MINIMUM CRITERIA DETERMINATION CHECKLIST

The following questions provide direction in determining when the Department is required to prepare environmental documents for state-funded construction and maintenance activities. Answer questions for Parts A through C by checking either "Yes" or "No". Complete Part D of the checklist when Minimum Criteria Rule categories #8, 12(i) or #15 are used.

TIP Project No.: B-5694

State Project No.: 45648.1.1

Project Location: Replace Bridge No. 51 on NC 11 over Lyon Creek in Bladen County.

Project Description: The proposed project involves replacing Bridge No. 51 on NC 11 over Lyon Creek in Bladen County.

Bridge No. 51 will be replaced on the existing alignment. The replacement structure will have a minimum clear roadway width of 33 feet. The bridge will include two twelve-foot lanes and 4.5-foot shoulders on each side. The bridge length is based on preliminary design information and is set by hydraulic requirements. The roadway grade of the new structure will be approximately the same as the existing structure.

The approach roadway will extend approximately 1205 feet from both ends of the proposed bridge. The approach roadway will consist of two 12-foot lanes with 2-foot shoulders. The existing right-of-way is 60 feet. It is anticipated that Permanent Drainage Easement (PDE) and Temporary Construction Easement (TCE) is needed to build the project.

Due to high traffic volumes caused by different transportation users including truck-trailers for this major collector, traffic will be detoured on-site during the construction period (see Vicinity Map). There are several agricultural accesses in the immediate project area. Local access to active farming in the immediate vicinity of the bridge replacement can be maintained during construction.

The latest estimated costs are as follows:

Right of Way Acquisition -	$4,988
Utilities -	$300,000
Construction -	$5,100,000
Total -	**$5,404,988**

Anticipated Permit or Consultation Requirements: A Nationwide Permit (NWP) 3 or General Permit 31 will likely be applicable. A NWP No. 33 may also apply for temporary construction activities such as stream dewatering, work bridges, or temporary causeways that are often used during bridge construction or rehabilitation. The USACE holds the final discretion as to what permit will be required to authorize project construction. If a

Section 404 permit is required, then a Section 401 Water Quality Certification (WQC) from the NCDWR will be needed.

Special Project Information:

Environmental Commitments: The list of project commitments (green-sheet) is located at the end of the checklist.

Estimated Traffic:

Current Year (2019):	3,100 vpd
Year 2040:	4,000 vpd
TTST:	11%
Dual:	2%
Design Speed:	60 MPH

Crash Rates:

Summary of Crashes in Vicinity of Bridges (2012-2016)

Total Crashes	Type(s) of Crashes
1	Injury Crashes
5	Property Damage Only Crashes

Cultural Resources: This project was reviewed and cleared by NCDOT's cultural resources staff under a programmatic agreement with the State Historic Preservation Office. No survey is required for historic architecture and landscapes. An intensive survey was recommended for archaeology based on early estimates of the study area. The study area has been reduced from initial estimates and this recommendation is being revised. A no survey recommendation is anticipated.

Bicycle and Pedestrian Accommodations: There is no presence of bicycle, pedestrian, greenway, or transit facilities, therefore, no bicycle or pedestrian accommodations are proposed for the project.

Bridge Demolition: The existing bridge is constructed of concrete. The replacement and demolition of this type of structure is likely to result in debris in the water based on standard demolition practices. NCDOT will ensure that the demolition process complies with environmental permit requirements.

Design Exceptions: There are no anticipated design exceptions for this project.

Alternatives Considered:

No Build – The no-build alternative would result in eventually closing the road, which is anticipated to cause considerable disruption to transportation users due to high traffic volumes served by NC 11.

Rehabilitation – The superstructure of the bridge is prestressed concrete channel with steel piles. The bridge was built in 1952. The concrete and steel joists within the bridge are reaching the end of their useful life. Rehabilitation would require replacing the joists which would constitute effectively replacing the bridge.

Off-site Detour: Two off-site detours were evaluated and proposed. As both detours are over 50 miles in length, neither detour is recommended.

- Eastern Detour: From NC 11 follow NC 210 South toward Currie, continue on NC 210 to US 421. Turn right onto US 421 and follow to I-140/NC 140 (if opened), follow I-140/NC 140 to US 74 West, follow US 74 West to NC 87 North, follow NC 87 North to NC 11. This detour is 51.7 miles or shorter if the I-140/NC 140 section is opened between US 421 and US 74. The above distance used the existing section of US 421/17 down to US 74.
- Western Detour: From NC 11/53 follow NC 53 West to US 701 near Elizabethtown / White Lake, follow US 701 south to NC 87 Bypass to NC 87 South, follow NC 87 South to NC 11. This detour is 57.7 miles long.

On-site Detour – An on-site detour is preferred due to the length of available off-site detours. The detour would be constructed upstream of the existing bridge location. The proposed detour roadway would consist of two eleven-foot lanes with two-foot shoulders.

Staged Construction – Staged construction was evaluated and considered due to unavailability of a reasonable off-site detour.

New Alignment – Given that the alignment for NC 11 is acceptable, a new alignment was not considered as an alternative.

PART A: MINIMUM CRITERIA

Item 1 to be completed by the Engineer.	YES	NO
1. Is the proposed project listed as a type and class of activity allowed under the Minimum Criteria Rule in which environmental documentation is not required?	☒	☐

If the answer to number 1 is "no", then the project does not qualify as a minimum criteria project. A state environmental assessment is required.

If yes, under which category? **9**

If either category #8, #12(i) or #15 is used complete Part D of this checklist.

PART B: MINIMUM CRITERIA EXCEPTIONS

Items 2 – 4 to be completed by the Engineer.	YES	NO
2. Could the proposed activity cause significant changes in land use concentrations that would be expected to create adverse air quality impacts?	☐	☒
3. Will the proposed activity have secondary impacts or cumulative impacts that may result in a significant adverse impact to human health or the environment?	☐	☒
4. Is the proposed activity of such an unusual nature or does the proposed activity have such widespread implications, that an uncommon concern for its environmental effects has been expressed to the Department?	☐	☒
Item 5-8 to be completed by Division Environmental Officer.		
5. Does the proposed activity have a significant adverse effect on wetlands; surface waters such as rivers, streams, and estuaries; parklands; prime or unique agricultural lands; or areas of recognized scenic, recreational, archaeological, or historical value?	☐	☒
6. Will the proposed activity endanger the existence of a species on the Department of Interior's threatened and endangered species list?	☐	☒
7. Could the proposed activity cause significant changes in land use concentrations that would be expected to create adverse water quality or ground water impacts?	☐	☒

	YES	NO
8. Is the proposed activity expected to have a significant adverse effect on longterm recreational benefits or shellfish, finfish, wildlife, or their natural habitats	☐	☒

If any questions 2 through 8 are answered "yes", the proposed project may not qualify as a Minimum Criteria project. A state environmental assessment (EA) may be required. For assistance, contact:

Manager, Environmental Analysis Unit
1598 Mail Service Center
Raleigh, NC 27699-1598
(919) 707 – 6000
Fax: (919) 212-5785

PART C: COMPLIANCE WITH STATE AND FEDERAL REGULATIONS

Items 9- 12 to be completed by Division Environmental Officer.	YES	NO
9. Is a federally protected threatened or endangered species, or its habitat, likely to be impacted by the proposed action?	☒	☐
10. Does the action require the placement of temporary or permanent fill in waters of the United States?	☐	☒
11. Does the project require the placement of a significant amount of fill in high quality or relatively rare wetland ecosystems, such as mountain bogs or pine savannahs?	☐	☒
12. Is the proposed action located in an Area of Environmental Concern, as defined in the coastal Area Management Act?	☐	☒
Items 13 – 15 to be completed by the Engineer.		
13. Does the project require stream relocation or channel changes?	☐	☒
Cultural Resources		
14. Will the project have an "effect" on a property or site listed on the National Register of Historic Places?	☐	☒
15. Will the proposed action require acquisition of additional right of way from publicly owned parkland or recreational areas?	☐	☒

Questions in Part "C" are designed to assist the Engineer and the Division Environmental Officer in determining whether a permit or consultation with a state or federal resource agency may be required. If any questions in Part "C" are answered "yes", follow the appropriate permitting procedures prior to beginning project construction.

Question 9: As of July 21, 2016, the U.S. Fish and Wildlife Service (USFWS) list seven federally protected species for Bladen County. A brief description of each species' habitat requirements follows, along with the Biological Conclusion rendered based on

survey results in the study area. Habitat requirements for the species are based on the current best available information from referenced literature and/or USFWS.

Scientific Name	Common Name	Federal Status	Potential Habitat Present	Biological Conclusion
Alligator mississippiensis	American alligator	T (S/A)	Yes	Not Required
Picoides borealis	Red-cockaded woodpecker	E	No	No Effect
Mycteria americana	Wood stork	T	Yes	MA-NLAA
Myotis septentrionalis	Northern long-eared bat	T	Yes	MA-NLAA
Schwalbea americana	American chaffseed*	E	No	No Effect
Lindrea melissifolia	Pondberry*	E	No	No Effect
Lysimachia asperulaefolia	Rough-leaved loosestrife	E	No	No Effect

T (S/A) - Threatened due to the similarity in appearance, E-Endangered, T-Threatened
MA-NLAA - May Affect-Not Likely to Adversely Affect
* Historic record (this species last observed in the county over 50 years ago)

PART D:(To be completed when either category #8, 12(i) or #15 of the rules are used.)

Items 16- 22 to be completed by Division Environmental Officer.

16. Project length: _____

17. Right of Way width: _____

18. Project completion date: _____

19. Total acres of newly disturbed ground surface: _____

20. Total acres of wetland impacts: _____

21. Total linear feet of stream impacts: _____

22. Project purpose: _____

If Part D of the checklist is completed, send a copy of the entire checklist document to:

David B. Harris, PE
State Roadside Environmental Engineer
Mail Service Center 1557
Raleigh, NC 27699-1557
(919) 707-2920
Fax (919) 715-2554
Email: davidharris@ncdot.gov

Prepared by: DocuSigned by: Dewayne Sykes 7AB1E75A70BE4E5... Date: 6/5/2019

Dewayne L. Sykes, PE, Project Manager
KCI Associates of North Carolina, PA

Prepared For: North Carolina Department of Transportation Structures Management Unit

Reviewed By: DocuSigned by: Kevin Fischer ED19A18D98EC496... Date: 6/11/2019

Kevin Fischer, PE Assistant State Structures Engineer – PEF Coordination, Program Management & Field Ops

