STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J. ERIC BOYETTE
SECRETARY

February 2, 2023

Wilmington Regulatory Field Office
US Army Corps of Engineers
3331 Heritage Trade Drive, Suite 105
Wake Forest, North Carolina 27587

Attention: Mr. Eric Alsmeyer
NCDOT Coordinator

Subject: Application for a Section 404 Individual Permit and Section 401 Water Quality Certification for the proposed construction of a new route from SR 1969 (Piney Grove Road) to NC 105 (North Main Street) in Kernersville, Forsyth County. TIP U-6003. Debit $570 from WBS 47138.1.1. USACE Action ID SAW-2018-00393. Service Log #22-229.

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes construction of a new route approximately 1.0 miles long from SR 1969 (Piney Grove Road) to NC 150 (North Main Street) in Kernersville, Forsyth County (U-6003). The project is scheduled to let for construction on November 20, 2023.

The purpose of this letter is to request approval for a Section 404 Individual Permit and Section 401 Water Quality certification. In addition to this cover letter, this application package includes the following:

- Alternative impact comparison
- USACE Jurisdictional Determination Letter (SAW-2018-00393)
- DWR Jurisdictional Determination Letter
- SA NC SAM rating form
- DMS mitigation acceptance letter
- Historic architecture and landscapes no survey required form August 7, 2017
- Historic architecture and landscapes no survey requited form January 5, 2023
- No architectural resources expanded study area email
- Archeological survey required form
- No archeological survey required form study area expansion
- No NRHP archeological sites present form
- NCDOT request for Catawba tribal response letter
- Catawba tribal coordination response letter

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION 9
375 SILAS CREEK PARKWAY
WINSTON SALEM, NC 27127

TELEPHONE: 336-747-7800
FAX: 336-761-2044

WEBSITE:NCDOT.GOV

Location:
375 SILAS CREEK PARKWAY
WINSTON SALEM, NC 27127

- USFWS Information for Planning and Consultation (IPaC) report
- USFWS Conference Opinion for the tricolored Bat
- ENG Form 4345
- Stormwater management plan
- Final permit plans and stormwater management plan
- Final roadway plans
- Meeting minutes from permit pre-application meeting
- DWR stormwater comments and NCDOT responses

Purpose and Need
The current roadway network to downtown Kernersville consists of several primary north-south facilities with little east-west connectivity. This lack of connectivity limits mobility in downtown Kernersville and the surrounding area.

The intersection of SR 2030 (Linville Springs Road) at Piney Grove Road is projected to have a failing Level of Service (LOS) in 2040 AM & PM peak hours without any improvements. The existing capacity of the adjacent two-lane highways, NC 150 and Piney Grove Road will be overwhelmed by growing demands as development, as indicated by the traffic forecast, occurs along NC 150 in the project area.

The purpose is to provide east-west connectivity between Piney Grove Road and NC 150, and to improve the operations of the intersection of Linville Springs Road at Piney Grove Road. With the proposed connectivity provided, this project serves as a stand-alone improvement that does not require additional facility upgrades.

Alignment Alternatives Studied
Two alignment alternatives were studied. Alternative 1 is the more northern horizontal alignment and Alternative 2 is the more southern horizontal alignment. Both alternatives were studied with a 23' raised median for initial comparison of impacts. See Table 1 for impact comparison and the Alternative Impact Comparison attachment.

Alternative 1 is NCDOT preferred alternative primarily based on the following:

- Alternative 1 alignment provides minimization of right of way impacts, including both property area impacts, and potential relocations.
- Regarding major drainage structures, Alternative 1 allows for a more perpendicular crossing of East Belews Creek compared to Alternative 2. At this main crossing, Alternative 2 alignment would require a longer, skewed culvert and channel relocation.
- While Alternative 1 has slightly more linear feet of stream impacts than Alternative 2, the stream acreage is equivalent between the alternatives.

<u>Right-of-Way Impacts</u>
It is estimated that Alternative 1 will require 2 relocations and Alternative 2 would require a total of 6 to 7 relocations. For Alternative 2, the additional 4 to 5 impacts would be residential relocations located in the vicinity of Belews Creek and the Whispering Brook Village subdivision.

Table 1: ROW and jurisdictional impacts for Alternative 1 and 2.

Alternative	ROW Parcel Relocations	Permanent Stream Impact (lf)(acres)	Temporary Stream Impact (lf) (acres)	Permanent Fill in Wetland (ac)
Alternative 1	2	1013 (0.12 acres)	304 (0.04 acres)	0.01
Alternative 2	6-7	860 (0.12 acres)	245 (0.05 acres)	N/A

Typical Section Alternatives Studied

2 Lane Divided vs. Undivided

The project typical section provides capacity for one lane in each direction; however, it is anticipated that future capacity may be needed to accommodate growth in the area. Current traffic projections show 10,300 vehicles per day in 2040, and do not support construction of a 4-lane facility at this time. According to general guidelines, traffic projections greater than 14,800 vehicles per day typically warrant a 4-lane facility. However, it is anticipated that there will be future development in the vicinity and accommodations should be made, in particular for future left turning traffic. Incorporation of median separation is intended to provide the space needed for incorporation of future left turn lanes, with safe sight distance as well as separation of opposing through traffic. For this reason, NCDOT has elected to incorporate a median as part of the project in order to facilitate future widening and provide added safety in the forms of separating the opposing travel lanes and additional sight distance.

Median Width

For 2 lane divided facilities, the NCDOT Roadway Design Manual specifies a desirable raised median width between 23 feet and 30 feet. The more desirable 30-foot median width provides a 6-foot offset and improved sight distance for left turn access. The minimum median width that will accommodate a turn lane is 17.5 feet and is typically only considered in areas with low-speed conditions and urban constraints. A 5.5-foot median alternative would preclude future left turn lane access along the corridor but does provide safety benefits for separation of traffic. The median widths that were studied for the project include:

- Median Width A: 23’ median throughout the corridor
- Median Width B: 23’ median with 5.5’ median at the jurisdictional crossings

Preferred Alternative

In order to minimize impacts, the preferred alternative (referred to as 1B) is a combination of preferred horizontal alignment alternative 1and optimized typical section/median option B. This includes utilizing a 23-foot median for as much of the corridor as possible with median transitions incorporated to reduce the median width to 5.5-feet at the stream crossings. This 5.5’ median width also includes a 4’ raised monolithic island for safety.

Resource Status

All jurisdictional features located in the project area are in the Roanoke River Basin (United States Geological Survey (USGS) Hydrologic Unit 03010103). All streams within the project area (except for East Belews Creek) are unnamed tributaries of East Belews Creek. The NCDWQ Stream Index for East Belews Creek is 22-27-8-(1). Unnamed tributaries have the stream index

number of their receiving water. Therefore, all the UTs to East Belews Creek have a stream index number of 22-27-8-(1).

There were no High-Quality Waters (HQW), Outstanding Resource Waters (ORW), WS-II, or WS-1 waters within 1.0 miles of the project area.

303(d) Impaired Waters
No streams within 1.0 mile downstream of the project area were identified on the North Carolina 2022 Final 303(d) list of impaired waters for turbidity or sedimentation.

Jurisdictional Determination
A Jurisdictional Determination (JD) field visit with the USACE and DWR was held on March 22, 2018. Please reference the attached USACE JD Letter (SAW-2018-00393), and the DWR JD Letter.

Impacts to Waters of the U.S.
The proposed impacts for the project will be approximately 0.01 acres of permanent wetland impacts, 1013 linear feet of permanent stream impacts, and 304 linear feet of temporary stream impacts. Reference Tables 2 and 3 for a breakdown of impacts.

Table 2: Stream Impacts from U-6003

Site	Stream Name	Stream ID[#] (P/I)*	Impact Type	Permanent Impacts (lf)(acres)	Temporary Impacts (lf)(acres)	Mitigation Required[+] (lf)(ratio)
1	UT East Belews Creek	SB (P)	42" RCP-III	211 (0.01 acres)	40 (<0.01 acres)	211 (2:1)
2	UT East Belews Creek	SA (I)	42" RCP-III	332 (0.03 acres)	59 (<0.01 acres)	332 (1:1)
3	East Belews Creek	East Belews Creek (P)	14'X7" RCBC	92 (0.02 acres)	44 (0.02 acres)	92 (2:1)
			Bank Stabilization	86 (0.02 acres)	-	No
4	UT East Belews Creek	SD (P)	3' Base Ditch	26 (<0.01 acres)	28 (<0.01 acres)	26 (2:1)
5	UT East Belews Creek	SC (P)	7'X7' RCBC	245 (0.02 acres)	105 (<0.01 acres)	245 (2:1)
7	UT East Belews Creek	SE (I)	Bank Stabilization	21 (<0.01 acres)	28 (<0.01 acres)	No
			Totals	**1013 (0.12 acres)**	**304 (0.04 acres)**	**906**

[#]The stream ID corresponds to the identifier in the Jurisdictional Determination.
*P – Perennial; I – Intermittent
[+]Mitigation for SA is proposed at a 1:1 ratio due to the NCSAM rating of 'low'. The NCSAM form for SA attached for review.

Table 3: Wetland Impacts from U-6003

Site	Wetland ID	Wetland Size (ac)	Permanent Fill in Wetland (ac)	Excavation (ac)	Mechanized Clearing (ac)	Impacts Requiring Mitigation (ac)
6	WA	0.01	0.01	-	-	0

Permit Site 1
Stream impacts from the installation of a 42-inch reinforced concrete pipe (RCP) will be 211 linear feet of permanent impacts and 40 linear feet of temporary impacts. The pipe is not buried the 20% to minimize stream bed instability between the pipe inlet and the outfall from the pond that is immediately upstream. It is also not being buried since pipe will tie to drainage system.

Permit Site 2
Stream impacts from the installation of a 42-inch reinforced concrete pipe (RCP) will be 332 linear feet of permanent impacts and 59 linear feet of temporary impacts. Rip rap at the outlet end will be embedded to the stream bed elevation. The pipes will not be buried 20%where they tie into the upstream and downstream channels since they are part of a larger drainage system.

Permit Site 3
Stream impacts from the installation of a 14-foot by seven foot (14x7) Reinforced Concrete Box Culvert (RCBC) will be 92 linear feet of permanent impacts, 44 linear feet of temporary impacts, and 86 linear feet of bank stabilization. The RCBC will be buried 1' below the stream bed elevation, and 1' sills and baffles will be installed in the culvert. Native bed material or class I rip rap will be placed in the culvert between the baffles and/or sills.

Permit Site 4
Stream impacts from the installation of a 3-foot base ditch will be 26 linear feet of permanent impacts and 28 linear feet of temporary impacts. The 3' base ditch will be lined with Class I rip rap and the rip rap will be keyed in at the stream bed elevation.

Permit Site 5
Stream impacts from the installation of a 7-foot by 7-foot RCB will be 245 linear feet of permanent impacts and 105 linear feet of temporary impacts. The RCBC will be buried 1' below the stream bed elevation, and 1' sills and baffles will be installed in the culvert. Native bed material or class I rip rap will be placed in the culvert between the baffles and/or sills.

Permit Site 6
There will be 0.01 acres of wetland impacts from permanent fill due to construction of the roadway and placement of roadway fill material.

Permit Site 7
Impacts at this site are due to the construction and tie in of a 3' base ditch. Class B size rip rap will be added to the opposite bank for bank stabilization. Therefore, the impact in this location will be 21 linear feet of bank stabilization. 28 linear feet of temporary stream impact has been included for the purpose of dewatering while final tie of base ditch is constructed. No permanent in-channel impacts will occur at this site.

Summary of Utility Impacts
There will be no impacts to jurisdictional resources associated with utility relocations.

Mitigation Options

The NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent practicable as described above. Tables 2 and 3 summarize the wetland and stream impacts for this project. This project will permanently impact 0.01 acres of wetlands and 1,013 linear feet of streams.

Avoidance & Minimization Measures

In addition to optimization of both the horizontal and vertical alignments, the proposed design includes the following measures in order to further minimize impacts.

- Slopes steepened to 2:1 where possible.
- 23-foot median reduced to 5.5-feet at each stream crossing.
- Box culverts at sites 3 and 5 are buried 1' below the stream bed and 1' sills and baffles will be installed in the culvert. Native bed material or class I rip rap will be placed in the culvert between the baffles and/or sills. This will aide in aquatic passage and reduce the likelihood of stream instability up and downstream of the culvert.

Both bridge and box culvert options at East Belews Creek were considered during design development. Based on both hydraulic and preliminary structure analyses, a bridge would require raising the proposed profile to accommodate bridge girders. While this would reduce impacts at the main crossing, it would increase impacts to surrounding tributaries and likely result in increased right-of-way impacts. A 14' X 7' RCBC will be installed at the crossing of East Belews Creek.

On-Site Mitigation

Opportunities for on-site mitigation were explored for the Preferred Alternative (Alternative 1). The two stream channels west of East Belews Creek were examined specifically. Channel grade and topography pose obstacles for successful stream mitigation for the channel realignment downstream of the ponds (Site 1). Simple realignment of this channel would result in additional right of way impacts to adjacent residential parcels. Allowance for an appropriate floodplain bench for this channel would require greater impacts to those same parcels. Possible realignment and mitigation for the second channel (Site 2) would be limited by utility crossings and a nearby access road. From the bank of realigned channel to the access road is approximately 50 feet, quickly necking down to where the access road will tie into the mainline.

Alternative 2, Site 3 would require channel realignment. This is not a good candidate for mitigation due to the short run of realignment and confined area to pursue sinuosity or other natural channel elements.

On-Site mitigation is not recommended for either alternative due to the above listed constraints.

Compensatory Mitigation

At this time, the Division of Mitigation Services (DMS) will provide compensatory mitigation for U-6003. Table 2 summarizes the total mitigation needs of 906 linear feet of stream impacts. In a letter dated January 23, 2023, DMS agreed to provide mitigation for impacts to 906 linear feet of streams. NCDOT proposes that 574 linear feet of stream impacts be provided at a 2:1 ratio and 332 linear feet of stream impacts be provided at a 1:1 ratio. A NCSAM form scoring low for stream SA as documentation for the reduced ratio.

SEPA Document Status

U-6003 is a State funded project and falls under the State Environmental Policy Act (SEPA). A state environmental document is not required. A Minimum Criteria Determination Checklist was prepared to document environmental impacts and was signed on June 25, 2018. A Consultation will be completed prior to construction fund authorization per NCDOT policy.

FEMA Compliance
This project does not include any impacts to FEMA regulated floodplains or floodways.

Section 106
The project will have no effects on resources regulated by Section 106 of the Historic Preservation Act. The project was reviewed for impacts to Historic Architecture, Archeology and Tribal resources. The project was reviewed by NCDOT Cultural Resource staff, and no surveys were required for historic architecture. 'No Survey Required' forms for historic architecture in the project area and the expanded project area are included in the application package. A survey was required for archeology in the original study area. The survey determined that there were 'no sites present of or affected'. There were no surveys required in the expanded study area. The 'no sites present or affected' form and the 'no survey required for' for archeology are included in the attachments. The 'No survey Required' forms for historic architecture in the project area and the expanded project area are included in the application package.

A request for historic properties of traditional religious or cultural importance was sent to the Catawba Indian Nation on April 14, 2020. A response dated May 18, 2020, confirmed there were no immediate concerns within the project area, however the Catawba Indian Nation should be notified should any artifacts and/or human remains are located during ground disturbance.

Threatened & Endangered Species
There are two federally listed species and one species proposed for federal listing within the project area (Table 4).

Table 4. Federally protected species listed for Forsyth County

Scientific Name	Common Name	Federal Status[+]	Habitat Present	Biological Conclusion
Glyptemys muhlenbergii	Bog turtle	T(S/A)	No	Not Required
Helianthus schweinitzii	Schweinitz's sunflower	E	Yes	No Effect
Perimyotis subflavus	Tricolored bat	PE	Yes	LAA[*]

[+]T(S/A) - Threatened due to similarity of appearance
[+]PE – Proposed Endangered
[+]E – Endangered
[*] LAA-Likely to Adversely Affect

Bog Turtle
Surveys for bog turtle are not required.

Schweinitz's Sunflower
Surveys for Schweinitz's sunflower (*Helianthus schweinitzii*) were conducted In October of 2021. No sunflowers were found during the survey. Additionally, there are no known populations of Schweinitz's sunflower or within one mile of the action area. With a negative species survey and no known populations within one mile of the action area, we recommend a biological conclusion of 'No Effect'.

Tricolored Bat
The USFWS proposed the listing of the tricolored bat (*Perimyotis subflavus*) in the Federal Register on September 14, 2022. The USFWS issued a Conference Opinion (CO) for adverse effects to the

tricolored bat dated January 04, 2023. The following commitments were made to minimize the impacts to the tricolored bat.

- No blasting will occur at night.
- NCDOT's Construction Manual 2012 Standard Specifications Section 220 Blasting will be followed for blasting activities.
- Blast monitoring will be required and includes, but not limited to, using seismographs capable of measuring air overpressure and vibration in the vertical, longitudinal, and transverse directions at the closest utility or structure to each blast.
- Blast mats will be used for smaller rock removal.
- NCDOT will implement a tree clearing moratorium during the maternity and fall migratory season (June 1 to October 15) to protect non-volant bats and those building fat reserves and entering hibernation.
- Tree clearing limits will be clearly denoted on project plans and NCDOT or USACE will ensure that contractors understand the limits.
- Tree clearing will be minimized to what is required to implement the project safely.
- NCDOT will not remove trees until ambient temperatures are 50 degrees F or above on the day of removal from April 1 to May 31.
- Temporary and permanent lighting will be downward facing, full cut-off lens light (with the same intensity or less for replacement lighting).
- Lighting used for nighttime construction will be limited to what is necessary to maintain safety standards and will only direct light towards work areas.
- Ensure that the contractor understands and follows the measures listed in Section 2.4, section 7.2, and Section7.3 of the CO.
- Reduce take to the maximum extent practicable.
- Monitor and document the surrogate measures of take and report to the Service.
- Ensure that procedures listed in Section 2.4, Section 7.2, and Section 7.3 of the CO are being implemented and that all project plans are being implemented in a manner that ensures the conditions of the CO are met.
- A biologist with knowledge of bat biology and the CO shall conduct on-site training with all individuals involved in ground disturbing activities including tree removal to review the requirements of the CO, species biological needs, and how to report any wildlife observations.
- Fell as many trees as possible prior to April 1st. Fell all trees prior to June 1st.
- Project monitoring, carried out by Federal agency or non-federal designated representative, ensures the terms of the CO are carried out, provides the Service with information essential to assessing the effects of various actions on listed species, and allows the Service to track incidental take levels. Monitor the acreage of tree removal during construction to ensure the surrogate measure of take is not exceeded for tricolored bat.
- Once the project is complete, provide a report to the USFWS by the end of the calendar or fiscal year in which the project is completed, whichever is more distant, that 1) indicated the acres of tree removal, 2) provides results/feedback/lessons-learned on the effectiveness of CMs, RPMs, and T&Cs, and 3) documents the start and end of the project and the dates of tree removal.

Bald and Golden Eagle Protection Act

The bald eagle is protected under the Bald and Golden Eagle Protection Act and enforced by the USFWS. Habitat for the bald eagle primarily consists of mature forests in proximity to large bodies of open water for foraging. Large dominant trees are utilized for nesting sites, typically within 1.0 mile of open water.

A desktop-GIS assessment of the project study area, as well as the area within a 1.0-mile radius of the project limits, was performed prior to the filed investigation in June of 2017 and May 2018 using 2016 color aerials. Water bodies large enough or sufficiently open to be considered potential feeding sources were not identified. Therefore, a survey of the study area and the area within 660 feet of the project limits was not conducted. Therefore, it has been determined that this project will not adversely affect this species.

Indirect and Cumulative Impact Analysis

Indirect Impact

It was determined from the Community Impact Assessment (CIA) that the U-6003 project may alter travel patterns, relieve congestion, and minimally increase property accessibility. The project is not expected to notably reduce travel times. Officials do not anticipate that this project will hasten planned growth. Federal, state and local policies are in place to effectively manage growth and development and protect natural resources within the FLUSA.

Cumulative Impact

The CIA determined that the cumulative effect of the U-6003 project when considered in the context of other past, present, and future actions, and the resulting impact on the notable human and natural features, will not notably contribute to cumulative impacts to environmental resources in the FLUSA. Direct natural environmental impacts have been by avoidance, minimization, or mitigation consistent with programmatic agreements with the natural resource agencies during the permitting process. All developments will be required to follow local, state, and federal guidelines and permitting regulations.

REGULATORY APPROVALS

Section 404: Application is hereby made for a USACE Individual 404 Permit as required for the above-described activities.

Section 401: We are hereby requesting a 401 Water Quality Certification from the N. C. Division of Water Resources. In compliance with Section 143 215.3D(e) of the NCAC, we will provide $570.00 to act as a payment for processing the Section 401 permit application previously noted in this application (see Subject line).

Thank you for your assistance with this project. If you have any questions or need additional information, please contact me at aeuliss@ncdot.gov or (336) 747-7802.

Sincerely,

Amy Euliss

Amy Euliss, Division 9 PDEA Engineer
NCDOT

Electronic cc: Dave Wanucha, NCDWR Transportation Permitting Unit
Amy Chapman, NCDWR Transportation Permitting Unit
Beth Harmon, NCDMS
Connie James, PE Division 9 Project Manager
Lauren Wilson, USFWS
Dave McHenry, NCWRC
Amanetta Somerville, USEPA

TIP # U-6003
Alternative Impact Comparison

U–6003 IMPACT COMPARISON
JAN. 2023

BEGIN CONSTRUCTION –Y15–

BEGIN TIP PROJECT U–6003 –L–

TO US 158

PINEY GROVE RD (SR 1969)

LINVILLE SPRINGS RD (SR 2030)

–Y15–

–Y16– TO KERNERSVILLE

EAST BELEWS CREEK

KERNERSVILLE LOOP

UT TO EAST BELEWS CREEK

NAD 83/ NA 2011

TO KERNERSVILLE

END CONSTRUCTION –Y15–

BEGIN CONSTRUCTION –Y16–

NC 150 (N. MAIN ST.)

MACY GROVE RD EXTENSION

TO US 421/BUS 40

END TIP PROJECT U–6003 –L–
TIE TO U–4734 (BY OTHERS)

PROPOSED SIGNAL

UPGRADED SIGNAL

50 25 0 50 100

PREFFERED ALTERNATIVE 1

ALTERNATIVE 2

TIP # U-6003
USACE Jurisdictional Determination Letter
(SAW-2018-00393)

U.S. ARMY CORPS OF ENGINEERS
WILMINGTON DISTRICT

Action Id. **SAW-2018-00393** County: **Forsyth** U.S.G.S. Quad: **NC-Belews Creek**

NOTIFICATION OF JURISDICTIONAL DETERMINATION

Property Owner: **North Carolina Department of Transportation, Division 9**
Amy Euliss
Address: **375 Silas Creek Parkway**
Winston Salem, NC 27127
Telephone Number: **336-747-7800**
E-mail: **aeuliss@ncdot.gov**

Size (acres) **48.0**
Nearest Waterway **East Belews Creek**
USGS HUC **03010103**
Nearest Town **Kernersville**
River Basin **Roanoke**
Coordinates Latitude: **36.137322**
Longitude: **-80.062558**

Location description: **The review area is located on the east side of Piney Grove Road, 0.9 miles north of the intersection of Piney Grove Road and N. Main Street. Reference review area description shown in Jurisdictional Determination Package entitled "Figure 3 Jurisdictional Features Map".**

Indicate Which of the Following Apply:

A. Preliminary Determination

☒ There appear to be **waters including wetlands,** on the above described project area/property, that may be subject to Section 404 of the Clean Water Act (CWA)(33 USC § 1344) and/or Section 10 of the Rivers and Harbors Act (RHA) (33 USC § 403). The **waters including wetlands,** have been delineated, and the delineation has been verified by the Corps to be sufficiently accurate and reliable. The approximate boundaries of these waters are shown on the enclosed delineation map dated **11/20/2017**. Therefore this preliminary jurisdiction determination may be used in the permit evaluation process, including determining compensatory mitigation. For purposes of computation of impacts, compensatory mitigation requirements, and other resource protection measures, a permit decision made on the basis of a preliminary JD will treat all waters and wetlands that would be affected in any way by the permitted activity on the site as if they are jurisdictional waters of the U.S. This preliminary determination is not an appealable action under the Regulatory Program Administrative Appeal Process (Reference 33 CFR Part 331). However, you may request an approved JD, which is an appealable action, by contacting the Corps district for further instruction.

☐ There appear to be **waters including wetlands,** on the above described project area/property, that may be subject to Section 404 of the Clean Water Act (CWA)(33 USC § 1344) and/or Section 10 of the Rivers and Harbors Act (RHA) (33 USC § 403). However, since the **waters including wetlands,** have not been properly delineated, this preliminary jurisdiction determination may not be used in the permit evaluation process. Without a verified wetland delineation, this preliminary determination is merely an effective presumption of CWA/RHA jurisdiction over all of the **waters including wetlands,** at the project area, which is not sufficiently accurate and reliable to support an enforceable permit decision. We recommend that you have the **waters including wetlands,** on your project area/property delineated. As the Corps may not be able to accomplish this wetland delineation in a timely manner, you may wish to obtain a consultant to conduct a delineation that can be verified by the Corps.

B. Approved Determination

☐ There are Navigable Waters of the United States within the above described project area/property subject to the permit requirements of Section 10 of the Rivers and Harbors Act (RHA) (33 USC § 403) and Section 404 of the Clean Water Act (CWA)(33 USC § 1344). Unless there is a change in law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

☐ There are **waters including wetlands,** on the above described project area/property subject to the permit requirements of Section 404 of the Clean Water Act (CWA) (33 USC § 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

☐ We recommend you have the **waters including wetlands,** on your project area/property delineated. As the Corps may not be able to accomplish this wetland delineation in a timely manner, you may wish to obtain a consultant to conduct a delineation that can be verified by the Corps.

SAW-2018-00393

☐ The **waters including wetlands,** on your project area/property have been delineated and the delineation has been verified by the Corps. The approximate boundaries of these waters are shown on the enclosed delineation map dated **MAP DATE**. If you wish to have the delineation surveyed, the Corps can review and verify the survey upon completion. Once verified, this survey will provide an accurate depiction of all areas subject to CWA and/or RHA jurisdiction on your property which, provided there is no change in the law or our published regulations, may be relied upon for a period not to exceed five years.

☐ The **waters including wetlands,** have been delineated and surveyed and are accurately depicted on the plat signed by the Corps Regulatory Official identified below on **SURVEY SIGNED DATE**. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

☐ There are no waters of the U.S., to include wetlands, present on the above described project area/property which are subject to the permit requirements of Section 404 of the Clean Water Act (33 USC 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

☐ The property is located in one of the 20 Coastal Counties subject to regulation under the Coastal Area Management Act (CAMA). You should contact the Division of Coastal Management in **Morehead City, NC, at (252) 808-2808** to determine their requirements.

Placement of dredged or fill material within waters of the US, including wetlands, without a Department of the Army permit may constitute a violation of Section 301 of the Clean Water Act (33 USC § 1311). Placement of dredged or fill material, construction or placement of structures, or work within navigable waters of the United States without a Department of the Army permit may constitute a violation of Sections 9 and/or 10 of the Rivers and Harbors Act (33 USC § 401 and/or 403). If you have any questions regarding this determination and/or the Corps regulatory program, please contact **Bryan Roden-Reynolds at 704-510-1440 or bryan.roden-reynolds@usace.army.mil**.

C. Basis For Determination: Basis For Determination: See the preliminary jurisdictional determination form dated 03/26/2018.

D. Remarks: None.

E. Attention USDA Program Participants

This delineation/determination has been conducted to identify the limits of Corps' Clean Water Act jurisdiction for the particular site identified in this request. The delineation/determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA Program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

F. Appeals Information **(This information applies only to approved jurisdictional determinations as indicated in B. above)**

This correspondence constitutes an approved jurisdictional determination for the above described site. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and request for appeal (RFA) form. If you request to appeal this determination you must submit a completed RFA form to the following address:

US Army Corps of Engineers
South Atlantic Division
Attn: Jason Steele, Review Officer
60 Forsyth Street SW, Room 10M15
Atlanta, Georgia 30303-8801

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by **Not applicable**.
It is not necessary to submit an RFA form to the Division Office if you do not object to the determination in this correspondence.

Corps Regulatory Official: RODEN REYNOLDS.BRYAN.KENNETH.1263385574 Digitally signed by RODEN REYNOLDS.BRYAN.KENNETH.1263385574 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=RODEN REYNOLDS.BRYAN.KENNETH.1263385574 Date: 2018.03.28 17:07:01 -04'00'

Date of JD: **03/26/2018** Expiration Date of JD: **Not applicable**

SAW-2018-00393

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 http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0

Copy furnished:

Field Work Rep.:	**HDR Engineering Inc. of the Carolinas**
	Sara Easterly
Address:	**555 Fayetteville Street, Suite 900**
	Raleigh, NC 27601
Telephone Number:	**919-232-6664**
E-mail:	**sara.easterly@hdrinc.com**

SAW-2018-00393

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: **North Carolina Department of Transportation, Division 9, Amy Euliss**	File Number: **SAW-2018-00393**	Date: **03/26/2018**

Attached is:	See Section below
☐ INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
☐ PROFFERED PERMIT (Standard Permit or Letter of permission)	B
☐ PERMIT DENIAL	C
☐ APPROVED JURISDICTIONAL DETERMINATION	D
☒ PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at or http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits.aspx or the Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the district engineer. This form must be received by the division engineer within 60 days of the date of this notice.

SAW-2018-00393

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:	If you only have questions regarding the appeal process you may also contact:
District Engineer, Wilmington Regulatory Division **Attn: Bryan Roden-Reynolds** **Asheville Regulatory Office** **U.S Army Corps of Engineers** **151 Patton Avenue, Room 208** **Asheville, North Carolina 28801**	Mr. Jason Steele, Administrative Appeal Review Officer CESAD-PDO U.S. Army Corps of Engineers, South Atlantic Division 60 Forsyth Street, Room 10M15 Atlanta, Georgia 30303-8801 Phone: (404) 562-5137

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

_____ Signature of appellant or agent.	Date:	Telephone number:

For appeals on Initial Proffered Permits send this form to:

District Engineer, Wilmington Regulatory Division, **Attn: Bryan Roden-Reynolds , 69 Darlington Avenue, Wilmington, North Carolina 28403**

For Permit denials, Proffered Permits and Approved Jurisdictional Determinations send this form to:

Division Engineer, Commander, U.S. Army Engineer Division, South Atlantic, Attn: Mr. Jason Steele, Administrative Appeal Officer, CESAD-PDO, 60 Forsyth Street, Room 10M15, Atlanta, Georgia 30303-8801
Phone: (404) 562-5137

PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PJD: 03/26/2018

B. NAME AND ADDRESS OF PERSON REQUESTING PJD: North Carolina Department of Transportation, Division 9, Amy, Euliss, 375 Silas Creek Parkway, Winston Salem, NC, 27127

C. DISTRICT OFFICE, FILE NAME, AND NUMBER: Wilmington District, U-6003, SAW-2018-00393

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION: The review area is located on the east side of Piney Grove Road, 0.9 miles north of the intersection of Piney Grove Road and N. Main Street. Reference review area description shown in Jurisdictional Determination Package entitled "Figure 3 Jurisdictional Features Map".

(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)

State: NC County: Forsyth City: Kernersville
Center coordinates of site (lat/long in degree decimal format): Latitude: 36.137322 Longitude: -80.062558

Universal Transverse Mercator:

Name of nearest waterbody: East Belews Creek

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☐ Office (Desk) Determination. Date:
☒ Field Determination. Date(s): **05/17/2017 and 06/28/2017**

TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.

Site Number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resources in review area (acreage and linear feet, if applicable	Type of aquatic resources (i.e., wetland vs. non-wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)
Wetland WA	36.1364	-80.058645	<0.01 acres	Wetland	404
Wetland WB	36.137021	-80.058824	0.01 acres	Wetland	404
East Belews Creek	36.137571	-80.064088	708 linear feet	Non-wetland	404
Stream SA	36.137791	-80.064759	515 linear feet	Non-wetland	404
Stream SB	36.138085	-80.064198	270 linear feet	Non-wetland	404
Stream SC	36.136319	-80.058444	822 linear feet	Non-wetland	404
Stream SD	36.137532	-80.063424	200 linear feet	Non-wetland	404

1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.

2) In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre- construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD, which does not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a PJD constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there *"may be"* waters of the U.S. and/or that there *"may be"* navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for PJD (check all that apply)

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

☒ Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:
Map: **Figure 1 Vicinity Map**

☒ Data sheets prepared/submitted by or on behalf of the PJD requestor.

☒ Office concurs with data sheets/delineation report.

☐ Office does not concur with data sheets/delineation report. Rationale:_____

☐ Data sheets prepared by the Corps:_____

☐ Corps navigable waters' study:_____

☐ U.S. Geological Survey Hydrologic Atlas:_____

☐ USGS NHD data.

☐ USGS 8 and 12 digit HUC maps.

☒ U.S. Geological Survey map(s). Cite scale & quad name: **Figure 2, 1:24,000 Belews Creek**

☒ Natural Resources Conservation Service Soil Survey. Citation: **Soil Survey of Forsyth County Sheet 25**

☒ National wetlands inventory map(s). Cite name: **USFWS NWI Mapper Dated 11/15/2017**

☐ State/local wetland inventory map(s):_____

☐ FEMA/FIRM maps:_____

☐ 100-year Floodplain Elevation is:_____ (National Geodetic Vertical Datum of 1929)

☐ Photographs: ☐ Aerial (Name & Date): _____

or ☐ Other (Name & Date):_____

☐ Previous determination(s). File no. and date of response letter:_____

☒ Other information (please specify): **NCDWQ Stream Identification Forms (Version 4.11) Dated 06/28/2017 and NCSAM Field Assessment Form (Version 2.1) Dated 05/17/2017**

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

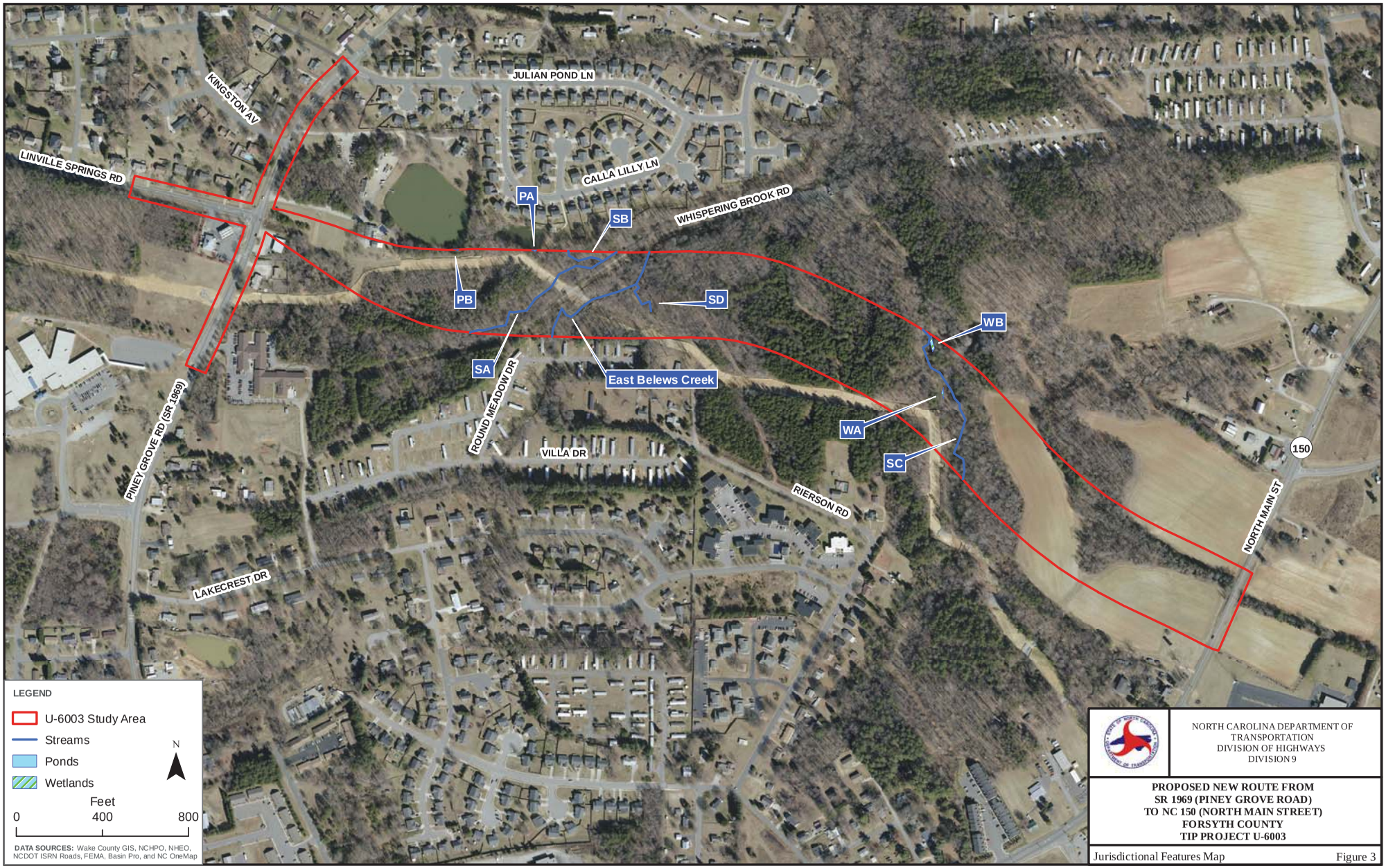
RODEN REYNOLDS.BRYAN.KENNETH.1263385574

Digitally signed by RODEN REYNOLDS.BRYAN.KENNETH.1263385574
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=RODEN REYNOLDS.BRYAN.KENNETH.1263385574
Date: 2018.03.28 17:06:37 -04'00'

Signature and date of Regulatory staff member completing PJD
03/26/2018

Signature and date of person requesting PJD (REQUIRED, unless obtaining the signature is impracticable)[1]

[1] Districts may establish timeframes for requester to return signed PJD forms. If the requester does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
DIVISION 9

PROPOSED NEW ROUTE FROM SR 1969 (PINEY GROVE ROAD) TO NC 150 (NORTH MAIN STREET) FORSYTH COUNTY TIP PROJECT U-6003

Jurisdictional Features Map Figure 3

TIP # U-6003
DWR Jurisdictional Determination Letter

Environmental Quality

ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

LINDA CULPEPPER
Interim Director

April 4, 2018

Ms. Amy Euliss
Division 9 Environmental Officer
NCDOT
375 Silas Creek Parkway
Winston Salem, NC 27127
Electronic correspondence

Subject: NCDOT TIP U-6003. Proposed new location roadway between SR 1969 (Piney Grove Road) and NC 150 (North Main Street), Forsyth County.

Drainage features within the Roanoke River Basin; East Belews Creek and UTs to East Belews Creek; C; 22-27-8-(1); ROA01 (03-02-01).

Site Determination for Applicability to the Mitigation Rules (15A NCAC 2H .0506[h])

Dear Ms. Euliss:

Per your request dated November 20, 2017, NC Division of Water Resource (NCDWR) staff, along with yourself and staff from the US Army Corps of Engineers and HDR Engineering, Inc., of the Carolinas reviewed drainage features within the above reference project area located in Forsyth County on March 22, 2018 for applicability to the mitigation rules (15A NCAC 2H .0506[h]). The drainage features are approximated on the attached map (Figure 3) initialed and dated April 4, 2018.

The stream feature identified as SA within the project area was determined to be intermittent and therefore not subject to the Mitigation Rules. Stream features identified as SB, SD, SC and East Belews Creek were determined to be perennial and therefore subject to the Mitigation Rules. Wetland features identified as WA and WB were assessed on site by US Army Corps of Engineers and were determined to be accurate as presented. No other features at the site were evaluated. Also, this letter only addresses the features specifically marked on the attached map and does not apply to other drainage features further downstream from NCDOT's project area, or to any other drainage features in the vicinity.

This letter only addresses the applicability to the mitigation rules and does not approve any activity within Waters of the United States, or Waters of the State. Any impacts to wetlands and streams must comply with 404/401 regulations, water supply regulations (15A NCAC 2B .0216), and any other required federal, state and local regulations.

The owner (or future owners) or permittee should notify NCDWR (and other relevant agencies) of this determination in any future correspondences concerning this property and/or project. This determination shall expire five (5) years from the date of this letter.

Landowners or affected parties that dispute a determination made by NCDWR or Delegated Local Authority that a surface water exists and that it is subject to the mitigation rules may request a determination by the Director. A request for a determination by the Director shall be referred to the Director in writing c/o Amy Chapman, NCDWR Wetlands/401 Unit, 1617 Mail Service Center, Raleigh, NC 27699-1617.

Individuals that dispute a determination by NCDWR or Delegated Local Authority that "exempts" a surface water from the mitigation rules may ask for an adjudicatory 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 and the date the affected party (including downstream and adjacent landowners) is

notified of this decision. A petition is considered filed when it is received in the office of Administrative Hearings during normal office hours. The Office of Administrative Hearings accepts filings Monday through Friday between the hours of 8:00am and 5:00pm, except for official state holidays. The original and one (1) copy of the petition must be filed with the Office of Administrative Hearings.

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

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

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

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

This determination is final and binding unless you ask for a hearing within 60 days.

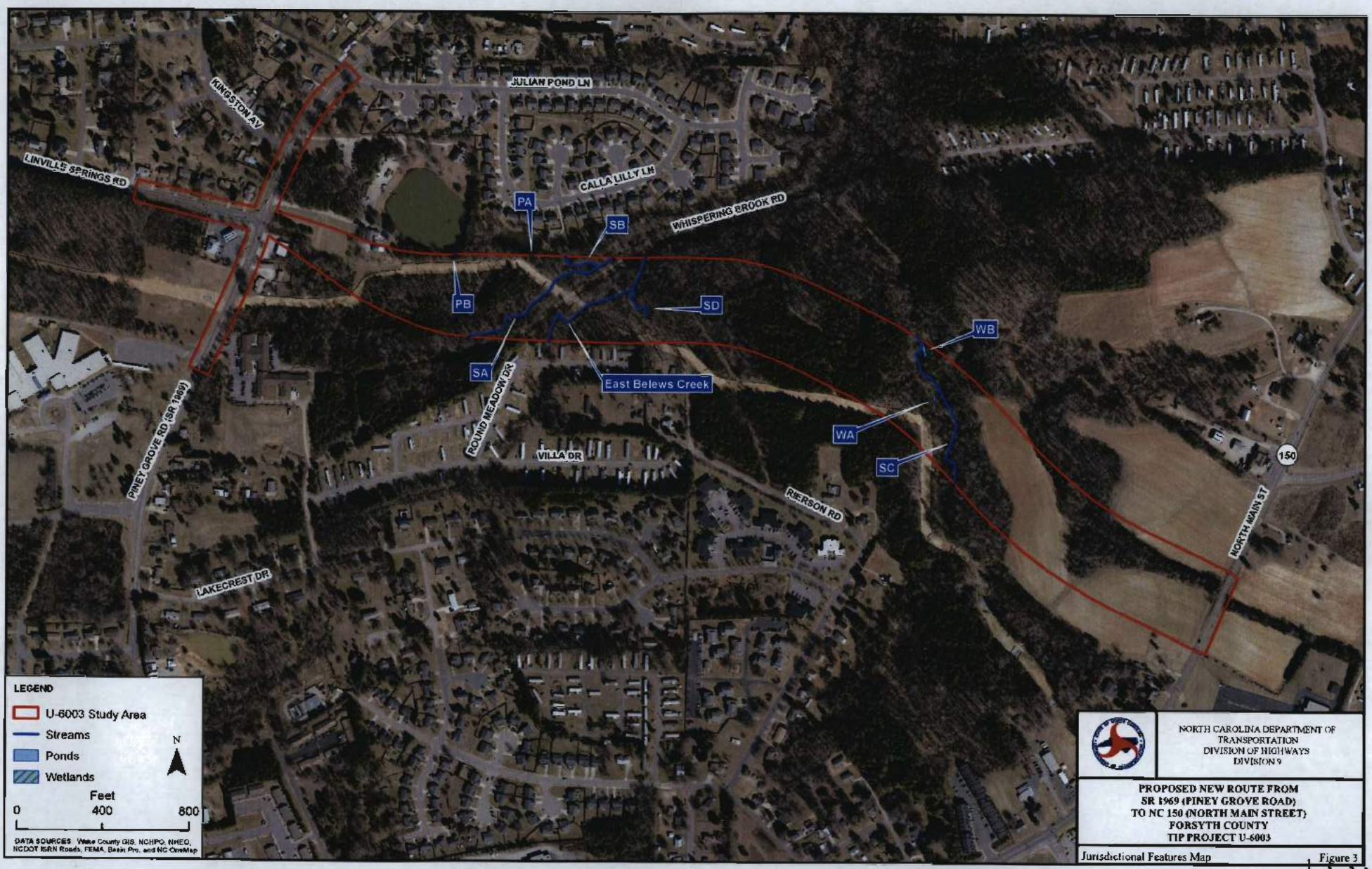
If you have any additional questions or require additional information, please call Dave Wanucha at 336-776-9703 or Dave.Wanucha@ncdenr.gov.

Sincerely,

Linda Culpepper, Interim Director
Division of Water Resources

Attachments: Figure 3

Electronic copy only distribution:
Sarah Easterly, HDR, Inc.
Bryan Roden-Reynolds, US Army Corps of Engineers, Charlotte Field Office
File Copy



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
DIVISION 9

PROPOSED NEW ROUTE FROM SR 1969 (PINEY GROVE ROAD) TO NC 150 (NORTH MAIN STREET) FORSYTH COUNTY TIP PROJECT U-6003

Jurisdictional Features Map — Figure 3

DJW 4-7-18

TIP # U-6003
SA NC SAM
Rating Form

NC SAM FIELD ASSESSMENT FORM
Accompanies User Manual Version 2.1

USACE AID #: NCDWR #:

INSTRUCTIONS: Attach a sketch of the assessment area and photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle, and circle the location of the stream reach under evaluation. If multiple stream reaches will be evaluated on the same property, identify and number all reaches on the attached map, and include a separate form for each reach. See the NC SAM User Manual for detailed descriptions and explanations of requested information. Record in the "Notes/Sketch" section if any supplementary measurements were performed. See the NC SAM User Manual for examples of additional measurements that may be relevant.
NOTE EVIDENCE OF STRESSORS AFFECTING THE ASSESSMENT AREA (do not need to be within the assessment area).

PROJECT / SITE INFORMATION:

1. Project name (if any): U-6003
2. Date of evaluation: 5-17-2017
3. Applicant/owner name: NCDOT
4. Assessor name/organization: S. Easterly/HDR
5. County: Forsyth
6. Nearest named water body on USGS 7.5-minute quad: East Belews Creek
7. River Basin: Roanoke
8. Site coordinates (decimal degrees, at lower end of assessment reach): 36.137791, -80.064759

STREAM INFORMATION: (depth and width can be approximations)

9. Site number (show on attached map): SA
10. Length of assessment reach evaluated (feet): 500
11. Channel depth from bed (in riffle, if present) to top of bank (feet): 1-6 ☐ Unable to assess channel depth.
12. Channel width at top of bank (feet): 3.5
13. Is assessment reach a swamp stream? ☐ Yes ☐ No
14. Feature type: ☐ Perennial flow ☒ Intermittent flow ☐ Tidal Marsh Stream

STREAM RATING INFORMATION:

15. NC SAM Zone: ☐ Mountains (M) ☒ Piedmont (P) ☐ Inner Coastal Plain (I) ☐ Outer Coastal Plain (O)
16. Estimated geomorphic valley shape **(skip for Tidal Marsh Stream):** ☒ a (more sinuous stream, flatter valley slope) ☐ b (less sinuous stream, steeper valley slope)
17. Watershed size: **(skip for Tidal Marsh Stream)** ☐ Size 1 (< 0.1 mi²) ☐ Size 2 (0.1 to < 0.5 mi²) ☒ Size 3 (0.5 to < 5 mi²) ☐ Size 4 (≥ 5 mi²)

ADDITIONAL INFORMATION:

18. Were regulatory considerations evaluated? ☒ Yes ☐ No If Yes, check all that appy to the assessment area.
- ☐ Section 10 water
- ☐ Classified Trout Waters
- ☐ Water Supply Watershed (☐ I ☐ II ☐ III ☐ IV ☐ V)
- ☐ Essential Fish Habitat
- ☐ Primary Nursery Area
- ☐ High Quality Waters/Outstanding Resource Waters
- ☐ Publicly owned property
- ☐ NCDWR riparian buffer rule in effect
- ☐ Nutrient Sensitive Waters
- ☐ Anadromous fish
- ☐ 303(d) List
- ☐ CAMA Area of Environmental Concern (AEC)
- ☐ Documented presence of a federal and/or state listed protected species within the assessment area. List species:
- ☐ Designated Critical Habitat (list species):

19. Are additional stream information/supplementary measurements included in "Notes/Sketch" section or attached? ☐ Yes ☒ No

1. Channel Water – assessment reach metric (skip for Size 1 streams and Tidal Marsh Streams)
- ☒ A Water throughout assessment reach.
- ☐ B No flow, water in pools only.
- ☐ C No water in assessment reach.

2. Evidence of Flow Restriction – assessment reach metric
- ☐ A At least 10% of assessment reach in-stream habitat or riffle-pool sequence is adversely affected by a flow restriction or fill to the point of obstructing flow or a channel choked with aquatic macrophytes or ponded water or impounded on flood or ebb within the assessment reach (examples: undersized or perched culverts, causeways that constrict the channel, tidal gates).
- ☒ B Not A

3. Feature Pattern – assessment reach metric
- ☐ A A majority of the assessment reach has altered pattern (examples: straightening, modification above or below culvert).
- ☒ B Not A.

4. Feature Longitudinal Profile – assessment reach metric
- ☒ A Majority of assessment reach has a substantially altered stream profile (examples: channel down-cutting, existing damming, over widening, active aggradation, dredging, and excavation where appropriate channel profile has not reformed from any of these disturbances).
- ☐ B Not A

5. Signs of Active Instability – assessment reach metric
Consider only current instability, not past events from which the stream has currently recovered. Examples of instability include active bank failure, active channel down-cutting (head-cut), active widening, and artificial hardening (such as concrete, gabion, rip-rap).
- ☐ A < 10% of channel unstable
- ☒ B 10 to 25% of channel unstable
- ☐ C > 25% of channel unstable

6. Streamside Area Interaction – streamside area metric
Consider for the Left Bank (LB) and the Right Bank (RB).

LB	RB	
☐ A	☐ A	Little or no evidence of conditions that adversely affect reference interaction
☒ B	☒ B	Moderate evidence of conditions (examples: berms, levees, down-cutting, aggradation, dredging) that adversely affect reference interaction (examples: limited streamside area access, disruption of flood flows through streamside area, leaky or intermittent bulkheads, causeways with floodplain constriction, minor ditching [including mosquito ditching])
☐ C	☐ C	Extensive evidence of conditions that adversely affect reference interaction (little to no floodplain/intertidal zone access [examples: causeways with floodplain and channel constriction, bulkheads, retaining walls, fill, stream incision, disruption of flood flows through streamside area] or too much floodplain/intertidal zone access [examples: impoundments, intensive mosquito ditching]) or floodplain/intertidal zone unnaturally absent or assessment reach is a man-made feature on an interstream divide

7. Water Quality Stressors – assessment reach/intertidal zone metric
Check all that apply.
- ☐ A Discolored water in stream or intertidal zone (milky white, blue, unnatural water discoloration, oil sheen, stream foam)
- ☐ B Excessive sedimentation (burying of stream features or intertidal zone)

- [ ] C Noticeable evidence of pollutant discharges entering the assessment reach and causing a water quality problem
- [ ] D Odor (not including natural sulfide odors)
- [ ] E Current published or collected data indicating degraded water quality in the assessment reach. Cite source in the "Notes/Sketch" section.
- [ ] F Livestock with access to stream or intertidal zone
- [ ] G Excessive algae in stream or intertidal zone
- [ ] H Degraded marsh vegetation in the intertidal zone (removal, burning, regular mowing, destruction, etc.)
- [ ] I Other: ______________________________ (explain in "Notes/Sketch" section)
- [x] J Little to no stressors

8. Recent Weather – watershed metric

For Size 1 or 2 streams, D1 drought or higher is considered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought.

- ( ) A Drought conditions and no rainfall or rainfall not exceeding 1 inch within the last 48 hours
- ( ) B Drought conditions and rainfall exceeding 1 inch within the last 48 hours
- (•) C No drought conditions

9 Large or Dangerous Stream – assessment reach metric

( ) Yes (•) No Is stream is too large or dangerous to assess? **If Yes, skip to Metric 13 (Streamside Area Ground Surface Condition)**.

10. Natural In-stream Habitat Types – assessment reach metric

10a. ( ) Yes ( ) No Degraded in-stream habitat over majority of the assessment reach (examples of stressors include excessive sedimentation, mining, excavation, in-stream hardening [for example, rip-rap], recent dredging, and snagging) **(evaluate for size 4 Coastal Plain streams only, then skip to Metric 12)**

10b. **Check all that occur** (occurs if > 5% coverage of assessment reach) **(skip for Size 4 Coastal Plain streams)**

- [ ] A Multiple aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
- [ ] B Multiple sticks and/or leaf packs and/or emergent vegetation
- [ ] C Multiple snags and logs (including lap trees)
- [ ] D 5% undercut banks and/or root mats and/or roots in banks extend to the normal wetted perimeter
- [x] E Little or no habitat

Check for Tidal Marsh Streams only

- [ ] F 5% oysters or other natural hard bottoms
- [ ] G Submerged aquatic vegetation
- [ ] H Low-tide refugia (pools)
- [ ] I Sand bottom
- [ ] J 5% vertical bank along the marsh
- [ ] K Little or no habitat

************************************REMAINING QUESTIONS ARE NOT APPLICABLE FOR TIDAL MARSH STREAMS*******************************

11. Bedform and Substrate – assessment reach metric (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

11a. ( ) Yes (•) No Is assessment reach in a natural sand-bed stream? **(skip for Coastal Plain streams)**

11b. Bedform evaluated. **Check the appropriate box(es).**

- [x] A Riffle-run section (evaluate 11c)
- [ ] B Pool-glide section (evaluate 11d)
- [ ] C Natural bedform absent **(skip to Metric 12, Aquatic Life)**

11c. In riffles sections, check all that occur below the normal wetted perimeter of the assessment reach – whether or not submerged. **Check at least one box in each row (skip for Size 4 Coastal Plain Streams and Tidal Marsh Streams)**. Not Present (NP) = absent, Rare (R) = present but ≤ 10%, Common (C) = > 10-40%, Abundant (A) = > 40-70%, Predominant (P) = > 70%. Cumulative percentages should not exceed 100% for each assessment reach.

NP	R	C	A	P	
(•)	( )	( )	( )	( )	Bedrock/saprolite
(•)	( )	( )	( )	( )	Boulder (256 – 4096 mm)
(•)	( )	( )	( )	( )	Cobble (64 – 256 mm)
( )	( )	(•)	( )	( )	Gravel (2 – 64 mm)
( )	( )	( )	(•)	( )	Sand (.062 – 2 mm)
( )	( )	( )	( )	(•)	Silt/clay (< 0.062 mm)
( )	( )	( )	(•)	( )	Detritus
(•)	( )	( )	( )	( )	Artificial (rip-rap, concrete, etc.)

