



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

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SECRETARY

February 12, 2004

U.S. Army Corps of Engineers
Wilmington Regulatory Field Office
P.O. Box 1890
Wilmington, NC 28402-1890

ATTN.: Mr. David Timpy
NCDOT Coordinator

Dear Sir:

Subject: **Application for Individual Section 404 and 401 permits** for the US 17 widening from SR 1327/1410 north of Jacksonville to SR 1330/1439 south of Belgrade/Maysville in Onslow County, North Carolina
Federal Aid Project No. NHF-17(7)
State Project No. 8.T190301
TIP No. R-2514A
\$475.00 Debit work order 8.T190301, WBS Element 34442.1.1

PROJECT DESCRIPTION

The North Carolina Department of Transportation (NCDOT) proposes to improve a portion of existing US 17 by constructing Project R-2514A, which is a 5.9-mile widening of existing US 17 from SR 1327/1410, north of Jacksonville, to SR 1330/1439, south of Belgrade/Maysville. It will be a high speed, four-lane divided roadway. The project area lies in the rural unincorporated section of Onslow County with the majority of the project passing through the Hofmann Forest, a research forest for North Carolina State University. Mixed residential and commercial land uses border the Hofmann Forest on the northern and southern ends of the project area. An abandoned Seaboard Coast Line Railroad bed lies just east of the existing roadway. The project crosses through two drainage basins, the White Oak River Basin and the New River Basin. This application consists of the cover letter, ENG Form 4345, 8 1/2 x 11-inch permit drawings (drawings, property owners, impact summary sheets, and mailing labels), Stormwater Management Plan, Wetland Delineation Update (September 2003) and half-sized plan sheet.

Purpose of the Project:

The primary purpose of the proposed project is to upgrade this section of US 17 to a modern, high speed, multi-lane facility. US 17 is the primary north-south corridor east of I-95 and serves as a key economic development highway as well as a military access route and hurricane evacuation route for the coastal region of the state. US 17 is a Strategic Highway Network (STRAHNET) route serving the Cherry Point Marine Corps Air Station and Camp

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LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC

LeJeune Marine Corps Base. A high speed, multi-lane roadway would facilitate progressive vehicular movement during military mobilizations, weather-related emergencies, and peak summer beach traffic.

Project Organization:

The proposed project improvements are scheduled in conjunction with two other projects R-2514B and R-2514C. The entire project will widen US 17 to a multi-lane facility from just north of Jacksonville to south of New Bern with bypasses of Belgrade, Maysville, and Pollocksville on new location.

Project Schedule:

Construction letting date is scheduled for June 2004.

Summary of Project Impacts:

Impacts to jurisdictional wetland areas on Project R-2514A total 31.10 acres, consisting of 22.37 acres of permanent fill, 3.65 acres of excavation, 4.34 acres of mechanized clearing and 0.74 acre of drained wetlands. The project will impact 0.07 acre of fill in surface waters and 774.27 feet of existing stream channels. There are no temporary impacts associated with this project.

Approximately 0.005 acre of fill material and 65.62 linear feet of stream impacts at Site 38 are associated with a non-mitigatable intermittent stream, per USACE field review on July 31, 2003, and therefore should be subtracted from any mitigation calculations.

Summary of Mitigation:

The project has been designed to avoid and minimize impacts to jurisdictional areas throughout the NEPA and design processes. Detailed descriptions of these actions are presented elsewhere in this application. Compensatory mitigation for the remaining impacts will be provided by the Ecosystem Enhancement Program (EEP).

NEPA DOCUMENT STATUS

An Environmental Assessment (EA) was completed by the NCDOT in compliance with the National Environmental Policy Act. The document addressed R-2514A, a widening of US 17 to a modern, high speed, multi-lane facility from SR 1327/1410 north of Jacksonville to SR 1330/1439 south of Belgrade/Maysville, in Onslow County. The EA explains the purpose and need for the project, provides a description of the alternatives considered and characterizes the social, economic, and environmental effects. After the approval of the EA (August 1999) and Finding of No Significant Impact (FONSI) (August 2000), copies were provided to regulatory review agencies involved in the approval process. Additional copies will be provided upon request.

R-2514A is in compliance with 23 CFR Part 771.111(f) which lists the Federal Highway Administration (FHWA) characteristics of independent utility of a project:

- (1) The project connects logical termini and is of sufficient length to address environmental matters on a broad scope;
- (2) The project is usable and a reasonable expenditure, even if no additional transportation improvements are made in the area; and
- (3) The project does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

RESOURCE STATUS

Delineations:

Wetland delineations were conducted using the criteria specified in the 1987 Corps of Engineers Wetland Delineation Manual. Guidance on the jurisdictional status of questionable areas was provided by USACE personnel during an on-site visit on December 11, 1996. Mr. Dave Timpy of the USACE Wilmington Regulatory Field Office verified the jurisdictional wetland delineations on October 27, 1998. Detailed descriptions for these resources can be found in the Natural Systems Report (September 1997). Updated wetland and stream delineations were verified by USACE on July 31, 2003 and are further described in the Wetland Delineation Update (September 2003). Table 1 is a list of verified impacts to jurisdictional wetland resources, which include impacts resulting from fill, excavation, mechanized clearing and draining. The calculations and drawings by NCDOT Hydraulics Unit are presented in the attached permit drawings.

Wetlands:

The impacted wetland areas are described in Table 1 by the Cowardin *et al.* classification, DWQ Fourth Version of Guidance for Rating the Wetlands in North Carolina, riverine or non-riverine status, and the Schafale and Weakley description. These wetland descriptions were reported and described further in the Environmental Assessment (August 1999) and Wetland Delineation Update (September 2003). The Wetland Delineation Update is attached as Appendix B.

Site	White Oak (WO) or New (N) River Basin	Wetland Impacts (acres)	Cowardin <i>et al.</i> description	DWQ Wetland Rating	Riverine (R) or Non-riverine (NR)	Schafale and Weakley description
1	N	0.136	PSS	34	R	SUC, M/D
2	--	--	--	--	--	--
3	N	0.148	PSS	20	NR	M/D
4	N	0.012	PSS	20	NR	M/D
4A	N	0.262	PSS	20	R	SUC, M/D
5	N	0.262	PSS	20	NR	SUC
6	N	0.571	PSS	21	NR	SUC
7	N	0.603	PSS	19	NR	SUC
8	N	0.052	PSS	19	NR	SUC
8A	N	0.005	PSS	19	NR	SUC
9	N	0.121	PSS	19	R	SUC
10	N	0.126	PFO1/4C	33	R	P/MH
10A	N	0.054	PFO4/1A	33	R	P/MH
11	N	0.022	PFO4/1A	16	NR	PW
12	N	1.033	PFO1/4A	27	NR	PW
12A	N	0.017	PFO1/4A	25	NR	P/MH
13	N	1.665	PFO4/1A	27	NR	PW
13A	N	0.020	PFO1/4A	25	NR	P/MH
14	N	5.130	PFO4/1A	27	NR	PW
15	N	0.100	PFO4/1A	16	NR	PW
15A	N	0.027	PFO1/4A	16	NR	P/MH
16	N	2.301	PFO4/1A	16	NR	PW
17	--	--	--	--	--	--
18	N	0.818	PFO4/1A	27	NR	PW

Table 1 – Wetland Impacts and Descriptions (con't.)*						
19	N	0.027	PFO1/4A	25	NR	P/MH
20	N	0.005	PFO4/1A	16	NR	PW
21	N	4.586	PFO4/1A	27	NR	PW
21A	N	0.020	PFO1/4A	25	NR	P/MH
21B	N	0.015	PFO1/4A	25	NR	P/MH
22	N	0.114	PFO4/1A	16	NR	PW
22A	N	0.010	PFO1/4A	16	NR	P/MH
23	N	0.217	PFO4/1A	16	NR	PW
24	N	0.146	PFO4/1A	16	NR	PW
24A	N	0.030	PFO1/4A	16	NR	P/MH
Total wetland impacts within New River basin		18.655				
25	WO	0.274	PFO4/1A	15	NR	PW
25A	WO	0.040	PFO4/1A	16	NR	PW
26	WO	0.030	PFO4/1A	16	NR	PW
27	--	--	--	--	--	--
28	WO	0.104	PFO4/1A	15	NR	PW
29	WO	0.077	PFO4/1A	16	NR	PW
30	WO	0.272	PFO4/1A	15	NR	PW
31	WO	0.022	PFO4/1A	6	NR	PW
32	WO	0.007	PFO4/1A	16	NR	PW
33	WO	0.383	PFO4/1A	16	NR	PW
34	WO	0.020	PFO4/1A	16	NR	PW
35	WO	0.761	PFO4/1A	16	NR	PW
36	WO	0.245	PFO1/4A	15	NR	P/MH
37	WO	0.677	PFO1/4A	46	R	P/MH
37A	WO	0.025	PFO1/4A	33	R	P/MH
38	WO	2.011	PFO4/1A	28	NR	PW
38A	WO	0.049	PSS	32	R	SUC
39	WO	1.567	PFO1/4A	10	NR	P/MH
40	WO	0.156	PSS	27	NR	SUC
41	WO	0.010	PFO1/4A	16	NR	M/D
42	WO	0.017	PFO1/4A	16	NR	M/D
43	WO	0.141	PFO4/1A	24	NR	P/MH
44	WO	0.717	PFO4/1A	24	NR	P/MH
45	WO	0.143	PSS	27	NR	SUC
46	WO	0.269	PFO1/4A	24	NR	P/MH
47	WO	0.057	PFO1/4A	9	NR	P/MH
48	WO	0.255	PSS	27	NR	SUC
49	WO	0.183	PFO1A	9	NR	P/MH
50	--	--	--	--	--	--
51	WO	0.042	PFO1/4A	27	NR	P/MH
52	WO	0.418	PFO1/4A	27	NR	P/MH
53	--	--	--	--	--	--
54	WO	0.343	PFO1/4A	49	R	P/MH
55	WO	0.208	PFO1/4C	54	R	SSS
56	WO	0.235	PFO1/2C	54	R	SSS
57	WO	0.482	PFO1/4C	49	R	P/MH
58	WO	0.371	PFO1/2C	54	R	SSS
59	--	--	--	--	--	--
60	WO	0.514	PSS	15	NR	SUC
61	WO	0.032	PSS	11	NR	SUC
62	WO	0.143	PSS	15	NR	SUC

Table 1 – Wetland Impacts and Descriptions (con't.)*						
63	WO	0.012	PFO1A	19	NR	P/MH
64	WO	0.274	PSS	15	NR	SUC
64A	WO	0.114	PSS	24	NR	SUC
65	WO	0.022	PFO1/4A	11	NR	P/MH
66	WO	0.573	PFO1/4A	14	NR	P/MH
67	WO	0.062	PSS	24	NR	SUC
68	WO	0.084	PFO1/4A	15	NR	P/MH
Total wetland impacts within White Oak River basin		12.441				
Project Totals		31.096				

*Schafale and Weakley and Cowardin *et al.* descriptions were not designated per wetland site in the EA or Wetland Delineation Update. Environmental Services Incorporated (E.S.I.) was contracted to revisit the wetland sites on January 13 - 14, 2004 and to assign DWQ wetland ratings and community designations to each site.

Wetland areas are generally described in the EA by the Cowardin *et al.* wetland classification system. The following wetland types are classified as PFO or PSS, with additional flora communities or different saturation levels found in the project area.

PFO1 – Palustrine, Forested,

- 1 Broad-leaved Deciduous,
- 2 Needle-leaved Deciduous,
- 4 Needle-leaved Evergreen,
- A Temporarily Flooded
- C Seasonally Flooded

PSS – Palustrine Scrub Shrub

Terrestrial community descriptions for these wetland areas (see Table 1) somewhat differ from the Schafale and Weakley due to their altered conditions. The project study area is described as the following:

Pine Woodlands (PW) – areas where a high percentage of pines, typically greater than 80%, dominate the area. Pine woodlands are common throughout the project study area.

Pine/Mixed Hardwood (P/MH) Forest – areas where a mix of pines and hardwoods exist.

Small Stream Swamp (SSS) – areas along the eight intermittent and perennial streams.

Maintained/Disturbed Land (M/D) – area along rights-of-way and residential yards.

Successional (SUC) – areas of fallow fields and recent cutovers.

Surface Waters:

As part of the Wetland Delineation Update (September 2003), stream channel segments were reviewed by the USACE on July 31, 2003 to confirm intermittent, perennial or ephemeral status and to determine if mitigation would be required and at what ratio it would be required.

Of the ten channel segments reviewed, seven channel segments were determined to require mitigation. Four of these mitigatable channels are associated with Starky's Creek and

are in the White Oak River Drainage (HU 03030001). Three of these mitigatable channels are associated with Northeast Creek and are in the New River Drainage (HU 03020106).

Three channel segments do not require mitigation, two ephemeral streams and one minor intermittent stream. Impacts and locations to the ephemeral streams are not shown on the permit drawings or impact summary sheets. However, their locations are noted in the Wetland Delineation Update (September 2003). The intermittent stream is an unnamed tributary located just north of the 900mm RCP at Site 38. There are 65.62 linear feet of impacts and 0.005 acre of fill material in the stream channel with no mitigation required per USACE, Mr. Timpy, and ESI, Mr. Gay.

Site 2 (station 106+00) contains a mitigatable unnamed tributary to Northeast Creek on the north side of US 17 that will be impacted by a 900mm RCP. This tributary actually begins on the south side of US 17, where it was classified as ephemeral by the USACE on July 31, 2003. The nick point is located at the pipe. Impact calculations for the intermittent channel begin at the pipe.

Table 2 shows the fill in surface waters and linear feet of stream impacts at each site. Descriptions of the streams were reported in the Natural Systems Report (September 1997), EA (August 1999), Wetland Delineation Update (September 2003), and the Stormwater Management Plan (September 2003). No DWQ stream rating forms were completed for these streams during the initial surveys; therefore, no stream ratings are reported in this permit application.

Table 2 – Surface Water Impacts						
Site	Stream Name and Intermittent (I) or Perennial (P)	Mitigation Ratio	Fill in Streams (acres)	Existing Channel impacted (feet)	DWQ Class	DWQ Index number
New River Basin						
2	UnT to Northeast Creek (I)	1:1	0.007	52.49	CNSW	UnT to 19-16
4A	UnT to Northeast Creek (I)	1:1	0.002	9.84	CNSW	UnT to 19-16
10	UnT to Northeast Creek (P)	2:1	0.032	314.96	CNSW	UnT to 19-16
10A				6.56	CNSW	UnT to 19-16
New River Basin Impacts			0.041	383.85		
White Oak River Basin						
37	Starky's Creek (P)	2:1	0.022	134.51	C	20-10
37A				59.05	C	20-10
38	UnT to Starky's Creek (I)	(no mitigation required)	0.005	65.62	C	UnT to 20-10
38A	UnT to Starky's Creek (I)	1:1	0	65.62	C	UnT to 20-10
53	UnT to Starky's Creek (I)	1:1	0.002	65.62	C	UnT to 20-10

Table 2 – Surface Water Impacts (con't.)						
54	Starky's Creek (P)	2:1	0	0	C	20-10
55					C	20-10
56					C	20-10
57					C	20-10
58					C	20-10
White Oak River Basin Impacts			0.029	390.42		
Total Impacts			0.070	774.27		

Drainage Ditches:

The Boussinesq Equation and DRAINMOD model were utilized to predict the lateral extent of the ditch impact on ground or surface water within one foot of the land surface for various jurisdictional thresholds (i.e. 5 or 12.5 percent of the growing season). In the Ditch Impact Study (August 2003), four locations (Sites 6, 12, 13, and 39) were studied to evaluate the drainage impacts caused by special ditches. These ditches are generally parallel to the road corridor and are designed to induce a groundwater withdrawal gradient within adjacent fill material. The predicted lateral effects for each ditch reported indicate the probable range of potential impacts. The predicted lateral effects for the ditches range from 25.4 to 992.5 feet (see Table 3).

Table 3 – Special Ditch Impacts				
Site Number	5% of Growing Season		12.5% of Growing Season	
	Boussinesq Drainage Impact in feet	DRAINMOD Maximum Drainage Impact in feet	Boussinesq Drainage Impact in feet	DRAINMOD Maximum Drainage Impact in feet
6	76.7	96.8	120.2	992.5
12	25.4	34.4	39.8	73.8
13	36.3	41.0	56.9	83.5
39	42.4	45.5	66.4	90.2
TOTALS	180.8	217.7	283.3	1,240.0

Temporary Impacts:

Top down construction will be utilized to construct the proposed bridge and therefore limit temporary impacts. Furthermore, the limits of the permanent impacts are sufficient to allow for the installation of all pipes and box culverts and for fill on temporary access roads and work pads. Pipe and culvert locations are shown in Table 6. Impacts from temporary access roads and work pads are located at Site 55 and 56 summarized on Sheet 81 of 81 of the attached permit drawings. Temporary work pads will be required for removal/demolition of the existing bridge. All temporary impacts are included within the footprint of the permanent impacts.

THREATENED AND ENDANGERED SPECIES

Plants and animals with Federal classification of Endangered (E) or Threatened (T) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of February 25, 2003, the U.S. Fish and Wildlife Service (FWS) lists 12 federally protected species for Onslow County. In the Natural Systems Report (September 1997), biological conclusions for each federally protected species were determined and are listed in Table 4.

Table 4 – Threatened and Endangered Species in Onslow County, NC			
Scientific Name	Common Name	Federal Status*	Biological Conclusion
<i>Picoides borealis</i>	Red-cockaded woodpecker	E	Not Likely to Adversely Affect
<i>Felis concolor cougar</i>	Eastern cougar	E	No Effect
<i>Lysimachia asperulaefolia</i>	Rough-leaved loosestrife	E	No Effect
<i>Thalictrum cooley</i>	Cooley's meadowrue	E	No Effect
<i>Dermochelys coriacea</i>	Leatherback sea turtle	E	No Effect
<i>Chelonia mydas</i>	Green sea turtle	T	No Effect
<i>Caretta caretta</i>	Loggerhead sea turtle	T	No Effect
<i>Charadrius melodus</i>	Piping plover	T	No Effect
<i>Amaranthus pumilus</i>	Seabeach amaranth	T	No Effect
<i>Alligator mississippiensis</i>	American alligator	T(S/A)	No opinion required
<i>Trichechus manatus</i>	West Indian manatee	E	No Effect
<i>Haliaeetus leucocephalus</i>	Bald eagle	T-proposed for delisting	No Effect
<i>Carex lutea</i>	Golden sedge	E	No Effect

*Note: E-Endangered, T-Threatened, T(S/A)-Threatened due to similarity of appearance, not subject to Section 7 consultation

The Natural Systems Report (September 1997) listed the red-cockaded woodpecker (RCW) with a biological conclusion of unresolved. Further studies indicated that there are no documented cases of RCW activity in the project vicinity, but RCW cavity trees have been documented in Croatan National Forest approximately 4.3 miles east and 4.7 miles northeast of the study corridor. Due to the proximity of these documented sites, all pine, pine-hardwood, and hardwood-pine stands affected by the study corridor were surveyed for the RCW. In August 1998, surveys were conducted of all potential nesting habitat located within 0.5 mile of the potential foraging habitat identified within the project corridor (ESI 1998). No RCW cavity trees were found within the 0.5-mile corridor. The FWS issued a letter of concurrence with No Effect status dated November 16, 1999. The referenced letter of concurrence is located in Appendix A of the R-2514A FONSI approved August 25, 2000. A biological assessment for the RCW occurred on December 31, 2003 due to recent discoveries in small amounts of nesting habitat within the project corridor. A biological conclusion of "Not likely to adversely affect" was determined after surveys were completed. Updates to the USFWS Protected Species List, dated February 25, 2003, include the bald eagle (*Haliaeetus leucocephalus*), federally threatened, West Indian manatee (*Trichechus manatus*), federally endangered, and golden sedge (*Carex lutea*), federally endangered, as protected species for Onslow County. NCDOT biologists determined a biological conclusion of "No effect" for these species due to lack of habitat.

CULTURAL RESOURCES

The investigation of the architectural resources was conducted in two phases, Phase I Architectural Reconnaissance Survey (June 20, 1995) and Phase II (Intensive Level) Architectural Survey and Evaluations of Eligibility (May 3, 1999). No properties listed in the National Register of Historic Places were identified; however, two resources were determined eligible for the National Register. These properties are the Nelson Deppe House and the Hofmann Forest/Deppe Lookout Tower and Equipment Headquarters. A copy of the concurrence form from the SHPO is attached to this application in Appendix A.

The Nelson Deppe House is located east of US 17 just south of the intersection with SR 1436 (Deppe Road). It is considered eligible for the National Register Criterion C for architecture. The right-of-way required for the proposed widening will encompass the abandoned railroad right-of-way and will not require any of the original property. FHWA and SHPO have determined that the project will have **No Adverse Effect** on this resource.

The Hofmann Forest/Deppe Lookout Tower and Equipment Headquarters are located on both sides of existing US 17 between Jacksonville and Maysville. The Hofmann Forest is eligible for the National Register under Criterion A for education, industry and conservation and is significant because two sites within the forest have been designated by the North Carolina Natural Heritage Program as registered natural heritage areas. FHWA and SHPO have determined that the project will have **No Effect** on this resource.

It was determined to evaluate the Hofmann Forest/Deppe Lookout Tower and Equipment Headquarters as a Programmatic Section 4(f) because the project meets the criteria set forth in the Federal Register (December 23, 1989). It also meets all of the requirements of "A Final Nationwide Section 4(f) Evaluation and Approval for Federally-Aided Highway Projects with Minor Involvements with Historic Sites", which satisfies the requirements of Section 4(f).

According to the FONSI (dated August 2000), SHPO will be provided the opportunity to comment on the roadway design plans in the vicinity of the Nelson Deppe House prior to right-of-way acquisition.

Archaeological survey results indicated that no archaeological resources were found within the project area. Occasional railroad ties were noted between US 17 and the abandoned Seaboard railroad bed. The railroad ties and hardware were removed from this portion of the railroad bed when it was abandoned. This portion of the railroad bed is recommended as not eligible for the National Register of Historic Places.

WILD AND SCENIC RIVERS

Northeast and Starky's Creek are not listed as a federal or state wild and scenic river.

ESSENTIAL FISH HABITAT

Based on the location, scope, and nature of impacts expected from this project, impacts to Essential Fish Habitat are not anticipated.

303(D) LIST

Section 303(d) of the Clean Water Act (CWA) requires states to develop a list of waters not meeting water quality standards or which have impaired uses. Both Starky's Creek and Northeast Creek are listed on the February 2003 303(d) List. Northeast Creek, from its source to Hwy. 24, is listed as impaired (impairment from fish advisory due to mercury) but is not directly impacted; however, an unnamed tributary near its source is crossed several times by the road widening project and is anticipated to indirectly impact Northeast Creek. Even though the tributary flows into Northeast Creek, the tributary is not considered a 303 (d) listed stream. Starky's Creek, from its source to Pettiford Creek Bay, is listed as impaired (impairment from fecal coliform) and is impacted by the road-widening project. Starky's Creek is crossed twice within the project area.

FEMA

There is no detailed flood insurance study involvement with any of the major stream crossings on this project. Therefore, coordination for compliance with FEMA will not be required.

CAMA CONSISTENCY DETERMINATION

The Coastal Area Management Act requires that state guidelines for coastal development pay particular attention to the types of development that are appropriate for environmentally sensitive areas, designated as Areas of Environmental Concern (AEC). R-2514A is consistent with the 1996 Land Use Plan for the City of Jacksonville and the 1992 Land Use Plan for Onslow County provided that all local, state and federal requirements can be satisfied. DCM concurred that the project does not encroach into any AEC. It was determined that the project is consistent with the North Carolina Coastal Management Program (NCCMP) provided that all state and local authorizations are obtained and the following conditions are met. See the DCM letter dated November 24, 1999 in Appendix A.

- An acceptable mitigation plan to compensate for unavoidable wetland losses is developed.
- If rare plant species will be negatively impacted by the proposed project, the NC Pant Conservation Program should be consulted in order to determine whether transplantation or other forms of mitigation would be desirable.
- A 401 Water Quality Certification is received from DWQ prior to the onset on construction.
- Sedimentation and Erosion Control requirements and the Memorandum of Agreement between the NCDOT and the DLQ must be adhered to.
- Borrow and waste areas are not allowed in wetlands.
- Construction staging areas are situated in uplands specially, not in wetland areas.
- Best management practices for the protection of surface waters will be strictly followed.
- All necessary DENR permits and/or approvals as indicated in the Intergovernmental Review dated October 25, 1999 are obtained and adhered to.

INDIRECT AND CUMULATIVE EFFECTS ANALYSIS

TIP R-2514A is a six-mile (approximately) widening of US 17 from Kellum Loop Road to just north of Deppe Loop Road in Onslow County (see Figure 1). The NCDOT proposes to add two 12-foot lanes in each direction, as well as a 46-foot grass median to the existing two-lane rural roadway. Access will be partial control. The minimum right of way required for TIP R-2514A will be 200 feet, with existing right of way currently at 100 feet. The project is currently undergoing right of way acquisition and is scheduled to begin construction during Fiscal Year 2004.

Study Area Directions and Goals

- TIP R-2514A is located in a portion of Onslow County which contains a substantial portion of Hofmann State Forest land. The Hofmann State Forest only permits the development of ten-acre farms or larger, forestry lands, greenways, and parks and playgrounds within its boundaries.
- Land along the TIP R-2514A portion of US 17 is predominantly undeveloped with some scattered single family dwellings and a few small businesses mainly surrounding the intersections.

- Population within the designated demographic area for TIP R-2514A grew by 17.4% between 1990 and 2000. This growth is less than North Carolina as a whole (21.4%), but more than Onslow County (0.3% ; 10% if military population was excluded).
- Zoning in unincorporated Onslow County is in the process of being implemented. The area surrounding TIP R-2514A is mostly zoned “Residential Agricultural” (RA), which allows a mixture of housing types, agricultural, and business uses.

Indirect and Cumulative Effects

- The 1999 Environmental Assessment (EA) concludes that no cavity trees of the federally endangered Red Cockaded Woodpecker species, which exists in the Jacksonville NW and Stella USGS Quads, were found within 0.5 miles of the US 17 corridor.
- After assessing a set of socio-economic factors that typically contribute to favorable conditions for indirect and cumulative impacts related to transportation projects, none indicated any measurable level of potential impacts.
- Because of relatively minimal travel time savings, low property value increases, low population growth, limited sewer service, and the lack of a market for development, there is a low potential for land use change as a result of TIP R-2514A. Therefore, a more detailed, quantitative impact analysis need not be conducted.

MITIGATION OPTIONS

The Corps of Engineers has adopted, through the Council on Environmental Quality (CEQ), a wetland mitigation policy that embraces the concept of “no net loss of wetlands” and sequencing. The purpose of this policy is to restore and maintain the chemical, biological, and physical integrity of the Waters of the United States. Mitigation of wetland and surface water impacts has been defined by the CEQ to include: avoiding impacts, minimizing impacts, rectifying impacts, reducing impacts over time and compensating for impacts (40 CFR 1508.20). Executive Order 11990 (Protection of Wetlands) and Department of Transportation Order 5660.1A (Preservation of the Nations Wetlands), emphasize protection of the functions and values provided by wetlands. These directives require that new construction in wetlands be avoided as much as possible and that all practicable measures are taken to minimize or mitigate impacts to wetlands.

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. Avoidance measures were taken during the planning and NEPA compliance stages; minimization measures were incorporated as part of the project design.

Avoidance:

At a meeting held on December 8, 1999 with state and federal environmental resource and regulatory agencies, avoidance measures were discussed. By widening to the east, impacts to the historic Hofmann Forest Headquarters complex and longitudinal encroachment to Starky’s Creek and other high quality wetlands were avoided.

Minimization:

Minimization has been employed in the project area by the proposed widening of the existing roadway and avoiding roadway construction on new location. Highway construction on

new location in the coastal plain of North Carolina typically results in greater impacts to wetlands. Thus widening and using the railroad right-of-way is considered the preferred solution from a minimization standpoint. Reduction of fill slopes and median widths at stream/wetland crossings will reduce unnecessary wetland takings. Table 5 shows the proposed structures at the jurisdictional locations.

Table 5 – Wetland Locations and Proposed Structures		
Site	Station	Structure Size and Type
1	105+66-105+99 RT	900 mm RCP
2	105+66-105+99 LT	900 mm RCP
4A	107+70 LT	600 mm RCP
9	111+66-112+12 RT	1.8x1.8 RCBC
10	112+10-112+77 RT	(same as site 9)
10A	112+08 LT	(same as site 9)
12	114+54-116+69 RT	450 RCP
12A	114+60-114+90 LT	(same as site 12)
13	116+81-119+83 RT	750 RCP
13A	119+48-119+66 LT	(same as site 13)
14	120+08-129+26 RT	600 RCP
15	124+48-125+75 RT	(same as site 14)
15A	125+57-125+79 LT	(same as site 14)
18	129+35-132+32 RT	375 mm RCP
19	132+47-132+64 LT	900 mm RCP
21A	136+00-136+15 LT	600 mm RCP
21B	140+54-140+69 LT	600 mm RCP
22	144+20-145+00 RT	600 mm RCP
22A	144+30-144+45 LT	600 mm RCP
23	145+22-146+97 RT	375 mm RCP
24	147+05-148+64 RT	600 mm RCP
24A	148+20-148+35 LT	600 mm RCP
37	160+40-162+10 RT	2@2.1w*1.8h RCBC
37A	161+38 LT	(same as site 37)
39	162+52-169+26 RT	600 mm RCP
45	173+58-174+25 LT	600 mm RCP
48	174+56-175+48 LT	600 mm RCP
52	177+07-177+88 LT	0.9 m base tail ditch
Table 5 – Wetland Locations and Proposed Structures (con't.)		
53	179+13-179+30 LT	0.9 m base tail ditch
54	181+51-182+79 CN	Bridge
55	181+70-182+70 LT	Bridge
56	182+97-185+66 LT	Bridge
57	183+00-185+05 CN	Bridge
64	188+44-192+19 RT	600 mm RCP
67	195+28-195+75 LT	600 mm & 900 mm RCP

Conservative use of culverts and sensitive placement of drainage structures will minimize further degradation of water quality and reduce adverse impacts on aquatic habitat viability in streams and tributaries. Table 6 shows the proposed structures at the stream locations.

Table 6 - Stream Location and Proposed Structures			
Site	Stream Name and Intermittent (I) or Perennial (P)	Proposed Structure	Mitigation Ratio
2	UnT to Northeast Creek (I)	900mm RCP	1:1
4A	UnT to Northeast Creek (I)	600 mm RCP	1:1
10	UnT to Northeast Creek (P)	Single 1.8m*1.8m RCBC	2:1
10A			
37	Starky's Creek (P)	Double 2.1m*1.8m RCBC	2:1
37A			
38	UnT to Starky's Creek (I)	900 mm RCP	(no mitigation required)
38A	UnT to Starky's Creek (I)		1:1
53	UnT to Starky's Creek (I)	600 mm RCP	1:1
54	Starky's Creek (P)	Bridge	2:1
55			
56			
57			
58			

At the meeting held on December 8, 1999 with state and federal environmental resource and regulatory agencies, minimization measures were discussed. These measures include the use of previously developed railroad right-of-way and bridging the lower limits of Starky's Creek.

In the FONSI (August 2000), the following commitments were also listed:

- The North Carolina Plant Conservation Program will be given the opportunity to survey the right-of-way for any state listed (specifically *Solidago verna*, *Xyris difformis* var. *floridanum*, and *Polygala hookeri*) or other rare species.
- A Sediment and Erosion Control plan will be prepared for the project in accordance with the NCAC Title 15A, Chapter 4 and will follow erosion and sediment control measures set forth in the NCDOT Erosion and Sediment Control Guidelines for Contract Construction (January 1995) as applicable.
- Borrow and waste areas for the project will not be allowed in wetlands without the appropriate permits.
- Construction staging areas will not be allowed in wetlands.
- NCDOT Best Management Practices for Protection of Surface Waters will be implemented as applicable.
- Three major drainage structures are located within the project area. One bridge and two box culverts will be replaced in accordance with NCDOT Guidelines for Drainage Studies. The bridge over the lower reach of Starky's Creek at Site Nos. 54 through 58 (station 182+80) and will be replaced with dual structures approximately 135 feet long. An existing double RCBC which conveys the upper reach of Starky's Creek at Site Nos. 37 and 37A (station 161+00) will be replaced with a double RCBC approximately 131 feet long. Also an existing RCBC which conveys an unnamed tributary to Northeast Creek at Site Nos. 10 and 10A (station 112+10) will be replaced with a RCBC approximately 136 feet long.
- Stormwater drainage design will be addressed during the Design Phase and will be included as part of the construction plans and documents. The Stormwater Management Plan (September 2003) is included in the Appendix.

- A Confederate soldier's gravesite is located in the southwest quadrant of the intersection of Deppe Loop Road and US 17. The proposed right-of-way at this intersection will be adjusted to avoid any impacts to the gravesite.

The Interagency Permit Review Meeting on April 24, 2003 discussed several mitigation measures to minimize impacts. The following points were discussed at the meeting.

- On-site mitigation could be pursued on the west side of existing US 17 in the area between the proposed roadway and old railroad bed, and on the old railroad bed itself. However, the On-site Mitigation Feasibility Analysis (June 27, 2003) stated that while on-site mitigation opportunities exist in the project area, they are limited by three factors. The first factor is the extensive drainage system of the Hofmann forest that is in close proximity to the potential onsite mitigation areas. The second factor is the somewhat poorly drained classification of Rains soil, which is not as desirable as a poorly or very poorly drained soil. The somewhat poorly drained classification adds reasonable uncertainty to the restoration of jurisdictional hydrology on over 50% of the potential restoration areas of segment A, given the proximity to the existing drainage system. The third factor is that the trustees of the Hofmann Forest are not expected to be agreeable in allowing the purchase of additional right-of-way for onsite mitigation. Therefore, off-site resources should be utilized.
- Four of the jurisdictional crossings where pipes or box culverts are proposed as replacement structures will be buried appropriately. They are located at Site Nos. 2, 4A, 10 and 10A, and 37 and 37A. There should be no adjustment of stream widths and no rip-rap should be placed in the bed of jurisdictional streams. Jurisdictional stream culvert inverts should be buried a minimum of 20% of culvert diameter or one foot for aquatic passage.
- All special ditches that run through or that are adjacent to wetlands were assessed for limit of impact due to drainage impacts. The Ditch Impact Study, completed in August 2003, reports drainage impacts to wetlands in Table 3.
- Pre-formed scour holes have been placed at all pipe outlets that empty into wetlands. See Table 5 for wetland locations.
- Implementation of the conservation measures for the spring-flowering goldenrod (*Solidago verna*) is encouraged. NCDOT will contact the NC Plant Conservation Program in March 2004 to coordinate any plant rescue situations along the project.
- The proposed excavation in wetlands is a result of steepening the slopes of the existing tail ditch at Site Nos. 12A, 13A, 15, 15A, 19, 21A, 21B, 38A, 51 and 52.
- The proposed bridge at Site Nos. 54 through 57 will be slightly longer than the existing bridge.

The Stormwater Management Plan (September 2003) describes the avoidance and minimization measures implemented in the design.

- Grassy shoulders and medians, as opposed to curb and gutter designs, will help remove pollutants before they reach receiving waters.
- Pre-formed scour holes will be used at the outlet end of a stormwater pipe to reduce the energy from stormwater and disperse it to sheet flow rather than concentrated flow. See Table 5 for the wetland locations.
- No deck drains on the bridge will be allowed directly over the surface water of Starky's Creek.
- Culverts and cross pipes will be buried (See Tables 5 and 6 for the locations of culverts/pipes in stream and wetland areas). The culverts will be buried a minimum of one foot for aquatic passage.

Compensatory Mitigation:

The primary emphasis of the compensatory mitigation is to reestablish a condition that would have existed if the project were not built. As previously stated, mitigation is limited to reasonable expenditures and practicable considerations related to highway operation. Mitigation is generally accomplished through a combination of methods designed to replace wetland functions and values lost as a result of construction of the project. These methods consist of creation of new wetlands from uplands, borrow pits, and other non-wetland areas; restoration of wetlands; and enhancement of existing wetlands. Where such options may not be available, or when existing wetlands and wetland-surface water complexes are considered to be important resources worthy of preservation, consideration is given to preservation as at least one component of a compensatory mitigation proposal.

FHWA STEP DOWN COMPLIANCE: All compensatory mitigation must be in compliance with 23 CFR Part 777.9, "Mitigation of Impacts" that describes the actions that should be followed to qualify for Federal-aid highway funding. This process is known as the FHWA "Step Down" procedures:

1. Consideration must be given to mitigation within the right-of-way and should include the enhancement of existing wetlands and the creation of new wetlands in the highway median, borrow pit areas, interchange areas and along the roadside.
2. Where mitigation within the right-of-way does not fully offset wetland losses, compensatory mitigation may be conducted outside the right-of-way including enhancement, creation, and preservation.

Based upon the agreements stipulated in the "Memorandum of Agreement Among the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U.S. Army Corps of Engineers, Wilmington District" (MOA), it is understood that the North Carolina Department of Environment and Natural Resources Ecosystem Enhancement Program (EEP), will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for NCDOT projects that are listed in Exhibit 1 of the subject MOA during the EEP transition period which ends on June 30, 2005.

Since the subject project is listed in Exhibit 1, the necessary compensatory mitigation to offset unavoidable impacts to waters that are jurisdictional under the federal Clean Water Act will be provided by the EEP. The offsetting mitigation will derive from an inventory of assets already in existence within the same 8-digit cataloguing unit. The Department has avoided and minimized impacts to jurisdictional resources to the greatest extent possible as described above. The remaining, unavoidable impacts to 31.1 acres of jurisdictional wetlands, 0.07 acres of fill in surface water and 774.27 feet of jurisdictional streams will be offset by compensatory mitigation provided by the EEP program.

REGULATORY APPROVALS

Application is hereby made for a Department of the Army Individual 404 Permit as required for the above-described activities. We are also hereby requesting a 401 Water Quality Certification from the Division of Water Quality. In compliance with Section 143-215.3D(e) of the NCAC, we will provide \$475 to act as payment for processing the Section 401 permit application previously noted in this application (see Subject line). We are providing seven

copies of this application to the North Carolina Department of Environment and Natural Resources, Division of Water Quality, for their review.

If you have any questions or need additional information please call Mr. Brett Feulner at (919) 715-1488.

Sincerely,

A handwritten signature in black ink, appearing to read 'Gregory J. Thorpe', with a stylized flourish at the end.

Gregory J. Thorpe, Ph.D., Environmental Management Director,
Project Development and Environmental Analysis Branch

cc: w/attachment

Mr. David Franklin, Corps of Engineers, Wilmington Field Office
Mr. Bill Arrington, DCM (Morehead City)
Ms. Cathy Brittingham, DCM (Raleigh)
Mr. Garland Pardue, Ph.D., USFWS (Raleigh)
Mr. John F. Sullivan III, P.E., FHWA
Mr. John Hennessy, NCDENR, Division of Water Quality
Mr. Calvin Leggett, P.E. Program Development Branch
Mr. Art McMillian, P.E., Highway Design Branch
Mr. David Chang, P.E., Hydraulics Unit
Mr. Greg Perfetti, P.E., Structure Design Unit
Mr. Jay Bennett, P.E., Roadway Design Unit
Mr. Mason Herndon, Division 3 Environmental Officer
Mr. H. Allen Pope, P.E., Division 3 Engineer

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT
(33 CFR 325)

OMB APPROVAL NO. 0710-0003
Expires December 31, 2004

The Public burden for this collection of information is estimated to average 10 hours per response, although the majority of applications should require 5 hours or less. This includes 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 this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Service Directorate of Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302; and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003), Washington, DC 20503. 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, 33 USC 1413, Section 103. 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. 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 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 COMPLETED
--------------------	----------------------	------------------	-------------------------------

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME N.C. Dept. of Transportation, PD&EA	8. AUTHORIZED AGENT'S NAME AND TITLE (an agent is not required)
6. APPLICANT'S ADDRESS 1548 Mail Service Center Raleigh, NC 27699-1548	9. AGENT'S ADDRESS
7. APPLICANT'S PHONE NOS. W/AREA CODE a. Residence b. Business 919-733-3141	10. AGENT'S PHONE NOS. W/AREA CODE a. Residence b. Business

11. STATEMENT OF AUTHORIZATION

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.

APPLICANT'S SIGNATURE

DATE

NAME, LOCATION AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)
US 17 Widening

13. NAME OF WATERBODY, IF KNOWN (if applicable)
Tributaries in the White Oak and New River Basins. See attached cover letter.

14. PROJECT STREET ADDRESS (if applicable)

15. LOCATION OF PROJECT
Onslow County North Carolina

COUNTY STATE

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

NCDOT proposes to widen US 17 from SR 1327/1410 north of Jacksonville to SR 1330/1439 south of Belgrade/Mayville

17. DIRECTIONS TO THE SITE

See attached vicinity map.

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

Highway widening

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

Upgrading US 17 in this area will help serve the purpose of US 17 being the primary north-south corridor east of I-95. It serves as a key economic development highway, a military access route and hurricane evacuation route for the coastal region of the state.

USE BLOCKS 20-22 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

Widening of the highway

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

See attached permit drawings.

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

See attached permit drawings and cover letter.

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

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

See attached property owners list on Sheets 76 and 77 of 81 in the permit drawing package. Mailing labels are attached for your convenience.

25. List of Other Certifications 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

26. Application is hereby made for a permit or permits to authorize the work described in this application. I certify that the 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.

Ray S. H. T.
SIGNATURE OF APPLICANT

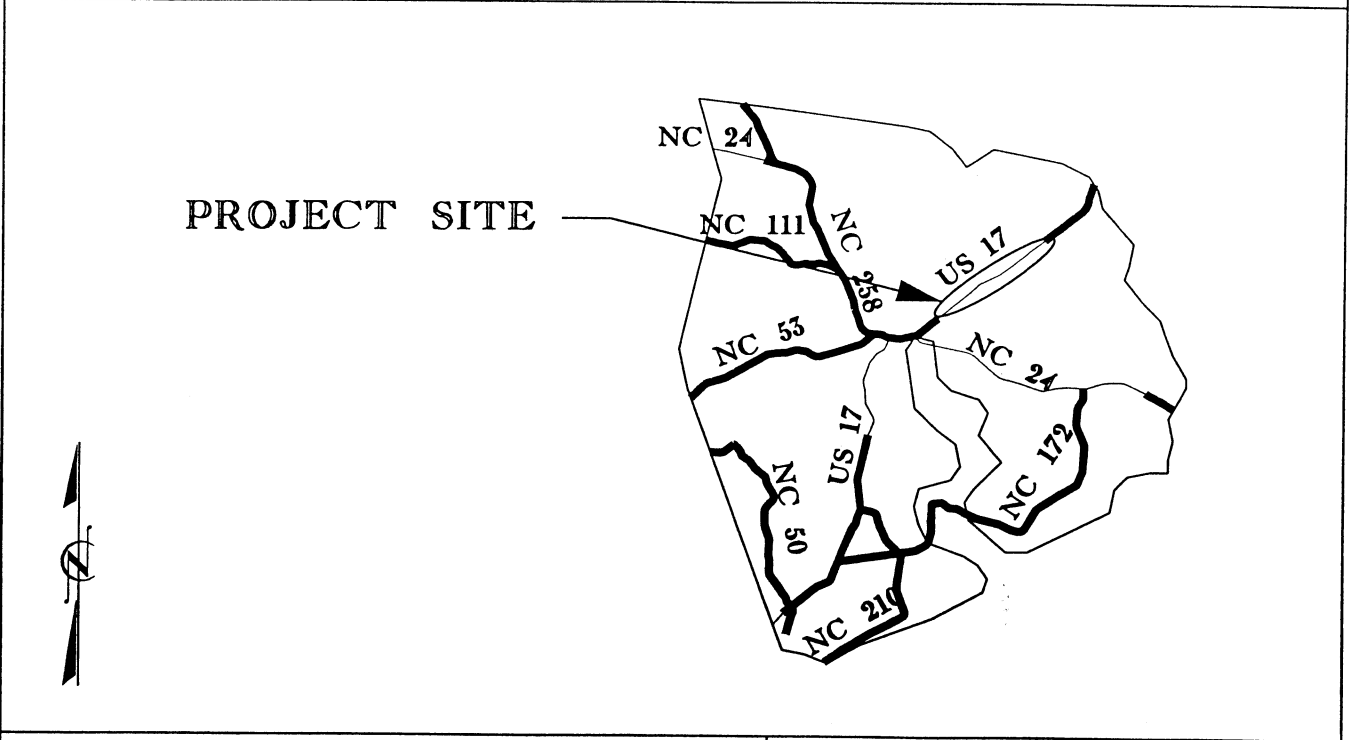
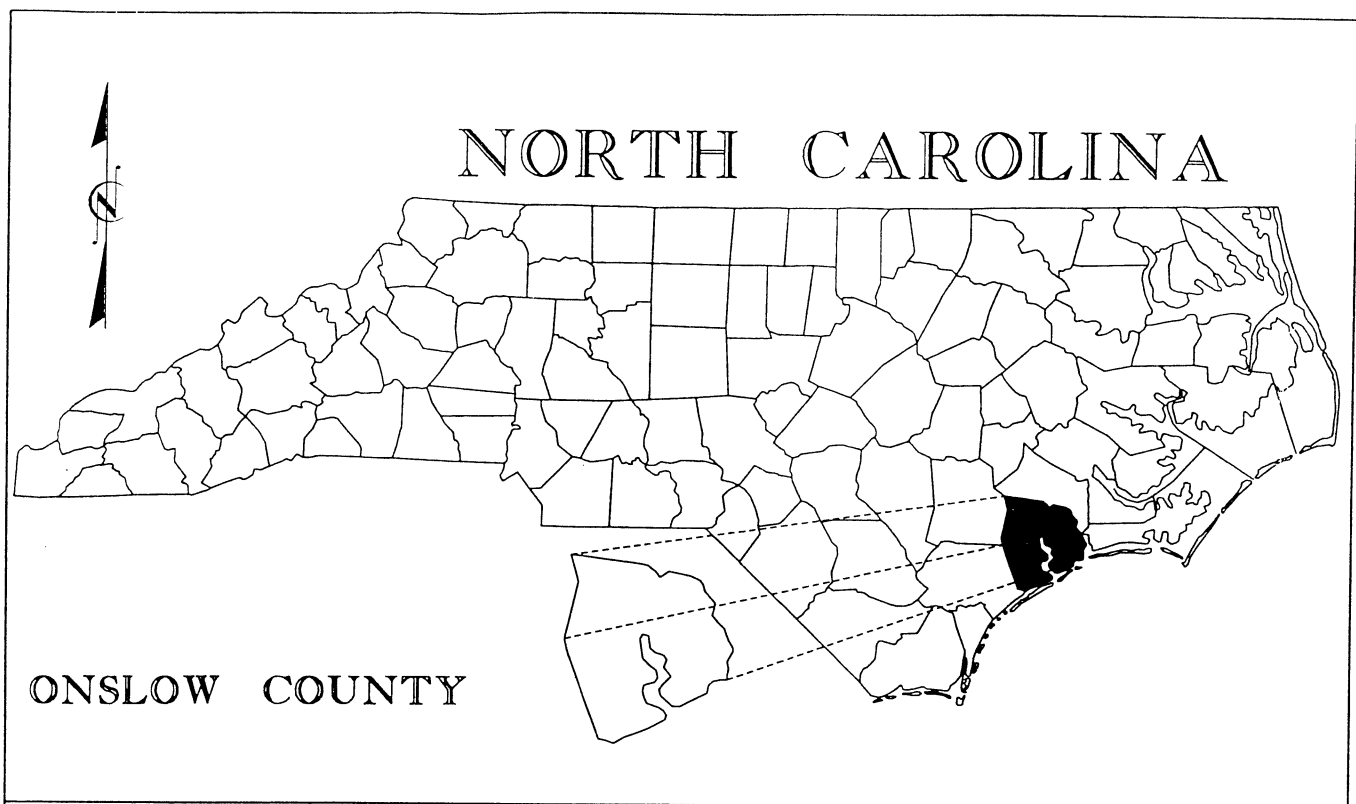
2/9/04
DATE

SIGNATURE OF AGENT

DATE

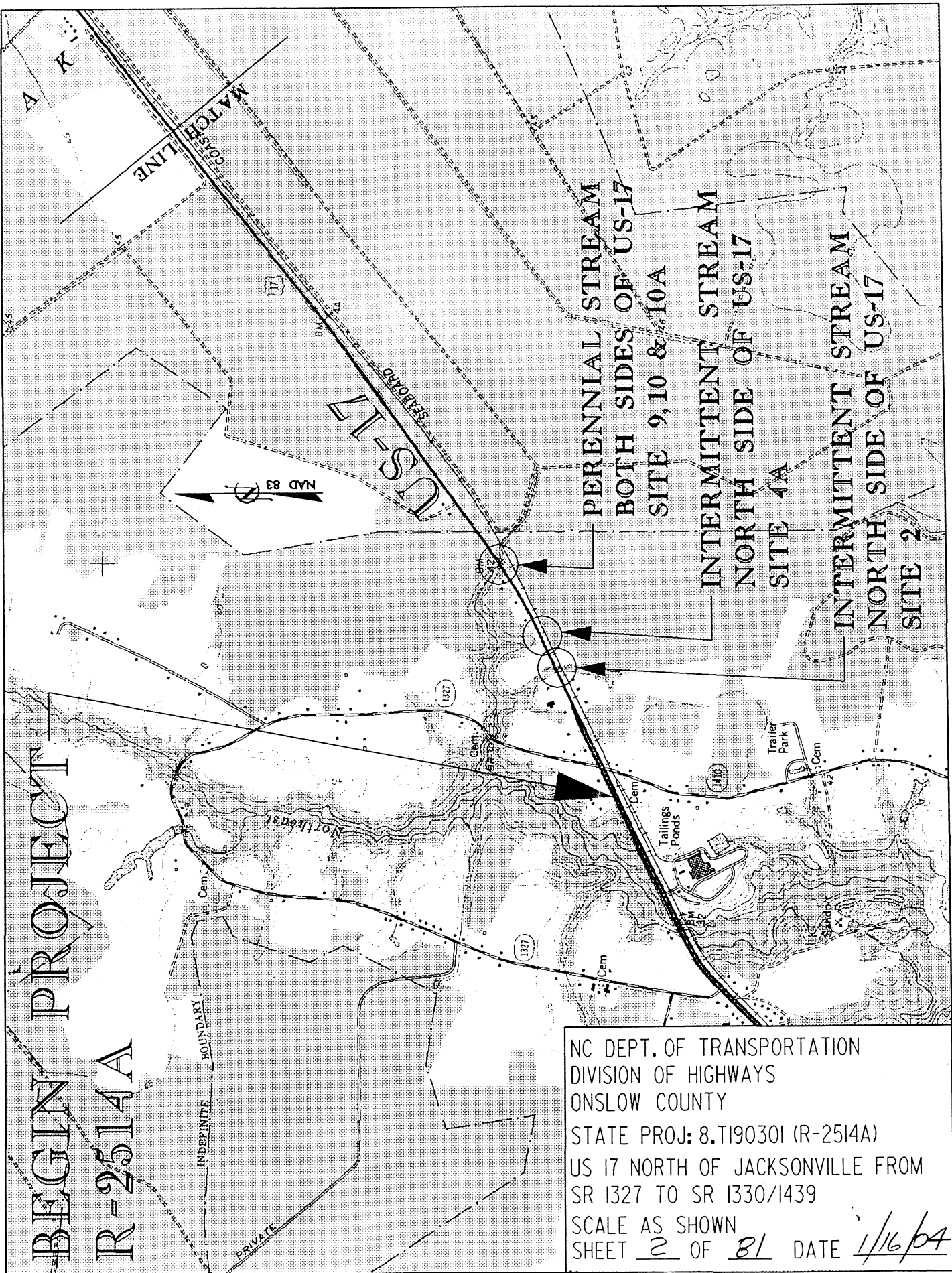
The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

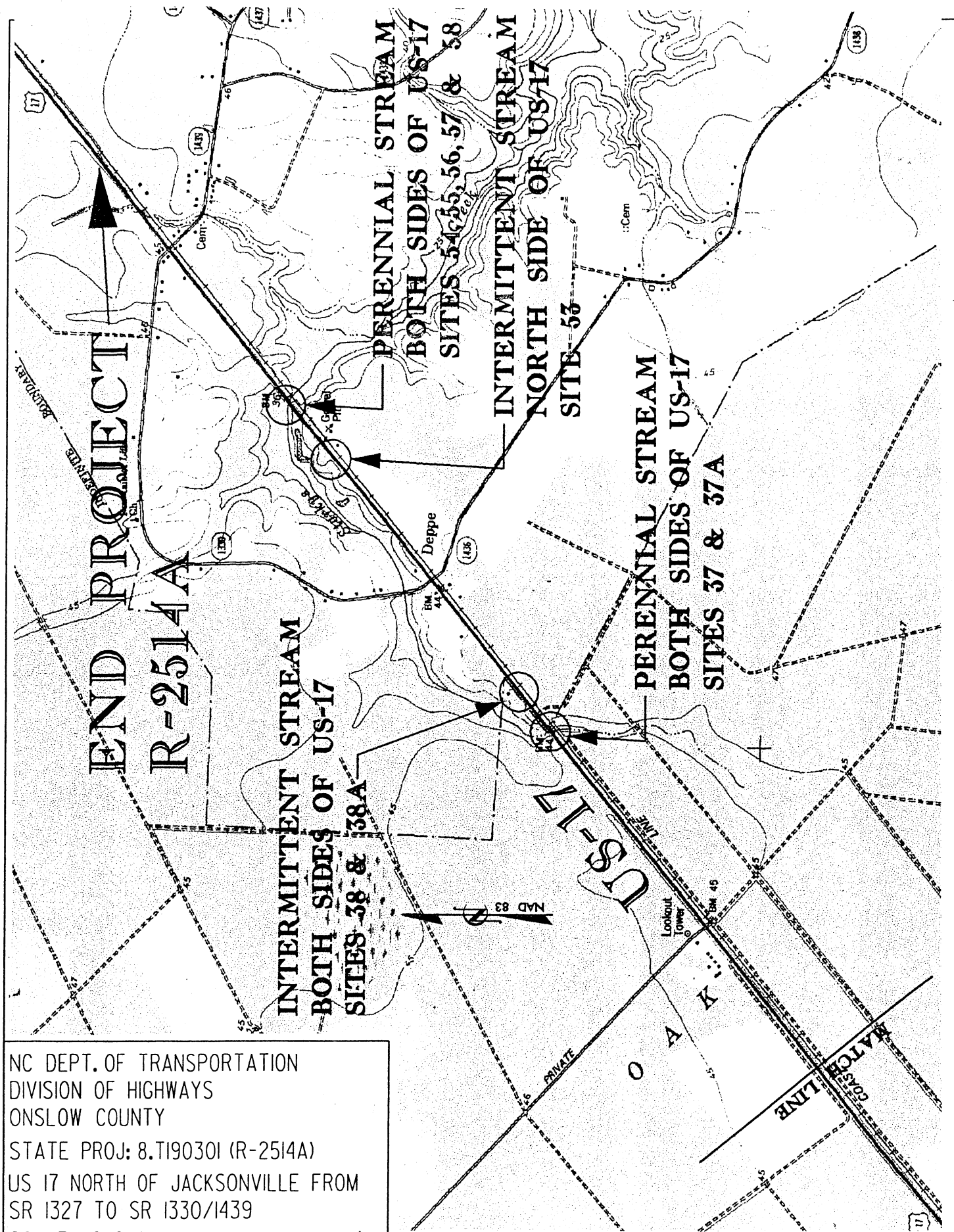
18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations 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.



VICINITY
MAP

NCDOT
DIVISION OF HIGHWAYS
ONSLOW COUNTY
PROJECT: 8.T190301 (R-2514A)
US 17 NORTH OF JACKSONVILLE
FROM SR 1327 / SR 1410
TO SR 1330 / SR 1439
SHEET **1** OF **81** DATE 7/14/03





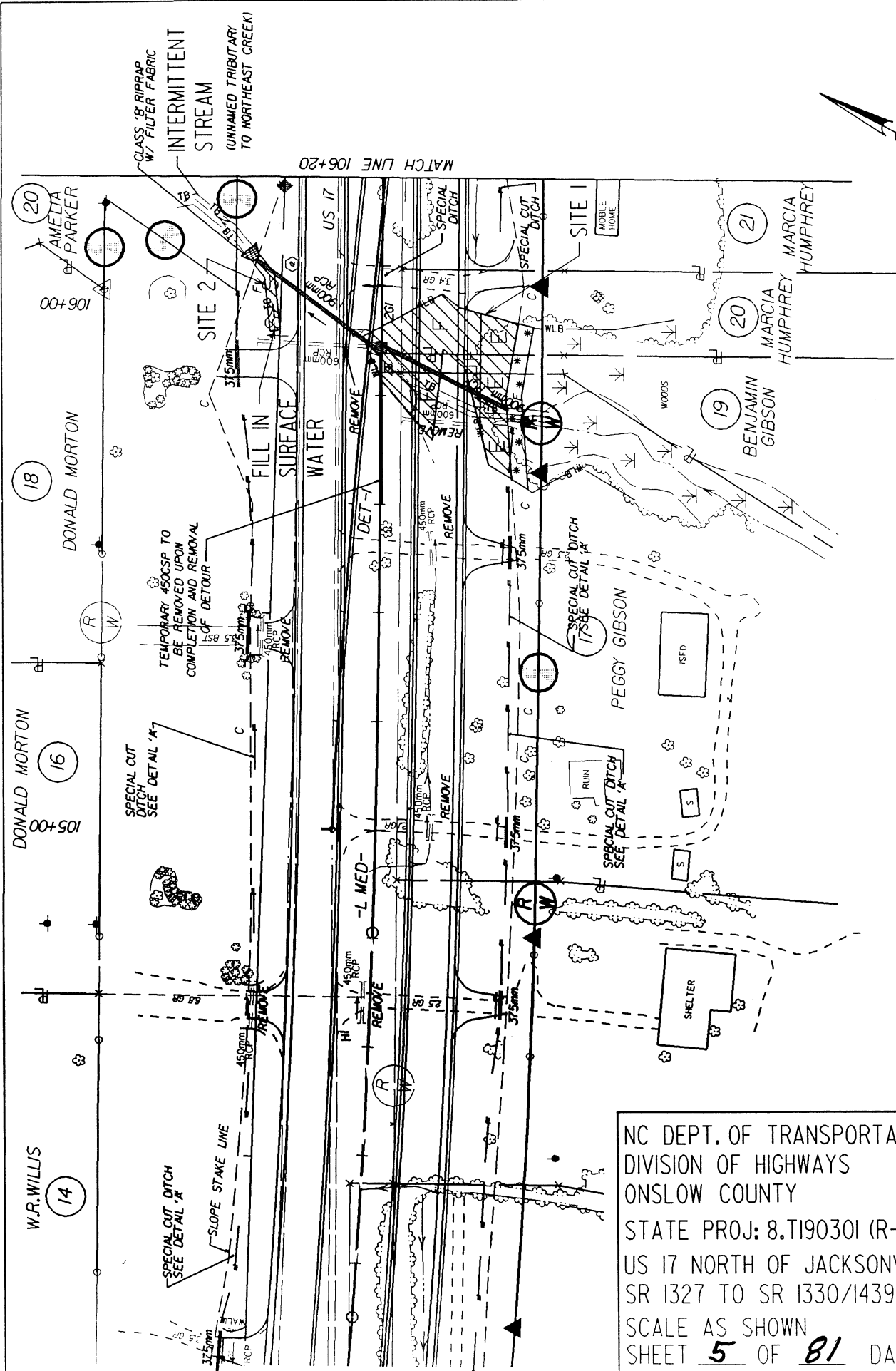
NC DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ONSLOW COUNTY
 STATE PROJ: 8.T190301 (R-2514A)
 US 17 NORTH OF JACKSONVILLE FROM
 SR 1327 TO SR 1330/1439
 SCALE AS SHOWN
 SHEET 3 OF 31 DATE 7/14/03

WETLAND LEGEND

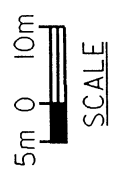
	WETLAND BOUNDARY		PROPOSED BRIDGE
	WETLAND		PROPOSED BOX CULVERT
	DENOTES FILL IN WETLAND		PROPOSED PIPE CULVERT 12"-48" PIPES 54" PIPES & ABOVE
	DENOTES FILL IN SURFACE WATER	(DASHED LINES DENOTE EXISTING STRUCTURES)	
	DENOTES FILL IN SURFACE WATER (POND)		SINGLE TREE
	DENOTES TEMPORARY FILL IN WETLAND		WOODS LINE
	DENOTES EXCAVATION IN WETLAND		DRAINAGE INLET
	DENOTES TEMPORARY FILL IN SURFACE WATER		ROOTWAD
	DENOTES DRAINED WETLAND		RIP RAP
	DENOTES MECHANIZED CLEARING		ADJACENT PROPERTY OWNER OR PARCEL NUMBER IF AVAILABLE
	FLOW DIRECTION		PREFORMED SCOUR HOLE
	TOP OF BANK		LEVEL SPREADER (LS)
	EDGE OF WATER		DITCH / GRASS SWALE
	PROP. LIMIT OF CUT		
	PROP. LIMIT OF FILL		
	PROP. RIGHT OF WAY		
	NATURAL GROUND		
	PROPERTY LINE		
	TEMP. DRAINAGE EASEMENT		
	PERMANENT DRAINAGE EASEMENT		
	EXIST. ENDANGERED ANIMAL BOUNDARY		
	EXIST. ENDANGERED PLANT BOUNDARY		
	WATER SURFACE		
	LIVE STAKES		
	BOULDER		
	CORE FIBER ROLLS		

NCDOT
DIVISION OF HIGHWAYS
ONSLOW COUNTY
PROJECT: 8.T190301 (R-2514A)
US 17 NORTH OF JACKSONVILLE
FROM SR 1327 / SR 1410
TO SR 1330 / SR 1439

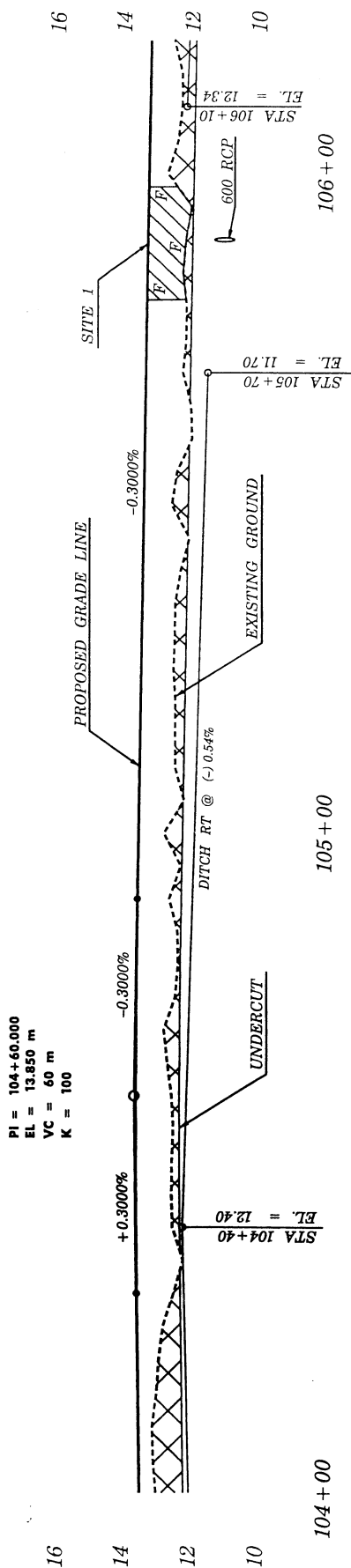
SHEET 4 OF 81 DATE 7/4/03



PLAN VIEW
SITE 1 & 2



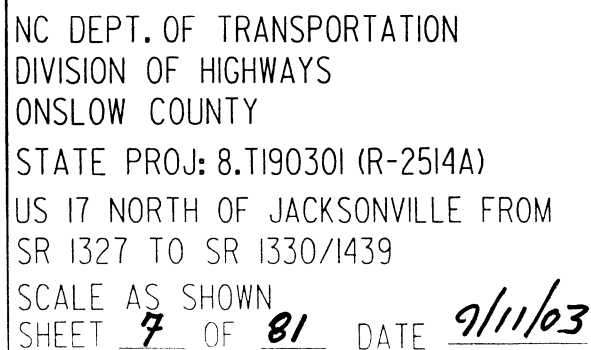
NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONSLOW COUNTY
STATE PROJ: 8.T190301 (R-2514A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439
SCALE AS SHOWN
SHEET 5 OF 81 DATE 1/16/04

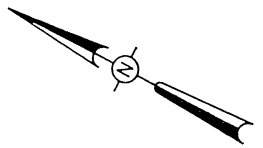
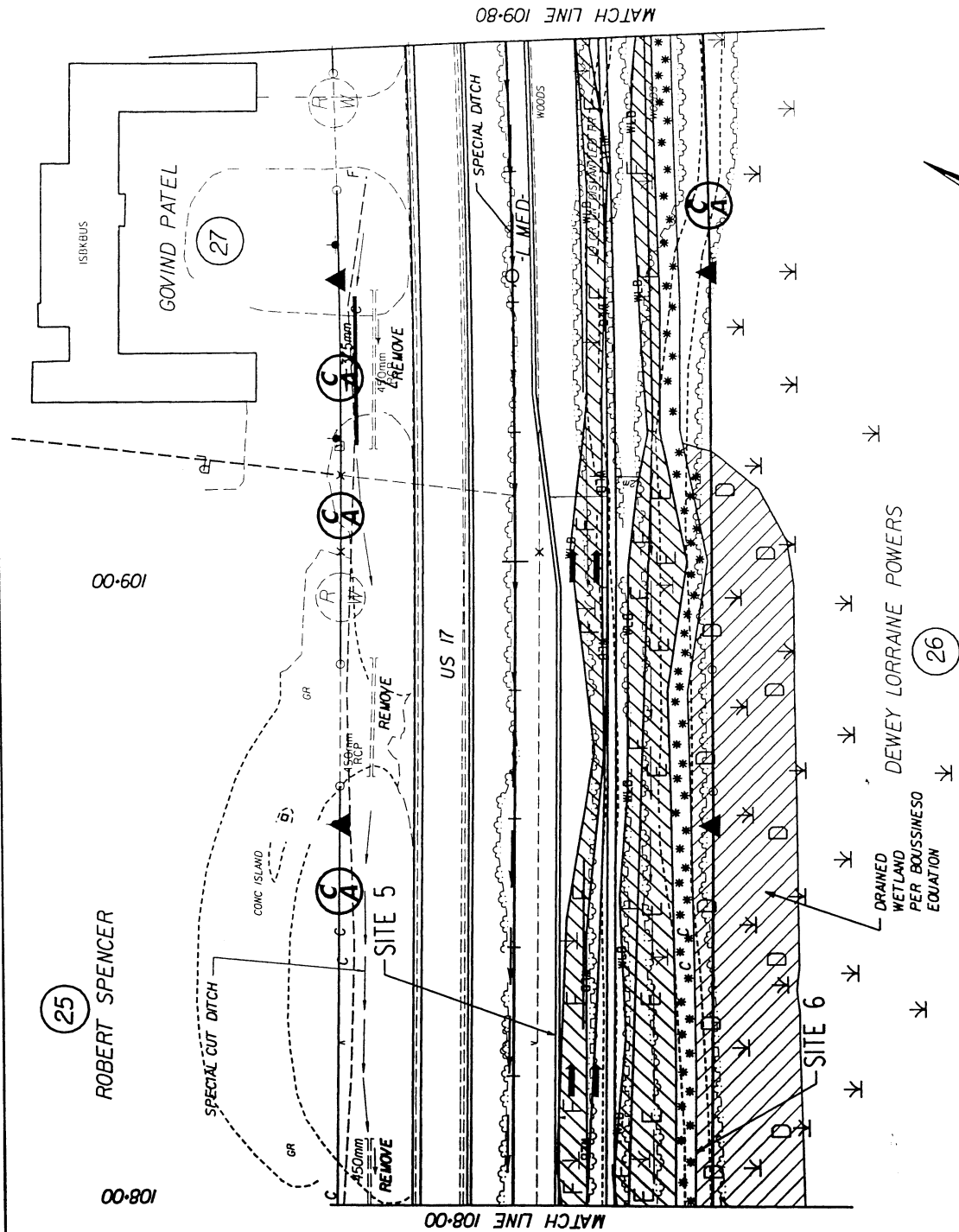


5m 0 10m
SCALE

PROFILE VIEW SITE 1

NC DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ONSLOW COUNTY
 STATE PROJ: 8.TI9030I (R-25I4A)
 US 17 NORTH OF JACKSONVILLE FROM
 SR 1327 TO SR 1330/I439
 SCALE AS SHOWN
 SHEET 6 OF 81 DATE 7/14/03

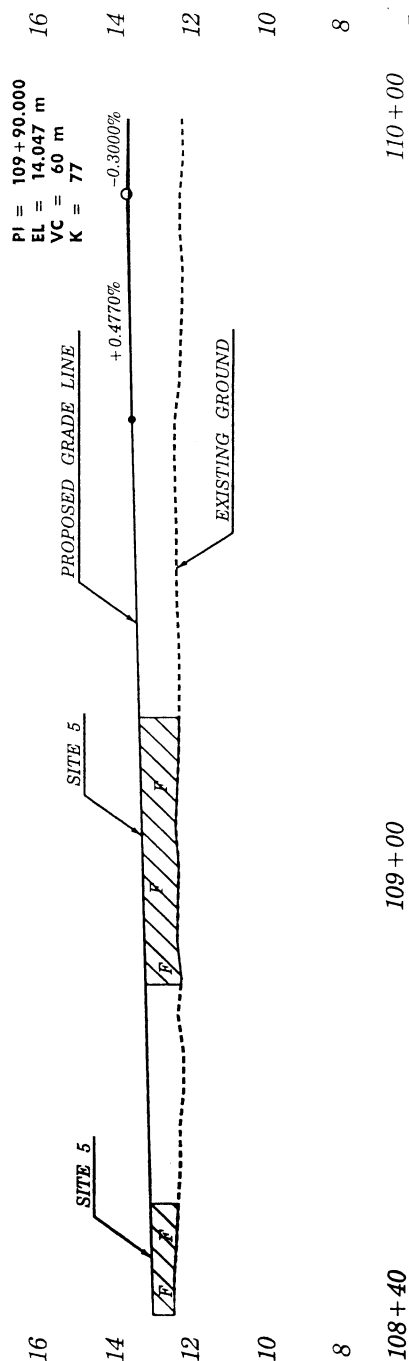
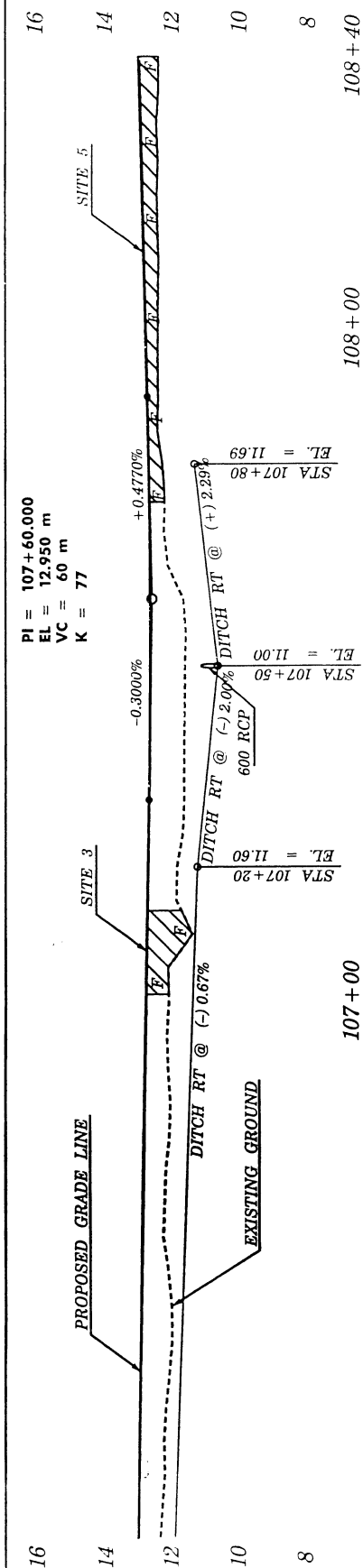




PLAN VIEW SITE 5 & 6

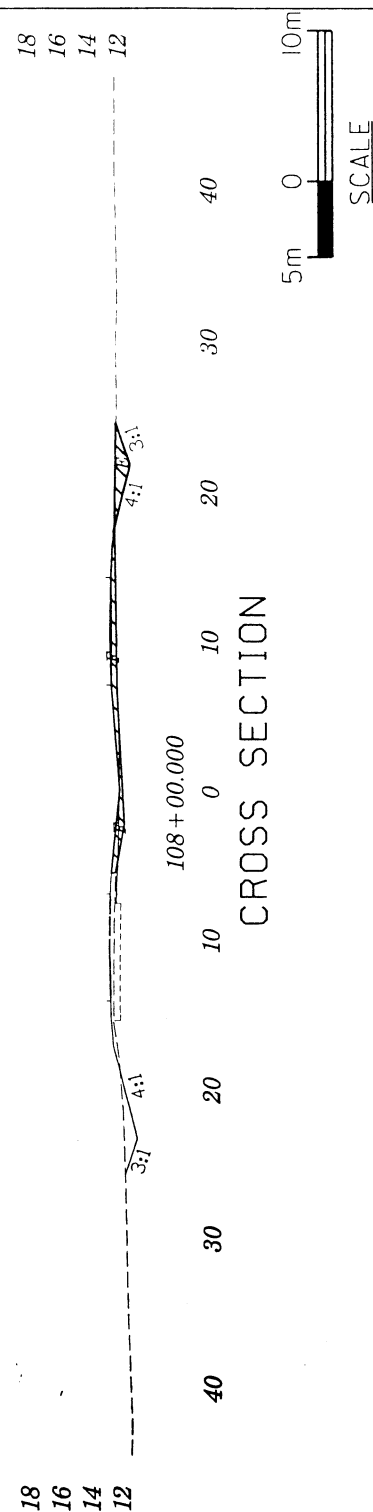
DRAINED WETLAND PER BOUSSINESQ EQUATION
SITE 6 2.43 1.5 SQ. METERS

NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONslow COUNTY
STATE PROJ: 8.TI9030I (R-25I4A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439
SCALE AS SHOWN
SHEET 8 OF 81 DATE 9/3/63

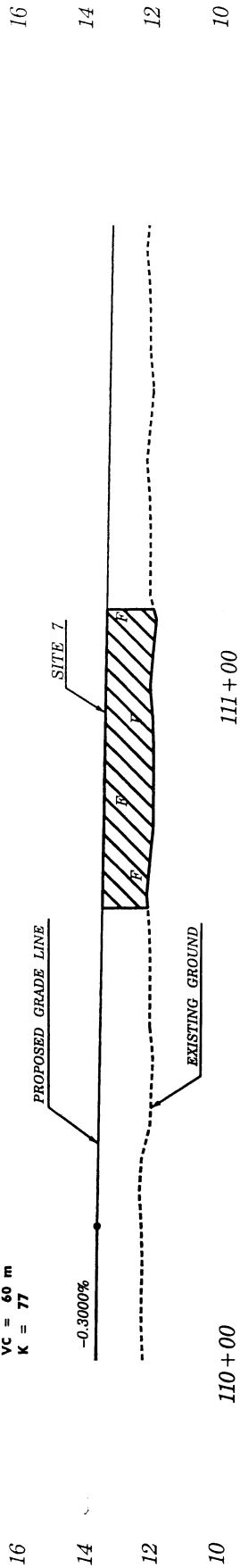


PROFILE VIEW SITES 3, 4, 4A, 5 & 6

NC DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ONSLOW COUNTY
 STATE PROJ: 8.T190301 (R-2514A)
 US 17 NORTH OF JACKSONVILLE FROM
 SR 1327 TO SR 1330/1439
 SCALE AS SHOWN
 SHEET 9 OF 81 DATE 7/14/03

