies to projects administered directly by NCDOT, not to projects administered by a sub-recipient of federal-aid highway funds, commonly referred to as locally-administered projects (LAP); and

WHEREAS, NCDOT and SHPO agree that NCDOT may use the provisions of this PA to address the applicable requirements of North Carolina General Statute (NCGS) 121-12(a) for minor transportation projects;

NOW THEREFORE, FHWA NCDOT, ACHP, AND SHPO agree that minor transportation projects are defined as Federal or state transportation projects that qualify as Categorical Exclusions and Environmental Assessments under the National Environmental Policy Act (NEPA), as defined in 23 CFR 771, and by the FHWA (NC Division), or the state equivalent (State Environmental Policy Act, SEPA), as defined in NCGS 113A-1 et seq. and 19A NCAC 02F.0102; and

FHWA, NCDOT, ACHP, and SHPO agree that minor transportation projects carried out by NCDOT with Federal-aid funding and/or requiring Federal permits shall be administered in accordance with the following stipulations to ensure that all federal responsibilities under Section 106 of NHPA are implemented; and as agreed to between the NCDOT and SHPO, all state responsibilities under NCGS 121-12(a) are implemented.

STIPULATIONS

FHWA in coordination with NCDOT, will ensure that the following measures are carried out:

I. Purpose and Applicability

A. This PA sets forth the process by which FHWA, with the assistance of NCDOT, will meet its responsibilities under Section 106 of NHPA for minor transportation projects of the Federal Aid Transportation Program. This PA establishes the basis for NCDOT's internal review of individual minor transportation projects and establishes how FHWA will be involved in any review.

B. This PA also sets forth, as agreed to between NCDOT and SHPO, procedures for NCDOT compliance with NCGS 121-12(a) for minor transportation projects carried out by NCDOT without any federal involvement, including funding, approvals, or permits.

C. Projects involving archaeological sites with human skeletal remains and associated grave goods are not covered under this PA.

II. Responsibilities of FHWA, NCDOT, and SHPO

A. NCDOT will initiate consultation with federally recognized Indian tribes for projects that may affect tribal lands or properties to which a tribe /tribes ascribes traditional cultural and religious significance.

1. FHWA shall retain ultimate responsibility for complying with all federal requirements pertaining to direct government-to-government consultation with Indian tribes.
2. Notwithstanding any other provision of this PA, FHWA shall honor the request of any federally recognized Indian tribe for direct government-to-government consultation regarding an undertaking covered by this PA.
3. For projects that occur on Tribal lands or may affect a historic property on Tribal lands, FHWA, in coordination with NCDOT, will complete Section 106 review for that project following 36 CFR 800.3 through 800.6 and the project shall be excluded from this PA.

B. FHWA will require NCDOT to carry out the requirements of this PA or of 36 CFR Part 800, and applicable Council guidelines for all NCDOT's minor transportation projects that receive Federal assistance. FHWA will participate in the process as specified in subsequent stipulations.

C. NCDOT shall employ personnel and consultants trained and qualified in the fields of archaeology, historic architecture, and architectural history whose duties shall include activities implementing this PA.

1. These personnel/consultants shall meet the *Secretary of the Interior's Professional Qualifications Standards* in the fields of archaeology, architectural history, or historical architecture.
2. NCDOT and SHPO shall provide regular cultural resource management and Section 106 compliance training, as described in Appendix A, for personnel responsible within NCDOT for activities described in this agreement.
3. Consultants employed by NCDOT shall attend training workshops as agreed upon or described in Appendix A.

D. NCDOT, in consultation with SHPO, FHWA, and ACHP, will maintain a user's manual to aid in the implementation this PA.
   1. The user's manual shall include detailed procedures for Section 106 and NCGS 121-12(a) reviews and be titled *NCDOT's Programmatic Agreement Implementation Manual for Minor Transportation Projects (Manual).*
   2. NCDOT shall distribute updates to the *Manual* throughout all NCDOT Divisions and Units to aid in their education and understanding of the terms and procedures encompassed by this PA.

E. NCDOT will follow the curation guidelines developed by OSA to ensure long-term preservation of the State's archaeological collections and associated field records. OSA will waive all fees for the curation of archaeological collections that result from NCDOT investigations, when those collections are documented, conserved, and submitted according to OSA's guidelines.

F. To prevent the risk of harm, and in accordance with NCGS 70-18, FHWA and NCDOT will ensure that the specific locations of archaeological sites are not placed in public documents or otherwise distributed to members of the public. FHWA and NCDOT personnel will be provided this information on a need-to-know basis with the understanding that these locations are privileged information.

III. Guidelines, Standards and Regulations

Guidelines, standards and regulations relevant to this PA and its purposes include:

- 36 CFR Part 61*: Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation;*
- *North Carolina Office of State Archaeology: Guidelines for Preparation of Archaeological Survey Reports* (1988);
- *North Carolina Office of State Archaeology: Archaeological Curation Standards and Guidelines* (1995);
- *North Carolina Historic Preservation Office Survey Manual: Practical Advice for Recording Historic Resources* (2002);
- North Carolina General Statute 121-12 (Archives and History);
- North Carolina General Statute 70-18 (Confidentiality)
- North Carolina Administrative Code T07:04R.0206;
- 23 CFR Part 771.117 FHWA Categorical Exclusions;
- 23 CFR Part 771.119 FHWA Environmental Assessments:
- 23 CFR Part 771.121 FHWA Findings of No Significant Impact;
- 36 CFR Part 800: Protection of Historic Properties;
- 40 CFR 1508 - CEQ - Regulations for Implementing NEPA and
- *North Carolina Department of Transportation: Historic Architecture Group Procedures and Work Products* (2015).

IV. Projects with Little or No Potential to Cause Effects

The project types listed in and meeting the conditions listed in Appendix B by their nature and definition, constitute undertakings that should pose minimal or no effects to historic properties.

A. Minor transportation projects that comprise the activity/ies listed in Appendix B and, in the best judgment of the NCDOT Project Manager or Engineer, meet all the conditions outlined, shall undergo no further Section 106 review.
B. Projects, which are certified as meeting the conditions and are exempt from further review, must be documented by the NCDOT project manager or Engineer using the *Programmatic Agreement Screening Checklist (Checklist)* (Appendix C).
    1. The *Checklist* shall be completed for every project or, in some cases, for a batch of similar projects whose actions have little or no potential for significant effects.
    2. A copy of the *Checklist* will be placed in the project file.
    3. The *Checklist* will be distributed to the parties of this PA, upon request.
C. Other minor actions may be approved as project types in Appendix B, if deemed appropriate by consultation and written agreement of FHWA, NCDOT, and SHPO.

V. Project Review - Minor Transportation Projects

For those projects considered Minor Transportation Projects and not exempt from review under terms of Stipulation IV, the review process shall be:

A. Initiate Section 106 Process - 36 CFR Part 800.3
NCDOT will initiate the Section 106 process on behalf of FHWA following the procedures in 36 CFR 800.3. NCDOT CR Specialists, including an archaeologist and architectural historian, will:
    1. Define the undertaking.
    2. Identify and invite other consulting parties (as identified in the NEPA or SEPA process, such as local governments and historic property owners) to participate in the consultation.
    3. Initiate consultation with appropriate Indian tribal governments, where applicable.
B. Identify Historic Properties – 36 CFR 800.4
    1. NCDOT CR Specialists shall determine and document the archaeological and architectural Area of Potential Effects (APE), as defined in 35 CFR 800.16(d).
    2. Based upon the best available background information gathered via a literature and map search, including SHPO files of identified, eligible, or National Register listed historic properties, a NCDOT CR Specialist shall assess the likelihood that unidentified historic properties exist in the APE and shall determine the need for further field survey.
        a. For those projects for which available information provides a reliable basis for reasonably predicting that there are no unidentified historic properties in either the archaeological or architectural APE, a NCDOT CR Specialist for archaeology and historic structures shall each issue a finding of No Survey Required for the project using the *No Survey Required Form* in Appendix C.
            i. The *No Survey Required Forms* shall be included in the Categorical Exclusion or Environmental Assessment, as part of the

NEPA project files. This document serves the consultation requirements under 36 CFR 800.4.

ii. NCDOT shall provide copies of the completed *No Survey Required Forms* to the SHPO annually.

iii. If historic properties are discovered after the NCDOT CR Specialists issue the findings of No Survey Required, reasonable efforts will be made to avoid, minimize, or mitigate adverse effects to such properties per 36 CFR 800.13.

b. For those projects for which available information does not provide a reliable basis for reasonably predicting that there are no unidentified historic properties in either the archaeological or architectural APE, a NCDOT CR Specialist shall issue a finding of *Survey Required* for the project using the *Survey Required Form* in Appendix C.

i. NCDOT shall conduct or cause to be conducted a survey to identify historic properties in a manner consistent with the *Manual* and applicable guidelines, standards, and regulations listed in Stipulation III.

ii. NCDOT shall provide copies of the completed *Survey Required Forms* to the SHPO annually.

iii. Where potential historic properties are identified, a NCDOT CR Specialist shall evaluate their eligibility for listing in the National Register of Historic Places (NRHP) in accordance with the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* and *National Register Bulletin 15, How to Apply the National Register Criteria for Evaluation.*

iv. For those projects which have no National Register-listed or eligible archaeological sites in the APE a NCDOT CR Archaeology Specialist shall document the finding, following the requirements in 36CFR 800.11(d) using the *No National Register of Historic Places Eligible or Listed Archaeological Sites Present Form*, in Appendix C.

1) The *No National Register of Historic Places Eligible or Listed Archaeological Sites Present Form* will be included in the Categorical Exclusion or Environmental Assessment, as part of the appropriate NEPA project files as well the annual report for the PA.

v. Where historic property boundaries have not previously been established, a NCDOT CR Specialist shall identify recommended boundaries following standards set forth in *National Register Bulletin 21: Defining Boundaries for National Register Properties*.

vi. These determinations of eligibility and proposed boundaries shall be documented in separate eligibility reports for archaeology

and/or historic architecture resources, the content and layout of which will be specified in the *Manual* and applicable guidelines, standards, and regulations listed in Stipulation III.

1) Archaeology will provide OSA with the relevant site forms as completed and as a part of the annual report.
2) Historic Architecture eligibility determinations will be sent to the SHPO for review and comment prior to the application of the criteria of effect outlined in Section C, below.
3) If within thirty (30) days of receiving this notification, SHPO/OSA does not object or does not comment, NCDOT may proceed with the project without further review.

c. For those projects for which available information provides a reliable basis for reasonably predicting that all of the historic properties have been identified and evaluated for National Register eligibility in the APE, and further survey work is not needed, but the effects need to be considered on the National Register-listed or eligible historic properties, a NCDOT CR Architectural Historian shall issue a finding of Effects Required for the project using the *Effects Required Form* in Appendix C and follow the procedures outlined in Section C, below.

C. Apply the Criteria of Effect – 36 CFR 800.5

For those undertakings in which there are National Register-listed or eligible historic properties in the APE, a NCDOT CR Specialist shall apply the Criteria of Effects in accordance with 36 CFR Part 800.5 in separate effects processes for archaeology and/or historic architecture resources as outlined below. The result of each process will be documented in writing using the corresponding effects forms provided in Appendix C. Copies of this documentation will be provided to the project's submitter and other consulting parties, as needed.

1. Archaeology:

a. <u>No National Register of Historic Places Eligible or Listed Archaeological Sites Affected</u>: For those projects which have no National Register-listed or eligible archaeological sites affected, a NCDOT CR Archaeology Specialist shall document the finding, following the requirements in 36CFR 800.11(d) using the *No National Register of Historic Places Eligible or Listed Archaeological Sites Affected Form*, in Appendix C.

i. The NCDOT CR Archaeology Specialist shall notify OSA, the project submitter, and other consulting parties, as needed, of the No National Register of Historic Places Eligible or Listed Archaeological Sites Affected finding for the project using the *No National Register of Historic Places Eligible or Listed Archaeological Sites Affected Form*. This form will be included in the Categorical Exclusion or

Environmental Assessment, as part of the appropriate NEPA project files as well the annual report for the PA.

ii. If within thirty (30) days of receiving this notification, OSA or another consulting party does not object or does not comment, NCDOT may proceed with the project without further review. If OSA or another consulting party objects to NCDOT's finding, then one of the following shall take place:

1) For federal undertakings, the documentation will be submitted to the lead federal agency for consideration. If the federal agency and the objecting party(ies) reach consensus, the process will move forward in accordance with this PA, either to a finding of effect or documenting that no historic properties are affected. If consensus is not achieved, the undertaking will not be developed under this PA, but will proceed in accordance with 36 CFR Part 800.3 through 800.6.

2) For state undertakings, with no federal involvement, that do not adversely affect any property listed in the NRHP, NCDOT shall provide a copy of the determination to the SHPO, as staff of the North Carolina Historical Commission. For undertakings that may have an adverse effect on a National Register-listed property, NCDOT shall consult with the SHPO pursuant to the administrative procedures outlined in North Carolina Administrative Code T07:04R.0206.

b. National Register of Historic Places Eligible or Listed Archaeological Sites Adversely Effected: For those projects which have adverse effects to National Register-listed or eligible archaeological sites NCDOT CR Archaeology Specialist shall document the finding and notify the OSA of the finding of adverse effect by forwarding the *Archaeological Adverse Effect Determination Form* provided in Appendix C.

i. The *Archaeological Adverse Effect Determination Form* will be included in the Categorical Exclusion or Environmental Assessment, as part of the appropriate NEPA project files.

ii. The NCDOT CR Archaeology Specialist will meet with OSA staff, lead federal agency (if applicable), and project submitter to discuss the adverse effect of the proposed project on the archaeological site(s).

iii. If OSA or another consulting party proposes conditions or changes to the project that would result in a determination of No Effect and NCDOT agrees to implement the conditions or changes, the NCDOT CR Archaeology Specialist will document them on the *No National Register of Historic Places Eligible or Listed Archaeological Sites Present or Affected Form*, and no further consultation will be necessary.

iv. Any conditions or changes to the project agreed to by NCDOT resulting in a determination of No Effect shall be included in the

Categorical Exclusion or Environmental Assessment, as part of the environmental commitments documentation.

v. If SHPO, the lead federal agency (if applicable), or another consulting party objects to NCDOT's finding of No Effect they shall indicate the reasons for non-concurrence and will consult further to resolve this matter, either by identifying project alternatives that may result in the undertaking having no adverse effect on historic properties or proceeding in accordance with Stipulation X of this PA.

2. Historic Architecture:

a. No National Register of Historic Places Eligible or Listed Historic Properties Present or Affected: For those projects which have no National Register-listed or eligible historic properties present or affected, a NCDOT CR Historic Architecture Specialist shall document a finding of No Historic Properties Present or Affected for the project, following the requirements in 36CFR 800.11(d) and using the *No National Register of Historic Places Eligible or Listed Historic Properties Present or Affected Form* in Appendix C.

i. The *No National Register of Historic Places Eligible or Listed Historic Properties Present or Affected Form* will be included in the Categorical Exclusion or Environmental Assessment, as part of the appropriate NEPA project files.

ii. The NCDOT CR Historic Architecture Specialist shall notify SHPO, the project submitter, and other consulting parties, as needed, of the No National Register of Historic Places Eligible or Listed Historic Properties Present or Affected finding for the project using the *No National Register of Historic Places Eligible or Listed Historic Properties Present or Affected Form.*

iii. If within thirty (30) days of receiving this notification, SHPO or another consulting party does not object or does not comment, NCDOT may proceed with the project without further review. If SHPO or another consulting party objects to NCDOT's finding, one of the following shall take place:

1) For federal undertakings, the documentation will be submitted to the lead federal agency for consideration. If the federal agency and objecting party(ies) reach consensus, the process will move forward in accordance with this PA, either to a finding of effect or documenting that no historic properties are affected. If consensus is not achieved, the undertaking will not be developed under this PA, but will proceed in accordance with 36 CFR Part 800.3 through 800.6.

2) For state undertakings, with no federal involvement, that do not adversely affect any property listed in the NRHP, NCDOT shall provide a copy of the determination to the SHPO, as staff of the North Carolina Historical Commission. For undertakings that may have an adverse effect on a National

Register-listed property, NCDOT shall consult with the SHPO pursuant to the administrative procedures outlined in North Carolina Administrative Code T07:04R.0206.

b. No Effect or No Adverse Effects on National Register of Historic Places Eligible or Listed Historic Properties: If the NCDOT CR Historic Architecture Specialist determines that the undertaking will have No Effect or No Adverse Effects on National Register-listed or eligible historic properties, it will meet with SHPO staff, lead federal agency (if applicable), and project submitter to discuss the effects of the proposed project on the historic properties.

   i. The *National Register of Historic Places Eligible or Listed Historic Properties Effects Determination Form* in Appendix C will document the application of the criteria of effect and will contain signatures from NCDOT CR Specialist, SHPO staff, and federal agency with jurisdiction (if applicable).

   ii. If SHPO or another consulting party proposes conditions or changes to the project that would result in a determination of No Effect or No Adverse Effect, and NCDOT agrees to implement the conditions or changes and will document them on the *National Register of Historic Places Eligible or Listed Historic Properties Effects Determination Form*, and no further consultation will be necessary.

   iii. Any conditions or changes to the project agreed to by NCDOT resulting in a determination of No Effect or No Adverse Effect shall be included in the Categorical Exclusion or Environmental Assessment, as part of the environmental commitments documentation.

   iv. If SHPO, lead federal agency (if applicable), or another consulting party objects to NCDOT's finding of No Effect or No Adverse Effect, they shall indicate the reasons for non-concurrence and will consult further to resolve this matter, either by identifying project alternatives that may result in the undertaking having no adverse effect on historic properties or proceeding in accordance with Stipulation X of this PA.

c. National Register of Historic Places Eligible or Listed Historic Properties Adversely Effected: If the NCDOT CR Historic Architecture Specialist determines that the undertaking will have Adverse Effects on National Register-listed or eligible historic properties, it will meet with SHPO staff, lead federal agency (if applicable), and project submitter to discuss the effects of the proposed project on the historic properties.

   i. The *National Register of Historic Places Eligible or Listed Historic Properties Effects Determination Form* in Appendix C will document the application of the criteria of effect and will contain signatures from NCDOT CR Specialist, SHPO staff, and lead federal agency (if applicable).

   ii. If SHPO or another consulting party proposes conditions or changes to the project that would result in a determination of No Effect or No

Adverse Effect, and NCDOT agrees to implement the conditions or changes and will document them on the *National Register of Historic Places Eligible or Listed Historic Properties Effects Determination Form*, and no further consultation will be necessary.

D. Adverse Effect – 36 CFR 800.6

For projects that have an Adverse Effect on historic properties, NCDOT will assist the lead federal agency in meeting its 36 CFR 800.6 responsibilities by undertaking the following steps:

1. The NCDOT CR Specialist will continue consultation with SHPO, lead federal agency, and other consulting parties to develop and evaluate alternatives or modifications to the project that could avoid minimize, or mitigate adverse effects on historic properties.
2. If the adverse effect cannot be avoided, then the NCDOT CR Specialist shall prepare a Finding of Adverse Effect for the lead federal agency so that they may notify the Council of the adverse effect finding in accordance with 36 CFR 800.11(e). Both the NCDOT CR Specialists for archaeology and historic architecture will contribute to the preparation of this document.
3. The lead federal agency shall provide all consulting parties the documentation specified in 36CFR 800.11(e), subject to the confidentiality provisions of 36CFR 800.11(c) and the federal agency shall also make this information available to the public.
4. The NCDOT CR Specialist will work with the SHPO, lead federal agency, and other consulting parties to negotiate terms of a Memorandum of Agreement (MOA).

E. Project Re-evaluation

1. If an undertaking changes in scope or APE, both the NCDOT CR Specialist for archaeology and historic architecture shall re-assess the previous findings issued by their respective specialties to determine if the findings remain valid or if additional survey or effects assessment is required.
2. In addition, the NCDOT CR Specialists will review the applicability of this PA to the project to determine if the project continues to qualify for treatment under Stipulations IV and V. If the undertaking no longer qualifies for such treatment, it will not be considered a minor project and will not be reviewed under the terms of this PA.
3. Should SHPO or a member of the public provide new information regarding a project that would alter the re-evaluation determination made above, NCDOT, SHPO, and consulting parties shall consult pursuant to 36 CFR 800.4 through 800.6 and 800.13. Such information shall be provided to NCDOT in a timely manner.

F. Unanticipated Discovery

All unanticipated discoveries made in conjunction with any project covered by this PA shall be treated in accordance with the procedures outlined in 36 CFR 800.13(b).

G. Historic Bridges

NCDOT shall use the findings of the Historic Bridge Inventory (NCDOT, 2004), or any updates thereof, to determine the National Register eligibility of bridges. Bridges considered not eligible for the National Register require no further evaluation unless the prior evaluation was incomplete or changing perceptions of significance after 2015 necessitate re-evaluation.

H. Emergency Situations
From time to time, NCDOT will be required to perform emergency actions in response to an immediate threat to the preservation of human life or property, in which case NCDOT will be allowed an emergency waiver from the review procedures set forth in this PA.
   1. The emergency waiver for minor transportation projects shall begin at the time that NCDOT determines that an emergency action is required and will only be applicable if NCDOT reasonably anticipates that the emergency action will be initiated within ten (10) days.
   2. In the event of such emergencies, NCDOT CR Specialists shall, within thirty (30) days of the emergency, provide a summary of the emergency undertaking to SHPO and note if and how National Register-listed or eligible properties were affected.
   3. If a listed or eligible property was adversely affected by the emergency undertaking, NCDOT shall consult with SHPO and other parties to this PA, as appropriate, to determine if post-emergency mitigation is needed.

VI. Cooperation and Communication

NCDOT and SHPO will continue to share information developed or generated by each agency related to the identification, evaluation, management and treatment of North Carolina's cultural resources.

VII. Annual Review and Monitoring

A. NCDOT and SHPO shall regularly consult to review implementation of the terms of the PA. NCDOT will maintain a list, sorted by Unit or Division, of all projects covered by this PA for a twelve (12)-month period from July 1 through June 30. NCDOT will provide all parties to this agreement with copies of this list called the *Annual Report on the Programmatic Agreement for Minor Transportation Projects in North Carolina (Annual Report)* by July 31 of each year.
   1. The content and format of the *Annual Report* will be described in the *Manual* for this PA.
   2. The FHWA, SHPO and other concurring parties (as requested) will review the *Annual Report* and assess the implementation of the PA for the year under review.
   3. If deemed appropriate by any signatory to this PA, NCDOT will notify the parties that they will meet to discuss and resolve any issues raised as a result of the review.

B. FHWA, Council, and SHPO may monitor activities carried out pursuant to this PA. NCDOT shall cooperate with these parties in carrying out their monitoring efforts.

C. The federal agency(ies), who have signed this PA, are responsible for ensuring that its terms are fulfilled. Should a federal agency and/or SHPO determine that a Unit or Division of NCDOT is not consistently complying with the provisions of this PA, it shall notify NCDOT managers, who will address the problem and report to all the parties of this PA on the corrective monitoring and/or coaching undertaken.

VIII. Amendment

A. Any of the primary signatories of this PA may request that it be amended, whereupon the parties will consult to consider such an amendment. An amendment to the PA will go into effect upon the written concurrence of the FHWA, SHPO, NCDOT and Council.
B. The forms and *Manual* referenced in Appendix C may be revised with the written concurrence of the Parties to this PA.
C. If a party invited to concur in this PA has not accepted by the time it is filed with the Council, they may become a concurring party for the duration of this PA upon the written concurrence of the primary signatories. Such action will not require an amendment to this PA.

IX. Termination

Any party of the primary signatories of this PA may terminate it by providing written notice of thirty (30) calendar days to the other parties, provided that the parties will consult during the period prior to termination to seek agreement on amendments and other actions that would avoid termination. In the event of termination, FHWA will comply with 36 CFR Part 800.4 through 36 CFR Part 800.6 with regard to individual undertakings covered by this PA.

X. Dispute Resolution

A. Should SHPO or another consulting party on an individual undertaking subject to review under this PA, object within thirty (30) days to any plans or documentation provided for review pursuant to this agreement, the federal agency with jurisdiction shall consult with the objecting party(ies) to resolve the objection. If the federal agency determines that the objection cannot be resolved, it shall forward all documentation relevant to the dispute to the Council. Within 30 days after receipt of all pertinent documentation, the Council will either:
    1. Provide the federal agency with recommendations which the federal agency will take into account in reaching a final decision regarding the dispute, or
    2. Notify the federal agency that it will comment pursuant to 36 CFR Section 800.7(c) and proceed to comment. Any Council comment provided in response to such a request will be taken into account by the federal agency in accordance with 36 CFR Section 800.7(c)(4) with reference to the subject of the dispute.

    Any recommendation or comment provided by the Council will be understood to pertain only to the subject of the dispute and FHWA's responsibility to carry out all the actions under this agreement that are not the subject of the dispute will remain unchanged.

B. Any member of the public, any agency or organization may request the Council review of section 106 compliance for an individual undertaking in accordance with 36 CFR Part 800.9(a).
C. For projects with no federal involvement, state law requires that state undertakings be reviewed under NCGS 121-12(a). Should SHPO or another consulting party on an individual undertaking subject to review under this PA, object within thirty (30) days to any plans or documentation provided for review pursuant to this agreement, NCDOT shall consult with SHPO as staff of the North Carolina Historical Commission as per the administrative procedures outlined in North Carolina Administrative Code T07:04R.0206.

XI. Duration

This PA shall continue in full force and effect until June 30, 2020. During the six (6) month period prior to this date, the signatory parties will consult to consider an extension or amendment of the PA. No extension or amendment will be effective unless the primary signatories to the PA agree in writing.

Execution and implementation of this PA evidences that FHWA, in cooperation with NCDOT, has satisfied its responsibilities under Section 106 of NHPA for all individual undertakings of minor transportation projects covered under this PA.

AGREE:

Federal Highway Administration

John F. Sullivan, III, P.E.
Division Administrator

9/22/2015
Date

North Carolina Department of Transportation

Nicholas J. Tennyson
Secretary

9/15/2015
Date

State Historic Preservation Office

Kevin Cherry, Ph.D.
North Carolina State Historic Preservation Officer

9/21/2015
Date

Advisory Council on Historic Preservation

John M. Fowler
Executive Director

10/22/15
Date

PROGRAMMATIC AGREEMENT
AMONG THE FEDERAL HIGHWAY ADMINISTRATION,
THE NORTH CAROLINA STATE HISTORIC PRESERVATION OFFICER,
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,
AND THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
FOR ADMINISTRATION OF THE FEDERAL AID HIGHWAY PROGRAM

WHEREAS, the Federal Highway Administration (FHWA) provides funding for various highway projects administered throughout the state of North Carolina by the North Carolina Department of Transportation (NCDOT) as authorized by 23 USC 771; and

WHEREAS, the Division Administrator, FHWA, is the "Agency Official" responsible for compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 USC 470 et seq.) and its implementing regulations (36 CFR Part 800, as amended); and

WHEREAS, FHWA has determined that implementation of the federal aid highway program may have an effect upon properties included in or eligible for inclusion in the National Register of Historic Places, and has consulted with the North Carolina State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (Council) pursuant to 36 CFR § 800.14(b) of the regulations implementing Section 106 of the National Historic Preservation Act; and

WHEREAS, the NCDOT employs qualified professional staff and consultants capable of completing many of the steps of the Section 106 review process on behalf of FHWA, and has a considerable record of successful compliance with Section 106; and

WHEREAS, the NCDOT has participated in the consultation and has been invited to be a signatory in this Programmatic Agreement; and

WHEREAS, the definitions contained in 36 CFR § 800.16 are appropriate to define the terms used in this agreement;

NOW, THEREFORE, the FHWA, the SHPO, the Council, and the NCDOT agree that the program shall be implemented in accordance with the following stipulations in order to take into the account the effect of its individual undertakings on historic properties.

Stipulations

The FHWA will ensure that the following measures are carried out:

1. NCDOT, using staff and /or consultants meeting the *Secretary of the Interior's Professional Qualifications Standards* (48 FR 44738-9), will independently perform the work and consultation described in specific sections of 36 CFR § 800.3 - 800.5 on behalf of FHWA as follows with the exception of conducting consultation with Indian tribes or Tribal Historic Preservation Officers (THPO):

   36 CFR § 800.3

   (1) Establish undertaking
   (2) Coordinate with other reviews
   (3) Identify the appropriate SHPO and/or THPO
   (5) Plan to involve the public
   (6) Identify other consulting parties
   (7) Expediting consultation

   36 CFR § 800.4

   (1) Determine scope of identification
   (2) Identify historic properties
   (3) Evaluate historic significance
   (4) Results of identification and evaluation

   36 CFR § 800.5

   (1) Apply criteria of adverse effect
   (2) Finding of no adverse effect
   (3) Consulting party review
   (4) Results of assessment

2. In recognition of the unique government-to-government relationship between the Federal government and Indian tribes, FHWA shall take the lead in identifying and establishing consultation with the appropriate THPO or Tribal representatives consistent with 36 CFR § 800.3 (c)-(f). If the tribe is agreeable, further consultation may be conducted among the tribe and NCDOT.

3. If consultation with the SHPO/THPO and other consulting parties results in agreement on a finding of "no adverse effect", NCDOT will prepare documentation in support of the finding as described in 36 CFR § 800.11(e) and forward it to the FHWA. FHWA concurrence in the finding will be sufficient to conclude Section 106 consultation without further review by the Council.

4. If consultation results in a finding of "adverse effect" or if no agreement can be reached, work required to conclude the Section 106 consultation process will be completed by the FHWA as described in 36 CFR § 800.6.

Written documentation will be prepared by NCDOT for use by the FHWA.

5. NCDOT will notify FHWA when a project falls beyond the routine Section 106 process as defined in 36 CFR § 800.3 - 800.6. Using information prepared by NCDOT, FHWA will then take appropriate actions to comply with special provisions of 36 CFR Part 800, especially as they apply to instances involving the protection of National Historic Landmarks (36 CFR § 800.10), post-review discoveries (36 CFR § 800.13), emergency situations (36 CFR § 800.12), and situations calling for program alternatives (36 CFR § 800.14).

ADMINISTRATIVE STIPULATIONS

6. This agreement applies to all projects that are administered through the NCDOT and funded or authorized by the FHWA.

7. It is the intent of the FHWA to become actively involved in the resolution of disagreements pertinent to findings eligibility and effects should they arise. Initially, FHWA will mediate between the NCDOT and SHPO to seek a solution. Disputes regarding eligibility of a property shall be resolved pursuant to 36 CFR § 800.4(c)(2). NCDOT and/or its consultants may prepare documentation in accordance with 36 CFR Part 63 for transmittal by the FHWA to the Keeper of the National Register for this purpose. In order to resolve questions of effect, NCDOT and/or its consultants will prepare documentation in accordance with the provisions of 36 CFR § 800.11(e) for transmittal by the FHWA to the Council for comment pursuant to 36 CFR § 800.6(c)(3).

8. All historic preservation work carried out pursuant to this agreement will be preformed by or under the direct supervision of a person or persons meeting the *Secretary of the Interior's Professional Qualifications Standards* (48 FR 44738-9), for the disciplines required to complete the necessary work.

9. The FHWA, the SHPO, or the Council may monitor any activities carried out pursuant to this agreement, and the Council will review such activity if so requested. NCDOT will cooperate with the FHWA, the SHPO and the Council in carrying out these monitoring and review responsibilities.

10. Any party to this agreement may request that it be amended, whereupon the parties shall consult in accordance with 36 CFR § 800.14(b) to consider such an amendment.

11. Any party to this agreement may terminate it by providing thirty days written notice to the other parties, provided that the parties will consult during the period prior to the termination to seek agreements on amendments or other actions that would avoid termination. In the event of termination, the FHWA will comply with 36 CFR § 800.3 through 800.6 with respect to the individual undertakings covered in this agreement.

12. In the event the FHWA or NCDOT cannot carry out the terms of this agreement, the FHWA will comply with 36 CFR § 800.3 through 800.6.

Execution of this Programmatic Agreement by FHWA, NCSHPO, the Council, and the NCDOT and implementation of its terms by FHWA evidence that the FHWA has afforded the Council an opportunity to comment on the Federal Aid Highway Program for North Carolina and that FHWA has taken into account the effects of the program on historic properties.

FEDERAL HIGHWAY ADMINISTRATION

Nicholas L. Graf DATE: 2/14/00

Nicholas L. Graf, Division Administrator

NORTH CAROLINA STATE HISTORIC PRESERVATION OFFICER

Jeffrey J. Crow DATE: 2/1/00

Jeffrey J. Crow, State Historic Preservation Officer

ADVISORY COUNCIL ON HISTORIC PRESERVATION

John M. Fowler DATE: 3/20/00

John M. Fowler, Executive Director

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

L A Sanderson DATE: 12-2-99

L. A. Sanderson, State Highway Administrator

RECEIVED
AUG 06 2015
HISTORIC PRESERVATION OFFICE

United States Department of the Interior

NATIONAL PARK SERVICE
Blue Ridge Parkway
199 Hemphill Knob Road
Asheville, North Carolina 28803

IN REPLY REFER TO:

EX 01-8333

H30

Draft letter - LGH/BJS 8-18-15

August 3, 2015

Due 8/14/15

Renee Gledhill-Earley
State Historic Preservation Office
4617 Mail Service Center
Raleigh, NC 27699-4617

Due 9/10/15 H

Dear Ms Gledhill-Earley:

In compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, we are writing to you concerning an archeological survey of the proposed limits of disturbance associated with replacement of the bridge over I-26.

An archeological survey of the Area of Potential Effect (APE) was conducted by the Blue Ridge Parkway archeologist Steven Kidd on July 21, 2015. His report (attached) resulted in a determination that no archeological sites were present within the APE.

It is the determination of the National Park Service that this project will have no adverse effect on cultural resources or sites eligible or potentially eligible for listing in the National Register of Historic Places. If you concur with this determination, please sign on the line provided below and return this letter to us. If we have not received this response within 30 days, as provided by 36 CFR 800.5(b) and (c), then we will consider our responsibilities under Section 106 of the National Historic Preservation Act, as amended, and 36 CFR Part 800 to be completed.

Sincerely,

Steven Kidd
Cultural Resource Program Manager/Archeologist

I concur (X) **I do not concur ( )**

Renee Gledhill-Earley, EPC 9.3.15
NC State Historic Preservation Office Date

AUG 07 2015

North Carolina Department of Natural and Cultural Resources

State Historic Preservation Office

Ramona M. Bartos, Administrator

Governor Pat McCrory
Secretary Susan Kluttz

Office of Archives and History
Deputy Secretary Kevin Cherry

March 28, 2016

Beth Byrd, Acting Cultural Resources Specialist beth_byrd@nps.gov
Blue Ridge Parkway
199 Hemphill Knob Road
Asheville, NC 28803

Re: Demolition and Replacement of Blue Ridge Parkway Bridge over I-26, Buncombe County, ER 01-8333

Dear Ms. Byrd:

Thank you for your letter of March 8, 2016, concerning the above-referenced undertaking, which will adversely affect the National Register-eligible Blue Ridge Parkway and is part of a larger project to improve I-26 from NC 225 to NC 280 (I-4400 & I-4700). We understand that this portion of that project is to be considered separately and have a separate Section 106 consultation due to the involvement and cooperation of the National Park Service (NPS), Eastern Federal Lands Highway Division Office (FHWA), and the North Carolina Department of Transportation (NCDOT).

Since representatives of the State Historic Preservation Office (HPO) were unable to attend the December 2015 Value Analysis/Choosing by Advantages workshop, we appreciate the information provided in your letter. It helps answer questions that were raised at an informal meeting between staff of NCDOT and HPO.

We now understand the reasoning behind the decisions to not use suicide fencing on the new bridge and to reject the arched girder design. However, we do not agree with the proposal to install a sidewalk on only the west side of the bridge. Or, to use a five foot (5') sidewalk on the west side and a two to three foot (2 – 3') sidewalk on the east side of the bridge. While we very much support pedestrian safety, we also believe that symmetry is an important element in the design of the new bridge and believe that this is supported by the statement on page 34 of the "Draft Value Analysis Study - REPLACEMENT OF BLUE RIDGE PARKWAY BRIDGE OVER INTERSTATE 26, Federal Project Number–NC_ST_BLRI_I26_NEPA, January 2016."

> Design recommendation – The Caltrans Type 80 rail is the recommended bridge railing design. The final design should adjust the railing heights on both sides of the bridge to account for the superelevation and *to maintain a balanced appearance for users approaching the bridge*. However, the design adjustments must maintain the crash ratings.

Having consulted with the Blue Ridge Parkway for more than thirty years on bridges, guard walls and rails, overlooks, and other historic structures, I personally understand that these elements are part of what makes the Parkway unique, that they have evolved over decades, and warrant our time and effort to ensure that any new element be compatible and complimentary to the whole. Thus, I look forward to continuing our conversation and consultation on the project as a whole and this issue in particular.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579 or environmental.review@ncdcr.gov. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

Renee Gledhill-Earley

for Ramona M. Bartos

cc: Mary Pope Furr, NCDOT, mfurr@ncdot.gov
Jennifer Harris, HNTB/NC, jhharris@HNTB.com

North Carolina Department of Natural and Cultural Resources

State Historic Preservation Office

Ramona M. Bartos, Administrator

Governor Pat McCrory
Secretary Susan Kluttz

Office of Archives and History
Deputy Secretary Kevin Cherry

September 27, 2016

John McDade
Blue Ridge Parkway
199 Hemphill Knob Road
Asheville, NC 28803

john_mcdade@nps.gov

RE: Replacement of Blue Ridge Parkway Bridge over I-26, Buncombe County, ER 01-8333

Dear Mr. McDade:

Thank you for your September 1, 2016, letter concerning the above-referenced undertaking and providing a link to recent visualizations. The visualizations appear to reflect the design items, which we discussed with the Blue Ridge Parkway and North Carolina Department of Transportation, and agreed appear to be compatible with the historic character of the Parkway. As the parties know we consider the Blue Ridge Parkway eligible for listing in the National Register of Historic Places at the national level of significance.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579 or environmental.review@ncdcr.gov. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

Renee Gledhill-Earley

for Ramona M. Bartos

cc: Mary Pope Furr, NCDOT mfurr@ncdot.gov

RECEIVED
AUG 06 2015
HISTORIC PRESERVATION OFFICE

United States Department of the Interior

NATIONAL PARK SERVICE
Blue Ridge Parkway
199 Hemphill Knob Road
Asheville, North Carolina 28803

IN REPLY REFER TO:

EX 01-8333

H30

Draft letter - LGH/BJS 8-18-15

August 3, 2015

Due 8/14/15

Renee Gledhill-Earley
State Historic Preservation Office
4617 Mail Service Center
Raleigh, NC 27699-4617

Due 9/10/15 H

Dear Ms Gledhill-Earley:

In compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, we are writing to you concerning an archeological survey of the proposed limits of disturbance associated with replacement of the bridge over I-26.

An archeological survey of the Area of Potential Effect (APE) was conducted by the Blue Ridge Parkway archeologist Steven Kidd on July 21, 2015. His report (attached) resulted in a determination that no archeological sites were present within the APE.

It is the determination of the National Park Service that this project will have no adverse effect on cultural resources or sites eligible or potentially eligible for listing in the National Register of Historic Places. If you concur with this determination, please sign on the line provided below and return this letter to us. If we have not received this response within 30 days, as provided by 36 CFR 800.5(b) and (c), then we will consider our responsibilities under Section 106 of the National Historic Preservation Act, as amended, and 36 CFR Part 800 to be completed.

Sincerely,

Steven Kidd
Cultural Resource Program Manager/Archeologist

I concur (X) **I do not concur ( )**

Renee Gledhill-Earley, EPC 9.3.15
NC State Historic Preservation Office Date

AUG 07 2015

United States Department of the Interior

NATIONAL PARK SERVICE
Blue Ridge Parkway
199 Hemphill Knob Road
Asheville, North Carolina 28803

IN REPLY REFER TO:

H30
PIN 16296

March 8, 2016

Renee Gledhill-Earley
State Historic Preservation Office
4617 Mail Service Center
Raleigh, NC 27699-4617

Dear Ms. Gledhill-Earley:

In compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, (54 U.S.C. 306108), the National Park Service (NPS) is writing to consult with your office on the proposed demolition and replacement of the bridge along the Blue Ridge Parkway (Parkway) over Interstate 26 in Buncombe County (ER 01-8333). The NPS is cooperating with the North Carolina Department of Transportation (NCDOT) and the Eastern Federal Lands Highway Division Office (FHWA) on Section 106 compliance and the design of the replacement bridge. Consultation began early in project planning and on August 3, 2015, NPS submitted an archeological survey of the Area of Potential Effect (APE) and found ***no archeological sites*** on Blue Ridge Parkway property. Your office concurred with this finding on September 3, 2015. The NPS also finds that the demolition of the existing bridge is an ***adverse effect*** since the Parkway (roadway) is a contributing resource to the proposed National Historic Landmark historic district.

Since that time, the NPS, NCDOT, and FHWA conducted a Value Analysis/Choosing By Advantages (VA/CBA) workshop and the draft study from that meeting is available along with the draft Section 4(f) evaluation. We understand from correspondence with NCDOT and FHWA that your office provided comments on these studies and suggested sidewalks be provided on both sides of the new bridge. The NPS would like to offer additional comments related to features of the bridge design meant to minimize the adverse effect, knowing that additional mitigation will be necessary.

Specific comments:

- Any suicide fencing would not be required by the Blue Ridge Parkway. The unique visual character of the designed landscape is our preeminent concern and no bridges along the 469-mile route have tall suicide fences. The proposed 42’ concrete railing identified in the VA/CBA study is preferred due to compatibility with other examples along the Parkway and meets pedestrian safety requirements. The issue of suicide fencing for such an elevated bridge was discussed during the VA/CBA workshop and dismissed.

- The arched girder design was dismissed during the VA/CBA workshop due to construction restraints. The footers of this bridge design would not have allowed the necessary width needed to add additional lanes to I-26 at this location. The arched design would require a retrofit to the existing bridge deck, mandating full replacement of the bridge deck in twenty years, causing excessive life cycle costs. There is no design precedent on the Parkway for a steel arched bridge, which encouraged the group to dismiss this option at the workshop.
- The preferred design of a 5' raised sidewalk on the west side of the bridge would accommodate current safety standards for pedestrians using the Mountain to Sea Trail (MST) as it crosses the I-26 Bridge. The elevated sidewalk would provide a measure of additional safety by reducing the conflict between bicycles and pedestrians. To further increase safety, the MST would be realigned along the abandoned section of Parkway at the northern approach to the bridge and would remain aligned at the existing location from the southern approach to the bridge. To preserve symmetrical design a raised 2 to 3 foot walk could be included on the east side of the bridge. All bridges on the Blue Ridge Parkway have raised walks on one or both side of the bridge and are integral to the bridge parapet wall.

We look forward to working with your office, NCDOT and FHWA as this project continues. If you have any questions, please contact Beth Byrd, Acting Cultural Resource Specialist at the Blue Ridge Parkway at (404) 507-5793 or beth_byrd@nps.gov.

Sincerely,

Beth Byrd
Acting Cultural Resource Specialist

Attachment: Draft Value Analysis workshop report

CC:
Mary Pope Furr, NCDOT
Larry Hulquist, DSC- Blue Ridge Parkway
Suzette Molling, Blue Ridge Parkway
Jack VanDop, FHWA
Jennifer Harris, HNTB North Carolina
Lisa Landers, FHWA

United States Department of the Interior

NATIONAL PARK SERVICE
Blue Ridge Parkway
199 Hemphill Knob Road
Asheville, North Carolina 28803

IN REPLY REFER

H30

JUN 0 6 2016

Renee Gledhill-Earley
State Historic Preservation Office
4617 Mail Service Center
Raleigh, NC 27699-4617

Dear Ms. Gledhill-Early:

Thank you for your letter received March 28, 2016, regarding the replacement Blue Ridge Parkway (Parkway) Bridge over I-26. The National Park Service (NPS) understands the need for a balanced appearance in addition to pedestrian safety on the new proposed bridge. While we agree that symmetry is an important element in the design of the new bridge, we would like to discuss outstanding concerns and work with your office, North Carolina Department of Transportation (NCDOT), and Eastern Federal Lands Highway Division (EFLHD) to accomplish a design that maintains a balanced visual appearance for users approaching the bridge.

The Value Analysis recommended a 5-foot wide raised concrete walkway be installed on Parkway right (west side), or low super-elevation side of the new bridge to counterbalance the curved alignment. On this side of the bridge, the new walkway would align with the Mountains to Sea Trail (MST) approach from the south side of the bridge. On the north approach of the new bridge, the MST would be realigned along the abandoned section of Parkway, and the crossing of the MST would be relocated (from Parkway right to left) further from the bridge to a straighter alignment of the Parkway, which would make this trail crossing safer for hikers. Varying options have been proposed by EFLHD Bridge Engineers for the walkway crossing of the new I-26 Bridge. The impacts of having a 5-foot wide raised concrete walkway installed on both sides of the bridge are discussed in the following analysis.

Cost and Safety Impacts to a Symmetrical Walkway Design

- A walking surface, on at least one side of the bridge at grade level to the road surface, and separated only by a white stripe from the travel surface, has been proposed. Blue Ridge Parkway and Federal Highway Safety and Bridge Engineers assessed this design to be particularly unsafe in that it would result in errant vehicle conflict between bicyclists, pedestrians and motorists. The new I-26 Bridge will have a curved alignment with limited sight distances, which makes this design particularly unsafe. The Linn Cove Viaduct is a curved bridge with widened lanes and no raised walking surfaces on either side. The Blue Ridge Parkway does not allow pedestrians to walk on the bridge because of the particular unsafe conditions. The I-26 Bridge differs from Linn Cove Viaduct due to the fact that the MST is aligned across this bridge, which invites hikers/pedestrians to routinely cross the bridge.

- EFLHD Safety Engineers and park staff suggest that having a walkway on both sides of the bridge could encourage a very unsafe pedestrian crossing of the bridge that is within a curved alignment. All the bridges in the Asheville corridor along the Parkway have a raised concrete surface on both sides of the bridge; however, these bridges have a straight alignment. The raised concrete surfaces adjoining the bridge rail are approximately 2.5 to 3 feet wide and are not intended to be pedestrian walk surfaces.

- Federal Highway Bridge and Safety Engineers have stated that because of the curved alignment of the I-26 Bridge and considering its limited sight distances, a minimum 5-foot raised walking surface would be needed to meet pedestrian safety requirements at the Parkway design speed limit of 45 MPH. A narrower walking surface would require reduced speed limits to less than 45 MPH or a revised bridge alignment. In addition, EFLHD Bridge Engineers recommend a minimum 5-foot width for at least one walkway to meet ADAAG handicap access codes. Although meeting this requirement may not be necessary currently, it may be necessary in the future.

- A 5- foot wide raised concrete walkway on both sides of the bridge would widen the bridge deck surface by 15 percent with a construction cost increase of 2.1 million dollars.

- The Value Analysis study for the new I-26 Bridge considered varying walkway design and trail realignment options and determined the minimal impact to the MST would be to preserve its present alignment on the south side of the bridge. It was determined there would be minimal impact to the MST to realign it along the abandoned alignment of the Parkway, to insure a safer trail crossing from Parkway right to left, as it presently does on the north side of the bridge. This trail realignment would move the trail crossing to a more ideal location than the existing trail crossing by improving sight distance away from the bridge.

In conclusion, the new I-26 Bridge is designed to be offset from the existing bridge so that the existing bridge can remain in place as the new bridge is being constructed. The new bridge will itself have a curve alignment to realign the Parkway motor road away from the existing bridge and to resolve a tight radius curve along the Parkway south of the bridge. Considering the curved alignment of the new bridge, Federal Highway Bridge and Safety Engineers have stated that a 5-foot wide raised walkway, aligned along the low side of the bridge super-elevation, provides the maximum pedestrian safety, meanwhile addressing the need to provide access for the MST and balancing the visual experience of driving along the Parkway. It is the low or west side of the new bridge that the existing Mountains-to-Sea Trail will be follow, also making that side the ideal location for the walkway.

We would like to discuss your comments about symmetry in the context of these safety and access concerns. We hope that NCDOT will address any cost concerns and together we can continue consultation on this project to minimize adverse effects.

Sincerely,

Mark Woods
Superintendent

United States Department of the Interior

NATIONAL PARK SERVICE
Blue Ridge Parkway
199 Hemphill Knob Road
Asheville, North Carolina 28803

IN REPLY REFER

L7617
PIN 16296

JUN 2 8 2016

Ms. Jennifer Harris
Mr. Bill Barrett
North Carolina, Department of Transportation
1548 Mail Service Center
Raleigh, NC 27699-1548

Dear Mr. Barrett and Ms. Harris:

The Section 4(f) documentation for the new Blue Ridge Parkway Bridge over I-26 describes impacts to the Mountains to Sea Trail (MST) as follows. Within the project area, the MST intersects the Blue Ridge Parkway at three locations (Posts with directional arrows and the MST logo mark these locations) (see Figure 2).

1) The realigned Blue Ridge Parkway would shift approximately 70 feet south in the location of the trail crossing at Milepost 392.1. This shift would require minor improvements to the trail at the relocated crossing, including installation of wayfinding markers; however, the trail would remain on the existing alignment.
2) At Milepost 391.9, the Blue Ridge Parkway realignment would be located approximately at the same location as the motor road currently; however, minor improvements to adjust the grade may be required at the trail head to tie into the improved motor road. The MST would be relocated to the proposed new Blue Ridge Parkway Bridge to cross I-26.
3) The realigned Blue Ridge Parkway would shift approximately 110 feet south in the location of the trail intersection at Milepost 391.7 on the east side of the bridge through a steep cut section. This shift would require minor improvements to the trail at the relocated crossing, including the resetting of wayfinding markers; however, the trail would remain on the existing alignment. Though some minor work is anticipated at the relocated motor road intersections, including but not limited to grading and the resetting of wayfinding signs, the trail would remain on the existing alignment – except as it crosses I-26 on the replacement Blue Ridge Parkway Bridge. This work would be minor in nature and would not alter any

features that contribute to the MST's recreational use and/or aesthetic qualities. The initial clearing activity associated with project construction would be of short duration and during a time of low probable usage (i.e., winter). Therefore, the minimal direct use of the MST constitutes a *de minimis* use under Section 4(f).

The Blue Ridge Parkway has sent a letter to the North Carolina State Historic Preservation Office stating that Blue Ridge Parkway supports the design of a single walk crossing on the low or west side of the bridge. With this decision, the Blue Ridge Parkway agrees that the minimal direct use of the MST does constitute a *de minimis* use under Section 4(f).

Sincerely,

Mark H. Woods
Superintendent

cc:
NPS:
SERO-Anita Barnett, Beth Byrd
BLRI-Mike Molling, Suzette Molling, Larry Hultquist, Andy Otten, Craig Yow

NCDOT:
Mitch Batuzich, Undrea Major, John Williams, Kristina Solberg

FHWA:
Jack VanDop, Lisa Landers, Allan Teikari, Yanina Kirtley, Hratch Pakhchanian

United States Department of the Interior

NATIONAL PARK SERVICE
Blue Ridge Parkway
199 Hemphill Knob Road
Asheville, North Carolina 28803

IN REPLY REFER TO:

H30
PIN 16296

September 1, 2016

Renee Gledhill-Earley
State Historic Preservation Office
4617 Mail Service Center
Raleigh, NC 27699-4617

Dear Ms. Gledhill-Earley:

In compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, (54 U.S.C. 306108), the National Park Service (NPS) is writing to consult with your office on the proposed demolition and replacement of the bridge along the Blue Ridge Parkway (Parkway) over Interstate 26 in Buncombe County (ER 01-8333). As the project moves forward we wanted to solicit a formal response regarding a few key elements of the design to ensure we are on the same page.

The most recent visualizations for the bridge are available at the following link: https://we.tl/mNYopEMf1c. You can download the files from this link until September 8. If you are unable to download the files before this date please let me know. I apologize the files were too large to send via email.

You will note the plan calls for a sidewalk on one side with no ramp. The plan also calls for stone guardwalls on both sides of the approaches to the bridge. Due to software limitations the visuals show the top course of stones on the guardwalls of equal thickness. The NPS has sent NCDOT specifications for class B masonry that will harmonize with other stonework on the Parkway, and they have agreed to complete the work in such a manner.

Please let us know if you have any issues with the proposed design at this time.

Best regards,

John McDade
Cultural Resource Manager

CC:

Mary Pope Furr, NCDOT
Larry Hulquist. DSC- Blue Ridge Parkway
Suzette Molling, Blue Ridge Parkway
Jack VanDop, FHWA
Jennifer Harris, HNTB North Carolina
Lisa Landers, FHWA
Mike Molling, Blue Ridge Parkway

Kat Bukowy

To: McDade, John; John Otten; jdmartin4@ncdot.gov; Dawn Leonard; Adam Archual
Subject: RE: [EXTERNAL] Proposed I-26 Widening Project Buncombe County, North Carolina (ACHPConnect Log Number: 12267)

---------- Forwarded message ---------
From: **e106** <e106@achp.gov>
Date: Thu, Nov 15, 2018 at 11:40 AM
Subject: [EXTERNAL] Proposed I-26 Widening Project Buncombe County, North Carolina (ACHPConnect Log Number: 12267)
To: john_mcdade@nps.gov <john_mcdade@nps.gov>
Cc: Christopher Wilson <cwilson@achp.gov>, Mandy Ranslow <mranslow@achp.gov>, Sarah Stokely <sstokely@achp.gov>

On October 9, 2018, the Advisory Council on Historic Preservation (ACHP) received a copy of the executed Section 106 agreement document (Agreement) for the referenced undertaking. In accordance with 36 CFR 800.6(b)(1)(iv) of the ACHP's regulations, the ACHP acknowledges receipt of the Agreement.

The filing of the Agreement and implementation of its terms fulfills the requirements of Section 106 of the National Historic Preservation Act and the ACHP's regulations.

We appreciate receiving a copy of this Agreement for our records. Please ensure that all consulting parties are provided a copy of the executed Agreement in accordance with 36 CFR 800.6(c)(9). If you have any questions or require additional assistance, please contact Mandy Ranslow at (202) 517- 0218 or by e-mail at mranslow@achp.gov and reference the ACHPConnect Log Number above.

North Carolina Department of Natural and Cultural Resources

State Historic Preservation Office

Ramona M. Bartos, Administrator

Governor Roy Cooper
Secretary Susi H. Hamilton

Office of Archives and History
Deputy Secretary Kevin Cherry

December 13, 2018

John McDade
Blue Ridge Parkway
199 Hemphill Knob Road
Asheville, NC 28803

john_mcdade@nps.gov

Re: 95% Plans for I-26 from NC 225 to NC 280, I-4400 & I-4700,
Buncombe and Henderson Counties, ER 01-8333

Dear Mr. McDade:

Thank you for your December 3, 2018, email providing a link to the 95% plans for the above-referenced undertaking per the mitigation measures included in the Memorandum of Agreement for the project. We have reviewed the plans and find that they are in accord with the design details covered by the agreement. We look forward to receiving notification of start of construction for this much anticipated new bridge.

The above comments are made pursuant to Section 106 and 110 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919-814-6579 or environmental.review@ncdcr.gov. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

Renee Gledhill-Earley

for Ramona M. Bartos

cc: Mary Pope Furr, NCDOT, mfurr@ncdot.gov

7/24/2017

TIP PROJECT: I-4700

CONTRACT:

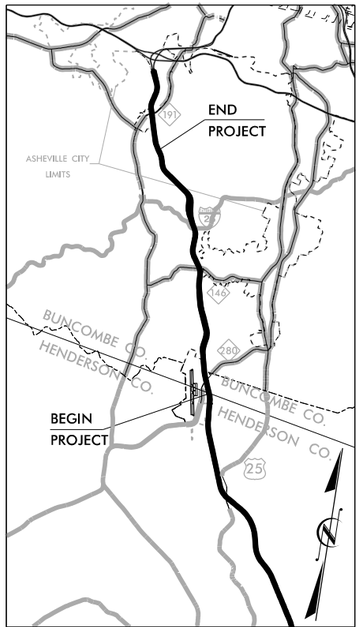
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BUNCOMBE & HENDERSON COUNTIES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-4700	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
WBS 36030.1.2	IMNHF-026-1(86)9	I-4700(P.E.)
TBD	TBD	I-4700A(R/W/UTIL)
TBD	TBD	I-4700B(R/W/UTIL)
WBS 36030.3.3	NHPP-026-1(198)3	I-4700A(CONST)
WBS 36030.3.4	NHPP-026-1(199)6	I-4700B(CONST)

PERMIT DRAWING
SHEET 1 OF 97

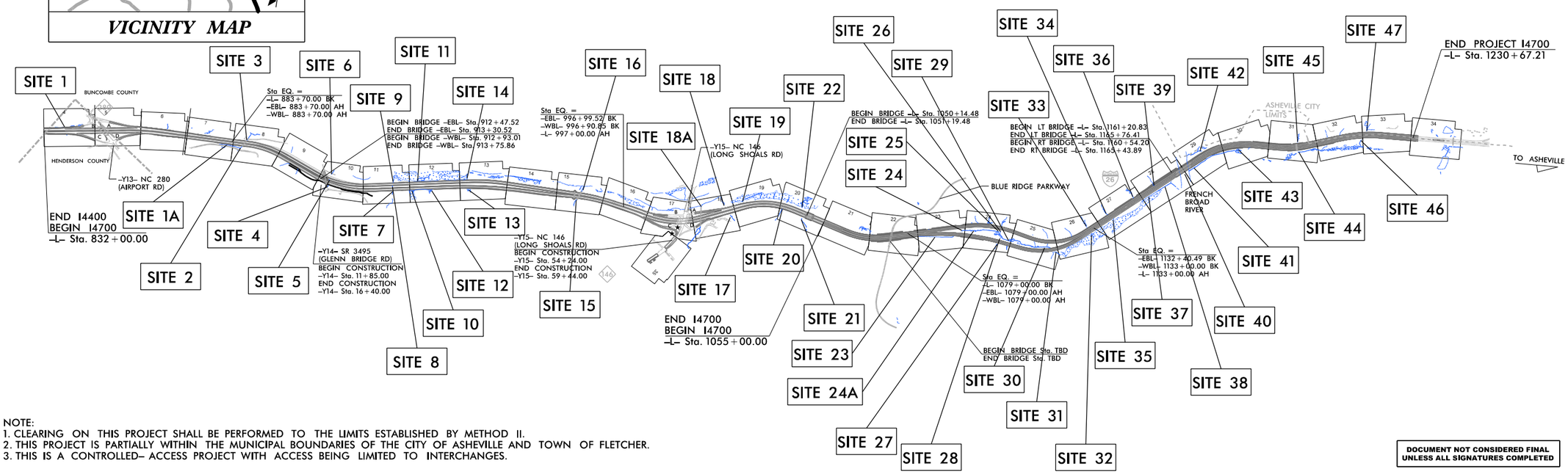


VICINITY MAP

LOCATION: I-26 FROM 0.3 MI EAST OF NC 280 (AIRPORT ROAD) TO 0.5 MI EAST OF NC 191 (BREVARD ROAD)

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

WETLAND AND SURFACE WATER IMPACTS PERMIT



NOTE:
1. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.
2. THIS PROJECT IS PARTIALLY WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF ASHEVILLE AND TOWN OF FLETCHER.
3. THIS IS A CONTROLLED- ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2011 = 72,000
ADT 2040 = 117,900
DHV = 11,790
D = 55%
T = 10% *
V = 65 MPH
* TTST = 4% DUAL 6%
FUNC CLASS = INTERSTATE
STATEWIDE TIER

PROJECT LENGTH

TOTAL LENGTH OF ROADWAY TIP PROJECT
I-4700A / I-4700B = 7.369 MI

TOTAL LENGTH OF STRUCTURES OF TIP PROJECT
I-4700A / I-4700B = 0.121 MI

TOTAL LENGTH OF TIP PROJECT
I-4700A / I-4700B = 7.490 MI

NOTE: LENGTHS WERE CALCULATED USING THE WBL ALIGNMENT

Prepared in the Office of:
HNTB
HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
July 1, 2018

LETTING DATE:
June 2019

JOSEPH OLSON, P.E.
PROJECT ENGINEER

JEFF HESS, P.E.
PROJECT DESIGN ENGINEER

WANDA AUSTIN, P.E.
NCDOT CONTACT

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

11/29/2018
...\Drawings\I4700A_HYD_PRM_TSH
HNTB

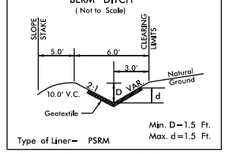
DRAINAGE DITCH DETAILS

HNTB NORTH CAROLINA, P.C.
343 W. Six Forks Road, Suite 200
Raleigh, North Carolina 27603
NC License Nbr C-1554

1-4700	2D-2
R/W SHEET NO.	
HYDRAULICS ENGINEER	

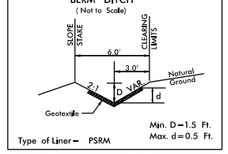
PERMIT DRAWING
SHEET 2 OF 97

DETAIL B
BERM DITCH
(Not to Scale)



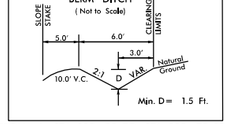
FROM –L– STA. 833+50 TO STA. 835+25 RT
FROM –L– STA. 835+75 TO STA. 837+83 RT
FROM –WBL– STA. 889+14 TO STA. 891+50 RT
FROM –WBL– STA. 896+25 TO STA. 901+50 RT.
FROM –WBL– STA. 924+50 TO STA. 931+25 RT
FROM –WBL– STA. 989+00 TO STA. 991+25 RT
FROM –WBL– STA. 994+35 TO STA. 994+95 RT
FROM –WBL– STA. 996+00 TO –Y15RPC– STA. 10+60 RT
FROM –L– STA. 997+00 TO STA. 1000+28 RT

DETAIL C
BERM DITCH
(Not to Scale)



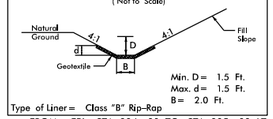
FROM –L– STA. 1063+50 TO STA. 1066+75 RT.