11d. ( ) Yes ( ) No Are pools filled with sediment? (**skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)**

12. Aquatic Life – assessment reach metric (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

12a. (•) Yes ( ) No Was an in-stream aquatic life assessment performed as described in the User Manual?
If No, select one of the following reasons and skip to Metric 13. ( ) No Water ( ) Other: ______________________

12b. ( ) Yes (•) No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.

1	>1	Numbers over columns refer to "individuals" for size 1 and 2 streams and "taxa" for size 3 and 4 streams.
[ ]	[ ]	Adult frogs
[ ]	[ ]	Aquatic reptiles
[ ]	[ ]	Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
[ ]	[ ]	Beetles (including water pennies)
[ ]	[ ]	Caddisfly larvae (Trichoptera [T])
[ ]	[ ]	Asian clam (*Corbicula*)
[ ]	[ ]	Crustacean (isopod/amphipod/crayfish/shrimp)
[ ]	[ ]	Damselfly and dragonfly larvae
[ ]	[ ]	Dipterans (true flies)
[ ]	[ ]	Mayfly larvae (Ephemeroptera [E])
[ ]	[ ]	Megaloptera (alderfly, fishfly, dobsonfly larvae)
[ ]	[ ]	Midges/mosquito larvae
[ ]	[ ]	Mosquito fish (*Gambusia*) or mud minnows (*Umbra pygmaea)*
[ ]	[ ]	Mussels/Clams (not *Corbicula*)
[ ]	[ ]	Other fish
[ ]	[ ]	Salamanders/tadpoles
[ ]	[ ]	Snails
[ ]	[ ]	Stonefly larvae (Plecoptera [P])
[ ]	[ ]	Tipulid larvae

☐ ☐ Worms/leeches

13. Streamside Area Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)
Consider for the Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.

LB	RB	
☐ A	☐ A	Little or no alteration to water storage capacity over a majority of the streamside area
◉ B	◉ B	Moderate alteration to water storage capacity over a majority of the streamside area
☐ C	☐ C	Severe alteration to water storage capacity over a majority of the streamside area (examples include: ditches, fill, soil, compaction, livestock disturbance, buildings, man-made levees, drainage pipes)

14. Streamside Area Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types)
Consider for the Left Bank (LB) and the Right Bank (RB) of the streamside area.

LB	RB	
☐ A	☐ A	Majority of streamside area with depressions able to pond water ≥ 6 inches deep
◉ B	◉ B	Majority of streamside area with depressions able to pond water 3 to 6 inches deep
☐ C	☐ C	Majority of streamside area with depressions able to pond water < 3 inches deep

15. Wetland Presence – streamside area metric (skip for Tidal Marsh Streams)
Consider for the Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal wetted perimeter of assessment reach.

LB	RB	
☐ Y	☐ Y	Are wetlands present in the streamside area?
◉ N	◉ N	

16. Baseflow Contributors – assessment reach metric (skip for size 4 streams and Tidal Marsh Streams)
Check all contributors within the assessment reach or within view of and draining to the assessment reach.

- ☐ A Streams and/or springs (jurisdictional discharges)
- ☐ B Ponds (include wet detention basins; do not include sediment basins or dry detention basins)
- ☐ C Obstruction that passes some flow during low-flow periods within assessment area (beaver dam, bottom-release dam)
- ☐ D Evidence of bank seepage or sweating (iron oxidizing bacteria in water indicates seepage)
- ☐ E Stream bed or bank soil reduced (dig through deposited sediment if present)
- ☑ F None of the above

17. Baseflow Detractors – assessment area metric (skip for Tidal Marsh Streams)
Check all that apply.

- ☐ A Evidence of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation)
- ☐ B Obstruction not passing flow during low flow periods affecting the assessment reach (ex: watertight dam, sediment deposit)
- ☐ C Urban stream (≥ 24% impervious surface for watershed)
- ☐ D Evidence that the stream-side area has been modified resulting in accelerated drainage into the assessment reach
- ☐ E Assessment reach relocated to valley edge
- ☑ F None of the above

18. Shading – assessment reach metric (skip for Tidal Marsh Streams)
Consider aspect. Consider "leaf-on" condition.

- ◉ A Stream shading is appropriate for stream category (may include gaps associated with natural processes)
- ☐ B Degraded (example: scattered trees)
- ☐ C Stream shading is gone or largely absent

19. Buffer Width – streamside area metric (skip for Tidal Marsh Streams)
Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.

Vegetated		Wooded		
LB	RB	LB	RB	
☐ A	☐ A	☐ A	☐ A	≥ 100-feet wide or extends to the edge of the watershed
◉ B	☐ B	◉ B	☐ B	From 50 to < 100-feet wide
☐ C	◉ C	☐ C	◉ C	From 30 to < 50-feet wide
☐ D	☐ D	☐ D	☐ D	From 10 to < 30-feet wide
☐ E	☐ E	☐ E	☐ E	< 10-feet wide or no trees

20. Buffer Structure – streamside area metric (skip for Tidal Marsh Streams)
Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).

LB	RB	
◉ A	◉ A	Mature forest
☐ B	☐ B	Non-mature woody vegetation or modified vegetation structure
☐ C	☐ C	Herbaceous vegetation with or without a strip of trees < 10 feet wide
☐ D	☐ D	Maintained shrubs
☐ E	☐ E	Little or no vegetation

21. Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)
Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).
If none of the following stressors occurs on either bank, check here and skip to Metric 22: ☑

Abuts		< 30 feet		30-50 feet		
LB	RB	LB	RB	LB	RB	
☐ A	☐ A	☐ A	☐ A	☐ A	☐ A	Row crops
☐ B	☐ B	☐ B	☐ B	☐ B	☐ B	Maintained turf
☐ C	☐ C	☐ C	☐ C	☐ C	☐ C	Pasture (no livestock)/commercial horticulture
☐ D	☐ D	☐ D	☐ D	☐ D	☐ D	Pasture (active livestock use)

22. Stem Density – streamside area metric (skip for Tidal Marsh Streams)
Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).

LB	RB	
◉ A	◉ A	Medium to high stem density
☐ B	☐ B	Low stem density
☐ C	☐ C	No wooded riparian buffer or predominantly herbaceous species or bare ground

23. Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)

Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10-feet wide.

LB	RB	
☐ A	☒ A	The total length of buffer breaks is < 25 percent.
☒ B	☐ B	The total length of buffer breaks is between 25 and 50 percent.
☐ C	☐ C	The total length of buffer breaks is > 50 percent.

24. Vegetative Composition – First 100 feet of streamside area metric (skip for Tidal Marsh Streams)

Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.

LB	RB	
☒ A	☒ A	Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.
☐ B	☐ B	Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees.
☐ C	☐ C	Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities with non-native invasive species dominant over a large portion of expected strata or communities composed of planted stands of non-characteristic species or communities inappropriately composed of a single species or no vegetation.

25. Conductivity – assessment reach metric (skip for all Coastal Plain streams)

25a. ☐ Yes ☒ No Was a conductivity measurement recorded?

If No, select one of the following reasons. ☐ No Water ☐ Other: _____

25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter).

☐ A <46 ☐ B 46 to < 67 ☐ C 67 to < 79 ☐ D 79 to < 230 ☐ E ≥ 230

Notes/Sketch:

NC SAM Stream Rating Sheet
Accompanies User Manual Version 2.1

Stream Site Name U-6003 | Date of Evaluation 5-17-2017

Stream Category Pa3 | Assessor Name/Organization S. Easterly/HDR

Notes of Field Assessment Form (Y/N)	NO
Presence of regulatory considerations (Y/N)	NO
Additional stream information/supplementary measurements included (Y/N)	NO
NC SAM feature type (perennial, intermittent, Tidal Marsh Stream)	Intermittent

Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	**LOW**	
(2) Baseflow	**MEDIUM**	
(2) Flood Flow	**LOW**	
(3) Streamside Area Attenuation	**MEDIUM**	
(4) Floodplain Access	**MEDIUM**	
(4) Wooded Riparian Buffer	**HIGH**	
(4) Microtopography	**LOW**	
(3) Stream Stability	**LOW**	
(4) Channel Stability	**MEDIUM**	
(4) Sediment Transport	**LOW**	
(4) Stream Geomorphology	**MEDIUM**	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	**HIGH**	
(2) Baseflow	**MEDIUM**	
(2) Streamside Area Vegetation	**HIGH**	
(3) Upland Pollutant Filtration	**HIGH**	
(3) Thermoregulation	**HIGH**	
(2) Indicators of Stressors	**NO**	
(2) Aquatic Life Tolerance	**HIGH**	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	**LOW**	
(2) In-stream Habitat	**LOW**	
(3) Baseflow	**MEDIUM**	
(3) Substrate	**LOW**	
(3) Stream Stability	**MEDIUM**	
(3) In-stream Habitat	**LOW**	
(2) Stream-side Habitat	**HIGH**	
(3) Stream-side Habitat	**HIGH**	
(3) Thermoregulation	**HIGH**	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA	
(4) Tidal Marsh Stream Geomorphology	NA	
(3) Tidal Marsh In-stream Habitat	NA	
(2) Intertidal Zone Habitat	NA	
Overall	**LOW**	

TIP # U-6003
DMS Mitigation
Acceptance Letter

ROY COOPER
Governor
ELIZABETH S. BISER
Secretary
MARC RECKTENWALD
Director

NORTH CAROLINA
Environmental Quality

January 23, 2023

Ms. Amy Euliss
Division 9 PDEA Engineer
North Carolina Department of Transportation
375 Silas Creek Parkway
Winston-Salem, North Carolina 27127-7167

Dear Ms. Euliss:

Subject: Mitigation Acceptance Letter:

U-6003, New Route from NC 150 (North Main Street) to SR 1969 (Piney Grove Road), Forsyth County, WBS Number 47138.1.1

The purpose of this letter is to notify you that the Division of Mitigation Services (DMS) will provide the compensatory mitigation for the subject project. Based on the information supplied by you on January 23, 2023, the impacts are located in CU 03010103 of the Roanoke River basin in the Central Piedmont (CP) Eco-Region, and are as follows:

Stream and Wetlands	River Basin	CU Location	Eco-Region	Stream			Wetlands		
				Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh
Impacts	Roanoke	03010103	CP	0	0	906.000	0	0	0

*Some of the stream and/or wetland impacts may be proposed to be mitigated at a 1:1 mitigation ratio. See permit application for details.

DMS commits to implementing sufficient compensatory mitigation credits to offset the impacts associated with this project as determined by the regulatory agencies in accordance with the In-Lieu Fee Instrument dated July 28, 2010. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from NCDEQ-DMS.

If you have any questions or need additional information, please contact Beth Harmon at 919-707-8420.

Sincerely,

Elizabeth Harmon

for James B. Stanfill
DMS Deputy Director

cc: Mr. Eric Alsmeyer, USACE – Raleigh Regulatory Field Office
Ms. Amy Chapman, NCDWR
File: U-6003 – Division 9

TIP # U-6003
Historic Architecture and Landscapes
No Survey Required
Form August 7, 2017

Project Tracking No. (Internal Use)

17-07-0010

HISTORIC ARCHITECTURE AND LANDSCAPES NO SURVEY REQUIRED FORM

This form only pertains to Historic Architecture and Landscapes for this project. It is not valid for Archaeological Resources. You must consult separately with the Archaeology Group.

PROJECT INFORMATION

Project No:	U-6003	***County***:	Forsyth
WBS No.:	47138.1.1	***Document Type***:	
Fed. Aid No:		***Funding***:	X State Federal
Federal Permit(s):	X Yes No	***Permit Type(s)***:	USACE
Project Description: Construct two-lane divided facility with bicycle/pedestrian accommodations on new location from SR 1969 (Piney Grove Road) to NC 150 (North Main Street) in Kernersville (no off-site detour specified in review request).			

SUMMARY OF HISTORIC ARCHITECTURE AND LANDSCAPES REVIEW

Description of review activities, results, and conclusions: HPOWeb reviewed on 7 August 2017 and yielded no NR, SL, LD, DE, or SS properties in the Area of Potential Effects (APE). Forsyth County current GIS mapping, aerial photography, and tax information indicated an APE of mostly woodland and cultivated fields and a concentration of residential and some commercial resources at its western end (viewed 7 August 2017). Several mid-twentieth-century houses are unexceptional and altered examples of their types. Google Maps "Street View" confirmed the absence of critical historic structures and landscapes in the APE (viewed 7 August 2017).

No architectural survey is required for the project as currently defined.

Why the available information provides a reliable basis for reasonably predicting that there are no unidentified significant historic architectural or landscape resources in the project area: APE equates with the study area provided in the review request. Comprehensive historic architectural survey of Forsyth County is extensive and eminently reliable (1979-80, 2006-9) and county GIS/tax materials and other visuals clearly illustrate the absence of significant architectural resources. No National Register-listed or –eligible properties are located within the APE.

Should the design of the project change, please notify NCDOT Historic Architecture as additional review may be necessary.

SUPPORT DOCUMENTATION

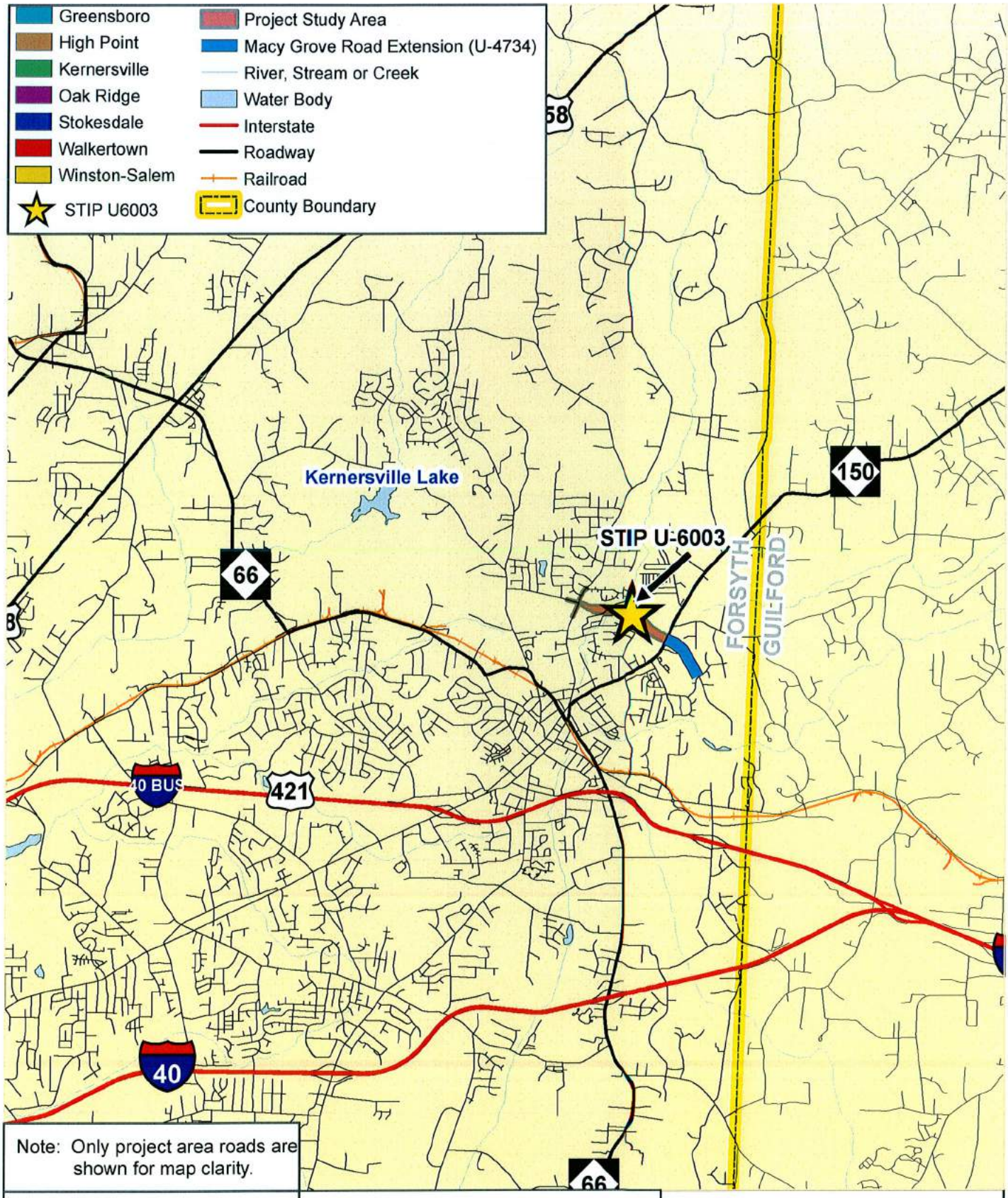
X Map(s) ☐Previous Survey Info. ☐Photos ☐Correspondence ☐Design Plans

FINDING BY NCDOT ARCHITECTURAL HISTORIAN

Historic Architecture and Landscapes -- NO SURVEY REQUIRED

Vanessa C. Patrick — 7 August 2017

NCDOT Architectural Historian — Date



Note: Only project area roads are shown for map clarity.

N

0 1 2
Miles

NCDOT RAIL DIVISION

HDR | ICA

DATA SOURCES: NCDOT GIS Data, NC OneMap, City of Winston Salem

PROJECT VICINITY MAP

STIP U-6003
ROAD EXTENSION BETWEEN PINEY GROVE RD. AND N MAIN ST.
TWO-LANE FACILITY WITH BICYCLE AND PEDESTRAIN ACCOMMODATIONS
KERNERSVILLE, FORSYTH COUNTY

JULY 2017

Tracking No. 17-07-0010

STUDY AREA MAP
STIP U-6003
PROPOSED NEW ROUTE FROM SR 1969 (PINEY GROVE ROAD) TO NC 150 (NORTH MAIN STREET) KERNERSVILLE, FORSYTH COUNTY

APRIL 2017

Tracking No. 17-07-0010

TIP # U-6003
Historic Architecture and Landscapes
No Survey Required
Form January 5, 2023

Project Tracking No. (Internal Use)

17-07-0010
Revised

HISTORIC ARCHITECTURE AND LANDSCAPES
NO SURVEY REQUIRED FORM

This form supercedes that dated 7 August 2017

This form only pertains to Historic Architecture and Landscapes for this project. It is not valid for Archaeological Resources. You must consult separately with the Archaeology Group.

PROJECT INFORMATION

Project No:	U-6003	***County***:	Forsyth
WBS No.:	47138.1.1	***Document Type:***	
Fed. Aid No:		***Funding***:	X State Federal
Federal Permit(s):	X Yes No	***Permit Type(s)***:	USACE

Project Description: Construct two-lane divided facility with bicycle/pedestrian accommodations on new location from SR 1969 (Piney Grove Road) to NC 150 (North Main Street) in Kernersville (no off-site detour specified in review request). Expanded study area received January 2023.

SUMMARY OF HISTORIC ARCHITECTURE AND LANDSCAPES REVIEW

Description of review activities, results, and conclusions: HPOWeb reviewed on 7 August 2017 and 3 January 2023 and yielded no NR, SL, LD, DE, or SS properties in the Area of Potential Effects (APE). Forsyth County current GIS mapping, aerial photography, and tax information indicated an APE of mostly woodland and cultivated fields with residential and a few commercial resources dating predominantly from the 1970s to the 2000s and concentrated at its western end (viewed 7 August 2017 and 3 January 2023). Several mid-twentieth-century houses are unexceptional (most are also altered) examples of their types. Expanded study area yielded no additional resources of concern. Google Maps "Street View" confirmed the absence of critical historic structures and landscapes in the APE (viewed 7 August 2017 and 3 January 2023). **No architectural survey is required for the project as currently defined.**

Why the available information provides a reliable basis for reasonably predicting that there are no unidentified significant historic architectural or landscape resources in the project area: APE equates with the study area provided in the original 2017 review request and additions received in January 2023. The comprehensive historic architectural survey of Forsyth County is extensive and eminently reliable (1979-80, 2006-9), and county GIS/tax materials and other visuals clearly illustrate the absence of significant architectural resources. No National Register-listed or –eligible properties are located within the APE.

Should the study area boundary of the project change, please notify NCDOT Historic Architecture as additional review may be necessary.

SUPPORT DOCUMENTATION

X Map(s) ☐ Previous Survey Info. ☐ Photos ☐ Correspondence ☐ Design Plans

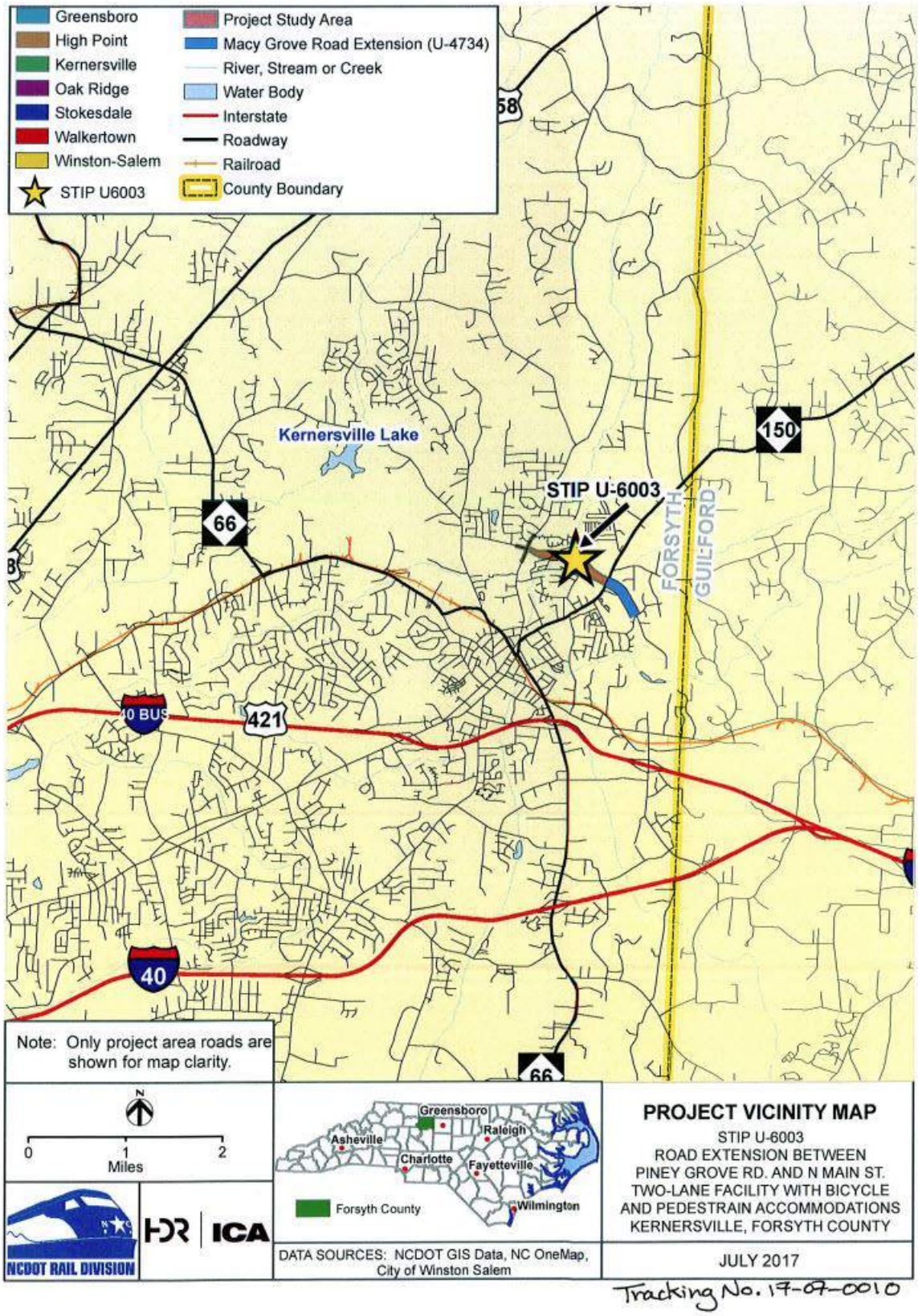
FINDING BY NCDOT ARCHITECTURAL HISTORIAN

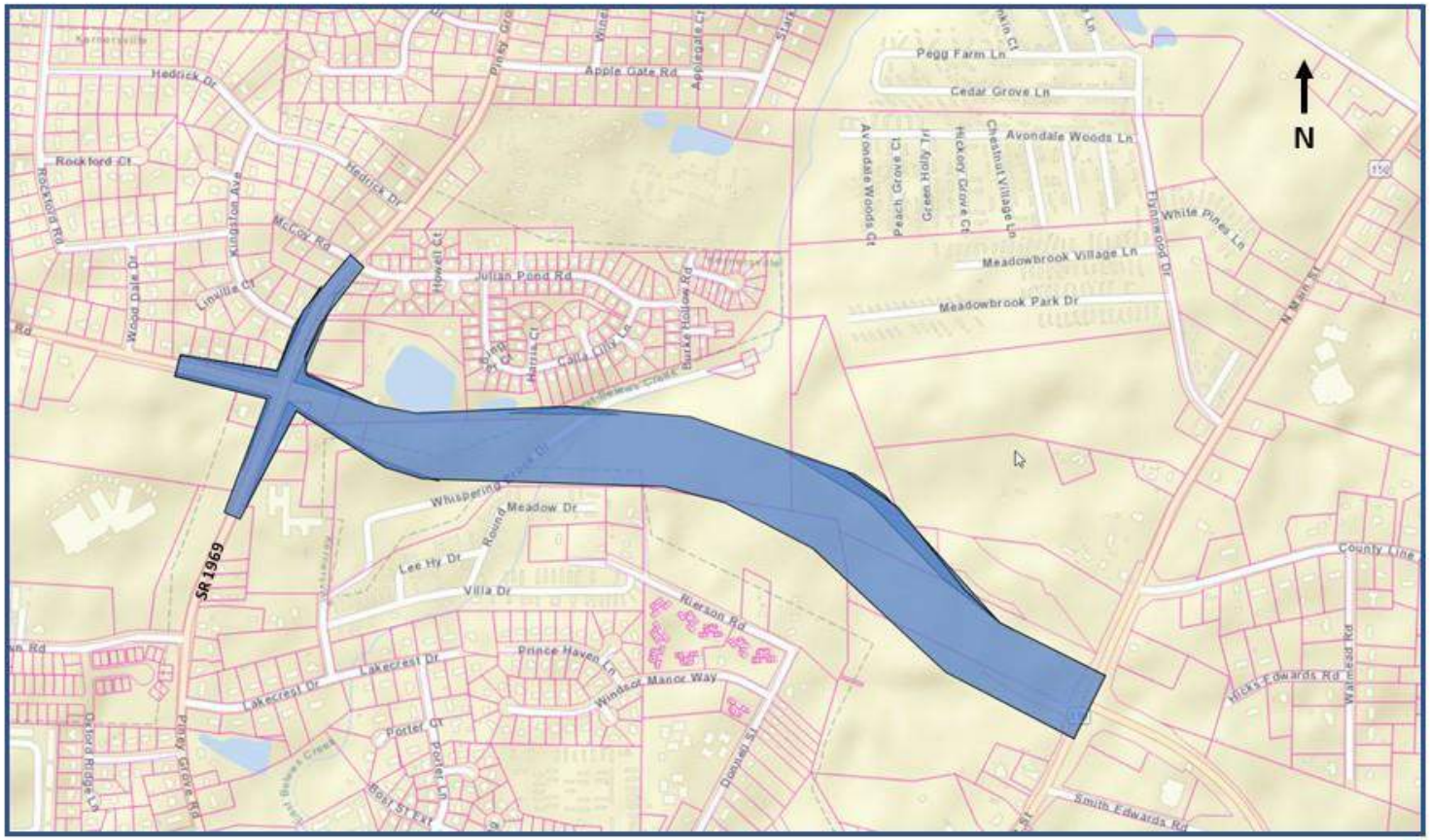
Historic Architecture and Landscapes -- NO SURVEY REQUIRED

Vanessa E. Patrick

NCDOT Architectural Historian

5 January 2023
Date


Greensboro
High Point
Kernersville
Oak Ridge
Stokesdale
Walkertown
Winston-Salem
STIP U6003
Project Study Area
Macy Grove Road Extension (U-4734)
River, Stream or Creek
Water Body
Interstate
Roadway
Railroad
County Boundary
Kernersville Lake
STIP U-6003
FORSYTH
GUILFORD
66
150
421
40 BUS
40
Note: Only project area roads are shown for map clarity.
N
0
1
2
Miles
Greensboro
Raleigh
Asheville
Charlotte
Fayetteville
Wilmington
Forsyth County
NCDOT RAIL DIVISION
HDR | ICA
DATA SOURCES: NCDOT GIS Data, NC OneMap, City of Winston Salem
PROJECT VICINITY MAP
STIP U-6003
ROAD EXTENSION BETWEEN
PINEY GROVE RD. AND N MAIN ST.
TWO-LANE FACILITY WITH BICYCLE
AND PEDESTRAIN ACCOMMODATIONS
KERNERSVILLE, FORSYTH COUNTY
JULY 2017
Tracking No. 17-07-0010



Area of Potential Effects (APE)

U-6003, Forsyth County WBS No. 47138.1.1

Combined 2017 study area and 2023 (darker blue) additions

Base map: HPOWeb, nts

NCDOT – Historic Architecture
January 2023
PA Tracking No. 17-07-0010

TIP # U-6003
No Architectural Resources, Expanded Study Area Email

Reep, Mark

From: Patrick, Vanessa E <vepatrick@ncdot.gov>
Sent: Friday, June 22, 2018 4:12 PM
To: Euliss, Amy
Cc: Reep, Mark; Blanton, William A; James, Connie K; Brown, Steve (Raleigh); Rogers, Phillip
Subject: RE: [External] FW: U-6003, Forsyth County -- Historic Architecture

Hi Amy: There are no additional architectural resources of concern in the expanded U-6003 study area. As I suspected, our earlier review in 2017 included the recently added sections, and so the original "no survey required" finding remains valid. You may consider the project in compliance with both GS 121-12(a) and Section 106 for historic architecture. I have not prepared a supplemental form, but will add a copy of this e-mail and the updated study area map to our project file to document that we considered the changes in our review.

I'll also add a note to the original ETRACS request, indicating that we completed a second round of screening. Please remember in future that if we are asked to revisit a project for which we have completed all work, a new ETRACS request should be submitted. Thanks. Vanessa

Vanessa E. Patrick
Architectural Historian
Environmental Analysis Unit
North Carolina Department of Transportation

919 707 6082 office
919 880 7600 mobile
vepatrick@ncdot.gov

1020 Birch Ridge Drive, Building B
1598 Mail Service Center
Raleigh, NC 27699-1598

From: Euliss, Amy
Sent: Friday, June 22, 2018 1:42 PM
To: Patrick, Vanessa E; Reep, Mark
Cc: Blanton, William A; James, Connie K; Brown, Steve (Raleigh); Rogers, Phillip
Subject: RE: [External] FW: U-6003, Forsyth County -- Historic Architecture

Hi Vanessa. Can you let us know if you had any concerns in the additional areas, and if you haven't looked into, let us know an estimated timeline? We are about to complete our MCDC. Thanks!

Amy Euliss

TIP # U-6003
Archaeological
Survey
Required Form

Project Tracking No.

17-07-0010

ARCHAEOLOGICAL SURVEY REQUIRED FORM

This form only pertains to ARCHAEOLOGICAL RESOURCES for this project. It is not valid for Historic Architecture and Landscapes. You must consult separately with the Historic Architecture and Landscapes Group.

PROJECT INFORMATION

Project No:	**U-6003**	*County:*	**Forsyth**
WBS No:	**47138.1.1**	*Document:*	**State EA/FONSI**
F.A. No:	**N/A**	*Funding:*	☒ State ☐ Federal

Federal Permit Required? ☒ Yes ☐ No *Permit Type:* **Not Specified**

Project Description: NCDOT's Division 9 proposes to construct a new route from Piney Grove Road (SR 1969) to NC 150 (North Main Street) in Kernersville, Forsyth County. The new route will consist of a two-lane, median-divided facility with bicycle/pedestrian accommodations. Project length measures approximately 1.00 mile (5,280 feet). Proposed ROW for this new location route will vary between 100 feet and 150 feet wide; however, its alignment has not been determined so the proposed width for the Study Area corridor is set at 400 feet, narrowing to about 130 feet as it approaches Piney Grove Road (SR 1969). Overall, the Study Area encompasses about 48.2 acres, inclusive of any development along any associated Y-lines (i.e. Piney Grove Road [SR 1969] and Linville Springs Road [SR 2030]).

SUMMARY OF ARCHAEOLOGICAL RESOURCES REVIEW: *SURVEY REQUIRED*

Brief description of review activities, results of review, and conclusions:

This project was accepted for review on Wednesday, July 19, 2017. An internal map review and site file search was conducted at the Office of State Archaeology (OSA) on Friday, July 21, 2017. A comprehensive archaeological survey has already been conducted for the Macy Grove Road Extension project (see TIP# U-4734 [OSA Biblio #6557]), with which the newly proposed route would connect at NC 150 (North Main Street). As a result of that survey (Jorgenson and Brown 2010), five (5) archaeological sites were recorded within similar environmental settings being traversed by this newly proposed project. Digital copies of HPO's maps (Belews Creek Quadrangle) as well as the HPOWEB GIS Service (http://gis.ncdcr.gov/hpoweb/) were reviewed on Monday, July 31, 2017. There is only one (1) known historic architectural resource located within or adjacent to the Study Areas (i.e. Henry Clay Edwards House [FY0384]); however, intact archaeological deposits associated with this resource are not anticipated within the footprint of the proposed project. In addition, topographic maps, historic maps (NCMaps website), USDA soil survey maps, and historic orthophotography were utilized and inspected to gauge environmental factors that may have contributed to historic or prehistoric settlement within the project limits, and to assess the level of modern, slope, agricultural, hydrological, and other erosive-type disturbances within and surrounding the archaeological APE.

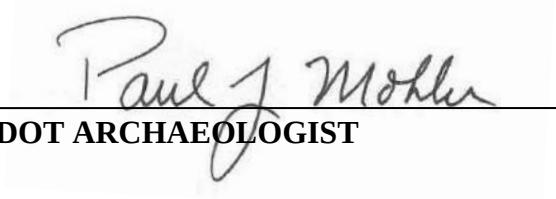
This is a State-funded project for which a Federal permit will be required. Both temporary and/or permanent easements may be required and additional ROW will be necessary since this is a new location project. The overall dimensions of the Study Area will capture any impacts beyond what is already owned and maintained by the NCDOT. At this time, we are in compliance with NC GS 121-12a since there are no eligible (i.e. National Register-listed) archaeological resources located within the project's Study Area that would require our attention. From an environmental perspective, the Study Area falls within a residentially developed section of Kernersville where large pockets of agricultural fields and

undisturbed woods still occur within upland settings along Whispering Brook and one of its unnamed tributaries. Previous archaeological survey for the Macy Grove Road Extension (TIP# U-4734) recovered archaeological materials (e.g. Sites 31FY1184/1184**, 31FY1185, 31FY1186, 31FY1188**) immediately east of NC 150 (North Main Street) and north of Smith Edwards Road (SR 2036) under similar environmental conditions, i.e. relatively level terrain composed of Appling sandy loam, 2-6% slopes (ApB). Previous studies in the region indicate that the longest occupied sites in the area during the Archaic period appear to be base camps located at the confluences of creeks. These sites are frequently located on gently sloping toeslopes overlooking the confluence area. Small, ephemeral campsites are also present on ridges, knolls, and adjacent slopes with the most heavily settled areas occurring in the interior uplands and on first terraces above the floodplains of first- to third-order streams. Woodland period occupations have been documented on the floodplains on larger waterways such as Muddy Creek and the Yadkin River. Based on this predictability, there is a high probability for archaeological resources to be recovered from within the Study Area. Although all four (4) of the archaeological sites mentioned earlier were recommended as not eligible for the National Register of Historic Places (NRHP), both prehistoric and historic materials may be anticipated within certain sections of the Study Area (i.e. the level upland settings on either side of the drainages); such areas should be the focus of any formal archaeological investigations. Based on the information provided, an archaeological survey is, therefore, recommended for the proposed project. A visual inspection of the entire Study Area should be conducted, followed then by systematic archaeological excavations within areas of moderate to high archaeological probability, focusing on the level upland settings on either side of Whispering Branch and its tributary. It should be noted that none of the property, potentially being investigated within the Study Area, is owned by the State of North Carolina so a State Archaeological Resources Protection Act (ARPA) permit should not be required. Should the description of this project change or design plans be made available prior to construction, additional consultation regarding archaeology will be required.

SUPPORT DOCUMENTATION

See attached: ☒ Map(s) ☒ Previous Survey Info ☐ Photos ☐ Correspondence
☐ Photocopy of County Survey Notes Other:

FINDING BY NCDOT ARCHAEOLOGIST – *SURVEY REQUIRED*



July 31, 2017

NCDOT ARCHAEOLOGIST **Date**

PROPOSED FIELDWORK COMPLETION DATE January 31, 2018

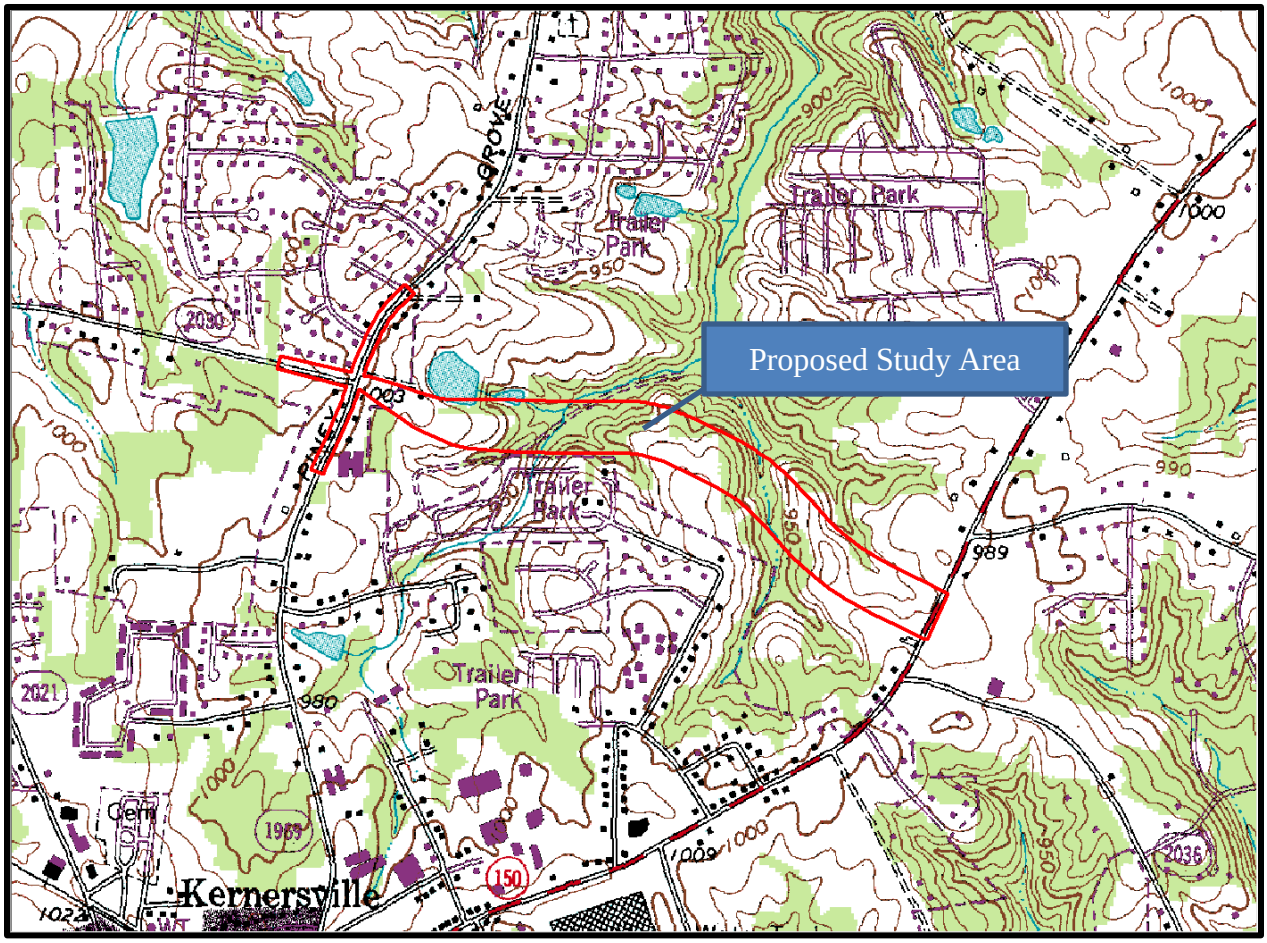
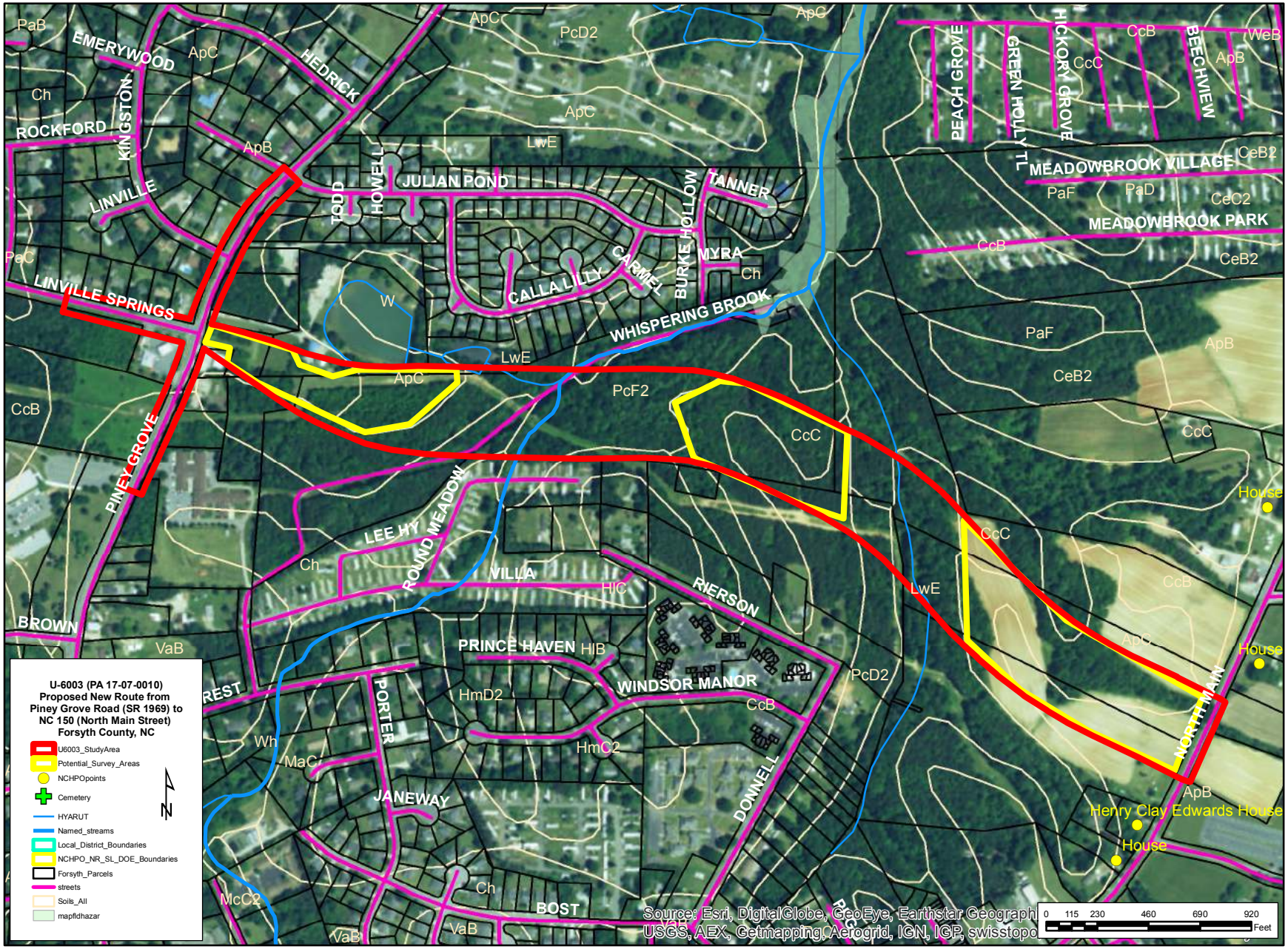


Figure 1: Belews Creek, NC (USGS 19??).


U-6003 (PA 17-07-0010)
Proposed New Route from
Piney Grove Road (SR 1969) to
NC 150 (North Main Street)
Forsyth County, NC
U6003_StudyArea
Potential_Survey_Areas
NCHPOpoints
Cemetery
HYARUT
Named_streams
Local_District_Boundaries
NCHPO_NR_SL_DOE_Boundaries
Forsyth_Parcels
streets
Soils_All
mapfldhazar
N
EMERYWOOD
HEDRICK
KINGSTON
ROCKFORD
LINVILLE
LINVILLE SPRINGS
PINEY GROVE
TODD
HOWELL
JULIAN POND
TANNER
BURKE HOLLOW
CARMEL
CALLA LILY
MYRA
WHISPERING BROOK
LEE HY
ROUND MEADOW
VILLA
RIERSON
BROWN
PRINCE HAVEN
WINDSOR MANOR
PORTER
JANEWAY
DONNELL
BOST
NORTH MAIN
PEACH GROVE
GREEN HOLLY TL
HICKORY GROVE
BEECHVIEW
MEADOWBROOK VILLAGE
MEADOWBROOK PARK
House
Henry Clay Edwards House
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geograph
USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo
0 115 230 460 690 920
Feet

TIP # U-6003
No Archaeological Survey Required Form, Study Area Expansion

Project Tracking No.:

17-07-0010

NO ARCHAEOLOGICAL SURVEY REQUIRED FORM

This form only pertains to ARCHAEOLOGICAL RESOURCES for this project. It is not valid for Historic Architecture and Landscapes. You must consult separately with the Historic Architecture and Landscapes Group.

PROJECT INFORMATION

Project No:	**U-6003**	*County:*	**Forsyth**
WBS No:	**47138.1.1**	*Document:*	**State EA/FONSI**
F.A. No:	**N/A**	*Funding:*	☒ State ☐ Federal

Federal Permit Required? ☒ Yes ☐ No *Permit Type:* **Not Specified**

Project Description: NCDOT's Division 9 proposes to construct a new route from Piney Grove Road (SR 1969) to NC 150 (North Main Street) in Kernersville, Forsyth County. The new route will consist of a two-lane, median-divided facility with bicycle/pedestrian accommodations. Project length measures approximately 1.00 mile (5,280 feet). Proposed ROW for this new location route will vary between 100 feet and 150 feet wide; however, its alignment has not been determined. This project was originally reviewed in July 2017, the Study Area for which was archaeologically surveyed in October 2017. Originally, the Study Area corridor was set at 400 feet, narrowing to about 130 feet as it approaches Piney Grove Road (SR 1969). Based on design changes, the original Study Area has since expanded in several locations, accounting for an additional 3.89 acres. This form can be considered an addendum to the original PA form calling for a survey; however, this form only covers the Study Area expansion.

SUMMARY OF CULTURAL RESOURCES REVIEW

Brief description of review activities, results of review, and conclusions:

The expansion of the Study Area was brought to our attention on Monday, May 7, 2018. Since this project had been previously reviewed and surveyed, an additional map review and site file search at the Office of State Archaeology (OSA) was deemed not necessary. An archaeological survey of the original Study Area was conducted by URS (now AECOM) in October 2017. No archaeological sites were documented as a result of those investigations. Digital copies of HPO's maps (Belews Creek Quadrangle) as well as the HPOWEB GIS Service (http://gis.ncdcr.gov/hpoweb/) were reviewed once more on Tuesday, May 8, 2018. There is still only one (1) known historic architectural resource located within or adjacent to the overall Study Area (i.e. Henry Clay Edwards House [FY0384]); however, intact archaeological deposits associated with this resource are not anticipated within the footprint of the proposed project or within the expanded Study Area. In addition, topographic maps, historic maps (NCMaps website), USDA soil survey maps, and historic orthophotography were utilized and inspected to gauge environmental factors that may have contributed to historic or prehistoric settlement within the project limits, and to assess the level of modern, slope, agricultural, hydrological, and other erosive-type disturbances within and surrounding the expanded Study Area.

Brief Explanation of why the available information provides a reliable basis for reasonably predicting that there are no unidentified historic properties in the APE:

This is a State-funded project for which a Federal permit will be required. Both temporary and/or permanent easements may be required and additional ROW will be necessary since this is a new location project. The overall dimensions of the newly expanded Study Area will capture any impacts beyond what

is already owned and maintained by the NCDOT. At this time, we are still in compliance with NC GS 121-12a since there are no eligible (i.e. National Register-listed) archaeological resources located within the project's Study Area that would require our attention. From an environmental perspective, the Study Area has expanded slightly in several locations: 1) to either side of the Eastern Branch of East Belews Creek, 2) to either side of the Western Branch of East Belews Creek near its confluence with a retaining pond, and 3) all four quadrants of the intersection of Piney Grove Road (SR 1969) and Linville Springs Road (SR 2030). Previous archaeological survey did not focus on many of these expanded areas because of disturbed soil conditions and/or steeply sloped and incised topography. Shovel testing occurred on the level, uplands along the Eastern Branch of East Belews Creek; no archaeological material was recovered in this area. Despite the presence of high probability landforms within the entire Study Area, no archaeological resources were documented as a result of the original survey for the project. There is a low probability for significant prehistoric and/or historic archaeological materials to be present within the expanded areas of the Study Area based on the disturbed contexts surrounding of the intersection at Piney Grove Road (SR 1969) and Linville Springs Road (SR 2030), the steeply sloped and incised topography along both drainages, and the results of the original survey of the Study Area in October 2017. Therefore, it is believed that the expanded locations of the Study Area, as depicted, are unlikely to contain intact and significant archaeological resources. No additional archaeological survey is required for this project. If design plans change again or are made available prior to construction, then additional consultation regarding archaeology will be required. At this time, no further archaeological work is recommended. If archaeological materials are uncovered during project activities, then such resources will be dealt with according to the procedures set forth for "unanticipated discoveries," to include notification of NCDOT's Archaeology Group.

SUPPORT DOCUMENTATION

See attached: ☒ Map(s) ☒ Previous Survey Info ☒ Photos ☐ Correspondence
☐ Photocopy of County Survey Notes Other:

FINDING BY NCDOT ARCHAEOLOGIST

NO ARCHAEOLOGY SURVEY REQUIRED

Paul J Mohler

NCDOT ARCHAEOLOGIST

May 8, 2018

Date

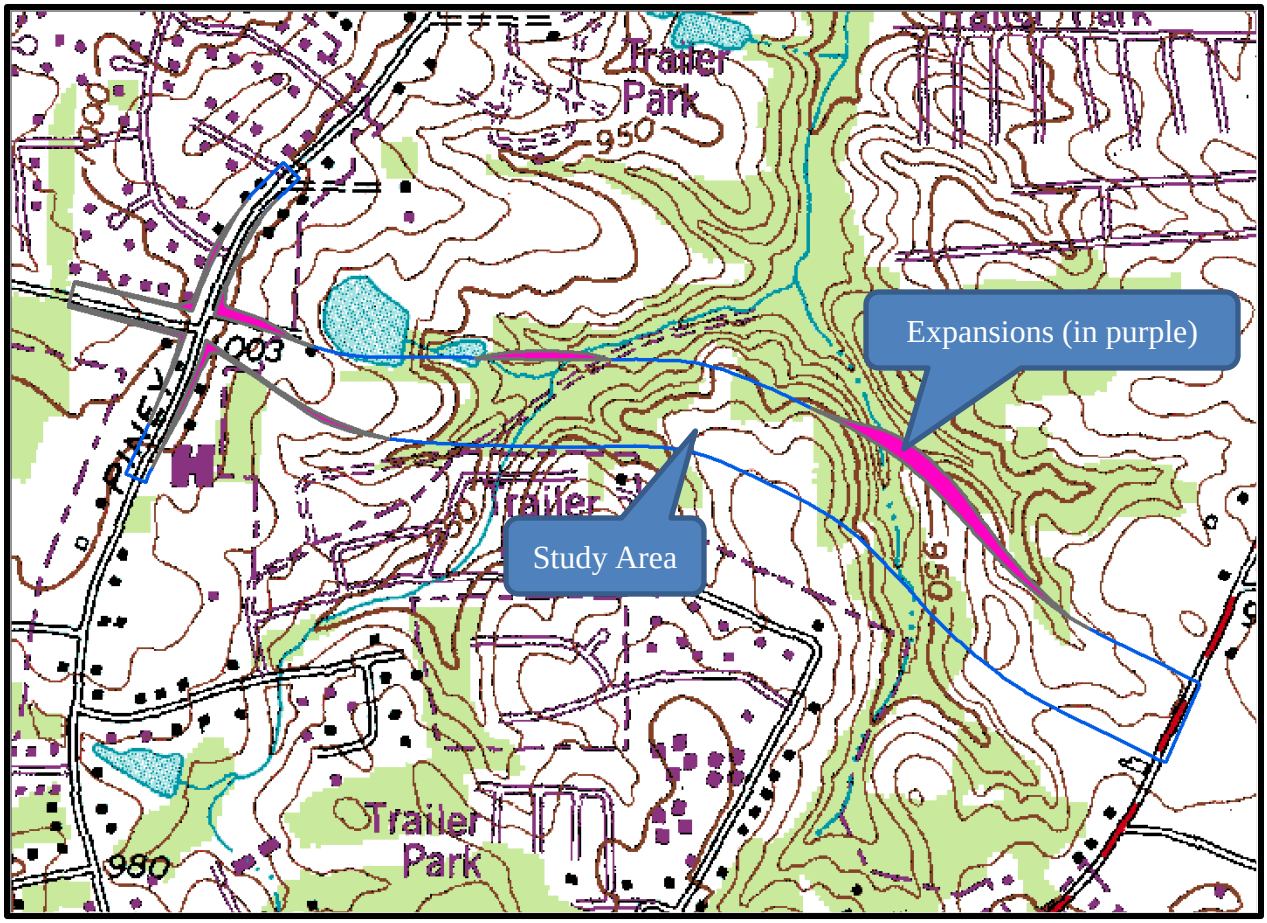
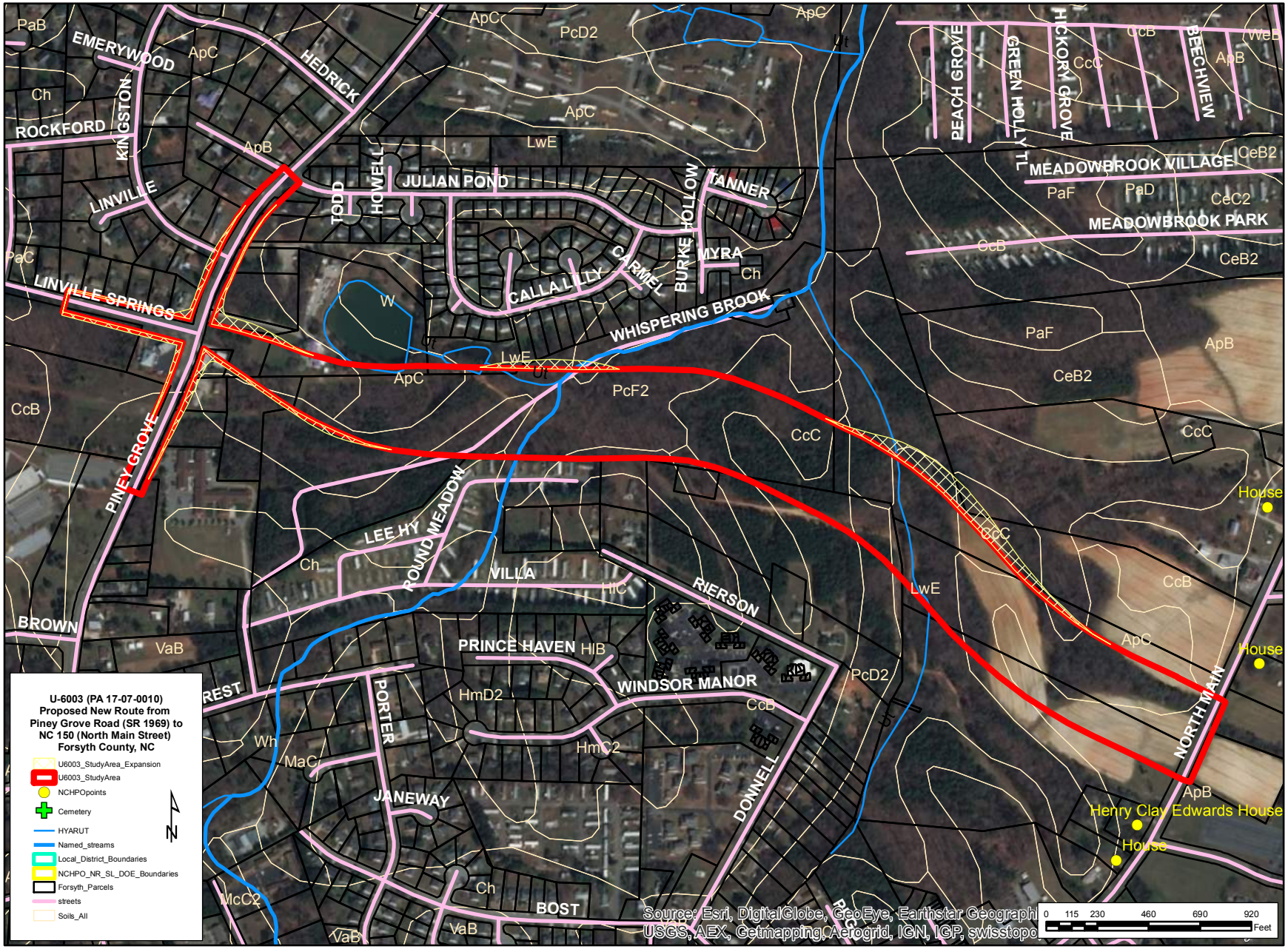


Figure 1: Belews Creek, NC (USGS 1969).