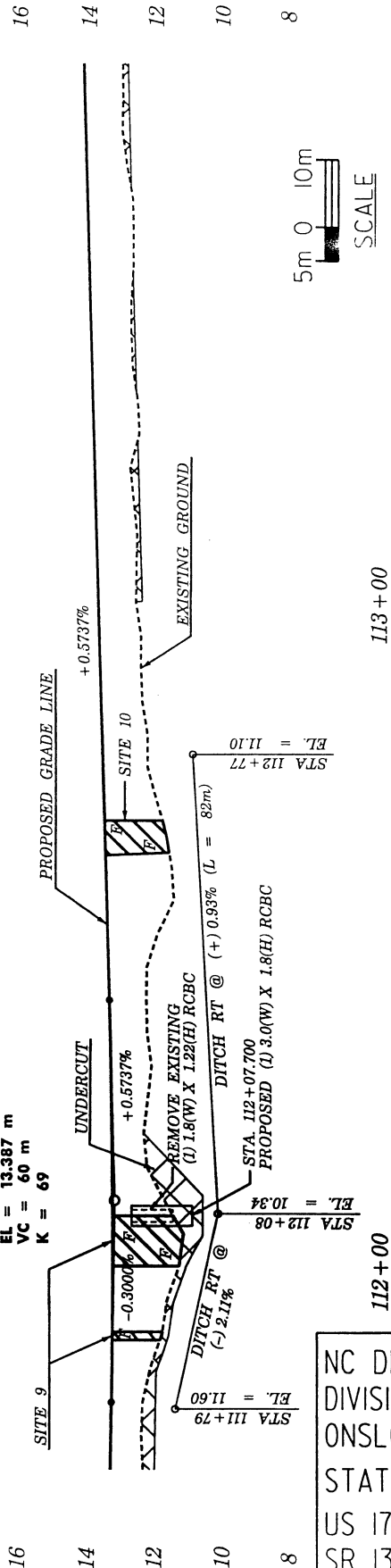


PI = 109+90.000
 EL = 14.047 m
 VC = 60 m
 K = 77

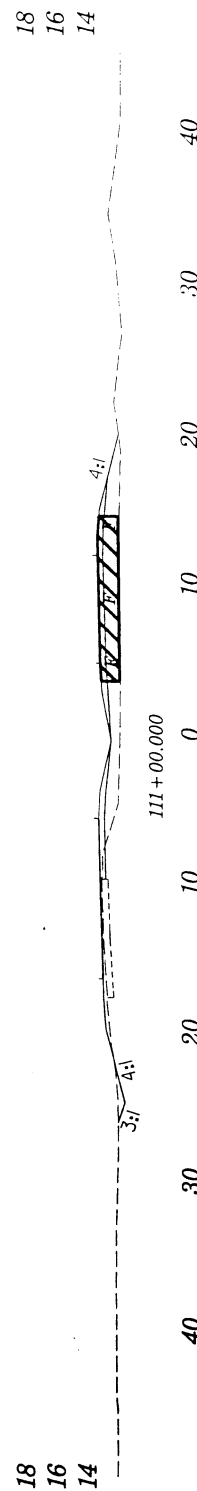


PROFILE VIEW SITES 7, 9 & 10

PI = 112+10.000
 EL = 13.387 m
 VC = 60 m
 K = 69



SCALE

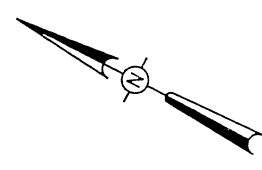
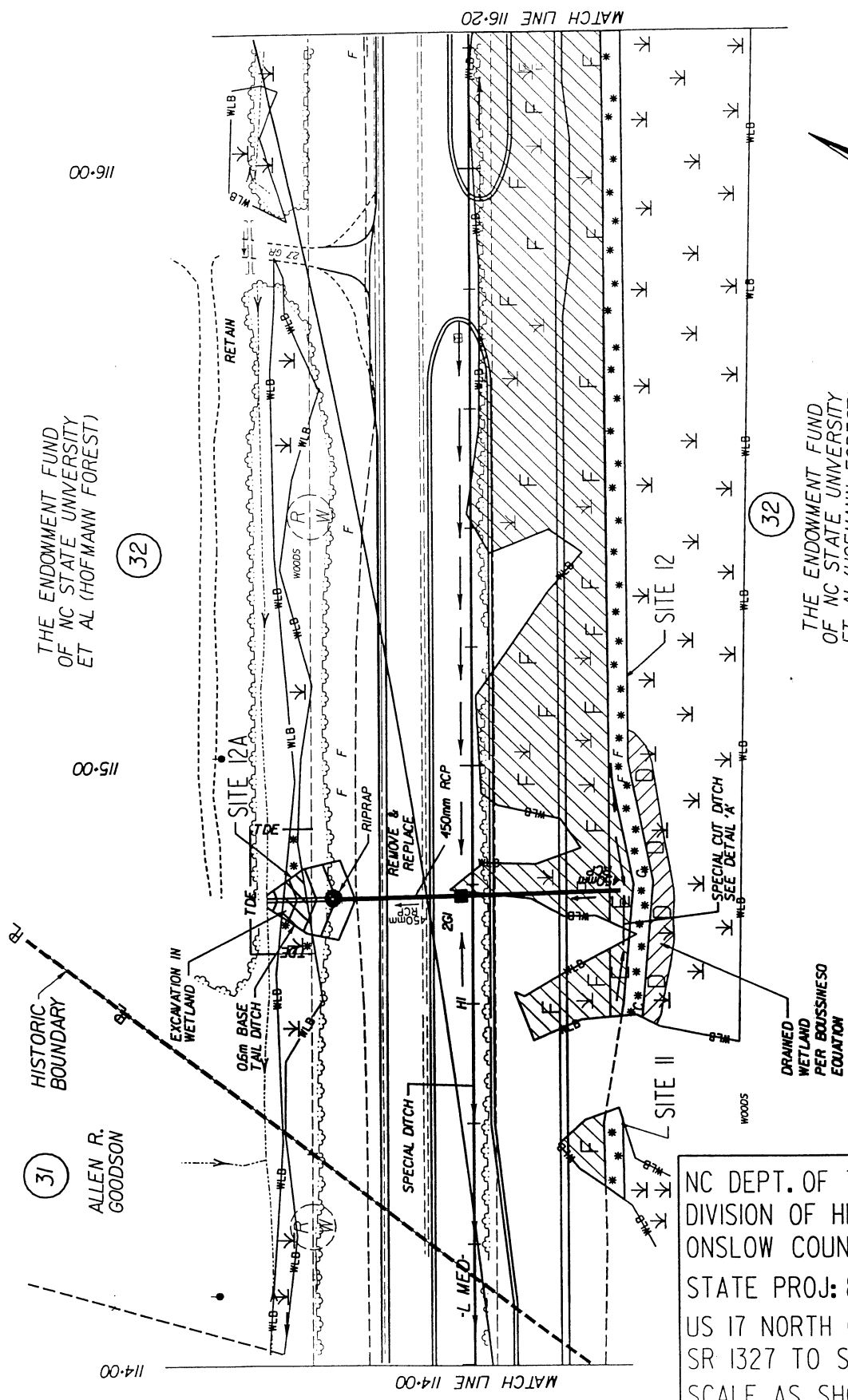


CROSS SECTION



SCALE

NC DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ONSLOW COUNTY
 STATE PROJ: 8.TI9030I (R-25I4A)
 US 17 NORTH OF JACKSONVILLE FROM
 SR 1327 TO SR 1330/1439
 SCALE AS SHOWN
 SHEET 12 OF 81 DATE 7/14/03



PLAN VIEW
SITE 11, 12, & 12A

THE ENDOWMENT FUND
OF NC STATE UNIVERSITY
ET AL (HOFMANN FOREST)

DRAINED WETLAND PER BOUSSINESQ EQUATION	
SITE 12	171.6 SQ. METERS

NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ON SLOW COUNTY
STATE PROJ: 8.T190301 (R-2514A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439
SCALE AS SHOWN
SHEET 13 OF 81 DATE 9/3/03

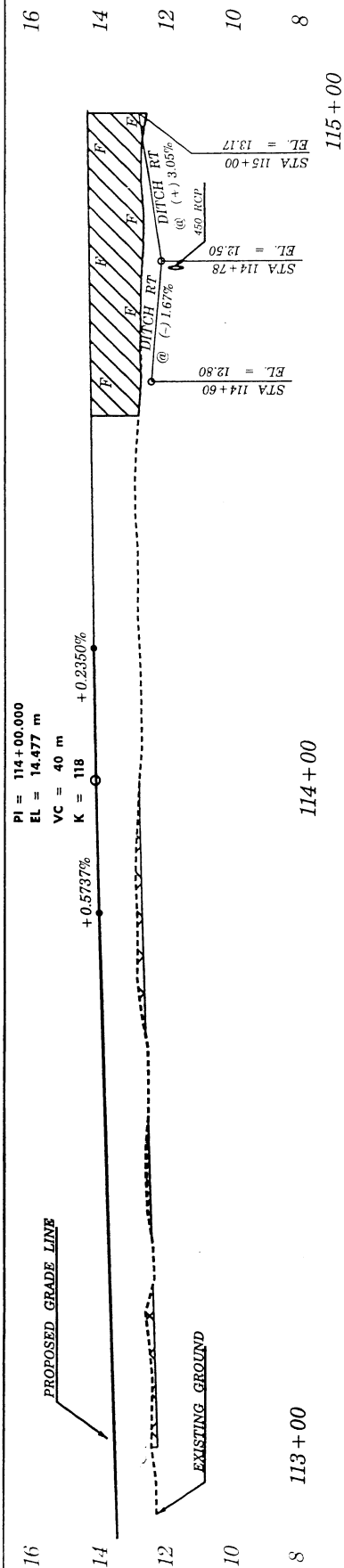
THE ENDOWMENT FUND
OF NC STATE UNIVERSITY
ET AL (HOFMANN FOREST)

32

32

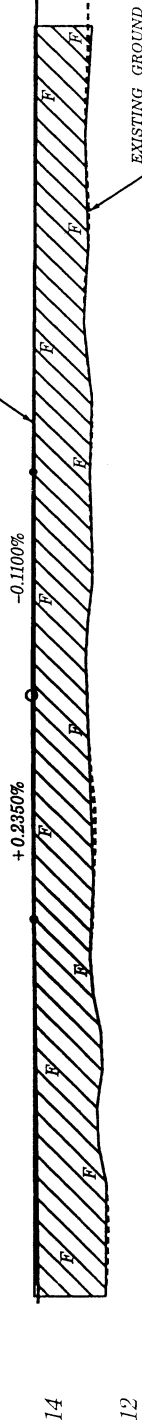
31

ALLEN R.
GOODSON

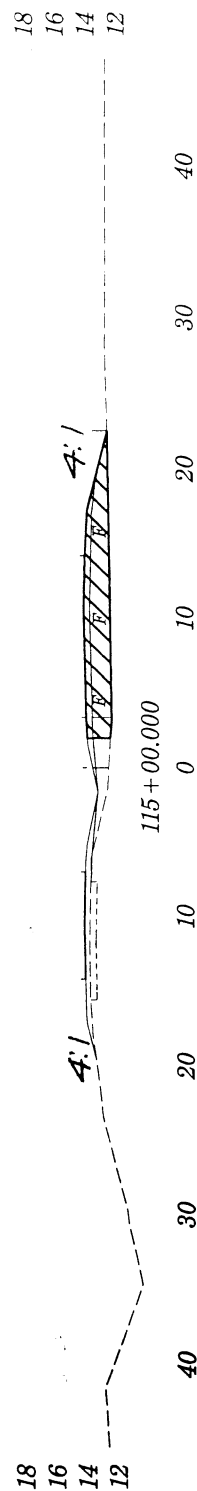


$PI = 115+80.000$
 $EL = 14.900 \text{ m}$
 $VC = 60 \text{ m}$
 $K = 174$

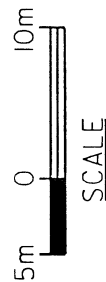
PROPOSED GRADE LINE



PROFILE VIEW SITE 12



CROSS SECTION



NC DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ONSLOW COUNTY

STATE PROJ: 8.T190301 (R-2514A)

US 17 NORTH OF JACKSONVILLE FROM
 SR 1327 TO SR 1330/1439

SCALE AS SHOWN

SHEET 14 OF 81 DATE 7/14/03

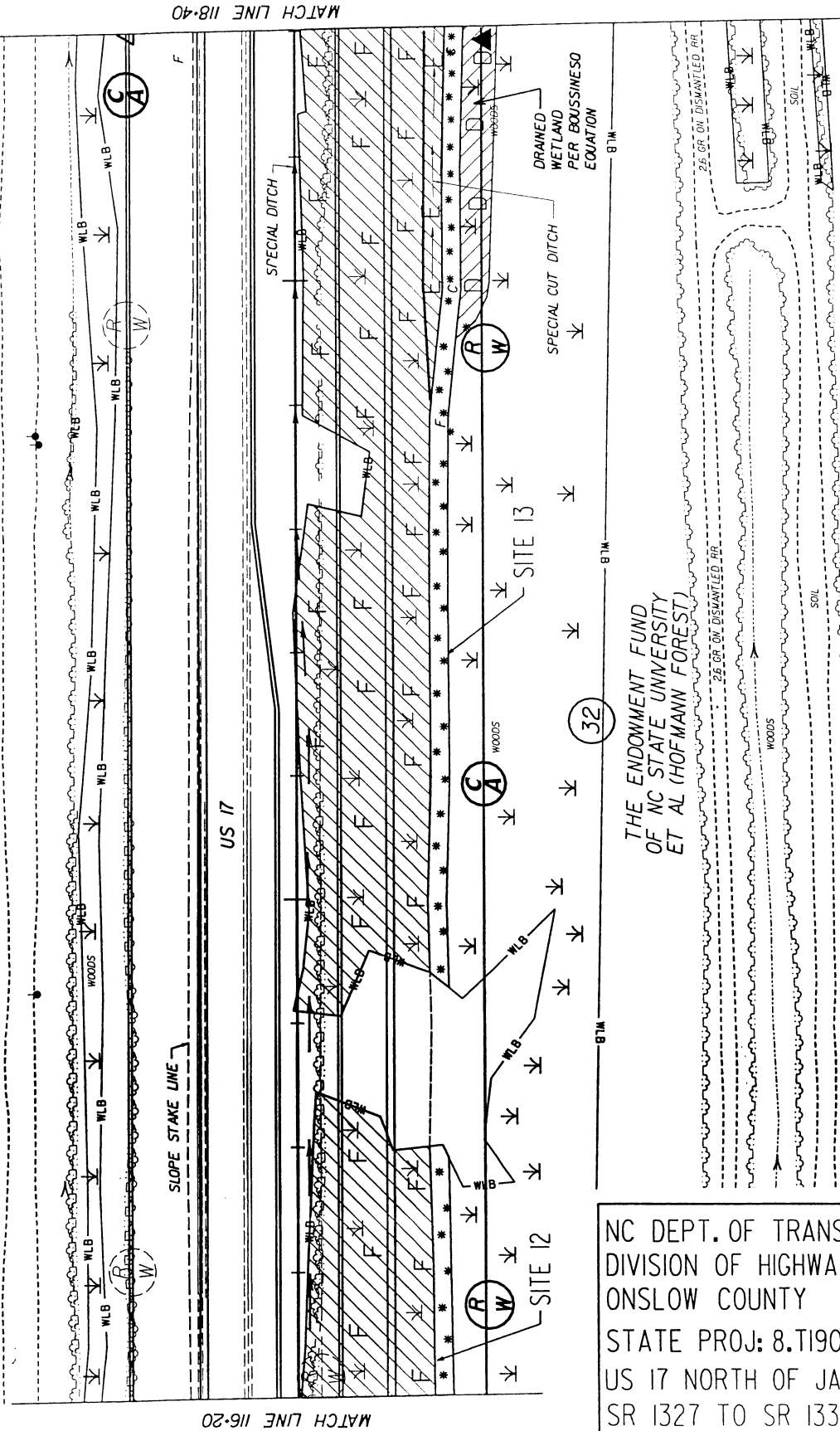
REV 8/19/03

17-00

THE ENDOWMENT FUND
OF NC STATE UNIVERSITY
ET AL (HOFMANN FOREST)

32

118-00



MATCH LINE 116-20

MATCH LINE 118-40

US 17

SITE 12

SITE 13

NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONslow COUNTY

STATE PROJ: 8.TI9030I (R-2514A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439

SCALE AS SHOWN

SHEET 15 OF 81

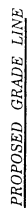
DATE

9/3/03

PLAN VIEW
SITE 12 & 13

5m 0 10m
SCALE

DRAINED WETLAND PER BOUSSINESQ EQUATION
SITE 13 884.7 SQ. METERS



$PI = 120 + 00.000$
 $EL = 14.438 \text{ m}$
 $VC = 60 \text{ m}$
 $K = 203$

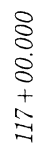
RT @

(+) 1.40%

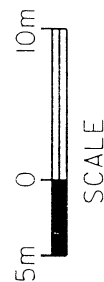
(+) 1.40%

 $+0.1852\%$

PROFILE VIEW
SITE 13



CROSS SECTION



NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONslow COUNTY

STATE PROJ: 8.TI9030I (R-25I4A)

US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439

SCALE AS SHOWN

SHEET 16 OF 81

REV 8/19/03
DATE 7/14/03

THE ENDOWMENT FUND
OF NC STATE UNIVERSITY
ET AL (HOFMANN FOREST)

32

12m BASE TAIL DITCH
CLASS 'B' RIPRAP
W/ FILTER FABRIC

119+00
2.9 GR

120+00

SITE 13A
EXCAVATION
IN WETLAND

REPLACE 750
WITH 750 RCP

MATCH LINE 118+40

MATCH LINE 120+40

US 17

301

L MED

SPECIAL CUT DITCH
DRAINED WETLAND
PER BOUSSINESQ
EQUATION

SITE 14

SITE 13

THE ENDOWMENT FUND
OF NC STATE UNIVERSITY
ET AL (HOFMANN FOREST)

32

5m 0 10m
SCALE

PLAN VIEW
SITE 13, 13A & 14

DRAINED WETLAND PER BOUSSINESQ EQUATION	
SITE 13	884.7 SQ. METERS

NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ON SLOW COUNTY
STATE PROJ: 8.T190301 (R-2514A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439
SCALE AS SHOWN
SHEET 17 OF 81 DATE 9/3/03

32



PLAN VIEW
SITE 14

SHEET 19 OF 81 DATE 7/14/03

THE ENDOWMENT FUND
OF NC STATE UNIVERSITY
ET AL (HOFMANN FOREST)

---bg file---

00.921

MATCH LINE 126.40

MATCH LINE 124.40

NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ON SLOW COUNTY
STATE PROJ: 8.TI9030I (R-25I4A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439
SCALE AS SHOWN
SHEET 20 OF 81 DATE 7/14/03

PLAN VIEW
SITE 14, 15, 15A & 16

5m 0 10m

SCALE

THE ENDOWMENT FUND
OF NC STATE UNIVERSITY
ET AL (HOFMANN FOREST)

32

SITE 16

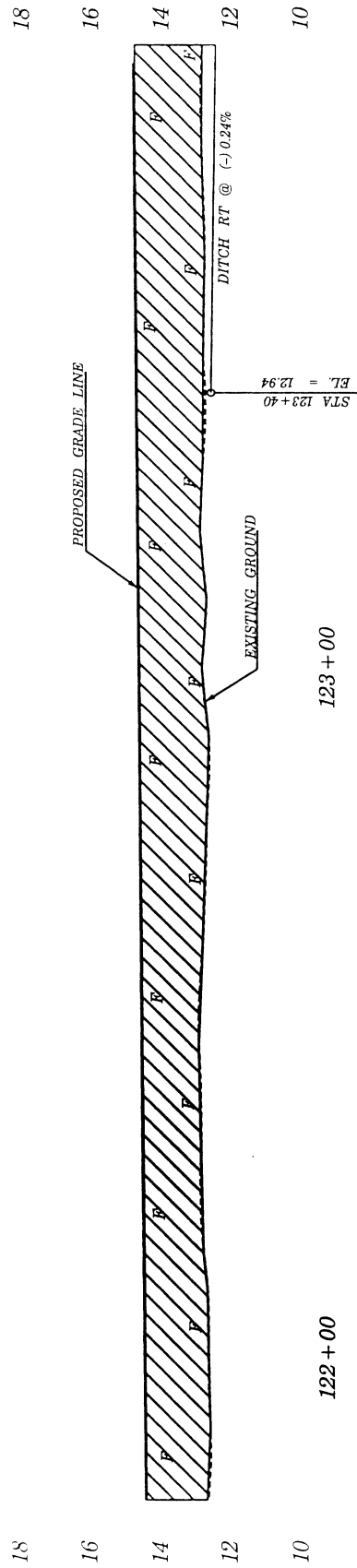
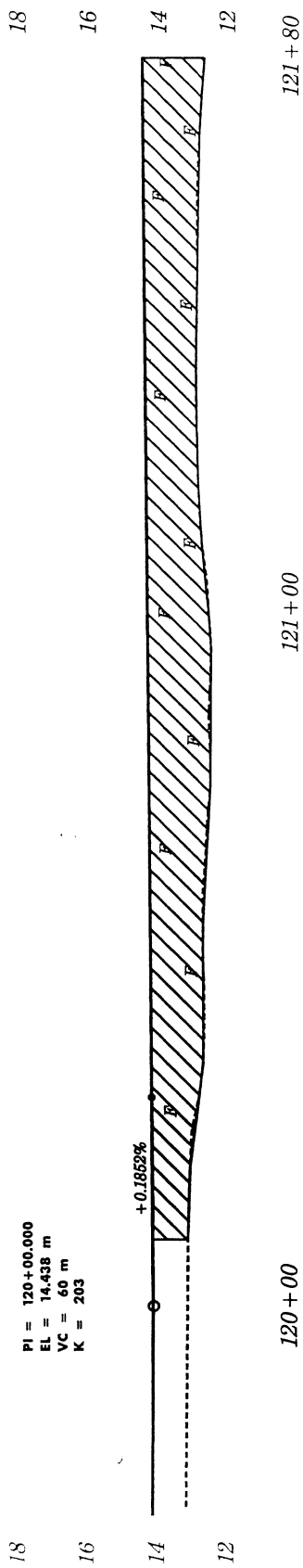
SITE 15

Y SITE 14

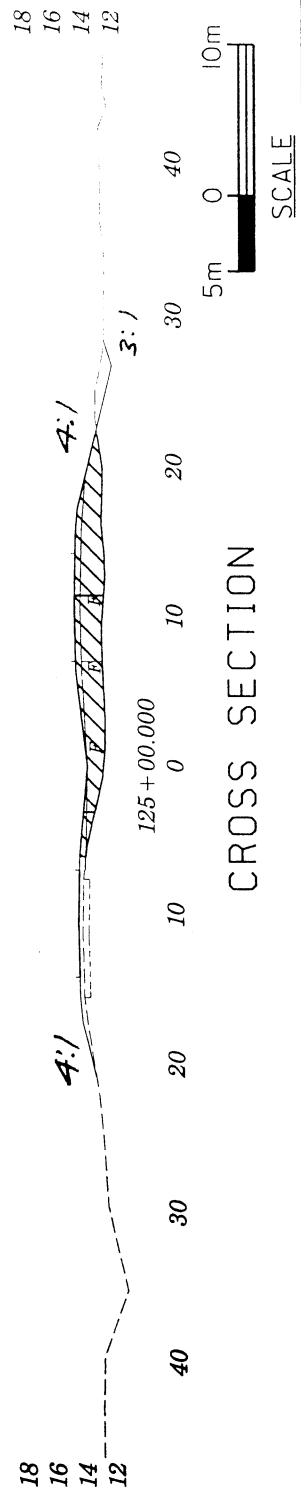
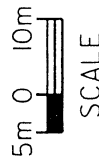
-SLOPE STAKE LINE

SLOPE STAKE LINE

32



PROFILE VIEW
SITE 14

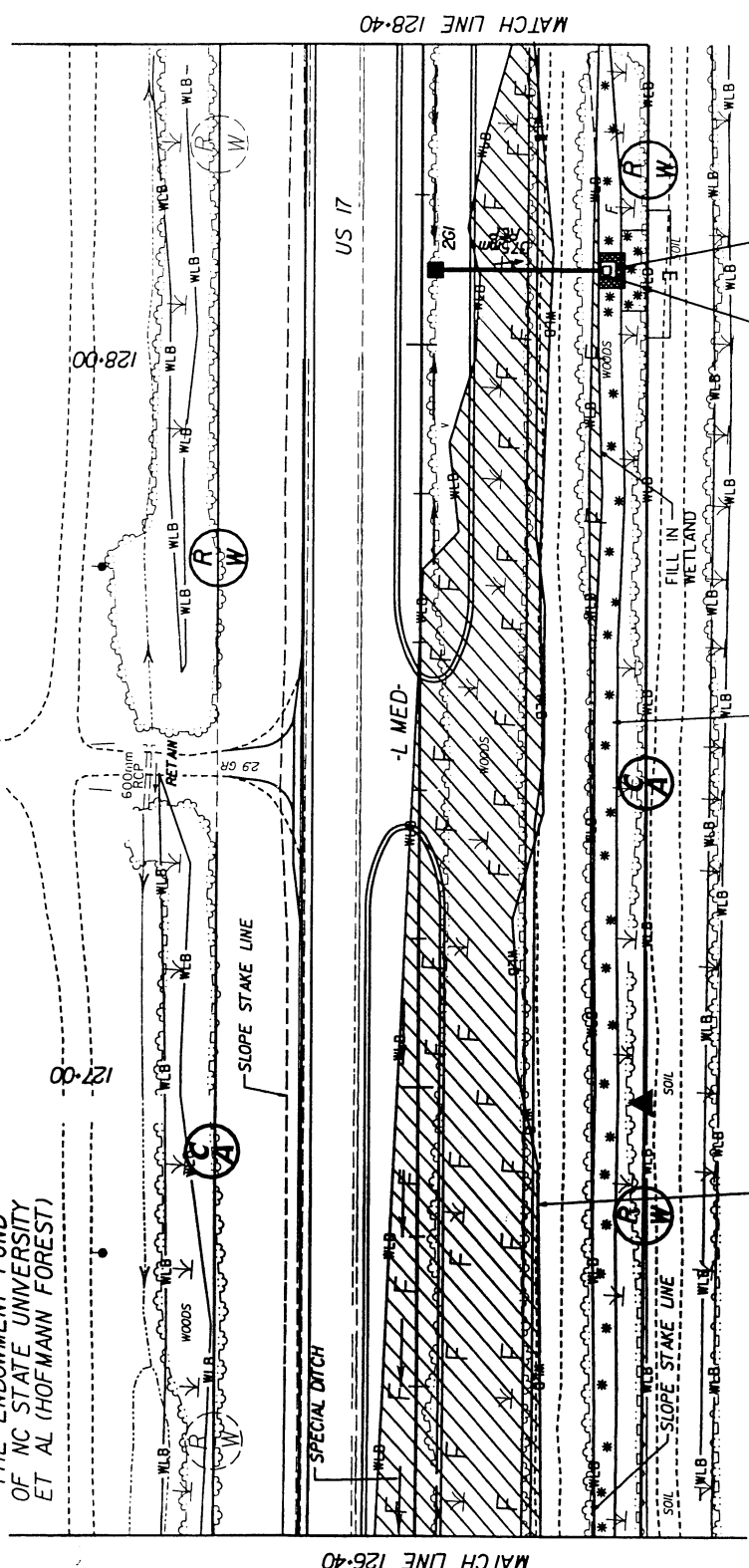


CROSS SECTION

NC DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ONSLOW COUNTY
 STATE PROJ: 8.T190301 (R-2514A)
 US 17 NORTH OF JACKSONVILLE FROM
 SR 1327 TO SR 1330/1439
 SCALE AS SHOWN
 SHEET 21 OF 81 DATE 7/14/03

32

THE ENDOWMENT FUND
OF NC STATE UNIVERSITY
ET AL (HOFMANN FOREST)



NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONSLOW COUNTY
STATE PROJ: 8.T190301 (R-2514A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439
SCALE AS SHOWN
SHEET 22 OF 81 DATE 7/14/03

SITE 14

SITE 16

32

THE ENDOWMENT FUND
OF NC STATE UNIVERSITY
ET AL (HOFMANN FOREST)



PLAN VIEW
SITE 14 & 16

PI = 124+60.000
EL = 15.290 m

+0.1852% -0.3000%

DITCH RT @ (-) 0.24%

STA 125+68
EL. = 12.40

124+00

125+00

126+00

PI = 126+00.000
EL = 14.870 m

PI = 127+40.000
EL = 15.290 m

+0.3000%

+0.3000%

-0.0129%

PROPOSED GRADE LINE

EXISTING GROUND

126+00

127+00

128+00

NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONSLOW COUNTY
STATE PROJ: 8.T190301 (R-2514A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439
SCALE AS SHOWN
SHEET **23** OF **81** DATE **7/14/03**

18

16

14

12

PROPOSED GRADE LINE

EXISTING GROUND

128+60

129+00

130+00

PROFILE VIEW
SITE 14

5m 0 10m
SCALE

THE ENDOWMENT FUND
OF NC STATE UNIVERSITY
ET AL (HOFMANN FOREST)

32

29 GR

129-00

130-00

MATCH LINE 130-40

MATCH LINE 128-40

US 17

US 17

SPECIAL DITCH

SPECIAL DITCH

-L MED-

261

27 GR ON DISMANTLED RR

47 SDW

SITE 16

SITE 18

SITE 14

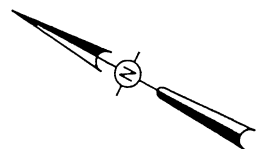
SITE 16

CLASS 'B' RIPRAP
W/ FILTER FABRIC

EXCAVATION
IN WETLAND
DRAINED
WETLAND

32

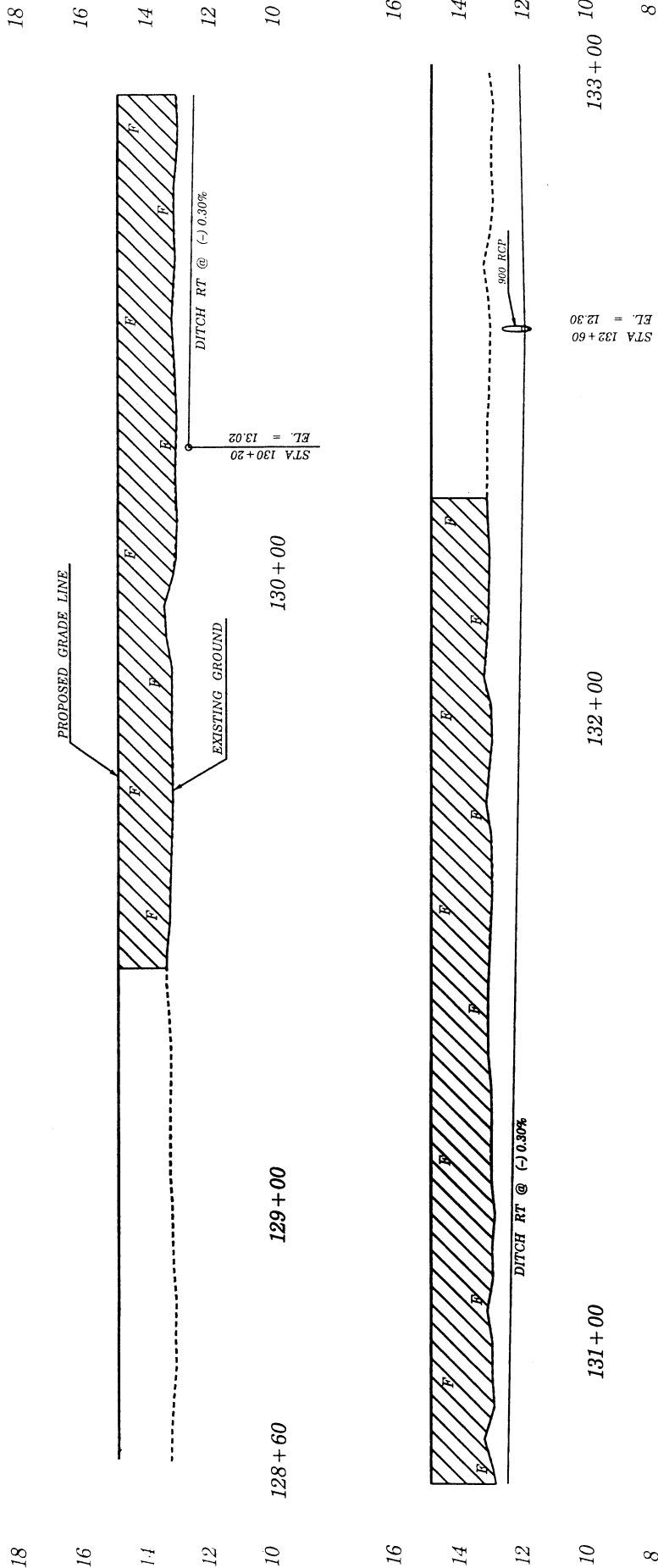
THE ENDOWMENT FUND
OF NC STATE UNIVERSITY
ET AL (HOFMANN FOREST)



5m 0 10m
SCALE

PLAN VIEW
SITE 14, 16, & 18

NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONSLOW COUNTY
STATE PROJ: 8.T190301 (R-2514A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439
SCALE AS SHOWN
SHEET 24 OF 81 DATE 7/14/03



PROFILE VIEW SITE 18



CROSS SECTION

NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONSLOW COUNTY

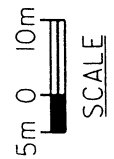
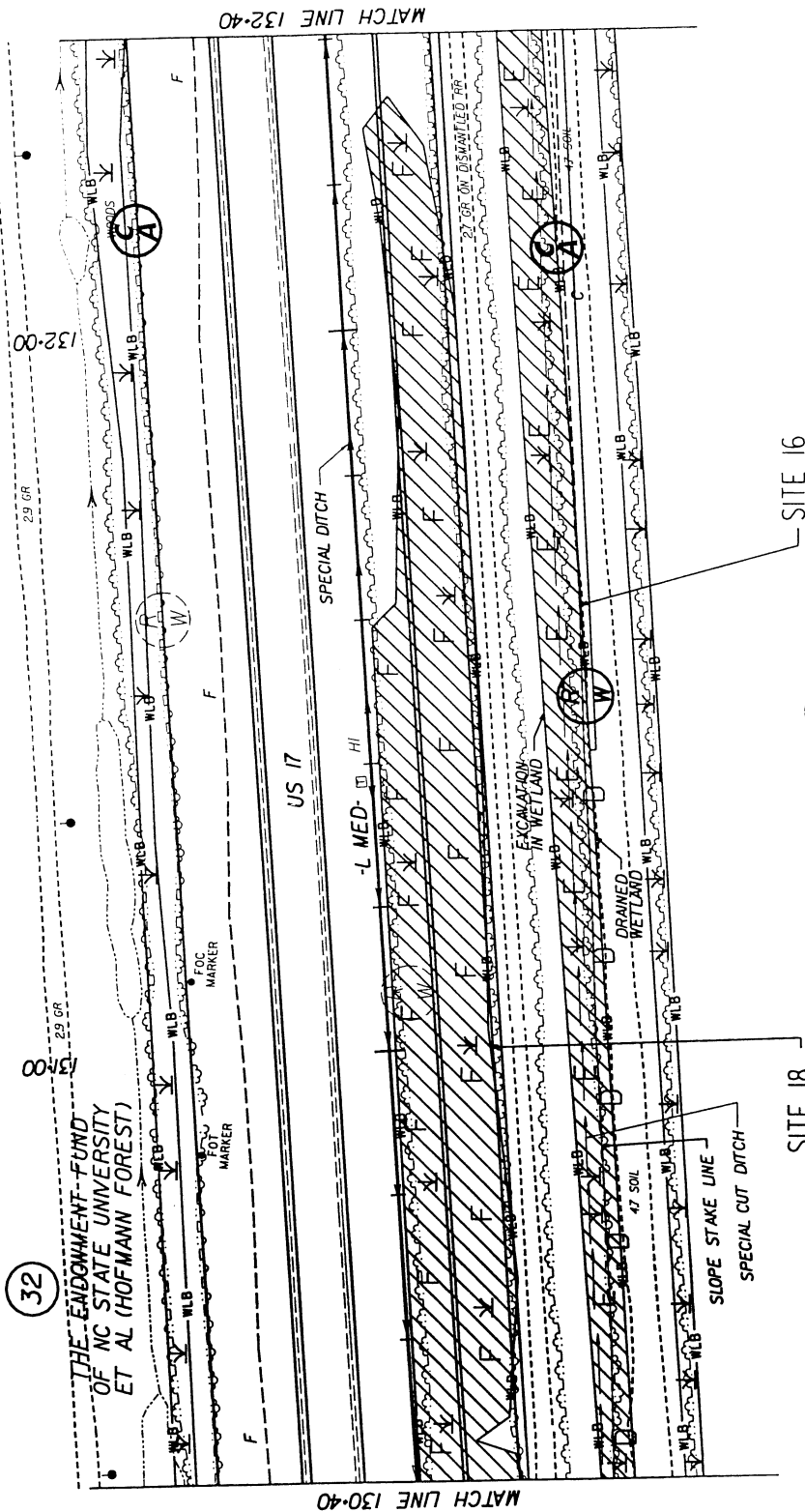
STATE PROJ: 8.TI9030I (R-25I4A)

US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439

SCALE AS SHOWN

SHEET 25 OF 81

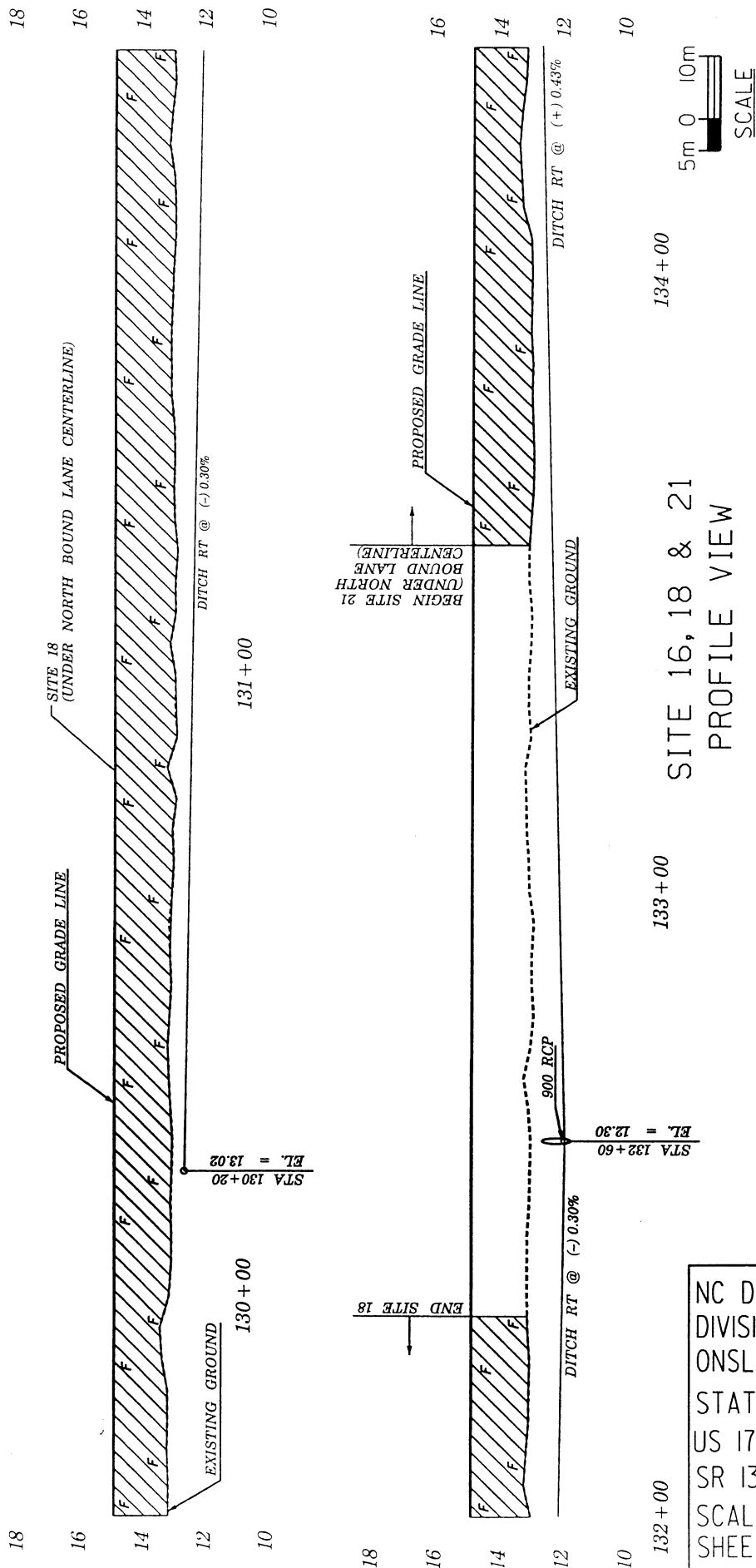
REV 8/19/03
DATE 7/14/03



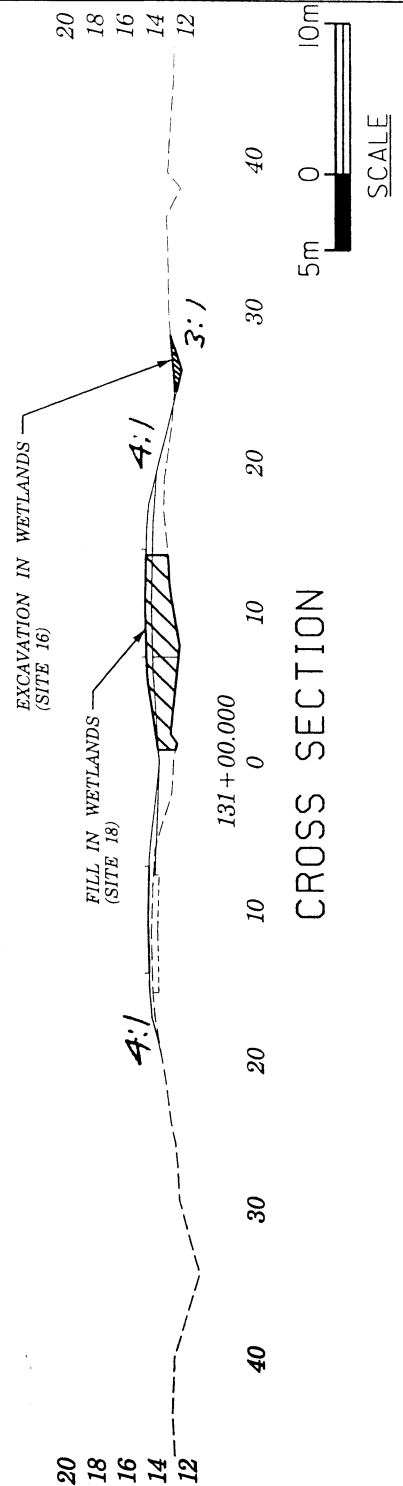
PLAN VIEW
SITE 16 & 18

32
THE ENDOWMENT FUND
OF NC STATE UNIVERSITY
ET AL (HOFMANN FOREST)

NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONSLOW COUNTY
STATE PROJ: 8.T190301 (R-2514A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439
SCALE AS SHOWN
SHEET 26 OF 81 DATE 7/14/03



SITE 16, 18 & 21 PROFILE VIEW



CROSS SECTION

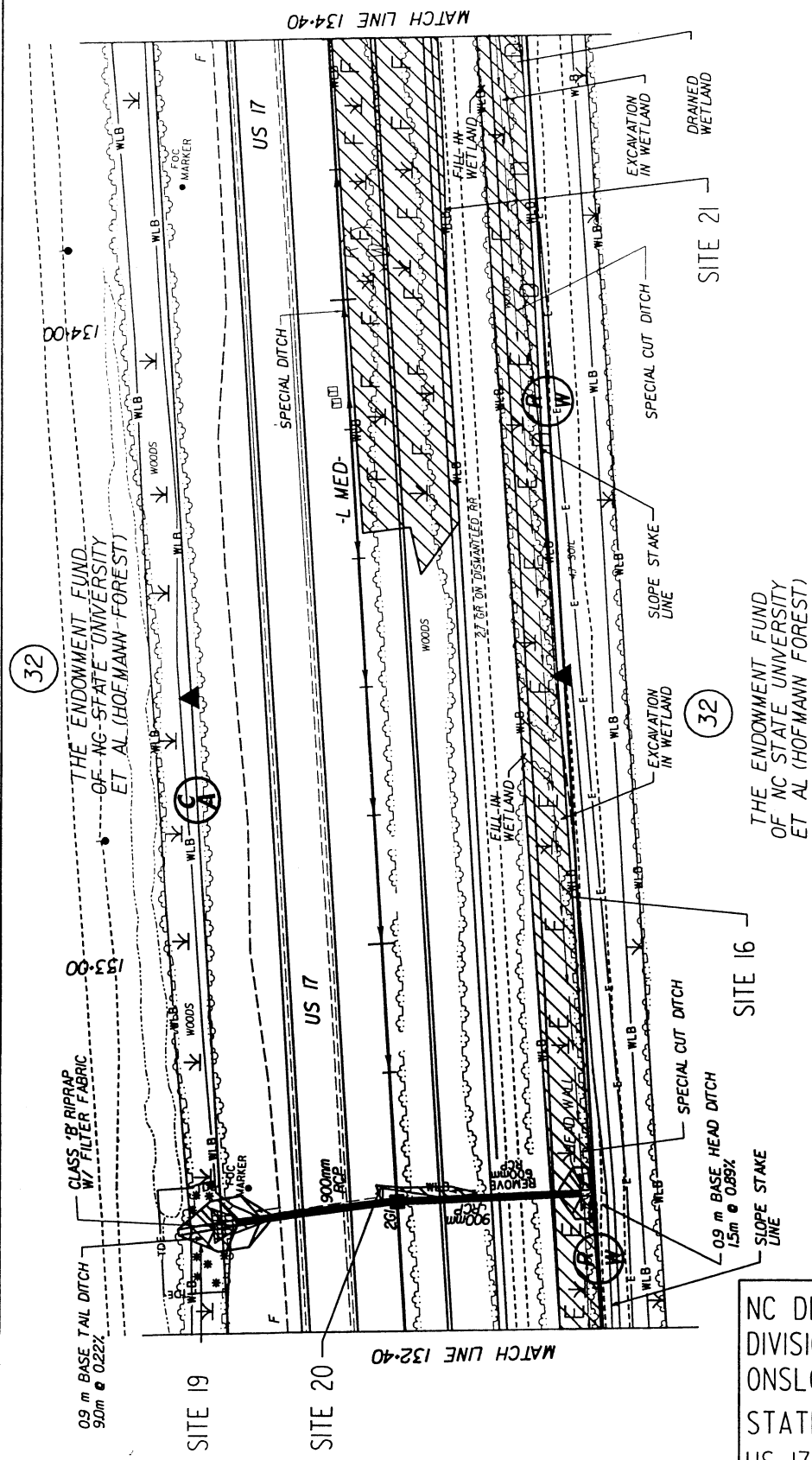
NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONSLOW COUNTY

STATE PROJ: 8.TI9030I (R-25I4A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/I439

SCALE AS SHOWN

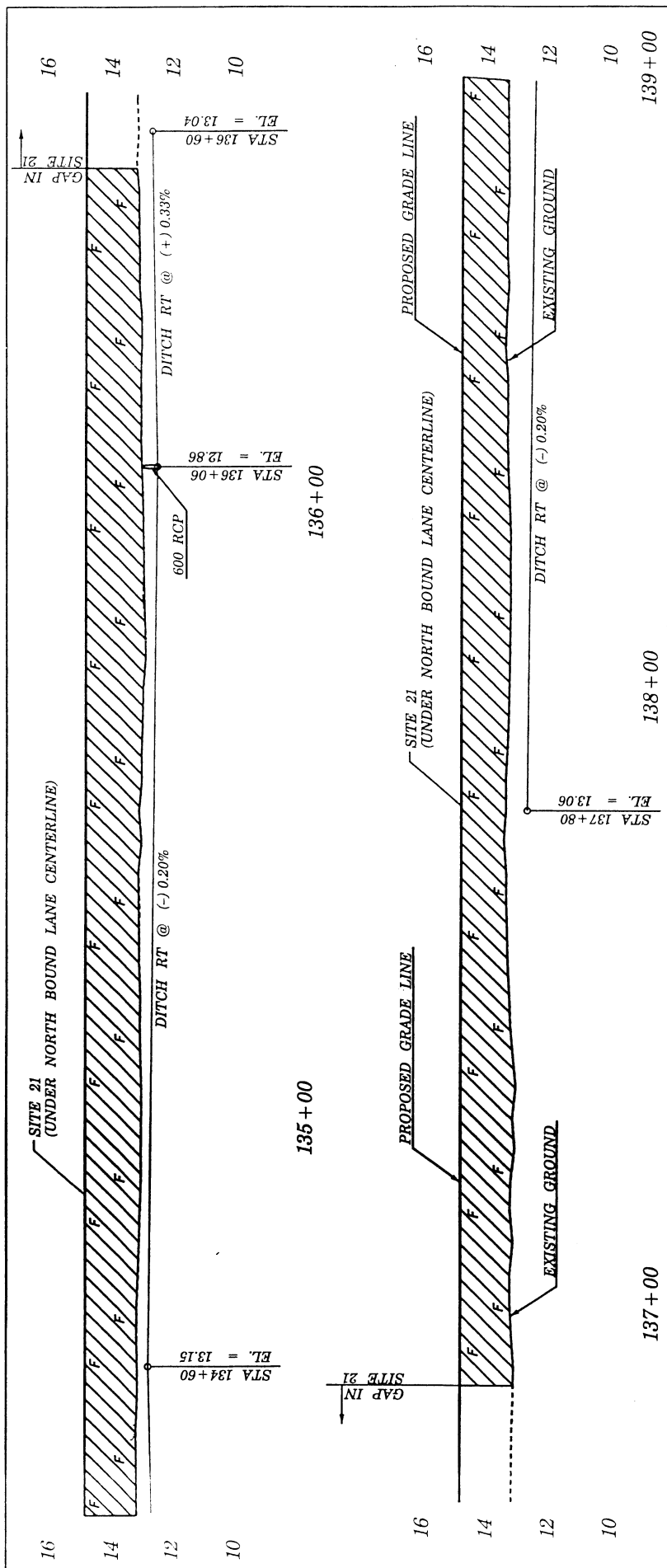
SHEET 27 OF 81 DATE 7/14/03

REV 8/19/03

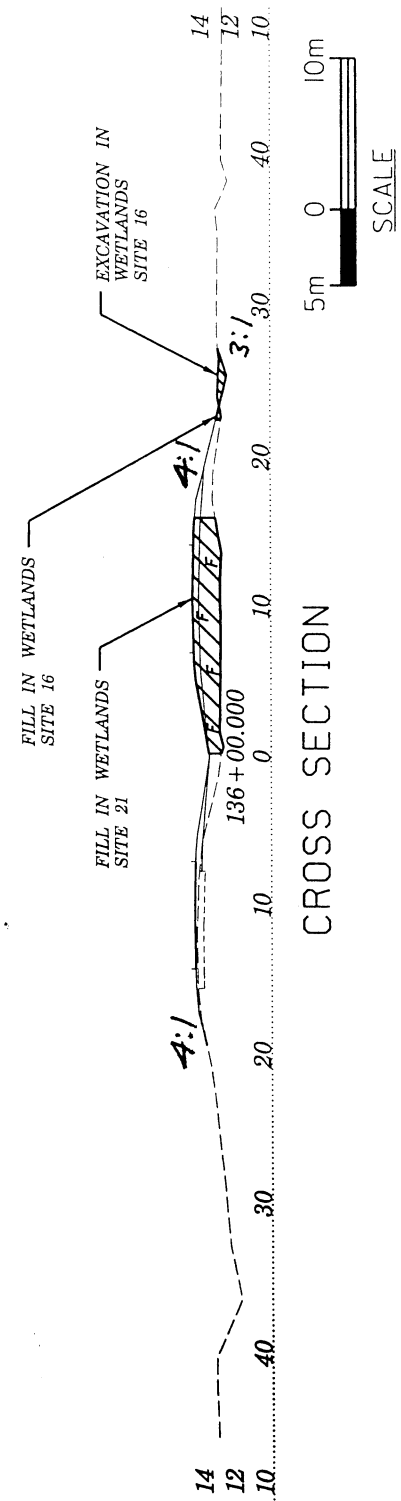
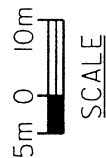


NC DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ONSLOW COUNTY
 STATE PROJ: 8.TI9030I (R-25I4A)
 US 17 NORTH OF JACKSONVILLE FROM
 SR 1327 TO SR 1330/1439
 SCALE AS SHOWN
 SHEET **28** OF **81** DATE **7/4/63**

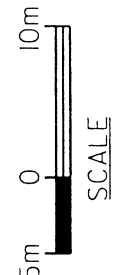
PLAN VIEW
 SITE 16, 19, 20, & 21



**SITE 16 & 21
PROFILE VIEW**



CROSS SECTION



NC DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ONSLOW COUNTY
 STATE PROJ: 8.T190301 (R-2514A)
 US 17 NORTH OF JACKSONVILLE FROM
 SR 1327 TO SR 1330/1439
 SCALE AS SHOWN
 SHEET **30** OF **81** DATE **7/14/03**

REV 8/19/03

32

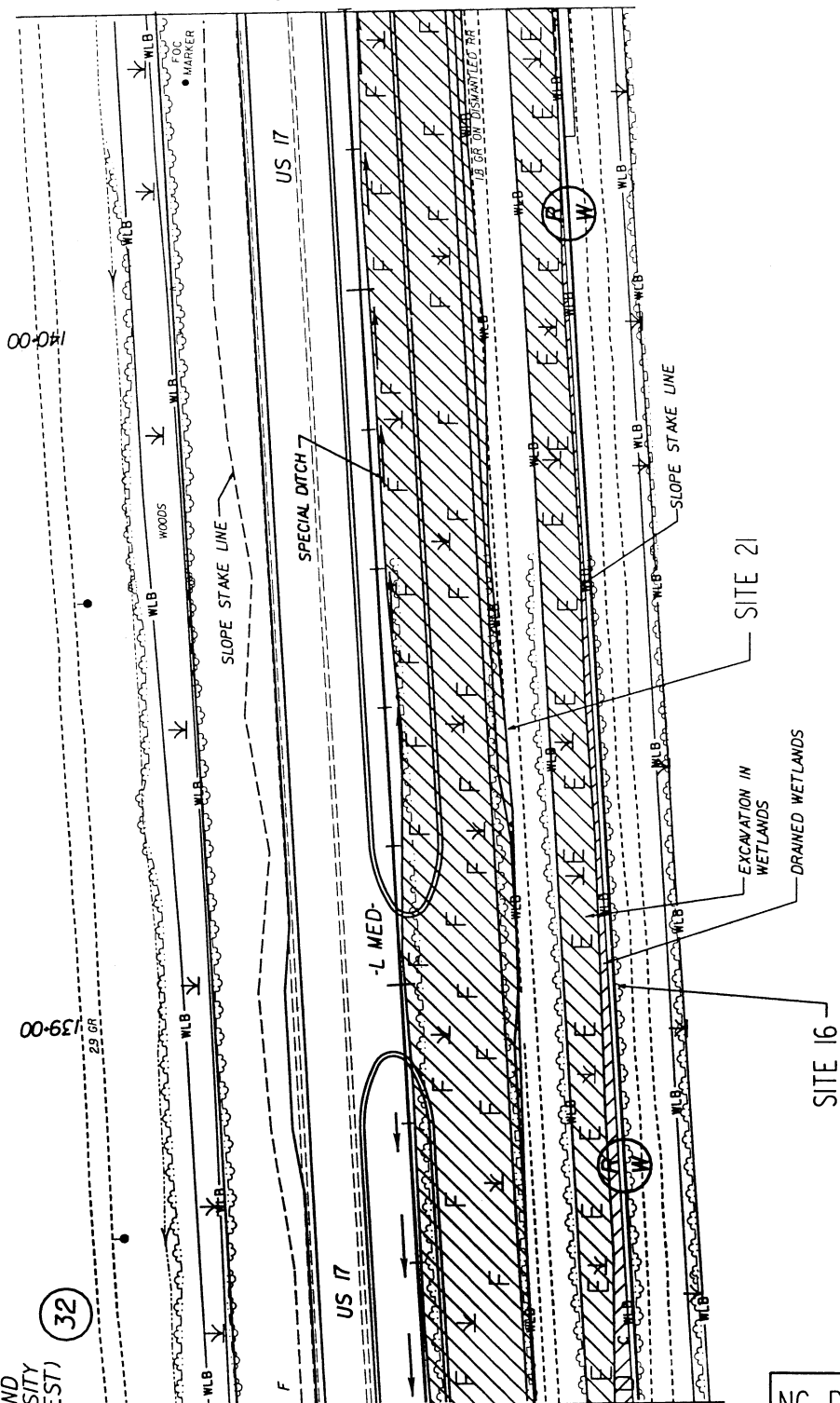


PLAN VIEW
SITE 16 & 21

NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ON SLOW COUNTY
STATE PROJ: 8.TI9030I (R-25I4A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439
SCALE AS SHOWN
SHEET 31 OF 81 DATE 7/14/03

32

MATCH LINE 138+40



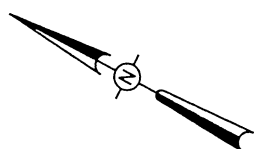
32

THE ENDOWMENT FUND
OF NC STATE UNIVERSITY
ET AL (HOFMANN FOREST)

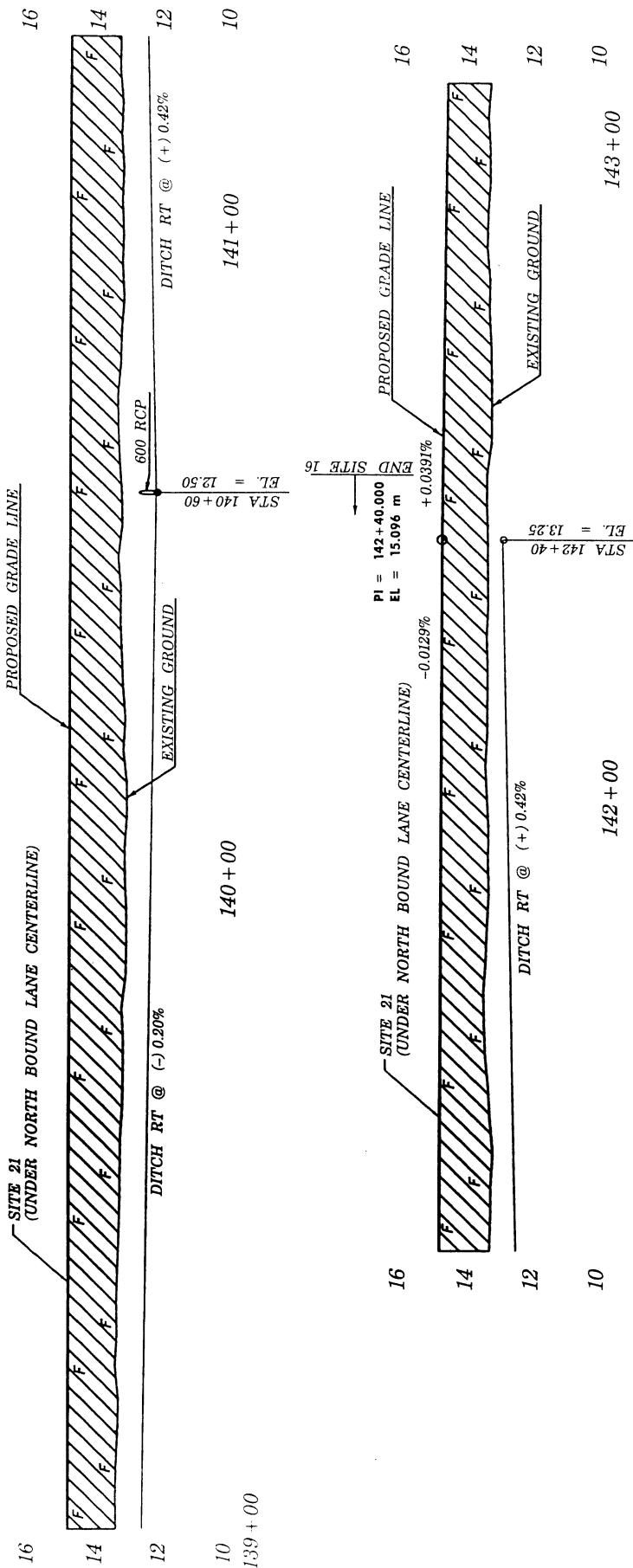
PLAN VIEW
SITE 16 & 21

5m 0 10m

SCALE

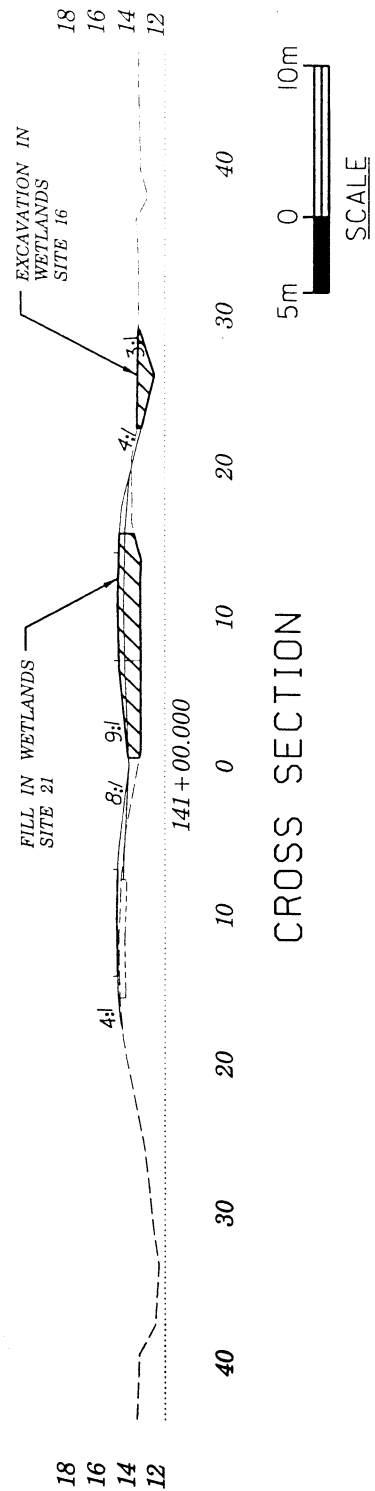


NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ON SLOW COUNTY
STATE PROJ: 8.T190301 (R-2514A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439
SCALE AS SHOWN
SHEET 32 OF 81 DATE 7/14/03



SITE 16 & 21 PROFILE VIEW

5m 0 10m
SCALE



CROSS SECTION

5m 0 10m
SCALE

NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONSLOW COUNTY
STATE PROJ: 8.T190301 (R-2514A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439
SCALE AS SHOWN
SHEET 34 OF 81 DATE 7/14/03

SITE 22A

EXCAVATION
IN WETLANDS

CLASS 'B' RIPRAP
W/ FILTER FABRIC

0.6m BASE TAIL DITCH
10.5m @ 0.381%

144+00

32

THE ENDOWMENT FUND
OF NC STATE UNIVERSITY
ET AL (HOFMANN FOREST)

143+00

SLOPE STAKE LINE

US 17

SPECIAL DITCH

US 17

MATCH LINE 142+40

-L MED-

MATCH LINE 144+40

EXCAVATION
IN WETLANDS

WOODS

EXCAVATION
IN WETLANDS

CLASS 'B' RIPRAP
W/ FILTER FABRIC

DRAINED
WETLANDS

SLOPE STAKE LINE

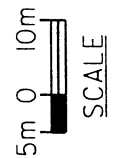
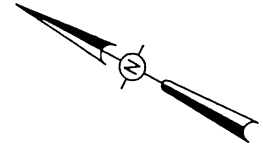
SITE 21

SITE 22

SITE 16

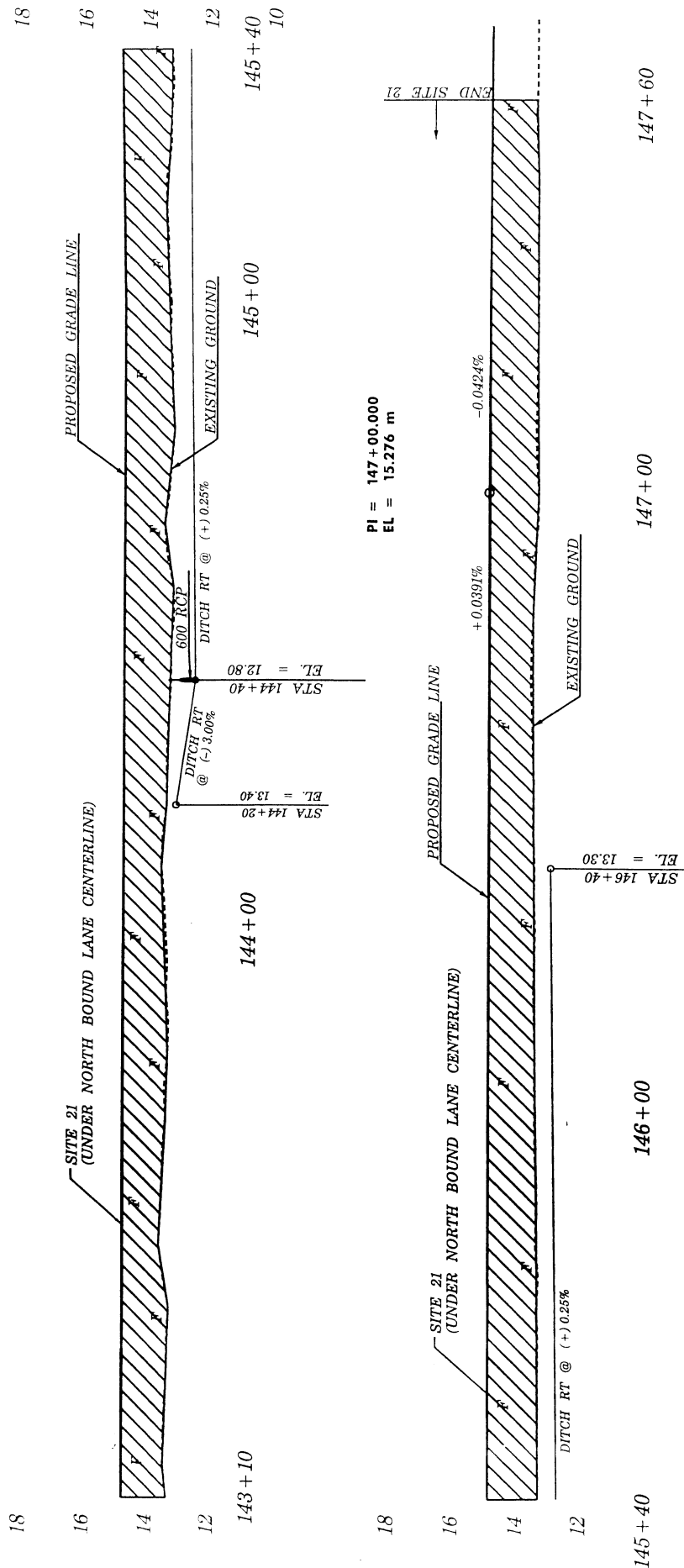
32

THE ENDOWMENT FUND
OF NC STATE UNIVERSITY
ET AL (HOFMANN FOREST)



PLAN VIEW
SITE 16, 21, 22 & 22A

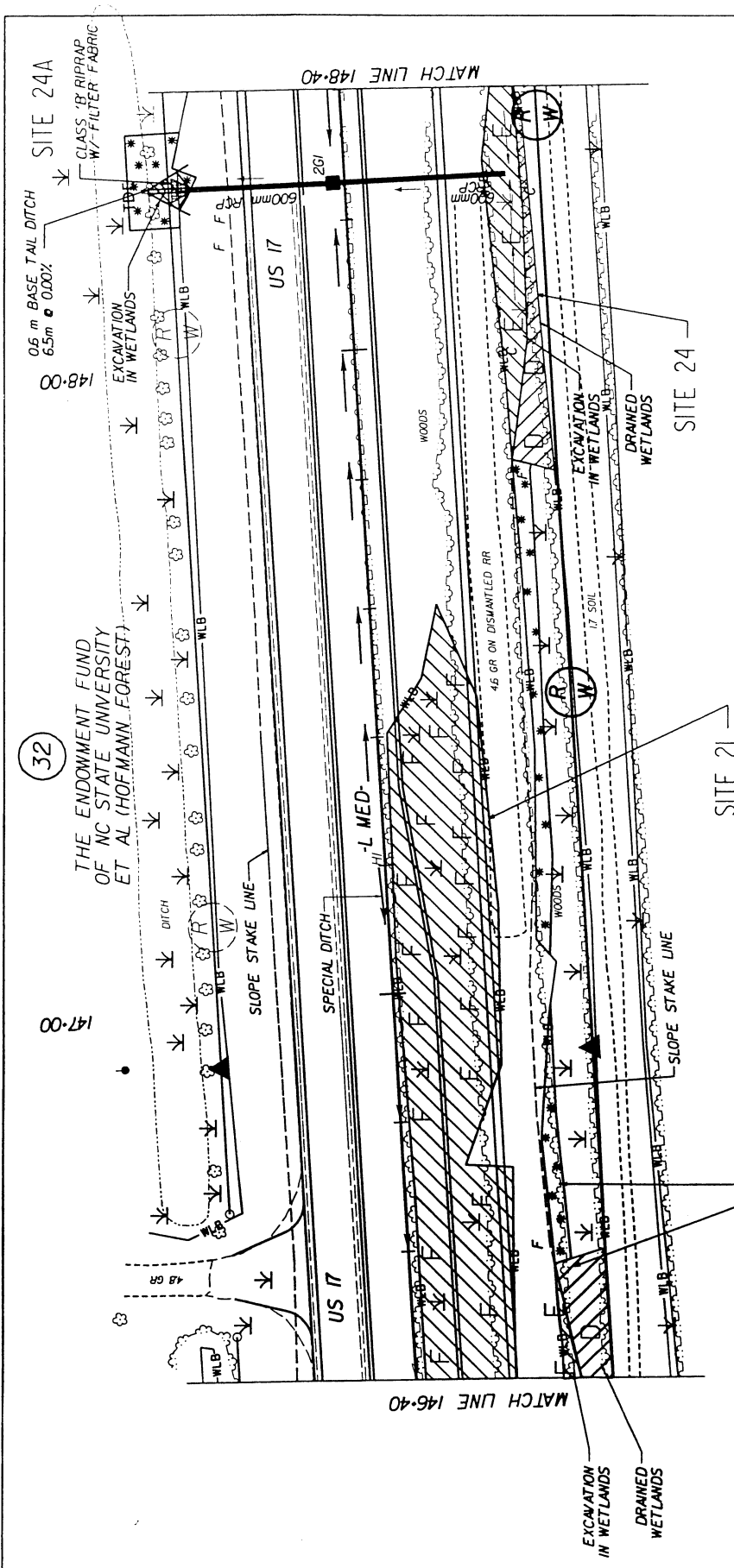
NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONSLOW COUNTY
STATE PROJ: 8.T190301 (R-2514A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439
SCALE AS SHOWN
SHEET 35 OF 81 DATE 7/14/03



5m 0 10m
SCALE

SITE 21 PROFILE VIEW

NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONSLOW COUNTY
STATE PROJ: 8.TI9030I (R-25I4A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439
SCALE AS SHOWN
SHEET **37** OF **81** DATE **7/14/03**



NC DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ONSLOW COUNTY
 STATE PROJ: 8.T19030I (R-2514A)
 US 17 NORTH OF JACKSONVILLE FROM
 SR 1327 TO SR 1330/1439
 SCALE AS SHOWN
 SHEET **38** OF **81** DATE **7/14/03**

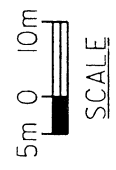
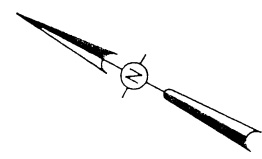
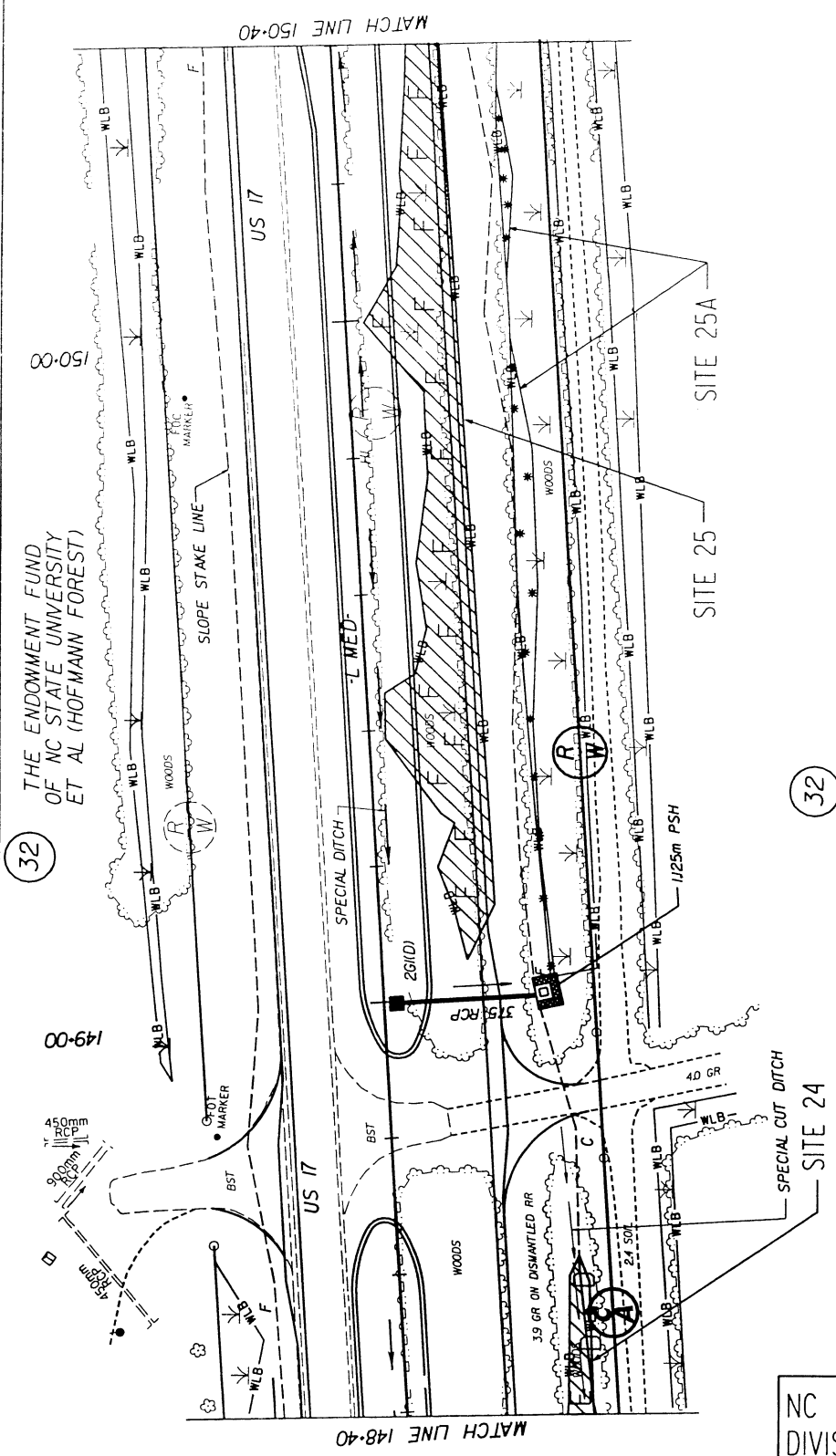
5m 0 10m
 SCALE

PLAN VIEW
 SITE 21, 23, 24 & 24A

THE ENDOWMENT FUND
 OF NC STATE UNIVERSITY
 ET AL (HOFMANN FOREST)

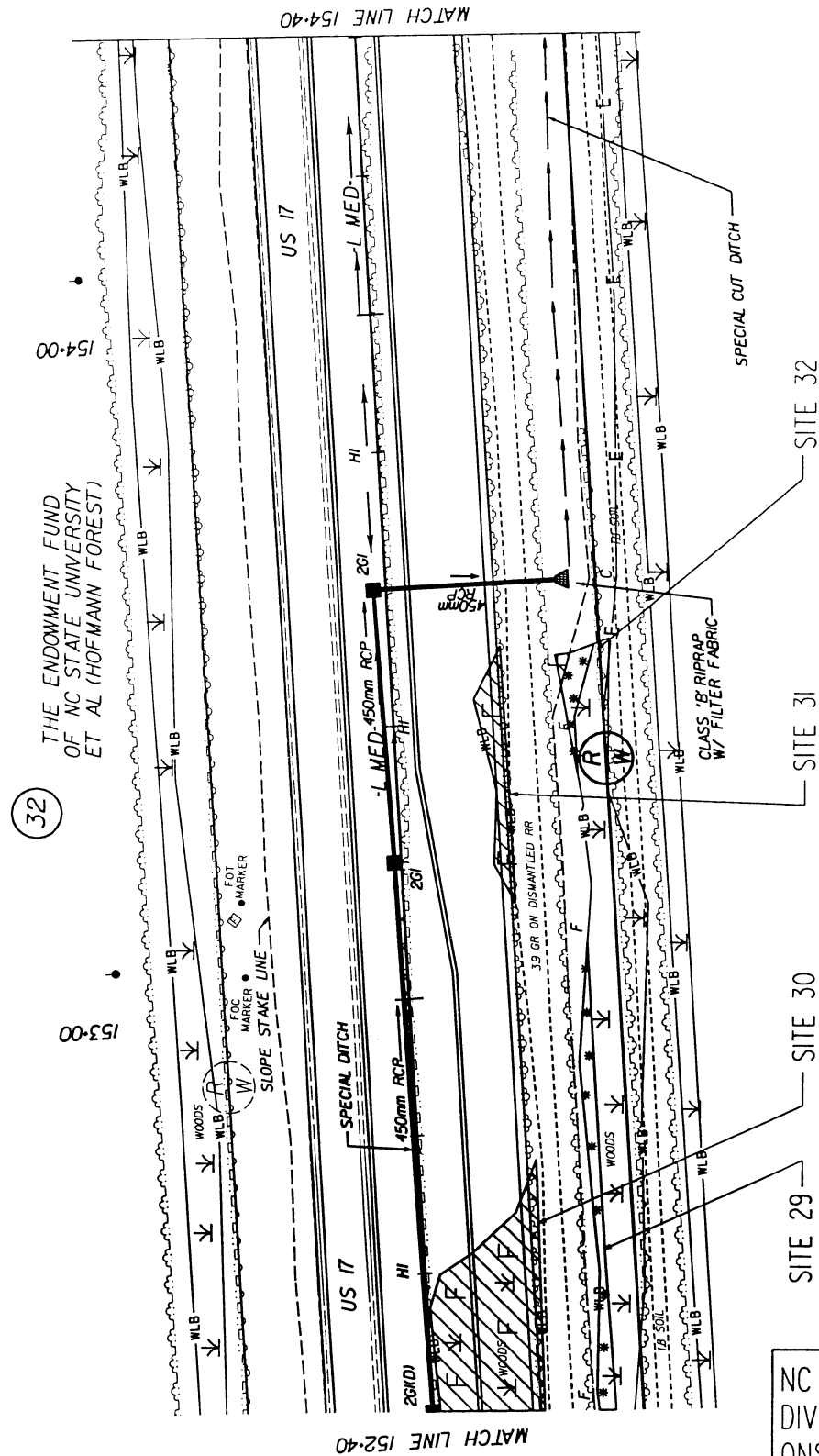
32

32

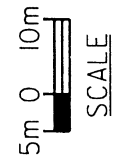


PLAN VIEW
SITE 24, 25 & 25A

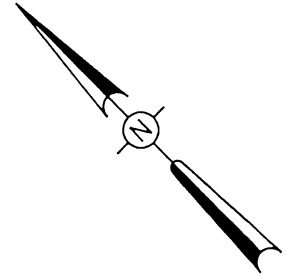
NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONSLOW COUNTY
STATE PROJ: 8.TI9030I (R-2514A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439
SCALE AS SHOWN
SHEET 39 OF 81 DATE 7/14/03