DETAIL D
BERM DITCH
(Not to Scale)



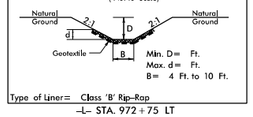
FROM –L– STA. 835+25 TO STA. 835+75 RT
FROM –WBL– STA. 891+50 TO STA. 896+25 RT
FROM –WBL– STA. 905+05 TO STA. 911+00 RT
FROM –WBL– STA. 932+50 TO STA. 936+47 RT
FROM –WBL– STA. 991+25 TO STA. 994+35 RT
FROM –WBL– STA. 994+95 TO STA. 996+00 RT
FROM –L– STA. 1031+50 TO 1042+25 STA. RT
FROM –WBL– STA. 1108+25 TO STA. 1110+50 RT
FROM –EBL– STA. 1114+51 TO STA. 1119+00 LT.
FROM –L– STA. 1217+75 TO STA. 1230+57.72 LT.

DETAIL E
SPECIAL LATERAL BASE DITCH
(Not to Scale)



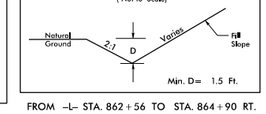
FROM –EBL– STA. 884+00 TO STA. 885+00 LT
FROM –WBL– STA. 902+00 TO STA. 903+25 RT

DETAIL F
STANDARD BASE DITCH
(Not to Scale)



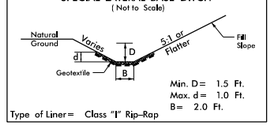
–L– STA. 972+75 LT

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



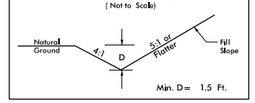
FROM –L– STA. 862+56 TO STA. 864+90 RT.

DETAIL H
SPECIAL LATERAL BASE DITCH
(Not to Scale)



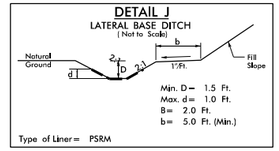
FROM –L– STA. 873+50 TO STA. 874+25 RT
FROM –Y15PRC– STA. 10+00 TO STA. 11+95 RT

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



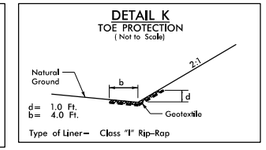
FROM –L– STA. 874+75 TO STA. 875+25 RT

DETAIL J
LATERAL BASE DITCH
(Not to Scale)



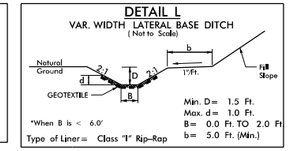
FROM –L– STA. 874+75 TO STA. 876+75 LT

DETAIL K
TOE PROTECTION
(Not to Scale)



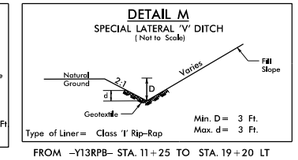
FROM –L– STA. 881+50 TO STA. 883+70 RT
FROM –WBL– STA. 883+70 TO STA. 885+00 RT
FROM –WBL– STA. 885+00 TO STA. 886+00 RT

DETAIL L
VAR. WIDTH LATERAL BASE DITCH
(Not to Scale)



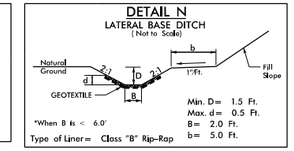
FROM –EBL– STA. 885+00 to 888+50 LT
FROM –WBL– STA. 942+75 TO STA. 943+75 RT

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



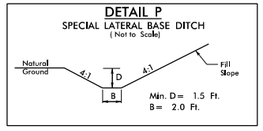
FROM –Y13RPB– STA. 11+25 TO STA. 19+20 LT

DETAIL N
LATERAL BASE DITCH
(Not to Scale)



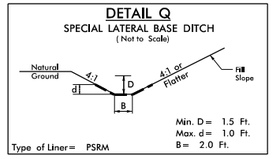
FROM –WBL– STA. 887+50 TO STA. 889+25 RT

DETAIL P
SPECIAL LATERAL BASE DITCH
(Not to Scale)



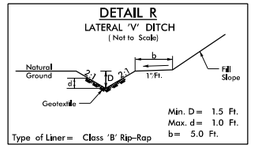
FROM –L– STA. 832+00 TO STA. 834+93 LT
FROM –WBL– STA. 902+00 TO STA. 905+25 RT

DETAIL Q
SPECIAL LATERAL BASE DITCH
(Not to Scale)



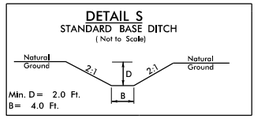
FROM –WBL– STA. 901+25 TO STA. 902+00 RT

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



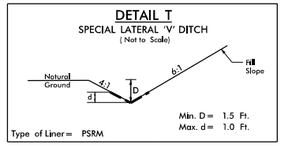
FROM –WBL– STA. 951+50 TO STA. 953+75 RT

DETAIL S
STANDARD BASE DITCH
(Not to Scale)



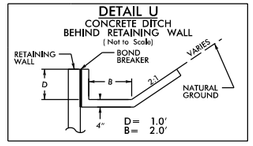
FROM –WBL– STA. 904+75 TO STA. 904+75 RT

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



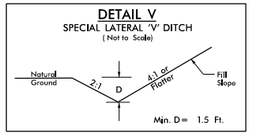
FROM –WBL– STA. 923+75 TO STA. 924+00 RT

DETAIL U
CONCRETE DITCH
BEHIND RETAINING WALL
(Not to Scale)



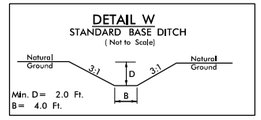
FROM –WBL– STA. 918+25 TO STA. 923+75 RT
FROM –WBL– STA. 948+75 TO STA. 951+25 RT
FROM –WBL– STA. 959+75 TO STA. 978+00 RT
FROM –L– STA. 1070+60 TO STA. 1078+00 LT.
FROM –L– STA. 1069+00 TO STA. 1079+00 RT.
FROM –EBL– STA. 1081+00 TO STA. 1084+50 LT.
FROM –EBL– STA. 1086+00 TO STA. 1093+00 LT.
FROM –WBL– STA. 1079+00 TO STA. 1081+00 RT.
FROM –WBL– STA. 1093+89 TO STA. 1100+50 RT.
FROM –L– STA. 1140+75 TO STA. 1146+58 LT.
FROM –L– STA. 1148+06 TO STA. 1161+65 LT.
FROM –L– STA. 1184+00 TO STA. 1194+92 LT.

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



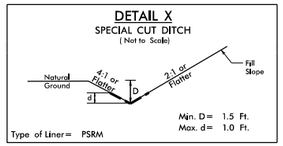
FROM –EBL– STA. 912+11 TO STA. 914+10 LT

DETAIL W
STANDARD BASE DITCH
(Not to Scale)



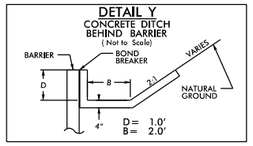
FROM –EBL– STA. 1106+73 TO STA. 1106+85 RT

DETAIL X
SPECIAL CUT DITCH
(Not to Scale)



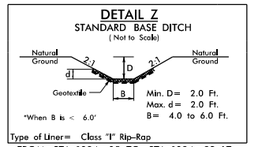
FROM –WBL– STA. 932+21 TO STA. 932+75 RT
FROM –WBL– STA. 936+25 TO STA. 937+40 RT

DETAIL Y
CONCRETE DITCH
BEHIND BARRIER
(Not to Scale)



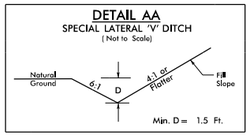
FROM –WBL– STA. 943+75 TO STA. 948+75 RT

DETAIL Z
STANDARD BASE DITCH
(Not to Scale)



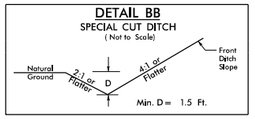
FROM STA. 1094+05 TO STA. 1094+32, LT.

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



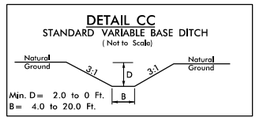
FROM –WBL– STA. 937+40 TO STA. 938+50 RT

DETAIL BB
SPECIAL CUT DITCH
(Not to Scale)



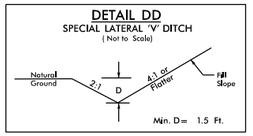
FROM –Y13RPA– STA. 18+00 TO STA. 23+00 RT
FROM –WBL– STA. 937+75 TO STA. 942+75 RT

DETAIL CC
STANDARD VARIABLE BASE DITCH
(Not to Scale)



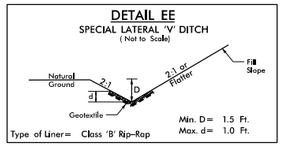
FROM –EBL– STA. 1106+85 TO STA. 1106+92 RT

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



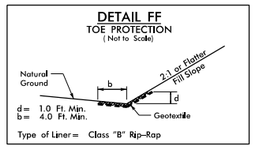
FROM –WBL– STA. 950+00 TO STA. 951+50 RT

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



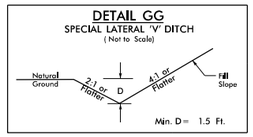
FROM –WBL– STA. 1081+00 TO STA. 1081+50, RT.

DETAIL FF
TOE PROTECTION
(Not to Scale)



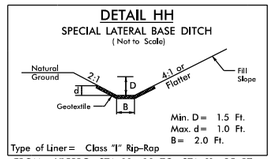
FROM –L– STA. 862+69 TO STA. 866+30 LT
FROM –L– STA. 866+40 TO 866+68 LT
FROM –WBL– STA. 956+00 TO STA. 959+50 RT

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



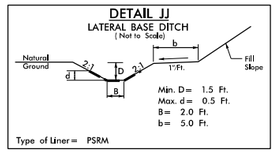
FROM –WBL– STA. 924+25 TO STA. 924+75 RT
FROM –WBL– STA. 988+00 TO STA. 992+00 RT

DETAIL HH
SPECIAL LATERAL BASE DITCH
(Not to Scale)



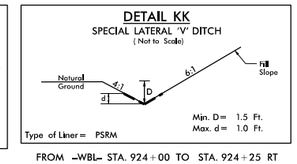
FROM –Y15PRC– STA. 10+00 TO STA. 11+95 RT

DETAIL JJ
LATERAL BASE DITCH
(Not to Scale)



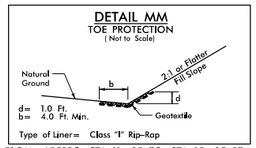
FROM –WBL– STA. 983+75 TO STA. 986+00 RT
FROM –L– STA. 1046+75 TO STA. 1049+00 RT
FROM –L– STA. 1060+26 TO STA. 1063+50, RT.

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



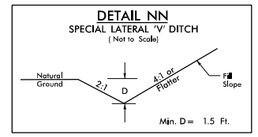
FROM –WBL– STA. 924+00 TO STA. 924+25 RT

DETAIL MM
TOE PROTECTION
(Not to Scale)



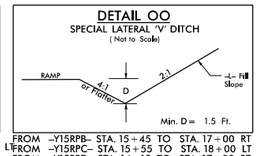
FROM –Y15PRC– STA. 11+95 TO STA. 15+85 RT
FROM –L– STA. 997+00 TO 997+56 LT

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



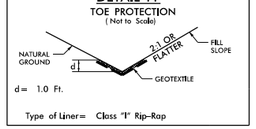
FROM –Y15RPB– STA. 1004+22 TO STA. 1005+65 LT

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



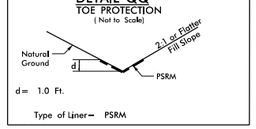
FROM –Y15RPB– STA. 15+45 TO STA. 17+00 RT
FROM –Y15RPC– STA. 15+55 TO STA. 18+00 LT
FROM –Y15RPD– STA. 14+15 TO STA. 17+38 RT
FROM –Y15RPA– STA. 15+40 TO STA. 21+06 LT
FROM –Y15RPD– STA. 17+38 TO STA. 17+47 RT

DETAIL PP
TOE PROTECTION
(Not to Scale)



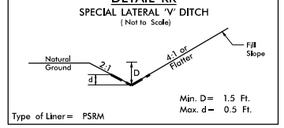
FROM –L– STA. 1027+50 TO STA. 1031+50 RT

DETAIL QQ
TOE PROTECTION
(Not to Scale)



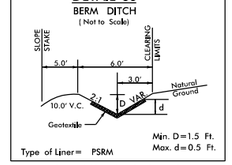
FROM –L– STA. 1026+50 TO STA. 1027+50 RT

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



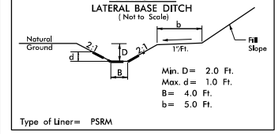
FROM –L– STA. 1042+25 TO STA. 1043+50 RT

DETAIL SS
BERM DITCH
(Not to Scale)



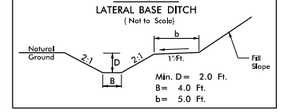
FROM –L– STA. 1043+10 TO STA. 1046+75 RT
FROM –L– STA. 1063+50 TO STA. 1066+75 RT.
FROM –EBL– STA. 1106+65 TO STA. 1109+13.21 LT.
FROM –EBL– STA. 1109+13.21 TO STA. 1114+50 LT.
FROM –EBL– STA. 1119+01 TO STA. 1125+75 LT.
FROM –WBL– STA. 1110+50 TO STA. 1114+25 RT.

DETAIL VV
LATERAL BASE DITCH
(Not to Scale)



FROM –L– STA. 1055+50 TO STA. 1058+50 LT.

DETAIL XX
LATERAL BASE DITCH
(Not to Scale)



FROM –L– STA. 1058+50 TO STA. 1061+50, LT.

11/30/2018
14:02 HYD_PRM_DrainageDetails.dgn
HNTB

8/17/99

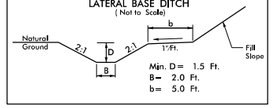
DRAINAGE DITCH DETAILS

HNTB NORTH CAROLINA, P.C.
343 W. Six Forks Road, Suite 200
Raleigh, North Carolina 27603
NC License Nbr C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	2D-2
R/W SHEET NO.	
	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 2A OF 97

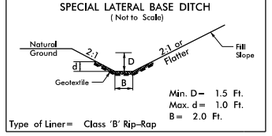
DETAIL YY
LATERAL BASE DITCH
(Not to Scale)



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

FROM –WBL– STA. 911+00 TO STA. 913+75 RT
FROM –WBL– STA. 914+40 TO STA. 918+25 RT
FROM –L– STA. 1051+50 TO STA. 1060+25 RT.
FROM –WBL– STA. 1118+75 TO STA. 1120+00 LT.

DETAIL ZZ
SPECIAL LATERAL BASE DITCH
(Not to Scale)

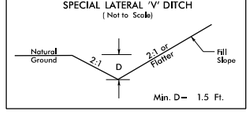


Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
B= 2.0 Ft.

Type of Liner= Class 'B' Rip-Rap

FROM –L– STA. 1066+76 TO STA. 1067+75, RT.

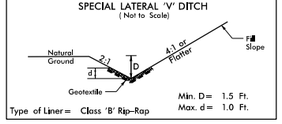
DETAIL AAA
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D= 1.5 Ft.

FROM –L– STA. 1066+00 TO STA. 1066+75 RT.
FROM –WBL– STA. 1081+00 TO STA. 1081+50 RT.

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

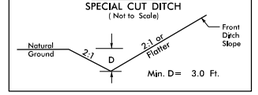


Min. D= 1.5 Ft.
Max. d= 1.0 Ft.

Type of Liner= Class 'B' Rip-Rap

FROM –L– STA. 1067+75 TO STA. 1069+00 RT.

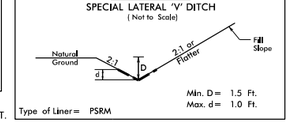
DETAIL CCC
SPECIAL CUT DITCH
(Not to Scale)



Min. D= 3.0 Ft.

FROM –L– STA. 1078+00 TO STA. 1079+00 LT.
FROM –EBL– STA. 1079+00 TO STA. 1080+75 LT.

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

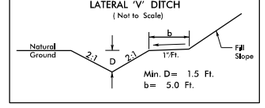


Min. D= 1.5 Ft.
Max. d= 1.0 Ft.

Type of Liner= PSRM

FROM –WBL– STA. 1118+00 TO STA. 1121+00 RT.
FROM –L– STA. 1183+00 TO STA. 1183+50 RT.

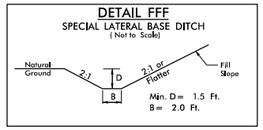
DETAIL EEE
LATERAL 'V' DITCH
(Not to Scale)



Min. D= 1.5 Ft.
b= 5.0 Ft.

FROM –WBL– STA. 1081+50 TO STA. 1082+50 RT.

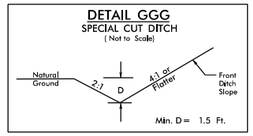
DETAIL FFF
SPECIAL LATERAL BASE DITCH
(Not to Scale)



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

FROM –EBL– STA. 1084+50 TO STA. 1086+00 LT.
FROM –WBL– STA. 1119+00 TO STA. 1120+50 LT.
FROM –L– STA. 1159+02 TO STA. 1161+00 LT.
FROM –L– STA. 1176+00 TO STA. 1184+00 LT.

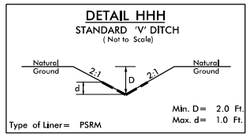
DETAIL GGG
SPECIAL CUT DITCH
(Not to Scale)



Min. D= 1.5 Ft.

FROM –WBL– STA. 1085+50 TO STA. 1088+50, LT.

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

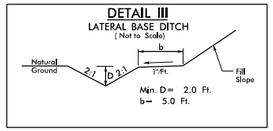


Min. D= 2.0 Ft.
Max. d= 1.0 Ft.

Type of Liner= PSRM

FROM –EBL– STA. 1093+75 TO STA. 1094+25 RT.
FROM –WBL– STA. 1102+75 TO STA. 1103+70 LT.
–EBL– STA. 1118+01 RT.

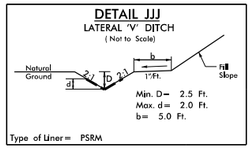
DETAIL III
LATERAL BASE DITCH
(Not to Scale)



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

FROM STA. 1082+00 TO STA. 1085+00 RT.

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

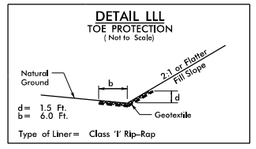


Min. D= 2.5 Ft.
Max. d= 2.0 Ft.
b= 5.0 Ft.

Type of Liner= PSRM

FROM –WBL– STA. 1082+50 TO STA. 1085+30 RT.

DETAIL LLL
TOE PROTECTION
(Not to Scale)

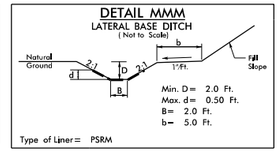


d= 1.5 Ft.
b= 6.0 Ft.

Type of Liner= Class 'I' Rip-Rap

FROM –EBL– STA. 1093+00 TO STA. 1096+25 LT.
FROM –WBL– STA. 1091+50 TO STA. 1093+89 RT.
FROM –WBL– STA. 1103+50 TO STA. 1104+30 RT.
FROM –WBL– STA. 1118+00 STA. TO STA. 1121+00, RT.

DETAIL MMM
LATERAL BASE DITCH
(Not to Scale)

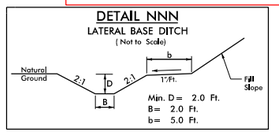


Min. D= 2.0 Ft.
Max. d= 0.50 Ft.
B= 2.0 Ft.
b= 5.0 Ft.

Type of Liner= PSRM

FROM –EBL– STA. 1105+51 TO STA. 1106+65 LT.

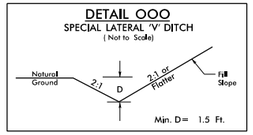
DETAIL NNN
LATERAL BASE DITCH
(Not to Scale)



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

FROM –EBL– STA. 1103+80 TO STA. 1105+50 LT.
FROM –EBL– STA. 1127+50 TO STA. 1131+00 LT.

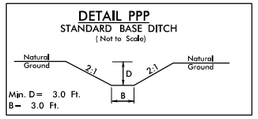
DETAIL OOO
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D= 1.5 Ft.

FROM –WBL– STA. 1107+25 TO STA. 1108+25 RT.
FROM –WBL– STA. 1115+50 TO STA. 1116+00 RT.
FROM –EBL– STA. 1122+00 TO STA. 1124+50 RT.
FROM –WBL– STA. 1125+00 TO STA. 1127+50 LT.

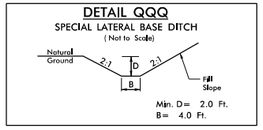
DETAIL PPP
STANDARD BASE DITCH
(Not to Scale)



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

–WBL– STA. 1107+34 RT.

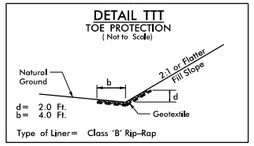
DETAIL QQQ
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D= 2.0 Ft.
B= 4.0 Ft.

FROM –WBL– STA. 1114+00 TO STA. 1115+50 RT.

DETAIL TTT
TOE PROTECTION
(Not to Scale)

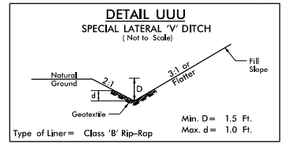


d= 2.0 Ft.
b= 4.0 Ft.

Type of Liner= Class 'B' Rip-Rap

FROM –EBL– STA. 1131+01 TO STA. 1132+40 LT.
FROM –L– STA. 1133+00 TO STA. 1140+00 LT.
FROM –L– STA. 1146+58 TO STA. 1148+06 LT.

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

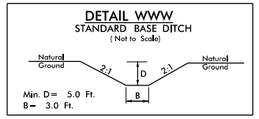


Min. D= 1.5 Ft.
Max. d= 1.0 Ft.

Type of Liner= Class 'B' Rip-Rap

FROM –EBL– STA. 1124+50 TO STA. 1125+00 RT.

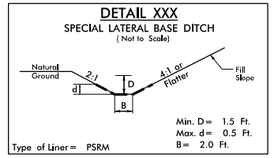
DETAIL WWW
STANDARD BASE DITCH
(Not to Scale)



Min. D= 5.0 Ft.
B= 3.0 Ft.

–EBL– STA. 1105+40 RT.
–L– STA. 1138+30 LT.
–L– STA. 1196+78 LT.

DETAIL XXX
SPECIAL LATERAL BASE DITCH
(Not to Scale)

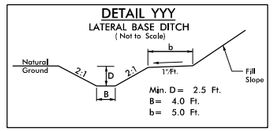


Min. D= 1.5 Ft.
Max. d= 0.5 Ft.
B= 2.0 Ft.

Type of Liner= PSRM

FROM –L– STA. 1161+00 TO STA. 1161+67 LT.

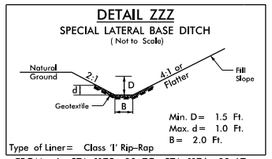
DETAIL YYY
LATERAL BASE DITCH
(Not to Scale)



Min. D= 2.5 Ft.
B= 4.0 Ft.
b= 5.0 Ft.

FROM –L– STA. 1149+50 TO STA. 1153+90 RT.

DETAIL ZZZ
SPECIAL LATERAL BASE DITCH
(Not to Scale)

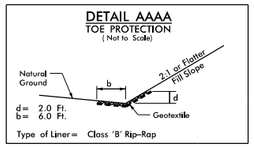


Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
B= 2.0 Ft.

Type of Liner= Class 'I' Rip-Rap

FROM –L– STA. 1175+00 TO STA. 1176+00 LT.

DETAIL AAAA
TOE PROTECTION
(Not to Scale)

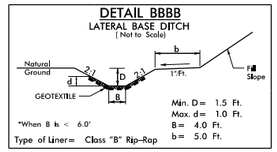


d= 2.0 Ft.
b= 6.0 Ft.

Type of Liner= Class 'B' Rip-Rap

FROM –L– STA. 1198+00 TO STA. 1205+25 LT.
FROM –L– STA. 1213+50 TO STA. 1216+15 LT.

DETAIL BBBB
LATERAL BASE DITCH
(Not to Scale)



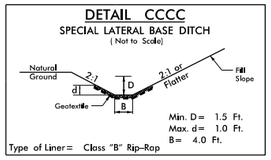
*When B is < 6.0'

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

Type of Liner= Class "B" Rip-Rap

FROM –L– STA. 1205+30 TO STA. 1207+00 LT.

DETAIL CCCC
SPECIAL LATERAL BASE DITCH
(Not to Scale)

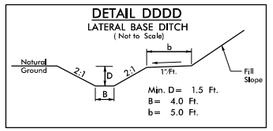


Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
B= 4.0 Ft.

Type of Liner= Class "B" Rip-Rap

FROM –L– STA. 1207+00 TO STA. 1209+50 LT.

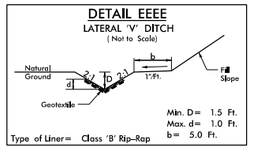
DETAIL DDDD
LATERAL BASE DITCH
(Not to Scale)



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

FROM –L– STA. 1216+25 TO STA. 1217+75 LT.

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



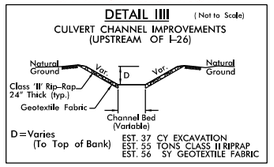
Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
b= 5.0 Ft.

Type of Liner= Class 'B' Rip-Rap

FROM –WBL– STA. 1081+50 TO STA. 1082+50, RT.

BANK STABILIZATION

DETAIL IIII
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS
(UPSTREAM OF I-26)

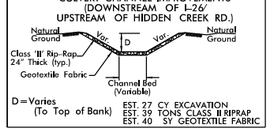


D=Varies
(To Top of Bank)

EST. 37 CY EXCAVATION
EST. 55 TONS CLASS II RIPRAP
EST. 56 SY GEOTEXTILE FABRIC

BANK STABILIZATION

DETAIL FFFF
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS
(DOWNSTREAM OF I-26/
UPSTREAM OF HIDDEN CREEK RD.)

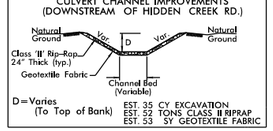


D=Varies
(To Top of Bank)

EST. 27 CY EXCAVATION
EST. 39 TONS CLASS II RIPRAP
EST. 40 SY GEOTEXTILE FABRIC

BANK STABILIZATION

DETAIL GGGG
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS
(DOWNSTREAM OF HIDDEN CREEK RD.)

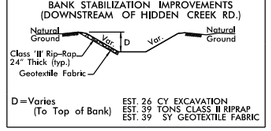


D=Varies
(To Top of Bank)

EST. 35 CY EXCAVATION
EST. 52 TONS CLASS II RIPRAP
EST. 53 SY GEOTEXTILE FABRIC

BANK STABILIZATION

DETAIL HHHH
(Not to Scale)
BANK STABILIZATION IMPROVEMENTS
(DOWNSTREAM OF HIDDEN CREEK RD.)

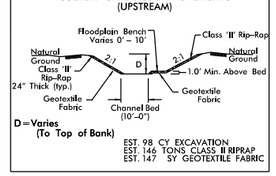


D=Varies
(To Top of Bank)

EST. 26 CY EXCAVATION
EST. 39 TONS CLASS II RIPRAP
EST. 39 SY GEOTEXTILE FABRIC

BANK STABILIZATION

DETAIL JJJJ
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS
(UPSTREAM)

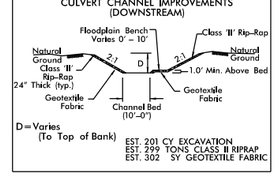


D=Varies
(To Top of Bank)

EST. 98 CY EXCAVATION
EST. 146 TONS CLASS II RIPRAP
EST. 147 SY GEOTEXTILE FABRIC

BANK STABILIZATION

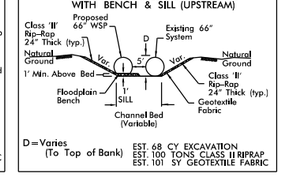
DETAIL KKKK
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS
(DOWNSTREAM)



D=Varies
(To Top of Bank)

EST. 201 CY EXCAVATION
EST. 299 TONS CLASS II RIPRAP
EST. 302 SY GEOTEXTILE FABRIC

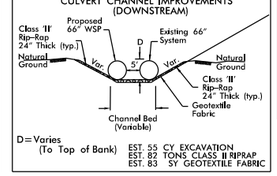
DETAIL LLLL
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS
WITH BENCH & SILL (UPSTREAM)



D=Varies
(To Top of Bank)

EST. 68 CY EXCAVATION
EST. 100 TONS CLASS II RIPRAP
EST. 101 SY GEOTEXTILE FABRIC

DETAIL MMMM
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS
(DOWNSTREAM)

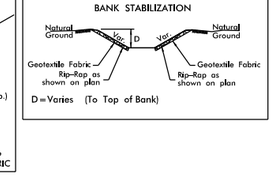


D=Varies
(To Top of Bank)

EST. 55 CY EXCAVATION
EST. 82 TONS CLASS II RIPRAP
EST. 83 SY GEOTEXTILE FABRIC

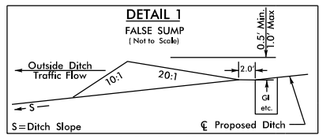
BANK STABILIZATION

DETAIL YYYY
(Not to Scale)
BANK STABILIZATION



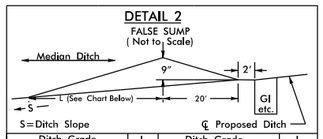
D=Varies (To Top of Bank)

DETAIL 1
FALSE SUMP
(Not to Scale)



–L– STA. 849+02 LT
–WBL– STA. 994+51 RT.
–WBL– STA. 996+06 RT.
–Y13RPD– STA. 18+61 LT
–Y13RPD– STA. 14+00 LT
–WBL– 1097+15 LT.

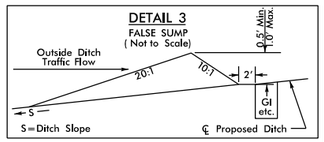
DETAIL 2
FALSE SUMP
(Not to Scale)



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'

–EBL– STA. 902+53 RT
–EBL– STA. 905+22 RT
–EBL– STA. 907+54 RT
–EBL– STA. 909+71 RT
–EBL– STA. 911+56 RT
–EBL– STA. 912+68 RT
–EBL– STA. 916+83 RT
–EBL– STA. 923+67 RT
–EBL– STA. 931+86 RT
–EBL– STA. 934+32 RT
–EBL– STA. 940+30 RT
–EBL– STA. 947+30 RT
–EBL– STA. 952+57 RT
–EBL– STA. 955+03 RT
–EBL– STA. 958+07 RT
–EBL– STA. 961+10 RT
–EBL– STA. 964+00 RT
–EBL– STA. 972+90 RT
–EBL– STA. 976+83 RT

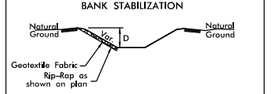
DETAIL 3
FALSE SUMP
(Not to Scale)



–Y13RPC– STA. 10+07 RT
–L– STA. 850+34 RT
–L– STA. 854+53 RT
–WBL– STA. 895+60 RT
–EBL– STA. 911+57 LT
–EBL– STA. 914+55 LT
–EBL– STA. 916+85 LT
–L– STA. 1037+28 RT
FROM STA. 1082+00 TO STA. 1085+00, RT.
–EBL– STA. 1109+15 LT.
–EBL– STA. 1113+15 LT.
–EBL– STA. 1114+70 LT.
–EBL– STA. 1119+22 LT.

BANK STABILIZATION

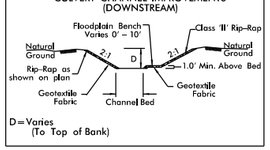
DETAIL ZZZZ
(Not to Scale)
BANK STABILIZATION



D=Varies (To Top of Bank)

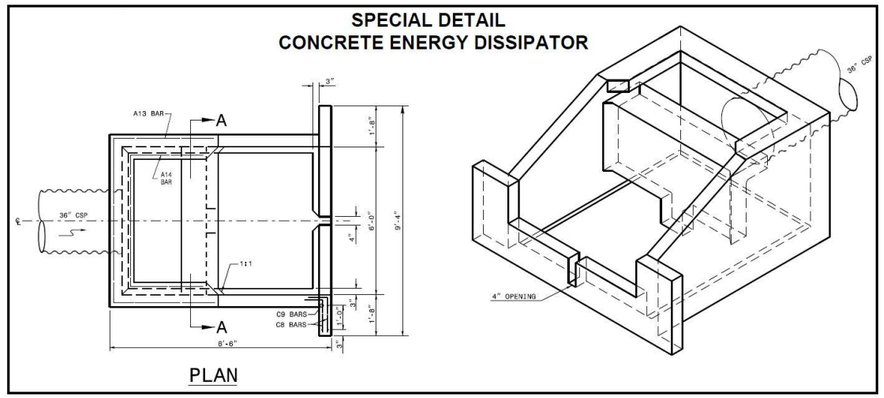
BANK STABILIZATION

DETAIL RRRR
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS
(DOWNSTREAM)



D=Varies
(To Top of Bank)

SPECIAL DETAIL
CONCRETE ENERGY DISSIPATOR



PLAN

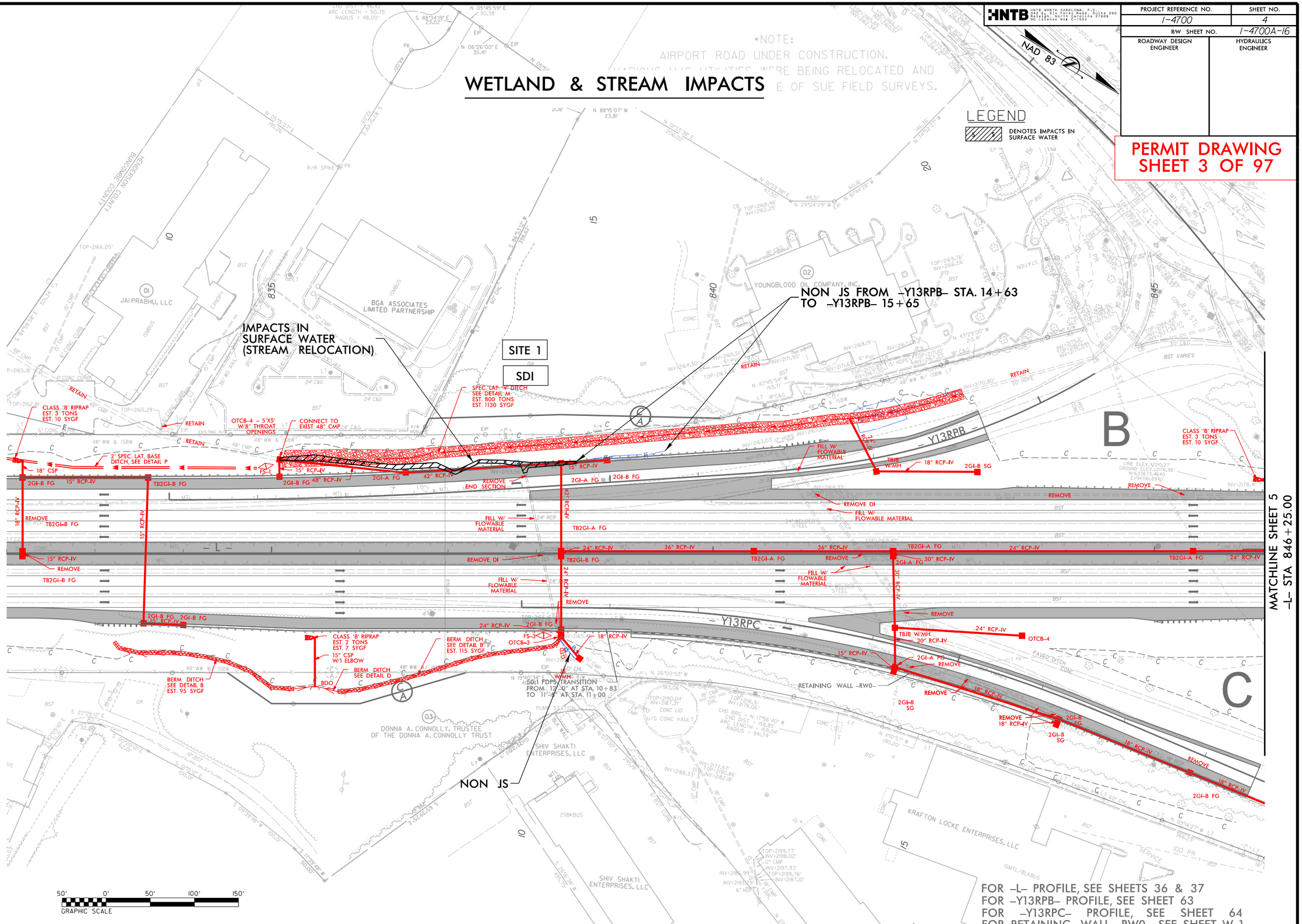
12/3/2018
I4700_HYD_PRM_DrainageDetails.dgn
HNTB

PROJECT REFERENCE NO.	SHEET NO.
I-4700	4
R/W SHEET NO.	I-4700A-I6
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C.
343 W. Six Forks Road, Suite 200
Raleigh, North Carolina 27603
NC License No: C-1554

PERMIT DRAWING
SHEET 3 OF 97

WETLAND & STREAM IMPACTS



8/17/99

11/30/2018
I-4700A_HYD_PRM_PSH_04.dgn
HNTB

PROJECT REFERENCE NO.	SHEET NO.
I-4700	4
R/W SHEET NO.	I-4700A-16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

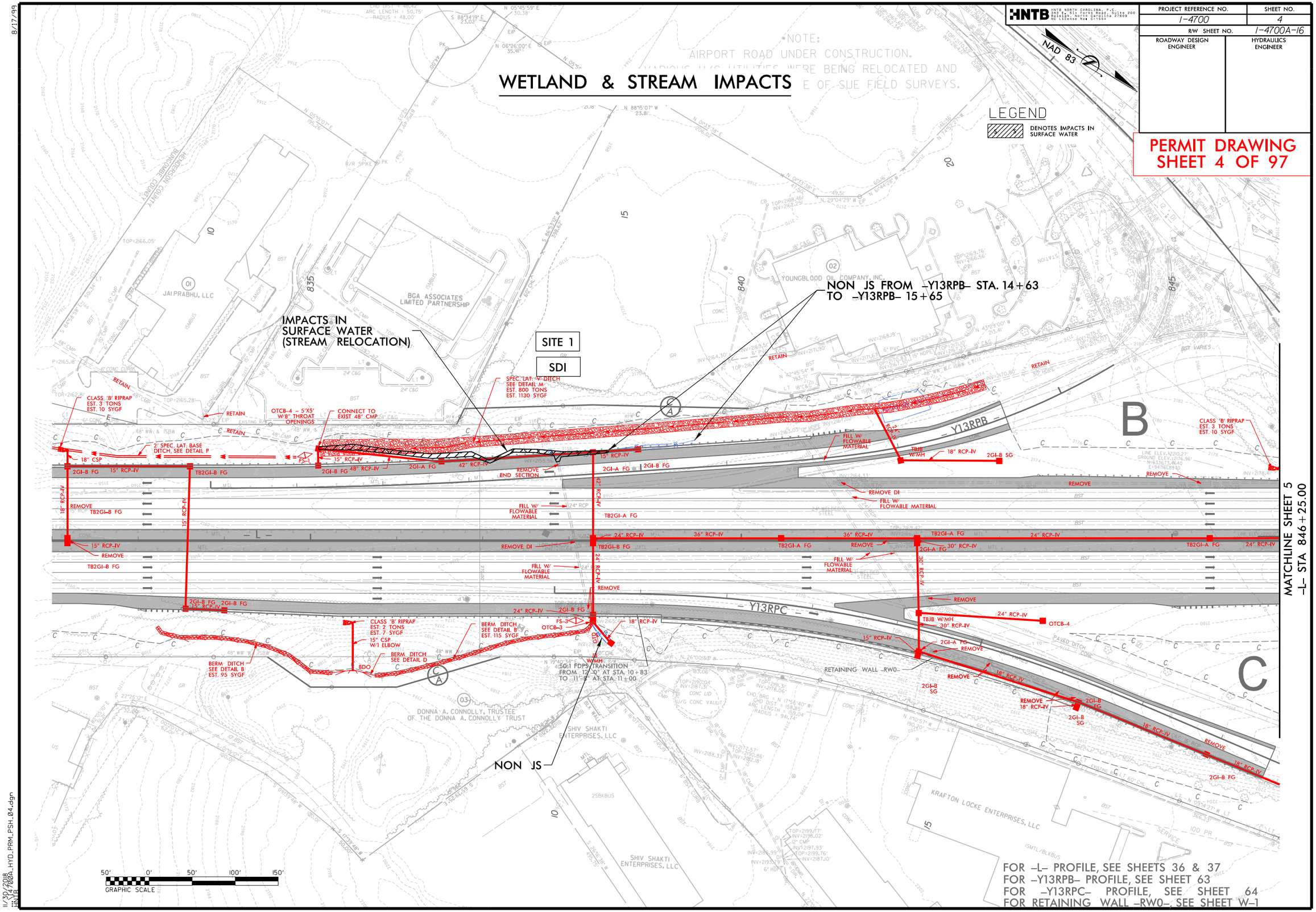
HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

WETLAND & STREAM IMPACTS

NOTE:
AIRPORT ROAD UNDER CONSTRUCTION.
VARIOUS U/G UTILITIES WERE BEING RELOCATED AND
E OF SUE FIELD SURVEYS.

LEGEND
DENOTES IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 4 OF 97



FOR -L- PROFILE, SEE SHEETS 36 & 37
FOR -Y13RPB- PROFILE, SEE SHEET 63
FOR -Y13RPC- PROFILE, SEE SHEET 64
FOR RETAINING WALL -RW0-, SEE SHEET W-1

8/17/99

11/30/2018
I-4700A_HYD_PRM_PSH_04.dgn
HNTB

8/17/99

HNTB NORTH CAROLINA, P.C.
343 W. Six Forks Road, Suite 200
Raleigh, North Carolina 27603
NC License Nbr C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	7
R/W SHEET NO.	I-4700A - 18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

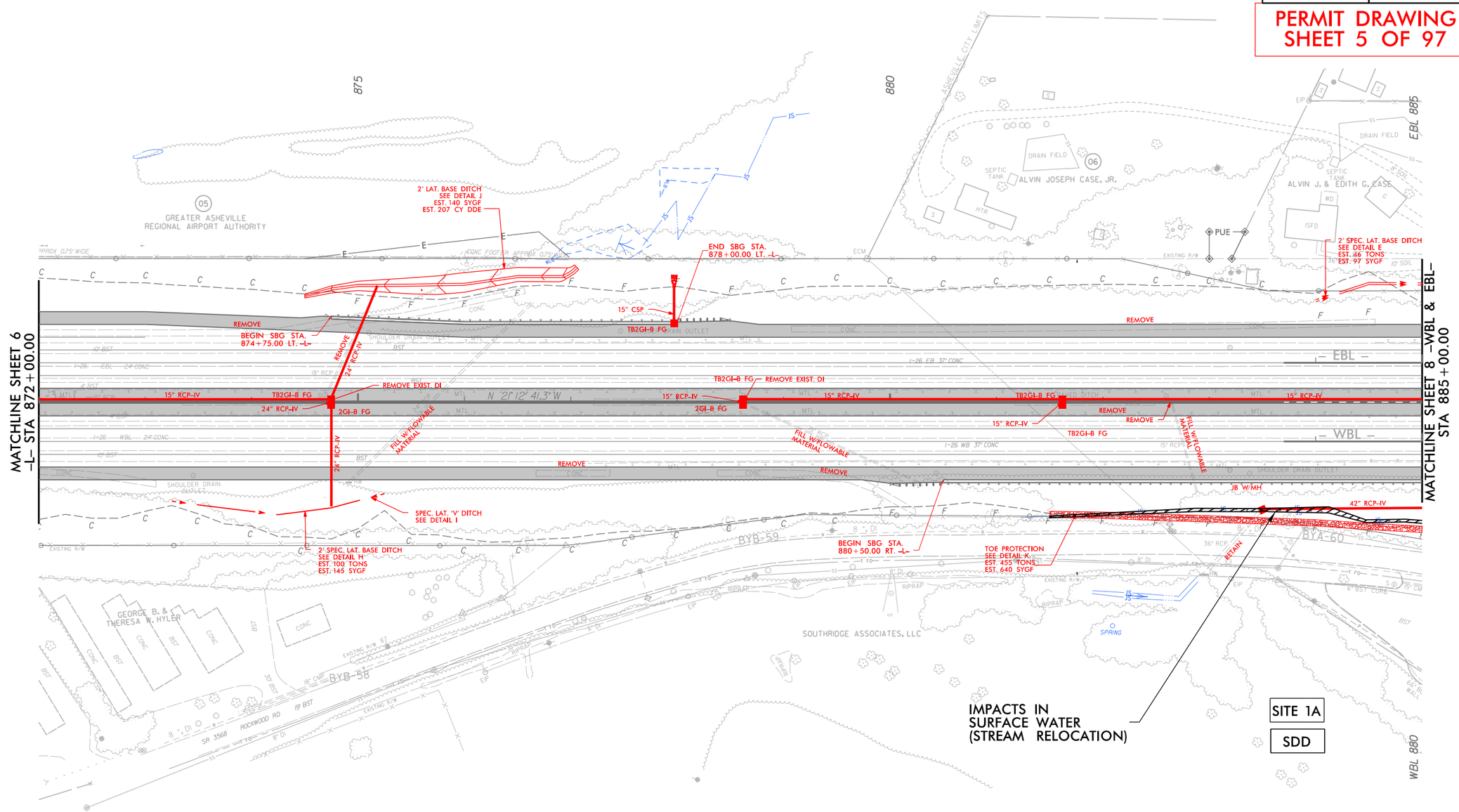
PERMIT DRAWING
SHEET 5 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

DENOTES IMPACTS IN SURFACE WATER



50' 0' 50' 100' 150'
GRAPHIC SCALE

FOR – L – PROFILE, SEE SHEET 38 & 39
FOR – EBL – PROFILE, SEE SHEET 39
FOR – WBL – PROFILE, SEE SHEET 39

11/23/2018
I-4700A_HYD_PRM_PSH_07.dgn
HNTB

8/17/99

HNTB NORTH CAROLINA, P.C.
343 W. Six Forks Road, Suite 200
Raleigh, North Carolina 27603
NC License No. C-1556

PROJECT REFERENCE NO.	SHEET NO.
I-4700	7
R/W SHEET NO.	I-4700A - 18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

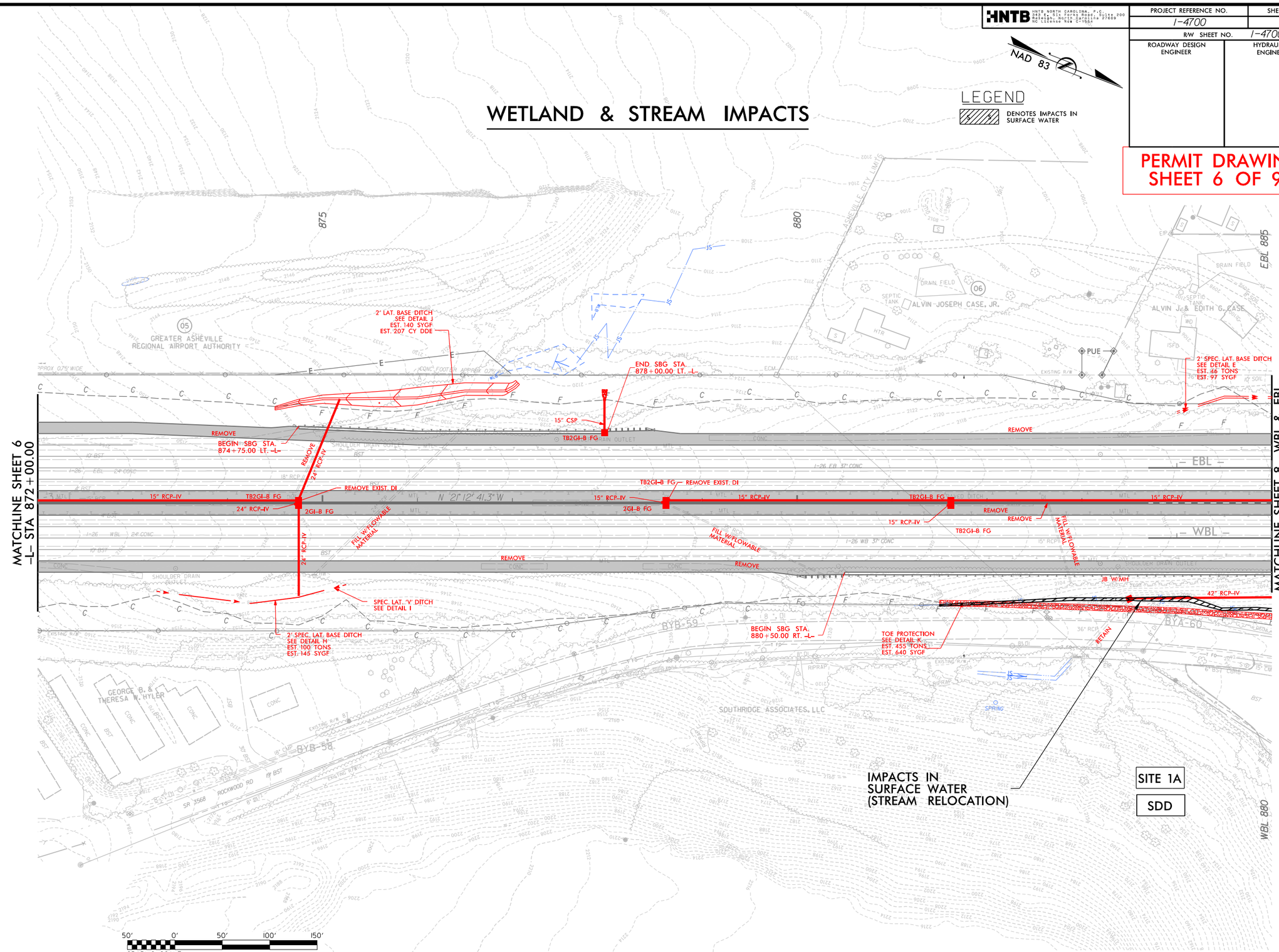
PERMIT DRAWING
SHEET 6 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

DENOTES IMPACTS IN SURFACE WATER



FOR – L – PROFILE, SEE SHEET 38 & 39
FOR – EBL – PROFILE, SEE SHEET 39
FOR – WBL – PROFILE, SEE SHEET 39

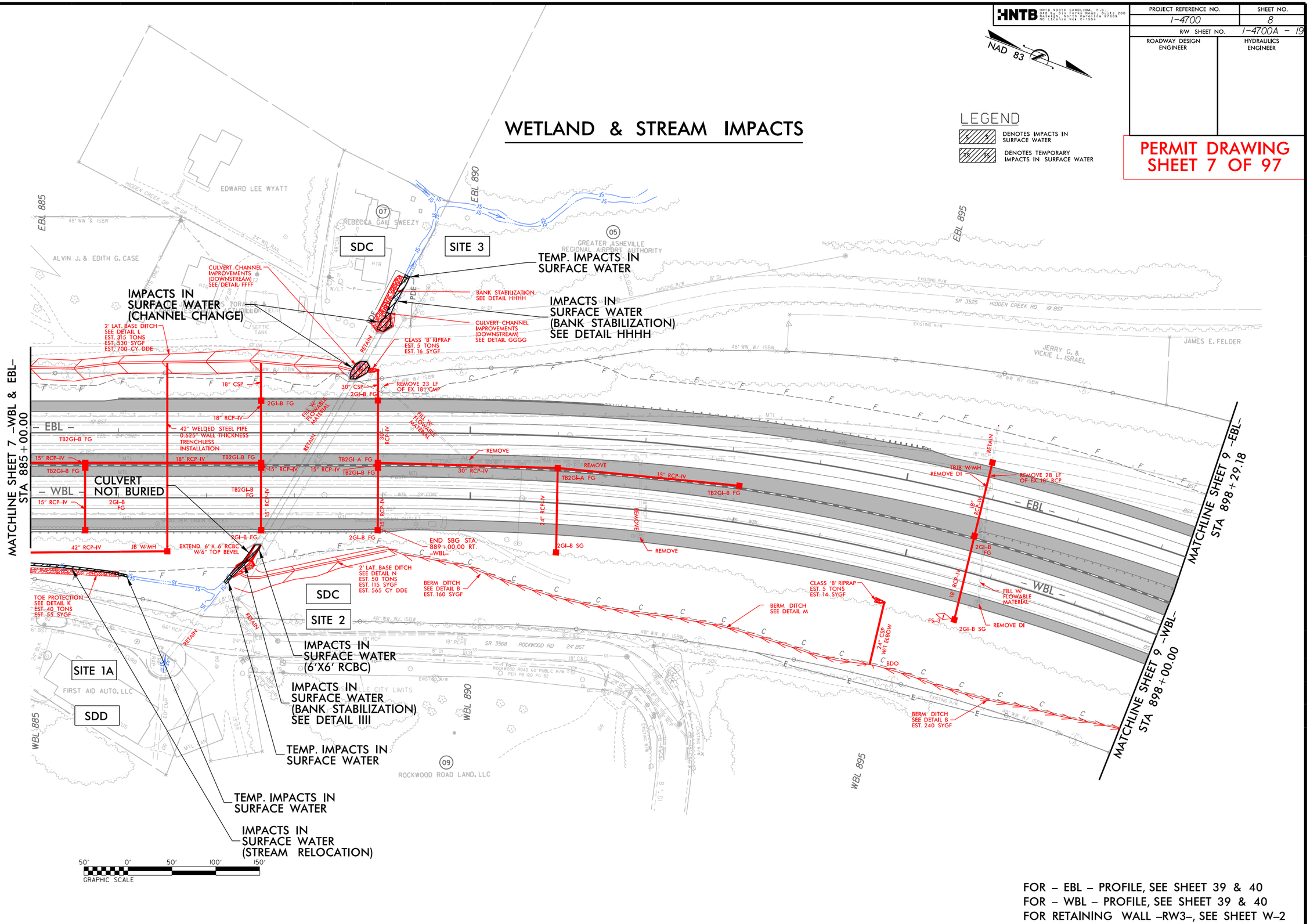
11/29/2018
I-4700A_HYD_PRM_PSH_07.dgn
HNTB

PROJECT REFERENCE NO.	SHEET NO.
I-4700	8
R/W SHEET NO.	I-4700A - 19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C. 343 W. Six Forks Road, Suite 200 Raleigh, North Carolina 27603 NC License Nbr. C-1554

