STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

January 4, 2008

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

Attn: Mr. William Wescott
NCDOT Coordinator

Dear Sir:

Subject: **Application for an Individual Section 404 permit for construction of the US 70 Bypass.** Construction of the US 70 bypass from west of NC 581 in Wayne County, to east of Goldsboro in the vicinity of SR 1323 (Promise Land Rd) in Lenoir County. State Project No. 6.339002T. TIP No. R-2554. WBS 34461.1.1.

The North Carolina Department of Transportation (NCDOT), Division of Highways, in consultation with the Federal Highway Administration (FHWA), proposes to construct the US 70 bypass around Goldsboro on new location. Construction of the US 70 bypass begins west of NC 581 in Wayne County and ends east of Goldsboro in the vicinity of SR 1323 (Promise Land Rd) in Lenoir County. The project is approximately 20 miles in length and has been divided into four sections: A, BA, BB, and C.

The purpose of this letter is to request approval for an U.S. Army Corps of Engineers (USACE) Section 404 Individual Permit. In addition to the cover letter and ENG Form 4345, this application package includes the following: permit drawings, Merger 4B and 4C meeting minutes, onsite mitigation plans, 2005 Resource Update, and a set of half-size roadway plans.

1.0 Purpose and Need

The purpose and need for this project, as identified in the Final Environmental Impact Statement (FEIS), is to improve safety, increase traffic capacity to meet projected transportation needs, and reduce travel times.

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2.0 Project Description

The improvements involve the construction of a new US 70 Goldsboro Bypass from existing US 70 west of Goldsboro in the vicinity of SR 1237 (Community Drive) in Wayne County to existing US 70 east of Goldsboro in the vicinity of SR 1323 (Promise Land Road) in Lenoir County. Proposed improvements include construction of a multi-lane, full control of access freeway, interchanges at locations with major traffic movements, and grade separations at minor crossroads and railroads. The facility will be a four-lane divided freeway on new location extending approximately 20 miles.

3.0 Summary of Impacts

Waters of the U.S.: Proposed impacts to jurisdictional areas of R-2554 total 27.63 acres of permanent wetland impacts and 13,153 linear of permanent stream impacts. See Table 1 for the permanent and temporary impact summary for all sections.

Table 1. Summary of Wetland and Stream Impacts for R-2554

Section	Permanent Wetland (ac.)		Temporary Wetland (ac.)		Permanent Stream (ft.)	Temporary Stream (ft.)
	Riverine	Non-riverine	Riverine	Non-riverine		
A*	1.89	0.38	0.24	0.00	949	0
BA	2.83	2.96	0.00	0.00	3,887	254
BB*	0.02	0.42	0.00	0.00	3,901	234
C*	11.58	7.54	0.00	0.00	4,416	0
Total	16.32	11.30	0.24	0.00	13,153	488

* Impacts are based on preliminary design, therefore, these sections are expected to decrease once the final design is completed.

4.0 Summary of Mitigation

This project has been designed to avoid and minimize impacts to jurisdictional areas in accordance with the National Environmental Policy Act (NEPA) throughout the design process. The Claridge Nursery site, which is adjacent to the roadway project in HU 03020201, has a total of 10,760 feet of stream restoration. This site will be debited 8,716 feet. The Bear Creek – Mill Branch Wetland Mitigation Bank (located at Impact Site 12, HU 03020202) will be debited to cover 26.84 acres of jurisdictional wetland impacts. Natural Stream Design (NSD) and onsite stream and wetland mitigation will be used to cover the remaining impacts. Summaries are provided below in Tables 2 and 3. Additional information can be found in Section 11.3 of this application.

Table 2. Summary of Wetland Mitigation for R-2554

Section	Wetland Mitigation (ac) (Ratio)		
	Restoration (1:1)	Preservation (5:1)	Total Credits Proposed
R-2554 BA Tommy's Road (Site 8)	0.33	2.37	0.79
R-2554C - Bear Creek Bank (Site 12)	26.84	0.00	26.84
Totals	27.17	2.37	27.63

Table 3. Summary of Stream Mitigation for R-2554

Section	Stream Mitigation (lf) (Ratio)		
	Restoration (1:1)	Preservation (5:1)	Total Credits Proposed
R-2554 A-Claridge Nursery	8,716	0	8,716
R-2554 BA – NSD* Site 4	1,083	0	1,083
R-2554 BA – NSD* Site 5	561	0	561
R-2554 BA-Tommys Rd (Site 8)	61	691	199
R-2554 BB – NSD* Site 9	1,236	0	1,236
R-2554 C - UT West Bear Creek Mitigation Site	1,243	0	1,243
Totals	12,900	691	13,038

* Natural Stream Design

5.0 Project Schedule

Construction of this project is divided into four sections (See Table 4 below). Permit drawings for each of the four sections are included in this permit application. The attached permit drawings are final in detailing all proposed impacts occurring within section R-2554 BA. However, permit drawings for sections R-2554 A, BB, and C detail the current best preliminary alignment and maximum potential impacts. The impacts associated with sections R-2554 A, BB, and C are expected to decrease once the final design is completed. Final permit drawings for R-2554 A, BB, and C will be provided under separate cover in the form of a permit modification request. NCDOT understands that no construction will occur on Sections A, BB, or C until the final design and resulting impacts have been approved by the regulatory agencies.

Table 4. Project Sections and Scheduling

Section	**Project Limits**	**Scheduled Let Date**
R-2554 A	West of NC 581 to SR 1300	Post year
R-2554 BA	SR 1300 to East of SR 1556	8/19/2008
R-2554 BB	East of SR 1556 to West of SR 1714	Post year
R-2554 C	West of SR 1714 to East of SR 1323 in Lenoir Co.	Post year

6.0 NEPA Document Status

The Draft Environmental Impact Statement (DEIS) was completed on April 28, 1994. The FHWA and NCDOT completed the Final Environmental Impact Statement (FEIS) on February

18, 1998 in compliance with the NEPA guidelines. The FEIS explains the purpose and need for the project, provides a description of the alternatives considered, and characterizes the social, economic, and environmental effects. The FEIS was approved and circulated to federal, state, and local agencies. A Record of Decision (ROD) was approved on August 3, 1998. Right of Way Consultations were completed on January 5, 2005 for R-2554 BA and December 7, 2005 for R-2554 A. Jurisdictional wetland and stream areas were re-verified by the USACE on October 19, 2005. Copies of the project documents have been provided to regulatory review agencies involved in the approval process. Additional copies will be provided upon request.

R-2554 did not originally go through the NEPA/404 merger process, however, a merger meeting was held on January 10, 2000. At this meeting, the merger team verbally agreed on Concurrence Points 1 through 4 (now 4A). At a Concurrence Point 4B meeting held for R-2554B, merger team members asked that formal concurrence forms be signed for the project. At a meeting held on December 17, 2003, the merger team signed concurrence forms for Concurrence Points 3 and 4A.Concurrence Points 4B and 4C were reached for the BA section on June 16, 2004 and December 14, 2005, respectively.

6.1 Independent Utility

R-2554 is in compliance with 23 CFR Part 771.111(f) which lists the FHWA characteristics of the independent utility of a project. The project meets the criteria for independent utility as discussed below:

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

7.0 Resource Status

The project is located in the Neuse River Basin and lies within in two Hydrologic Units (03020201, 03020202). Best Usage Classifications for jurisdictional streams are provided in the attached 2005 Updated Resources Packet. Neither High Quality Waters (HQW), Water Supplies (WS-I: undeveloped watersheds or WS-II: predominately undeveloped watersheds), nor Outstanding Resource Waters (ORW) occur within 1.0 mile of the project study area. Latham Creek is not designated as a North Carolina Natural or Scenic River, or as a National Wild and Scenic River. Additionally, none of the jurisdictional streams are listed on the Final 2006 Section 303(d) list of impaired waters due to sedimentation for the Neuse River Basin, nor does it drain into any Section 303(d) waters within 1.0 mile of the project study area.

7.1 Wetland Delineations

A wetland identification and preliminary assessment analysis for the study area was performed and summarized in the 1992 Natural Systems Report Goldsboro Bypass (NRTR). A 1993 Wetland Delineation and Functional Assessment Report was prepared for the project and discussed the major wetland impacts associated with the project. After the selection of Alternative 9 as the Preferred Alternative, the wetlands within that corridor were delineated based on the 1987 USACE Wetland Delineation Manual and a preliminary design was prepared to avoid and minimize wetlands to the maximum extent possible. This delineation was verified by Mr. Mike Bell of the USACE, Wilmington District in October 1995. Jurisdictional wetlands within the project area are shown on Exhibits 2.4-1 through 2.4-21 and described in detail in Section 3.6.4. within the FEIS. A field review was conducted of the original (1995) and updated delineation on July 26, 2005 and August 24, 2005 with Bill Biddlecome of the USACE. Jurisdictional wetland and stream areas were verified on October 19, 2005.

7.2 Stream Delineations

A Stream Assessment Report was completed in July of 1999. A field review was conducted of the original (1995) and updated delineation on July 26, 2005 and August 24, 2005 with Bill Biddlecome of the USACE. During this review, current jurisdictional wetland and stream areas were verified and an Important/Unimportant determination was conducted for each jurisdictional stream channel.

7.3 R-2554 BA: Characterization of Jurisdictional Sites

7.3.1 Wetlands

Based on the U.S. Fish and Wildlife Service (USFWS) Wetland Inventory Maps, seven jurisdictional wetland types are found within the project area. A detailed discussion of these systems is provided in the 1992 NRTR.

The wetlands occurring throughout the project area vary in vegetative composition and hydrological regime. Riverine wetlands within the Little River channel will not be directly impacted by the project, and therefore, have been eliminated from further discussion. The following wetland systems have been identified.

Palustrine forested, broad-leaved deciduous wetlands, seasonally/temporarily flooded (PFO1 C/A)

Deciduous, palustrine wetlands are concentrated along streams and tributaries, receive seasonal inundation and support bottomland forest vegetation. These systems are functionally valuable ecosystems and are expected to have high functional value for sediment stabilization, sediment/toxicant retention, nutrient removal/transformation, floodflow alteration, and wildlife habitat.

Palustrine forested, needle-leaved evergreen/broad-leaved deciduous wetlands (PFO4/1)
Pine mixed hardwood wetlands are found along the upper fringes of floodplains and stream corridors and within isolated woodlots subject to groundwater saturation. These wetland communities are important for sediment stabilization, sediment/toxicant retention, and nutrient removal/transformation, due to their interspersion among agricultural fields. The wildlife habitat value of pine mixed hardwood wetlands is expected to be moderate to high due to canopy diversity and continuity with other bottomland communities.

Palustrine forested, needle-leaved evergreen wetlands (PFO4)
The majority of pine-dominated wetlands occur in small, isolated areas throughout the project area, with a large concentration located in a former Carolina Bay north of the Elroy community. However, silvicultural operations such as loblolly pine plantings, ditching, and bedding have greatly changed the natural characteristics of this area. These wetland systems have moderate potential for sediment stabilization, sediment/toxicant retention, and nutrient removal/transformation functions. Floodflow alteration and wildlife habitat are considered minimal in these evergreen wetlands.

Palustrine forested, evergreen wetlands (PFO7)
Evergreen palustrine wetland types refer to the pine/bay systems found in Walnut Pocosin and Carolina Bays throughout the project area. The largest concentration of pine/bay wetlands are located within a former bay near the Elroy community. Evergreen palustrine wetlands are of moderate importance for sediment stabilization, sediment/toxicant retention, and nutrient removal/transformation functions. Floodflow alteration and wildlife habitat values are considered minimal in these systems.

Palustrine emergent wetlands (PEM)
Palustrine emergent wetlands are herbaceous systems consisting of soft rush, sedges, bulrush and a variety of grasses. These wetlands are generally limited in size and distribution and are located in bottomlands or wetland forest tracts cleared by logging, along utility corridors, on former farmland tracts, and in fallow fields. Emergent communities along the study corridors have low wetland value due to their limited size and distribution.

See the attached packet, 2005 Updated Resources, for detailed information pertaining to jurisdictional wetlands.

7.3.2 Streams

As part of the 1999 assessment, all stream reaches falling within the 1,000 ft. study corridor of the Preferred Alternative were identified and assessed. This assessment was reviewed in the field on July 01, 1999 by representatives from North Carolina Department of Environment and Natural Resources; Division of Water Quality (NCDENR; DWQ), the USACE, and the North Carolina Wildlife Resources Commission (NCWRC). See the attached packet, 2005 Updated Resources, for the table with all the stream information.

7.4 Impacts to Jurisdictional Resources

At the present time R-2554 A, BB, and C permit drawings detailing the jurisdictional impacts are preliminary. Preliminary estimated impacts to jurisdictional areas within Sections A, BB, and C (as shown on their respective impact summary sheets and in Table 1) are the result of minimization and avoidance measures and represent the maximum possible impacts foreseen at this time. NCDOT will continue to explore avenues to reduce these projected impacts. Proposed changes will be coordinated with the relevant review agencies.

Impacts to jurisdictional wetlands and streams for R-2554 BA are summarized below in Table 5 and Table 6.

Table 5. Impacts to Wetlands within the BA Section

Permit Drawing Site Number (2007)	Name assigned during original Delineation (1995)	Name in Update (2005)	Type	Permanent (ac.)	Temporary (ac.)	Mitigation Required?
3	N/A	I	R	1.64	0.00	Yes
5	KI/CN	KI/CN	R	0.07	0.00	Yes
6	KI/CN	KI/CN	R	0.03	0.00	Yes
7	GA/GB	GA/GB	R	0.01	0.00	Yes
9	KA/CA/LC	KA/CA/LC/py	R	0.15	0.00	Yes
10	KK/KG/KF	KK/KG/KF	NR	2.96	0.00	Yes
11	KS/CY	KS/CY	R	0.13	0.00	Yes
12	CZ/LE/LD	CZ/LE/LD	R	0.79	0.00	Yes
Total	N/A	N/A	N/A	5.79	0.00	N/A

Note: R-Riverine, NR-Non-riverine

Table 6. Impacts to Streams within the BA Section

Permit Drawing Site Number (2007)	Name assigned during original Delineation (1995)	Name in Update (2005)	Type of Stream	DWQ Stream Classification	Perm. (ft.)	Temp. (ac.)	Mitigation Required?
1	B1-2	N/A	P	WS-IV; NSW	142	<0.00	Yes
2	B1-4	N/A	P	WS-IV; NSW	24	<0.00	Yes
3	B1-5	N/A	P	WS-IV; NSW	854	<0.00	Yes
3	B3-2	N/A	P	WS-IV; NSW	194	<0.00	Yes
4	K3	K3/sxa, spy	P	WS-IV; NSW	1,058	0.03	Yes

Table 6 (continued)

Permit Drawing Site Number (2007)	Name assigned during original Delineation (1995)	Name in Update (2005)	Type of Stream	DWQ Stream Classification	Perm. (ft.)	Temp. (ac.)	Mitigation Required?
4	K5	K5	I	WS-IV; NSW	115	<0.00	No
5	K2B	spb/K2B	P	C; NSW	541	<0.00	Yes
11	CY	spz/J2/CY	P	C; NSW	506	<0.00	Yes
11	KT	spc/KT	P	C; NSW	325	<0.00	Yes
14	Ut to Howell Branch*	N/A	P	C; NSW	128	<0.00	Yes
Total	N/A	N/A	N/A	N/A	3,887	0.04	N/A

Notes: *Added since 2005 Update.
P-Perennial, I-Intermittent

Permanent Impacts: Proposed permanent impacts include fill, excavation, and mechanized clearing in wetlands. Of these impacts, 2.96 ac. are to non-riverine wetlands and 2.83 ac. are to riverine wetlands. The total permanent wetland impacts for R-2554 BA is 5.79 ac. Proposed permanent impacts due to fill in surface waters are 3,887 ft.

Temporary Impacts: There are no proposed temporary impacts to wetlands for R-2554 BA. Proposed temporary fill in surface waters is 254 ft. (0.04 ac.).

Utility Impacts: There will be no impacts to jurisdictional resources as a result of utility relocations for R-2554 BA.

8.0 Protected Species

Plants and animals with federal classification of Endangered (E), Threatened (T), Proposed Endangered (PE), and Proposed Threatened (PT) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. The United States Fish and Wildlife Service (USFWS, 2007) lists two (2) federally protected species for Wayne and Lenoir County as of the November 5, 2007 listing (Table 7).

Table 7. Federally Protected Species in Wayne and Lenoir County

Common Name	Scientific Name	Federal Status	County	Habitat Present	Biological Conclusion
Red-cockaded woodpecker	*Picoides borealis*	E	W & L	No	No Effect
Sensitive joint-vetch	*Aeschynomene virginica*	T	L	No	No Effect

Surveys were completed prior to the completion of the Final Environmental Impact Statement for the red-cockaded woodpecker and the sensitive joint-vetch. During these surveys in 1997 it was determined that there was no habitat within project study area. In addition to the field surveys, the NC Natural Heritage Program (NCNHP) database was reviewed by NCDOT in September 28, 2007 for recorded occurrences of protected species. No occurrences of federally protected species were recorded for the project study area. Therefore, a biological conclusion of **No Effect** was given due to the lack of habitat for both federally protected species listed for Wayne and Lenoir Counties.

8.1 Bald and Golden Eagle Protection Act (BGPA)

In the July 9, 2007 Federal Register (72:37346-37372), the bald eagle was declared recovered, and removed (de-listed) from the Federal List of Threatened and Endangered wildlife. This delisting took effect August 8, 2007. After delisting, the Bald and Golden Eagle Protection Act (Eagle Act) (16 U.S.C. 668-668d) becomes the primary law protecting bald eagles. Bald eagle occurrences and nesting habitat were surveyed April 25-26, 2005, using the old approach covering a one mile radius. Surveys found no individuals or nesting sites within one mile of the project limits. This project will, therefore, have no effect on the bald eagle.

9.0 Cultural Resources

The potential effect of the proposed US 70 Goldsboro Bypass on the cultural resources in the project area was evaluated in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended. As described in Section 3.3.7 and listed in Table 3.7 of the FEIS, eight properties within the proposed US 70 Goldsboro Bypass study area were determined eligible for the National Register. However, none of the proposed Final Build Alternatives results in an effect upon the eligible historic properties. The State Historic Preservation Office concurs that none of the proposed alternatives would have an effect upon these historic properties (See letter dated March 2, 1994 in Appendix B of the FEIS).

The initial archaeological sample survey performed for the proposed construction of the new US 70 Goldsboro Bypass was completed in March 1994. During the survey, 84 archaeological sites were recorded and 10 previously recorded sites were revisited. Of these 94 total sites, 57 contained both historic and prehistoric components, 22 contained only prehistoric components and 15 contained only historic components.

In a letter dated 17 Feb 1994 (see Appendix B of the Final EIS), the State Historic Preservation Office (NC-HPO) stated that additional information was needed to assess twenty-one (21) of these sites. These sites include 31LR90/90**, 31WYl95**, 31WY215**, 31WY238**, 31WY343**, 31WY344**, 31WY347**, 31WY351/351**, 31WY355**, 31WY376/376**, 31WY386**, 31WY398**, 31WY399**, 31WY406**, 31WY407**, 31WY408**, 31WY409**, 31WY410/410**, 31WY412**, 31WY415** and 31WY416**. Three (3) of these sites, 31LR90/90**, 31WY376/376**, and 31WY410/410**, are located within the Alternative 9 (Preferred) corridor boundary, while two (2) of these sites, 31WY238** and 31WY416**, are located along the Alternative 9 (Preferred) corridor perimeter.

During August 1996, a second intensive cultural resource assessment survey was conducted in Wayne and Lenoir Counties. The intent of this assessment was twofold: 1) to locate and assess all cultural resources within the Alternative 9 (Preferred) corridor, and 2) to revisit and determine the National Register status of three (3) previously recorded sites (31LR90/90**, 31WY376/376**, and 31WY410/410**). Shovel testing combined with a pedestrian survey resulted in the recording of fifteen (15) new archaeological sites and two (2) previously recorded sites. Of the twenty (20) total sites now recorded within the boundaries of Alternative 9 (Preferred), only one (31WY410/410**) has been recommended as eligible for the National Register. Testing at 31WY410/410** revealed the presence of intact sub-plowzone features dating to the late 18th/early 19th century. Although the site's intact historic component, measuring 90 m (295 ft) (N-S) by 50 m (164 ft) (E-W), is situated within the boundaries of the original 300 m (1000 ft) wide corridor, it is located outside of the proposed 90 m (300 ft) wide Alternative 9 (Preferred) right-of-way. In fact, the intact historic component of 31WY410/410** lies approximately 50 m (164 ft) north of the proposed right-of-way boundary for the R-2554 A section of the project; therefore, 31WY410/410** will not be impacted by the proposed project as currently designed. Construction activities in this area must be limited to the project corridor only; staging areas will not be located outside of the proposed project corridor in the vicinity of 31WY410/410**. If preservation/avoidance of the site's intact historic component is not possible, archaeological data recovery efforts with extensive background research will be required. In a letter dated 6 Feb 1997, NC-HPO has concurred with these findings (see Appendix B of the Final EIS).

In addition, numerous cemeteries, both active and inactive, are present either within or along the Alternative 9 (Preferred) corridor with at least two (2) cemeteries (the Deans Cemetery on Tommy's Road [SR 1571] and a small family cemetery on the old Nora F. Smith property along Wayne Memorial Drive [SR 1556]) located within the R-2554 BA section of the project. Avoidance of all cemeteries is recommended; however, if any such site is to be impacted by the proposed project, removal per applicable North Carolina General Statutes (i.e. NC GS 65 or NC GS 70, Article 3) is strongly suggested and to be determined in consultation with representatives of the NCDOT Archaeology Group and North Carolina Office of State Archaeology (OSA).

10.0 FEMA Compliance

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

11.0 Mitigation Options

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts. Avoidance measures were taken during the planning and NEPA compliance stages; minimization measures were incorporated as part of the project design.

11.1 Avoidance and Minimization

All jurisdictional features were delineated, field verified and surveyed within the corridor for the Goldsboro Bypass. Using these surveyed features, preliminary designs were adjusted to avoid and / or minimize impacts to jurisdictional areas. NCDOT employs many strategies to avoid and minimize impacts to jurisdictional areas in all of its designs. Many of these strategies have been incorporated into BMP documents that have been reviewed and approved by the resource agencies and which will be followed throughout construction. All wetland areas not affected by the project will be protected from unnecessary encroachment. Individual avoidance and minimization items are as follows:

- No staging of construction equipment or storage of construction supplies will be allowed in wetlands or near surface waters.
- The project was designed to avoid or minimize disturbance to aquatic life movements.
- NCDOT will minimize long-term water quality impacts through the use of the most recent Best Management Practices for Protection of Surface Waters, as identified in the Federal Aid Highway Program (FHPM) and North Carolina Administrative Code, Chapter 4.
- NCDOT and its contractors will not excavate, fill, or perform land clearing activities within Waters of the U.S. or any areas under the jurisdiction of the USACE, except as authorized by the USACE. To ensure that all borrow and waste activities occur on high ground, except as authorized by permit, the NCDOT shall require its contractors to identify all areas to be used to borrow material, or to dispose of dredged, fill or waste material. Documentation of the location and characteristics of all borrow and disposal sites associated with the project will be available to the USACE on request.
- NCDOT and its contractors will not be allowed to perform any construction activities that will adversely impact anadromous spawning streams during the spring migration period - February 15 through June 15.
- Crossings of jurisdictional areas were angled to cross as perpendicular as possible to minimize impacts.
- Design Standards in Sensitive Watersheds will be implemented to minimize erosion/sedimentation loss during construction phase.
- Median widths were reduced to 46 ft. in order to minimize impacts to jurisdictional areas.
- Use of Natural Stream Design on sites 4, 5, and 6 on R-2554 BA.
- In the vicinity of St.141, west of SR 1556 (Wayne Memorial Drive), at the request of resource agencies the alignment was shifted approximately south 90 ft to reduce impacts to jurisdictional resources.
- In the vicinity of St.132, west of SR 1556 (Wayne Memorial Drive), at the request of resource agencies the proposed bridge is approximately 460 ft. in length which spans Stoney Creek and adjacent wetlands. Additionally, the alignment was shifted approximately south 200 ft to avoid two small tributaries and reduce impacts associated with Stoney Creek.
- In the vicinity of St.114, west of NC 111 (Patetown Road), at the request of resource agencies the alignment was shifted approximately south 300 ft to avoid the forked section of Howell Branch and provide an approximately 300 ft. bridge over Howell Branch and the associated

wetlands. Additionally, this resulted in the removal of a portion of the existing roadway and the bridge over Howell Branch on SR 1571 (Tommy's Road).

- The use of Preformed Scour Holes.
- The use of 3:1 fill slopes in jurisdictional areas where practicable.
- The use of bridges verses culverts at three crossings.
- The use of hand clearing in wetlands where practicable.

11.3 Compensation

The NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent possible as described above. The unavoidable impacts to jurisdictional wetlands and streams will be offset by compensatory mitigation provided by mitigation that is either onsite or immediately adjacent to the roadway project. As stated previously, the project is located in two Hydrologic Units (03020201, 03020202). Compensatory mitigation sources are located within both of these units.

Detailed information pertaining to these mitigation sites is included in attachments submitted with this permit application. These attachments include the Claridge Nursery Onsite Stream Mitigation Project Draft Technical Memorandum, Tommy's Road Mitigation Plan, UT West Bear Creek Mitigation Plan, Bear Creek-Mill Branch Wetland Mitigation Bank, and Natural Channel Stream Designs (included in the permit drawings).

The Claridge Nursery site will provide the majority of the stream mitigation. The Bear Creek Mitigation Bank will provide the majority of the wetland mitigation. These sites combined with the on-site mitigation provide the most suitable compensatory mitigation for the roadway impacts in that they provide mitigation adjacent to the impact sites. Please refer to Tables 2 and 3.

12.0 Indirect and Cumulative Effects

An Indirect and Cumulative Effects (ICE) report is currently being prepared for this project. It is anticipated to be completed by March, 2008. Preliminary ICE results in the form of Build versus No Build projected land use maps will be made available to NCDWQ in January, 2008. Based on these preliminary results, the decision on whether or not a quantitative Indirect and Cumulative Impacts (ICI) report is necessary. If it is determined that an ICI report is needed, it should be completed by late April 2008.

13.0 Regulatory Approvals

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

Section 401: Under separate cover NCDOT will submit a request for a Section 401 Water Quality Certification from the N. C. Division of Water Quality after the completion of the ICE.

Neuse Riparian Buffer Authorization: NCDOT will request a Neuse Riparian Buffer Authorization from the NCDWQ with the request for the 401 Water Quality Certification.

A copy of this permit application will be posted on the NCDOT website at: http://www.ncdot.org/doh/preconstruct/pe/neu/permit.html

If you have any questions or need additional information, please call Mr. Chris Manley, at 919-715-1487.

Sincerely,

Gregory J. Thorpe, Ph.D.
Environmental Management Director, PDEA Branch

cc List:
w/attachment
Mr. Travis Wilson, NCWRC
Ms. Kathy Matthews, USEPA
Mr. Ronald Mikulak, USEPA – Atlanta, GA
Mr. Clarence W. Coleman, P.E., FHWA
Mr. Gary Jordan, USFWS
Mr. Ron Sechler, NMFS
Mr. Michael Street, NCDMF

w/o attachment (see website for attachments)
Dr. David Chang, P.E., Hydraulics
Mr. Greg Perfetti, P.E., Structure Design
Mr. Victor Barbour, P.E., Project Services
Mr. Mark Staley, Roadside Environmental
Mr. C. E. Lassiter, P.E., Div. 2 Engineer
Mr. Richard E. Greene, P.E. Div. 4 Engineer
Mr. Jay Johnson, Div. 2
Mr. Jamie Guerrero, Div. 4
Mr. Scott McLendon, USACE, Wilmington
Mr. Jay Bennett, P.E., Roadway Design
Mr. Majed Alghandour, P.E., Programming & TIP
Mr. Art McMillan, P.E., Highway Design
Mr. Andy Hussey, PDEA
Mr. Carl Goode, P.E., HEU
Ms. LeiLani Paugh, NEU
Mr. Randy Griffin, NEU

STATE OF NORTH CAROLINA
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March 27, 2008

N.C. Division of Water Quality
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Attention: Mr. Brian Wrenn
NCDOT Coordinator

Dear Sir:

Subject: **Application for an Individual Section 401 Water Quality Certification and Neuse Riparian Buffer Authorization for construction of the US 70 Bypass.** Construction of the US 70 bypass from west of NC 581 in Wayne County, to east of Goldsboro in the vicinity of SR 1323 (Promise Land Rd) in Lenoir County. State Project No. 6.339002T. TIP No. R-2554. WBS 34461.1.1.

The North Carolina Department of Transportation (NCDOT), Division of Highways, in consultation with the Federal Highway Administration (FHWA), proposes to construct the US 70 bypass around Goldsboro on new location. Construction of the US 70 bypass begins west of NC 581 in Wayne County and ends east of Goldsboro in the vicinity of SR 1323 (Promise Land Rd) in Lenoir County. The project is approximately 20 miles in length and has been divided into four sections: A, BA, BB, and C.

The purpose of this letter is to request approval for Individual Section 401 Water Quality Certification and Neuse Riparian Buffer Authorization. In addition to the cover letter, this application package includes the following: permit drawings, Merger 4B and 4C meeting minutes, onsite mitigation plans, 2005 Resource Update, and a set of half-size roadway plans.

1.0 Purpose and Need

The purpose and need for this project, as identified in the Final Environmental Impact Statement (FEIS), is to improve safety, increase traffic capacity to meet projected transportation needs, and reduce travel times.

2.0 Project Description

The improvements involve the construction of a new US 70 Goldsboro Bypass from existing US 70 west of Goldsboro in the vicinity of SR 1237 (Community Drive) in Wayne County to

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existing US 70 east of Goldsboro in the vicinity of SR 1323 (Promise Land Road) in Lenoir County. Proposed improvements include construction of a multi-lane, full control of access freeway, interchanges at locations with major traffic movements, and grade separations at minor crossroads and railroads. The facility will be a four-lane divided freeway on new location extending approximately 20 miles.

3.0 Summary of Impacts

Waters of the U.S.: Proposed impacts to jurisdictional areas of R-2554 total 27.63 acres of permanent wetland impacts and 13,153 linear of permanent stream impacts. See Table 1 for the permanent and temporary impact summary for all sections.

Table 1. Summary of Wetland and Stream Impacts for R-2554

Section	Permanent Wetland (ac.)		Temporary Wetland (ac.)		Permanent Stream (ft.)	Temporary Stream (ft.)
	Riverine	Non-riverine	Riverine	Non-riverine		
A*	1.89	0.38	0.24	0.00	949	0
BA	2.83	2.96	0.00	0.00	3,887	254
BB*	0.02	0.42	0.00	0.00	3,901	234
C*	11.58	7.54	0.00	0.00	4,416	0
Total	16.32	11.30	0.24	0.00	13,153	488

* Impacts are based on preliminary design, therefore, these sections are expected to decrease once the final design is completed.

Neuse Riparian Buffers: Buffer impacts total 1,616,266 ft^2 for all sections; of this Zone 1 has 990,842 ft^2 and Zone 2 has 625,424 ft^2. See Table 2 for a summary of proposed riparian buffer impacts, wetlands within the buffers, and the remaining buffer impacts that will require compensatory mitigation.

Table 2. Summary of Buffer Impacts for R-2554

	Buffers (ft^2)			Wetlands within Buffers (ft^2)			Buffers Requiring Mitigation (ft^2)		
Section	Zone 1	Zone 2	Total	Zone 1	Zone 2	Total	Zone 1	Zone 2	Total
A*	58,254	36,490	94,744	23,145	10,290	33,435	14,442	15,512	29,954
BA	356,506	231,837	588,343	56,106	21,981	78,087	283,493	194,187	477,680
BB*	296,268	195,786	492,054	805	0	805	270,461	179,526	449,987
C*	279,814	161,311	441,125	69,524	36,942	106,466	207,694	112,760	320,454
Total	990,842	625,424	1,616,266	149,580	69,213	218,793	776,090	501,985	1,278,075

* Impacts are based on preliminary design, therefore, these sections are expected to decrease once the final design is completed.

4.0 Summary of Mitigation

This project has been designed to avoid and minimize impacts to jurisdictional areas in accordance with the National Environmental Policy Act (NEPA) throughout the design process. The Claridge Nursery site, which is adjacent to the roadway project in HU 03020201, has a total of 10,760 feet of stream restoration. This site will be debited 8,716 feet. The Bear Creek – Mill Branch Wetland Mitigation Bank (located at Impact Site 12, HU 03020202) will be debited to

cover 26.84 acres of jurisdictional wetland impacts. Natural Stream Design (NSD) and onsite stream, riparian buffer, and wetland mitigation will be used to cover a portion of the impacts. The N.C. Ecosystem Enhancement Program (EEP) will provide mitigation for the remaining impacts to riparian buffers Summaries are provided below in Tables 3, 4, and 5. Additional information can be found in Section 11.3 of this application.

Table 3. Summary of Wetland Mitigation for R-2554

Section	Wetland Mitigation (ac) (Ratio)		
	Restoration (1:1)	Preservation (5:1)	Total Credits Proposed
R-2554 BA Tommy's Road (Site 8)	0.33	2.37	0.79
R-2554C - Bear Creek Bank (Site 12)	26.84	0.00	26.84
Totals	27.17	2.37	27.63

Table 4. Summary of Stream Mitigation for R-2554

Section	Stream Mitigation (lf) (Ratio)		
	Restoration (1:1)	Preservation (5:1)	Total Credits Proposed
R-2554 A-Claridge Nursery	8,716	0	8,716
R-2554 BA – NSD* Site 4	1,083	0	1,083
R-2554 BA – NSD* Site 5	561	0	561
R-2554 BA-Tommys Rd (Site 8)	61	691	199
R-2554 BB – NSD* Site 9	1,236	0	1,236
R-2554 C - UT West Bear Creek Mitigation Site	1,243	0	1,243
Totals	12,900	691	13,038

* Natural Stream Design

Table 5. Summary of Buffer Mitigation

Section	Buffer Mitigation (ft^2)	
	Restoration	Total Credits Proposed
R-2554A-Claridge Nursery	1,393,920	1,393,920
R-2554BA - NSD Site 4	95,139	95,139
R-2554BA - NSD Site 5	55,959	55,959
R-2554BA-Tommys Rd (Site 8)	7,792	7792
R-2554BB - NSD Site 9	120,821	120,821
R-2554C - UT West Bear Creek Site	121,968	121,968
EEP	1,818,672	1,818,672
Totals	3,614,271	3,614,271

5.0 Project Schedule

Construction of this project is divided into four sections (See Table 6 below). Permit drawings for each of the four sections are included in this permit application. The attached permit

drawings are final in detailing all proposed impacts occurring within section R-2554 BA. However, permit drawings for sections R-2554 A, BB, and C detail the current best preliminary alignment and maximum potential impacts. The impacts associated with sections R-2554 A, BB, and C are expected to decrease once the final design is completed. Final permit drawings for R-2554 A, BB, and C will be provided under separate cover in the form of a permit modification request. NCDOT understands that no construction will occur on Sections A, BB, or C until the final design and resulting impacts have been approved by the regulatory agencies.

Table 6. Project Sections and Scheduling

Section	Project Limits	Scheduled Let Date
R-2554 A	West of NC 581 to SR 1300	Post year
R-2554 BA	SR 1300 to East of SR 1556	8/19/2008
R-2554 BB	East of SR 1556 to West of SR 1714	Post year
R-2554 C	West of SR 1714 to East of SR 1323 in Lenoir Co.	Post year

6.0 NEPA Document Status

The Draft Environmental Impact Statement (DEIS) was completed on April 28, 1994. The FHWA and NCDOT completed the Final Environmental Impact Statement (FEIS) on February 18, 1998 in compliance with the NEPA guidelines. The FEIS explains the purpose and need for the project, provides a description of the alternatives considered, and characterizes the social, economic, and environmental effects. The FEIS was approved and circulated to federal, state, and local agencies. A Record of Decision (ROD) was approved on August 3, 1998. Right of Way Consultations were completed on January 5, 2005 for R-2554 BA and December 7, 2005 for R-2554 A. Jurisdictional wetland and stream areas were re-verified by the USACE on October 19, 2005. Copies of the project documents have been provided to regulatory review agencies involved in the approval process. Additional copies will be provided upon request.

R-2554 did not originally go through the NEPA/404 merger process, however, a merger meeting was held on January 10, 2000. At this meeting, the merger team verbally agreed on Concurrence Points 1 through 4 (now 4A). At a Concurrence Point 4B meeting held for R-2554B, merger team members asked that formal concurrence forms be signed for the project. At a meeting held on December 17, 2003, the merger team signed concurrence forms for Concurrence Points 3 and 4A.Concurrence Points 4B and 4C were reached for the BA section on June 16, 2004 and December 14, 2005, respectively.

6.1 Independent Utility

R-2554 is in compliance with 23 CFR Part 771.111(f) which lists the FHWA characteristics of the independent utility of a project. The project meets the criteria for independent utility as discussed below:

- The project has logical termini and independent utility and is of sufficient length to address environmental matters on a broad scope;

- The project is usable and a reasonable expenditure of funds, even if no additional transportation improvements are made in the area; and
- The project does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

7.0 Resource Status

The project is located in the Neuse River Basin and lies within in two Hydrologic Units (03020201, 03020202). Best Usage Classifications for jurisdictional streams are provided in the attached 2005 Updated Resources Packet. Neither High Quality Waters (HQW), Water Supplies (WS-I: undeveloped watersheds or WS-II: predominately undeveloped watersheds), nor Outstanding Resource Waters (ORW) occur within 1.0 mile of the project study area. None of the jurisdictional streams are designated as a North Carolina Natural or Scenic River, or as a National Wild and Scenic River. Additionally, none of the jurisdictional streams are listed on the Final 2006 Section 303(d) list of impaired waters due to sedimentation for the Neuse River Basin, nor does it drain into any Section 303(d) waters within 1.0 mile of the project study area.

7.1 Wetland Delineations

A wetland identification and preliminary assessment analysis for the study area was performed and summarized in the 1992 Natural Systems Report Goldsboro Bypass (NRTR). A 1993 Wetland Delineation and Functional Assessment Report was prepared for the project and discussed the major wetland impacts associated with the project. After the selection of Alternative 9 as the Preferred Alternative, the wetlands within that corridor were delineated based on the 1987 USACE Wetland Delineation Manual and a preliminary design was prepared to avoid and minimize wetlands to the maximum extent possible. This delineation was verified by Mr. Mike Bell of the USACE, Wilmington District in October 1995. Jurisdictional wetlands within the project area are shown on Exhibits 2.4-1 through 2.4-21 and described in detail in Section 3.6.4. within the FEIS. A field review was conducted of the original (1995) and updated delineation on July 26, 2005 and August 24, 2005 with Bill Biddlecome of the USACE. Jurisdictional wetland and stream areas were verified on October 19, 2005.

7.2 Stream Delineations

A Stream Assessment Report was completed in July of 1999. A field review was conducted of the original (1995) and updated delineation on July 26, 2005 and August 24, 2005 with Bill Biddlecome of the USACE. During this review, current jurisdictional wetland and stream areas were verified and an Important/Unimportant determination was conducted for each jurisdictional stream channel.

7.3 Riparian Buffer Verification

The project study area is located within the Neuse River Basin. Streams and jurisdictional surface waters depicted on either the most recent U.S. Geological Survey 7.5-minute topographic quadrangle or the county soil survey map are subject to the Neuse River Riparian Buffer Rules. On July 29,

2005 a field review was conducted with Christina Breen of the NCDWQ to determine which stream and open water features are subject to the Neuse River Riparian Buffer Rules.

7.4 R-2554 BA: Characterization of Jurisdictional Sites

7.4.1 Wetlands

Based on the U.S. Fish and Wildlife Service (USFWS) Wetland Inventory Maps, seven jurisdictional wetland types are found within the project area. A detailed discussion of these systems is provided in the 1992 NRTR.

The wetlands occurring throughout the project area vary in vegetative composition and hydrological regime. Riverine wetlands within the Little River channel will not be directly impacted by the project, and therefore, have been eliminated from further discussion. The following wetland systems have been identified.

Palustrine forested, broad-leaved deciduous wetlands, seasonally/temporarily flooded (PFO1 C/A)
Deciduous, palustrine wetlands are concentrated along streams and tributaries, receive seasonal inundation and support bottomland forest vegetation. These systems are functionally valuable ecosystems and are expected to have high functional value for sediment stabilization, sediment/toxicant retention, nutrient removal/transformation, floodflow alteration, and wildlife habitat.

Palustrine forested, needle-leaved evergreen/broad-leaved deciduous wetlands (PFO4/1)
Pine mixed hardwood wetlands are found along the upper fringes of floodplains and stream corridors and within isolated woodlots subject to groundwater saturation. These wetland communities are important for sediment stabilization, sediment/toxicant retention, and nutrient removal/transformation, due to their interspersion among agricultural fields. The wildlife habitat value of pine mixed hardwood wetlands is expected to be moderate to high due to canopy diversity and continuity with other bottomland communities.

Palustrine forested, needle-leaved evergreen wetlands (PFO4)
The majority of pine-dominated wetlands occur in small, isolated areas throughout the project area, with a large concentration located in a former Carolina Bay north of the Elroy community. However, silvicultural operations such as loblolly pine plantings, ditching, and bedding have greatly changed the natural characteristics of this area. These wetland systems have moderate potential for sediment stabilization, sediment/toxicant retention, and nutrient removal/transformation functions. Floodflow alteration and wildlife habitat are considered minimal in these evergreen wetlands.

Palustrine forested, evergreen wetlands (PFO7)
Evergreen palustrine wetland types refer to the pine/bay systems found in Walnut Pocosin and Carolina Bays throughout the project area. The largest concentration of pine/bay wetlands are

located within a former bay near the Elroy community. Evergreen palustrine wetlands are of moderate importance for sediment stabilization, sediment/toxicant retention, and nutrient removal/transformation functions. Floodflow alteration and wildlife habitat values are considered minimal in these systems.

Palustrine emergent wetlands (PEM)
Palustrine emergent wetlands are herbaceous systems consisting of soft rush, sedges, bulrush and a variety of grasses. These wetlands are generally limited in size and distribution and are located in bottomlands or wetland forest tracts cleared by logging, along utility corridors, on former farmland tracts, and in fallow fields. Emergent communities along the study corridors have low wetland value due to their limited size and distribution.

See the attached packet, 2005 Updated Resources, for detailed information pertaining to jurisdictional wetlands.

7.4.2 Streams

As part of the 1999 assessment, all stream reaches falling within the 1,000 ft. study corridor of the Preferred Alternative were identified and assessed. This assessment was reviewed in the field on July 01, 1999 by representatives from North Carolina Department of Environment and Natural Resources; Division of Water Quality (NCDENR; DWQ), the USACE, and the North Carolina Wildlife Resources Commission (NCWRC). See the attached packet, 2005 Updated Resources, for the table with all the stream information.

7.5 Impacts to Jurisdictional Resources

At the present time R-2554 A, BB, and C permit drawings detailing the jurisdictional impacts are preliminary. Preliminary estimated impacts to jurisdictional areas within Sections A, BB, and C (as shown on their respective impact summary sheets and in Table 1) are the result of minimization and avoidance measures and represent the maximum possible impacts foreseen at this time. NCDOT will continue to explore avenues to reduce these projected impacts. Proposed changes will be coordinated with the relevant review agencies.

Impacts to jurisdictional wetlands and streams for R-2554 BA are summarized below in Table 7 and Table 8.

Table 7. Impacts to Wetlands within the BA Section

Permit Drawing Site Number (2007)	Name assigned during original Delineation (1995)	Name in Update (2005)	Type	Permanent (ac.)	Temporary (ac.)	Mitigation Required?
3	N/A	I	R	1.64	0.00	Yes
5	KI/CN	KI/CN	R	0.07	0.00	Yes
6	KI/CN	KI/CN	R	0.03	0.00	Yes
7	GA/GB	GA/GB	R	0.01	0.00	Yes
9	KA/CA/LC	KA/CA/LC/py	R	0.15	0.00	Yes
10	KK/KG/KF	KK/KG/KF	NR	2.96	0.00	Yes
11	KS/CY	KS/CY	R	0.13	0.00	Yes
12	CZ/LE/LD	CZ/LE/LD	R	0.79	0.00	Yes
Total	N/A	N/A	N/A	5.79	0.00	N/A

Note: R-Riverine, NR-Non-riverine

Table 8. Impacts to Streams within the BA Section

Permit Drawing Site Number (2007)	Name assigned during original Delineation (1995)	Name in Update (2005)	Type of Stream	DWQ Stream Classification	Perm. (ft.)	Temp. (ac.)	Mitigation Required?
1	B1-2	N/A	P	WS-IV; NSW	142	<0.00	Yes
2	B1-4	N/A	P	WS-IV; NSW	24	<0.00	Yes
3	B1-5	N/A	P	WS-IV; NSW	854	<0.00	Yes
3	B3-2	N/A	P	WS-IV; NSW	194	<0.00	Yes
4	K3	K3/sxa, spy	P	WS-IV; NSW	1,058	0.03	Yes
4	K5	K5	I	WS-IV; NSW	115	<0.00	No
5	K2B	spb/K2B	P	C; NSW	541	<0.00	Yes
11	CY	spz/J2/CY	P	C; NSW	506	<0.00	Yes
11	KT	spc/KT	P	C; NSW	325	<0.00	Yes
14	Ut to Howell Branch*	N/A	P	C; NSW	128	<0.00	Yes
Total	N/A	N/A	N/A	N/A	3,887	0.04	N/A

Notes: *Added since 2005 Update.
P-Perennial, I-Intermittent

Permanent Impacts: Proposed permanent impacts include fill, excavation, and mechanized clearing in wetlands. Of these impacts, 2.96 ac. are to non-riverine wetlands and 2.83 ac. are to

riverine wetlands. The total permanent wetland impacts for R-2554 BA is 5.79 ac. Proposed permanent impacts due to fill in surface waters are 3,887 ft.

Temporary Impacts: There are no proposed temporary impacts to wetlands for R-2554 BA. Proposed temporary fill in surface waters is 254 ft. (0.04 ac.).

Utility Impacts: There will be no impacts to jurisdictional resources as a result of utility relocations for R-2554 BA.

Neuse River Basin Riparian Buffer Rules:

This project is located in the Neuse River Basin; therefore, the regulations pertaining to the buffer rules apply. There will be a total of 588,343 ft^2 of impacts to riparian buffers within R-2554 BA. This includes 30,196 ft^2 (17,561 ft^2 in Zone 1 and 12,635 ft^2 in Zone 2) due to the bridge crossings. According to the buffer rules, bridges are allowable. In addition, 20,052 ft^2 (12,581 ft^2 in Zone 1 and 7,470ft^2 in Zone 2) of impacts will occur from approach fill and mechanized clearing activities due to road crossings. These road crossing activities are allowable because impacts are less than the 150-foot or one-third of an acre threshold per crossing, for which mitigation is required. Uses designated as allowable may proceed within the riparian buffer provided that there are no practical alternatives to the requested use pursuant to Item (8) of this rule. There are 538,095 ft^2 (326,364 ft^2 in Zone 1 and 211,731 ft^2 in Zone 2) of road crossing impacts that exceed the threshold for mitigation, which is considered allowable with mitigation.

8.0 Protected Species

Plants and animals with federal classification of Endangered (E), Threatened (T), Proposed Endangered (PE), and Proposed Threatened (PT) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. The United States Fish and Wildlife Service (USFWS, 2007) lists two (2) federally protected species for Wayne and Lenoir County as of the November 5, 2007 listing (Table 7).

Table 7. Federally Protected Species in Wayne and Lenoir County

Common Name	Scientific Name	Federal Status	County	Habitat Present	Biological Conclusion
Red-cockaded woodpecker	*Picoides borealis*	E	W & L	No	No Effect
Sensitive joint-vetch	*Aeschynomene virginica*	T	L	No	No Effect

Surveys were completed prior to the completion of the Final Environmental Impact Statement for the red-cockaded woodpecker and the sensitive joint-vetch. During these surveys in 1997 it was determined that there was no habitat within project study area. In addition to the field surveys, the NC Natural Heritage Program (NCNHP) database was reviewed by NCDOT in September 28, 2007 for recorded occurrences of protected species. No occurrences of federally protected species were recorded for the project study area. Therefore, a biological conclusion of **No Effect**

was given due to the lack of habitat for both federally protected species listed for Wayne and Lenoir Counties.

8.1 Bald and Golden Eagle Protection Act (BGPA)

In the July 9, 2007 Federal Register (72:37346-37372), the bald eagle was declared recovered, and removed (de-listed) from the Federal List of Threatened and Endangered wildlife. This delisting took effect August 8, 2007. After delisting, the Bald and Golden Eagle Protection Act (Eagle Act) (16 U.S.C. 668-668d) becomes the primary law protecting bald eagles. Bald eagle occurrences and nesting habitat were surveyed April 25-26, 2005, using the old approach covering a one mile radius. Surveys found no individuals or nesting sites within one mile of the project limits. This project will, therefore, have no effect on the bald eagle.

9.0 Cultural Resources

The potential effect of the proposed US 70 Goldsboro Bypass on the cultural resources in the project area was evaluated in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended. As described in Section 3.3.7 and listed in Table 3.7 of the FEIS, eight properties within the proposed US 70 Goldsboro Bypass study area were determined eligible for the National Register. However, none of the proposed Final Build Alternatives results in an effect upon the eligible historic properties. The State Historic Preservation Office concurs that none of the proposed alternatives would have an effect upon these historic properties (See letter dated March 2, 1994 in Appendix B of the FEIS).

The initial archaeological sample survey performed for the proposed construction of the new US 70 Goldsboro Bypass was completed in March 1994. During the survey, 84 archaeological sites were recorded and 10 previously recorded sites were revisited. Of these 94 total sites, 57 contained both historic and prehistoric components, 22 contained only prehistoric components and 15 contained only historic components.

In a letter dated 17 Feb 1994 (see Appendix B of the Final EIS), the State Historic Preservation Office (NC-HPO) stated that additional information was needed to assess twenty-one (21) of these sites. These sites include 31LR90/90**, 31WYl95**, 31WY215**, 31WY238**, 31WY343**, 31WY344**, 31WY347**, 31WY351/351**, 31WY355**, 31WY376/376**, 31WY386**, 31WY398**, 31WY399**, 31WY406**, 31WY407**, 31WY408**, 31WY409**, 31WY410/410**, 31WY412**, 31WY415** and 31WY416**. Three (3) of these sites, 31LR90/90**, 31WY376/376**, and 31WY410/410**, are located within the Alternative 9 (Preferred) corridor boundary, while two (2) of these sites, 31WY238** and 31WY416**, are located along the Alternative 9 (Preferred) corridor perimeter.

During August 1996, a second intensive cultural resource assessment survey was conducted in Wayne and Lenoir Counties. The intent of this assessment was twofold: 1) to locate and assess all cultural resources within the Alternative 9 (Preferred) corridor, and 2) to revisit and determine the National Register status of three (3) previously recorded sites (31LR90/90**, 31WY376/376**, and 31WY410/410**). Shovel testing combined with a pedestrian survey

resulted in the recording of fifteen (15) new archaeological sites and two (2) previously recorded sites. Of the twenty (20) total sites now recorded within the boundaries of Alternative 9 (Preferred), only one (31WY410/410**) has been recommended as eligible for the National Register. Testing at 31WY410/410** revealed the presence of intact sub-plowzone features dating to the late 18th/early 19th century. Although the site's intact historic component, measuring 90 m (295 ft) (N-S) by 50 m (164 ft) (E-W), is situated within the boundaries of the original 300 m (1000 ft) wide corridor, it is located outside of the proposed 90 m (300 ft) wide Alternative 9 (Preferred) right-of-way. In fact, the intact historic component of 31WY410/410** lies approximately 50 m (164 ft) north of the proposed right-of-way boundary for the R-2554 A section of the project; therefore, 31WY410/410** will not be impacted by the proposed project as currently designed. Construction activities in this area must be limited to the project corridor only; staging areas will not be located outside of the proposed project corridor in the vicinity of 31WY410/410**. If preservation/avoidance of the site's intact historic component is not possible, archaeological data recovery efforts with extensive background research will be required. In a letter dated 6 Feb 1997, NC-HPO has concurred with these findings (see Appendix B of the Final EIS).

In addition, numerous cemeteries, both active and inactive, are present either within or along the Alternative 9 (Preferred) corridor with at least two (2) cemeteries (the Deans Cemetery on Tommy's Road [SR 1571] and a small family cemetery on the old Nora F. Smith property along Wayne Memorial Drive [SR 1556]) located within the R-2554 BA section of the project. Avoidance of all cemeteries is recommended; however, if any such site is to be impacted by the proposed project, removal per applicable North Carolina General Statutes (i.e. NC GS 65 or NC GS 70, Article 3) is strongly suggested and to be determined in consultation with representatives of the NCDOT Archaeology Group and North Carolina Office of State Archaeology (OSA).

10.0 FEMA Compliance

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

11.0 Mitigation Options

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts. Avoidance measures were taken during the planning and NEPA compliance stages; minimization measures were incorporated as part of the project design.

11.1 Avoidance and Minimization

All jurisdictional features were delineated, field verified and surveyed within the corridor for the Goldsboro Bypass. Using these surveyed features, preliminary designs were adjusted to avoid and / or minimize impacts to jurisdictional areas. NCDOT employs many strategies to avoid and

minimize impacts to jurisdictional areas in all of its designs. Many of these strategies have been incorporated into BMP documents that have been reviewed and approved by the resource agencies and which will be followed throughout construction. All wetland areas not affected by the project will be protected from unnecessary encroachment. Individual avoidance and minimization items are as follows:

- No staging of construction equipment or storage of construction supplies will be allowed in wetlands or near surface waters.
- The project was designed to avoid or minimize disturbance to aquatic life movements.
- NCDOT will minimize long-term water quality impacts through the use of the most recent Best Management Practices for Protection of Surface Waters, as identified in the Federal Aid Highway Program (FHPM) and North Carolina Administrative Code, Chapter 4.
- NCDOT and its contractors will not excavate, fill, or perform land clearing activities within Waters of the U.S. or any areas under the jurisdiction of the USACE, except as authorized by the USACE. To ensure that all borrow and waste activities occur on high ground, except as authorized by permit, the NCDOT shall require its contractors to identify all areas to be used to borrow material, or to dispose of dredged, fill or waste material. Documentation of the location and characteristics of all borrow and disposal sites associated with the project will be available to the USACE on request.
- NCDOT and its contractors will not be allowed to perform any construction activities that will adversely impact anadromous spawning streams during the spring migration period - February 15 through June 15.
- Crossings of jurisdictional areas were angled to cross as perpendicular as possible to minimize impacts.
- Design Standards in Sensitive Watersheds will be implemented to minimize erosion/sedimentation loss during construction phase.
- Median widths were reduced to 46 ft. in order to minimize impacts to jurisdictional areas.
- Use of Natural Stream Design on sites 4, 5, and 6 on R-2554 BA.
- In the vicinity of St.141, west of SR 1556 (Wayne Memorial Drive), at the request of resource agencies the alignment was shifted approximately south 90 ft to reduce impacts to jurisdictional resources.
- In the vicinity of St.132, west of SR 1556 (Wayne Memorial Drive), at the request of resource agencies the proposed bridge is approximately 460 ft. in length which spans Stoney Creek and adjacent wetlands. Additionally, the alignment was shifted approximately south 200 ft to avoid two small tributaries and reduce impacts associated with Stoney Creek.
- In the vicinity of St.114, west of NC 111 (Patetown Road), at the request of resource agencies the alignment was shifted approximately south 300 ft to avoid the forked section of Howell Branch and provide an approximately 300 ft. bridge over Howell Branch and the associated wetlands. Additionally, this resulted in the removal of a portion of the existing roadway and the bridge over Howell Branch on SR 1571 (Tommy's Road).
- The use of Preformed Scour Holes.
- The use of 3:1 fill slopes in jurisdictional areas where practicable.
- The use of bridges verses culverts at three crossings.
- The use of hand clearing in wetlands where practicable.

11.3 Compensation

The NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent possible as described above. The unavoidable impacts to jurisdictional wetlands, streams, and a portion of the impacts riparian buffers will be offset by compensatory mitigation provided by mitigation that is either onsite or immediately adjacent to the roadway project. The remaining portion of impacts to riparian buffers will be mitigated by EEP. As stated previously, the project is located in two Hydrologic Units (03020201, 03020202). Compensatory mitigation sources are located within both of these Hydrologic Units.

Detailed information pertaining to these mitigation sites is included in attachments submitted with this permit application. These attachments include the Claridge Nursery Onsite Stream Mitigation Project Draft Technical Memorandum, Tommy's Road Mitigation Plan, UT West Bear Creek Mitigation Plan, Bear Creek-Mill Branch Wetland Mitigation Bank, and Natural Channel Stream Designs (included in the permit drawings).

The Claridge Nursery site will provide the majority of the stream mitigation and a portion of the riparian buffer mitigation. The Bear Creek Mitigation Bank will provide the majority of the wetland mitigation. These sites combined with the on-site mitigation provide the most suitable compensatory mitigation for the roadway impacts in that they provide mitigation adjacent to the impact sites. Please refer to Tables 2 and 3.

A portion of the riparian buffer impacts overlap with jurisdictional wetlands. When this occurs, wetland mitigation will be provided instead of buffer mitigation. Of these mitigable buffer impact totals there are 130,214 square feet in Zone 1 and 64,775 square feet in Zone 2 that contain wetlands. Therefore, total buffer impacts requiring mitigation after the wetlands were subtracted out, equate to 779,534 square feet in Zone 1 and 499,441 square feet in Zone 2, which equals to a total of 1,278,975 square feet needed for mitigation. Additional information is provided in the buffer impacts summary sheets.

12.0 Indirect and Cumulative Effects

Construction of the Goldsboro Bypass is expected to have modest indirect and cumulative effects to natural and human resources (Kimley-Horn & Assoc., ICE Assessment, March 2008). While some effects may occur, they are considered modest when comparing the projected land use in the future year Build and No-Build scenarios. Future changes in land use will be governed primarily by local land use plans and demand changes that may result from fluctuations at Seymour Johnson Air Force Base. The City of Goldsboro, Wayne County, and Lenoir County all have future land use plans and existing zoning regulations (Wayne County and Lenoir County plans are presently in Draft form). In addition, the City of Goldsboro is developing a water and sewer master plan that will identify likely areas for future infrastructure. Regulations are in place in the City and Counties to address potential future discharges into surface waters including stormwater runoff.

The ICE assessment shows that the first section of the bypass to be constructed, R-2554 BA, has minimal indirect effects on the three watersheds of concern within the study area: Stoney Creek;

Bear Creek (both 303(d) listed impaired streams); and West Bear Creek (which drains directly into Bear Creek). Quantitative analyses of potential indirect and cumulative impacts (ICI) for future sections of R-2554 will be completed as the other sections progress through final design. Both Wayne County and the City of Goldsboro are committed to working with both NCDOT and NCDWQ to address possible indirect and cumulative impact concerns on future sections of the project. This effort includes the implementation of the Wayne County Comprehensive Plan, presently under review, and other measures to minimize potential impacts (e.g. enhanced stormwater management, zoning ordinances, etc.) as identified in the forthcoming ICI report.

13.0 Regulatory Approvals

Section 404: Under separate cover, NCDOT has applied for a U. S. Army Corps of Engineers Individual 404 Permit as required for the above-described activities.

Section 401: We are hereby requesting a 401 Water Quality Certification from the N. C. Division of Water Quality. In compliance with Section 143-215.3D(e) of the NCAC, we will provide $570.00 to act as payment for processing the Section 401 permit application previously noted in this application (see Subject line). We are providing five (5) copies of this application to the NCDWQ, for their review and approval.

Neuse Riparian Buffer Authorization: NCDOT requests that the NC Division of Water Quality review this application and issue a written approval for a Neuse Riparian Buffer Authorization.

A copy of this permit application will be posted on the NCDOT website at:
http://www.ncdot.org/doh/preconstruct/pe/neu/permit.html

If you have any questions or need additional information, please call Mr. Chris Manley, at 919-715-1487.

Sincerely,

Gregory J. Thorpe, Ph.D.
Environmental Management Director, PDEA Branch

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

Mr. Travis Wilson, NCWRC
Ms. Kathy Matthews, USEPA
Mr. Ronald Mikulak, USEPA ,Atlanta, GA
Mr. Clarence W. Coleman, P.E., FHWA
Mr. Gary Jordan, USFWS
Mr. Ron Sechler, NMFS
Mr. Michael Street, NCDMF
Dr. David Chang, P.E., Hydraulics
Mr. Greg Perfetti, P.E., Structure Design
Mr. Victor Barbour, P.E., Project Services
Mr. Mark Staley, Roadside Environmental
Mr. C. E. Lassiter, P.E., Div. 2 Engineer
Mr. Richard E. Greene, P.E. Div. 4 Engineer
Mr. Jay Johnson, Div. 2
Mr. Jamie Guerrero, Div. 4
Mr. Scott McLendon, USACE, Wilmington
Mr. Jay Bennett, P.E., Roadway Design
Mr. Majed Alghandour, P.E., Programming & TIP
Mr. Art McMillan, P.E., Highway Design
Mr. Andy Hussey, PDEA
Mr. Carl Goode, P.E., HEU
Ms. LeiLani Paugh, NEU
Mr. Randy Griffin, NEU
Ms. Beth Harmon, EEP
Mr. Todd Jones, NCDOT External Audit Branch

Baker

Draft Technical Memorandum

Project:	Claridge Nursery On-site Mitigation	**Prepared By:**	Baker Engineering
Subject:	Mitigation Summary	**Prepared For:**	NCDOT
Date:	December 18, 2007 (revision 1)		

The purpose of this document is to describe the proposed design approach for the Claridge Nursery On-Site Stream Mitigation Project. The project is located in Wayne County, near Goldsboro, in DWQ sub-basin 03-04-06 and within HU 03020201, on land that is owned by the North Carolina Division of Forest Resources. The purpose of the project is to provide on-site stream mitigation for TIP R-2554 (US 70, Goldsboro Bypass).

The site contains an unnamed main stem reach (M1) and two unnamed tributaries (UT1 and UT2) that empty into the main stem (see Exhibit 1). All stream reaches have been channelized and straightened in the past to reduce flooding and provide drainage for the adjacent fields. Land use within the watershed is primarily agriculture and forestry. Existing stream lengths, drainage areas, and jurisdictional status are summarized in Table 1.

Table 1. Summary of Existing Stream Lengths and Drainage Areas.

Stream Reach	Existing Length (LF)	Drainage Area (sq mi)	Intermittent/Perennial Status
M1	6,400	1.80	NCDWQ Form Score = > 30 Stream reach already considered perennial by agencies during impact assessments. Status = Perennial
UT1	740	0.13	NCDWQ Form Score = 19.75 Stream is shown as intermittent on USGS map. Stream is not shown on County soils, but hydric soils indicate the presence of a channel. Status = Intermittent
UT2	2,530	0.25	NCDWQ Form Score = 24.75 Stream is shown as intermittent on USGS map. Stream is shown on County soils. Status = Intermittent

Stream Restoration (Braided Channel) - UT1 and UT2

A braided channel restoration approach is proposed for the two smaller tributaries (UT1 and UT2) due to the small drainage areas of the two streams and their low slopes. It is likely that in their undisturbed condition, these two systems existed as headwater wetland/stream complexes, exhibiting diffuse flows and wetland plant communities within a narrow valley of hydric soils. Lumbee sandy loam soils are mapped along the corridors of the proposed stream restoration reaches. Lumbee soils are hydric soils mapped along shallow drainage ways, were formed in stream sediments, and are commonly found along stream channels in the area surrounding Goldsboro.

Restoration of these systems will follow the guidance provided by the US Army Corps of Engineers (USACE) in "*Information Regarding Stream Restoration with Emphasis on the Coastal Plain - April 4, 2007*". Project reaches UT1 and UT2 will be designed as "riparian headwater systems", as described in the guidance. For the proposed reaches, watershed sizes are 85 and 160 acres, respectively. Soils, topography, and morphology data indicate that these reaches once supported a headwater wetland system. Restoration will seek to restore hydrology and connection of surface flows to a defined floodplain, thereby restoring diffuse surface flows and wetland hydrology. The stream type for this design approach is best described as a Rosgen "DA" stream channel.

Specific restoration techniques for reaches UT1 and UT2 will involve the grading and widening of a floodplain at the approximate elevation of the existing channel bottoms. Floodplain widths will generally range from 30 to 40 feet, and the valleys will be graded to support diffuse flow toward reach M1. The microtopography of the floodplain will left rough, to promote diffuse flows and a diversity of riparian wetland vegetation.

Stream Restoration (Single-Thread Channel) – Reach M1

The main stem through the site, reach M1, will be restored using natural channel design approaches to restore a single-thread channel. Reference reach data and past project experience support the design of a single-thread channel for M1, due to its watershed size, slope, and sediment transport competency (stream power). The design will involve a Rosgen Priority Level II approach in which a new meandering single-thread channel (E streamtype) will be constructed through a floodplain excavated at a lower elevation. Channel dimensions and pattern are based on regional curve relationships, reference reach information, and past project experience. In-stream structures (not shown at this concept level) will consist of log and wooden structures. The streambanks and adjacent floodplain wetland areas will be planted with native vegetation that are moderately to highly tolerant of flooded conditions.

The vegetation plan for the site will include the planting of bare-root trees in riparian buffer areas adjacent to all three restored streams. A minimum buffer width of 50 feet will be maintained on all restored streams with wider buffers in most areas. Tree species planted across the site will include a mixture of no less than six native species adapted to site conditions, such as river birch (*Betula nigra*), sugarberry (*Celtis laevigata*), green ash (*Fraxinus pennsylvanica*), swamp tupelo (Nyssa sylvatica var.biflora), sycamore (*Platanus occidentalis*), overcup oak (*Quercus lyrata*), swamp chestnut oak (*Quercus michauxii*), and bald cypress (*Taxodium distichum*).

Site Considerations

Several existing culverted road crossings will be incorporated into the restoration designs for the three stream reaches. In some locations, existing culverts will need to be replaced to provide increased capacity, promote connection with the restored floodplain, and set culvert inverts to appropriate elevations. An existing irrigation line crosses the proposed design for M1 at approximate station 49+00; this crossing will not be placed in an easement in case future maintenance is required for the irrigation line. An existing water line that crosses M1 near station 19+00 will be relocated to cross at the upstream culverted road crossing.

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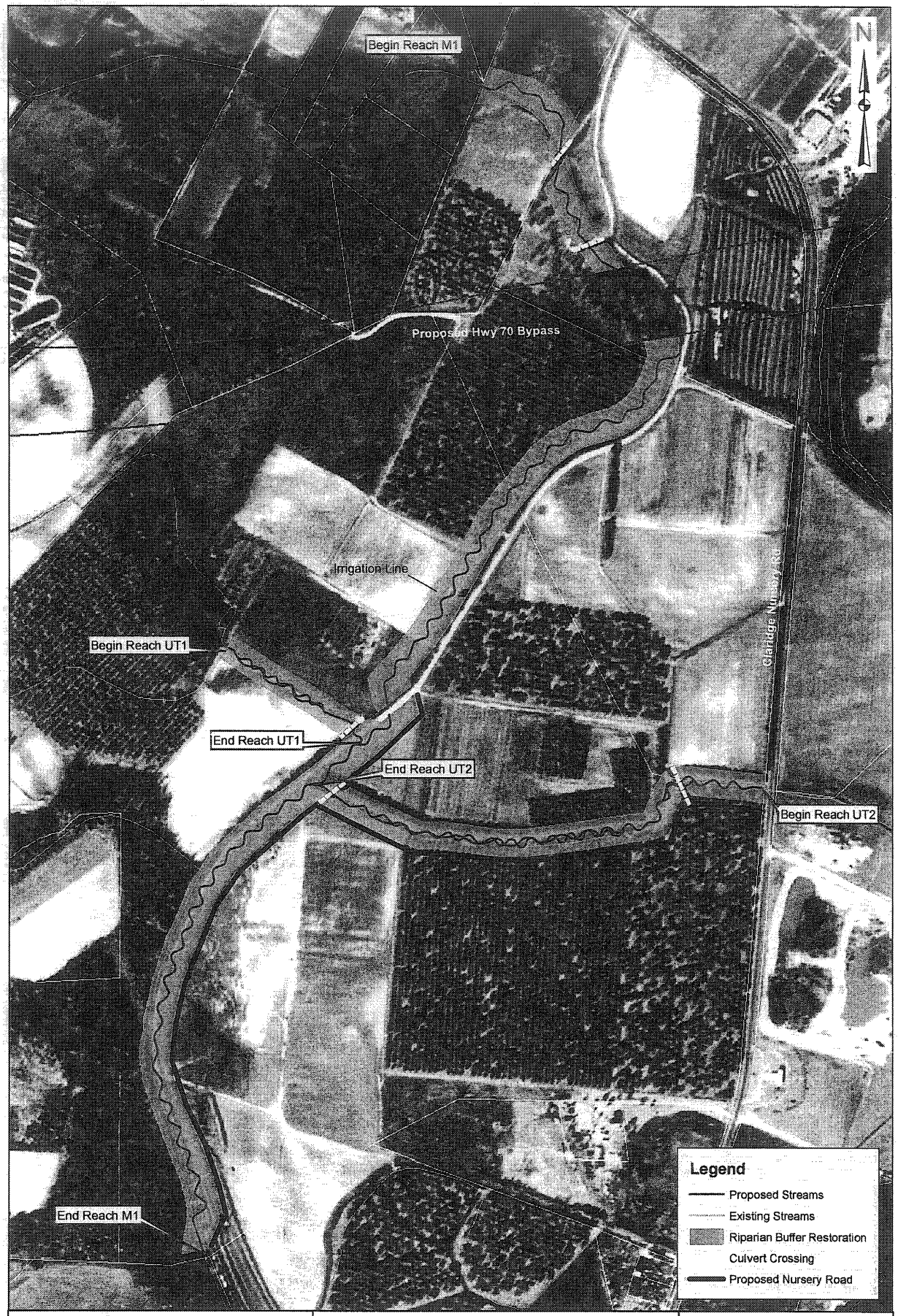
Table 2. Restoration Approaches and Proposed Mitigation Amounts.

Mitigation Area	Size	Potential Credits	Restoration Approach
Stream Reach M1	7,600 LF*	7,600 (1:1 ratio)	Restoration will consist of a Rosgen Priority Level II approach. A new floodplain will be excavated at a lower elevation, and a stable meandering channel restored through the new floodplain. (E streamtype)
Stream Reach UT1	690 LF*	690 (1:1 ratio)	Restoration will consist of grading a floodplain and promoting diffuse surface flows toward M1. The system will be allowed to form on its own as a braided channel headwater stream. (DA streamtype)
Stream Reach UT2	2,430 LF*	2,430 (1:1 ratio)	Restoration will consist of grading a floodplain and promoting diffuse surface flows toward M1. The system will be allowed to form on its own as a braided channel headwater stream. (DA streamtype)
Riparian Buffer Restoration	32 acres	32 (1:1 ratio)	Restoration will include the planting of 50 foot riparian buffers on both sides of the restored stream segments.
Totals	**10,720 LF 32 acres**	**10,720 (stream) 32 (buffer)**	

* Stream lengths exclude the sections of channel which will flow through culverted crossings or lie outside of the protected right-of-way boundaries.



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Feet

Exhibit 1
Mitigation Concept
Claridge Nursery Site

Appendix A.

Geomorphology Tables

Typical Design Cross-sections (Reaches M1, UT1, and UT2)

Design Profile (Reach M1)

NCDWQ Stream Identification Forms (Reaches UT1 and UT2)

MORPHOLOGICAL MEASUREMENTS TABLE

Claridge Nursery On-Site Mitigation Project - Reach M1

	Variables	Existing Channel		Proposed Design		Notes
1.	stream type		G5c		E5	design stream type based on reference reach information and past project experienc
2.	drainage area (sq. mi)		1.80		1.80	
3.	bankfull width (ft)	mean:	17.6	mean:	11.0	design width = A / design depth
		range:	14.4 - 20.4	range:	---- - ----	
4.	bankfull mean depth (ft)	mean:	1.88	mean:	1.10	design depth = (A/(W/D))^.5
		range:	1.25 - 2.34	range:	---- - ----	
5.	width/depth ratio	mean:	9.7	mean:	10	design (W/D) selected based on past project experience.
		range:	6.6 - 12.9	range:	---- - ----	
6.	bankfull cross-sectional area (sq. ft)	mean:	33.3	mean:	12	existing XSEC area enlarged due to past dredging.
		range:	20.4 - 42.9	range:	---- - ----	design area (A) selected from regional curve since no apparent bankfull indicators.
7.	bankfull mean velocity (ft/sec)	mean:	0.9	mean:	0.9	estimated from Manning's equation.
		range:	---- - ----	range:	---- - ----	
8.	bankfull discharge (cfs)	mean:	11.1	mean:	11.1	estimated from Manning's equation.
		range:	---- - ----	range:	---- - ----	
9.	bankfull max depth (ft)	mean:	2.77	mean:	1.53	design max depth based on typical reference reach ratios
		range:	1.78 - 3.43	range:	---- - ----	
10.	width of floodprone area (ft)	mean:	25.8	mean:	62	design value based on width of floodplain to be excavated.
		range:	19.5 - 41.3	range:	---- - ----	
11.	entrenchment ratio	mean:	1.5	mean:	5.7	design value based on width of floodplain to be excavated.
		range:	1.3 - 2.3	range:	-	
12.	meander length (ft)	mean:	NA	mean:	110	existing channel displays no natural stream pattern.
		range:	---- - ----	range:	88 - 131	
13.	ratio of meander length to bankfull width	mean:	NA	mean:	10	design based on reference reach information and past projects.
		range:	---- - ----	range:	8 - 12	
14.	radius of curvature (ft)	mean:	NA	mean:	33	existing channel displays no natural stream pattern.
		range:	---- - ----	range:	27 - 38	
15.	ratio of radius of curvature to bankfull width	mean:	NA	mean:	3	design based on reference reach information and past projects.
		range:	---- - ----	range:	2.5 - 3.5	
16.	belt width (ft)	mean:	NA	mean:	44	existing channel displays no natural stream pattern.
		range:	---- - ----	range:	33 - 55	
17.	meander width ratio	mean:	NA	mean:	4	design based on reference reach information and past projects.
		range:	---- - ----	range:	3 - 5	
18.	sinuosity (stream length/vallley length)	mean:	1.23	mean:	1.41	
		range:	---- - ----	range:	---- - ----	
19.	valley slope (ft/ft)	mean:	0.0009	mean:	0.0008	
		range:	---- - ----	range:	---- - ----	
20.	average slope (ft/ft)	mean:	0.0007	mean:	0.0006	
		range:	---- - ----	range:	---- - ----	
21.	Pool slope (ft/ft)	mean:	0	mean:	0	pool slope not measurable due to low overall slope.
		range:	---- - ----	range:	---- - ----	
22.	Ratio of pool slope to average slope	mean:	NA	mean:	NA	
		range:	---- - ----	range:	---- - ----	
23.	maximum pool depth (ft)	mean:	3	mean:	2.7	
		range:	---- - ----	range:	---- - ----	
24.	ratio of pool depth to average bankfull depth	mean:	1.60	mean:	2.5	design based on reference reach information and past projects.
		range:	---- - ----	range:	---- - ----	
25.	pool width (ft)	mean:	18	mean:	16.4	
		range:	---- - ----	range:	---- - ----	
26.	ratio of pool width to bankfull width	mean:	1.0	mean:	1.5	design based on reference reach information and past projects.
		range:	---- - ----	range:	---- - ----	
27	pool to pool spacing (ft) *	mean:	NM	mean:	55	
		range:	---- - ----	range:	44 - 66	
28	ratio of pool to pool spacing to bankfull width *	mean:	NM	mean:	5	pool-pool spacing based on 1/2 meander wavelength.
		range:	---- - ----	range:	4 - 6	
29	ratio of lowest bank height to bankfull height (or max bankfull depth)	mean:	2.2	mean:	1.00	design should achieve BHR of approximately 1.0.
		range:	1.6 - 3.4	range:	1.00 - 1.20	

NA = not applicable NM = not measured

Note: Sections of the stream reach experience backwater from culvert crossings and past dredging. Bankfull parameters were calculated by adding bankfull areas predicted from the regional curve to the area backwatered at baseflow conditions. Stream system is highly modified, therefore, existing geomorphic parameters may be misleading.

MORPHOLOGICAL MEASUREMENTS TABLE

Claridge Nursery On-Site Mitigation Project - Reach UT1

	Variables	Existing Channel		Proposed Design		Notes
1.	stream type	F5/G5c		DA		design stream type based on reference reach information and past project experienc
2.	drainage area (sq. mi)	0.13		0.13		
3.	bankfull width (ft)	mean: 7.9		mean: 10.2		design width = A / design depth
		range: 6.3 -	9.4	range: ---- -	----	
4.	bankfull mean depth (ft)	mean: 0.55		mean: 0.41		design depth = (A/(W/D))^.5
		range: 0.46 -	0.65	range: ---- -	----	
5.	width/depth ratio	mean: 15.2		mean: 25		design (W/D) approximated based on reference reach information.
		range: 9.8 -	20.6	range: ---- -	----	
6.	bankfull cross-sectional area (sq. ft)	mean: 4.2		mean: 4.2		existing area based on regional curves since no bankfull indicators.
		range: ---- -	----	range: ---- -	----	design area (A) selected from regional curve since no apparent bankfull indicators.
7.	bankfull mean velocity (ft/sec)	mean: 1.9		mean: 0.5		estimated from Manning's equation.
		range: ---- -	----	range: ---- -	----	
8.	bankfull discharge (cfs)	mean: 8.1		mean: 8.1		estimated from Manning's equation.
		range: ---- -	----	range: ---- -	----	
9.	bankfull max depth (ft)	mean: 0.85		mean: 0.57		design max depth based on typical reference reach ratios
		range: 0.77 -	0.92	range: ---- -	----	
10.	width of floodprone area (ft)	mean: 10.0		mean: 36		design value based on width of floodplain to be excavated.
		range: 8.2 -	11.8	range: ---- -	----	
11.	entrenchment ratio	mean: 1.3		mean: 3.5		design value based on width of floodplain to be excavated.
		range: 1.3 -	1.3	range:	-	
12.	meander length (ft)	mean: NA		mean: NA		existing channel displays no natural stream pattern.
		range: ---- -	----	range: ---- -	----	pattern will be allowed to form on its own.
13.	ratio of meander length to bankfull width	mean: NA		mean: NA		existing channel displays no natural stream pattern.
		range: ---- -	----	range: ---- -	----	pattern will be allowed to form on its own.
14.	radius of curvature (ft)	mean: NA		mean: NA		existing channel displays no natural stream pattern.
		range: ---- -	----	range: ---- -	----	pattern will be allowed to form on its own.
15.	ratio of radius of curvature to bankfull width	mean: NA		mean: NA		existing channel displays no natural stream pattern.
		range: ---- -	----	range: ---- -	----	pattern will be allowed to form on its own.
16.	belt width (ft)	mean: NA		mean: NA		existing channel displays no natural stream pattern.
		range: ---- -	----	range: ---- -	----	pattern will be allowed to form on its own.
17.	meander width ratio	mean: NA		mean: NA		existing channel displays no natural stream pattern.
		range: ---- -	----	range: ---- -	----	pattern will be allowed to form on its own.
18.	sinuosity (stream length/vallley length)	mean: 1.00		mean: 1.00		sinuosity is measured straight along the fall of the valley.
		range: ---- -	----	range: ---- -	----	
19.	valley slope (ft/ft)	mean: 0.0061		mean: 0.003		slope will be lowered to promote diffuse flow conditions and reduce stream power.
		range: ---- -	----	range: ---- -	----	
20.	average slope (ft/ft)	mean: 0.0061		mean: 0.003		slope will be lowered to promote diffuse flow conditions and reduce stream power.
		range: ---- -	----	range: ---- -	----	
21.	Pool slope (ft/ft)	mean: 0		mean: 0		pool slope not measurable due to low overall slope.
		range: ---- -	----	range: ---- -	----	
22.	Ratio of pool slope to average slope	mean: NA		mean: NA		
		range: ---- -	----	range: ---- -	----	
23.	maximum pool depth (ft)	mean: 0.8		mean: NA		pools will not be designed but allowed to form naturally as a function of debris and
		range: ---- -	----	range: ---- -	----	local scour. Pools are not common for DA systems.
24.	ratio of pool depth to average bankfull depth	mean: 1.45		mean: NA		pools will not be designed but allowed to form naturally as a function of debris and
		range: ---- -	----	range: ---- -	----	local scour. Pools are not common for DA systems.
25.	pool width (ft)	mean: 8		mean: NA		pools will not be designed but allowed to form naturally as a function of debris and
		range: ---- -	----	range: ---- -	----	local scour. Pools are not common for DA systems.
26.	ratio of pool width to bankfull width	mean: 1.0		mean: NA		pools will not be designed but allowed to form naturally as a function of debris and
		range: ---- -	----	range: ---- -	----	local scour. Pools are not common for DA systems.
27	pool to pool spacing (ft) *	mean: NM		mean: NA		pools will not be designed but allowed to form naturally as a function of debris and
		range: ---- -	----	range: 41 -	61	local scour. Pools are not common for DA systems.
28	ratio of pool to pool spacing to bankfull width *	mean: NM		mean: 5		pools will not be designed but allowed to form naturally as a function of debris and
		range: ---- -	----	range: 4 -	6	local scour. Pools are not common for DA systems.
29	ratio of lowest bank height to bankfull height (or max bankfull depth)	mean: 5.5		mean: 1.00		design should achieve BHR of approximately 1.0.
		range: 5.5 -	5.5	range: 1.00 -	1.20	

NA = not applicable NM = not measured

MORPHOLOGICAL MEASUREMENTS TABLE

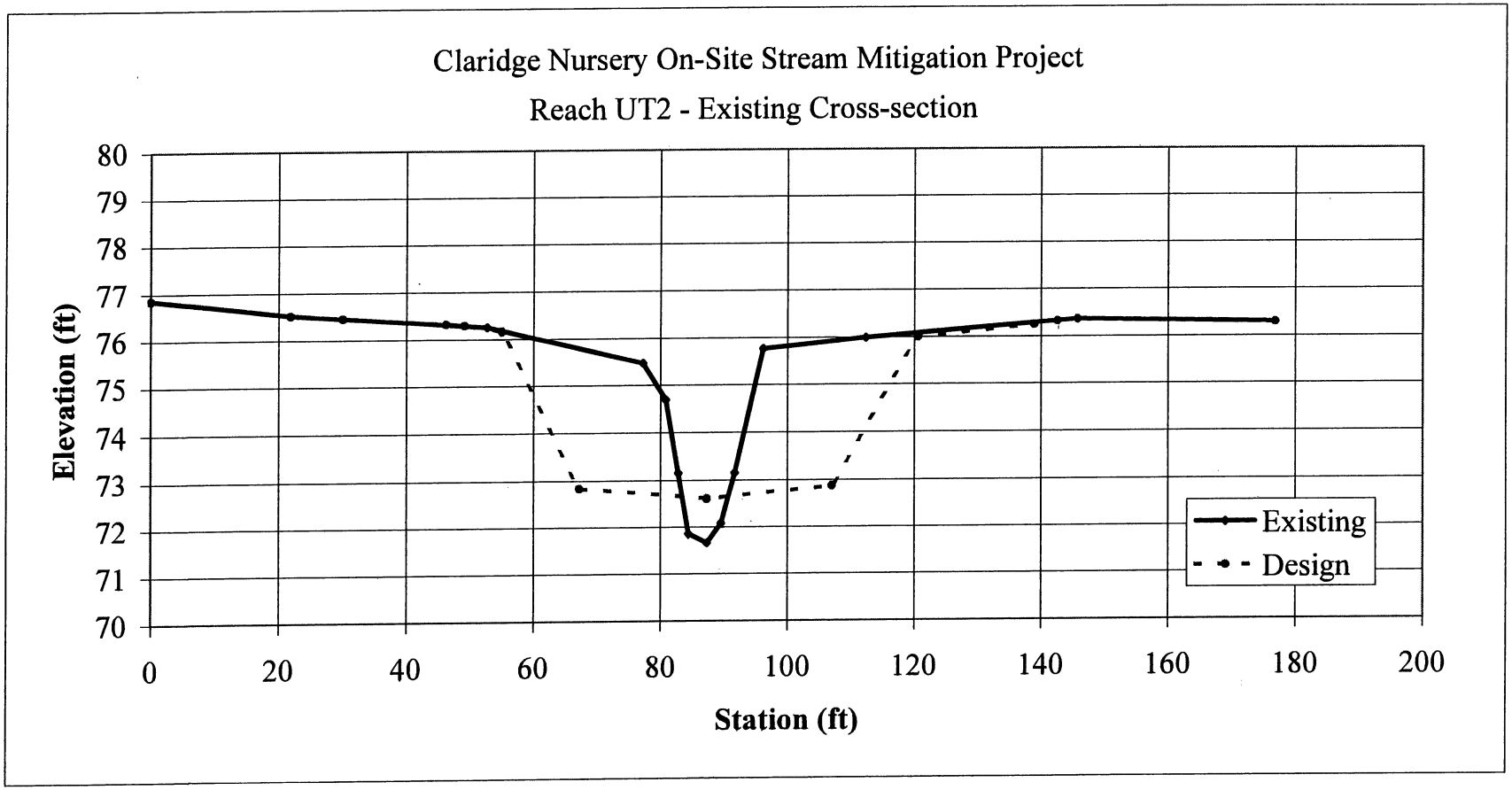
Claridge Nursery On-Site Mitigation Project - Reach UT2

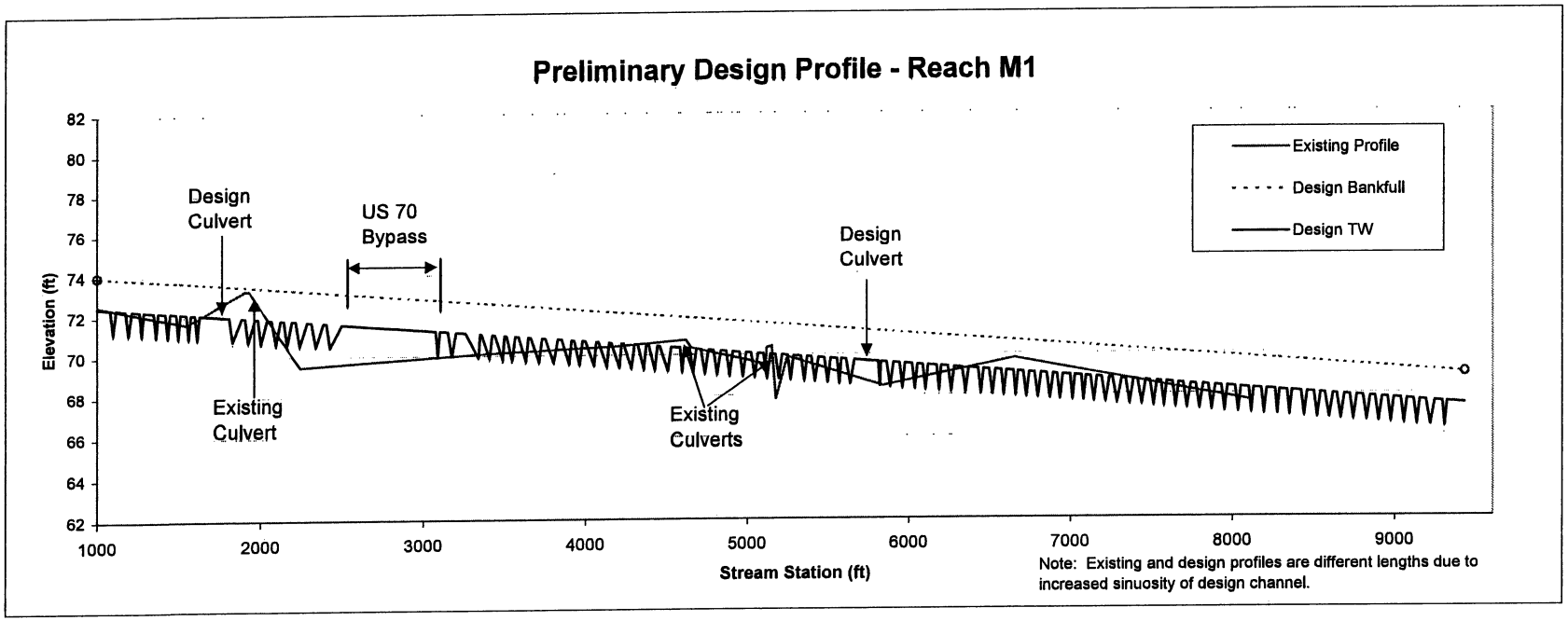
	Variables	Existing Channel		Proposed Design		Notes
1.	stream type	G5c		DA		design stream type based on reference reach information and past project experienc
2.	drainage area (sq. mi)	0.25		0.25		
3.	bankfull width (ft)	mean: 8.9		mean: 12.2		design width = A / design depth
		range: 8.2 -	9.6	range: ---- - ----		
4.	bankfull mean depth (ft)	mean: 1.0		mean: 0.49		design depth = (A/(W/D))^.5
		range: 0.8 -	1.2	range: ---- - ----		
5.	width/depth ratio	mean: 9.0		mean: 25		design (W/D) approximated based on reference reach information.
		range: 6.6 -	12.0	range: ---- - ----		
6.	bankfull cross-sectional area (sq. ft)	mean: 8.9		mean: 6		existing XSEC area enlarged due to past dredging.
		range: 7.6 -	10.1	range: ---- - ----		design area (A) selected from regional curve since no apparent bankfull indicators.
7.	bankfull mean velocity (ft/sec)	mean: 0.4		mean: 0.2		estimated from Manning's equation.
		range: ---- - ----		range: ---- - ----		
8.	bankfull discharge (cfs)	mean: 2.4		mean: 2.4		estimated from Manning's equation.
		range: ---- - ----		range: ---- - ----		
9.	bankfull max depth (ft)	mean: 1.5		mean: 0.69		design max depth based on typical reference reach ratios
		range: 1.1 -	2	range: ---- - ----		
10.	width of floodprone area (ft)	mean: 14		mean: 45		design value based on width of floodplain to be excavated.
		range: 13 -	15	range: ---- - ----		
11.	entrenchment ratio	mean: 1.6		mean: 3.7		design value based on width of floodplain to be excavated.
		range: 1.5 -	1.9	range: ---- - ----		
12.	meander length (ft)	mean: NA		mean: NA		existing channel displays no natural stream pattern.
		range: ---- - ----		range: ---- - ----		pattern will be allowed to form on its own.
13.	ratio of meander length to bankfull width	mean: NA		mean: NA		existing channel displays no natural stream pattern.
		range: ---- - ----		range: ---- - ----		pattern will be allowed to form on its own.
14.	radius of curvature (ft)	mean: NA		mean: NA		existing channel displays no natural stream pattern.
		range: ---- - ----		range: ---- - ----		pattern will be allowed to form on its own.
15.	ratio of radius of curvature to bankfull width	mean: NA		mean: NA		existing channel displays no natural stream pattern.
		range: ---- - ----		range: ---- - ----		pattern will be allowed to form on its own.
16.	belt width (ft)	mean: NA		mean: NA		existing channel displays no natural stream pattern.
		range: ---- - ----		range: ---- - ----		pattern will be allowed to form on its own.
17.	meander width ratio	mean: NA		mean: NA		existing channel displays no natural stream pattern.
		range: ---- - ----		range: ---- - ----		pattern will be allowed to form on its own.
18.	sinuosity (stream length/vallley length)	mean: 1.09		mean: 1.09		sinuosity is measured straight along the fall of the valley.
		range: ---- - ----		range: ---- - ----		
19.	valley slope (ft/ft)	mean: 0.0003		mean: 0.0003		
		range: ---- - ----		range: ---- - ----		
20.	average slope (ft/ft)	mean: 0.0002		mean: 0.0002		
		range: ---- - ----		range: ---- - ----		
21.	Pool slope (ft/ft)	mean: 0		mean: 0		pool slope not measurable due to low overall slope.
		range: ---- - ----		range: ---- - ----		
22.	Ratio of pool slope to average slope	mean: NA		mean: NA		pools will not be designed but allowed to form naturally as a function of debris and
		range: ---- - ----		range: ---- - ----		local scour. Pools are not common for DA systems.
23.	maximum pool depth (ft)	mean: 2.4		mean: NA		pools will not be designed but allowed to form naturally as a function of debris and
		range: ---- - ----		range: ---- - ----		local scour. Pools are not common for DA systems.
24.	ratio of pool depth to average bankfull depth	mean: 2.40		mean: NA		pools will not be designed but allowed to form naturally as a function of debris and
		range: ---- - ----		range: ---- - ----		local scour. Pools are not common for DA systems.
25.	pool width (ft)	mean: 8.9		mean: NA		pools will not be designed but allowed to form naturally as a function of debris and
		range: ---- - ----		range: ---- - ----		local scour. Pools are not common for DA systems.
26.	ratio of pool width to bankfull width	mean: 1.0		mean: NA		pools will not be designed but allowed to form naturally as a function of debris and
		range: ---- - ----		range: ---- - ----		local scour. Pools are not common for DA systems.
27	pool to pool spacing (ft) *	mean: NM		mean: NA		pools will not be designed but allowed to form naturally as a function of debris and
		range: ---- - ----		range: ---- - ----		local scour. Pools are not common for DA systems.
28	ratio of pool to pool spacing to bankfull width *	mean: NM		mean: NA		pools will not be designed but allowed to form naturally as a function of debris and
		range: ---- - ----		range: ---- - ----		local scour. Pools are not common for DA systems.
29	ratio of lowest bank height to bankfull height (or max bankfull depth)	mean: 2.4		mean: 1.00		design should achieve BHR of approximately 1.0.
		range: 2.1 -	2.6	range: 1.00 -	1.20	

NA = not applicable NM = not measured

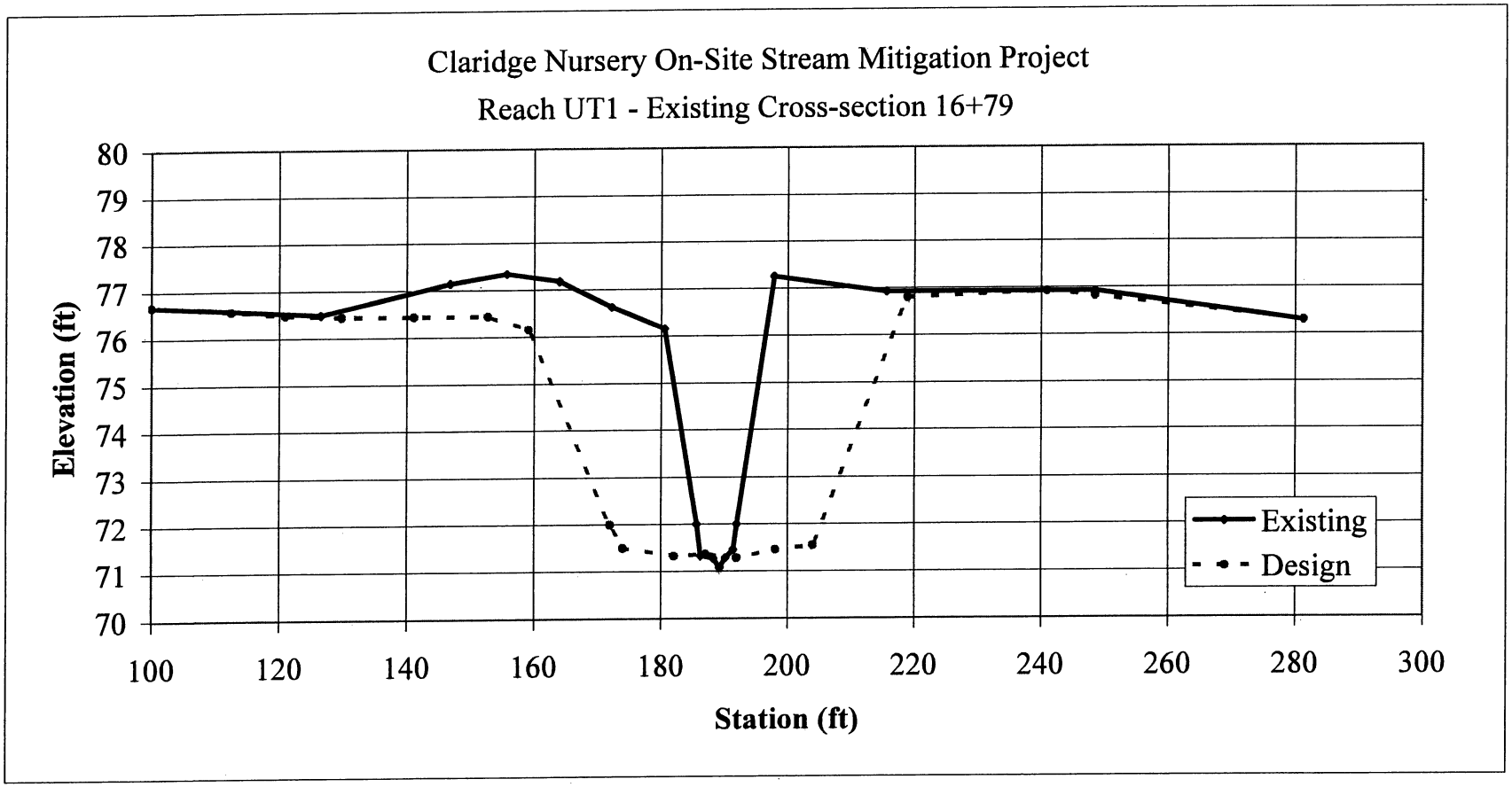
Note: Entire stream reach experiences backwater from culvert crossings and past dredging. Bankfull parameters were calculated by adding bankfull areas predicted from the regional curve to the area backwatered at baseflow conditions. Stream system is highly modified, therefore, existing geomorphic parameters may be misleading.

15+21	Feature	Type	Wfpa	LBKF	RBKF	ELbkf	Wbkf	Dbkf	W/D	Abkf	Dmax	ER	BHR
Existing	Pool	G5c	13.5	82.8	91.7	73.15	8.8	1.0	8.6	9.1	1.5	1.5	2.6
Design	Run	DA	45	81.0	94.0	73.00	12.2	0.5	25.0	6.0	0.7	3.7	1.0

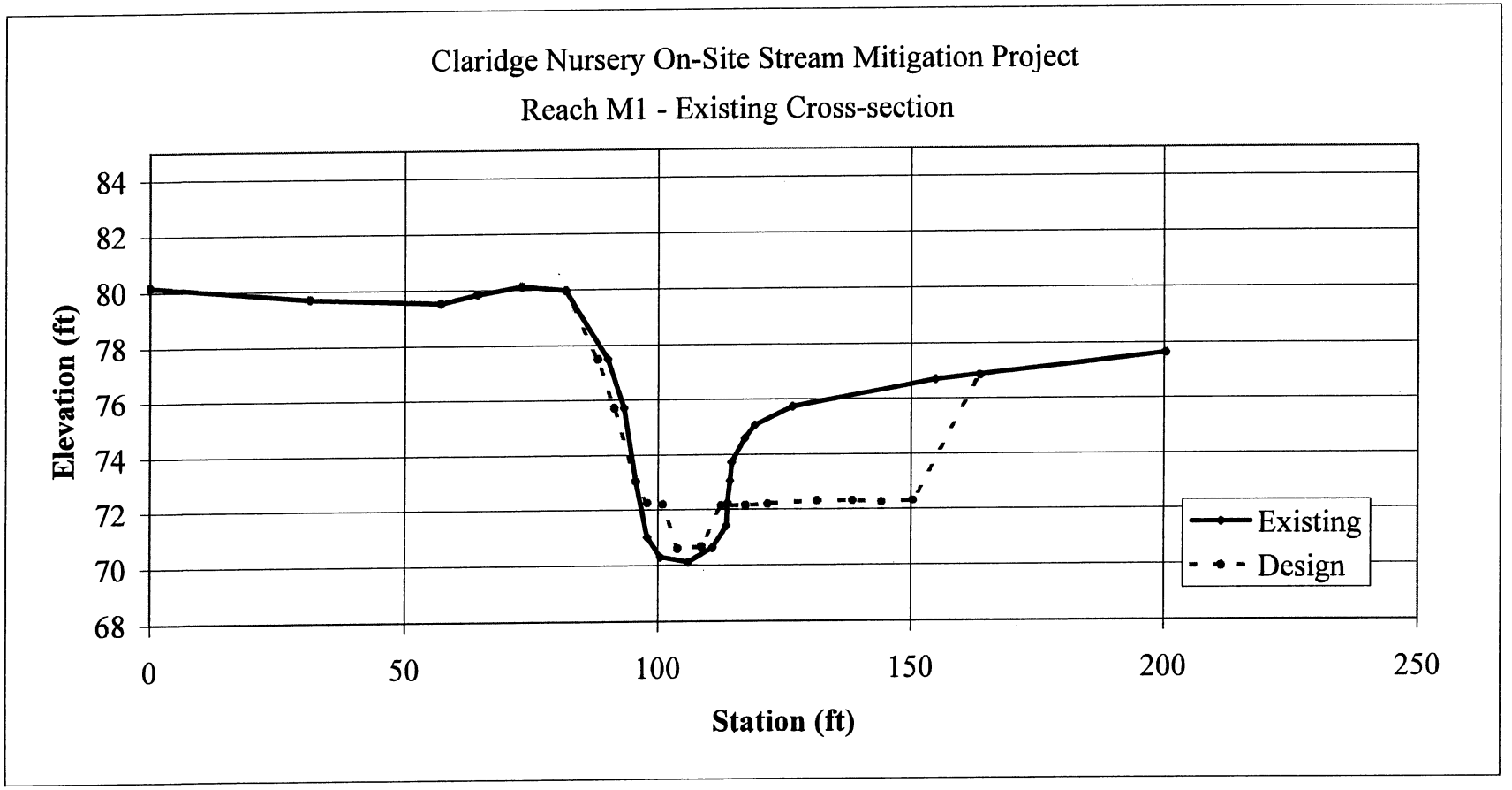



Preliminary Design Profile - Reach M1
Elevation (ft)
82
80
78
76
74
72
70
68
66
64
62
1000
2000
3000
4000
5000
6000
7000
8000
9000
Stream Station (ft)
Design Culvert
US 70 Bypass
Design Culvert
Existing Culvert
Existing Culverts
Existing Profile
Design Bankfull
Design TW
Note: Existing and design profiles are different lengths due to increased sinuosity of design channel.

16+79	Feature	Type	Wfpa	LBKF	RBKF	ELbkf	Wbkf	Dbkf	W/D	Abkf	Dmax	ER	BHR
Existing	Run	G5c	8.2	185.7	192.0	72.00	6.3	0.6	9.8	4.1	0.9	1.3	5.5
Design	Run	DA	36	172.0	204.0	71.50	10.2	0.4	25.0	4.1	0.5	3.5	1.0



33+93	Feature	Type	Wfpa	LBKF	RBKF	ELbkf	Wbkf	Dbkf	W/D	Abkf	Dmax	ER	BHR
Existing	Run	E	41.3	95.6	114.2	73.05	18.3	2.3	7.8	42.9	2.9	2.3	1.7
Design	Run	E	62	100.9	112.7	72.15	11.0	1.1	10.0	12.4	1.5	5.6	3.4



North Carolina Division of Water Quality – Stream Identification Form; Version 3.1

Date: 7-26-07	**Project:** Claridge Nursery	**Latitude:**
Evaluator: Tweedy	**Site:** UT1 - short small trib	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30* 19.75	**County:** Wayne	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 6.5)	Absent	Weak	Moderate	Strong
1[a]. Continuous bed and bank	0	1	2	3
2. Sinuosity	(0)	1	2	3
3. In-channel structure: riffle-pool sequence	0	(1)	2	3
4. Soil texture or stream substrate sorting	0	(1)	2	3
5. Active/relic floodplain	0	1	(2)	3
6. Depositional bars or benches	0	(1)	2	3
7. Braided channel	(0)	1	2	3
8. Recent alluvial deposits	(0)	1	2	3
9[a] Natural levees	(0)	1	2	3
10. Headcuts	0	(1)	2	3
11. Grade controls	(0)	0.5	1	1.5
12. Natural valley or drainageway	0	(0.5)	1	1.5
13. Second or greater order channel on existing USGS or NRCS map or other documented evidence.	(No = 0)		Yes = 3	

[a] Man-made ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 7)				
14. Groundwater flow/discharge	0	1	(2)	3
15. Water in channel and > 48 hrs since rain, or Water in channel -- dry or growing season	0	1	(2)	3
16. Leaflitter	1.5	1	(0.5)	0
17. Sediment on plants or debris	0	(0.5)	1	1.5
18. Organic debris lines or piles (Wrack lines)	0	(0.5)	1	1.5
19. Hydric soils (redoximorphic features) present?	No = 0		Yes = 1.5	

C. Biology (Subtotal = 6.25)				
20[b]. Fibrous roots in channel	3	2	(1)	0
21[b]. Rooted plants in channel	3	2	(1)	0
22. Crayfish	0	(0.5)	1	1.5
23. Bivalves	(0)	1	2	3
24. Fish	0	(0.5)	1	1.5
25. Amphibians	0	(0.5)	1	1.5
26. Macrobenthos (note diversity and abundance)	(0)	0.5	1	1.5
27. Filamentous algae; periphyton	0	1	(2)	3
28. Iron oxidizing bacteria/fungus.	(0)	0.5	1	1.5
29[b]. Wetland plants in streambed	FAC = 0.5; (FACW = 0.75;) OBL = 1.5 . SAV = 2.0; Other = 0			

[b] Items 20 and 21 focus on the presence of upland plants, Item 29 focuses on the presence of aquatic or wetland plants.

Notes: (use back side of this form for additional notes.)

assessment done during dry conditions.
Stream is shown on USGS, but not soils, but hydric soils indicate a valley.
LIDAR indicates valley.

Sketch:

North Carolina Division of Water Quality – Stream Identification Form; Version 3.1

Date: 7-26-07	**Project:** Claridge Nursery		**Latitude:**
Evaluator: Tuxedo	**Site:** UT2- lower tributary		**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30* 24.75	**County:** Wayne		**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 7)	Absent	Weak	Moderate	Strong
1[a]. Continuous bed and bank	0	1	2	3
2. Sinuosity	0	(1)	2	3
3. In-channel structure: riffle-pool sequence	0	(1)	2	3
4. Soil texture or stream substrate sorting	0	(1)	2	3
5. Active/relic floodplain	0	1	(2)	3
6. Depositional bars or benches	0	(1)	2	3
7. Braided channel	(0)	1	2	3
8. Recent alluvial deposits	(0)	1	2	3
9[a] Natural levees	(0)	1	2	3
10. Headcuts	(0)	1	2	3
11. Grade controls	(0)	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	(1)	1.5
13. Second or greater order channel on existing USGS or NRCS map or other documented evidence.	No (0)		Yes = 3	

[a] Man-made ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8.5)				
14. Groundwater flow/discharge	0	1	(2)	3
15. Water in channel and > 48 hrs since rain, or Water in channel -- dry or growing season	0	1	2	(3)
16. Leaflitter	(1.5)	1	0.5	0
17. Sediment on plants or debris	(0)	0.5	1	1.5
18. Organic debris lines or piles (Wrack lines)	0	(0.5)	1	1.5
19. Hydric soils (redoximorphic features) present?	No = 0		Yes (= 1.5)	

C. Biology (Subtotal = 9.25)				
20[b]. Fibrous roots in channel	(3)	2	1	0
21[b]. Rooted plants in channel	3	(2)	1	0
22. Crayfish	0	(0.5)	1	1.5
23. Bivalves	(0)	1	2	3
24. Fish	0	(0.5)	1	1.5
25. Amphibians	0	(0.5)	1	1.5
26. Macrobenthos (note diversity and abundance)	(0)	0.5	1	1.5
27. Filamentous algae; periphyton	0	1	(2)	3
28. Iron oxidizing bacteria/fungus.	(0)	0.5	1	1.5
29[b]. Wetland plants in streambed	FAC = 0.5; FACW = 0.75; (OBL = 1.5) SAV = 2.0; Other = 0			

[b] Items 20 and 21 focus on the presence of upland plants, Item 29 focuses on the presence of aquatic or wetland plants.

Notes: (use back side of this form for additional notes.)

assessment done during dry conditions.
Stream is shown on USGS map and on Soils Map.
LIDAR indicates valley

Sketch:

ANNUAL WETLAND MONITORING REPORT
YEAR 2005 (YEAR 4)

BEAR CREEK - MILL BRANCH WETLAND MITIGATION BANK
LENOIR COUNTY, NORTH CAROLINA

Natural Resources
Restoration & Conservation

RESTORATION SYSTEMS, LLC
1101 Haynes Street, Suite 107
Raleigh, North Carolina 27604
restorationsystems.com
(919) 755-9490

October 2005

EXECUTIVE SUMMARY

Restoration Systems, a private sector mitigation company, has established the Bear Creek-Mill Branch mitigation site (Site) approximately 5 miles from confluence with the Neuse River, in western Lenoir County. The Site is composed of approximately 145 acres within the floodplain of Bear Creek, and supports stream flows from Mill Branch and two unnamed tributaries at confluence with the river. This Site offers opportunities for riverine (stream-side) wetland restoration, Neuse River basin riparian buffer establishment, and Neuse River nitrogen reduction.

This mitigation plan details restoration and enhancement procedures for riverine wetland restoration. The Site historically serviced a watershed of approximately 54 square miles. The objective of this plan is to restore watershed functions associated with water quality and to restore a regional wildlife corridor extending from the Neuse River. The Site will be coupled with approximately 300 acres of riverine wetland preservation within the watershed to ensure that a viable wetland refuge is established in the region.

Under existing conditions, the river floodplain has been ditched, leveled, and drained to support agricultural and silvicultural activities. Streams and the river have been dredged, straightened, and levees constructed to further impede surface water impacts to alternative land uses. Based on surface water models, river flooding onto the former floodplain has been effectively reduced to a 100-year return interval due to constructed levees. This plan includes removal of a section of the river levee; consequently, flooding from the river may be restored to a 5-year return interval, a 95-year increase in return interval relative to existing conditions.

Under existing conditions, nitrogen loading into the Neuse River from the Bear Creek and Mill Branch watersheds is projected to total 2,575,000 pounds per year, representing a seven-fold increase in nutrient loads discharged into the River due to land uses in the watershed. River dredging and levee construction throughout the Bear Creek watershed has most likely exacerbated the water quality problems. Nutrient recycling functions associated with riverine wetlands and floodplains is expected to be diminished or negated throughout the region. Therefore, wetland restoration plans have been designed specifically to maximize nutrient cycling functions at this Site. The effort includes: 1) restoration of overbank flooding from the river as described above; 2) maximizing the amount of groundwater recharge across the floodplain from auxiliary watersheds; 3) establishment of backwater sloughs, cypress-tupelo swamps, and bottomland hardwood forests in flow pathways; and 4) diversion of treated stream flows back into historic channels, located approximately 3000 feet down-valley from the existing ditch outlets. Based on preliminary studies, this wetland restoration project exhibits potential to provide up to a 5 percent reduction in nitrogen loads for the 54-square mile Bear Creek region, or an 80 percent reduction in nitrogen loads for the 3-square mile, Mill Branch watershed.

Site alterations to restore groundwater, surface flow dynamics, and wetland function include: 1) ditch backfilling; 2) ditch outlet plugs; 3) river levee removal; 4) embankment construction; 5) Mill Branch channel repair; 6) wetland surface scarification; 7) seasonal pool construction; 8) woody debris deposition; and 9) tree planting. The alterations will serve to: 1) establish a backwater cypress-tupelo swamp; 2) provide a perennial source for groundwater recharge

through restored bottomland hardwood forest; 3) allow diversion of Mill Branch back into the historic stream channel; and 4) facilitate nutrient reduction goals in the Neuse River basin. The wetland design has been prepared to mimic riverine wetland attributes measured in regional reference wetlands (carbon copy method for wetland restoration). A total of 34,750 characteristic trees will be planted within the restored wetland systems.

Mill Branch will be diverted from inter-field ditches into exiting forested areas. In the forested area, the stream will be allowed to re-develop primarily through passive processes. Braiding, ponding, and anastomosed conditions will occur, mimicking reference streams in the region. Reference streams often exhibit braided (alluvial fan), backwater, or anastomosed features at the confluence with large river floodplains. The outlet for Mill Branch will be established approximately 3000 feet down-valley from the existing outfall, providing approximately 1710 feet in additional valley length relative to existing, straightened conditions (restored sinuosity not included). The increased length of stream corridor will allow for the restoration and maintenance of in-stream aquatic habitat relative to existing conditions. In addition, nutrient reduction in surface water flows will be maximized.

A Monitoring Plan has been prepared that consists of a comparison between regional reference wetlands along with evaluation of jurisdictional wetland criteria. Monitoring will entail analysis of wetland hydrology, soil, and vegetation for 5 years or until success criteria are fulfilled.

Restoration Systems intends to immediately transfer the land deed and conservation easements for the Site and regional wetland preservation areas to the North Carolina Wildlife Habitat Foundation (Eddie C. Bridges, Executive Director). Immediate transfer to the conservation organization will ensure that the 445-acre land area remains protected and managed as a regional wetland refuge in perpetuity.

Restoration plans will re-introduce surface water flood hydrodynamics from a 54 square mile watershed. The plan includes establishment of an array of riverine communities, including levee forest, bottomland hardwood forests, riverine swamp forests, and backwater cypress-gum swamps. Therefore, riverine hydrodynamic and biogeochemical functions will be restored, including pollutant removal, organic carbon export, sediment retention, nutrient cycling, flood storage, and energy dissipation. Physical wetland functions typically associated with water quality will be replaced within the Neuse River basin.

Biological functions associated with the riverine system will also be restored including in-stream aquatic habitat, structural floodplain habitat, and interspersion and connectivity between the restored stream, floodplain, and adjacent uplands.

Based on restoration plans, the area includes approximately 88 acres of riverine wetland restoration, 34 acres of wetland enhancement, 300 acres of wetland preservation, and 23 acres of upland buffer restoration. Based on Environmental Protection Agency guidelines, the plan provides 88 wetland mitigation credits for bottomland hardwood and swamp forest wetlands on riverine floodplains (5th order streams or less). In addition, the Site provides for 3390 linear feet of riparian buffer credit and a conservative estimate of 100,000 pounds per year of nitrogen removal in the Neuse River Basin. The project is scheduled for completion in December, 2000.

3.0 CONCLUSIONS AND SUMMARY OF RESULTS FOR YEARS 1 THROUGH 5

The restoration site exhibits hydrological characteristics that are very similar to the reference wetlands. Community patterns continue to develop in a clumped distribution, with a variety of tree seedlings surviving in local niches along the hydrology gradient. Areas that are characterized primarily by shrub/emergent assemblages contain an abundance of young, swamp forest species including water tupelo (*Nyssa aquatica*), swamp tupelo (*Nyssa biflora*), and bald cypress (*Taxodium distichum*). As these trees/forests mature throughout the years and the canopy closes, the emergent species are expected to be shaded out as the cypress-tupelo swamp develops with interspersed pockets of permanent inundation similar to that of other swamp forests throughout the region.

Several beaver dams were observed and removed within the site between 2004 and 2006. Beaver are present and active within reference wetland areas and have become a part of bottomland hardwood and swamp forest ecosystems throughout the Neuse River watershed. In addition, river otter (*Lutra canadensis*) populations that are likely present within the site and adjacent areas may be threatened by beaver removal programs.

Chinese privet (*Ligustrum sinense*) is present along mature forest edges and within established bottomland hardwoods located in the southeast portion of the site. The density of Chinese privet stems has decreased within bottomland hardwoods from 229 stems per acre in year 4 (2005) to 86 stems per acre in year 5 (2006). This is likely due to increased saturation/inundation of the site and an intolerance of this species to endure prolonged periods of saturation/inundation. Drier conditions during earlier monitoring years may have encouraged proliferation of this species within the site. During field investigation in late July and early August of 2006, many of the more mature, established stems of Chinese privet were dead or dying, most likely resulting from continual saturation/inundation. In addition, Chinese privet was present within the reference forest used to design this site and the species has become naturalized within bottomland hardwood and swamp forests throughout the Neuse River watershed. It is not recommended that measures to control this species should be taken. This species is extremely difficult to control due to propagation from root and stump sprouts, production of numerous fruits that are easily dispersed by area wildlife (mostly birds) and moving water, and tolerance of drought conditions.

In summary, the restoration site achieved success criteria for hydrology and vegetation in the Fifth Monitoring Year. In addition, the site is highly successful having achieved success criteria for hydrology and vegetation over the entire 5-year monitoring period. Tables 5 and 6 below summarize hydrology and vegetation data gathered each of the five monitoring years.

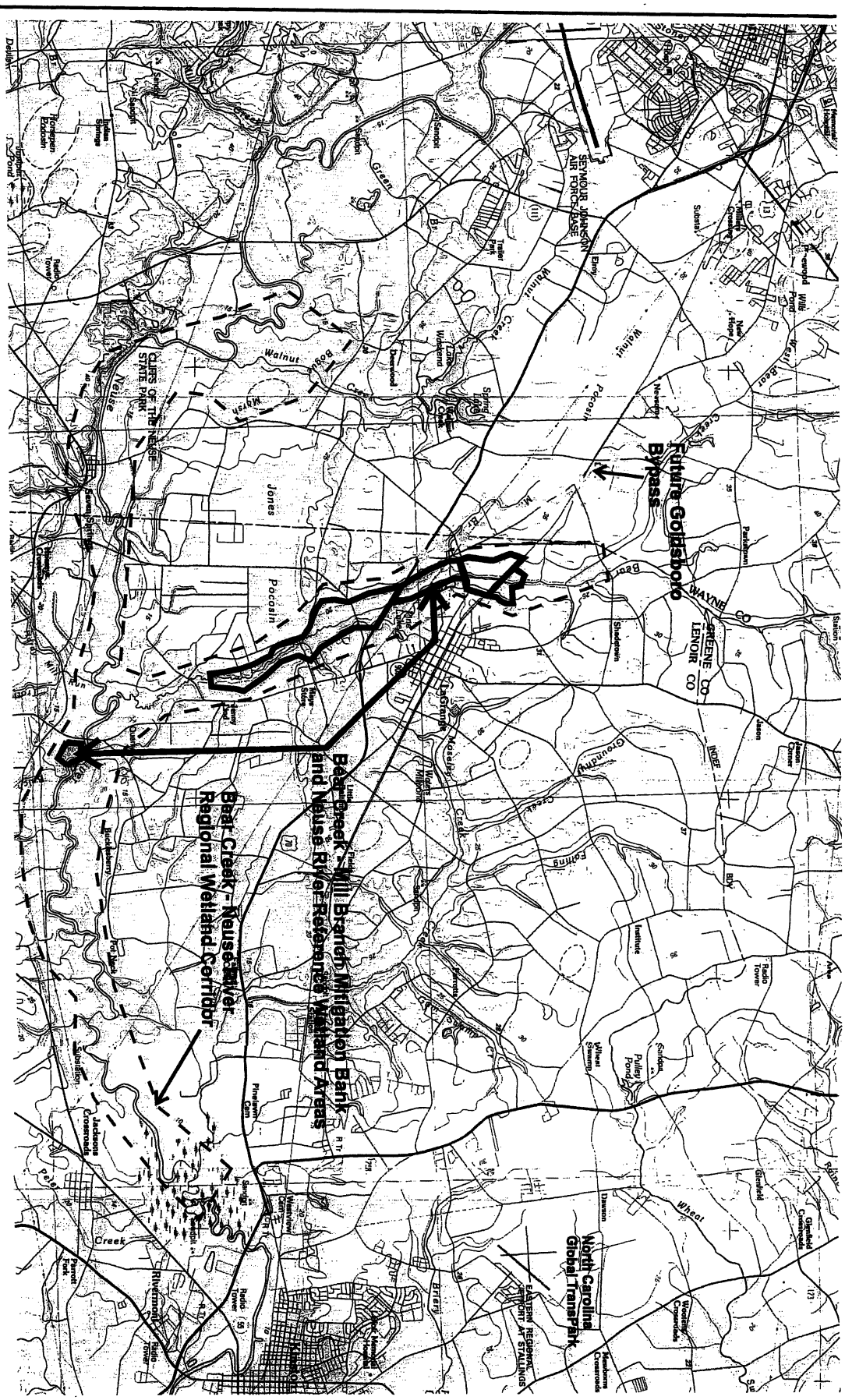
Table 5. Summary of Groundwater Gauge Results for Years 1 through 5

	Success Criteria Achieved (Max Consecutive Days Saturated During Growing Season)				
Gauge	**Year 1 (2002)**	**Year 2 (2003)**	**Year 3 (2004)**	**Year 4 (2005)**	**Year 5 (2006)**
BH1	Yes (27 days)	Yes (135 days)	Yes (217 days)	Yes (119 days)	Yes (249 days)
BH2	Yes (49 days)	Yes (136 days)	Yes (207 days)	Yes (100 days)*	Yes (167 days)
BH3	Yes (59 days)	Yes (249 days)	Yes (249 days)	Yes (114 days)*	Yes (167 days)
BH4	Yes (59 days)	Yes (249 days)	Yes (249 days)	Yes (102 days)	Yes (196 days)
BH5	Yes (152days)	Yes (249days)	Yes (249 days)	Yes (225 days)*	Yes (249 days)
BH6	Yes (154 days)	Yes (249 days)	Yes (249 days)	Yes (157 days)*	Yes (249 days)
Ref BH100	Yes (64 days)	Yes (249 days)	Yes (166 days)	malfunctioned	Yes (86 days)
SF1	Yes (43 days)	Yes (249 days)	Yes (249 days)	Yes (249 days)	Yes (133 days)
SF2	Yes (249 days)	Yes (249 days)	Yes (249 days)	Yes (177 days)	Yes (249 days)
SF3	Yes (56 days)	Yes (249 days)	Yes (249 days)	Yes (103 days)*	Yes (247 days)
SF4	Yes (249 days)	Yes (249days)	Yes (249 days)	Yes (130 days)*	Yes (249 days)
SF5	Yes (220 days)	Yes (249 days)	Yes (249 days)	Yes (249 days)	Yes (249 days)
Ref SF100	Yes (130 days)	Yes (249 days)	Yes (249 days)	Yes (249 days)	Yes (249 days)

* Gauge malfunctioned for a portion of the growing season.

Table 6. Summary of Vegetation Plot Results for Years 1 through 5

	Total Stems/Acre Counting Toward Success Criteria				
Community	**Year 1 (2002)**	**Year 2 (2003)**	**Year 3 (2004)**	**Year 4 (2005)**	**Year 5 (2006)**
Bottomland Hardwood	361	842	904	1554	1128
Riverine Swamp Forest	490	876	1028	1534	1282



Restoration Systems
1101 Haynes Street,
Suite 107
Raleigh, N.C. 27604

Site Location
Bear Creek - Mill Branch Mitigation Site
Lenoir County, North Carolina

Dwn. by:	JN
Scale:	1 in=1400 ft
Date:	December 2003
Project:	04-2677

FIGURE
1

Tommy's Road Mitigation Plan
Wayne County

R-2554BA
WBS Element: 34461.1.1

December 3, 2007

NCDOT will perform on-site mitigation to offset unavoidable stream and wetland impacts associated with Transportation Improvement Program (TIP) R-2554BA. The mitigation is located within the NCDOT right-of-way and an NCDOT conservation easement area adjacent to this TIP within NCDWQ sub-basin 03-04-05 and within HU 03020202. This site contains 3.91 acres of which 2.79 acres is NCDOT right-of-way and 1.12 acres is a NCDOT conservation easement along Howell's Branch. Tommy's Road currently bisects the site.

At this site, the proposed mitigation will include stream and wetland preservation as well as wetland and buffer restoration. NCDOT proposes to preserve 691 linear feet of Howell's Branch as well as 2.37 acres of adjacent riverine wetlands. This will be used as onsite mitigation at a ratio of 5:1. As part of the R-2554BA project, NCDOT also plans to remove a section of Tommy's Road and the culvert for Howell's Branch between Sta. 21+20 and Sta. 21+80 as shown on plan sheet 10 at Site 8. This will enhance the existing riverine and wetland system as well as provide 61 ft of stream restoration, 0.33 acres of riverine wetland restoration and 7792 sq. feet of buffer restoration. NCDOT plans to use this as onsite mitigation at a ratio of 1:1. (See Table 1)

Existing Conditions

Howell's Branch is a tributary to Stoney Creek. The Stoney Creek watershed drains approximately 30 square miles from the Goldsboro/Wayne Airport to the Neuse River. Howell Branch flows through the site in a north to south direction for 752 linear ft. Existing wetlands adjacent to the stream on the eastern side, north of Tommy's Road, total 1.12 acres. Existing wetlands along the western side of the stream, north of Tommy's Rd. total 0.48 acres. There is also a 0.2 acre pond along the western side that NCDOT has acquired as a Permanent Drainage Easement (PDE) within its conservation easement area. The site is bisected by Tommy's Rd. which is a two lane paved road with a 2400 mm culvert through which Howell Branch currently flows. An area south of Tommy's Rd. has also been acquired as NCDOT right-of-way and has 0.77 acres total of wetlands associated with Howell Branch.

Proposed Conditions

NCDOT plans to restore 61 linear ft of Howell Branch, 0.33 acre of riverine wetlands and 7792 square ft. of riparian buffer through removal of the existing pavement and fill material associated with Tommy's Rd as well as removal of the 2400 mm culvert that

Howell Branch currently flows through. NCDOT will excavate the existing roadbed to the existing wetland elevation and match the base width of the existing culvert (See Detail V, sheet 2-T and Sheets x-242 & x-243). These restored areas will be planted with a mix of bare root saplings as described in Table 2 at a rate of 680 trees per acre. This area will be protected through fencing of the entire site.

Success Criteria and Monitoring Plan

The following monitoring will be performed each year of the 3-year monitoring period on the restoration areas: reference photos, plant survival (i.e., identify specific problems areas (missing, stressed, damaged or dead plantings), estimated causes and proposed/required remedial action), visual inspection of channel stability. Physical measurements of channel stability/morphology will not be performed. A monitoring report will be submitted within sixty (60) days after completing the monitoring.

TABLE 1 MITIGATION SUMMARY		
Type	**Quantity**	**Credits**
Stream Preservation	691 ft	138.2 ft
Stream Restoration	61 ft	61 ft.
Wetland Preservation	2.37 ac	0.47 ac
Wetland Restoration	0.33 ac	0.33 ac
Buffer Restoration	7792 sq. ft	7792 sq. ft

TABLE 2. PROPOSED BARE-ROOT AND LIVESTAKE SPECIES		
Common Name	Scientific Name	Percent Planted by Species
Type II Streambank Reforestation – Bare Root Plantings		
River Birch	*Betula nigra*	30%
Sycamore	*Platanus occidentalis*	30%
Overcup Oak	*Quercus lyrata*	20%
Swamp Chestnut Oak	*Quercus michauxii*	20%
Type I Streambank Reforestation - Live Stakes		
Black willow	*Salix nigra*	50%
Silky Dogwood	*Cornus amomum*	50%

UT West Bear Creek Mitigation Plan
Wayne County

R-2554C
WBS Element: 34461.1

December 20, 2007

NCDOT will perform on-site mitigation to offset unavoidable stream and wetland impacts associated with Transportation Improvement Program (TIP) R-2554C. The mitigation is located within the NCDOT right-of-way within NCDWQ sub-basin 03-04-05 and within HU 03020202. The site totals 19.36 acres and contains approximately 600 ft of an unnamed tributary to West Bear Creek as well as approximately 800 ft of West Bear Creek. It is located on the La Grange USGS quad map and on sheets 11-13 of the preliminary plans from Sta. 250+60 to Sta. 256.

At this site, both the unnamed tributary as well as West Bear Creek will be impacted by R-2554C (Site 4). The proposed mitigation involves relocating these stream channels into an adjacent agricultural field within the NCDOT right-of-way. NCDOT proposes to restore approximately 1243 linear feet of stream and 2.8 acres of riparian buffer at a ratio of 1:1.

Existing Conditions

West Bear Creek is a tributary to Bear Creek. Bear Creek runs just west of La Grange and is a tributary to the Neuse River. The UT to West Bear Creek begins, within this site, at the outfall of a large residential pond. The outfall pipe is perched and a large scour hole has form at this location. The UT flows from here in a southwesterly direction along the edge of an agricultural field. The riparian buffer is sparse and ranges from approximately 0-10 ft. The channel is incised with high, unstable banks for the majority of its length within the site. The confluence with West Bear Creek occurs at a 90-degree angle at the corner of the agricultural field. From this point, West Bear Creek flows in an easterly direction along the field. It continues to have a sparse riparian buffer and exhibits evidence of past straightening.

Proposed Conditions

NCDOT proposes to restore 1243 linear feet of UT West Bear Creek by re-establishing the correct pattern, profile and dimensions of the channel within the adjacent farm field. A riparian buffer of at least 50 ft will be planted along each bank of the new channel with a mix of bare root saplings at a rate of 680 trees per acre. (Table 2) Final stream design plans will be submitted with final roadway plans for Section C of the TIP R-2554.

Success Criteria and Monitoring Plan

The following monitoring will be performed each year of the 3-year monitoring period on the restoration areas: reference photos, plant survival (i.e., identify specific problems areas (missing, stressed, damaged or dead plantings), estimated causes and proposed/required remedial action), visual inspection of channel stability. Physical measurements of channel stability/morphology will not be performed. A monitoring report will be submitted within sixty (60) days after completing the monitoring.

TABLE 1 MITIGATION SUMMARY		
Type	**Quantity**	**Credits**
Stream Restoration	1243 ft	1243 ft
Buffer Restoration	121968 sq. ft	121968 sq ft

TABLE 2. PROPOSED BARE-ROOT AND LIVESTAKE SPECIES		
Common Name	Scientific Name	Percent Planted by Species
Type II Streambank Reforestation – Bare Root Plantings		
River Birch	*Betula nigra*	30%
Sycamore	*Platanus occidentalis*	30%
Overcup Oak	*Quercus lyrata*	20%
Swamp Chestnut Oak	*Quercus michauxii*	20%
Type I Streambank Reforestation - Live Stakes		
Black willow	*Salix nigra*	50%
Silky Dogwood	*Cornus amomum*	50%

Subject: Draft Minutes from Interagency Hydraulic Design Review Meeting on December 14, 2005 for R-2554BA in Wayne County

Team Members:

William Wescott-USACE	(present)
Brian Wrenn-NCDWQ	(present)
Travis Wilson-NCWRC	(present)
Gary Jordan-USFWS	(present)
Chris Militscher-EPA	(present)
Jay McInnis-PDEA	(present)
Ron Lucas-FHWA	(present)
Chris Manley-NEU	(present)
Gail Tynek-ESI	(present)
Steven Kichefshi-ESI	(present)

** Provided comments.

Participants:
Marshall Clawson, NCDOT Hydraulics
Galen Cail, NCDOT Hydraulics
Tina Swiezy, RK&K
Matthew Cook, RK&K
Scott Blevins, NCDOT Design Services
Omar Azizi, NCDOT Structure Design
Tim Coggins, NCDOT Structure Design
Lonnie I. Brooks, NCDOT Structure Design
Doug Taylor, NCDOT Roadway
Kanchana Noland, NCDOT Roadway
Mark Staley, NCDOT REU
Jeff Walston, NCDOT REU
Theresa Canales, Highway Admin. Office
Wendi Johnson, NCDOT Div.4
Mike Robinson, NCDOT Area Bridge Eng **

The meeting began by everyone introducing themselves. After this, Tina began by giving a brief description of the project and then going through the permit package sheet by sheet.

General

- Due to the breakup of the R-2554B project into 3 separate projects and the long range letting dates (except for R-2554BA), the permits discussed today are only for the R-2554BA section. RK&K will submit preliminary permits for the BB section when the final permit for the BA section is submitted. A 4C meeting will be scheduled and final permit drawings provided for the BB section when they are prompted by the scheduled LET date.
- For all buffer and stream sites the impact limits need to be increased to allow for additional work area: minimum of 10 ft beyond slope stakes (the mechanized clearing). For stream impacts need 10 ft beyond the rip rap limits and/or to limits of any temporary channel diversions.
- At bridge crossings, account for hand clearing in wetlands 10 ft beyond bridge limits. Also, show a 30 ft wide work bridge between proposed bridges for construction. If drilled shafts are used, show work bridge "fingers" 20 ft wide for access.
- Try to improve permit drawing clarity as best can. Improved scale on plan views for interchange sheets are provided.
- Permit summary sheets need to display quantities in English and metric.

- Provide filtration and velocity notes and calcs in the permit sheets at applicable buffer and wetland sites.
- Need detail sheets and construction sequences for the natural stream designs (NSD) in the permit and plans.
- Account for Buffer Replacement at NSD sites.
- A guide was provided by DWQ on how to account for "Wetlands in Buffer".
- Permanent pier impacts and shading need to be accounted for at bridge crossings. NEU will provide.

Sheet 5A:

- Need preformed scour hole (PSH) at appr. Sta. 93+00 –L2- LT. inside the loop.

- The pipes at Sta. 93+00 –L2- RT need to outlet at the same place. They share the riprap.

Sheet 5B:

- Need preformed scour hole (PSH) at appr. Sta. 2+80 –L2LPD- RT. inside the loop.

Sheet 6A:

- It was noted the stream at appr. Sta. 96+80 – L- LT. was verified as jurisdictional. However, buffers do not apply.

- The restoration at appr. Sta. 97+20 – 99+80 – L- RT. will need additional buffer takes and buffer restoration calcs.

- Review the need for additional easement (and impacts) to construct the 1350 Sta 99+95 –L- LT.

Sheet 7A:

- The special cut ditches were questioned and verified to be grass lined.

- Check the 3 @ 1050's at Sta. 20+20 –Y2- to insure the pipes are not wider than the actual stream width. If they are, need to adjust pipe elevations to provide low flow conveyance or provide sill(s) in pipe(s).

Sheet 7C:

- Investigate using a flow spreader for the 450 RCP at appr. Sta. 109+00 –L- RT.

Sheet 10:

- Investigate providing horizontal distance/separation between the outlet and inlet inside the sediment basin RT.

- The BDO Sta 113+85 –L- RRT. was questioned. This layout was discussed at the 4B meeting and was found to be acceptable due to the steep topo.

- Need to extend buffer impacts to account for construction access.

Sheet 15:

- Per discussion with Structures, the span layout will be rearranged to eliminate a pier. Rearranged piers should not be located in close proximity to stream and banks.

- Investigate capacity of PSH Sta. 131+60 –L- RT. May need an energy dissipater design. Relocate further away from buffer.

Sheet 18:

- Relocate PSH at appr Sta. 142+20 –L- RT further away from buffer.

Sheet 19A:

- It was noted that structure #157A is being filtered in the gore area.

- It was noted that the structure at appr. Sta .148+70 –L- RT is a 3GI.

- Show wetland and stream impacts as total take within gore areas.

Sheet 20:

- Investigate providing horizontal distance/separation between the outlet and inlet inside the sediment basin RT.

- It was noted that the wetland at appr. Sta. 152+60 –L- LT is a total take.

- Investigate the location of bent relative to the stream. Check the stream (Reedy Branch) at appr. Sta. 153+90 –L- for the correct location.

Sheet 25:

- It was noted that there is no buffer on the roadway side of the site at appr. Sta. 101+40 –L2- LT.

Sheet 26:

- The PSH at appr. Sta. 12+40 –Y2- RT needs to be moved outside the buffer.
- Insure the impacts due to the new culvert outlet are accounted for.
- Roadway will notify Geotech concerning their recommendation for removal of the existing RCBC.

Meeting adjourned

Subject: **Draft** Minutes of the Interagency Hydraulic Design Review Meeting on October 20, 2004 for R-2554A, Wayne County

Participants:

Team Members:	Other Attendees
Randy Henegar, NCDOT Hydraulics (present)	Malcolm Watson, NCDOT Roadway
Eric Alsmeyer in attendance for Mike Bell, USACE	Omar Azizi, NCDOT Structures
Beth Barnes in attendance for Nikki Thomson, NCDWQ	Tim Coggins, NCDOT Structures
Missy Dickens, NCDOT PD&EA (present)	Greg Crosby, NCDOT Hydraulics
Travis Wilson, NCWRC (present)	David Scheffel, NCDOT Roadway
Gary Jordan, USFWS (absent)	Jamie Shern, NCDOT Division 4
Chris Militscher, EPA (present)	Jerry Page, NCDOT Division 4
Cathy Houser, NCDOT Project Services (absent)	Kevin Bowen, NCDOT Division 4 Const.
Michael Turchy, NCDOT ONE (present)	
Wendi Johnson, NCDOT Division 4 (absent)	

This meeting commenced at approximately 10:30 a.m., with a brief overview of the project. Randy Henegar proceeded to review jurisdictional streams and wetlands sites for each plan sheet. Comments were as follows:

R-2554A

1. Wetlands Impacts: Sites 1thru 12 on the Wetland Impact Summary.

Plan sheet 8 depicts a wetland between –L- and –Y1-. This wetland will not be impacted by construction, but drainage out of the wetland will need to be maintained. This site does not show up on the Wetland Impact Summary and will be revisited by the agencies.