THE ENDOWMENT FUND
OF NC STATE UNIVERSITY
ET AL (HOFMANN FOREST)



PLAN VIEW
SITE 29, 30, 31, & 32



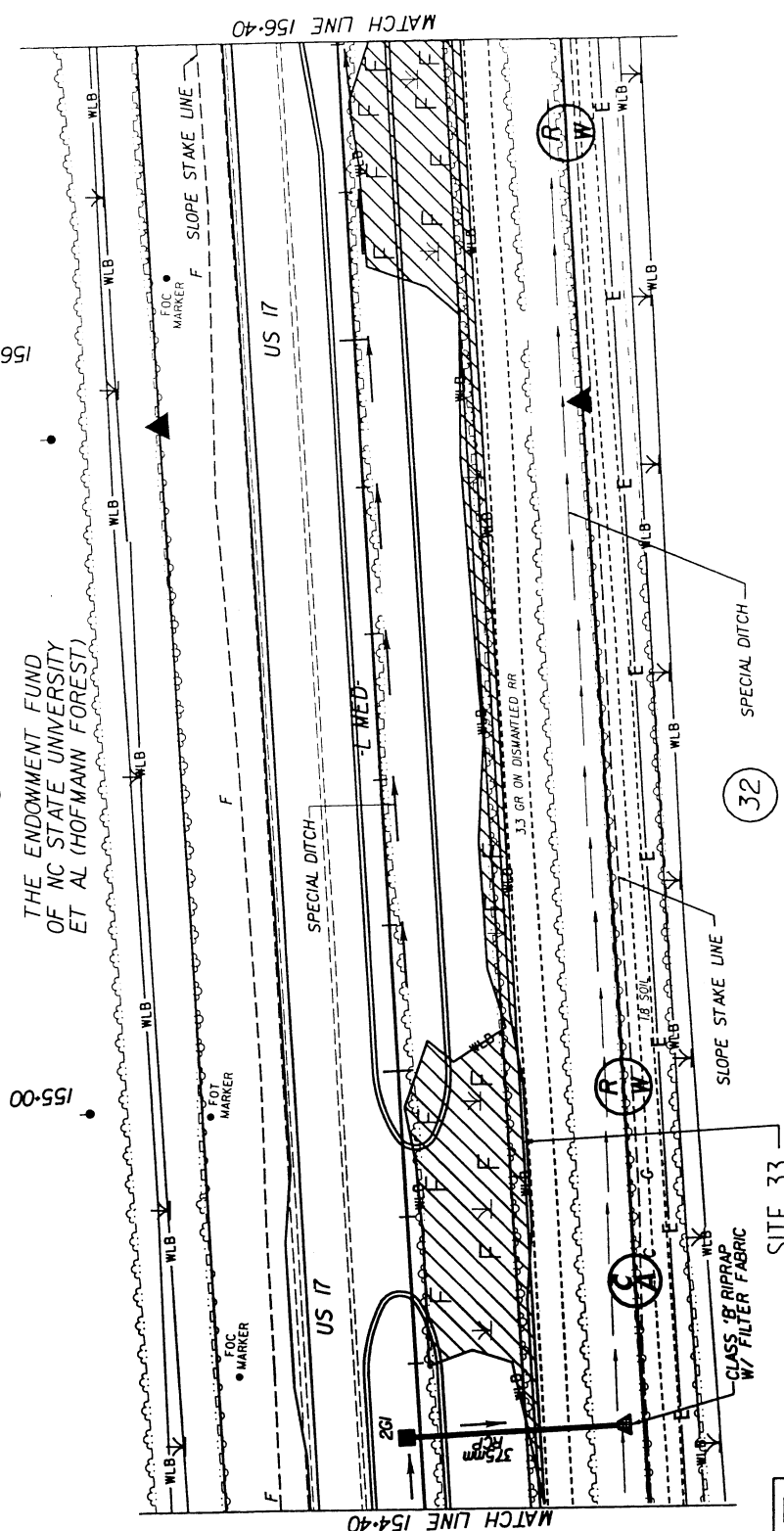
NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONSLOW COUNTY

STATE PROJ: 8.T190301 (R-2514A)

US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439

SCALE AS SHOWN

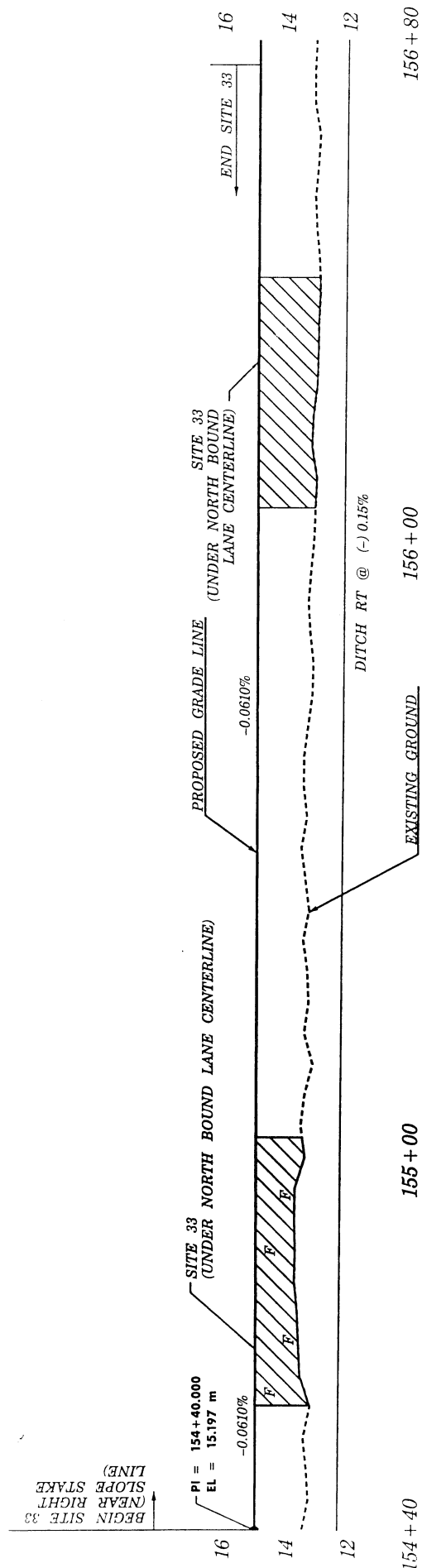
SHEET **41** OF **81** DATE **7/14/03**



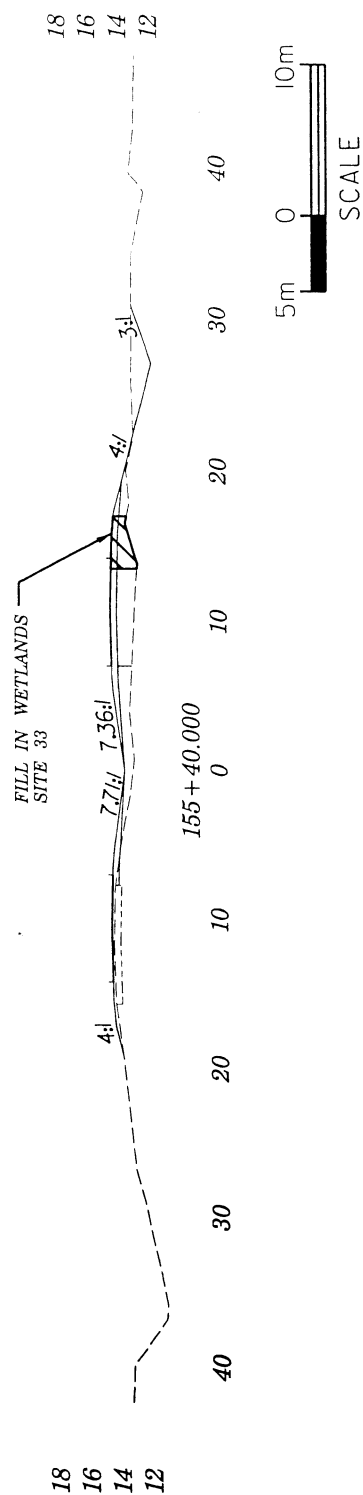
5m 0 10m
SCALE

PLAN VIEW
SITE 33

NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONSLOW COUNTY
STATE PROJ: 8.TI9030I (R-25I4A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/I439
SCALE AS SHOWN
SHEET 42 OF 81 DATE 7/14/03



SITE 33 PROFILE VIEW



NC DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ONSLOW COUNTY

STATE PROJ: 8.TI9030I (R-25I4A)

US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439

SCALE AS SHOWN

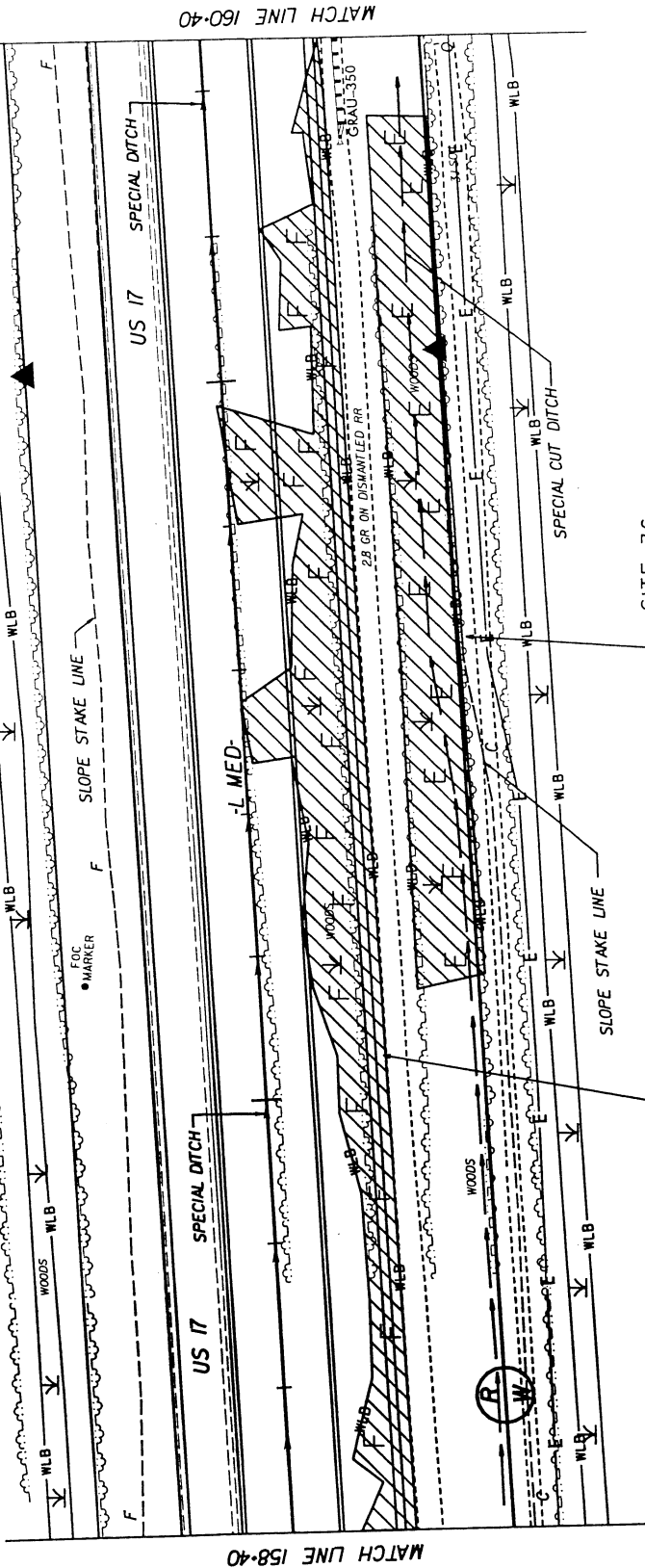
SHEET 43 OF 81 DATE 7/14/03

THE ENDOWMENT FUND
OF NC STATE UNIVERSITY
ET AL (HOFMANN FOREST)

32

159-00

00-09

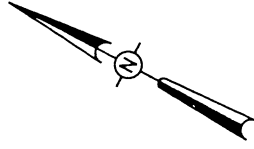


32

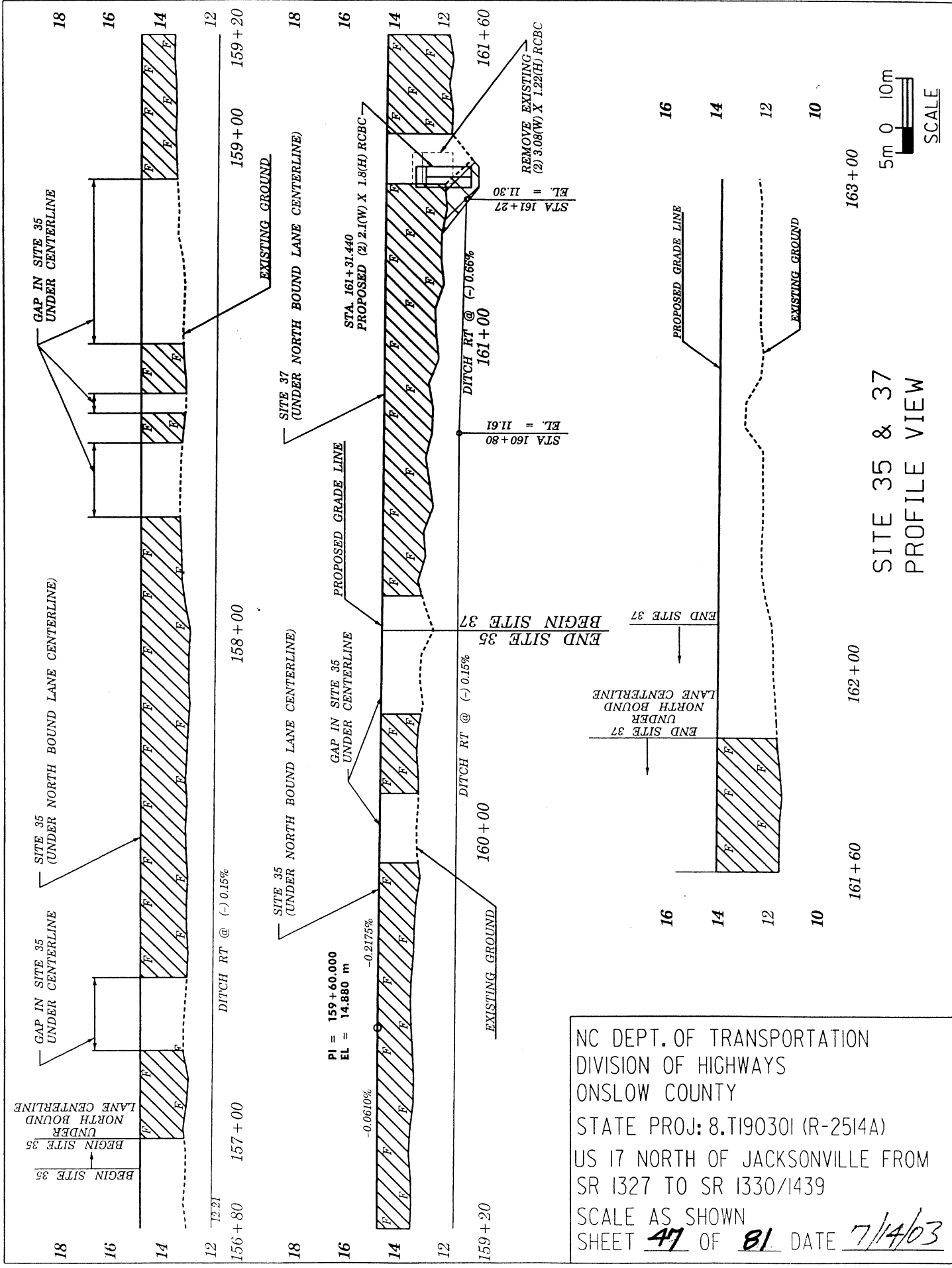
THE ENDOWMENT FUND
OF NC STATE UNIVERSITY
ET AL (HOFMANN FOREST)

NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONSLOW COUNTY
STATE PROJ: 8.T190301 (R-2514A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439
SCALE AS SHOWN
SHEET 45 OF 81 DATE 7/14/03

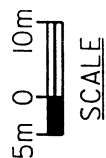
5m 0 10m
SCALE



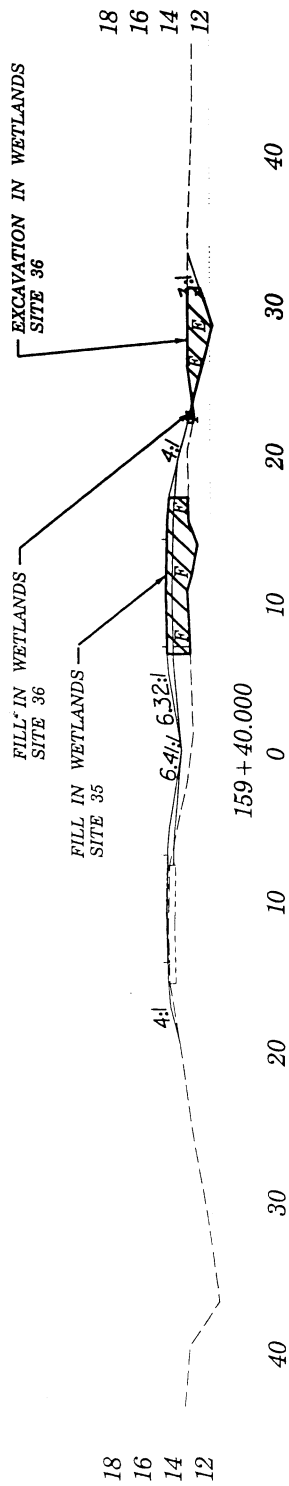
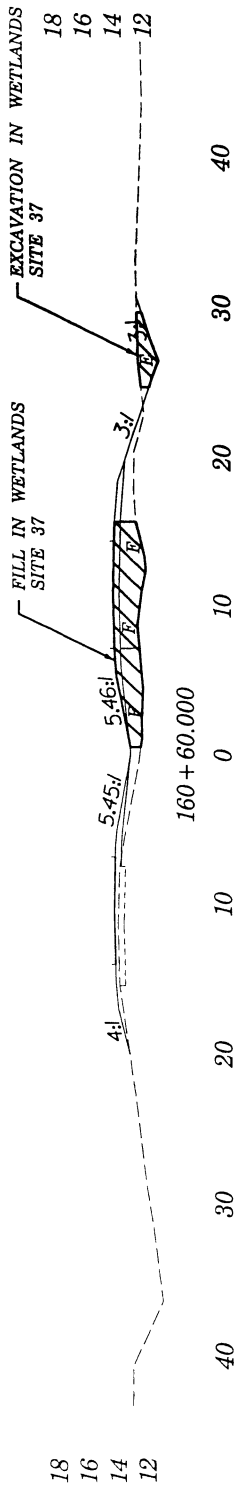
PLAN VIEW
SITE 35 & 36



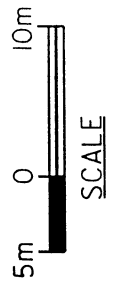
SITE 35 & 37 PROFILE VIEW



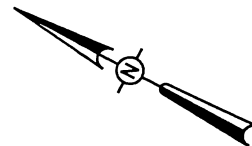
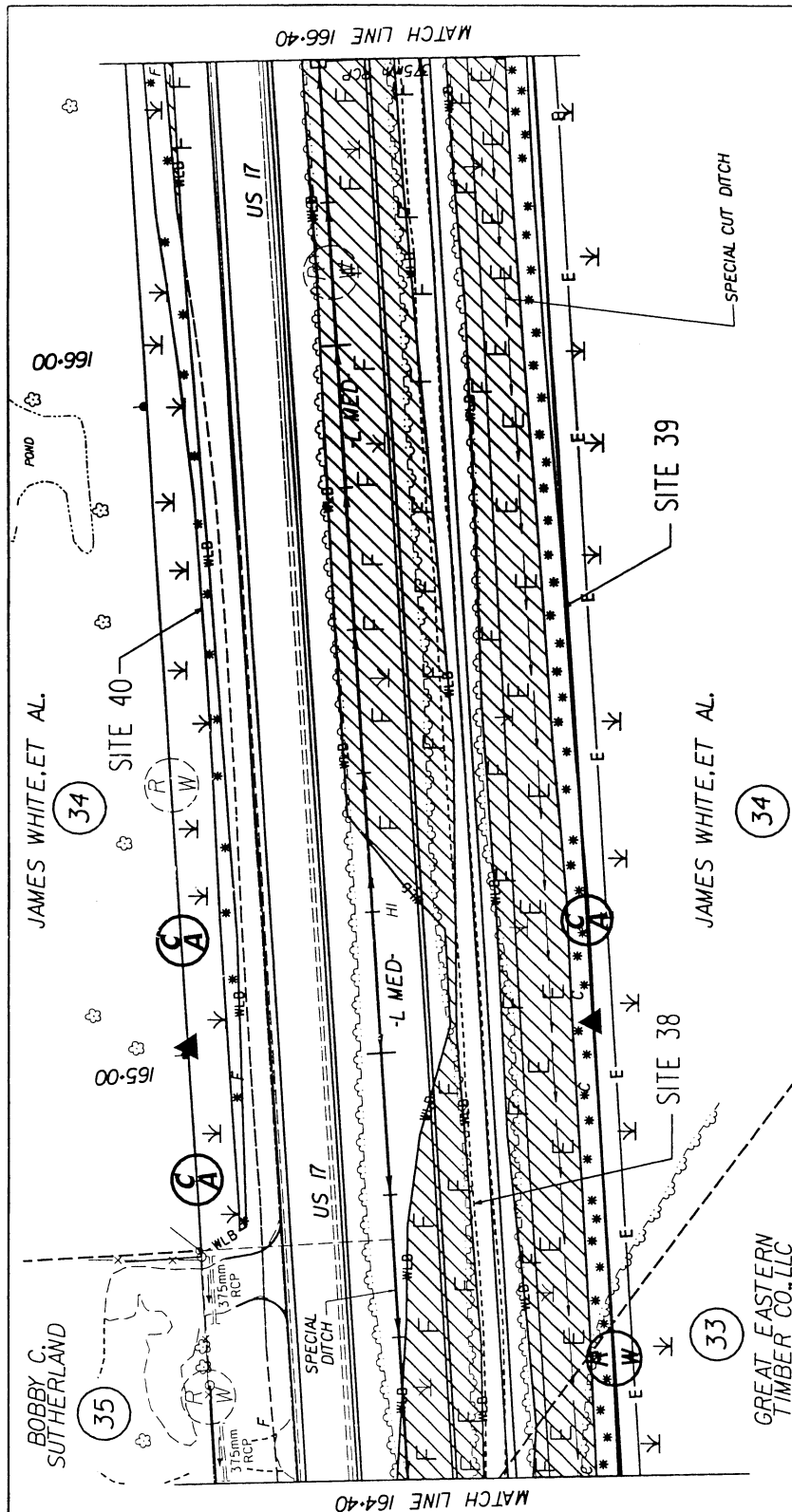
NC DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ONSLOW COUNTY
 STATE PROJ: 8.T190301 (R-2514A)
 US 17 NORTH OF JACKSONVILLE FROM
 SR 1327 TO SR 1330/1439
 SCALE AS SHOWN
 SHEET 47 OF 81 DATE 7/14/03



CROSS SECTION



NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONslow COUNTY
STATE PROJ: 8.T190301 (R-2514A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439
SCALE AS SHOWN
SHEET 48 OF 81 DATE 7/14/03



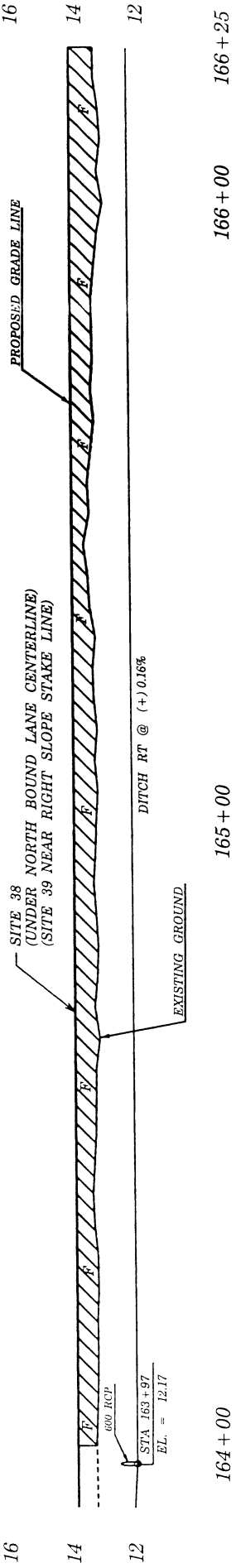
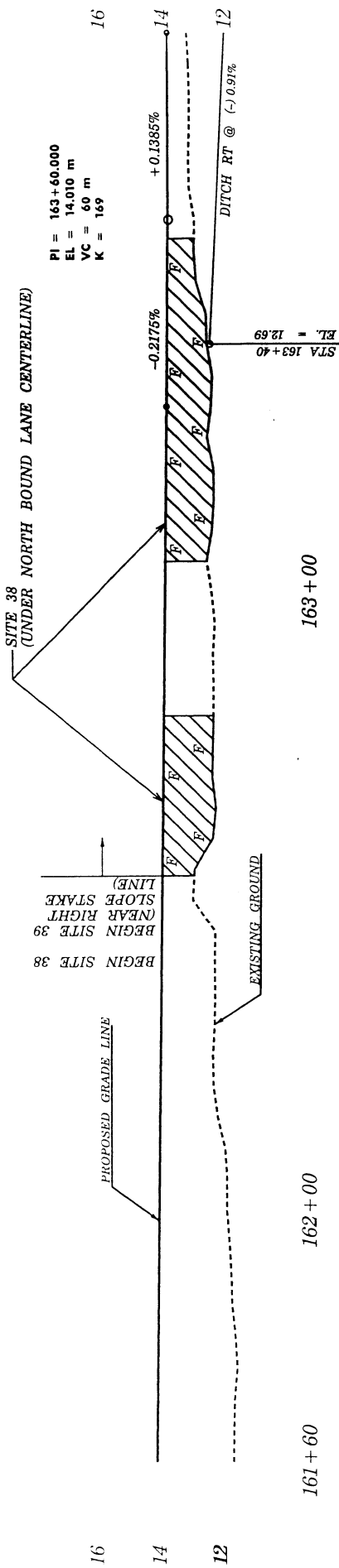
5m 0 10m
SCALE

PLAN VIEW
SITE 38, 39 & 40

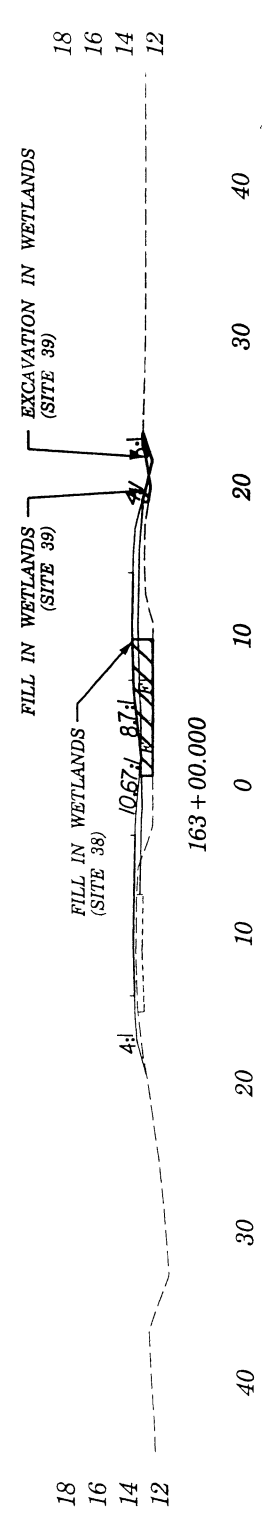
NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONslow COUNTY
STATE PROJ: 8.TI9030I (R-25I4A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/I439
SCALE AS SHOWN
SHEET 50 OF 81 DATE 7/14/03

BEGIN SITE 38
BEGIN SITE 39
(NEAR RIGHT
SLOPE STAKE
LINE)

PI = 163+60.000
EL = 14.010 m
VC = 60 m
K = 169

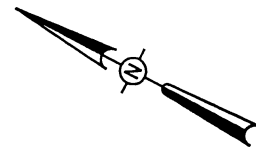
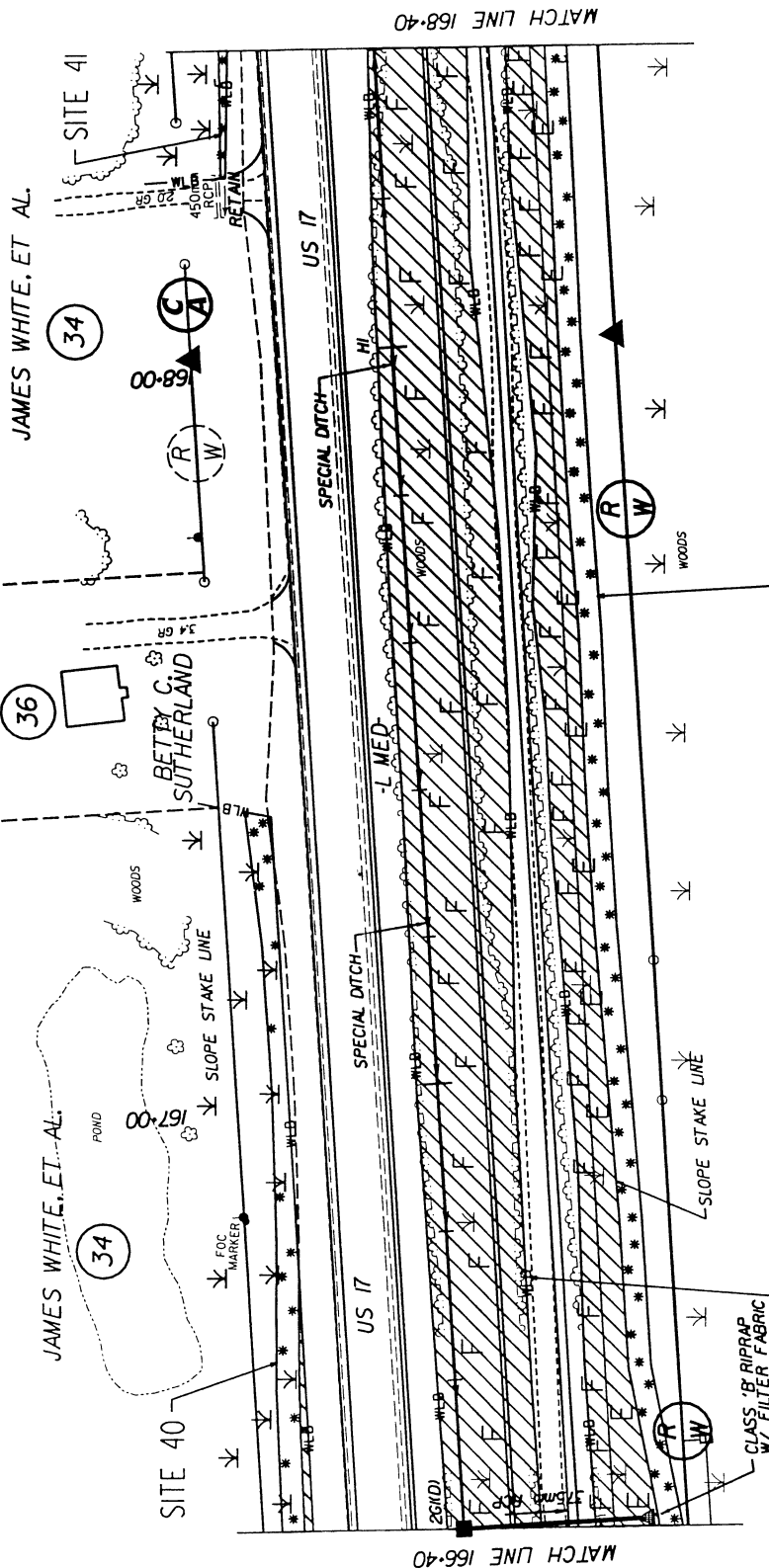


PROFILE VIEW SITE 38 & 39



CROSS SECTION

NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONslow COUNTY
STATE PROJ: 8.T190301 (R-2514A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439
SCALE AS SHOWN
SHEET 51 OF 81 DATE 7/14/03



PLAN VIEW
SITE 38, 39, 40 & 41

NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ON SLOW COUNTY

STATE PROJ: 8.TI90301 (R-2514A)

US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439

SCALE AS SHOWN

SHEET 52 OF 81 DATE 7/14/03

18
16
14
12
168+55

PI = 167+60.000
EL = 14.564 m
VC = 60 m
K = 184

PROPOSED GRADE LINE

-0.1882%

SITE 38
(UNDER NORTH BOUND LANE CENTERLINE)
(SITE 39 NEAR RIGHT SLOPE STAKE LINE)
+0.1385%

EXISTING GROUND

167+00

375 RCP

STA 166+40
EL = 12.56

166+25

18

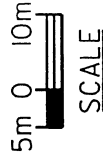
16

14

12

170+00

PROFILE VIEW SITE 38 & 39



END SITE 39

SITE 38
(UNDER NORTH BOUND LANE CENTERLINE)
(SITE 39 NEAR RIGHT SLOPE STAKE LINE)

PROPOSED GRADE LINE

EXISTING GROUND

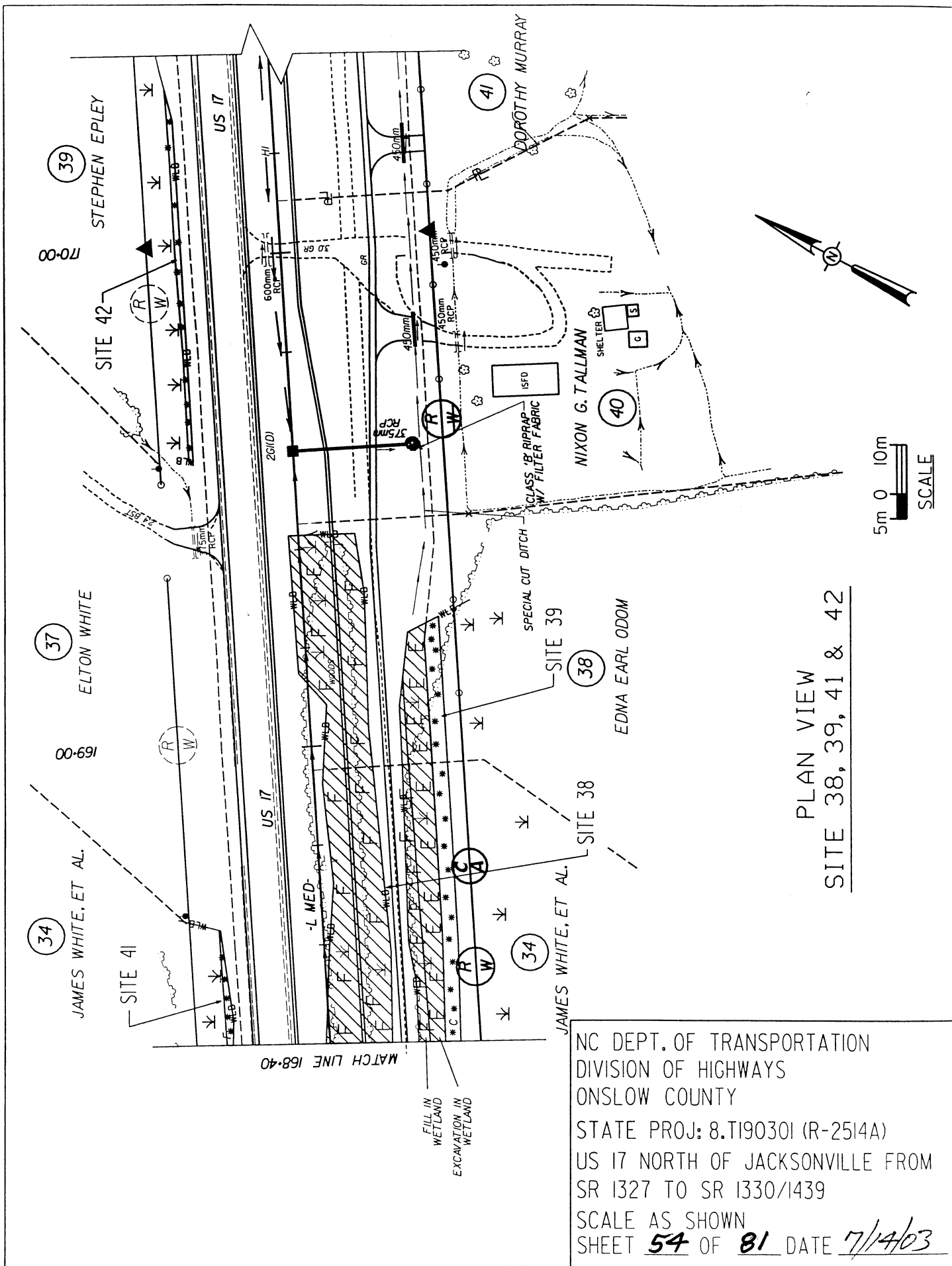
169+00

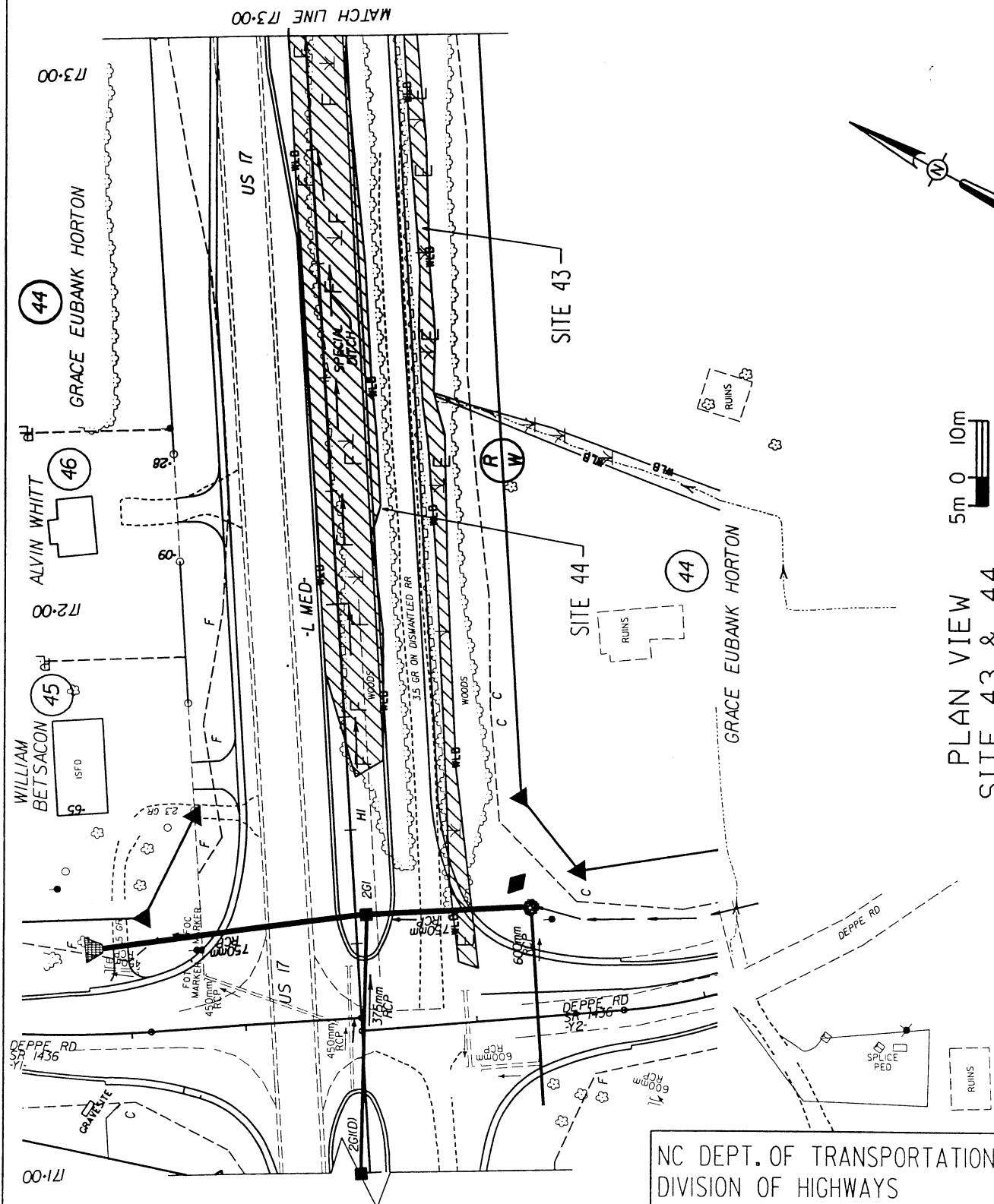
168+55

STA 169+25
EL = 12.48

DITCH RT @ (-) 0.20%

NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ON SLOW COUNTY
STATE PROJ: 8.T190301 (R-2514A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439
SCALE AS SHOWN
SHEET **53** OF **81** DATE **7/14/03**





PLAN VIEW
SITE 43 & 44

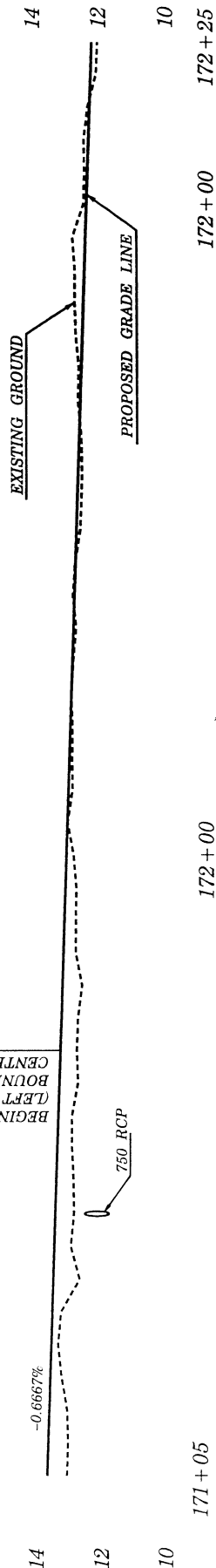
5m 0 10m
SCALE

NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONSLow COUNTY

STATE PROJ: 8.T190301 (R-2514A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439

SCALE AS SHOWN
SHEET 55 OF 81 DATE 7/14/03

BEGIN SITE 44
(LEFT OF NORTH
BOUND LANE
CENTERLINE)



END SITE 44

PI = 174+00.000
EL = 11.924 m
VC = 100 m
K = 89

FILL IN WETLANDS

DITCH RT @ (+) 0.88%
600 RCP
EL = 10.83
STA 173+60

+0.4627%

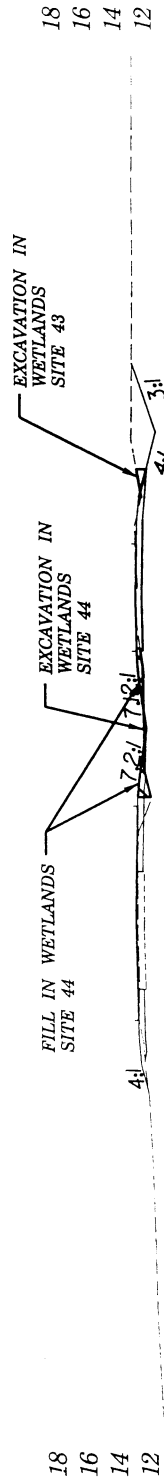
DITCH RT @ (-) 0.57%

600 RCP
STA 174+60
EL = 10.84

STA 175+40
EL = 11.83

5m 0 10m
SCALE

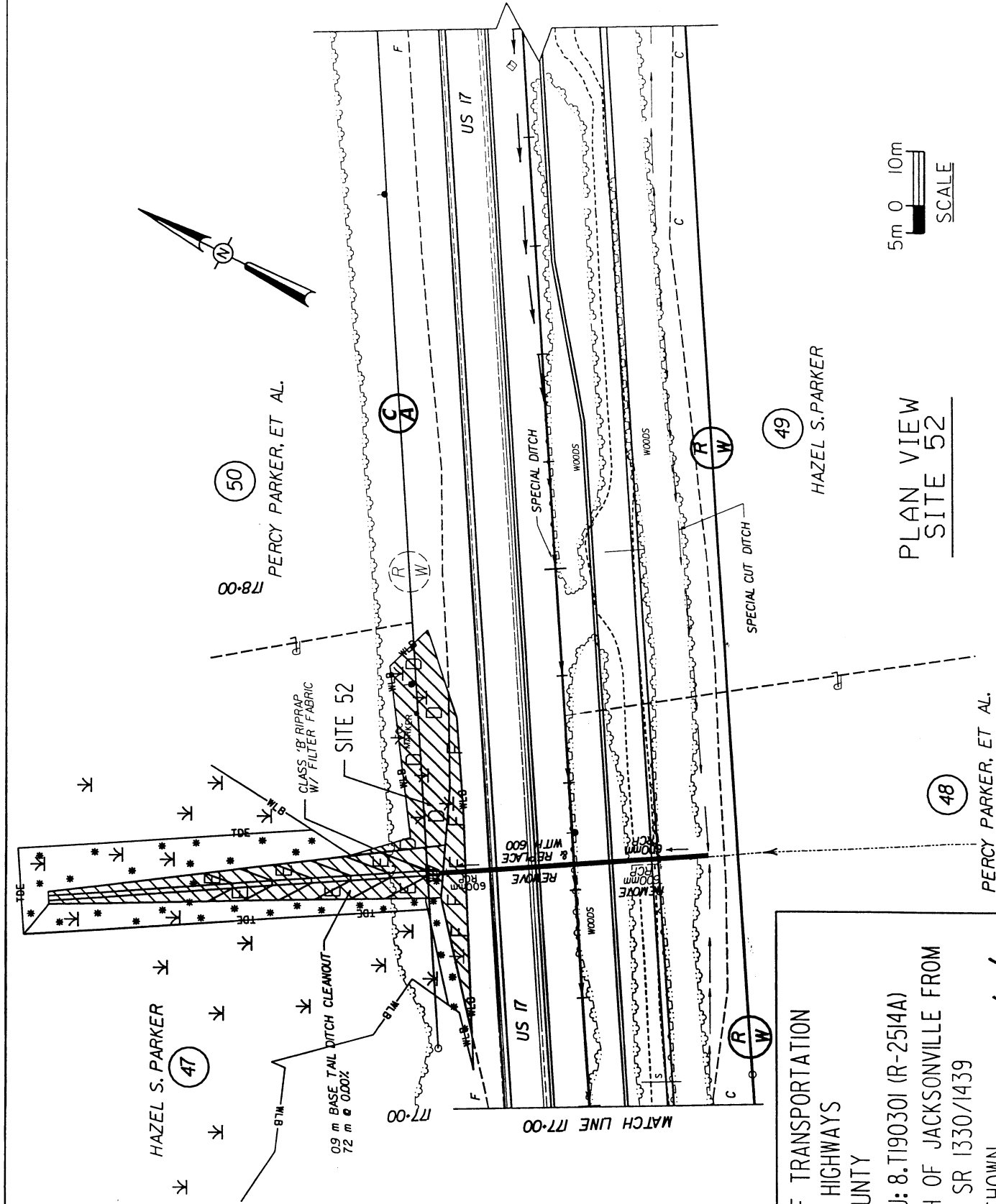
PROFILE VIEW
SITE 44



CROSS SECTION

5m 0 10m
SCALE

NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ON SLOW COUNTY
STATE PROJ: 8.TI9030I (R-25I4A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/I439
SCALE AS SHOWN
SHEET 57 OF 81 DATE 8/19/63



5m 0 10m
SCALE

PLAN VIEW
SITE 52

NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONslow COUNTY

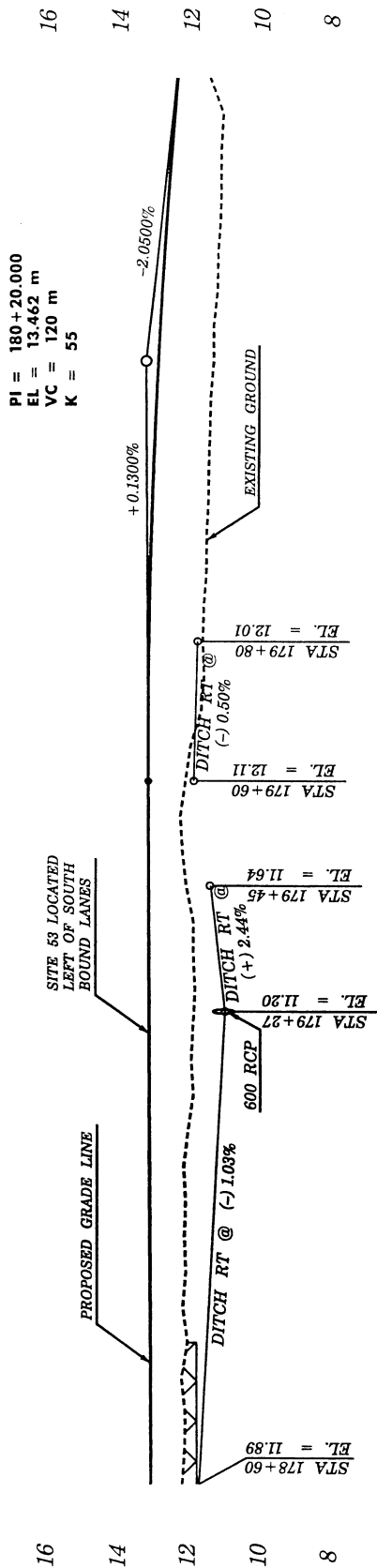
STATE PROJ.: 8.T190301 (R-2514A)

US 17 NORTH OF JACKSONVILLE FROM

SR 1327 TO SR 1330/1439

SCALE AS SHOWN

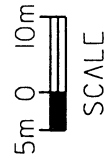
SHEET 59 OF 81 DATE 7/14/03



179+00

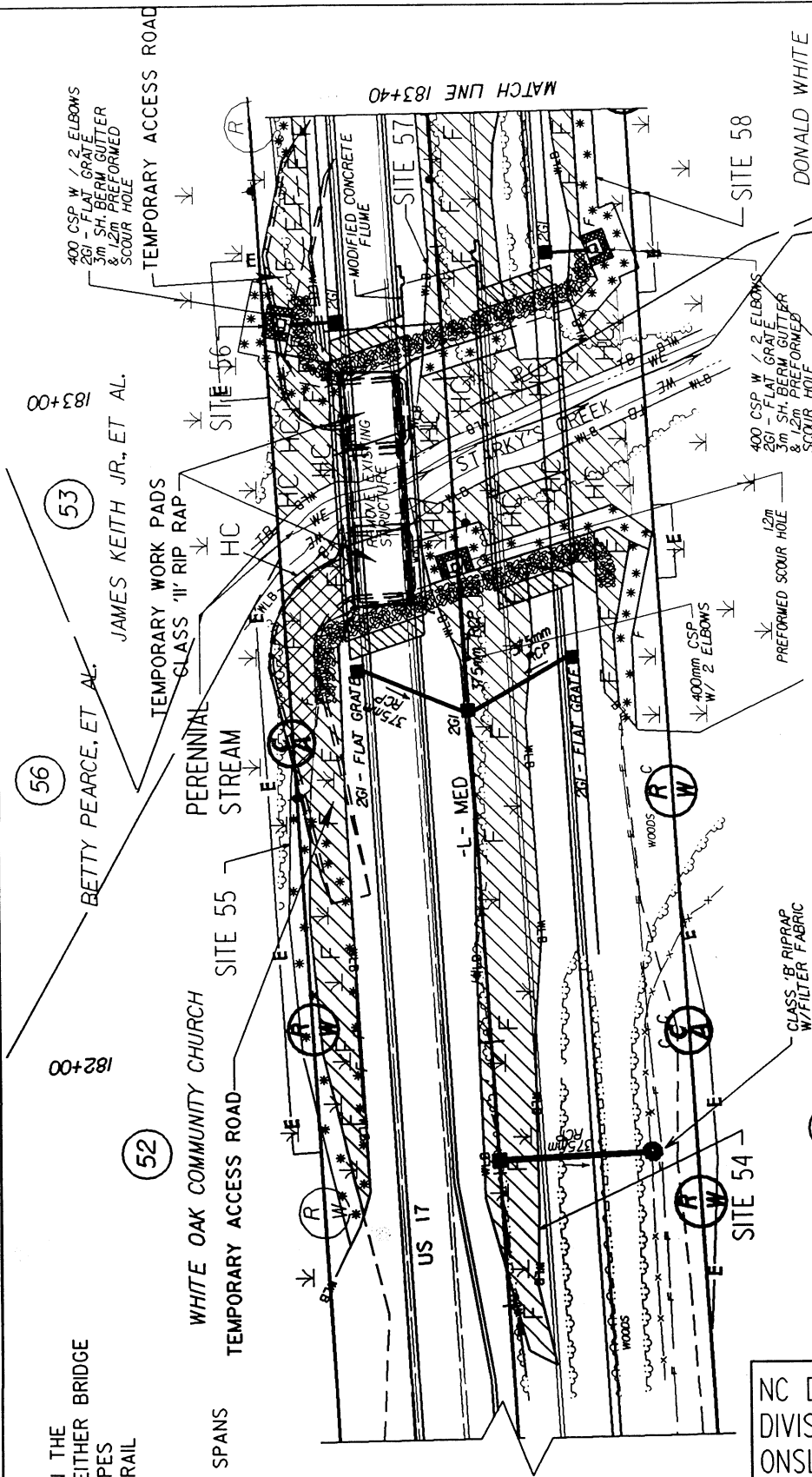
180+00

PROFILE VIEW SITE 53



NC DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ONSLOW COUNTY
 STATE PROJ: 8.TI9030I (R-2514A)
 US 17 NORTH OF JACKSONVILLE FROM
 SR 1327 TO SR 1330/1439
 SCALE AS SHOWN
 SHEET 61 OF 81 DATE 7/14/03

DECK DRAINS:
NO DECK DRAINS IN THE
CENTER SPAN OF EITHER BRIDGE
USE 102mm DIA PIPES
THROUGH BARRIER RAIL
AT 1.8m CNTS
ON BOTH SIDES
OF EACH BRIDGE
ONLY ON THE END SPANS



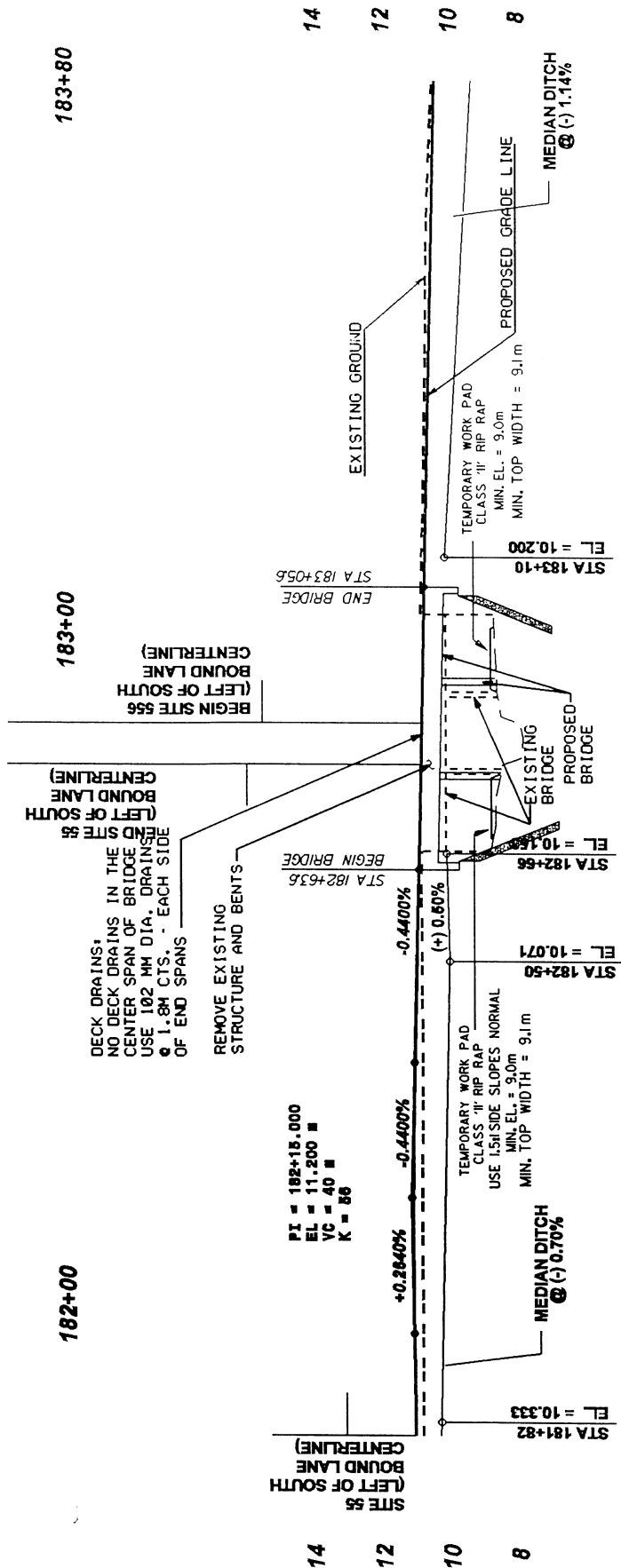
HAND CLEARING AREAS	
SITE 54	0.030 Ha
SITE 55	0.002 Ha
SITE 56	0.013 Ha
SITES 57/58	0.028 Ha
TOTAL	0.073 Ha

BARRUS CONSTRUCTION CO.

PLAN VIEW

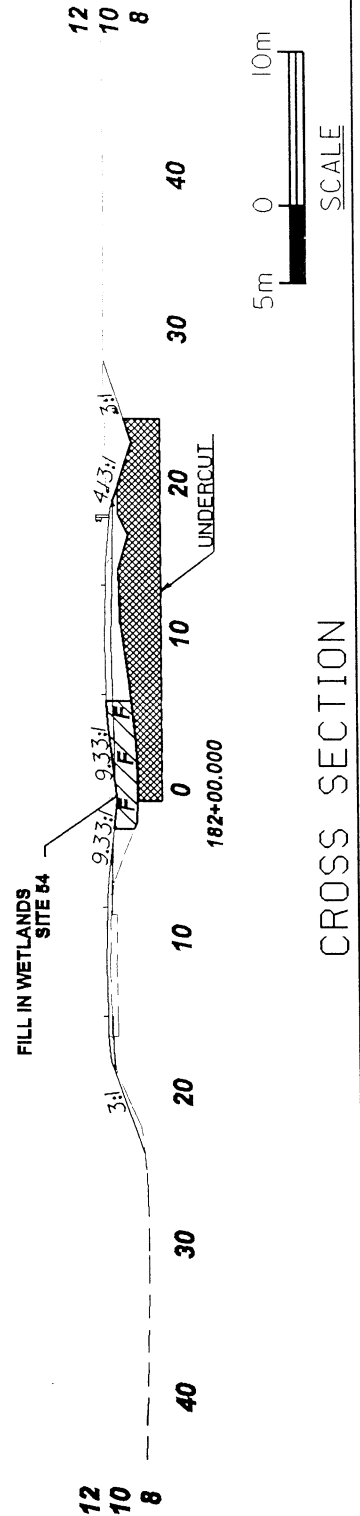
SITE 54, 55, 56, 57, & 58

NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONSLOW COUNTY
STATE PROJ: 8.T190301 (R-2514A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439
SCALE AS SHOWN
SHEET 62 OF 81 DATE 01/16/04

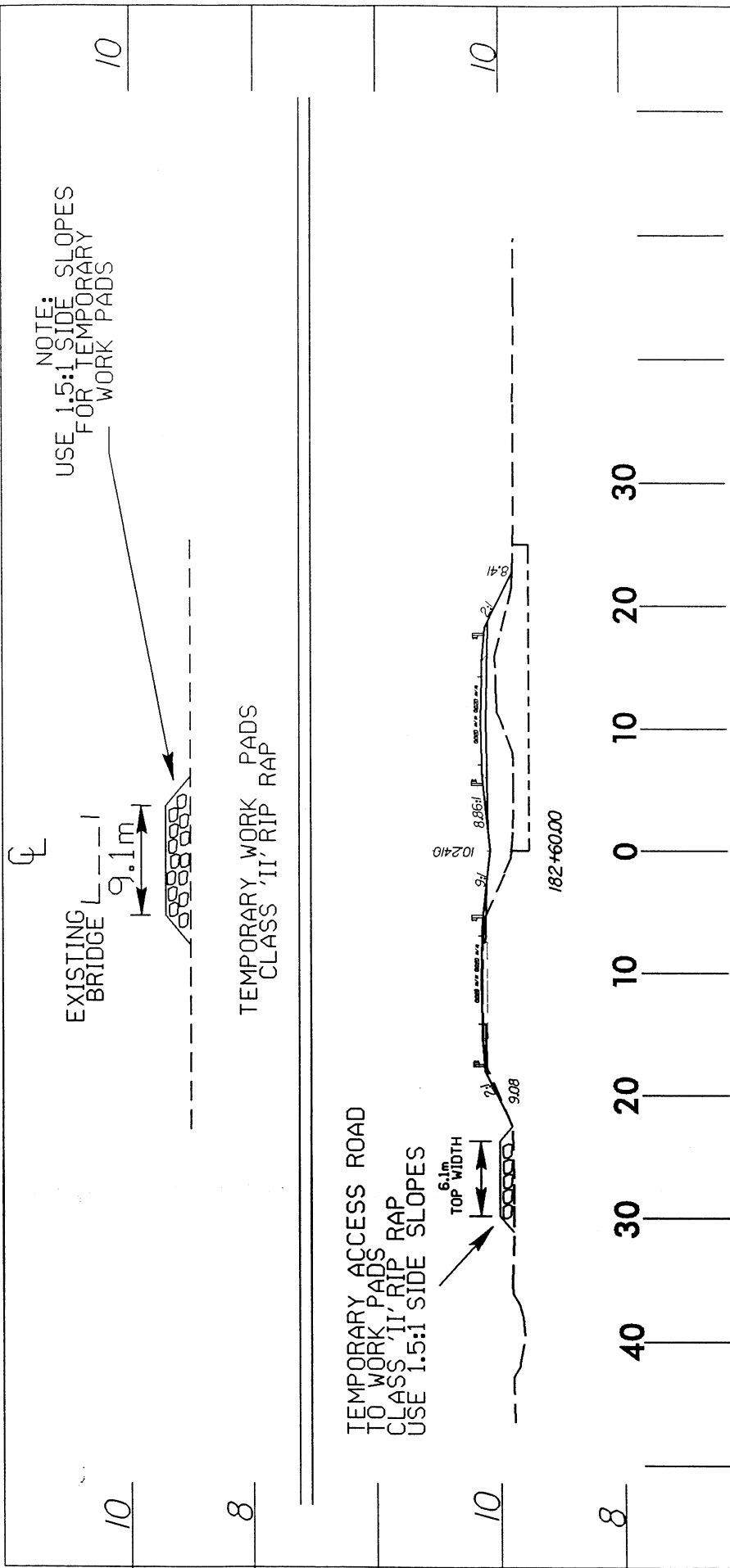


PROFILE VIEW ALONG -SBL- ROADWAY SITE 54, 55, & 56

NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONslow COUNTY
STATE PROJ: 8.TI9030I (R-25I4A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/I439
SCALE AS SHOWN
SHEET 63 OF 81 DATE 12/09/03

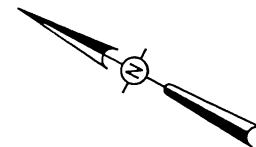


CROSS SECTION



TEMPORARY WORK PADS
UNDER EXISTING BRIDGE AND
TEMPORARY ACCESS ROAD TO
WORK PADS

NCDOT
DIVISION OF HIGHWAYS
ONslow COUNTY
PROJECT: 8.T190301 (R-2514A)
US 17 NORTH OF JACKSONVILLE
FROM SR 1327 TO SR 1330 // 1439
SHEET 63A OF 81 12 // 09 // 03



DONALD WHITE

A horizontal scale bar with markings at 5m, 0, and 10m. The word "SCALE" is written vertically below the bar.

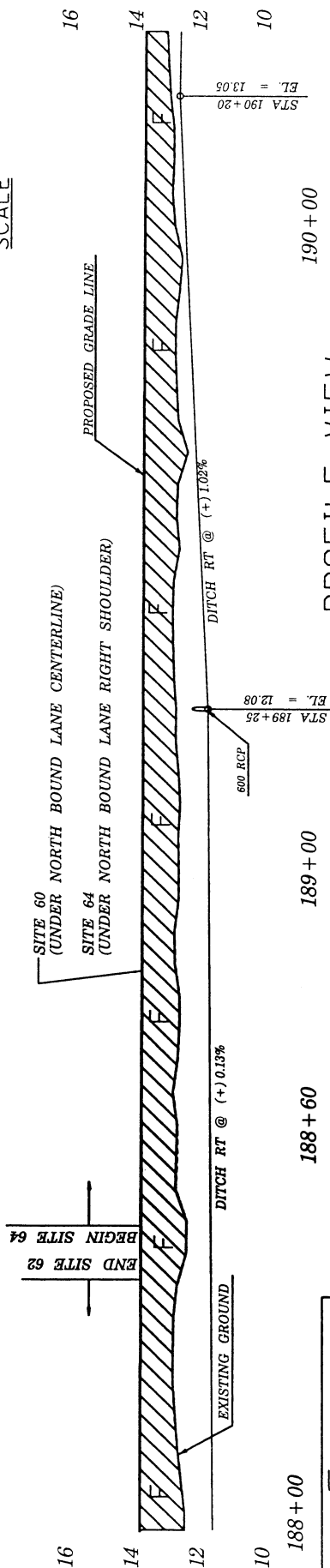
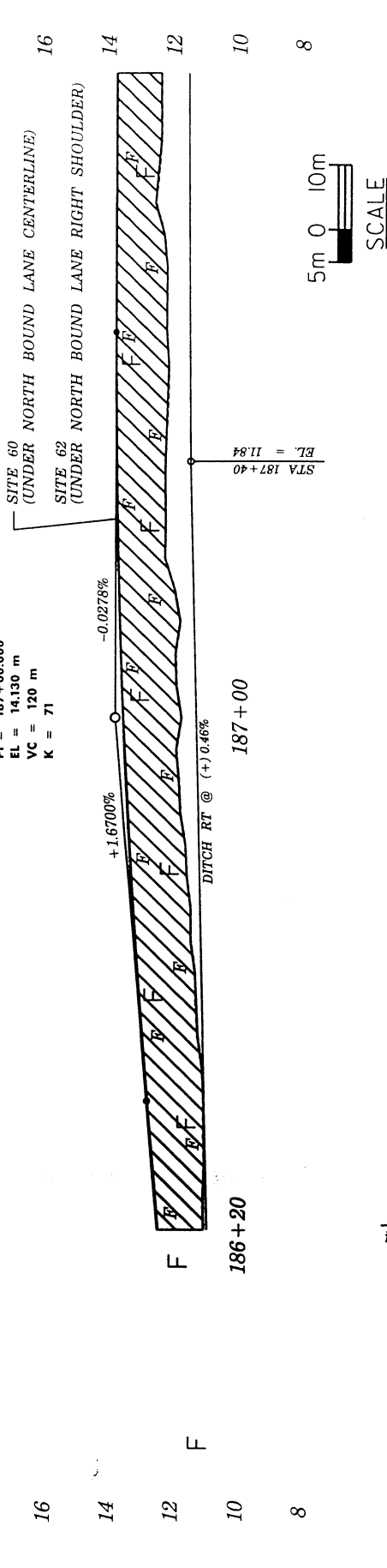
PLAN VIEW
SITE 56, 58, 60, 61, 62 & 63

STATE PROJ: 8.TI9030I (R-25I4A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439

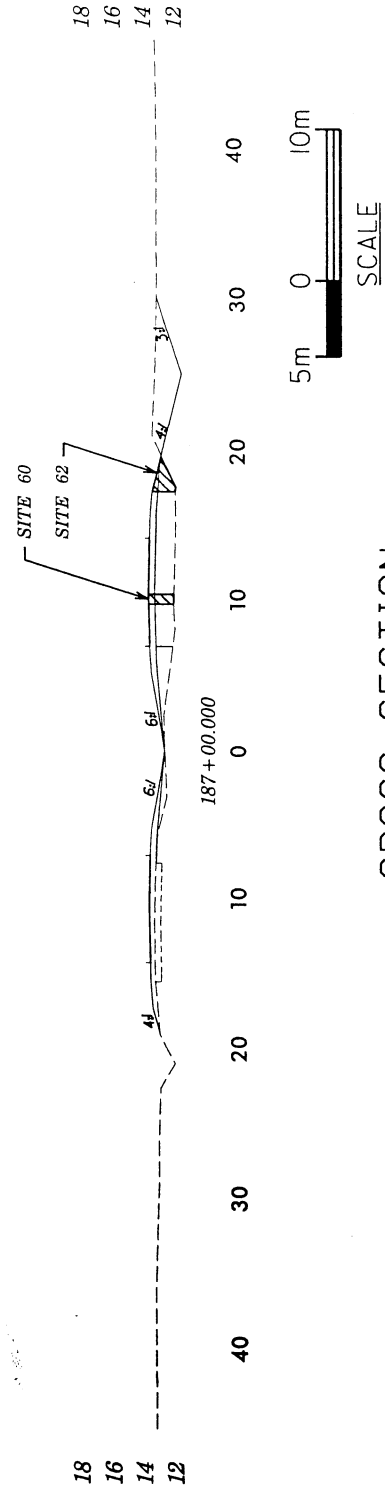
SCALE AS SHOWN

SHEET 66 OF 81 DATE 7/14/03

PI = 187+00.000
 EL = 14.130 m
 VC = 120 m
 K = 71



PROFILE VIEW SITE 60, 62 & 64



NC DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ONSLOW COUNTY

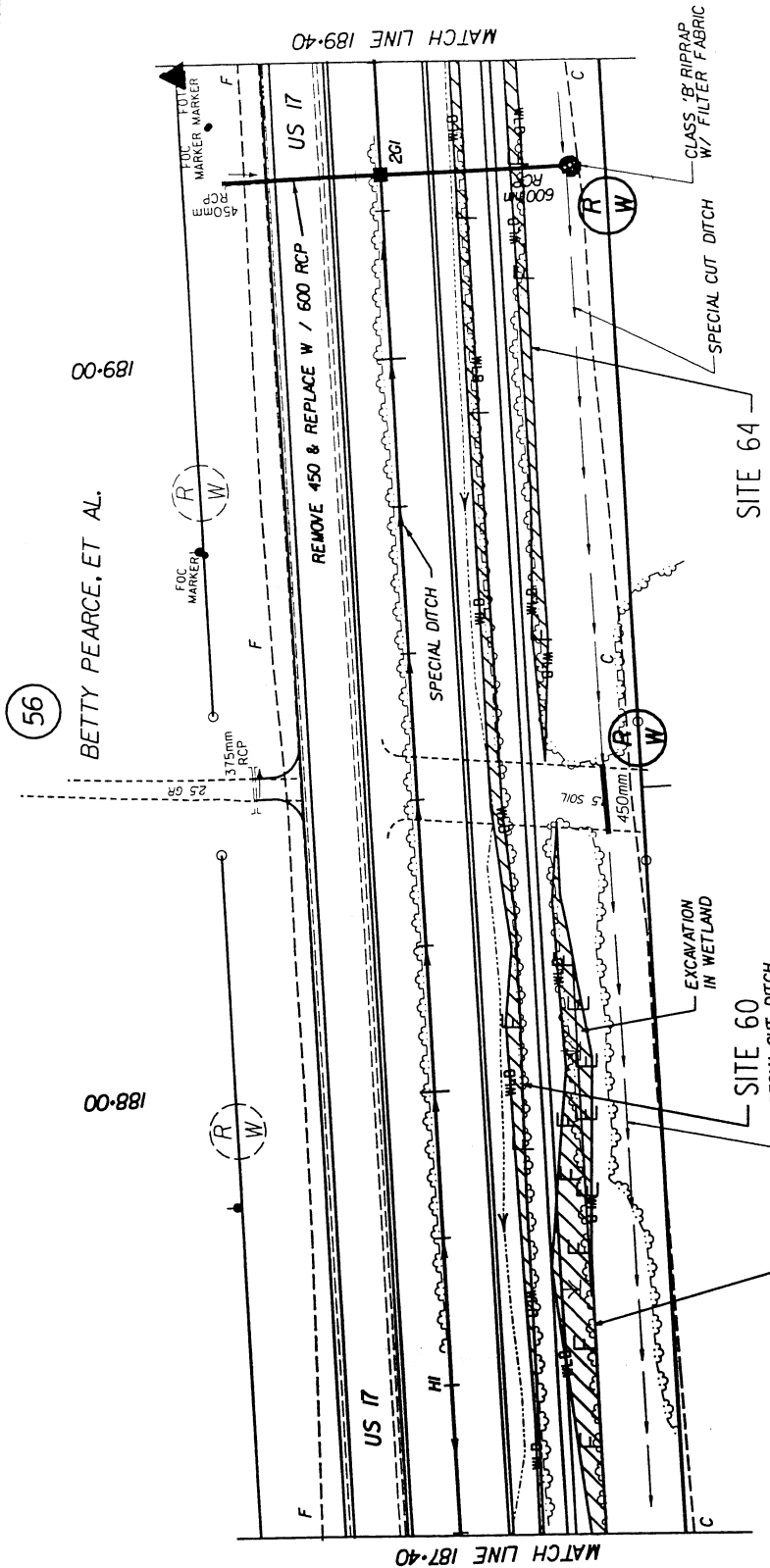
STATE PROJ: 8.TI9030I (R-25I4A)
 US 17 NORTH OF JACKSONVILLE FROM
 SR 1327 TO SR 1330/1439

SCALE AS SHOWN
 SHEET 67 OF 81 DATE 7/14/03

00-881

BETTY PEARCE, ET AL.

