STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

September 30, 2019

Mr. Tom Steffens
U.S. Army Corps of Engineers
Washington Regulatory Field Office
Post Office Box 1000
Washington, NC 27889-1000

Mr. Stephen Lane
N.C. Dept. of Environmental Quality
Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557

Subject: **Application for CAMA Major Development Permit, Section 404 and Section 10 Individual Permit, Section 401 Water Quality Certification, and Neuse River Buffer Authorization** for the Proposed Replacement of Bridges 138 and 139 over the Neuse River on SR 14770 (Maple Cypress Road) in Craven County, North Carolina. TIP B-4484. Debit Permit Fees from WBS No. 33723.1.2

Dear Sirs:

The North Carolina Department of Transportation (NCDOT) proposes to replace the existing bridges 138 and 139 over the Neuse River in Craven County with a parallel bridges to the northwest. The purpose of this letter is to request approval under a Coastal Area Management Act (CAMA) Major Development Permit, Clean Water Act (CWA) Section 404 Individual Permit, a CWA Section 401 Water Quality Certification, Rivers and Harbors Act (RHA) Section 10, and Neuse River Buffer Authorization. In addition to this cover letter, ENGE Form 4345 and CAMA MP 1, 2, and 5 Forms, this application package includes the following: adjacent landowner list, CAMA adjacent riparian landowner notifications, stormwater management plan, permit impact drawings (including utility relocation plans), and half size roadway plans. The US Coast Guard has issued an exemption for this project, which is attached. In addition, a request has been submitted to the National Marine Fisheries Service for concurrence that the project will not affect the Atlantic Sturgeon.

1.0 Purpose and Need

As identified in the October 2017 Environmental Assessment / Finding of No Significant Impact (EA/FONSI), the need for the proposed action is to replace two structurally deficient, functionally obsolete bridges. The purpose of the proposed action is to improve bridge structural safety and functionality for vehicular traffic.

NCDOT Structures Management Unit records (*Bridge Inspection Report*, March 29, 2019; *Bridge Inspection Report*, June 7, 2019) indicate Bridge No. 138 and 139 have sufficiency ratings of 7.98 and 71.42, respectively, out of a possible 100 for a new structure. Bridge No. 138 is considered structurally deficient due to superstructure and substructure ratings of four or less and has two years of estimated

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KINSTON, NC 28504

remaining life left. Bridge No. 139 has an estimated twelve years of estimated remaining life. NCDOT has completed recent repairs to both structures.

2.0 Project Description

The proposed project is located in northeastern Craven County, approximately midway between Kinston and Vanceboro. The land surrounding the bridge is predominantly rural and includes marshes, wooded areas, large tracts of agricultural crops, and low-density single family homes.

SR 1470 (Maple Cypress Road) is a two-lane roadway with a statutory speed limit of 55 miles per hour (mph). It is classified as a major collector road according to NCDOT Functional Classification maps. The estimated (2012) annual average daily traffic (AADT) along SR 1470 (Maple Cypress Road) is 1,800 vehicles per day (vpd). There are no signalized intersections within the project study area. Craven County school buses make two total trips per day across the bridges.

Known utilities in the project study area include a water line, power, and telecommunications cable.

3.0 Summary of Impacts

Construction of the project would result in 2.5 acres of permanent wetland impacts, 0.4 acre of temporary wetland impacts, <0.01 acre of permanent surface water impacts, and 0.13 acre of temporary surface water impacts.

See Section 7.3 for wetland and surface water impact summary tables.

4.0 Summary of Mitigation

The proposed construction of B-4484 will permanently impact 2.5 acres of jurisdictional wetlands. NCDOT has investigated potential on-site wetland mitigation opportunities, but no practical mitigation sites were available. The existing roadway embankments that will be graded as part of the project were evaluated for potential mitigation credit. However, due to the presence of overhead utility lines and the relocated water line, access and clearing would be required in these areas. Therefore no mitigation credit opportunity was practical.

Therefore, mitigation will be provided by North Carolina Department of Environmental Quality – Division of Mitigation Services (DMS). In accordance with the "Memorandum of Agreement Among the North Carolina Department of Transportation, and the U.S. Army Corps of Engineers, Wilmington District" (MOA), July 22, 2003, the DMS will be requested to provide off-site mitigation to satisfy the federal CWA compensatory mitigation requirements for this project.

5.0 Project Schedule

B-4484 is scheduled to be let in April 2020. Mobilization will begin upon let followed by upland staging and construction, and relocation of utilities in uplands or via directional bore. In-water construction will start in October 2020. Due to the in-water work moratorium of February 15-September 30, proposed completion of the new bridge is 2023 and demolition of existing bridges is scheduled for 2024.

6.0 NEPA Document Status

An Environmental Assessment / Finding of No Significant Impact was signed on October 2, 2017 and is attached.

7.0 Resource Status

The project is located in the Neuse River Basin and lies within the USGS Hydrologic Unit 03020202. The project crosses the Neuse River (NCDEQ Index No. 27-(85) which is classified as C;Sw;NSW.

7.1 Wetland Delineations

Wetland delineations were performed using the 1987 U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual and the USACE 2010 Regional Supplement for the Atlantic and Gulf Coastal Plain Region. Results of the wetland delineation were reported in the April 2014 Natural Resources Technical Report (NRTR). While updated delineations were performed in 2017, inundation of the Neuse River floodplain prevented verification of this delineation, which had reduced wetland sizes in several locations. Therefore the impacts provided in this application are based on the 2014 delineation. The 2017 delineation data was used to extend the wetland boundary parallel and adjacent to the existing boat ramp driveway only. This line was field inspected on September 12, 2019 and deemed accurate. The final design avoids and minimizes wetland impacts to the maximum extent practical.

7.2 Characterization of Jurisdictional Sites

The project area bridges the Neuse River on Maple Cypress Road in Craven County. Seven wetlands were mapped within the project footprint, including riverine swamp forest and bottomland hardwood forest. All wetlands are subject only to Section 404 regulations. No CAMA coastal wetlands are present on the site.

The Neuse River has not been designated an Outstanding Resource Water (ORW), High Quality Water (HQW) or water supply watershed (WS-I or WS-II) within 1.0 mile downstream of the study area.

Per the above NSW designation, NCDOT's Design Standards in Sensitive Watersheds will be implemented for the project.

7.3 Impacts to Jurisdictional Resources

Impacts to jurisdictional wetlands as well as surface waters for B-4484 are summarized below in Tables 1 and 2.

Table 1: Wetland Impacts

Permit Drawing Site Number	Wetland Biotic Communities (2014 NRTR)	Wetland Type	Permanent Impacts (ac.)	Temporary Impacts (ac.)
1	Riverine Swamp Forest / Bottomland Hardwood Forest	404	0.74	-
2	Riverine Swamp Forest / Bottomland Hardwood Forest	404	1.76	0.4
		Total:	**2.5**	**0.4**

- Permanent Impacts represent permanent excavation, fill, and mechanized clearing
- Temporary Impacts represent temporary fill (work platform) and construction access (hand clearing)
- Totals represent the cumulative area of each site (not rounded per site) so differ slightly from individual site impacts

Table 2: Surface Water Impacts

Permit Drawing Site Number	Waterbody	Permanent (ac.)	Temporary (ac.)	Mitigation Required
1	Neuse River	<0.01	0.13	No
	Total:	**<0.01**	**0.13**	

- Totals represent the cumulative area of each site (not rounded per site) so differ slightly from individual site impacts

Table 3: Riparian Buffer Impacts

Permit Drawing Site Number	Waterbody	Zone 1 (s.f.)	Zone 2 (s.f.)	Mitigation Required
1	Neuse River	7,479	4,364	No
	Total:	**7,479**	**4,364**	

Permanent Impacts: Proposed permanent impacts include fill for roadway embankment in 1.09 acres of 404 jurisdictional wetlands at Sites 1 and 2. Permanent excavation impacts to 404 riparian wetlands consist of 0.09 acre for relocation of an existing channel at impact site 2. There will be 1.2 acres of mechanized clearing at both sites 1 and 2 in wetlands for construction access (0.58 ac) and maintenance (0.62 ac). Proposed permanent impacts to surface waters are <0.01 acre (141 sq. ft), which includes the proposed bridge piles (Sites 1 and 2).

Temporary Impacts: There will be 0.27 acre of temporary wetland impacts for dewatering and construction access associated with the channel relocation within the Neuse River floodplain at Site 2, which will also require 0.09 acre of excavation in wetlands to construct. A total of 0.11 acre of excavation will also be required to allow the grading of the causeway areas downstream of the new bridge 139 to be tied into adjacent wetland elevation. There will be 0.13 acre of temporary surface water impacts to the Neuse River due to the work platforms, bridge construction, and existing bridge demolition. Of the 1.2 acres of mechanized clearing, 0.58 acre will be allowed to revegetate after project completion.

Utility Relocation: Overhead power lines and aerial and subsurface water lines will require relocation to allow construction of the proposed project. The overhead power line relocation will involve one pole moved within an upland location near bridge 139 at the Wildlife Resources Commission boat ramp access

drive. The existing water line is both aerial and subsurface throughout the project. The new line will be installed from upland roadside bore pits using directional drill methods.

Bridge Demolition

Both bridges will be demolished using top-down methods. Temporary impacts associated with the removal of the existing piles at each bridge total 0.07 acre of surface water for bridge 138, and 0.03 acre of wetland for bridge 139. The superstructure of each bridge will be cut and removed with measures in place to prevent materials from entering jurisdictional waters. Once a segment of bridge is removed, the existing piles will be pulled. Full removal of piles will be accomplished unless they break off during removal. In that case, the piles will be cut at or below the river bed (bridge 138) or wetland elevation (bridge 139) to avoid increased disturbance to completely remove the piles. NCDOT's Best Management Practices for Construction and Maintenance Activities will be implemented for the bridge demolition. A Bridge Demolition Plan will be prepared by the selected contractor, submitted to NCDOT for approval, and shared with permitting agencies.

Individual impact site descriptions are provided below:

7.3.1 Site 1 (Permit Drawings 4-5)
Site 1 is the replacement of bridge 138 over the Neuse River. The bridge approaches will be constructed with retaining walls to reduce encroachment into adjacent wetlands. Fill slopes above the retaining wall have been steepened as much as practical to 2:1 due to load limits on the retaining wall and constructability and safety considerations adjacent to the sheet pile walls. Rock plating, while not required, will be applied to the slopes for added protection and stability. Mechanized clearing will be performed adjacent to the retaining walls for construction access and under the bridge for maintenance access. A work platform will be used to construct the new bridge from both sides of the Neuse River, with a span left open to maintain boat passage. Three minor impacts (fill and mechanized clearing) are also proposed to allow for non-erosive discharge of stormwater from the bridge into the adjacent wetlands, rather than direct discharge into the river.

7.3.2 Site 2 (Permit Drawings 6-9)
Site 2 is the construction of the new bridge over the Neuse River overflow and associated approaches. The roadway fill approaching this bridge will be constructed with 1.5:1 side slopes protected with rock plating. A retaining wall was evaluated for this area but deemed not practical due to design and constructability considerations. Construction of the wall at this location would require tie-backs that would result in moving the wall further out into the wetland in order to maintain traffic on the existing road. This would have caused additional impacts to wetlands as compared to the proposed 1.5:1 slopes without retaining walls. Mechanized clearing will be performed adjacent to the fill slope and for the bridge and work platform to allow for construction access and pile installation. The existing road embankment will be abandoned upon completion of the construction and graded down to drain via sheet flow into the adjacent wetlands. A temporary construction area has been established around the channel relocation to allow for sheet piling or other dewatering method to be implemented so the culvert extension can be constructed in the dry.

8.0 Protected Species

The United States Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) list 16 federally protected species for Craven County as of the September 20, 2019 listing (Table 3).

Table 3. Federally Protected Species in Craven County

Scientific Name	Common Name	Federal Status	Habitat	Biological Conclusion
Alligator mississippiensis	American alligator	T(S/A)	Yes	N/A
Chelonia mydas	Green sea turtle	T	No	No Effect
Dermochelys coriacea	Leatherback sea turtle	E	No	No Effect
Myotis septentrionalis	Northern long-eared bat	T	Yes	MALAA
Necturus lewisi	Neuse River waterdog	PT	Yes	N/A
Noturus furiosus	Carolina madtom	PE	Yes	N/A
Picoides borealis	Red-cockaded woodpecker	E	No	No Effect
Calidris canutus rufa	Red knot	T	No	No Effect
Acipenser oxyrinchus	Atlantic Sturgeon	E	Yes	MANLAA
Trichechus manatus	West Indian manatee	E	Yes	MANLAA
Lysimachia asperulaefolia	Rough-leaved loosestrife	E	No	No Effect
Aeschynomene virginica	Sensitive joint-vetch	T	No	No Effect

E = Endangered, T = Threatened, T(S/A) = Threatened(Similarity of Appearance), T = Threatened, P=Proposed; MANLAA= May Affect, Not Likely to Adversely Affect, MALAA = May Affect, Likely to Adversely Affect, N/A = Not Applicable.

NCDOT has determined that the project will not affect listed species, with the exception of Northern long-eared bat, Atlantic sturgeon, and West Indian manatee. Biological conclusions from the 2014 NRTR are provided in Table 3. A request has been submitted to the NMFS for concurrence that the project is not likely to adversely affect the Atlantic sturgeon.

American alligator
Biological Conclusion: Not Applicable

The American alligator remains on the protected species list due to its similarity in appearance to the Endangered American crocodile and no biological conclusion is required.

Green sea turtle
Biological Conclusion: No Effect

This project will not affect the beaches or coastal waters of North Carolina, therefore no habitat for green sea turtles exists within the study area. A review of NCNHP records, accessed September 24, 2019, indicates no known green sea turtle occurrences within 1.0 mile of the study area.

Leatherback sea turtle
Biological Conclusion: No Effect

This project will not affect the beaches or coastal waters of North Carolina, therefore no habitat for leatherback sea turtles exists within the study area. A review of NCNHP records, updated May 1, 2009, indicates no known leatherback sea turtle occurrences within 1.0 mile of the study area.

Northern long-eared bat

Biological Conclusion: May Affect, Likely to Adversely Affect

The USFWS has developed a programmatic biological opinion (PBO) in conjunction with the Federal Highway Administration, the US Army Corps of Engineers and NCDOT for the northern long-eared bat (NLEB) (*Myotis septentrionalis*) in eastern North Carolina. The PBO covers the entire NCDOT program in Divisions 1-8, including all NCDOT projects and activities. The programmatic determination for NLEB for the NCDOT program is "May Affect, Likely to Adversely Affect." The PBO provides incidental take coverage for NLEB and will ensure compliance with Section 7 of the Endangered Species Act for five years for all NCDOT projects with a federal nexus in Divisions 1-8, which includes Craven County.

Red-cockaded woodpecker

Biological Conclusion: No Effect

Suitable habitat for the red cockaded woodpecker does not exist in the study area. Forests in the study area are comprised of a closed hardwood canopy and subcanopy. Where pine trees occur in maintained or disturbed areas, they are not of sufficient age or density to provide suitable nesting or foraging habitat. A review of NCNHP records, accessed September 25, 2019, indicates no known RCW occurrences within 1.0 mile of the study area.

Red knot

Biological Conclusion: No Effect

Suitable habitat for the red knot does not exist in the study area. The study area consists of forested, riparian areas in a freshwater system. It lacks coastal foraging and roosting areas preferred by the red knot. A review of NCNHP records, accessed September 25, 2019, indicates no known red knot occurrences within 1.0 mile of the study area.

Atlantic Sturgeon

Biological Conclusion: May Affect, Not Likely to Adversely Affect

The Neuse River at this location is designated as critical habitat for the Atlantic sturgeon. A review of NCNHP records, access September 25, 2019, indicates there are no known Atlantic sturgeon occurrences within 1.0 mile of the study area.

West Indian manatee

Biological Conclusion: May Affect, Not Likely to Adversely Affect

Suitable habitat for the West Indian manatee does exist in the study area. A review of NCNHP records, accessed September 25, 2019, revealed a 1994 manatee occurrence within the study area (EO ID: 5451). NCDOT will utilize the "Guidelines for Avoiding Impacts to the West Indian Manatee: precautionary Measures for Construction Activities in North Carolina's Waters" during construction of the bridge.

Rough-leaved loosestrife

Biological Conclusion: No Effect

Suitable habitat for rough-leaved loosestrife does not exist in the study area. The canopy in the wetland areas that are not regularly flooded is too dense to allow rough-leaved loosestrife to grow. A review of NCNHP records, accessed September 25, 2019, indicates no known rough-leaved loosestrife occurrence within 1.0 mile of the study area.

Sensitive joint-vetch
Biological Conclusion: No Effect

Suitable habitat for sensitive joint-vetch does not exist in the study area. The wetland areas and roadside ditches are not brackish or tidally influenced and therefore do not provide the necessary conditions for this vetch. A review of NCNHP records, accessed September 25, 2019, indicates no known sensitive joint-vetch occurrence within 1.0 mile of the study area.

Two other species, the Neuse River waterdog and the Carolina madtom are proposed for listing under the Endangered Species Act. Surveys were performed at the site in Spring 2019 and none were found.

8.1 Bald and Golden Eagle Protection Act (BGPA)

In the July 9, 2007 Federal Register (72:37346-37372), the bald eagle was declared recovered, and removed (de-listed) from the Federal List of Threatened and Endangered wildlife. This delisting took effect August 8, 2007. After delisting, the Bald and Golden Eagle Protection Act (Eagle Act) (16 U.S.C. 668-668d) became the primary law protecting bald eagles.

The Neuse River is a water body of sufficient size to be considered potential feeding habitat. Also, there are trees near the project large enough to support the nesting of bald eagles. While a bald eagle was seen on the July 6, 2009 site visit, no nest trees were visible within 660 feet of the study area. A review of NCNHP records, accessed September 26, 2019, indicates no known bald eagle occurrence within 1.0 mile of the study area. The NCDOT will survey the project area again for bald eagle nests prior to construction.

8.2 Protection Measures

Protection measures for several species have been recommended for B-4484. The Neuse River within the project area is designated as critical habitat for the Atlantic sturgeon. In order to minimize potential effects to these resources, NCDOT has committed to the following nondiscretionary measures for the construction of this project:

In-Water Work Moratorium:
An in-water work moratorium will be implemented during the construction of B-4484. Construction activity at or below the mean high water elevation within the Neuse River, including its floodplain when inundated, will not be allowed from February 15 to September 30. Work in upland areas, on the bridge superstructure, and within exclusion devices around individual bents or other work areas (installed prior to the start of the moratorium) will be allowed to continue.

West Indian Manatee:
All conditions outlined in Guidelines for Avoiding Impacts to the West Indian Manatee: Precautionary Measures for Construction Activities in North Carolina Waters (USFWS, 2003) will be adhered to.

9.0 Cultural Resources

No sites eligible for the National Register of Historic Places are within the project area. NC State Historic Preservation Office concurrence is included in the attached EA.

10.0 FEMA Compliance

The project has been coordinated with appropriate state and local officials and the Federal Emergency Management Agency (FEMA) to assure compliance with FEMA, state, and local floodway regulations.

11.0 Mitigation Options

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts.

11.1 Avoidance & Minimization

All jurisdictional features were delineated, field verified and surveyed within the corridor for B-4484 as described above. Using these surveyed features, preliminary designs were adjusted to avoid and/or minimize impacts to jurisdictional areas. NCDOT employs many strategies to avoid and minimize impacts to jurisdictional areas in all of its designs. Many of these strategies have been incorporated into BMP documents that have been reviewed and approved by the resource agencies and which will be followed throughout construction. All wetland areas and environmental sensitive areas (ESA) not affected by the project will be protected from unnecessary encroachment. Individual avoidance and minimization measures include the following:

11.1.1 Design Measures

- Bridge 138 over the Neuse River has been lengthened to span riparian buffers and the river banks.
- Retaining walls have been utilized to reduce wetland impacts on the approaches to bridge 138.
- There will be no deck drains or direct discharge of stormwater off the bridges. All stormwater will be discharged at the ends of the bridges at non-erosive velocity.
- Riprap has been eliminated along the base of sheet pile walls.
- Granite, not marl, will be specified for riprap protection areas.
- Fill slopes have been steepened to the maximum extent practical considering erosive velocities and geotechnical considerations.
    - 2:1 slopes are used above retaining walls for load, constructability, and safety considerations
    - 1.5:1 slopes are used where retaining walls were not practical (see Impact Site 2 discussion)

11.1.2 General Construction Measures

- Refer to Section 8.2 for protected species measures
- No staging of construction equipment or storage of construction supplies will be allowed in wetlands.
- Temporary work platforms are proposed to access the new bridge alignments except one span to allow boat passage along the river where a barge may be used.
- Sediment and erosion control measures shall adhere to the Design Standards in Sensitive Watersheds during construction of the project.
- Special Sediment Control Fence and Environmentally-Sensitive Area fencing will be used where applicable.
- Bridge piles will be driven, and no jetting will be used.
- Pile driving will be accomplished using pile cushions and will be ramped up to minimize the effects of in-water noise.
- No dredging is proposed.
- Turbidity curtains will be considered in areas of adequate shallow depth and lower velocity. Turbidity will be monitored during in-water work to ensure compliance with state water quality standards.

- Water line relocation will be accomplished using directional subsurface methods to avoid wetland and surface water impacts.
- To ensure that all borrow and waste activities occur on high ground, except as authorized by permit, the NCDOT shall require its contractors to identify all areas to be used to borrow material, or to dispose of dredged, fill or waste material. Documentation of the location and characteristics of all borrow and disposal sites associated with the project will be available on request.

11.1.3 Demolition Measures

- NCDOT will adhere to Best Management Practices for Construction and Maintenance Activities.
- Demolition will be accomplished through top-down and/or barge access.
- Non-shattering methods will be implemented (no explosives) for bridge removal.
- No bridge deck or substructure components will be dropped in the water.
- Existing bridge piles will be removed completely, unless not practicable.
- If a pile snaps off at a depth below the stream bed or wetland elevation it will be left in place rather than disturb additional area to remove.
- A demolition plan will be finalized by the selected contractor. The final demolition plan will also be approved by NCDOT and provided to permitting agencies for review prior to implementation.

11.2 Compensation

The NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent possible as described above. Unavoidable jurisdictional wetland impacts will be offset by in-lieu fee payment to the NCDMS.

12.0 Indirect and Cumulative Effects

The project is a replacement of existing infrastructure; therefore, additional development is not likely to occur as a result of the project. The replacement will neither influence nearby land use or stimulate growth as no new travel lanes are proposed.

13.0 Regulatory Approvals

NCDOT requests that the proposed work be authorized under:

- A Coastal Area Management Act Major Development Permit. The Certified Mail records for each adjacent riparian landowner are provided with this permit application. The return receipts will be forwarded once they have been received. Authorization to debit the $475 Permit Application Fee from WBS 33723.1.2 is hereby given.
- A Clean Water Act Section 404 Individual Permit and Rivers and Harbors Act Section 10 Permit.
- A Clean Water Act Section 401 Certification and Neuse Buffer Authorization. Authorization to debit the $540 Application Fee from WBS 33723.1.2 is hereby given.

A copy of this permit application and its distribution list will be posted on the NCDOT website at: http://xfer.services.ncdot.gov/pdea/PermApps/.

If you have any questions regarding this information, please contact me at (252) 439-2811 or ckwhitley@ncdot.gov.

Sincerely,

Casey Whitley, PE PLS
Division 2

cc: NCDOT Permit Application Standard Distribution List
Garcy Ward, NCDWR
Jay Johnson, NCDOT Division 2
Jennifer Farino, P.E., RS&H
Phil May, Carolina Ecosystems, Inc.

Attachments:
- ENG 4345 Form
- DCM MP-1 Form: Application for Major Development Permit
- DCM MP-2 Form: Excavation and Fill
- DCM MP-5 Form: Bridges and Culverts
- USACE Landowner List
- CAMA Landowner List & Notification Receipts
- EA/FONSI
- Vicinity Map
- USGS Map
- Stormwater Management Plan
- Permit Impact Drawings
- Impact Summary Table
- Buffer Drawings
- Roadway Drawings
- Utility Drawings

U.S. ARMY CORPS OF ENGINEERS

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

33 CFR 325. The proponent agency is CECW-CO-R.

OMB APPROVAL NO. 0710-0003
EXPIRES: 28 FEBRUARY 2013

Public reporting for this collection of information 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 this burden estimate or any other aspect of the collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters, Executive Services and Communications Directorate, Information Management Division and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003). 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 form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

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.

(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 - Casey Middle - Last - Whitley	First - Middle - Last -
Company - NCDOT Highway Division 2	Company -
E-mail Address - ckwhitley@ncdot.gov	E-mail Address -
6. APPLICANT'S ADDRESS:	**9. AGENT'S ADDRESS:**
Address- 1037 W.H. Smith Blvd	Address-
City - Greenville State - NC Zip - 27835 Country - USA	City - State - Zip - Country -
7. APPLICANT'S PHONE NOs. w/AREA CODE	**10. AGENTS PHONE NOs. w/AREA CODE**
a. Residence b. Business (252)439-2811 c. Fax (252)830-3352	a. Residence b. Business c. Fax

STATEMENT OF AUTHORIZATION

11. I hereby authorize, _____ 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.

_____ _____
SIGNATURE OF APPLICANT DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)
B-4484

13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)
Neuse River	Address Maple Cypress Road
15. LOCATION OF PROJECT Latitude: °N 35.3132 Longitude: °W -77.3006	City - Dover State- NC Zip- 28526

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)
State Tax Parcel ID Municipality Dover
Section - Township - Range -

17. DIRECTIONS TO THE SITE

From Washington, take US-17 Business to Vanceboro. Turn right onto NC-118 W/Bailey Ln/Dawson Ln and continue for approximately three miles. Turn left onto Nelson Road, and in six miles, turn left onto Maple Cypress Road. Project will be located in approximately 0.5 mile crossing the Neuse River and it's overflow channel.

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

Bridge No. 138 is 22 feet wide accommodating a two-lane roadway and is 580.5 feet in length. Bridge No. 139 is 29 feet wide accommodating a two-lane roadway and is 180 feet in length. Bridge No. 138 is proposed to be 600 feet in length, and Bridge No. 139 is proposed to be 375 feet in length. Bridge 138 will be 34.5 feet wide (30-foot clear roadway width) accommodating two 11-foot lanes and four-foot shoulders and will be constructed on the northwest side of the existing bridge. Bridge 139 will accommodate two 11-foot lanes and one three-foot should, and one six-foot shoulder. Traffic will use the existing bridges during construction, with temporary pavement widening and one-lane, two-way flagger operations.

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

The purpose of this project is to improve bridge safety and functionality. The need for the project is to replace the structurally deficient bridges.

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

20. Reason(s) for Discharge

Proposed impacts are required as a result of a new alignment for the roadway and bridges, as well as shoulders and lengthening/replacing existing hydraulic structures within the project corridor.

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 See attached cover letter.

or

Linear Feet See attached cover letter.

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

See attached cover letter.

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- See attached Property Owners List.

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.

Jose White — 10/1/19

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.

DCM MP-1

APPLICATION for Major Development Permit

(last revised 12/27/06)

North Carolina DIVISION OF COASTAL MANAGEMENT

1. Primary Applicant/ Landowner Information

Business Name Ncdot Division 2			Project Name (if applicable) B-4484 Replace Bridges No. 138 & 139 over the Neuse River	
Applicant 1: First Name Casey	MI K		Last Name Whitley	
Applicant 2: First Name N/A	MI N/A		Last Name N/A	
If additional applicants, please attach an additional page(s) with names listed.				
Mailing Address 1037 W H Smith Blvd			PO Box 1587	City Greenville	State NC
ZIP 27835	Country USA	Phone No. 252 - 439 - 2811 ext.		FAX No. N/A - -
Street Address *(if different from above)* N/A			City N/A	State N/A	ZIP N/A-
Email ckwhitley@ncdot.gov				

2. Agent/Contractor Information

Business Name N/A				
Agent/ Contractor 1: First Name N/A	MI N/A		Last Name N/A	
Agent/ Contractor 2: First Name N/A	MI N/A		Last Name N/A	
Mailing Address N/A			PO Box N/A	City N/A	State N/A
ZIP N/A		Phone No. 1 N/A - - ext.		Phone No. 2 N/A - - ext.
FAX No. N/A		Contractor # N/A		
Street Address *(if different from above)* N/A			City N/A	State N/A	ZIP N/A -
Email N/A				

<Form continues on back>

3. Project Location

County (can be multiple)	Street Address		State Rd. #
Craven	Maple Cypress Road		1470
Subdivision Name	**City**	**State**	**Zip**
N/A	Dover	NC	28526 -

Phone No.	Lot No.(s) *(if many, attach additional page with list)*
N/A - - ext.	N/A, , ,
a. In which NC river basin is the project located? Neuse	b. Name of body of water nearest to proposed project Neuse River
c. Is the water body identified in (b) above, natural or manmade? ☒Natural ☐Manmade ☐Unknown	d. Name the closest major water body to the proposed project site. Neuse River
e. Is proposed work within city limits or planning jurisdiction? ☐Yes ☒No	f. If applicable, list the planning jurisdiction or city limit the proposed work falls within. N/A

4. Site Description

a. Total length of shoreline on the tract (ft.)	b. Size of entire tract (sq.ft.)
154 feet	504,700 sq.ft.
c. Size of individual lot(s) N/A, , , *(If many lot sizes, please attach additional page with a list)*	d. Approximate elevation of tract above NHW *(normal high water)* or NWL *(normal water level)* 20' ☐NHW or ☒NWL

e. Vegetation on tract
Primarily maintained roadside grasses and herbs, mixed pine and oak forest, and riverine swamp forest.

f. Man-made features and uses now on tract
Man-made features include existing bridges and roadway, as well as subsurface and aerial utilities. Uses include transportation and recreational fishing and boating.

g. Identify and describe the existing land uses adjacent to the proposed project site.
Primarily undeveloped land, open water, and institutional (boat ramp and public river access).

h. How does local government zone the tract?	i. Is the proposed project consistent with the applicable zoning? (Attach zoning compliance certificate, if applicable)
Craven County has not zoned this area.	☐Yes ☐No ☒NA

j. Is the proposed activity part of an urban waterfront redevelopment proposal? ☐Yes ☒No

k. Has a professional archaeological assessment been done for the tract? If yes, attach a copy. ☒Yes ☐No ☐NA

If yes, by whom? NCDOT

l. Is the proposed project located in a National Registered Historic District or does it involve a National Register listed or eligible property? ☐Yes ☒No ☐NA

<Form continues on next page>

m. (i) Are there wetlands on the site?	☒Yes ☐No
(ii) Are there coastal wetlands on the site?	☐Yes ☒No
(iii) If yes to either (i) or (ii) above, has a delineation been conducted? *(Attach documentation, if available)*	☒Yes ☐No
n. Describe existing wastewater treatment facilities. N/A	
o. Describe existing drinking water supply source. N/A	
p. Describe existing storm water management or treatment systems. Existing roadway stormwater either sheet flows to existing roadside ditches or drains directly from the bridges into the Neuse River or it's overflow.	

5. Activities and Impacts

a. Will the project be for commercial, public, or private use?	☐Commercial ☒Public/Government ☐Private/Community
b. Give a brief description of purpose, use, and daily operations of the project when complete. See cover letter.	
c. Describe the proposed construction methodology, types of construction equipment to be used during construction, the number of each type of equipment and where it is to be stored. See cover letter.	
d. List all development activities you propose. See cover letter.	
e. Are the proposed activities maintenance of an existing project, new work, or both?	Both - construction of replacement bridges on new location and existing roadway.
f. What is the approximate total disturbed land area resulting from the proposed project?	3.8 acres ☐Sq.Ft or ☒Acres
g. Will the proposed project encroach on any public easement, public accessway or other area that the public has established use of?	☒Yes ☐No ☐NA
h. Describe location and type of existing and proposed discharges to waters of the state. See cover letter and attached permit impact drawings.	
i. Will wastewater or stormwater be discharged into a wetland?	☒Yes ☐No ☐NA
If yes, will this discharged water be of the same salinity as the receiving water?	☐Yes ☒No ☐NA
j. Is there any mitigation proposed? If yes, attach a mitigation proposal.	☒Yes ☐No ☐NA

<Form continues on back>

6. Additional Information

In addition to this completed application form, (MP-1) the following items below, if applicable, must be submitted in order for the application package to be complete. Items (a) – (f) are always applicable to any major development application. Please consult the application instruction booklet on how to properly prepare the required items below.

a. A project narrative.

b. An accurate, dated work plat (including plan view and cross-sectional drawings) drawn to scale. Please give the present status of the proposed project. Is any portion already complete? If previously authorized work, clearly indicate on maps, plats, drawings to distinguish between work completed and proposed.

c. A site or location map that is sufficiently detailed to guide agency personnel unfamiliar with the area to the site.

d. A copy of the deed (with state application only) or other instrument under which the applicant claims title to the affected properties.

e. The appropriate application fee. Check or money order made payable to DENR.

f. A list of the names and complete addresses of the adjacent waterfront (riparian) landowners and signed return receipts as proof that such owners have received a copy of the application and plats by certified mail. Such landowners must be advised that they have 30 days in which to submit comments on the proposed project to the Division of Coastal Management.

Name See attached landowner list Phone No.

Address

Name Phone No.

Address

Name Phone No.

Address

g. A list of previous state or federal permits issued for work on the project tract. Include permit numbers, permittee, and issuing dates.

h. Signed consultant or agent authorization form, if applicable.

i. Wetland delineation, if necessary.

j. A signed AEC hazard notice for projects in oceanfront and inlet areas. *(Must be signed by property owner)*

k. A statement of compliance with the N.C. Environmental Policy Act (N.C.G.S. 113A 1-10), if necessary. If the project involves expenditure of public funds or use of public lands, attach a statement documenting compliance with the North Carolina Environmental Policy Act.

7. Certification and Permission to Enter on Land

I understand that any permit issued in response to this application will allow only the development described in the application. The project will be subject to the conditions and restrictions contained in the permit.

I certify that I am authorized to grant, and do in fact grant permission to representatives of state and federal review agencies to enter on the aforementioned lands in connection with evaluating information related to this permit application and follow-up monitoring of the project.

I further certify that the information provided in this application is truthful to the best of my knowledge.

Date 10/1/2019 Print Name Casey Whitley

Signature Casey Whitley

Please indicate application attachments pertaining to your proposed project.

☒DCM MP-2 Excavation and Fill Information ☒DCM MP-5 Bridges and Culverts

☐DCM MP-3 Upland Development

☐DCM MP-4 Structures Information

Form DCM MP-2

EXCAVATION and FILL

(Except for bridges and culverts)

Attach this form to Joint Application for CAMA Major Permit, Form DCM MP-1. Be sure to complete all other sections of the Joint Application that relate to this proposed project. Please include all supplemental information.

Describe below the purpose of proposed excavation and/or fill activities. **All values should be given in feet.**

	Access Channel (NLW or NWL)	Canal	Boat Basin	Boat Ramp	Rock Groin	Rock Breakwater	Other (excluding shoreline stabilization)
Length							170'
Width							20'
Avg. Existing Depth					NA	NA	1.5'
Final Project Depth					NA	NA	1.5'

1. EXCAVATION

☐ *This section not applicable*

a. Amount of material to be excavated from below NHW or NWL in cubic yards.
N/A

b. Type of material to be excavated.
Soil

c. (i) Does the area to be excavated include coastal wetlands/marsh (CW), submerged aquatic vegetation (SAV), shell bottom (SB), or other wetlands (WL)? If any boxes are checked, provide the number of square feet affected.
☐CW ____ ☐SAV ____ ☐SB ____
☒WL 3,924 ☐None

(ii) Describe the purpose of the excavation in these areas:
Channel relocation within the floodplain at Site 2.

d. High-ground excavation in cubic yards.

2. DISPOSAL OF EXCAVATED MATERIAL

☐ *This section not applicable*

a. Location of disposal area.
To be determined by contractor at an approved location.

b. Dimensions of disposal area.
Undetermined

c. (i) Do you claim title to disposal area?
☐Yes ☒No ☐NA

(ii) If no, attach a letter granting permission from the owner.

d. (i) Will a disposal area be available for future maintenance?
☒Yes ☐No ☐NA

(ii) If yes, where?
Undetermined

e. (i) Does the disposal area include any coastal wetlands/marsh (CW), submerged aquatic vegetation (SAV), shell bottom (SB), or other wetlands (WL)? If any boxes are checked, provide the number of square feet affected.
☐CW ____ ☐SAV ____ ☐SB ____
☐WL ____ ☒None

(ii) Describe the purpose of disposal in these areas:
Contractor will be required to dispose of material in upland areas only.

f. (i) Does the disposal include any area in the water?
☐Yes ☒No ☐NA

(ii) If yes, how much water area is affected?

3. SHORELINE STABILIZATION

☒ *This section not applicable*

(If development is a wood groin, use MP-4 – Structures)

a. Type of shoreline stabilization:
☐Bulkhead ☐Riprap ☐Breakwater/Sill ☐Other: _____

b. Length: _____
Width: _____

c. Average distance waterward of NHW or NWL:

d. Maximum distance waterward of NHW or NWL:

e. Type of stabilization material:

f. (i) Has there been shoreline erosion during preceding 12 months?
☐Yes ☐No ☐NA
(ii) If yes, state amount of erosion and source of erosion amount information.

g. Number of square feet of fill to be placed below water level.
Bulkhead backfill _____ Riprap _____
Breakwater/Sill _____ Other _____

h. Type of fill material.

i. Source of fill material.

4. OTHER FILL ACTIVITIES

☒ *This section not applicable*

(Excluding Shoreline Stabilization)

a. (i) Will fill material be brought to the site? ☐Yes ☐No ☐NA
If yes,
(ii) Amount of material to be placed in the water _____
(iii) Dimensions of fill area _____
(iv) Purpose of fill

b. (i) Will fill material be placed in coastal wetlands/marsh (CW), submerged aquatic vegetation (SAV), shell bottom (SB), or other wetlands (WL)? If any boxes are checked, provide the number of square feet affected.
☐CW _____ ☐SAV _____ ☐SB _____
☐WL _____ ☐None
(ii) Describe the purpose of the fill in these areas:

5. GENERAL

a. How will excavated or fill material be kept on site and erosion controlled?
Fill material will be contained behind a retaining wall, or protected with rock plating.

b. What type of construction equipment will be used (e.g., dragline, backhoe, or hydraulic dredge)?
Standard construction equipment including excavator, backhoe, dump truck etc. No dredge or dragline proposed.

c. (i) Will navigational aids be required as a result of the project?
☐Yes ☒No ☐NA
(ii) If yes, explain what type and how they will be implemented.

d. (i) Will wetlands be crossed in transporting equipment to project site? ☐Yes ☒No ☐NA
(ii) If yes, explain steps that will be taken to avoid or minimize environmental impacts.
Access to project will be via existing roadways

09/23/2019
Date

Casey Whitley
Applicant Name

B-4484 Maple Cypress Road Bridge Replacement
Project Name

Applicant Signature

Form DCM MP-5

BRIDGES and CULVERTS

Attach this form to Joint Application for CAMA Major Permit, Form DCM MP-1. Be sure to complete all other sections of the Joint Application that relate to this proposed project. Please include all supplemental information.

1. BRIDGES

☐ *This section not applicable*

a. Is the proposed bridge:
☐Commercial ☒Public/Government ☐Private/Community

b. Water body to be crossed by bridge:
Neuse River

c. Type of bridge (construction material):
Prestressed concrete

d. Water depth at the proposed crossing at NLW or NWL:
4' @ Bridge 138; 2' @ Bridge 139

e. (i) Will proposed bridge replace an existing bridge? ☒Yes ☐No
If yes,
(ii) Length of existing bridge: 580.5' & 180'
(iii) Width of existing bridge: 22' & 30'
(iv) Navigation clearance underneath existing bridge: 28.0' @ Bridge 138; 10.2' @ Bridge 139
(v) Will all, or a part of, the existing bridge be removed?
(Explain) Both Bridge 138 and 139 will be removed in their entirety.

f. (i) Will proposed bridge replace an existing culvert? ☐Yes ☒No
If yes,
(ii) Length of existing culvert: N/A
(iii) Width of existing culvert: N/A
(iv) Height of the top of the existing culvert above the NHW or NWL: N/A
(v) Will all, or a part of, the existing culvert be removed?
(Explain) N/A

g. Length of proposed bridge: 600' & 400'

h. Width of proposed bridge: 30' & 31'

i. Will the proposed bridge affect existing water flow? ☐Yes ☒No
If yes, explain: N/A

j. Will the proposed bridge affect navigation by reducing or increasing the existing navigable opening? ☒Yes ☐No
If yes, explain: Proposed low chord is approximately 0.5' higher than existing @ Bridge 138 amd 1.3' higher @ Bridge 139.

k. Navigation clearance underneath proposed bridge: 28.5' & 11.5"

l. Have you contacted the U.S. Coast Guard concerning their approval? ☒Yes ☐No
If yes, explain: USCG has issued an exemption for this project.

m. Will the proposed bridge cross wetlands containing no navigable waters? ☒Yes ☐No
If yes, explain: Bridge 139 will be constructed at 8.3' (11.5' from NWS elevation).

n. Height of proposed bridge above wetlands: 12-18'

2. CULVERTS

☒ *This section not applicable*

a. Number of culverts proposed: _____

b. Water body in which the culvert is to be placed:

< Form continues on back>

c. Type of culvert (construction material):

d. (i) Will proposed culvert replace an existing bridge? ☐Yes ☐No

If yes,

(ii) Length of existing bridge: _____

(iii) Width of existing bridge: _____

(iv) Navigation clearance underneath existing bridge: _____

(v) Will all, or a part of, the existing bridge be removed? (Explain)

e. (i) Will proposed culvert replace an existing culvert? ☐Yes ☐No

If yes,

(ii) Length of existing culvert(s): _____

(iii) Width of existing culvert(s): _____

(iv) Height of the top of the existing culvert above the NHW or NWL: _____

(v) Will all, or a part of, the existing culvert be removed? (Explain)

f. Length of proposed culvert: _____

g. Width of proposed culvert: _____

h. Height of the top of the proposed culvert above the NHW or NWL. _____

i. Depth of culvert to be buried below existing bottom contour. _____

j. Will the proposed culvert affect navigation by reducing or increasing the existing navigable opening? ☐Yes ☐No

If yes, explain:

k. Will the proposed culvert affect existing water flow? ☐Yes ☐No

If yes, explain:

3. EXCAVATION and FILL

☐*This section not applicable*

a. (i) Will the placement of the proposed bridge or culvert require any excavation below the NHW or NWL? ☐Yes ☒No

If yes,

(ii) Avg. length of area to be **excavated**: _____

(iii) Avg. width of area to be **excavated**: _____

(iv) Avg. depth of area to be **excavated**: _____

(v) Amount of material to be excavated in cubic yards: _____

b. (i) Will the placement of the proposed bridge or culvert require any excavation within coastal wetlands/marsh (CW), submerged aquatic vegetation (SAV), shell bottom (SB), or other wetlands (WL)? If any boxes are checked, provide the number of square feet affected.

☐CW _____ ☐SAV _____ ☐SB _____

☐WL _____ ☒None

(ii) Describe the purpose of the excavation in these areas:

N/A.

c. (i) Will the placement of the proposed bridge or culvert require any high-ground excavation? ☒Yes ☐No

If yes,

(ii) Avg. length of area to be excavated: 87.5'

(iii) Avg. width of area to be excavated: 75'

(iv) Avg. depth of area to be excavated: 8'

(v) Amount of material to be excavated in cubic yards: 7,090 cu. yd.

d. If the placement of the bridge or culvert involves any excavation, please complete the following:

(i) Location of the spoil disposal area: Undetermined

(ii) Dimensions of the spoil disposal area: Undetermined

(iii) Do you claim title to the disposal area? ☐Yes ☒No *(If no, attach a letter granting permission from the owner.)*

(iv) Will the disposal area be available for future maintenance? ☒Yes ☐No

(v) Does the disposal area include any coastal wetlands/marsh (CW), submerged aquatic vegetation (SAVs), other wetlands (WL), or shell bottom (SB)?

☐CW ☐SAV ☐WL ☐SB ☒None

If any boxes are checked, give dimensions if different from (ii) above. Undetermined

(vi) Does the disposal area include any area below the NHW or NWL? ? ☐Yes ☒No

If yes, give dimensions if different from (ii) above. Undetermined

e. (i) Will the placement of the proposed bridge or culvert result in any fill (other than excavated material described in Item d above) to be placed below NHW or NWL? ☒Yes ☐No

If yes,

(ii) Avg. length of area to be filled: 12 sq ft

(iii) Avg. width of area to be filled: 12 sq ft

(iv) Purpose of fill: Pilings for the two proposed bridges.

f. (i) Will the placement of the proposed bridge or culvert result in any fill (other than excavated material described in Item d above) to be placed within coastal wetlands/marsh (CW), submerged aquatic vegetation (SAV), shell bottom (SB), or other wetlands (WL)? If any boxes are checked, provide the number of square feet affected.

☐CW ____ ☐SAV ____ ☐SB ____

☒WL 103,708 ☐None

(ii) Describe the purpose of the excavation in these areas:

Retaining wall construction, rip rap outlets, and proposed roadway for bridges 138 and 139.

g. (i) Will the placement of the proposed bridge or culvert result in any fill (other than excavated material described in Item d above) to be placed on high-ground? ☒Yes ☐No

If yes,

(ii) Avg. length of area to be filled: 25' & 11'

(iii) Avg. width of area to be filled: 95' & 61'

(iv) Purpose of fill: Roadway construction

4. GENERAL

a. Will the proposed project require the relocation of any existing utility lines? ☒Yes ☐No

If yes, explain: Overhead electric and aerial/subsurafce water. (see cover letter).

b. Will the proposed project require the construction of any temporary detour structures? ☐Yes ☒No

If yes, explain:

If this portion of the proposed project has already received approval from local authorities, please attach a copy of the approval or certification.

< Form continues on back>

c. Will the proposed project require any work channels? ☐Yes ☒No

If yes, complete Form DCM-MP-2.

d. How will excavated or fill material be kept on site and erosion controlled?

NCDOT standard practices (i.e. silt fence & check dams)

e. What type of construction equipment will be used (for example, dragline, backhoe, or hydraulic dredge)?

Standard construction equipment including cranes, pile drivers, backhoes, excavators, barges, boats, & dump trucks

f. Will wetlands be crossed in transporting equipment to project site? ☐Yes ☒No

If yes, explain steps that will be taken to avoid or minimize environmental impacts.

g. Will the placement of the proposed bridge or culvert require any shoreline stabilization? ☐Yes ☒No

If yes, complete form MP-2, Section 3 for Shoreline Stabilization only.