U-6003 (PA 17-07-0010)
Proposed New Route from
Piney Grove Road (SR 1969) to
NC 150 (North Main Street)
Forsyth County, NC
U6003_StudyArea_Expansion
U6003_StudyArea
NCHPOpoints
Cemetery
HYARUT
Named_streams
Local_District_Boundaries
NCHPO_NR_SL_DOE_Boundaries
Forsyth_Parcels
streets
Soils_All
N
EMERYWOOD
HEDRICK
KINGSTON
ROCKFORD
LINVILLE
LINVILLE SPRINGS
PINEY GROVE
JULIAN POND
HOWELL
TODD
TANNER
BURKE HOLLOW
MYRA
CARMEL
CALLA LILY
WHISPERING BROOK
PEACH GROVE
GREEN HOLLY TL
HICKORY GROVE
BEECHVIEW
MEADOWBROOK VILLAGE
MEADOWBROOK PARK
ROUND MEADOW
LEE HY
VILLA
RIERSON
PRINCE HAVEN
WINDSOR MANOR
PORTER
JANEWAY
DONNELL
BOST
BROWN
NORTH MAIN
House
Henry Clay Edwards House
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographi
USGS, AEX, Getmapping,Aerogrid, IGN, IGP, swisstopo
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Feet

TIP # U-6003
No NRHP
Archaeological Sites
Present Form

NO NATIONAL REGISTER OF HISTORIC PLACES ELIGIBLE OR LISTED ARCHAEOLOGICAL SITES PRESENT FORM

This form only pertains to ARCHAEOLOGICAL RESOURCES for this project. It is not valid for Historic Architecture and Landscapes. You must consult separately with the Historic Architecture and Landscapes Group.

PROJECT INFORMATION

Project No:	**U-6003**	*County:*	**Forsyth**
WBS No:	**47138.1.1**	*Document:*	**State EA/ FONSI**
F.A. No:	**N/A**	*Funding:*	☒ State ☐ Federal

Federal Permit Required? ☒ Yes ☐ No *Permit Type:* **Not Specified**

Project Description:
NCDOT's Division 9 proposes to construct a new route from Piney Grove Road (SR 1969) to NC 150 (North Main Street) in Kernersville, Forsyth County. The new route will consist of a two-lane, median-divided facility with bicycle/pedestrian accommodations. Project length measures approximately 1.00 mile (5,280 feet). Proposed ROW for this new location route will vary between 100 feet and 150 feet wide; however, its alignment has not been determined so the proposed width for the Study Area corridor is set at 400 feet, narrowing to about 130 feet as it approaches Piney Grove Road (SR1969). Overall, the Study Area encompasses about 48.2 acres, inclusive of any development along any associated Y-lines (i.e. Piney Grove Road [SR 1969] and Linville Springs Road [SR 2030]).

SUMMARY OF ARCHAEOLOGICAL FINDINGS

A map review and site file search was conducted at the Office of State Archaeology (OSA) on Monday, July 21, 2017 by the NCDOT (Mohler 2016). In addition, AECOM performed an additional check of OSA files on November 16, 2017 to capture any sites within a one-mile buffer surrounding the project area. URS Corporation (now AECOM) conducted a comprehensive archaeological survey for the Macy Grove Road Extension project (see TIP# U-4734 [OSA Biblio #6557]), with which the newly proposed route would connect at NC 150. Five archaeological sites (31FY1184/1184**, 31FY1185, 31FY1186, 31FY1187/1187**, and 31FY1188**) were recorded as a result of this survey; all are considered not eligible for inclusion in the National Register of Historic Places (NRHP). Wake Forest University archaeologists have recorded an additional seven sites (31FY393, 31FY67/67**, 31FY68/68**, 31FY69, 31FY213, 31FY424, 31FY432) in the general area with an unassessed determination of eligibility. A total of 12 sites are located within the one-mile buffer area which are either unassessed or considered not eligible for the NRHP. Examination of the files at the NC-HPO revealed no NRHP eligible sites within the boundaries of the Study Area. In addition, topographic maps, historic maps, USDA soil survey maps, and aerial photographs were inspected to gauge environmental factors that may have contributed to historic or prehistoric settlement within the project limits, and to assess the level of modern, slope, agricultural, hydrological, and other erosive-type disturbances within and surrounding the Study Area.

The North Carolina Department of Transportation (NCDOT) Archaeology Group reviewed the subject project and determined:

☒ **There are no National Register listed or eligible ARCHAEOLOGICAL SITES present within the project's area of potential effects. (Attach any notes or documents as needed)**

☐ No subsurface archaeological investigations were required for this project.
☒ Subsurface investigations did not reveal the presence of any archaeological resources.
☒ **Subsurface investigations did not reveal the presence of any archaeological resources considered eligible for the National Register.**
☒ **All identified archaeological sites located within the APE have been considered and all compliance for archaeological resources with Section 106 of the National Historic Preservation Act and GS 121-12(a) has been completed for this project.**

Brief description of review activities, results of review, and conclusions:
The project's Study Area, between Piney Grove Road (SR1969) and North Main Street (NC 150) in Forsyth County, was subjected to an intensive archaeological survey (Figure 1). The Study Area measured approximately 1.00 mile (1.6 km) long. The Study Area covers approximately 48.2 acres (19.5 hectares). The Study Area crosses two tributaries of East Belews Creek and a ridge nose through secondary growth forests, agricultural fields, with residential and commercial properties nearest roadways (Figure 2 and Figure 3). In October 2017, AECOM completed shovel testing at 30-meter intervals to survey for potential archaeological resources that might be impacted by the proposed undertaking. No archaeological sites were identified within the Study Area during the current field work. Therefore, no further archaeological investigations are recommended for this project, as currently proposed.

SURVEY AREA DESCRIPTIONS

The project was divided into three survey areas, labeled East, Center, and West. Shovel tests in each area were spaced 30 meters apart and assigned a letter; individual STPs along each transect were assigned a sequential number starting with 1. This system provides a unique trinomial provenience label for each individual STP within the project consisting of the area, transect, and STP number (e.g., East-B-6, Center-C-1). A grand total of 93 STPs were excavated in the project area.

Survey Area East. The eastern terminus of the project area lies approximately 100 meters northeast of the intersection of North Main Street (NC 150) and Smith Edwards Road in an agricultural field. The Study Area traverses northwesterly through an agricultural field with a wooded drainage along the northern half (Figure 4). The wooded drainage consists of deeply incised banks and eroded slopes (Figure 5). Surface visibility varied from poor (<25 percent) to good (ca. +/- 50 percent) with most of this section exhibiting good visibility. Soils generally consisted of a plowzone (Ap) approximately 5-25 centimeters (cm) thick of brown (7.5YR 4/2) sandy loam with a moderate amount of gravels underlain by strong brown (7.5YR 5/6) clay loam subsoil. Areas with a moderate amount of side slope consistently exhibited a much thinner plowzone due to erosional slope wash. A total of 44 shovel tests were excavated in this section. No cultural resources were identified within Survey Area East.

Survey Area Center. The central portion of the project area encompasses a ridge nose between two branches of East Belews Creek, which converge approximately 150 meters to the north, and outside of the project area. The eastern branch of the creek contains steep and eroded side slopes (>15 percent) on either side of the creek (Figure 6). The central portion of this survey area contains a wide ridge nose that exhibits evidence of substantive logging operations, with planted pine furrows and push-piles present throughout (Figure 7). Surface visibility was generally poor in this segment. Soils were largely deflated and contained a sometimes present organic A-horizon (Ao) approximately 0-5 cm thick comprised of very dark grayish brown (10YR 3/2) sandy loam underlain by yellowish red (5YR 4/6) sandy clay subsoil across the entirety of the landform. The western branch of East Belews Creek contains pronounced steep slopes west of the ridge nose and exhibits evidence of high-energy erosional activities (Figure 8). This survey area ends at a gravel access road which traverses across the entirety of the Study Area. A total of 30 STPs were excavated and no cultural resources were identified within the Center survey area.

Survey Area West. The eastern portion of this survey area begins immediately west of the gravel access road with the Study Area measuring approximately 120 meters (393 feet) wide consisting of a wooded side slope to the south and an existing gas utility corridor to the north (Figure 9). Surface visibility ranged from poor (<25 percent) to excellent (>75 percent), with the majority exhibiting good visibility (+/- 50 percent). Soils within the wooded areas exhibited a disturbed strong brown (7.5YR 5/6) sandy clay underlain by similarly strong brown (7.5YR 5/8) sterile clay subsoil. Further to the west, an existing house structure with associated outbuildings is positioned along the northern edge of the ROW with a buried septic leach field and disturbed powerline utility corridor (Figure 10). From here the Study Area narrows to approximately 35 meters (114 feet) wide to the intersection of Piney Grove Road (SR 1969) and Linville Springs Road (SR 2030) (Figure 11). The Study Area then encompasses approximately 10 meters (33 feet) on either side of the roadway for a total of 30 meters (99 feet). The Study Area extends along Piney Grove Road to the north approximately 260 meters (850 feet) ending at McCoy Drive, and also extends approximately 230 meters (756 feet) to the south. Additionally, the Study Area extends along Linville Springs Road approximately 185 meters (606 feet) to the western terminus of the project area. A total of 19 STPs were excavated. No cultural materials were identified within Survey Area West.

SUMMARY AND RECOMMENDATIONS

In summary, archaeological field studies for the U-6003 project have been completed. A total of 93 shovel tests were excavated. No archaeological resources were identified. We recommend no additional archaeological work be required in conjunction with the U-6003 project, as currently planned.

REFERENCES CITED:

Mohler, Paul J.

2017 Archaeological Survey Required Form for Project # U-6003, Project Tracking # 17-07-0010. North Carolina Department of Transportation, Raleigh. Manuscript on file, North Carolina Department of Transportation, Environmental Analysis Unit, Archaeology Group, Raleigh.

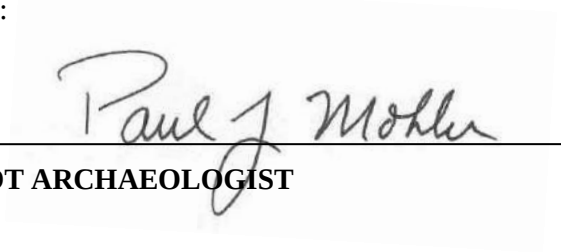
2017 *Scope of Work for Intensive Archaeological Survey and Evaluation for the Proposed New Route from Piney Grove Road (SR 1969) to North Main Street (NC 150) in Forsyth County.* NCDOT TIP U-6003; WBS #47138.1.1.

FIGURE LIST:

CONCLUSIONS:
AECOM conducted an archaeological survey and evaluation for a proposed new route between Piney Grove Road (SR 1969) and North Main Street (NC 150) in Forsyth County in October 2017 (TIP# U-6003). No cultural materials were recovered as a result of this survey. Therefore, no further archaeological investigations are warranted for this project. I concur that no additional archaeological work should be required; however, if the project expands and impacts subsurface areas beyond the defined Study Area, further archaeological studies may be necessary.

SUPPORT DOCUMENTATION

See attached: ☒ Map(s) ☒ Previous Survey Info ☒ Photos ☐ Correspondence
Signed:



November 27, 2017

NCDOT ARCHAEOLOGIST **Date**

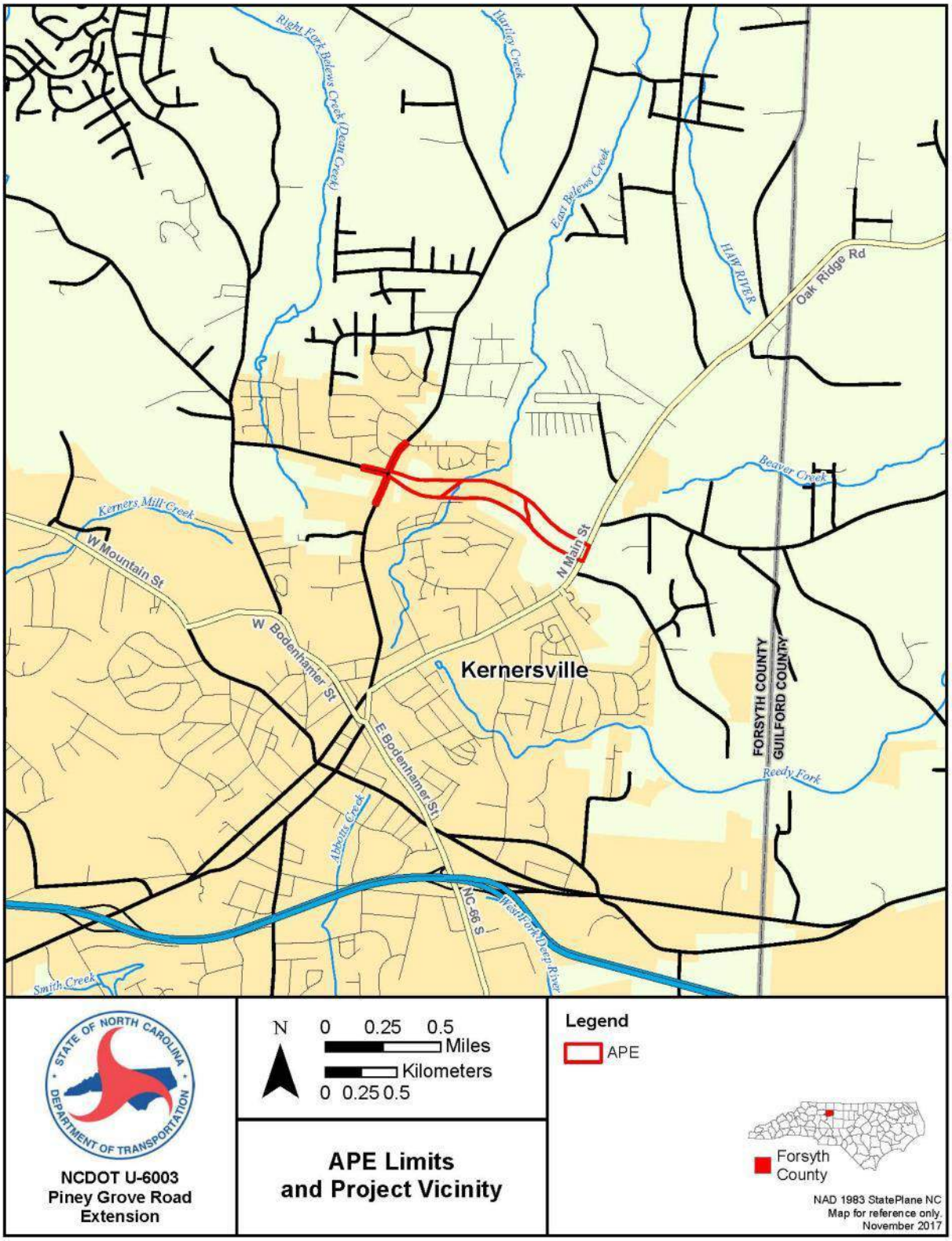


Figure 1. General Location of U-6003 Piney Grove Road Extension Project, Forsyth County, North Carolina.

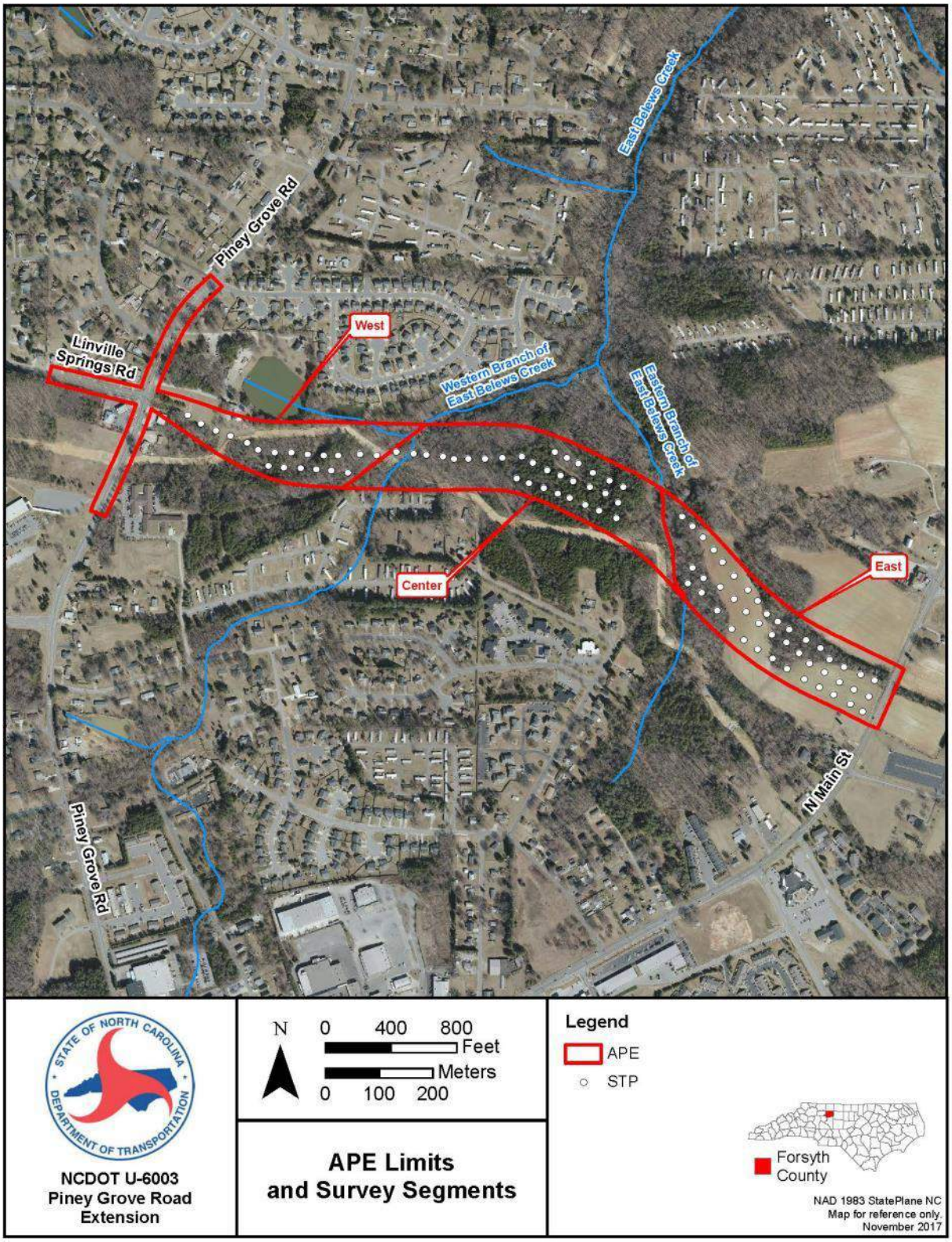


Figure 2. Aerial Overview of Piney Grove Road Extension Project.

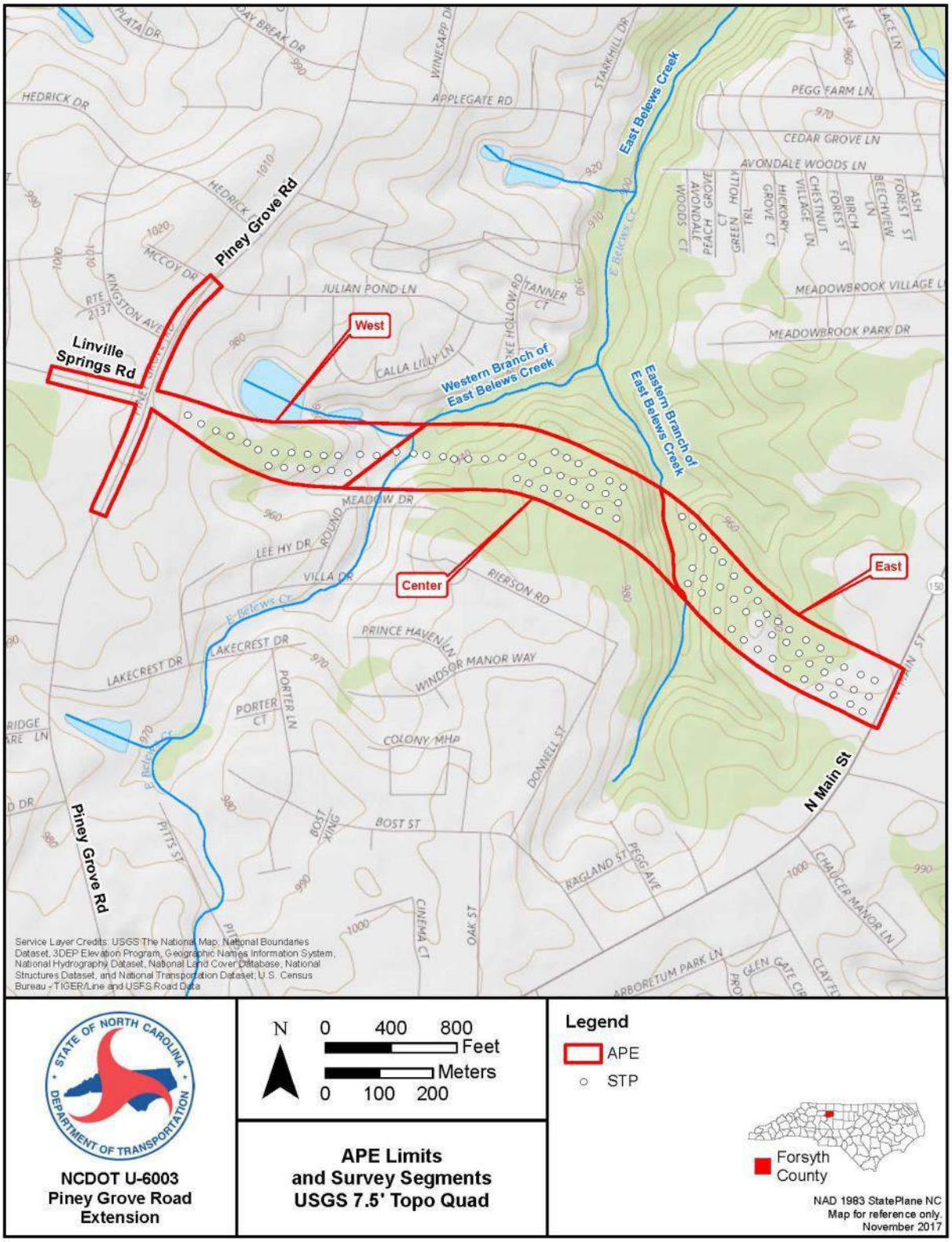


Figure 3. Topographic Overview of Piney Grove Extension Project.

Figure 4. Soy Field at Eastern Terminus of Project Area, Survey Area East, View East.

Figure 5. Deeply Incised and Eroded Creek Drainage, Survey Area East, View Northwest.

Figure 6. Side Slope (Background) to Eastern Branch of East Belews Creek (Foreground), Survey Area Center, View East.

Figure 7. Planted Pine Tract with Push Piles and Eroded Subsoil, Survey Area Center, View East.

Figure 8. Incised Erosional Banks of Western Branch of East Belews Creek, Survey Area Center, View West.

Figure 9. Gas Utility Corridor, Survey Area West, View Northwest.

Figure 10. Gas Utility Corridor (Foreground); Outbuilding and Septic Leach Field (Background), Survey Area West, View Northwest.

Figure 11. Intersection of Piney Grove Road and Linville Springs Road, Survey Area West, View Southwest.

TIP # U-6003
NCDOT Request for Catawba Tribal Response Letter

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J. ERIC BOYETTE
SECRETARY

April 14, 2020

Dr. Wenonah Haire
Catawba Indian Nation
Tribal Historic Preservation Office
1536 Tom Steven Road
Rock Hill, SC 29730

Dear Dr. Haire,

The North Carolina Department of Transportation is starting the project development, environmental, and engineering studies for the new location Macy Grove Road from SR 1969 (Piney Grove Road) to NC 150 (North Main Street) in Kernersville, Forsyth County as project U-6003. The US Army Corps of Engineers is the lead federal agency for compliance with the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act (NHPA) and a Permit is anticipated under the Section 404 Process with the USACE. The project vicinity map is attached. The coordinates of this project are approximately to 36.138553, -80.069459 and 36.133636, -80.054161.

We would appreciate any information you might have that would be helpful in evaluating potential environmental impacts of the project including recommendation of alternates to be studied. Your comments may be used in the preparation of a NEPA/ State Environmental Policy Act (SEPA) Environmental Document.

In accordance with Section 106 of the NHPA, we also request that you inform us of any historic properties of traditional religious or cultural importance that you are aware of that may be affected by the proposed project. Be assured that, in accordance with confidentiality and disclosure stipulations in Section 304 of the NHPA, we will maintain strict confidentiality about certain types of information regarding historic properties.

Please respond by June 15, 2020 so that your comments can be used in the scoping of this project. If you have any questions concerning this project, or would like any additional information, please contact me at aeuliss@ncdot.gov or (336) 747-7800.

Thank you,

Amy Euliss

Amy Euliss
NCDOT Division 9 Environmental Officer

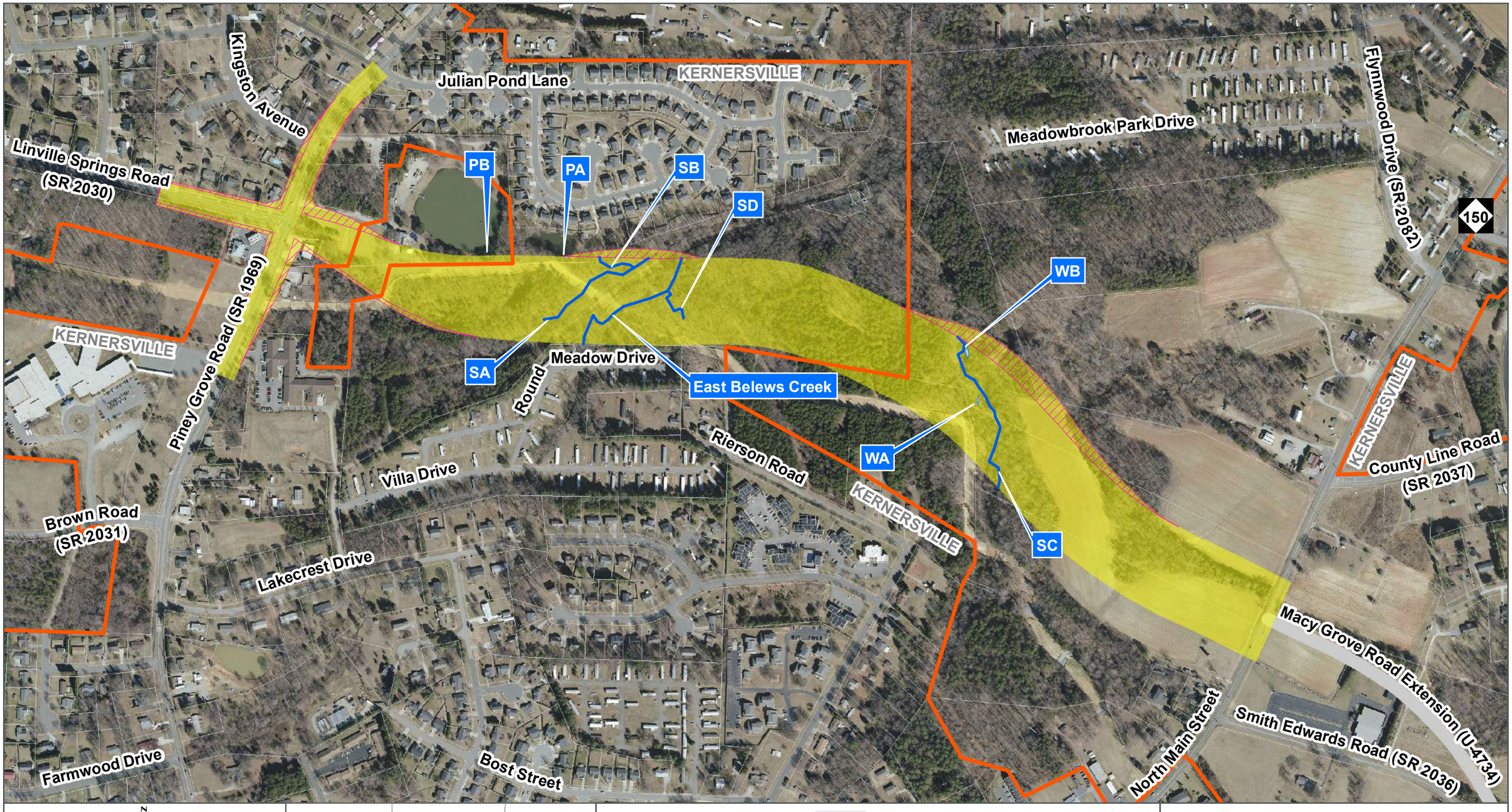
cc: Matt Wilkerson, NCDOT Archaeology Team Leader
Monte Matthews, USACE Project Manager
Connie James, PE NCDOT Division 9 Project Manager

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
DIVISION 9
375 SILAS CREEK PARKWAY
WINSTON SALEM, NC 27127

Telephone: (336) 747-7800
Fax: (336) 703-6693
Customer Service: 1-877-368-4968

Website: ncdot.gov

Location:
375 SILAS CREEK PARKWAY
WINSTON-SALEM, NC 27127



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Feet

Surry
Stokes
Yadkin
Forsyth
Guilford
Project Location
Davie
Davidson

Project Study Area

Study Area Expansion

Kernersville Town Limits

Parcel

Wetlands*

Pond*

Macy Grove Road Extension (U-4734)

Stream/Creek*

* Jurisdictional Resource

STUDY AREA MAP
STIP U-6003
PROPOSED NEW ROUTE FROM SR 1969 (PINEY GROVE ROAD) TO NC 150 (NORTH MAIN STREET) KERNERSVILLE, FORSYTH COUNTY

MAY 2018

TIP # U-6003
Catawba Tribal Coordination Response Letter

Office 803-328-2427
Fax 803-328-5791

May 18, 2020

Attention: Amy Euliss
NC Department of Transportation
375 Silas Creek Parkway
Winston-Salem, NC 27127

Re. THPO #	Project #	Project Description
2020-193-184	U-6003	New location for the Macy Grove Road from SR 1969 to NC 150 in Kernersville

Dear Ms. Euliss,

The Catawba have no immediate concerns with regard to traditional cultural properties, sacred sites or Native American archaeological sites within the boundaries of the proposed project areas. **However, the Catawba are to be notified if Native American artifacts and / or human remains are located during the ground disturbance phase of this project.**

If you have questions please contact Caitlin Rogers at 803-328-2427 ext. 226, or e-mail Caitlin.Rogers@catawba.com.

Sincerely,

Caitlin Rogers for

Wenonah G. Haire
Tribal Historic Preservation Officer

TIP # U-6003
USFWS Information for Planning and Consultation (IPaC) Report

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Asheville Ecological Services Field Office
160 Zillicoa Street
Asheville, NC 28801-1082
Phone: (828) 258-3939 Fax: (828) 258-5330

In Reply Refer To:
Project Code: 2023-0037307
Project Name: U-6003

January 24, 2023

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The enclosed species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please note that new species information can change your official species list. Under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends you visit the ECOS-IPaC website at regular intervals during project planning and implementation to ensure your species list is accurate or obtain an updated species list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A biological assessment (BA) or biological evaluation (BE) should be completed for your project. A BA is required for major construction activities (or other undertakings having similar physical impacts) considered to be Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)) (NEPA). For projects other than major construction activities, the Service suggests that a BE be prepared to determine effects of the action and whether those effects may affect listed species and/or designated critical habitat. E?ects of the action are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other

activities that are caused by the proposed action. A consequence is caused by the proposed action if it is reasonably certain to occur and would not occur “but for” the proposed action.. Recommended contents of a BA/BE are described at 50 CFR 402.12. More information and resources about project review and preparing a BA/BE can be found at the following web link: https://www.fws.gov/office/asheville-ecological-services/asheville-field-office-online-review-process-overview.

If a Federal agency determines listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. The Service is not required to concur with "no effect" determinations from Federal action agencies. If consultation is required, the Service recommends that candidate species, proposed species, proposed critical habitat, and at-risk species be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or licensed applicants, can be found in the "Endangered Species Consultation Handbook" at the following web link: https://www.fws.gov/media/endangered-species-consultation-handbook.

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Act, there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). More information about MBTA and BGEPA can be found at the following web link: https://www.fws.gov/program/migratory-birds.

We appreciate your consideration of Federally listed species. The Service encourages Federal agencies to include conservation of threatened and endangered species in their project planning to further the purposes of the Act. Please contact our staff at 828-258-3939, if you have any questions. In any future correspondence concerning this project, please reference the Consultation Code which can be found in the header of this letter.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Asheville Ecological Services Field Office
160 Zillicoa Street
Asheville, NC 28801-1082
(828) 258-3939

Project Summary

Project Code: 2023-0037307
Project Name: U-6003
Project Type: Road/Hwy - New Construction
Project Description: New Location Roadway Between SR 1969 (Piney Grove Road) and NC 150 (North Main Street)
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@36.13688165,-80.05980763677266,14z

Counties: Forsyth County, North Carolina

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

Reptiles

NAME	STATUS
Bog Turtle *Glyptemys muhlenbergii* Population: U.S.A. (GA, NC, SC, TN, VA) No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6962	Similarity of Appearance (Threatened)

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
Schweinitz's Sunflower *Helianthus schweinitzii*	Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/3849

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Sep 1 to Jul 31
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
Prairie Warbler *Dendroica discolor* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31

NAME	BREEDING SEASON
Prothonotary Warbler *Protonotaria citrea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Rusty Blackbird *Euphagus carolinus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Wood Thrush *Hylocichla mustelina* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

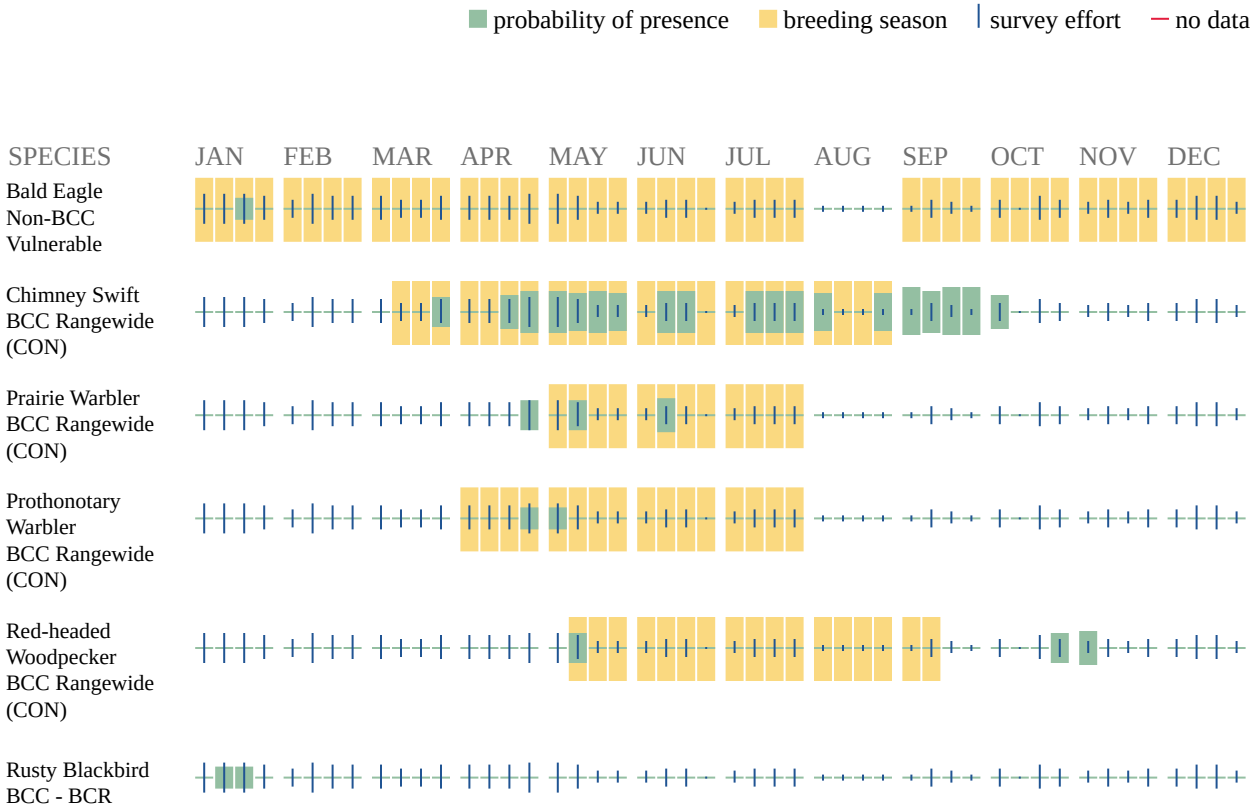
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

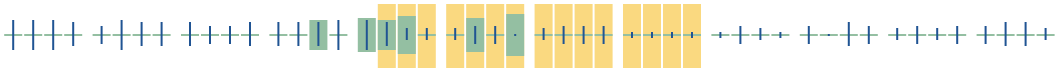
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Wood Thrush
BCC Rangewide
(CON)



Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

THERE ARE NO WETLANDS WITHIN YOUR PROJECT AREA.

IPaC User Contact Information

Agency: North Carolina Department of Transportation
Name: Sara Easterly
Address: 555 Fayetteville Street, Suite 9
City: Raleigh
State: NC
Zip: 27601
Email saraeasterly@nc.rr.com
Phone: 9192326664

Lead Agency Contact Information

Lead Agency: Department of Transportation

TIP # U-6003
USFWS Conference Opinion for the Tricolored Bat

Conference Opinion

Extension of Macy Grove Road from North Main Street (NC 150) to Piney Grove Road (SR 1969) in Kernersville, Forsyth County, North Carolina

TIP U-6003
SAW-2018-00393
Service Log #22-229
Service ECOSphere Project Code 2022-0090839

Prepared by:

U.S. Fish and Wildlife Service
Asheville Ecological Services Field Office
160 Zillicoa Street
Asheville, North Carolina 28801

JANET MIZZI Digitally signed by JANET MIZZI
Date: 2023.01.04 16:14:14 -05'00'

Janet Mizzi
Field Supervisor
Asheville Ecological Services Field Office
Asheville, North Carolina

Date

Table of Contents

Suggested Citation: U.S. Fish and Wildlife Service (2022). Conference Opinion for the Extension of Macy Grove Road from North Main Street (NC 150) to Piney Grove Rd (SR 1969) in Kernersville, Forsyth County, North Carolina. Service Log # 22-229. ECOSPhere Project Code: 2022-0090839. TIP U-6003. Asheville Ecological Services Field Office, Asheville, North Carolina. January 2023. 22 pages.

Consultation History

March 18, 2022:	The North Carolina Department of Transportation (NCDOT) requests informal consultation on U-6003.
March 21, 2022:	The U.S. Army Corps of Engineers (USACE) determined that they are the Federal lead for the project and requests informal consultation.
April 26, 2022:	The U.S. Fish and Wildlife Service (Service) sends questions to USACE on the northern long-eared bat and tricolored bat.
April 27-28, 2022:	The Service and NCDOT discuss tree clearing dates but do not address all questions.
May 17, 2022:	The Service notifies the USACE that the 60-day timeline for informal consultations has passed and will need to be reinitiated when the USACE submits complete project information to the Service.

May 19, 2022:	The USACE requests initiation of informal consultation and includes an updated concurrence request letter (dated May 5, 2022) with a new determination for the northern long-eared bat and additional information on tricolored bat.
May 23, 2022:	The Service submits additional questions to USACE and NCDOT. NCDOT provides responses on the same day.
May 25, 2022:	The Service requests a meeting to discuss outstanding concerns.
May 27, 2022:	The Service, NCDOT, and USACE meet to discuss the project. NCDOT provides additional information for the consultation.
June 6, 2022:	The Service conducts a site visit to the action area.
June 16, 2022:	The Service sends NCDOT and USACE a concurrence letter which concludes informal consultation. However, it does not render concurrence with a "may affect, not likely to adversely affect" conclusion for tricolored bat.
June 23, 2022:	NCDOT provides additional information on blasting and asks additional questions.
July 7, 2022:	The Service responds to questions and recommends another meeting.
July 8, 2022:	The Service, NCDOT, and USACE meet. An NCDOT blasting expert provides information on blasting. The Service recommended a Conference Opinion to address tricolored bat. Decision is put on hold as NCDOT determines whether the project timeline is changing and when tree clearing will be needed. After the meeting, NCDOT notifies USACE of the revised let date, a change in tree clearing conservation measures, and the need for formal consultation.
August 17, 2022:	The Service and USACE discuss initiation of formal consultation. USACE submits the request in writing after a phone call. The Service responds and notes the 135-day deadline for conclusion of consultation is December 30, 2022.
November 14, 2022:	The Service asks USACE and NCDOT if they could add one more conservation measure to the project description.
November 28, 2022:	NCDOT agrees to additional conservation measure.
December 6, 2022:	NCDOT and the Service discuss an existing conservation measure and agree to modify it to reduce adverse effects.
December 8, 2022:	The Service sends the draft conference opinion to USACE and NCDOT for review.
December 12, 2022:	NCDOT sends comments on the draft conference opinion.
December 15, 2022:	USACE sends a question on the draft conference opinion.
December 21, 2022:	The Service answers the USACE's question.
December 22, 2022:	USACE confirms they have no more concerns with the conference opinion.

Informal Consultation

An informal consultation and concurrence letter, completed on June 16, 2022, reviewed all currently listed species within the action area, including Schweinitz's sunflower (*Helianthus schweinitzii*) and northern long-eared bat (*Myotis septentrionalis*). While that consultation determined that the project was not likely to jeopardize the continued existence of the tricolored bat (*Perimyotis subflavus*), it did not conclude that conservation measures would minimize all adverse effects from the project on tricolored bat. As a result, NCDOT requested a conference opinion for tricolored bat as their project is expected to be ongoing after the effective date of a final listing, if one occurs.

In November 2022, the Service updated the consultation range for the northern-long eared bat. This project is no longer within the consultation range for the species, and therefore, section 7 consultation is no longer required for the northern-long eared bat on this project. This finding supersedes information in the June 16, 2022 informal concurrence letter.

Conference Opinion

1. Introduction

This document transmits the Service's Conference Opinion (Opinion) based on the Service's review of the proposed extension of Macy Grove Road and its effects on the tricolored bat in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). The Service received the request for formal conference on August 17, 2022.

This Opinion is based on information in the original concurrence requests NCDOT and USACE submitted on March 18, 2022, revisions submitted on May 5 and 19, 2022, and additional correspondence and meeting notes from May 23 and 27, 2022 and July 8, 2022. A complete administrative record of this consultation is on file at the Asheville Ecological Services Field Office.

On July 5, 2022, the U.S. District Court of the Northern District Court of California vacated the 2019 regulations implementing section 7 of the Endangered Species Act. On September 21, 2022, the Ninth Circuit Court of Appeals granted a request to stay the U.S. District Court of Northern California's July 5, 2022, order that vacated the 2019 Endangered Species Act regulations. As a result, the 2019 regulations are again in effect, and the Service has relied upon the 2019 regulations in rendering this Opinion. However, because the outcome of the legal challenges to 2019 Endangered Species Regulations is still unknown, we considered whether our substantive analyses and conclusions in this consultation would have been different if the pre-2019 regulations were applied. Our analysis included the prior definition of "*effects of the action*," among other prior terms and provisions. We considered all the "*direct and indirect effects*" and the "*interrelated and interdependent activities*" when determining the "*effects of the action*." As a result, we determined the substantive analysis and conclusions would have been the same, irrespective of which regulations applied.

2. Proposed Action

As defined in the Service's section 7 regulations (50 CFR 402.02), "action" means "*all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas*." 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*." The direct and indirect effects of the actions and activities must be considered in conjunction with the effects of other past and present Federal, State, or private activities, as well as the cumulative effects of reasonably certain future state or private activities within the action area.

2.1 Action Area

The action area includes the project footprint and a noise buffer. The project footprint is approximately 400 feet (ft) by 5,000 ft long on new alignment between North Main Street and Piney Grove Road. It also includes work on about 600 ft of Linville Springs Road and 100 ft by 1,600 ft of Piney Grove Road. The action area includes a 400-meter (0.25 mile) sound buffer around the project footprint. The action area encompasses approximately 800 acres.

2.2 Project Description

NCDOT proposes extending Macy Grove Road on new alignment from North Main Street (NC 150) to Piney Grove Road (SR 1969) in Kernersville, Forsyth County. The new roadway is needed to relieve congestion by providing west-east traffic circulation, allowing traffic to loop around Kernersville. This is an extension of the Kernersville Loop to accommodate future traffic demands. The project is state-funded, though it requires a Clean Water Act 404 Permit; therefore, the USACE is the designated lead Federal

action agency for section 7 consultation. The let date for construction is November 2023. NCDOT may complete utility relocations prior to the November 2023 let date. There are no bridges in the action area, and NCDOT will not replace the three small culverts (36-inch, 30-inch, and 24-inch diameter) that occur in the action area.

NCDOT estimated the maximum amount of tree clearing to be 12.7 acres over a 0.96-mile-long corridor. Tree clearing will occur along the new road corridor and involve clearing along streams and wetlands. With a let date of November 2023, it is unlikely that the contractor will be able to mobilize and complete tree removal efforts prior to April 1st and avoid adverse effects to bats.

NCDOT will replace and may relocate existing lights at the intersection of Linville Springs Road and Piney Grove Road. NCDOT will add new permanent lighting to the intersection of Macy Grove Road and North Main Street. Night work in the form of grading and paving may occur throughout the construction period. Construction crews need temporary night lighting for safety and visibility.

Blasting may be needed to allow site development. In accordance with blasting specifications, before blasting occurs, NCDOT will remove all overburden material including trees for at least 30 feet (ft) beyond blasting or rock limits, whichever is less. NCDOT blasting operations use minimal charges, blast mats, and overburden which reduce noise to a level less than the pre-blast warning horn. The use of blasting mats helps to contain blasts and suppress noise and dust. Blast mats are less likely to be used for mass blasting, which may be used in areas of high rock.

Operational and maintenance activities for the proposed project include stormwater device maintenance and management; use of the road for transportation by vehicles, bikes, and pedestrians; maintenance of the road, sidewalk, signs, lights, etc.; and other related activities.

2.4 Conservation Measures

CM 1. No blasting will occur at night.
CM 2. NCDOT's Construction Manual 2012 Standard Specifications Section 220 Blasting will be followed for all blasting activities.
CM 3. Blast monitoring will be required per NCDOT's Section 220 Standard Specifications and includes, but is not limited to, using seismographs capable of measuring air overpressure and vibration in the vertical, longitudinal, and transverse directions at the closest utility or structure to each blast.
CM 4. Blast mats will be used for smaller rock removal.
CM 5. NCDOT will implement a tree clearing moratorium during the maternity and fall migratory season (June 1 to October 15) to protect non-volant bats and those building fat reserves and entering hibernation.
CM 6. Tree clearing limits will be clearly denoted on project plans and NCDOT or USACE will ensure that contractors understand the limits.
CM 7. Tree clearing will be minimized to what is required to implement the project safely.
CM 8. NCDOT will not remove trees until ambient temperatures are 50 degrees F or above on the day of removal from April 1 to May 31.
CM 9. Temporary and permanent lighting will be downward facing, full cut-off lens light (with the same intensity or less for replacement lighting).
CM 10. Lighting used for nighttime construction will be limited to what is necessary to maintain safety standards and will only direct light towards active work areas.

2.5 Interrelated and Interdependent Actions

A conference opinion evaluates the effects of a proposed Federal action on species proposed for listing under the Endangered Species Act. For purposes of consultation under section 7 of the Endangered Species Act, the effects of a Federal action on listed species include the direct and indirect effects of the action, plus the effects of interrelated or interdependent actions. "*Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration*" (50 CFR §402.02).

While this project is not a highway interchange, it is a new road on new alignment and is "*a valuable economic development catalyst*" (Town of Kernersville 2018). Despite this, development activities are likely to occur regardless of the proposed action under consultation, as the Land Use Plan (Town of Kernersville 2018) already zones the area for mixed residential and commercial neighborhoods. Also, development activity does not depend on the action for its justification and has independent utility. Therefore, development activity is not interdependent or interrelated and will not be analyzed as an indirect effect with the effects of the action in this Opinion. No other potential interrelated or interdependent actions were identified.

3. Status of the Tricolored Bat

Scientific Name: *Perimyotis subflavus*
Status: Proposed Endangered
Date of Proposed Listing: September 14, 2022
Critical Habitat: None proposed to be designated

This section summarizes best available data about the life history, population size, and distribution of and threats to the tricolored bat throughout its range that are relevant to formulating an opinion about the action. The Service received a petition to list the tricolored bat as threatened on June 16, 2016. On December 20, 2017, the Service found the petition presented substantial scientific or commercial information indicating that the petitioned action may be warranted. The Service commenced a review (known as a 12-month finding) to determine if listing of the tricolored bat was warranted. The Service proposed to list the tricolored bat as endangered on September 14, 2022, and released the Species Status Assessment (SSA, Service 2022b) in conjunction with that announcement. No conservation or recovery plans exist for this species.

3.1 Life History

Inactive Season

Tricolored bats are an obligate hibernator with populations in subtropical regions hibernating even in the absence of severe winters (McNab 1974). In Missouri, tricolored bats enter hibernation with an average beginning date of mid-October and an average ending date of mid-April (LaVal and LaVal 1980). In Western North Carolina, the winter, inactive season is considered to be October 15 to April 1st. However, tricolored bats have been found in bridges and culverts in Western North Carolina as early as February 6th and as late as November 7th (Katherine Etchison, NCWRC, September 20, 2022, personal communication).

In addition to caves, tricolored bats use a wide variety of other hibernacula including mines (Whitaker and Stacy 1996, Brack 2007), storm sewers (Goehring 1954), box culverts (Sandel et al. 2001, Lutsch et al. 2022), and surge tunnels at quarries (Slider and Kurta 2011). Recent evidence indicates that tricolored bats also hibernate in rock faces in Nebraska (Lemen et al. 2016) and suggests that the species may have a wider winter range than previously suspected. Hibernating tricolored bats typically roost singly but will form small clusters and often select a roost on the walls as opposed to the ceiling of the hibernaculum

(Brack 1979, Kurta 2008). Throughout most of the range, they select relatively warm, stable sites often located further from the hibernaculum entrance than other bat species (Brack 2007). Individuals in hibernation alternate between bouts of torpor that last, on average, about 15 and 25 days though may last longer (Brack and Twente 1985) and short periods of arousal (McNab 1982, Service 2022b).

As previously noted, there is little information about tricolored bat movements, including swarming sites and hibernacula, but the species is currently believed to be a short distance regional migrant (Fraser et al. 2012; Fujita and Kunz 1984). Species engaging in regional migration travel annually from hibernaculum to summer roosting sites, and then move among swarming locations in the autumn (Fenton 1969; Fraser et al. 2012; Hitchcock 1965). Recent research has led to speculations that some individuals migrate farther distances than previously suspected, and that migratory behavior may differ between males and females (Davis 1959; Fraser et al. 2012). Fraser et al. (2012) investigated tricolored bat migration by conducting stable hydrogen isotope analyses of 184 museum specimen fur samples and compared the results to published values of collection site growing season precipitation. Their results suggested that 33% of males and 16% of females collected during the postulated non-molt period were south of their location for fur growth. Fraser et al. (2012) also noted that if tricolored bats only engaged in regional migration, then evidence would be expected to show equal numbers of bats migrating north and south during the non-molt period. Respectively, Fraser et al. (2012) concluded that at least some tricolored bats, of both sexes, engage in latitudinal migration.

Summer Habitat Use

Tricolored bat roost trees may occur in a relatively small area. One study found that the average distance between roost trees was 86 meter (m) (range 5-482 m) and between capture locations and roost trees was 2.5 kilometer (range 165 to 2,290 m) (Schaefer 2016). Roost home ranges were between 0.005 acres (ac) and 10.9 ac for seven individuals (Schaefer 2016) and 0.25 to 5.7 ac for four individuals (Veilleux and Veilleux 2004b). In Indiana, Veilleux and Veilleux (2004b) radio-tracked four tricolored bats to their respective roosts trees and found that minimum and maximum distances from roosts trees were between 21 m and 926 m. A study in Nova Scotia found that the average roosting area of maternity colonies using more than five trees (n=5; 12 to 31 trees) varied from 4 - 191 ac, with a mean of 67.5 ac (Table 4 in Poissant 2009). A study conducted in Arkansas radio-tagged 28 male and nine female tricolored bats and found that roosts trees varied from 1-3 roost trees for males and 1-5 roost trees for females (Perry and Thill 2007b). Seven of 14 female roosts were colonies and based on exit counts and visible pups, the estimated number of bats (adults and pups) in colonies was 3-13, with an average of 6.9 (±1.5) (Perry and Thill 2007b). Other studies report maternity colony sizes of 3.7 individuals (Veillieux and Veillieux 2004b), 15 individuals (Whitaker and Hamilton 1998), and 18 individuals with an average of 10 individuals (Poissant 2009). Perry and Thill (2007b) found males roosting in forested habitats also occupied by females, but primarily in solitary roosts. One study found that individuals within a roosting area/colony did not switch or overlap other roost areas/colonies though all individuals from all colonies shared foraging space (Poissant 2009).