00-681



SITE 62

SITE 60

SPECIAL CUT DITCH

EXCAVATION
IN WETLAND

SITE 64

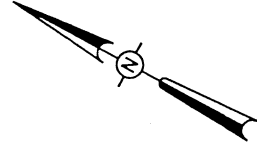
SPECIAL CUT DITCH

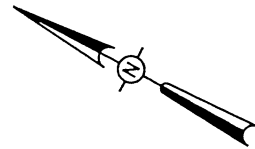
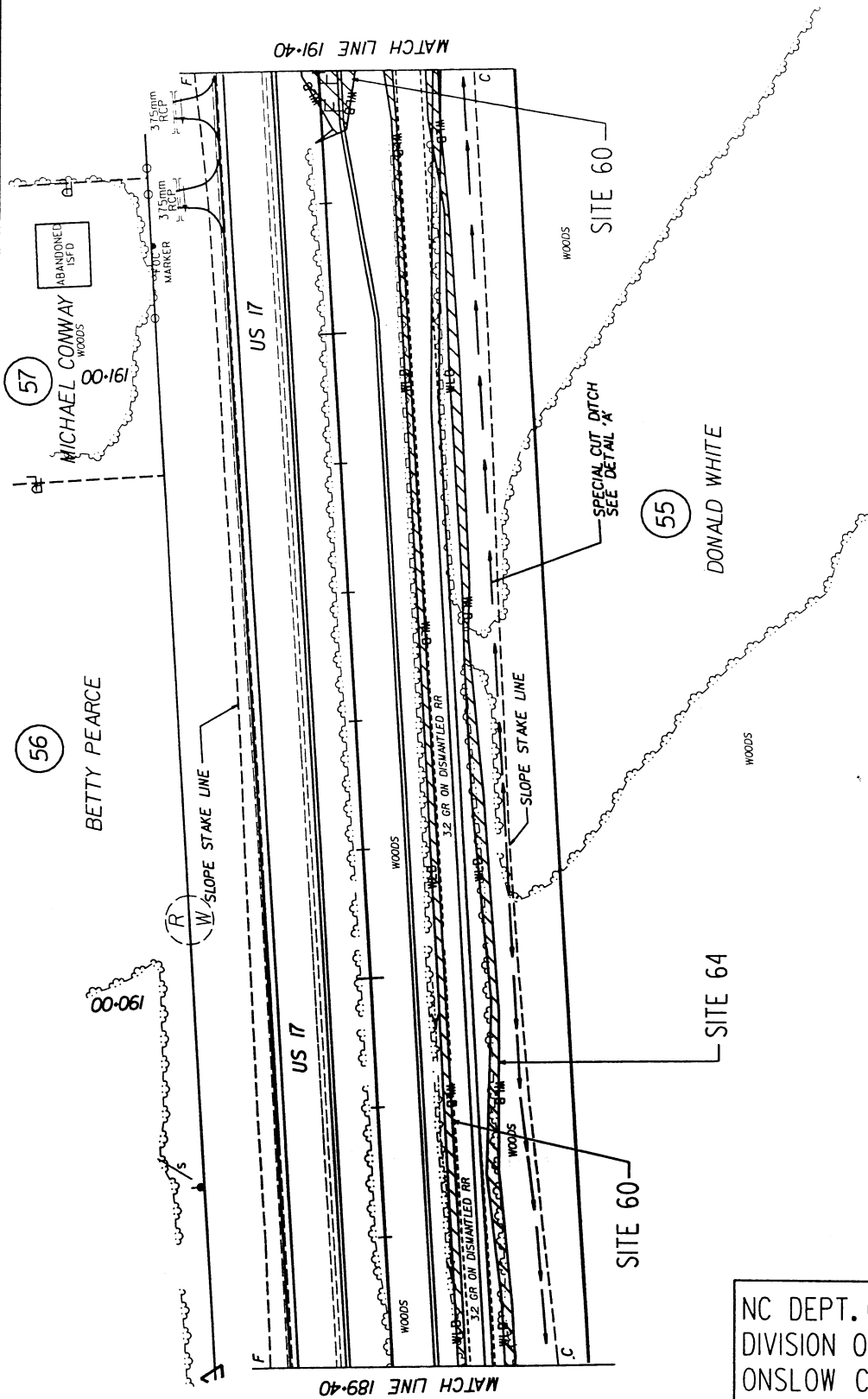
CLASS 'B' RIPRAP
W/ FILTER FABRIC

NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONSLOW COUNTY
STATE PROJ: 8.T190301 (R-2514A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439
SCALE AS SHOWN
SHEET 68 OF 81 DATE 7/14/03

DONALD WHITE

PLAN VIEW
SITE 60, 62, & 64
SCALE
5m 0 10m





5m 0 10m
SCALE

PLAN VIEW
SITE 60 & 64

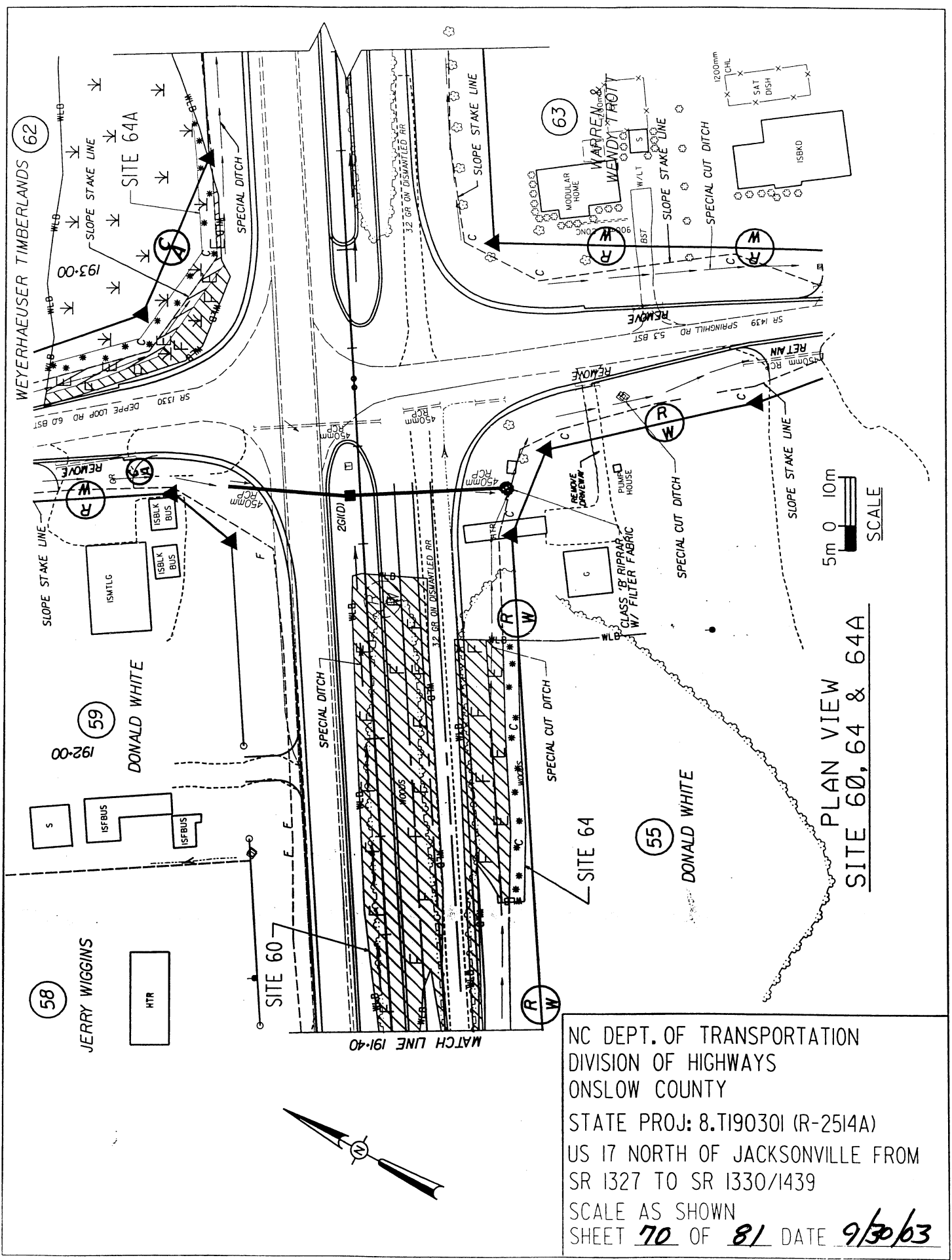
NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONSLOW COUNTY

STATE PROJ: 8.TI9030I (R-25I4A)

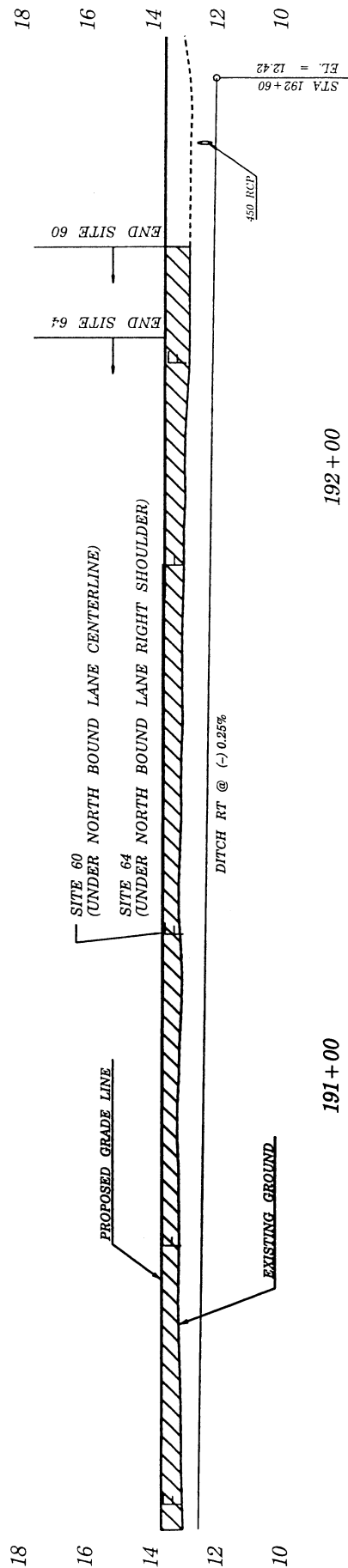
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439

SCALE AS SHOWN

SHEET 69 OF 81 DATE 7/14/03



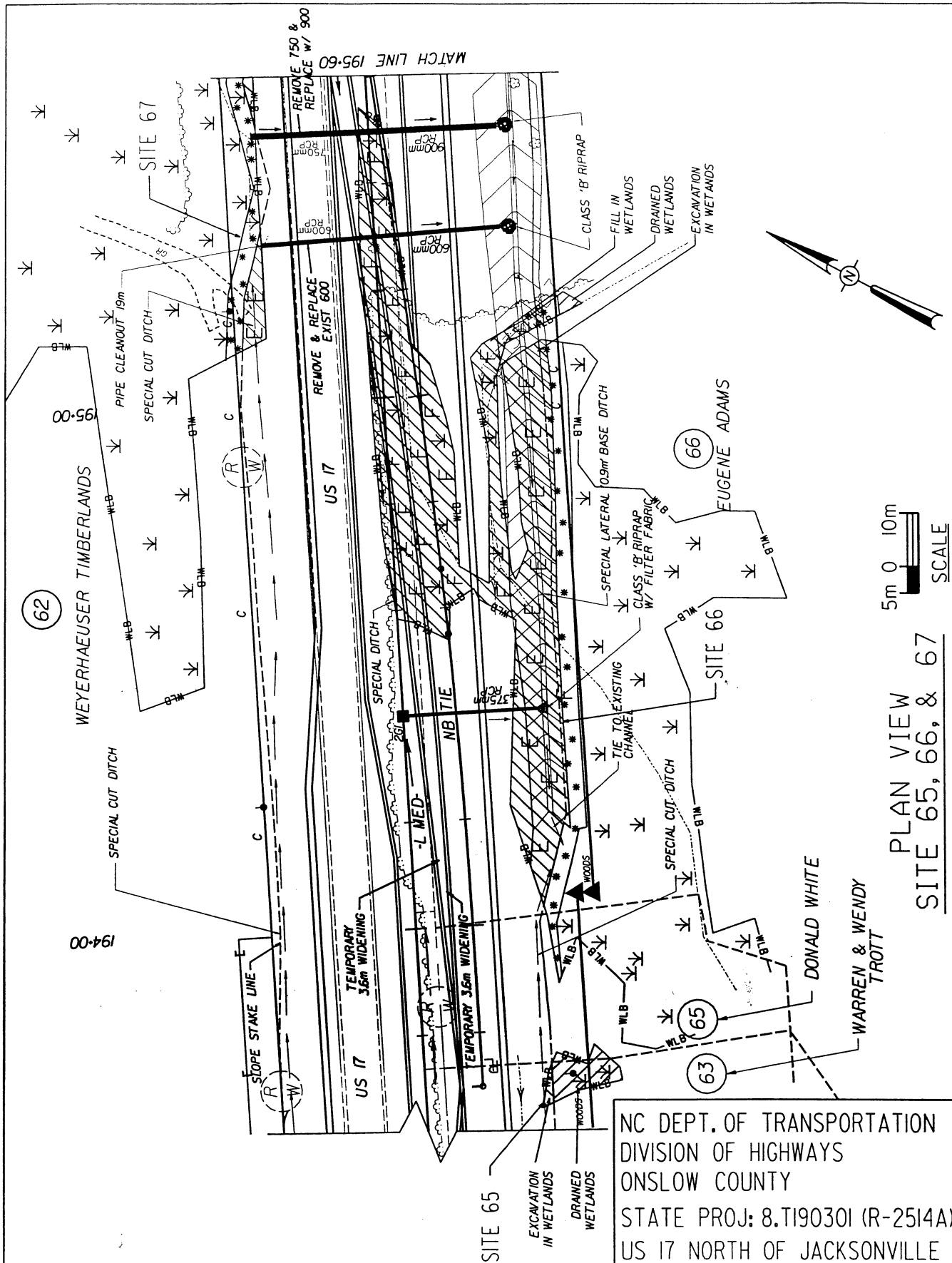
NC DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ONSLOW COUNTY
 STATE PROJ: 8.T190301 (R-2514A)
 US 17 NORTH OF JACKSONVILLE FROM
 SR 1327 TO SR 1330/1439
 SCALE AS SHOWN
 SHEET 70 OF 81 DATE 9/30/63



PROFILE VIEW SITE 62 & 64



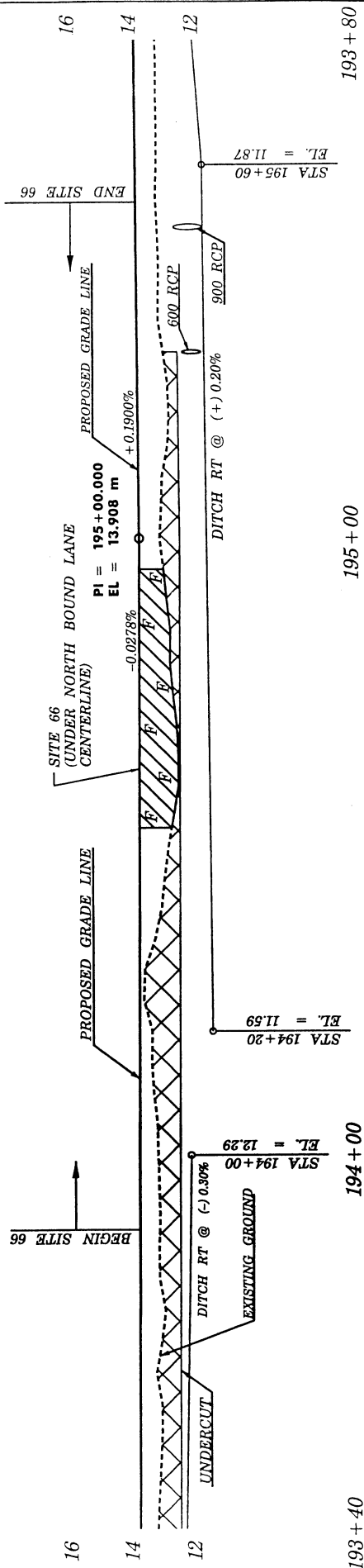
NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONSLOW COUNTY
STATE PROJ: 8.TI9030I (R-25I4A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/I439
SCALE AS SHOWN
SHEET 71 OF 81 DATE 7/14/03



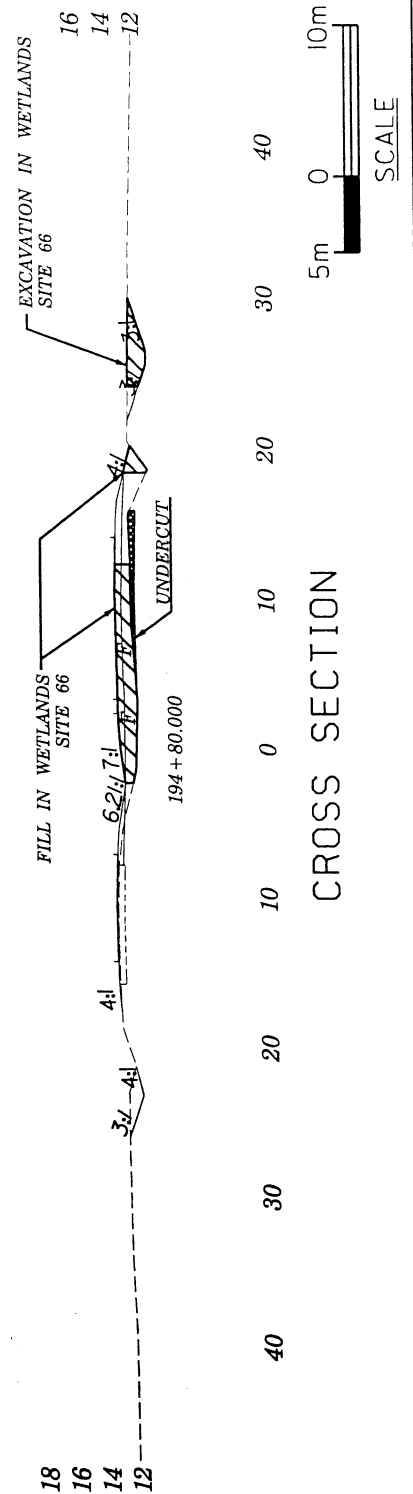
5m 0 10m
SCALE

PLAN VIEW
SITE 65, 66, & 67

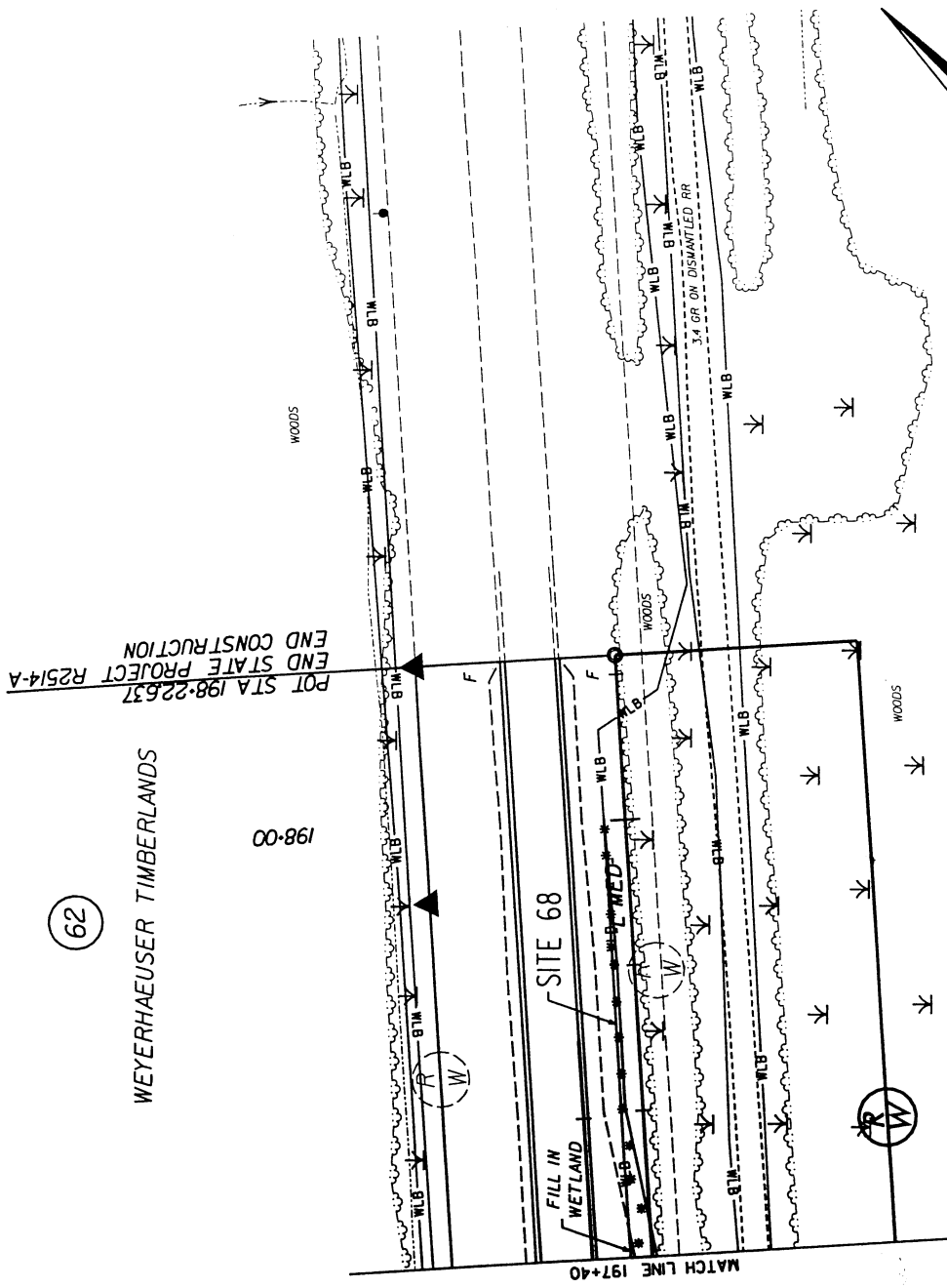
NC DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ONSLOW COUNTY
STATE PROJ: 8.TI9030I (R-25I4A)
US 17 NORTH OF JACKSONVILLE FROM
SR 1327 TO SR 1330/1439
SCALE AS SHOWN
SHEET 72 OF 81 DATE 9/30/03



SITE 66



NC DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ONSLOW COUNTY
 STATE PROJ: 8.T190301 (R-2514A)
 US 17 NORTH OF JACKSONVILLE FROM
 SR 1327 TO SR 1330/1439
 SCALE AS SHOWN
 SHEET **73** OF **81** DATE **7/14/03**



(62)

WYERHAEUSER TIMBERLANDS

198+00

(62)

WYERHAEUSER TIMBERLANDS

NC DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ONSLOW COUNTY
 STATE PROJ: 8.TI9030I (R-2514A)
 US 17 NORTH OF JACKSONVILLE FROM
 SR 1327 TO SR 1330/1439
 SCALE AS SHOWN
 SHEET 75 OF 81 7/14/03

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
17	PEGGY GIBSON	4206 NEW BERN HWY JACKSONVILLE, NC 28546
19	BENJAMIN GIBSON	4184 NEW BERN HWY JACKSONVILLE, NC 28546
20	MARCIA HUMPHREY	1698 KELLUM LOOP RD JACKSONVILLE, NC 28546
21	MARCIA HUMPHREY	1698 KELLUM LOOP RD JACKSONVILLE, NC 28546
22	ESTERLENE DIXON	1402 ADAM COURT JACKSONVILLE, NC 28546
23	RETHA EDWARDS	4260 NEW BERN HWY JACKSONVILLE, NC 28546
26	DEWEY L. POWERS	944 ETON DRIVE JACKSONVILLE, NC 28546
30	ANTHONY HERNANDEZ	4339 N. MARINE BLVD JACKSONVILLE, NC 28546
32	THE ENDOWMENT FUND OF NC STATE UNIV., ET AL (HOFFMANN FOREST)	JACKSONVILLE, NC 28540
33	GREAT EASTERN TIMBER CO., LLC	15 PIEDMONT CENTER SUITE 1250 ATLANTA, GA 30305
34	JAMES WHITE	2573 BELGRADE SWANSBORO RD MAYSVILLE, NC 28555
35	BETTY C. SUTHERLAND	5743 NEW BERN HWY MAYSVILLE, NC 28555
38	EDNA EARL ODOM	P.O. BOX 833 MAYSVILLE, NC 28555
44	GRACE E. HORTON	11 RUTH STREET JACKSONVILLE, NC 28540
47	HAZEL S. PARKER	2798 BELGRADE SWANSBORO RD MAYSVILLE, NC 28555
48	PERCY & LINA PARKER	2780 BELGRADE SWANSBORO ROAD MAYSVILLE, NC 28555
50	PERCY PARKER, ET. AL.	2780 BELGRADE SWANSBORO ROAD MAYSVILLE, NC 28555

NCDOT
DIVISION OF HIGHWAYS
ONSLOW COUNTY
PROJECT: 8.T190301 (R-2514A)
US 17 NORTH OF JACKSONVILLE
FROM SR 1327 / SR 1410
TO SR 1330 / SR 1439
SHEET 76 OF 81 DATE 7/14/03

[illegible]

NCDOT
DIVISION OF HIGHWAYS
ON SLOW COUNTY
PROJECT: 8.T190301 (R-2514A)
US 17 NORTH OF JACKSONVILLE
FROM SR 1327 / SR 1410
TO SR 1330 / SR 1439
SHEET 77 OF 81 DATE 7/14/03

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS				SURFACE WATER IMPACTS				
			Fill In Wetlands (Hectares)	Temp. Fill In Wetlands (Hectares)	Excavation In Wetlands (Hectares)	Mechanized Clearing (Method III) (Hectares)	Drained Wetlands (Hectares)	Fill In SW (Natural) (Hectares)	Temp. Fill In SW (Hectares)	Existing Channel Impacted (Meters)	Natural Stream Design (Meters)
1	105+66 - 105+99 RT	900 mm RCP	0.031		0.015	0.009					
2	106+01 - 106+04 LT	900 mm RCP						0.003		16	
3	106+98 - 107+26 RT		0.039		0.005		0.016				
4	107+48 - 107+63 CL		0.005								
4A	107+70 LT	600mm RCP	0.099				0.007	0.001		3	
5	107+60 - 111+40 RT		0.099			0.007					
6	107+61 - 110+64 RT		0.049		0.096	0.086					
7	110+58 - 111+65 RT		0.244								
8	111+26 - 111+73 LT		0.003		0.008	0.010					
8A	111+80 - 111+88 LT					0.002					
9	111+66 - 112+12 RT	1.8 x 1.8 RCBC	0.049								
10	112+10 - 112+77 RT	(same culvert as site 9)	0.023		0.006		0.022	0.013		96	
10A	112+08 LT	(same culvert as site 9)			0.001	0.021		0.000		2	
11	114+23 - 114+43 RT		0.005			0.004					
12	114+54 - 116+69 RT	450 RCP	0.344		0.010	0.064					
12A	114+60 - 114+90 LT	(same pipe as site 12)			0.003	0.004					
13	116+81 - 119+83 RT	750 RCP	0.521		0.070	0.083					
13A	119+48 - 119+66 LT	(same pipe as site 13)			0.003	0.005					
14	120+08 - 129+26 RT	600 RCP	1.930		0.024	0.122					
15	124+48 - 125+75 RT	(same pipe as site 14)			0.011	0.029					
15A	125+57 - 125+79 LT	(same pipe as site 14)			0.004	0.007					
16	125+80 - 142+50 RT		0.093		0.374	0.330	0.134				
17	Not Used										
TOTALS:			3.534	0	0.630	0.782	0.179	0.017	0	117	0

NCDOT

DIVISION OF HIGHWAYS
ONslow COUNTY
PROJECT 8.T190301 (R-2514A)
US 17 NORTH OF JACKSONVILLE
TO SOUTH OF BELGRADE

SHEET 78 OF 81

REV 01/16/04

File: g:\va00\02201\cad\permits\WetlandPermitSummaryM.xls

Form Revised 3/22/01

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS				SURFACE WATER IMPACTS				
			Fill In Wetlands (Hectares)	Temp. Fill In Wetlands (Hectares)	Excavation In Wetlands (Hectares)	Mechanized Clearing (Method III) (Hectares)	Drained Wetlands (Hectares)	Fill In SW (Natural) (Hectares)	Temp. Fill In SW (Hectares)	Existing Channel Impacted (Meters)	Natural Stream Design (Meters)
18	129+35 - 132+32 RT	375 mm RCP	0.331								
19	132+47 - 132+64 LT	900 mm RCP			0.005	0.006					
20	132+60 - 132+63 CL		0.002		0.000	0.000					
21	133+56 - 147+60 RT		1.856								
21A	136+00 - 136+15 LT	600 mm RCP			0.002	0.006					
21B	140+54 - 140+69 LT	600 mm RCP			0.001	0.005					
22	144+20 - 145+00 RT	600 mm RCP			0.031	0.015					
22A	144+30 - 144+45 LT	600 mm RCP			0.001	0.003					
23	145+22 - 146+97 RT	375 mm RCP			0.041	0.007	0.040				
24	147+05 - 148+64 RT	600 mm RCP			0.028	0.016	0.015				
24A	148+20 - 148+35 LT	600 mm RCP			0.002	0.010	0.000				
25	149+06 - 150+63 RT		0.111		0.000	0.000					
25A	149+02 - 150+33 RT					0.016					
26	150+55 - 151+05 RT		0.001			0.011					
27	Not Used										
28	150+68 - 151+37 RT		0.042								
29	151+41 - 153+07 RT					0.031					
30	151+84 - 152+76 RT		0.110								
31	153+13 - 153+51 RT		0.009								
32	153+32 - 153+49 RT		0.000			0.003					
33	154+40 - 156+76 RT		0.155								
34	156+97 - 157+18 RT				0.008						
TOTALS:			2.616	0	0.119	0.131	0.055	0	0	0	0

NCDOT

DIVISION OF HIGHWAYS
 ONSLOW COUNTY
 PROJECT 8.T190301 (R-2514A)
 US 17 NORTH OF JACKSONVILLE
 TO SOUTH OF BELGRADE

SHEET 79 OF 81

9/30/03

g:\a0002001\card\permits\WetlandPermitSummaryM.xls

File:

Form Revised 3/22/01

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS				SURFACE WATER IMPACTS				
			Fill In Wetlands (Hectares)	Temp. Fill In Wetlands (Hectares)	Excavation In Wetlands (Hectares)	Mechanized Clearing (Method III) (Hectares)	Drained Wetlands (Hectares)	Fill In SW (Natural) (Hectares)	Temp. Fill In SW (Hectares)	Existing Channel Impacted (Meters)	Natural Stream Design (Meters)
35	156+92 - 160+40 RT		0.308								
36	159+14 - 160+35 RT				0.099						
37	160+40 - 162+10 RT	2 @ 2.1w x 1.8h RCBC	0.192		0.039	0.043		0.009		41	
37A	161+38 LT	(same culvert as site 37)				0.010				18	
38	162+52 - 169+43 RT		0.814					0.002	*	20	*
38A	163+77 - 163+96 RT				0.003	0.017				20	
39	162+52 - 169+26 RT	600 mm RCP	0.156		0.274	0.204					
40	164+76 - 167+38 LT		0.004			0.059					
41	168+24 - 168+64 LT					0.004					
42	169+59 - 170+34 LT					0.007					
43	170+35 - 173+39 RT										
44	171+69 - 174+29 CL				0.039	0.000	0.018				
45	173+58 - 174+25 LT	600 mm RCP	0.290			0.042					
46	173+70 - 176+59 RT		0.016			0.008					
47	174+56 - 174+82 CL		0.023		0.101						
48	174+56 - 175+48 LT	600 mm RCP	0.019		0.010	0.074					
49	175+08 - 176+91 RT		0.074								
50	Not Used										
51	176+61 - 176+83 LT		0.002		0.008		0.007				
52	177+07 - 177+88 LT	0.9m Base Tail Ditch	0.016		0.044	0.075	0.034				
53	179+13 - 179+30 LT	0.9m Base Tail Ditch						0.001		20	
54	181+51 - 182+79 CN	Bridge	0.116		0.001	0.022					
TOTALS:			2.031	0	0.618	0.566	0.059	0.011	0	120	0

* No Mitigation Required (Intermittent Stream in Site 38)

NCDOT

DIVISION OF HIGHWAYS
 ONSLOW COUNTY
 PROJECT 8.T190301 (R-2514A)
 US 17 NORTH OF JACKSONVILLE
 TO SOUTH OF BELGRADE

SHEET **80** OF **81**

1/16/2004

File: g:\va000201\cad\permits\WetlandPermitSummaryM.xls

Form Revised 3/22/01

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Fill In Wetlands (Hectares)	Temp. Fill In Wetlands (Hectares)	Excavation In Wetlands (Hectares)	Mechanized Clearing (Method III) (Hectares)	Drained Wetlands (Hectares)	Fill In SW (Natural) (Hectares)	Temp. Fill In SW (Hectares)	Existing Channel Impacted (Meters)	Natural Stream Design (Meters)	
55	181+70 - 182+70 LT	Bridge	0.064	*			0.020					
56	182+97 - 185+66 LT	Bridge	0.040	*		0.001	0.054					
57	183+00 - 185+05 CN	Bridge	0.191				0.004					
58	183+07 - 185+67 RT		0.066		0.002		0.082					
59	Not Used											
60	185+20 - 192+33 RT		0.208									
61	185+23 - 185+57 CN		0.013									
62	185+40 - 188+36 RT		0.054		0.004							
63	185+80 - 186+13 RT						0.005					
64	188+44 - 192+19 RT	600 mm RCP	0.081		0.014		0.016					
64A	192+76 - 193+31 LT		0.015		0.011		0.020					
65	193+65 - 193+77 RT				0.001			0.008				
66	193+88 - 195+54 RT		0.126		0.071		0.035					
67	195+28 - 195+75 LT	600 mm & 900 mm RCP	0.002		0.006		0.017					
68	196+77 - 197+44 RT		0.009				0.025					
SHEET TOTALS:			0.870	0	0.111		0.278	0.008	0	0	0	0
PROJECT TOTALS:			9.051	0	1.478		1.757	0.300	0.028	0	237	0

* SITE 55 - 0 064 ha INC 1 IDES 0 022 ha OF EIL FOR TEMPORARY ACCESS ROAD AND WORK PAD.

* SITE 56 - 0.0398 ha INCLUDES 0.019 ha OF FILL FOR TEMPORARY ACCESS ROAD AND WORK PAD.

NCDOT

DIVISION OF HIGHWAYS
ON SLOW COUNTY
PROJECT 8.T190301 (R-2514A)
US 17 NORTH OF
JACKSONVILLE
TO SOUTH OF BELGRADE

SHEET 81 OF 81

1/16/2004

Application for Individual Section 404 and 401 permits for the US 17 widening
from SR 1327/1410 north of Jacksonville to SR 1330/1439 south of Belgrade/Maysville in
Onslow County, North Carolina
Federal Aid Project No. NHF-17(7)
State Project No. 8.T190301
TIP No. R-2514A

Project Commitments

- According to the FONSI (August 2000), SHPO will be provided the opportunity to comment on the roadway design plans in the vicinity of the Nelson Deppe House prior to right-of-way acquisition.
- The NC Plant Conservation Program will be given the opportunity to survey the right-of-way for any state listed (specifically *Solidago verna*, *Xyris difformis* var. *floridanum*, and *Polygala hookeri*) or other rare species. Implementation of the conservation measures for the spring-flowering goldenrod is encouraged. If rare plant species will be negatively impacted by the proposed project, the NC Plant Conservation Program should be consulted in order to determine whether transplantation or other forms of mitigation would be desirable. NCDOT will contact the NC Plant Conservation Program in March 2004 to coordinate any plant rescue situations along the project.
- Also prior to construction, a wetland mitigation plan will be developed and coordinated with the appropriate environmental regulatory agencies.
- A Sediment and Erosion Control plan will be prepared for the project in accordance with the NCAC Title 15A, Chapter 4 and will follow erosion and sediment control measures set forth in the NCDOT Erosion and Sediment Control Guidelines for Contract Construction (January 1995) as applicable.
- Borrow and waste areas for the project will not be allowed in wetlands without the appropriate permits.
- Construction staging areas will not be allowed in wetlands.
- Three major drainage structures, one bridge and two box culverts, will be replaced in accordance with NCDOT Guidelines for Drainage Studies. The bridge is located on the lower reach of Starky's Creek and will be replaced with dual structures approximately 135 feet long. An existing double RCBC which conveys the upper reach of Starky's Creek will be replaced with a double RCBC approximately 131 feet long. Also an existing RCBC which conveys an unnamed tributary to Northeast Creek will be replaced with a RCBC approximately 136 feet long.
- Stormwater drainage design will be addressed during the Design Phase and will be included as part of the construction plans and documents.
- A Confederate soldier's gravesite is located in the southwest quadrant of the intersection of Deppe Loop Road and US 17. The proposed right-of-way at this intersection will be adjusted to avoid any impacts to the gravesite.
- All special ditches that run through or that are adjacent to wetlands will need to be assessed for limit of impact due to drainage impacts.
- There should be no adjustment of stream widths and no rip rap should be placed in the bed of jurisdictional streams. Four of the jurisdictional crossings where pipes or box culverts are proposed, as replacement structures will be buried appropriately. Jurisdictional stream culvert inverts should be buried a minimum of 20% of culvert diameter or one foot for aquatic passage.
- Pre-formed scour holes have been placed at all pipe outlets that empty into wetlands.

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
1548 MAIL SERVICE CENTER
RALEIGH NC 27699-1548

TELEPHONE: 919-733-3141
FAX: 919-733-9794

WEBSITE: WWW.NCDOT.ORG

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC

- The Department has avoided and minimized impacts to jurisdictional resources to the greatest extent possible as described above. The remaining, unavoidable impacts to 31.1 acres of jurisdictional wetlands, 0.07 acre of fill in surface waters, and 830 feet of jurisdictional streams will be offset by compensatory mitigation provided by the EEP program.
- A 401 Water Quality Certification is received from DWQ prior to the onset on construction.
- Sedimentation and Erosion Control requirements and the Memorandum of Agreement between the NCDOT and the DLQ must be adhered to.
- Construction staging areas are situated in uplands specially, not in wetland areas.
- Best management practices for the protection of surface waters will be strictly followed.
- All necessary DENR permits and/or approvals as indicated in the Intergovernmental Review dated October 25, 1999 are obtained and adhered to.

PERMIT DRAWINGS, PROPERTY OWNERS,
IMPACT SUMMARY SHEET, LABELS

APPENDIX

APPENDIX A

- NCDOT Stormwater Management Plan for R-2514A dated 09/10/03
- NCDENR - CAMA Consistency Determination letter dated 11/24/99
- SHPO Concurrence Form dated 08/31/99

STORMWATER MANAGEMENT PLAN

Project: 8.T190301, TIP R-2514A
Onslow County

March 17, 2003
Revised May 8, 2003
Revised September 10, 2003

Hydraulics Designer: Ray D. Lovinggood, P.E., TranSystems Corporation
Hydraulics Project Manager: John W. Twisdale, Jr., P.E., NCDOT Hydraulics Unit

PROJECT ROADWAY LOCATION

This roadway project will widen the existing US-17 in northeast Onslow County north of Jacksonville and runs from the intersection of US 17 with SR 1327 (Kellum Loop) / SR 1310 Halltown Road) to the intersection of US 17 and SR 1330 (Deppe Loop Road) / SR 1439 (Springhill Road) south of Belgrade.

ROADWAY DESCRIPTION

The project adds two lanes adjacent to and parallel with the existing US-17. The new lanes will be on the southeast side of the existing roadway. Total project length is 9.885 kilometers. The proposed typical section uses the existing two lanes as the southbound lanes and adds two northbound lanes and a 14 meter wide grass median. The outside shoulders have both paved and grassed sections, the width of each component dependant upon the requirement at each location. Typically, the shoulders are 3.0 meters wide, with 1.2 meters paved and the remaining 1.8 meters grassed. Short lengths of concrete gutter are used in areas of high earthen fills. The gutters are necessary to capture rainwater from running down the high and steep (2:1) fill slopes.

ENVIRONMENTAL DESCRIPTION

Land Use

The project runs through rural land where homes are sparsely distributed. The largest landowner is North Carolina State University with its "Hoffmann Forest." Two timber companies, "Weyerhaeuser Timberlands" and "Great Eastern Timber Company" also own land adjoining the highway. Overall land use is a mix of silviculture, agriculture, and fallow fields.

Topography and Water Resources

The project is located within two river basins: the southern portion of the project drains to the New River and the northern portion drains to White Oak River. Jurisdictional stream crossings are listed in Table 1.

TABLE 1

Station	Location	Stream Name	Type	Structure
106+00	Left side of US-17 (North side)	Unnamed tributary to Northeast Creek	Intermittent	900 mm RCP
107+80	Left side of US-17 (North side)	Unnamed tributary to Northeast Creek	Intermittent	600 mm RCP
112+10	Both sides of US-17	Unnamed tributary to Northeast Creek	Perennial	Single 1.8m x 1.8m RCBC
161+40	Both sides of US-17	Starkys Creek	Perennial	Double 2.1m x 1.8m RCBC
164+00	Both sides of US-17	Unnamed tributary to Starkys Creek	Intermittent	900 mm RCP
179+30	Left side of US-17	Unnamed tributary to Starkys Creek	Intermittent	600 mm RCP
182+80	Both sides of US-17	Starkys Creek	Perennial	Bridge

BEST MANAGEMENT PRACTICES AND MAJOR STRUCTURES

The primary goal of Best Management Practices (BMP's) is to prevent degradation of the state's surface waters by the location, construction, and operation of the highway system. BMP's are activities, practices, and procedures taken to prevent or reduce stormwater pollution. For this project, the most extensive BMP used is within the basic design element of the road. This basic design, called the Typical Section, uses grassy shoulders and medians, as opposed to a curb and gutter design. The grassed areas help in the removal of pollutants before they reach receiving waters. Generally, the grassed side slopes of fill sections and ditches are 3:1 (three horizontal units to one vertical unit) or flatter. Fill slopes behind guardrail sections are 2:1.

Another BMP designed for this project is a device called a Preformed Scour Hole (PSH). A PSH is a small area of excavation at the outlet end of a stormwater pipe. The excavation is sized according to the pipe flowing to it, but it can generally be considered to be roughly 1.2m x 1.2m and is placed approximately 0.3m below the invert of the pipe. The depression is filled with rip rap and is surrounded on three sides by Permanent Soil Reinforcement Mat (PSRM) placed level. The 0.3m drop and the rip rap will reduce the energy of the stormwater and the leveled sides will allow the stormwater to disperse in "sheet flow" rather than concentrated flow. Preformed Scour Holes are used at all stormwater outlets in wetlands to produce non-erosive velocities.

Thirdly, no deck drains on the bridges will be allowed directly over the surface water of Starkys Creek.

The fourth BMP used is the design of burying culverts and cross pipes. The culverts will be buried a minimum of 0.3 meters.

These design features will aid in conveying stormwater from the roadway surface to the receiving streams with minimal environmental impacts.



JAMES B. HUNT JR.
GOVERNOR

WAYNE McDEVITT
SECRETARY

DONNA D. MORFITT
DIRECTOR

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES

November 24, 1999 DIVISION OF COASTAL MANAGEMENT

Mr. William D. Gilmore, P.E., Manager
Project Development and Environmental Analysis Branch
Division of Highways
North Carolina Department of Transportation
P.O. Box 25201
Raleigh, N.C. 27611-5201

SUBJECT: SCH File # 00-E-4220-0155; Environmental Assessment and
Programmatic Section 4(F) Evaluation, US 17 widening from SR
1327/1410 north of Jacksonville to SR 1330/1439 south of
Belgrade/Maysville, Onslow County, Federal Aid Project No. NHF-
17(7), State Project No. 8.T190301, TIP No. R-2514A.

Dear Mr. *Bill* Gilmore:

The State has completed its review pursuant to Section 307 of the Coastal Zone Management Act of 1972 as Amended of the above referenced Environmental Assessment and Programmatic Section 4(F) Evaluation dated August 23, 1999. The NC Department of Transportation proposes to widen 5.9 miles of existing US 17 through rural Onslow County to a four-lane, median-divided roadway. The primary purpose of the proposed project, as well as adjacent TIP projects, is to upgrade US 17 to a modern, high speed, multi-lane facility through eastern North Carolina from South Carolina to Virginia. It appears from the comments received during this review that the preferred alternative to widen US 17 to the east of the existing roadway along the abandoned Seaboard Coast Line Railroad is the least environmentally damaging alternative. We understand that the preferred alternative will impact 25.27 acres of wetlands which will be mitigated at Clay Hill Farms, an off-site mitigation site in Jones County.

DCM staff concur with the statement in the Environmental Assessment that the project does not encroach into any AEC, [REDACTED] DCM staff also believe that this project appears to be consistent with the 1996 Land Use Plan for the City of Jacksonville and the 1992 Land Use Plan for Onslow County, provided all local, state and federal requirements can be satisfied.

Based upon our review, we determined on November 10, 1999 that the DOT proposal for widening of US 17 from SR 1327/1410 north of Jacksonville to SR 1330/1439 south of Belgrade/Maysville in Onslow County, TIP No. R-2514A, is consistent with the North Carolina Coastal Management Program (NCCMP) provided all state and local authorizations are obtained and the conditions therein are met, and provided the following conditions are met:

1638 MAIL SERVICE CENTER, RALEIGH, NC 27688-1638
2728 CAPITAL BLVD., RALEIGH, NC 27604
PHONE 919-733-2283 FAX 919-733-1485

AN EQUAL OPPORTUNITY / AFFIRMATIVE ACTION EMPLOYER - 50% RECYCLED/10% POST-CONSUMER PAPER

1. An acceptable mitigation plan to compensate for unavoidable wetland losses is developed and conducted in coordination with DCM, the NC Wildlife Resources Commission and the NC Division of Water Quality. Coastal Resources Commission mitigation policy (T15 NCAC 7M .0700) requires that primary mitigation to offset project impacts be in the form of wetland creation, restoration and/or enhancement. Mitigation in the form of wetlands preservation can be considered, but only in combination with one or more of the above.

DCM staff understand that the preferred alternative will impact 25.27 acres of wetlands within Onslow County. DCM staff are concerned that the off-site mitigation site is described as wetland flatwoods restoration, where clearly some of the project impacts will be to riverine wetlands. The mitigation plan will need to clearly identify how DOT proposes to mitigate for the loss of riverine wetlands with non-riverine mitigation. The mitigation plan will need to describe how the DOT arrived at this decision, what efforts were made to find riverine mitigation, and what mitigation ratios are being proposed to make up for this apparent discrepancy. The mitigation plan should also elaborate on the following statement on pages 50-51 regarding possible on-site mitigation: "Because restoration of wetlands within silvicultural areas or enhancement of pre-ditching hydrology in these areas may not be compatible with efficient timber production practices, mitigation options in silvicultural stands may be limited". DCM staff question why incompatibility with efficient timber production practices is a criteria for on-site wetland mitigation. DCM requests clarification of this determination within the wetland mitigation plan.

2. The Division of Coastal Management strongly supports the following statement found on page 55 of the Environmental Assessment under the state protected species heading: "Widening on the east side of existing US 17 would avoid direct impacts to a colony of spring-flowering goldenrod (which is also listed as FSC) located on the west side of the roadway. If impacts are unavoidable, mitigation for this species may be possible on-site by creating new habitat and transplanting individuals to the new right-of-way prior to project construction activities."

Based on the June 19, 1995 memorandum from Stephen Hall of the NC Division of Parks and Recreation and a recent telephone conversation, DOT should conduct a survey for the spring-flowering goldenrod (*Solidago verna*) and other rare species of plants, such as Florida yellow-eyed grass (*Xyris difformis* var. *floridanum*) and Hooker's milkwort (*Polygala hookeri*), that may occur in this area. If rare plant species will be negatively impacted by the proposed project, Cecil Frost, Director of the NC Plant Conservation Program, should be consulted in order to determine whether transplantation or other forms of mitigation would be desirable.

3. A 401 Water Quality Certification is received from the NC Division of Water Quality prior to the onset of construction.
4. Sedimentation and Erosion Control requirements and the Memorandum of Agreement between the Department of Transportation and the Division of Land Quality must be adhered to.

5. Borrow and waste areas are not allowed in wetlands.
6. Construction staging areas are situated in uplands specifically, not in wetland areas.
7. Best management practices for the protection of surface waters will be strictly followed.
8. All necessary DENR permits and/or approvals as indicated in the Intergovernmental Review dated 10-25-99 are obtained and adhered to.

If you have any questions regarding our finding or conditions, please contact Cathy Brittingham, DCM Transportation Project Coordinator, at (919) 733-2293 or via e-mail at Cathy.Brittingham@ncmail.net. Thank you for your consideration of the North Carolina Coastal Management Program.

Sincerely,



Donna D. Moffitt

cc: Chrys Baggett, NC Department of Administration
David Cox, NC Wildlife Resources Commission
Cecil Frost, Plant Conservation Program
Steve Hall, NC Division of Parks and Recreation
Larry Hardy, National Marine Fisheries Service
John Hennessy, NC Division of Water Quality
Melba McGee, NC DENR
Bill Pickens, NC Division of Forest Resources
Dave Timpy, US Army Corps of Engineers
Ted Tyndall, NC Division of Coastal Management

Federal Aid # NHF-(17)7 TIP # R-2514A County ONslow

CONCURRENCE FORM
FOR
ASSESSMENT OF EFFECTS

Brief Project Description

WIDENING US 17

On 31 AUG., 1999, representatives of the

☒ North Carolina Department of Transportation (NCDOT)
☒ Federal Highway Administration (FHWA)
☒ North Carolina State Historic Preservation Office (SHPO)
☐ Other _____

reviewed the subject project and agreed

_____ there are no effects on the National Register-listed property within the project's area of potential effect and listed on the reverse.

_____ there are no effects on the National Register-eligible properties located within the project's area of potential effect and listed on the reverse.

_____ there is an effect on the National Register-listed property/properties within the project's area of potential effect. The property-properties and the effect(s) are listed on the reverse.

☒ there is an effect on the National Register-eligible property/properties within the project's area of potential effect. The property/properties and effect(s) are listed on the reverse.

Signed:

[Signature] AUG 31, 1999
Representative, NCDOT, Historic Architectural Resources Section Date

[Signature] 8/31/99
FHWA, for the Division Administrator, or other Federal Agency Date

[Signature] 8/31/99
Representative, SHPO Date

[Signature] 8/31/99
State Historic Preservation Officer Date

(over)

Federal Aid # NHF-17(7) TIP # R-2514 A County ONSLOW

Properties within area of potential effect for which there is no effect. Indicate if property is National Register-listed (NR) or determined eligible (DE).

HOFFMAN FOREST / DEPPE LOOKOUT TOWER (DE)

Properties within area of potential effect for which there is an effect. Indicate property status (NR or DE) and describe effect.

NELSON DEPPE HOUSE (D.E.) NO ADVERSE EFFECT

Reason(s) why effect is not adverse (if applicable).

NELSON DEPPE HOUSE CONDITIONED UPON AN ENVIRONMENTAL COMMITMENT TO CONTINUE CONSULTATION WITH SHPO DURING FINAL DESIGNS.

Initialed:

NCDOT

ED

FHWA

sw

SHPO

AS

APPENDIX B

- Wetland Delineation Update (September 2003)

US 17 IMPROVEMENTS WETLAND DELINEATION UPDATE ONSLOW COUNTY, NORTH CAROLINA

T.I.P. No R-2514A
State Project No. 8.T190301

NCDOT Consulting Project No. 02-ES-13

Prepared for:

The North Carolina Department of Transportation
Raleigh, North Carolina



September 2003

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Appendix A	Routine Wetland Data Forms, 1998
Appendix B	2003 Stream Channel and Wetland Update Locations and New Routine Wetland Data Forms
Appendix C	Wetland and Stream GPS Figures

**US 17 IMPROVEMENTS WETLAND DELINEATION UPDATE
ONSLow COUNTY, NORTH CAROLINA
T.I.P. NO. R-2514A
CONSULTING PROJECT NUMBER 02-ES-13
STATE PROJECT NUMBER 8.T190301**

1.0 INTRODUCTION

The North Carolina Department of Transportation (NCDOT) is proposing to improve an approximately 6-mile portion of U.S. Highway 17 (US 17) north of the City of Jacksonville in Onslow County, North Carolina (Figure 1). As part of the environmental study, Environmental Services, Inc., (ESI) was contracted to conduct a jurisdictional wetland delineation in 1998. The delineation was reviewed and accepted by the U.S. Army Corps of Engineers (COE) representative, Dave Timpy in October 1998 (ESI 1998). In 2003, ESI was requested to update the jurisdictional delineation effort. This report outlines the findings of the delineation update effort.

2.0 KEY PERSONNEL

The jurisdictional wetland delineation update effort was conducted on 24-25 June 2003 by ESI biologist Jan Gay. Mr. Gay is a Senior Scientist with 11 years of professional experience with jurisdictional wetland issues. Mr. Gay field managed and participated in the 1998 delineation effort.

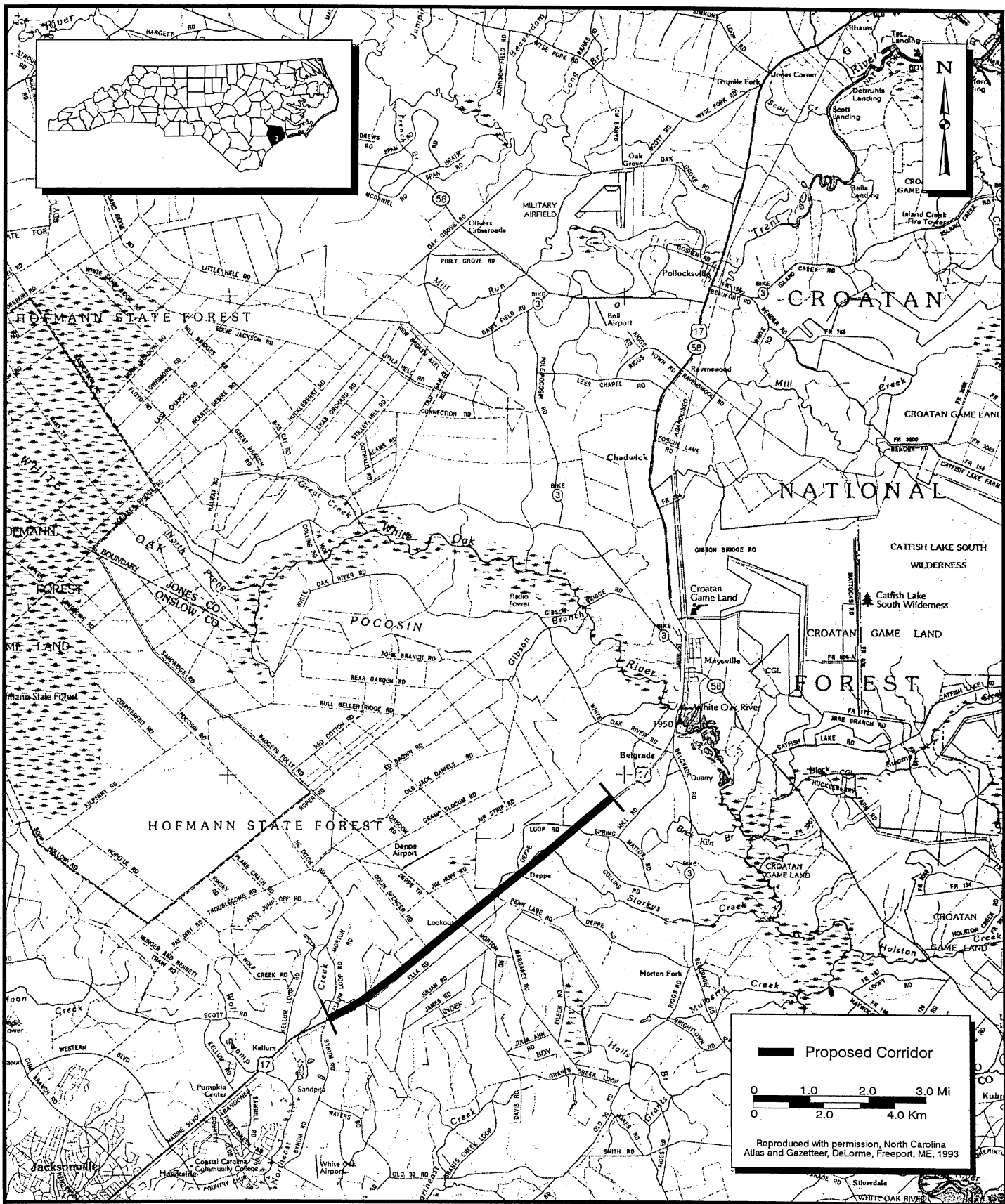
3.0 METHODS

The 1998 jurisdictional delineation was conducted using the three parameter approach as outlined by the COE (DOA 1987). The three parameters evaluated to determine the presence or absence of jurisdictional wetland areas include the presence of hydric soils, the presence of hydrophytic vegetation, and evidence of jurisdictional hydrology within 12 inches of the soil surface. Routine wetland data forms were completed for each wetland system delineated and are included in Appendix A. The jurisdictional boundaries were located using GPS technology following procedures outlined by NCDOT.

The 2003 wetland delineation update was conducted using the three parameter approach. Each jurisdictional boundary established in 1998 was reviewed to determine if any changes in jurisdictional status had occurred. In areas where changes in jurisdictional status were noted, a new boundary was established and located using a GPS unit. A new routine wetland data form was prepared for the revised sections of the jurisdictional lines. The new data forms are found in Appendix B.

4.0 WETLANDS

Jurisdictional wetland boundaries within the project study area were reviewed. The majority of jurisdictional boundaries have not changed. Two changes in jurisdictional boundaries were noted.



Proposed Corridor

0 1.0 2.0 3.0 Mi
0 2.0 4.0 Km

Reproduced with permission, North Carolina Atlas and Gazetteer, DeLorme, Freeport, ME, 1993



Environmental
Services, Inc.

Project Location
US 17 Improvements Wetland Delineation Update
Onslow County, North Carolina
T.I.P. R-2514A

Figure: 1

Project: ER0206.13

Date: Sept 2003

The first jurisdictional change is located at the southern end of the project study area (Point A on Figure B-1 in appendix B). The area has been recently cleared of timber. During the 1998 effort, the area was considered non-jurisdictional due to the presence of a drainage ditch removing hydrology from the site. Clearing activities destroyed the drainage feature. During the 2003 update, the area was determined to be jurisdictional. A new data form for this area is included in Appendix B. Remaining vegetation was hydrophytic in nature, consisting of widely scattered saplings of loblolly pine (*Pinus taeda*) and giant cane (*Arundinaria gigantea*). Soils exhibited hydric characteristics (Munsell color 2.5Y 4/1). Evidence of jurisdictional hydrology was noted, with saturation occurring within 12 inches of the soil surface. The revised wetland area is depicted on Figure C-1 in Appendix C.

The second jurisdictional change is located in the northern end of the project study area, at the intersection of US 17 and State Road (SR) 1439 (Point B on Figure B-2 in Appendix B). The area has been recently cleared. During the 1998 effort, the area consisted of young loblolly pine and was determined to be non-jurisdictional. Clearing activities removed the original soil surface layers, creating a low spot in the landscape. During the 2003 update, the area was determined to be jurisdictional. New data forms for this area are included in Appendix B. Vegetation was hydrophytic in nature, consisting of common cattail (*Typha latifolia*), soft rush (*Juncus effusus*), and various sedges (*Carex* spp.). Evidence of jurisdictional hydrology was noted, with the majority of the area inundated. The revised wetland area is depicted on Figure C-5 in Appendix C.

5.0 SURFACE WATERS

The project study area is located in the Coastal Plain physiographic province within the White Oak River Drainage Basin and is located within two subbasins as designated by the U.S. Geologic Service (USGS) and the N.C. Division of Water Quality (DWQ). Subbasin 03030001 contains the surface waters south of a point approximately 0.6 mile south of the intersection of US 17 and SR 1436 (USGS 1987) and has been designated subbasin 03-05-01 by DWQ (DENR 2001). Subbasin 03020106 contains the surface waters north of this the intersection of US 17 and SR 1436 (USGS 1987) and has been designated subbasin 03-05-02 by DWQ (DENR 2001).

Surface waters within the project study area include ten channel segments comprising six stream channel crossings. Three of the stream channels include Starky's Creek (Stream Index Number [SIN] 20-10), which is crossed twice, and two unnamed tributaries located in subbasin 03030001. The three remaining stream channels are associated with Northeast Creek (SIN 19-16-0.5) located in subbasin 03020106.

Waters of the State of North Carolina are assigned Best Usage Classifications based on the existing or contemplated best usage of various streams or segments of streams within each drainage basin.

Starky's Creek, from its source to the White Oak River, has been assigned a Best Usage Classification of **C** (DENR 2003). The designation **C** denotes fresh waters with appropriate uses including aquatic life propagation and survival, fishing, wildlife, secondary recreation, agriculture, and any other usage except for primary recreation or as a source of water supply for drinking, culinary or food processing purposes. Primary recreation refers to human body contact with water in an organized or on a frequent basis; secondary recreation refers to human body contact with water on an infrequent or incidental basis. The unnamed tributaries to Starky's Creek have not been assigned separate Best Usage Classifications and so share the Classification of their receiving water, **C**.

Northeast Creek, from its source to NC 24, has been assigned a Best Usage Classification of **SC NSW**. The designation **SC** denotes salt waters with appropriate uses including aquatic life propagation and maintenance of biological integrity, including fishing, fish and functioning Primary Nursery Areas, wildlife, secondary recreation, and any other usage except primary recreation or shellfishing for marketing purposes. The supplemental classification **NSW** indicates nutrient sensitive waters. Nutrient sensitive waters are those waters that are experiencing or are subject to excessive growths of microscopic or macroscopic vegetation determined sufficient to impair the use of the water for its assigned Best Usage Classification. The unnamed tributaries to Northeast Creek within the project study area have not been assigned separate Best Usage Classification and so share the Classification of their receiving water, **SC NSW**.

As part of this project, ESI reviewed the channel segments with COE representative Dave Timpy on 31 July 2003 to confirm intermittent, perennial, or ephemeral status and to determine if mitigation would be required and at what ratio mitigation would be required. No stream channel forms were completed for this effort. A total of ten (10) channel segments were reviewed. Channel segment locations are depicted on Figures B-1 and B-2 in Appendix B. Table 1 indicates the status of each channel segment.

Table 1. Channel segments jurisdictional status and mitigation requirements, determined by the COE on 31 July 2003.

Channel Segment	Status	Mitigation Required	Receiving Water
1	Intermittent	Yes, 1:1	Northeast Creek
2	Intermittent	Yes, 1:1	Northeast Creek
3	Ephemeral	No	Northeast Creek
4	Perennial	Yes, 2:1	Northeast Creek
5	Perennial	Yes, 2:1	Starky's Creek
6	Intermittent	Yes, 1:1	Starky's Creek
7	Intermittent	No	Segment 7
8	Intermittent	Yes, 1:1	Starky's Creek
9	Ephemeral	No	Segment 8
10	Perennial	Yes, 2:1	Starky's Creek

Channel segments 3 and 9 were confirmed as ephemeral channels and are not considered jurisdictional. Channel segment 7 was determined to be intermittent but would not require mitigation. Channel segments 1 and 2, unnamed tributaries to Northeast Creek, were determined to be intermittent and would require mitigation at a ratio of 1:1. Channel segment 4, an unnamed tributary to Northeast Creek, was determined to be perennial and would require mitigation at a ratio of 2:1. Channel segments 6 and 8, unnamed tributaries to Starky's Creek, were determined to be intermittent and would require mitigation at a ratio of 1:1. Channel segments 5 and 10, Starky's Creek, were determined to be perennial and would require mitigation at a ratio of 2:1.

6.0 SUMMARY

Two changes in jurisdictional wetland status were noted within the project study area. Both changes resulted from impacts due to clearing activities which severely impacted the ground surface. Seven stream channel crossings intersecting the project study area were determined to require mitigation. Four of the channels were determined to be intermittent and would require mitigation at a ratio of 1:1; three channels were determined to be perennial and would require mitigation at a ratio of 2:1.

7.0 REFERENCES

- Department of the Army (DOA). 1987. Corps of Engineers Wetlands Delineation Manual. Tech. Rpt. Y-87-1. Waterways Experiment Station, Corps of Engineers, Vicksburg, Mississippi. 100 pp.
- Department of Environment and Natural Resources (DENR). 2001. White Oak River Basinwide Water Quality Plan. Draft. July 2001. 108 pp. plus appendices. Downloaded on 18 August 2003 from <http://h2o.enr.state.nc.us/basinwide/whiteoak/2001/whiteoak2001.htm>
- DENR. 2003. Water Qualities and Stream Classification. Downloaded on 18 August 2003 from <http://h2o.enr.state.nc.us/bims/reports/basinsandwaterbodies/hydrowhiteoak.pdf>
- Environmental Services, Inc., (ESI). 1998. Wetland and Stream Evaluation. US 17, SR 1327 to South of Belgrade. Onslow County, North Carolina. (T.I.P. No. R-2414-A). 9 pp. plus appendices.
- U.S. Geological Survey (USGS). 1974. Hydrologic Units Map, State of North Carolina.

APPENDIX A
ROUTINE WETLAND DATA FORMS, 1998

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

JA wet

Project/Site: US 17 Bypass	Date: 8/11/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: mixed hardwoods
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: JA2
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: wetland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. swamp tupelo <i>Nyssa sylvatica var. biflora</i>	tree	OBL	7.		
2. red maple <i>Acer rubrum</i>	tree	FAC	8.		
3. sweetgum <i>Liquidambar styraciflua</i>	tree	FAC+	9.		
4. giant cane <i>Arundinaria gigantea</i>	herb	FACW	10.		
5. royal fern <i>Osmunda regalis</i>	herb	OBL	11.		
6. cinnamon fern <i>Osmunda cinnamomea</i>	herb	FACW	12.		
Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):			100%		
Remarks: The hydrophytic vegetation criterion has been met. Linear depression					

HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input checked="" type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands <p>Secondary Indicators (2 or more required):</p> <input checked="" type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input checked="" type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: 0"</p> <p>Depth to Free Water in Pit: >14"</p> <p>Depth to Saturated Soil: 12"</p>	
Remarks: The hydrologic criterion has been met.	

SOILS

MAP UNIT NAME (Series and Phase): Mapped as Rains fine sandy loam Series			DRAINAGE CLASS: poorly drained		
TAXONOMY (SUBGROUP): Typic Paleaquults			FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4"		10YR 2/1			fine sandy loam
4-10"		10YR 3/2			sandy loam
10-14"		10YR 6/1			sandy clay loam

HYDRIC SOIL INDICATORS:

<input type="checkbox"/> Histosol <input type="checkbox"/> Concretions <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils <input type="checkbox"/> Reducing Conditions <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listing on National Hydric Soils List <input type="checkbox"/> Listed on State or Local Hydric Soils List <input checked="" type="checkbox"/> Gleyed or Low Chroma <input type="checkbox"/> Color <input type="checkbox"/> Other (Explain in Remarks)
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Remarks: The hydric soil criterion has been met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Wetland Hydrology Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Remarks: Data point is jurisdictional.		

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

JB wet

Project/Site: US 17 Bypass	Date: 8/11/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: mixed hardwoods
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: JB4
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: wetland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. red maple <i>Acer rubrum</i>	tree	FAC	7.		
2. sweetgum <i>Liquidambar styraciflua</i>	tree	FAC+	8.		
3. Virginia chainfern <i>Woodwardia virginica</i>	herb	OBL	9.		
4.			10.		
5.			11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	100%
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Remarks	The hydrophytic vegetation criterion has been met. Linear depression
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input checked="" type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input checked="" type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
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<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: <u>0"</u></p> <p>Depth to Free Water in Pit: <u>>14"</u></p> <p>Depth to Saturated Soil: <u>12"</u></p>	<p>Remarks: The hydrologic criterion has been met.</p>
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SOILS

MAP UNIT NAME (Series and Phase): Mapped as Rains fine sandy loam Series			DRAINAGE CLASS: poorly drained		
TAXONOMY (SUBGROUP): Typic Paleaquults			FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4"		10YR 3/1			sandy clay loam
4-14"		10YR 4/1			sandy clay

HYDRIC SOIL INDICATORS:

<input type="checkbox"/> Histosol <input type="checkbox"/> Concretions <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils <input type="checkbox"/> Reducing Conditions <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listing on National Hydric Soils List <input type="checkbox"/> Listed on State or Local Hydric Soils List <input checked="" type="checkbox"/> Gleyed or Low Chroma <input type="checkbox"/> Color <input type="checkbox"/> Other (Explain in Remarks)
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Remarks: The hydric soil criterion has been met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Wetland Hydrology Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Remarks: Data point is jurisdictional.		

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

JB up

Project/Site: US 17 Bypass	Date: 8/11/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: mixed hardwoods
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: JB4
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: upland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. loblolly pine <i>Pinus taeda</i>	tree	FAC	7.		
2. sweetgum <i>Liquidambar styraciflua</i>	tree	FAC+	8.		
3. flowering dogwood <i>Cornus florida</i>	shrub	FACU	9.		
4. giant cane <i>Arundinaria gigantea</i>	herb	FACW	10.		
5.			11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	≤	75%
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Remarks	The hydrophytic vegetation criterion has been met.
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: 0"</p> <p>Depth to Free Water in Pit: >14"</p> <p>Depth to Saturated Soil: >14"</p>	
Remarks: The hydrologic criterion has not been met.	

SOILS

MAP UNIT NAME (Series and Phase): Mapped as Rains fine sandy loam Series			DRAINAGE CLASS: poorly drained		
TAXONOMY (SUBGROUP): Typic Paleaquults			FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-14"		10YR 2/1			sandy loam
HYDRIC SOIL INDICATORS:					
<input type="checkbox"/> Histosol			<input type="checkbox"/> Organic Streaking in Sandy Soils		
<input type="checkbox"/> Concretions			<input type="checkbox"/> Listing on National Hydric Soils List		
<input type="checkbox"/> Histic Epipedon			<input type="checkbox"/> Listed on State or Local Hydric Soils List		
<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			<input checked="" type="checkbox"/> Gleyed or Low Chroma		
<input type="checkbox"/> Reducing Conditions			<input type="checkbox"/> Color		
<input type="checkbox"/> Aquic Moisture Regime			<input type="checkbox"/> Other (Explain in Remarks)		
<input type="checkbox"/> Sulfidic Odor					
Remarks: The hydric soil criterion has been met.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Remarks: Data point is not jurisdictional.		

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

JF wet

Project/Site: US 17 Bypass	Date: 8/11/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: mixed hardwoods
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: JF29
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: wetland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. swamp tupelo <i>Nyssa sylvatica var. biflora</i>	tree	OBL	7.		
2. red maple <i>Acer rubrum</i>	tree	FAC	8.		
3. netted chainfern <i>Woodwardia aereolata</i>	herb	OBL	9.		
4. cinnamon fern <i>Osmunda cinnamomea</i>	herb	FACW	10.		
5.			11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	100%
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Remarks	The hydrophytic vegetation criterion has been met. Rutted wet depression
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
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<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: <u>0"</u></p> <p>Depth to Free Water in Pit: <u>>14"</u></p> <p>Depth to Saturated Soil: <u>10"</u></p>	
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Remarks:	The hydrologic criterion has been met.
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SOILS

MAP UNIT NAME (Series and Phase): Mapped as Rains fine sandy loam Series			DRAINAGE CLASS: poorly drained		
TAXONOMY (SUBGROUP): Typic Paleaquults			FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-8"		10YR 2/1			clay loam
8-14"		10YR 3/1			sandy clay loam
HYDRIC SOIL INDICATORS:					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Concretions		<input type="checkbox"/> Listing on National Hydric Soils List			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> Listed on State or Local Hydric Soils List			
<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils		<input checked="" type="checkbox"/> Gleyed or Low Chroma			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Color			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Other (Explain in Remarks)			
<input type="checkbox"/> Sulfidic Odor					
Remarks: The hydric soil criterion has been met.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Is this Sampling Point Within a Wetland?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Wetland Hydrology Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Remarks: Data point is jurisdictional.					

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

JF up

Project/Site: US 17 Bypass	Date: 8/11/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: pine/hardwood
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: JF29
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: upland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. loblolly pine <i>Pinus taeda</i>	tree	FAC	7.		
2. mockernut hickory <i>Carya tomentosa</i>	tree	UPL	8.		
3. white oak <i>Quercus alba</i>	tree	FACU	9.		
4. water oak <i>Quercus nigra</i>	tree	FAC	10.		
5. greenbrier <i>Smilax spp.</i>	vine	FAC or wetter	11.		
6. giant cane <i>Arundinaria gigantea</i>	herb	FACW	12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	≥	67%
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Remarks	The hydrophytic vegetation criterion has been met.
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: <u>0"</u></p> <p>Depth to Free Water in Pit: <u>>14"</u></p> <p>Depth to Saturated Soil: <u>>14"</u></p>	
Remarks: The hydrologic criterion has not been met.	

SOILS

MAP UNIT NAME (Series and Phase): Mapped as Rains fine sandy loam Series			DRAINAGE CLASS: poorly drained		
TAXONOMY (SUBGROUP): Typic Paleaquults			FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-6"		10YR 2/1			fine sandy loam
6-10"		10YR 4/1			fine sandy loam
10-14"		10YR 3/2			sandy loam
HYDRIC SOIL INDICATORS:					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Concretions		<input type="checkbox"/> Listing on National Hydric Soils List			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> Listed on State or Local Hydric Soils List			
<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils		<input checked="" type="checkbox"/> Gleyed or Low Chroma			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Color			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Other (Explain in Remarks)			
<input type="checkbox"/> Sulfidic Odor					
Remarks: The hydric soil criterion has been met.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Remarks: Data point is not jurisdictional.		

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

JG wet

Project/Site: US 17 Bypass	Date: 8/11/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: mixed hardwoods
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: JG2
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: wetland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. swamp tupelo <i>Nyssa sylvatica var. biflora</i>	tree	OBL	7.		
2. red maple <i>Acer rubrum</i>	tree	FAC	8.		
3. giant cane <i>Arundinaria gigantea</i>	herb	FACW	9.		
4.			10.		
5.			11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	100%
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Remarks	The hydrophytic vegetation criterion has been met. depressional wetland
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input checked="" type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands <p>Secondary Indicators (2 or more required):</p> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input checked="" type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: 0"</p> <p>Depth to Free Water in Pit: >14"</p> <p>Depth to Saturated Soil: >14"</p>	
Remarks: The hydrologic criterion has been met.	

SOILS

MAP UNIT NAME (Series and Phase): Mapped as Rains fine sandy loam Series			DRAINAGE CLASS: poorly drained		
TAXONOMY (SUBGROUP): Typic Paleaquults			FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
3-0"	O				organic
0-14"		10YR 3/2			clay loam
HYDRIC SOIL INDICATORS:					
<div><input type="checkbox"/> Histosol</div> <div><input type="checkbox"/> Concretions</div> <div><input type="checkbox"/> Histic Epipedon</div> <div><input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils</div> <div><input type="checkbox"/> Reducing Conditions</div> <div><input type="checkbox"/> Aquic Moisture Regime</div> <div><input type="checkbox"/> Sulfidic Odor</div> <div><input type="checkbox"/> Organic Streaking in Sandy Soils</div> <div><input type="checkbox"/> Listing on National Hydric Soils List</div> <div><input type="checkbox"/> Listed on State or Local Hydric Soils List</div> <div><input checked="" type="checkbox"/> Gleyed or Low Chroma</div> <div><input type="checkbox"/> Color</div> <div><input type="checkbox"/> Other (Explain in Remarks)</div>					
Remarks: The hydric soil criterion has been met.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Is this Sampling Point Within a Wetland?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Wetland Hydrology Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Remarks: Data point is jurisdictional.					

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

JG up

Project/Site: US 17 Bypass	Date: 8/11/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: pine/hardwood
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: JG2
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: upland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. loblolly pine <i>Pinus taeda</i>	tree	FAC	7.		
2. sweetgum <i>Liquidambar styraciflua</i>	tree	FAC+	8.		
3. black cherry <i>Prunus serotina</i>	tree	FACU	9.		
4. water oak <i>Quercus nigra</i>	tree	FAC	10.		
5. yellow jessamine <i>Gelsemium sempervirens</i>	vine	FAC	11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	≤ 80%
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Remarks	The hydrophytic vegetation criterion has been met.
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: 0"</p> <p>Depth to Free Water in Pit: >14"</p> <p>Depth to Saturated Soil: >14"</p>	
Remarks: The hydrologic criterion has not been met.	

SOILS

MAP UNIT NAME (Series and Phase): Mapped as Rains fine sandy loam Series			DRAINAGE CLASS: poorly drained		
TAXONOMY (SUBGROUP): Typic Paleaquults			FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-3"		10YR 2/1			fine sandy loam
3-8"		10YR 4/1			sandy loam
8-14"		10YR 5/1			sandy loam

HYDRIC SOIL INDICATORS:

☐ Histosol
☐ Concretions
☐ Histic Epipedon
☐ High Organic Content in Surface Layer in Sandy Soils
☐ Reducing Conditions
☐ Aquic Moisture Regime
☐ Sulfidic Odor

☐ Organic Streaking in Sandy Soils
☐ Listing on National Hydric Soils List
☐ Listed on State or Local Hydric Soils List
☒ Gleyed or Low Chroma
☐ Color
☐ Other (Explain in Remarks)

Remarks: The hydric soil criterion has been met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Remarks: Data point is not jurisdictional.		

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

MB wet

Project/Site: US 17 Bypass	Date: 9/16/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: pine/hardwoods
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: MB54
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: wetland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. swamp tupelo <i>Nyssa sylvatica var. biflora</i>	tree	OBL	7.		
2. loblolly pine <i>Pinus taeda</i>	tree	FAC	8.		
3. sweetgum <i>Liquidambar styraciflua</i>	tree	FAC+	9.		
4. tulip poplar <i>Liriodendron tulipifera</i>	tree	FAC	10.		
5. cinnamon fern <i>Osmunda cinnamomea</i>	herb	FACW	11.		
6. netted chainfern <i>Woodwardia aereolata</i>	herb	OBL	12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	100%
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Remarks	The hydrophytic vegetation criterion has been met. Wet area surrounding Starkey's Creek
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input checked="" type="checkbox"/> Water Marks <input checked="" type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: <u>0"</u></p> <p>Depth to Free Water in Pit: <u>>14"</u></p> <p>Depth to Saturated Soil: <u>10"</u></p>	
Remarks: The hydrologic criterion has been met.	