9/23/2019

Date

B-4484 Maple Cypress Road Bridge Replacement

Project Name

Casey Whitley

Applicant Name

Casey Whitley

Applicant Signature

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

September 26, 2019

Dear Landowner:

The North Carolina Department of Transportation is planning to replace bridges 138 and 139 on SR 1470 (Maple Cypress Road) over the Neuse River. The proposed project will replace the aging existing structures over the Neuse River and its overflow channel. A full permit application detailing the bridge replacement will be provided to you in the Fall of 2019. NCDOT is currently proposing to relocate utilities (overhead power lines and underground water) out of the future construction area.

This bridge relocation crosses an Area of Environmental Concern, as defined by the North Carolina Division of Coastal Management (DCM), and must be approved by the DCM under provisions of the Coastal Area Management Act (CAMA). One of the prerequisites to this approval is that adjacent riparian landowners be given an opportunity to comment on the proposal.

The attached form is submitted to ensure that you have an opportunity to comment on the proposal. If you have **no** objections to the proposal, please return the form with your response within 30 days to this office. If you **do** have objections to the project, please forward your comments to:

Mr. Stephen Lane
N.C. Division of Coastal Management
400 Commerce Ave.
Morehead City, NC 28557

Thank you for your cooperation.

Sincerely,

Casey Whitley, P.E.
NCDOT Division 2

cc: Stephen Lane, NCDCM

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION 2
1037 W.H. SMITH BLVD
GREENVILLE, NC 27835

Telephone: (252) 439-2811
Customer Service: 1-877-368-4968
Website: www.ncdot.gov

Location:
1037 W.H. SMITH BLVD
GREENVILLE, NC 27835

ADJACENT RIPARIAN LANDOWNER STATEMENT

(Craven County: Replace Bridge Nos. 138 and 139 over the Neuse River)
NCDOT TIP B-4484

General Statutes and Division of Coastal Management Major Permit approval procedures require that riparian landowners with property adjoining a proposed development in an Area of Environmental Concern (AEC) be given thirty (30) days in which to comment on the proposed development. This form allows the adjacent riparian landowner to express either: (1) that he/she objects to the project; or, (2) that he/she does not object and desires to waive his/her right to the 30-day period so that the processing of the application can progress more rapidly. Of course, the adjacent riparian landowner need not sign this form at all if he/she so chooses.

I, _____ , am an adjacent riparian property owner and am aware of the North Carolina Department of Transportation's plans for relocating utilities associated with the future replacement of bridges 138 and 139 over the Neuse River in Craven County, North Carolina. I am further aware that this work will occur in one or more Areas of Environmental Concern and therefore will require authorization from the Division of Coastal Management in accordance with the Coastal Area Management Act (CAMA).

_____ I have no objection to the project as presently proposed and hereby waive that right of objection as provided in General Statute 113-229.

_____ I have objections to the project as presently proposed and my comments are attached.

_____ _____

Signature of Adjacent Riparian Landowner Date

_____

Phone Number with Area Code

Parcel	Owner Name	Mailing Address
1	Frances T. Kilpatrick	9201 NC Highway 55 West, Dover, NC 28526
2	Sandra N. White	428 White Columns Way, Wilmington, NC 28411
3	William E. Daniels	202 7th Street, New Bern, NC 28560
4	Coastal Forest Resources Company	PO Box 709, Buckhannon, WV 26201
5	Vonnie Heath	138 Castle Ct, Washington, NC 27889
6	Ray Heath	165 Maple Cypress Road, Grifton, NC 28530
7	Tonya H Byrd & Margaret Hargett & Dallas Delabruere & Austin A Hargett	116 Pinenut Lane, Bogart, GA 30622
8	Tonya H Byrd & Margaret Hargett & Dallas Delabruere & Austin A Hargett	116 Pinenut Lane, Bogart, GA 30622
Add.	Heath Family Farms, LLC	650 Biddle Road, Dover, NC 28526

REPLACEMENT OF BRIDGE NO. 138 AND 139
CARRYING SR 1470 (MAPLE CYPRESS ROAD)
OVER THE NEUSE RIVER
CRAVEN COUNTY, NORTH CAROLINA

WBS NO. 33723.1.1
STIP PROJECT NO. B-4484

ADMINISTRATIVE ACTION

STATE ENVIRONMENTAL ASSESSMENT /
FINDING OF NO SIGNIFICANT IMPACT

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS – DIVISION 2

Submitted pursuant to the North Carolina State Environmental Policy Act

APPROVED:

10/2/2017

DocuSigned by:
Preston Hunter
5433AB43E8E9415...

Date

R. Preston Hunter, PE, Division Engineer
North Carolina Department of Transportation – Division 2

REPLACEMENT OF BRIDGES NO. 138 AND 139 CARRYING SR 1470 (MAPLE CYPRESS ROAD) OVER THE NEUSE RIVER CRAVEN COUNTY, NORTH CAROLINA

WBS NO. 33723.1.1
STIP PROJECT NO. B-4484

ADMINISTRATIVE ACTION

STATE ENVIRONMENTAL ASSESSMENT /
FINDING OF NO SIGNIFICANT IMPACT

October 2017

Prepared by RS&H Architects-Engineers-Planners, Inc.
For the North Carolina Department of Transportation

10/2/2017

DocuSigned by:
Meredith Van Duyn
6614D9C576564D8...

Date — Meredith H. Van Duyn, PE, Project Manager
RS&H Architects-Engineers-Planners, Inc.

10/2/2017

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PROJECT COMMITMENTS

REPLACEMENT OF BRIDGES NO. 138 AND 139
CARRYING SR 1470 (MAPLE CYPRESS ROAD)
OVER THE NEUSE RIVER
CRAVEN COUNTY, NORTH CAROLINA

WBS NO. 33723.1.1
STIP PROJECT NO. B-4484

NCDOT Division 2

NCDOT will adhere to *Guidelines for Avoiding Impacts to the West Indian Manatee: Precautionary Measures for Construction Activities in North Carolina Waters* for this project.

The Neuse River is identified by the North Carolina Wildlife Resources Commission (NCWRC) as anadromous fish habitat and an inland primary nursery area. As a result, an in-water construction moratorium will be in effect from February 15 to September 30.

The project study area contains suitable habitat for bald eagles, which are protected under the Bald and Golden Eagle Protection Act. Bald eagles were observed during site visits in 2009 and 2017. NCDOT will conduct surveys for bald eagle nests prior to construction.

REPLACEMENT OF BRIDGES NO. 138 AND 139
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INTRODUCTION

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridges No. 138 and 139 carrying SR 1470 (Maple Cypress Road) over the Neuse River and overflow in Craven County. Currently, Bridge No. 138 is 22 feet wide accommodating a two-lane roadway and is 580.5 feet in length. Bridge No. 139 is 29 feet wide accommodating a two-lane roadway and is 180 feet in length. Bridge No. 138 is proposed to be 600 feet in length, and Bridge No. 139 is proposed to be 375 feet in length. Both bridges will be 34.5 feet wide (30-foot clear roadway width) accommodating two 11-foot lanes and four-foot shoulders and will be constructed on the west side of the existing bridges. Traffic will use the existing bridges during construction, with temporary pavement widening and one-lane, two-way flagger operations.

This project is included in the NCDOT *State Transportation Improvement Program* (STIP) as Project No. B-4484. Right-of-way acquisition is scheduled in the summer of 2018, and construction is scheduled to begin in the summer of 2019. The project is subject to compliance with the North Carolina (State) Environmental Policy Act (SEPA). No substantial environmental impacts are anticipated as a result of the proposed project. This action is classified as State Environmental Assessment / Finding of No Significant Impact.

I. PURPOSE AND NEED STATEMENT

The purpose of this project is to improve bridge safety and functionality. The need for the project is to replace the structurally deficient bridges. The project location is shown in **Figures 1, 2, and 3**. Photos of the project area are included in **Figure 4**.

NCDOT Structures Management Unit records (*Bridge Inspection Report - 240138*, July 14, 2017; *Bridge Inspection Report - 240139*, December 07, 2016) indicate Bridge No. 138 and 139 have sufficiency ratings of 26.2 and 52.93, respectively, out of a possible 100 for a new structure. Bridge No. 138 is considered structurally deficient due to superstructure and substructure ratings of four or less and has two years of estimated remaining life left. Bridge No. 139 has an estimated twelve years of estimated remaining life. NCDOT has completed recent repairs to both structures.

Bridge No. 138 was built in 1952 and has a steel girder floor beam system with a reinforced concrete deck, as well as timber pile substructure. The posted weight limit on the bridge at the time of the Bridge Inspection Report (July 2017) was 34 tons for single vehicles and 37 tons for truck-tractor semi-trailers. The posted weight limit during a site visit in August 2017 was 22 tons for single vehicles and 26 tons for truck-tractor semi-trailers. A change to the posted weight limit listed on the Bridge Inspection Report (July 2017) was requested to match the 22 tons for single

vehicles and 26 tons for truck-tractor semi-trailers currently posted at the bridge and seen on the August 2017 site visit.

Bridge No. 139 was built in 1972 and has a steel substructure (floor and pile), a steel girder floor beam system with a prestressed concrete deck. No weight limits are posted.

II. EXISTING CONDITIONS

The proposed project is located in northeastern Craven County, approximately midway between Kinston and Vanceboro. The land surrounding the bridge is predominantly rural and includes marshes, wooded areas, large tracts of agricultural crops, and low-density single family homes.

SR 1470 (Maple Cypress Road) is a two-lane roadway with a statutory speed limit of 55 miles per hour (mph). It is classified as a major collector road according to NCDOT Functional Classification maps. The estimated (2012) annual average daily traffic (AADT) along SR 1470 (Maple Cypress Road) is 1,800 vehicles per day (vpd). There are no signalized intersections within the project study area. Craven County school buses make two total trips per day across the bridge.

Known utilities in the project study area include a water line, power, and telecommunications cable.

There were four crashes reported to have occurred in the immediate project vicinity during the ten-year period of October 1, 1998 through September 30, 2008. There were no fatal collisions reported. Crash data is summarized in **Tables 1 and 2**.

Total crash rates for the segment in **Table 1** is lower than the North Carolina statewide average (2012-2014) for a two-lane rural secondary route undivided (average 649.92 crashes per 100 million vehicle miles traveled (100MVMT)). The critical crash rate based on the North Carolina statewide average for a similar facility and a 95% confidence interval is 248.47.

Two of the collisions on the roadway segment of Maple Cypress Road on both sides of Bridge No. 138 during the ten year analysis period were fixed-object collisions, and two were rear-end collisions.

Table 1. Crash Summary: Totals and Severity

Roadway Segment	Total Crashes	Crash Rate*		Crash Severity**					
		Total	Non-Fatal Injury	Fatal	Type A Injury	Type B Injury	Type C Injury	PDO	EPDO Severity Index***
Maple Cypress Road – 500 feet on both sides of Bridge No. 138	4	208.57	52.14	0	0	0	1	3	2.85

* Rate = Crashes per 100 Million Vehicles Miles; 2003-2013 (10 years)
** Crash severity is rated Fatal, Class A to C (highest to lowest), or PDO (property damage only)
*** EPDO severity index of 8.4 is the threshold for locations that have more serious crashes. (Chapter 14 of NCDOT TEAAS Training Material)

Table 2. Roadway Segment Crash Type Summary: 10/01/1998 to 09/30/2008 (10 years)

Roadway Segment	Fixed Object	Rear End	Total
Maple Cypress Road – 500 feet on both sides of Bridge No. 138	2	2	**4**

III. ALTERNATIVES

A. Description of the Build Alternative

The proposed Build Alternative involves replacement of the structure along the existing roadway alignment, to its immediate west side. Improvements to the approach roadways will be required for a distance of approximately 510 feet to the south(west) of Bridge No. 138 and 870 feet to the north(east) of Bridge No. 139 to tie in the proposed pavement improvements to the existing roadway. This alternate will be designed using Sub Regional Tier guidelines with a design speed of 60 miles per hour. The driveway to the public boat ramp will be realigned slightly to avoid a sight distance issue. Traffic will not be detoured offsite during the construction period. The boat ramp access will remain open during construction.

Typical sections and the preliminary roadway design for Alternative 1 are included in **Figures 5 and 6**.

B. Alternatives Eliminated from Further Study

No Build

The No Build Alternative serves as a basis of comparison between not replacing the bridge and the associated impacts with the Build alternative. The No Build Alternative would result in no new construction costs; no impacts to streams, wetlands, or other natural or cultural resources; and no residential or business relocations. However, this alternative would result in increased maintenance cost for a period of a few years prior to complete bridge closure. The eventual closure would result in travel delays. The No Build Alternative would not meet the purpose of and need for the proposed project to improve bridge safety. This alternative was dropped from consideration.

Offsite Detour

The Craven County Emergency Services Director has expressed concern about the potential impacts of an off-site detour on emergency response times. Craven County is divided by the Neuse River and closing the bridge would impact response times for EMS, fire, and law enforcement services. The nearest detour on either side of the bridge is 32 miles (approximately 40 minutes driving time). Traffic will use the existing bridges during construction, with temporary pavement widening and one-lane operations. An off-site detour will not be used.

Alternative 2

Build Alternative 2 proposed replacement of Bridges No. 138 and 139 on the east side, immediately adjacent to the existing structures and roadway. Alternative 2 was eliminated in 2017 due to its higher potential wetland impacts, with no other measurable benefits above Alternative 1. A comparison of Alternatives 1 and 2 was completed in February 2017 for the field meeting with permitting/regulatory agency representatives and is included in **Table 3** and in the meeting minutes in the Appendix.

Table 3. Build Alternative Comparison

Category	Alternative 1	Alternative 2
Project Length	3,700 ft.	4,000 ft.
Overhead Utility Relocations (power and telecommunications)	10 poles	10 poles
Riparian Wetland Impacts	3.68 ac.	4.63 ac.
Surface Water Impacts	0.01 ac.	0.02 ac.
Stream Impacts	240 lf.	230 lf.
Neuse River Buffer Impacts	4,303 sq. ft.	3,926 sq. ft.
Water line relocation (underground and above-ground)	approx. 3,900 lf.	approx. 1,600 lf.
Construction Cost Estimate (as of Feb. 2017)	$10.5 Million	$11.1 Million

A combination of Alternative 1 and 2 was briefly discussed but eliminated due to sight distance concerns. This design would not have met NCDOT or AASHTO design standards.

IV. ESTIMATED COSTS

The estimated costs for the Build Alternative, based on 2017 prices are as follows:

Table 4. Estimated Project Costs (Alternative 1)

Item	Build Alternative
Right-of-Way [1]	$66,000
Utility Relocation [2]	$1,786,000
Construction [3]	$11,548,000
TOTAL	**$13,400,000**

[1] From NCDOT R/W Cost Estimate completed on 8/2/17.
[2] Includes power pole relocation cost ($87,600) from NCDOT Utility Estimate completed on 8/8/17, and water line construction/relocation utility cost ($1,536,000) from NCDOT Preliminary Estimate completed on 7/12/17, as well as a 10% contingency.
[3] Includes roadway, drainage, and structure costs ($8,718,000) from NCDOT Preliminary Estimate completed on 7/12/17, as well as miscellaneous, mobilization, engineering, and construction contingencies.

V. OTHER HIGHWAY PROJECTS IN THE AREA

The New Bern Area Metropolitan Planning Organization's (NBAMPO) *2016-2025 Metropolitan Transportation Improvement Plan*, adopted in July 23, 2015, *Amendment No.* 1, adopted September 24, 2015, and *Amendment No. 2*, adopted January 28, 2016, do not include any projects in the vicinity of B-4484. There are no nearby projects listed in the 2018-2027 STIP.

VI. NATURAL ENVIRONMENT

A. Methodology

All work was conducted in accordance with the NCDOT Natural Environment Section standard operating procedures and July 2012 Natural Resources Technical Report (NRTR) template. Fieldwork was conducted on July 6, 2009, February 26, 2014, March 11, 2014, March 26, 2014, and September 11, 2017. The 2014 B-4484 NRTR and 2017 wetland survey updates are summarized here and incorporated by reference.

B. Physiography and Soils

The study area lies in the southern outer coastal plain physiographic region of North Carolina. Topography in the project vicinity is generally flat. Elevations in the study area range from 4 to 8 feet above sea level. Land use in the project vicinity consists primarily of forestland and agriculture.

The Craven County Soil Survey identifies four soil types within the study area. The characteristics of the soils in this area are provided in **Table 5**.

Table 5. Soils in the Study Area

Soil Series	Mapping Unit	Drainage Class	Hydric Status
Conetoe loamy sand	CnB	Well Drained	Non-hydric
Masontown mucky fine sandy loam & Muckalee sandy loam	MM	Poorly Drained/Very Poorly Drained	Hydric
Tarboro sand	TaB	Somewhat Excessively Drained	Non-hydric
Seabrook loamy sand	Se	Moderately Well Drained	Hydric*

*Soils which are predominantly non-hydric, but which contain hydric inclusions

C. Water Resources

Water resources in the study area are part of the Neuse River Basin (U.S. Geological Survey [USGS] Hydrologic Unit 03020204). One stream, the Neuse River, was identified in the study area (**Table 6**). The physical characteristics of this stream are provided in **Table 7**. An unnamed tributary of the Neuse River was identified just outside of the study area at the northwest corner of the project.

Table 6. Water Resources in the Study Area

Stream Name	Map ID	DWQ Stream Index Number	Best Usage Classification
Neuse River	Neuse River	27-(85)	C;Sw;NSW

Table 7. Physical Characteristics of Water Resources in the Study Area

Map ID	Bank Height (ft)	Bankfull Width (ft)	Water Depth (in)	Channel Substrate	Velocity	Clarity
Neuse River	15	320	48-120	Sand	Medium	Turbid

The Neuse River is not designated an Outstanding Resource Water (ORW), High Quality Water (HQW) or water supply watershed (WS-I or WS-II) within 1.0 mile downstream of the study area. The Neuse River was not on the North Carolina 2014 Final 303(d) list of impaired waters due to sedimentation or turbidity, nor does it drain into any Section 303(d) waters within 1.0 mile of the study area, that are listed for sedimentation or turbidity.

This portion of the Neuse River is designated as an inland primary nursery by the North Carolina Wildlife Resources Commission (NCWRC). There are no benthic samples taken within one mile of Bridge No. 138. Craven County is not designated by the NCWRC as containing Mountain Trout Waters, and no streams within the project study area are designated as Trout Waters.

D. Biotic Resources

This section describes the existing vegetation and associated wildlife that occur within the project study area. Potential impacts affecting these resources are also discussed.

1. Terrestrial Communities

Five terrestrial communities were identified in the study area: maintained/disturbed, riverine swamp forest, bottomland hardwood forest, mixed pine hardwoods, and clearcut/cutover areas. The NRTR includes detailed mapping showing the location and extent of these terrestrial communities in the study area. A brief description of each community type follows.

Maintained/Disturbed

Maintained/disturbed areas in the study area are in places where the vegetation is periodically mowed, such as roadside shoulders, agricultural fields, and residences. The vegetation in this community is comprised of low growing grasses and herbs, including fescue, clover, wild onion, broomsedge, kudzu, and henbit.

Riverine Swamp Forest

The riverine swamp forest community occurs in each quadrant of the study area near the river and its overflow areas. The vegetation in this community includes bald cypress, red maple, swamp cottonwood, black willow, overcup oak, green ash, American elm, lizard’s tail, trumpet creeper, and various sedges.

Bottomland Hardwood Forest
Bottomland hardwood forest community exists in several locations in the study area. Species in this community include willow oak, laurel oak, blackgum, water hickory, box elder, sycamore, ironwood, sweetgum, Chinese privet, and deciduous holly in the overstory and understory. Greenbrier, wild grape, trumpet creeper, poison ivy, Japanese honeysuckle, and various sedges area also in the understory.

Mixed Pine Hardwood Forest
The extreme northeast portion of the study area includes small areas of mixed pine and hardwood forest, on slopes rising from the Neuse River floodplain. These areas are dominated by loblolly pine.

Clearcut/Cutover
The 2009 NRTR identified a recent clearcut northwest of the Neuse River bridge. This area has grown into a dense stand of saplings. Most of this area was inundated during the February-March 2014 field visits. South of the roadway, an area mapped by the 2009 NRTR as riverine swamp forest, bottomland hardwood, and pine plantation has now also recently been cut.

Terrestrial Community Impacts
Terrestrial communities in the study area may be impacted by project construction as a result of grading and paving of portions of the study area. Community data of each type within the study area and potential impacts from Alternative 1 are shown in **Table 8.**

Table 8. Coverage of Terrestrial Communities in the Study Area

Community	Coverage (ac.)	Impacts (ac.)
Maintained/Disturbed	7.36	3.28
Riverine Swamp Forest	14.63	1.61
Bottomland Hardwood Forest	3.98	0.33
Clearcut/Cutover	5.89	0.68
Mixed Pine Hardwood	1.64	0.03
Total	**33.50**	**5.93**

2. Terrestrial Wildlife

Terrestrial communities in the study area are comprised of both natural and disturbed habitats that may support a diversity of wildlife species (those species actually observed are indicated with an asterisk *). Mammal species that commonly exploit forested habitats and stream corridors found within the study area include species such as marsh rabbit*, raccoon, Virginia opossum*, gray squirrel, and white-tailed deer*. Birds that commonly use forest and forest edge habitats include the American goldfinch*, American robin*, Carolina wren*, Acadian flycatcher*, great crested flycatcher*, blue-gray gnatcatcher*, prairie warbler*, killdeer*, northern cardinal*, northern parula warbler*, northern flicker*, red-bellied woodpecker* yellow throated vireo*, indigo bunting* barred owl*, and red-shouldered hawk. Birds that may use the open habitat or water bodies within the study area include belted kingfisher, great blue heron, yellow crowned night heron*, bald eagle*, and turkey vulture*. Reptile and amphibian species that may use terrestrial communities located in the study area include the king snake*, eastern box turtle*, Cope's gray treefrog*, eastern fence lizard, and five-lined skink.

3. Aquatic Communities

Aquatic communities in the study area consist of a perennial coastal plain river and its overflow tributaries. The Neuse River can support these fish species: hickory shad, alewife, gizzard shad, silvery minnow, golden shiner, comely shiner, satinfin shiner, dusky shiner, whitefin shiner, channel catfish, pirate perch, warmouth, redbreast sunfish, bluegill, pumpkinseed, largemouth bass, white crappie, black crappie, scalyhead darter, and southern flounder. The Neuse River can also support beaver, stinkpot, southern dusky salamander, crayfish, and various benthic macroinvertebrates.

Aquatic organisms are acutely sensitive to changes in their environment, and environmental impacts from construction activities may result in long term or irreversible effects. Impacts usually associated with in-stream activities include alterations to the substrate and impacts to the adjacent streamside vegetation. Such disturbances within the substrate lead to increased siltation, which can clog the gills and/or feeding mechanisms of benthic organisms, fish, and amphibian species. Siltation may cover benthic macroinvertebrates with excessive amounts of sediment that inhibit their ability to obtain oxygen.

The removal of streamside vegetation and placement of fill material during construction enhances erosion and possible sedimentation. Quick revegetation of these areas helps to reduce the impacts by supporting the underlying soils. Erosion and sedimentation may carry soils, toxic compounds, trash, and other materials into the aquatic communities at the construction site. As a result, bars may form downstream of the site. Increased light from the removal of streamside vegetation may increase water temperatures. Warmer water contains less oxygen, thus reducing aquatic life that depends on high oxygen concentrations.

4. Invasive Species

Three species from the NCDOT Invasive Exotic Plant List for North Carolina were found to occur in the study area. The species identified were Chinese privet (Threat level 1), kudzu (Threat level 1), and Japanese honeysuckle (Threat level 2). NCDOT will manage invasive plant species as appropriate.

E. Jurisdictional Issues

1. Clean Water Act Waters of the United States

Section 404 of the Clean Water Act requires regulation of discharges into Waters of the United States. The USACE has the responsibility for implementation, permitting, and enforcement of the provisions of the Act. The USACE regulatory program is defined in 33 CFR 320-330.

One jurisdictional stream, the Neuse River, was identified in the study area (**Table 10**). The location of this stream is shown on **Figure 1**. The physical characteristics and water quality designations of the Neuse River are detailed in Section VI.C. This stream has been designated as a warm water stream for the purposes of stream mitigation.

Table 10. Jurisdictional Characteristics of Water Resources in the Study Area

Map ID	Length (ft)	Classification	Compensatory Mitigation Required	River Basin Buffers	Buffer Impacts (sq ft)
Neuse River	200	Perennial	Yes	Subject	3,185*

* Includes 50 foot offset from the top of bank delineation

Wetlands are those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Much of the project study area was inundated during the February-March 2014 site visits, which complicated the process of delineating the jurisdictional boundaries and mapping with the excess water. These wetland boundaries were reviewed in August and September 2017 when normal hydrologic conditions existed on the site. The updated delineation shows a reduced wetland area.

Eight jurisdictional wetlands were identified within the study area (**Figure 5**). Wetland classification data are presented in **Table 11**. All wetlands in the study area are within the Neuse River Basin (USGS Hydrologic Unit 03020204).

Table 11. Jurisdictional Characteristics of Wetlands in the Study Area

Map ID	Hydrologic Classification	Area (ac)	Potential Impacts (ac)[1]
WA	Riparian	1.24	0
WB	Riparian	0.95[2]	0
WC	Riparian	1.22	0
WD	Riparian	11.19[3]	1.59
WE	Riparian	0.06	0
WF	Riparian	0.03	0.02
WG	Riparian	0.14	0
WAA	Riparian	0.20	0
Total		**15.03**	**1.61**

[1] Potential impacts include a 25-foot offset from preliminary construction limits.
[2] WB area approximated per aerial imagery and wetland delineation.
[3] WD area only includes wetlands within study area.

2. Clean Water Act Permits

The proposed project has been designated as a State EA/FONSI for the purposes of SEPA documentation. The USACE stated in the February 2017 field meeting with other agency representatives that an Individual Permit will be required.

In addition to the Section 404 permit, other required authorizations include the corresponding Section 401 Water Quality Certification (WQC) from the NCDWR. A NCDWR Section 401 Water Quality General certification may be required prior to the issuance of a Section 404 Permit. Other

required 401 certifications may include a GC 3688 for temporary construction access and dewatering.

3. Construction Moratoria

The Neuse River has been identified by the NCWRC as anadromous fish habitat and an inland primary nursery area. As a result, a construction moratorium has been requested from February 15 to September 30.

4. North Carolina River Basin Buffer Rules

Streamside riparian zones within the study area are protected under provisions of the Neuse River Buffer Rules as administered by NCDWR. **Table 10** indicates which streams in the study area are subject to the buffer rule protection. The unnamed tributary at the northwest corner of the project lies outside of the study area, but its buffers may lie inside it. Due to floodplain inundation, it was not possible to locate the top of bank during the February-March site visits. Potential impacts to protected stream buffers will be determined once a final alignment and design have been determined.

5. Rivers and Harbors Act Section 10 Navigable Waters

The Neuse River has been designated by the USACE as a Navigable Water under Section 10 of the Rivers and Harbors Act.

6. Wetland and Stream Mitigation

Avoidance and Minimization of Impacts

The NCDOT has attempted to avoid and minimize impacts to streams and wetlands to the greatest extent practicable in choosing Alternative 1 as the preferred alternative. Due to buffer rules, Design Standards for Sensitive Watersheds will be followed. Further minimization of impacts will be determined during final design.

Compensatory Mitigation of Impacts

The NCDOT will investigate potential on-site stream and wetland mitigation opportunities. If on-site mitigation is not feasible, mitigation will be provided by North Carolina Department of Environmental Quality – Division of Mitigation Services (DMS). In accordance with the "Memorandum of Agreement Among the North Carolina Department of Transportation, and the U.S. Army Corps of Engineers, Wilmington District" (MOA), July 22, 2003, the DMS will be requested to provide off-site mitigation to satisfy the federal Clean Water Act compensatory mitigation requirements for this project.

F. Federally Protected Species

Federal law under the provisions of Section 7 of the Endangered Species Act (ESA) of 1973, as amended, requires that any action likely to adversely affect a federally protected species be subject to review by U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS). Other species may warrant protection under separate state laws.

Plants and animals with federal classifications of Endangered (E), Threatened (T), Proposed Endangered (PE), and Proposed Threatened (PT) are protected under Section 7 and Section 9 of the ESA.

As of May 23, 2017 (verified August 30, 2017), the USFWS and NMFS list eight federally protected species for Craven County (**Table 12**). A brief description of each species' habitat requirements follows, along with the Biological Conclusion rendered based on survey results.

Table 12. Federally Protected Species Listed for Craven County

Scientific Name	Common Name	Federal Status	Habitat Present	Biological Conclusion
Myotis septentrionalis	Northern long-eared bat	T	Yes	MA/LAA
Calidris canutus rufa	Rufa red knot	T	No	No Effect
Picoides borealis	Red-cockaded woodpecker	E	No	No Effect
Trichechus manatus	West Indian manatee	E	Yes	MA/NLAA
Dermochelys coriacea	Leatherback sea turtle	E	No	No Effect
*Aeschynomene virginica**	Sensitive joint-vetch	T	No	No Effect
Lysimachia asperulaefolia	Rough-leaved loosestrife	E	No	No Effect
Acipenser oxyrinchus	Atlantic sturgeon	E	Yes	MA/NLAA

E = Endangered; T = Threatened; MA/NLTAA = May Affect, Not Likely to Adversely Affect; MA/LAA = May Affect, Likely to Adversely Affect

* Historic record (the species was last observed in the county more than 50 years ago)

Northern long-eared bat

The USFWS has developed a programmatic biological opinion in conjunction with the Federal Highway Administration, the US Army Corps of Engineers, and NCDOT for the northern long-eared bat (*Myotis septentrionalis*) in eastern North Carolina. The programmatic biological opinion covers the entire NCDOT program in Divisions 1-8, including all NCDOT projects and activities. The programmatic determination for the northern long-eared bat for the NCDOT program is "May Affect, Likely to Adversely Affect." The programmatic biological opinion provides incidental take coverage for northern long-eared bat and will ensure compliance with Section 7 of the Endangered Species Act for five years for all NCDOT projects with a federal nexus in Divisions 1-8, which includes Craven County.

Rufa red knot

The rufa red knot is a medium sized shorebird about 9 to 11 inches in length. Red knots are a specialized molluscivore, eating hard-shelled mollusks, sometimes supplemented with easily accessed softer invertebrate prey. The red knot migrates annually between its breeding ground in the Canadian arctic and several wintering regions, including the Southeast United States from Florida to North Carolina. During both the northbound (spring) and southbound (fall) migrations, red knots use key staging and stopover areas to rest and feed. This species typically makes long flights between stops. The birds migrate in large flocks northward through the contiguous United States mainly March – early June, southward July – August. Arrival in breeding areas occurs in late May or early June; most have departed breeding areas by mid-August. Red knots are restricted to the ocean coasts during winter and occur primarily along the coast during migration. Habitats used by red knots in migration and wintering areas are similar in character, generally coastal

marine and estuarine habitats with large areas of exposed intertidal sediments. In North America, red knots are commonly found along sandy, gravel, or cobble beaches, tidal mudflats, salt marshes, shallow coastal impoundments, lagoons, and peat banks.

Biological Conclusion: No Effect
Suitable habitat for the red knot does not exist in the study area. The study area consist of forested, riparian areas in a freshwater system. It lacks coastal foraging and roosting areas preferred by the red knot. A review of NCNHP records, updated August 18, 2017, indicates no known red knot occurrences within one mile of the study area.

Red-cockaded woodpecker
The red-cockaded woodpecker (RCW) typically occupies open, mature stands of southern pines, particularly longleaf pine, for foraging and nesting/roosting habitat. The RCW excavates cavities for nesting and roosting in living pine trees, aged 60 years or older, and which are contiguous with pine stands of at least 30 years of age to provide foraging habitat. The foraging range of the RCW is normally no more than 0.5 mile.

Biological Conclusion: No Effect
Suitable habitat for the red-cockaded woodpecker does not exist in the study area. Forests in the study area are comprised of a closed hardwood canopy and sub-canopy. Where pine trees occur in maintained or disturbed areas, they are not of sufficient age or density to provide suitable nesting or foraging habitat. A review of NCNHP records, updated August 18, 2017, indicates no known RCW occurrences within one mile of the study area.

West Indian Manatee
USFWS optimal survey window: year round
Habitat Description: West Indian manatees have been observed in all the N.C. coastal counties. West Indian manatees are found in canals, sluggish rivers, estuarine habitats, salt water bays, and as far off shore as 3.7 miles. They utilize freshwater and marine habitats at shallow depths of 5 to 20 feet. In the winter, between October and April, manatees concentrate in areas with warm water. During other times of the year, habitats appropriate for the West Indian manatee are those with sufficient water depth, an adequate food supply, and in proximity to freshwater. West Indian manatees require a source of freshwater to drink. West Indian manatees are primarily herbivores, feeding on any aquatic vegetation present, but they may occasionally feed on fish.

Biological Conclusion: *May Affect, Not Likely to Adversely Affect*
Suitable habitat for West Indian manatee does exist in the study area. A review of NCNHP records, updated May 1, 2009, revealed a 1990 manatee occurrence approximately 1100 feet downstream of the study area. NCDOT will utilize the *Guidelines for Avoiding Impacts to the West Indian Manatee: Precautionary Measures for Construction Activities in North Carolina Waters* during construction of the bridge.

Leatherback sea turtle
Leatherbacks are distributed worldwide in tropical waters of the Atlantic, Pacific, and Indian Oceans. They are generally open-ocean species, and may be common off the North Carolina coast

during certain times of the year. However, in northern waters, leatherbacks are reported to enter into bays, estuaries, and other inland bodies of water. Major nesting areas occur mainly in tropical regions. In the United States, primary nesting areas are in Florida; however, nests are known from Georgia, South Carolina, and North Carolina as well. Nesting occurs from April to August. Leatherbacks need sandy beaches backed with vegetation in the proximity of deep water and generally with rough seas. Beaches with a relatively steep slope are usually preferred.

Biological Conclusion: No Effect
This project will not affect the beaches or coastal waters of North Carolina. Therefore, no habitat for leatherback sea turtles exists within the study area. A review of NCNHP records, updated August 18, 2017, indicates no known leatherback sea turtle occurrences within one mile of the study area.

Sensitive joint-vetch
Sensitive joint-vetch grows in the mildly brackish intertidal zone where plants are flooded twice daily. This annual legume prefers the marsh edge at an elevation near the upper limit of tidal fluctuation but can also be found in swamps and on river banks. Sensitive joint-vetch normally occurs in areas with high plant diversity where annual species predominate and can grow in sand, mud, gravel, or peat substrates. Bare to sparsely vegetated substrates appear to be a microhabitat feature of critical importance to this plant. Such microhabitats may include accreting point bars that have not yet been colonized by perennial species, areas scoured out by ice, low swales within marshes, muskrat “eat outs” where this rodent removes all of the vegetation within a small portion of the marsh, storm damaged areas, and the saturated organic sediments of some interior marshes that have local nutrient deficiencies. In North Carolina, stable populations have been found in the estuarine meander zone of tidal rivers where sediments transported from upriver settle out, and extensive marshes are formed. Additional North Carolina occurrences are also found in moist to wet roadside ditches and moist fields, but these are not considered stable populations.

Biological Conclusion: No Effect
Suitable habitat for sensitive joint-vetch does not exist in the study area. The wetland areas and roadside ditches are not brackish or tidally influenced, and therefore do not provide the necessary conditions for this vetch. A review of NCNHP records, updated August 18, 2017, indicates no known sensitive joint-vetch occurrence within one mile of the study area.

Rough-leaved loosestrife
Rough-leaved loosestrife, endemic to the Coastal Plain and Sandhills of North and South Carolina, generally occurs in the ecotones or edges between longleaf pine uplands and pond pine pocosins in dense shrub and vine growth on moist to seasonally saturated sands and on shallow organic soils overlaying sand (spodosolic soils). Occurrences are found in such disturbed habitats as roadside depressions, maintained power and utility line rights-of-way, firebreaks, and trails. The species prefers full sunlight, is shade intolerant, and requires areas of disturbance (e.g., clearing, mowing, and periodic burning) where overstory is minimal. It can, however, persist vegetatively for many years in overgrown, fire-suppressed areas. Blaney, Gilead, Johnston, Kalmia, Leon, Mandarin, Murville, Torhunta, and Vaucluse some of the soil series that occurrences have been found on.

Biological Conclusion: No Effect
Suitable habitat for rough-leaved loosestrife does not exist in the study area. The canopy in the wetland areas that are not regularly flooded is too dense to allow rough-leaved loosestrife to grow. A review of NCNHP records, updated August 18, 2017, indicates no known rough-leaved loosestrife occurrence within one mile of the study area.

Atlantic sturgeon
Habitat Description: Atlantic sturgeon spawn in freshwater in the spring and migrate to the estuarine waters where they spend most of their lives. Spawning occurs in moderately flowing waters in the deep parts of large rivers between the salt front and fall line of large rivers. Eggs are deposited on the bottom, usually attaching to hard substrates. They occur in most major river systems along the eastern seaboard of the United States. The species prefers the near shore marine, estuarine and riverine habitat of large river systems. Subadults and adults live in coastal waters and estuaries when not spawning, generally in nearshore areas dominated by gravel and sand substrates. Long distance migrations away from spawning rivers are common. Large freshwater rivers that are unobstructed by dams or pollutants are imperative to successful reproduction.

Biological Conclusion: *May Affect, Not Likely to Adversely Affect*
Correspondence with Fritz Rohde (NMFS) indicated that habitat for the Atlantic sturgeon is present in the study area. A review of NCNHP records, updated August 18, 2017, indicates there are no known Atlantic sturgeon occurrences within one mile of the study area.

Bald and Golden Eagle Protection Act

The bald eagle was removed from the USFWS's list of Threatened and Endangered Species (effective August 8, 2007), but it is protected under the Bald and Golden Eagle Protection Act. 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 one mile of open water.

Suitable habitat for bald eagle exists in the project study area, as it is within one mile of suitable habitat (Neuse River). Bald eagles were observed during field work in 2009 and 2017. NCDOT will conduct surveys for nests prior to construction and coordinate with the USFWS if needed.

Endangered Species Act Candidate Species

As of May 23, 2017 (verified August 30, 2017), the USFWS lists no Candidate species for Craven County.

Coastal Zone Issues

Coastal Area Management Act (CAMA) Areas of Environmental Concern

CAMA Areas of Environmental Concern (AEC) were identified in the project study area. The Neuse River is a Public Trust Water. A CAMA Major Development Permit from the North

Carolina Division of Coastal Management (NCDCM) will be required for all impacts to designated AECs within the project study area.

Essential Fish Habitat

The National Marine Fisheries Service (NMFS) has identified the Neuse River as an Essential Fish Habitat (EFH).

The proposed project will require that the existing structure over the Neuse River be removed and a new structure built in its place or in proximity. The new bridge structure will likely require footings to be placed within the Neuse River. However, the existing bridge footings will be removed. Therefore, the proposed project will likely result in a negligible net effect on available Essential Fish Habitat.

VII. HUMAN ENVIRONMENT

A. Section 106 Compliance

This project is subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, implemented by the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106, codified at 36 CFR Part 800. Section 106 requires Federal agencies to take into account the effect of their undertakings (federally-funded, licensed, or permitted) on properties included in or eligible for inclusion in the National Register of Historic Places and to afford the Advisory Council a reasonable opportunity to comment on such undertakings.

The State Historic Preservation Office (HPO) reviewed the subject project and is not aware of any historic resources which would be affected by the project. HPO has no comment on the project as proposed. (November 18, 2008 response is included in the **Appendix**).

B. Community Impacts

No adverse impact on families or communities is anticipated. Right-of-way acquisition will be limited. One abandoned house is anticipated to be impacted by the proposed realignment of the driveway to the boat ramp. No relocatees are expected with implementation of the proposed alternative.

No adverse effects on public facilities or services is expected. While two bus trips are made daily through the study area, the Craven County Schools Transportation Information Management Systems (TIMS) Coordinator expects bridge closure during construction to have an overall low impact on school transportation services. The project is not expected to adversely affect social, economic, or religious opportunities in the area.

Access to the public boat ramp, operated by NCWRC, will remain open throughout construction.

Craven County Emergency Services Director has expressed concern about the potential impacts of an off-site detour on emergency response times. Craven County is divided by the Neuse River and closing the bridge would impact response times for EMS, fire, and law enforcement services.

Traffic will use the existing bridges during construction, with temporary pavement widening and one-lane operations. An off-site detour will not be used.

The project is not in conflict with any plan, existing land use, or zoning regulation. No change in land use is expected to result from the construction of the project. The Farmland Protection Policy Act requires all federal agencies or their representatives to consider the potential impact to prime farmland of all land acquisition and construction projects. FPPA eligible soils are present within all quadrants of the Direct Bridge Impact Area (DBIA). A preliminary screening of farmland conversion impacts in the project was completed (NRCS Form AD-1006, Part VI only) and a total score of 51 out of 160 points was calculated. Due to this score, this land is not covered by the act.

The project will not have a disproportionately high and adverse human health and environmental effect on any minority or low-income population.

Three access driveways are located within the DBIA providing access to single family homes and a cell tower. Access to properties will be maintained during construction.

C. Noise and Air Quality

The project is located in Craven County, which has been determined to comply with the National Air Quality Standards. The proposed project is located in an attainment area; therefore, 40 CFR Parts 51 and 93 are not applicable. This project is not anticipated to create any adverse effects on the air quality of this attainment area. This project will not result in any meaningful changes in traffic volume, vehicle mix, location of the existing facility, or any other factor that would cause an increase in emissions impacts relative to the no-build alternative. As such, FHWA has determined that this project will generate minimal air quality impacts for Clean Air Act criteria pollutants and has not been linked with any special MSAT concerns. Consequently this effort is exempt from analysis for MSAT's.

Noise levels may increase during project construction; however, these impacts are not expected to be substantial considering the relatively short-term nature of construction noise and the limitation of construction to daytime hours. The transmission loss characteristics of nearby natural elements and man-made structures are believed to be sufficient to moderate the effects of intrusive construction noise.

This project has been determined to be a Type III Noise Project and therefore, no traffic noise analysis is required to meet the requirements of 23 CFR 772.

VIII. GENERAL ENVIRONMENTAL EFFECTS

This action is classified as a State Environmental Assessment / Finding of No Significant Impact. The proposed project is not expected to have an adverse effect on the quality of the human or natural environment with the use of current NCDOT standards and specifications.

No adverse effect on public facilities or services is anticipated. The project is not expected to adversely affect social, economic, or religious opportunities in the area. There are no anticipated impacts from this project to publicly owned public facilities, wildlife or waterfowl refuges, or sites

of national, state, or local importance. It is recommended to coordinate with Craven County Emergency Services to minimize emergency response impacts during construction.

The project's impact on noise and air will not be substantial. Noise levels could increase during construction but will be temporary.

Anticipated impacts to utilities include water and telephone cable lines. Coordination with utility companies for relocation plans will be complete before construction begins.

IX. COORDINATION AND AGENCY COMMENTS

A scoping letter was mailed to the following agencies on November 4, 2008 asking for input regarding anticipated permits or other known potential issues. Responses were received from agencies marked in bold with an asterisk (*). A field meeting with agency representatives was held in February 2017 to discuss alternatives. Letters and additional agency comments are included in the **Appendix**.

Federal Highway Administration
US Army Corps of Engineers (USACE)
US Environmental Protection Agency
US Fish and Wildlife Service (USFWS)
***NC Department of Cultural Resources, State Historic Preservation Office**
NC Department of Environment and Natural Resources

- Division of Marine Fisheries
- Division of Water Resources (NCDWR)

NC Wildlife Resources Commission (NCWRC)
***Craven County**

- ***Office of Planning and Community Development**
- ***Board of Commissioners**
- ***Craven County Schools – Transportation Department**

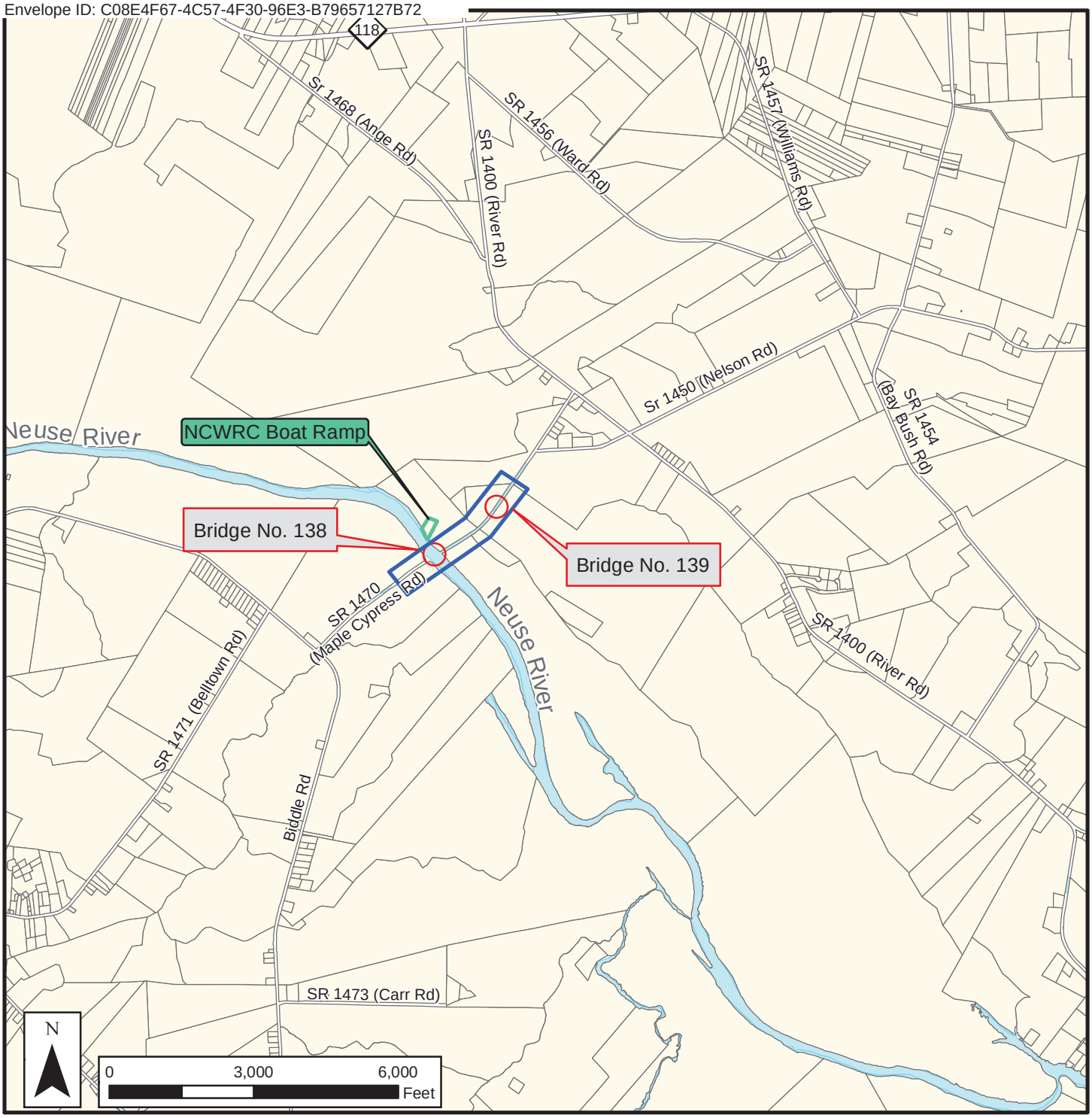
X. PUBLIC INVOLVEMENT

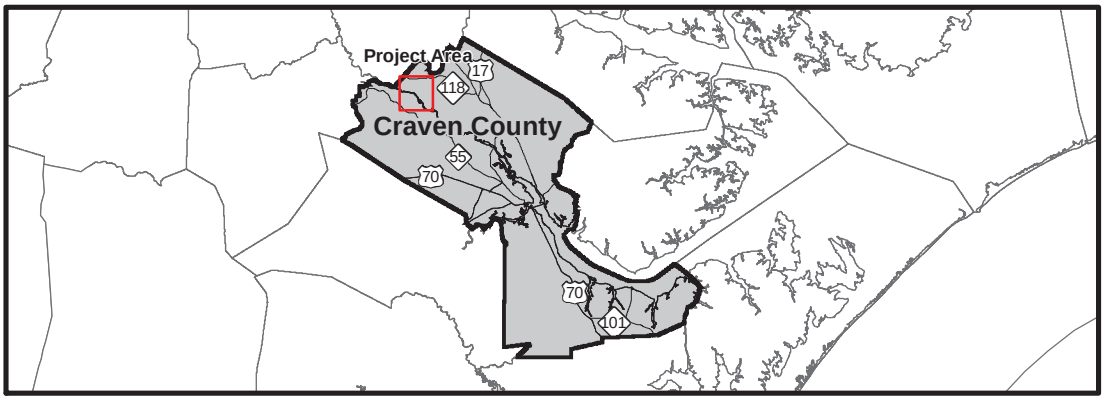
A mailing list of approximately 126 citizens and property owners; federal, state, and local environmental regulatory/resource agencies; local elected officials and governmental agencies; and interested persons was developed and continuously updated throughout the project development process. To date, NCDOT has mailed one newsletter and received no comments.