Maternity colonies are most likely to be found roosting in umbrella-shaped clusters of dead leaves, but may also be found in live leaf foliage, lichens, patches of pine needles caught in tree limbs, buildings, caves, bridges, culverts, and rock crevices (Humphrey 1975, Veilleux et al. 2003, Veilleux and Veilleux 2004a; b, Veilleux et al. 2004, Perry and Thill 2007, Newman et al. 2021). Perry and Thill (2007) suggest that tricolored bat's yellow-brown coloration allows them to blend in with brown, dead leaf clusters imparting protection from visual predators. Oak (genus *Quercus*) and maple (*Acer*) trees are preferred by maternity colonies of tricolored bats presumably because the ends of the branches tend to have many leaves (Veilleux et al. 2003; 2004, Perry and Thill 2007), and thus maternity colonies are more often associated with uplands than bottomland forest. O'Keefe (2009) found male tricolored bats primarily in hickories, maples, and birches and not oaks. Veilleux et al. (2003) found 27% of tricolored bat roosts in oak trees when oaks compromised only 3% of the available trees; others found at least 80% of tricolored

bat roosts in oaks (Leput 2004, Perry and Thill 2007). Tricolored bats are known to forage near trees, as well as forest perimeters, and along waterways (Fujita and Kunz 1984).

In Indiana, female tricolored bat maternity roosts occurred mostly in upland habitats (9.4%) as opposed to riparian (0.8%) and bottomland (0.2%) habitats (Veilleux et al. 2003). Preferred upland habitat by this species could be related to the greater availability of preferred roost tree species: white oak (Quercus alba), bur oak (*Quercus macrocarpa*), and red oak (*Quercus rubra*) (Veilleux et al. 2003). O'Keefe (2009) found that non-reproductive tricolored bats in North Carolina only roosted in forest stands older than 72 years, and preferentially roosted at lower elevations, closer to non-linear openings, and closer to streams than expected by random chance. Other researchers have found that at the stand level or greater, tricolored bats seem to roost selectively in more mature forest within riparian buffers or corridors (Perry and Thill 2007, O'Keefe 2009), within a diversity of patch types, farther than expected from roads (Perry et al. 2008), and in unharvested pine or pine-hardwood stands greater than or equal to 50 years old (94% of female roosts and 52% of male roosts, Perry and Thill 2007b). One small study in the Nantahala National Forest in Macon County, North Carolina found male tricolored bat roosts were on average 136 m from roads or trails, and while the distance ranged from 4 to 285 m, 75% of the roads in the study area were gated grass-covered U.S. Forest Service roads with virtually no vehicular traffic (O'Keefe 2009). Other studies found tricolored bat roosts on average 70 m and 52 m from edges (Leput 2004, Veilleux et al. 2003, respectively).

Tricolored bats vary their roost position in the canopy and landscape depending on reproductive conditions. Reproductive female bats roost lower in the canopy and farther from forest edges than non-reproductive females. Veilleux and Veilleux (2004b) speculated that lower position in the canopy and greater distances from the forest edge may reduce wind exposure and allow for more stable temperatures. Gestation is typically 44 days (Wimsatt 1945), and females produce twin pups whose mass is approximately 44-54% of the size of the mother, a higher ratio than most Vespertilionid bats (Kurta and Kunz 1987). Young are volant at 3 weeks and act as adults around 4 weeks old (Hoying and Kunz 1998). Post-natal growth rates slow during cold snaps because the mothers cannot eat, and available energy is used for thermoregulation (Hoying and Kunz 1998). As with other species of bats, some male tricolored bats remain at hibernacula year-round (Whitaker and Rissler 1992). Most males roost in the same types of leaf clusters used by female tricolored bats (Veilleux and Veilleux 2004a), although they return to the same roost for multiple days, with one individual in Arkansas roosting in the same cluster for 33 days (Perry and Thill 2007). Male bats also select roosts in the same species of trees, although males tend to use thinner and shorter trees (Veilleux and Veilleux 2004a). Males also tend to roost at lower heights than females; often 16.4 ft (5 m) from the ground (Perry and Thill 2007).

Culverts

Katzenmeyer (2016), conducting winter surveys in Mississippi over five years, found tricolored bats in culverts as small as 2 ft tall and 30 ft long. Tricolored bats use culverts in Florida as small as 3 ft tall by 60 ft long though smaller culverts are not surveyed. Preliminary analysis did not find an effect of culvert height or length on tricolored bat presence in Florida (L. Smith, personal communication, March 9, 2022). The Louisiana Department of Wildlife and Fisheries has surveyed more than 1,000 culverts over three winters and found tricolored bats in 21% of them. Summer surveys of a much smaller number of culverts found the species in about 4% of surveyed culverts. The shortest length culvert occupied by tricolored bats was 23.3 ft long. The culvert with the shortest height was 2.5 ft tall. The smallest culvert used by the species in Georgia is a 3 ft tall pipe culvert that is 388 ft long (Emily Ferrall, personal communication, April 7, 2022). In North Carolina, tricolored bats have been found in culverts as small as 40 inches in height by 60 ft long (Cheryl Knepp, personal communication, September 8, 2021). There are numerous culvert records for this species across multiple states (Walker et al. 1996, Martin et al. 2005, Katzenmeyer 2016, L. Smith, personal communication, 2022, Nikki Anderson, unpublished data, March 24, 2022).

3.2 Population Size

White-nose syndrome (WNS) has recently decimated tricolored bat populations in several states. Before the onset of WNS, the tricolored bat was generally believed to be common and secure throughout most of its range in the eastern US, with some even considering the species to be rapidly increasing in population and range, especially in grassland areas (Benedict et al. 2000, Sparks and Choate 2000, Geluso et al. 2004). However, subsequent analysis of survey data suggests that even prior to WNS, the tricolored bat, along with several other WNS-affected species, was in a state of gradual decline in the eastern US (Ingersoll et al. 2013). Correcting for biases inherent in hibernacula counts, Ingersoll et al. (2013) found that from 1999-2011, (i.e., both pre- and post-WNS), the tricolored bat declined by 34% in a multi-state study area (New York, Pennsylvania, West Virginia, and Tennessee). Capture rates of tricolored bats in Pennsylvania declined by 56% between pre-WNS years (2001-2008) and 2013 (Butchkoski and Bearer 2016), which is similar to the 53.8% decline observed in Missouri hibernacula (Colatskie 2017). Cheng et al. (2021) estimates range-wide declines of 93% from 1995 to 2018 and a 59% overlap of species and WNS occurrence ranges. The range-wide population of tricolored bats is estimated to be 67,898 individuals as of 2020 (Service 2022b).

3.3 Distribution

Tricolored bats are known from 39 States (from New Mexico north to Wyoming and all states to the east), Washington D.C., 4 Canadian Provinces (Ontario, Quebec, New Brunswick, Nova Scotia), and Guatemala, Honduras, Belize, Nicaragua, and Mexico. The species current distribution in New Mexico, Colorado, Wyoming, South Dakota, and Texas is the result of westward range expansion in recent decades (Geluso et al. 2005, Adams et al. 2018, Hanttula and Valdez 2021) as well as into the Great Lakes Basin (Kurta et al. 2007; Slider and Kurta 2011). This expansion is largely attributed to increases in trees along rivers and increases in suitable winter roosting sites, such as abandoned mines and other human-made structures (Benedict et al. 2000, Geluso et al. 2005, Slider and Kurta 2011).

3.4 Threats

WNS is a threat to many bat species throughout North America. While WNS has been assumed to be the sole driver of bat population declines, new research indicates that many factors are likely acting synergistically (Ingersoll et al. 2016). Bats are subject to a suite of severe threats (Mickleburgh et al. 1992, Hutson et al. 2001, Pierson 1998), including disturbance and altered microclimates of critical hibernacula and day roosts (Tuttle 1979, Neilson and Fenton 1994, Thomas 1995), loss and modification of foraging areas (Pierson 1998, Hein 2012, Jones et al. 2009), toxicity and changed prey composition and abundances from pesticide use and other chemical compounds (Shore and Rattner 2001, Clark 1988), climate change (Frick et al. 2010, Rodenhouse et al. 2009), and in-flight collisions with vehicles, buildings, and wind turbines (Russell et al. 2009, Arnett et al. 2008, Kunz et al. 2007). Bats are often subject to more than one of these threats simultaneously; such co-occurring threats may result in synergistic or interacting effects, with impacts more severe than from any single threat in isolation (Crain et al. 2008, Kannan et al. 2010, Laurance and Useche 2009, Harvell et al. 2002). The tendency of tricolored bats to occupy a wide variety of hibernacula makes them vulnerable to entombment during mine closures (Whitaker and Stacy 1996). As with other bats, chemical contamination may kill bats directly or lead to sublethal effects that eventually lead to death or reduced reproduction (Clark et al. 1978, Clark et al. 1980, Clark et al. 1982, Eidels et al. 2016). Climate change is also an emerging threat to the tricolored bat, primarily because temperature is an essential feature of both hibernacula and maternity roosts. Lastly, the tricolored bat (and other bat species) may be threatened by the recent surge in construction and operation of wind turbines across the species' range. Mortality of tricolored bats has been documented at multiple operating wind turbines/farms.

4. Environmental Baseline

The U-6003 action area is in the Northern Inner Piedmont ecoregion in the Upper Dan River Basin. The project footprint is 37% developed open space, 27% forested, 23% developed low intensity, 11% pasture/hay/grass/forb/shrub regeneration, and 1% developed medium intensity. Building footprints within 1 mile of the action area cover 5% of the land. The project footprint includes woody habitats, three unnamed intermittent streams, two perennial streams (East Belews Creek, Unnamed Tributary to East Belews Creek), one unnamed stream that is intermittent and perennial, and two small wetlands. Three small culverts (36-inch, 30-inch, and 24-inch diameter) are near the intersection of North Main Street and Macy Grove Road.

Suitable tree and culvert roosts for tricolored bat occur within the action area. The closest element occurrence record for the tricolored bat is approximately 18 miles away at Hanging Rock State Park in Stokes County. The Service surveyed the three culverts at the intersection of Macy Grove Road and North Main Street on June 6, 2022 and found no evidence of bat use. NCDOT reviewed hibernacula locations and underground mine data to determine if project activities may impact winter roosting habitat for tricolored bats and did not find this habitat type in or near the action area. Given the lack of presence/absence surveys, presence of suitable habitat, and the proximity of known active and inactive season occurrence records within 18 miles, tricolored bats are assumed to be present in the action area.

As a conservative scenario, we estimate that 1,120 tricolored bats could be roosting within the action area and 18 tricolored bats could be roosting within areas where NCDOT will remove trees. As presented in Section 3.1 *Life History*, a maternity colony could occupy an area between 0.0005 and 191 ac (Schaefer 2016, Veilleux and Veilleux 2004b, Poissant 2009) and the size of maternity colonies vary from 3 to 18 individuals (Veilleux and Veilleux 2004b, Schaefer 2016, Perry and Thill 2007b, Whitaker and Hamilton 1998, Poissant 2009). For our conservative estimation, we used approximate numbers from Schaefer 2016 and assume that a maternity colony of 7 bats occupies 5 acres. The action area is 800 acres so 1,120 tricolored bats (= (800 acres/5 acres) x 7 bats) could occur. NCDOT will remove trees on 12.7 acres which could support 18 tricolored bats (= (12.7 acres/5 acres) x 7 bats).

5. Effects of the Action

In accordance with 50 CFR 402.02, the pre-2019 Endangered Species Act regulatory definition of effects of the action is "*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, that will be added to the environmental baseline. Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration."* The 2019 regulatory definition of effects of the action is "*all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action*." Both were considered during the writing of this Opinion. This section analyzes the direct and indirect effects or consequences of the action on the tricolored bat. The effects of the action are added to the environmental baseline and, after taking into consideration the status of the species, serve as the basis for the determination in this Opinion (50 CFR 402.14(g)(4)).

Stressors are alterations of the environment that may result from the proposed action that are relevant to the species. Based on the description of the proposed action and the species' biology, NCDOT and the Service have identified four stressors to bats (Table 1). Each section below describes a stressor, the

species response to the stressor, and the rationale for the determination of effects. Tricolored bat may be present in the action area and vulnerable to effects from construction between April 1 and October 15. However, tricolored bats have been found in bridges and culverts in Western North Carolina as early as February 6th and as late as November 7th. The closest such inactive season detection is in Stokes County about 20 miles from the action area (Katherine Etchison, NCWRC, September 20, 2022, personal communication). Stressors from construction will last the length of the project while bats are active on the landscape. Individual stressors will generally be short term in nature.

5.1 Stressors

Tree Removal: Loss of Tree Roosts and Individuals

Tricolored bats can roost in a variety of places in the summer, including trees where they are often found roosting in the foliage. Tricolored bat females show some roost fidelity, returning to the same small roosting area day after day within a single summer and across successive years, and show use of their natal roosting habitat (Veilleux and Veilleux 2004b). While tricolored bat females may switch roost sites frequently, both with and without volant offspring (Whitaker 1998, Amelon 2006), they have stayed as long as 17 days in one roost tree. Trees are an ephemeral resource, especially when dead trees are used as roosts. Potential bat responses to roost loss, caused by natural factors or felling by humans, depends on when the loss occurs.

Removal of an occupied roost tree during the active season has direct and immediate effects when bats are present. If a bat is in the tree and a tree is cut down, the bat may either 1) fly out (adults or volant pups) of the tree while the tree is still falling, 2) stay in the tree and be crushed by the fall, 3) stay in the tree and fly away (adults or volant pups) or be retreived by adults (non-volant pups) once the tree is on the ground, or 4) stay in the tree and die on the ground (non-volant pups not retrieved by adults). Whether and how a bat escapes from a falling/fallen tree is also likely to be related to ambient temperatures, which affect bat activity levels. Below 50 degrees Fahrenheit (F), bats may be slow to arouse if they are in torpor, leading to increased response times if disturbed. Also, daytime flushing of bats causes them to be more susceptible to predation (e.g., raptors) (Mikula et al. 2016) and expend additional energy resources finding roosts that may impact the fitness of the individual, especially if distrubed in the spring when fat reserves are low. Finally, the removal of primary or alternate maternity tree roosts could lead to the fragmentation or break up of a maternity colony as it has been shown to do for some *Myotis* species (Sparks *et al*. 2003; Silvis *et al*. 2014).

Due to their small size, it is extremely unlikely to detect a tricolored bat killed or injured by trees removed in a forested setting. However, the Service has accounts of Indiana bat (*Myotis sodalis*) injury and mortality resulting from tree removal during the active season. Three accounts document adult and juvenile bat mortality as well as adult and juvenile survival (Cope et al. 1974, Belwood 2002, and J. Whitaker, personal communication, 2005 as cited in the *Programmatic Biological Opinion for Activities Affecting Indiana Bat and Northern Long-Eared Bat on Eastern Band of Cherokee Indians Trust Lands*, Service Log #4-2-22-010).

Due to the let schedule for this project, scheduled for November 2023, and the size of the tree clearing effort, NCDOT will be removing trees during the winter (October 16 through March 31) and active season (April 1 through May 31). Therefore, bats may be present in some trees cleared by the project. Their chances of survival may be reduced due to issues associated with the spring migratory period. The weeks following emergence from hibernation mark a critical period when bats incur energetic costs of clearing infection, recovering from over-winter sickness (Reichard and Kunz 2009, p. 461; Meteyer et al. 2012, p. 3; Field et al. 2015, p. 20; Fuller et al. 2020, pp. 7–8), migration, and reproduction, all when their fat reserves are their lowest. Compliance with conservation measures (CM 8) will, however, ensure that

bats are not in torpor during tree removal. Within the project area, average low temperatures in April are about 49 degrees F, rising to about 58 degrees F in May.

In summary, we find that tree removal from construction may affect and is likely to adversely affect (LAA) the tricolored bat. Adverse effects from tree clearing may result in crushing, killing, wounding, or energetic and reproductive impacts that result in harm to tricolored bats. CMs 5, 6, 7, and 8 will serve to minimize the amount of take to the maximum extent possible, which includes a tree clearing moratorium from June 1st through October 15th.

Tree Removal: Reduction of Habitat

We agree with the biological rationale provided in NCDOT's letter that effects from a reduction in commuting and foraging area due to 12.7 ac of tree removal during construction are expected to be insignificant due to the availability of alternative forested habitat in the immediate and surrounding areas, and therefore "not likely to adversely affect" (NLAA) the tricolored bat.

Lighting

We agree with the biological rationale provided in NCDOT's letter that effects from lighting on nighttime foraging and commuting activities are expected to be insignificant due to the pre-existence of permanent lighting, and the temporary and limited nature and spatial extent of night work. While NCDOT will replace and potentially relocate existing lights at the intersection of Linville Springs Road and Piney Grove Road, these lighting changes are not expected to change baseline conditions at this location. We believe construction-related temporary night lighting will have insignificant effects based on the implementation of CMs 9 and 10 and are thus NLAA the tricolored bat. We do not expect the operation and maintenance of permanent lighting to significantly change or alter lighting from baseline conditions and thus believe effects from the replacement and relocation of existing permanent lighting to be insignificant with the implementation of CM 9 and thus NLAA the tricolored bat.

Noise and Vibration

The use of construction equipment and certain construction activities are anticipated to cause temporary and sporadic increased noise and vibration levels (CalTrans 2016) within the action area any time of year, day, or night, during and post-construction. The maximum noise level expected for the project is from blasting, which can create an average maximum background noise level of 112 decibels (dBA) at locations 50 ft away (CalTrans 2016) up to 126 dBA (NRC 2012). Blasting can create significant noise (measured in decibels, dBA), flying rock, ground vibration (measured in peak particle velocity, inches per second), and air vibration (airblasts, measured in unweighted decibels, dB). Blasting is expected to produce noise levels of 95 dBA at 250 ft away within the proposed project area. According to noise attenuation formulas (CalTrans 2016), noise from point sources traveling over a soft site (for example, forest or meadow) attenuates at approximately 7.5 dBA for each doubling of distance. Therefore, blasting is not expected to meet background noise levels of 60 dBA for several miles. Blasting imparts energy into the air and substrate which may cause an impact to bat roosts. Increases in air pressure or ground vibration could presumably cause roost trees to shake or fall or underground environments to collapse.

Typical roadway construction activities that are also part of this project produce slightly less noise: jack hammers and pile drivers (101-110 dBA at 50 ft), track hoes (91-106 dBA at 50 ft), guardrail installation (95-105 dBA at 50 ft), and truck horns (104 dBA at 50 ft). For comparison, natural background levels of noise within most of the action area include the occasional thunderclap and thunder (110-120 dBA) and sounds associated with wind blowing through the trees and birds singing (60-62 dBA) (CalTrans 2016).

A review of the literature on ground vibration impacts to bats turned up just one report from West Virginia. It summarized other results that concluded that hibernating bats could withstand ground vibration levels (peak particle velocity) of 0.06 to 0.20 inches per second without adverse effects

(WVDEP 2006). NCDOT did not provide an estimate of peak particle velocity for their project, however, no occupied cave, mine, or culvert habitat is expected to be impacted by the project.

Available information on airblast pressure impacts to bats is limited. A blast registering an airblast of 140 dB may cause glass and plaster breakage though structure damage is not expected at less than 175 dB (Singh et al. 2005). Other sources state that airblasts at 134 dB are likely to cause minor structural damage (Nicholson 2005). Humans experience an airblast with a peak overpressure of 130 dB as mildly to distinctly unpleasant. Airblasts that measure 134 dB are equivalent to winds of about 28.5 miles per hour per Nicholson (2005) or 20-28 miles per hour per WVDEP (2006). Winds reaching gale force of 70 miles per hour are equivalent to an airblast of 149.5 dB (Nicholson 2005). Wind gusts higher than 28.5 miles per hour occurred in every month of 2021 in Kernersville (Weather Underground, Weather History, accessed October 17, 2022), which we assume is similar to other years.

NCDOT estimates that bats exposed to the blasting noise associated with this project will not have an adverse response as construction noises are expected to be similar to thunderstorm noises. Based on the above, we also expect airblasts to be similar to strong winds present in the action area. We do not expect, and have no evidence, that thunderstorms or strong winds adversely affect bat populations (i.e., that they cause mortality of or harm to bats).

A biological opinion written by the Service's Virginia Field Office submitted that the impacts of blasting and rough grading are a source of noise on the landscape and create edge habitat similar to that of roads (Service 2022c). Thus, bats are expected to respond to the noise from blasting in a similar manner as they respond to noise from roads. That response is typically avoidance. Berthinussen and Altringham (2012) found that bat activity, including that of *Myotis* spp., increased with distance from a road while noise levels decreased with distance from a road. Additionally, a large-scale analysis found the majority (>95%) of Indiana bat roosts are located >100 ft and >90% are located >300 ft from roads (Service 2018). However, bats have been noted to tolerate noise, for instance when they roost on bridges and in culverts underneath roads and/or above loud rivers and streams, therefore, it is not definitive that bats will shift or abandon their roosts as a result of any adjacent disturbances.

To reduce and minimize noise and vibratory impacts, NCDOT has included several conservation measures. First, blasting will not occur at night (CM 1) so will not interfere with echolocation and foraging/commuting activity. Second, NCDOT will place blast mats or overburden material (for example, soil) over all blast sites, which minimizes noise, air blasts, and debris (flying rock) (CM 4). Third, blasting will not occur until trees within 30 ft have been removed (CM 2), increasing the distance between any roosting bat and blasting activity. Per the NCDOT Division 9 Construction Engineer, trees within 20-30 ft of the blast site are removed prior to blasting and NCDOT blasting activities are not strong enough to cause trees to fall or glass to break. Lastly, NCDOT will follow standard specifications (Section 220 Blasting) (CM 2), which requires that blasts should be designed such that air-overpressure (i.e., airblast, or airwaves generated by the blasting activity) at any structure does not exceed 133 dB.

Due to the implementation of these conservation measures, we believe all construction noise and vibratory effects from the action are likely to be insignificant and NLAA the tricolored bat. Noise and vibratory effects from operations and maintenance activities mimics those stressors already present in this medium- to low-density developed area. We believe, therefore, that effects from operations and maintenance activities will be discountable and NLAA the tricolored bat.

5.2 Cumulative Effects

Cumulative effects are defined 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 Endangered Species Act.

Parcels in the action area are zoned primarily for mixed residential and business support (Town of Kernersville 2018). The potential exists for additional tree clearing, construction activities, and additional lighting to occur in the future associated with residential, commercial, and/or business development in the area.

5.3 Summary of Effects

In summary, of the anticipated stressors and effects discussed above, construction-phase, active, spring season tree removal is the stressor that is expected to adversely affect the tricolored bat. Take from this stressor is expected in the form of harm, wounding, and/or killing. The other stressors and operation- and maintenance-phase activities discussed above are expected to have no effect or insignificant or discountable effects on tricolored bat (Table 1).

Table 1. Summary of Effects

Project Activity / Stressor	Construction Phase Activities		Operations and Maintenance (O&M) Phase Activities		Effect Determination Summary
	Does Stressor Occur During Construction?	Effect to the Species	Does Stressor Occur during O&M?	Effect to the Species	
Tree Removal / Loss of Tree Roosts and Individuals	Yes	Direct. Adverse (Harm, Wound, Kill). Minimized by CMs 5, 6, 7, 8.	NA, not included in this Opinion		LAA
Tree Removal / Reduction of Habitat	Yes	Indirect. Insignificant.	NA, not included in this Opinion		NLAA
Night Lighting	Yes, temporary construction night lighting	Direct. Insignificant due to CMs 9 and 10.	Yes, permanent lighting	Direct. Insignificant due to CM 9.	NLAA
Noise and Vibration	Yes, construction equipment and blasting	Direct. Insignificant. Minimized by CMs 1, 2, 3, 4.	Yes, traffic	Direct; Discountable.	NLAA

6. Conclusion

After reviewing the current status of tricolored bat, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's Opinion that the action, as proposed, is not likely to jeopardize the continued existence of the tricolored bat.

1. Although some activities associated with the proposed action are expected to result in adverse effects to the tricolored bat, we have determined that the species' reproduction, numbers, and distribution will not be appreciably reduced because of the proposed action. If the tricolored bat range-wide population is 67,898 individuals (Service 2022b), then this project will adversely affect less than 0.03% (= 18 / 67,898) of the range-wide population. Section 4 *Environmental Baseline* describes how we estimated 18 bats.
2. Effects of the action will adversely affect a small portion (12.7 acres) of tricolored bat habitat.

7. Incidental Take Statement

Section 9 of the Endangered Species Act and Federal regulations pursuant to section 4(d) of the Endangered Species Act prohibit the taking of endangered and threatened species, respectively, without

special exemption. Take "*means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct*" (16 U.S.C §1532). Harm in the definition of "take" in the Endangered Species Act "*means an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering*" (50 CFR 17.3). Incidental taking "*means any taking otherwise prohibited, if such taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity*" (50 CFR 17.3). Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered to be prohibited under the Endangered Species Act, provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The prohibitions against taking the species found in section 9 of the Endangered Species Act do not apply until the species is listed. However, the Service advises USACE to consider implementing the following reasonable and prudent measures. If this Opinion is adopted as a biological opinion following a listing, these measures, with their implementing terms and conditions, will be binding conditions of any grant or permit issued, as appropriate, for the exemption in section 7(o)(2) to apply. USACE has a continuing duty to regulate the activity covered by this incidental take statement. If USACE (1) fails to assume and implement the terms and conditions or (2) fails to require NCDOT or a contractor to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, USACE must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

7.1 Amount or Extent of Take Anticipated

Incidental take of tricolored bat is anticipated to occur as a result of the Macy Grove Road Extension Project (U-6003) due to the removal of trees. The take associated with this project is expected in the form of harm, wounding, and/or killing.

The Service anticipates the incidental taking of tricolored bats associated with this project will be difficult to detect because: 1) the individuals are small, mostly nocturnal, and occupy trees and foliage where they are especially difficult to observe, 2) finding dead or injured bats during or following project implementation is unlikely, and 3) some incidental take is in the form of non-lethal harm and not directly observable. Given this, the Service will measure the extent of take for tricolored bats using a surrogate: the total acreage of tree removal associated with U-6003 (estimated to contain 18 tricolored bats, see *Environmental Baseline*), which will not exceed 12.7 acres.

This surrogate measure is appropriate because the anticipated taking will result from the effects of tree removal. The surrogate measure serves to set a clear limit for determining when take has been exceeded for tricolored bat. In this Opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species.

7.2 Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measure(s) are necessary and appropriate to minimize take of tricolored bat. The prohibitions against taking tricolored bat found in section 9 of the Endangered Species Act do not apply until the species is listed. However, the Service advises the USACE to consider implementing the following reasonable and prudent measures (RPMs). If this Opinion is adopted as a biological opinion following a listing, these measures, with their implementing terms and conditions, will be nondiscretionary.

RPM 1. Ensure that the contractor understands and follows the measures listed in Section 2.4 *Conservation Measures*, Section 7.2 *Reasonable and Prudent Measures*, and Section 7.3 *Terms and Conditions* of this Opinion.
RPM 2. Reduce take to the maximum extent practicable.
RPM 3. Monitor and document the surrogate measure of take and report it to the Service.

7.3 Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Endangered Species Act, the USACE must comply with the following terms and conditions (T&C), which implement the RPMs above and outline required reporting and/or monitoring requirements. When incidental take is anticipated, the T&Cs must include provisions for monitoring project activities to determine the actual project effects on listed fish or wildlife species (50 CFR §402.14(i)(3)). These T&Cs are nondiscretionary.

T&C 1a. Ensure that the procedures listed in Section 2.4 *Conservation Measures*, Section 7.2 *Reasonable and Prudent Measures*, and Section 7.3 *Terms and Conditions* of this Opinion are being implemented and that all project plans are being implemented in a manner that ensures the conditions of this Opinion are met.
T&C 1b. A biologist with knowledge of bat biology and this Opinion shall conduct on-site training with all individuals involved in ground disturbing activities including tree removal to review the requirements of this Opinion, species biological needs, and how to report any wildlife observations.
T&C 2. Fell as many of the trees as possible prior to April 1st. Fell all trees prior to June 1st.
T&C 3a. Project monitoring, carried out by the Federal agency or non-Federal designated representative, ensures the terms of this Opinion are carried out, provides the Service with information essential to assessing the effects of various actions on listed species, and allows the Service to track incidental take levels. Monitor the acreage of tree removal during construction to ensure the surrogate measure of take is not exceeded for tricolored bat.
T&C 3b. Once the project is complete, provide a report to this office by the end of the calendar or fiscal year in which the project is completed, whichever is more distant, that 1) indicates the acres of tree removal, 2) provides results/feedback/lessons-learned on the effectiveness of CMs, RPMs, and T&Cs, and 3) documents the start and end of the project and the dates of tree removal.

The RPMs, with their implementing T&Cs, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, the level of incidental take is exceeded, such incidental take represents new information requiring re-initiation of consultation and review of the RPMs. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the RPMs.

8. Conservation Recommendations

Section 7(a)(l) of the Endangered Species Act directs Federal agencies to use their authorities to further the purposes of the Endangered Species Act by carrying out conservation programs for the benefit of endangered and threatened species. The following conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of the proposed action on listed species, to help implement recovery plans, or to develop information.

CR 1. During any tree removal activities during the active bat season (April 1 through May 31), have a biologist monitor to see if they observe any bats flying from falling trees. After felling, have a biologist survey fallen trees for any evidence or sign of bats. This will

provide additional anecdotal evidence of taking and additional information about roosting bats when their roost tree is felled during the active season.

For the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

9. Reinitiation Notice

This concludes the conference for the Macy Grove Road Extension (U-6003). If the species is listed, ask the Service to confirm this Opinion as a Biological Opinion issued through formal consultation. The request must be in writing. If the Service reviews the proposed action and finds that there have been no significant changes in the action as planned or in the information used during the conference, the Service will confirm the Opinion as the Biological Opinion on the project and no further section 7 consultation will be necessary.

The Federal agency shall request reinitiation of consultation if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect the species in a manner or to an extent not considered in this conference opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the species or critical habitat that was not considered in this conference opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

The incidental take statement provided in this conference opinion does not become effective until the species is listed, and the Opinion is adopted as the Biological Opinion. At that time, the project will be reviewed to determine whether any take of the tricolored bat has occurred. Modifications of the Opinion and incidental take statement may be appropriate to reflect that take.

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TIP # U-6003
ENG Form 4345

U.S. Army Corps of Engineers (USACE)

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

For use of this form, see 33 CFR 325. The proponent agency is CECW-CO-R.

Form Approved - OMB No. 0710-0003 Expires: 08-31-2023

The public reporting burden for this collection of information, OMB Control Number 0710-0003, is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR APPLICATION TO THE ABOVE EMAIL.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned. System of Record Notice (SORN). The information received is entered into our permit tracking database and a SORN has been completed (SORN #A1145b) and may be accessed at the following website: http://dpcld.defense.gov/Privacy/SORNsIndex/DOD-wide-SORN-Article-View/Article/570115/a1145b-ce.aspx

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required)
First - Amy Middle - Last - Euliss	First - Sara Middle - Last - Easterly
Company - NCDOT	Company - HDR
E-mail Address - aeuliss@ncdot.gov	E-mail Address - sara.easterly@hdrinc.com
6. APPLICANT'S ADDRESS:	9. AGENT'S ADDRESS:
Address- 375 Silas Creek Parkway	Address- 555 Fayetteville Street, Suite 900
City - Winston Salem State - NC Zip - 27127 Country - USA	City - Raleigh State - NC Zip - 27601 Country - USA
7. APPLICANT'S PHONE NOs. w/AREA CODE	10. AGENTS PHONE NOs. w/AREA CODE
a. Residence b. Business 336-747-7800 c. Fax 336-761-2004	a. Residence b. Business 919-232-6664 c. Fax

STATEMENT OF AUTHORIZATION

11. I hereby authorize, Sara Easterly to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

Amy Euliss — SIGNATURE OF APPLICANT

February 3, 203 — DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)
U-6003

13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)
East Belews Creek, UTs to East Belews Creek	Address
15. LOCATION OF PROJECT	City - State- Zip-
Latitude: ◦N 36.136581 Longitude: ◦W -80.059596	

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)

State Tax Parcel ID Municipality

Section - Township - Range -

17. DIRECTIONS TO THE SITE

The project is located approximately 0.3 miles west of NC 150, 0.2 miles north of Donnell Street, 0.6 miles east of Piney Grove Road, and 0.2 miles south of Meadowbrook Park Drive.

18. Nature of Activity (Description of project, include all features)

New roadway construction from Piney Grove Road (SR 1969) to NC 150 (North Main Street) in Kernersville, Forsyth County

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

To provide east-west connectivity between Piney Grove road and NC 150, and to improve the intersection of Linville Springs Road and Piney Grove Road.

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

Impacts will result from road construction

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards
See attached cover letter		

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres

or

Linear Feet See attached cover letter

23. Description of Avoidance, Minimization, and Compensation (see instructions)

24. Is Any Portion of the Work Already Complete? ☐ Yes ☒ No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address-

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

Amy Eiliss — February 3, 203

SIGNATURE OF APPLICANT | DATE | SIGNATURE OF AGENT | DATE

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

TIP # U-6003
Adjacent
Property
Owners Table

PROJ. REFERENCE NO.	SHEET NO.
U-6003	3P-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4	L. STEVE HORD & EVELYN B. HORD
2	4	QUALITY OIL COMPANY LLC
3	4	DONALD L & AGATHA W MARTIN
4	4	DONALD A. KAPP
5	4	MARIA D. L. BERNAL
6	4	BILLY R. LAWSON & KAY LAWSON
7	4	CHRISTINA F. TILLOTSON
8	4	MICHAEL E. SMITH
9	4	VICTOR M. GALLARDO & NORMA R. GUTIERREZ
10	4	CAROLYN D. OZMENT
11	4	JAMES C. ROBERTS & BERNICE ROBERTS
12	4	WILLOWBROOK CARE CENTER, INC.
13	4	BROOKSIDE MONTESSORI SCHOOL, INC
14	4	MALIK M. ASLAM & NYLA ASLAM
15	4	DAVID W. WEAVIL
16	4	CHARLES W. CARTER & LINDA CARTER
17	4	CHARLES W. CARTER & LINDA CARTER
18	4, 5	CHARLES W. CARTER & LINDA CARTER
19	4	TOWN OF KERNERSVILLE
20	4	HEIRS OF ANNA BROOKS
21	4, 5, 6	TOWN OF KERNERSVILLE
22	5	JULIAN POND HOMEOWNERS ASSOCIATION, INC.
23	6, 7	NANCY EDWARDS
24	7	PAULA J. TURNER
25	7, 8	SIMON S. EDWARDS
26	8	WILLIAM C. EDWARDS, JR.
27	4	ERIC E. SCHULTZE & KATRINA SCHULTZE

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

TIP # U-6003
Final Permit Plans and Stormwater Management Plan

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 3.00; Released August 2021)

General Project Information

WBS Element:	47138.1.1	**TIP Number:**	U-6003	**Project Type:**	New Location	**Date:**	1/17/2023	
NCDOT Contact:	Connie James			**Contractor / Designer:**	Wyatt Yelverton			
	Address:	375 Silas Creek Parkway Winston Salem, 27127			**Address:**	555 Fayetteville St. Suite 900 Raleigh, NC 27601		
	Phone:	(336) 747-7800			**Phone:**	919-232-6623		
	Email:	ckjames1@ncdot.gov			**Email:**	wyatt.yelverton@hdrinc.com		
City/Town:	Kernersville			**County(ies):**	Forsyth			
River Basin(s):	Roanoke			**CAMA County?**	No			
Wetlands within Project Limits?	Yes							

Project Description

Project Length (lin. miles or feet):	0.962 miles	**Surrounding Land Use:**	Residential/Agricultural					
	Proposed Project			**Existing Site**				
Project Built-Upon Area (ac.)	9.5	ac.		1.5	ac.			
Typical Cross Section Description:	(2) 12'-0" travel lanes with 4'-0" bike lanes, curb and gutter. Variable grassed median between 14'-0" and 23'-0" (width inclusive of median curb and gutter). Also, areas of variable concrete median between 5'-6" and 14'-0".			New Alignment.				
Annual Avg Daily Traffic (veh/hr/day):	Design/Future:	10,100	Year: 2039	Existing:	N/A - New Alignment	Year:	N/A	

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

Project Description: The proposed project (U-6003) is a new alignment connector between SR 1969 (Piney Grove Road) and NC 150 (North Main Street) in Kernersville, NC. The new route is proposed to be a two-lane divided facility with bicycle and pedestrian accommodations.

Impact Minimization Efforts: The project has been designed to minimize wetland and stream impacts along the project corridor. Steepened 2:1 fill slopes have been implemented to reduce stream impacts at all permit sites. Culverts in the project area that convey jurisdictional streams have been buried to provide aquatic passage. The culverts are also designed with sills and baffles in order to retain bed material inside the culvert.

At the system outlet for Site 2 (48” pipe), site topography and close proximity to the access road (future DR1 and DR2) restrict opportunities for strormwater treatment. As a result, the design focus was to minimize velocity coming out of the system. The junction box at the end of the system allows the last pipe segment to be installed at a slope of 0.3%. This minimizes the outlet velocity. Rip rap is for the outlet protection is to be embedded to stream bed level.

At the culvert sites (Sites 3 and 5) steep topography also restricted prospects for stormwater treatment. Attempts for grass swale treatment through system outlets to the outside fill slopes would not meet grass swale criteria due to proposed slopes and subsequent high velocities. Stability in any such outside ditch would require the use of rip rap lining. Rather than using small, rip rap lined ditches for tying to drainage systems to East Belews Creek and UT to East Belews Creek, direct system ties to culvert walls are proposed. All energy dissipation from the systems will be achieved inside the culvert barrel. This option also reduces impacts to overbank areas near culvert inlets and outlets.

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 3.00; Released August 2021)

WBS Element:	47138.1.1	TIP/Proj No.:	U-6003	County(ies):	Forsyth	Page	2	of	3

General Project Information

Waterbody Information

Surface Water Body (1):	UT to East Belews Creek			**NCDWR Stream Index No.:**	22-27-8-(1)		
NCDWR Surface Water Classification for Water Body			**Primary Classification:**	Class C			
			Supplemental Classification:	None			
Other Stream Classification:	None						
Impairments:	None						
Aquatic T&E Species?	No	Comments:					
NRTR Stream ID:	SA, SC				**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No		**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A		(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)							

Surface Water Body (2):	East Belews Creek			**NCDWR Stream Index No.:**	22-27-8-(1)		
NCDWR Surface Water Classification for Water Body			**Primary Classification:**	Class C			
			Supplemental Classification:	None			
Other Stream Classification:	None						
Impairments:	None						
Aquatic T&E Species?	No	Comments:					
NRTR Stream ID:	East Belews Creek				**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No		**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A		(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)							

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

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 3.00; Released August 2021)

WBS Element: 47138.1.1 **TIP/Proj No.:** U-6003 **County(ies):** Forsyth

Swale

Sheet No.	Line	Station	Location (LT,RT,CL)	Latitude	Longitude	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
4	Y16	16+55	LT			(2)East Belews Creek	0.0	4.0	2.0	2.8	283	50	2.06%	3.8	2.8	6.2	3.2	No	No
5	L	23+00	LT			(2)East Belews Creek	2.0	2.0	2.0	1.4	136	205	3.02%	2.3	2.4	3.7	2.8	No	No
5	L	28+00	RT			(2)East Belews Creek	3.0	2.0	2.0	15.2	1524	150	0.60%	25.5	2.5	41.9	2.9	No	No
6	L	35+50	RT			(2)East Belews Creek	0.0	2.0	2.0	0.6	57	322	3.63%	1.2	2.3	1.9	2.6	No	No
6	L	40+15	RT			(1)UT to East Belews Creek	0.0	2.0	2.0	0.7	66	143	2.92%	1.3	2.2	2.2	2.5	No	No
6	L	40+15	RT			(1)UT to East Belews Creek	0.0	2.0	2.0	0.5	47	125	5.36%	0.9	2.6	1.6	2.9	No	No
7	L	46+15	LT			(1)UT to East Belews Creek	0.0	2.0	2.0	0.4	44	310	3.91%	0.6	2.4	1.0	2.8	No	No
8	L	56+70	RT			(1)UT to East Belews Creek	0.0	2.0	2.0	0.4	40	70	4.00%	0.8	2.2	1.3	2.5	No	No
8	L	59+40	RT			(1)UT to East Belews Creek	2.0	2.0	2.0	1.2	120	160	1.09%	2.4	1.7	4.0	2.0	No	No

Additional Comments

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

FORSYTH COUNTY

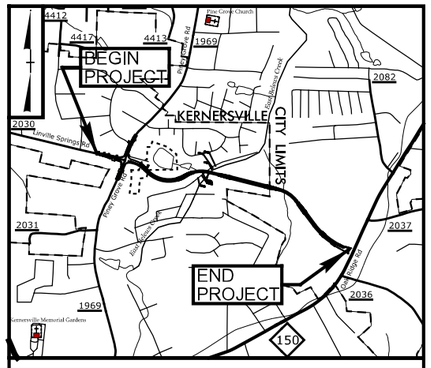
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-6003	1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
47138.1.1		PE	

LOCATION: *KERNERSVILLE – KERNERSVILLE LOOP*
FROM SR 1969 (PINEY GROVE RD) TO NC 150
(N. MAIN ST.)

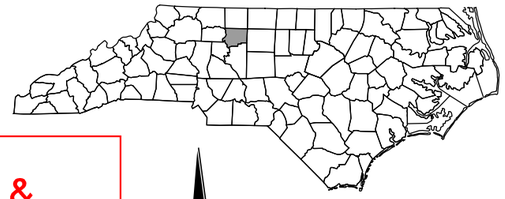
TYPE OF WORK: *GRADING, PAVING, SIGNALS, DRAINAGE AND STRUCTURES*

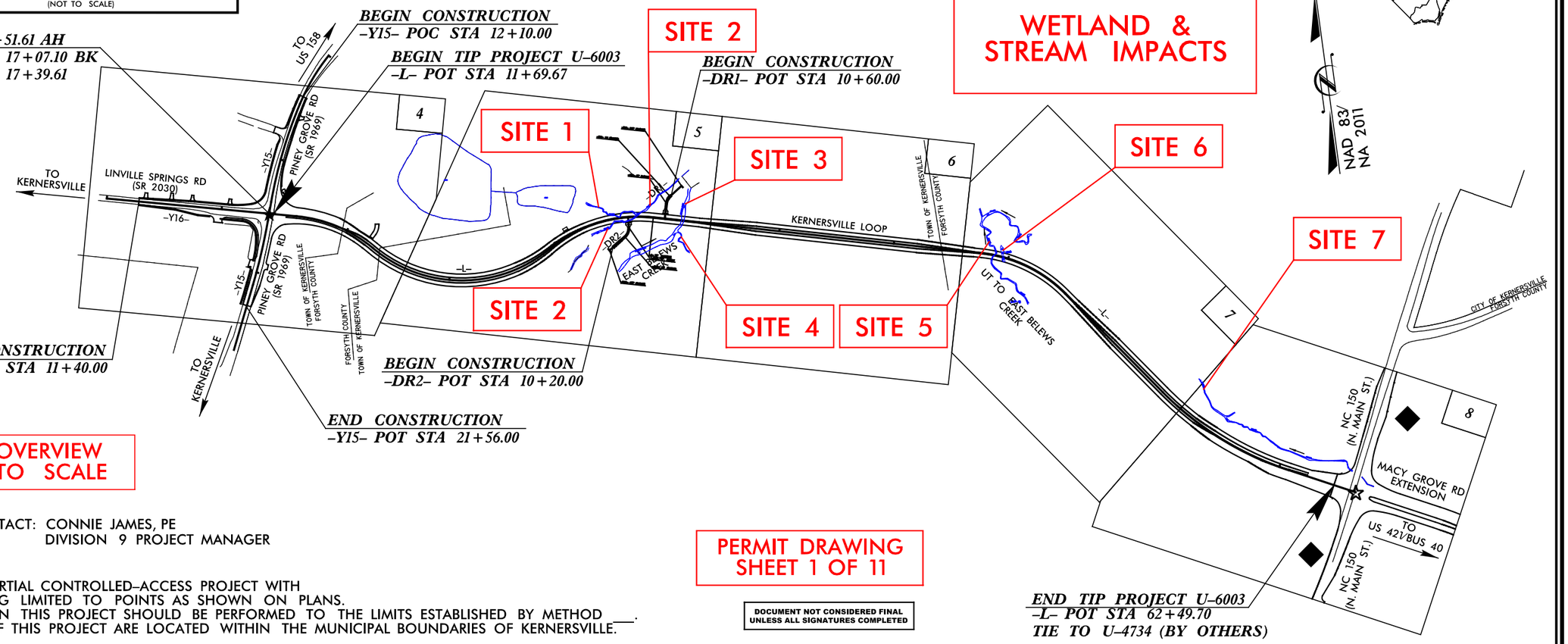
TIP PROJECT: U-6003

CONTRACT:



VICINITY MAP
(NOT TO SCALE)





SITE OVERVIEW
NOT TO SCALE

PERMIT DRAWING
SHEET 1 OF 11

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NCDOT CONTACT: CONNIE JAMES, PE
DIVISION 9 PROJECT MANAGER

NOTES:

THIS IS A PARTIAL CONTROLLED–ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON PLANS.
CLEARING ON THIS PROJECT SHOULD BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ___.
PORTIONS OF THIS PROJECT ARE LOCATED WITHIN THE MUNICIPAL BOUNDARIES OF KERNERSVILLE.

GRAPHIC SCALES

PLANS: 100 50 0 100 200
PROFILE (HORIZONTAL): 20 10 0 20 40
PROFILE (VERTICAL): 20 10 0 20 40

DESIGN DATA

ADT (2019) = 5,400
ADT (2039) = 10,100
K = 10 %
D = 55 %
T = 3 % *
V = 40 MPH
* TTST = 1% DUAL 2%
FUNC CLASS = ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U–6003 = 0.962 MILES

TOTAL LENGTH TIP PROJECT U–6003 = 0.962 MILES

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

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: TBD

LETTING DATE: TBD

PHILLIP E. ROGERS, PE
PROJECT ENGINEER

ALEXANDER D. SNIDER, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS

STATE OF NORTH CAROLINA

1/5/2023
U-6003_PRR_U6003_PRM_TSH.dgn
$$$$USERNAME$$$$

8/17/99

HDR Engineering, Inc. of the Carolinas 555 Fayetteville St, Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116	PROJECT REFERENCE NO.	SHEET NO.
	U-6003	5
	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LEGEND:

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

REGARDING TEMPORARY STREAM IMPACTS AREAS: THERE SHALL BE NO DISTURBANCE TO THE EXISTING STREAM BED IN THESE LOCATIONS. TEMPORARY IMPACTS ARE INTENDED FOR DEWATERING EFFORTS DURING CONSTRUCTION.

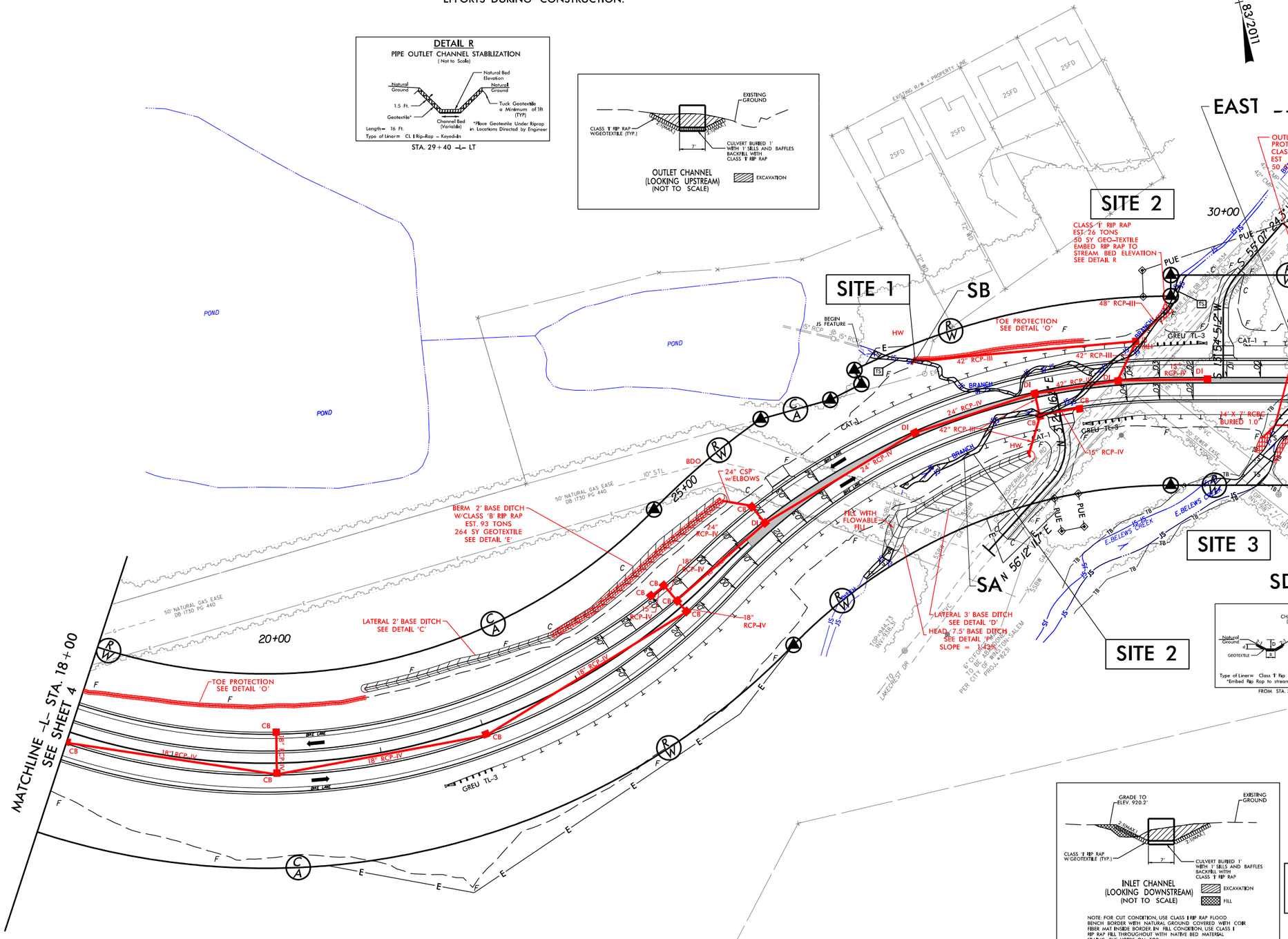
NAD 83/2011

DETAIL R
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)

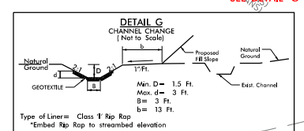
Length= 16 Ft.
Type of Liner= CL I Rip-Rap – Keyed-In

STA. 29+40 –L– LT

OUTLET CHANNEL
(LOOKING UPSTREAM)
(NOT TO SCALE)



DETAIL G
CHANNEL CHANGE
(Not to Scale)



Min. D= 1.5 Ft.
Max. d= 3 Ft.
B= 3 Ft.
b= 13 Ft.
Type of Liner= Class 'I' Rip Rap
*Embed Rip Rap to streambed elevation
FROM STA. 30+45 TO STA. 30+76 –L– RT

INLET CHANNEL
(LOOKING DOWNSTREAM)
(NOT TO SCALE)

NOTE: FOR CUT CONDITION, USE CLASS I RIP RAP FLOOD BENCH BORDER WITH NATURAL GROUND COVERED WITH COIR FIBER MAT INSIDE BORDER. IN FILL CONDITION, USE CLASS I RIP RAP FILL THROUGHOUT WITH NATIVE BED MATERIAL FILLING THE VOIDS ON TOP.

PERMIT DRAWING SHEET 2 OF 11

FOR –L– PROFILE, SEE SHEET 9
FOR –DR1– PROFILE, SEE SHEET 11
FOR –DR2– PROFILE, SEE SHEET 11

1/24/2023
Drawings\U6003_PRM_PSH.dgn
\$\$\$\$USERNAME\$\$\$\$

8/17/99

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

PROJECT REFERENCE NO.	SHEET NO.
U-6003	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LEGEND:

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

REGARDING TEMPORARY STREAM IMPACTS AREAS: THERE SHALL BE NO DISTURBANCE TO THE EXISTING STREAM BED IN THESE LOCATIONS. TEMPORARY IMPACTS ARE INTENDED FOR DEWATERING EFFORTS DURING CONSTRUCTION.