SOILS

MAP UNIT NAME (Series and Phase): Mapped as Muckalee loam Series			DRAINAGE CLASS: poorly drained		
TAXONOMY (SUBGROUP): Typic Fluvaquents			FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4"		10YR 2/1			sandy loam
4-14"		10YR 4/1			sandy clay loam
HYDRIC SOIL INDICATORS:					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Concretions		<input type="checkbox"/> Listing on National Hydric Soils List			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> Listed on State or Local Hydric Soils List			
<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils		<input checked="" type="checkbox"/> Gleyed or Low Chroma			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Color			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Other (Explain in Remarks)			
<input type="checkbox"/> Sulfidic Odor					
Remarks: The hydric soil criterion has been met.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Wetland Hydrology Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Remarks: Data point is jurisdictional.		

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

MB up

Project/Site: US 17 Bypass	Date: 9/16/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: pine/hardwood
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: MB54
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: upland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. loblolly pine <i>Pinus taeda</i>	tree	FAC	7.		
2. sweetgum <i>Liquidambar styraciflua</i>	tree	FAC+	8.		
3. red maple <i>Acer rubrum</i>	tree	FAC	9.		
4. greenbrier <i>Smilax spp.</i>	vine	FAC or wetter	10.		
5.			11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	100%
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Remarks	The hydrophytic vegetation criterion has been met.
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: 0"</p> <p>Depth to Free Water in Pit: >14"</p> <p>Depth to Saturated Soil: >14"</p>	
Remarks: The hydrologic criterion has not been met.	

SOILS

MAP UNIT NAME (Series and Phase): Mapped as Muckalee loam Series			DRAINAGE CLASS: poorly drained		
TAXONOMY (SUBGROUP): Typic Fluvaquents			FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-6"		10YR 2/1			sandy loam
6-14"		10YR 5/3			sandy clay loam

HYDRIC SOIL INDICATORS:

<input type="checkbox"/> Histosol	<input type="checkbox"/> Organic Streaking in Sandy Soils
<input type="checkbox"/> Concretions	<input type="checkbox"/> Listing on National Hydric Soils List
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> Listed on State or Local Hydric Soils List
<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils	<input type="checkbox"/> Gleyed or Low Chroma
<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Color
<input type="checkbox"/> Aquic Moisture Regime	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Sulfidic Odor	

Remarks: The hydric soil criterion has not been met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Hydric Soil Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Remarks: Data point is not jurisdictional.	

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

JK wet

Project/Site: US 17 Bypass	Date: 8/11/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: mixed hardwoods
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: JK8
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: wetland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. sweetgum <i>Liquidambar styraciflua</i>	tree	FAC+	7.		
2. red maple <i>Acer rubrum</i>	tree	FAC	8.		
3. water oak <i>Quercus nigra</i>	tree	FAC	9.		
4. netted chainfern <i>Woodwardia aereolata</i>	herb	OBL	10.		
5.			11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	100%
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Remarks	The hydrophytic vegetation criterion has been met. Linear depression
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input checked="" type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: <u>0"</u></p> <p>Depth to Free Water in Pit: <u>>14"</u></p> <p>Depth to Saturated Soil: <u>8"</u></p>	

Remarks:	The hydrologic criterion has been met. Mucky upper surface
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SOILS

MAP UNIT NAME (Series and Phase): Mapped as Rains Series			DRAINAGE CLASS: poorly drained		
TAXONOMY (SUBGROUP): Typic Paleaquults			FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
2-0"	O	10YR 2/1			organic
0-1"		10YR 2/1			mucky fine sandy loam
1-7"		10YR 2/1			fine sandy loam
7-14"		10YR 3/1			clay loam
HYDRIC SOIL INDICATORS:					
<input type="checkbox"/> Histosol <input type="checkbox"/> Concretions <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils <input type="checkbox"/> Reducing Conditions <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Sulfidic Odor			<input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listing on National Hydric Soils List <input type="checkbox"/> Listed on State or Local Hydric Soils List <input checked="" type="checkbox"/> Gleyed or Low Chroma <input type="checkbox"/> Color <input type="checkbox"/> Other (Explain in Remarks)		
Remarks: The hydric soil criterion has been met.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Is this Sampling Point Within a Wetland?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Wetland Hydrology Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Remarks: Data point is jurisdictional.					

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

JK up

Project/Site: US 17 Bypass	Date: 8/11/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: pine/hardwood
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: JK8
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: upland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. loblolly pine <i>Pinus taeda</i>	tree	FAC	7.		
2. swamp chestnut oak <i>Quercus michauxii</i>	tree	FACW-	8.		
3. water oak <i>Quercus nigra</i>	tree	FAC	9.		
4. cinnamon fern <i>Osmunda cinnamomea</i>	herb	FACW	10.		
5. bracken fern <i>Pteridium aquilinum</i>	herb	FACU	11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-): ≤ 80%

Remarks The hydrophytic vegetation criterion has been met.

HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: 0"</p> <p>Depth to Free Water in Pit: >14"</p> <p>Depth to Saturated Soil: >14"</p>	
<p>Remarks: The hydrologic criterion has not been met.</p>	

SOILS

MAP UNIT NAME (Series and Phase): Mapped as Rains Series			DRAINAGE CLASS: poorly drained		
TAXONOMY (SUBGROUP): Typic Paleaquults			FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-14"		10YR 3/2			fine sandy loam
HYDRIC SOIL INDICATORS:					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Concretions		<input type="checkbox"/> Listing on National Hydric Soils List			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> Listed on State or Local Hydric Soils List			
<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils		<input checked="" type="checkbox"/> Gleyed or Low Chroma			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Color			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Other (Explain in Remarks)			
<input type="checkbox"/> Sulfidic Odor					
Remarks: The hydric soil criterion has been met.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Is this Sampling Point Within a Wetland?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No			
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Remarks: Data point is not jurisdictional.					

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

JZ wet

Project/Site: US 17 Bypass	Date: 9/10/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: pine/hardwood
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: JZ10
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: wetland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. loblolly pine <i>Pinus taeda</i>	tree	FAC	7.		
2. red maple <i>Acer rubrum</i>	tree	FAC	8.		
3. cinnamon fern <i>Osmunda cinnamomea</i>	herb	FACW	9.		
4. netted chainfern <i>Woodwardia aereolata</i>	herb	OBL	10.		
5.			11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	100%
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Remarks	The hydrophytic vegetation criterion has been met.
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input checked="" type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: <u>0"</u></p> <p>Depth to Free Water in Pit: <u>>14"</u></p> <p>Depth to Saturated Soil: <u>0"</u></p>	
Remarks: The hydrologic criterion has been met. Linear depression	

SOILS

MAP UNIT NAME (Series and Phase): Mapped as Rains Series			DRAINAGE CLASS: poorly drained		
TAXONOMY (SUBGROUP): Typic Paleaquults			FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1"		10YR 2/1			muck
1-12"		10YR 2/1			sandy loam
HYDRIC SOIL INDICATORS:					
<div><input type="checkbox"/> Histosol</div> <div><input type="checkbox"/> Concretions</div> <div><input type="checkbox"/> Histic Epipedon</div> <div><input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils</div> <div><input type="checkbox"/> Reducing Conditions</div> <div><input type="checkbox"/> Aquic Moisture Regime</div> <div><input type="checkbox"/> Sulfidic Odor</div> <div><input type="checkbox"/> Organic Streaking in Sandy Soils</div> <div><input type="checkbox"/> Listing on National Hydric Soils List</div> <div><input type="checkbox"/> Listed on State or Local Hydric Soils List</div> <div><input checked="" type="checkbox"/> Gleyed or Low Chroma</div> <div><input type="checkbox"/> Color</div> <div><input type="checkbox"/> Other (Explain in Remarks)</div>					
Remarks: The hydric soil criterion has been met.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Is this Sampling Point Within a Wetland?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Wetland Hydrology Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Remarks: Data point is jurisdictional.					

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

JZ up

Project/Site: US 17 Bypass	Date: 9/10/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: pine/hardwood
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: JZ10
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: upland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. loblolly pine <i>Pinus taeda</i>	tree	FAC	7.		
2. red maple <i>Acer rubrum</i>	tree	FAC	8.		
3. giant cane <i>Arundinaria gigantea</i>	herb	FACW	9.		
4. bracken fern <i>Pteridium aquilinum</i>	herb	FACU	10.		
5.			11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	≤	75%
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Remarks	The hydrophytic vegetation criterion has been met.
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: <u>0"</u></p> <p>Depth to Free Water in Pit: <u>>14"</u></p> <p>Depth to Saturated Soil: <u>14"</u></p>	
Remarks: The hydrologic criterion has not been met.	

SOILS

[illegible]

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Is this Sampling Point Within a Wetland?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No			
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Remarks: Data point is not jurisdictional.					

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

JT wet

Project/Site: US 17 Bypass	Date: 9/16/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: mixed hardwoods
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: JT26
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: wetland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. red maple <i>Acer rubrum</i>	tree	FAC	7.		
2. swamp tupelo <i>Nyssa sylvatica var. biflora</i>	tree	OBL	8.		
3. tulip poplar <i>Liriodendron tulipifera</i>	tree	FAC	9.		
4. willow oak <i>Quercus phellos</i>	tree	FACW-	10.		
5. sweetgum <i>Liquidambar styraciflua</i>	tree	FAC+	11.		
6. netted chainfern <i>Woodwardia aereolata</i>	herb	OBL	12.		
Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):			100%		
Remarks: The hydrophytic vegetation criterion has been met.					

HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input checked="" type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input checked="" type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input checked="" type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: 0"</p> <p>Depth to Free Water in Pit: 6"</p> <p>Depth to Saturated Soil: 0"</p>	
Remarks: The hydrologic criterion has been met.	

SOILS

MAP UNIT NAME (Series and Phase): Mapped as Rains Series			DRAINAGE CLASS: poorly drained		
TAXONOMY (SUBGROUP): Typic Paleaquults			FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12"		10YR 2/1			sandy loam

HYDRIC SOIL INDICATORS:

<input type="checkbox"/> Histosol <input type="checkbox"/> Concretions <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils <input type="checkbox"/> Reducing Conditions <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listing on National Hydric Soils List <input type="checkbox"/> Listed on State or Local Hydric Soils List <input checked="" type="checkbox"/> Gleyed or Low Chroma <input type="checkbox"/> Color <input type="checkbox"/> Other (Explain in Remarks)
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Remarks: The hydric soil criterion has been met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Is this Sampling Point Within a Wetland?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Wetland Hydrology Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Remarks: Data point is jurisdictional.					

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

JT up

Project/Site: US 17 Bypass	Date: 9/16/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: pine/hardwood
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: JT26
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: upland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. loblolly pine <i>Pinus taeda</i>	tree	FAC	7.		
2. southern red oak <i>Quercus falcata</i>	tree	FACU-	8.		
3. red maple <i>Acer rubrum</i>	tree	FAC	9.		
4. greenbrier <i>Smilax spp.</i>	vine	FAC or wetter	10.		
5.			11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	≤	75%
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Remarks	The hydrophytic vegetation criterion has been met.
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
<p>FIELD OBSERVATIONS</p> <div style="margin-left: 20px;"> Depth of Surface Water: 0" </div> <div style="margin-left: 20px;"> Depth to Free Water in Pit: >14" </div> <div style="margin-left: 20px;"> Depth to Saturated Soil: 14" </div>	
Remarks: The hydrologic criterion has not been met.	

SOILS

MAP UNIT NAME (Series and Phase):			DRAINAGE CLASS:		
Mapped as Rains Series			poorly drained		
TAXONOMY (SUBGROUP):			FIELD OBSERVATIONS: Confirm Mapped Type?		
Typic Paleaquults			<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-6"		10YR 2/1			sandy loam
6-14"		10YR 5/1			sandy clay loam
HYDRIC SOIL INDICATORS:					
<input type="checkbox"/> Histosol <input type="checkbox"/> Organic Streaking in Sandy Soils					
<input type="checkbox"/> Concretions <input type="checkbox"/> Listing on National Hydric Soils List					
<input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Listed on State or Local Hydric Soils List					
<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils <input checked="" type="checkbox"/> Gleyed or Low Chroma					
<input type="checkbox"/> Reducing Conditions <input type="checkbox"/> Color					
<input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Other (Explain in Remarks)					
<input type="checkbox"/> Sulfidic Odor					
Remarks: The hydric soil criterion has been met.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Is this Sampling Point Within a Wetland?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No			
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Remarks: Data point is not jurisdictional.					

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

JT wet

Project/Site: US 17 Bypass	Date: 9/17/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: mixed hardwoods
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: JT150
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: wetland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. sweetgum <i>Liquidambar styraciflua</i>	tree	FAC+	7.		
2. loblolly pine <i>Pinus taeda</i>	tree	FAC	8.		
3. swamp tupelo <i>Nyssa sylvatica var. biflora</i>	tree	OBL	9.		
4. water oak <i>Quercus nigra</i>	tree	FAC	10.		
5. royal fern <i>Osmunda regalis</i>	herb	OBL	11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	100%
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Remarks	The hydrophytic vegetation criterion has been met. Wet area associated with a stream
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input checked="" type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input checked="" type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input checked="" type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: <u>0"</u></p> <p>Depth to Free Water in Pit: <u>>14"</u></p> <p>Depth to Saturated Soil: <u>6"</u></p>	
Remarks: The hydrologic criterion has been met.	

SOILS

MAP UNIT NAME (Series and Phase): Mapped as Rains Series			DRAINAGE CLASS: poorly drained		
TAXONOMY (SUBGROUP): Typic Paleaquults			FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-6"		10YR 2/1			sandy loam
6-14"		10YR 4/1			sandy clay loam
HYDRIC SOIL INDICATORS:					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Concretions		<input type="checkbox"/> Listing on National Hydric Soils List			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> Listed on State or Local Hydric Soils List			
<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils		<input checked="" type="checkbox"/> Gleyed or Low Chroma			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Color			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Other (Explain in Remarks)			
<input type="checkbox"/> Sulfidic Odor					
Remarks: The hydric soil criterion has been met.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Is this Sampling Point Within a Wetland?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Wetland Hydrology Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Remarks: Data point is jurisdictional.					

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

JT up

Project/Site: US 17 Bypass	Date: 9/17/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: pine/hardwood
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: JT150
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: upland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. loblolly pine <i>Pinus taeda</i>	tree	FAC	7.		
2. sweetgum <i>Liquidambar styraciflua</i>	tree	FAC+	8.		
3. blackberry <i>Rubus spp.</i>	vine	unknown	9.		
4.			10.		
5.			11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	≥	67%
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Remarks	The hydrophytic vegetation criterion has been met.
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	WETLAND HYDROLOGY INDICATORS Primary Indicators: <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> Secondary Indicators (2 or more required): <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
FIELD OBSERVATIONS Depth of Surface Water: 0" Depth to Free Water in Pit: >14" Depth to Saturated Soil: >14"	
Remarks: The hydrologic criterion has not been met.	

SOILS

MAP UNIT NAME (Series and Phase): Mapped as Rains Series			DRAINAGE CLASS: poorly drained		
TAXONOMY (SUBGROUP): Typic Paleaquults			FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-6"		10YR 3/1			sandy loam
6-14"		10YR 4/1			sandy loam
HYDRIC SOIL INDICATORS:					
<div><input type="checkbox"/> Histosol</div> <div><input type="checkbox"/> Concretions</div> <div><input type="checkbox"/> Histic Epipedon</div> <div><input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils</div> <div><input type="checkbox"/> Reducing Conditions</div> <div><input type="checkbox"/> Aquic Moisture Regime</div> <div><input type="checkbox"/> Sulfidic Odor</div> <div><input type="checkbox"/> Organic Streaking in Sandy Soils</div> <div><input type="checkbox"/> Listing on National Hydric Soils List</div> <div><input type="checkbox"/> Listed on State or Local Hydric Soils List</div> <div><input checked="" type="checkbox"/> Gleyed or Low Chroma</div> <div><input type="checkbox"/> Color</div> <div><input type="checkbox"/> Other (Explain in Remarks)</div>					
Remarks: The hydric soil criterion has been met.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Is this Sampling Point Within a Wetland?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No			
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Remarks: Data point is not jurisdictional.					

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

PE wet

Project/Site: US 17 Bypass	Date: 9/15/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID:
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: PE17
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: wetland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. water oak <i>Quercus nigra</i>	tree	FAC	7. cinnamon fern <i>Osmunda cinnamomea</i>	herb	FACW
2. swamp chestnut oak <i>Quercus michauxii</i>	tree	FACW-	8. giant cane <i>Arundinaria gigantea</i>	herb	FACW
3. red maple <i>Acer rubrum</i>	tree	FAC	9.		
4. sweetgum <i>Liquidambar styraciflua</i>	tree	FAC+	10.		
5. greenbrier <i>Smilax spp.</i>	vine	FAC or wetter	11.		
6. royal fern <i>Osmunda regalis</i>	herb	OBL	12.		
Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):			100%		
Remarks: The hydrophytic vegetation criterion has been met.					

HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input checked="" type="checkbox"/> Sediment Deposits <input checked="" type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: _____ 0"</p> <p>Depth to Free Water in Pit: _____ 0"</p> <p>Depth to Saturated Soil: _____ 0"</p>	
Remarks: The hydrologic criterion has been met.	

SOILS

MAP UNIT NAME (Series and Phase): Mapped as Rains Series			DRAINAGE CLASS: poorly drained		
TAXONOMY (SUBGROUP): Typic Paleaquults			FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-6"		10YR 2/1			sandy loam
6-12"		10YR 5/1	7.5YR 5/8		sandy loam
HYDRIC SOIL INDICATORS:					
<input type="checkbox"/> Histosol			<input type="checkbox"/> Organic Streaking in Sandy Soils		
<input type="checkbox"/> Concretions			<input type="checkbox"/> Listing on National Hydric Soils List		
<input type="checkbox"/> Histic Epipedon			<input type="checkbox"/> Listed on State or Local Hydric Soils List		
<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			<input checked="" type="checkbox"/> Gleyed or Low Chroma		
<input checked="" type="checkbox"/> Reducing Conditions			<input type="checkbox"/> Color		
<input type="checkbox"/> Aquic Moisture Regime			<input type="checkbox"/> Other (Explain in Remarks)		
<input checked="" type="checkbox"/> Sulfidic Odor					
Remarks: The hydric soil criterion has been met.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Is this Sampling Point Within a Wetland?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Wetland Hydrology Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Remarks: Data point is jurisdictional.					

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

PE up

Project/Site: US 17 Bypass	Date: 9/15/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: abandoned RR bed
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: PE17
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: upland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. sweetgum <i>Liquidambar styraciflua</i>	tree	FAC+	7.		
2. loblolly pine <i>Pinus taeda</i>	tree	FAC	8.		
3. red maple <i>Acer rubrum</i>	tree	FAC	9.		
4. greenbrier <i>Smilax spp.</i>	vine	FAC or wetter	10.		
5.			11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	100%
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Remarks	The hydrophytic vegetation criterion has been met.
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: 0"</p> <p>Depth to Free Water in Pit: >12"</p> <p>Depth to Saturated Soil: >12"</p>	
<p>Remarks: The hydrologic criterion has not been met.</p>	

SOILS

MAP UNIT NAME (Series and Phase): Mapped as Rains Series			DRAINAGE CLASS: poorly drained		
TAXONOMY (SUBGROUP): Typic Paleaquults			FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12+"					gravel/sand ; RR bed
HYDRIC SOIL INDICATORS:					
<input type="checkbox"/> Histosol <input type="checkbox"/> Concretions <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils <input type="checkbox"/> Reducing Conditions <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Sulfidic Odor			<input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listing on National Hydric Soils List <input type="checkbox"/> Listed on State or Local Hydric Soils List <input type="checkbox"/> Gleyed or Low Chroma <input type="checkbox"/> Color <input type="checkbox"/> Other (Explain in Remarks)		
Remarks: The hydric soil criterion has not been met.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Is this Sampling Point Within a Wetland?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No			
Hydric Soil Present?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No			
Remarks: Data point is not jurisdictional.					

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

PA wet

Project/Site: US 17 Bypass	Date: 9/15/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID:
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: PA3
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: wetland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. red maple <i>Acer rubrum</i>	tree	FAC	7.		
2. sweetgum <i>Liquidambar styraciflua</i>	tree	FAC+	8.		
3. loblolly pine <i>Pinus taeda</i>	tree	FAC	9.		
4. netted chainfern <i>Woodwardia aereolata</i>	herb	OBL	10.		
5. Virginia chainfern <i>Woodwardia virginica</i>	herb	OBL	11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	100%
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Remarks	The hydrophytic vegetation criterion has been met.
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input checked="" type="checkbox"/> Water Marks <input checked="" type="checkbox"/> Drift Lines <input checked="" type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: 0"</p> <p>Depth to Free Water in Pit: >12"</p> <p>Depth to Saturated Soil: 0"</p>	

Remarks:	The hydrologic criterion has been met.
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SOILS

MAP UNIT NAME (Series and Phase):		DRAINAGE CLASS:			
Mapped as Rains	Series	poorly drained			
TAXONOMY (SUBGROUP): Typic Paleaquults		FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12"		10YR 6/1	10YR 6/8		sandy clay
HYDRIC SOIL INDICATORS:					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Concretions		<input type="checkbox"/> Listing on National Hydric Soils List			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> Listed on State or Local Hydric Soils List			
<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils		<input checked="" type="checkbox"/> Gleyed or Low Chroma			
<input checked="" type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Color			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Other (Explain in Remarks)			
<input type="checkbox"/> Sulfidic Odor					
Remarks: The hydric soil criterion has been met.					

WETLAND DETERMINATION

Wetland Determination		Is this Sampling Point Within a Wetland?	
Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Wetland Hydrology Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Remarks: Data point is jurisdictional.			

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

PA up

Project/Site: US 17 Bypass	Date: 9/15/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: abandoned RR bed
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: PA3
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: upland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. sweetgum <i>Liquidambar styraciflua</i>	tree	FAC+	7.		
2. loblolly pine <i>Pinus taeda</i>	tree	FAC	8.		
3. red maple <i>Acer rubrum</i>	tree	FAC	9.		
4. dog fennel <i>Eupatorium capillifolium</i>	herb	FACU	10.		
5.			11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	≤	75%
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Remarks	The hydrophytic vegetation criterion has been met.
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: 0"</p> <p>Depth to Free Water in Pit: >12"</p> <p>Depth to Saturated Soil: >12"</p>	
<p>Remarks: The hydrologic criterion has not been met.</p>	

SOILS

[illegible]

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Is this Sampling Point Within a Wetland?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No			
Hydric Soil Present?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No			
Remarks: Data point is not jurisdictional.					

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

GO wet

Project/Site: US 17 Bypass	Date: 9/10/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: hardwood
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: GO36
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: wetland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. red maple <i>Acer rubrum</i>	tree	FAC	7.		
2. wax myrtle <i>Myrica cerifera</i>	shrub	FAC+	8.		
3. cinnamon fern <i>Osmunda cinnamomea</i>	herb	FACW	9.		
4. netted chainfern <i>Woodwardia aereolata</i>	herb	OBL	10.		
5.			11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	100%
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Remarks	The hydrophytic vegetation criterion has been met.
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input checked="" type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: <u>0"</u></p> <p>Depth to Free Water in Pit: <u>>14"</u></p> <p>Depth to Saturated Soil: <u>6"</u></p>	
Remarks: The hydrologic criterion has been met.	

SOILS

MAP UNIT NAME (Series and Phase): Mapped as Pantego mucky loam Series			DRAINAGE CLASS: very poorly drained		
TAXONOMY (SUBGROUP): Umbric Paleaquults			FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-6"					organic
6-14"		10YR 2/1			loam

HYDRIC SOIL INDICATORS:

<input type="checkbox"/> Histosol <input type="checkbox"/> Concretions <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils <input type="checkbox"/> Reducing Conditions <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listing on National Hydric Soils List <input type="checkbox"/> Listed on State or Local Hydric Soils List <input checked="" type="checkbox"/> Gleyed or Low Chroma <input type="checkbox"/> Color <input type="checkbox"/> Other (Explain in Remarks)
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Remarks: The hydric soil criterion has been met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Hydric Soil Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Remarks: Data point is jurisdictional. Ditch along roadside acting as a channelized stream	

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

GO up

Project/Site: US 17 Bypass	Date: 9/10/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: mixed hardwood
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: GO3
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: upland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. titi <i>Cyrilla racemiflora</i>	shrub	FACW	7.		
2. sweetgum <i>Liquidambar styraciflua</i>	tree	FAC+	8.		
3. winged sumac <i>Rhus copallina</i>	shrub	FACU	9.		
4. wax myrtle <i>Myrica cerifera</i>	shrub	FAC+	10.		
5.			11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC+):	100%
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Remarks	The hydrophytic vegetation criterion has been met. Next to highway right of way
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: <u>0"</u></p> <p>Depth to Free Water in Pit: <u>>14"</u></p> <p>Depth to Saturated Soil: <u>>14"</u></p>	
Remarks: The hydrologic criterion has not been met.	

SOILS

MAP UNIT NAME (Series and Phase): Mapped as Pantego mucky loam Series			DRAINAGE CLASS: very poorly drained		
TAXONOMY (SUBGROUP): Umbric Paleaquults			FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4"					organic
4-14"		10YR 2/1			loam
HYDRIC SOIL INDICATORS:					
<input type="checkbox"/> Histosol			<input type="checkbox"/> Organic Streaking in Sandy Soils		
<input type="checkbox"/> Concretions			<input type="checkbox"/> Listing on National Hydric Soils List		
<input type="checkbox"/> Histic Epipedon			<input type="checkbox"/> Listed on State or Local Hydric Soils List		
<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			<input checked="" type="checkbox"/> Gleyed or Low Chroma		
<input type="checkbox"/> Reducing Conditions			<input type="checkbox"/> Color		
<input type="checkbox"/> Aquic Moisture Regime			<input type="checkbox"/> Other (Explain in Remarks)		
<input type="checkbox"/> Sulfidic Odor					
Remarks: The hydric soil criterion has been met.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Is this Sampling Point Within a Wetland?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No			
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Remarks:	Data point is not jurisdictional. Next to roadside ditch				

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

GY wet

Project/Site: US 17 Bypass	Date: 9/17/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: mixed hardwood
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: GY3
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: wetland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. sweetgum <i>Liquidambar styraciflua</i>	tree	FAC+	7.		
2. red maple <i>Acer rubrum</i>	tree	FAC	8.		
3. royal fern <i>Osmunda regalis</i>	herb	OBL	9.		
4. false nettle <i>Boehmeria cylindrica</i>	herb	FACW+	10.		
5.			11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	100%
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Remarks	The hydrophytic vegetation criterion has been met.
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input checked="" type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: <u>0"</u></p> <p>Depth to Free Water in Pit: <u>>10"</u></p> <p>Depth to Saturated Soil: <u>6"</u></p>	
Remarks: The hydrologic criterion has been met.	

SOILS

MAP UNIT NAME (Series and Phase): Mapped as Lynchburg fine sandy loam Series			DRAINAGE CLASS: somewhat poorly drained		
TAXONOMY (SUBGROUP): Aeric Paleaquults			FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-10"		10YR 2/1			clayey loam
HYDRIC SOIL INDICATORS:					
<div><input type="checkbox"/> Histosol</div> <div><input type="checkbox"/> Concretions</div> <div><input type="checkbox"/> Histic Epipedon</div> <div><input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils</div> <div><input type="checkbox"/> Reducing Conditions</div> <div><input type="checkbox"/> Aquic Moisture Regime</div> <div><input type="checkbox"/> Sulfidic Odor</div> <div><input type="checkbox"/> Organic Streaking in Sandy Soils</div> <div><input type="checkbox"/> Listing on National Hydric Soils List</div> <div><input type="checkbox"/> Listed on State or Local Hydric Soils List</div> <div><input checked="" type="checkbox"/> Gleyed or Low Chroma</div> <div><input type="checkbox"/> Color</div> <div><input type="checkbox"/> Other (Explain in Remarks)</div>					
Remarks: The hydric soil criterion has been met.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Is this Sampling Point Within a Wetland?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Wetland Hydrology Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Remarks: Data point is jurisdictional. Next to roadside ditch.					

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

GY up

Project/Site: US 17 Bypass	Date: 9/17/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: hardwood
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: GY3
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: upland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. sweetgum <i>Liquidambar styraciflua</i>	tree	FAC+	7.		
2. muscadine grape <i>Vitis rotundifolia</i>	vine	FAC	8.		
3.			9.		
4.			10.		
5.			11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	100%
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Remarks	The hydrophytic vegetation criterion has been met.
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: <u>0"</u></p> <p>Depth to Free Water in Pit: <u>>10"</u></p> <p>Depth to Saturated Soil: <u>>10"</u></p>	

Remarks:	The hydrologic criterion has not been met.
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SOILS

MAP UNIT NAME (Series and Phase): Mapped as Lynchburg fine sandy loam Series			DRAINAGE CLASS: somewhat poorly drained		
TAXONOMY (SUBGROUP): Aeric Paleaquults			FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-5"		10YR 4/2			loam
5-10"		10YR 5/1			loam

HYDRIC SOIL INDICATORS:	
<input type="checkbox"/> Histosol <input type="checkbox"/> Concretions <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils <input type="checkbox"/> Reducing Conditions <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listing on National Hydric Soils List <input type="checkbox"/> Listed on State or Local Hydric Soils List <input checked="" type="checkbox"/> Gleyed or Low Chroma <input type="checkbox"/> Color <input type="checkbox"/> Other (Explain in Remarks)
Remarks: The hydric soil criterion has been met.	

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Is this Sampling Point Within a Wetland?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No			
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Remarks: Data point is not jurisdictional. Next to roadside ditch					

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

GAA wet

Project/Site: US 17 Bypass	Date: 9/16/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: hardwood
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: GAA12
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: wetland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. sweetgum <i>Liquidambar styraciflua</i>	tree	FAC+	7.		
2. Chinese privet <i>Ligustrum sinense</i>	shrub	FAC	8.		
3. giant cane <i>Arundinaria gigantea</i>	herb	FACW	9.		
4. netted chainfern <i>Woodwardia aereolata</i>	herb	OBL	10.		
5.			11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	100%
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Remarks	The hydrophytic vegetation criterion has been met.
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	WETLAND HYDROLOGY INDICATORS Primary Indicators: <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input checked="" type="checkbox"/> Drainage Patterns in Wetlands </div> Secondary Indicators (2 or more required): <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input checked="" type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
FIELD OBSERVATIONS Depth of Surface Water: <u>0</u> Depth to Free Water in Pit: <u>>10"</u> Depth to Saturated Soil: <u>>10"</u>	
Remarks: The hydrologic criterion has been met.	

SOILS

MAP UNIT NAME (Series and Phase): Mapped as Craven fine sandy loam Series			DRAINAGE CLASS: moderately well drained		
TAXONOMY (SUBGROUP): Aquic Hapludults			FIELD OBSERVATIONS: Confirm Mapped Type? <div style="display: flex; justify-content: space-around;"> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No </div>		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-10"		10YR 3/1			clayey loam

HYDRIC SOIL INDICATORS:

☐ Histosol
☐ Concretions
☐ Histic Epipedon
☐ High Organic Content in Surface Layer in Sandy Soils
☐ Reducing Conditions
☐ Aquic Moisture Regime
☐ Sulfidic Odor

☐ Organic Streaking in Sandy Soils
☐ Listing on National Hydric Soils List
☐ Listed on State or Local Hydric Soils List
☒ Gleyed or Low Chroma
☐ Color
☐ Other (Explain in Remarks)

Remarks: The hydric soil criterion has been met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Is this Sampling Point Within a Wetland?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Wetland Hydrology Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Remarks:	Data point is jurisdictional. Ditch found between old railroad bed and an agricultural field				

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

GAA up

Project/Site: US 17 Bypass	Date: 9/16/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: hardwood/ag field
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: GAA12
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: upland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. persimmon <i>Diospyros virginiana</i>	tree	FAC	7.		
2. Chinese privet <i>Ligustrum sinense</i>	shrub	FAC	8.		
3. goldenrod <i>Solidago spp.</i>	herb	unknown	9.		
4.			10.		
5.			11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	≥ 67%
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Remarks	The hydrophytic vegetation criterion has been met.
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	WETLAND HYDROLOGY INDICATORS Primary Indicators: <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> Secondary Indicators (2 or more required): <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
FIELD OBSERVATIONS Depth of Surface Water: <u>0"</u> Depth to Free Water in Pit: <u>>10"</u> Depth to Saturated Soil: <u>>10"</u>	

Remarks:	The hydrologic criterion has not been met.
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SOILS

MAP UNIT NAME (Series and Phase): Mapped as Craven fine sandy loam Series			DRAINAGE CLASS: moderately well drained		
TAXONOMY (SUBGROUP): Aquic Hapludults			FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-10"		10YR 4/2			loam
HYDRIC SOIL INDICATORS:					
<div><input type="checkbox"/> Histosol</div> <div><input type="checkbox"/> Concretions</div> <div><input type="checkbox"/> Histic Epipedon</div> <div><input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils</div> <div><input type="checkbox"/> Reducing Conditions</div> <div><input type="checkbox"/> Aquic Moisture Regime</div> <div><input type="checkbox"/> Sulfidic Odor</div> <div><input type="checkbox"/> Organic Streaking in Sandy Soils</div> <div><input type="checkbox"/> Listing on National Hydric Soils List</div> <div><input type="checkbox"/> Listed on State or Local Hydric Soils List</div> <div><input checked="" type="checkbox"/> Gleyed or Low Chroma</div> <div><input type="checkbox"/> Color</div> <div><input type="checkbox"/> Other (Explain in Remarks)</div>					
Remarks: The hydric soil criterion has been met.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Is this Sampling Point Within a Wetland?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No			
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Remarks:	Data point is not jurisdictional. Borders agricultural field				

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

GL wet

Project/Site: US 17 Bypass	Date: 9/8/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: pine/hardwood
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: GL36
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: wetland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. red maple <i>Acer rubrum</i>	tree	FAC	7.		
2. loblolly pine <i>Pinus taeda</i>	tree	FAC	8.		
3. sweetgum <i>Liquidambar styraciflua</i>	tree	FAC+	9.		
4. wax myrtle <i>Myrica cerifera</i>	shrub	FAC+	10.		
5. royal fern <i>Osmunda regalis</i>	herb	OBL	11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	100%
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Remarks	The hydrophytic vegetation criterion has been met.
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input checked="" type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input checked="" type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input checked="" type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>		
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: <u>1"</u></p> <p>Depth to Free Water in Pit: <u>0"</u></p> <p>Depth to Saturated Soil: <u>0"</u></p>			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">Remarks:</td> <td>The hydrologic criterion has been met.</td> </tr> </table>		Remarks:	The hydrologic criterion has been met.
Remarks:	The hydrologic criterion has been met.		

SOILS

MAP UNIT NAME (Series and Phase): Mapped as Rains fine sandy loam Series			DRAINAGE CLASS: poorly drained		
TAXONOMY (SUBGROUP): Typic Paleaquults			FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4"		10YR 5/1			loam
4-10"		10YR 6/1			loam
HYDRIC SOIL INDICATORS:					
<input type="checkbox"/> Histosol			<input type="checkbox"/> Organic Streaking in Sandy Soils		
<input type="checkbox"/> Concretions			<input type="checkbox"/> Listing on National Hydric Soils List		
<input type="checkbox"/> Histic Epipedon			<input type="checkbox"/> Listed on State or Local Hydric Soils List		
<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			<input checked="" type="checkbox"/> Gleyed or Low Chroma		
<input type="checkbox"/> Reducing Conditions			<input type="checkbox"/> Color		
<input type="checkbox"/> Aquic Moisture Regime			<input type="checkbox"/> Other (Explain in Remarks)		
<input type="checkbox"/> Sulfidic Odor					
Remarks: The hydric soil criterion has been met.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Is this Sampling Point Within a Wetland?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Wetland Hydrology Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Remarks: Data point is jurisdictional. Ditch along roadside acting as a channelized stream					

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

GL up

Project/Site: US 17 Bypass	Date: 9/8/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: pine/hardwood
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: GL26
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: upland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. loblolly pine <i>Pinus taeda</i>	tree	FAC	7.		
2. sweetgum <i>Liquidambar styraciflua</i>	tree	FAC+	8.		
3. red maple <i>Acer rubrum</i>	tree	FAC	9.		
4. flowering dogwood <i>Cornus florida</i>	shrub	FACU	10.		
5. wax myrtle <i>Myrica cerifera</i>	shrub	FAC+	11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-): ≤ 80%

Remarks The hydrophytic vegetation criterion has been met.

HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	WETLAND HYDROLOGY INDICATORS Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
FIELD OBSERVATIONS Depth of Surface Water: 0" Depth to Free Water in Pit: >10" Depth to Saturated Soil: >10"	

Remarks: The hydrologic criterion has not been met.

SOILS

MAP UNIT NAME (Series and Phase): Mapped as Rains Series			DRAINAGE CLASS: poorly drained		
TAXONOMY (SUBGROUP): Typic Paleaquults			FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-6"		10YR 4/1			sandy clay loam
6-10"		10YR 6/2			sandy clay loam
HYDRIC SOIL INDICATORS:					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Concretions		<input type="checkbox"/> Listing on National Hydric Soils List			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> Listed on State or Local Hydric Soils List			
<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils		<input checked="" type="checkbox"/> Gleyed or Low Chroma			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Color			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Other (Explain in Remarks)			
<input type="checkbox"/> Sulfidic Odor					
Remarks: The hydric soil criterion has been met.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Is this Sampling Point Within a Wetland?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No			
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Remarks: Data point is not jurisdictional.					

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

GN wet

Project/Site: US 17 Bypass	Date: 9/9/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: mixed hardwood
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: GN52
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: wetland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. red maple <i>Acer rubrum</i>	tree	FAC	7.		
2. sweetgum <i>Liquidambar styraciflua</i>	tree	FAC+	8.		
3. wax myrtle <i>Myrica cerifera</i>	shrub	FAC+	9.		
4. netted chainfern <i>Woodwardia aereolata</i>	herb	OBL	10.		
5. royal fern <i>Osmunda regalis</i>	herb	OBL	11.		
6. Virginia chainfern <i>Woodwardia virginica</i>	herb	OBL	12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	100%
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Remarks	The hydrophytic vegetation criterion has been met.
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	WETLAND HYDROLOGY INDICATORS Primary Indicators: <input checked="" type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input checked="" type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input checked="" type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
FIELD OBSERVATIONS Depth of Surface Water: <u>1"</u> Depth to Free Water in Pit: <u>0"</u> Depth to Saturated Soil: <u>0"</u>	

Remarks:	The hydrologic criterion has been met.
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SOILS

MAP UNIT NAME (Series and Phase): Mapped as Pantego mucky loam Series			DRAINAGE CLASS: very poorly drained		
TAXONOMY (SUBGROUP): Umbric Paleaquults			FIELD OBSERVATIONS: Confirm Mapped Type? <div style="display: flex; justify-content: space-around;"> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No </div>		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-6"					mucky organics
6-10"		10YR 3/1			clayey loam

HYDRIC SOIL INDICATORS:

☐ Histosol
☐ Concretions
☐ Histic Epipedon
☐ High Organic Content in Surface Layer in Sandy Soils
☐ Reducing Conditions
☐ Aquic Moisture Regime
☐ Sulfidic Odor

☐ Organic Streaking in Sandy Soils
☐ Listing on National Hydric Soils List
☐ Listed on State or Local Hydric Soils List
☒ Gleyed or Low Chroma
☐ Color
☐ Other (Explain in Remarks)

Remarks: The hydric soil criterion has been met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Is this Sampling Point Within a Wetland?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Wetland Hydrology Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Remarks: Data point is jurisdictional. Ditch along roadside acting as a channelized stream					

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

GN up

Project/Site: US 17 Bypass	Date: 9/9/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: pine/hardwood
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: GL26
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: upland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. red maple <i>Acer rubrum</i>	tree	FAC	7.		
2. loblolly pine <i>Pinus taeda</i>	tree	FAC	8.		
3. American holly <i>Ilex opaca</i> var. <i>opaca</i>	shrub	FAC-	9.		
4. wax myrtle <i>Myrica cerifera</i>	shrub	FAC+	10.		
5. yellow jessamine <i>Gelsemium sempervirens</i>	vine	FAC	11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-): ≤ 80%

Remarks The hydrophytic vegetation criterion has been met.

HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: 0"</p> <p>Depth to Free Water in Pit: >10"</p> <p>Depth to Saturated Soil: >10"</p>	
<p>Remarks: The hydrologic criterion has not been met.</p>	

SOILS

MAP UNIT NAME (Series and Phase): Mapped as Pantego mucky loam Series			DRAINAGE CLASS: very poorly drained		
TAXONOMY (SUBGROUP): Umbric Paleaquults			FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-2"					organic
2-10"		10YR 3/1			loam

HYDRIC SOIL INDICATORS:	
<input type="checkbox"/> Histosol <input type="checkbox"/> Concretions <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils <input type="checkbox"/> Reducing Conditions <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listing on National Hydric Soils List <input type="checkbox"/> Listed on State or Local Hydric Soils List <input checked="" type="checkbox"/> Gleyed or Low Chroma <input type="checkbox"/> Color <input type="checkbox"/> Other (Explain in Remarks)
Remarks: The hydric soil criterion has been met.	

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Is this Sampling Point Within a Wetland?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No			
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Remarks: Data point is not jurisdictional. Next to roadside ditch					

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

GX wet

Project/Site: US 17 Bypass	Date: 9/16/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: mixed hardwood
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: GX28
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: wetland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. red maple <i>Acer rubrum</i>	tree	FAC	7.		
2. sweetgum <i>Liquidambar styraciflua</i>	tree	FAC+	8.		
3. wax myrtle <i>Myrica cerifera</i>	shrub	FAC+	9.		
4. muscadine grape <i>Vitis rotundifolia</i>	vine	FAC	10.		
5. royal fern <i>Osmunda regalis</i>	herb	OBL	11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	100%
--	------

Remarks	The hydrophytic vegetation criterion has been met.
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input checked="" type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input checked="" type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: <u>0"</u></p> <p>Depth to Free Water in Pit: <u>>10"</u></p> <p>Depth to Saturated Soil: <u>>10"</u></p>	

Remarks:	The hydrologic criterion has been met.
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SOILS

MAP UNIT NAME (Series and Phase): Mapped as Muckalee loam Series			DRAINAGE CLASS: poorly drained		
TAXONOMY (SUBGROUP): Typic Fluvaquents			FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-8"		10YR 3/1			clayey loam
8-10"		10YR 4/2			sandy loam
HYDRIC SOIL INDICATORS:					
<input type="checkbox"/> Histosol			<input type="checkbox"/> Organic Streaking in Sandy Soils		
<input type="checkbox"/> Concretions			<input type="checkbox"/> Listing on National Hydric Soils List		
<input type="checkbox"/> Histic Epipedon			<input type="checkbox"/> Listed on State or Local Hydric Soils List		
<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			<input checked="" type="checkbox"/> Gleyed or Low Chroma		
<input type="checkbox"/> Reducing Conditions			<input type="checkbox"/> Color		
<input type="checkbox"/> Aquic Moisture Regime			<input type="checkbox"/> Other (Explain in Remarks)		
<input type="checkbox"/> Sulfidic Odor					
Remarks: The hydric soil criterion has been met.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Is this Sampling Point Within a Wetland?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Wetland Hydrology Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Remarks: Data point is jurisdictional. Ditch along roadside					

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

GX up

Project/Site: US 17 Bypass	Date: 9/16/1998
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: mixed pine/hardwood
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: GX28
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: upland

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. sweetgum <i>Liquidambar styraciflua</i>	tree	FAC+	7.		
2. loblolly pine <i>Pinus taeda</i>	tree	FAC	8.		
3. poison ivy <i>Toxicodendron radicans</i>	herb	FAC	9.		
4. yellow jessamine <i>Gelsemium sempervirens</i>	vine	FAC	10.		
5.			11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	100%
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Remarks	The hydrophytic vegetation criterion has been met.
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>		
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: <u>0"</u></p> <p>Depth to Free Water in Pit: <u>>10"</u></p> <p>Depth to Saturated Soil: <u>>10"</u></p>			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">Remarks:</td> <td>The hydrologic criterion has not been met.</td> </tr> </table>		Remarks:	The hydrologic criterion has not been met.
Remarks:	The hydrologic criterion has not been met.		

SOILS

MAP UNIT NAME (Series and Phase): Mapped as Pantego mucky loam Series			DRAINAGE CLASS: very poorly drained		
TAXONOMY (SUBGROUP): Umbric Paleaquults			FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4"		10YR 5/1			sandy loam
4-10"		10YR 5/2			sandy loam
HYDRIC SOIL INDICATORS:					
<input type="checkbox"/> Histosol <input type="checkbox"/> Concretions <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils <input type="checkbox"/> Reducing Conditions <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Sulfidic Odor		<input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listing on National Hydric Soils List <input type="checkbox"/> Listed on State or Local Hydric Soils List <input checked="" type="checkbox"/> Gleyed or Low Chroma <input type="checkbox"/> Color <input type="checkbox"/> Other (Explain in Remarks)			
Remarks: The hydric soil criterion has been met.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Is this Sampling Point Within a Wetland?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No			
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Remarks: Data point is not jurisdictional. Next to roadside ditch					

APPENDIX B
2003 STREAM CHANNEL AND WETLAND UPDATE LOCATIONS AND NEW ROUTINE
WETLAND DATA FORMS

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

JA, new

Project/Site: US 17 Bypass	Date: 6/24/2003
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: recently clear cut area
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: JA1
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: wet

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. Loblolly pine <i>Pinus taeda</i>	sapling	FAC	7.		
2. persimmon <i>Diospyros virginiana</i>	sapling	FAC	8.		
3. giant cane <i>Arundinaria gigantea</i>	herb	FACW	9.		
4.			10.		
5.			11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	100%
--	------

Remarks	The hydrophytic vegetation criterion has been met. Area has been recently clear cut
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: <u>0"</u></p> <p>Depth to Free Water in Pit: <u>6</u></p> <p>Depth to Saturated Soil: <u>surface</u></p>	
Remarks: The hydrologic criterion has been met.	

SOILS

MAP UNIT NAME (Series and Phase): Mapped as Rains Series			DRAINAGE CLASS: <div></div> poorly drained		
TAXONOMY (SUBGROUP): Typic Paleaquults			FIELD OBSERVATIONS: Confirm Mapped Type? <div><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</div>		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-6		2.5Y 4/1			loamy sand
6-12		10YR 5/1			sandy clay loam
HYDRIC SOIL INDICATORS:					
<div><input type="checkbox"/> Histosol</div>			<div><input type="checkbox"/> Organic Streaking in Sandy Soils</div>		
<div><input type="checkbox"/> Concretions</div>			<div><input type="checkbox"/> Listing on National Hydric Soils List</div>		
<div><input type="checkbox"/> Histic Epipedon</div>			<div><input type="checkbox"/> Listed on State or Local Hydric Soils List</div>		
<div><input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils</div>			<div><input checked="" type="checkbox"/> Gleyed or Low Chroma</div>		
<div><input type="checkbox"/> Reducing Conditions</div>			<div><input type="checkbox"/> Color</div>		
<div><input type="checkbox"/> Aquic Moisture Regime</div>			<div><input type="checkbox"/> Other (Explain in Remarks)</div>		
<div><input type="checkbox"/> Sulfidic Odor</div>					
Remarks: The hydric soil criterion has been met.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Is this Sampling Point Within a Wetland?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Wetland Hydrology Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Remarks: Data point is jurisdictional.					

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

Project/Site: US 17 Bypass	Date: 6/24/2003
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: recently clear cut area
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: JB2
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: wet

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. cattail <i>Typha latifolia</i>	herb	OBL	7.		
2. soft rush <i>Juncus effusus</i>	herb	FACW+	8.		
3.			9.		
4.			10.		
5.			11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	100%
--	------

Remarks	The hydrophytic vegetation criterion has been met. area has been recently cleared
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HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: 0"</p> <p>Depth to Free Water in Pit: 6</p> <p>Depth to Saturated Soil: surface</p>	

Remarks:	The hydrologic criterion has been met.
----------	--

SOILS

MAP UNIT NAME (Series and Phase): Mapped as Goldsboro Series		DRAINAGE CLASS: moderately well drained			
TAXONOMY (SUBGROUP): Aquic Paleudults		FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12		10YR 3/1			Sandy clay loam
HYDRIC SOIL INDICATORS:					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Concretions		<input type="checkbox"/> Listing on National Hydric Soils List			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> Listed on State or Local Hydric Soils List			
<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils		<input checked="" type="checkbox"/> Gleyed or Low Chroma			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Color			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Other (Explain in Remarks)			
<input type="checkbox"/> Sulfidic Odor					
Remarks: The hydric soil criterion has been met.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Is this Sampling Point Within a Wetland?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Wetland Hydrology Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Hydric Soil Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Remarks: Data point is jurisdictional.					

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 CE Wetlands Delineation Manual)

Project/Site: US 17 Bypass	Date: 6/24/2003
Applicant/Owner: NCDOT	County: Onslow
Investigator: Environmental Services, Inc.	State: NC
Do normal circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: recently clear cut area
Is the site significantly disturbed (atypical situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: JB2
Is the area a potential problem area (If needed, explain)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: up

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. loblolly pine <i>Pinus taeda</i>	seedlings	FAC	7.		
2. soft rush <i>Juncus effusus</i>	herb	FACW+	8.		
3.			9.		
4.			10.		
5.			11.		
6.			12.		

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-):	100%
--	------

Remarks	The hydrophytic vegetation criterion has been met. area has been recently cleared
---------	--

HYDROLOGY

<input type="checkbox"/> RECORDED DATA (DESCRIBE IN REMARKS): <div style="margin-left: 20px;"> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other </div> <input checked="" type="checkbox"/> NO RECORDED DATA AVAILABLE	<p>WETLAND HYDROLOGY INDICATORS</p> <p>Primary Indicators:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands </div> <p>Secondary Indicators (2 or more required):</p> <div style="margin-left: 20px;"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks) </div>
<p>FIELD OBSERVATIONS</p> <p>Depth of Surface Water: <u>0"</u></p> <p>Depth to Free Water in Pit: <u>>12"</u></p> <p>Depth to Saturated Soil: <u>>12"</u></p>	
Remarks: The hydrologic criterion has not been met.	

SOILS

MAP UNIT NAME (Series and Phase): Mapped as Goldsboro Series		DRAINAGE CLASS: moderately well drained			
TAXONOMY (SUBGROUP): Aquic Paleudults		FIELD OBSERVATIONS: Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4		10YR 3/2			Sandy clay loam
4-12		10YR 4/3			Sandy clay loam
HYDRIC SOIL INDICATORS:					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Concretions		<input type="checkbox"/> Listing on National Hydric Soils List			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> Listed on State or Local Hydric Soils List			
<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils		<input type="checkbox"/> Gleyed or Low Chroma			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Color			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Other (Explain in Remarks)			
<input type="checkbox"/> Sulfidic Odor					
Remarks: The hydric soil criterion has not been met.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Is this Sampling Point Within a Wetland?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Wetland Hydrology Present?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No			
Hydric Soil Present?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No			
Remarks: Data point is jurisdictional.					



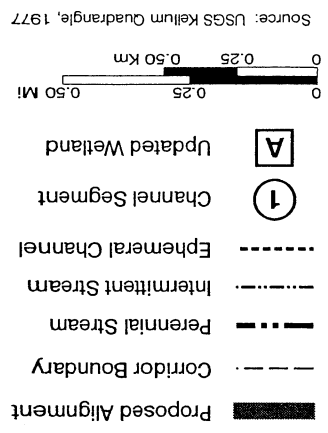
Environmental
Services, Inc.

Wetland and Stream Evaluation
US 17 Improvements Wetland Delineation Update
Onslow County, North Carolina
T.I.P. R-2514A

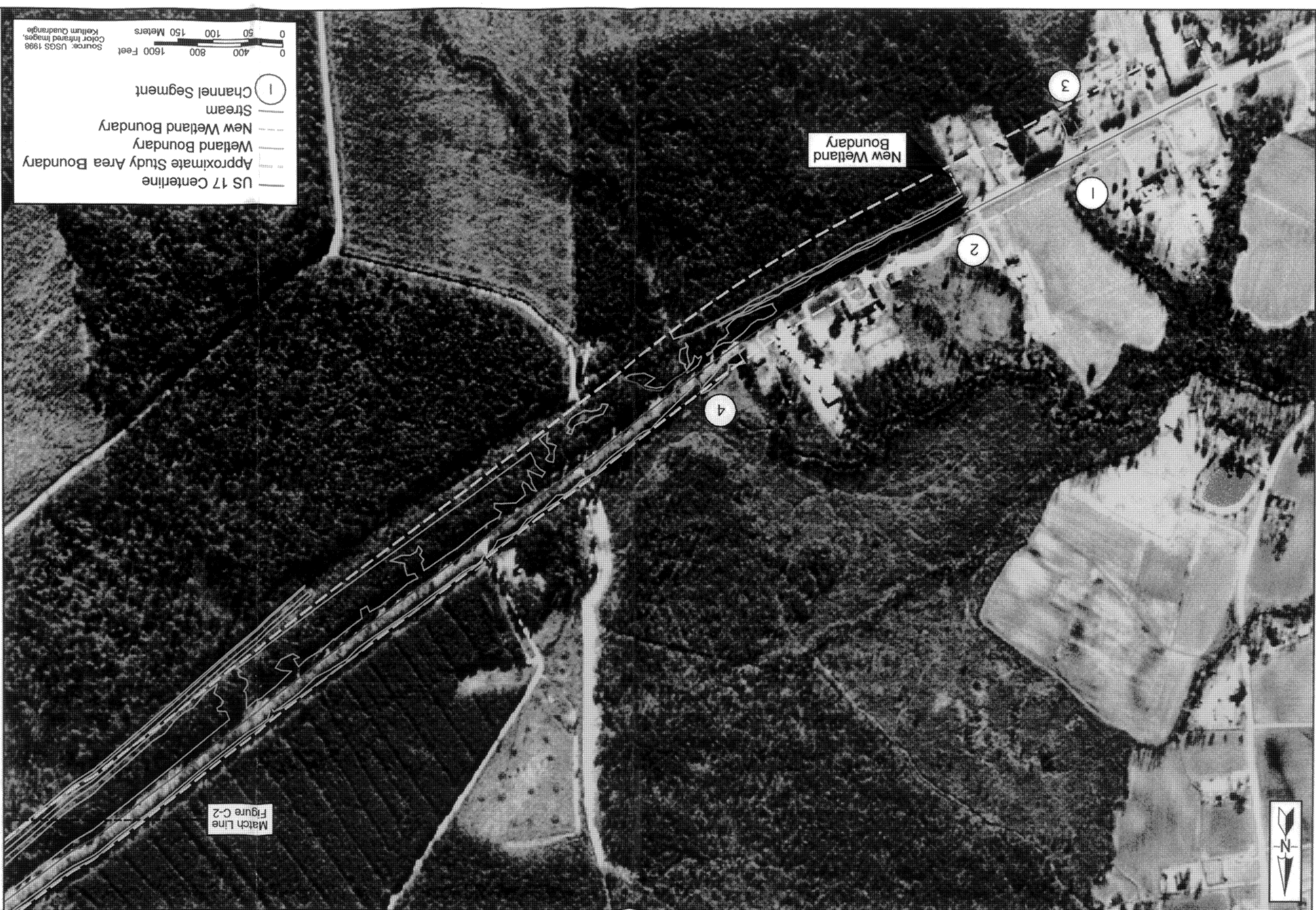
Figure: B-1

Project: ER02026.13

Date: September 2003



APPENDIX C
WETLAND AND STREAM GPS FIGURES



Environmental
Services, Inc.

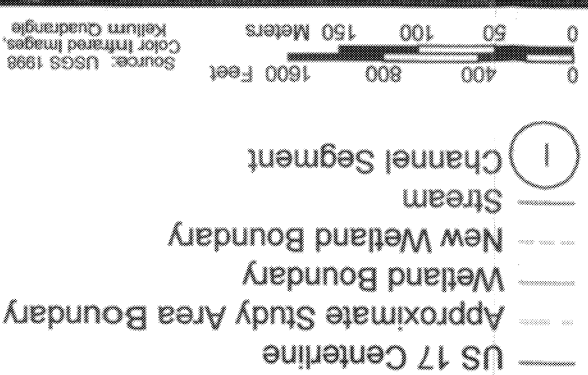
Jurisdictional Areas
US 17 Improvements Wetland Delineation Update
Onslow County, North Carolina
T.I.P. R-2514A

Drawn By: AUS	Figure: C-1
Checked By: JUC	Project: ER02026.13
Scale: 1"=400'	Date: September 2003



Match Line
Figure C-1

Match Line
Figure C-3

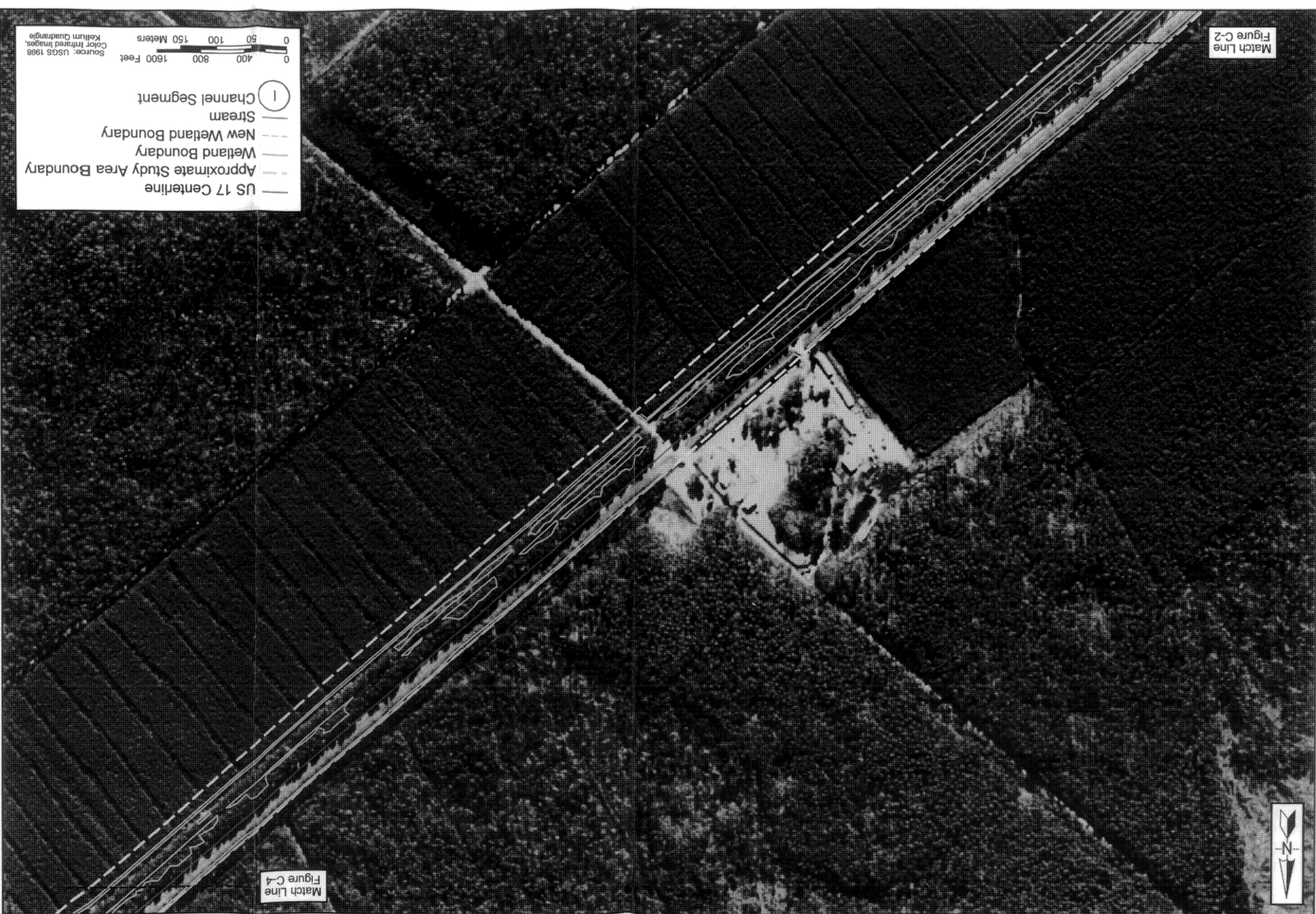


Environmental
Services, Inc.

Jurisdictional Areas
US 17 Improvements Wetland Delineation Update
Onslow County, North Carolina
T.I.P. R-2514A

Drawn By: AJS	Figures: C-2
Checked By: JUC	Project: ER02026.13
Scale: 1"=400'	Date: September 2003

Match Line
Figure C-2



Match Line
Figure C-4

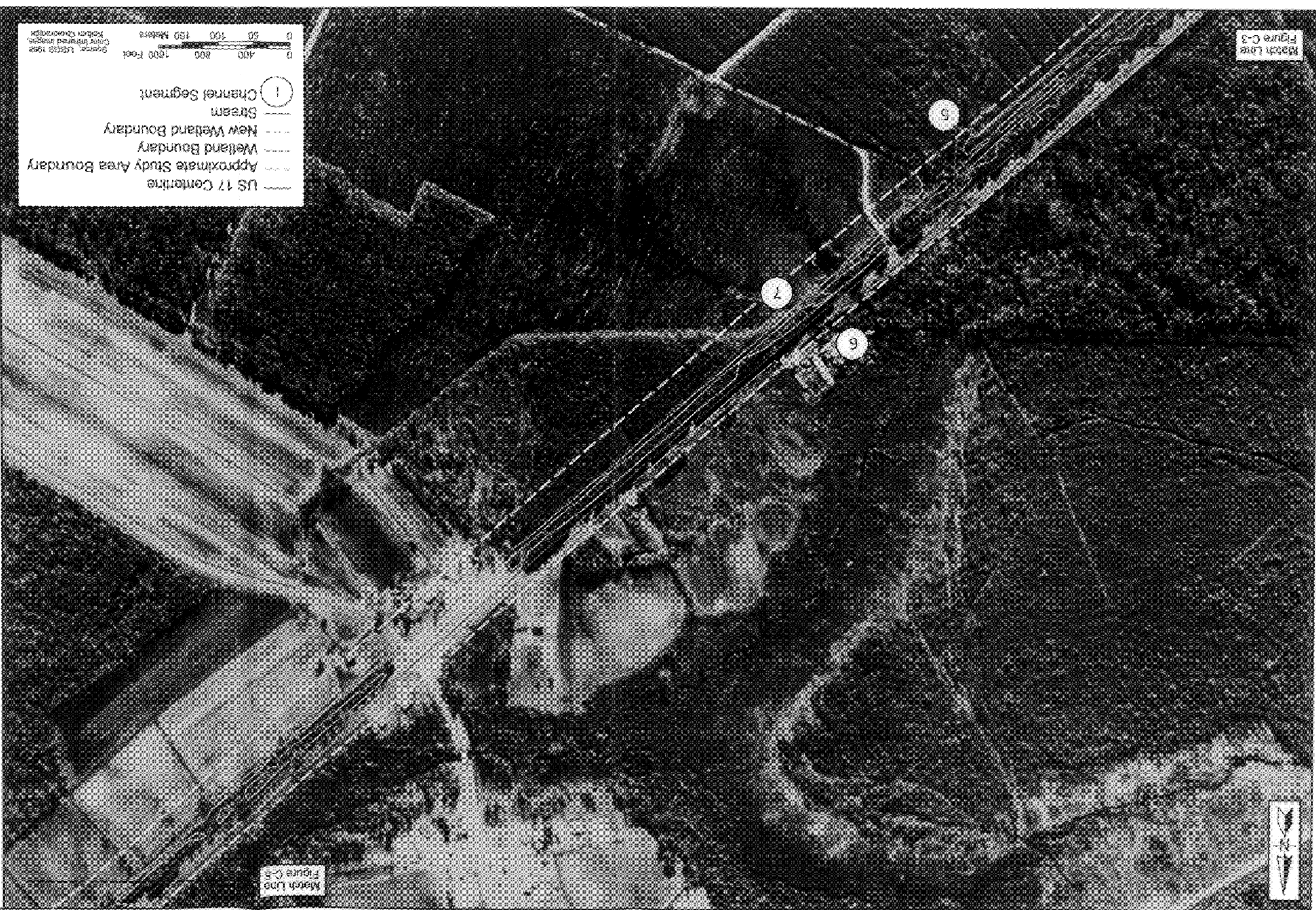


Environmental
Services, Inc.

Jurisdictional Areas
US 17 Improvements Wetland Delineation Update
Onslow County, North Carolina
T.I.P. R-2514A

Drawn By: AJS	Figure: C-3
Checked By: JUC	Project: ER02026.13
Scale: 1"=400'	Date: September 2003

Match Line
Figure C-3



US 17 Centerline
Approximate Study Area Boundary
Wetland Boundary
New Wetland Boundary
Stream
Channel Segment

0 50 100 150 Meters
0 400 800 1600 Feet

Source: USGS 1998
Color Infrared Images,
Kellum Quadrangle



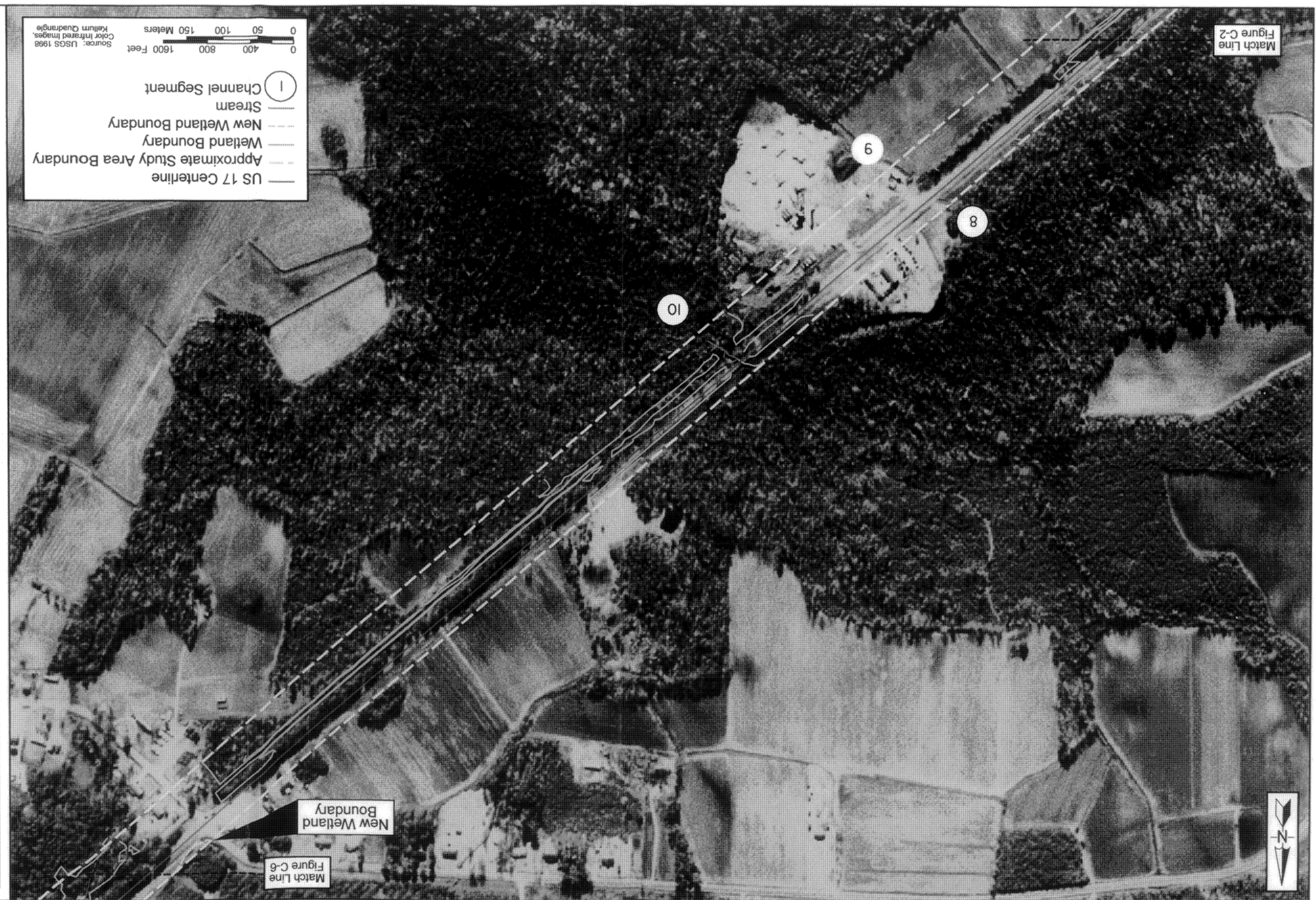
Environmental
Services, Inc.

Jurisdictional Areas
US 17 Improvements Wetland Delineation Update
Onslow County, North Carolina
T.I.P. R-2514A

Drawn By: AJS	Figures: C-4
Checked By: JUC	Project: ER02026.13
Scale: 1"=400'	Date: September 2003



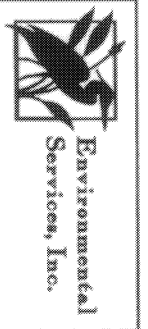
Match Line
Figure C-2



US 17 Centerline
Approximate Study Area Boundary
Wetland Boundary
New Wetland Boundary
Stream
Channel Segment

0 400 800 1600 Feet
0 50 100 150 Meters

Source: USGS 1998
Color Infrared Images,
Kellum Quadrangle

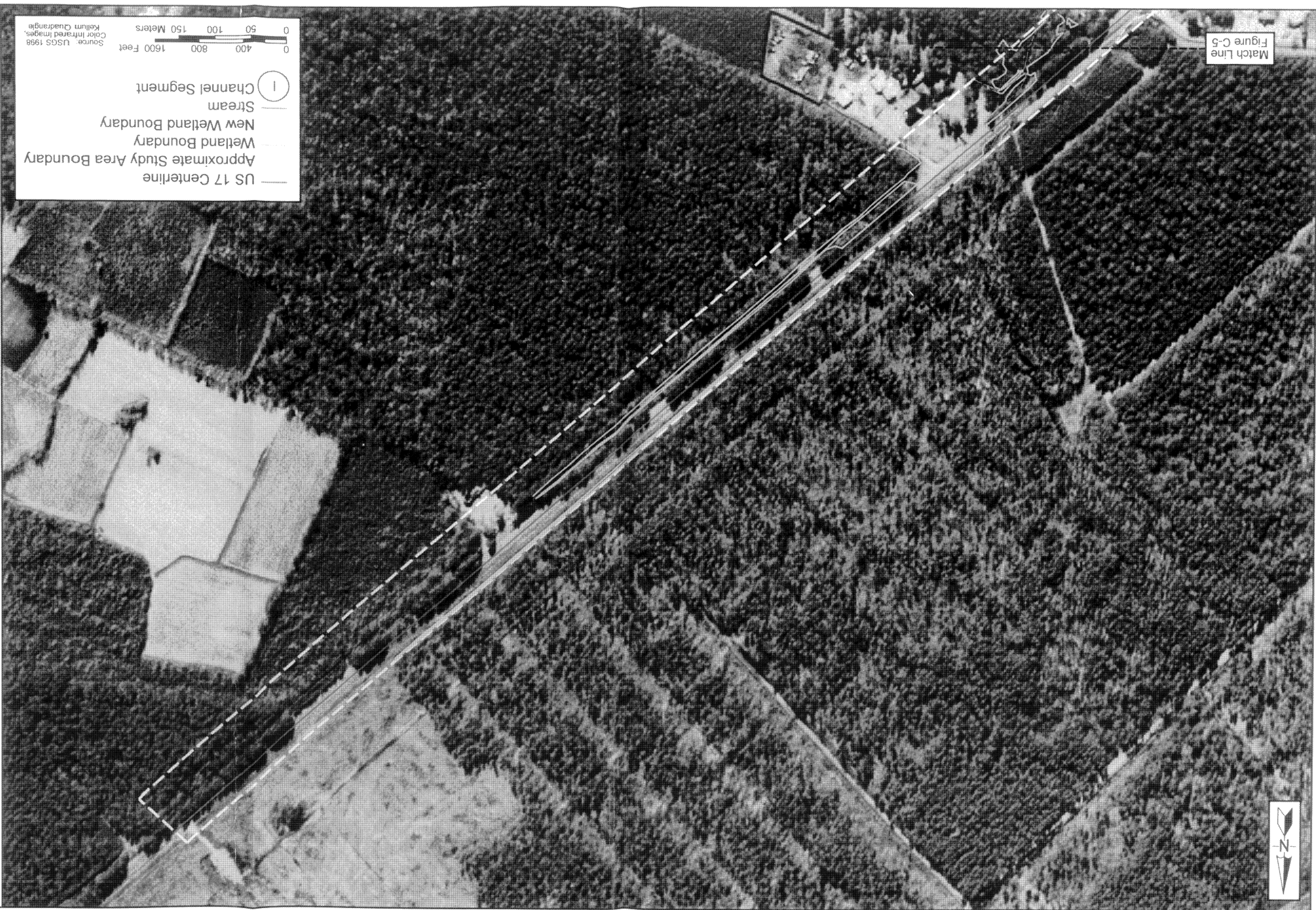


Jurisdictional Areas
US 17 Improvements Wetland Delineation Update
Onslow County, North Carolina
T.I.P. R-2514A

Drawn By: AJS	Figure: C-5
Checked By: JUC	Project: ER02026.13
Scale: 1"=400'	Date: September 2003



Match Line
Figure C-5



Environmental
Services, Inc.