PERMIT DRAWING
SHEET 7 OF 97

WETLAND & STREAM IMPACTS



FOR – EBL – PROFILE, SEE SHEET 39 & 40
FOR – WBL – PROFILE, SEE SHEET 39 & 40
FOR RETAINING WALL –RW3–, SEE SHEET W–2

8/17/99

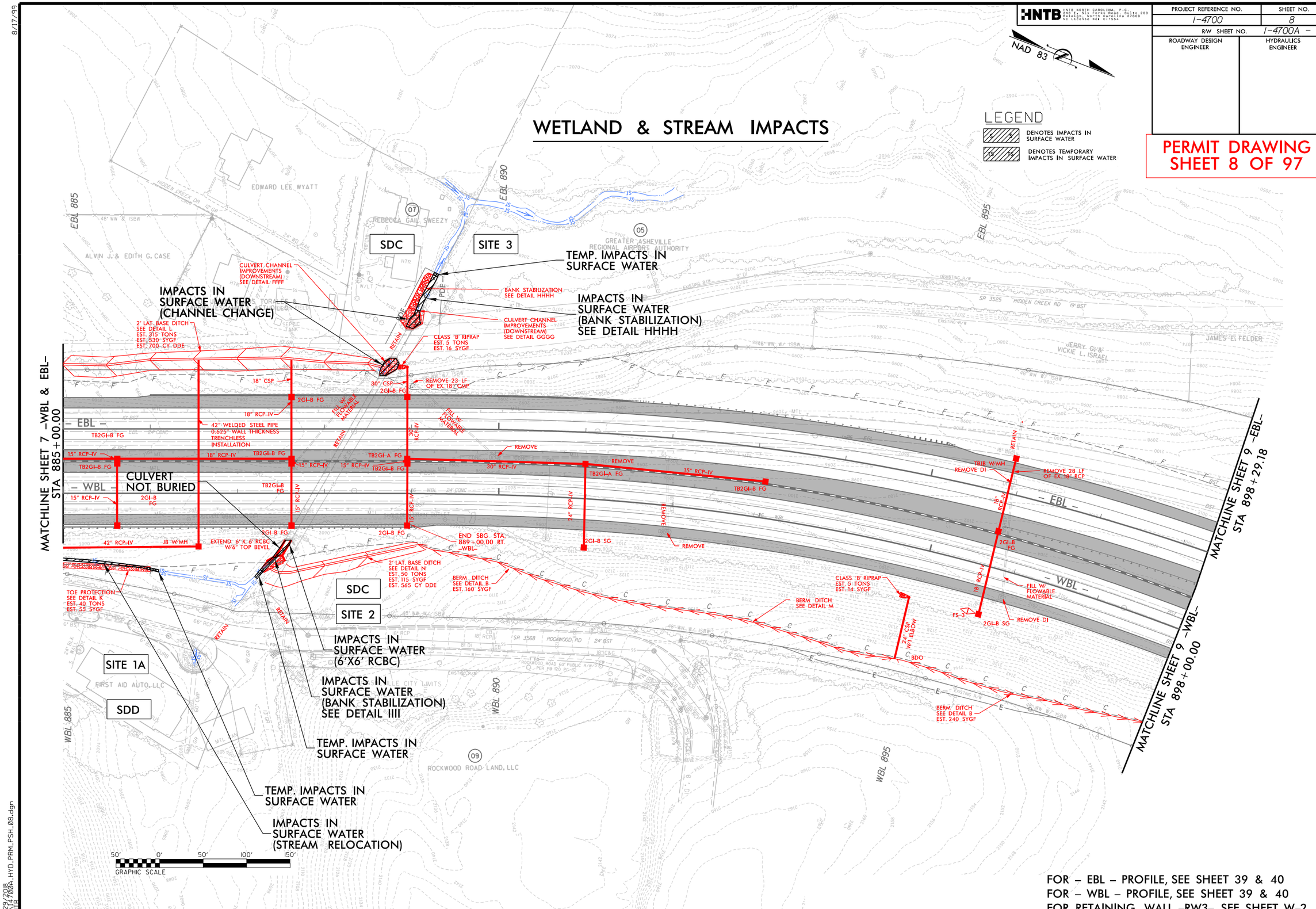
11/29/2018
I-4700A_HYD_PRM_PSH_08.dgn
HNTB

PROJECT REFERENCE NO.	SHEET NO.
I-4700	8
R/W SHEET NO.	I-4700A - 19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

WETLAND & STREAM IMPACTS

PERMIT DRAWING
SHEET 8 OF 97



FOR – EBL – PROFILE, SEE SHEET 39 & 40
FOR – WBL – PROFILE, SEE SHEET 39 & 40
FOR RETAINING WALL –RW3–, SEE SHEET W–2

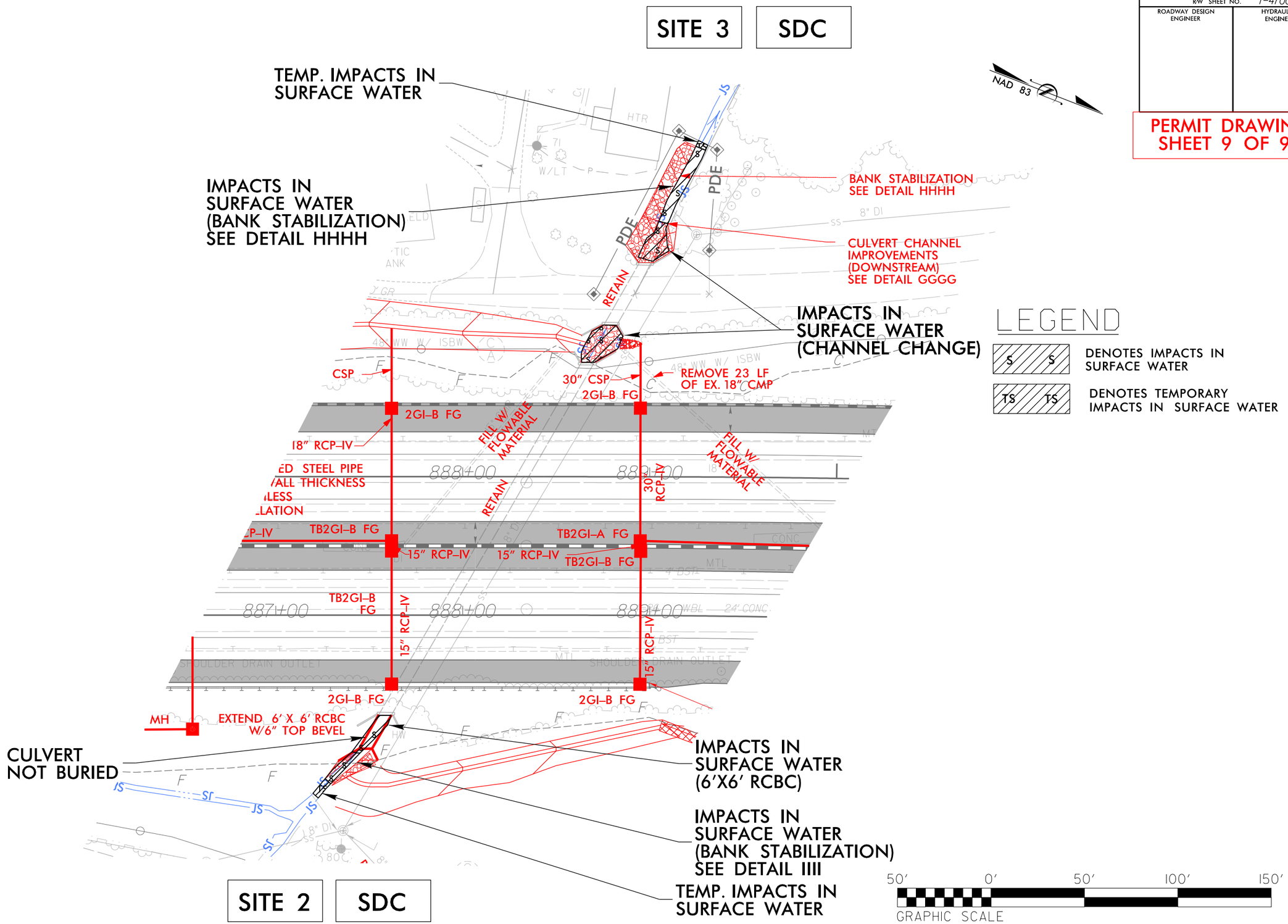
8/17/99

11/29/2018
I-4700A_HYD_PRM_PSH_08.dgn
HNTB

PROJECT REFERENCE NO.	SHEET NO.
I-4700	8
R/W SHEET NO.	I-4700A - 19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

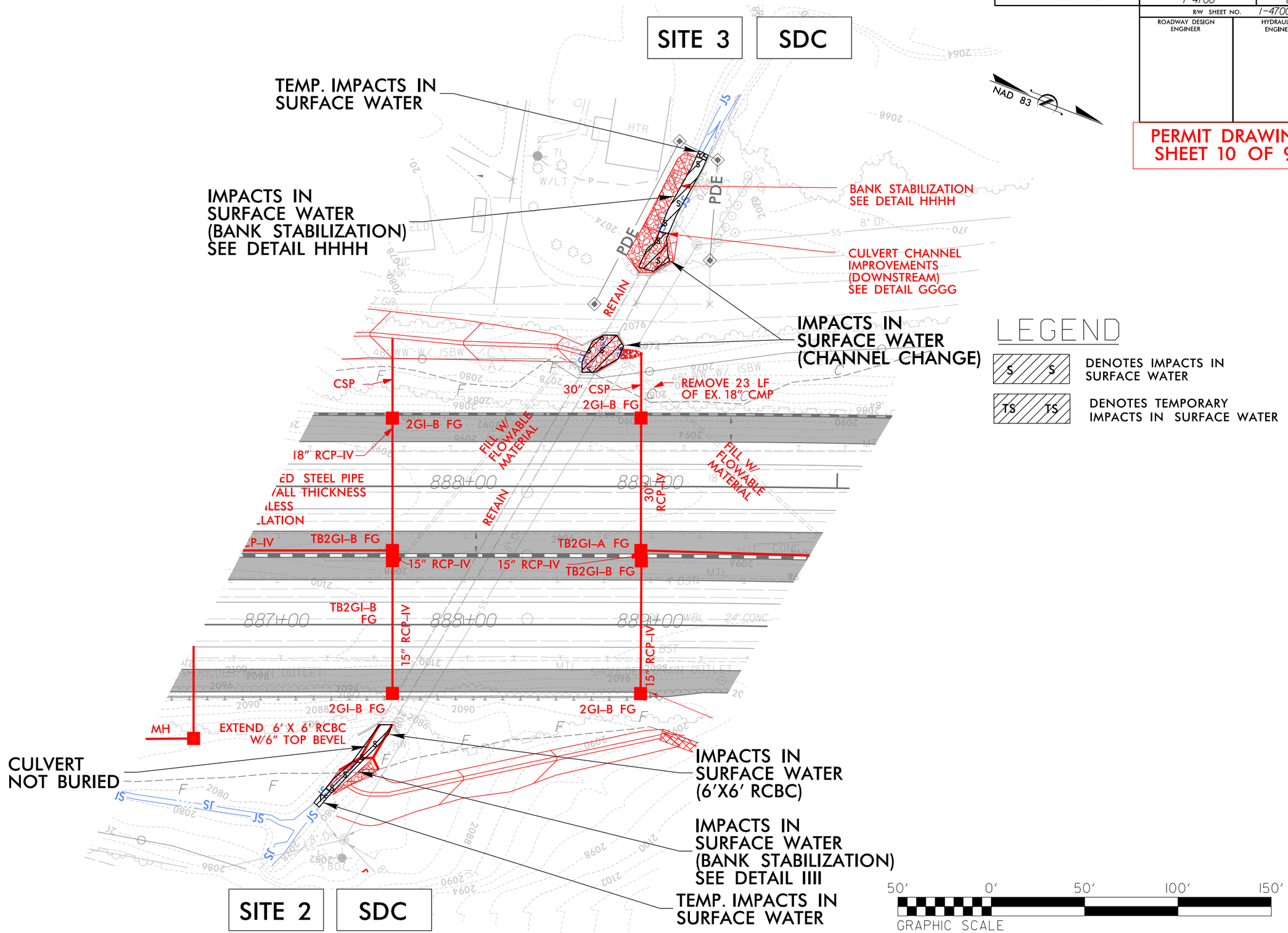
HNTB NORTH CAROLINA, P.C. 343 W. Six Forks Road, Suite 200 Raleigh, North Carolina 27603 NC License Num C-1554

PERMIT DRAWING SHEET 9 OF 97



HNTB NORTH CAROLINA, P.C. 343 W. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License Num C-1554	PROJECT REFERENCE NO.	SHEET NO.
	I-4700	8
	R/W SHEET NO.	I-4700A - 19
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

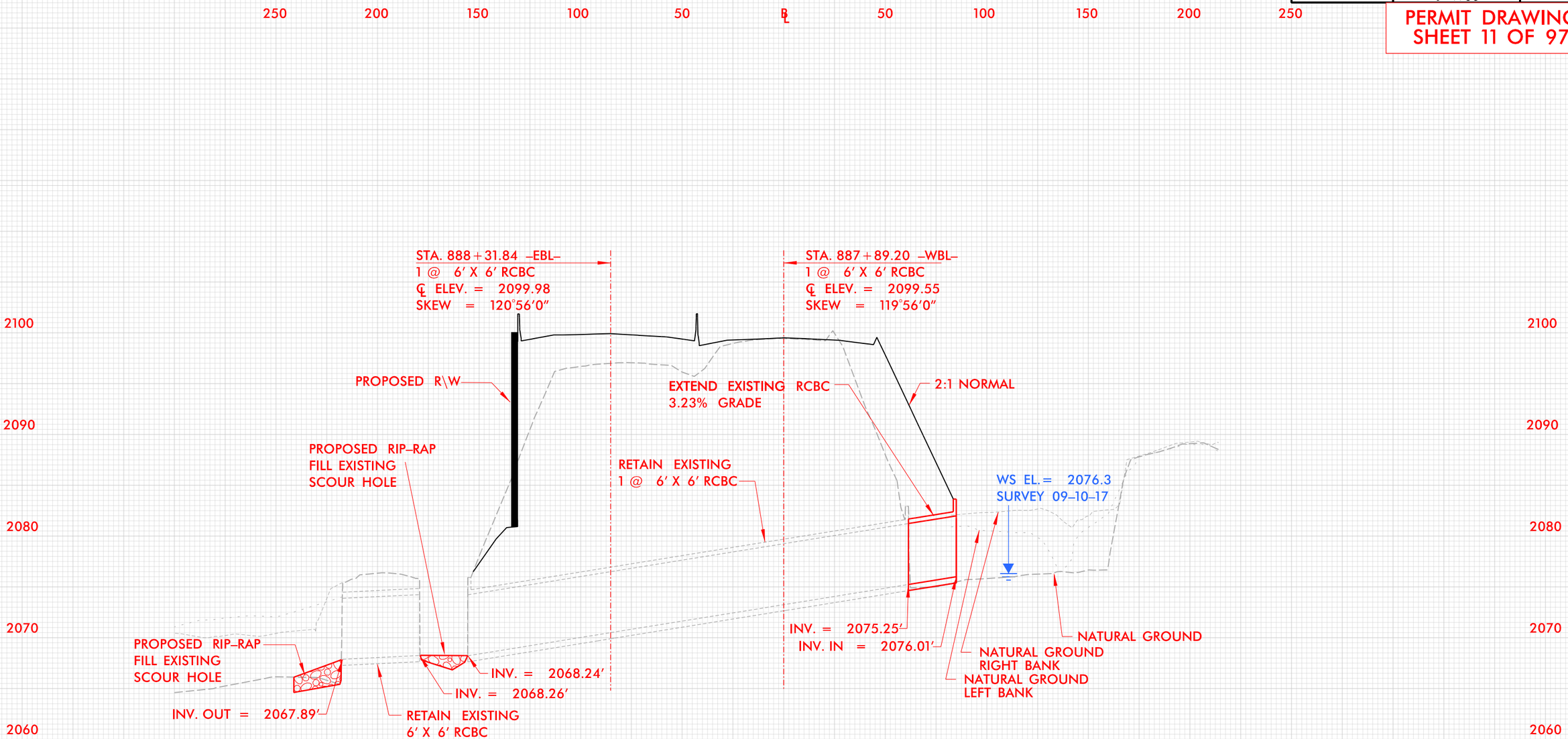
PERMIT DRAWING
SHEET 10 OF 97



6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 11 OF 97



PROFILE

BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4700
I-26
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

11/25/2018
I-4700A_HYD_PRM_PSH_08B_PFL.dgn
HNTB

PROJECT REFERENCE NO.	SHEET NO.
I-4700	10
R/W SHEET NO.	I-4700A - 21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C. 343 W. Six Forks Road, Suite 200 Raleigh, North Carolina 27603 NC License Nbr C-1554

NAD 83

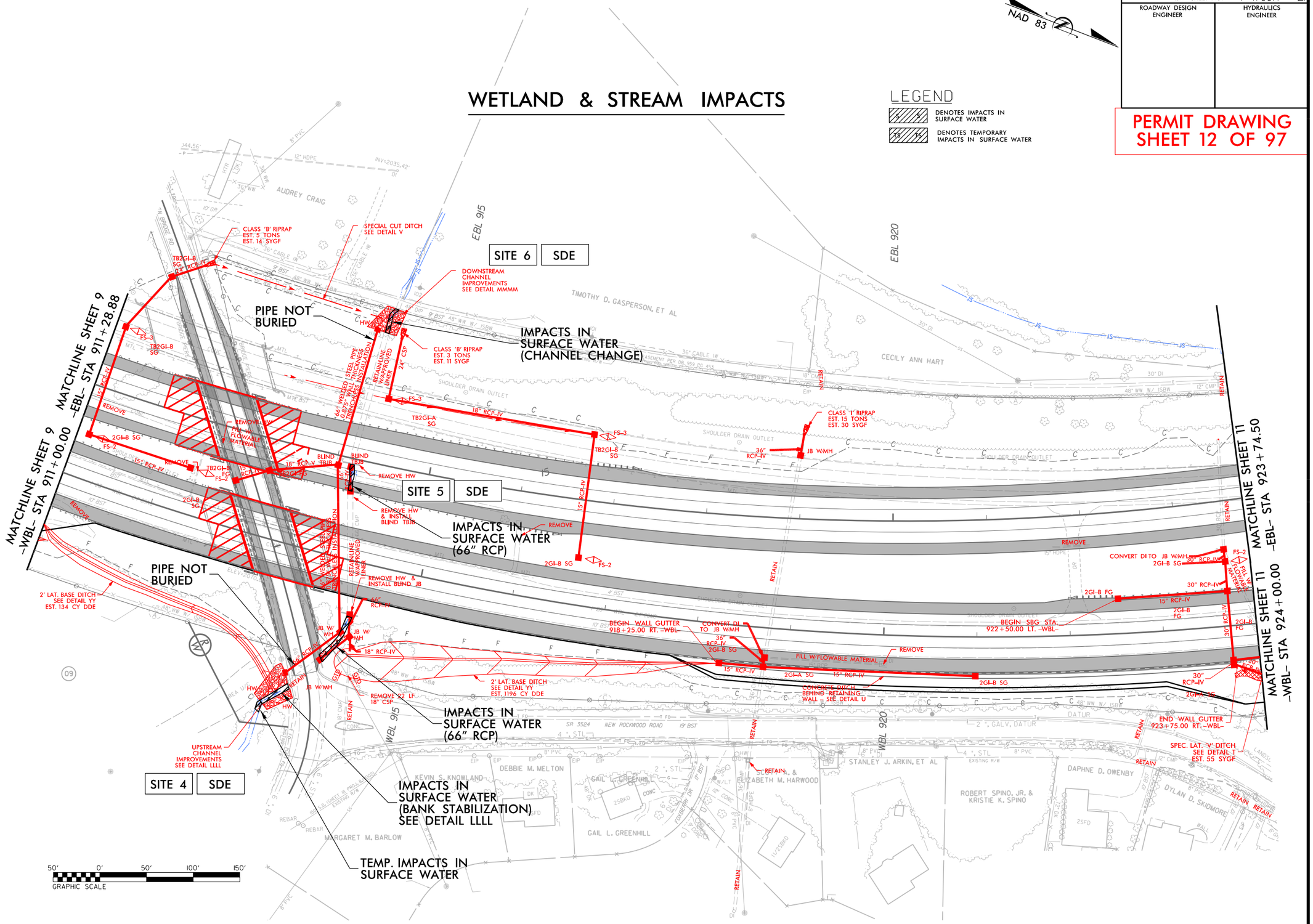
PERMIT DRAWING
SHEET 12 OF 97

WETLAND & STREAM IMPACTS

LEGEND

S — DENOTES IMPACTS IN SURFACE WATER

TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER



8/17/99

11/29/2018
I-4700A_HYD_PRM_PSH_10.dgn
HNTB

8/17/99

HNTB NORTH CAROLINA, P.C.
343 W. Six Forks Road, Suite 200
Raleigh, North Carolina 27603
NC License Nbr C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	10
R/W SHEET NO.	I-4700A - 21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

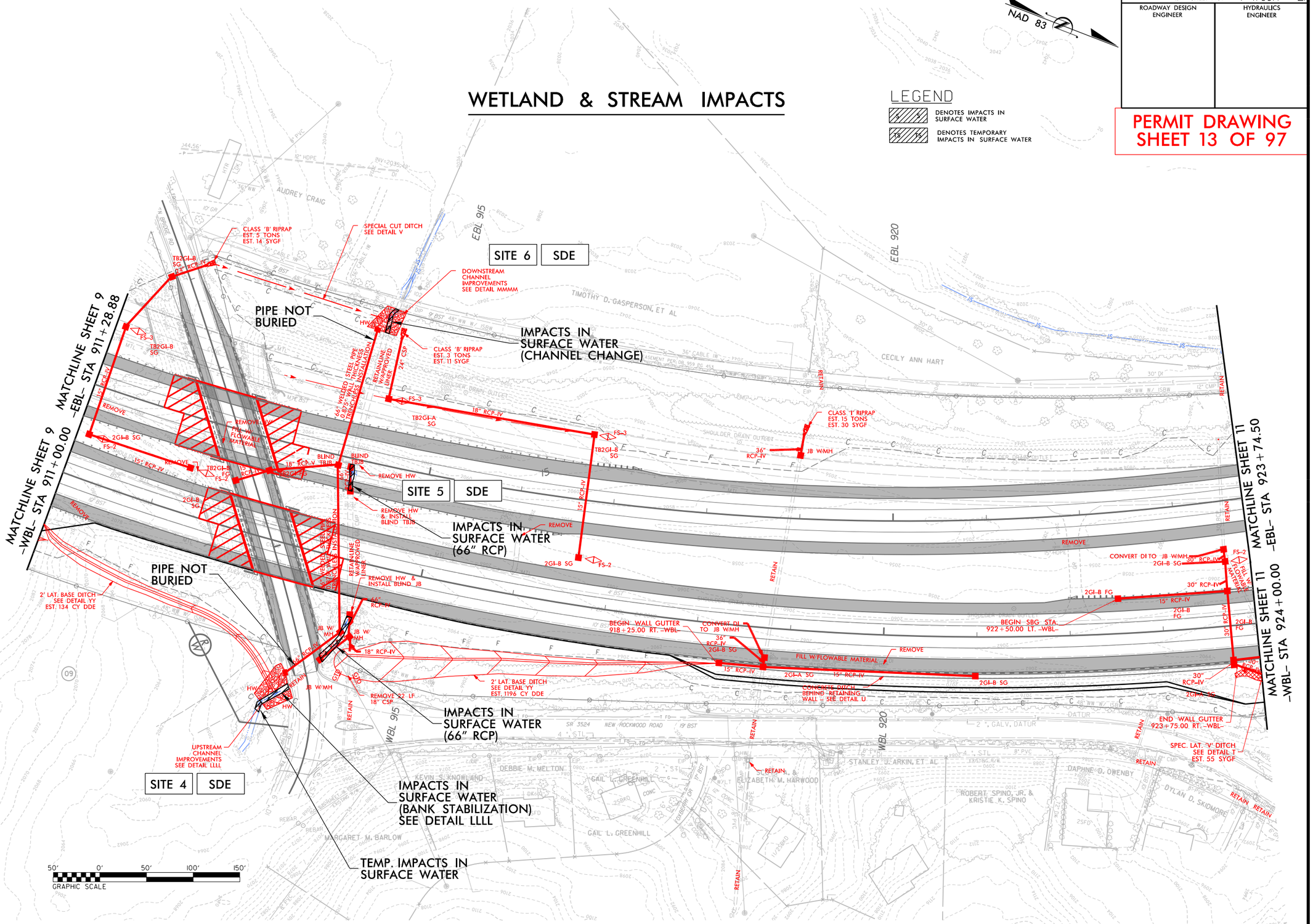
PERMIT DRAWING
SHEET 13 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

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

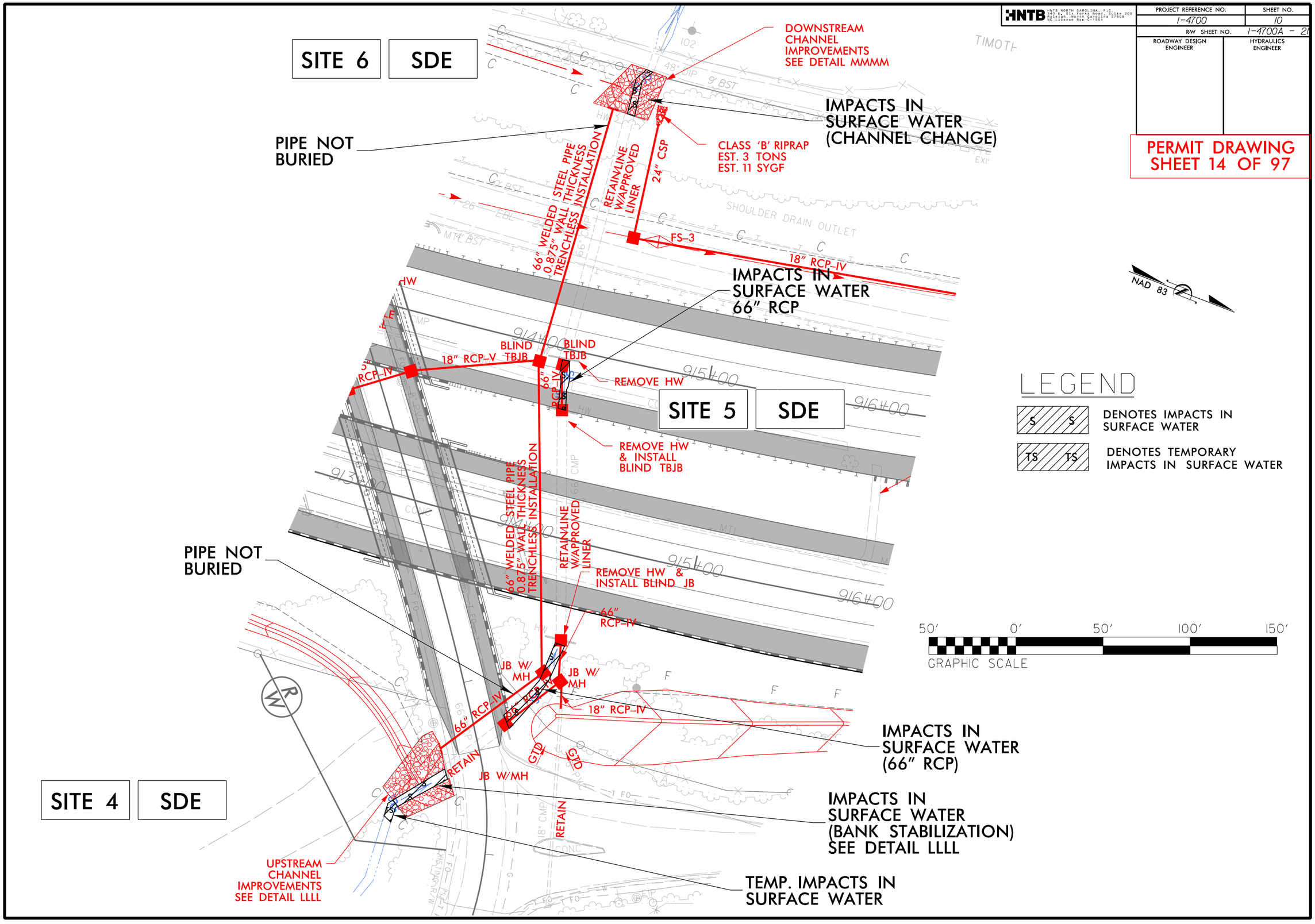


11/29/2018
I-4700A_HYD_PRM_PSH_10.dgn
HNTB

HNTB NORTH CAROLINA, P.C.
343 W. Six Forks Road, Suite 200
Raleigh, North Carolina 27603
NC License No. C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	10
R/W SHEET NO.	I-4700A - 21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

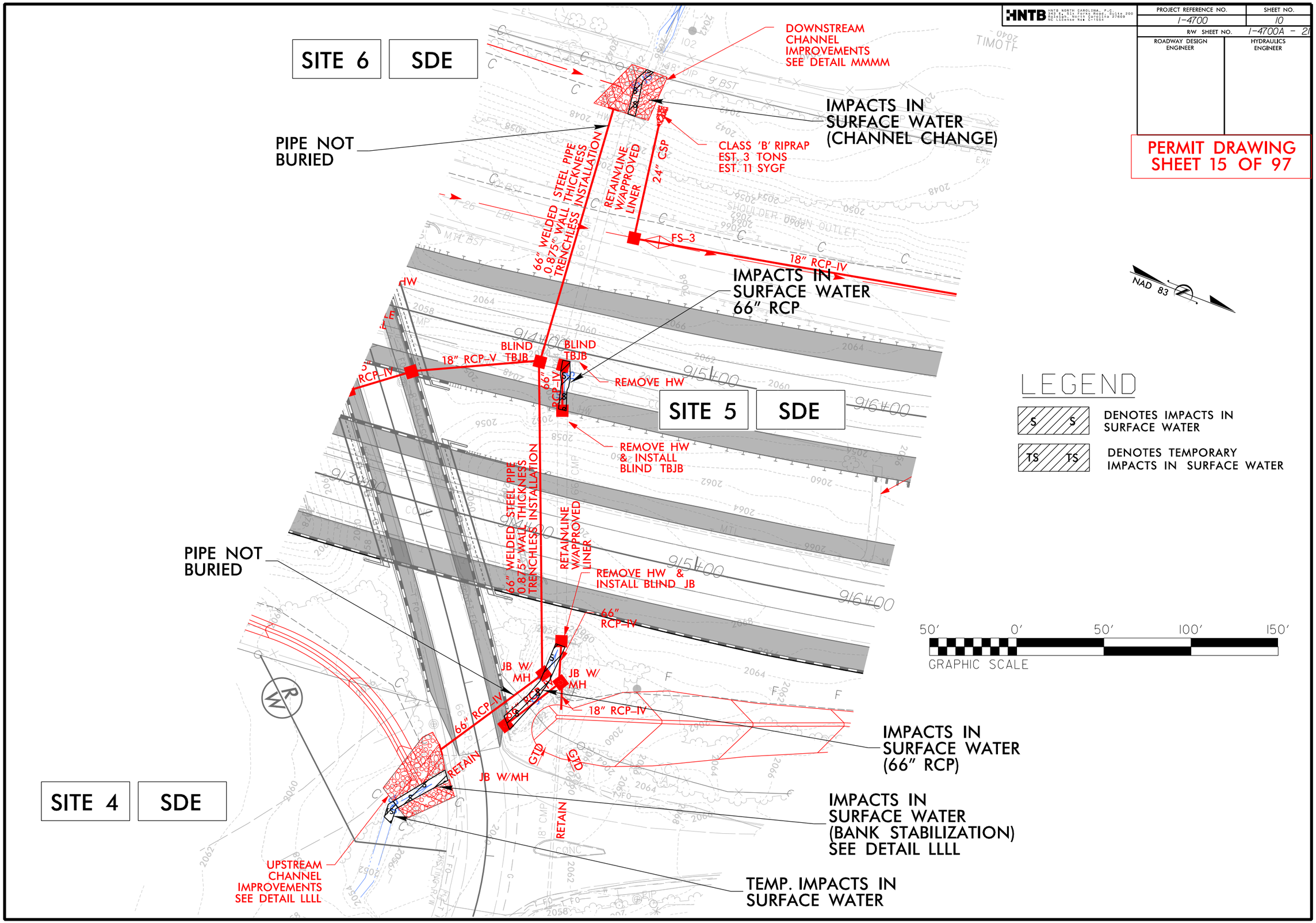
PERMIT DRAWING
SHEET 14 OF 97



HNTB NORTH CAROLINA, P.C.
343 W. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License Num C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	10
R/W SHEET NO.	I-4700A - 21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

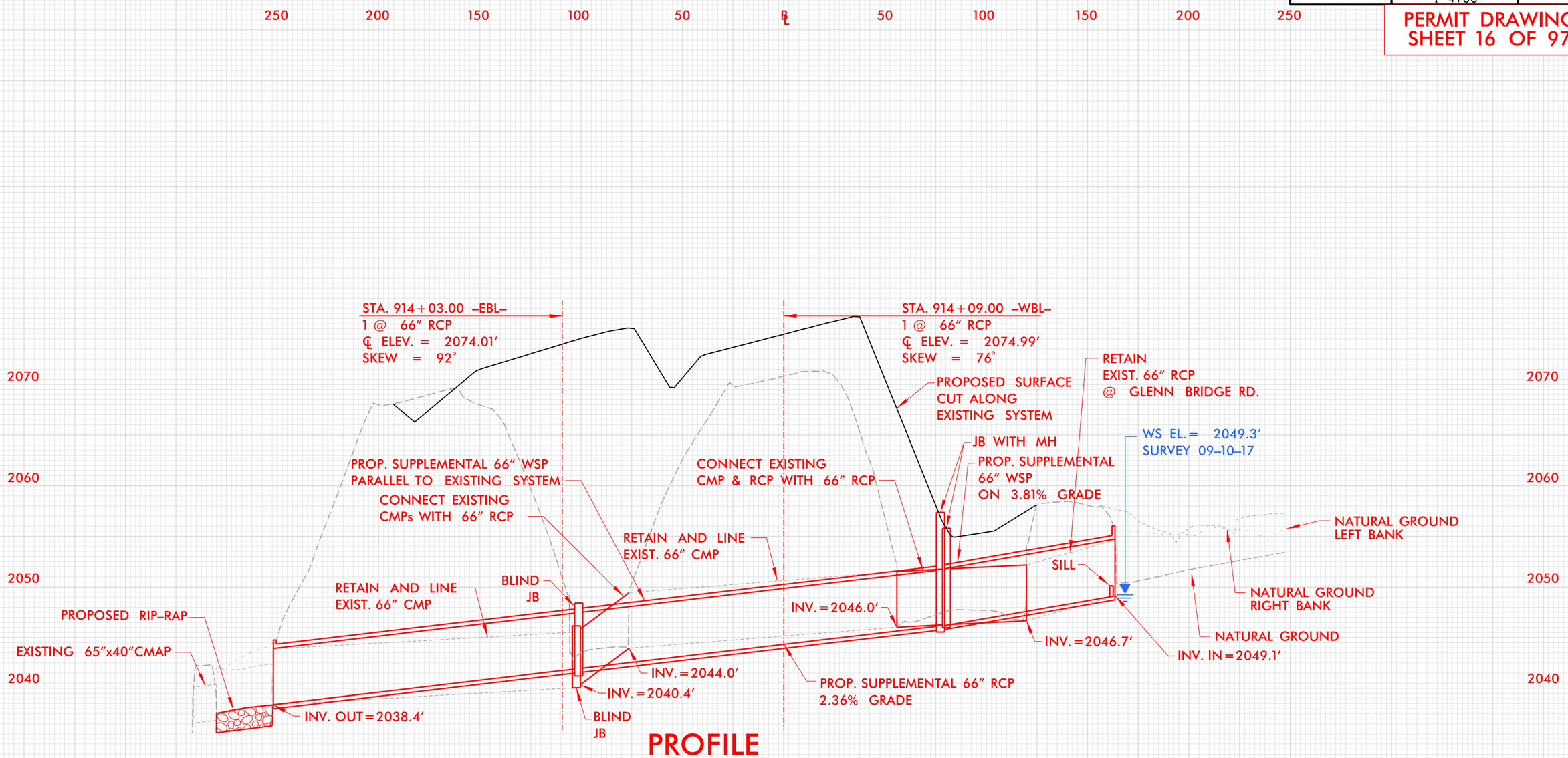
PERMIT DRAWING
SHEET 15 OF 97



6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 16 OF 97



BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4700
I-26
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

11/29/2018
I-4700A_HYD_PRM_PSH_10B_PFL.dgn
HNTB

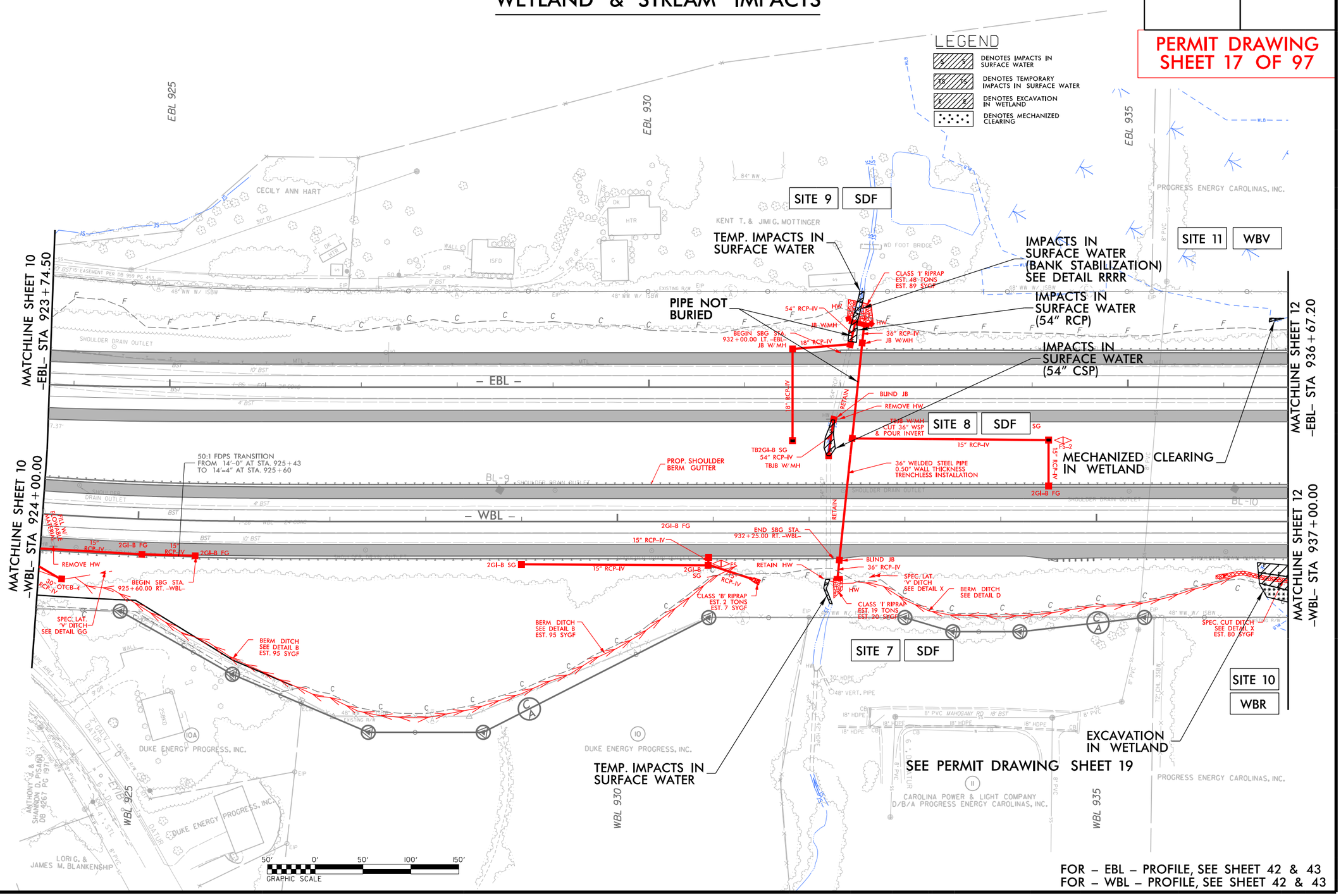
8/17/99

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License Num C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	11
R/W SHEET NO.	I-4700A-22
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 17 OF 97

WETLAND & STREAM IMPACTS



FOR – EBL – PROFILE, SEE SHEET 42 & 43
FOR – WBL – PROFILE, SEE SHEET 42 & 43

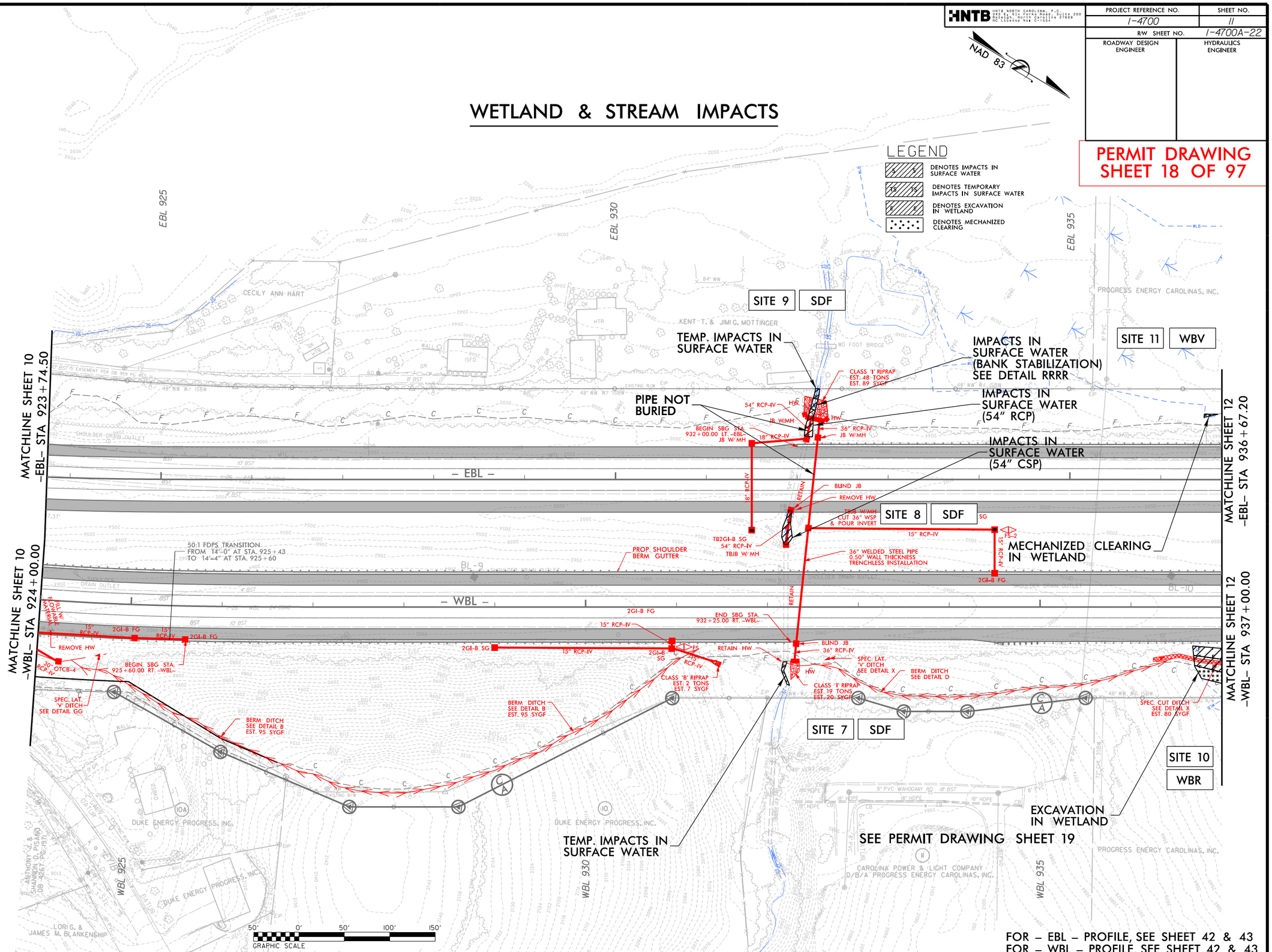
12/3/2018
I-4700A_HYD_PRM_PSH_11.dgn
HNTB

PROJECT REFERENCE NO.	SHEET NO.
I-4700	11
R/W SHEET NO.	I-4700A-22
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C. 343 W. Six Forks Road, Suite 200 Raleigh, North Carolina 27603 NC License Num C-1554

PERMIT DRAWING
SHEET 18 OF 97

WETLAND & STREAM IMPACTS



FOR – EBL – PROFILE, SEE SHEET 42 & 43
FOR – WBL – PROFILE, SEE SHEET 42 & 43

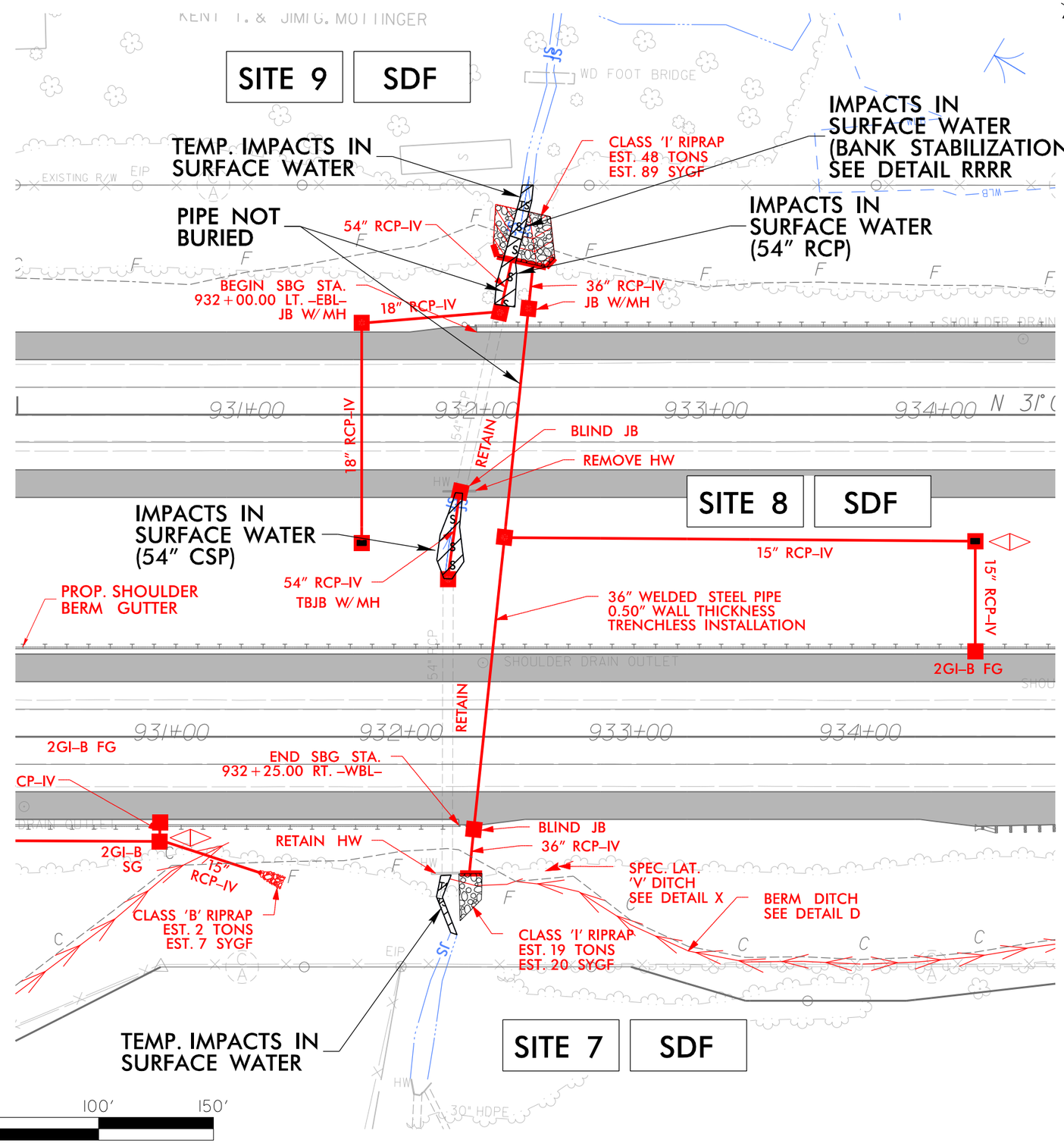
8/17/99

12/3/2018
I-4700A_HYD_PRM_PSH_11.dgn
HNTB

HNTB NORTH CAROLINA, P.C.
343 W. Six Forks Road, Suite 200
Raleigh, North Carolina 27603
NC License Num C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	11
R/W SHEET NO.	I-4700A-22
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

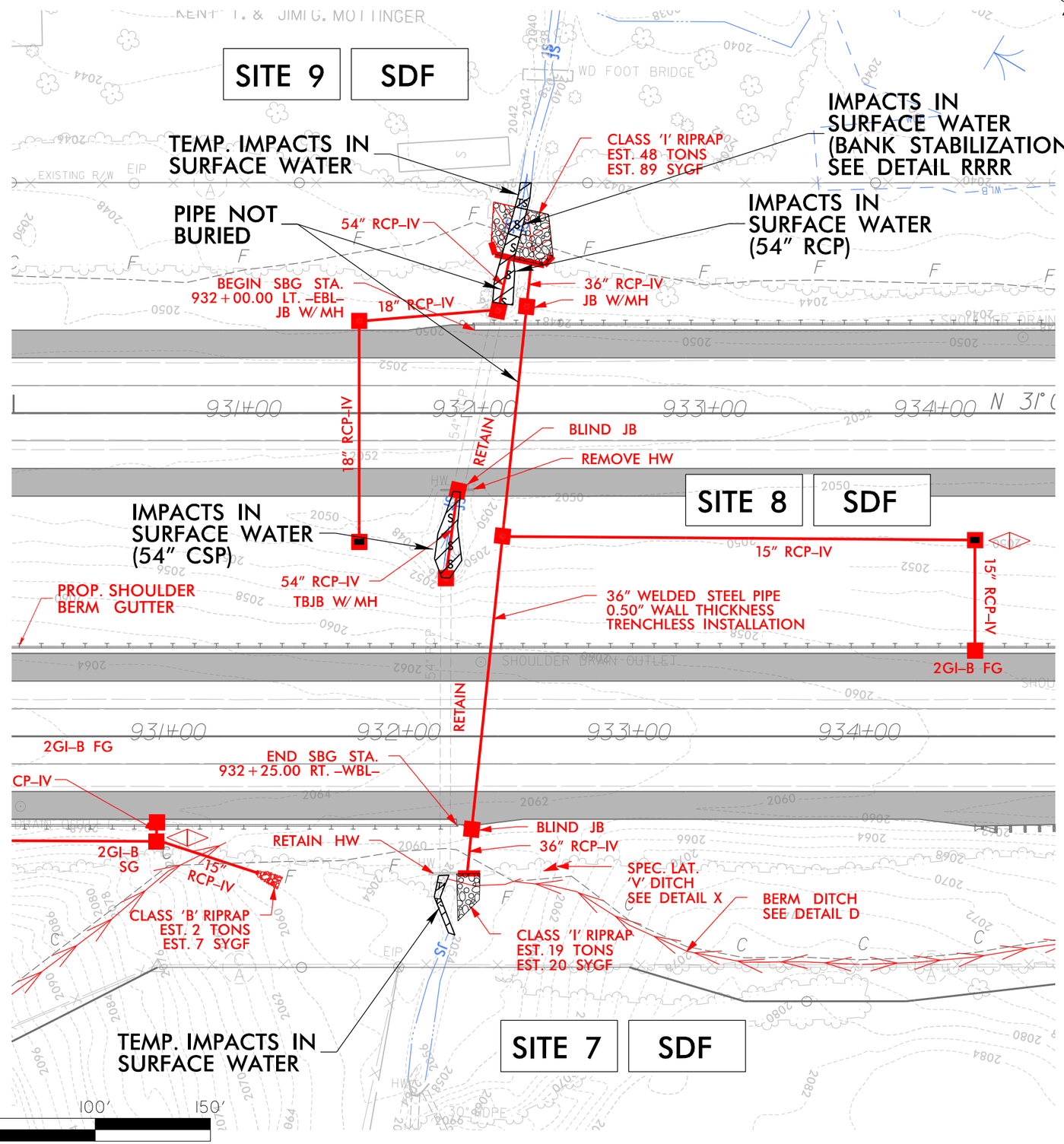
PERMIT DRAWING
SHEET 19 OF 97



HNTB NORTH CAROLINA, P.C.
343 W. Six Forks Road, Suite 200
Raleigh, North Carolina 27603
NC License: Nbr C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	11
R/W SHEET NO.	I-4700A-22
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 20 OF 97



LEGEND

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

8/17/99

HNTB NORTH CAROLINA, P.C.
343 W. Six Forks Road, Suite 200
Raleigh, North Carolina 27603
NC License No. C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	12
R/W SHEET NO.	I-4700A-23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

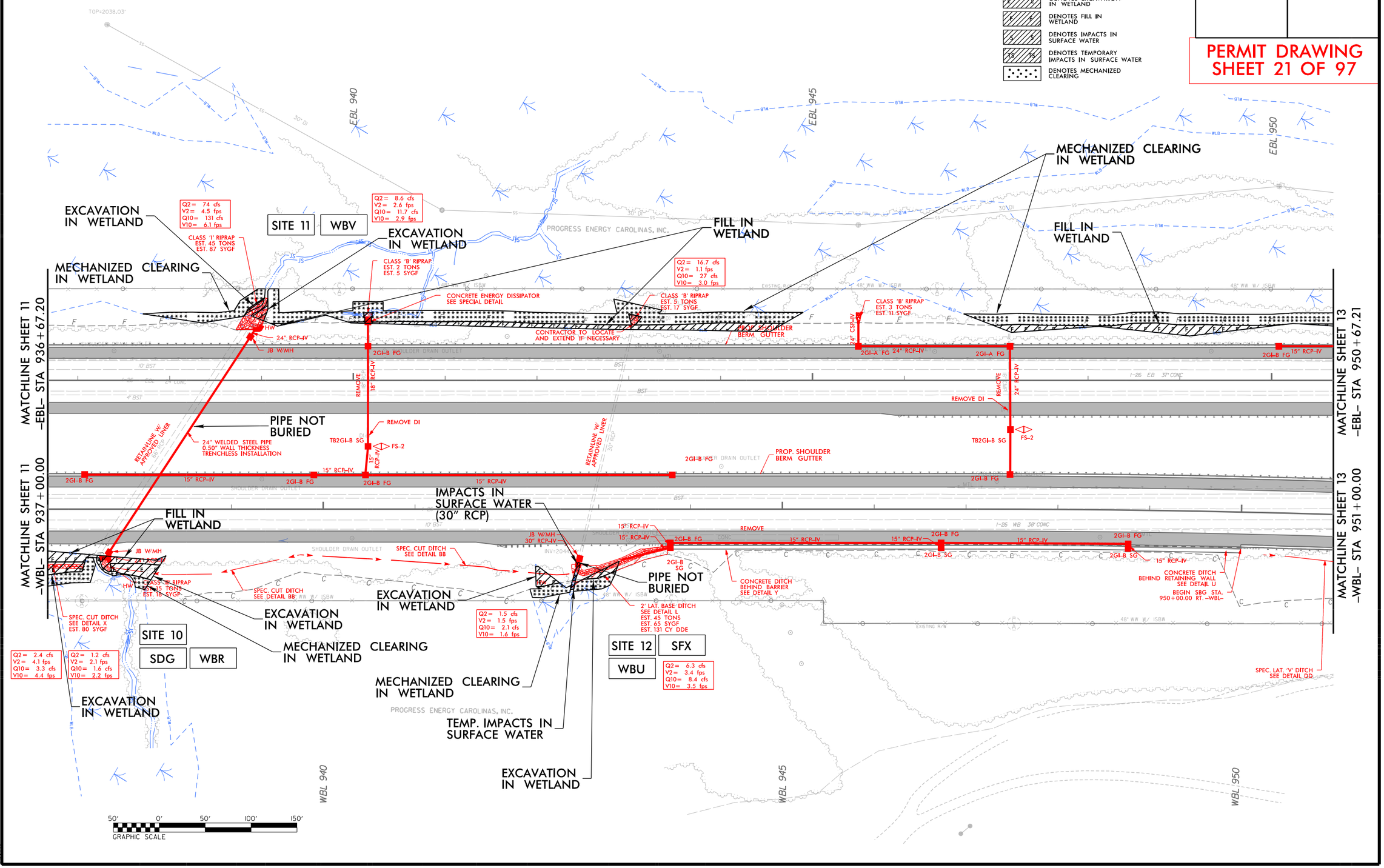
PERMIT DRAWING SHEET 21 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

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



11/29/2018
I-4700A_HYD_PRM_PSH_12.dgn
HNTB

PROJECT REFERENCE NO.	SHEET NO.
I-4700	12
R/W SHEET NO.	I-4700A-23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C. 343 W. Six Forks Road, Suite 200 Raleigh, North Carolina 27603 NC License Num C-1554

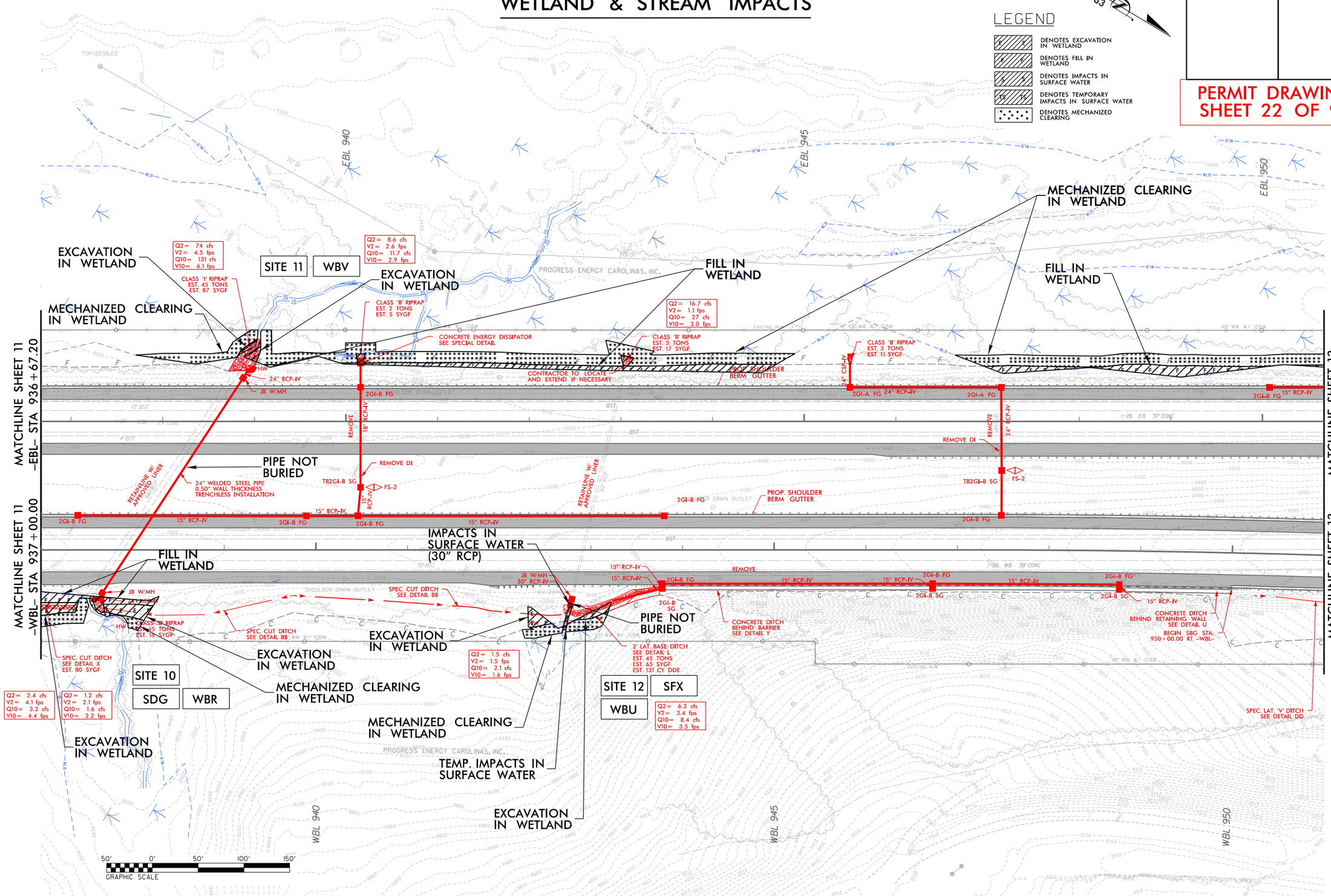
PERMIT DRAWING
SHEET 22 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