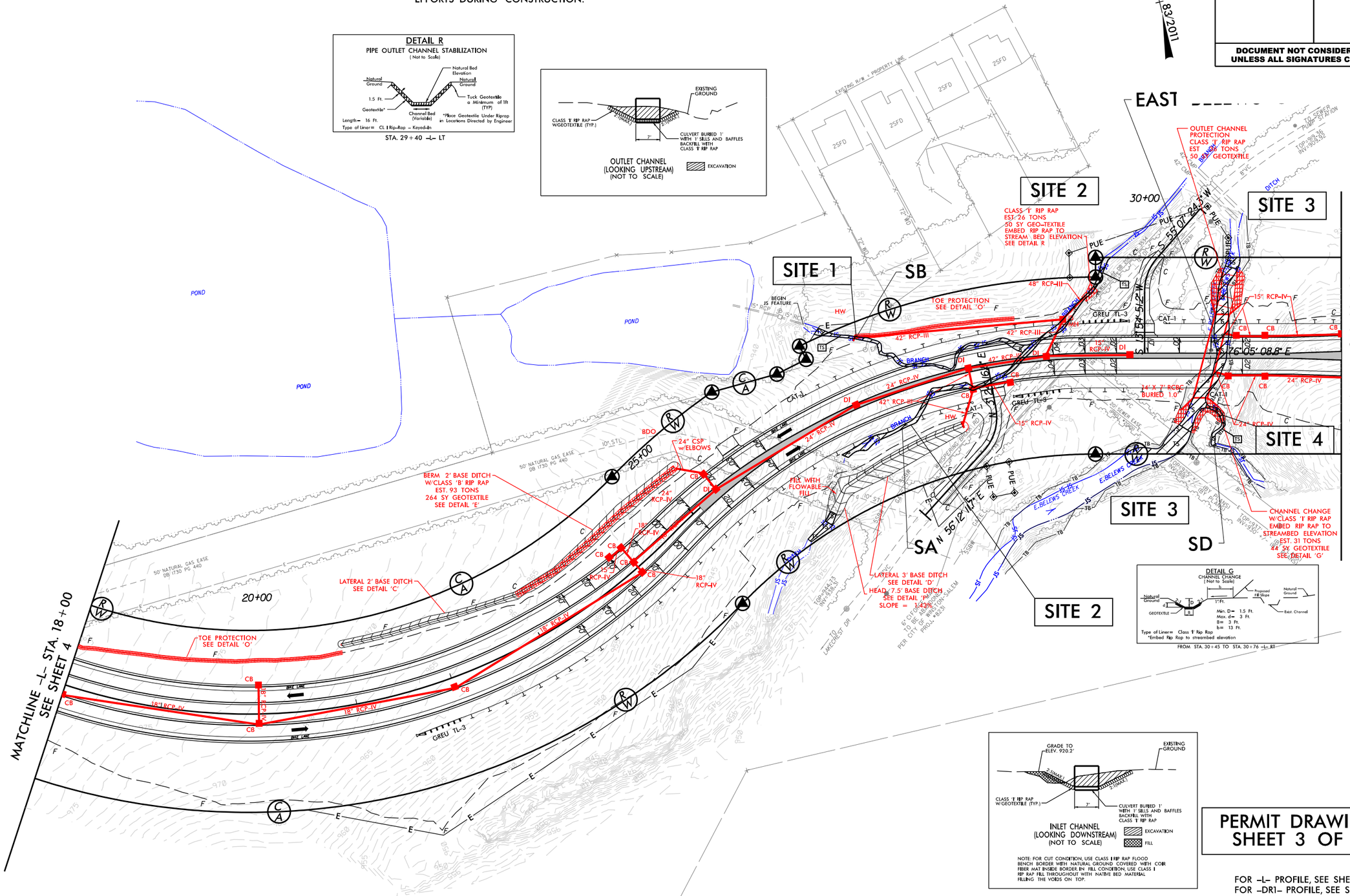
NAD 83/2011

DETAIL R
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)

Length= 16 Ft.
Type of Liner= CL I Rip-Rap – Keyed-In
*Place Geotextile Under Riprap in Locations Directed by Engineer

STA. 29+40 –L– LT

OUTLET CHANNEL
(LOOKING UPSTREAM)
(NOT TO SCALE)



DETAIL G
CHANNEL CHANGE
(Not to Scale)

Min. D= 1.5 Ft.
Max. d= 3 Ft.
B= 3 Ft.
b= 13 Ft.
Type of Liner= Class 'I' Rip Rap
*Embed Rip Rap to streambed elevation

FROM STA. 30+45 TO STA. 30+76 –L– RT

INLET CHANNEL
(LOOKING DOWNSTREAM)
(NOT TO SCALE)

NOTE: FOR CUT CONDITION, USE CLASS I RIP RAP FLOOD BENCH BORDER WITH NATURAL GROUND COVERED WITH COIR FIBER MAT INSIDE BORDER. IN FILL CONDITION, USE CLASS I RIP RAP FILL THROUGHOUT WITH NATIVE BED MATERIAL FILLING THE VOIDS ON TOP.

PERMIT DRAWING SHEET 3 OF 11

FOR –L– PROFILE, SEE SHEET 9
FOR –DR1– PROFILE, SEE SHEET 11
FOR –DR2– PROFILE, SEE SHEET 11

1/24/2023
...\Drawings\U6003_PRM_PSH.dgn
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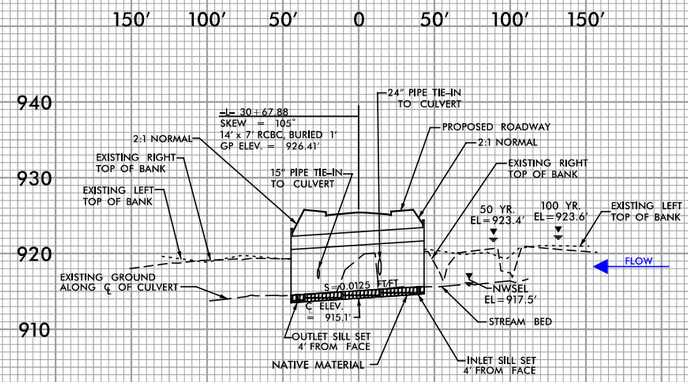
HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
U-6003	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SCALE:
1" = 100' HORIZONTAL
1" = 20' VERTICAL

SITE 3



PROFILE ALONG ℄ OF CULVERT

PERMIT DRAWING
SHEET 4 OF 11

REVISIONS 5/14/99

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TIME: 1:34:12 PM

8/17/99

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

PROJECT REFERENCE NO.	SHEET NO.
U-6003	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

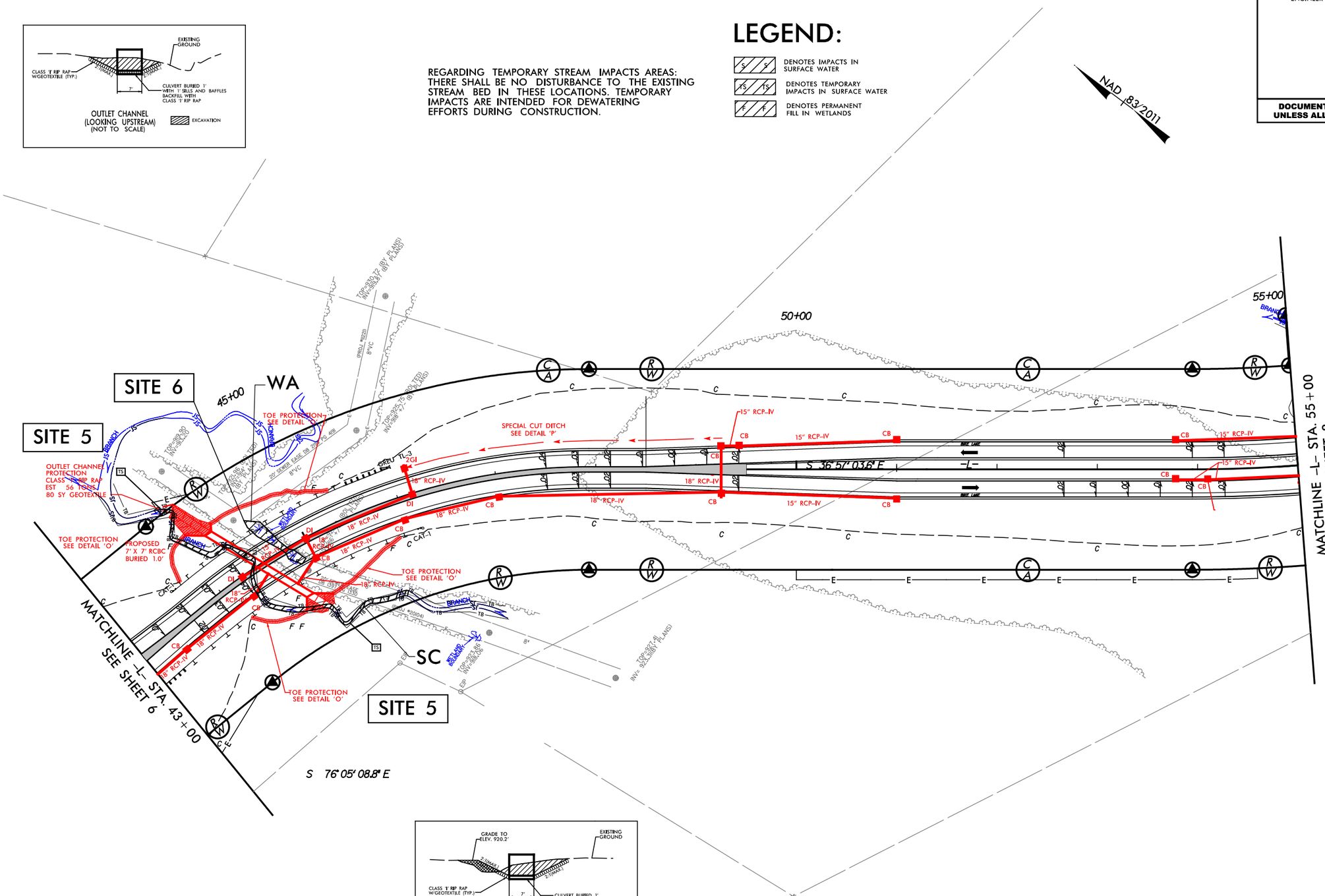
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

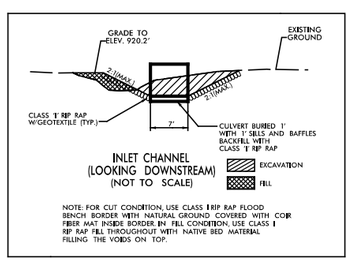
REGARDING TEMPORARY STREAM IMPACTS AREAS: THERE SHALL BE NO DISTURBANCE TO THE EXISTING STREAM BED IN THESE LOCATIONS. TEMPORARY IMPACTS ARE INTENDED FOR DEWATERING EFFORTS DURING CONSTRUCTION.

LEGEND:

- S S — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- F F — DENOTES PERMANENT FILL IN WETLANDS

NAD 83/2011





PERMIT DRAWING SHEET 5 OF 11

FOR -L- PROFILE, SEE SHEET 10

1/9/2023
...\Drawings\U6003_PRM_PSH.dgn
$$$$USERNAME$$$$

8/17/99

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

PROJECT REFERENCE NO.	SHEET NO.
U-6003	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

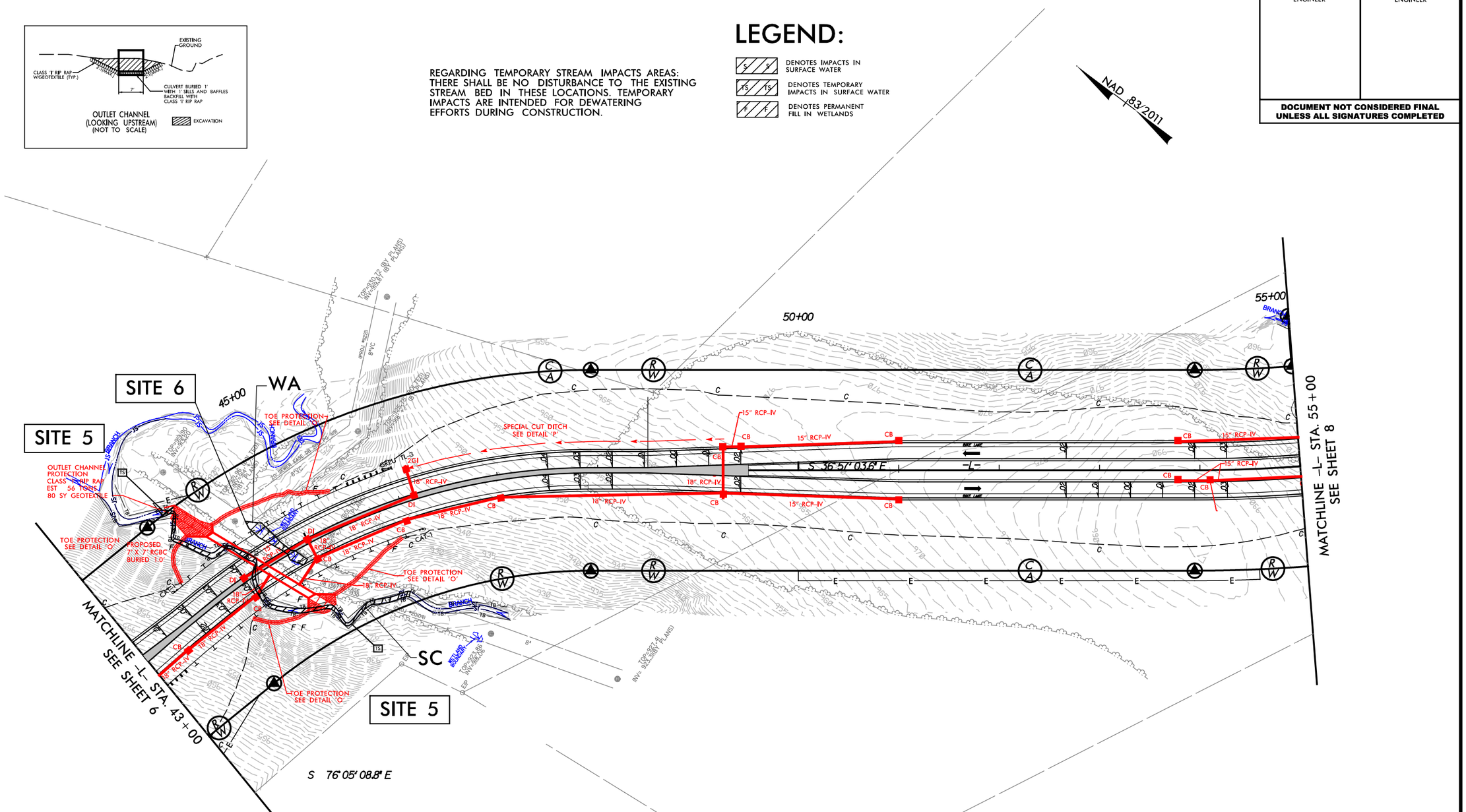
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

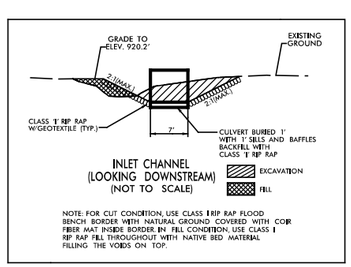
REGARDING TEMPORARY STREAM IMPACTS AREAS: THERE SHALL BE NO DISTURBANCE TO THE EXISTING STREAM BED IN THESE LOCATIONS. TEMPORARY IMPACTS ARE INTENDED FOR DEWATERING EFFORTS DURING CONSTRUCTION.

LEGEND:

- S / S — DENOTES IMPACTS IN SURFACE WATER
- TS / TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- F / F — DENOTES PERMANENT FILL IN WETLANDS

NAD 83/2011





PERMIT DRAWING SHEET 6 OF 11

FOR -L- PROFILE, SEE SHEET 10

1/9/2023
...\Drawings\U6003_PRM_PSH.dgn
$$$$USERNAME$$$$

5/14/99

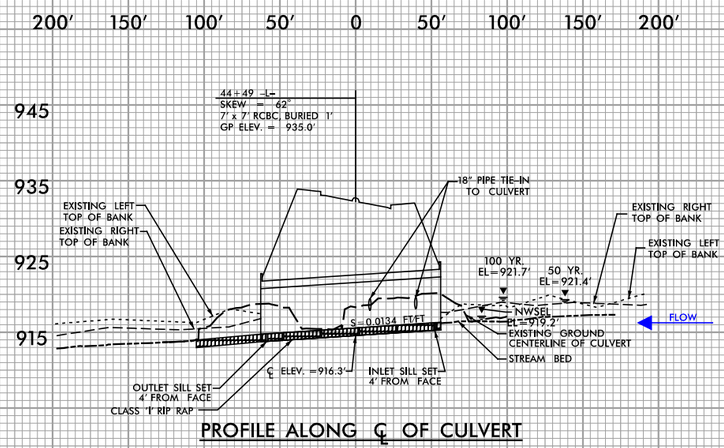
HDR Engineering, Inc. of the Carolinas
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
U-6003	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SCALE:
1" = 100' HORIZONTAL
1" = 20' VERTICAL

SITE 5



PROFILE ALONG ℄ OF CULVERT

PERMIT DRAWING
SHEET 7 OF 11

REVISIONS

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6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
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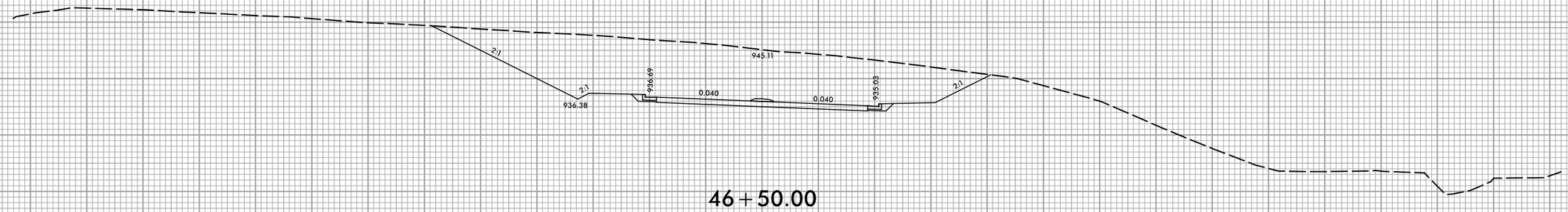
950 940 930 920 910



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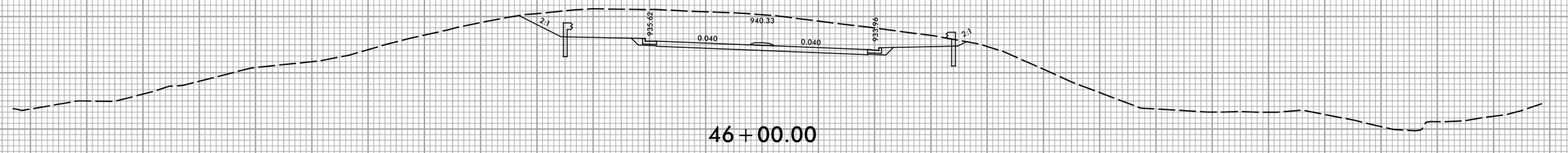

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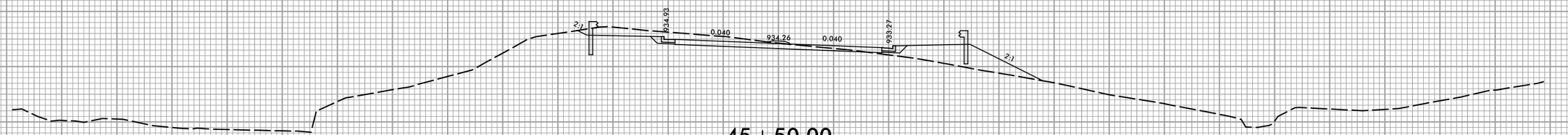

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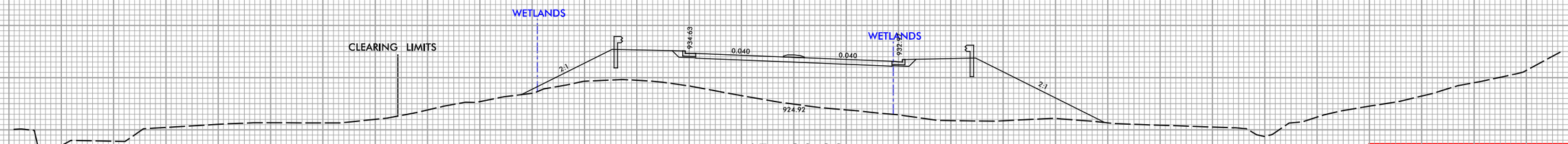

45+00.00

SITE 6

PERMIT DRAWING
SHEET 8 OF 11

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U6003_PRM_XPLL.dgn
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PROJECT REFERENCE NO.	SHEET NO.
U-6003	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

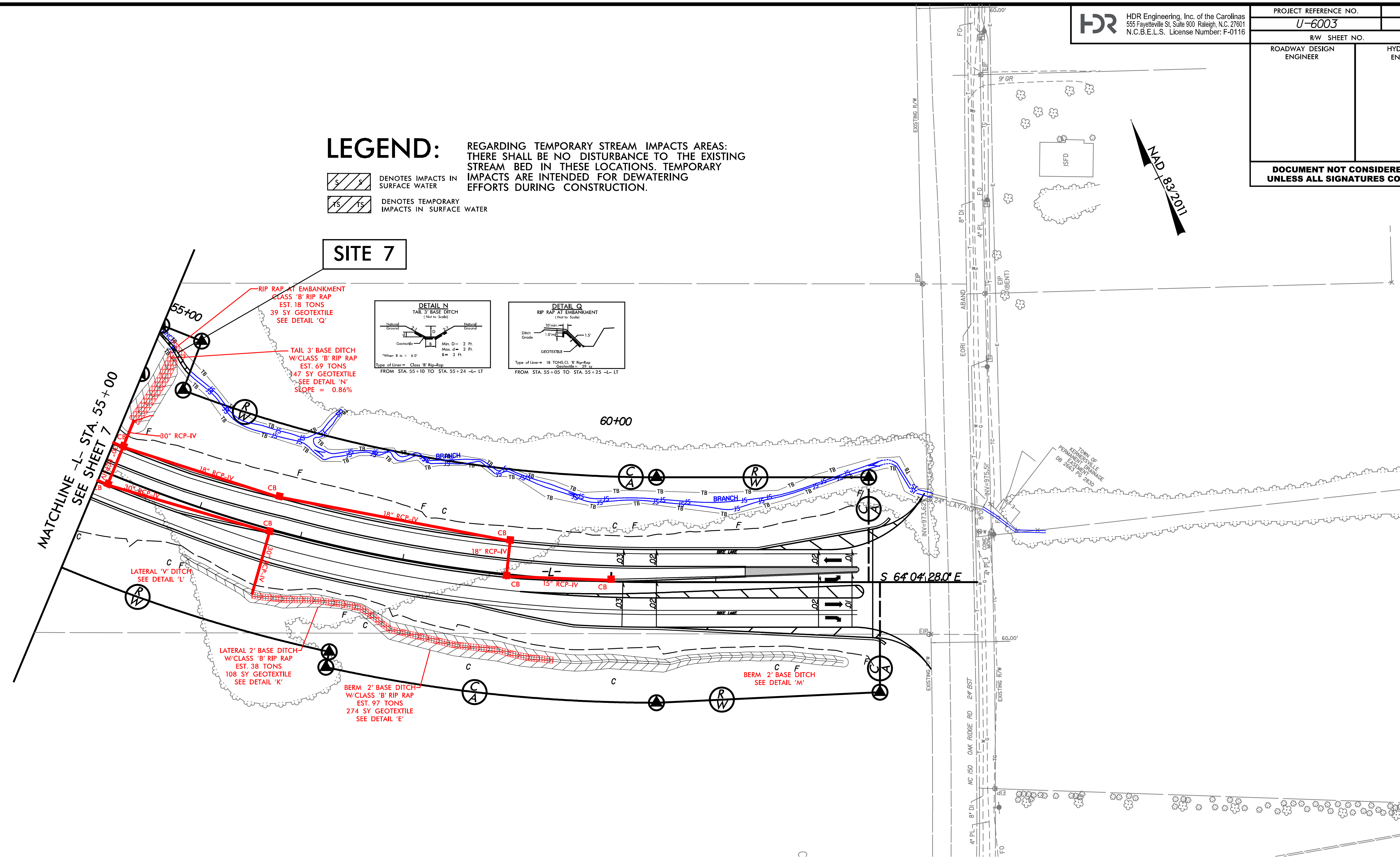
LEGEND:

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

REGARDING TEMPORARY STREAM IMPACTS AREAS: THERE SHALL BE NO DISTURBANCE TO THE EXISTING STREAM BED IN THESE LOCATIONS. TEMPORARY IMPACTS ARE INTENDED FOR DEWATERING EFFORTS DURING CONSTRUCTION.

SITE 7



RIP RAP AT EMBANKMENT CLASS 'B' RIP RAP EST. 18 TONS 39 SY GEOTEXTILE SEE DETAIL 'Q'
TAIL 3' BASE DITCH W/CLASS 'B' RIP RAP EST. 69 TONS 147 SY GEOTEXTILE SEE DETAIL 'N' SLOPE = 0.86%
DETAIL N TAIL 3' BASE DITCH (Not to Scale)
FROM STA. 55+10 TO STA. 55+24 -L- LT
DETAIL Q RIP RAP AT EMBANKMENT (Not to Scale)
FROM STA. 55+05 TO STA. 55+25 -L- LT
55+00
60+00
MATCHLINE -L- STA. 55+00 SEE SHEET 7
30" RCP-IV
18" RCP-IV
15" RCP-IV
BRANCH
-L-
S 64°04'28.0" E
LATERAL 'V' DITCH SEE DETAIL 'L'
LATERAL 2' BASE DITCH W/CLASS 'B' RIP RAP EST. 38 TONS 108 SY GEOTEXTILE SEE DETAIL 'K'
BERM 2' BASE DITCH W/CLASS 'B' RIP RAP EST. 97 TONS 274 SY GEOTEXTILE SEE DETAIL 'E'
BERM 2' BASE DITCH SEE DETAIL 'M'
NC 150 OAK RIDGE RD 24' BST
EXISTING R/W
NAD 83/2011
TOWN OF KERNERSVILLE PERMANENT DRAINAGE EASEMENT DB 2863 PG 2830

PERMIT DRAWING SHEET 9 OF 11

FOR -L- PROFILE, SEE SHEET 10

8/17/99
1/9/2023

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

PROJECT REFERENCE NO.	SHEET NO.
U-6003	8
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

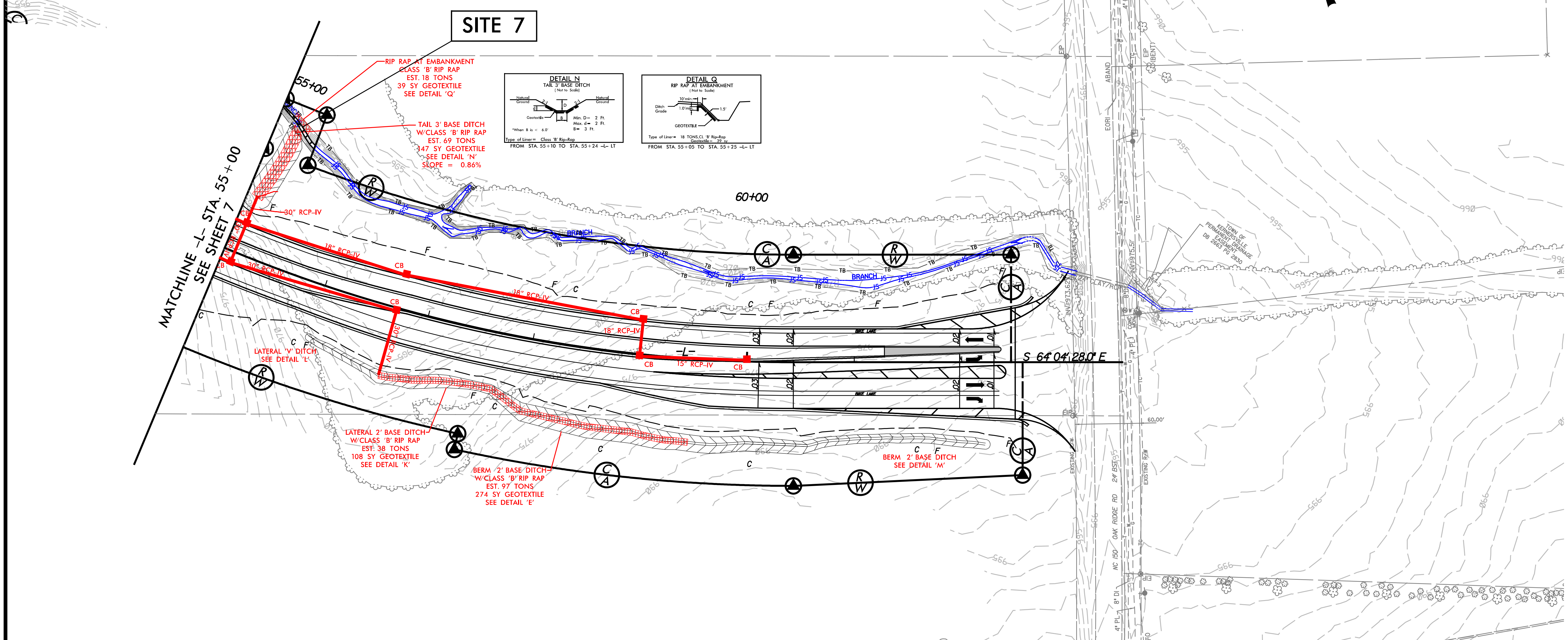
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LEGEND:

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

REGARDING TEMPORARY STREAM IMPACTS AREAS: THERE SHALL BE NO DISTURBANCE TO THE EXISTING STREAM BED IN THESE LOCATIONS. TEMPORARY IMPACTS ARE INTENDED FOR DEWATERING EFFORTS DURING CONSTRUCTION.



SITE 7
RIP RAP AT EMBANKMENT CLASS 'B' RIP RAP EST. 18 TONS 39 SY GEOTEXTILE SEE DETAIL 'Q'
TAIL 3' BASE DITCH W/CLASS 'B' RIP RAP EST. 69 TONS 147 SY GEOTEXTILE SEE DETAIL 'N' SLOPE = 0.86%
DETAIL N
TAIL 3' BASE DITCH
FROM STA. 55+10 TO STA. 55+24 -L- LT
DETAIL Q
RIP RAP AT EMBANKMENT
FROM STA. 55+05 TO STA. 55+25 -L- LT
MATCHLINE -L- STA. 55+00 SEE SHEET 7
55+00
60+00
30" RCP-IV
18" RCP-IV
15" RCP-IV
BRANCH
-L-
S 64°04'28.0" E
LATERAL 'V' DITCH SEE DETAIL 'L'
LATERAL 2' BASE DITCH W/CLASS 'B' RIP RAP EST. 38 TONS 108 SY GEOTEXTILE SEE DETAIL 'K'
BERM 2' BASE DITCH W/CLASS 'B' RIP RAP EST. 97 TONS 274 SY GEOTEXTILE SEE DETAIL 'E'
BERM 2' BASE DITCH SEE DETAIL 'M'
NC 150 OAK RIDGE RD
NAD 83/2011

PERMIT DRAWING
SHEET 10 OF 11

FOR -L- PROFILE, SEE SHEET 10

8/17/99

1/9/2023

WETLAND AND SURFACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L- 26+95/28+83	42" RCP-III						0.01	< 0.01	211	40	
2	-L- 26+66/29+53	42" RCP-III						0.03	< 0.01	332	59	
3	-L- 30+22/30+97	14'X7' RCBC						0.02	0.02	92	44	
		BANK STABILIZATION						0.02		86		
4	-L- 30+59/30+86	3' BASE DITCH						< 0.01	< 0.01	26	28	
5	-L- 43+96/44+93	7'X7' RCBC						0.02	< 0.01	245	105	
6	-L- 44+57/44+91	ROADWAY FILL	0.01									
7	-L- 55+03/55+39	BANK STABILIZATION						< 0.01	< 0.01	21	28	
TOTALS*:			0.01					0.12	0.04	1013	304	0

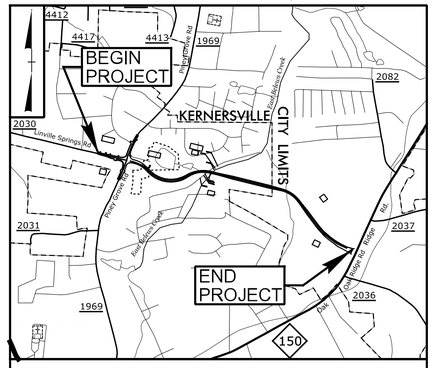
*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
01/17/2023
FORSYTH COUNTY
U-6003
47138.1.1

TIP # U-6003
Final Roadway
Plans

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



VICINITY MAP
(NOT TO SCALE)

ROW PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

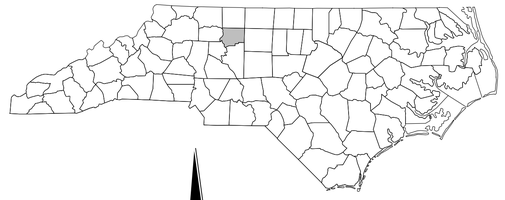
FORSYTH COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-6003	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
47138.1.1		PE
47138.2.1		RW/UTILS
47138.3.1		CONST

LOCATION: ***KERNERSVILLE – KERNERSVILLE LOOP***
FROM SR 1969 (PINEY GROVE RD) TO NC 150
(N. MAIN ST.)

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



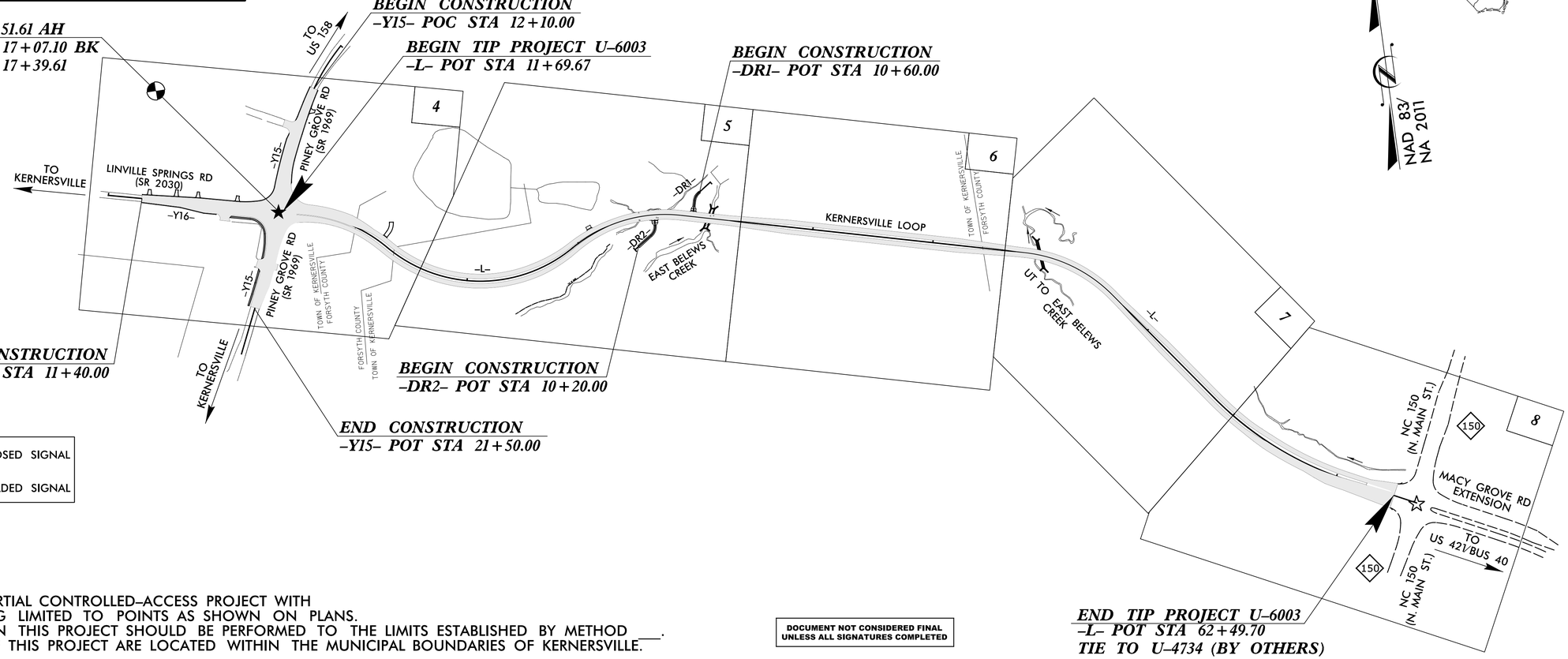
NAD 83/
NA 2011

–L– POT 11+51.61 AH
=–Y16– POT 17+07.10 BK
=–Y15– POT 17+39.61

BEGIN CONSTRUCTION
–Y15– POC STA 12+10.00

BEGIN TIP PROJECT U–6003
–L– POT STA 11+69.67

BEGIN CONSTRUCTION
–DRI– POT STA 10+60.00



BEGIN CONSTRUCTION
–Y16– POC STA 11+40.00

END CONSTRUCTION
–Y15– POT STA 21+50.00

★ PROPOSED SIGNAL
☆ UPGRADED SIGNAL

END TIP PROJECT U–6003
–L– POT STA 62+49.70
TIE TO U–4734 (BY OTHERS)

NOTES:

THIS IS A PARTIAL CONTROLLED–ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON PLANS.
CLEARING ON THIS PROJECT SHOULD BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ___.
PORTIONS OF THIS PROJECT ARE LOCATED WITHIN THE MUNICIPAL BOUNDARIES OF KERNERSVILLE.

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 (2019) = 5,400
ADT (2039)= 10,100
K = 10 %
D = 55 %
T = 3 % *
V = 40 MPH
* TTST =1% DUAL 2%
FUNC CLASS = ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U–6003 = 0.962 MILES

TOTAL LENGTH TIP PROJECT U–6003 = 0.962 MILES

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

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOVEMBER 30, 2018

LETTING DATE:
JUNE 21, 2022

PHILLIP E. ROGERS, PE
PROJECT ENGINEER

ALEXANDER D. SNIDER, PE
PROJECT DESIGN ENGINEER

CONNIE JAMES, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

SIGNATURE: *P.E.*

DIVISION OF HIGHWAYS

STATE OF NORTH CAROLINA

CONTRACT:

TIP PROJECT: U–6003

REVISIONS

3-26-2019	PUE ADDED ON PARCELS 2, 11, AND 28
3-24-2020	PARCEL 23 ADDED ON, ROW ADJUSTED ON PARCEL 26
9-14-2020	PUE ALSO ADDED ON PARCEL 23 AND ROW
12-02-2021	PUE REMOVED AND TCE REVISED ON PARCEL 2
1-20-2022	ROW REVISED ON PARCELS 14, 18, 19, & 20-CA REVISED ON PARCEL 11; PUE ADDED ON PARCEL 2; DUE REVISED ON PARCEL 10; PARCEL 28 IMPACTS REMOVED;
7-12-2022	AUE REVISED ON PARCELS 17, 18, & 21; PUE REVISED ON PARCEL 18; TCE ADDED ON PARCEL 18
	PUE & TCE REVISED ON PARCEL 12
12-07-2022	ROW/CA & TCE REVISED ON PACRELS 21 & 23; TCE REVISED ON PARCEL 21
1-17-2023	TDE REVISED ON PARCEL 23

1/17/2023
U6003_tip.tsh.dgn
HDR ENGINEERING, INC.

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
U-6003	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale **S.U.E. = Subsurface Utility Engineering*

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Computed Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Existing Historic Property Boundary — HPB
- Known Contamination Area: Soil — S
- Potential Contamination Area: Soil — S
- Known Contamination Area: Water — W
- Potential Contamination Area: Water — W
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream — JS
- Buffer Zone 1 — BZ 1
- Buffer Zone 2 — BZ 2
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY & PROJECT CONTROL:

- Secondary Horiz and Vert Control Point
- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Exist Permanent Easment Pin and Cap
- New Permanent Easement Pin and Cap
- Vertical Benchmark
- Existing Right of Way Marker
- Existing Right of Way Line
- New Right of Way Line — RW
- New Right of Way Line with Pin and Cap — RW
- New Right of Way Line with Concrete or Granite R/W Marker — RW
- New Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- New Control of Access — CA
- Existing Easement Line — E
- New Temporary Construction Easement — E
- New Temporary Drainage Easement — TDE
- New Permanent Drainage Easement — PDE
- New Permanent Drainage / Utility Easement — DUE
- New Permanent Utility Easement — PUE
- New Temporary Utility Easement — TUE
- New Aerial Utility Easement — AUE

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard — Vineyard

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H–Frame Pole
- U/G Power Line LOS B (S.U.E.*) — P
- U/G Power Line LOS C (S.U.E.*) — P
- U/G Power Line LOS D (S.U.E.*) — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- U/G Telephone Cable LOS B (S.U.E.*) — T
- U/G Telephone Cable LOS C (S.U.E.*) — T
- U/G Telephone Cable LOS D (S.U.E.*) — T
- U/G Telephone Conduit LOS B (S.U.E.*) — TC
- U/G Telephone Conduit LOS C (S.U.E.*) — TC
- U/G Telephone Conduit LOS D (S.U.E.*) — TC
- U/G Fiber Optics Cable LOS B (S.U.E.*) — T FO
- U/G Fiber Optics Cable LOS C (S.U.E.*) — T FO
- U/G Fiber Optics Cable LOS D (S.U.E.*) — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line LOS B (S.U.E*) — W
- U/G Water Line LOS C (S.U.E*) — W
- U/G Water Line LOS D (S.U.E*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- U/G TV Cable LOS B (S.U.E.*) — TV
- U/G TV Cable LOS C (S.U.E.*) — TV
- U/G TV Cable LOS D (S.U.E.*) — TV
- U/G Fiber Optic Cable LOS B (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS C (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS D (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line LOS B (S.U.E.*) — G
- U/G Gas Line LOS C (S.U.E.*) — G
- U/G Gas Line LOS D (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- SS Forced Main Line LOS B (S.U.E.*) — FSS
- SS Forced Main Line LOS C (S.U.E.*) — FSS
- SS Forced Main Line LOS D (S.U.E.*) — FSS

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line LOS B (S.U.E.*) — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole LOS A (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

PROJECT REFERENCE NO.	SHEET NO.
U-6003	2A-1
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

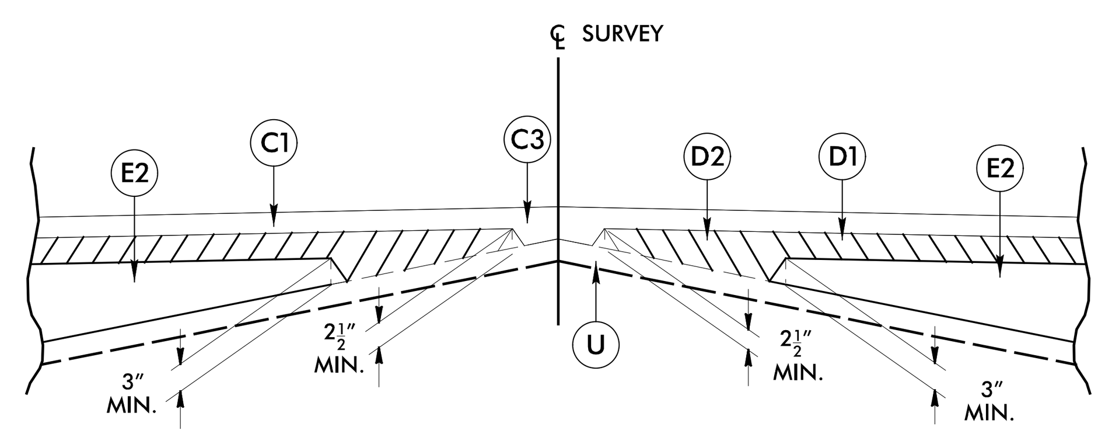
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

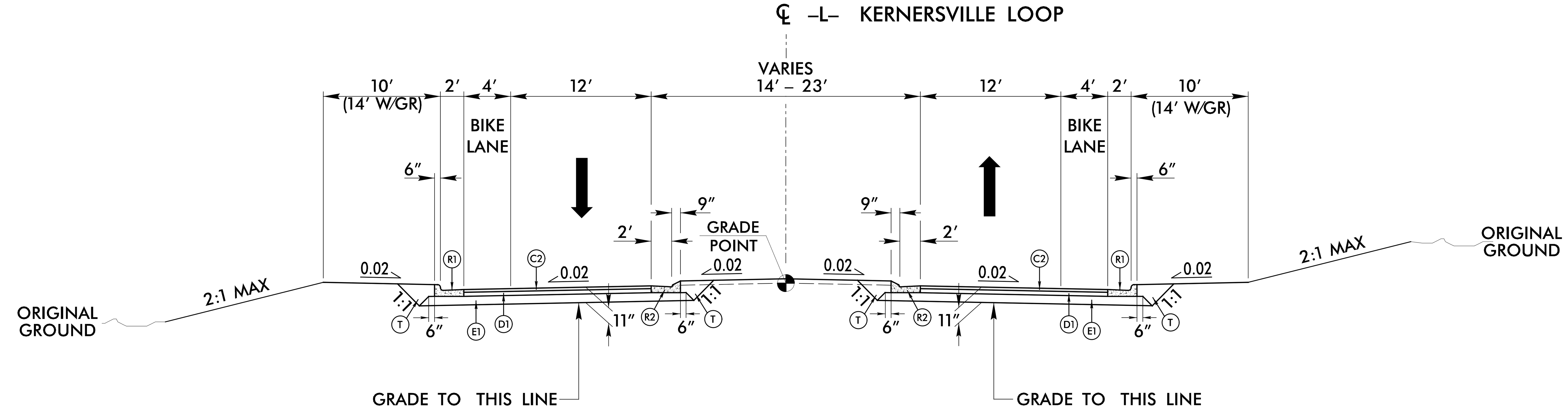
FINAL PAVEMENT SCHEDULE
(BASED ON U-6003 PAVEMENT DESIGN; OCTOBER 18, 2018)

C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN ONE LAYER.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1½" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
M	2'x4" BENCH MILL
R1	PROP. 2'-6" CONCRETE CURB & GUTTER
R2	PROP. 2'-9" CONCRETE CURB & GUTTER
R3	PROP. 5" MONOLITHIC CONCRETE ISLAND (KEYED-IN) (SEE PLANS FOR LOCATION)
S	4" CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL ON THIS PAGE.)

NOTE: ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE
NOTE: USE I19.0C INTERMEDIATE COURSE FOR 2' X 4" BENCH MILL

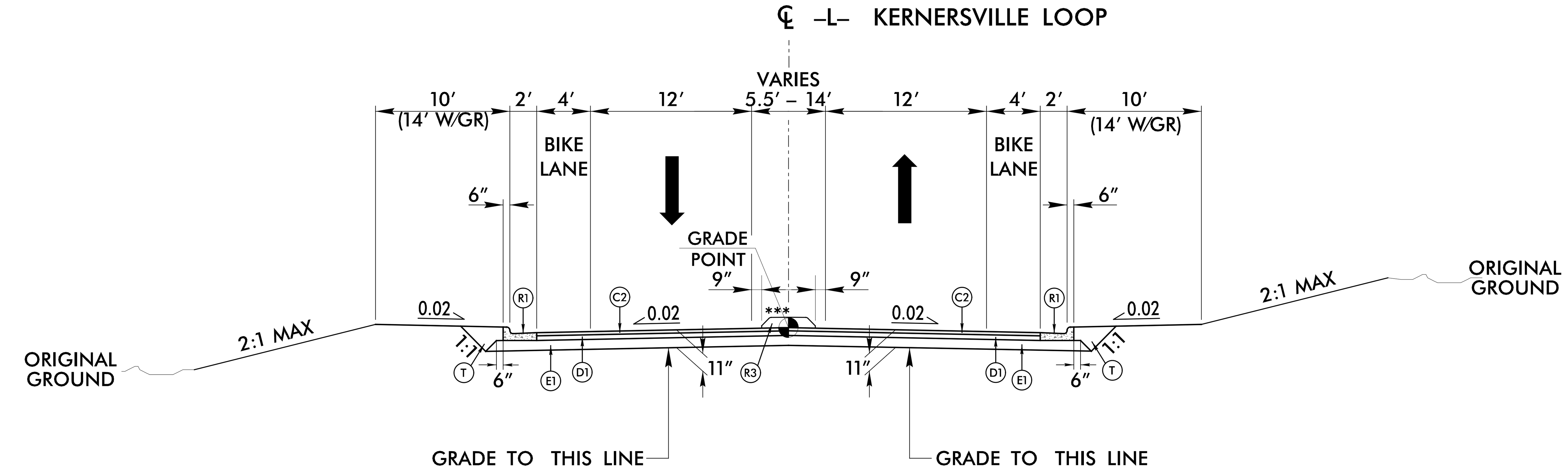


(W) Detail Showing Method of Wedging
FOR -Y15- & -Y16-



TYPICAL SECTION NO. 1

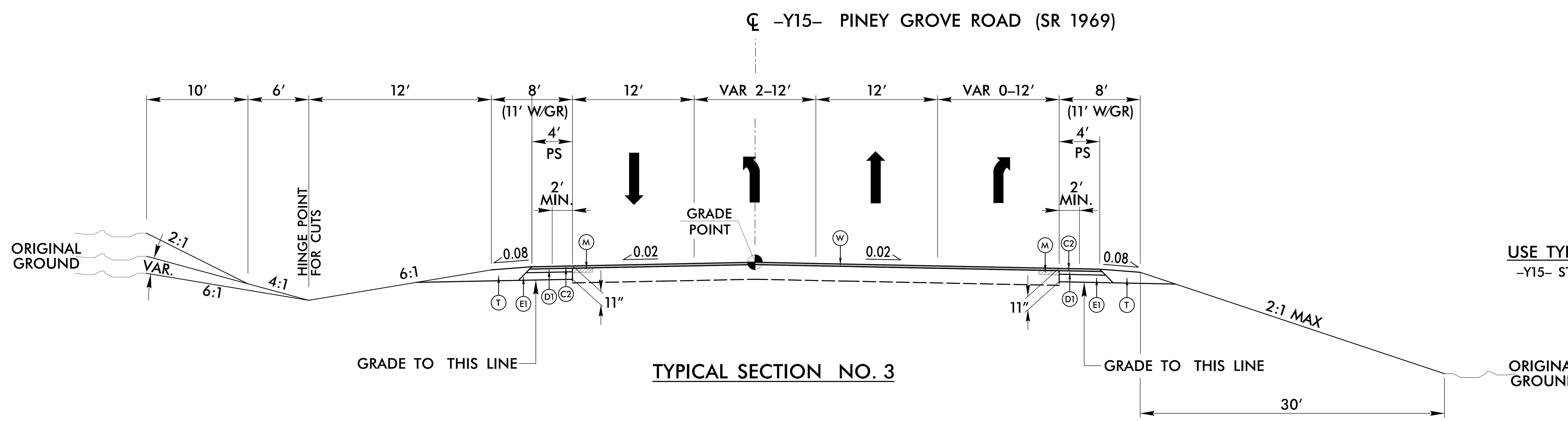
USE TYPICAL SECTION NO. 1 FOR:
-L- STA 11+69.67 TO STA 12+24.00
-L- STA 14+95.35 TO STA 25+10.00
-L- STA 32+71.46 TO STA 42+28.54
-L- STA 49+50.00 TO STA 61+27.97



TYPICAL SECTION NO. 2

*** ALL CONC. ISLANDS TO BE KEYED-IN

USE TYPICAL SECTION NO. 2 FOR:
-L- STA 12+24.00 TO STA 14+95.35
-L- STA 25+10.00 TO STA 32+71.46
-L- STA 42+28.54 TO STA 49+50.00
-L- STA 61+27.97 TO STA 62+49.70



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3 FOR:
-Y15- STA 12+10.00 TO STA 17+39.61

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

PROJECT REFERENCE NO.	SHEET NO.
U-6003	2A-2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

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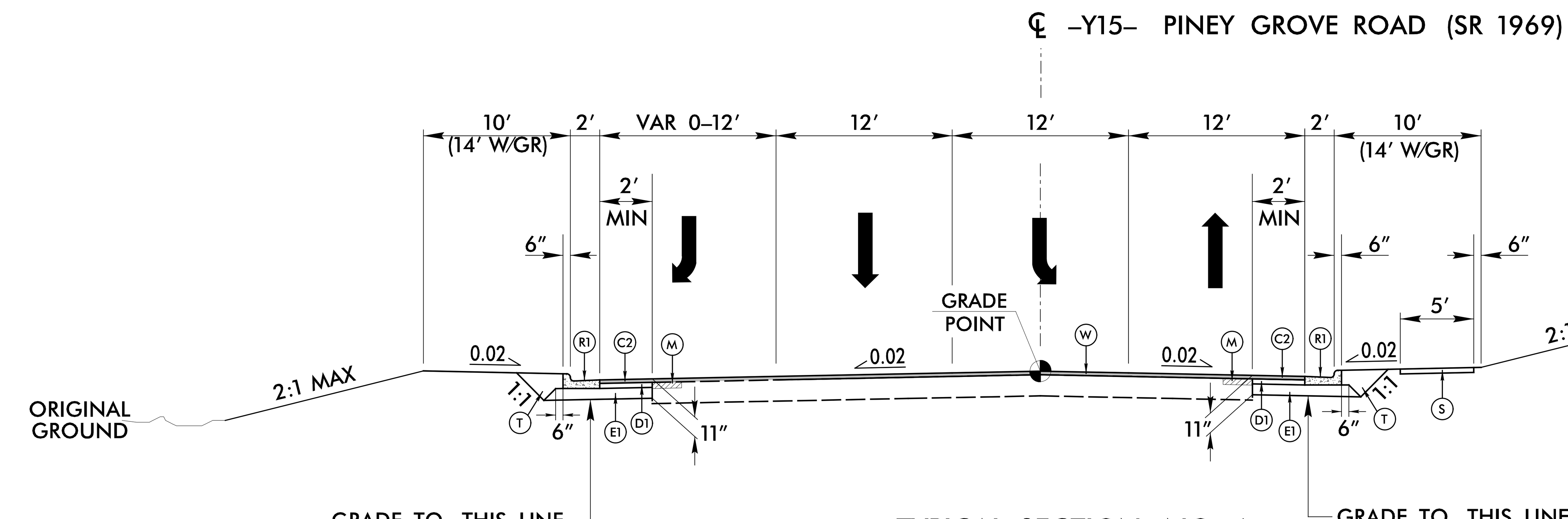
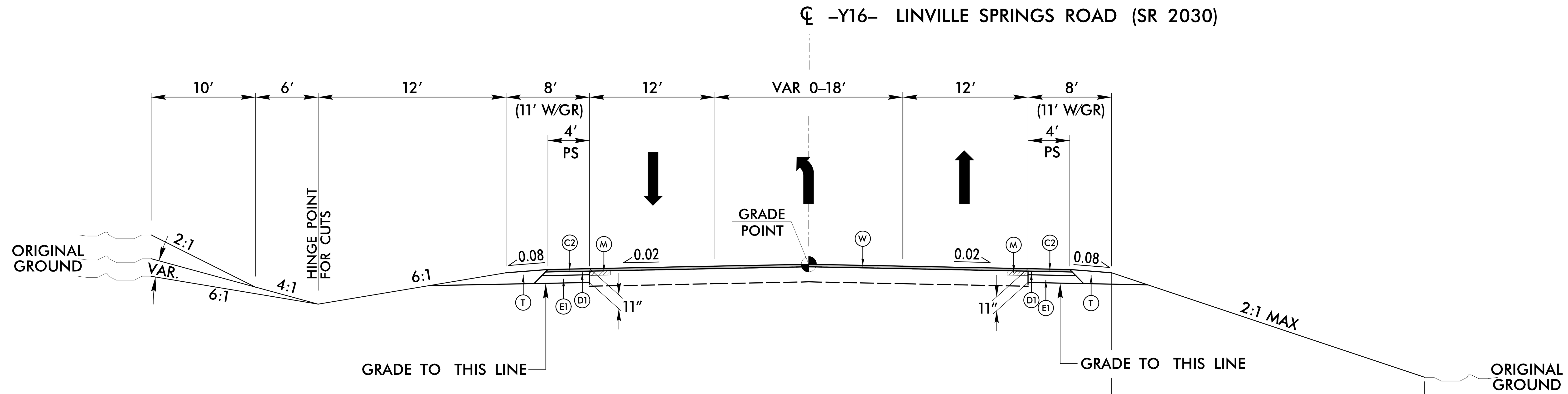