Jurisdictional Areas
US 17 Improvements Wetland Delineation Update
Onslow County, North Carolina
T.I.P. R-2514A

Drawn By: AUS	Figure: C-6
Checked By: JUC	Project: ER02026.13
Scale: 1"=400'	Date: September 2003

QUALITATIVE INDIRECT AND
CUMULATIVE EFFECTS ASSESSMENT

US 17

TIP R-2514A

Onslow County, North Carolina

Prepared for
North Carolina Department of Transportation
Office of Human Environment

Prepared by:

HNTB North Carolina, PC

*2108 South Boulevard
Suite 108
Charlotte, North Carolina 28203
February 6, 2004*

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**North Carolina Department of Transportation
Office of Human Environment**

Qualitative Indirect and Cumulative Effects (ICE) Report

I. EXECUTIVE SUMMARY

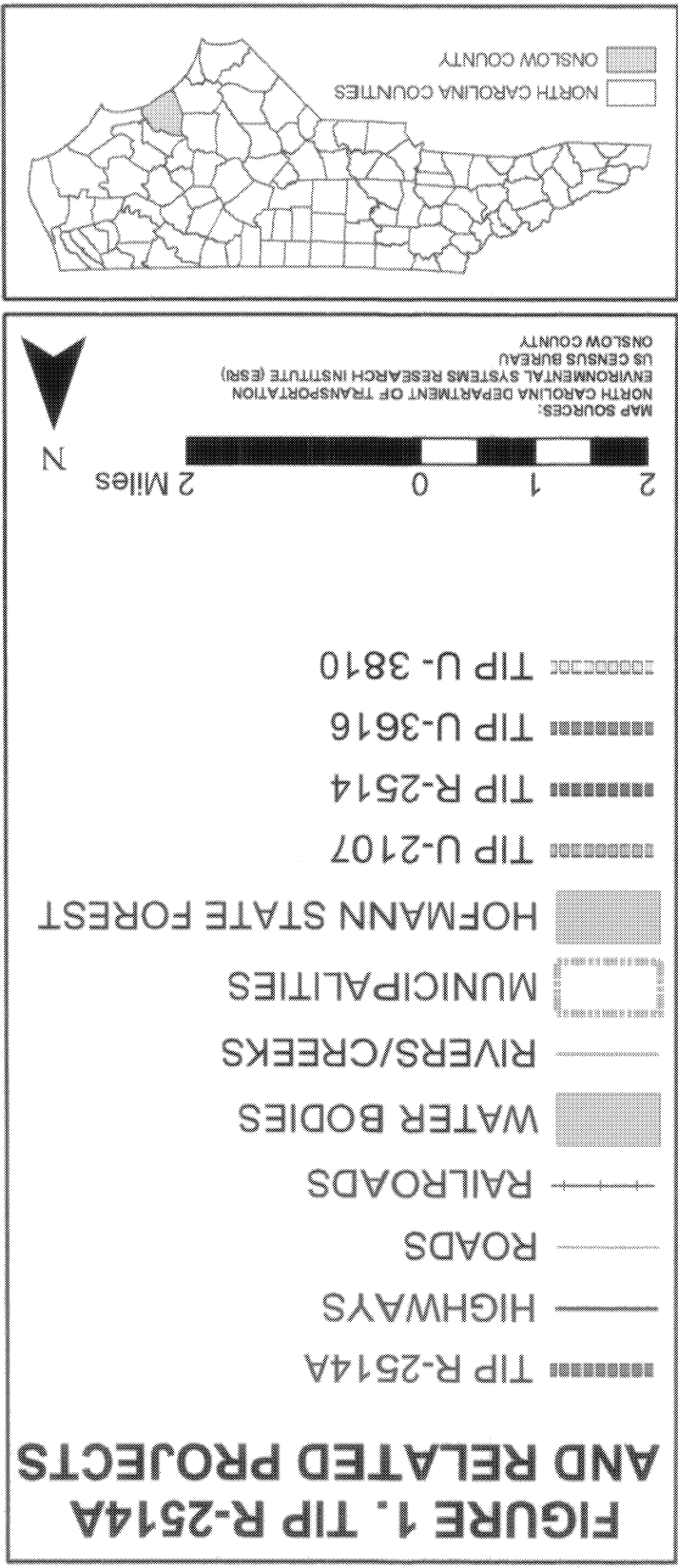
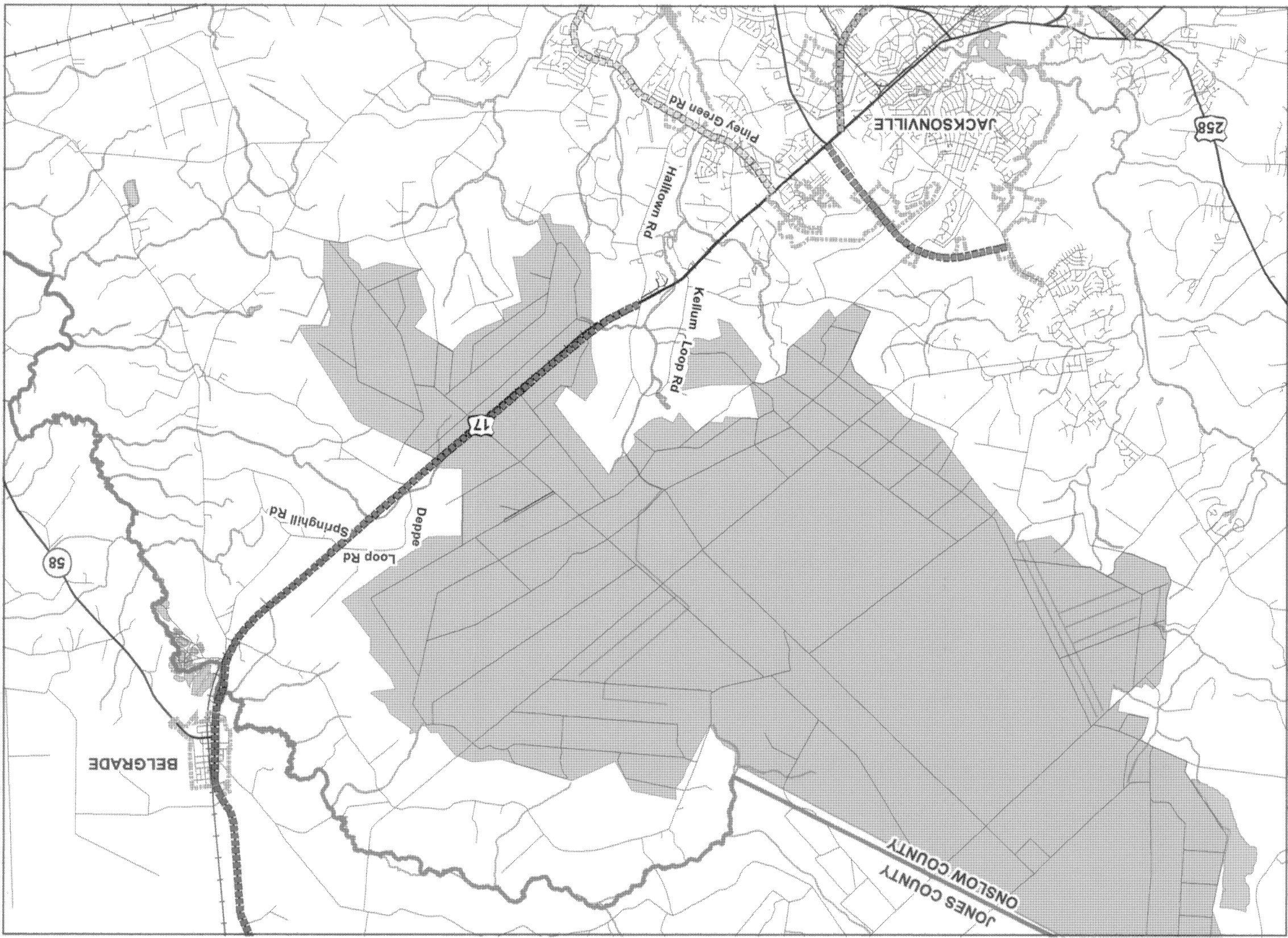
TIP R-2514A is a six-mile (approximately) widening of US 17 from Kellum Loop Road to just north of Deppe Loop Road in Onslow County (see Figure 1). The NCDOT proposes to add two 12-foot lanes in each direction, as well as a 46-foot grass median to the existing two-lane rural roadway. Access will be partial control. The minimum right of way required for TIP R-2514A will be 200 feet, with existing right of way currently at 100 feet. The project is currently undergoing right of way acquisition and is scheduled to begin construction during Fiscal Year 2004.

Study Area Directions and Goals

- TIP R-2514A is located in a portion of Onslow County which contains a substantial portion of Hofmann State Forest land. The Hofmann State Forest only permits the development of ten-acre farms or larger, forestry lands, greenways, and parks and playgrounds within its boundaries.
- Land along the TIP R-2514A portion of US 17 is predominantly undeveloped with some scattered single family dwellings and a few small businesses mainly surrounding the intersections.
- Population within the designated demographic area for TIP R-2514A grew by 17.4% between 1990 and 2000. This growth is less than North Carolina as a whole (21.4%), but more than Onslow County (0.3% ; 10% if military population was excluded).
- Zoning in unincorporated Onslow County is in the process of being implemented. The area surrounding TIP R-2514A is mostly zoned "Residential Agricultural" (RA), which allows a mixture of housing types, agricultural, and business uses.

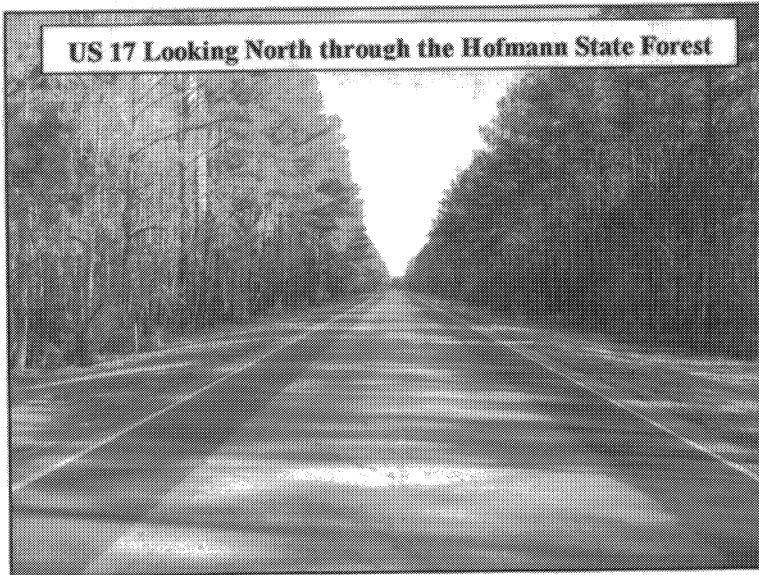
Indirect and Cumulative Effects

- The 1999 Environmental Assessment (EA) concludes that no cavity trees of the federally endangered Red Cockaded Woodpecker species, which exists in the Jacksonville NW and Stella USGS Quads, were found within 0.5 miles of the US 17 corridor.
- After assessing a set of socio-economic factors that typically contribute to favorable conditions for indirect and cumulative impacts related to transportation projects, none indicated any measurable level of potential impacts.
- Because of relatively minimal travel time savings, low property value increases, low population growth, limited sewer service, and the lack of a market for development, there is a low potential for land use change as a result of TIP R-2514A. Therefore, a more detailed, quantitative impact analysis need not be conducted.



II. PROJECT DOCUMENTATION AND BACKGROUND

TIP R-2514A is a multi-lane widening of US 17 from Kellum Loop Road north of Jacksonville to just north of Deppe Loop Road, south of Belgrade. The entire project is within a rural, unincorporated portion of Onslow County. The majority of TIP R-2514A traverses the Hofmann State Forest, the largest university research forest in the world. TIP R-2514A is approximately six miles in length, and parallels the abandoned Seaboard Coast Line Railroad. There is currently no control of access on US 17 along the project length, and all intersections are controlled by stop signs.



According to the August 1999 Environmental Assessment (EA), the primary purpose of the project is to upgrade US 17 to a modern, high speed, multi-lane facility connecting South Carolina to Virginia. A July 1969 report entitled *Coastal Plains Regional Transportation Study* recommended that the highest priority in North and South Carolina be given to providing a multi-lane,

limited access facility in the coastal corridor from Savannah, Georgia to Norfolk, Virginia., now served by US 17.

Other TIP projects in the surrounding area include (see Figure 1):

- **U-3810** – Widening of Piney Green Road to multi-lanes from NC 24 to US 17; right of way acquisition to start in FY 2010; construction post years.
- **U-2107** – US 17 Jacksonville Bypass from US 17 South to US 17 North (four lanes divided on new location); currently under construction.
- **R-2514 B-D** – Widening of US 17 to multi-lanes from terminus of R-2514A to just south of New Bern, NC; right of way acquisition to start in FY 2007, 2008, 2010; construction in FY 2009, 2010 and post years.
- **U-3616** – Widening of Western Blvd. to multi-lanes from US 17 to SR 1308 (Gum Branch Road); right of way acquisition and construction dates not listed in TIP.

III. STUDY AREA BOUNDARIES

Identification of Demographic Area

TIP R-2514A is located in Onslow County in eastern North Carolina. A demographic area for the project was delineated in order to analyze the population and employment growth trends encompassing the project (see Figure 2). This area is generally surrounded by the Onslow/Jones County border (White Oak River) to the north, Comfort Road to the west, Hofmann Forest Road/Western Boulevard/Jacksonville city limits to the south, and Old Rocky Run Road/CPLI Railroad to the east. The following US Census Bureau Block Groups from 2000 are included in the demographic area for TIP R-2514A:

- Census Tract 1.03, Block Groups 1, 2
- Census Tract 13, Block Group 1
- Census Tract 21, Block Groups 2, 3
- Census Tract 23, Block Groups 1, 2

Identification of Potential Growth Impact Area

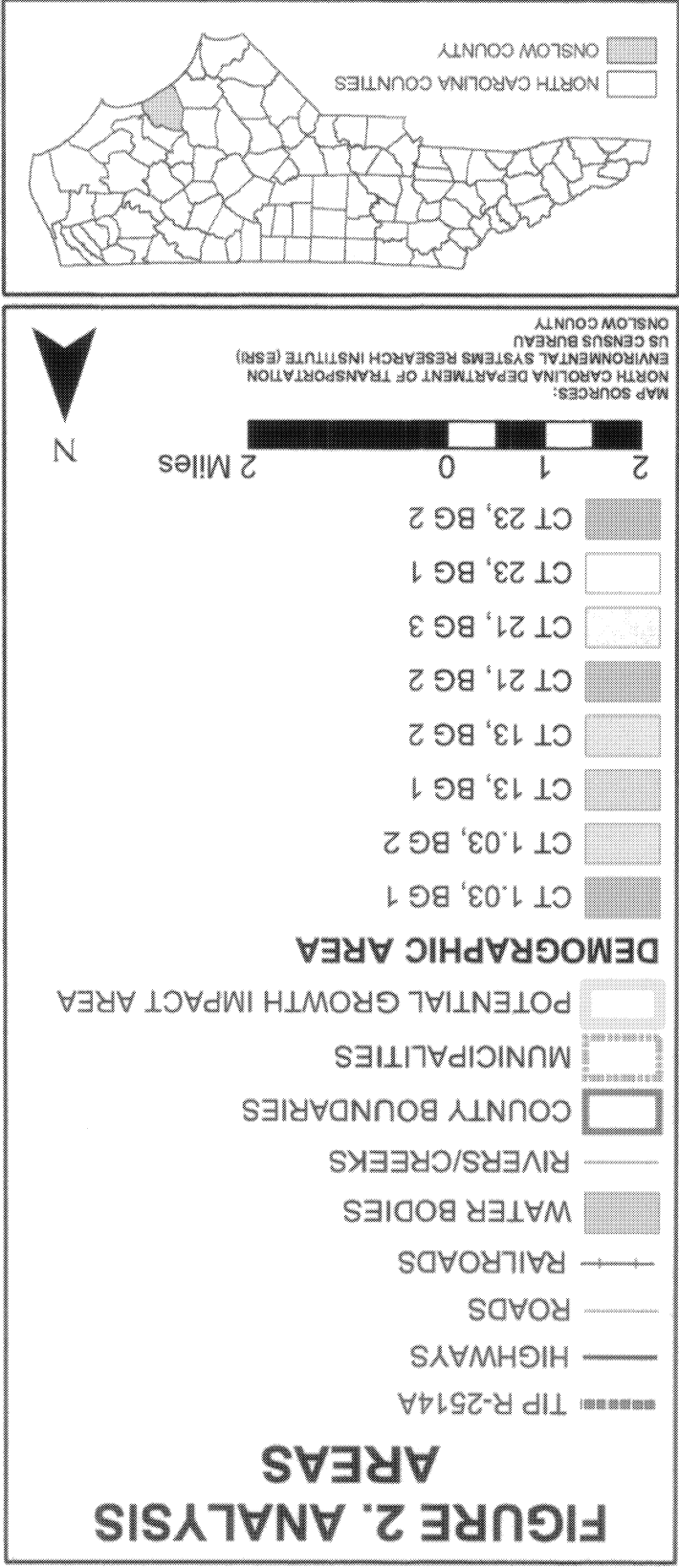
The North Carolina DOT's and North Carolina Department of Environment and Natural Resources (DENR) *Guidance for Assessing Indirect and Cumulative Impacts of Transportation Projects in North Carolina* indicate that the development effects of a new or improved roadway facility are most often found up to one mile around an interchange, and up to two to five miles along major feeder roadways to the interchange. Based on this guidance, the fact that TIP R-2514A is a widening effort and not a new location project, an initial review of project area conditions, and professional judgment, it was determined that the potential for growth impact as a result of TIP R-2514A would mostly be within a three-mile radius of the project alignment (see Figure 2). This three-mile radius, referred to as the Potential Growth Impact Area (PGIA), is the area within which the project has the potential to induce land use changes, and will determine the data collection and analysis area, but will not necessarily be the extent of the growth impact that is expected to occur.

IV. STUDY AREA DIRECTION AND GOALS

Regional Influences

Onslow County is located in southeastern North Carolina and is bordered by Pender County to the south, Duplin County to the west, Carteret and Jones Counties to the northeast and north, and the Atlantic Ocean to the east. The County is approximately 120 miles east of Raleigh, NC, and 50 miles north of Wilmington, NC.

Onslow County has a flat, gently rolling terrain which slopes from an altitude of 63 feet at the town of Richlands to sea level and covers nearly 500,000 acres. Of this total, 151,000 acres make up U.S. Marine Corps Base Camp Lejeune. The city of Jacksonville is home to the County government, and the areas surrounding Jacksonville comprise the



major population centers and growth area in the County. The County is home to over 150,000 people.

US 17 is the major coastal route for both North and South Carolina. It is currently undergoing upgrades throughout four States that will improve accessibility to major coastal destinations from Norfolk, Virginia to Savannah, Georgia.

Growth Trends

Table 1 below indicates population growth trends for the selected demographic area, Onslow County, and North Carolina. The demographic area grew by 17.4% between 1990 and 2000, less than North Carolina as a whole (21.4%), but more than Onslow County (0.3%). The demographic area added more population (1,934) than Onslow County as a whole (517) because it did not experience the loss/deployment of any military personnel, which created a population loss in some Census geographies. The military population at Camp Lejeune Marine Base decreased by nearly 50% from about 33,000 personnel in 1990 to approximately 18,500 personnel in 2000. If the military population would have remained constant during this time period, Onslow County would have experienced a 10% increase in population, adding over 15,000 people.

Table 1. Population Growth, 1990-2000

Area	Population		Growth, 90-00	
	1990	2000	#	%
Demographic Area	11,104	13,038	1,934	17.4%
Onslow County	149,838	150,355	517	0.3%
North Carolina	6,628,637	8,049,313	1,420,676	21.4%

Source: US Census Bureau

According to data from the North Carolina Employment Security Commission, Onslow County employment increased by 29.7% (8,974 jobs) between 1990 and 2002, with the accommodation and food services sector leading the way, adding 2,104 jobs. Similar to most other counties in North Carolina, Onslow County's manufacturing sector lost over half its workforce (-1,317 jobs) during the last 12 years. In terms of percent increase, the administrative and waste services sector grew the most of any sector in Onslow County, escalating by 255.2% from 616 jobs in 1990 to 2,188 jobs in 2002.

Table 2. Employment By Sector Growth, Onslow County

Sector	Employment		Change, '90-'02	
	1990	2002	#	%
Agriculture, Forestry, Fishing & Hunting	194	182	-12	-6.2%
Utilities	195	207	12	6.2%
Construction	1,704	2,630	926	54.3%
Manufacturing	2,490	1,173	-1,317	-52.9%
Wholesale Trade	371	470	99	26.7%
Retail Trade	6,332	8,421	2,089	33.0%
Transportation and Warehousing and Information	1,348	1,876	528	39.2%
Finance, Insurance, Real Estate and Rental/Leasing	1,195	1,383	188	15.7%
Professional and Technical Services	790	975	185	23.4%
Management of Companies and Enterprises	N/A	N/A	N/A	N/A
Administrative and Waste Services	616	2,188	1,572	255.2%
Educational Services	N/A	N/A	N/A	N/A
Health Care and Social Assistance	2,381	4,090	1,709	71.8%
Arts, Entertainment, and Recreation	669	529	-140	-20.9%
Accommodation and Food Services	2,948	5,052	2,104	71.4%
Other Services, Ex. Public Administration	1,064	1,193	129	12.1%
Public Administration	4,620	4,719	99	2.1%
Total*:	30,184	39,158	8,974	29.7%

Source: North Carolina Employment Security Commission

* Total employment does not equate to the sum of sector employment as displayed in table as a result of some sector employment unavailability (designated by "N/A").

When compared to overall employment growth in North Carolina between 1990 and 2002, Onslow County employment grew slightly faster (29.7% compared to 22.3%). North Carolina only lost employment in one industry sector, manufacturing, between 1990 and 2002. However, this loss (-21.5%) was less substantial than the loss incurred in Onslow County (-52.9%). The health care and social assistance sector added 178,394 jobs, the most of any North Carolina employment sector.

**Table 3. Employment By Sector Growth, North Carolina**

Sector	Employment		Change, '90-'02	
	1990	2002	#	%
Agriculture, Forestry, Fishing & Hunting	21,827	31,376	9,549	43.7%
Construction	166,733	219,036	52,303	31.4%
Manufacturing	820,249	643,978	-176,271	-21.5%
Wholesale Trade	139,697	162,233	22,536	16.1%
Retail Trade	381,041	442,878	61,837	16.2%
Transportation and Warehousing and Information	161,308	213,393	52,085	32.3%
Finance, Insurance, Real Estate and Rental/Leasing	135,534	184,990	49,456	36.5%
Professional and Technical Services	91,327	148,043	56,716	62.1%
Management of Companies and Enterprises	35104	63,565	28,461	81.1%
Administrative and Waste Services	110,979	209,753	98,774	89.0%
Educational Services	233,161	317,043	83,882	36.0%
Health Care and Social Assistance	261,592	439,986	178,394	68.2%
Arts, Entertainment, and Recreation	31,090	50,554	19,464	62.6%
Accommodation and Food Services	206,014	288,201	82,187	39.9%
Other Services, Ex. Public Administration	80,279	98,844	18,565	23.1%
Public Administration	171,716	214,079	42,363	24.7%
Total	3,047,651	3,727,952	680,301	22.3%

Source: North Carolina Employment Security Commission

Transportation Plans

According to the NCDOT 2004-2010 Transportation Improvement Program, right of way acquisition has already begun (April 2002) for TIP R-2514A, with a proposed letting date during Fiscal Year 2004. At the time of this report, Onslow County did not have a Long Range Transportation/Thoroughfare Plan. However, the Down East Rural Planning Organization recently submitted a list of planning needs in the region to the NCDOT, and Onslow County obtained a high priority status to receive such a plan.

The 2000-2025 Jacksonville Urban Area Transportation Plan Update, completed in 1999, listed the top ten transportation issues mentioned by survey respondents. The second highest priority was the congestion of US 17/Marine Boulevard. A total of 66% of the respondents supported the construction of the US 17 Bypass. Although this issue deals more with the Jacksonville portion of US 17 and not the TIP R-2514A section, it also suggests that the entire Onslow County portion of the US 17 corridor is a high priority within the region. This finding suggests that, in terms of traffic flow, a widening of US 17 is necessary.

Land Use

Citizens' Comprehensive Plan for Onslow County

This document was approved in April 2003 and indicates that the existing land use along TIP R-2514A is predominantly vacant with scattered single family residential (including a few mobile home parks). This plan identifies the US 17 corridor north of Jacksonville as a "Traditional Rural Area," where residential development tends to be scattered along rural roadways rather than clustered in planned subdivisions.

Also within the plan are designated areas for "town and village" clusters where future development is to be focused. The Growth Strategy Map within this plan shows a "town and village" cluster area proposed south of US 17 between the existing Jacksonville city limits and the Hofmann State Forest boundary. This area is generally bounded by Piney Green Road to the south, the Hofmann State Forest to the north, US 17 to the west, and Old Rocky Run Road to the east. Notably this area already has a substantial amount of residential development taking place. Please see Figure 3 which depicts the existing land use for the area surrounding TIP R-2514A.

Onslow County Joint Land Use Study

This study was completed in February 2003. Its study area only includes a small portion of the US 17 corridor north of Jacksonville, which in itself is evidence of the lack of market activity and development interest in the extremely rural northeastern part of Onslow County. The study designates a mix of constrained and unconstrained areas in terms of development potential along the southernmost portion of TIP R-2514A. A constrained area is defined as an area with one or more moderate environmental constraints such as freshwater wetlands, 100-year floodplain, storm surge areas, and poor soils for septic systems. According to the compatibility matrix within the report, the following land uses are considered "compatible" or "compatible with conditions" within a *constrained* environmental surrounding:

Freshwater Wetlands: permits recreation, military training, agricultural uses

100-Year Floodplains: all uses except public facilities, industrial/warehouse

Storm Surge Areas: all uses

Poor Soils for Septic Systems: permits recreation, military training, agricultural

Two of these four environmental constraints (freshwater wetlands and 100-year floodplains) are known to exist within the Potential Growth Impact Area (PGIA) of TIP



R-2514A. Current land use and proposed land use within this area is consistent with the "compatible" land uses identified above.

Coastal Area Management Act (CAMA) Land Use Planning

Onslow County is considered a Coastal Area Management Act county, and is therefore subject to its land use planning guidelines. The Citizen's Comprehensive Plan for Onslow County includes the required elements for a CAMA plan, which are:

1. Executive Summary
2. Introduction
3. Goals and Objectives
4. Data Collection and Analysis
5. Present Conditions
6. Constraints
7. Policy Statements
8. Land Classifications
9. Intergovernmental Coordination and Implementation
10. Public Participation

In addition, if any development is anticipated within an Area of Environmental Concern (AEC), a CAMA permit and review is required. AECs typically are located:

- in or on navigable waters within the 20 CAMA counties;
- on a marsh or wetland;
- within 75 feet of the mean high water line along an estuarine shoreline;
- near the ocean beach;
- near an inlet;
- within 30 feet of the normal high water level of areas designated as inland fishing waters by the N.C. Marine Fisheries Commission; and
- near a public water supply.

There are some pockets of wetland areas (identified in the 1999 EA) along the TIP R-2514A corridor that could potentially require CAMA review if development were proposed for any of these sites.

Zoning

Onslow County is currently in the process of creating zoning districts within its boundaries. Only Phase 1 of 7 has been completed to date, which includes the area along US 17 between the northern boundary of the Hofmann State Forest and the Jacksonville city limits. Most of this area is designated as "Residential Agricultural" (RA), which permits a mixture of housing types, agricultural, and business uses. The permitted uses are designated as SR, or Special Requirement uses. These uses require the submission of a site plan drawn by the applicant, with special requirements outlined in the Zoning Ordinance that must be met before a permit can be issued. The Hofmann State Forest is

designated as "Conservation" which only allows the development of ten-acre farms or larger, forestry lands, greenways, and parks and playgrounds.

Environmental Regulations

There are no water supply watersheds located either along the US 17 corridor or within the Potential Growth Impact Area (PGIA) of TIP R-2514A. There is, however, one 303d impaired creek: Little Northeast Creek. The creek is located southeast of TIP R-2514A, partially within the PGIA (see Figure 4). It is impaired because of low dissolved oxygen, which may or may not be due to the natural swamp conditions of the landscape. The creek is listed as medium priority in terms of mitigation. According to the Environmental Assessment (EA), Little Northeast Creek and its associated tributaries are classified as Nutrient Sensitive Waters, which require limitations on nutrient inputs. No Outstanding Resource Waters were identified in the PGIA.

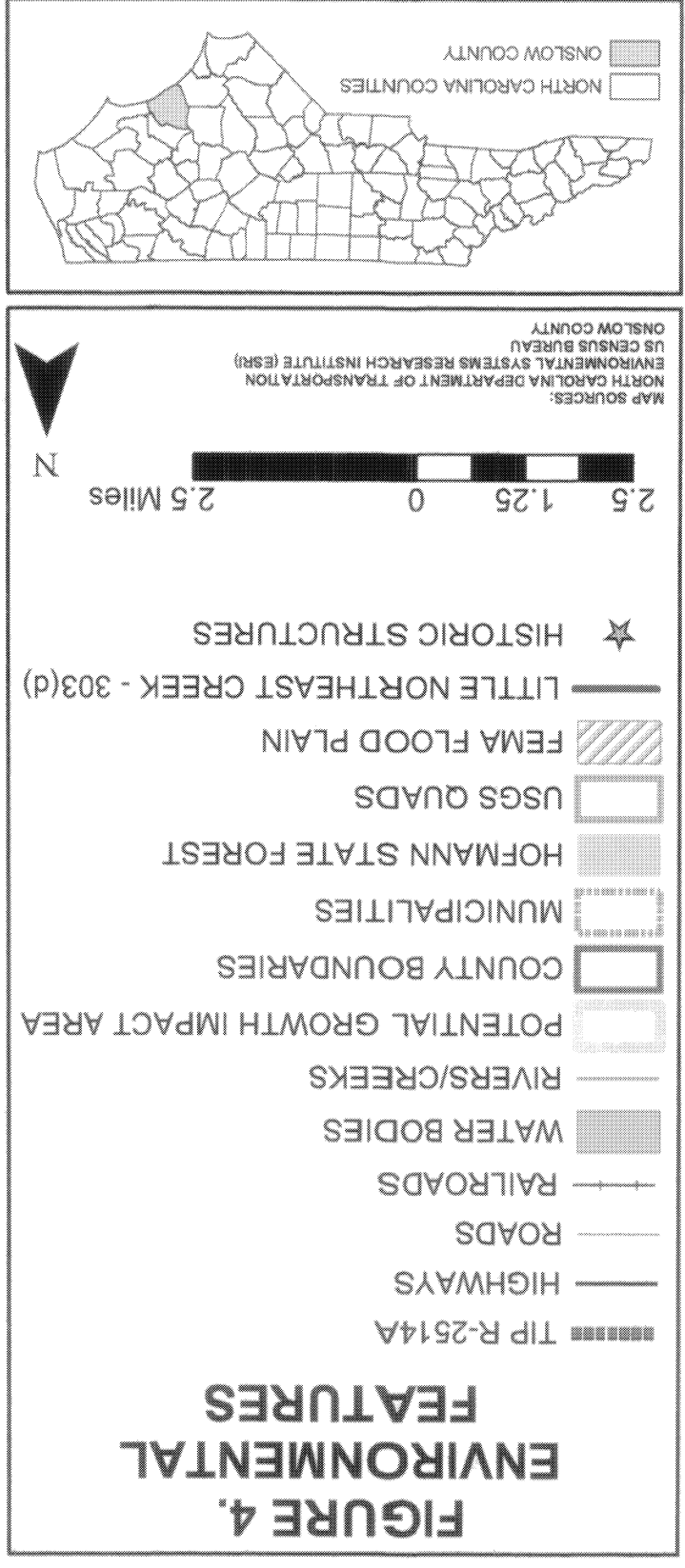
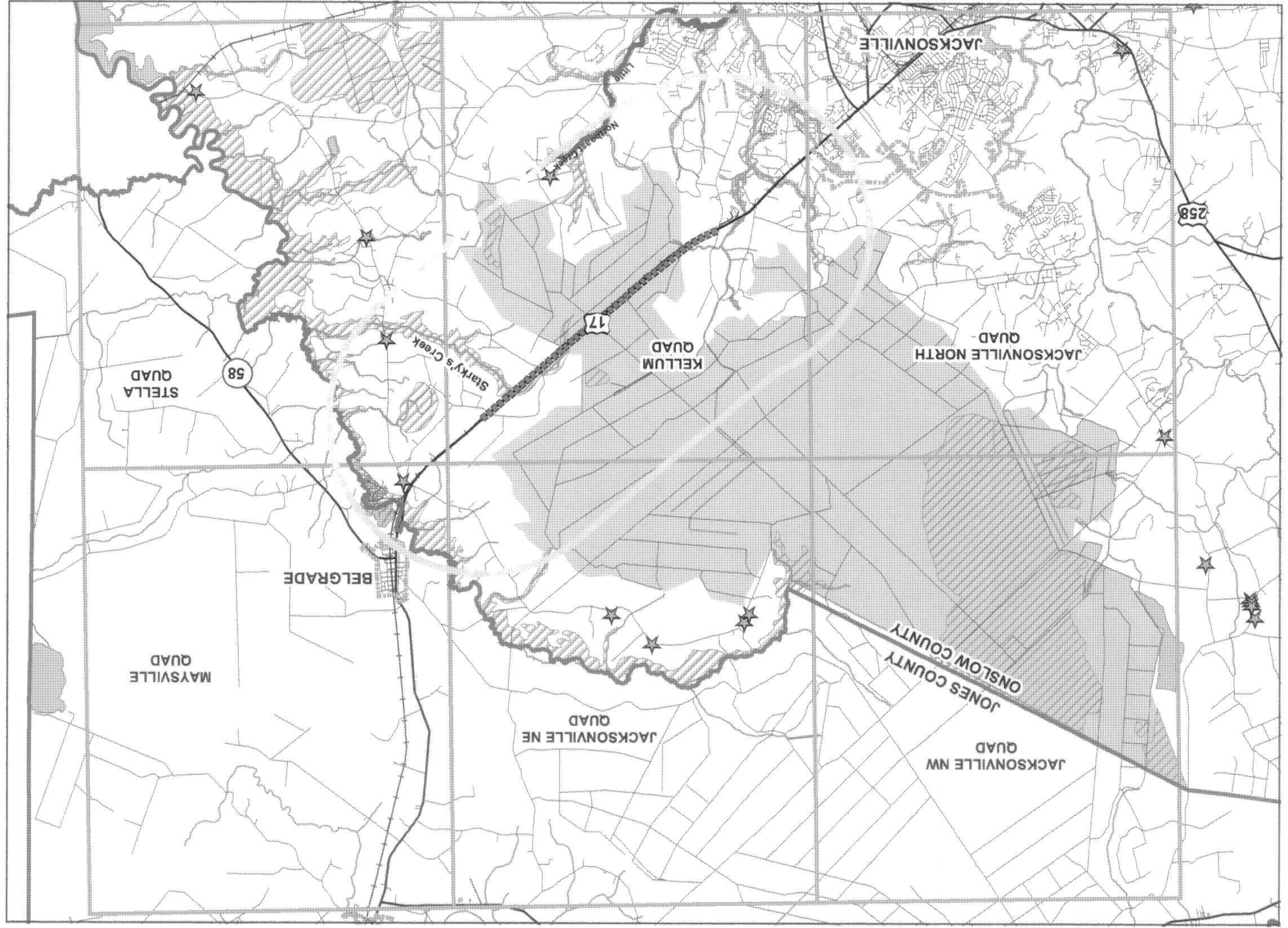
The floodplain of Starky's Creek, located at the northern end of TIP R-2514A, limits the amount of available land upon which to develop (see Figure 4). Other than that creek, the floodplain for Little Northeast Creek extends into the PGIA, but it is not as opportunistic in terms of its location as Starky's Creek floodplain, which actually intersects with US 17 within the project limits.

V. INVENTORY OF NOTABLE FEATURES

In order to determine the potential of TIP R-2514A indirectly impacting environmentally notable features within the surrounding area, an exhaustive inventory of different types of notable features was assembled. The following tables indicate the type of notable feature present, where it is located (specifically or generally), and its current status (see website for code definitions):

STATE AND FEDERALLY PROTECTED SPECIES

Common Name	Scientific Name	Federal Status	State Status	USGS Quad Map
Plant:				
Shadow-witch	<i>Ponthieva racemosa</i>	-	Significantly Rare - Peripheral	Current - STELLA
Grassleaf Arrowhead	<i>Sagittaria graminea</i> var <i>weatherbiana</i>	-	Significantly Rare - Throughout	Current - STELLA
Drooping Bulrush	<i>Scirpus lineatus</i>	-	Significantly Rare - Peripheral	Current - STELLA
Rough-leaved loosestrife**	<i>Lysimachia asperulaefolia</i>	Endangered	Endangered	N/A
Leconte's Thistle	<i>Cirsium lecontei</i>	-	Significantly Rare - Peripheral	Historic - KELLUM



Venus Flytrap	<i>Dionaea muscipula</i>	Species of Concern	Significantly Rare - Limited (Special Concern)	Historic - KELLUM
Spoonflower	<i>Peltandra sagittifolia</i>	-	Significantly Rare - Peripheral	Historic - KELLUM
Hooker's Milkwort	<i>Polygala hookeri</i>	-	Significantly Rare - Throughout	Current - KELLUM
Cooley's Meadowrue**	<i>Thalictrum cooleyi</i>	Endangered	Endangered	N/A
Short-bristled Beaksedge	<i>Rhynchospora breviseta</i>	-	Significantly Rare - Peripheral	Current - KELLUM
Carolina Goldenrod	<i>Solidago pulchra</i>	Species of Concern	Endangered	Current - KELLUM & STELLA
Florida Yellow-eyed-grass	<i>Xyris difformis</i> var <i>floridana</i>	-	Significantly Rare - Peripheral	Current - KELLUM
Seabeach Amaranth**	<i>Amaranthus pumilus</i>	Threatened	Threatened	N/A
Gulfcoast Spikerush	<i>Eleocharis cellulosa</i>	-	Significantly Rare - Peripheral	Historic - STELLA
Spring-flowering Goldenrod	<i>Solidago verna</i>	Species of Concern	Significantly Rare - Limited	Current - JACKSONVILLE NE, KELLUM & STELLA
Reptile:				
American Alligator*	<i>Alligator mississippiensis</i>	Threatened(S/A)	Threatened	Historic - JACKSONVILLE NORTH & STELLA
Leatherback Sea Turtle**	<i>Dermochelys coriacea</i>	Endangered	Endangered	N/A
Green Sea Turtle**	<i>Chelonia mydas</i>	Threatened	Threatened	N/A
Loggerhead Sea Turtle**	<i>Caretta caretta</i>	Threatened	Threatened	N/A
Eastern Diamondback Rattlesnake	<i>Crotalus adamanteus</i>	-	Endangered	Historic - STELLA
Glossy Crayfish Snake	<i>Regina rigida</i>	-	Significantly Rare	Obscure - STELLA
Bird:				
Red-cockaded Woodpecker*	<i>Picoides borealis</i>	Endangered	Endangered	Current - JACKSONVILLE NW & STELLA
Purple Gallinule	<i>Porphyryla martinica</i>	-	Significantly Rare	Historic - STELLA
Piping Plover**	<i>Charadrius melodus</i>	Threatened	Threatened	N/A
-	Wading Bird Rookery	-	-	Current - JACKSONVILLE NE
Amphibian:				
Pine Barrens Treefrog	<i>Hyla andersonii</i>	-	Significantly Rare	Current - STELLA & KELLUM

Insect:				
Dismal Swamp Green Stink Bug	Chlorochroa dismalia	-	Significantly Rare	Historic - JACKSONVILLE NORTH
Mammal:				
Eastern Cougar**	Felis concolor cougar	Endangered	Endangered	N/A
Eastern Woodrat - Coastal Plain Population	Neotoma floridana floridana	-	Threatened	Current - STELLA
Mollusk:				
Grooved Fingernailclam	Sphaerium simile	-	Significantly Rare	Current - JACKSONVILLE NE

Source: NC Natural Heritage Program; <http://ils.unc.edu/parkproject/nhp>

* Also listed in the 1999 EA

** Only listed in the 1999 EA

Natural Communities

Name	USGS Quad Map
High Pocosin	Current - JACKSONVILLE NORTH & NW
Pond Pine Woodland*	Current - JACKSONVILLE NORTH, NW, NE & KELLUM
Tidal Cypress-Gum Swamp	Current - JACKSONVILLE NORTH, KELLUM & STELLA
Nonriverine Swamp Forest	Historic - JACKSONVILLE NW
Agricultural Land**	N/A
"Tidal Red Cedar Forest"	Current - KELLUM
"Tidal Red Cedar Forest"	Current - STELLA
Maintained/Disturbed Land**	N/A
Basic Mesic Forest (Coastal Plain Subtype)	Current - STELLA
Coastal Plain Bottomland Hardwoods (Blackwater Subtype)*	Current - STELLA
Successional Land**	N/A
Coastal Plain Small Stream Swamp (Blackwater Subtype)	Current - STELLA
Dry-Mesic Oak-Hickory Forest	Current - STELLA
Mesic Mixed Hardwood Forest (Coastal Plain Subtype)*	Current - STELLA
Tidal Freshwater Marsh	Current - STELLA
Wet Pine Flatwoods	Current - STELLA

Source: NC Natural Heritage Program; <http://ils.unc.edu/parkproject/nhp>

* Also listed in the 1999 EA

** Only listed in the 1999 EA

National Register Historic Properties
TIP R-2514A Potential Growth Impact Area

Name	USGS Quad Map	Property Description
Morton Family House	Kellum	Mid 19th century coastal cottage
David Sanders Amon House	Stella	19th century coastal cottage
Zinnie Eubank House	Maysville	1912 house with wrap around porch

Source: NCDOT Statewide Planning GIS Shapefile

Note: See Figure 4 for exact locations

According to the 1999 Environmental Assessment (EA), no properties listed in the National Register of Historic Places were identified within the project area of potential effect (as defined by the EA). However, two properties were identified as being eligible for the register: the Nelson Deppe House located just south of the intersection of US 17 and Deppe Road, and the Hofmann Forest Lookout Tower and Equipment Headquarters located along the west side of US 17 approximately 3 miles from Kellum Loop Road. The Federal Highway Administration (FHWA) and State Historic Preservation Office (SHPO) determined that TIP R-2514A will have no adverse effect on either property.

In addition to the nationally-listed properties above, the following are state-listed with the USGS Quad in which they are found in parentheses:

- James R. Franck House (Richlands Quad)
- Bell-Strobel House (Jacksonville NE Quad)
- Benjamin C. Smith House (Jacksonville NE Quad)
- White Oak Rural Historic District (Jacksonville NE Quad)
- Zinnie Eubank House/Store (Maysville)
- Cavanaugh House (Jacksonville N)
- Morton Family House (Kellum)
- David Sanders Amon House (Stella)
- Mattocks Family House (Stella)
- Tabernacle Elementary School (Stella)

Solid Waste Facilities, Onslow County

Name	Type	Location
Camp Lejeune Compost Facility	Compost	Piney Greene Road
Morton Site	LCID	US 17
Mosely Demolition Landfill	LCID	SR 1320
Onslow County Landfill	LCID	415 Meadowview Road
Parker Meadow	LCID	SR 1325
Eastern Excavating Landfill	LCID	143 Penguin Lane
Haugen Landfill	LCID	Jacksonville, NC
Camp Lejeune MSW Landfill	MSWLF	Piney Greene Road
Camp Lejeune Marine Corp. Base	TP	Piney Greene Road

Source: NCDENR website

The August 1999 Environmental Assessment (EA) identified three potential sites for underground storage tanks:

1. An abandoned Exxon station located 0.5 miles north of SR 1327 (Kellum Loop Road)
2. White's Trucking Company located just south of SR 1330/SR 1439 (Deppe Loop Road/Spring Hill Road)
3. Abandoned gas station located just south of SR 1330/SR 1439 (Deppe Loop Road/Spring Hill Road)

All sites are located on the west side of US 17, whereas TIP R-2514A is planned to be widened predominantly along the east side, taking advantage of the abandoned Seaboard Coast railroad. Therefore, the EA concludes that the project is not anticipated to impact these sites. Also, according to GIS data from the NCDOT, there are no hazardous substance disposal areas within the PGIA.

VI. ACTIVITIES THAT CAUSE EFFECTS

Previous Conclusions

According to the August 1999 Environmental Assessment (EA), although short-term impacts to water quality are anticipated as a result of the construction of TIP R-2514A due to soil erosion and sedimentation, long-term impacts are expected to be negligible and limited to increased runoff from the widened roadway with the potential of carrying higher pollutant loads. The EA also concludes that TIP R-2514A is expected to disturb approximately 25 acres of wetlands. In addition, of the federally and state endangered or threatened species within Onslow County, only the Red-cockaded woodpecker (RCW)

and the American alligator have potential habitats within the study area. After a more thorough investigation, the EA concludes that no RCW cavity trees were found within 0.5 miles of the US 17 corridor, and no long-term impact is anticipated for the American alligator species.

VII. POTENTIAL INDIRECT AND CUMULATIVE EFFECTS FOR ANALYSIS

The North Carolina DOT, in their April 2001 handbook titled "Guidance for Assessing Indirect and Cumulative Impacts of Transportation Projects in North Carolina," outlines a set of factors that need to be evaluated to determine whether or not a detailed quantitative indirect and cumulative impact analysis (ICI) may be necessary for specific projects. The following is an assessment of those factors as they relate to TIP R-2514A.

Conflict with local plan:

The Citizens' Comprehensive Plan for Onslow County indicates land along the US 17 corridor north of Jacksonville predominantly as "Traditional Rural Area," which includes large lot, scattered single family uses (not in subdivisions), and agricultural uses. This plan also identifies improving traffic congestion along US 17 as a priority for the county. Therefore, TIP R-2514A is neither in conflict with local land use policy, nor is it inconsistent with recommended transportation priorities within the county plan.

Explicit economic development purpose:

Historically, the construction and many improvements of US 17 have been completed within the context of the July 1969 report "Coastal Plains Regional Transportation Study," which recommended that the highest priority in North and South Carolina be given to providing a multi-lane, limited access facility from Savannah, Georgia to Norfolk, Virginia. This report indicated that accomplishing this task would be a key step in realizing the economic potential of the tourism industry in the coastal regions.

In addition, the 2001 North Carolina Transportation Plan identifies US 17 as an economic development highway which could enhance the opportunity for the continued prosperity of the coastal region. The roadway was considered a vital connection between major economic centers, such as Wilmington, Jacksonville, New Bern, and Edenton, NC.

However, with the R-2514A portion of US 17 having no land designated for commercial uses and only a few pockets of land planned for low density residential uses, it is unlikely that the project is being built for an explicit local economic development purpose. Other than timber-related trucking activity in and out of Hofmann State Forest, and a rock quarry near the intersection of US 17 and Kellum Loop Road, there are no existing industries along TIP R-2514A.

Planned to serve specific development:

Existing development is very limited along the TIP R-2514A portion of the US 17 corridor, and little or no development is planned for the area. Therefore, it is unlikely that the project is being built to serve a specific development or industry.

Likely to stimulate land development having complementary (to highway-related travel) functions:

The assessment of this factor partially involves an evaluation of a subset of factors commonly used to determine the potential for induced growth surrounding rural roadways/interchanges including:

- Distance to a major urban center
- Traffic volumes along intersecting roadways
- Presence of frontage roads
- Availability of water/sewer

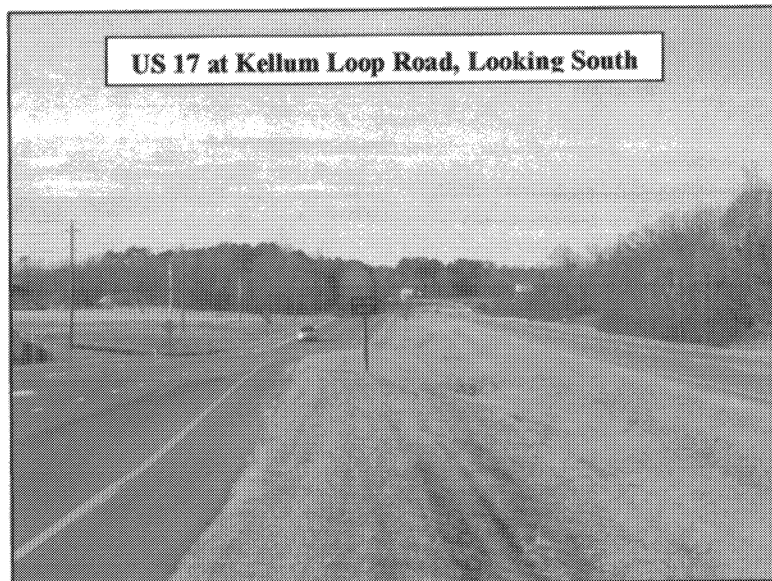
TIP R-2514A begins less than a mile from the Jacksonville city limits, which is the only urban area until New Bern, approximately 40 miles to the north. There are three main intersections along the project length: Kellum Loop Road/Halltown Road at the beginning of the project, and both ends of Deppe Loop Road (including the Deppe Loop Road/Springhill Road intersection) at the end of the project. All three intersections are currently controlled by stop signs, and intersecting traffic was observed to be low during the site visit. Because they are “loop” roads that do not connect to other major arterials east or west of US 17, they only serve as feeder routes to some of the residences and farms along the corridor.

There are no frontage roads planned as part of TIP R-2514A. There is an existing water main located along US 17 in this area, but no sewer service exists outside of the Jacksonville city limits. As a result of the weak correlation between TIP R-2514A and these factors, it is unlikely that the project would stimulate much development.

Likely to influence intraregional land development location decisions:

As development is restricted within the Hofmann State Forest, contributing to minimal available land along the TIP R-2514A portion of US 17, any type of intraregional land development (i.e. distribution industries) would be limited to the areas surrounding the Kellum Loop Road/Halltown Road

and the Deppe Loop Road/Springhill Road intersections. A four-lane stretch of roadway would make it more attractive for this type of development to occur because of improved access, safety, and travel time savings. However, distribution industries tend to locate closer to urban centers where there is better access for employees.



Notable feature present in Potential Growth Impact Area (PGIA):

The Hofmann State Forest encompasses most of the land fronting the TIP R-2514A portion of US 17. Other than 10-acre farms or larger, passive parks, or other natural recreation, there is no development permitted within the boundaries of the Hofmann State Forest. Therefore, it is unlikely that it would be indirectly impacted by TIP R-2514A.

In addition, although the presence of federally or state protected species has been verified as part of the Inventory of Notable Features section, an in-depth field search would be required to determine if any of these species are located within the PGIA.

VIII. INDIRECT AND CUMULATIVE EFFECTS

Potential For Land Use Change

To further evaluate the potential for indirect and cumulative impacts, an analysis of a set of quantitative factors was completed. This analysis helped determine the potential for land use change as a result of the project. Table 4 below indicates the results of this rating analysis.

Table 4. Potential For Land Use Change, 2000-2020

Rating	Change in Accessibility	Change in Property Values	Forecasted Growth	Land Supply vs. Land Demand	Water/ Sewer Availability	Market For Development	Public Policy
Strong	> 10 min. travel time savings	> 50% increase in property values	> 3% annual pop. growth	< 10-year supply of land	Existing service available	Development activity abundant	Less stringent; no growth management
^							
"							
"				X			
"	X	X	X		X	X	X
"							
Weak	< 2 min. travel time savings	No property value increase	0-1% annual pop. Growth	> 20-year supply of land	No service available now or in future	Development activity lacking	More stringent; growth management

Because of the short distance of the widening project and constant free-flowing traffic, travel time savings should be low to moderate for the six-mile long widening project. Traffic volumes can be high during peak hours (7,020 vpd in 1999 as cited in the EA). Even though access will become somewhat limited as a result of TIP R-2514A, US 17 traffic, which currently is relatively free-flowing at the existing speed limit of 45-55 miles per hour (mph), should not become more congested. In addition, although no traffic signals are proposed as part of the project, widening the road from two to four lanes with a proposed speed limit of 60 mph should provide no more than 2-3 minutes of

travel time savings from the beginning to the end of the project, particularly since it currently only takes about 8 minutes to travel the length of the project based on field observations.

Property values are unlikely to increase along the project length because most of the land is included within the Hofmann State Forest where very limited development is permitted to take place. However, land surrounding the existing intersections and/or termini of the project (outside of the Hofmann State Forest boundaries) should become slightly more valuable with access to a four-lane rather than a two-lane rural highway.

With population growth of about 17% between 1990 and 2000, it is unlikely that future growth would approach the 3% annual growth level. Furthermore, there is an existing water line along US 17 in the project area, but no sewer service currently exists or is expected in the near future. As such, development activity is basically non-existent. With limited available land supply as a result of the presence of Hofmann State Forest, developable sites are numbered. However, other than the development restrictions imposed by the Hofmann State Forest, local public policy promotes the growth and development of the region, although the TIP R-2514A portion of US 17 is in an area that is not proposed for high intensity land uses.

IX. EVALUATE ANALYSIS RESULTS

Consideration of Indirect Effects

Induced growth related to TIP R-2514A should be minimal. It is located in a rural portion of a predominantly rural county. Historically, very little development activity has taken place surrounding the project, and based on the designated land uses and zoning, the future development potential of this area is negligible. Furthermore, the Hofmann State Forest dominates the landscape along the project area, limiting the amount of available land upon which to develop. If induced growth occurs, it is likely to be limited to the areas surrounding the Kellum Loop Road/Halltown Road and the two Deppe Loop Road (including Deppe Loop Road/Springhill Road) intersections.

The project itself is a widening of a two-lane rural roadway, which is not going to create new access to property within the PGIA. In fact, it will convert the uncontrolled access that currently exists to partial control of access, due to the construction of the grass median (which restricts non-median break turning movements to right in and right out only) and the stipulation that each land parcel along the project length will only be permitted to have one point of vehicular access.

Overall, potential indirect impacts should be limited to additional storm water runoff created by the increase in pavement, as well as the minimal induced development that could occur (particularly along intersecting roadways at the beginning and end of the project). Environmentally, there are some issues related to the presence of wetlands, a 303(d) impaired creek, and floodplains that intersect the project. However, according to the 1999 Environmental Assessment, these issues can be resolved with Best Management

Practices (BMPs) during the construction period of the project and during the development process of any induced growth that may result.

Consideration of Cumulative Effects

Cumulatively, TIP R-2514A, when linked with related TIP projects along US 17 to the north and south, has the potential to create more economic development opportunities and subsequent population growth for the coastal region of North Carolina. Sections B-D of TIP R-2514 will widen and partially relocate US 17 almost to New Bern. This project as a whole should create a more efficient link between the economic centers of Jacksonville and New Bern, making land along the US 17 corridor more attractive for businesses and residential communities.

CONTRACT: C200819

TIP: R-2514A

6/24/99

GRAPHIC SCALE

PLANS

5 0 10

PROFILE (HORIZONTAL)

5 0 10

PROFILE (VERTICAL)

1 0 2

The graphic scale consists of three horizontal bars. The top bar is labeled 'PLANS' and has a scale from 0 to 10. The middle bar is labeled 'PROFILE (HORIZONTAL)' and also has a scale from 0 to 10. The bottom bar is labeled 'PROFILE (VERTICAL)' and has a scale from 0 to 2. Each bar has a checkered pattern at the right end.

DESIGN DATA

ADT 2005 =	20,080
ADT 2025 =	29,600
DHV =	10 %
D =	60 %
T =	13 % *
V =	100 km/h

(TTST 6% + DUAL 7%)

LENGTH ROADWAY TIP PROJECT R-2514A	=	9.885	km
LENGTH STRUCTURE TIP PROJECT R-2514A	=	0.042	km
TOTAL LENGTH TIP PROJECT R-2514A	=	9.927	km

PROJECT LENGTH

LETTING DATE:

April, 18 2002

RIGHT OF WAY DATE:

2002 STANDARD SPECIFICATIONS

Prepared in the Office of:
TAYLOR, WISEMAN, & TAYLOR
3500 REGENCY PARKWAY, SUITE H
DALLAS, TEXAS 75218

JAMES H. JATKO, P.E.
PROJECT ENGINEER

KENNETH W. DUNN, P.E.
DESIGN ENGINEER

ROADWAY DESIGN
 ANSWER

HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

STATE DESIGN ENGINEER

APPROVED _____
DIVISION ADMINISTRATOR _____
DATE _____

[illegible]

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

LOCATION: US 17 NORTH OF JACKSONVILLE FROM SR 1327 / SR 1410 TO SR 1330 / SR 1439 SOUTH	TYPE OF WORK: WIDENING, GRADING, DRAINAGE, PAVING CULVERTS, STRUCTURES AND SIGNING

ALNNOO MOTSNO

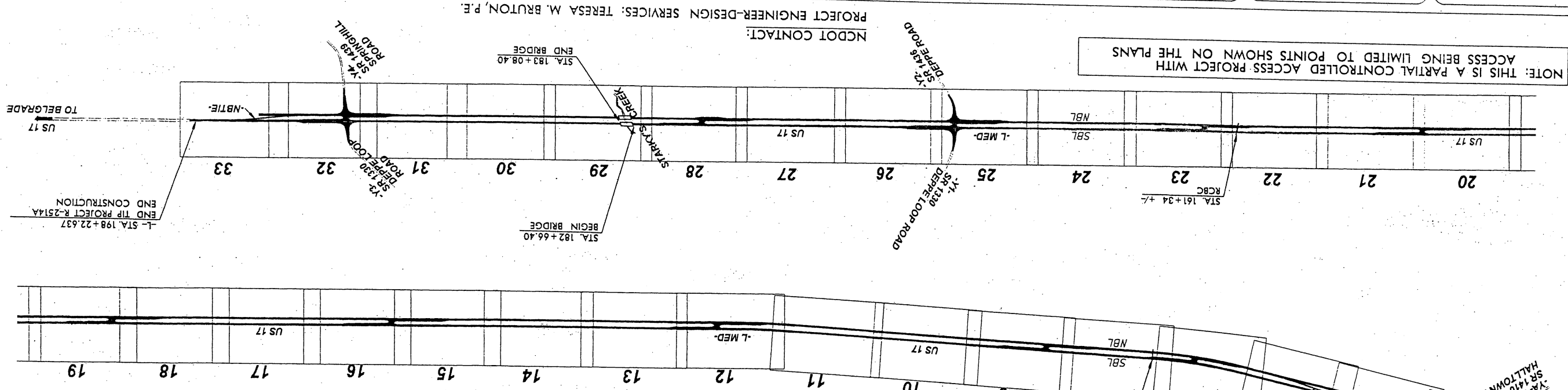
DIVISION OF HIGHWAYS

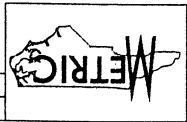
STATE OF NORTH CAROLINA

ALL DIMENSIONS IN THESE
PLANS ARE IN METERS
UNLESS OTHERWISE SHOWN

STATE	N.C.	R-2514A		SHEET NO.	1
STATE PROJECT REFERENCE NO.		TOTAL SHEETS			
STATE PROJ. NO.	F. A. PROJ. NO.				
34442.17	NHF-17(7)				
34442.22	NHF-17(7)				
34426.33	NHF-17(7)				
		CONST.			
		RW & UTIL			
		PE			
		DESCRIPTION			

1708/1
received





CONVENTIONAL SYMBOLS

*S.U.E = SUBSURFACE UTILITY ENGINEER

ROADS & RELATED ITEMS

Edge of Pavement	
Curb	
Prop. Slope Stakes Cut	
Prop. Slope Stakes Fill	
Prop. Woven Wire Fence	
Prop. Chain Link Fence	
Prop. Barbed Wire Fence	
Prop. Wheelchair Ramp	
Exist. Guardrail	
Prop. Guardrail	
Equality Symbol	
Pavement Removal	
Baseline Control Point	
Existing Right of Way Marker	
Exist. Right of Way Line w/Marker	
Prop. Right of Way Line with Proposed RW marker (Iron Pin & Cap)	
Prop. Right of Way Line with Proposed (Concrete or Granite) R/W Marker	
Exist. Control of Access Line	
Prop. Control of Access Line	
Exist. Easement Line	
Prop. Temp. Construction Easement Line	
Prop. Temp. Drainage Easement Line	
Prop. Perm. Drainage Easement Line	

HYDROLOGY

Stream or Body of Water	
Flow Arrow	
Disappearing Stream	
Spring	
Swamp Marsh	
Shoreline	
Falls, Rapids	
Prop Lateral, Tail, Head Ditches	

STRUCTURES

MAJOR	
Bridge, Tunnel, or Box Culvert	
Bridge Wing Wall, Head Wall and End Wall	

UTILITIES

UTILITIES	
MINOR	Head & End Wall
	Pipe Culvert
	Footbridge
	Drainage Boxes
	Paved Ditch Gutter
	Exist. Pole
	Exist. Power Pole
	Prop. Power Pole
	Exist. Telephone Pole
	Prop. Telephone Pole
	Exist. Joint Use Pole
	Prop. Joint Use Pole
	Telephone Pedestal
	Cable TV Pedestal
	Hydrant
	Satellite Dish
	Exist. Water Valve
	Sewer Clean Out
	Power Manhole
	Telephone Booth
	Water Manhole
	Light Pole
	H-Frame Pole
	Power Line Tower
	Pole with Base
	Gas Valve
	Gas Meter
	Telephone Manhole
	Power Transformer
	Sanitary Sewer Manhole
	Storm Sewer Manhole
	Tank, Water, Gas, Oil
	Water Tank With Legs
	Traffic Signal Junction Box
	Fiber Optic Splice Box
	Television or Radio Tower
	Utility Power Line Connects to Traffic Signal Lines Cut Into the Pavement

BOUNDARIES & PROPERTIES

Recorded Water Line
Designated Water Line (S.U.E.*)
Sanitary Sewer
Recorded Sanitary Sewer Force Main
Designated Sanitary Sewer Main (S.U.E.*)
Recorded Gas Line
Designated Gas Line (S.U.E.*)
Storm Sewer
Recorded Power Line
Designated Power Line (S.U.E.*)
Recorded Telephone Cable
Designated Telephone Cable (S.U.E.*)
Recorded UG Telephone Conduit
Designated UG Telephone Conduit (S.U.E.*)
Unknown Utility (S.U.E.*)
Recorded Television Cable
Designated Television Cable (S.U.E.*)
Recorded Fiber Optics Cable
Designated Fiber Optics Cable (S.U.E.*)
Exist. Water Meter
UG Test Hole (S.U.E.*)
Abandoned According to UG Record
End of Information

State Line
County Line
Township Line
City Line
Reservation Line
Property Line
Property Line Symbol
Exist. Iron Pin
Property Corner
Property Monument
Property Number
Parcel Number
Fence Line
Existing Wetland Boundaries
Proposed Wetland Boundaries
Existing Endangered Animal Boundaries

BOUNDARIES & PROPERTIES

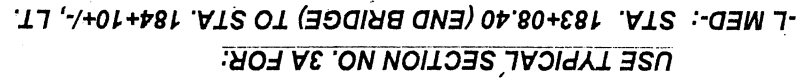
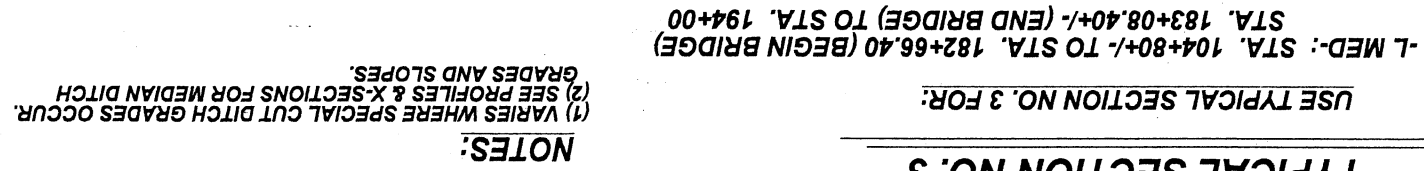
W
-W-
SS
-SS-
FSS
-FSS-
FSS
-FSS-
Recorded Gas Line
Designated Gas Line (S.U.E.*)
C
-C-
C
-C-
Storm Sewer
S
-S-
P
-P-
P
-P-
Designated Power Line (S.U.E.*)
Recorded Telephone Cable
T
-T-
T
-T-
Designated Telephone Cable (S.U.E.*)
Recorded UG Telephone Conduit
TC
-TC-
TC
-TC-
Designated UG Telephone Conduit (S.U.E.*)
Unknown Utility (S.U.E.*)
2UTL
-2UTL-
TV
-TV-
TV
-TV-
Designated Television Cable (S.U.E.*)
Recorded Fiber Optics Cable
FO
-FO-
FO
-FO-
Designated Fiber Optics Cable (S.U.E.*)
Exist. Water Meter
UG Test Hole (S.U.E.*)
X
-X-
ATUR
-ATUR-
End of Information

VEGETATION

Buildings	
Foundations	
Area Outline	
Gate	
Gas Pump Vent or UG Tank Cap	
Church	
School	
Park	
Cemetery	
Dam	
Sign	
Well	
Small Mine	
Swimming Pool	
TOPOGRAPHY	
Loose Surface	
Hard Surface	
Change in Road Surface	
Curb	
Right of Way Symbol	
Guard Post	
Paved Walk	
Bridge	
Box Culvert or Tunnel	
Ferry	
Culvert	
Footbridge	
Trail, Footpath	
Light House	
VEGETATION	
Single Tree	
Single Shrub	
Hedge	
Woods Line	
Orchard	
Vineyard	
RAILROADS	
Standard Gauge	
RR Signal Milepost	
Switch	

RAILROADS

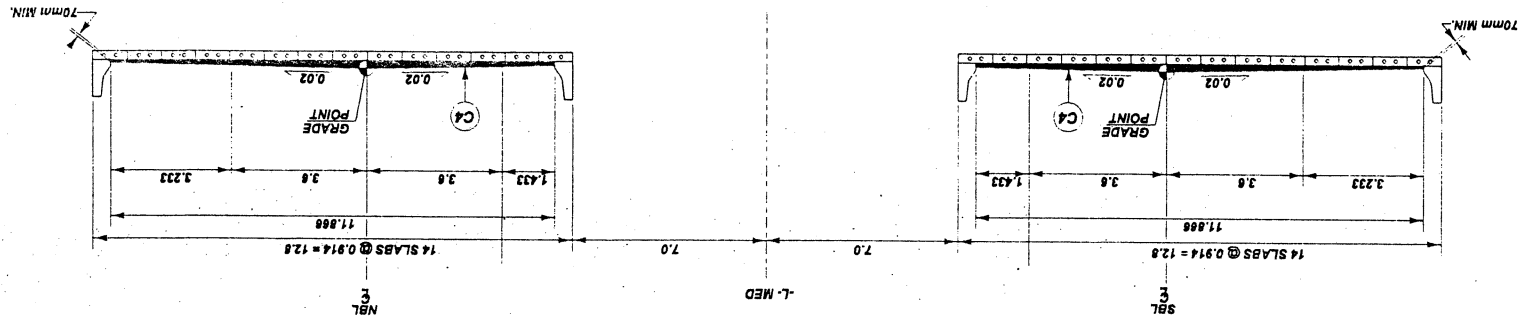
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C:\70154\H001\F-2514A\Food=msg\R-2514A-RDY_TYP.dgn
williams AT WILLIAMS



TAYLOR • WISEMAN & TAYLOR
ENGINEERS • SURVEYORS • PLANNERS
P. O. BOX 100, SUBSURFACE UTILITY ENGINEERING
3500 RESIDENCY PARKWAY, SUITE H, CARY, N. C. 27511
TELEPHONE NO. (919) 297-0085 FAX NO. (919) 297-0090

USE TYPICAL SECTION NO. 3C FOR:
-L MED-: STA. 182+66.40± (BEGIN BRIDGE) TO STA. 183+08.40± (END BRIDGE)

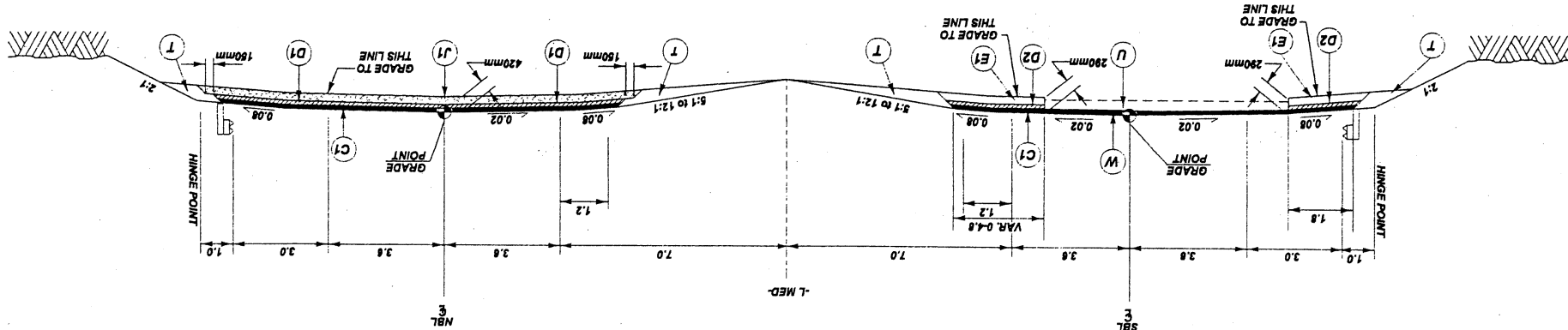
TYPICAL SECTION NO. 3C



-L MED-: STA. 111+26+/- TO STA. 112+14+/- RT.
STA. 112+02+/- TO STA. 112+90+/- LT.
STA. 160+48+/- TO STA. 116+39+/- RT.
STA. 161+32+/- TO STA. 162+39+/- LT.
STA. 181+93+/- TO STA. 183+65+/- RT.
STA. 182+18+/- TO STA. 183+80+/- LT.

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 3 AND NO. 3A AT GUIDE RAIL LOCATIONS:

TYPICAL SECTION NO. 3B



PAVEMENT SCHEDULE	
C1	70mm TYPE S9.5C
C2	60mm TYPE S9.5A
C3	60mm TYPE S9.5C
C4	VAR. DEPTH S9.5C
D1	100mm 119.0C
D2	80mm 119.0C
D3	70 mm 119.0C
D4	55 mm 119.0C
D5	VAR. DEPTH 119.0C
E1	140 mm B25.0C
E2	100 mm B25.0B
E3	VAR. DEPTH B25.0C
E4	VAR. DEPTH B25.0B
J1	250mm AGG. BASE COURSE
J2	200mm AGG. BASE COURSE
J3	150mm AGG. BASE COURSE
R1	125mm MONO. CONC. ISLAND.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	55mm MILLING
W	VAR. DEPTH BITUMINOUS

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TELEPHONE NO. (919)297-0085 FAX NO. (919)297-0080

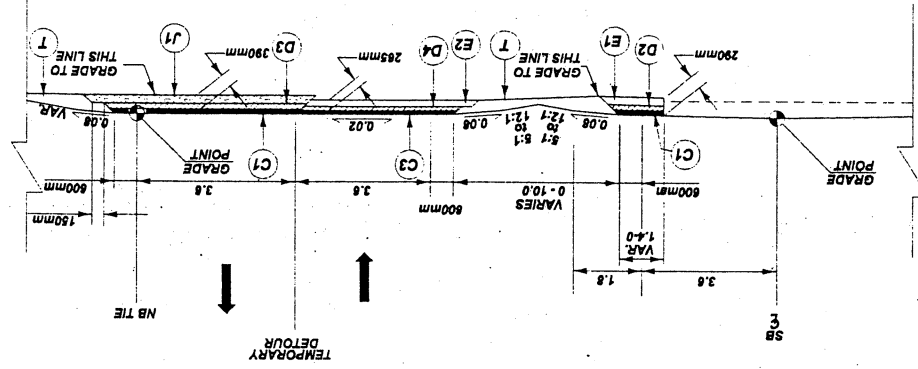


PROJECT REFERENCE NO. R-2514A
SHEET NO. 2B

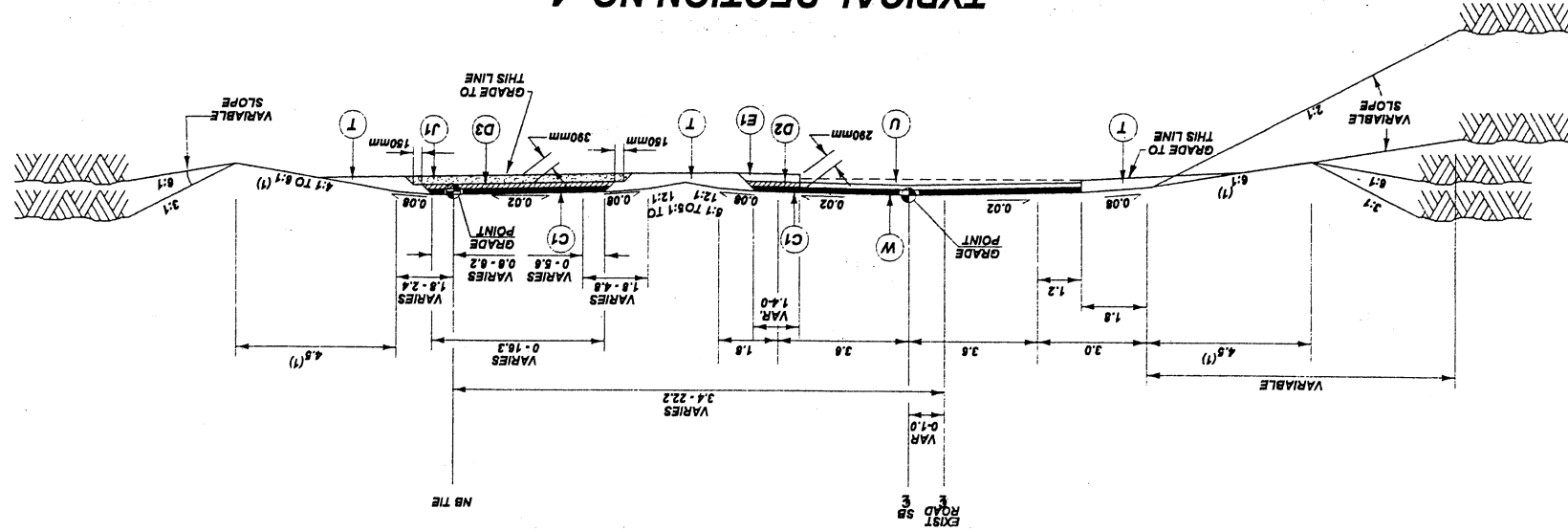
ROADWAY DESIGN
PAVEMENT DESIGN
ENGINEER
R/W SHEET NO. 2B

SEAL
023385
JAMES H. JAYNO
NORTH CAROLINA
REGISTERED PROFESSIONAL ENGINEER

TEMPORARY WIDENING DETAIL
USE IN CONJUNCTION WITH TYPICAL SECTION NO. 4 FOR:
NB TIE: STA. 194+00 TO STA. 196+40



TYPICAL SECTION NO. 4
USE TYPICAL SECTION NO. 4 FOR:
NB TIE: STA. 194+00.000 TO STA. 198+22.637



NOTES:

(1) VARIES WHERE SPECIAL CUT DITCH GRADES OCCUR.

PAVEMENT SCHEDULE	
C1	70mm TYPE S9.5C
C2	60mm TYPE S9.5A
C3	60mm TYPE S9.5C
C4	VAR. DEPTH S9.5C
D1	100mm 119.0C
D2	80mm 119.0C
D3	70 mm 119.0C
D4	55 mm 119.0C
D5	VAR. DEPTH 119.0C
E1	140 mm B25.0C
E2	100 mm B25.0B
E3	VAR. DEPTH B25.0C
E4	VAR. DEPTH B25.0B
J1	250mm AGG. BASE COURSE
J2	200mm AGG. BASE COURSE
J3	150mm AGG. BASE COURSE
R1	125mm MONO. CONC. ISLAND.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	55mm MILLING
W	VAR. DEPTH BITUMINOUS

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O.P.S. • SUBSURFACE UTILITY ENGINEERING
3500 REGENCY PARKWAY, SUITE H, CARY, N.C. 27511
TELEPHONE NO. (919)297-0085 FAX NO. (919)297-0090



PROJECT REFERENCE NO. R-2514A
SHEET NO. 2C
ROADWAY DESIGN
PAVEMENT DESIGN
ENGINEER

Figure 1 is a cross-sectional diagram of the test specimen. It shows a central dark area representing the soil stabilization fabric, which is 600mm wide. Above this fabric is a layer of soil, 900mm thick, labeled 'UNDERCUT'. The top surface of the soil is labeled 'EXISTING GROUND'. The bottom surface of the fabric is labeled 'GRADE POINT'. The total length of the specimen is 7.0m. The diagram also shows a 600mm dimension for the width of the fabric and a 1.2m dimension for the width of the undercut. The diagram is labeled 'L-MED' and 'NBL'.

-L.M.D.: STA. 111+90 TO STA. 112+20, RT.
STA. 181+60 TO STA. 182+75, RT.
STA. 183+05 TO STA. 184+00, RT.

[illegible]

**SEE PROFILES & X-SECTIONS FOR
MEDIAN DITCH GRADES AND SLOPES.**

-Y4: STA. 0+14.255 - STA. 1+05.000
-Y3: STA. 0+14.283 - STA. 0+90.000
-Y2: STA. 0+14.203 - STA. 1+10.000
-Y1: STA. 0+14.201 - STA. 0+90.000
-YB: STA. 0+21.473 - STA. 1+00.000
-YAREV: STA. 0+21.326 - STA. 1+30.000

USE TYPICAL SECTION NO. 5 FOR:

(1) VARIES WHERE SPECIAL DITCH GRADES OCCUR.

PAVEMENT SCHEDULE	
C1	70mm TYPE S9.5C
C2	60mm TYPE S9.5A
C3	60mm TYPE S9.5C
C4	VAR. DEPTH S9.5C
D1	100mm 119.0C
D2	80mm 119.0C
D3	70 mm 119.0C
D4	55 mm 119.0C
D5	VAR. DEPTH 119.0C
E1	140 mm B25.0C
E2	100 mm B25.0B
E3	VAR. DEPTH B25.0C
E4	VAR. DEPTH B25.0B
J1	250mm AGG. BASE COURSE
J2	200mm AGG. BASE COURSE
J3	150mm AGG. BASE COURSE
R1	125mm MONO. CONC. ISLAND.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	55mm MILLING
W	VAR. DEPTH BITUMINOUS

-L MED:- STA. 103+20 TO 111+90 RT
STA. 112+40 TO 181+20 RT
STA. 190+20 TO 194+30 RT



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PROJECT REFERENCE NO.	R-2514A	R / W SHEET NO.	PAVEMENT DESIGN	ROADWAY DESIGN
SHEET NO.	2D		ENGINEER	ENGINEER

DETAIL N°

L.L. +/- 112+071

FILL SCOUR HOLE

2m

FILTER FABRIC

1

15m

0.45 KEY

SIDE SLOPE TO EXISTING

TOP OF BANK

TIE IN PROPOSED

15m

3.0 MIN.

0.08

TRANSITION FROM EXISTING TO 2.1m AT INLET

VARIES FROM 2.0m - 1.1m

1.8m

3

DOE = 680m

3.0 MIN.

0.08

TRANSITION FROM EXISTING TO 2.1m AT INLET

VARIES FROM 2.0m - 1.1m

1.8m

3

DOE = 680m

Technical drawing of a diamond-shaped structure, likely a cross-section of a pipe or tunnel. The drawing includes the following labels and dimensions:

- Labels:**
 - TRANSITION T
 - 3:1 SLOES 9.0
 - TAPER FROM EXIST
 - DE = +/- 1m
 - 0.5m
- Dimensions:**
 - 0.5m (vertical dimension on the right side)
 - DE = +/- 1m (horizontal dimension at the bottom)

DETAIL 7.

TRANSITION FROM EXISTING

TO 2.1m AT INLET

1.0m

3m

4.5m

DDE = 80m

Technical drawing of a detail 'P' showing a transition from a 3:1 slope to a 4:1 outlet. The drawing includes labels for 'DOE = +/- .15m', 'TRANSITION FROM 3:1 SLOPES', '0.45M THK FILTER FABRIC', 'TAPER TO EXISTING FROM 4:1 OUTLET', and '0.45M (KENT) (TP)'.

DETAIL M.

EXISTING 1.5M AT INLET

TRANSITION FROM

0.8m

KEY

4+1.7m

90°

3.0 MIN.

BEGN

0.3M THK

FILTER FABRIC

C

DETAIL "Q"

PREFORMED SCOUR HOLE APRON

(Not to Scale)

PLAN VIEW

Install level and flush with natural ground

Permanent Soil Reinforcement (PSRM)

Square performed (PSH) (Rip in fabric not shown)

Pipe or Ditch

Seeds with native grasses at installation.

W (1.5m min.)