XI. BASIS FOR FINDING OF NO SIGNIFICANT IMPACT

Based upon a study of the proposed project documented in this assessment and upon comments received from federal, state, and local agencies, and the public, it is the finding of the NCDOT that this project would not have a significant adverse impact upon the human or natural environment. The proposed project is consistent with local plans and would not disrupt communities. Per this evaluation, a Finding of No Significant Impact is applicable for this project. Therefore, no further environmental analysis will be required.

FIGURES





Legend

- Project Study Area
- State Owned Land
- Water Body
- Property Limits

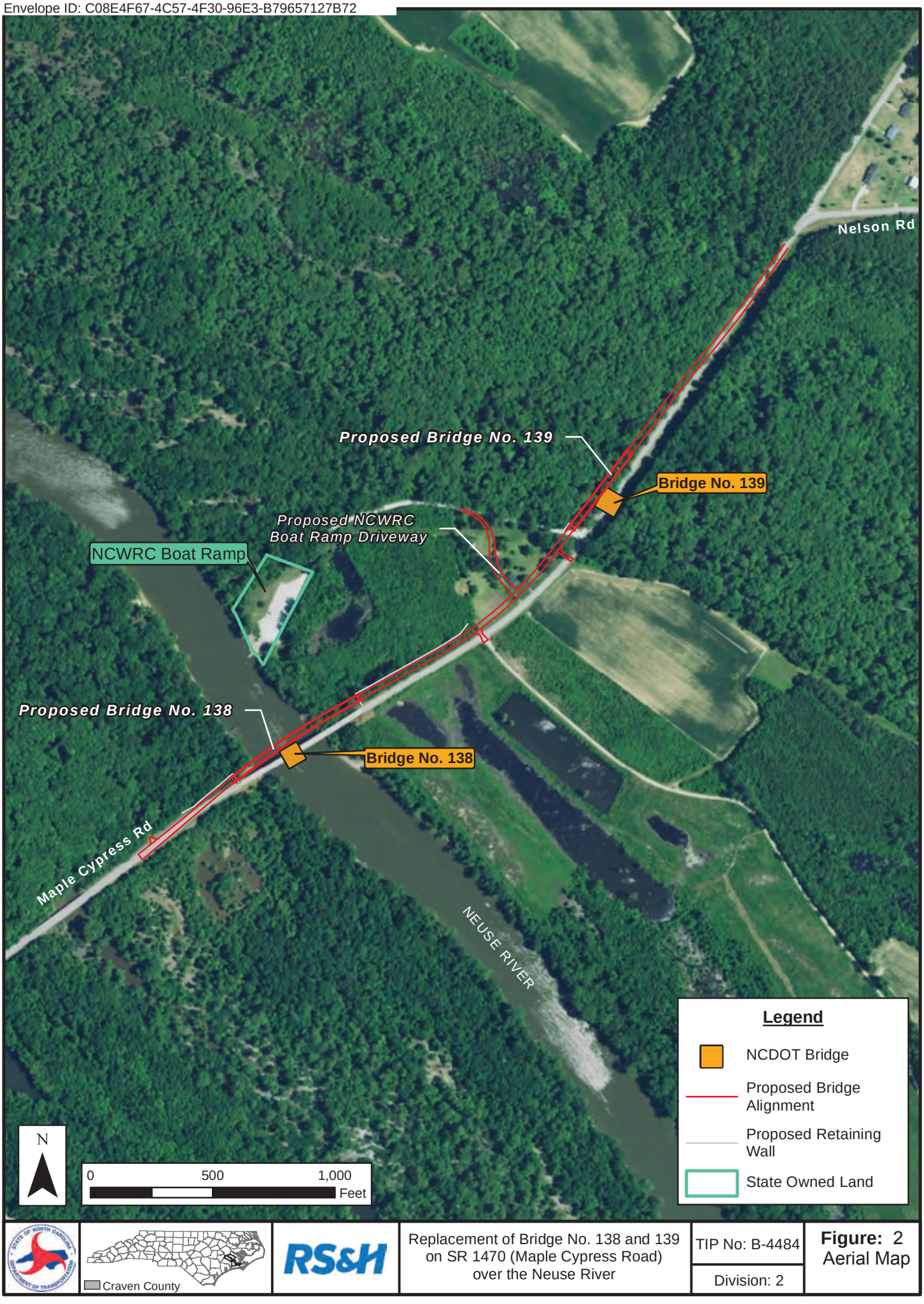
RS&H

Replacement of Bridge No. 138 and 139 on SR 1470 (Maple Cypress Road) over the Neuse River

TIP No: B-4484

Division: 2

Figure: 1 Vicinity Map



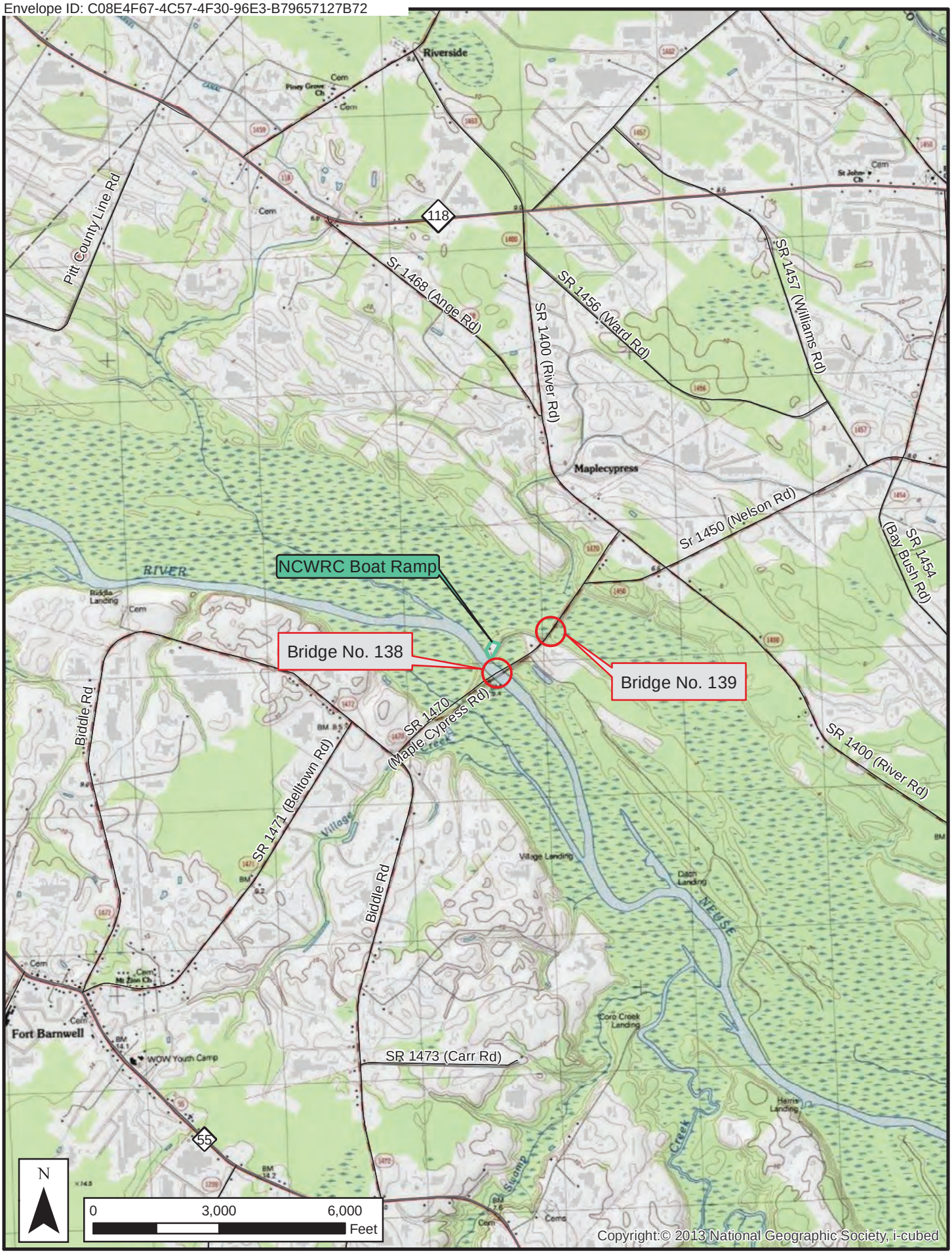
RS&H

Replacement of Bridge No. 138 and 139 on SR 1470 (Maple Cypress Road) over the Neuse River

TIP No: B-4484

Division: 2

Figure: 2
Aerial Map



Craven County

RS&H

Replacement of Bridge No. 138 and 139 on SR 1470 (Maple Cypress Road) over the Neuse River

TIP No: B-4484

Division: 2

Figure: 3 Topographic Map

Bridge 139 approach facing NW direction toward SR 1450 (Nelson Rd)

Bridge 139 approach facing SE direction toward Biddle Rd

East side of Bridge

West side of Bridge

Neuse River West of Bridge 139

Neuse River East of Bridge 139

	Craven County	RS&H	Replacement of Bridge No. 138 and No. 139 on SR 1470 (Maple Cypress Road) over the Neuse River	TIP No: B-4484 Division: 2	**Figure:** 4a Project Area Photos

Bridge 138 approach facing NE direction toward SR 1450 (Nelson Rd)

Bridge 138 approach facing SW direction toward Biddle Rd

West side of Bridge 138 from Boat Launch site

East side of Bridge 138

Neuse River West of Bridge 138

Neuse River East of Boat Launch

	Craven County	RS&H	Replacement of Bridge No. 138 and No. 139 on SR 1470 (Maple Cypress Road) over the Neuse River	TIP No: B-4484 Division: 2	**Figure:** 4b Project Area Photos

Maple Cypress Boat Launch
northwest of Bridge 138

Maple Cypress Boat Launch
northwest of Bridge 138

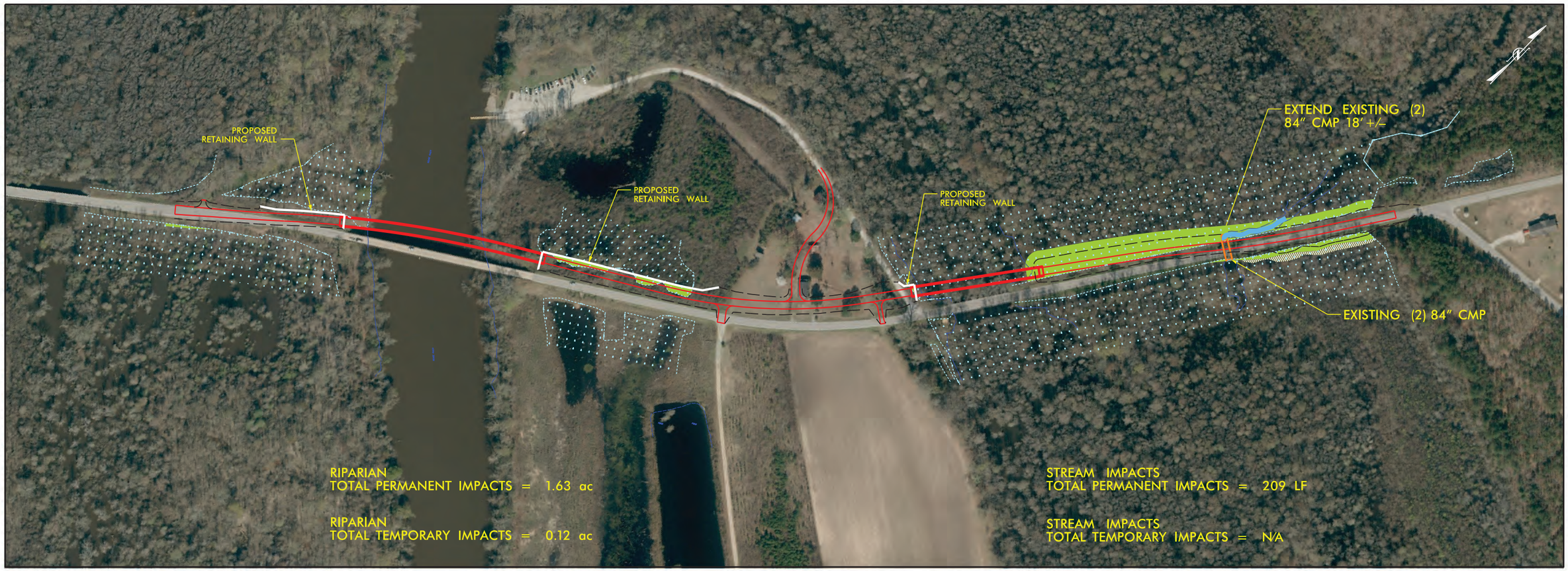
Parking Lot for Launch

Parking Lot for Launch

Abandoned House northeast of Bridge 138

Abandoned Shack northeast of Bridge 138
(south of abandoned house)

	 Craven County	RS&H	Replacement of Bridge No. 138 and No. 139 on SR 1470 (Maple Cypress Road) over the Neuse River	TIP No: B-4484 Division: 2	**Figure:** 4c Project Area Photos



Legend

- Riparian Wetland Impacts
- Temporary Riparian Wetland Impacts
- Permanent Stream Water Impacts
- WLB — Wetland Boundary
- Roadway Footprint (Slope Stakes)

Total Riparian Wetland Impacts = 1.75 acres

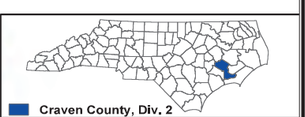
Total Stream Water Impacts = 209 LF

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

150' 0' 150' 300'
75' SCALE

Build Alternative
Affected Natural Environment

RS&H



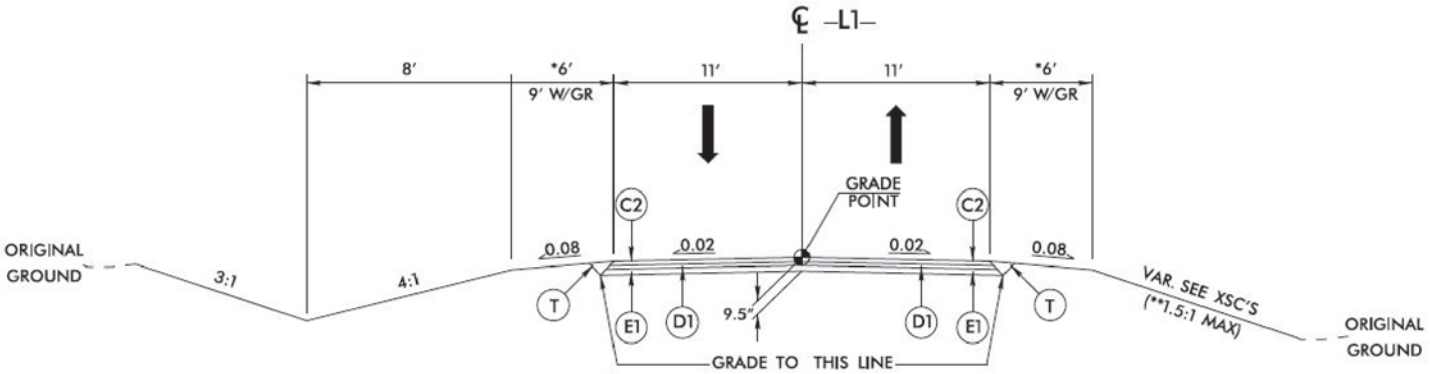
Maple Cypress Rd. Bridge Replacements Project

TIP No: B - 4484

Bridge No. 138 and No. 139 over the Neuse River and Neuse River Overflow - SR 1470

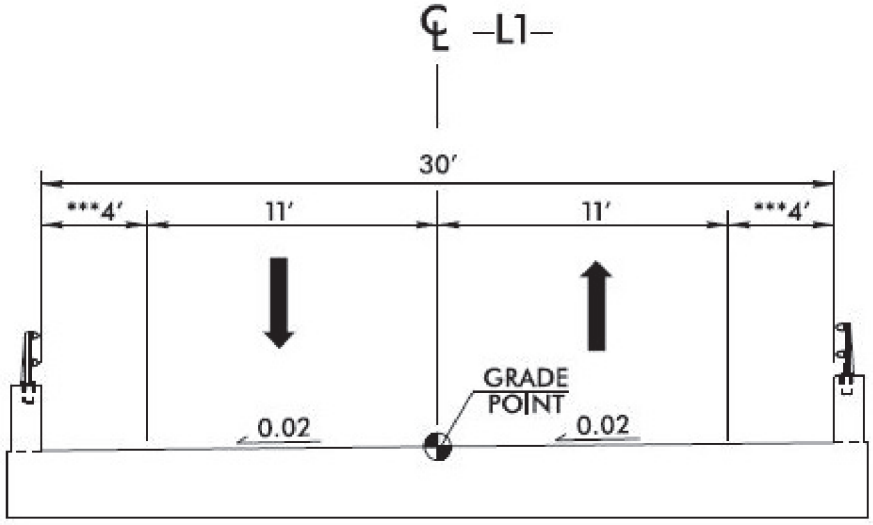
Figure 5

September 2017



Roadway Typical Section

*6' full depth paved shoulder proposed in areas with guardrail only
**Rock plating proposed for all slopes steeper than 3:1



Bridge Typical Section

***4' shoulder required for sight distance
Note: The cross slope of 0.02 to the west is for Bridge No. 139.
Bridge No. 138 would have a cross slope 0.04 in an easterly direction.

AGENCY CORRESPONDENCE

North Carolina Department of Cultural Resources

State Historic Preservation Office

Peter B. Sandbeck, Administrator

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

November 18, 2008

MEMORANDUM

TO: Tracy Walter
Project Development and Environmental Analysis Branch
NCDOT Bridge Unit

FROM: Peter Sandbeck RSE for Peter Sandbeck

SUBJECT: Bridge 138 on SR 1470 over the Neuse River, B-4484, Craven County, ER 08-2754

Thank you for your letter of November 4, 2008, concerning the above project.

We have conducted a review of the proposed undertaking and are aware of no historic resources which would be affected by the project. Therefore, we have no comment on the undertaking as proposed.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579. In all future communication concerning this project, please cite the above referenced tracking number.

cc: Mary Pope Furr, NCDOT
Matt Wilkerson, NCDOT

Craven County

1712

Administration Building
406 Craven Street
New Bern, NC 28560
Fax 252-637-0526
manager@cravencounty.com

Commissioners 252-636-6601
Manager 252-636-6600
Finance 252-636-6603
Human Resources 252-636-6602

February 11, 2009

Tracy Walter
NC Department of Transportation
1551 Mail Service Center
Raleigh, NC 27699-1551

RE: Tip Project N. B-4484: Replacement of Bridge No. 138 on SR 1470 over the Neuse River in Craven County

Dear Tracy Walter:

As a Commissioner of Craven County, I received notice that Bridge #138 on State Road 1470 was due to be replaced. Having traveled over, as well as under this bridge for several years, I will agree the bridge is in need of replacement and has served western Craven County well over its life span.

At the time B-138 was constructed this section of the Neuse River was used by larger boats, mainly in the operation of moving timber down the river to saw mill operations in New Bern. Under the river's current condition of year-round shallow water, along with other forms of moving time, a replacement bridge with current water clearance in today's market place cannot be justified. The bridges on either side, even though miles away, do not allow for such clearance.

The second, and main issue of my concern, is the hardship it will cause on the residents of Craven County if B-138 is removed prior to the opening of B-4484. As you are aware, western Craven County is divided by the Neuse River with only two points to cross which are 14.8 miles apart by water. There are roads on each side of the river that run parallel to it, but with only two crossings the removal of B-138 will cause a tremendous hardship on everyone from school students to emergency services.

Living in a rural area, most emergency services operations are run by volunteers and often mutual aid is requested and must travel B-138 in order to save a life. With removal of B-138 mutual aid time will be increased by a minimum of twenty minutes if the next unit is staffed and ready to roll.

Craven County

Therefore, I strongly recommend building B-4484 parallel to B-138 and removing B-138 **only** after B-4484 is open to traffic. There is land available for this project to be built in this manner and would be a well accepted D.O.T. project in western Craven County.

Again, I support the replacement of B-138, but feel it very important that traffic not be disrupted during the construction phase.

If I may be of further help to you, please do not hesitate to contact me at 252-514-1733.

Sincerely,

Perry Morris (ajn

Commissioner Perry Morris
Craven County

PLM/ajn

Craven County

1712

Administration Building
406 Craven Street
New Bern, NC 28560
Fax 252-637-0526
manager@cravencounty.com

Commissioners 252-636-6601
Manager 252-636-6600
Finance 252-636-6603
Human Resources 252-636-6602

January 26, 2009

Tracy Walter
NC Dept. Of Transportation
1551 Mail Service Center
Raleigh NC 27699-1551

Dear Tracey Walter:

SUBJECT: Tip Project No. B-4484: Replacement of Bridge No. 138 on SR 1470 over the Neuse River in Craven County

Craven County government was notified by you on November 4, 2008 that the Project Development and Environmental Analysis Branch was starting development, environment and engineering studies for the replacement of the above referenced bridge.

As a county commissioner representing the western end of Craven County that adjoins the Neuse River I am concerned about the closing of bridge no. 138 for an extended period of time. Western Craven County is an agricultural area where many farmers tend land on both sides of the Neuse River. Also, there are local businesses that depend on trade from both sides of the Neuse River. Maple Cypress Road is traveled by many citizens in western Craven County as a primary route to their work in Grifton, Vanceboro, Greenville, Ayden and other surrounding towns. To prohibit travel across the Neuse River on bridge no. 138 would cause a financial struggle on the above mentioned. Alternative routes would add at least 10 – 15 miles of travel to access farm land, businesses, and work for western Craven County citizens.

It is my recommendation that the NC Department of Transportation build the new bridge project no. B-4484 beside the existing bridge no. 138 and after completion of the new bridge project no. B-4484 the existing bridge no. 138 then be demolished.

I ask that the Project Development and Environmental Analysis Branch consider this recommendation before proceeding with this project. I do support the construction of a new bridge across the Neuse River but I feel there are appropriate ways to proceed with this without hurting the local economy.

Craven County

1712

If you desire additional information, please contact me at (252) 672-5656.

Sincerely,

Jason R. Jones, Chairman
Craven County Board of Commissioners

Craven County Schools

Transportation Department

Becton Broughton, Director

BOARD OF EDUCATION
3600 Trent Road
New Bern, NC 28562
(919)514-6300
FAX (919)514-6327

SCHOOL BUS GARAGE
1816 Hazel Avenue
New Bern, NC 28560
(919)514-6377
FAX (919)514-4301

December 22, 2003

NC Department Of Transportation
Project Development and Environmental Analysis
1548 Mail Service Center
Raleigh, NC 27699-1548

Dear Mr. Davis Moore,

This letter is in response to - TIP project Number: B-4484.
Subject: Bridge No. 138 on SR 1470, over Neuse River, Craven County

As of December 2003, there is one school bus routed over this bridge each day. However, the bridge replacement would not create an unworkable school bus routing situation. The single requirement for safe school bus routing is a safe turn around near the last student passenger's residence before the section of road closed near the bridge. When construction begins, if NC DOT could assist with development of a suitable turn around, then any bus routing inconvenience would be minimal. Our local NC DOT has always been very helpful in assisting with road maintenance at existing school bus turn around areas; therefore, I do not foresee any significant problem.

Sincerely,

Becton Broughton

Becton Broughton

PDEA

Craven County

Office of Planning
and
Community Development

Donald R. Baumgardner, Director
R. Chad Strawn, Assistant Director
Shelton P. Toler, Chief Building Codes Inspector

Human Services Annex
2828 Neuse Boulevard
New Bern, North Carolina 28562

Planning & CD (252) 636-6618
Fax (252) 636-5190
Inspections (252) 636-4987
Fax (252) 636-4984

February 10, 2009

Ed Eatmon
Division Construction Engineer
NCDOT Division Two
105 Pactolus Hwy. (NC 33)
PO Box 1587
Greenville, NC 27835

Re: Project No. B-4484 of Bridge No. 138 in Craven County

Dear Mr. Eatmon,

This letter is in regards to the proposed replacement of Bridge No. 138 over the Neuse River at Maple Cypress in Craven County. Craven County would like to express a few concerns about the replacement of this bridge as well as recommend that an onsite detour be provided during the construction process. The concerns are as follows;

1) **Fire and Rescue Response** – Fort Barnwell Fire and Rescue, Vanceboro Fire and Rescue, and New Bern – Craven Rescue all rely on each other for mutual aid in times of need. If Bridge No. 138 would be impassable without an on-site detour, the response time would increase substantially during emergency situations. (Map Attached)
2) **West Craven Middle and High School Traffic Flow** – If an on-site detour were to not be provided during the construction process, the traffic patterns of West Craven Middle and High School would be diverted through the Spring Garden Community to Hwy 43 to River Rd. This would be an inconvenience and add substantial transportation cost and require students to be picked up earlier. Also, this would cause a major delay in traffic at the Spring Garden stop light and River Rd stop light. (Map Attached)
3) **Large Farm Equipment** – This area of the county has a high number of agriculture farmers that store their equipment on one side of the river, but tends land on the other side of the river. It would be very beneficial to have an on-site detour to allow for the transfer of large farm equipment.

We have determined that an off-site detour for this location would result in more than 20 minute delay for the traveling public and the delay would be for a period of 24

months or more to replace a bridge of this magnitude. With this being determined, we have referred to the NCDOT guidelines for evaluation of detours for bridge replacement projects. According to the "Acceptable Delay" table with 20 minutes detour delay for the traveling public for a period of 24 months, it would be an unacceptable delay to not have an onsite detour during this period. Therefore, we respectfully request an on-site detour bridge remain in place during the construction of the new bridge.

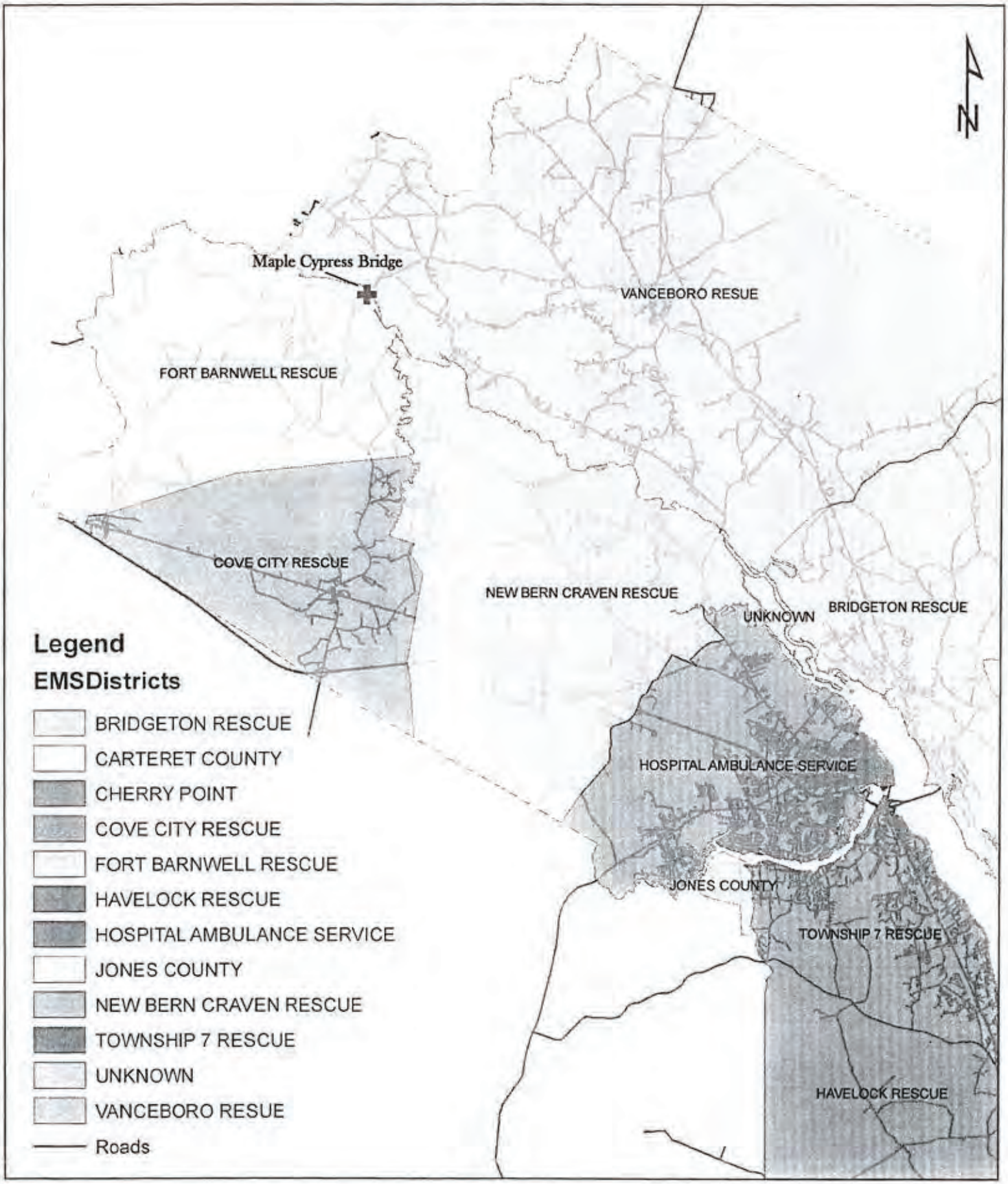
Sincerely,

Don Baumgardner

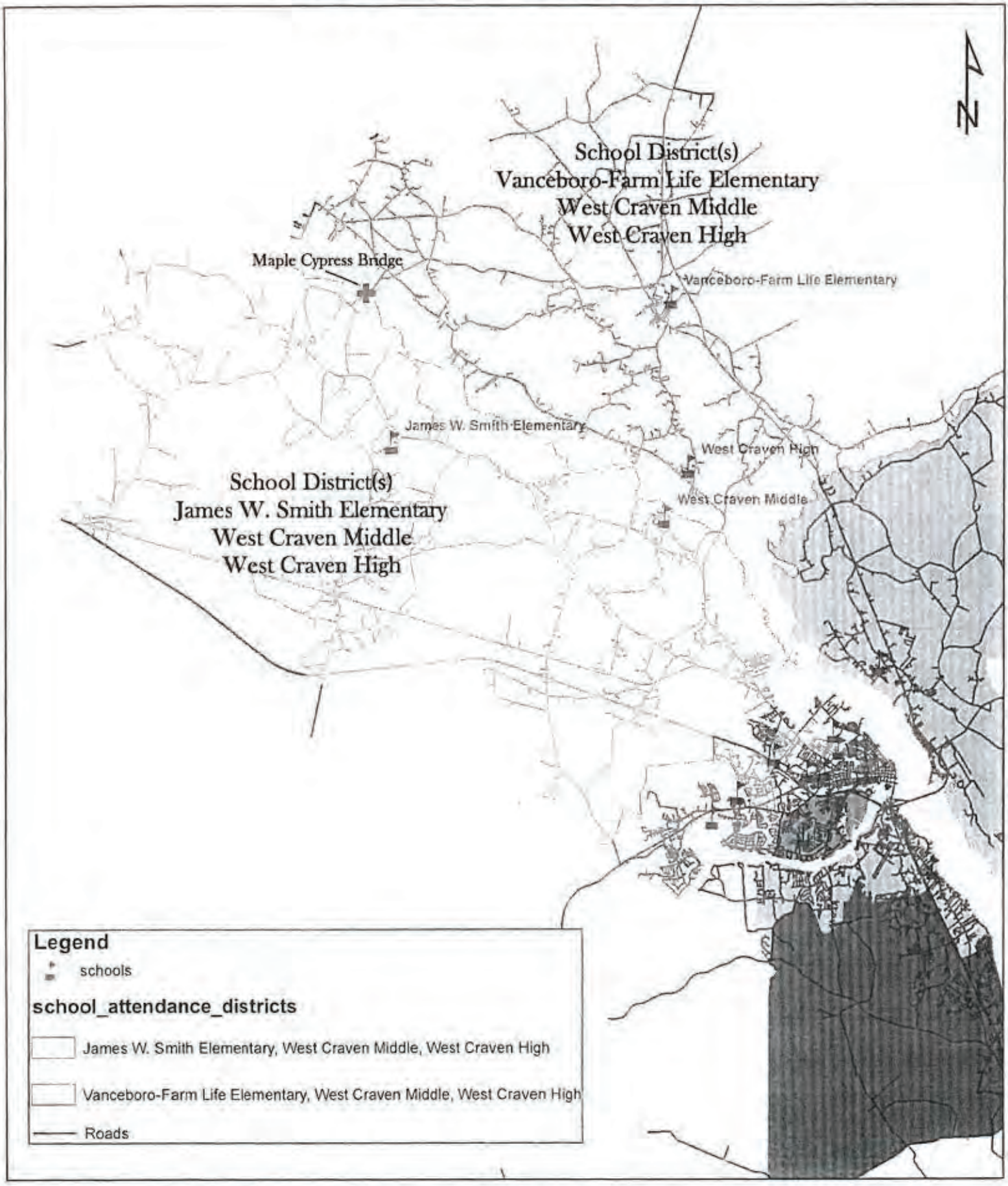
Don Baumgardner, Director
Planning and Inspections
Craven County

cc. Commissioner Jason Jones
Commissioner Perry Morris
Harold Blizzard, Craven County Manager
Gene Conti, Secretary of Transportation
Neil Lassiter, NCDOT Division Two Engineer
Johnny Metcalfe, NCDOT Resident Engineer (Craven)
Reed Smith, NCDOT District Two Engineer

Maple Cypress Bridge Relative to EMS Districts



Maple Cypress Bridge Relative to School Districts & Schools



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

February 28, 2009

MEMORANDUM TO: Mr. William T. Goodwin, PE.,
Project Development-Bridge Unit

FROM: FOR D. R. Henderson, P.E.
State Hydraulics Engineer R C Henry

SUBJECT: Preliminary Hydraulic Information for the Proposed Replacement of Bridge No. 138 on SR 1470 over Neuse River, Craven Co., WBS No. 33723.1.1, TIP No. B-4484

Hydraulic Structure Recommendations:
The recommended replacement structure for Bridge No. 138 is a 595 ft. bridge. The bridge should be built at approximately the same elevation as that of the existing bridge with a minimum 0.3% gradient to facilitate deck drainage. The off-site detour length is 31.9 mi. long, therefore an on-site detour is recommended, utilizing the existing bridge. The new bridge should be constructed downstream, (east) of the existing bridge to minimize utility conflicts.

Existing structure:
The existing structure is a 582 ft. fourteen span bridge, with concrete deck, caps, and vertical abutments. Built in 1952, it consists of steel girders, round wooden piles, and concrete rails. The bridge deck is situated approximately 36.5 feet above the creek bed, and the normal depth of water is approximately 5 ft. The river channel base width is approximately 310 ft. The banks are approximately 6 ft. high, with a channel top width of approximately 350 ft.

Floodplain Management:
Craven County is a participant in the National Flood Insurance Program, administered by the Federal Emergency Management Agency (FEMA). The effective FEMA floodplain mapping indicates that the subject crossing is located within a flood hazard zone designated as Zone AE, where 100-year base flood elevations have been established in a "Detailed Study". It is anticipated that a Conditional Letter of Map Revision (CLOMR) and a subsequent final Letter of Map Revision (LOMR) will be required for the project.

Environmental Considerations:
This crossing of Neuse River is located within the Neuse River Basin and has a drainage area of approximately 3900 sq. mi. The current land use in the watershed is predominantly rural and wooded with low density agricultural and residential

development. The project is not located within a water supply watershed protected area. This stream location carries a best usage classification of SA, HQW, & NSW by NC Division of Water Quality. NCDOT's *Best Management Practices for Protection of Surface Waters* (March 1997) will be followed throughout the design and construction of the project. It is anticipated that there will be a State Stormwater Permit (SSP) required for this project.

DRH/RCH/wsh

Cc: Mr. Art McMillan, P.E. (Highway Design Branch)
Mr. Jay Bennett, P.E. (Roadway Design Unit)
Mr. Philip Harris III, P.E. (PDEA, Natural Environment Unit)
Mr. Greg Perfetti, P.E. (Structure Design Unit)
Mr. Njorge W. Wainaina, P.E. (Geotechnical Engineering Unit)
Mr. Keith Johnston, P.E, P.L.S. (Photogrammetry Unit)
Mr. Charles W. Brown, P.E, P.L.S. (Location and Surveys Unit)
Mr. Eddie Bunn, P.E. (Area Bridge Construction Engineer)
Mr. C.E.(Neil) Lassiter Jr. P.E. (Division Engineer)

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Division of Highways

FEB 17 2009

Preconstruction
Project Development and
Environmental Analysis Branch

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

FEBRUARY 9, 2009

EUGENE A. CONTI, JR.
SECRETARY

MEMORANDUM TO: Greg Thorpe
PDEA Director

FROM: Charlie Brown, PE, PLS
State Location and Surveys Engineer

SUBJECT: Scoping Comments for the Proposed Replacement of Bridge No. 138 on SR 1470 over Neuse River in Craven County. TIP No. B-4484

I have reviewed this project and offer the following observations:

UTILITIES
Direct buried telephone cable is evident outside of the project limits north of the bridge but, no evidence of telephone cable could be found south of the Neuse River.

A water pipe line is along the west shoulder of SR 1470 throughout the project limits. The owner of the water line is unknown.

There is no evidence of existing power, cable TV, sanitary sewer or gas utilities at or near the project. I would rate the utility conflict low.

GENERAL COMMENTS
Bridge No. 138 is located along SR 1470, Maple Cypress Road over the Neuse River. The existing structure is 14 spans at 582 ft. in length and 22 ft wide. Built in 1952, it consists of a timber superstructure with reinforced concrete caps, steel girders and reinforced concrete deck. It is currently posted at 24 tons for single axial and legal gross weight for semi axial vehicles. This bridge is one of only a few bridges that provide a way to cross the Neuse River west of New Bern and east of Kinston. Therefore, an on-site detour is recommended.

The existing right of way appears to be 60 ft. (30 ft. each side). The horizontal alignment of SR 1470 is tangent with a slight grade on both approaches. There are no site distance concerns. The posted speed limit for SR 1470 is 55 mph.

North Carolina Geodetic Survey vertical control monument "CR-8 1971" will be destroyed as a result of this project and a USGS monitoring station is attached to the upstream side of the bridge.

If I can be of further assistance, please advise.

KEH/keh
Cc: Art McMillan, PE – Highway Design Engineer
Jay Bennett, PE – Roadway Design Engineer
Dave Henderson, PE – Hydraulics Design Engineer
Njorge Wainaina, PE – Geotechnical Design Engineer
Robert Memory – State Utilities Agent
Roger Worthington, PE – Utilities Section Engineer
File

MAIL: 1588 Mail Service Center, Raleigh, 27699-1588
(919) 250-4109 FAX: (919) 250-4223 Courier: 51-31-00

Meeting Notes Memorandum

Meeting Date: February 13, 2017

Subject: B-4484 Maple Cypress Bridge Replacements
Agency Field Meeting

Location: Project Site, Maple Cypress Road, Grifton, NC – Bridge No. 138 and 139

Attendees:

NCDOT	AGENCIES	RS&H
Maria Rogerson, Division 2	Tom Steffens, USACE	Edith Peters
Bill Kincannon, Division 2	Garcy Ward, NCDWR	Drew Morrow
Jay Johnson, Division 2	Travis Wilson, NCWRC	Samantha Schober
	Gary Jordan, USFWS	
	Stephan Lane, NCDCM	

The purpose of this meeting was to meet with the environmental agency stakeholders for the B-4484 Maple Cypress Bridge Replacements Project to provide an update on the project status, information on alternatives being considered, and to determine a selected alternative.

- **General Notes**
  - Construction moratorium will apply to Neuse River, overflow, and culvert. Consider constructability meeting in the future and look at potential staging areas.
  - Maintain access to the boat ramp during construction. NCWRC is ok with the proposed driveway location for both alternatives.
  - Distinguish in water line impacts how much are above vs. underground.
  - Coordinate with Utilities unit to see why estimates are the same for both alternatives.
  - Manatee guidelines will apply for this project.
  - USACE Individual Permit is anticipated.
  - Any existing causeway that is unused needs to be brought back to wetland height and tied in with surrounding wetlands.
  - Consider steepening and armoring slopes to reduce wetland impacts.
  - NCDWR requested Neuse River Buffer Impacts be provided prior to selection of the alternative (see attached maps and table below).
  - Storm water will need to be collected – deck drains would have to be outside of buffer.
  - Look at adding EQ pipes/culverts on northern end (3 or more would be helpful in storm events).
  - CAMA Major Permit is anticipated.
  - NCDOT will provide preliminary design on selected alterative to agencies before permitting.
  - Be sure to include a write up of previously considered alternatives and why they were eliminated. This includes looking at the option of Alt 1 and 2 combined but sight distance issues would make it below design standards.
  - USACE, NCWRC, NCDCM, and USFWS prefer Alternative 1. NCDWR needs Neuse River Buffer Impacts to make decision on preferred alternative.

- **Follow-up Coordination**
  - RS&H provided the Neuse River Buffer Impacts to NCDWR on 2/16/17. Additional coordination and guidance was provided to RS&H and buffer impacts were updated on 2/20/17. On 3/9/17, NCDWR approved the buffer calculations and agreed on Alternative 1 as the preferred alternative.

Category	Alternative 1	Alternative 2
Project Length	3,700 ft.	4,000 ft.
Overhead Utility Relocations (power and telecommunications)	10 poles	10 poles
Riparian Wetland Impacts	3.68 ac.	4.63 ac.
Surface Water Impacts	0.01 ac.	0.02 ac.
Stream Impacts	240 lf.	230 lf.
Neuse River Buffer Impacts	4,303 sq. ft.	3,926 sq. ft.
Water line relocation (underground and above-ground)	approx. 3,900 lf.	approx. 1,600 lf.
Construction Cost Estimate	$10.5 Million	$11.1 Million

- **Next Steps**
  - Alternative 1 has been selected as the Preferred Alternative.
  - RS&H and NCDOT will carry forward with preliminary design for Alternative 1.

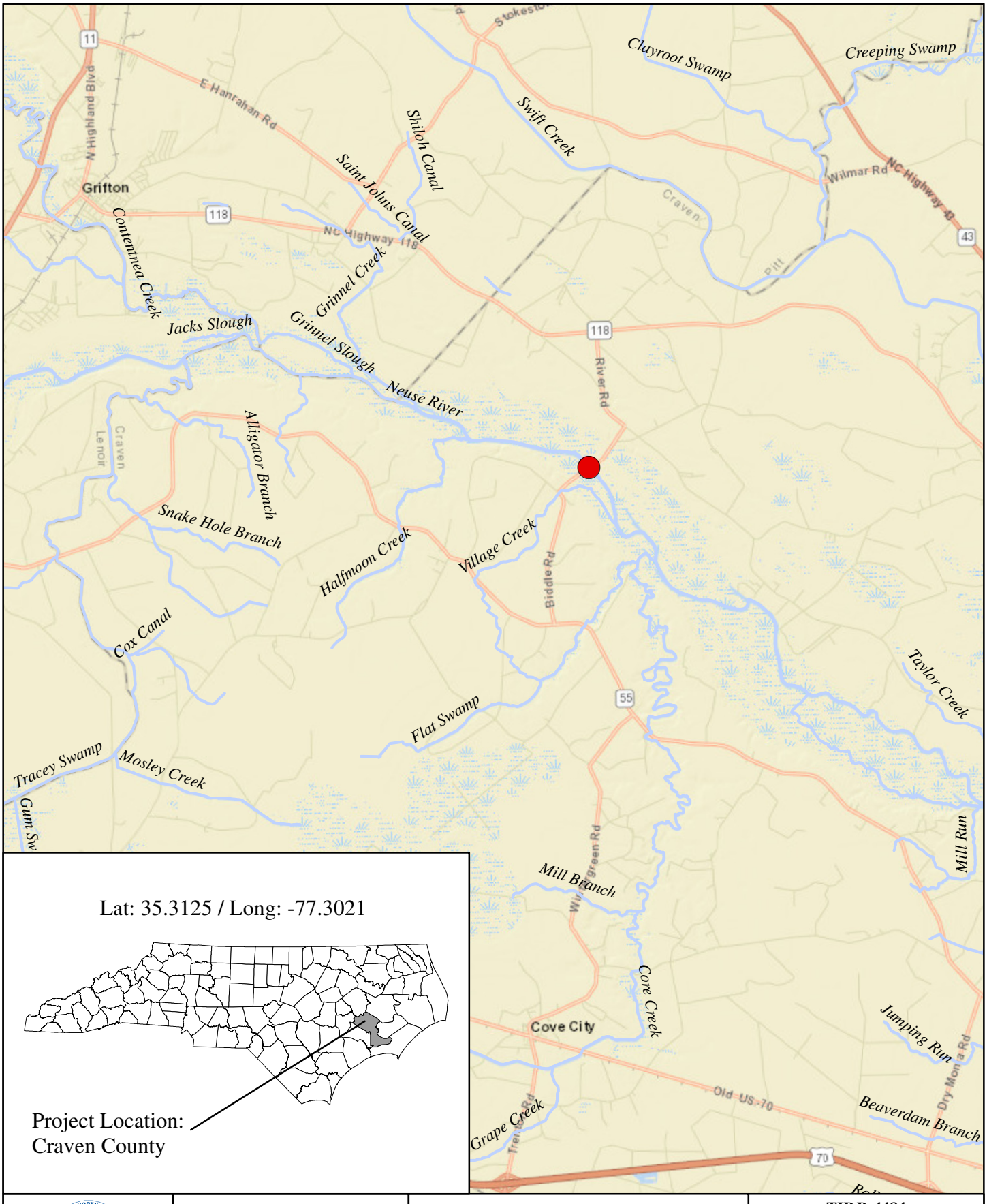
If any recipient of the meeting notes would like to add comments or feels a comment is erroneous or needs to be expanded, please feel free to contact Samantha Schober by email at Samantha.Schober@rsandh.com.