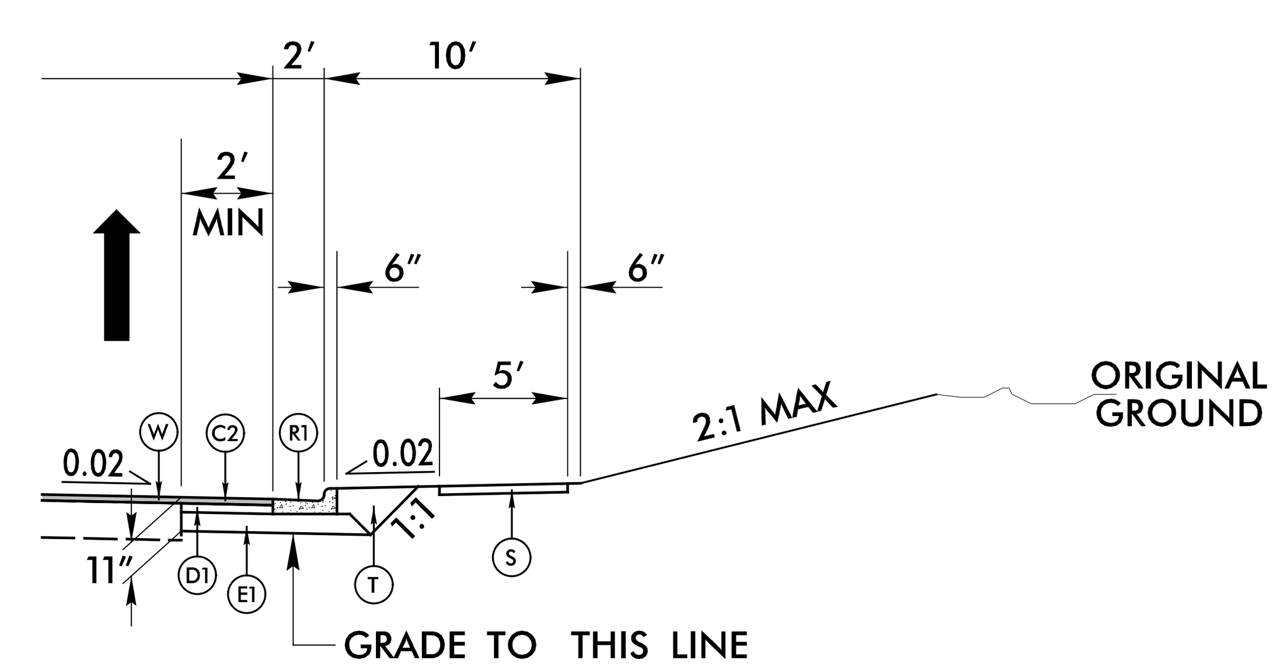
TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4 FOR:
-Y15- STA 17+39.61 TO STA 21+50.00

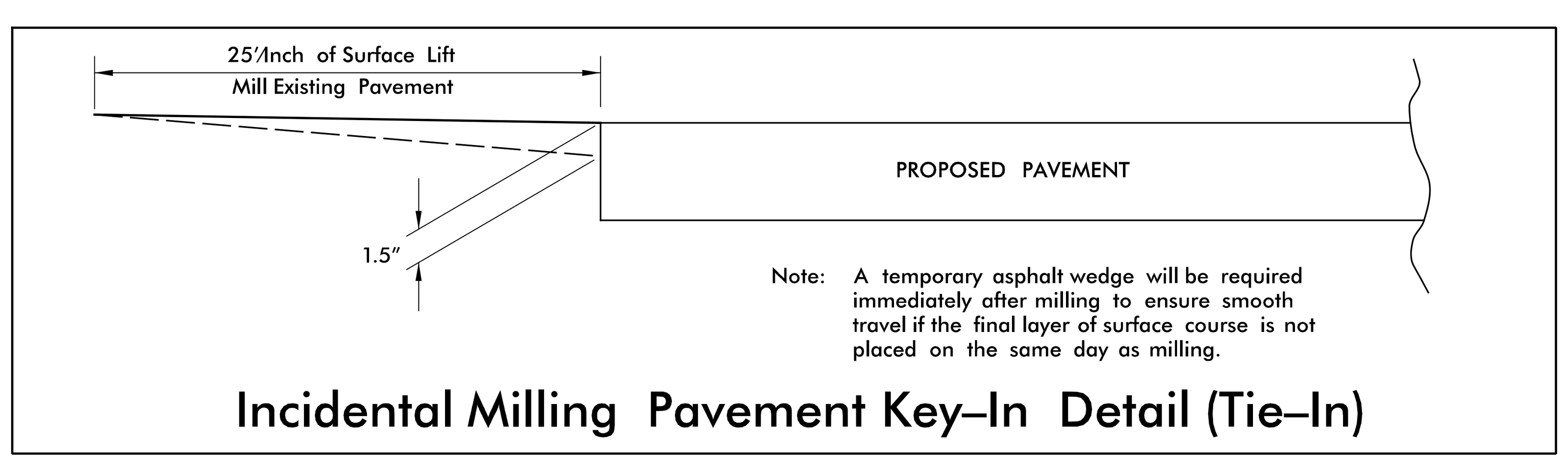


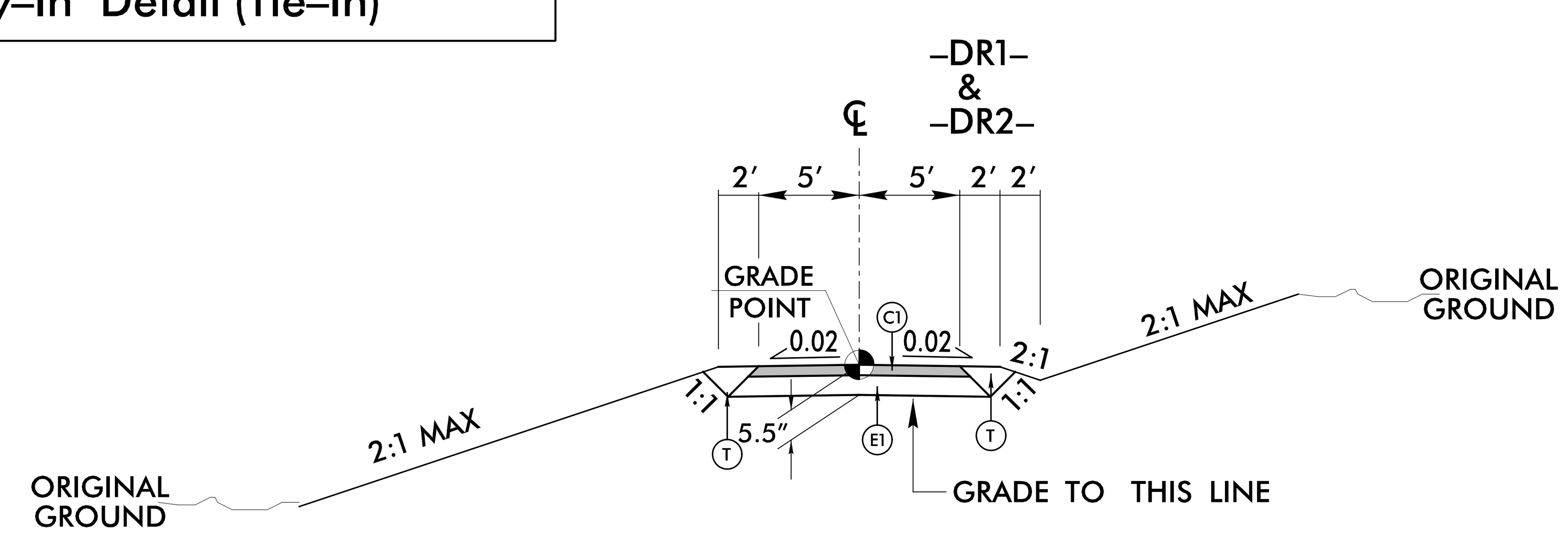
TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5 FOR:
-Y16- STA 11+40.00 TO STA 16+77.00



PARTIAL TYPICAL SECTION NO. 5A
USE PARTIAL TYPICAL SECTION NO. 4A
IN CONJUNCTION WITH TYPICAL
SECTION NO. 4 AS FOLLOWS:
-Y16- STA 15+08.64 TO -Y16- STA 16+77.00 RT





TYPICAL SECTION NO. 6

USE TYPICAL SECTION NO. 6 FOR:
-DR1- STA 10+60.00 TO STA 11+27.63
-DR2- STA 10+20.00 TO STA 11+37.76

C1	1.5" S9.5B
C2	3" S9.5B
C3	VAR S9.5B
D1	4" I19.0C
D2	VAR I19.0C
E1	4" B25.0C
E2	VAR B25.0C
M	2'x4" BENCH MILL
R1	2'-6" C&G
R2	2'-9" C&G
R3	5" MONO. CONC. ISLAND
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	VAR WEDGING

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

PROJECT REFERENCE NO.	SHEET NO.
U-6003	2B-1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	

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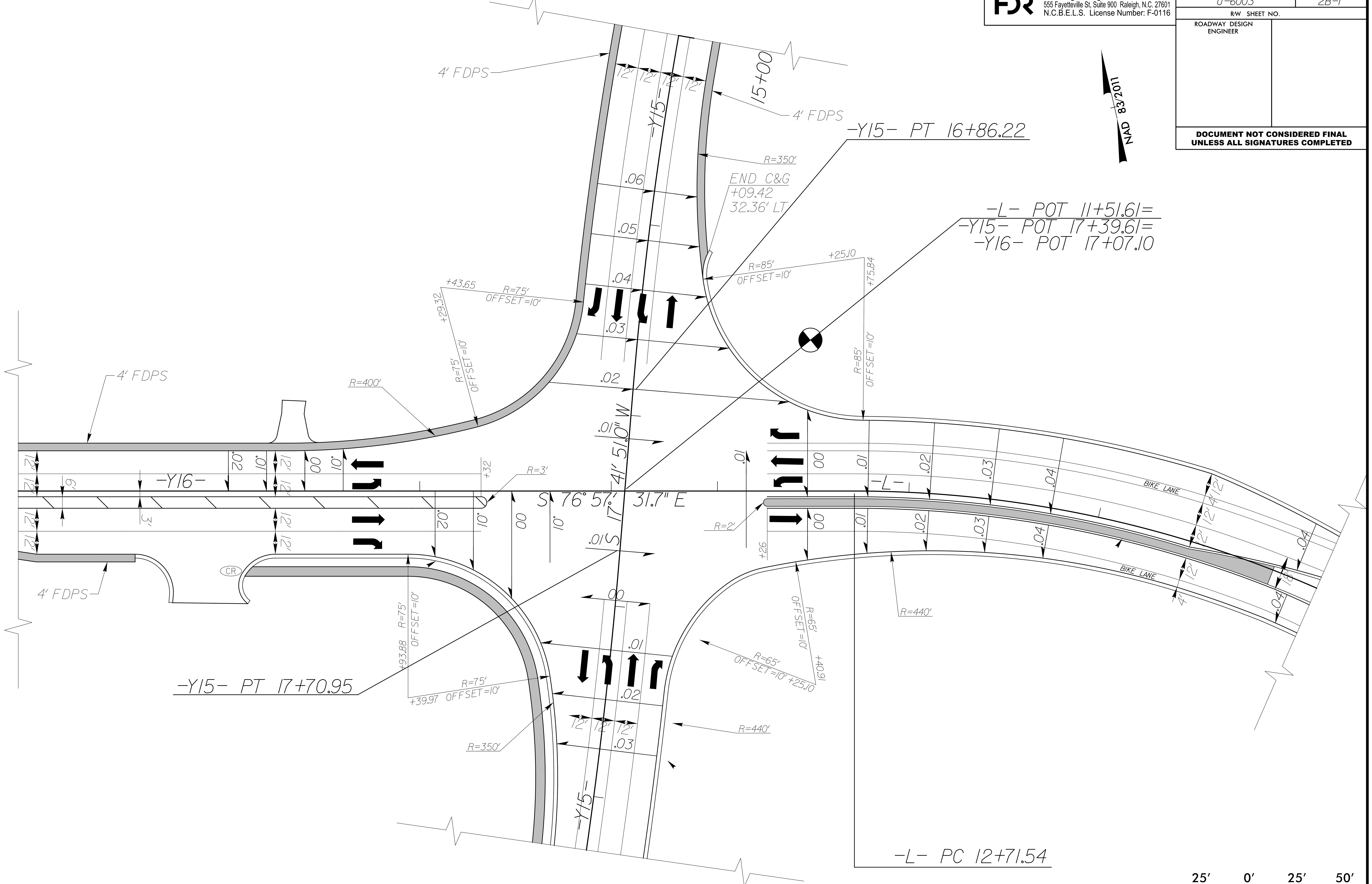


25' 0' 25' 50'

GRAPHIC SCALE

★ PROPOSED SIGNAL

DETAIL OF INTERSECTION -L-, -Y15-, & -Y16-

FOR FULL VIEW OF THIS AREA, SEE PLAN SHEET 4

COMPUTED BY: *ADS* DATE: *4/19/2018*

CHECKED BY: *DCS* DATE: *4/20/2018*

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
U-6003	*3B-1*

NC10481

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL

GUARDRAIL SUMMARY

G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL WIDTH	FLARE LENGTH		W		ANCHORS							IMPACT ATTENUATOR TYPE 350		SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE & STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	XI	GREU TL-3	M-350	AT-1	CAT-1	VI MOD	TES	TYPE III	G	NG				
L	21+47.75	28+16.50	RT	668.75			22+22.75	28+16.50	14	16	50		1				1			1									
L	28+60.25	30+72.75	RT	212.50			28+60.25	30+72.75	14	16	50		1				1			1									
L	26+52.75	29+84.00	LT	331.25			29+84.00	26+52.75	14	16	50		1				1			1									
L	30+20.25	32+51.50	LT	231.25			31+76.50	30+20.25	14	16	50		1				1			1									
L	42+75.00	46+12.50	RT	337.50			43+50.00	46+12.50	14	16	50		1				1			1									
L	43+64.25	46+01.75	LT	237.50			45+26.75	43+64.25	14	16	50		1				1			1									
TOTALS				2018.75													6			6									
DEDUCTIONS FOR ANCHOR UNITS																													
	GREU TL-3	6	50	-300																									
	CAT-1	6	6.25	-37.5																									
	TYPE III	0	22.875	0																									
	AT-1	0	6.25	0																									
GRAND TOTAL				1681.25													6			6									
		SAY		**1700.00**																									

5 EACH ADDITIONAL GUARDRAIL POSTS

PROJ. REFERENCE NO.	SHEET NO.
U-6003	3P-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

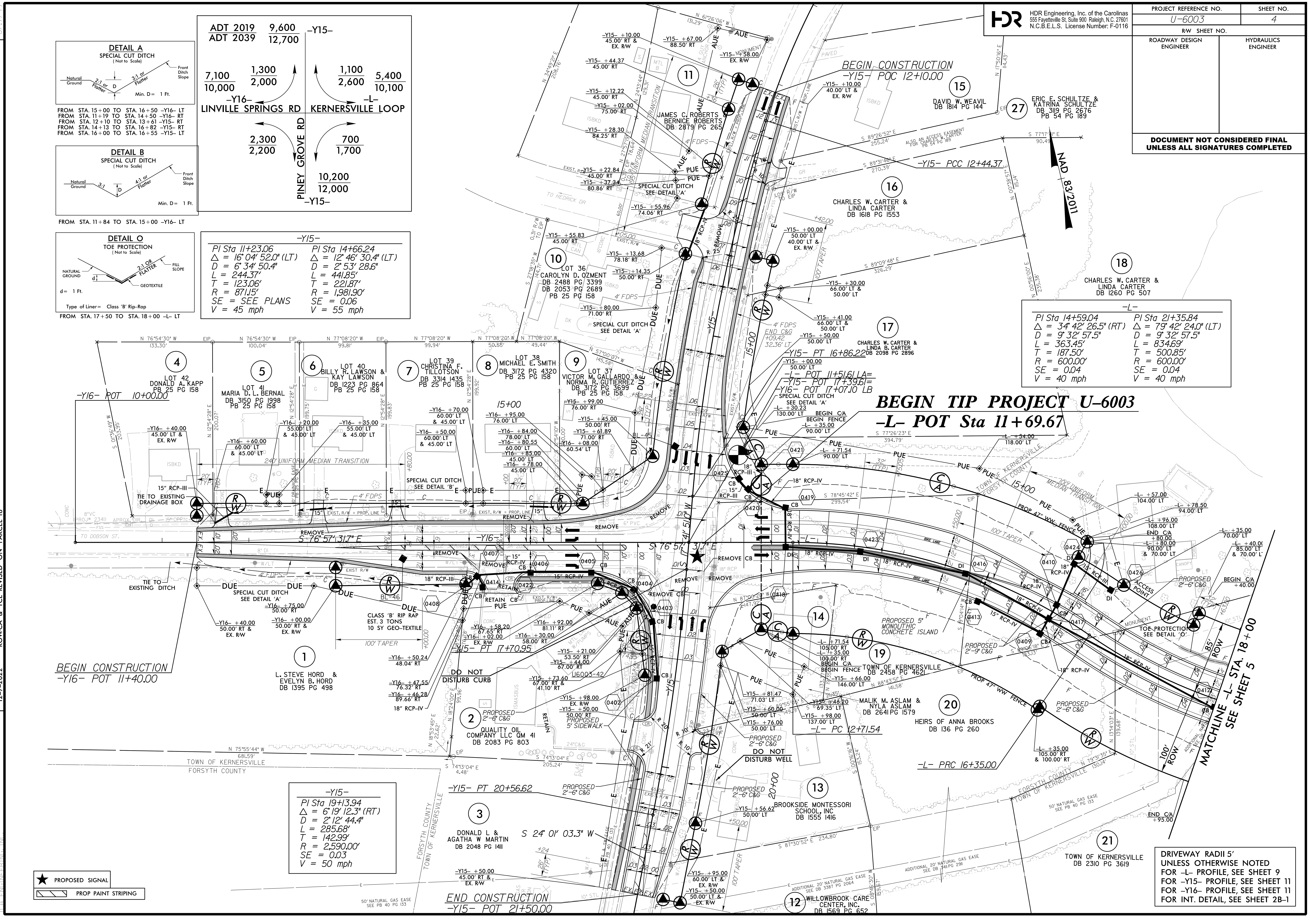
PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4	L. STEVE HORD & EVELYN B. HORD
2	4	QUALITY OIL COMPANY LLC
3	4	DONALD L & AGATHA W MARTIN
4	4	DONALD A. KAPP
5	4	MARIA D. L. BERNAL
6	4	BILLY R. LAWSON & KAY LAWSON
7	4	CHRISTINA F. TILLOTSON
8	4	MICHAEL E. SMITH
9	4	VICTOR M. GALLARDO & NORMA R. GUTIERREZ
10	4	CAROLYN D. OZMENT
11	4	JAMES C. ROBERTS & BERNICE ROBERTS
12	4	WILLOWBROOK CARE CENTER, INC.
13	4	BROOKSIDE MONTESSORI SCHOOL, INC
14	4	MALIK M. ASLAM & NYLA ASLAM
15	4	DAVID W. WEAVIL
16	4	CHARLES W. CARTER & LINDA CARTER
17	4	CHARLES W. CARTER & LINDA CARTER
18	4, 5	CHARLES W. CARTER & LINDA CARTER
19	4	TOWN OF KERNERSVILLE
20	4	HEIRS OF ANNA BROOKS
21	4, 5, 6	TOWN OF KERNERSVILLE
22	5	JULIAN POND HOMEOWNERS ASSOCIATION, INC.
23	6, 7	NANCY EDWARDS
24	7	PAULA J. TURNER
25	7, 8	SIMON S. EDWARDS
26	8	WILLIAM C. EDWARDS, JR.
27	4	ERIC E. SCHULTZE & KATRINA SCHULTZE

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

REVISIONS

3-26-2019 PUE ADDED ON PARCELS 2, 11, AND 28
12-02-2021 PUE REMOVED AND TCE REVISED ON PARCEL 2
1-20-2022 ROW REVISED ON PARCELS 14, 18, 19, & 20; C/A REVISED ON PARCELS 17, 18, & 21; PUE REVISED ON PARCEL 18; TCE ADDED ON PARCEL 18
7-12-2022 AUE REVISED ON PARCELS 2 & 11; PUE REVISED ON PARCEL 11; PUE ADDED ON PARCEL 2; DUE REVISED ON PARCEL 10; PARCEL 28 IMPACTS REMOVED
12-7-2022 ROW/CA & TCE REVISED ON PARCEL 18



HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116
PROJECT REFERENCE NO. U-6003
SHEET NO. 4
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
DETAIL A
SPECIAL CUT DITCH (Not to Scale)
FROM STA. 15+00 TO STA. 16+50 -Y16- LT
FROM STA. 11+19 TO STA. 14+50 -Y16- RT
FROM STA. 12+10 TO STA. 13+61 -Y15- RT
FROM STA. 14+13 TO STA. 16+82 -Y15- RT
FROM STA. 16+00 TO STA. 16+55 -Y15- LT
DETAIL B
SPECIAL CUT DITCH (Not to Scale)
FROM STA. 11+84 TO STA. 15+00 -Y16- LT
DETAIL O
TOE PROTECTION (Not to Scale)
Type of Liner= Class 'B' Rip-Rap
FROM STA. 17+50 TO STA. 18+00 -L- LT
ADT 2019 9,600
ADT 2039 12,700
-Y15-
-Y16- LINVILLE SPRINGS RD
-L- KERNERSVILLE LOOP
PINEY GROVE RD
-Y15-
PI Sta 11+23.06
Δ = 16° 04' 52.0" (LT)
D = 6° 34' 50.4"
L = 244.37'
T = 123.06'
R = 871.15'
SE = SEE PLANS
V = 45 mph
PI Sta 14+66.24
Δ = 12° 46' 30.4" (LT)
D = 2° 53' 28.6"
L = 441.85'
T = 221.87'
R = 1,981.90'
SE = 0.06
V = 55 mph
-L-
PI Sta 14+59.04
Δ = 34° 42' 26.5" (RT)
D = 9° 32' 57.5"
L = 363.45'
T = 187.50'
R = 600.00'
SE = 0.04
V = 40 mph
PI Sta 21+35.84
Δ = 79° 42' 24.0" (LT)
D = 9° 32' 57.5"
L = 834.69'
T = 500.85'
R = 600.00'
SE = 0.04
V = 40 mph
-Y15-
PI Sta 19+13.94
Δ = 6° 19' 12.3" (RT)
D = 2° 12' 44.4"
L = 285.68'
T = 142.99'
R = 2,590.00'
SE = 0.03
V = 50 mph
BEGIN CONSTRUCTION -Y15- POC 12+10.00
-Y15- PCC 12+44.37
BEGIN TIP PROJECT U-6003
-L- POT Sta 11+69.67
-Y15- PT 16+86.22
-L- POT 11+51.61 LA=
-Y15- POT 17+39.61=
-Y16- POT 17+07.10 LB
-Y16- POT 10+00.00
BEGIN CONSTRUCTION -Y16- POT 11+40.00
-Y15- PT 17+70.95
-L- PC 12+71.54
-L- PRC 16+35.00
-Y15- PT 20+56.62
END CONSTRUCTION -Y15- POT 21+50.00
MATCHLINE -L- STA. 18+00 SEE SHEET 5
NAD 83/2011
1 L. STEVE HORD & EVELYN B. HORD DB 1395 PG 498
2 QUALITY OIL COMPANY LLC QM 41 DB 2083 PG 803
3 DONALD L & AGATHA W MARTIN DB 2048 PG 1411
4 LOT 42 DONALD A. KAPP PB 25 PG 158
5 LOT 41 MARIA D. L. BERNAL DB 3150 PG 1998 PB 25 PG 158
6 LOT 40 BILLY R. LAWSON & KAY LAWSON DB 1223 PG 864 PB 25 PG 158
7 LOT 39 CHRISTINA F. TILLOTSON DB 3314 1435 PB 25 PG 158
8 LOT 38 MICHAEL E. SMITH DB 3172 PG 4320 PB 25 PG 158
9 LOT 37 VICTOR M. GALLARDO & NORMA R. GUTIERREZ DB 3172 PG 3699 PB 25 PG 158
10 LOT 36 CAROLYN D. OZMENT DB 2488 PG 3399 DB 2053 PG 2689 PB 25 PG 158
11 JAMES C. ROBERTS BERNICE ROBERTS DB 2879 PG 265
12 WILLOWBROOK CARE CENTER, INC. DB 1569 PG 652
13 BROOKSIDE MONTESSORI SCHOOL, INC DB 1555 1416
14
15 DAVID W. WEAVIL DB 1814 PG 144
16 CHARLES W. CARTER & LINDA CARTER DB 1618 PG 1553
17 CHARLES W. CARTER & LINDA B. CARTER DB 2098 PG 2896
18 CHARLES W. CARTER & LINDA CARTER DB 1260 PG 507
19 TOWN OF KERNERSVILLE DB 2458 PG 4621
MALIK M. ASLAM & NYLA ASLAM DB 2641 PG 1579
20 HEIRS OF ANNA BROOKS DB 136 PG 260
21 TOWN OF KERNERSVILLE DB 2310 PG 3619
27 ERIC E. SCHULTZE & KATRINA SCHULTZE DB 3119 PG 2676 PB 54 PG 189
TOWN OF KERNERSVILLE
FORSYTH COUNTY
PROPOSED SIGNAL
PROP PAINT STRIPING
DRIVEWAY RADII 5' UNLESS OTHERWISE NOTED
FOR -L- PROFILE, SEE SHEET 9
FOR -Y15- PROFILE, SEE SHEET 11
FOR -Y16- PROFILE, SEE SHEET 11
FOR INT. DETAIL, SEE SHEET 2B-1

PROJECT REFERENCE NO.	SHEET NO.
U-6003	5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

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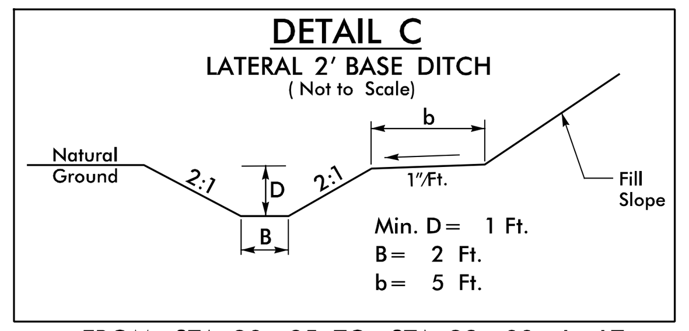
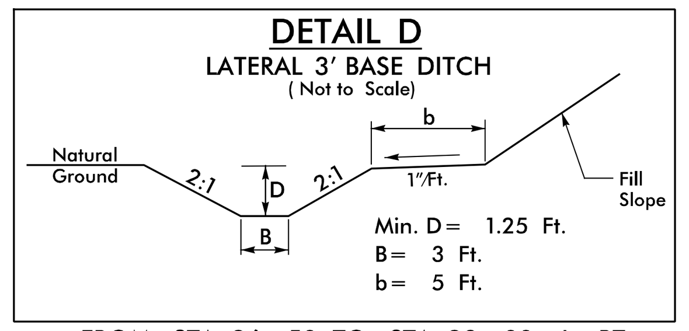
REVISIONS

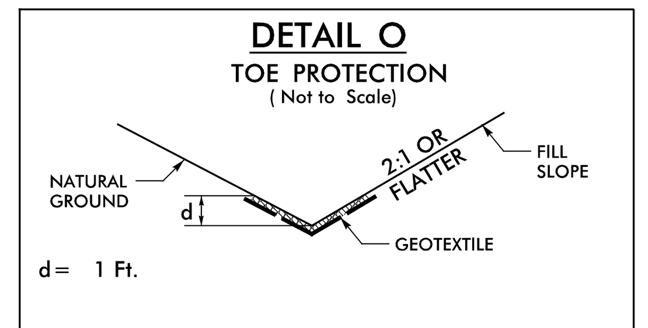
Date	Revision
1-20-2022	C/A REVISED AND TCE ADDED ON PARCEL 21
7-12-2022	PUE AND TCE REVISED ON PARCEL 21
12-7-2022	CA & TCE REVISED ON PARCEL 21



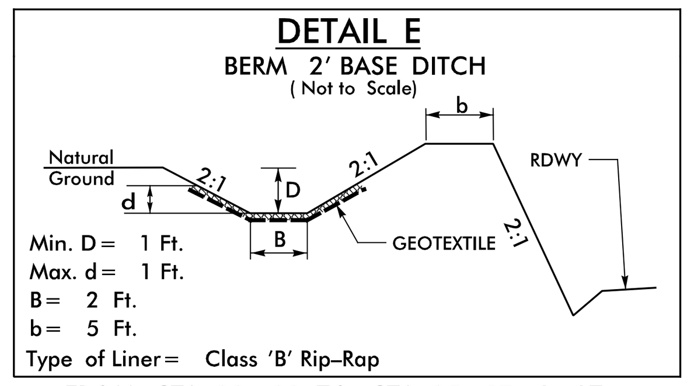
FROM STA. 20+95 TO STA. 23+00 -L- LT



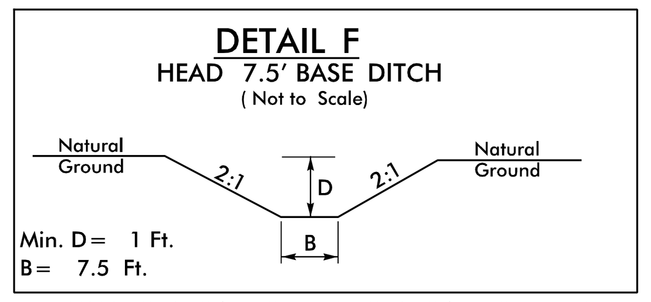
FROM STA. 26+50 TO STA. 28+00 -L- RT



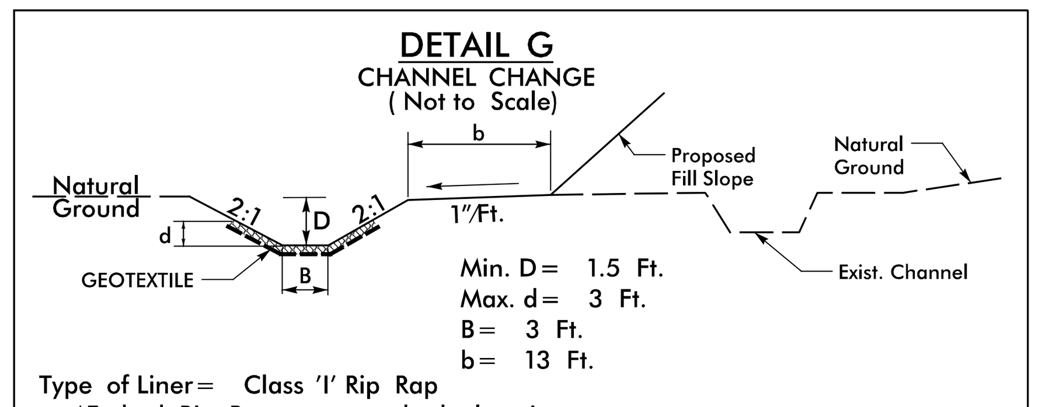
FROM STA. 18+00 TO STA. 21+00 -L- LT
FROM STA. 27+09 TO STA. 29+00 -L- LT



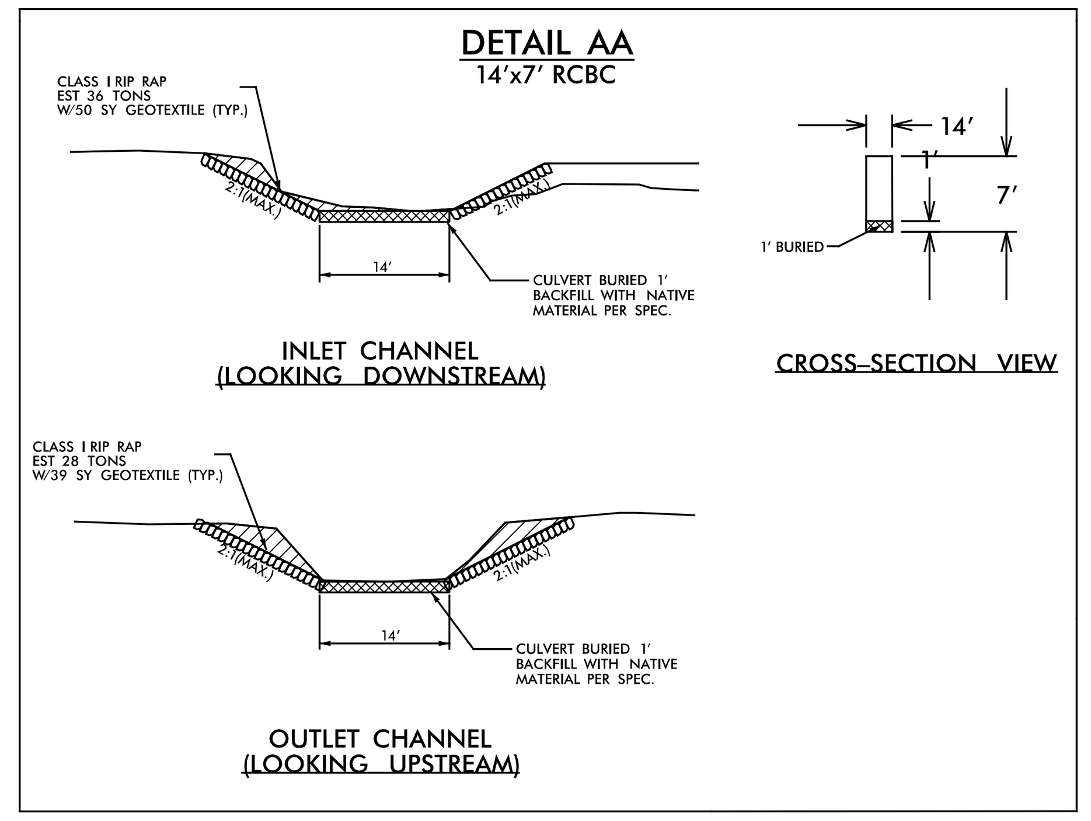
FROM STA. 23+00 TO STA. 25+17 -L- LT



FROM STA. 26+10 TO STA. 26+50 -L- RT



FROM STA. 30+66 TO STA. 30+77 -L- RT



-L-

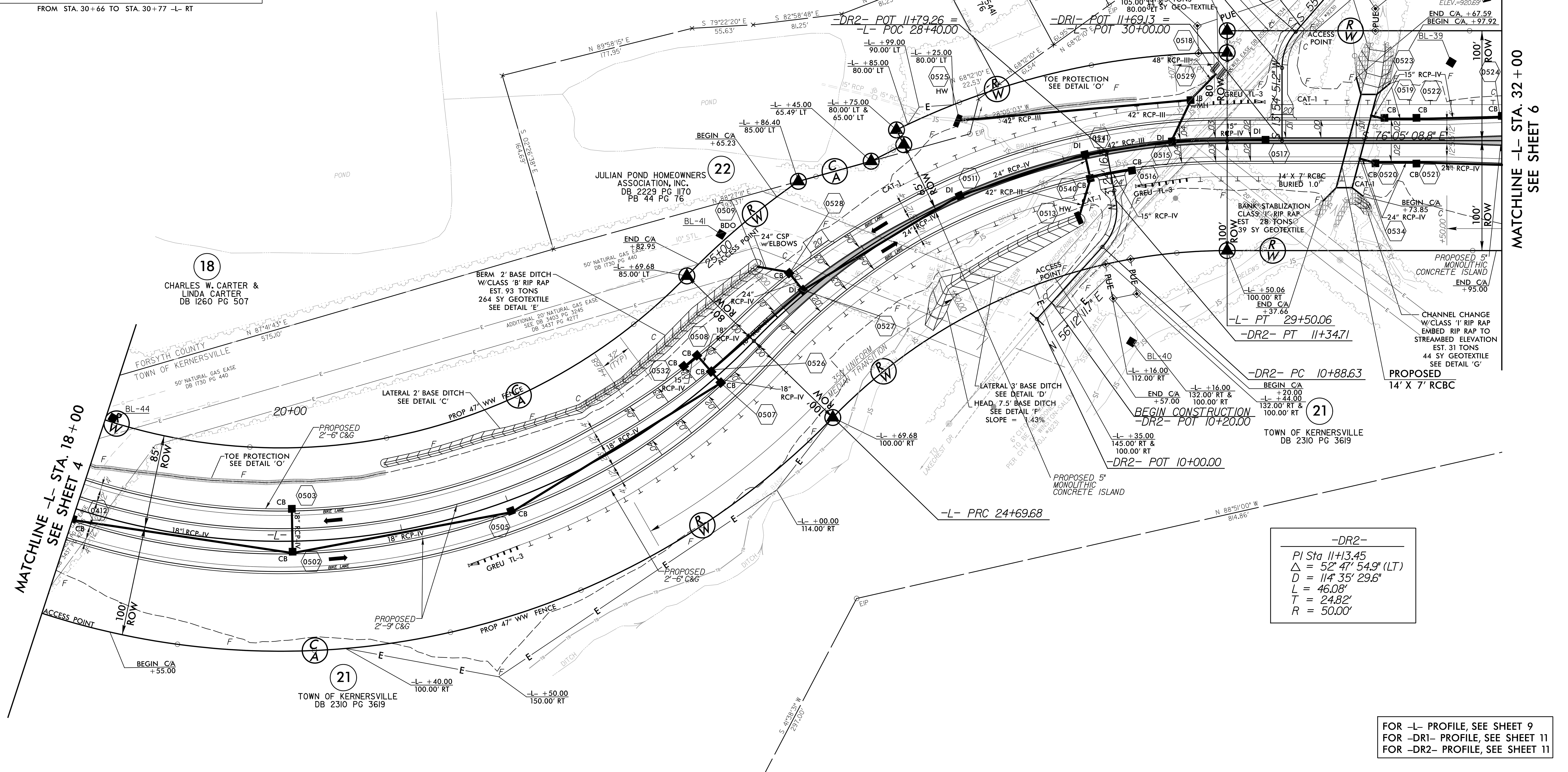
PI Sta 21+35.84	PI Sta 27+23.58
Δ = 79° 42' 24.0" (LT)	Δ = 45° 52' 20.5" (RT)
D = 9° 32' 57.5"	D = 9° 32' 57.5"
L = 834.69'	L = 480.37'
T = 500.85'	T = 253.90'
R = 600.00'	R = 600.00'
SE = 0.04	SE = 0.04
V = 40 mph	V = 40 mph

-DRI-

PI Sta 10+85.79
Δ = 41° 12' 33.1" (LT)
D = 114° 35' 29.6"
L = 35.96'
T = 18.80'
R = 50.00'

-DR2-

PI Sta 11+13.45
Δ = 52° 47' 54.9" (LT)
D = 114° 35' 29.6"
L = 46.08'
T = 24.82'
R = 50.00'



FOR -L- PROFILE, SEE SHEET 9
FOR -DRI- PROFILE, SEE SHEET 11
FOR -DR2- PROFILE, SEE SHEET 11

8/17/99

REVISIONS

9-14-2020	PARCEL OWNER 23 NAME CHANGED
1-20-2022	C/A REVISED ON PARCEL 21
12-7-2022	CA REVISED ON PARCEL 21

HDR Engineering, Inc. of the Carolinas
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PROJECT REFERENCE NO.	SHEET NO.
U-6003	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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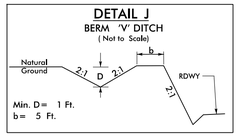
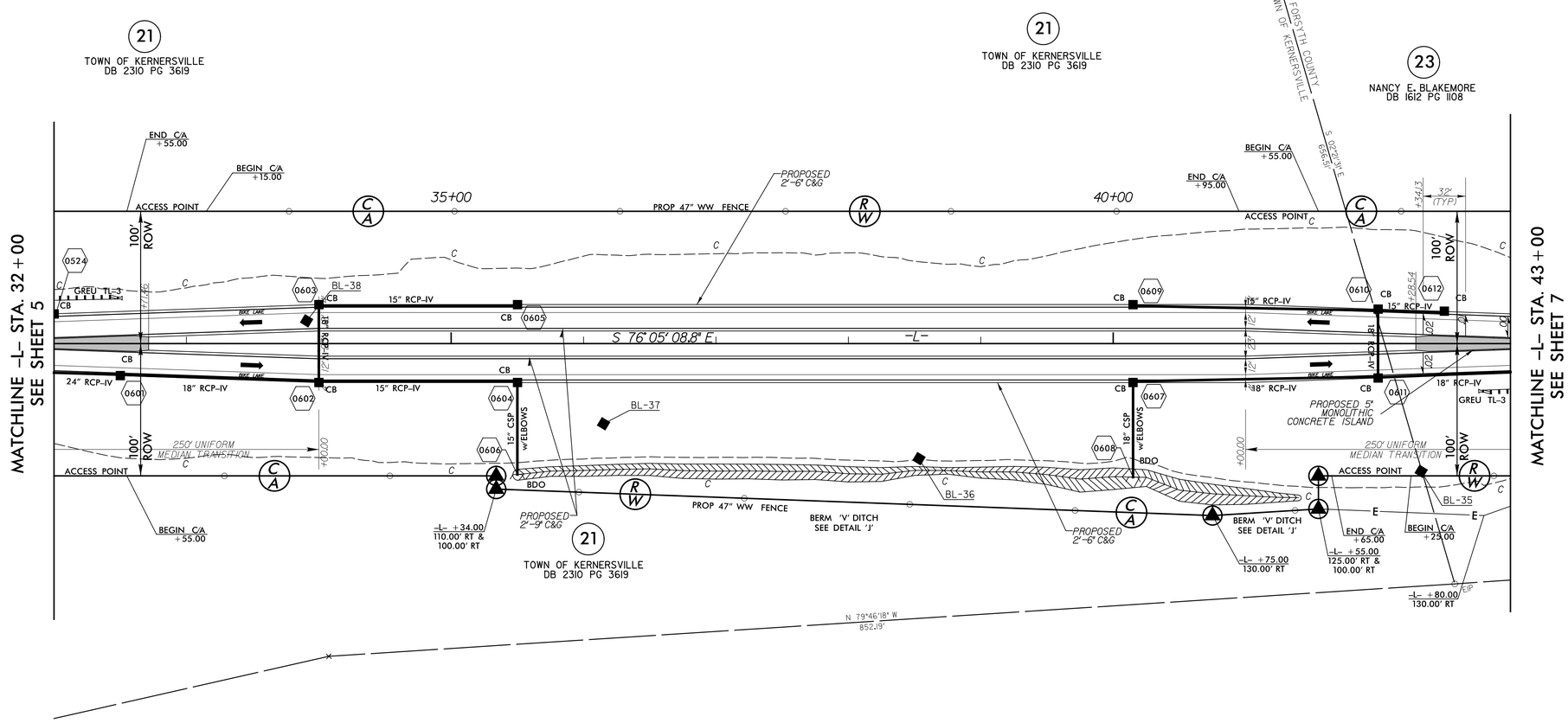
DETAIL J
BERM 'V' DITCH
(Not to Scale)



FROM STA. 35+50 TO STA. 41+40 –L– RT

NAD 83/2011



FOR –L– PROFILE, SEE SHEETS 9 & 10

12/15/2022
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PROJECT REFERENCE NO.	SHEET NO.
U-6003	7
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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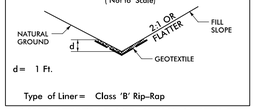
8/17/99

REVISIONS

3-24-2020	TCE ADDED ON PARCEL 25
9-14-2020	PARCEL OWNER 23 NAME CHANGED
12-7-2022	CA REVISED ON PARCEL 23
1-17-2023	PDE REVISED ON PARCEL 23

DETAIL O
TOE PROTECTION
(Not to Scale)

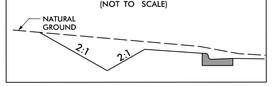


d = 1 Ft.

Type of Liner = Class 'B' Rip-Rap

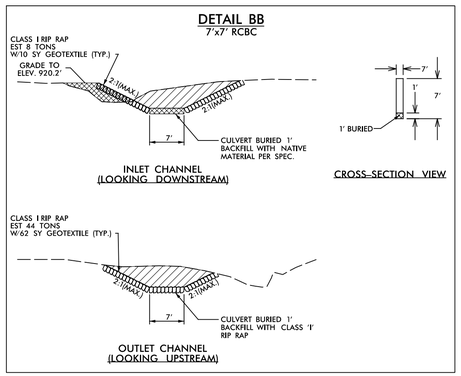
FROM STA. 44+25 TO STA. 45+50 –L– LT

DETAIL P
SPECIAL BACK OF CURB CUT DITCH
(NOT TO SCALE)



FROM STA. 46+15 TO STA. 49+25 –L– LT

DETAIL BB
7'x7' RCBC



–L–
PI Sta 45+96.73
△ = 39° 08' 05.1" (RT)
D = 9° 32' 57.5"
L = 409.82'
T = 213.27'
R = 600.00'
SE = 0.04
V = 40 mph

NAD 83/2011

N 20°49'14" W
783.77'

N 20°49'07" W
464.42'

N 81°23'56" W
714.38'

N 64°39'10" W
1536.51'

PAULA J. TURNER
DB 894 PG 434

24

23
NANCY F. BLAKEMORE
DB 1612 PG 1108

23
NANCY F. BLAKEMORE
DB 1612 PG 1108

–L– PC 53+94.77

50+00

55+00

45+00

PROPOSED
7' X 7' RCBC

TOE PROTECTION
SEE DETAIL 'O'

SPECIAL CUT DITCH
SEE DETAIL 'P'

PROPOSED
2'–6" C&G

PROP 47" WW FENCE

–L– +93.28
100.00' LT

–L– +94.77
100.00' LT

–L– +99.00
150.00' LT &
100.00' LT

BL–32

BL–31

BEGIN C/A
+30.55
–L– +20.00
109.00' LT
–L– +98.00
120.00' LT

–L– +30.00
100.00' LT

OUTLET CHANNEL
PROTECTION
CLASS 'I' RIP RAP
EST 56 TONS
80 SY GEOTEXTILE
–L– +91.00
100.00' LT
–L– +83.46
100.00' LT
END C/A
+05.74

TOE PROTECTION
SEE DETAIL 'O'

PROPOSED
7' X 7' RCBC
BURIED 1.0'

100' ROW

MATCHLINE –L– STA. 43+00
SEE SHEET 6

BL–33
BEGIN C/A +98.18
END C/A +63.65

BANK STABLIZATION
CLASS 'I' RIP RAP
EST 23 TONS
33 SY GEOTEXTILE

TOE PROTECTION
SEE DETAIL 'O'

BL–34
–L– +83.46
100.00' RT

–L– +65.00
100.00' RT

–L– PC 43+83.46

S 76°05'08.8" E
CLARENCE L. RIERSON
DB 3330 PG0037

S 11°41'55" E
67.00'

S 05°20'35" E
395.41'

PROPOSED 5'
MONOLITHIC
CONCRETE ISLAND

BM 1
ELEV.=925.97'

–L– PT 47+93.28

–L– +93.28
100.00' RT

–L– +00.00
100.00' RT
110.00' RT

PROPOSED
2'–9" C&G

250' UNIFORM
MEDIAN TRANSITION

PROPOSED
2'–6" C&G

–L– +94.77
100.00' RT
–L– +94.77
110.00' RT

–L– +55.00
100.00' RT
110.00' RT

25
SIMON S. EDWARDS
DB 2418 PG 2778

WILLIAM C. EDWARDS, JR.
DB 2078 PG 0625

MATCHLINE –L– STA. 55+00
SEE SHEET 8

FOR –L– PROFILE, SEE SHEET 10

1/17/2023
C:\PWorking\Nash\d0498613\U6003_rdy_PSH07.dgn
dlee

PROJECT REFERENCE NO.	SHEET NO.
U-6003	8

RW SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

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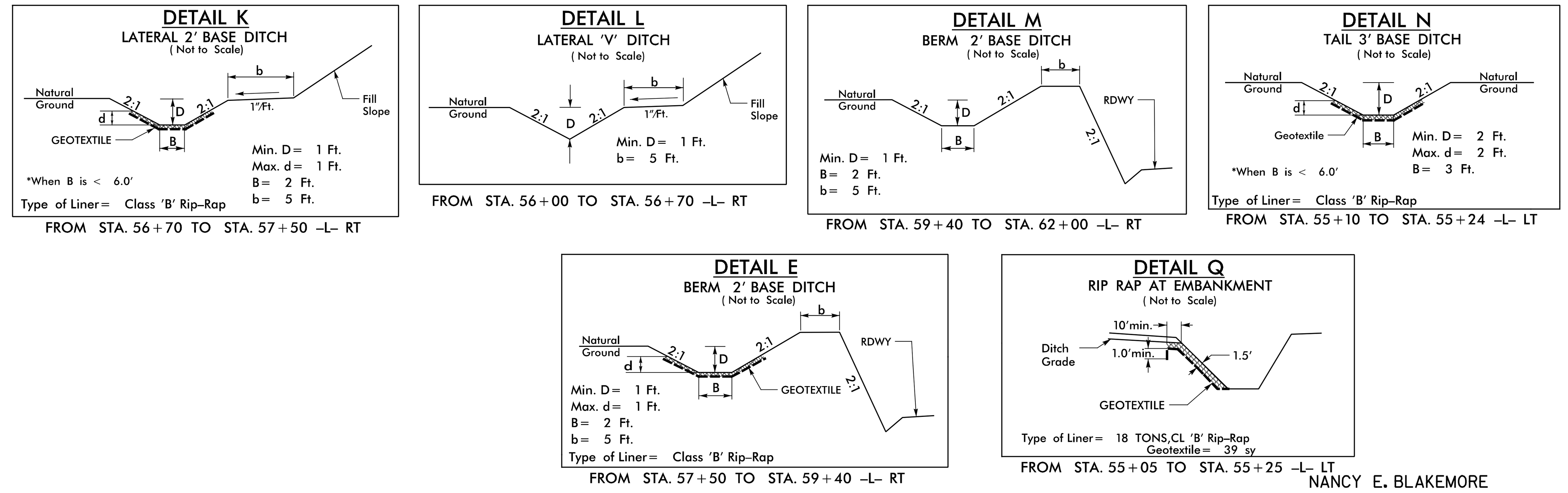
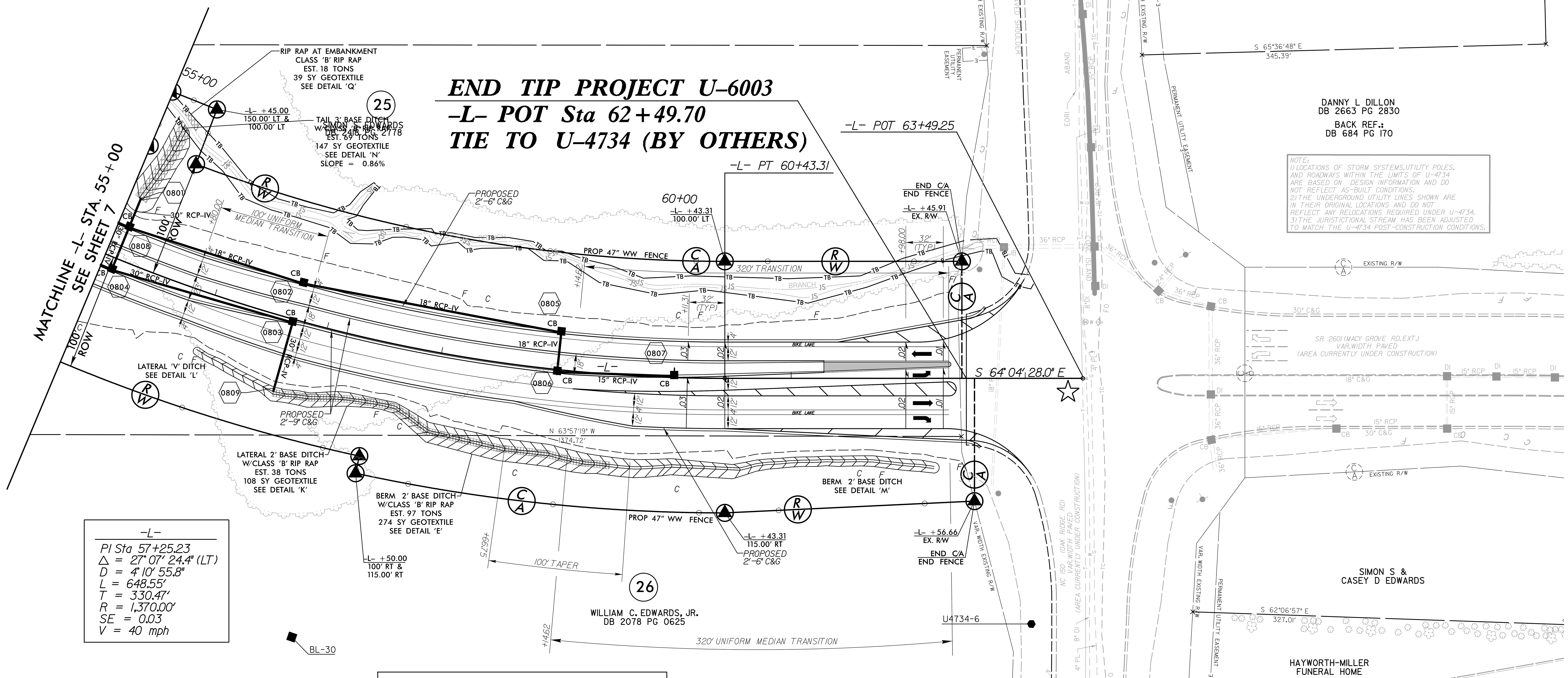
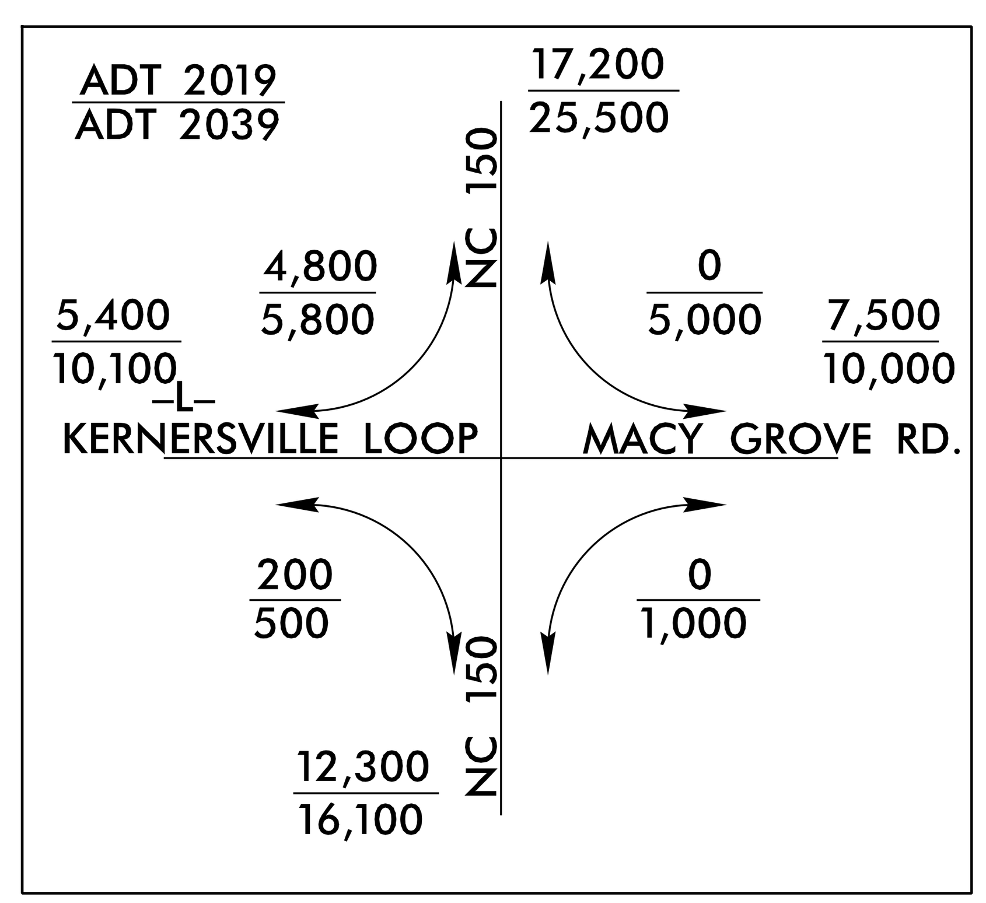