SECTION A-A

Fill Slope

Pipe or Ditch Outer

PSRM

d (0.3m min.)

tuck

0.3m

300 mm thick with Filter Fabric

D	0.15M
W	1.2M
D	0.3M
B	SEE PLAN

DETAIL 'J'
DRAINAGE DITCH CLEANOUT DETAIL

(Not to Scale)

Base Width
 Varies

3:1

3:1

Natural Ground

Natural Ground

Existing Slopes

Existing Slopes Vary

Lower Ditch Bottom
 At 0.0% Grade
 To Provide Tailditch
 See Plan For Limits.

-L-: 103+25L TO 103+85L, BASE=1.2m
 148+26L, BASE=0.6m
 176+73L, BASE=0.6m

-L-: 132+60R
132+60L
163+97L
177+45L
179+27L

-L-: 123+20R

DETAIL "I"
EARTH DAM DETAIL

173+60L
179+57L :-L-

DITCH DETAIL 'H'
LATERAL BASE DITCH
(Not to scale)

-L-: 100+46R
105+90L
114+77L
125+68L
136+06L
140+60L
-L-: 140+60R
144+40L
144+40R
174+60L
176+73L

-L-: 99+80R TO 100+0

DITCH DETAIL 'B'
SPECIAL 0.6m BASE LATERAL DITCH
 (Not to Scale)

Diagram illustrating a ditch detail with the following dimensions and labels:

- 0.6m**: Vertical dimension of the ditch base.
- 0.1m**: Vertical dimension of the ditch base.
- 3:1**: Slope ratio of the ditch.
- 4.5m**: Horizontal dimension of the ditch base.
- 4.5m**: Horizontal dimension of the ditch base.
- 4:1**: Slope ratio of the ditch.
- SHOULDER POINT**: Label for the shoulder point.
- EXIST DITCH POINT**: Label for the existing ditch point.
- VARIES**: Label indicating variable dimensions.
- VARIES**: Label indicating variable dimensions.
- VARIES**: Label indicating variable dimensions.
- VARIES**: Label indicating variable dimensions.
- SEE PROFILE**: Label indicating the profile view.

DITCH DETAIL 'A'
SPECIAL CUT DITCH

Diagram illustrating a ditch cross-section. The ditch has a 3:1 slope and a minimum depth of 0.3m. The minimum length of the ditch is 1.8m. The ditch is shown on natural ground. Labels include: "Natural Ground", "Front Slope", "Ditch Slope", "Flatter", "SEE PROFILE", "MINIMUM LENGTH 1.8m", and "0.3m MIN.".

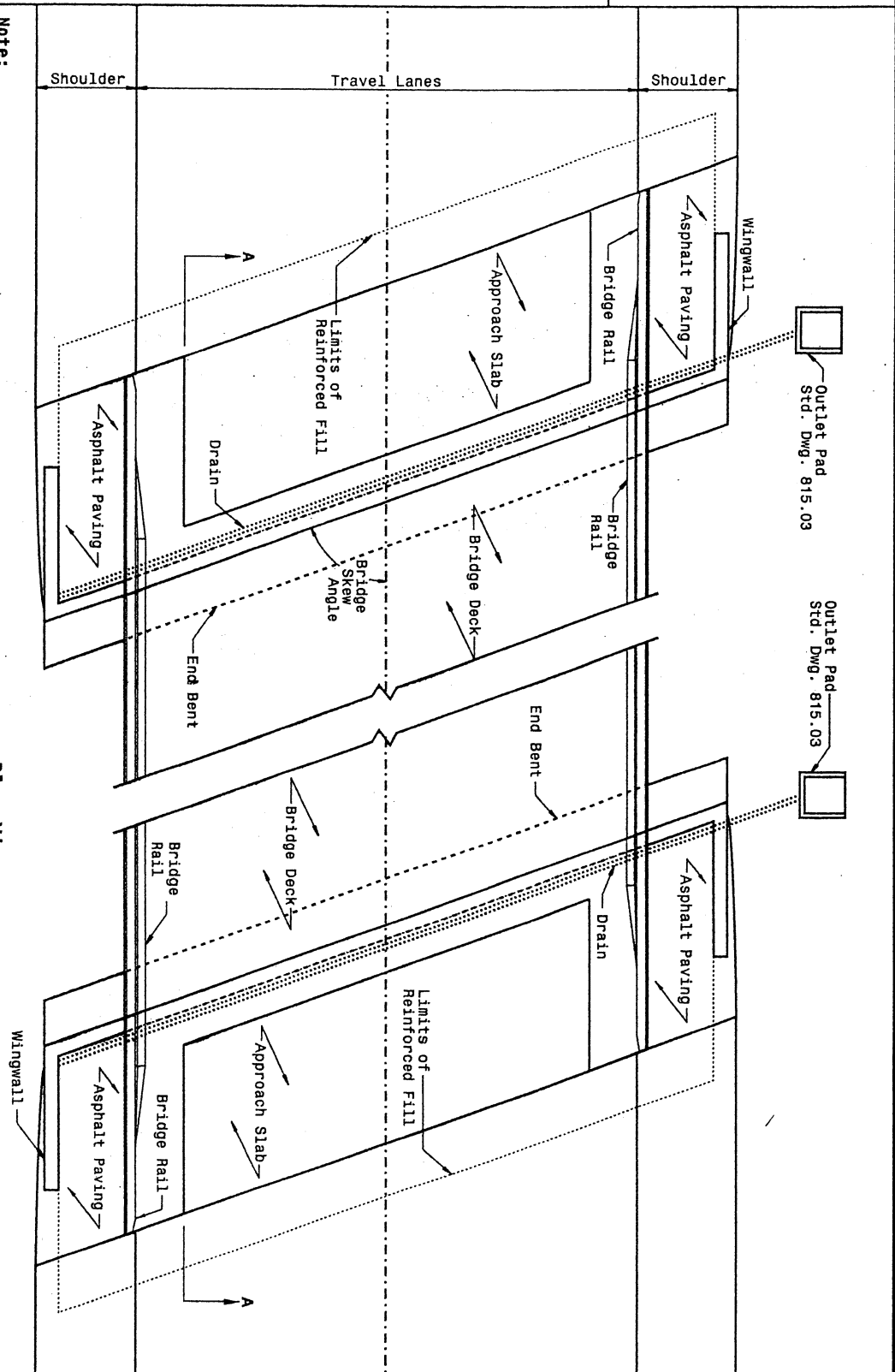
DITCH DETAIL 'C'
0.6m BASE HEAD / TAIL DITCH

DITCH DETAIL 'D'
1.2m BASE TAIL DITCH
(Not to Scale)

DITCH DETAIL 'E'
0.9m BASE HEAD / TAIL DITCH
(Not to Scale)

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**METRIC DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS**



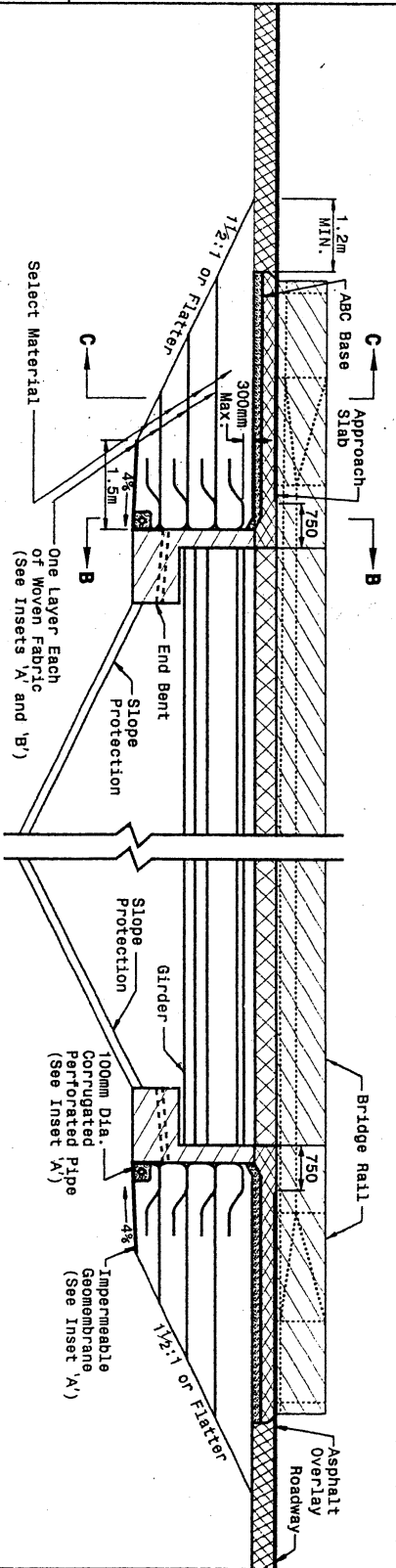
SHEET 1 OF 4
422D10

Note: This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.

Plan View

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METRIC DETAIL DRAWING FOR
REINFORCED BRIDGE APPROACH FILLS
PRESTRESSED AND PLATE GIRDER BRIDGES



SECTION A-A

SECTION R-R

SECTION B-E

Diagram illustrating the cross-section of a bridge deck structure, showing the following layers from top to bottom:

- Bridge Rail
- Approach Slab With Asphalt Overlay
- ABC Base
- Select Material
- One Layer Each of Woven Fabric or Moven Fabric (See Insets A and B')
- Limits of Select Material

SECTION C-C

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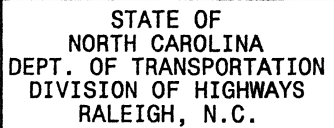
SHEET 2 OF 4
422D10

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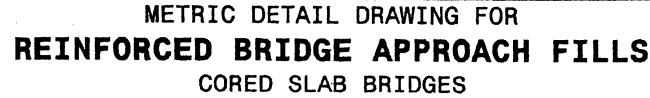
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PROJECT REFERENCE NO.	R-2514A
SHEET NO.	25





S



SHEET 3 OF 4
422D10



SHEET 4 OF 4
422D10

DETAIL DRAWING EDGE APPROX. TS AND CHARTS

C DE
BR
NSET

MORE

INFO

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SHEET 4 OF 5

SHEET 4 OF 4
422D10

SHEET 4 OF 4
422D10

7

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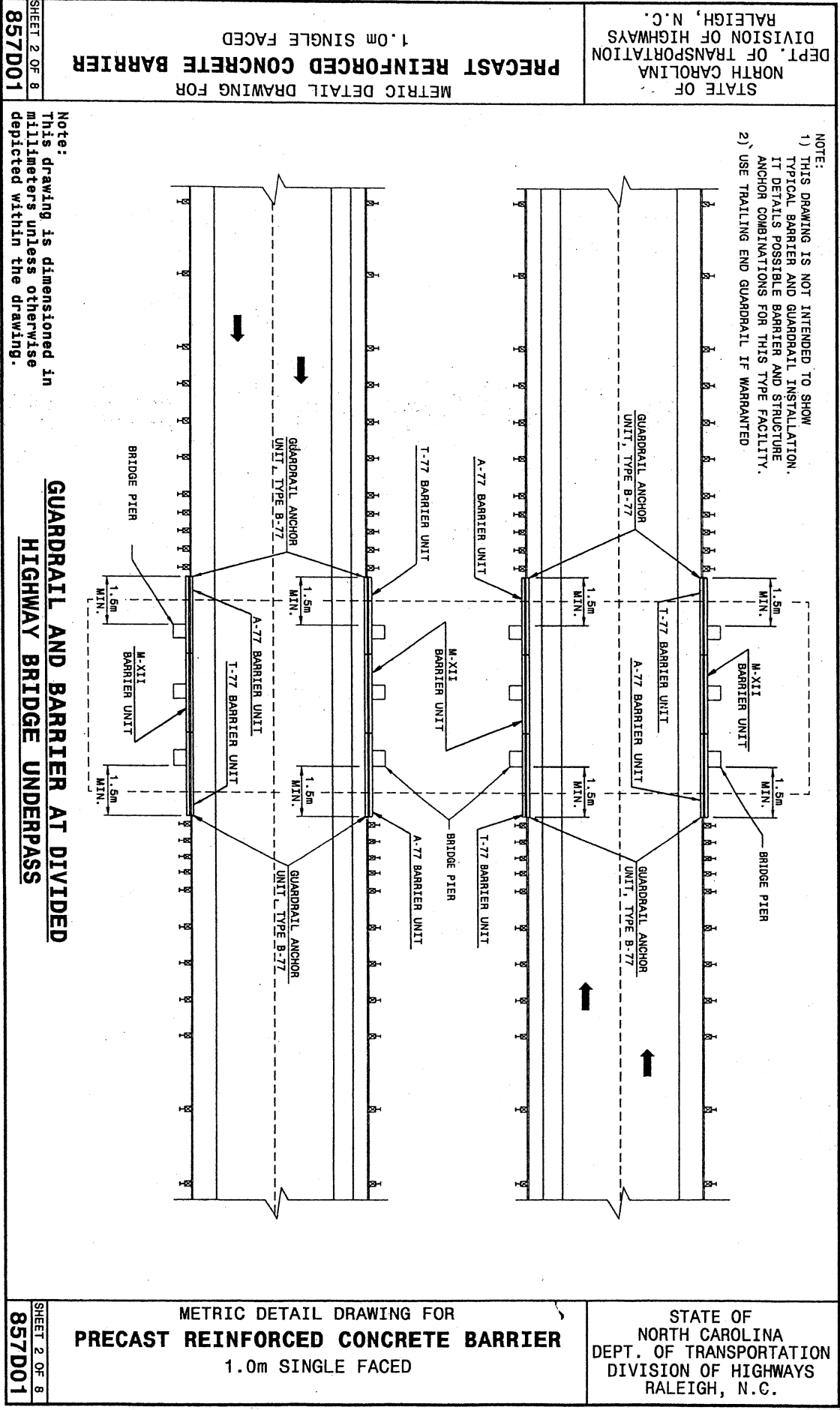
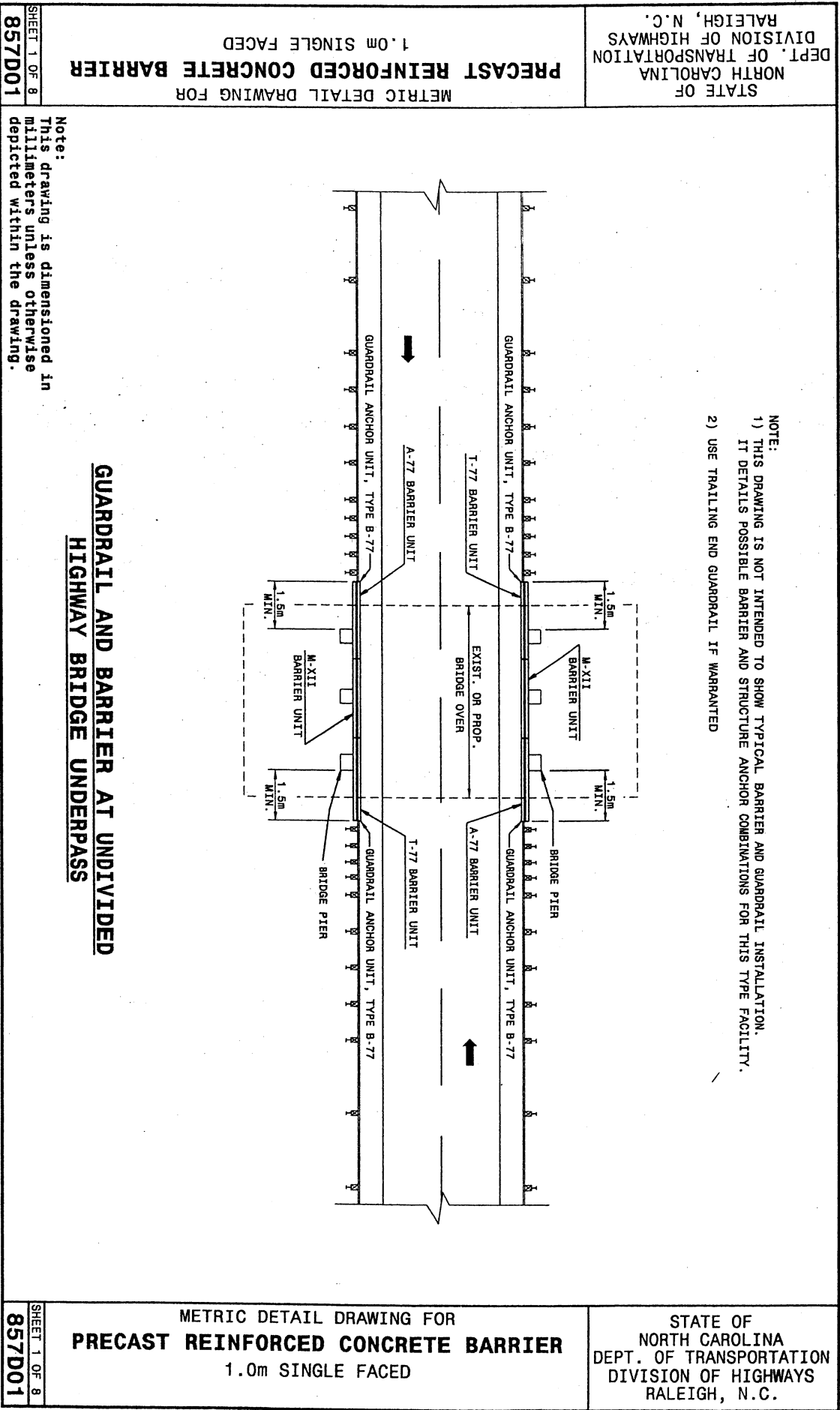
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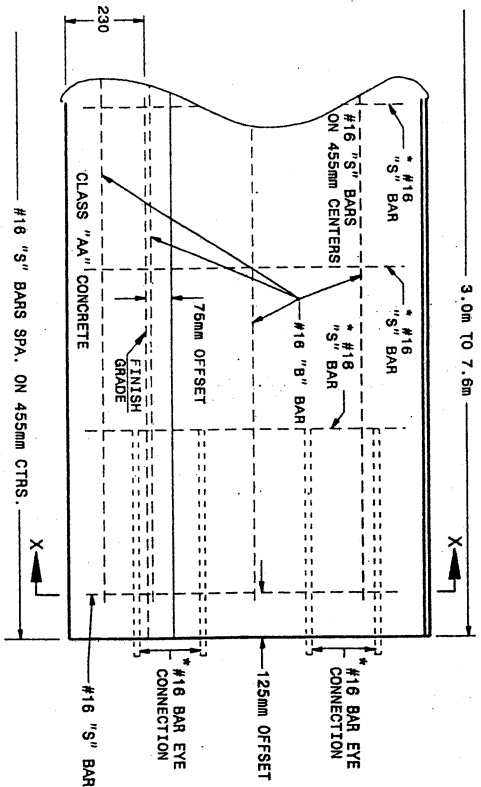
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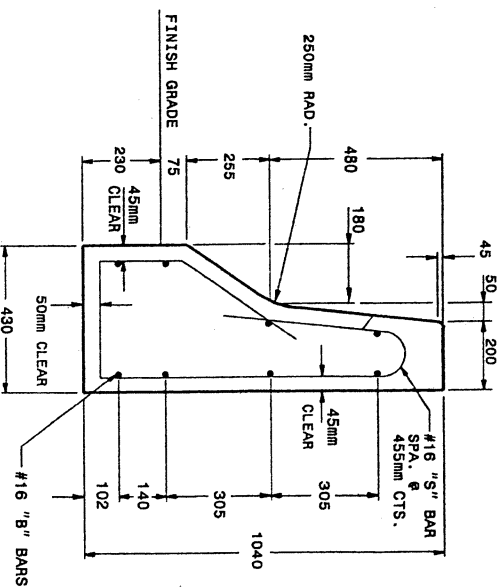


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*SEE SHEET 4
FOR DIMENSIONS

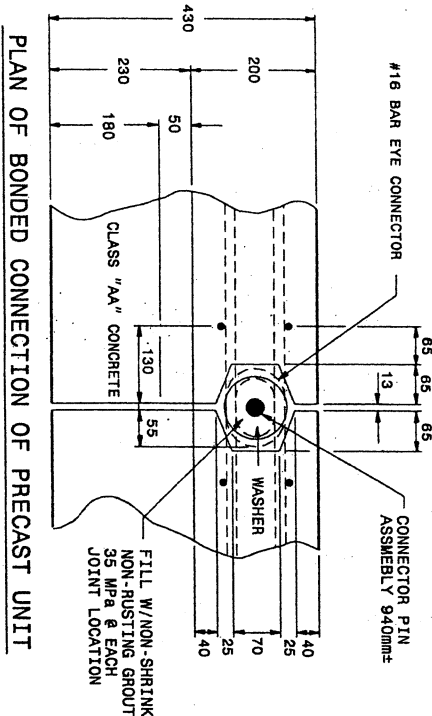
DETAIL X-X
CROSS SECTIONAL VIEW



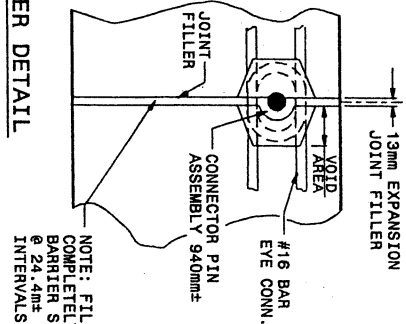
METRIC DETAIL DRAWING FOR
PRECAST REINFORCED
CONCRETE BARRIER
1.0m SINGLE FACED

SHEET 5 OF 8
857D01

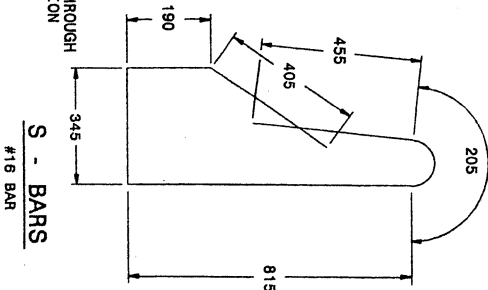
Note:
This drawing is dimensioned in
millimeters unless otherwise
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JOINT FILLER DETAIL



NOTE: FILL
COMPLETELY THROUGH
BARRIER SECTION
AT 24.4mm
INTERVALS



METRIC DETAIL DRAWING FOR
PRECAST REINFORCED
CONCRETE BARRIER
1.0m SINGLE FACED

SHEET 5 OF 8
857D01

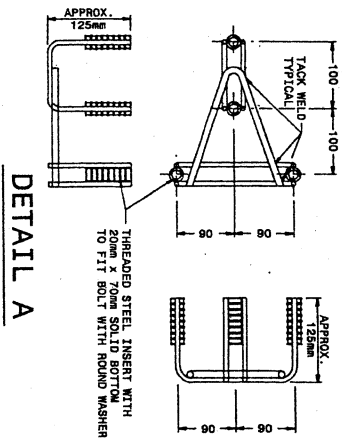
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METRIC DETAIL DRAWING FOR
PRECAST REINFORCED
CONCRETE BARRIER
1.0m SINGLE FACED

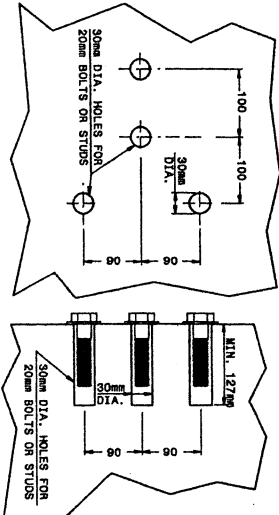
SHEET 6 OF 8
857D01

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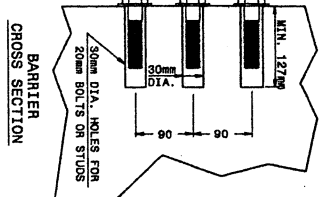
4 BOLT INSERT ASSEMBLY



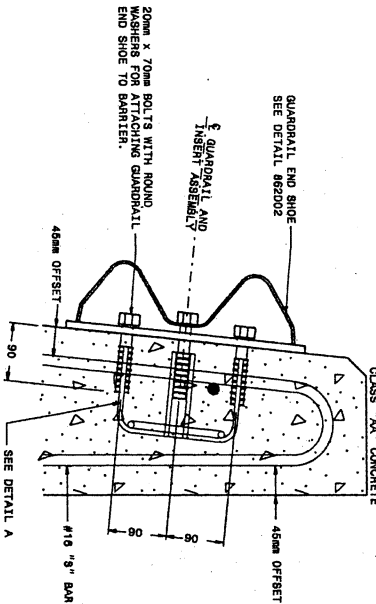
DETAIL A



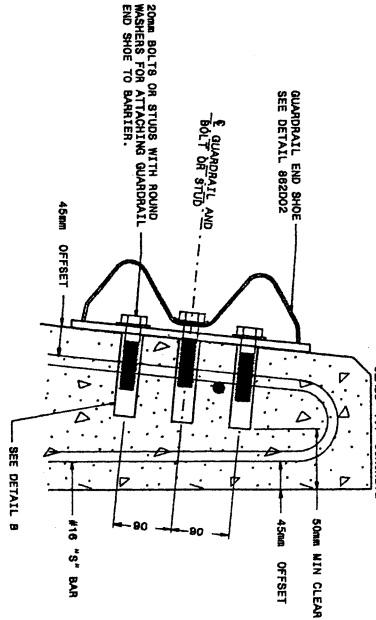
DETAIL B



PART SECTION
OF BARRIER
THRU END SHOE SECTION AND
4 BOLT INSERT ASSEMBLY



PART SECTION
OF BARRIER
THRU END SHOE SECTION AND
CHEMICALLY BOUND BOLTS OR STUDS



METRIC DETAIL DRAWING FOR
PRECAST REINFORCED
CONCRETE BARRIER
1.0m SINGLE FACED

SHEET 6 OF 8
857D01

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ORIGINAL BY: 2002 STD. 857.01 DATE:
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CHECKED BY: E.E. WARD
FILE SPEC.: \\s01\p003\642\2002\standards\02\stds to Special Details\metric\85701\857d01m.dgn

Technical drawing of a mechanical part showing front and top views.

Front View: A trapezoid with a top width of 57, a bottom width of 140, and a height of 114.

Top View: A rectangle with overall dimensions of 89 by 114. It features a 6mm diameter hole. Internal dimensions include 57 (width from the left edge to the hole) and 44 (width from the hole to the right edge).

RUBRAIL BLOCKS 17mm HIGH x 102mm WIDE	POST	1	108	229
	THICKNESS	2	83	127*
		3	51	152
		4	25	76*
* BOLTS FOR POSTS 2 AND 4 ARE USED TO ATTACH BLOCK TO POST. RUBRAIL NOT ATTACHED TO BLOCK.				

GENERAL NOTES:

1) POSTS 1 THROUGH 5 REQUIRE AN ADDITIONAL HOLE TO ATTACH LOWER BLOCKS AND/OR RUBRAIL.

2) RUBRAIL BLOCKS LOCATED ON POSTS 1 THROUGH 4 ARE OFFSET DRILLED AND SECURED WITH 18mm RUBRAIL HEAD BOLTS (SEE CHART FOR BOLT LENGTHS). SECURE BOLTS ONLY TO POSTS 2 AND 4. SECURE RUBRAIL AND BLOCKS TO POSTS 1 AND 3. RUBRAIL IS SECURED TO POST 5 WITH A 16mm x 114mm RUBRAIL BOLT. RUBRAIL IS PLACED TO BACK OF POST 6 AND NOT SECURED.

3) STEEL SPACER TUBE IS A SCHEDULE 40 GALVANIZED PIPE 127mm INSIDE DIAMETER x 229mm LONG. ATTACH TUBE TO GUARDRAIL ONLY WITH 16mm x 32mm LONG BUTTOMED BOLT AND RECTANGULAR PLATE WASHER.

4) SEE DETAIL D FOR SLOPED RUBRAIL BLOCKOUT. BLOCKOUT IS ATTACHED TO RAIL ELEMENT ONLY. USE 10mm x 76mm LAG BOLT WITH FLAT WASHER. SHOP FABRICATE THE C150x12 RUBRAIL END TO BE CONSISTENT WITH THE SLOPE OF THE JERSEY SHAPE AND ATTACH FLUSH WITH THE SLOPED TOE OF THE BARRIER OR BRIDGE RAIL.

5) ANCHORAGE:

(a) AT EXISTING BRIDGE RAIL AND NEW OR EXISTING BARRIERS, RUBRAIL SHALL BE ANCHORED USING THREE 16mm x 152mm CHEMICALLY ANCHORED BOLTS WITH WASHERS. MAXIMUM PROTECTION FOR BOLTS SHALL BE 13mm.

(b) AT EXISTING BRIDGE RAIL AND NEW OR EXISTING BARRIERS, THE W-BEAM END SHOE SHALL BE ANCHORED USING FIVE 22mm x 305mm CHEMICALLY ANCHORED BOLTS WITH WASHERS. MAXIMUM PROTECTION FOR BOLTS SHALL BE 13mm. THE W-BEAM END SHOE SHALL BE INSTALLED BEHIND REINFORCED CONCRETE.

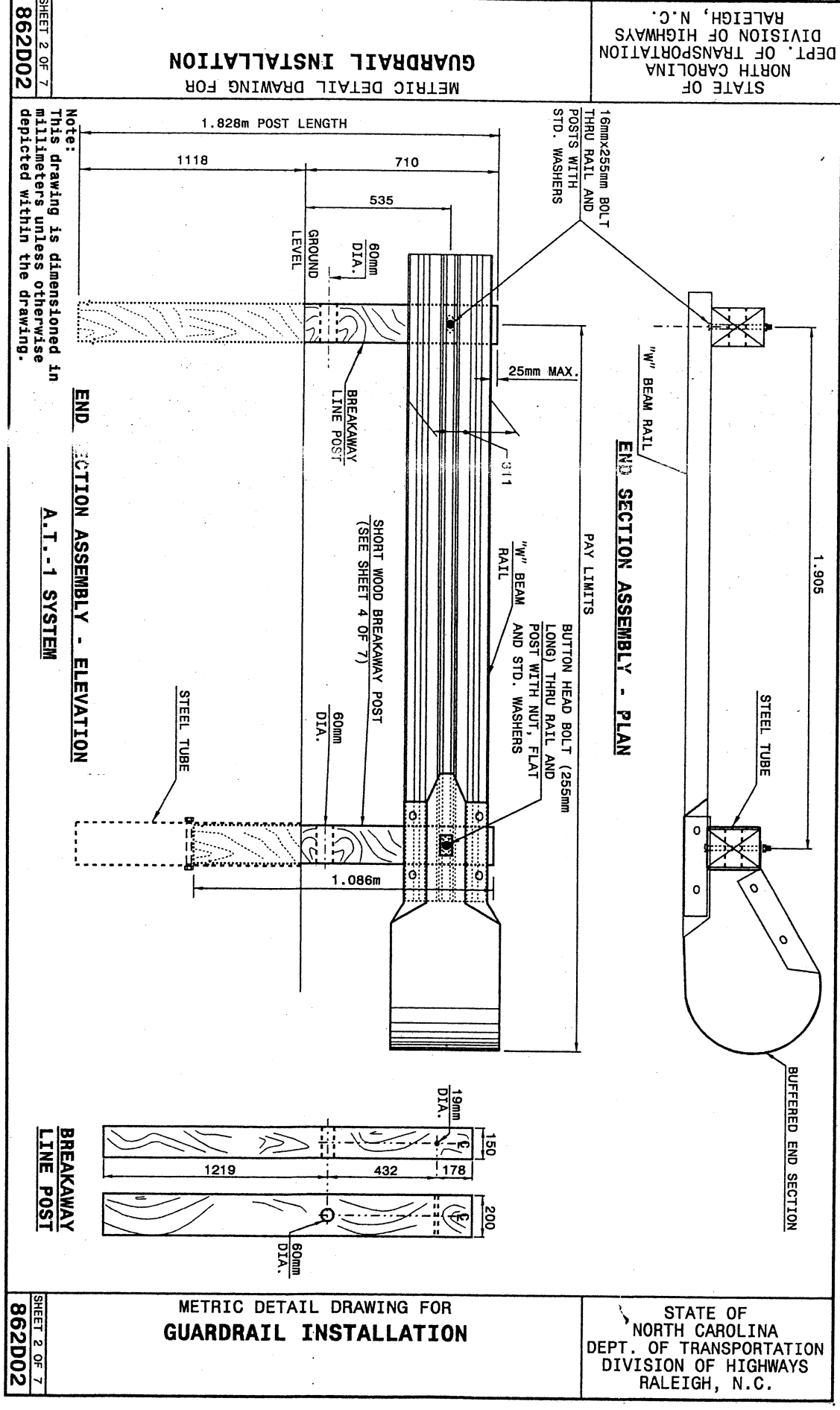
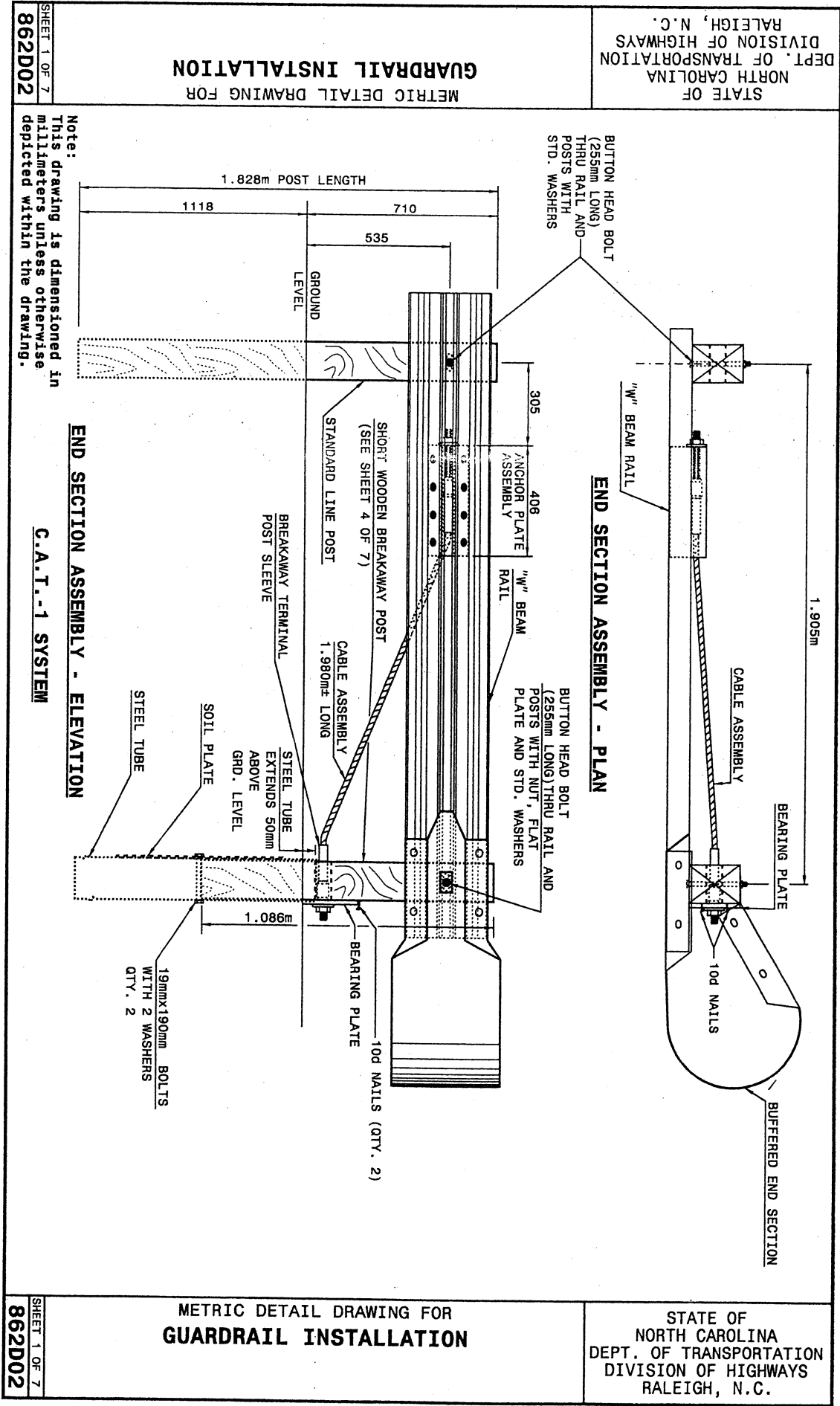
(c) AT NEW BRIDGE RAIL, THE W-BEAM END SHOE AND RUBRAIL SHALL BE ANCHORED AS DETAILED ON THE STRUCTURE PLANS.

7) POSTS 1 AND 2 ARE W200 x 19, 2290mm LONG. ALL OTHER POSTS IN THE ANCHOR UNIT ARE W150 x 13.5.

Note:
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MODIFIED BY:	E.E. WARD	DATE:	6-10-02
CHECKED BY:	<i>[Signature]</i>	DATE:	8-02
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ISOMETRIC VIEWS



METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 3 OF 7
862D02

TYPICAL GUARDRAIL AND GUARDRAIL POST ALTERNATIVES

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METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 4 OF 7
862D02

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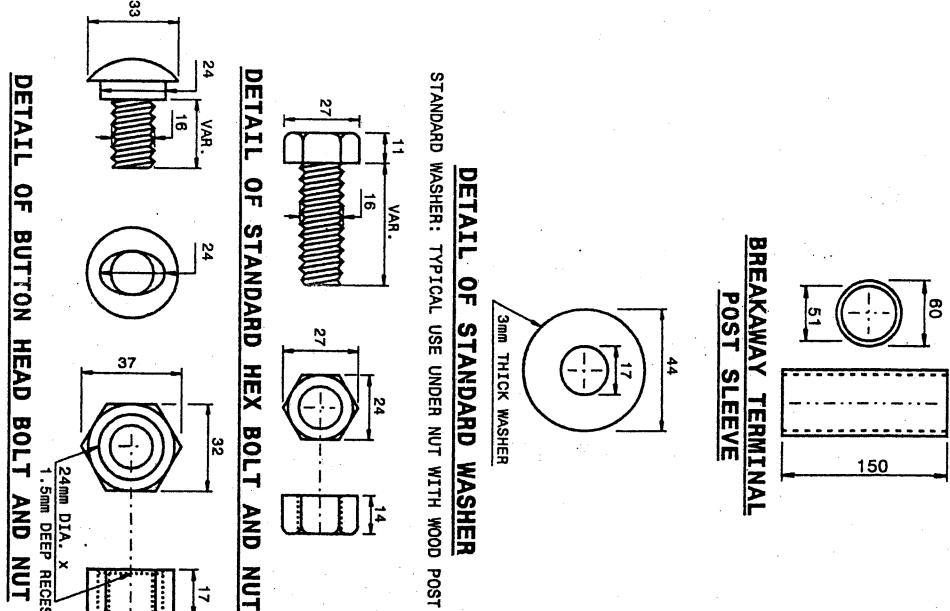
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SHEET NO.	2-N

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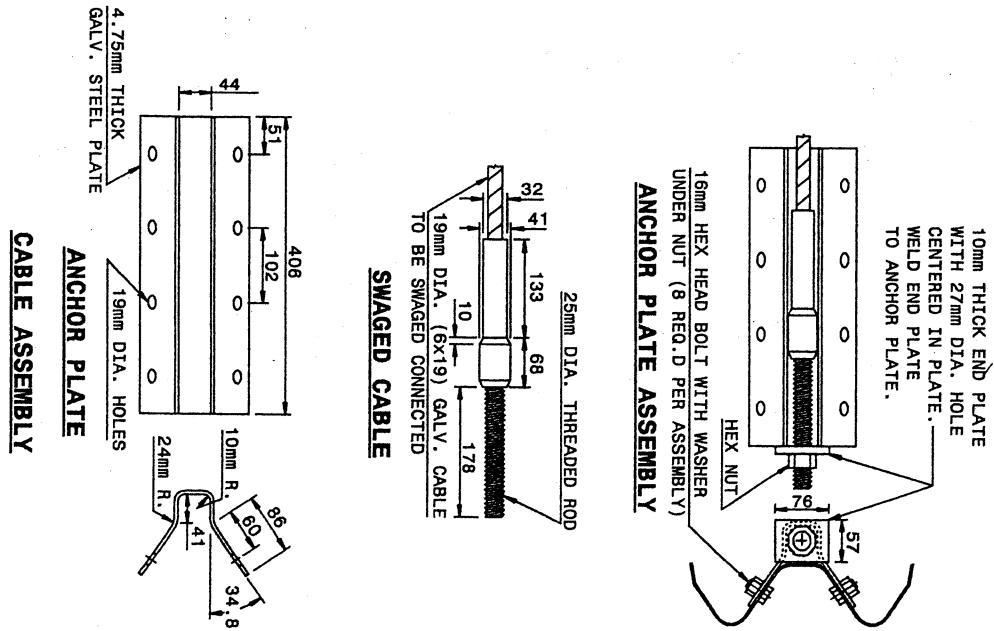
METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 5 OF 7
862D02

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SYSTEM PARTS



METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 5 OF 7
862D02

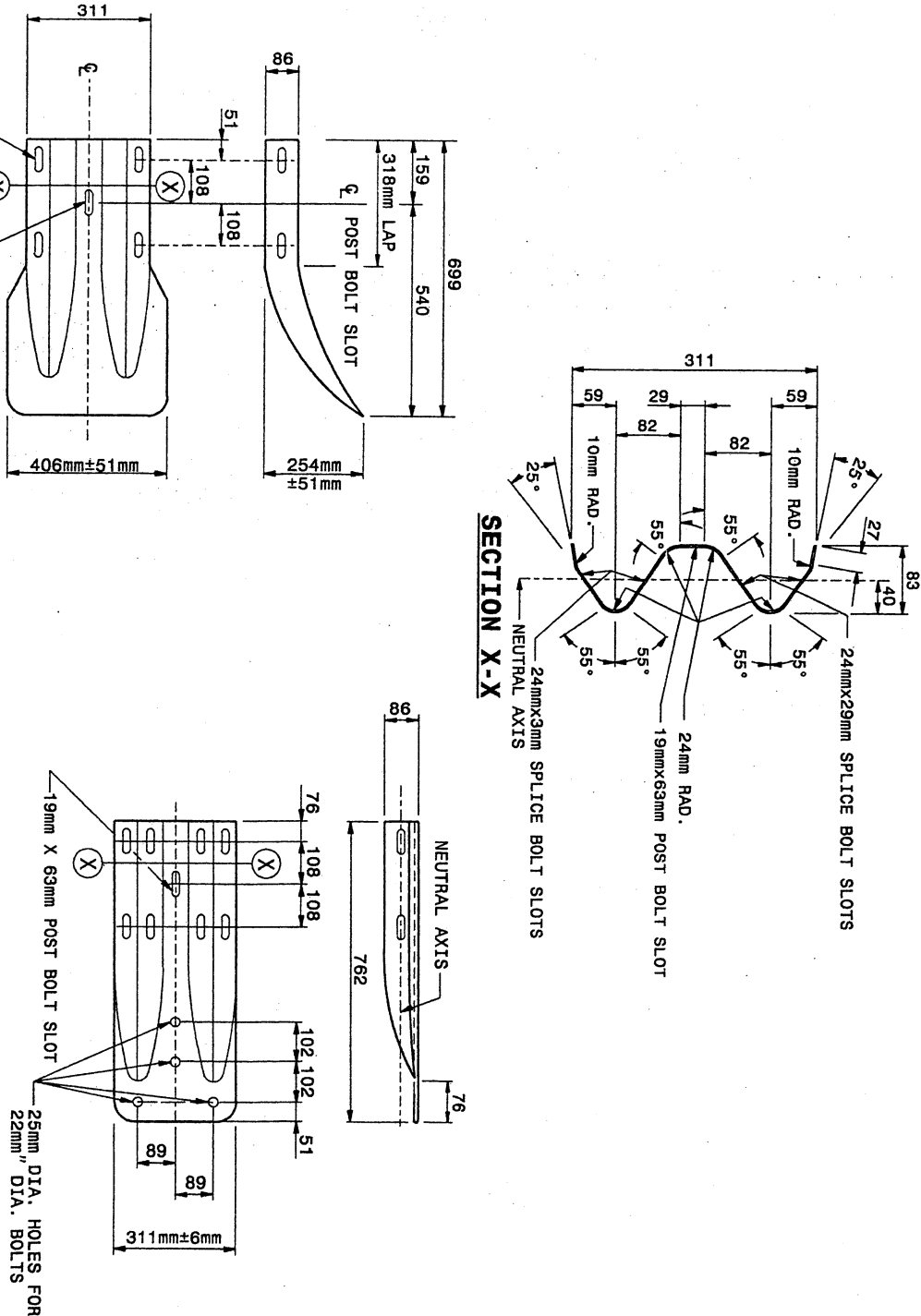
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METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 7
862D02

Note:
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depicted within the drawing.



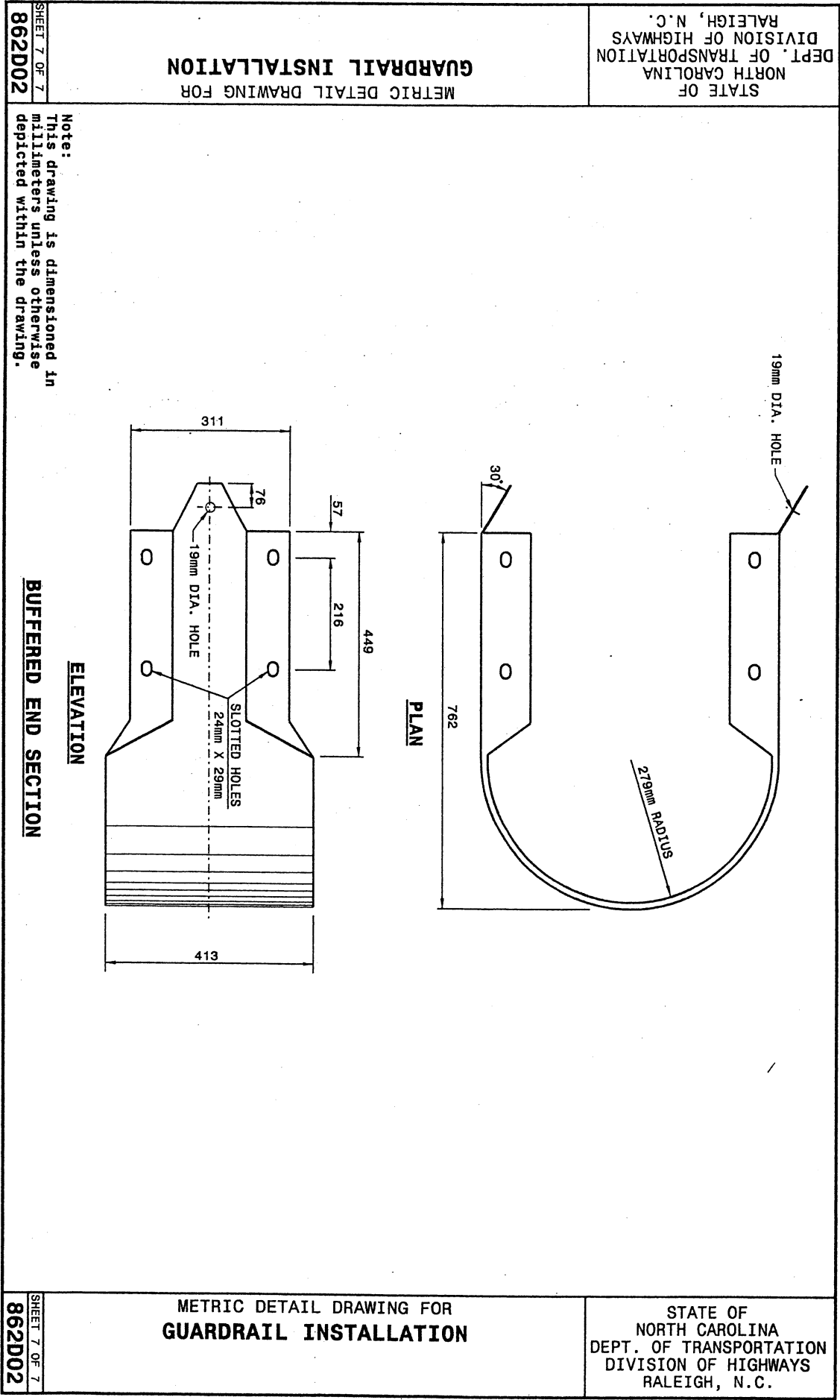
METRIC DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 7
862D02

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ORIGINAL BY: 2002 STD. 862.02 DATE:
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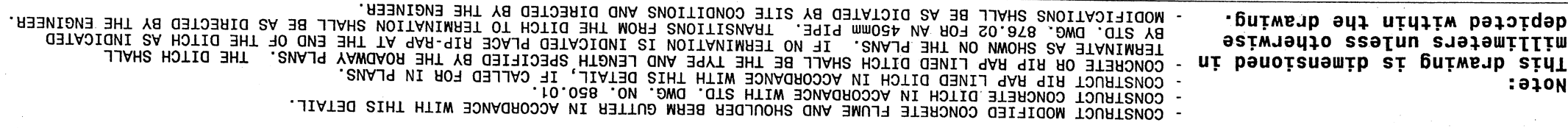


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CHECKED BY: *E.E. Ward* DATE: *02-09-03*
FILE SPEC.: \\usr\stds\02stds\86202\metric\86202m.dgn

**METRIC DETAIL DRAWING FOR
MODIFIED CONCRETE FLUME
WITH CONCRETE OR RIP-RAP DITCH**

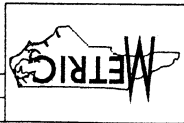
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MODFLMDTCH
SHEET 1 OF 1

9-001 2603185C
A. J. Lewis, D. J. G. M. Vrijt, metric 2514 modified flame-dgn
metric at 00003034



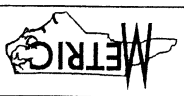
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LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 1200 mm & UNDER)

STATION	LOCATION (LT, RT, OR CJ)	STRUCTURE NO.	FROM TO	THICKNESS OR GAUGE	SIZE	LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 1200 mm & UNDER)										REMARKS
						ENDWALLS	STANDARD OR (UNLESS NOTED OTHERWISE)	C.S.P.	CU. METERS	R.C.P.	450mm SIDE DRAIN PIPE	375mm SIDE DRAIN PIPE	600mm SIDE DRAIN PIPE	PER EACH (0 THRU 1.50) QUANTITIES STRUCTURES 1.50 THRU 3.00 3.00 AND ABOVE IN METERS	PER EACH (0 THRU 1.50) QUANTITIES STRUCTURES 1.50 THRU 3.00 3.00 AND ABOVE IN METERS	
107+15	RT 30															
107+50	RT 31															
107+50	LT 31															
108+00	LT															
108+70	LT 33															
109+18	LT 34															
100+22	LT 35															
110+45	RT 36															
110+45	LT 37															
100+62	LT 37															
111+02	LT 38															
SHEET 6 CONT.																

107+15	RT 30															
107+50	RT 31															
107+50	LT 31															
108+00	LT															
108+70	LT 33															
109+18	LT 34															
100+22	LT 35															
110+45	RT 36															
110+45	LT 37															
100+62	LT 37															
111+02	LT 38															
SHEET 6 CONT.																
111+85	LT 41															
111+97.3	LT 42															
112+00	CL 43															
114+78	LT 45															
114+78	RT 45															
114+78	RT 45															
SHEET 10																
119+57	LT 47															
119+57	RT 47															
123+40	RT 49															
SHEET 11																
123+40	RT 49															
125+68	LT 52															
125+68	RT 52															
128+10	RT 53															
SHEET 13																
130+20	RT 55															
SHEET 14																
132+60	LT 58															
132+60	RT 58															
SHEET 15																
135+40	CL 59															
136+06	LT 61															
136+06	RT 61															
136+60	CL 62															
SHEET 3-B TOTAL																

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS



LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 1200 mm & UNDER)

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO.	TOP ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	THICKNESS OR GAUGE	SIZE	REMARKS	LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 1200 mm & UNDER)									
140+60	LT	64	14.21	12.33														
140+60	RT	63		12.50	12.41													
142+40	RT	65	13.89	13.33	13.25													
144+40	LT	68	13.99	12.66	12.54													
144+40	RT	68		12.79	12.66													
146+20	RT	69	14.07	13.51	13.25													
148+26	LT	72	14.37	12.95	12.40													
148+26	RT	72		13.01	12.95													
149+00	RT	73	14.33	13.77	13.65													
152+40	CL	75	13.88	13.17	12.93													
153+20	CL	76	14.10	12.93	12.82													
153+60	RT	77	14.45	12.82	12.69													
154+50	RT	79	14.34	13.50	12.56													
156+80	RT	81	13.83	13.02	12.21													
160+80	RT	83	13.47	12.66	11.61													
161+45	CL	85	13.63	12.82	12.00													
161+51	RT	86	14.25	13.44	12.10													
162+30	LT	89	14.04	13.20	12.90													
162+30	RT	90	13.68	13.12	13.00													
163+97	LT	92	13.23	11.60	11.55													
163+97	RT	93		11.87	11.60													
164+42	LT																	
164+42	RT																	
166+40	RT	94	13.24	12.68	12.56													
169+60	RT	97	13.24	12.68	12.41													
169+80	RT	99																
SHEET 3-C TOTAL									230.5	195.2	95.5	45.5	8.5	7.0	19	0.56	11.7	2-400

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 1200 mm & UNDER)

[illegible]

PROJECT REFERENCE NO.	R-2514A
SHEET NO.	3-E

COMPUTED BY: K. DUNN KTD
CHECKED BY: J. JAIKO
DATE: OCTOBER 8, 2003
DATE: OCTOBER 8, 2003

"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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

[illegible]

SUMMARY OF ASPHALT PAVEMENT REMOVAL

IN SQUARE METERS

LINE	STATION TO STATION	LOCATION	SQ. METERS
-LMED-	99+00 TO 100+00	NB ISS	130 m ²
-LMED-	99+25 TO 100+20	NB OSS	123 m ²
-YA-REV	0+25 TO 0+37	RT SHLD	28 m ²
-LMED-	100+22 TO 100+41	NB ISS	29 m ²
-LMED-	100+22 TO 100+41	SB ISS	21 m ²
-LMED-	100+75 TO 104+40	SB OSS	474 m ²
-LMED-	101+40 TO 102+50	SB ISS	143 m ²
-LMED-	101+40 TO 102+80	NB OSS	177 m ²
-LMED-	109+61 TO 109+72	LT	48 m ²
-LMED-	111+36 TO 111+95	SB ISS	190 m ²
-LMED-	179+43 TO 179+73	RT	76 m ²
-LMED-	180+55 TO 180+73	RT	66 m ²
-LMED-	180+78 TO 180+89	LT	43 m ²
-LMED-	183+07.3 TO 184+10	SBL	800 m ²
		TOTAL	2,348 m ²
		SAY	2,350 m ²

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

IN CUBIC METERS

LOCATION	UNCL. EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
-LMED- RT 104 + 00 TO 114 + 00 SUBTOTAL SUMMARY NO. 1	1,114 1,114	2,878 2,878	21,518 21,518	21,295 21,295	3,769 3,769
-LMED- RT 114 + 00 TO 124 + 00 SUBTOTAL SUMMARY NO. 2	385 385	1 1	26,913 26,913	26,836 26,836	309 309
-LMED- RT 124 + 00 TO 134 + 00 SUBTOTAL SUMMARY NO. 3	1,440 1,440		34,266 34,266	33,978 33,978	1,152 1,152
-LMED- RT 134 + 00 TO 144 + 00 SUBTOTAL SUMMARY NO. 4	1,348 1,348		27,434 27,434	27,164 27,164	1,078 1,078
-LMED- RT 144 + 00 TO 154 + 00 SUBTOTAL SUMMARY NO. 5	689 689		25,746 25,746	25,608 25,608	551 551
-LMED- RT 154 + 00 TO 164 + 00 SUBTOTAL SUMMARY NO. 6	4,413 4,413		30,158 30,158	29,275 29,275	3,530 3,530
-LMED- RT 164 + 00 TO 174 + 00 -Y2- 0 + 00 TO 1 + 10 SUBTOTAL SUMMARY NO. 7	5,000 422 5,422	3,476 3,476	12,149 209 12,358	11,149 125 11,274	7,476 338 7,814
-LMED- RT 174 + 00 TO 182 + 66.40 SUBTOTAL SUMMARY NO. 8	5,415 5,415	2,185 2,185	12,823 12,823	11,740 11,740	6,517 6,517
-LMED- RT 183 + 08.40 TO 193 + 00 -Y4- 0 + 00 TO 1 + 05 SUBTOTAL SUMMARY NO. 9	3,090 354 3,444	1,630 1,630	16,901 380 17,281	16,283 309 16,592	4,102 283 4,385
-LMED- RT 193 + 00 TO 195 + 80 SUBTOTAL SUMMARY NO. 10	264 264	560 560	4,128 4,128	4,075 4,075	771 771
-LMED- RT 99 + 00 TO 100 + 80 -YB- 0 + 00 TO 1 + 00 SUBTOTAL SUMMARY NO. 11	18 244 262		923 128 1,051	919 79 998	14 195 209
-LMED- RT 101 + 65 TO 104 + 00 -DET1- 0 + 00 TO 3 + 00.385 SUBTOTAL SUMMARY NO. 12	856 856	176 176	2,463 758 3,221	2,292 758 3,050	861 816
-NBITE- 193 + 70 TO 197 + 70.709 SUBTOTAL SUMMARY NO. 13			776 776	776 776	
-LMED- RT 100 + 80 TO 101 + 65 SUBTOTAL SUMMARY NO. 14	344 344		213 213	144 144	275 275
-LMED- LT 107 + 20 TO 117 + 00 SUBTOTAL SUMMARY NO. 15	764 764		414 414	261 261	611 611
-LMED- LT 117 + 00 TO 127 + 00 SUBTOTAL SUMMARY NO. 16	401 401		270 270	190 190	321 321
-LMED- LT 127 + 00 TO 137 + 00 SUBTOTAL SUMMARY NO. 17	421 421		285 285	201 201	337 337
-LMED- LT 137 + 00 TO 147 + 00 SUBTOTAL SUMMARY NO. 18	492 492		228 228	130 130	394 394
-LMED- LT 147 + 00 TO 157 + 00 SUBTOTAL SUMMARY NO. 19	347 347		559 559	490 490	278 278
-LMED- LT 157 + 00 TO 167 + 00 SUBTOTAL SUMMARY NO. 20	366 366		776 776	703 703	293 293
SUBTOTAL FOR SHEET 1	28,187	10,906	220,418	214,780	33,455



COMPUTED BY: _____
CHECKED BY: _____


COMPUTED BY: K. DUNN
CHECKED BY: J. LATKO

COMPUTED BY: K. DUNN
CHECKED BY: J. LATKO

COMPUTED BY: K. DUNN
CHECKED BY: J. LATKO
DATE: 7/22/03
DATE: 7/23/03

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

RIGHT OF WAY AREA DATA SHEET



PROJECT REFERENCE NO. R-2514A
SHEET NO. 31



PARCEL NO.	PROPERTY OWNERS NAME	TOTAL AREA	AREA TAKEN	AREA REMAINING	AREA REMAINING LEFT	CONSTR. EASEMENT	PERMANENT DRAINAGE EASEMENT	TEMPORARY DRAINAGE EASEMENT
1	MARIE RIGGS	13,164 ha	170 m²	1830 sf	32.49 Ac			
2	CDW HOLDINGS, LLC	7243 m²	1983 m²	5260 m²	1.30 Ac			
		32.53 Ac						
3	WOODROW HUMPHREY	4050 m²	193 m²	3857 m²	0.95 Ac			
		1,000 Ac	2077 sf					
4								
5	JOHN KELLUM	6596 m²	1012 m²	5584 m²	1.38 Ac			124 m²
		1.63 Ac	0.25 Ac					1335 sf
6								
7	RUSSELL KELLUM	2428 m²	202 m²	2226 m²	0.55 Ac			
		0.60 Ac	2174 sf					
8	BOBBY MORTON	10,642 ha	2064 m²	10,436 ha	25.79 Ac			
		26.30 Ac	0.51 Ac					95 m²
9	FRANK COLLINS	3399 m²		3399 m²	0.84 Ac			
10								
11	JOSEPH MORTON, ET AL	6,280 ha	15.52 Ac		15.52 Ac			202 m²
								2177 sf
12	WOODROW HUMPHREY	1,720 ha	3237 m²	1,396 ha	3.45 Ac			
13	FERDINARD DAMIANO	567 m²		567 m²				153 m²
		6099 sf						1645 sf
14	W.R. WILLIS	1,121 ha		1,121 ha				
15	BENJAMIN GIBSON	2,752 ha	1,700 m²	2,582 ha	6.38 Ac			
		6.80 Ac	0.42 Ac					
16	DONALD MORTON	4046 m²		4046 m²	1.00 Ac			
17	PEGGY GIBSON	7648 m²	3035 m²	4613 m²	1.14 Ac			
		1,890 Ac	0.75 Ac					
18	DONALD MORTON	1,764 ha		1,764 ha				4.36 Ac
19								

PARCEL NO.	PROPERTY OWNERS NAME	TOTAL AREA	AREA TAKEN	AREA REMAINING	AREA REMAINING LEFT	CONSTR. EASEMENT	PERMANENT DRAINAGE EASEMENT	TEMPORARY DRAINAGE EASEMENT
20	MARCIA HUMPHREY	27,475 ha	2023 m²	2,756 ha	24,517 ha	89 m²		310 m²
		67.90 Ac	0.50 Ac	6.81 Ac	60.59 Ac	958 sf		3337 sf
20A	AMELIA PARKER	4168 m²						
		1.03 Ac						1.03 Ac
22	ESTERLENE DIXON	5750 m²	1207 m²	4543 m²	1.12 Ac			
		1.42 Ac	0.30 Ac					
23	RETHA EDWARDS	1,409 ha	1302 m²	1,279 ha	3.16 Ac			
		3.48 Ac	0.32 Ac					
24	WILBUR PARKER	6030 m²						6030 m²
		1,490 Ac						1,490 Ac
25	ROBERT SPENCER	2,841 ha						2,841 ha
		7.02 Ac						7.02 Ac
26	DEWEY LORRAINE POWERS	16,058 ha	1,725 ha	14,333 ha	35.42 Ac			
		39.68 Ac	4.26 Ac					
27	GOVIND PATEL	1,161 ha						1,161 ha
		2.87 Ac						2.87 Ac
28	W.R. WILLIS	1,728 ha						1,728 ha
		4.27 Ac						4.27 Ac
29								
30	ANTHONY HERNANDEZ	7750 m²						7750 m²
		1.92 Ac						1.92 Ac
31	ALLEN R. GOODSON	30,409 ha	1282 m²	4,622 ha	25,659 ha			
		75.15 Ac	0.32 Ac	11.42 Ac	63.41 Ac			
32	ENDOWMENT FUND OF NC STATE UNIVERSITY ET AL	33192,496 ha	13,070 ha	25642,411 ha	30617,015 ha	6611 m²		2134 m²
		82029,870 Ac	32.30 Ac	6332,62 Ac	75663,95 Ac	1.63 Ac		0.53 Ac
33	GREAT EASTERN TIMBER COMPANY, LLC	68,311 ha	2295 m²	68,081 ha		271 m²		
		168,80 Ac	0.55 Ac	168,25 Ac		2917 sf		
34	JAMES WHITE, ET AL	20,653 ha	1,331 ha	4,751 ha	14,571 ha	535 m²		
		51.04 Ac	3.29 Ac	11.74 Ac	36.01 Ac	5759 sf		
35	BETTY C. SUTHERLAND	8093 m²				8093 m²		
		2.00 Ac				2.00 Ac		
36	BETTY C. SUTHERLAND	2050 m²				2050 m²		
		0.507 Ac				0.507 Ac		
37	ELTON WHITE	6070 m²				6070 m²		
		1,500 Ac				1,500 Ac		
38	EDNA EARL ODOM	3,132 ha	1335 m²	2,998 ha	7.41 Ac			

RIGHT OF WAY AREA DATA SHEET

PARCEL NO.	PROPERTY OWNERS NAME	AREA TOTAL	AREA TAKEN	AREA REMAINING RIGHT	AREA REMAINING LEFT	CONSTR. EASEMENT	PERMANENT DRAINAGE EASEMENT	TEMPORARY DRAINAGE EASEMENT
39	STEPHEN EPLEY	1,230 ha 688 m ²	0.17 Ac	1.161 ha	2.87 Ac			
40	NIXON G. TALLMAN	1,684 ha 4.16 Ac	1,720 m ² 0.43 Ac	1,512 ha 3.73 Ac		21 m ² 226 sf		
41	DOROTHY MURRAY	2,288 ha 5.66 Ac	2,166 m ² 0.54 Ac	2,072 ha 5.12 Ac		252 m ² 2713 sf		
42								
43								
44	GRACE EUBANK HORTON	10,666 ha 26.36 Ac	1,667 ha 4.12 Ac	6,118 ha 15.12 Ac	2,881 ha 7.12 Ac	160 m ² 1722 sf		1191 m ² 0.29 Ac
45	WILLIAM BETSACON	5580 m ² 1.38 Ac	634 m ² 0.16 Ac		4946 m ² 1.22 Ac			
46	ALVIN WHITT	4250 m ² 1.050 Ac			4250 m ² 1.050 Ac			
47	HAZEL S. PARKER	2,108 ha 5.21 Ac			2,108 ha 5.21 Ac			1934 m ² 0.48 Ac
48	PERCY PARKER, ET AL.	10,938 ha 27.03 Ac	4208 m ² 1.04 Ac	10,517 ha 25.99 Ac				
49	HAZEL S. PARKER	5,969 ha 14.75 Ac	4226 m ² 1.04 Ac	5,546 ha 13.71 Ac				
50	PERCY PARKER, ET AL.	2,088 ha 5,160 Ac			2,088 ha 5,160 Ac			282 m ² 3036 sf
51	BARBUS CONSTRUCTION COMPANY	6,604 ha 16.32 Ac	1,052 ha 2.60 Ac	5,552 ha 13.72 Ac		1368 m ² 0.338 Ac		
52	WHITE OAK COMMUNITY CHURCH	2,258 ha 5,580 Ac			2,258 ha 5,580 Ac	356 m ² 3832 sf		
53	JAMES KEITH JR., ET AL.	5,180 ha 12.80 Ac			5,180 ha 12.80 Ac	150 m ² 1615 sf		
54								
55	DONALD WHITE	21,264 ha 52,55 Ac	2,622 ha 6.48 Ac	18,642 ha 46.07 Ac		760 m ² 0.188 Ac		
56	BETTY PEARCE, ET AL.	14,426 ha 35.65 Ac			14,426 ha 35.65 Ac			
57	MICHAEL CONWAY	1580 m ² 0.390 Ac			1580 m ² 0.390 Ac			


[illegible]

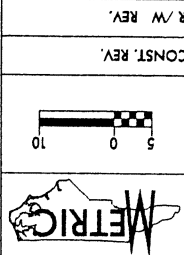
PROJECT REFERENCE NO.	SHEET NO.
R-2514A	8
ROADWAY DESIGN	
	
HYDRAULIC DESIGN:	
	
#21 MATHE'S CORP. 5140 S.W. 255 HIGHLAND, NC 27506 (919) 233-9155	
TNS CORPORATION 10000 W. 10th St. Suite 100 Overland Park, KS 66211 (913) 666-1100	

ROADWAY DESIGN BY:

TAYLOR • WISEMAN & TAYLOR

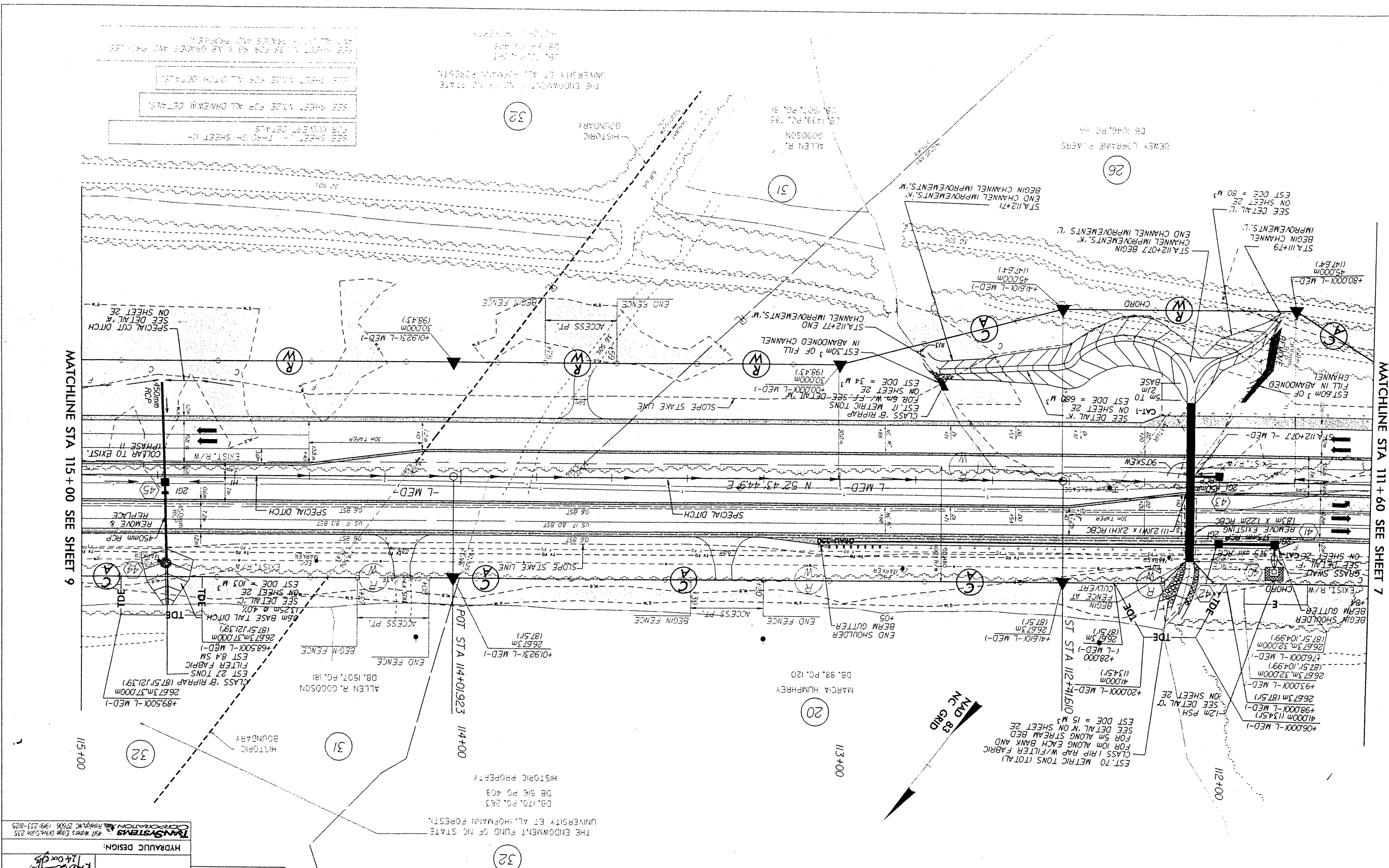
ENGINEERS • SURVEYORS • PLANNERS
P. O. BOX 3 • SUBSURFACE UTILITY ENGINEERING

 3500 REGENCY PARKWAY, SUITE H, CARY, N.C. 27511
TELEPHONE NO. (919)297-0085 FAX NO. (919)297-0080

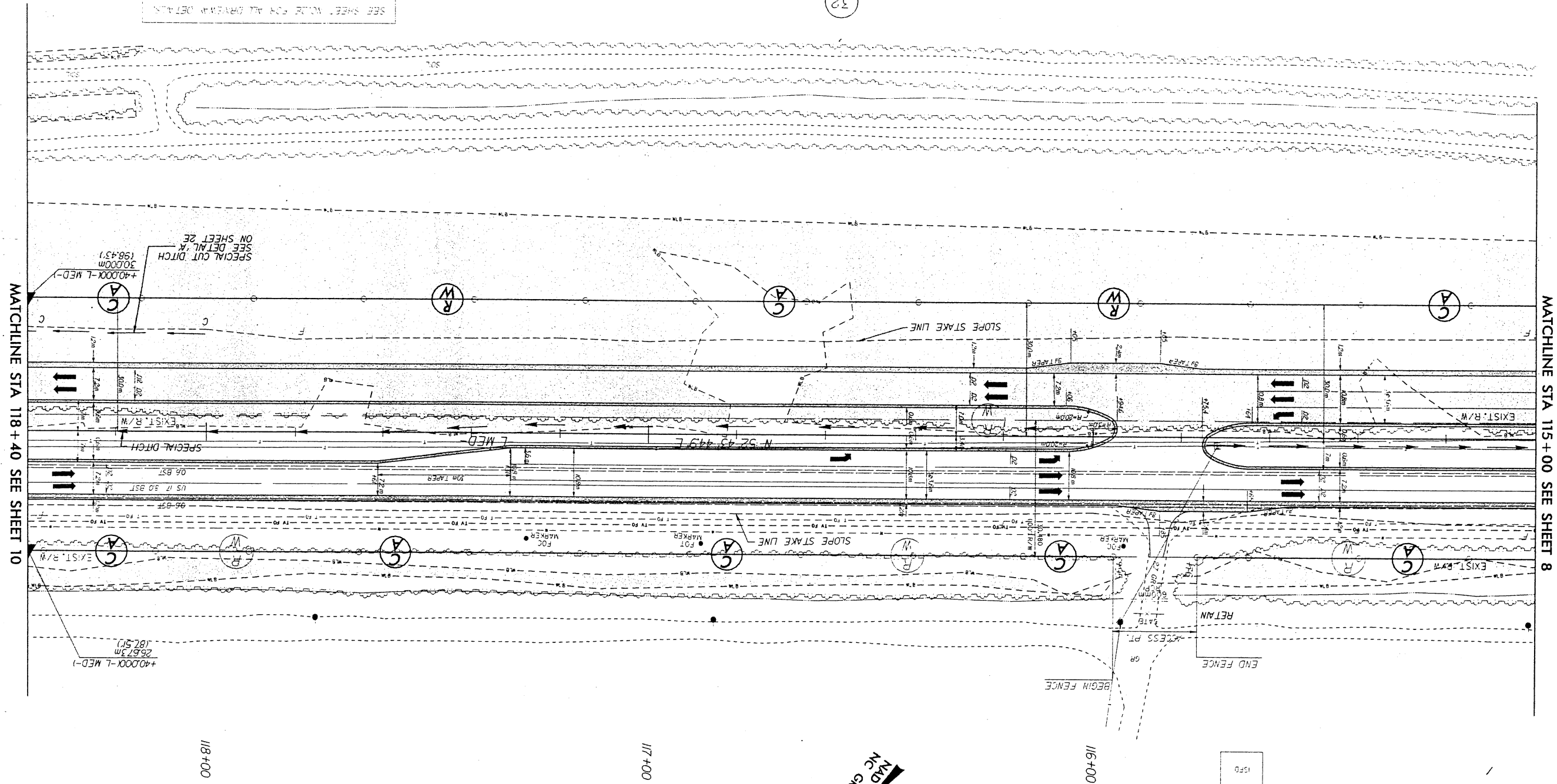


MATCHLINE STA 115+00 SEE SHEET 9

MATCHLINE STA 111+60 SEE SHEET 7



SEE SHEET NUMBER 200 FOR OTHER DETAILS.



THE ENDOWMENT FUND OF NC STATE
UNIVERSITY ET AL. (HOFFMANN FOREST).
DB. 170. PG. 263
DB 516 PG. 409
HISTORIC PROPERTY

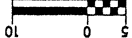

NAD
NC
83
GRID

ROADWAY DESIGN BY:



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ENGINEERS • SURVEYORS • PLANNERS
P. S. • SUBSURFACE UTILITY ENGINEERING

3500 REGENCY PARKWAY, SUITE H, CARY, N.C. 27511
TELEPHONE NO. (919)297-0085 FAX NO. (919)297-0090



CONST. REV.	R/W REV.
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ROADWAY DESIGN ENGINEER		ROADWAY DESIGN ENGINEER	
R / W SHEET NO.		R / W SHEET NO.	
R-2514A		R-2514A	
PROJECT REFERENCE NO.		PROJECT REFERENCE NO.	
SHEET NO.		SHEET NO.	
9		9	

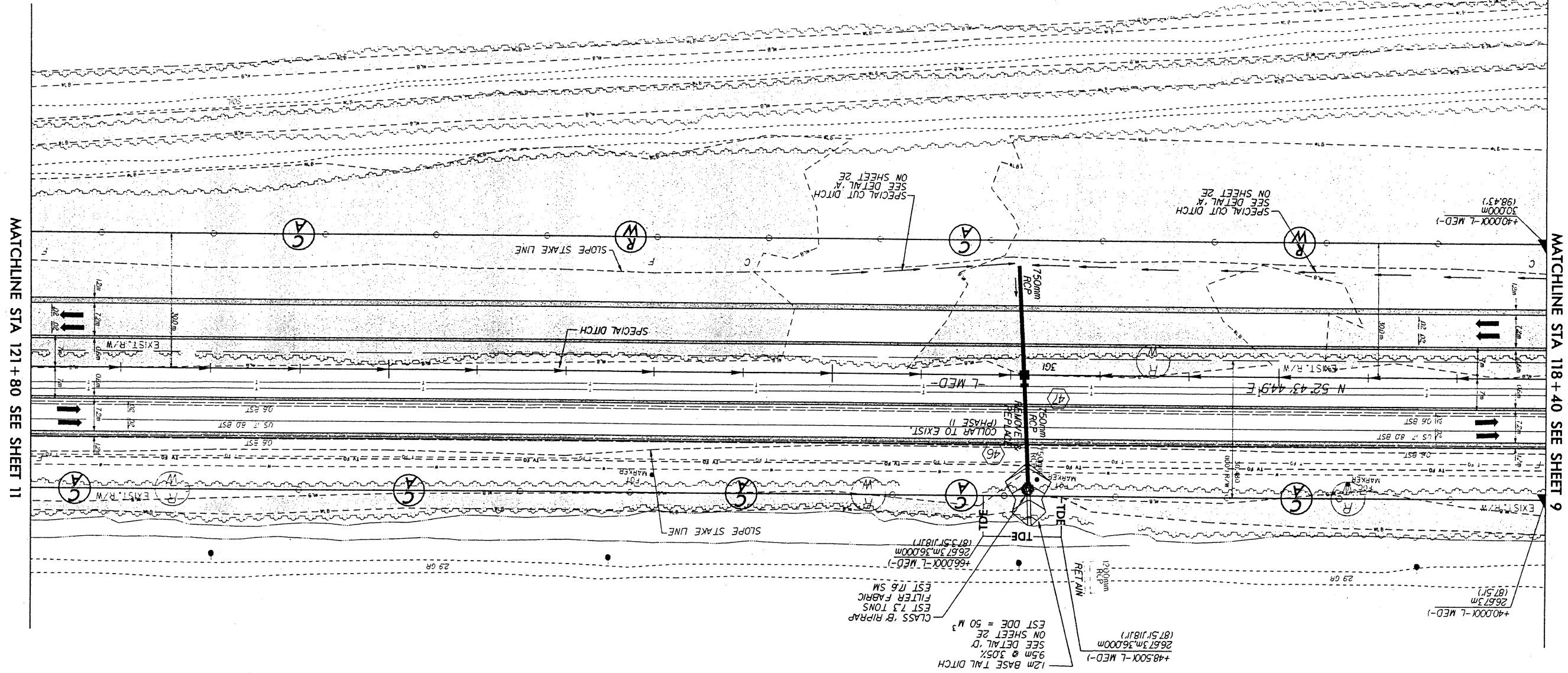
THE ENDOWMENT FUND OF NC STATE
UNIVERSITY ET AL. (HOFFMANN FOREST).