Attachments:

Meeting Handout
Neuse River Buffer Impact Figures 3 and 4

Copies to:

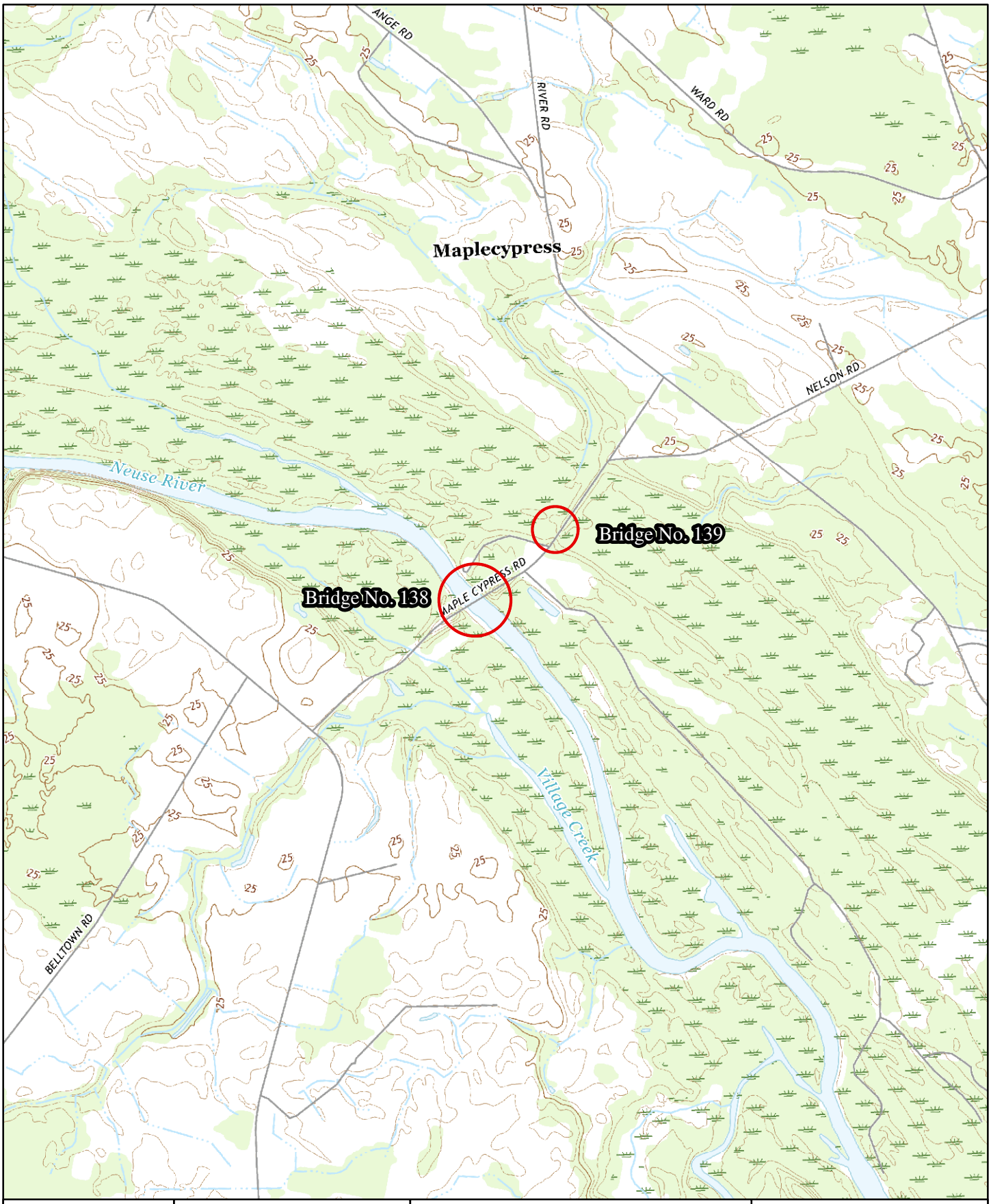
Meeting Attendees



TIP B-4484
Replace Bridges No. 138 & 139
Craven County, NC

September 2019

Figure 1: Vicinity Map



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0 1,000 2,000 Feet

Fort Barnwell (2016) USGS 1:24,000 Quadrangle Map

September 2019

TIP B-4484
Replace Bridges No. 138 & 139
Craven County, NC

Figure 2: USGS Map

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.06; Released June 2016)

WBS Element: 33723.1.2 **TIP No.:** B-4484 **County(ies):** Craven

General Project Information

WBS Element:	33723.1.2	**TIP Number:**	B-4484	**Project Type:** Bridge replacement	**Date:** 8/7/2019
NCDOT Contact:	Hon Yeung, PE		**Contractor / Designer:**	Richard Bollinger, PE	
Address:	1037 W.H. Smith Blvd. Greenville, NC 27835		**Address:**	8521 Six Forks Rd. Suite 400 Raleigh, NC 27615	
Phone:	(252) 439-2827		**Phone:**	(919) 926-4105	
Email:	hfyeung@ncdot.gov		**Email:**	richard.bollinger@rsandh.com	
City/Town:	Ft. Barnwell		**County(ies):**	Craven	
River Basin(s):	Neuse		**CAMA County?**	Yes	
Wetlands within Project Limits?	Yes				

Project Description

Project Length (lin. miles or feet):	0.701 miles	**Surrounding Land Use:**	Woods, Farmland, Residential

	Proposed Project	**Existing Site**
Project Built-Upon Area (ac.)	4.0 ac.	3.0 ac.
Typical Cross Section Description:	Bridge 138: Two 11' lanes with 8' total shoulder width Bridge 139: Two 11' lanes with 9' total shoulder width	Bridge 138: Two 12' lanes with 1.5' shoulders Bridge 139: Two 12' lanes with 3' shoulders
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 2279 Year: 2039	Existing: 1863 Year: 2019

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

This is a bridge replacement project. The existing Bridge 138 over the Neuse River is 1@40'3"; 5@40'; 1@60'; 6@40'; 1@40.3" RC floor in I-beams. The proposed bridge will go upstream from existing crossing. Proposed Bridge 138 is a 6@100' 54" girder bridge with 4' caps. The bridge will have 2 drop inlets at the end of the approach slab to collect deck drainage with a single outlet to the side of the bridge. Rip rap pads will be used at all ditch outlets to reduce flows into wetlands.
The existing Bridge 139 over the Neuse River overflow is a 4@45' prestressed concrete cored slab bridge. The proposed bridge will go upstream from existing crossing. Proposed Bridge 139 is a 4@100' 54" girder bridge with 4' caps. The bridge will have 2 drop inlets at the end of the approach slab to collect deck drainage with a single outlet to the side of the bridge. Rip rap pads will be used at all ditch outlets to reduce flows into wetlands.
Retaining walls are being used along the upstream side of the project where practicable to minimize wetland impacts.
NCDOT will attempt to avoid and minimize impacts to streams to the greatest extent practicable during project design.

Waterbody Information

Surface Water Body (1):	Neuse River		**NCDWR Stream Index No.:**	27-(85)	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	Swamp Waters (Sw)	(NSW)	
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	Neuse River			**Buffer Rules in Effect:**	Neuse
Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	No	**Dissipator Pads Provided in Buffer?**	No
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

09/08/99

TIP PROJECT: B–4484

CONTRACT:

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CRAVEN COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–4484	1	

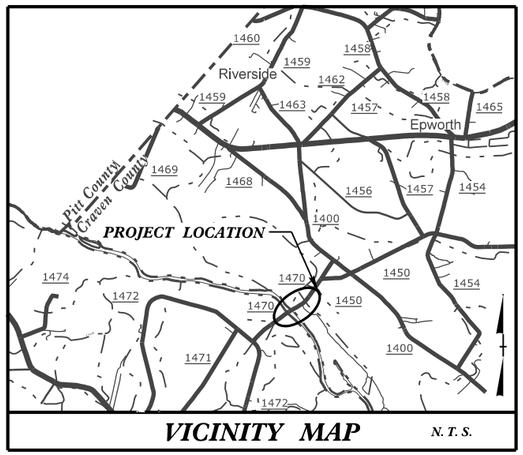
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33723.1.2	N/A	PE
33723.2.1	N/A	ROW, UTIL

LOCATION: REPLACE BRIDGES NO. 138 & 139 OVER NEUSE RIVER AND NEUSE RIVER OVERFLOW ON SR 1470 (MAPLE CYPRESS ROAD)

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

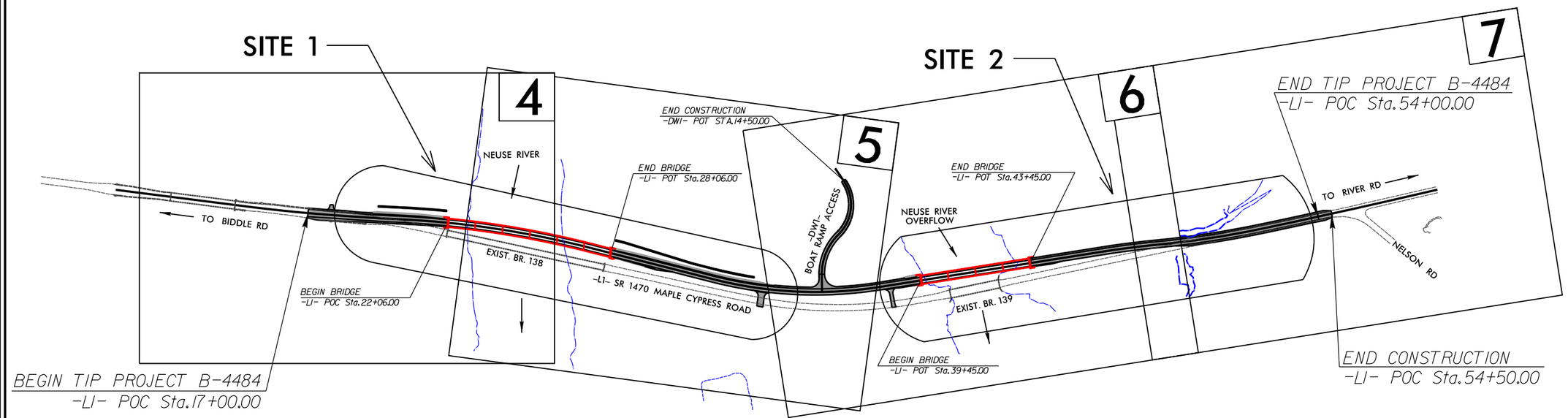
WETLAND AND SURFACE WATER IMPACTS PERMIT

PERMIT DRAWING SHEET 1 OF 15



VICINITY MAP N. T. S.

PERMIT DRAWINGS



THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
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 = 1,863
ADT 2039 = 2,279
K = 12 %
D = 60 %
T = 10 % *
V = 60 MPH
*(TTST = 3% + DUAL = 7%)
FUNC CLASS = MAJOR COLLECTOR
SUB–REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B–4484	=	0.512 MILE
LENGTH STRUCTURE TIP PROJECT B–4484	=	0.189 MILE
TOTAL LENGTH TIP PROJECT B–4484	=	0.701 MILE

PREPARED IN THE OFFICE OF:

RS&H

1520 SOUTH BOULEVARD, SUITE 200
CHARLOTTE, NC 28203
NC FIRM LICENSE No: F-0493

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MARCH 7, 2019

LETTING DATE:
APRIL 21, 2020

JENNIFER FARINO, PE
PROJECT ENGINEER

DREW MORROW, PE
PROJECT DESIGN ENGINEER

HON YEUNG, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

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PROJECT REFERENCE NO.	SHEET NO.
B-4484	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H
NC FIRM LICENSE No: F-0493

PERMIT DRAWING
SHEET 2 OF 15

BEGIN TIP PROJECT B-4484
-L1- POC STA. 17+00.00

SITE 1

INSET B

NAD 83/2001

1 FRANCES T. KILPATRICK

2 SANDRA N. WHITE

WOODS

TIE TO EXIST. GUARDRAIL
REMOVE APPROX. 50 LF OF EXIST. GUARDRAIL FROM -L1- STA. 17+00.00 TO 17+52 LT +/-

END PROP. RET. WALL #1
-L1- STA. 19+50.00

BEGIN PROP. RET. WALL #1
-L1- STA. 22+00.00

BEGIN HDD OF 12" HDPE WATERLINE

SEE INSET B

RETAIN

10" A/C WATER LINE

EXISTING R/W VARIES

SR 1470
MAPLE CYPRESS RD

22' BST

N 53° 39' 20.5" E

NEUSE RIVER OVERFLOW BRIDGE

RETAIN EXISTING OVERFLOW BRIDGE

12" CMP

TIE TO EXIST. GUARDRAIL
REMOVE APPROX. 250 LF OF EXIST. GUARDRAIL FROM -L1- STA. 17+00.00 TO 19+50 RT +/-

REMOVE EXISTING 12" CMP

MECHANIZED CLEARING

SEE INSET A

GRADE EXISTING EMBANKMENT DOWN TO ELEV. 13' FROM -L1- STA. 22+28 TO 23+46, AND LAY BACK EMBANKMENT AT A 3:1 FROM -L1- STA. 21+78 TO 22+28.

SBG FROM -L1- STA. 19+34 TO STA. 21+95 LT
SBG FROM -L1- STA. 20+49 TO STA. 21+95 RT

PROPERTY LINE RUNS ALONG HIGH WATER LINE OF NEUSE RIVER

EXCAVATION LIMITS

MATCH TO SHEET 5
-L1- STA. 24+00

INSET A

TEMPORARY WORK PLATFORM

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

50' 0' 50' 100' 150'

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PROJECT REFERENCE NO.	SHEET NO.
B-4484	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H
NC FIRM LICENSE No: F-0493

PERMIT DRAWING
SHEET 3 OF 15

BEGIN TIP PROJECT B-4484
-L1- POC STA. 17+00.00

SITE 1

NAD 83/2001

1 FRANCES T. KILPATRICK

2 SANDRA N. WHITE

INSET B

INSET A

TIE TO EXIST. GUARDRAIL
REMOVE APPROX. 50 LF OF EXIST. GUARDRAIL FROM -L1- STA. 17+00.00 TO 17+52 LT +/-

END PROP. RET. WALL #1
-L1- STA. 19+50.00

BEGIN PROP. RET. WALL #1
-L1- STA. 22+00.00

BEGIN HDD OF 12" HDPE WATERLINE

SEE INSET B

SEE INSET A

RETAIN

RETAIN 10" A/C WATER LINE

RETAIN EXISTING OVERFLOW BRIDGE

NEUSE RIVER OVERFLOW BRIDGE

SR 1170 MAPLE CYPRESS RD

N 53° 39' 20.5" E

22' BST

TIE TO EXIST. GUARDRAIL
REMOVE APPROX. 250 LF OF EXIST. GUARDRAIL FROM -L1- STA. 17+00.00 TO 19+50 RT +/-

REMOVE EXISTING 12" CMP

MECHANIZED CLEARING

EXISTING R/W VARIES

EXCAVATION LIMITS

GRADE EXISTING EMBANKMENT DOWN TO ELEV. 13' FROM -L1- STA. 22+23 TO 22+46, AND LAY BACK EMBANKMENT AT A 3:1 FROM -L1- STA. 21+78 TO 22+28.

SBG FROM -L1- STA. 19+34 TO STA. 21+95 LT

SBG FROM -L1- STA. 20+49 TO STA. 21+95 RT

MATCH TO SHEET 5

-L1- STA. 24+00

PROPERTY LINE RUNS ALONG HIGH WATER LINE OF NEUSE RIVER

WOODS

TEMPORARY WORK PLATFORM

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

50' 0' 50' 100' 150'

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-4484	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H
NC FIRM LICENSE No: F-0493

PERMIT DRAWING
SHEET 4 OF 15

SITE 1

NAD 83/2001

STATE OF NORTH CAROLINA

PROPERTY LINE RUNS ALONG HIGH WATER LINE OF NEUSE RIVER

NEUSE RIVER

3
WILLIAM E. DANIELS

WOODS

25

30

35

*SEE NOTE ON W.I.S.S. FOR IMPACT INFORMATION REGARDING THE TEMPORARY WORK PLATFORM

END PROP. RET. WALL #2
-L1- STA. 28+10.00

BEGIN PROP. RET. WALL #2
-L1- STA. 33+35.00

FALLOW

MATCH TO SHEET 4 -L1- STA. 24+00

MATCH TO SHEET 6 -L1- STA. 35+00

PUE

12" WL

10" DI (NW CRAVEN WSD)

NOTE: 2 SEPARATE MONITORING INSTRUMENTS ARE ATTACHED TO THE BRIDGE STRUCTURE. INSTRUMENTS MEASURE FLOW RATE AND WATER LEVEL OF NEUSE RIVER. ONE IS MAINTAINED BY USGS AND THE OTHER IS UNKNOWN, POSSIBLY N.C. STATE UNIVERSITY OR NCDWQ.

BRIDGE #138

NOTE: BRIDGE HAS CONC DECK, RAILS AND HEXA PILES. STEEL I-BEAM STRINGERS SUPPORTED ON WOOD PILES

REMOVE EXISTING BRIDGE

RELOCATE TO PROPOSED BRIDGE BY OTHERS

EXCAVATION LIMITS

EXISTING R/W

TB2GI

10" PLAS. (NW CRAVEN WSD)

15" RCP-III

MH

SR 1470 MAPLE CYPRESS RD 22' PST

END HDD OF 12" HDPE WATERLINE

HDPE

15" CAAP w/ELBOWS

GRADE EXISTING EMBANKMENT DOWN TO ELEV. 11' FROM -L1- STA. 27+42 TO 27+89, AND LAY BACK EMBANKMENT AT A 3:1 FROM -L1- STA. 27+89 TO 28+39.

SBG FROM -L1- STA. 28+10 TO STA. 34+11 LT

SBG FROM -L1- STA. 28+19 TO STA. 29+74 RT

MECHANIZED CLEARING

4
COASTAL LUMBER COMPANY

HEATH FAMILY FARMS, LLC

POND

GATE

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

TEMPORARY WORK PLATFORM*

50′ 0′ 50′ 100′ 150′

FOR -L1- PROFILE, SEE SHEET 8

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PROJECT REFERENCE NO.	SHEET NO.
B-4484	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H
NC FIRM LICENSE No: F-0493

PERMIT DRAWING
SHEET 5 OF 15

SITE 1

NAD 83/2001

STATE OF NORTH CAROLINA

PROPERTY LINE RUNS ALONG HIGH WATER LINE OF NEUSE RIVER

NEUSE RIVER

3
WILLIAM E. DANIELS

WOODS

*SEE NOTE ON W.I.S.S. FOR IMPACT INFORMATION REGARDING THE TEMPORARY WORK PLATFORM

END PROP. RET. WALL #2
-L1- STA. 28+10.00

FALLOW

MATCH TO SHEET 4 -L1- STA. 24+00

PUE
12" WL
10" DI (NW CRAVEN WSD)
10" PLAS. (NW CRAVEN WSD)

NOTE: 2 SEPARATE MONITORING INSTRUMENTS ARE ATTACHED TO THE BRIDGE STRUCTURE. ONE IS MEASURING WATER FLOW RATE AND WATER LEVEL OF NEUSE RIVER, ONE IS MEASURING BRIDGE MOVEMENT AND THE OTHER IS UNKNOWN, POSSIBLY N.C. STATE UNIVERSITY OR NCDWQ

BRIDGE #138

NOTE: BRIDGE HAS CONC DECK, RAILS AND WEAR PILES. STELL I-BEAM STRINGERS SUPPORTED ON WOOD PILES

REMOVE EXISTING BRIDGE

RELOCATE TO PROPOSED BRIDGE BY OTHERS

EXCAVATION LIMITS

GRADE EXISTING EMBANKMENT DOWN TO ELEV. 11 FROM -L1- STA. 27+42 TO 27+89, AND LAY BACK EMBANKMENT AT A 3:1 FROM -L1- STA. 27+89 TO 28+39.

SBG FROM -L1- STA. 28+10 TO STA. 34+11 LT
SBG FROM -L1- STA. 28+19 TO STA. 29+74 RT

PROPERTY LINE RUNS ALONG HIGH WATER LINE OF NEUSE RIVER

EXISTING R/W

TB2GI

15" RCP-III

MH

15" CAAP w/ELBOWS

SR 1470 MAPLE CYPRESS RD. 22' PST

END HDD OF 12" HDPE WATERLINE

BEGIN PROP. RET. WALL #2
-L1- STA. 33+35.00

MECHANIZED CLEARING

4
COASTAL LUMBER COMPANY

HEATH FAMILY FARMS, LLC

POND

MATCH TO SHEET 6 -L1- STA. 35+00

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

TEMPORARY WORK PLATFORM*

50' 0' 50' 100' 150'

FOR -L1- PROFILE, SEE SHEET 8

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PROJECT REFERENCE NO.	SHEET NO.
B-4484	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

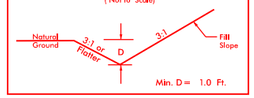
RS&H
NC FIRM LICENSE No: F-0493

SITE 2

NAD 83/2001

PERMIT DRAWING SHEET 6 OF 15

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



FROM -L1- STA. 35+20 TO STA. 35+50 LT
FROM -L1- STA. 36+50 TO STA. 37+21 LT

DETAIL B
SPECIAL CUT DITCH
(Not to Scale)

FROM -DW1- STA. 10+26 TO STA. 14+40 LT
FROM -DW1- STA. 10+29 TO STA. 13+90 RT

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

-DW1- STA. 14+00 RT

WILLIAM E. DANIELS

WOODS

END CONSTRUCTION
-DW1- POT STA.14+37.00

STANDARD 'V' DITCH
SEE DETAIL C

18" RCP IV

SPECIAL CUT DITCH
SEE DETAIL B

END ASPHALT PAVEMENT
-DW1- 10+89.79

CAROL U. HEATH

BEGIN GRADE
-DW1- POT STA.10+11.00
SPECIAL LATERAL 'V' DITCH
SEE DETAIL A

SPECIAL CUT DITCH
SEE DETAIL B

15" RCP III

15" RCP III

10" PLAS. (NW CRAVEN WSD)

EXISTING R/W

MATCH TO SHEET 5
-L1- STA. 35+00

SBG FROM -L1- STA. 38+89 TO 39+34 LT

SBG FROM -L1- STA. 43+56 TO 43+72 LT

BEGIN ROCK PLATING
-L1- POT STA.43+57 +/- LT

CYPRESS SWAMP

EXCAVATION LIMITS

NEUSE RIVER OVERFLOW BRIDGE #139

SR 1470 MAPLE CYPRESS RD 22' BST

REMOVE EXISTING BRIDGE

GRADE EXISTING EMBANKMENT DOWN TO ELEV. 7' (WETLAND ELEVATION) FROM -L1- STA. 39+73 TO 40+47 AND 42+21 TO 43+32. LAY BACK EMBANKMENT AT A 2:1 FROM -L1- STA. 39+41 TO 39+73 AND FROM 43+32 TO 43+58.

BEGIN HDD OF 12" HDPE WATERLINE

END HDD OF 12" HDPE WATERLINE

MATCH TO SHEET 7
-L1- STA. 48+00

HAROLD HARGETT JR & TONYA H. BYRD

CAROL U. HEATH

RAY M. HEATH

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

DENOTES EXCAVATION IN WETLAND

TEMPORARY WORK PLATFORM

50' 0' 50' 100' 150'

FOR -DW1- PROFILE, SEE SHEET 10

FOR -L1- PROFILE, SEE SHEET 9

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PROJECT REFERENCE NO.	SHEET NO.
B-4484	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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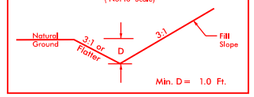
RS&H
NC FIRM LICENSE No: F-0493

SITE 2

NAD 83/2001

PERMIT DRAWING SHEET 7 OF 15

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



FROM -L1- STA. 35+20 TO STA. 35+50 LT
FROM -L1- STA. 36+50 TO STA. 37+21 LT

DETAIL B
SPECIAL CUT DITCH
(Not to Scale)

FROM -DW1- STA. 10+26 TO STA. 14+40 LT
FROM -DW1- STA. 10+29 TO STA. 13+90 RT

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

-DW1- STA. 14+00 RT

WILLIAM E. DANIELS

WOODS

END CONSTRUCTION
-DW1- POT STA.14+37.00

STANDARD 'V' DITCH
SEE DETAIL C

PDE

18" RCP IV

SPECIAL CUT DITCH
SEE DETAIL B

END ASPHALT PAVEMENT
-DW1- 10+89.79

CAROL U. HEATH

SPECIAL CUT DITCH
SEE DETAIL B

BEGIN GRADE
-DW1- POT STA.10+11.00

SPECIAL LATERAL 'V' DITCH
SEE DETAIL A

MATCH TO SHEET 5
-L1- STA. 35+00

5
CAROL U. HEATH

SBG FROM -L1- STA. 38+89 TO 39+34 LT

SBG FROM -L1- STA. 43+56 TO 43+72 LT

BEGIN ROCK PLATING
-L1- POT STA.43+57 +/- LT

CYPRESS SWAMP

15" RCP-III
SBG

(BRIDGE)

15" RCP-III

EXCAVATION LIMITS

NEUSE RIVER OVERFLOW BRIDGE #139

SR 1470 MAPLE CYPRESS RD 22' BST

EXISTING R/W

10" PLAS. (NW CRAVEN WSD)

BEGIN HDD OF
12" HDPE WATERLINE

END HDD OF
12" HDPE WATERLINE

REMOVE EXISTING
BRIDGE

GRADE EXISTING EMBANKMENT DOWN TO ELEV. 7' (WETLAND ELEVATION) FROM -L1- STA. 39+73 TO 40+47 AND 42+21 TO 43+32 LAY BACK EMBANKMENT AT A 2:1 FROM -L1- STA. 39+41 TO 39+73 AND FROM 43+32 TO 43+58.

6
RAY M. HEATH

7
HAROLD HARGETT JR & TONYA H. BYRD

8

MATCH TO SHEET 7
-L1- STA. 48+00

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

DENOTES EXCAVATION IN WETLAND

TEMPORARY WORK PLATFORM

50' 0' 50' 100' 150'

FOR -DW1- PROFILE, SEE SHEET 10

FOR -L1- PROFILE, SEE SHEET 9

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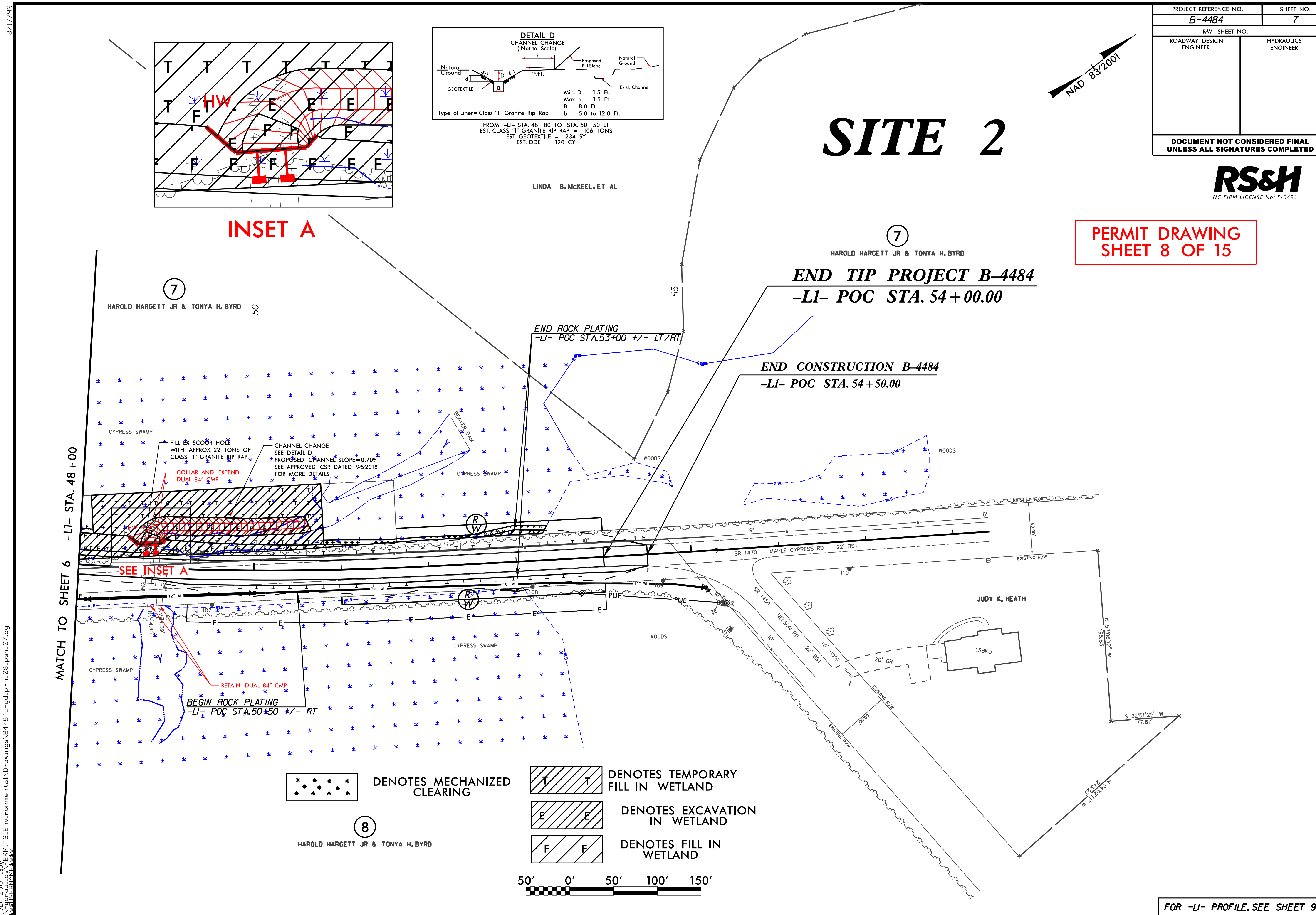

PROJECT REFERENCE NO.
B-4484
SHEET NO.
7
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
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NC FIRM LICENSE No: F-0493
NAD 83/2001
SITE 2
PERMIT DRAWING
SHEET 8 OF 15
DETAIL D
CHANNEL CHANGE
(Not to Scale)
Natural Ground
Proposed Fill Slope
Exist. Channel
GEOTEXTILE
Min. D= 1.5 Ft.
Max. d= 1.5 Ft.
B= 8.0 Ft.
b= 5.0 to 12.0 Ft.
Type of Liner= Class "I" Granite Rip Rap
FROM -L1- STA. 48+80 TO STA. 50+50 LT
EST. CLASS "I" GRANITE RIP RAP = 106 TONS
EST. GEOTEXTILE = 234 SY
EST. DDE = 120 CY
LINDA B. McKEEL, ET AL
INSET A
HW
HAROLD HARGETT JR & TONYA H. BYRD
END TIP PROJECT B-4484
-L1- POC STA. 54+00.00
END ROCK PLATING
-L1- POC STA.53+00 +/- LT/RT
END CONSTRUCTION B-4484
-L1- POC STA. 54+50.00
CYPRESS SWAMP
FILL EX SCOUR HOLE WITH APPROX. 22 TONS OF CLASS "I" GRANITE RIP RAP
COLLAR AND EXTEND DUAL 84" CMP
CHANNEL CHANGE SEE DETAIL D PROPOSED CHANNEL SLOPE=0.70% SEE APPROVED CSR DATED 9/5/2018 FOR MORE DETAILS
BEAVER DAM
WOODS
SEE INSET A
-L1- STA. 48+00
MATCH TO SHEET 6
SR 1470 MAPLE CYPRESS RD 22' BST
SR 1450 NELSON RD 22' BST
EXISTING R/W
PUE
JUDY K. HEATH
1SBKD
20' GR.
RETAIN DUAL 84" CMP
BEGIN ROCK PLATING
-L1- POC STA.50+50 +/- RT
DENOTES MECHANIZED CLEARING
DENOTES TEMPORARY FILL IN WETLAND
DENOTES EXCAVATION IN WETLAND
DENOTES FILL IN WETLAND
50' 0' 50' 100' 150'
FOR -L1- PROFILE, SEE SHEET 9
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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-4484	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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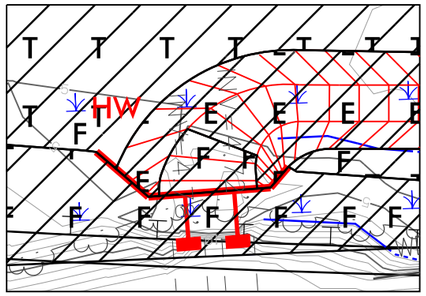
SITE 2

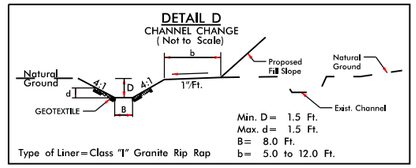
NAD 83/2001

PERMIT DRAWING
SHEET 9 OF 15



INSET A

DETAIL D
CHANNEL CHANGE
(Not to Scale)



Type of Liner= Class "I" Granite Rip Rap

FROM -L1- STA. 48+80 TO STA. 50+50 LT
EST. CLASS "I" GRANITE RIP RAP = 106 TONS
EST. GEOTEXTILE = 234 SY
EST. DDE = 120 CY

LINDA B. McKEEL, ET AL

7
HAROLD HARGETT JR & TONYA H. BYRD

7
HAROLD HARGETT JR & TONYA H. BYRD

END TIP PROJECT B-4484
-L1- POC STA. 54+00.00

END CONSTRUCTION B-4484
-L1- POC STA. 54+50.00

END ROCK PLATING
-L1- POC STA.53+00 +/- LT/RT

MATCH TO SHEET 6 -L1- STA. 48+00

CYPRESS SWAMP

FILL EX SCOUR HOLE WITH APPROX. 22 TONS OF CLASS "I" GRANITE RIP RAP

COLLAR AND EXTEND DUAL 84" CMP

CHANNEL CHANGE SEE DETAIL D
PROPOSED CHANNEL SLOPE=0.70%
SEE APPROVED CSR DATED 9/5/2018 FOR MORE DETAILS

BEAVER DAM

SEE INSET A

RETAIN DUAL 84" CMP

BEGIN ROCK PLATING
-L1- POC STA.50+50 +/- RT

WOODS

SR 1470 MAPLE CYPRESS RD 22' BST

SR 1450 NELSON RD 22' BST

EXISTING R/W

JUDY K. HEATH

SBKD

20' GR

15" HDPE

PUE

10' BRSL

N 57°06'21" W 195.83'

S 32°51'25" W 77.87'

N 07°07'11" W 247.23'

8
HAROLD HARGETT JR & TONYA H. BYRD

DENOTES MECHANIZED CLEARING

DENOTES TEMPORARY FILL IN WETLAND

DENOTES EXCAVATION IN WETLAND

DENOTES FILL IN WETLAND

50' 0' 50' 100' 150'

FOR -L1- PROFILE, SEE SHEET 9

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-L1-

STRUCTURE HYDRAULIC DATA

DRAINAGE AREA	= 3.950	SQ.MI.
DESIGN DISCHARGE	= 19,400	CFS
DESIGN FREQUENCY	= 2	YRS
DESIGN HW ELEVATION	= 13.2	FT
BASE DISCHARGE	= 70,000	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 23.3	FT
OVERTOPPING DISCHARGE	= 22,400	CFS
OVERTOPPING FREQUENCY	= 2+	YRS
OVERTOPPING ELEVATION	= 13.8	FT

PERMIT DRAWING SHEET 10 OF 15

PROJECT REFERENCE NO.	SHEET NO.
B-4484	8
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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BEGIN PROPOSED GRADE
-L1- STA. 17+00.00
ELEV.= 18.26'

PI = 18+40.00
EL = 21.62'
VC = 280'
K = 271

BEGIN BRIDGE
-L1- STA. 22+06.00
ELEV.= 32.61'

35.40'

(+)3.4343%

PROPOSED GRADE

(+)2.4000%

(+)3.4343%

TEMPORARY WORK PLATFORM*

EXISTING GROUND

PROPOSED EXCAVATION TO ELEV. 13 @ 450 CY

KEY IN CLASS "II" RIP RAP 3'-6" BELOW ELEV 13.0'

NCDOT GPS (B4484-1)
-L1- STA. 19+61.03 (29.42' RT)
ELEV.= 24.216'

PROP 12" HDPE HDD 12' (MIN.) BELOW STREAMBED

FOR -L1- ALIGNMENT, SEE SHEET 4

TEMPORARY WORK PLATFORM
*SEE NOTE ON WETLAND IMPACT SUMMARY

-L1-

PI = 25+40.00
EL = 45.66'
VC = 1120'
K = 162

35.40'

(+)3.4343%

(-)3.4935%

END BRIDGE
-L1- STA. 28+06.00
ELEV.= 33.69'

PROPOSED GRADE

PI = 34+60.00
EL = 13.52'
VC = 630'
K = 138

16.70'

(-)3.4935%

(+)1.0780%

PROPOSED DOWNSTREAM EXCAVATION TO ELEV. 11'

2' (TYP.)

KEY IN CLASS "II" RIP RAP 3'-6" BELOW ELEV 11.0'

NWS EL = 1.5' +/-
DATE OF SURVEY: 7/15/2018

TEMPORARY WORK PLATFORM

EXISTING GROUND

PROP 12" HDPE HDD

12' (MIN.) BELOW STREAMBED

FOR -L1- ALIGNMENT, SEE SHEET 5

TEMPORARY WORK PLATFORM
*SEE NOTE ON WETLAND IMPACT SUMMARY

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PROJECT REFERENCE NO.	SHEET NO.
B-4484	9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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NC FIRM LICENSE No: F-0493

LEFT DITCH — - - — -

PERMIT DRAWING
SHEET 11 OF 15

-L1-

STRUCTURE HYDRAULIC DATA

DRAINAGE AREA	= 3.950	SQ.MI.
DESIGN DISCHARGE	= 19.400	CFS
DESIGN FREQUENCY	= 2	YRS
DESIGN HW ELEVATION	= 13.2	FT
BASE DISCHARGE	= 70.000	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 23.3	FT
OVERTOPPING DISCHARGE	= 22.400	CFS
OVERTOPPING FREQUENCY	= 2+	YRS
OVERTOPPING ELEVATION	= 13.8	FT

-L1- STA. 35+85.25 =
-DW1- STA. 10+00.00
ELEV. = 16.18'

BEGIN BRIDGE
-L1- STA. 39+45.00
ELEV. = 18.75'

PI = 42+34.00
EL = 21.86'
VC = 320'
K = 154

END BRIDGE
-L1- STA. 43+45.00
ELEV. = 20.68'

16.70'

(+)11.0780%

(-)10.9971%

16.22'

PROPOSED GRADE

EXISTING GROUND

NWS EL = 3.8' +/-
DATE OF SURVEY:
7/15/2018

BEGIN SPECIAL LATERAL
"V" DITCH GRADE
-L1- STA. 35+20 LT
ELEV. = 13.56'

(-)3.7667%

END SPECIAL LATERAL
"V" DITCH GRADE
-L1- STA. 35+50 LT
ELEV. = 12.23'

BEGIN SPECIAL LATERAL
"V" DITCH GRADE
-L1- STA. 36+50 LT
ELEV. = 12.50'

(+)1.0000%

PI = 37+00.00
EL = 13.00'

(+)4.4769%

END SPECIAL LATERAL
"V" DITCH GRADE
-L1- STA. 37+21 LT
ELEV. = 14.00'

KEY IN CLASS "II" RIP RAP
3'-6" BELOW ELEV 6.0'

KEY IN CLASS "II" RIP RAP
3'-6" BELOW ELEV 7.0'

PROPOSED DOWNSTREAM
EXCAVATION TO ELEV. 7'

PROPOSED DOWNSTREAM
EXCAVATION TO ELEV. 7'

PROP 12" HDPE HDD

*TEMPORARY WORK
PLATFORM

6' (MIN.) BELOW
STREAMBED

TEMPORARY WORK PLATFORM

*SEE NOTE ON WETLAND IMPACT SUMMARY

FOR -L1- ALIGNMENT, SEE SHEET 6

-L1-

PI = 49+90.00
EL = 14.33'
VC = 200'
K = 139

16.22'

(-)10.9971%

(+)10.4385%

PROPOSED GRADE

END PROPOSED GRADE
BEGIN MILL AND OVERLAY
-L1- STA. 54+00.00
ELEV. = 16.12'

END MILL AND OVERLAY
-L1- STA. 54+50.00
ELEV. = 16.58'

EXISTING GROUND

EXISTING DUAL
84" CMP

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 19.400	CFS
DESIGN FREQUENCY	= 2	YRS
DESIGN HW ELEVATION	= 13.2	FT
BASE DISCHARGE	= 70.000	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 23.3	FT
OVERTOPPING DISCHARGE	= 22.400	CFS
OVERTOPPING FREQUENCY	= 2+	YRS
OVERTOPPING ELEVATION	= 13.8	FT

FOR -L1- ALIGNMENT, SEE SHEET 7

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-DWI-

LEFT DITCH	— - - — -
RIGHT DITCH	- - - - - - -
NOTE: DITCH VPI TRIANGLE MARKERS TURNED OFF FOR CLARITY	

PROJECT REFERENCE NO.	SHEET NO.
B-4484	10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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PERMIT DRAWING
SHEET 12 OF 15

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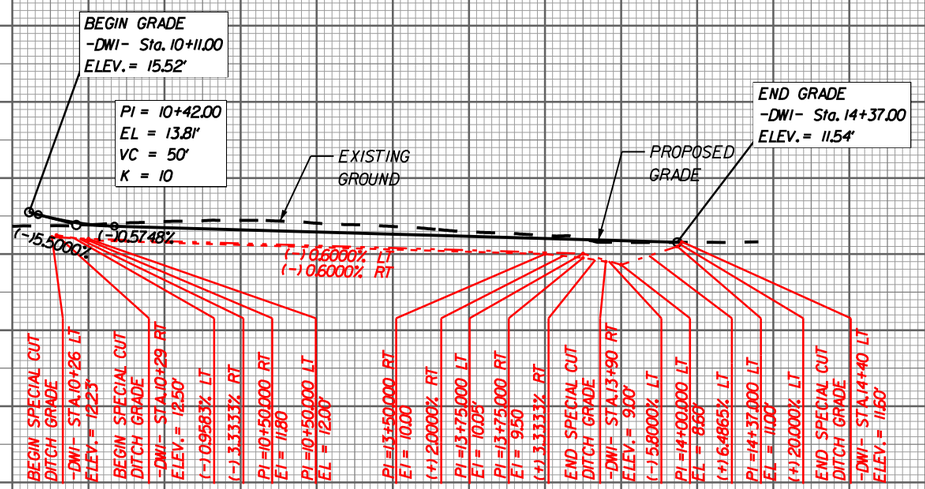
NC FIRM LICENSE No: F-0493



FOR -DWI- ALIGNMENT.SEE SHEET 6

10 11 12 13 14 15

30 20 10 0 –10 –20 –30

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4484	X-1

PERMIT DRAWING
SHEET 13 OF 15

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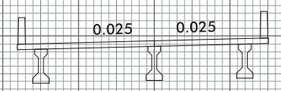
30 20 10 0 30 20 10 0