DETAIL K
LATERAL 2' BASE DITCH
(Not to Scale)
Min. D = 1 Ft.
Max. d = 1 Ft.
B = 2 Ft.
b = 5 Ft.
*When B is < 6.0'
Type of Liner = Class 'B' Rip-Rap
FROM STA. 56+70 TO STA. 57+50 -L- RT
DETAIL L
LATERAL 'V' DITCH
(Not to Scale)
Min. D = 1 Ft.
b = 5 Ft.
FROM STA. 56+00 TO STA. 56+70 -L- RT
DETAIL M
BERM 2' BASE DITCH
(Not to Scale)
Min. D = 1 Ft.
B = 2 Ft.
b = 5 Ft.
FROM STA. 59+40 TO STA. 62+00 -L- RT
DETAIL N
TAIL 3' BASE DITCH
(Not to Scale)
Min. D = 2 Ft.
Max. d = 2 Ft.
B = 3 Ft.
*When B is < 6.0'
Type of Liner = Class 'B' Rip-Rap
FROM STA. 55+10 TO STA. 55+24 -L- LT
DETAIL E
BERM 2' BASE DITCH
(Not to Scale)
Min. D = 1 Ft.
Max. d = 1 Ft.
B = 2 Ft.
b = 5 Ft.
Type of Liner = Class 'B' Rip-Rap
FROM STA. 57+50 TO STA. 59+40 -L- RT
DETAIL Q
RIP RAP AT EMBANKMENT
(Not to Scale)
Type of Liner = 18 TONS,CL 'B' Rip-Rap
Geotextile = 39 sy
FROM STA. 55+05 TO STA. 55+25 -L- LT


END TIP PROJECT U-6003
-L- POT Sta 62+49.70
TIE TO U-4734 (BY OTHERS)
MATCHLINE -L- STA. 55+00
SEE SHEET 7
NANCY E. BLAKEMORE
RIP RAP AT EMBANKMENT
CLASS 'B' RIP RAP
EST. 18 TONS
39 SY GEOTEXTILE
SEE DETAIL 'Q'
TAIL 3' BASE DITCH
EST. 69 TONS
147 SY GEOTEXTILE
SEE DETAIL 'N'
SLOPE = 0.86%
PROP 47" WW FENCE
-L- POT 63+49.25
-L- PT 60+43.31
320' TRANSITION
END C/A
END FENCE
EX. R/W
NAD 83/2011
DANNY L & WILLIAM B DILLON
DB 2989 PG 838
DB 3254 PG 1531
DANNY L DILLON
DB 2663 PG 2830
BACK REF.:
DB 684 PG 170
NOTE:
1) LOCATIONS OF STORM SYSTEMS, UTILITY POLES, AND ROADWAYS WITHIN THE LIMITS OF U-4734 ARE BASED ON DESIGN INFORMATION AND DO NOT REFLECT AS-BUILT CONDITIONS.
2) THE UNDERGROUND UTILITY LINES SHOWN ARE IN THEIR ORIGINAL LOCATIONS AND DO NOT REFLECT ANY RELOCATIONS REQUIRED UNDER U-4734.
3) THE JURISTICTIONAL STREAM HAS BEEN ADJUSTED TO MATCH THE U-4734 POST-CONSTRUCTION CONDITIONS.
SR 2601 (MACY GROVE RD.EXT.)
VAR. WIDTH PAVED
(AREA CURRENTLY UNDER CONSTRUCTION)
S 64°04'28.0" E
N 63°57'19" W
LATERAL 'V' DITCH
SEE DETAIL 'L'
LATERAL 2' BASE DITCH
W/CLASS 'B' RIP RAP
EST. 38 TONS
108 SY GEOTEXTILE
SEE DETAIL 'K'
BERM 2' BASE DITCH
W/CLASS 'B' RIP RAP
EST. 97 TONS
274 SY GEOTEXTILE
SEE DETAIL 'E'
BERM 2' BASE DITCH
SEE DETAIL 'M'
100' TAPER
320' UNIFORM MEDIAN TRANSITION
WILLIAM C. EDWARDS, JR.
DB 2078 PG 0625
SIMON S & CASEY D EDWARDS
HAYWORTH-MILLER FUNERAL HOME
U4734-6
BL-30

-L-
PI Sta 57+25.23
△ = 27° 07' 24.4" (LT)
D = 4° 10' 55.8"
L = 648.55'
T = 330.47'
R = 1,370.00'
SE = 0.03
V = 40 mph



☆ UPGRADED SIGNAL

PROP PAINT STRIPING

FOR -L- PROFILE, SEE SHEET 10

REVISIONS

3-24-2020 ROW ADJUSTED ON PARCEL 26

9-14-2020 PARCEL OWNER (23) NAME CHANGED TO BLAKEMORE

HDR Engineering, Inc. of the Carolinas
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PROJECT REFERENCE NO.	SHEET NO.
U-6003	9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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–L–

–L– STA 11+51.61
=–Y15– STA 17+39.61, EL 1002.67'
BEGIN GRADE
–L– STA 11+69.67, EL 1002.48' =
–Y15– STA 17+38.15, 18' RT
(–)0.01%
PROPOSED GRADE
EXISTING GROUND
PI = 16+60.00
EL = 982.88'
VC = 220'
K = 73
DS = 40mph
(–)3.9983%
(–)0.9834%
PI = 21+80.00
EL = 977.76'
VC = 750'
K = 113
DS = 50mph
(–)0.9834%
(–)17.5980%
STA. 20+95.00 LT
ELEV.970.00
2' Base Lateral Ditch @ 4.29%
2' Base Lateral Ditch @ 1.70%
STA. 23+75.00 LT
ELEV.961.50
EXISTING GROUND
STA. 22+00.00 LT
ELEV.965.50
STA. 23+00.00 LT
ELEV.963.80
PROPOSED GRADE
Berm Ditch w/Rip Rap @ 3.07%
Berm Ditch w/Rip Rap @ 4.67%
1,010
1,000
990
980
970
960
950
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24

–L–

Berm Ditch w/Rip Rap @ 4.67%
Berm Ditch w/Rip Rap @ 7.84%
STA. 24+50.00 LT
ELEV.958.00
STA. 25+17.00 LT
ELEV.952.75
3' Base Lateral Ditch @ 0.60%
STA. 26+50.00 RT
ELEV.928.20
STA. 28+00.00 RT
ELEV.927.30
PROPOSED GRADE
EXISTING GROUND
(–)17.5980%
(+)6.5229%
14' x 7' RCBC
SAG
STA 31+22.31
PI = 30+85.00
EL = 909.00'
VC = 980'
K = 69
DS = 40mph
BM #2,
–L– STA. 31+85, OFFSET 130' LT
ELEV = 920.69'
STA.35+50.00 RT
ELEV.963.00
Berm Ditch @ 3.63%
(+)6.5229%
970
960
950
940
930
920
910
900
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38

CULVERT HYDRAULIC DATA
14' X 7' RCBC (BURIED 1.0') Sta.30+68

DRAINAGE AREA	= 345.6	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 500.00	CFS
DESIGN HW ELEVATION	= 923.40	FT
100 YEAR DISCHARGE	= 550.00	CFS
100 YEAR HW ELEVATION	= 923.60	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 875.00	CFS
OVERTOPPING ELEVATION	= 925.80	FT

FOR –L– PLAN, SEE SHEETS 4 THRU 6

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PROJECT REFERENCE NO.	SHEET NO.
U-6003	10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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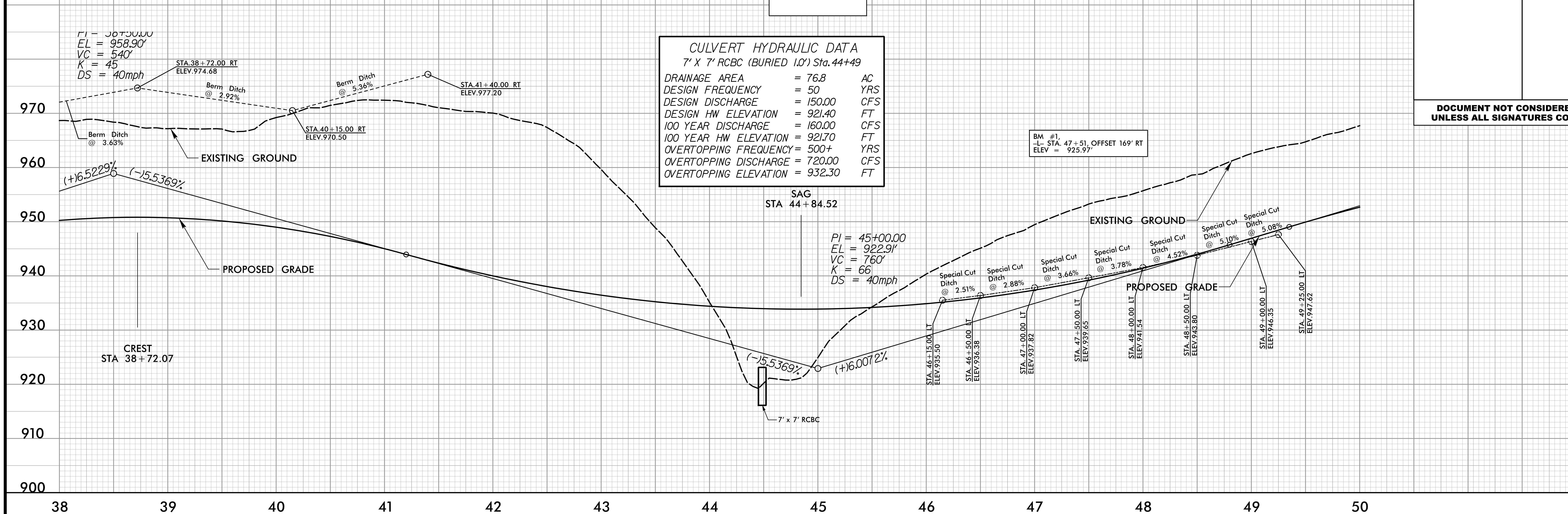
-L-



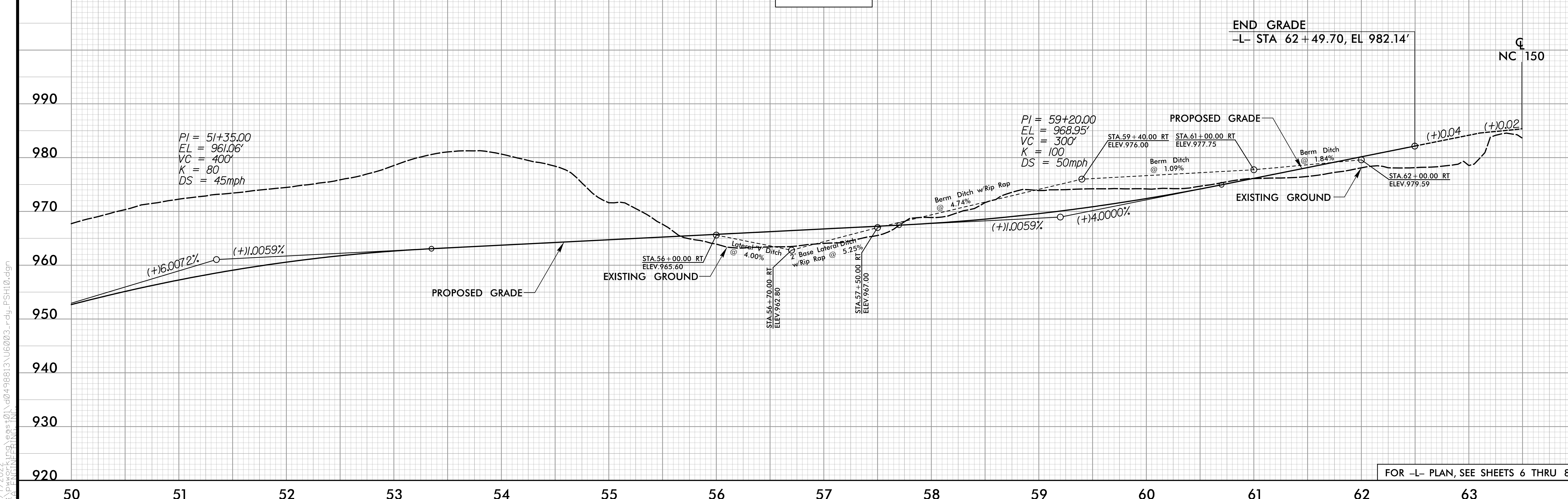
PI = 38+50.00
EL = 958.90'
VC = 540'
K = 45
DS = 40mph
STA.38+72.00 RT ELEV.974.68
Berm Ditch @ 2.92%
Berm Ditch @ 5.36%
STA.41+40.00 RT ELEV.977.20
Berm Ditch @ 3.63%
STA.40+15.00 RT ELEV.970.50
EXISTING GROUND
(+)6.5229%
(−)15.5369%
PROPOSED GRADE
CREST
STA 38+72.07
SAG
STA 44+84.52
PI = 45+00.00
EL = 922.91'
VC = 760'
K = 66
DS = 40mph
(−)15.5369%
(+)6.0072%
7' x 7' RCBC
BM #1, -L- STA. 47+51, OFFSET 169' RT ELEV = 925.97'
EXISTING GROUND
PROPOSED GRADE
Special Cut Ditch @ 2.51%
Special Cut Ditch @ 2.88%
Special Cut Ditch @ 3.66%
Special Cut Ditch @ 3.78%
Special Cut Ditch @ 4.52%
Special Cut Ditch @ 5.10%
Special Cut Ditch @ 5.08%
STA. 46+15.00 LT ELEV.935.50
STA. 46+50.00 LT ELEV.936.38
STA. 47+00.00 LT ELEV.937.82
STA. 47+50.00 LT ELEV.939.65
STA. 48+00.00 LT ELEV.941.54
STA. 48+50.00 LT ELEV.943.80
STA. 49+00.00 LT ELEV.946.35
STA. 49+25.00 LT ELEV.947.62
970
960
950
940
930
920
910
900
38
39
40
41
42
43
44
45
46
47
48
49
50

CULVERT HYDRAULIC DATA

7' X 7' RCBC (BURIED 1.0') Sta.44+49

DRAINAGE AREA	= 76.8	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 150.00	CFS
DESIGN HW ELEVATION	= 921.40	FT
100 YEAR DISCHARGE	= 160.00	CFS
100 YEAR HW ELEVATION	= 921.70	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 720.00	CFS
OVERTOPPING ELEVATION	= 932.30	FT

-L-



END GRADE
-L- STA 62+49.70, EL 982.14'
℄ NC 150
PI = 51+35.00
EL = 961.06'
VC = 400'
K = 80
DS = 45mph
PI = 59+20.00
EL = 968.95'
VC = 300'
K = 100
DS = 50mph
PROPOSED GRADE
STA.59+40.00 RT ELEV.976.00
STA.61+00.00 RT ELEV.977.75
Berm Ditch @ 1.09%
Berm Ditch @ 1.84%
(+)0.04
(+)0.02
STA.62+00.00 RT ELEV.979.59
EXISTING GROUND
Berm Ditch w/Rip Rap @ 4.74%
(+)1.0059%
(+)4.0000%
(+)6.0072%
(+)1.0059%
STA.56+00.00 RT ELEV.965.60
Lateral V Ditch @ 4.00%
2' Base Lateral Ditch w/Rip Rap @ 5.25%
EXISTING GROUND
PROPOSED GRADE
STA.56+70.00 RT ELEV.962.80
STA.57+50.00 RT ELEV.967.00
990
980
970
960
950
940
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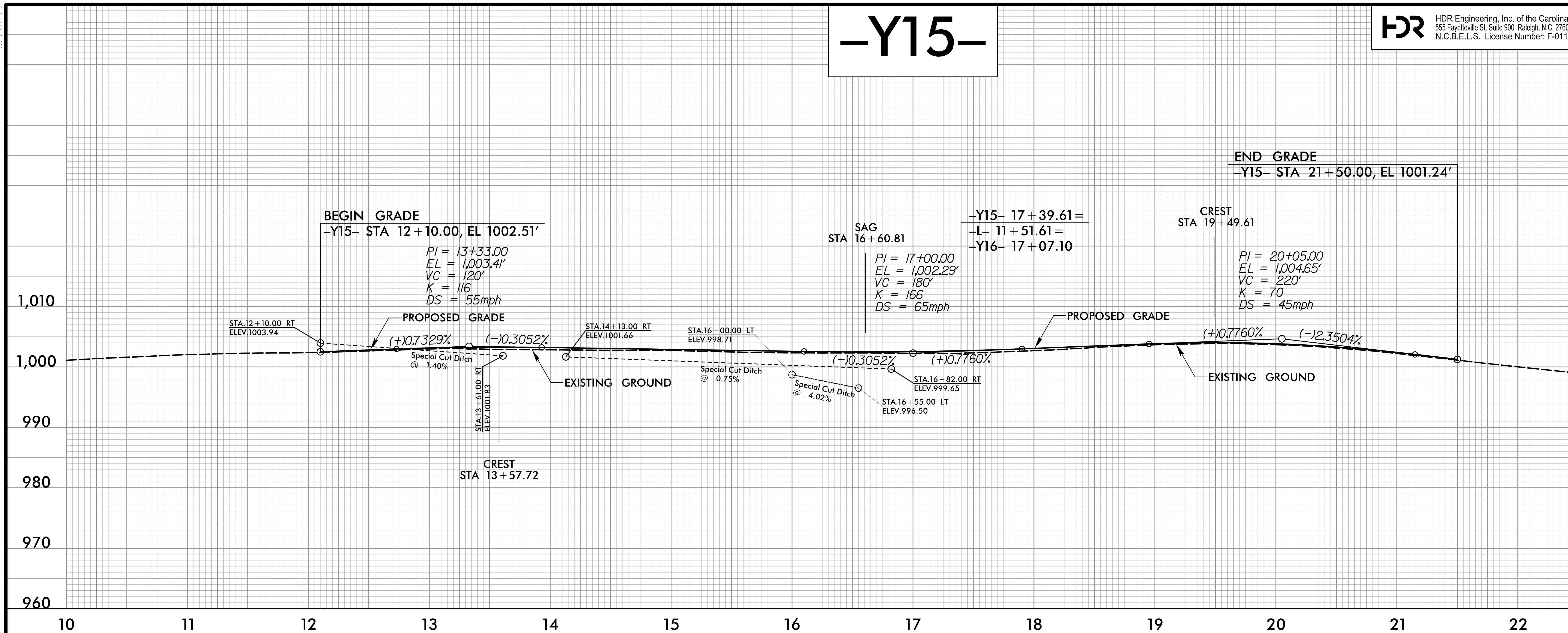
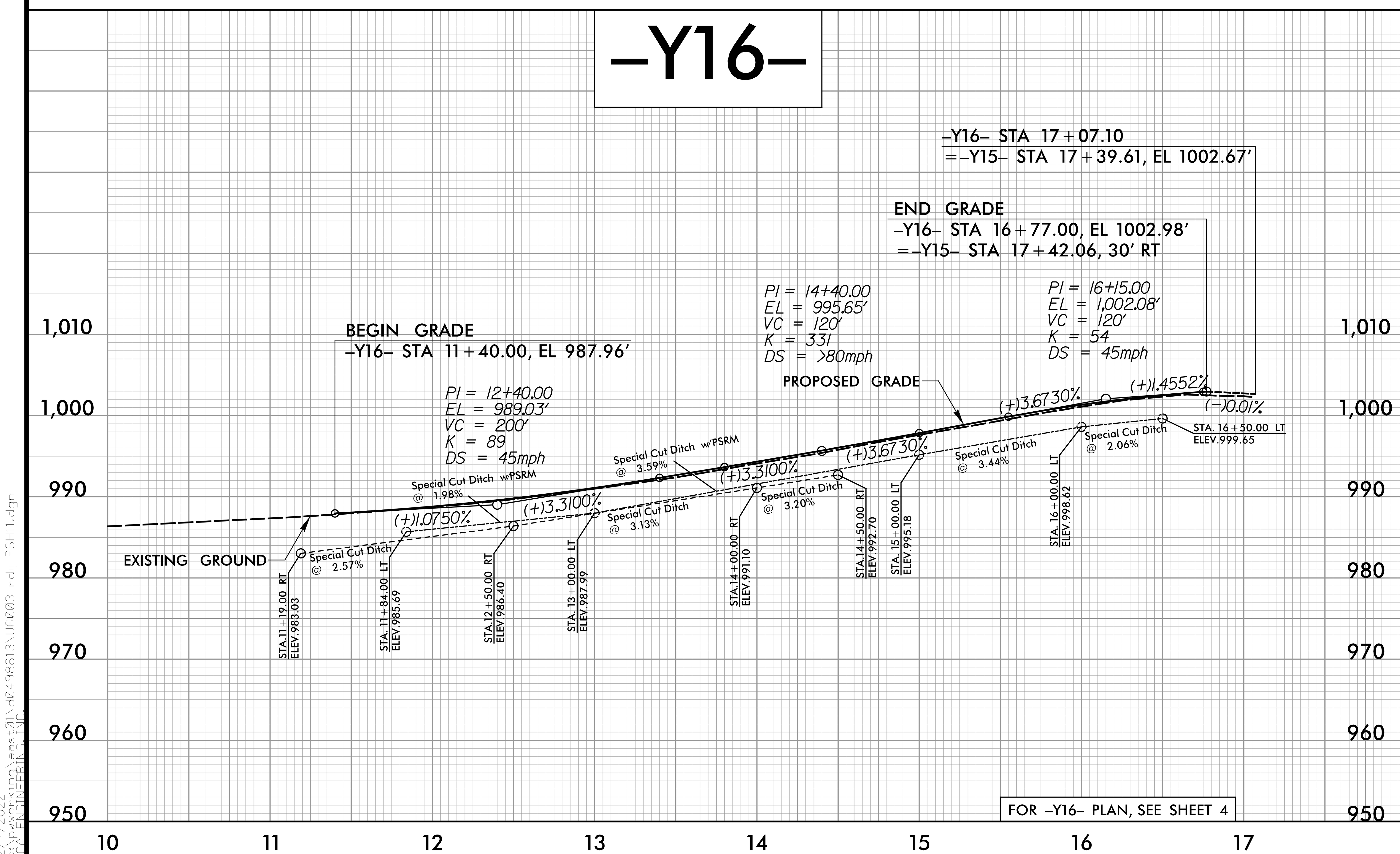
FOR -L- PLAN, SEE SHEETS 6 THRU 8

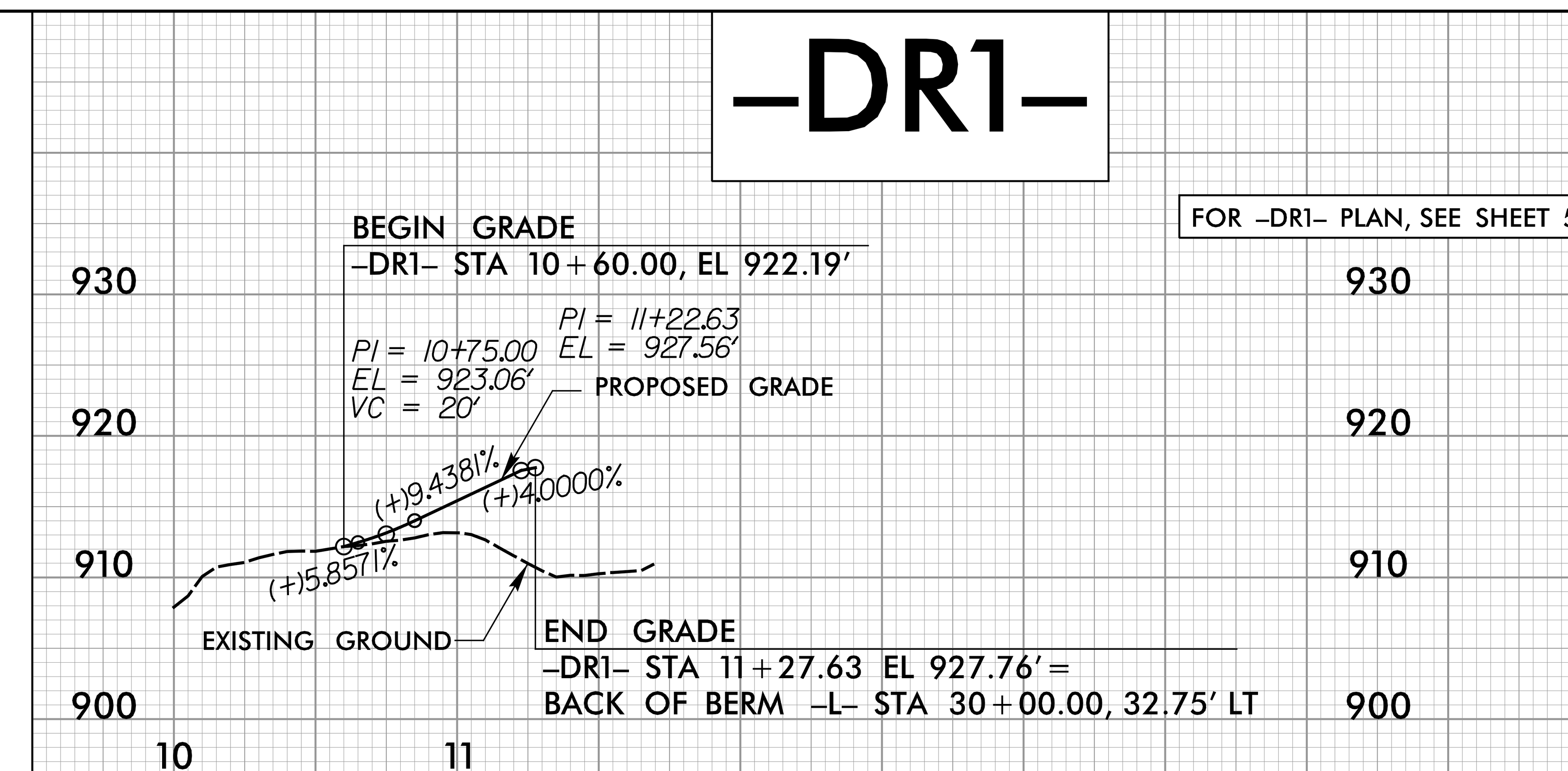
HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

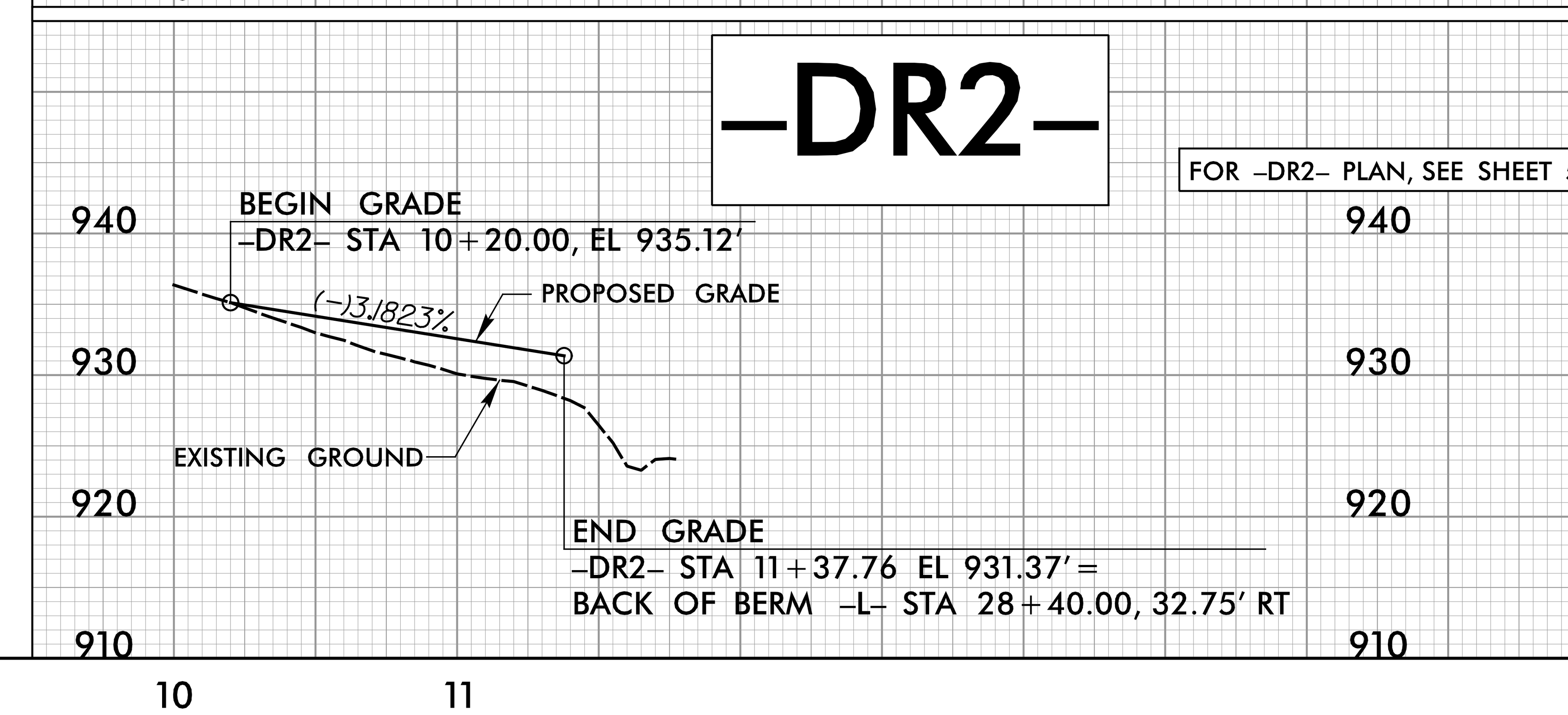
PROJECT REFERENCE NO.	SHEET NO.
U-6003	11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED









TIP # U-6003
Meeting
Minutes from
Permit
Pre-Application
Meeting

Meeting Notes

Project:	NCDOT STIP Project U-6003
Subject:	Permit Pre-application Meeting
Date:	Tuesday, September 20, 2022
Location:	Teams
Attendees:	[NCDOT Division 9 – Amy Euliss, Connie James]; [USACE – Andrew Williams, Eric Alsmeyer]; [NCDENR – Dave Wanucha]; [HDR – Sara Easterly, Phillip Rogers, Jeff Dayton, Wyatt Yelverton, Alex Snider, Molly Diehl]

I. Introductions and NCDOT opening comments

- Project packet provided prior to the meeting (attached)

II. Presentation (attached)

III. Discussion/Comments

- Define what East-West connectivity is – from Piney Grove Rd to Bus. 40.
- Includes location of Macy Grove Rd on Quad map.
- Include description of narrowed down median as an alternate considered.
- Summarize any other options we considered and why they are not feasible. Discuss impacts for each.
- Agency preference to utilize a 2-lane, 2-way roadway without a median. Current information presented likely does not justify use a median. If median is not feasible, provide detailed description/justification.
- Stormwater Management Plan (SMP); include notes about any stormwater controls in project narrative
- SMP; add sheet for grass swale analysis even if ditches to not meet criteria.
- Permit sheet (sites 1-4) – add bank stabilization details at inlet and outlet of culvert to the permit drawings
    - Discussed outlet of system at Site 2 and use of JB to decrease outlet velocity
    - Questioning of direct system tie-ins with culvert
    - Clarification on realigning stream at site 4 and using rip rap embedded in channel
- Permit sheet (sites 5&6) – add bank stabilization details at inlet and outlet of culvert to the permit drawings
    - Add more bank stabilization to the outlet side of culvert at R/W where stream turns
    - Same questioning about direct system ties to culvert in this location.

- Amy asked about keeping the existing stream intact during construction of culvert. Amy to send note wording from recent projects to be included on applicable sheets.
- Impact summary sheet – consider adding "2A" and "3A" designations for bank stabilization portions at sites 2 and 3. The same idea for site 5 if we are to add bank stabilization at downstream stream turn.
- SA had a low score on the SAM form that will help justify Alt 1 vs Alt 2.
- Project Let date is set for November 2023.
- Amy let Andy and Eric know to expect the permit application in January 2023.

iv. Next Steps

In order to further minimize impacts NCDOT has developed a revised design option that would transition the proposed median width from 23' to 5.5' at the stream crossings. The 5.5' median width provides a 4' monolithic separator island along with 9 inches of striped offset for the adjacent through lanes. NCDOT has reviewed this typical section with the Town of Kernersville and they have confirmed acceptance of this design modification.

v. Follow-up Comments (via email)

The team has not responded directly to these comments yet but have discussed the comments with NCDOT Hydraulics. We will provide responses as design revisions are finalized.

- DWR (10/4/22) Dave Wanucha
  - As mentioned in our meeting, there needs to be more detail and elaboration on the SMP narrative. We are concerned about the lack of treatment regarding direct discharges tying into the culvert wall. Please explain why this is necessary.
  - Were post-construction SW BMPs evaluated as treatment options on this project?
  - At Site 2 - is there no opportunity for any type of treatment before discharging into the creek?
  - At Site 7 - is there treatment opportunity in the location of the proposed base (tail) ditch? Is there opportunity to bypass the flow from the lateral base ditch to avoid proposed tail ditch and reduce flow to allow for treatment area? In other words, it appears that the flow from the lateral base ditch may not need treatment. So, if DOT could convey that flow to its own outfall, away from the proposed tail ditch, any treatment provided at the tail ditch would be based on a much smaller drainage area.
- DWR (10/4/22) Susan Locklear
  - As a follow up, if I recall correctly, there was mention that the SELDM model did not require treatment. In meeting with DOT Hydraulics staff last week, it was clarified that minimum measures should be used even if the SELDM model results in direct discharge being acceptable.
    I hope this clarifies the expectation regarding the design of the storm system as it relates to this project.

U-6003

Pre-application Meeting

Pre-Meeting Packet

(submitted on 9/7/22)

U-6003
PROJECT OVERVIEW AND ALTERNATIVE ANALYSIS SUMMARY

Project Description

NCDOT STIP Project U-6003 involves design and construction of a new route from North Main Street (NC 150) to Piney Grove Road (SR 1969) in Forsyth County. This new location roadway will be approximately 1.0 mile long. The roadway will provide a critical connection from the existing Linville Springs Road/Piney Grove Road intersection to NC 150 in Kernersville.

Purpose & Need

Primary Need

The current roadway network in downtown Kernersville consists of several primarily north-south facilities with little east-west connectivity. This lack of connectivity limits mobility in downtown Kernersville and the surrounding area.

Secondary Need

The intersection of SR 2030 (Linville Springs Road) at SR 1969 (Piney Grove Road) is projected to having a failing Level of Service (LOS) in 2040 AM & PM peak hours without any improvements. The existing capacity of the adjacent two-lane highways, NC 150 and SR 1969 (Piney Grove Road) will be overwhelmed by growing demands as development, as indicated by the traffic forecast, occurs along NC 150 in the project area.

Primary Purpose

The primary purpose is to provide east-west connectivity between SR 1969 (Piney Grove Road) and NC 150.

Secondary Purpose

Improve the operations of the intersection of SR 2030 (Linville Springs Road) at SR 1969 (Piney Grove Road).

Typical Section Alternatives

2 Lane Divided vs. Undivided

The project typical section provides capacity for one lane in each direction however it is anticipated that future capacity will be needed to accommodate growth in the area. For this reason, NCDOT has elected to incorporate a median as part of the project in order to facilitate future widening.

Median Width

For facilities of this type, the NCDOT Roadway Design Manual specifies a desirable raised median width between 23' and 30' wide. The more desirable 30' median width provides a 6' offset and improved sight distance for left turn access. With consideration to impact minimization, a 23' median is considered acceptable since it provides a 4' offset and generally acceptable sight distance for left turn access. The minimum median width that will accommodate a turn lane is 17.5' and is typically only considered in areas with low-speed conditions and urban constraints. Additionally, a 5.5' median alternative was considered but eliminated since this option presents safety concerns and would preclude future left turn access along the corridor.

Alignment Alternatives

Two alignment alternatives were analyzed, and a comparison of impacts completed for each. Please reference the provided figures and impact summary tables attached for comparison.

- Permit Impact Comparison Tables
  - Table 1.1 – Alternate 1
  - Table 1.2 – Alternate 2
- Alignment Alternative Mapping
  - Figure 1 – Overview Map
  - Figure 2 – Alternate 1 Map
  - Figure 3 – Alternate 2 Map

Calculated Stream Impacts

Each alternate was developed to the same level of detail and includes proposed horizontal alignment, vertical alignment, major drainage elements and a 23' median width. For comparison between alternatives, impacts were calculated to the limits of construction (slope stake line to slope stake line). See U-6003 Permit Impact Comparison Tables 1.1 and 1.2 for a quantitative summary.

Stream Mitigation

Opportunities for on-site mitigation were explored for Alternate 1. The two stream channels west of East Belews Creek were examined specifically. Channel grade and topography pose obstacles for successful stream mitigation for the channel realignment downstream of the ponds (Site 1). Simple realignment of this channel would result in additional right of way impacts to adjacent residential parcels. Allowance for an appropriate floodplain bench for this channel would require greater impacts to those same parcels. Possible realignment and mitigation for the second channel (Site 2) would be limited by utility crossings and a nearby access road.

Alternate 2, Site 3 would require channel realignment as shown in the provided mapping. However, this channel will require rock stability for stabilization.

On-Site mitigation is not recommended for either alternative due to the above listed constraints.

Threatened & Endangered Species

Surveys for Schweinitz's sunflower (*Helianthus schweinitzii*) were conducted In October of 2021. No sunflowers were found during the survey.

IPAC identifies the Northern long-eared bat (NLEB-*Myotis septentrionalis*) as threatened in the USACE project action area. NCDOT consulted on the NLEB since the species status listing is anticipated to be revised prior to construction of the project. Any effects to the Northern long-eared bat would be discountable since its highly unlikely that it would occur in the USACE project action area. In a letter dated June 16, 2022, USFWS Asheville Field office concurred with a Not likely to Adversely Affect determination.

A Biological Assessment/ Biological Opinion is under review by the USFWS For tricolored bat (*Perimyotis subflavus*).

Section 106

Section 106 requires Federal agencies to consider the effects on historic properties. As part of the project coordination, a "no survey required" finding was obtained for historic architecture. All archaeological sites have been considered and all are compliant with Section 106, including a no survey required form on May 8, 2018.

A request for historic properties of traditional religious or cultural importance was sent to the Catawba Indian Nation on April 14, 2020. A response dated May 18, 2020, confirmed there were no immediate concerns within the project area, however the Catawba Indian Nation should be notified should any artifacts and/or human remains are located during ground disturbance.

Right-of-Way Impacts

It is estimated that Alternate 1 will require 2 relocations and Alternate 2 would require a total of 6 to 7 relocations. For Alternate 2, the additional 4 to 5 impacts would be residential relocations located in the vicinity of Belews Creek and the Whispering Brook Village subdivision.

Avoidance & Minimization

In addition to optimization of both the horizontal and vertical alignments, the proposed design includes slopes steepened to 2:1 in order to minimize environmental impacts. Considering the project constraints, the proposed 23' median width is also the minimum median width with consideration to balancing the accommodation of future development and reducing impacts to the surrounding environment.

Preferred Alternative

After careful consideration, the Alternate 1 horizontal alignment along with a 23’ raised median typical section is preferred. This design is preferred primarily based on the following features.

- The Alternate 1 alignment provides an option that minimizes right of way impacts, including both property area impacts and potential relocations.
- The 23’ median width will accommodate future traffic growth and provide a 4’ offset to accommodate sight distance for left turns.
- Regarding major drainage structures, Alternate 1 allows for a more perpendicular crossing of East Belews Creek compared to Alternate 2. At this main crossing, Alternate 2 would require a longer, skewed culvert and channel relocation.
- The calculated stream impact area for Alternate 1 is slightly lower than Alternate 2.

U-6003 Permit Impact Comparison Table for Permanent Impacts

Table 1.1 - Alternate 1

Site	Station	Structure	SW Impact (AC)	Linear Impact (FT)	Fill in Wetland (AC)
1	-L- 26+95/28+83	42" RCP-III	0.0160	317	-
2	-L- 26+66/29+53	42" RCP-III	0.0314	235	-
3	-L- 30+22/30+97	14'X7' RCBC	0.0468	183	-
4	-L- 30+59/30+86	3' BASE DITCH	0.0048	65	-
5	-L- 43+96/44+93	7X7 RCBC	0.0198	239	-
6	-L- 44+57/44+91	Fill	-	-	0.0139
7	-L- 55+03/55+39	3' BASE DITCH	0.0013	21	-
		Total	**0.1201**	**1060**	**0.0139**

Table 1.2 - Alternate 2

Site	Station	Structure	SW Impact (AC)	Linear Impact (FT)	Fill inWetland (AC)
1	-L2- 23+14/25+04	42" RCP-III	0.0181	256	-
2	(combined with site 1)	N/A	-	-	-
3	-L2- 26+13/27+90	14'X7' RCBC	0.0832	328	-
4	(combined with site 3)	N/A	-	-	-
5	-L2- 45+0/46+75	7X7 RCBC	0.0211	255	-
6	(no impact)	N/A	-	-	-
7	-L2- 53+44/53+60	3' BASE DITCH	0.0013	21	-
		Total	**0.1237**	**860**	**0.0000**

Notes:

1) There was minimal difference in the slope stake locations when comparing the 17.5' median vs the 23' median for each of the 3 alternatives. The 23' median option was analyzed for each alternative for impact purposes.
2) Impacts were determined between the slope stake limits
3) Both alternates will result in total takes of parcels 9 & 14; additonally -ALT2- Alternate will result in relocations of 4 mobile homes and 1 site foundation on the WHISPERING BROOK VILLAGE MHC LLC parcel.

FIGURE 1

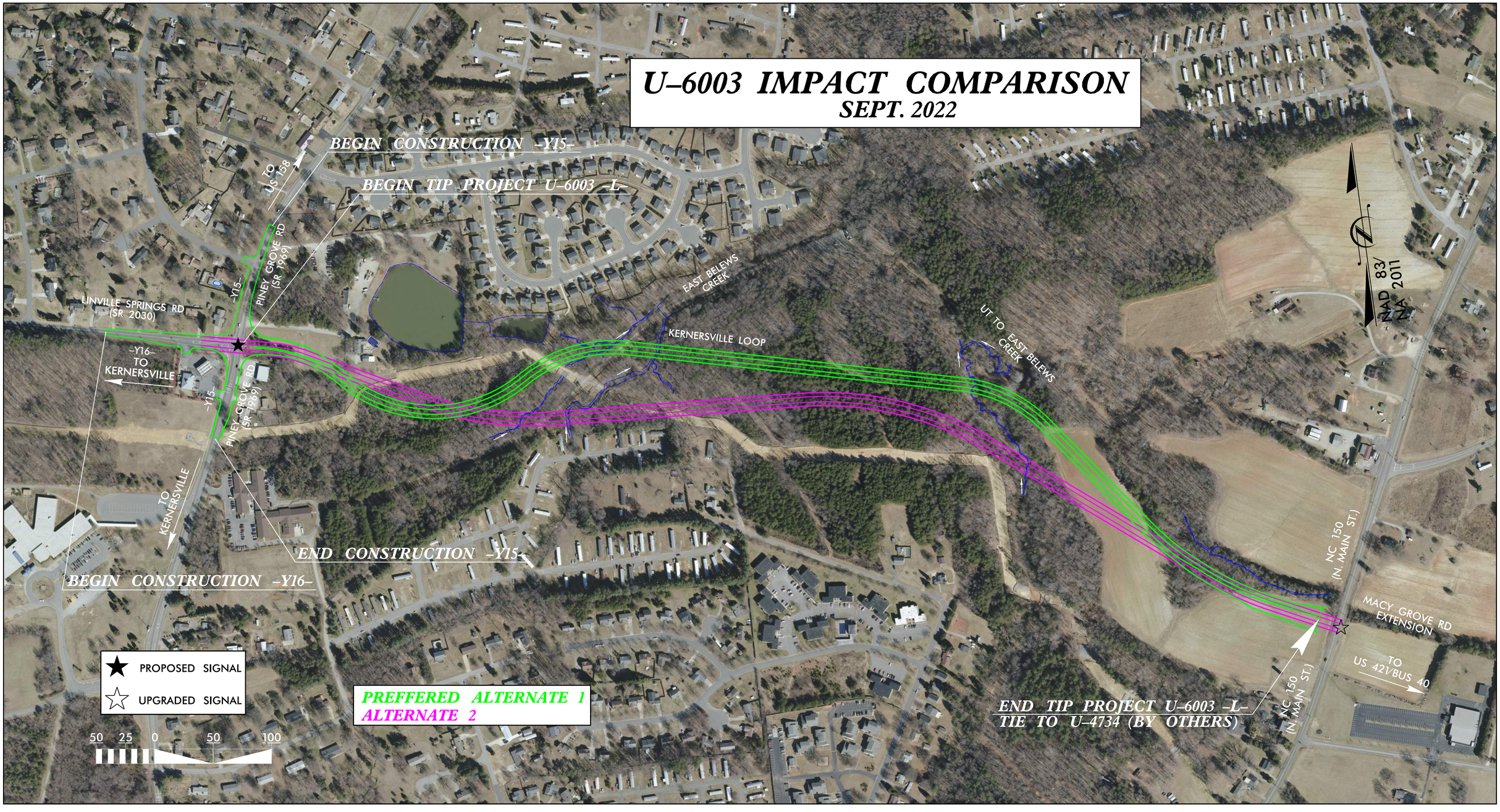

U–6003 IMPACT COMPARISON
SEPT. 2022
BEGIN CONSTRUCTION –Y15–
BEGIN TIP PROJECT U–6003 –L–
TO US 158
PINEY GROVE RD (SR 1969)
LINVILLE SPRINGS RD (SR 2030)
–Y15–
–Y16– TO KERNERSVILLE
EAST BELEWS CREEK
KERNERSVILLE LOOP
UT TO EAST BELEWS CREEK
NAD 83/ NA 2011
NC 150 (N. MAIN ST.)
MACY GROVE RD EXTENSION
TO US 421/BUS 40
END CONSTRUCTION –Y15–
BEGIN CONSTRUCTION –Y16–
PROPOSED SIGNAL
UPGRADED SIGNAL
50 25 0 50 100
PREFFERED ALTERNATE 1
ALTERNATE 2
END TIP PROJECT U–6003 –L–
TIE TO U–4734 (BY OTHERS)

FIGURE 2

U–6003 PREFERRED ALTERNATE 1 IMPACTS

SEPT. 2022

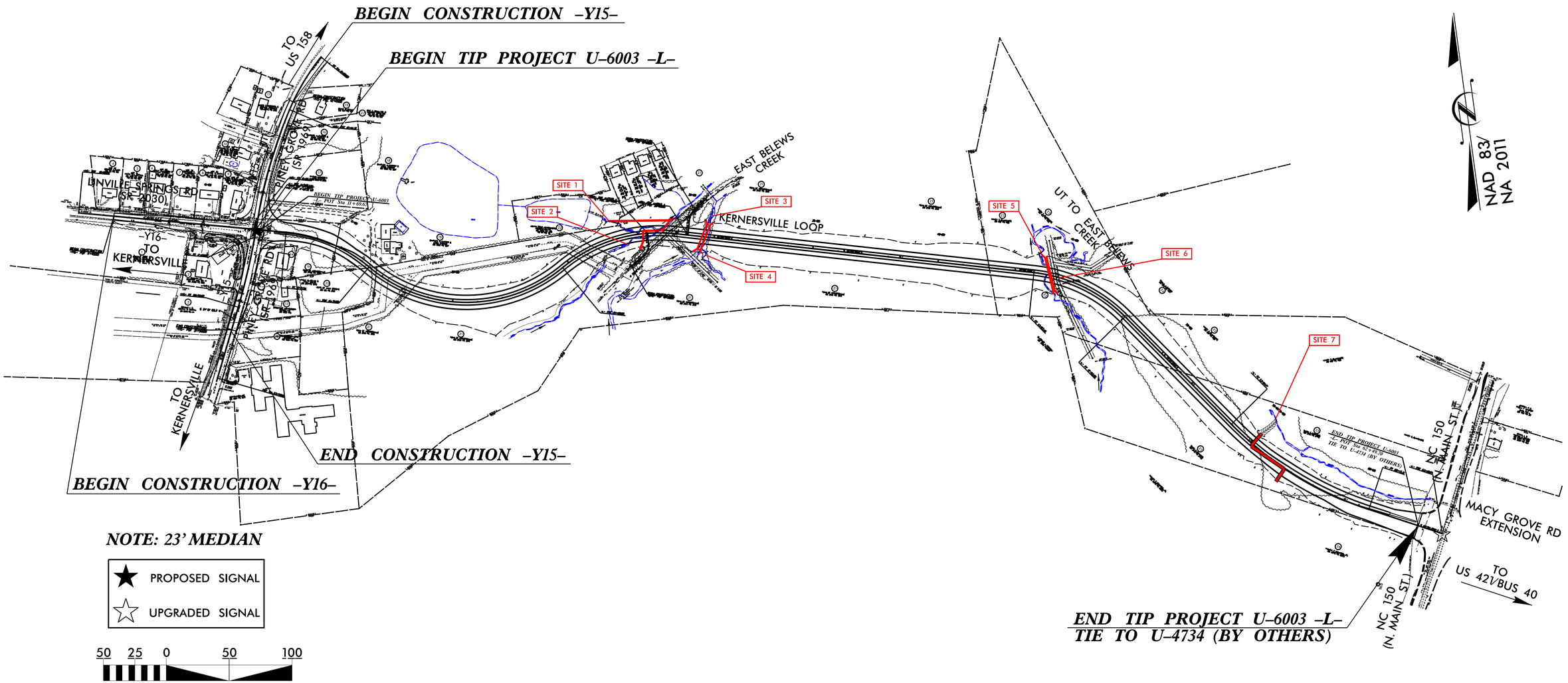
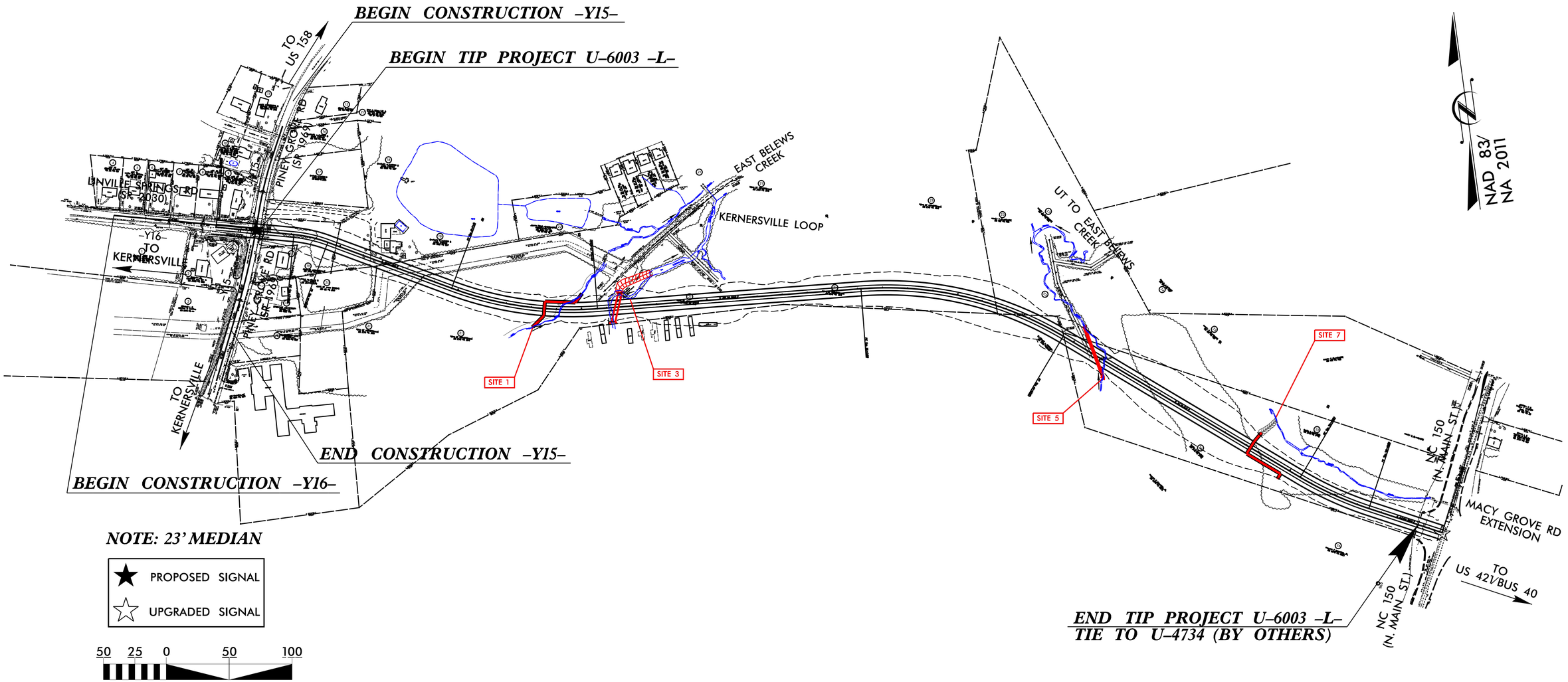


FIGURE 3

U–6003 ALTERNATE 2 IMPACTS

SEPT. 2022



North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 3.00; Released August 2021)

General Project Information

WBS Element:	47138.1.1	**TIP Number:**	U-6003	**Project Type:**	New Location	**Date:**	10/26/2021
NCDOT Contact:	Connie James			**Contractor / Designer:**	Wyatt Yelverton		
	Address: 375 Silas Creek Parkway Winston Salem, 27127			**Address:**	555 Fayetteville St. Suite 900 Raleigh, NC 27601		
	Phone: (336) 747-7800			**Phone:**	919-232-6623		
	Email: ckjames1@ncdot.gov			**Email:**	wyatt.yelverton@hdrinc.com		
City/Town:	Kernersville			**County(ies):**	Forsyth		
River Basin(s):	Roanoke			**CAMA County?**	No		
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	0.962 miles	**Surrounding Land Use:**	Residential/Agricultural				
	Proposed Project			**Existing Site**			
Project Built-Upon Area (ac.)	9.5	ac.		1.5	ac.		
Typical Cross Section Description:	(2) 12'-0" travel lanes with 4'-0" bike lanes, curb and gutter, and 18'-0" to 23'-0" grass median.			New Alignment.			
Annual Avg Daily Traffic (veh/hr/day):	Design/Future:	10,100	Year: 2040	Existing:	N/A - New Alignment	Year:	N/A

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

Project Description: The proposed project (U-6003) is a new alignment connector between SR 1969 (Piney Grove Road) and NC 150 (North Main Street) in Kernersville, NC. The new route is proposed to be a two-lane divided facility with bicycle and pedestrian accomodations.