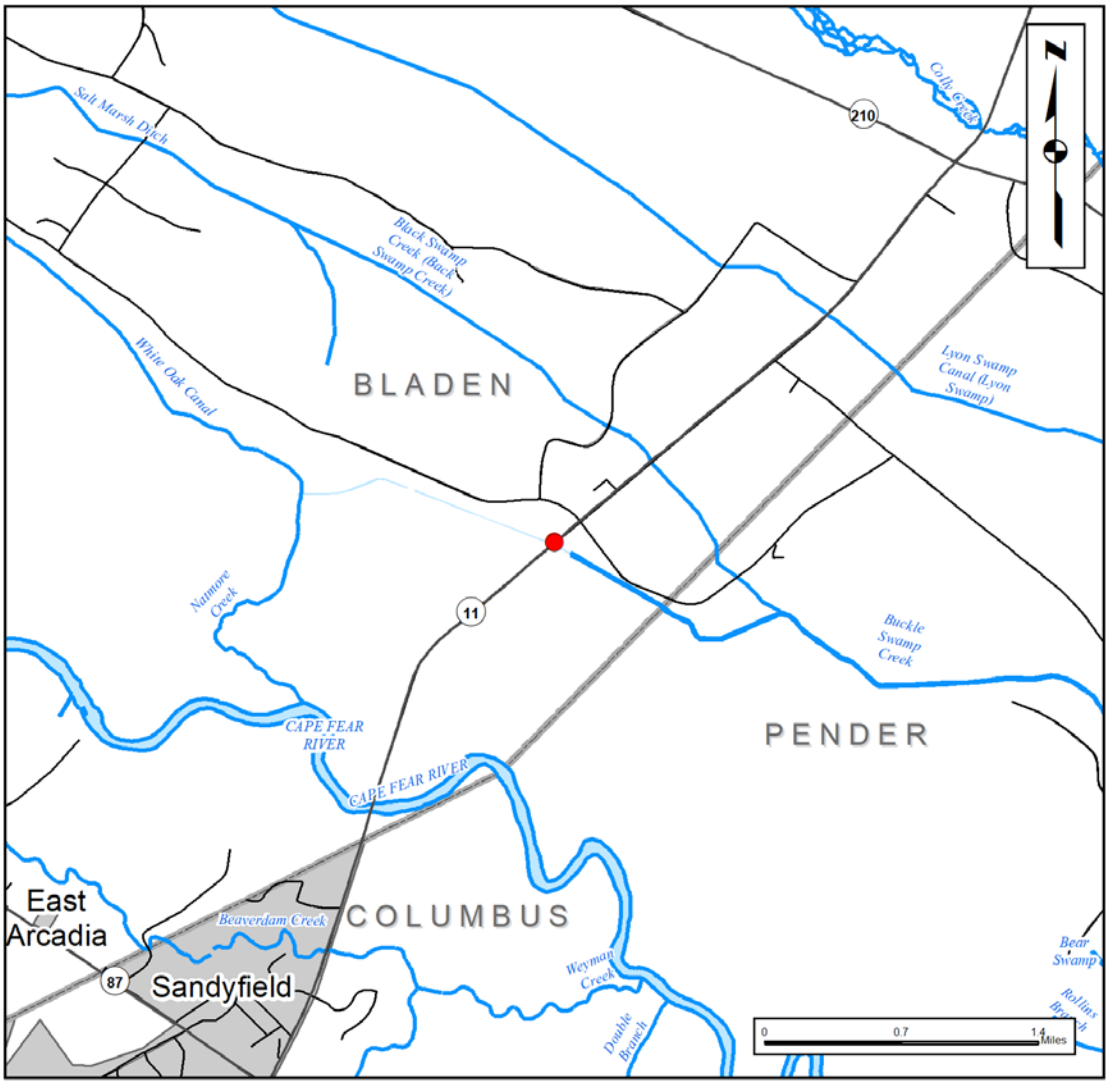
PROJECT COMMITMENTS

Bladen County
Bridge N. 51 on NC 11 over Lyon Creek
W.B.S. No. 45648.1.1
TIP Project No. NA

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

Contracts Unit
According to the Bladen County Emergency Services director, the County EMS usually has one ambulance covering the east Arcadia and Kelly area 24 hours. If construction will occur during summer months, traffic will increase due to traveling from the beaches and Jacksonville area. The County EMS director also mentioned that any detour could delay response times for emergency services and cause moderate impacts on EMS services. Due to the possible disruption of access and EMS response delays, it is recommended that NCDOT coordinate with the County EMS to minimize temporary disruptions in access and EMS response delays in the project study area.

Vicinity Map

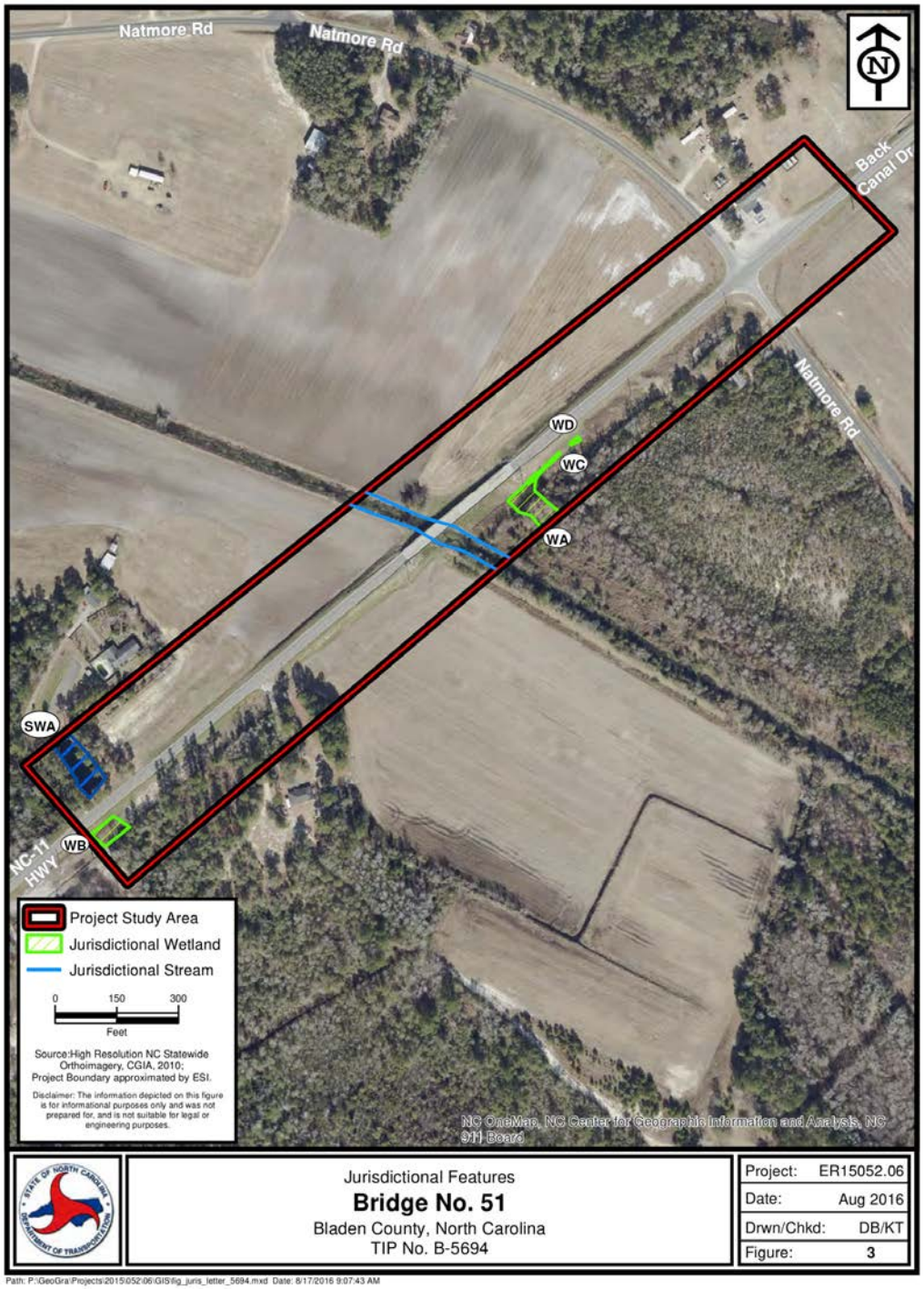


NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT & ENVIRONMENTAL ANALYSIS UNIT

BLADEN COUNTY
REPLACE BRIDGE NO. 51
ON NC 11 OVER A CANAL

VICINITY MAP

Jurisdictional Features Map



Project Tracking No.:

16-01-0034

NO ARCHAEOLOGICAL SURVEY REQUIRED FORM

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

PROJECT INFORMATION

Project No:	**B-5694**	*County:*	**Bladen**
WBS No:	**45648.1.1**	*Document:*	**M C C**
F.A. No:		*Funding:*	☒ State ☐ Federal

Federal Permit Required? ☒ Yes ☐ No *Permit Type:* **usace**

Project Description: NOTE THIS IS A REVISED RECOMMENDATION AND FORM BASED ON INFORMATION AVAILABLE IN DECEMBER 2018. NCDOT proposes to replace Bridge No. 0051 on NC 11 over a canal (White Oak Canal) in southeastern Bladen County near the Kelly community close to the Pender County line. This is a state funded project to Section 106 of the National Historic Preservation Act.

The original recommedation for a survey, dated 2/21/2017, was based on a very large archaeological Area of Potential Effects that was nearly half a mile long largely due to the scale and better soils at either end of the APE. Please reference that document for additional information. Preliminary plans have now become available and have been used to redefine an appropriate archaeological Area of Potential Effects based on design. The result is a fraction of the original APE. The proposed length of the project is about 1400 feet. A temporary on site detour northwest of the bridge results in an APE width of about 225 feet for necessary easements. Because some new ROW expansion and potential easements, a width of 75 feet to either side of the existing facility was considered.

SUMMARY OF CULTURAL RESOURCES REVIEW

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

The bridge to be replaced is in a rural setting. USGS mapping (Kelly and Point Caswell) and aerial photography was studied (see Figures 1 and 2). The Google streetview tool was available at this location and used. Examination using the tool showed rutted agricultural lands in the APE, a stretch of low often wet soils near the bridge. The canal is a narrow drainage constructed in the twentieth century.

According to USGS mapping and GIS resources (data layer created by NCDOT archaeologist Paul J. Mohler), no cemetery is present at the APE or immediately nearby.

Historic maps were examined with details available on the 2/17/2017 documentation. In summary, the roadway and the canal appear to be of mid twentieth century construction. The higway was renamed from NC 141 to NC 11 around 1980. The canal shifted in location and pattern still in the 1950s. No structures or industry was noted on historic maps in this presumably reclaimed swampy soils.

Soil survey data was gathered and examined for the revised project area. Rather than having some fair soils on either end of the original oversized APE, the new boundaries are confined to mainly swampy soils. Those generally poorly drained or regularly flooded soils encountered include Portsmouth mucky sandy loam (Pt), Pamlico muck (Pa), Wasda muck (Wh). A small amount of other soils is encountered as the design tapers back into the existing NC 11 facility. These soils are not commonly examined for archaeological sites due to a general avoidance of lasting activities in wet areas that would create an archaeological site.

The Office of State Archaeology was visited to review archaeological mapping and to reference any known archaeological surveys and sites. This helps establish an archaeological context for comparison. The canal

appears to have had an environmental review on record with the OSA (ER 97-7864) though does not appear to have been recommended for an archaeological survey. No archaeological sites are recorded within the APE or nearby vicinity.

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

The bridge replacement will be constructed roughly on the same location and alignment though a temporary onsite detour will be necessary. The new bridge will likely overlap the existing facility and therefore over previously disturbed soils. The majority of the APE spans low, wet soils that are considered unfavorable for long term human activities or occupation. The road and canal are of modern construction with nothing mapped at this location much earlier than the 1940s. There are no recorded archaeological sites or cemeteries within the APE.

The context doesn't indicate a high probabilty for archaeological sites within the altered and swampy APE. It is unlikely that significant, intact archaeological remains would be present and impacted by the bridge replacement project. For archaeological review, this federally permitted undertaking should be considered compliant with Section 106.