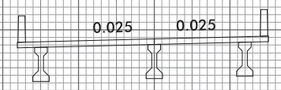


WETLAND BOUNDARY

WETLAND BOUNDARY

3.66

40+00.00



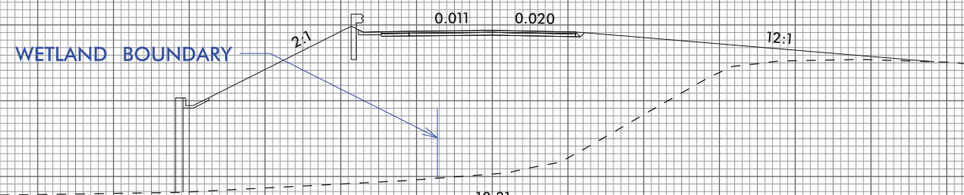
WETLAND BOUNDARY

6.81

39+50.00

40 30 20 10 0 40 30 20 10 0

WETLAND BOUNDARY

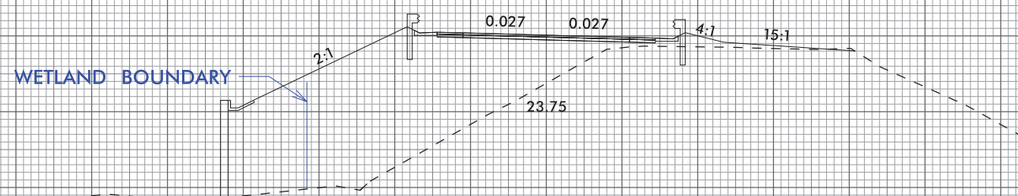


10.31

30+00.00

40 30 20 10 0 40 30 20 10 0

WETLAND BOUNDARY



23.75

WETLAND BOUNDARY

21+00.00

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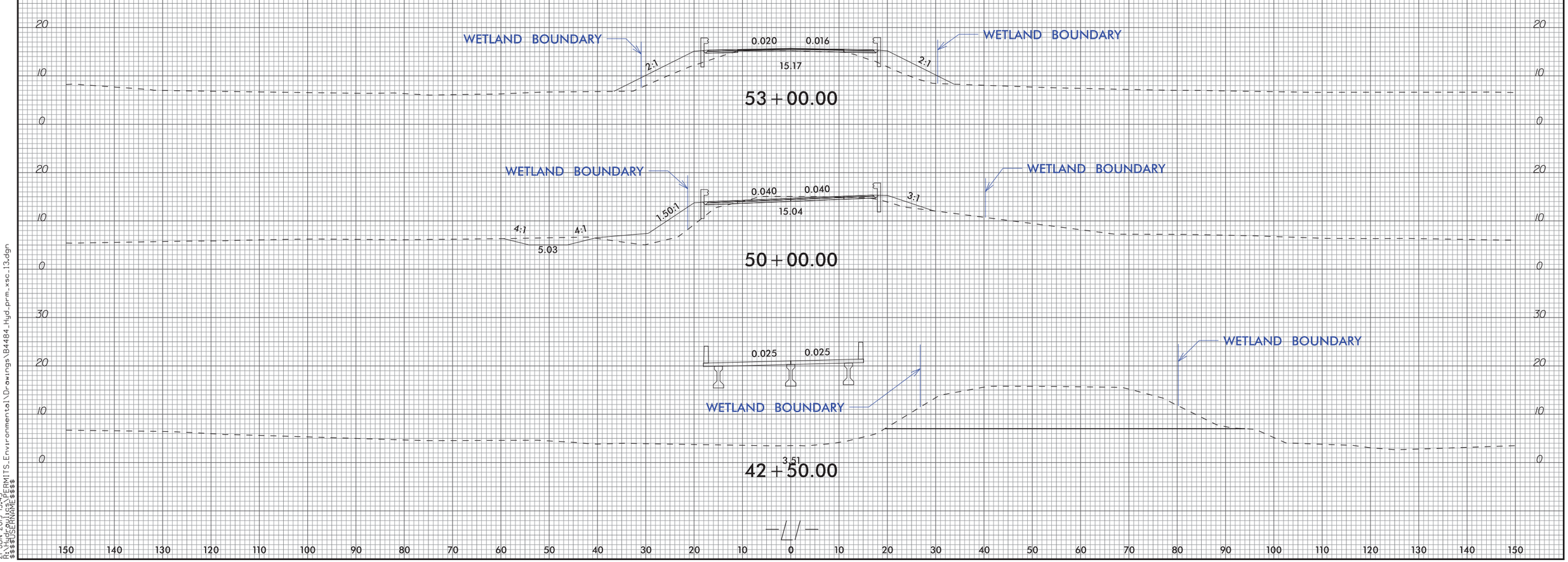
	B-4484	X-2

PERMIT DRAWING
SHEET 14 OF 15



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WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L1- 17+85 RT	Exist. 12" CMP Removal				< 0.01						
1	-L1- 19+41 LT	Rip Rap Outlets	< 0.01			< 0.01						
1	-L1- 20+50 RT	Rip Rap Outlet	< 0.01			< 0.01						
1	-L1- 20+62 to 22+28 LT	Ret Wall / Fill / Work Platform	0.07			0.19						
1	-L1- 27+85 to 32+70 LT	Ret Wall / Fill / Work Platform	0.36			0.10						
1	-L1- 29+73 RT	Rip Rap Outlet				< 0.01						
2	-L1- 39+17 LT	Roadway Fill Slope	0.03									
2	-L1- 39+62 RT	Roadway Cut Slope			< 0.01							
2	-L1- 39+71 to 40+45 RT	Roadway Cut Slope			0.04							
2	-L1- 39+00 to 43+32	Proposed Bridge / Work Platform				0.82						
2	-L1- 42+26 to 43+32 RT	Roadway Cut Slope			0.07							
2	-L1- 43+32 to 51+32 LT	Proposed Roadway/Fill Slope	0.61			0.08						
2	-L1- 48+60 to 50+66 LT	Channel Relocation	< 0.01	0.27	0.09							
2	-L1- 53+00 LT	Roadway Fill Slope	< 0.01									
2	-L1- 52+97 RT	Roadway Fill Slope	< 0.01									
TOTALS*:			1.09	0.27	0.20	1.20				0	0	0

*Rounded totals are sum of actual impacts

NOTES:
Total permanent Wetland Impacts due to proposed piles = 38 sq.ft.
Total permanent SW Impacts due to proposed piles = 141 sq.ft.
Temp Work Platform
Based on 20' or shorter spans, with pile rows 2' long and the full width of the platform (both conservative):
Temporary Fill in Wetlands = 4,567 sq.ft and Temporary Surface Water Impacts = 2,905 sq.ft

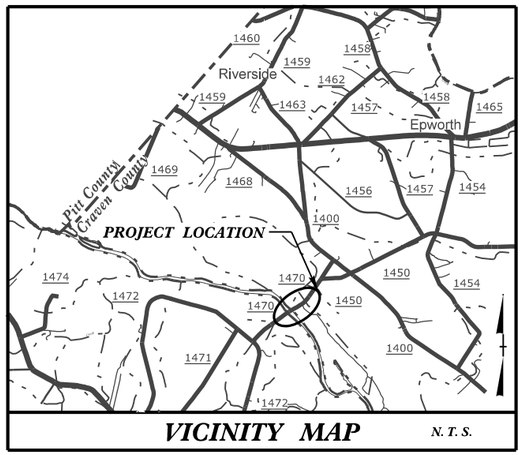
NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
9/10/2019
Craven County
B-4484
33723.1.2
SHEET 15 OF 15

09/08/99

TIP PROJECT: B-4484

CONTRACT:

BUFFER DRAWINGS



VICINITY MAP N. T. S.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CRAVEN COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4484	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33723.1.2	N/A	PE
33723.2.1	N/A	ROW, UTIL

LOCATION: REPLACE BRIDGES NO. 138 & 139 OVER NEUSE RIVER AND NEUSE RIVER OVERFLOW ON SR 1470 (MAPLE CYPRESS ROAD)

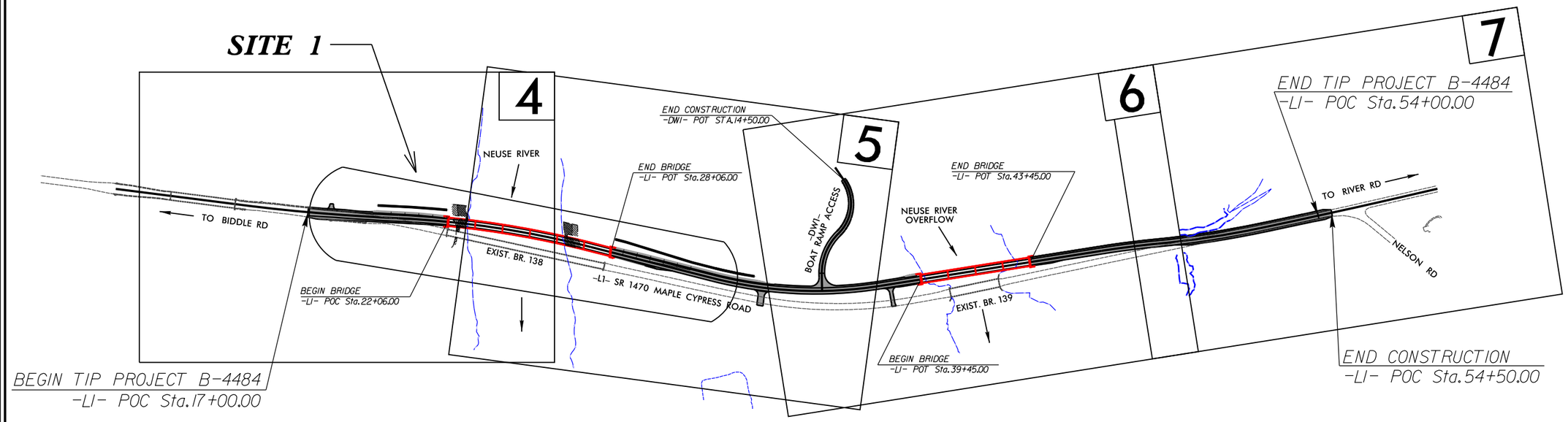
TYPE OF WORK: GRADING, DRAINAGE, PAVING, RETAINING WALLS, AND STRUCTURES

BUFFER IMPACTS PERMIT

BUFFER DRAWING SHEET 1 OF 5

NAD 83/2001

SITE 1



THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
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 = 1,863
ADT 2039 = 2,279
K = 12 %
D = 60 %
T = 10 % *
V = 60 MPH
*(TTST=3% + DUAL=7%)
FUNC CLASS = MAJOR COLLECTOR
SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4484	=	0.512 MILE
LENGTH STRUCTURE TIP PROJECT B-4484	=	0.189 MILE
TOTAL LENGTH TIP PROJECT B-4484	=	0.701 MILE

PREPARED IN THE OFFICE OF:
RS&H
1520 SOUTH BOULEVARD, SUITE 200
CHARLOTTE, NC 28203
NC FIRM LICENSE No: F-0493
FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MARCH 7, 2019

LETTING DATE:
APRIL 21, 2020

JENNIFER FARINO, PE
PROJECT ENGINEER

DREW MORROW, PE
PROJECT DESIGN ENGINEER

HON YEUNG, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

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PROJECT REFERENCE NO.	SHEET NO.
B-4484	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H
NC FIRM LICENSE No: F-0493

BUFFER DRAWING
SHEET 2 OF 5

SITE 1

BEGIN TIP PROJECT B-4484
-L1- POC STA. 17+00.00

NAD 83/2001

1 FRANCES T. KILPATRICK

2 SANDRA N. WHITE

TIE TO EXIST. GUARDRAIL
REMOVE APPROX. 50 LF OF EXIST. GUARDRAIL FROM -L1- STA. 17+00.00 TO 17+52 LT +/-

END PROP. RET. WALL #1
-L1- STA. 19+50.00

BEGIN PROP. RET. WALL #1
-L1- STA. 22+00.00

BEGIN HDD OF 12" HDPE WATERLINE

RETAIN

10" A/C WATER LINE

SR 1470
MAPLE CYPRESS RD
22' BST

N 53° 39' 20.5" E

NEUSE RIVER OVERFLOW BRIDGE

RETAIN EXISTING OVERFLOW BRIDGE

TIE TO EXIST. GUARDRAIL
REMOVE APPROX. 250 LF OF EXIST. GUARDRAIL FROM -L1- STA. 17+00.00 TO 19+50 RT +/-

REMOVE EXISTING 12" CMP

GRADE EXISTING EMBANKMENT DOWN TO ELEV. 13' FROM -L1- STA. 22+28 TO 23+46, AND LAY BACK EMBANKMENT AT A 3:1 FROM -B- STA. 21+78 TO 22+28.

EXISTING TRANSPORTATION FACILITY

MATCH TO SHEET 5
-L1- STA. 24+00

PROPERTY LINE RUNS ALONG HIGH WATER LINE OF NEUSE RIVER

WOODS

EXISTING R/W VARIES

EXISTING R/W MON

PUE

BZ 1

BZ 2

TEMPORARY WORK PLATFORM

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

50' 0' 50' 100' 150'

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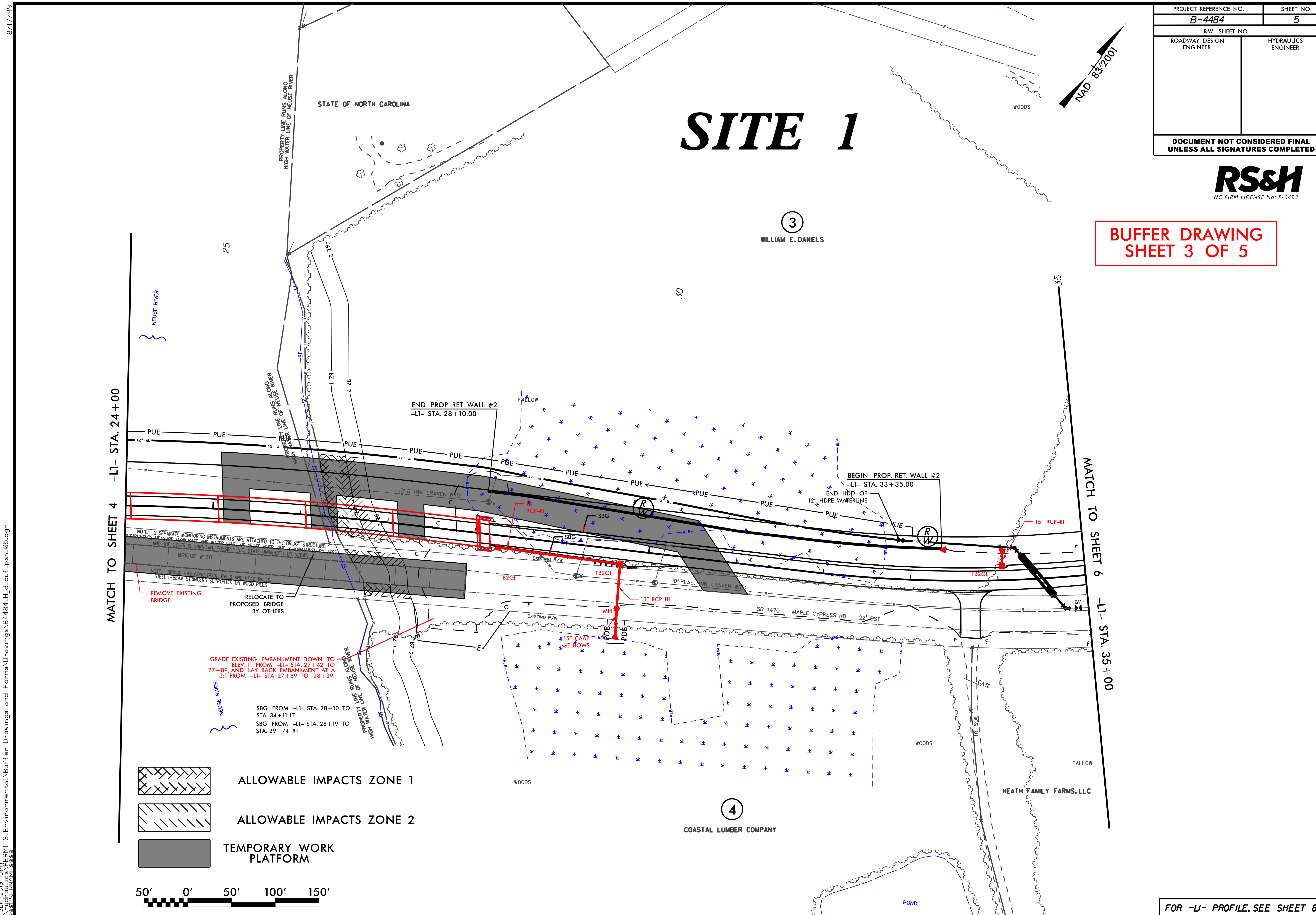
PROJECT REFERENCE NO.
B-4484
SHEET NO.
5
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
RS&H
NC FIRM LICENSE No: F-0493
NAD 83/2001
SITE 1
BUFFER DRAWING SHEET 3 OF 5
STATE OF NORTH CAROLINA
PROPERTY LINE RUNS ALONG HIGH WATER LINE OF NEUSE RIVER
WOODS
WILLIAM E. DANIELS
NEUSE RIVER
MATCH TO SHEET 4 -L1- STA. 24+00
MATCH TO SHEET 6 -L1- STA. 35+00
END PROP. RET. WALL #2 -L1- STA. 28+10.00
BEGIN PROP. RET. WALL #2 -L1- STA. 33+35.00
END HDD OF 12" HDPE WATERLINE
FALLOW
PUE
SBG
15" RCP-III
TB2GI
MH
15" CAAP w/ELBOWS
PDE
SR 1470 MAPLE CYPRESS RD 22' BST
EXISTING R/W
10" PLAS. INW CRAVEN WSD
10" DI INW CRAVEN WSD
NOTE: 2 SEPARATE MONITORING INSTRUMENTS ARE ATTACHED TO THE BRIDGE STRUCTURE. INSTRUMENTS MEASURE FLOW RATE AND WATER LEVEL OF NEUSE RIVER. ONE IS MAINTAINED BY USGS AND THE OTHER IS UNKNOWN, POSSIBLY N.C. STATE UNIVERSITY OR NCDWQ.
BRIDGE #138
NOTE: BRIDGE HAS CONC DECK, RAILS AND HEAD WALLS. STEEL I-BEAM STRINGERS SUPPORTED ON WOOD PILES
REMOVE EXISTING BRIDGE
RELOCATE TO PROPOSED BRIDGE BY OTHERS
GRADE EXISTING EMBANKMENT DOWN TO ELEV. 11' FROM -L1- STA. 27+42 TO 27+89, AND LAY BACK EMBANKMENT AT A 3:1 FROM -L1- STA. 27+89 TO 28+39.
SBG FROM -L1- STA. 28+10 TO STA. 34+11 LT
SBG FROM -L1- STA. 28+19 TO STA. 29+74 RT
BZ 1
BZ 2
GATE
GV
COASTAL LUMBER COMPANY
HEATH FAMILY FARMS, LLC
POND
ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
TEMPORARY WORK PLATFORM
50' 0' 50' 100' 150'
FOR -L1- PROFILE, SEE SHEET 8
8/17/99
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RIPARIAN BUFFER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	IMPACTS									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
			ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
1	-L1- 22+15 to 22+78	Prop Bridge		X		1468	443	1911					
1	-L1- 22+15 to 22+78	Temp Work Platform		X		1746	1147	2893					
1	-L1- 22+45 RT	Ex Road/Bridge Removal		X		434	167	601					
1	-L1- 26+16 to 27+00	Prop Bridge / Temp Platform		X		2889	1976	4865					
1	-L1- 27+00 RT	Ex Bridge Removal		X		942	631	1573					
TOTALS*:						**7479**	**4364**	**11843**	**0**	**0**	**0**	**0**	**0**

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
9/19/2019
Craven County
B-4484
33723.1.2
SHEET 4 OF 5

WETLANDS IN BUFFER IMPACTS SUMMARY

SITE NO.	STATION (FROM/TO)		WETLANDS IN BUFFERS	
			ZONE 1 (ft^2)	ZONE 2 (ft^2)
1	-L1- 22+15 to 22+78	54" Girder Bridge	812	219
1	-L1- 22+15 to 22+78	Temp Work Bridge	1732	1147
TOTAL:			**2544**	**1366**

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
9/19/2019
Craven County
B-4484
33723.1.2
SHEET 5 OF 5

Revised 2018 Feb

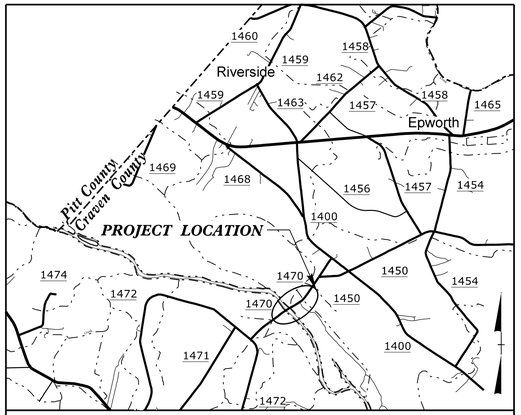
Rev. Jan 2009

09/08/99

TIP PROJECT: B-4484

CONTRACT: C204434

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



VICINITY MAP N. T. S.

90% PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CRAVEN COUNTY

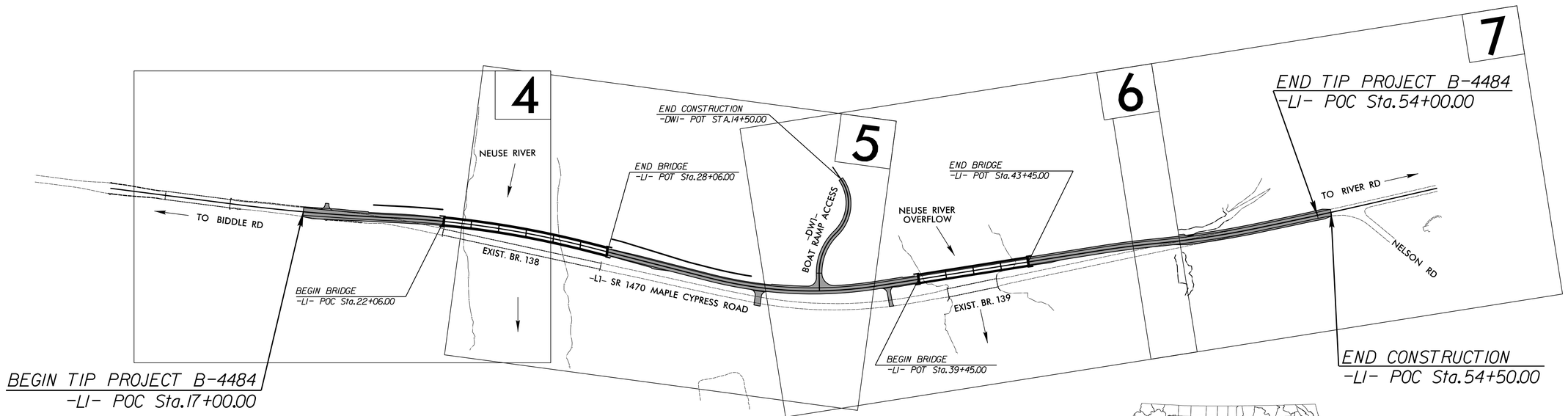
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4484	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33723.1.2	N/A	PE
33723.2.1	N/A	ROW, UTIL
33723.3.1	N/A	CONST

LOCATION: REPLACE BRIDGES NO. 138 & 139 OVER NEUSE RIVER AND NEUSE RIVER OVERFLOW ON SR 1470 (MAPLE CYPRESS ROAD)

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

NAD 83/2001



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 = 1,863
ADT 2039 = 2,279
K = 12 %
D = 60 %
T = 10 % *
V = 60 MPH
*(TTST = 3% + DUAL = 7%)
FUNC CLASS = MAJOR COLLECTOR
SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4484	=	0.512 MILE
LENGTH STRUCTURE TIP PROJECT B-4484	=	0.189 MILE
TOTAL LENGTH TIP PROJECT B-4484	=	0.701 MILE

PREPARED IN THE OFFICE OF:

RS&H

1520 SOUTH BOULEVARD, SUITE 200
CHARLOTTE, NC 28203
NC FIRM LICENSE No: F-0493

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MARCH 7, 2019

LETTING DATE:
APRIL 21, 2020

JENNIFER FARINO, PE
PROJECT ENGINEER

DREW MORROW, PE
PROJECT DESIGN ENGINEER

HON YEUNG, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 018442 ENGINEER RICHARD BOLLINGER P.E.

SIGNATURE:

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030952 ENGINEER JENNIFER D FARINO P.E.

SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

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PROJECT REFERENCE NO.	SHEET NO.
B-4484	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030952 ENGINEER JENNIFER D. FARINO

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H
NC FIRM LICENSE No: F-0493

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1 THRU 2A-3	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2C-1	W-BEAM RAIL SECTION DETAIL
2C-2	TRAILING END UNIT ASSEMBLY - AT-1 SYSTEM
2C-3	TYPE III - STRUCTURE ANCHOR UNIT
2C-4	84" PIPE COLLAR AND HEADWALL DETAIL (TO BE INCLUDED IN NEXT SUBMITTAL)
3B-1	ROADWAY SUMMARIES
3D-1	DRAINAGE SUMMARIES
3G-1	GEOTECHNICAL SUMMARIES
3P-1	PARCEL INDEX SHEET
4 THRU 7	PLAN SHEETS
8 THRU 10	PROFILE SHEETS
RW1	R/W TITLE SHEET (TO BE INCLUDED UPON RECEIPT)
RW2C-1 THRU RW2C-?	SURVEY CONTROL SHEETS (TO BE INCLUDED UPON RECEIPT)
RW2D-1 THRU RW2D-?	DESIGN ALIGNMENT CONTROL SHEETS (TO BE INCLUDED UPON RECEIPT)
RW3E-1 THRU RW3E-?	R/W AND EASEMENT TABLES SHEETS (TO BE INCLUDED UPON RECEIPT)
RW4 THRU RW7	R/W SHEETS (TO BE INCLUDED UPON RECEIPT)
TMP-1 THRU TMP-12	TRAFFIC CONTROL SHEETS
PMP-1 THRU PMP-5	PAVEMENT MARKING PLANS (TO BE INCLUDED IN NEXT SUBMITTAL)
EC-1 THRU EC-12	EROSION CONTROL PLANS
RF-1	REFORESTATION DETAIL SHEET
SIGN-1 THRU SIGN-8	SIGNING PLANS (TO BE INCLUDED IN NEXT SUBMITTAL)
UC-1 THRU UC-9	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS
X-1A	CROSS-SECTION SUMMARY SHEET
X-1 THRU X-26	CROSS-SECTIONS
S-1 THRU S-37	BR 138 STRUCTURE PLANS
S-1 THRU S-31	BR 139 STRUCTURE PLANS
W-1 THRU W-2	RETAINING WALL PLANS
W-3 THRU W-5	RETAINING WALL DETAIL SHEETS

GENERAL NOTES

GENERAL NOTES: 2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADE LINE:
GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01

GUARDRAIL:

THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

END BENTS:

THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE DUKE ENERGY, CENTURYLINK

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY CONTRACT.

STANDARD DRAWINGS

EFF. 01-16-2018
REV.

2018 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2018 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
275.01	Rock Plating
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
DIVISION 4 - MAJOR STRUCTURES	
422.01	Bridge Approach Fills - Type I Standard Approach Fill
422.02	Bridge Approach Fills - Type II Modified Approach Fill
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.52	Precast Manhole - 4', 5' and 6' Diameter
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets

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PROJECT REFERENCE NO.	SHEET NO.
B-4484	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 Easement 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.)

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-4484	2A-1

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030952 ENGINEER JENNIFER D. FARINO

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022896 ENGINEER CLARK T. MORRISON

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

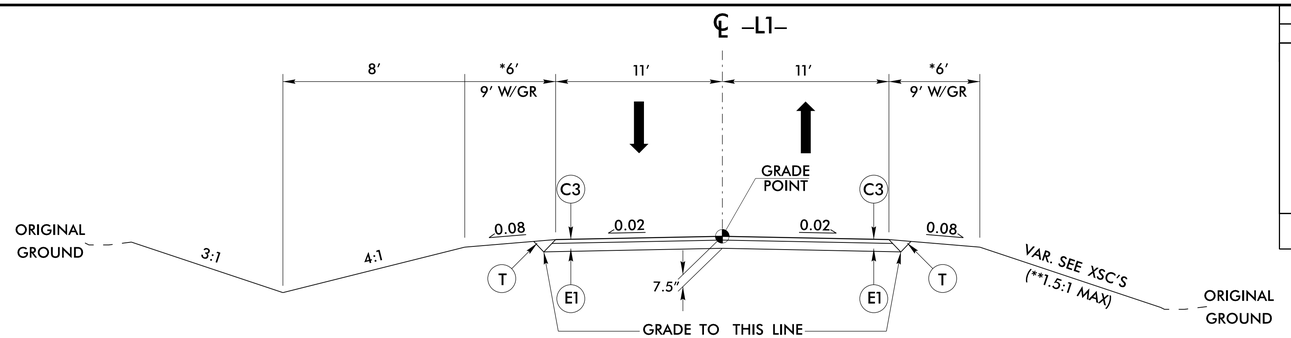
RS&H

NC FIRM LICENSE No: F-0493

PAVEMENT SCHEDULE
(FINAL PAVEMENT DESIGN)

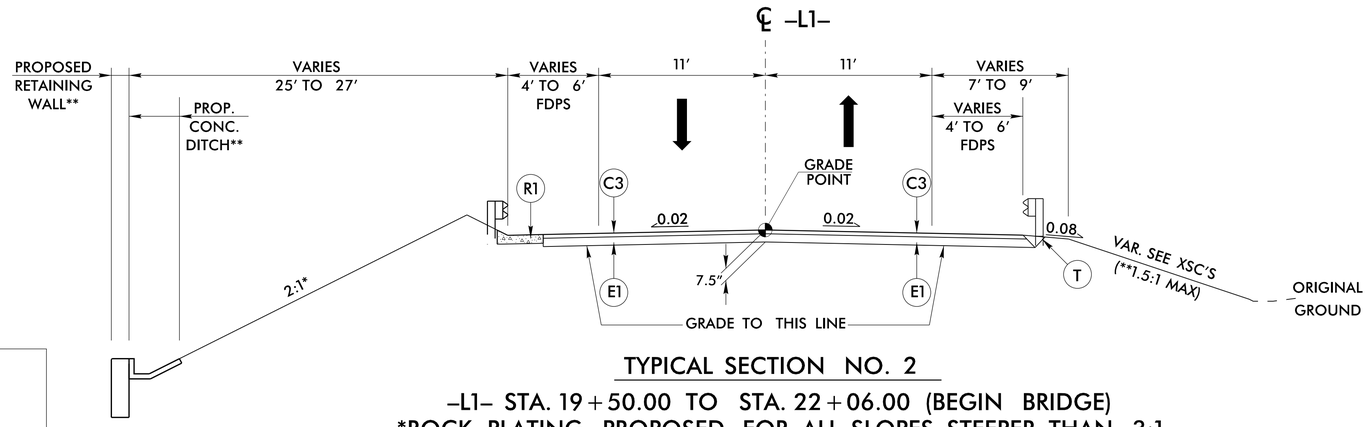
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 2½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B,AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1" IN DEPTH OR GREATER THAN 1½" IN DEPTH.
C3	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.
C4	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B,AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1" IN DEPTH OR GREATER THAN 1½" IN DEPTH.
E1	PROP. APPROX. 4½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 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 4" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
J1	PROP. 6" AGGREGATE BASE COURSE.
J2	PROP. 8" AGGREGATE BASE COURSE.
P	PRIME COAT
R1	PROP. SHOULDER BERM GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	WEDGING (SEE WEDGING DETAIL SHEET 2A-1)

NOTE: ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE



TYPICAL SECTION NO. 1

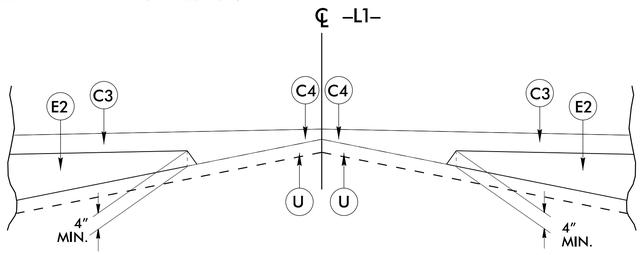
–L1– STA. 17+00.00 TO –L1– STA. 19+50.00
–L1– STA. 43+45.00 (END BRIDGE) TO –L1– STA. 51+89.00
*VARIABLE WIDTH FULL DEPTH PAVED SHOULDER PROPOSED IN AREAS WITH GUARDRAIL ONLY – SEE PLANS
**ROCK PLATING PROPOSED FOR ALL SLOPES STEEPER THAN 3:1



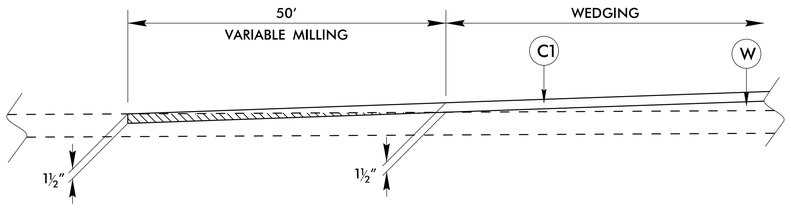
TYPICAL SECTION NO. 2

–L1– STA. 19+50.00 TO STA. 22+06.00 (BEGIN BRIDGE)
*ROCK PLATING PROPOSED FOR ALL SLOPES STEEPER THAN 3:1
** SEE SHEET W–1 FOR RETAINING WALL AND CONC. DITCH DETAILS

SEE PLANS FOR ALL WEDGING LOCATIONS

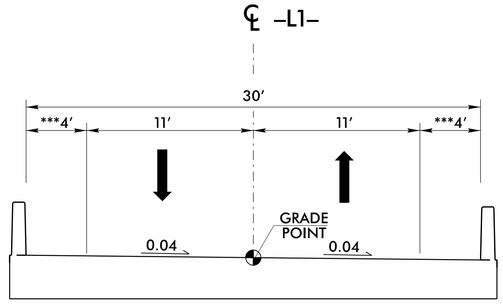


Detail Showing Method of Wedging



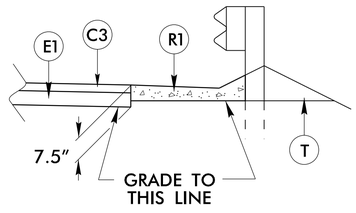
Detail of Incidental Milling at Pavement Tie–ins

Use Detail
–L1– STA. 54+00.00 TO STA. 54+50.00



TYPICAL SECTION NO. 3

–L1– STA. 22+06.00 (BEGIN BRIDGE) TO
–L1– STA. 28+06.00 (END BRIDGE)
***4′ SHOULDER REQUIRED FOR SIGHT DISTANCE



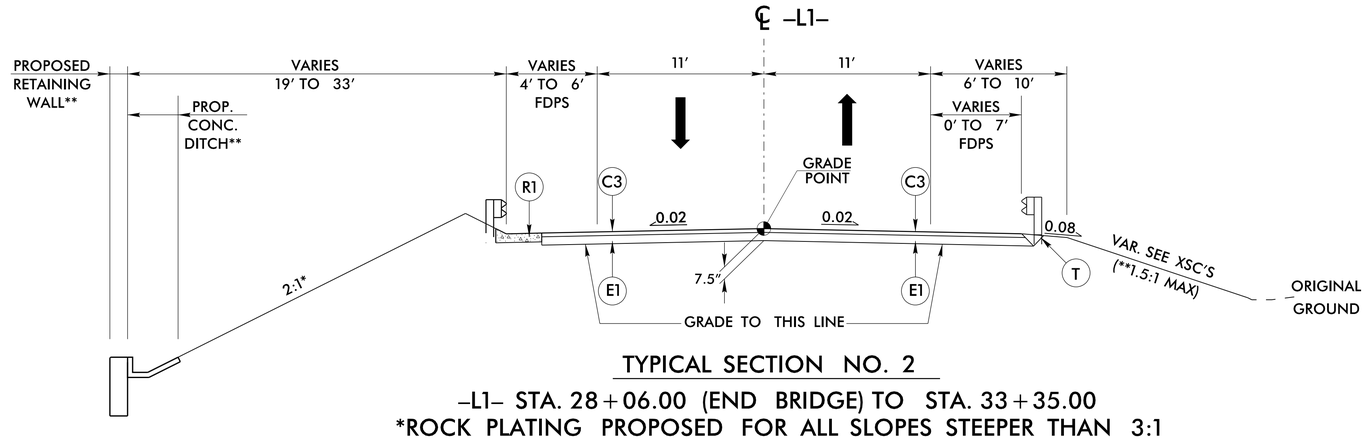
SHOULDER BERM GUTTER DETAIL

–L1– STA. 19+34.00 TO –L1– STA. 21+95.00 LT
–L1– STA. 20+49.00 TO –L1– STA. 21+95.00 RT
–L1– STA. 28+15.00 TO –L1– STA. 34+11.00 LT
–L1– STA. 28+19.00 TO –L1– STA. 29+74.00 RT
–L1– STA. 38+90.00 TO –L1– STA. 39+34.00 LT
–L1– STA. 43+56.00 TO –L1– STA. 43+72.00 LT

8/17/99

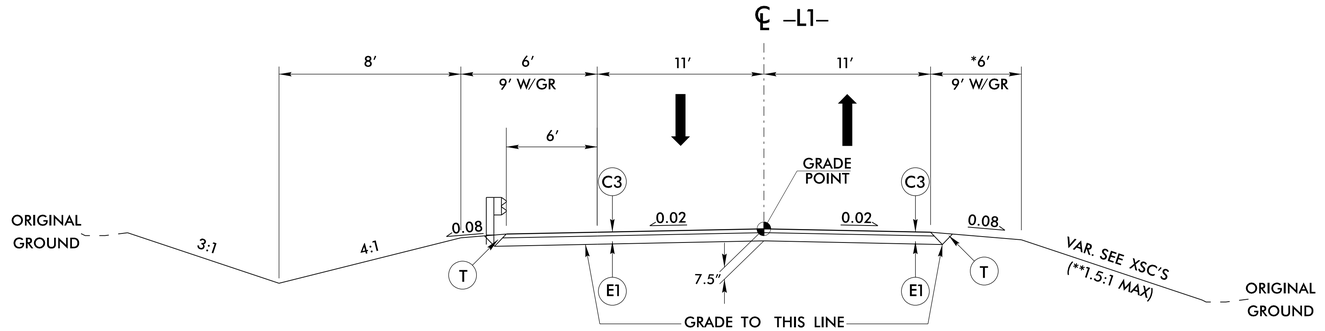
PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 2½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B,AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1" IN DEPTH OR GREATER THAN 1½" IN DEPTH.
C3	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.
C4	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B,AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1" IN DEPTH OR GREATER THAN 1½" IN DEPTH.
E1	PROP. APPROX. 4½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 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 4" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
J1	PROP. 6" AGGREGATE BASE COURSE.
J2	PROP. 8" AGGREGATE BASE COURSE.
P	PRIME COAT
R1	PROP. SHOULDER BERM GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	WEDGING (SEE WEDGING DETAIL SHEET 2A-1)

NOTE: ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE



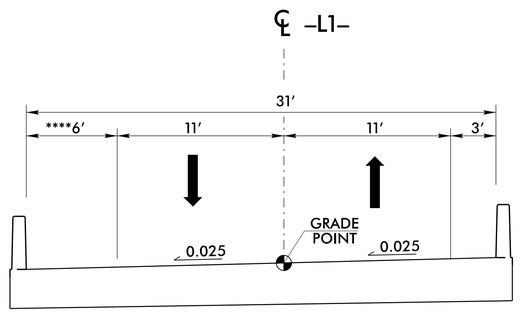
TYPICAL SECTION NO. 2

–L1– STA. 28+06.00 (END BRIDGE) TO STA. 33+35.00
*ROCK PLATING PROPOSED FOR ALL SLOPES STEEPER THAN 3:1
** SEE SHEET W–1 FOR CONC. DITCH DETAIL, AND SHEET W–2 FOR RETAINING WALL DETAIL



TYPICAL SECTION NO. 4

–L1– STA. 33+35.00 TO –L1– STA. 39+45.00
*VARIABLE WIDTH FULL DEPTH PAVED SHOULDER PROPOSED IN AREAS WITH GUARDRAIL ONLY – SEE PLANS



TYPICAL SECTION NO. 7

–L1– STA. 39+45.00 (BEGIN BRIDGE) TO
–L1– STA. 43+45.00 (END BRIDGE)
****6′ SHOULDER REQUIRED FOR SPREAD

PROJECT REFERENCE NO.	SHEET NO.
B-4484	2A-2

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 030952 ENGINEER JENNIFER D. FAHEY

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 022896 ENGINEER CLARK T. MORRISON

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H
NC FIRM LICENSE No: F-0493

15-AUG-2019 07:46
H:\Projects\B4484_Rdy_typ.dgn
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PROJECT REFERENCE NO.	SHEET NO.
B-4484	2A-3
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030952 JENNIFER D. FARINO	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022896 CLARK S. MORRISON

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H
NC FIRM LICENSE No: F-0493

8/17/99

PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 2½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B,AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1" IN DEPTH OR GREATER THAN 1½" IN DEPTH.
C3	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.
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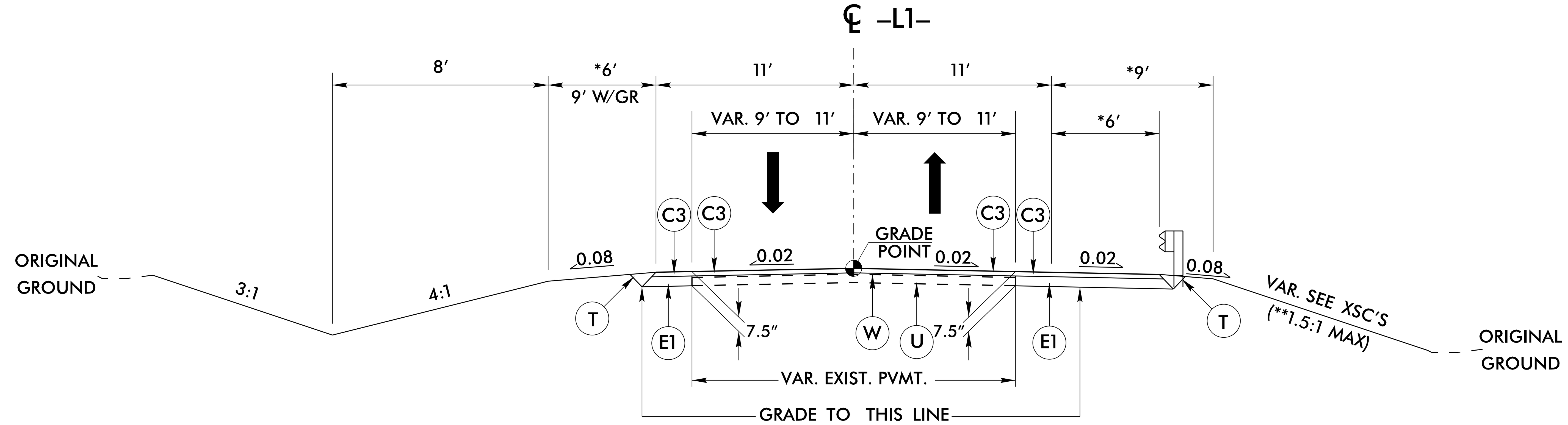
E1	PROP. APPROX. 4½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 4" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
J1	PROP. 6" AGGREGATE BASE COURSE.
J2	PROP. 8" AGGREGATE BASE COURSE.
P	PRIME COAT
R1	PROP. SHOULDER BERM GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	WEDGING (SEE WEDGING DETAIL SHEET 2A-1)

NOTE: ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE

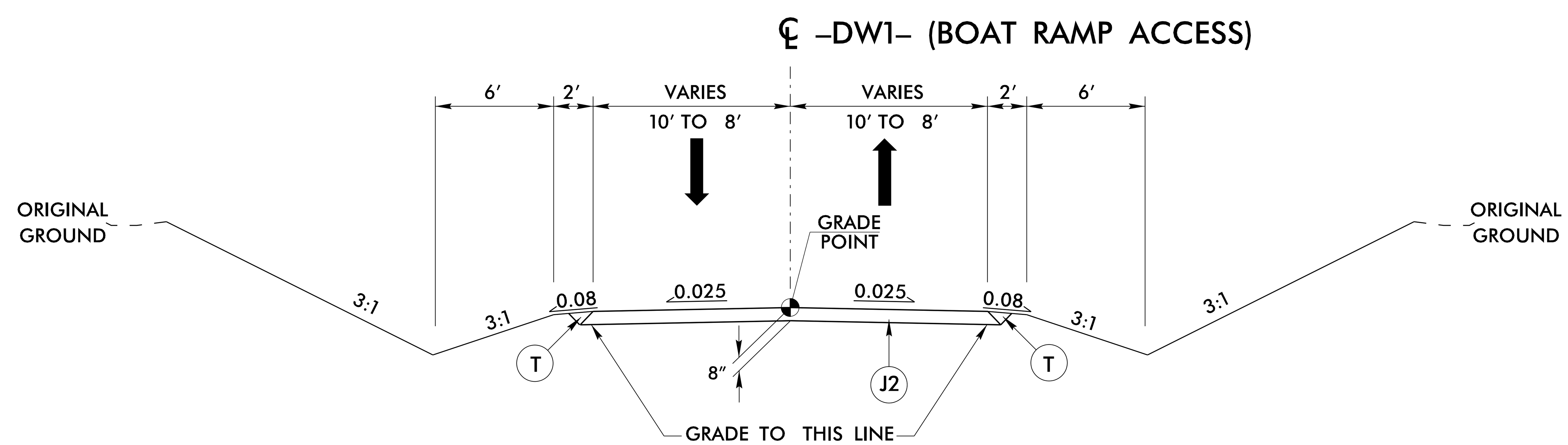


TYPICAL SECTION NO. 8

-L1- STA. 51+89.00 TO -L1- STA. 54+00.00

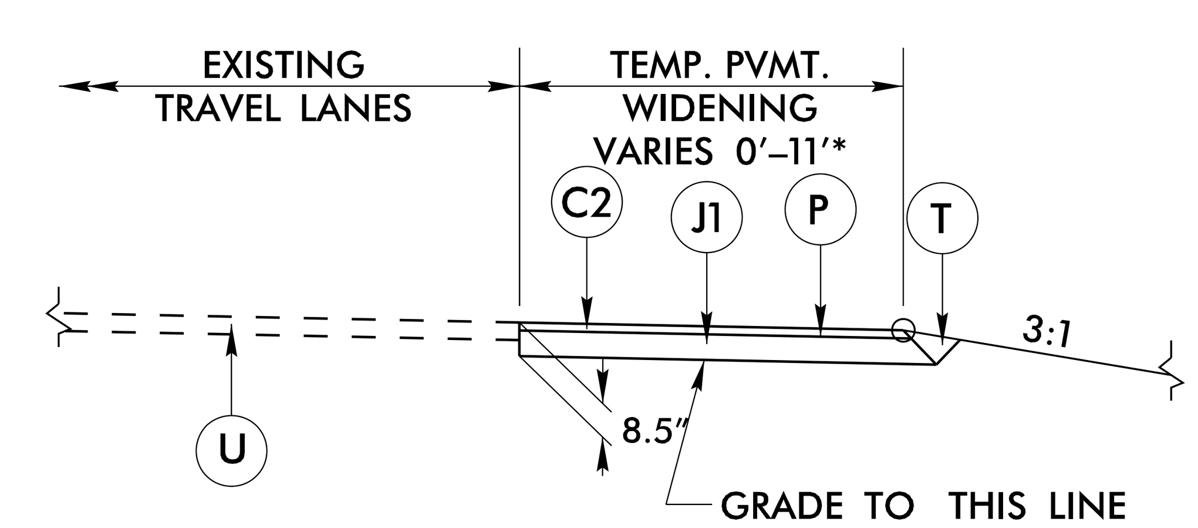
*6' FULL DEPTH PAVED SHOULDER PROPOSED IN AREAS WITH GUARDRAIL ONLY

**ROCK PLATING PROPOSED FOR ALL SLOPES STEEPER THAN 3:1



TYPICAL SECTION NO. 9

-DW1- STA. 10+11.00 TO -DW1- STA. 14+37.00



TEMPORARY WIDENING DETAIL A

-L- STA. 49+14± TO -L- STA. 54+67+/- RT

* WIDTH INCLUDES 2' PAVED SHOULDER

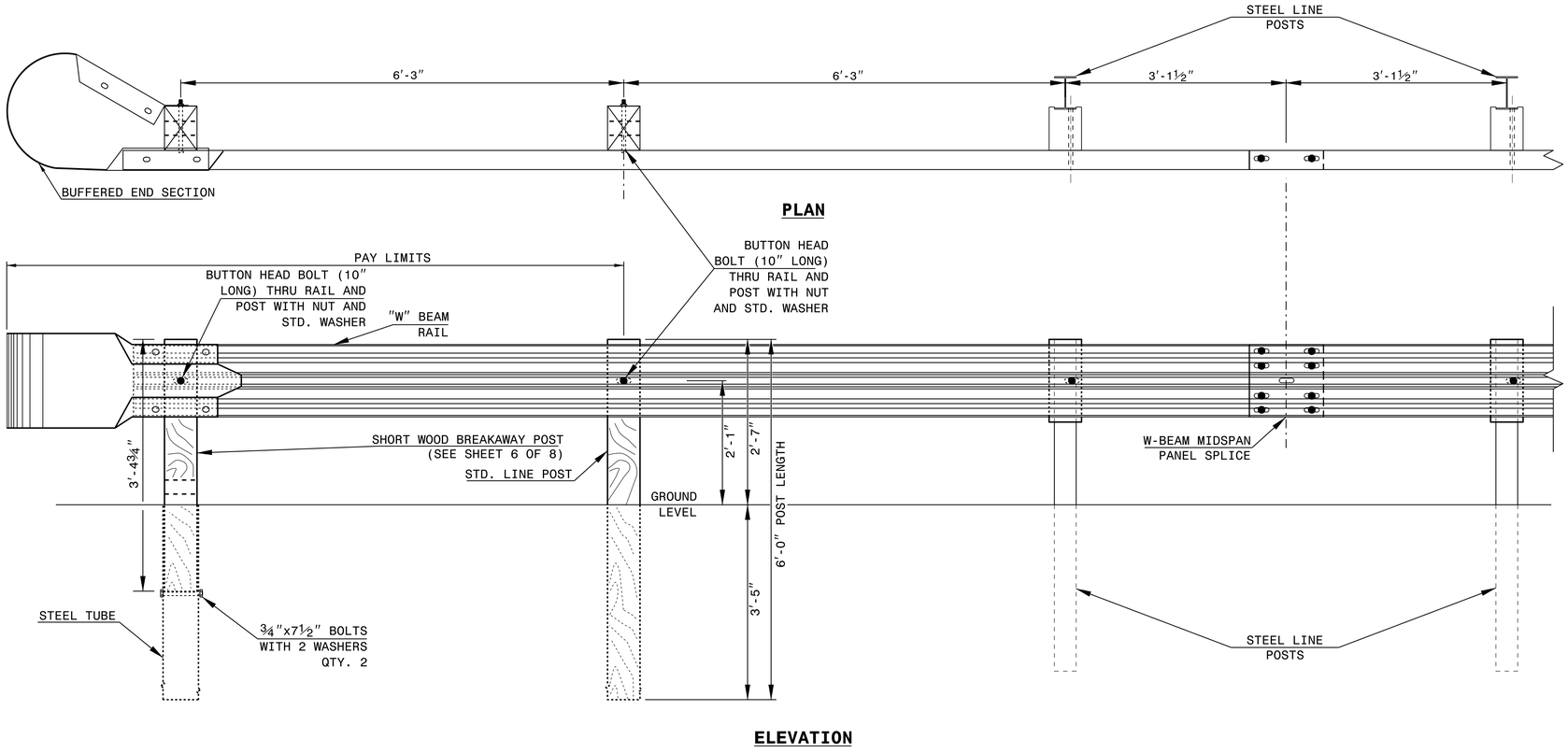
05-SEP-2019 15:39
R:\Roadway\Proj\B4484_Rdy_typ.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-4484	2C-2