Plan sheet 9, site 1 on the Wetland Impact Summary appears to be in a ditch and may not be a wetland. This site will be revisited by the agencies.

Wetland Impact Summary sites 3, 4, 5, 6, 7, 8, and 9 are referenced on the Roadway Plan Sheets and do not appear to have any discrepancies.

Site 2 is outside the limits of –Y3- and will not be disturbed by the project.

Site 10 is not referenced on Roadway Plan sheet 19 as indicated in the Wetland Impact Summary. The agencies will revisit this site.

Site 11 is referenced on Roadway Plan Sheet 20 and appears to encompass the Canal and its banks. This site will be revisited by the agencies.

Site 12 is referenced on Plan sheet 21 and encompasses Little River water surface and the wetland. This site will be revisited to confirm the wetland boundary along the river.

Plan sheet 32 references a wetland along –Y10- (NC581). This wetland is not depicted on the Wetland Impact Summary and will be revisited by the agencies.

2. Stream Impacts: Sites AT1 – AT9 on the Stream Impact Summary.

Sites AT1, AT3, AT4, AT6, and AT7 are referenced on the Roadway Plan Sheets and do not appear to have any discrepancies. Of these streams AT6 is the only one that does not showing up as a blue line stream on the Quad. Map.

Sites AT8 and AT9 are not blue line streams on the Quad. Map. There is some questions as to weather these sites are buffer streams or ditches. DWQ will investigate this in the field.

There are two potential stream sites not listed on the Stream Impact Summary at stations 49+20 –L- and 54+00 – L-. The agencies will visit these sites for verification.

General comments:

Chris questioned the use of 3:1 slopes at jurisdictional sites. Randy replied 3:1 slopes or flatter will be used at all jurisdictional sites.

That portion of wetland sites 4, 5, and 7 lying right of –L- and outside of the fill slope will be considered an impact.

Question about R/W interfering with greenhouse right of station 56+50 -L-. David Scheffel indicated the R/W could be tucked in to avoid greenhouse.

Note that originally the canal was to be a culvert but because of the extent of the flood study, the bridge over Little River had to be extended over the canal to meet FEMA requirements.

2005

Updated

Resources

9 September 2005

Mr. Michael Turchy
North Carolina Department of Transportation
Office of Natural Environment
Parker Lincoln Building
1598 Mail Service Center
Raleigh, NC 27699-1598

Re: US 70 Goldsboro Bypass Update
Wayne and Lenoir Counties, NC
Consultant Project: 04-ES-04
TIP No. R-2554 **ER04-046.04**
State Project No.: 6.339002T

Mr. Turchy;

Environmental Services, Inc., (ESI) was asked to complete an update for the US 70 Goldsboro Bypass (TIP No. R-2554) located in Wayne and Lenoir Counties, North Carolina (Figure 1). The purpose of this update was to determine if any major changes had occurred to the Threatened and Endangered Species habitat assessment and/or the jurisdictional delineation within the preferred alternative since the original delineation was completed in 1995.

ESI personnel began work on the Threatened and Endangered species update and the jurisdictional re-verification in April 2005. During the field investigation for the jurisdictional re-verification, it was noted that multiple areas required additional delineation to reflect changes which had occurred within previously jurisdictional areas. It was also noted that supplemental data forms for both jurisdictional streams and wetlands were necessary for each jurisdictional area in order to meet current North Carolina Department of Transportation (NCDOT) and U.S. Army Corps of Engineer (USACE) standards. In addition, the project study area is now subject to Neuse River Riparian Buffer Rules, and a field review by the North Carolina Division of Water Quality (NCDWQ) would be required.

After consultation and additional scoping with the NCDOT, ESI re-delineated and mapped these areas, using sub-meter Global Positioning Systems (GPS), where changes had occurred. The updated and approved 2005 jurisdictional delineation is depicted in Figures 2 (A-T) included with this letter report.

A field review of the original and updated delineation was conducted on 26 July 2005 and 24 August 2005 with Bill Biddlecome of the USACE. During this review, current jurisdictional wetland and stream areas were verified and an Important/Unimportant determination was conducted for each jurisdictional stream channel. A summary of jurisdictional streams and surface waters is presented in Table A (attached) and a summary of jurisdictional wetlands is presented in Table B (attached).

The project study area is located within the Neuse River Basin. Streams and jurisdictional surface waters depicted on either the most recent U.S. Geological Survey 7.5-minute topographic quadrangle or the county soil survey map are subject to the Neuse River Riparian Buffer Rules. On 29 July 2005 a field review was conducted with Christina Breen of the NCDWQ to determine which stream and open water features are subject to the Neuse River Riparian Buffer Rules. These determinations are presented within the jurisdictional stream summary in Table A.

ESI completed two data forms for each jurisdictional wetland area and stream channel within the project study area in order to meet current NCDOT and USACE standards. For each jurisdictional wetland area occurring within the project study area, both a USACE Routine Wetland Determination Data Form as well as a NCDWQ Wetland Rating Form was completed. For each jurisdictional stream channel within the project study area, both a USACE Stream Quality Assessment Worksheet as well as a NCDWQ Stream Identification Form was completed.

The data forms for all of the jurisdictional features are included with this letter report. ESI has also provided a CD with an electronic copy of the letter report, tables and two GPS files. The first GPS file is the 2005 jurisdictional delineation. This file contains the final USACE approved jurisdictional delineation in NC Map format. The second file contains the approved jurisdictional delineation with comments to clarify changes made between the 1995 and 2005 delineations.

ESI conducted a habitat evaluation within the project study area for federally protected species listed for Wayne and Lenoir Counties. The current list (29 January 2003) provided by the U.S. Fish and Wildlife Service (USFWS) of federally protected species with ranges extending into Wayne and Lenoir Counties was reviewed prior to the initiation of field studies. In addition, records maintained by the N.C. Natural Heritage Program (NCNHP) were consulted for documented occurrences of federal-listed and state-listed species before commencing the field effort. The attached report contains descriptions of those listed species known to occur in Wayne and Lenoir Counties, a description of habitat considered suitable for each species, and a Biological Conclusion for each species.

Environmental Services, Inc., appreciates this opportunity to offer you our services. If you need any additional information or have any questions, please call Steve Kichefski or me at (919) 212-1760.

Sincerely,

ENVIRONMENTAL SERVICES, INC.

Gail Tyner
Senior Scientist

Attachments:

Figure 1: Project and Figure Location Map
Figures 2 (A-T): Jurisdictional Areas
Table A: Jurisdictional Stream and Surface Water Characteristics
Table B: Jurisdictional Wetland Characteristics
Data Forms: USACE Routine Wetland Determination Form
NCDWQ Wetland Rating Form
USACE Stream Quality Assessment Worksheet
NCDWQ Stream Identification Form
Threatened and Endangered Species Update
CD

THREATENED AND ENDANGERED SPECIES UPDATE
US 70 Goldsboro Bypass Update
T.I.P. No.: R-2554
State Project No.: 6.339002T
Consultant Project: 04-ES-04

I. Project Description

The North Carolina Department of Transportation (NCDOT) is investigating the feasibility of the US 70 Goldsboro Bypass in Wayne and Lenoir Counties. The project study area consists of a single corridor on a new location north of Goldsboro, extending from US 70 west of NC 581 in Wayne County east to US 70 just east of Bear Creek in Lenoir County. The project study area width is approximately 400 feet (ft) with expanded areas around intersections. Areas within the proposed US 70 Goldsboro Bypass corridor associated with the US 117 corridor, currently under construction, were not re-evaluated as part of this effort.

Environmental Services, Inc., (ESI) was asked to update the natural resources field investigation associated with the US 70 Goldsboro Bypass, including a jurisdictional re-verification of the wetland and stream delineation and completion of the appropriate data forms, and determining the applicability of the Neuse River Riparian Buffer Rules. ESI was also asked to conduct a habitat evaluation and any surveys necessary for federally protected species listed in Wayne and Lenoir Counties. The current list (29 January 2003) provided by the U.S. Fish and Wildlife Service (USFWS) of federally protected species with ranges extending into Wayne and Lenoir Counties was reviewed prior to the initiation of field studies. Records maintained by the N.C. Natural Heritage Program (NCNHP) were consulted for documented occurrences of federal-listed and state-listed species before commencing the field effort (Review date 5 April 2005). This report contains descriptions of those listed species known to occur in Wayne and Lenoir Counties, a description of habitat considered suitable for each species, and a Biological Conclusion for each species.

Field investigations and potential habitat assessments were conducted on 25 and 26 April 2005 by ESI biologists Gail Tyner, Lauren Cobb, and Steve Kichefski. Ms. Tyner is a Senior Scientist with a B.S. in Fisheries and Wildlife Science and more than seven years of professional experience. Ms. Cobb is a Senior Scientist with a B.S. in Natural Resources and more than five years of professional experience. Mr. Kichefski is a Project Scientist with a B.S. in Environmental Science and more than three years of professional experience.

II. Federally Protected Species

Species with the federal classification of Endangered (E), Threatened (T), or officially Proposed (P) for such listing, are protected under the Endangered Species Act (ESA) of 1973, as amended (16 USC 1531 *et seq.*). Table 1 presents the federal protected species listed for Wayne and Lenoir Counties (USFWS 2003a). Descriptions of these federally protected species along with habitat requirements and Biological Conclusions for this project are presented below.

Table 1. Federally Listed Species for Wayne and Lenoir Counties, NC (USFWS 2003a).

Common Name	Scientific Name	Federal Status[a]	Potential Habitat Present	County W/L[b]	Biological Conclusion
Bald eagle	*Haliaeetus leucocephalus*	T[c]	No	L	No Effect
Red-cockaded woodpecker	*Picoides borealis*	E	No	W/L	No Effect
Sensitive joint-vetch	*Aeschynomene virginica*	T	No	L*	No Effect

[a] E – Endangered, T – Threatened.

[b] W – Wayne, L – Lenoir.

[c] Proposed for delisting.

* Counties in which the element was last observed more than 50 years ago.

Bald eagle - The bald eagle is a large raptor with a wingspan greater than six ft. Adult bald eagles are dark brown with white head and tail. Immature eagles are brown with whitish mottling on their tail, belly, and wing linings. Bald eagles typically feed on fish but may also eat birds and small mammals. In the Carolinas, nesting season extends from December through May (Potter *et al.* 1980).

Bald eagles typically nest in tall, living trees in a conspicuous location near water and forage over large bodies of water with adjacent trees available for perching (Hamel 1992). Preventing disturbance activities within a primary zone which may extend 750 to 1500 ft outward from a nest tree is considered critical for maintaining acceptable conditions for eagles (USFWS 1987). USFWS recommends avoiding any disturbance activities, including construction and tree-cutting, within this primary zone. Within a secondary zone extending from the primary zone boundary out to a distance of up to an additional 1.0 mile from a nest tree, construction and land-clearing activities should be restricted to the non-nesting period (October to May). USFWS also recommends avoiding alteration of natural shorelines where bald eagles forage, and avoiding significant land-clearing activities within 1500 ft of roosting sites (USFWS 1987).

BIOLOGICAL CONCLUSION: NO EFFECT

NCNHP records indicate that there are no known bald eagle nest sites located within 3.0 miles of the project study area. No bald eagle nests were observed during field investigations. The portions of the project study area and areas adjacent to the project study area within Lenoir County lack large bodies of water. Therefore, potentially suitable foraging and nesting habitat for the bald eagle is not present within the project study area. The Neuse River is the only large body of water in Lenoir County within 5.0 miles of the project study area and it is located approximately 4.5 miles south of the project study area. The proposed US 70 Goldsboro Bypass should have no impact to known bald eagle nesting and/or foraging habitat.

Red-cockaded woodpecker (RCW) – This small woodpecker, 7 to 8.5 inches long, has a black head, prominent white cheek patch, and black-and-white barred back. Males often have red markings (cockades) behind the eye, but the cockades may be absent or difficult to see (Potter *et al.* 1980). Primary habitat consists of mature to over-mature southern pine forests dominated by loblolly (*Pinus taeda*), long-leaf (*P. palustris*), slash (*P. elliotii*), and pond (*P. serotina*) pines (Henry 1989). Primary nest sites for RCWs include open pine stands greater than 60 years of age with little or no mid-story development. Nest cavity trees tend to occur in clusters, which are referred to as colonies (USFWS 2003b). Foraging habitat is comprised of open pine or pine/mixed hardwood stands 30 years of age or older. Pine flatwoods or pine-dominated savannas which have been maintained by frequent natural fires serve as ideal nesting and foraging sites for this woodpecker. Development of a thick understory may result in abandonment of cavity trees. The woodpecker drills holes into the bark around the cavity entrance, resulting in a shiny, resinous buildup around the entrance that allows for easy detection of active nest trees (Henry 1989).

BIOLOGICAL CONCLUSION: NO EFFECT

NCNHP records indicate that there are no RCW colonies within 3.0 miles of the project study area. There are no pine or pine/hardwood with stands present in the project study area that contain pines >60 years old. Therefore, pine stands within the project study area do not provide potential nesting habitat for RCW. There are scattered small stands of pines within the project study area. The majority of these areas are too young in age and too small in areal extent to provide potential RCW foraging habitat. These small pine stands are not contiguous with other large stands of pines and would be considered isolated from potential nesting habitat due to surrounding agriculture and residential areas. Therefore, potentially suitable foraging and nesting habitat for the RCW is not present within the project

study area. The proposed US 70 Goldsboro Bypass will have no impact to RCW nesting and/or foraging habitat.

Sensitive joint-vetch – Sensitive joint-vetch is a robust, bushy-branched, annual legume often exceeding 3.0 ft in height. Young stems have bristly hairs with large swollen bases (Leonard 1985). The alternate, compound leaves are even-pinnate, approximately 1.25 to 2.0 inches wide, with 30 to 56 toothless leaflets (USFWS 1994). Flowers are bright greenish-yellow with red veins, about 0.5 inch long, and are subtended by bractlets with toothed margins (Leonard 1985). The flowers are produced on few-flowered racemes from July to October. The jointed legume (loment) is about 2.0 inches long, has 6 to 10 segments, and a 0.5-to 1.0-inch stalk. Habitat for this species in North Carolina consists of moist to wet coastal roadside ditches and moist fields that are nearly tidal (USFWS 1994), especially in full sun (Leonard 1985). This species seems to favor microhabitats where there is a reduction in competition from other plant species, and usually some form of soil disturbance (USFWS 1994). Sensitive joint-vetch is known from Hyde and Beaufort Counties, North Carolina, and in scattered coastal areas from New Jersey to Virginia (USFWS 2003c).

BIOLOGICAL CONCLUSION: NO EFFECT

NCNHP records indicate that there are no documented occurrences of sensitive joint-vetch within 3.0 miles of the project study area. The streams within the project study area are part of a non-tidal freshwater system and do not provide potential habitat for sensitive joint-vetch. The proposed US 70 Goldsboro Bypass will have no impact on sensitive joint-vetch.

III. Federal Species of Concern

The 29 January 2003 USFWS list also includes a category of species designated as "Federal Species of Concern" (FSC). The FSC designation provides no federal protection under the ESA for the species listed. However, these species are listed since they may attain federally protected status in the future. The presence of potential habitat (based on LeGrand *et al.* 2004 and Franklin and Finnegan 2004) within the project study area has been evaluated in Table 2 for the FSC species listed for Wayne and Lenoir Counties.

Table 2. Federal Species of Concern (FSC) listed for Wayne and Lenoir Counties.

Common Name	Scientific Name	State Designation[a]	County[b] W/L	Potential Habitat[c]
Rafinesque's big-eared bat	*Corynorhinus rafinesquii*	T	W*	Y
Southern hognose snake	*Heterodon simus*	SC	W*	Y
"Neuse" madtom	*Noturus furiosus* pop. 1	SC (PT)	W/L	Y
Pinewoods shiner	*Lythrurus matutinus*	W2	W	Y
Atlantic pigtoe	*Fusconaia masoni*	E	W	Y
Tar River crayfish	*Procambarus medialis*	W3	L	Y
Georgia indigo-bush	*Amorpha georgiana* var. *georgiana*	E	L*	Y
Venus flytrap	*Dionaea muscipula*	SR-L, SC	L*	N
Pondspice	*Litsea aestivalis*	SR-T	W	N

[a] E – Endangered, T - Threatened, SC - Special Concern, SC (PT) - Special Concern Proposed Threatened, SR-T – Significantly Rare species are rare throughout their range, SR-L – Significantly Rare range of species is limited to North Carolina and adjacent states, W2 – Watch List 2 species that are rare to uncommon in NC, but are not necessarily considered to be declining or otherwise in trouble, and W3 – Watch List 3 are species poorly known in NC, but are not necessarily considered to be declining or otherwise in trouble .

[b] W – Wayne, L – Lenoir

[c] Potential habitat based extensively on Franklin and Finnegan (2004), LeGrand *et al.* (2004), and other literature previously cited.

* Counties in which the element was last observed more than 50 years ago.

According to NCNHP records (Review date 5 April 2005), no occurrences of FSC species have been documented in the project study area. There are two FSC species occurrences documented within 3.0 miles of the project study area. One historic occurrence (more than 50 years ago) for southern hognose snake was documented along US 70 approximately 0.5 mile west of the project study area. One historic occurrence for Rafinesque's big-eared bat was documented approximately 2.5 miles south of the project study area. The "Neuse" madtom has been documented in the Little River approximately 3.5 river miles upstream of the project study area at the NC 581 bridge. The proposed US 70 Goldsboro Bypass will have no impact to any known occurrences of listed FSC species.

IV. State Protected Species

Species of mammals, birds, reptiles, amphibians, and plants with the North Carolina status of Endangered (E), Threatened (T), and Special Concern (SC) receive limited protection under the North Carolina Endangered Species Act (G.S. 113-331 *et seq.*) and the North Carolina Plant Protection Act of 1979 (G.S. 106-202.12 *et seq.*). A review of the NCNHP records indicates that the Neuse River waterdog is the only state-listed species (species listed as E, T, or SC), other than the FSC species, documented within 3.0

miles of the project study area. The Neuse River waterdog has been documented in the Little River approximately 3.5 river miles upstream of the project study area at the NC 581 bridge and in Bear Creek approximately 1.25 miles downstream of the US 70 bridge. The proposed US 70 Goldsboro Bypass will have no impact any known occurrences of state listed species.

V. References

Franklin, Misty A. and J. T. Finnegan. 2004. Natural Heritage Program List of the Rare Plant Species of North Carolina. North Carolina Natural Heritage Program, Division of Parks and Recreation; N.C. Department of Environment, Health, and Natural Resources; Raleigh. 112 pp.

Hamel, P.B. 1992. Land Manager's Guide to the Birds of the South. The Nature Conservancy, Southeastern Region, Chapel Hill. 437 pp.

Henry, G.V. 1989. Guidelines for the Preparation of Biological Assessments and Evaluations for the Red-cockaded Woodpecker. U.S. Fish and Wildlife Service, Atlanta, GA.

LeGrand, H.E. Jr., S.E. McRae, S.P. Hall and J. T. Finnegan. 2004. Natural Heritage Program List of the Rare Animal Species of North Carolina. N.C. Natural Heritage Program, Division of Parks and Recreation; Department of Environment, Health, and Natural Resources; Raleigh. 99 pp.

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[USFWS] U.S. Fish and Wildlife Service. 1987. Habitat Management Guidelines for the Bald Eagle in the Southeast Region. U.S. Department of the Interior, Fish and Wildlife Service. 8 pp.

[USFWS] U.S. Fish and Wildlife Service. 1994. Agency Draft Sensitive Jointvetch Recovery Plan. U.S. Fish and Wildlife Service, Atlanta, GA.

[USFWS] U.S. Fish and Wildlife Service. 2003. Endangered, Threatened, and Candidate Species and Federal Species of Concern, by County, in North Carolina: Wayne and Lenoir Counties. 29 January 2003. Asheville, NC.

[USFWS] U.S. Fish and Wildlife Service. 2003b. Recovery plan for the red-cockaded woodpecker (*Picoides borealis*): second revision. U.S. Fish and Wildlife Service, Atlanta, GA. 296 pp.

[USFWS] U.S. Fish and Wildlife Service. 2003c. Sensitive Joint-vetch (Virginia joint-vetch) in North Carolina. <http://nc-es.fws.gov/plant/sensjointv.html>. Accessed 22 September 2003.

Table B. Jurisdictional Wetland Characteristics

Site Number	Figure	Cowardin Classification	DWQ Rating	Community Type	Riverine [a]/ Non-Riverine
no wetlands present	2A	n/a	n/a	n/a	n/a
kc	2B	PFO	29	mixed hardwood	Riverine
kb/gb	2C	PFO	60	bottomland hardwood	Riverine
nb	2C	PFO/PSS	12	mixed hardwood/successional	Non-Riverine
nc	2C	PFO	27	bottomland hardwood	Non-Riverine
1cf/1ka/1md	2C	PFO	40	bottomland hardwood	Riverine
ke/ci/kf	2C	PFO/PSS	20	mixed hardwood/successional	Non-Riverine
MX	2D	PFO	66	swamp forest	Riverine
ks/mv/la/pa/nk/sa	2E	PFO	40	mixed hardwood	Riverine
no wetlands present	2F	n/a	n/a	n/a	n/a
KI/CN	2G	PSS	32	mixed hardwood	Riverine
GA/GB/pb	2G	PFO/PEM	83	swamp forest	Riverine
KA/CA/LC/py	2H	PFO/PEM	83	swamp forest	Riverine
KK/KG/KF	2H	PFO	20	mixed hardwood	Non-Riverine
KS/CY	2I	PFO	54	mixed pine/hardwood	Riverine
CZ/LE/LD	2I	PFO	70	bottomland hardwood	Riverine
3LD/3LA	2J	PSS/PFO	73	successional/bottomland hardwood	Riverine
CA	2K	PFO	34	mixed pine/hardwood	Non-Riverine
CH/KC	2K	PFO	40	mixed hardwood	Non-Riverine
no wetlands present	2L	n/a	n/a	n/a	n/a
no wetlands present	2M	n/a	n/a	n/a	n/a
T5/KH	2N	PFO	65	mixed hardwood	Riverine
ya	2N	PFO	36	mixed hardwood	Non-Riverine
JI	2O	PEM	37	emergent wetland	Non-Riverine
JJ/CK	2O	PFO	50	mixed hardwood	Non-Riverine
KL	2P	PFO	42	mixed pine/hardwood	Non-Riverine
yb	2Q	PFO	34	mixed hardwood	Non-Riverine
CL	2Q	PFO	32	bottomland hardwood	Non-Riverine
CS/JK	2R	PFO	46	bottomland hardwood	Riverine
KQ/nf	2S	PFO	49	bottomland hardwood	Riverine
ne/nd/SE/SC/KZ/SB	2S/2T	PFO	71	bottomland hardwood	Riverine
nh/ni/nj/ng	2T	PFO	67	bottomland hardwood	Riverine

a Riverine: Associated with streams and portions may receive overbank flooding.

Table A. Jurisdictional Stream and Surface Water Characteristics

Site No.	Name	DWQ SIN. [a]	BUC [b]	TOB[c] Width (ft)	TOB[c] Depth (ft)	Flow	Clarity (Turbidity)	Substrate	Perennial/ Intermittent (R2/R4) [d]	Mitigation Required (yes/no) [e]	Subject to Buffer Rules [f]	Forms	
												DWQ	COE
Figure 2A	none												
Figure 2B													
AT8/sna	UT Little River	27-57-(20.2)[a]	WS-IV; NSW[b]	1.5	1	moderate	slight to none	sand/silt	Intermittent (R4)	Y	Y	23.5	56
Figure 2C													
AT7	UT Little River	27-57-(20.2)[a]	WS-IV; NSW[b]	5	3	good	none	sand/silt	Perennial (R2)	Y	Y	38.5	62
AT6/snb	UT The Canal	24-57-21.3[a]	C; NSW[b]	3	0.5	poor	moderate	sand/silt	Intermittent (R4)	Y	Y	19.5	42
AT4	UT The Canal	24-57-21.3[a]	C; NSW[b]	3	6	poor	slight to none	sand	Perennial (R2)	Y	Y	20.5	37
Figure 2D													
AT3/cs/kp	The Canal	24-57-21.3	C; NSW	45	15	moderate	moderate	muck/sand	Perennial (R2)	Y	Y	35	33
AT1/mw	Little River	27-57-(20.2)	WS-IV; NSW	45	10	good	slight to none	sand	Perennial (R2)	Y	Y	51.5	65
Figure 2E													
B5/B7/spa	UT Little River	27-57-(20.2)[a]	WS-IV; NSW[b]	3	1	slight	moderate	sand/silt	Intermittent (R4)	Y	Y	32.5	54
Figure 2F													
K5	UT Smith Mill Run	27-57-21[a]	WS-IV; NSW[b]	15	6	moderate	slight to none	sand	Intermittent (R4)	N	N	27.5	34
K3/sxa	UT Smith Mill Run	27-57-21[a]	WS-IV; NSW[b]	15	6	moderate	slight to none	sand	Perennial (R2)	Y	Y	36.5	45
spy	UT Smith Mill Run	27-57-21[a]	WS-IV; NSW[b]	20	6	slight	moderate	sand	Perennial (R2)	Y	Y	27	48
Figure 2G													
spb/K2B	UT Howell Branch	27-62-1[a]	C; NSW[b]	6	1.5	moderate	slight to none	sand	Perennial (R2)	Y	Y	26	29
KW	pond	-	-	-	-	-	-	-	-	Y	Y	-	-
K1	Howell Branch	27-62-1	C; NSW	15	3	good	moderate	muck	Perennial (R2)	Y	Y	46	64
J5	UT Howell Branch	27-62-1[a]	C; NSW[b]	2	0.5	moderate	none	sand	Perennial (R2)	Y	Y	30.5	62
Figure 2H													
J4	Stoney Creek	27-62	C; NSW	30	3	good	moderate	muck	Perennial (R2)	Y	Y	45	68
J4B	UT Stoney Creek	27-62[a]	C;NSW[b]	3	0.5	slight	slight	muck	Intermittent (R4)	Y	Y	20	44
J3	UT Stoney Creek	27-62[a]	C;NSW[b]	2	1.5	slight	slight to none	sand	Perennial (R2)	Y	Y	36	64
Figure 2I													
spz/J2/CY	UT Reedy Branch	27-62-2[a]	C;NSW[b]	6	4	slight	slight to none	sand	Perennial (R2)	Y	Y	36	54
spc/KT	UT Reedy Branch	27-62-2[a]	C;NSW[b]	4	5	slight	slight to none	sand	Perennial (R2)	Y	Y	27.5	47
W8	Reedy Branch	27-62-2	C;NSW	4	1	slight	slight to none	muck	Perennial (R2)	Y	Y	35.5	67
Figure 2J													
W6/W7/W4	UT West Bear Creek	27-72-2[a]	C; Sw;NSW[b]	10	4	moderate	none	muck/sand	Perennial (R2)	Y	Y	28	47
Figure 2K													
spf/svb/W3	West Bear Creek	27-72-2	C; Sw;NSW	15	10	moderate	slight	sand	Perennial (R2)	Y	Y	29.5	36
27	UT West Bear Creek	27-72-2[a]	C; Sw;NSW[b]	3	5	slight	none	sand	Intermittent (R4)	N	Y	20.5	31
28B	UT West Bear Creek	27-72-2[a]	C; Sw;NSW[b]	3	5	slight	slight to none	sand	Perennial (R2)	Y	Y	31	32
Figure 2L													
W1A	UT West Bear Creek	27-72-2[a]	C; Sw;NSW[b]	4	3	slight	slight	sand/clay	Perennial (R2)	Y	Y	22	38
Figure 2M													
JF	pond	-	-	-	-	-	-	-	-	N	Y	-	-
T6/T7/CD/JC	Peters Branch	27-72-2-2	C; Sw;NSW	20	8	moderate	slight	sand	Perennial (R2)	Y	Y	31	29

Table A Continues

Table A Concluded

Site No.	Name	DWQ SIN. [a]	BUC [b]	TOB[c] Width (ft)	TOB[c] Depth (ft)	Flow	Clarity (Turbidity)	Substrate	Perennial/ Intermittent (R2/R4) [d]	Mitigation Required (yes/no) [e]	Subject to Buffer Rules [f]	Forms	
												DWQ	COE
Figure 2N													
KG/T4	West Bear Creek	27-72-2	C; Sw, NSW	30	10	good	slight	sand	Perennial (R2)	Y	Y	37.5	57
T5	UT West Bear Creek	27-72-2[a]	C; Sw, NSW[b]	3	0.75	moderate	none	sand	Perennial (R2)	Y	Y	31.25	36
Figure 2O													
CT/T2	UT West Bear Creek	27-72-2[a]	C; Sw, NSW[b]	5	4	moderate	none	sand	Perennial (R2)	Y	Y	28.5	41
Figure 2P	none												
Figure 2Q	none												
Figure 2R													
M5	Mill Branch	27-72-4	C; Sw, NSW	3	1	slight	none	sand/muck	Perennial (R2)	Y	Y	15.5	36
Figure 2S													
syb/M3	Mill Branch	27-72-4	C; Sw, NSW	3	1	moderate	none	sand	Perennial (R2)	Y	Y	29.5	46
sya	UT Bear Creek	27-72-(0.1)[a]	C; Sw, NSW	3	3	moderate	none	sand/pebble	Intermittent (R4)	Y	Y	24	43
Figure 2T													
snc/snd/spd	Bear Creek	27-72-(0.1)	C; Sw, NSW	40	10	moderate	none	sand	Perennial (R2)	Y	Y	43	79
spe	UT Bear Creek	27-72-(0.1)[a]	C; Sw, NSW	3	3	moderate	none	sand	Perennial (R2)	Y	Y	21.5	35

[a] Unless otherwise noted, NCDWQ Stream Index Numbers for receiving waters:

[b] Unnamed tributaries carry the same Best Usage Classification as their receiving water

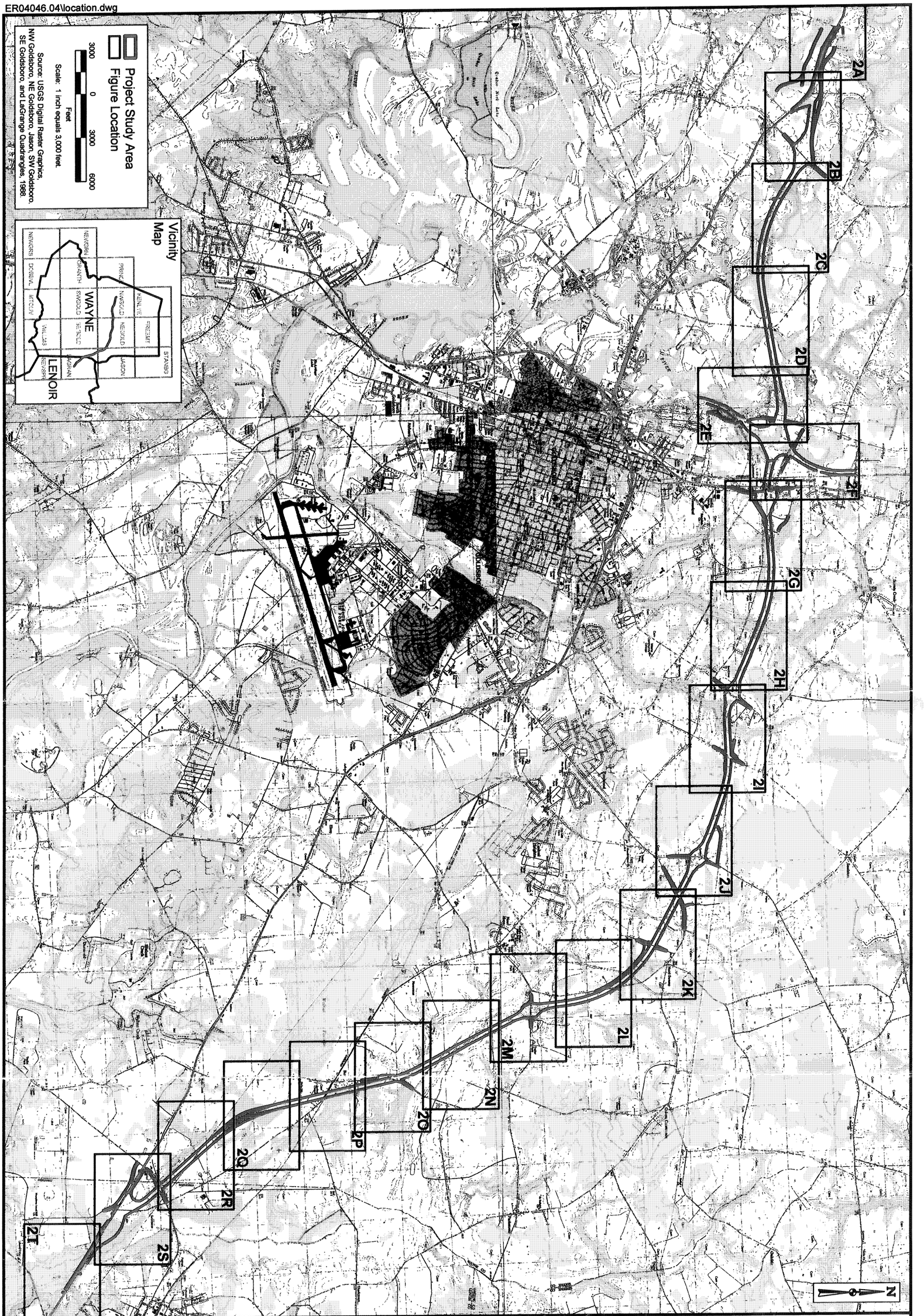
[c] TOB: Top of bank

[d] Cowardin Classification: R2: perennial, R4: intermittent

[e] Final determination for mitigation requirements made by Bill Biddlecome of the USACE.

[f] Final buffer determination made by Christina Breen of the NCDWQ

ER04046.04\location.dwg



Environmental Services, Inc.

Project and Figure Location Map
US 70 Goldsboro Bypass Update
Wayne and Lenoir Counties, North Carolina
T.I.P. No. R-2554

Figure:	1
Project:	ER04046.04
Date:	Sept 2005

N

Begin Evaluation

US 70

Match Line Figure 2B

Project Study Area
Previously Delineated Jurisdictional Wetland
Previously Delineated Jurisdictional Stream/Pond
2005 Additional Delineated Jurisdictional Wetland
2005 Additional Delineated Jurisdictional Stream/Pond
aa Line Sequence Label

0 250 500 750 Feet
0 125 250 Meters
Scale: 1 inch equals 500 feet.

Source: 1993 USGS Color Infrared Images, NW Goldsboro, NE Goldsboro, Jason, and LaGrange Quadrangles.

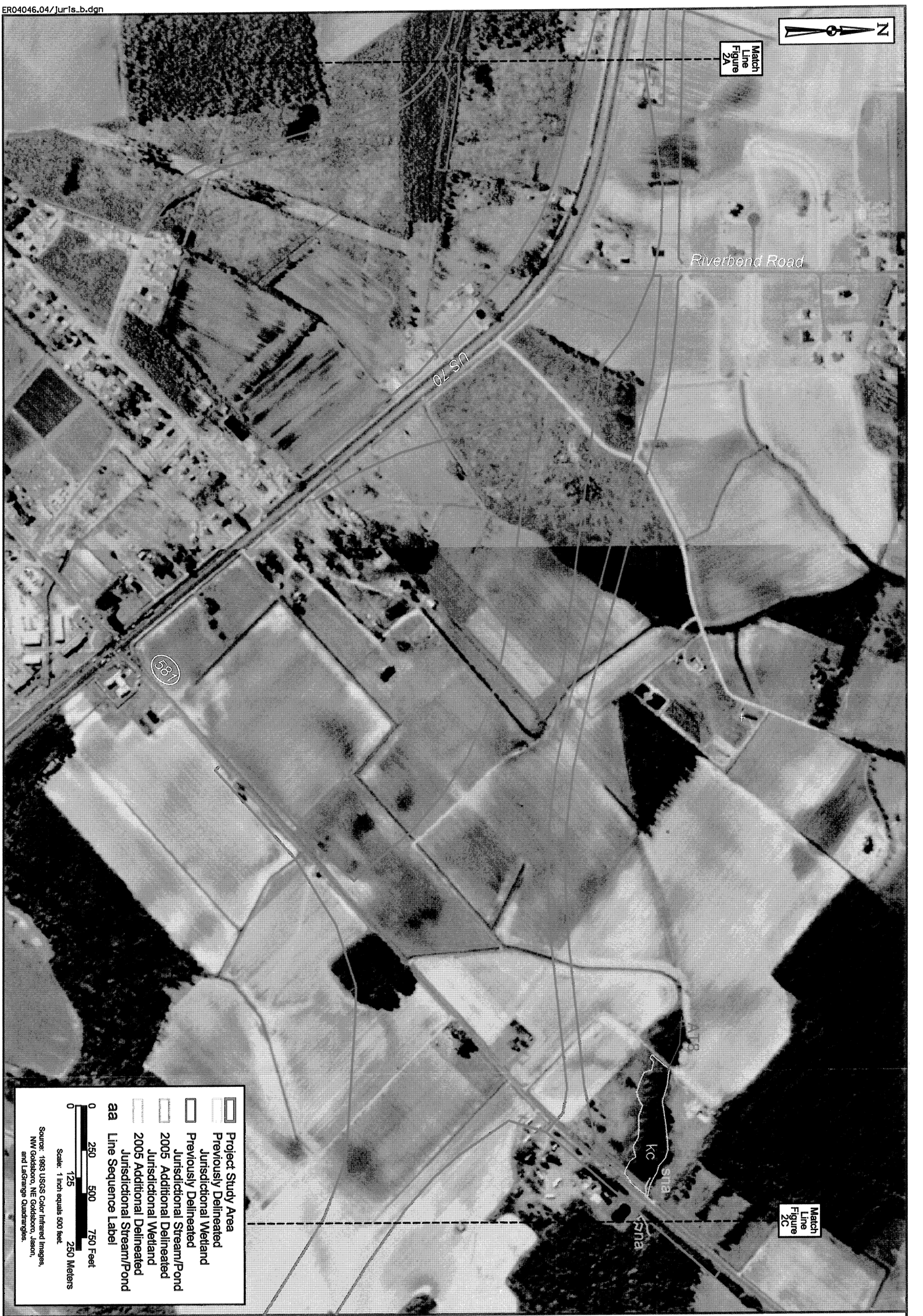
ER04046.04/Juris_a.dgn

Jurisdictional Areas
US 70 Goldsboro Bypass Update
Wayne and Lenoir Counties, North Carolina
T.I.P. No. R-2554

Environmental Services, Inc.

Figure:	2A
Project:	ER04046.04
Date:	Sept 2005

ER04046.04/juris_b.dgn



Environmental Services, Inc.

Jurisdictional Areas
US 70 Goldsboro Bypass Update
Wayne and Lenoir Counties, North Carolina
T.I.P. No. R-2554

Figure:	2B
Project:	ER04046.04
Date:	Sept 2005

N

Project Study Area
Previously Delineated Jurisdictional Wetland
Previously Delineated Jurisdictional Stream/Pond
2005 Additional Delineated Jurisdictional Wetland
2005 Additional Delineated Jurisdictional Stream/Pond
aa Line Sequence Label

0 250 500 750 Feet
0 125 250 Meters
Scale: 1 inch equals 500 feet.

Source: 1993 USGS Color Infrared Images, NW Goldsboro, NE Goldsboro, Jason, and LaGrange Quadrangles.

Match Line Figure 2B

Match Line Figure 2D

Leslie Road

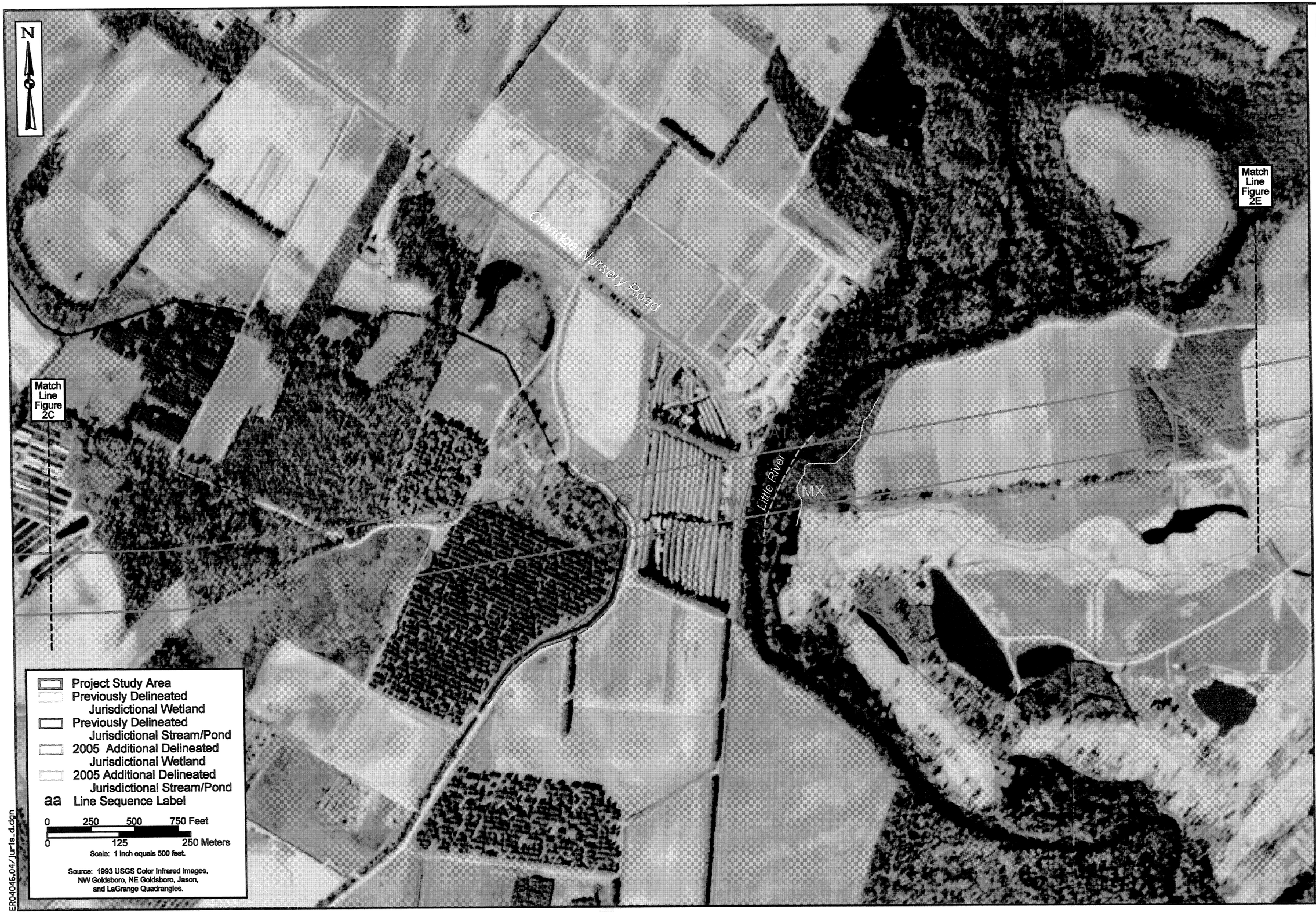
Howell Road

ER04046.04\Juris_c.dgn

Jurisdictional Areas
US 70 Goldsboro Bypass Update
Wayne and Lenoir Counties, North Carolina
T.I.P. No. R-2554

Figure: 2C
Project: ER04046.04
Date: Sept 2005

Environmental Services, Inc.



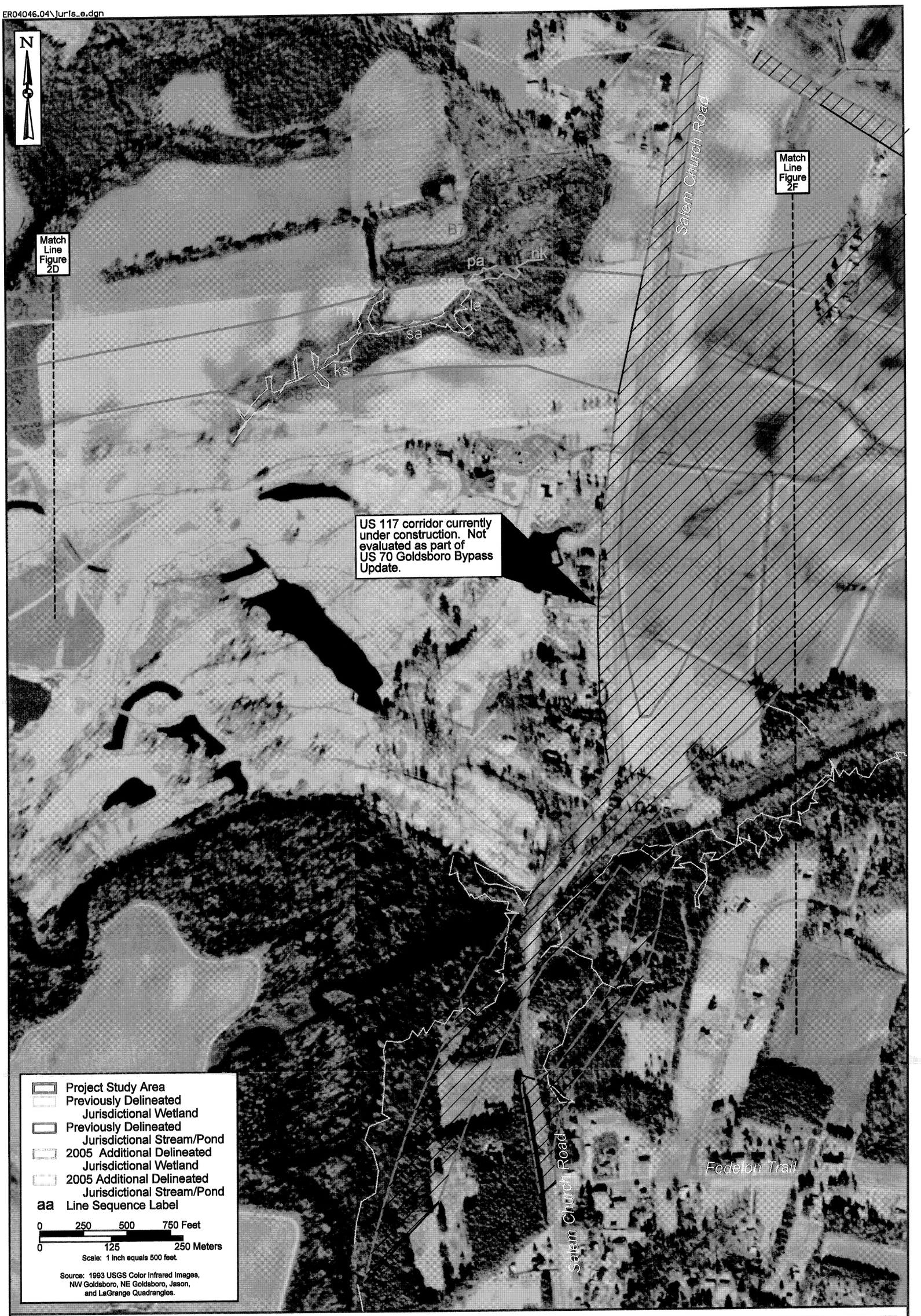
ER04046.04/Juris_d.dgn

Jurisdictional Areas
US 70 Goldsboro Bypass Update
Wayne and Lenoir Counties, North Carolina
T.I.P. No. R-2554

Figure: 2D
Project: ER04046.04
Date: Sept 2005

Environmental Services, Inc.

ER04046.04\jurls_e.dgn

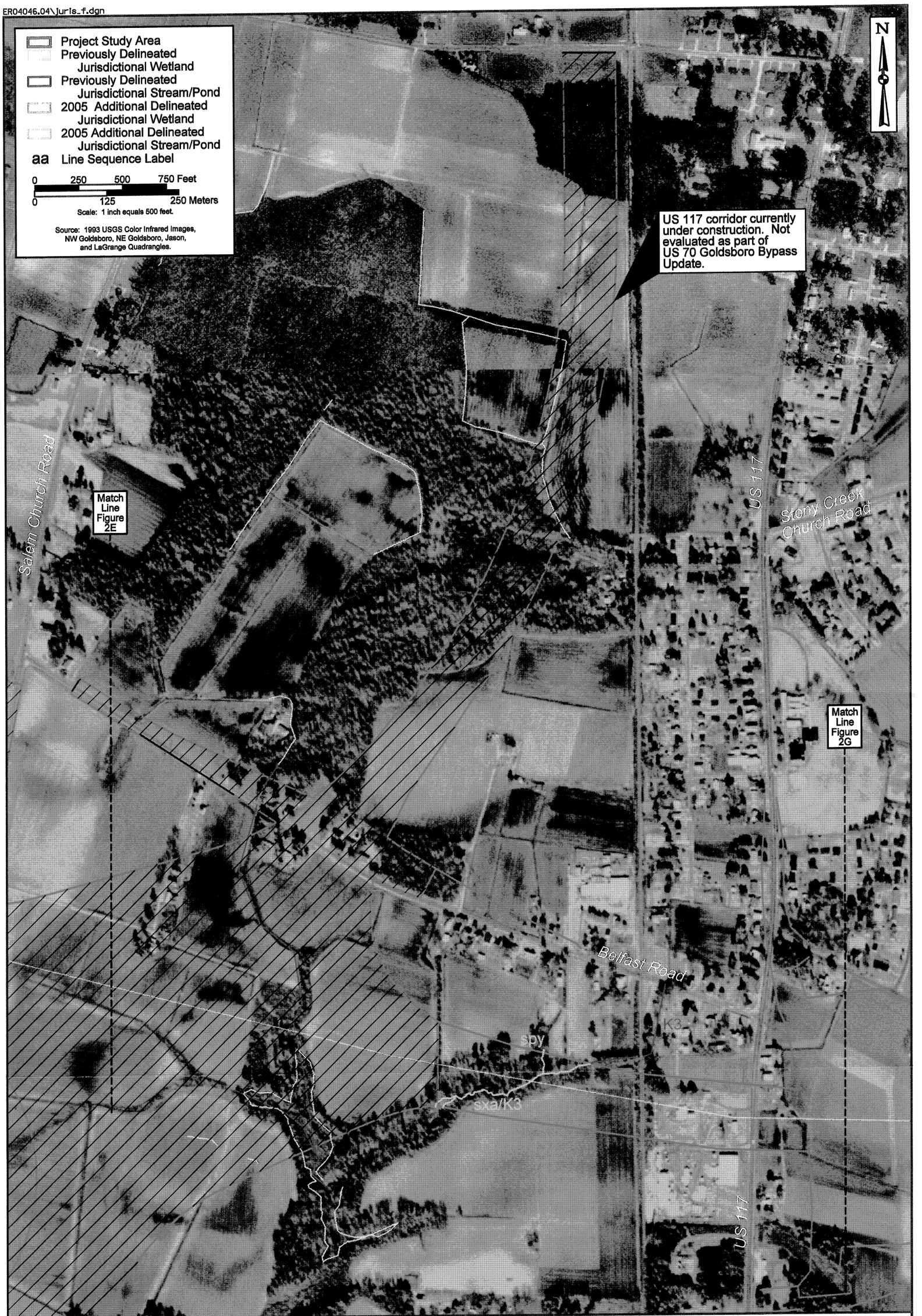


Environmental Services, Inc.

Jurisdictional Areas
US 70 Goldsboro Bypass Update
Wayne and Lenoir Counties, North Carolina
T.I.P. No. R-2554

Figure:	2E
Project:	ER04046.04
Date:	Sept 2005

ER04046.04\juris_f.dgn



Environmental Services, Inc.

Jurisdictional Areas
US 70 Goldsboro Bypass Update
Wayne and Lenoir Counties, North Carolina
T.I.P. No. R-2554

Figure:	2F
Project:	ER04046.04
Date:	Sept 2005

N

Match Line Figure 2F

Match Line Figure 2H

Belfast Road

US 117

Tommy's Road

111

GA

GB

pb

KI

spb/K2B

CN

Project Study Area
Previously Delineated Jurisdictional Wetland
Previously Delineated Jurisdictional Stream/Pond
2005 Additional Delineated Jurisdictional Wetland
2005 Additional Delineated Jurisdictional Stream/Pond
aa Line Sequence Label

0 250 500 750 Feet
0 125 250 Meters
Scale: 1 inch equals 500 feet.

Source: 1993 USGS Color Infrared Images, NW Goldsboro, NE Goldsboro, Jason, and LaGrange Quadrangles.

Jurisdictional Areas
US 70 Goldsboro Bypass Update
Wayne and Lenoir Counties, North Carolina
T.I.P. No. R-2554

Figure: 2G
Project: ER04046.04
Date: Sept 2005

Environmental Services, Inc.

ER04046.04/juris_g.dgn

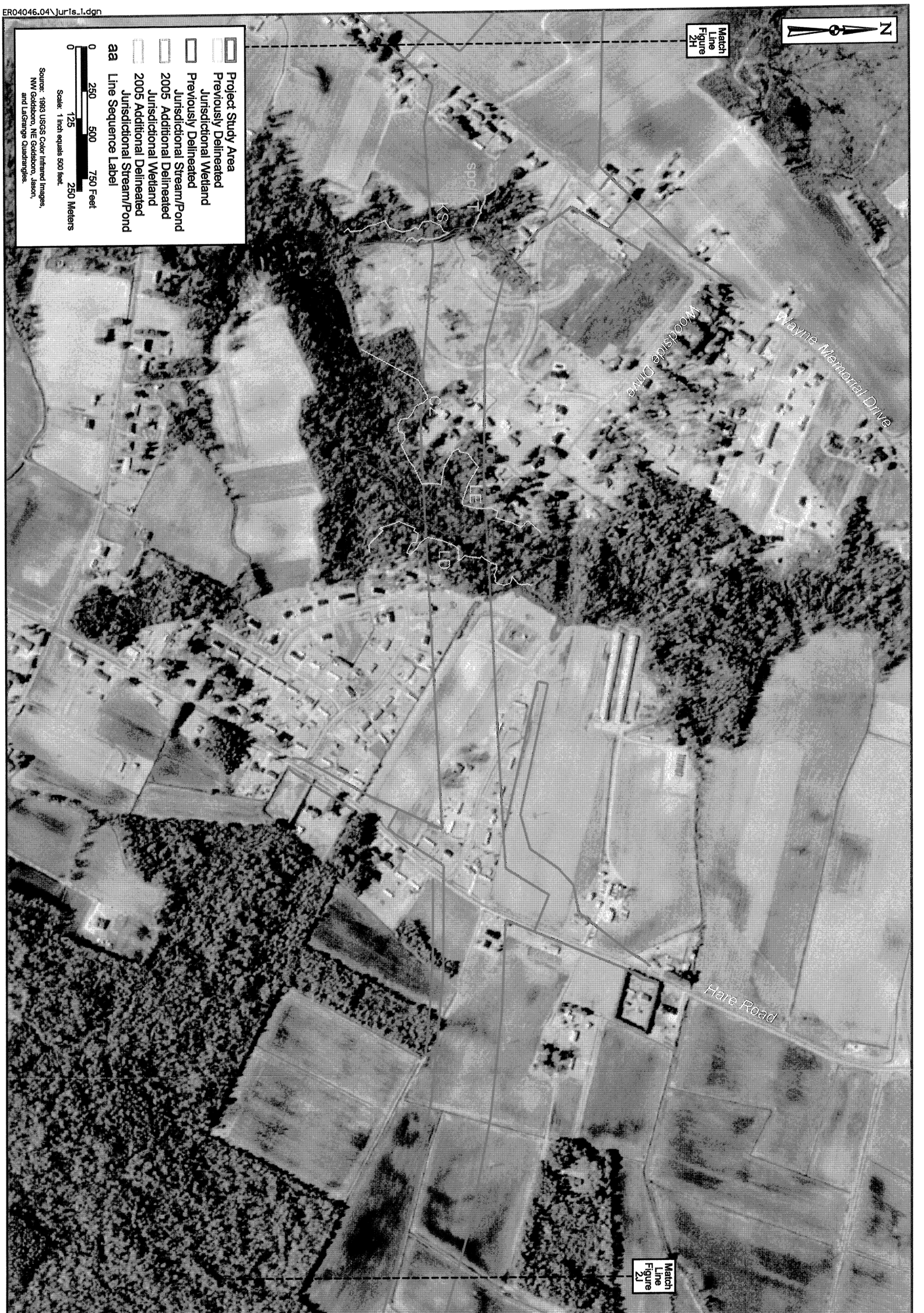
ER04046.04\Jur's_h.dgn

Jurisdictional Areas
US 70 Goldsboro Bypass Update
Wayne and Lenoir Counties, North Carolina
T.I.P. No. R-2554

Figure:	2H
Project:	ER04046.04
Date:	Sept 2005

Environmental Services, Inc.

ER04046.04\juris_1.dgn



Environmental Services, Inc.

Jurisdictional Areas
US 70 Goldsboro Bypass Update
Wayne and Lenoir Counties, North Carolina
T.I.P. No. R-2554

Figure:	2I
Project:	ER04046.04
Date:	Sept 2005

Match Line Figure 2I

Match Line Figure 2K

US 13

W6

W7

3L4

N

Project Study Area
Previously Delineated Jurisdictional Wetland
Previously Delineated Jurisdictional Stream/Pond
2005 Additional Delineated Jurisdictional Wetland
2005 Additional Delineated Jurisdictional Stream/Pond
aa Line Sequence Label

0 250 500 750 Feet
0 125 250 Meters
Scale: 1 inch equals 500 feet.

Source: 1993 USGS Color Infrared Images, NW Goldsboro, NE Goldsboro, Jason, and LaGrange Quadrangles.

ER04046.04\Juris_1.dgn

Jurisdictional Areas
US 70 Goldsboro Bypass Update
Wayne and Lenoir Counties, North Carolina
T.I.P. No. R-2554

Environmental Services, Inc.

Figure:	2J
Project:	ER04046.04
Date:	Sept 2005

Match Line Figure 2J

Hood Swamp Road

Mark Edwards Road

CH

CA

KC

Match Line Figure 2L

N

Project Study Area
Previously Delineated Jurisdictional Wetland
Previously Delineated Jurisdictional Stream/Pond
2005 Additional Delineated Jurisdictional Wetland
2005 Additional Delineated Jurisdictional Stream/Pond
aa Line Sequence Label

0 250 500 750 Feet
0 125 250 Meters

Scale: 1 inch equals 500 feet.

Source: 1993 USGS Color Infrared Images, NW Goldsboro, NE Goldsboro, Jason, and LaGrange Quadrangles.

ER04046.04\Juris_k.dgn

Figure: 2K
Project: ER04046.04
Date: Sept 2005

Jurisdictional Areas
US 70 Goldsboro Bypass Update
Wayne and Lenoir Counties, North Carolina
T.I.P. No. R-2554

Environmental Services, Inc.

N

Match Line
Figure 2K

CA
KC
CC/JA
W1A
GE
GD
W1
Mark Edwards Road

Match Line
Figure 2M

Project Study Area
Previously Delineated Jurisdictional Wetland
Previously Delineated Jurisdictional Stream/Pond
2005 Additional Delineated Jurisdictional Wetland
2005 Additional Delineated Jurisdictional Stream/Pond
aa Line Sequence Label

0 250 500 750 Feet
0 125 250 Meters
Scale: 1 inch equals 500 feet.

Source: 1993 USGS Color Infrared Images, NW Goldsboro, NE Goldsboro, Jason, and LaGrange Quadrangles.

ER04046.04\Jurls_l.dgn

Jurisdictional Areas
US 70 Goldsboro Bypass Update
Wayne and Lenoir Counties, North Carolina
T.I.P. No. R-2554

Figure: 2L
Project: ER04046.04
Date: Sept 2005

Environmental Services, Inc.

N

Match Line
Figure 2L

Mark Edwards Road

Mark Edwards Road

Parkstown Road

Project Study Area
Previously Delineated Jurisdictional Wetland
Previously Delineated Jurisdictional Stream/Pond
2005 Additional Delineated Jurisdictional Wetland
2005 Additional Delineated Jurisdictional Stream/Pond
aa Line Sequence Label

0 250 500 750 Feet
0 125 250 Meters
Scale: 1 inch equals 500 feet.

Source: 1993 USGS Color Infrared Images, NW Goldsboro, NE Goldsboro, Jason, and LaGrange Quadrangles.

Match Line
Figure 2N

ER04046.04\Juris_m.dgn

Jurisdictional Areas
US 70 Goldsboro Bypass Update
Wayne and Lenoir Counties, North Carolina
T.I.P. No. R-2554

Environmental Services, Inc.

Figure:	2M
Project:	ER04046.04
Date:	Sept 2005

N

Match Line
Figure 2M

KG/T4

T5

KH

KG/T4

N. Boston Road

Match Line
Figure 2O

Project Study Area
Previously Delineated Jurisdictional Wetland
Previously Delineated Jurisdictional Stream/Pond
2005 Additional Delineated Jurisdictional Wetland
2005 Additional Delineated Jurisdictional Stream/Pond
aa Line Sequence Label

0 250 500 750 Feet
0 125 250 Meters
Scale: 1 inch equals 500 feet.

Source: 1993 USGS Color Infrared Images, NW Goldsboro, NE Goldsboro, Jason, and LaGrange Quadrangles.

ER04046.04\Juris_n.dgn

Jurisdictional Areas
US 70 Goldsboro Bypass Update
Wayne and Lenoir Counties, North Carolina
T.I.P. No. R-2554

Environmental Services, Inc.

Figure:	2N
Project:	ER04046.04
Date:	Sept 2005

N

Match Line
Figure 2N

N. Beston Road

MA

2

JI

CK

Match Line
Figure 2P

Project Study Area
Previously Delineated Jurisdictional Wetland
Previously Delineated Jurisdictional Stream/Pond
2005 Additional Delineated Jurisdictional Wetland
2005 Additional Delineated Jurisdictional Stream/Pond
aa Line Sequence Label

0 250 500 750 Feet
0 125 250 Meters
Scale: 1 inch equals 500 feet.

Source: 1993 USGS Color Infrared Images, NW Goldsboro, NE Goldsboro, Jason, and LaGrange Quadrangles.

ER04046.04\Juris_o.dgn

Jurisdictional Areas
US 70 Goldsboro Bypass Update
Wayne and Lenoir Counties, North Carolina
T.I.P. No. R-2554

Environmental Services, Inc.

Figure:	2O
Project:	ER04046.04
Date:	Sept 2005

N

Match Line
Figure 2O

N. Beston Road

JJ

KK

Old Jason Road

New Hope Road

Match Line
Figure 2Q

Project Study Area
Previously Delineated Jurisdictional Wetland
Previously Delineated Jurisdictional Stream/Pond
2005 Additional Delineated Jurisdictional Wetland
2005 Additional Delineated Jurisdictional Stream/Pond
aa Line Sequence Label

0 250 500 750 Feet
0 125 250 Meters
Scale: 1 inch equals 500 feet.

Source: 1993 USGS Color Infrared Images,
NW Goldsboro, NE Goldsboro, Jason,
and LaGrange Quadrangles.

ER04046.04\Juris_p.dgn

Jurisdictional Areas
US 70 Goldsboro Bypass Update
Wayne and Lenoir Counties, North Carolina
T.I.P. No. R-2554

Environmental Services, Inc.

Figure:	2P
Project:	ER04046.04
Date:	Sept 2005

N

Match Line
Figure 2P

N. Beston Road

New Hope Road

yb

CL

Match Line
Figure 2R

Beston Drive

Project Study Area
Previously Delineated Jurisdictional Wetland
Previously Delineated Jurisdictional Stream/Pond
2005 Additional Delineated Jurisdictional Wetland
2005 Additional Delineated Jurisdictional Stream/Pond
aa Line Sequence Label

0 250 500 750 Feet
0 125 250 Meters

Scale: 1 inch equals 500 feet.

Source: 1993 USGS Color Infrared Images, NW Goldsboro, NE Goldsboro, Jason, and LaGrange Quadrangles.

ER04046.04\Juris_q.dgn

Jurisdictional Areas
US 70 Goldsboro Bypass Update
Wayne and Lenoir Counties, North Carolina
T.I.P. No. R-2554

Environmental Services, Inc.

Figure:	2Q
Project:	ER04046.04
Date:	Sept 2005

N

Match Line
Figure 2Q

CS

M5

JK

Beston Drive

New Hope Road

County Line Road

Project Study Area
Previously Delineated Jurisdictional Wetland
Previously Delineated Jurisdictional Stream/Pond
2005 Additional Delineated Jurisdictional Wetland
2005 Additional Delineated Jurisdictional Stream/Pond
aa Line Sequence Label

0 250 500 750 Feet
0 125 250 Meters
Scale: 1 inch equals 500 feet.

Source: 1993 USGS Color Infrared Images, NW Goldsboro, NE Goldsboro, Jason, and LaGrange Quadrangles.

US 70

Match Line
Figure 2S

Washington Street

KC

SP

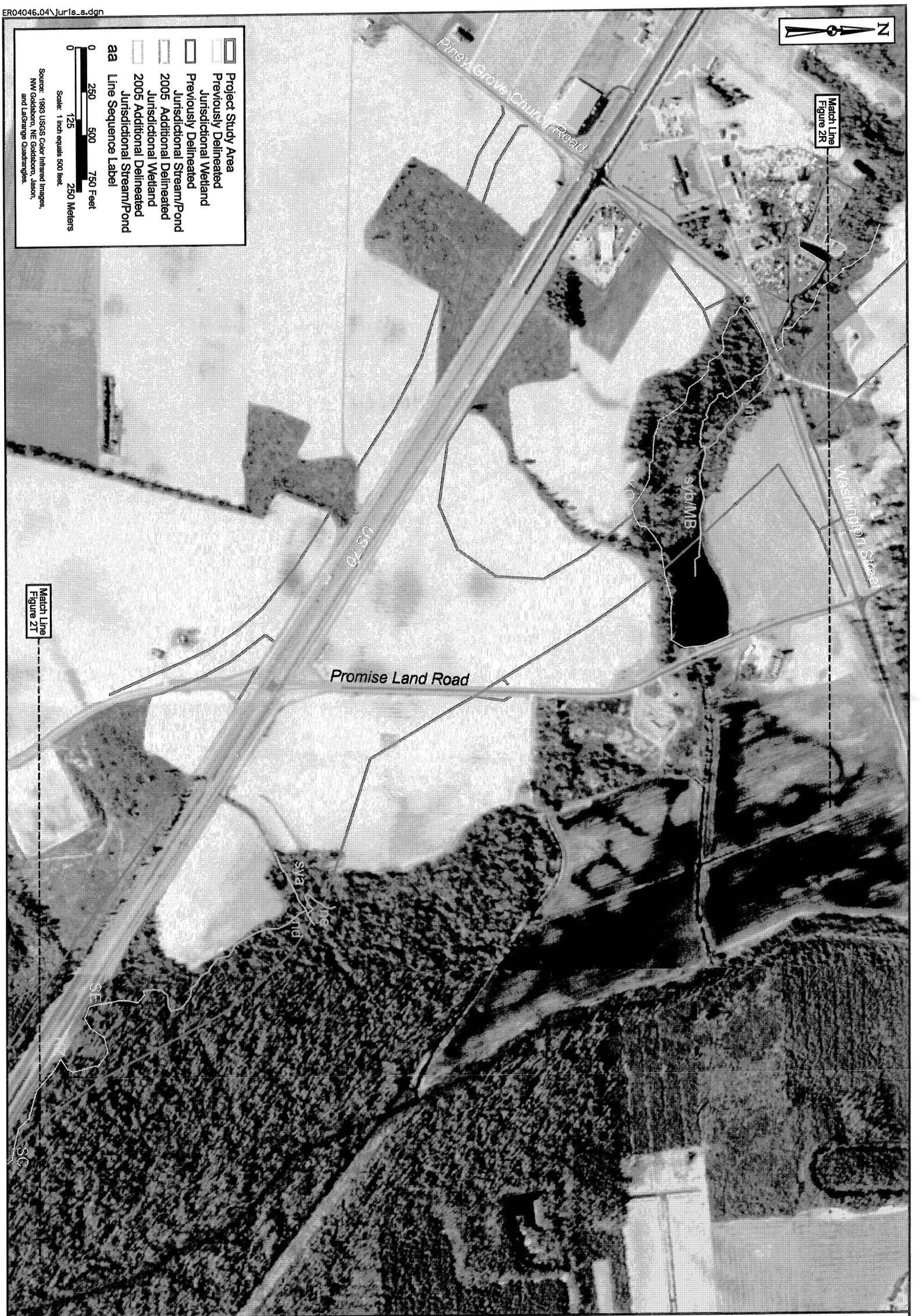
ER04046.04\jurls_r.dgn

Jurisdictional Areas
US 70 Goldsboro Bypass Update
Wayne and Lenoir Counties, North Carolina
T.I.P. No. R-2554

Environmental Services, Inc.

Figure:	2R
Project:	ER04046.04
Date:	Sept 2005

ER04046.04\juris_s.dgn



Environmental Services, Inc.

Jurisdictional Areas
US 70 Goldsboro Bypass Update
Wayne and Lenoir Counties, North Carolina
T.I.P. No. R-2554

Figure:	2S
Project:	ER04046.04
Date:	Sept 2005

N

Match Line
Figure 2S

sc

sc

nd/spd

nf

spe

sB

snc

Evaluation Ends
at Bear Creek

US 70

Project Study Area
Previously Delineated
Jurisdictional Wetland
Previously Delineated
Jurisdictional Stream/Pond
2005 Additional Delineated
Jurisdictional Wetland
2005 Additional Delineated
Jurisdictional Stream/Pond
aa Line Sequence Label

0 250 500 750 Feet
0 125 250 Meters
Scale: 1 inch equals 500 feet.

Source: 1993 USGS Color Infrared Images,
NW Goldsboro, NE Goldsboro, Jason,
and LaGrange Quadrangles.

ER04046.04\Jur1s_s.dgn

Figure: 2T
Project: ER04046.04
Date: Sept 2005

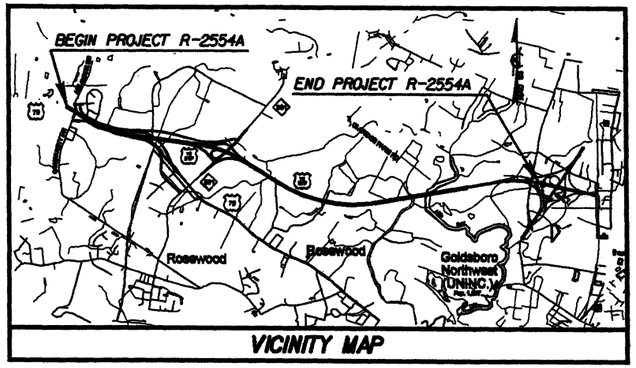
Jurisdictional Areas
US 70 Goldsboro Bypass Update
Wayne and Lenoir Counties, North Carolina
T.I.P. No. R-2554

Environmental
Services, Inc.

TIP PROJECT: R-2554A

CONTRACT No.:

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAYNE COUNTY

LOCATION: US 70 (GOLDSBORO BYPASS) FROM WEST OF NC 581 TO SR 1300 (SALEM CHURCH ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, CULVERTS AND SIGNING

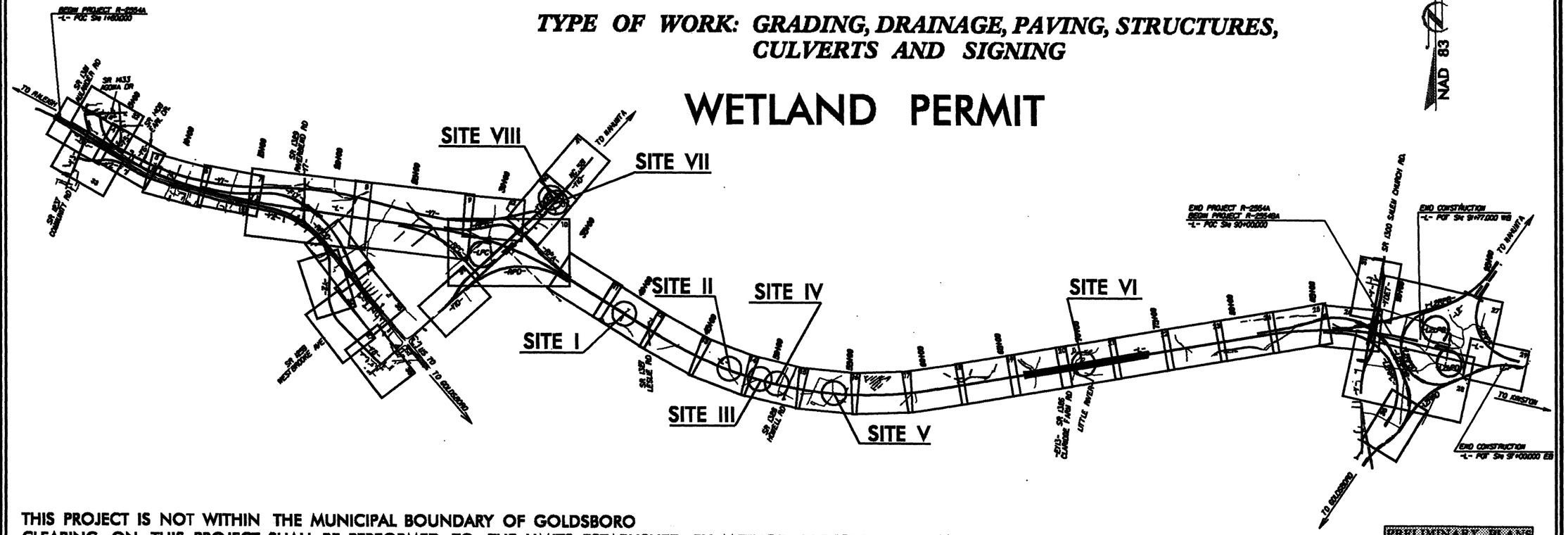
WETLAND PERMIT

METRIC

ALL DIMENSIONS IN THESE PLANS ARE IN METERS AND/OR MILLIMETERS UNLESS OTHERWISE SHOWN

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2554A	1	

STATE PROJ.NO.	F.A.PROJ.NO.	DESCRIPTION
34461.1.3	NHF-70(30)	P.E.
34461.2.4		R/W, UTIL



PRELIMINARY PLANS
NOT FOR CONSTRUCTION

THIS PROJECT IS NOT WITHIN THE MUNICIPAL BOUNDARY OF GOLDSBORO
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III EXCEPT BY PERMIT
THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS LIMITED TO INTERCHANGES.

GRAPHIC SCALES

PLANS 5 0 10

PROFILE (HORIZONTAL) 5 0 10

PROFILE (VERTICAL) 1 0 2

DESIGN DATA

ADT 2007 = 21,600
ADT 2027 = 39,000
DHV = 10 %
D = 55 %
T = 9 % *
V = 110 km/h

* TTST 5 % + DUAL 4 %

PROJECT LENGTH

LENGTH ROADWAY T.I.P. PROJECT R-2554A	8.028 KM.
LENGTH STRUCTURES T.I.P. PROJECT R-2554A	0.778 KM.
TOTAL LENGTH OF STATE T.I.P. PROJECT R-2554A	8.806 KM.

NOTE: EB LANE USED TO DETERMINE PROJECT LENGTH

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4000 WESTCHASE BLVD., SUITE 470
RALEIGH, NC 27607
PREPARED FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JANUARY 20, 2006

LETTING DATE: JULY 21, 2009

D. J. MORY, P.E. — PROJECT ENGINEER

W. E. TILLITT, E.I. — PROJECT DESIGN ENGINEER

NCDOT CONTACT: CATHY S. HOUSER, P.E. — ROADWAY DESIGN - PROJECT ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

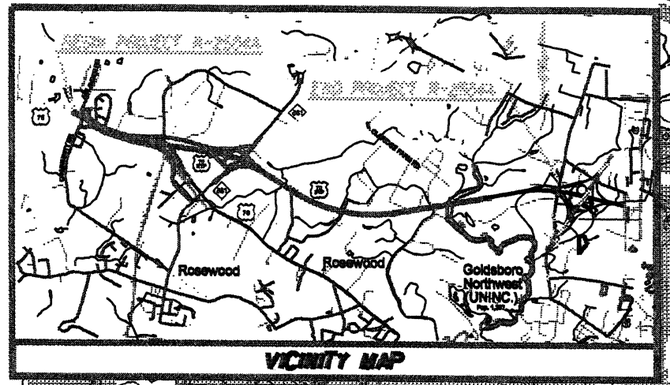
Permit Drawing
Sheet 1 of 1

P.E.
STATE HIGHWAY DESIGN ENGINEER

TIP PROJECT: R-2554A

CONTRACT No.:

See Sheet 1-B For Conventional Symbols



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAYNE COUNTY

LOCATION: US 70 (GOLDSBORO BYPASS) FROM WEST OF NC 581 TO SR 1300 (SALEM CHURCH ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, CULVERTS AND SIGNING

WETLAND PERMIT

SR 1329
SITE VIII
SITE VII
SR 1326
SITE II
SITE IV
SITE VI
SITE I
SITE III
SITE V
NC 581
US 70

THE PROJECT IS NOT WITHIN THE MUNICIPAL BOUNDARY OF GOLDSBORO.
CONSTRUCTION ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III EXCEPT BY PERMIT.
THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS LIMITED TO INTERCHANGES.

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

METRIC

GRAPHIC SCALES
5 0 10
PLANS
5 0 10
PROFILE HORIZONTAL
1 0 2
PROFILE VERTICAL

DESIGN DATA
ADT 2002 = 21,400
ADT 2022 = 29,850
DHV = 12 %
D = 59 %
T = 8 %
V = 110 km/h
* TWO (2) WAY - DUAL 4 LT

PROJECT LENGTH
LENGTH ROADWAY TIP PROJECT R-2554A 6.585 mi.
LENGTH STRUCTURES TIP PROJECT R-2554A 0.215 mi.
TOTAL LENGTH OF STATE TIP PROJECT R-2554A 6.585 mi.
NOTE: SR LANE USED TO DETERMINE PROJECT LENGTH

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4000 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607
PREPARED FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
2002 STANDARD SPECIFICATIONS
RIGHT OF WAY DATE: JANUARY 20, 2004
LETTING DATE: JULY 21, 2005
PROJECT ENGINEER
PROJECT DESIGN ENGINEER
NCDOT CONTACT: CARY L. HOLLAR, P.E.
ROADWAY DESIGN - PROJECT ENGINEER

HYDRAULICS ENGINEER
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER
SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

Permit Drawing
Sheet 2 of 26

P.E.
STATE HIGHWAY DESIGN ENGINEER

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS			
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Natural Stream Design (ft)
I	40+00-L-		0.85			0.10		0.04		246	
II	47+40-L-		0.14			0.04					
III	49+20-L-		0.10			0.02		0.02		276	
IV	50+40-L-		0.62			0.04		0.01		204	
V	54+10-L-		0.18			0.02		0.02		223	
VI	70+00-L-						0.95				
VII	20+00-Y10-		0.04			0.04					
VIII	19+60-Y10-			0.24		0.06					
	DETOUR										
TOTALS:			1.94	0.24		0.33	0.95	0.09		949	

Permit Drawing
Sheet 3 of 26

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

COUNTY

WBS - 34461.1.3 (R-2554A)

SHEET October-07

JMD Revised 2/03/05

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ha)	Temp. Fill In Wetlands (ha)	Excavation in Wetlands (ha)	Mechanized Clearing in Wetlands (ha)	Hand Clearing in Wetlands (ha)	SURFACE WATER IMPACTS: Permanent SW impacts (ha)	Temp. SW impacts (ha)	Existing Channel Impacts Permanent (m)	Natural Stream Design (m)
I	40+00-L-		0.346			0.039		0.015		75	
II	47+40-L-		0.055			0.015					
III	49+20-L-		0.042			0.009		0.008		84	
IV	50+40-L-		0.250			0.017		0.006		62	
V	54+10-L-		0.073			0.010		0.007		68	
VI	70+00-L-						0.386				
VII	20+00-Y10-		0.018			0.017					
VIII	19+60-Y10-			0.096		0.025					
	DETOUR										
TOTALS:			0.784	0.096	0.000	0.132	0.386	0.036	0.000	289.000	0.000

Permit Drawing
Sheet 4 of 20

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
34461.1.3 (R-2554A)

SHEET October-07

JMD Revised 2/03/05

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
30	GEORGE H. BECTON	N NC 581 HWY GOLDSBORO, N.C. 27530
31	DANNY P. SASSER	203 SADDLEWOOD DR. GOLDSBORO, N.C. 27534
32	CATHERINE S. SMITH	405 PARK AVE. GOLDSBORO, N.C. 27530
33	BILDAN, LLC	P.O. BOX 867 NEW BERN, N.C. 28562
35	GRAVES T. LEWIS	P.O. BOX 429 LAKE WACCAMAW, N.C. 28450
34	DONALD G. WATKINS	644 NOBLES MILL RD. DEEP RUN, N.C. 28525
36	ALVIN WATKINS	2199 US 70 WEST GOLDSBORO, N.C. 27530
37	J. FRANK CASEY	156 BLUEBERRY RD. GOLDSBORO, N.C. 27530
41	ISAAC J. MOZINGO	2716 SALEM CHURCH ROAD GOLDSBORO, N.C. 27530
59	JEAN C. BECTON	343 NC HWY 581 N. GOLDSBORO, N.C. 27530
64	HARRISON R. BECTON	385 NC HWY 581 N. GOLDSBORO, N.C. 27530

Permit Drawing
Sheet 5 of 20

NCDOT

DIVISION OF HIGHWAYS

WAYNE COUNTY

PROJECT: 34461.1.3 (R-2554A)

GOLDSBORO BYPASS FROM US 70 WEST OF NC 581 TO SR 1300

SHEET OF

R/W REV. - 11/28/06
CORRECTED PROPERTY OWNER INFORMATION
REMOVED LEVEL SPREADERS

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4000 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

R-2554A	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
Not approved for construction

CONST. REV.
R/W REV.

-L-

PIs Sta 42+31.878	PI Sta 51+64.793	PIs Sta 60+24.817
Es = 1'01' 52.8"	Δ = 39° 42' 57.7" (LT)	Es = 1'01' 52.8"
Ls = 90.000	L = 1,732.939	Ls = 90.000
LT = 60.001	T = 902.916	LT = 60.001
ST = 30.001	R = 2,500.000	ST = 30.001
	SE = 0.03	

NAD 83

GEORGE H. BECTON, HEIRS
DB 191 PG. 98
30

DANNY P. SASSER
DB 1803 PG. 284
31

CATHERINE S. SMITH
WB 81 PG. 282
DB 360 PG. 389
32

39 40 41 42

+40.000 -L- 50.000m LT (164.04')

+40.000 -L- 45.000m LT (147.64')

-EY11- POT Sta 10+00.000

-L- POT Sta 41+64.336 = -EY11- POT Sta 10+43.597

-L- TS Sta 41+71.877 (45.000m LT - 147.64')

SOIL

GRAU 350

CAT-1

S 57° 53' 24.7" E

GOLDSBORO BYPASS

EXISTING R/W

MATCH LINE -L- 38+40.000 SEE SHEET 11

MATCH LINE -L- 41+40.000 SEE SHEET 13

+47.716

+40.000 -L- 45.000m RT (147.64')

+40.000 -L- 55.000m RT (180.45')

+71.877 -L- 45.000m RT (147.64')

PROP. GR. w/ TERM. SECTIONS

+15.388 -EY11- 2.816m RT

GEORGE H. BECTON, HEIRS
DB 633 PG. 55
29

GEORGE H. BECTON, HEIRS
DB 191 PG. 98
30

DANNY P. SASSER
DB 1803 PG. 284
31

CATHERINE S. SMITH
WB 81 PG. 282
DB 360 PG. 389
32

SOIL

SITE 1

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

DENOTES FILL IN SURFACE WATER

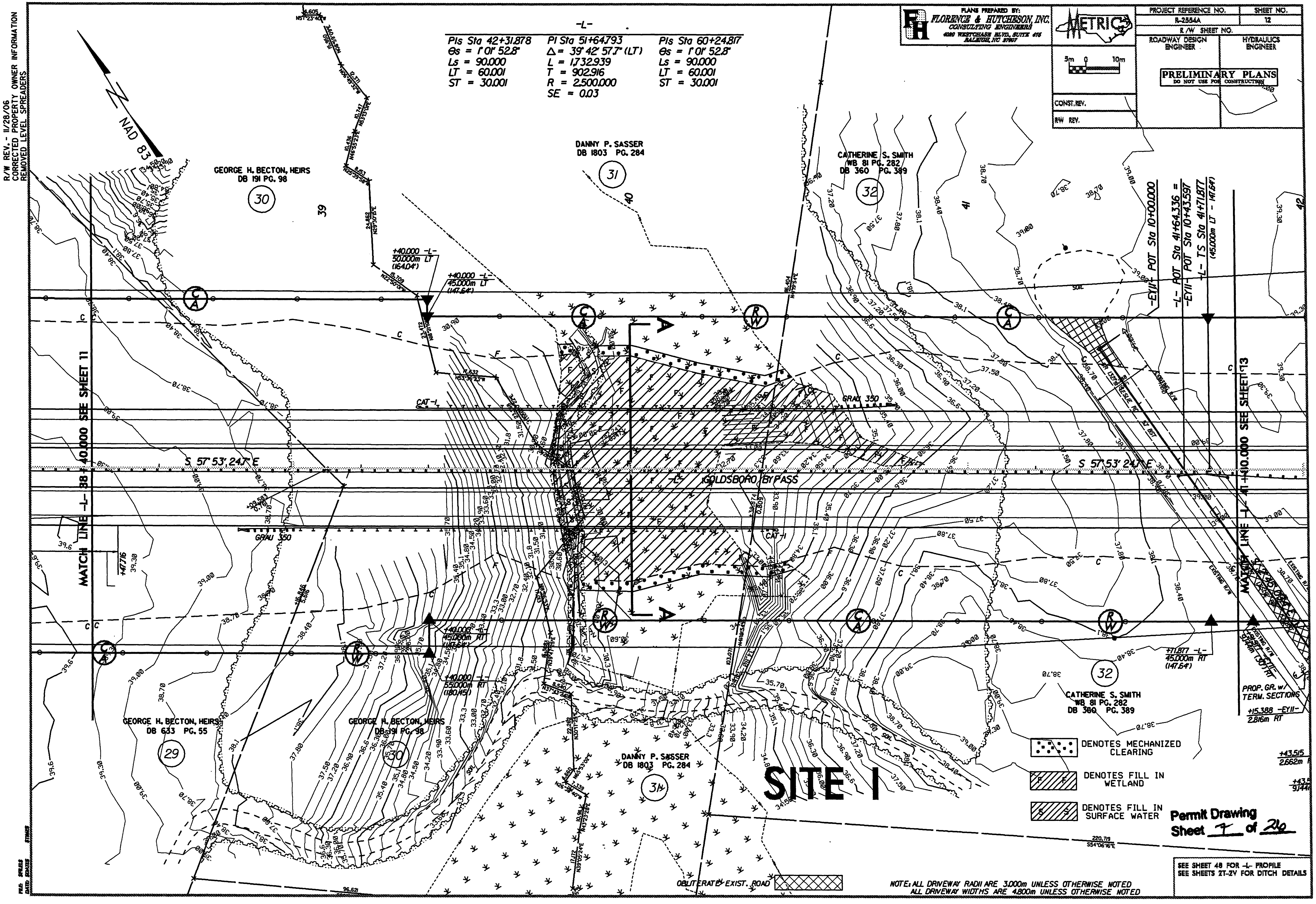
Permit Drawing
Sheet 6 of 20

OBLITERATE EXIST. ROAD

NOTE: ALL DRIVEWAY RADII ARE 3.000m UNLESS OTHERWISE NOTED
ALL DRIVEWAY WIDTHS ARE 4.800m UNLESS OTHERWISE NOTED

SEE SHEET 48 FOR -L- PROFILE
SEE SHEETS 2T-2V FOR DITCH DETAILS

FIELD SPHERES STAKES
DATE: 8/24/05

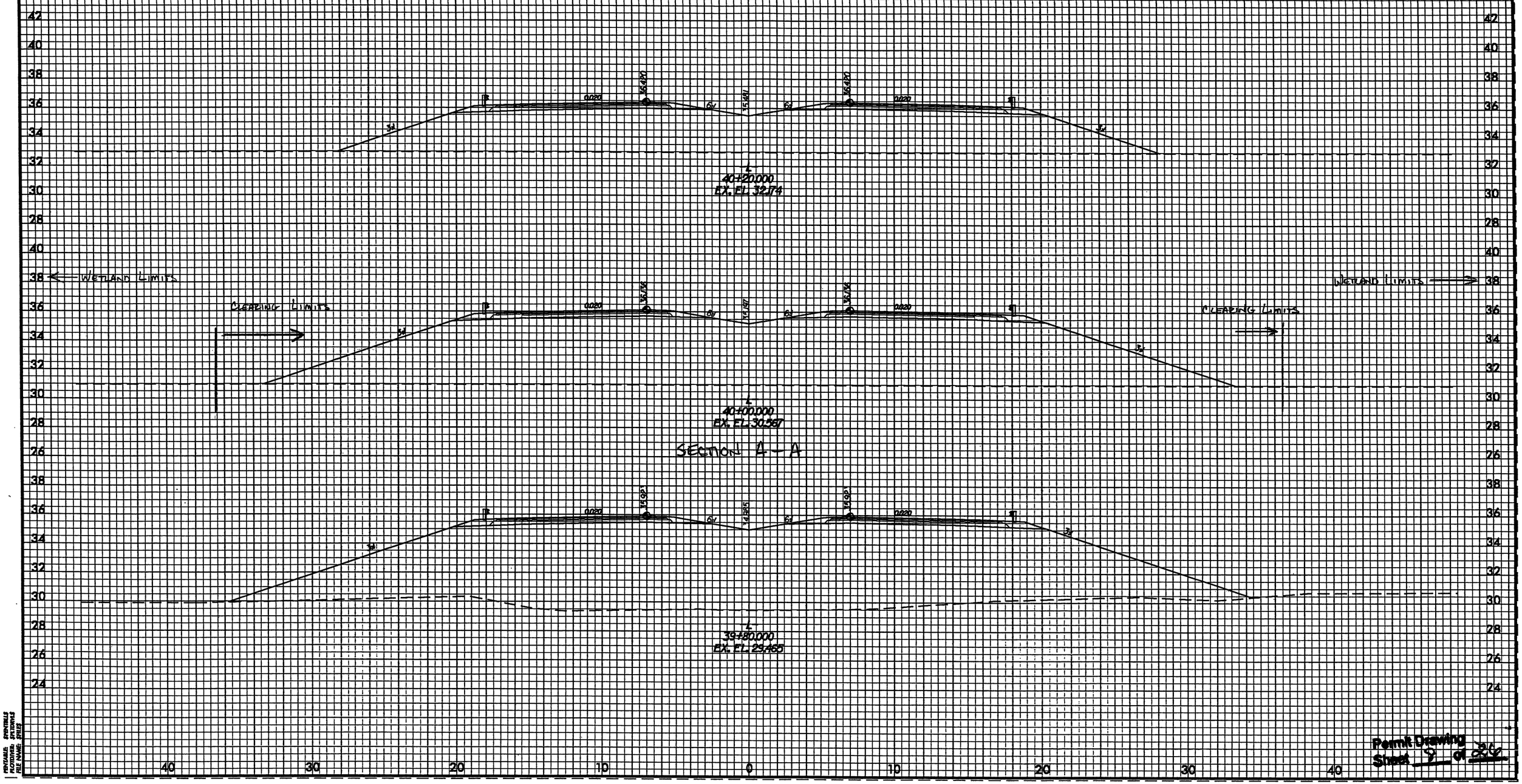

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
METRIC
PROJECT REFERENCE NO.
SHEET NO.
R-2554A
12
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
CONST. REV.
R/W REV.
R/W REV. - 11/28/06
CORRECTED PROPERTY OWNER INFORMATION
REMOVED LEVEL SPREADERS
NAD 83
-L-
PIs Sta 42+31.878
θs = 1° 01' 52.8"
Ls = 90.000
LT = 60.001
ST = 30.001
PI Sta 51+64.793
Δ = 39° 42' 57.7" (LT)
L = 1,732.939
T = 902.916
R = 2,500.000
SE = 0.03
PIs Sta 60+24.817
θs = 1° 01' 52.8"
Ls = 90.000
LT = 60.001
ST = 30.001
GEORGE H. BECTON, HEIRS
DB 191 PG. 98
DANNY P. SASSER
DB 1803 PG. 284
CATHERINE S. SMITH
WB 81 PG. 282
DB 360 PG. 389
GEORGE H. BECTON, HEIRS
DB 633 PG. 55
MATCH LINE -L- 38+40.000 SEE SHEET 11
MATCH LINE -L- 41+10.000 SEE SHEET 13
S 57° 53' 24.7" E
-L- GOLDSBORO BYPASS
-EYII- POT Sta 10+00.000
-L- POT Sta 41+64.336 =
-EYII- POT Sta 10+43.597
-L- TS Sta 41+71.877
(45.000m LT - (147.64')
PROP. GR. w/ TERM. SECTIONS
SITE I
DENOTES MECHANIZED CLEARING
DENOTES FILL IN WETLAND
DENOTES FILL IN SURFACE WATER
Permit Drawing
Sheet 7 of 26
OBLITERATE EXIST. ROAD
NOTE: ALL DRIVEWAY RADII ARE 3.000m UNLESS OTHERWISE NOTED
ALL DRIVEWAY WIDTHS ARE 4.800m UNLESS OTHERWISE NOTED
SEE SHEET 48 FOR -L- PROFILE
SEE SHEETS 2T-2V FOR DITCH DETAILS

PROJ. REFERENCE NO.	SHEET NO.
R-2554A	X-56
GOLDSBORO BYPASS	

METRIC

2m 0 2m

SCALE



Permit Drawing
Sheet 9 of 242

R/W REV. - 11/28/06
CORRECTED PROPERTY OWNER INFORMATION

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4000 WESTCHASE BLVD., SUITE 415
RALEIGH, NC 27607

METRIC

5m 0 10m

PROJECT REFERENCE NO.	SHEET NO.
R-2554A	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

CONST. REV.

R/W REV.

-L-
PI Sta 42+31.878
Θs = 1°01' 52.8"
Ls = 90.000
LT = 60.001
ST = 30.001

PI Sta 51+64.793
Δ = 39° 42' 57.7" (LT)
L = 1,732.939
T = 902.916
R = 2,500.000
SE = 0.03

PI Sta 60+24.817
Θs = 1°01' 52.8"
Ls = 90.000
LT = 60.001
ST = 30.001

NAD 83

33
BILDAN, LLC
DB 2367 PG. 640

46

GRAVES T. LEWIS
WB 78E PG. 139
DB 537 PG. 303

35

+90.000 -L-
45.000m LT
(147.64')

+90.000 -L-
45.000m RT
(147.64')

R/W
1.2m WW 1-S-BW

45.000m
(146.64')

C
F

CAT-1

GRADE

GRAU 350

-L- GOLDSBORO BYPASS

B

SEE SHEET 13

MATCH LINE -L- 45+20.000

SEE SHEET 15

MATCH LINE -L- 48+60.000

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

33
BILDAN, LLC
DB 2367 PG. 640

34
DONALD G. WATKINS
DB 2063 PG. 548

SITE II

OBLITERATE EXIST. ROAD

NOTE: ALL DRIVEWAY RADII ARE 3.000m UNLESS OTHERWISE NOTED
ALL DRIVEWAY WIDTHS ARE 4.800m UNLESS OTHERWISE NOTED

Permit Drawing
Sheet 9 of 26

SEE SHEET 49 FOR -L- PROFILE
SEE SHEETS 2T-2V FOR DITCH DETAILS

FILE: SITE2B
DATE: 2/14/07
TIME:

R/W REV. - 11/28/06
CORRECTED PROPERTY OWNER INFORMATION

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4000 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554A	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT TO BE USED FOR CONSTRUCTION

CONST. REV.
R/W REV.

Pls Sta 42+31.878
Øs = 1°01'52.8"
Ls = 90.000
LT = 60.001
ST = 30.001

PI Sta 51+64.793
Δ = 39°42'57.7" (LT)
L = 1732.939
T = 902.916
R = 2500.000
SE = 0.03

Pls Sta 60+24.817
Øs = 1°01'52.8"
Ls = 90.000
LT = 60.001
ST = 30.001

NAD 83

BILDAN, LLC
DB 2367 PG. 640

GRAVES T. LEWIS
WB 78E PG. 139
DB 537 PG. 303

GUARDRAIL

GRAU 350

+90.000 -L-
45.000m RT
(147.64')

+90.000 -L-
45.000m LT
(147.64')

CAT-I

MATCH LINE -L- 45 + 20.000 SEE SHEET 13

MATCH LINE -L- 48 + 60.000 SEE SHEET 15

-L- GOLDSBORO BYPASS

R/W
12m WW I-S-BW

45.000m
(146.64')

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

33
BILDAN, LLC
DB 2367 PG. 640

34
DONALD G. WATKINS
DB 2063 PG. 548

SITE II

OBLITERATE EXIST. ROAD

NOTE: ALL DRIVEWAY RADII ARE 3.000m UNLESS OTHERWISE NOTED
ALL DRIVEWAY WIDTHS ARE 4.800m UNLESS OTHERWISE NOTED

Permit Drawing
Sheet 10 of 26

SEE SHEET 49 FOR -L- PROFILE
SEE SHEETS 2T-2V FOR DITCH DETAILS

FILES SHEETS
DATES STAKES

METRIC	PROJ. REFERENCE NO.	SHEET NO.
	R-2554A	X-68
	GOLDSBORO BYPASS	
	2m 0 2m SCALE	

WETLAND LIMIT

CLEARING LIMIT

-L-
47+40.000
EX. EL. 34.077

Section B-B

-L-
47+20.000
EX. EL. 34.338

-L-
47+00.000
EX. EL. 34.789

Permit Drawing
Sheet 11 of 22

PROJECT REFERENCE NO.
R-2554A
FILE NAME: PROJECT REFERENCE NO.
R-2554A
FILE NAME: FILE

R/W REV. - 11/28/06
CORRECTED PROPERTY OWNER INFORMATION
REMOVED TURN AROUND ON PARCEL 35
ADDED R/W MONUMENT ALONG EXIST. R/W
REMOVED R/W MONUMENT ALONG EXIST. R/W ON PARCEL 34

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4208 WESTGLADE BLVD., SUITE 470
RALEIGH, NC 27617

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554A	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

CONST. REV.
R/W REV.

NAD 83

SITE III

SITE IV

GRAVES T. LEWIS
WB 78E PG. 139
DB 537 PG. 303

35

GRAVES T. LEWIS
WB 78E PG. 139
DB 537 PG. 303

35

SR 1328 HOWELL RD

MATCH LINE -L- 48+60.000 SEE SHEET 14

MATCH LINE -L- 52+00.000 SEE SHEET 16

-L- GOLDSBORO BYPASS

PROP. GR. w/ TERM. SECTIONS

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

DENOTES FILL IN SURFACE WATER

34

DONALD G. WATKINS
DB 2063 PG. 548

STEVEN HARRISON
DB 1579 PG. 465

-L-

PIs Sta 42+31.878	PI Sta 51+64.793	PIs Sta 60+24.817
Es = 1'01' 52.8"	Δ = 39° 42' 57.7" (LT)	Es = 1'01' 52.8"
Ls = 90.000	L = 1,732.939	Ls = 90.000
LT = 60.001	T = 902.916	LT = 60.001
ST = 30.001	R = 2,500.000	ST = 30.001
	SE = 0.03	

OBLITERATE EXIST. ROAD

NOTE: ALL DRIVEWAY RADII ARE 3.000m UNLESS OTHERWISE NOTED
ALL DRIVEWAY WIDTHS ARE 4.800m UNLESS OTHERWISE NOTED

Permit Drawing
Sheet 12 of 26

SEE SHEET 50 FOR -L- PROFILE
SEE SHEETS 27-27 FOR DITCH DETAILS

FILE: SPIKES
DATE: 10/4/05
STAKES

R/W REV. - 11/28/06
CORRECTED PROPERTY OWNER INFORMATION
REMOVED TURN AROUND ON PARCEL 35
ADDED R/W MONUMENT ALONG EXIST. R/W
REMOVED R/W MONUMENT ALONG EXIST. R/W ON PARCEL 34

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4000 WESTCHASE BLVD., SUITE 470
RALEIGH, NC 27607

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554A	15

R/W SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

CONST. REV.
R/W REV.

NAD 83

SITE III

SITE IV

GRAVES T. LEWIS
WB 78E PG. 139
DB 537 PG. 303

SR 1109 HOWELL RD

MATCH LINE -L- 48+60.000 SEE SHEET 14

MATCH LINE -L- 52+60.000 SEE SHEET 16

-L- GOLDSBORO BYPASS

PROP. GR'W/ TERM. SECTIONS

DONALD G. WATKINS
DB 2063 PG. 548

STEVEN HARRISON
DB 1579 PG. 465

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

DENOTES FILL IN SURFACE WATER

OBLITERATE EXIST. ROAD

-L-

PIs Sta 42+31.878	PI Sta 51+64.793	PIs Sta 60+24.817
θs = 1° 01' 52.8"	Δ = 39° 42' 57.7" (LT)	θs = 1° 01' 52.8"
Ls = 90.000	L = 1,732.939	Ls = 90.000
LT = 60.001	T = 902.916	LT = 60.001
ST = 30.001	R = 2,500.000	ST = 30.001
	SE = 0.03	

NOTE: ALL DRIVEWAY RADII ARE 3.000m UNLESS OTHERWISE NOTED
ALL DRIVEWAY WIDTHS ARE 4.800m UNLESS OTHERWISE NOTED

Permit Drawing
Sheet 13 of 26

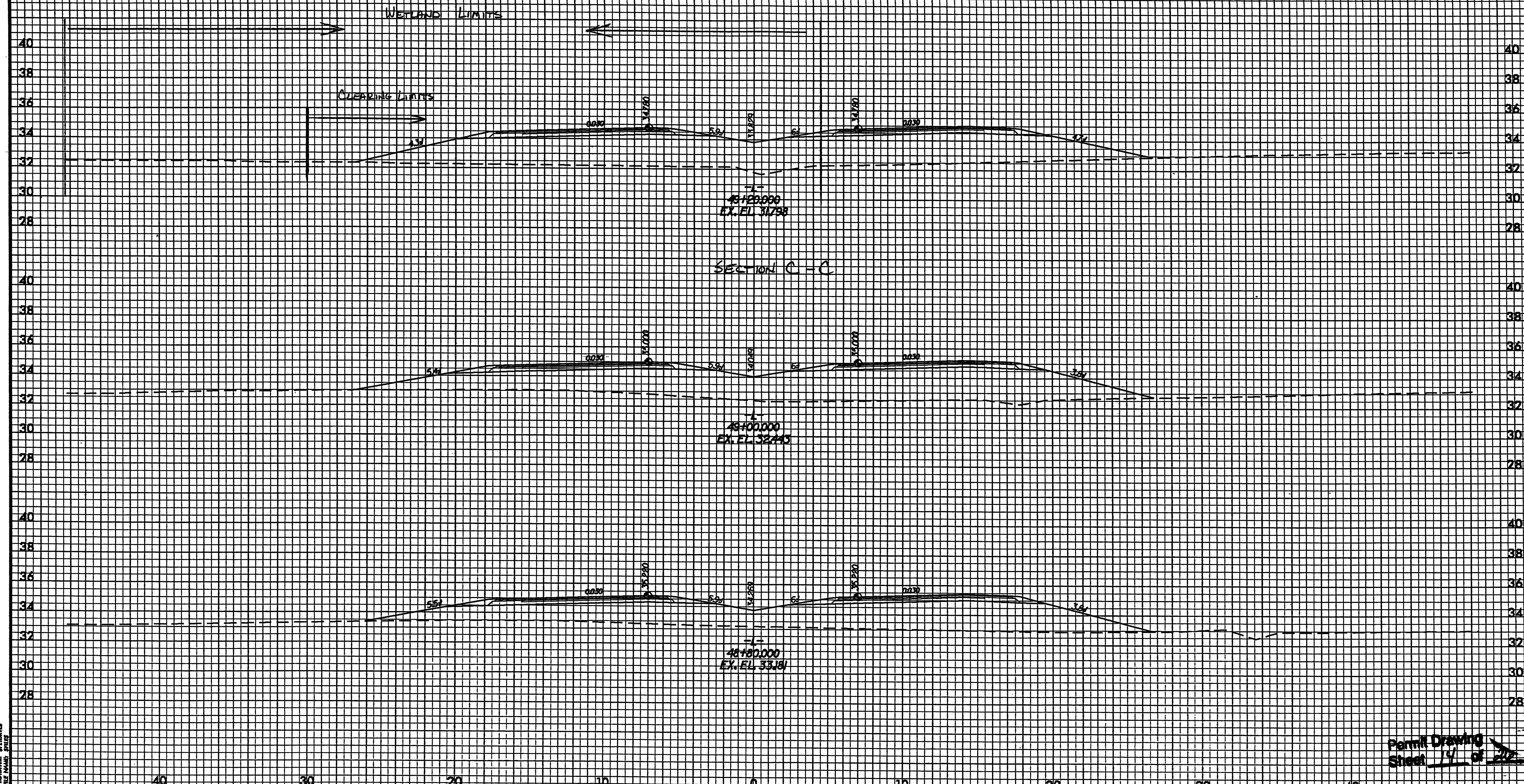
SEE SHEET 50 FOR -L- PROFILE
SEE SHEETS 2T-2V FOR DITCH DETAILS

FILE: SPIELS STINES
DATE: DATES SOATES

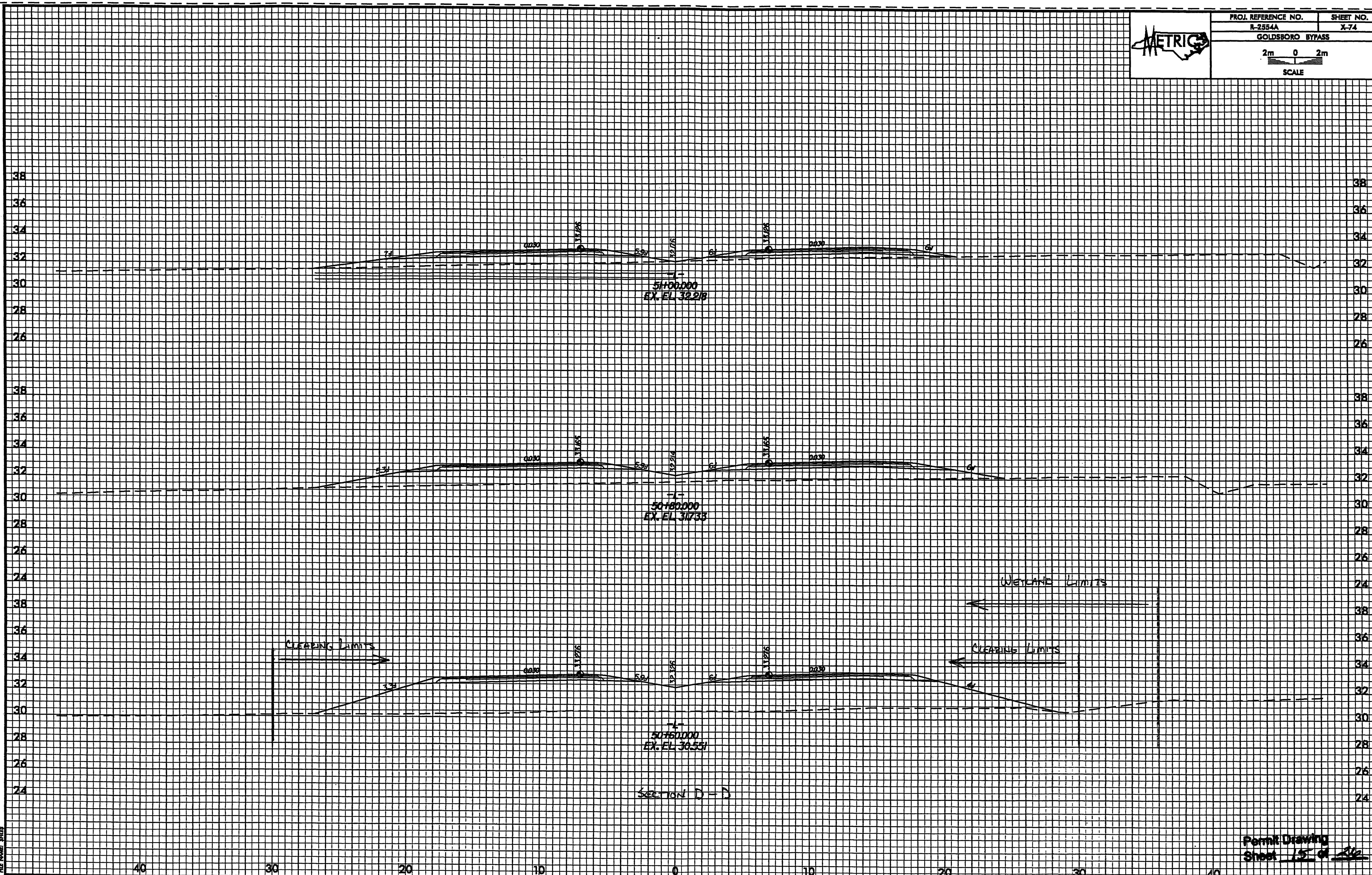
PROJ. REFERENCE NO.	SHEET NO.
R-2554A	X-71

GOLDSBORO BYPASS

2m 0 2m
SCALE



Permit Drawing
Sheet 14 of 22



PROJ. REFERENCE NO.
R-2554A
SHEET NO.
X-74
METRIC
GOLDSBORO BYPASS
2m 0 2m
SCALE
-L-
51+00.000
EX. EL. 32.218
-L-
50+80.000
EX. EL. 31.733
WETLAND LIMITS
CLEARING LIMITS
CLEARING LIMITS
-L-
50+60.000
EX. EL. 30.551
SECTION D - D
Permit Drawing
Sheet 15 of 26

R/W REV. - 11/28/06
CORRECTED PROPERTY OWNER INFORMATION

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4000 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

PROJECT REFERENCE NO.	SHEET NO.
R-2554A	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS	(SEE SHEET NO.)
CONST. REV.	
R/W REV.	

-L-
Pls Sta 42+31.878
Es = 1°01' 52.8"
Ls = 90.000
LT = 60.001
ST = 30.001

Pl Sta 51+64.793
Δ = 39° 42' 57.7" (LT)
L = 1,732.939
T = 902.916
R = 2,500.000
SE = 0.03

Pls Sta 60+24.817
Es = 1°01' 52.8"
Ls = 90.000
LT = 60.001
ST = 30.001

NAD 83

GRAVES T. LEWIS
WB 78E PG. 139
DB 537 PG. 303
35

LEWIS
PG. 139
303

ALVIN WATKINS
DB 748 PG. 529
DB 174 PG. 384
36

37
J. FRANK CASEY
91E-105

52

53

55

MATCH LINE -L- 52+00.000 SEE SHEET 15

MATCH LINE -L- 55+40.000 SEE SHEET 17

-L- GOLDSBORO BYPASS

CAT-1 GUARDRAIL

GRAU 350

GUARDRAIL

CAT-1

+06.048
1.989

+07.644
2.291

+81.580
105.822

POND

SITE V

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

DENOTES FILL IN SURFACE WATER

Permit Drawing
Sheet 16 of 26

OBLITERATE EXIST. ROAD

NOTE: ALL DRIVEWAY RADII ARE 3.000m UNLESS OTHERWISE NOTED
ALL DRIVEWAY WIDTHS ARE 4.800m UNLESS OTHERWISE NOTED

SEE SHEET 30 FOR -L- PROFILE
SEE SHEETS 27-29 FOR DITCH DETAILS

PLOT SCALE
PLOT DATE
STATE

R/W REV. - 11/28/06
CORRECTED PROPERTY OWNER INFORMATION

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4200 WESTGRASS BLVD. SUITE 410
RALEIGH, NC 27617

METRIC

5m 0 10m

CONST. REV.

R/W REV.

PROJECT REFERENCE NO. R-2554A — SHEET NO. 16

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

-L-

PIs Sta 42+31.878	PI Sta 51+64.793	PIs Sta 60+24.817
Es = 1' 01' 52.8"	Δ = 39° 42' 57.7" (LT)	Es = 1' 01' 52.8"
Ls = 90.000	L = 1,732.939	Ls = 90.000
LT = 60.001	T = 902.916	LT = 60.001
ST = 30.001	R = 2,500.000	ST = 30.001
	SE = 0.03	

NAD 83

GRAVES T. LEWIS
WB 78E PG. 139
DB 537 PG. 303

LEWIS
PG. 139
PG. 303

ALVIN WATKINS
DB 748 PG. 529
DB 174 PG. 384

J. FRANK CASEY
91E-105

GUARDRAIL

GRAU 350

CAT-1

-L- GOLDSBORO BYPASS

MATCH LINE -L- 52+00.000 SEE SHEET 15

MATCH LINE -L- 55+40.000 SEE SHEET 17

+06.048
L989

+81.580
105.822

SITE V

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

DENOTES FILL IN SURFACE WATER

OBLITERATE EXIST. ROAD

Permit Drawing
Sheet 17 of 28

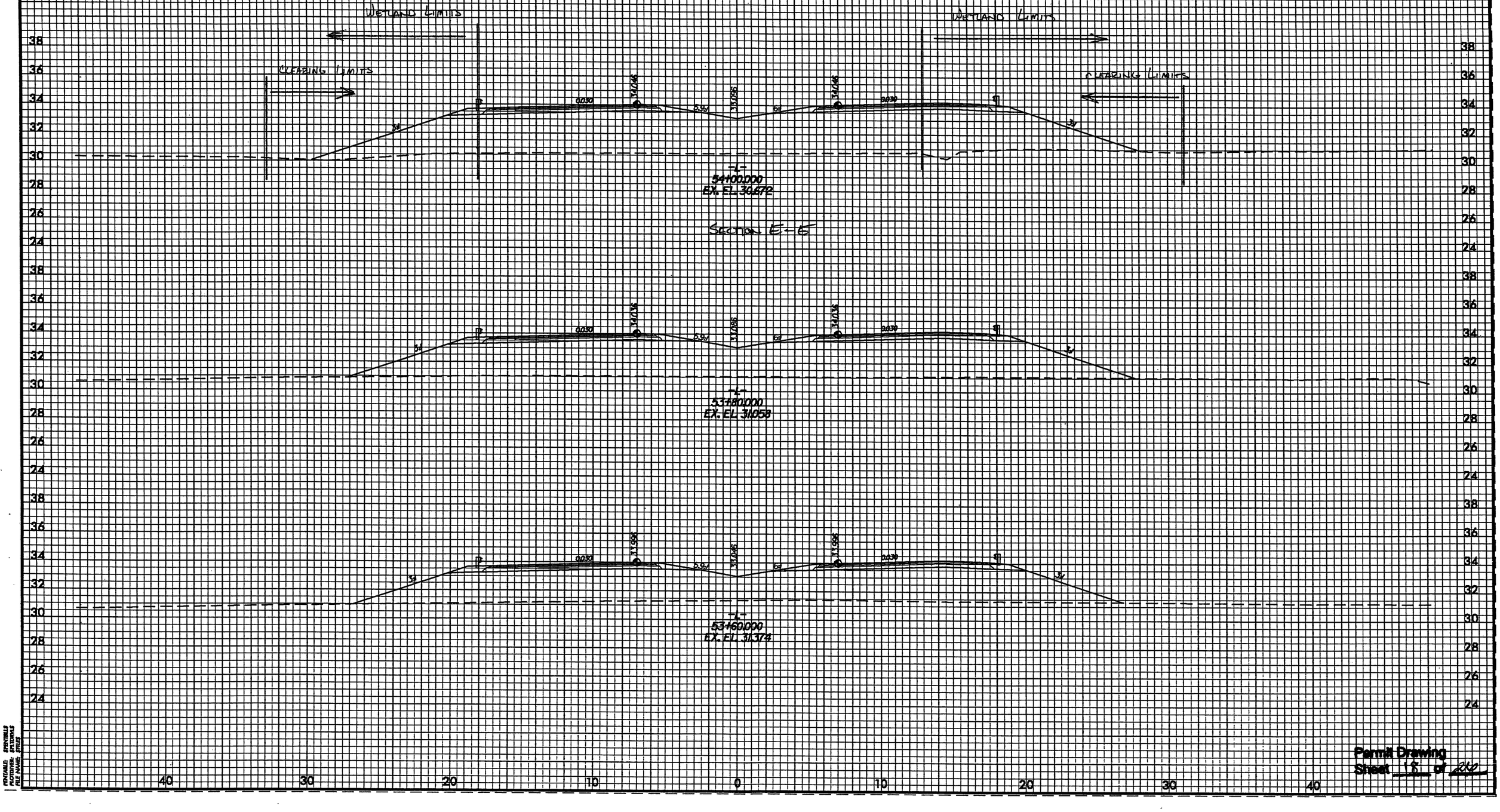
NOTE: ALL DRIVEWAY RADII ARE 3.000m UNLESS OTHERWISE NOTED
ALL DRIVEWAY WIDTHS ARE 4.800m UNLESS OTHERWISE NOTED

SEE SHEET 90 FOR -L- PROFILE
SEE SHEETS 2T-2V FOR DITCH DETAILS

FIELD SPLICE DATES ESTIMATES

PROJ. REFERENCE NO.	SHEET NO.
R-2554A	X-79
GOLDSBORO BYPASS	

2m 0 2m
SCALE



Permit Drawing
Sheet 16 of 202

R/W REV. - 11/28/06
REVISED R/W AND ADDED R/W MONUMENTS
ADDED/SHIFTED R/W MONUMENTS ALONG EXIST. R/W

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4230 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554A	21
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

5m 0 10m

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST. REV.

R/W REV.

NAD 83

SR 1395 CLAYBRIDGE HANSLEY RD

BK 1/W

375mm CONC

1200mm CONC

1500mm CONC

ISFBUS

13

69

LT

S

STATE OF NORTH CAROLINA

902

70

RIVER IS PROPERTY LINE

71

41

ISAAC J. MOZINGO
DB 798 PG. 829

72

EXISTING R/W

-L- POT Sta 69+04.696 =
-EY13- POC Sta 14+17.717

-EY13- PT Sta 14+28.253

NEUSE RIVER

SWAMP

HC

14

±46.768
16.17%

BRIDGE

-L- GOLDSBORO BYPASS

N 80° 19' 52.0" E

MATCH LINE -L- 68+80.000 SEE SHEET 20

MATCH LINE -L- 72+00.000 SEE SHEET 22

S 4° 54' 43.7" W

-EY13-

EXISTING R/W

15

STATE OF NORTH CAROLINA

RIVER IS PROPERTY LINE

902

EXISTING R/W

BK 1/W

GOLF COURSE

S

LANE FARMS INC.
DB 965 PG. 766

ISAAC J. MOZINGO
DB 798 PG. 829

41

S85°42'
N89°21'36"E

-EY13-
PI Sta 12+89.712
Δ = 57° 14' 47.8" (RT)
L = 292.078
T = 159.537
R = 292.329

SITE VI

HC HC DENOTES HAND CLEARING

OBLITERATE EXIST. ROAD

Permit Drawing
Sheet 19 of 26

SEE SHEET 53 FOR -L- PROFILE

FIELD SPHERE STAKES
DATED: 8/24/05

R/W REV. - 11/28/06
REVISED R/W AND ADDED R/W MONUMENTS
ADDED/SHIFTED R/W MONUMENTS ALONG EXIST. R/W

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4030 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554A	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

5m 0 10m

CONST. REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

MATCH LINE -L- 68+80.000 SEE SHEET 20

MATCH LINE -L- 72+00.000 SEE SHEET 22

STATE OF NORTH CAROLINA

RIVER IS PROPERTY LINE

EXISTING R/W

-L- POT Sta 68+04.696 =
-EY13- POC Sta 14+17.717
-EY13- PT Sta 14+28.253

-L- GOLDSBORO BYPASS

N 80° 19' 52.0" E

BRIDGE

SWAMP

ISAAC J. MOZINGO
DB 798 PG. 829

LANE FARMS INC.
DB 965 PG. 766

GOLF COURSE

S 54° 43' 37" W

-EY13-
PI Sta 12+89.712
Δ = 57° 14' 47.8" (RT)
L = 292.078
T = 159.537
R = 292.329

SITE VI

HC HC DENOTES HAND CLEARING

OBLITERATE EXIST. ROAD

Permit Drawing
Sheet 20 of 26

SEE SHEET 53 FOR -L- PROFILE

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4000 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2554A	40
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

SITE VII

-Y1- PC Sta 39+24.039

-Y1- PT Sta 39+99.283

-Y10- ST Sta 19+29.274

-Y10- CS Sta 18+69.275

-Y1- POT Sta 40+13.167 =
-Y10- POS Sta 18+98.155 =
-DWY1- POT Sta 10+00.000

END CONSTRUCTION
-DWY1- POT Sta 10+83.101

END CONST
-Y10- POT

N 40°11' 18.1" E

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

OBLITERATE EXIST. ROAD

NOTE: ALL DRIVEWAY RADII ARE 3.000m UNLESS OTHERWISE NOTED
ALL DRIVEWAY WIDTHS ARE 4.800m UNLESS OTHERWISE NOTED

Permit Drawing
Sheet 21 of 26

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4000 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2554A	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT APPROVED FOR CONSTRUCTION

-Y1- PC Sta 39+24.039

-Y1- PT Sta 39+99.283

-Y10- ST Sta 19+29.274

-Y10- CS Sta 18+69.275

-Y10- N, 40° 11' 18" E

END CONST
-Y10- POT

-Y1- POT Sta 40+13.167 =
-Y10- POT Sta 18+98.155 =
-DWY1- POT Sta 10+00.000

END CONSTRUCTION
-DWY1- POT Sta 10+83.101

11+29.296 = 15+94.518 = 17+67.320

N 16° 39' 09" E

59 JEAN CASEY BECTON
WB 95E PG. 657
DB 633 PG. 53

64 HARRISON RAY BECTON
DB 1614 PG. 395

59 JEAN CASEY BECTON
WB 95E PG. 657
DB 633 PG. 55

64 HARRISON RAY BECTON
DB 1614 PG. 395

59 JEAN CASEY BEC
WB 95E PG. 6
DB 633 PG. 5

60 P.O. JAMES HEIRS

61 GLENN A. SASSER
DB 587 PG. 453

62 GLENDA GAIL SASSER
DB 1520 PG. 196

63 GLENN A. SASSER
DB 455 PG. 144

MARY COBB WO
JOSEPH FIELDS
DB 1662

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

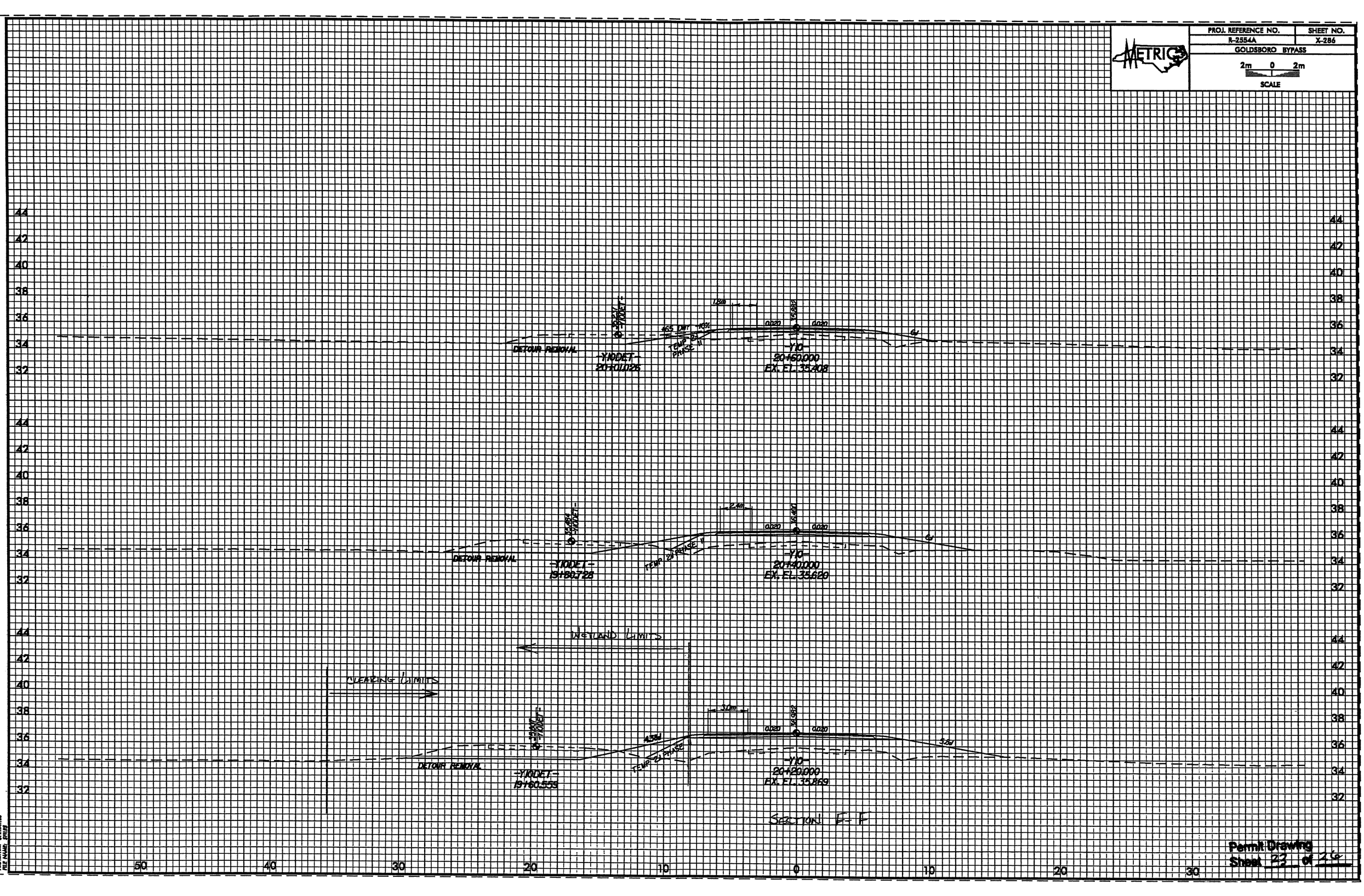
OBLITERATE EXIST. ROAD

NOTE: ALL DRIVEWAY RADII ARE 3.000m UNLESS OTHERWISE NOTED
ALL DRIVEWAY WIDTHS ARE 4.800m UNLESS OTHERWISE NOTED

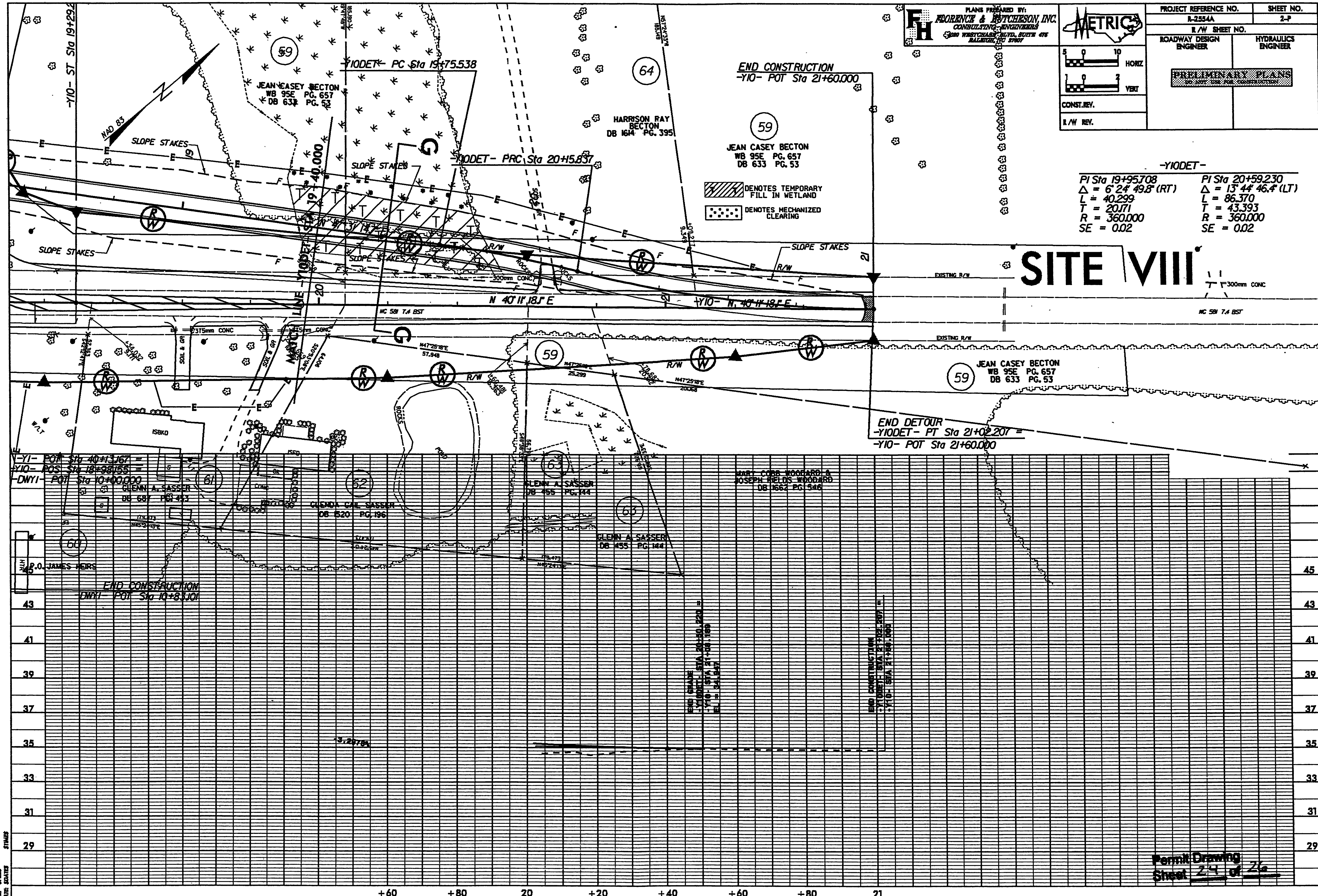
SITE VII

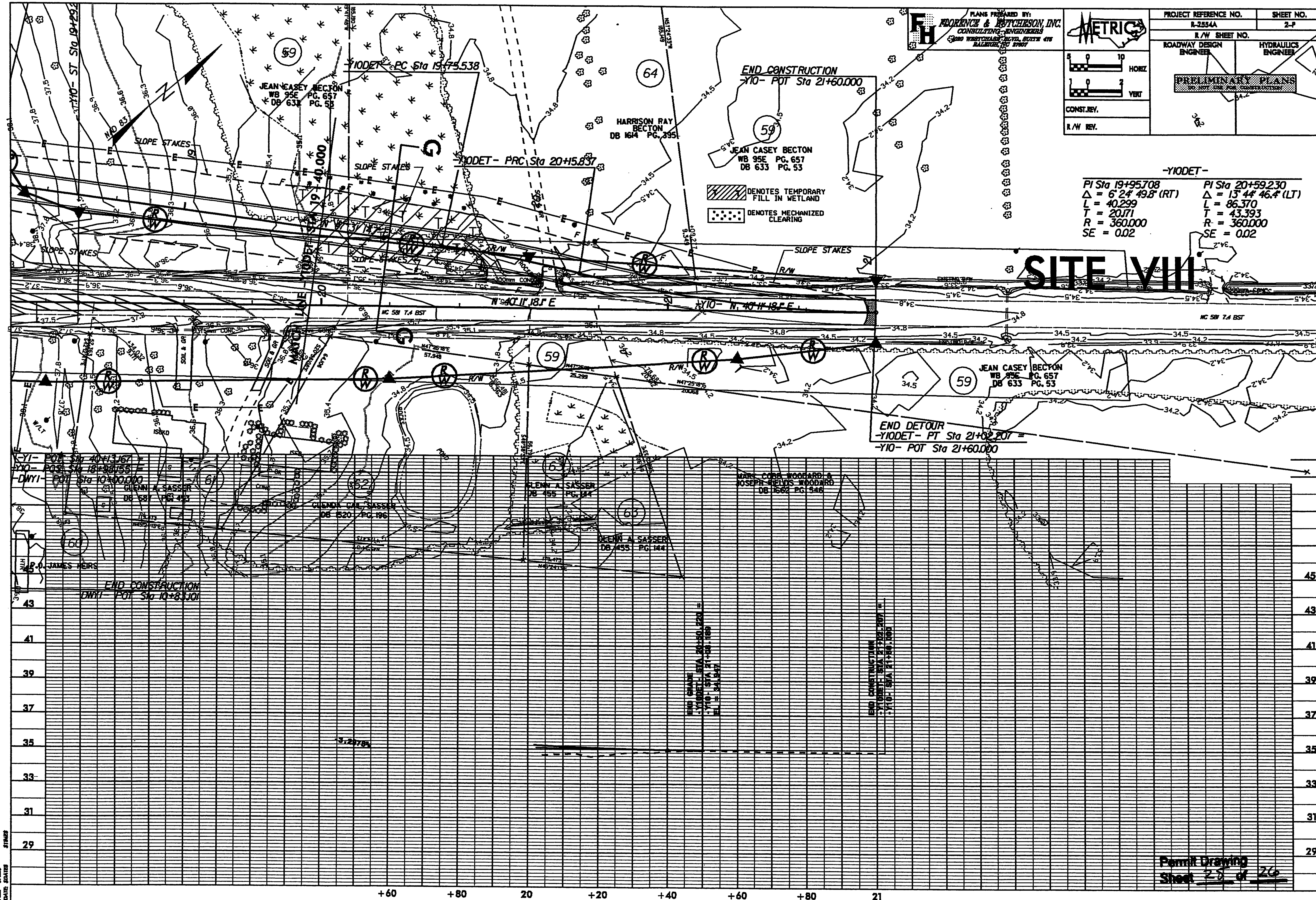
Permit Drawing
Sheet 22 of 26

METRIC	PROJ. REFERENCE NO.	SHEET NO.
	R-2554A	X-286
	GOLDSBORO BYPASS	
	2m 0 2m SCALE	



Permit Drawing
Sheet 22 of 24

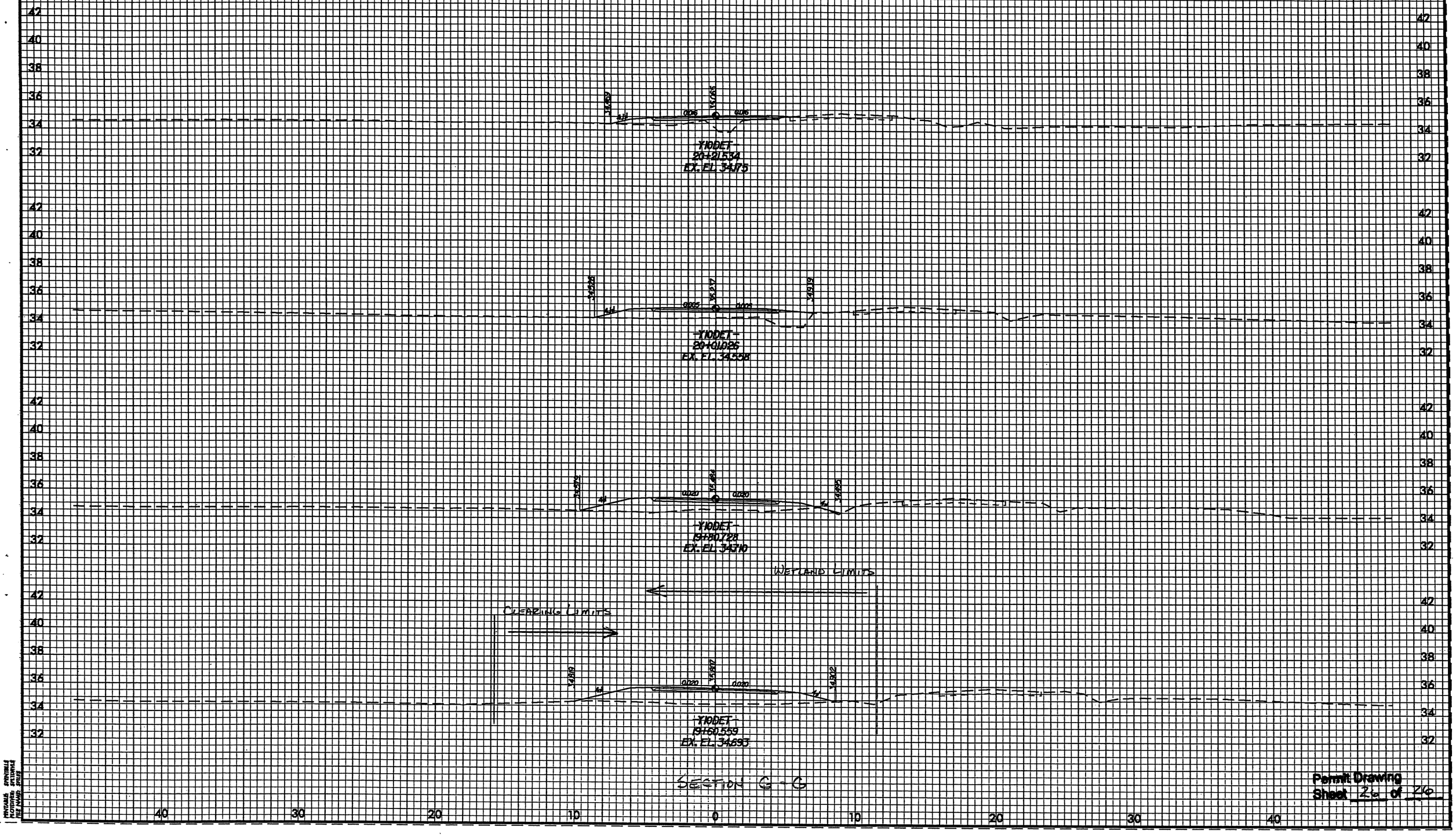

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
METRIC
PROJECT REFERENCE NO.
SHEET NO.
R-2554A
2-P
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
HORZ
VERT
CONST. REV.
R/W REV.
SITE VIII
END CONSTRUCTION
-Y10- POT Sta 21+60.000
-Y10DET- PC Sta 19+75.538
-Y10DET- PRC Sta 20+15.837
JEAN CASEY BECTON
WB 95E PG. 657
DB 633 PG. 53
HARRISON RAY BECTON
DB 1614 PG. 395
DENOTES TEMPORARY FILL IN WETLAND
DENOTES MECHANIZED CLEARING
-Y10DET-
PI Sta 19+95.708
Δ = 6° 24' 49.8" (RT)
L = 40.299
T = 20.171
R = 360.000
SE = 0.02
PI Sta 20+59.230
Δ = 13° 44' 46.4" (LT)
L = 86.370
T = 43.393
R = 360.000
SE = 0.02
SLOPE STAKES
N 40° 11' 18.1" E
-Y10- N 40° 11' 18.1" E
NC 581 7.4 BST
EXISTING R/W
300mm CONC
MATCH LINE -Y10DET- Sta 19+40.000
END DETOUR
-Y10DET- PT Sta 21+02.207 =
-Y10- POT Sta 21+60.000
-Y1- POT Sta 40+13.167 =
-Y10- POS Sta 18+98.155 =
-DWY1- POT Sta 10+00.000
GLENN A. SASSER
DB 687 PG 453
GLENDA GAIL SASSER
DB 1520 PG 196
GLENN A. SASSER
DB 455 PG 144
MARY COBB WOODARD &
JOSEPH FIELDS WOODARD
DB 1662 PG 546
P.O. JAMES HEIRS
END CONSTRUCTION
-DWY1- POT Sta 10+83.101
POND
NAD 83
Permit Drawing
Sheet 24 of 26



PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
METRIC
PROJECT REFERENCE NO.
R-2554A
SHEET NO.
2-P
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
HORIZ
VERT
CONST. REV.
R/W REV.
END CONSTRUCTION
-Y10- POT Sta 21+60.000
-Y10DET- PC Sta 19+75.538
-Y10DET- PRC Sta 20+15.837
JEAN CASEY BECTON
WB 95E PG. 657
DB 633 PG. 53
HARRISON RAY BECTON
DB 1614 PG. 395
DENOTES TEMPORARY FILL IN WETLAND
DENOTES MECHANIZED CLEARING
SLOPE STAKES
-Y10DET-
PI Sta 19+95.708
Δ = 6° 24' 49.8" (RT)
L = 40.299
T = 20.171
R = 360.000
SE = 0.02
PI Sta 20+59.230
Δ = 13° 44' 46.4" (LT)
L = 86.370
T = 43.393
R = 360.000
SE = 0.02
SITE VIII
-Y10- N. 40° 11' 18.2" E
NC 581 7.4 BST
END DETOUR
-Y10DET- PT Sta 21+02.207 =
-Y10- POT Sta 21+60.000
-Y1- POT Sta 40+13.167 =
-Y10- POT Sta 18+98.155 =
-DWY1- POT Sta 10+00.000
GLENN A. SASSER
GLENDA GAIL SASSER
DB 1520 PG. 196
GLENN A. SASSER
DB 455 PG. 144
MARC COBB WOODARD &
JOSEPH FIELDS WOODARD
DB 1662 PG. 546
R.D. JAMES HEIRS
END CONSTRUCTION
-DWY1- POT Sta 10+83.101
END GRADE
END CONSTRUCTION
+60
+80
20
+20
+40
+60
+80
21
Permit Drawing
Sheet 25 of 26

PROJ. REFERENCE NO.	SHEET NO.
R-2554A	X-314
GOLDSBORO BYPASS	

2m 0 2m
SCALE



Permit Drawing
Sheet 24 of 26

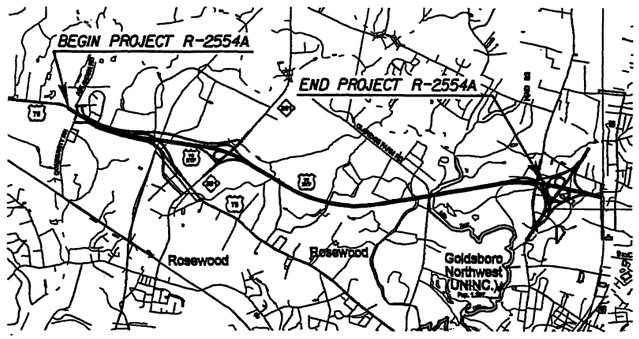
09/09/9

TIP PROJECT: R-2554A

CONTRACT No.:

FILE: SHEETS
DATE: SHEETS

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



METRIC	STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
ALL DIMENSIONS IN THESE PLANS ARE IN METERS AND/OR MILLIMETERS UNLESS OTHERWISE SHOWN	N.C.	R-2554A	1	

STATE PROJ.NO.	F.A.PROJ.NO.	DESCRIPTION
34461.1.3	NHF-70(30)	P.E.
34461.2.4		R/W, UTIL

STATE OF NORTH CAROLINA

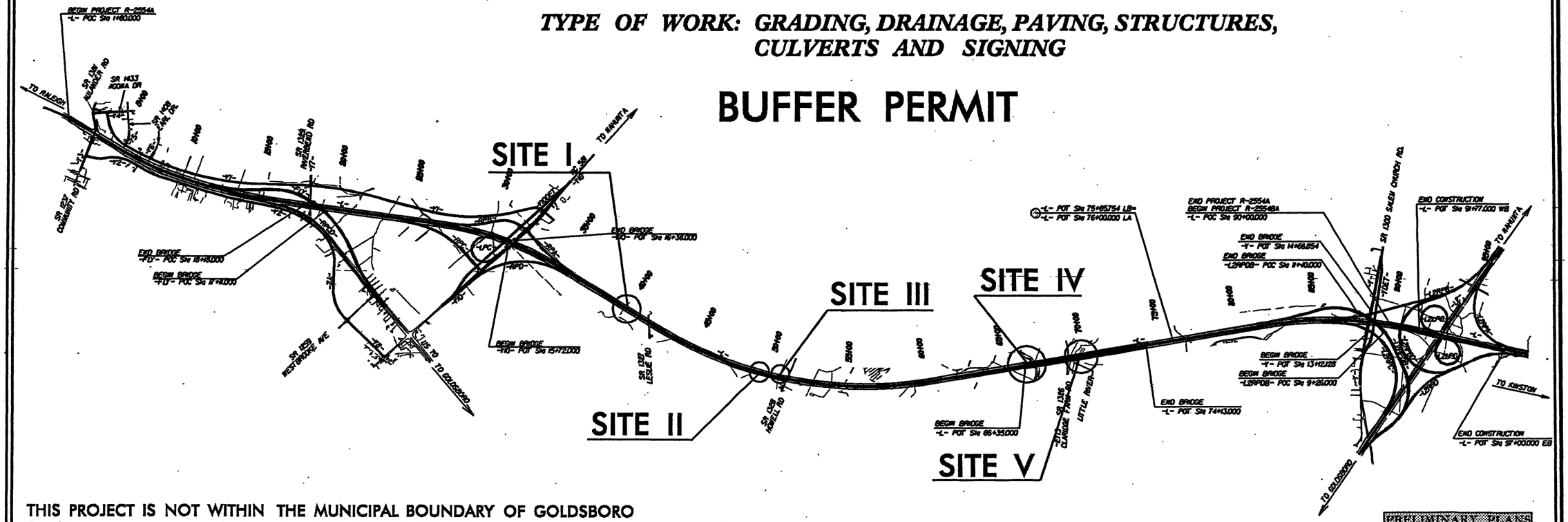
DIVISION OF HIGHWAYS

WAYNE COUNTY

LOCATION: US 70 (GOLDSBORO BYPASS) FROM WEST OF NC 581 TO SR 1300 (SALEM CHURCH ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, CULVERTS AND SIGNING

BUFFER PERMIT



PRELIMINARY PLANS
NOT FOR CONSTRUCTION

THIS PROJECT IS NOT WITHIN THE MUNICIPAL BOUNDARY OF GOLDSBORO
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III EXCEPT BY PERMIT
THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS LIMITED TO INTERCHANGES.