SUPPORT DOCUMENTATION

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

FINDING BY NCDOT ARCHAEOLOGIST

NO ARCHAEOLOGY SURVEY REQUIRED

12/27/2018

NCDOT ARCHAEOLOGIST Date

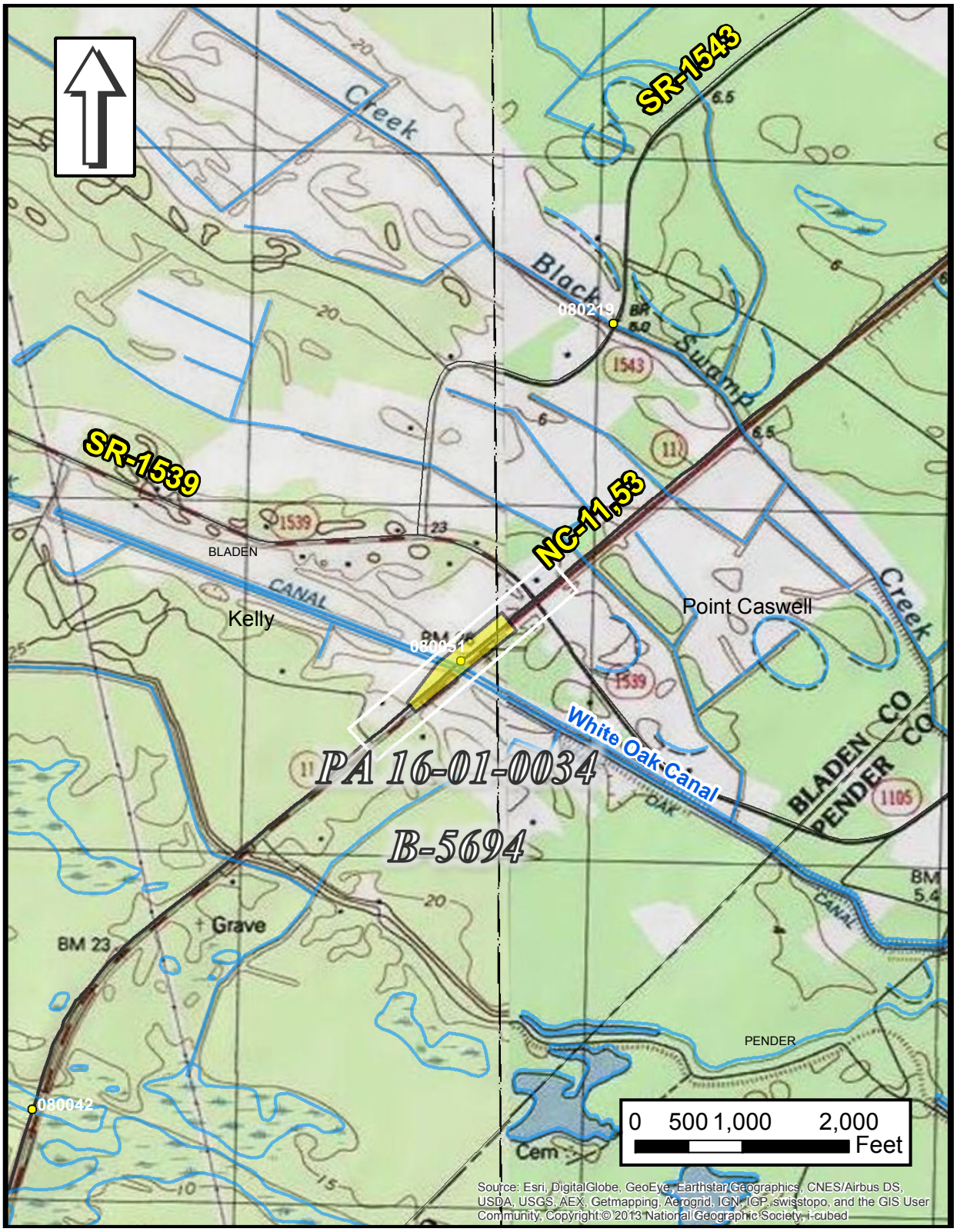


Figure 1. Vicinity of PA 16-01-0034, the replacement of Br. No. 0051on White Oak Canal in Bladen County near Kelly, shown on USGS mapping (Kelly and Point Caswell). The APE is shown in yellow.

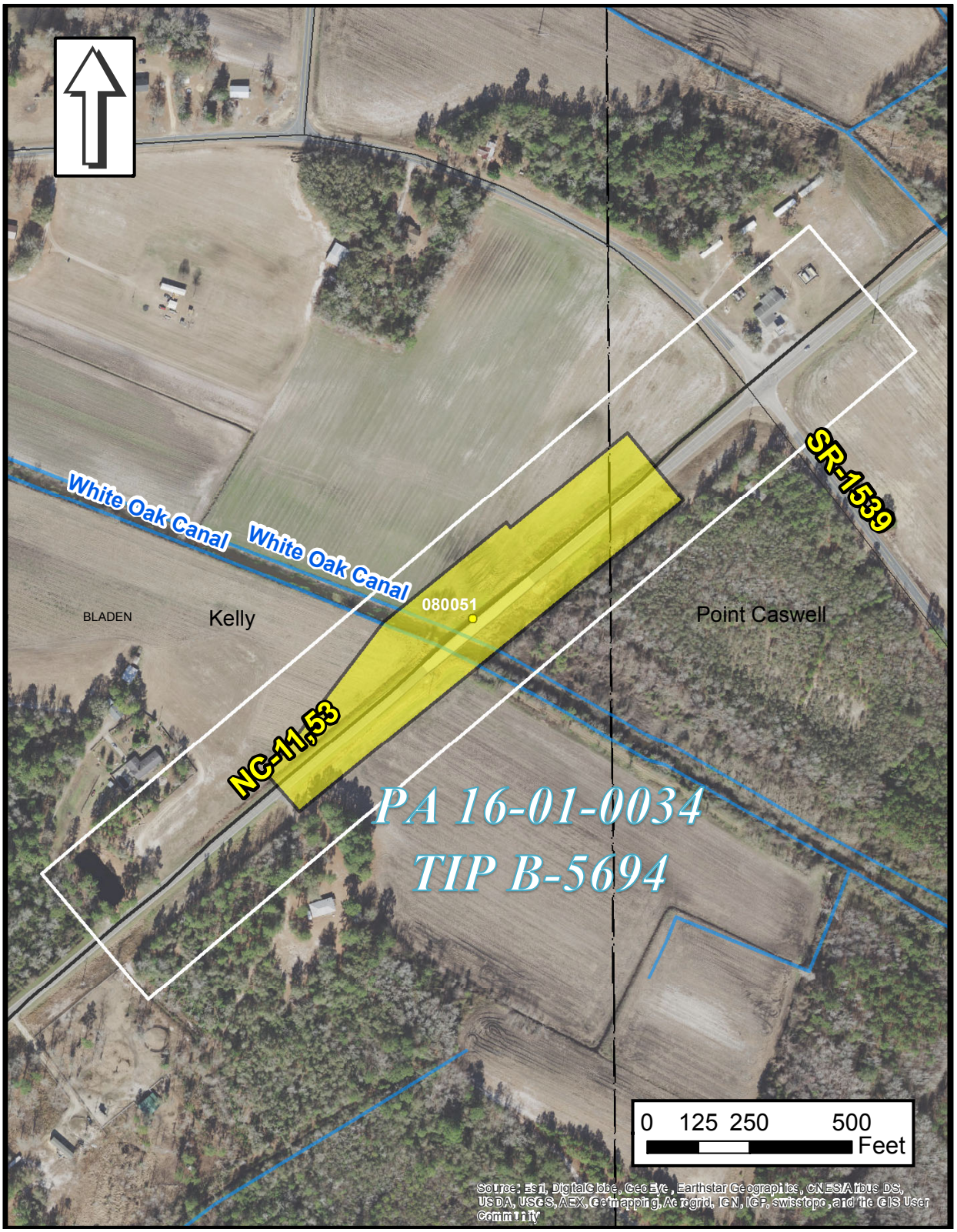


Figure 2. Aerial map of the proposed replacement of Br. No. 0051 on NC 11 over White Oak Canal (TIP B-5694, PA 16-01-0034). The approximate REVISED APE is shown in yellow with the original shown as a white boundary.

Project Tracking No. (Internal Use)

16-01-0034

HISTORIC ARCHICTECTURE AND LANDSCAPES NO SURVEY REQUIRED FORM

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

PROJECT INFORMATION

Project No:	B-5694	***County***:	Bladen
WBS No.:	45648.1.1	***Document Type***:	SMC
Fed. Aid No:	N/A	***Funding***:	☒ State ☐ Federal
Federal Permit(s):	☒ Yes ☐ No	***Permit Type(s)***:	NWP
Project Description: Replace Bridge NO. 51 on NC 11 over Canal.			

SUMMARY OF HISTORIC ARCHICTECTURE AND LANDSCAPES REVIEW

Description of review activities, results, and conclusions:

Review of HPO quad maps, HPO GIS information, historic designations roster, and indexes was undertaken on January 12, 2016. Based on this review, there are no existing NR, SL, LD, DE, or SS properties in the Area of Potential Effects, which is approximately 1200' from each end of the bridge and 190' from the centerline each way. South of the bridge are two one-story brick ranch homes. Bladen County GIS/Tax information indicates that the two houses, 1798 NC HWY 11(1980) and 5509 Natmore Road (1967) are under fifty years of age. A one-story concrete block store, located in the southeast quadrant of the intersection of NC HWY 11 and Natmore Road is also under fifty years of age (now abandoned and overgrown based on Google Maps imagery). Within the northwest quadrant of the intersection is 2213 NC HWY 11, a one-story concrete block convenience store and gas station built 1960. The store is unremarkable and not eligible for National Register listing. Bridge No. 51, built 1952, is not eligible for NR listing based on the NCDOT Historic Bridge Inventory. There are no National Register listed or eligible properties and no survey is required. If design plans change, additional review will be required.

Why the available information provides a reliable basis for reasonably predicting that there are no unidentified significant historic architectural or landscape resources in the project area:

HPO quad maps and GIS information recording NR, SL, LD, DE, and SS properties for the Bladen County survey, Bladen County GIS/Tax information, and Google Maps are considered valid for the purposes of determining the likelihood of historic resources being present. There are no National Register listed or eligible properties within the APE and no survey is required.