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF



TRAILING END UNIT ASSEMBLY

A.T.-1 SYSTEM

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER DAVID S. HOWERTON

CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

A.T.-1 SYSTEM

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

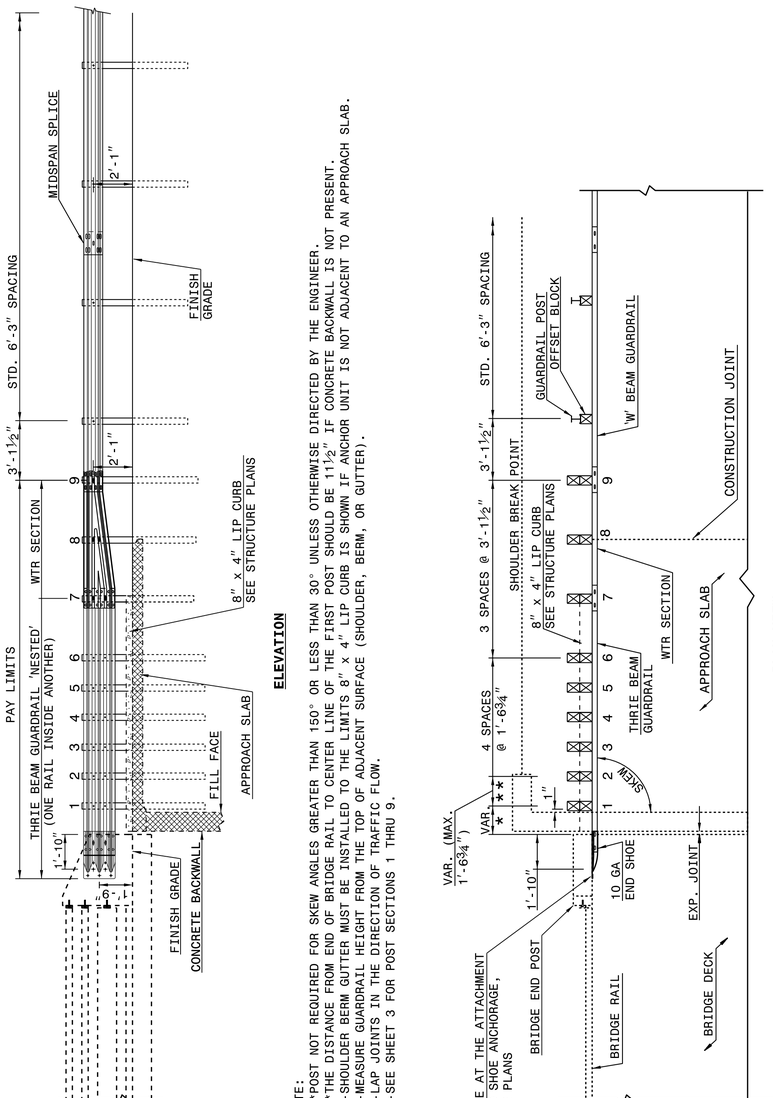
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
B-4484	2C-3

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III
FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 1 OF 7
862D03



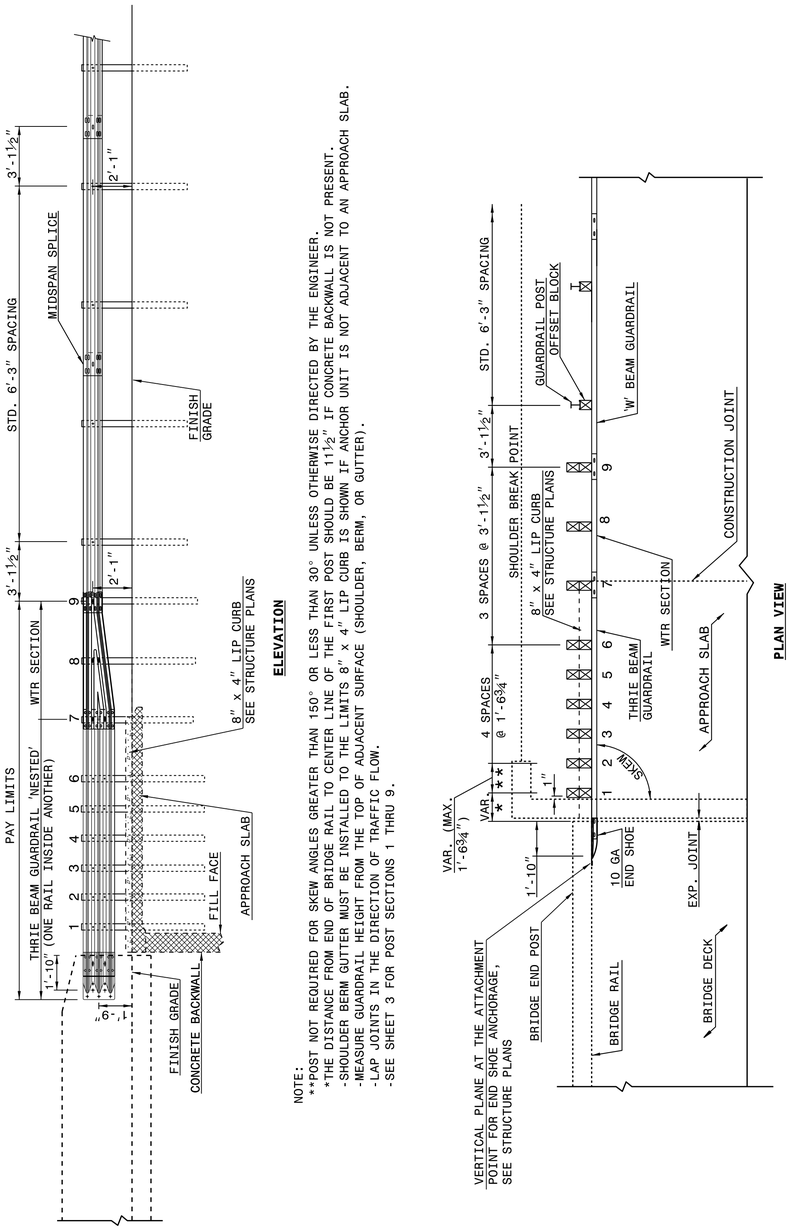
NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.

GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 2 OF 7
862D03



NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.

GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

ORIGINAL BY:	J HOWERTON	DATE:	06-22-12
MODIFIED BY:		DATE:	
CHECKED BY:		DATE:	
FILE SPEC.:			

PROJECT REFERENCE NO.	SHEET NO.
B-4484	2C-1

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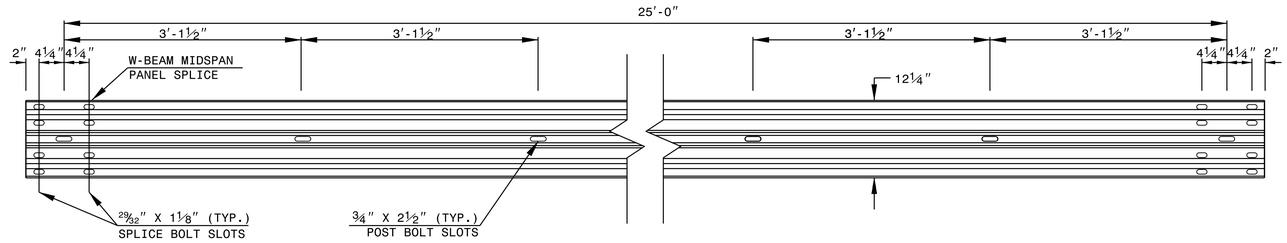
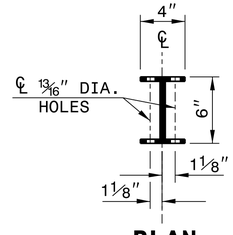
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

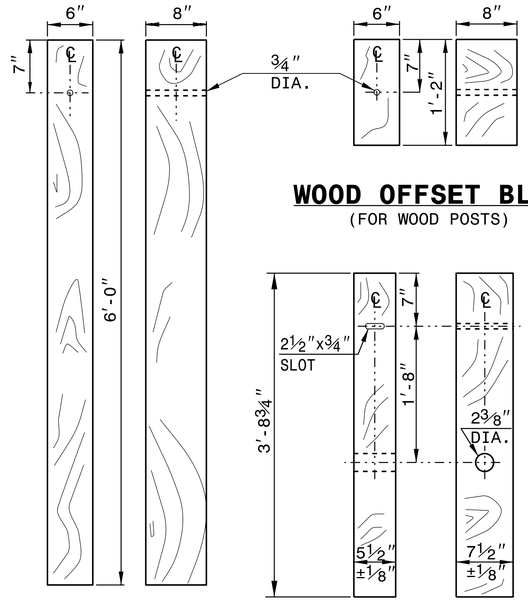
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION



STANDARD W-BEAM GUARDRAIL



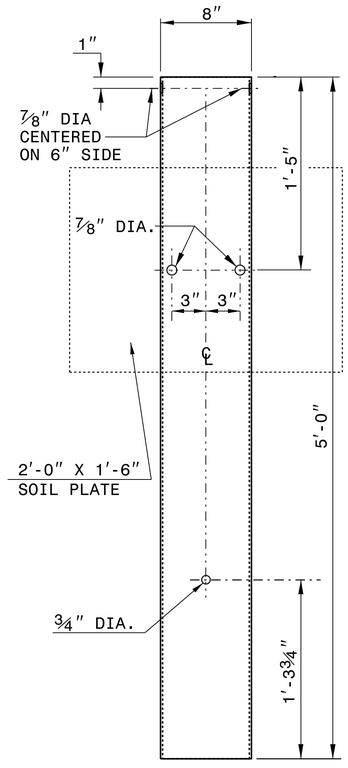
PLAN



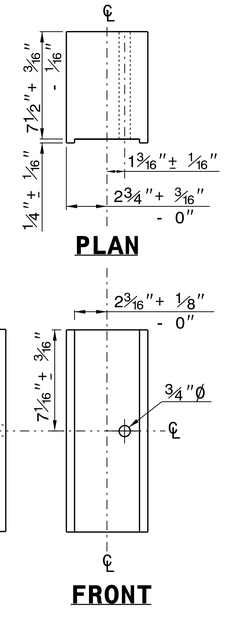
STANDARD LINE POST

SHORT WOOD BREAKAWAY POST

WOOD OFFSET BLOCK
(FOR WOOD POSTS)



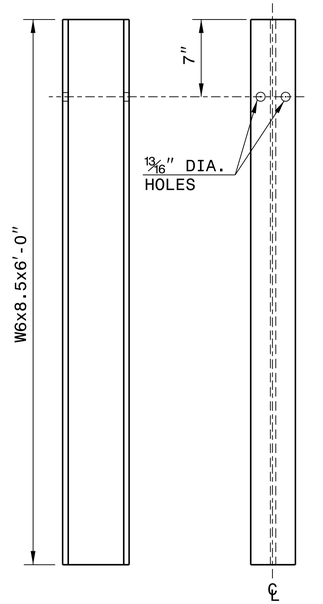
STEEL TUBE
TS 6"x8"x0.1875"



PLAN

SIDE **FRONT**

ROUTED OFFSET BLOCK



SIDE **FRONT**

"W6" STEEL POST

SYSTEM PARTS

SHEET 6 OF 8
862D02

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOHN S. HOWERTON

CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

ORIGINAL BY: J.HOWERTON DATE: 3-7-2018
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

12/06/07

COMPUTED BY: ANK DATE: 8/5/19
CHECKED BY: DDM DATE: 8/5/19

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-4484	3B-1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SUMMARY OF EARTHWORK

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
PHASE I AND II					
–L1– 17+00.00	–L1– 22+05.00	162	6,349	6,187	0
–L1– 28+10.00	–L1– 39+44.00	34	30,237	30,203	0
–L1– 43+46.00	–L1– 54+00.00	153	13,335	13,182	0
–EL– 49+50.00	–EL– 54+50.00	36	636	600	0
–DW1– 10+11.00	–DW1– 14+37.00	1,097	21	0	1,076
SUBTOTALS:		1,482	50,578	50,172	1,076
PHASE III					
–L1– 17+00.00	–L1– 21+50.00	68	155	87	0
–L1– 48+00.00	–L1– 54+00.00	51	384	333	0
SUBTOTALS:		119	539	420	0
EROSION CONTROL					
–L1– 21+00.00	–L1– 22+06.00	394	21	0	373
–L1– 27+50.00	–L1– 40+00.00	2,578	3,666	1,088	0
–L1– 42+50.00	–L1– 47+50.00	2,170	520	0	1,650
SUBTOTALS:		5,142	4,207	1,088	2,023
TOTALS:		6,743	55,324	51,680	3,099
WASTE IN LIEU OF BORROW				–3,099	–3,099
PROJECT TOTALS:		6,743	55,324	48,581	0
EST. 5% TO REPLACE SOIL IN BORROW PIT				2,429	
GRAND TOTALS:		6,743	55,324	51,010	0
SAY:		7,090		53,570	

Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

EST DDE (FROM HYDRO TBD)
EST UNDERCUT EXCAVATION (FROM GEOTECH TBD)
EST SELECT GRANULAR MATERIAL (FROM GEOTECH TBD)
EST GEOTEXTILE FOR SOIL STABILIZATION (FROM GEOTECH TBD)

ROW AREA DATA SUMMARY

PARCEL NO.	PROPERTY OWNERS NAMES	PROP. ROW	PERM. UTILITY EASE.	PERM. DRAIN EASE.	PERM. DRAINAGE UTILITY EASE.	CONST. EASE.
1	FRANCES T. KILPATRICK	15,493.49 S.F.	11,732.96 S.F.			
2	SANDRA N. WHITE			558.04 S.F.		1,840.03 S.F.
3	WILLIAM E. DANIELS	65,099.98 S.F.	19,208.65 S.F.			
4	COASTAL LUMBER COMPANY			541.79 S.F.		4,009.94 S.F.
5	CAROL U. HEATH	64,196.66 S.F.	2,679.74 S.F.	969.12 S.F.		18,884.11 S.F.
6	RAY M. HEATH		15,848.44 S.F.			2,206.45 S.F.
7	HAROLD HARGETT JR & TONYA H. BYRD	3,526.15 S.F.				
8	HAROLD HARGETT JR & TONYA H. BYRD	2,980.53 S.F.	2,721.57 S.F.			10,454.05 S.F.

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH (LF)
–L1– LT	19+34.03	21+95.13	261.10
–L1– RT	20+48.75	21+95.04	146.29
–L1– LT	28+15.08	34+10.85	595.77
–L1– RT	28+18.95	29+74.49	155.54
–L1– LT	38+89.50	39+33.83	44.33
–L1– LT	43+56.17	43+72.17	16.00
		TOTAL:	1,219.03
		SAY:	1,220

PAVEMENT REMOVAL

LINE	STATION	STATION	LOCATION	AREA	SQUARE YARDS
–L1–	17+00	22+08	RT	14,582.65	1,620.29
–L1–	27+95	40+43	RT	28,940.96	3,215.66
–L1–	42+22	49+87	RT	21,800.08	2,422.23
–L1–	49+14	54+60	RT	4,328.65	480.96
				TOTAL:	7,739.15
				SAY:	7,740

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

GUARDRAIL SUMMARY

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 GUARDRAIL	REMOVE EXISTING GUARDRAIL (LF)	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GREU TL–3	TYPE III	AT–1					EA	G	NG				
–L1–	17+00.00	17+50.00	LT	50.00					3'	9'		50		1	1											75		REMOVE AND REPLACE EXIST. GR., USE GR TRANSITION SECTION
–L1–	17+00.00	22+06.00 (BR)	RT	487.50					6'	9'						1										250		TIE TO EXIST. GR AT BEGIN PROJECT, REMOVE EXIST. GR., USE GR. TRANSITION SECTION
–L1–	18+25.00	22+06.00 (BR)	LT	381.25				22+06.00 (BR)	6'	9'		50		1	1	1											
–L1–/–DW1–	28+06.00 (BR)	10+52.84	LT	737.50	50.00		34+00.00		6'	9'						1	1										
–L1–	28+06.00 (BR)	29+87.50	RT	181.25				28+90.00	6'	9'		100		2	1	1											
–DW1–/–L1–	10+69.45	39+45.00 (BR)	LT	300.00	75.00			39+45.00 (BR)	6'	9'						1	1										
–L1–	38+63.75	39+45.00 (BR)	RT	81.25			39+45.00 (BR)		3'	9'	50		1		1	1											
–L1–	43+45.00 (BR)	54+25.00	LT	1081.25			53+00.00		6'	9'	50		1		1	1											
–L1–	43+45.00 (BR)	44+26.25	RT	81.25				43+45.00 (BR)	3'	9'		50		1	1	1											
–L1–	49+25.00	54+25.00	RT	500.00			50+50.00	53+00.00	6'	9'	50	50	1	1	2												
			SUBTOTALS	3881.25	125.00																						
			ANCHOR DEDUCTION	562.50	0.00																						
			TOTAL	3318.75	125.00																						
			SAY	3337.50	137.50																						

ANCHOR DEDUCTION
GREU TL–3: 8 @ 50' = 400'
TYPE III: 8 @ 18.75' = 150'
AT–1: 2 @ 6.25' = 12.5'
GRAND TOTAL = 562.5'
ADDITIONAL GUARDRAIL POSTS = 5

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12/06/07

COMPUTED BY: ANK DATE: 2/27/19
CHECKED BY: ARV DATE: 2/27/19

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-4484	3D-1

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & UNDER)

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO.		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC)								C.A.A. PIPE (UNLESS OTHERWISE NOTED)								CLASS III R.C. PIPE (UNLESS OTHERWISE NOTED)								CLASS IV R.C. PIPE (UNLESS OTHERWISE NOTED)								15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS.		QUANTITIES FOR DRAINAGE STRUCTURES	* TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. *FT.		C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE			G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	T.B.D.I. STD. 840.35	PRECAST MANHOLE 4', 5', AND 6' DIAMETER STD. 840.52	MANHOLE FRAME AND COVER STD. 840.54	ELBOWS	REMARKS
SIZE		FROM	TO					12"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"	30"	36"	42"	48"				R.C.P.	C.S.P.	PER EACH (0' THRU 5.0')	A 5.0' THRU 10.0'	B 10.0' AND ABOVE		E	F	G						
THICKNESS OR GAUGE																.064	.064	.064	.064	.079	.079	.109	.109																																		
-L1- 21+86	15RT	0401		31.59																																									1							1	1				
		0401	0402		28.84	26.00																			128																																
-L1- 20+54	17RT	0402		28.65																																									1							1	1				
		0402	0403		24.65	22.45																			24																																
-L1- 20+55	39RT	0403		26.00																																									1									1	1		
		0403	0404		21.00	10.00											28																																							2	
-L1- 19+40	17LT	0405		24.75																																									1							1	1				REMOVE 32 LF OF EXIST 12" CMP
		0405	0406		22.00	7.00											40																																							2	
-L1- 28+28	15RT	0501		32.70																																									1							1	1				
		0501	0502		29.95	27.05																			140																																
-L1- 29+69	15RT	0502		29.80																																									1							1	1				
		0502	0503		26.30	21.45																			52																																
-L1- 29+71	67RT	0503		25.00																																									1									1	1		
		0503	0504		21.35	10.00											32																																							2	
-L1- 34+05	17 LT	0506		17.00																																									1							1	1				
		0506	0507		14.25	12.50																			16																																
-L1- 39+25	17LT	0601		18.10																																									1							1	1				
		0601	0602		13.50	13.00																			36																																
-L1- 38+95	17LT	0602		17.50																																									1	0.3						1	1				
		0602	0603		12.20	12.00																			36																																
-L1- 43+65	17LT	0604		20.10																																									1	3.1						1	1				
		0604	0605		12.00	9.00											24																																							2	
		0606			8.60	8.40																												44									1															CROSS PIPE WITH HEADWALL
TOTALS																	124								428									44									1		11	4.4						9	9	2	2	8	

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I. (N.S.)	GRATED DROP INLET (NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-4484	3P-1

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PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4	FRANCES T. KILPATRICK
2	4	SANDRA N. WHITE
3	5,6	WILLIAM E. DANIELS
4	5	COASTAL LUMBER COMPANY
5	6	CAROL U. HEATH
6	6	RAY M. HEATH
7	6,7	HAROLD HARGETT JR & TONYA H. BYRD
8	6,7	HAROLD HARGETT JR & TONYA H. BYRD

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

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PROJECT REFERENCE NO.	SHEET NO.
B-4484	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — SEAL 030952 — NORTH CAROLINA PROFESSIONAL ENGINEER — JENNIFER D. FARINO

HYDRAULICS ENGINEER — SEAL 018442 — NORTH CAROLINA PROFESSIONAL ENGINEER — RICHARD LEON BOLLINGER, JR.

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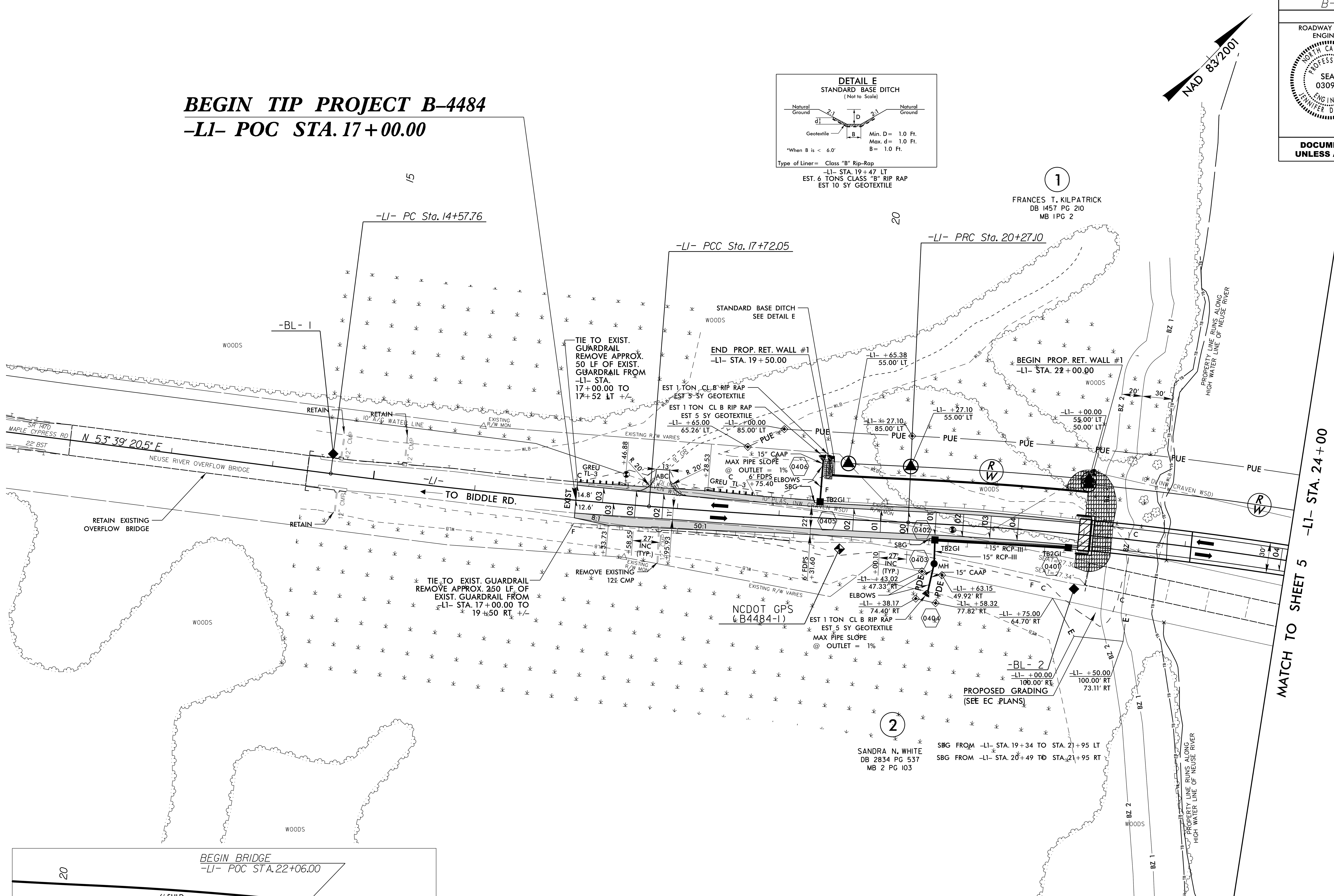
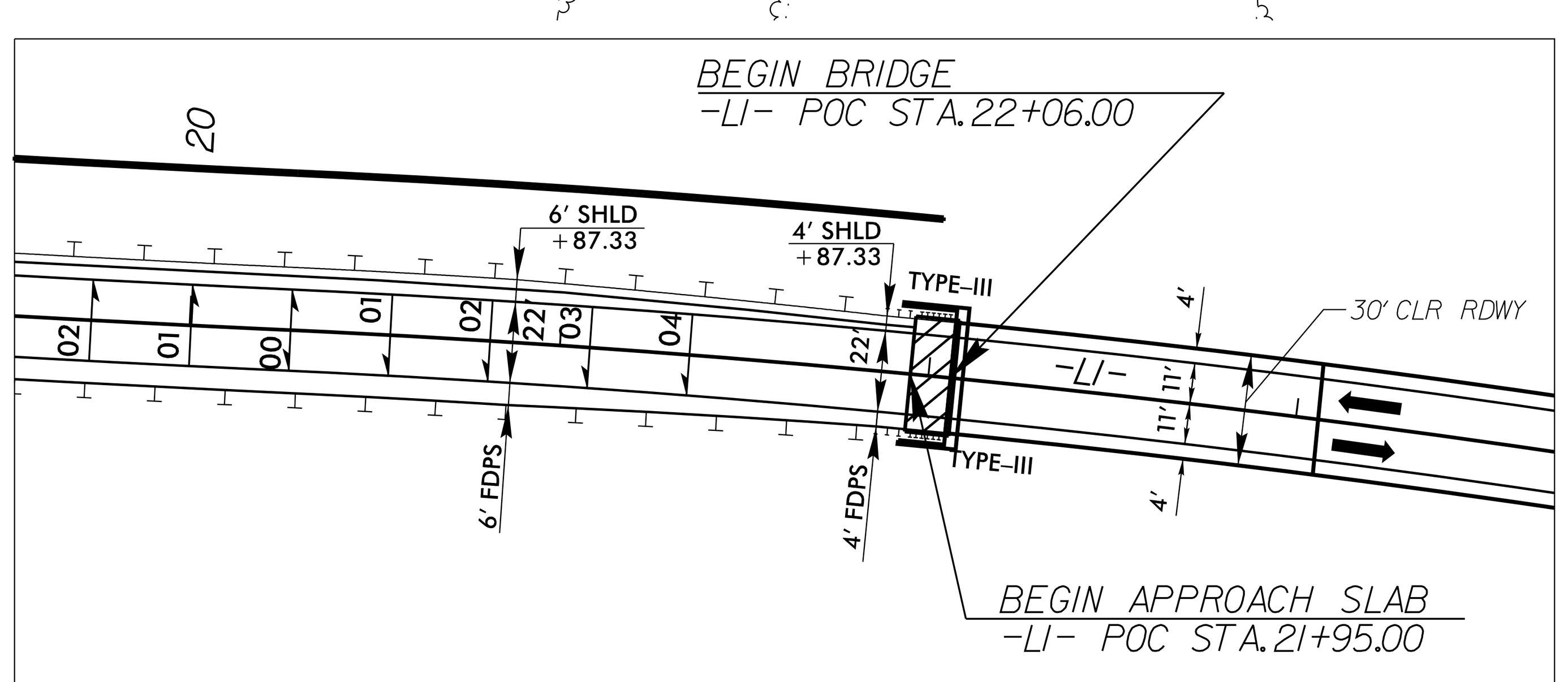
NC FIRM LICENSE No: F-0493



BEGIN TIP PROJECT B-4484
-L1- POC STA. 17+00.00
NAD 83/2001
DETAIL E
STANDARD BASE DITCH
(Not to Scale)
Natural Ground
Geotextile
Min. D= 1.0 Ft.
Max. d= 1.0 Ft.
B= 1.0 Ft.
*When B is < 6.0'
Type of Liner= Class "B" Rip-Rap
-L1- STA. 19+47 LT
EST. 6 TONS CLASS "B" RIP RAP
EST 10 SY GEOTEXTILE
FRANCES T. KILPATRICK
DB 1457 PG 210
MB 1 PG 2
-L1- PC Sta. 14+57.76
-L1- PCC Sta. 17+72.05
-L1- PRC Sta. 20+27.10
STANDARD BASE DITCH
SEE DETAIL E
END PROP. RET. WALL #1
-L1- STA. 19+50.00
BEGIN PROP. RET. WALL #1
-L1- STA. 22+00.00
-BL- 1
WOODS
TIE TO EXIST. GUARDRAIL
REMOVE APPROX. 50 LF OF EXIST. GUARDRAIL FROM -L1- STA. 17+00.00 TO 17+52 LT +/-
RETAIN
SR 1470
MAPLE CYPRESS RD
22' BST
N 53° 39' 20.5" E
NEUSE RIVER OVERFLOW BRIDGE
RETAIN EXISTING OVERFLOW BRIDGE
TO BIDDLE RD.
EST 1 TON CL B RIP RAP
EST 5 SY GEOTEXTILE
15" CAAP
MAX PIPE SLOPE @ OUTLET = 1%
6' FDPS
ELBOWS
SBG
TB2GI
15" RCP-III
MH
PUE
TIE TO EXIST. GUARDRAIL
REMOVE APPROX. 250 LF OF EXIST. GUARDRAIL FROM -L1- STA. 17+00.00 TO 19+50 RT +/-
REMOVE EXISTING 12" CMP
NCDOT GPS (B4484-1)
-BL- 2
PROPOSED GRADING (SEE EC PLANS)
SANDRA N. WHITE
DB 2834 PG 537
MB 2 PG 103
SBG FROM -L1- STA. 19+34 TO STA. 21+95 LT
SBG FROM -L1- STA. 20+49 TO STA. 21+95 RT
PROPERTY LINE RUNS ALONG HIGH WATER LINE OF NEUSE RIVER
MATCH TO SHEET 5 -L1- STA. 24+00



DETAIL SHOWING PAVEMENT - BRIDGE RELATIONSHIP (NOT TO SCALE)

-L1- CURVE DATA

PI Sta 16+14.94	PI Sta 18+99.59	PI Sta 23+80.19
Δ = 2° 51' 30.1" (LT)	Δ = 1° 48' 46.9" (LT)	Δ = 11° 41' 14.5" (RT)
D = 0° 54' 34.0"	D = 0° 42' 39.1"	D = 1° 39' 38.7"
L = 314.29'	L = 255.05'	L = 703.74'
T = 157.18'	T = 127.53'	T = 353.10'
R = 6,300.00'	R = 8,060.00'	R = 3,450.00'
SE = 03	SE = 02	SE = 04
RO = 81'	RO = 54'	RO = 108'

FOR -L1- PROFILE, SEE SHEET NO. 8

BRIDGE APPROACH SLAB

PAVEMENT REMOVAL

FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-37

FOR RETAINING WALL PLANS, SEE SHEETS W-1 THRU W-5

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PROJECT REFERENCE NO.	SHEET NO.
B-4484	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 030952 ENGINEER JENNIFER D. FARINO	NORTH CAROLINA PROFESSIONAL SEAL 018442 ENGINEER RICHARD LEON BOLLINGER, JR.

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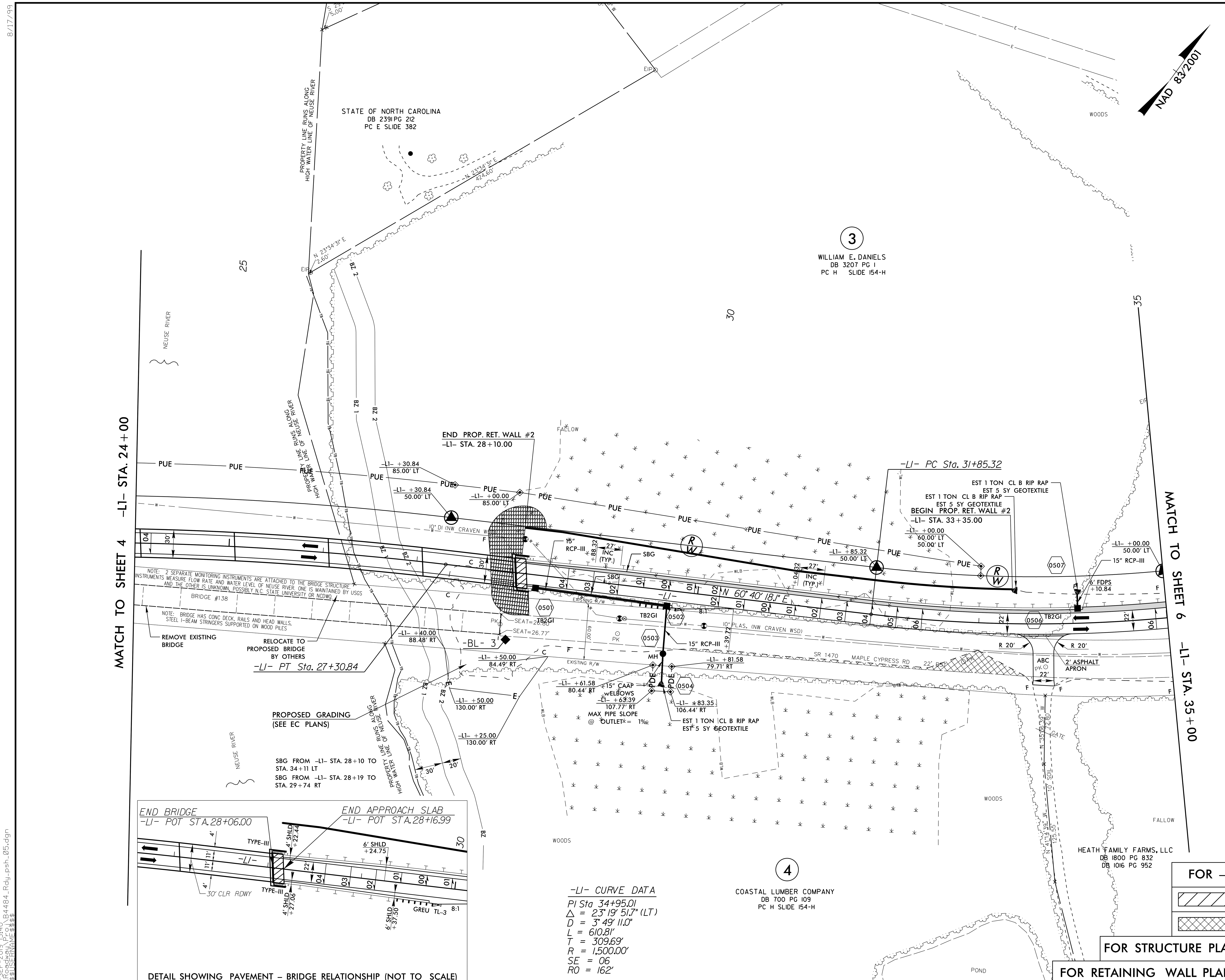

NAD 83/2001
STATE OF NORTH CAROLINA
DB 2391 PG 212
PC E SLIDE 382
PROPERTY LINE RUNS ALONG HIGH WATER LINE OF NEUSE RIVER
N 23°34'31" E 424.60'
N 23°34'31" E 2.60'
EIP
WOODS
3
WILLIAM E. DANIELS
DB 3207 PG 1
PC H SLIDE 154-H
NEUSE RIVER
MATCH TO SHEET 4 -L1- STA. 24+00
MATCH TO SHEET 6 -L1- STA. 35+00
END PROP. RET. WALL #2
-L1- STA. 28+10.00
-L1- +30.84 85.00' LT
-L1- +30.84 50.00' LT
-L1- +00.00 85.00' LT
PUE
FALLOW
-L1- PC Sta. 31+85.32
EST 1 TON CL B RIP RAP
EST 5 SY GEOTEXTILE
BEGIN PROP. RET. WALL #2
-L1- STA. 33+35.00
-L1- +00.00 60.00' LT 50.00' LT
-L1- +85.32 50.00' LT
-L1- +00.00 50.00' LT
15" RCP-III
6" FDPS +10.84
15" RCP-III
27' INC (TYP.)
SBG
NOTE: 2 SEPARATE MONITORING INSTRUMENTS ARE ATTACHED TO THE BRIDGE STRUCTURE. INSTRUMENTS MEASURE FLOW RATE AND WATER LEVEL OF NEUSE RIVER. ONE IS MAINTAINED BY USGS AND THE OTHER IS UNKNOWN, POSSIBLY N.C. STATE UNIVERSITY OR NCDWQ.
BRIDGE #138
NOTE: BRIDGE HAS CONC DECK, RAILS AND HEAD WALLS, STEEL I-BEAM STRINGERS SUPPORTED ON WOOD PILES
10" DI (NW CRAVEN WSD)
10" PLAS. (NW CRAVEN WSD)
-L1- N 60° 40' 18.1" E
TB2GI
0501 0502 0503 0504 0506 0507
SEAT=26.77'
-BL- 3
REMOVE EXISTING BRIDGE
RELOCATE TO PROPOSED BRIDGE BY OTHERS
-L1- +40.00 88.48' RT
-L1- PT Sta. 27+30.84
-L1- +50.00 84.49' RT
15" RCP-III
-L1- +81.58 79.71' RT
-L1- +61.58 80.44' RT
15" CAAP W/ELBOWS
-L1- +63.39 107.77' RT
MAX PIPE SLOPE @ OUTLET = 1%
-L1- +83.35 106.44' RT
EST 1 TON CL B RIP RAP
EST 5 SY GEOTEXTILE
SR 1470 MAPLE CYPRESS RD
EXISTING R/W
R 20'
ABC
2' ASPHALT APRON
PROPOSED GRADING (SEE EC PLANS)
-L1- +50.00 130.00' RT
-L1- +25.00 130.00' RT
SBG FROM -L1- STA. 28+10 TO STA. 34+11 LT
SBG FROM -L1- STA. 28+19 TO STA. 29+74 RT
WOODS
4
COASTAL LUMBER COMPANY
DB 700 PG 109
PC H SLIDE 154-H
HEATH FAMILY FARMS, LLC
DB 1800 PG 832
DB 1016 PG 952
FALLOW
POND
END BRIDGE
-L1- POT STA. 28+06.00
END APPROACH SLAB
-L1- POT STA. 28+16.99
TYPE-III
4' SHLD +22.44
6' SHLD +24.75
30' CLR RDWY
4' SHLD +27.06
6' SHLD +37.50
GREU TL-3
DETAIL SHOWING PAVEMENT - BRIDGE RELATIONSHIP (NOT TO SCALE)

-L1- CURVE DATA

PI Sta 34+95.01
Δ = 23° 19' 51.7" (LT)
D = 3° 49' 11.0"
L = 610.81'
T = 309.69'
R = 1,500.00'
SE = .06
RO = 162'

FOR -L1- PROFILE, SEE SHEET NO. 8

BRIDGE APPROACH SLAB

PAVEMENT REMOVAL

FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-37

FOR RETAINING WALL PLANS, SEE SHEETS W-1 THRU W-5

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
B-4484	6
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — SEAL 030952 — NORTH CAROLINA PROFESSIONAL ENGINEER — JENNIFER D. FARINO

HYDRAULICS ENGINEER — SEAL 018442 — NORTH CAROLINA PROFESSIONAL ENGINEER — RICHARD LEON BOLLINGER, JR.