5 0 10 PLANS

5 0 10 PROFILE (HORIZONTAL)

1 0 2 PROFILE (VERTICAL)

DESIGN DATA

ADT 2007 = 21,600
ADT 2027 = 39,000
DHV = 10 %
D = 55 %
T = 9 % *
V = 110 km/h

* TTST 5 % + DUAL 4 %

PROJECT LENGTH

LENGTH ROADWAY T.I.P. PROJECT R-2554A	8.028 KM.
LENGTH STRUCTURES T.I.P. PROJECT R-2554A	0.778 KM.
TOTAL LENGTH OF STATE T.I.P. PROJECT R-2554A	8.806 KM.

NOTE: EB LANE USED TO DETERMINE PROJECT LENGTH

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607
PREPARED FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JANUARY 20, 2006

LETTING DATE: JULY 21, 2009

D. J. MORY, P.E. — PROJECT ENGINEER

W. E. TILLITT, E.I. — PROJECT DESIGN ENGINEER

NCDOT CONTACT: CATHY S. HOUSER, P.E. — ROADWAY DESIGN - PROJECT ENGINEER

HYDRAULICS ENGINEER

Buffer Drawing
Sheet 1 of 14

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

BUFFER IMPACTS SUMMARY

			IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (m^2)	ZONE 2 (m^2)	TOTAL (m^2)	ZONE 1 (m^2)	ZONE 2 (m^2)	TOTAL (m^2)	ZONE 1 (m^2)	ZONE 2 (m^2)
I		39+80-L-							1398.0	917.0	2315.0		
II		49+20-L-							948.0	770.0	1718.0		
III		50+70-L-							1146.0	739.0	1885.0		
IV		66+60-L-							934.0	616.0	1550.0		
V		69+60-L-							986.0	348.0	1334.0		
TOTAL:						0.0	0.0	0.0	5412.0	3390.0	8802.0		

Buffer Drawing
Sheet 2 of 14

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
PROJECT: 34461.1.3 (R-2554A)

8/2/2007
SHEET OF

BUFFER IMPACTS SUMMARY

			IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
I		39+80-L-							15048	9871	24918		
II		49+20-L-							10204	8288	18492		
III		50+70-L-							12335	7955	20290		
IV		66+60-L-							10053	6631	16684		
V		69+60-L-							10613	3746	14359		
TOTAL:						0.0	0.0	0.0	58254	36490	94744		

Buffer Drawing
Sheet 3 of 14

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
PROJECT: 34461.1.3 (R-2554A)

39296
SHEET OF

BUFFER IMPACTS SUMMARY

		WETLANDS IN BUFFER		REMAINING BUFFER	
Site	Station	ZONE 1 (ft^2)	ZONE 2 (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
I	39+80 -L-	9690	4973	5358	4898
II	49+20 -L-	5468	1281	4736	7007
III	50+70 -L-	7987	4036	4348	3607
		23145	10290	14442	15512

Buffer Drawing Sheet 4 of 14

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
PROJECT: 34461.1.3 (R-2554A)

October-07

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
34	DONALD G. WATKINS	644 NOBLES MILL RD. DEEP RUN, N.C. 28525
30	GEORGE H. BECTON	N NC 581 HWY GOLDSBORO, N.C. 27530
35	GRAVES T. LEWIS	P.O. BOX 429 LAKE WACCAMAW, N.C. 28450
31	DANNY P. SASSER	203 SADDLEWOOD DRIVE GOLDSBORO, N.C. 27534
41	ISAAC J. MOZINGO	2716 SALEM CHURCH ROAD GOLDSBORO, N.C. 27530
902	DEPARTMENT OF TRANSPORTATION	P.O. BOX 3165 WILSON, N.C. 27895

Buffer Drawing
Sheet 5 of 14

NCDOT

DIVISION OF HIGHWAYS

WAYNE COUNTY

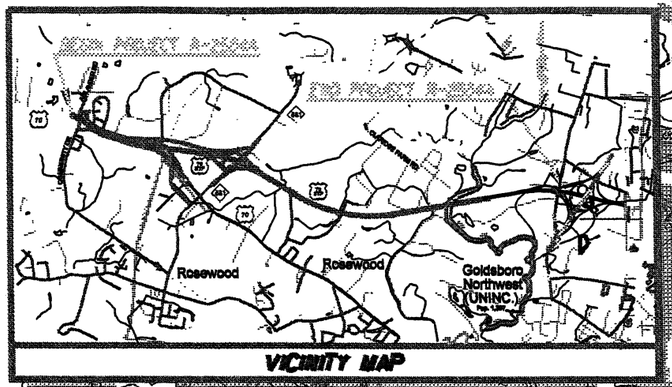
PROJECT: 34461.1.3 (R-2554A)

GOLDSBORO BYPASS FROM US 70 WEST OF NC 581 TO SR 1300

SHEET OF

TIP PROJECT: R-2554

CONTRACT No.:



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAYNE COUNTY

LOCATION: US 70 (GOLDSBORO BYPASS) FROM WEST OF NC 581 TO SR 1300 (SALEM CHURCH ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, CULVERTS AND SIGNING

WETLAND PERMIT

SR 1329
SITE VIII
SITE VII
SR 1326
SITE II
SITE IV
SITE VI
SITE I
SITE III
SITE V
NC 581
US 70

THIS PROJECT IS NOT WITHIN THE MUNICIPAL BOUNDARY OF GOLDSBORO.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED ON MAP NO. III EXCEPT BY PERMIT.
THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS LIMITED TO INTERCHANGES.

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

GRAPHIC SCALES

PLANS 5 0 10

PROFILE (HORIZONTAL) 5 0 10

PROFILE (VERTICAL) 1 0 2

DESIGN DATA

ADT 2002 = 21,000
ADT 2022 = 32,000
DHV = 10 %
D = 60 %
T = 8 %
V = 110 MPH

* TTST 8 % -- DUAL 4 %

PROJECT LENGTH

LENGTH ROADWAY T.I.P. PROJECT R-2554A 5.488 MI.
LENGTH STRUCTURES T.I.P. PROJECT R-2554A 0.375 MI.
TOTAL LENGTH OF STATE T.I.P. PROJECT R-2554A 5.863 MI.

NOTE: NO LANE MILES TO BE ADDED TO EXISTING PROJECT LENGTH

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

PREPARED FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

1997 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JANUARY 20, 2004

LETTING DATE: JULY 21, 2005

D.L. KOPP, P.E. — PROJECT ENGINEER

K.B. [illegible] — PROJECT DESIGN ENGINEER

NCDOT CONTACT: [illegible] — ROADWAY DESIGN - PROJECT ENGINEER

HYDRAULICS ENGINEER

Buffer Drawing
Sheet 6 of 14

P.E.

SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.

SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.

STATE HIGHWAY DESIGN ENGINEER

R/W REV. - 11/28/06
CORRECTED PROPERTY OWNER INFORMATION
REMOVED LEVEL SPREADERS

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4080 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

PROJECT REFERENCE NO.	SHEET NO.
R-2554A	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT TO BE USED FOR CONSTRUCTION

CONST.REV.
NW REV.

-L-
Pls Sta 42+31.878
Θs = 1° 01' 52.8"
Ls = 90.000
LT = 60.001
ST = 30.001

Pl Sta 51+64.793
Δ = 39° 42' 57.7" (LT)
L = 1,732.939
T = 902.916
R = 2,500.000
SE = 0.03

Pls Sta 60+24.817
Θs = 1° 01' 52.8"
Ls = 90.000
LT = 60.001
ST = 30.001

NAD 83

GEORGE H. BECTON, HEIRS
DB 191 PG. 98
30

DANNY P. SASSER
DB 1803 PG. 284
31

CATHERINE S. SMITH
WB 81 PG. 282
DB 360 PG. 389
32

GEORGE H. BECTON, HEIRS
DB 633 PG. 55
29

GEORGE H. BECTON, HEIRS
DB 633 PG. 55
30

DANNY P. SASSER
DB 1803 PG. 284
34

CATHERINE S. SMITH
WB 81 PG. 282
DB 360 PG. 389
32

-L- POT Sta 41+64.336 =
-EYII- POT Sta 10+43.597
-L- TS Sta 41+71.877
-EYII- POT Sta 10+00.000

MATCH LINE -L- 38+40.000 SEE SHEET 11

MATCH LINE -L- 41+40.000 SEE SHEET 13

S 57° 53' 24" E

-L- GOLDSBORO BYPASS

GRAD 350

CAT-1

CAT-2

SITE I

PROP. GR. w/ TERM. SECTIONS

EXISTING R/W

MITIGABLE IMPACTS ZONE 1

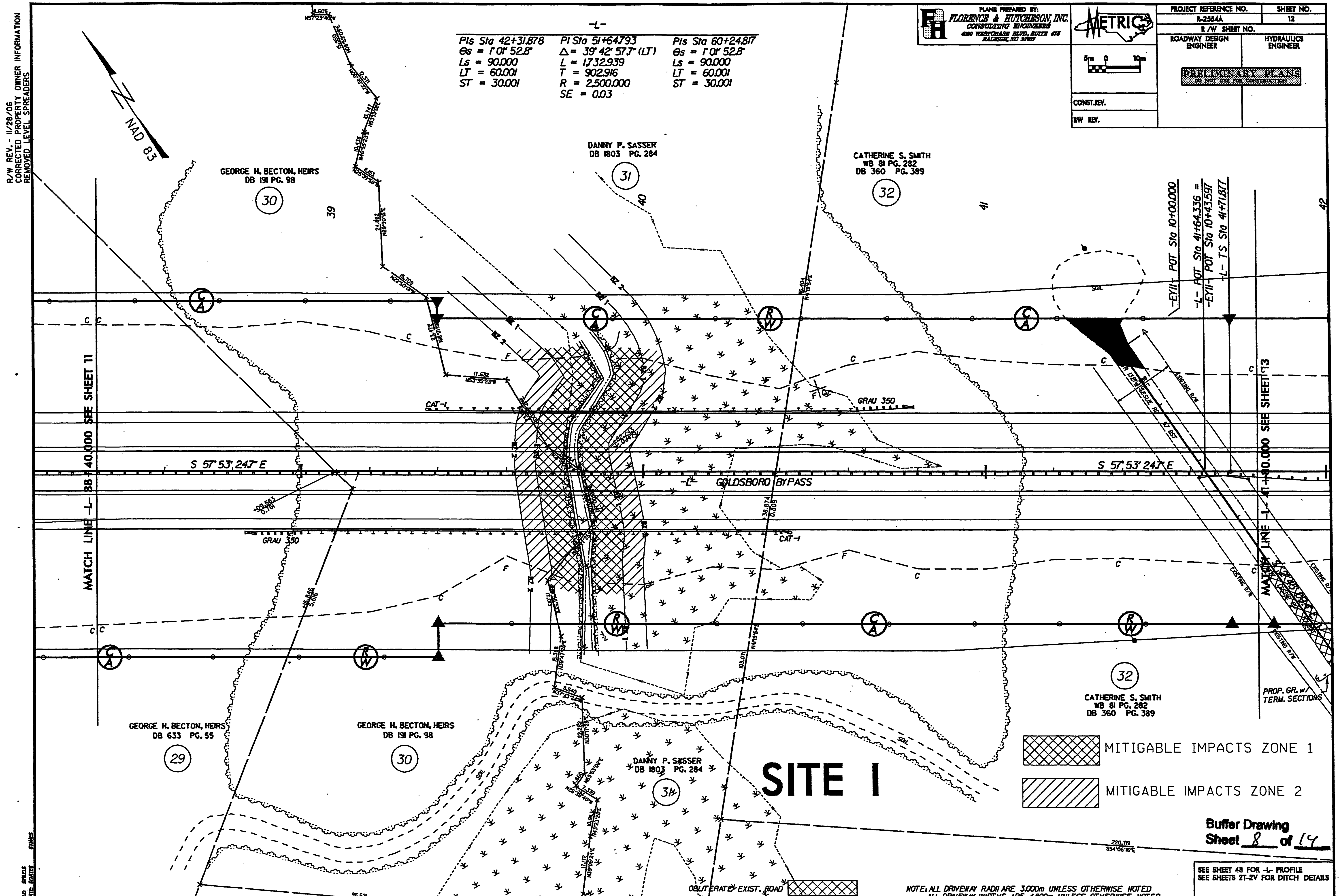
MITIGABLE IMPACTS ZONE 2

Buffer Drawing
Sheet 7 of 14

OBLITERATE EXIST. ROAD

NOTE: ALL DRIVEWAY RADII ARE 3.000m UNLESS OTHERWISE NOTED
ALL DRIVEWAY WIDTHS ARE 4.800m UNLESS OTHERWISE NOTED

SEE SHEET 48 FOR -L- PROFILE
SEE SHEETS 2T-2V FOR DITCH DETAILS



R/W REV. - 11/28/06
CORRECTED PROPERTY OWNER INFORMATION
REMOVED LEVEL SPREADERS
PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
METRIC
PROJECT REFERENCE NO. R-2554A
SHEET NO. 12
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
CONST. REV.
R/W REV.
NAD 83
-L-
PIs Sta 42+31.878
Θs = 1° 01' 52.8"
Ls = 90.000
LT = 60.001
ST = 30.001
PI Sta 51+64.793
Δ = 39° 42' 57.7" (LT)
L = 1,732.939
T = 902.916
R = 2,500.000
SE = 0.03
PIs Sta 60+24.817
Θs = 1° 01' 52.8"
Ls = 90.000
LT = 60.001
ST = 30.001
GEORGE H. BECTON, HEIRS
DB 191 PG. 98
30
DANNY P. SASSER
DB 1803 PG. 284
31
CATHERINE S. SMITH
WB 81 PG. 282
DB 360 PG. 389
32
MATCH LINE -L- 38+40.000 SEE SHEET 11
MATCH LINE -L- 41+40.000 SEE SHEET 13
S 57° 53' 24.7" E
-L- GOLDSBORO BYPASS
GRAU 350
CAT-I
-EYII- POT Sta 10+00.000
-L- POT Sta 41+64.336 =
-EYII- POT Sta 10+43.597
-L- TS Sta 41+71.877
GEORGE H. BECTON, HEIRS
DB 633 PG. 55
29
GEORGE H. BECTON, HEIRS
DB 191 PG. 98
30
DANNY P. SASSER
DB 1803 PG. 284
31
CATHERINE S. SMITH
WB 81 PG. 282
DB 360 PG. 389
32
PROP. GR. w/ TERM. SECTIONS
SITE I
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
Buffer Drawing
Sheet 8 of 14
OBLITERATE EXIST. ROAD
NOTE: ALL DRIVEWAY RADII ARE 3.000m UNLESS OTHERWISE NOTED
ALL DRIVEWAY WIDTHS ARE 4.800m UNLESS OTHERWISE NOTED
SEE SHEET 48 FOR -L- PROFILE
SEE SHEETS 2T-2V FOR DITCH DETAILS

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4030 WESTCHASE BLVD., SUITE 470
RALEIGH, NC 27607

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554A	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST. REV.
R/W REV.

SITE II

SITE III

NAD 83

MATCH LINE -L- 48+60.000 SEE SHEET 14

MATCH LINE -L- 52+00.000 SEE SHEET 16

-L- GOLDSBORO BYPASS

HOWELL RD SR 1328

GRAVES T. LEWIS
WB 78E PG. 139
DB 537 PG. 303

DONALD G. WATKINS
DB 2063 PG. 548

STEVEN HARRISON
DB 1579 PG. 465

PROP. GR w/ TERM. SECTIONS

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

-L-

PIs Sta 42+31.878	PI Sta 51+64.793	PIs Sta 60+24.817
θs = 1° 01' 52.8"	Δ = 39° 42' 57.7" (LT)	θs = 1° 01' 52.8"
Ls = 90.000	L = 1,732.939	Ls = 90.000
LT = 60.001	T = 902.916	LT = 60.001
ST = 30.001	R = 2,500.000	ST = 30.001
	SE = 0.03	

OBLITERATE EXIST. ROAD

NOTE: ALL DRIVEWAY RADII ARE 3.000m UNLESS OTHERWISE NOTED
ALL DRIVEWAY WIDTHS ARE 4.800m UNLESS OTHERWISE NOTED

SEE SHEET 50 FOR -L- PROFILE
SEE SHEETS 2T-2V FOR DITCH DETAILS

Buffer Drawing
Sheet 9 of 14

FILE: SPILES
DATE: 10/4/05
STAKES

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4290 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554A	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST. REV.
R/W REV.

SITE II

SITE III

NAD 83

GRAVES T. LEWIS
WB 78E PG. 139
DB 537 PG. 303
35

GRAVES T. LEWIS
WB 78E PG. 139
DB 537 PG. 303
35

DONALD G. WATKINS
DB 2063 PG. 548
34

STEVEN HARRISON
DB 1579 PG. 465

SR 1328 HOWELL RD 5.9 BST

-L- GOLDSBORO BYPASS

MATCH LINE -L- 48+60.000 SEE SHEET 14

MATCH LINE -L- 52+60.000 SEE SHEET 16

PROP. GR. w/ TERM. SECTIONS

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

OBLITERATE EXIST. ROAD

-L-

PIs Sta 42+31.878	PI Sta 51+64.793	PIs Sta 60+24.817
Es = 1°01'52.8"	Δ = 39°42'57.7" (LT)	Es = 1°01'52.8"
Ls = 90.000	L = 1,732.939	Ls = 90.000
LT = 60.001	T = 902.916	LT = 60.001
ST = 30.001	R = 2,500.000	ST = 30.001
	SE = 0.03	

NOTE: ALL DRIVEWAY RADII ARE 3.000m UNLESS OTHERWISE NOTED
ALL DRIVEWAY WIDTHS ARE 4.800m UNLESS OTHERWISE NOTED

SEE SHEET 50 FOR -L- PROFILE
SEE SHEETS 2T-2V FOR DITCH DETAILS

Buffer Drawing
Sheet 10 of 11

FILE: SPILES
DATE: STAKES

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4286 WESTCHASE BLVD. SUITE 416
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST. REV.

R/W REV.

PROJECT REFERENCE NO. R-2554A | SHEET NO. 20

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

R/W REV. - 11/28/06
SHIFTED R/W MONUMENTS ALONG EXIST. R/W

NAD 83

MATCH LINE -L- 65+60.000 SEE SHEET 19

MATCH LINE -L- 68+80.000 SEE SHEET 21

STATE OF NORTH CAROLINA

902

STATE OF NORTH CAROLINA

EXISTING R/W

TREE FARM

BRIDGE

-L- GOLDSBORO BYPASS

N 80° 19' 52.0" E

TYPE III

TYPE III

TYPE III

F
BEGIN APPROACH SLAB
-L- POT Sta 66+27.389
BEGIN BRIDGE
-L- POT Sta 66+35.000
F

TREE FARM

EXISTING R/W

902

STATE OF NORTH CAROLINA

SITE IV

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

Buffer Drawing
Sheet 11 of 44

OBLITERATE EXIST. ROAD

NOTE: ALL DRIVEWAY RADII ARE 3.000m UNLESS OTHERWISE NOTED
ALL DRIVEWAY WIDTHS ARE 4.800m UNLESS OTHERWISE NOTED

SEE SHEET 22 FOR -L- PROFILE
SEE SHEETS 23 & 24 FOR DITCH DETAILS

FILE: SPIELES
DATE: 8/24/06
STRMER

R/W REV. - 11/28/06
SHIFTED R/W MONUMENTS ALONG EXIST. R/W

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4286 WESTCHASE BLVD., SUITE 416
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST. REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2554A	20
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

SOIL & GR

66

CANAL

67

STATE OF NORTH CAROLINA

902

STATE OF NORTH CAROLINA

68

EXISTING R/W

TREE FARM

MATCH LINE -L- 65+60.000 SEE SHEET 19

TYPE III

BRIDGE

-L- GOLDSBORO BYPASS

N 80°19'52.0" E

108.680m (360')

BRIDGE

TYPE III

TYPE III

F

BEGIN APPROACH SLAB F
-L- POT Sta 66+27.389

BEGIN BRIDGE
-L- POT Sta 66+35.000

3A

Z ZB

1 ZB

TREE FARM

EXISTING R/W

CANAL

MATCH LINE -L- 68+80.000 SEE SHEET 21

902

STATE OF NORTH CAROLINA

SITE IV

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

S 1°29'13.4" W

Buffer Drawing
Sheet 12 of 14

OBLITERATE EXIST. ROAD

NOTE: ALL DRIVEWAY RADII ARE 3.000m UNLESS OTHERWISE NOTED
ALL DRIVEWAY WIDTHS ARE 4.800m UNLESS OTHERWISE NOTED

SEE SHEET 52 FOR -L- PROFILE
SEE SHEETS 2T-2V FOR DITCH DETAILS

FILES SFILES STAMES
DATE: 6/24/2015

R/W REV. - 11/28/06
REVISED R/W AND ADDED R/W MONUMENTS
ADDED/SHIFTED R/W MONUMENTS ALONG EXIST. R/W

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4030 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2554A	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

MATCH LINE -L- 68+80.000 SEE SHEET 20

MATCH LINE -L- 72+00.000 SEE SHEET 22

1500mm

NEW PUMPHOUSE

FORESTRY SERVICE COMPOUND

STATE OF NORTH CAROLINA

902

RIVER IS PROPERTY LINE

EXISTING R/W

69

70

71

72

41

ISAAC J. MOZINGO
DB 798 PG. 829

-L- POT Sta 69+04.696 =
-EY13- POC Sta 14+17.717
-EY13- PT Sta 14+28.253

NEUSE RIVER

BZ 1

BZ 2

14

+45.768
16.777

BRIDGE

-L- GOLDSBORO BYPASS

N 80°19'52.0"E

S 45°54'43"W -EY13-

EXISTING R/W

15

STATE OF NORTH CAROLINA

RIVER IS PROPERTY LINE

902

ISAAC J. MOZINGO
DB 798 PG. 829

41

GOLF COURSE

LANE FARMS INC.
DB 965 PG. 766

-EY13-
PI Sta 12+89.712
Δ = 57°14'47.8" (RT)
L = 292.078
T = 159.537
R = 292.329

SITE V

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

Buffer Drawing
Sheet 13 of 14

SEE SHEET 53 FOR -L- PROFILE

OBLITERATE EXIST. ROAD

NOTE: ALL DRIVEWAY RADII ARE 3.000m UNLESS OTHERWISE NOTED
ALL DRIVEWAY WIDTHS ARE 4.800m UNLESS OTHERWISE NOTED

FILE: SPIKES
DATE: SPIKES
STAMPS

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4030 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

PROJECT REFERENCE NO.	SHEET NO.
R-2554A	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST. REV.
R/W REV.

R/W REV. - 11/28/06
REVISED R/W AND ADDED R/W MONUMENTS
ADDED/SHIFTED R/W MONUMENTS ALONG EXIST. R/W

NAD 83

MATCH LINE -L- 68+80.000 SEE SHEET 20

MATCH LINE -L- 72+00.000 SEE SHEET 22

STATE OF NORTH CAROLINA

RIVER IS PROPERTY LINE

NEW PUMPHOUSE

FORESTRY SERVICE COMPOUND

EXISTING R/W

-L- POT Sta 13+04.696
-EY13- POC Sta 14+17.717
-EY13- PT Sta 14+28.253

NEUSE RIVER

BRIDGE

-L- GOLDSBORO BYPASS

N 80° 19' 52.0" E

S 4° 54' 43.7" W

ISAAC J. MOZINGO
DB 798 PG. 829

LANE FARMS INC.
DB 965 PG. 766

GOLF COURSE

-EY13-
PI Sta 12+89.712
Δ = 57° 14' 47.8" (RT)
L = 292.078
T = 159.537
R = 292.329

SITE V

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

OBLITERATE EXIST. ROAD

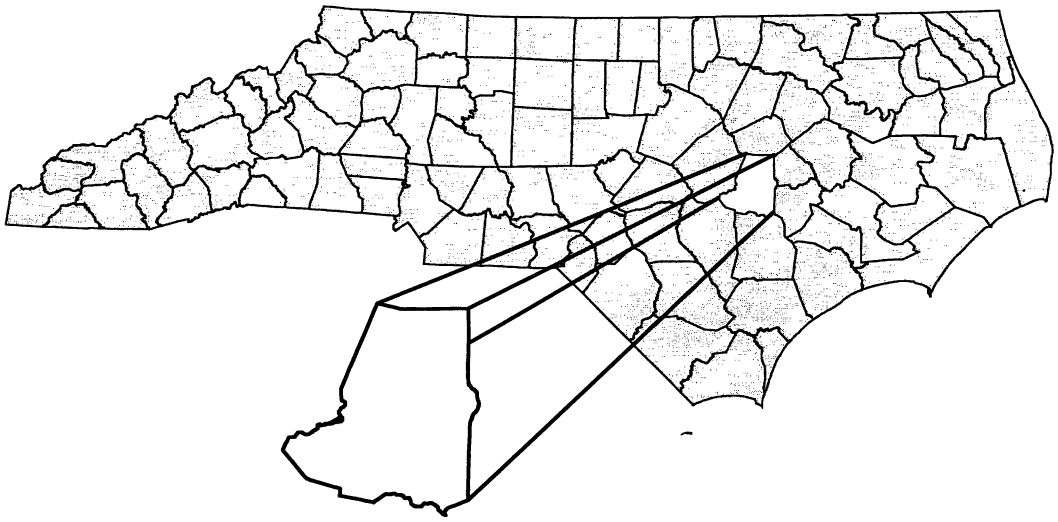
NOTE: ALL DRIVEWAY RADII ARE 3.000m UNLESS OTHERWISE NOTED
ALL DRIVEWAY WIDTHS ARE 4.800m UNLESS OTHERWISE NOTED

Buffer Drawing
Sheet 14 of 14

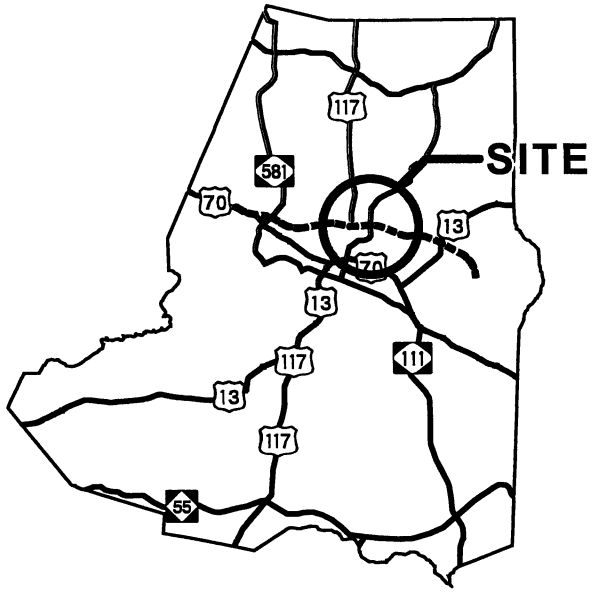
SEE SHEET 53 FOR -L- PROFILE

FILE: SHEETS
DATE: SHEETS

NORTH CAROLINA



WAYNE



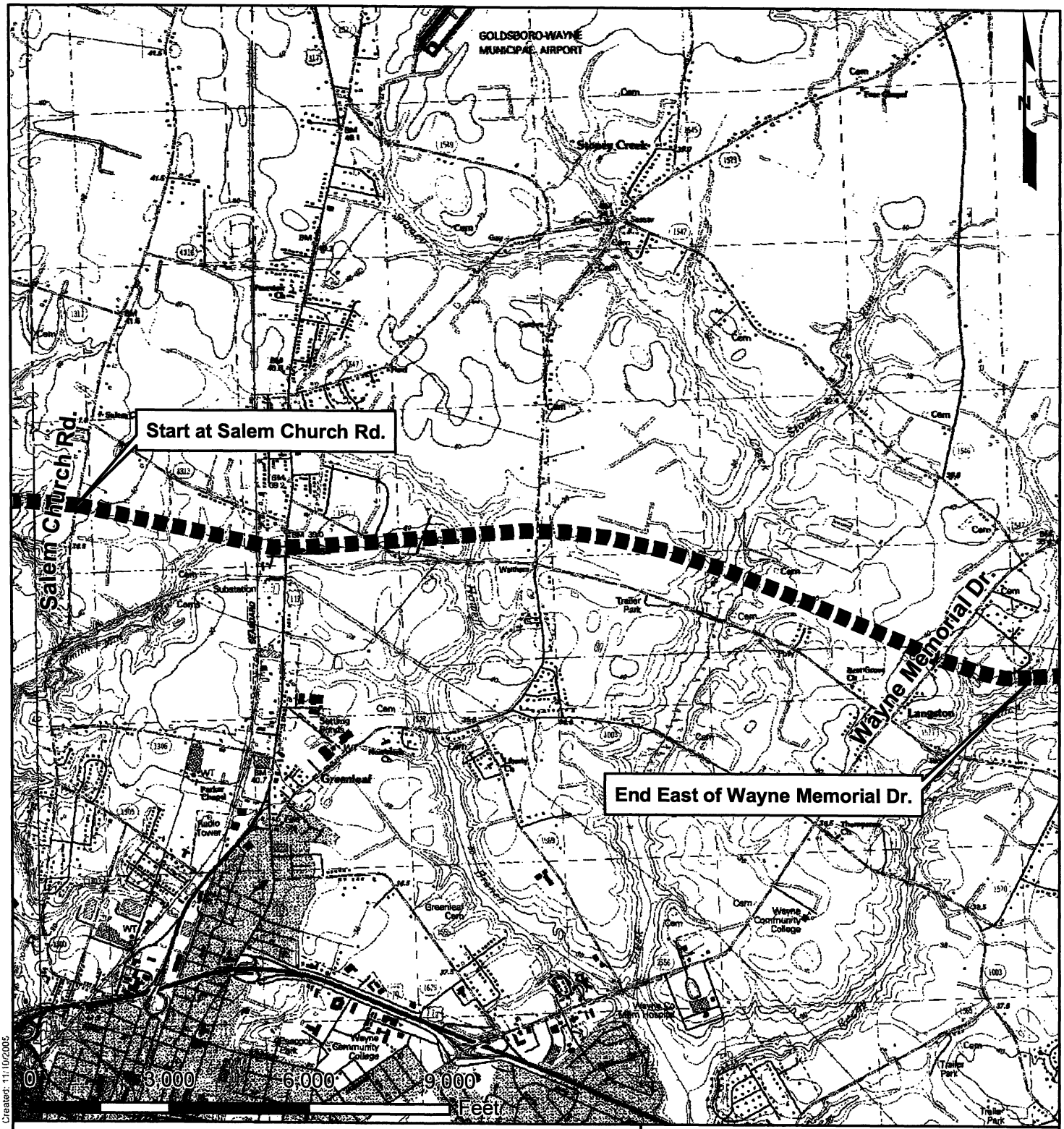
Buffer Drawing
Sheet 1 of 44

VICINITY MAPS

NCDOT

DIVISION OF HIGHWAYS
WAYNE COUNTY
PROJECT: 34461.1.3 (R-2554BA)
US 70 BYPASS

10/17/07



1 inch equals 3,000 feet

LOCATION

NCDOT

DIVISION OF HIGHWAYS
WAYNE COUNTY
PROJECT: 34461.1.3 (R-2554BA)
US 70 BYPASS

Buffer Drawing
Sheet 2 of 114

10/17/07

Source: USGS 7.5 Minute Quadrangle, NE Goldsboro, NC

\\Dvd 2\TBRIDGE_Maps\R 2510Beaufort\R-2510_USGS.mxd Created: 11/10/2005

BUFFER IMPACTS SUMMARY

			IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
1	Roadway	-L2RPBD- 4+25 +/-	X						9909	5820	15729		
2	Roadway	-L2- 92+00 +/-	X			2671	1639	4310					
3	Roadway	-L- 94+40 +/-	X						60642	37274	97916		
4	Roadway	-L- 98+60 +/-	X						68271	42177	110448	59609	35530
5	Roadway	-L- 102+64 - 109+19 +/	X						131027	89077	220104	34199	21760
7	Roadway	-L- 114+20 +/-	X			598	401	1000					
	Bridge	-L- 114+80 +/-		X					8798	6748	15546		
8	Roadway	-SR5- 21+60 +/-	X			1929	555	2484				4459	3333
9	Bridge	-L- 132+00 +/-		X		8763	5887	14650					
11	Roadway	-L- 148+60 +/-	X						51025	32871	83896		
13	Roadway	-L2- 101+40+/-			X				5490	4512	10002		
14	Roadway	-Y2- 12+60 +/-	X			7383	4875	12258					
TOTAL:						21344	13358	34701	335162	218479	553642	98268	60622

Buffer Drawing
Sheet 3 of 44

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
PROJECT: 34461.1.3 (R-2554BA)

December-07

BUFFER IMPACTS SUMMARY

			IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (m^2)	ZONE 2 (m^2)	TOTAL (m^2)	ZONE 1 (m^2)	ZONE 2 (m^2)	TOTAL (m^2)	ZONE 1 (m^2)	ZONE 2 (m^2)
1	Roadway	-L2RPBD- 4+25 +/-	X						920.6	540.7	1461.3		
2	Roadway	-L2- 92+00 +/-	X			248.1	152.3	400.4					
3	Roadway	-L- 94+40 +/-	X						5633.8	3462.9	9096.7		
4	Roadway	-L- 98+60 +/-	X						6342.6	3918.4	10261.0	5537.9	3300.8
5	Roadway	-L- 102+64 - 109+19 +/	X						12172.8	8275.5	20448.3	3177.2	2021.6
7	Roadway	-L- 114+20 +/-	X			55.6	37.3	92.9					
	Bridge	-L- 114+80 +/-		X					817.4	626.9	1444.3		
8	Roadway	-SR5- 21+60 +/-	X			179.2	51.6	230.8				414.3	309.6
9	Bridge	-L- 132+00 +/-		X		814.1	546.9	1361.0					
11	Roadway	-L- 148+60 +/-	X						4740.4	3053.8	7794.2		
13	Roadway	-L2- 101+40+/-			X				510.0	419.2	929.2		
14	Roadway	-Y2- 12+60 +/-	X			685.9	452.9	1138.8					
TOTAL:						1982.9	1241.0	3223.9	31137.6	20297.4	51435.0	9129.4	5632.0

Buffer Drawing Sheet 4 of 44

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
PROJECT: 34461.1.3 (R-2554BA)

December-07

BUFFER IMPACTS SUMMARY

		WETLANDS IN BUFFER		REMAINING BUFFER	
Site	Station	ZONE 1 (ft^2)	ZONE 2 (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
3	-L- 94+40 +/-	37903	15780	22739	21494
5	-L- 102+64 - 109+19 +/-	2569	539	128457	88537
7	-L- 114+80 +/-	6745	1392	2652	5758
8	-SR5- 21+260 +/-	706	250	1223	306
9	-L- 132+00 +/-	5785	2796	2978	3090
11	-L- 148+60 +/-	2398	1224	48627	31647
		56106	21981	206677	150833

Buffer Drawing Sheet 5 of 44

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
PROJECT: 34461.1.3 (R-2554BA)

December-07

BUFFER IMPACTS SUMMARY

		WETLANDS IN BUFFER		REMAINING BUFFER	
Site	Station	ZONE 1 (m^2)	ZONE 2 (m^2)	ZONE 1 (m^2)	ZONE 2 (m^2)
3	-L- 94+40 +/-	3521.3	1466.0	2112.5	1996.9
5	-L- 102+64 - 109+19 +/-	238.7	50.1	11934.1	8225.4
7	-L- 114+80 +/-	626.6	129.3	246.4	534.9
8	-SR5- 21+60 +/-	65.6	23.2	113.6	28.4
9	-L- 132+00 +/-	537.4	259.8	276.7	287.1
11	-L- 148+60 +/-	222.8	113.7	4517.6	2940.1
		5212.4	2042.1	19200.9	14012.8

Buffer Drawing Sheet 6 of 44

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
PROJECT: 34461.1.3 (R-2554BA)

December-07

PROP. NO.	PROPERTY OWNER NAME	PROP. OWNER ADDRESS
1A	NCDOT (PREVIOUSLY LANE FARMS, INC.)	
1	DAN R. CASEY	DB 350 PG. 13 DB 335 PG 397 DB 350 PG. 54
2	NORFAM, LLC	DB 1541 PG 198
7	SARAH SCOTT KIRBY & SALLY WADE SCOTT	DB 02E PG 506
9	EMILY W. PRIVOTT	DB 1486 PG 432
14	HELEN R. GODWIN	DB 439 PG 320
16	ANDREWS FARMS OF WAYNE CO. INC	DB 1037 PG 181 DB 1193 PG 737
17	WILLIAM WHITE	UNKNOWN
20	JOHN M. MERRITT	E 03E PG 667
26	JAMES W. HUBBLE	DB 1171 PG 405
26A	CAROLYN B. MORRIS, W. THOMAS BARDIN	ESTATE FILE 02E-245
27	PATRICIA GABRIEL	WB 1930 PG 169
28	CAREY R. HAM	DB 1621 PG 708
31	HUBERT C. MATHEWS	DB 582 PG 536
32	SHERMAN E. BEST	DB 1534 PG 253
43	MALCOLM E. GURLEY	DB 648 PG 416 DB 937 PG 807 DB 1044 PG 849
43A	JETHO H. HARE	DB 728 PG 105
901	NCDOT	DB 1472 PG 411

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
PROJECT: 34461.1.3 (R-2554BA)

10/17/2007

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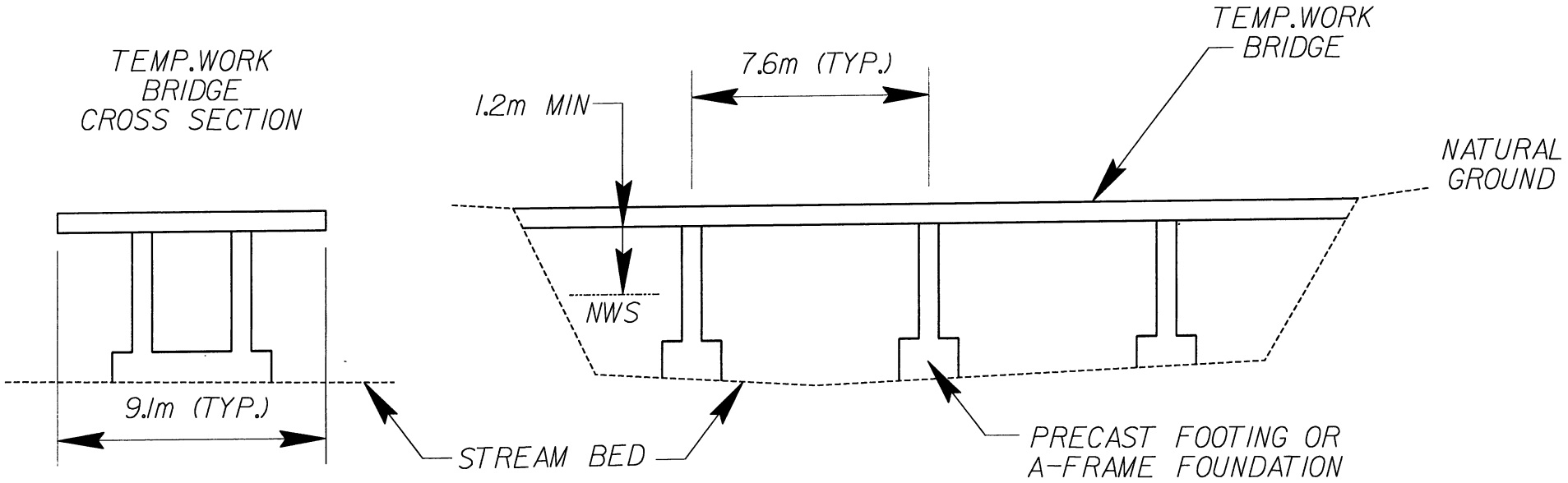


WORK BRIDGE LAYOUT IS ESTIMATED.
ACTUAL LAYOUT MAY VARY
ACCORDING TO CONTRACTOR.

NOT TO SCALE

Buffer Drawing
Sheet 8 of 44

TEMPORARY WORK BRIDGE DETAIL

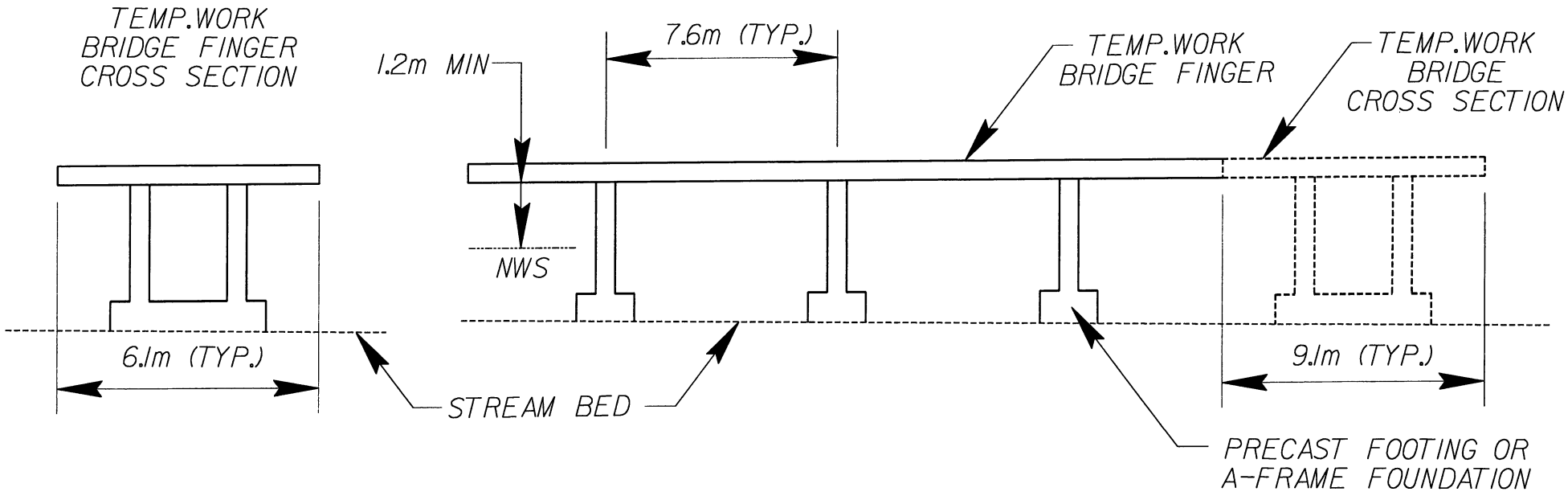
(FOR PROP. BRIDGE CONSTRUCTION)

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
PROJECT 34461.1.3 (R-2554BA)

10 / 17 / 07

R:\Z-MISC\HYDRO\PERMITS\r2554ba_rdy_tempbridge_detl.dgn



WORK BRIDGE FINGER LAYOUT IS ESTIMATED. ACTUAL LAYOUT MAY VARY ACCORDING TO CONTRACTOR.

Buffer Drawing
Sheet 9 of 44

NOT TO SCALE

TEMPORARY WORK BRIDGE FINGER DETAIL

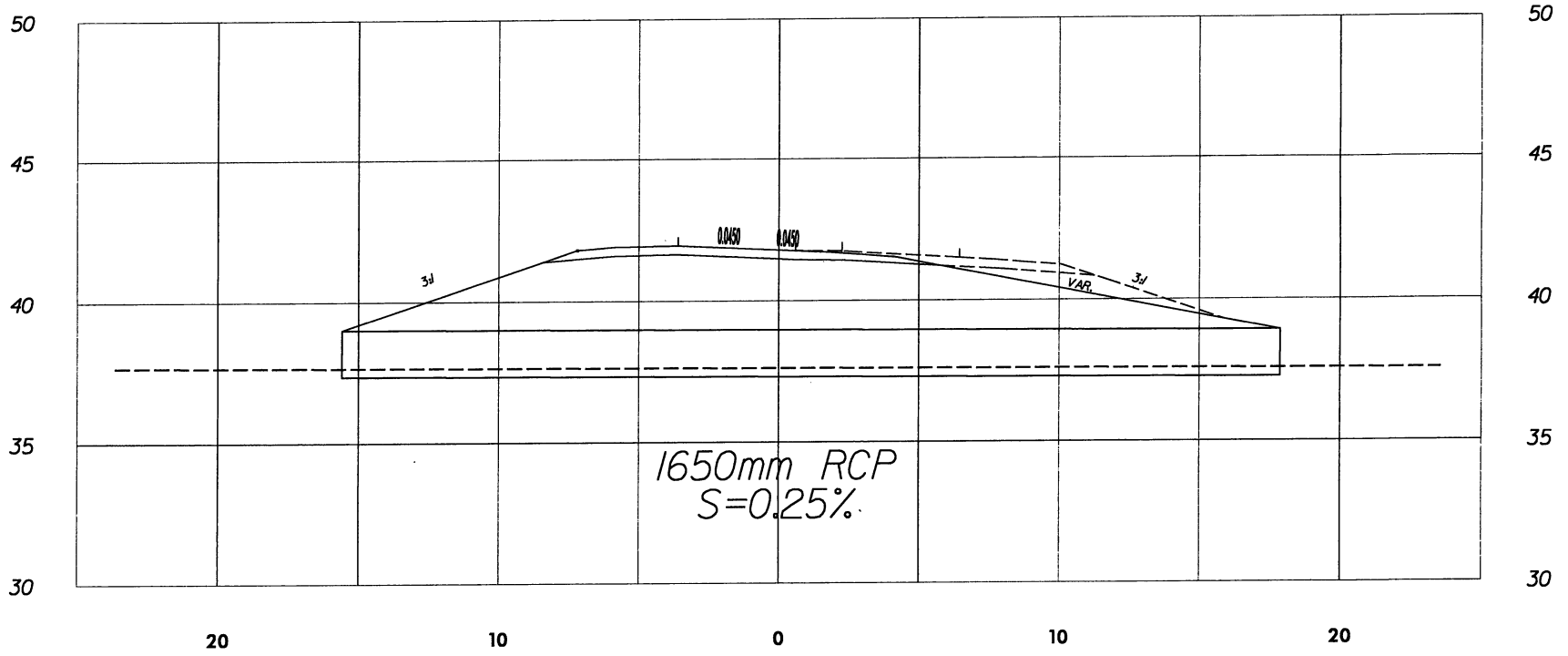
(FOR PROP. BRIDGE CONSTRUCTION)

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
PROJECT 34461.1.3 (R-2554BA)

10 / 17 / 07

R:\7-MISC\HYDRO\PERMITS\r2554ba_rdy_tempbr1dge_det2.dgn



Buffer Drawing
Sheet 10 of 44

HORIZONTAL 2.5 0 5

VERTICAL 2.5 0 5

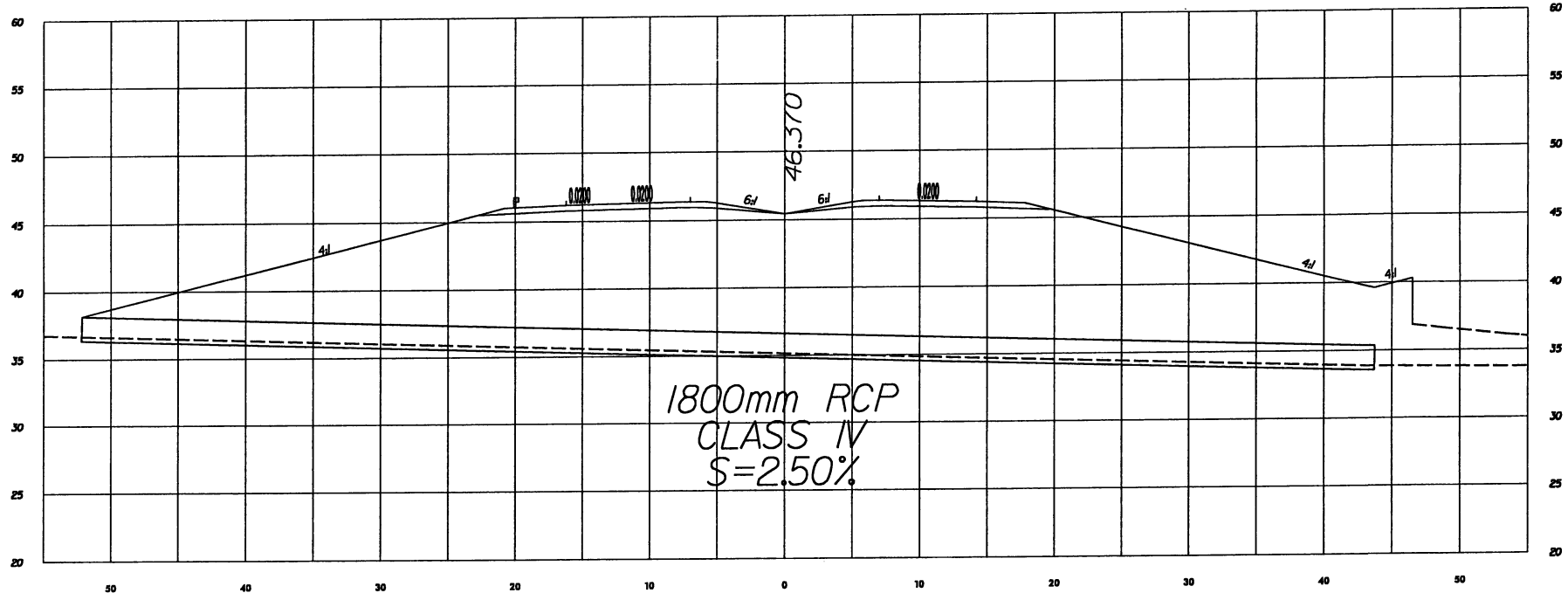
SITE 1
-L2RPBD- STA. 4+24

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
WAYNE COUNTY

PROJECT 34461.1.3 (R-2554BA)

US 70 BYPASS

10/17/07



Buffer Drawing
Sheet 11 of 44

HORIZONTAL 5 0 10

VERTICAL 5 0 10

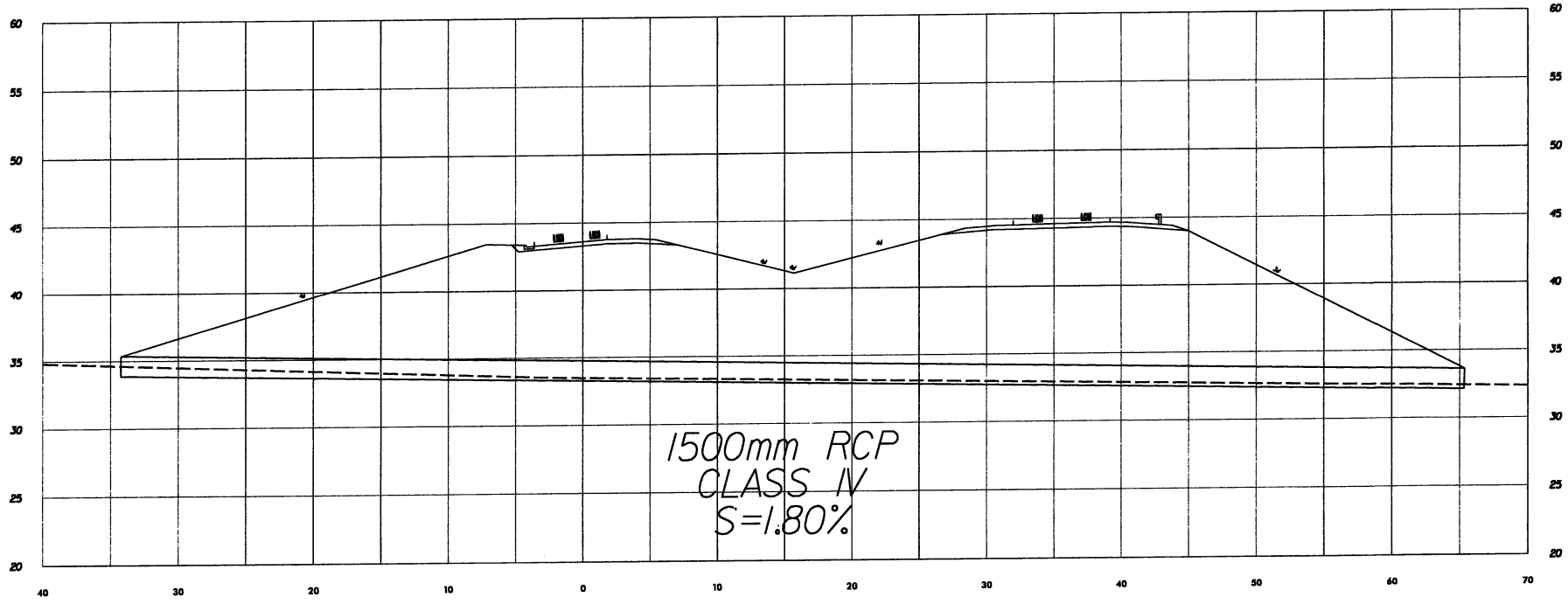
SITE 3
-L- STA. 94+73

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
WAYNE COUNTY

PROJECT 34461.1.3 (R-2554BA)

US 70 BYPASS

10/17/07



Buffer Drawing
Sheet 12 of 44

HORIZONTAL 5 0 10

VERTICAL 5 0 10

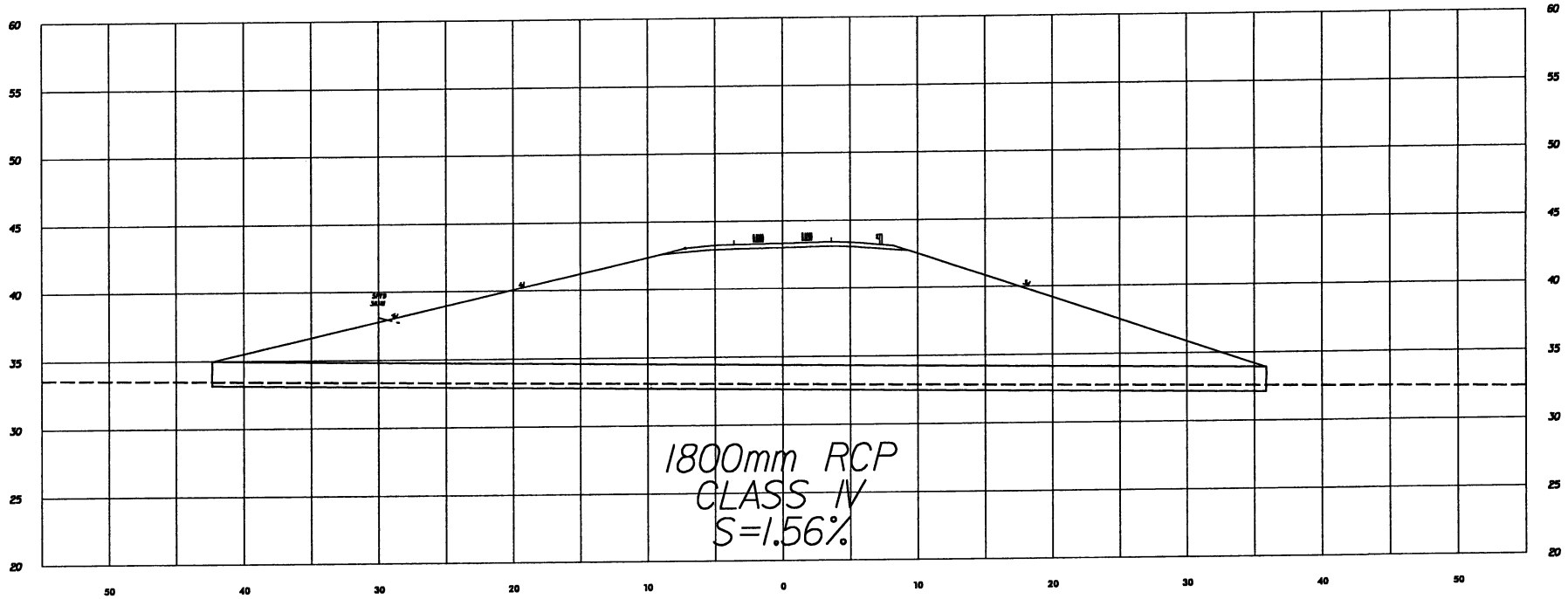
SITE 3
-L2LPD- STA. 2+20

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
WAYNE COUNTY

PROJECT 34461.1.3 (R-2554BA)

US 70 BYPASS

10/17/07



Buffer Drawing
Sheet 13 of 44

HORIZONTAL 5 0 10

VERTICAL 5 0 10

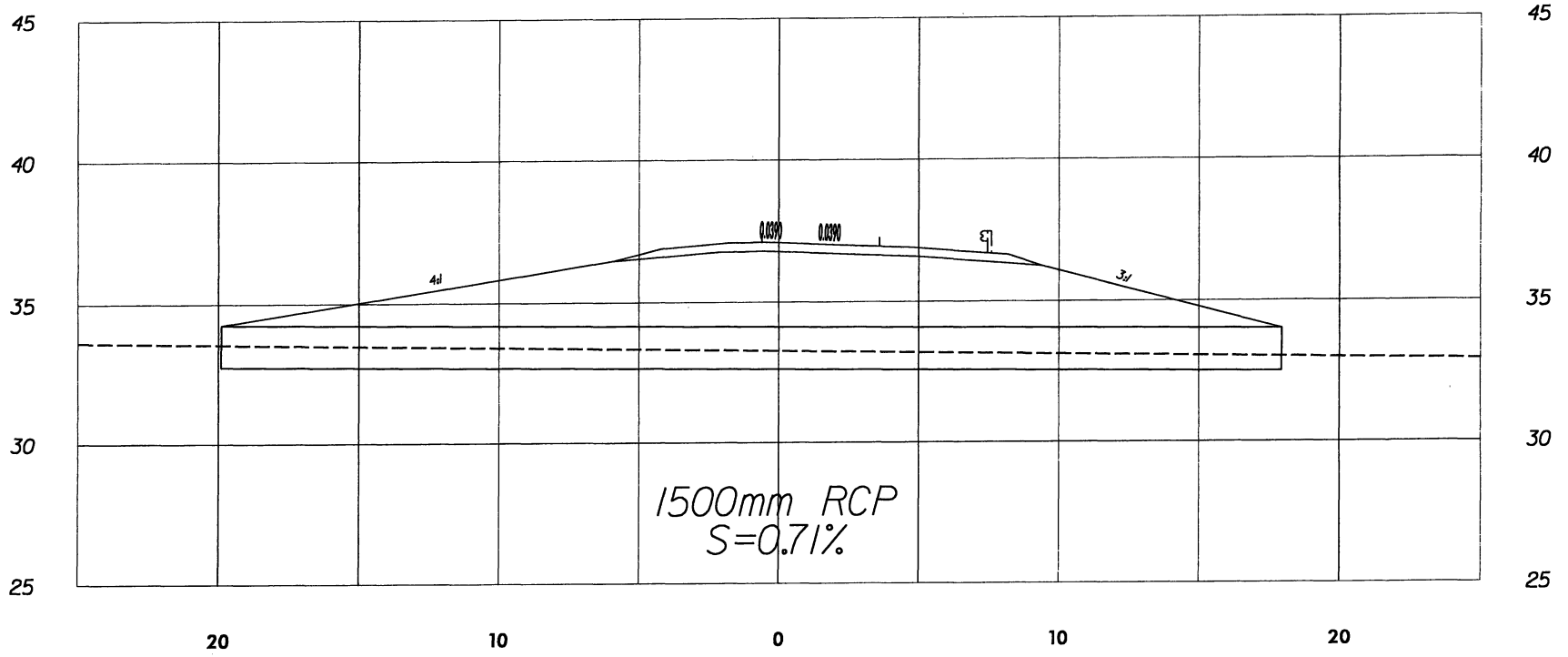
SITE 3
-L2RPBD- STA. 14+23

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
WAYNE COUNTY

PROJECT 34461.1.3 (R-2554BA)

US 70 BYPASS

10/17/07



Buffer Drawing
Sheet 14 of 44

HORIZONTAL 2.5 0 5

VERTICAL 2.5 0 5

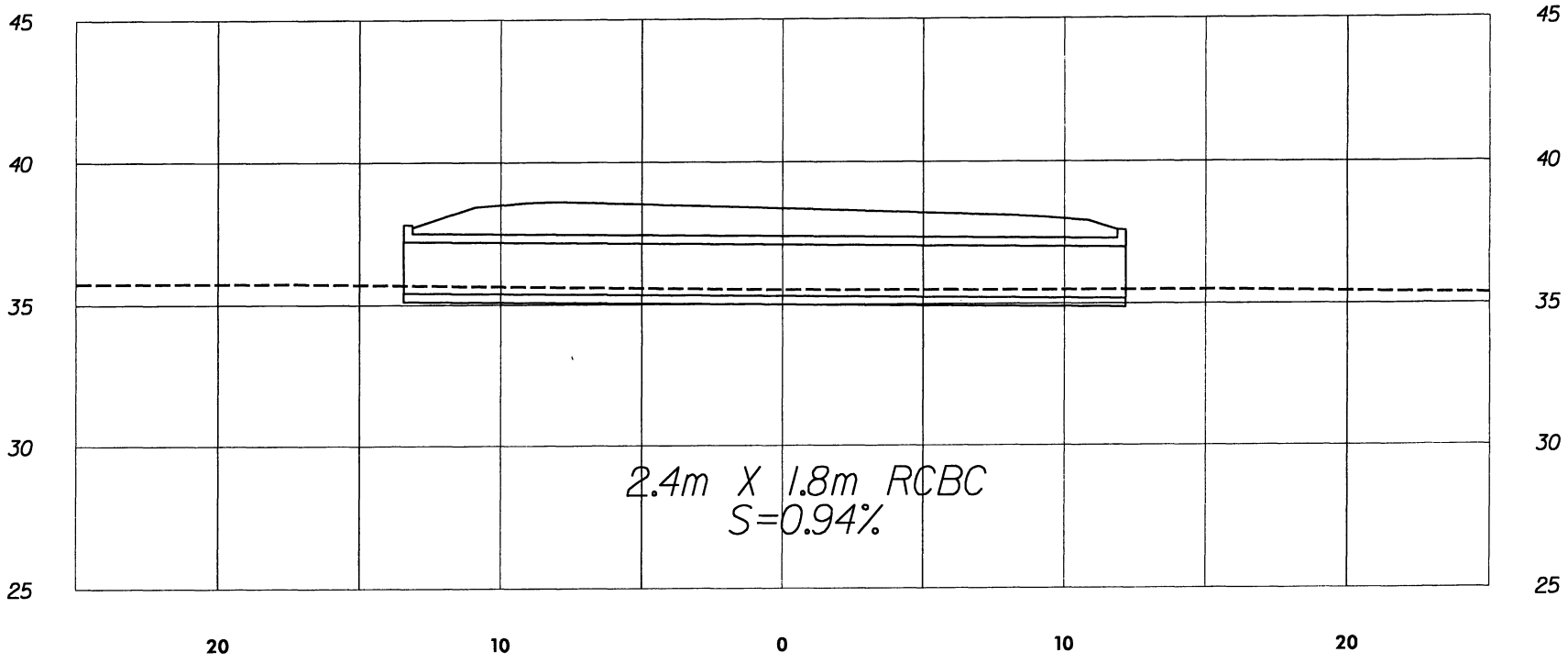
SITE 11
-Y8RPD- STA. 12 + 51

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
WAYNE COUNTY

PROJECT 34461.1.3 (R-2554BA)

US 70 BYPASS

10/17/07



Buffer Drawing
Sheet 15 of AG

HORIZONTAL 2.5 0 5

VERTICAL 2.5 0 5

SITE 14
-Y2- STA. 12 + 60

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
WAYNE COUNTY

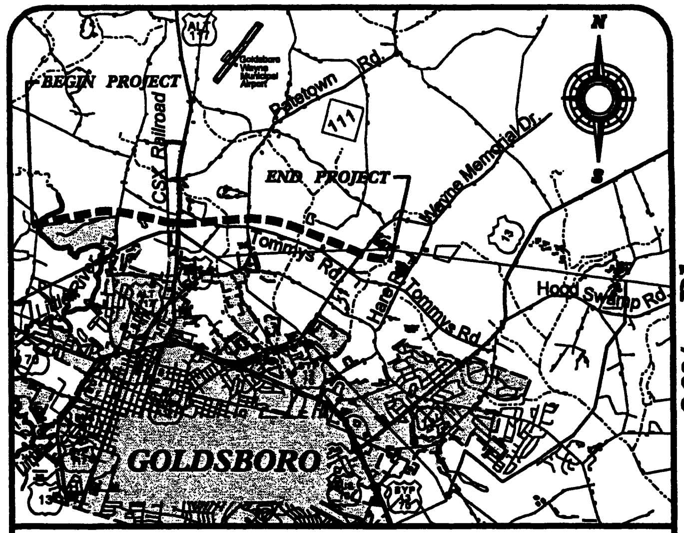
PROJECT 34461.1.3 (R-2554BA)

US 70 BYPASS

10/17/07

CONTRACT:C201818 T.I.P. PROJ:R-2554BA

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



VICINITY MAP

90% Plans

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
WAYNE COUNTY

LOCATION: US 70 (GOLDSBORO BYPASS) FROM EAST OF SR 1300 (SALEM CHURCH ROAD) TO EAST OF SR 1556 (WAYNE MEMORIAL DRIVE)

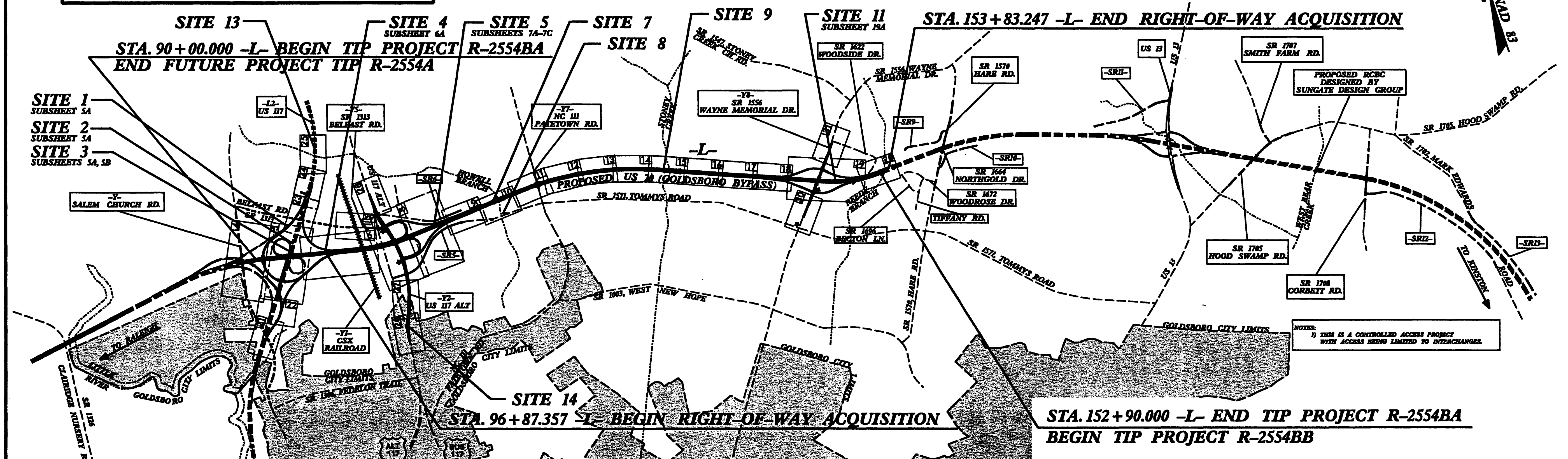
TYPE OF WORK: GRADING, PAVING, DRAINAGE, STRUCTURES, CULVERTS, SIGNING, AND SIGNALS

METRIC

ALL DIMENSIONS IN THESE PLANS ARE IN METERS UNLESS OTHERWISE SHOWN

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2554BA	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34461.1.3	NHF-70(30)	PE
34461.2.7		R/W & UTIL.
34461.3.GV1	NHS-70(160)	CONST.



GRAPHIC SCALE

PLANS

PROFILE (HORIZONTAL)

PROFILE (VERTICAL)

DESIGN DATA

ADT 2008 = 20,728
ADT 2028 = 29,048
DHV = 10 %
D = 55 %
T = 10 % *
V = 110 km/h

FUNCTIONAL CLASSIFICATION: FREEWAY

* TTST 6% DUAL 4%

PROJECT LENGTH

Length Roadway TIP Project R-2445BA .... 5.802 km

*Length Structure TIP Project R-2445BA .... 0.489 km

TOTAL LENGTH TIP Project R-2445BA ..... 6.290 km (3.91 MILES)

*USED EBL -L- STATIONS FOR STRUCTURE LENGTHS

PLANS PREPARED BY :
RUMMEL, KLEPPER & KAHL, LLP
consulting engineers
900 RIDGEFIELD DRIVE, SUITE 350
RALEIGH, NORTH CAROLINA 27609
(919) 878-9560
FOR

DIVISION OF HIGHWAYS

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MAY 18, 2005

LETTING DATE: APRIL 15, 2008

B. KEITH SKINNER, P.E.
PROJECT ENGINEER

MICHAEL T. MERRITT, P.E.
PROJECT DESIGN ENGINEER

NCDOT CONTACT: Scott Blevins, P.E. Engineering Coordinator - Roadway Design

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

Buffer Drawing Sheet 16 of 41

STATE DESIGN ENGINEER P.E.

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR DATE

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	2-S
R/W SHEET NO.	

METRIC

5 0 10

CONST.REV.

R/W REV.

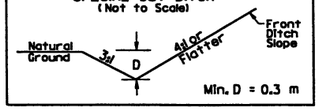
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21122 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER

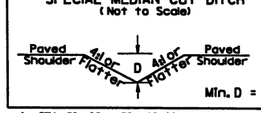
NORTH CAROLINA PROFESSIONAL SEAL 18181 ENGINEER TARA H. SWEZY

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



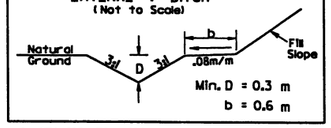
-L- STA. 113+40 – 114+01 RT.
-L- STA. 142+40 – 144+20 LT.
-L- STA. 144+11 – 144+20 LT.
-L- STA. 143+80 – 144+60 RT.
-L- STA. 142+80 – 144+00 RT.
-L- STA. 145+00 – 145+60 RT.
-L- STA. 145+20 – 146+30 LT.
-L- STA. 148+65 – 149+20 LT.
-L- STA. 149+00 – 150+80 RT.
-L- STA. 150+40 – 151+00 LT.
-L- STA. 151+60 – 152+40 LT.
-L2- STA. 83+20 – 83+40 RT.
-L2- STA. 86+60 – 87+00 RT.
-L2- STA. 87+20 – 87+50 LT.
-L2LPB- STA. 3+40 – 3+85 LT.
-L2LPD- STA. 3+20 – 3+95 LT.
-L2RPA- STA. 6+20 – 6+50 RT.
-L2RPBD- STA. 0+60 – 2+30 RT.
-L2RPBD- STA. 2+20 – 2+40 LT.
-L2RPDB- STA. 1+00 – 1+60 RT.
-L2RPDB- STA. 1+60 – 1+80 LT.
-L2RPDB- STA. 2+00 – 2+20 LT.
-L2RPDB- STA. 3+20 – 3+60 LT.
-Y2- STA. 10+75 – 11+00 LT.
-Y2- STA. 12+20 – 12+62 LT.
-Y2- STA. 13+00 – 13+60 LT.
-Y2- STA. 20+32 – 20+40 LT.
-Y2- STA. 21+20 – 22+60 RT.
-Y2- STA. 22+88 – 23+80 RT.
-Y2- STA. 24+10 – 25+60 RT.
-Y2- STA. 23+60 – 26+35 LT.
-Y2A- STA. 11+00 – 11+35 RT.
-Y2B- STA. 10+08 – 11+20 LT.
-Y2RPA- STA. 10+70 – 11+30 RT.
-Y2RPA- STA. 11+91 – 13+40 LT.
-Y2RPA- STA. 15+60 – 16+40 RT.
-Y2RPA- STA. 15+80 – 16+20 LT.
-Y2RPD- STA. 12+00 – 12+60 RT.
-SR5- STA. 17+79 – 18+05 LT.
-SR5- STA. 16+98 – 17+18 LT.
-SR6- STA. 10+20 – 10+80 RT.
-SR6- STA. 10+20 – 11+80 LT.
-SR6- STA. 11+00 – 11+80 RT.
-SR6- STA. 14+20 – 15+80 LT.
-SR6- STA. 14+20 – 15+15 RT.
-Y5- STA. 11+20 – 12+30 RT.
-Y8- STA. 11+50 – 12+20 RT.
-Y8- STA. 11+30 – 12+20 LT.
-Y8- STA. 18+40 – 20+00 LT.
-Y8DET- STA. 10+00 – 10+71.315 LT.
-Y8DET- STA. 15+19.37 – 16+84.310 LT.
-Y8DET- STA. 16+44.085 – 16+84.310 RT.
-Y8RPA- STA. 12+47 – 13+40 RT.
-Y8RPB- STA. 11+70 – 12+40 RT.

DETAIL B
SPECIAL MEDIAN CUT DITCH
(Not to Scale)



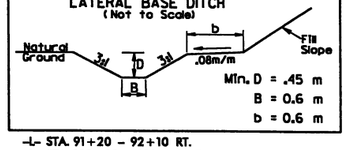
-L- STA. 91+10 – 91+40 M
-L- STA. 95+60 – 96+80 M
-L- STA. 101+00 – 102+80 M
-L- STA. 108+00 – 108+60 M
-L- STA. 113+60 – 114+20 M
-L- STA. 130+80 – 131+40 M
-L- STA. 145+00 – 146+16 M
-L- STA. 151+80 – 152+60 M

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



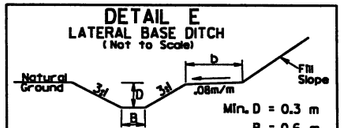
-L- STA. 118+70 – 118+82 RT.
-L- STA. 145+60 – 146+05 RT.
-L- STA. 148+80 – 149+00 RT.
-Y8- STA. 15+00 – 15+40 LT.
-SR5- STA. 14+36 – 15+47 LT.
-L2RPBD- STA. 2+30 – 2+50 RT.
-L2RPBD- STA. 10+30 – 10+69 RT.
-L2RPBD- STA. 16+10 – 16+30 RT.
-Y8DET- STA. 13+57.673 – 15+19.337 LT.
-Y8DET- STA. 14+78 – 15+19 RT.

DETAIL D
LATERAL BASE DITCH
(Not to Scale)



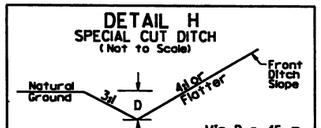
-L- STA. 91+20 – 92+10 RT.
-L- STA. 103+00 – 103+40 LT.
-L2RPBD- STA. 9+60 – 10+80 LT.
-Y2- STA. 15+15 – 16+00 LT.
-Y8- STA. 17+40 – 18+40 LT.

DETAIL E
LATERAL BASE DITCH
(Not to Scale)



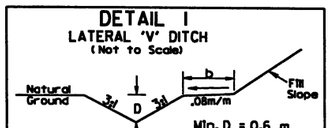
-L- STA. 96+70 – 98+00 LT.
-L- STA. 130+20 – 131+28 RT.
-L- STA. 141+80 – 142+40 LT.
-L- STA. 142+32 – 142+80 RT.
-L- STA. 147+60 – 148+50 RT.
-L2RPD- STA. 2+07 – 3+30 LT.

DETAIL H
SPECIAL CUT DITCH
(Not to Scale)



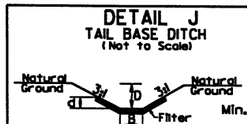
-L- STA. 112+20 – 114+01 LT.
-L- STA. 151+00 – 151+60 LT.
-L2- STA. 91+00 – 91+97 RT.
-L2LPB- STA. 3+64 – 4+80 RT.
-Y2- STA. 19+20 – 20+12 RT.
-Y2- STA. 19+20 – 20+32 LT.
-Y2- STA. 21+65 – 22+40 LT.
-Y2RPA- STA. 11+30 – 11+91 RT.

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



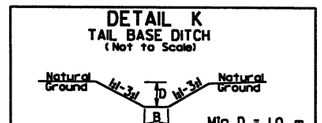
-L- STA. 91+20 – 91+60 LT.
-L- STA. 102+60 – 103+00 LT.
-L- STA. 105+40 – 107+10 LT.
-L- STA. 117+00 – 118+00 RT.
-L2RPB- STA. 3+20 – 4+40 RT.
-L2RPBD- STA. 7+10 – 7+80 RT.
-L2RPBD- STA. 9+56 – 9+83 RT.
-Y2LPD- STA. 14+50 – 14+75 LT.
-Y2- STA. 12+62 – 13+00 LT.
-Y2- STA. 12+80 – 13+20 RT.
-Y2RPD- STA. 12+60 – 14+20 RT.
-Y8- STA. 16+00 – 16+70 LT.
-Y8RPA- STA. 13+40 – 14+00 RT.
-EY2- STA. 14+35 – 15+30 LT.

DETAIL J
TAIL BASE DITCH
(Not to Scale)



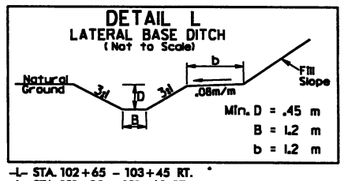
-L- STA. 151+80 – 151+90 LT. (ACTUAL LENGTH=20m)
S=22.26%, DDE=8cm
-L- STA. 152+00 – 152+10 LT. (ACTUAL LENGTH=20m)
S=23.89%, DDE=8cm
-SR5- STA. 15+38 – 15+39 RT. (ACTUAL LENGTH=9m)
S=6.67%, DDE=8cm

DETAIL K
TAIL BASE DITCH
(Not to Scale)



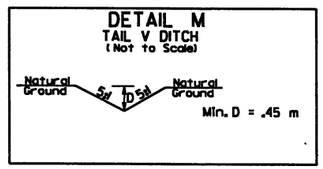
-SR6- STA. 11+25 RT. (ACTUAL LENGTH=50m)
S=0.28%, DDE=100cm
-Y2LPA- STA. 13+60 LT. (ACTUAL LENGTH=45m)
S=0.28%, DDE=90cm

DETAIL L
LATERAL BASE DITCH
(Not to Scale)



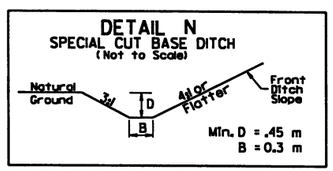
-L- STA. 102+65 – 103+45 RT.
-L- STA. 131+28 – 131+60 RT.
-L- STA. 147+09 – 148+65 LT.
-Y8RPA- STA. 13+20 – 14+20 LT.

DETAIL M
TAIL V DITCH
(Not to Scale)



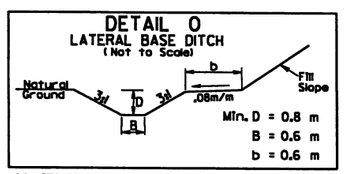
-L- STA. 107+40 RT. (ACTUAL LENGTH=35m)
S=0.30%, DDE=38cm
-L- STA. 137+92 RT. (ACTUAL LENGTH=10m)
S=4.00%, DDE=12cm
-Y8DET- STA. 14+78 RT. (ACTUAL LENGTH=40m)
S=0.58%, DDE=41cm

DETAIL N
SPECIAL CUT BASE DITCH
(Not to Scale)



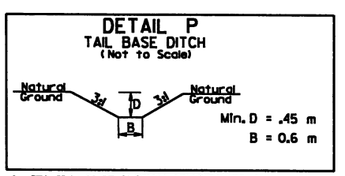
-L2- STA. 88+20 – 89+40 LT.

DETAIL O
LATERAL BASE DITCH
(Not to Scale)



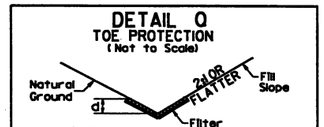
-L2- STA. 101+40 – 102+00 LT.

DETAIL P
TAIL BASE DITCH
(Not to Scale)



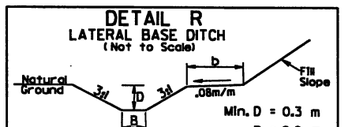
-L- STA. 114+01 RT. (ACTUAL LENGTH=55m)
S=0.30%, DDE=90cm

DETAIL Q
TOE PROTECTION
(Not to Scale)



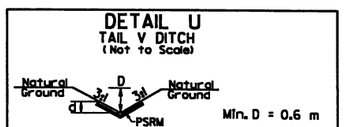
-L- STA. 115+30 – 115+80 RT.
-L- STA. 133+20 – 133+90 LT.
-L- STA. 152+50 – 153+03 LT.

DETAIL R
LATERAL BASE DITCH
(Not to Scale)



-L2LPD- STA. 1+40 – 1+80 LT.

DETAIL U
TAIL V DITCH
(Not to Scale)



-SR5- STA. 14+34 – 14+54 RT. (ACTUAL LENGTH=31m)
S=1.52%, DDE=33cm

Buffer Drawing
Sheet 17 of 44

PLANS PREPARED BY :
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consulting engineers
900 RIDGEFIELD DRIVE • SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

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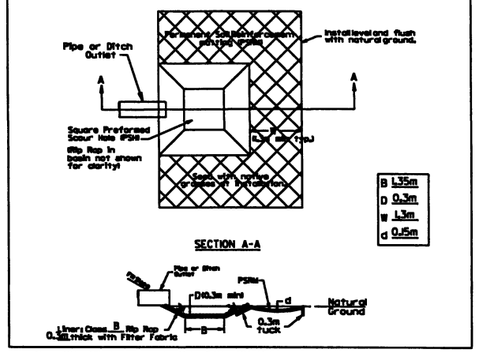
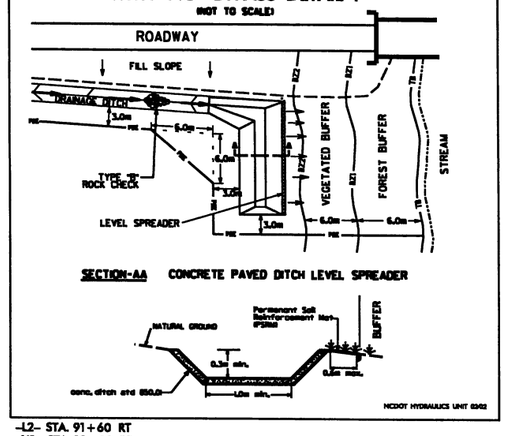
mpooch

DETAIL F
PREFORMED SCOUR HOLE WITH LEVEL SPREADER APRON



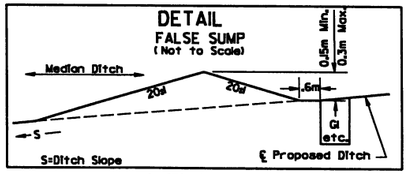
-L- STA. 92+81 LT.
-L- STA. 95+82 RT.
-L- STA. 100+31 RT.
-L- STA. 115+40 LT.
-L- STA. 139+60 RT.
-L- STA. 140+20 LT.
-L- STA. 141+80 LT.
-L- STA. 142+30 RT.
-L- STA. 152+75 RT.
-L- STA. 152+87 LT.
-L2LPD- STA. 2+80 RT.
-L2RPBD- STA. 16+30 RT.
-Y2- STA. 12+40 RT.

LEVEL SPREADER DETAIL WITH NO BYPASS DETAIL T
(NOT TO SCALE)



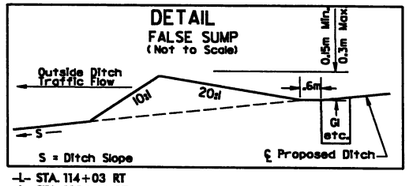
-L2- STA. 91+60 RT
-Y2- STA. 12+80 RT

DETAIL
FALSE SUMP
(Not to Scale)



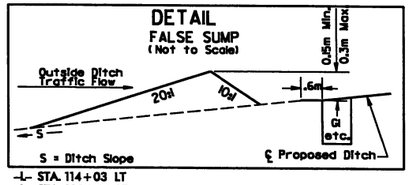
-L- STA. 96+96 M
-L- STA. 97+97 M
-L- STA. 107+44 M
-L- STA. 111+55 M
-L- STA. 117+98 M
-L- STA. 121+17 M
-L- STA. 123+25 M
-L- STA. 125+33 M
-L- STA. 127+43 M
-L- STA. 129+44 M
-L- STA. 130+24 M
-L- STA. 130+84 M
-L- STA. 131+30 M
-L- STA. 133+25 M
-L- STA. 134+16 M
-L- STA. 136+56 M
-L- STA. 137+89 M
-L- STA. 140+16 M
-L- STA. 142+24 M
-L- STA. 148+44 M
-L- STA. 150+24 M
-L- STA. 151+64 M
-L2- STA. 82+81 M
-L2- STA. 84+36 M
-L2- STA. 85+96 M
-L2RPBD- STA. 10+71 RT

DETAIL
FALSE SUMP
(Not to Scale)



-L- STA. 114+03 RT
-L- STA. 129+44 RT
-L2- STA. 85+96 LT
-L2- STA. 84+36 LT

DETAIL
FALSE SUMP
(Not to Scale)



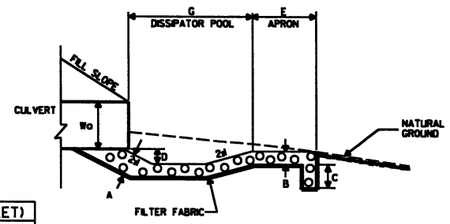
-L- STA. 114+03 LT
-L- STA. 129+44 LT
-L- STA. 130+24 LT
-L- STA. 151+13 LT
-L2- STA. 84+36 RT
-L2- STA. 85+97 RT

DIM. (m)	RIP RAP BASIN * 1	2	3
A	1.0	1.0	
B	0.7	0.7	
C	1.2	1.2	
D	0.8	0.6	
E	4.0	3.1	
F	10.0	9.0	
G	8.0	6.1	

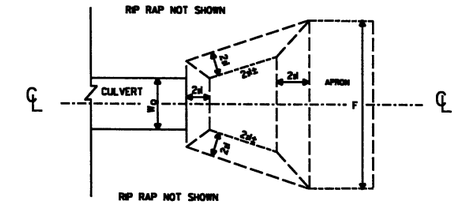
ALL DIMENSIONS APPROXIMATE

BASIN *	LOCATION (AT OUTLET)
1	Sta 95+07 -L- (Rt)
2	Sta 14+08 -L2RPBD- (Rt)
3	

℄ SECTION

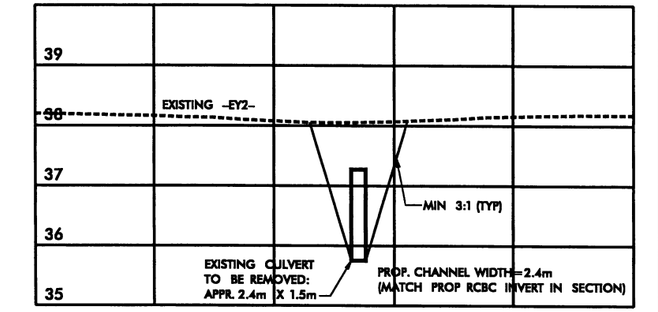


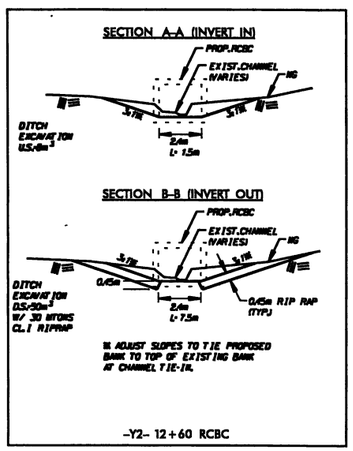
HALF PLAN



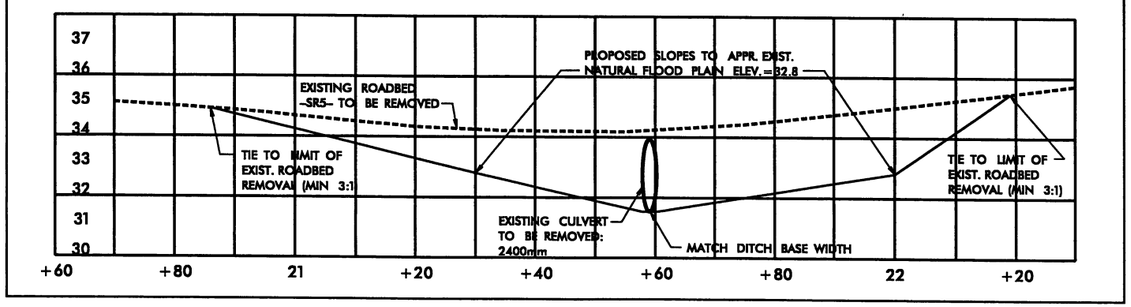
DETAIL OF RIP-RAPPED OUTLET
ENERGY DISSIPATOR BASIN
DETAIL S

DETAIL W
REMOVE EXIST. CULVERT STA. 23+94 -EY2- AND TIE TO PROPOSED RCBC CHANNEL





DETAIL V
REMOVE EXIST. CULVERT AND ROADBED FOR MITIGATION CREDIT, STA. 21+60 -SR5-.
EXCAVATE EXIST. ROAD TO NATURAL FLOOD PLAIN.



Buffer Drawing
Sheet 18 of 44

PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
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900 RIDGEFIELD DRIVE • SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

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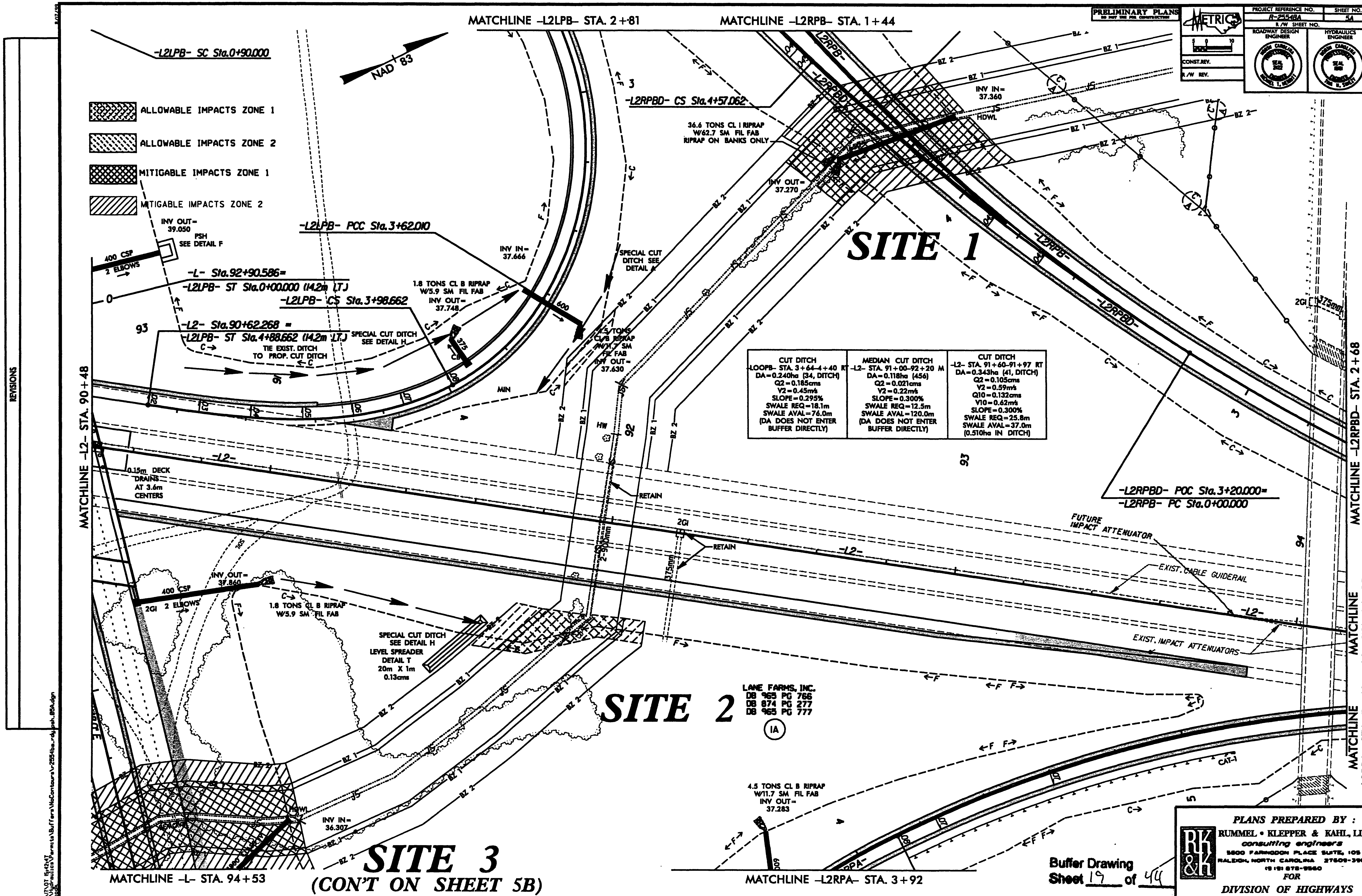
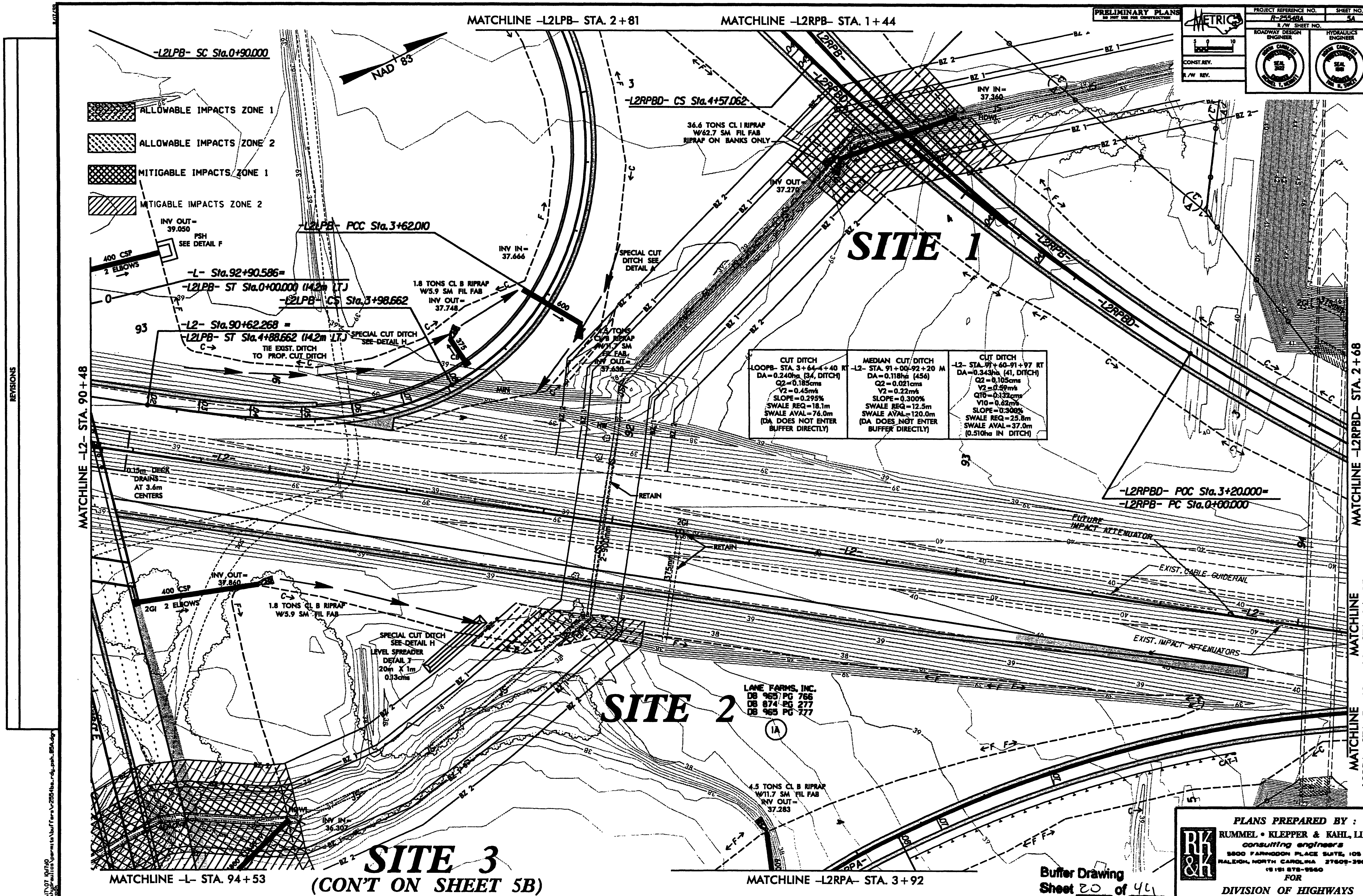
mcook


MATCHLINE -L2LPB- STA. 2+81
MATCHLINE -L2RPB- STA. 1+44
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
METRIC
PROJECT REFERENCE NO. R-2554BA
SHEET NO. 5A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST. REV.
R/W REV.
REVISIONS
-L2LPB- SC Sta.0+90.000
NAD 83
ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
INV OUT= 39.050
PSH SEE DETAIL F
400 CSP 2 ELBOWS
-L- Sta.92+90.586=
-L2LPB- ST Sta.0+00.000 (14.2m LT.)
-L2LPB- CS Sta.3+98.662
-L2- Sta.90+62.268 =
-L2LPB- ST Sta.4+88.662 (14.2m LT.)
SPECIAL CUT DITCH SEE DETAIL H
TIE EXIST. DITCH TO PROP. CUT DITCH
-L2LPB- PCC Sta.3+62.010
INV IN= 37.666
1.8 TONS CL B RIPRAP W/5.9 SM FIL FAB
INV OUT= 37.748
SPECIAL CUT DITCH SEE DETAIL A
4.5 TONS CL B RIPRAP W/11.7 SM FIL FAB
INV OUT= 37.630
-L2RPBD- CS Sta.4+57.062
36.6 TONS CL I RIPRAP W/62.7 SM FIL FAB RIPRAP ON BANKS ONLY
INV OUT= 37.270
INV IN= 37.360
HDWL
SITE 1
CUT DITCH
-LOOPB- STA. 3+64-4+40 RT
DA=0.240ha (34, DITCH)
Q2=0.185cms
V2=0.45m/s
SLOPE=0.295%
SWALE REQ=18.1m
SWALE AVAL=76.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)
MEDIAN CUT DITCH
-L2- STA. 91+00-92+20 M
DA=0.118ha (456)
Q2=0.021cms
V2=0.22m/s
SLOPE=0.300%
SWALE REQ=12.5m
SWALE AVAL=120.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)
CUT DITCH
-L2- STA. 91+60-91+97 RT
DA=0.343ha (41, DITCH)
Q2=0.105cms
V2=0.59m/s
Q10=0.132cms
V10=0.62m/s
SLOPE=0.300%
SWALE REQ=25.8m
SWALE AVAL=37.0m
(0.510ha IN DITCH)
-L2RPBD- POC Sta.3+20.000=
-L2RPB- PC Sta.0+00.000
MATCHLINE -L2RPBD- STA. 2+68
MATCHLINE -L2- STA. 90+48
0.15m DECK DRAINS AT 3.6m CENTERS
RETAIN
2GI
FUTURE IMPACT ATTENUATOR
EXIST. CABLE GUIDERAIL
EXIST. IMPACT ATTENUATORS
MATCHLINE -L2- STA. 94+15
MATCHLINE -L2RPA- STA. 5+48
INV OUT= 37.860
400 CSP 2GI 2 ELBOWS
1.8 TONS CL B RIPRAP W/5.9 SM FIL FAB
SPECIAL CUT DITCH SEE DETAIL H
LEVEL SPREADER DETAIL T 20m X 1m 0.13cms
SITE 2
LANE FARMS, INC.
DB 965 PG 766
DB 874 PG 277
DB 965 PG 777
4.5 TONS CL B RIPRAP W/11.7 SM FIL FAB
INV OUT= 37.283
INV IN= 36.307
HDWL
SITE 3
(CON'T ON SHEET 5B)
MATCHLINE -L- STA. 94+53
MATCHLINE -L2RPA- STA. 3+92
Buffer Drawing Sheet 19 of 44
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
5800 FARRINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS



MATCHLINE -L2LPB- STA. 2+81
MATCHLINE -L2RPB- STA. 1+44
PRELIMINARY PLANS
METRIC
PROJECT REFERENCE NO. R-2554BA
SHEET NO. 5A
-L2LPB- SC Sta.0+90.000
NAD 83
ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
-L2RPBD- CS Sta.4+57.062
36.6 TONS CL I RIPRAP W/62.7 SM FIL FAB RIPRAP ON BANKS ONLY
INV IN= 37.360
INV OUT= 37.270
INV OUT= 39.050
PSH SEE DETAIL F
-L2LPB- PCC Sta.3+62.010
SITE 1
INV IN= 37.666
SPECIAL CUT DITCH SEE DETAIL A
400 CSP 2 ELBOWS
-L- Sta.92+90.586= -L2LPB- ST Sta.0+00.000 (14.2m LT.)
1.8 TONS CL B RIPRAP W/5.9 SM FIL FAB
INV OUT= 37.748
-L2LPB- CS Sta.3+98.662
-L2- Sta.90+62.268 = -L2LPB- ST Sta.4+88.662 (14.2m LT.)
SPECIAL CUT DITCH SEE DETAIL H
TIE EXIST. DITCH TO PROP. CUT DITCH
INV OUT= 37.630
CUT DITCH
-LOOPB- STA. 3+64-4+40 RT
DA=0.240ha (34, DITCH)
Q2=0.185cms
V2=0.45m/s
SLOPE=0.295%
SWALE REQ=18.1m
SWALE AVAL=76.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)
MEDIAN CUT DITCH
-L2- STA. 91+00-92+20 M
DA=0.118ha (456)
Q2=0.021cms
V2=0.22m/s
SLOPE=0.300%
SWALE REQ=12.5m
SWALE AVAL=120.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)
CUT DITCH
-L2- STA. 91+60-91+97 RT
DA=0.343ha (41, DITCH)
Q2=0.105cms
V2=0.59m/s
Q10=0.132cms
V10=0.62m/s
SLOPE=0.300%
SWALE REQ=25.8m
SWALE AVAL=37.0m
(0.510ha IN DITCH)
-L2RPBD- POC Sta.3+20.000= -L2RPB- PC Sta.0+00.000
MATCHLINE -L2- STA. 90+48
MATCHLINE -L2RPBD- STA. 2+68
0.15m DECK DRAINS AT 3.6m CENTERS
RETAIN
FUTURE IMPACT ATTENUATOR
EXIST. CABLE GUIDERAIL
EXIST. IMPACT ATTENUATORS
INV OUT= 37.860
400 CSP 2GI 2 ELBOWS
1.8 TONS CL B RIPRAP W/5.9 SM FIL FAB
SPECIAL CUT DITCH SEE DETAIL H
LEVEL SPREADER DETAIL 7 20m X 1m 0.13cms
LANE FARMS, INC. DB 965 PG 766 DB 874 PG 277 DB 965 PG 777
SITE 2
MATCHLINE -L2- STA. 94+15
MATCHLINE -L2RPA- STA. 5+48
4.5 TONS CL B RIPRAP W/11.7 SM FIL FAB
INV OUT= 37.283
INV IN= 36.302
SITE 3
(CON'T ON SHEET 5B)
MATCHLINE -L- STA. 94+53
MATCHLINE -L2RPA- STA. 3+92
Buffer Drawing Sheet 20 of 41
PLANS PREPARED BY :
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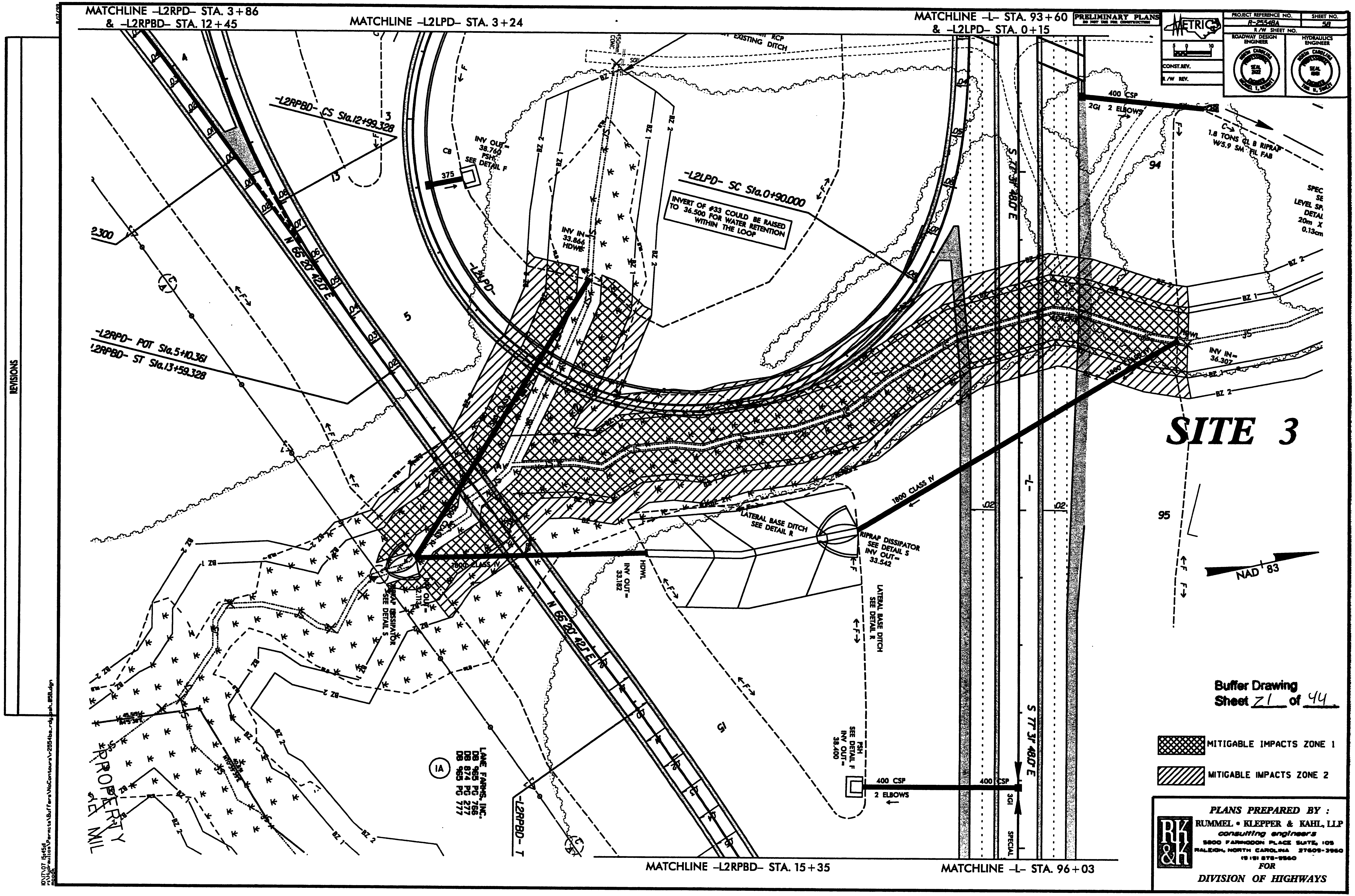
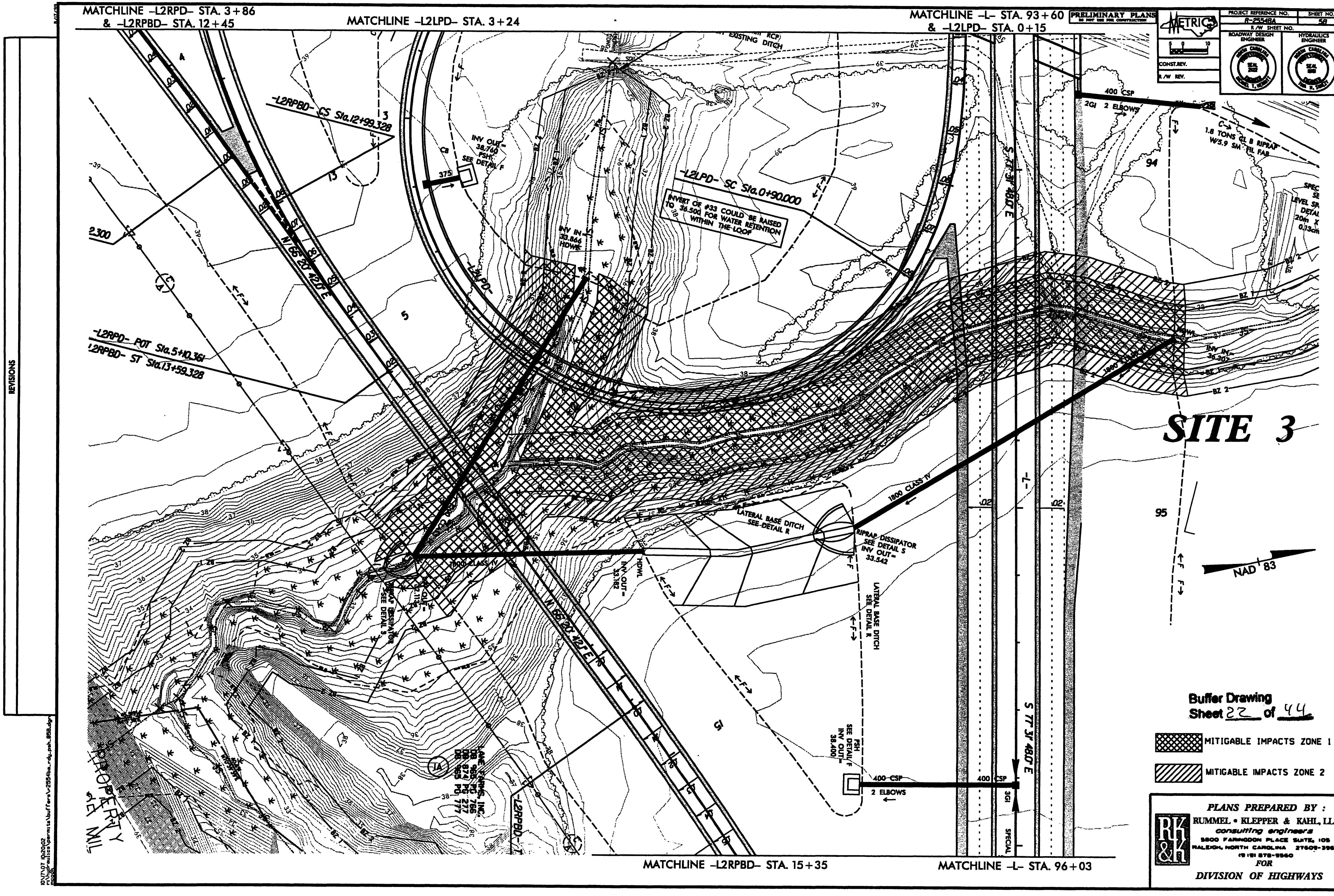
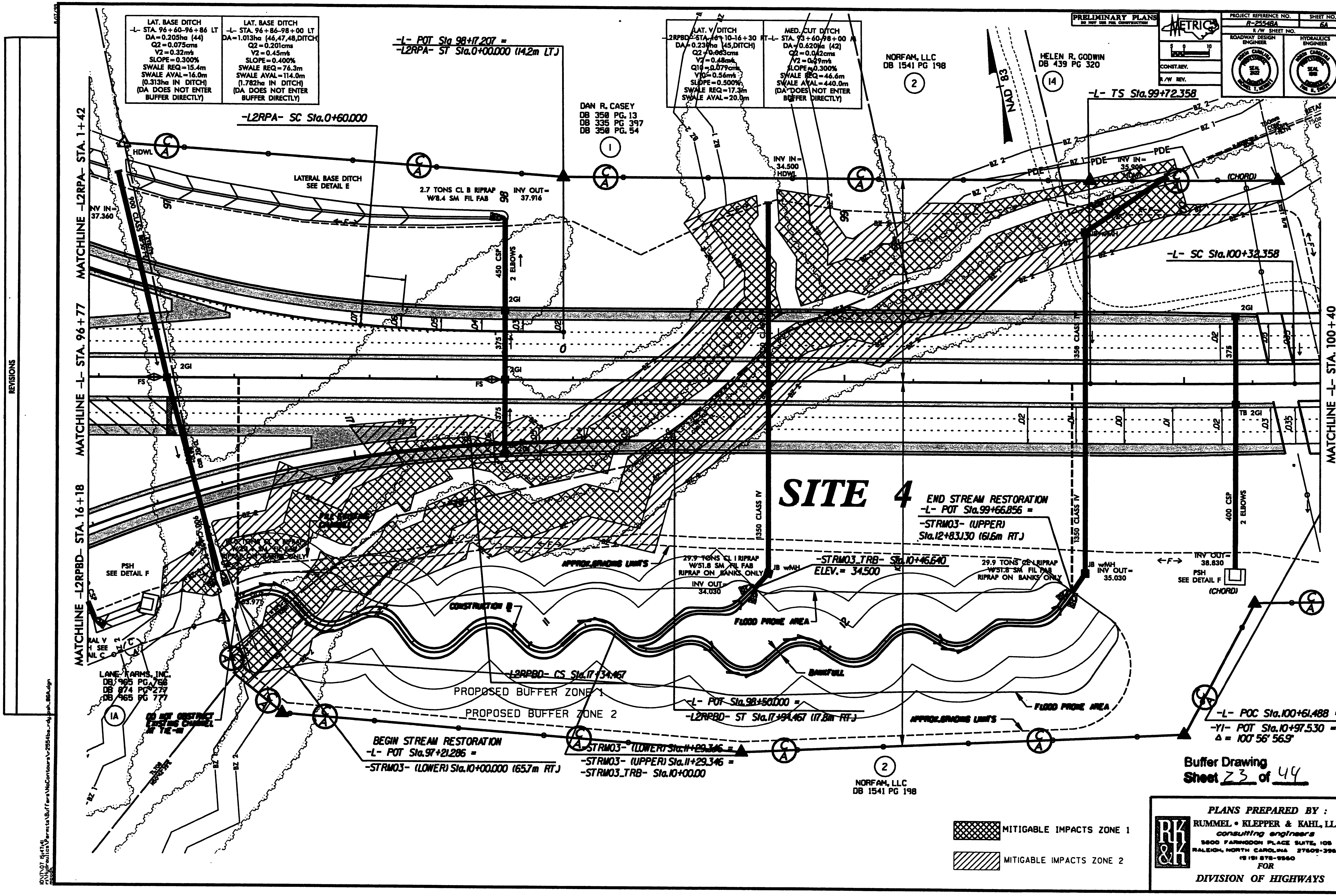
FOR DIVISION OF HIGHWAYS
REVISIONS

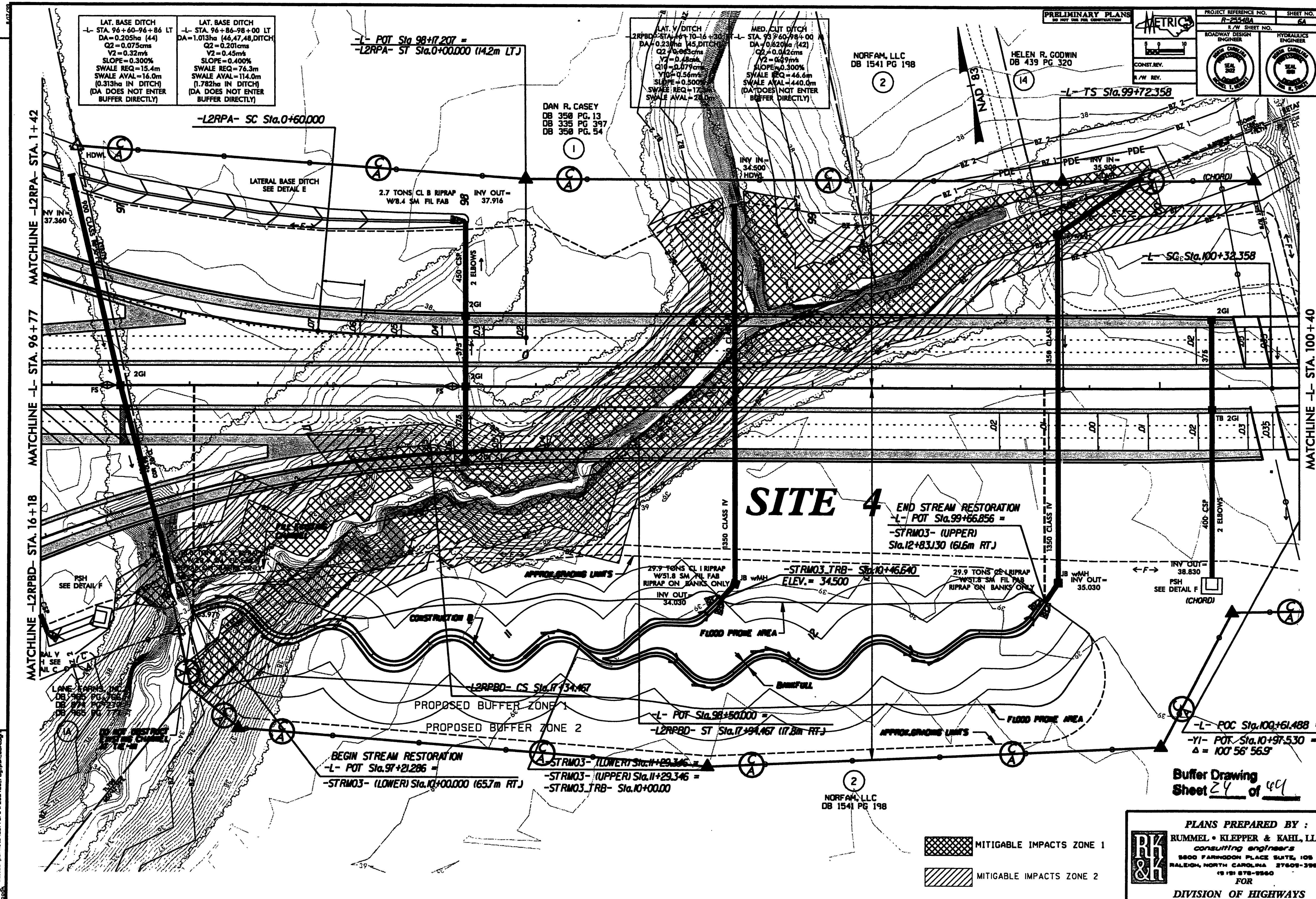


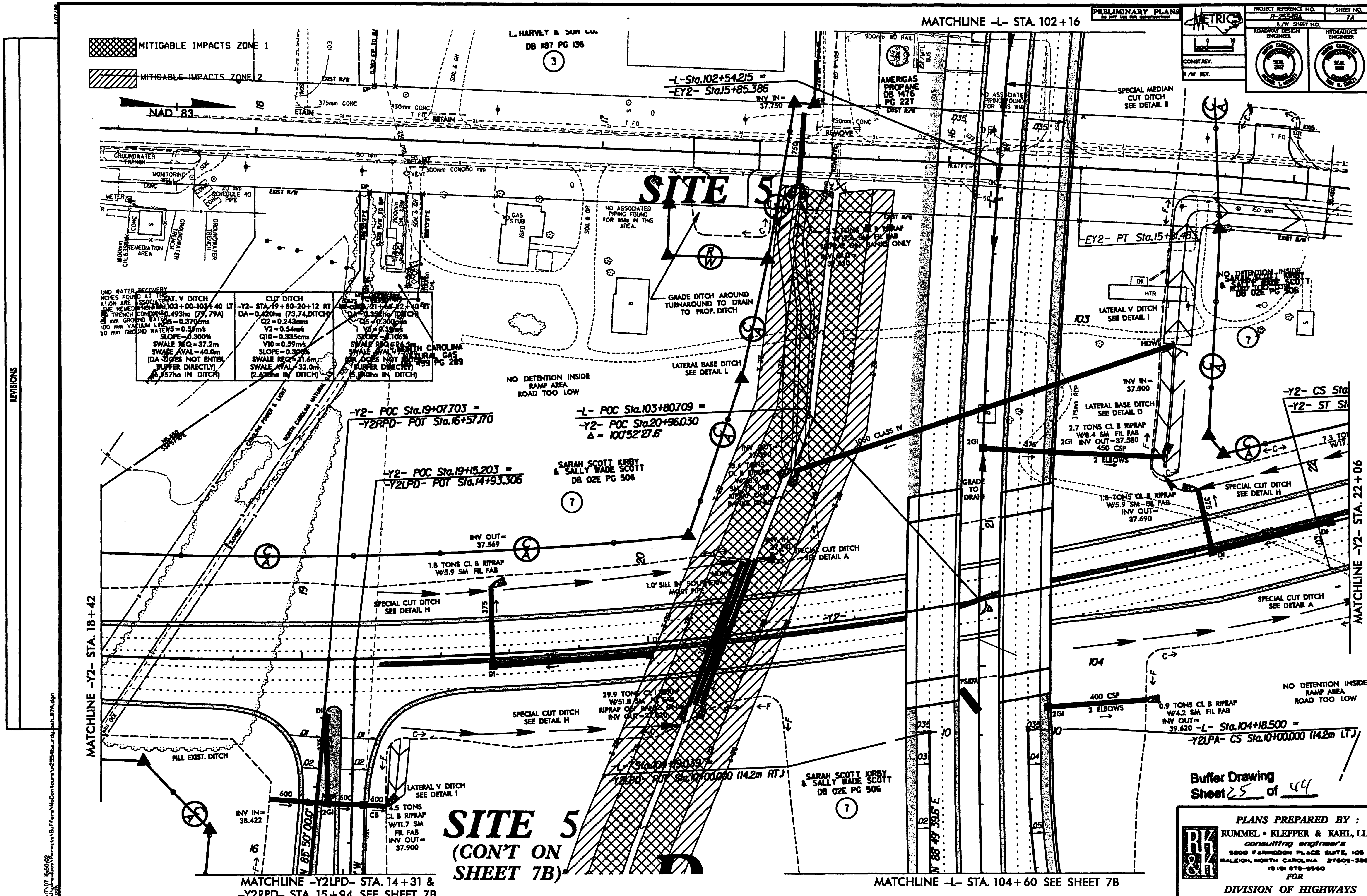
MATCHLINE -L2RPD- STA. 3+86
& -L2RPBD- STA. 12+45
MATCHLINE -L2LPD- STA. 3+24
MATCHLINE -L- STA. 93+60
& -L2LPD- STA. 0+15
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
METRIC
PROJECT REFERENCE NO.
R-2554BA
SHEET NO.
5B
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST.REV.
R/W REV.
-L2RPBD- CS Sta.12+99.328
-L2LPD- SC Sta.0+90.000
INVERT OF #33 COULD BE RAISED TO 36.500 FOR WATER RETENTION WITHIN THE LOOP
INV OUT= 38.760 PSH SEE DETAIL F
INV IN= 33.866 HDWL
N 66°20' 42.0" E
-L2RPD- POT Sta.5+10.361
-L2RPBD- ST Sta.13+59.328
400 CSP
2GI 2 ELBOWS
1.8 TONS CL B RIPRAP W/5.9 SM FIL FAB
INV IN= 36.307
SITE 3
1800 CLASS IV
LATERAL BASE DITCH SEE DETAIL R
RIPRAP DISSIPATOR SEE DETAIL S INV OUT= 33.542
INV OUT= 33.182
HDWL
RIPRAP DISSIPATOR SEE DETAIL S
S 77°31' 48.0" E
-L-
NAD 83
Buffer Drawing
Sheet 21 of 44
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
LANE FARMS, INC.
DB 965 PG 766
DB 874 PG 277
DB 965 PG 777
-L2RPBD-
PSH SEE DETAIL F INV OUT= 38.400
400 CSP
2 ELBOWS
MATCHLINE -L2RPBD- STA. 15+35
MATCHLINE -L- STA. 96+03
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
5800 FARINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS
REVISIONS



MATCHLINE -L2RPD- STA. 3+86
& -L2RPBD- STA. 12+45
MATCHLINE -L2LPD- STA. 3+24
MATCHLINE -L- STA. 93+60
& -L2LPD- STA. 0+15
PRELIMINARY PLANS
METRIC
R-2554BA
58
-L2RPBD- CS Sta.12+99.328
-L2LPD- SC Sta.0+90.000
INVERT OF #33 COULD BE RAISED TO 36.500 FOR WATER RETENTION WITHIN THE LOOP
-L2RPD- POT Sta.5+10.361
-L2RPBD- ST Sta.13+59.328
400 CSP
2GI 2 ELBOWS
1.8 TONS CL B RIPRAP W/5.9 SM FIL FAB
SITE 3
1800 CLASS IV
LATERAL BASE DITCH SEE DETAIL R
RIPRAP DISSIPATOR SEE DETAIL S INV OUT= 33.542
NAD 83
LANE FARMS, INC.
S 77 31' 48.0" E
MATCHLINE -L2RPBD- STA. 15+35
MATCHLINE -L- STA. 96+03
Buffer Drawing Sheet 22 of 44
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
5800 FARINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
FOR
DIVISION OF HIGHWAYS
REVISIONS


LAT. BASE DITCH
-L- STA. 96+60-96+86 LT
DA=0.205ha (44)
Q2=0.075cms
V2=0.32m/s
SLOPE=0.300%
SWALE REQ=15.4m
SWALE AVAL=16.0m
(0.313ha IN DITCH)
(DA DOES NOT ENTER BUFFER DIRECTLY)
LAT. BASE DITCH
-L- STA. 96+86-98+00 LT
DA=1.013ha (46,47,48,DITCH)
Q2=0.201cms
V2=0.45m/s
SLOPE=0.400%
SWALE REQ=76.3m
SWALE AVAL=114.0m
(1.782ha IN DITCH)
(DA DOES NOT ENTER BUFFER DIRECTLY)
-L- POT Sta 98+17.207 =
-L2RPA- ST Sta.0+00.000 (14.2m LT)
-L2RPA- SC Sta.0+60.000
DAN R. CASEY
DB 350 PG. 13
DB 335 PG 397
DB 350 PG. 54
LAT. V DITCH
-L2RPBD- STA. 16+10-16+30 RT
DA=0.230ha (45,DITCH)
Q2=0.063cms
V2=0.48m/s
Q10=0.079cms
V10=0.56m/s
SLOPE=0.500%
SWALE REQ=17.3m
SWALE AVAL=20.0m
MED. CUT DITCH
-L- STA. 93+60-98+00 RT
DA=0.620ha (42)
Q2=0.042cms
V2=0.29m/s
SLOPE=0.300%
SWALE REQ=46.6m
SWALE AVAL=440.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)
NORFAM, LLC
DB 1541 PG 198
HELEN R. GODWIN
DB 439 PG 320
NAD 83
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
METRIC
PROJECT REFERENCE NO. R-2554BA
SHEET NO. 6A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST.REV.
R/W REV.
-L- TS Sta.99+72.358
-L- SC Sta.100+32.358
MATCHLINE -L2RPA- STA. 1+42
MATCHLINE -L- STA. 96+77
MATCHLINE -L2RPBD- STA. 16+18
MATCHLINE -L- STA. 100+40
LATERAL BASE DITCH
SEE DETAIL E
2.7 TONS CL B RIPRAP
W/8.4 SM FIL FAB
INV OUT= 37.916
INV IN= 37.360
INV IN= 34.500
HDWL
INV IN= 35.900
450 CSP
2 ELBOWS
2GI
375
FS
(CHORD)
SITE 4
END STREAM RESTORATION
-L- POT Sta.99+66.856 =
-STRM03- (UPPER)
Sta.12+83.130 (61.6m RT)
1350 CLASS IV
400 CSP
2 ELBOWS
29.9 TONS CL I RIPRAP
W/51.8 SM FIL FAB
RIPRAP ON BANKS ONLY
INV OUT= 34.030
JB w/MH
-STRM03_TRB- Sta.10+46.640
ELEV.= 34.500
INV OUT= 35.030
INV OUT= 38.830
PSH
SEE DETAIL F
APPROX. GRADING LIMITS
CONSTRUCTION
FLOOD PRONE AREA
BANKFULL
-L2RPBD- CS Sta.17+34.467
PROPOSED BUFFER ZONE 1
PROPOSED BUFFER ZONE 2
-L- POT Sta.98+50.000 =
-L2RPBD- ST Sta.17+94.467 (17.8m RT)
LANE FARMS, INC.
DB 965 PG 768
DB 874 PG 277
DB 965 PG 777
DO NOT OBSTRUCT EXISTING CHANNEL AT TIE-IN
BEGIN STREAM RESTORATION
-L- POT Sta.97+21.286 =
-STRM03- (LOWER) Sta.10+00.000 (65.7m RT)
-STRM03- (LOWER) Sta.11+29.346 =
-STRM03- (UPPER) Sta.11+29.346 =
-STRM03_TRB- Sta.10+00.00
NORFAM, LLC
DB 1541 PG 198
-L- POC Sta.100+61.488 =
-Y1- POT Sta.10+97.530 =
Δ = 100° 56' 56.9"
Buffer Drawing
Sheet 23 of 44
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
5800 FARINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS
REVISIONS


PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
PROJECT REFERENCE NO. R-2554BA
SHEET NO. 6A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST. REV.
R/W REV.
REVISIONS
LAT. BASE DITCH
-L- STA. 96+60-96+86 LT
DA=0.205ha (44)
Q2=0.075cms
V2=0.32m/s
SLOPE=0.300%
SWALE REQ=15.4m
SWALE AVAL=16.0m
(0.313ha IN DITCH)
(DA DOES NOT ENTER BUFFER DIRECTLY)
LAT. BASE DITCH
-L- STA. 96+86-98+00 LT
DA=1.013ha (46,47,48,DITCH)
Q2=0.201cms
V2=0.45m/s
SLOPE=0.400%
SWALE REQ=76.3m
SWALE AVAL=114.0m
(1.782ha IN DITCH)
(DA DOES NOT ENTER BUFFER DIRECTLY)
-L- POT Sta.98+17.207 =
-L2RPA- ST Sta.0+00.000 (14.2m LT)
-L2RPA- SC Sta.0+60.000
DAN R. CASEY
DB 350 PG. 13
DB 335 PG 397
DB 350 PG. 54
NORFAM, LLC
DB 1541 PG 198
HELEN R. GODWIN
DB 439 PG 320
NAD 83
-L- TS Sta.99+72.358
-L- SG Sta.100+32.358
LATERAL BASE DITCH
SEE DETAIL E
2.7 TONS CL B RIPRAP
W/8.4 SM FIL FAB
INV OUT= 37.916
INV IN= 37.360
INV IN= 34.500
INV IN= 35.900
MATCHLINE -L2RPA- STA. 1+42
MATCHLINE -L- STA. 96+77
MATCHLINE -L2RPBD- STA. 16+18
MATCHLINE -L- STA. 100+40
SITE 4
END STREAM RESTORATION
-L- POT Sta.99+66.856 =
-STRM03- (UPPER)
Sta.12+83.130 (61.6m RT)
-STRM03_TRB- Sta.10+46.640
ELEV.= 34.500
29.9 TONS CL I RIPRAP
W/51.8 SM FIL FAB
RIPRAP ON BANKS ONLY
INV OUT= 34.030
INV OUT= 35.030
INV OUT= 38.830
PSH
SEE DETAIL F
APPROX. GRADING LIMITS
FLOOD PRONE AREA
BANKFULL
CONSTRUCTION
-L2RPBD- CS Sta.17+34.467
PROPOSED BUFFER ZONE 1
PROPOSED BUFFER ZONE 2
-L- POT Sta.98+50.000 =
-L2RPBD- ST Sta.17+94.467 (17.8m RT)
BEGIN STREAM RESTORATION
-L- POT Sta.97+21.286 =
-STRM03- (LOWER) Sta.10+00.000 (65.7m RT)
-STRM03- (LOWER) Sta.11+29.346 =
-STRM03- (UPPER) Sta.11+29.346 =
-STRM03_TRB- Sta.10+00.00
-L- POC Sta.100+61.488 =
-Y1- POT Sta.10+97.530 =
Δ = 100° 56' 56.9"
LANE FARMS, INC.
Buffer Drawing Sheet 24 of 44
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
5800 FARINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS



MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
NAD 83
MATCHLINE -L- STA. 102+16
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
METRIC
PROJECT REFERENCE NO.
SHEET NO.
R-2554BA
7A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
L. HARVEY & SON CO.
DB 187 PG 136
-L-Sta.102+54.215 =
-EY2- Sta.15+85.386
AMERIGAS PROPANE
DB 1476 PG 227
SPECIAL MEDIAN CUT DITCH SEE DETAIL B
SITE 5
NO ASSOCIATED PIPING FOUND FOR WMs IN THIS AREA.
GAS STUB
GROUNDWATER TRENCH
REMEDIATION AREA
-EY2- PT Sta.15+81.45
GRADE DITCH AROUND TURNAROUND TO DRAIN TO PROP. DITCH
LATERAL V DITCH SEE DETAIL I
LAT. V DITCH
CUT DITCH
NORTH CAROLINA NATURAL GAS
NO DETENTION INSIDE RAMP AREA ROAD TOO LOW
LATERAL BASE DITCH SEE DETAIL L
-Y2- POC Sta.19+07.703 =
-Y2RPD- POT Sta.16+57.170
-L- POC Sta.103+80.709 =
-Y2- POC Sta.20+96.030
Δ = 100°52'27.6"
INV IN= 37.500
LATERAL BASE DITCH SEE DETAIL D
2.7 TONS CL B RIPRAP W/8.4 SM FIL FAB
INV OUT=37.580
450 CSP
2 ELBOWS
-Y2- CS Sta
-Y2- ST Sta
SARAH SCOTT KIRBY & SALLY WADE SCOTT
DB 02E PG 506
-Y2- POC Sta.19+15.203 =
-Y2LPD- POT Sta.14+93.306
SPECIAL CUT DITCH SEE DETAIL H
1.8 TONS CL B RIPRAP W/5.9 SM FIL FAB
INV OUT= 37.690
INV OUT= 37.569
1.8 TONS CL B RIPRAP W/5.9 SM FIL FAB
SPECIAL CUT DITCH SEE DETAIL A
1.0' SILL IN SOUTHERN MOST PIPE
SPECIAL CUT DITCH SEE DETAIL H
SPECIAL CUT DITCH SEE DETAIL A
MATCHLINE -Y2- STA. 22+06
MATCHLINE -Y2- STA. 18+42
NO DETENTION INSIDE RAMP AREA ROAD TOO LOW
29.9 TONS CL B RIPRAP
SPECIAL CUT DITCH SEE DETAIL H
400 CSP
2 ELBOWS
0.9 TONS CL B RIPRAP W/4.2 SM FIL FAB
INV OUT= 39.620
-L- Sta.104+18.500 =
-Y2LPA- CS Sta.10+00.000 (14.2m LT)
FILL EXIST. DITCH
LATERAL V DITCH SEE DETAIL I
INV IN= 38.422
4.5 TONS CL B RIPRAP W/11.7 SM FIL FAB
INV OUT= 37.900
SITE 5
(CON'T ON SHEET 7B)
SARAH SCOTT KIRBY & SALLY WADE SCOTT
DB 02E PG 506
Buffer Drawing
Sheet 25 of 44
PLANS PREPARED BY :
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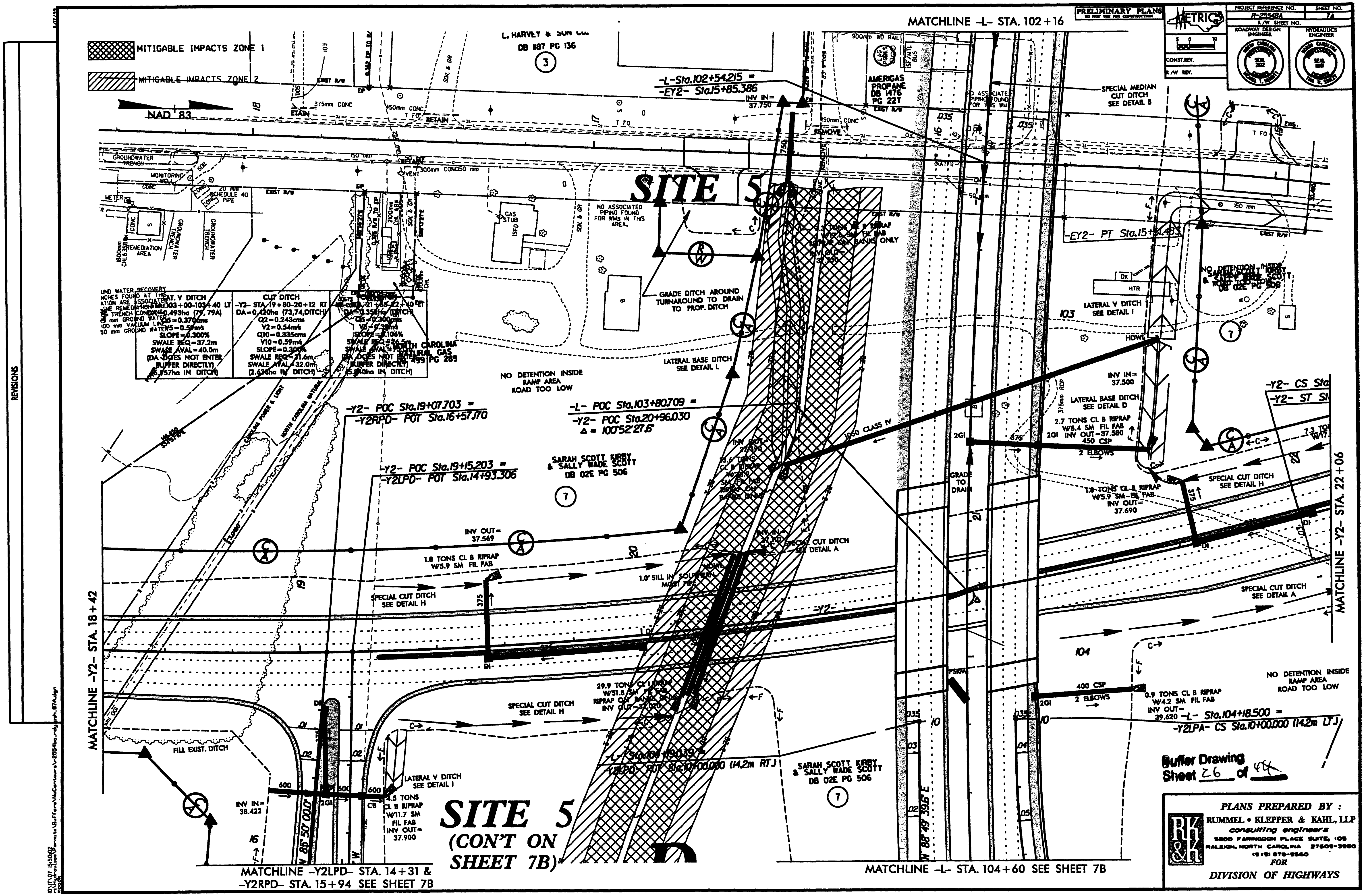
consulting engineers
5800 FARINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
FOR
DIVISION OF HIGHWAYS
MATCHLINE -Y2LPD- STA. 14+31 &
-Y2RPD- STA. 15+94 SEE SHEET 7B
MATCHLINE -L- STA. 104+60 SEE SHEET 7B
REVISIONS


MATCHLINE -L- STA. 102+16
PRELIMINARY PLANS
METRIC
PROJECT REFERENCE NO. R-2554BA
SHEET NO. 7A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
NAD 83
L. HARVEY & SON CO.
DB 1187 PG 136
SITE 5
-L-Sta.102+54.215 =
-EY2- Sta.15+85.386
AMERICAS PROPANE DB 1476 PG 227
SPECIAL MEDIAN CUT DITCH SEE DETAIL B
NO ASSOCIATED PIPING FOUND FOR WMs IN THIS AREA.
GRADE DITCH AROUND TURNAROUND TO DRAIN TO PROP. DITCH
-EY2- PT Sta.15+81.483
LATERAL V DITCH SEE DETAIL I
NORTH CAROLINA NATURAL GAS 499 PG 289
NO DETENTION INSIDE RAMP AREA ROAD TOO LOW
LATERAL BASE DITCH SEE DETAIL L
-Y2- POC Sta.19+07.703 =
-Y2RPD- POT Sta.16+57.170
-L- POC Sta.103+80.709 =
-Y2- POC Sta.20+96.030
Δ = 100°52'27.6"
-Y2- POC Sta.19+15.203 =
-Y2LPD- POT Sta.14+93.306
SARAH SCOTT KIRBY & SALLY WADE SCOTT DB 02E PG 506
LATERAL BASE DITCH SEE DETAIL D
SPECIAL CUT DITCH SEE DETAIL H
SPECIAL CUT DITCH SEE DETAIL A
1.0' SILL IN SOUTHERN MOST PIPE
MATCHLINE -Y2- STA. 18+42
MATCHLINE -Y2- STA. 22+06
FILL EXIST. DITCH
LATERAL V DITCH SEE DETAIL I
NO DETENTION INSIDE RAMP AREA ROAD TOO LOW
-L- Sta.104+18.500 =
-Y2LPA- CS Sta.10+00.000 (14.2m LT)
Buffer Drawing Sheet 26 of 44
SITE 5 (CON'T ON SHEET 7B)
MATCHLINE -Y2LPD- STA. 14+31 &
-Y2RPD- STA. 15+94 SEE SHEET 7B
MATCHLINE -L- STA. 104+60 SEE SHEET 7B
PLANS PREPARED BY :
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consulting engineers
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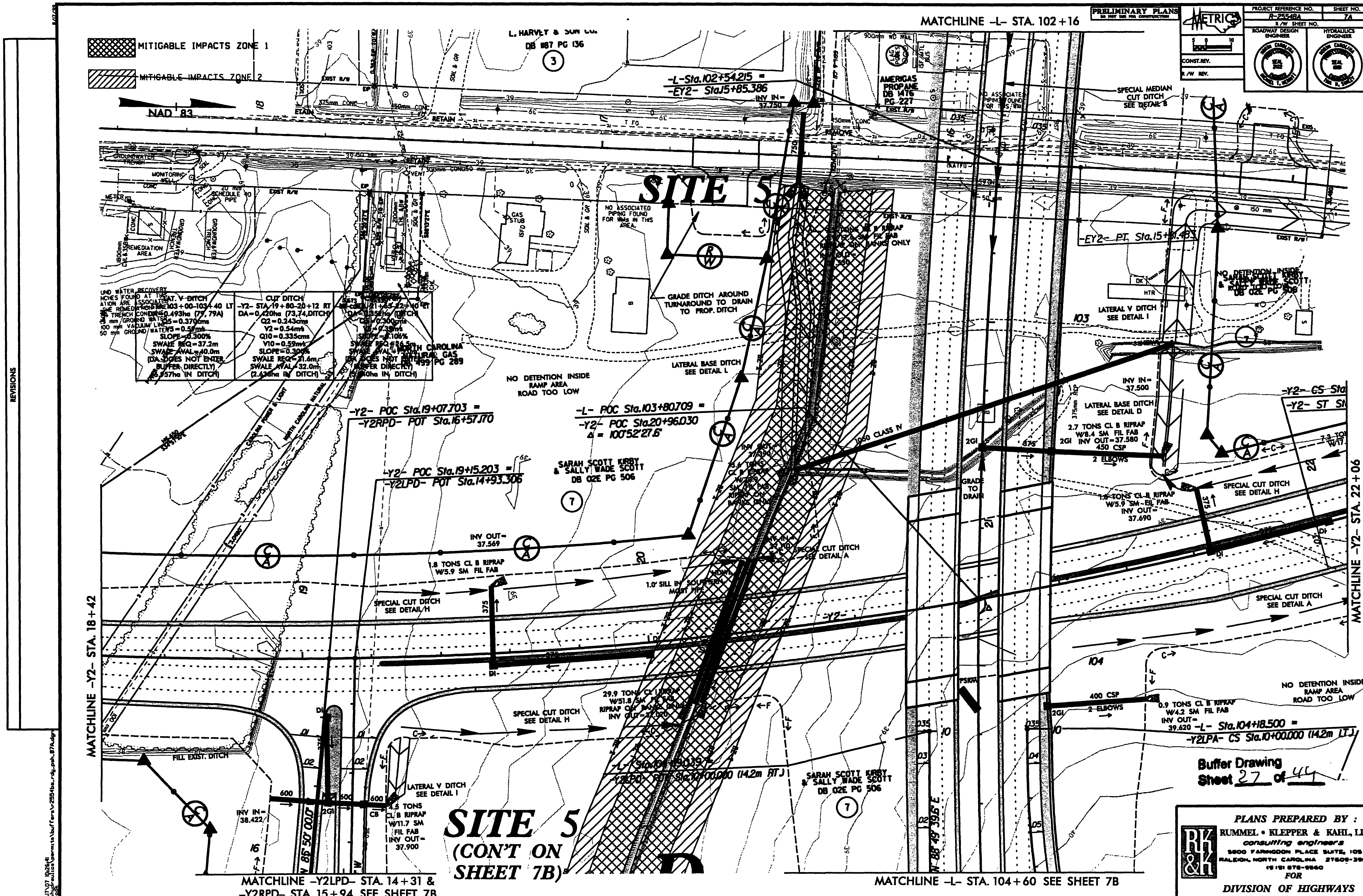

PRELIMINARY PLANS
METRIC
PROJECT REFERENCE NO. R-2554BA
SHEET NO. 7A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
MATCHLINE -L- STA. 102+16
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
NAD 83
L. HARVEY & SON CO.
DB 887 PG 136
-L-Sta.102+54.215 =
-EY2- Sta.15+85.386
AMERIGAS PROPANE DB 1416 PG 227
SPECIAL MEDIAN CUT DITCH SEE DETAIL B
SITE 5
NO ASSOCIATED PIPING FOUND FOR MWs IN THIS AREA.
-EY2- PT Sta.15+81.483
GRADE DITCH AROUND TURNAROUND TO DRAIN TO PROP. DITCH
LATERAL V DITCH SEE DETAIL I
NORTH CAROLINA NATURAL GAS DB 499 PG 289
NO DETENTION INSIDE RAMP AREA ROAD TOO LOW
LATERAL BASE DITCH SEE DETAIL L
-Y2- POC Sta.19+07.703 =
-Y2RPD- POT Sta.16+57.170
-L- POC Sta.103+80.709 =
-Y2- POC Sta.20+96.030
Δ = 100°52'27.6"
-Y2- POC Sta.19+15.203 =
-Y2LPD- POT Sta.14+93.306
SARAH SCOTT KIRBY & SALLY WADE SCOTT DB 02E PG 506
INV OUT= 37.569
1.8 TONS CL B RIPRAP W/5.9 SM FIL FAB
SPECIAL CUT DITCH SEE DETAIL H
SPECIAL CUT DITCH SEE DETAIL A
1.0' SILL IN SOUTHERN MOST PIPE
LATERAL BASE DITCH SEE DETAIL D
2.7 TONS CL B RIPRAP W/8.4 SM FIL FAB
2GI INV OUT=37.580
450 CSP
2 ELBOWS
INV IN= 37.500
1.8 TONS CL B RIPRAP W/5.9 SM FIL FAB INV OUT= 37.690
GRADE TO DRAIN
MATCHLINE -Y2- STA. 22+06
MATCHLINE -Y2- STA. 18+42
29.9 TONS CL B RIPRAP W/51.8 SM FIL FAB RIPRAP ON BANKS
400 CSP
2 ELBOWS
0.9 TONS CL B RIPRAP W/4.2 SM FIL FAB INV OUT= 39.620
-L- Sta.104+18.500 =
-Y2LPA- CS Sta.10+00.000 (14.2m LT)
FILL EXIST. DITCH
INV IN= 38.422
LATERAL V DITCH SEE DETAIL I
4.5 TONS CL B RIPRAP W/11.7 SM FIL FAB INV OUT= 37.900
SITE 5 (CON'T ON SHEET 7B)
Buffer Drawing Sheet 27 of 44
MATCHLINE -Y2LPD- STA. 14+31 & -Y2RPD- STA. 15+94 SEE SHEET 7B
MATCHLINE -L- STA. 104+60 SEE SHEET 7B
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
5800 FARINGDON PLACE SUITE 105
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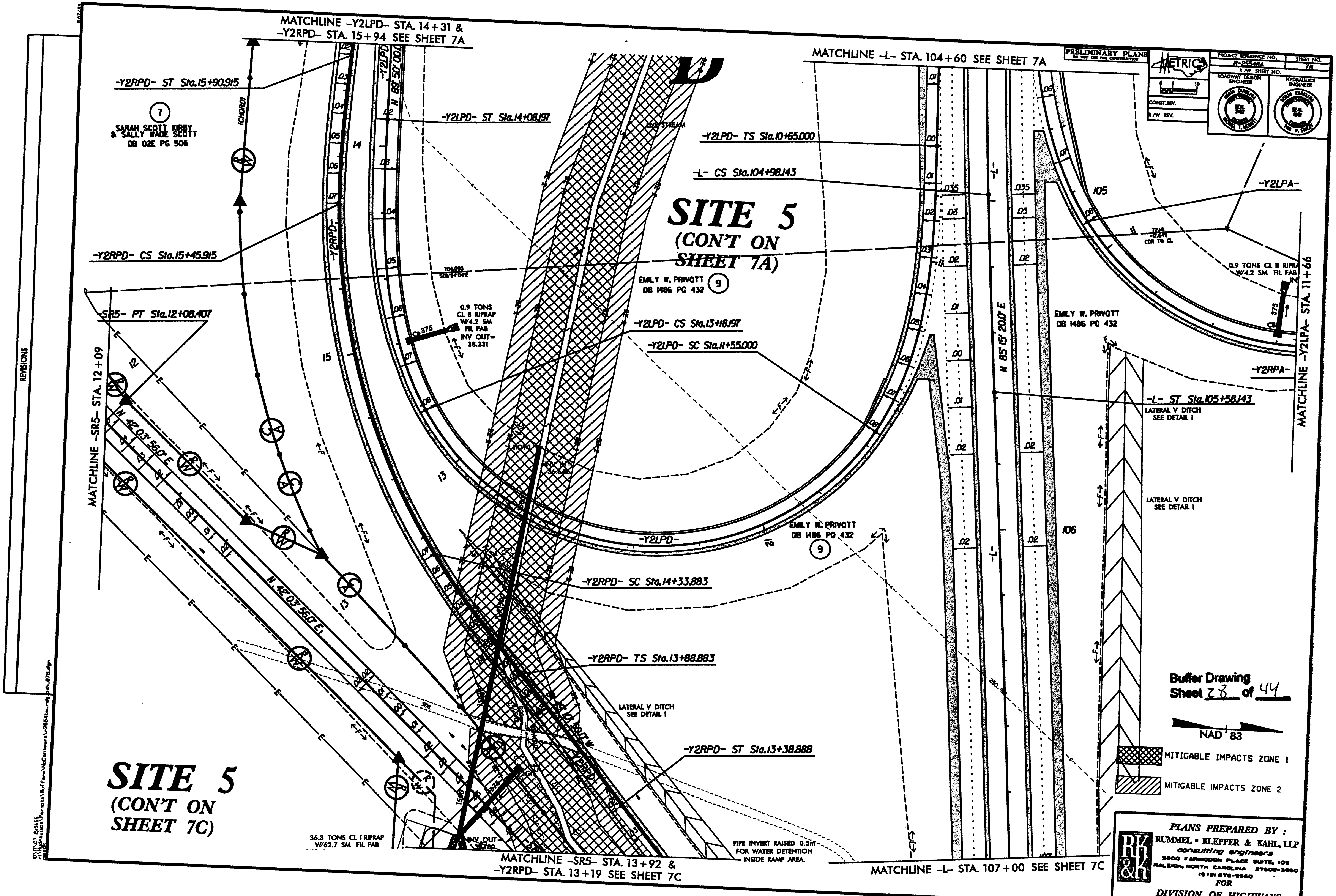
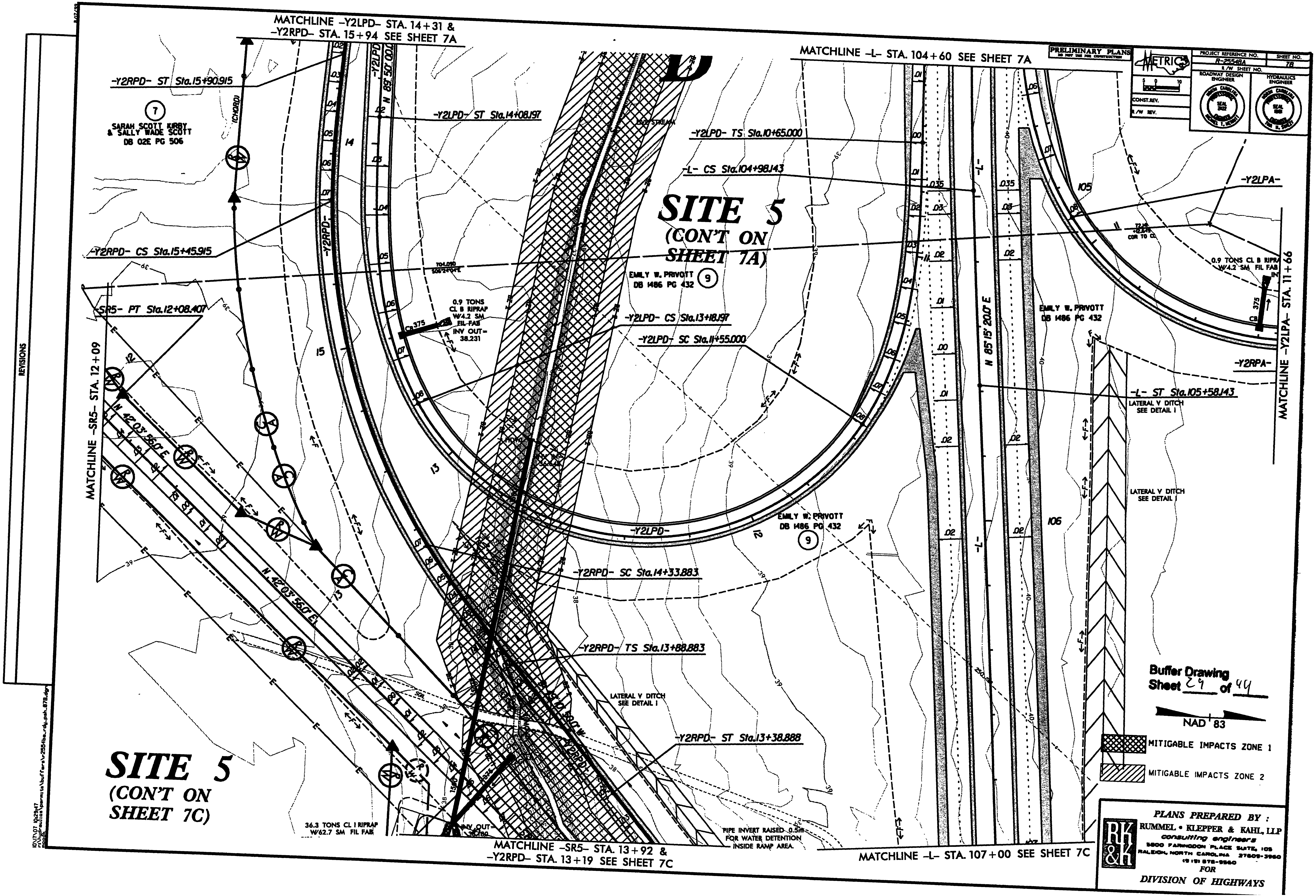
FOR
DIVISION OF HIGHWAYS
REVISIONS



MATCHLINE -Y2LPD- STA. 14+31 & -Y2RPD- STA. 15+94 SEE SHEET 7A
MATCHLINE -L- STA. 104+60 SEE SHEET 7A
PRELIMINARY PLANS
PROJECT REFERENCE NO. R-2554BA
SHEET NO. 7B
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
-Y2RPD- ST Sta.15+90.915
SARAH SCOTT KIRBY & SALLY WADE SCOTT DB 02E PG 506
-Y2LPD- ST Sta.14+08.197
-Y2LPD- TS Sta.10+65.000
-L- CS Sta.104+98.143
SITE 5 (CON'T ON SHEET 7A)
-Y2LPA-
-Y2RPD- CS Sta.15+45.915
EMILY W. PRIVOTT DB 1486 PG 432
0.9 TONS CL B RIPRAP W/4.2 SM FIL FAB
-SR5- PT Sta.12+08.407
0.9 TONS CL B RIPRAP W/4.2 SM FIL FAB INV OUT= 38.231
-Y2LPD- CS Sta.13+18.197
-Y2LPD- SC Sta.11+55.000
-Y2RPA-
-L- ST Sta.105+58.143
LATERAL V DITCH SEE DETAIL I
MATCHLINE -SR5- STA. 12+09
MATCHLINE -Y2LPA- STA. 11+66
N 42°03'56.0" E
N 85°15'20.0" E
-Y2LPD-
EMILY W. PRIVOTT DB 1486 PG 432
-Y2RPD- SC Sta.14+33.883
-Y2RPD- TS Sta.13+88.883
LATERAL V DITCH SEE DETAIL I
Buffer Drawing Sheet 28 of 44
NAD 83
-Y2RPD- ST Sta.13+38.888
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
SITE 5 (CON'T ON SHEET 7C)
36.3 TONS CL I RIPRAP W/62.7 SM FIL FAB
PIPE INVERT RAISED 0.5m FOR WATER DETENTION INSIDE RAMP AREA.
MATCHLINE -SR5- STA. 13+92 & -Y2RPD- STA. 13+19 SEE SHEET 7C
MATCHLINE -L- STA. 107+00 SEE SHEET 7C
PLANS PREPARED BY: RUMMEL • KLEPPER & KAHL, LLP consulting engineers
FOR DIVISION OF HIGHWAYS
REVISIONS


MATCHLINE -Y2LPD- STA. 14+31 &
-Y2RPD- STA. 15+94 SEE SHEET 7A
MATCHLINE -L- STA. 104+60 SEE SHEET 7A
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
METRIC
PROJECT REFERENCE NO.
R-2554BA
SHEET NO.
7B
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST. REV.
R/W REV.
-Y2RPD- ST Sta.15+90.915
7
SARAH SCOTT KIRBY
& SALLY WADE SCOTT
DB 02E PG 506
(CHORD)
-Y2LPD- ST Sta.14+08.197
-Y2LPD- TS Sta.10+65.000
-L- CS Sta.104+98.143
SITE 5
(CON'T ON
SHEET 7A)
-Y2RPD- CS Sta.15+45.915
EMILY W. PRIVOTT
DB 1486 PG 432
9
-SR5- PT Sta.12+08.407
0.9 TONS
CL B RIPRAP
W/4.2 SM
FIL FAB
INV OUT=
38.231
-Y2LPD- CS Sta.13+18.197
-Y2LPD- SC Sta.11+55.000
-Y2LPA-
0.9 TONS CL B RIPRAP
W/4.2 SM FIL FAB
-Y2RPA-
-L- ST Sta.105+58.143
LATERAL V DITCH
SEE DETAIL I
MATCHLINE -SR5- STA. 12+09
MATCHLINE -Y2LPA- STA. 11+66
N 42°03'56.0" E
N 85°15'20.0" E
-Y2LPD-
EMILY W. PRIVOTT
DB 1486 PG 432
9
-Y2RPD- SC Sta.14+33.883
-Y2RPD- TS Sta.13+88.883
LATERAL V DITCH
SEE DETAIL I
-Y2RPD- ST Sta.13+38.888
Buffer Drawing
Sheet 29 of 44
NAD 83
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
SITE 5
(CON'T ON
SHEET 7C)
36.3 TONS CL I RIPRAP
W/62.7 SM FIL FAB
PIPE INVERT RAISED 0.5m
FOR WATER DETENTION
INSIDE RAMP AREA.
MATCHLINE -SR5- STA. 13+92 &
-Y2RPD- STA. 13+19 SEE SHEET 7C
MATCHLINE -L- STA. 107+00 SEE SHEET 7C
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
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RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
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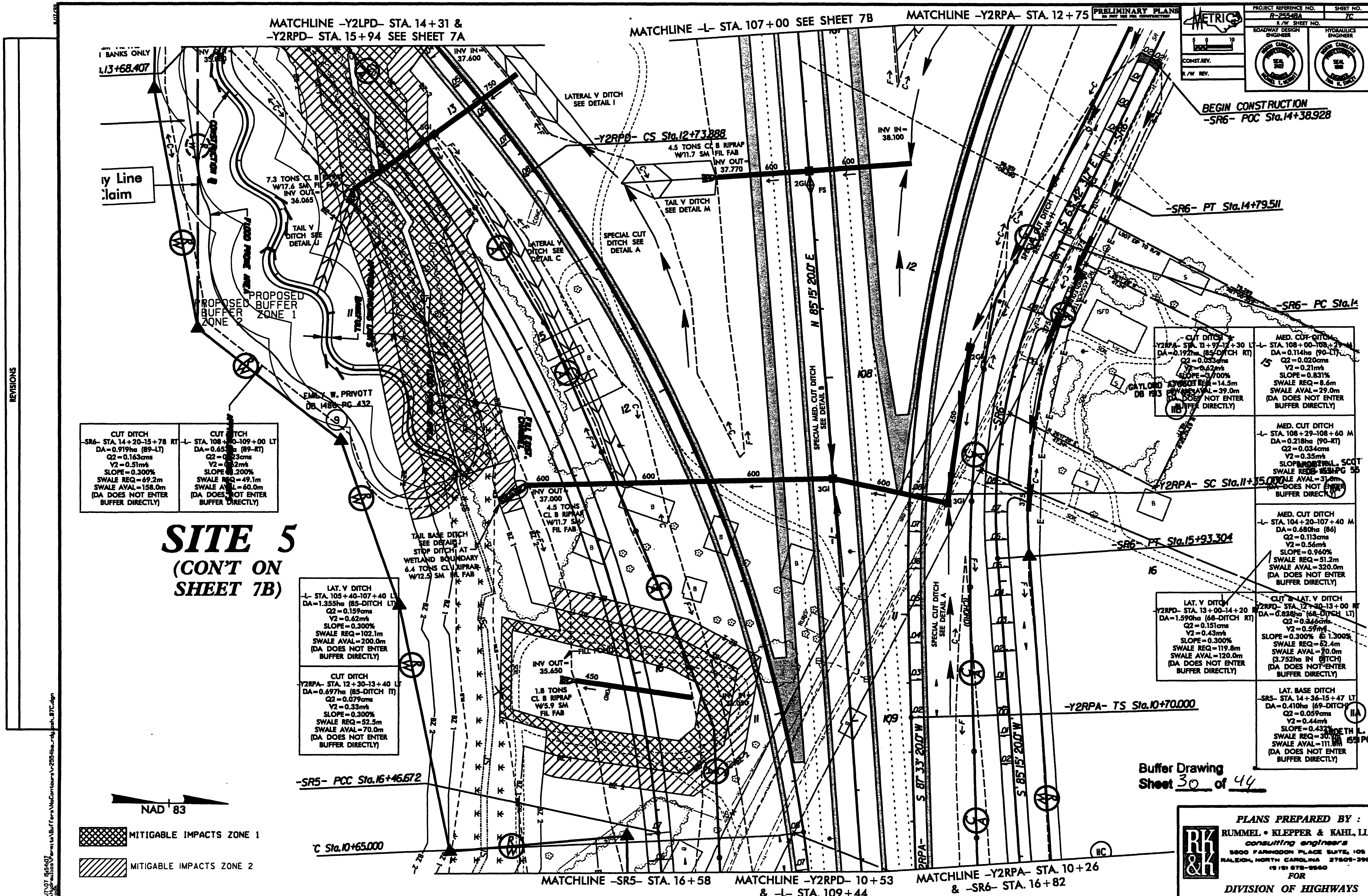
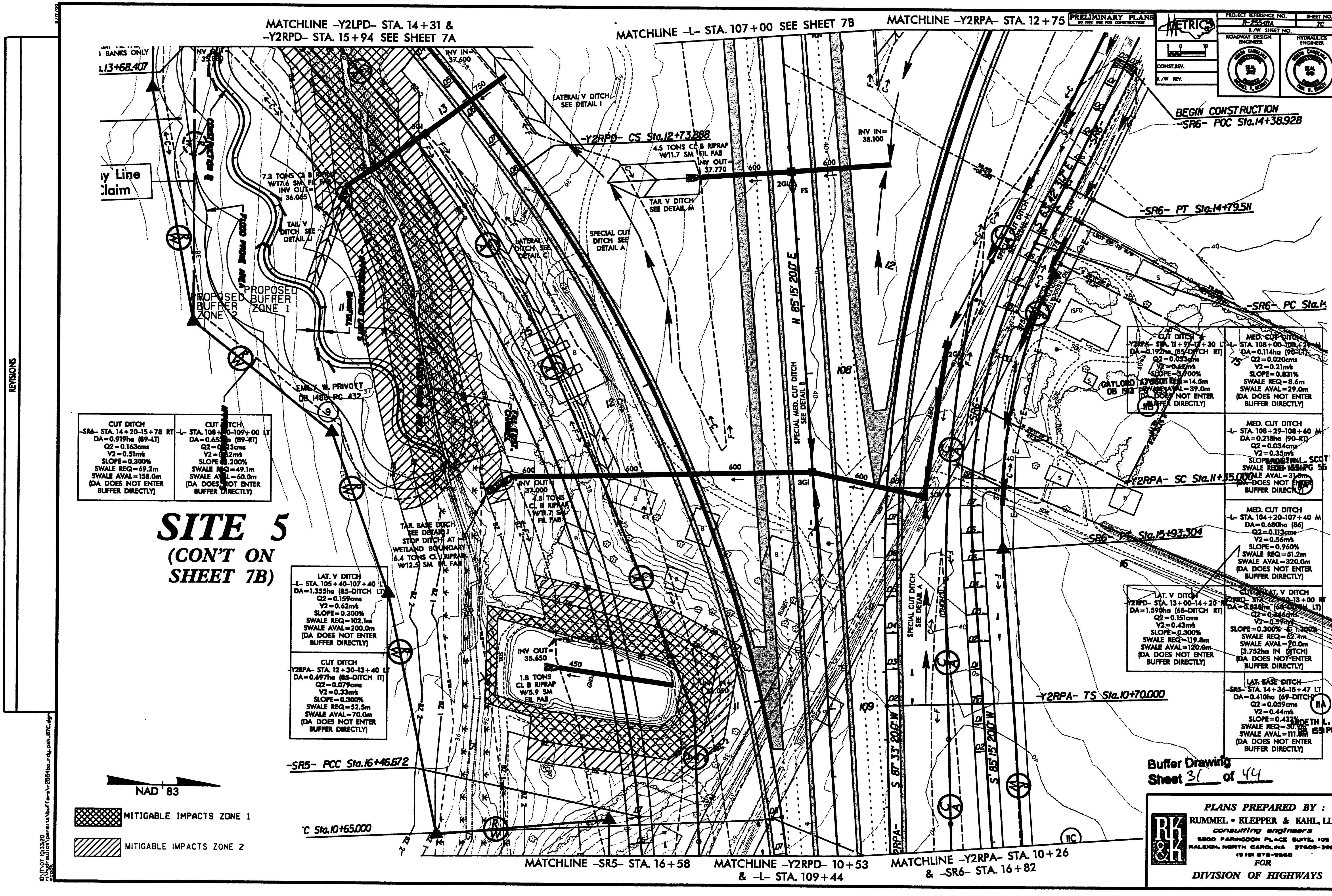


MATCHLINE -Y2LPD- STA. 14+31 & -Y2RPD- STA. 15+94 SEE SHEET 7A
MATCHLINE -L- STA. 107+00 SEE SHEET 7B
MATCHLINE -Y2RPA- STA. 12+75
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION
METRIC
PROJECT REFERENCE NO. R-2554BA
SHEET NO. 7C
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
BEGIN CONSTRUCTION -SR6- POC Sta.14+38.928
-SR6- PT Sta.14+79.511
-SR6- PC Sta.1
-Y2RPD- CS Sta.12+73.888
LATERAL V DITCH SEE DETAIL I
4.5 TONS CL B RIPRAP W/11.7 SM FIL FAB INV OUT= 37.770
TAIL V DITCH SEE DETAIL M
SPECIAL CUT DITCH SEE DETAIL A
INV IN= 38.100
INV IN= 37.600
7.3 TONS CL B RIPRAP W/17.6 SM FIL FAB INV OUT= 36.065
TAIL V DITCH SEE DETAIL J
LATERAL V DITCH SEE DETAIL C
SPECIAL MED. CUT DITCH SEE DETAIL B
N 85°15'20.0" E
PROPOSED BUFFER ZONE 2
PROPOSED BUFFER ZONE 1
EMILY W. PRIVOTT DB 1486 PG 432
GAYLORD ATWOOD DB 1513
CUT DITCH -Y2RPA- STA. 11+97-12+30 LT DA=0.192ha (85-DITCH RT) Q2=0.033cms V2=0.62m/s SLOPE=0.700% SWALE REQ=14.5m SWALE AVAL=39.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
MED. CUT DITCH -L- STA. 108+00-108+29 M DA=0.114ha (90-LT) Q2=0.020cms V2=0.21m/s SLOPE=0.831% SWALE REQ=8.6m SWALE AVAL=29.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
MED. CUT DITCH -L- STA. 108+29-108+60 M DA=0.218ha (90-RT) Q2=0.034cms V2=0.35m/s SWALE AVAL=31.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
MED. CUT DITCH -L- STA. 104+20-107+40 M DA=0.680ha (86) Q2=0.113cms V2=0.56m/s SLOPE=0.960% SWALE REQ=51.2m SWALE AVAL=320.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
CUT DITCH -SR6- STA. 14+20-15+78 RT DA=0.919ha (89-LT) Q2=0.163cms V2=0.51m/s SLOPE=0.300% SWALE REQ=69.2m SWALE AVAL=158.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
CUT DITCH -L- STA. 108+00-109+00 LT DA=0.655ha (89-RT) Q2=0.123cms SLOPE=0.200% SWALE REQ=49.1m SWALE AVAL=60.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
-Y2RPA- SC Sta.11+35.000
INV OUT= 37.000 4.5 TONS CL B RIPRAP W/11.7 SM FIL FAB
SITE 5 (CON'T ON SHEET 7B)
TAIL BASE DITCH SEE DETAIL J STOP DITCH AT WETLAND BOUNDARY 6.4 TONS CL B RIPRAP W/12.5 SM FIL FAB
-SR6- PT Sta.15+93.304
LAT. V DITCH -L- STA. 105+40-107+40 LT DA=1.355ha (85-DITCH LT) Q2=0.159cms V2=0.62m/s SLOPE=0.300% SWALE REQ=102.1m SWALE AVAL=200.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
CUT DITCH -Y2RPA- STA. 12+30-13+40 LT DA=0.697ha (85-DITCH IT) Q2=0.079cms V2=0.33m/s SLOPE=0.300% SWALE REQ=52.5m SWALE AVAL=70.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
LAT. V DITCH -Y2RPD- STA. 13+00-14+20 RT DA=1.590ha (68-DITCH RT) Q2=0.151cms V2=0.43m/s SLOPE=0.300% SWALE REQ=119.8m SWALE AVAL=120.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
CUT & LAT. V DITCH -Y2RPD- STA. 12+20-13+00 RT DA=0.838ha (68-DITCH LT) Q2=0.146cms V2=0.59m/s SLOPE=0.300% & 1.300% SWALE REQ=62.4m SWALE AVAL=70.0m (3.752ha IN DITCH) (DA DOES NOT ENTER BUFFER DIRECTLY)
LAT. BASE DITCH -SR5- STA. 14+36-15+47 LT DA=0.410ha (69-DITCH) Q2=0.059cms V2=0.44m/s SLOPE=0.432% SWALE REQ=30.9m SWALE AVAL=111.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
INV OUT= 35.650 1.8 TONS CL B RIPRAP W/5.9 SM FIL FAB
-Y2RPA- TS Sta.10+70.000
S 87°33'20.0" W
S 85°15'20.0" W
SPECIAL CUT DITCH SEE DETAIL A
Buffer Drawing Sheet 30 of 44
-SR5- PCC Sta.16+46.672
C Sta.10+65.000
NAD 83
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
MATCHLINE -SR5- STA. 16+58
MATCHLINE -Y2RPD- 10+53 & -L- STA. 109+44
MATCHLINE -Y2RPA- STA. 10+26 & -SR6- STA. 16+82
PLANS PREPARED BY : RUMMEL • KLEPPER & KAHL, LLP consulting engineers 5800 FARRINGDON PLACE SUITE 105 RALEIGH, NORTH CAROLINA 27609-3960 FOR DIVISION OF HIGHWAYS
REVISIONS



MATCHLINE -Y2LPD- STA. 14+31 & -Y2RPD- STA. 15+94 SEE SHEET 7A
MATCHLINE -L- STA. 107+00 SEE SHEET 7B
MATCHLINE -Y2RPA- STA. 12+75
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION
METRIC
PROJECT REFERENCE NO. R-2554BA
SHEET NO. 7C
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
BEGIN CONSTRUCTION -SR6- POC Sta.14+38.928
-SR6- PT Sta.14+79.511
-SR6- PC Sta.1
-Y2RPD- CS Sta.12+73.888
4.5 TONS CL B RIPRAP W/11.7 SM FIL FAB
INV OUT= 37.770
INV IN= 38.100
INV IN= 37.600
7.3 TONS CL B RIPRAP W/17.6 SM FIL FAB INV OUT= 36.065
TAIL V DITCH SEE DETAIL J
TAIL V DITCH SEE DETAIL M
LATERAL V DITCH SEE DETAIL I
LATERAL V DITCH SEE DETAIL C
SPECIAL CUT DITCH SEE DETAIL A
SPECIAL MED. CUT DITCH SEE DETAIL B
N 85°15' 20.0" E
PROPOSED BUFFER ZONE 2
PROPOSED BUFFER ZONE 1
EMILY W. PRIVOTT DB 1480 PG 432
GAYLORD A. SCOTT DB 193 PG 653
CUT DITCH -SR6- STA. 14+20-15+78 RT DA=0.919ha (89-LT) Q2=0.163cms V2=0.51m/s SLOPE=0.300% SWALE REQ=69.2m SWALE AVAL=158.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
CUT DITCH -L- STA. 108+40-109+00 LT DA=0.655ha (89-RT) Q2=0.123cms V2=0.52m/s SLOPE=0.200% SWALE REQ=49.1m SWALE AVAL=60.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
CUT DITCH -Y2RPA- STA. 11+97-12+30 LT DA=0.192ha (85-DITCH RT) Q2=0.033cms V2=0.62m/s SLOPE=3.700% SWALE REQ=14.5m SWALE AVAL=39.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
MED. CUT DITCH -L- STA. 108+00-108+29 M DA=0.114ha (90-LT) Q2=0.020cms V2=0.21m/s SLOPE=0.831% SWALE REQ=8.6m SWALE AVAL=29.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
MED. CUT DITCH -L- STA. 108+29-108+60 M DA=0.218ha (90-RT) Q2=0.034cms V2=0.35m/s SWALE AVAL=31.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
-Y2RPA- SC Sta.11+35.000
MED. CUT DITCH -L- STA. 104+20-107+40 M DA=0.680ha (86) Q2=0.113cms V2=0.56m/s SLOPE=0.960% SWALE REQ=51.2m SWALE AVAL=320.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
-SR6- PT Sta.15+93.304
LAT. V DITCH -Y2RPD- STA. 13+00-14+20 RT DA=1.590ha (68-DITCH RT) Q2=0.151cms V2=0.43m/s SLOPE=0.300% SWALE REQ=119.8m SWALE AVAL=120.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
CUT & LAT. V DITCH -Y2RPD- STA. 12+30-13+00 RT DA=0.828ha (68-DITCH LT) Q2=0.346cms V2=0.59m/s SLOPE=0.300% & 1.300% SWALE REQ=62.4m SWALE AVAL=70.0m (3.752ha IN DITCH) (DA DOES NOT ENTER BUFFER DIRECTLY)
LAT. BASE DITCH -SR5- STA. 14+36-15+47 LT DA=0.410ha (69-DITCH) Q2=0.059cms V2=0.44m/s SLOPE=0.432% SWALE AVAL=111.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
-Y2RPA- TS Sta.10+70.000
SITE 5
(CON'T ON SHEET 7B)
INV OUT= 37.000
7.5 TONS CL B RIPRAP W/11.7 SM FIL FAB
TAIL BASE DITCH SEE DETAIL J STOP DITCH AT WETLAND BOUNDARY 6.4 TONS CL B RIPRAP W/12.5 SM FIL FAB
LAT. V DITCH -L- STA. 105+40-107+40 LT DA=1.355ha (85-DITCH LT) Q2=0.159cms V2=0.62m/s SLOPE=0.300% SWALE REQ=102.1m SWALE AVAL=200.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
CUT DITCH -Y2RPA- STA. 12+30-13+40 LT DA=0.697ha (85-DITCH LT) Q2=0.079cms V2=0.33m/s SLOPE=0.300% SWALE REQ=52.5m SWALE AVAL=70.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
INV OUT= 35.650
1.8 TONS CL B RIPRAP W/5.9 SM FIL FAB
SPECIAL CUT DITCH SEE DETAIL A
S 81°33' 20.0" W
S 85°15' 20.0" W
-SR5- PCC Sta.16+46.672
C Sta.10+65.000
NAD 83
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
MATCHLINE -SR5- STA. 16+58
MATCHLINE -Y2RPD- 10+53 & -L- STA. 109+44
MATCHLINE -Y2RPA- STA. 10+26 & -SR6- STA. 16+82
Buffer Drawing Sheet 31 of 44
PLANS PREPARED BY:
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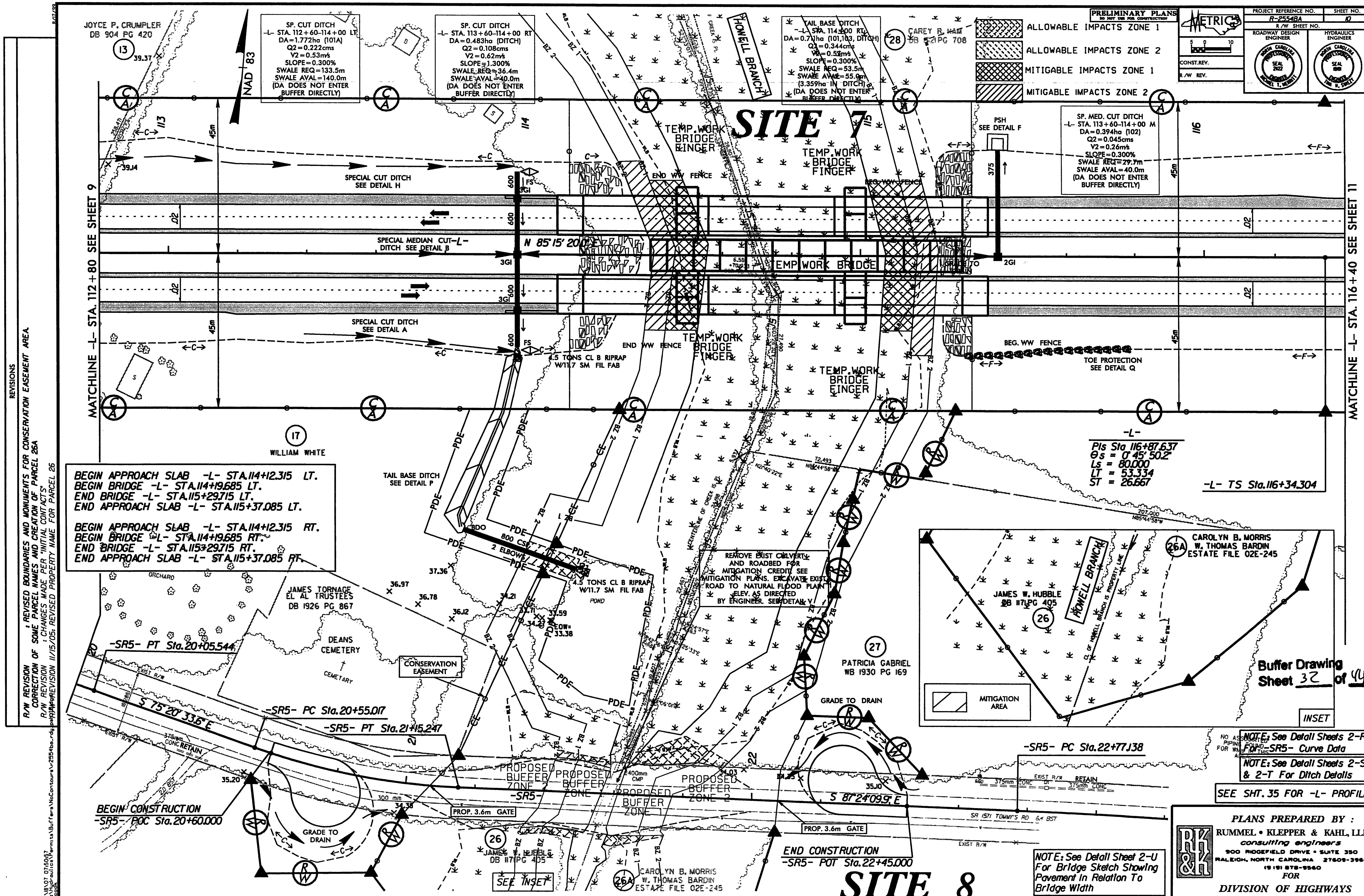
FOR
DIVISION OF HIGHWAYS
REVISIONS


SITE 7
SITE 8
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION
METRIC
PROJECT REFERENCE NO. R-2554BA
SHEET NO. 10
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST.REV.
R/W REV.
ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
JOYCE P. CRUMPLER
DB 904 PG 420
SP. CUT DITCH
-L- STA. 112+60-114+00 LT
DA=1.772ha (101A)
Q2=0.222cms
V2=0.53m/s
SLOPE=0.300%
SWALE REQ=133.5m
SWALE AVAL=140.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)
SP. CUT DITCH
-L- STA. 113+60-114+00 RT
DA=0.483ha (DITCH)
Q2=0.108cms
V2=0.62m/s
SLOPE=1.300%
SWALE REQ=36.4m
SWALE AVAL=40.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)
HOWELL BRANCH
TAIL BASE DITCH
-L- STA. 114+00 RT
SWALE REQ=53.5m
(DA DOES NOT ENTER BUFFER DIRECTLY)
CAREY R. HAM
DB 521 PG 708
SP. MED. CUT DITCH
-L- STA. 113+60-114+00 M
DA=0.394ha (102)
Q2=0.045cms
V2=0.26m/s
SLOPE=0.300%
SWALE REQ=29.7m
SWALE AVAL=40.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)
PSH
SEE DETAIL F
TEMP. WORK BRIDGE FINGER
END WW FENCE
BEG. WW FENCE
SPECIAL CUT DITCH
SEE DETAIL H
SPECIAL MEDIAN CUT-L- DITCH SEE DETAIL B
N 85°15' 20.0" E
TEMP WORK BRIDGE
SPECIAL CUT DITCH
SEE DETAIL A
4.5 TONS CL B RIPRAP W/11.7 SM FIL FAB
TOE PROTECTION
SEE DETAIL Q
MATCHLINE -L- STA. 112+80 SEE SHEET 9
MATCHLINE -L- STA. 116+40 SEE SHEET 11
WILLIAM WHITE
-L-
PIs Sta 116+87.637
Θs = 0° 45' 50.2"
Ls = 80.000
LT = 53.334
ST = 26.667
-L- TS Sta.116+34.304
BEGIN APPROACH SLAB -L- STA.114+12.315 LT.
BEGIN BRIDGE -L- STA.114+19.685 LT.
END BRIDGE -L- STA.115+29.715 LT.
END APPROACH SLAB -L- STA.115+37.085 LT.
BEGIN APPROACH SLAB -L- STA.114+12.315 RT.
BEGIN BRIDGE -L- STA.114+19.685 RT.
END BRIDGE -L- STA.115+29.715 RT.
END APPROACH SLAB -L- STA.115+37.085 RT.
TAIL BASE DITCH
SEE DETAIL P
REMOVE EXIST CULVERT AND ROADBED FOR MITIGATION CREDIT. SEE MITIGATION PLANS. EXCAVATE EXIST. ROAD TO NATURAL FLOOD PLAIN ELEV. AS DIRECTED BY ENGINEER. SEE DETAIL V
JAMES TORNAGE
EL AL TRUSTEES
DB 1926 PG 867
DEANS CEMETERY
CONSERVATION EASEMENT
CAROLYN B. MORRIS
W. THOMAS BARDIN
ESTATE FILE 02E-245
JAMES W. HUBBLE
DB 117 PG 405
MITIGATION AREA
INSET
PATRICIA GABRIEL
WB 1930 PG 169
Buffer Drawing Sheet 32 of 44
-SR5- PT Sta.20+05.544
-SR5- PC Sta.20+55.017
-SR5- PT Sta.21+15.247
S 75° 20' 33.6" E
BEGIN CONSTRUCTION
-SR5- POC Sta.20+60.000
GRADE TO DRAIN
PROP. 3.6m GATE
PROPOSED BUFFER ZONE 2
PROPOSED BUFFER ZONE 1
-SR5- PC Sta.22+77.138
S 87° 24' 09.9" E
SR 1571 TOMMY'S RD
END CONSTRUCTION
-SR5- POT Sta.22+45.000
SEE INSET
NOTE: See Detail Sheets 2-R For -SR5- Curve Data
NOTE: See Detail Sheets 2-S & 2-T For Ditch Details
SEE SHT. 35 FOR -L- PROFILE
NOTE: See Detail Sheet 2-U For Bridge Sketch Showing Pavement In Relation To Bridge Width
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
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900 RIDGEFIELD DRIVE • SUITE 350
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(919) 878-9560
FOR
DIVISION OF HIGHWAYS
REVISIONS
R/W REVISION : REVISED BOUNDARIES AND MONUMENTS FOR CONSERVATION EASEMENT AREA. CORRECTION OF SOME PARCEL NAMES AND CREATION OF PARCEL 26A
R/W REVISION : CHANGES MADE PER "INITIAL CONTACTS"
R/W REVISION 11/15/05: REVISED PROPERTY NAME FOR PARCEL 26

SITE 7

SITE 8

MATCHLINE -L- STA. 112+80 SEE SHEET 9

MATCHLINE -L- STA. 116+40 SEE SHEET 11

JOYCE P. CRUMPLER
DB 904 PG 420

CAREY R. HALE
WB 82 PG 708

WILLIAM WHITE

JAMES TORNAGE EL AL TRUSTEES
DB 1926 PG 867

DEANS CEMETERY

PATRICIA GABRIEL
WB 1930 PG 169

JAMES W. HUBBLE
DB 871 PG 405

CAROLYN B. MORRIS
W. THOMAS BARDIN
ESTATE FILE 02E-245

SP. CUT DITCH
-L- STA. 112+60-114+00 LT
DA=1.772ha (101A)
Q2=0.222cms
V2=0.53m/s
SLOPE=0.300%
SWALE REQ=133.5m
SWALE AVAL=140.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)

SP. CUT DITCH
-L- STA. 113+60-114+00 RT
DA=0.483ha (DITCH)
Q2=0.108cms
V2=0.62m/s
SLOPE=1.300%
SWALE REQ=36.4m
SWALE AVAL=40.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)

TAIL BASE DITCH
-L- STA. 114+00 RT
DA=0.711ha (101,103, DITCH)
Q2=0.344cms
V2=0.53m/s
SLOPE=0.300%
SWALE REQ=53.5m
SWALE AVAL=55.0m
(3.359ha IN DITCH)
(DA DOES NOT ENTER BUFFER DIRECTLY)

SP. MED. CUT DITCH
-L- STA. 113+60-114+00 M
DA=0.394ha (102)
Q2=0.045cms
V2=0.26m/s
SLOPE=0.300%
SWALE REQ=29.7m
SWALE AVAL=40.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)

SPECIAL CUT DITCH SEE DETAIL H

SPECIAL MEDIAN CUT DITCH SEE DETAIL B

SPECIAL CUT DITCH SEE DETAIL A

TEMP. WORK BRIDGE FINGER

END WW FENCE

BEG. WW FENCE

PSH SEE DETAIL F

TOE PROTECTION SEE DETAIL Q

N 85°15'20.0"E

S 75°20'33.6"E

S 87°24'09.9"E

-SR5- PT Sta.20+05.544

-SR5- PC Sta.20+55.017

-SR5- PT Sta.21+15.247

-SR5- PC Sta.22+77.138

-L-
Pls Sta 116+87.637
Θs = 0°45'50.2"
Ls = 80.000
LT = 53.334
ST = 26.667

-L- TS Sta.116+34.304

BEGIN APPROACH SLAB -L- STA.114+12.315 LT.
BEGIN BRIDGE -L- STA.114+19.685 LT.
END BRIDGE -L- STA.115+29.715 LT.
END APPROACH SLAB -L- STA.115+37.085 LT.

BEGIN APPROACH SLAB -L- STA.114+12.315 RT.
BEGIN BRIDGE -L- STA.114+19.685 RT.
END BRIDGE -L- STA.115+29.715 RT.
END APPROACH SLAB -L- STA.115+37.085 RT.

BEGIN CONSTRUCTION
-SR5- POC Sta.20+60.000

END CONSTRUCTION
-SR5- POT Sta.22+45.000

REMOVE EXIST CULVERT AND ROADBED FOR MITIGATION CREDIT. SEE MITIGATION PLANS. EXCAVATE EXIST. ROAD TO NATURAL FLOOD PLAIN ELEV. AS DIRECTED BY ENGINEER. SEE DETAIL V

TAIL BASE DITCH SEE DETAIL P

2.5 TONS CL B RIPRAP W11.7 SM FIL FAB

POND

CONSERVATION EASEMENT

PROPOSED BUFFER ZONE 1

PROPOSED BUFFER ZONE 2

PROP. 3.6m GATE

GRADE TO DRAIN

RETAIN

SEE INSET

HOWELL BRANCH

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

MITIGATION AREA

INSET

Buffer Drawing Sheet 33 of 44

NOTE: See Detail Sheets 2-R For -SR5- Curve Data

NOTE: See Detail Sheets 2-S & 2-T For Ditch Details

SEE SHT. 35 FOR -L- PROFILE

NOTE: See Detail Sheet 2-U For Bridge Sketch Showing Pavement In Relation To Bridge Width

PRELIMINARY PLANS
NO. NOT USE FOR CONSTRUCTION

METRIC

PROJECT REFERENCE NO. R-2548A
SHEET NO. RD
R/W SHEET NO.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 022 ENGINEER MICHAEL T. MUMFORD

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 16816 ENGINEER JOHN W. SWEET

CONST. REV.

R/W REV.

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consulting engineers
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(919) 878-9560
FOR
DIVISION OF HIGHWAYS

REVISIONS
1 REVISED BOUNDARIES AND MONUMENTS FOR CONSERVATION EASEMENT AREA.
R/W REVISION CORRECTION OF SOME PARCEL NAMES AND CREATION OF PARCEL 26A
R/W REVISION : CHANGES MADE PER "INITIAL CONTACTS"
R/W REVISION 11/15/05: REVISED PROPERTY NAME FOR PARCEL 26

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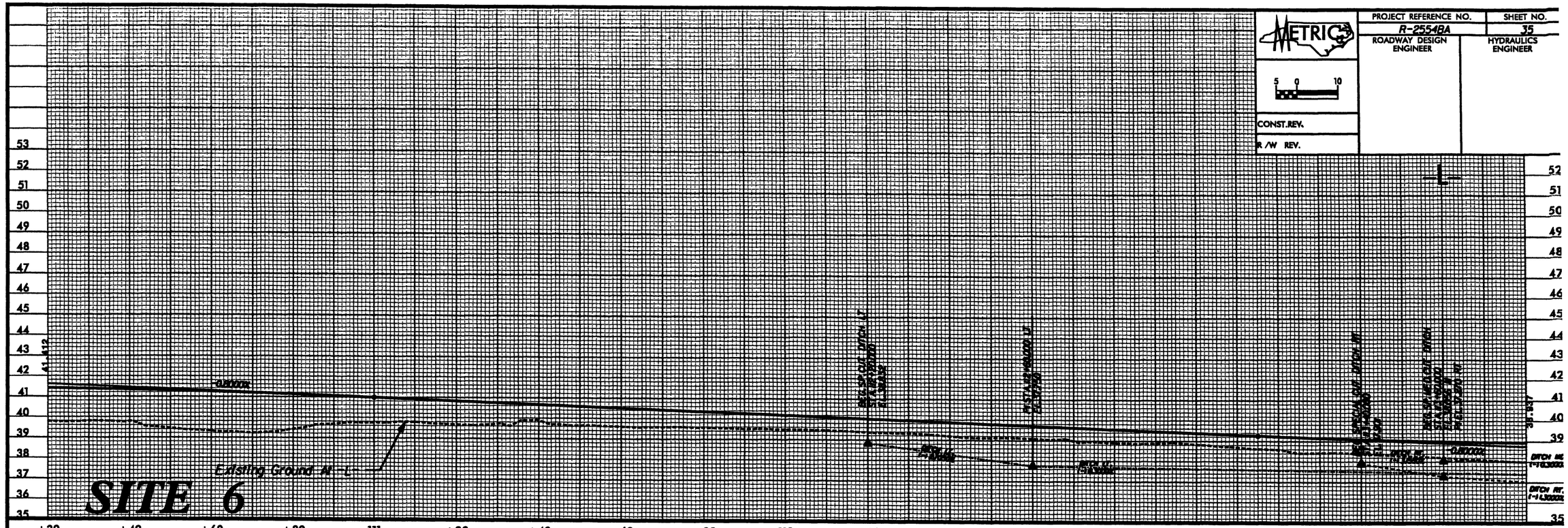
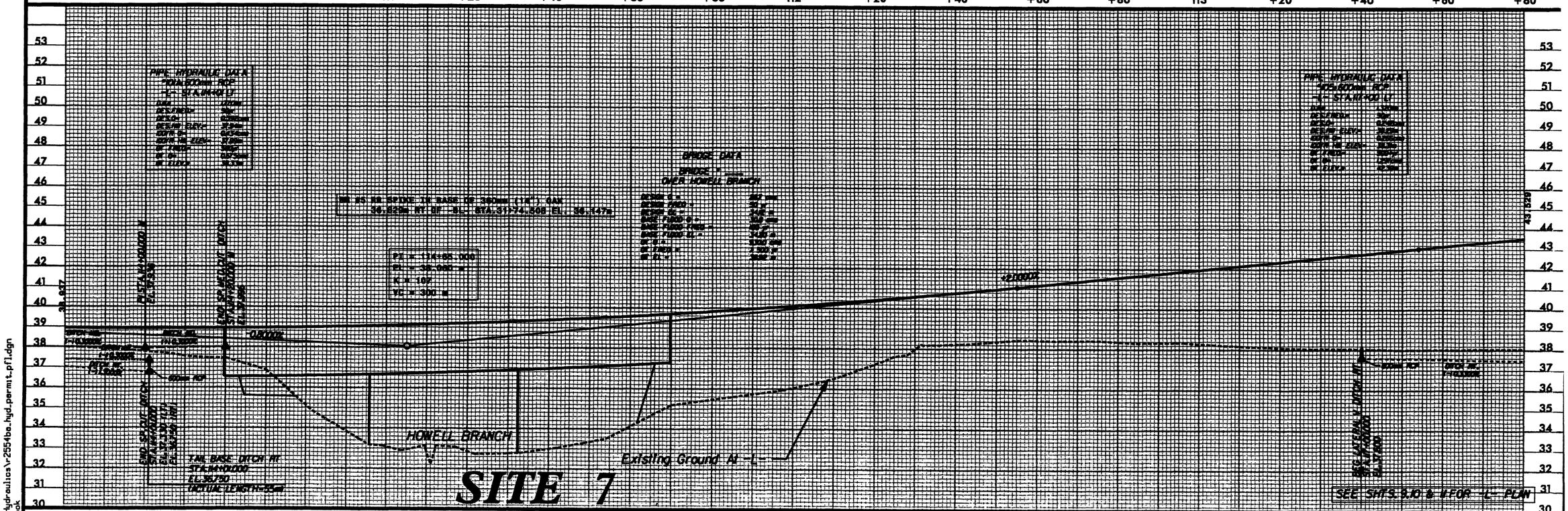
mcook

METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	R-2554BA	35
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R /W REV.		





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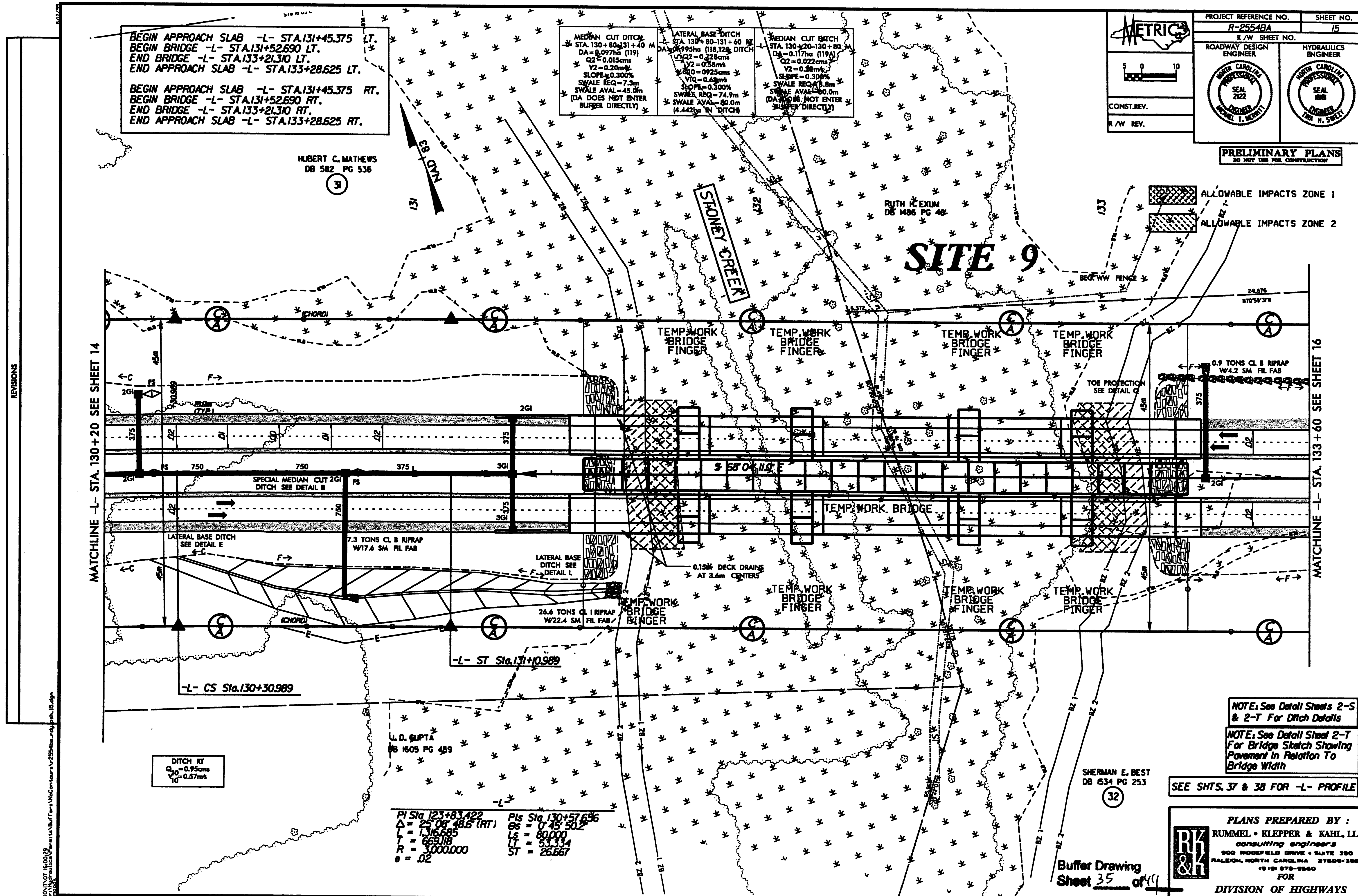
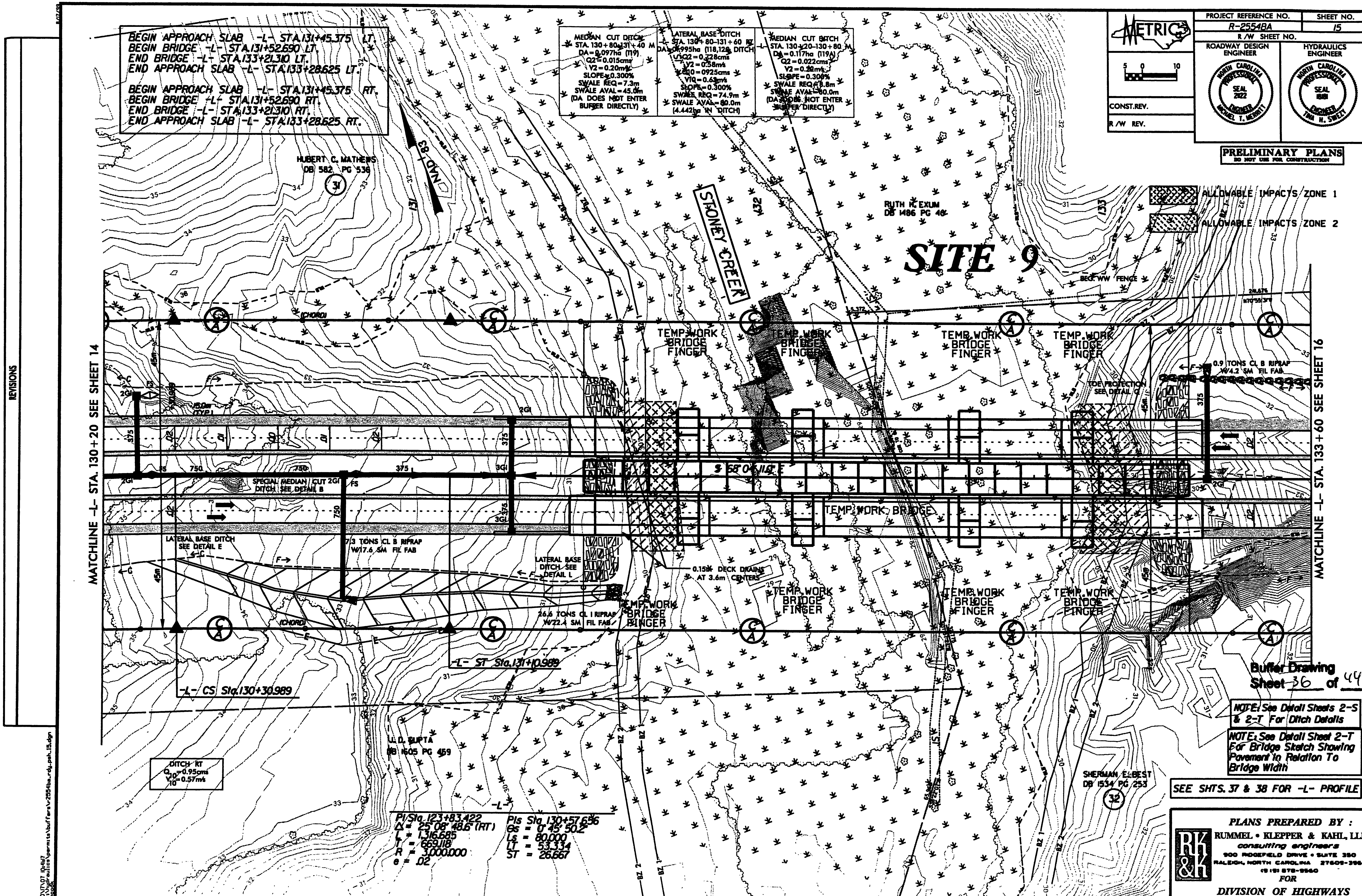
mcook

Buffer Drawing
Sheet 34 of 44


BEGIN APPROACH SLAB -L- STA.131+45.375 LT.
BEGIN BRIDGE -L- STA.131+52.690 LT.
END BRIDGE -L- STA.133+21.310 LT.
END APPROACH SLAB -L- STA.133+28.625 LT.
BEGIN APPROACH SLAB -L- STA.131+45.375 RT.
BEGIN BRIDGE -L- STA.131+52.690 RT.
END BRIDGE -L- STA.133+21.310 RT.
END APPROACH SLAB -L- STA.133+28.625 RT.
MEDIAN CUT DITCH
-L- STA. 130+80-131+40 M
DA=0.097ha (119)
Q2=0.015cms
V2=0.20m/s
SLOPE=0.300%
SWALE REQ=7.3m
SWALE AVAL=45.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)
LATERAL BASE DITCH
-L- STA. 130+80-131+60 RT
DA=0.995ha (118,120, DITCH)
Q2=0.728cms
V2=0.58m/s
Q10=0925cms
V10=0.63m/s
SLOPE=0.300%
SWALE REQ=74.9m
SWALE AVAL=80.0m
(4.442ha IN DITCH)
MEDIAN CUT DITCH
-L- STA. 130+20-130+80 M
DA=0.117ha (119A)
Q2=0.022cms
V2=0.20m/s
SLOPE=0.300%
SWALE REQ=8.8m
SWALE AVAL=60.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)
METRIC
PROJECT REFERENCE NO.
R-2554BA
SHEET NO.
15
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST.REV.
R/W REV.
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
HUBERT C. MATHEWS
DB 582 PG 536
31
NAD 83
STONEY CREEK
RUTH H. EXUM
DB 1486 PG 46
ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
SITE 9
TEMP. WORK BRIDGE FINGER
TEMP. WORK BRIDGE
0.9 TONS CL B RIPRAP W/4.2 SM FIL FAB
TOE PROTECTION SEE DETAIL C
SPECIAL MEDIAN CUT DITCH SEE DETAIL B
LATERAL BASE DITCH SEE DETAIL E
7.3 TONS CL B RIPRAP W/17.6 SM FIL FAB
LATERAL BASE DITCH SEE DETAIL L
0.15m DECK DRAINS AT 3.6m CENTERS
26.6 TONS CL I RIPRAP W/22.4 SM FIL FAB
MATCHLINE -L- STA. 130+20 SEE SHEET 14
MATCHLINE -L- STA. 133+60 SEE SHEET 16
-L- ST Sta.131+10.989
-L- CS Sta.130+30.989
U. D. GUPTA
DB 1605 PG 459
DITCH RT
Q10=0.95cms
V10=0.57m/s
-L-
PI Sta 123+83.422
Δ = 25°08' 48.6" (RT)
L = 1,316.685
T = 669.118
R = 3,000.000
e = .02
PIs Sta 130+57.656
θs = 0°45' 50.2"
Ls = 80.000
LT = 53.334
ST = 26.667
NOTE: See Detail Sheets 2-S & 2-T For Ditch Details
NOTE: See Detail Sheet 2-T For Bridge Sketch Showing Pavement In Relation To Bridge Width
SEE SHTS. 37 & 38 FOR -L- PROFILE
SHERMAN E. BEST
DB 1534 PG 253
32
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
900 RIDGEFIELD DRIVE • SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
FOR
DIVISION OF HIGHWAYS
Buffer Drawing
Sheet 35 of 41
REVISIONS



BEGIN APPROACH SLAB -L- STA.131+45.375 LT.
BEGIN BRIDGE -L- STA.131+52.690 LT.
END BRIDGE -L- STA.133+21.310 LT.
END APPROACH SLAB -L- STA.133+28.625 LT.
BEGIN APPROACH SLAB -L- STA.131+45.375 RT.
BEGIN BRIDGE -L- STA.131+52.690 RT.
END BRIDGE -L- STA.133+21.310 RT.
END APPROACH SLAB -L- STA.133+28.625 RT.
METRIC
PROJECT REFERENCE NO. R-2554BA
SHEET NO. 15
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST. REV.
R/W REV.
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
HUBERT C. MATHEWS
DB 582 PG 536
STONEY CREEK
RUTH H. EXUM
DB 1486 PG 46
SITE 9
TEMP. WORK BRIDGE FINGER
TEMP. WORK BRIDGE
MATCHLINE -L- STA. 130+20 SEE SHEET 14
MATCHLINE -L- STA. 133+60 SEE SHEET 16
SPECIAL MEDIAN CUT DITCH SEE DETAIL B
LATERAL BASE DITCH SEE DETAIL E
LATERAL BASE DITCH SEE DETAIL L
7.3 TONS CL B RIPRAP W/17.6 SM FIL FAB
26.6 TONS CL I RIPRAP W/22.4 SM FIL FAB
0.9 TONS CL B RIPRAP W/4.2 SM FIL FAB
TOE PROTECTION SEE DETAIL C
0.15m DECK DRAINS AT 3.6m CENTERS
-L- ST Sta.131+10.989
-L- CS Sta.130+30.989
Buffer Drawing Sheet 36 of 44
NOTE: See Detail Sheets 2-S & 2-T For Ditch Details
NOTE: See Detail Sheet 2-T For Bridge Sketch Showing Pavement In Relation To Bridge Width
SEE SHTS. 37 & 38 FOR -L- PROFILE
U. D. GUPTA
DB 1605 PG 459
SHERMAN E. BEST
DB 1534 PG 253
PI Sta.123+83.422
Δ = 25°08' 48.6" (RT)
L = 1,316.685
T = 669.118
R = 3,000.000
e = .02
PIs Sta.130+57.656
θs = 0°45' 50.2"
Ls = 80.000
LT = 53.334
ST = 26.667
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
900 RIDGEFIELD DRIVE • SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS
REVISIONS

METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	R-2554BA	37
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R /W REV.		

-L-

PI = 120+00.000
EL = 38.564 m
VC = 200 m
K = 53.8

Existing Ground At -L-

40.104

38.961

-0.78%

FOR UNDERCUT SEE CROSS SECTION SHEETS 72 TO 72

+60 +80 125 +20 +40 +60 +80 126 +20 +40 +60 +80 127 +20 +40 +60 +80 128 +20

BRIDGE DATA
BRIDGE #
OVER STONEY CREEK

PI = 130+07.000
EL = 36.016 m
VC = 300 m
K = 184

BM 86 RR SPIKE IN BASE OF 810mm (24") OAK
50.661m LT OF -L- STA.129+86.305

Existing Ground At -L-

38.961

-0.78%

BEG BR #
EL=36.298

END BR #
EL=36.298

36.298

SITE 9

SEE SHTS 13 M & 78 FOR -L- PLAN

+20 +40 +60 +80 129 +20 +40 +60 +80 130 +20 +40 +60 +80 131 +20 +40 +60 +80

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mcook

Buffer Drawing
Sheet 37 of 44

METRIC

5 0 10

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	38
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CONST.REV.	
R /W REV.	

BRIDGE DATA
BRIDGE # ____
OVER STONEY CREEK

DESIGN Q =	850 cms
DESIGN FREQ =	50 yr
DESIGN EL. =	3049 ft
BASE FLOOD Q =	1417 cms
BASE FLOOD FREQ =	100 yr
BASE FLOOD EL. =	3055 ft
Q OPT =	2460 cms
OPT FREQ =	1 500 yr
OPT EL. =	3065 ft

BM #8 RR SPIKE IN BASE OF 810mm (32") PINE
45.754m LT OF -BL- STA.51+28.380 EL. 32.631m

STONEY CREEK

Existing Ground At -L-

SITE 9

PIPE HYDRAULIC DATA
1524.00mm RCP
-L- STA.52+92.00
INV. 2974m
INV.FINISH 2974m
SPAN 1524mm
RISE 1524mm
RCP/AP ELEV. 3049m
DEPTH OF 3049m
DEPTH OF CONC. 3049m
Q = (MGS) 3049m
Q = cms 3049m
V ELEV. 3049m

BM #10 RR SPIKE IN BASE OF 350mm (16") OAK
52.639m LT OF -BL- STA.54+93.003 EL. 36.785m

PI = 134+00.000
EL = 36.825 m
VC = 200 m
K = 1599

SEE SHTS.15 & 17 FOR "-L-" PLAN

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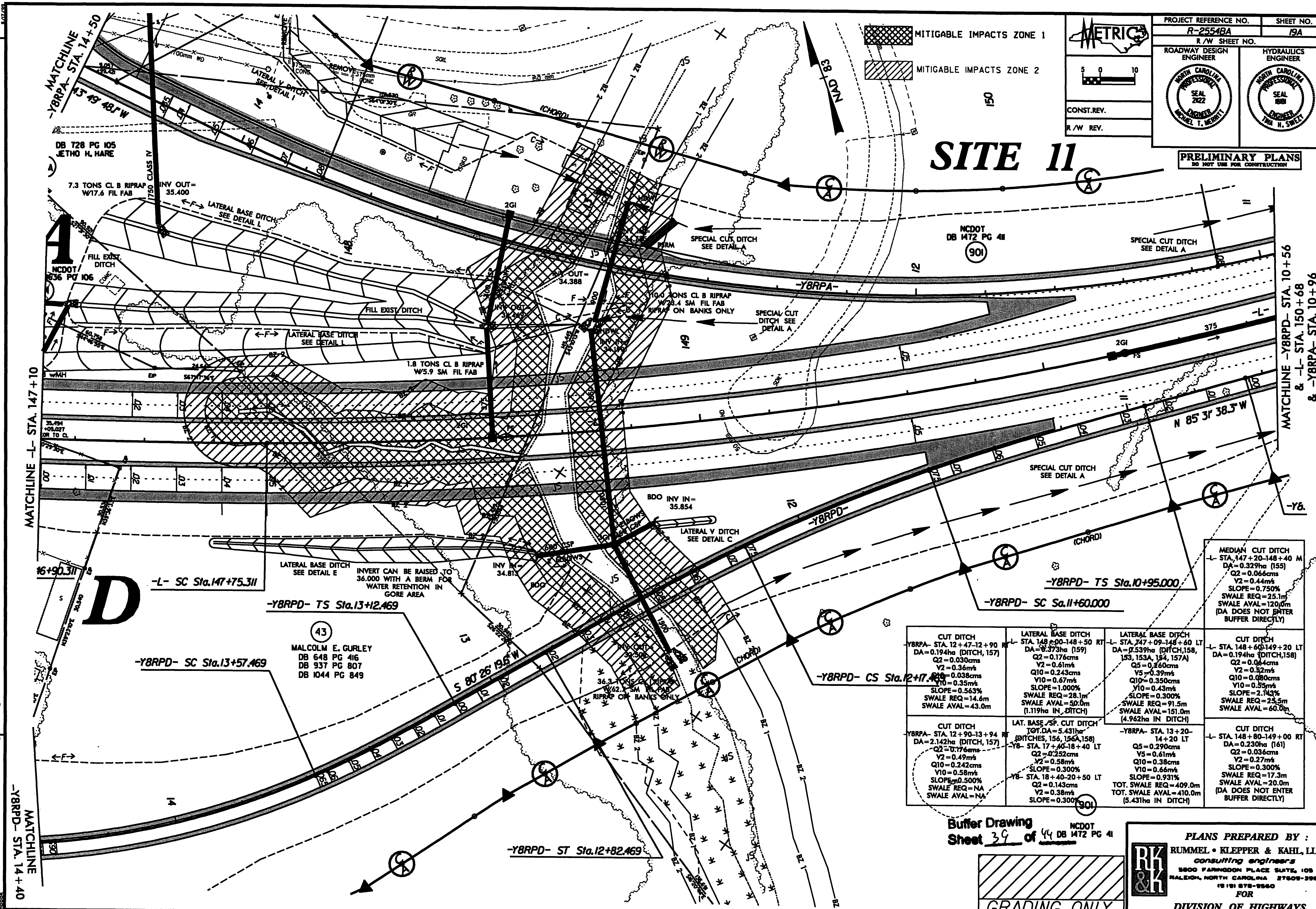
R:\Hydraulics\r2554ba_hyd_permit_pfl.dgn
mcook


PROJECT REFERENCE NO. R-2554BA
SHEET NO. 19A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
METRIC
CONST.REV.
R/W REV.
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
SITE 11
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
NAD 83
MATCHLINE -Y8RPA- STA. 14+50
MATCHLINE -L- STA. 147+10
MATCHLINE -Y8RPD- STA. 14+40
MATCHLINE -Y8RPD- STA. 10+56 & -L- STA. 150+68 & -Y8RPA- STA. 10+96
DB 728 PG 105
JETHO H. HARE
NCDOT
DB 1472 PG 41
7.3 TONS CL B RIPRAP W/17.6 FIL FAB
INV OUT= 35.400
LATERAL BASE DITCH SEE DETAIL L
LATERAL V DITCH SEE DETAIL 1
FILL EXIST. DITCH
SPECIAL CUT DITCH SEE DETAIL A
10.0 TONS CL B RIPRAP W/23.4 SM FIL FAB RIPRAP ON BANKS ONLY
1.8 TONS CL B RIPRAP W/5.9 SM FIL FAB
INV OUT= 34.388
BDO INV IN= 35.854
LATERAL V DITCH SEE DETAIL C
LATERAL BASE DITCH SEE DETAIL E
INVERT CAN BE RAISED TO 36.000 WITH A BERM FOR WATER RETENTION IN GORE AREA
-L- SC Sta.147+75.311
-Y8RPD- TS Sta.13+12.469
-Y8RPD- SC Sta.13+57.469
-Y8RPD- CS Sta.12+17.469
-Y8RPD- ST Sta.12+82.469
-Y8RPD- TS Sta.10+95.000
-Y8RPD- SC Sa.11+60.000
36.3 TONS CL B RIPRAP W/62.7 SM FIL FAB RIPRAP ON BANKS ONLY
N 85° 31' 38.3" W
S 80° 26' 19.6" W
43° 49' 48.1" W
MALCOLM E. GURLEY
DB 648 PG 416
DB 937 PG 807
DB 1044 PG 849
CUT DITCH
-Y8RPA- STA. 12+47-12+90 RT
DA=0.194ha (DITCH, 157)
Q2=0.030cms
V2=0.36m/s
Q10=0.038cms
V10=0.35m/s
SLOPE=0.563%
SWALE REQ=14.6m
SWALE AVAL=43.0m
LATERAL BASE DITCH
-L- STA. 148+00-148+50 RT
DA=0.373ha (159)
Q2=0.176cms
V2=0.61m/s
Q10=0.243cms
V10=0.67m/s
SLOPE=1.000%
SWALE REQ=28.1m
SWALE AVAL=50.0m
(1.119ha IN DITCH)
LATERAL BASE DITCH
-L- STA. 147+09-148+60 LT
DA=0.539ha (DITCH,158, 153, 153A, 154, 157A)
Q5=0.260cms
V5=0.39m/s
Q10=0.350cms
V10=0.43m/s
SLOPE=0.300%
SWALE REQ=91.5m
SWALE AVAL=151.0m
(4.962ha IN DITCH)
MEDIAN CUT DITCH
-L- STA. 147+20-148+40 M
DA=0.329ha (155)
Q2=0.066cms
V2=0.44m/s
SLOPE=0.750%
SWALE REQ=25.1m
SWALE AVAL=120.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)
CUT DITCH
-L- STA. 148+60-149+20 LT
DA=0.194ha (DITCH,158)
Q2=0.064cms
V2=0.52m/s
Q10=0.080cms
V10=0.55m/s
SLOPE=2.143%
SWALE REQ=25.5m
SWALE AVAL=60.0m
CUT DITCH
-Y8RPA- STA. 12+90-13+94 RT
DA=2.142ha (DITCH, 157)
Q2=0.176cms
V2=0.49m/s
Q10=0.242cms
V10=0.58m/s
SLOPE=0.500%
SWALE REQ=NA
SWALE AVAL=NA
LAT. BASE /SP. CUT DITCH
TOT.DA=5.431ha
(DITCHES, 156, 156A,158)
-Y8- STA. 17+40-18+40 LT
Q2=0.252cms
V2=0.58m/s
SLOPE=0.300%
-Y8- STA. 18+40-20+50 LT
Q2=0.143cms
V2=0.38m/s
SLOPE=0.300%
-Y8RPA- STA. 13+20-14+20 LT
Q5=0.290cms
V5=0.61m/s
Q10=0.38cms
V10=0.66m/s
SLOPE=0.931%
TOT. SWALE REQ=409.0m
TOT. SWALE AVAL=410.0m
(5.431ha IN DITCH)
CUT DITCH
-L- STA. 148+80-149+00 RT
DA=0.230ha (161)
Q2=0.036cms
V2=0.27m/s
SLOPE=0.300%
SWALE REQ=17.3m
SWALE AVAL=20.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)
Buffer Drawing Sheet 39 of 44
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
FOR
DIVISION OF HIGHWAYS
GRADING ONLY

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	19A
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 2922 ENGINEER MICHEL T. MERRITT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 1881 ENGINEER TINA H. SWEET

CONST.REV.

R/W REV.

METRIC 5 0 10

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

SITE 11

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

MATCHLINE -Y8RPA- STA. 14+50

-Y8RPA- STA. 14+50

-L- STA. 147+10

MATCHLINE -L- STA. 147+10

MATCHLINE -Y8RPD- STA. 10+56 & -L- STA. 150+68 & -Y8RPA- STA. 10+96

MATCHLINE -L- STA. 14+40 -Y8RPD- STA. 10+56

DB 728 PG 105 JETHO H. HARE

NCDOT DB 1472 PG 41

NCDOT DB 1536 PG 106

MALCOLM E. GURLEY DB 648 PG 416 DB 937 PG 807 DB 1044 PG 849

7.3 TONS CL B RIPRAP W17.9 FIL FAB

INV OUT= 35.400

INV OUT= 34.388

10.0 TONS CL B RIPRAP W28.4 SM FIL FAB RIPRAP ON BANKS ONLY

8.5 TONS CL B RIPRAP W24.9 SM FIL FAB

36.3 TONS CL B RIPRAP W62.1 SM FIL FAB RIPRAP ON BANKS ONLY

INVERT CAN BE RAISED TO 36.000 WITH A BERM FOR WATER RETENTION IN GORE AREA

INV IN 34.81

BDO INV IN 34.62

FILL EXIST. DITCH

LATERAL BASE DITCH SEE DETAIL L

LATERAL BASE DITCH SEE DETAIL I

LATERAL BASE DITCH SEE DETAIL E

LATERAL V DITCH SEE DETAIL C

SPECIAL CUT DITCH SEE DETAIL A

-Y8RPD- TS Sta.13+12.469

-Y8RPD- SC Sta.13+57.469

-L- SC Sta.147+75.311

-Y8RPD- ST Sta.12+82.469

-Y8RPD- CS Sta.12+17.469

-Y8RPD- TS Sta.10+95.000

-Y8RPD- SC Sta.11+60.000

S 80° 26' 19.5" W

N 85° 31' 38.3" W

CUT DITCH
-Y8RPA- STA. 12+47-12+90 RT
DA=0.194ha (DITCH, 157)
Q2=0.030cms
V2=0.36m/s
Q10=0.038cms
V10=0.39m/s
SLOPE=0.563%
SWALE REQ=14.6m
SWALE AVAL=43.0m

CUT DITCH
-Y8RPA- STA. 12+90-13+94 RT
DA=2.142ha (DITCH, 157)
Q2=0.176cms
V2=0.49m/s
Q10=0.242cms
V10=0.58m/s
SLOPE=0.500%
SWALE REQ=NA
SWALE AVAL=NA

LATERAL BASE DITCH
STA. 148+00-148+50 RT
DA=0.373ha (159)
Q2=0.176cms
V2=0.61m/s
Q10=0.243cms
V10=0.67m/s
SLOPE=1.000%
SWALE REQ=28.1m
SWALE AVAL=50.0m
(1.119ha IN DITCH)

LAT. BASE /SP. CUT DITCH
TOT. DA=5.431ha
(DITCHES, 156, 156A, 158)
-Y8- STA. 17+40-18+40 LT
Q2=0.252cms
V2=0.58m/s
SLOPE=0.300%
-Y8- STA. 18+40-20+50 LT
Q2=0.143cms
V2=0.38m/s
SLOPE=0.300%

LATERAL BASE DITCH
STA. 147+09-148+60 LT
DA=0.539ha (DITCH, 158, 153, 153A, 154, 157A)
Q5=0.360cms
V5=0.39m/s
Q10=0.350cms
V10=0.43m/s
SLOPE=0.300%
SWALE REQ=91.5m
SWALE AVAL=157.0m
(4.962ha IN DITCH)

-Y8RPA- STA. 13+20-14+20 LT
Q5=0.290cms
V5=0.61m/s
Q10=0.38cms
V10=0.66m/s
SLOPE=0.931%
TOT. SWALE REQ=409.0m
TOT. SWALE AVAL=410.0m
(5.431ha IN DITCH)

MEDIAN CUT DITCH
-L- STA. 147+20-148+40 RT
DA=0.329ha (155)
Q2=0.066cms
V2=0.44m/s
SLOPE=0.750%
SWALE REQ=25.1m
SWALE AVAL=120.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)

CUT DITCH
-L- STA. 148+60-149+20 LT
DA=0.194ha (DITCH, 158)
Q2=0.064cms
V2=0.82m/s
Q10=0.080cms
V10=0.95m/s
SLOPE=2.143%
SWALE REQ=25.5m
SWALE AVAL=60.0m

CUT DITCH
-L- STA. 148+80-149+00 RT
DA=0.230ha (161)
Q2=0.036cms
V2=0.27m/s
SLOPE=0.300%
SWALE REQ=17.3m
SWALE AVAL=20.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)

Buffer Drawing
Sheet 40 of 44

GRADING ONLY

PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
3800 PARKWOOD PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3860
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	25
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 2822 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 16161 ENGINEER TIM H. SWEATT

METRIC 5 0 10

CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NO "A" BASIN REQUIRED.
THE DRAINAGE IS MINIMAL.

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

NAD 83

101 102 103

SITE 13

MATCHLINE -L2- STA. 100+00 SEE SHEET 24

LATERAL BASE DITCH SEE DETAIL O

SHOULDER BERM GUTTER -L- STA. 101+40 TO 102+10

EXIST. CABLE GUIDERAIL

1350mm

1350 mm

2GI W/ FLAT GRATE

2GIW/FLAT GRATE

EXIST SHOULDER BERM GUTTER

REMOVE 2GI

COLLAR

375mm

2GI

RETAIN SYSTEM

600mm

600 mm

-L2-

BZ 1

BZ 2

-L2- POC Sta.102+10.000
END CONSTRUCTION

Buffer Drawing Sheet 41 of 44

NOTE: See Detail Sheets 2-S & 2-T For Ditch Details

NOTE: See Detail Sheet 2-O for Interchange Curve Data.

SEE SHT. 46 FOR -L2- PROFILE

PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
900 ROEBLING DRIVE • SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

REVISIONS

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PLOTTED BY:[Mark Warnick]
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METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	R-2554BA	25
CONST.REV.	R /W SHEET NO.	
R /W REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 2922 ENGINEER MICHAEL T. MERRITT

NORTH CAROLINA PROFESSIONAL SEAL 16161 ENGINEER TIMOTHY W. SWEATT

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NO "A" BASIN REQUIRED.
THE DRAINAGE IS MINIMAL.

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

NAD 83

SITE 13

MATCHLINE -L2- STA. 100+00 SEE SHEET 24

LATERAL BASE DITCH SEE DETAIL

SHOULDER BERM GUTTER -L- STA. 101+40 TO 102+10

2GI W/ FLAT GRATE

2GI

REMOVE 2GI COLLAR

EXIST. CABLE GUIDERAIL

1350mm

375mm

2GI

RETAIN SYSTEM

600mm

EXIST SHOULDER BERM GUTTER

-L2- POC Sta.102+10.000
END CONSTRUCTION

NOTE: See Detail Sheets 2-S & 2-T For Ditch Details

NOTE: See Detail Sheet 2-O for Interchange Curve Data.

SEE SHT. 46 FOR -L2- PROFILE

Buffer Drawing
Sheet 47 of 411

PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
900 RIDGEFIELD DRIVE • SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	26
R/W SHEET NO.	

METRIC

CONST. REV.

R/W REV.

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 22122 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 18181 ENGINEER TWA H. SWEZY

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

CUT DITCH	LATERAL V DITCH
-Y2- STA. 12+40-12+62 LT	-Y2- STA. 12+62-13+00 LT
DA=0.077ha (DITCH)	DA=0.391ha (DITCH)
Q2=0.012cms	Q2=0.126cms
V2=0.49m/s	V2=0.58m/s
Q10=0.015cms	Q10=0.166cms
V10=0.53m/s	V10=0.62m/s
SLOPE=4.000%	SLOPE=0.300%
SWALE REQ=5.8m	SWALE REQ=29.4m
SWALE AVAL=22.0m	SWALE AVAL=38.0m

NO "A" BASIN REQUIRED. THE DRAINAGE IS MINIMAL.

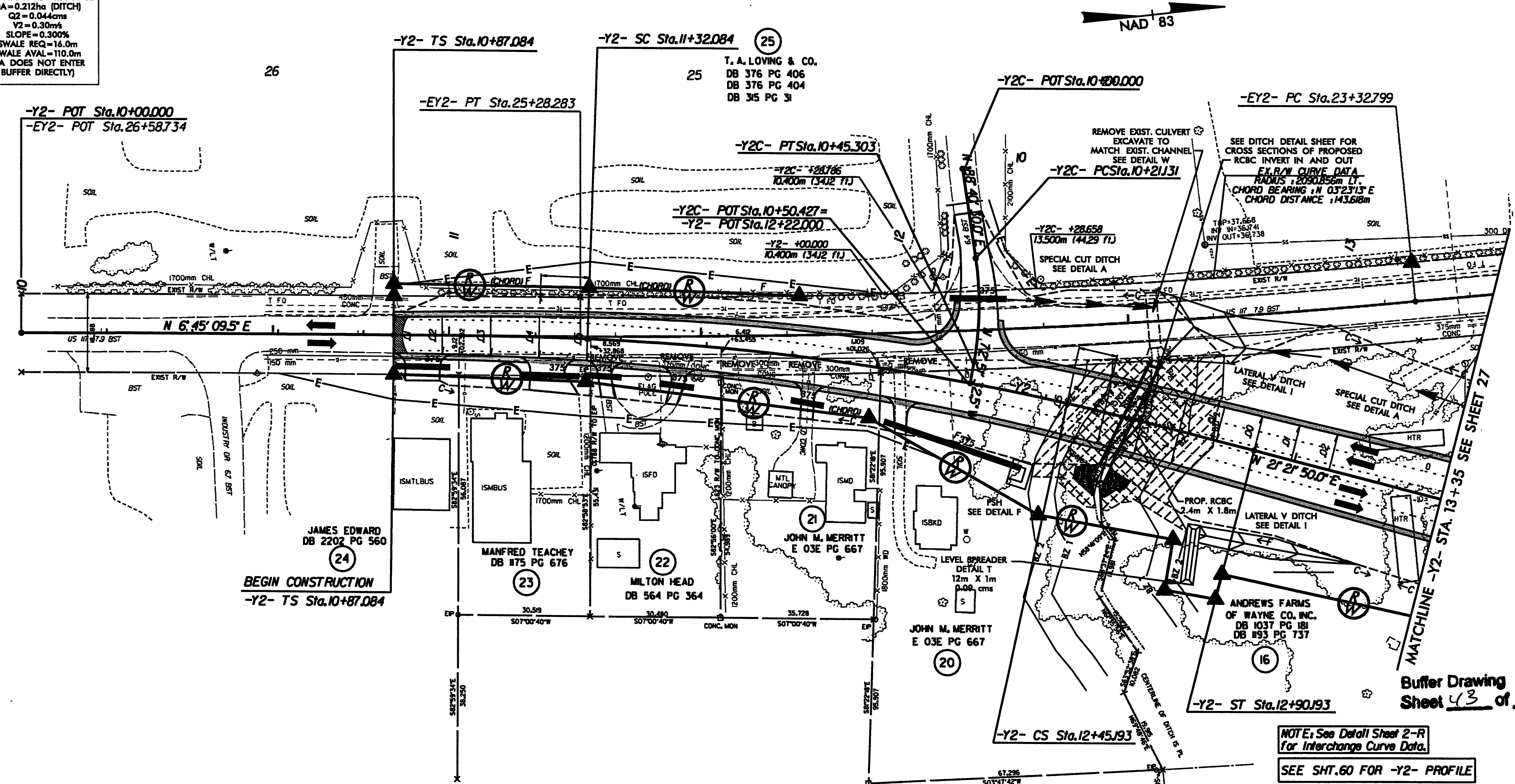
CUT DITCH
-Y2- STA. 10+90-12+00 RT
DA=0.212ha (DITCH)
Q2=0.044cms
V2=0.30m/s
SLOPE=0.300%
SWALE REQ=16.0m
SWALE AVAL=110.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)

-Y2C-
PI Sta 10+33.323
Δ = 18° 27' 57.5" (RT)
L = 24.172
T = 12.192
R = 75.000

-EY2-
PI Sta 12+09.420
Δ = 9° 25' 07.271" (RT)
L = 213.703
T = 52.268
R = 1000.000

PI Sta 15+09.310
Δ = 5° 59' 02.430" (LT)
L = 104.393
T = 107.093
R = 1300.000

PI Sta 24+30.612
Δ = 5° 20' 00.714" (RT)
L = 195.484
T = 97.813
R = 2100.000



Buffer Drawing Sheet 43 of 41

NOTE: See Detail Sheet 2-R for Interchange Curve Data.

SEE SHT.60 FOR -Y2- PROFILE

NOTE: All Proposed Drive Pipes are 375 mm.

NOTE: 240m Uniform Transition -Y2- Sta.10+90 (2 lanes) to Sta.13+30 (5 lanes).

SITE 14

NOTE: See Detail Sheets 2-S & 2-T For Ditch Details

PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
900 RIDGEFIELD DRIVE • SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

REVISIONS
R/W REVISION : ADDED R/W CURVE DATA, REVISED EASEMENT FOR PARCELS 21,22,23,& 24.
R/W REVISION : CHANGES MADE PER "INITIAL CONTACTS"
R/W REVISION : PARCELS 20 AND 21 NAMES CHANGED TO JOHN M. MERRITT

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	26
R/W SHEET NO.	

METRIC

CONST. REV.

R/W REV.

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 2022 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 1818 ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

CUT DITCH	LATERAL V DITCH
-Y2- STA. 12+40-12+62 LT DA=0.077ha (DITCH) Q2=0.012cms V2=0.49m/s Q10=0.015cms V10=0.53m/s SLOPE=4.000% SWALE REQ=5.8m SWALE AVAL=22.0m	-Y2- STA. 12+62-13+00 LT DA=0.391ha (DITCH) Q2=0.126cms V2=0.58m/s Q10=0.166cms V10=0.62m/s SLOPE=0.300% SWALE REQ=29.4m SWALE AVAL=38.0m

CUT DITCH
-Y2- STA. 10+90-12+00 RT DA=0.212ha (DITCH) Q2=0.044cms V2=0.30m/s SLOPE=0.300% SWALE REQ=16.0m SWALE AVAL=110.0m (DA DOES NOT ENTER BUFFER DIRECTLY)

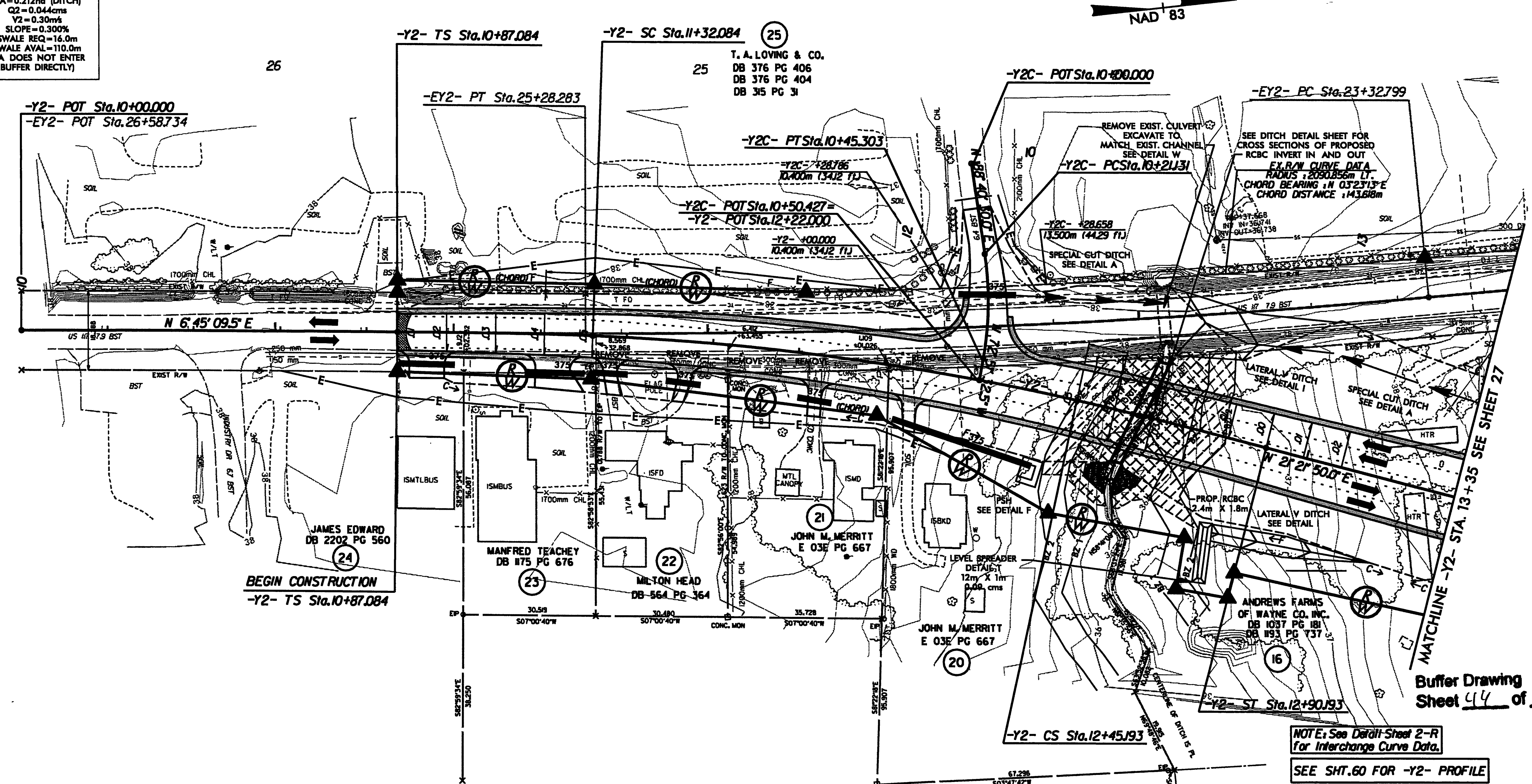
NO "A" BASIN REQUIRED. THE DRAINAGE IS MINIMAL.

-Y2C-
PI Sta 10+33.323
Δ = 18° 27' 57.5" (RT)
L = 24.172
T = 12.192
R = 75.000

-EY2-
PI Sta 12+09.420
Δ = 9° 25' 07.271" (RT)
L = 213.703
T = 52.268
R = 1000.000

PI Sta 15+09.310
Δ = 5° 59' 02.430" (LT)
L = 104.393
T = 107.093
R = 1300.000

PI Sta 24+30.612
Δ = 5° 20' 00.714" (RT)
L = 195.484
T = 97.813
R = 2100.000



Buffer Drawing Sheet 44 of 44

NOTE: See Detail Sheet 2-R for Interchange Curve Data.

SEE SHT.60 FOR -Y2- PROFILE

NOTE: All Proposed Drive Pipes are 375 mm.

NOTE: 240m Uniform Transition -Y2- Sta.10+90 (2 lanes) to Sta.13+30 (5 lanes).

SITE 14

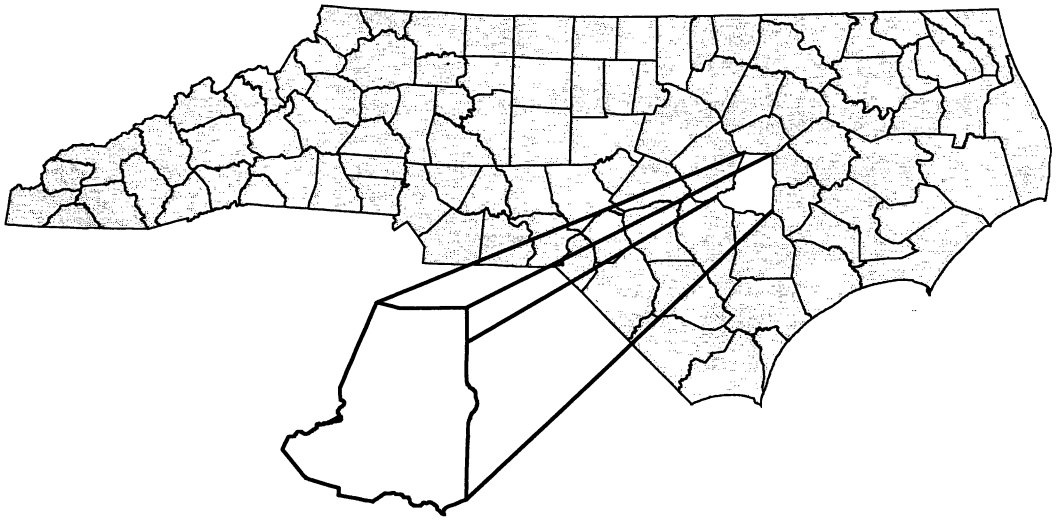
NOTE: See Detail Sheets 2-S & 2-T For Ditch Details

PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
900 RIDGEFIELD DRIVE • SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

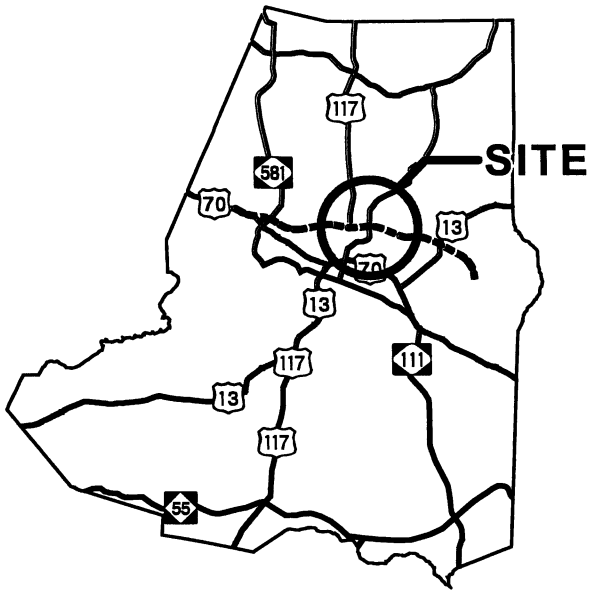
REVISIONS

R/W REVISION : ADDED R/W CURVE DATA, REVISED EASEMENT FOR PARCELS 21,22,23,& 24.
R/W REVISION : CHANGES MADE PER "INITIAL CONTACTS"
R/W REVISION : PARCELS 20 AND 21 NAMES CHANGED TO JOHN M.MERRITT

NORTH CAROLINA



WAYNE



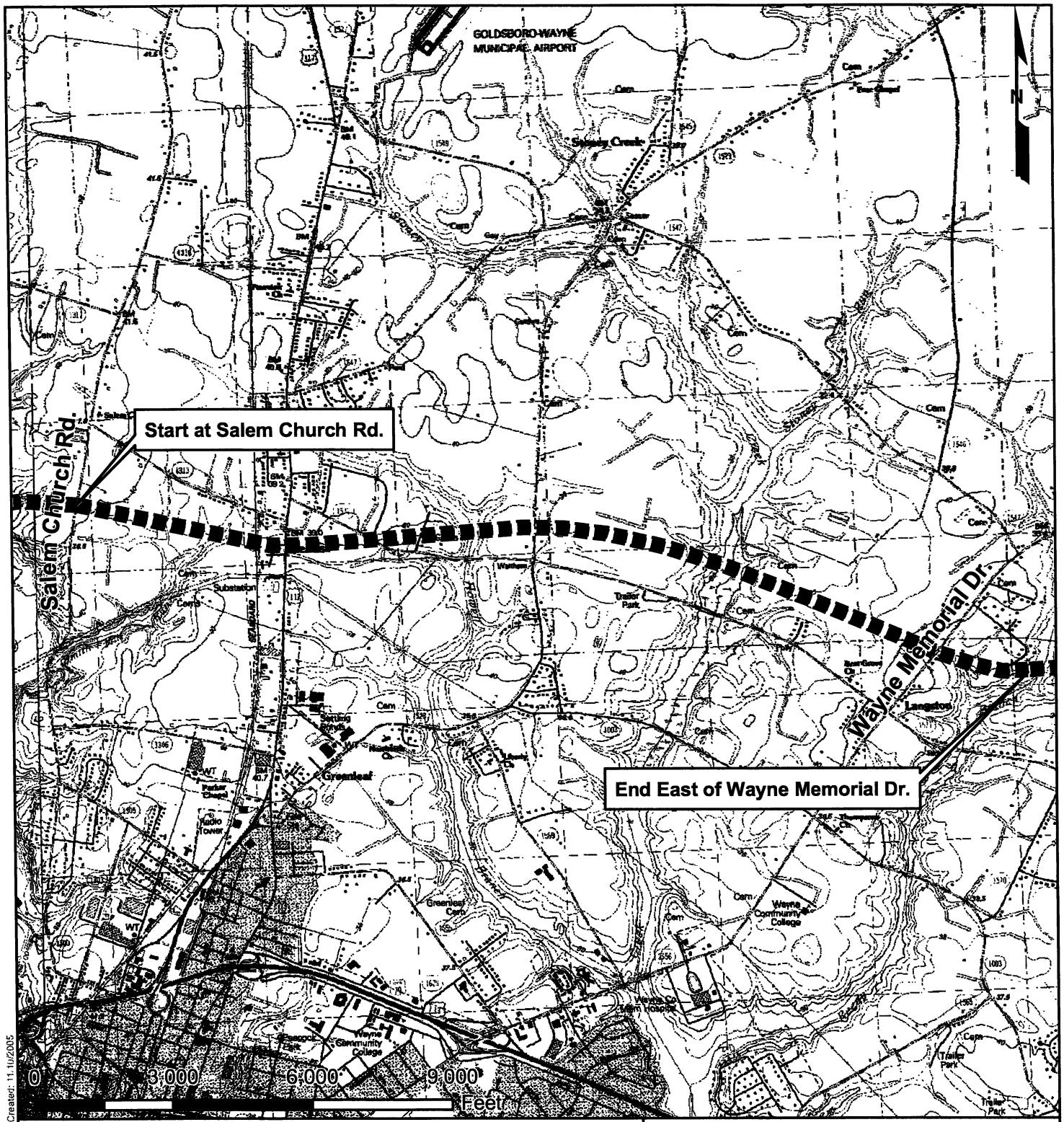
VICINITY MAPS

NCDOT

DIVISION OF HIGHWAYS
WAYNE COUNTY
PROJECT: 34461.1.3 (R-2554BA)
US 70 BYPASS

Permit Drawing
Sheet 1 of 111

10/17/07



1 inch equals 3,000 feet

LOCATION

NCDOT

DIVISION OF HIGHWAYS
WAYNE COUNTY
PROJECT: 34461.1.3 (R-2554BA)
US 70 BYPASS

Permit Drawing
Sheet 2 of 111

10/17/07

Source: USGS 7.5 Minute Quadrangle, NE Goldsboro, NC

\\Dyd-211\BRIDGE Maps\R-2510\Beaufort\R 2510_USGS.mxd Created: 11-10-2005

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ha)	WETLAND IMPACTS: Temp. Fill In Wetlands (ha)	WETLAND IMPACTS: Excavation in Wetlands (ha)	WETLAND IMPACTS: Mechanized Clearing in Wetlands (ha)	WETLAND IMPACTS: Hand Clearing in Wetlands (ha)	SURFACE WATER IMPACTS: Permanent SW impacts (ha)	SURFACE WATER IMPACTS: Temp. SW impacts (ha)	SURFACE WATER IMPACTS: Existing Channel Impacts Permanent (m)	SURFACE WATER IMPACTS: Existing Channel Impacts Temp. (m)	SURFACE WATER IMPACTS: Natural Stream Design (m)
1	-L2RPBD- 4+25 +/-	Roadway						0.005	0.001	43.4	6.7	
2	-L2- 92+00 +/-	Roadway						0.001	0.001	7.3	6.7	
3	-L- 94+40 +/-	Roadway	0.636			0.028		0.040	0.001	319.1	9.4	
4	-L- 98+60 +/-	Roadway						0.078	0.011	357.2	25.7	329.8
5	-L- 102+64 - 109+19 +/-	Roadway	0.024			0.005		0.142	0.001	164.8	10.3	170.9
6	-SR5- 17+60 +/-	Roadway				0.012						
7	-L- 114+80 +/-	Bridge	0.002			0.004	0.292	0.001				
8	-SR5- 21+60 +/-	Roadway			0.008	0.021						
9	-L- 132+00 +/-	Bridge	0.047			0.012	0.573					
10	-L- 141+00 +/-	Roadway	1.073			0.125						
11	-L- 148+60 +/-	Roadway	0.041			0.013		0.132	0.002	253.1	6.2	
12	-L- 153+00 +/-	Bridge	0.305			0.015						
14	-Y2- 12+60 +/-	Roadway						0.006	0.001	38.9	3.2	
TOTALS:			2.128	0.000	0.008	0.235	0.865	0.405	0.018	1183.8	68.2	500.7

Impacts due to piers in wetlands and streams at Site 7= 11sqm

Impacts due to piers in wetlands and streams at Site 9= 22sqm

Proposed wetland restoration due to existing road removal (Site 8)= 0.129ha

Permit Drawing
Sheet 3 of 11

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
WBS - 34461.1.3 (R-2554BA)

10/17/2007

JMD Revised 2/03/05
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WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L2RPBD- 4+25 +/-	Roadway						0.01	0.00	142	22	
2	-L2- 92+00 +/-	Roadway						0.00	0.00	24	22	
3	-L- 94+40 +/-	Roadway	1.57			0.07		0.10	0.00	1048	31	
4	-L- 98+60 +/-	Roadway						0.19	0.03	1173	84	1083
5	-L- 102+64 - 109+19 +/-	Roadway	0.06			0.01		0.35	0.00	541	34	561
6	-SR5- 17+60 +/-	Roadway				0.03						
7	-L- 114+80 +/-	Bridge	0.00			0.01	0.72	0.00				
8	-SR5- 21+60 +/-	Roadway					0.04		* 0.00		* 30	* 61
9	-L- 132+00 +/-	Bridge	0.12			0.03	1.42					
10	-L- 141+00 +/-	Roadway	2.65			0.31						
11	-L- 148+60 +/-	Roadway	0.10			0.03		0.33	0.00	831	20	
12	-L- 153+00 +/-	Bridge	0.75			0.04						
14	-Y2- 12+60 +/-	Roadway						0.01	0.00	128	11	
TOTALS:			5.26	0.00	0.00	0.53	2.18	1.00	0.04	3887	254	1705

Impacts due to piers in wetlands and streams at Site 7= 118.4sqft
Impacts due to piers in wetlands and streams at Site 9= 236.8sqft

Proposed weltand restoration due to existing road removal (Site 8)= 0.33ac
* Impacts due to removal of existing culvert on Tommy's Road. See Mitigation Plans.

Permit Drawing
Sheet 4 of 11

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
WBS - 34461.1.3 (R-2554BA)

12/4/2007

JMD Revised 2/03/05

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ha)	WETLAND IMPACTS: Temp. Fill In Wetlands (ha)	WETLAND IMPACTS: Excavation in Wetlands (ha)	WETLAND IMPACTS: Mechanized Clearing in Wetlands (ha)	WETLAND IMPACTS: Hand Clearing in Wetlands (ha)	SURFACE WATER IMPACTS: Permanent SW impacts (ha)	SURFACE WATER IMPACTS: Temp. SW impacts (ha)	SURFACE WATER IMPACTS: Existing Channel Impacts Permanent (m)	SURFACE WATER IMPACTS: Existing Channel Impacts Temp. (m)	SURFACE WATER IMPACTS: Natural Stream Design (m)
1	-L2RPBD- 4+25 +/-	Roadway						0.005	0.001	43.4	6.7	
2	-L2- 92+00 +/-	Roadway						0.001	0.001	7.3	6.7	
3	-L- 94+40 +/-	Roadway	0.636			0.028		0.040	0.001	319.1	9.4	
4	-L- 98+60 +/-	Roadway						0.078	0.011	357.2	25.7	329.8
5	-L- 102+64 - 109+19 +/-	Roadway	0.024			0.005		0.142	0.001	164.8	10.3	170.9
6	-SR5- 17+60 +/-	Roadway				0.012						
7	-L- 114+80 +/-	Bridge	0.002			0.004	0.292	0.001				
8	-SR5- 21+60 +/-	Roadway					0.018		* 0.002		* 9.1	* 18.6
9	-L- 132+00 +/-	Bridge	0.047			0.012	0.573					
10	-L- 141+00 +/-	Roadway	1.073			0.125						
11	-L- 148+60 +/-	Roadway	0.041			0.013		0.132	0.002	253.1	6.2	
12	-L- 153+00 +/-	Bridge	0.305			0.015						
14	-Y2- 12+60 +/-	Roadway						0.006	0.001	38.9	3.2	
TOTALS:			2.128	0.000	0.000	0.214	0.883	0.405	0.020	1183.8	77.3	519.7

Impacts due to piers in wetlands and streams at Site 7= 11sqm
Impacts due to piers in wetlands and streams at Site 9= 22sqm

Proposed weltand restoration due to existing road removal (Site 8)= 0.135ha
* Impacts due to removal of existing culvert on Tommy's Road. See Mitigation Plans.

Permit Drawing
Sheet 5 of 111

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
WBS - 34461.1.3 (R-2554BA)

12/4/2007

JMD Revised 2/03/05

PROP. NO.	PROPERTY OWNER NAME	PROP. OWNER ADDRESS
1A	NCDOT (PREVIOUSLY LANE FARMS, INC.)	
1	DAN R. CASEY	DB 350 PG. 13 DB 335 PG 397 DB 350 PG. 54
2	NORFAM, LLC	DB 1541 PG 198
9	EMILY W. PRIVOTT	DB 1486 PG 432
14	HELEN R. GODWIN	DB 439 PG 320
16	ANDREWS FARMS OF WAYNE CO. INC	DB 1037 PG 181 DB 1193 PG 737
17	WILLIAM WHITE	UNKNOWN
20	JOHN M. MERRITT	E 03E PG 667
26	JAMES W. HUBBLE	DB 1171 PG 405
26A	CAROLYN B. MORRIS, W. THOMAS BARDIN	ESTATE FILE 02E-245
27	PATRICIA GABRIEL	WB 1930 PG 169
28	CAREY R. HAM	DB 1621 PG 708
30	NCDOT	DB 1744 PG 533
31	HUBERT C. MATHEWS	DB 582 PG 536
32	SHERMAN E. BEST	DB 1534 PG 253
35	GEORGE MEADE BEST	DB 854 PG 681
36	KENNETH L. WIGGINS	DB 648 PG 95
38	NORA F. SMITH	DB 1424 PG 773
41	DAVID KENNEDY	DB 823 PG 873
43	MALCOLM E. GURLEY	DB 648 PG 416 DB 937 PG 807 DB 1044 PG 849
43A	JETHO H. HARE	DB 728 PG 105
47	ROBERT R. EARNEST	DB 834 PG 484
901	NCDOT	DB 1472 PG 411

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
PROJECT: 34461.1.3 (R-2554BA)

10/17/2007

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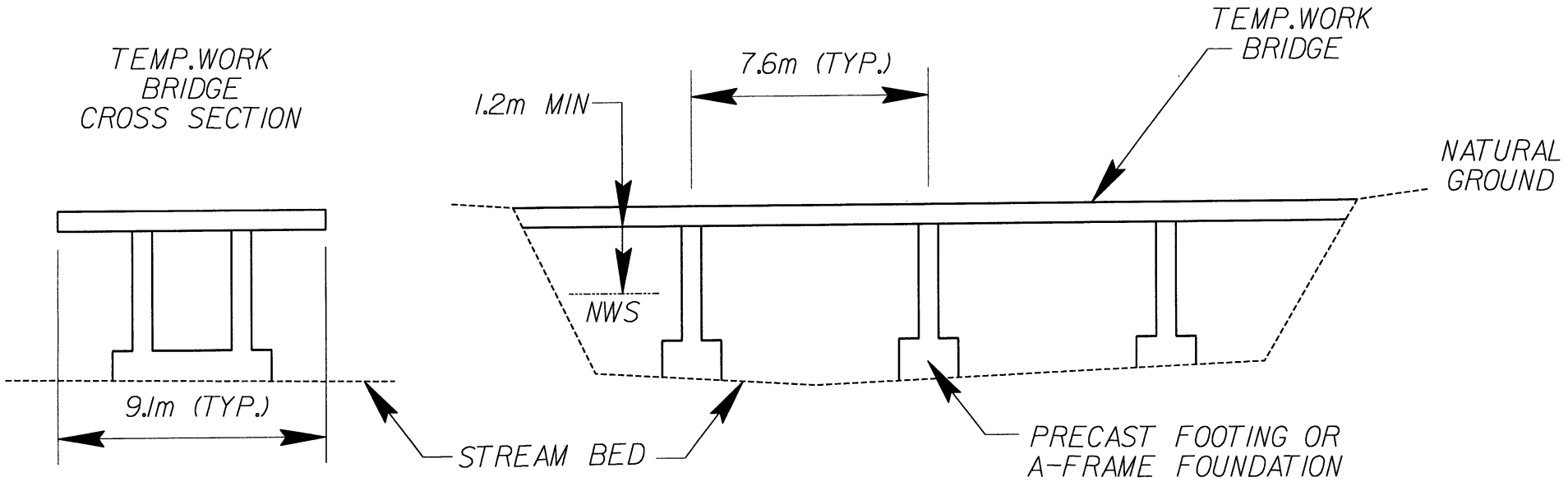
Permit Drawing
Sheet 5 of 11



WORK BRIDGE LAYOUT IS ESTIMATED.
ACTUAL LAYOUT MAY VARY
ACCORDING TO CONTRACTOR.

NOT TO SCALE

TEMPORARY WORK BRIDGE DETAIL

(FOR PROP. BRIDGE CONSTRUCTION)

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
PROJECT 34461.1.3 (R-2554BA)

Permit Drawing
Sheet 4 of 11

10/17/07

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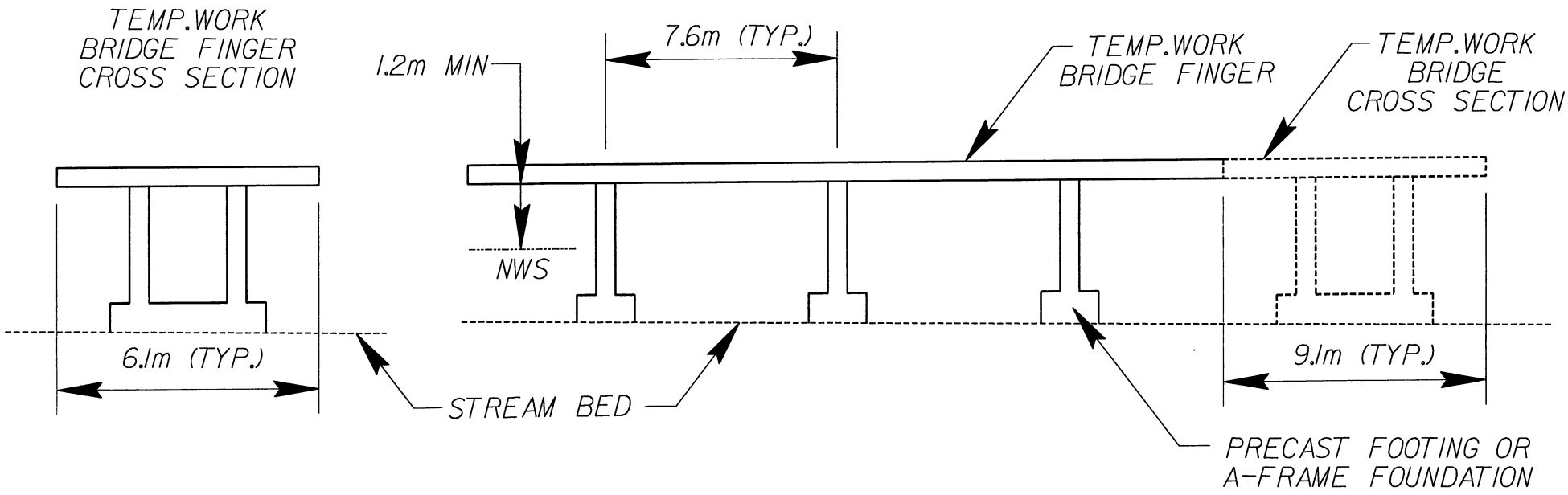

WORK BRIDGE FINGER LAYOUT IS ESTIMATED. ACTUAL LAYOUT MAY VARY ACCORDING TO CONTRACTOR.