(32)

SEE SHEET NO. 25 FOR ALL DRAWING DETAILS.

SEE PAGE 133-134

SECRET



MATCHLINE STA 121+80 SEE SHEET 11

MATCHLINE STA 118+40 SEE SHEET 9

THE ENDOWMENT FUND OF NC STATE
UNIVERSITY ET AL. (HOFMANN FOREST).
DB-170, PG. 263
DB 516 PG. 408
HISTORIC PROPERTY

32

119+00


120+00

121+00



NAD 83
NC GRID

ROADWAY DESIGN BY:

TAYLOR • WISEMAN & TAYLOR
ENGINEERS • SURVEYORS • PLANNERS
P. O. BOX 1000, SUBSURFACE UTILITY ENGINEERING


3500 REGENCY PARKWAY, SUITE H, CARY, N.C. 27511
TELEPHONE NO. (919) 297-0088 FAX NO. (919) 297-0080

A metric ruler showing 0, 5, and 10 centimeters. Below the ruler is a map of Michigan with the word "METRIC" written vertically across it.

	
<p>HYDRAULICS ENGINEER</p>	<p>ROADWAY DESIGN ENGINEER</p>
<p>10 SHEET NO.</p>	<p>R-2514A PROJECT REFERENCE NO.</p>
<p>4917 Waters Edge Drive Suite 235 Raleigh, NC 27606 (919) 232-9125</p>	<p>CONSISTENT INFORMATION</p>

MATCHLINE STA 121+80 SEE SHEET 10

122+00

123+00

32

THE ENDOWMENT FUND OF NC STATE
UNIVERSITY ET AL. (HOFMANN FOREST).
DB 516 PG. 263
DB 516 PG. 408

HISTORIC PROPERTY

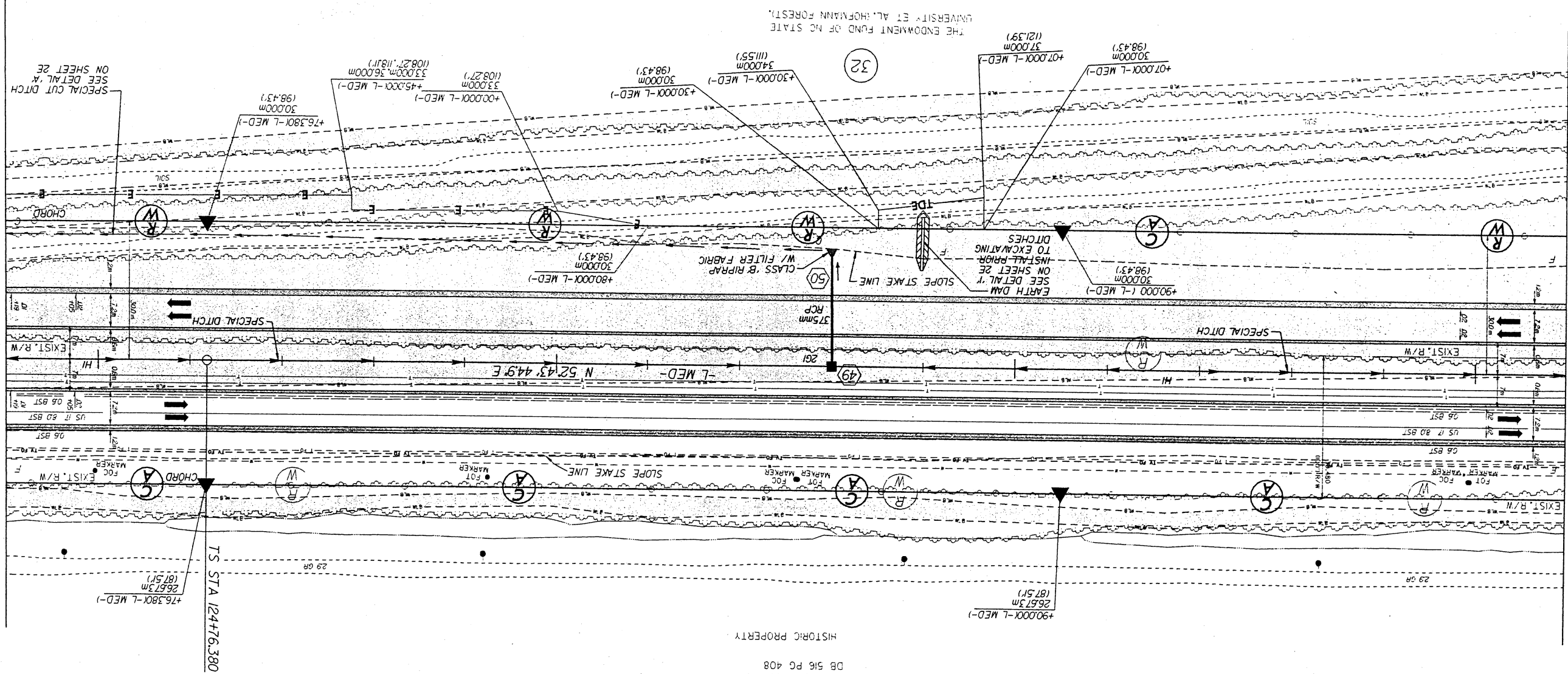
124+00

125+00

ROADWAY DESIGN BY:
TAYLOR, WISEMAN & TAYLOR
ENGINEERS • SURVEYORS • PLANNERS
3900 REGENCY PARKWAY, SUITE H, CARY, N.C. 27511
TELEPHONE NO. (919) 287-0088 FAX NO. (919) 287-0080

METRIC
R/W REV.
CONST. REV.
R/W REV.

PROJECT REFERENCE NO. R-251A
SHEET NO. 11
ROADWAY DESIGN
R/W SHEET NO. 11
ENGINEER
JAMES H. JAMES
PROFESSIONAL ENGINEER
NORTH CAROLINA
1975
125 OCT 03
HYDRAULIC DESIGN:
TAYLOR, WISEMAN & TAYLOR
CORPORATION
4901 WATERS EDGE DRIVE, SUITE 235
RALEIGH, NC 27606 (919) 233-8125



THE ENDOWMENT FUND OF NC STATE
UNIVERSITY ET AL. (HOFMANN FOREST).
DB 516 PG. 263
DB 516 PG. 408
HISTORIC PROPERTY

Pls Sta 125+33.0+7
Ls = 85.000
LT = 56.668
ST = 28.334
SE = 0.02
R = 2,200.000
L = 25.915
T = 51.829
Δ = 120.593 (LT)
θs = 1.06247
Pls Sta 126+41.543
L MED-
PI Sta 125+87.295

SEE SHEET NO. 12 FOR ALL DRIVEWAY DETAILS.

SEE SHEET NO. 12 FOR ALL CATCH BASIN DETAILS.

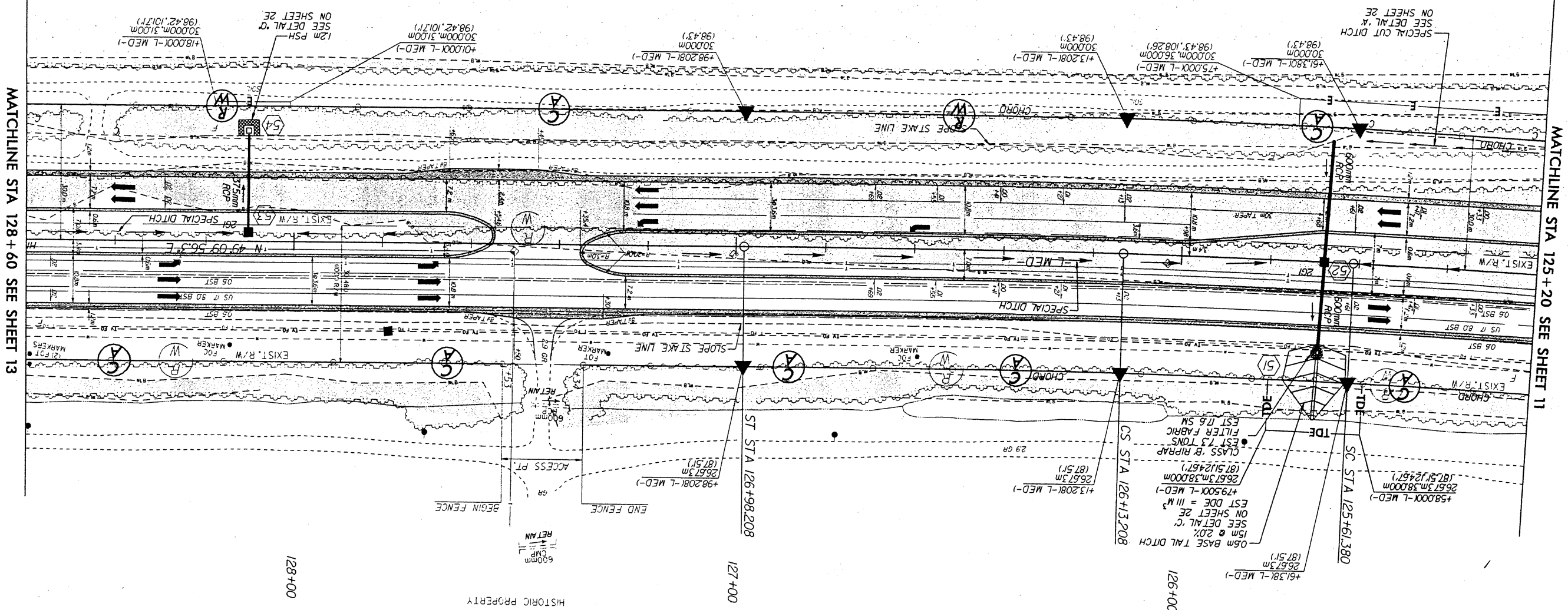
SEE SHEET NO. 12 FOR ALL GRADES AND PROFILES.
AND ALL DRAINAGE AND EROSION CONTROL DETAILS.

MATCHLINE STA 125+20 SEE SHEET 12

SEE SHEET NO.22 FOR ALL DRIVER'S DETAILS.

THE ENDOWMENT FUND OF NC STATE
UNIVERSITY ET AL. (HOFMANN FOREST)
DB 170, PG. 263
DB 516 PG. 403
HISTORIC PROPERTY

32



MATCHLINE STA 128+60 SEE SHEET 13


MATCHLINE STA 125+20 SEE SHEET 11

128+00


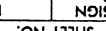
THE ENDOWMENT FUND OF NC STATE
UNIVERSITY ET AL. (HOFMANN FOREST).
DB. 170. PG. 263
DB 516 PG 408
HISTORIC PROPERTY

32



ROADWAY DESIGN BY:	
TAYLOR • WISEMAN & TAYLOR	 ENGINEERS • SURVEYORS • PLANNERS P.O. BOX 1000, SUITE 100, WASHINGTON, D.C. 20004 TEL: (202) 331-1000

A metric ruler showing a scale from 0 to 10 centimeters. The ruler is marked in millimeters. Below the ruler is a logo for 'METRIC' with a stylized map of Australia to its left.

		ROADWAY DESIGNER NORTH CAROLINA PROFESSIONAL ENGINEER 102283 12/31/2000 JAMES H. JACO
SHEET NO. 12	R/W SHEET NO.	R-2514A
PROJECT REFERENCE NO.	HYDRAULIC DESIGN:	
4911 WATERS EDGE DRIVE, SUITE 235 RICHMOND, NC 27266 (919) 533-2325 TRANS SYSTEMS CORPORATION		

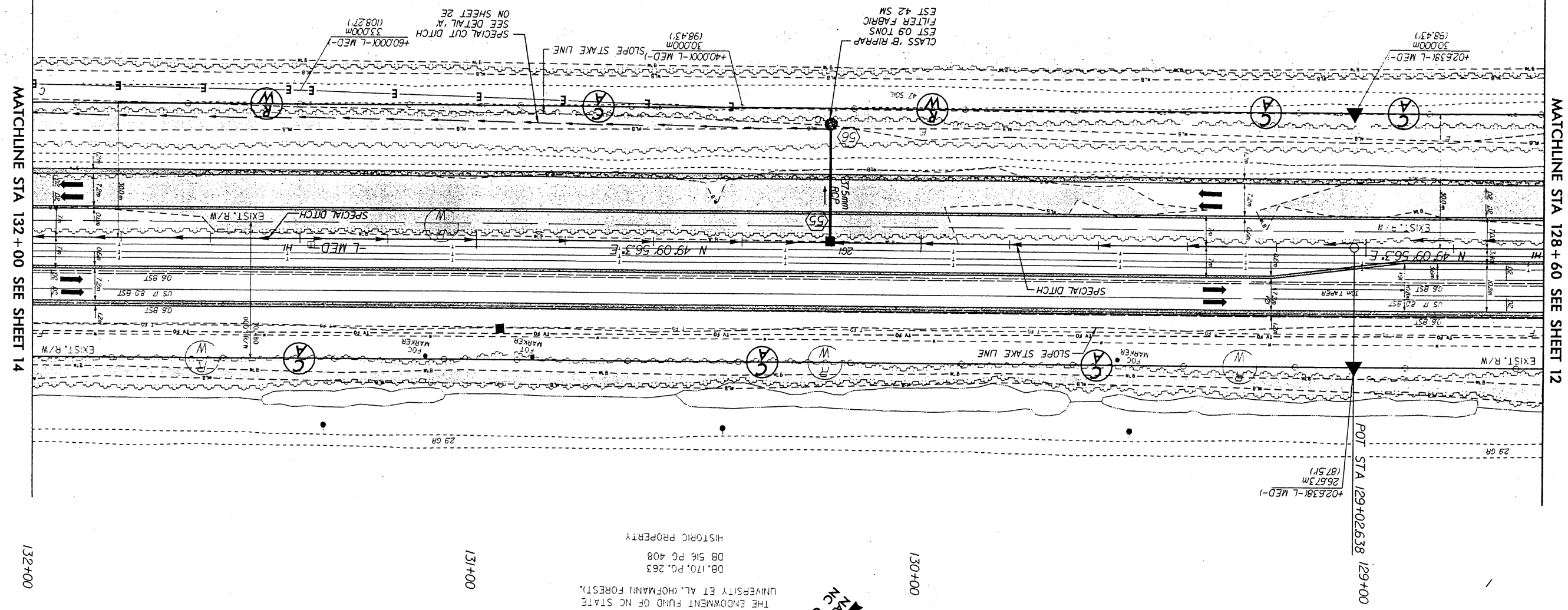
SEE SHEET NO. 1 FOR ALL DRIVEWAY DETAILS.

STANLEY HOPE TR 804 ETON 12345 235

SECRET - ON ORDER - NO TO BE
SECRET ON SECRETARY'S ORDER - ON ORDER

THE ENDOWMENT FUND OF NC STATE
UNIVERSITY ET AL. (HOFFMANN FOREST).
DB. 170. PG. 063
DB. 516. PG. 408
HISTORIC PROPERTY

32



THE ENDOWMENT FUND OF NC STATE
UNIVERSITY ET AL. (HOFMANN FOREST).
DB. 170. PG. 263
DB. 516 PG. 408
HISTORIC PROPERTY


130+00.

131+00



132+00

32

NAD 83
NC GRID

ROADWAY DESIGN BY: TAYLOR, WISEMAN & TAYLOR ENGINEERS • SURVEYORS • PLANNERS P.O. BOX 308 • SUBSURFACE UTILITY ENGINEERING 3500 REGENCY PARKWAY, SUITE H, CARY, N.C. 27511 TELEPHONE NO. (919)297-0085 FAX NO. (919)297-0090	
--	---

A metric ruler showing a scale from 0 to 10 centimeters. To the right of the ruler is a map of Mexico with the word "METRIC" written vertically along its right edge.

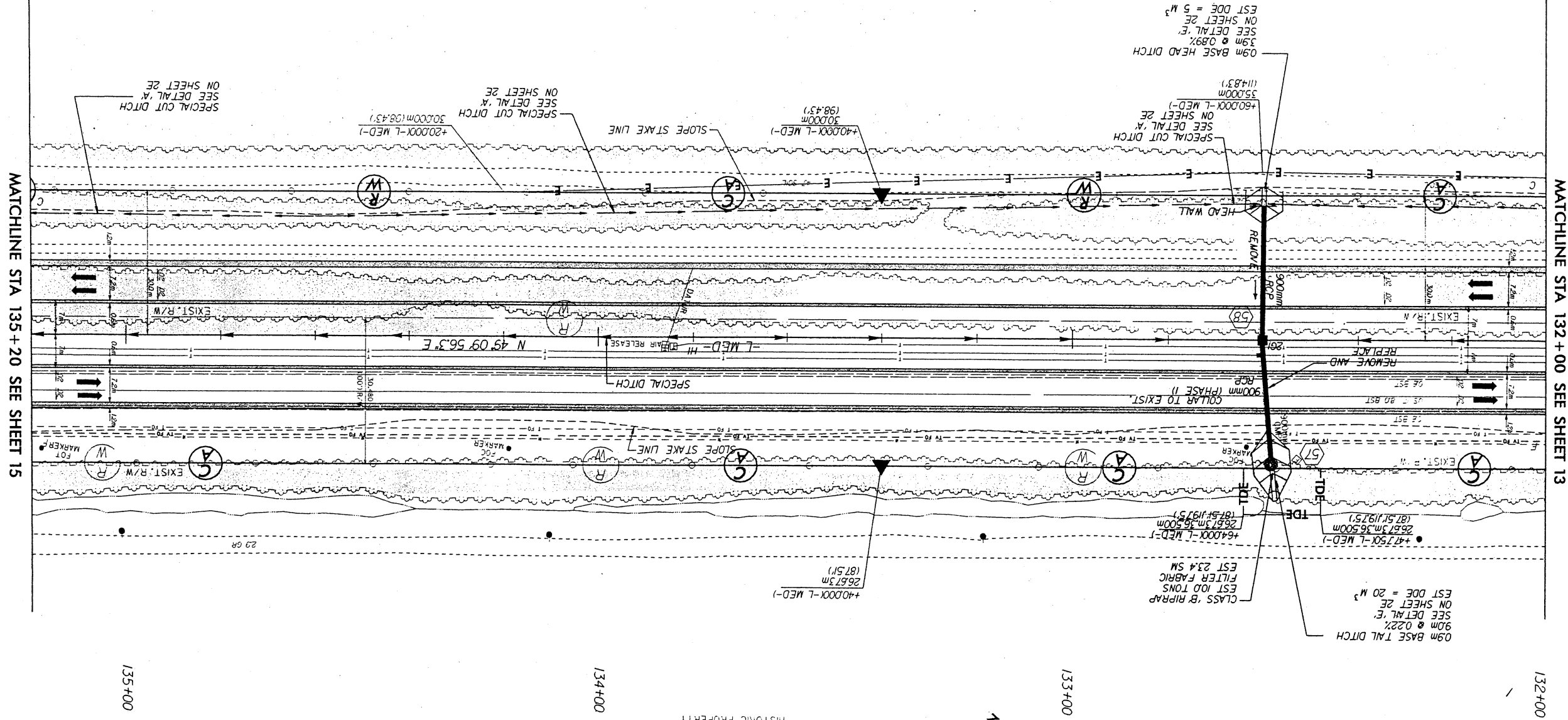
			
HYDRAULICS		ROADWAY DESIGN	
SHEET NO. 13		R-2314A	
PROJECT REFERENCE NO.		R / W SHEET NO.	

THE ENDOWMENT FUND OF NC STATE
UNIVERSITY ET AL. (HOFFMANN FOREST)
DB, ITO, PG. 263
DB 916 PG. 408
HISTORIC PROPERTY

SEE SHEET NO. 13 FOR ALL DRIVEWAY DETAILS.

SEE 8-57 FOR ALL OTHER DETAILS.

SECRET AND SECURITY MATTER
SECRET AND SECURITY MATTER



THE ENDOWMENT FUND OF NC STATE
UNIVERSITY ET AL. (HOFMANN FOREST).
DB. ITO. PC. 263
DB 516 PC 408
HISTORIC PROPERTY



32

ROADWAY DESIGN BY:

TAYLOR • WISEMAN & TAYLOR

G.P.E. • SURFACE UTILITY ENGINEERS
P.L.S. • SUBSURFACE UTILITY ENGINEERS

3500 REGGANCE PARKWAY, SUITE H, CARY, N.C. 27511
TELEPHONE NO. (919)297-0085 FAX NO. (919)297-0080

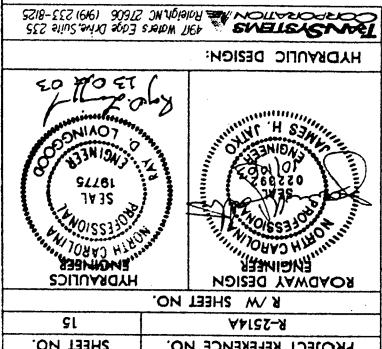
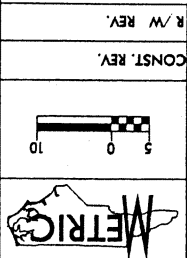
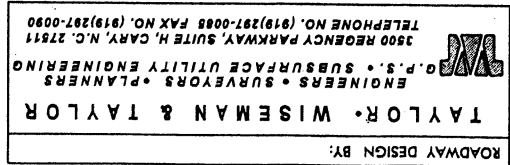
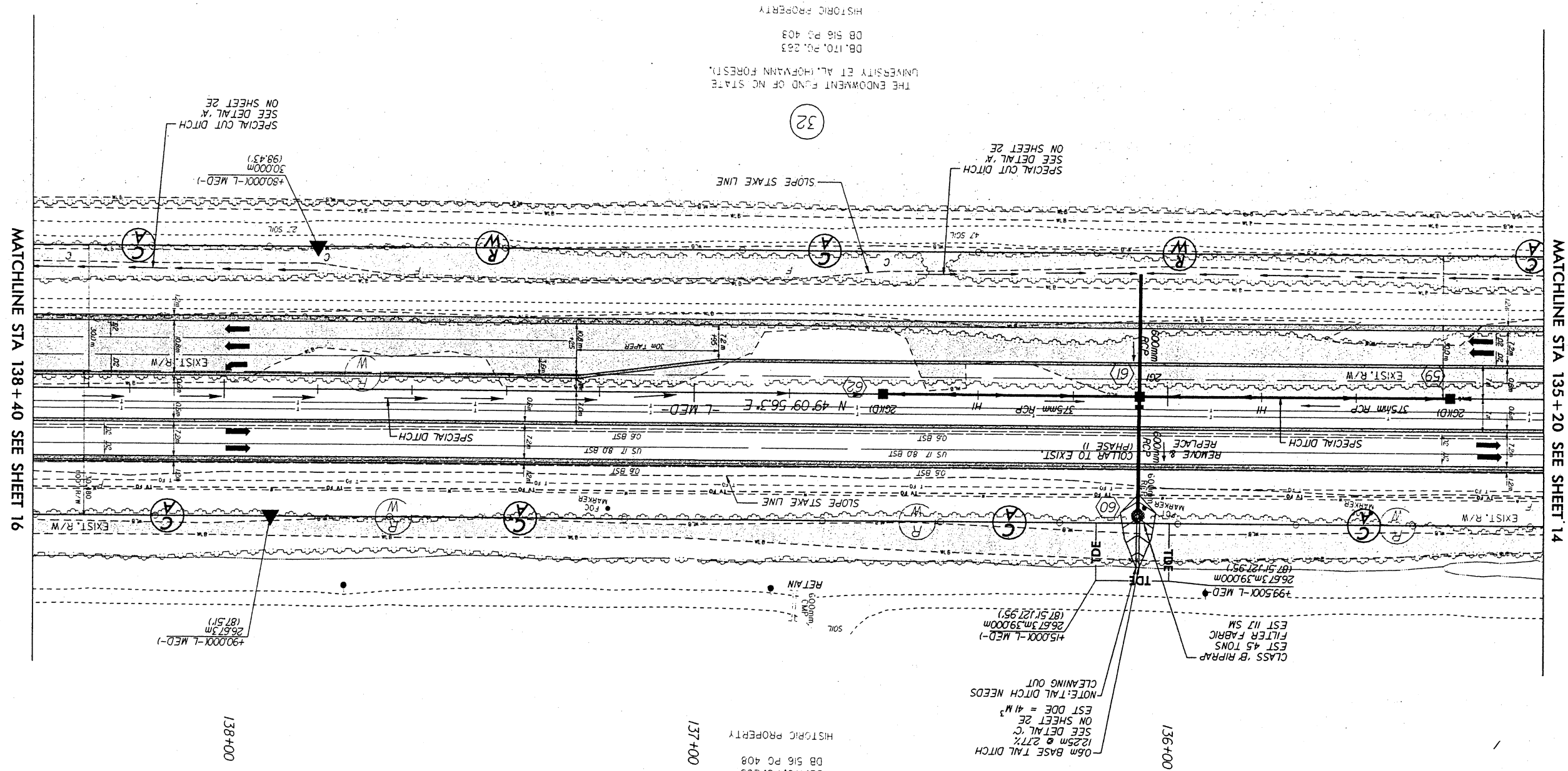


CONST. REV.
R/W REV.

HYDRAULIC DESIGN:

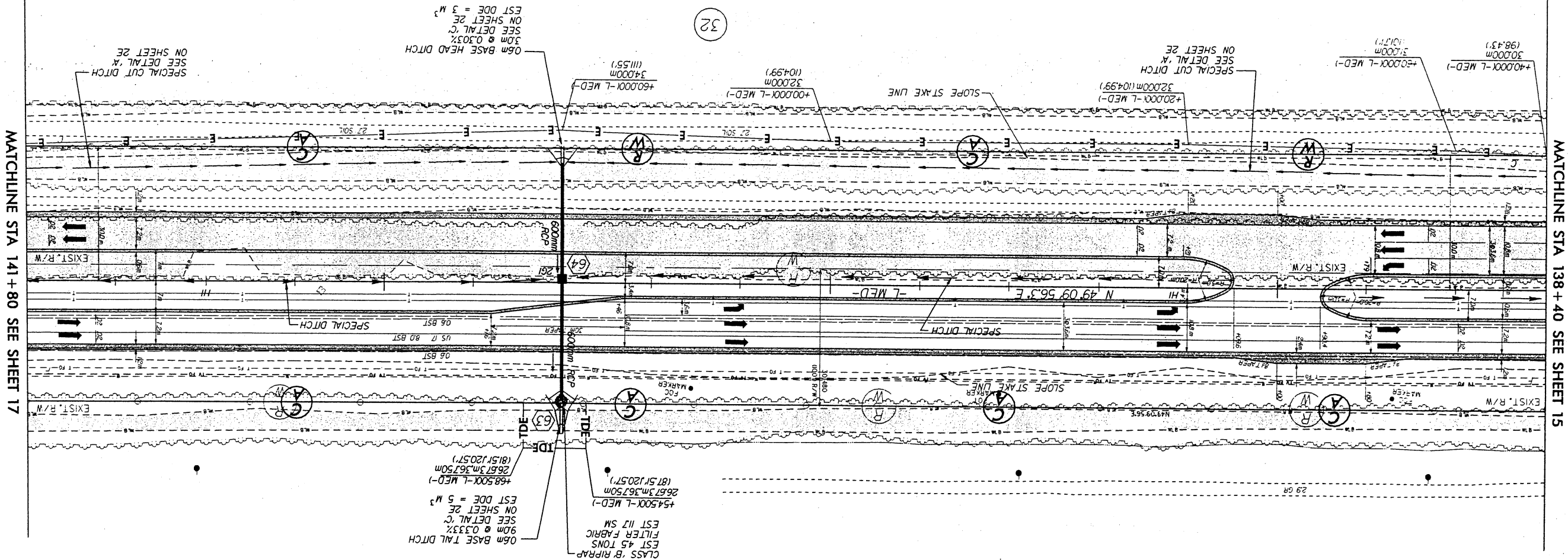
TRANSYSTEMS CORPORATION
4917 Waters Edge Drive, Suite 235
Raleigh, NC 27606 (919) 233-8125

PROJECT REFERENCE NO.	R-2514A
R / W SHEET NO.	14



SEE SHEET NO. 14 FOR ALL DITCH DETAILS.
SEE SHEET NO. 14 FOR ALL DITCH DETAILS.
SEE SHEET NO. 14 FOR ALL DITCH DETAILS.

THE ENDOWMENT FUND OF NC STATE
UNIVERSITY ET AL. (HOFMANN FOREST).
DB, 170, PG. 263
DB, 516 PG. 408
HISTORIC PROPERTY



THE ENDOWMENT FUND OF NC STATE
UNIVERSITY ET AL. (HOFMANN FOREST).
DB, 170, PG. 263
DB, 516 PG. 408
HISTORIC PROPERTY

140+00

139+00

NAD 83
NC GRID

ROADWAY DESIGN BY:
TAYLOR, WISEMAN & TAYLOR
ENGINEERS • SURVEYORS • PLANNERS
P.O. BOX 200, SUITE H, CARY, N.C. 27511
TELEPHONE NO. (919) 297-0088 FAX NO. (919) 297-0080

PROJECT REFERENCE NO. R-251A
SHEET NO. 16

ROADWAY DESIGN ENGINEER
JAMES H. JAMES
Professional Engineer
No. 22294
North Carolina
1975

HYDRAULIC DESIGN ENGINEER
JAMES H. JAMES
Professional Engineer
No. 22294
North Carolina
1975

CONST. REV.
R/W REV.

10 0 5

TRANSTEC CORPORATION
4811 North Edge Drive, Suite 235
Raleigh, NC 27606 (919) 233-8125

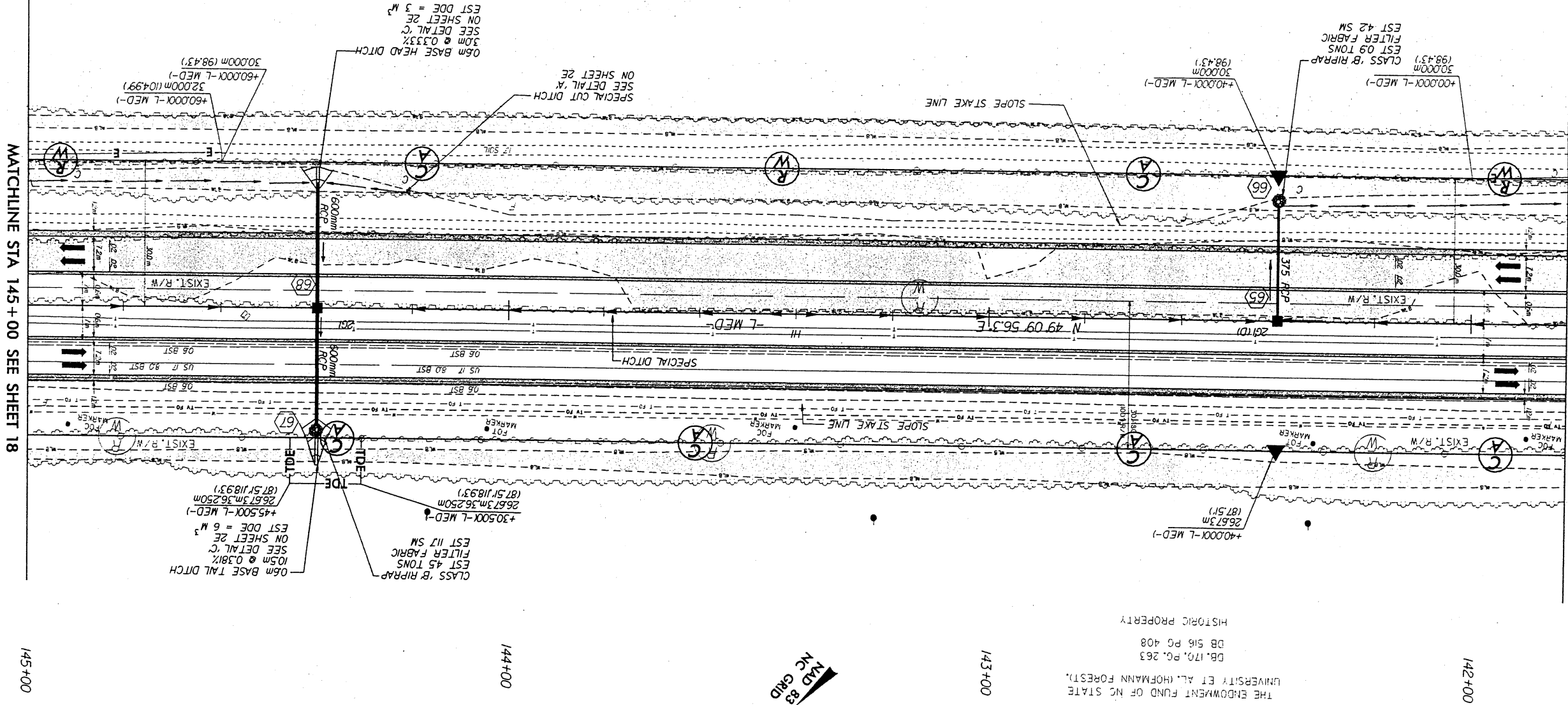
HYDRAULIC DESIGN:
JAMES H. JAMES
Professional Engineer
No. 22294
North Carolina
1975

ROADWAY DESIGN:
JAMES H. JAMES
Professional Engineer
No. 22294
North Carolina
1975

THE ENDOWMENT FUND OF NC STATE
UNIVERSITY ET AL. (HOFMANN FOREST)
DB 516 PG. 408
DB 510 PG. 263
HISTORIC PROPERTY

32

MATCHLINE STA 141+80 SEE SHEET 16



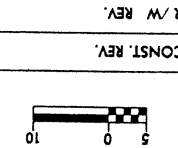
MATCHLINE STA 145+00 SEE SHEET 18

THE ENDOWMENT FUND OF NC STATE
UNIVERSITY ET AL. (HOFMANN FOREST)
DB 516 PG. 408
DB 510 PG. 263
HISTORIC PROPERTY

32

NAD 83
NC GRID

ROADWAY DESIGN BY:
TAYLOR • WISEMAN & TAYLOR
ENGINEERS • SURVEYORS • PLANNERS
P.O. BOX 281
3600 REGENCY PARKWAY, SUITE H, CARY, N.C. 27511
TELEPHONE NO. (919) 287-0088 FAX NO. (919) 287-0080



R/W REV.
CONST. REV.

R/W REV.
CONST. REV.

PROJECT REFERENCE NO.	R-2514A
SHEET NO.	17
ROADWAY DESIGN	
HYDRAULIC DESIGN	
TAYLOR • WISEMAN & TAYLOR	
ENGINEERS • SURVEYORS • PLANNERS	
P.O. BOX 281	
3600 REGENCY PARKWAY, SUITE H, CARY, N.C. 27511	
TELEPHONE NO. (919) 287-0088 FAX NO. (919) 287-0080	

40 11/25/2008 11:50:51 AM 2008 09/28/2008 11:50:51 AM R-2514A.PDX PSH18.dgn

MATCHLINE STA 145+00 SEE SHEET 17

145+00

146+00

NAD 83
NC GRID

THE ENDOWMENT FUND OF NC STATE
UNIVERSITY ET AL. (HOFFMANN FOREST)
DB 516 PG 408
DB 170 PG 263
HISTORIC PROPERTY

32

147+00

148+00

MATCHLINE STA 148+20 SEE SHEET 19

THE ENDOWMENT FUND OF NC STATE
UNIVERSITY ET AL. (HOFFMANN FOREST)
DB 516 PG 408
DB 170 PG 263
HISTORIC PROPERTY

32

SPECIAL CUT DITCH
SEE DETAIL 'A'
ON SHEET 2E

CLASS 'B' RIPRAP
EST 09 TONS
FILTER FABRIC
EST 42 SM

+50.000 (-98.43')
50.000m L-MED-1

+90.000 (-1.51')
26.573m L-MED-1

RETAIN
450mm
RCP

RETAIN
450mm
RCP

RETAIN
450mm
RCP

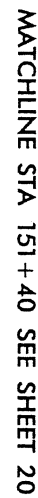
RETAIN
450mm
RCP

ROADWAY DESIGN BY:
TAYLOR • WISEMAN & TAYLOR
ENGINEERS • SURVEYORS • PLANNERS
P.S. • SUBSURFACE UTILITY ENGINEERING
3500 REGENCY PARKWAY, SUITE H, CARY, N.C. 27811
TELEPHONE NO. (919)297-0085 FAX NO. (919)297-0080

METRIC
SCALE: 1" = 10'
CONST. REV.
R/W REV.

PROJECT REFERENCE NO. R-2514A
SHEET NO. 18
ROADWAY DESIGN: **TRANSTHEM**
HYDRAULIC DESIGN:
497 WATERS EDGE DRIVE, SUITE 235
FARMINGTON, NC 27606 (919) 233-8125

SEE SHEET 148 FOR ALL DRAINAGE DETAILS.
SEE SHEET 149 FOR ALL DITCH DETAILS.
SEE SHEET 148 FOR ALL GRADES AND PROFILES.




ROADWAY DESIGN BY:

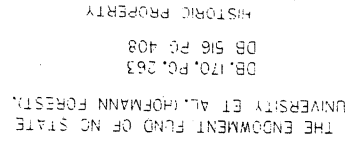
TAYLOR • WISEMAN & TAYLOR

ENGINEERS • SURVEYORS • PLANNERS
P. O. BOX 100 • SUBURBAN UTILITY ENGINEERING

3500 REGENCY PARKWAY, SUITE H, CARY, N.C. 27511
TELEPHONE NO. (919) 297-0085 FAX NO. (919) 297-0080



<p>HYDRAULICS ENGINEER</p>	<p>ENGINEER NORTH CAROLINA</p>
<p>19 SHEET NO.</p>	<p>R-2314A PROJECT REFERENCE NO.</p>
<p>R/W SHEET NO.</p>	<p>ROADWAY DESIGN</p>



MATCHLINE STA 151+40 SEE SHEET 19

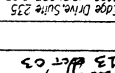
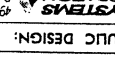


THE ENDOWMENT FUND OF NC STATE
UNIVERSITY ET AL. (HOFMANN FOREST),
DB, 170, PG. 263
DB 516 PG 408
HISTORIC PROPERTY



153+00

152+00

154+00

TAYLOR • WISEMAN & TAYLOR
ENGINEERS • SURVEYORS • PLANNERS
P.O. BOX 100 • SUBSURFACE UTILITY ENGINEERING
3600 REGENCY PARKWAY, SUITE H, CARY, N.C. 27511
TELEPHONE NO. (919) 297-0088 FAX NO. (919) 297-0090

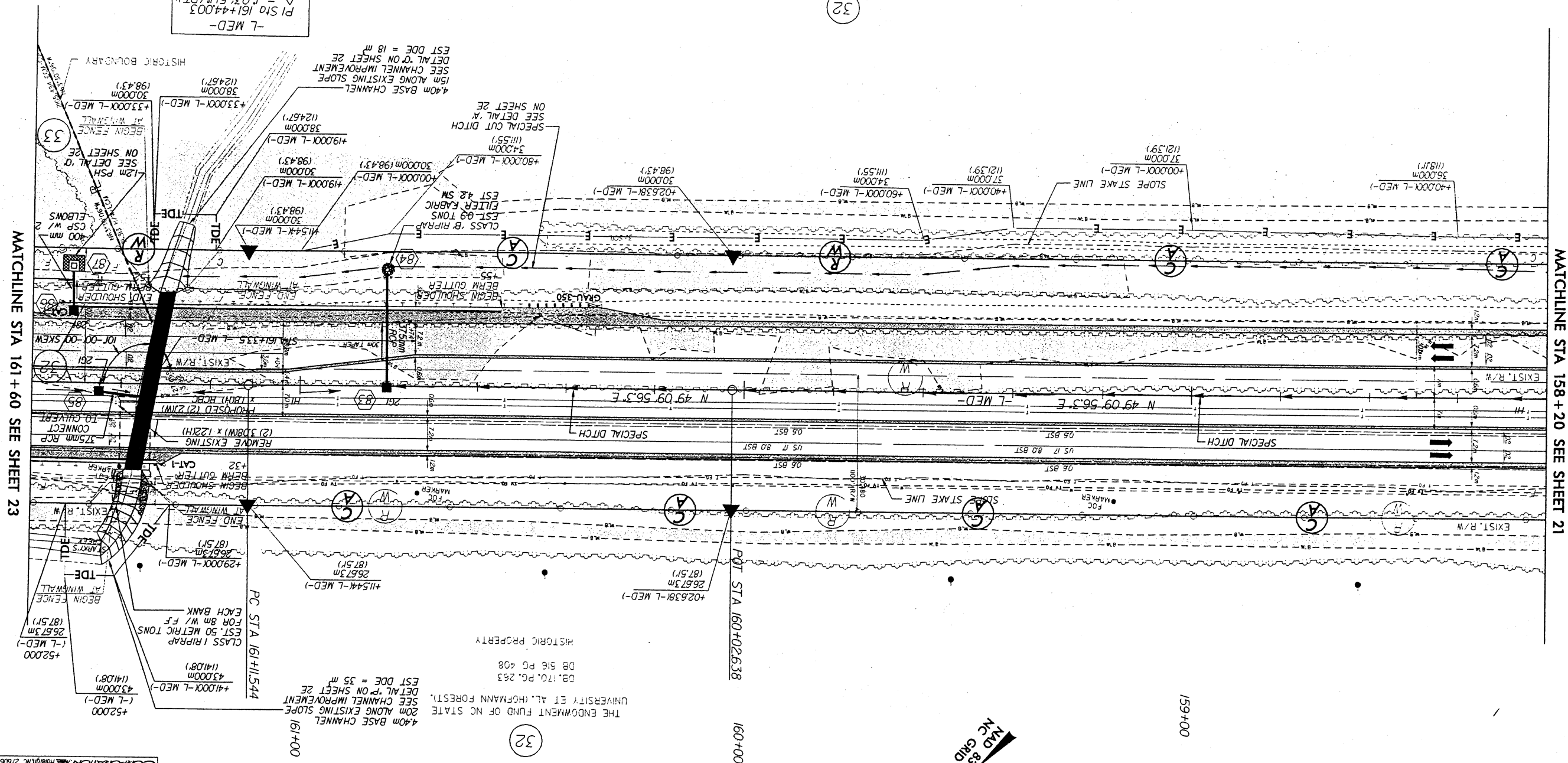
							
PROJECT REFERENCE NO. _____		R-2514A		R/W SHEET NO. _____		R/W SHEET NO. _____	
SHEET NO. _____		20		HYDRAULICS		ROADWAY DESIGN	
NORTH CAROLINA PROFESSIONAL ENGINEER 19275 STATE LICENSE		NORTH CAROLINA PROFESSIONAL ENGINEER 19275 STATE LICENSE		NORTH CAROLINA PROFESSIONAL ENGINEER 19275 STATE LICENSE		NORTH CAROLINA PROFESSIONAL ENGINEER 19275 STATE LICENSE	
13 OCT 03		13 OCT 03		13 OCT 03		13 OCT 03	
235 SLOPE ST. ELDERIDGE, NC 27606 (919) 272-9125		235 SLOPE ST. ELDERIDGE, NC 27606 (919) 272-9125		235 SLOPE ST. ELDERIDGE, NC 27606 (919) 272-9125		235 SLOPE ST. ELDERIDGE, NC 27606 (919) 272-9125	
HYDRAULIC DESIGN:		HYDRAULIC DESIGN:		HYDRAULIC DESIGN:		HYDRAULIC DESIGN:	
CONSTRUCTION SYSTEMS, INC.		CONSTRUCTION SYSTEMS, INC.		CONSTRUCTION SYSTEMS, INC.		CONSTRUCTION SYSTEMS, INC.	

PROJECT REFERENCE NO. R-2514A		SHEET NO. 21	
ROADWAY DESIGN R / W SHEET NO.		HYDRAULICS ENGINEER	
			
HYDRAULIC DESIGN: 15.00.03			

32

SEE SHEET 0- FOR ALL OTHER DETAILS
SEE SHEET 0- FOR ALL OTHER DETAILS

$\Delta = 1.03, 51.1 (RT)$
 $L = 64.915$
 $T = 32.459$
 $R = 3.495.000$
 $SE = NC$



THE ENDOWMENT FUND OF NC STATE
UNIVERSITY ET AL. (HOFMANN FOREST).
DB. 170, PG. 263

DB. 170. PG. 263
DB 516 PG 408
HISTORIC PROPERTY

32

NAD
NC
GRID 83

159+00

MATCHLINE STA 158+20 SEE SHEET 21

MATCHLINE STA 161+60 SEE SHEET 23

ROADWAY DESIGN BY:
TAYLOR • WISEMAN & TAYLOR
ENGINEERS • SURVEYORS • PLANNERS
P.E.'S • SUBSURFACE UTILITY ENGINEERING
3500 REGENCY PARKWAY, SUITE H, CARY, N.C. 27511
TELEPHONE NO. (919) 287-0088 FAX NO. (919) 287-0090

[illegible]

SEE SHEET NO. 25 FOR RE-DITCH DETAILS.

THE SHEET VOLUME FOR 1974-75

$PI_{Sta} = 163 + 88.511$
 $\Delta = 104' 33.1'' (LT)$
 $L = 65.627$
 $T = 32.814$
 $R = 3,495.000$
 $SE = NC$

GREAT EASTERN TIMBER
CO. LLC.
DB. 1606, PG. 319

MATCHLINE STA 165+00 SEE SHEET 24

MATCHLINE STA 161+60 SEE SHEET 22

162+00

**WAD
NC
GRIL**

163+00

164+00

BETTY C.
SUTHERLAND
785, PG. 00
520, PG. 713

35

ROADWAY DESIGN BY:

TAYLOR • WISEMAN & TAYLOR

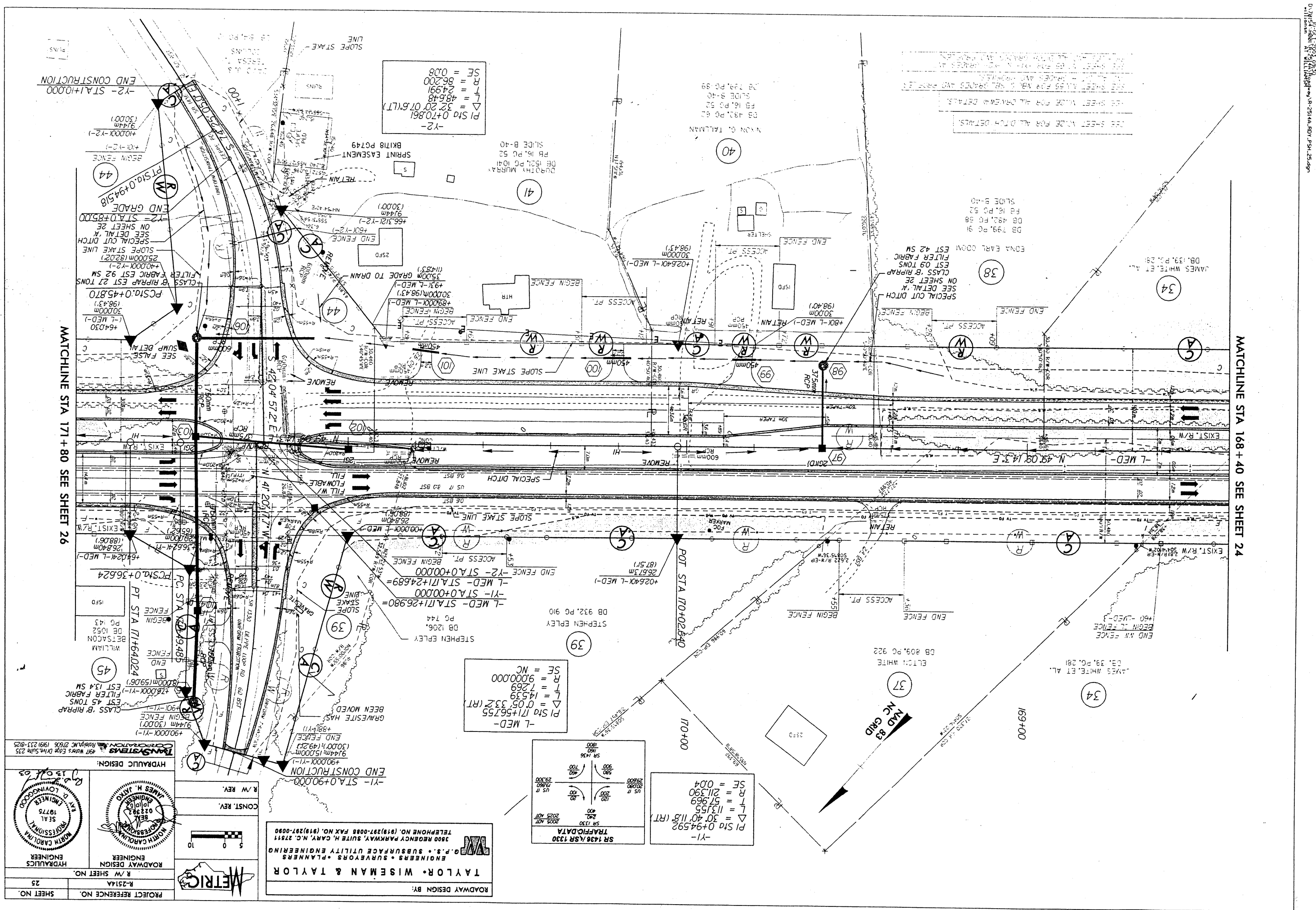
G.P. • ENGINEERS • SURVEYORS • PLANNERS

300 REGENCY PARKWAY, SUITE H, CARY, N.C. 27511

TELEPHONE NO. (919) 237-0088 FAX NO. (919) 237-0090

A metric ruler showing centimeters from 0 to 10. Below the ruler is a map of the United States with the word 'METRIC' written vertically across it.

		ROADWAY DESIGN R/W SHEET NO. 23
HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 18778 JAMES H. MAYO ENGINEER	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 18778 JAMES H. MAYO ENGINEER	PROJECT REFERENCE NO. R-2514A



MATCHLINE STA 175 + 20 SEE SHEET 26

44

GRACE EUBANK HORTON
DB. 1345, PG. 563
DB. 1331, PG. 975
DB. 593, PG. 178

SPECIAL CUT DITCH
SEE DETAIL 'A'
ON SHEET 26

+026.5371-L MED-
(199.43')
30.000m

NO. 25
14.25m R/W COR

SLOPE STAKE LINE

48

PERCY PARKER, ET AL.
DB. 853, PG. 663
PB. 25, PG. 22, SLIDE D-210
DB. 1427, PG. 605

END FENCE
ACCESS PT.

W

345.5720E
359.25' P/W COR

49

HAZEL S. PARKER
DB. 853, PG. 661
PB. 25, PG. 22, SLIDE D-210

END FENCE

ACCESS PT.

MATCHLINE STA 178 + 60 SEE SHEET 28

44

GRACE EUBANK HORTON
DB. 1345, PG. 563
DB. 1331, PG. 975
DB. 593, PG. 178

176+00

POT STA 176+02637

SEE DETAIL 'C'
ON SHEET 26
40m @ 0.00%
EST DDE = 94 M³
FULL DEPTH CLEAOUT
10m @ 0.00%
SEE DETAIL 'A'
ON SHEET 26
EST DDE = 51 M³

+67.000X-L MED-
(248.69')
75.800m

177+00

177+00

HAZEL S. PARKER
DB. 853, PG. 661
PB. 25, PG. 22, SLIDE D-210

CLASS 'B' RIPRAP
EST. 4.5 TONS
FILTER FABRIC
EST. 117 SM
+54.000X-L MED-
(88.06')
26.840m

END FENCE
ACCESS PT.

178+00

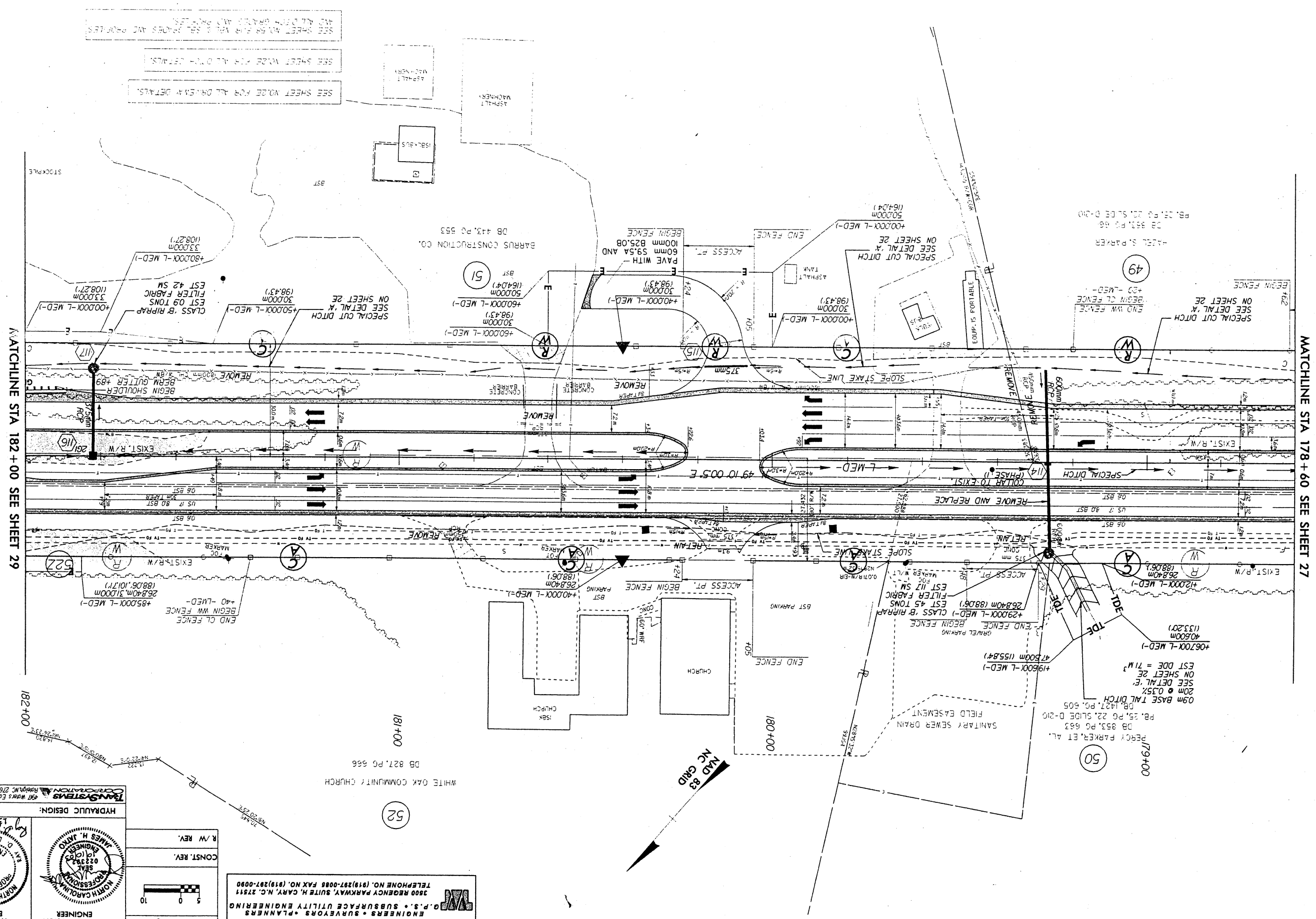
50

PERCY PARKER, ET AL.
DB. 853, PG. 663
PB. 25, PG. 22, SLIDE D-210
DB. 1427, PG. 605

ROADWAY DESIGN BY:
TAYLOR, WISEMAN & TAYLOR
ENGINEERS • SURVEYORS • PLANNERS
G.P.S. • SUBSURFACE UTILITY ENGINEERING
3600 REOBANCY PARKWAY, SUITE H, CARY, N.C. 27511
TELEPHONE NO. (919) 297-0085 FAX NO. (919) 297-0080



METRIG
5 0 10
CONST. REV.
R/W REV.

PROJECT REFERENCE NO. R-2514A
SHEET NO. 27
ROADWAY DESIGN ENGINEER
JAMES H. JINKS
NORTH CAROLINA PROFESSIONAL ENGINEER
102392
19775
SEAL
NORTH CAROLINA
HYDRAULICS ENGINEER
1304163
TRANS SYSTEMS CORPORATION
4917 WATERS EDGE DRIVE, SUITE 235
Raleigh, NC 27606 (919) 233-8125



WATCHLINE STA 182+00 SEE SHEET 29

MATCHLINE STA 178+60 SEE SHEET 27

ROADWAY DESIGN BY: TAYLOR • WISEMAN & TAYLOR ENGINEERS • SURVEYORS • PLANNERS P.O. BOX 100, SUBSURFACE UTILITY ENGINEERING 3500 REGENCY PARKWAY, SUITE H, CARY, N.C. 27514 TELEPHONE NO. (919) 297-0088 FAX NO. (919) 297-0090		 JAMES H. JATRO PROFESSIONAL ENGINEER STATE OF NORTH CAROLINA 19775	 DAVID O. LOVINGSGOOD PROFESSIONAL ENGINEER STATE OF NORTH CAROLINA 19775
PROJECT REFERENCE NO. R-2514A R/W SHEET NO. 28		HYDRAULIC DESIGN: TAYLOR • WISEMAN & TAYLOR 19775 19775 19775	

MATCHLINE STA 182+00 SEE SHEET 28

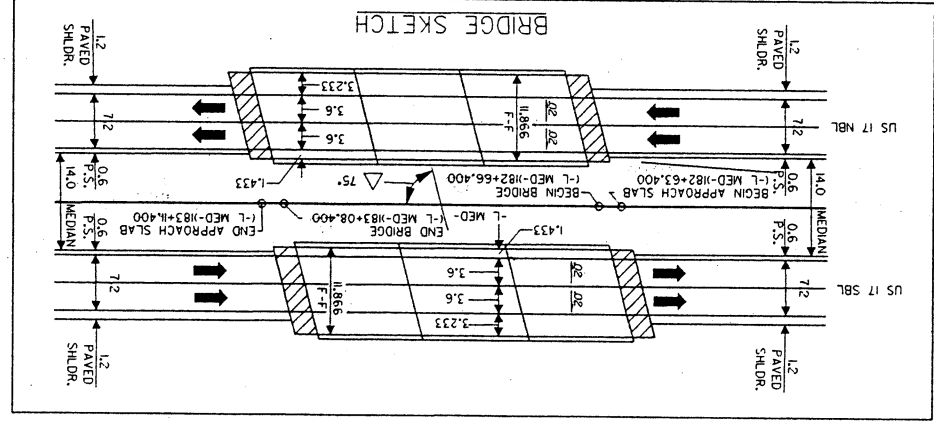
MATCHLINE STA 185+40 SEE SHEET 30

SEE SHEET S- THROUGH SHEET S- FOR
ALL STRUCTURE DETAILS.
SEE SHEET NO. 28 FOR ALL DITCH DETAILS.
SEE SHEET NO. 29 FOR ALL DITCH DETAILS.
SEE SHEET NO. 29 FOR ALL DITCH DETAILS.

DONALD WHITE
DB. 944, PG. 472 - 476
MB. 26, PG. 164, SLIDE E-192

JAMES KEITH, JR., ET AL.
DB. 1517, PG. 202

BETTY PEARCE, ET AL.
DB. 443, PG. 351



ROADWAY DESIGN BY:
TAYLOR, WISEMAN & TAYLOR
ENGINEERS • SURVEYORS • PLANNERS
3500 REGENCY PARKWAY, SUITE H, CARY, N.C. 27511
TELEPHONE NO. (919) 297-0088 FAX NO. (919) 297-0090

PROJECT REFERENCE NO. R-2514A
SHEET NO. 29

ROADWAY DESIGN
ENGINEER
JAMES H. JAYNO
NORTH CAROLINA
PROFESSIONAL
ENGINEER
023382
10/23/2003

HYDRAULIC DESIGN
ENGINEER
D. LONGGORD
NORTH CAROLINA
PROFESSIONAL
ENGINEER
023382
10/23/2003

CONST. REV.
R/W REV.

10 0 10

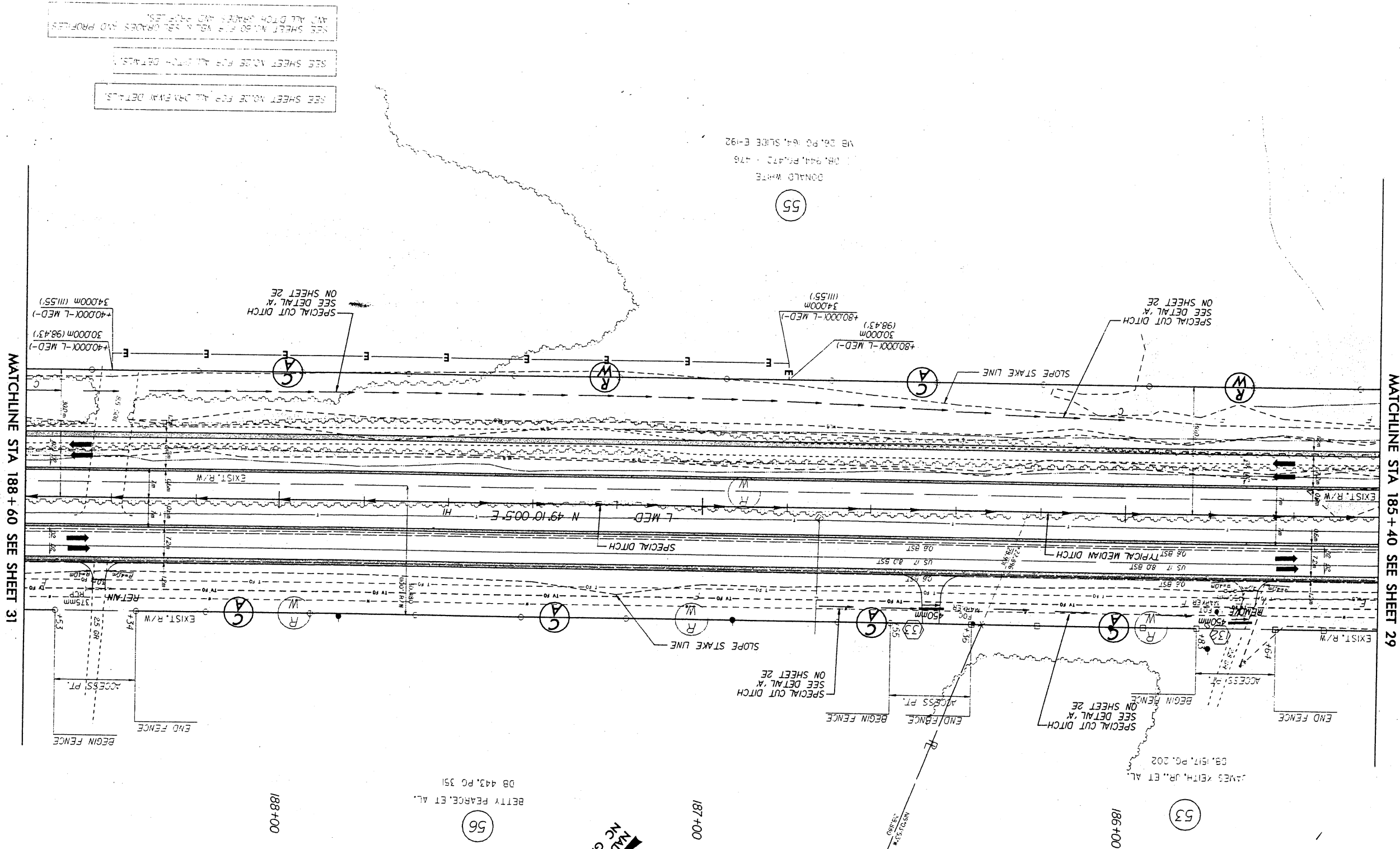
PROJECT REFERENCE NO. R-2514A
SHEET NO. 29

ROADWAY DESIGN
ENGINEER
JAMES H. JAYNO
NORTH CAROLINA
PROFESSIONAL
ENGINEER
023382
10/23/2003

HYDRAULIC DESIGN
ENGINEER
D. LONGGORD
NORTH CAROLINA
PROFESSIONAL
ENGINEER
023382
10/23/2003

CONST. REV.
R/W REV.

10 0 10



PROJECT REFERENCE NO. R-2514A SHEET NO. 30

ROADWAY DESIGN: JAMES H. JINNO, PROFESSIONAL ENGINEER, NORTH CAROLINA, 19775, SEAL, 023383, 101003

HYDRAULIC DESIGN: KATHY D. LOVINGGOOD, PROFESSIONAL ENGINEER, NORTH CAROLINA, 19775, SEAL, 023383, 101003

SCALE: 1" = 40'

CONSTRUCTION REVIEW: R/W REVIEW

ROADWAY DESIGN BY: TAYLOR, WISEMAN & TAYLOR

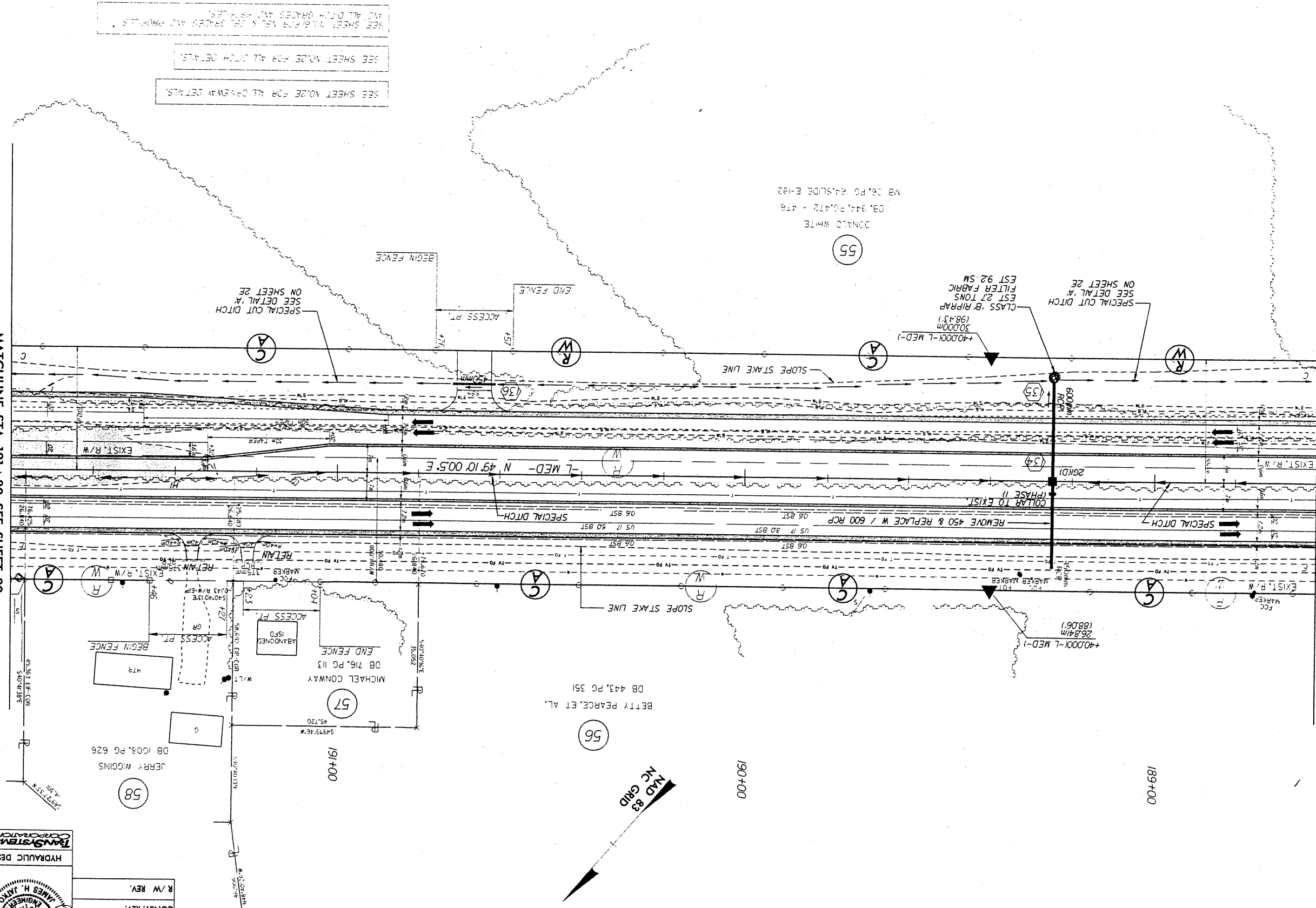
ENGINEERS • SURVEYORS • PLANNERS
P.E. • SUBSURFACE UTILITY ENGINEERING

3800 REGENCY PARKWAY, SUITE H, CARY, N.C. 27511
TELEPHONE NO. (919) 297-0088 FAX NO. (919) 297-0080

0.11155-561-2003-0913
0.11155-561-2003-0913
0.11155-561-2003-0913

MATCHLINE STA 188 + 60 SEE SHEET 30

MATCHLINE STA 191 + 80 SEE SHEET 32



SEE SHEET NO. 26 FOR ALL DITCH DETAILS.
SEE SHEET NO. 26 FOR ALL DITCH DETAILS.
SEE SHEET NO. 26 FOR ALL DITCH DETAILS.

ROADWAY DESIGN BY: **TAYLOR, WISEMAN & TAYLOR**
ENGINEERS • SURVEYORS • PLANNERS
P.O. BOX 1000, SUITE 100, CARY, N.C. 27511
TELEPHONE NO. (919) 297-0088 FAX NO. (919) 297-0080

CONSTR. REV. _____
R/W REV. _____

METRIC

10 0 5

PROJECT REFERENCE NO. R-2514A
SHEET NO. 31

HYDRAULIC DESIGN: **ANDREW H. JENKINS**
PROFESSIONAL ENGINEER
NORTH CAROLINA
010106
02/28/97
19775

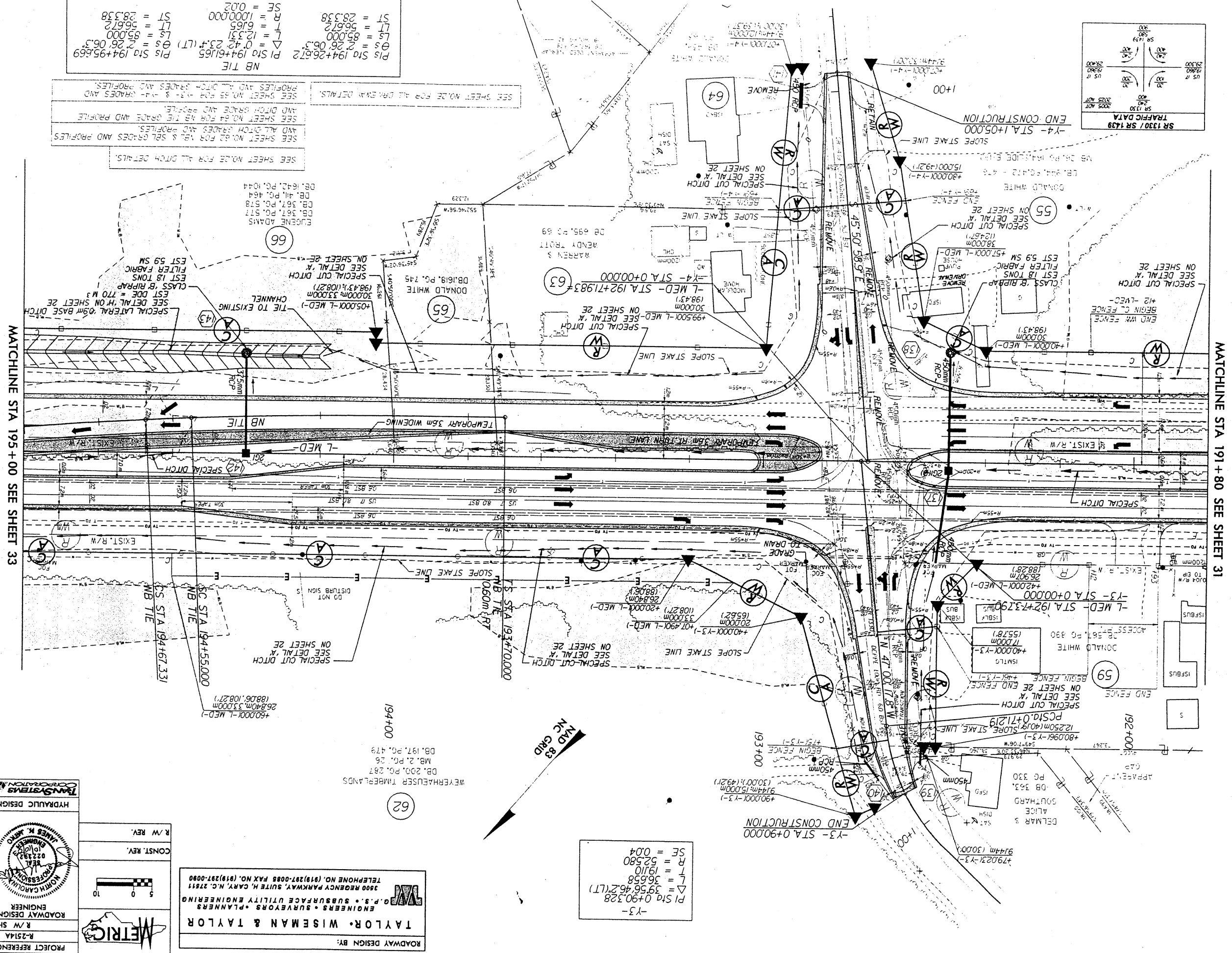
13 OCT 03

TAYLOR, WISEMAN & TAYLOR
CORPORATION
4911 WATERS EDGE DRIVE, SUITE 255
HARRISBURG, NC 27606 (919) 233-8125

TRAFFIC DATA			
SR 1330 / SR 1439	SR 1330	SR 1439	2005 ADT
US 17	300	300	2005 ADT
US 17	200	200	2005 ADT
US 17	200	200	2005 ADT
US 17	200	200	2005 ADT

PIS STA 194+26.672	PIS STA 194+61.65	PIS STA 194+95.669	NB TIE
$\Delta = 0.42$	$\Delta = 2.26$	$\Delta = 2.26$	$\Delta = 0.42$
$L = 12.33$	$L = 85.000$	$L = 85.000$	$L = 12.33$
$R = 1,000.000$	$R = 1,000.000$	$R = 1,000.000$	$R = 1,000.000$
$SE = 0.02$	$SE = 0.02$	$SE = 0.02$	$SE = 0.02$

SEE SHEET NO. 32 FOR ALL DITCH DETAILS.
SEE SHEET NO. 32 FOR ALL GRADES AND PROFILES.
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-Y-3-	PIS STA 0+90.328	$\Delta = 39.56$	$\Delta = 46.2$	(LT)
-Y-3-	$L = 36.58$	$L = 19.10$	$R = 52.80$	$SE = 0.04$

ROADWAY DESIGN BY: TAYLOR, WISEMAN & TAYLOR
ENGINEERS • SURVEYORS • PLANNERS
3500 REGENCY PARKWAY, SUITE H, CARY, NC 27511
TELEPHONE NO. (919) 297-0088 FAX NO. (919) 297-0080

METRIC
R/W REV.
CONST. REV.

PROJECT REFERENCE NO. R-2514A SHEET NO. 32
HYDRAULIC DESIGN: JAMES K. LLOYD, PROFESSIONAL ENGINEER
ROADWAY DESIGN: JAMES K. LLOYD, PROFESSIONAL ENGINEER
SEAL 19775
NORTH CAROLINA PROFESSIONAL ENGINEER