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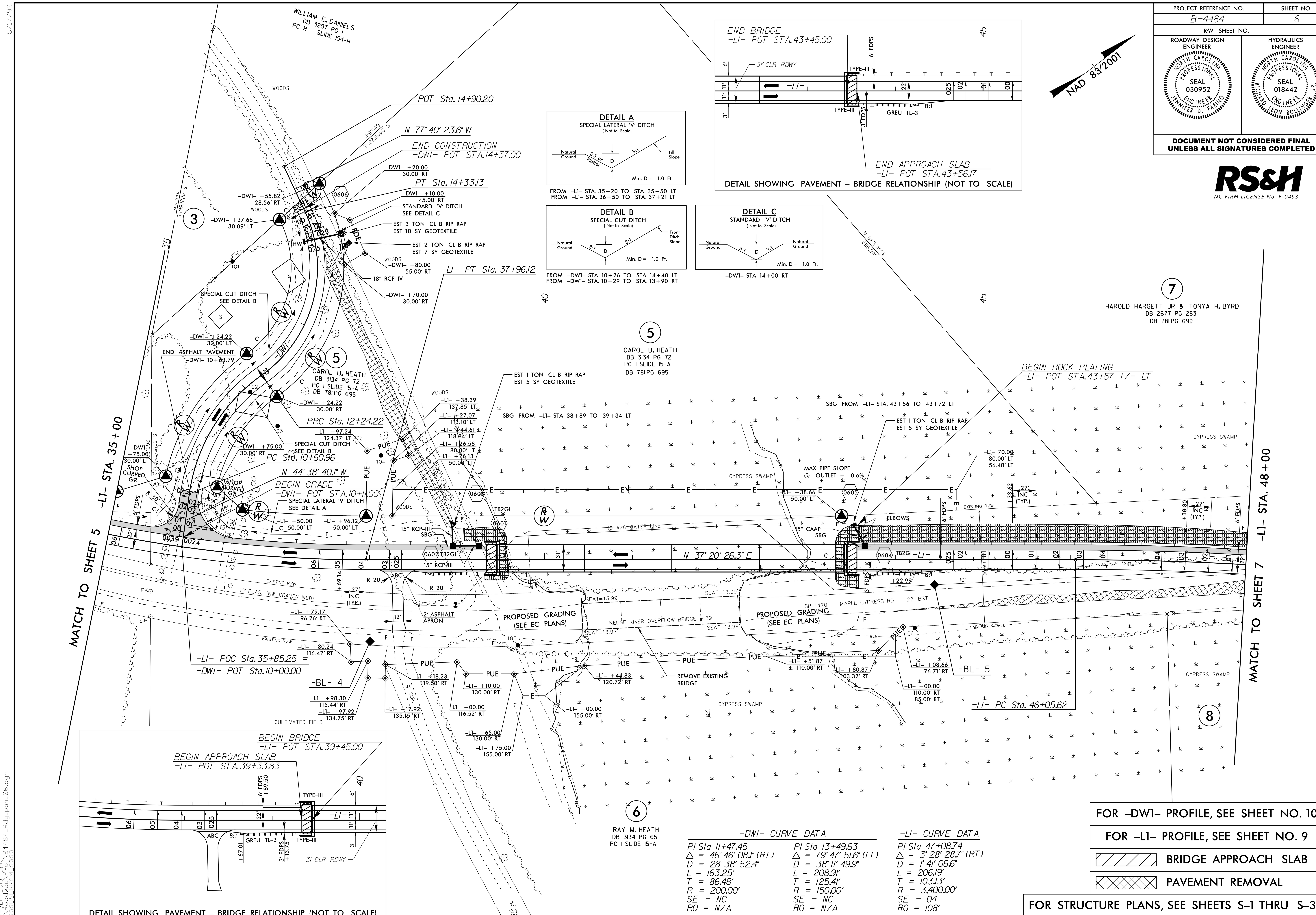
RS&H
NC FIRM LICENSE No: F-0493



NAD 83/2001
WILLIAM E. DANIELS DB 3207 PG 1 PC H SLIDE 154-H
POT Sta. 14+90.20
N 77° 40' 23.6" W
END CONSTRUCTION -DW1- POT STA.14+37.00
PT Sta. 14+33.13
-L1- PT Sta. 37+96.12
EST 3 TON CL B RIP RAP
EST 10 SY GEOTEXTILE
EST 2 TON CL B RIP RAP
EST 7 SY GEOTEXTILE
18" RCP IV
SPECIAL CUT DITCH SEE DETAIL B
END ASPHALT PAVEMENT -DW1- 10+63.79
CAROL U. HEATH DB 3134 PG 72 PC 1 SLIDE 15-A DB 781PG 695
PRC Sta. 12+24.22
PC Sta. 10+60.96
N 44° 38' 40.1" W
BEGIN GRADE -DW1- POT STA.10+11.00
SPECIAL LATERAL 'V' DITCH SEE DETAIL A
SHOP CURVED GR
MATCH TO SHEET 5
-L1- STA. 35+00
-L1- POC Sta.35+85.25 = -DW1- POT Sta.10+00.00
-BL- 4
-BL- 5
PROPOSED GRADING (SEE EC PLANS)
2' ASPHALT APRON
NEUSE RIVER OVERFLOW BRIDGE #139
SR 1470 MAPLE CYPRESS RD 22' BST
REMOVE EXISTING BRIDGE
N 37° 20' 26.3" E
SBG FROM -L1- STA. 38+89 TO 39+34 LT
SBG FROM -L1- STA. 43+56 TO 43+72 LT
EST 1 TON CL B RIP RAP
EST 5 SY GEOTEXTILE
MAX PIPE SLOPE @ OUTLET = 0.6%
BEGIN ROCK PLATING -L1- POT STA.43+57 +/- LT
CYPRESS SWAMP
HAROLD HARGETT JR & TONYA H. BYRD DB 2677 PG 283 DB 781PG 699
-L1- PC Sta. 46+05.62
MATCH TO SHEET 7
-L1- STA. 48+00
RAY M. HEATH DB 3134 PG 65 PC 1 SLIDE 15-A
CULTIVATED FIELD
DETAIL A
SPECIAL LATERAL 'V' DITCH (Not to Scale)
Min. D= 1.0 Ft.
FROM -L1- STA. 35+20 TO STA. 35+50 LT
FROM -L1- STA. 36+50 TO STA. 37+21 LT
DETAIL B
SPECIAL CUT DITCH (Not to Scale)
Min. D= 1.0 Ft.
FROM -DW1- STA. 10+26 TO STA. 14+40 LT
FROM -DW1- STA. 10+29 TO STA. 13+90 RT
DETAIL C
STANDARD 'V' DITCH (Not to Scale)
Min. D= 1.0 Ft.
-DW1- STA. 14+00 RT
END BRIDGE -L1- POT STA.43+45.00
END APPROACH SLAB -L1- POT STA.43+56.17
31' CLR RDWY
DETAIL SHOWING PAVEMENT - BRIDGE RELATIONSHIP (NOT TO SCALE)
BEGIN BRIDGE -L1- POT STA.39+45.00
BEGIN APPROACH SLAB -L1- POT STA.39+33.83
DETAIL SHOWING PAVEMENT - BRIDGE RELATIONSHIP (NOT TO SCALE)

-DW1- CURVE DATA		-L1- CURVE DATA
PI Sta 11+47.45	PI Sta 13+49.63	PI Sta 47+08.74
Δ = 46° 46' 08.1" (RT)	Δ = 79° 47' 51.6" (LT)	Δ = 3° 28' 28.7" (RT)
D = 28° 38' 52.4"	D = 38° 11' 49.9"	D = 1° 41' 06.6"
L = 163.25'	L = 208.91'	L = 206.19'
T = 86.48'	T = 125.41'	T = 103.13'
R = 200.00'	R = 150.00'	R = 3,400.00'
SE = NC	SE = NC	SE = 04
RO = N/A	RO = N/A	RO = 108'

FOR -DW1- PROFILE, SEE SHEET NO. 10

FOR -L1- PROFILE, SEE SHEET NO. 9

BRIDGE APPROACH SLAB

PAVEMENT REMOVAL

FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-31

8/17/99

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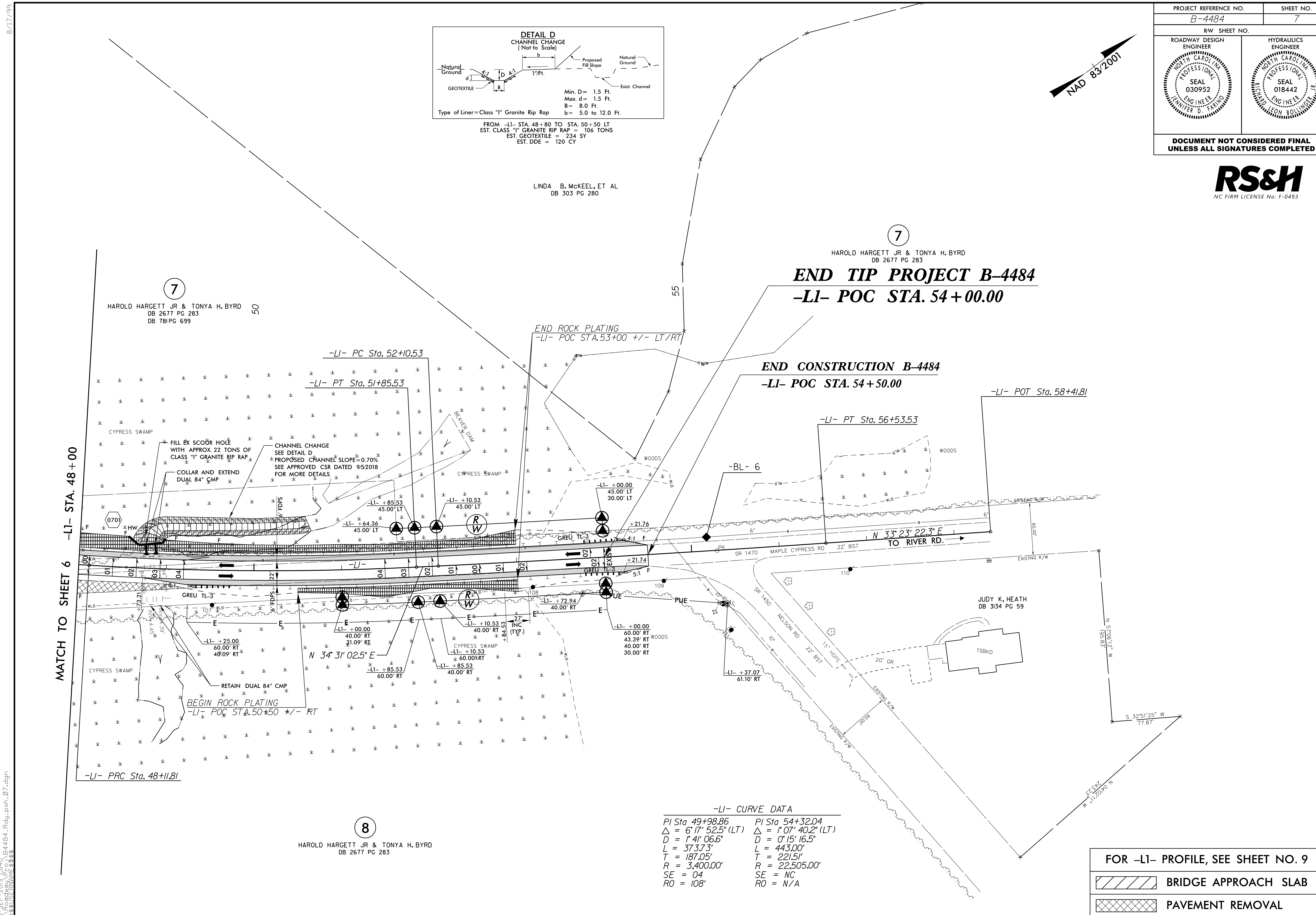


PROJECT REFERENCE NO.
SHEET NO.
B-4484
7
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 030952 ENGINEER JENNIFER D. FARINO
NORTH CAROLINA PROFESSIONAL SEAL 018442 ENGINEER RICHARD LEON BOLLINGER, JR.
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
RS&H
NC FIRM LICENSE No: F-0493
NAD 83/2001
DETAIL D
CHANNEL CHANGE
(Not to Scale)
Natural Ground
Proposed Fill Slope
Exist. Channel
GEOTEXTILE
Min. D= 1.5 Ft.
Max. d= 1.5 Ft.
B= 8.0 Ft.
b= 5.0 to 12.0 Ft.
Type of Liner = Class "I" Granite Rip Rap
FROM -L1- STA. 48+80 TO STA. 50+50 LT
EST. CLASS "I" GRANITE RIP RAP = 106 TONS
EST. GEOTEXTILE = 234 SY
EST. DDE = 120 CY
LINDA B. McKEEL, ET AL
DB 303 PG 280
7
HAROLD HARGETT JR & TONYA H. BYRD
DB 2677 PG 283
END TIP PROJECT B-4484
-L1- POC STA. 54+00.00
END CONSTRUCTION B-4484
-L1- POC STA. 54+50.00
7
HAROLD HARGETT JR & TONYA H. BYRD
DB 2677 PG 283
DB 781 PG 699
END ROCK PLATING
-L1- POC STA.53+00 +/- LT/RT
-L1- PC Sta. 52+10.53
-L1- PT Sta. 51+85.53
-L1- POT Sta. 58+41.81
-L1- PT Sta. 56+53.53
-BL- 6
CYPRESS SWAMP
FILL EX SCOUR HOLE WITH APPROX. 22 TONS OF CLASS "I" GRANITE RIP RAP
COLLAR AND EXTEND DUAL 84" CMP
CHANNEL CHANGE SEE DETAIL D PROPOSED CHANNEL SLOPE = 0.70% SEE APPROVED CSR DATED 9/5/2018 FOR MORE DETAILS
BEAVER DAM
WOODS
N 33° 23' 22.3" E
TO RIVER RD.
SR 1470 MAPLE CYPRESS RD 22' BST
SR 1450 NELSON RD 22' BST
EXISTING R/W
JUDY K. HEATH
DB 3134 PG 59
MATCH TO SHEET 6 -L1- STA. 48+00
-L1-
GREU TL-3
RETAIN DUAL 84" CMP
BEGIN ROCK PLATING
-L1- POC STA.50+50 +/- RT
N 34° 31' 02.5" E
-L1- PRC Sta. 48+11.81
8
HAROLD HARGETT JR & TONYA H. BYRD
DB 2677 PG 283
-L1- CURVE DATA
PI Sta 49+98.86
Δ = 6° 17' 52.5" (LT)
D = 1° 41' 06.6"
L = 373.73'
T = 187.05'
R = 3,400.00'
SE = .04
RO = 108'
PI Sta 54+32.04
Δ = 1° 07' 40.2" (LT)
D = 0° 15' 16.5"
L = 443.00'
T = 221.51'
R = 22,505.00'
SE = NC
RO = N/A
FOR -L1- PROFILE, SEE SHEET NO. 9
BRIDGE APPROACH SLAB
PAVEMENT REMOVAL

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
B-4484	8

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030952 ENGINEER JENNIFER D. FAHEY

HYDRAULICS ENGINEER

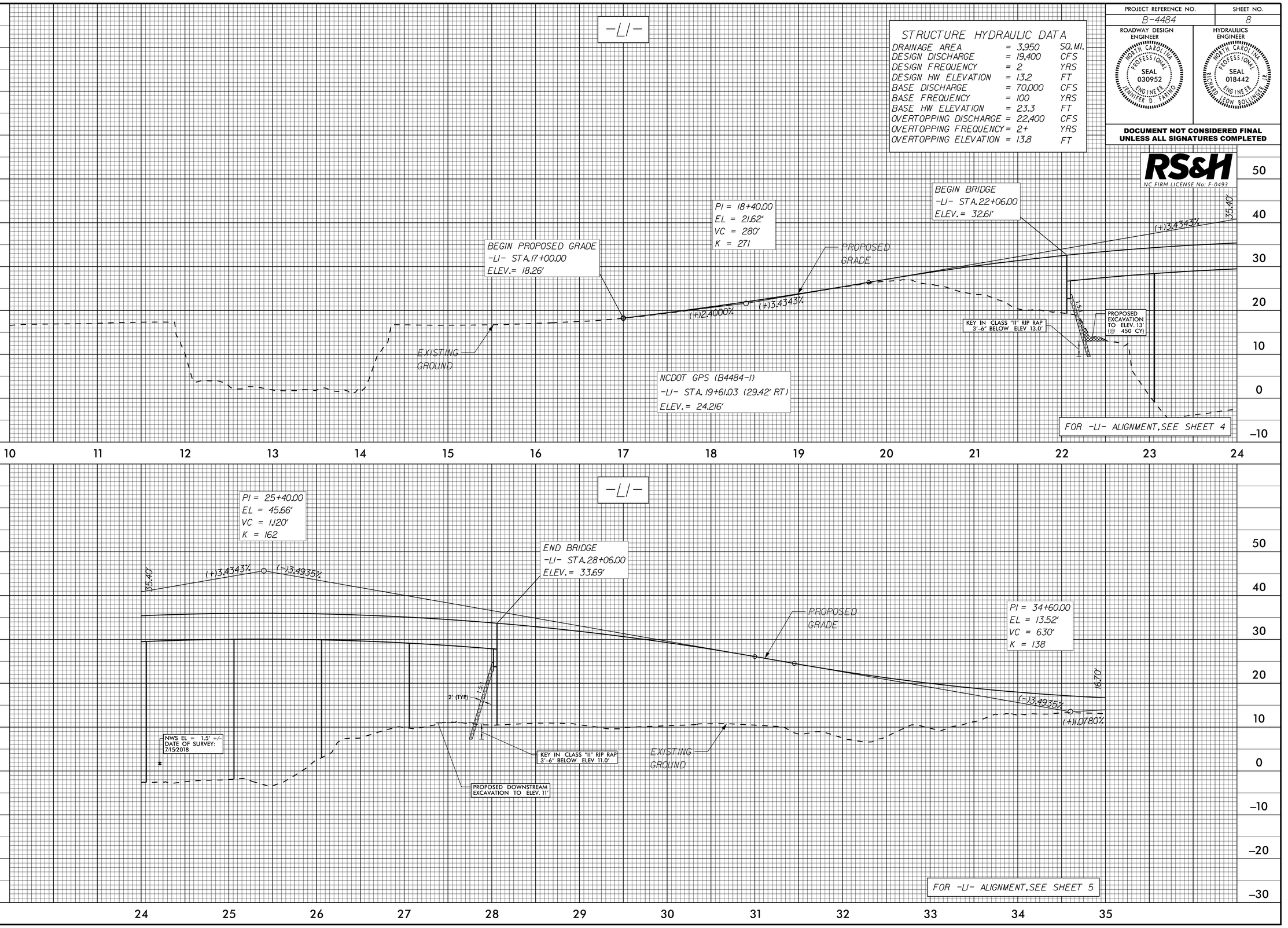
NORTH CAROLINA PROFESSIONAL SEAL 018442 ENGINEER RICHARD LEON BOLLINGER III

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H
NC FIRM LICENSE No: F-0493

STRUCTURE HYDRAULIC DATA

DRAINAGE AREA	= 3,950	SQ.MI.
DESIGN DISCHARGE	= 19,400	CFS
DESIGN FREQUENCY	= 2	YRS
DESIGN HW ELEVATION	= 13.2	FT
BASE DISCHARGE	= 70,000	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 23.3	FT
OVERTOPPING DISCHARGE	= 22,400	CFS
OVERTOPPING FREQUENCY	= 2+	YRS
OVERTOPPING ELEVATION	= 13.8	FT



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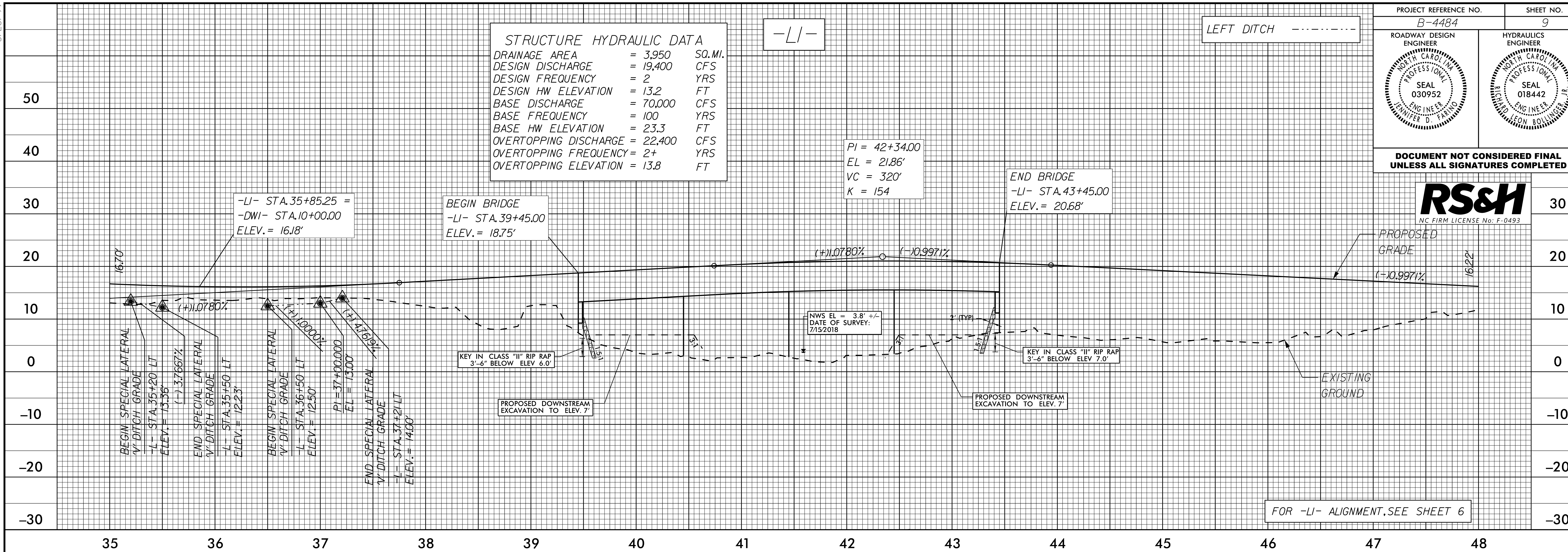
PROJECT REFERENCE NO.	SHEET NO.
B-4484	9

ROADWAY DESIGN ENGINEER — SEAL 030952 — NORTH CAROLINA PROFESSIONAL ENGINEER — JENNIFER D. FARINO

HYDRAULICS ENGINEER — SEAL 018442 — NORTH CAROLINA PROFESSIONAL ENGINEER — RICHARD LEON BOLLINGER, JR.

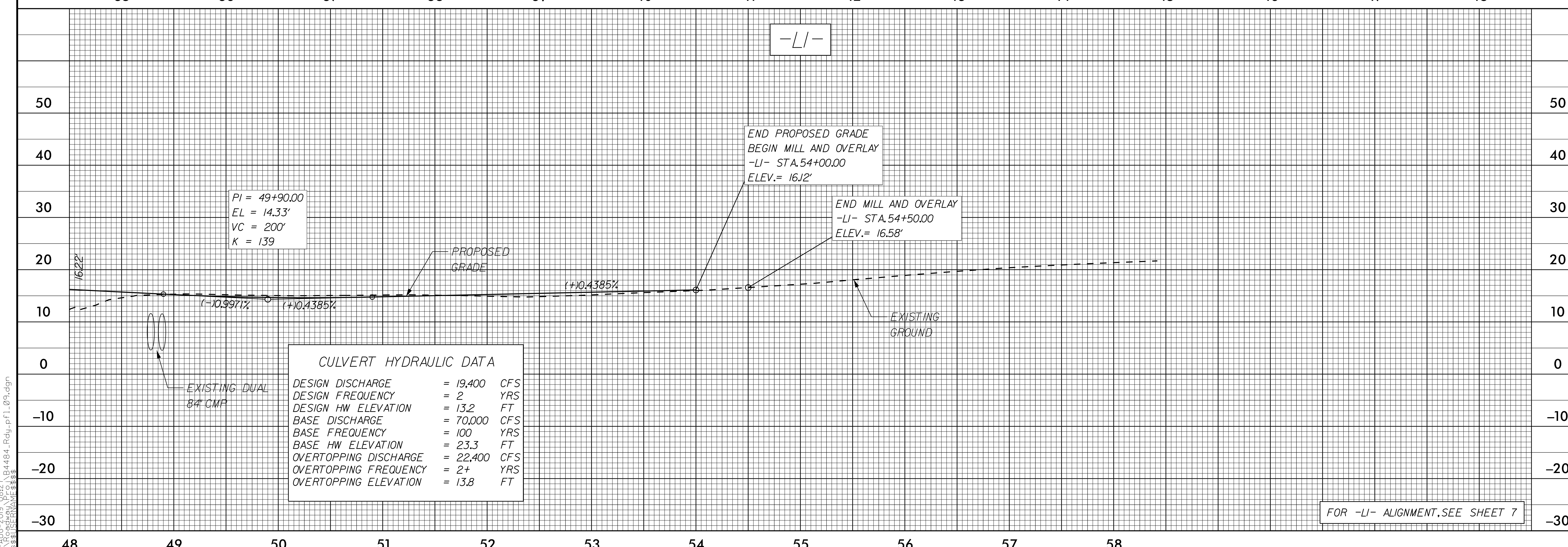
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H — NC FIRM LICENSE No: F-0493



STRUCTURE HYDRAULIC DATA

DRAINAGE AREA	= 3.950	SQ.MI.
DESIGN DISCHARGE	= 19,400	CFS
DESIGN FREQUENCY	= 2	YRS
DESIGN HW ELEVATION	= 13.2	FT
BASE DISCHARGE	= 70,000	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 23.3	FT
OVERTOPPING DISCHARGE	= 22,400	CFS
OVERTOPPING FREQUENCY	= 2+	YRS
OVERTOPPING ELEVATION	= 13.8	FT



CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 19,400	CFS
DESIGN FREQUENCY	= 2	YRS
DESIGN HW ELEVATION	= 13.2	FT
BASE DISCHARGE	= 70,000	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 23.3	FT
OVERTOPPING DISCHARGE	= 22,400	CFS
OVERTOPPING FREQUENCY	= 2+	YRS
OVERTOPPING ELEVATION	= 13.8	FT

5/28/99

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5/28/99

-DWI-

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

NOTE: DITCH VPI TRIANGLE MARKERS TURNED OFF FOR CLARITY

PROJECT REFERENCE NO.	SHEET NO.
B-4484	10

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030952 ENGINEER JENNIFER D. FARING

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 018442 ENGINEER RICHARD LEON ROLLINGER III

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H
NC FIRM LICENSE No: F-0493

BEGIN GRADE
-DWI- Sta. 10+11.00
ELEV.= 15.52'

PI = 10+42.00
EL = 13.81'
VC = 50'
K = 10

EXISTING GROUND

PROPOSED GRADE

END GRADE
-DWI- Sta. 14+37.00
ELEV.= 11.54'

(+)5.40802%
(+)0.57482%
(-)0.60000% LT
(-)0.60000% RT

BEGIN SPECIAL CUT
DITCH GRADE
-DWI- STA.10+26 LT
ELEV.= 12.23'

BEGIN SPECIAL CUT
DITCH GRADE
-DWI- STA.10+29 RT
ELEV.= 12.50'
(-)0.9583% LT
(-)3.3333% RT

PI =10+50.000 RT
ET = 11.80'

PI =10+50.000 LT
EL = 12.00'

PI =13+50.000 RT
ET = 10.00'
(+)2.0000% RT

PI =13+75.000 LT
ET = 10.05'

PI =13+75.000 RT
ET = 9.50'
(+)3.3333% RT

END SPECIAL CUT
DITCH GRADE
-DWI- STA.13+90 RT
ELEV.= 9.60'
(-)5.8000% LT

PI =14+00.000 LT
EL = 9.65'
(+)16.4865% LT

PI =14+37.000 LT
EL = 11.00'
(+)2.0000% LT

END SPECIAL CUT
DITCH GRADE
-DWI- STA.14+40 LT
ELEV.= 11.60'

FOR -DWI- ALIGNMENT, SEE SHEET 6

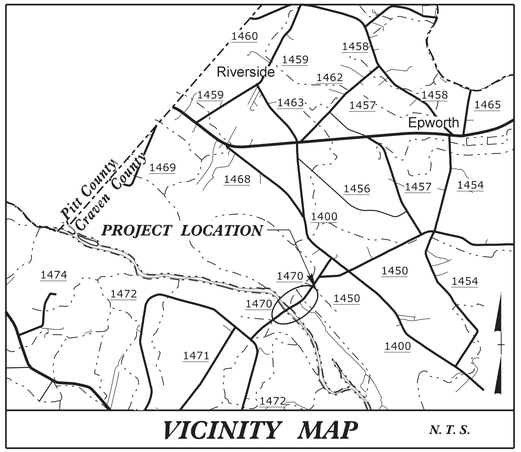
09/08/99

TIP PROJECT: B–4484

T.I.P. NO.	SHEET NO.
B–4484	UC–1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITY CONSTRUCTION PLANS
CRAVEN COUNTY



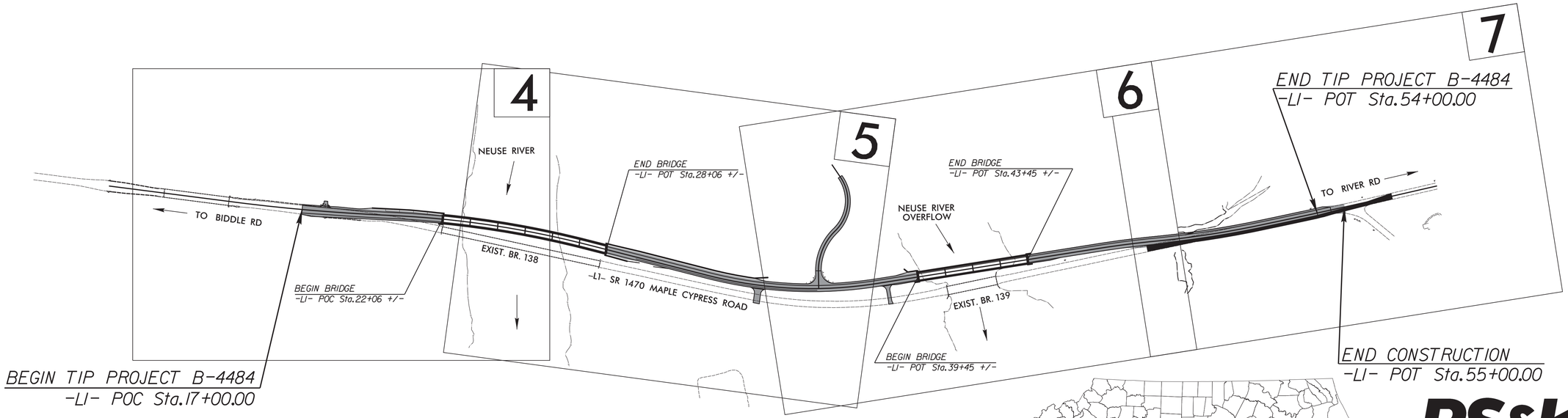
VICINITY MAP N. T. S.

UC PLANS

LOCATION: REPLACE BRIDGES NO. 138 & 139 OVER NEUSE RIVER AND NEUSE RIVER OVERFLOW ON SR 1470 (MAPLE CYPRESS ROAD)

TYPE OF WORK: WATER LINE RELOCATION

NAD 83/2001



THERE IS NO CONTROL OF ACCESS ON THIS PROJECT.
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

RS&H

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)

INDEX OF SHEETS

SHEET NO.:	*DESCRIPTION:*
UC–1	*TITLE SHEET*
UC–2	*UTILITY SYMBOLOGY*
UC–3	*NOTES*
UC–3A TO UC–3E	*DETAILS*
UC–4 TO UC–7	*UTILITY CONSTRUCTION SHEET*
UC–8 TO UC–9	*PROFILE SHEET*

WATER AND SEWER OWNERS ON PROJECT

(A) CRAVEN COUNTY WATER

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 038442 ENGINEER RICHARD LEON BOLLINGER
Digitally signed by RICHARD LEON BOLLINGER
9/4/2019

PREPARED IN THE OFFICE OF
RS&H
ARCHITECTS–ENGINEERS–PLANNERS, INC.
8521 SIX FORKS ROAD, SUITE 400
RALEIGH, NC 27615

RICHARD BOLLINGER, PE
PROJECT ENGINEER

ALEX VINSON, EI
PROJECT DESIGN ENGINEER

HON YEUNG, PE
NCDOT CONTACT

CONTRACT:

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PROJECT REFERENCE NO.	SHEET NO.
B-4484	UC-2

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

- Water Line (Sized as Shown) — 12" WL
- 11¼ Degree Bend
- 22½ Degree Bend
- 45 Degree Bend
- 90 Degree Bend
- Plug
- Tee
- Cross
- Reducer
- Gate Valve — GV
- Butterfly Valve — BV
- Tapping Valve — TGV
- Line Stop — LS
- Line Stop with Bypass — LS/BP
- Blow Off — BO
- Fire Hydrant — PFH
- Relocate Fire Hydrant — RFH
- Remove Fire Hydrant — REM FH
- Water Meter — PWM
- Relocate Water Meter — RWM
- Remove Water Meter — REM WM
- Water Pump Station — PS(W)
- RPZ Backflow Preventer — PRPZ
- DCV Backflow Preventer — PBFP
- Relocate RPZ Backflow Preventer — RRPZ
- Relocate DCV Backflow Preventer — RBFP

PROPOSED SEWER SYMBOLS

- Gravity Sewer Line (Sized as Shown) — 12" SS
- Force Main Sewer Line (Sized as Shown) — 12" FSS
- Manhole (Sized per Note)
- Sewer Pump Station — PS(SS)

PROPOSED MISCELLANOUS UTILITIES SYMBOLS

- Power Pole
- Telephone Pole
- Joint Use Pole
- Telephone Pedestal — TEL PED
- Utility Line by Others (Type as Shown) — PROP O/H POW LINES
- Trenchless Installation — 12" TL INSTALL
- Encasement by Open Cut — 24" ENCAS BY OC
- Encasement — 24" ENCASEMENT
- Thrust Block
- Air Release Valve — AR
- Utility Vault — UV
- Concrete Pier — CP
- Steel Pier — SP
- Plan Note — NOTE
- Pay Item Note — PAY ITEM

EXISTING UTILITIES SYMBOLS

- Power Pole
- Telephone Pole
- Joint Use Pole
- Utility Pole
- Utility Pole with Base
- H-Frame Pole
- Power Transmission Line Tower
- Water Manhole
- Power Manhole
- Telephone Manhole
- Sanitary Sewer Manhole
- Hand Hole for Cable
- Power Transformer
- Telephone Pedestal — T
- CATV Pedestal — C
- Gas Valve
- Gas Meter
- Located Miscellaneous Utility Object
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.
- *Underground Power Line — P
- *Underground Telephone Cable — T
- *Underground Telephone Conduit — TC
- *Underground Fiber Optics Telephone Cable — T FO
- *Underground TV Cable — TV
- *Underground Fiber Optics TV Cable — TV FO
- *Underground Gas Pipeline — G
- Aboveground Gas Pipeline — A/G Gas
- *Underground Water Line — W
- Aboveground Water Line — A/G Water
- *Underground Gravity Sanitary Sewer Line — SS
- Aboveground Gravity Sanitary Sewer Line — A/G Sanitary Sewer
- *Underground SS Forced Main Line — FSS
- Underground Unknown Utility Line — ?UTL
- SUE Test Hole
- Water Meter
- Water Valve
- Fire Hydrant
- Sanitary Sewer Cleanout

*For Existing Utilities

- Utility Line Drawn from Record (Type as Shown) — W
- Designated Utility Line (Type as Shown) — W

REV: 2/1/2012

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UTILITY CONSTRUCTION

GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.

2. THE EXISTING UTILITIES BELONG TO CRAVEN COUNTY WATER .

3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER RESOURCES, PUBLIC WATER SUPPLY SECTION. ALL SEWER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER RESOURCES, WATER QUALITY SECTION. PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE PLUMBING CODES.

4. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT. THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.

5. PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION. NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND ONE WEEK PRIOR TO SERVICE INTERRUPTION. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPORTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.

6. THE PLANS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE, AND TYPE MATERIAL OF THE EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING FACILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE DEPARTMENT.

7. MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE PLANS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.

8. MAKE CONNECTIONS BETWEEN EXISTING AND PROPOSED UTILITIES AT TIMES MOST CONVENIENT TO THE PUBLIC, WITHOUT ENDANGERING THE UTILITY SERVICE, AND IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS. MAKE CONNECTIONS ON WEEKENDS, AT NIGHT, AND ON HOLIDAYS IF NECESSARY.

9. ALL UTILITY MATERIALS SHALL BE APPROVED PRIOR TO DELIVERY TO THE PROJECT. SEE 1500-7, " SUBMITTALS AND RECORDS" IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.

PROJECT SPECIFIC NOTES:

1. ALL PROPOSED WATER LINE SHALL BE D.I.R.J. (DUCTILE IRON RESTRAINED JOINT) PIPE FOR TRENCHED INSTALLATION AND HDPE FOR TRENCHLESS.

2. THE EXISTING ABOVE GROUND WATER LINE IS TO BE REMOVED AND/OR THE EXISTING UNDER GROUND WATER LINE IS TO BE ABANDONED OR REMOVED WHERE RELOCATIONS ARE PROPOSED.

3. CONTRACTOR'S ATTENTION IS DIRECTED TO SECTIONS 102, 107, AND 1550 OF THE STANDARD SPECIFICATIONS CONCERNING TRENCHLESS INSTALLATION. IT IS CONTRACTOR'S RESPONSIBILITY TO HAVE BORE DESIGNED AND SEALED BY A LICENSED NORTH CAROLINA PROFESSIONAL ENGINEER. NO DAMAGE IS ALLOWED TO RIVER, WETLANDS, OR BUFFER ZONES.

LIST OF STANDARD DRAWINGS

1515.01 WATER METER

PROJECT REFERENCE NO.	SHEET NO.
B-4484	UC-3
DESIGNED BY: ARV	
DRAWN BY: ARV	
CHECKED BY: RLB	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER ROBERT LEON BOLLINGER JR.
9/4/2018

UTILITY CONSTRUCTION

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PROJECT TYPICAL DETAILS

PROJECT REFERENCE NO.	SHEET NO.
B-4484	UC-3A
DESIGNED BY: ARV	
DRAWN BY: ARV	
CHECKED BY: RLB	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	

NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER RICHARD LEON BOLLINGER III

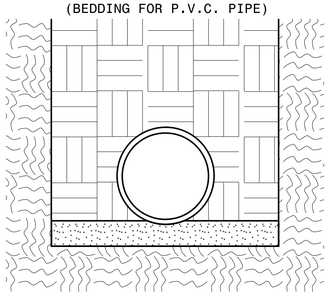
9/4/2019

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

CLASS "C"

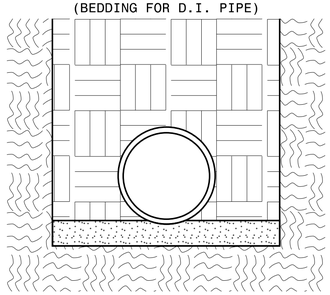
(BEDDING FOR P.V.C. PIPE)



PIPE BEDDED IN LOOSE MATERIAL, LIGHTLY TAMPED WITH A MINIMUM OF 6" UNDER PIPE. TRENCH BACKFILLED IN LOOSE 6" LAYERS COMPACTED TO TOP OF TRENCH USING LOCAL EXCAVATED MATERIAL, IF APPROVED BY THE ENGINEER, OR SELECT MATERIAL. ALL MATERIAL SHALL BE FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH. COMPACTION SHALL BE TO APPROX. 95% DENSITY IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY THE DEPARTMENT OF TRANSPORTATION.

TYPE "3"

(BEDDING FOR D.I. PIPE)



PIPE BEDDED IN 4" MINIMUM LOOSE SOIL. TRENCH BACKFILLED IN LOOSE 6" LAYERS COMPACTED TO TOP OF TRENCH USING LOCAL EXCAVATED MATERIAL, IF APPROVED BY THE ENGINEER, OR SELECT MATERIAL. ALL MATERIAL SHALL BE FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH. COMPACTION SHALL BE TO APPROX. 95% DENSITY IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY THE DEPARTMENT OF TRANSPORTATION.

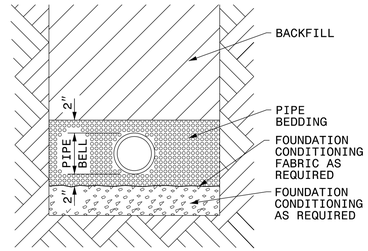
NOTES:

1. CONSIDERATION OF THE PIPE-ZONE EMBEDMENT CONDITIONS INCLUDED IN THIS FIGURE MAY BE INFLUENCED BY FACTORS OTHER THAN PIPE STRENGTH. FOR ADDITIONAL INFORMATION ON PIPE BEDDING AND BACKFILL, SEE ANSI/AWWA C600.

STANDARD PIPE BEDDING DETAILS

NOT TO SCALE

TRENCH DETAIL



PLACE FOUNDATION CONDITIONING MATERIAL BELOW BEDDING IF REQUIRED, AS DIRECTED BY ENGINEER. PIPE BEDDED IN SELECT MATERIAL, CLASS II (TYPE 1) OR CLASS III. TRENCH BACKFILLED IN LOOSE 6" LAYERS COMPACTED TO TOP OF TRENCH USING LOCAL EXCAVATED MATERIAL IF APPROVED BY THE ENGINEER, OR SELECT MATERIAL. ALL MATERIAL SHALL BE FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH. COMPACTION SHALL BE TO APPROXIMATELY 95% DENSITY IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY THE DEPARTMENT OF TRANSPORTATION.

GENERAL TRENCH DETAIL

NOT TO SCALE

MAXIMUM TRENCH WIDTH AT TOP OF PIPE

NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)	NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)
4	28	20	44
6	30	24	48
8	32	30	54
10	34	36	60
12	36	42	66
14	38	48	72
16	40	54	78
18	42		

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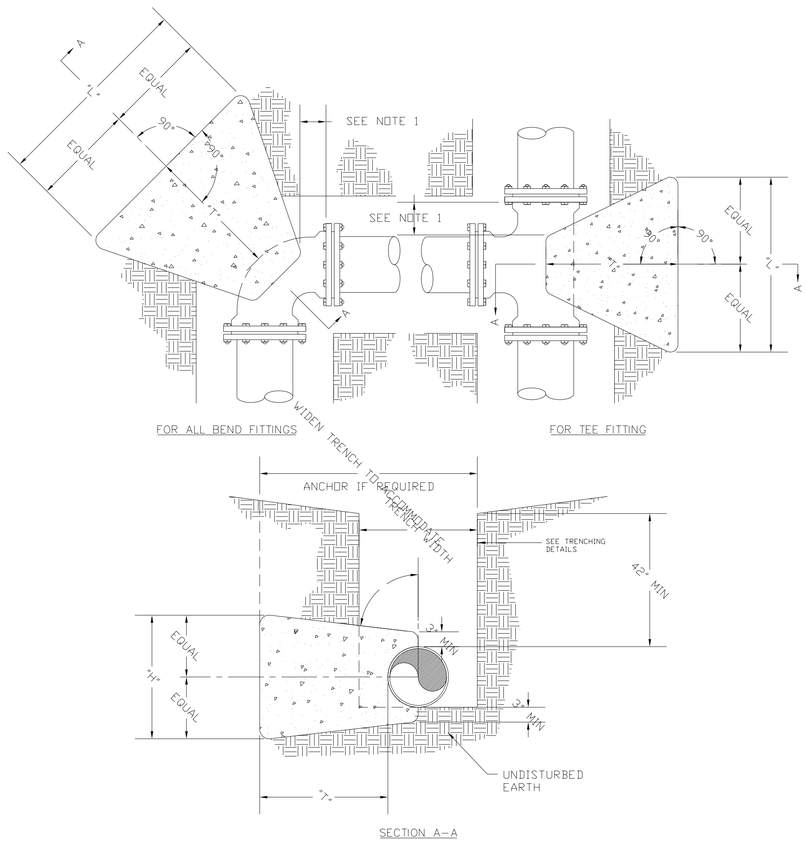
PROJECT TYPICAL DETAILS

PROJECT REFERENCE NO.	SHEET NO.
B-4484	UC-3B
DESIGNED BY: ARV	
DRAWN BY: ARV	
CHECKED BY: RLB	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	

NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER RICHARD LEON BOLLINGER III
9/4/2019
UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



SECTION A-A

NOTES:
1. CONCRETE BLOCKING IS TO BE FORMED TO ENSURE ACCESSIBILITY TO FITTINGS AND POURED AGAINST UNDISTURBED EARTH.
2. ALL FITTINGS SHALL BE WRAPPED IN POLYETHYLENE TO PREVENT CONCRETE FROM CONTACTING FITTINGS, BOLTS, OR ENDS OF MECHANICAL JOINT BENDS.
3. CONCRETE TO BE MINIMUM 3,000 PSI @ 28 DAYS.
4. WHEN SACKRETE IS TO BE USED, IT SHALL BE PROPERLY MIXED PER MANUFACTURER SPECIFICATIONS.
5. FOR REQUIRED DIMENSIONS, SEE WS_TB2

THRUST BLOCKING
NOT TO SCALE

TEST PRESSURE = 150 PSI

PIPE SIZE	TYPE FITTING	DIMENSIONS (FT) "L"	"H"	"T"	VOLUME CONCRETE CU. YD.
<4 INCHES	11 1/4°	----	----	----	----
	22 1/2°	1.00	1.00	1.50	0.06
	45°	1.00	1.00	1.50	0.06
	90°	1.00	1.00	2.50	0.09
	TEE	1.00	1.00	2.00	0.07
4 INCHES	11 1/4°	1.00	1.00	2.50	0.09
	22 1/2°	1.00	1.00	2.50	0.09
	45°	1.00	1.00	2.50	0.09
	90°	1.50	1.50	2.50	0.15
	TEE	1.50	1.50	2.00	0.12
6 INCHES	11 1/4°	1.50	1.50	2.50	0.15
	22 1/2°	1.50	1.50	2.50	0.15
	45°	1.50	1.50	2.50	0.15
	90°	2.00	2.00	3.00	0.28
	TEE	2.00	2.00	2.50	0.23
8 INCHES	11 1/4°	2.00	2.00	2.50	0.23
	22 1/2°	2.00	2.00	2.50	0.23
	45°	2.00	2.00	2.75	0.25
	90°	3.00	2.00	3.00	0.39
	TEE	3.00	2.00	2.50	0.32
12 INCHES	11 1/4°	2.00	2.00	3.00	0.28
	22 1/2°	2.00	2.00	3.00	0.28
	45°	3.00	2.50	3.00	0.47
	90°	4.50	3.00	3.50	0.94
	TEE	4.50	3.00	3.00	0.81
16 INCHES	11 1/4°	2.00	2.00	3.00	0.28
	22 1/2°	3.00	2.00	3.00	0.39
	45°	4.00	3.00	3.50	0.84
	90°	6.50	3.50	3.50	1.54
	TEE	6.50	3.50	3.00	1.32

TEST PRESSURE = 200 PSI

PIPE SIZE	TYPE FITTING	DIMENSIONS (FT) "L"	"H"	"T"	VOLUME CONCRETE CU. YD.
<4 INCHES	11 1/4°	1.00	1.00	1.00	0.04
	22 1/2°	1.00	1.00	1.50	0.06
	45°	1.00	1.00	1.50	0.06
	90°	1.50	1.50	2.50	0.15
	TEE	1.50	1.50	2.00	0.12
4 INCHES	11 1/4°	1.00	1.00	2.50	0.09
	22 1/2°	1.00	1.00	2.50	0.09
	45°	1.50	1.50	2.50	0.15
	90°	1.50	1.50	2.50	0.15
	TEE	1.50	1.50	2.00	0.12
6 INCHES	11 1/4°	1.50	1.50	2.50	0.15
	22 1/2°	1.50	1.50	2.50	0.15
	45°	1.50	1.50	2.50	0.15
	90°	2.50	2.00	3.00	0.33
	TEE	2.50	2.00	2.50	0.28
8 INCHES	11 1/4°	2.00	2.00	2.50	0.23
	22 1/2°	2.00	2.00	2.50	0.23
	45°	2.00	2.00	2.75	0.23
	90°	4.00	2.00	3.00	0.50
	TEE	4.00	2.00	2.50	0.42
12 INCHES	11 1/4°	2.00	2.00	3.00	0.28
	22 1/2°	3.00	2.00	3.00	0.39
	45°	4.00	2.50	3.00	0.61
	90°	5.50	3.00	3.50	1.13
	TEE	5.50	3.00	3.00	0.97
16 INCHES	11 1/4°	2.00	2.00	3.00	0.28
	22 1/2°	4.00	2.00	3.00	0.50
	45°	5.50	3.00	3.50	1.13
	90°	7.50	4.00	3.50	2.01
	TEE	7.50	4.00	3.00	1.72

CHART NOTES:
1. IF BLOCKING EXCAVATION IS IN LIGHTLY COMPACTED FILL AREAS, OR IN AREAS WHERE BOULDERS OR STUMPS HAVE BEEN REMOVED, BLOCKING SIZE MUST BE RE-SIZED FOR THE SPECIFIC LOCATION/CIRCUMSTANCE BY A NC LICENSED PROFESSIONAL ENGINEER.
2. BLOCKING SIZES SHOWN IN THESE TABLES ASSUME THE FOLLOWING:
   a. BLOCKING IS CONSTRUCTED IN RESIDUAL SOILS AS SHOWN IN DETAIL
   b. SOIL BEARING PRESSURE = 2000 PSF
   c. VELOCITY OF FLOW = 15 FPS
3. THIS DETAIL NOT APPLICABLE TO REDUCING BENDS.
4. NEITHER THE WEIGHT OF THE CONCRETE BLOCKING NOR FRICTION BETWEEN CONCRETE BLOCKING AND SOIL WAS ADDED INTO BLOCKING SIZES COMPUTATION. THEREFORE, BLOCKING SIZE IS CONSERVATIVE.