NOT TO SCALE

TEMPORARY WORK BRIDGE FINGER DETAIL

(FOR PROP. BRIDGE CONSTRUCTION)

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
PROJECT 34461.1.3 (R-2554BA)

Permit Drawing
Sheet 22 of 116

10 / 17 / 07

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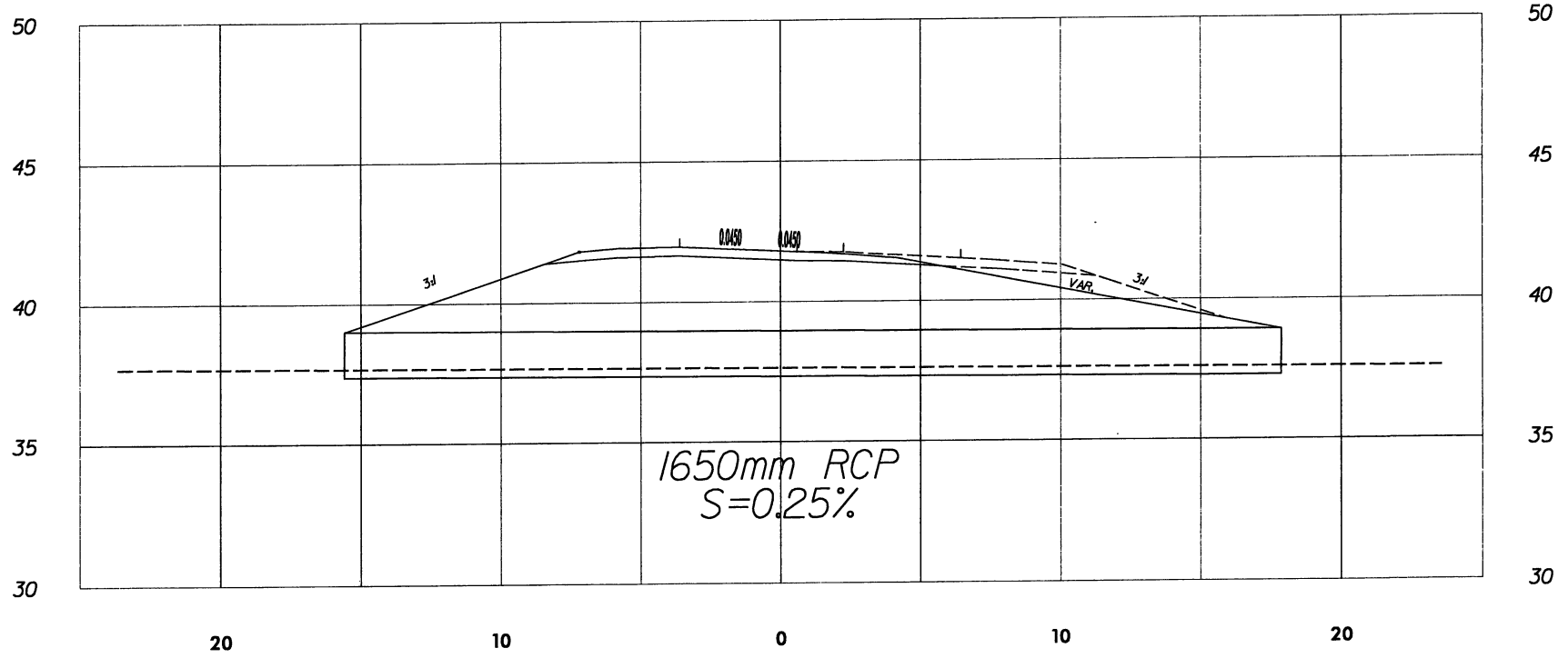


Permit Drawing
Sheet 9 of 111

HORIZONTAL 2.5 0 5

VERTICAL 2.5 0 5

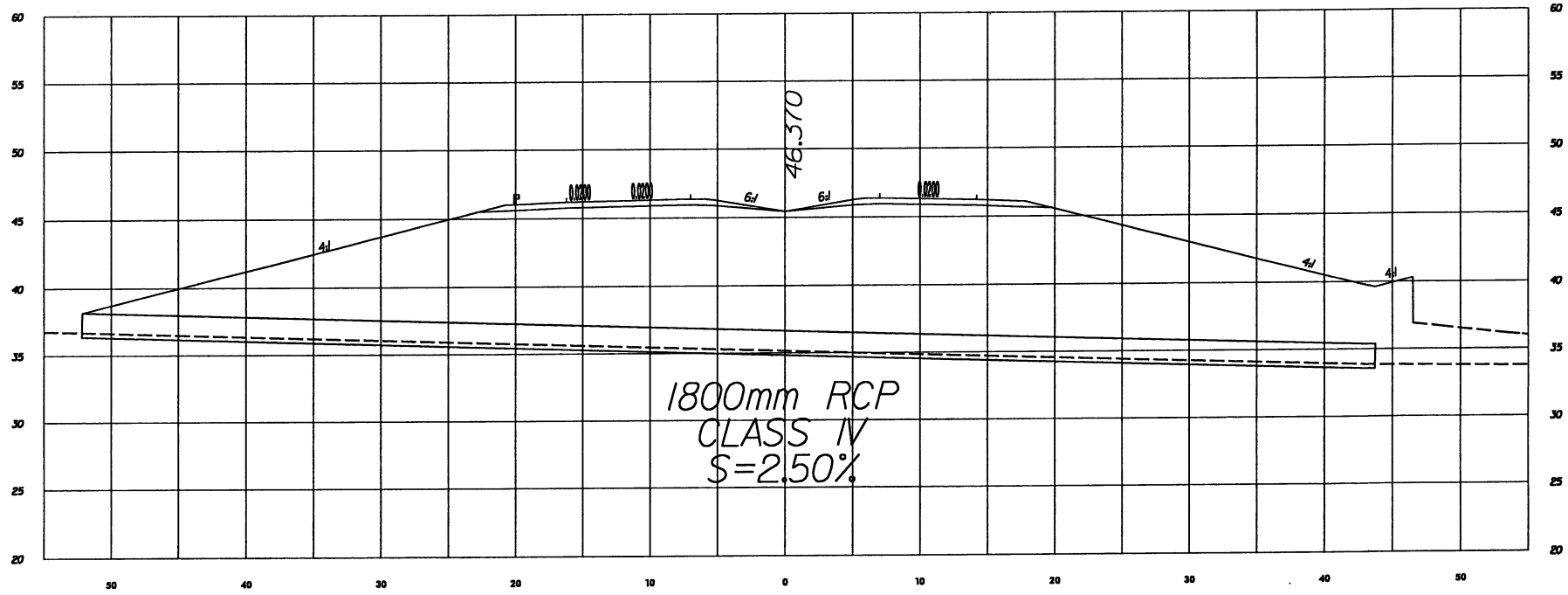
SITE 1
-L2RPBD- STA. 4+24

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
WAYNE COUNTY

PROJECT 34461.1.3 (R-2554BA)

US 70 BYPASS

10/17/07



Permit Drawing
Sheet 10 of 11

HORIZONTAL 5 0 10

VERTICAL 5 0 10

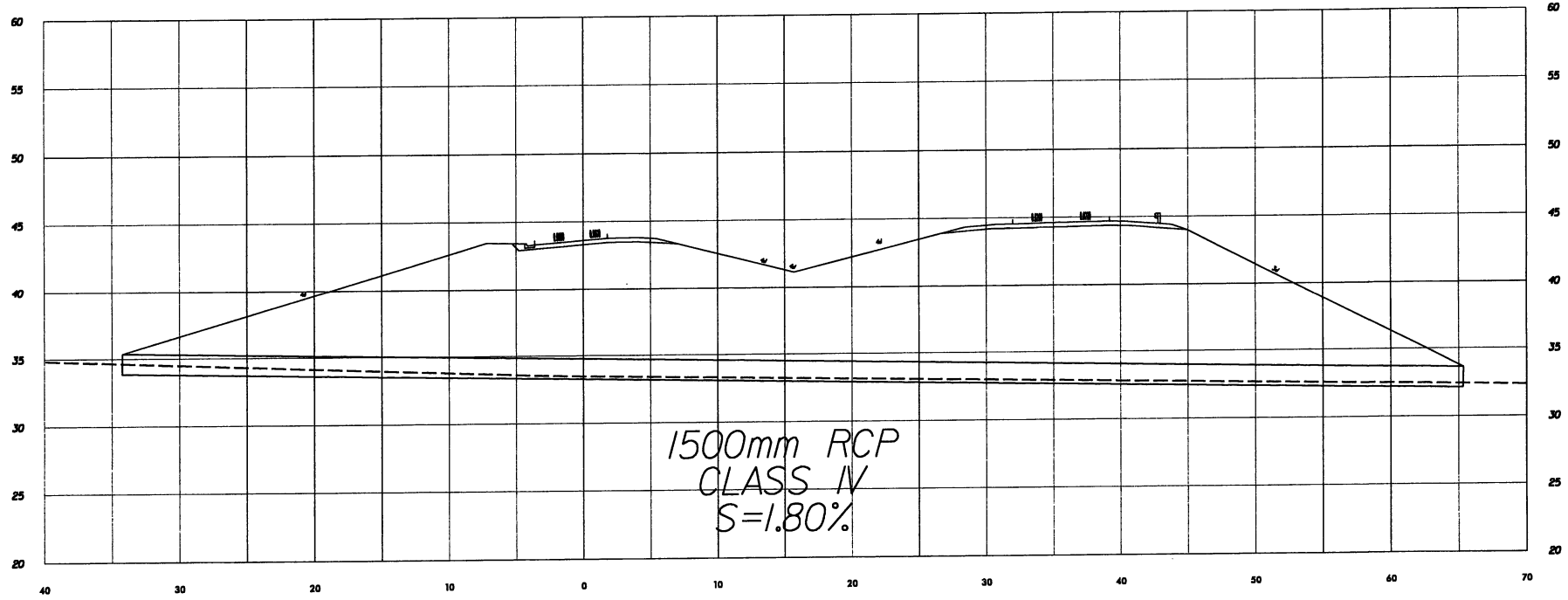
SITE 3
-L- STA. 94+73

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
WAYNE COUNTY

PROJECT 34461.1.3 (R-2554BA)

US 70 BYPASS

10/17/07



Permit Drawing
Sheet 16 of 111

HORIZONTAL 5 0 10

VERTICAL 5 0 10

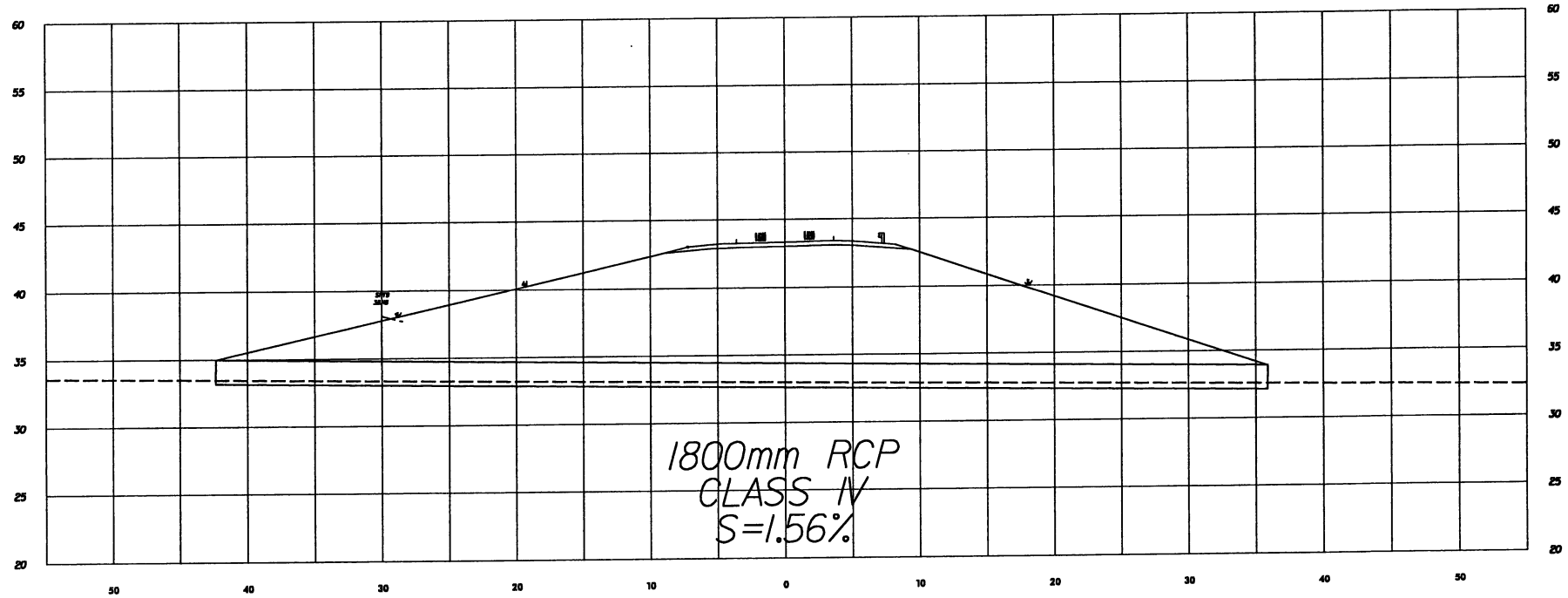
SITE 3
-L2LPD- STA. 2+20

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
WAYNE COUNTY

PROJECT 34461.1.3 (R-2554BA)

US 70 BYPASS

10/17/07



Permit Drawing
Sheet 12 of 111

HORIZONTAL 5 0 10

VERTICAL 5 0 10

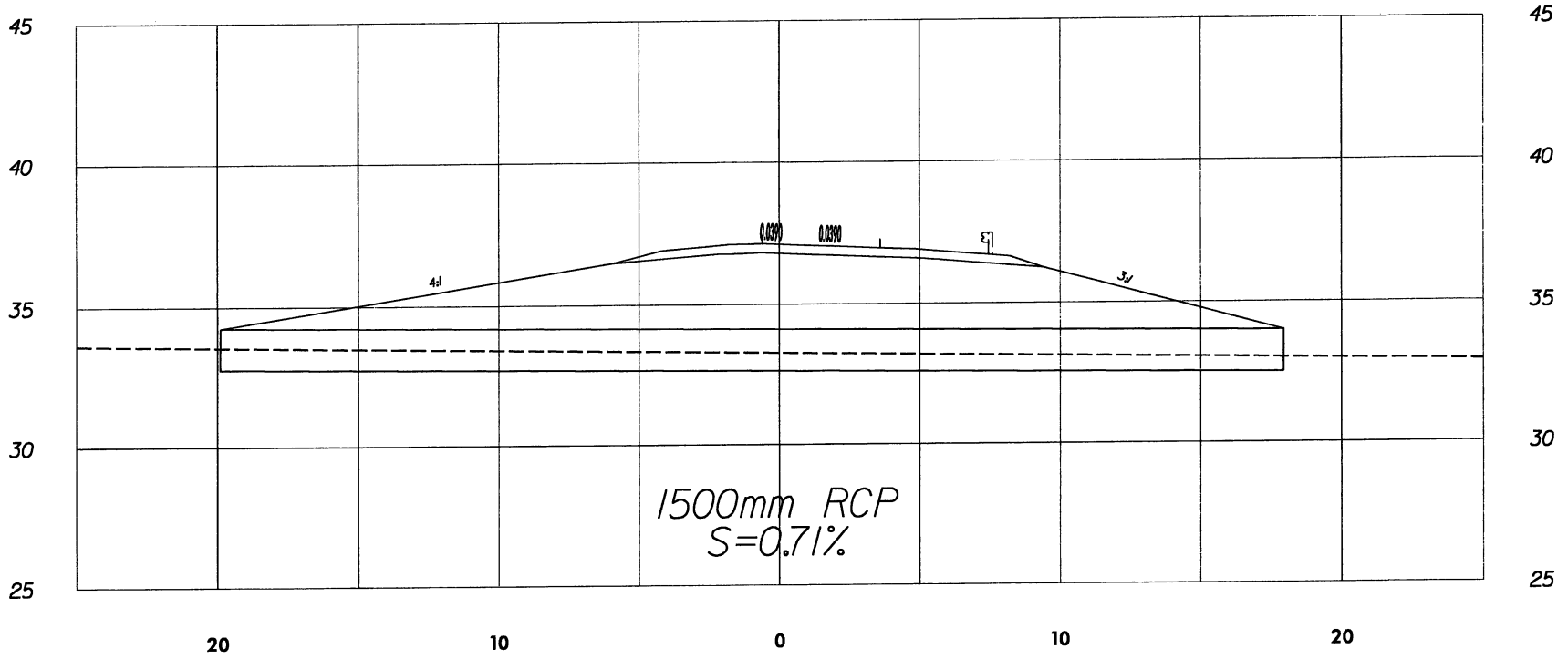
SITE 3
-L2RPBD- STA. 14+23

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
WAYNE COUNTY

PROJECT 34461.1.3 (R-2554BA)

US 70 BYPASS

10/17/07



Permit Drawing
Sheet 12 of 111

HORIZONTAL 2.5 0 5

VERTICAL 2.5 0 5

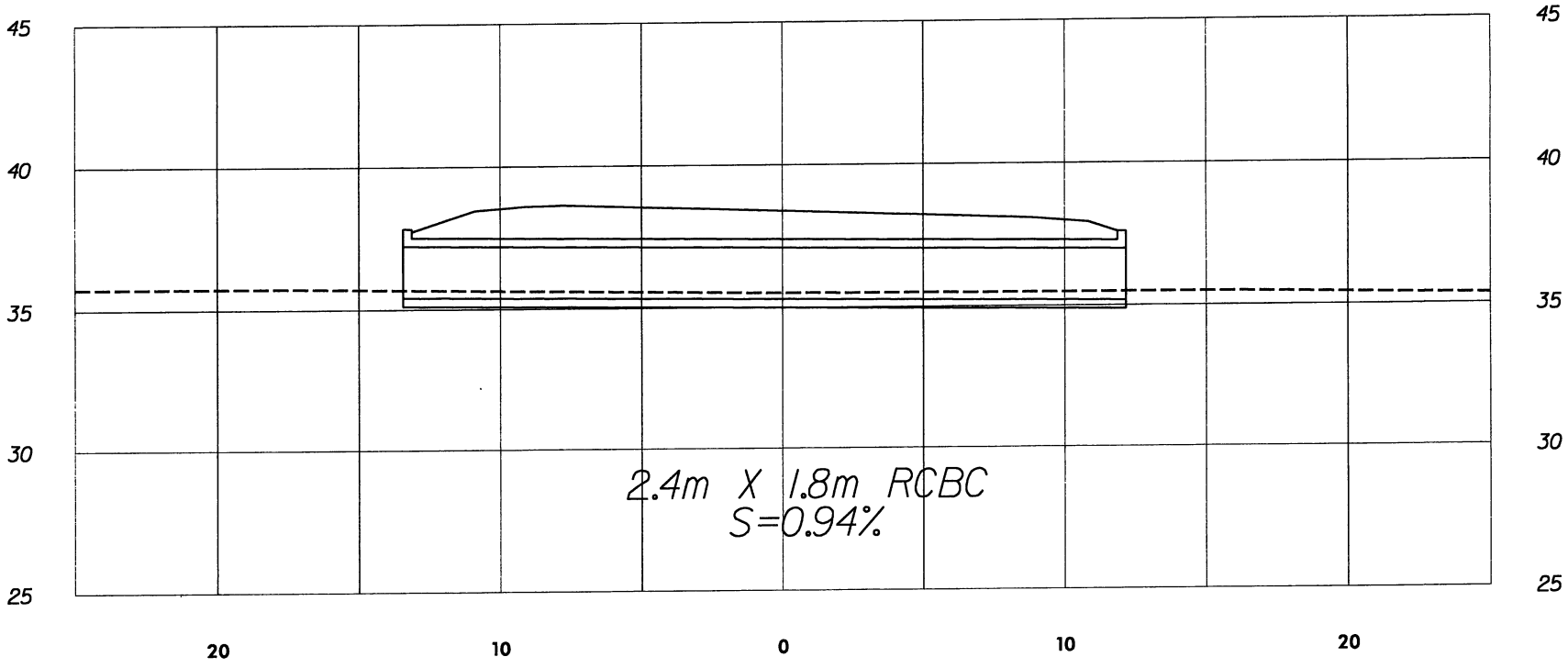
SITE 11
-Y8RPD- STA. 12 + 51

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
WAYNE COUNTY

PROJECT 34461.1.3 (R-2554BA)

US 70 BYPASS

10/17/07



Permit Drawing
Sheet 14 of 111

HORIZONTAL 2.5 0 5

VERTICAL 2.5 0 5

SITE 14
-Y2- STA. 12+60

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
WAYNE COUNTY

PROJECT 34461.1.3 (R-2554BA)

US 70 BYPASS

10/17/07

PROJECT #: R-2554BA

COUNTY: Wayne

DESCRIPTION: Construction of US Highway 70 in Goldsboro, NC

STREAM: Unnamed tributary to Smith Mill Run

NATURAL CHANNEL DESIGN: SITE 3

Sta 97+21.286 to 99+66.856 -L- (RT)

(Rev. October 10th, 2007)

The construction of the US Highway 70 bypass in northern Goldsboro, NC will result in numerous impacts to stream channels and other waters of the United States. In order to mitigate some of these impacts, on behalf of the North Carolina Department of Transportation (NCDOT), Rummel, Klepper, and Kahl (RK&K), LLP proposes stream restoration at Site 3, located immediately south of the Highway 70 right-of-way, south of SR 1313 (Belfast Road) in Goldsboro, NC.

Portions of two tributaries will be restored: a longer, southwest-flowing reach and a shorter tributary that flows into the longer reach from the north. The impacted stream channels are unnamed tributaries to the Smith Mill Run, which is in the Neuse River Basin, and are subject to the Neuse River Riparian Buffer Rules (15A NCAC 2B.0233). The channels are located in the upper coastal plain physiographic province. Land use within the channels' watershed is primarily agricultural, forested, and low-density residential.

In their existing conditions, both channels have been conspicuously channelized (i.e. straightened and dredged). The channel flowing from the north has incised considerably within its banks and represents a G-type channel (per Rosgen). The channels intersect just north of the proposed US 70 bypass footprint. Downstream of the confluence of the two channels, beaver activity has caused water to pond within the banks of the existing channel. The deepness of the water in ponded areas within the channel rendered existing conditions survey work infeasible. However, the Rosgen classification of the channel in this area is likely an F-type channel due to its very high width-to-depth ratio and high degree of incision.

In each of the streams, channel substrate consists of fine to very coarse sands. Along the channel flowing coming from the north, which flows through an agricultural field, the riparian corridor has been mowed and maintained and consists of fescue (*Festuca* spp.) and other grasses. Along the channel flowing towards the southwest and downstream of the confluence of the two channels, a well-developed riparian corridor is present, though relatively narrow (30-50 ft. off both the right and left banks of the channel). Vegetation consists mainly of loblolly pine (*Pinus taeda*), sweetgum (*Liquidambar styraciflua*), blackberry (*Rubus* spp.), yellow-poplar (*Liriodendron tulipifera*), devil's walking stick (*Aralia spinosa*), and greenbrier (*Smilax rotundifolia*).

Using existing stream channel conditions survey information (where possible), general site survey information, North Carolina Stream Restoration Institute bankfull hydraulic relationship data for the coastal plain (Doll et al., unpublished), and reference reach data, the natural channel design process (per Rosgen) was used to design a stable C-type stream channel with a narrow bankfull width-to-depth ratio at Site 3. It has been suggested by Rosgen (via personal correspondence) that in order to restore a channel to an E-type classification, it is best to design a C-type channel with the narrowest possible with-to-depth ratio as to not compromise stream bank stability. The reference reach used to guide the design of the proposed channel's pattern, profile, and dimension is an E5-type channel in Craven County, NC (see Table 1 for reference reach morphological variables). Proposed channel morphological variables are displayed in Table 1. The existing channels will be conveyed under US 70 and its associated filled slopes through 1350-mm diameter RCP culverts. The longer, main channel will start immediately below the culvert's outlet protection and flow towards the west for approximately 930 linear feet until its confluence with its existing downstream reach that will not be impacted by construction (see attached plan sheets). The smaller tributary to the north will flow for approximately 155 linear feet until its confluence with the longer stream to the south.

Due to the existing land grade and other constraints in the vicinity of the culvert outlets of both channels, a priority one restoration (per Rosgen), in which the restored channel's bankfull elevation is consistent with the existing floodplain elevation, is not possible. Thus, a priority two restoration is proposed, in which a bankfull bench is excavated adjacent to both banks of the restored channel. The bench's minimum width will be 23 ft. The bench should be planted with appropriate native tree and shrub species.

Furthermore, the 50-ft. Neuse River Buffer will be re-established adjacent to both sides of the restored bankfull channel and will be contained within the proposed right-of-way for the US 70 project. The re-established buffer areas should be replanted in accordance with North Carolina Ecosystem Enhancement Program (EEP, formerly WRP) buffer restoration guidelines.

Due to the relatively high difference in elevations between the proposed culvert's outfall and the existing stream channel thalweg, and the limited amount of space to route the designed stream channel to gradually dissipate slope, rock cross-vane grade control structures will be used to step the proposed channel's elevation down to its confluence with the existing channel. In order to ensure vertical channel stability and prevent creating a barrier to potential fish migration upstream, cross-vanes will result in no more than one-foot difference between the channel thalweg elevations upstream and downstream of the structure. Rock vanes will be placed on the outside of proposed meander bends to provide additional stream bank stability. Restored stream banks should be matted with coir matting (CF-7 or other similar material) and live staked with black willow (*Salix nigra*) and silky dogwood (*Cornus amomum*) to enhance bank stability. Refer to the attached plan sheets for cross-vane, coir matting, and rock vane details.

Channel substrate consists of fine to very coarse sands. Shear stresses and sediment transport analyses of the reference reach and the proposed restoration reaches were compared to ensure, to the maximum extent possible, that the restored stream will function properly. The shear stresses were calculated based on the velocity and flow depth results of the HEC-RAS analysis of the proposed restoration and the velocity and flow depth of the reference reach. These results were compared to the maximum permissible velocities in HDS-3 Table 2 and permissible shear stress for non-cohesive soils in HEC-15 Chart 1. The Shields Diagram was used to determine the particle size moved by each stream. The comparison of the proposed restoration reach data to the reference reach data indicates the restoration design is within acceptable velocity, shear stress and particle entrainment limits that will allow proper sediment transport under bankfull conditions.

Table 1. Rosgen Stream Channel Parameters			
Parameter	**Reference Reach**	**Proposed Upper Channel**	**Proposed Lower Channel**
Rosgen channel type	E5	C5	C5
Drainage area ($mi.^2$)	0.38	0.084	0.15
Bankfull discharge, Q_{BKF} (cfs)	8.3	2.8	4.2
Bankfull cross-sectional area, riffle A_{BKF} – riffle ($ft.^2$)	6.5	3.0	5.6
Bankfull cross-sectional area, A_{BKF} – pool ($ft.^2$)	6.2-11.3	6.8	11.6
Bankfull width, W_{BKF} (ft.)	7.1-12.0	6.0	8.0
Bankfull mean depth, d_{BKF} (ft.)	0.9	0.5	0.7
Maximum bankfull depth, d_{max} riffle (ft.)	1.0-1.6	0.65	1.0
Ratio of max. riffle bankfull depth to mean bankfull depth, d_{max} riffle/d_{bkf}	1.1-1.8	1.3	1.7
Maximum bankfull depth, pool d_{max} pool (ft.)	1.7-2.0	1.5	2.0
Ratio of max. pool bankfull depth to mean bankfull depth, d_{max} pool/d_{bkf}	1.9-2.2	3.0*	2.9*
Average bankfull slope, S	0.0012	0.0017	0.0017
Bankfull width-to-depth ratio	7.9	12.0	11.4
Hydraulic radius, R (ft.)	0.73	0.43	0.60
Average bankfull velocity , u (ft./s)	1.28	0.93	0.75
D_{50} (mm)	0.25	0.5 (estimated)	0.5 (estimated)
Shear Stress (lbs/ft.2)	0.055	0.046	0.064
Particle size entrained by shear stress per Shields diagram (mm)	4.0	3.6	4.5
Stream Power (lbs/ft.·s)	0.07	0.043	0.048
Entrenchment ratio (W_{fpa}/W_{BKF})	14	14.8-16.8	7.9-11.9
Width of flood-prone area, W_{fpa} (ft.)	102	89-101	62-95
Bank Height Ratio, TOB (top of bank elevation)/d_{max}	1.0	1.0	1.0
Pool-to-pool spacing (ft.)	42-90	35.4-45	47-60
Ratio of pool-to-pool spacing to W_{bkf}	5.9-7.5	5.9-7.5	5.9-7.5
Meander length, L_m(ft.)	75-120	60	80
Ratio of meander length to W_{bkf}	10-10.6	10	10
Sinuosity, K	1.6	1.15	1.16
Radius of curvature, R_c (ft.)	3.8-35.8	≥15	≥20
R_c ratio (radius of curvature/W_{BKF})	0.5-3.0	≥2.5	≥2.5

**The North Carolina Stream Restoration Institute (NCSRI) has recommended that pools be excavated slightly deeper than indicated by reference reach data because they have a tendency to partially fill in with fine sediment immediately following channel construction. Thus, the ratio of maximum pool depth to average bankfull depth of the proposed channel is higher than that of the reference reach.*

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Permit Drawing
Sheet 18 of 111

PROJECT #: R-2554BA

COUNTY: Wayne

DESCRIPTION: Construction of US Highway 70 in Goldsboro, NC

STREAM: Unnamed tributary to Howell Branch

NATURAL CHANNEL DESIGN: SITE 5

Sta. 13+73.949 -SR5- (Rt.) to Sta. 15+26.859 -SR5- (Rt.)

(Rev. October 10th 2007)

The construction of the US Highway 70 bypass in northern Goldsboro, NC will result in numerous impacts to stream channels and other waters of the United States. In order to mitigate some of these impacts, on behalf of the North Carolina Department of Transportation (NCDOT), Rummel, Klepper, and Kahl (RK&K), LLP proposes stream restoration at Site 5, located immediately south of SR 1571 (Tommys Road) in Goldsboro, NC.

The impacted stream channel is an unnamed tributary to the Howell Branch, which is in the Neuse River Basin, and is subject to the Neuse River Riparian Buffer Rules (15A NCAC 2B.0233). The channel is located in the upper coastal plain physiographic province. Land use within the channel's watershed is primarily agricultural, forested, and low-density residential.

In its existing condition, the channel appears to have been straightened and modified. Channel bed form is generally poor with few riffle/pool sequences present. Cross-sectional surveys were performed at two riffles, yielding bankfull cross-sectional areas of 5.9-6.5 $ft.^2$. Channel substrate consists of medium to coarse sands. The Rosgen classification of the existing channel is F5. Prior to past disturbance, the channel was probably classified as a C or E channel type in its natural state. As the channel was straightened, its slope was increased, resulting in higher shear stress. The higher shear stress caused the channel to incise within its bed, which confined bankfull (channel-forming) and other high volume flows within its banks. The increased stress on the

stream banks induced by bankfull and greater volume flows caused bank erosion, which cause the channel to widen to its present unstable dimensions.
The riparian corridor along the channel is highly variable in width, ranging from less than 10 ft. (generally in areas further upstream) to greater than 50 ft. on the channel's north side midway through the reach to be restored. Vegetation consists mainly of loblolly pine (*Pinus taeda*), sweetgum (*Liquidambar styraciflua*), blackberry (*Rubus* spp.), green ash (*Fraxinus pennsylvanica*), and greenbrier (*Smilax rotundifolia*).

Using existing stream channel conditions survey information (where possible), general site survey information, North Carolina Stream Restoration Institute bankfull hydraulic relationship data for the coastal plain (Doll et al., unpublished), and reference reach data, the natural channel design process (per Rosgen) was used to design a stable C-type stream channel with a narrow bankfull width-to-depth ratio at Site 5. It has been suggested by Rosgen (via personal correspondence) that in order to restore a channel to an E-type classification, it is best to design a C-type channel with the narrowest possible with-to-depth ratio as to not compromise stream bank stability. The reference reach used to guide the design of the proposed channel's pattern, profile, and dimension is an E5-type channel in Craven County, NC (see Table 1 for reference reach morphological variables). Proposed channel morphological variables are displayed in Table 1. The proposed channel will be conveyed under Tommys Road through a single RCP culvert and flow to the east for approximately 560 linear feet until its confluence with its existing downstream reach that will not be impacted by construction (see attached plan sheets).

Due to the existing land grade and other constraints, a priority one restoration (per Rosgen), in which the restored channel's bankfull elevation is consistent with the existing floodplain elevation, is not possible. Thus, a priority two restoration is proposed, in which a bankfull bench is excavated adjacent to both banks of the restored channel. The bench's minimum width will be 23 ft. The bench will be planted with appropriate native tree and shrub species. Furthermore, the 50-ft. Neuse River Buffer will be re-established adjacent to both sides of the restored bankfull channel and will be contained within the proposed right-of-way for the US 70 project. The re-established buffer areas will be replanted in accordance with North Carolina Ecosystem Enhancement Program (EEP, formerly WRP) buffer restoration guidelines.

Due to the relatively high difference in elevations between the proposed culvert's outfall and the existing stream channel thalweg, and the limited amount of space to route the designed stream channel to gradually dissipate slope, rock cross-vane grade control structures will be used to step the proposed channel's elevation down to its confluence with the existing channel. In order to ensure vertical channel stability and prevent creating a barrier to potential fish migration upstream, cross-vanes will result in no more than one-foot difference between the channel thalweg elevations upstream and downstream of the structure. Rock vanes will be placed on the outside of proposed meander bends to provide additional stream bank stability. Restored stream banks will be matted with coir matting (CF-7 or other similar material) and live staked with black willow (*Salix nigra*) and silky dogwood (*Cornus amomum*) to enhance bank stability. Refer to the attached plan sheets for cross-vane, coir matting, and rock vane details.

Channel substrate consists of fine to very coarse sands. Shear stresses and sediment transport analyses of the reference reach and the proposed restoration reaches were compared to ensure, to the maximum extent possible, that the restored stream will function properly. The shear stresses were calculated based on the velocity and flow depth results of the HEC-RAS analysis of the proposed restoration and the velocity and flow depth of the reference reach. These results were compared to the maximum permissible velocities in HDS-3 Table 2 and permissible shear stress for non-cohesive soils in HEC-15 Chart 1. The Shields Diagram was used to determine the particle size moved by each stream. The comparison of the proposed restoration reach data to the reference reach data indicates the restoration design is within acceptable velocity, shear stress and particle entrainment limits that will allow proper sediment transport under bankfull conditions.

Table 1. Rosgen Stream Channel Parameters		
Parameter	**Reference Reach**	**Proposed Channel**
Rosgen channel type	E5	C5
Drainage area ($mi.^2$)	0.38	0.17
Bankfull discharge, Q_{BKF} (cfs)	8.3	4.6
Bankfull cross-sectional area, riffle A_{BKF} – riffle ($ft.^2$)	6.5	6.3
Bankfull cross-sectional area, A_{BKF} – pool ($ft.^2$)	6.2-11.3	13.9
Bankfull width, W_{BKF} (ft.)	7.1-12.0	9.0
Bankfull mean depth, d_{BKF} (ft.)	0.9	0.7
Maximum bankfull depth, d_{max} riffle (ft.)	1.0-1.6	1.0
Ratio of max. riffle bankfull depth to mean bankfull depth, d_{max} riffle/d_{bkf}	1.1-1.8	1.8
Maximum bankfull depth, pool d_{max} pool (ft.)	1.7-2.0	2.0
Ratio of max. pool bankfull depth to mean bankfull depth, d_{max} pool/d_{bkf}	1.9-2.2	2.9*
Average bankfull slope, S	0.0012	0.0017
Bankfull width-to-depth ratio	7.9	12.9
Hydraulic radius, R (ft.)	0.73	0.68
Average bankfull velocity, u (ft./s)	1.28	0.64
D_{50} (mm)	0.25	0.5 (estimated)
Shear Stress ($lbs/ft.^2$)	0.055	0.072
Particle size entrained by shear stress per Shields diagram (mm)	4.0	4.8
Stream Power (lbs/ft.·s)	0.07	0.046
Entrenchment ratio (W_{fpa}/W_{BKF})	14	9.0-17.2
Width of flood-prone area, W_{fpa} (ft.)	102	72-155
Bank Height Ratio, TOB (top of bank elevation)/d_{max}	1.0	1.0
Pool-to-pool spacing (ft.)	42-90	53-68
Ratio of pool-to-pool spacing to W_{bkf}	5.9-7.5	5.9-7.5
Meander length, L_m (ft.)	75-120	90
Ratio of meander length to W_{bkf}	10-10.6	10
Sinuosity, K	1.6	1.24
Radius of curvature, R_c (ft.)	3.8-35.8	≥22.5
R_c ratio (radius of curvature/W_{BKF})	0.5-3.0	≥2.5

**The North Carolina Stream Restoration Institute (NCSRI) has recommended that pools be excavated slightly deeper than indicated by reference reach data because they have a tendency to partially fill in with fine sediment immediately following channel construction. Thus, the ratio of maximum pool depth to average bankfull depth of the proposed channel is higher than that of the reference reach.*

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CONTRACT:C201818 T.I.P. PROJ: R-2554BA

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

VICINITY MAP

90% Plans

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
WAYNE COUNTY

LOCATION: US 70 (GOLDSBORO BYPASS)
FROM EAST OF SR 1300 (SALEM CHURCH ROAD)
TO EAST OF SR 1556 (WAYNE MEMORIAL DRIVE)

TYPE OF WORK: GRADING, PAVING, DRAINAGE, STRUCTURES, CULVERTS, SIGNING, AND SIGNALS

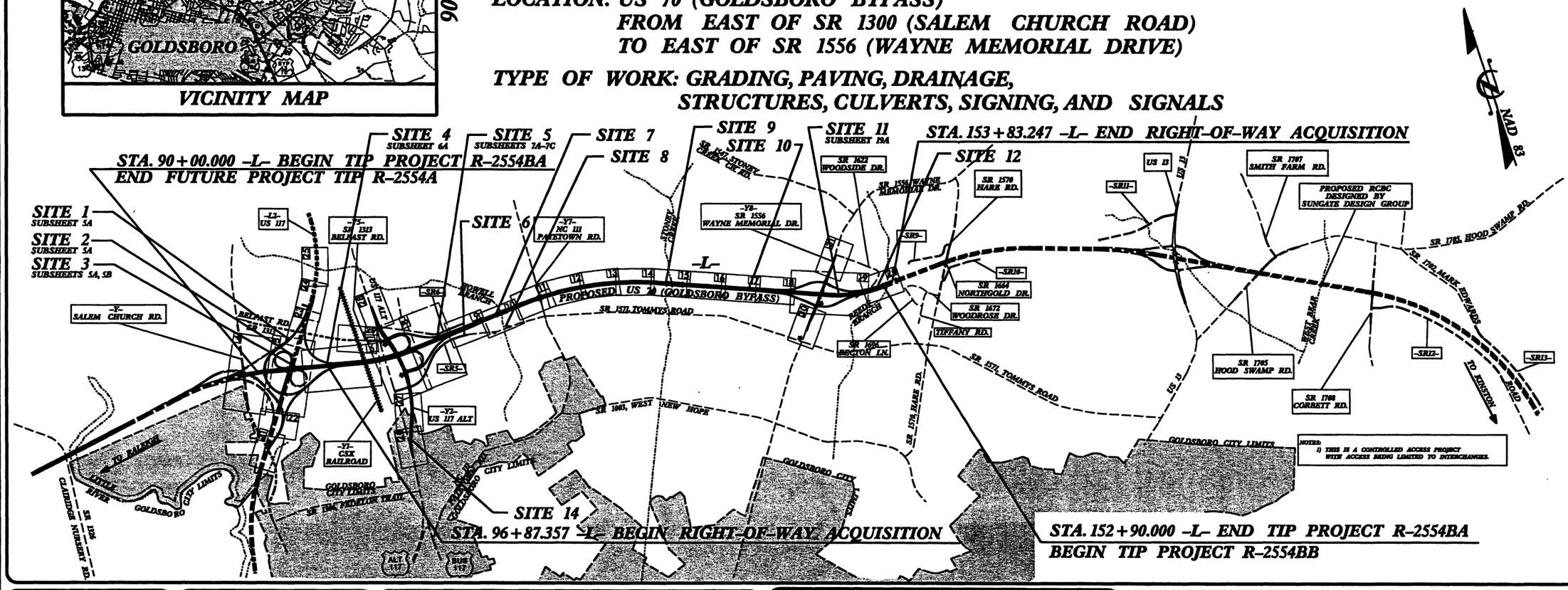
METRIC

ALL DIMENSIONS IN THESE PLANS ARE IN METERS UNLESS OTHERWISE SHOWN

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2554BA	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34461.1.3	NHF-70(30)	PE
34461.2.7		RW & UTIL.
34461.3.GV1	NHS-70(160)	CONST.

NAD 83



GRAPHIC SCALE

PLANS 5 0 10

PROFILE (HORIZONTAL) 5 0 10

PROFILE (VERTICAL) 1 0 2

DESIGN DATA

ADT 2008 = 20,728
ADT 2028 = 29,048
DHV = 10 %
D = 55 %
T = 10 % *
V = 110 km/h

FUNCTIONAL CLASSIFICATION: FREEWAY

* TTST 6% DUAL 4%

PROJECT LENGTH

Length Roadway TIP Project R-2445BA ..... 5.802 km

**Length Structure TIP Project R-2445BA ..... 0.489 km*

TOTAL LENGTH TIP Project R-2445BA ..... 6.290 km (3.91 MILES)

**USED EBL -L- STATIONS FOR STRUCTURE LENGTHS*

PLANS PREPARED BY :
RUMMEL, KLEPPER & KAHL, LLP
consulting engineers
900 RIDGEFIELD DRIVE, SUITE 350
RALEIGH, NORTH CAROLINA 27609
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MAY 18, 2005

LETTING DATE: APRIL 15, 2008

B. KEITH SKINNER, P.E.
PROJECT ENGINEER

MICHAEL T. MERRITT, P.E.
PROJECT DESIGN ENGINEER

NCDOT CONTACT: Scott Blevins, P.E.
Engineering Coordinator – Roadway Design

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
Permit Drawing Sheet 23 of 111

P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR DATE

10/17/07 10:26:23
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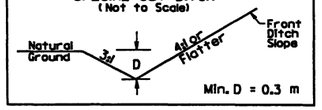
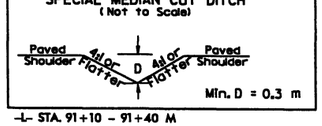
DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



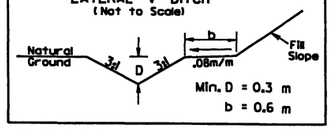
-L- STA. 113+40 – 114+01 RT.
-L- STA. 142+40 – 144+20 LT.
-L- STA. 144+11 – 144+20 LT.
-L- STA. 143+80 – 144+60 RT.
-L- STA. 142+80 – 144+00 RT.
-L- STA. 145+00 – 145+60 RT.
-L- STA. 145+20 – 146+30 LT.
-L- STA. 148+65 – 149+20 LT.
-L- STA. 149+00 – 150+80 RT.
-L- STA. 150+40 – 151+00 LT.
-L- STA. 151+60 – 152+40 LT.
-L2- STA. 83+20 – 83+40 RT.
-L2- STA. 86+60 – 87+00 RT.
-L2- STA. 87+20 – 87+50 LT.
-L2LPB- STA. 3+40 – 3+85 LT.
-L2LPD- STA. 3+20 – 3+95 LT.
-L2RPA- STA. 6+20 – 6+50 RT.
-L2RPBD- STA. 0+60 – 2+30 RT.
-L2RPBD- STA. 2+20 – 2+40 LT.
-L2RPDB- STA. 1+00 – 1+60 RT.
-L2RPDB- STA. 1+60 – 1+80 LT.
-L2RPDB- STA. 2+00 – 2+20 LT.
-L2RPDB- STA. 3+20 – 3+60 LT.
-Y2- STA. 10+75 – 11+00 LT.
-Y2- STA. 12+20 – 12+62 LT.
-Y2- STA. 13+00 – 13+60 LT.
-Y2- STA. 20+32 – 20+40 LT.
-Y2- STA. 21+20 – 22+60 RT.
-Y2- STA. 22+88 – 23+80 RT.
-Y2- STA. 24+10 – 25+60 RT.
-Y2- STA. 23+60 – 26+35 LT.
-Y2A- STA. 11+00 – 11+35 RT.
-Y2B- STA. 10+08 – 11+20 LT.
-Y2RPA- STA. 10+70 – 11+30 RT.
-Y2RPA- STA. 11+91 – 13+40 LT.
-Y2RPA- STA. 15+60 – 16+40 RT.
-Y2RPA- STA. 15+80 – 16+20 LT.
-Y2RPD- STA. 12+00 – 12+60 RT.
-SR5- STA. 17+79 – 18+05 LT.
-SR5- STA. 16+98 – 17+18 LT.
-SR6- STA. 10+20 – 10+80 RT.
-SR6- STA. 10+20 – 11+80 LT.
-SR6- STA. 11+00 – 11+80 RT.
-SR6- STA. 14+20 – 15+80 LT.
-SR6- STA. 14+20 – 15+15 RT.
-Y5- STA. 11+20 – 12+30 RT.
-Y8- STA. 11+50 – 12+20 RT.
-Y8- STA. 11+30 – 12+20 LT.
-Y8- STA. 18+40 – 20+00 LT.
-Y8DET- STA. 10+00 – 10+71.315 LT.
-Y8DET- STA. 15+19.37 – 16+84.310 LT.
-Y8DET- STA. 16+44.085 – 16+84.310 RT.
-Y8RPA- STA. 12+47 – 13+40 RT.
-Y8RPB- STA. 11+70 – 12+40 RT.

DETAIL B
SPECIAL MEDIAN CUT DITCH
(Not to Scale)



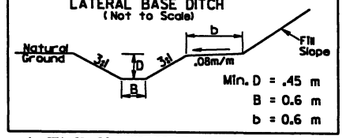
-L- STA. 91+10 – 91+40 M
-L- STA. 95+60 – 96+80 M
-L- STA. 101+00 – 102+80 M
-L- STA. 108+00 – 108+60 M
-L- STA. 113+60 – 114+20 M
-L- STA. 130+80 – 131+40 M
-L- STA. 145+00 – 146+16 M
-L- STA. 151+80 – 152+60 M

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



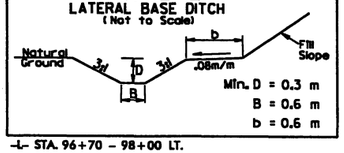
-L- STA. 118+70 – 118+82 RT.
-L- STA. 145+60 – 146+05 RT.
-L- STA. 148+80 – 149+00 RT.
-Y8- STA. 15+00 – 15+40 LT.
-SR5- STA. 14+36 – 15+47 LT.
-L2RPBD- STA. 2+30 – 2+50 RT.
-L2RPBD- STA. 10+30 – 10+69 RT.
-L2RPBD- STA. 16+10 – 16+30 RT.
-Y8DET- STA. 13+57.673 – 15+19.337 LT.
-Y8DET- STA. 14+78 – 15+19 RT.

DETAIL D
LATERAL BASE DITCH
(Not to Scale)



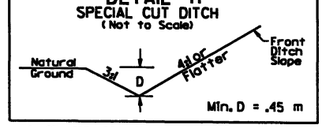
-L- STA. 91+20 – 92+10 RT.
-L- STA. 103+00 – 103+40 LT.
-L2RPBD- STA. 9+60 – 10+80 LT.
-Y2- STA. 15+15 – 16+00 LT.
-Y8- STA. 17+40 – 18+40 LT.

DETAIL E
LATERAL BASE DITCH
(Not to Scale)



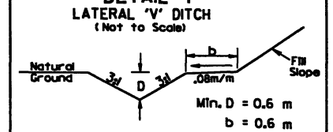
-L- STA. 96+70 – 98+00 LT.
-L- STA. 130+20 – 131+28 RT.
-L- STA. 141+80 – 142+40 LT.
-L- STA. 142+32 – 142+80 RT.
-L- STA. 147+60 – 148+50 RT.
-L2RPD- STA. 2+07 – 3+30 LT.

DETAIL H
SPECIAL CUT DITCH
(Not to Scale)



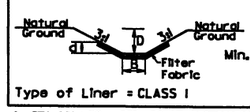
-L- STA. 112+20 – 114+01 LT.
-L- STA. 151+00 – 151+60 LT.
-L2- STA. 91+00 – 91+97 RT.
-L2LPB- STA. 3+64 – 4+80 RT.
-Y2- STA. 19+20 – 20+12 RT.
-Y2- STA. 19+20 – 20+32 LT.
-Y2- STA. 21+65 – 22+40 LT.
-Y2RPA- STA. 11+30 – 11+91 RT.

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



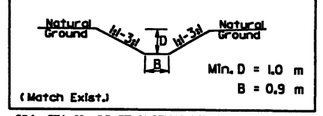
-L- STA. 91+20 – 91+60 LT.
-L- STA. 102+60 – 103+00 LT.
-L- STA. 105+40 – 107+10 LT.
-L- STA. 117+00 – 118+00 RT.
-L2RPB- STA. 3+20 – 4+40 RT.
-L2RPBD- STA. 7+10 – 7+80 RT.
-L2RPBD- STA. 9+56 – 9+83 RT.
-Y2LPD- STA. 14+50 – 14+75 LT.
-Y2- STA. 12+62 – 13+00 LT.
-Y2- STA. 12+80 – 13+20 RT.
-Y2RPD- STA. 12+60 – 14+20 RT.
-Y8- STA. 16+00 – 16+70 LT.
-Y8RPA- STA. 13+40 – 14+00 RT.
-EY2- STA. 14+35 – 15+30 LT.

DETAIL J
TAIL BASE DITCH
(Not to Scale)



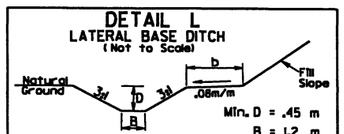
-L- STA. 151+80 – 151+90 LT. (ACTUAL LENGTH=20m)
S=22.26%, DDE=8cm
-L- STA. 152+00 – 152+10 LT. (ACTUAL LENGTH=20m)
S=23.89%, DDE=8cm
-SR5- STA. 15+38 – 15+39 RT. (ACTUAL LENGTH=9m)
S=6.67%, DDE=8cm

DETAIL K
TAIL BASE DITCH
(Not to Scale)



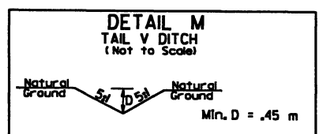
-SR6- STA. 11+25 RT. (ACTUAL LENGTH=50m)
S=0.28%, DDE=100cm
-Y2LPA- STA. 13+60 LT. (ACTUAL LENGTH=45m)
S=0.28%, DDE=90cm

DETAIL L
LATERAL BASE DITCH
(Not to Scale)



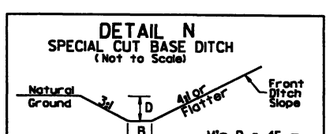
-L- STA. 102+65 – 103+45 RT.
-L- STA. 131+28 – 131+60 RT.
-L- STA. 147+09 – 148+65 LT.
-Y8RPA- STA. 13+20 – 14+20 LT.

DETAIL M
TAIL V DITCH
(Not to Scale)



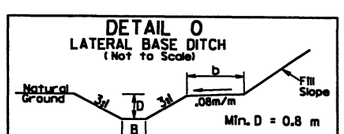
-L- STA. 107+40 RT. (ACTUAL LENGTH=35m)
S=0.30%, DDE=38cm
-L- STA. 137+92 RT. (ACTUAL LENGTH=10m)
S=4.00%, DDE=12cm
-Y8DET- STA. 14+78 RT. (ACTUAL LENGTH=40m)
S=0.58%, DDE=41cm

DETAIL N
SPECIAL CUT BASE DITCH
(Not to Scale)



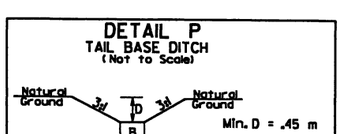
-L2- STA. 88+20 – 89+40 LT.

DETAIL O
LATERAL BASE DITCH
(Not to Scale)



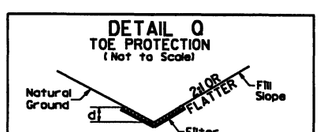
-L2- STA. 101+40 – 102+00 LT.

DETAIL P
TAIL BASE DITCH
(Not to Scale)



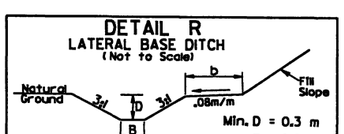
-L- STA. 114+01 RT. (ACTUAL LENGTH=55m)
S=0.30%, DDE=90cm

DETAIL Q
TOE PROTECTION
(Not to Scale)



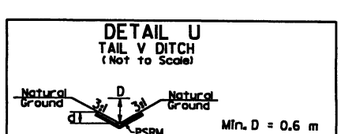
-L- STA. 115+30 – 115+80 RT.
-L- STA. 133+20 – 133+90 LT.
-L- STA. 152+50 – 153+03 LT.

DETAIL R
LATERAL BASE DITCH
(Not to Scale)



-L2LPD- STA. 1+40 – 1+80 LT.

DETAIL U
TAIL V DITCH
(Not to Scale)



-SR5- STA. 14+34 – 14+54 RT. (ACTUAL LENGTH=31m)
S=1.52%, DDE=33cm

METRIC
5 0 10

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	2-5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 21022 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 15181 ENGINEER TINA H. SWEET

CONST.REV.

R/W REV.

Permit Drawing
Sheet 24 of 111

PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
900 RIDGEFIELD DRIVE • SUITE 350
RALEIGH, NORTH CAROLINA 27609-3860
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

IDVRNGT 07/32/09
n:\roadway\proj\r2554ba_rdy_psh_02_tx.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	2-T
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 21422 ENGINEER MICHAEL T. MERRITT

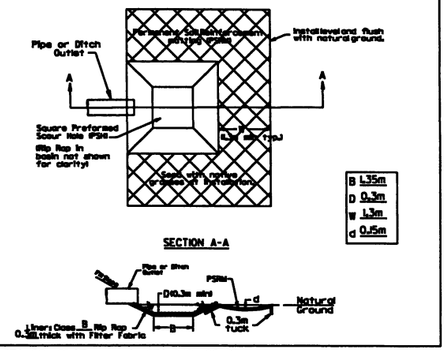
HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 19181 ENGINEER TINA N. SWEET

5 0 10

CONST.REV.

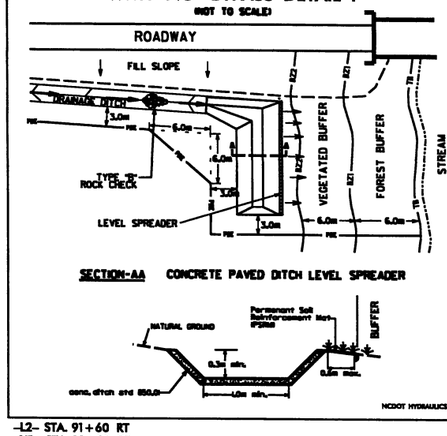
R/W REV.

DETAIL F
PREFORMED SCOUR HOLE WITH LEVEL SPREADER APRON



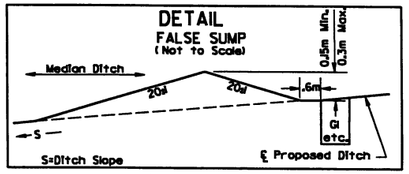
-L- STA. 92+81 LT.
-L- STA. 95+82 RT.
-L- STA. 100+31 RT.
-L- STA. 115+40 LT.
-L- STA. 139+60 RT.
-L- STA. 140+20 LT.
-L- STA. 141+80 LT.
-L- STA. 142+30 RT.
-L- STA. 152+75 RT.
-L- STA. 152+87 LT.
-L2LPD- STA. 2+80 RT.
-L2RPBD- STA. 16+30 RT.
-Y2- STA. 12+40 RT.

LEVEL SPREADER DETAIL WITH NO BYPASS DETAIL T
(NOT TO SCALE)



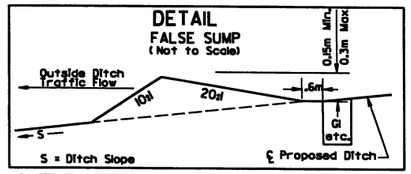
-L2- STA. 91+60 RT
-Y2- STA. 12+80 RT

DETAIL
FALSE SUMP
(Not to Scale)



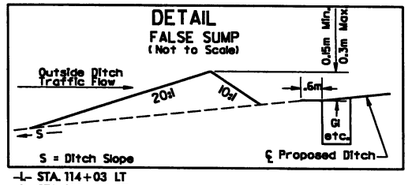
-L- STA. 96+96 M
-L- STA. 97+97 M
-L- STA. 107+44 M
-L- STA. 111+55 M
-L- STA. 117+98 M
-L- STA. 121+17 M
-L- STA. 123+25 M
-L- STA. 125+33 M
-L- STA. 127+43 M
-L- STA. 129+44 M
-L- STA. 130+24 M
-L- STA. 130+84 M
-L- STA. 131+30 M
-L- STA. 133+25 M
-L- STA. 134+16 M
-L- STA. 136+56 M
-L- STA. 137+89 M
-L- STA. 140+16 M
-L- STA. 142+24 M
-L- STA. 148+44 M
-L- STA. 150+24 M
-L- STA. 151+64 M
-L2- STA. 82+81 M
-L2- STA. 84+36 M
-L2- STA. 85+96 M
-L2RPBD- STA. 10+71 RT

DETAIL
FALSE SUMP
(Not to Scale)



-L- STA. 114+03 RT
-L- STA. 129+44 RT
-L2- STA. 85+96 LT
-L2- STA. 84+36 LT

DETAIL
FALSE SUMP
(Not to Scale)



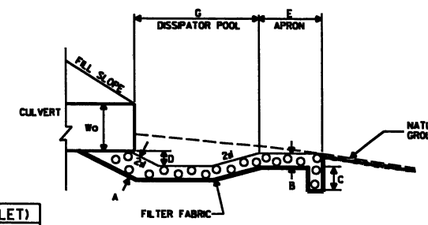
-L- STA. 114+03 LT
-L- STA. 129+44 LT
-L- STA. 130+24 LT
-L- STA. 151+13 LT
-L2- STA. 84+36 RT
-L2- STA. 85+97 RT

DIM. (m)	RIP RAP BASIN # 1	2	3
A	1.0	1.0	
B	0.7	0.7	
C	1.2	1.2	
D	0.8	0.6	
E	4.0	3.1	
F	10.0	9.0	
G	8.0	6.1	

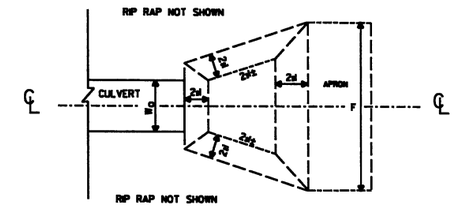
ALL DIMENSIONS APPROXIMATE

BASIN #	LOCATION (AT OUTLET)
1	Sta 95+07 -L- (Rt)
2	Sta 14+08 -L2RPBD- (Rt)
3	

℄ SECTION

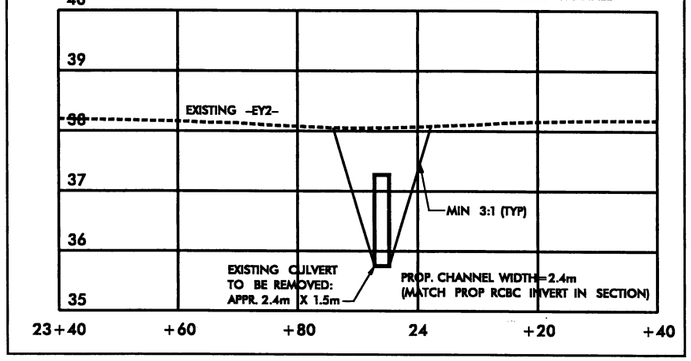


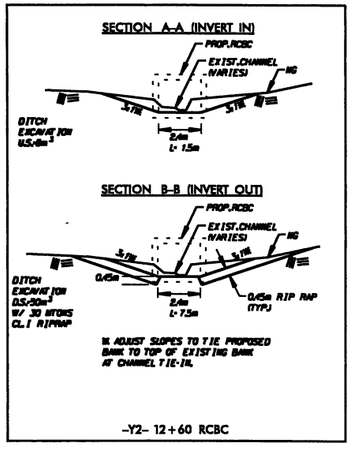
HALF PLAN



DETAIL OF RIP-RAPPED OUTLET ENERGY DISSIPATOR BASIN DETAIL S

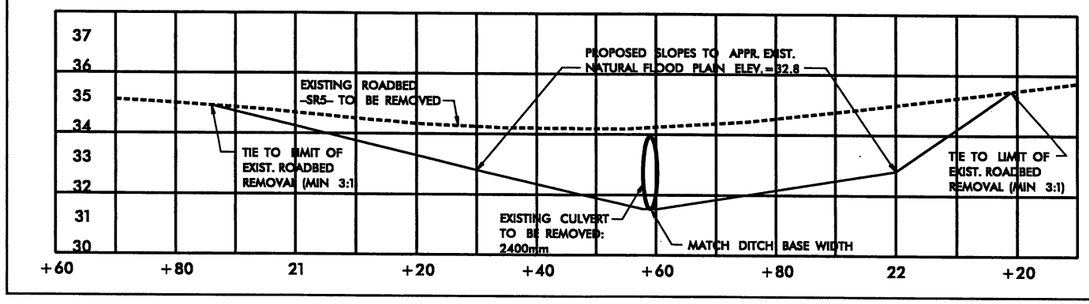
DETAIL W
REMOVE EXIST. CULVERT STA. 23+94 -EY2- AND TIE TO PROPOSED RCBC CHANNEL





-Y2- 12+60 RCBC

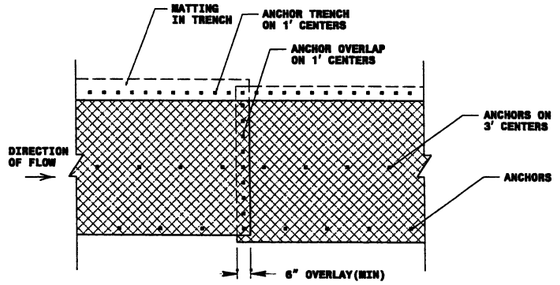
DETAIL V
REMOVE EXIST. CULVERT AND ROADBED FOR MITIGATION CREDIT, STA. 21+60 -SR5-.
EXCAVATE EXIST. ROAD TO NATURAL FLOOD PLAIN.



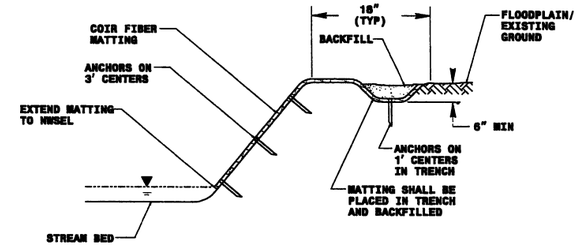
Permit Drawing
Sheet 25 of 111

PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
900 RIDGEFIELD DRIVE • SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

DO NOT PLOT
10/7/44
n:\projects\dwg\VP-roj\v-2554ba-rdy_psh_82-T.dgn



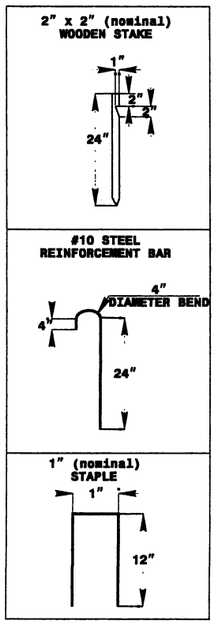
PLAN VIEW



TYPICAL CROSS SECTION

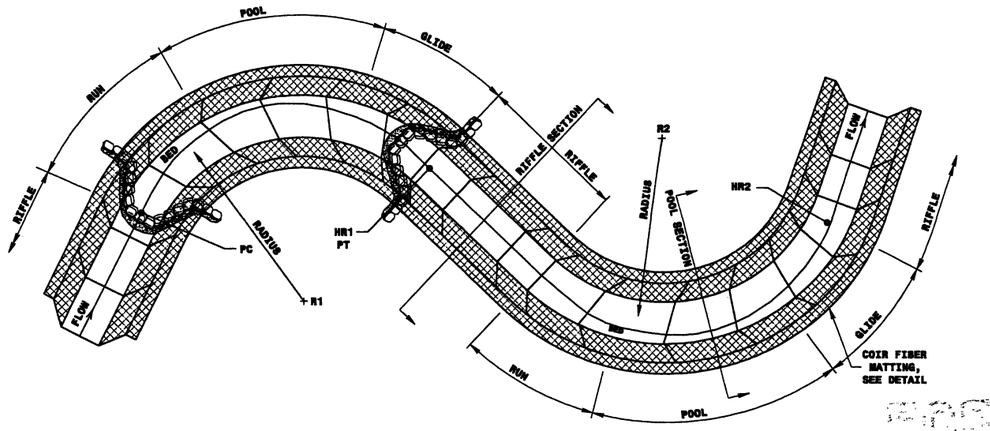
COIR FIBER MATTING DETAIL

NOT TO SCALE

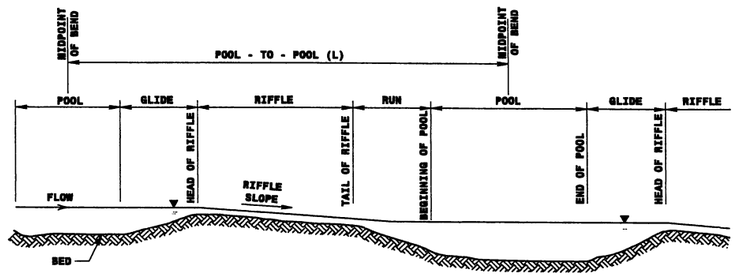


ANCHOR OPTIONS

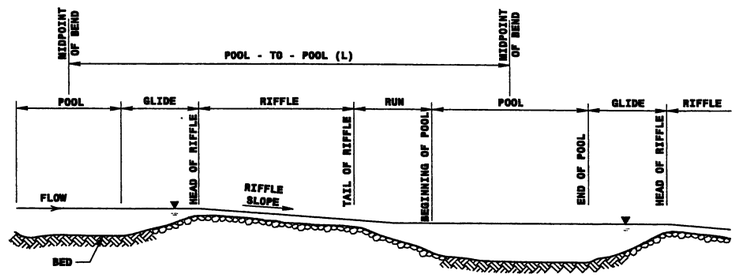
NOTES:
1. IN AREAS TO BE MATTED, ALL SEEDING, SOIL AMENDMENTS, AND SOIL PREPARATION MUST BE COMPLETED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS PRIOR TO PLACEMENT OF COIR FIBER MATTING.
2. REBAR OR STAPLES MAY BE USED IN PLACE OF WOODEN STAKES AS DIRECTED BY THE ENGINEER.



TYPICAL PLAN



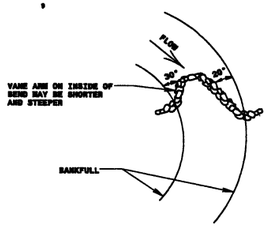
TYPICAL PROFILE



TYPICAL PROFILE FOR ARMORED RIFFLE SECTION

CHANNEL TYPICAL DETAIL

NOT TO SCALE



CROSS VANE CONSTRUCTION IN MEANDER-BEND PLAN VIEW

NOTES:
1. THE COORDINATES FOR EACH CENTER OF RADIUS (EX. "R1","R2") AND EACH HEAD OF RIFFLE (EX. "HR1", "HR2") ARE INDICATED ON THE PLAN SHEETS.
2. SEE COORDINATE GEOMETRY SHEETS FOR CURVE CENTERS (CC), HEAD OF RIFFLE AT PT'S AND TAIL OF RIFFLE AT PC'S.

W_{bkf} = BANKFULL WIDTH
D_{max} = MAXIMUM DEPTH
W_b = BOTTOM WIDTH
W_{fpa} = FLOOD PRONE AREA WIDTH

CROSS-SECTION DIMENSIONS

	RIFFLE				POOL				
REACH	W_{bkf}	D_{max}	W_b	W_{fpa}	W_{bkf}	D_{max}	W_b	W_{fpa}	Width/Depth Ratio
SITE 3 (UPPER)	1.8m (6.0')	0.20m (0.65')	0.80m (2.6')	SEE PLAN VIEW	2.3m (7.5')	0.45m (1.5')	0.5m (1.6')	SEE PLAN VIEW	12.0
SITE 3 (LOWER)	2.4m (8.0')	0.30m (1.00')	0.90m (3.0')	SEE PLAN VIEW	3.0m (10.0')	0.60m (2.0')	0.6m (2.0')	SEE PLAN VIEW	11.4
SITE 3 (TRIB)	1.8m (6.0')	0.20m (0.65')	0.80m (2.6')	SEE PLAN VIEW	2.3m (7.5')	0.45m (1.5')	0.5m (1.6')	SEE PLAN VIEW	12.0
SITE 5	2.7m (9.0')	0.30m (1.00')	1.20m (4.0')	SEE PLAN VIEW	3.3m (11.0')	0.60m (2.0')	0.95m (3.1')	SEE PLAN VIEW	12.9

METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	R-2554BA	2-W
	R/W SHEET NO.	
CONST.REV.		HYDRAULICS ENGINEER
R/W REV.		

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

RECEIVED
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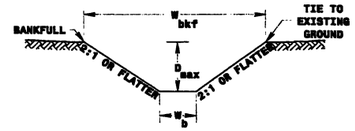
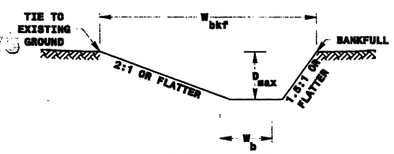
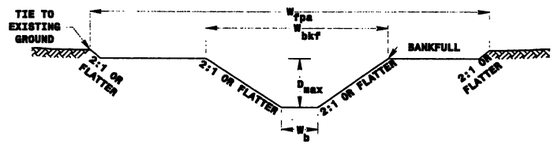
DIVISION OF HIGHWAYS
PROJECTS UNIT



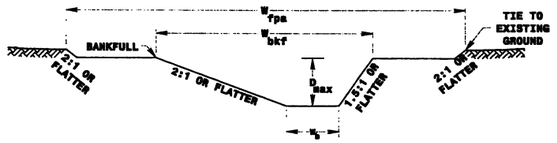
TYPICAL RIFFLE



TYPICAL POOL



TYPICAL RIFFLE WITH BANKFULL BENCH



TYPICAL POOL WITH BANKFULL BENCH

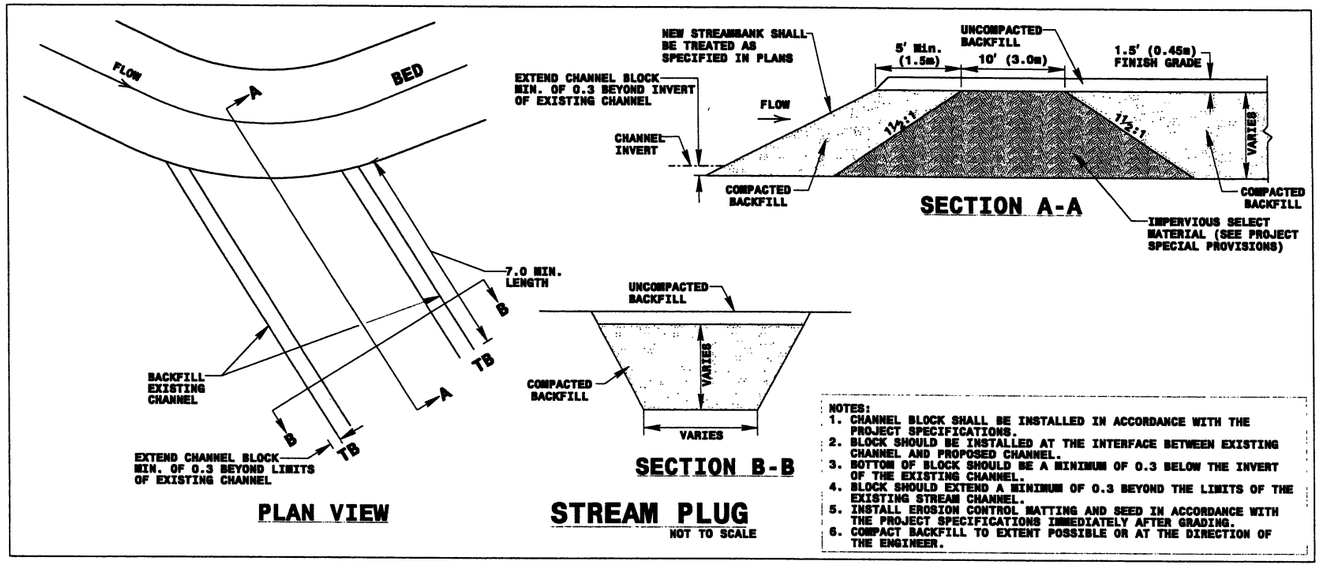
TYPICAL RIFFLE SECTION NOTES:
1. KEY-IN MATTING AT TOP OF SLOPE
2. MATTING IS TO OVERLAP TOP OF BANK BY 0.45m.
2. UNIFORMLY TRANSITION TO POOL SECTIONS.

TYPICAL POOL SECTION NOTES:
1. KEY-IN MATTING AT TOP OF SLOPE
2. MATTING IS TO OVERLAP TOP OF BANK BY 0.45m.
3. UNIFORMLY TRANSITION TO RIFFLE SECTIONS.
4. THALWEG LOCATION AT OUTSIDE EDGE OF HORIZONTAL CURVES.

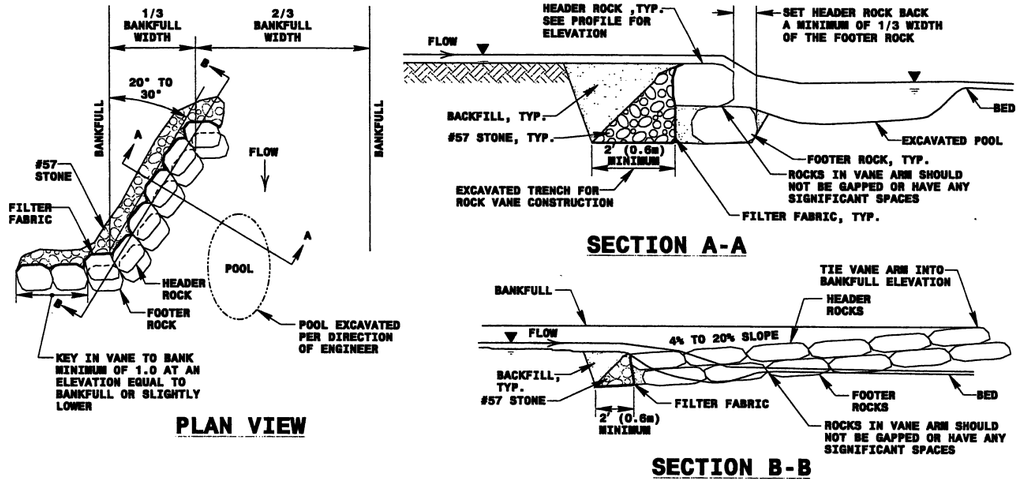
Permit Drawing
Sheet 26 of 111

PLANS PREPARED BY :
RUMMEL KLEPPER & KAHL, LLP
consulting engineers
900 RIDGEFIELD DRIVE, SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

METRIC	PROJECT REFERENCE NO.	SHEET NO.
	R-2554BA	2-X
	R/W SHEET NO.	
CONST.REV.		HYDRAULICS ENGINEER
R/W REV.		



NOTES:
1. CHANNEL BLOCK SHALL BE INSTALLED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
2. BLOCK SHOULD BE INSTALLED AT THE INTERFACE BETWEEN EXISTING CHANNEL AND PROPOSED CHANNEL.
3. BOTTOM OF BLOCK SHOULD BE A MINIMUM OF 0.3 BELOW THE INVERT OF THE EXISTING CHANNEL.
4. BLOCK SHOULD EXTEND A MINIMUM OF 0.3 BEYOND THE LIMITS OF THE EXISTING STREAM CHANNEL.
5. INSTALL EROSION CONTROL MATTING AND SEED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS IMMEDIATELY AFTER GRADING.
6. COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.

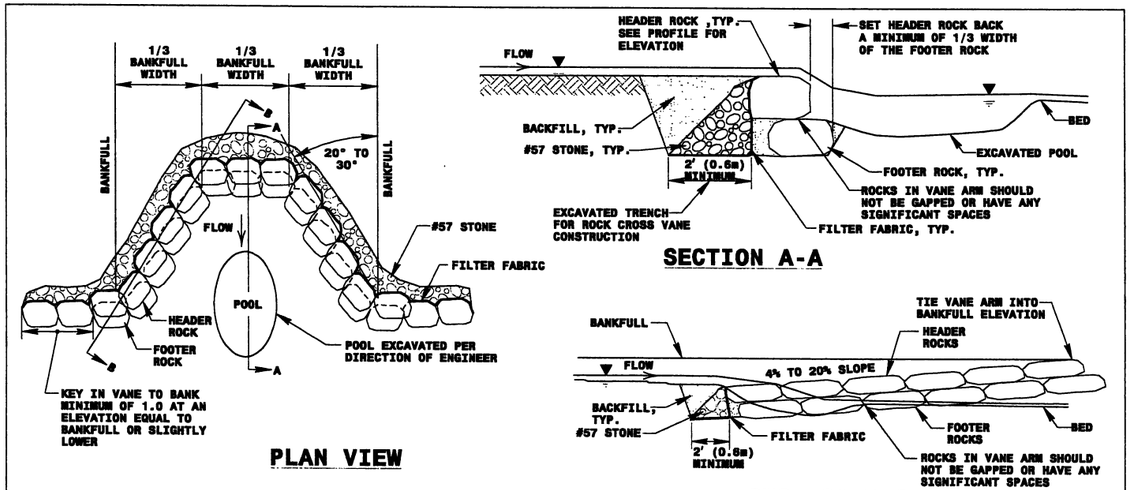


-STMR03-			
	BOULDER DIMENSIONS (M)		
STATION	HEIGHT	LENGTH	WIDTH
10+09	1.2	0.9	0.6
10+13	1.2	0.9	0.6
10+27	1.2	0.9	0.6
10+31	1.2	0.9	0.6
11+20	1.2	0.9	0.6
11+24	1.2	0.9	0.6
11+70	1.2	0.9	0.6
11+75	1.2	0.9	0.6
11+89	1.2	0.9	0.6
11+93	1.2	0.9	0.6
12+41	1.2	0.9	0.6
12+45	1.2	0.9	0.6

-STMR05-			
	BOULDER DIMENSIONS (M)		
STATION	HEIGHT	LENGTH	WIDTH
10+10	1.2	0.9	0.6
10+14	1.2	0.9	0.6
10+58	1.2	0.9	0.6
10+82	1.2	0.9	0.6
10+85	1.2	0.9	0.6
11+13	1.2	0.9	0.6
11+17	1.2	0.9	0.6

NOTES:
1. DEEPEST PART OF POOL TO BE IN LINE WITH WHERE VANE ARM TIES INTO BANKFULL.
2. DO NOT EXCAVATE POOL TOO CLOSE TO FOOTER BOULDERS.
3. CLASS "A" STONE CAN BE USED TO REDUCE VOIDS BETWEEN HEADERS AND FOOTERS.
4. COMPACT BACKFULL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.
5. POOL DEPTH SHOULD BE 2 TO 3 TIMES BANKFULL DEPTH.

ROCK VANE DETAIL
NOT TO SCALE



-STMR03-			
	BOULDER DIMENSIONS (M)		
STATION	HEIGHT	LENGTH	WIDTH
11+60	1.2	0.9	0.6
11+98	1.2	0.9	0.6
12+38	1.2	0.9	0.6
12+77	1.2	0.9	0.6
-STMR03_TRB-			
	BOULDER DIMENSIONS (M)		
STATION	HEIGHT	LENGTH	WIDTH
10+41	1.2	0.9	0.6

-STMR05-			
	BOULDER DIMENSIONS (M)		
STATION	HEIGHT	LENGTH	WIDTH
10+06	1.2	1.2	0.6
10+71	1.2	1.2	0.6

NOTES:
1. DEEPEST PART OF POOL TO BE IN LINE WITH WHERE VANE ARM TIES INTO BANKFULL.
2. DO NOT EXCAVATE POOL TOO CLOSE TO FOOTER BOULDERS.
3. CLASS "A" STONE CAN BE USED TO REDUCE VOIDS BETWEEN HEADERS AND FOOTERS.
4. COMPACT BANKFULL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.
5. POOL DEPTH SHOULD BE 2 TO 3 TIMES BANKFULL DEPTH.

Permit Drawing
Sheet 27 of 111

ROCK CROSS VANE DETAIL
NOT TO SCALE

PLANS PREPARED BY :
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900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	R-2554BA	2-Y
	R /W SHEET NO.	
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R /W REV.		

MORPHOLOGICAL MEASUREMENTS TABLE

US 70 (GOLDBORO BYPASS)
–STRM03– (LOWER) Sta. 10+00.000 to Sta. 11+29.346
–STRM03– (UPPER) Sta. 11+29.346 to Sta. 12+83.130

Variables	Existing Channel	Proposed Upper Reach	Proposed Lower Reach	Reference Reach
1. Stream type	F	C5	C5	E5
2.Drainage area (sq.mi.)	0.15	0.084	0.15	0.38
3. Bankfull width (ft)	11.5	6.0	8.0	7.1-12.0
4. Bankfull mean depth (ft)	0.4	0.5	0.7	0.9
5. Width/depth ratio	26.0	12.0	11.4	7.9
6. Bankfull cross-sectional area (sq.ft)	5.6	3.0	5.6	6.5
7. Bankfull mean velocity (ft/s)	*	0.93	0.75	1.28
8. Bankfull discharge (cfs)	*	2.8	4.2	8.3
9. Bankfull max depth (ft)	*	0.65	1.0	1.0-1.6
10. Width of floodprone area (ft)	*	89-101	62-95	102
11. Entrenchment ratio	*	14.8-16.8	7.9-11.9	14
12. Meander length (ft) (average)	*	60	80	75-120
13. Ratio of meander length to bankfull width	*	10	10	10.0-10.6
14. Radius of curvature (ft)	*	>15	>20	3.8-35.8
15. Ratio of radius of curvature to bankfull width	*	>2.5	>2.5	0.5-3.0
16. Belt width (ft)	43	37	40	*
17. Meander width ratio	3.7	6.2	5.0	*
18. Sinuosity (stream length/valley length)	1.14	1.15	1.16	1.6
19. Valley slope (ft/ft)	*	0.0085	.0020	*
20. Average slope (ft/ft)	*	0.0017	.0017	0.0012
21. Pool slope(ft/ft)	*	0.0	0.0	*
22. Ratio of pool slope to average slope	*	0.0	0.0	*
23. Maximum pool depth (ft)	*	1.5	2.0	1.7-2.0
24. Ratio of pool depth to average bankfull depth	*	3.0	2.9	1.9-2.2
25. Pool width (ft)	*	2.0	1.6	*
26. Ratio of pool width to bankfull width	*	0.33	0.2	*
27. Pool to pool spacing (ft) (average)	*	35.4-45.0	47-60	42-90
28. Ratio of pool to pool spacing to bankfull width	*	5.9-7.5	5.9-7.5	5.9-7.5
29. Ratio of lowest bank height to bankfull height (or max bankfull depth)	*	1.0	1.0	1.0

* = NOT MEASURED

NOTE: ENGLISH UNITS WERE USED FOR ALL VARIABLES IN THE MORPHOLOGICAL MEASUREMENTS TABLE.

Permit Drawing
Sheet 28 of 111

PLANS PREPARED BY :
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900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
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FOR
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	2-Z
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

5 0 10

CONST.REV.

R /W REV.

STRM03 (LOWER)									
STATIONS	TANGENT/ CURVE NO.	POINT DESCRIPTOR	NORTHING	EASTING	TANGENT / CHORD BEARING	TANGENT / CHORD LENGTH	CURVE LENGTH	DELTA ANGLE	RADIUS
10+00.000			186386.414	701530.092					
	T1				N 81° 30' 50.58" E	5.600m	N/A	N/A	N/A
10+05.600		PC	186387.24	701535.631					
	C1	CC	186376.855	701537.18	S 64° 00' 15.47" E	11.889m	12.638m	68° 57' 47.91" right	10.500m
10+18.238		PT	186382.03	701546.317					
	T2				S 29° 31' 21.51" E°	5.200m	N/A	N/A	N/A
10+23.438		PC	186377.505	701548.88					
	C2	CC	186382.186	701557.146	S 66° 19' 36.96" E	11.383m	12.205m	73° 36' 30.91" left	9.500m
10+35.643		PT	186372.934	701559.304					
	T3				N 76° 52' 7.58" E	5.200m	N/A	N/A	N/A
10+40.843		PC	186374.116	701564.368					
	C3	CC	186365.351	701566.413	S 63° 34' 38.78" E	11.462m	12.426m	79° 06' 27.27" right	9.000m
10+53.269		PT	186369.015	701574.633					
	T4				S 24° 01' 25.15" E	5.200m	N/A	N/A	N/A
10+58.469		PC	186364.266	701576.75					
	C4	CC	186368.133	701585.427	S 72° 16' 19.06" E	14.175m	16.000m	96° 29' 47.83" left	9.500m
10+74.469		PT	186359.949	701590.252					
	T5				N 59° 28' 47.02" E	5.400m	N/A	N/A	N/A
10+79.869		PC	186362.692	701594.904					
	C5	CC	186354.939	701599.474	S 76° 39' 56.13" E	12.471m	13.777m	87° 42' 33.70" right	9.000m
10+93.646		PT	186359.815	701607.039					
	T6				S 32° 48' 39.28" E	5.000m	N/A	N/A	N/A
10+98.646		PC	186355.613	701609.748					
	C6	CC	186359.948	701616.472	S 76° 23' 2.43" E	11.028m	12.168m	87° 08' 46.30" left	8.000m
11+10.814		PT	186353.017	701620.466					
	T7				N 60° 02' 34.42" E	5.500m	N/A	N/A	N/A
11+16.314		PC	186355.763	701625.232					
	C7	CC	186347.966	701629.726	S 78° 28' 32.93" E	11.923m	13.032m	82° 57' 45.30" right	9.000m
11+29.346		PT	186353.381	701636.914					
STRM03 (UPPER)									
11+29.346		PT	186353.381	701636.914					
	T8				S 36° 59' 40.28" E	5.000m	N/A	N/A	N/A
11+34.346		PC	186349.388	701639.923					
	C8	CC	186355.405	701647.91	S 68° 35' 31.74" E	10.479m	11.030m	63° 11' 42.92" left	10.000m
11+45.376		PT	186345.563	701649.679					
	T9				N 79° 48' 36.80" E	5.000m	N/A	N/A	N/A
11+50.376		PC	186346.448	701654.6					
	C9	CC	186338.082	701656.104	S 66° 34' 4.30" E	9.413m	9.976m	67° 14' 37.81" right	8.500m
11+60.351		PT	186342.704	701663.237					
	T10				S 32° 56' 45.40" E	5.200m	N/A	N/A	N/A
11+65.551		PC	186338.341	701666.065					
	C10	CC	186343.235	701673.617	S 75° 51' 24.77" E	12.255m	13.481m	85° 49' 18.76" left	9.000m
11+79.032		PT	186335.346	701677.949					
	T11				N 61° 13' 55.85" E	5.400m	N/A	N/A	N/A
11+84.432		PC	186337.945	701682.682					
	C11	CC	186328.741	701687.735	S 82° 08' 42.72" E	12.527m	13.423m	73° 14' 42.87" right	10.500m
11+97.855		PT	186336.233	701695.092					
	T12				S 45° 31' 21.28" E	5.000m	N/A	N/A	N/A
12+02.855		PC	186332.73	701698.66					
	C12	CC	186339.508	701705.316	S 85° 50' 14.89" E	12.293m	13.369m	80° 37' 47.21" left	9.500m
12+16.224		PT	186331.837	701710.92					
	T13				N 53° 50' 51.51" E	5.200m	N/A	N/A	N/A
12+21.424		PC	186334.905	701715.119					
	C13	CC	186328.042	701720.133	S 86° 30' 50.00" E	10.845m	11.761m	79° 16' 36.98" right	8.500m
12+33.185		PT	186334.246	701725.944					
	T14				S 46° 52' 31.51" E	5.000m	N/A	N/A	N/A
12+38.185		PC	186330.828	701729.593					
	C14	CC	186337.396	701735.745	S 80° 50' 39.68" E	10.057m	10.672m	67° 56' 16.34" left	9.000m
12+48.857		PT	186329.227	701739.522					
	T15				N 65° 11' 12.15" E	5.200m	N/A	N/A	N/A
12+54.057		PC	186331.41	701744.242					
	C15	CC	186322.333	701748.439	N 84° 30' 5.00" E	6.615m	6.742m	38° 37' 45.71" right	10.000m
12+60.799		PT	186332.043	701750.827					
	T16				S 76° 11' 2.14" E	5.200m	N/A	N/A	N/A
12+65.999		PC	186330.802	701755.876					
	C16	CC	186341.969	701758.623	N 76° 05' 16.38" E	10.701m	11.131m	55° 27' 22.96" left	11.500m
12+77.130		PT	186333.375	701766.264					
	T17				N 48° 21' 34.90" E	6.000m	N/A	N/A	N/A
12+83.130		PT	186337.361	701770.748					

STRM03_TRB									
STATIONS	TANGENT/ CURVE NO.	POINT DESCRIPTOR	NORTHING	EASTING	TANGENT / CHORD BEARING	TANGENT / CHORD LENGTH	CURVE LENGTH	DELTA ANGLE	RADIUS
10+00.000		PC	186353.201	701637.05					
	C17	CC	186359.218	701645.037	S 77° 47' 28.29" E	13.068m	14.241m	81° 35' 36.01" left	10.000m
10+14.241		PT	186350.437	701649.822					
	T18				N 61° 24' 43.71" E	6.647m	N/A	N/A	N/A
10+20.888		PC	186353.618	701655.659					
	C18	CC	186345.276	701660.205	N 82° 42' 6.24" E	6.899m	7.060m	42° 34' 45.08" right	9.500m
10+27.948		PT	186354.495	701662.502					
	T19				S 76° 00' 31.22" E	5.000m	N/A	N/A	N/A
10+32.948		PC	186353.286	701667.353					
	C19	CC	186362.504	701669.65	N 80° 47' 45.12" E	7.484m	7.692m	46° 23' 27.32" left	9.500m
10+40.640		PT	186354.483	701674.74					
	T20				N 57° 36' 1.47" E	6.000m	N/A	N/A	N/A
10+46.640		PC	186357.698	701679.806					

Permit Drawing
Sheet 21 of 211

PLANS PREPARED BY :
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900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3961
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	2-AA
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CONST.REV.	
R /W REV.	

METRIC

5 0 10

SHOULDER BERM GUTTER -L2RPA- STA. 0+00 TO 1+60

SHOULDER BERM GUTTER -L- STA. 98+17 TO 100+41

SHOULDER BERM GUTTER -L2RPBD- STA. 16+10 TO 17+94

SHOULDER BERM GUTTER -L- STA. 98+50 TO 100+30

END STREAM RESTORATION

-L- POT Sta.98+50.000 = -L2RPBD- ST Sta.17+94.467 (14.2m RT)

-L- POT Sta.99+66.856 = -STRM03- (UPPER) Sta.12+83.130 (61.6m RT)

-L2RPBD- CS Sta.17+34.467

-STRM03_TRB- Sta.10+46.640 ELEV. = 34.500

-L- POC Sta.100+61.488

-Y1- POT Sta.10+97.530 = -L- +54.15 65m (213.25 ft)

-L- POT Sta.10+00.000

-L2RPBD- +60.000 7.0m (229.66 ft) = -L- POT Sta.97+21.286

-STRM03- (LOWER) Sta.10+00.000 (65.7m RT)

-STRM03- (LOWER) Sta.11+29.346 = -STRM03- (UPPER) Sta.11+29.346 = -STRM03_TRB- Sta.10+00.00

-L- +70.000 110m (360.89 ft)

-L- +00.000 104m (341.22 ft)

APPROX.GRADING LIMITS

FLOOD PRONE AREA

CONSTRUCTION ℄

BANKFULL

FILL EXISTING CHANNEL

DO NOT OBSTRUCT EXISTING CHANNEL AT TIE-IN

FILL SLOPES UNDERNEATH BRIDGE OVER RAILROAD ARE NOT TO FILL EXISTING DITCHES

BL-556B PINC 17+77.540= BY1556B POT 8+16.689= -Y1- STA. 10+15.204 (4.189m EL. 38.922

NOTE: PIPE TO BE BURIED 20% OF PIPE DIAMETER UP TO 0.3m.

-STRM03-

BEGIN STREAM RESTORATION
-STRM03- STA. 10+00.000
EL. BKF = 34.129m
EL. GROUND = 33.829m

EXISTING GROUND AT CONSTRUCTION ℄

PROPOSED BANKFULL PROFILE

PROPOSED THALWEG PROFILE

STEP/CROSS VANE
11+60.351 - ELEV. 34.402m (BKF - BACK)
- ELEV. 34.623m (BKF - AHD)

STEP/CROSS VANE
11+97.855 - ELEV. 34.698m (BKF - BACK)
- ELEV. 34.908m (BKF - AHD)

STEP/CROSS VANE
12+33.185- ELEV. 34.978m (BKF - BACK)
- ELEV. 35.191m (BKF - AHD)

STEP/CROSS VANE
12+77.130 - ELEV. 35.279m (BKF - BACK)
- ELEV. 35.485m (BKF - AHD)

END STREAM RESTORATION
-STRM03- STA. 12+83.130
EL. BKF = 35.500m
EL. GROUND = 35.300m
1350mm PIPE
EL. INV. = 35.030

LEGEND
— ROOTWAD – LOGVANE
— ROCK CROSSVANE
— ROCKVANE
---- — BUFFER ZONE 1
-·- — BUFFER ZONE 2

PLANS PREPARED BY :
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900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

Permit Drawing
Sheet 30 of 114

METRIC	PROJECT REFERENCE NO.	SHEET NO.
	R-2554BA	2-AB
	R /W SHEET NO.	
5 0 10	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CONST.REV.		
R /W REV.		

MORPHOLOGICAL MEASUREMENTS TABLE

US 70 (GOLDBORO BYPASS)
–STRM05– Sta. 10+00.000 to Sta. 15+26.859

Variables	Existing Channel	Proposed Reach	Reference Reach
1. Stream type	F5	C5	E5
2.Drainage area (sq.mi.)	0.17	0.17	0.38
3. Bankfull width (ft)	*	9.0	7.1-12.0
4. Bankfull mean depth (ft)	0.5	0.7	0.9
5. Width/depth ratio	21.6	12.9	7.9
6. Bankfull cross-sectional area (sq.ft)	6.3	6.3	6.5
7. Bankfull mean velocity (ft/s)	*	0.64	1.28
8. Bankfull discharge (cfs)	*	4.6	8.3
9. Bankfull max depth (ft)	*	1.0	1.0-1.6
10. Width of floodprone area (ft)	*	72-155	102
11. Entrenchment ratio	*	9.0-17.2	14
12. Meander length (ft) (average)	*	90	75-120
13. Ratio of meander length to bankfull width	*	10	10.0-10.6
14. Radius of curvature (ft)	*	>22.5	3.8-35.8
15. Ratio of radius of curvature to bankfull width	*	>2.5	0.5-3.0
16. Belt width (ft)	*	45	*
17. Meander width ratio	*	5	*
18. Sinuosity (stream length/valley length)	1.0	1.2	1.6
19. Valley slope (ft/ft)	0.000	0.0035	*
20. Average slope (ft/ft)	*	0.0017	0.0012
21. Pool slope(ft/ft)	*	0.0	*
22. Ratio of pool slope to average slope	*	0.0	*
23. Maximum pool depth (ft)	*	2.0	1.7-2.0
24. Ratio of pool depth to average bankfull depth	*	2.9	1.9-2.2
25. Pool width (ft)	*	3.1	*
26. Ratio of pool width to bankfull width	*	0.34	*
27. Pool to pool spacing (ft) (average)	*	53-68	42-90
28. Ratio of pool to pool spacing to bankfull width	*	5.9-7.5	5.9-7.5
29. Ratio of lowest bank height to bankfull height (or max bankfull depth)	0.9	1.0	1.0

* = NOT MEASURED

NOTE: ENGLISH UNITS WERE USED FOR ALL VARIABLES IN THE MORPHOLOGICAL MEASUREMENTS TABLE.

Permit Drawing
Sheet 31 of 111

PLANS PREPARED BY :
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900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	2-AC
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

5 0 10

CONST.REV.

R /W REV.

STRM05

STATIONS	TANGENT/ CURVE NO.	POINT DESCRIPTOR	NORTHING	EASTING	TANGENT / CHORD BEARING	TANGENT / CHORD LENGTH	CURVE LENGTH	DELTA ANGLE	RADIUS
10+00.000		PT	186,202.353	702,515.476					
	T1				S 75° 13' 22.10" E	6.100m	N/A	N/A	N/A
10+06.100		PC	186,200.797	702,521.374					
	C1	CC	186,210.950	702,524.052	N 75° 56' 2.31" E	10.131m	10.572m	57° 41' 11.18" left	10.500m
10+16.672		PT	186,203.260	702,531.201					
	T2				N 47° 05' 26.73" E	5.400m	N/A	N/A	N/A
10+22.072		PC	186,206.936	702,535.156					
	C2	CC	186,200.344	702,541.284	N 79° 28' 32.64" E	9.641m	10.174m	64° 46' 11.83" right	9.000m
10+32.246		PT	186,208.697	702,544.635					
	T3				S 68° 08' 21.44" E	5.200m	N/A	N/A	N/A
10+37.446		PC	186,206.761	702,549.461					
	C3	CC	186,214.186	702,552.440	N 70° 00' 55.53" E	10.674m	11.685m	83° 41' 26.05" left	8.000m
10+49.131		PT	186,210.409	702,559.492					
	T4				N 28° 10' 12.51" E	5.000m	N/A	N/A	N/A
10+54.131		PC	186,214.817	702,561.853					
	C4	CC	186,210.804	702,569.346	N 71° 17' 50.15" E	11.622m	12.796m	86° 15' 15.28" right	8.500m
10+66.927		PT	186,218.543	702,572.861					
	T5				S 65° 34' 32.21" E	4.800m	N/A	N/A	N/A
10+71.727		PC	186,216.558	702,577.231					
	C5	CC	186,223.387	702,580.332	N 63° 37' 24.03" E	11.624m	13.300m	101° 36' 7.51" left	7.500m
10+85.027		PT	186,221.723	702,587.645					
	T5				N 12° 49' 20.28" E	4.800m	N/A	N/A	N/A
10+89.827		PC	186,226.403	702,588.710					
	C6	CC	186,224.517	702,596.998	N 52° 39' 16.48" E	10.889m	11.818m	79° 39' 52.40" right	8.500m
11+01.645		PT	186,233.009	702,597.367					
	T6				S 87° 30' 47.33" E	5.300m	N/A	N/A	N/A
11+06.945		PC	186,232.779	702,602.662					
	C7	CC	186,241.770	702,603.053	N 45° 28' 45.86" E	13.166m	14.768m	94° 00' 53.62" left	9.000m
11+21.713		PT	186,242.010	702,612.050					
	T7				N 01° 31' 40.95" W	5.000m	N/A	N/A	N/A
11+26.713		PC	186,247.008	702,611.916					
	C8	CC	186,247.262	702,621.413	N 45° 49' 40.48" E	13.976m	15.704m	94° 42' 42.85" right	9.500m
11+42.417		PT	186,256.747	702,621.940					
	T8				S 86° 48' 58.10" E	5.300m	N/A	N/A	N/A
11+47.717		PC	186,256.453	702,627.232					
	C9	CC	186,264.440	702,627.677	N 55° 40' 35.34" E	9.742m	10.474m	75° 00' 53.11" left	8.000m
11+58.191		PT	186,261.946	702,635.278					
	T9				N 18° 10' 8.79" E	5.300m	N/A	N/A	N/A
11+63.491		PC	186,266.982	702,636.930					
	C10	CC	186,264.409	702,644.769	N 44° 00' 18.48" E	7.191m	7.440m	51° 40' 19.39" right	8.250m
11+70.931		PT	186,272.154	702,641.926					

Permit Drawing
Sheet 32 of 111

PLANS PREPARED BY :
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900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO
R-2554BA	2-AD
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

CONST.REV.

R/W REV.

PRELIMINARY PLANS

REVISIONS

-Y2RPD- CS Sta.4+53.883

-Y2RPD- ST Sta.13+38.888

-Y2RPD- TS Sta.13+88.883

-Y2RPD- SC Sta.14+33.883

-Y2LPD-

-SR5- PCC Sta.16+46.672

-Y2RPD- SC Sta.10+65.000

-SR5- +46.570
60m (196.85 ft)

BY4 506B PINC 12+12.616=
-Y2RPA- STA. 10+34.718 151.738m LT
EL. 38.921

LATERAL V DITCH SEE DETAIL I

PIPE INVERT RAISED 0.5m FOR WATER DETENTION INSIDE RAMP AREA.

SPECIAL CUT DITCH SEE DETAIL A

LATERAL V DITCH SEE DETAIL C

FILL EXIST. CHANNEL

INV OUT = 37.000
4.5 TONS CL B RIPRAP W/11.7 SM FIL FAB

INV OUT = 35.650
1.8 TONS CL B RIPRAP W/

FILL POND

TAIL BASE DITCH SEE DETAIL J
STOP DITCH AT WETLAND BOUNDARY
6.4 TONS CL B RIPRAP W/12.5 SM FIL FAB

-SR5- +00.000
11m (36.09 ft)

-Y2RPD- +73.888
20m (65.62 ft)

-Y2RPD- +38.888
20m (65.62 ft)

-Y2RPD- +88.883
20m (65.62 ft)

-SR5- +12.000
21.3m (69.63 ft)

-SR5- +00.000
57m (187.01 ft)

-SR5- +40.000
75m (246.06 ft)

-SR5- +60.000
60m (196.85 ft)

-SR5- +70.000
m (229.68 ft)

FLOOD PRONE AREA

APPROX.GRADING LIMITS

BANKFULL

FLOOD PRONE AREA

APPROX.GRADING LIMITS

CONSTRUCTION ℄

END CONSTRUCTION
-STRM05- Sta.11+70.931 =
-SR5- Sta.15+26.859 (29.7m RT)

BEGIN CONSTRUCTION
-STRM05- POC Sta.10+00.000=
-SR5- Sta.13+73.949 (13.0m RT)

Right of Way Line for First Claim

7.3 TONS CL B RIPRAP W/17.6 SM FIL FAB
INV OUT = 36.085

3.3 TONS CL B RIPRAP W/63.7 SM FIL FAB ON BANKS ONLY
INV OUT = 35.480

TAIL V DITCH SEE DETAIL J

REMOVE

1350 RCP

1500 RCP

1500 CMP

1200 RCP

1500 RCP

NC GRID NAD 83

LEGEND

- ROOTWAD – LOGVANE
- ROCK CROSSVANE
- ROCKVANE
- BUFFER ZONE 1
- BUFFER ZONE 2

-STRM05-

BEGIN STREAM RESTORATION
-STRM05- STA. 10+00.000
EL. BKF = 36.480m
EL. GROUND = 36.180m

1350mm PIPE
EL INV. = 35.880m

CROSS VANE
10+06.100 - ELEV. 36.468m (BKF)

STEP/CROSS VANE
10+71.727 - ELEV. 36.337m (BKF - BACK)
- ELEV. 36.164m (BKF - AHD)

EXISTING GROUND AT CONSTRUCTION ℄

PROPOSED BANKFULL PROFILE

END STREAM RESTORATION
-STRM05- STA. 11+70.931
EL. BKF = 35.966m
EL. GROUND = 35.666m

PROPOSED THALWEG PROFILE

-0.1967%
-0.2037%
-0.2115%
-0.2000%
-0.1875%
-0.2000%
-0.2083%
-0.2075%
-0.2000%
-0.2075%
-0.1886%

PI = 10+06.100 EL = 36.468m
PI = 10+16.612 EL = 36.347m
PI = 10+22.672 EL = 36.336m
PI = 10+32.246 EL = 36.216m
PI = 10+37.446 EL = 36.105m
PI = 10+49.131 EL = 36.098m
PI = 10+54.130 EL = 36.072m
PI = 10+66.927 EL = 36.046m
PI = 10+71.727 EL = 35.864m
PI = 10+85.027 EL = 35.838m
PI = 10+89.827 EL = 35.828m
PI = 11+01.645 EL = 35.805m
PI = 11+06.945 EL = 35.794m
PI = 11+21.713 EL = 35.764m
PI = 11+26.713 EL = 35.754m
PI = 11+42.417 EL = 35.723m
PI = 11+47.717 EL = 35.712m
PI = 11+58.190 EL = 35.691m
PI = 11+63.491 EL = 35.681m

PI = 10+41.386 EL = 35.857m
PI = 10+27.159 EL = 35.826m
PI = 10+43.288 EL = 35.793m
PI = 10+60.529 EL = 35.759m
PI = 10+78.377 EL = 35.555m
PI = 10+95.736 EL = 35.516m
PI = 11+14.329 EL = 35.479m
PI = 11+34.565 EL = 35.439m
PI = 11+52.954 EL = 35.402m
PI = 11+67.211 EL = 35.373m

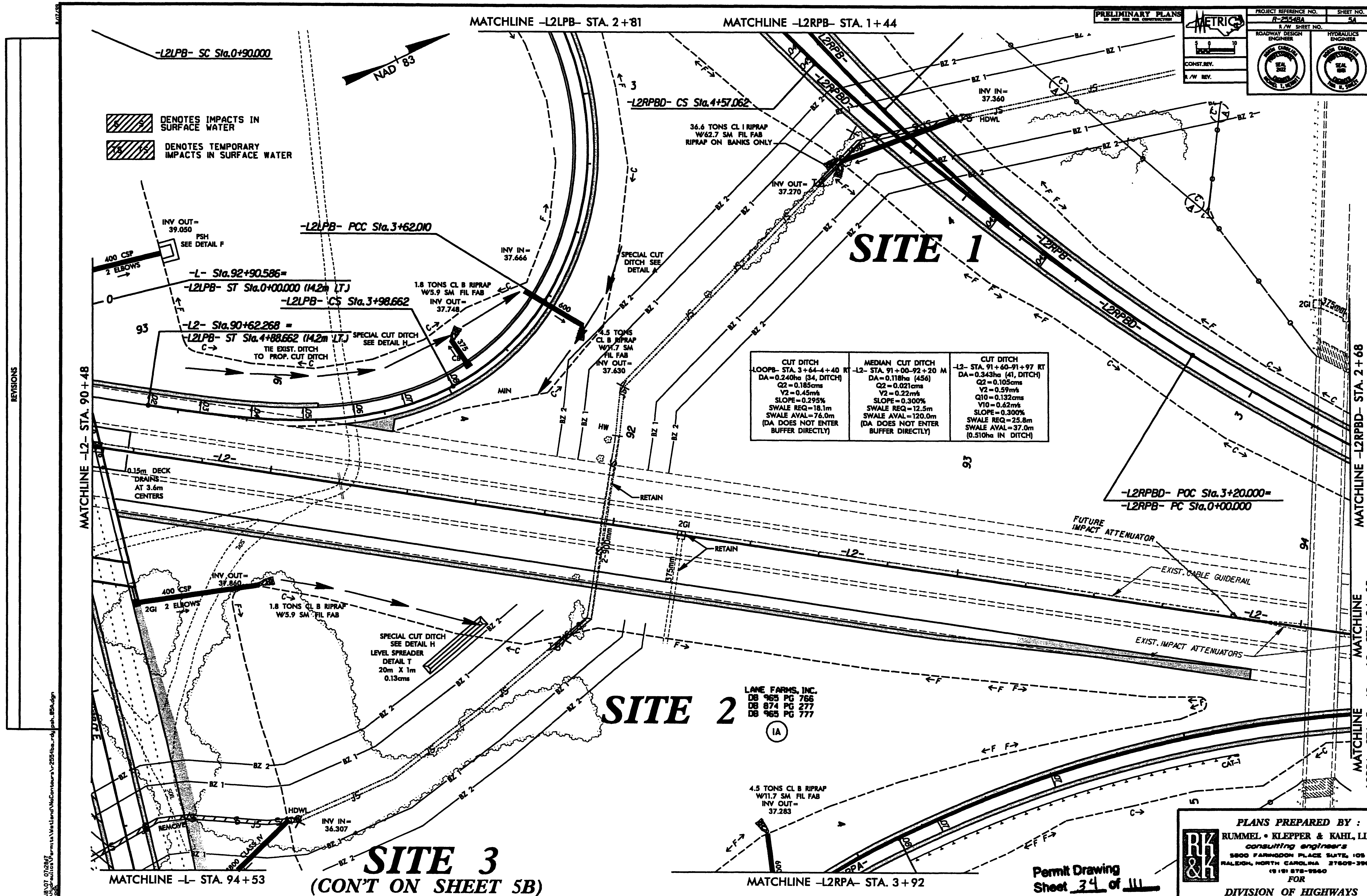
38 37 36 35 34 33 32 31

10 +20 +40 +60 +80 11 +20 +40 +60

NOTE:
PIPE TO BE BURIED 20% OF PIPE DIAMETER UP TO 0.3m.

Permit Drawing Sheet 33 of 111

PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LL
consulting engineers
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-39
(919) 878-9560
FOR
DIVISION OF HIGHWAYS



MATCHLINE -L2LPB- STA. 2+81
MATCHLINE -L2RPB- STA. 1+44
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
METRIC
PROJECT REFERENCE NO.
R-2554BA
SHEET NO.
5A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST. REV.
R/W REV.
REVISIONS
-L2LPB- SC Sta.0+90.000
NAD 83
-L2RPBD- CS Sta.4+57.062
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
36.6 TONS CL I RIPRAP W/62.7 SM FIL FAB RIPRAP ON BANKS ONLY
INV IN= 37.360
HDWL
INV OUT= 37.270
INV OUT= 39.050
PSH SEE DETAIL F
-L2LPB- PCC Sta.3+62.010
INV IN= 37.666
SPECIAL CUT DITCH SEE DETAIL A
SITE 1
400 CSP 2 ELBOWS
-L- Sta.92+90.586=
-L2LPB- ST Sta.0+00.000 (14.2m LT.)
1.8 TONS CL B RIPRAP W/5.9 SM FIL FAB
INV OUT= 37.748
-L2LPB- CS Sta.3+98.662
-L2- Sta.90+62.268 =
-L2LPB- ST Sta.4+88.662 (14.2m LT.)
SPECIAL CUT DITCH SEE DETAIL H
TIE EXIST. DITCH TO PROP. CUT DITCH
4.5 TONS CL B RIPRAP W/11.7 SM FIL FAB
INV OUT= 37.630
MIN
HW
CUT DITCH
-LOOPB- STA. 3+64-4+40 RT
DA=0.240ha (34, DITCH)
Q2=0.185cms
V2=0.45m/s
SLOPE=0.295%
SWALE REQ=18.1m
SWALE AVAL=76.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)
MEDIAN CUT DITCH
-L2- STA. 91+00-92+20 M
DA=0.118ha (456)
Q2=0.021cms
V2=0.22m/s
SLOPE=0.300%
SWALE REQ=12.5m
SWALE AVAL=120.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)
CUT DITCH
-L2- STA. 91+60-91+97 RT
DA=0.343ha (41, DITCH)
Q2=0.105cms
V2=0.59m/s
Q10=0.132cms
V10=0.62m/s
SLOPE=0.300%
SWALE REQ=25.8m
SWALE AVAL=37.0m
(0.510ha IN DITCH)
MATCHLINE -L2- STA. 90+48
0.15m DECK DRAINS AT 3.6m CENTERS
RETAIN
2GI
-L2RPBD- POC Sta.3+20.000=
-L2RPB- PC Sta.0+00.000
MATCHLINE -L2RPBD- STA. 2+68
FUTURE IMPACT ATTENUATOR
EXIST. CABLE GUIDERAIL
EXIST. IMPACT ATTENUATORS
MATCHLINE -L2- STA. 94+15
INV OUT= 37.860
400 CSP 2GI 2 ELBOWS
1.8 TONS CL B RIPRAP W/5.9 SM FIL FAB
SPECIAL CUT DITCH SEE DETAIL H
LEVEL SPREADER DETAIL T
20m X 1m
0.13cms
LANE FARMS, INC.
DB 965 PG 766
DB 874 PG 277
DB 965 PG 777
SITE 2
IA
MATCHLINE -L2RPA- STA. 5+48
CAT-1
HDWL
REMOVE
INV IN= 36.307
SITE 3
(CON'T ON SHEET 5B)
4.5 TONS CL B RIPRAP W/11.7 SM FIL FAB
INV OUT= 37.283
MATCHLINE -L- STA. 94+53
MATCHLINE -L2RPA- STA. 3+92
Permit Drawing
Sheet 34 of 111
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
5800 FARINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

METRIC
0 5 10
CONST. REV.
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2548A	5A
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 3322 — KEVIN L. KENNEY

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL — JOHN R. SIMES

MATCHLINE –L2LPB– STA. 2+81

MATCHLINE –L2RPB– STA. 1+44

NAD 83

–L2LPB– SC Sta.0+90.000

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

–L2RPBD– CS Sta.4+57.062

36.6 TONS CL I RIPRAP W/62.7 SM FIL FAB RIPRAP ON BANKS ONLY

INV IN= 37.360

INV OUT= 37.271

HDWL

–L2LPB– PCC Sta.3+62.010

INV OUT= 39.050

PSH SEE DETAIL F

400 CSP 2 ELBOWS

INV IN= 37.666

–L– Sta.92+90.586= –L2LPB– ST Sta.0+00.000 (14.2m LT)

–L2LPB– CS Sta.3+98.662

1.8 TONS CL B RIPRAP W/5.9 SM FIL FAB

INV OUT= 37.748

–L2– Sta.90+62.268 = –L2LPB– ST Sta.4+88.662 (14.2m LT)

SPECIAL CUT DITCH SEE DETAIL H

SPECIAL CUT DITCH SEE DETAIL A

TIE EXIST. DITCH TO PROP. CUT DITCH

4.5 TONS CL B RIPRAP W/11.7 SM FIL FAB INV OUT= 37.630

SITE 1

CUT DITCH –L2LPB– STA. 3+64.4+40 RT	MEDIAN CUT DITCH –L2– STA. 91+00-92+20 M	CUT DITCH –L2– STA. 89+60-91+97 RT
DA=0.240ha (34, DITCH)	DA=0.118ha (456)	DA=0.343ha (41, DITCH)
Q2=0.185cms	Q2=0.021cms	Q2=0.105cms
V2=0.45m/s	V2=0.22m/s	V2=0.59m/s
SLOPE=0.295%	SLOPE=0.300%	Q10=0.132cms
SWALE REQ=18.1m	SWALE REQ=12.5m	V10=0.62m/s
SWALE AVAL=76.0m	SWALE AVAL=120.0m	SLOPE=0.300%
(DA DOES NOT ENTER BUFFER DIRECTLY)	(DA DOES NOT ENTER BUFFER DIRECTLY)	SWALE REQ=25.8m
		SWALE AVAL=37.0m
		(0.510ha IN DITCH)

–L2RPBD– POC Sta.3+20.000=

–L2RPB– PC Sta.0+00.000

MATCHLINE –L2– STA. 90+48

MATCHLINE –L2– STA. 94+15

MATCHLINE –L2RPA– STA. 5+48

MATCHLINE –L2RPBD– STA. 2+68

0.15m DEEP DRAINS AT 3.6m CENTERS

RETAIN

2GI

2-1800mm CSP

1.8 TONS CL B RIPRAP W/5.9 SM FIL FAB

INV OUT= 37.860

400 CSP 2GI 2 ELBOWS

SPECIAL CUT DITCH SEE DETAIL H

LEVEL SPREADER DETAIL F 20m X 1m 0.13cms

FUTURE IMPACT ATTENUATOR

EXIST. CABLE GUIDERAIL

EXIST. IMPACT ATTENUATORS

–L2–

SITE 2

LANE FARMS, INC.
DB 965 PG 766
DB 974 PG 277
DB 965 PG 777

1A

4.5 TONS CL B RIPRAP W/11.7 SM FIL FAB INV OUT= 37.283

CAT-1

REMOVE

INV IN= 36.307

1800 CLASS V

SITE 3

(CON'T ON SHEET 5B)

MATCHLINE –L– STA. 94+53

MATCHLINE –L2RPA– STA. 3+92

Permit Drawing Sheet 35 of 111

PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
5800 FAIRINGDON PLACE SUITE, 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

REVISIONS

10/17/07 10:55:07
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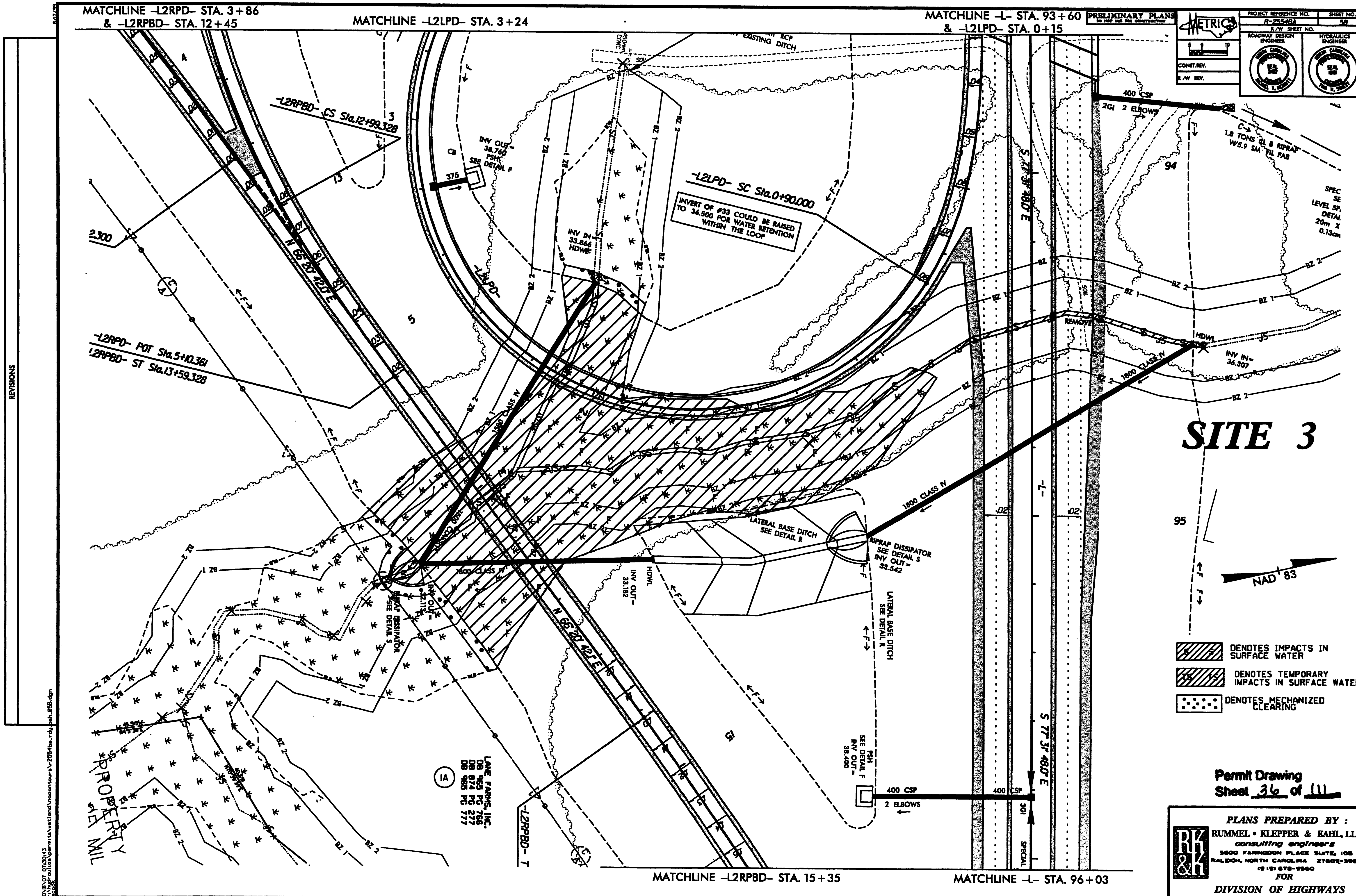
MATCHLINE -L2RPD- STA. 3+86
& -L2RPBD- STA. 12+45
MATCHLINE -L2LPD- STA. 3+24
MATCHLINE -L- STA. 93+60
& -L2LPD- STA. 0+15
PRELIMINARY PLANS
METRIC
PROJECT REFERENCE NO.
R-2554BA
SHEET NO.
58
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST. REV.
R/W REV.
-L2RPBD- CS Sta.12+99.328
-L2LPD- SC Sta.0+90.000
INVERT OF #33 COULD BE RAISED TO 36.500 FOR WATER RETENTION WITHIN THE LOOP
INV OUT= 38.760 PSH SEE DETAIL F
INV IN= 33.866 HDWL
EXISTING DITCH
400 CSP
2GI 2 ELBOWS
1.8 TONS CL B RIPRAP W/5.9 SM FIL FAB
-L2RPD- POT Sta.5+10.361
-L2RPBD- ST Sta.13+59.328
N 66°20'42.1" E
S 77°31'48.0" E
REMOVE
HDWL
INV IN= 36.307
1800 CLASS IV
SITE 3
95
NAD 83
LATERAL BASE DITCH SEE DETAIL R
RIPRAP DISSIPATOR SEE DETAIL S INV OUT= 33.542
RIPRAP DISSIPATOR SEE DETAIL S
HDWL INV OUT= 33.182
PSH SEE DETAIL F INV OUT= 38.400
400 CSP
2 ELBOWS
LANE FARMS, INC.
DB 965 PG 766
DB 874 PG 776
DB 965 PG 777
-L2RPBD-
PROPERTY
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES MECHANIZED CLEARING
Permit Drawing
Sheet 36 of 111
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
5800 FARINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
FOR
DIVISION OF HIGHWAYS
MATCHLINE -L2RPBD- STA. 15+35
MATCHLINE -L- STA. 96+03
REVISIONS

MATCHLINE –L2RPD– STA. 3+86
& –L2RPBD– STA. 12+45

MATCHLINE –L2LPD– STA. 3+24

MATCHLINE –L– STA. 93+60
& –L2LPD– STA. 0+15

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2548A	5B
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 3302 — JAMES T. HEWETT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 020 — JOHN E. SMITH

CONST.REV.

R/W REV.

-L2RPBD- SC Sta.12+99.328

-L2LPD- SC Sta.0+90.000

INVERT OF #33 COULD BE RAISED TO 36.500 FOR WATER RETENTION WITHIN THE LOOP

-L2RPD- POT Sta.5+10.361

-L2RPBD- ST Sta.13+59.328

N 65° 20' 42" E

S 77° 31' 48.0" E

400 CSP
2GI 2 ELBOWS

1.8 TONS CL B RIPRAP
WS5.9 SM FIL FAB

1800 CLASS IV

LATERAL BASE DITCH
SEE DETAIL R

RIPRAP DISSIPATOR
SEE DETAIL S
INV OUT=
33.542

INV OUT=
33.182

HDWL

INV IN=
35.866
HDWE

CB
INV OUT=
38.760
PSHT
SEE DETAIL F

PSH
SEE DETAIL F
INV OUT=
38.400

400 CSP
2 ELBOWS

400 CSP
3GI

SPECIAL

REMOVE

-L-

-L2RPD-

-L2RPBD-

LANE TRANS, INC.
DB 855 PG 766
DB 874 PG 227
DB 965 PG 777

PROPERTY LINE

SITE 3

95

NAD 83

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

Permit Drawing
Sheet 37 of 111

MATCHLINE –L2RPBD– STA. 15+35

MATCHLINE –L– STA. 96+03

REVISIONS

PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
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5500 FARINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 872-9560
FOR
DIVISION OF HIGHWAYS

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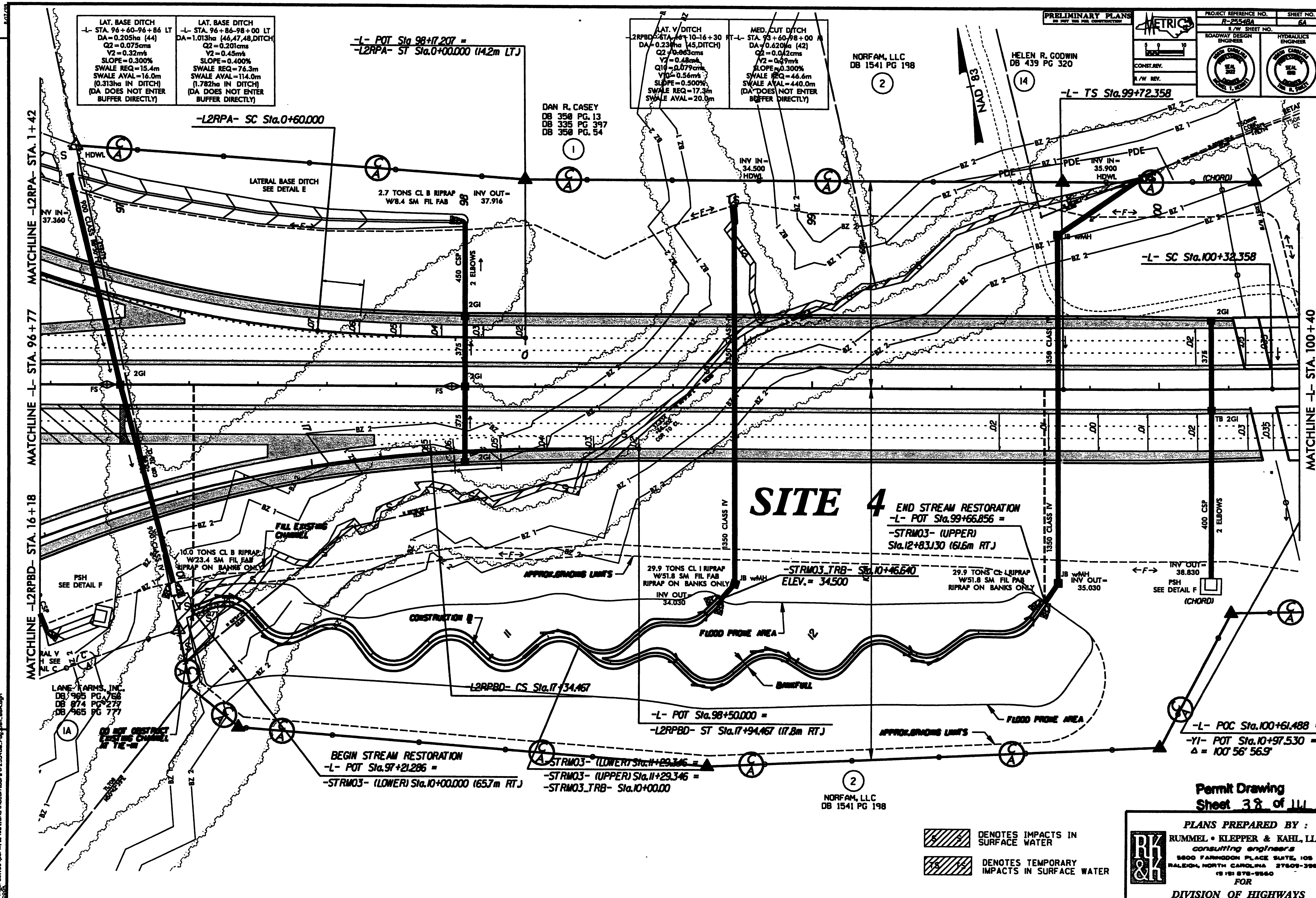
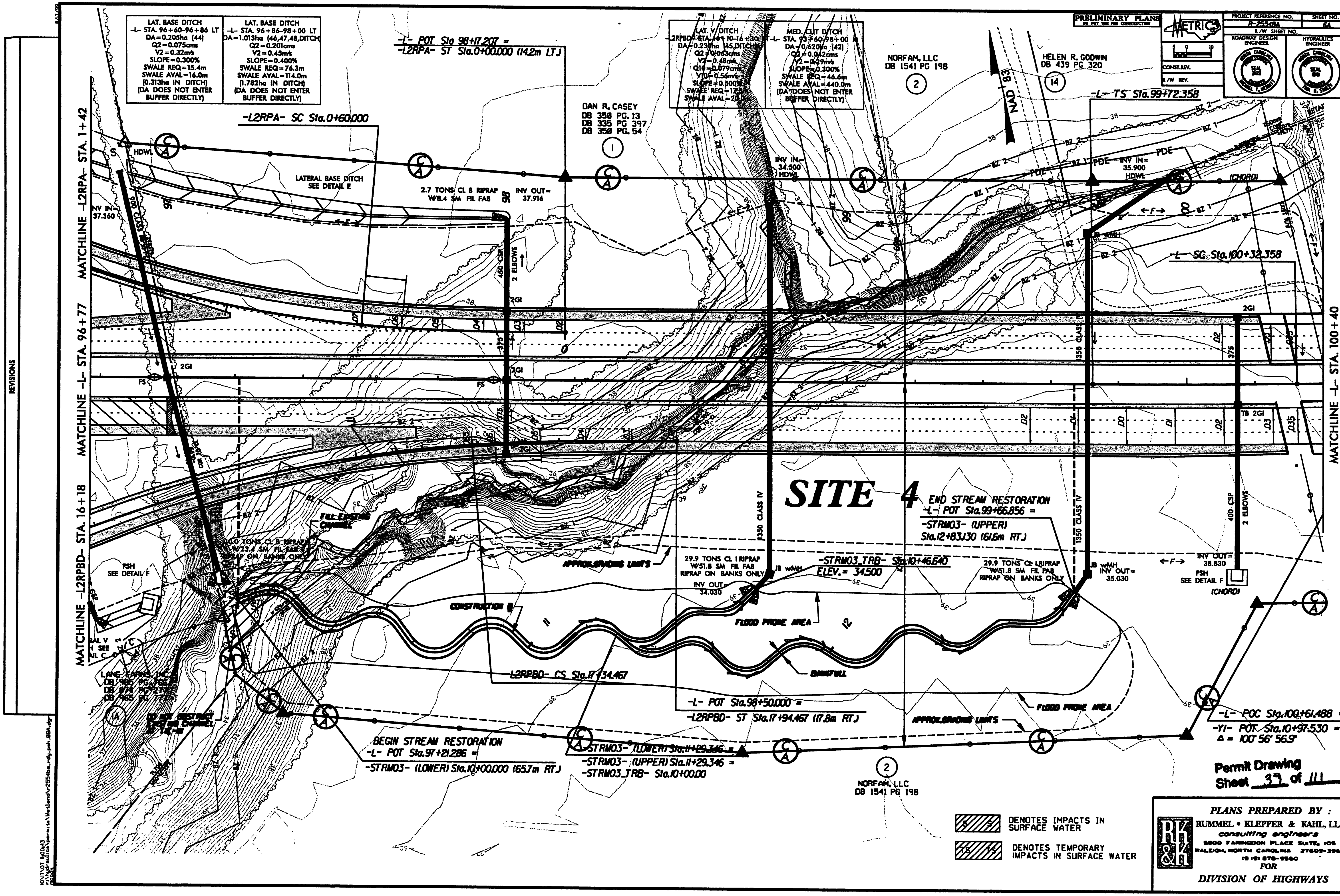
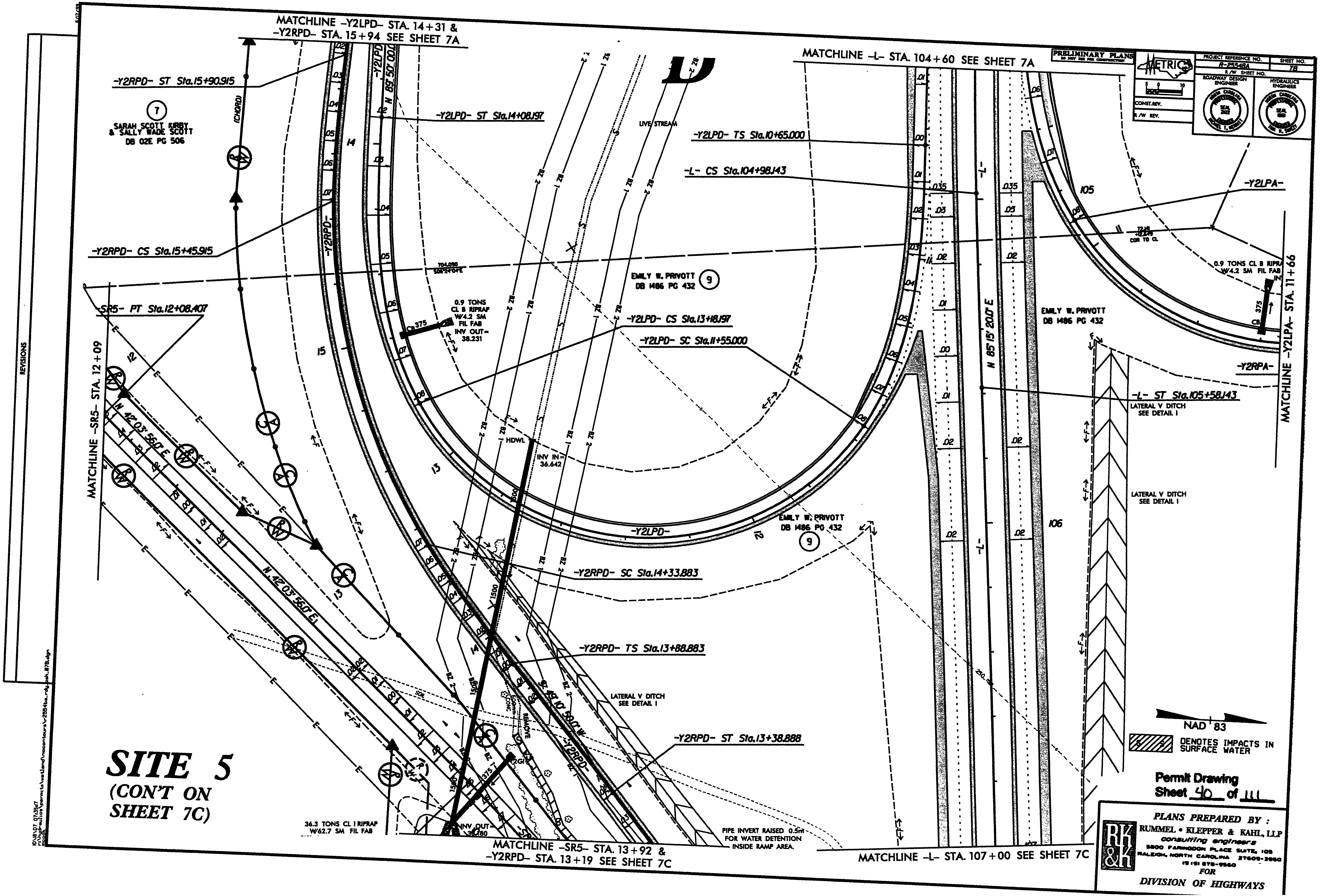
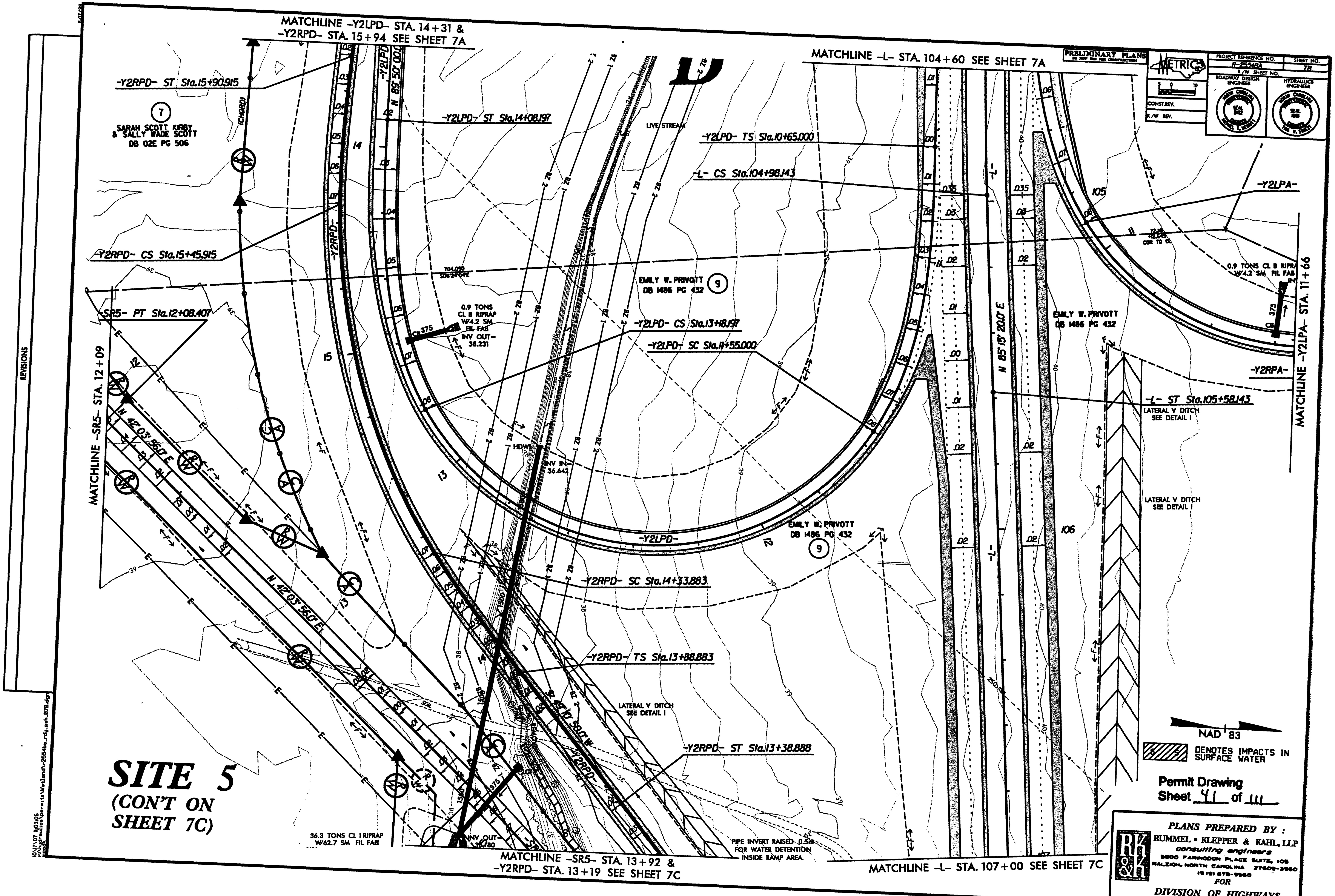


LAT. BASE DITCH
-L- STA. 96+60-96+86 LT
DA=0.205ha (44)
Q2=0.075cms
V2=0.32m/s
SLOPE=0.300%
SWALE REQ=15.4m
SWALE AVAL=16.0m
(0.313ha IN DITCH)
(DA DOES NOT ENTER BUFFER DIRECTLY)
LAT. BASE DITCH
-L- STA. 96+86-98+00 LT
DA=1.013ha (46,47,48,DITCH)
Q2=0.201cms
V2=0.45m/s
SLOPE=0.400%
SWALE REQ=76.3m
SWALE AVAL=114.0m
(1.782ha IN DITCH)
(DA DOES NOT ENTER BUFFER DIRECTLY)
-L- POT Sta.98+17.207 =
-L2RPA- ST Sta.0+00.000 (14.2m LT)
-L2RPA- SC Sta.0+60.000
DAN R. CASEY
DB 350 PG. 13
DB 335 PG 397
DB 350 PG. 54
1
LAT. V DITCH
-L2RPBD- STA. 16+10-16+30 RT
DA=0.230ha (45,DITCH)
Q2=0.063cms
V2=0.48m/s
Q10=0.079cms
V10=0.56m/s
SLOPE=0.500%
SWALE REQ=17.3m
SWALE AVAL=20.0m
MED. CUT DITCH
-L- STA. 93+60-98+00 M
DA=0.620ha (42)
Q2=0.042cms
V2=0.29m/s
SLOPE=0.300%
SWALE REQ=46.6m
SWALE AVAL=440.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)
NORFAM, LLC
DB 1541 PG 198
2
NAD 83
HELEN R. GODWIN
DB 439 PG 320
14
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
METRIC
PROJECT REFERENCE NO. R-2554BA
SHEET NO. 6A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST. REV.
R/W REV.
-L- TS Sta.99+72.358
-L- SC Sta.100+32.358
MATCHLINE -L2RPA- STA. 1+42
MATCHLINE -L- STA. 96+77
MATCHLINE -L2RPBD- STA. 16+18
MATCHLINE -L- STA. 100+40
REVISIONS
S
HDWL
INV IN= 37.360
LATERAL BASE DITCH
SEE DETAIL E
2.7 TONS CL B RIPRAP
W/8.4 SM FIL FAB
INV OUT= 37.916
450 CSP
2 ELBOWS
2GI
375
FS
INV IN= 34.500
HDWL
INV IN= 35.900
HDWL
PDE
(CHORD)
JB wMH
BZ 1
BZ 2
1350 CLASS IV
400 CSP
2 ELBOWS
TB 2GI
SITE 4
END STREAM RESTORATION
-L- POT Sta.99+66.856 =
-STRM03- (UPPER)
Sta.12+83.130 (61.6m RT)
FILL EXISTING CHANNEL
10.0 TONS CL B RIPRAP
W/23.4 SM FIL FAB
RIPRAP ON BANKS ONLY
APPROX. GRADING LIMITS
29.9 TONS CL I RIPRAP
W/51.8 SM FIL FAB
RIPRAP ON BANKS ONLY
INV OUT= 34.030
JB wMH
-STRM03_TRB- Sta.10+46.640
ELEV.= 34.500
29.9 TONS CL I RIPRAP
W/51.8 SM FIL FAB
RIPRAP ON BANKS ONLY
JB wMH
INV OUT= 35.030
INV OUT= 38.830
PSH
SEE DETAIL F
(CHORD)
PSH
SEE DETAIL F
CONSTRUCTION
FLOOD PRONE AREA
BANKFULL
LANE FARMS, INC.
DB 965 PG 766
DB 874 PG 277
DB 965 PG 777
1A
DO NOT OBSTRUCT EXISTING CHANNEL AT TIE-IN
-L2RPBD- CS Sta.17+34.467
-L- POT Sta.98+50.000 =
-L2RPBD- ST Sta.17+94.467 (17.8m RT)
FLOOD PRONE AREA
APPROX. GRADING LIMITS
BEGIN STREAM RESTORATION
-L- POT Sta.97+21.286 =
-STRM03- (LOWER) Sta.10+00.000 (65.7m RT)
-STRM03- (LOWER) Sta.11+29.346 =
-STRM03- (UPPER) Sta.11+29.346 =
-STRM03_TRB- Sta.10+00.00
NORFAM, LLC
DB 1541 PG 198
-L- POC Sta.100+61.488 =
-Y1- POT Sta.10+97.530 =
Δ = 100°56' 56.9"
Permit Drawing
Sheet 38 of 111
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
5800 FARINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

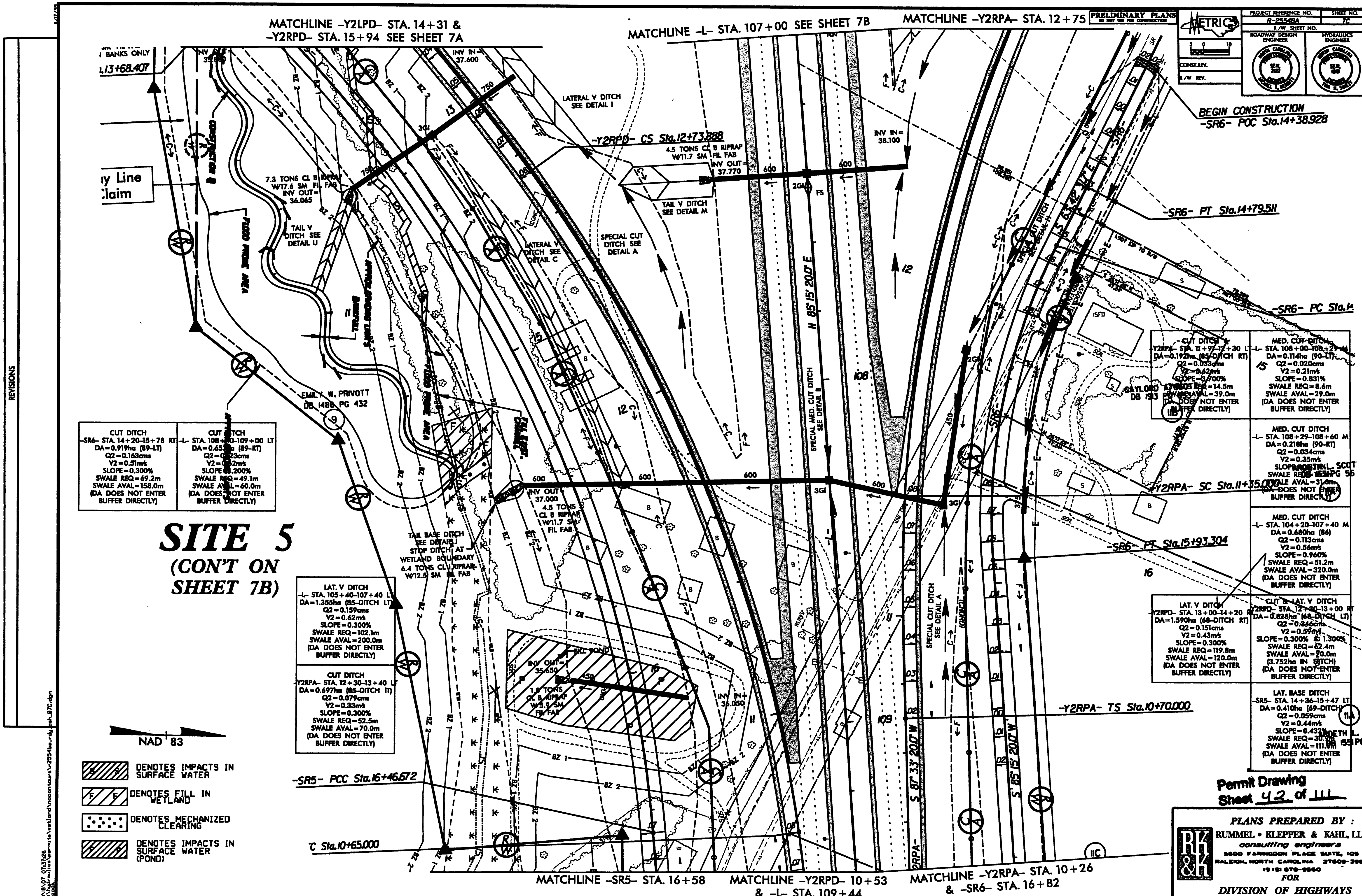


LAT. BASE DITCH
-L- STA. 96+60-96+86 LT
DA=0.205ha (44)
Q2=0.075cms
V2=0.32m/s
SLOPE=0.300%
SWALE REQ=15.4m
SWALE AVAL=16.0m
(0.313ha IN DITCH)
(DA DOES NOT ENTER BUFFER DIRECTLY)
LAT. BASE DITCH
-L- STA. 96+86-98+00 LT
DA=1.013ha (46,47,48,DITCH)
Q2=0.201cms
V2=0.45m/s
SLOPE=0.400%
SWALE REQ=76.3m
SWALE AVAL=114.0m
(1.782ha IN DITCH)
(DA DOES NOT ENTER BUFFER DIRECTLY)
-L- POT Sta 98+17.207 =
-L2RPA- ST Sta.0+00.000 (14.2m LT)
MED. CUT DITCH
-L- STA. 93+60-98+00
DA=0.620ha (42)
Q2=0.042cms
SLOPE=0.300%
SWALE REQ=46.6m
SWALE AVAL=440.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)
NORFAM, LLC
DB 1541 PG 198
HELEN R. GODWIN
DB 439 PG 320
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
METRIC
PROJECT REFERENCE NO.
R-2554BA
SHEET NO.
6A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
-L- TS Sta.99+72.358
DAN R. CASEY
DB 350 PG. 13
DB 335 PG 397
DB 350 PG. 54
-L2RPA- SC Sta.0+60.000
LATERAL BASE DITCH
SEE DETAIL E
2.7 TONS CL B RIPRAP
W/8.4 SM FIL FAB
INV OUT=
37.916
INV IN=
34.500
HDWL
INV IN=
35.900
HDWL
PDE
-L- SG Sta.100+32.358
MATCHLINE -L2RPA- STA. 1+42
MATCHLINE -L- STA. 96+77
MATCHLINE -L2RPBD- STA. 16+18
MATCHLINE -L- STA. 100+40
SITE 4
END STREAM RESTORATION
-L- POT Sta.99+66.856 =
-STRM03- (UPPER)
Sta.12+83.130 (61.6m RT.)
FILL EXISTING CHANNEL
PSH
SEE DETAIL F
APPROX. GRADING LIMITS
29.9 TONS CL I RIPRAP
W/51.8 SM FIL FAB
RIPRAP ON BANKS ONLY
INV OUT=
34.030
-STRM03_TRB- Sta.10+46.640
ELEV.= 34.500
INV OUT=
35.030
INV OUT=
38.830
CONSTRUCTION B
FLOOD PRONE AREA
BANKFULL
-L2RPBD- CS Sta.17+34.467
LANE KARNS, INC.
-L- POT Sta.98+50.000 =
-L2RPBD- ST Sta.17+94.467 (17.8m RT.)
DO NOT DISTURB EXISTING CHANNEL
BEGIN STREAM RESTORATION
-L- POT Sta.97+21.286 =
-STRM03- (LOWER) Sta.10+00.000 (65.7m RT.)
-STRM03- (LOWER) Sta.11+29.346 =
-STRM03- (UPPER) Sta.11+29.346 =
-STRM03_TRB- Sta.10+00.00
-L- POC Sta.100+61.488 =
-Y1- POT Sta.10+97.530 =
Δ = 100° 56' 56.9"
NORFAM, LLC
DB 1541 PG 198
Permit Drawing
Sheet 39 of 111
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
5800 FARINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS
REVISIONS


MATCHLINE -Y2LPD- STA. 14+31 &
-Y2RPD- STA. 15+94 SEE SHEET 7A
MATCHLINE -L- STA. 104+60 SEE SHEET 7A
PRELIMINARY PLANS
METRIC
PROJECT REFERENCE NO.
R-2554BA
SHEET NO.
7B
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST. REV.
R/W REV.
-Y2RPD- ST Sta.15+90.915
-Y2LPD- ST Sta.14+08.197
-Y2LPD- TS Sta.10+65.000
-L- CS Sta.104+98.143
-Y2LPA-
SARAH SCOTT KIRBY
& SALLY WADE SCOTT
DB 02E PG 506
LIVE STREAM
-Y2RPD- CS Sta.15+45.915
EMILY W. PRIVOTT
DB 1486 PG 432
0.9 TONS CL B RIPRAP
W/4.2 SM FIL FAB
-SR5- PT Sta.12+08.407
0.9 TONS
CL B RIPRAP
W/4.2 SM
FIL FAB
INV OUT=
38.231
-Y2LPD- CS Sta.13+18.197
-Y2LPD- SC Sta.11+55.000
-Y2RPA-
MATCHLINE -SR5- STA. 12+09
MATCHLINE -Y2LPA- STA. 11+66
N 42° 03' 56.0" E
N 89° 50' 00.0"
N 85° 15' 20.0" E
-L- ST Sta.105+58.143
LATERAL V DITCH
SEE DETAIL 1
HDWL
INV IN=
36.642
-Y2LPD-
-Y2RPD- SC Sta.14+33.883
-Y2RPD- TS Sta.13+88.883
-Y2RPD- ST Sta.13+38.888
REMOVE
NAD 83
DENOTES IMPACTS IN
SURFACE WATER
Permit Drawing
Sheet 40 of 111
SITE 5
(CON'T ON
SHEET 7C)
36.3 TONS CL I RIPRAP
W/62.7 SM FIL FAB
INV OUT=
PIPE INVERT RAISED 0.5m
FOR WATER DETENTION
INSIDE RAMP AREA.
MATCHLINE -SR5- STA. 13+92 &
-Y2RPD- STA. 13+19 SEE SHEET 7C
MATCHLINE -L- STA. 107+00 SEE SHEET 7C
PLANS PREPARED BY:
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
RALEIGH, NORTH CAROLINA
FOR
DIVISION OF HIGHWAYS
REVISIONS



MATCHLINE -Y2LPD- STA. 14+31 & -Y2RPD- STA. 15+94 SEE SHEET 7A
MATCHLINE -L- STA. 104+60 SEE SHEET 7A
PRELIMINARY PLANS
METRIC
PROJECT REFERENCE NO. R-2554BA
SHEET NO. 7B
-Y2RPD- ST Sta.15+90.915
SARAH SCOTT KIRBY & SALLY WADE SCOTT DB 02E PG 506
-Y2LPD- ST Sta.14+08.197
-Y2LPD- TS Sta.10+65.000
-L- CS Sta.104+98.143
LIVE STREAM
-Y2LPA-
-Y2RPD- CS Sta.15+45.915
EMILY W. PRIVOTT DB 1486 PG 432
0.9 TONS CL B RIPRAP W/4.2 SM FIL FAB
-SR5- PT Sta.12+08.407
0.9 TONS CL B RIPRAP W/4.2 SM FIL FAB INV OUT= 38.231
-Y2LPD- CS Sta.13+18.197
-Y2LPD- SC Sta.11+55.000
-Y2RPA-
-L- ST Sta.105+58.143
LATERAL V DITCH SEE DETAIL I
MATCHLINE -Y2LPA- STA. 11+66
MATCHLINE -SR5- STA. 12+09
N 42°03'56.0"E
HDWL
INV IN= 36.642
N 85°15'20.0"E
-Y2LPD-
-Y2RPD- SC Sta.14+33.883
-Y2RPD- TS Sta.13+88.883
LATERAL V DITCH SEE DETAIL I
-Y2RPD- ST Sta.13+38.888
NAD 83
DENOTES IMPACTS IN SURFACE WATER
Permit Drawing Sheet 41 of 111
SITE 5 (CON'T ON SHEET 7C)
36.3 TONS CL I RIPRAP W/62.7 SM FIL FAB
INV OUT= 36.180
PIPE INVERT RAISED 0.5m FOR WATER DETENTION INSIDE RAMP AREA.
MATCHLINE -SR5- STA. 13+92 & -Y2RPD- STA. 13+19 SEE SHEET 7C
MATCHLINE -L- STA. 107+00 SEE SHEET 7C
PLANS PREPARED BY: RUMMEL • KLEPPER & KAHL, LLP consulting engineers 5800 FARRINGDON PLACE SUITE 105 RALEIGH, NORTH CAROLINA 27609-3960 FOR DIVISION OF HIGHWAYS
REVISIONS


MATCHLINE -Y2LPD- STA. 14+31 &
-Y2RPD- STA. 15+94 SEE SHEET 7A
MATCHLINE -L- STA. 107+00 SEE SHEET 7B
MATCHLINE -Y2RPA- STA. 12+75
PRELIMINARY PLANS
METRIC
PROJECT REFERENCE NO. R-2554BA
SHEET NO. 7C
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST. REV.
R/W REV.
BEGIN CONSTRUCTION
-SR6- POC Sta.14+38.928
-Y2RPD- CS Sta.12+73.888
4.5 TONS CL B RIPRAP W/11.7 SM FIL FAB
INV OUT= 37.770
INV IN= 38.100
INV IN= 37.600
LATERAL V DITCH SEE DETAIL I
7.3 TONS CL B RIPRAP W/17.6 SM FIL FAB
INV OUT= 36.065
TAIL V DITCH SEE DETAIL U
TAIL V DITCH SEE DETAIL M
SPECIAL CUT DITCH SEE DETAIL A
LATERAL V DITCH SEE DETAIL C
-SR6- PT Sta.14+79.511
-SR6- PC Sta.14
N 85° 15' 20.0" E
SPECIAL MED. CUT DITCH SEE DETAIL B
EMILY W. PRIVOTT
DB 1486 PG 432
GAYLORD
DB 193
INV OUT= 37.000
4.5 TONS CL B RIPRAP W/11.7 SM FIL FAB
TAIL BASE DITCH SEE DETAIL J
STOP DITCH AT WETLAND BOUNDARY
6.4 TONS CL I RIPRAP W/12.5 SM FIL FAB
-Y2RPA- SC Sta.11+35.000
-SR6- PT Sta.15+93.304
SPECIAL CUT DITCH SEE DETAIL A
INV OUT= 35.650
1.8 TONS CL B RIPRAP W/5.9 SM FIL FAB
FILL POND
INV IN= 36.050
-Y2RPA- TS Sta.10+70.000
S 87° 33' 20.0" W
S 85° 15' 20.0" W
-SR5- PCC Sta.16+46.672
C Sta.10+65.000
MATCHLINE -SR5- STA. 16+58
MATCHLINE -Y2RPD- 10+53 & -L- STA. 109+44
MATCHLINE -Y2RPA- STA. 10+26 & -SR6- STA. 16+82
SITE 5
(CON'T ON SHEET 7B)
NAD 83
DENOTES IMPACTS IN SURFACE WATER
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
DENOTES IMPACTS IN SURFACE WATER (POND)
CUT DITCH -SR6- STA. 14+20-15+78 RT DA=0.919ha (89-LT) Q2=0.163cms V2=0.51m/s SLOPE=0.300% SWALE REQ=69.2m SWALE AVAL=158.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
CUT DITCH -L- STA. 108+ 0-109+00 LT DA=0.653 a (89-RT) Q2=0. 23cms V2= 2m/s SLOPE .200% SWALE REQ=49.1m SWALE AVAL=60.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
LAT. V DITCH -L- STA. 105+40-107+40 LT DA=1.355ha (85-DITCH LT) Q2=0.159cms V2=0.62m/s SLOPE=0.300% SWALE REQ=102.1m SWALE AVAL=200.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
CUT DITCH -Y2RPA- STA. 12+30-13+40 LT DA=0.697ha (85-DITCH LT) Q2=0.079cms V2=0.33m/s SLOPE=0.300% SWALE REQ=52.5m SWALE AVAL=70.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
CUT DITCH -Y2RPA- STA. 11+97-12+30 LT DA=0.192ha (85-DITCH RT) Q2=0.033cms V2=0.62m/s SLOPE=3.700% SWALE REQ=14.5m SWALE AVAL=39.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
MED. CUT DITCH -L- STA. 108+00-108+29 M DA=0.114ha (90-LT) Q2=0.020cms V2=0.21m/s SLOPE=0.831% SWALE REQ=8.6m SWALE AVAL=29.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
MED. CUT DITCH -L- STA. 108+29-108+60 M DA=0.218ha (90-RT) Q2=0.034cms V2=0.35m/s (DA DOES NOT ENTER BUFFER DIRECTLY)
MED. CUT DITCH -L- STA. 104+20-107+40 M DA=0.680ha (86) Q2=0.113cms V2=0.56m/s SLOPE=0.960% SWALE REQ=51.2m SWALE AVAL=320.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
LAT. V DITCH -Y2RPD- STA. 13+00-14+20 RT DA=1.590ha (68-DITCH RT) Q2=0.151cms V2=0.43m/s SLOPE=0.300% SWALE REQ=119.8m SWALE AVAL=120.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
CUT & LAT. V DITCH -Y2RPD- STA. 12+30-13+00 RT DA=0.828ha (68-DITCH LT) Q2=0.346cms V2=0.59m/s SLOPE=0.300% & 1.300% SWALE REQ=62.4m (3.752ha IN DITCH) (DA DOES NOT ENTER BUFFER DIRECTLY)
LAT. BASE DITCH -SR5- STA. 14+36-15+47 LT DA=0.410ha (69-DITCH) Q2=0.059cms V2=0.44m/s (DA DOES NOT ENTER BUFFER DIRECTLY)
Permit Drawing Sheet 42 of 111
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
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FOR
DIVISION OF HIGHWAYS
REVISIONS

MATCHLINE –Y2LPD– STA. 14+31 &
–Y2RPD– STA. 15+94 SEE SHEET 7A

MATCHLINE –L– STA. 107+00 SEE SHEET 7B

MATCHLINE –Y2RPA– STA. 12+75

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	7C
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

CONST. REV.