SUPPORT DOCUMENTATION

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

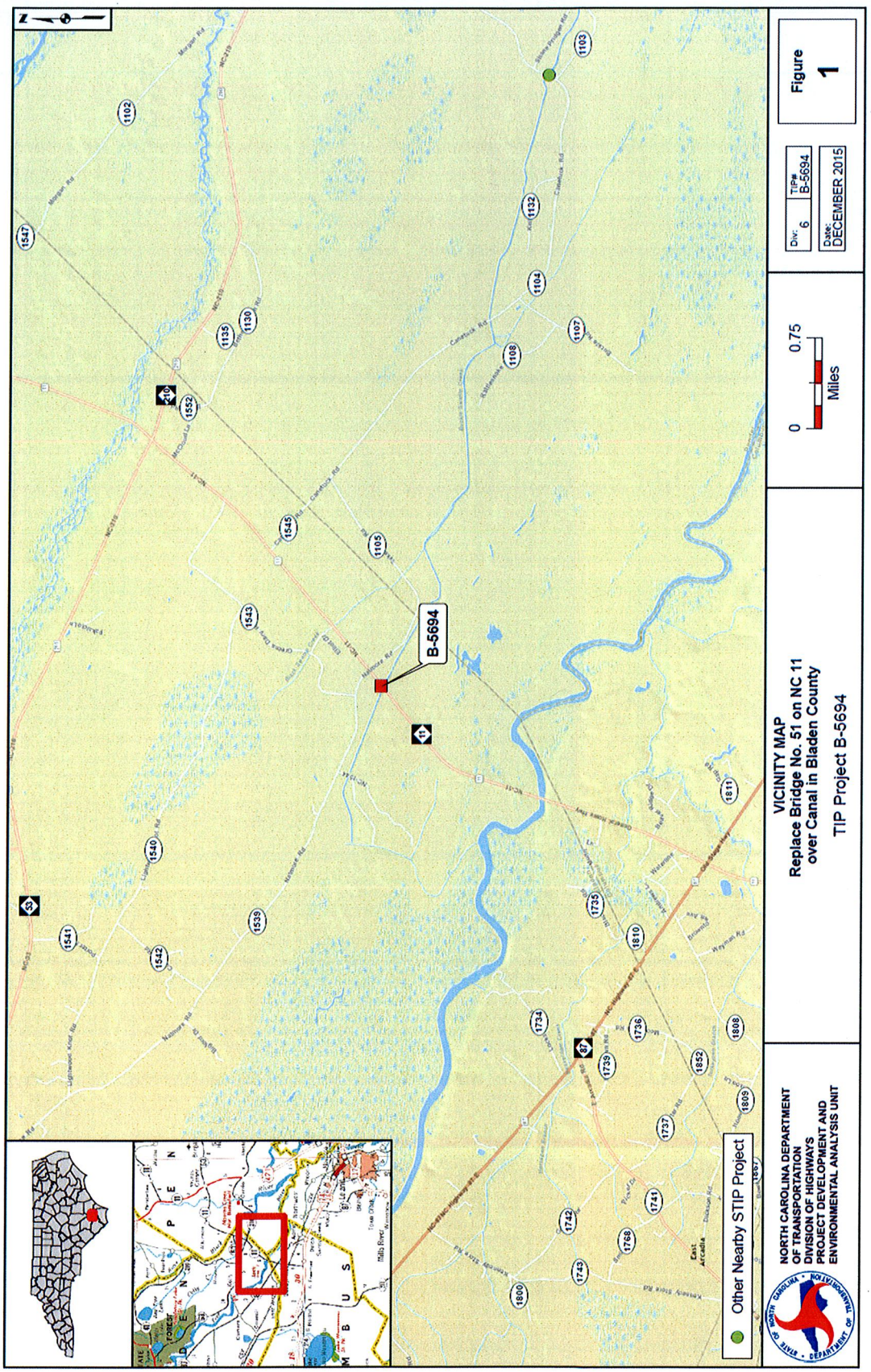
FINDING BY NCDOT ARCHITECTURAL HISTORIAN

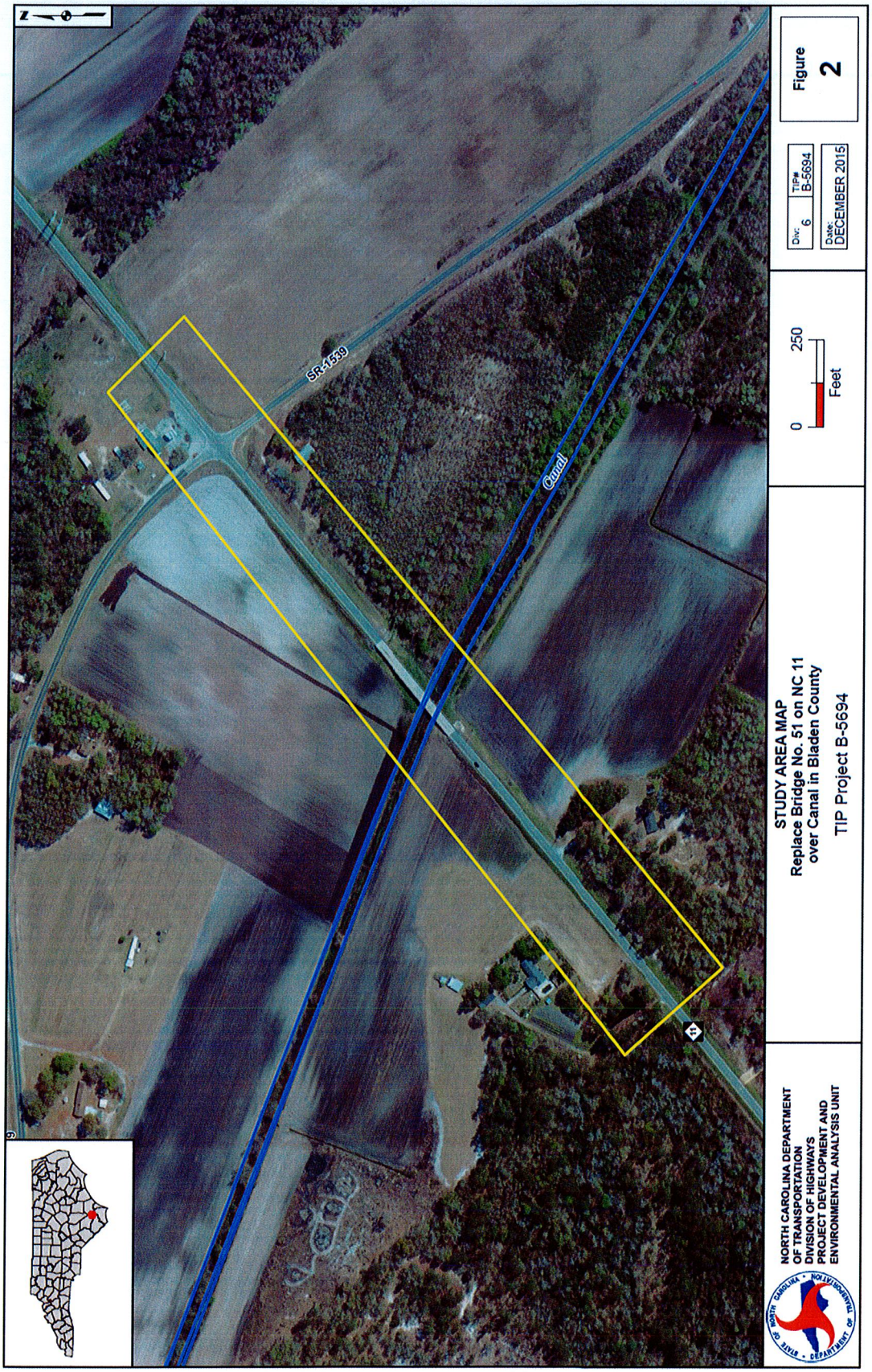
Historic Architecture and Landscapes -- NO SURVEY REQUIRED

Kate Husband 1/12/2016

NCDOT Architectural Historian Date

Historic Architecture and Landscapes NO SURVEY REQUIRED form for Minor Transportation Projects as Qualified in the 2007 Programmatic Agreement.



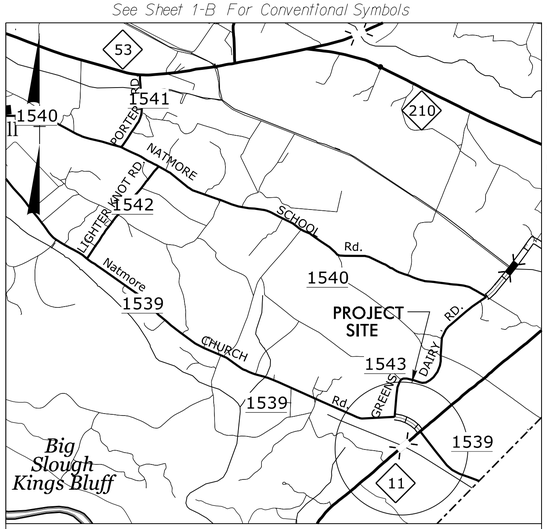


2213 NC HWY 11, Not eligible for NR listing.

09/08/99

TIP PROJECT: B-5694

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



VICINITY MAP (NTS)

75% PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BLADEN COUNTY

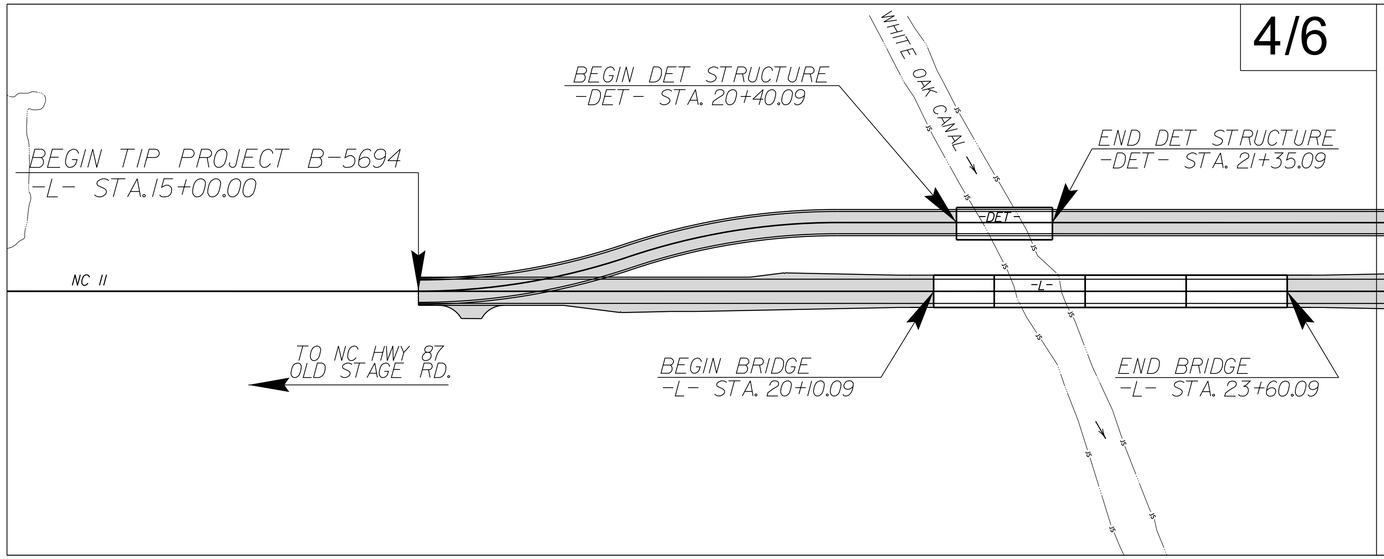
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5694	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
45648.1.1		P.E.
45648.2.1		ROW & UTIL.
45648.3.1		CONSTR.