THRUST BLOCKING
NOT TO SCALE

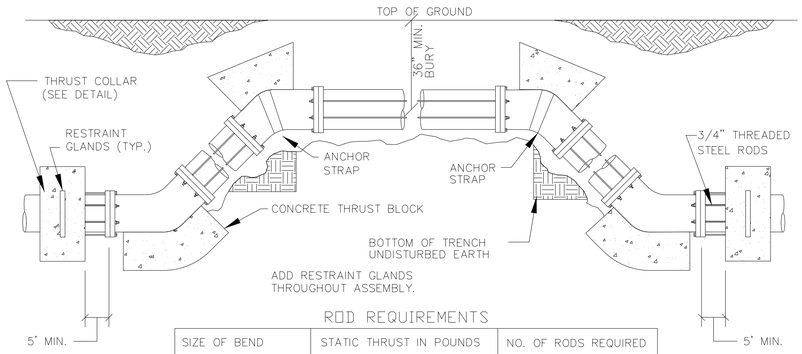
5/14/99

PROJECT TYPICAL DETAILS

PROJECT REFERENCE NO.	SHEET NO.
B-4484	UC-3C
DESIGNED BY: ARV	
DRAWN BY: ARV	
CHECKED BY: RLB	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

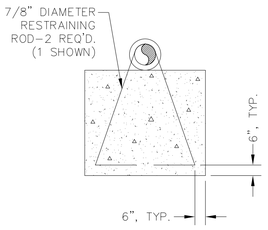
NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER RICHARD LEON BOLLINGER JR. 9/4/2019

UTILITY CONSTRUCTION



ROD REQUIREMENTS

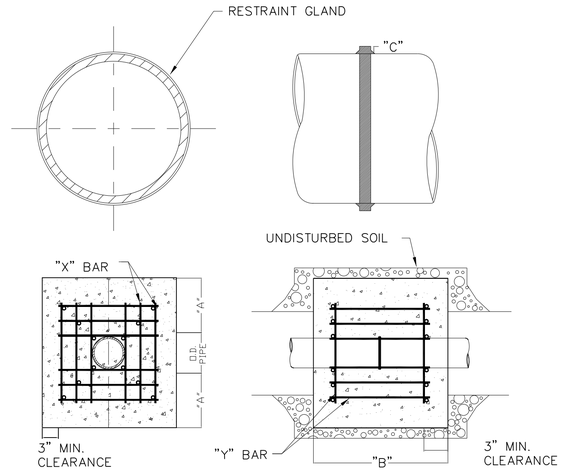
SIZE OF BEND	STATIC THRUST IN POUNDS	NO. OF RODS REQUIRED
6"	4,328	4
8"	7,694	4
12"	17,312	4
16"	30,779	8
24"	69,252	8



BLOCKING CROSS SECTION
NO SCALE

GENERAL NOTES:

1. ALL FITTINGS SHALL BE WRAPPED IN POLYETHYLENE TO PREVENT CONCRETE FROM CONTACTING FITTINGS, BOLTS, OR ENDS OF MECHANICAL JOINT BENDS.
2. EACH FITTING SHALL BE SECURED BY TWO FORMS OF RESTRAINT. RESTRAINING GLANDS AND CONCRETE THRUST BLOCKING ARE PREFERRED. WEDGE-ACTION RESTRAINT GLANDS (I.E. MEGALUGS) ARE APPROVED ONLY FOR USE ON DUCTILE IRON PIPE. FULL-CIRCUMFERENTIAL PIPE RESTRAINT GLANDS (I.E. GRIP RINGS) MAY BE USED ON PVC OR DUCTILE IRON PIPE. ALL RESTRAINT GLANDS SHALL BE SPECIFICALLY DESIGNED FOR USE ON THE TYPE OF PIPE FOR WHICH THEY ARE BEING INSTALLED. OTHER FORMS OF RESTRAINT SUCH AS THREADED ROD, BELL RESTRAINT HARNESSES, ETC. MAY BE APPROVED BY ONWASA ON A CASE-BY-CASE BASIS.
3. IF APPROVED FOR USE BY ONWASA, STEEL RODS AND BOLTS SHALL BE 3/4" HOT DIPPED GALVANIZED.
4. MUST USE DUCTILE IRON EYE BOLTS WHERE NECESSARY.



REINFORCING REQUIREMENTS

I.D. PIPE	REBAR SIZE	"X" BAR LENGTH	"X" BAR WEIGHT	"Y" BAR LENGTH	"Y" BAR WEIGHT	NO. REQUIRED
6" - 36"	#5	2'-2"+ O.D. PIPE	1.043 LBS/FT	1'-1"	1.1 LBS. EACH	X-24, Y-12
48" & greater	#6	3'-0"+ O.D. PIPE	1.502 LBS/FT	1'-3"	1.9 LBS. EACH	X-24, Y-12

THRUST COLLAR, AND THRUST SCHEDULE

I.D. PIPE	"A"	"B"	"C-6"-16", 20"-24", 30"-36", 48"
6" - 36"	1'-4"	1'-7"	2" 3" 4"
48" & greater	1'-8"	1'-9"	6"

NOTES:

1. CONCRETE SHALL BE 3000 PSI AND TRANSIT MIXED.
2. REINFORCING BARS SHALL BE DEFORMED AND TIED TOGETHER.
3. TRENCH BOTTOM WIDTH IN VICINITY OF THRUST BLOCK INSTALLATION SHALL BE THE MINIMUM WIDTH AS SHOWN ON STANDARD EMBEDMENT DETAIL.
4. BACKFILL TAMPED IN 6" LIFTS PER STANDARD EMBEDMENT DETAIL.

THRUST BLOCKING DESIGN QUANTITY TABLE

NOT TO SCALE

THRUST COLLAR DESIGN QUANTITY TABLE

NOT TO SCALE

31-OCT-2018 14:18
R:\Utilities\Engineering\UC\Proj\B4484_UC_details.dgn
$$$$USERNAME$$$$

5/14/99

PROJECT TYPICAL DETAILS

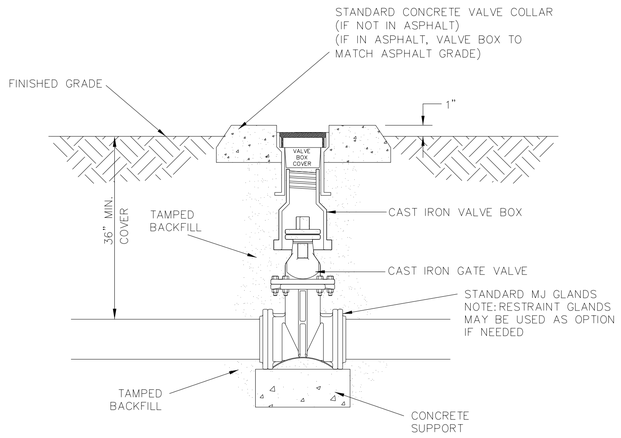
PROJECT REFERENCE NO.	SHEET NO.
B-4484	UC-3D
DESIGNED BY: ARV	
DRAWN BY: ARV	
CHECKED BY: RLB	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	

NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER ROBERT LEON BOLLINGER JR.

9/4/2019

UTILITY CONSTRUCTION PLANS ONLY

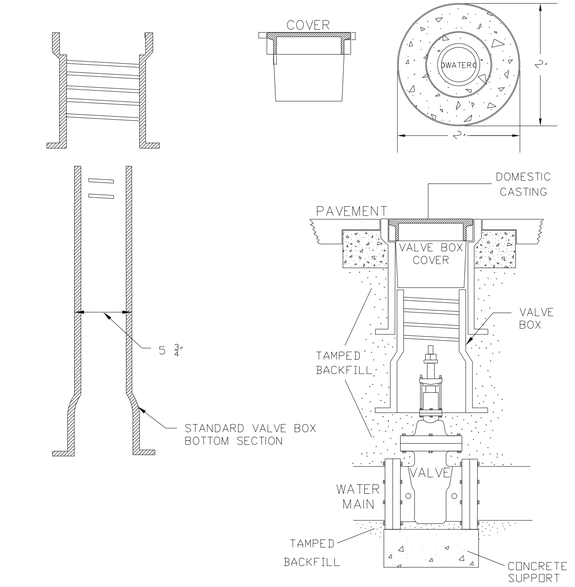
UTILITY CONSTRUCTION



TYPICAL INLINE VALVE DETAIL

NOT TO SCALE

NOTE: CONCRETE VALVE COLLAR REQUIRED ON ALL VALVES.



VALVE BOX DETAIL

NOT TO SCALE

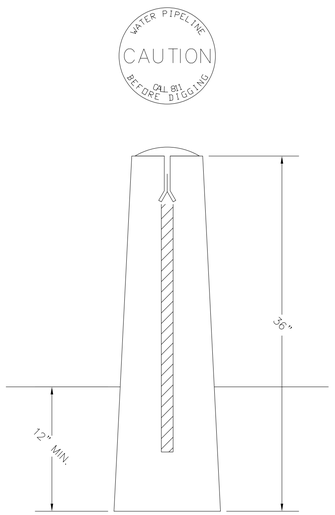
5/14/99

PROJECT TYPICAL DETAILS

PROJECT REFERENCE NO.	SHEET NO.
B-4484	UC-3E
DESIGNED BY: ARV	
DRAWN BY: ARV	
CHECKED BY: RLB	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	9/4/2019 UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER RICHARD LEON BOLLINGER III

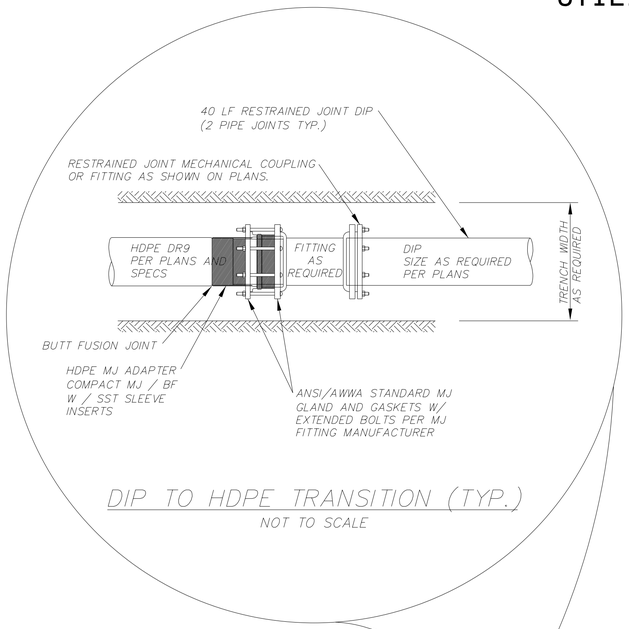
UTILITY CONSTRUCTION



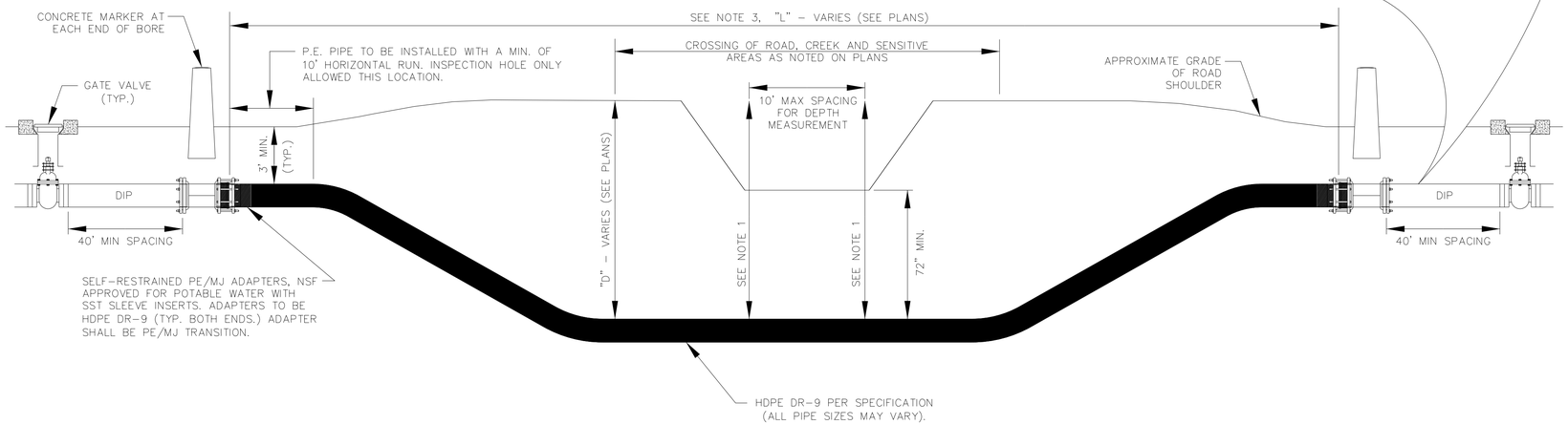
CONCRETE MARKER
CROSS SECTION

NOTES:

1. A PROFILE AND PLAN SHALL BE PROVIDED FROM ENTRY TO EXIT FOR EACH DIRECTIONAL BORE SECTION BY THE DIRECTIONAL BORE CONTRACTOR.
2. ALL BORE SECTIONS SHALL BE HYDROSTATICALLY TESTED, PER SPECIFICATIONS UPON COMPLETION OF INSTALLATION AND PRIOR TO CONNECTION TO THE MAIN WATER LINE.
3. LENGTH OF CROSSING, LOCATION OF INSPECTION/OBSERVATION EXCAVATION, NUMBER OF P.E. PIPE JOINTS, LOCATION OF BORE MACHINE, AUGER ENTRANCE LOCATION, AND TIE-IN POINTS ARE TO BE APPROVED BY CRAVEN COUNTY WATER PRIOR TO ANY START OF WORK OR ORDERING MATERIALS.
4. CONCRETE MARKERS SHALL BE PLACED AT THE BOTH THE ENTRY AND EXIT POINT OF ALL DIRECTIONAL BORES, REFERENCING THE TYPE OF UTILITY UNDERGROUND.
5. THE BORE DEVELOPED FOR THE LEAD-IN END OF THE PIPE SHALL BE KEPT AT A MINIMUM DIAMETER FOR THE PIPE INSTALLATION. THE LEAD-IN END SHALL BE PULLED THROUGH WITHOUT THE M.J. FLANGE ATTACHED FOR LARGER THAN 6" PIPE INSTALLATION. THE M.J. FLANGE FOR SAID LEAD-IN END SHALL BE INSTALLED AFTER THE PIPE INSTALLATION WITH THE USE OF A SPLIT M.J. FLANGE.
6. IF BURIED OBSTRUCTIONS ARE LOCATED IN THE LENGTH OF THE DIRECTIONAL BORE, DIRECTIONAL BORE CONTRACTOR SHALL AVOID CONFLICT WITH THESE OBSTRUCTIONS BY GOING UNDER A MINIMUM OF 12" WITH PROPOSED PIPE UNLESS OTHERWISE SPECIFIED OR IDENTIFIED IN GENERAL NOTES ON SHEET, OR IN SPECIFICATIONS.



DIP TO HDPE TRANSITION (TYP.)
NOT TO SCALE



HORIZONTAL DIRECTIONAL DRILL PROFILE (TYP.)
NOT TO SCALE

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-4484	UC-4

DESIGNED BY: ARV
DRAWN BY: ARV
CHECKED BY: RLB
APPROVED BY:
REVISED:

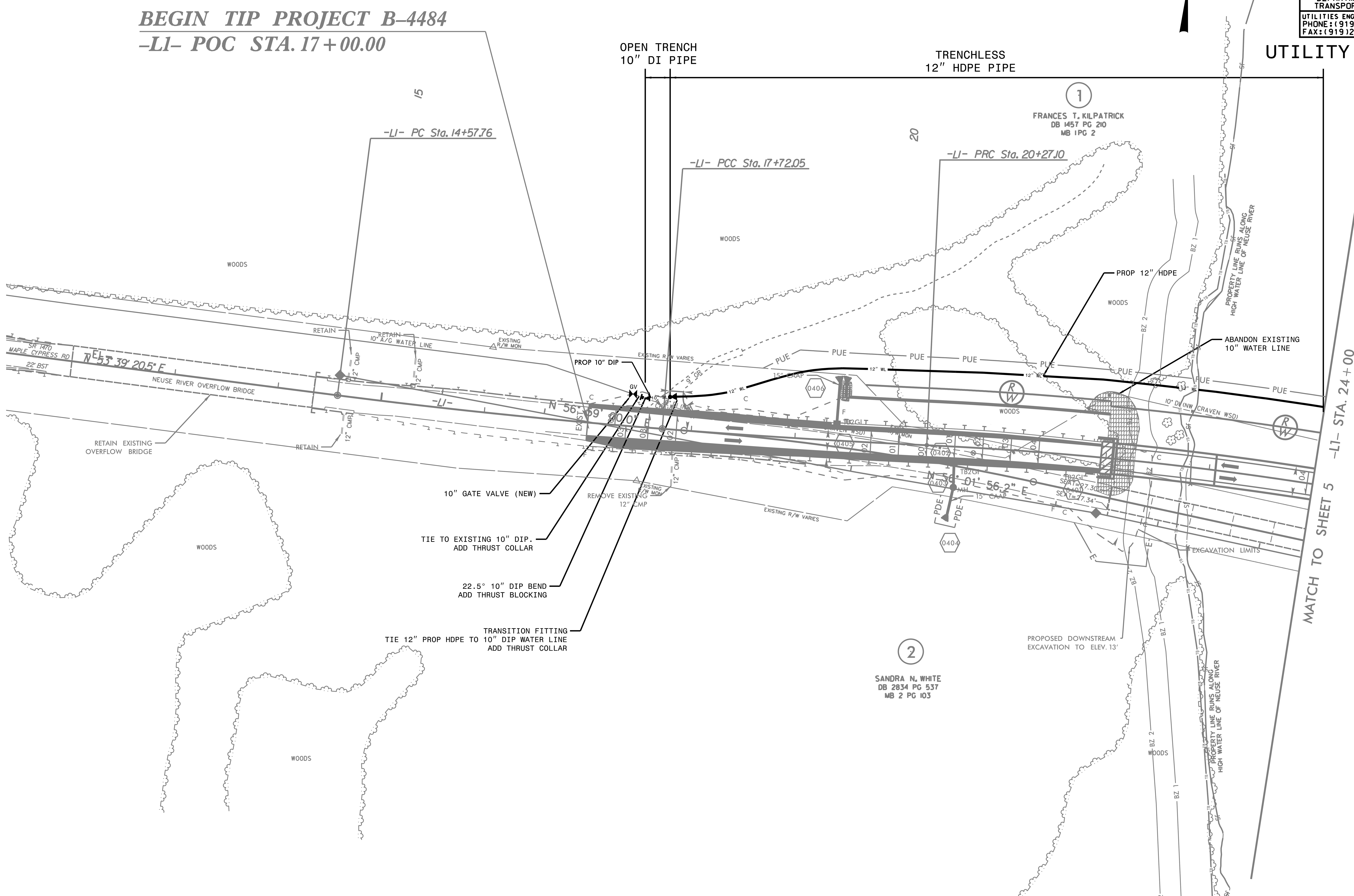
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

UTILITIES ENGINEERING SEC.
PHONE: (919)707-6690
FAX: (919)250-4151

NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER RICHARD LEON BOLLINGER, JR.
9/4/2019

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



NOTE:
THERE ARE NO DEFINABLE DITCHES ALONG THE ROAD
VEGETATED, BUT MAINTAINED. OVERALL THE AREA WITH
SOME OF THE WOODEN PILES ON BRIDGE 138 HAVE
SOME SIGNS OF SCOUR ALONG THE RIVER BANKS. BR
MANY OF THE WOODEN PILES HAVE BEEN ENCASED
BEHIND THE WINGWALLS. THE 84" CMPs ARE IN FAIR
STREAM BOUNDARIES ARE DIFFICULT TO DISCERN. THI
CONSTRUCTED OF OR REINFORCED WITH SANDBAGS.
AT THE DATE OF THE FIELD VISIT.

NOTE: PRIOR TO COMMENCING ANY WORK ON ANY TRENCHLESS INSTALLATION ON THIS PROJECT, PROVIDE A DESIGN FOR THE TRENCHLESS INSTALLATION CERTIFIED BY AN ENGINEER LICENSED BY THE STATE OF NORTH CAROLINA, AS REQUIRED BY SUBARTICLE 1550-3(B) OF THE STANDARD SPECIFICATIONS.

FOR -WL- PROFILE, SEE SHEET 8

PROJECT REFERENCE NO.	SHEET NO.
B-4484	UC-5
DESIGNED BY: ARV	
DRAWN BY: ARV	
CHECKED BY: RLB	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18442 RICHARD LEON BOLLINGER JR. 9/4/2019

UTILITY CONSTRUCTION

8/17/99

REVISIONS

TRENCHLESS
12" HDPE PIPE

OPEN TRENCH
10" DI PIPE

STATE OF NORTH CAROLINA
DB 2391 PG 212
PC E SLIDE 382

PROPERTY LINE RUNS ALONG HIGH WATER LINE OF NEUSE RIVER

N 23°34'31" E 624.60'

N 23°34'31" E 8.60'

EIP

3
WILLIAM E. DANIELS
DB 3207 PG 1
PC H SLIDE 154-H

NEUSE RIVER

ABANDON EXISTING 10" WATER LINE

PUE

12" WL

10" DI (NW CRAVEN WSD)

MATCH TO SHEET 4 -L1- STA. 24+00

END PROP. RET. WALL #2
-L1- STA. 28+10.00

TRANSITION FITTING
TIE 12" PROP HDPE TO 10" DIP WATER LINE
ADD THRUST COLLAR

PROP 12" HDPE

45° 10" DIP BEND
ADD THRUST BLOCKING

-L1- PC Sta. 31+85.32

EST 1 TON CL B RIP RAP
EST 5 SY GEOTEXTILE

PROP 10" DIP

BEGIN PROP. RET. WALL #2
-L1- STA. 33+35.00

15" RCP-III

EXISTING R/W

-L1-

-L-

-EL-

-BL- 3

TB2GI

10" PLAS. (NW CRAVEN WSD)

SR 1470 MAPLE CYPRESS RD 22' R/W

REMOVE EXISTING BRIDGE

HIGH PT. STA. 25+35.22 -L1-
3.43% 3.49%

RELOCATE TO PROPOSED BRIDGE BY OTHERS

-L1- PT Sta. 27+30.84

EXCAVATION LIMITS

PROPOSED DOWNSTREAM EXCAVATION TO ELEV. 11'
PROPOSED GRADING
(SEE EC PLANS)

15" CAAP w/ELBOWS

EST 1 TON CL B RIP RAP
EST 5 SY GEOTEXTILE

20" STEEL ENCASING PIPE

45° 10" DIP BEND
ADD THRUST BLOCKING

TIE TO EXISTING 10" PLAS. WATER LINE
ADD THRUST COLLAR

10" GATE VALVE (NEW)

MATCH TO SHEET 6 -L1- STA. 35+00

4
COASTAL LUMBER COMPANY
DB 700 PG 109
PC H SLIDE 154-H

HEATH FAMILY FARMS, LLC
DB 1800 PG 832
DB 1016 PG 952

NOTE: PRIOR TO COMMENCING ANY WORK ON ANY TRENCHLESS INSTALLATION ON THIS PROJECT, PROVIDE A DESIGN FOR THE TRENCHLESS INSTALLATION CERTIFIED BY AN ENGINEER LICENSED BY THE STATE OF NORTH CAROLINA, AS REQUIRED BY SUBARTICLE 1550-3(B) OF THE STANDARD SPECIFICATIONS.

FOR -WL- PROFILE, SEE SHEET 8

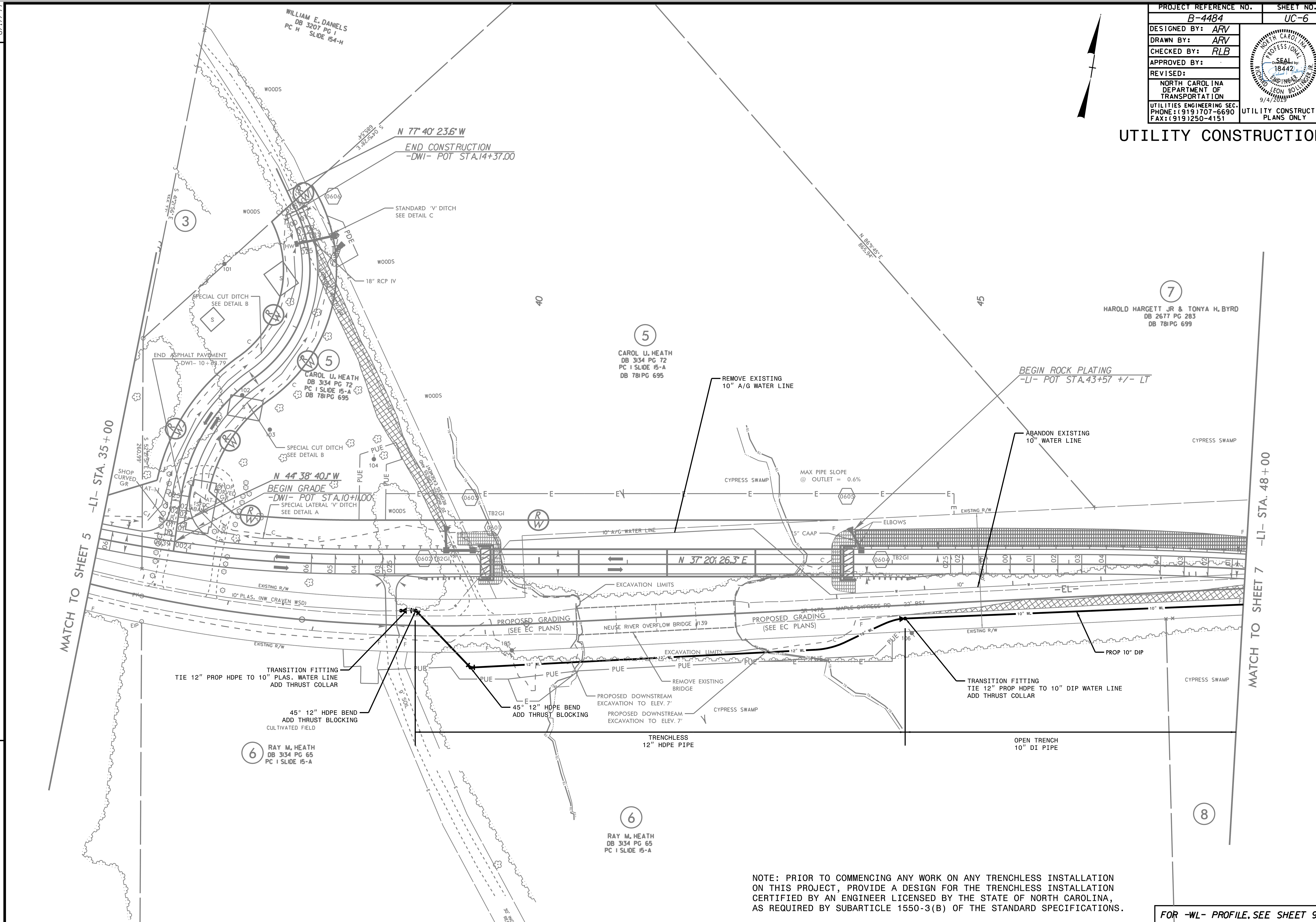
PROJECT REFERENCE NO.	SHEET NO.
B-4484	UC-6

DESIGNED BY: ARV
DRAWN BY: ARV
CHECKED BY: RLB
APPROVED BY:
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



8/17/99
REVISIONS
WILLIAM E. DANIELS
DB 3207 PG 1
PC H SLIDE 154-H
N 77° 40' 23.6" W
END CONSTRUCTION
-DWI- POT STA.14+37.00
STANDARD 'V' DITCH
SEE DETAIL C
18" RCP IV
SPECIAL CUT DITCH
SEE DETAIL B
END ASPHALT PAVEMENT
-DWI- 10+83.79
CAROL U. HEATH
DB 3134 PG 72
PC 1 SLIDE 15-A
DB 781PG 695
SPECIAL CUT DITCH
SEE DETAIL B
N 44° 38' 40.1" W
BEGIN GRADE
-DWI- POT STA.10+11.00
SPECIAL LATERAL 'V' DITCH
SEE DETAIL A
WOODS
-L1- STA. 35+00
MATCH TO SHEET 5
REMOVE EXISTING
10" A/G WATER LINE
CYPRESS SWAMP
MAX PIPE SLOPE
@ OUTLET = 0.6%
BEGIN ROCK PLATING
-L1- POT STA.43+57 +/- LT
ABANDON EXISTING
10" WATER LINE
HAROLD HARGETT JR & TONYA H. BYRD
DB 2677 PG 283
DB 781PG 699
ELBOWS
N 37° 20' 26.3" E
10" A/G WATER LINE
EXCAVATION LIMITS
10" PLAS. (NW CRAVEN WSD)
PROPOSED GRADING
(SEE EC PLANS)
NEUSE RIVER OVERFLOW BRIDGE #139
MAPLE CYPRESS RD
PROP 10" DIP
-L1- STA. 48+00
MATCH TO SHEET 7
TRANSITION FITTING
TIE 12" PROP HDPE TO 10" PLAS. WATER LINE
ADD THRUST COLLAR
45° 12" HDPE BEND
ADD THRUST BLOCKING
REMOVE EXISTING
BRIDGE
PROPOSED DOWNSTREAM
EXCAVATION TO ELEV. 7'
TRANSITION FITTING
TIE 12" PROP HDPE TO 10" DIP WATER LINE
ADD THRUST COLLAR
CULTIVATED FIELD
TRENCHLESS
12" HDPE PIPE
OPEN TRENCH
10" DI PIPE
RAY M. HEATH
DB 3134 PG 65
PC 1 SLIDE 15-A

NOTE: PRIOR TO COMMENCING ANY WORK ON ANY TRENCHLESS INSTALLATION ON THIS PROJECT, PROVIDE A DESIGN FOR THE TRENCHLESS INSTALLATION CERTIFIED BY AN ENGINEER LICENSED BY THE STATE OF NORTH CAROLINA, AS REQUIRED BY SUBARTICLE 1550-3(B) OF THE STANDARD SPECIFICATIONS.

FOR -WL- PROFILE. SEE SHEET 9

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-4484	UC-7

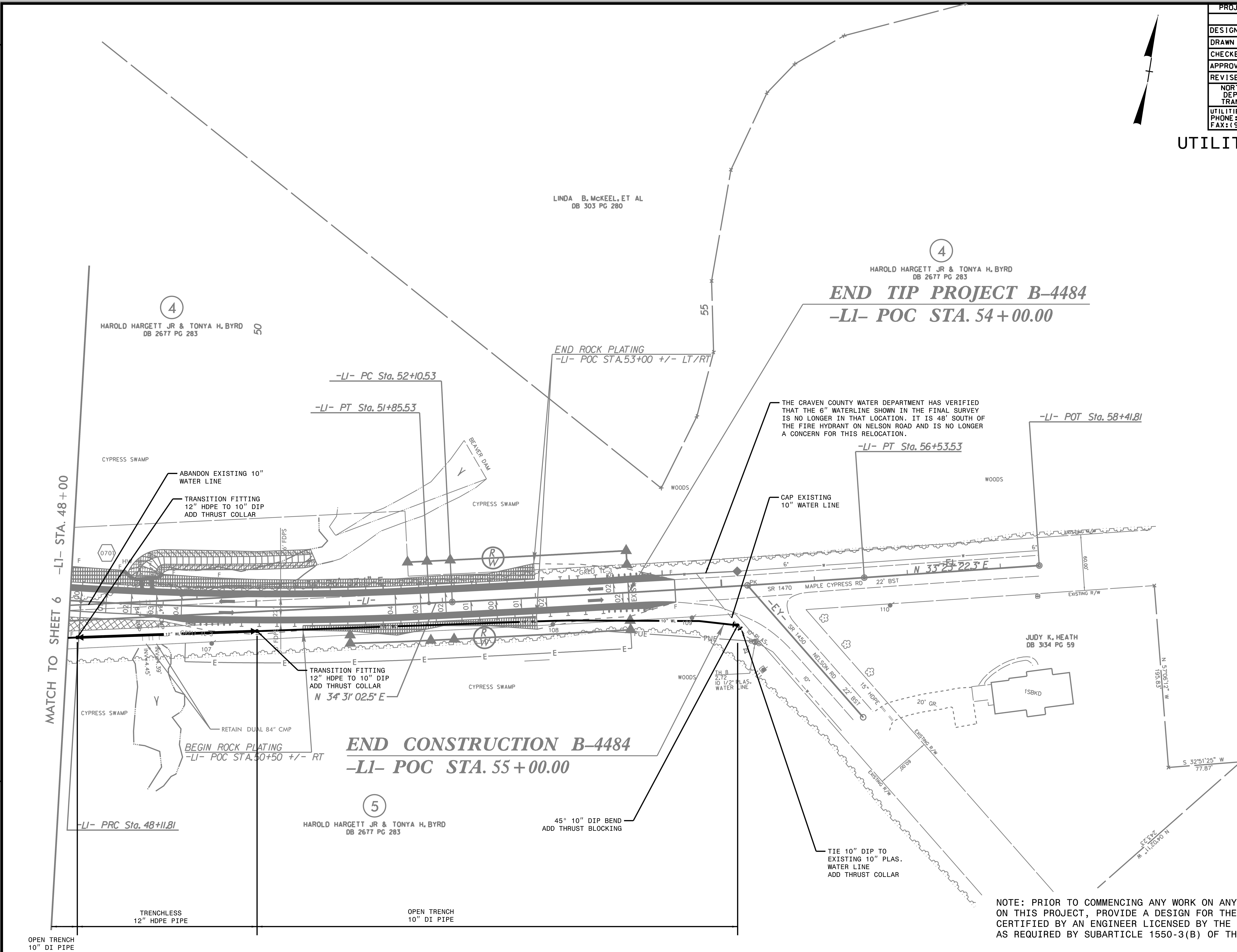
DESIGNED BY: ARV
DRAWN BY: ARV
CHECKED BY: RLB
APPROVED BY:
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18442 RICHARD LEON BOLLINGER, JR. 9/4/2019

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION


LINDA B. McKEEL, ET AL
DB 303 PG 280
HAROLD HARGETT JR & TONYA H. BYRD
DB 2677 PG 283
END TIP PROJECT B-4484
-L1- POC STA. 54+00.00
END ROCK PLATING
-L1- POC STA.53+00 +/- LT/RT
-L1- PC Sta. 52+10.53
-L1- PT Sta. 51+85.53
THE CRAVEN COUNTY WATER DEPARTMENT HAS VERIFIED THAT THE 6" WATERLINE SHOWN IN THE FINAL SURVEY IS NO LONGER IN THAT LOCATION. IT IS 48' SOUTH OF THE FIRE HYDRANT ON NELSON ROAD AND IS NO LONGER A CONCERN FOR THIS RELOCATION.
-L1- POT Sta. 58+41.81
-L1- PT Sta. 56+53.53
CYPRESS SWAMP
ABANDON EXISTING 10" WATER LINE
TRANSITION FITTING 12" HDPE TO 10" DIP ADD THRUST COLLAR
BEAVER DAM
WOODS
CAP EXISTING 10" WATER LINE
-L1- STA. 48+00
MATCH TO SHEET 6
N 33°25'22.3" E
SR 1470 MAPLE CYPRESS RD 22' BST
SR 1450 NELSON RD 22' BST
JUDY K. HEATH
DB 3134 PG 59
TRANSITION FITTING 12" HDPE TO 10" DIP ADD THRUST COLLAR
N 34°31'02.5" E
RETAIN DUAL 84" CMP
BEGIN ROCK PLATING
-L1- POC STA.50+50 +/- RT
END CONSTRUCTION B-4484
-L1- POC STA. 55+00.00
HAROLD HARGETT JR & TONYA H. BYRD
DB 2677 PG 283
-L1- PRC Sta. 48+11.81
45° 10" DIP BEND ADD THRUST BLOCKING
TIE 10" DIP TO EXISTING 10" PLAS. WATER LINE ADD THRUST COLLAR
S 32°51'25" W 77.87'
OPEN TRENCH 10" DI PIPE
TRENCHLESS 12" HDPE PIPE
OPEN TRENCH 10" DI PIPE

NOTE: PRIOR TO COMMENCING ANY WORK ON ANY TRENCHLESS INSTALLATION ON THIS PROJECT, PROVIDE A DESIGN FOR THE TRENCHLESS INSTALLATION CERTIFIED BY AN ENGINEER LICENSED BY THE STATE OF NORTH CAROLINA, AS REQUIRED BY SUBARTICLE 1550-3(B) OF THE STANDARD SPECIFICATIONS.

FOR -WL- PROFILE, SEE SHEET 9

5/28/99

-WL-

WATER LINE PROFILE

PROJECT REFERENCE NO.	SHEET NO.
B-4484	UC-8
DESIGNED BY: ARV	
DRAWN BY: BJF	
CHECKED BY: RLB	
APPROVED BY:	
REVISED:	

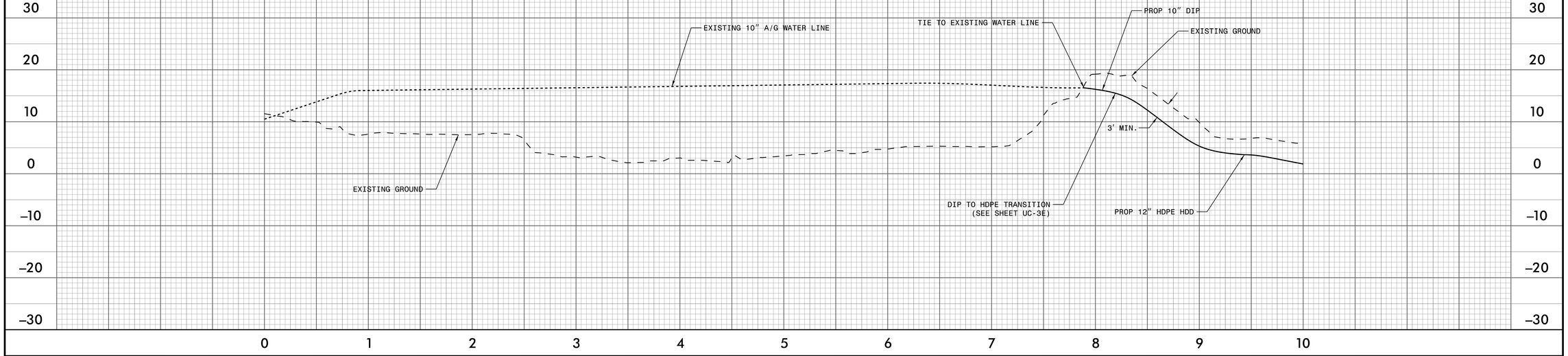
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

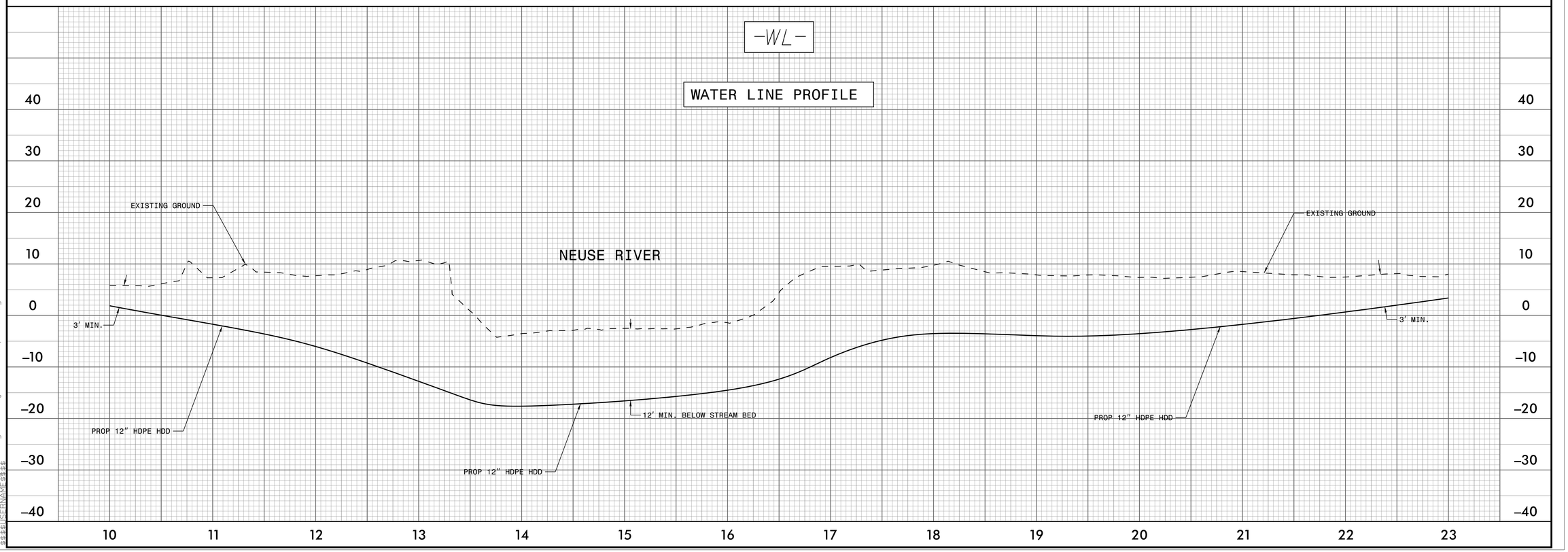
UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER RICHARD LEON BOWLING III

9/4/2019
UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION





5/28/99

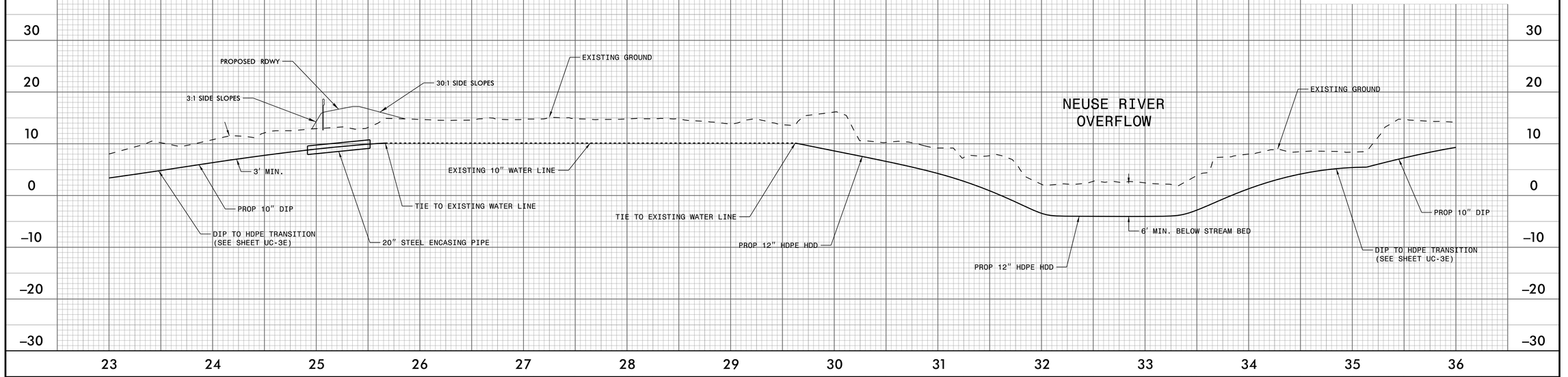
-WL-

WATER LINE PROFILE

PROJECT REFERENCE NO.	SHEET NO.
B-4484	UC-9
DESIGNED BY: ARV	
DRAWN BY: BJF	
CHECKED BY: RLB	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919)707-6690 FAX: (919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

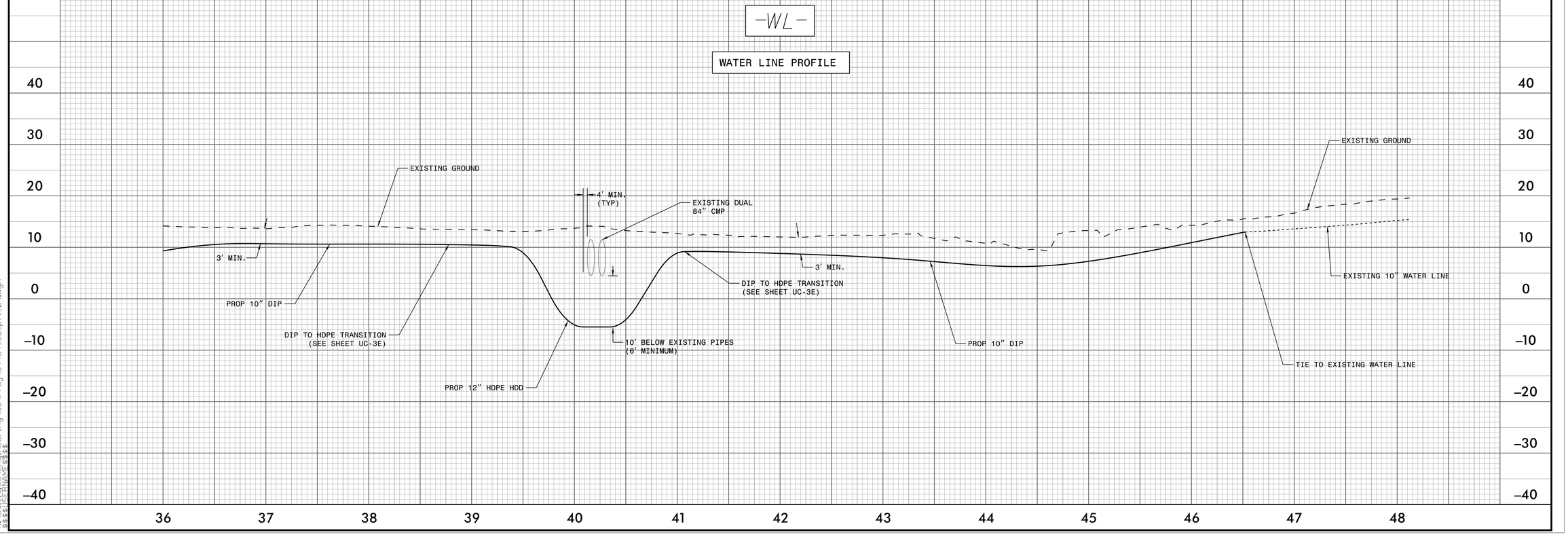
NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER LEON BOLLINGER
9/4/2019

UTILITY CONSTRUCTION



-WL-

WATER LINE PROFILE



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$$$$USERNAME$$$$