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

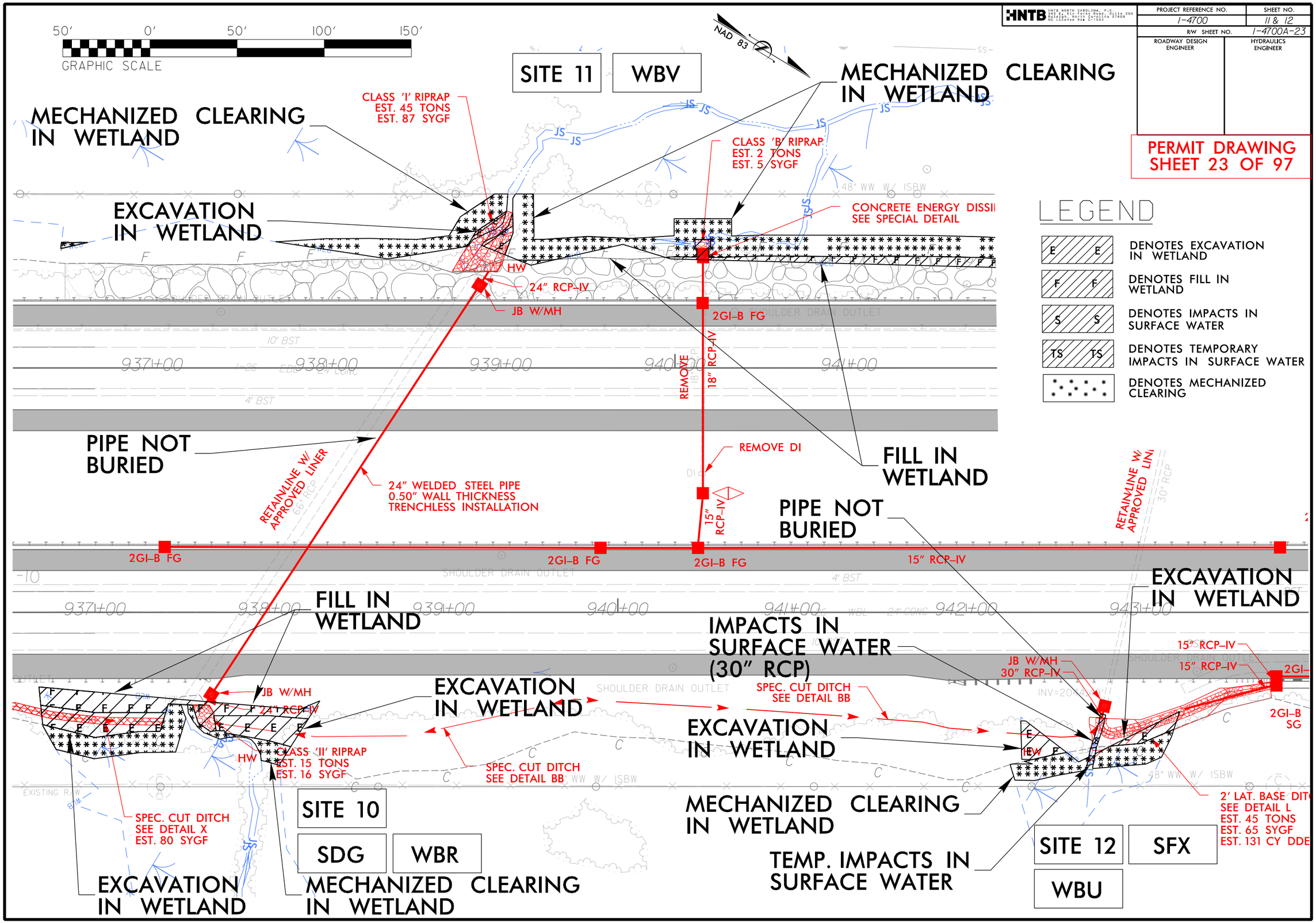


11/29/2018
I-4700A_HYD_PRM_PSH_12.dgn
HNTB
8/17/99

PROJECT REFERENCE NO.	SHEET NO.
I-4700	11 & 12
R/W SHEET NO.	I-4700A-23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C. 343 W. Six Forks Road, Suite 200 Raleigh, North Carolina 27603 NC License No. C-1554

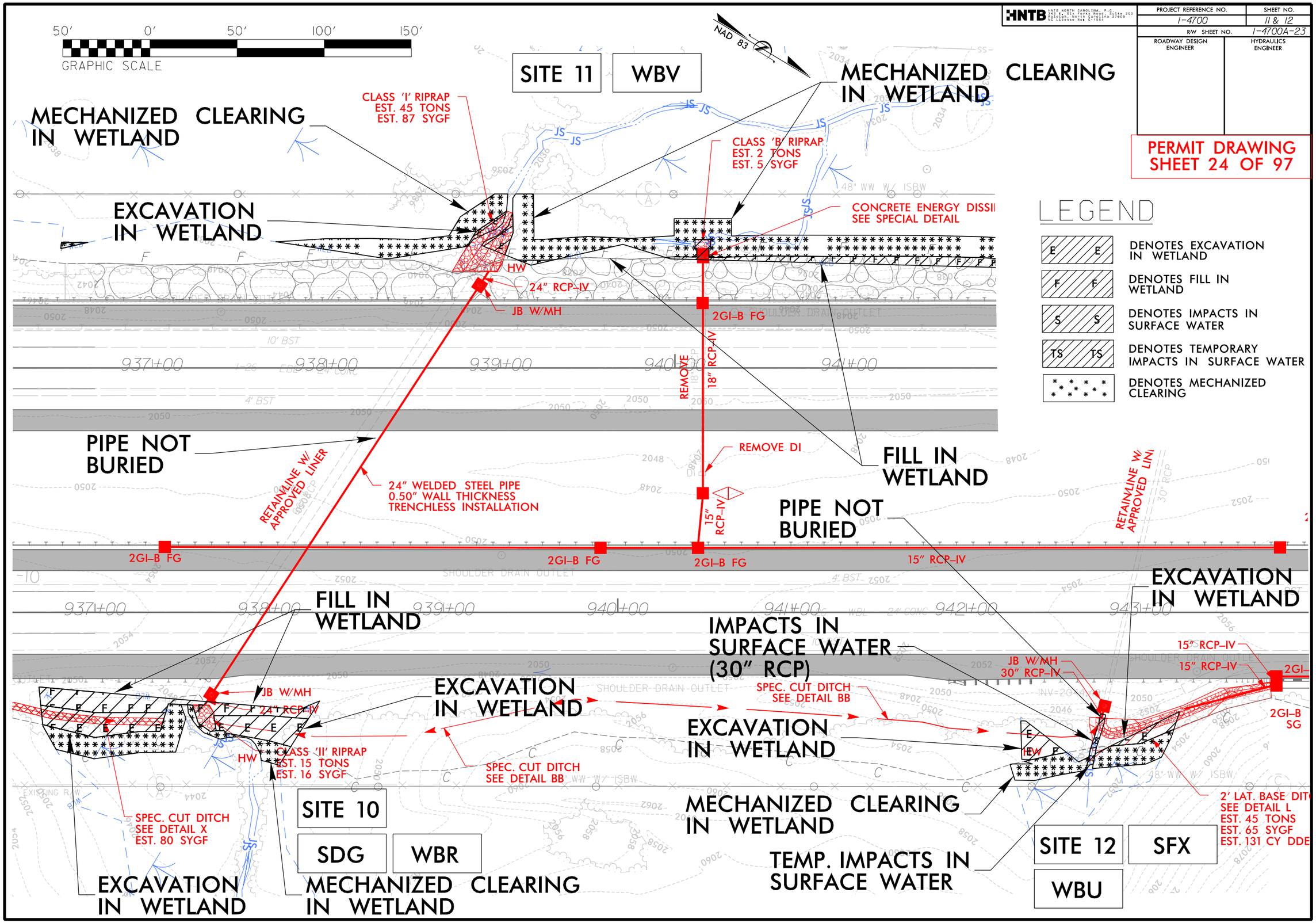
PERMIT DRAWING SHEET 23 OF 97



PROJECT REFERENCE NO.	SHEET NO.
I-4700	11 & 12
R/W SHEET NO.	I-4700A-23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C. 343 W. Six Forks Road, Suite 200 Raleigh, North Carolina 27603 NC License Nbr C-1554

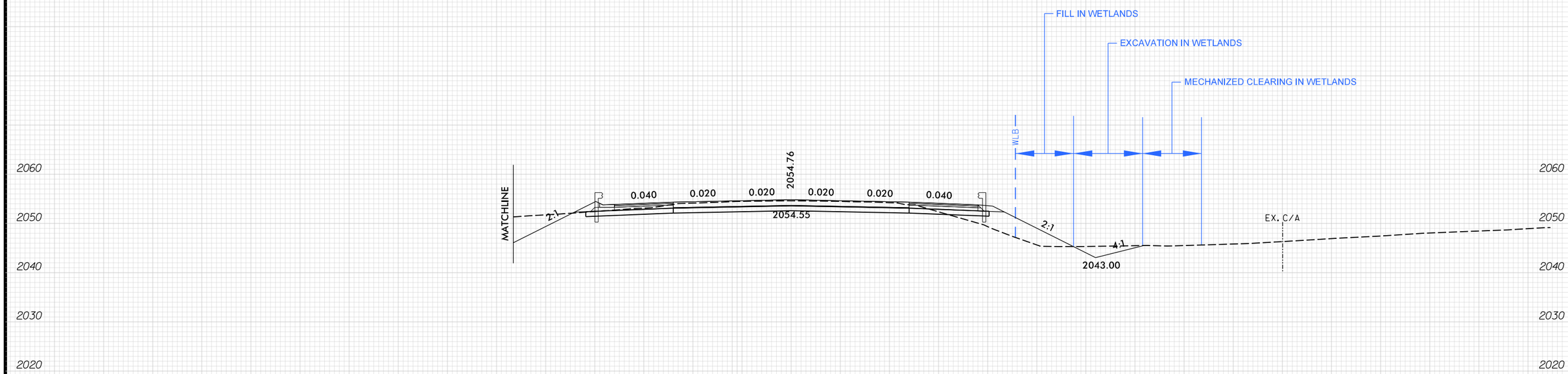
PERMIT DRAWING SHEET 24 OF 97



PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 25 OF 97

WETLAND CROSS SECTIONS



SITE 10

–WBL– 937+00.00

SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4700
I-26
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

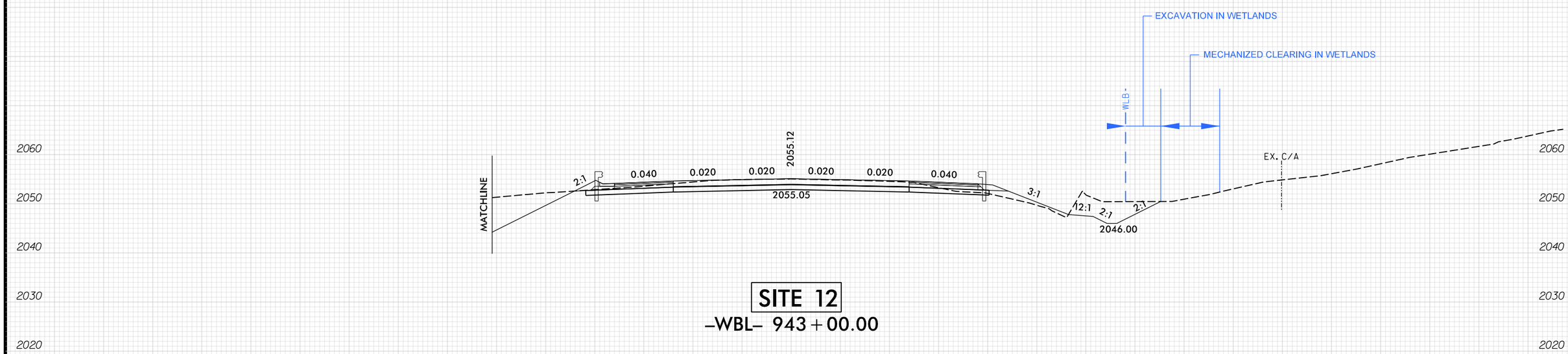
6/23/16

11/30/2018
I-4700A_HYD_PRM_PSH_XPL
HNTB

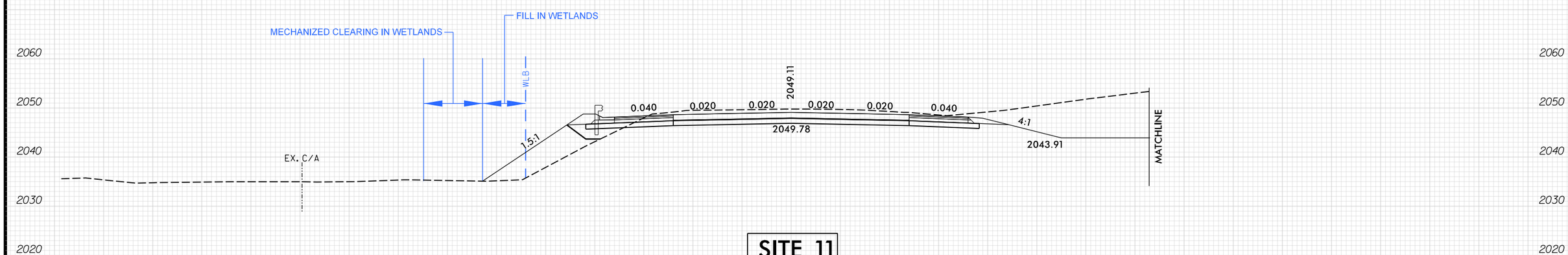
PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 26 OF 97

WETLAND CROSS SECTIONS



SITE 12
–WBL– 943+00.00



SITE 11
–EBL– 944+00.00

SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4700
I-26
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

6/23/16
12/3/2018
I-4700A_HYD_PRM_PSH_XPL
HNTB

PROJECT REFERENCE NO.	SHEET NO.
I-4700	13
R/W SHEET NO.	I-4700A-24
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C. 343 W. Six Forks Road, Suite 200 Raleigh, North Carolina 27603 NC License Num C-1554

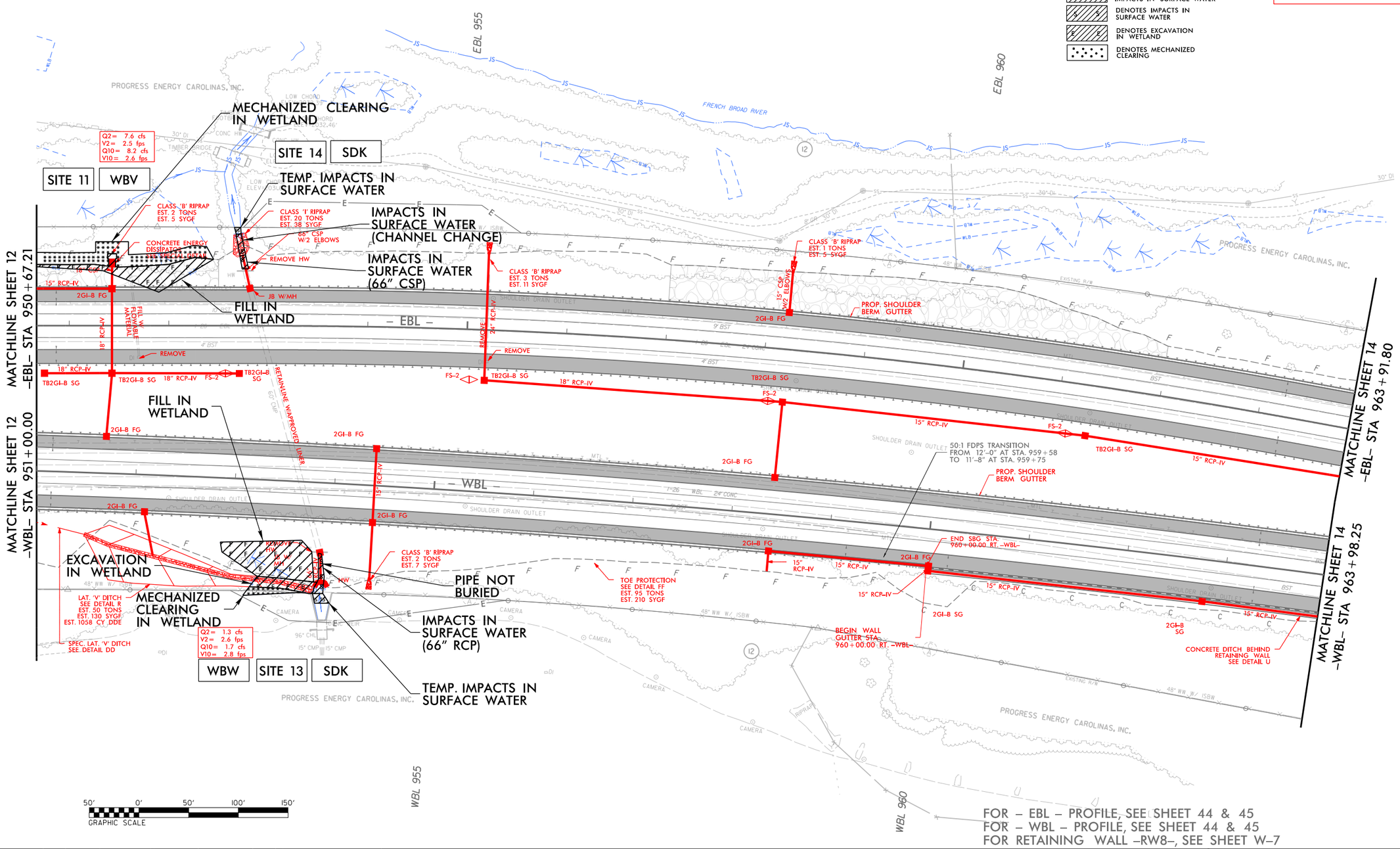
PERMIT DRAWING
SHEET 27 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

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



FOR – EBL – PROFILE, SEE SHEET 44 & 45
FOR – WBL – PROFILE, SEE SHEET 44 & 45
FOR RETAINING WALL –RW8–, SEE SHEET W-7

8/17/99

11/30/2018
I-4700A_HYD_PRM_PSH_13.dgn
HNTB

8/17/99

HNTB NORTH CAROLINA, P.C.
343 W. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License Nbr C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	13
R/W SHEET NO.	I-4700A-24
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

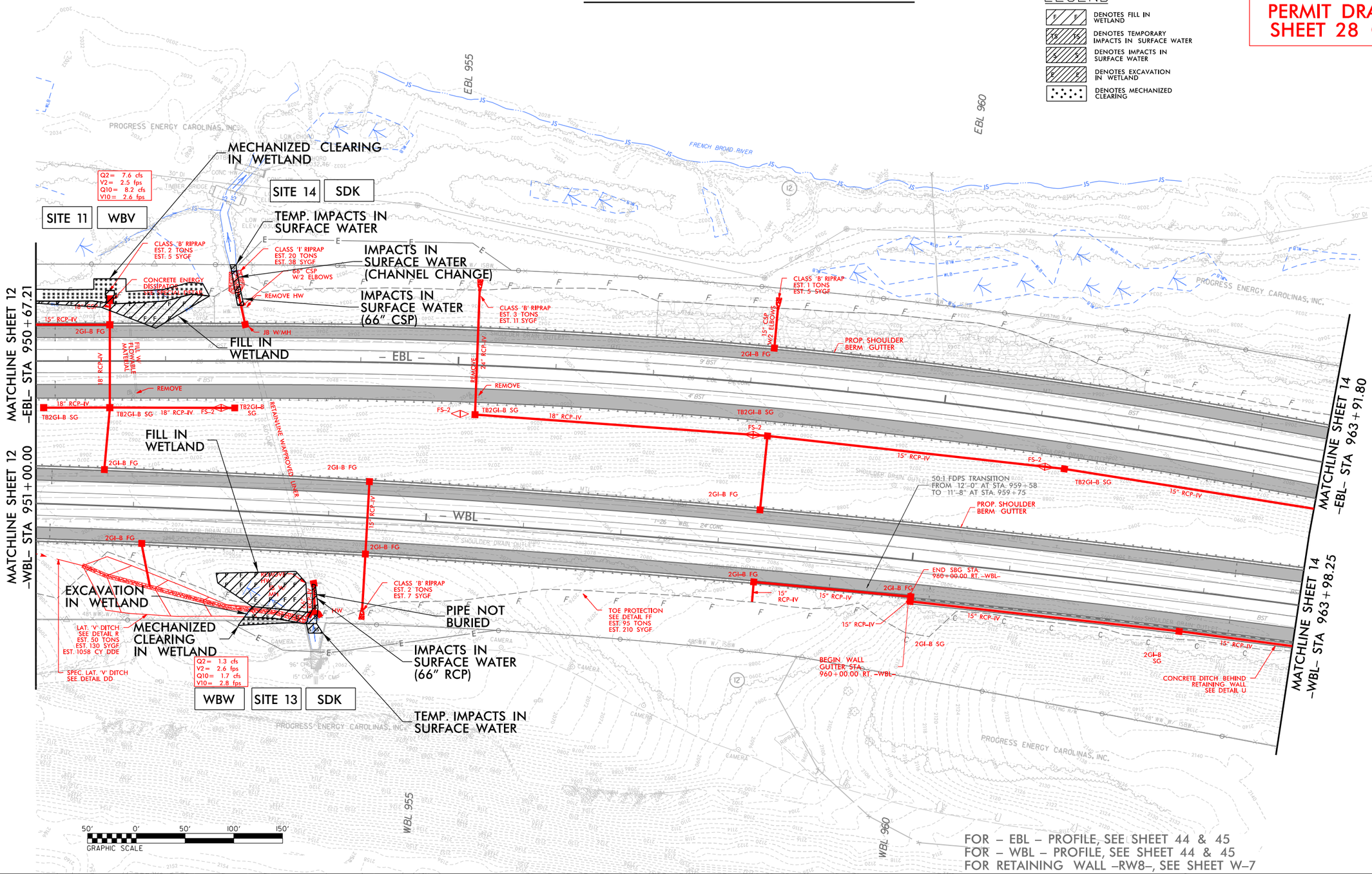
PERMIT DRAWING
SHEET 28 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

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



FOR – EBL – PROFILE, SEE SHEET 44 & 45
FOR – WBL – PROFILE, SEE SHEET 44 & 45
FOR RETAINING WALL –RW8–, SEE SHEET W-7

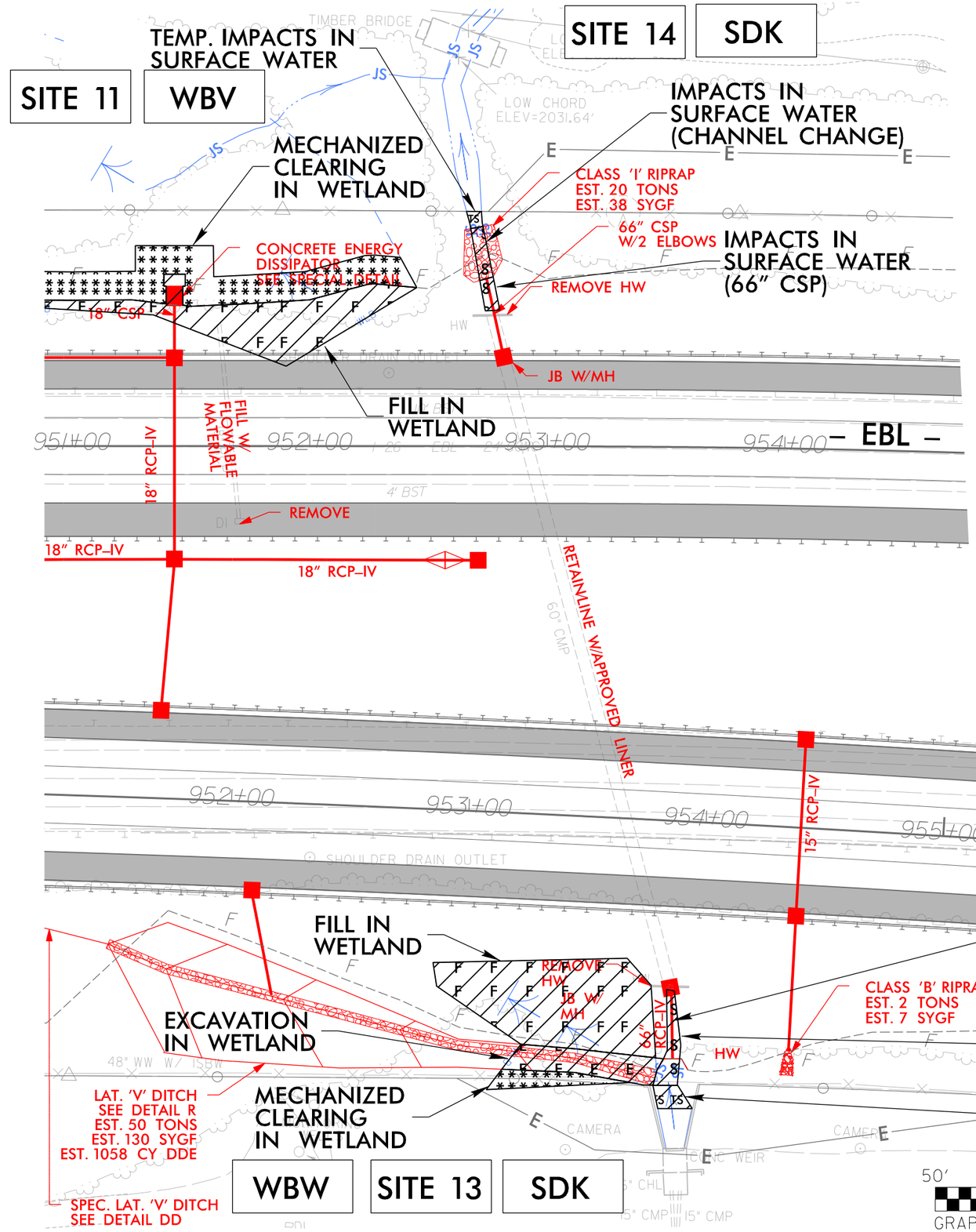
11/30/2018
I-4700A_HYD_PRM_PSH_13.dgn
HNTB

HNTB NORTH CAROLINA, P.C.
343 W. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License Nbr C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	13
R/W SHEET NO.	I-4700A-24
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 29 OF 97

NAD 83



LEGEND

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

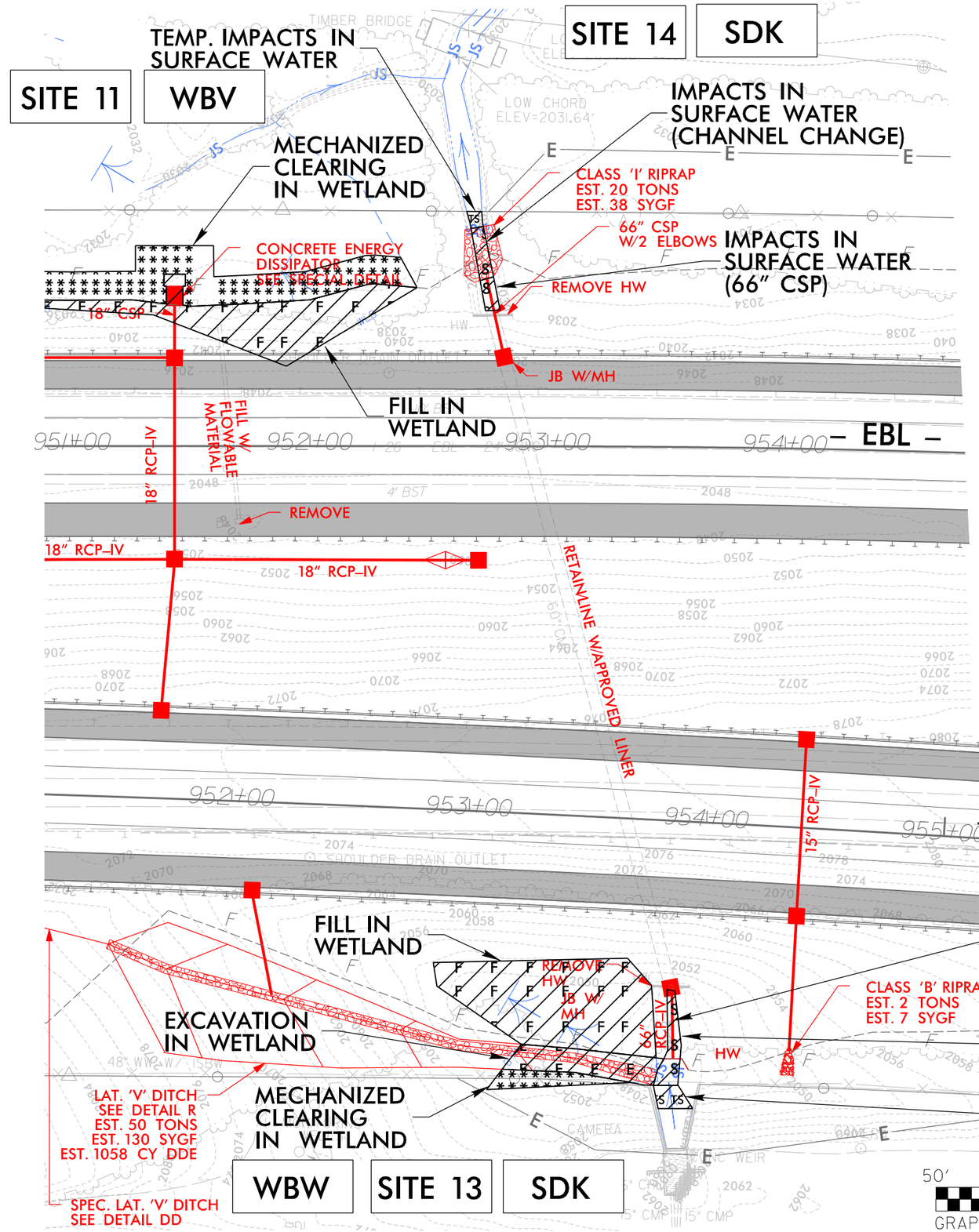
50' 0' 50' 100' 150'
GRAPHIC SCALE

PROJECT REFERENCE NO.	SHEET NO.
I-4700	13
R/W SHEET NO.	I-4700A-24
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C. 343 W. Six Forks Road, Suite 200 Raleigh, North Carolina 27603 NC License No. C-1554

NAD 83

PERMIT DRAWING SHEET 30 OF 97



LEGEND

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

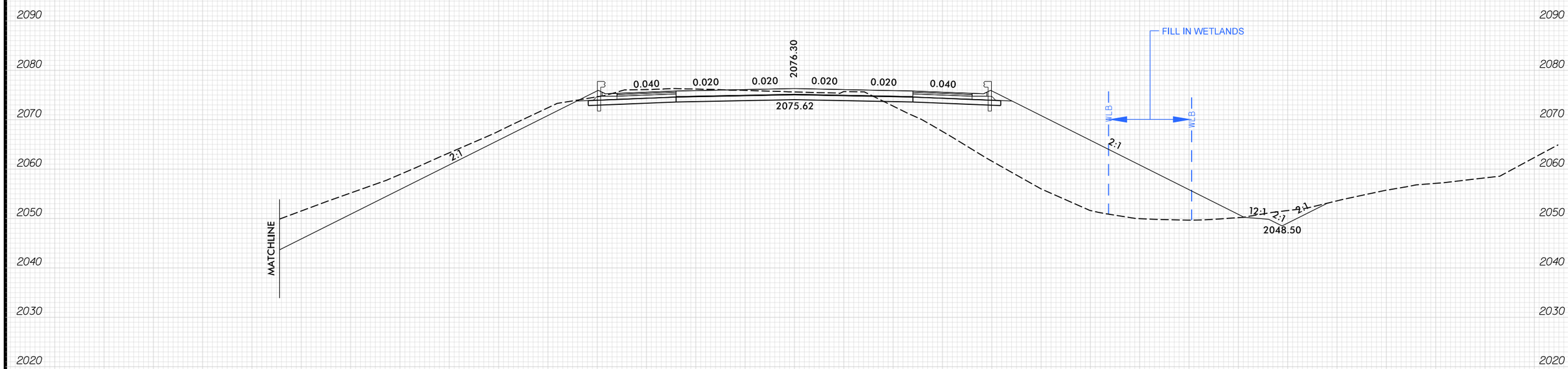
50' 0' 50' 100' 150'

GRAPHIC SCALE

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 31 OF 97

WETLAND CROSS SECTIONS



SITE 13

–WBL– 953+00.00

SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

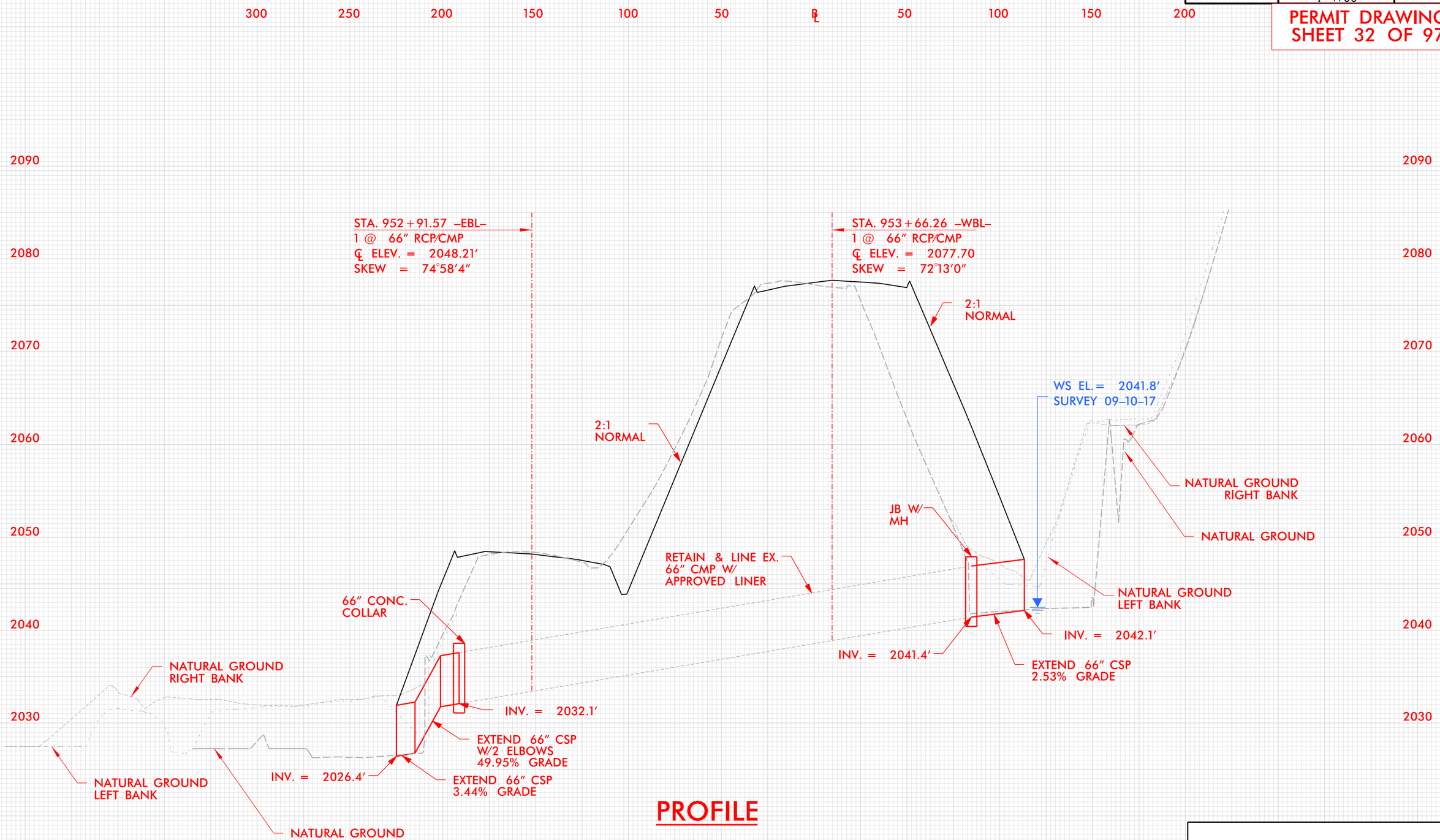
BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4700
I-26
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

6/23/16

11/13/2018
I4700A_HYD_PRM_PSH_XPL
HNTB

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 32 OF 97



PROFILE

BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4700
I-26
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

6/23/16

11/13/2018
I4700A_HYD_PRM_PSH_13C_PFL.dgn
HNTB

PROJECT REFERENCE NO.	SHEET NO.
I-4700	15
R/W SHEET NO.	I-4700A-26
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License Nbr C-1554

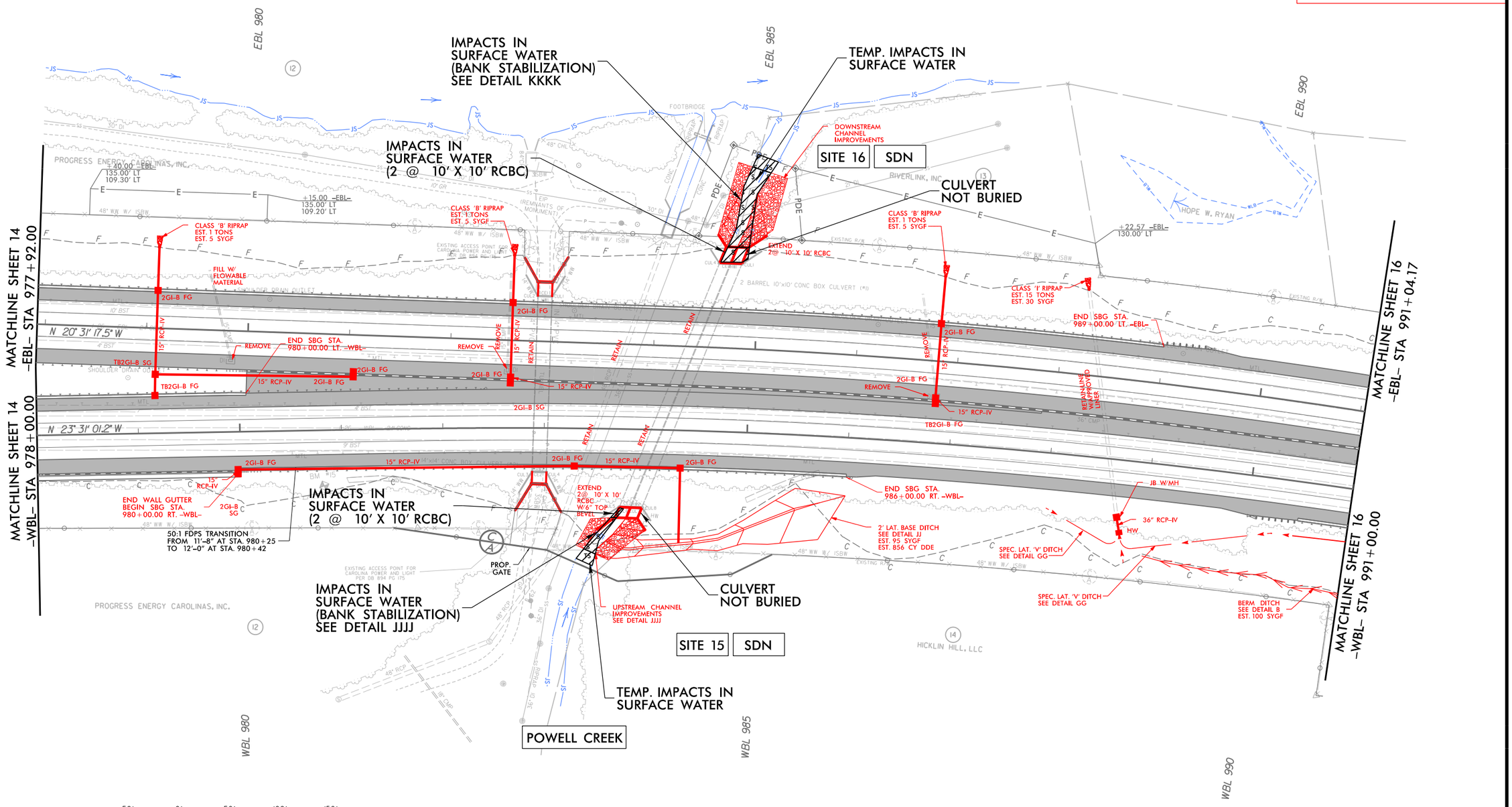
PERMIT DRAWING
SHEET 33 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER



8/17/99

11/30/2018
I-4700A_HYD_PRM_PSH_15.dgn
HNTB

PROJECT REFERENCE NO.	SHEET NO.
I-4700	15
R/W SHEET NO.	I-4700A-26
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB

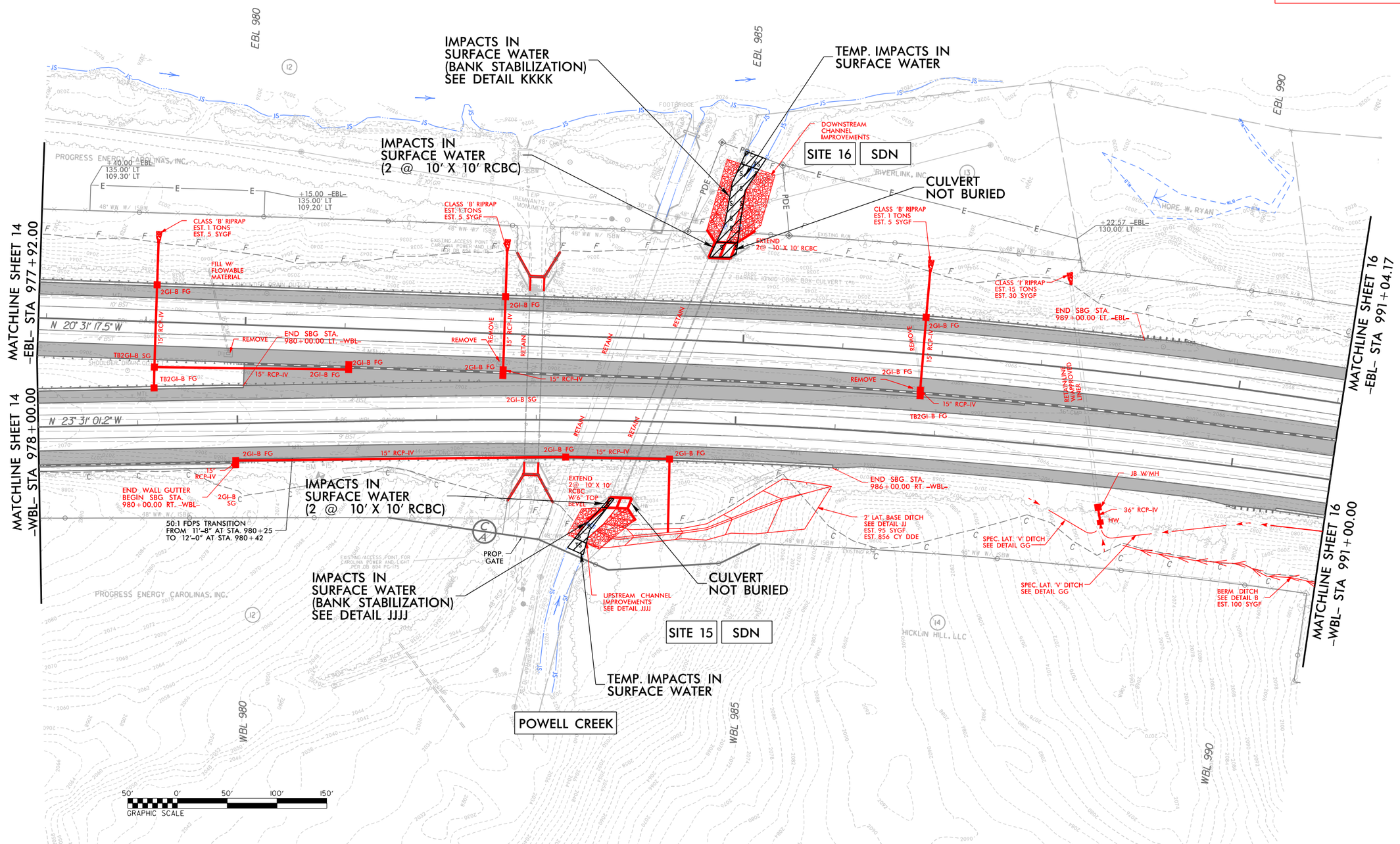
PERMIT DRAWING
SHEET 34 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER



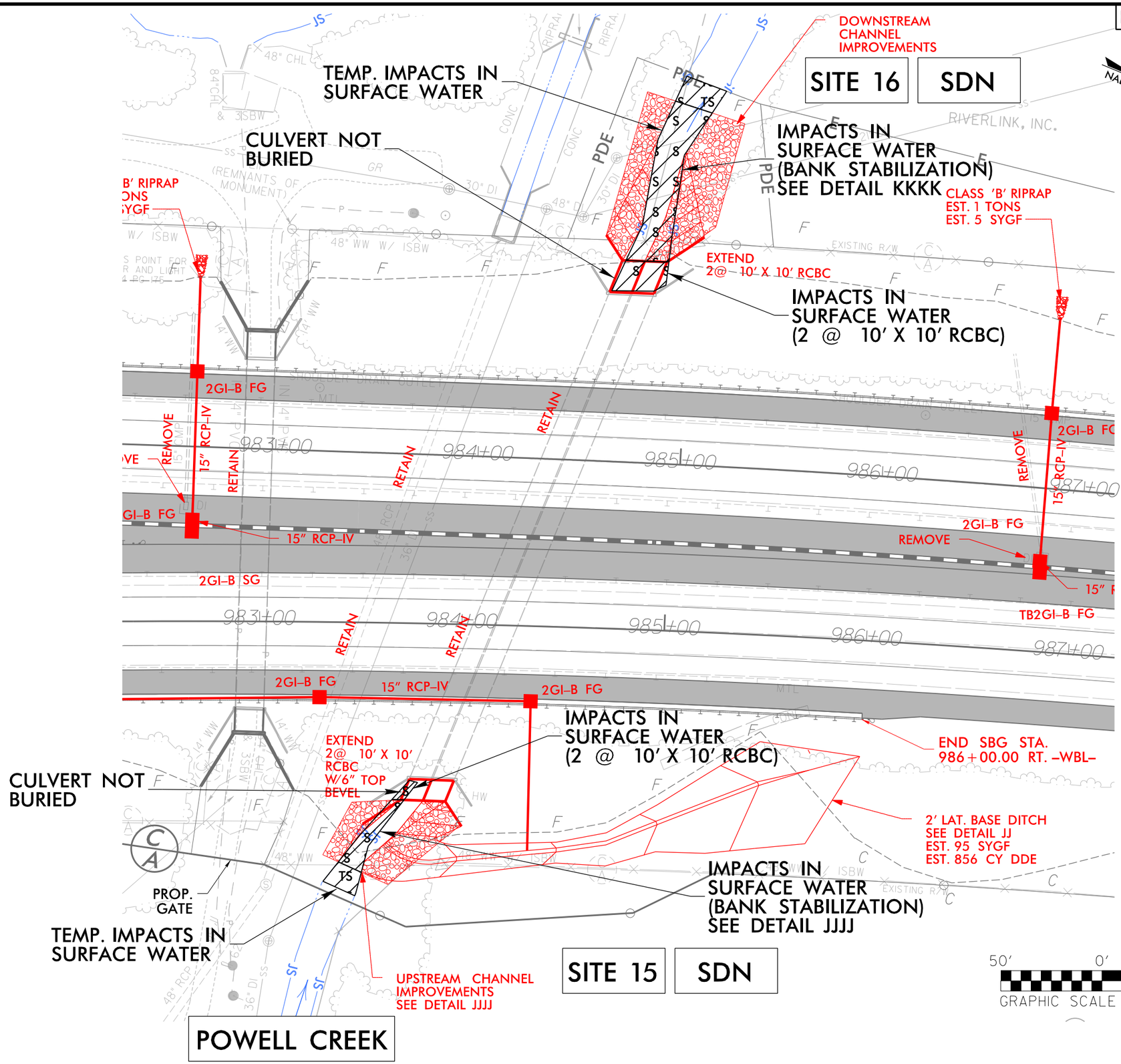
8/17/99

11/30/2018
I-4700A_HYD_PRM_PSH_15.dgn
HNTB

PROJECT REFERENCE NO.	SHEET NO.
I-4700	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C. 343 W. Six Forks Road, Suite 200 Raleigh, North Carolina 27603 NC License Num C-1554

PERMIT DRAWING SHEET 35 OF 97



LEGEND

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

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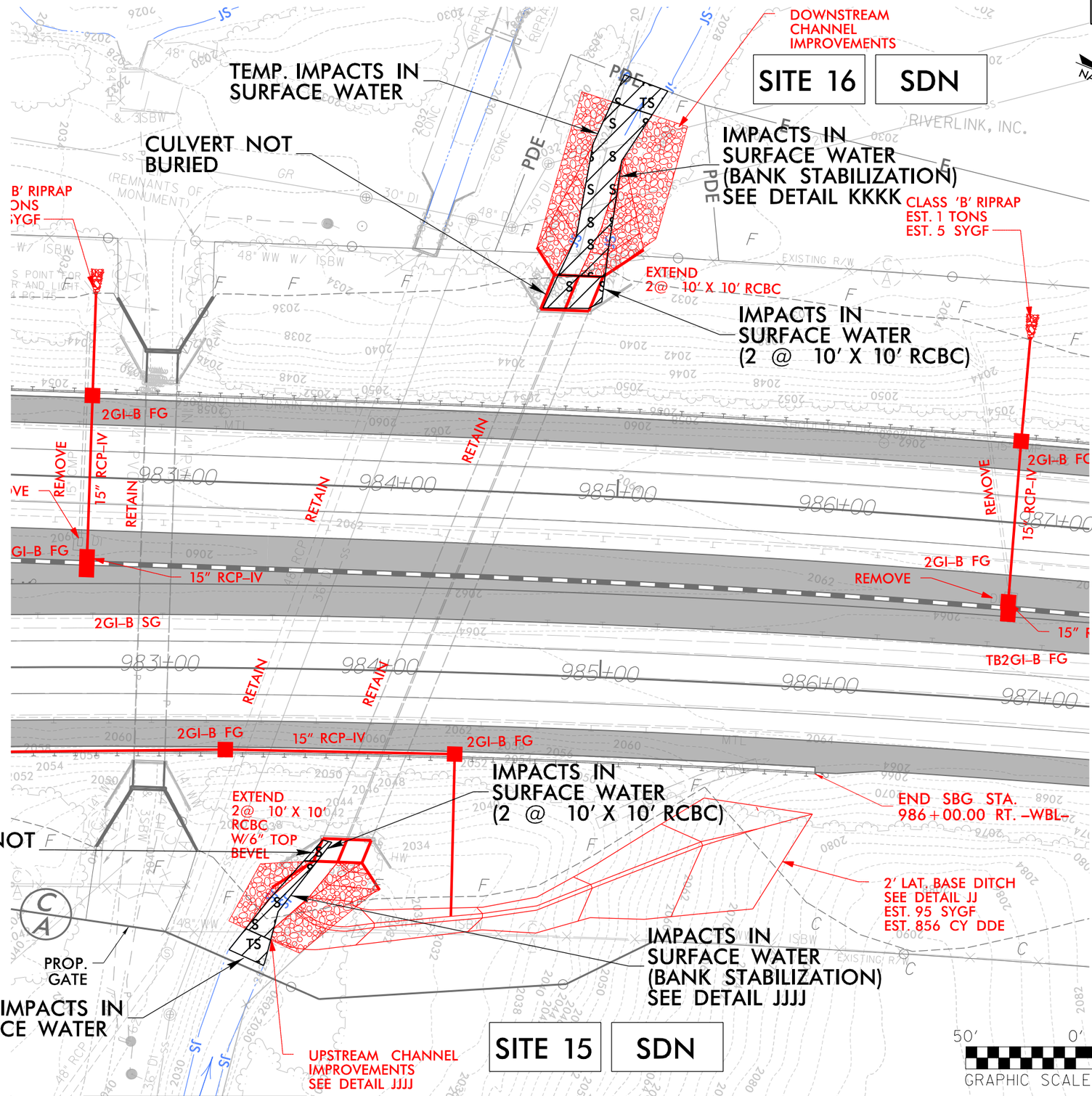
343 W. Six Forks Road, Suite 200
Raleigh, North Carolina 27603
NC License Num C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 36 OF 97



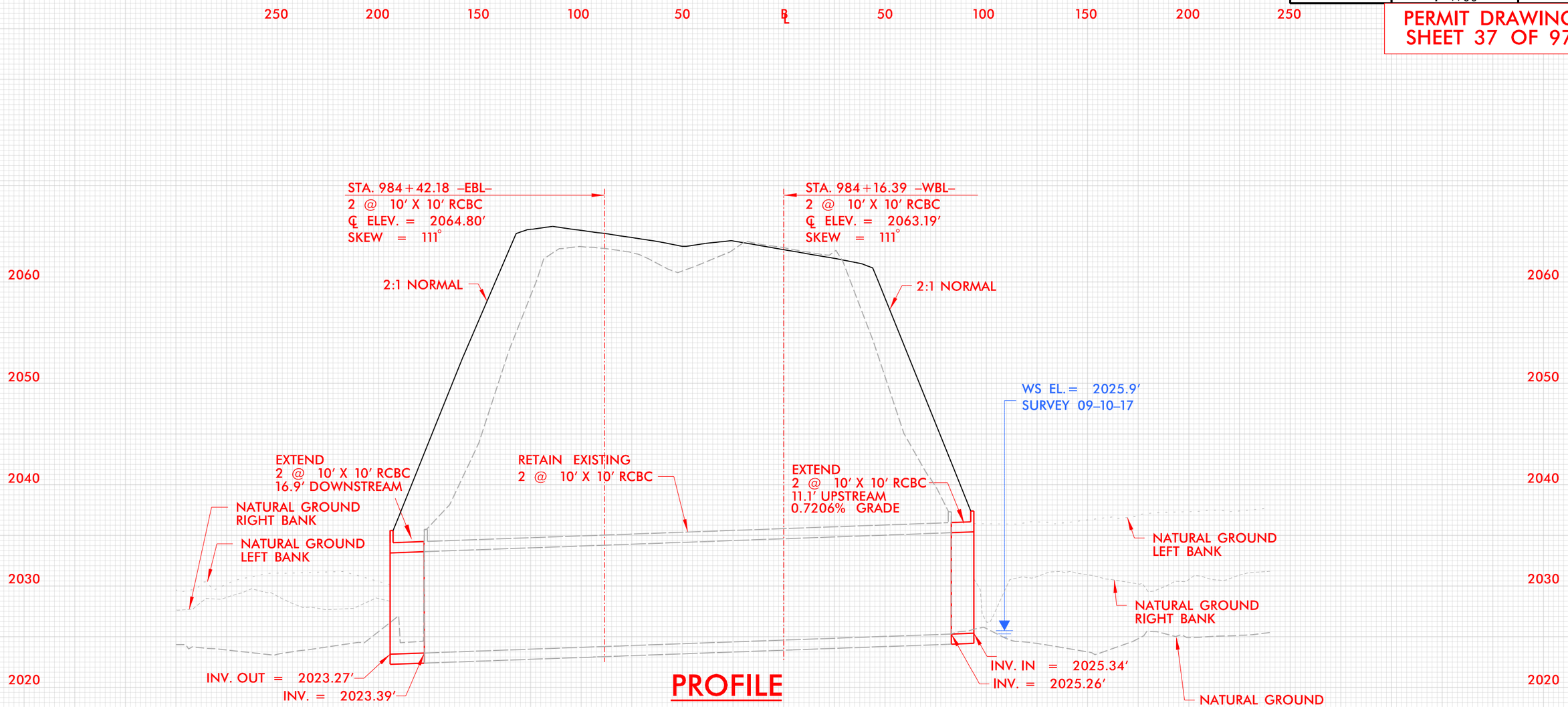
LEGEND

S S	DENOTES IMPACTS IN SURFACE WATER
TS TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

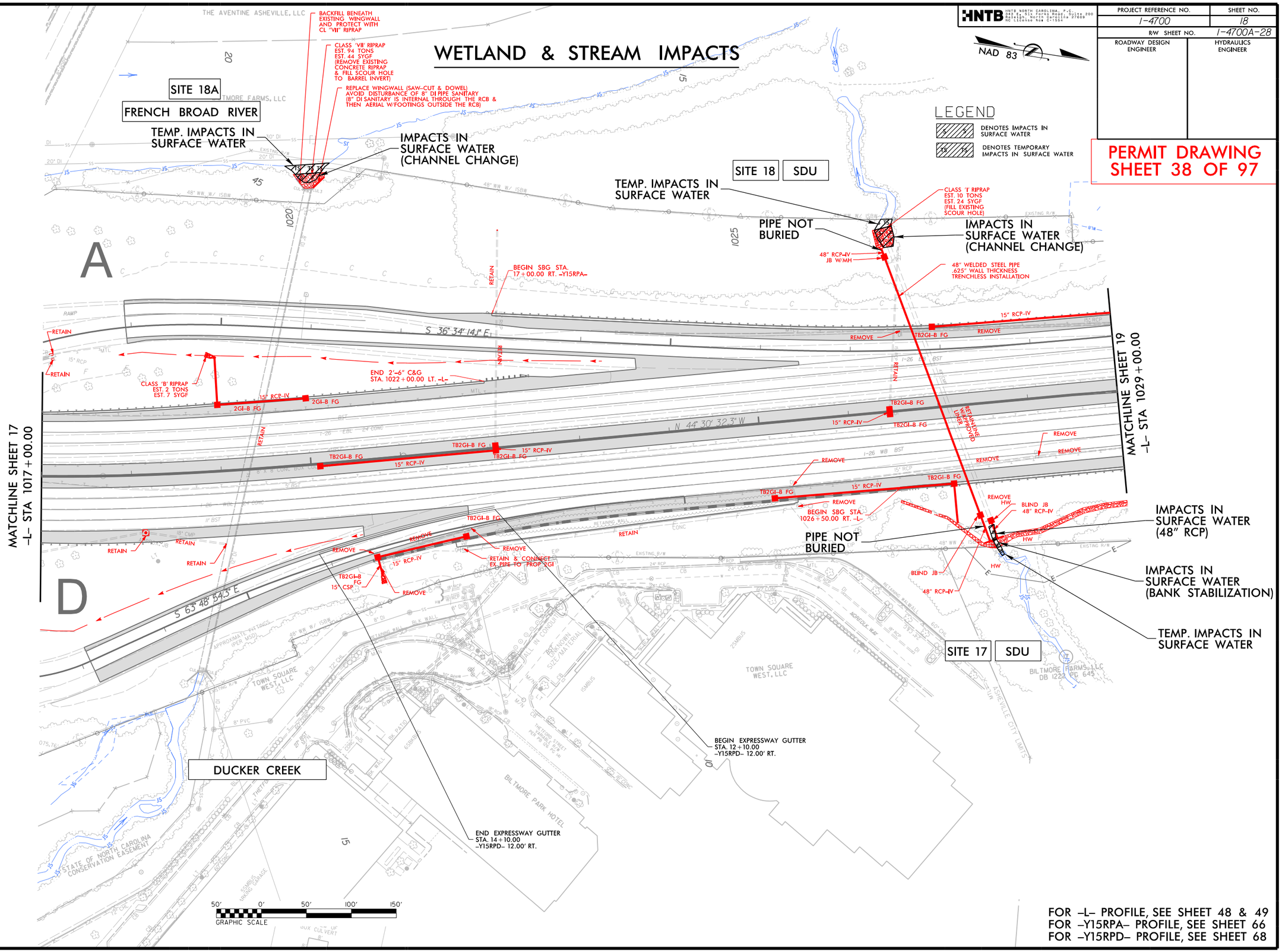
PERMIT DRAWING
SHEET 37 OF 97



PROFILE

BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4700
I-26
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