LOCATION: REPLACE BRIDGE NO. 080051 OVER WHITE OAK CANAL ON NC 11

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

4/6



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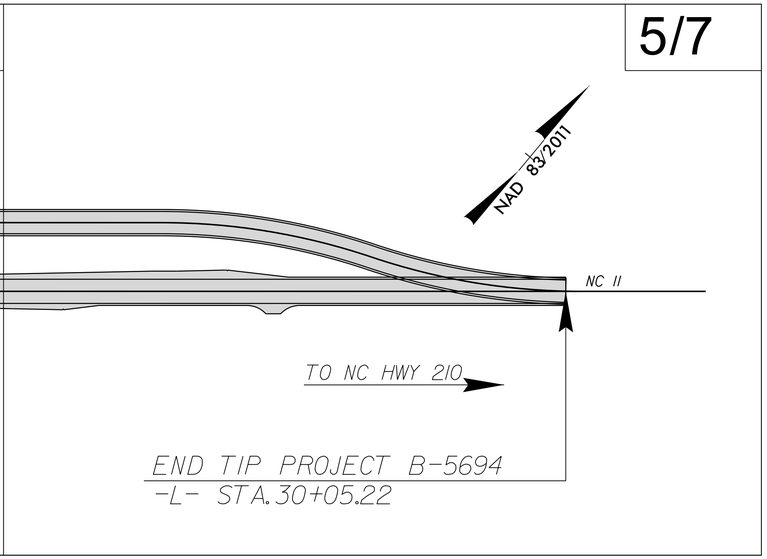
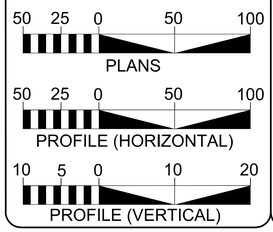


THIS PROJECT IS NOT WITHIN MUNICIPAL BOUNDARIES.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACT:

GRAPHIC SCALES



DESIGN DATA

ADT 2019	=	3213
ADT 2040	=	4000
K	=	10 %
D	=	55 %
T	=	13 % *
V	=	60 MPH
V (DET)	=	45 MPH

* TTST =11% DUAL 2%
FUNC CLASS =
MAJOR COLLECTOR
REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-5694	= .219 MILES
LENGTH OF STRUCTURE TIP PROJECT B-5694	= .066 MILES
TOTAL LENGTH OF TIP PROJECT B-5694	= .285 MILES

Prepared In the Office of:
KCI Associates of N.C., P.A.
4505 Falls of Neuse Road, Suite 400
Raleigh, NC 27609
Phone (919) 783-9214
Fax (919) 783-9266
http://www.kci.com

Plans Prepared For:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr.
Raleigh NC, 27610

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MAY 31, 2019

LETTING DATE:
DEC. 17, 2019

NCDOT CONTACT: KRISTY ALFORD, PE
STRUCTURES MANAGEMENT UNIT

DEWAYNE L. SYKES, P.E.
PROJECT ENGINEER

BRYAN E. HOUGH, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

15-MAY-2019 13:59
M:\208\25801945\2 B-5694\Roadway\Proj\B-5694_Rdy_tsh.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-5694	2A-1
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

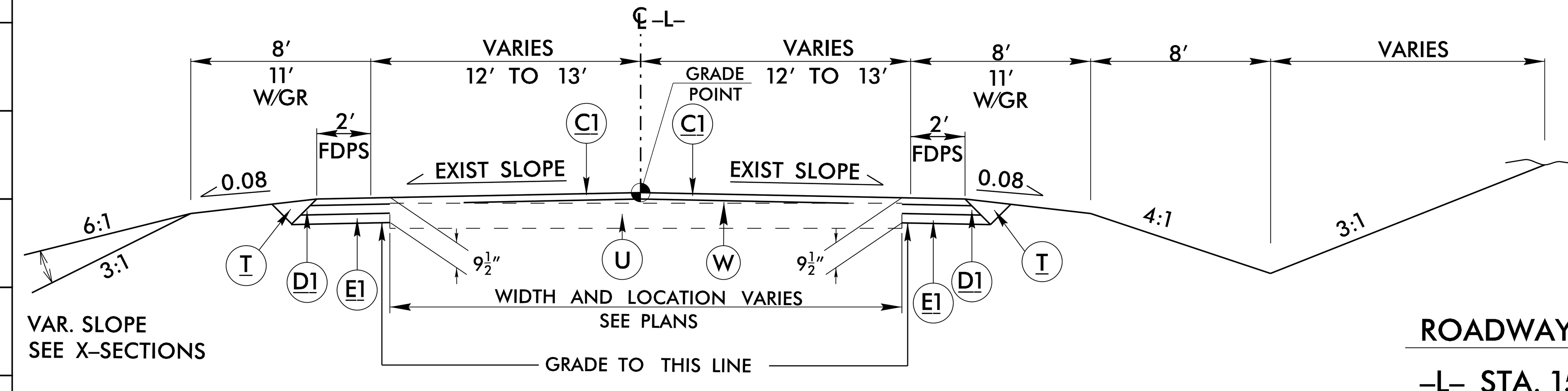
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

KCI
Engineers • Planners • Scientists • Construction Managers
4505 Falls of Neuse Road, Suite 400
Raleigh, NC 27609
Phone (919) 783-9214 • Fax (919) 783-9266
http://www.kci.com

PRELIMINARY PAVEMENT SCHEDULE

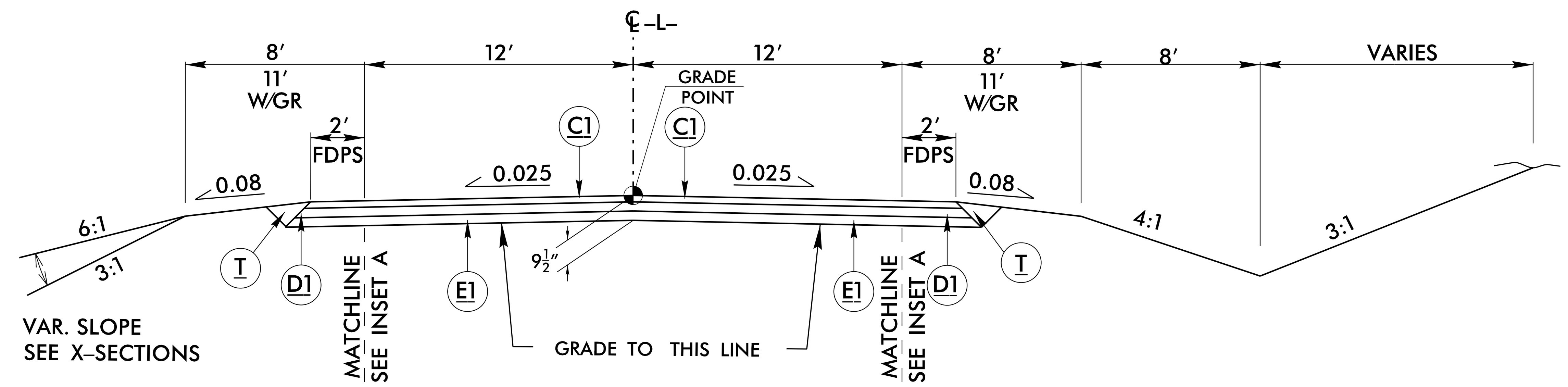
ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.
FINAL PAVEMENT INFORMATION HAS NOT BEEN RECEIVED.

C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165.0 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	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 TO EXCEED 1.5" IN DEPTH.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
J1	PROP. 6" AGGREGATE BASE COURSE.
P	PRIME COAT.
R1	SHOULDER BERM GUTTER.
T_	EARTH MATERIAL.
U_	EXISTING PAVEMENT.
W_	VARIABLE DEPTH ASPHALT PAVEMENT (SEE DETAIL SHOWING METHOD OF WEDGING).