R/W REV.

BEGIN CONSTRUCTION
–SR6– POC Sta.14+38.928

–SR6– PT Sta.14+79.511

–SR6– PC Sta.14

–Y2RPA– SC Sta.11+35.000

–SR6– PT Sta.15+93.304

–Y2RPA– TS Sta.10+70.000

–SR5– PCC Sta.16+46.572

℄ Sta.10+65.000

–Y2RPD– CS Sta.12+73.888

SITE 5

(CON'T ON SHEET 7B)

CUT DITCH
–SR6– STA. 14+20–15+78 RT
DA=0.919ha (89–LT)
Q2=0.163cms
V2=0.51m/s
SLOPE=0.300%
SWALE REQ=69.2m
SWALE AVAL=158.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)

CUT DITCH
–L– STA. 108+90–109+00 LT
DA=0.653ha (89–RT)
Q2=0.123cms
V2=0.62m/s
SLOPE=0.200%
SWALE REQ=49.1m
SWALE AVAL=60.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)

LAT. V DITCH
–L– STA. 105+40–107+40 LT
DA=1.355ha (85–DITCH LT)
Q2=0.159cms
V2=0.62m/s
SLOPE=0.300%
SWALE REQ=102.1m
SWALE AVAL=200.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)

CUT DITCH
–Y2RPA– STA. 12+30–13+40 LT
DA=0.697ha (85–DITCH LT)
Q2=0.079cms
V2=0.33m/s
SLOPE=0.300%
SWALE REQ=52.5m
SWALE AVAL=70.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)

CUT DITCH
–Y2RPA– STA. 12+97–13+30 LT
DA=0.192ha (85–DITCH RT)
Q2=0.033cms
V2=0.42m/s
SLOPE=3.700%
SWALE REQ=14.5m
SWALE AVAL=39.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)

MED. CUT DITCH
–L– STA. 108+00–108+29 M
DA=0.114ha (90–LT)
Q2=0.020cms
V2=0.21m/s
SLOPE=0.831%
SWALE REQ=8.6m
SWALE AVAL=29.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)

MED. CUT DITCH
–L– STA. 108+29–108+60 M
DA=0.218ha (90–RT)
Q2=0.034cms
V2=0.35m/s
SLOPE=0.831%
SWALE REQ=11.2m
SWALE AVAL=31.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)

MED. CUT DITCH
–L– STA. 104+20–107+40 M
DA=0.680ha (86)
Q2=0.113cms
V2=0.54m/s
SLOPE=0.960%
SWALE REQ=51.2m
SWALE AVAL=320.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)

LAT. V DITCH
–Y2RPD– STA. 13+00–14+20 RT
DA=1.599ha (68–DITCH RT)
Q2=0.151cms
V2=0.43m/s
SLOPE=0.300%
SWALE REQ=119.8m
SWALE AVAL=120.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)

CUT DITCH / LAT. V DITCH
–Y2RPD– STA. 12+90–13+00 RT
DA=0.838ha (68–DITCH LT)
Q2=0.346cms
V2=0.59m/s
SLOPE=0.300% & 1.300%
SWALE REQ=62.4m
SWALE AVAL=70.0m
(3.752ha IN DITCH)
(DA DOES NOT ENTER BUFFER DIRECTLY)

LAT. BASE DITCH
–SR5– STA. 14+36–15+47 LT
DA=0.410ha (69–DITCH)
Q2=0.059cms
V2=0.44m/s
SLOPE=0.432%
SWALE REQ=30.0m
SWALE AVAL=111.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)

NAD 83

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY FILL IN WETLAND

DENOTES MECHANIZED CLEARING

DENOTES IMPACTS IN SURFACE WATER (POND)

MATCHLINE –SR5– STA. 16+58

MATCHLINE –Y2RPD– 10+53 & –L– STA. 109+44

MATCHLINE –Y2RPA– STA. 10+26 & –SR6– STA. 16+82

Permit Drawing
Sheet 43 of 111

PLANS PREPARED BY :
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(919) 878-9560
FOR
DIVISION OF HIGHWAYS

REVISIONS

10/17/07 13:33:30
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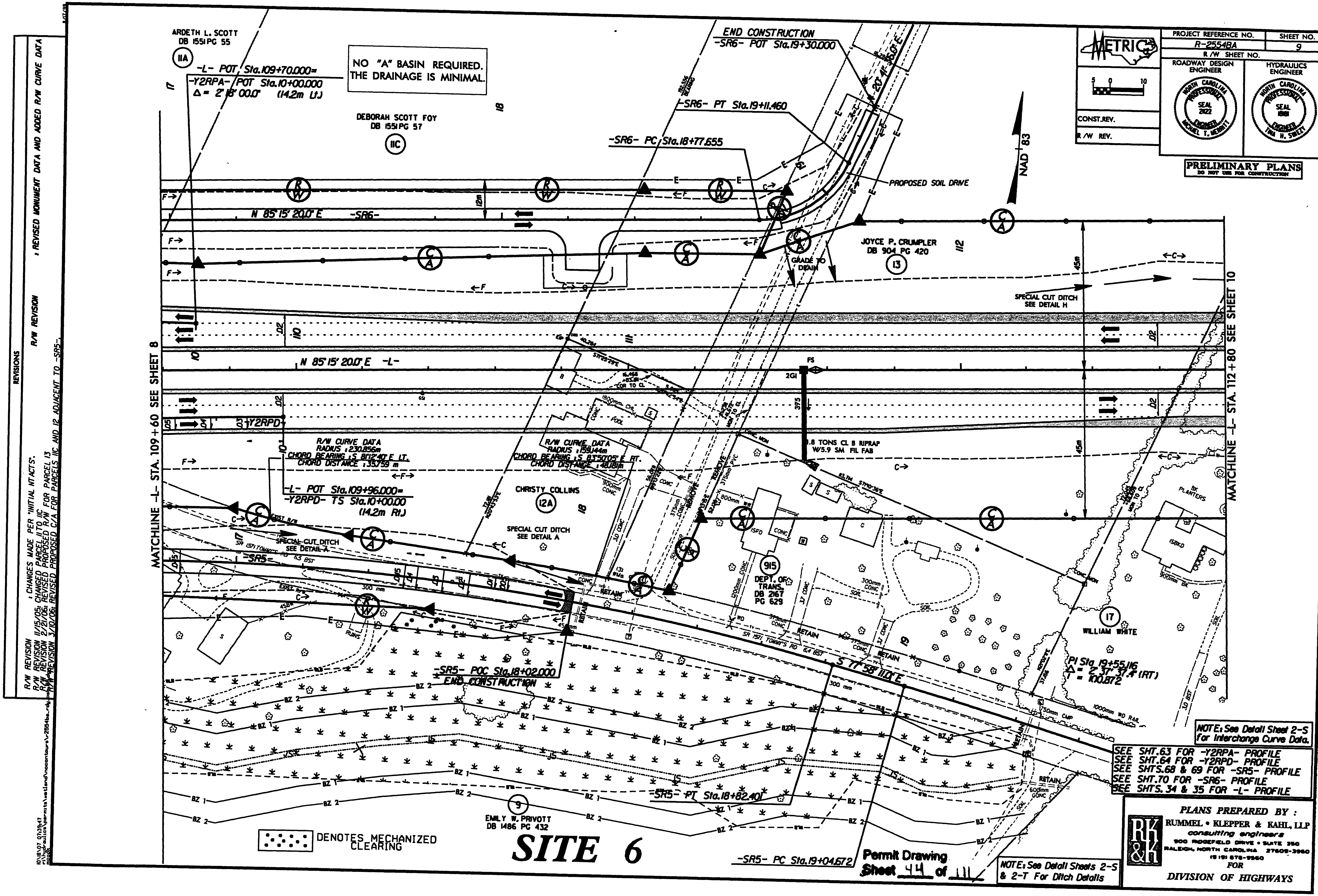
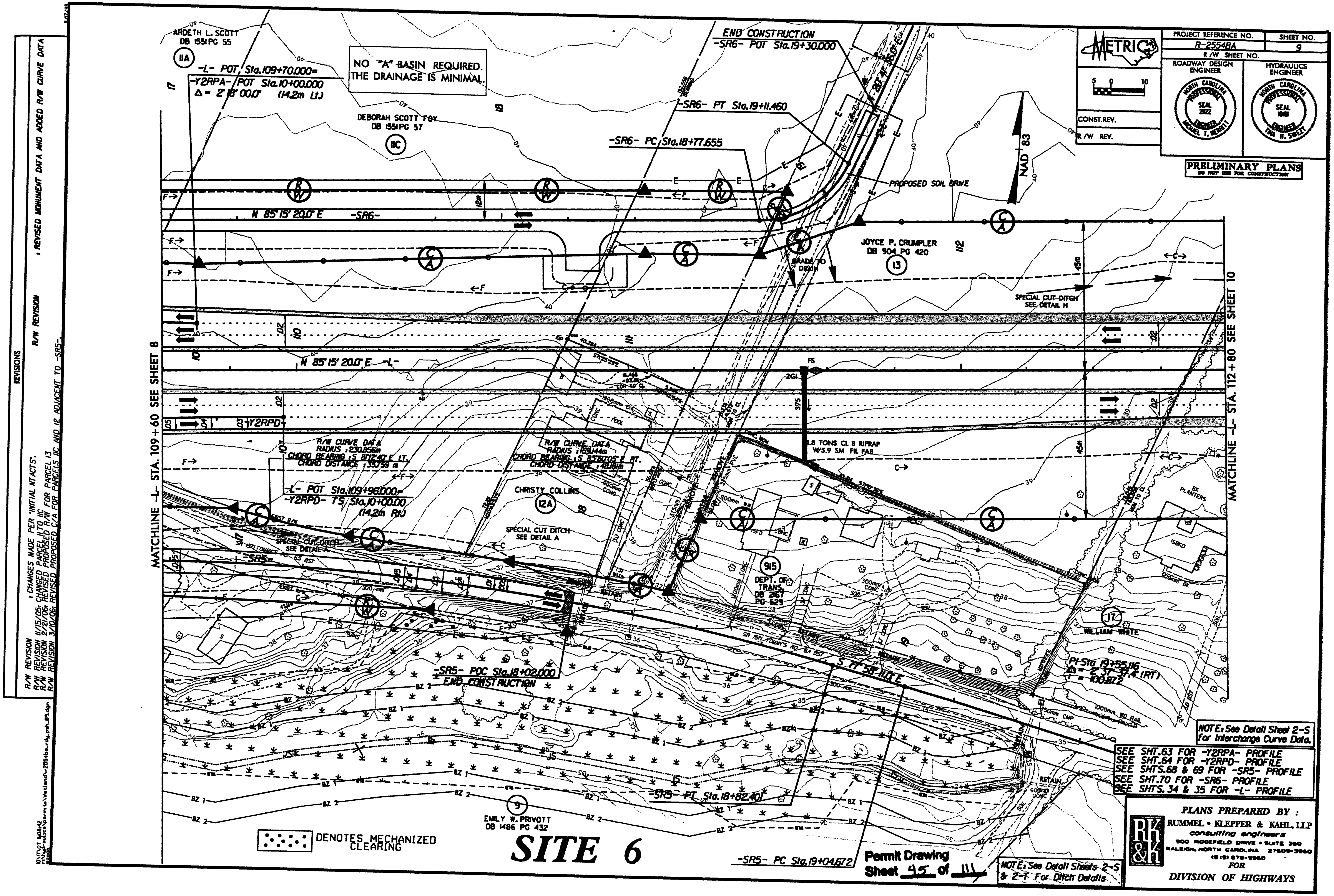


ARDETH L. SCOTT
DB 1551 PG 55
11A
-L- POT Sta.109+70.000=
-Y2RPA- POT Sta.10+00.000
Δ = 2°18'00.0" (14.2m Lt.)
NO "A" BASIN REQUIRED. THE DRAINAGE IS MINIMAL.
END CONSTRUCTION
-SR6- POT Sta.19+30.000
-SR6- PT Sta.19+11.460
-SR6- PC Sta.18+77.655
DEBORAH SCOTT FOY
DB 1551 PG 57
11C
PROPOSED SOIL DRIVE
N 85°15' 20.0" E -SR6-
JOYCE P. CRUMPLER
DB 904 PG 420
13
GRADE TO DRAIN
SPECIAL CUT DITCH
SEE DETAIL H
N 85°15' 20.0" E -L-
MATCHLINE -L- STA. 109+60 SEE SHEET 8
MATCHLINE -L- STA. 112+80 SEE SHEET 10
-Y2RPD-
R/W CURVE DATA
RADIUS : 230.856m
CHORD BEARING : S 81°12'40" E LT.
CHORD DISTANCE : 35.759 m
R/W CURVE DATA
RADIUS : 159.144m
CHORD BEARING : S 83°50'05" E RT.
CHORD DISTANCE : 48.181m
-L- POT Sta.109+96.000=
-Y2RPD- TS Sta.10+00.00
(14.2m Rt.)
CHRISTY COLLINS
12A
SPECIAL CUT DITCH
SEE DETAIL A
8 TONS CL B RIPRAP
W/5.9 SM FIL FAB
REMOVE
RETAIN
915
DEPT. OF TRANS.
DB 2167
PG 629
-SR5-
SR 1571 TOMMY'S RD 6.4 BST
S 77°58' 11.0" E
17
WILLIAM WHITE
PI Sta 19+55.116
Δ = 2°37' 37.4" (RT)
T = 100.872
-SR5- POC Sta.18+02.000
END CONSTRUCTION
-SR5- PT Sta.18+82.401
-SR5- PC Sta.19+04.672
9
EMILY W. PRIVOTT
DB 1486 PG 432
DENOTES MECHANIZED CLEARING
SITE 6
Permit Drawing
Sheet 44 of 111
NOTE: See Detail Sheets 2-S & 2-T For Ditch Details
NOTE: See Detail Sheet 2-S for Interchange Curve Data.
SEE SHT.63 FOR -Y2RPA- PROFILE
SEE SHT.64 FOR -Y2RPD- PROFILE
SEE SHTS.68 & 69 FOR -SR5- PROFILE
SEE SHT.70 FOR -SR6- PROFILE
SEE SHTS. 34 & 35 FOR -L- PROFILE
METRIC
PROJECT REFERENCE NO. R-2554BA
SHEET NO. 9
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST. REV.
R/W REV.
NAD 83
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
900 RIDGEFIELD DRIVE • SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
FOR
DIVISION OF HIGHWAYS
REVISIONS
R/W REVISION : REVISED MONUMENT DATA AND ADDED R/W CURVE DATA
R/W REVISION
R/W REVISION : CHANGES MADE PER "INITIAL NTACTS".
R/W REVISION 11/15/05: CHANGED PARCEL 11 TO 11C
R/W REVISION 2/21/06: CHANGED PROPOSED R/W FOR PARCEL 13
R/W REVISION 3/10/06: REVISED PROPOSED C/A FOR PARCELS 11C AND 12 ADJACENT TO -SR5-


REVISIONS
R/W REVISION : CHANGES MADE PER 'INITIAL MTACTS'.
R/W REVISION 11/15/05: CHANGED PARCEL 11 TO 11C
R/W REVISION 2/21/06: REVISED PROPOSED R/W FOR PARCEL 13
R/W REVISION 3/10/06: REVISED PROPOSED C/A FOR PARCELS 11C AND 12 ADJACENT TO -SR5-
R/W REVISION ; REVISED MONUMENT DATA AND ADDED R/W CURVE DATA
METRIC
PROJECT REFERENCE NO. R-2554BA
SHEET NO. 9
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST.REV.
R/W REV.
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
NAD 83
ARDETH L. SCOTT
DB 1551 PG 55
11A
-L- POT Sta.109+70.000=
-Y2RPA- POT Sta.10+00.000
Δ= 2°18' 00.0" (14.2m Lt.)
NO "A" BASIN REQUIRED.
THE DRAINAGE IS MINIMAL.
DEBORAH SCOTT FOY
DB 1551 PG 57
11C
END CONSTRUCTION
-SR6- POT Sta.19+30.000
-SR6- PT Sta.19+11.460
-SR6- PC Sta.18+77.655
PROPOSED SOIL DRIVE
N 85°15' 20.0" E -SR6-
JOYCE P. CRUMPLER
DB 904 PG 420
13
GRADE TO DRAIN
SPECIAL CUT DITCH
SEE DETAIL H
N 85°15' 20.0" E -L-
MATCHLINE -L- STA. 109+60 SEE SHEET 8
MATCHLINE -L- STA. 112+80 SEE SHEET 10
1.8 TONS CL B RIPRAP
W/5.9 SM FIL FAB
R/W CURVE DATA
RADIUS: 230.856m
CHORD BEARING: S 81°12'47" E LT.
CHORD DISTANCE: 35.759 m
R/W CURVE DATA
RADIUS: 159.144m
CHORD BEARING: S 83°50'05" E RT.
CHORD DISTANCE: 48.18m
-L- POT Sta.109+96.000=
-Y2RPD- TS Sta.10+00.00
(14.2m Rt.)
CHRISTY COLLINS
12A
SPECIAL CUT DITCH
SEE DETAIL A
DEPT. OF TRANS.
DB 2167 PG 629
915
WILLIAM WHITE
17
-SR5- POC Sta.18+02.000
END CONSTRUCTION
S 77°58' 11.0" E
PI Sta 19+55.116
Δ = 2°37' 37.4" (RT)
R = 100.872
-SR5- PT Sta.18+82.401
EMILY W. PRIVOTT
DB 1486 PG 432
9
DENOTES MECHANIZED CLEARING
SITE 6
-SR5- PC Sta.19+04.672
Permit Drawing
Sheet 45 of 111
NOTE: See Detail Sheet 2-S for Interchange Curve Data.
SEE SHT.63 FOR -Y2RPA- PROFILE
SEE SHT.64 FOR -Y2RPD- PROFILE
SEE SHTS.68 & 69 FOR -SR5- PROFILE
SEE SHT.70 FOR -SR6- PROFILE
SEE SHTS.34 & 35 FOR -L- PROFILE
NOTE: See Detail Sheets 2-S & 2-T For Ditch Details
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
RALEIGH, NORTH CAROLINA
FOR
DIVISION OF HIGHWAYS

8/17/99

REVISIONS

R/W REVISION : REVISED BOUNDARIES AND MONUMENTS FOR CONSERVATION EASEMENT AREA.
R/W REVISION : CORRECTION OF SOME PARCEL NAMES AND CREATION OF PARCEL 26A
R/W REVISION : CHANGES MADE PER "INITIAL CONTACTS"
R/W REVISION 11/15/05: REVISED PROPERTY NAME FOR PARCEL 26

12/8/07 08:00:38
R:\Highway\Projects\Permits\Wetland\NoContours\r-2554ba_rdy_pmt.dgn
mcook

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	10
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — HYDRAULICS ENGINEER

METRIC 5 0 10
CONST.REV.
R/W REV.

DENOTES HAND CLEARING
DENOTES MECHANIZED CLEARING
DENOTES FILL IN WETLAND
DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SITE 7

SP. CUT DITCH
-L- STA. 112+60–114+00 LT
DA=1.772ha (101A)
Q2=0.222cms
V2=0.53m/s
SLOPE=0.300%
SWALE REQ=133.5m
SWALE AVAL=140.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)

SP. CUT DITCH
-L- STA. 113+60–114+00 RT
DA=0.483ha (DITCH)
Q2=0.108cms
V2=0.62m/s
SLOPE=1.300%
SWALE REQ=36.4m
SWALE AVAL=40.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)

TAIL BASE DITCH
-L- STA. 114+00 RT
DA=0.71ha (101,103, DITCH)
Q2=0.344cms
V2=0.53m/s
SLOPE=0.300%
SWALE REQ=53.5m
SWALE AVAL=55.0m
(3.359ha IN DITCH)
(DA DOES NOT ENTER BUFFER DIRECTLY)

SP. MED. CUT DITCH
-L- STA. 113+60–114+00 M
DA=0.394ha (102)
Q2=0.045cms
V2=0.26m/s
SLOPE=0.300%
SWALE REQ=29.7m
SWALE AVAL=40.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)

NAD 83

JOYCE P. CRUMPLER
DB 904 PG 420
(13)

CAREY B. HALL
DB 821 PG 708
(28)

HOWELL BRANCH

MATCHLINE -L- STA. 112+80 SEE SHEET 9

MATCHLINE -L- STA. 116+40 SEE SHEET 11

SPECIAL CUT DITCH
SEE DETAIL H

SPECIAL MEDIAN CUT-L-
DITCH SEE DETAIL B

SPECIAL CUT DITCH
SEE DETAIL A

TEMP. WORK BRIDGE FINGER

END WW FENCE

BEG. WW FENCE

PSH
SEE DETAIL F

TOE PROTECTION
SEE DETAIL Q

GRADE TO DRAIN

15 TONS CL B RIPRAP
W/11.7 SM FIL FAB

N 85°15'20" E

-L-
Pls Sta 116+87.637
Θs = 0°45'50.2"
Ls = 80.000
LT = 53.334
ST = 26.667

-L- TS Sta. 116+34.304

WILLIAM WHITE
(17)

TAIL BASE DITCH
SEE DETAIL P

BEGIN APPROACH SLAB -L- STA.114+12.315 LT.
BEGIN BRIDGE -L- STA.114+19.685 LT.
END BRIDGE -L- STA.115+29.715 LT.
END APPROACH SLAB -L- STA.115+37.085 LT.

BEGIN APPROACH SLAB -L- STA.114+12.315 RT.
BEGIN BRIDGE -L- STA.114+19.685 RT.
END BRIDGE -L- STA.115+29.715 RT.
END APPROACH SLAB -L- STA.115+37.085 RT.

JAMES TORNAGE
EL AL TRUSTEES
DB 1926 PG 867

ORCHARD

DEANS CEMETERY
CEMETARY

CONSERVATION EASEMENT

-SR5- PT Sta.20+05.544

-SR5- PC Sta.20+55.017

-SR5- PT Sta.21+15.247

S 75°20'33.6" E

EXIST R/W

375mm CONC RETAIN

BEGIN CONSTRUCTION
-SR5- POC Sta.20+60.000

300 mm

GRADE TO DRAIN

PROP. 3.6m GATE

-SR5-

2400mm CMP

REMOVE EXIST CULVERT AND ROADBED FOR MITIGATION CREDIT. SEE MITIGATION PLANS. EXCAVATE EXIST. ROAD TO NATURAL FLOOD PLAIN ELEV. AS DIRECTED BY ENGINEER. SEE DETAIL Y

JAMES W. HUBBLE
DB 1171 PG 405
(26)

SEE INSET

CAROLYN B. MORRIS
W. THOMAS BARDIN
ESTATE FILE 02E-245
(26A)

PATRICIA GABRIEL
WB 1930 PG 169
(27)

GRADE TO DRAIN

-SR5- PC Sta.22+77.138

S 87°24'09.9" E

PROP. 3.6m GATE

END CONSTRUCTION
-SR5- POT Sta.22+45.000

SR 1571 TOMMY'S RD 6.4 BST

EXIST R/W

RETAIN 375mm CONC

NOTE: See Detail Sheets 2-R For -SR5- Curve Data

NOTE: See Detail Sheets 2-S & 2-T For Ditch Details

SEE SHT. 35 FOR -L- PROFILE

NOTE: See Detail Sheet 2-U For Bridge Sketch Showing Pavement In Relation To Bridge Width

Permit Drawing
Sheet 46 of 111

INSET
MITIGATION AREA
JAMES W. HUBBLE DB 1171 PG 405
HOWELL BRANCH
C/L OF HOWELL BRANCH IS PROPERTY LINE
CAROLYN B. MORRIS W. THOMAS BARDIN ESTATE FILE 02E-245

SITE 8

PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
900 RIDGEFIELD DRIVE • SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

PRELIMINARY PLANS
NO RIGHT OF WAY OR CONSTRUCTION

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	10
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 2622 — ROBERT T. WENDT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL — PAUL R. SHEEK

CONST. REV.

R/W REV.

DENOTES HAND CLEARING

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

REVISIONS

R/W REVISION ; REVISED BOUNDARIES AND MONUMENTS FOR CONSERVATION EASEMENT AREA.
CORRECTION OF SOME PARCEL NAMES AND CREATION OF PARCEL 26A
R/W REVISION ; CHANGES MADE PER "INITIAL CONTACTS"
R/W REVISION 11/15/05; REVISED PROPERTY NAME FOR PARCEL 26

JOYCE P. CRUMPLER
DB 904 PG 420

SP. CUT DITCH
-L- STA. 112+60-114+00 LT
DA=1.772ha (101A)
Q2=0.222cms
V2=0.53m/s
SLOPE=0.300%
SWALE REQ=133.5m
SWALE AVAL=140.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)

SP. CUT DITCH
-L- STA. 113+60-114+00 RT
DA=0.483ha (DITCH)
Q2=0.108cms
V2=0.62m/s
SLOPE=1.300%
SWALE REQ=36.4m
SWALE AVAL=40.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)

TAIL BASE DITCH
-L- STA. 114+00 RT
DA=0.71ha (101,103, DITCH)
Q2=0.344cms
V2=0.55m/s
SLOPE=0.300%
SWALE REQ=53.5m
SWALE AVAL=55.0m
(3.359ha IN DITCH)
(DA DOES NOT ENTER BUFFER DIRECTLY)

CAREY R. HAM
DB 521 PG 708

SP. MED. CUT DITCH
-L- STA. 113+60-114+00 M
DA=0.394ha (102)
Q2=0.045cms
V2=0.26m/s
SLOPE=0.300%
SWALE REQ=29.7m
SWALE AVAL=40.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)

HOWELL BRANCH

SITE 7

TEMP. WORK BRIDGE FINGER

PSH SEE DETAIL F

SPECIAL CUT DITCH SEE DETAIL H

SPECIAL MEDIAN CUT DITCH SEE DETAIL B

SPECIAL CUT DITCH SEE DETAIL A

N 85°15'20"E

END WW FENCE

BEG. WW FENCE

TOE PROTECTION SEE DETAIL Q

4.5 TONS CL B RIPRAP W/11.7 SM FIL FAB

-L-
Pls Sta 116+87.637
Θs = 0°45'50.2"
Ls = 80.000
LT = 53.334
ST = 26.667
-L- TS Sta. 116+34.304

MATCHLINE -L- STA. 112+80 SEE SHEET 9

MATCHLINE -L- STA. 116+40 SEE SHEET 11

WILLIAM WHITE

BEGIN APPROACH SLAB -L- STA.114+12.315 LT.
BEGIN BRIDGE -L- STA.114+19.685 LT.
END BRIDGE -L- STA.115+29.715 LT.
END APPROACH SLAB -L- STA.115+37.085 LT.

BEGIN APPROACH SLAB -L- STA.114+12.315 RT.
BEGIN BRIDGE -L- STA.114+19.685 RT.
END BRIDGE -L- STA.115+29.715 RT.
END APPROACH SLAB -L- STA.115+37.085 RT.

TAIL BASE DITCH SEE DETAIL P

JAMES TORNAGE EL AL TRUSTEES
DB 1926 PG 867

DEANS CEMETERY

-SR5- PT Sta. 20+05.544

-SR5- PC Sta. 20+55.017

-SR5- PT Sta. 21+15.247

S 75°20'33.6"E

BEGIN CONSTRUCTION
-SR5- POC Sta. 20+60.000

GRADE TO DRAIN

PROP. 3.6m GATE

CONSERVATION EASEMENT

REMOVE EXIST CULVERT AND ROADBED FOR MITIGATION CREDIT. SEE MITIGATION PLANS. EXCAVATE EXIST. ROAD TO NATURAL FLOOD PLAIN ELEV. AS DIRECTED BY ENGINEER. SEE DETAIL Y

PATRICIA GABRIEL
WB 1930 PG 169

-SR5- PC Sta. 22+77.138

S 87°24'09"E

END CONSTRUCTION
-SR5- POT Sta. 22+45.000

JAMES W. HUBBLE
DB 1171 PG 405

CAROLYN B. MORRIS
W. THOMAS BARDIN
ESTATE FILE 02E-245

SEE INSET

INSET

MITIGATION AREA

NOTE: See Detail Sheets 2-R For -SR5- Curve Data

NOTE: See Detail Sheets 2-S & 2-T For Ditch Details

SEE SHT. 35 FOR -L- PROFILE

NOTE: See Detail Sheet 2-U For Bridge Sketch Showing Pavement In Relation To Bridge Width

SITE 8

Permit Drawing
Sheet 47 of 111

PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
900 RIDGEFIELD DRIVE • SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

R:\18\07 07155\44 Roadway\Design Roadplots\Permits\Wetlands\r-2554ba_rdy_psh_18.dgn
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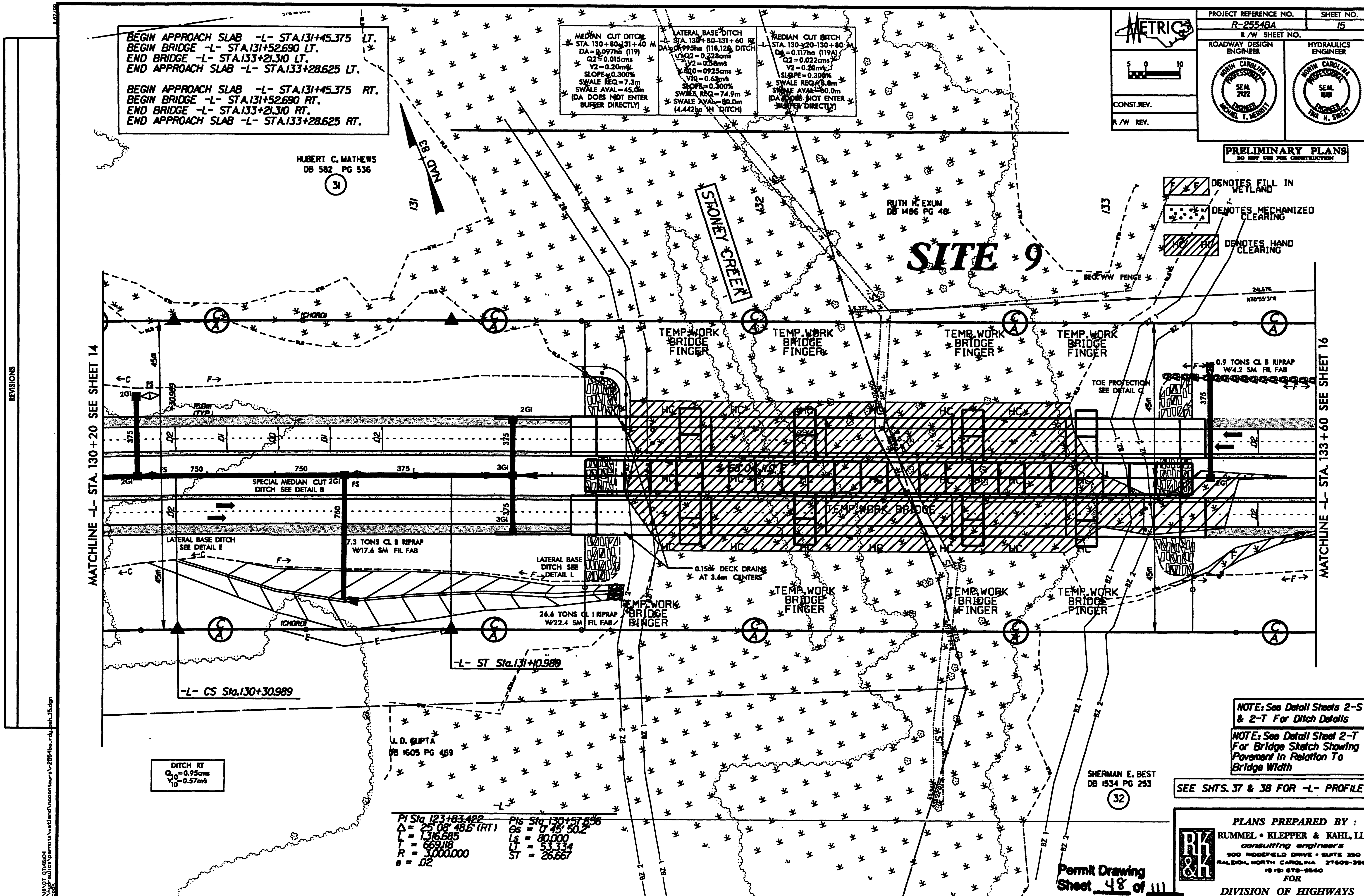
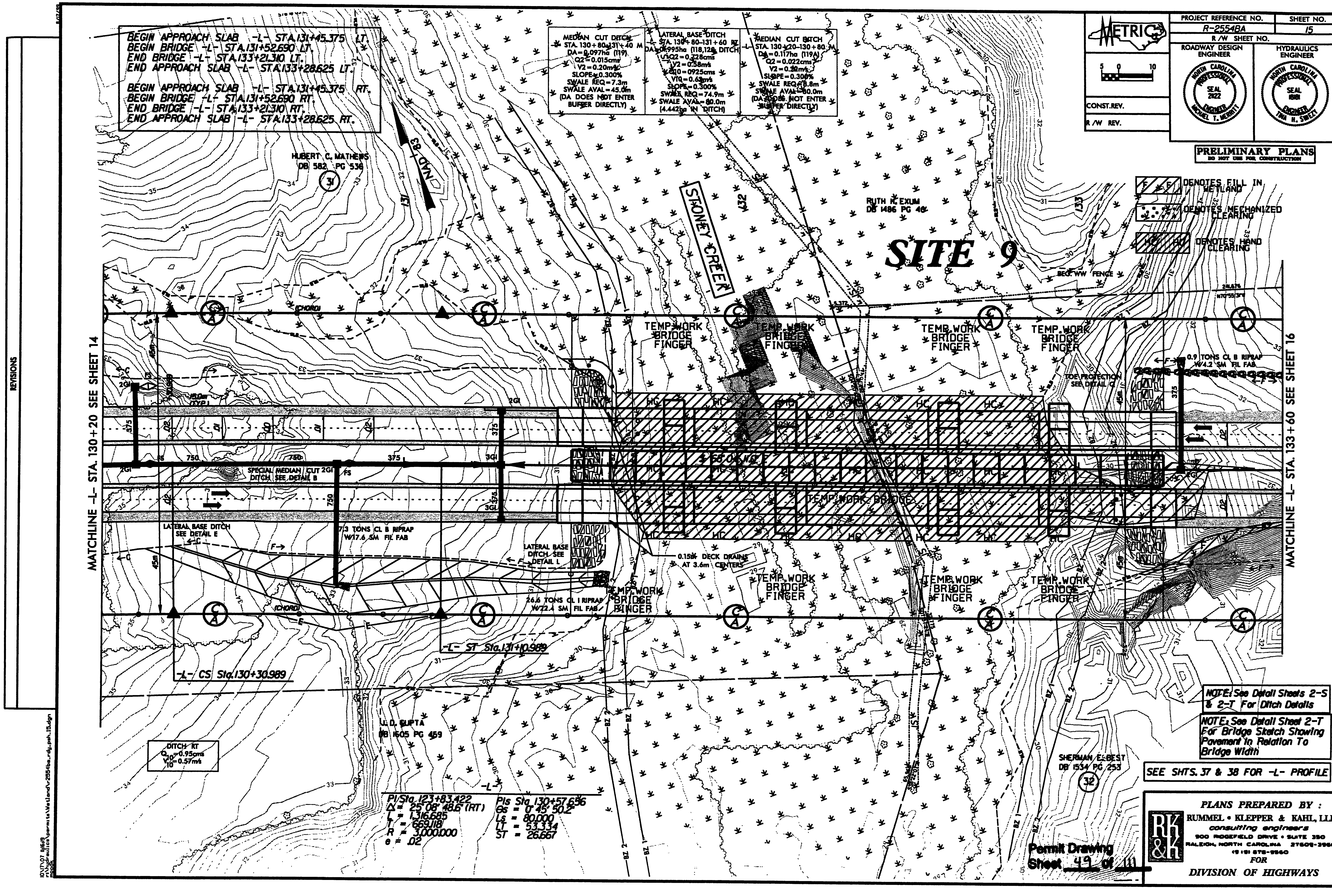

BEGIN APPROACH SLAB -L- STA.131+45.375 LT.
BEGIN BRIDGE -L- STA.131+52.690 LT.
END BRIDGE -L- STA.133+21.310 LT.
END APPROACH SLAB -L- STA.133+28.625 LT.
BEGIN APPROACH SLAB -L- STA.131+45.375 RT.
BEGIN BRIDGE -L- STA.131+52.690 RT.
END BRIDGE -L- STA.133+21.310 RT.
END APPROACH SLAB -L- STA.133+28.625 RT.
MEDIAN CUT DITCH -L- STA. 130+80-131+40 M
LATERAL BASE DITCH -L- STA. 130+80-131+60 RT
MEDIAN CUT DITCH -L- STA. 130+20-130+80 M
PROJECT REFERENCE NO. R-2554BA
SHEET NO. 15
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST.REV.
R/W REV.
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
HUBERT C. MATHEWS
DB 582 PG 536
31
NAD 83
STONEY CREEK
RUTH H. EXUM
DB 1486 PG 40
SITE 9
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
DENOTES HAND CLEARING
TEMP. WORK BRIDGE FINGER
TEMP. WORK BRIDGE
0.9 TONS CL B RIPRAP W/4.2 SM FIL FAB
TOE PROTECTION SEE DETAIL C
MATCHLINE -L- STA. 130+20 SEE SHEET 14
MATCHLINE -L- STA. 133+60 SEE SHEET 16
SPECIAL MEDIAN CUT DITCH SEE DETAIL B
LATERAL BASE DITCH SEE DETAIL E
7.3 TONS CL B RIPRAP W/17.6 SM FIL FAB
LATERAL BASE DITCH SEE DETAIL L
0.15m DECK DRAINS AT 3.6m CENTERS
26.6 TONS CL I RIPRAP W/22.4 SM FIL FAB
-L- ST Sta.131+10.989
-L- CS Sta.130+30.989
U. D. GUPTA
DB 1605 PG 459
DITCH RT
SHERMAN E. BEST
DB 1534 PG 253
32
NOTE: See Detail Sheets 2-S & 2-T For Ditch Details
NOTE: See Detail Sheet 2-T For Bridge Sketch Showing Pavement In Relation To Bridge Width
SEE SHTS. 37 & 38 FOR -L- PROFILE
PI Sta 123+83.422
Δ = 25°08' 48.6" (RT)
L = 1,316.685
T = 669.118
R = 3,000.000
e = .02
PIs Sta 130+57.656
θs = 0°45' 50.2"
Ls = 80.000
LT = 53.334
ST = 26.667
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
FOR
DIVISION OF HIGHWAYS
Permit Drawing
Sheet 48 of 111
REVISIONS



BEGIN APPROACH SLAB -L- STA.131+45.375 LT.
BEGIN BRIDGE -L- STA.131+52.690 LT.
END BRIDGE -L- STA.133+21.310 LT.
END APPROACH SLAB -L- STA.133+28.625 LT.
BEGIN APPROACH SLAB -L- STA.131+45.375 RT.
BEGIN BRIDGE -L- STA.131+52.690 RT.
END BRIDGE -L- STA.133+21.310 RT.
END APPROACH SLAB -L- STA.133+28.625 RT.
MEDIAN CUT DITCH -L- STA. 130+80-131+40 M DA=0.097ha (119) Q2=0.015cms V2=0.20m/s SLOPE=0.300% SWALE REQ=7.3m SWALE AVAL=45.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
LATERAL BASE DITCH -L- STA. 130+80-131+60 RT DA=0.995ha (118,120 DITCH) Q2=0.228cms V2=0.58m/s Q10=0925cms V10=0.63m/s SLOPE=0.300% SWALE REQ=74.9m SWALE AVAL=80.0m (4.442ha IN DITCH)
MEDIAN CUT DITCH -L- STA. 130+20-130+80 M DA=0.117ha (119A) Q2=0.022cms V2=0.32m/s SLOPE=0.300% SWALE REQ=8.8m SWALE AVAL=80.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
METRIC
PROJECT REFERENCE NO. R-2554BA
SHEET NO. 15
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST.REV.
R/W REV.
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
DENOTES HAND CLEARING
SITE 9
STONEY CREEK
NAD 83
HUBERT C. MATHEWS DB 582 PG 536
RUTH H. EXUM DB 1486 PG 46
TEMP.WORK BRIDGE FINGER
TEMP. WORK BRIDGE
MATCHLINE -L- STA. 130+20 SEE SHEET 14
MATCHLINE -L- STA. 133+60 SEE SHEET 16
SPECIAL MEDIAN CUT DITCH SEE DETAIL B
LATERAL BASE DITCH SEE DETAIL E
7.3 TONS CL B RIPRAP W/17.6 SM FIL FAB
LATERAL BASE DITCH SEE DETAIL L
0.15m DECK DRAINS AT 3.6m CENTERS
26.6 TONS CL I RIPRAP W/22.4 SM FIL FAB
0.9 TONS CL B RIPRAP W/4.2 SM FIL FAB
TOE PROTECTION SEE DETAIL C
-L- ST Sta.131+10.989
-L- CS Sta.130+30.989
U.D. GUPTA DB 1605 PG 459
DITCH RT Q2=0.95cms V10=0.57m/s
SHERMAN E. BEST DB 1534 PG 253
NOTE: See Detail Sheets 2-S & 2-T For Ditch Details
NOTE: See Detail Sheet 2-T For Bridge Sketch Showing Pavement In Relation To Bridge Width
SEE SHTS. 37 & 38 FOR -L- PROFILE
PI Sta 123+83.422
Δ = 25°08' 48.6" (RT)
L = 1,316.685
T = 669.118
R = 3,000.000
e = .02
PIs Sta 130+57.656
θs = 0°45' 50.2"
Ls = 80.000
LT = 53.334
ST = 26.667
PLANS PREPARED BY:
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
900 RIDGEFIELD DRIVE • SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
FOR
DIVISION OF HIGHWAYS
Permit Drawing Sheet 49 of 111
REVISIONS

NO "A" BASIN REQUIRED.
THE DRAINAGE IS MINIMAL.

NAD 83

METRIC

5 0 10

CONST.REV.

R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	17
R /W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21022 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15181 ENGINEER TIMA N. SWEET

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REUBEN HAMILTON
DB 1486 PG 43

138 139 140

27% AVG BEARING

KENNETH L. WIGGINS
DB 648 PG 95

34 MCCLINTON BEST
DB 854 PG 670

36

SHIRLEY WIMBERLY
DB 854 PG 674

33

35 GEORGE MEADE BEST
DB 854 PG 681

MATCHLINE -L- STA. 137+00 SEE SHEET 16

MATCHLINE -L- STA. 140+40 SEE SHEET 18

45m

600

2GI

FS

-L- S 68°04'11.0" E

PSH
SEE DETAIL F

400 CSP
ELBOWS

4.5 TONS CL B RIPRAP
W/1.2 GM FIL FAB

TAIL V DITCH
SEE DETAIL M

BZ 1 BZ 2

JS

15.079 N69°42'02"W

EP

SITE 10
(CON'T ON SHEET 18)

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

NOTE: See Detail Sheets 2-S & 2-T For Ditch Details

SEE SHTS. 38 & 39 FOR -L- PROFILE

PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
900 RIDGEFIELD DRIVE • SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

Permit Drawing Sheet 50 of 111

REVISIONS

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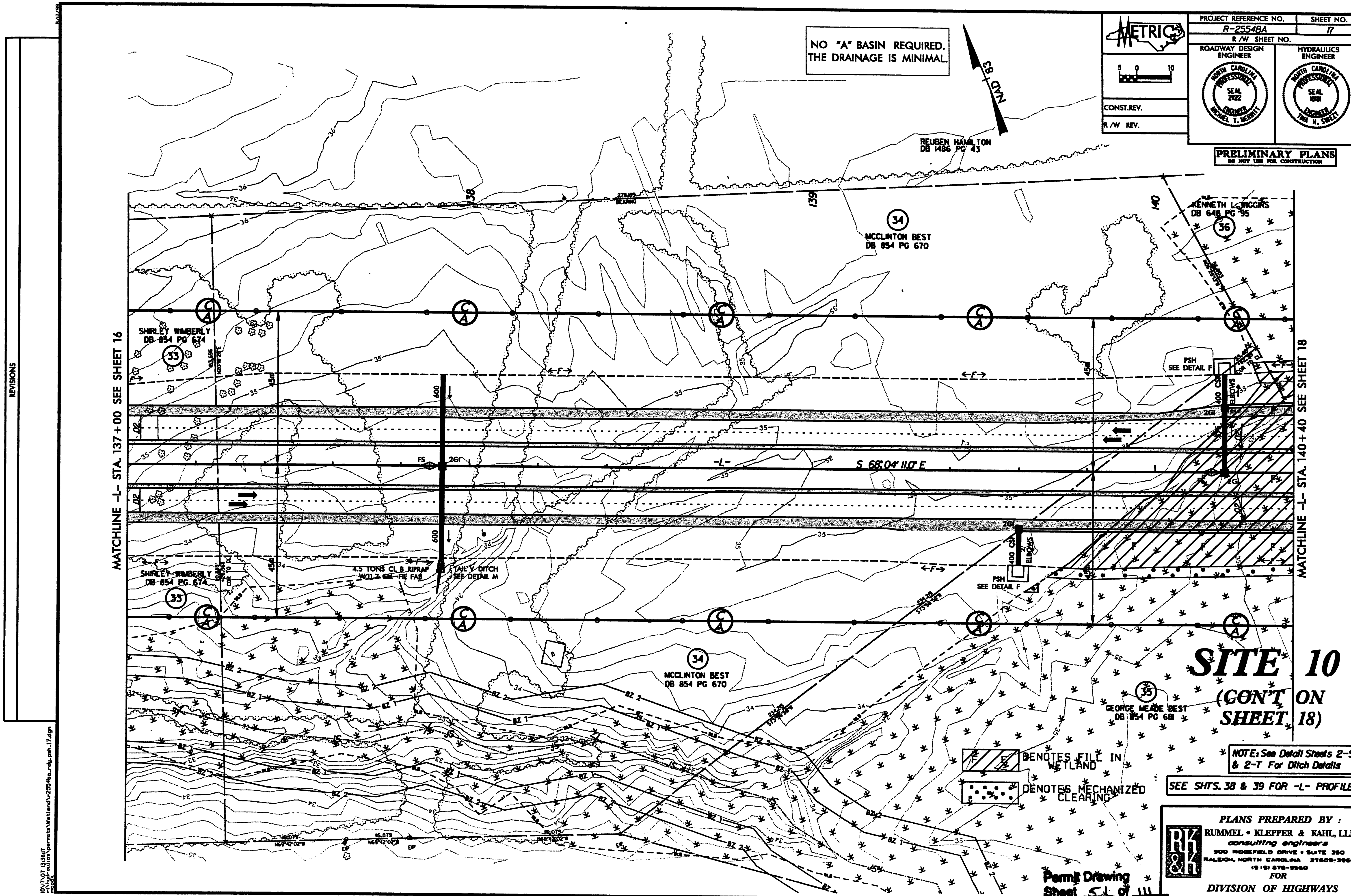
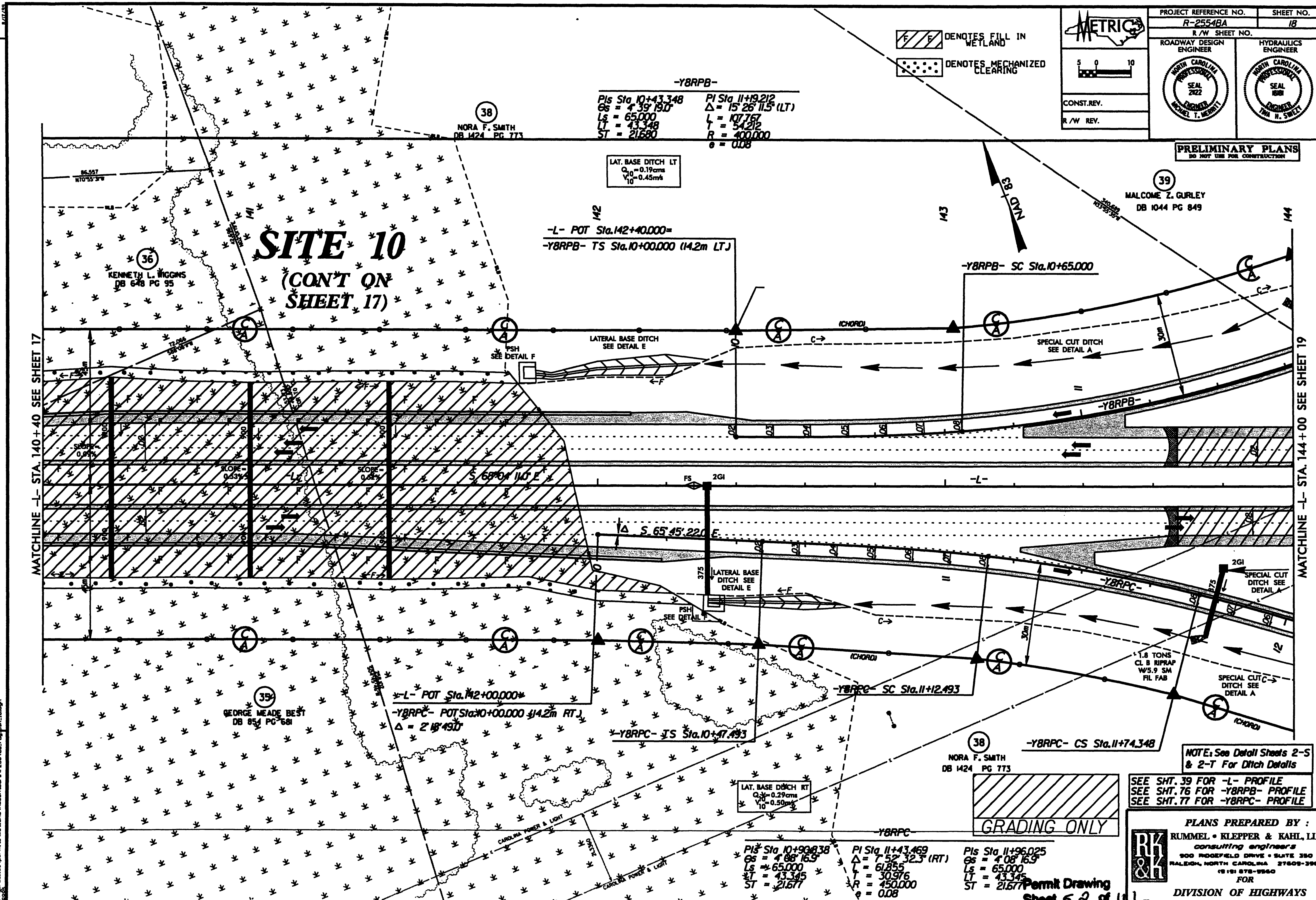
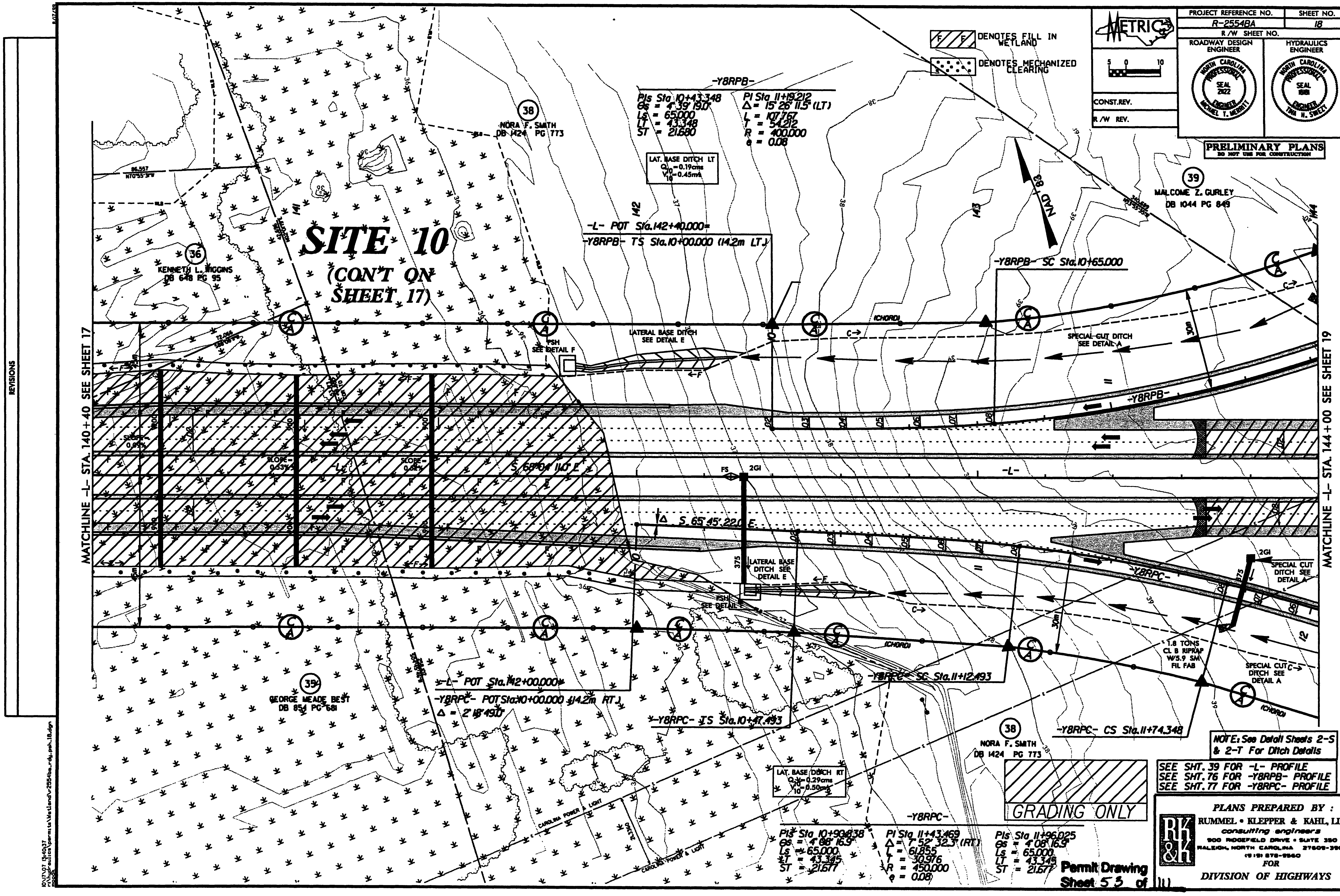
mcook

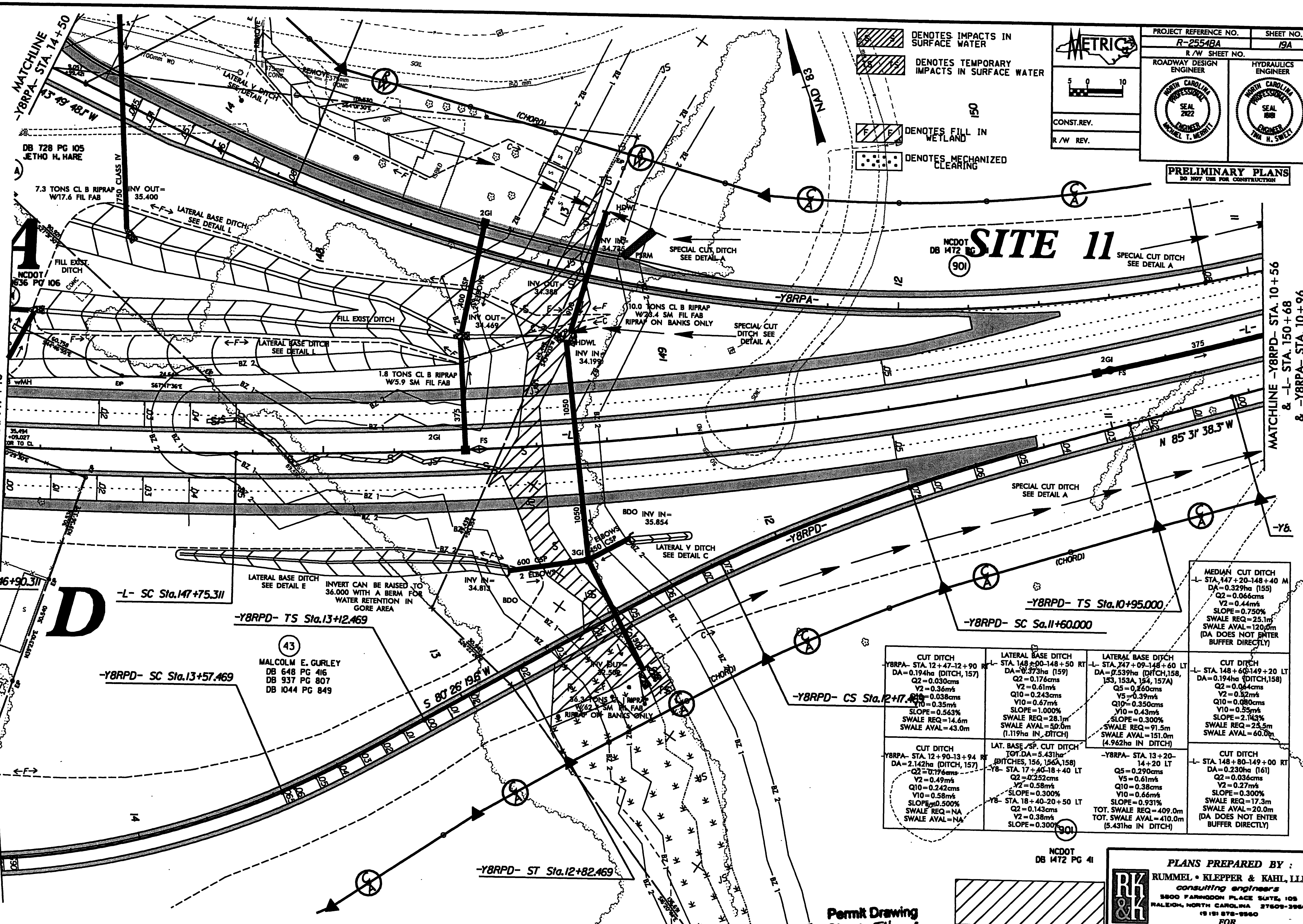


PROJECT REFERENCE NO. R-2554BA
SHEET NO. 17
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
METRIC
CONST. REV.
R/W REV.
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
NO "A" BASIN REQUIRED. THE DRAINAGE IS MINIMAL.
NAD 83
REUBEN HAMILTON DB 1486 PG 43
MCCLINTON BEST DB 854 PG 670
KENNETH L. WIGGINS DB 648 PG 95
SHIRLEY WIMBERLY DB 854 PG 674
MATCHLINE -L- STA. 137+00 SEE SHEET 16
MATCHLINE -L- STA. 140+40 SEE SHEET 18
S 68°04'11.0" E
4.5 TONS CL B RIPRAP W/11.7 SM FIL FAB
TAIL V DITCH SEE DETAIL M
PSH SEE DETAIL F
GEORGE MEADE BEST DB 854 PG 681
SITE 10 (CON'T ON SHEET 18)
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
NOTE: See Detail Sheets 2-S & 2-T For Ditch Details
SEE SHTS. 38 & 39 FOR -L- PROFILE
PLANS PREPARED BY:
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
900 RIDGEFIELD DRIVE • SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR DIVISION OF HIGHWAYS
Permit Drawing Sheet 51 of 111
REVISIONS


PROJECT REFERENCE NO. R-2554BA
SHEET NO. 18
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
METRIC
CONST. REV.
R/W REV.
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
SITE 10
(CON'T ON SHEET 17)
-Y8RPB-
PIs Sta 10+43.348
Θs = 4°39'19.0"
Ls = 65.000
LT = 43.348
ST = 21.680
PI Sta 11+19.212
Δ = 15°26'11.5" (LT)
L = 107.767
T = 54.212
R = 400.000
e = 0.08
LAT. BASE DITCH LT
38
NORA F. SMITH
DB 1424 PG 773
39
MALCOME Z. GURLEY
DB 1044 PG 849
36
KENNETH L. WIGGINS
DB 648 PG 95
35
GEORGE MEADE BEST
DB 854 PG 681
NAD 83
-L- POT Sta.142+40.000=
-Y8RPB- TS Sta.10+00.000 (14.2m LT)
-Y8RPB- SC Sta.10+65.000
LATERAL BASE DITCH SEE DETAIL E
PSH SEE DETAIL F
SPECIAL CUT DITCH SEE DETAIL A
MATCHLINE -L- STA. 140+40 SEE SHEET 17
MATCHLINE -L- STA. 144+00 SEE SHEET 19
S 68°04'11.0" E
S 65°45'22.0" E
-Y8RPC-
1.8 TONS CL B RIPRAP W/5.9 SM FIL FAB
-L- POT Sta.142+00.000=
-Y8RPC- POT Sta.10+00.000 (14.2m RT)
Δ = 2°18'49.0"
-Y8RPC- SC Sta.11+12.493
-Y8RPC- TS Sta.10+47.493
-Y8RPC- CS Sta.11+74.348
LAT. BASE DITCH RT
CAROLINA POWER & LIGHT
NOTE: See Detail Sheets 2-S & 2-T For Ditch Details
SEE SHT. 39 FOR -L- PROFILE
SEE SHT. 76 FOR -Y8RPB- PROFILE
SEE SHT. 77 FOR -Y8RPC- PROFILE
GRADING ONLY
PIs Sta 10+90.838
Θs = 4°08'16.9"
Ls = 65.000
LT = 43.345
ST = 21.677
PI Sta 11+43.469
Δ = 7°52'32.3" (RT)
L = 61.855
T = 30.976
R = 450.000
e = 0.08
PIs Sta 11+96.025
Θs = 4°08'16.9"
Ls = 65.000
LT = 43.345
ST = 21.677
PLANS PREPARED BY:
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
900 RIDGEFIELD DRIVE • SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
FOR
DIVISION OF HIGHWAYS
Permit Drawing
Sheet 52 of 111



PROJECT REFERENCE NO. R-2554BA
SHEET NO. 18
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
METRIC
CONST. REV.
R/W REV.
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
SITE 10
(CON'T ON SHEET 17)
-Y8RPB-
PIs Sta 10+43.348
Θs = 4°39' 19.0"
Ls = 65.000
LT = 43.348
ST = 21.680
PI Sta 11+19.212
Δ = 15°26' 11.5" (LT)
L = 107.767
T = 54.212
R = 400.000
e = 0.08
NORA F. SMITH
DB 1424 PG 773
KENNETH L. WIGGINS
DB 648 PG 95
MALCOME Z. GURLEY
DB 1044 PG 849
GEORGE MEADE BEST
DB 854 PG 681
LAT. BASE DITCH LT
-L- POT Sta.142+40.000=
-Y8RPB- TS Sta.10+00.000 (14.2m LT)
-Y8RPB- SC Sta.10+65.000
NAD 83
LATERAL BASE DITCH SEE DETAIL E
PSH SEE DETAIL F
SPECIAL CUT DITCH SEE DETAIL A
MATCHLINE -L- STA. 140+40 SEE SHEET 17
MATCHLINE -L- STA. 144+00 SEE SHEET 19
S 68°04' 11.0" E
S 65°45' 22.0" E
-Y8RPC-
1.8 TONS CL B RIPRAP W5.9 SM FIL FAB
-Y8RPC- SC Sta.11+12.493
-L- POT Sta.142+00.000=
-Y8RPC- POT Sta.10+00.000 (14.2m RT)
Δ = 2°18'49.0"
-Y8RPC- TS Sta.10+47.493
-Y8RPC- CS Sta.11+74.348
LAT. BASE DITCH RT
CAROLINA POWER & LIGHT
NOTE: See Detail Sheets 2-S & 2-T For Ditch Details
SEE SHT. 39 FOR -L- PROFILE
SEE SHT. 76 FOR -Y8RPB- PROFILE
SEE SHT. 77 FOR -Y8RPC- PROFILE
GRADING ONLY
PIs Sta 10+90.838
Θs = 4°08' 16.9"
Ls = 65.000
LT = 43.345
ST = 21.677
PI Sta 11+43.469
Δ = 7°52' 32.3" (RT)
L = 61.855
T = 30.976
R = 450.000
e = 0.08
PIs Sta 11+96.025
Θs = 4°08' 16.9"
Ls = 65.000
LT = 43.345
ST = 21.677
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
900 RIDGEFIELD DRIVE • SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS
Permit Drawing
Sheet 53 of 111
REVISIONS



			MEDIAN CUT DITCH -L- STA. 147+20-148+40 M DA=0.329ha (155) Q2=0.066cms V2=0.44m/s SLOPE=0.750% SWALE REQ=25.1m SWALE AVAL=120.0m (DA DOES NOT ENTER BUFFER DIRECTLY)
CUT DITCH -Y8RPA- STA. 12+47-12+90 RT DA=0.194ha (DITCH, 157) Q2=0.030cms V2=0.36m/s Q10=0.038cms V10=0.35m/s SLOPE=0.563% SWALE REQ=14.6m SWALE AVAL=43.0m	LATERAL BASE DITCH -L- STA. 148+00-148+50 RT DA=0.373ha (159) Q2=0.176cms V2=0.61m/s Q10=0.243cms V10=0.67m/s SLOPE=1.000% SWALE REQ=28.1m SWALE AVAL=50.0m (1.119ha IN DITCH)	LATERAL BASE DITCH -L- STA. 147+09-148+60 LT DA=0.539ha (DITCH,158, 153, 153A, 154, 157A) Q5=0.260cms V5=0.39m/s Q10=0.350cms V10=0.43m/s SLOPE=0.300% SWALE REQ=91.5m SWALE AVAL=151.0m (4.962ha IN DITCH)	CUT DITCH -L- STA. 148+60-149+20 LT DA=0.194ha (DITCH,158) Q2=0.064cms V2=0.52m/s Q10=0.080cms V10=0.55m/s SLOPE=2.143% SWALE REQ=25.5m SWALE AVAL=60.0m
CUT DITCH -Y8RPA- STA. 12+90-13+94 RT DA=2.142ha (DITCH, 157) Q2=0.176cms V2=0.49m/s Q10=0.242cms V10=0.58m/s SLOPE=0.500% SWALE REQ=NA SWALE AVAL=NA	LAT. BASE /SP. CUT DITCH TOT.DA=5.431ha (DITCHES, 156, 156A,158) -Y8- STA. 17+40-18+40 LT Q2=0.252cms V2=0.58m/s SLOPE=0.300% -Y8- STA. 18+40-20+50 LT Q2=0.143cms V2=0.38m/s SLOPE=0.300%	-Y8RPA- STA. 13+20-14+20 LT Q5=0.290cms V5=0.61m/s Q10=0.38cms V10=0.66m/s SLOPE=0.931% TOT. SWALE REQ=409.0m TOT. SWALE AVAL=410.0m (5.431ha IN DITCH)	CUT DITCH -L- STA. 148+80-149+00 RT DA=0.230ha (161) Q2=0.036cms V2=0.27m/s SLOPE=0.300% SWALE REQ=17.3m SWALE AVAL=20.0m (DA DOES NOT ENTER BUFFER DIRECTLY)

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	19A

R/W SHEET NO.

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 2122 MICHAEL T. MERRITT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 1881 TINA H. SWETT

CONST.REV.

R/W REV.

REVISIONS

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
5800 FARINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

GRADING ONLY

Permit Drawing
Sheet 54 of 111

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	19A
R/W SHEET NO.	

METRIC

5 0 10

CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 21022 ENGINEER MICHEL T. MERRITT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 16151 ENGINEER TINA H. SWEET

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

REVISIONS

MATCHLINE -L- STA. 147+10

MATCHLINE -Y8RPA- STA. 14+50

MATCHLINE -Y8RPD- STA. 14+40

MATCHLINE -Y8RPD- STA. 10+56 & -L- STA. 150+68 & -Y8RPA- STA. 10+96

SITE 11

A

B

C

D

DB 728 PG 105 JETHO H. HARE

NCDOT DB 1472 PG 901

NCDOT 1836 PG 106

43 MALCOLM E. GURLEY DB 648 PG 416 DB 937 PG 807 DB 1044 PG 849

NCDOT DB 1472 PG 41

-L- SC Sta.147+75.311

-Y8RPD- TS Sta.13+12.469

-Y8RPD- SC Sta.13+57.469

-Y8RPD- ST Sta.12+82.469

-Y8RPD- TS Sta.10+95.000

-Y8RPD- SC Sta.11+60.000

-Y8RPD- CS Sta.12+17.469

-Y8RPA-

-Y8-

-Y8RPD-

-L-

S 80°26'19.5"W

N 85°31'38.3"W

7.3 TONS CL B RIPRAP W/17.8 FIL FAB

10.0 TONS CL B RIPRAP W/28.4 SM FIL FAB RIPRAP ON BANKS ONLY

1.8 TONS CL B RIPRAP W/5.9 SM FIL FAB

36.3 TONS CL B RIPRAP W/62 SM FIL FAB RIPRAP ON BANKS ONLY

INV OUT= 35.400

INV OUT= 34.468

INV OUT= 34.388

INV IN= 34.785

INV IN= 34.199

INV IN= 34.812

INV OUT= 32.598

INVERT CAN BE RAISED TO 36.000 WITH A BERM FOR WATER RETENTION IN GORE AREA

FILL EXIST DITCH

SPECIAL CUT DITCH SEE DETAIL A

LATERAL BASE DITCH SEE DETAIL L

LATERAL BASE DITCH SEE DETAIL E

LATERAL V DITCH SEE DETAIL C

LATERAL V DITCH SEE DETAIL

REMOVE

1750 CLASS IV

2GI

HDWL

FS

BDO

(CHORD)

CUT DITCH -Y8RPA- STA. 12+47-12+90 RT	LATERAL BASE DITCH -L- STA. 148+00-148+50 RT	LATERAL BASE DITCH -L- STA. 147+09-148+60 LT	MEDIAN CUT DITCH -L- STA. 147+20-148+40 LT
DA=0.194ha (DITCH, 157)	DA=0.373ha (159)	DA=0.539ha (DITCH,158, 153,153A, 154, 157A)	DA=0.329ha (155)
Q2=0.030cms	Q2=0.176cms	Q5=0.360cms	Q2=0.066cms
V2=0.36m/s	V2=0.61m/s	V5=0.39m/s	V2=0.44m/s
Q10=0.038cms	Q10=0.243cms	Q10=0.350cms	SLOPE=0.750%
V10=0.35m/s	V10=0.67m/s	V10=0.43m/s	SWALE REQ=25.1m
SLOPE=0.563%	SLOPE=1.000%	SLOPE=0.300%	SWALE AVAL=120.0m
SWALE REQ=14.6m	SWALE REQ=28.1m	SWALE REQ=91.5m	(DA DOES NOT ENTER
SWALE AVAL=43.0m	SWALE AVAL=50.0m	SWALE AVAL=157.0m	BUFFER DIRECTLY)
	(1,319ha IN DITCH)	(4.962ha IN DITCH)	

CUT DITCH -Y8RPA- STA. 12+90-13+94 RT	LAT. BASE /SP. CUT DITCH -Y8- STA. 17+40-18+40 LT & -Y8- STA. 18+40-20+50 LT	-Y8RPA- STA. 13+20-14+20 LT	CUT DITCH -L- STA. 148+80-149+00 RT
DA=2.142ha (DITCH, 157)	TOT.DA=5.431ha (DITCHES, 156, 156A, 158)	Q5=0.290cms	DA=0.230ha (161)
Q2=0.176cms	Q2=0.252cms	V5=0.61m/s	Q2=0.036cms
V2=0.49m/s	V2=0.58m/s	Q10=0.38cms	V2=0.27m/s
Q10=0.242cms	SLOPE=0.300%	V10=0.66m/s	SLOPE=0.300%
V10=0.58m/s	Q2=0.143cms	SLOPE=0.981%	SWALE REQ=17.3m
SLOPE=0.500%	V2=0.38m/s	TOT. SWALE REQ=409.0m	SWALE AVAL=20.0m
SWALE REQ=NA	SLOPE=0.300%	TOT. SWALE AVAL=410.0m	(DA DOES NOT ENTER
SWALE AVAL=NA		(5.431ha IN DITCH)	BUFFER DIRECTLY)

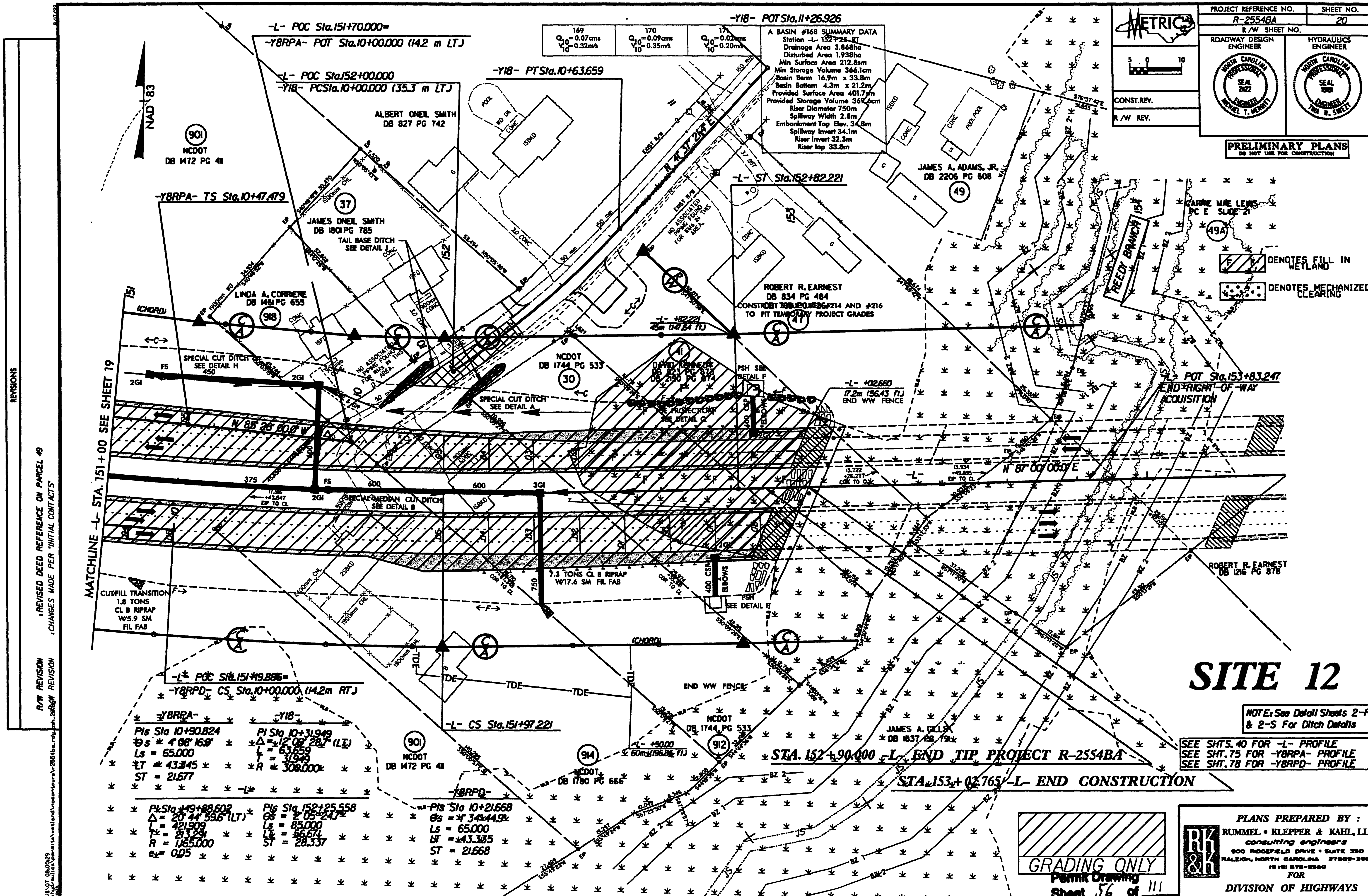
Permit Drawing Sheet 55 of 111

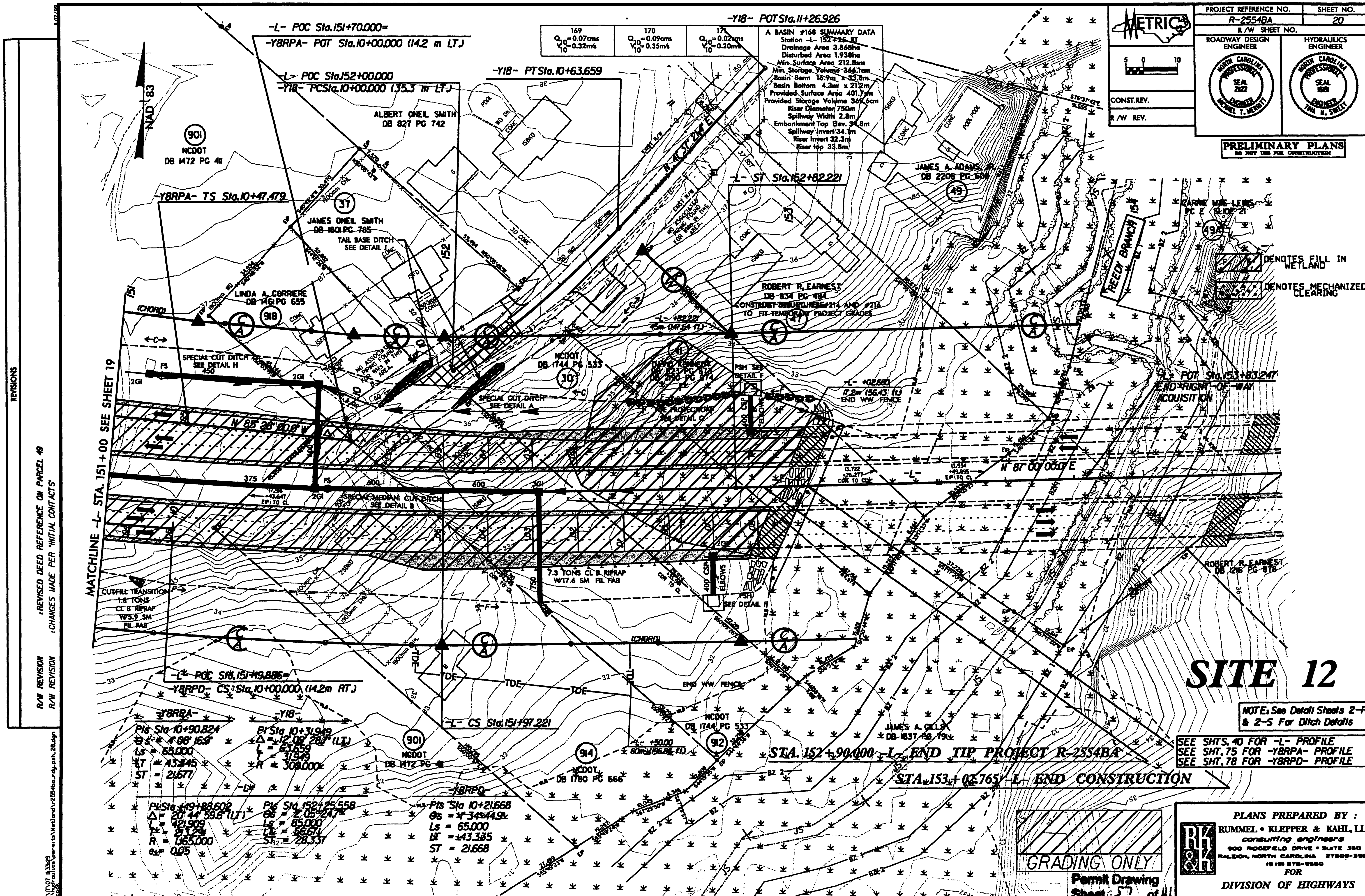
GRADING ONLY

PLANS PREPARED BY :

RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
3800 PARKWOOD PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3860
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

R:\DOT 0744629
R:\Hydraulics\permits\Wetland\r-2554ba_rdp_pah_19A.dgn
2006/


PROJECT REFERENCE NO. R-2554BA
SHEET NO. 20
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
METRIC
CONST.REV.
R/W REV.
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
REVISIONS
R/W REVISION
:REVISED DEED REFERENCE ON PARCEL 49
:CHANGES MADE PER "INITIAL CONTACTS"
NAD 83
-L- POC Sta.151+70.000=
-Y8RPA- POT Sta.10+00.000 (14.2 m LT)
-L- POC Sta.152+00.000
-Y18- PCSta.10+00.000 (35.3 m LT)
-Y18- PT Sta.10+63.659
-Y18- POT Sta.11+26.926
-Y8RPA- TS Sta.10+47.479
-L- ST Sta.152+82.221
-L- POT Sta.153+83.247
END RIGHT-OF-WAY ACQUISITION
A BASIN #168 SUMMARY DATA
NCDOT DB 1472 PG 411
ALBERT ONEIL SMITH DB 827 PG 742
JAMES ONEIL SMITH DB 1801 PG 785
LINDA A. CORRIERE DB 1461 PG 655
ROBERT R. EARNEST DB 834 PG 484
JAMES A. ADAMS, JR. DB 2206 PG 608
CARRIE MAE LEWIS PC E SLIDE 21
NCDOT DB 1744 PG 533
ROBERT R. EARNEST DB 1216 PG 878
JAMES A. GILL DB 1837 PG 791
NCDOT DB 1780 PG 666
REEDY BRANCH
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
SPECIAL CUT DITCH SEE DETAIL H
SPECIAL CUT DITCH SEE DETAIL A
SPECIAL MEDIAN CUT DITCH SEE DETAIL B
TAIL BASE DITCH SEE DETAIL I
CONSTRUCT TEMPORARY ... TO FIT TEMPORARY PROJECT GRADES
-L- +82.221 45m (147.64 ft.)
-L- +02.660 (17.2m (56.43 ft.)) END WW FENCE
7.3 TONS CL B RIPRAP W/17.6 SM FIL FAB
CUT/FILL TRANSITION 1.8 TONS CL B RIPRAP W/5.9 SM FIL FAB
N 85° 26' 00.0" W
N 87° 00' 00.0" E
MATCHLINE -L- STA. 151+00 SEE SHEET 19
-L- POC Sta.151+19.886=
-Y8RPD- CS Sta.10+00.000 (14.2m RT)
-L- CS Sta.151+97.221
END WW FENCE
-L- +50.00 (15.60m (196.85 ft.))
SITE 12
NOTE: See Detail Sheets 2-R & 2-S For Ditch Details
SEE SHTS. 40 FOR -L- PROFILE
SEE SHT. 75 FOR -Y8RPA- PROFILE
SEE SHT. 78 FOR -Y8RPD- PROFILE
STA. 152+90.000 -L- END TIP PROJECT R-2554BA
STA. 153+02.765 -L- END CONSTRUCTION
-Y8RPA-
PIs Sta 10+90.824
Ls = 65.000
ST = 21.677
-Y18-
PI Sta 10+31.949
Δ = 12° 09' 28.7" (LT)
L = 63.659
T = 31.949
R = 300.000
-L-
PI Sta 149+88.602
Δ = 20° 44' 59.6" (LT)
L = 421.909
T = 213.291
R = 1,165.000
e = 0.05
PIs Sta 152+25.558
Ls = 65.000
ST = 28.337
-Y8RPD-
PIs Sta 10+21.668
Ls = 65.000
ST = 21.668
GRADING ONLY
Permit Drawing Sheet 56 of 111
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
900 RIDGEFIELD DRIVE • SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
FOR
DIVISION OF HIGHWAYS



PROJECT REFERENCE NO. R-2554BA
SHEET NO. 20
R/W SHEET NO.
METRIC
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST.REV.
R/W REV.
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
REVISIONS
R/W REVISION :REVISED DEED REFERENCE ON PARCEL 49
R/W REVISION :CHANGES MADE PER "INITIAL CONTACTS"
NAD 83
-L- POC Sta.151+70.000=
-Y8RPA- POT Sta.10+00.000 (14.2 m LT)
-L- POC Sta.152+00.000
-Y18- PCSta.10+00.000 (35.3 m LT)
-Y18- PTSta.10+63.659
-Y18- POTSta.11+26.926
A BASIN #168 SUMMARY DATA
Station -L- 152+26 RT
Drainage Area 3.868ha
Disturbed Area 1.938ha
Min. Surface Area 212.8sm
Min. Storage Volume 366.1cm
Basin Berm 16.9m x 33.8m
Basin Bottom 4.3m x 21.2m
Provided Surface Area 401.7sm
Provided Storage Volume 362.6cm
Riser Diameter 750m
Spillway Width 2.8m
Embankment Top Elev. 34.8m
Spillway Invert 34.1m
Riser Invert 32.3m
Riser top 33.8m
NCDOT DB 1472 PG 411
ALBERT ONEIL SMITH DB 827 PG 742
JAMES ONEIL SMITH DB 1801 PG 785
TAIL BASE DITCH SEE DETAIL I
-Y8RPA- TS Sta.10+47.479
LINDA A. CORRIERE DB 1461 PG 655
JAMES A. ADAMS, JR. DB 2206 PG 608
CARRIE MAE LEWIS PC E SLIDE 21
REEDY BRANCH
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
-L- ST Sta.152+82.221
ROBERT R. EARNEST DB 834 PG 484
CONSTRUCT DRIVEWAYS #214 AND #216 TO FIT TEMPORARY PROJECT GRADES
SPECIAL CUT DITCH SEE DETAIL H
NCDOT DB 1744 PG 533
SPECIAL CUT DITCH SEE DETAIL A
SEE PROJECTOR SEE DETAIL C
-L- POT Sta.153+83.247
END RIGHT-OF-WAY ACQUISITION
END WW FENCE
MATCHLINE -L- STA. 151+00 SEE SHEET 19
N 85° 28' 00.0" W
N 87° 00' 00.0" E
SPECIAL MEDIAN CUT DITCH SEE DETAIL B
CUT/FILL TRANSITION 1.8 TONS CL B RIPRAP W/5.9 SM FIL FAB
7.3 TONS CL B RIPRAP W/17.6 SM FIL FAB
PSH SEE DETAIL F
ROBERT R. EARNEST DB 1216 PG 878
(CHORD)
-L- POC Sta.151+19.886=
-Y8RPD- CS Sta.10+00.000 (14.2m RT)
-L- CS Sta.151+97.221
END WW FENCE
NCDOT DB 1744 PG 533
JAMES A. GILLS DB 1837 PG 79
NCDOT DB 1472 PG 411
NCDOT DB 1780 PG 666
SITE 12
NOTE: See Detail Sheets 2-R & 2-S For Ditch Details
SEE SHTS. 40 FOR -L- PROFILE
SEE SHT. 75 FOR -Y8RPA- PROFILE
SEE SHT. 78 FOR -Y8RPD- PROFILE
STA. 152+90.000 -L- END TIP PROJECT R-2554BA
STA. 153+02.765 -L- END CONSTRUCTION
-Y8RPA-
PIs Sta 10+90.824
θs = 4°08' 16.9"
Ls = 65.000
LT = 43.345
ST = 21.677
-Y18-
PI Sta 10+31.949
Δ = 12°09' 28.1" (LT)
L = 63.659
T = 31.949
R = 300.000
PI Sta 149+88.602
Δ = 20°44' 59.6" (LT)
L = 421.969
T = 213.291
R = 1165.000
PIs Sta 152+25.558
θs = 2°05' 24.7"
Ls = 65.000
LT = 56.671
ST = 28.337
-Y8RPD-
PIs Sta 10+21.668
θs = 1°34' 44.9"
Ls = 65.000
LT = 43.335
ST = 21.668
GRADING ONLY
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
900 RIDGEFIELD DRIVE • SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS
Permit Drawing
Sheet 57 of 41

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	26
R/W SHEET NO.	

METRIC

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21122 MICHAEL T. MERRITT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 11181 TINA H. SWEZY

CONST. REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CUT DITCH	LATERAL V DITCH
-Y2- STA. 12+40-12+62 LT	-Y2- STA. 12+62-13+00 LT
DA=0.077ha (DITCH)	DA=0.391ha (DITCH)
Q2=0.012cms	Q2=0.126cms
V2=0.49m/s	V2=0.58m/s
Q10=0.015cms	Q10=0.166cms
V10=0.53m/s	V10=0.62m/s
SLOPE=4.000%	SLOPE=0.300%
SWALE REQ=5.8m	SWALE REQ=29.4m
SWALE AVAL=22.0m	SWALE AVAL=38.0m

NO "A" BASIN REQUIRED. THE DRAINAGE IS MINIMAL.

CUT DITCH
-Y2- STA. 10+90-12+00 RT
DA=0.212ha (DITCH)
Q2=0.044cms
V2=0.30m/s
SLOPE=0.300%
SWALE REQ=16.0m
SWALE AVAL=110.0m
(DA DOES NOT ENTER BUFFER DIRECTLY)

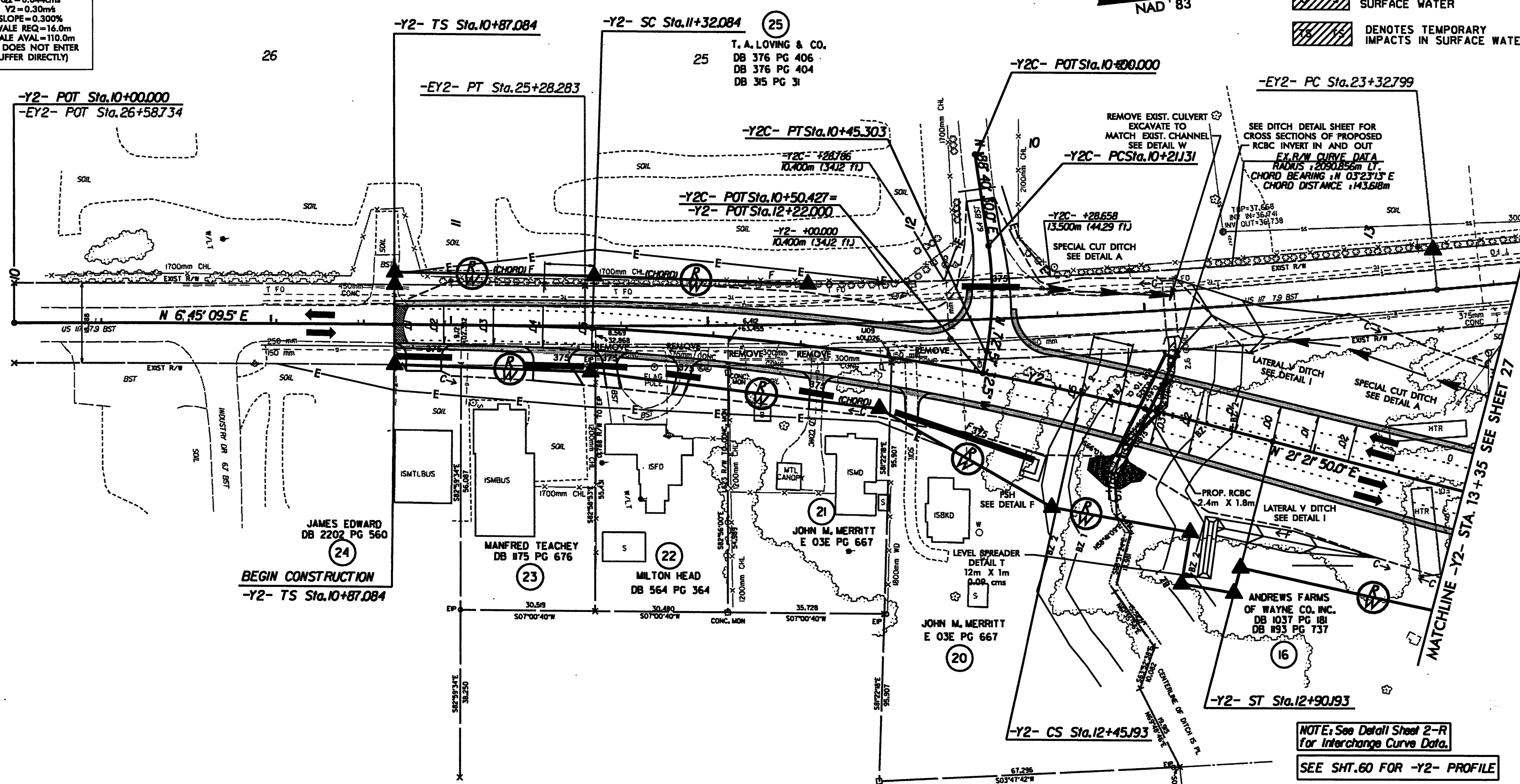
-Y2C-
PI Sta 10+33.323
Δ = 18° 27' 57.5" (RT)
L = 24.172
T = 12.192
R = 75.000

-EY2-

PI Sta 12+09.420	PI Sta 15+09.310	PI Sta 24+30.612
Δ = 9° 25' 07.271" (RT)	Δ = 5° 59' 02.430" (LT)	Δ = 5° 20' 00.714" (RT)
L = 213.703	L = 104.393	L = 195.484
T = 52.268	T = 107.093	T = 97.813
R = 1000.000	R = 1300.000	R = 2100.000

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER



NOTE: See Detail Sheet 2-R for Interchange Curve Data.

SEE SHT.60 FOR -Y2- PROFILE

NOTE: All Proposed Drive Pipes are 375 mm.

NOTE: 240m Uniform Transition -Y2- Sta.10+90 (2 lanes) to Sta.13+30 (5 lanes).

SITE 14

Permit Drawing Sheet 58 of 111

NOTE: See Detail Sheets 2-S & 2-T For Ditch Details

PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
900 RIDGEFIELD DRIVE • SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

REVISIONS

R/W REVISION	: ADDED R/W CURVE DATA, REVISED EASEMENT FOR PARCELS 21, 22, 23, & 24.
R/W REVISION	: CHANGES MADE PER "INITIAL CONTACTS"
R/W REVISION	: PARCELS 20 AND 21 NAMES CHANGED TO JOHN M. MERRITT

CUT DITCH	LATERAL V DITCH	
-Y2- STA. 12+40-12+62 LT DA=0.077ha (DITCH) Q2=0.012cms V2=0.49m/s Q10=0.015cms V10=0.53m/s SLOPE=4.000% SWALE REQ=5.8m SWALE AVAL=22.0m	-Y2- STA. 12+62-13+00 LT DA=0.391ha (DITCH) Q2=0.126cms V2=0.58m/s Q10=0.166cms V10=0.62m/s SLOPE=0.300% SWALE REQ=29.4m SWALE AVAL=38.0m	NO "A" BASIN REQUIRED. THE DRAINAGE IS MINIMAL.
CUT DITCH -Y2- STA. 10+90-12+00 RT DA=0.212ha (DITCH) Q2=0.044cms V2=0.30m/s SLOPE=0.300% SWALE REQ=16.0m SWALE AVAL=110.0m (DA DOES NOT ENTER BUFFER DIRECTLY)		

-Y2C-
PI Sta 10+33.323
Δ= 18° 27' 57.5" (RT)
L = 24.172
T = 12.192
R = 75.000

-EY2-
PI Sta 12+09.420
Δ= 9° 25' 07.271" (RT)
L = 213.703
T = 52.268
R = 1000.000

-EY2-
PI Sta 15+09.310
Δ= 5° 59' 02.430" (LT)
L = 104.393
T = 107.093
R = 1300.000

-EY2-
PI Sta 24+30.612
Δ= 5° 20' 00.714" (RT)
L = 195.484
T = 97.813
R = 2100.000

NAD 83

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

-Y2- TS Sta.10+87.084

-Y2- SC Sta.11+32.084

-Y2- POT Sta.10+00.000
-EY2- POT Sta.26+58.734

-EY2- PT Sta.25+28.283

-Y2C- POT Sta.10+00.000

-EY2- PC Sta.23+32.799

-Y2C- PT Sta.10+45.303

-Y2C- +28.186
10.400m (34.12 ft.)

-Y2C- POT Sta.10+50.427 =
-Y2- POT Sta.12+22.000

-Y2- +00.000
10.400m (34.12 ft.)

-Y2C- PC Sta.10+21.31

-Y2C- +28.658
13.500m (44.29 ft.)

REMOVE EXIST. CULVERT
EXCAVATE TO MATCH EXIST. CHANNEL
SEE DETAIL W

SEE DITCH DETAIL SHEET FOR CROSS SECTIONS OF PROPOSED RCBC INVERT IN AND OUT

EX. R/W CURVE DATA
RADIUS = 2090.856m LT.
CHORD BEARING = N 03°31'13" E
CHORD DISTANCE = 143.618m

SPECIAL CUT DITCH
SEE DETAIL A

N 6°45'09.5" E

N 22°40'00" E

N 21°21'50.0" E

MATCHLINE -Y2- STA. 13+35 SEE SHEET 27

-Y2- CS Sta.12+45.193

-Y2- ST Sta.12+90.193

BEGIN CONSTRUCTION
-Y2- TS Sta.10+87.084

JAMES EDWARD
DB 2202 PG 560
24

MANFRED TEACHEY
DB 1175 PG 676
23

MILTON HEAD
DB 564 PG 364
22

JOHN M. MERRITT
E 03E PG 667
21

JOHN M. MERRITT
E 03E PG 667
20

ANDREWS FARMS OF WAYNE CO. INC.
DB 1037 PG 181
DB 1193 PG 737
16

T. A. LOVING & CO.
DB 376 PG 406
DB 376 PG 404
DB 315 PG 31
25

26

LEVEL SPREADER DETAIL T
12m X 1m
0.09 cms

PSH
SEE DETAIL F

PROP. RCBC
2.4m X 1.8m

LATERAL V DITCH
SEE DETAIL

LATERAL V DITCH
SEE DETAIL I

SPECIAL CUT DITCH
SEE DETAIL A

NOTE: See Detail Sheet 2-R for Interchange Curve Data.

SEE SHT. 60 FOR -Y2- PROFILE

NOTE:
All Proposed Drive Pipes are 375 mm.

NOTE: 240m Uniform Transition -Y2- Sta.10+90 (2 lanes) to Sta.13+30 (5 lanes).

NOTE: See Detail Sheets 2-S & 2-T For Ditch Details

SITE 14

Permit Drawing
Sheet 59 of 111

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	26
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 2022 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 15161 ENGINEER TIMA H. SWEITZ

5 0 10

CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
900 RIDGEFIELD DRIVE • SUITE 350
RALEIGH, NORTH CAROLINA 27609-3560
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

REVISIONS

R/W REVISION : ADDED R/W CURVE DATA, REVISED EASEMENT FOR PARCELS 21,22,23,& 24.
R/W REVISION : CHANGES MADE PER 'INITIAL CONTACTS'
R/W REVISION : PARCELS 20 AND 21 NAMES CHANGED TO JOHN M.MERRITT

DO NOT DELETE
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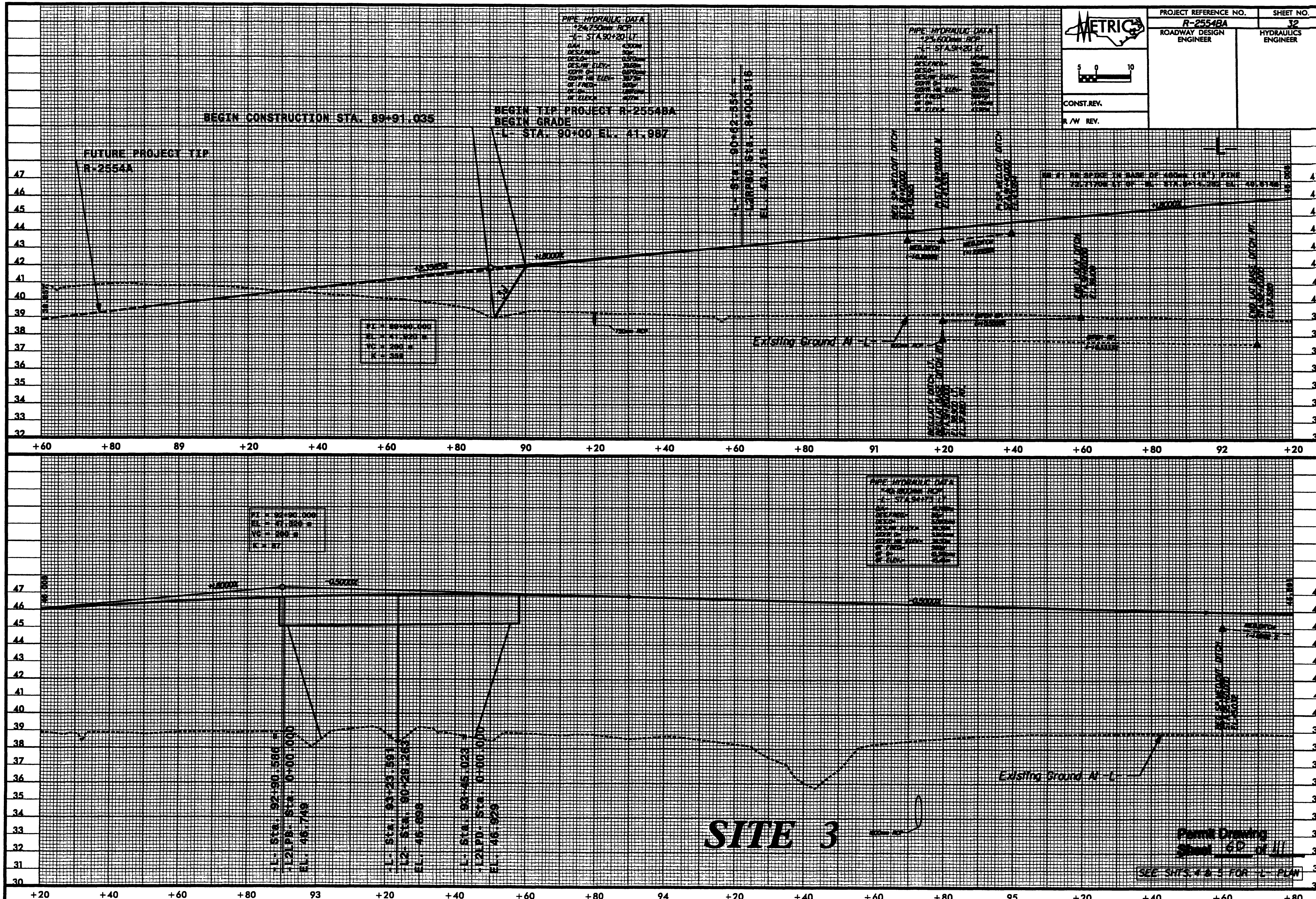
mmock



PROJECT REFERENCE NO.
R-2554BA
SHEET NO.
32
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
METRIC
CONST.REV.
R/W REV.
PIPE HYDRAULIC DATA
1-2x750mm RCP
-L- STA.90+20 LT
BEGIN CONSTRUCTION STA. 89+91.035
BEGIN TIP PROJECT R-2554BA
BEGIN GRADE
-L- STA. 90+00 EL. 41.987
FUTURE PROJECT TIP
R-2554A
-L- Sta. 90+42.554 =
-L2RPBD Sta. 0+00.916
EL. 43.215
-L-
Existing Ground At -L-
SITE 3
-L- Sta. 92+90.586 =
-L2LPB- Sta. 0+00.000
EL. 46.749
-L- Sta. 93+23.591
-L2- Sta. 90+29.263
EL. 46.898
-L- Sta. 93+45.023
-L2LPD- Sta. 0+00.000
EL. 46.929
Permit Drawing
Sheet 6D of 111
SEE SHTS. 4 & 5 FOR -L- PLAN
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PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	33
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

5 0 10

CONST.REV.

R/W REV.

PIPE HYDRAULIC DATA
-43- 900mm RCP
-L- STA.9+100 LT

DIA.=	1200mm
DES.FREQ.=	25yr.
DES.Q=	1.52cms
DES.HW ELEV.=	39.24m
CONT.Q=	0.44cms
CONT.HW ELEV.=	38.23m
OT FREQ.=	100yr.
OT Q=	2.57cms
OT ELEV.=	40.61m

BM #2 RR SPIKE IN BASE OF 610mm (24") OAK
97.86m RT OF -SL- STA.13+80.274 EL. 39.613m

PI = 95+58.314
EL. = 45.492 m
VC = 200.m
K = 144

Existing Ground Al -L-

SITE 4

PIPE HYDRAULIC DATA
-254-1350mm RCP
-L- STA.98+50 LT

DIA.=	1350mm
DES.FREQ.=	25yr.
DES.Q=	2.83cms
DES.HW ELEV.=	47.29m
CONT.Q=	2.83cms
CONT.HW ELEV.=	47.29m
OT FREQ.=	100yr.
OT Q=	4.25cms
OT ELEV.=	47.67m

BM #3 RR SPIKE IN BASE OF 300mm (12") OAK
81.854m RT OF -SL- STA.15+01.681 EL. 39.197m

PI = 101+95.000
EL. = 50.274 m
VC = 200 m
K = 115

Existing Ground Al -L-

SITE 5

SEE SHTS 6 & 7 FOR -L- PLAN

Permit Drawings
Sheet 61 of 67

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mcook

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

CONST.REV.

R/W REV.

PIPE HYDRAULIC DATA
477 1050mm RCP
-L- STA. 103+25 LT
DIAM. 1050mm
DES. FREQ= 50yr
DES. Q= 1.40cms
DES. HW ELEV= 39.09m
CONTR. Q= 1.50cms
CONTR. HW ELEV= 39.09m
OT FREQ= 500yr
OT Q= 1.80cms
OT ELEV= 39.28m

-L- Sta. 104+19.039
=Y2PD= Sta. 10+00.000
El.= 46.849

-L- Sta. 103+80.709
=Y2PA= Sta. 20+36.030
El.= 47.434

-L- Sta. 104+18.500 =
=Y2PA= Sta. 10+00.000
El.= 46.867

Existing Ground At -L-

SITE 5

PIPE HYDRAULIC DATA
1829.000mm RCP
-L- STA. 107+40.00
DIAM. 1829mm
DES. FREQ= 50yr
DES. Q= 6.00cms
DES. HW ELEV= 39.85m
CONTR. Q= 6.00cms
CONTR. HW ELEV= 41.16m
OT FREQ= 500yr
OT Q= 7.00cms
OT ELEV= 41.36m

BE PC SR SPLICE IN BASE OF 1400mm (55") RCP LAT
30.000m RT OF -RL- STA. 22+20.007 EL. 39.64m

-L- Sta. 109+70.000 =
=Y2PA= Sta. 10+00.000
El.= 41.471

-L- Sta. 109+96.000 =
=Y2PD= Sta. 10+00.000
El.= 41.400

Existing Ground At -L-

SITE 5

Permit Drawing Sheet 6.2 of 11

SEE SHTS. 7.8 & 9 FOR -L- PLAN

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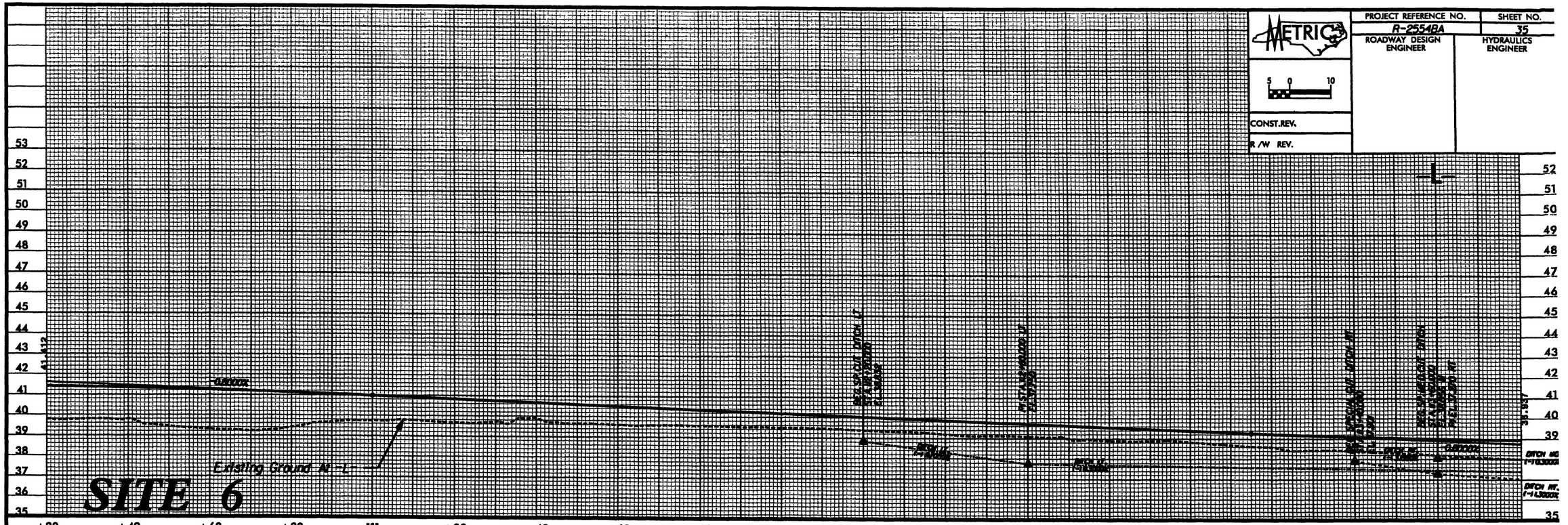
METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	R-2554BA	35
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R/W REV.		



Permit Drawing
Sheet 6.2 of 111

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mcook

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	37
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

5 0 10

CONST.REV.

R/W REV.

-L-

PI = 308+00.000
El = 36.594 ft
VC = 200 ft
K = 556

40.104

Existing Ground At -L-

Ditch

36.581

30" RCP

SEE CROSS SECTION SHEETS 77 TO 79

+60 +80 125 +20 +40 +60 +80 126 +20 +40 +60 +80 127 +20 +40 +60 +80 128 +20

41 40 39 38 37 36 35 34 33 32 31 30

BRIDGE DATA
STRUCTURE NO. 000 STONEY CREEK

PI = 130+97.000
El = 38.616 ft
VC = 200 ft
K = 96

36.861

Existing Ground At -L-

Ditch

36.228

SITE 9

Permit Drawing Sheet 37 of 101

SEE SHTS. 15/A & 15 FOR -L- PLAN

+20 +40 +60 +80 129 +20 +40 +60 +80 130 +20 +40 +60 +80 131 +20 +40 +60 +80

41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25

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PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	38
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CONST.REV.	
R/W REV.	

METRIC

5 0 10

BRIDGE DATA

BRIDGE # ____
OVER STONEY CREEK

DESIGN Q =	850 cms
DESIGN FREQ =	50 yr
DESIGN EL =	368.8 m
BASE FLOOD Q =	1417 cms
BASE FLOOD FREQ =	100 yr
BASE FLOOD EL =	369.5 m
50 Q =	1080 cms
50 FREQ =	2 yrs
50 EL =	368.1 m

BM #9 RR SPIKE IN BASE OF 810mm (32") PINE
45.754m LT OF -RL- STA 51+28.380 EL. 32.651m

STONEY CREEK

Existing Ground At -L-

SITE 9

PIPE HYDRAULIC DATA
"SCALDTOWN" RCP
-L- STA 51+52.00

SIZE	2438mm
NO. PIPES	3
RCP/CMP	RCP
DESIGN DISCH.	850cms
DESIGN VEL.	6.8mps
DESIGN HW	369.5m
DESIGN HW ELEV.	369.5m
# BARRELS	3
# PIPES	3
# SPANS	3
RISE	2438mm
SPAN	2438mm

BM #10 RR SPIKE IN BASE OF 460mm (18") OAK
52.426m LT OF -RL- STA 54+92.603 EL. 36.755m

PI = 136+96.000
EL = 36.829 m
VC = 200 m
K = 1496

36.375

36.300%

40.000%

37.305

Existing Ground At -L-

600mm RCP

CB #1 FLOOR EL. 36.829m
CB #1 INV. OUT EL. 33.829m
CB #1 INV. IN EL. 33.829m
CB #2 INV. IN EL. 33.829m
CB #2 FLOOR EL. 36.829m

Pond Drawing
Sheet 6,5 of 11

SEE SHTS. 15 R & 17 FOR -L- PLAN

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+80 132 +20 +40 +60 +80 133 +20 +40 +60 +80 134 +20 +40 +60 +80 135 +20 +40

+40 +60 +80 136 +20 +40 +60 +80 137 +20 +40 +60 +80 138 +20 +40 +60 +80 139

METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	R-2554BA	19
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R /W REV.		

PIPE HYDRAULIC DATA
"126A,"126B,"126C
900mm RCP
"C" STA.140+60 LT.
"A" STA.141+10 LT.
"C" STA.141+40 LT.

WETLAND EQUALIZER PIPES

SITE 10

Existing Ground At "L"

Permit Drawing Sheet 66 of 111

SEE SHTS.17,18 & 19 FOR "L" PLAN

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METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	R-2554BA	40
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R/W REV.		

SITE 11

PIPE HYDRAULIC DATA
=150x100mm RCP
-L- STA. 148+65 LT

-L-

-L- Sta. 146+62.803
V8 = 8.4 m/s
EL. = 38.209

-L- Sta. 151+70.000 = -YBRPA- Sta. 19+00.000
EL. = 35.729

-L- Sta. 151+70.000 = -YBRPB- Sta. 19+00.000
EL. = 35.999

END CONSTRUCTION STA. 153+02.765

END TIP PROJECT R-2554BA
END GRADE
-L- STA. 152+90 EL. 35.864

PI = 152+17.379
EL = 35.888 ft
VC = 200 ft
K = 61

FUTURE CONSTRUCTION
R-2554BB

REEDY BRANCH

Existing Ground At -L-

SITE 12 Permit Drawing Sheet 62 of 111

SEE SHTS. 19 & 20 FOR -L- PLAN

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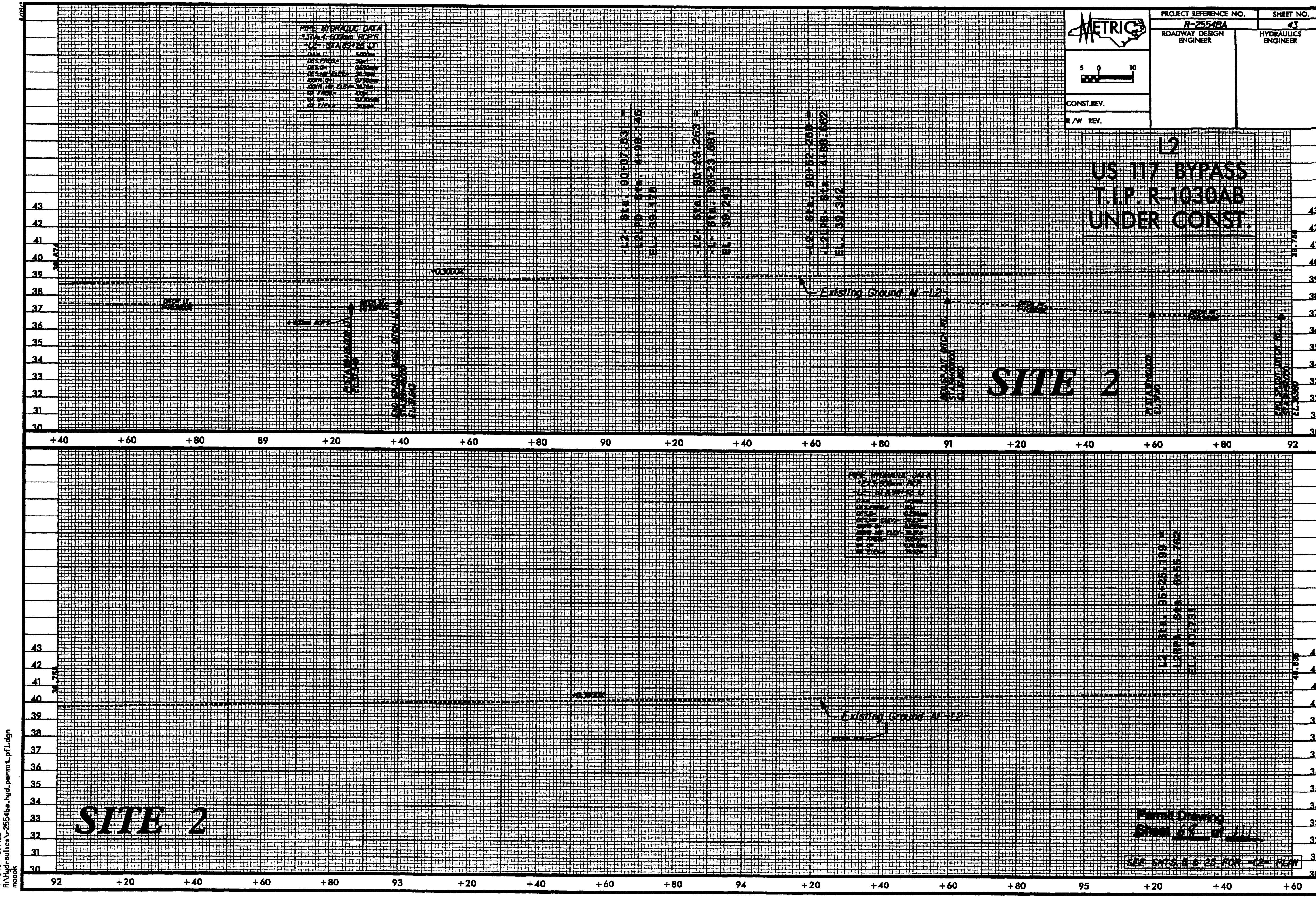
METRIC
PROJECT REFERENCE NO. R-2554BA
SHEET NO. 43
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST. REV.
R/W REV.
L2
US 117 BYPASS
T.I.P. R-1030AB
UNDER CONST.
PIPE HYDRAULIC DATA
-L2- Sta. 90+07.831 =
-L2LPD- Sta. 4+98.146
EL. 39.178
-L2- Sta. 90+29.263 =
-L- Sta. 93+23.591
EL. 39.243
-L2- Sta. 90+92.268 =
-L2RB- Sta. 4+88.662
EL. 39.342
+0.3000%
Existing Ground At -L2-
SITE 2
+40 +60 +80 89 +20 +40 +60 +80 90 +20 +40 +60 +80 91 +20 +40 +60 +80 92
PIPE HYDRAULIC DATA
-L2- Sta. 95+25.199 =
-L2RPA- Sta. 6+55.762
EL. 40.731
+0.3000%
Existing Ground At -L2-
SITE 2
Permit Drawing
Sheet 68 of 111
SEE SHTS. 5 & 25 FOR -L2- PLAN
92 +20 +40 +60 +80 93 +20 +40 +60 +80 94 +20 +40 +60 +80 95 +20 +40 +60
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mcook

METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	R-2554BA	5J
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R /W REV.		