11/30/2018
I-4700A_HYD_PRM_PSH_15B_PFL.dgn
HNTB



WETLAND & STREAM IMPACTS
HNTB
PROJECT REFERENCE NO. I-4700
SHEET NO. 18
R/W SHEET NO. I-4700A-28
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PERMIT DRAWING SHEET 38 OF 97
NAD 83
LEGEND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
SITE 18A
FRENCH BROAD RIVER
TEMP. IMPACTS IN SURFACE WATER
IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
BACKFILL BENEATH EXISTING WINGWALL AND PROTECT WITH CL "VII" RIPRAP
CLASS 'VII' RIPRAP EST. 94 TONS EST. 44 SYGF (REMOVE EXISTING CONCRETE RIPRAP & FILL SCOUR HOLE TO BARREL INVERT)
REPLACE WINGWALL (SAW-CUT & DOWEL) AVOID DISTURBANCE OF 8" DI PIPE SANITARY (8" DI SANITARY IS INTERNAL THROUGH THE RCB & THEN AERIAL W/FOOTINGS OUTSIDE THE RCB)
SITE 18
SDU
TEMP. IMPACTS IN SURFACE WATER
PIPE NOT BURIED
IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
CLASS 'I' RIPRAP EST. 10 TONS EST. 24 SYGF (FILL EXISTING SCOUR HOLE)
48" RCP-IV JB W/MH
48" WELDED STEEL PIPE .625" WALL THICKNESS TRENCHLESS INSTALLATION
BEGIN SBG STA. 17+00.00 RT. -Y15RPA-
A
D
S 36° 34' 14.1" E
N 44° 30' 32.3" W
S 63° 48' 54.3" E
CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF
END 2'-6" C&G STA. 1022+00.00 LT. -L-
MATCHLINE SHEET 17 -L- STA 1017+00.00
MATCHLINE SHEET 19 -L- STA 1029+00.00
BEGIN SBG STA. 1026+50.00 RT. -L-
PIPE NOT BURIED
IMPACTS IN SURFACE WATER (48" RCP)
IMPACTS IN SURFACE WATER (BANK STABILIZATION)
TEMP. IMPACTS IN SURFACE WATER
SITE 17
SDU
BLIND JB 48" RCP-IV
RETAIN & CONNECT EX PIPE TO PROP 2GI
BEGIN EXPRESSWAY GUTTER STA. 12+10.00 -Y15RPD- 12.00' RT.
END EXPRESSWAY GUTTER STA. 14+10.00 -Y15RPD- 12.00' RT.
DUCKER CREEK
TOWN SQUARE WEST, LLC
BILTMORE PARK HOTEL
STATE OF NORTH CAROLINA CONSERVATION EASEMENT
GRAPHIC SCALE
FOR -L- PROFILE, SEE SHEET 48 & 49
FOR -Y15RPA- PROFILE, SEE SHEET 66
FOR -Y15RPD- PROFILE, SEE SHEET 68

PROJECT REFERENCE NO.	SHEET NO.
I-4700	18
R/W SHEET NO.	I-4700A-28
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C.
343 W. Six Forks Road, Suite 200
Raleigh, North Carolina 27603
NC License No: C-1554

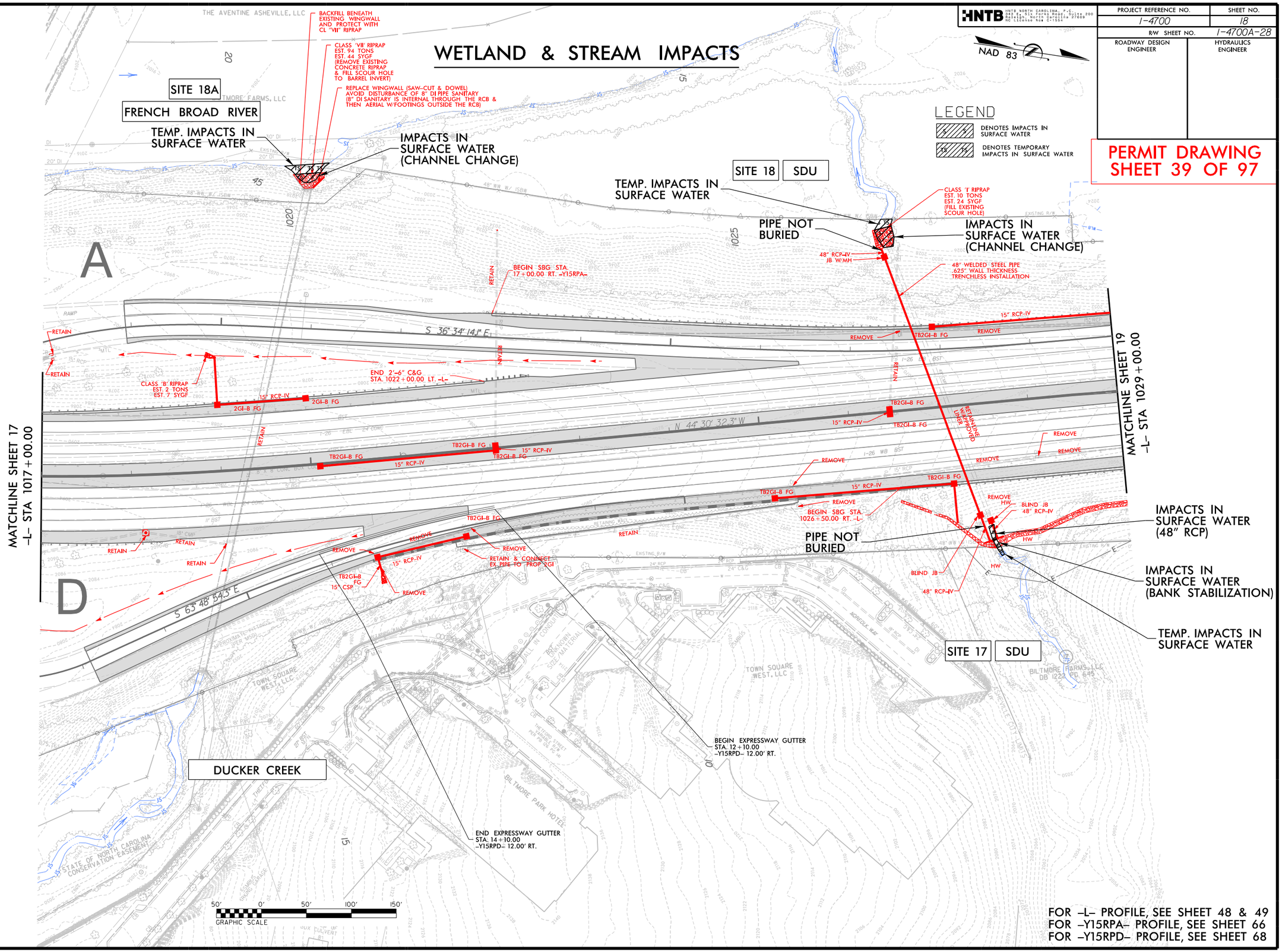
WETLAND & STREAM IMPACTS

NAD 83

LEGEND

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING SHEET 39 OF 97



FOR -L- PROFILE, SEE SHEET 48 & 49
FOR -Y15RPA- PROFILE, SEE SHEET 66
FOR -Y15RPD- PROFILE, SEE SHEET 68

8/17/99

11/30/2018
I-4700A_HYD_PRM_PSH_18.dgn
HNTB

PROJECT REFERENCE NO.	SHEET NO.
I-4700	18
R/W SHEET NO.	I-4700A-28
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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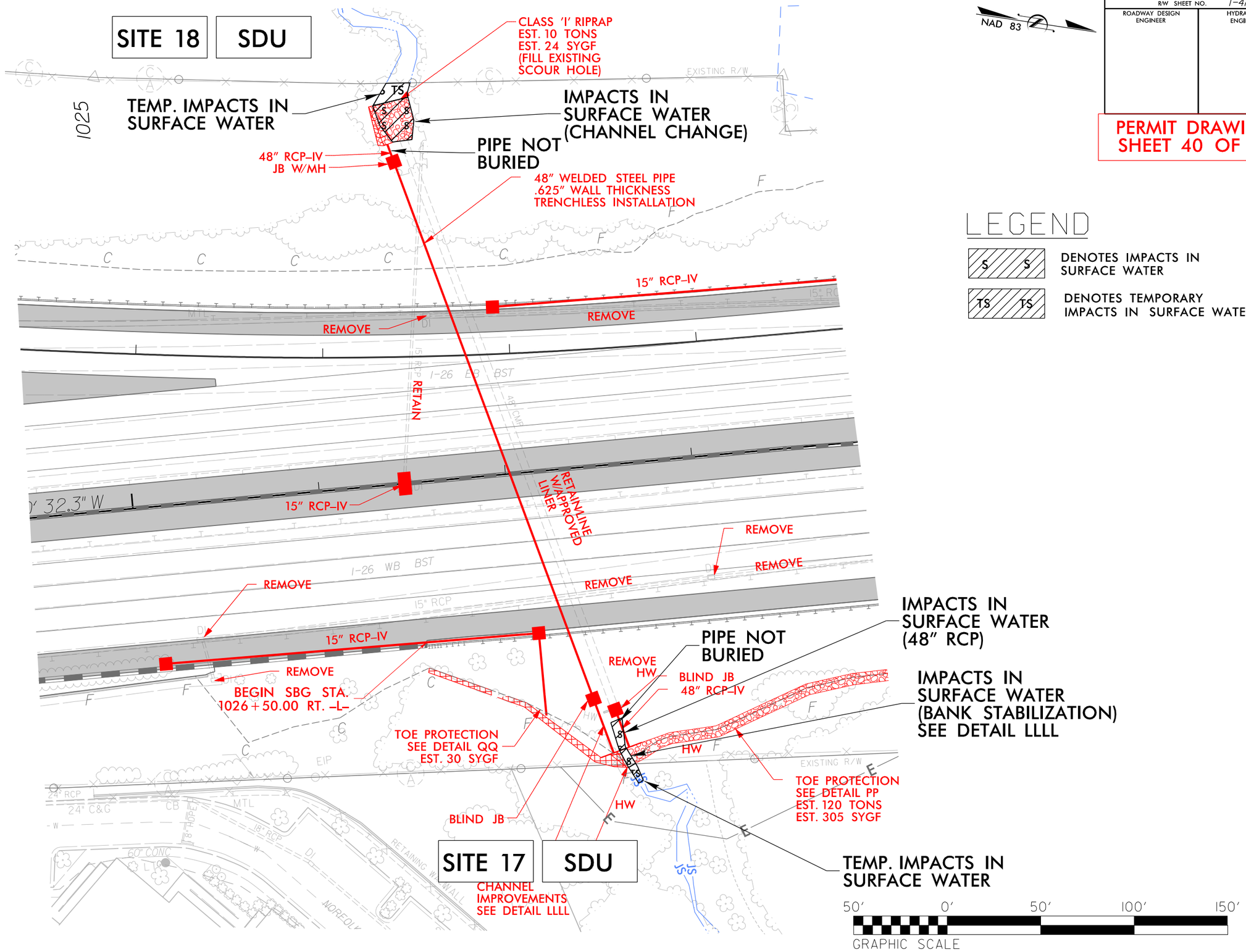
343 W. Six Forks Road, Suite 200
Raleigh, North Carolina 27603
NC License Nbr C-1554

NAD 83

PERMIT DRAWING
SHEET 40 OF 97



LEGEND

S S	DENOTES IMPACTS IN SURFACE WATER
TS TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

8/17/99

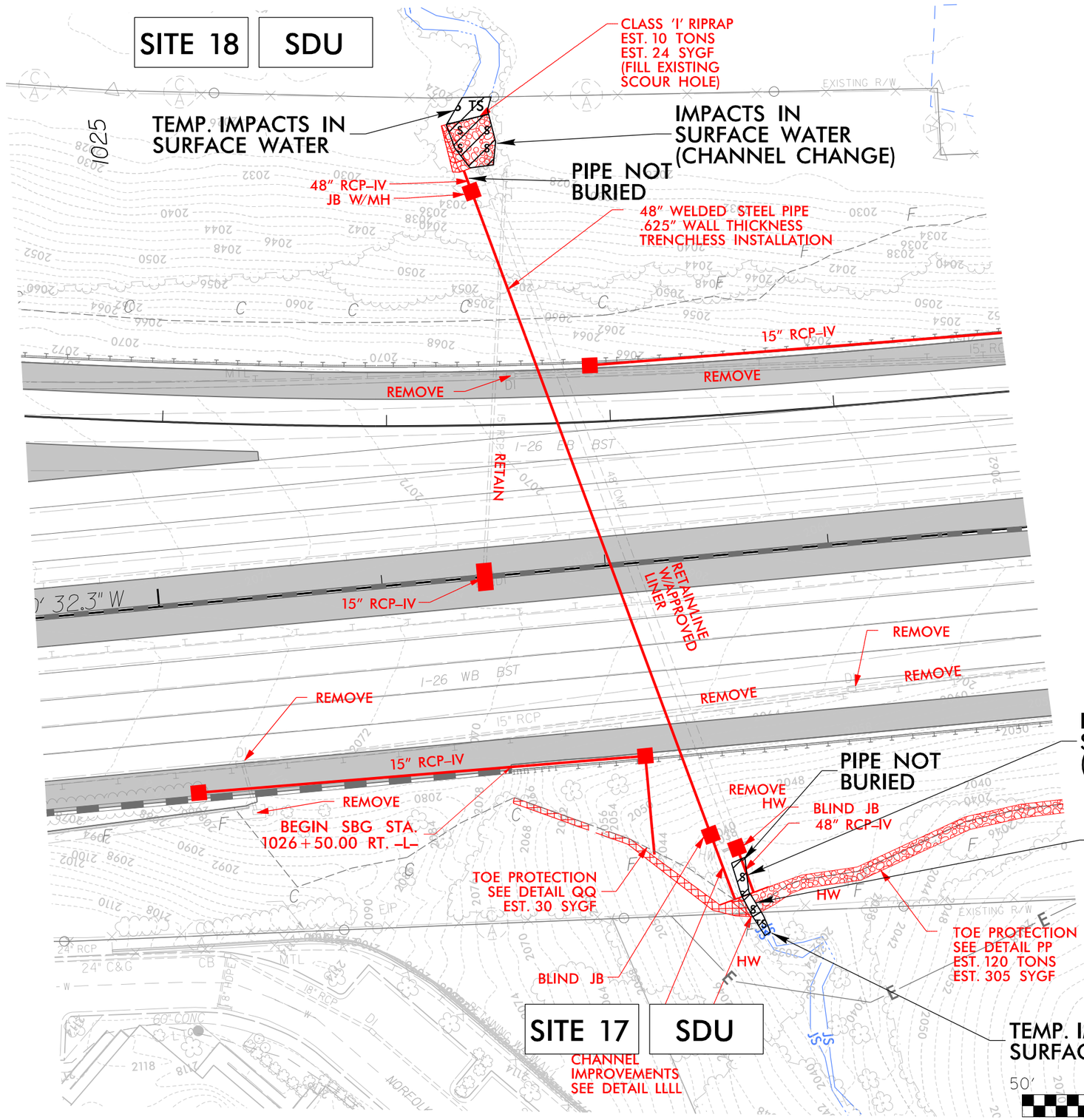
11/30/2018
I-4700A_HYD_PRM_PSH_18A.dgn
HNTB

PROJECT REFERENCE NO.	SHEET NO.
I-4700	18
R/W SHEET NO.	I-4700A-28
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C.
343 W. Six Forks Road, Suite 200
Raleigh, North Carolina 27603
NC License Nbr C-1554

NAD 83

PERMIT DRAWING
SHEET 41 OF 97



LEGEND

S S	DENOTES IMPACTS IN SURFACE WATER
TS TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

8/17/99

11/30/2018
I-4700A_HYD_PRM_PSH_18A.dgn
HNTB

PROJECT REFERENCE NO.	SHEET NO.
I-4700	19
R/W SHEET NO.	I-4700A-29
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C. 343 W. Six Forks Road, Suite 200 Raleigh, North Carolina 27603 NC License Num C-1554

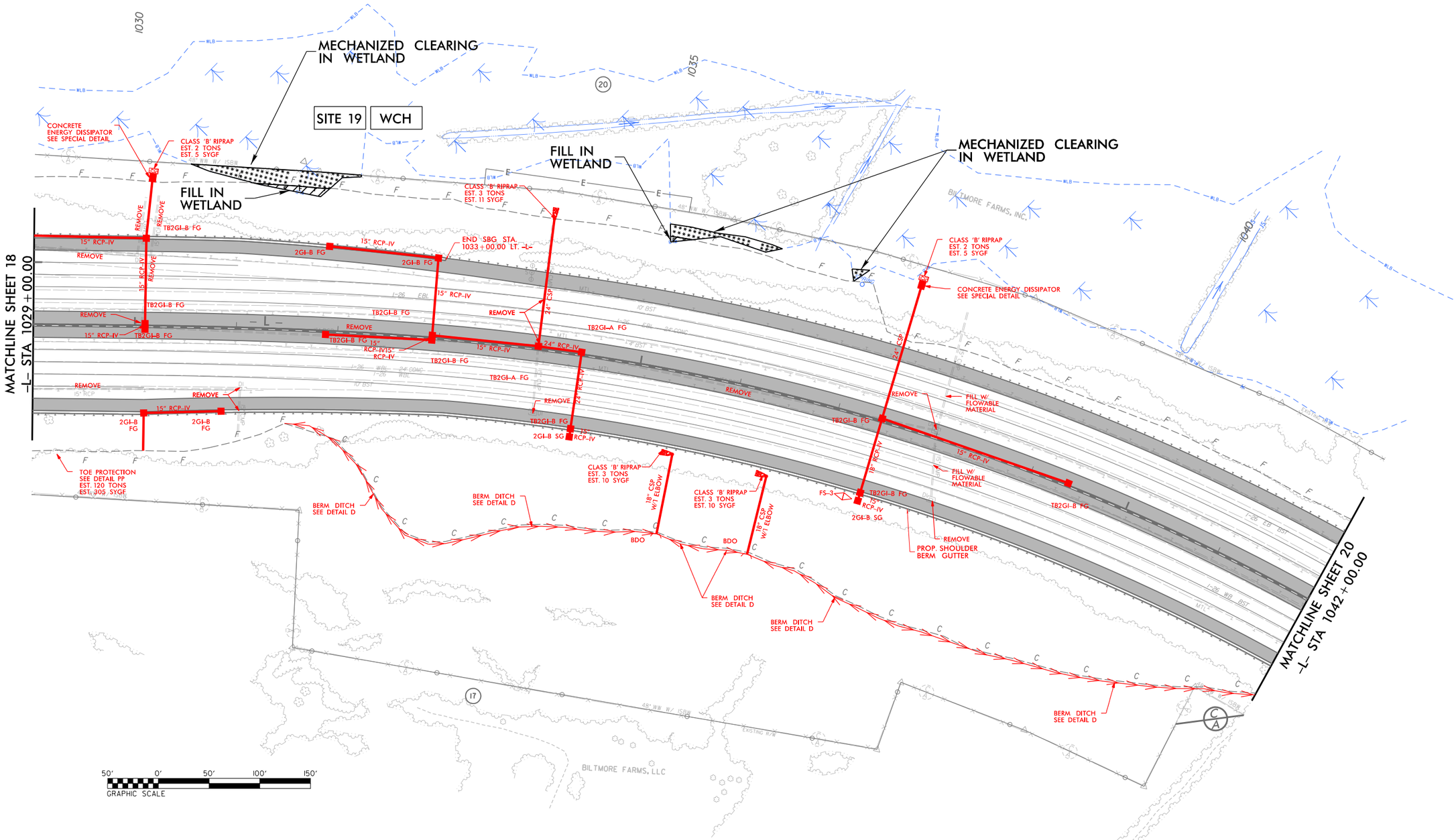
PERMIT DRAWING SHEET 42 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING



FOR – L – PROFILE, SEE SHEET 49

8/17/99

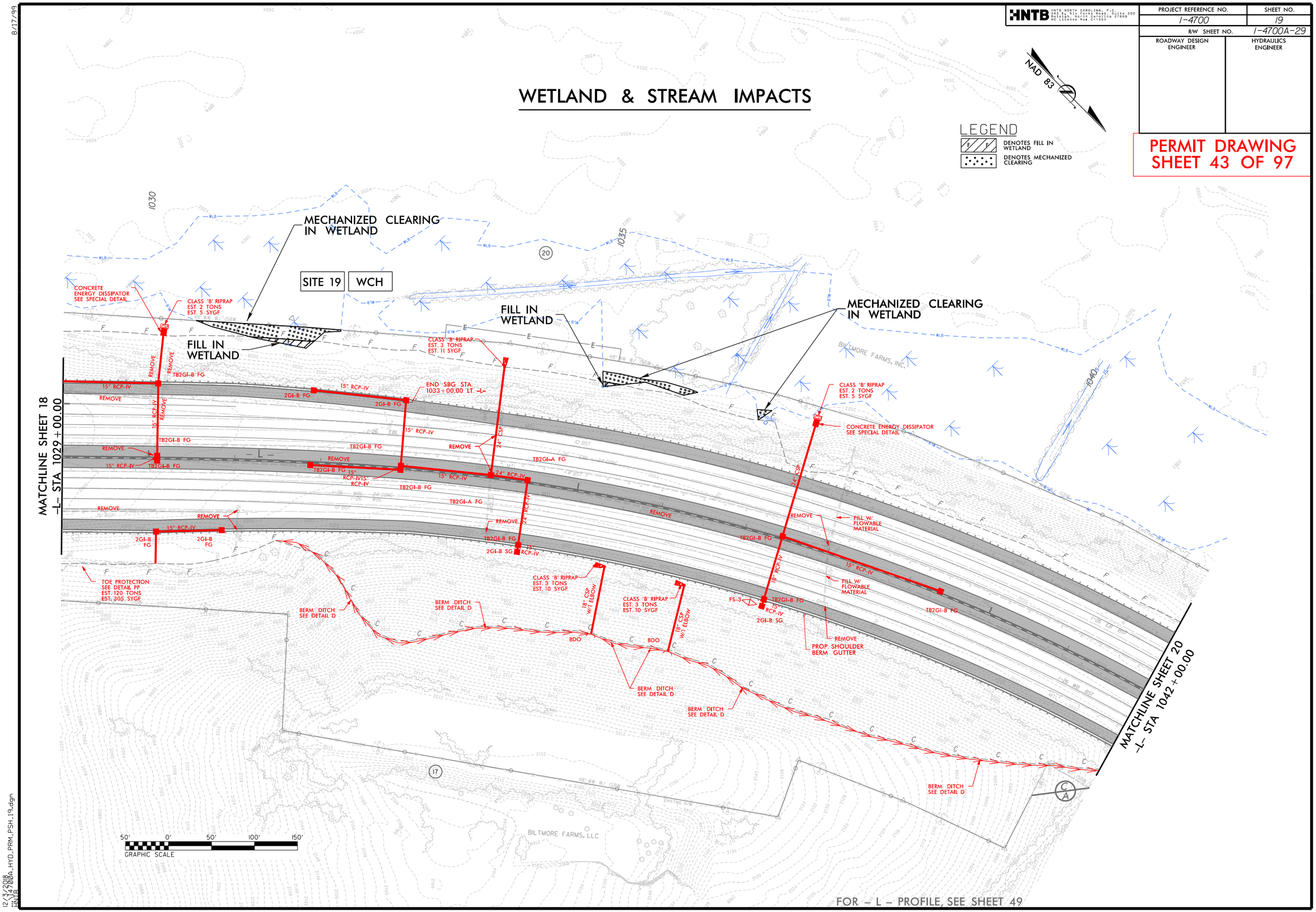
12/31/2008 I-4700A_HYD_PRM_PSH_19.dgn HNTB

PROJECT REFERENCE NO.	SHEET NO.
I-4700	19
R/W SHEET NO.	I-4700A-29
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License Nbr C-1554

PERMIT DRAWING SHEET 43 OF 97

WETLAND & STREAM IMPACTS



FOR - L - PROFILE, SEE SHEET 49

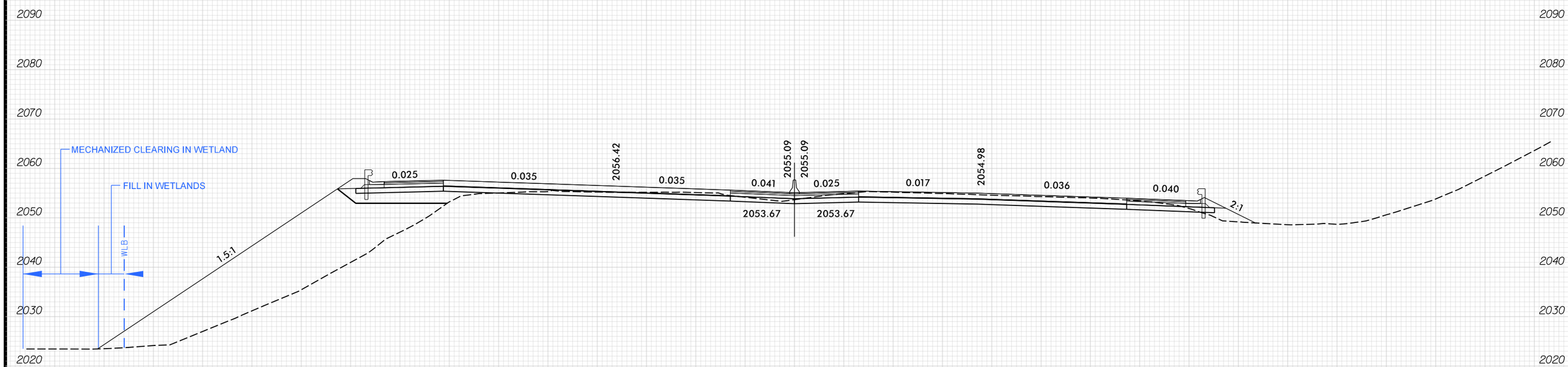
8/17/99

12/3/2008
I4700A_HYD_PRM_PSH_19.dgn
HNTB

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 44 OF 97

WETLAND CROSS SECTIONS



SITE 19
–L– 1031+50.00

SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4700
I-26
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

6/23/16

11/30/2018
I-4700A_HYD_PRM_PSH_XPL
HNTB

PROJECT REFERENCE NO.	SHEET NO.
I-4700	20
R/W SHEET NO.	I-4700A-30
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB HNTB NORTH CAROLINA, P.C. 343 W. Six Forks Road, Suite 200 Raleigh, North Carolina 27603 NC License Nbr C-1554

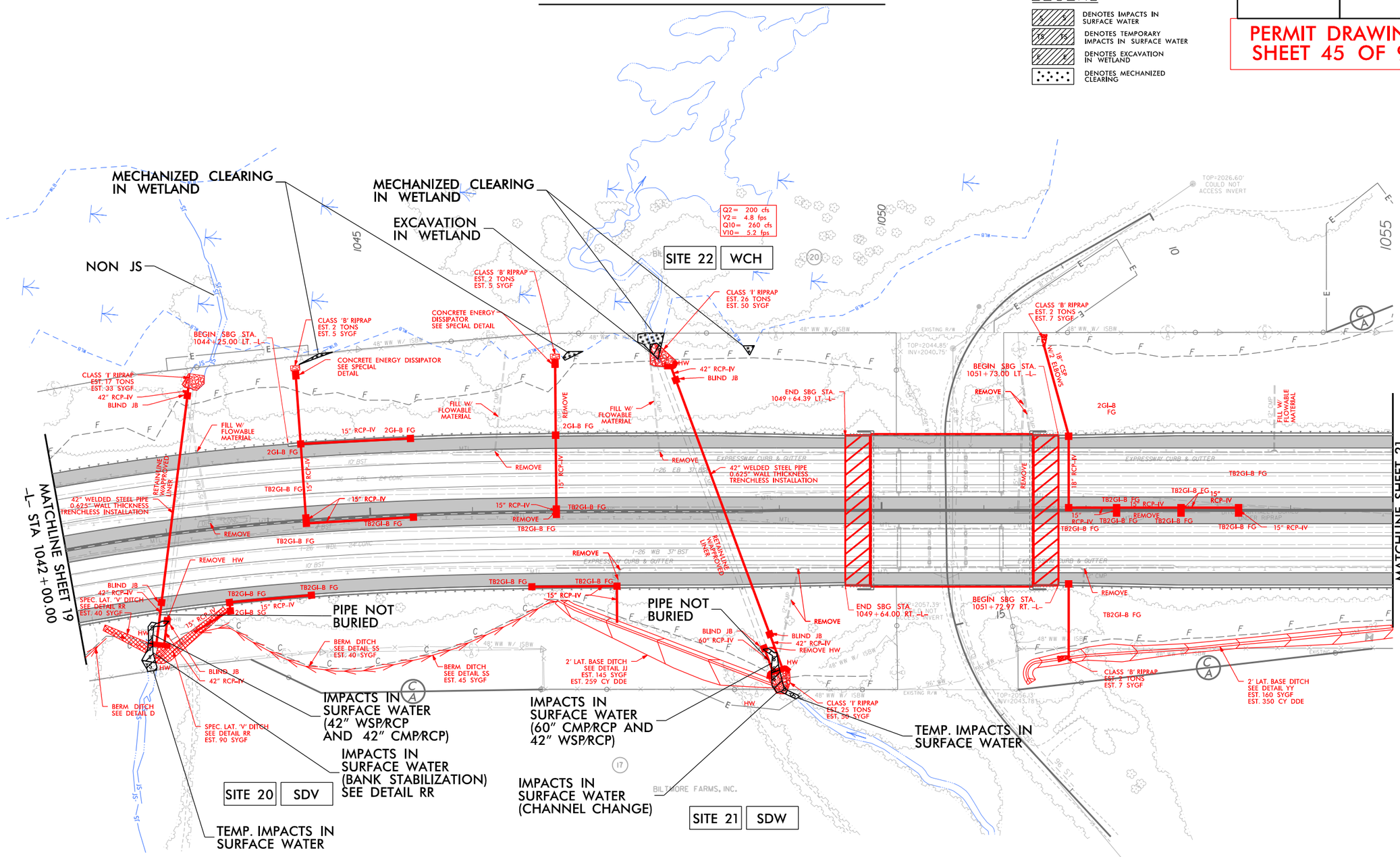
NAD 83

PERMIT DRAWING
SHEET 45 OF 97

WETLAND & STREAM IMPACTS

LEGEND

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES EXCAVATION IN WETLAND
- DENOTES MECHANIZED CLEARING



8/17/99

12/3/2018
I-4700A_HYD_PRM_PSH_20.dgn
HNTB

PROJECT REFERENCE NO.	SHEET NO.
I-4700	20
R/W SHEET NO.	I-4700A-30
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C. 343 W. Six Forks Road, Suite 200 Raleigh, North Carolina 27603 NC License No: C-1554

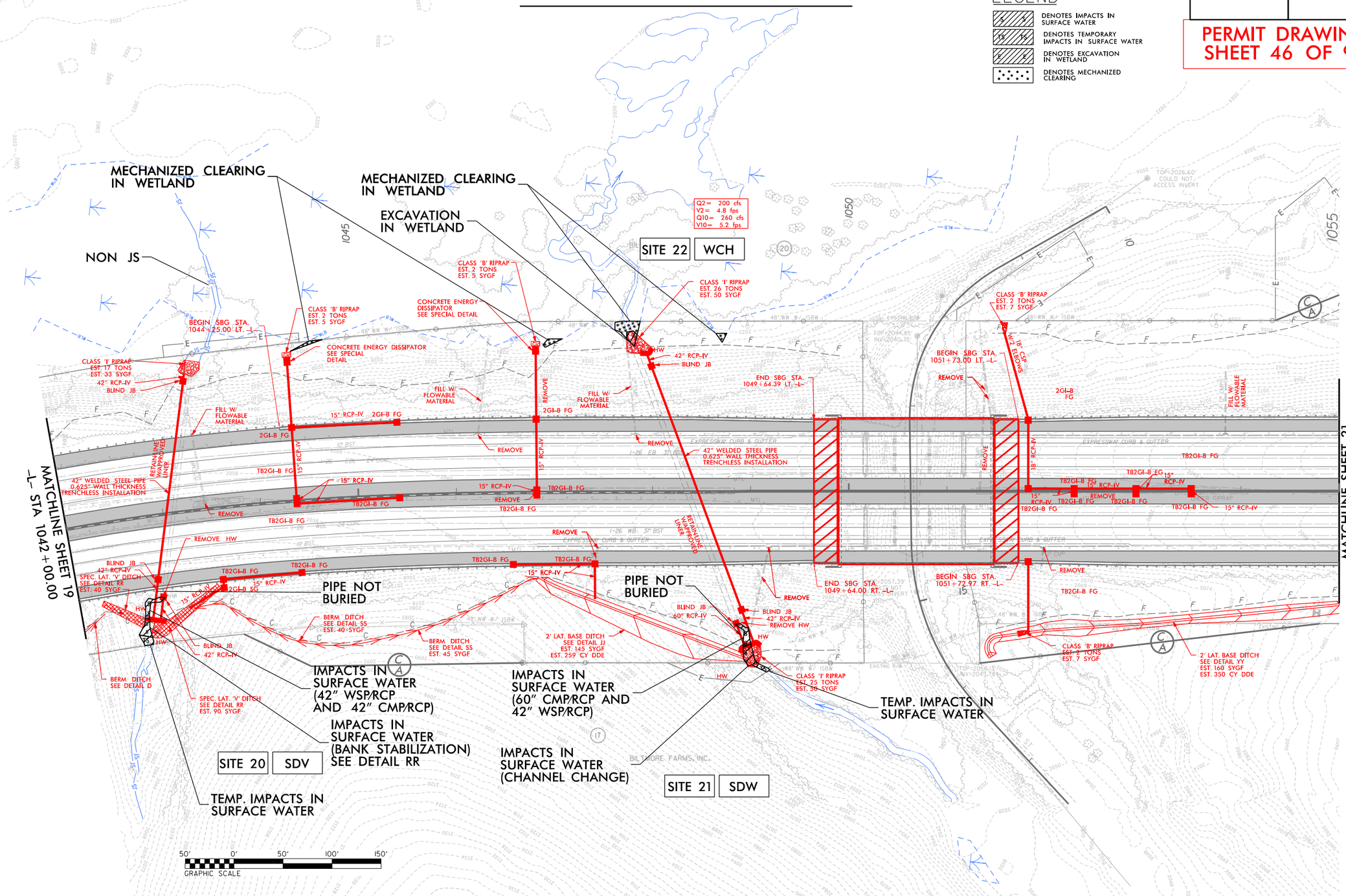
NAD 83

PERMIT DRAWING
SHEET 46 OF 97

WETLAND & STREAM IMPACTS

LEGEND

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES EXCAVATION IN WETLAND
- DENOTES MECHANIZED CLEARING



8/17/99

12/3/2018
I-4700A_HYD_PRM_PSH_20.dgn
HNTB

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343 W. Six Forks Road, Suite 200
Raleigh, North Carolina 27603
NC License No. C-1554

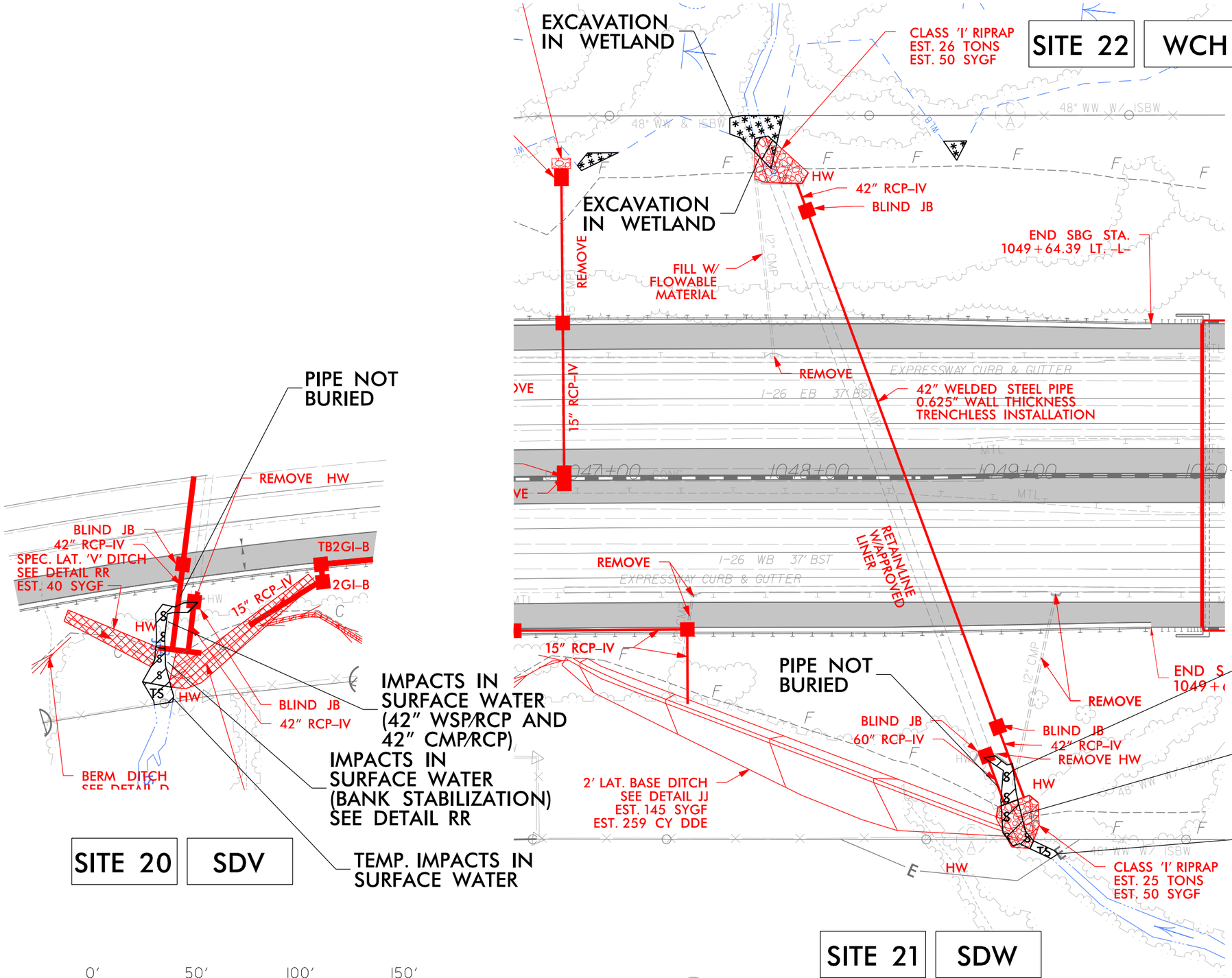
PROJECT REFERENCE NO.	SHEET NO.
I-4700	20
R/W SHEET NO.	I-4700A-30
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 47 OF 97

LEGEND

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES EXCAVATION IN WETLAND
- DENOTES MECHANIZED CLEARING

NAD 83



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Raleigh, North Carolina 27603
NC License Nbr C-1554

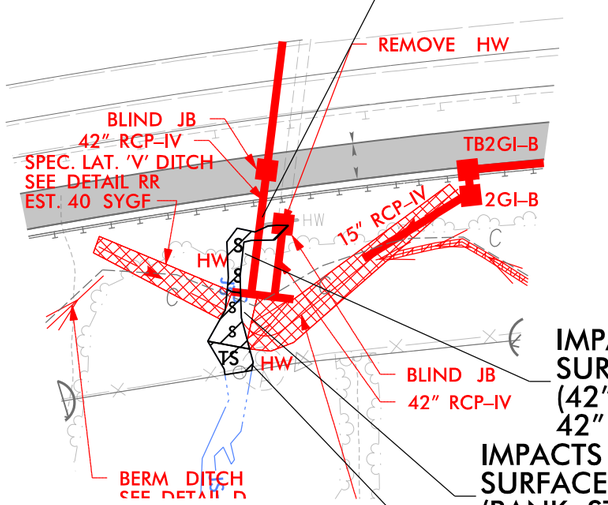
PROJECT REFERENCE NO.	SHEET NO.
I-4700	20
R/W SHEET NO.	I-4700A-30
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 48 OF 97

LEGEND

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES EXCAVATION IN WETLAND
- DENOTES MECHANIZED CLEARING

NAD 83

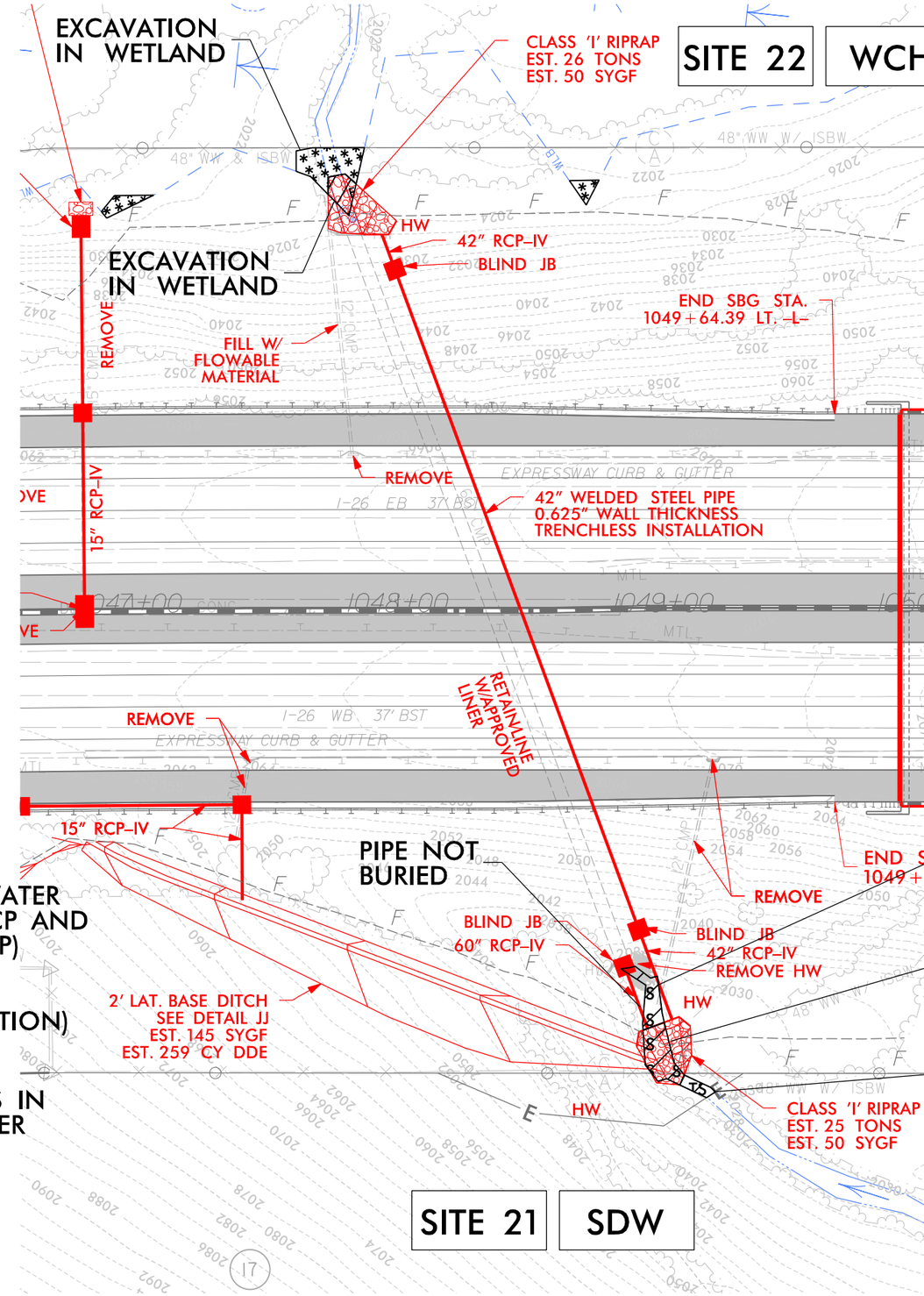


IMPACTS IN SURFACE WATER (42" WSP/RCP AND 42" CMP/RCP)

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL RR

TEMP. IMPACTS IN SURFACE WATER

SITE 20 | SDV



IMPACTS IN SURFACE WATER (60" CMP/RCP AND 42" WSP/RCP)

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

TEMP. IMPACTS IN SURFACE WATER

SITE 21 | SDW

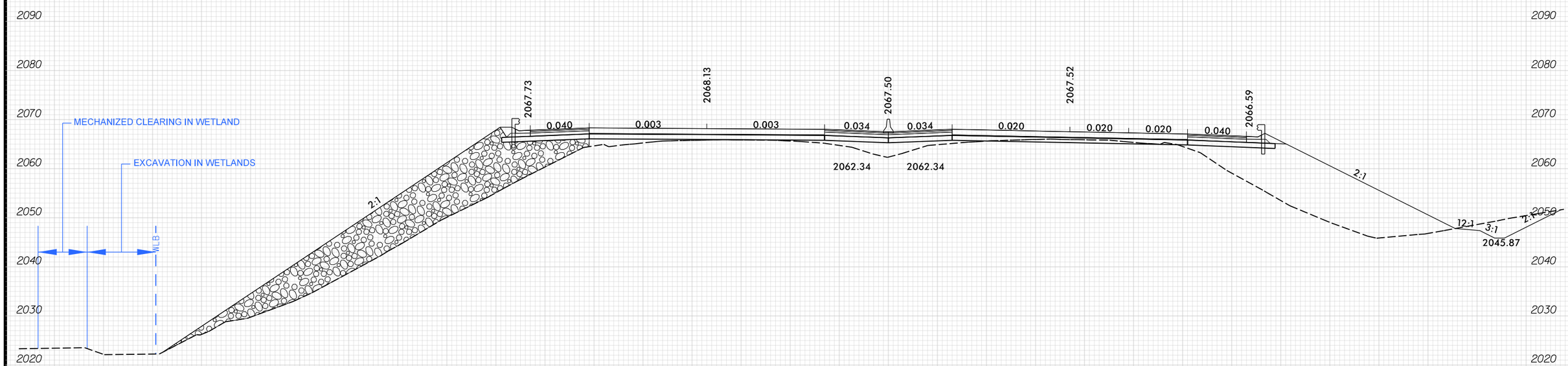
50' 0' 50' 100' 150'
GRAPHIC SCALE

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 49 OF 97

WETLAND CROSS SECTIONS



SITE 22

–L2– 1047 + 80.00

SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4700
I-26
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

11/30/2018
I-4700A_HYD_PRM_PSH_XPL
HNTB

7/19/2017

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	23
R/W SHEET NO.	I-4700B-33
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

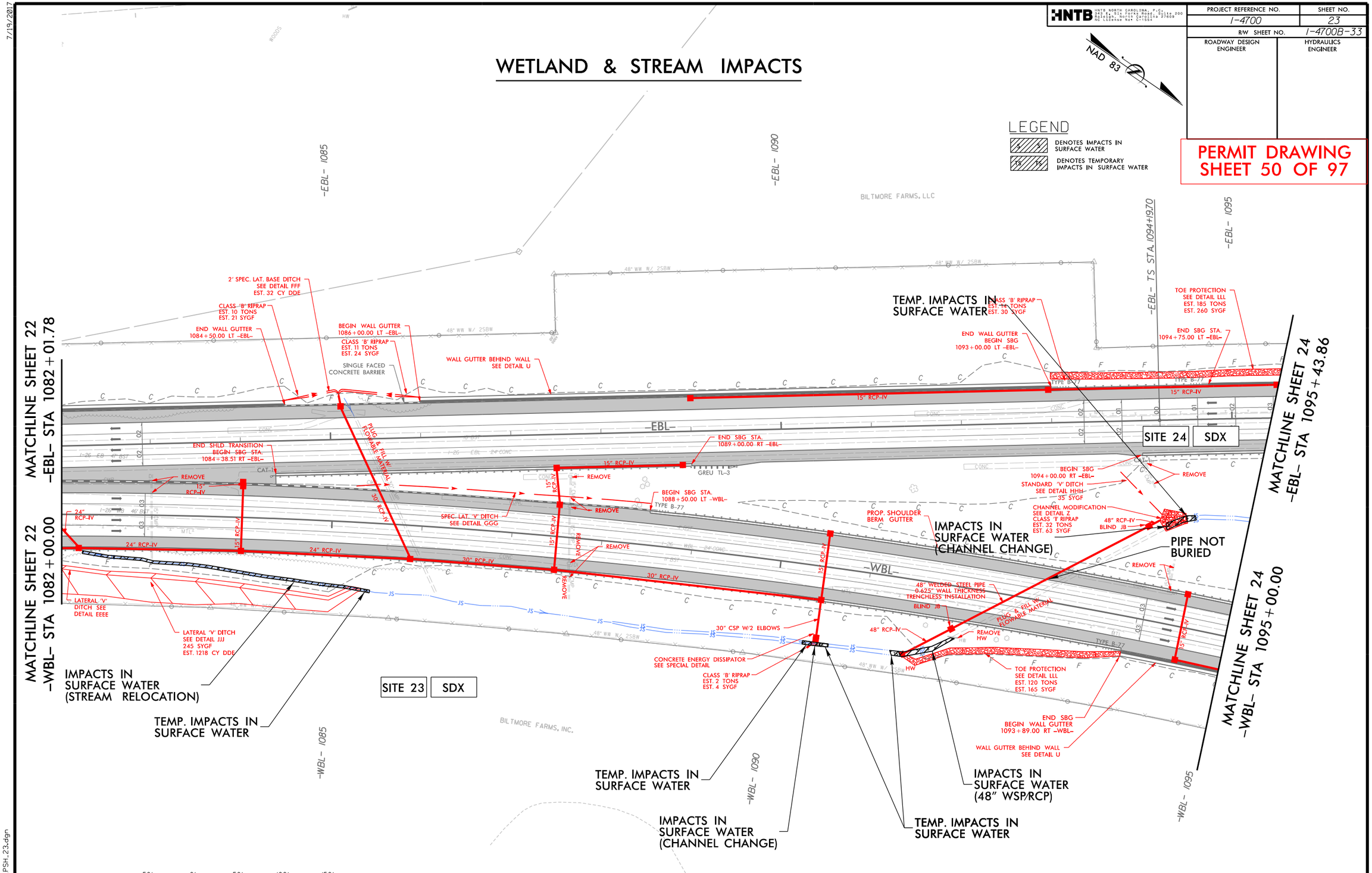
PERMIT DRAWING
SHEET 50 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER



FOR -WBL- & -EBL- PROFILES, SEE SHEETS 52
FOR RETAINING WALL -RW12-, SEE SHEETS W-13
FOR RETAINING WALL -RW13-, SEE SHEETS W-14
FOR RETAINING WALL -RW14-, SEE SHEETS W-15
FOR RETAINING WALL -RW15-, SEE SHEETS W-16

11/30/2018
I-4700B_HYD_PRM_PSH_23.dgn
HNTB

7/19/2017

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	23
R/W SHEET NO.	I-4700B-33
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 51 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

MATCHLINE SHEET 22 –EBL– STA 1082+01.78

MATCHLINE SHEET 22 –WBL– STA 1082+00.00

MATCHLINE SHEET 24 –EBL– STA 1095+43.86

MATCHLINE SHEET 24 –WBL– STA 1095+00.00

–EBL– 1085

–EBL– 1090

–EBL– 1095

–EBL– TS STA 1094+70

–WBL– 1085

–WBL– 1090

–WBL– 1095

BILTMORE FARMS, LLC

BILTMORE FARMS, INC.