Impact Minimization Efforts: The project has been designed to minimize wetland and stream impacts along the project corridor. Steepened 2:1 fill slopes have been implemented in areas where wetlands and streams have been impacted by the project. Culverts in the project area that convey jurisdictional streams have been buried to provide aquatic passage. Drainage was designed to avoid direct discharge into jurisdictional streams to the maximum extent practicle.

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 3.00; Released August 2021)

WBS Element:	47138.1.1	TIP/Proj No.:	U-6003	County(ies):	Forsyth	Page	2	of	2

General Project Information

Waterbody Information

Surface Water Body (1):	UT to East Belews Creek		**NCDWR Stream Index No.:**	22-27-8-(1)		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SA, SC			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

Surface Water Body (2):	East Belews Creek		**NCDWR Stream Index No.:**	22-27-8-(1)		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	East Belews Creek			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

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

TIP PROJECT: U-6003

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

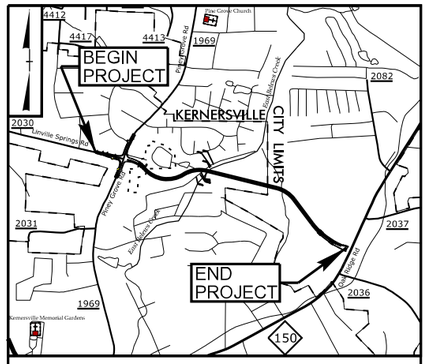
FORSYTH COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-6003	1	

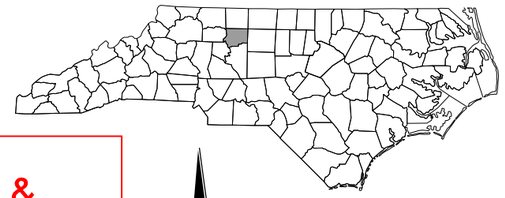
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
47138.1.1		PE

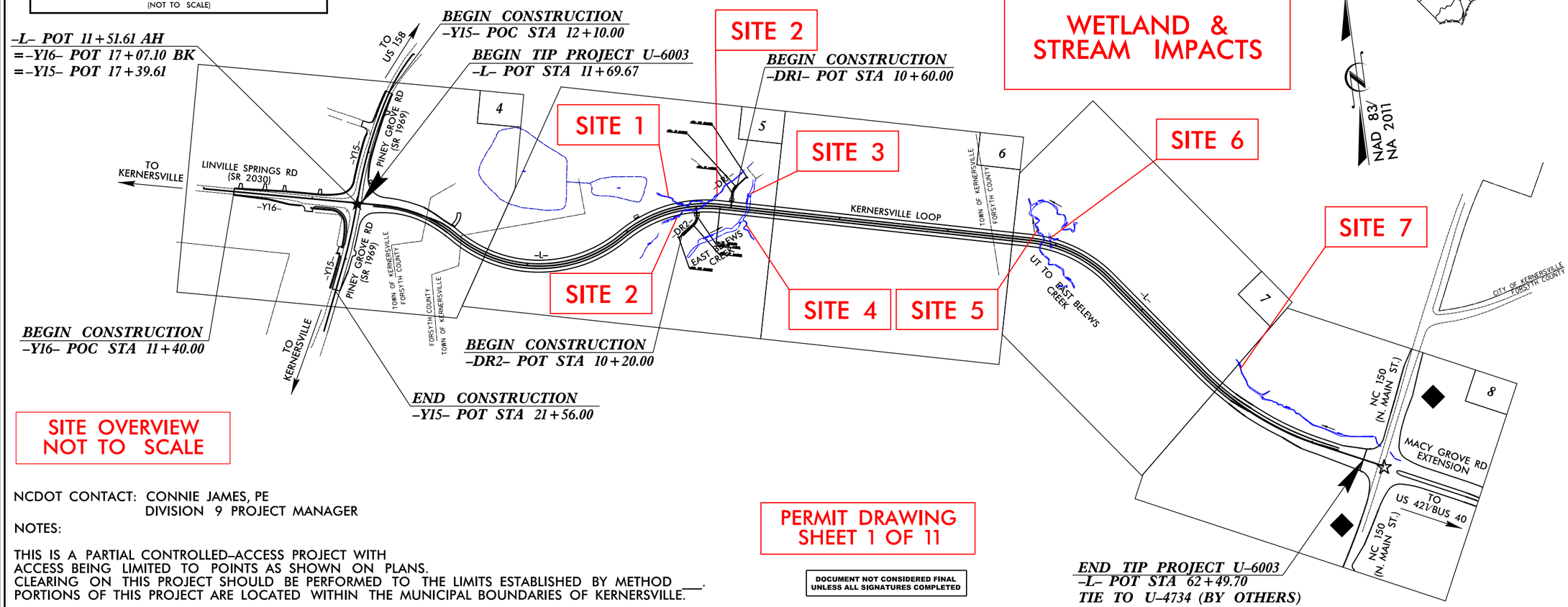
LOCATION: ***KERNERSVILLE – KERNERSVILLE LOOP***
FROM SR 1969 (PINEY GROVE RD) TO NC 150
(N. MAIN ST.)

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



VICINITY MAP
(NOT TO SCALE)





SITE OVERVIEW
NOT TO SCALE

PERMIT DRAWING
SHEET 1 OF 11

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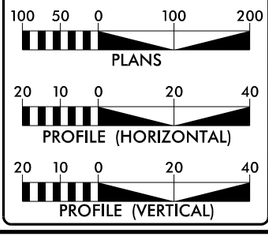
NCDOT CONTACT: CONNIE JAMES, PE
DIVISION 9 PROJECT MANAGER

NOTES:

THIS IS A PARTIAL CONTROLLED–ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON PLANS.
CLEARING ON THIS PROJECT SHOULD BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ___.
PORTIONS OF THIS PROJECT ARE LOCATED WITHIN THE MUNICIPAL BOUNDARIES OF KERNERSVILLE.

CONTRACT:

GRAPHIC SCALES



DESIGN DATA

ADT (2019) = 5,400
ADT (2039) = 10,100
K = 10 %
D = 55 %
T = 3 % *
V = 40 MPH
* TTST = 1% DUAL 2%
FUNC CLASS = ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U–6003 = 0.962 MILES

TOTAL LENGTH TIP PROJECT U–6003 = 0.962 MILES

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

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: TBD

LETTING DATE: TBD

PHILLIP E. ROGERS, PE
PROJECT ENGINEER

ALEXANDER D. SNIDER, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·

STATE OF NORTH CAROLINA

3/3/2022
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$$$$USERNAME$$$$

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

PROJECT REFERENCE NO.	SHEET NO.
U-6003	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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LEGEND:

▨ S	DENOTES IMPACTS IN SURFACE WATER
▨ TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 2 OF 11

FOR -L- PROFILE, SEE SHEET 9
FOR -DR1- PROFILE, SEE SHEET 11
FOR -DR2- PROFILE, SEE SHEET 11

8/17/99

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

PROJECT REFERENCE NO.	SHEET NO.
U-6003	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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LEGEND:

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83/2011

EAST

SITE 1

SITE 2

SITE 3

SITE 4

SB

SA

SD

POND

MATCHLINE –L– STA. 18+00 SEE SHEET 4

MATCHLINE –L– STA. 32+00 SEE SHEET 6

BEGIN IS FEATURE

BRANCH

BDO

HW

BERM 2' BASE DITCH W/CLASS 'B' RIP RAP EST. 93 TONS 264 SY GEOTEXTILE SEE DETAIL 'E'

LATERAL 2' BASE DITCH SEE DETAIL 'C'

LATERAL 3' BASE DITCH SEE DETAIL 'D'

HEAD 7.5' BASE DITCH SEE DETAIL 'P'

SLOPE = 1.42%

TOE PROTECTION SEE DETAIL 'O'

CLASS 'I' RIP RAP EST. 15 TONS 37 SY GEO-TEXTILE

OUTLET CHANNEL PROTECTION CLASS 'I' RIP RAP EST. 108 TONS 50 SY GEOTEXTILE

GRADE TO DRAIN C

FILL EXISTING JS CHANNEL TO FILL SLOPE 95 CY

CHANNEL CHANGE W/CLASS 'I' RIP RAP EMBED RIP RAP TO STREAMBED ELEVATION EST. 31 TONS 44 SY GEOTEXTILE SEE DETAIL 'G'

DETAIL G
CHANNEL CHANGE
(Not to Scale)

Min. D= 1.5 Ft.
Max. d= 3 Ft.
B= 3 Ft.
b= 13 Ft.

Type of Liner= Class 'I' Rip Rap
*Embed Rip Rap to streambed elevation

FROM STA. 30+45 TO STA. 30+76 –L– RT

PERMIT DRAWING
SHEET 3 OF 11

FOR –L– PROFILE, SEE SHEET 9
FOR –DR1– PROFILE, SEE SHEET 11
FOR –DR2– PROFILE, SEE SHEET 11

3/3/2022
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555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

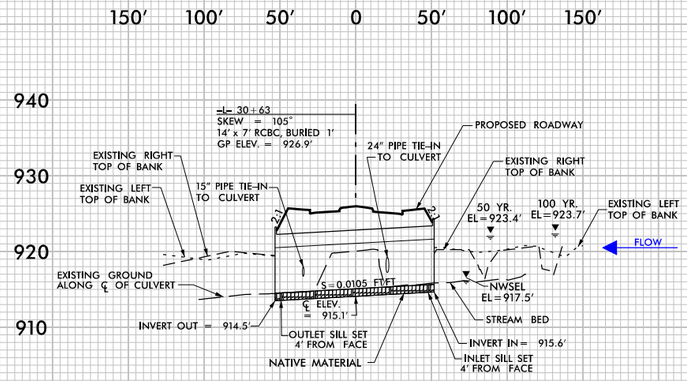
PROJECT REFERENCE NO.	SHEET NO.
U-6003	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SCALE:
1" = 100' HORIZONTAL
1" = 20' VERTICAL

SITE 3



PROFILE ALONG ℄ OF CULVERT

PERMIT DRAWING
SHEET 4 OF 11

REVISIONS

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5/14/99

8/17/99

HDR Engineering, Inc. of the Carolinas 555 Fayetteville St, Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116	PROJECT REFERENCE NO.	SHEET NO.
	U-6003	7
	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LEGEND:

- S S — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- F F — DENOTES PERMANENT FILL IN WETLANDS

NAD 83/2011

SITE 6

SITE 5

WA

SC

45+00

50+00

55+00

TOE PROTECTION SEE DETAIL

SPECIAL CUT DITCH SEE DETAIL 'P'

OUTLET CHANNEL PROTECTION CLASS II RIP RAP EST 44 TONS 62 SY GEOTEXTILE

PROPOSED 7' X 7' RCBC BURIED 1.0'

L S 36°57'03.6" E

S 16°05'08.8" E

MATCHLINE –L– STA. 43+00 SEE SHEET 6

MATCHLINE –L– STA. 55+00 SEE SHEET 8

15" RCP–IV

18" RCP–IV

CB

BIKE LANE

PERMIT DRAWING SHEET 5 OF 11

FOR –L– PROFILE, SEE SHEET 10

3/3/2022
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	R/W SHEET NO.		
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	

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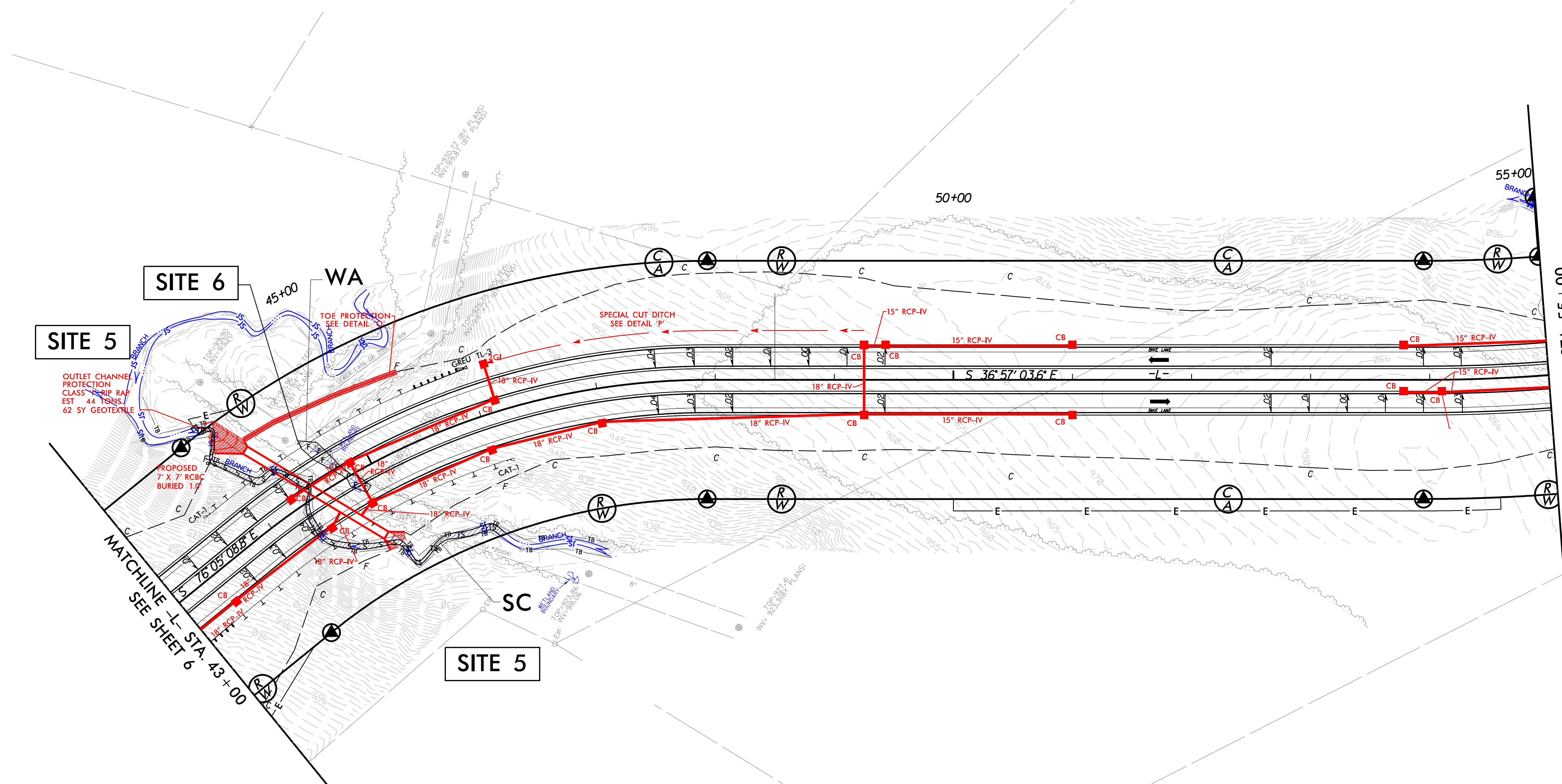
LEGEND:

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES PERMANENT FILL IN WETLANDS



PERMIT DRAWING SHEET 6 OF 11

FOR -L- PROFILE, SEE SHEET 10

8/17/99

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5/14/99

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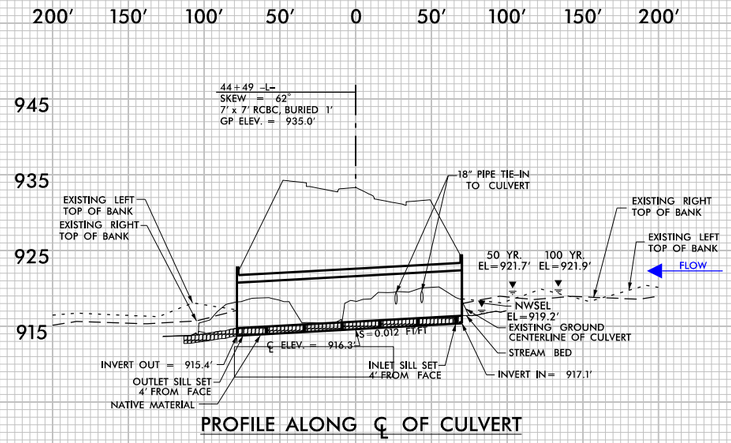
PROJECT REFERENCE NO.	SHEET NO.
U–6003	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SCALE:
1" = 100' HORIZONTAL
1" = 20' VERTICAL

SITE 5



PROFILE ALONG ℄ OF CULVERT

PERMIT DRAWING
SHEET 7 OF 11

REVISIONS

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6/23/16

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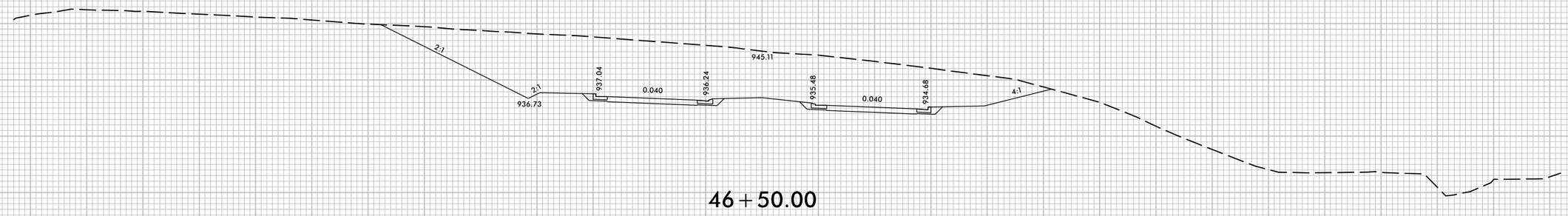

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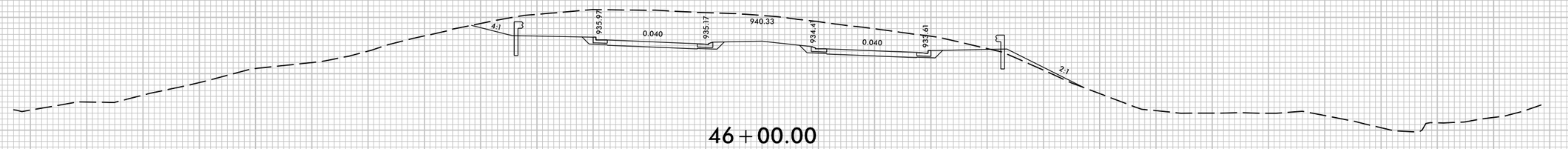

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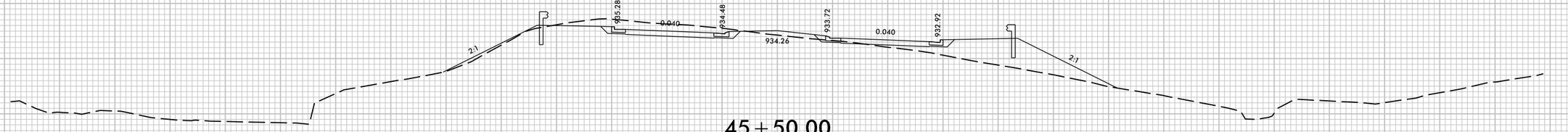

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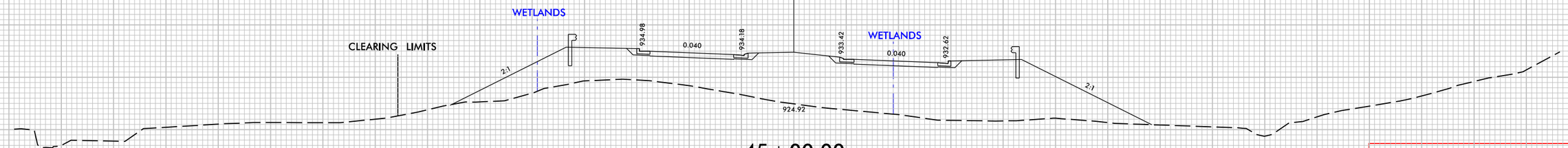

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SITE 6

PERMIT DRAWING
SHEET 8 OF 11

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PROJECT REFERENCE NO.	SHEET NO.
U-6003	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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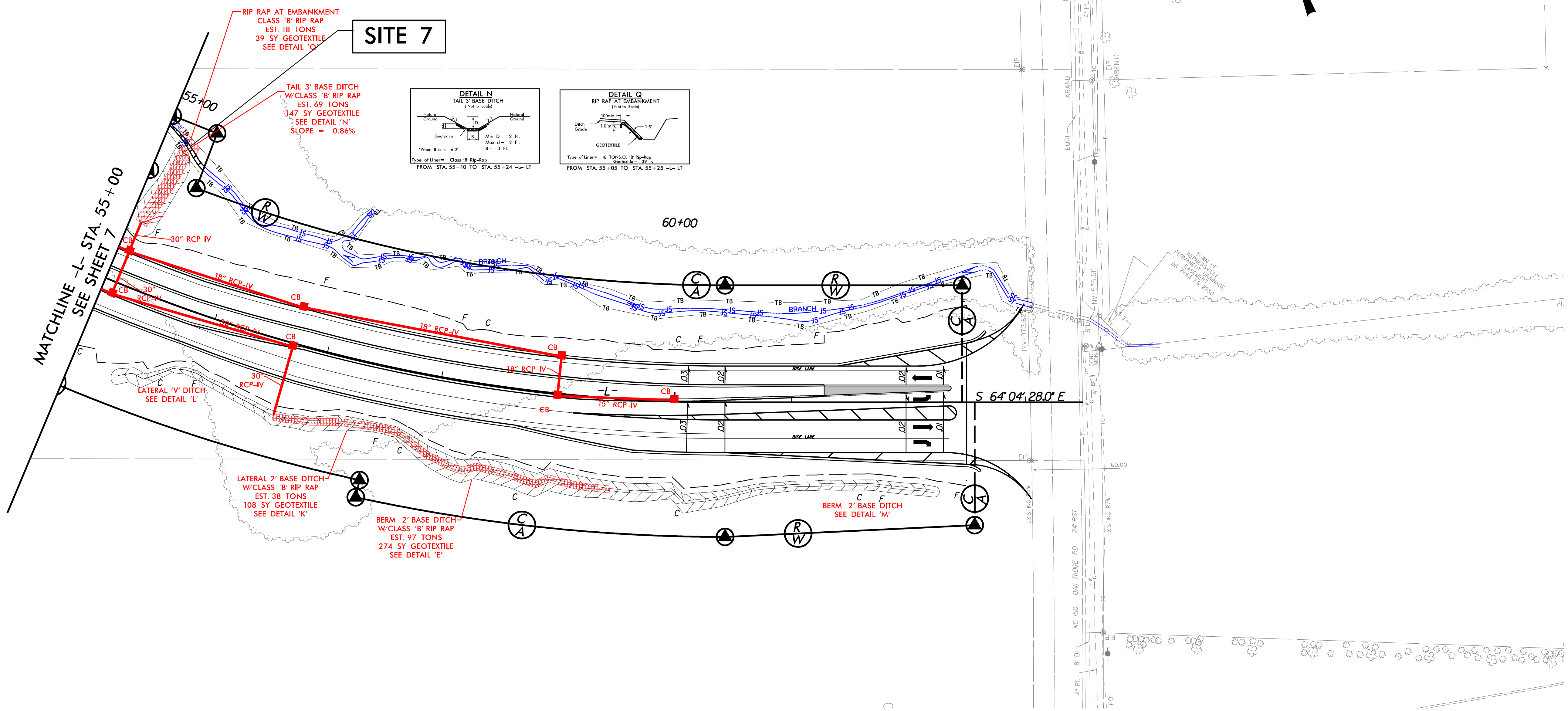
LEGEND:

S — DENOTES IMPACTS IN SURFACE WATER

TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER



SITE 7
RIP RAP AT EMBANKMENT CLASS 'B' RIP RAP EST. 18 TONS 39 SY GEOTEXTILE SEE DETAIL 'Q'
TAIL 3' BASE DITCH W/CLASS 'B' RIP RAP EST. 69 TONS 147 SY GEOTEXTILE SEE DETAIL 'N' SLOPE = 0.86%
DETAIL N TAIL 3' BASE DITCH (Not to Scale)
FROM STA. 55+10 TO STA. 55+24 -L- LT
DETAIL Q RIP RAP AT EMBANKMENT (Not to Scale)
FROM STA. 55+05 TO STA. 55+25 -L- LT
MATCHLINE -L- STA. 55+00 SEE SHEET 7
55+00
60+00
30" RCP-IV
18" RCP-IV
15" RCP-IV
BRANCH
-L-
S 64°04'28.0" E
LATERAL 'V' DITCH SEE DETAIL 'L'
LATERAL 2' BASE DITCH W/CLASS 'B' RIP RAP EST. 38 TONS 108 SY GEOTEXTILE SEE DETAIL 'K'
BERM 2' BASE DITCH W/CLASS 'B' RIP RAP EST. 97 TONS 274 SY GEOTEXTILE SEE DETAIL 'E'
BERM 2' BASE DITCH SEE DETAIL 'M'
NAD 83/2011
NC 150 OAK RIDGE RD
EXISTING R/W

PERMIT DRAWING SHEET 9 OF 11

FOR -L- PROFILE, SEE SHEET 10

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3/3/2022
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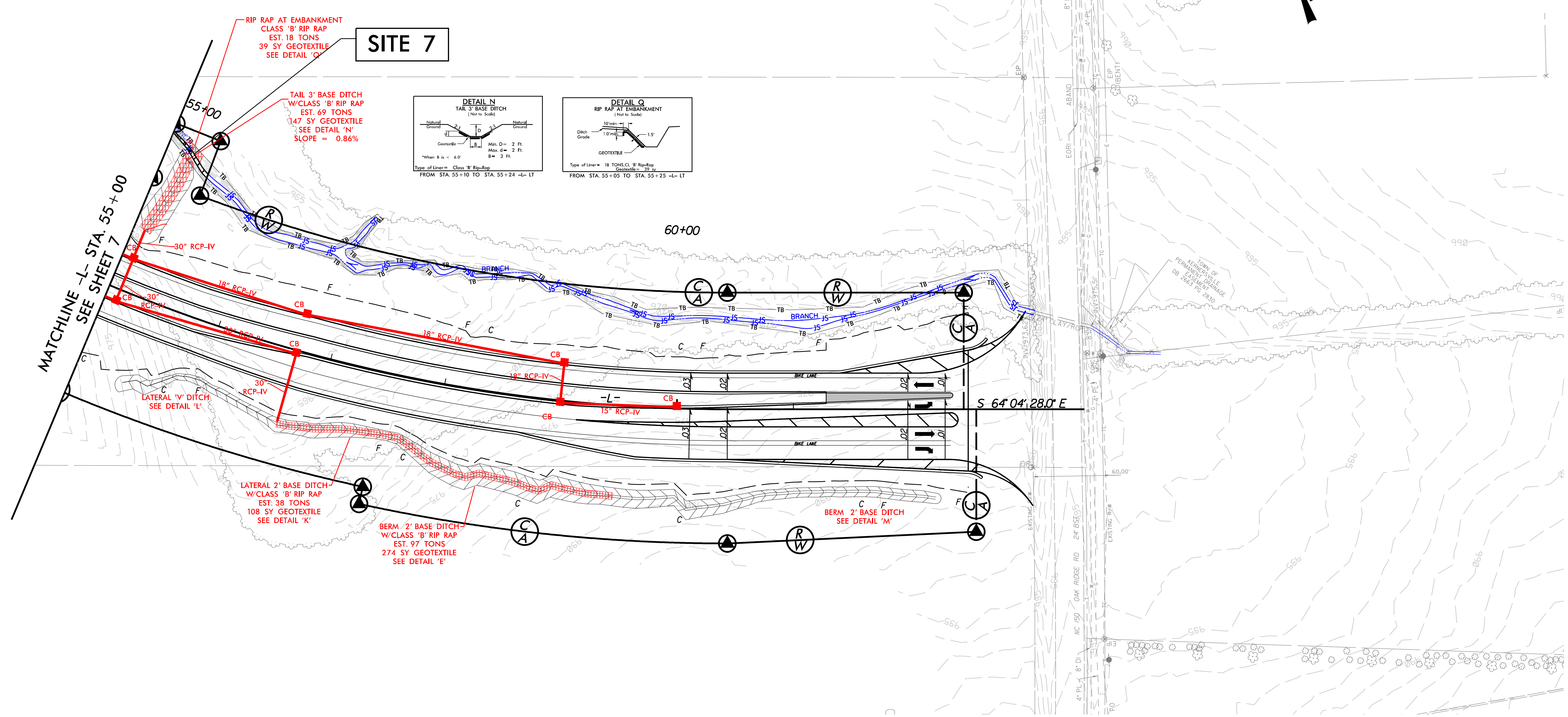
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
U-6003	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LEGEND:

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER



SITE 7
RIP RAP AT EMBANKMENT
CLASS 'B' RIP RAP
EST. 18 TONS
39 SY GEOTEXTILE
SEE DETAIL 'Q'
TAIL 3' BASE DITCH
W/CLASS 'B' RIP RAP
EST. 69 TONS
147 SY GEOTEXTILE
SEE DETAIL 'N'
SLOPE = 0.86%
DETAIL N
TAIL 3' BASE DITCH
FROM STA. 55+10 TO STA. 55+24 -L- LT
DETAIL Q
RIP RAP AT EMBANKMENT
FROM STA. 55+05 TO STA. 55+25 -L- LT
55+00
60+00
MATCHLINE -L- STA. 55+00
SEE SHEET 7
30" RCP-IV
18" RCP-IV
15" RCP-IV
BRANCH
-L-
S 64° 04' 28.0" E
LATERAL 'V' DITCH
SEE DETAIL 'L'
LATERAL 2' BASE DITCH
W/CLASS 'B' RIP RAP
EST. 38 TONS
108 SY GEOTEXTILE
SEE DETAIL 'K'
BERM 2' BASE DITCH
W/CLASS 'B' RIP RAP
EST. 97 TONS
274 SY GEOTEXTILE
SEE DETAIL 'E'
BERM 2' BASE DITCH
SEE DETAIL 'M'
NAD 83/2011

PERMIT DRAWING
SHEET 10 OF 11

FOR -L- PROFILE, SEE SHEET 10

3/3/2022
U6003_PRM_PSH.dgn

WETLAND AND SURFACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L- 26+95/28+83	42" RCP-III						0.02	< 0.01	235	10	
2	-L- 26+66/29+53	42" RCP-III						0.03	< 0.01	307	10	
		BANK STABILIZATION						< 0.01		10		
3	-L- 30+22/30+97	14'X7' RCBC						0.03	0.02	112	20	
		BANK STABILIZATION						0.02		71		
4	-L- 30+59/30+86	3' BASE DITCH						< 0.01	< 0.01	65	10	
5	-L- 43+96/44+93	7'X7' RCBC						0.02	< 0.01	239	15	
6	-L- 44+57/44+91		0.01									
7	-L- 55+03/55+39	BANK STABILIZATION						< 0.01	< 0.01	20	20	
TOTALS*:			0.01					0.12	0.04	1059	85	0

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
03/31/2022
FORSYTH COUNTY
U-6003
47138.1.1
SHEET 11 OF 11

U-6003

Pre-application Meeting

Presentation

NCDOT STIP U-6003
New Route from North Main Street (NC 150) to Piney Grove Road (SR 1969) in Forsyth County

NCDOT Division 9

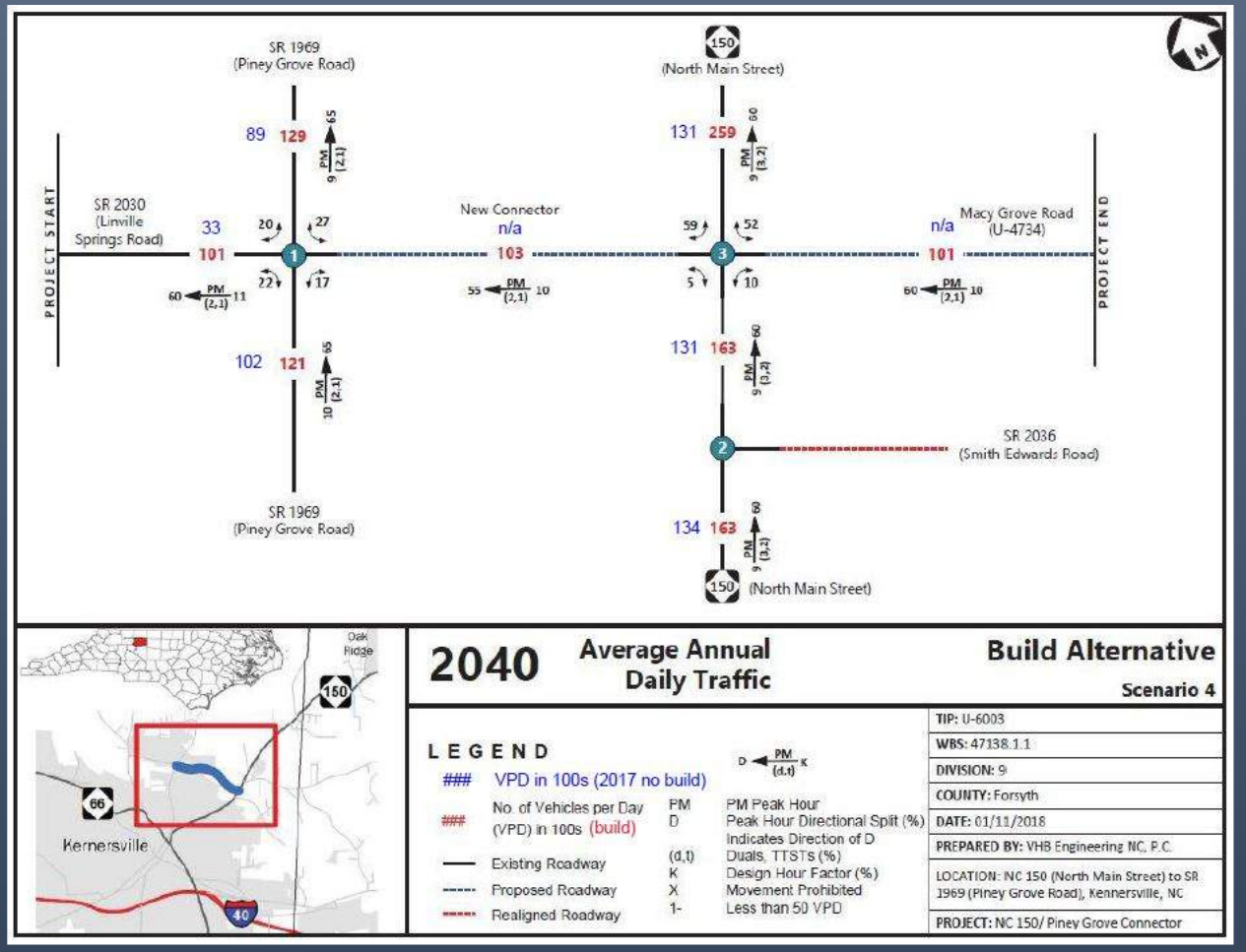
September 20, 2022

NCDOT STIP U-6003
New Route from North Main Street (NC 150) to Piney Grove Road (SR 1969) in Forsyth County

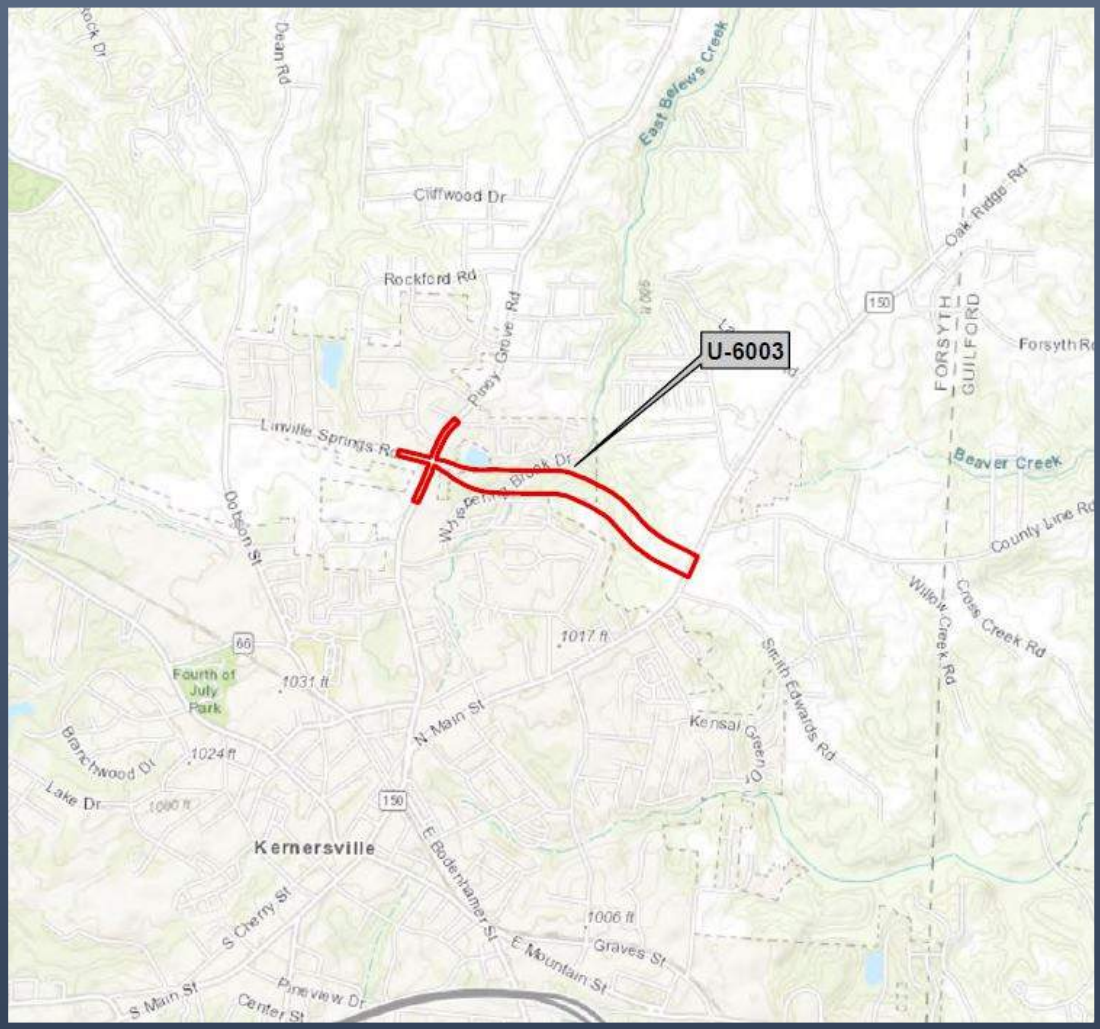
- ❑ Project Purpose and Need
- ❑ Project Location and Overview
- ❑ Alternative Analysis
- ❑ Pre-application review for Preferred Alternate

U-6003 Project Purpose and Need

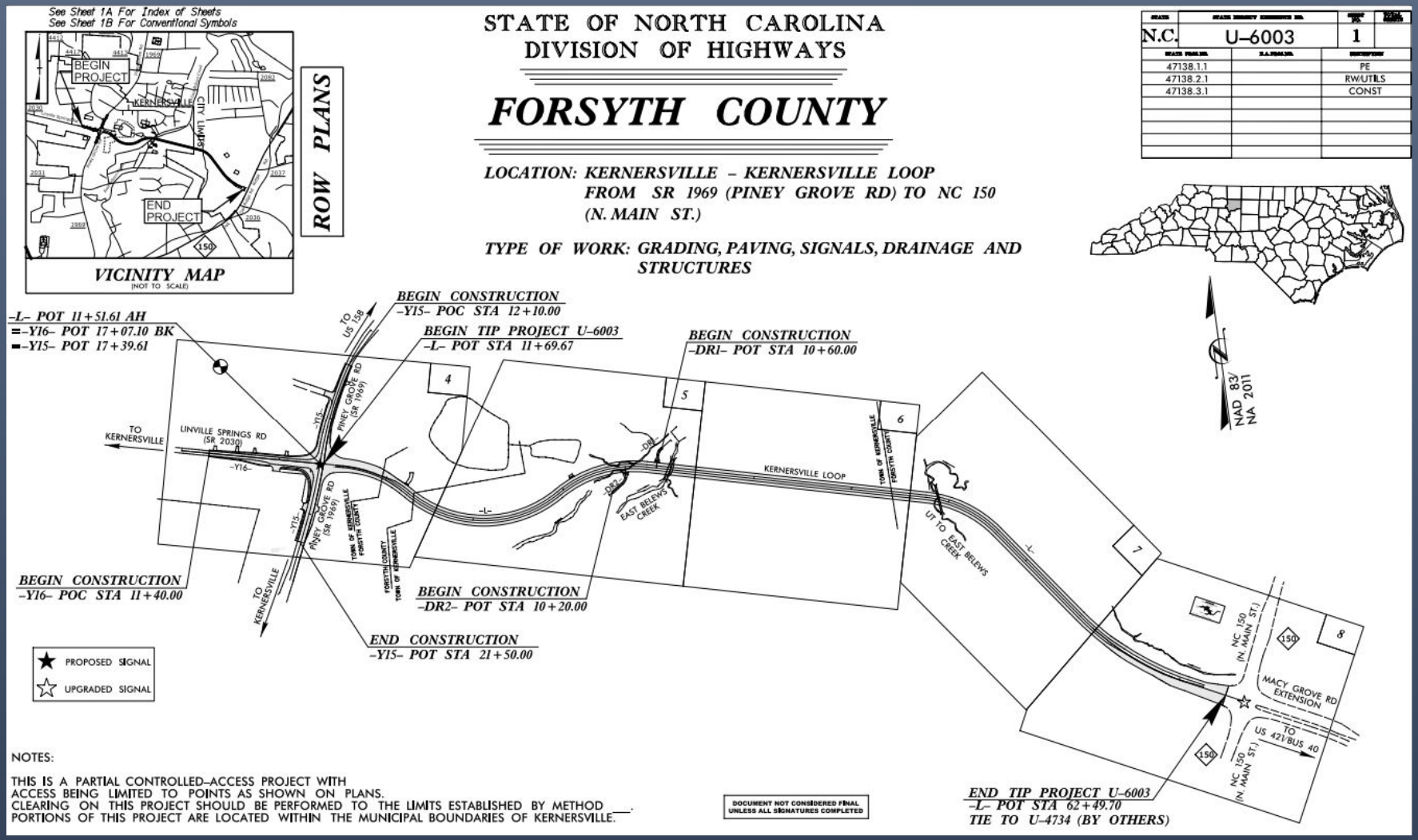
- Primary Need
  - Lack of east-west connectivity in the Kernersville area
- Secondary Need
  - Projected failing LOS for adjacent roadways
- Primary Purpose
  - Provide east-west connectivity
- Secondary Purpose
  - Improve adjacent intersections an roadway network LOS



U-6003 Project Location



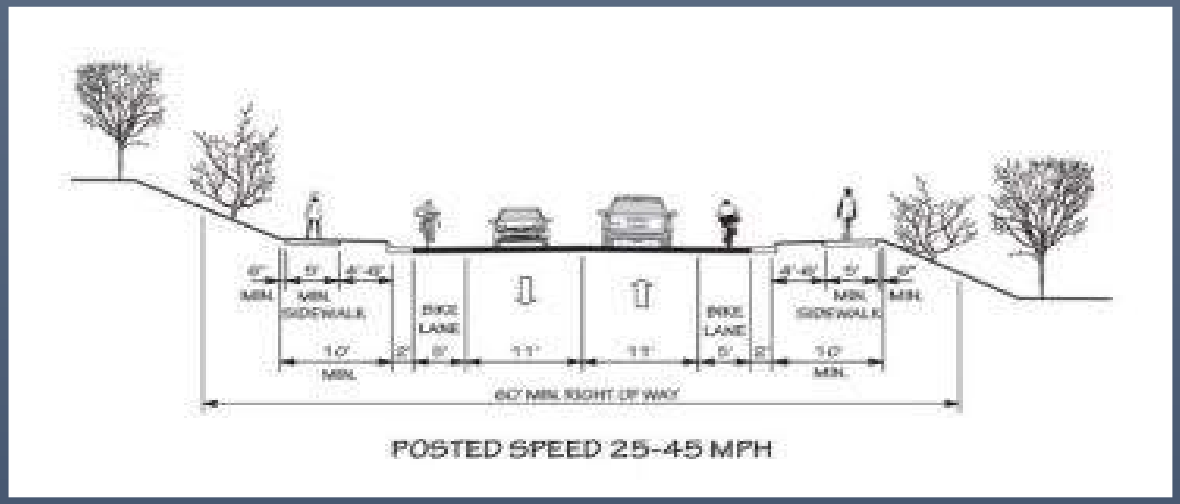
U-6003 Project Overview

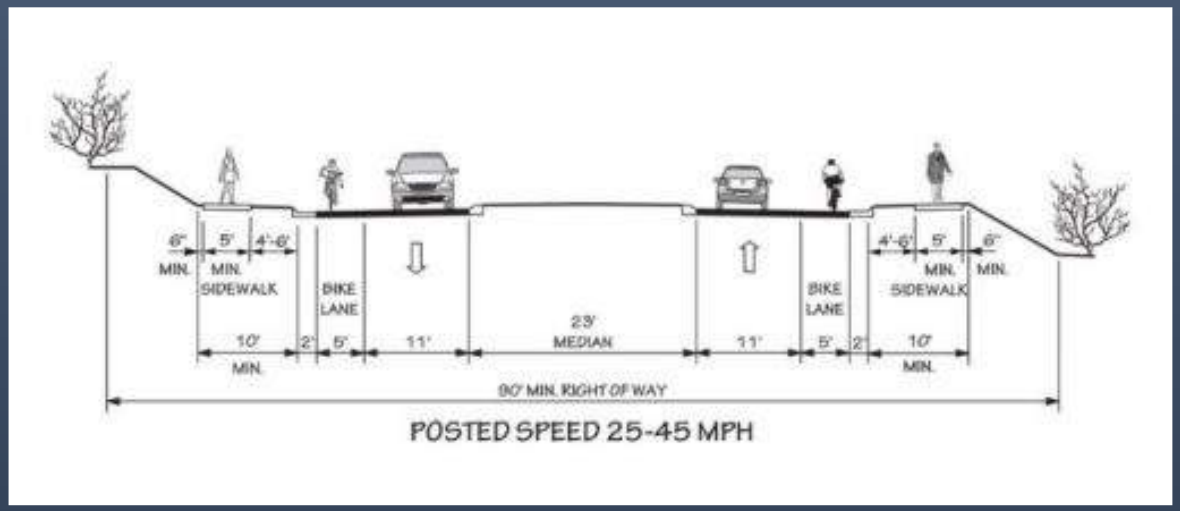


U-6003 Alternative Analysis

- Typical Sections
  - 2-lane divided vs. undivided
  - Median Width
- Alignments
  - 2 Horizontal alignments considered

U-6003 Alternative Analysis - Typical Sections Considered





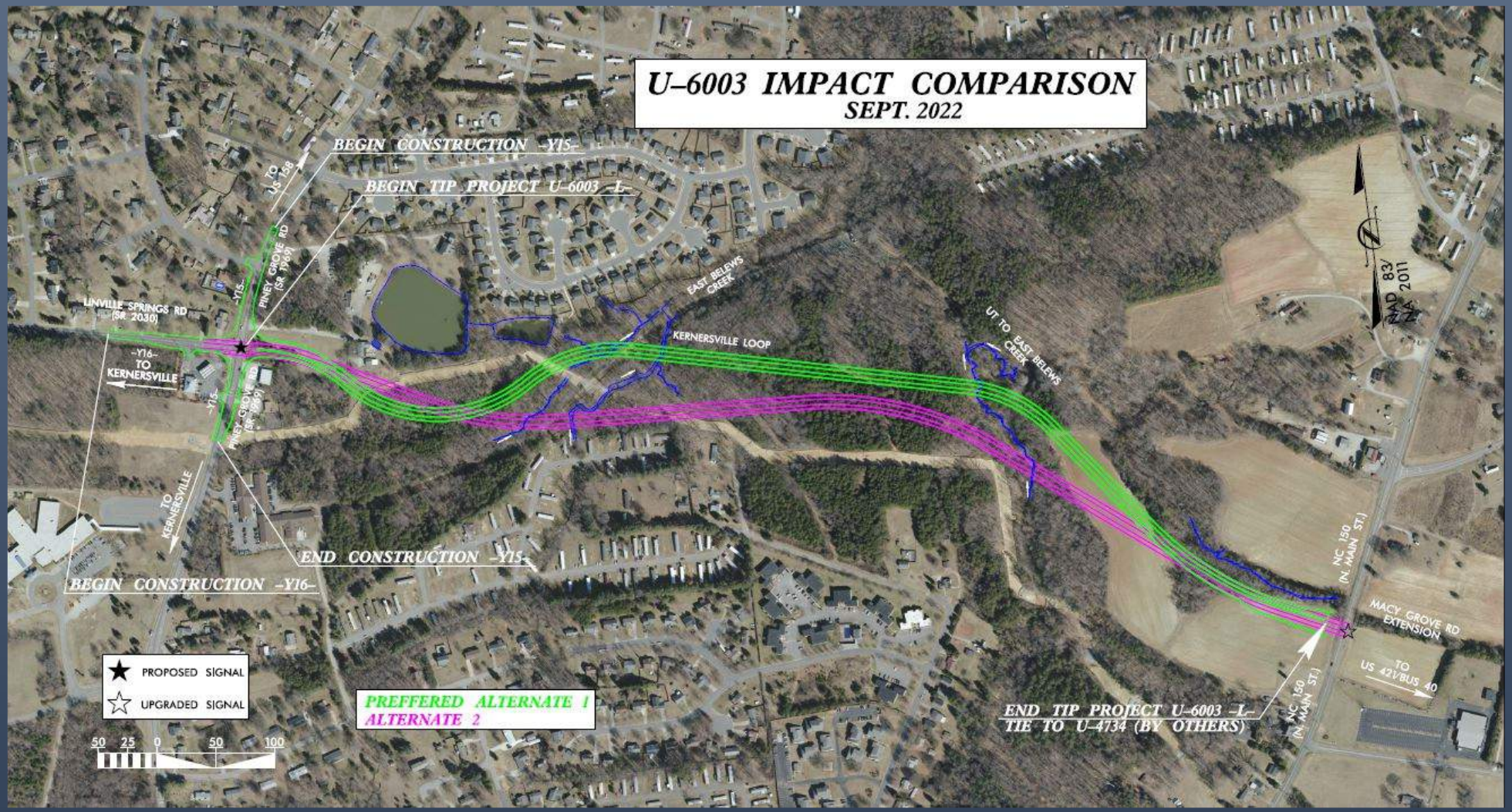
2-Lane Undivided

- 12’ lanes
- Accommodates future sidewalk

2-Lane Divided

- 17.5’, 23’, and 30’ raised medians considered
- 12’ lanes, 4’ bike lanes
- Accommodates future sidewalk

U-6003 Alternative Analysis - Alignments



U-6003 Alternative Analysis – Stream Impact Comparison

U-6003 Permit Impact Comparison Table for Permanent Impacts

Table 1.1 - Alternate 1

Site	Station	Structure	SW Impact (AC)	Linear Impact (FT)	Fill in Wetland (AC)
1	-L- 26+95/28+83	42" RCP-III	0.0160	317	-
2	-L- 26+66/29+53	42" RCP-III	0.0314	235	-
3	-L- 30+22/30+97	14'X7' RCBC	0.0468	183	-
4	-L- 30+59/30+86	3' BASE DITCH	0.0048	65	-
5	-L- 43+96/44+93	7X7 RCBC	0.0198	239	-
6	-L- 44+57/44+91	Fill	-	-	0.0139
7	-L- 55+03/55+39	3' BASE DITCH	0.0013	21	-
		Total	**0.1201**	**1060**	**0.0139**

Table 1.2 - Alternate 2

Site	Station	Structure	SW Impact (AC)	Linear Impact (FT)	Fill inWetland (AC)
1	-L2- 23+14/25+04	42" RCP-III	0.0181	256	-
2	(combined with site 1)	N/A	-	-	-
3	-L2- 26+13/27+90	14'X7' RCBC	0.0832	328	-
4	(combined with site 3)	N/A	-	-	-
5	-L2- 45+0/46+75	7X7 RCBC	0.0211	255	-
6	(no impact)	N/A	-	-	-
7	-L2- 53+44/53+60	3' BASE DITCH	0.0013	21	-
		Total	**0.1237**	**860**	**0.0000**

Notes:

1) There was minimal difference in the slope stake locations when comparing the 17.5' median vs the 23' median for each of the 3 alternatives. The 23' median option was analyzed for each alternative for impact purposes.
2) Impacts were determined between the slope stake limits
3) Both alternates will result in total takes of parcels 9 & 14; additonally -ALT2- Alternate will result in relocations of 4 mobile homes and 1 site foundation on the WHISPERING BROOK VILLAGE MHC LLC parcel.

U-6003 Preferred Alternate

- Typical Section
  - 2-lane divided
  - 23’ median Width
- Alignment
  - Alternate 1
- Avoidance and Minimization
  - Optimized horizontal alignment, profile, and drainage designs
  - Steepened slopes
  - Minimized ROW impacts
  - Lower stream impact area

U-6003 Permit Pre-application Review

TIP # U-6003
DWR stormwater comments and NCDOT responses

Comments and Responses from Concurrence Meeting

- As mentioned in our meeting, there needs to be more detail and elaboration on the SMP narrative. We are concerned about the lack of treatment regarding direct discharges tying into the culvert wall. Please explain why this is necessary.

  More detail has been added in the narrative of the updated SMP. We have addressed the decision making regarding direct discharges to culverts.

- Were post-construction SW BMPs evaluated as treatment options on this project?
  Post-construction SW BMPs were evaluated. The need for major SW controls, such as SW basins, were ruled out due to site topography and pre/post analysis at major outfalls did not result in significant changes to discharge amounts. Grass swale treatment was determined to be the most feasible SW control measure. Swales are now listed in the updated SMP. However, site topography was a limiting factor in achieving grass swale design criteria.

- At Site 2 - is there no opportunity for any type of treatment before discharging into the creek?

  Typical treatment methods would be difficult here due to steep valley grades and limited usable area. As mentioned in the SMP narrative, we then focused on ways to reduce outlet velocities from the system and used the junction box to allow the final pipe to be constructed at a low grade to dissipate energy/velocity. Also, we have added outlet protection to further dissipate energy. Outlet pad rock will be embedded to stream bed level. At the upstream side of Site 2, we elected to relocate the channel on the right side instead of immediately picking up drainage in a system.

- At Site 7 - is there treatment opportunity in the location of the proposed base (tail) ditch? Is there opportunity to bypass the flow from the lateral base ditch to avoid proposed tail ditch and reduce flow to allow for treatment area? In other words, it appears that the flow from the lateral base ditch may not need treatment. So, if DOT could convey that flow to its own outfall, away from the proposed tail ditch, any treatment provided at the tail ditch would be based on a much smaller drainage area.

  The main intent with the proposed design was to maintain existing drainage patterns. Combining the offsite drainage with the on-site system drainage to one tail ditch is preferable to reduce impacts to the receiving stream. A separate outfall to convey only drainage form lateral base diches on the south side of alignment would require a separate cross pipe and ditch tie to the jurisdictional stream. So, we would end up with a second impact location in addition to the tail ditch.

  The other option would be to divert the south side drainage by keeping on the right side of alignment and doing a combination of piping and ditching to UT East Belews Creek on sheet 7. This option would not be reasonable due to extensive pipe depth to get across the hill side and then significant ditch excavation with ditch grades requiring rip rap.