-L2RPBD-

Begin Grade
-L2RPBD- Sta. 0+00.000 =
-L2- Sta. 96+70.000
Elev. 41.021

PIPE HYDRAULIC DATA
-RPBD- 450mm RCP
-RAMP BD1- STA 2+20 RT

DIA	450MM
DESIGNQ=	30cfs
DESIGN V=	6.8fps
DESIGN ELEV=	38.56ft
EGGIVQ=	43.80cfs
EGGIV HW ELEV=	39.63ft
QF TYPE=	FULL
HF DIA=	450MM
HF ELEVA	38.13ft

PI = 0+70.000
PE = 40.611 ft
VC = 100 ft
K = 196

PI = 2+20.000
PE = 38.660 ft
VC = 196 ft
K = 314

-0.200%

-1.960%

-4.000%

+3.000%

+5.000%

+10.000%

+9.000%

Existing Ground At L2RPBD

SITE 1

Permit Drawing
Sheet 64 of 111

SEE SHT. 4 FOR -L2RPBD- PLAN

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mcook

METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	R-2554BA	52
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R /W REV.		

-L2RPBD-

PI = 7475.000
El. = 51.985 ft
VC = 160 ft
K = 36

+3.00%

-1.00%

50.417

-L2RPBD- Sta. 8+18.816
-L- Sta. 60+62.554
EL. 41.009

SW LAY BACK
Ld = 30.00

SW LAY BACK
Ld = 30.00

-1.00%

RIP-RAP
Ld = 30.00

SW LAY BACK
Ld = 30.00

RIP-RAP
Ld = 30.00

SW LAY BACK
Ld = 30.00

RIP-RAP
Ld = 30.00

SW LAY BACK
Ld = 30.00

46.767

Existing Ground -L2RPBD-

-L2RPBD- Sta. 11+09.326
-L2- Sta. 87+73.739
EL. 46.268

46.787

PI = 13+38.680
El. = 42.346 ft
VC = 200 ft
K = 70

-L2RPBD- Sta. 13+59.328
-L2RPBD- Sta. 13+10.36
EL. 43.067

42.939

-2.00%

+2.82%

PIPE HYDRAULIC DATA
1.5% BOOM AOP
HW/PIPE DIA RATIO
STA/PIPE ID
DIA
INVERTS
SLOPE
SLOPE RATIO
CAPACITY
CAP. OF FLOW
VELOCITY
HW ELEV.
HW STA.

Existing Ground -L2RPBD-

SITE 3

Parent Drawing
Sheet 20 of 21

SEE SHT. 8 FOR -L2RPBD- PLAN

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mcook

METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	R-2554BA	58
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R /W REV.		

PIPE HYDRAULIC DATA
-L2LPD- STA. 2+30 RT
SIZE: 1500mm RCP
DESIGNQ: 3.0 cms
DESIGNV: 2.78 m/s
DESIGN ELEV: 34.48 m
CAPR Q: 5.21 cms
CAPR VEL: 3.05 m/s
CAPR TYPE: SUPER
SF: 1.74
SF ELEV: 37.96 m

Begin Grade
-L2LPD- Sta. 0+00.000 =
-L- Sta. 93+45.023
Elev. 46.785

PI = 0+80.000
EL = 46.390 m
VC = 100 m
K = 42

PI = 0+15.000
EL = 46.780 m
VC = 30 m
K = 33

-0.030ft/ft
-0.060ft/ft
-0.060ft/ft
-0.100ft/ft

-L2LPD-

Existing Ground Along -L2LPD-

SITE 3

FOR UNDERCUT SEE CROSS SECTION SHEETS 22 TO 22

PI = 3+48.000
EL = 37.840 m
VC = 130 m
K = 52

PI = 4+35.000
EL = 38.240 m
VC = 60 m
K = 35

End Grade
-L2LPD- Sta. 4+98.146 =
-L2- Sta. 90+07.831
Elev. 39.034

-0.100ft/ft
-0.100ft/ft
-0.029ft/ft

FOR UNDERCUT SEE CROSS SECTION SHEETS 22 TO 22

Form Drawing Sheet 21 of 44

SEE SHT 5 FOR -L2LPD- PLAN

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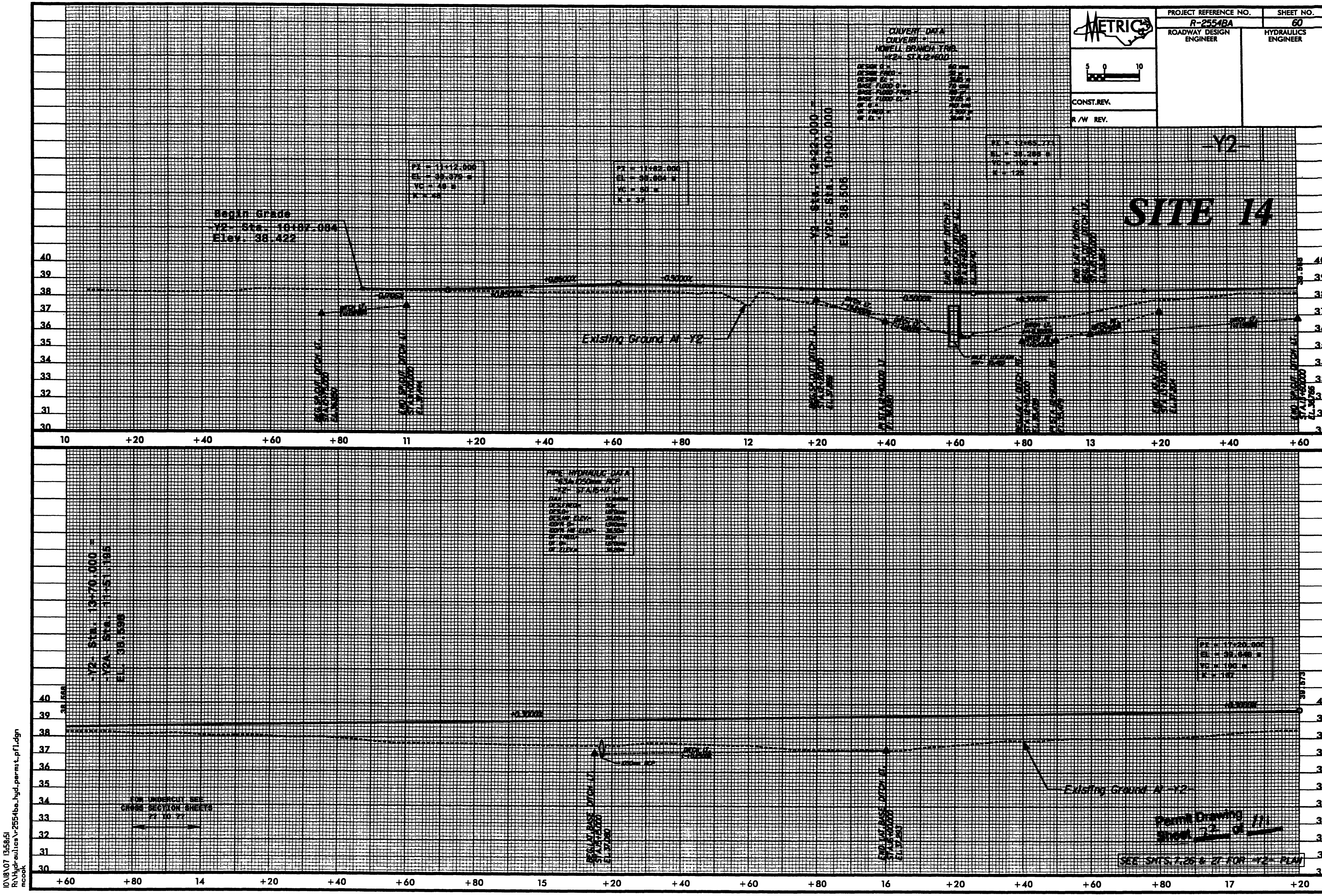
mcook


METRIC
PROJECT REFERENCE NO. R-2554BA
SHEET NO. 60
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST. REV.
R/W REV.
CULVERT DATA
HOWELL BRANCH TRIB.
-Y2-
SITE 14
Begin Grade
-Y2- Sta. 10+07.084
Elev. 38.422
PI = 11+12.000
EL = 38.379 m
VC = 40 m
PI = 11+62.000
EL = 38.604 m
VC = 80 m
-Y2- Sta. 12+22.000 =
-Y2C- Sta. 10+00.000
EL. 38.505
Existing Ground At -Y2-
PIPE HYDRAULIC DATA
-Y2- Sta. 13+70.000 =
-Y2A- Sta. 11+51.195
EL. 38.598
PI = 17+20.000
VC = 100 m
FOR UNDERCUT SEE CROSS SECTION SHEETS
Existing Ground At -Y2-
Permit Drawing
Sheet 72 of 111
SEE SHTS. 7, 26 & 27 FOR -Y2- PLAN
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mcook

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	61
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

CONST.REV.

R /W REV.

-Y2-

PI = 17+20.000
EL = 38.640 ft
VC = 100 ft
K = 167

-Y2- Sta. 17+57.703 =
-SR5- Sta. 10+00.000 =
-Y2B- Sta. 11+49.340
EL. 39.231

-Y2- Sta. 19+07.703 =
-Y2RPD- Sta. 16+57.170
EL. 39.085

-Y2- Sta. 19+16.203 =
-Y2LPD- Sta. 14+93.306
EL. 39.063

PI = 19+46.000
VG = 30 ft
K = 100

PI = 20+36.000
EL = 38.260 ft
VG = 70 ft
K = 88

PIPE HYDRAULIC DATA
79LF 900mm RCP
-Y2- STA 20+22 LT

38.673

39.282

Existing Ground Alt -Y2-

SITE 5

FOR UNDERCUT SEE CROSS SECTION SHEETS 72 TO 75

+20 +40 +60 +80 18 +20 +40 +60 +80 19 +20 +40 +60 +80 20 +20 +40 +60 +80

PI = 21+40.000
EL = 38.994 ft
VC = 70 ft
K = 100

-Y2- Sta. 20+36.030 =
-Y2LT- Sta. 103+80.709
EL. 39.246

-Y2- Sta. 22+77.703 =
-Y2LBX- Sta. 144+68.392
-Y5- Sta. 13+05.503
EL. 39.332

-Y2- Sta. 22+81.203 =
-Y2RA- Sta. 16+45.048
EL. 39.358

PI = 22+61.600
EL = 39.582 ft
VC = 150 ft
K = 167

PIPE HYDRAULIC DATA
90LF 750mm RCP
-Y2- STA 22+20 RT

39.282

Existing Ground Alt -Y2-

FOR UNDERCUT SEE CROSS SECTION SHEETS 72 TO 77

SEE SHTS. 76 & 78 FOR -Y2- PLAN

Permit Drawing Sheet 23 of 41

+80 21 +20 +40 +60 +80 22 +20 +40 +60 +80 23 +20 +40 +60 +80 24 +20 +40

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METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	R-2554BA	64
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R /W REV.		

-Y2RPD-

PIPE HYDRAULIC DATA
*65x600mm RCP
-Y2RPD- STA.16+14 LT
DES.FREQ= 50yr
DES.Q= 0.139cms
DES.HW ELEV= 39.9ft
CONTR Q= 0.173cms
CONTR HW ELEV= 40.0ft
OT FREQ= 100yr
OT Q= 0.190cms
OT ELEV= 40.2ft

PI = 14+77.527
BL = 40.226 a
VC = 70 a
K = 68

End Grade
-Y2RPD- Sta. 16+47.523
-Y2- Sta. 19+06.753
Elev. 39.376

-0.500%

+0.300%

39.873

Existing Ground At -Y2RPD-

SITE 5

PI = 12+78.000
BL = 36.903 a
VC = 100 a
K = 92

-0.700%

+0.300%

PIPE HYDRAULIC DATA
*66x750mm RCP
-Y2RPD- STA.10+00 RT
DES.FREQ= 50yr
DES.Q= 0.70cms
DES.HW ELEV= 37.4ft
CONTR Q= 0.850cms
CONTR HW ELEV= 37.8ft
OT FREQ= 100yr
OT Q= 1.05cms
OT ELEV= 38.2ft

750mm RCP

STA.12+00.00 RT
EL=37.20

END 30 DEG SKEW RT
STA.12+00.00
EL=37.20

STA.12+00.00 RT
EL=37.20

30 DEG SKEW RT
STA.12+00.00
EL=37.20

Begin Grade
-Y2RPD- Sta. 10+00.000
-L- Sta. 109+96.000
Elev. 41.317

PI = 10+46.509
BL = 41.469 a
VC = 70 a
K = 60

Existing Ground At -Y2RPD-

Permit Drawing
Sheet ___ of ___

Permit Drawing
Sheet 32 of ___

SITE 5

SEE SHTS.7,8 & 9 FOR -Y2RPD- PLAN

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PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	64
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

CONST.REV.

R/W REV.

-Y2RPD-

PIPE HYDRAULIC DATA
*65.600mm RCP
-Y2RPD- STA.16+14 LT
DIA. 2.100m
DES.FREQ= 50yr
DES.Q= 0.139cms
DES.HW ELEV= 39.07m
CORR Q= 0.173cms
CORR HW ELEV= 39.08m
OF FREQ= 100yr
OF Q= 0.190cms
OF ELEV= 39.25m

PI = 14+77.527
EL = 40.226 a
VC = 70 a
K = 98

End Grade
-Y2RPD- Sta. 16+47.523
-Y2- Sta. 19+06.753
Elev. 39.376

-0.500ft
+0.300ft
39.873
Existing Ground At -Y2RPD-
PROPOSED PIPE
SITE 5

PI = 12+70.000
EL = 36.669 a
VC = 100 a
K = 95

-0.700ft
+0.000ft
39.873
Existing Ground At -Y2RPD-

Begin Grade
-Y2RPD- Sta. 10+00.000
-L- Sta. 108+96.000
Elev. 41.317

PI = 10+60.000
EL = 41.969 a
VC = 70 a
K = 95

PIPE HYDRAULIC DATA
*48.750mm RCP
-Y2RPD- STA.0+00 RT
DIA. 1.950m
DES.FREQ= 50yr
DES.Q= 0.170cms
DES.HW ELEV= 37.46m
CORR Q= 0.207cms
CORR HW ELEV= 37.46m
OF FREQ= 100yr
OF Q= 0.232cms
OF ELEV= 37.57m

PI STA.1+30.00 RT
EL=36.00
Sag 18" CMP Ditch RT
BEGIN STA.2+00.00
EL=37.20
PI STA.2+80.00 RT
EL=36.80
BEGIN CMP Ditch RT
STA.3+00.00
EL=36.80

SITE 5

Permit Drawing Sheet 7 of 11

Permit Drawing Sheet ___ of ___

SEE SHTS.7,8 & 9 FOR -Y2RPD- PLAN

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PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	68
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CONST.REV.

R/W REV.

-SR5-

Begin Grade
-SR5- Sta. 10+09.064 =
-Y2- Sta. 17+58.775
Elev. 39.798

PI = 12+44.652
EL = 40.496 ft
VC = 100 ft
K = 167

PI = 15+20.000
EL = 38.887 ft
VC = 100 ft
K = 167

PI = 16+86.000
EL = 40.150 ft
VC = 50 ft
K = 28

Existing Ground Alt -SR5-

SITE 5

Permit Drawing Sheet ___ of ___

Permit Drawing Sheet 7 of 11

SEE SHTS.7.1 & 8 FOR -SR5- PLAN

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METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	R-2554BA	66
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R/W REV.		

PIPE HYDRAULIC DATA
-Y1:1500mm RCP
-Y2LPD- STA.2+73 RT
CLASS
DES.FREQ:
DES.Q=
DES.HW ELEV=
CONT.Q=
CONT.HW ELEV=
OF FREQ:
OF Q=
OF ELEV=

End Grade
-Y2LPD- Sta. 14+83.699
-Y2- Sta. 19+14.860
Elev. 39.352

PI = 12+61.000
EL = 40.418 m
VC = 150 m
K = 70

-Y2LPD-

-0.500%

-0.350%

-2.000%

Existing Ground At -Y2LPD-

Existing Ground At -Y2LPD-

FOR THROUGH SEE CROSS SECTION SHEETS FF TO FF

SITE 5

Begin Grade
-Y2LPD- Sta. 10+00.000
-L- Sta. 104+19.039
Elev. 47.100

PI = 10+97.000
EL = 45.560 m
VC = 85 m
K = 71

-2.100%

-1.490%

Existing Ground At -Y2LPD-

Permit Drawing Sheet 2 of 11

Permit Drawing Sheet ____ of ____

SEE SHTS.7 & 8 FOR -Y2LPD- PLAN

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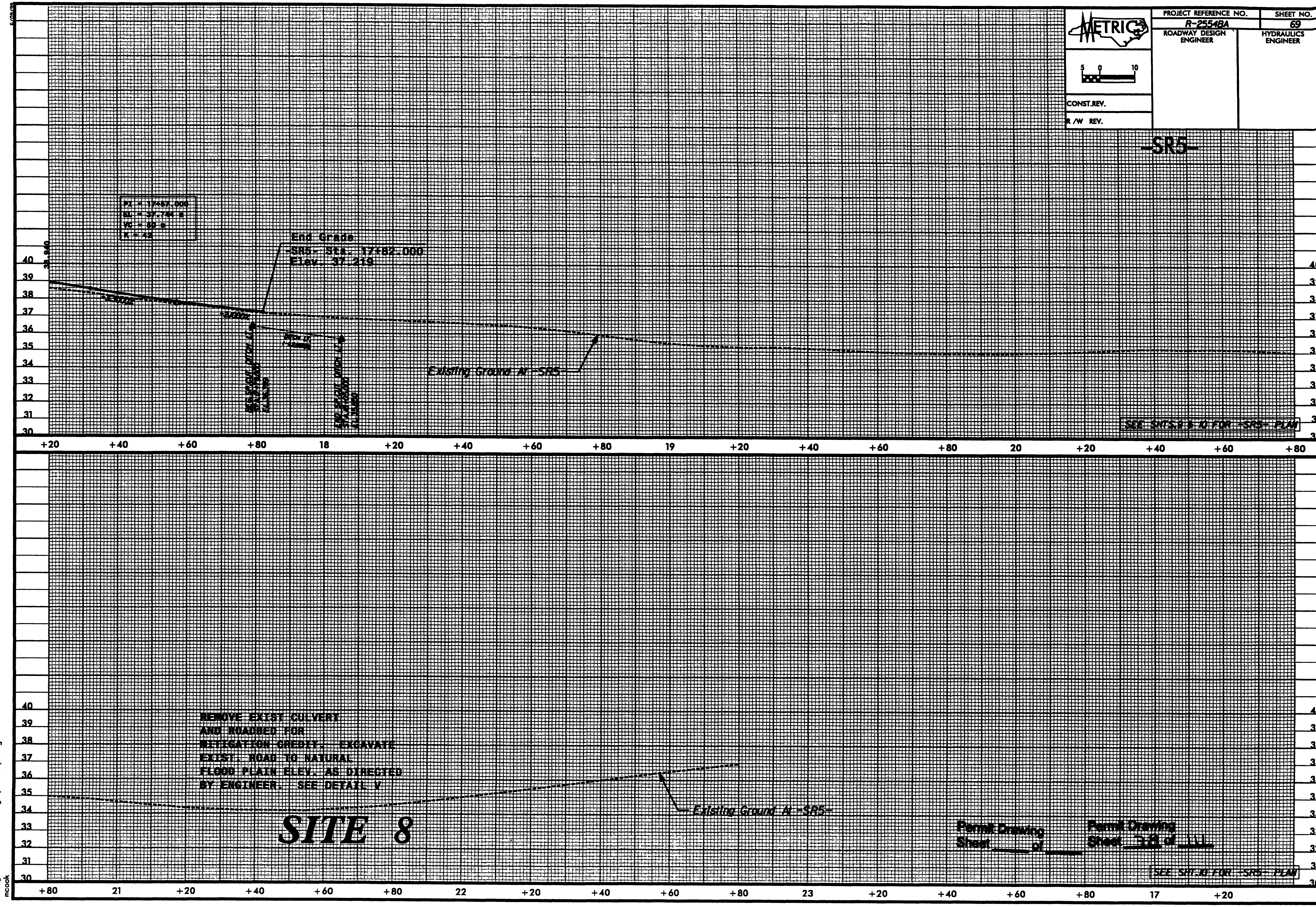

METRIC
PROJECT REFERENCE NO.
R-2554BA
SHEET NO.
69
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST.REV.
R /W REV.
-SR5-
PI = 17+57.000
EL = 37.744 m
VC = 50 m
K = 42
End Grade
-SR5- Sta. 17+82.000
Elev. 37.219
Existing Ground At -SR5-
SEE SHTS.8 & 10 FOR -SR5- PLAN
REMOVE EXIST CULVERT
AND ROADBED FOR
MITIGATION CREDIT. EXCAVATE
EXIST. ROAD TO NATURAL
FLOOD PLAIN ELEV. AS DIRECTED
BY ENGINEER. SEE DETAIL V
Existing Ground At -SR5-
SITE 8
Permit Drawing
Sheet ___ of ___
Permit Drawing
Sheet 28 of 111
SEE SHT.10 FOR -SR5- PLAN
10\18\07 13:53:01
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METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	R-2554BA	75
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R /W REV.		

-Y8RPA-

End Grade
-Y8RPA- Sta. 14+65.207 =
-Y8- Sta. 17+06.325
Elev. 43.720

PI1 = 14+30.800
EL = 43.032 ft
Vc = 50 ft
K = 20

PIPE HYDRAULIC DATA
1156.750mm RCP
-Y8RPA- STA.14+35.15 Rt.
DIAM. 1200mm
DES.FREQ= 50yr
DESQ= 6.00cms
DES.HW ELEV= 39.45m
100YR Q= 6.91cms
100YR HW ELEV= 39.49m
OF FREQ= 500yr
OF Q= 7.00cms
HW ELEV= 40.04m

PIPE HYDRAULIC DATA
1157.900mm RCP
-Y8RPA- STA.12+90.Rt
DIAM. 1200mm
DES.FREQ= 50yr
DESQ= 6.00cms
DES.HW ELEV= 39.85m
100YR Q= 6.91cms
100YR HW ELEV= 39.89m
OF FREQ= 100yr
OF Q= 7.00cms
HW ELEV= 39.92m

PI2 = 12+60.000
EL = 38.240 ft
VC = 200 ft
K = 48

-Y8RPA-

*2.000%
*4.500%
*5.000%
*4.500%
*4.000%

Existing Ground
At -Y8RPA-

Begin Grade
-Y8RPA- Sta. 10+00.000 =
-L- Sta. 151+70.000
Elev. 35.369

*4.000%

Existing Ground
At -Y8RPA-

SITE 11

Permit Drawing
Sheet 32 of 111

SEE SHTS.19 & 20 FOR -Y8RPA- PLAN

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METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	R-2554BA	78
CONST.REV.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
R /W REV.		

PIPE HYDRAULIC DATA
1960x1500mm RCP
-Y8RPD- STA.12+30 RT
SIZE 1960mm
DESIGN Q 7.4cms
DESIGN V 4.2m/s
DESIGN SLOPE 0.30%
CORR Q 7.4cms
CORR VEL EGBL 4.2m/s
QF TYPE MANN
QF VAL 0.013
QF FLOW SUPER

End Grade
-Y8RPD- Sta. 15+21.089 =
-Y8- Sta. 14+66.608
Elev. 45.905

PI = 14+90.000
EL = 44.980 m
VC = 60 m
K = 26

PI = 12+75.000
EL = 38.853 m
VC = 170 m
K = 32

-Y8RPD-

47.1191

Existing Ground
At -Y8RPD-

SITE 11

Begin Grade
-Y8RPD- Sta. 10+00.000 =
-L-: Sta. 151+19.886
Elev. 36.359

PI = 11+50.000
EL = 37.433 m
VC = 80 m
K = 47

PI = 10+50.000
EL = 36.803 m
VC = 40 m
K = 881

37.1191

Existing Ground
At -Y8RPD-

Permit Drawing
Sheet 20 of 41

SEE SHTS.19 & 20 FOR -Y8RPD- PLAN

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PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	X-6

5 0 5 10

METRIC

SITE 3

46.670 94+20000

46.670 94+20000

L21D Qt 9200 46.957 94+09200

38263 94+20000

46.770 94+00000

46.770 94+00000

L21D Qt 35224 46.993 93+85224

38698 94+00000

46.864 46.864

L21D Qt 35002 46.951 93+85002

38804 93+80000

Permit Drawing
Sheet 6.2 of 11

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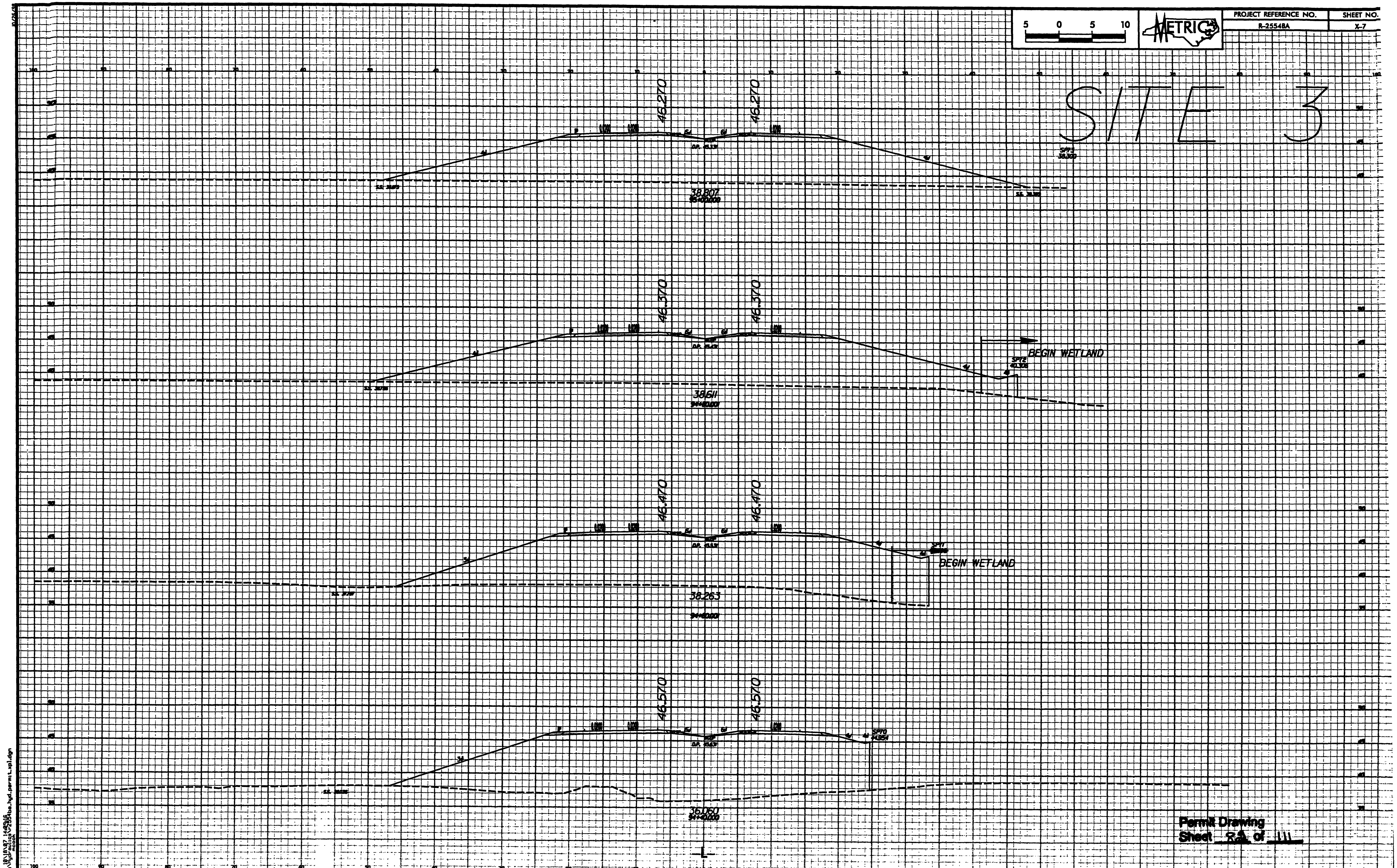
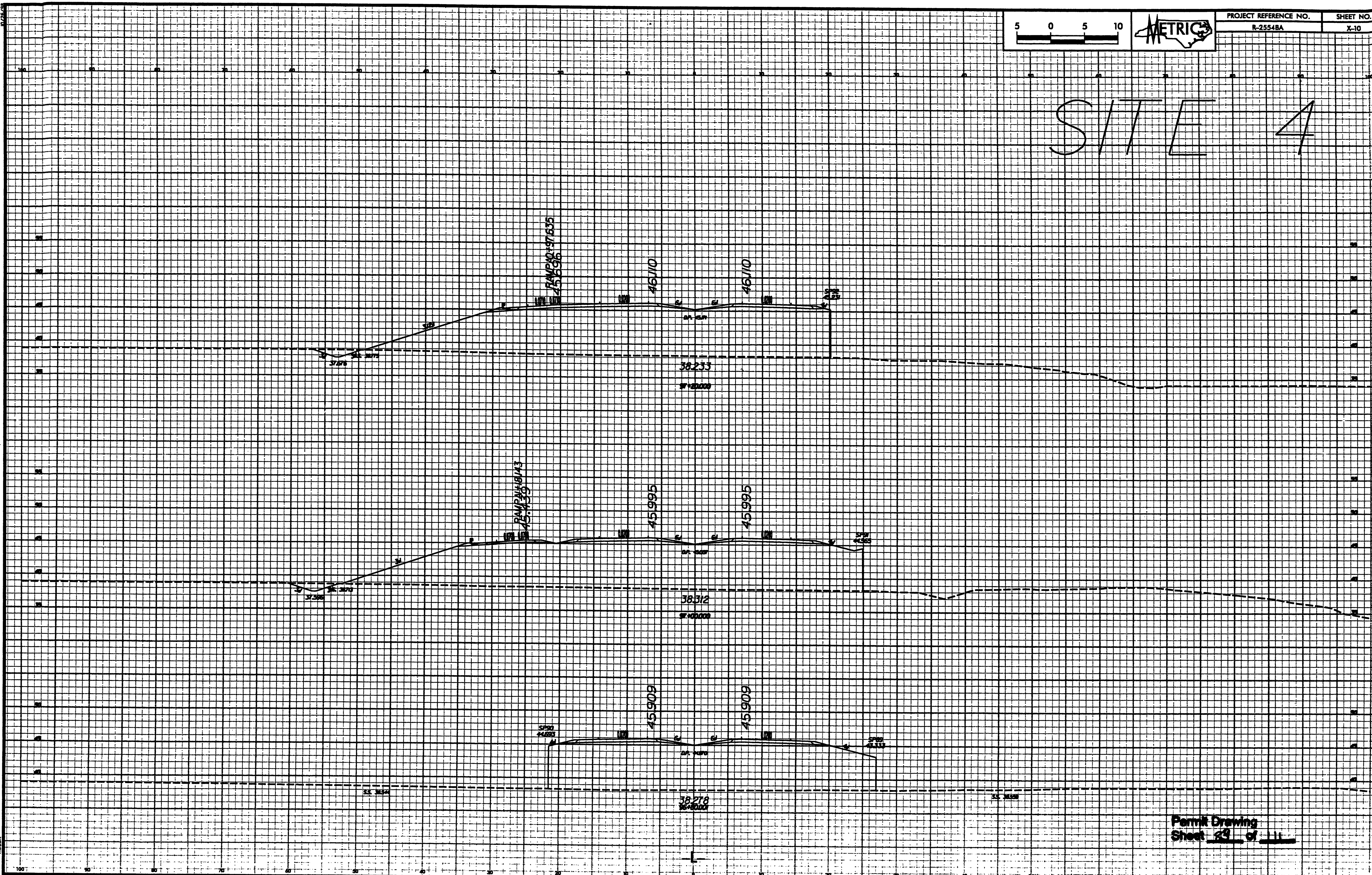
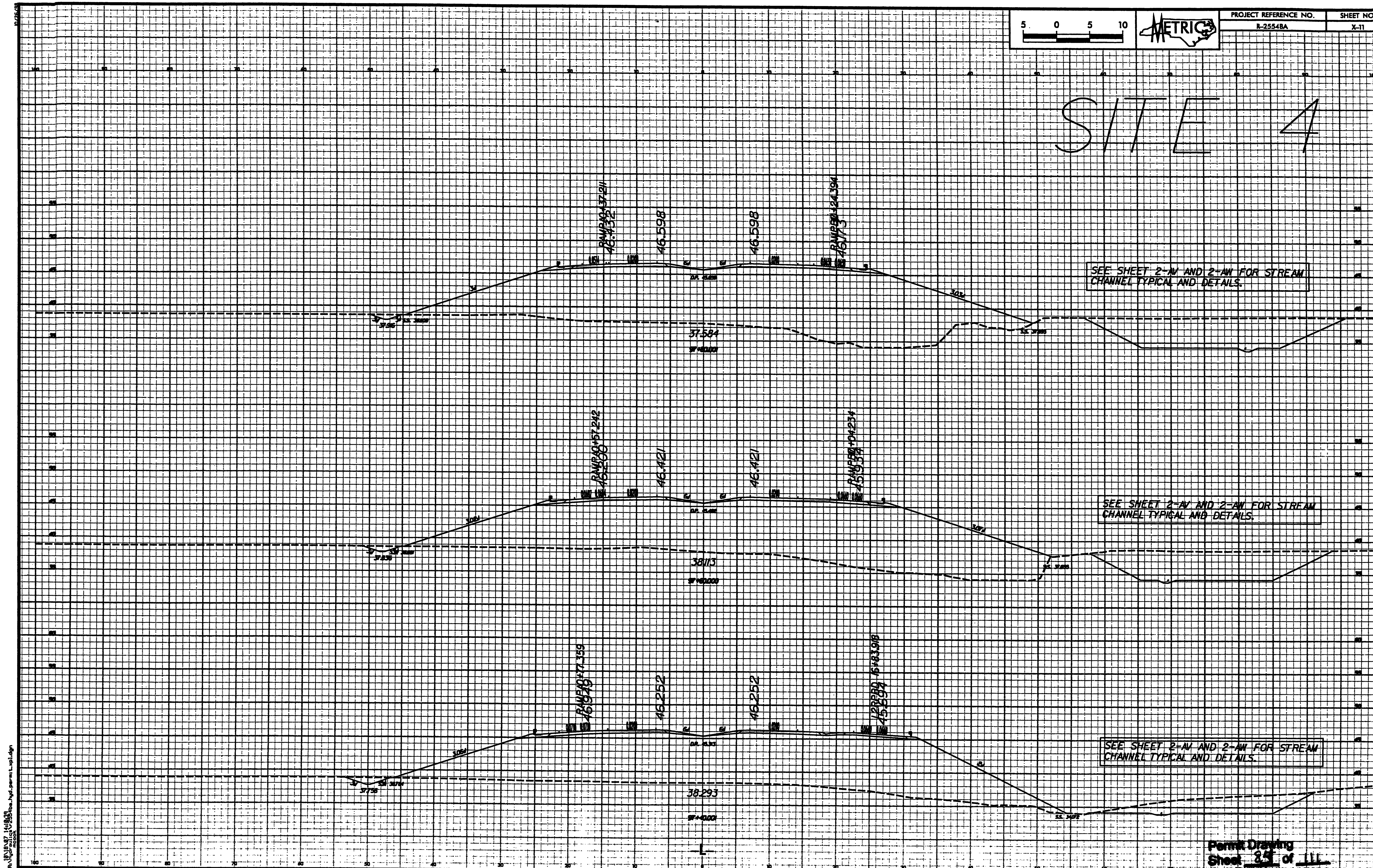
mcook


PROJECT REFERENCE NO.
R-2554BA
SHEET NO.
X-7
METRIC
5 0 5 10
SITE 3
46.270
46.270
38.307
46.370
46.370
BEGIN WETLAND
38.611
46.470
46.470
BEGIN WETLAND
38.263
46.570
46.570
36.060
-L-
Permit Drawing
Sheet 8A of 111



PROJECT REFERENCE NO.
R-2554BA
SHEET NO.
X-10
METRIC
5 0 5 10
SITE 4
RAMP40+97.635
45.696
46.110
46.110
38.233
97+20.000
RAMP2W+48.143
45.439
45.995
45.995
38.312
97+00.000
45.909
45.909
38.278
96+80.001
-L-
Permit Drawing
Sheet 29 of 111


PROJECT REFERENCE NO.
R-2554BA
SHEET NO.
X-11
METRIC
5 0 5 10
SITE 4
SEE SHEET 2-AV AND 2-AW FOR STREAM CHANNEL TYPICAL AND DETAILS.
46.598
46.598
37.584
SEE SHEET 2-AV AND 2-AW FOR STREAM CHANNEL TYPICAL AND DETAILS.
46.421
46.421
38.113
SEE SHEET 2-AV AND 2-AW FOR STREAM CHANNEL TYPICAL AND DETAILS.
46.252
46.252
38.293
-L-
Permit Drawing
Sheet 85 of 111

5 0 5 10	METRIC	PROJECT REFERENCE NO.	SHEET NO.
		R-2554BA	X-12

SITE 4

47.129

47.129

46.884

SEE SHEET 2-AV AND 2-AW FOR STREAM CHANNEL TYPICAL AND DETAILS.

37.460

38+000

46.952

46.952

RAMP D 46.547

SEE SHEET 2-AV AND 2-AW FOR STREAM CHANNEL TYPICAL AND DETAILS.

38.712

39+50.000

RAMP D 46.528

46.775

46.775

RAMP D 46.410

SEE SHEET 2-AV AND 2-AW FOR STREAM CHANNEL TYPICAL AND DETAILS.

38.049

39+00.000

-L-

Permit Drawing
Sheet 85 of 111

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5 0 5 10	METRIC	PROJECT REFERENCE NO.	SHEET NO.
		R-2554BA	X-27

SITE 5

Permit Drawing
Sheet 87 of 111

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PROJECT REFERENCE NO.
R-2554BA
SHEET NO.
X-28
METRIC
SITE 5
SR5 15+77.680
39.334
Y2RPA 11+01.109
40.781
41.103
41.103
Y2RPD 11+37.009
40.527
39.783
SR5 15+57.136
39.77
Y2RPA 11+30.190
40.561
41.087
41.087
Y2RPD 11+57.729
40.468
39.946
BEGIN WETLAND
SR6 15+5.40
40.939
Y2RPA 11+50.375
40.581
41.34
41.34
39.979
BEGIN WETLAND
Permit Drawing
Sheet 82 of 111
-L-

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	X-31

5 0 5 10

METRIC

SITE 6

Permit Drawing
Sheet 56 of 111

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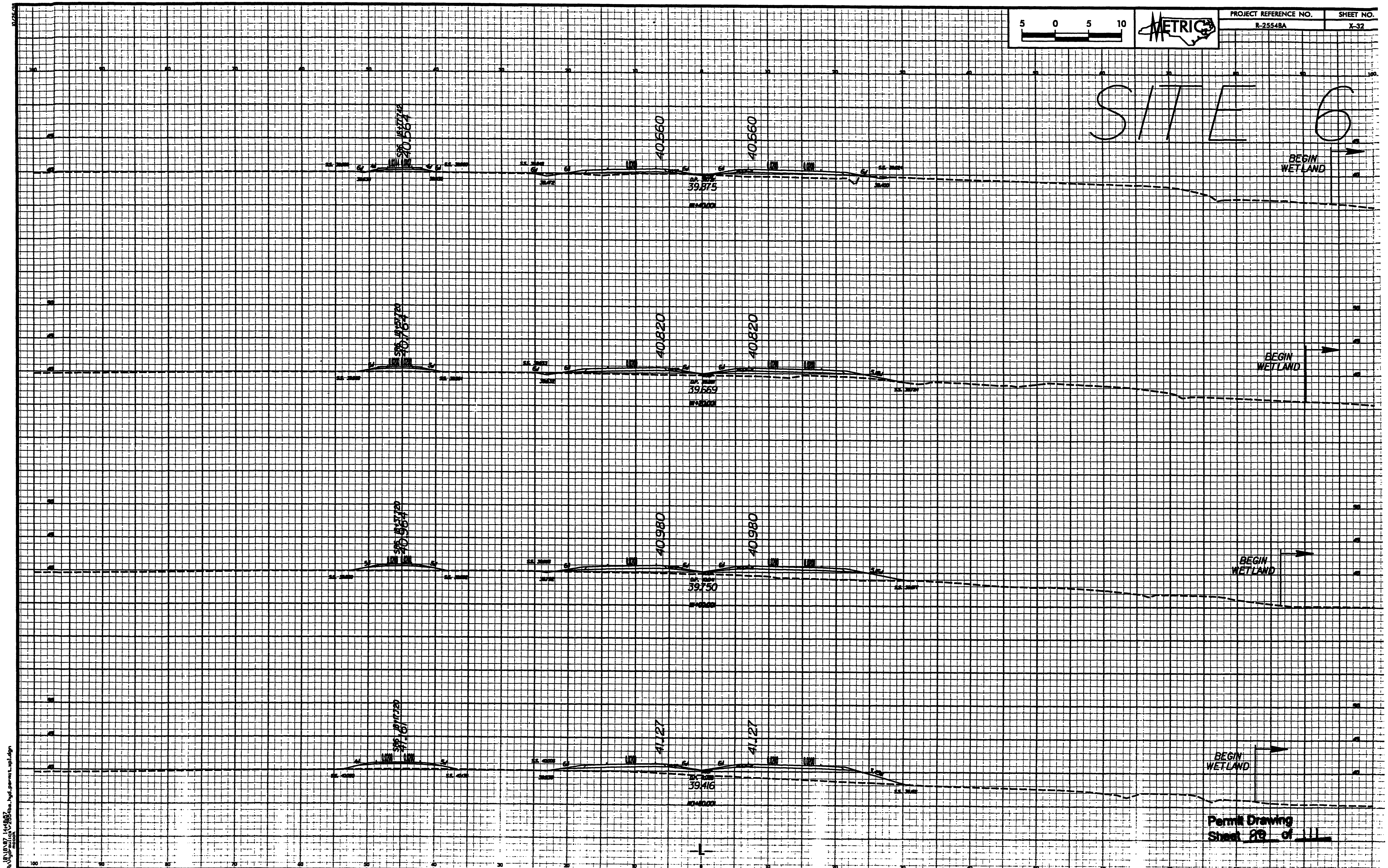
mmoore


PROJECT REFERENCE NO.
R-2554BA
SHEET NO.
X-32
METRIC
5 0 5 10
SITE 6
40.560
40.560
39.875
BEGIN WETLAND
40.820
40.820
39.669
BEGIN WETLAND
40.980
40.980
39.750
BEGIN WETLAND
41.127
41.127
39.416
BEGIN WETLAND
-L-
Permit Drawing
Sheet 89 of 111

5 0 5 10	METRIC	PROJECT REFERENCE NO.	SHEET NO.
		R-2554BA	X-35

SITE 7

BEGIN WETLAND

38.989

38.989

35.009

BEGIN WETLAND

38.935

38.935

35.935

BEGIN WETLAND

38.917

38.917

37.777

38.937

38.937

38.001

38.995

38.995

38.198

Permit Drawing
Sheet 9D of 11

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5 0 5 10	METRIC	PROJECT REFERENCE NO.	SHEET NO.
		R-2554BA	X-36

SITE 7

BEGIN WETLAND

WETLAND

WETLAND

39581

39581

34398

39377

39377

BEGIN WETLAND

32963

39211

39211

ALL WETLAND

32823

39081

39081

ALL WETLAND

32868

Permit Drawing
Sheet 96 of 111

(DW)(8.5" 14:23:35
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PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	X-54

5 0 5 10

METRIC

SITE 9

BEGIN WETLAND

35.254

30.520
(31+00.00)

35.254

BEGIN WETLAND

BEGIN WETLAND

35.232

31.665
(31+00.00)

35.232

BEGIN WETLAND

BEGIN WETLAND

35.230

32.516
(30+20.000)

35.230

WETLAND

BEGIN WETLAND

BEGIN WETLAND

35.250

32.801
(30+00.000)

35.250

WETLAND

BEGIN WETLAND

35.289

33.337
(30+80.000)

35.289

WETLAND

Permit Drawing
Sheet 9 of 11

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mcook

5 0 5 10

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	X-55

SITE 9

35.475
ALL WETLAND
35.475

28.36
SS+00.00

35.415
ALL WETLAND
35.415

29.16
SS+00.00

35.355
ALL WETLAND
35.355

29.22
SS+00.00

35.296
ALL WETLAND
35.296

29.29
SS+00.00

-L-

Permit Drawing
Sheet 9 of 11

10/26/01
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PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	X-57

5 0 5 10

METRIC

SITE 9

36.015 — ℄ 35.279 ℄ — 36.015
134+20.00

35.955 — 33.515 — 35.955
134+00.00

35.895 — 32.047 — 35.895
133+80.00

35.835 — WETLAND — 35.835
31.801
133+60.00

35.775 — WETLAND — WETLAND — 35.775
30.835
133+40.00

BEGIN WETLAND

Permit Drawing
Sheet 14 of 111

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5 0 5 10	METRIC	PROJECT REFERENCE NO.	SHEET NO.
		R-2554BA	X-64

SITE 10

WETLAND

BEGIN WETLAND

38.45

38.45

34836
140+00.00

38.065

38.065

BEGIN WETLAND

34832
140+00.00

37.985

37.985

BEGIN WETLAND

14965
139+00.00

37.905

37.905

BEGIN WETLAND

35103
139+00.00

L

Permit Drawing
Sheet 35 of 111

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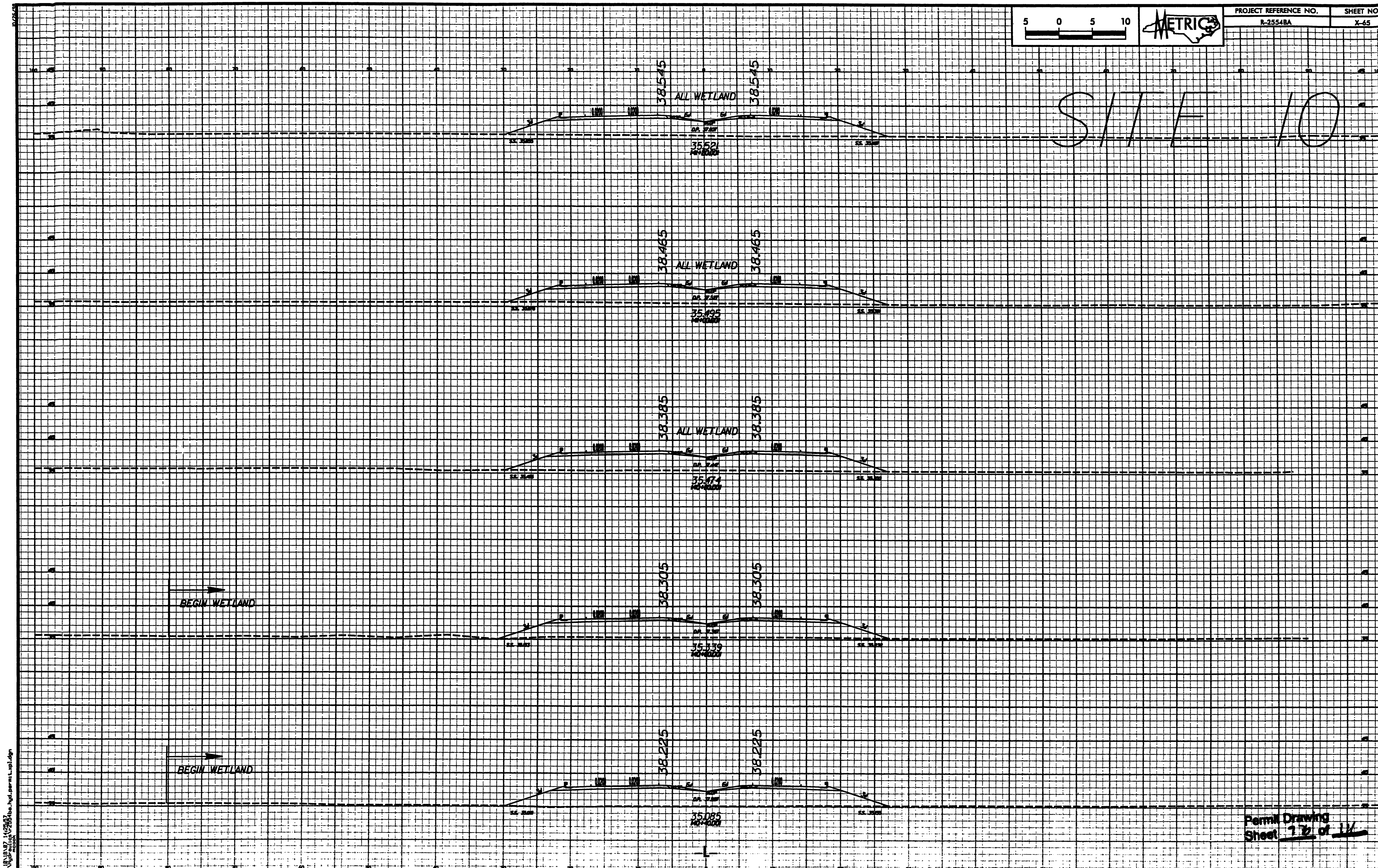
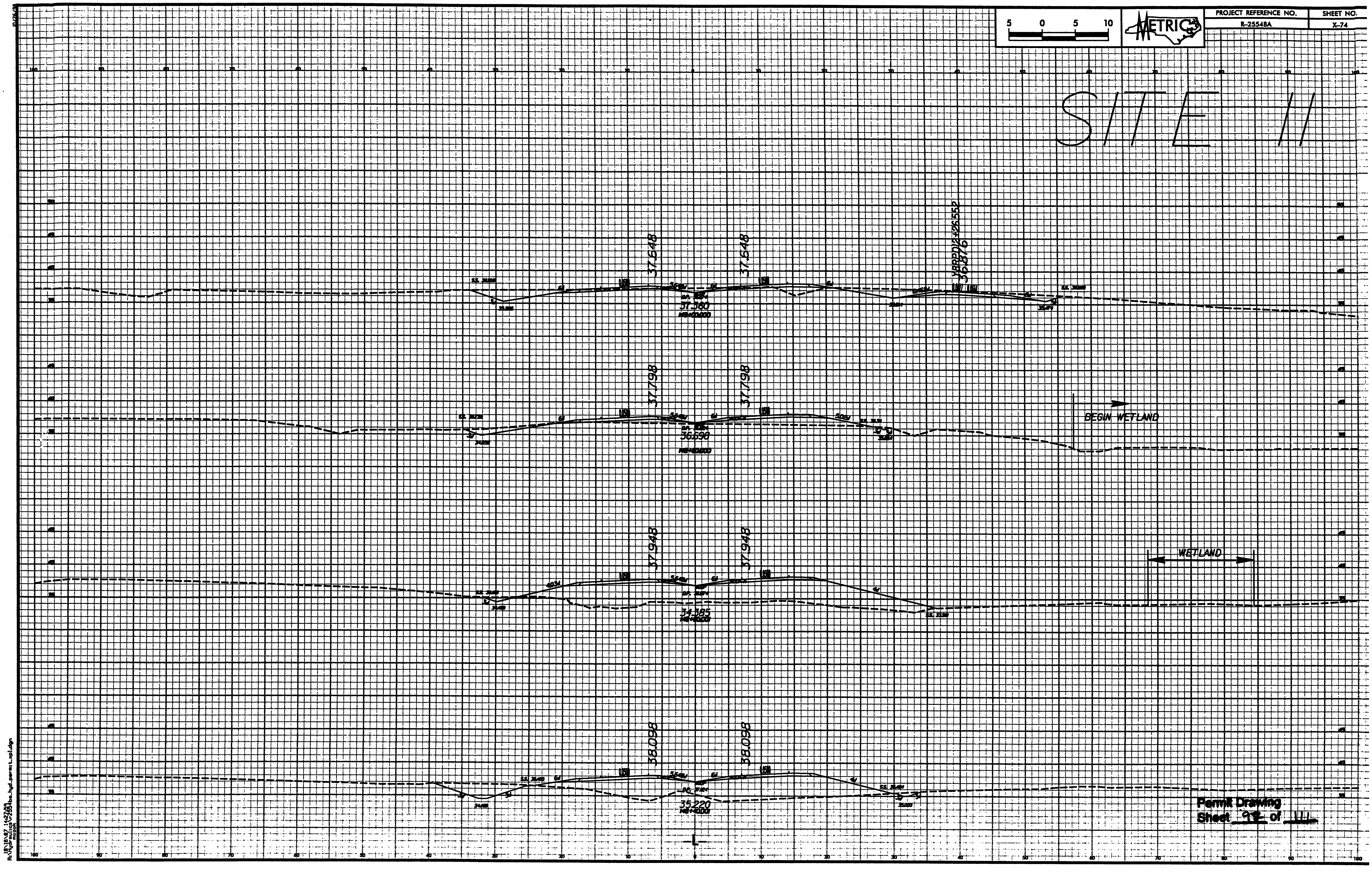


METRIC
5 0 5 10
PROJECT REFERENCE NO.
R-2554BA
SHEET NO.
X-65
SITE 10
ALL WETLAND
38.545
38.545
35.521
ALL WETLAND
38.465
38.465
35.495
ALL WETLAND
38.385
38.385
35.474
BEGIN WETLAND
38.305
38.305
35.339
BEGIN WETLAND
38.225
38.225
35.085
-L-
Permit Drawing
Sheet 76 of 114


PROJECT REFERENCE NO.
R-2554BA
SHEET NO.
X-74
METRIC
5 0 5 10
SITE 11
37.648
37.648
Y8RPD)+26.552
36.876
37.360
37.798
37.798
36.598
BEGIN WETLAND
37.948
37.948
WETLAND
34.385
38.098
38.098
35.220
-L-
Permit Drawing
Sheet 92 of 111

5 0 5 10	METRIC	PROJECT REFERENCE NO.	SHEET NO.
		R-2554BA	X-79

SITE #2

BEGIN WETLAND

35925

35925

31671
454+00000

WETLAND

35810

35810

32158
452+00000

WETLAND

35727

35727

32616
453+00000

WETLAND

35674

35674

33296
453+00000

35651

35651

34014
452+00000

Permit Drawing
Sheet 98 of 111

10/19/07 11:29:35
R:\SgPrjcts\R-2554BA\roadway\mcook\R2554ba_hyd_permit_sp1.dgn
mcook

2.5	0	2.5	5

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	X-131

SITE

L2RPB 0+79.95 Lt
41.790

L2RPB 0+79.95 Rt
41.765

L2RPB 0+79.95
41.428

L2RPB 0+59.982
41.056

4+20.000

4+00.000

3+80.000

L2RPBD

Permit Drawing
Sheet 99 of 111

10/16/97 14:47:25
R:\DGN files\2554ba_hyd_permit_sp1.dgn
mcook

2.5	0	2.5	5

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	X-155

SITE 3

43°33'33"N

ALL WETLAND

SMPS 33968

54580
14+20.000

43°33'34"N

ALL WETLAND

SMPS 33968

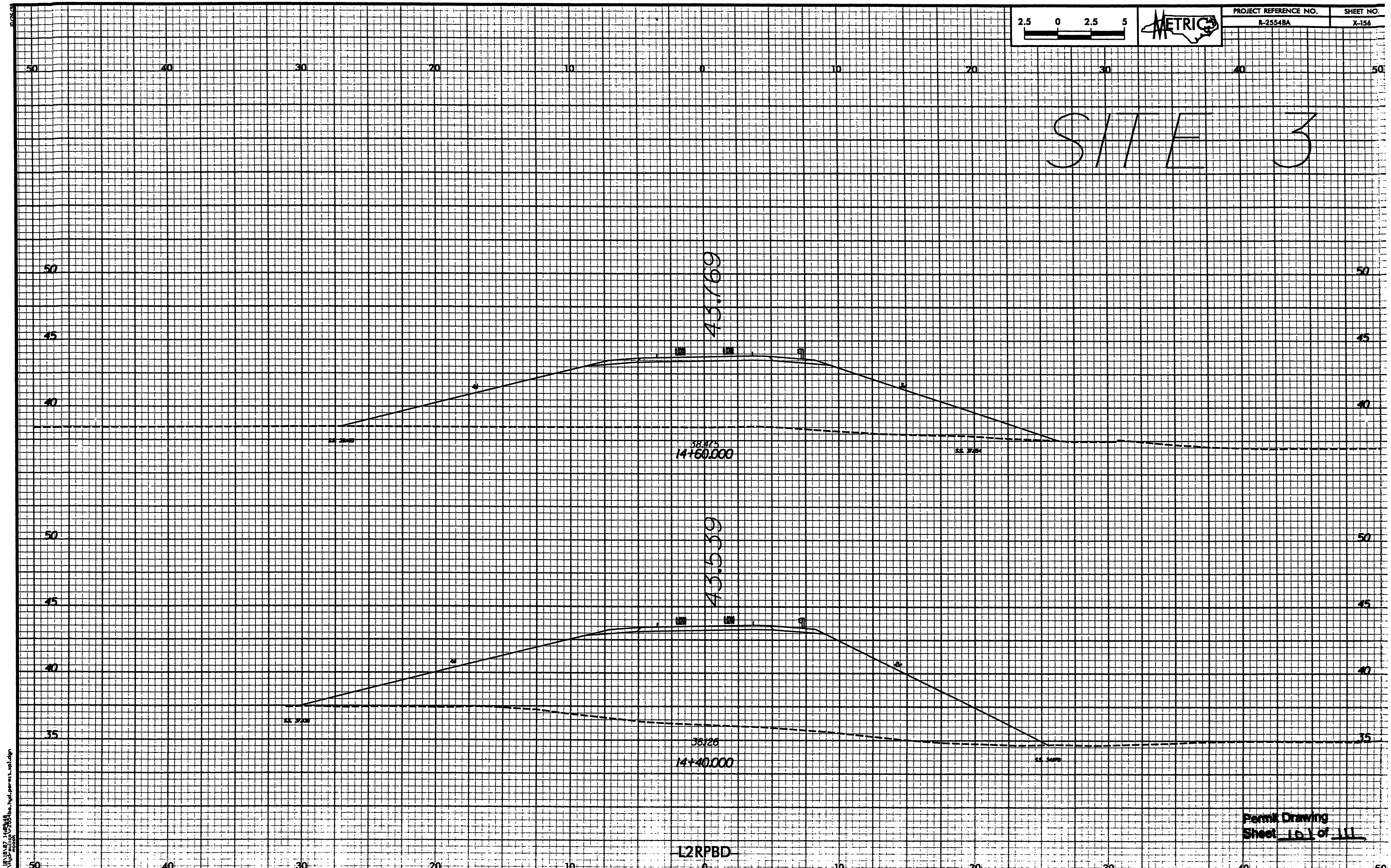
33968
14+00.000

L2RPBD

Permit Drawing
Sheet 10 D of 111

10/26/98
JOB NO. 47 148933
DESIGN 2554ba_hyd_permit_wpl.dgn
DRAWN
CHECK

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	X-156



Permit Drawing
Sheet 161 of 111

2.5	0	2.5	5

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	X-185

SITE 3

WETLAND

43+90

1:1

1:1

4H

3H

SS 37+80

SS 36+20

36.204

1+80.000

WETLAND

43+90

1:1

1:1

4H

3H

SS 37+80

SS 36+20

35.759

1+60.000

WETLAND

44+50

1:1

1:1

4H

3H

SS 37+80

SS 36+20

SS 36+73

36.300

36.683

1+40.000

Permit Drawing
Sheet 162 of 166

-L2LPD-

50 45 40 30 20 10 0 10 20 30 40 45 50

10/18/07 11:49:33
R:\Projects\2554ba\roadway\2554ba_hyd_permitL_sp1.dgn
mcook

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	X-186

2.5 0 2.5 5

METRIC

SITE 3

50 40 30 20 10 0 10 20 30 40 50

45 40 35

42100
LWM
LWM
SPT
39733
36.500
2+23.000

42580
LWM
LWM
SPT
38.283
34.458
2+07.000

BEGIN WETLAND

43060
LWM
LWM
SPT
38.09
36.354
1+91.000

BEGIN WETLAND

-L2LPD-

Permit Drawing
Sheet 10.3 of 10.4

10/25/97 14:47:56
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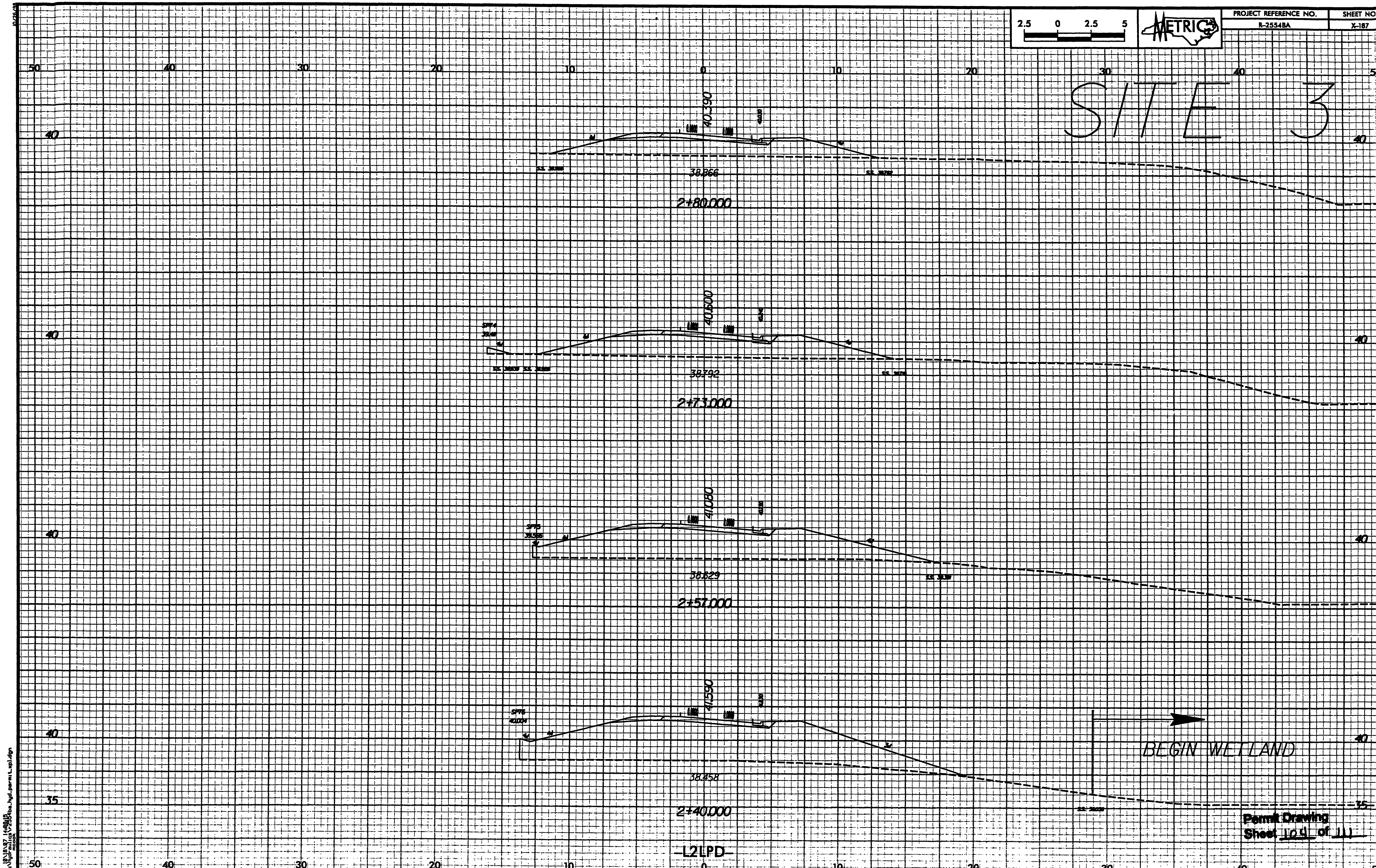
mcox

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	X-187



2.5 0 2.5 5	METRIC	PROJECT REFERENCE NO.	SHEET NO.
		R-2554BA	X-192

SITE 14

-Y1-

38.393

38.393

12+60.000

38.438

38.438

37.019

12+40.000

38.515

37.622

12+20.000

-Y2-

Permit Drawing
Sheet 105 of 111

RELEASED FOR PLOTTING
Rundgren, Gerald
mcook
R:\projects\2554ba_hyd_par-mtl_sp1.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	X-223

5 0 5 10

METRIC

SITE 5

WETLAND

WETLAND

WETLAND

-Y2RPD-

Permit Drawing
Sheet 16L of 111

5 0 5 10	METRIC	PROJECT REFERENCE NO.	SHEET NO.
		R-2554BA	X-224

SITE 5

SR5 13+765.72
4028

SR5 13+765.72
4028

13+60.000

SR5 13+765.72
4028

SR5 13+765.72
4028

13+0.000

SR5 14+165.42
3971

SR5 14+165.42
3971

13+20.000

SR5 14+565.42
3913

SR5 14+565.42
3913

13+00.000

SR5 14+965.42
3856

SR5 14+965.42
3856

12+80.000

Permit Drawing
Sheet ID: 5 of 11

-Y2RPD-

R:\Projects\Y2554ba_hyd_permit_wpi.dgn
[P]VANZ 14:18:12
mcclain

2.5 0 2.5 5	METRIC	PROJECT REFERENCE NO.	SHEET NO.
		R-2554B	X-231

SITE 5

50 40 30 20 10 0 10 20 30 40 50

40

37991
12+60.001

40

38004
12+60.000

40

38314
12+40.001

45

40

38300
12+20.000

50 40 30 20 10 0 10 20 30 40 50

-Y2LPD-

Permit Drawing
Sheet 108 of 111

18JAN97 14:58:34
R:\hydraulics\r2554bs_hyd_permit_sp1.dgn
mmccoy

10/26/98

PROJECT REFERENCE NO.	SHEET NO.
R-2554BA	X-242

2.5 0 2.5 5

METRIC

50 40 30 20 10 0 10 20 30 40 50

SITE 8

WETLAND

BEGIN WETLAND

34243

REMOVE EXISTING ROADWAY

21+60.000

35

30

WETLAND

BEGIN WETLAND

34199

REMOVE EXISTING ROADWAY

21+40.000

BEGIN WETLAND

34327

REMOVE EXISTING ROADWAY

21+20.000

34685

21+00.000

SR5

Permit Drawing
Sheet 109 of 111

R:\Hydraulics\2554ba_hyd_permit_xpl.dgn
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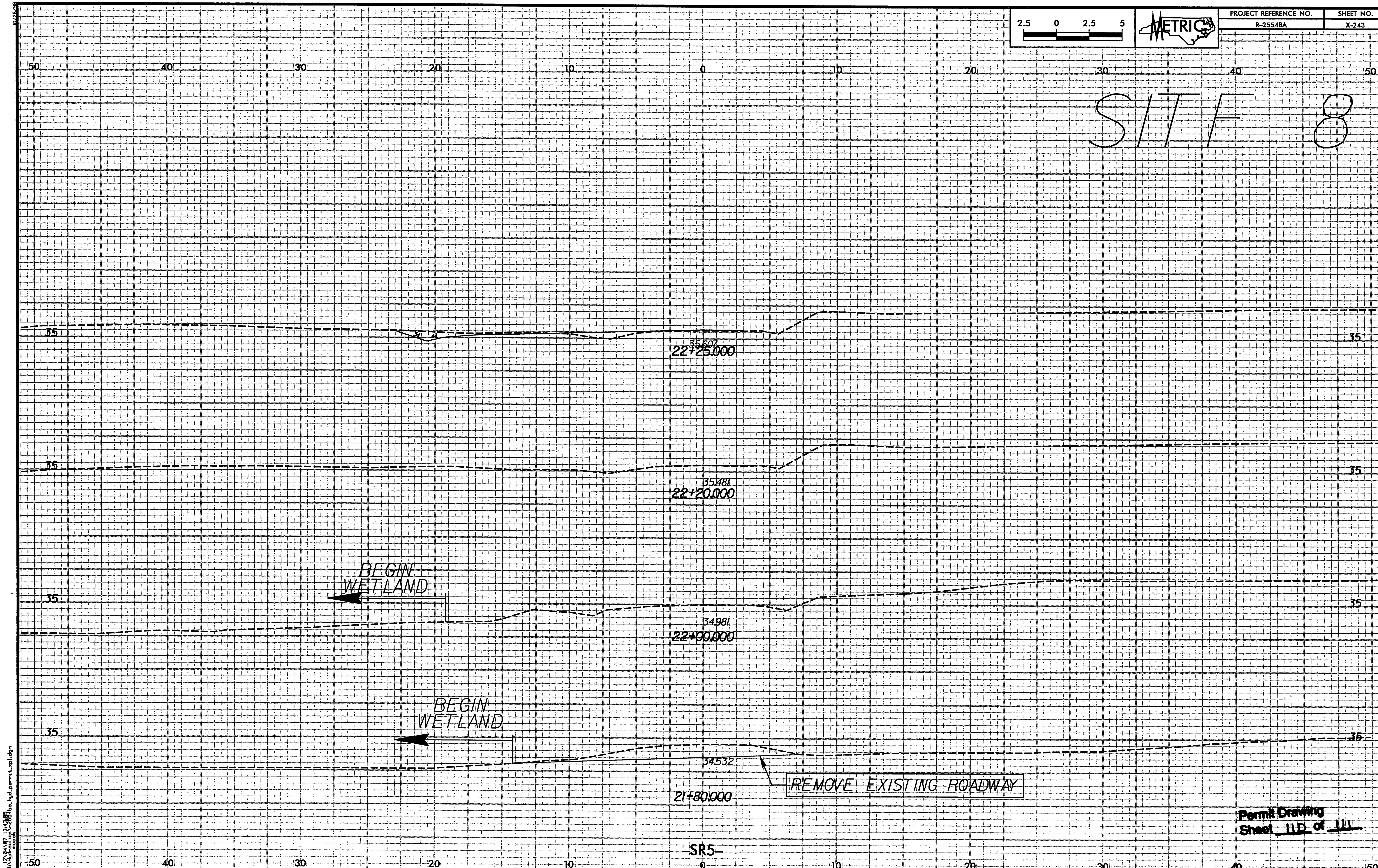
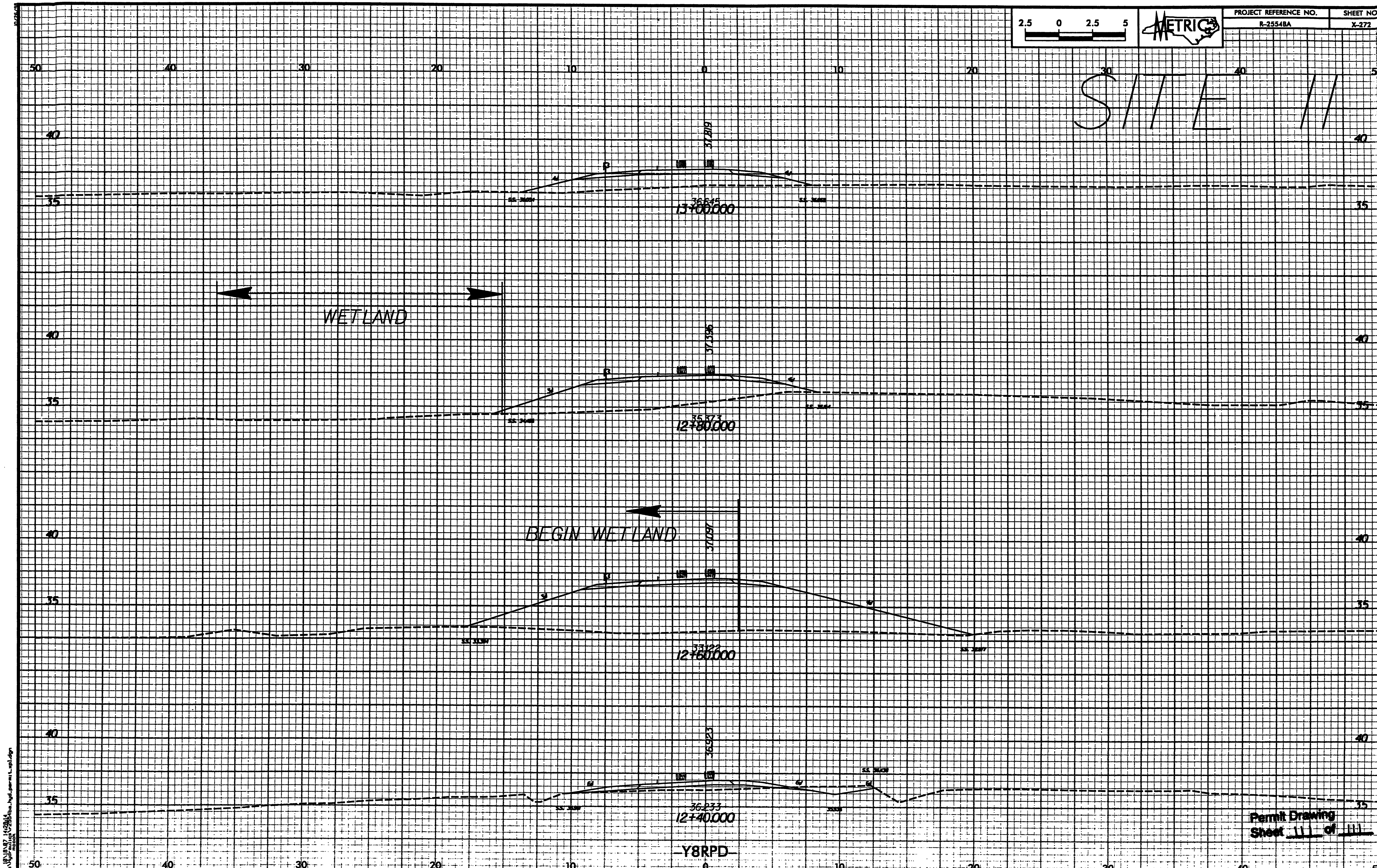
mcook

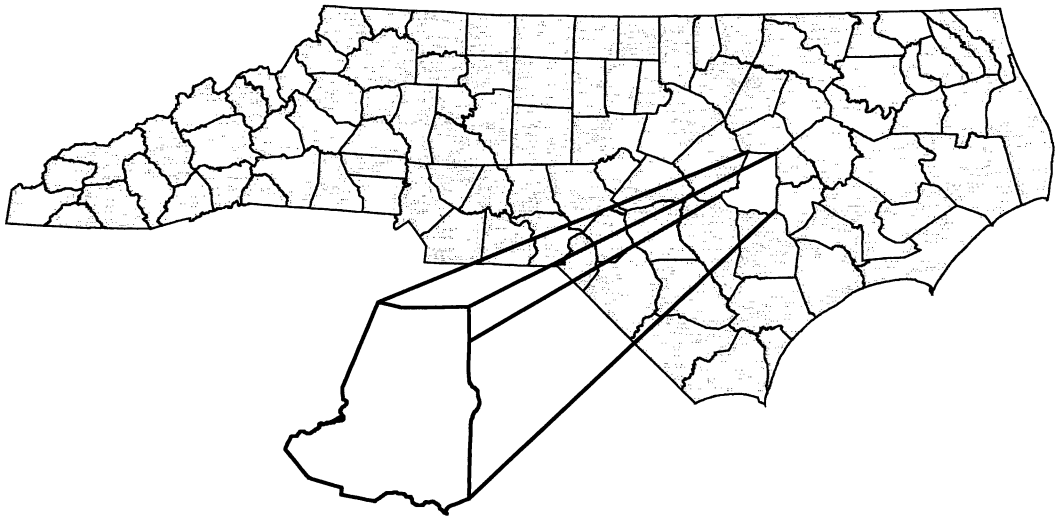


2.5 0 2.5 5
METRIC
PROJECT REFERENCE NO.
R-2554BA
SHEET NO.
X-243
SITE 8
35.607
22+25.000
35.481
22+20.000
BEGIN WETLAND
34.981
22+00.000
BEGIN WETLAND
34.532
REMOVE EXISTING ROADWAY
21+80.000
-SR5-
Permit Drawing
Sheet 110 of 111

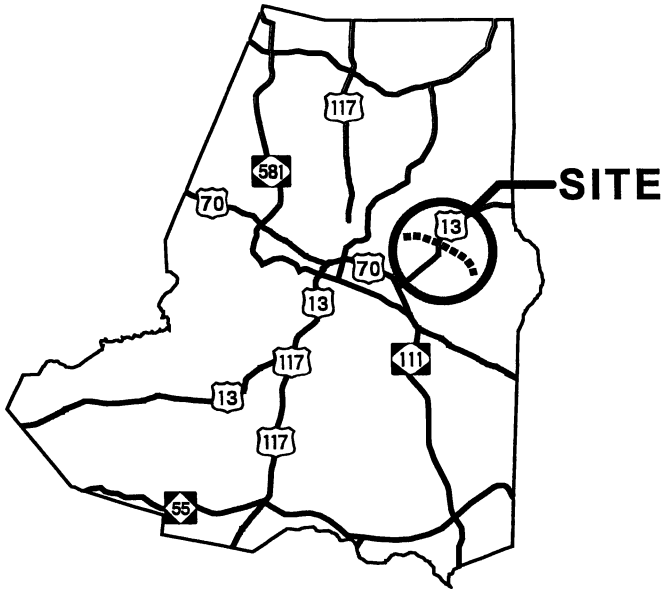


PROJECT REFERENCE NO.
R-2554BA
SHEET NO.
X-272
METRIC
2.5 0 2.5 5
SITE 11
37.819
36.645
13+00.000
WETLAND
37.336
35.373
12+80.000
BEGIN WETLAND
37.091
33.122
12+60.000
36.923
36.233
12+40.000
-Y8RPD-
Permit Drawing
Sheet 111 of 111

NORTH CAROLINA



WAYNE



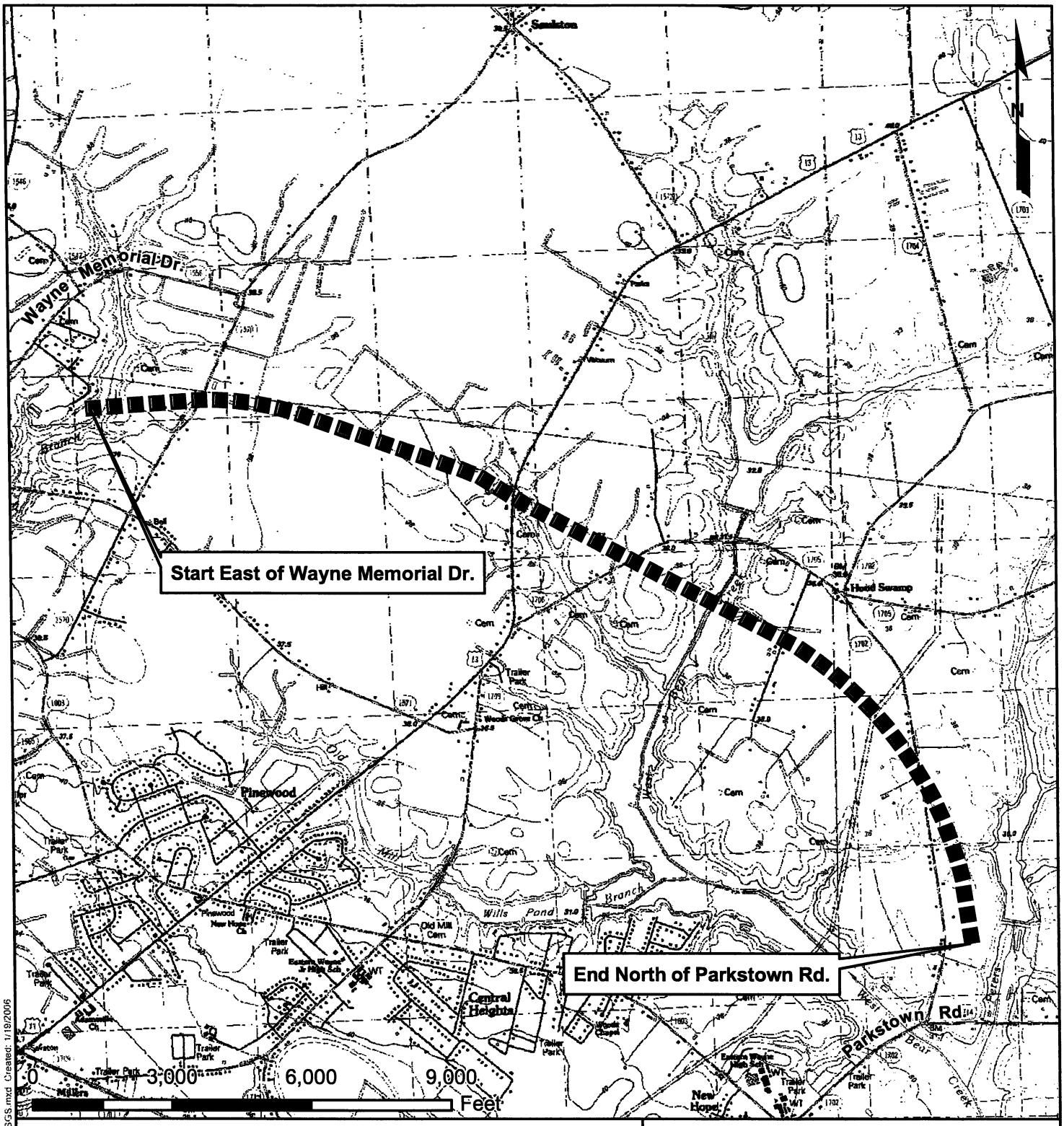
VICINITY MAPS

NCDOT

DIVISION OF HIGHWAYS
WAYNE COUNTY
PROJECT: 34461.1.3 (R-2554BB)
US 70 BYPASS

10/22/07

Permit Drawing



1 inch equals 3,000 feet

LOCATION

NCDOT

DIVISION OF HIGHWAYS
WAYNE COUNTY
PROJECT: 34461.1.3 (R-2554BB)
US 70 BYPASS

10/22/07

Permit Drawing

Source: USGS 7.5 Minute Quadrangle, NE Goldsboro & Jason, NC

\\Dvd 21\BRIDGE_Maps\Wayne_2554BB_US70\R 2554BB_USGS.mxd Created: 1/19/2006

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ha)	Temp. Fill In Wetlands (ha)	Excavation in Wetlands (ha)	Mechanized Clearing in Wetlands (ha)	Hand Clearing in Wetlands (ha)	SURFACE WATER IMPACTS: Permanent SW impacts (ha)	Temp. SW impacts (ha)	Existing Channel Impacts Permanent (m)	Existing Channel Impacts Temp. (m)	Natural Stream Design (m)
1	-L- 153+60 +/-	Raodway / Bridge	< 0.000			0.001	0.443					
3	-Y14RPB- 14+00 TO -Y14RPD- 13+00 +/-	Roadway						0.052	0.002	350.0	16.7	
4	-L- 196+50 TO 199+00 +/-	Roadway						0.045	0.003	290.0	14.7	
6	-SR12- 16+90 +/-	Roadway	0.064			0.002						
7	-L- 209+50 +/-	Roadway	0.081			0.025						
9	-SR13- 10+30 TO -SR12- 23+40 +/-	Roadway						0.053	0.003	473.8	27.5	376.4
10	-SR13- 18+30 +/-	Roadway	0.001			0.009		0.002	0.001	5.8	3.1	
12	-SR11- 15+45 +/-	Roadway						0.006	0.001	40.5	6.2	
13	-Y15- 15+20 +/-	Roadway						0.002	< 0.000	28.1	3.1	
TOTALS:			0.146			0.037	0.443	0.160	0.010	1188.2	71.3	376.4

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
WBS - 34461.1.3 (R-2554BB)

10/31/07
#########

JMD Revised 2/03/05
R:/z-misc/Hydro/Permit/New_wetland_Summary.xls

Permit Drawing
Sheet 3 of 28

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L- 153+60 +/-	Raodway / Bridge	< 0.00			< 0.00	0.44					
3	-Y14RPB- 14+00 TO -Y14RPD- 13+00 +/-	Roadway						0.13	< 0.00	1149	55	
4	-Y14RPB- 196+50 TO 199+00 +/-	Roadway						0.11	0.01	952	48	
6	-SR12- 16+90 +/-	Roadway	0.16			< 0.00						
7	-L- 209+50 +/-	Roadway	0.20			0.06						
9	-SR13- 10+30 TO -SR12- 23+40 +/-	Roadway						0.13	0.01	1556	90	1236
10	-SR13- 18+30 +/-	Roadway	< 0.00			0.02		< 0.00	< 0.00	19	10	
12	-SR11- 15+45 +/-	Roadway						0.01	< 0.00	133	20	
13	-Y15- 15+20 +/-	Roadway						< 0.00	< 0.00	92	10	
TOTALS:			0.36			0.09	0.44	0.40	0.03	3901	234	1236

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
WBS - 34461.1.3 (R-2554BB)

10/31/07
########

JMD Revised 2/03/05
R:/z-misc/Hydro/Permit/New_wetland_Summary.xls

Permit Drawing Sheet 4 of 28

BUFFER IMPACTS SUMMARY

		WETLANDS IN BUFFER		REMAINING BUFFER	
Site	Station	ZONE 1 (m^2)	ZONE 2 (m^2)	ZONE 1 (m^2)	ZONE 2 (m^2)
10	-SR13- 18+30 +/-	74.8	0.0	1649.7	1238.6
		74.8	0.0	1649.7	1238.6

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
PROJECT: 34461.1.3 (R-2554BB)

10/31/2007

BUFFER IMPACTS SUMMARY

		WETLANDS IN BUFFER		REMAINING BUFFER	
Site	Station	ZONE 1 (ft^2)	ZONE 2 (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
10	-SR13- 18+30 +/-	805	0	17757	13332
		805	0	17757	13332

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
PROJECT: 34461.1.3 (R-2554BB)

10/31/2007

Permit Drawing
Sheet 6 of 28

PROP. NO.	PROPERTY OWNER NAME	PROP. OWNER ADDRESS
1	CARRIE MAYE LEWIS	PC E SLIDE 21
2	JAMES A. GILLS	DB 1537 PG 791
58	BELFAST-PATETOWN SANITARY DIST.	DB 1379 PG 749
59 / 67	J. ISAAC GURLEY, FARMS, INC.	DB 822 PG 455; DB 822 PG 453; DB 822 PG 463; DB 822 PG 430; DB 1560 PG 547
64 / 130	DONNIE J. WADE	PC 1 SLIDE 98
80	RAYMOND D. SMITH, ETALS	DB 1177 PG 654
81	ELTON L. SMITH	DB 1769 PG 927
87	ROBERT PARKS	DB 1504 PG 870
88 / 89	PAULA THOMAS	DB 570 PG 25
95	WINSTON C. SMITH	DB 1564 PG 219
96 / 102 / 103	WINSTON P. BEST	DB 786 PG 237; DB 163 / 115
97 / 163	BERRY A. PARKS	DB 1491 PG 856; DB 1221 PG 283; DB 1222 PG 873; DB 1491 PG 861
99	DARRYL LEE CARLYLE	DB 1351 PG 602
100	ROLAND GRAY	DB 292 PG 462; DB 1512 PG 345
104	CHARLES A. PARKS	DB 1491 PG 861
104	BEST FARMS	DB 822 PG 500

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
PROJECT: 34461.1.3 (R-2554BB)

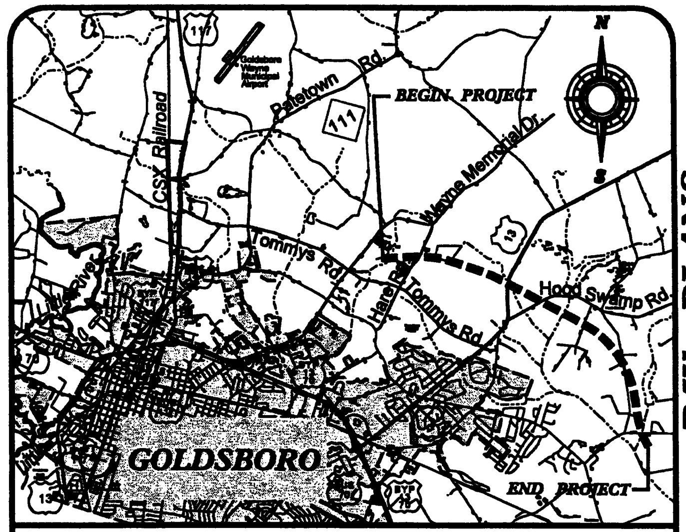
10/22/2007

R:/z-misc/Hydro/Wetprop.xls

Permit Drawing
Sheet 7 of 28

PROJECT: R-2554BB

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



VICINITY MAP

RW PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
WAYNE COUNTY

LOCATION: US 70 (GOLDSBORO BYPASS)
FROM EAST OF SR 1556 (WAYNE MEMORIAL DRIVE)
TO WEST OF SR 1714 (PARKSTOWN ROAD)

TYPE OF WORK: GRADING, PAVING, DRAINAGE,
STRUCTURES, CULVERTS, SIGNING, AND SIGNALS

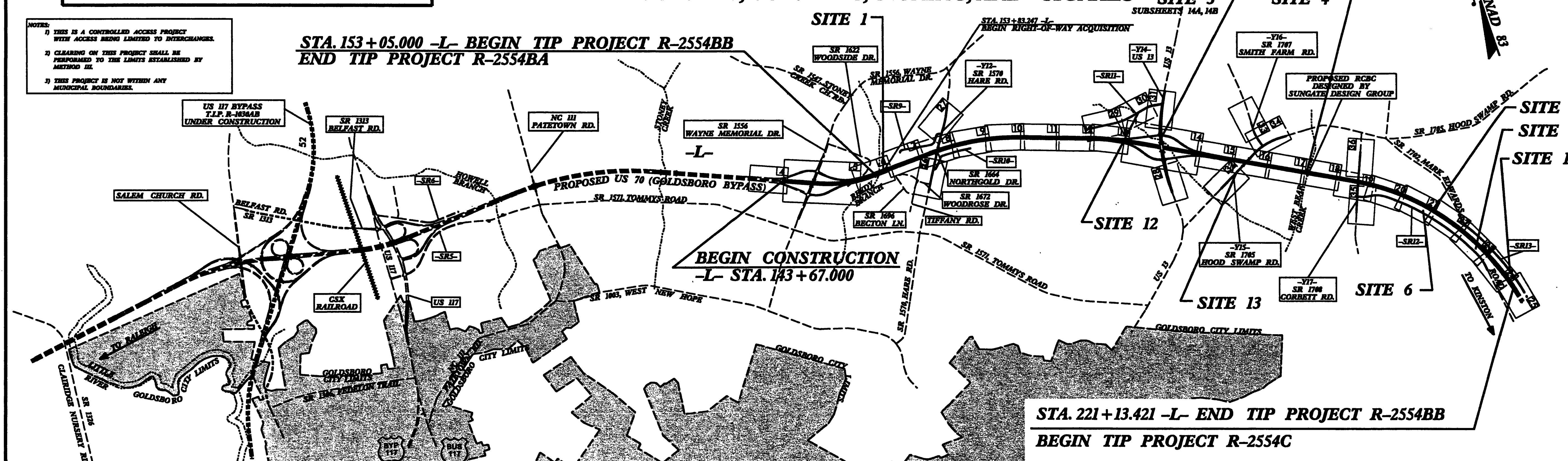
METRIC

ALL DIMENSIONS IN THESE PLANS ARE IN METERS UNLESS OTHERWISE SHOWN

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2554BB	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34461.1.3	NHF-70(30)	PE
34461.2.7		R/W

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



GRAPHIC SCALE	DESIGN DATA
5 0 10 PLANS	ADT 2008 = 22,172
5 0 10 PROFILE (HORIZONTAL)	ADT 2028 = 37,852
1 0 2 PROFILE (VERTICAL)	DHV = 10 %
	D = 55 %
	T = 10 % *
	V = 110 km/h
	* TTST 6% DUAL 4%

PROJECT LENGTH

Length Roadway TIP Project R-2445B .... 6.685 km

**Length Structure TIP Project R-2445B .... 0.123 km*

TOTAL LENGTH TIP Project R-2445B ..... 6.808 km (4.23 MILES)

**USED EBL -L- STATIONS FOR STRUCTURE LENGTHS*

PLANS PREPARED BY :
RUMMEL, KLEPPER & KAHL, LLP
consulting engineers
5800 FARINGDON PLACE, SUITE 105
RALEIGH, NORTH CAROLINA 27609
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: TBD

LETTING DATE:

B. KEITH SKINNER, P.E.
PROJECT ENGINEER

MICHAEL T. MERRITT, P.E.
PROJECT DESIGN ENGINEER

NCDOT CONTACT: Scott Blevins, P.E.
Project Engineer–Project Services

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER P.E.

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR DATE

CONTRACT:

Permit Drawing
Sheet 8 of 28

PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	6
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 21022 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 18181 ENGINEER TIMM H. SWEET

METRIC 5 0 10

CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SITE 1

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

HC HC DENOTES HAND CLEARING

-L- POC Sta.151+70.000=
-Y8RPA- POT Sta.10+00.000 (14.2 m LT)

-L- POC Sta152+00.000
-Y18- PCSta.10+00.000 (35.3 m LT)

-Y18- PTSta.10+63.659

-Y18- POTSta.11+26.926

NC GRID NAD 83

NCDOT DB 1472 PG 411

-Y8RPA- TS Sta.10+47.479

JAMES ONEIL SMITH DB 1801PG 785

ALBERT ONEIL SMITH DB 827 PG 742

LINDA A. CORRIERE DB 1461PG 655

DAVID KENNEDY DB 823 PG 873

ROBERT R. EARNEST DB 834 PG 484 DB 795 PG 726

-L- ST Sta.152+82.221

JAMES A. ADAMS, JR. DB 1548 PG 425

CARRIE MAE LEWIS PC E SLIDE 21

REELY BRANCH

-L- ON P/L 45m (147.64 ft.)

NCDOT DB 1744 PG 533

BEG. WW FENCE TIE TO EXIST.

WEST SIDE OF BRIDGE IS PERMITTED UNDER R-2554BA

-L- +02.660 17.2m (56.43 ft.) END WW FENCE

MATCHLINE -L- STA. 151+00 SEE SHEET 5

MATCHLINE -L- STA. 154+40 SEE SHEET7

N 85° 28' 00.0" W

N 87° 00' 00.0" E

END WW FENCE

BEG. WW FENCE

-L- +19.170 45m (147.64 ft.)

ROBERT R. EARNEST DB 1216 PG 878

-L- POC Sta.151+19.886=
-Y8RPD- CS Sta.10+08.000 (14.2m RT)

-L- CS Sta.151+97.221

-Y8RPA-
Pls Sta 10+90.824
θs = 4° 08' 16.9"
Ls = 65.000
LT = 43.345
ST = 21.677

-Y18-
PI Sta 10+31.949
Δ = 12° 09' 28.7" (LT)
L = 63.659
T = 31.949
R = 300.000

-L-
PI Sta 149+88.602
Δ = 20° 44' 59.6" (LT)
L = 421.909
T = 213.291
R = 1165.000
ex = 0.05

Pls Sta 152+25.558
θs = 2° 05' 24.7"
Ls = 85.000
LT = 56.671
ST = 28.337

-Y8RPD-
Pls Sta 10+21.668
θs = 1° 34' 44.9"
Ls = 65.000
LT = 43.335
ST = 21.668

NCDOT DB 1472 PG 411

NCDOT DB 1780 PG 666

JAMES A. GILLS DB 1837 PG 191

STA. 152+90.000 -L- BEGIN TIP PROJECT R-2554BB

END TIP PROJECT R-2554BA

SEE SHTS. 38 & 39 FOR -L- PROFILE
SEE SHT. 49 FOR -Y8RPA- PROFILE
SEE SHT. 50 FOR -Y8RPD- PROFILE

NOTE: See Detail Sheets 2-S & 2-T For Ditch Details

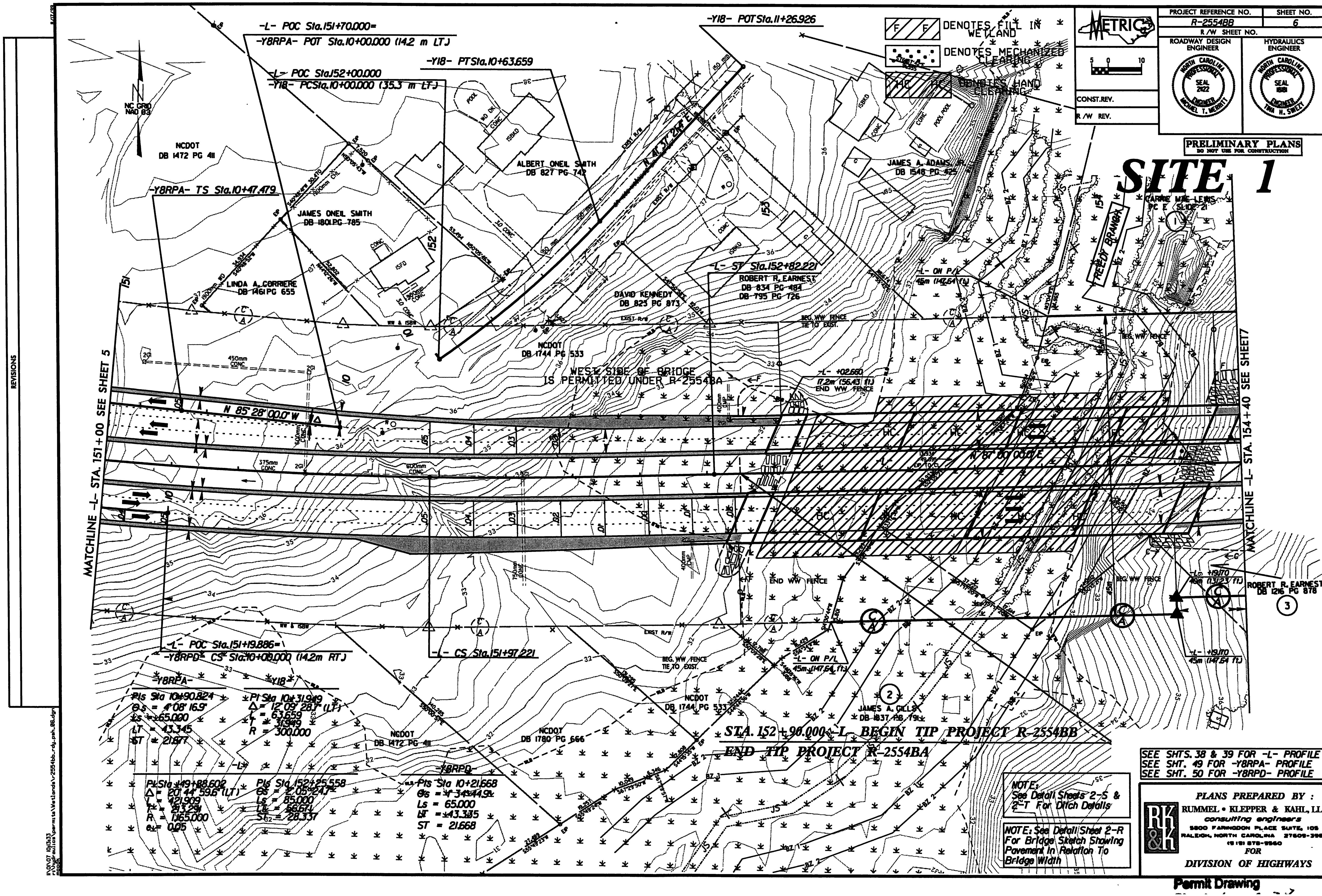
NOTE: See Detail Sheet 2-R For Bridge Sketch Showing Pavement In Relation To Bridge Width

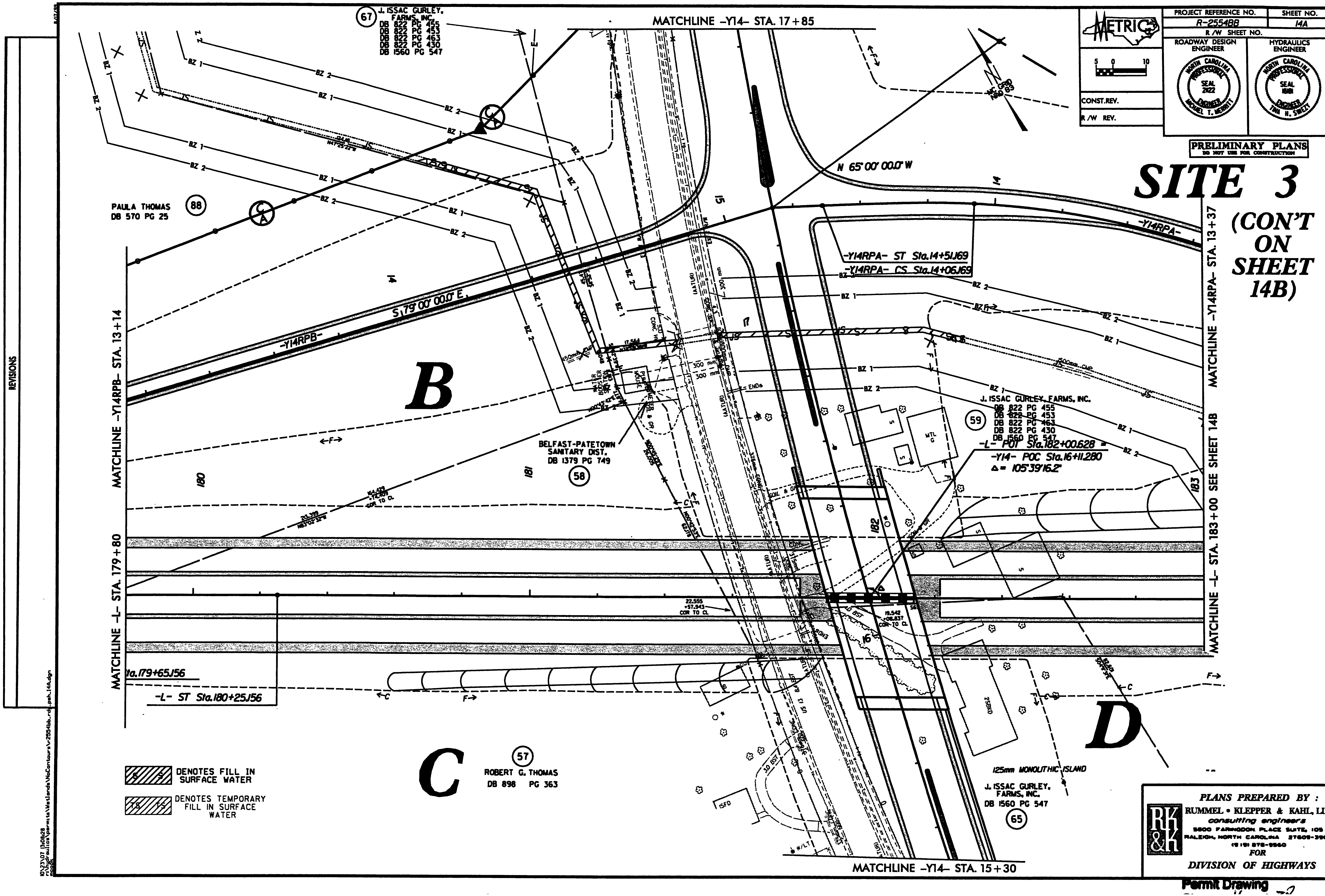
REVISIONS

PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
3800 FARINGDON PLACE SUITE, 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

Permit Drawing

R:\2007 10\BJT Roadway\Plans\Permits\Wetlands\WetContours\r-2554bb_rdpmh_88.dgn


PROJECT REFERENCE NO. R-2554BB
SHEET NO. 6
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
METRIC
CONST. REV.
R/W REV.
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SITE 1
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
DENOTES HAND CLEARING
REVISIONS
NC GRID NAD 83
-L- POC Sta.151+70.000=
-Y8RPA- POT Sta.10+00.000 (14.2 m LT)
-L- POC Sta.152+00.000
-Y18- PCSta.10+00.000 (35.3 m LT)
-Y18- PTSta.10+63.659
-Y18- POTSta.11+26.926
-Y8RPA- TS Sta.10+47.479
-L- ST Sta.152+82.221
NCDOT DB 1472 PG 411
ALBERT ONEIL SMITH DB 827 PG 742
JAMES ONEIL SMITH DB 1801 PG 785
LINDA A. CORRIERE DB 1461 PG 655
DAVID KENNEDY DB 825 PG 873
ROBERT R. EARNEST DB 834 PG 484 DB 795 PG 726
JAMES A. ADAMS, JR. DB 1548 PG 425
CARRIE MAE LEWIS PC E SLIDE 21
REEDY BRANCH
NCDOT DB 1744 PG 533
WEST SIDE OF BRIDGE IS PERMITTED UNDER R-2554BA
N 85° 28' 00.0" W
N 87° 00' 00.0" E
MATCHLINE -L- STA. 151+00 SEE SHEET 5
MATCHLINE -L- STA. 154+40 SEE SHEET 7
ROBERT R. EARNEST DB 1216 PG 878
-L- POC Sta.151+19.886=
-Y8RPD- CS Sta.10+00.000 (14.2m RT)
-L- CS Sta.151+97.221
JAMES A. GILLS DB 1837 PG 791
NCDOT DB 1744 PG 533
NCDOT DB 1472 PG 411
NCDOT DB 1780 PG 666
STA. 152+90.000 -L- BEGIN TIP PROJECT R-2554BB
END TIP PROJECT R-2554BA
-Y8RPA-
PIs Sta 10+90.824
θs = 4° 08' 16.9"
Ls = 65.000
LT = 43.345
ST = 21.677
-Y18-
PI Sta 10+31.949
Δ = 12° 09' 28.7" (LT)
L = 63.659
T = 31.949
R = 300.000
-L-
PI Sta 149+88.602
Δ = 20° 44' 59.6" (LT)
L = 421.909
T = 213.291
R = 1165.000
e = 0.05
PIs Sta 152+25.558
θs = 2° 05' 24.7"
Ls = 85.000
LT = 56.674
ST = 28.337
-Y8RPD-
PIs Sta 10+21.668
θs = 4° 34' 44.9"
Ls = 65.000
LT = 43.385
ST = 21.668
SEE SHTS. 38 & 39 FOR -L- PROFILE
SEE SHT. 49 FOR -Y8RPA- PROFILE
SEE SHT. 50 FOR -Y8RPD- PROFILE
NOTE: See Detail Sheets 2-S & 2-T For Ditch Details
NOTE: See Detail Sheet 2-R For Bridge Sketch Showing Pavement In Relation To Bridge Width
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
5800 FARINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS
Permit Drawing



PROJECT REFERENCE NO. R-2554BB
SHEET NO. 14A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST.REV.
R/W REV.
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SITE 3
(CON'T ON SHEET 14B)
MATCHLINE -Y14- STA. 17+85
MATCHLINE -Y14- STA. 15+30
MATCHLINE -Y14RPB- STA. 13+14
MATCHLINE -Y14RPA- STA. 13+37
MATCHLINE -L- STA. 179+80
MATCHLINE -L- STA. 183+00 SEE SHEET 14B
J. ISSAC GURLEY, FARMS, INC. DB 822 PG 455 DB 822 PG 453 DB 822 PG 463 DB 822 PG 430 DB 1560 PG 547
PAULA THOMAS DB 570 PG 25
BELFAST-PATETOWN SANITARY DIST. DB 1379 PG 749
ROBERT G. THOMAS DB 898 PG 363
J. ISSAC GURLEY, FARMS, INC. DB 1560 PG 547
-Y14RPA- ST Sta.14+51.169
-Y14RPA- CS Sta.14+06.169
-L- POT Sta.182+00.628 = -Y14- POC Sta.16+11.280
Δ= 105°39'16.2"
N 65° 00' 00.0" W
S 79° 00' 00.0" E
-L- ST Sta.180+25.156
Sta.179+65.156
125mm MONOLITHIC ISLAND
B
C
D
DENOTES FILL IN SURFACE WATER
DENOTES TEMPORARY FILL IN SURFACE WATER
PLANS PREPARED BY :
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PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	14A
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 2922 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 16981 ENGINEER TINA H. SWEET

METRIC 5 0 10

CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SITE 3

(CON'T ON SHEET 14B)

MATCHLINE -Y14- STA. 17+85

MATCHLINE -Y14RPB- STA. 13+14

MATCHLINE -L- STA. 179+80

MATCHLINE -Y14RPA- STA. 13+37

MATCHLINE -L- STA. 183+00 SEE SHEET 14B

MATCHLINE -Y14- STA. 15+30

J. ISSAC GURLEY, FARMS, INC. (67) DB 822 PG 455, DB 822 PG 453, DB 822 PG 463, DB 822 PG 430, DB 1560 PG 547

PAULA THOMAS (88) DB 570 PG 25

BELFAST-PATETOWN SANITARY DIST. (58) DB 1379 PG 749

ROBERT G. THOMAS (57) DB 898 PG 363

J. ISSAC GURLEY, FARMS, INC. (59) DB 822 PG 455, DB 822 PG 453, DB 822 PG 463, DB 822 PG 430, DB 1560 PG 547

J. ISSAC GURLEY, FARMS, INC. (65) DB 1560 PG 547

S 79° 00' 00.0" E

N 65° 00' 00.0" W

-Y14RPB-

-Y14RPA-

-Y14RPA- ST Sta.14+51.169

-Y14RPA- CS Sta.14+06.169

-L- POT Sta.182+00.628

-Y14- POC Sta.16+11.280

Δ = 105°39'16.2"

-L- ST Sta.180+25.156

Sta.179+65.156

A B C D

125mm MONOLITHIC ISLAND

DENOTES FILL IN SURFACE WATER

DENOTES TEMPORARY FILL IN SURFACE WATER

REVISIONS

PLANS PREPARED BY :
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FOR
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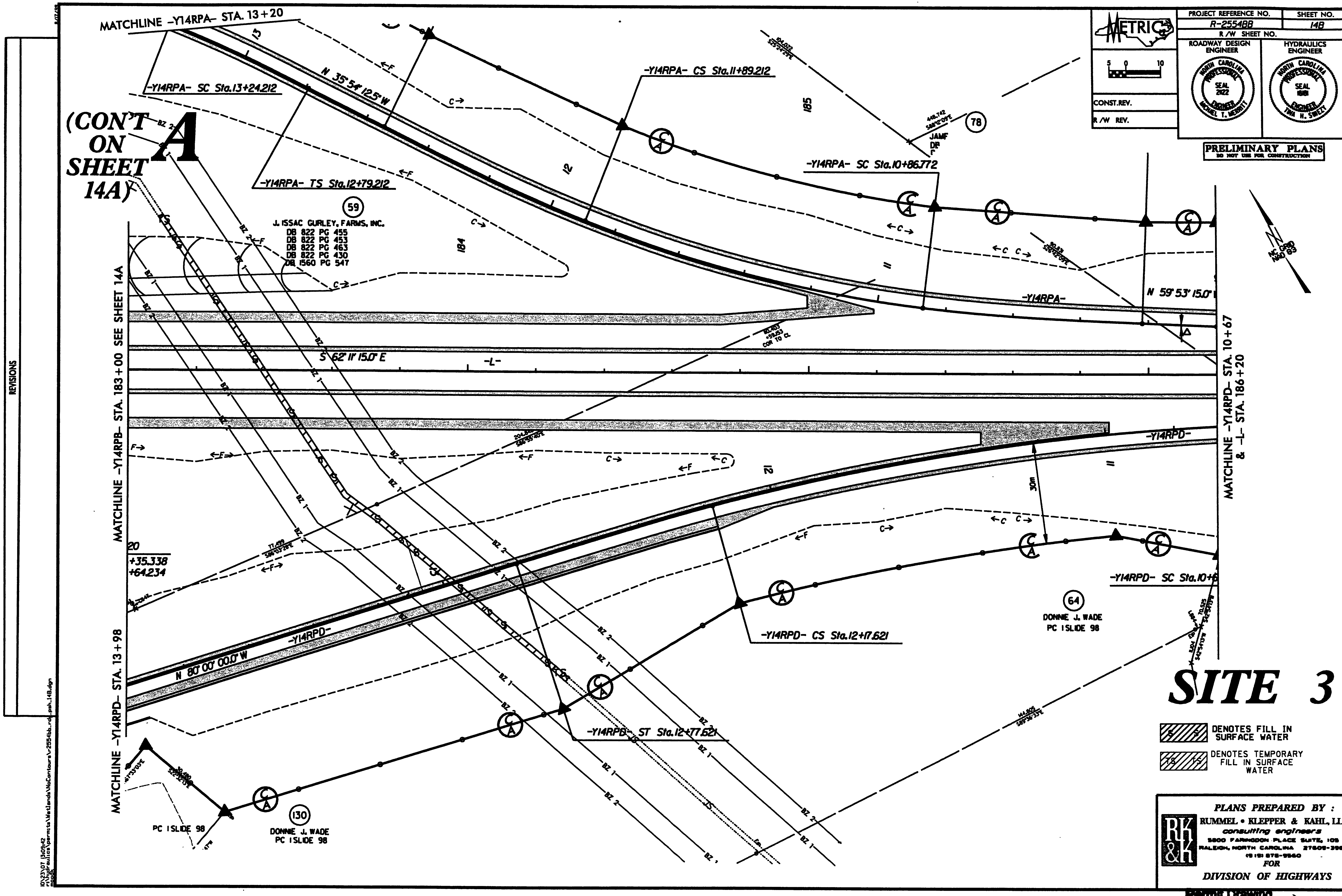
METRIC
PROJECT REFERENCE NO. R-2554BB
SHEET NO. 14B
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST. REV.
R/W REV.
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
MATCHLINE -Y14RPA- STA. 13+20
-Y14RPA- SC Sta.13+24.212
-Y14RPA- TS Sta.12+79.212
-Y14RPA- CS Sta.11+89.212
-Y14RPA- SC Sta.10+86.772
N 35° 54' 12.5" W
N 59° 53' 15.0"
-Y14RPA-
(CON'T ON SHEET 14A)
A
J. ISSAC GURLEY, FARMS, INC.
DB 822 PG 455
DB 822 PG 453
DB 822 PG 463
DB 822 PG 430
DB 1560 PG 547
S 62° 11' 15.0" E
-L-
MATCHLINE -Y14RPB- STA. 183+00 SEE SHEET 14A
MATCHLINE -Y14RPD- STA. 10+67 & -L- STA. 186+20
MATCHLINE -Y14RPD- STA. 13+98
-Y14RPD-
N 80° 00' 00.0" W
-Y14RPD- CS Sta.12+17.621
-Y14RPD- SC Sta.10+6
-Y14RPB- ST Sta.12+77.621
DONNIE J. WADE
PC I SLIDE 98
PC I SLIDE 98
DONNIE J. WADE
PC I SLIDE 98
JAMF
NC GRID NAD 83
SITE 3
DENOTES FILL IN SURFACE WATER
DENOTES TEMPORARY FILL IN SURFACE WATER
PLANS PREPARED BY :
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RALEIGH, NORTH CAROLINA
FOR
DIVISION OF HIGHWAYS
Permit Drawing
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	14B
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 2922 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 16181 ENGINEER TIMA H. SWEET

METRIC 5 0 10

CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

MATCHLINE -Y14RPA- STA. 13+20

-Y14RPA- SC Sta.13+24.212

N 35°54'12.5"W

-Y14RPA- TS Sta.12+79.212

(CONT'D ON SHEET 14A)

J. ISSAC GURLEY, FARMS, INC.
DB 822 PG 455
DB 822 PG 453
DB 822 PG 463
DB 822 PG 430
DB 1560 PG 547

-Y14RPA- CS Sta.11+89.212

-Y14RPA- SC Sta.10+86.77

-Y14RPA-

N 59°53'15.0"E

S 62°11'15.0"E

-L-

MATCHLINE -Y14RPB- STA. 183+00 SEE SHEET 14A

MATCHLINE -Y14RPD- STA. 13+98

N 80°00'00.0"W

-Y14RPD-

+35.338
+64.234

-Y14RPD- ST Sta.12+77.621

-Y14RPD- CS Sta.12+17.621

-Y14RPD- SC Sta.10+

MATCHLINE -Y14RPD- STA. 10+67
& -L- STA. 186+20

-Y14RPD-

PC 1 SLIDE 98

DONNIE J. WADE
PC 1 SLIDE 98

SITE 3

DENOTES FILL IN SURFACE WATER

DENOTES TEMPORARY FILL IN SURFACE WATER

PLANS PREPARED BY :
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FOR
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PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	18
R/W SHEET NO.	

METRIC 5 0 10

CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 21222 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 18181 ENGINEER TINA N. SWEET

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

DENOTES FILL IN SURFACE WATER

DENOTES TEMPORARY FILL IN SURFACE WATER

SITE 4

-L- Sta.196+66.500
PROPOSED RCBC
2@ 3.0m x 3.0m SKEW 97.5°
(DESIGNED BY SUNGATE DESIGN GROUP)

81 ELTON L. SMITH
DB 1769 PG 927

87 ROBERT PARKS
DB 1504 PG 870

80 RAYMOND D. SMITH, ET ALS
DB 877 PG 654

86 JAMES P. SMITH, JR
DB 104 PG 118

S 62°11'15.0" E

MATCHLINE -L- STA. 196+20 SEE SHEET 17

MATCHLINE -L- STA. 199+60 SEE SHEET 19

NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details

SEE SHTS. 44 & 45 FOR -L- PROFILE

PLANS PREPARED BY :
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consulting engineers
5800 FARINGDON PLACE SUITE, 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

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PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	18
R/W SHEET NO.	

METRIC

5 0 10

CONST. REV.

R/W REV.

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 2622 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 16815 ENGINEER IAN N. SWEZY

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

DENOTES FILL IN SURFACE WATER

DENOTES TEMPORARY FILL IN SURFACE WATER

-L- Sta. 196+66.500
PROPOSED RCBC
2@ 3.0m x 3.0m SKEW 97.5°
(DESIGNED BY SUNGATE DESIGN GROUP)

SITE 4

81 ELTON L. SMITH
DB 1769 PG 927

87 ROBERT PARKS
DB 1504 PG 870

80 RAYMOND D. SMITH, ETAL
DB/ 877 PG 654

86 JAMES P. SMITH, JR
DB 104 PG 118

MATCHLINE -L- STA. 196+20 SEE SHEET 17

MATCHLINE -L- STA. 199+60 SEE SHEET 19

S 62° 11' 50.0" E

NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details

SEE SHTS. 44 & 45 FOR -L- PROFILE

PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
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FOR
DIVISION OF HIGHWAYS

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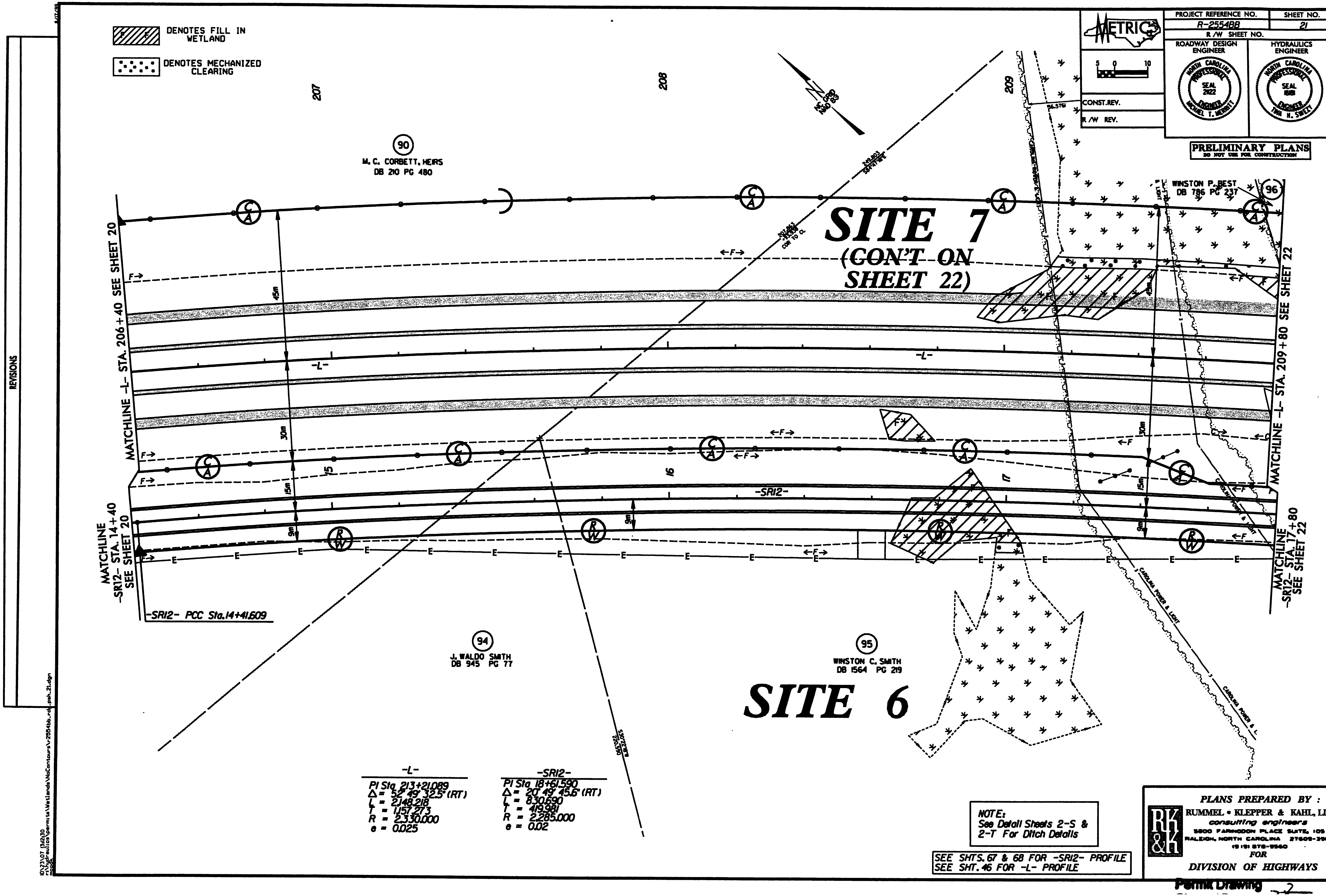

DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
METRIC
PROJECT REFERENCE NO.
R-2554BB
SHEET NO.
21
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST. REV.
R/W REV.
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
REVISIONS
SITE 7
(CON'T ON SHEET 22)
SITE 6
M. C. CORBETT, HEIRS
DB 210 PG 480
WINSTON P. BEST
DB 786 PG 237
J. WALDO SMITH
DB 945 PG 77
WINSTON C. SMITH
DB 1564 PG 219
MATCHLINE -L- STA. 206+40 SEE SHEET 20
MATCHLINE -L- STA. 209+80 SEE SHEET 22
MATCHLINE -SR12- STA. 14+40 SEE SHEET 20
MATCHLINE -SR12- STA. 17+80 SEE SHEET 22
-SR12- PCC Sta. 14+41.609
-L-
-SR12-
CAROLINA POWER & LIGHT
-L-
PI Sta 213+21.089
Δ = 52° 49' 32.5" (RT)
L = 2148.218
T = 1157.273
R = 2330.000
e = 0.025
-SR12-
PI Sta 18+61.590
Δ = 20° 49' 45.6" (RT)
L = 830.690
T = 419.981
R = 2285.000
e = 0.02
NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details
SEE SHTS. 67 & 68 FOR -SR12- PROFILE
SEE SHT. 46 FOR -L- PROFILE
PLANS PREPARED BY:
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
5800 FARINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS
Permit Drawing

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

METRIC

5 0 10

PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	21
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 2922 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 16819 ENGINEER TIM H. SWEET

CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

SITE 7

(CON'T ON SHEET 22)

SITE 6

M.C. CORBETT, HEIRS
DB 210 PG 480

WINSTON P. BEST
DB 786 PG 237

J. WALDO SMITH
DB 945 PG 77

WINSTON C. SMITH
DB 1564 PG 219

MATCHLINE -L- STA. 206+40 SEE SHEET 20

MATCHLINE -SR12- STA. 14+40 SEE SHEET 20

-SR12- PCC Sta. 14+41.609

MATCHLINE -L- STA. 209+80 SEE SHEET 22

MATCHLINE -SR12- STA. 17+80 SEE SHEET 22

CAROLINA POWER & LIGHT

-L-
PI Sta 213+21.089
Δ = 52° 49' 32.5" (RT)
L = 2148.218
T = 1157.273
R = 2330.000
e = 0.025

-SR12-
PI Sta 18+61.590
Δ = 20° 49' 45.6" (RT)
L = 830.690
T = 419.981
R = 2285.000
e = 0.02

NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details

SEE SHTS. 67 & 68 FOR -SR12- PROFILE
SEE SHT. 46 FOR -L- PROFILE

PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
5800 FAIRNOOK PLACE SUITE 105
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(919) 878-9560
FOR
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Permit Drawing
Sheet 10 of 22

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PLANS PREPARED BY :
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RALEIGH, NORTH CAROLINA 27609-3960
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FOR
DIVISION OF HIGHWAYS

METRIC
5 0 10

CONST.REV.
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	22
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 2022 ENGINEER MICHAEL T. MERRITT
HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 19181 ENGINEER TIMOTHY H. SWEET

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

DENOTES FILL IN SURFACE WATER
DENOTES TEMPORARY FILL IN SURFACE WATER
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING

SITE 7

(CON'T ON SHEET 21)

SITE 9

(CON'T ON SHEET 23)

96 WINSTON P. BEST DB 786 PG 237

163 BERRY A. PARKS DB 1491 PG 856, DB 1221 PG 283, DB 1222 PG 873, DB 1491 PG 861

EULA MAE W. WORRELL DB UNKNOWN

102 ROLAND MILTON GRAY, et als DB 1406 PG 793

98 WANDA W. SUTTON DB 1792 PG 248

99 ROLAND GRAY DB 1392 PG 462 & PG 465

100 ROLAND GRAY DB 1392 PG 462 & PG 465

101 DB 1221 PG 283, DB 1222 PG 873

103 WINSTON P. BEST DB 786 PG 237, DB 1631 PG 85

95 WINSTON C. SMITH DB 1564 PG 219

-SRI3- POT Sta.10+00.000
-SRI3- POT Sta.10+34.000
BEGIN CONSTRUCTION

-SRI3- PC Sta.10+94.505

BEGIN STREAM #1 -SRI3- Sta.10+81.755 = -STRM21- Sta.10+80.000 (17.8m RT.)

END CULVERT -STRM21- Sta.11+68.223

MATCHLINE -SRI3- STA. 11+38 SEE SHEET 23

MATCHLINE -L- STA. 209+80 SEE SHEET 21

MATCHLINE -SR12- STA. 17+80 - SEE SHEET 21

MATCHLINE -L- STA. 213+40 SEE SHEET 23

MATCHLINE -SR12- STA. 21+30 SEE SHEET 23

PROPOSED BUFFER ZONE 1

PROPOSED BUFFER ZONE 2

FLOOD PRONE AREA

APPROACHING LIMITS

-L-
PI Sta 213+21.089
Δ = 52° 49' 32.5" (RT)
L = 2148.218
T = 1157.273
R = 2330.000
e = 0.025

-SR12-
PI Sta 18+61.590
Δ = 20° 49' 45.6" (RT)
L = 830.690
T = 419.981
R = 2285.000
e = 0.02

-SRI3-
PI Sta 11+83.854
Δ = 20° 15' 48.5" (LT)
L = 176.832
T = 89.349
R = 500.000

NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details

STREAM RESTORATION SITE 21 (SEE SHEET STRM-8)

SEE SHT. 68 FOR -SR12- PROFILE
SEE SHT. 70 FOR -SRI3- PROFILE
SEE SHTS. 46 & 47 FOR -L- PROFILE

Permit Drawing

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PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
5800 FARINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

METRIC

5 0 10

CONST.REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	22
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 21022 ENGINEER RACHEL T. MERRITT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 8918 ENGINEER TIMI H. SWEET

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SITE 7

(CON'T ON SHEET 21)

SITE 9

(CON'T ON SHEET 23)

DENOTES FILL IN SURFACE WATER

DENOTES TEMPORARY FILL IN SURFACE WATER

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

-SRI3- POT Sta.10+00.000

-SRI3- POT Sta.10+34.000
BEGIN CONSTRUCTION

-SRI3- PC Sta.10+94.505

BEGIN STREAM
-SRI3- Sta.10+81.75
-STRM21- Sta.10+60.000 (7.6m RT)
STREAM PI#5

MATCHLINE -L- STA. 209+80
-SR12- STA. 17+80
SEE SHEET 21

MATCHLINE -L- STA. 213+40
-SR12- STA. 21+30
SEE SHEET 23

MATCHLINE -L- STA. 211+38
-SRI3- STA. 11+38
SEE SHEET 23

EULA MAE D. WORRELL
DB UNKNOWN

WINSTON P. BEST
DB 786 PG 237

BERRY A. PARKS
DB 149 PG 856
DB 122 PG 283
DB 1222 PG 873
DB 149 PG 861

WANDA W. SUTTON
DB 1792 PG 418

ROLAND MILTON GRAY, et als
DB 1408 PG 793

ROLAND GRAY
DB 1792 PG 1625
DB 135 PG 345

WINSTON C. SMITH
DB 1564 PG 219

PROPOSED BUFFER ZONE 1

PROPOSED BUFFER ZONE 2

PROPOSED BUFFER ZONE

FLOOD PRONE AREA

APPROX. GRADING LIMITS

END CULVERT
-STRM21- Sta.11+68.223

-L-
PI Sta 213+21.089
Δ = 52° 49' 32.5" (RT)
L = 2148.218
T = 1157.273
R = 2330.000
e = 0.025

-SRI2-
PI Sta 18+61.590
Δ = 20° 49' 45.6" (RT)
L = 830.690
T = 419.981
R = 2285.000
e = 0.02

-SRI3-
PI Sta 11+83.854
Δ = 20° 15' 48.5" (LT)
L = 176.832
T = 89.349
R = 500.000

NOTES:
See Detail Sheets 2-S & 2-T For Ditch Details

STREAM RESTORATION SITE 21
(SEE SHEET STRM-8)

FILL EXISTING CULVERT

SEE SHT. 68 FOR -SRI2- PROFILE
SEE SHT. 70 FOR -SRI3- PROFILE
SEE SHTS. 46 & 47 FOR -L- PROFILE

RETAIN EXIST. CULVERT

REVISIONS

Permit Drawing
Sheet 20 of 26

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

METRIC 5 0 10

PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	23
R/W SHEET NO.	

CONST. REV.

R/W REV.

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 2922 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 18181 ENGINEER TINA H. SWEET

REVISIONS

-L-
PI Sta 213+21.089
Δ = 52° 49' 32.5" (RT)
L = 2,148.218
T = 1,157.273
R = 2,330.000
e = 0.025

-SR12-
PI Sta 18+61.590
Δ = 20° 49' 45.6" (RT)
L = 830.690
T = 419.981
R = 2,285.000
e = RC

PI Sta 23+60.241
Δ = 19° 57' 03.0" (RT)
L = 174.104
T = 87.942
R = 500.000
e = 0.06

-SR13-
PI Sta 11+06.437
Δ = 23° 15' 01.2" (LT)
L = 101.449
T = 51.432
R = 250.000
e = 0.080

PI Sta 12+20.884
Δ = 3° 05' 06.8" (RT)
L = 128.830
T = 64.431
R = 2,392.500
e = RC

N 25° 38' 53" W
440.633

(102) ROLAND MILTON GRAY, et als
DB 1406 PG 793

(103) WINSTON P. BEST
DB 786 PG 237
DB 163 PG 115

-SR13- PT Sta.12+71.337

MATCHLINE -SR13- STA. 11+85 SEE SHEET 22

MATCHLINE -SR13- STA.15+50 SEE SHEET 24

S 29° 16' 16.0" E
-SR13-

-SR13- PC Sta.15+23.337

MATCHLINE -L- STA. 213+40 SEE SHEET 22

MATCHLINE -L- STA. 216+80 SEE SHEET 24

MATCHLINE -SR12- STA. 21+30 SEE SHEET 22

MATCHLINE -SR12- STA. 24+60 SEE SHEET 24

EXIST R/W

375 mm CONC

300 mm

SR 1702 MARK EDWARDS RD. TO BEST

FILL EXIST. CHANNEL

-SR12-

-SR12- PC Sta.22+72.299

-SR12- PT Sta.24+46.403

S 9° 00' 27.4" E

FLOOD-PRONE AREA

PROPOSED BUFFER ZONE 1

WINSTON P. BEST
DB 786 PG 237
DB 163 PG 115

CHARLES A. PARKS
DB 1491 PG 861

BEGIN CULVERT
-STRM21- Sta.13+73.03

END CULVERT
-STRM21- Sta.13+87.957

TIE-IN EXISTING CHANNEL STREAM RESTORATION SITE 21 (SEE SHEET STRM-8)

END STREAM RESTORATION
-SR12- Sta.23+27.872 =
-STRM21- Sta.14+75.887 (24.84m RT)

NOTE: See Detail Sheets 2-S & 2-T For Ditch Details

SITE 9

(CON'T ON SHEET 22)

DENOTES FILL IN SURFACE WATER

DENOTES TEMPORARY FILL IN SURFACE WATER

SEE SHTS. 68 & 69 FOR -SR12- PROFILE
SEE SHT. 70 -SR13- PROFILE
SEE SHT. 47 FOR -L- PROFILE

PLANS PREPARED BY :
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consulting engineers
5800 FARINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3860
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

Permit Drawing

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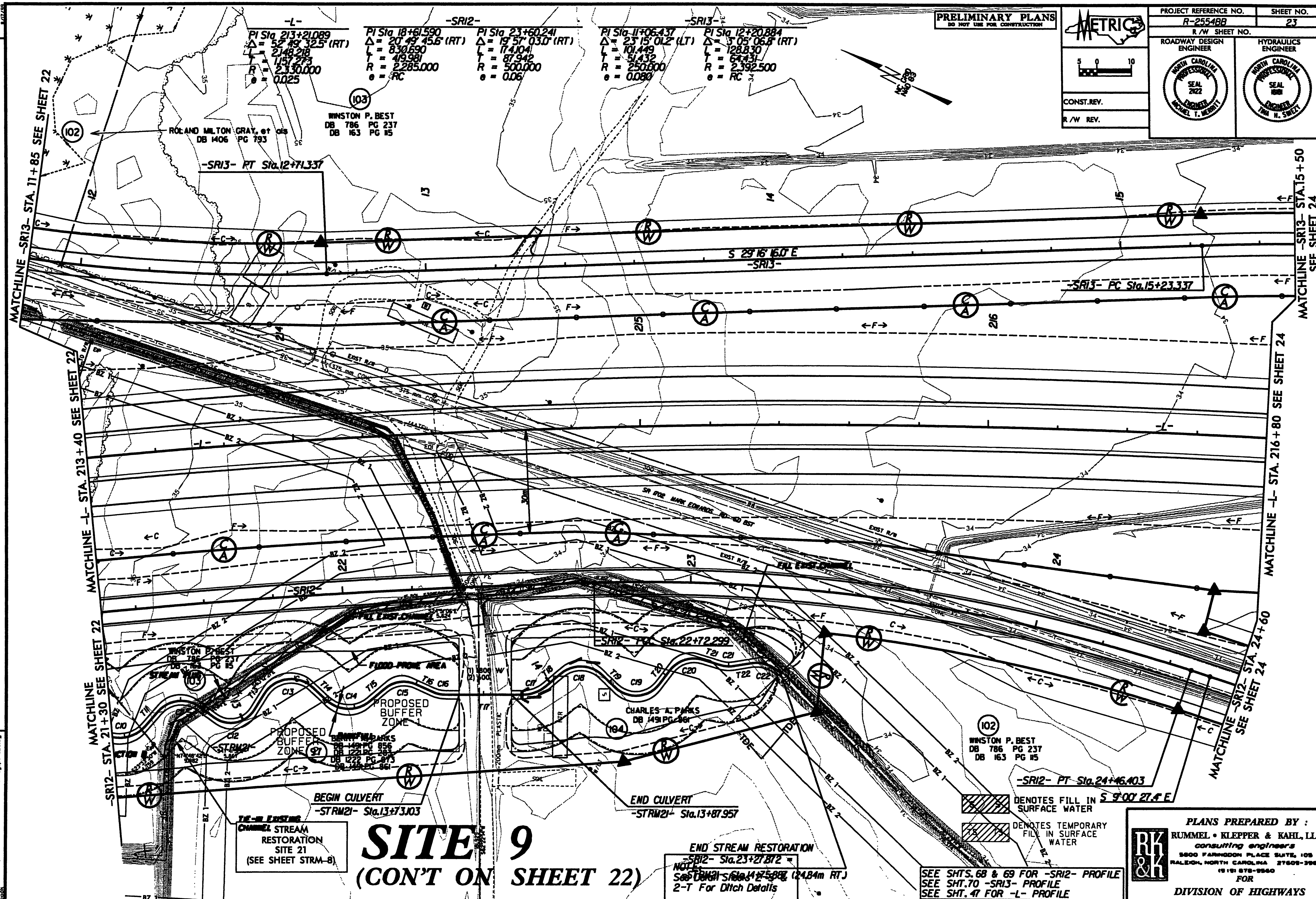
Civil\Roadway\Plans Sheets\Variables\NoContours\r-2554bb_rdpsh_23.dgn



REVISIONS

Permit Drawing

SITE 10

DENOTES FILL IN SURFACE WATER

DENOTES TEMPORARY FILL IN SURFACE WATER

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	24
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 2022 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 16181 ENGINEER TIMA H. SWEZI

CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-SR13- PT Sta.17+51.714

MATCHLINE -SR13- STA. 15+50 SEE SHEET 21

MATCHLINE -SR13- STA. 18+90 SEE SHEET 25

MATCHLINE -L- STA. 216+80 SEE SHEET 23

MATCHLINE -L- STA. 220+20 SEE SHEET 25

MATCHLINE -SR12- STA. 24+60 SEE SHEET 23

103 WINSTON P. BEST
DB 786 PG 237
DB 163 PG 115

104 BEST FARMS, INC.
DB 822 PG 500

S 13°52'37.0" E

S 9°00'27.4" E

END CONSTRUCTION
-SR12- POC Sta.25+15.000

-SR12- POT Sta.26+66.403

HENRY WALKER
DB 595 PG 163

EDITH B. WALKER
DB 1077 PG 294

NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details

SEE SHT.69 FOR -SR12- PROFILE
SEE SHTS.70 & 71 FOR -SR13- PROFILE
SEE SHTS. 47 & 48 FOR -L- PROFILE

-L-	-SR13-
PI Sta 213+21.089	PI Sta 16+38.218
Δ = 52°49'32.5" (RT)	Δ = 15°23'38.9" (RT)
L = 2148.218	L = 228.377
T = 1157.273	T = 114.880
R = 2330.000	R = 850.000
e = 0.025	

PLANS PREPARED BY :
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consulting engineers
3500 FARRINGDON PLACE SUITE, 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

Permit Drawing

REVISIONS

N:\DOT 10\20\9 Corridor\Roadway\Variations\NoContours\v-2554bb_rdy_pah_24.dgn

SITE 10

DENOTES FILL IN SURFACE WATER

DENOTES TEMPORARY FILL IN SURFACE WATER

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10	R-2554BB	24
CONST.REV.	R /W SHEET NO.	
R /W REV.	ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 2922 ENGINEER MICHAEL T. MERRITT	HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 16161 ENGINEER IAN H. SWEZY

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-SR13- PT Sta.17+51.714

MATCHLINE -SR13- STA. 15+50 SEE SHEET 21

MATCHLINE -SR13- STA. 18+90 SEE SHEET 25

MATCHLINE -L- STA. 216+80 SEE SHEET 23

MATCHLINE -L- STA. 220+20 SEE SHEET 25

MATCHLINE -SR12- STA. 24+60 SEE SHEET 23

END CONSTRUCTION
-SR12- POC Sta.25+15.000

-SR12- POT Sta.26+66.403

S 9°00'27.4" E

S 13°52'37.0" E

103 WINSTON P. BEST
DB 786 PG 237
DB 163 PG 115

104 BEST FARMS, INC.
DB 822 PG 500

HENRY WALKER
DB 595 PG 163

EDITH B. WALKER
DB 1077 PG 294

SR 1702 MARK EDWARDS RD

-L-	-SR13-
PI Sta 213+21.089	PI Sta 16+38.218
Δ = 52°49'32.5" (RT)	Δ = 15°23'38.9" (RT)
L = 2148.218	L = 228.377
T = 1157.273	T = 114.880
R = 2330.000	R = 850.000
e = 0.025	

NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details

SEE SHT.69 FOR -SR12- PROFILE
SEE SHTS.70 & 71 FOR -SR13- PROFILE
SEE SHTS. 47 & 48 FOR -L- PROFILE

PLANS PREPARED BY :
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consulting engineers
5800 FARINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

Permit Drawing

REVISIONS

PLOT 10:35
PLOTTED BY: smista
P:\Projects\smista\Wetlands\r-2554bb_r-dy_psh_24.dgn

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	30
R/W SHEET NO.	