–EBL–

–WBL–

SITE 23 | SDX

SITE 24 | SDX

2' SPEC. LAT. BASE DITCH SEE DETAIL FFF EST. 32 CY DDE

CLASS 'B' RIPRAP EST. 10 TONS EST. 21 SYGF

END WALL GUTTER 1084+50.00 LT –EBL–

BEGIN WALL GUTTER 1086+00.00 LT –EBL–

CLASS 'B' RIPRAP EST. 11 TONS EST. 24 SYGF

SINGLE FACED CONCRETE BARRIER

WALL GUTTER BEHIND WALL SEE DETAIL U

END SHLD TRANSITION BEGIN SBG STA. 1084+38.51 RT –EBL–

REMOVE

15" RCP-IV

24" RCP-IV

30" RCP-IV

PLUG & FILL W/ FLOWABLE MATERIAL

END SBG STA. 1089+00.00 RT –EBL–

GREU TL-3

BEGIN SBG STA. 1088+50.00 LT –WBL–

TYPE B-77

SPEC. LAT. 'V' DITCH SEE DETAIL GGG

LATERAL 'V' DITCH SEE DETAIL EEEE

LATERAL 'V' DITCH SEE DETAIL JJJ 245 SYGF EST. 1218 CY DDE

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

TEMP. IMPACTS IN SURFACE WATER

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

CLASS 'B' RIPRAP EST. 2 TONS EST. 4 SYGF

30" CSP W/2 ELBOWS

48" RCP-IV

PROP. SHOULDER BERM GUTTER

48" WELDED STEEL PIPE 0.625" WALL THICKNESS TRENCHLESS INSTALLATION

BLIND JB

REMOVE HW

HW

TOE PROTECTION SEE DETAIL LLL EST. 120 TONS EST. 165 SYGF

END SBG BEGIN WALL GUTTER 1093+89.00 RT –WBL–

WALL GUTTER BEHIND WALL SEE DETAIL U

IMPACTS IN SURFACE WATER (48" WSP/RCP)

TEMP. IMPACTS IN SURFACE WATER

TEMP. IMPACTS IN SURFACE WATER

CLASS 'B' RIPRAP EST. 14 TONS EST. 30 SYGF

END WALL GUTTER BEGIN SBG 1093+00.00 LT –EBL–

TOE PROTECTION SEE DETAIL LLL EST. 185 TONS EST. 260 SYGF

END SBG STA. 1094+75.00 LT –EBL–

BEGIN SBG 1094+00.00 RT –EBL–

STANDARD 'V' DITCH SEE DETAIL HHH 35 SYGF

CHANNEL MODIFICATION SEE DETAIL Z CLASS 'I' RIPRAP EST. 32 TONS EST. 63 SYGF

48" RCP-IV BLIND JB

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

PIPE NOT BURIED

15" RCP-IV

GRAPHIC SCALE 50' 0' 50' 100' 150'

FOR –WBL– & –EBL– PROFILES, SEE SHEETS 52
FOR RETAINING WALL –RW12–, SEE SHEETS W-13
FOR RETAINING WALL –RW13–, SEE SHEETS W-14
FOR RETAINING WALL –RW14–, SEE SHEETS W-15
FOR RETAINING WALL –RW15–, SEE SHEETS W-16

11/30/2018
I-4700B_HYD_PRM_PSH_23.dgn
HNTB

7/19/2017

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	24
R/W SHEET NO.	I-4700B-34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

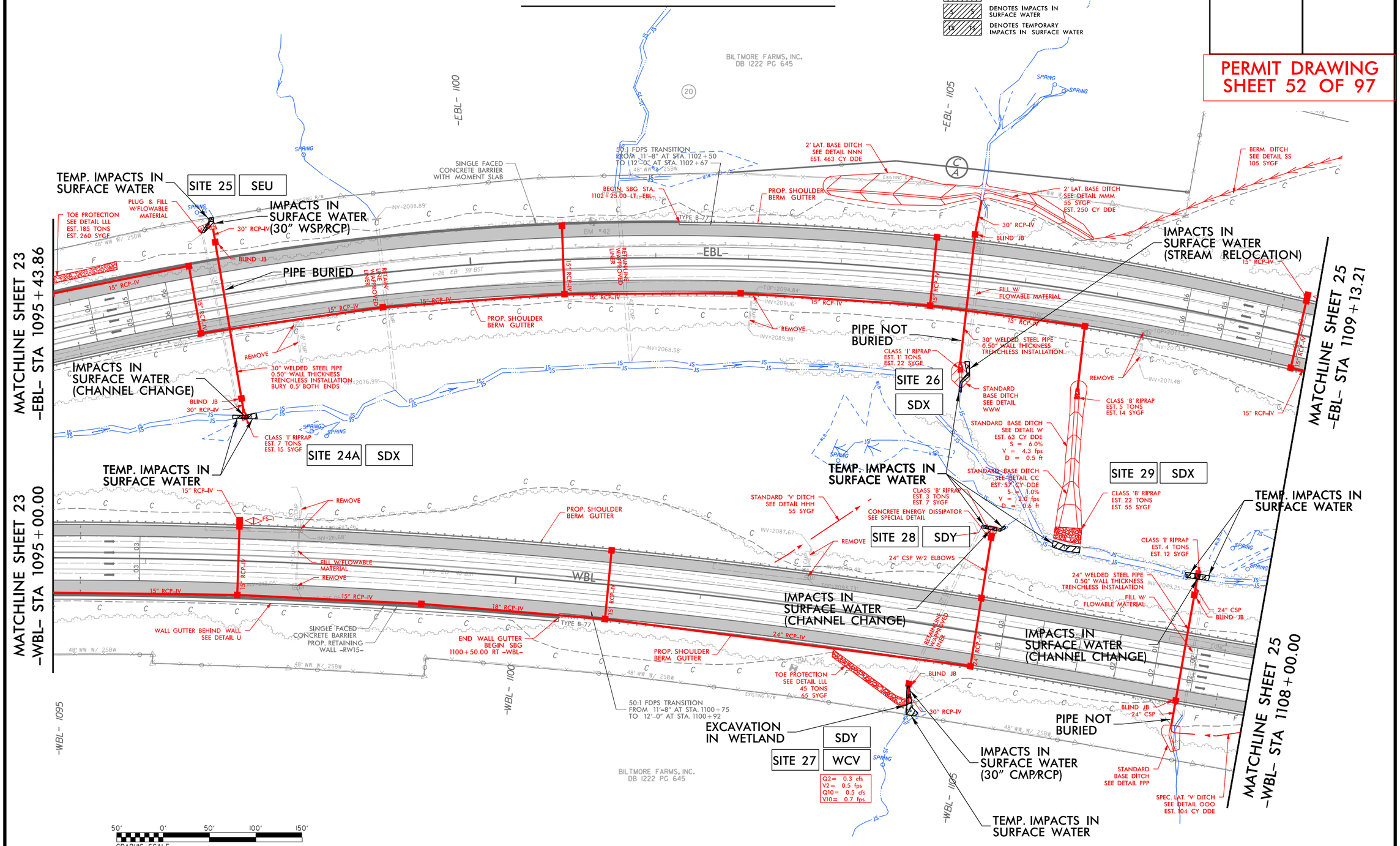
PERMIT DRAWING
SHEET 52 OF 97

WETLAND & STREAM IMPACTS

NAD 83

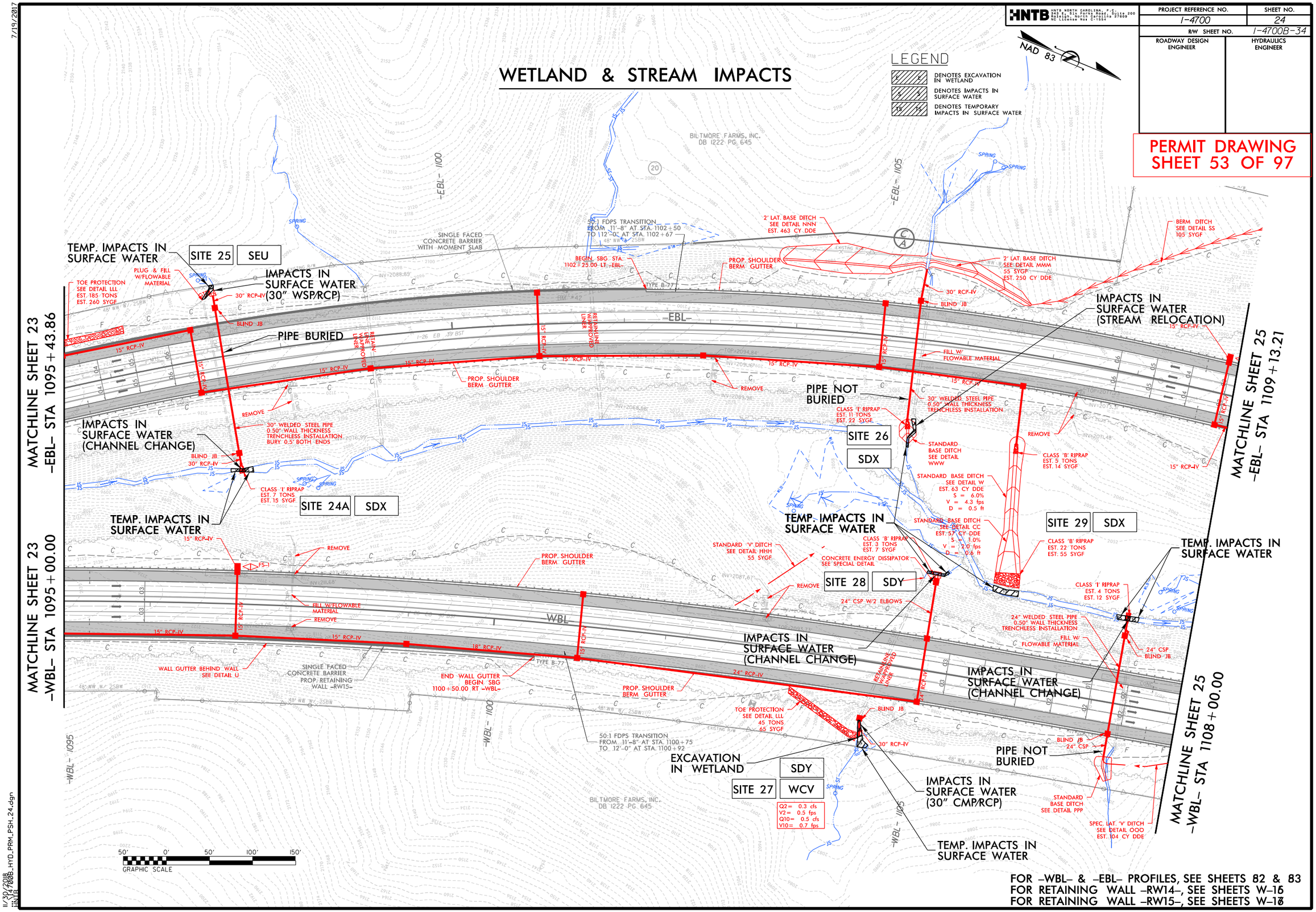
LEGEND

- DENOTES EXCAVATION IN WETLAND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER



FOR -WBL- & -EBL- PROFILES, SEE SHEETS 82 & 83
FOR RETAINING WALL -RW14-, SEE SHEETS W-16
FOR RETAINING WALL -RW15-, SEE SHEETS W-18

11/30/2016
I-4700B_HYD_PRM_PSH_24.dgn
HNTB

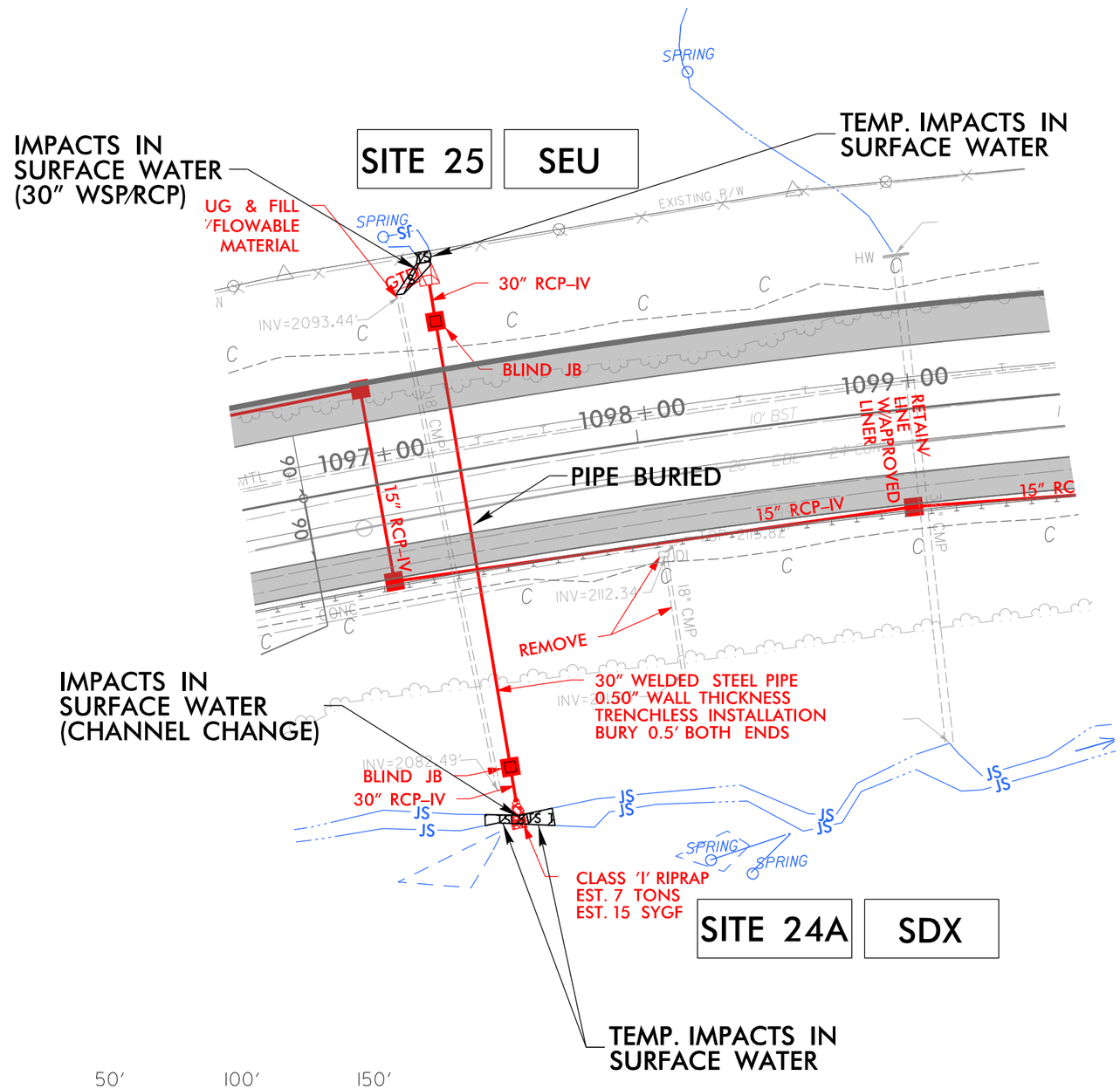


WETLAND & STREAM IMPACTS
LEGEND
DENOTES EXCAVATION IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
NAD 83
HNTB
PROJECT REFERENCE NO. I-4700
SHEET NO. 24
R/W SHEET NO. I-4700B-34
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PERMIT DRAWING SHEET 53 OF 97
MATCHLINE SHEET 23 -EBL- STA 1095+43.86
MATCHLINE SHEET 23 -WBL- STA 1095+00.00
MATCHLINE SHEET 25 -EBL- STA 1109+13.21
MATCHLINE SHEET 25 -WBL- STA 1108+00.00
TEMP. IMPACTS IN SURFACE WATER
SITE 25
SEU
IMPACTS IN SURFACE WATER (30" WSP/RCP)
PIPE BURIED
IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
SITE 24A
SDX
TEMP. IMPACTS IN SURFACE WATER
PIPE NOT BURIED
SITE 26
SDX
IMPACTS IN SURFACE WATER (STREAM RELOCATION)
SITE 29
SDX
TEMP. IMPACTS IN SURFACE WATER
SITE 28
SDY
IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
EXCAVATION IN WETLAND
SITE 27
SDY
WCV
Q2= 0.3 cfs
V2= 0.5 fps
Q10= 0.5 cfs
V10= 0.7 fps
IMPACTS IN SURFACE WATER (30" CMP/RCP)
TEMP. IMPACTS IN SURFACE WATER
PIPE NOT BURIED
BILTMORE FARMS, INC. DB 1222 PG 645
GRAPHIC SCALE
FOR -WBL- & -EBL- PROFILES, SEE SHEETS 82 & 83
FOR RETAINING WALL -RW14-, SEE SHEETS W-16
FOR RETAINING WALL -RW15-, SEE SHEETS W-17

HNTB NORTH CAROLINA, P.C. 343 W. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554	PROJECT REFERENCE NO.	SHEET NO.
	I-4700	24
	R/W SHEET NO.	I-4700B-34
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

PERMIT DRAWING
SHEET 54 OF 97



LEGEND

S S	DENOTES IMPACTS IN SURFACE WATER
TS TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

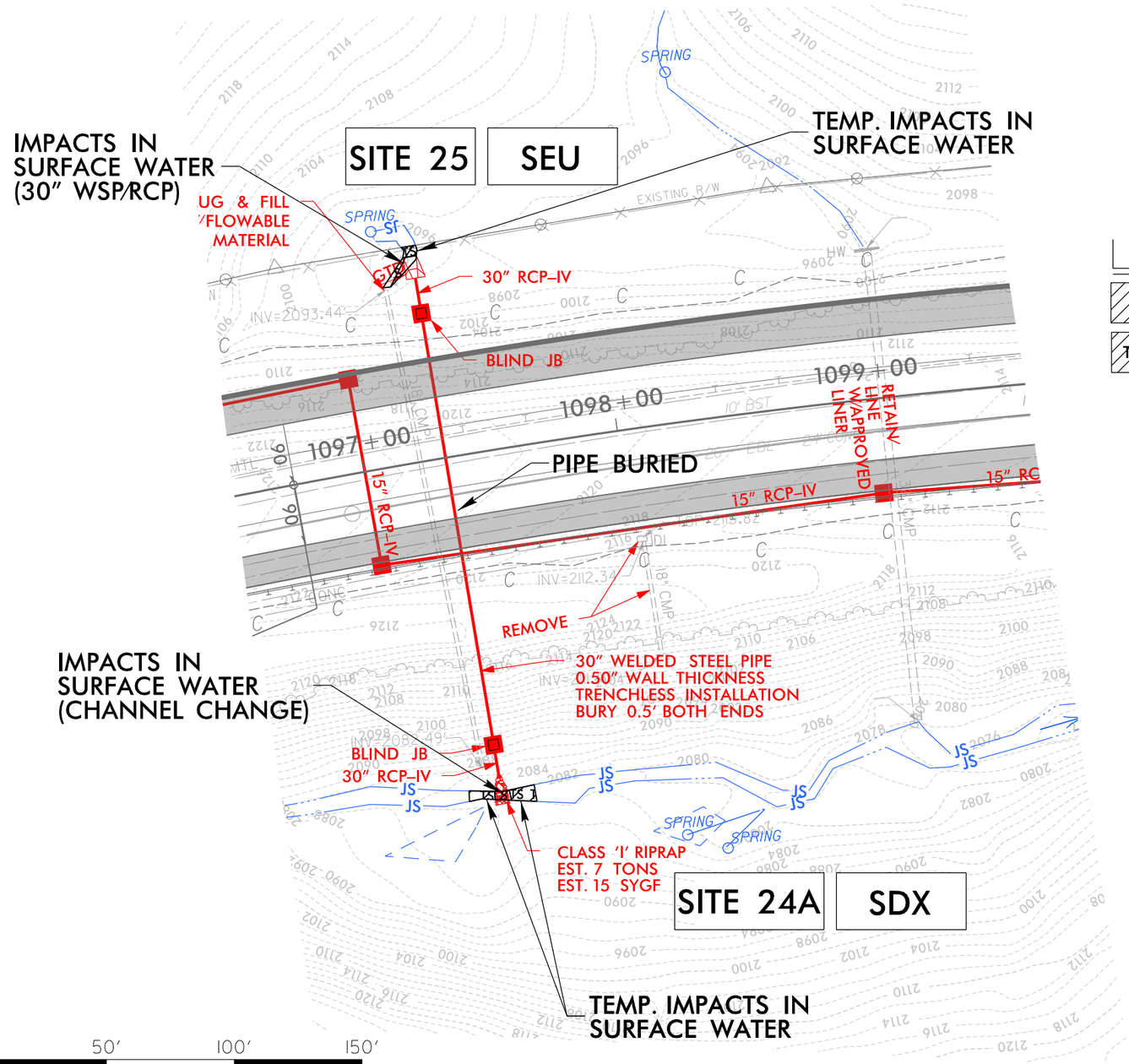
50' 0' 50' 100' 150'
GRAPHIC SCALE

HNTB NORTH CAROLINA, P.C.
343 W. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License Nos C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	24
R/W SHEET NO.	I-4700B-34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

PERMIT DRAWING
SHEET 55 OF 97



LEGEND

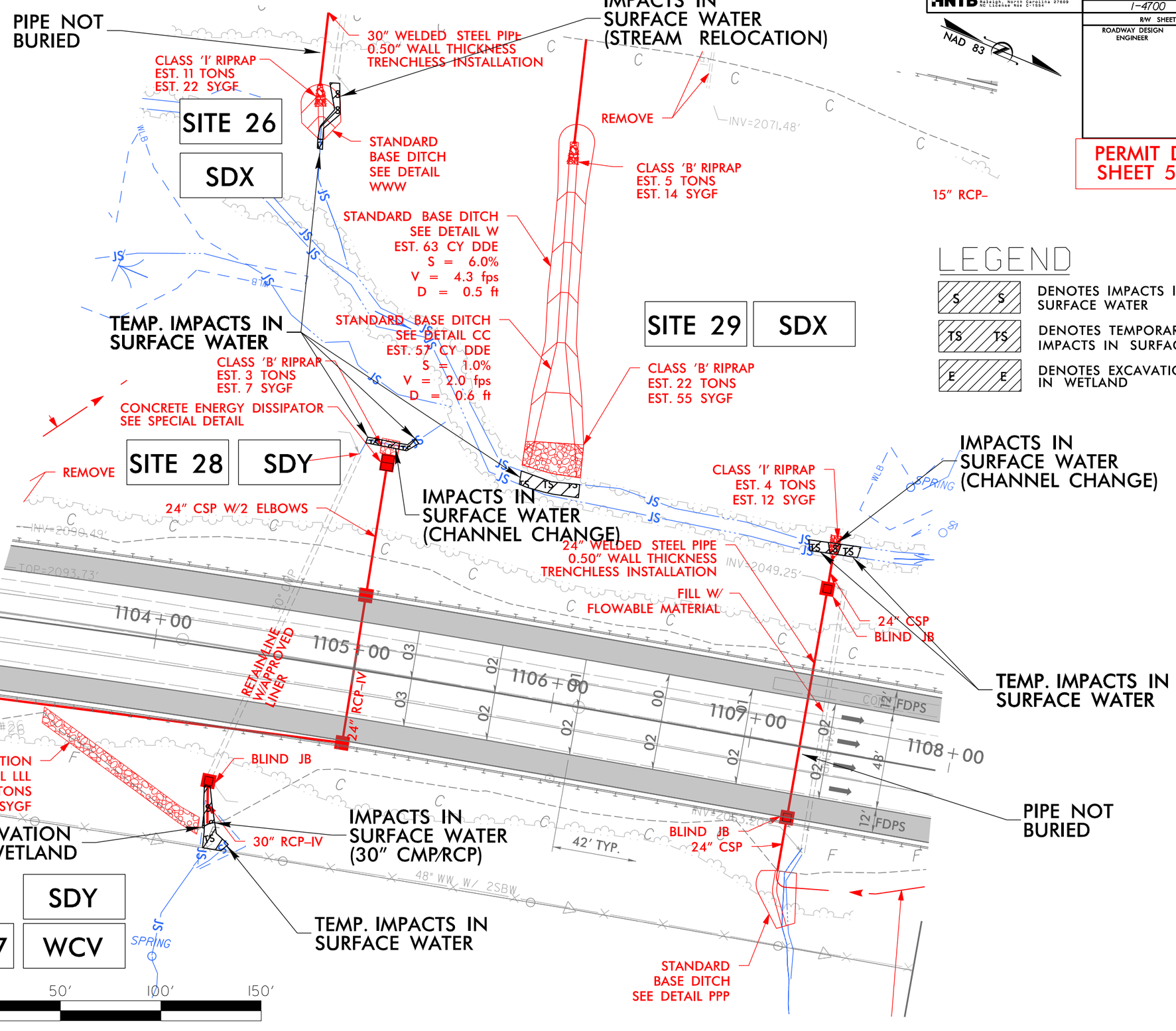
S S	DENOTES IMPACTS IN SURFACE WATER
TS TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 0' 50' 100' 150'
GRAPHIC SCALE

PROJECT REFERENCE NO.	SHEET NO.
I-4700	24
R/W SHEET NO.	I-4700B-34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C. 343 W. Six Forks Road, Suite 200 Raleigh, North Carolina 27603 NC License Nbr C-1554

PERMIT DRAWING SHEET 56 OF 97

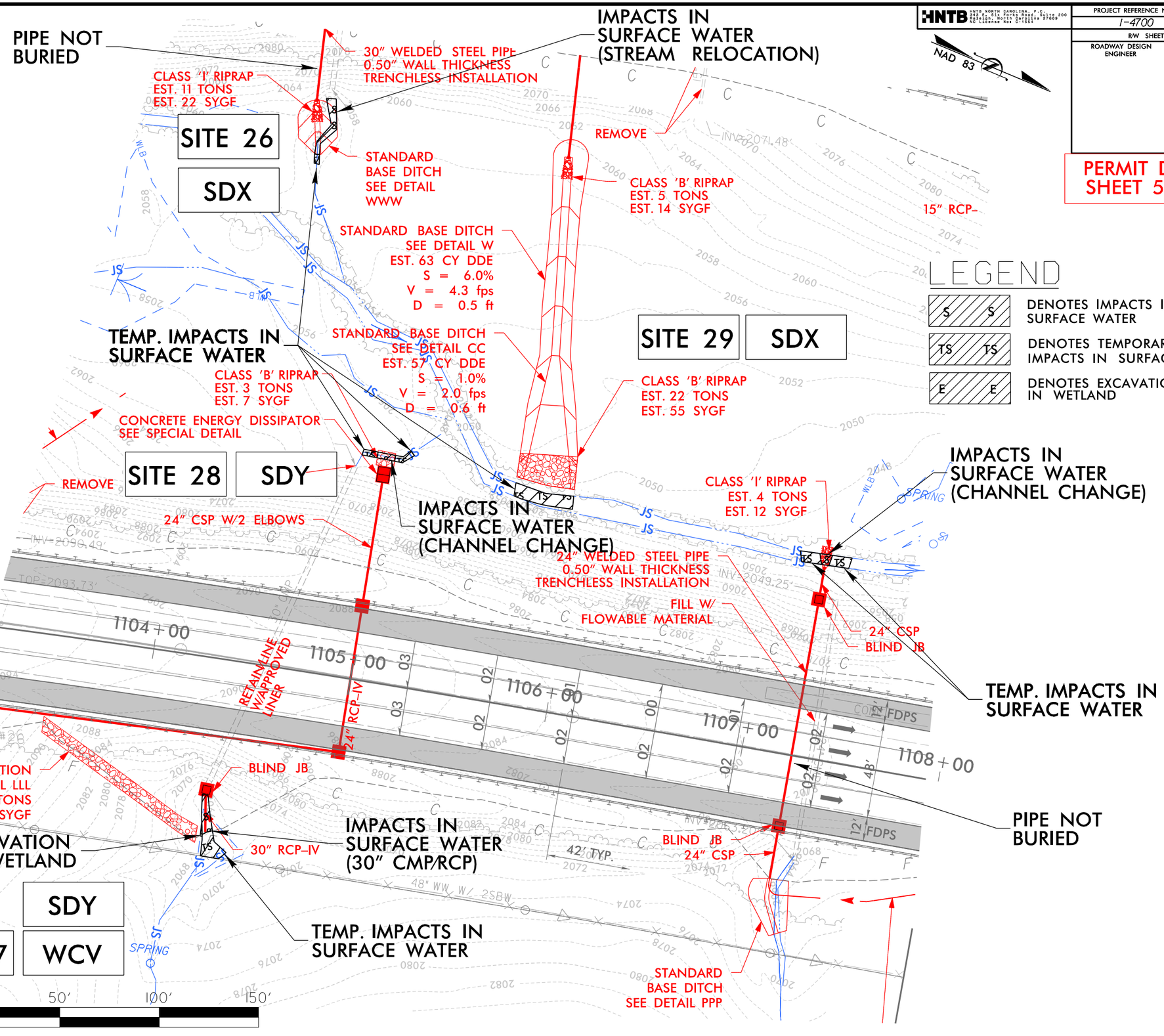


PROJECT REFERENCE NO.	SHEET NO.
I-4700	24
R/W SHEET NO.	I-4700B-34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C. 343 W. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554

NAD 83

PERMIT DRAWING
SHEET 57 OF 97

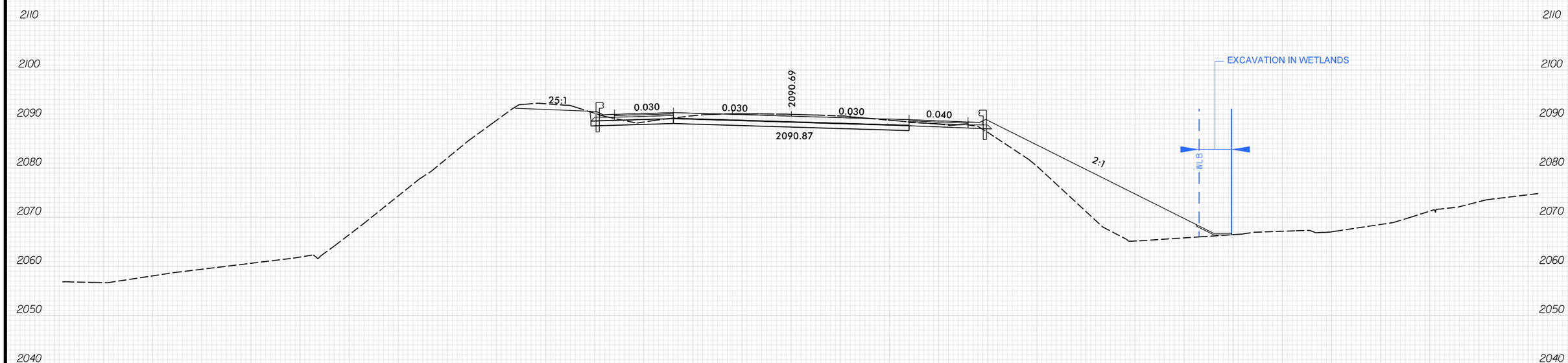


6/23/16

5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-4700	

PERMIT DRAWING
SHEET 58 OF 97

WETLAND CROSS SECTIONS



SITE 27
–WBL– 1104+37.00

SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4700
I-26
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

11/14/2018
I4700B_HYD_PRM_XPL.dgn
HNTB

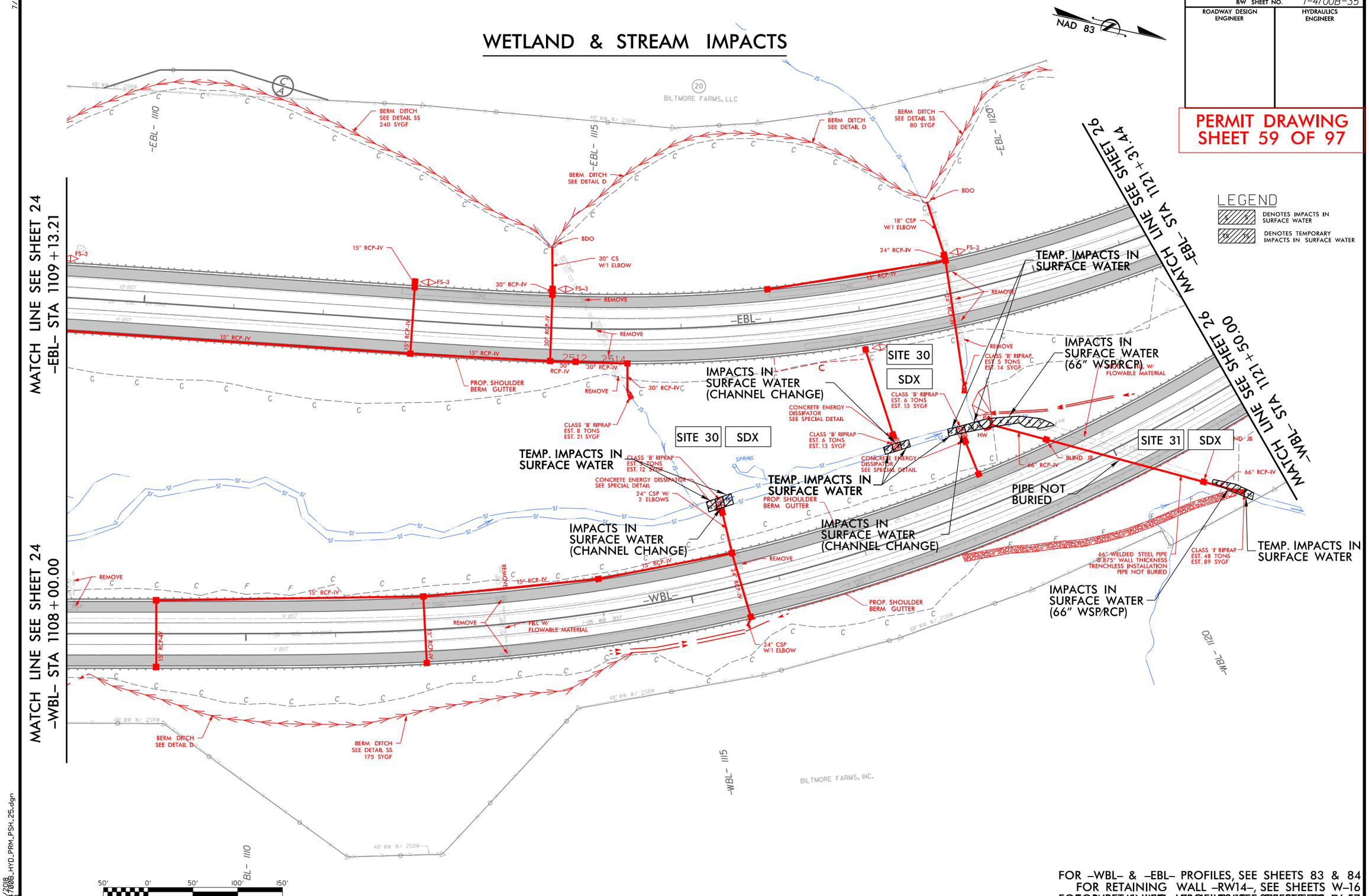
7/19/2017

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	25
R/W SHEET NO.	I-4700B-35
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 59 OF 97

WETLAND & STREAM IMPACTS



FOR -WBL- & -EBL- PROFILES, SEE SHEETS 83 & 84
FOR RETAINING WALL -RW14-, SEE SHEETS W-16
FOR -WBL- & -EBL- PROFILES, SEE SHEETS 53 & 54

11/30/2018
I-4700B_HYD_PRM_PSH_25.dgn
HNTB

7/19/2017

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700D	25
R/W SHEET NO.	I-4700B-35
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 60 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

MATCH LINE SEE SHEET 24 –EBL– STA 1109+13.21

MATCH LINE SEE SHEET 24 –WBL– STA 1108+00.00

MATCH LINE SEE SHEET 26 –EBL– STA 1121+31.44

MATCH LINE SEE SHEET 26 –WBL– STA 1121+50.00

BILTMORE FARMS, LLC

BILTMORE FARMS, INC.

–EBL– 1110

–EBL– 1115

–EBL– 1120

–WBL– 1110

–WBL– 1115

–WBL– 1120

–EBL–

–WBL–

BERM DITCH SEE DETAIL SS 240 SYGF

BERM DITCH SEE DETAIL D

BERM DITCH SEE DETAIL SS 80 SYGF

BERM DITCH SEE DETAIL SS 175 SYGF

BDO

30" CS W/1 ELBOW

18" CSP W/1 ELBOW

24" CSP W/ 2 ELBOWS

24" CSP W/1 ELBOW

15" RCP-IV

30" RCP-IV

24" RCP-IV

66" RCP-IV

FS-3

REMOVE

FILL W/ FLOWABLE MATERIAL

PROP. SHOULDER BERM GUTTER

CLASS 'B' RIPRAP EST. 8 TONS EST. 21 SYGF

CLASS 'B' RIPRAP EST. 3 TONS EST. 12 SYGF

CLASS 'B' RIPRAP EST. 6 TONS EST. 13 SYGF

CLASS 'B' RIPRAP EST. 5 TONS EST. 14 SYGF

CLASS 'I' RIPRAP EST. 48 TONS EST. 89 SYGF

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

SITE 30 SDX

SITE 31 SDX

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

IMPACTS IN SURFACE WATER (66" WSP/RCP)

PIPE NOT BURIED

66" WELDED STEEL PIPE 0.875" WALL THICKNESS TRENCHLESS INSTALLATION PIPE NOT BURIED

BLIND JB

HW

SPRING

GRAPHIC SCALE 50' 0' 50' 100' 150'

FOR –WBL– & –EBL– PROFILES, SEE SHEETS 83 & 84
FOR RETAINING WALL –RW14–, SEE SHEETS W-16
FOR –WBL– & –EBL– PROFILES, SEE SHEETS 53 & 54

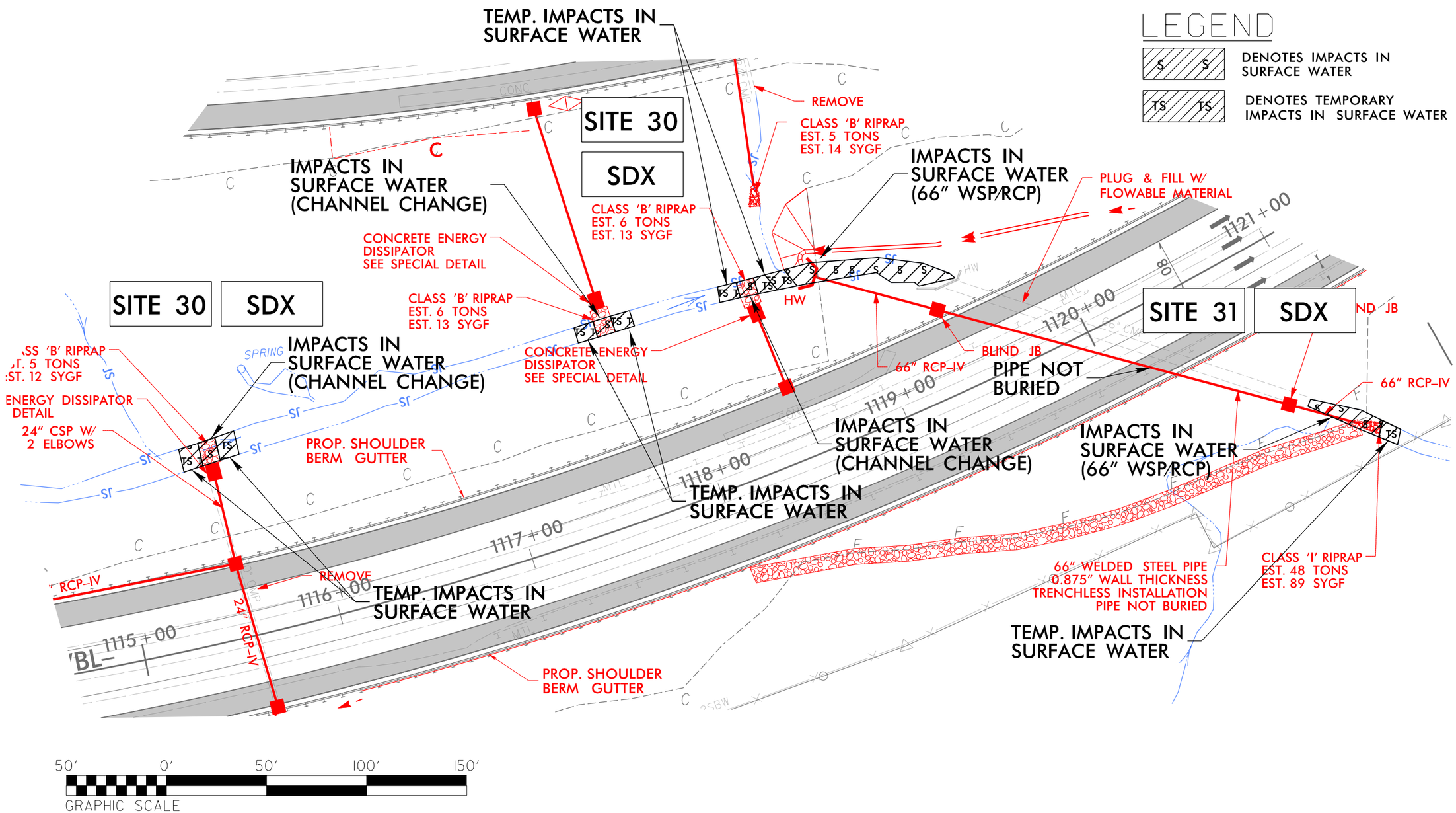
11/30/2018
I-4700B_HYD_PRM_PSH_25.dgn
HNTB

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License Nos C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	25
R/W SHEET NO.	I-4700B-35
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

PERMIT DRAWING
SHEET 61 OF 97

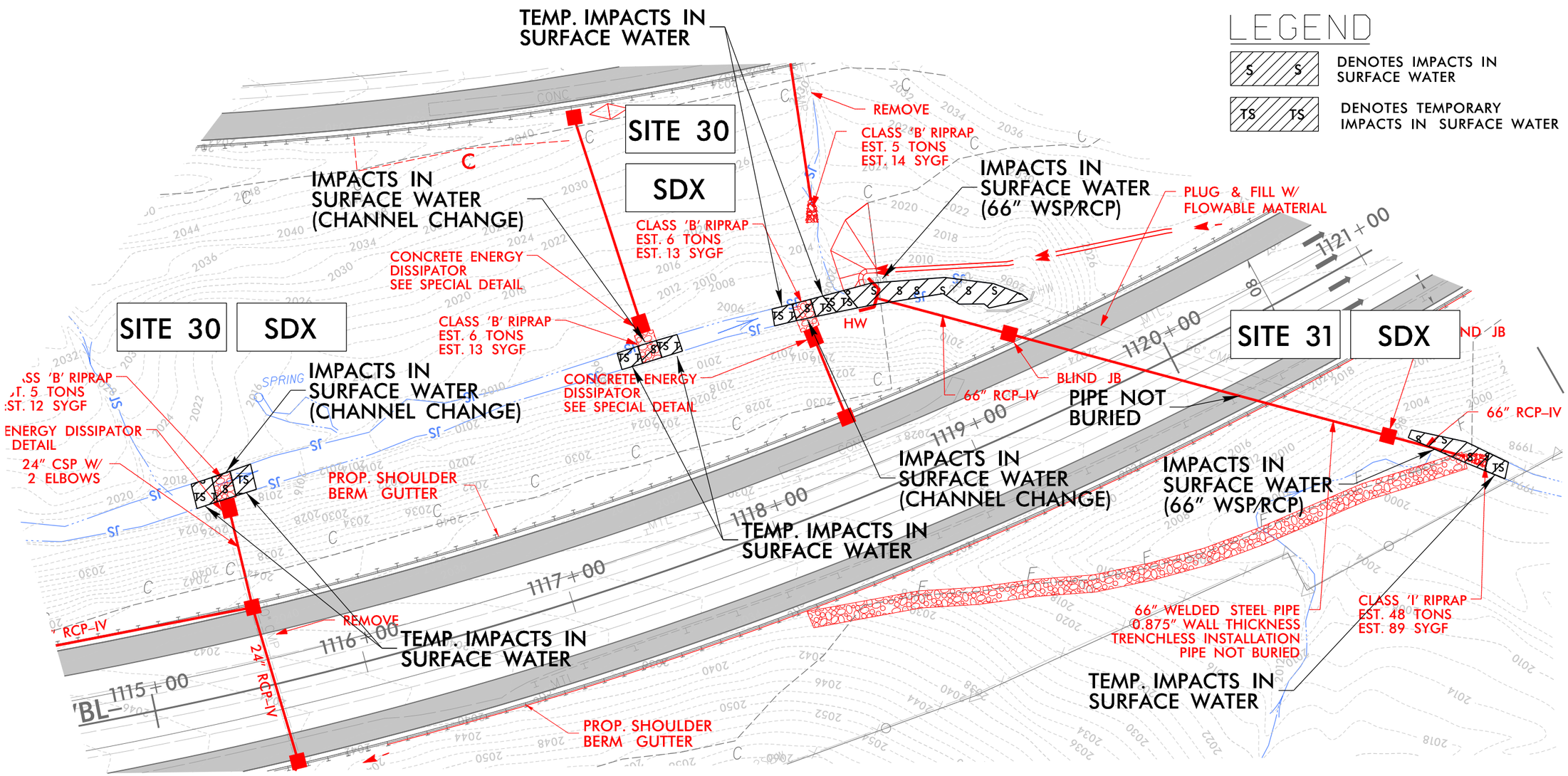


HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License Nos C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	25
R/W SHEET NO.	I-4700B-35
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

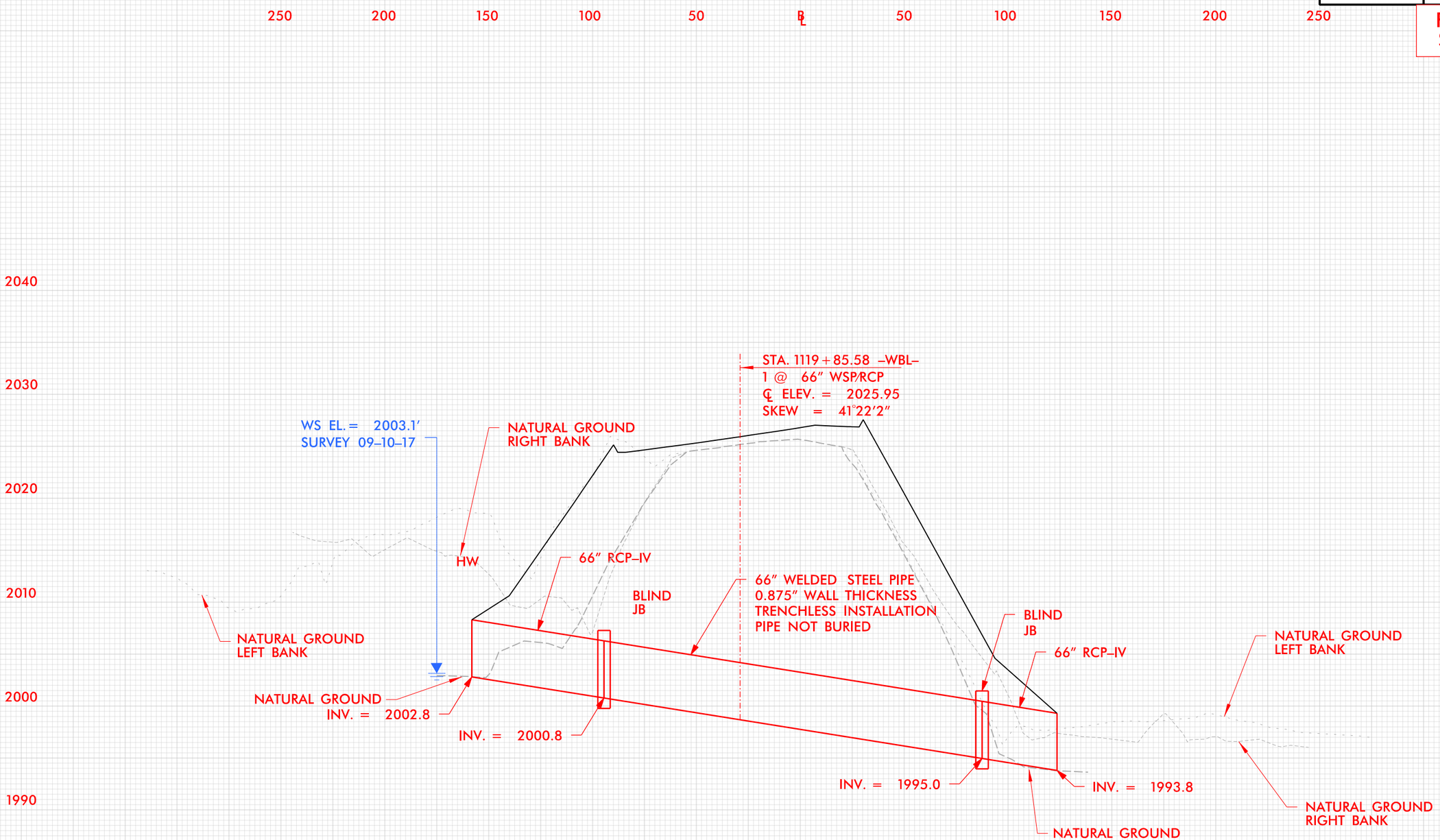
NAD 83

PERMIT DRAWING
SHEET 62 OF 97



PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 63 OF 97



BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4700
I-26
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

6/23/16

11/30/2018
I-4700B_HYD_PRM_PSH_25B_PFL.dgn
HNYB

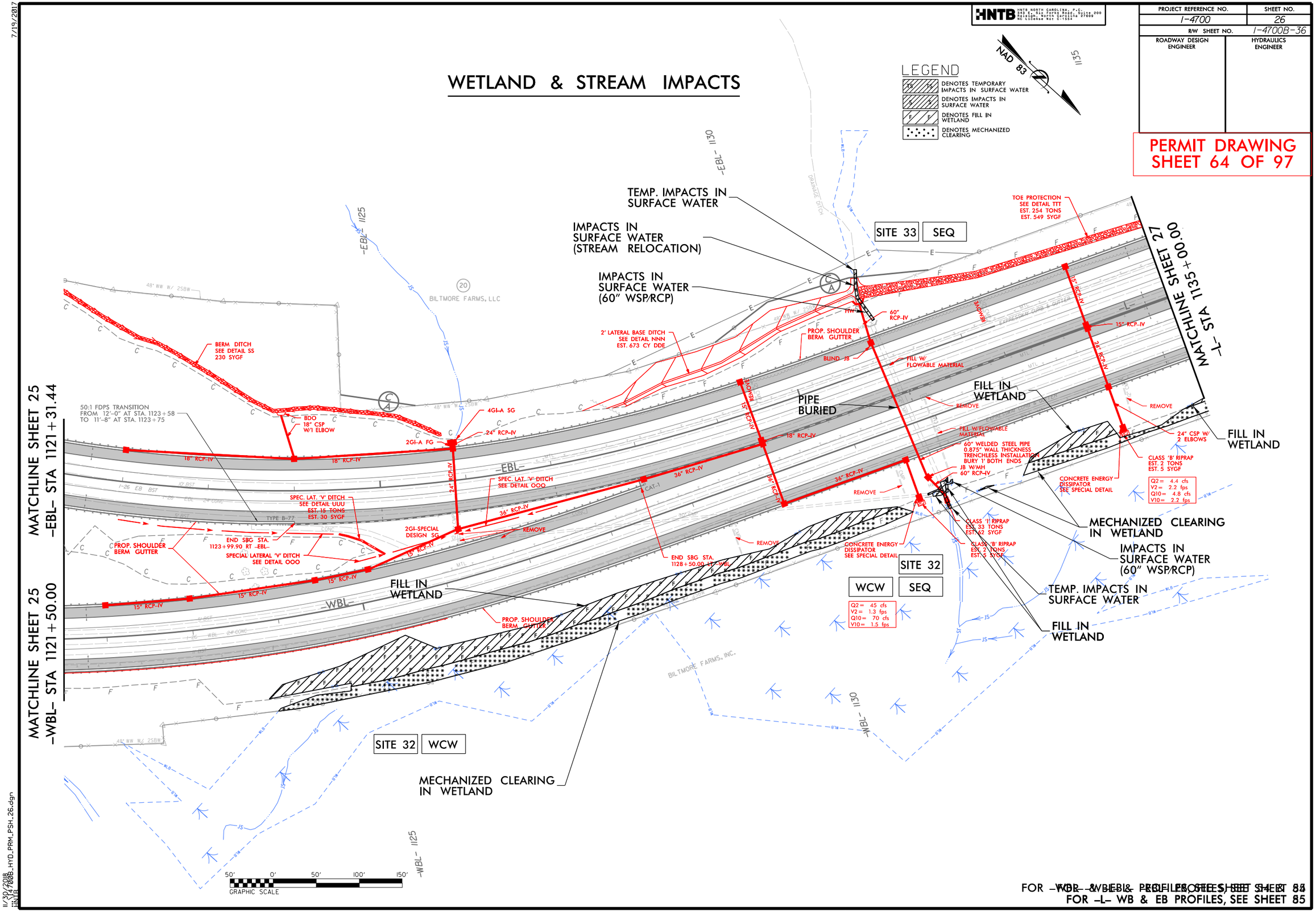
7/19/2017

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	26
R/W SHEET NO.	I-4700B-36
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 64 OF 97

WETLAND & STREAM IMPACTS



FOR -WBL- & -WBL- PROFILES, SEE SHEET 84
FOR -L- WB & EB PROFILES, SEE SHEET 85

11/30/2018
I-4700B_HYD_PRM_PSH_26.dgn
HNTB

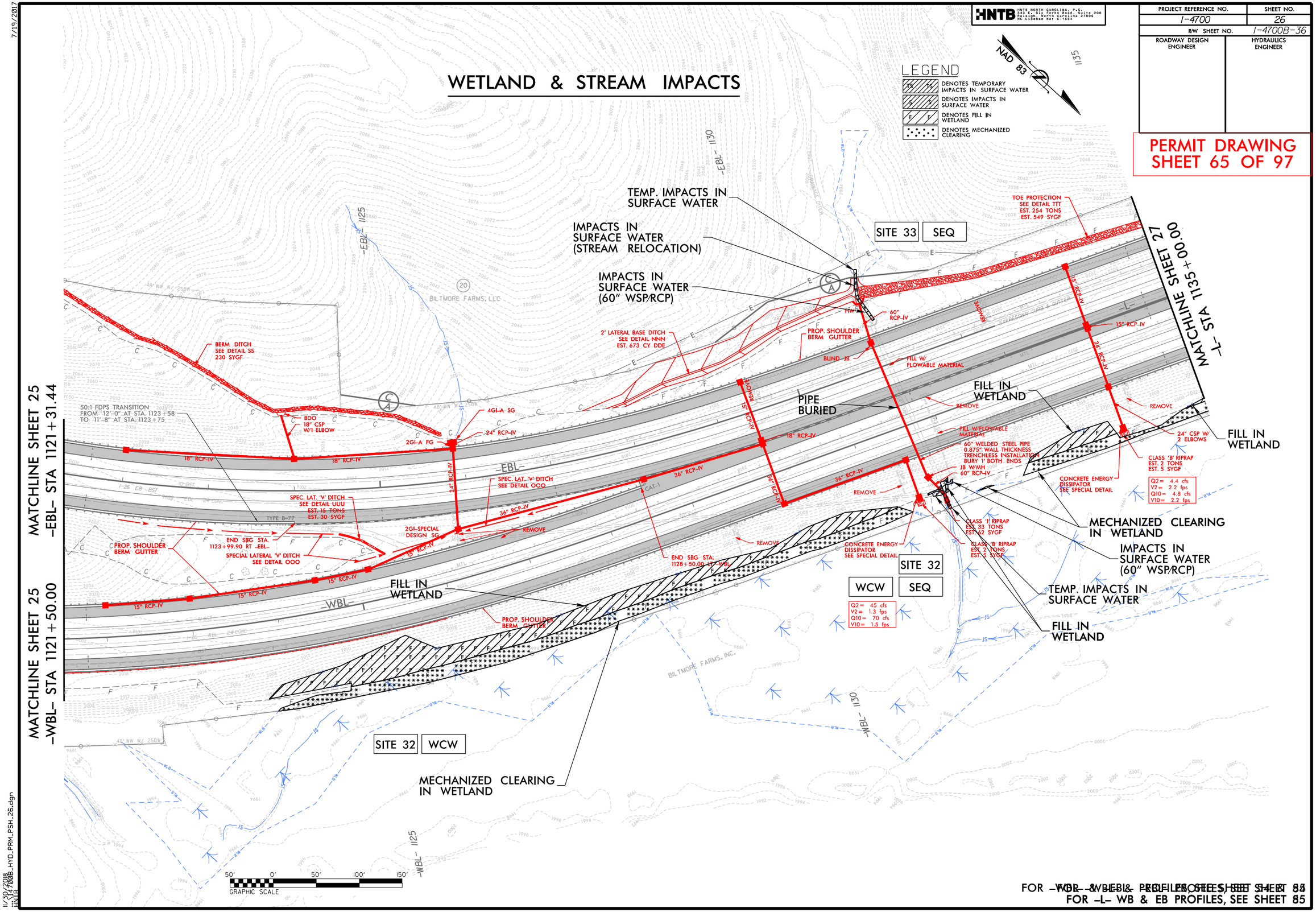
7/19/2017

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC LICENSE NO: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	26
R/W SHEET NO.	I-4700B-36
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 65 OF 97

WETLAND & STREAM IMPACTS



FOR -WBL- & -EBL- PROFILES, SEE SHEET 84
FOR -L- WB & EB PROFILES, SEE SHEET 85

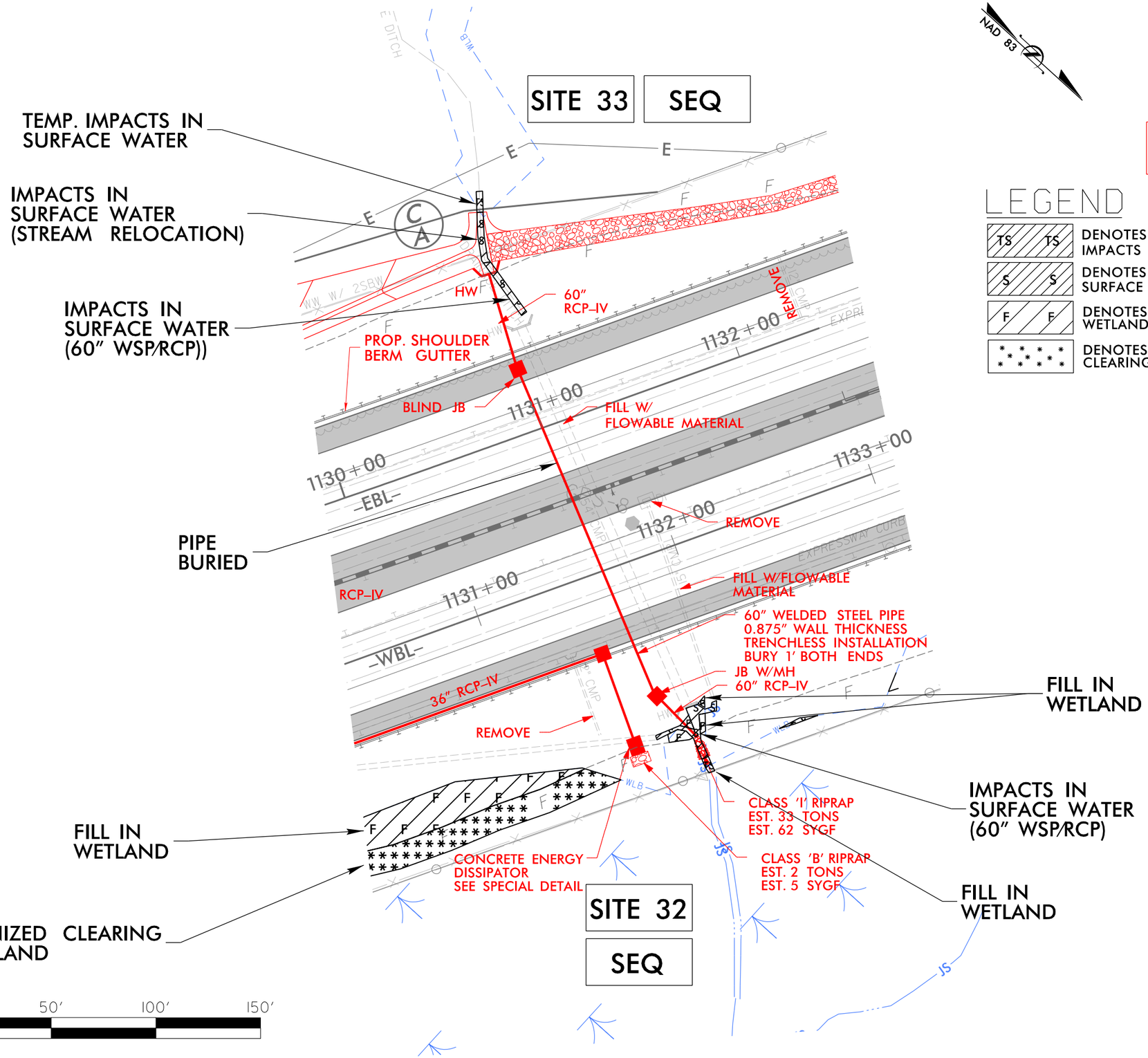
11/30/2018
I4700B_HYD_PRM_PSH_26.dgn
HNTB

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

I-4700	26
R/W SHEET NO.	I-4700B-36
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 66 OF 97

NAD 83



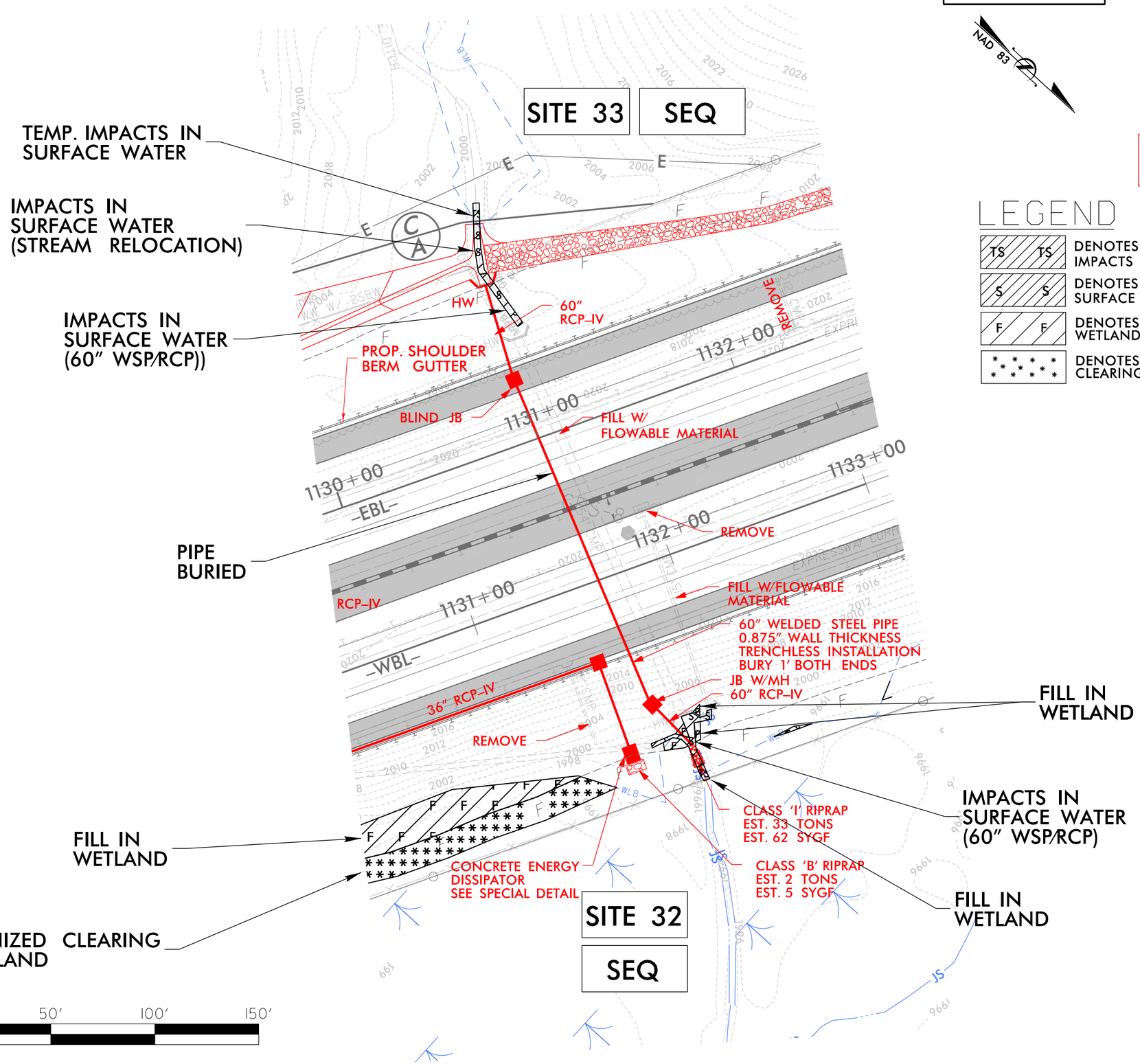
LEGEND

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

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

I-4700	26
R/W SHEET NO.	I-4700B-36
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 67 OF 97