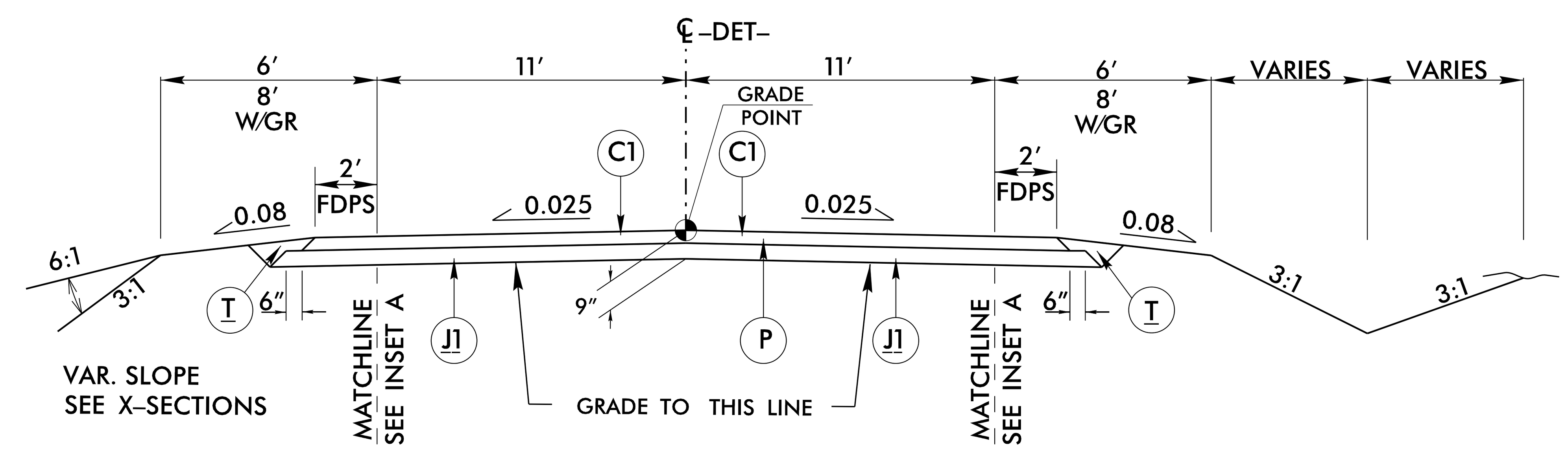
ROADWAY TYPICAL SECTION NO. 1

ROADWAY TYPICAL SECTION NO. 1
-L- STA. 15+00.00 TO STA. 16+70.00
-L- STA. 28+45.00 TO STA. 30+05.22



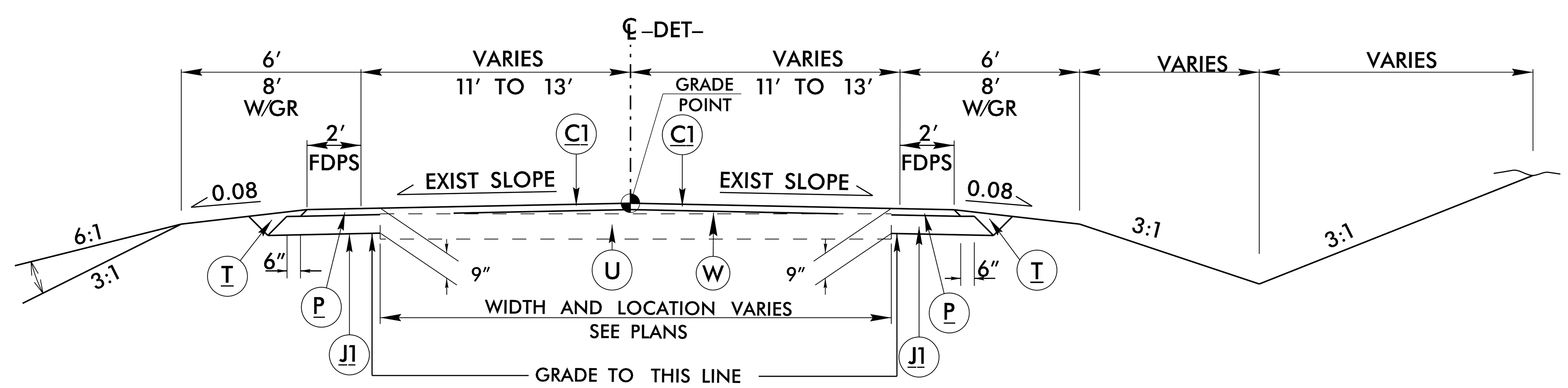
ROADWAY TYPICAL SECTION NO. 2

ROADWAY TYPICAL SECTION NO. 2
-L- STA. 16+70.00 TO STA. 20+10.09
-L- STA. 23+60.09 TO STA. 28+45.00



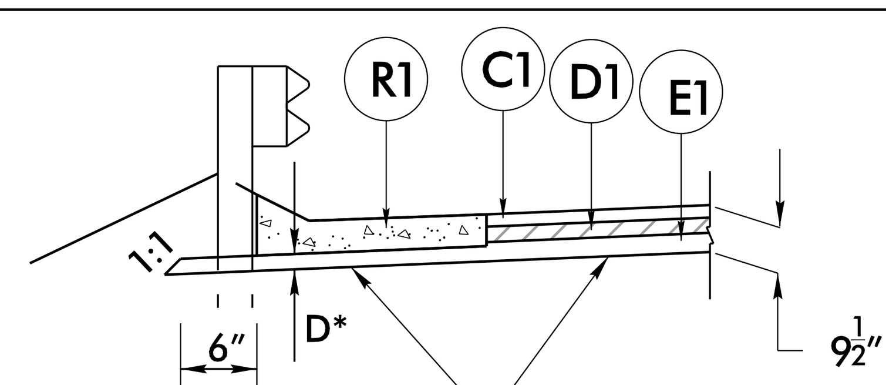
ROADWAY TYPICAL SECTION NO. 3

ROADWAY TYPICAL SECTION NO. 3
-DET- STA. 16+83.99 TO STA. 20+40.09
-DET- STA. 21+35.09 TO STA. 28+52.00



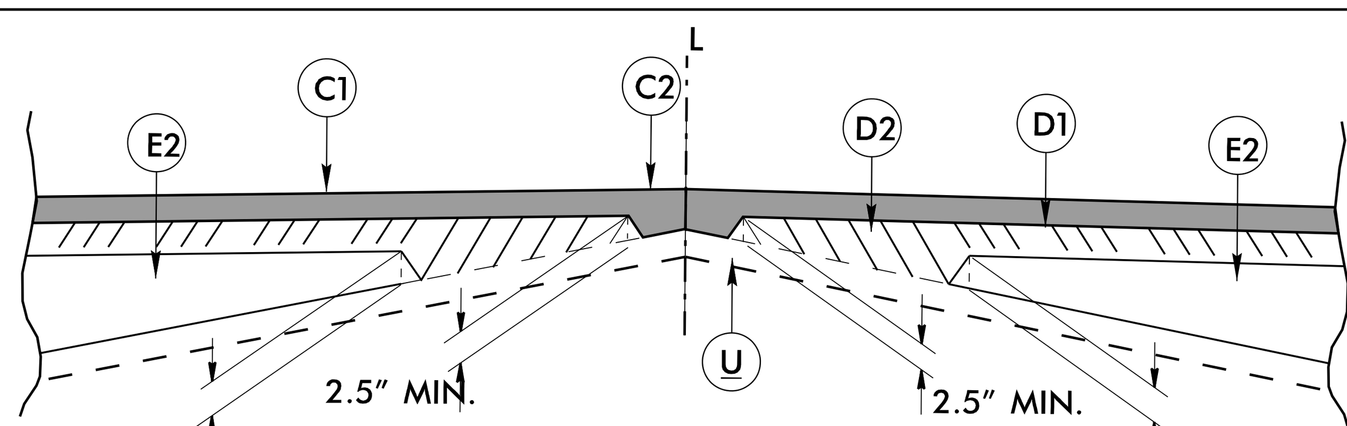
ROADWAY TYPICAL SECTION NO. 4

ROADWAY TYPICAL SECTION NO. 4
-DET- STA. 15+00.00 TO STA. 16+83.99
-DET- STA. 28+52.00 TO STA. 30+20.00



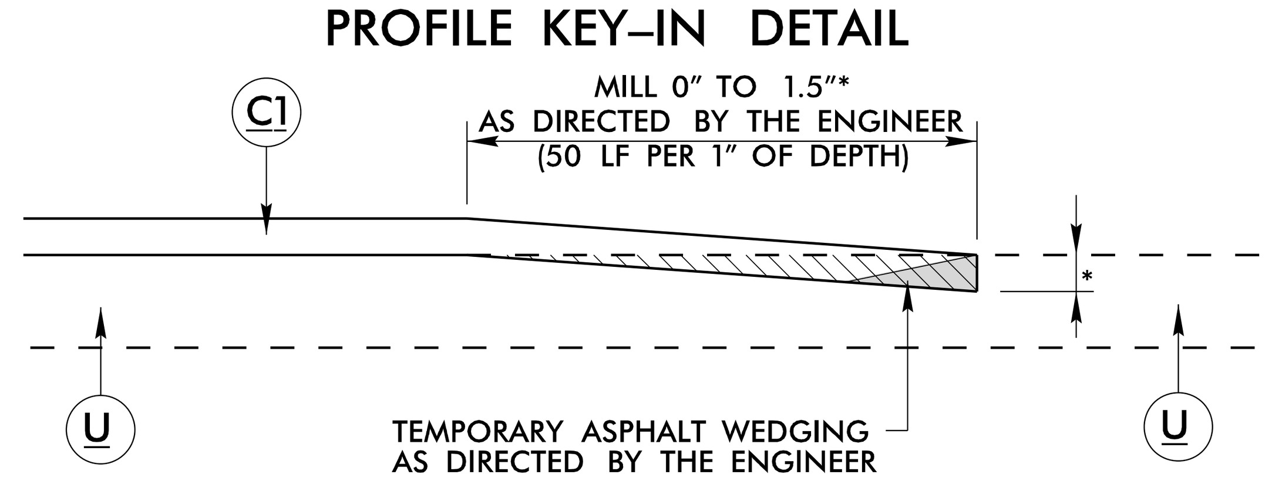
* WHEN D IS LESS THAN 3" THE CURB & GUTTER WILL BE PLACED ON THE SUBGRADE.

DETAIL SHOWING SHOULDER BERM GUTTER (SBG) ON TOP OF SUBGRADE



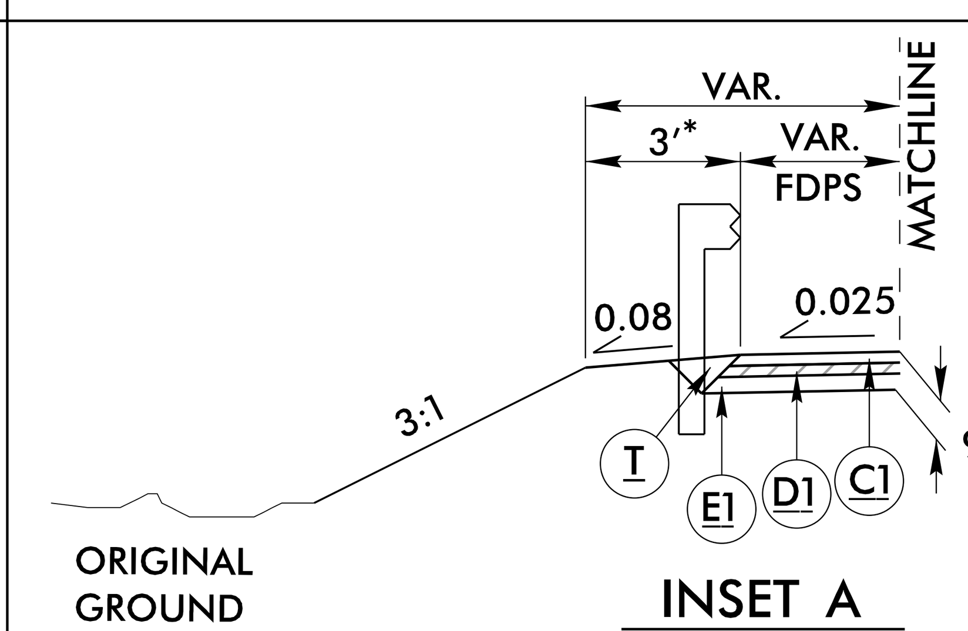
Detail Showing Method of Wedging

PROFILE KEY-IN DETAIL



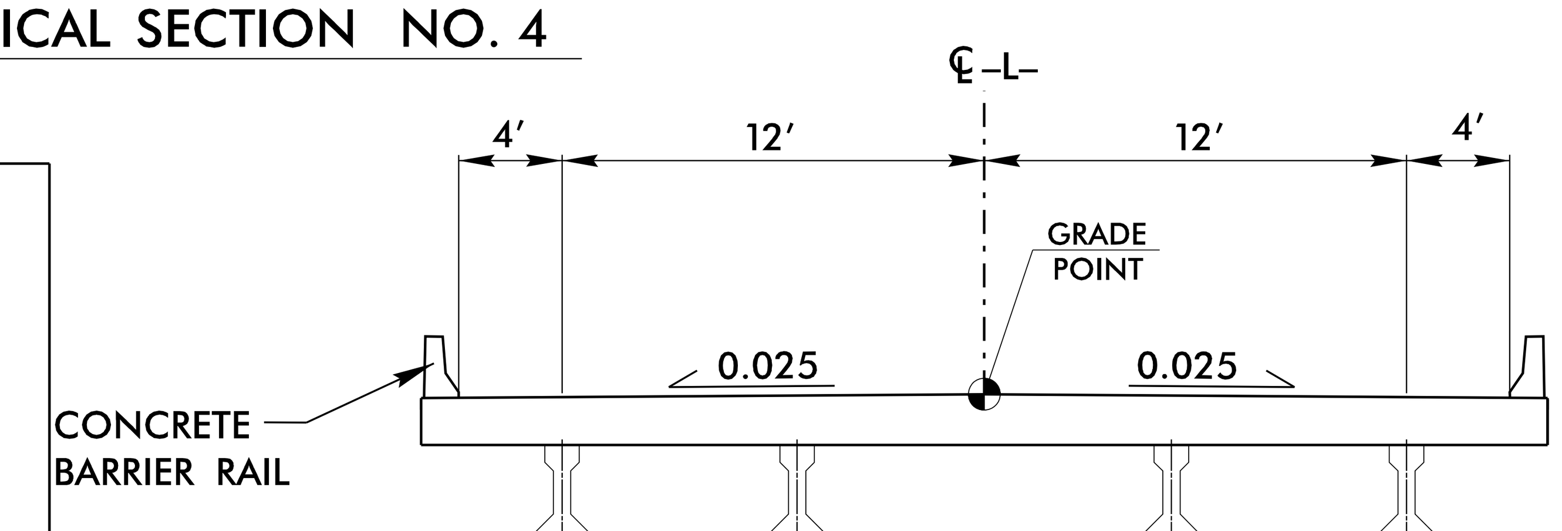
* MILL DEPTH AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER

** SEE TYPICALS FOR MIX TYPE



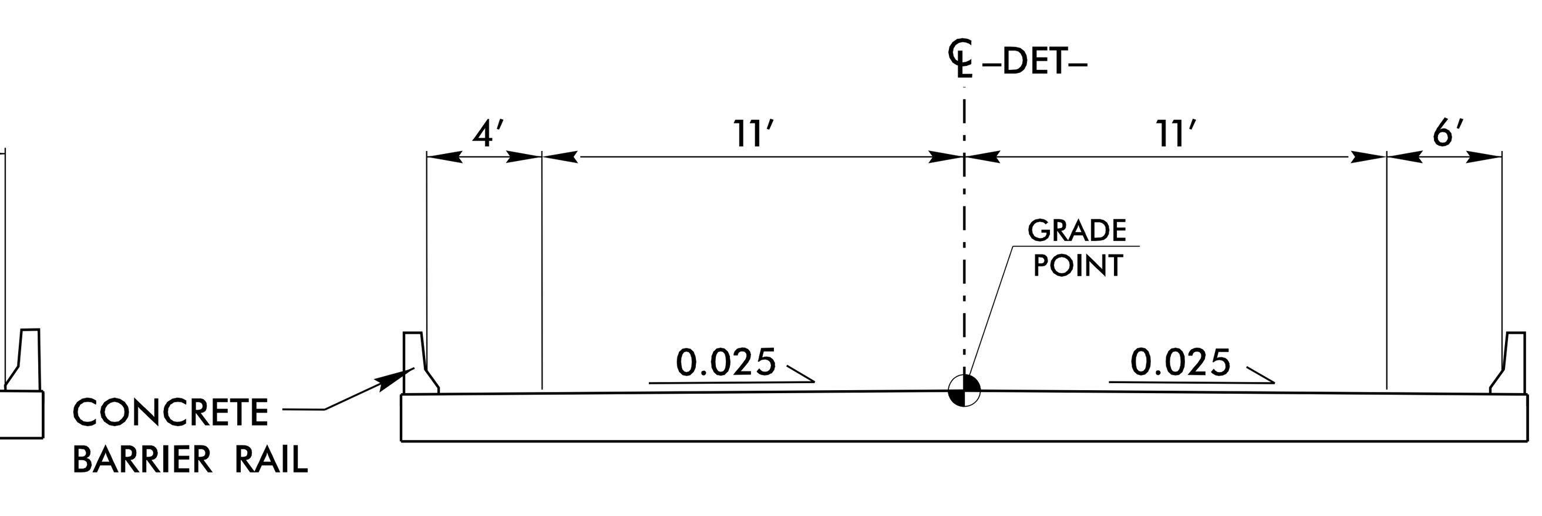
INSET A
USE IN GUARDRAIL LOCATIONS

* 2' FOR -DET-



BRIDGE TYPICAL SECTION

-L- BRIDGE TYPICAL SECTION
-L- STA. 20+10.09 TO STA. 23+60.09



BRIDGE TYPICAL SECTION

-DET- BRIDGE TYPICAL SECTION
-DET- STA. 20+40.09 TO STA. 21+35.09

PROJECT REFERENCE NO.	SHEET NO.
B-5694	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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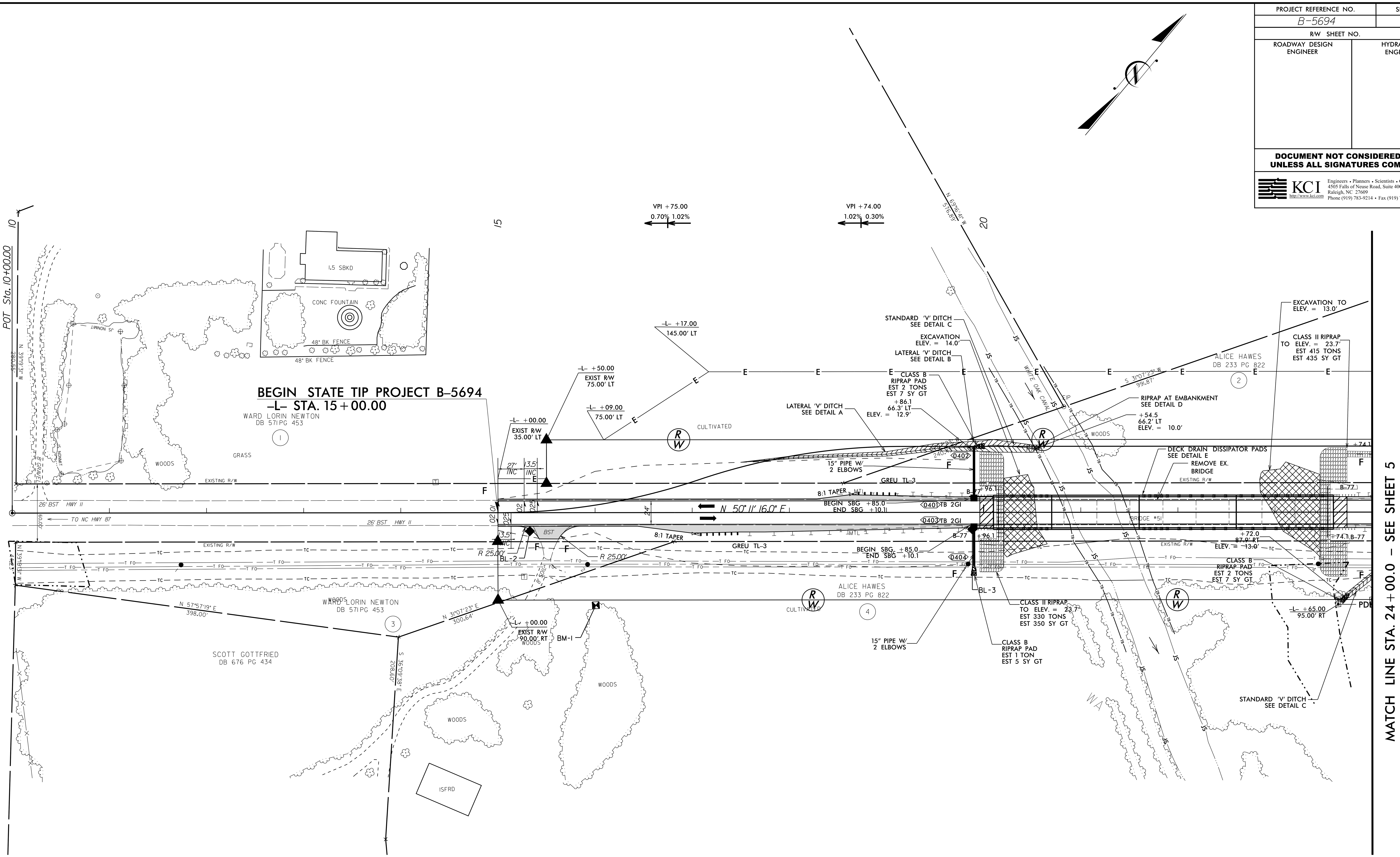
REVISIONS


BEGIN STATE TIP PROJECT B-5694
-L- STA. 15+00.00
POT Sta. 10+00.00
VPI +75.00
0.70% 1.02%
VPI +74.00
1.02% 0.30%
-L- +17.00
145.00' LT
-L- +50.00
EXIST R/W
75.00' LT
-L- +09.00
75.00' LT
-L- +00.00
EXIST R/W
35.00' LT
WARD LORIN NEWTON
DB 571 PG 453
1.5 SBKD
CONC FOUNTAIN
48" BK FENCE
CULTIVATED
WOODS
GRASS
EXISTING R/W
26' BST HWY 11
TO NC HWY 87
N 50° 11' 16.0" E
8:1 TAPER
GREU TL-3
BEGIN SBG +85.0
END SBG +10.1
TB 2GI
B-77
BL-2
BL-3
R 25.00'
BST
STANDARD 'V' DITCH
SEE DETAIL C
EXCAVATION
ELEV. = 14.0'
LATERAL 'V' DITCH
SEE DETAIL B
CLASS B
RIPRAP PAD
EST 2 TONS
EST 7 SY GT
LATERAL 'V' DITCH
SEE DETAIL A
+86.1
66.3' LT
ELEV. = 12.9'
15" PIPE W/
2 ELBOWS
WHITE OAK CANAL
RIPRAP AT EMBANKMENT
SEE DETAIL D
+54.5
66.2' LT
ELEV. = 10.0'
DECK DRAIN DISSIPATOR PADS
SEE DETAIL E
REMOVE EX.
BRIDGE
BRIDGE #51
EXCAVATION TO
ELEV. = 13.0'
CLASS II RIPRAP
TO ELEV. = 23.7'
EST 415 TONS
EST 435 SY GT
ALICE HAWES
DB 233 PG 822
S 31°07'23" W
991.87'
+72.0
87.9' RT
ELEV. = 13.0'
CLASS B
RIPRAP PAD
EST 2 TONS
EST 7 SY GT
CLASS II RIPRAP
TO ELEV. = 23.7'
EST 330 TONS
EST 350 SY GT
CLASS B
RIPRAP PAD
EST 1 TON
EST 5 SY GT
-L- +65.00
95.00' RT
STANDARD 'V' DITCH
SEE DETAIL C
N 57°57'19" E
398.00'
N 31°07'23" E
300.64'
S 36°09'38" E
208.60'
SCOTT GOTTFRIED
DB 676 PG 434
-L- +00.00
EXIST R/W
90.00' RT
BM-1
1SFRD
10
15
20

MATCH LINE STA. 24+00.0 - SEE SHEET 5

FOR -L- PROFILE SEE SHEET 8

FOR DETOUR SEE SHEETS 6/7

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-5694	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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MATCH LINE STA. 24+00.0 – SEE SHEET 4

HP +55.87
0.30% 1.53%

VPI +85.00
1.53% 0.75%

25

30

E/P

END CONSTRUCTION
–DET– STA. 30+20.00
= –L– STA. 30+05.22

–L– +47.00
145.00' LT

–L– +50.00
EXIST R/W
75.00' LT

–L– +79.00
EXIST. R/W

ALICE HAWES
DB 233 PG 822
2

TOE PROTECTION
CLASS B RIPRAP
EST 195 TONS
EST 425 SY GT
SEE DETAIL F

CULTIVATED

GREU TL-3

8:1 TAPER

N 50° 11' 16.0" E

24'

R 25.00'

R 25.00'

GREU TL-3

BL-4

FALLOW

WOODS

–L– +00.00
95.00' RT

LATERAL 'V' DITCH
SEE DETAIL A

ALICE HAWES
DB 233 PG 822
4

–L– +75.00
EXIST R/W
40.00' RT

–L– +55.00
EXIST R/W
40.00' RT
90.00' RT

2' BST NATMORE RD (SR 1539)

BST

26' BST HWY 11

TO NC HWY 210

CULTIVATED

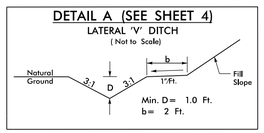
EOI

RET.

RET.