LEGEND

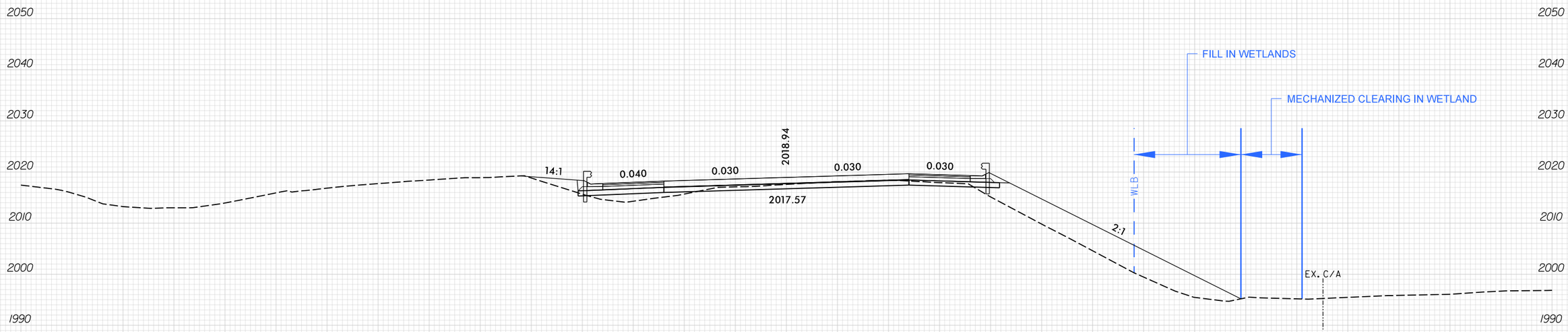
TS TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
S S	DENOTES IMPACTS IN SURFACE WATER
F F	DENOTES FILL IN WETLAND
* * * *	DENOTES MECHANIZED CLEARING

6/23/16

5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-4700	

PERMIT DRAWING
SHEET 68 OF 97

WETLAND CROSS SECTIONS



SITE 32

–WBL– 1128+00.00

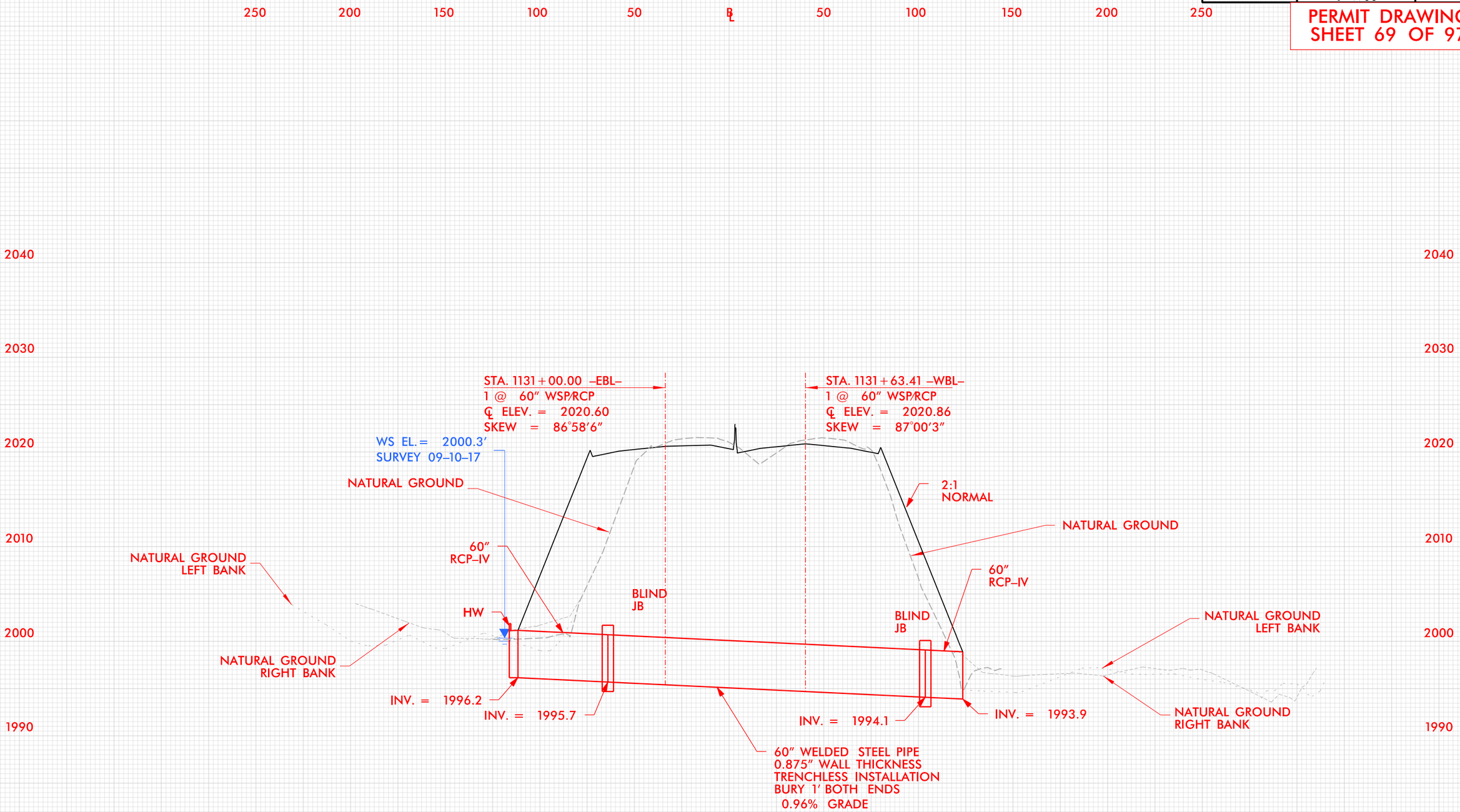
SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4700
I-26
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

11/30/2018
I4700B_HYD_PRM_XPL.dgn
HNTB

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 69 OF 97



PROFILE

BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4700
I-26
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

6/23/16

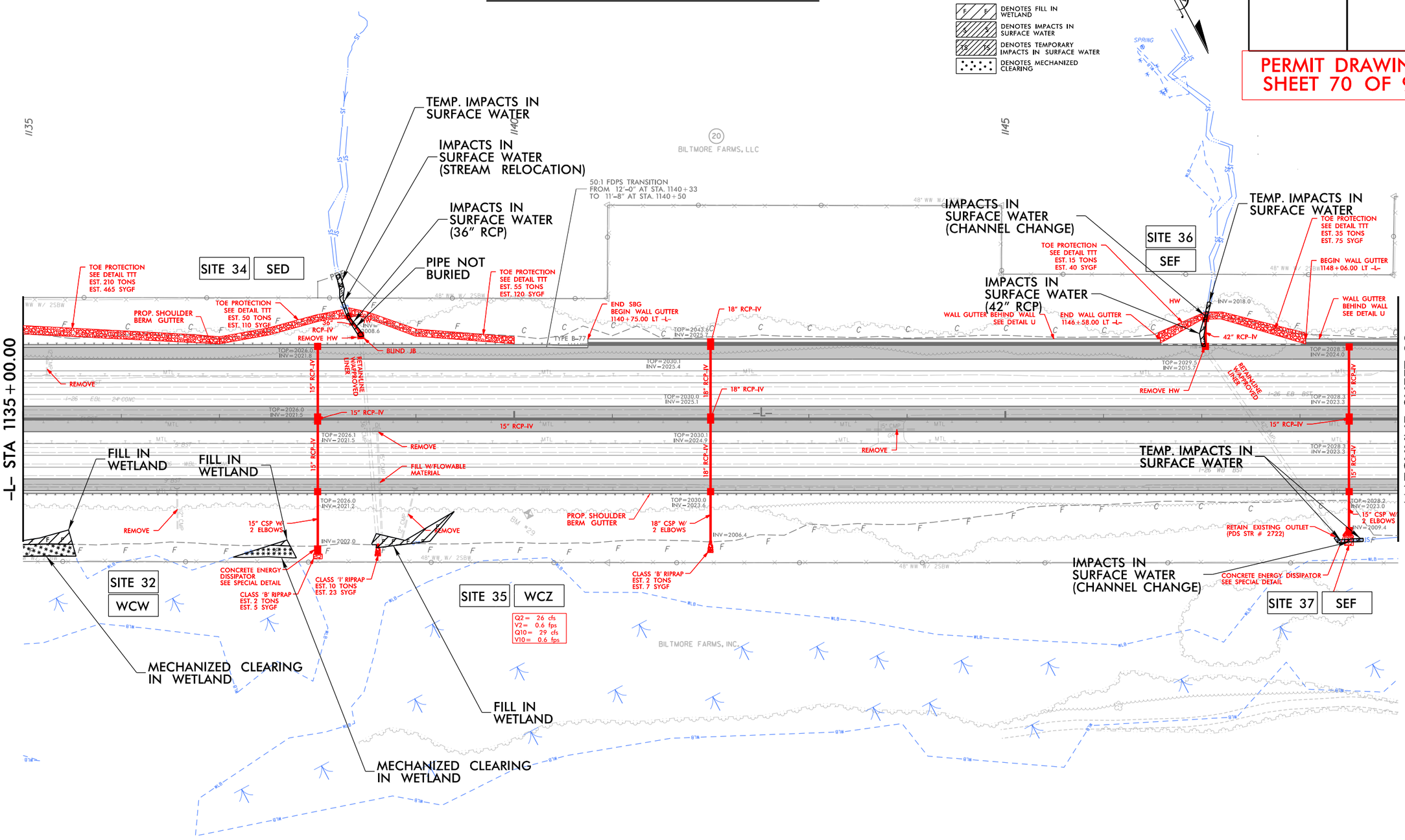
11/30/2018
I4700B_HYD_PRM_PSH_26_PFL.dgn
HNTB

PROJECT REFERENCE NO.	SHEET NO.
I-4700	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PERMIT DRAWING SHEET 70 OF 97

WETLAND & STREAM IMPACTS



FOR -L- EB & -L- WB PROFILES, SEE SHEETS 85 & 86
FOR RETAINING WALL -RW16-, SEE SHEETS W-18
FOR RETAINING WALL -RW17-, SEE SHEETS W-19

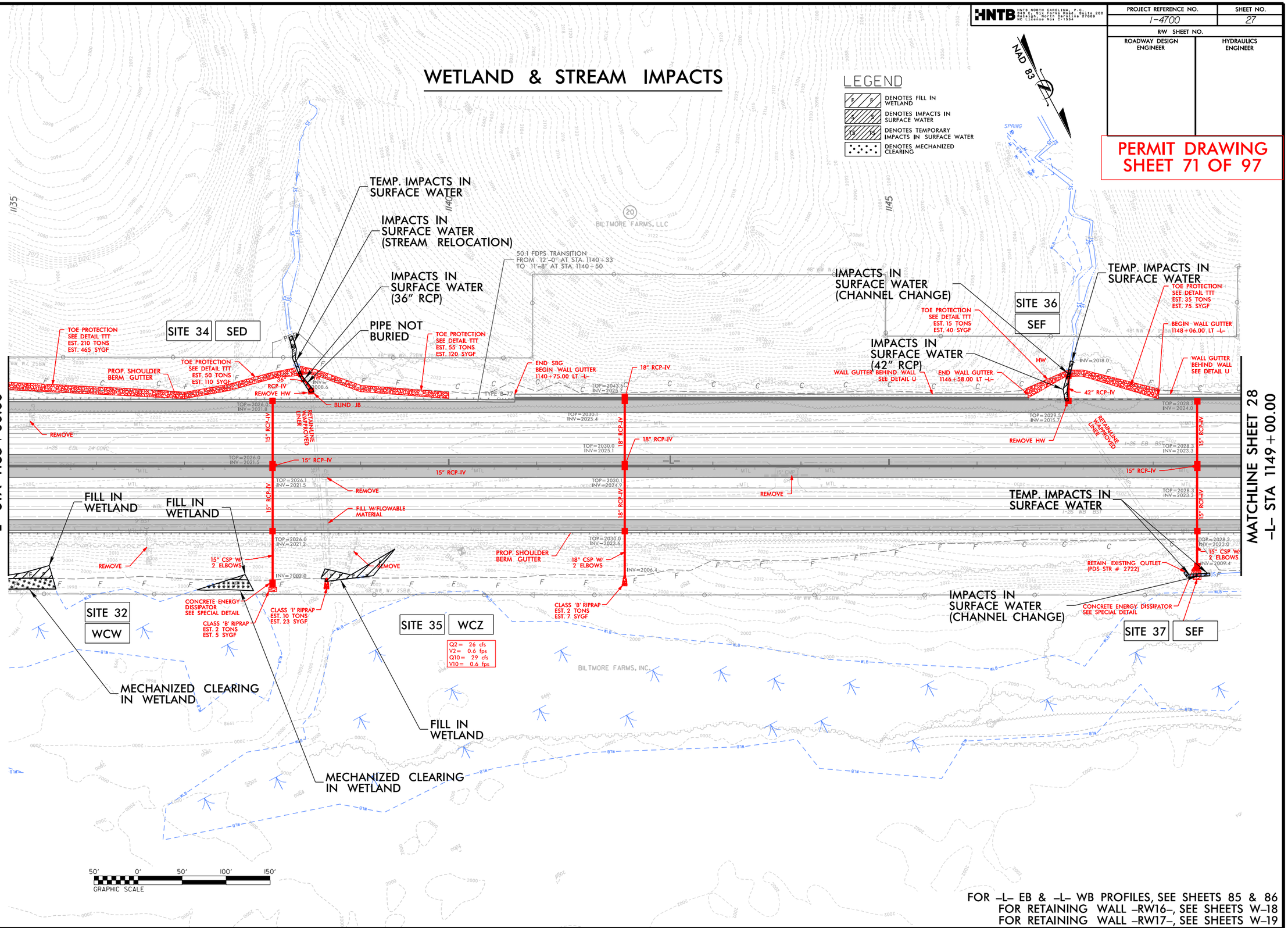
7/19/2017
11/30/2018
I-4700_HYD_PRM_PSH_27.dgn
HNTB

PROJECT REFERENCE NO.	SHEET NO.
I-4700	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PERMIT DRAWING
SHEET 71 OF 97

WETLAND & STREAM IMPACTS



FOR -L- EB & -L- WB PROFILES, SEE SHEETS 85 & 86
FOR RETAINING WALL -RW16-, SEE SHEETS W-18
FOR RETAINING WALL -RW17-, SEE SHEETS W-19

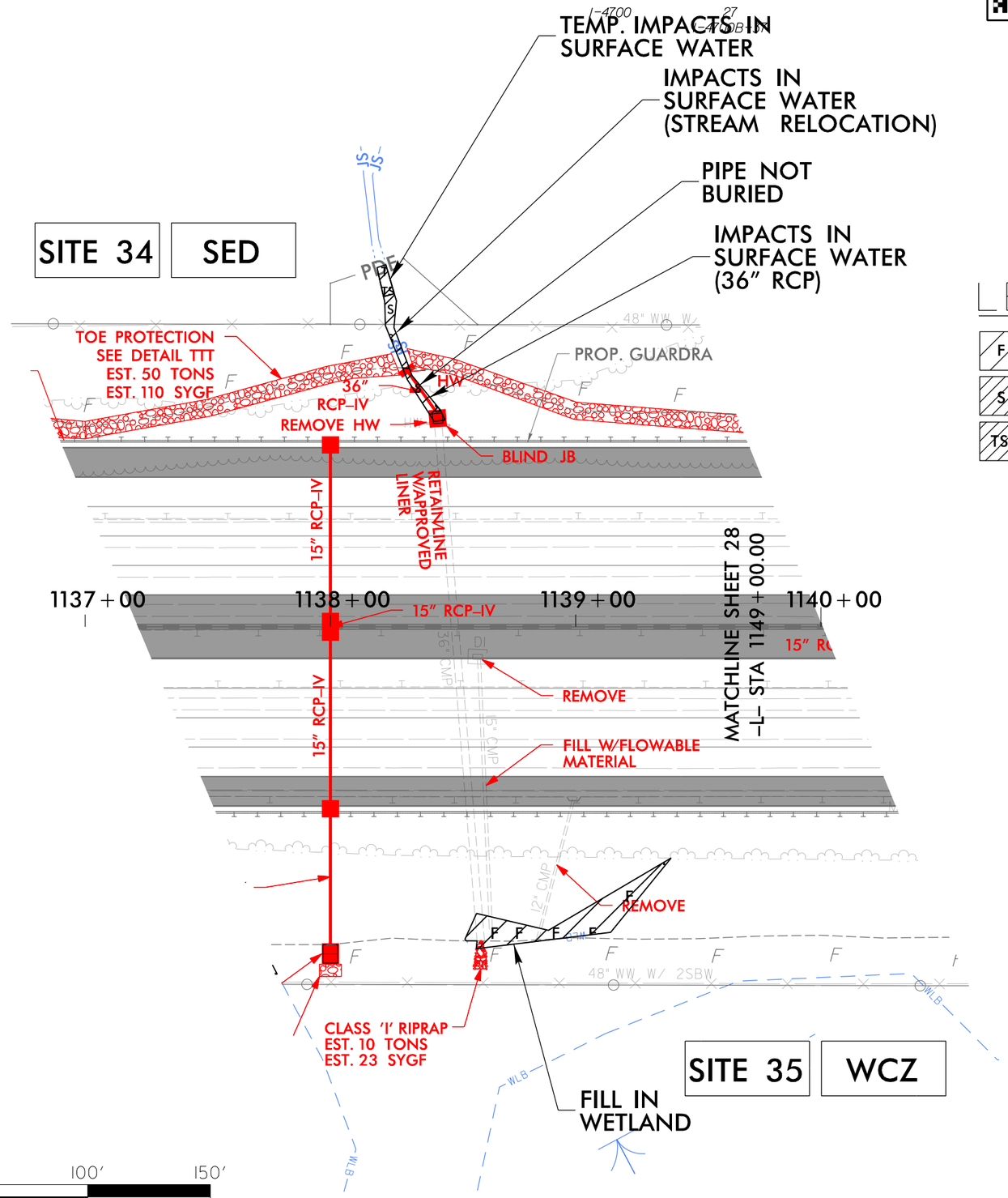
7/19/2017

11/30/2018
I-4700B_HYD_PRM_PSH_27.dgn
HNTB

HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554	PROJECT REFERENCE NO.	SHEET NO.
	I-4700	27
	R/W SHEET NO.	I-4700B-37
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 72 OF 97

NAD 83



LEGEND

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

50' 0' 50' 100' 150'
GRAPHIC SCALE

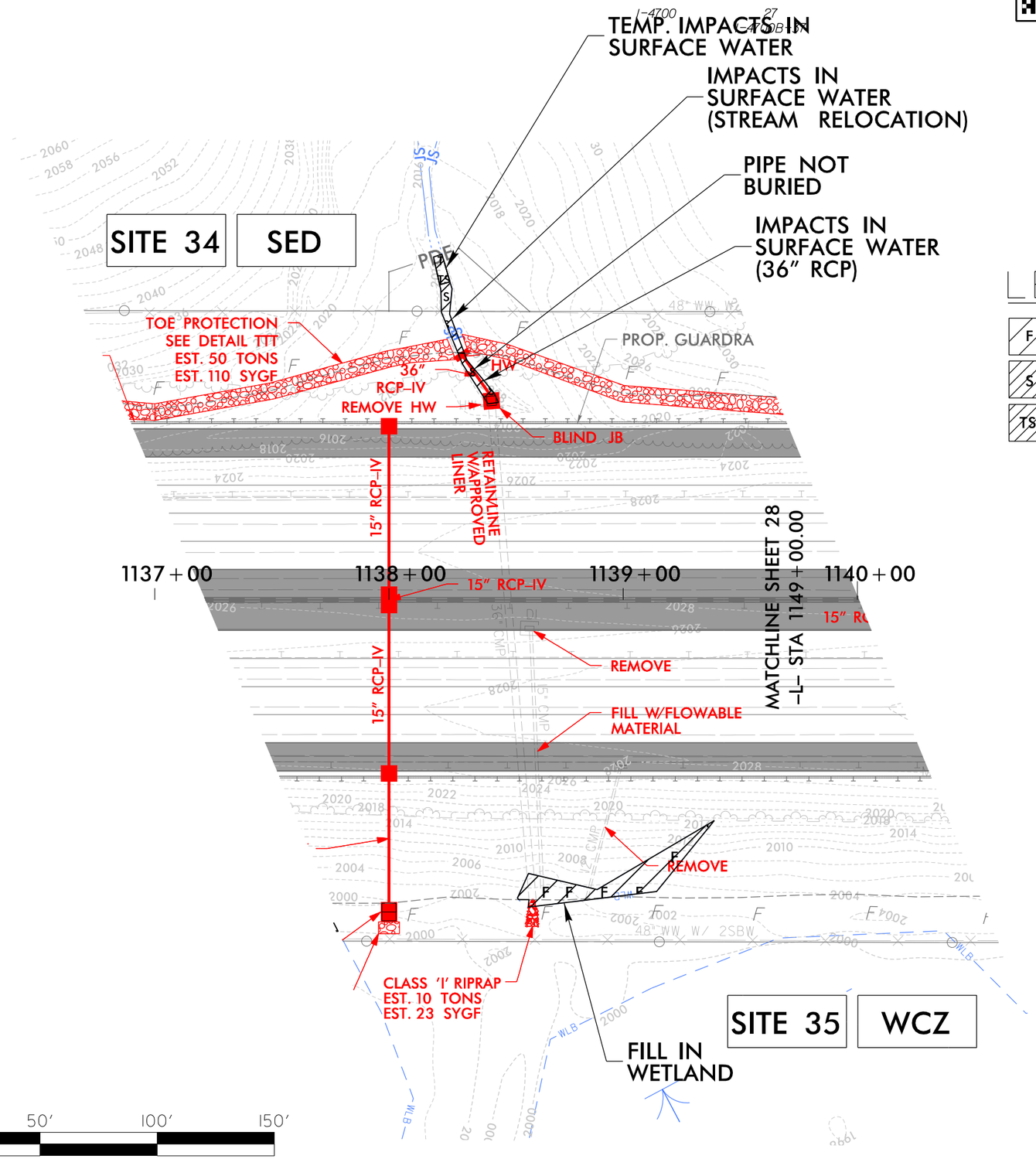
FOR -L- EB & -L- WB PROFILES, SEE SHEETS 55 & 56
FOR RETAINING WALL -RW16-, SEE SHEETS W-17
FOR RETAINING WALL -RW17-, SEE SHEETS W-18

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	27
R/W SHEET NO.	I-4700B-37
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 73 OF 97

NAD 83



LEGEND

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

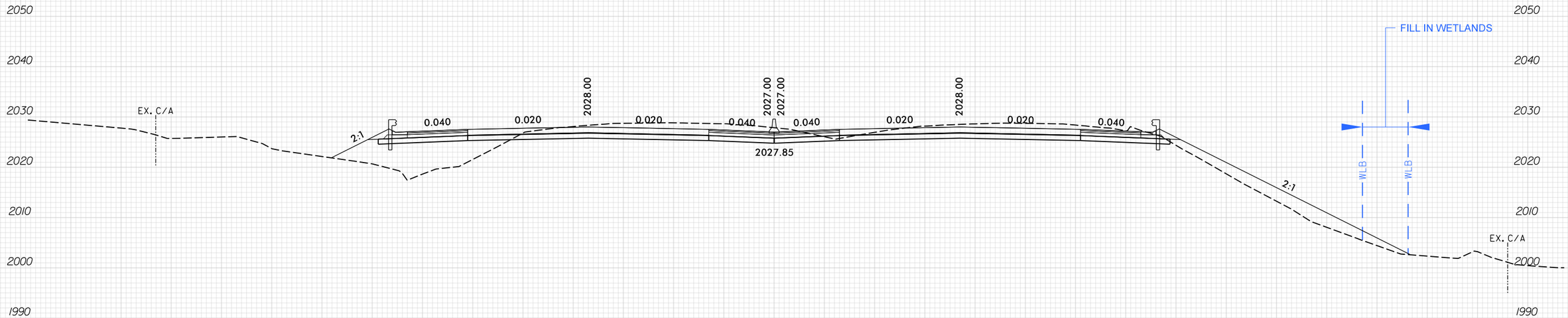
50' 0' 50' 100' 150'
GRAPHIC SCALE

FOR -L- EB & -L- WB PROFILES, SEE SHEETS 55 & 56
FOR RETAINING WALL -RW16-, SEE SHEETS W-17
FOR RETAINING WALL -RW17-, SEE SHEETS W-18

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 74 OF 97

WETLAND CROSS SECTIONS



SITE 35

–L3– 1139+00.00

SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4700
I-26
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

6/23/16

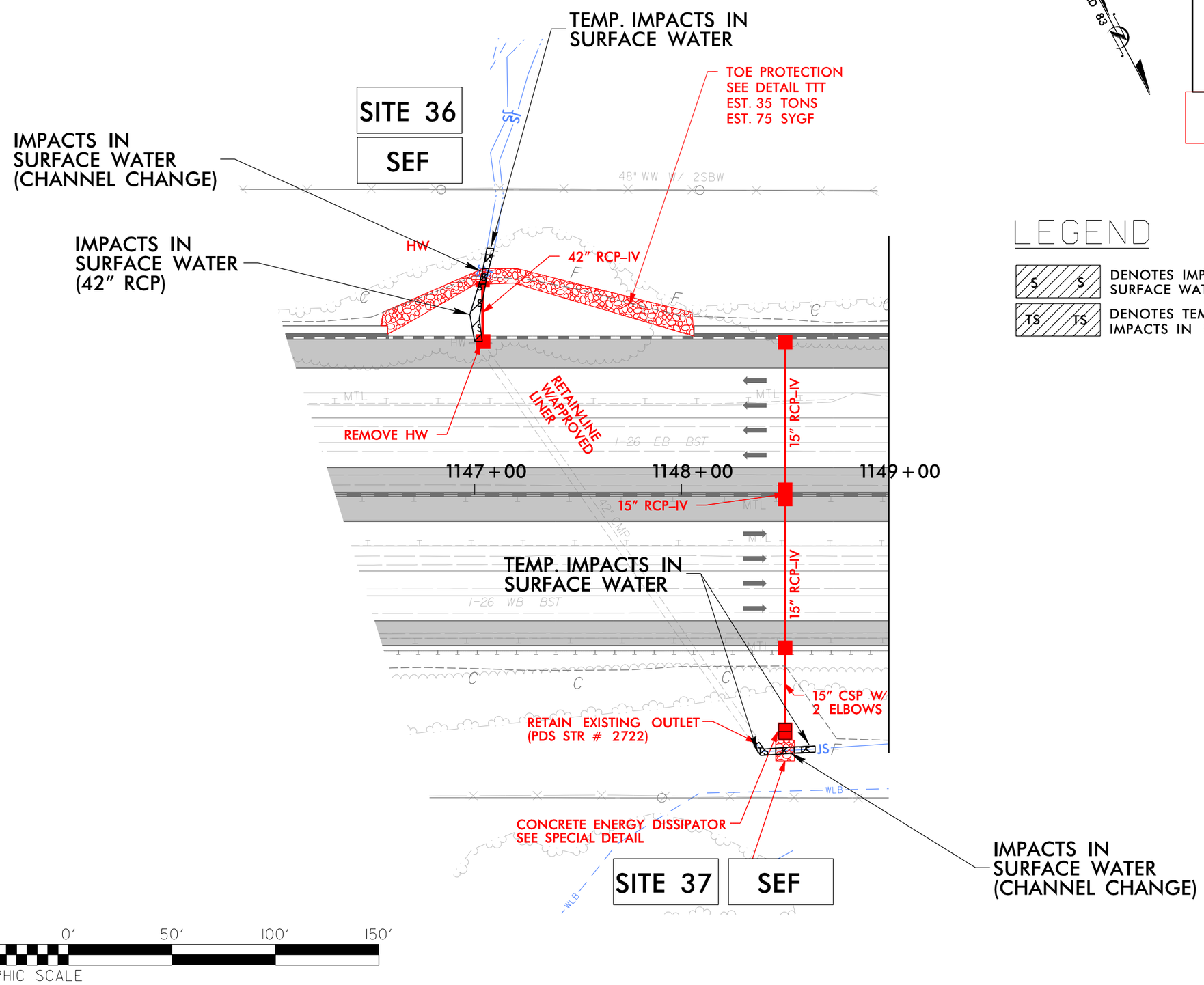
11/14/2018
I4700B_HYD_PRM_XPL.dgn
HNTB

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License Nos C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	27
R/W SHEET NO.	I-4700B-37
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 75 OF 97

NAD 83

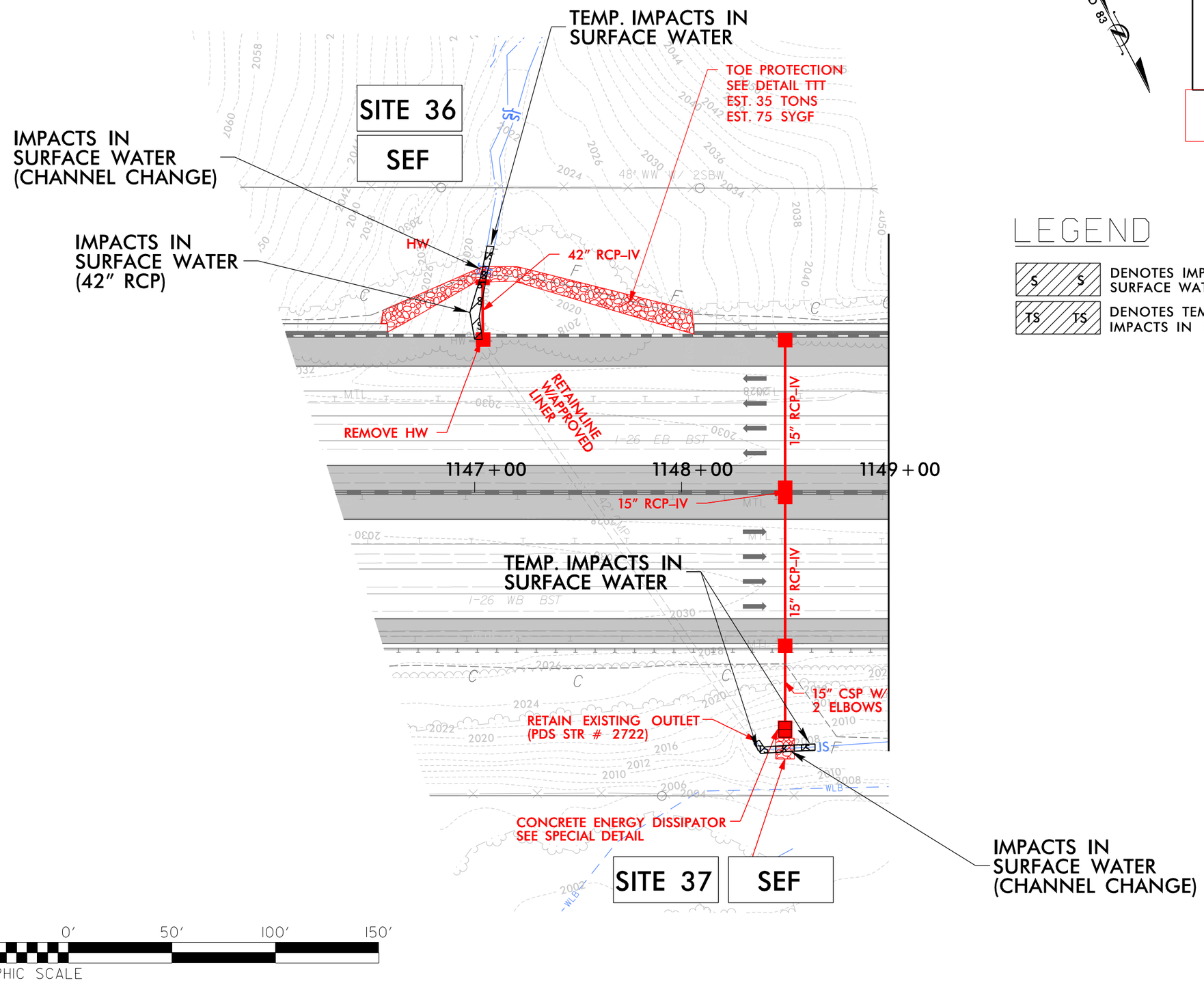


LEGEND

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

HNTB	PROJECT REFERENCE NO.	SHEET NO.
	I-4700	27
	R/W SHEET NO.	I-4700B-37
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 76 OF 97



LEGEND

S S DENOTES IMPACTS IN SURFACE WATER

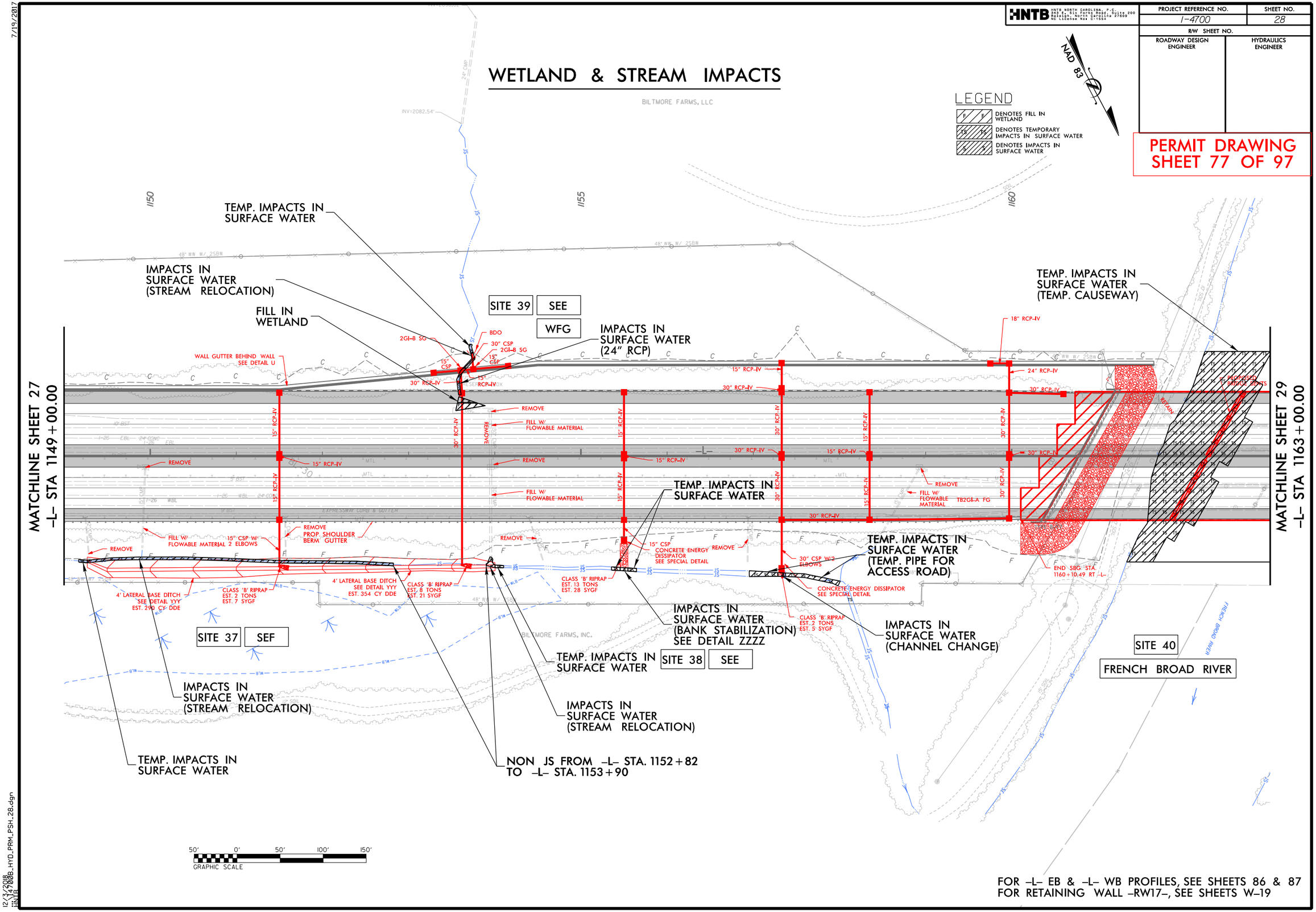
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
I-4700	28
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554

PERMIT DRAWING
SHEET 77 OF 97

WETLAND & STREAM IMPACTS



FOR -L- EB & -L- WB PROFILES, SEE SHEETS 86 & 87
FOR RETAINING WALL -RW17-, SEE SHEETS W-19

7/19/2017

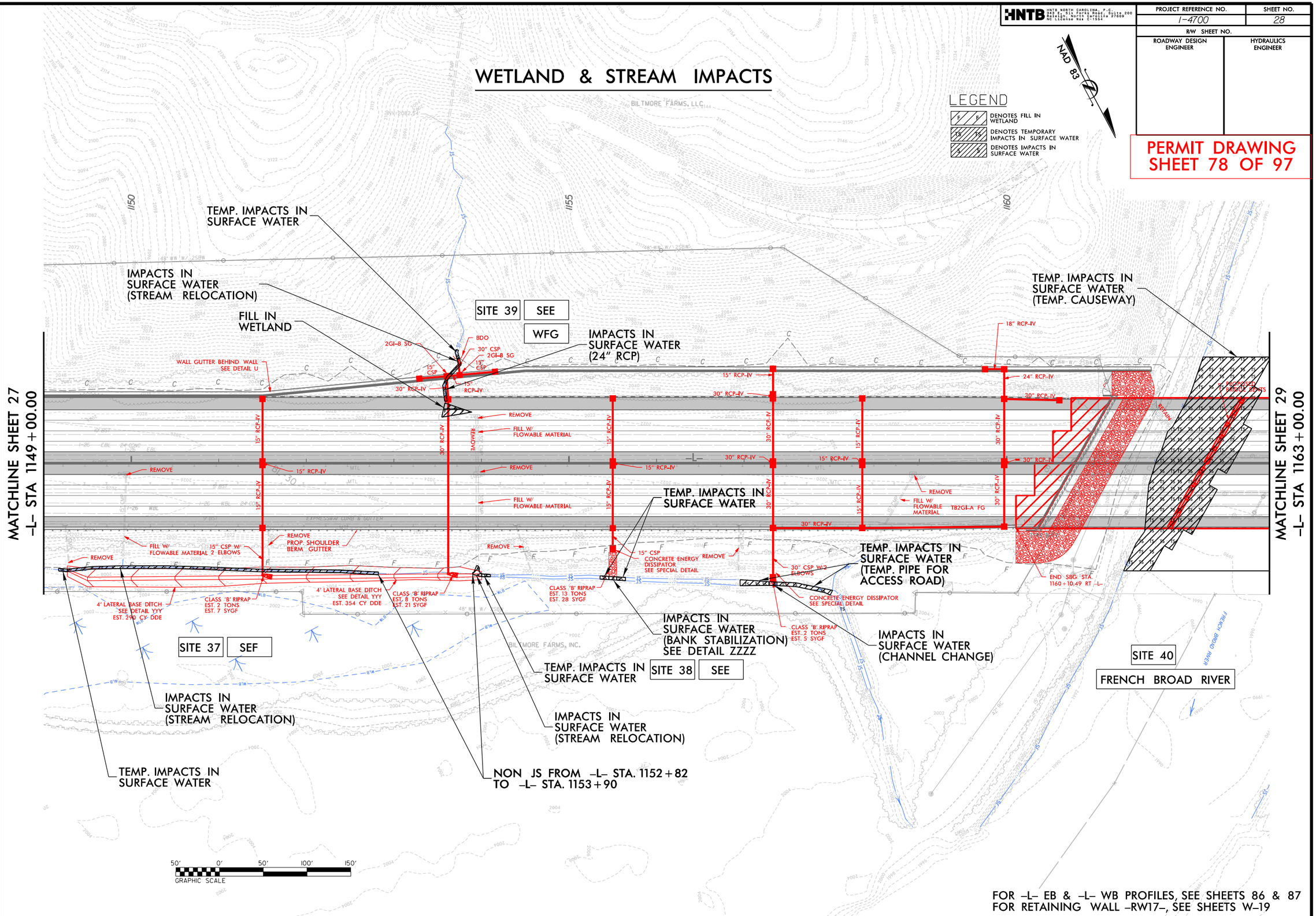
12/13/2018
I4700B_HYD_PRM_PSH_28.dgn
HNTB

PROJECT REFERENCE NO.	SHEET NO.
I-4700	28
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PERMIT DRAWING
SHEET 78 OF 97

WETLAND & STREAM IMPACTS



FOR -L- EB & -L- WB PROFILES, SEE SHEETS 86 & 87
FOR RETAINING WALL -RW17-, SEE SHEETS W-19

7/19/2017

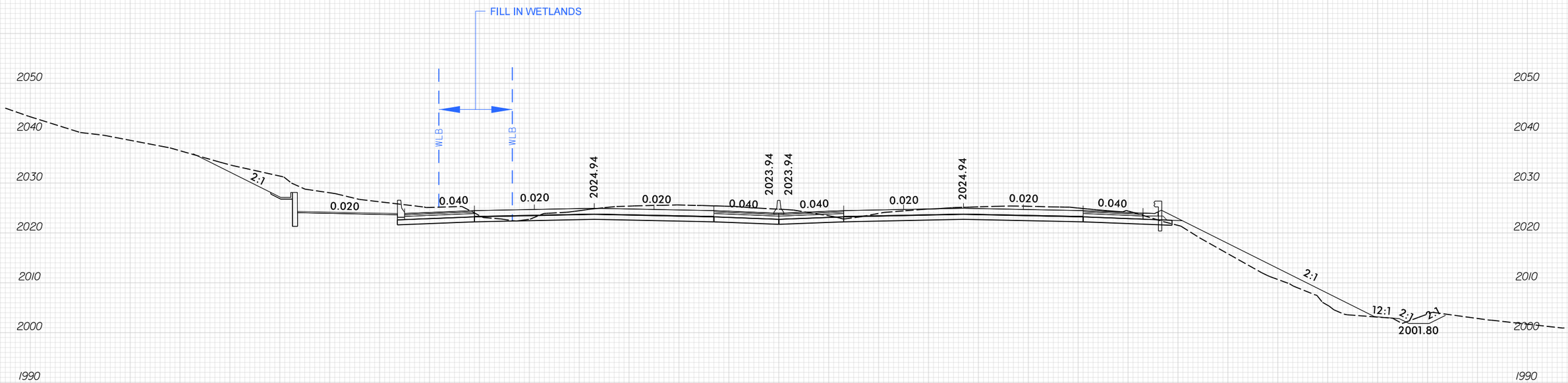
12/3/2018
I-4700B_HYD_PRM_PSH_28.dgn
HNTB

6/23/16

5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-4700	

PERMIT DRAWING
SHEET 79 OF 97

WETLAND CROSS SECTIONS



SITE 39
–L3– 1153+60.00

SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4700
I-26
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

11/26/2018
I4700B_HYD_PRM_XPL.dgn
HNTB

7/19/2017

HNTB HNTB NORTH CAROLINA, P.C. 343 W. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License Nos C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	29
R/W SHEET NO.	I-4700B-39
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

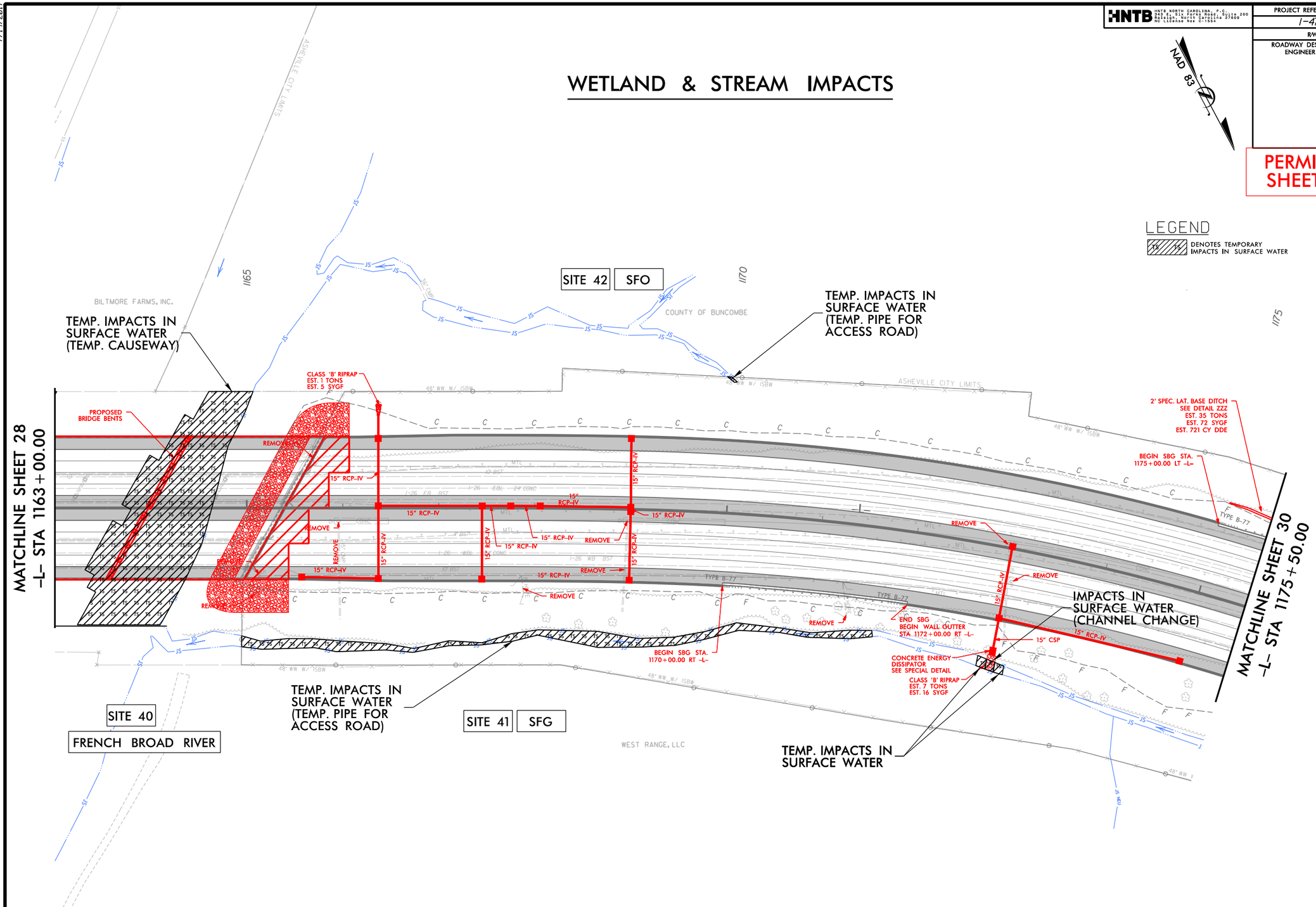
PERMIT DRAWING
SHEET 80 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

JS DENOTES TEMPORARY IMPACTS IN SURFACE WATER



50' 0' 50' 100' 150'
GRAPHIC SCALE

FOR -L- EB & -L- WB PROFILES, SEE SHEETS 57 & 58
FOR RETAINING WALL -RW18-, SEE SHEETS W-19
FOR RETAINING WALL -RW19-, SEE SHEETS W-20
FOR RETAINING WALL -RW20-, SEE SHEETS W-21

11/14/2018
I4700B_HYD_PRM_PSH_29.dgn
HNTB

7/19/2017

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License Nos C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	29
R/W SHEET NO.	I-4700B-39
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 81 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

JS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SITE 42 SFO

SITE 40

FRENCH BROAD RIVER

SITE 41 SFG

TEMP. IMPACTS IN SURFACE WATER (TEMP. CAUSEWAY)

TEMP. IMPACTS IN SURFACE WATER (TEMP. PIPE FOR ACCESS ROAD)

TEMP. IMPACTS IN SURFACE WATER (TEMP. PIPE FOR ACCESS ROAD)

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

MATCHLINE SHEET 28
-L- STA 1163+00.00

MATCHLINE SHEET 30
-L- STA 1175+50.00

PROPOSED BRIDGE BENTS

CLASS 'B' RIPRAP
EST. 1 TONS
EST. 5 SYGF

REMOVE

15" RCP-IV

2' SPEC. LAT. BASE DITCH
SEE DETAIL ZZZ
EST. 35 TONS
EST. 72 SYGF
EST. 721 CY DDE

BEGIN SBG STA.
1175+00.00 LT -L-

END SBG
BEGIN WALL GUTTER
STA 1172+00.00 RT -L-

BEGIN SBG STA.
1170+00.00 RT -L-

15" CSP

CONCRETE ENERGY DISSIPATOR
SEE SPECIAL DETAIL

CLASS 'B' RIPRAP
EST. 7 TONS
EST. 16 SYGF

TYPE B-77

ASHEVILLE CITY LIMITS

BILTMORE FARMS, INC.

COUNTY OF BUNCOMBE

WEST RANGE, LLC

1165 1170 1175

GRAPHIC SCALE 50' 0' 50' 100' 150'

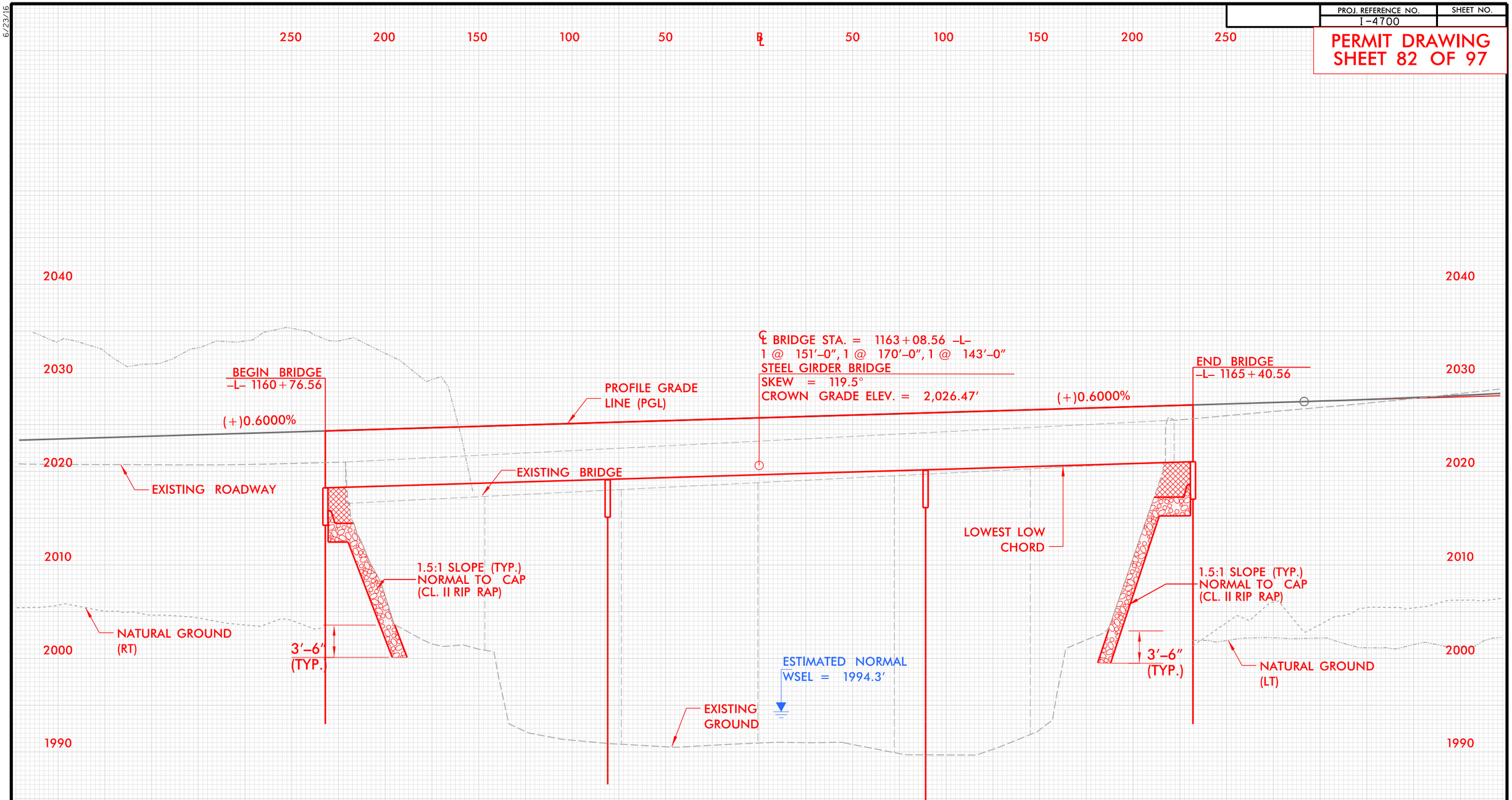
FOR -L- EB & -L- WB PROFILES, SEE SHEETS 57 & 58
FOR RETAINING WALL -RW18-, SEE SHEETS W-19
FOR RETAINING WALL -RW19-, SEE SHEETS W-20
FOR RETAINING WALL -RW20-, SEE SHEETS W-21

11/14/2018
I-4700B_HYD_PRM_PSH_29.dgn
HNTB

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 82 OF 97



PROFILE

BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4700
I-26
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

11/14/2018
I4700B_HYD_PRM_PSH_29A_BPFL.dgn
HNTB

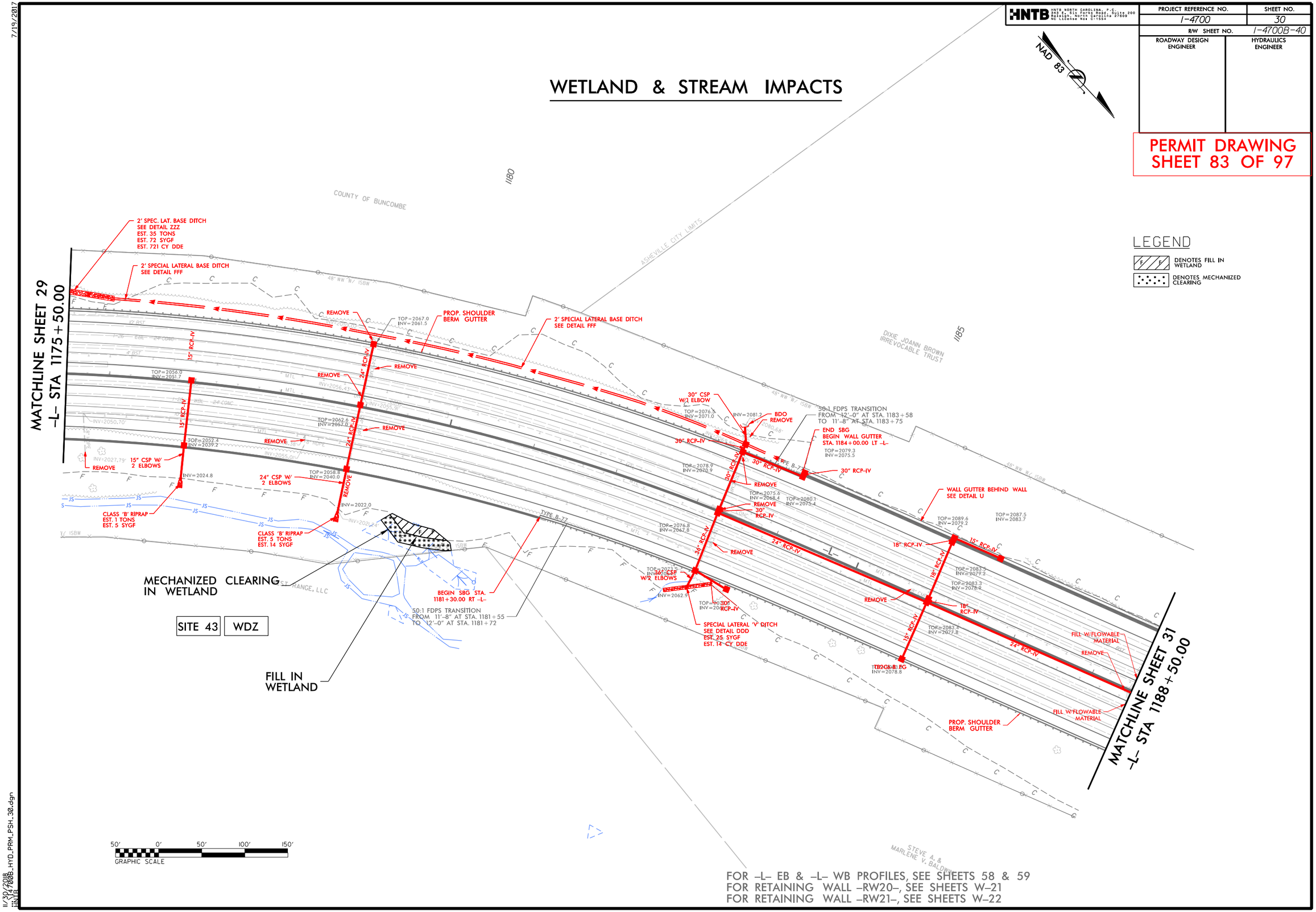
7/19/2017

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	30
R/W SHEET NO.	I-4700B-40
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 83 OF 97

WETLAND & STREAM IMPACTS



FOR -L- EB & -L- WB PROFILES, SEE SHEETS 58 & 59
FOR RETAINING WALL -RW20-, SEE SHEETS W-21
FOR RETAINING WALL -RW21-, SEE SHEETS W-22

11/30/2018
I-4700B_HYD_PRM_PSH_30.dgn
HNTB

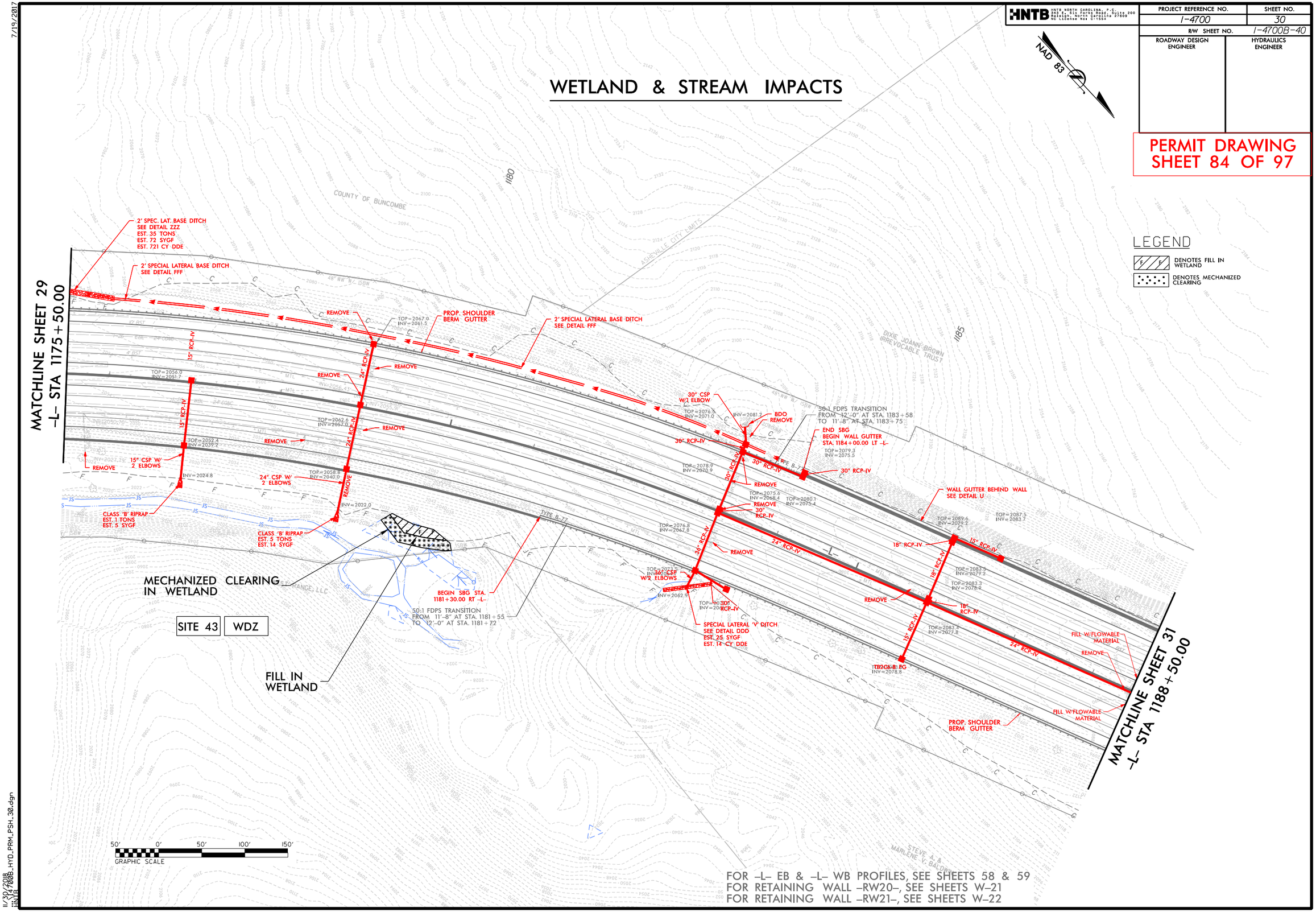
7/19/2017

HNTB HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	30
R/W SHEET NO.	I-4700B-40
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 84 OF 97

WETLAND & STREAM IMPACTS



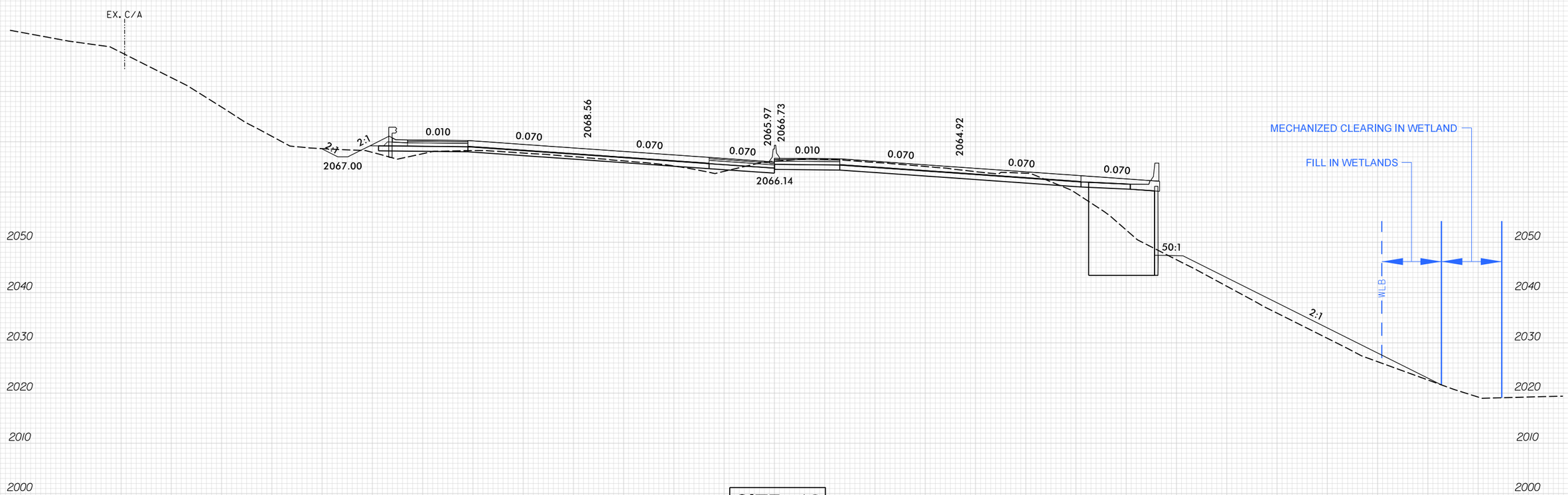
FOR -L- EB & -L- WB PROFILES, SEE SHEETS 58 & 59
FOR RETAINING WALL -RW20-, SEE SHEETS W-21
FOR RETAINING WALL -RW21-, SEE SHEETS W-22

11/30/2018
I-4700B_HYD_PRM_PSH_30.dgn
HNTB

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 85 OF 97

WETLAND CROSS SECTIONS



SITE 43
-L3- 1180+00.00

SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4700
I-26
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

6/23/16

11/30/2018
I-4700B_HYD_PRM_XPL.dgn
HNYB

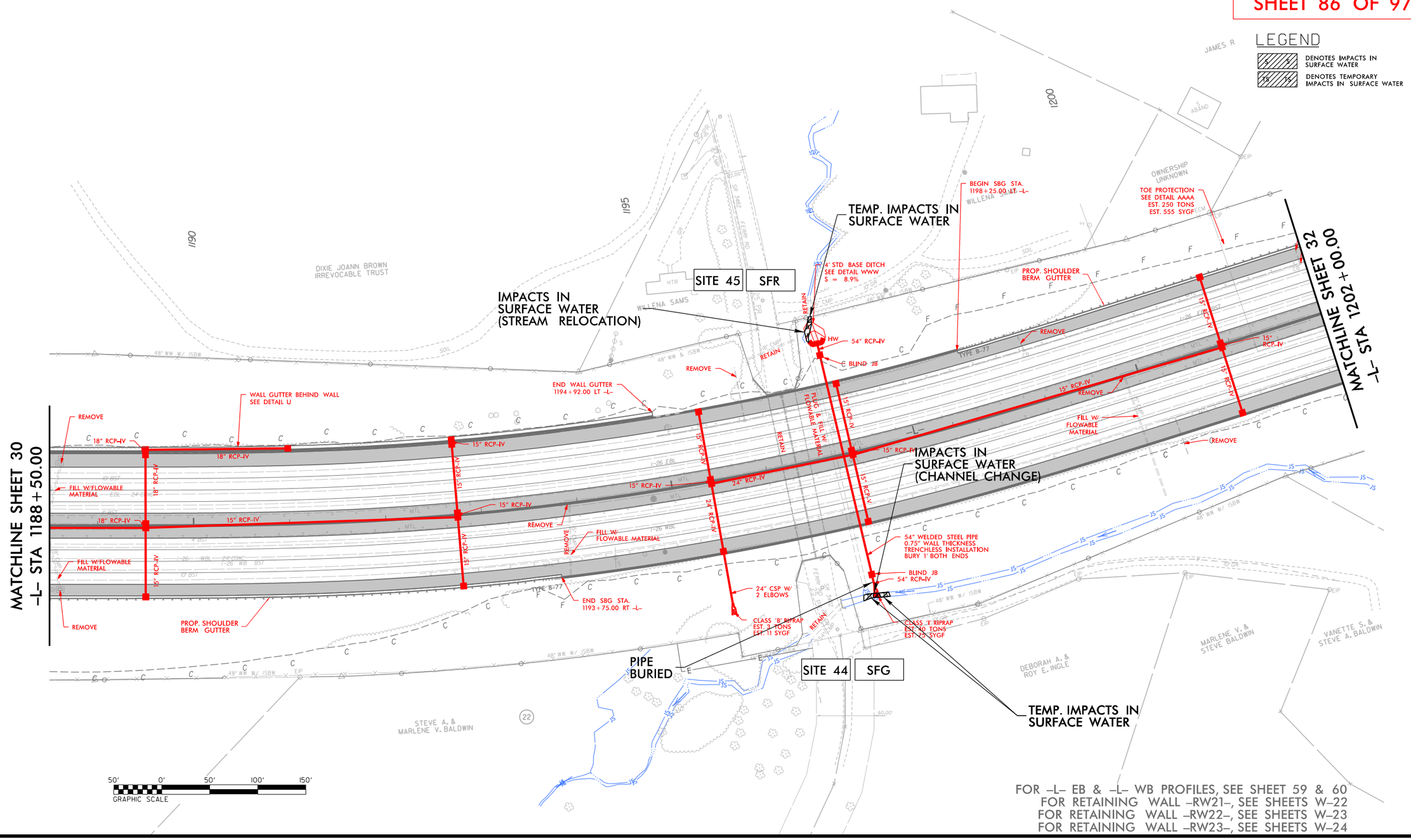
7/19/2017

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	31
R/W SHEET NO.	I-4700B-41
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 86 OF 97

WETLAND & STREAM IMPACTS



FOR -L- EB & -L- WB PROFILES, SEE SHEET 59 & 60
FOR RETAINING WALL -RW21-, SEE SHEETS W-22
FOR RETAINING WALL -RW22-, SEE SHEETS W-23
FOR RETAINING WALL -RW23-, SEE SHEETS W-24

11/30/2018
I-4700B_HYD_PRM_PSH_31.dgn
HNTB

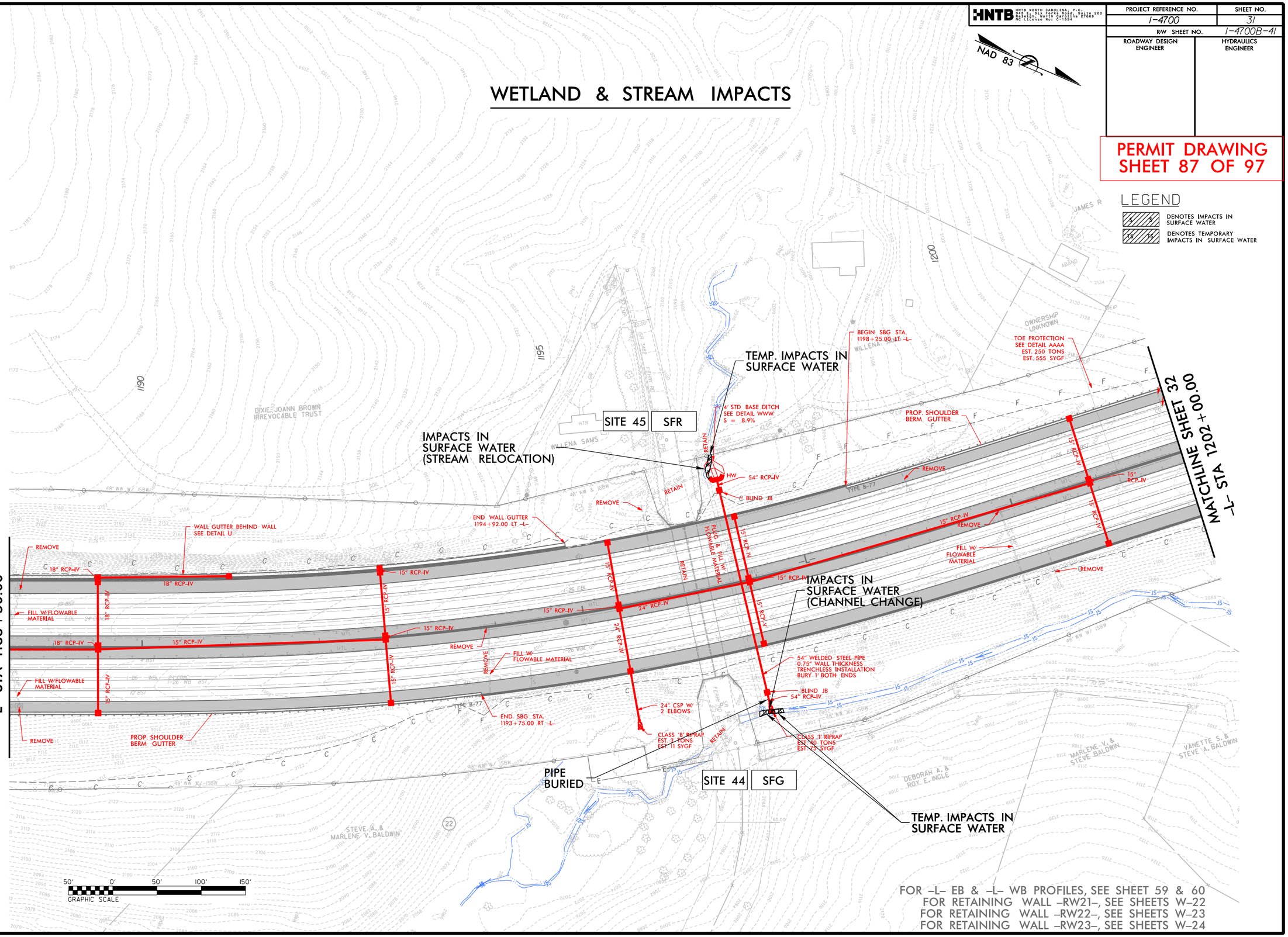
7/19/2017

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	31
R/W SHEET NO.	I-4700B-41
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 87 OF 97

WETLAND & STREAM IMPACTS



FOR -L- EB & -L- WB PROFILES, SEE SHEET 59 & 60
FOR RETAINING WALL -RW21-, SEE SHEETS W-22
FOR RETAINING WALL -RW22-, SEE SHEETS W-23
FOR RETAINING WALL -RW23-, SEE SHEETS W-24

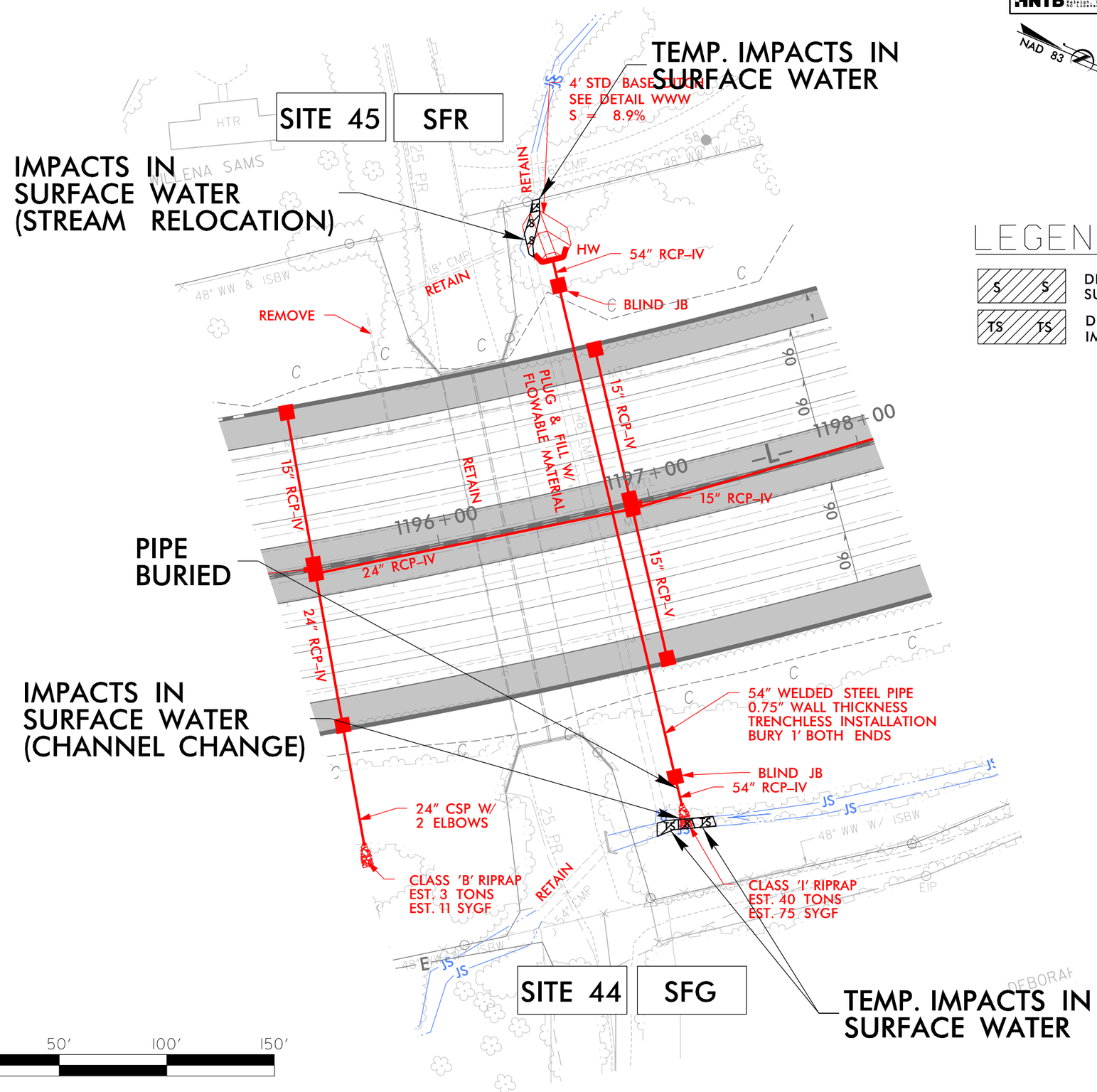
11/30/2018
I-4700B_HYD_PRM_PSH_31.dgn
HNTB

HNTB NORTH CAROLINA, P.C.
343 W. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	31
R/W SHEET NO.	I-4700B-41
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

PERMIT DRAWING
SHEET 88 OF 97



LEGEND

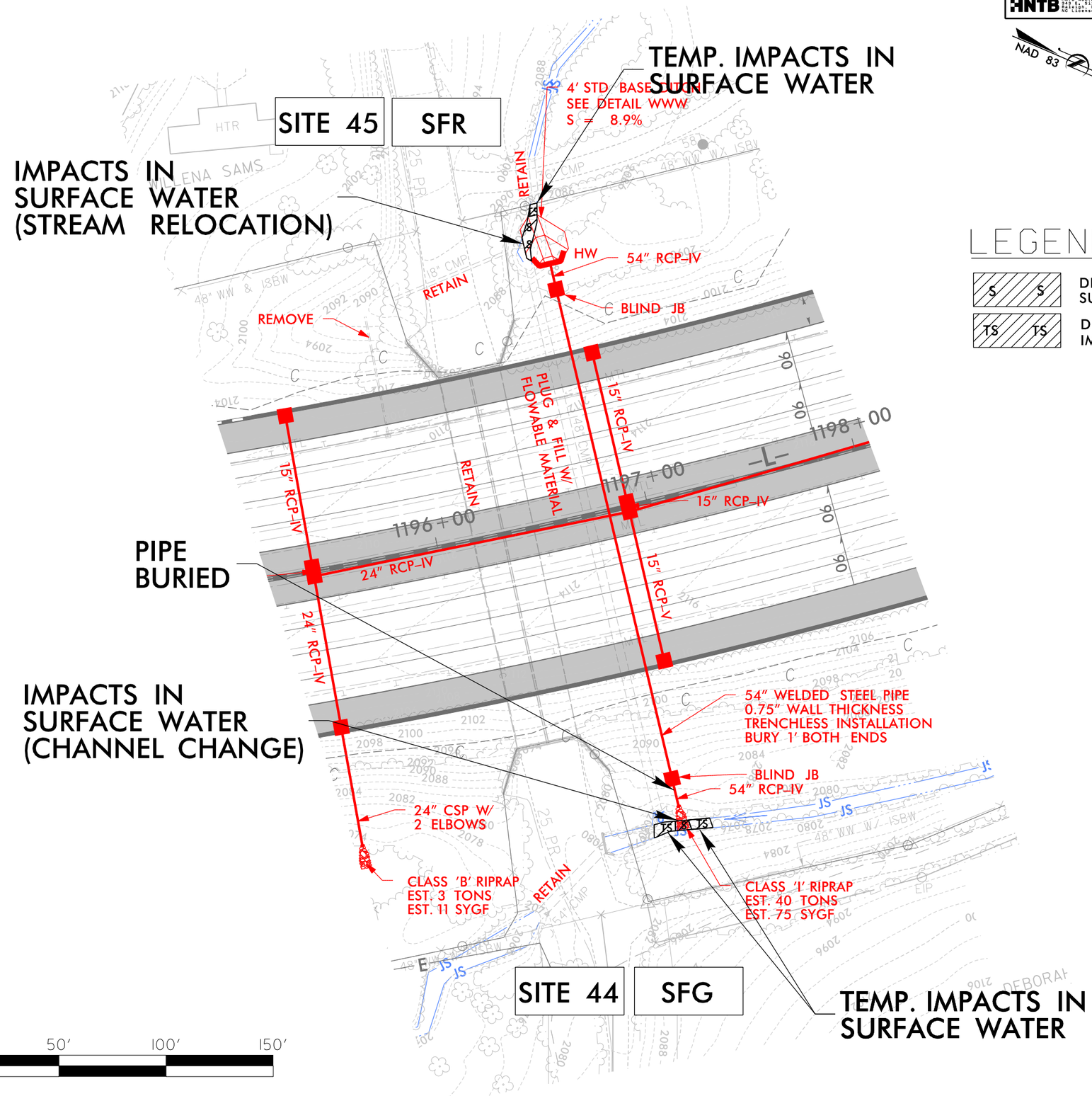
S S	DENOTES IMPACTS IN SURFACE WATER
TS TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

HNTB NORTH CAROLINA, P.C.
343 W. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	31
R/W SHEET NO.	I-4700B-41
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

PERMIT DRAWING
SHEET 89 OF 97



LEGEND

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

7/19/2017

HNTB NORTH CAROLINA, P.C.
343 W. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	32
R/W SHEET NO.	I-4700B-42
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

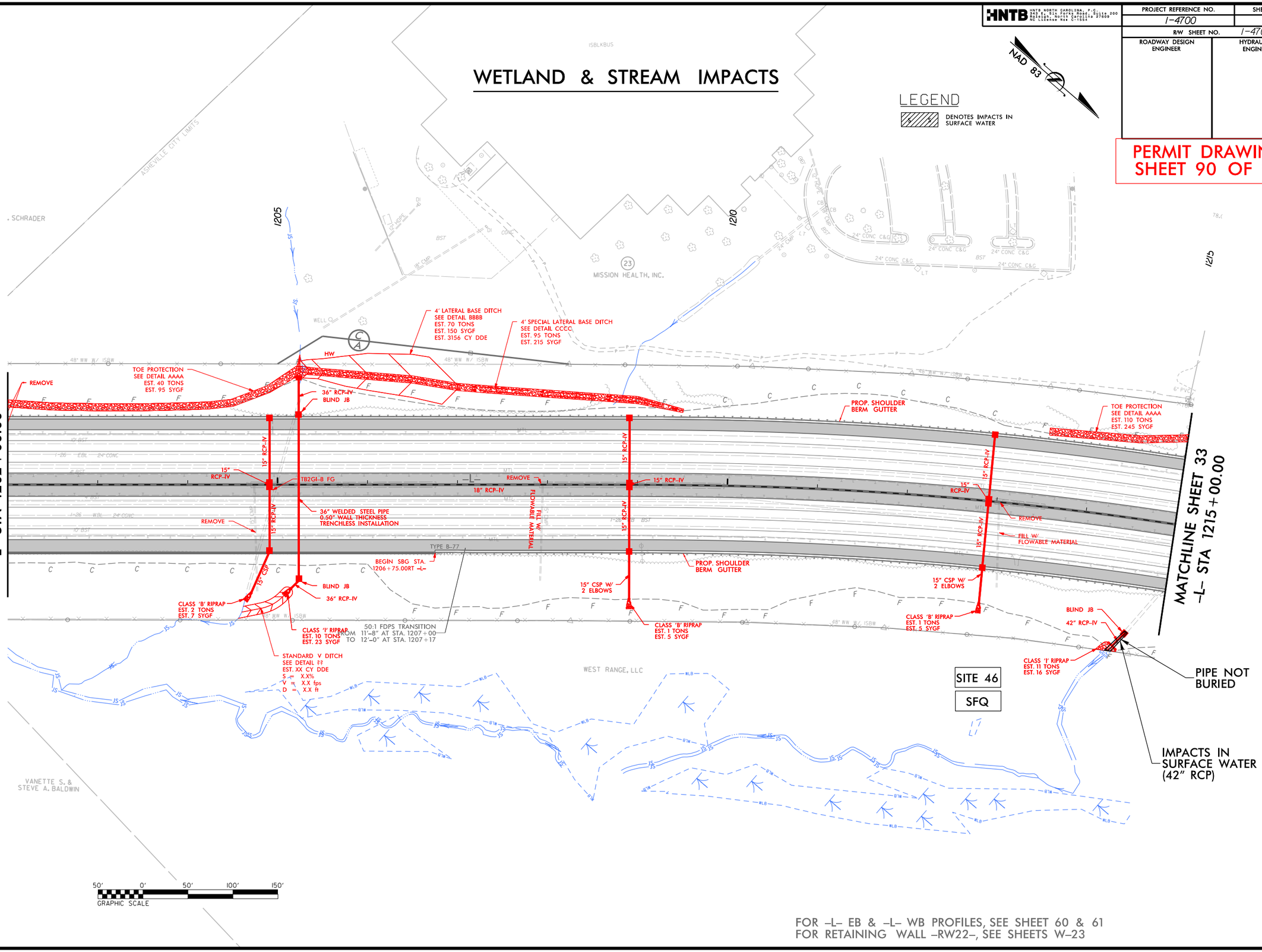
PERMIT DRAWING
SHEET 90 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

DENOTES IMPACTS IN SURFACE WATER



FOR -L- EB & -L- WB PROFILES, SEE SHEET 60 & 61
FOR RETAINING WALL -RW22-, SEE SHEETS W-23

11/30/2018
I-4700B_HYD_PRM_PSH_32.dgn
HNTB

7/19/2017

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	32
R/W SHEET NO.	I-4700B-42
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 91 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

DENOTES IMPACTS IN SURFACE WATER

MATCHLINE SHEET 31
-L- STA 1202+00.00

MATCHLINE SHEET 33
-L- STA 1215+00.00

1205

1210

1215

ASHEVILLE CITY LIMITS

SCHRADER

MISSION HEALTH, INC.

WEST RANGE, LLC

VANETTE S. & STEVE A. BALDWIN

4' LATERAL BASE DITCH
SEE DETAIL BBBB
EST. 70 TONS
EST. 150 SYGF
EST. 3156 CY DDE

4' SPECIAL LATERAL BASE DITCH
SEE DETAIL CCCC
EST. 95 TONS
EST. 215 SYGF

TOE PROTECTION
SEE DETAIL AAAA
EST. 40 TONS
EST. 95 SYGF

REMOVE

HW

36" RCP-IV
BLIND JB

15" RCP-IV

15" RCP-IV

TB2GI-8 FG

REMOVE

18" RCP-IV

15" RCP-IV

36" WELDED STEEL PIPE
0.60" WALL THICKNESS
TRENCHLESS INSTALLATION

FILL W/ FLOWABLE MATERIAL

REMOVE

TYPE B-77

BEGIN SBG STA.
1206+75.00RT -L-

15" CSP

BLIND JB

36" RCP-IV

CLASS 'B' RIPRAP
EST. 2 TONS
EST. 7 SYGF

CLASS 'I' RIPRAP
EST. 10 TONS
EST. 23 SYGF

50:1 FDPS TRANSITION
FROM 11'-8" AT STA. 1207+00
TO 12'-0" AT STA. 1207+17

STANDARD V DITCH
SEE DETAIL ??
EST. XX CY DDE
S = X.X%
V = X.X fps
D = X.X ft

PROP. SHOULDER
BERM GUTTER

15" CSP W/
2 ELBOWS

CLASS 'B' RIPRAP
EST. 1 TONS
EST. 5 SYGF

TOE PROTECTION
SEE DETAIL AAAA
EST. 110 TONS
EST. 245 SYGF

15" RCP-IV

15" RCP-IV

REMOVE

FILL W/
FLOWABLE MATERIAL

15" CSP W/
2 ELBOWS

CLASS 'B' RIPRAP
EST. 1 TONS
EST. 5 SYGF

BLIND JB

42" RCP-IV

CLASS 'I' RIPRAP
EST. 11 TONS
EST. 16 SYGF

SITE 46

SFQ

PIPE NOT BURIED

IMPACTS IN SURFACE WATER (42" RCP)

50' 0' 50' 100' 150'
GRAPHIC SCALE

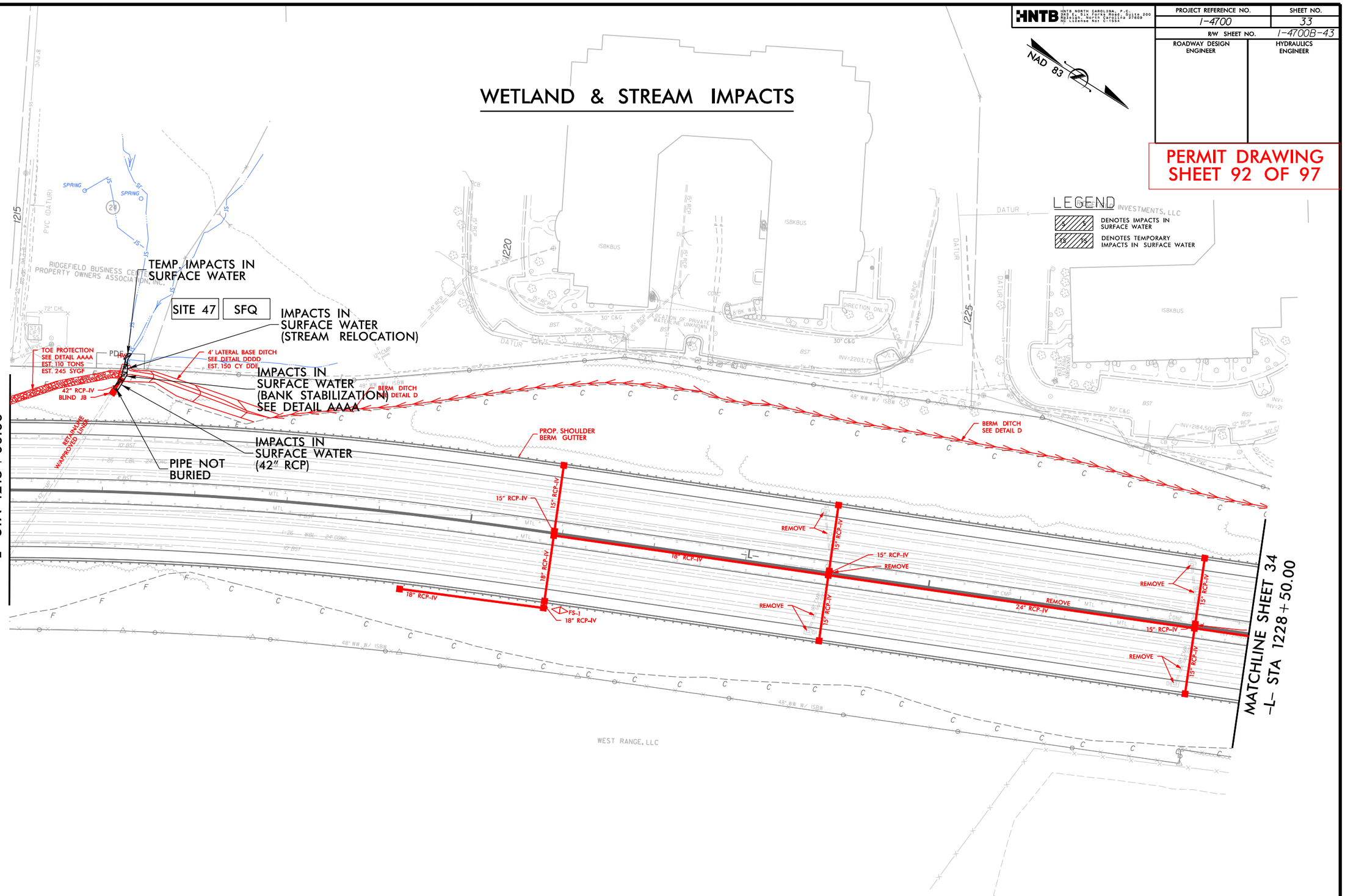
FOR -L- EB & -L- WB PROFILES, SEE SHEET 60 & 61
FOR RETAINING WALL -RW22-, SEE SHEETS W-23

11/30/2016
I-4700B_HYD_PRM_PSH_32.dgn
HNTB

HNTB	PROJECT REFERENCE NO.	SHEET NO.
HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554	I-4700	33
	R/W SHEET NO.	I-4700B-43
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 92 OF 97

WETLAND & STREAM IMPACTS



FOR -L- EB & -L- WB PROFILES, SEE SHEETS 61 & 62

7/19/2017

11/30/2018
I-4700B_HYD_PRM_PSH_33.dgn
HNTB

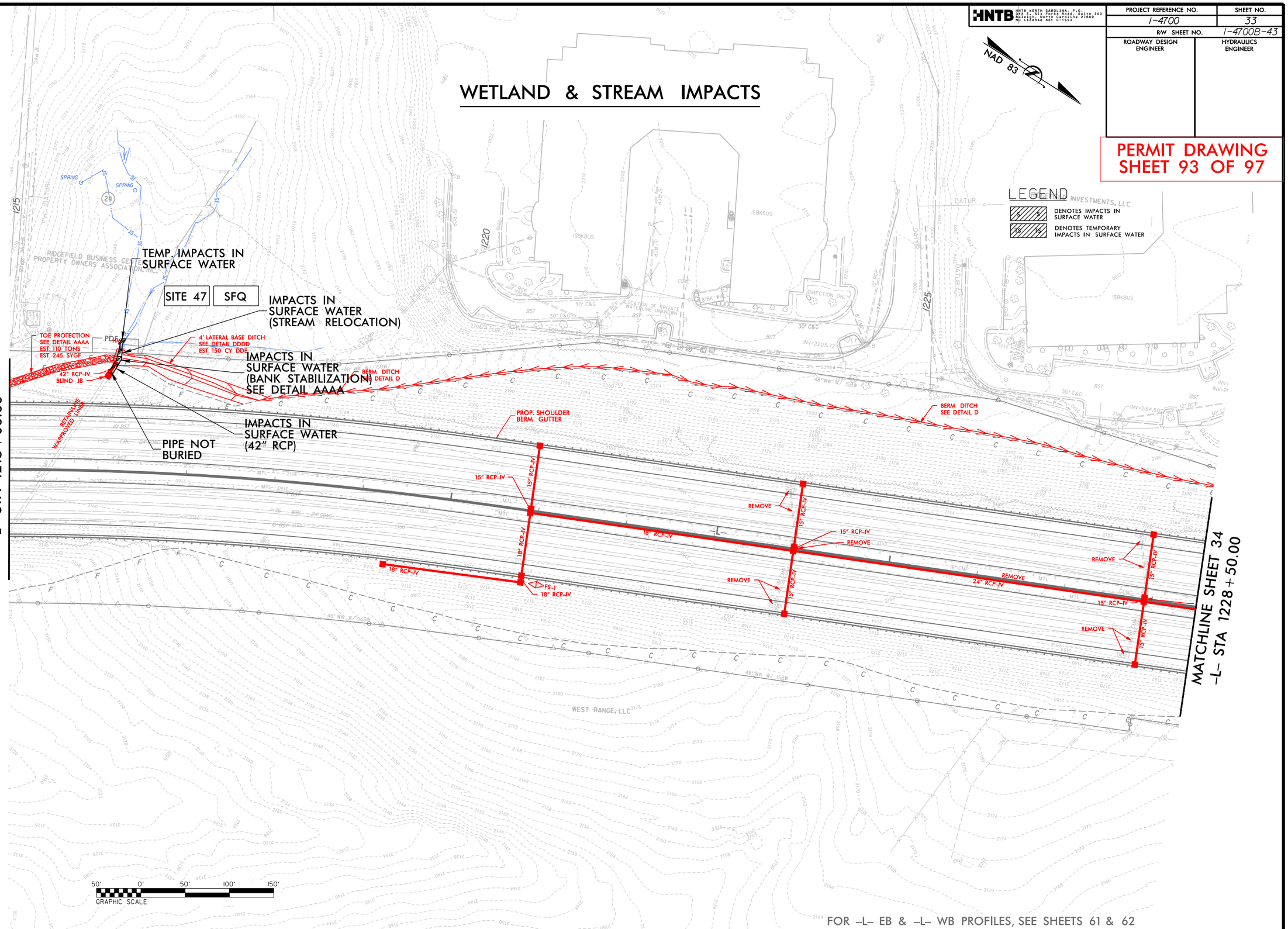
7/19/2017

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	33
R/W SHEET NO.	I-4700B-43
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 93 OF 97

WETLAND & STREAM IMPACTS



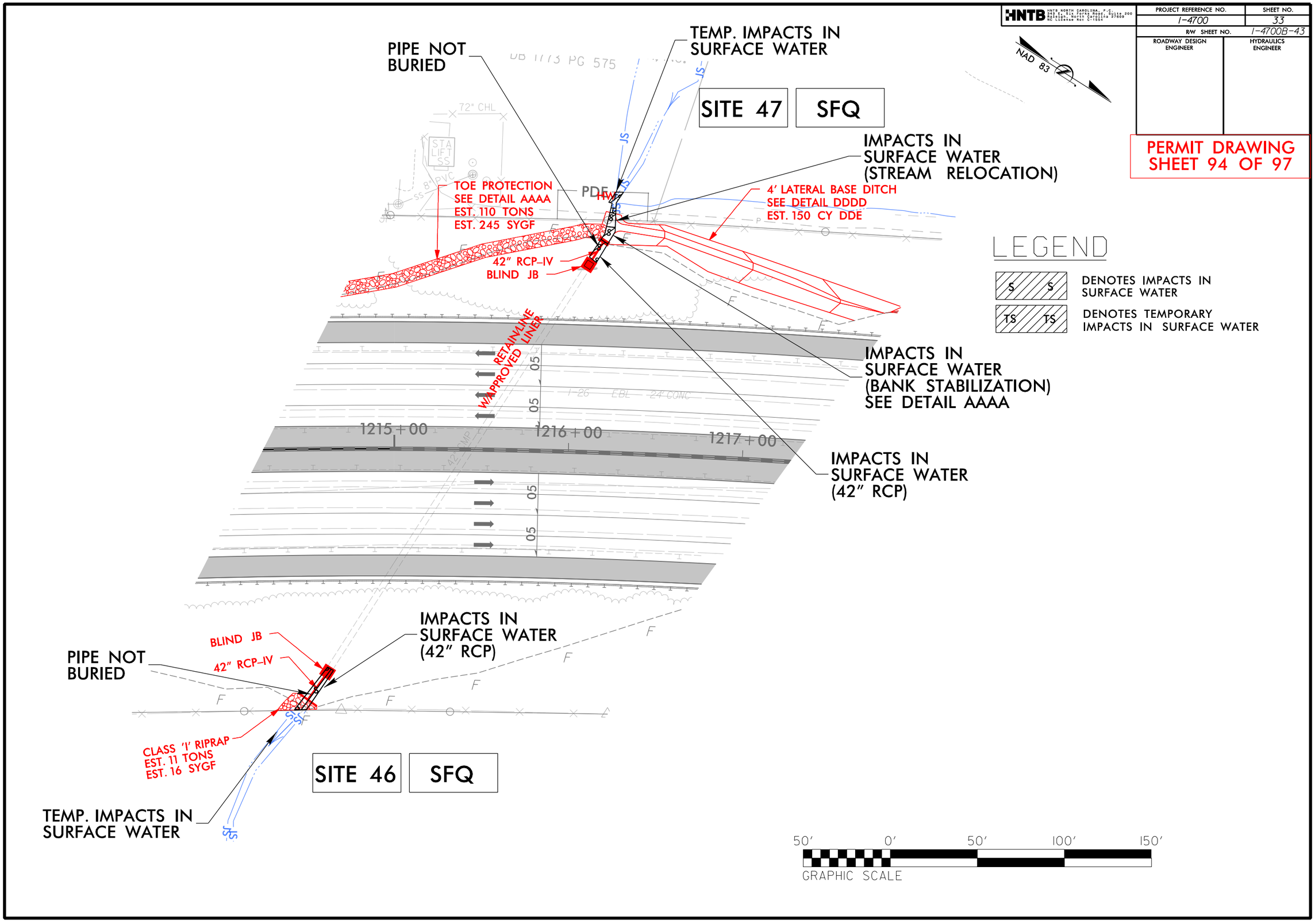
FOR -L- EB & -L- WB PROFILES, SEE SHEETS 61 & 62

11/30/2016
I-4700B_HYD_PRM_PSH_33.dgn
HNTB

PROJECT REFERENCE NO.	SHEET NO.
I-4700	33
R/W SHEET NO.	I-4700B-43
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C.
343 W. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PERMIT DRAWING
SHEET 94 OF 97



PROJECT REFERENCE NO.	SHEET NO.
I-4700	33
R/W SHEET NO.	I-4700B-43
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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Raleigh, North Carolina 27609
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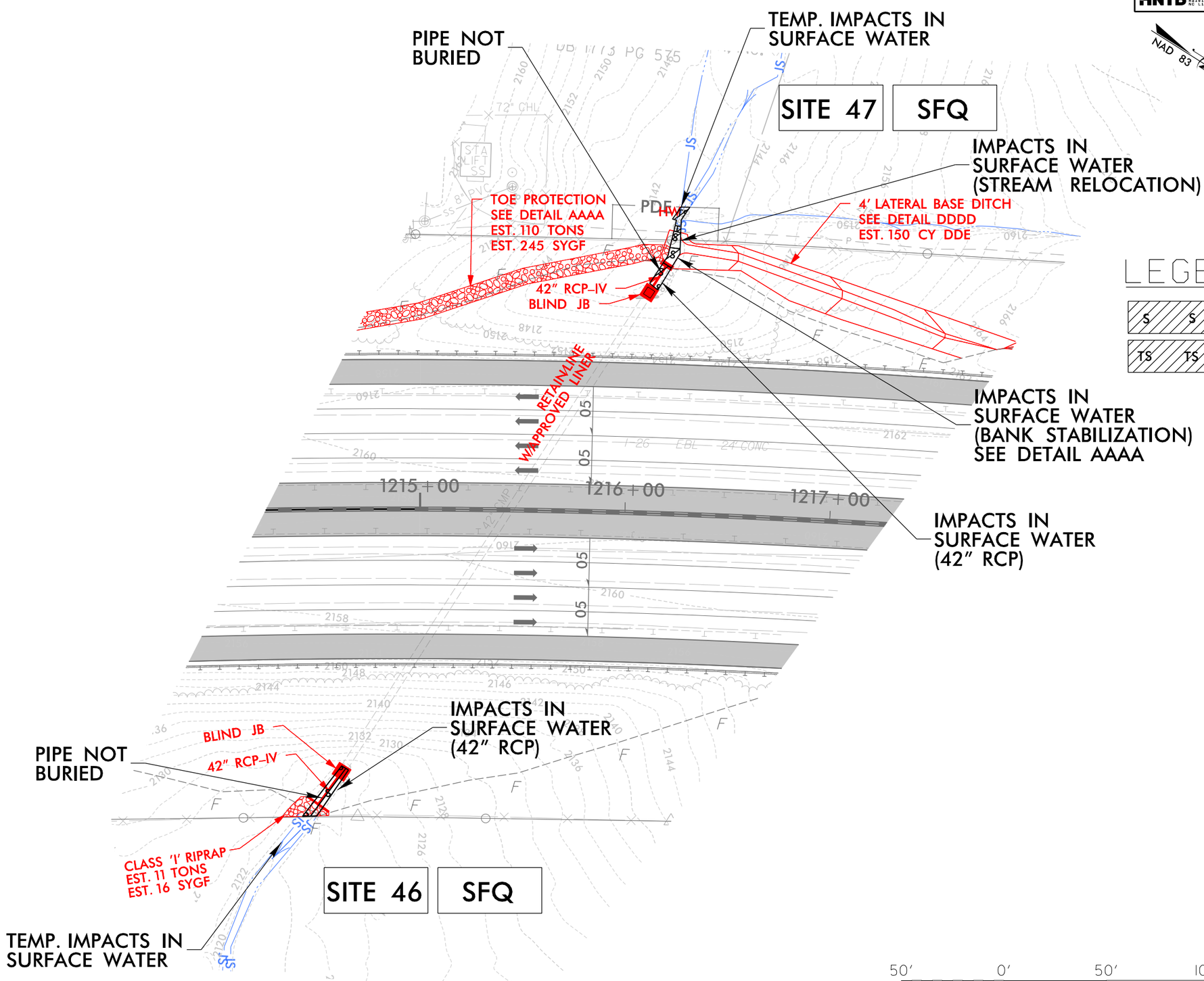
PERMIT DRAWING
SHEET 95 OF 97



LEGEND

S S	DENOTES IMPACTS IN SURFACE WATER
TS TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 0' 50' 100' 150'
GRAPHIC SCALE

WETLAND AND SURFACE WATER IMPACTS SUMMARY

Site No.	Stream Name Stream ID	Station (From/To)	Structure Size / Type	WETLAND IMPACTS Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	UT to French Broad River / SDI	Y13RPB 11+26 to 15+64 LT	Stream relocated to Proposed Roadside ditch Due to Roadway Widening								342		
1A	UT to French Broad River / SDD	WBL 881+50 to 886+10 RT	Stream relocated to Toe Protection due to Roadway Widening								452	10	
2	UT to French Broad River / SDC	WBL 887+41 to 887+62 RT	6' x 6' RCBC Culvert Extension Due to Roadway Widening								25		
2	UT to French Broad River / SDC	WBL 887+20 to 887+45 RT	Bank Stabilization at inlet of 6' X 6' RCBC								22	10	
3	UT to French Broad River / SDC	EBL 888+63 to 889+10 LT	Channel change*1 at upstream and downstream of Existing Culvert								45		
3	UT to French Broad River / SDC	EBL 889+04 to 889+30 LT	Bank Stabilization at outlet of Existing Culvert								44	3	
4	UT to French Broad River / SDE	WBL 914+14 to 914+38 RT	66" RCP between Existing 66" RCP and 66" CMP in the WBL								55		
4	UT to French Broad River / SDE	WBL 913+64 to 913+93 RT	Bank Stabilization at inlet of 66" RCP								34	10	
5	UT to French Broad River / SDE	EBL 914+15 to 914+22 Median	66" RCP between Existing 66" CMP and 66" CMP in the Median								28		
6	UT to French Broad River / SDE	EBL 914+20 to 914+30 LT	Channel Change*1 between outlet of Existing 66" CMP and proposed 66" WSP and Existing 48" CMP								29		
7	UT to French Broad River / SDF	WBL 932+16 to 932+22 RT	54" RCP Extension due to Roadway Widening									27	
8	UT to French Broad River / SDF	EBL 931+83 to 931+95 Median	54" CSP between two Existing 54" RCP in the Median								38		
9	UT to French Broad River / SDF	EBL 932+08 to 932+20 LT	54" RCP Extension Due to Roadway Widening and Conc. Energy Dissipator								30		
9	UT to French Broad River / SDF	EBL 932+14 to 932+23 LT	Bank Stabilization at the outlet of Proposed 54" RCP Extension								12	11	
10	WBR	WBL 936+68 to 938+29 RT	Special Cut Ditches on both side of Inlet of Proposed 24" WSP and Existing 66" RCP	0.03		0.03	0.03						
11	WBV	EBL 938+81 to 952+45 LT	RipRap Outlet Protection of Proposed 24" CSP and Existing 66" RCP	0.15		< 0.01	0.37						
12	UT to French Broad River / SFX / WBU	WBL 942+31 to 943+22 RT	30" RCP Extension Due to Roadway Widening			0.01	0.02				20	10	
13	UT to French Broad River / SDK / WBW	WBL 952+88 to 954+00 RT	66" RCP Extension Due to Roadway Widening / Fill and Excavation in wetland Due to Roadway Widening	0.07		0.02	< 0.01				40	10	
14	UT to French Broad River / SDK	EBL 952+66 to 952+77 LT	66" CSP Extension Due to Roadway Widening								14		
14	UT to French Broad River / SDK	EBL 952+72 to 952+80 LT	Channel Change*1 at downstream of 66" CSP Extension								22	7	
15	Powell Creek / SDN	WBL 983+40 to 983+73 RT	Bank Stabilization at inlet of Proposed 2@ 10' X 10' RCBC								42	10	
15	Powell Creek / SDN	WBL 983+67 to 983+80 RT	Existing 10' X10' RCBC Extension Due to Roadway Widening								12		
16	Powell Creek / SDN	EBL 984+63 to 984+90 LT	Existing 10' X10' RCBC Extension Due to Roadway Widening								16		
16	Powell Creek / SDN	EBL 984+69 to 985+07 LT	Bank Stabilization at outlet of Proposed 2@ 10' X 10' RCBC								82	13	
17	UT to French Broad River / SDU	L 1027+43 to 1027+51 RT	Existing 48" RCP Extension Due to Roadway Widening								16		
17	UT to French Broad River / SDU	L 1027+47 to 1027+ 58 RT	Bank Stabilization at inlet of 2 @ 48" RCP								10	10	
18	UT to French Broad River / SDU	L 1026+47 to 1026+68 LT	Channel Change*1 at outlet of Existing and Proposed 48" CMP and WSP								22	10	
18 A	French Broad River	L 1019+98 to 1020+50 LT	Channel Change*1 at outlet of Existing 8' X 8' Conc. Box Culvert								10	10	
19	WCH	L 1031+14 to 1035+27 LT	Fill in Wetlands Due to Roadway Widening	< 0.01			0.06						
20	UT to French Broad River / SDV	L 1042+57 to 1042+72 RT	Bank Stabilization at outlet of proposed 42" RCP due to Existing 42" CMP Extension and Proposed 42" WSP								18	10	
20	UT to French Broad River / SDV	L 1042+69 to 1042+91 RT	Existing 42" CMP Extension Due to Roadway Widening and Proposed 42" WSP								33		
21	UT to French Broad River / SDW	L 1048+84 to 1049+00 RT	Existing 60" CMP Extension Due to Roadway Widening and Proposed 42" RCP								27		
21	UT to French Broad River / SDW	L 1048+93 to 1049+20 RT	Channel Change*1 at inlet of Proposed 60" CMP Extension and Proposed 42" RCP								24	12	
22	WCH	L 1047+74 to 1047+84	Excavation in Wetland Due to Roadway Widening			< 0.01	0.01						
TOTALS*:				0.26		0.07	0.50				1564	173	

*Rounded totals are sum of actual impacts

NOTES:
*1: Emedding Riprap

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
12/3/2018
Buncombe & Henderson County
I-4700

Revised 2018 Feb

WETLAND AND SURFACE WATER IMPACTS SUMMARY

Site No.	Stream Name Stream ID	Station (From/To)	Structure Size / Type	WETLAND IMPACTS Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
23	UT to French Broad River / SDX	WBL 1082+23 to 1085+46 RT	Stream relocated to Proposed Lateral 'V' ditch due to Roadway Widening								312	10	
23	UT to French Broad River / SDX	WBL 1090+35 to 1090+65 RT	Channel change*1 at the Outlet of Proposed 30" CSP and Conc. Energy Dissipator								9	20	
23	UT to French Broad River / SDX	WBL 1091+34 to 1092+04 RT	Proposed 48" WSP with 48" RCP Extension								62	10	
24	UT to French Broad River / SDX	WBL 1094+12 to 1094+42 median	Channel Change*1 at Outlet of Proposed 48" RCP								24	10	
24A	UT to French Broad River / SDX	EBL 1097+18 to 1097+46 median	Channel Change*1 at Outlet of Proposed 30" WSP with 30" RCP Extension								7	20	
25	UT to French Broad River / SEU	EBL 1097+19 to 1097+34 LT	Proposed 30" WSP with 30" RCP Extension								15	4	
26	UT to French Broad River / SDX	EBL 1105+42 to 1105+52 RT	Stream relocated to Proposed Standard Base Ditch								32	5	
27	UT to French Broad River / SDY / WCV	WBL 1104+37 to 1104+51 RT	Existing 30" CMP with 30" RCP Extension			< 0.01					19	13	
28	UT to French Broad River / SDY	WBL 1104+88 to 1105+14 LT	Channel Change*1 at Outlet of Proposed 24" CSP and Conc. Energy Dissipator								9	18	
29	UT to French Broad River / SDX	EBL 1106+74 to 1107+07 RT	Temp. Impact for Constructing Standard Base Ditch									30	
29	UT to French Broad River / SDX	WBL 1107+12 to 1107+38 LT	Channel Change*1 at Outlet of Proposed 24" WSP with 24" CSP Extension								7	20	
30	UT to French Broad River / SDX	WBL 1115+40 to 1115+70 LT	Channel Change*1 at Outlet of 24" CSP and Conc. Energy Dissipator								9	20	
30	UT to French Broad River / SDX	EBL 1118+02 to 1118+30 RT	Channel Change*1 at Outlet of Proposed 15" CSP and Conc. Energy Dissipator								9	20	
30	UT to French Broad River / SDX	WBL 1118+34 to 1118+65 LT	Channel Change*1 at Outlet of 15" CSP and Conc. Energy Dissipator								9	18	
30	UT to French Broad River / SDX	WBL 1118+62 to 1119+51 LT	Proposed 66" WSP with 66" RCP Extension								77	10	
31	UT to French Broad River / SDX	WBL 1120+78 to 1121+11 RT	Proposed 66" WSP with 66" RCP Extension								38	10	
32	WCW	WBL 1123+76 to L 1137+72 RT	Fill in Wetland Due to Roadway Widening	0.37			0.30						
32	UT to French Broad River / SEQ	WBL 1131+60 to 1131+94 RT	Proposed 60" WSP with 60" RCP Extension								57	7	
33	UT to French Broad River / SEQ	EBL 1131+02 to 1131+11 LT	Stream relocated to Proposed 60" WSP with 60" RCP Extension								24	10	
33	UT to French Broad River / SEQ	EBL 1131+00 to 1131+12 LT	Proposed 60" WSP with 60" RCP Extension								30		
34	UT to French Broad River / SED	L 1138+18 to 1138+32 LT	Stream relocated to Standard Base Ditch at the Outlet of Proposed 36" RCP								30	12	
34	UT to French Broad River / SED	L 1138+29 to 1138+47 LT	Existing 36" CMP Extension with a 36" RCP Due to Roadway Widening								25		
35	WCZ	L 1138+55 to 1139+39 RT	Fill in Wetland Due to Roadway Widening	0.02									
36	UT to French Broad River / SEF	L 1147+02 to 1147+09 LT	Channel Change*1 at Outlet of Proposed 42" RCP								8	10	
36	UT to French Broad River / SEF	L 1146+98 to 1147+07 LT	Existing 42" CMP Extension with a 42" RCP Due to Roadway Widening								28		
37	UT to French Broad River / SEF	L 1148+35 to 1148+64 RT	Channel Change*1 at the Outlet of Proposed 15" CSP and Conc. Energy Dissipator								9	20	
37	UT to French Broad River / SEF	L 1149+17 to 1151+55 RT	Stream relocated to Proposed 4' Lateral Base Ditch due to Roadway Widening								356	10	
38	UT to French Broad River / SEE	L 1153+90 to 1154+10 RT	Stream relocated to Proposed 4' Lateral Base Ditch due to Roadway Widening								18	10	
38	UT to French Broad River / SEE	L 1155+35 to 1155+64 RT	Bank Stabilization at outlet of Proposed 15" CSP and Conc. Energy Dissipator								9	20	
38	UT to French Broad River / SEE	L 1156+95 to 1158+01 RT	Temp. Pipe for Access Road									106	
38	UT to French Broad River / SEE	L 1157+29 to 1157+38 RT	Channel Change*1 at Outlet of Proposed 30" CSP and Conc. Energy Dissipator								9		
39	WFG	L 1153+55 to 1153+89 LT	Fill in Wetland Due to Roadway Widening	< 0.01		< 0.01							
39	UT to French Broad River / SEE	L 1153+56 to 1153+67 LT	Proposed 24" RCP								33		
39	UT to French Broad River / SEE	L 1153+63 to 1153+77 LT	Stream relocated to Retaining Wall Gutter								22	10	
40	French Broad River	L 1161+33 to 1165+06	Bridge									245	
41	UT to French Broad River / SFG	L 1164+95 to 1171+67 RT	Temporary Pipe Due to Acess Road									662	
41	UT to French Broad River / SFG	L 1172+85 to 1173+15 RT	Channel Change*1 at Outlet of Proposed 15" CSP and Conc. Energy Dissipator								9	20	
42	UT to French Broad River / SFO	L 1169+93 to 1170+02 LT	Temporary Pipe Due to Acess Road									9	
43	WDZ	L 1179+54 to 1180+29 RT	Fill in Wetland Due to Roadway Widening	0.02			0.02						
44	UT to French Broad River / SFG	L 1196+69 to 1196+95 RT	Channel Change*1 at Outlet of Proposed 54" WSP with 54" RCP Extension								8	20	
45	UT to French Broad River / SFR	L 1196+70 to 1196+81 LT	Stream relocated to Proposed 4' Standard Base Ditch at Outlet of Proposed 54" WSP with 54" RCP Extension								21	6	
46	UT to French Broad River / SFQ	L 1214+30 to 1214+64 RT	Existing 42" CMP Extension with a 42" RCP Due to Roadway Widening								29		
47	UT to French Broad River / SFQ	L 1216+09 to 1216+19 LT	Existing 42" CMP Extension with a 42" RCP Due to Roadway Widening								12		
47	UT to French Broad River / SFQ	L 1216+15 to 1216+22 LT	Bank Stabilization at end of Toe Protection								9		
47	UT to French Broad River / SFQ	L 1216+18 to 1216+26 LT	Stream relocated to Proposed 4' Lateral Base Ditch due to Roadway Widening								8	13	
TOTALS*:				0.41		< 0.01	0.32				1392	1428	
TOTALS FOR I-4700:				0.67		0.07	0.82				2956	1601	

*Rounded totals are sum of actual impacts

NOTES:
Site 40: Impacts of interior bents are 400 SF
*1: Emedding Riprap

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