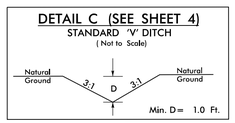
POT. Sta 30+20.00

DETAIL A (SEE SHEET 4)
LATERAL 'V' DITCH
(Not to Scale)



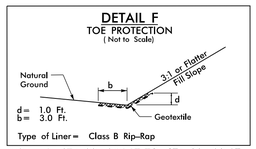
FROM –L– STA. 17+50 LT TO STA. 19+50 LT
FROM –L– STA. 24+50 RT TO STA. 26+00 RT

DETAIL C (SEE SHEET 4)
STANDARD 'V' DITCH
(Not to Scale)



FROM –L– STA. 20+10.1 LT TO STA. 20+54.5 LT
FROM –L– STA. 23+72 RT TO STA. 24+50 RT

DETAIL F
TOE PROTECTION
(Not to Scale)



FROM –L– STA. 23+84.1 LT TO STA. 29+00 LT

FOR –L– PROFILE SEE SHEET 8

FOR DETOUR SEE SHEETS 6/7

15-MAY-2019 13:59
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-5694	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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-DET-

PI Sta 16+06.52
△ = 18° 36' 49.2" (LT)
D = 8° 48' 53.0"
L = 211.17'
T = 106.52'
R = 650.00'

PI Sta 18+17.69
△ = 18° 36' 49.2" (RT)
D = 8° 48' 53.0"
L = 211.17'
T = 106.52'
R = 650.00'

PI Sta 27+18.97
△ = 18° 36' 49.2" (RT)
D = 8° 48' 53.0"
L = 211.17'
T = 106.52'
R = 650.00'

PI Sta 29+30.14
△ = 18° 36' 49.2" (LT)
D = 8° 48' 53.0"
L = 211.17'
T = 106.52'
R = 650.00'

BEGIN CONSTRUCTION
-DET- STA. 15+00.00
= -L- STA. 15+00.00

POT Sta. 10+00.00

PC Sta. 15+00.00

PRC Sta. 17+11.17

PT Sta. 19+22.33

MATCH LINE STA. 23+00.00 – SEE SHEET 7

-L- +17.00
145.00' LT
TEMP. TOE PROTECTION
CLASS B RIPRAP
EST 70 TONS
EST 145 SY GT
SEE DETAIL J

-L- +50.00
EXIST R/W
75.00' LT

-L- +09.00
75.00' LT

-L- +00.00
EXIST R/W
35.00' LT

-L- +00.00
EXIST R/W
90.00' RT

BEG TEMP. SHORING
-DET- STA 19+80.6 LT
SEE STRUCTURE PLANS

BEG TEMP. SHORING
-DET- STA 19+80.6 RT
SEE STRUCTURE PLANS

TEMP. CLASS I RIPRAP
EST 100 TONS
EST 105 SY GT

TEMP. RIPRAP AT EMBANKMENT
SEE DETAIL H

TEMP. CLASS I RIPRAP
EST 80 TONS
EST 85 SY GT

HP +79.21
0.70%, 0.87%

PROP. TEMP. RETAINING WALL

END TEMP. SHORING
-DET- STA 22+00.0 LT
SEE STRUCTURE PLANS

401A TEMP. TB 2GI

TYPE B-77

GREU TL-3

402A TEMP. 15" PIPE W/ 2 ELBOWS

TEMP. SBG
BEGIN +70.0
END +40.1

TEMP. STANDARD 'V' DITCH
CLASS B RIPRAP
EST 40 TONS
EST 85 SY GT
SEE DETAIL I

TEMP. STANDARD 'V' DITCH
SEE DETAIL G

N 50° 11' 16.0" E

26' BST HWY 11

TO NC HWY 87

EXISTING R/W

WHITE OAK CANAL

I.5 SBKD

CONC FOUNTAIN

48" BK FENCE

WARD LORIN NEWTON
DB 571PG 453
(1)

ALICE HAWES
DB 233 PG 822
(2)

WARD LORIN NEWTON
DB 571PG 453
(3)

ALICE HAWES
DB 233 PG 822
(4)

SCOTT GOTTFRIED
DB 676 PG 434

BL-1
BL-2
BL-3
BM-1

LYNNON ST

SUNNY

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

Natural Ground
2:1
D
d
Geotextile
Min. D = 1.0 Ft.
Max. d = 1.0 Ft.

Type of Liner = Class B Rip-Rap

FROM -DET- 21+80.1 RT STA. TO STA. 24+15.0 RT

DETAIL H
TEMP. RIP RAP AT EMBANKMENT
(Not to Scale)

10' min.
Ditch Grade
1.0' min.
2.0'
NWS
GEOTEXTILE

Type of Liner = 15 TONS, CL I RIPRAP
Geotextile = 16 SY

-DET- STA. 20+57.3 RT TO STA 20+77.1 RT

DETAIL J
TEMP. TOE PROTECTION
(Not to Scale)

NATURAL GROUND
d
2:1 OR FLATTER
FILL SLOPE
GEOTEXTILE

d = 1.0 Ft.

Type of Liner = Class B Rip-Rap

FROM -DET- STA. 17+29.9 RT TO STA. 19+95.4 RT
FROM -DET- STA. 24+16.7 RT TO STA. 28+05.4 RT

FOR -DET- PROFILE SEE SHEET 9
FOR -L- SEE SHEETS 4/5

REVISIONS

8/17/99

15-MAY-2019 13:59
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PROJECT REFERENCE NO.	SHEET NO.
B-5694	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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-DET-

PI Sta 16+06.52
△ = 18° 36' 49.2" (LT)
D = 8° 48' 53.0"
L = 211.17'
T = 106.52'
R = 650.00'

PI Sta 18+17.69
△ = 18° 36' 49.2" (RT)
D = 8° 48' 53.0"
L = 211.17'
T = 106.52'
R = 650.00'

PI Sta 27+18.97
△ = 18° 36' 49.2" (RT)
D = 8° 48' 53.0"
L = 211.17'
T = 106.52'
R = 650.00'

PI Sta 29+30.14
△ = 18° 36' 49.2" (LT)
D = 8° 48' 53.0"
L = 211.17'
T = 106.52'
R = 650.00'

25

30

END CONSTRUCTION
-DET- STA. 30+20.00
-L- STA. 30+05.22

PT Sta. 30+34.78

POT Sta. 31+58.57

MATCH LINE -L- STA. 23+00.00 – SEE SHEET 6

-L- +47.00
145.00' LT

TEMP. STANDARD 'V' DITCH
CLASS B RIPRAP
EST 40 TONS
EST 85 SY GT
SEE DETAIL I

TEMP. TOE PROTECTION
CLASS B RIPRAP
EST 95 TONS
EST 210 SY GT
SEE DETAIL J

ALICE HAWES
DB 233 PG 822
2

END TEMP. SHORING
-DET- STA 24+33.0 RT
SEE STRUCTURE PLANS

-L- +50.00
EXIST R/W
75.00' LT

-L- +79.00
EXIST. R/W

F GREU TL-3

PROP. TEMP SHORING

+05.0
48.0' RT
ELEV. = 12.4'

BL-4

N 50° 11' 16.0" E

2" BST NATMORE RD (SR 1539)

BST

26' BST HWY 11

TO NC HWY 210

BL-5

-L- +65.00
95.00' RT

PDE

-L- +00.00
95.00' RT

PC Sta. 26+12.45

ALICE HAWES
DB 233 PG 822
4

PRC Sta. 28+23.61

-L- +75.00
EXIST R/W
40.00' RT

-L- +55.00
EXIST R/W
40.00' RT
90.00' RT

REF.

FOR -DET- PROFILE SEE SHEET 9
FOR -L- SEE SHEETS 4/5

REVISIONS

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
B-5694	8
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BM #1 - WOODED AREA
-L- STA. 11+20.62, 95.36' RT
EL = 18.15'

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 950	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 12.8	FT
BASE DISCHARGE	= 1200	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 13.7	FT
OVERTOPPING DISCHARGE	= 17000	CFS
OVERTOPPING FREQUENCY	= >500+	YRS
OVERTOPPING ELEVATION	= 22.8	FT
DATE OF SURVEY	= 08/16/2017	
W.S.ELEVATION AT DATE OF SURVEY	= 5.3	FT

BEGIN GRADE -L- STA 15+00.00
ELEV. 23.37'

PI = 16+75.00
EL = 24.59'
VC = 218'
K = 68.4
DS = 60 mph

PI = 18+74.00
EL = 26.62'
VC = 180'
K = 250
DS = 60 mph

(+)0.7000%
(+)1.0186%
(+)1.0186%
(+)0.3000%

C/L STA 21+85.1
ELEV. 27.56'
SKEW = 90 DEG
54" GIRDER
1@ 60'; 1@ 90'; 2@ 100' (OAL = 350')
35.25' OTO
(32.0' CLEAR ROADWAY WIDTH)

100YR CAPE FEAR RIVER
WS ELEV. = 23.7'

BEGIN BRIDGE
-L- STA 20+10.1
ELEV = 27.03

END BRIDGE
-L- STA 23+60.1
ELEV = 28.08

LOWEST
LOW CHORD
+86.1 LT
EL=12.9

4'-0" DEEP CAPS
(3'-3" WIDE)

-1.00%
-0.30%
+0.31%

BEGIN LAT. 'V' DITCH
+50.0 LT
EL=14.0

+00.0 LT
EL=13.5

BEGIN STD. 'V' DITCH
+10.1 LT
EL=11.9

BEGIN STD. 'V' DITCH
+72.0 RT
EL=13.0

CLASS II RIPRAP
1.5:1
MIN DEPTH OF
RIPRAP = 3.5'

EXCAVATION
ELEV. = 14.0'

-4.24%

END STD. 'V' DITCH
+54.5 LT
EL=10.0

100YR WS ELEV. = 13.7'
50YR WS ELEV. = 12.8'
NWS ELEV. = 5.3

CLASS II RIPRAP
1.5:1
MIN DEPTH OF
RIPRAP = 3.5'

EXCAVATION
ELEV. = 13.0'

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

PI = 25+50.00
EL = 28.65'
VC = 280'
K = 153
DS = 60 mph

PI = 28+85.00
EL = 23.52'
VC = 180'
K = 231
DS = 60 mph

(+)0.3000%
(-)1.5313%
(=)1.5313%
(-)0.7514%

END GRADE/BEGIN MILL&OVERLAY -L- STA 29+75.00
ELEV. 22.84'
END MILL&OVERLAY -L- STA 30+05.22
ELEV. 22.60'

FOR -L- ALIGNMENT SEE SHEETS 4/5

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
B-5694	9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-DET-

BM #1 - WOODED AREA
-L- STA. 16+20.62, 95.36' RT
EL = 18.15'

BEGIN GRADE -DET- STA 15+00.00
ELEV. 23.37'

DETOUR BRIDGE HYDRAULIC DATA		
DESIGN DISCHARGE	= 550	CFS
DESIGN FREQUENCY	= 10	YRS
DESIGN HW ELEVATION	= 10.8	FT
BASE DISCHARGE	= 1200	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 13.8	FT
OVERTOPPING DISCHARGE	= 17000	CFS
OVERTOPPING FREQUENCY	= >500+	YRS
OVERTOPPING ELEVATION	= 24.7	FT
DATE OF SURVEY	= 08/16/2017	
W.S. ELEVATION AT DATE OF SURVEY	= 5.3	FT

(+)0.7000%

BEGIN TEMP. STD. 'V' DITCH
+00.0 RT
EL=14.8

TEMP. VERTICAL ABUTMENTS

-4.17%

END TEMP. STD. 'V' DITCH
+67.3 RT
EL=12.0

C/L -DET- STA 20+87.6
ELEV. 27.49'
1@95' TEMPORARY
DETOUR BRIDGE
SKEW = 90 DEG
36.0' OTO
(32.0' CLEAR ROADWAY WIDTH)

PI = 22+92.00
EL = 28.92'
VC = 240'
K = 153
DS = 60 mph

(+)0.7000%

(-)0.8670%

3' MAX STRUCTURE DEPTH

TEMP. VERTICAL ABUTMENTS

BEGIN TEMP. STD. 'V' DITCH
+80.1 RT
EL=10.9

+2.43%

+0.30%

+50.0 RT
EL=11.1

+00.0 RT
EL=14.1

RIGHT DITCH ----------

LEFT DITCH -·-·-·-·-·-

100YR WS ELEV. = 13.8'
10YR WS ELEV. = 10.8'
NWS ELEV. = 5.3'

BEGIN GRADE -DET- STA 30+20.00
ELEV. 22.61'

(-)0.8670%

+8.20%

END TEMP. STD. 'V' DITCH
+15.0 RT
EL=15.9

FOR -DET- ALIGNMENT SEE SHEETS 6/7