5 0 10

CONST. REV.

R/W REV.

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 2822 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 1881 ENGINEER TINA H. SWEET

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SITE 12

REVISIONS

DENOTES FILL IN SURFACE WATER

DENOTES TEMPORARY FILL IN SURFACE WATER

RUSSELL SMITH
DB 1353 PG 68
(88)

(55)
JOHN W. SMITH
DB 1565 PG 44

LINDA F. TAYLOR
DB 1563 PG 485

MARIE P. PEELE
PC A SLIDE 30AA

(89)
PAULA THOMAS
DB 570 PG 25

(75)
EARL E. PARKS
DB 1315 PG 197

NC GRID NAD 83

-SR11- PT Sta. 14+53.809

-SR11- PC Sta. 16+28.801

MATCHLINE -SR11- STA. 13+40 SEE SHEET 29

MATCHLINE -SR11- STA. 16+80 SEE SHEET 31

-SR11-
N 78° 01' 30.0" E

-SR11-

PI Sta 13+65.072	PI Sta 16+68.567
Δ = 17° 04' 30.0" (LT)	Δ = 19° 37' 06.0" (RT)
L = 178.809	L = 78.753
T = 90.072	T = 39.766
R = 600.000	R = 230.000
e = 0.045	e = 0.075

NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details

SEE SHT. 61 FOR -SR11- PROFILE

PLANS PREPARED BY :
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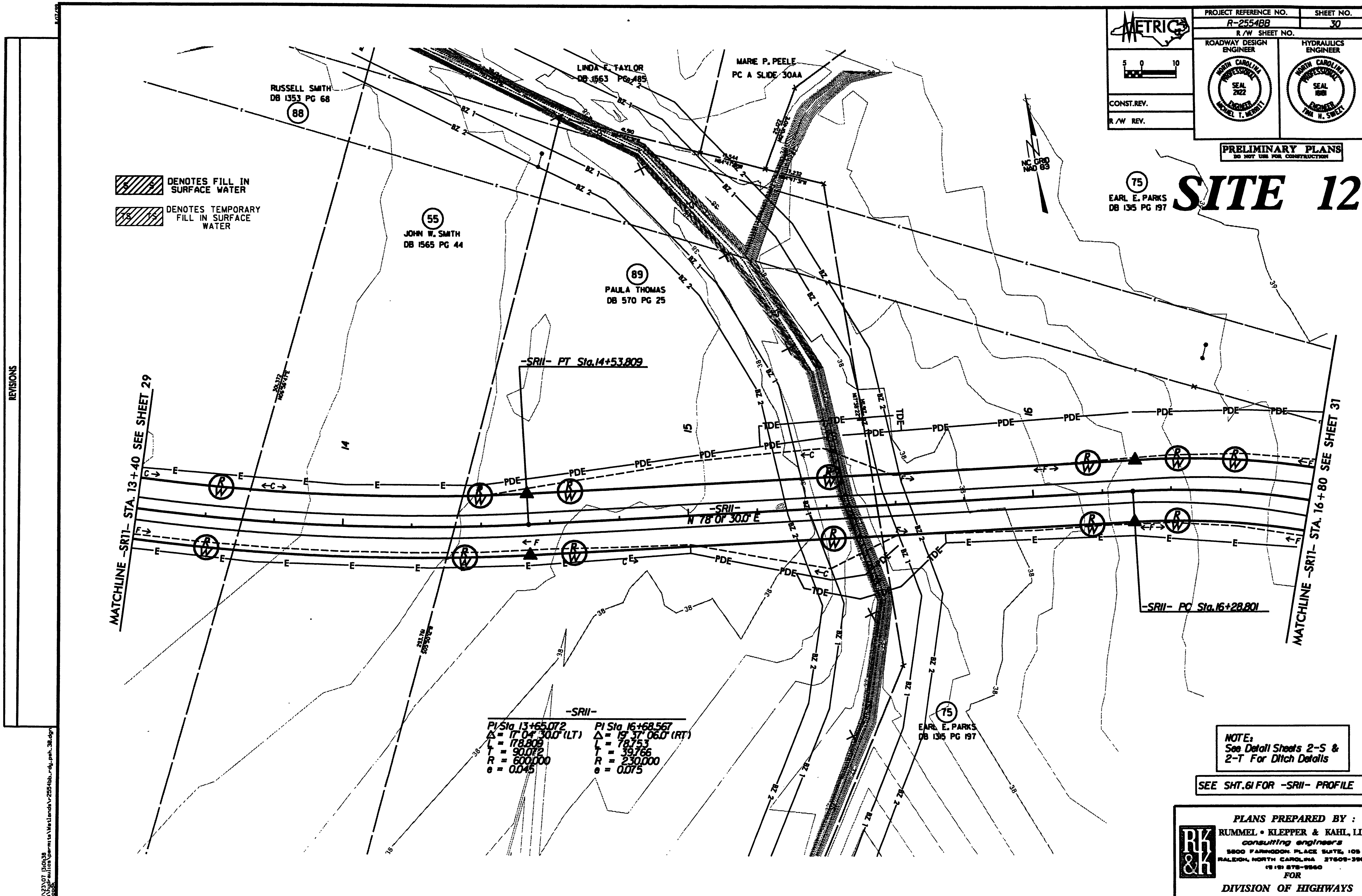
consulting engineers
3500 FARINGDON PLACE SUITE, 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

Permit Drawing


METRIC
PROJECT REFERENCE NO. R-2554BB
SHEET NO. 30
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST.REV.
R/W REV.
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SITE 12
NC GRID NAD 83
REVISIONS
DENOTES FILL IN SURFACE WATER
DENOTES TEMPORARY FILL IN SURFACE WATER
RUSSELL SMITH DB 1353 PG 68
88
LINDA F. TAYLOR DB 1563 PG 485
MARIE P. PEELE PC A SLIDE 30AA
55
JOHN W. SMITH DB 1565 PG 44
89
PAULA THOMAS DB 570 PG 25
75
EARL E. PARKS DB 1315 PG 197
-SRII- PT Sta.14+53.809
-SRII- N 78° 01' 30.0" E
-SRII- PC Sta.16+28.801
MATCHLINE -SR11- STA. 13+40 SEE SHEET 29
MATCHLINE -SR11- STA. 16+80 SEE SHEET 31
-SRII-
PI Sta 13+65.072
Δ = 17° 04' 30.0" (LT)
L = 178.809
T = 90.072
R = 600.000
e = 0.045
PI Sta 16+68.567
Δ = 19° 37' 06.0" (RT)
L = 78.753
T = 39.766
R = 230.000
e = 0.075
NOTE: See Detail Sheets 2-S & 2-T For Ditch Details
SEE SHT.61 FOR -SRII- PROFILE
PLANS PREPARED BY :
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consulting engineers
5800 FARRINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
FOR
DIVISION OF HIGHWAYS
Permit Drawing

PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	32
R/W SHEET NO.	

METRIC

5 0 10

CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 2922 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 18818 ENGINEER TINA H. SWEET

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

DENOTES FILL IN SURFACE WATER

DENOTES TEMPORARY FILL IN SURFACE WATER

N 64° 09' 45.0" E

-Y15- STA.13+00.000
BEGIN CONSTRUCTION

-Y15-

MATCHLINE -Y15- STA. 15+60 SEE SHEET 16

78
JAMES W. SMITH
DB 797 PG 142
DB 1351 PG 412

78
JAMES W. SMITH
DB 797 PG 142
DB 1351 PG 412

80
RAYMOND D. SMITH, ETALS
DB 877 PG 654

82
DANIEL L. SMITH
DB 1283 PG 806

RAYMOND D. SMITH
DB 1093 PG 440

80A

80
RAYMOND D. SMITH, ETALS
DB 877 PG 654

ISFD
ISBKD
HTR
CONC
METER
TV
EXIST R/W
SOIL & GAR
(2)TV
300 mm CONC
375 mm CONC
1200 mm
1800mm RCP
SR 1705 HOOD SWAMP RD SB ST
375mm CONC
37 CONC
39.624
S60°59'02"W
EP

SITE 13

NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details

SEE SHT.63 FOR -Y15- PROFILE

PLANS PREPARED BY :
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consulting engineers
3800 FARINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

Permit Drawing

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PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	32
R/W SHEET NO.	

METRIC

5 0 10

CONST. REV.

R/W REV.

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 2922 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 16181 ENGINEER TINA H. SWEET

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

DENOTES FILL IN SURFACE WATER

DENOTES TEMPORARY FILL IN SURFACE WATER

-Y15- ST.A13+00.000
BEGIN CONSTRUCTION

N 61° 09' 45.0" E

78
JAMES W. SMITH
DB 797 PG 142
DB 1351 PG 412

78
JAMES W. SMITH
DB 797 PG 142
DB 1351 PG 412

80
RAYMOND D. SMITH, ETALS
DB 1177 PG 654

82
DANIEL L. SMITH
DB 1283 PG 806

RAYMOND D. SMITH
DB 1093 PG 440

80A

80
RAYMOND D. SMITH, ETALS
DB 1177 PG 654

MATCHLINE -Y15- STA. 15+60 SEE SHEET 16

SITE 13

NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details

SEE SHT. 63 FOR -Y15- PROFILE

PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
3500 FARRINGDON PLACE SUITE, 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

Permit Drawing

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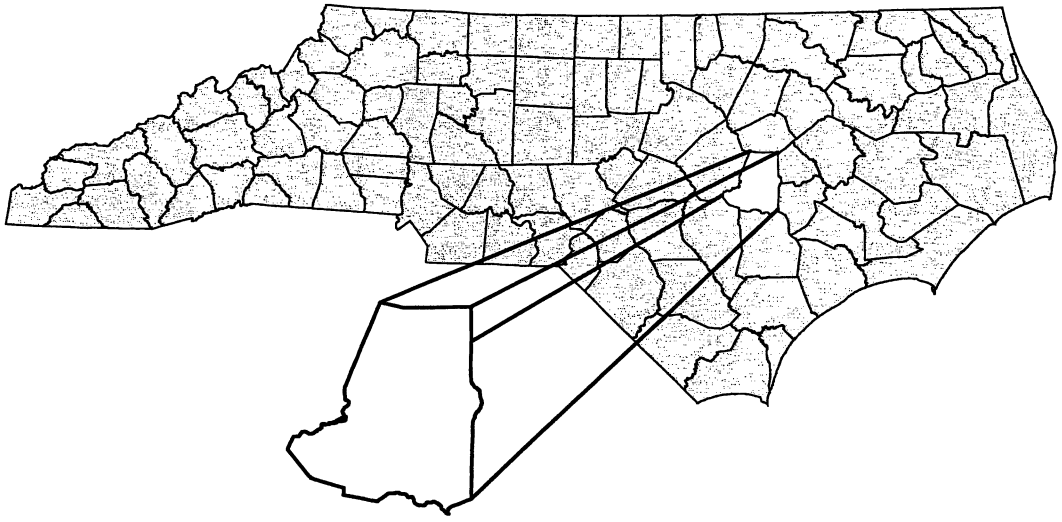
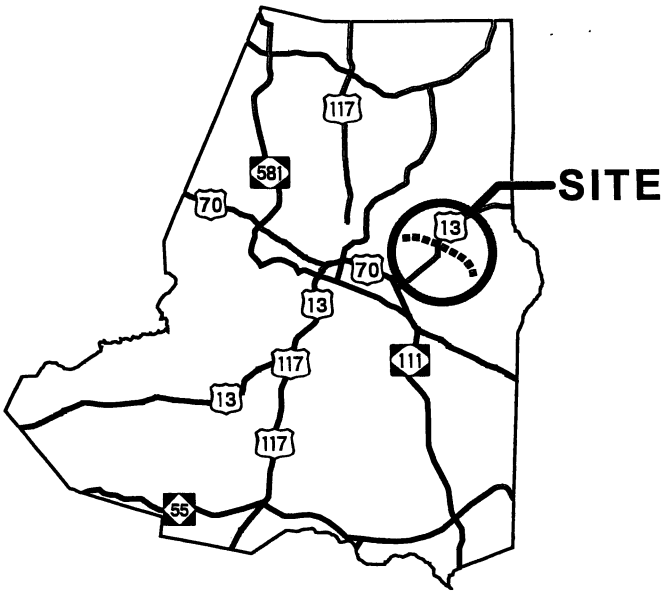
NORTH CAROLINA



WAYNE



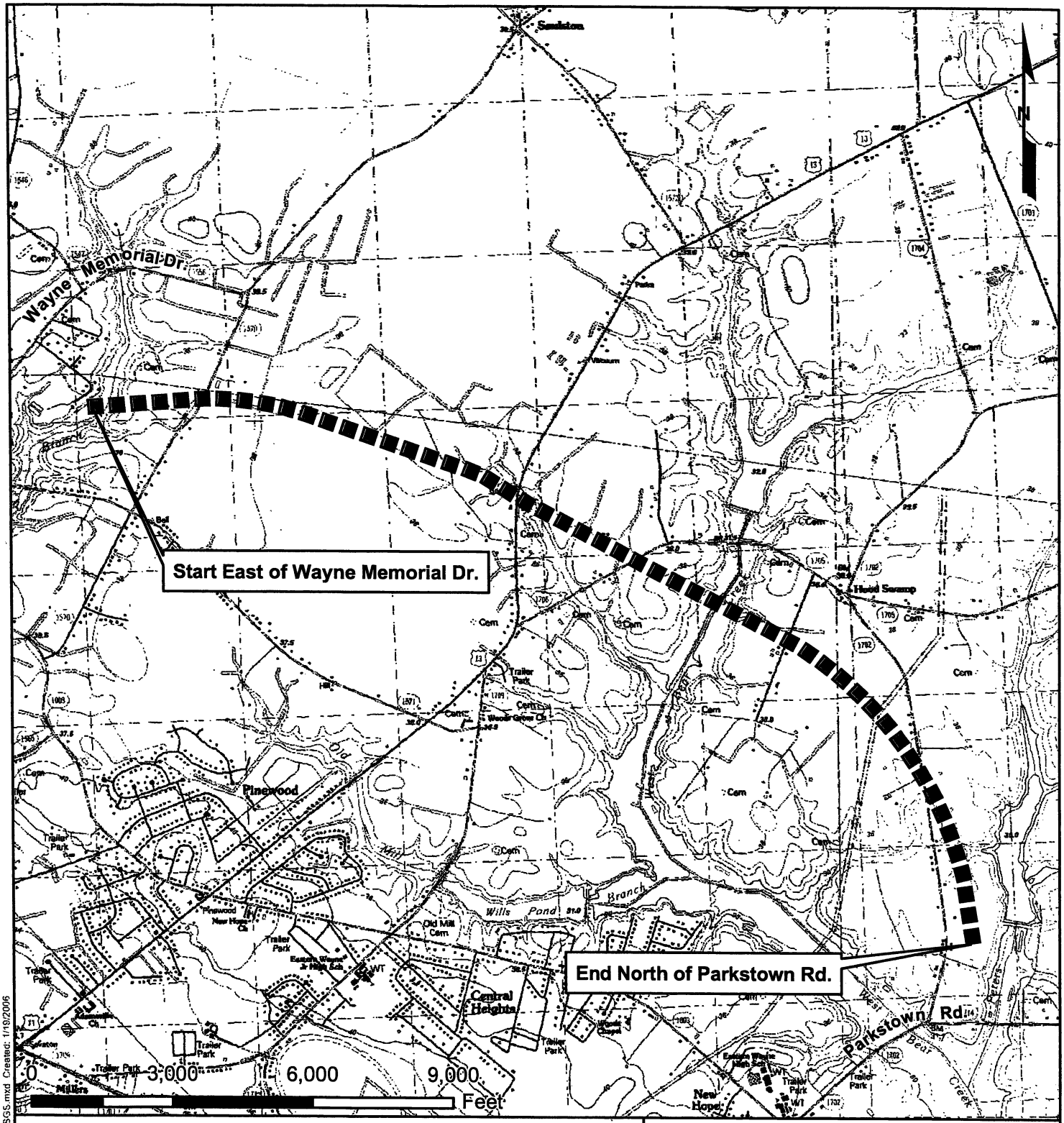
VICINITY MAPS

NCDOT

DIVISION OF HIGHWAYS
WAYNE COUNTY
PROJECT: 34461.1.3 (R-2554BB)
US 70 BYPASS

10/22/07

Buffer Drawing



1 inch equals 3,000 feet

LOCATION

NCDOT

DIVISION OF HIGHWAYS
WAYNE COUNTY
PROJECT: 34461.1.3 (R-2554BB)
US 70 BYPASS

Buffer Drawing
Sheet 2 of 38

10/22/07

Source: USGS 7.5 Minute Quadrangle, NE Goldsboro & Jason, NC

\\Dyd-21\BRIDGE_Maps\Wayne_2554BB_US70\R-2554BB_USGS.mxd Created: 1/19/2006

BUFFER IMPACTS SUMMARY

SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
			ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (m^2)	ZONE 2 (m^2)	TOTAL (m^2)	ZONE 1 (m^2)	ZONE 2 (m^2)	TOTAL (m^2)	ZONE 1 (m^2)	ZONE 2 (m^2)
1	Bridge	-L- 153+60		X					996.7	683.2	1679.9		
2	Roadway	-L- 171+30 +/-	X						1509.9	938.5	2448.4		
3	Roadway	-Y14RPB- 14+00 TO -Y14RPD- 13+00 +/-	X						6589.4	4494.8	11084.2		
4	Roadway	- 196+50 TO 199+00 +	X						4933.3	2853.6	7786.9		
5	Roadway	-Y17- 14+40 +/-	X			650.3	409.6	1059.9					
8	Roadway	-SR12- 18+00 +/-	X						2735.6	1950.3	4685.9		
9	Roadway	-SR13- 10+30 TO -SR12- 23+40 +/-	X						6875.8	4733.1	11608.9	6884.9	4339.8
10	Roadway	-SR13- 18+30 +/-	X						1724.5	1238.6	2963.1		
11	Roadway	-Y12- 18+50 +/-	X			128.3	83.7	212.0					
12	Roadway	-SR11- 15+45 +/-	X						833.0	469.5	1302.5		
13	Roadway	-Y15- 15+20 +/-	X			547.4	334.2	881.6					
TOTAL:						1326.0	827.5	2153.5	26198.2	17361.6	43559.8	6884.9	4339.8

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
PROJECT: 34461.1.3 (R-2554BB)

10/31/2007

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Buffer Drawing
Sheet 3 of 38

BUFFER IMPACTS SUMMARY

SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	IMPACT TYPE: ROAD CROSSING	IMPACT TYPE: BRIDGE	IMPACT TYPE: PARALLEL IMPACT	ALLOWABLE: ZONE 1 (ft^2)	ALLOWABLE: ZONE 2 (ft^2)	ALLOWABLE: TOTAL (ft^2)	MITIGABLE: ZONE 1 (ft^2)	MITIGABLE: ZONE 2 (ft^2)	MITIGABLE: TOTAL (ft^2)	BUFFER REPLACEMENT: ZONE 1 (ft^2)	BUFFER REPLACEMENT: ZONE 2 (ft^2)
1	Bridge	-L- 153+60		X					10728	7354	18082		
2	Roadway	-L- 171+30 +/-	X						16252	10102	26354		
3	Roadway	-Y14RPB- 14+00 TO -Y14RPD- 13+00 +/-	X						70928	48382	119309		
4	Roadway	-L- 196+50 TO 199+00 +	X						53102	30716	83817		
5	Roadway	-Y17- 14+40 +/-	X			7000	4409	11409					
8	Roadway	-SR12- 18+00 +/-	X						29446	20993	50439		
9	Roadway	-SR13- 10+30 TO -SR12- 23+40 +/-	X						74010	50947	124957	74108	46713
10	Roadway	-SR13- 18+30 +/-	X						18562	13332	31895		
11	Roadway	-Y12- 18+50 +/-	X			1381	901	2282					
12	Roadway	-SR11- 15+45 +/-	X						8966	5054	14020		
13	Roadway	-Y15- 15+20 +/-	X			5892	3597	9489					
TOTAL:						14273	8907	23180	281995	186879	468874	74108	46713

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
PROJECT: 34461.1.3 (R-2554BB)

10/31/2007

Buffer Drawing Sheet 4 of 34

R:\2-misc\Hydro\Permit\BUFFER IMPACT SUMMARY Rev.xls

BUFFER IMPACTS SUMMARY

		WETLANDS IN BUFFER		REMAINING BUFFER	
Site	Station	ZONE 1 (m^2)	ZONE 2 (m^2)	ZONE 1 (m^2)	ZONE 2 (m^2)
10	-SR13- 18+30 +/-	74.8	0.0	1649.7	1238.6
		74.8	0.0	1649.7	1238.6

Buffer Drawing Sheet 5 of 38

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
PROJECT: 34461.1.3 (R-2554BB)

10/31/2007

BUFFER IMPACTS SUMMARY

		WETLANDS IN BUFFER		REMAINING BUFFER	
Site	Station	ZONE 1 (ft^2)	ZONE 2 (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
10	-SR13- 18+30 +/-	805	0	17757	13332
		805	0	17757	13332

Buffer Drawing Sheet 2 of 2

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
PROJECT: 34461.1.3 (R-2554BB)

10/31/2007

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PROP. NO.	PROPERTY OWNER NAME	DEED BOOK AND PAGE
1	CARRIE MAYE LEWIS	PC E SLIDE 21
44	DAVID H. WARD	DB 1792 PG 491
49	J.M. PATE JR.	DB 1471 PG 657
50	GROVER A. SMITH	DB 1316 PG 60
51	JOHN W. SMITH	DB 1249 PG 502
57	ROBERT G. THOMAS	DB 898 PG 363
58	BELFAST-PATETOWN SANITARY DIST.	DB 1379 PG 749
59 / 67	J. ISAAC GURLEY, FARMS, INC.	DB 822 PG 455; DB 822 PG 453; DB 822 PG 463; DB 822 PG 430; DB 1560 PG 547
64 / 130	DONNIE J. WADE	PC 1 SLIDE 98
75	EARL E. PARKS	DB 1315 PG 197
80	RAYMOND D. SMITH, ETALS	DB 1177 PG 654
81	ELTON L. SMITH	DB 1769 PG 927
86	JAMES P. SMITH, JR.	DB 104 PG 118
87	ROBERT PARKS	DB 1504 PG 870
88 / 89	PAULA THOMAS	DB 570 PG 25
95	WINSTON C. SMITH	DB 1564 PG 219
102 / 103	WINSTON P. BEST	DB 786 PG 237; DB 163 / 115
97 / 101 / 163	BERRY A. PARKS	DB 1491 PG 856; DB 1221 PG 283; DB 1222 PG 873; DB 1491 PG 861
98	WANDA W. SUTTON	DB 1792 PG 149
99	DARRYL LEE CARLYLE	DB 1351 PG 602
100	ROLAND GRAY	DB 292 PG 462; DB 1512 PG 345
104	CHARLES A. PARKS	DB 1491 PG 861
104	BEST FARMS	DB 822 PG 500
?	EULA MAE W. WORRELL	UNKNOWN

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
PROJECT: 34461.1.3 (R-2554BB)

10/22/2007

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Buffer Drawing
Sheet 7 of 38

PROJECT: R-2554BB

CONTRACT:

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

VICINITY MAP

RW PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
WAYNE COUNTY

METRIC

ALL DIMENSIONS IN THESE PLANS ARE IN METERS UNLESS OTHERWISE SHOWN

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2554BB	1	
STATE FED.NO.	F.A.PROJ.NO.	DESCRIPTION	
34461.1.3	NHF-70(30)	PE	
34461.2.7		R/W	

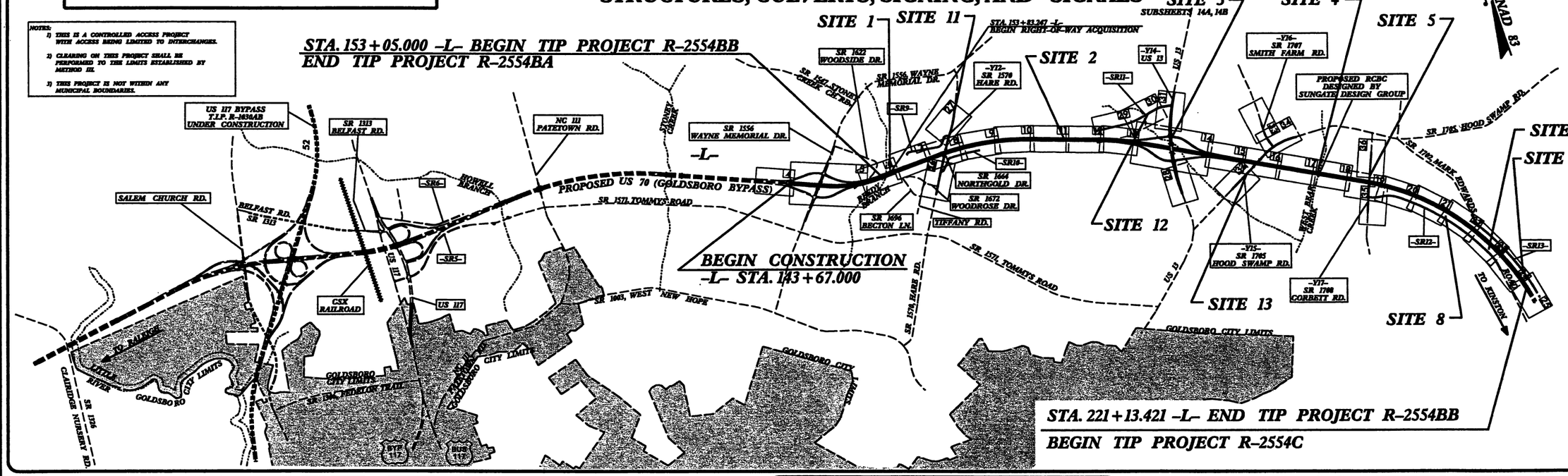
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

LOCATION: US 70 (GOLDSBORO BYPASS)
FROM EAST OF SR 1556 (WAYNE MEMORIAL DRIVE)
TO WEST OF SR 1714 (PARKSTOWN ROAD)

TYPE OF WORK: GRADING, PAVING, DRAINAGE,
STRUCTURES, CULVERTS, SIGNING, AND SIGNALS

NOTES:
1) THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.
2) CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.
3) THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

STA. 153+05.000 -L- BEGIN TIP PROJECT R-2554BB
END TIP PROJECT R-2554BA



GRAPHIC SCALE

5 0 10
PLANS

5 0 10
PROFILE (HORIZONTAL)

1 0 2
PROFILE (VERTICAL)

DESIGN DATA

ADT 2008 = 22,172
ADT 2028 = 37,852
DHV = 10 %
D = 55 %
T = 10 % *
V = 110 km/h

* TTST 6% DUAL 4%

PROJECT LENGTH

Length Roadway TIP Project R-2445B ..... 6.685 km

**Length Structure TIP Project R-2445B ..... 0.123 km*

TOTAL LENGTH TIP Project R-2445B ..... 6.808 km
(4.23 MILES)

**USED EBL -L- STATIONS FOR STRUCTURE LENGTHS*

PLANS PREPARED BY :
RUMMEL, KLEPPER & KAHL, LLP
consulting engineers
5800 FARRINGDON PLACE, SUITE 105
RALEIGH, NORTH CAROLINA 27609
(919) 878-9560

FOR
DIVISION OF HIGHWAYS

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: TBD

LETTING DATE:

B. KEITH SKINNER, P.E.
PROJECT ENGINEER

MICHAEL T. MERRITT, P.E.
PROJECT DESIGN ENGINEER

NCDOT CONTACT: Scott Blevins, P.E.
Project Engineer-Project Services

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR DATE

Buffer Drawing
Sheet 2 of 3R

10/23/07 #6403
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PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	6
R /W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 21122 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 18181 ENGINEER TINA H. SWEET

METRIC 5 0 10

CONST. REV.

R /W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SITE 1

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

REVISIONS

NC GRID NAD 83

-L- POC Sta.151+70.000=
-Y8RPA- POT Sta.10+00.000 (14.2 m LT)

-Y18- PT Sta.10+63.659

-L- POC Sta.152+00.000
-Y18- PC Sta.10+00.000 (35.3 m LT)

-Y18- POT Sta.11+26.926

-Y8RPA- TS Sta.10+47.479

NCDOT
DB 1472 PG 411

JAMES ONEIL SMITH
DB 1801 PG 785

ALBERT ONEIL SMITH
DB 827 PG 742

LINDA A. CORRIERE
DB 1461 PG 655

DAVID KENNEDY
DB 823 PG 873

ROBERT R. EARNEST
DB 834 PG 484
DB 795 PG 726

-L- ST Sta.152+82.221

JAMES A. ADAMS, JR.
DB 1548 PG 425

CARRIE MAE LEWIS
PC E SLIDE 21

TREEBY BRANCH

NCDOT
DB 1744 PG 533

BEG. WW FENCE TIE TO EXIST.

-L- CL Sta.151+97.221

-L- ON P/L 45m (147.64 ft.)

-L- +02.660
17.2m (56.43 ft.)
END WW FENCE

WEST SIDE OF BRIDGE IS PERMITTED UNDER R-2554BA

BEG. WW FENCE

END WW FENCE

-L- +19.170
45m (147.64 ft.)

ROBERT R. EARNEST
DB 1216 PG 878

JAMES A. GILLS
DB 1837 PG 791

NCDOT
DB 1780 PG 666

NCDOT
DB 1472 PG 411

MATCHLINE -L- STA. 151+00 SEE SHEET 5

MATCHLINE -L- STA. 154+40 SEE SHEET7

STA. 152+90.000 -L- BEGIN TIP PROJECT R-2554BB
END TIP PROJECT R-2554BA

-Y8RPA-
Pls Sta 10+90.824
Θs = 4°08'16.9"
Ls = 65.000
LT = 43.345
ST = 21.677

-Y18-
Pl Sta 10+31.949
Δ = 12°09'28.7" (LT)
L = 63.659
T = 31.949
R = 300.000

-L-
Pl Sta 149+88.602
Δ = 20°44'59.6" (LT)
L = 421.909
T = 213.294
R = 1165.000
e = 0.05

Pls Sta 152+25.558
Θs = 2°05'24.7"
Ls = 85.000
Lt = 66.674
ST = 28.337

-Y8RPD-
Pls Sta 10+21.668
Θs = 4°34'44.9"
Ls = 65.000
LT = 43.335
ST = 21.668

-L- CS Sta.151+19.886=
-Y8RPD- CS Sta.10+08.000 (14.2m RT)

SEE SHTS. 38 & 39 FOR -L- PROFILE
SEE SHT. 49 FOR -Y8RPA- PROFILE
SEE SHT. 50 FOR -Y8RPD- PROFILE

NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details

NOTE: See Detail Sheet 2-R For Bridge Sketch Showing Pavement In Relation To Bridge Width

PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
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(919) 875-9360
FOR
DIVISION OF HIGHWAYS

Buffer Drawing
Sheet 9 of 38

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R:\Projects\Projects\Buffers\WoContours\V-2554bb_rdy.prjph_86.dgn
05:06:06

PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	6
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 21221 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 19181 ENGINEER TINA H. SWEEZY

METRIC 5 0 10

CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SITE 1

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE

-L- POC Sta.151+70.000=
-Y8RPA- POT Sta.10+00.000 (142 m LT)

-Y18- PT Sta.10+63.659

-L- POC Sta.152+00.000
-Y18- PC Sta.10+00.000 (35.3 m LT)

-Y18- POT Sta.11+26.926

NC GRID NAD 83

NCDOT DB 1472 PG 411

-Y8RPA- TS Sta.10+47.479

JAMES ONEIL SMITH DB 1801 PG 785

LINDA A. CORRIERE DB 1461 PG 655

ALBERT ONEIL SMITH DB 827 PG 742

DAVID KENNEDY DB 823 PG 873

ROBERT R. EARNEST DB 834 PG 484 DB 795 PG 726

-L- SP Sta.152+82.221

JAMES A. ADAMS, JR. DB 1548 PG 425

CARRIE MAE LEWIS DB 1021 PG 21

TREELEY BRANCH

-L- ON P/L 45m (147.64 ft)

NCDOT DB 1744 PG 533

WEST SIDE OF BRIDGE IS PERMITTED UNDER R-2554BA

BEG. WW FENCE TIE TO EXIST.

-L- +02.660 17.2m (56.43 ft) END WW FENCE

N 85° 28' 00.0" W

N 87° 00' 00.0" E

MATCHLINE -L- STA. 151+00 SEE SHEET 5

MATCHLINE -L- STA. 154+40 SEE SHEET 7

END WW FENCE

BEG. WW FENCE

-L- +19.170 45m (147.64 ft)

ROBERT R. EARNEST DB 1216 PG 878

-L- POC Sta.151+19.886=
-Y8RPD- CS Sta.10+09.000 (14.2m RT)

-L- CS Sta.151+97.221

-L- ON P/L 45m (147.64 ft)

NCDOT DB 1744 PG 533

JAMES A. GILL, JR. DB 1837 PG 191

NCDOT DB 1472 PG 411

NCDOT DB 1780 PG 666

-Y8RPA-
PIs Sta 10+90.824
Θs = 4°08'16.9"
Ls = 65.000
LT = 43.345
ST = 21.677

-Y18
PI Sta 10+31.949
Δ = 12°09'28.1" (LT)
T = 63.659
L = 119.949
R = 300.000

-L-
PI Sta 149+88.602
Δ = 20°44'59.6" (LT)
T = 421.909
L = 843.294
R = 1165.000
e = 0.05

PIs Sta 152+25.558
Θs = 2°05'24.7"
Ls = 65.000
LT = 86.671
SΘ2 = 28.337

-Y8RPD-
PIs Sta 10+21.668
Θs = 4°34'44.9"
Ls = 65.000
LT = 43.335
ST = 21.668

STA. 152+90.000=L= BEGIN TIP PROJECT R-2554BB

END TIP PROJECT R-2554BA

SEE SHTS. 38 & 39 FOR -L- PROFILE
SEE SHT. 49 FOR -Y8RPA- PROFILE
SEE SHT. 50 FOR -Y8RPD- PROFILE

NOTE: See Detail Sheets 2-S & 2-T For Ditch Details

NOTE: See Detail Sheet 2-R For Bridge Sketch Showing Pavement In Relation To Bridge Width

PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
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(919) 878-9560
FOR
DIVISION OF HIGHWAYS

Border Drawing

REVISIONS

R-2554bb_rdy_pah_86.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CONST.REV.	
R/W REV.	

METRIC 5 0 10

NORTH CAROLINA PROFESSIONAL SEAL 2422 ENGINEER MICHAEL T. MERRITT

NORTH CAROLINA PROFESSIONAL SEAL 1981 ENGINEER TIMOTHY H. SWEET

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SITE 2

(CON'T ON SHEET 12)

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

NC GRID NAD 83

JOHN W. SMITH
DB 1249 PG 502
51

169

170

111

MATCHLINE -L- STA. 168+20 SEE SHEET 10

MATCHLINE -L- STA. 171+60 SEE SHEET 12

-L- S 71°24'57.0" E

368.830
S53°42'48"E

708.730
N53°59'48"W

400mm WW/IS ELEC

45m

Δ2

BZ 1

BZ 2

49
ROBERT THOMAS
DB 875 PG 720

50
GROVER A. SMITH
DB 1316 PG 60

50
GROVER A. SMITH
DB 1316 PG 60

NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details

SEE SHT. 41 FOR -L- PROFILE

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FOR
DIVISION OF HIGHWAYS

Buffer Drawing
Sheet 11 of 38

REVISIONS

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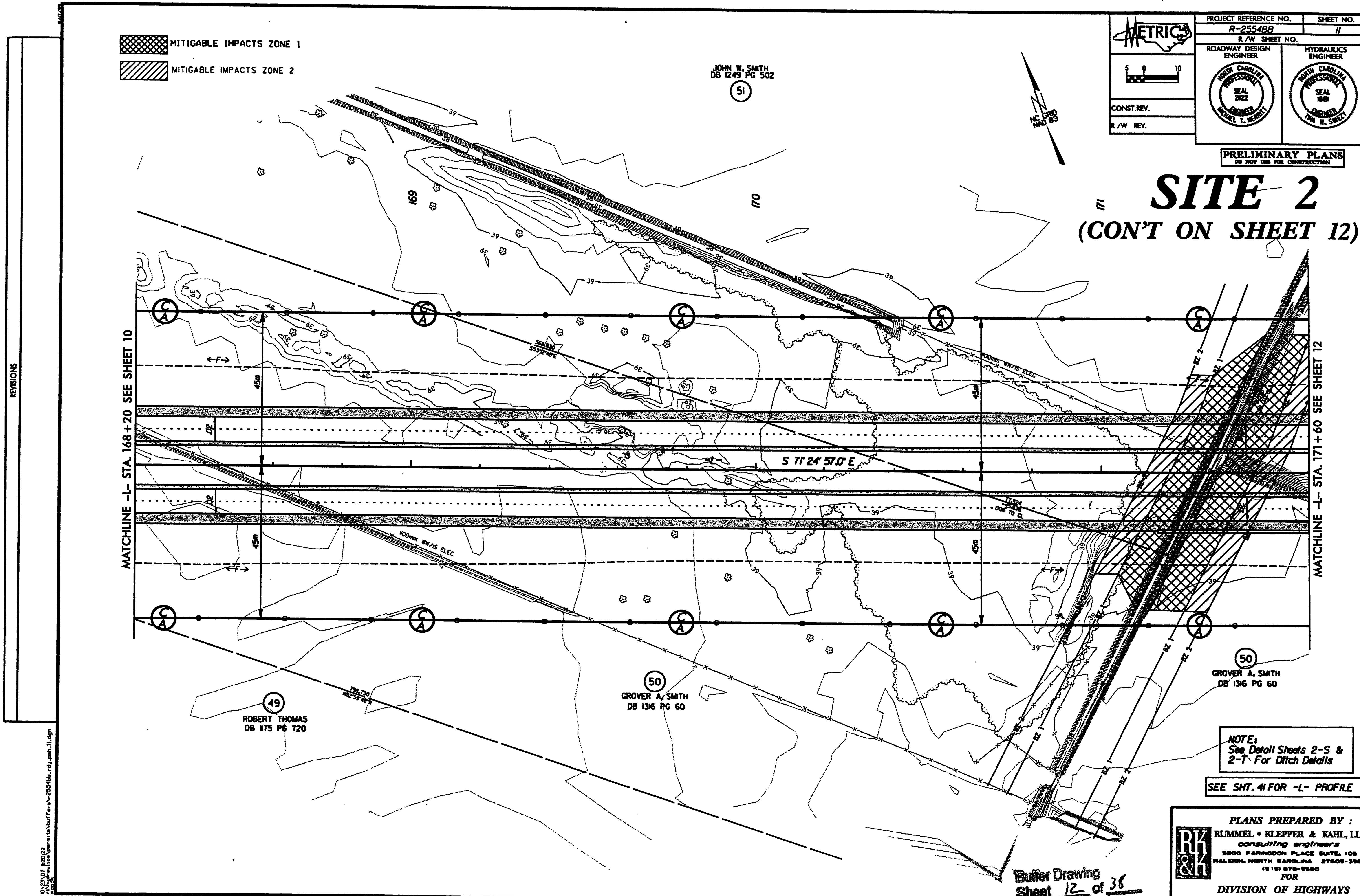

MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
PROJECT REFERENCE NO. R-2554BB
SHEET NO. 11
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
METRIC
CONST.REV.
R/W REV.
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SITE 2
(CON'T ON SHEET 12)
JOHN W. SMITH
DB 1249 PG 502
MATCHLINE -L- STA. 168+20 SEE SHEET 10
MATCHLINE -L- STA. 171+60 SEE SHEET 12
S 71° 24' 57.0" E
100mm WW/IS ELEC
GROVER A. SMITH
DB 1316 PG 60
ROBERT THOMAS
DB 875 PG 720
NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details
SEE SHT. 41 FOR -L- PROFILE
PLANS PREPARED BY :
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FOR
DIVISION OF HIGHWAYS
REVISIONS
Buffer Drawing
Sheet 12 of 38

PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	12
R/W SHEET NO.	

METRIC

5 0 10

CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 2022 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 16181 ENGINEER TINA H. SWEET

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

SITE 2

(CON'T ON SHEET 11)

MITIGABLE IMPACTS ZONE 2

NC GRID NAD 83

172 173 174

(50) GROVER A. SMITH DB 1316 PG 60

(53) MARIE F. BEST DB 1353 PG 893

MATCHLINE -L- STA. 171+60 SEE SHEET 11

MATCHLINE -L- STA. 175+00 SEE SHEET 13

S 71° 24' 57.0" E

-L-

+03.508

-L- TS Sta.174+02.235

-L- SC Sta.174+62.235

-L-

PIs Sta 174+42.235	PI Sta 177+14.130
Θs = 0° 29' 15.8"	Δ = 8° 14' 41.0" (RT)
Ls = 60.000	L = 502.921
LT = 40.000	T = 251.896
ST = 20.000	R = 3,495.000
	e = 0.02

NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details

SEE SHT. 41 FOR -L- PROFILE

Buffer Drawing Sheet 13 of 38

PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
3800 FAIRNOOK PLACE SUITE, 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

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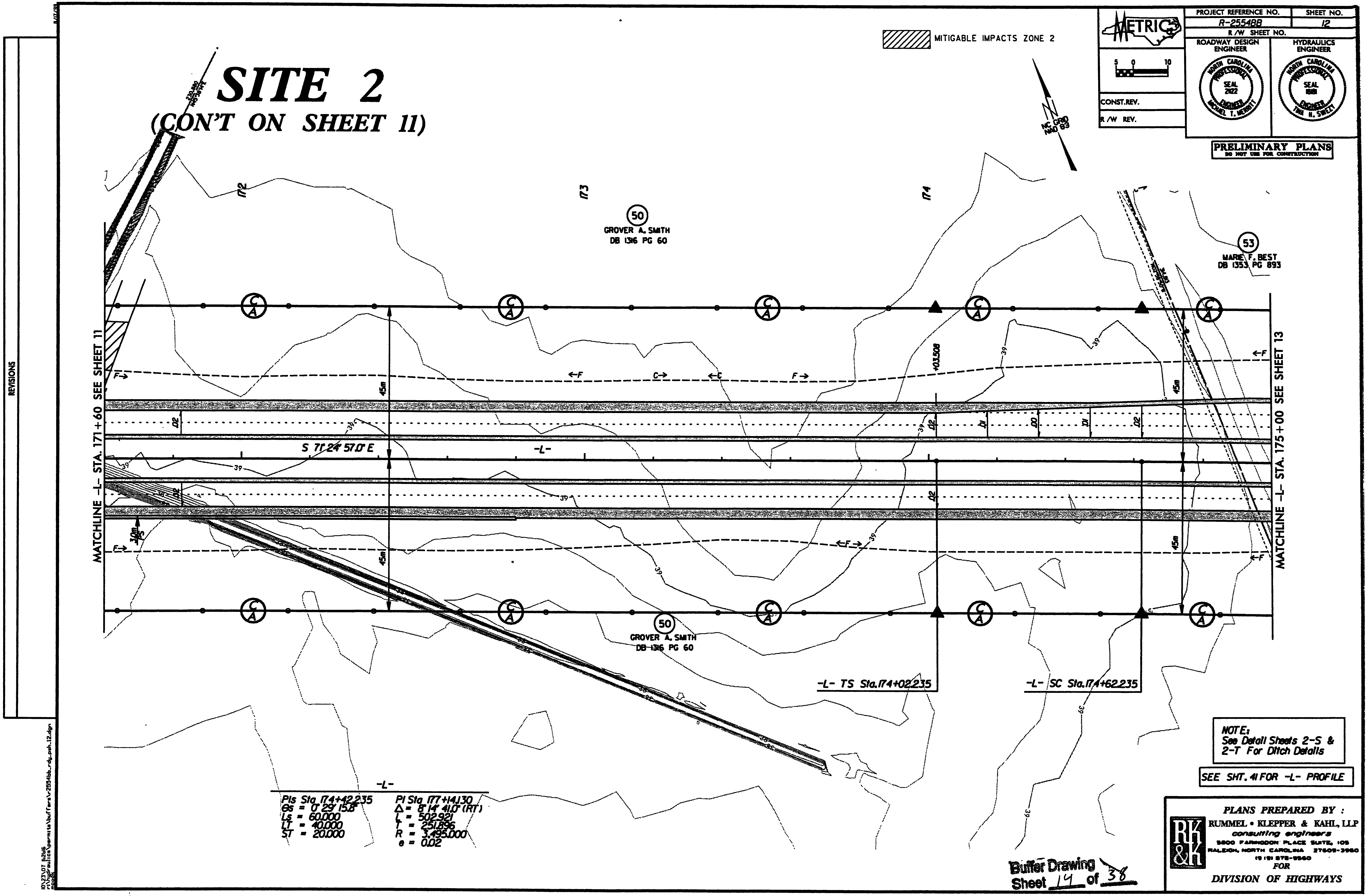
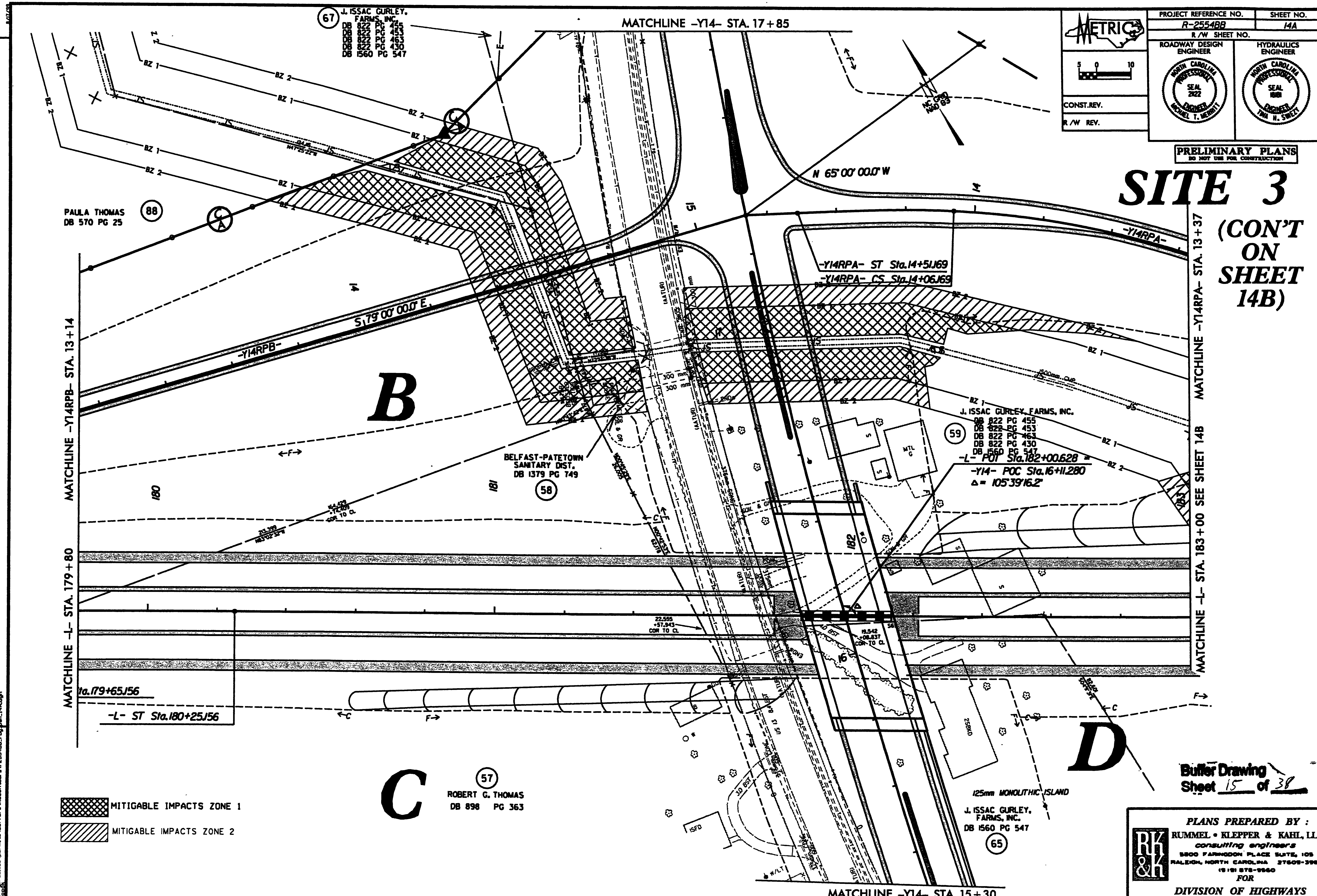
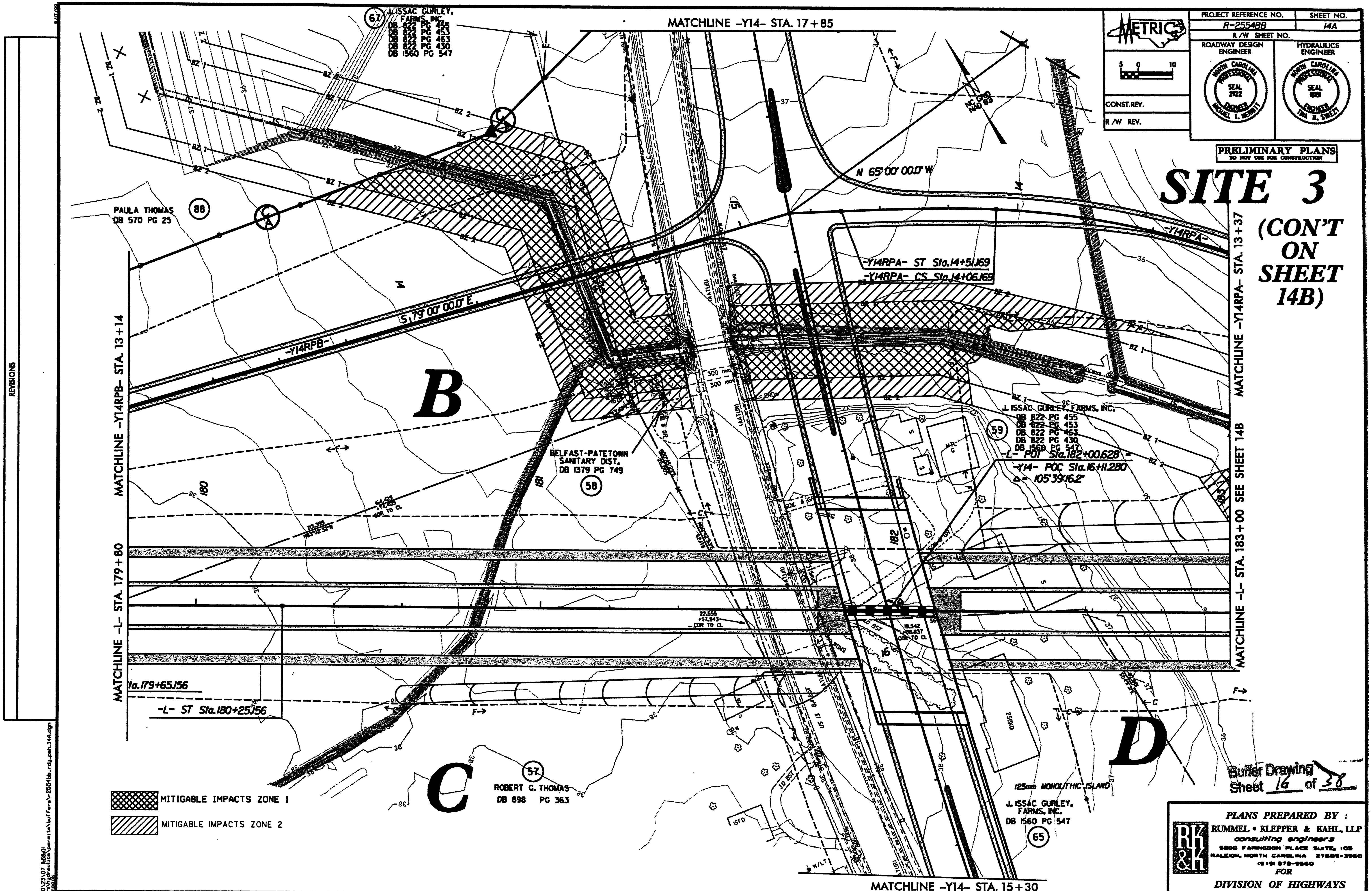

SITE 2
(CON'T ON SHEET 11)
MITIGABLE IMPACTS ZONE 2
METRIC
PROJECT REFERENCE NO.
R-2554BB
SHEET NO.
12
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST. REV.
R/W REV.
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
NC GRID NAD 83
REVISIONS
172
173
174
50
GROVER A. SMITH
DB 1316 PG 60
53
MARIE F. BEST
DB 1353 PG 893
MATCHLINE -L- STA. 171+60 SEE SHEET 11
MATCHLINE -L- STA. 175+00 SEE SHEET 13
S 71° 24' 57.0" E
-L-
45m
-L- TS Sta.174+02.235
-L- SC Sta.174+62.235
NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details
SEE SHT. 41 FOR -L- PROFILE
-L-
PIs Sta 174+42.235
θs = 0° 29' 15.8"
Ls = 60.000
LT = 40.000
ST = 20.000
PI Sta 177+14.130
Δ = 8° 14' 41.0" (RT)
L = 502.921
T = 251.896
R = 3,495.000
e = 0.02
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
FOR
DIVISION OF HIGHWAYS
Buffer Drawing
Sheet 14 of 38



MATCHLINE -Y14- STA. 17+85
PROJECT REFERENCE NO.
R-2554BB
SHEET NO.
14A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
METRIC
CONST.REV.
R/W REV.
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SITE 3
(CON'T ON SHEET 14B)
J. ISSAC GURLEY, FARMS, INC.
DB 822 PG 455
DB 822 PG 453
DB 822 PG 463
DB 822 PG 430
DB 1560 PG 547
67
PAULA THOMAS
DB 570 PG 25
88
N 65° 00' 00.0" W
S 79° 00' 00.0" E
-Y14RPB-
-Y14RPA-
-Y14RPA- ST Sta.14+51.169
-Y14RPA- CS Sta.14+06.169
B
C
D
MATCHLINE -Y14RPB- STA. 13+14
MATCHLINE -Y14RPA- STA. 13+37
MATCHLINE -L- STA. 183+00 SEE SHEET 14B
MATCHLINE -L- STA. 179+80
BELFAST-PATETOWN SANITARY DIST.
DB 1379 PG 749
58
J. ISSAC GURLEY FARMS, INC.
DB 822 PG 455
DB 822 PG 453
DB 822 PG 463
DB 822 PG 430
DB 1560 PG 547
59
-L- POT Sta.182+00.628 =
-Y14- POC Sta.16+11.280
Δ = 105°39'16.2"
Sta.179+65.156
-L- ST Sta.180+25.156
ROBERT G. THOMAS
DB 898 PG 363
57
125mm MONOLITHIC ISLAND
J. ISSAC GURLEY, FARMS, INC.
DB 1560 PG 547
65
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
Buffer Drawing
Sheet 15 of 38
MATCHLINE -Y14- STA. 15+30
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
5800 FARINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS
REVISIONS



MATCHLINE -Y14- STA. 17+85
PROJECT REFERENCE NO. R-2554BB
SHEET NO. 14A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST.REV.
R/W REV.
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SITE 3
(CON'T ON SHEET 14B)
J. ISSAC GURLEY, FARMS, INC.
DB 822 PG 455
DB 822 PG 453
DB 822 PG 463
DB 822 PG 430
DB 1560 PG 547
PAULA THOMAS
DB 570 PG 25
N 65°00'00.0" W
S 79°00'00.0" E
-Y14RPA-
-Y14RPB-
-Y14RPA- ST Sta.14+51.169
-Y14RPA- CS Sta.14+06.169
B
BELFAST-PATETOWN SANITARY DIST.
DB 1379 PG 749
-L- POT Sta.182+00.628 =
-Y14- POC Sta.16+11.280
Δ = 105°39'16.2"
MATCHLINE -Y14RPB- STA. 13+14
MATCHLINE -Y14RPA- STA. 13+37
MATCHLINE -L- STA. 179+80
MATCHLINE -L- STA. 183+00 SEE SHEET 14B
Sta.179+65.156
-L- ST Sta.180+25.156
C
ROBERT G. THOMAS
DB 898 PG 363
D
125mm MONOLITHIC ISLAND
J. ISSAC GURLEY, FARMS, INC.
DB 1560 PG 547
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
Buffer Drawing Sheet 16 of 38
PLANS PREPARED BY :
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consulting engineers
FOR
DIVISION OF HIGHWAYS
MATCHLINE -Y14- STA. 15+30
REVISIONS

MATCHLINE -Y14RPA- STA. 13+20

-Y14RPA- SC Sta.13+24.212

-Y14RPA- TS Sta.12+79.212

-Y14RPA- CS Sta.11+89.212

-Y14RPA- SC Sta.10+86.772

-Y14RPA-

N 35° 54' 12.5" W

N 59° 53' 15.0" E

S 62° 11' 15.0" E

-L-

N 80° 00' 00.0" W

-Y14RPD-

-Y14RPD- CS Sta.12+17.621

-Y14RPD- SC Sta.10+6

-Y14RPB- ST Sta.12+77.621

(CONT ON SHEET 14A)

A

MATCHLINE -Y14RPB- STA. 13+98 SEE SHEET 14A

MATCHLINE -Y14RPD- STA. 13+98

MATCHLINE -Y14RPD- STA. 10+67 & -L- STA. 186+20

+35.338
+64.234

59
J. ISSAC GURLEY, FARMS, INC.
DB 822 PG 455
DB 822 PG 453
DB 822 PG 463
DB 822 PG 430
DB 1560 PG 547

78
JAMF
DB

64
DONNIE J. WADE
PC 1 SLIDE 98

130
DONNIE J. WADE
PC 1 SLIDE 98

185

184

12

11

21

30m

BZ 1

BZ 2

SITE 3

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

METRIC

5 0 10

CONST.REV.

R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	14B
R /W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 2922 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 15181 ENGINEER TIMI N. SWEZY

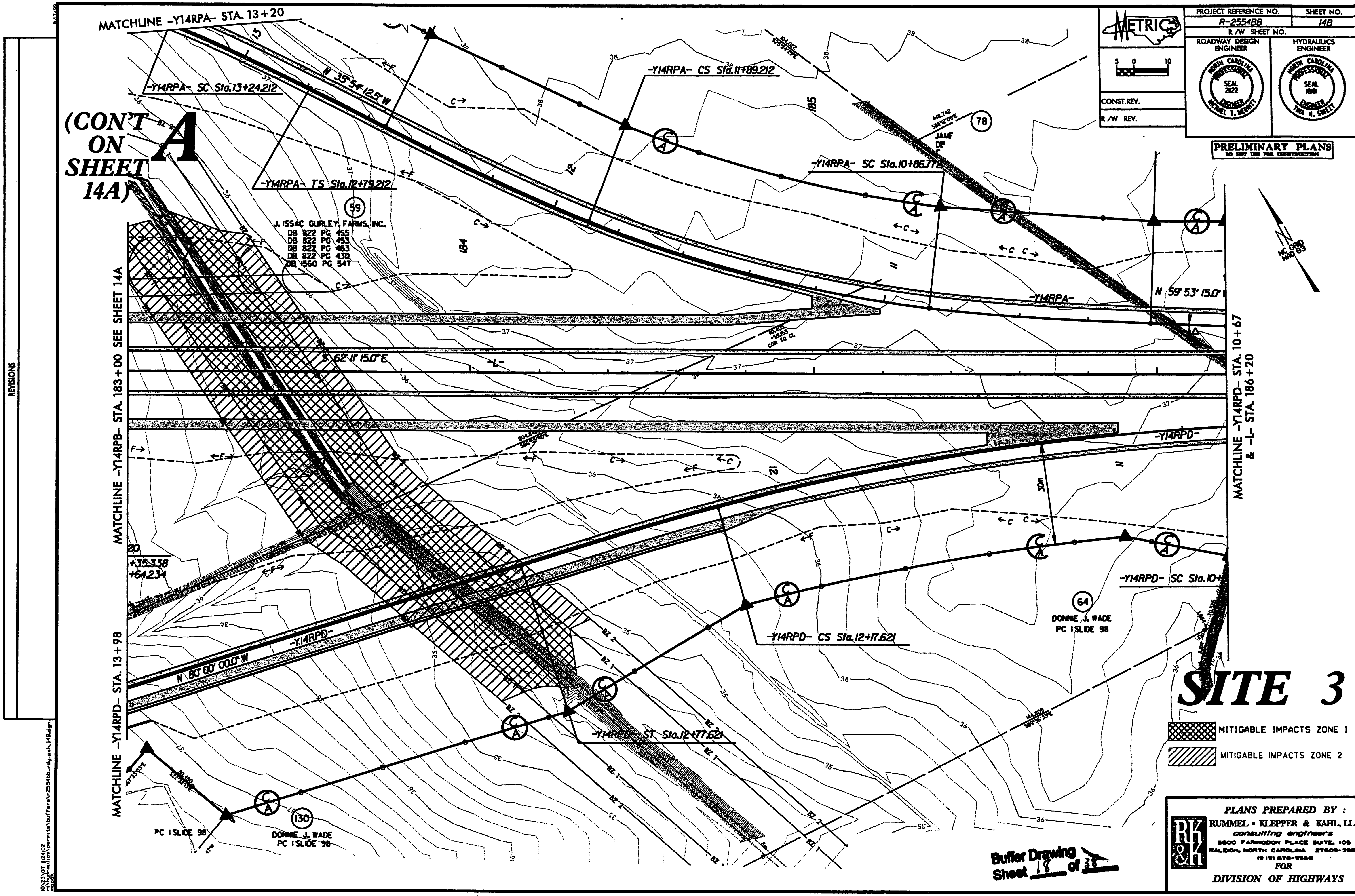
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

Buffer Drawing Sheet 17 of 38

PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
5800 FARINGDON PLACE SUITE, 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

D:\23\07 [22]26
N:\23\07\Highways\Bullfers\MoContours\r-2554bb_rdy_sh_14B.dgn
mgoble


MATCHLINE -Y14RPA- STA. 13+20
-Y14RPA- SC Sta.13+24.212
-Y14RPA- CS Sta.11+89.212
-Y14RPA- TS Sta.12+79.212
-Y14RPA- SC Sta.10+86.712
N 35°54' 12.5" W
N 59°53' 15.0"
-Y14RPA-
(CON'T ON SHEET 14A)
A
J. ISSAC GURLEY, FARMS, INC.
DB 822 PG 455
DB 822 PG 453
DB 822 PG 463
DB 822 PG 430
DB 1560 PG 547
JAMF
S 62°11' 15.0" E
-L-
MATCHLINE -Y14RPB- STA. 183+00 SEE SHEET 14A
MATCHLINE -Y14RPD- STA. 10+67 & -L- STA. 186+20
MATCHLINE -Y14RPD- STA. 13+98
-Y14RPD-
N 80°00' 00.0" W
-Y14RPD- CS Sta.12+17.621
-Y14RPD- ST Sta.12+77.621
-Y14RPD- SC Sta.10+
DONNIE J. WADE
PC 1 SLIDE 98
PC 1 SLIDE 98
DONNIE J. WADE
PC 1 SLIDE 98
30m
NC GRID NAD 83
SITE 3
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
METRIC
PROJECT REFERENCE NO.
R-2554BB
SHEET NO.
14B
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST.REV.
R/W REV.
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
REVISIONS
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
5800 FARRINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS
Buffer Drawing Sheet 18 of 38

PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	18
R/W SHEET NO.	

METRIC

5 0 10

CONST. REV.

R/W REV.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21022 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 16181 ENGINEER TIMOTHY R. SWEET

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

SITE 4

-L- Sta. 196+66.500
PROPOSED RCBC
2@ 3.0m x 3.0m SKEW 97.5°
(DESIGNED BY SUNGATE DESIGN GROUP)

81 ELTON L. SMITH
DB 1769 PG 927

87 ROBERT PARKS
DB 1504 PG 870

80 RAYMOND D. SMITH, ETALS
DB 1177 PG 654

86 JAMES P. SMITH, JR
DB 104 PG 118

MATCHLINE -L- STA. 196+20 SEE SHEET 17

MATCHLINE -L- STA. 199+60 SEE SHEET 19

S 62° 11' 50.0" E

NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details

SEE SHTS. 44 & 45 FOR -L- PROFILE

PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
3600 FARNSDON PLACE SUITE, 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

Buffer Drawing
Sheet 19 of 38

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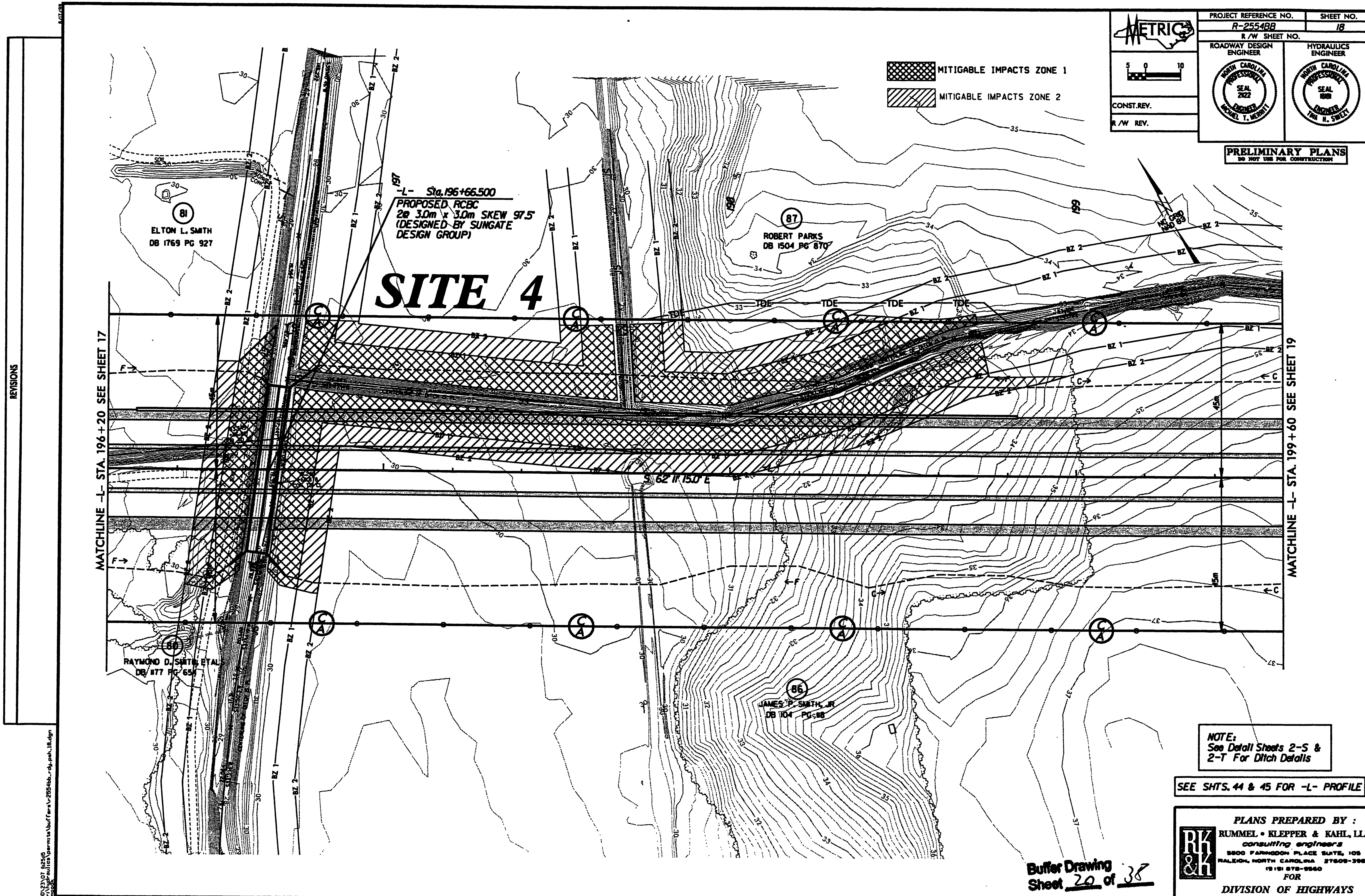


METRIC
PROJECT REFERENCE NO. R-2554BB
SHEET NO. 18
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST. REV.
R/W REV.
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
SITE 4
-L- Sta.196+66.500
PROPOSED RCBC
2@ 3.0m x 3.0m SKEW 97.5°
(DESIGNED BY SUNGATE DESIGN GROUP)
ELTON L. SMITH
DB 1769 PG 927
ROBERT PARKS
DB 1504 PG 870
RAYMOND D. SMITH ETAL
JAMES P. SMITH, JR
MATCHLINE -L- STA. 196+20 SEE SHEET 17
MATCHLINE -L- STA. 199+60 SEE SHEET 19
S 62° 11' 15.0" E
NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details
SEE SHTS. 44 & 45 FOR -L- PROFILE
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
RALEIGH, NORTH CAROLINA
FOR
DIVISION OF HIGHWAYS
REVISIONS
Buffer Drawing Sheet 20 of 38

SITE 5
(CON'T ON SHEET 36)

ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2

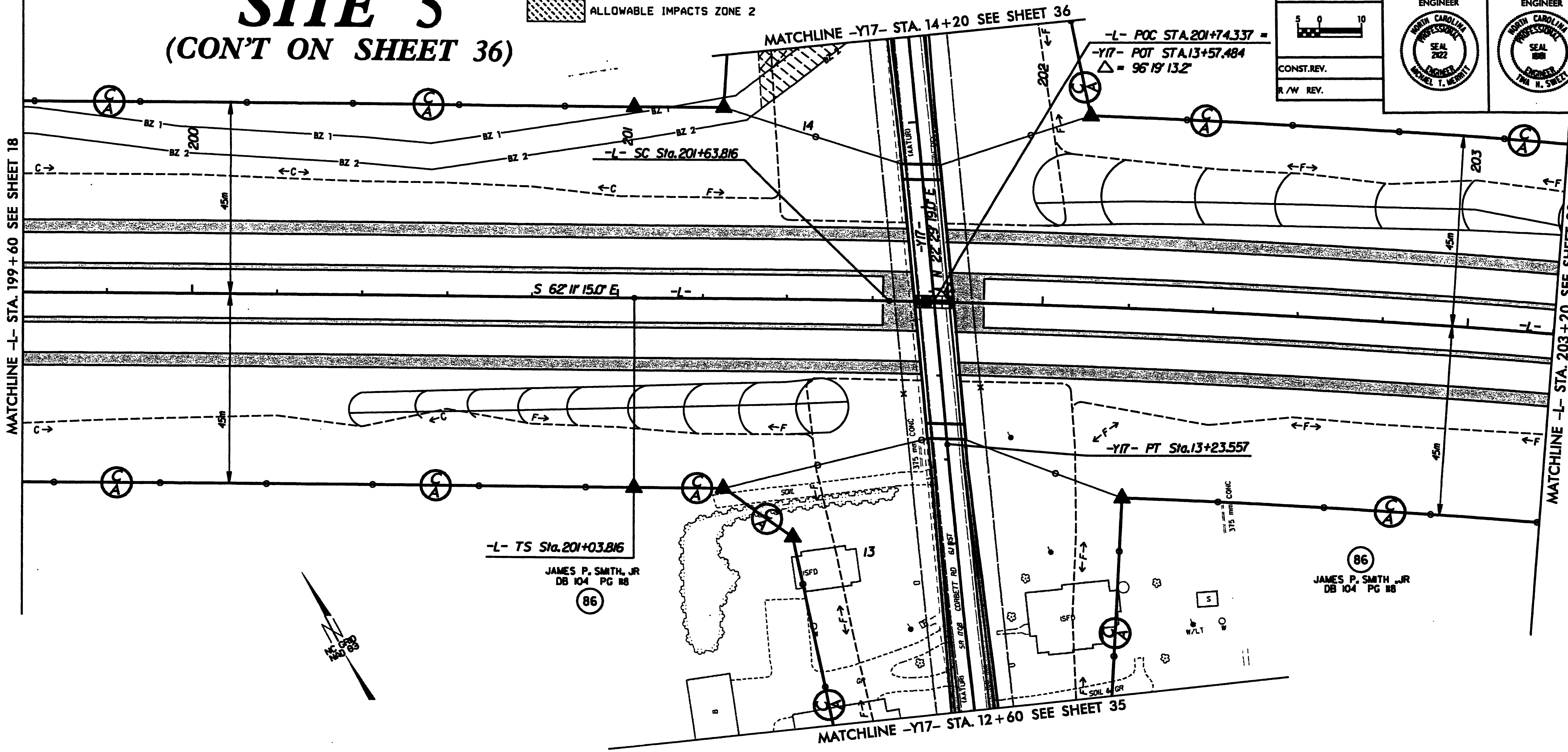
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CONST.REV.
R/W REV.

NORTH CAROLINA PROFESSIONAL SEAL 22122 ENGINEER MICHAEL T. MERRITT
NORTH CAROLINA PROFESSIONAL SEAL 18181 ENGINEER TINA H. SWEZY



NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details

NOTE: See Detail Sheet 2-R For Bridge Sketch Showing Pavement In Relation To Bridge Width

SEE SHT. 66 FOR -Y17- PROFILE
SEE SHT. 45 FOR -L- PROFILE

-L-

PIs Sta 201+43.816	PI Sta 213+21.089
θs = 0°44'15.8"	Δ = 52°49'32.5" (RT)
Ls = 60.000	L = 2148.218
LT = 40.000	T = 1157.273
ST = 20.000	R = 2330.000
	e = 0.025

-Y17-

PI Sta 12+85.202
Δ = 1°27'54.5" (RT)
L = 76.714
T = 38.359
R = 3000.000
e = NC

Buffer Drawing
Sheet 21 of 38

PLANS PREPARED BY :
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consulting engineers
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RALEIGH, NORTH CAROLINA 27609-3960
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FOR
DIVISION OF HIGHWAYS

REVISIONS

SITE 5
(CON'T ON SHEET 36)

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

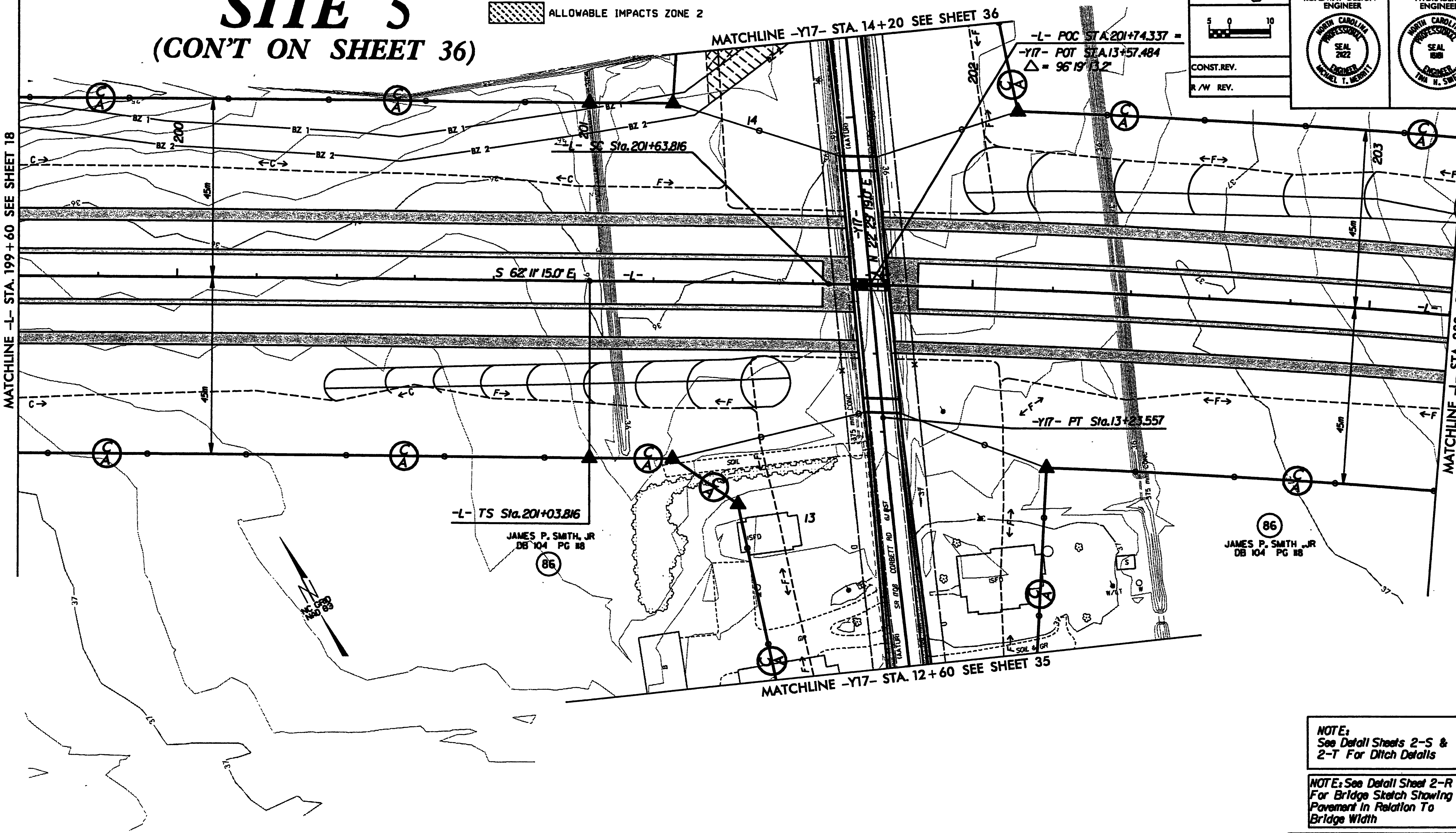
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CONST. REV.

R/W REV.



-L-	
PIs Sta 201+43.816	PI Sta 213+21.089
θs = 0°44'15.8"	Δ = 52°49'32.5" (RT)
Ls = 60.000	L = 2148.218
LT = 40.000	T = 1157.273
ST = 20.000	R = 2330.000
	e = 0.025

-Y17-
PI Sta 12+85.202
Δ = 1°21'54.5" (RT)
L = 76.714
T = 38.359
R = 3,000.000
e = NC

NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details

NOTE: See Detail Sheet 2-R For Bridge Sketch Showing Pavement In Relation To Bridge Width

SEE SHT. 66 FOR -Y17- PROFILE
SEE SHT. 45 FOR -L- PROFILE

REVISIONS

Buffer Drawing Sheet 22 of 38

PLANS PREPARED BY :
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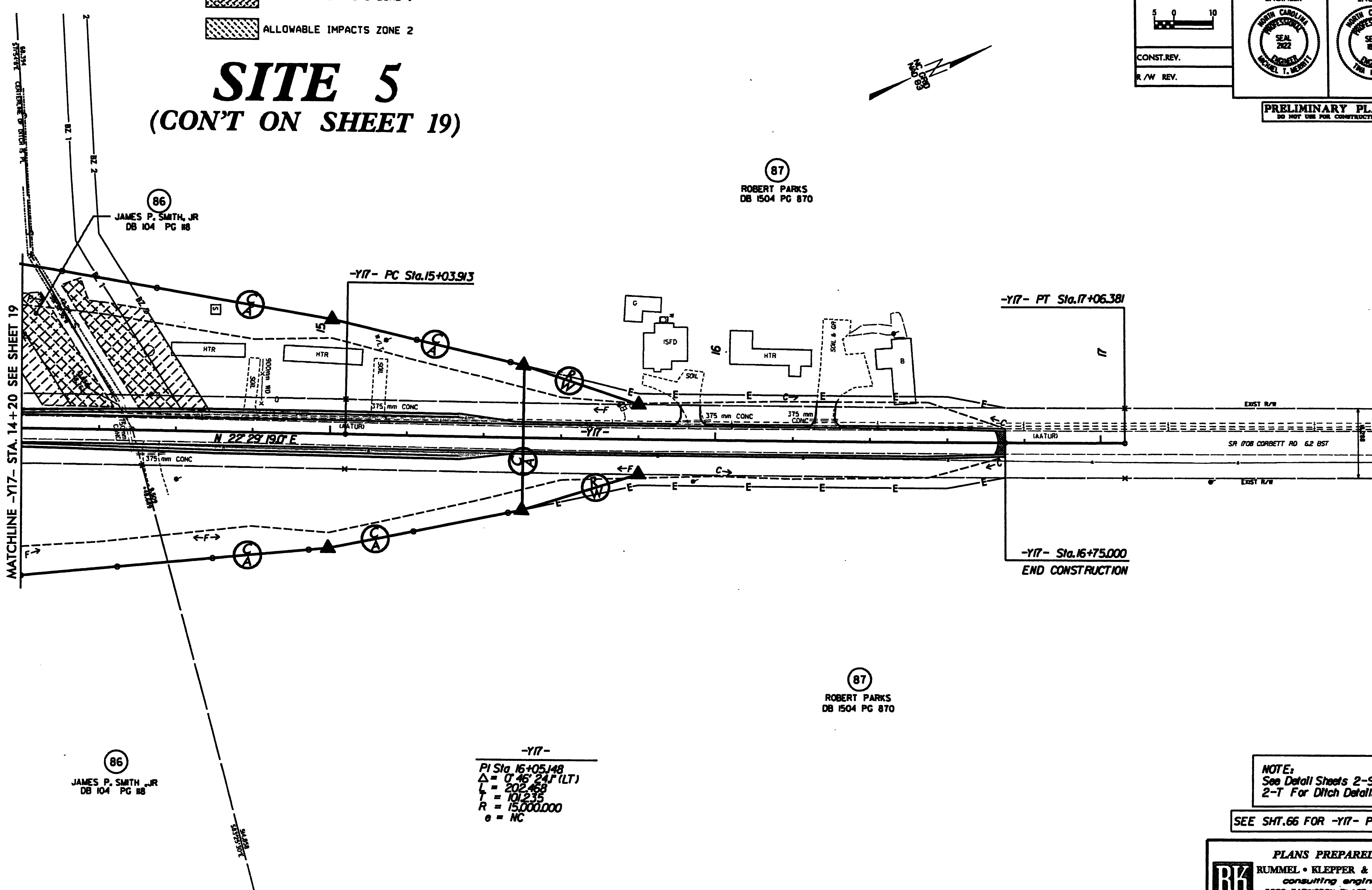
5600 FARINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS

SITE 5
(CON'T ON SHEET 19)

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2



-Y17-
PI Sta 16+05.148
Δ = 0°46'24.1" (LT)
L = 202.468
T = 101.235
R = 15,000.000
e = NC

NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details

SEE SHT.66 FOR -Y17- PROFILE

PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	36

R/W SHEET NO.

ROADWAY DESIGN ENGINEER — HYDRAULICS ENGINEER

CONST.REV.

R/W REV.

METRIC

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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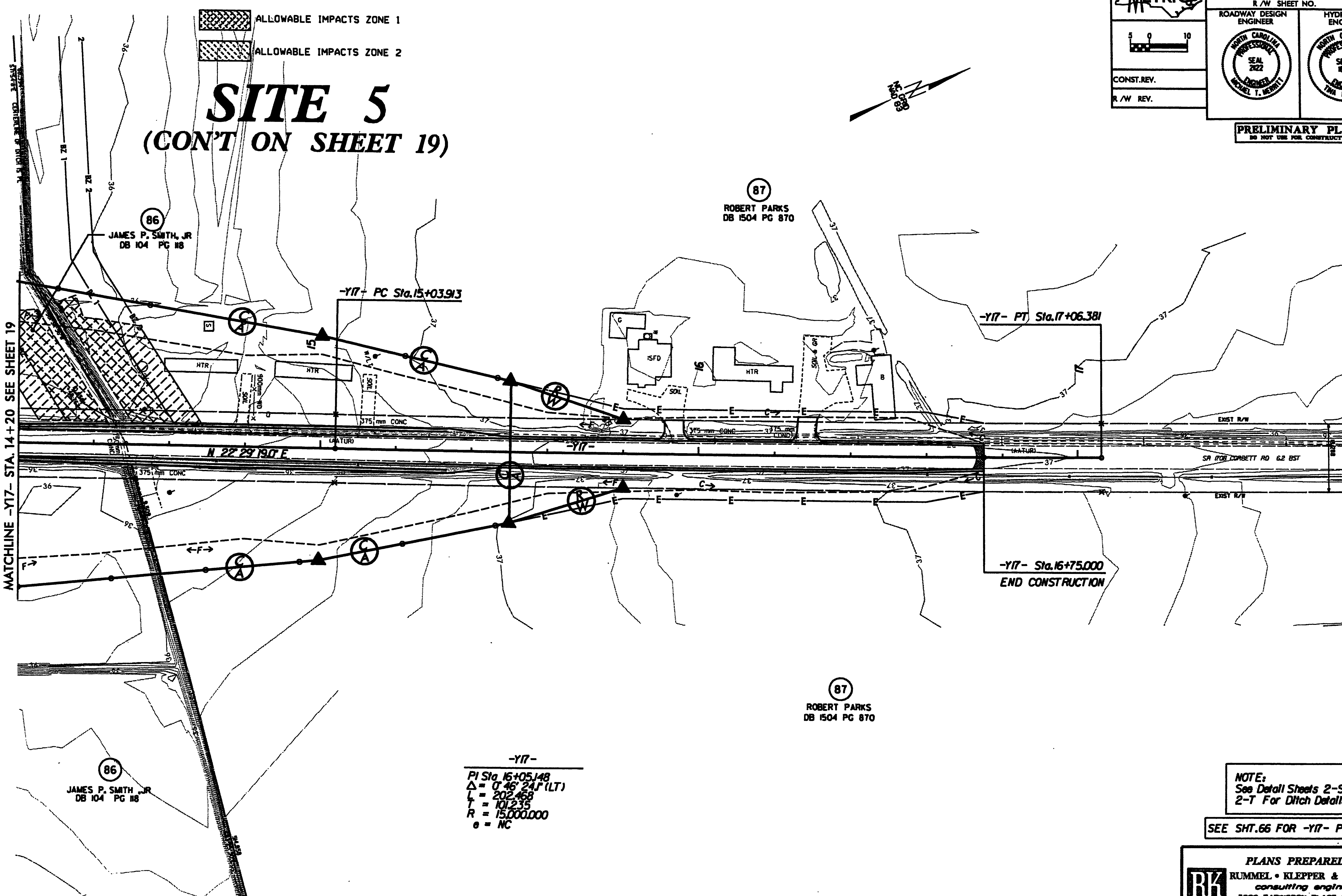
REVISIONS

Buffer Drawing Sheet 23 of 38



REVISIONS

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	36
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21122 MICHAEL T. MERRITT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18181 TINA H. SWEZY

CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details

SEE SHT.66 FOR -Y17- PROFILE

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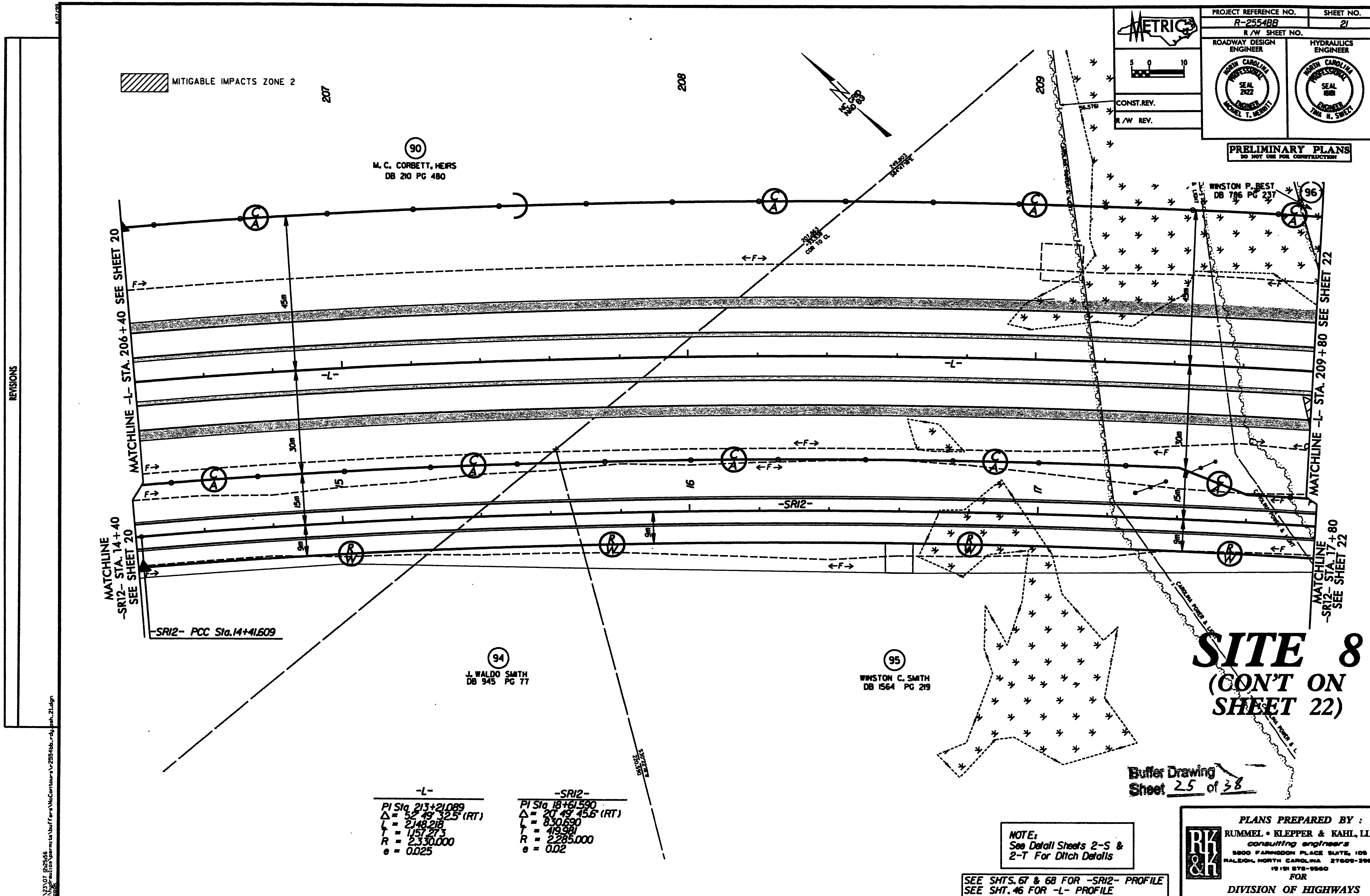
Buffer Drawing Sheet 24 of 38


METRIC
PROJECT REFERENCE NO.
R-2554BB
SHEET NO.
21
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST. REV.
R/W REV.
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
MITIGABLE IMPACTS ZONE 2
207
208
209
90
M. C. CORBETT, HEIRS
DB 210 PG 480
WINSTON P. BEST
DB 786 PG 237
96
94
J. WALDO SMITH
DB 945 PG 77
95
WINSTON C. SMITH
DB 1564 PG 219
MATCHLINE -L- STA. 206+40 SEE SHEET 20
MATCHLINE -L- STA. 209+80 SEE SHEET 22
MATCHLINE -SR12- STA. 14+40 SEE SHEET 20
MATCHLINE -SR12- STA. 17+80 SEE SHEET 22
-SR12- PCC Sta.14+41.609
-L-
-SR12-
45m
30m
15m
9m
15
16
17
CAROLINA POWER & LIGHT
SITE 8
(CON'T ON SHEET 22)
Buffer Drawing Sheet 25 of 38
-L-
PI Sta 213+21.089
Δ = 52° 49' 32.5" (RT)
L = 2,148.218
T = 1,157.273
R = 2,330.000
e = 0.025
-SR12-
PI Sta 18+61.590
Δ = 20° 49' 45.6" (RT)
L = 830.690
T = 419.981
R = 2,285.000
e = 0.02
NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details
SEE SHTS. 67 & 68 FOR -SR12- PROFILE
SEE SHT. 46 FOR -L- PROFILE
PLANS PREPARED BY :
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consulting engineers
RALEIGH, NORTH CAROLINA
FOR
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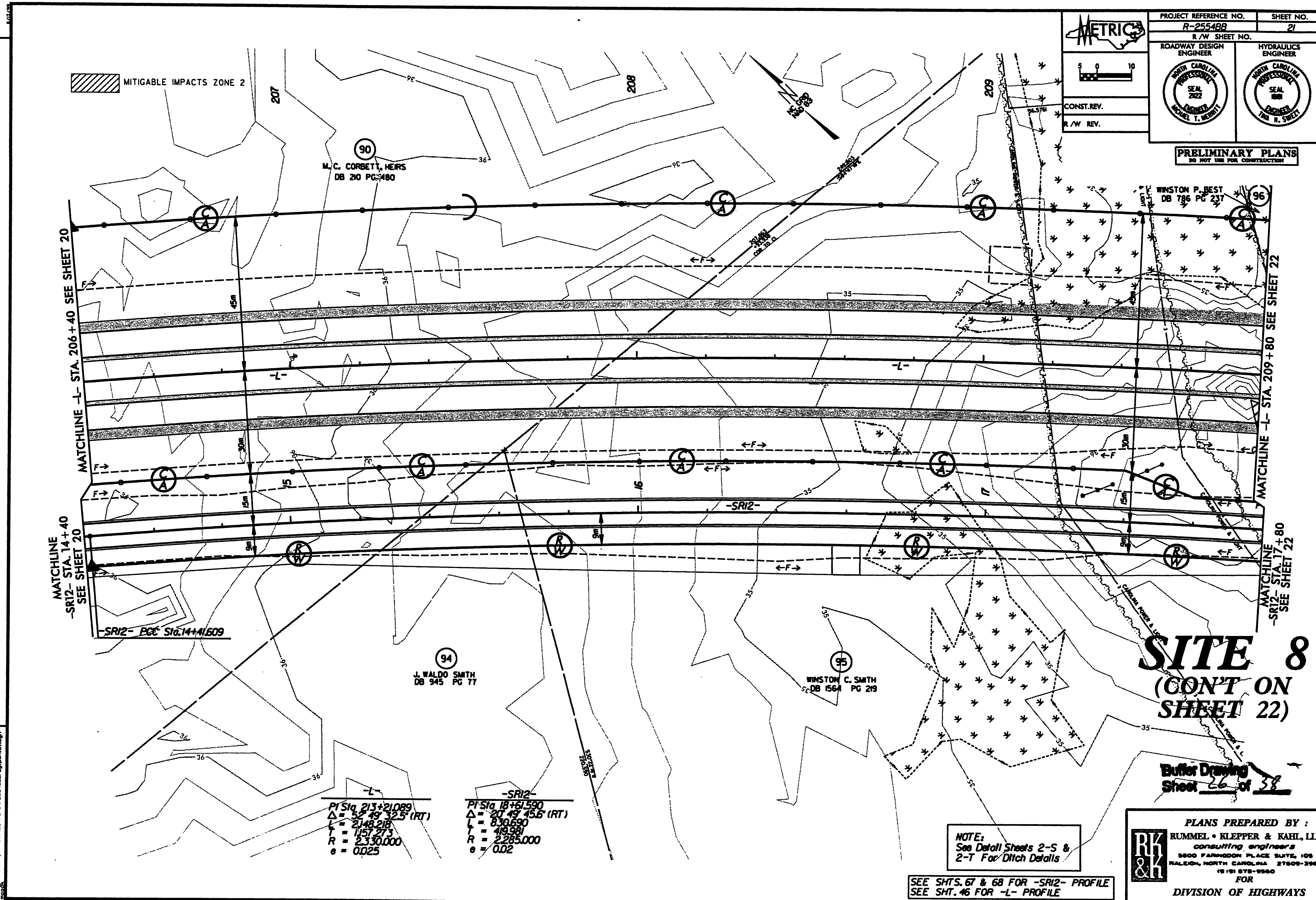
REVISIONS



PROJECT REFERENCE NO. R-2554BB
SHEET NO. 21
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
METRIC
CONST. REV.
R/W REV.
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
MITIGABLE IMPACTS ZONE 2
M.C. CORBETT, HEIRS
DB 210 PG 480
WINSTON P. BEST
DB 786 PG 237
J. WALDO SMITH
DB 945 PG 77
WINSTON C. SMITH
DB 1564 PG 219
MATCHLINE -L- STA. 206+40 SEE SHEET 20
MATCHLINE -L- STA. 209+80 SEE SHEET 22
MATCHLINE -SR12- STA. 14+40 SEE SHEET 20
MATCHLINE -SR12- STA. 17+80 SEE SHEET 22
-SR12- PCC Sta.14+41.609
-L-
-SR12-
SITE 8
(CON'T ON SHEET 22)
Buffer Drawing Sheet 26 of 38
-L-
PI Sta 213+21.089
Δ = 52° 49' 32.5" (RT)
L = 2148.218
T = 1157.273
R = 2330.000
e = 0.025
-SR12-
PI Sta 18+61.590
Δ = 20° 49' 45.6" (RT)
L = 830.690
T = 419.981
R = 2285.000
e = 0.02
NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details
SEE SHTS. 67 & 68 FOR -SR12- PROFILE
SEE SHT. 46 FOR -L- PROFILE
PLANS PREPARED BY:
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
5800 FARINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
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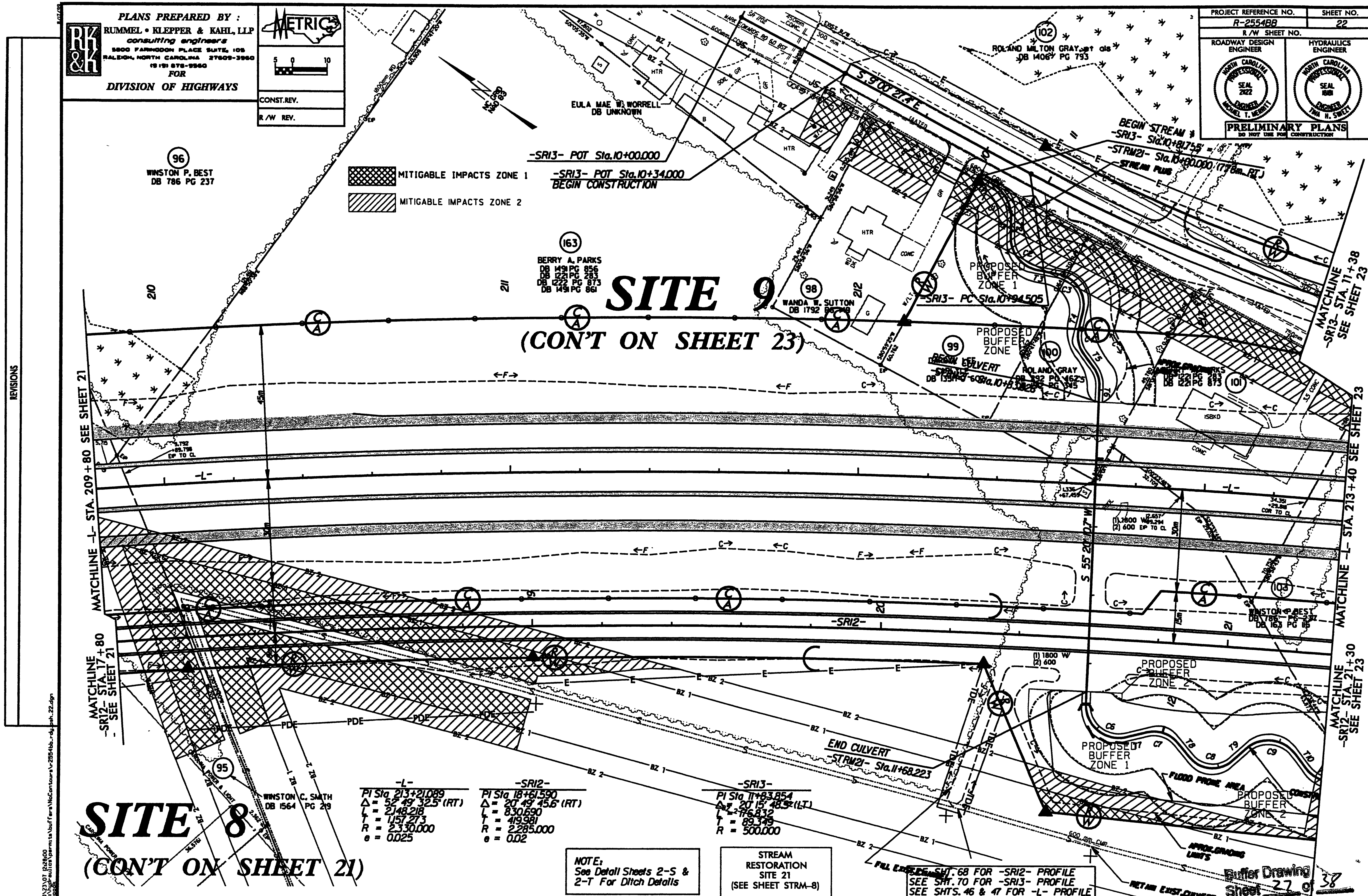
REVISIONS



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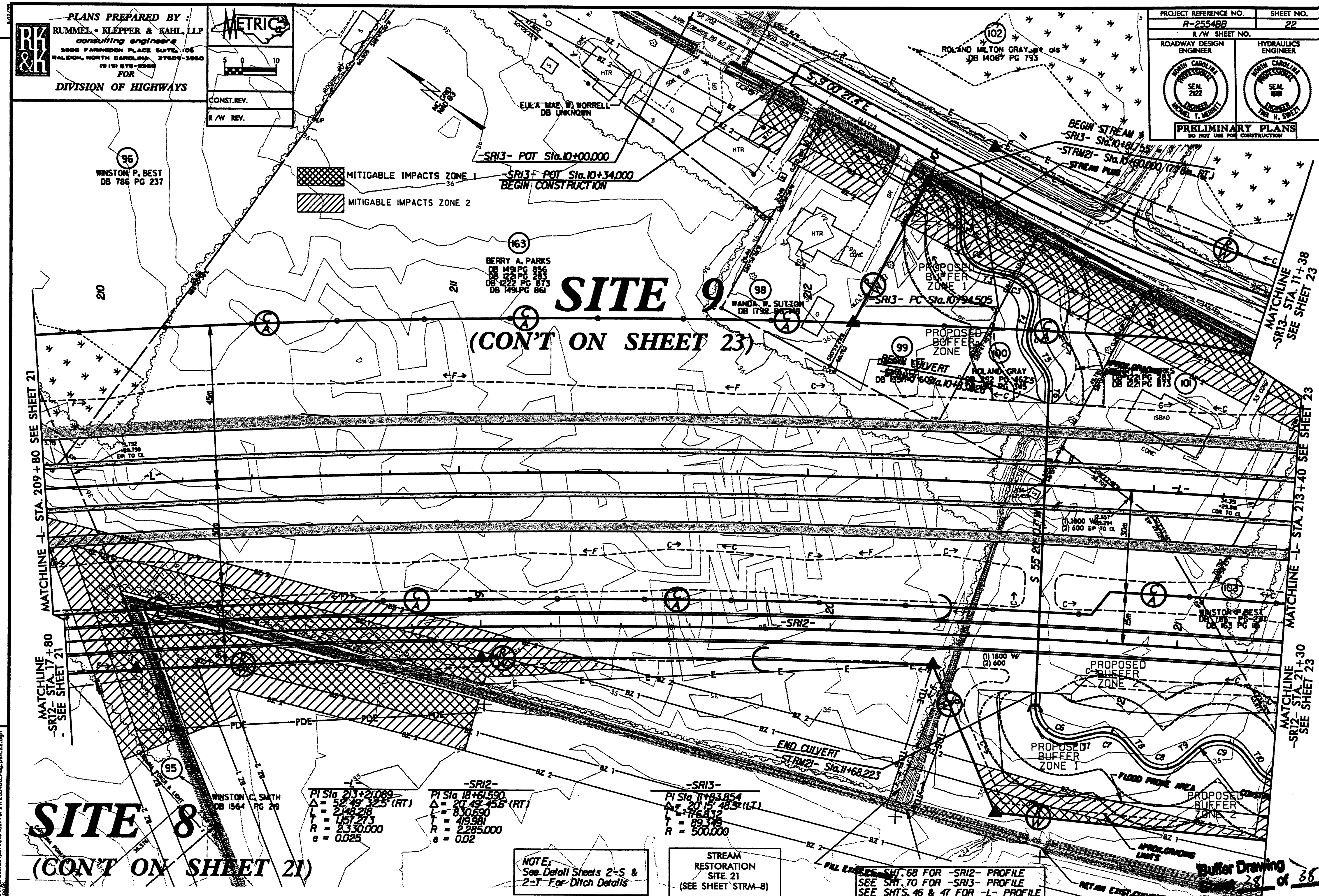
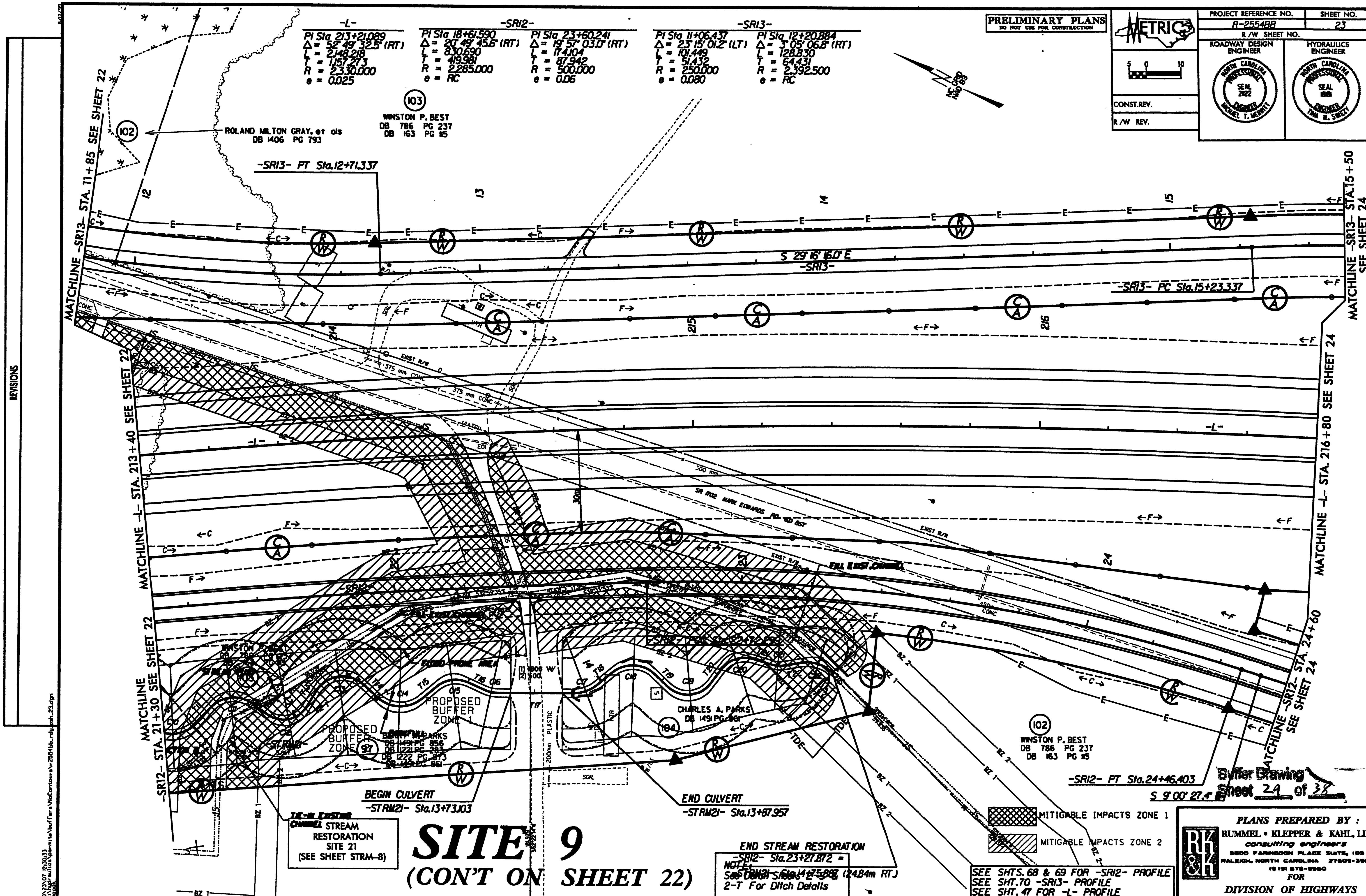
RALEIGH, NORTH CAROLINA 27609-3960
(919) 878-9560
FOR
DIVISION OF HIGHWAYS
METRIC
CONST. REV.
R/W REV.
PROJECT REFERENCE NO.
R-2554BB
SHEET NO.
22
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
REVISIONS
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
SITE 9
(CON'T ON SHEET 23)
SITE 8
(CON'T ON SHEET 21)
WINSTON P. BEST
DB 786 PG 237
BERRY A. PARKS
DB 1491 PG 856
DB 1221 PG 283
DB 1222 PG 873
DB 1491 PG 861
EULA MAE W. WORRELL
DB UNKNOWN
ROLAND MILTON GRAY, et als
DB 1406 PG 793
WANDA W. SUTTON
DB 1792
ROLAND GRAY
WINSTON C. SMITH
DB 1564 PG 219
-SR13- POT Sta.10+00.000
-SR13- POT Sta.10+34.000
BEGIN CONSTRUCTION
BEGIN STREAM
-SR13- Sta.10+81.755
-STRM21- Sta.10+00.000 (7.78m RT)
STREAM PLUG
-SR13- PC Sta.10+94.505
BEGIN CULVERT
END CULVERT
-STRM21- Sta.11+68.223
PROPOSED BUFFER ZONE 1
PROPOSED BUFFER ZONE 2
PROPOSED BUFFER ZONE
FLOOD PRONE AREA
APPROX. GRADING LIMITS
RETAIN EXIST. CULVERT
FILL EXIST. DITCH
MATCHLINE -L- STA. 209+80 SEE SHEET 21
MATCHLINE -SR12- STA. 17+80 SEE SHEET 21
MATCHLINE -SR13- STA. 11+38 SEE SHEET 23
MATCHLINE -L- STA. 213+40 SEE SHEET 23
MATCHLINE -SR12- STA. 21+30 SEE SHEET 23
-L-
PI Sta 213+21.089
Δ = 52° 49' 32.5" (RT)
L = 2,148.218
T = 1,157.273
R = 2,330.000
e = 0.025
-SR12-
PI Sta 18+61.590
Δ = 20° 49' 45.6" (RT)
L = 830.690
T = 419.981
R = 2,285.000
e = 0.02
-SR13-
PI Sta 11+83.854
Δ = 20° 15' 48.5" (LT)
L = 176.832
T = 89.349
R = 500.000
NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details
STREAM RESTORATION SITE 21 (SEE SHEET STRM-8)
SEE SHT. 68 FOR -SR12- PROFILE
SEE SHT. 70 FOR -SR13- PROFILE
SEE SHTS. 46 & 47 FOR -L- PROFILE
Buffer Drawing Sheet 27 of 38



PLANS PREPARED BY:
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
FOR
DIVISION OF HIGHWAYS
METRIC
CONST. REV.
R/W REV.
PROJECT REFERENCE NO.
R-2554BB
SHEET NO.
22
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
REVISIONS
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
-SR13- POT Sta.10+00.000
-SR13- POT Sta.10+34.000
BEGIN CONSTRUCTION
WINSTON P. BEST
DB 786 PG 237
EULA MAE W. WORRELL
DB UNKNOWN
BERRY A. PARKS
DB 1491 PG 856
DB 1221 PG 283
DB 1222 PG 873
DB 1491 PG 861
ROLAND MILTON GRAY, et als
DB 1406 PG 793
WANDA W. SUTTON
DB 1792 PG 719
SITE 9
(CON'T ON SHEET 23)
BEGIN STREAM
-SR13- Sta.10+81.755
-STRM21- Sta.10+80.000 (7.78m RT)
STREAM PLUG
-SR13- PC Sta.10+94.505
PROPOSED BUFFER ZONE 1
PROPOSED BUFFER ZONE II
PROPOSED BUFFER ZONE 2
ROLAND GRAY
BEGIN CULVERT
MATCHLINE -SR13- STA. 11+38 SEE SHEET 23
MATCHLINE -L- STA. 213+40 SEE SHEET 23
MATCHLINE -L- STA. 209+80 SEE SHEET 21
MATCHLINE -SR12- STA. 17+80 SEE SHEET 21
MATCHLINE -SR12- STA. 21+30 SEE SHEET 23
-L-
-SR12-
WINSTON P. BEST
WINSTON C. SMITH
DB 1564 PG 219
END CULVERT
STRM21- Sta.11+68.223
FLOOD PRONE AREA
APPROX. GRADING LIMITS
-L-
PI Sta 213+21.089
Δ = 52°49' 32.5" (RT)
L = 2,148.218
T = 1,157.273
R = 2,330.000
e = 0.025
-SR12-
PI Sta 18+61.590
Δ = 20°49' 45.6" (RT)
L = 830.690
T = 419.981
R = 2,285.000
e = 0.02
-SR13-
PI Sta 11+83.854
Δ = 20°15' 48.5" (LT)
L = 176.832
T = 89.349
R = 500.000
SITE 8
(CON'T ON SHEET 21)
NOTE: See Detail Sheets 2-S & 2-T For Ditch Details
STREAM RESTORATION SITE 21 (SEE SHEET STRM-8)
SEE SHT. 68 FOR -SR12- PROFILE
SEE SHT. 70 FOR -SR13- PROFILE
SEE SHTS. 46 & 47 FOR -L- PROFILE
Buffer Drawing Sheet 28 of 36


PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
METRIC
PROJECT REFERENCE NO. R-2554BB
SHEET NO. 23
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST. REV.
R/W REV.
-L-
PI Sta 213+21.089
Δ = 52° 49' 32.5" (RT)
L = 2148.218
T = 1,157.273
R = 2330.000
e = 0.025
-SR12-
PI Sta 18+61.590
Δ = 20° 49' 45.6" (RT)
L = 830.690
T = 419.981
R = 2,285.000
e = RC
PI Sta 23+60.241
Δ = 19° 57' 03.0" (RT)
L = 174.104
T = 87.942
R = 500.000
e = 0.06
-SR13-
PI Sta 11+06.437
Δ = 23° 15' 01.2" (LT)
L = 101.449
T = 51.432
R = 250.000
e = 0.080
PI Sta 12+20.884
Δ = 3° 05' 06.8" (RT)
L = 128.830
T = 64.431
R = 2,392.500
e = RC
ROLAND MILTON GRAY, et als
DB 1406 PG 793
WINSTON P. BEST
DB 786 PG 237
DB 163 PG 115
-SR13- PT Sta.12+71.337
S 29° 16' 16.0" E
-SR13- PC Sta.15+23.337
MATCHLINE -SR13- STA. 11+85 SEE SHEET 22
MATCHLINE -SR13- STA.15+50 SEE SHEET 24
MATCHLINE -L- STA. 213+40 SEE SHEET 22
MATCHLINE -L- STA. 216+80 SEE SHEET 24
MATCHLINE -SR12- STA. 21+30 SEE SHEET 22
MATCHLINE -SR12- STA. 24+60 SEE SHEET 24
SR 1702 MARK EDWARDS RD.
FILL EXIST. CHANNEL
FLOOD-PRONE AREA
PROPOSED BUFFER ZONE 1
PROPOSED BUFFER ZONE 2
CHARLES A. PARKS
DB 1491 PG 861
WINSTON P. BEST
DB 786 PG 237
DB 163 PG 115
-SR12- PT Sta.24+46.403
S 9° 00' 27.4" E
Buffer Drawing Sheet 24 of 38
BEGIN CULVERT
-STRM21- Sta.13+73.103
END CULVERT
-STRM21- Sta.13+87.957
TIE-IN EXISTING CHANNEL STREAM RESTORATION SITE 21 (SEE SHEET STRM-8)
SITE 9
(CON'T ON SHEET 22)
END STREAM RESTORATION
-SR12- Sta.23+27.872 =
-STRM21- Sta.14+75.887 (24.84m RT)
NOTE: See Detail Sheets 2-S & 2-T For Ditch Details
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
SEE SHTS. 68 & 69 FOR -SR12- PROFILE
SEE SHT. 70 -SR13- PROFILE
SEE SHT. 47 FOR -L- PROFILE
PLANS PREPARED BY :
RUMMEL • KLEPPER & KAHL, LLP
consulting engineers
5800 FARINGDON PLACE SUITE 105
RALEIGH, NORTH CAROLINA 27609-3960
FOR
DIVISION OF HIGHWAYS
REVISIONS

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	23
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 2922 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 16818 ENGINEER TIM H. SWEET

CONST.REV.

R/W REV.

REVISIONS

-L-
PI Sta 213+21.089
Δ = 52° 49' 32.5" (RT)
L = 2148.218
T = 1157.273
R = 2330.000
e = 0.025

-SR12-
PI Sta 18+61.590
Δ = 20° 49' 45.6" (RT)
L = 830.690
T = 419.981
R = 2285.000
e = RC

PI Sta 23+60.241
Δ = 19° 57' 03.0" (RT)
L = 174.104
T = 87.942
R = 500.000
e = 0.06

-SR13-
PI Sta 11+06.437
Δ = 23° 15' 01.2" (LT)
L = 101.449
T = 51.432
R = 250.000
e = 0.080

PI Sta 12+20.884
Δ = 3° 05' 06.8" (RT)
L = 128.830
T = 64.431
R = 2392.500
e = RC

N 45° 58' 39" W

MATCHLINE -SR13- STA. 11+85 SEE SHEET 22

MATCHLINE -SR13- STA. 15+50 SEE SHEET 24

MATCHLINE -L- STA. 213+40 SEE SHEET 22

MATCHLINE -L- STA. 216+80 SEE SHEET 24

MATCHLINE -SR12- STA. 21+30 SEE SHEET 22

MATCHLINE -SR12- STA. 24+60 SEE SHEET 24

ROLAND MILTON GRAY, et als
DB 1406 PG 793

WINSTON P. BEST
DB 786 PG 237
DB 163 PG 115

-SR13- PT Sta. 12+71.337

-SR13- PC Sta. 15+23.337

S 29° 16' 16.0" E
-SR13-

-SR12- PT Sta. 24+46.403

S 9° 00' 27.4" E

PROPOSED BUFFER ZONE 1

PROPOSED BUFFER ZONE 2

CHARLES A. PARKS
DB 1491 PG 861
DB 1222 PG 873
DB 1491 PG 861

CHARLES A. PARKS
DB 1491 PG 861

BEGIN CULVERT
-STRM21- Sta. 13+73.03

END CULVERT
-STRM21- Sta. 13+87.957

TIE-IN EXISTING CHANNEL STREAM RESTORATION SITE 21
(SEE SHEET STRM-8)

END STREAM RESTORATION
-SR12- Sta. 23+27.872 ℄
-STRM21- Sta. 14+25.882 (24.84m RT)

NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details

SEE SHTS. 68 & 69 FOR -SR12- PROFILE
SEE SHT. 70 -SR13- PROFILE
SEE SHT. 47 FOR -L- PROFILE

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

EXIST R/W

EXIST EDGE OF PAVEMENT

SR 1112 MARK EDWARDS RD

375 mm CONC.

600mm PLASTIC

200mm PLASTIC

SDR

TDE

BZ 1

BZ 2

SITE 9

(CON'T ON SHEET 22)

Buffer Drawing Sheet 30 of 38

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consulting engineers
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(919) 878-9560
FOR
DIVISION OF HIGHWAYS

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SITE 10

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

METRIC

5 0 10

CONST.REV.

R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	24
R /W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 21022 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 19181 ENGINEER TINA H. SWEET

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-SR13- PT Sta.17+51.714

(103) WINSTON P. BEST
DB 786 PG 237
DB 163 PG 115

NC GRID NAD 83

MATCHLINE -SR13- STA. 15+50 SEE SHEET 21

MATCHLINE -SR13- STA. 18+90 SEE SHEET 25

MATCHLINE -L- STA. 216+80 SEE SHEET 23

MATCHLINE -L- STA. 220+20 SEE SHEET 25

MATCHLINE -SR12- STA. 24+60 SEE SHEET 23

16 17 18 25 26 217 218 220

PDE — E — F — C — L — S — RW — CA — BZ 1 — BZ 2

9m 45m 300 mm

END CONSTRUCTION
-SR12- POC Sta.25+15.000

-SR12- POT Sta.26+66.403

S 9°00'27.4" E

S 13°52'37.0" E

(104) BEST FARMS, INC.
DB 822 PG 500

HENRY WALKER
DB 595 PG 163

EDITH B. WALKER
DB 1077 PG 294

HTR — WD DK — ISFD — W/L'T — SHED — GAR

EXIST R/W — CONC. MON — 600 mm — 375mm CONC — EXISTING R/W

SR 1702 MARK EDWARDS RD 60' BST

Butler Drawing Sheet 31 of 38

NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details

SEE SHT.69 FOR -SR12- PROFILE
SEE SHTS.70 & 71 FOR -SR13- PROFILE
SEE SHTS. 47 & 48 FOR -L- PROFILE

-L-
PI Sta 213+21.089
Δ = 52°49'32.5" (RT)
L = 2,148.218
T = 1,157.273
R = 2,330.000
e = 0.025

-SR13-
PI Sta 16+38.218
Δ = 15°23'38.9" (RT)
L = 228.377
T = 114.880
R = 850.000

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DO NOT PLOT
Projection: NAD83 Zone: NC Units: Meters
Data: C:\Projects\2554bb\Roadway\Surfaces\NoContours\r2554bb_rdysph_24.dgn

SITE 10

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	24
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 2022 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 16181 ENGINEER TINA H. SWEET

5 0 10

CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

-SR13- PT Sta.17+51.714

MATCHLINE -SR13- STA. 15+50 SEE SHEET 21

MATCHLINE -SR13- STA. 18+90 SEE SHEET 25

MATCHLINE -L- STA. 216+80 SEE SHEET 23

MATCHLINE -L- STA. 220+20 SEE SHEET 25

MATCHLINE -SR12- STA. 24+60 SEE SHEET 23

END CONSTRUCTION -SR12- POC Sta.25+15.000

-SR12- POT Sta.26+66.403

S 9°00'21.4" E

S 13°52'37.0" E

103 WINSTON P. BEST
DB 786 PG 237
DB 163 PG 115

104 BEST FARMS, INC.
DB 822 PG 500

HENRY WALKER
DB 595 PG 163

EDITH B. WALKER
DB 1077 PG 294

SR 1702 MARK EDWARDS RD 60' RW

-L-
PI Sta. 213+21.089
Δ = 52°49'32.5" (RT)
L = 2148.218
T = 1157.273
R = 2,330.000
e = 0.025

-SR13-
PI Sta. 16+38.218
Δ = 15°23'38.9" (RT)
L = 228.377
T = 114.880
R = 850.000

Buffer Drawing Sheet 32 of 38

NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details

SEE SHT. 69 FOR -SR12- PROFILE
SEE SHTS. 70 & 71 FOR -SR13- PROFILE
SEE SHTS. 47 & 48 FOR -L- PROFILE

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PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	27
R/W SHEET NO.	

METRIC

5 0 10

CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 2422 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 19981 ENGINEER TIMOTHY N. SWEZY

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

NC NAD 1983

SITE 11

-Y12-
PI Sta 15+40.573
Δ = 2° 5' 02.5"
L = 47.266
T = 23.638
R = 950.000
e = 0.05

Pls Sta 15+79.203
θs = 1° 21' 25.2"
Ls = 45.000
LT = 30.001
ST = 15.001

Pls Sta 16+39.203
θs = 1° 21' 25.2"
Ls = 45.000
LT = 30.001
ST = 15.001

PI Sta 17+20.150
Δ = 7° 56' 31.5" (LT)
L = 131.685
T = 65.948
R = 950.000
e = 0.05

Pls Sta 18+00.888
θs = 1° 21' 25.2"
Ls = 45.000
LT = 30.001
ST = 15.001

-SR9-
PI Sta 14+65.429
Δ = 92° 16' 36.0" (RT)
L = 48.316
T = 31.216
R = 30.000
e = 0.04

-SR9- PT Sta.14+82.529
-SR9- PC Sta.14+95.690
-Y12- POT Sta.15+92.534
-Y12- SC Sta.16+54.202
-SR9- PC Sta.14+34.213
-SR9-
N 33° 09' 00.0" E
-Y12- SRS Sta.16+09.202
-Y12- CS Sta.15+64.202
S 54° 34' 24.0" E
-Y12-
-Y12- POT Sta.18+50.000
END OF CONSTRUCTION
-Y12- ST Sta.18+30.887
-Y12- CS Sta.17+85.887
-Y12- +60.000
ON R/W
N 72° 49' 46.0" E
-Y12-
MATCHLINE STA.14+00 -SR9- SEE SHEET 8
MATCHLINE STA.15+30 -Y12- SEE SHEET 8

UNKNOWN
UNKNOWN

Buffer Drawing
Sheet 33 of 38

NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details

SEE SHTS.51 & 52 FOR -Y12- PROFILE
SEE SHT.53 FOR -SR9- PROFILE

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PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	27
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 2122 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 19181 ENGINEER TINA N. SWEET

METRIC 5 0 10

CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SITE 11

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

-Y12-
PI Sta 15+40.573
Δ = 2° 5' 02.5"
L = 47.266
T = 23.638
R = 950.000
e = 0.05
Pls Sta 15+79.203 Θs = 1° 21' 25.2" Ls = 45.000 LT = 30.001 ST = 15.001
Pls Sta 16+39.203 Θs = 1° 21' 25.2" Ls = 45.000 LT = 30.001 ST = 15.001

PI Sta 17+20.150
Δ = 7° 56' 31.5" (LT)
L = 131.685
T = 65.948
R = 950.000
e = 0.05
Pls Sta 18+00.888 Θs = 1° 21' 25.2" Ls = 45.000 LT = 30.001 ST = 15.001

-SR9-
PI Sta 14+65.429
Δ = 92° 16' 36.0" (RT)
L = 48.316
T = 31.216
R = 30.000
e = 0.04

-SR9- PT Sta.14+82.529
-SR9- PC Sta.14+95.690
-Y12- POT Sta.15+92.534
-Y12- SC Sta.16+54.202
-SR9- PC Sta.14+34.213
-Y12- SR5 Sta.16+09.202
-Y12- CS Sta.15+64.202
-Y12- ST Sta.18+30.887
-Y12- CS Sta.17+85.887
-Y12- POT Sta.18+50.000
END OF CONSTRUCTION
-Y12- +60.000 ON R/W

MATCHLINE -SR9- STA 14+00 SEE SHEET 8

MATCHLINE -Y12- STA 15+30 SEE SHEET 8

N 33° 09' 00.0" E

S 54° 14' 24.0" E

N 24° 49' 45.0" E

13 N. J. DAW DB 517 PG 95

DELANOR L. DAW DB 1001 PG. 623

JAMES EDWARD GURGANUS DB 1050 PG 650 DB 1236 PG 116 (22)

49 J. M. PATE JR. DB 1471 PG 657

EXIE SMITH DB 639 PG 560 (48)

N. J. DAW DB 576 PG 234 (13)

44 DAVID H. WARD DB 1792 PG 491

43 ALMA GURLEY NEWSOME DB 1035 PG 190

42 JULIA NEWSOME TILLETT DB 1375 PG 783

41 DAVID RANDELL NEWSOME DB 787 PG 787

PIPER NEWSOME BROCK DB 1375 PG 785 (40)

UNKNOWN

Buffer Drawing Sheet 34 of 38

NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details

SEE SHTS.51 & 52 FOR -Y12- PROFILE
SEE SHT.53 FOR -SR9- PROFILE

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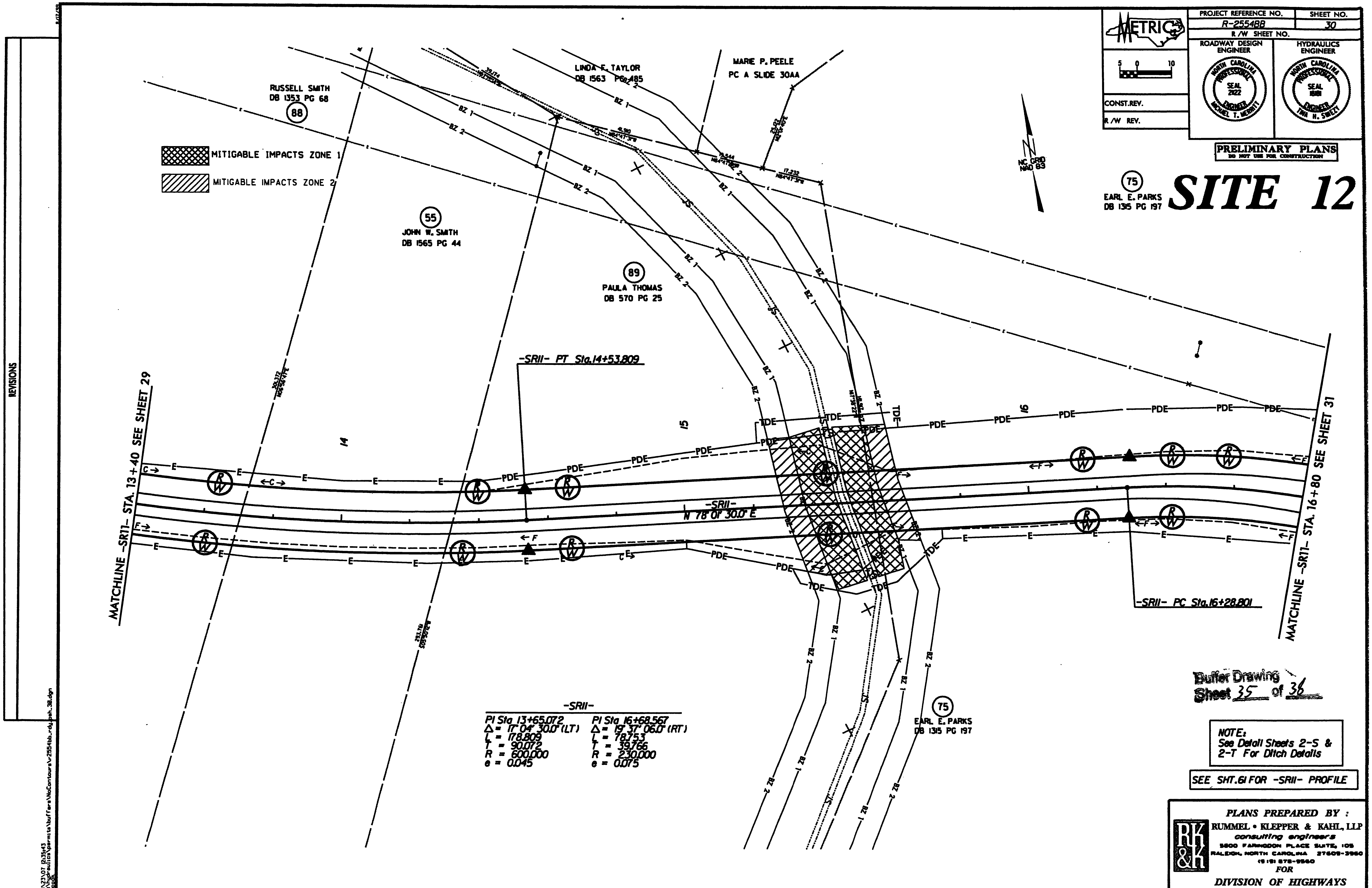

PROJECT REFERENCE NO.
R-2554BB
SHEET NO.
30
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
METRIC
CONST.REV.
R/W REV.
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SITE 12
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
RUSSELL SMITH
DB 1353 PG 68
LINDA F. TAYLOR
DB 1563 PG 485
MARIE P. PEELE
PC A SLIDE 30AA
JOHN W. SMITH
DB 1565 PG 44
PAULA THOMAS
DB 570 PG 25
EARL E. PARKS
DB 1315 PG 197
NC GRID
NAD 83
-SRII- PT Sta.14+53.809
-SRII-
N 78° 01' 30.0" E
-SRII- PC Sta.16+28.801
MATCHLINE -SR11- STA. 13+40 SEE SHEET 29
MATCHLINE -SR11- STA. 16+80 SEE SHEET 31
-SRII-
PI Sta 13+65.072
Δ = 17° 04' 30.0" (LT)
L = 178.809
T = 90.072
R = 600.000
e = 0.045
PI Sta 16+68.567
Δ = 19° 37' 06.0" (RT)
L = 78.753
T = 39.766
R = 230.000
e = 0.075
Buffer Drawing
Sheet 35 of 36
NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details
SEE SHT.61 FOR -SRII- PROFILE
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PROJECT REFERENCE NO.	SHEET NO.
R-2554BB	30
R/W SHEET NO.	

METRIC

5 0 10

CONST.REV.

R/W REV.

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 2022 ENGINEER MICHAEL T. MERRITT

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 15181 ENGINEER IAN N. SWEET

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SITE 12

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

RUSSELL SMITH
DB 1353 PG 68
(88)

LINDA F. TAYLOR
DB 3563 PG 485

MARIE P. PEELE
PC A SLIDE 30AA

(55)
JOHN W. SMITH
DB 1565 PG 44

(89)
PAULA THOMAS
DB 570 PG 25

(75)
EARL E. PARKS
DB 1315 PG 197

NC GRID NAD 83

-SRII- PT Sta.14+53.809

-SRII- PC Sta.16+28.801

-SRII-
N 78° 01' 30.0" E

MATCHLINE -SR11- STA. 13+40 SEE SHEET 29

MATCHLINE -SR11- STA. 16+80 SEE SHEET 31

-SRII-

PI Sta 13+65.072	PI Sta 16+68.567
Δ = 11° 04' 30.0" (LT)	Δ = 19° 37' 06.0" (RT)
L = 178.809	L = 78.753
T = 90.012	T = 39.766
R = 600.000	R = 230.000
e = 0.045	e = 0.075

Buffer Drawing
Sheet 36 of 38

NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details

SEE SHT.61 FOR -SRII- PROFILE

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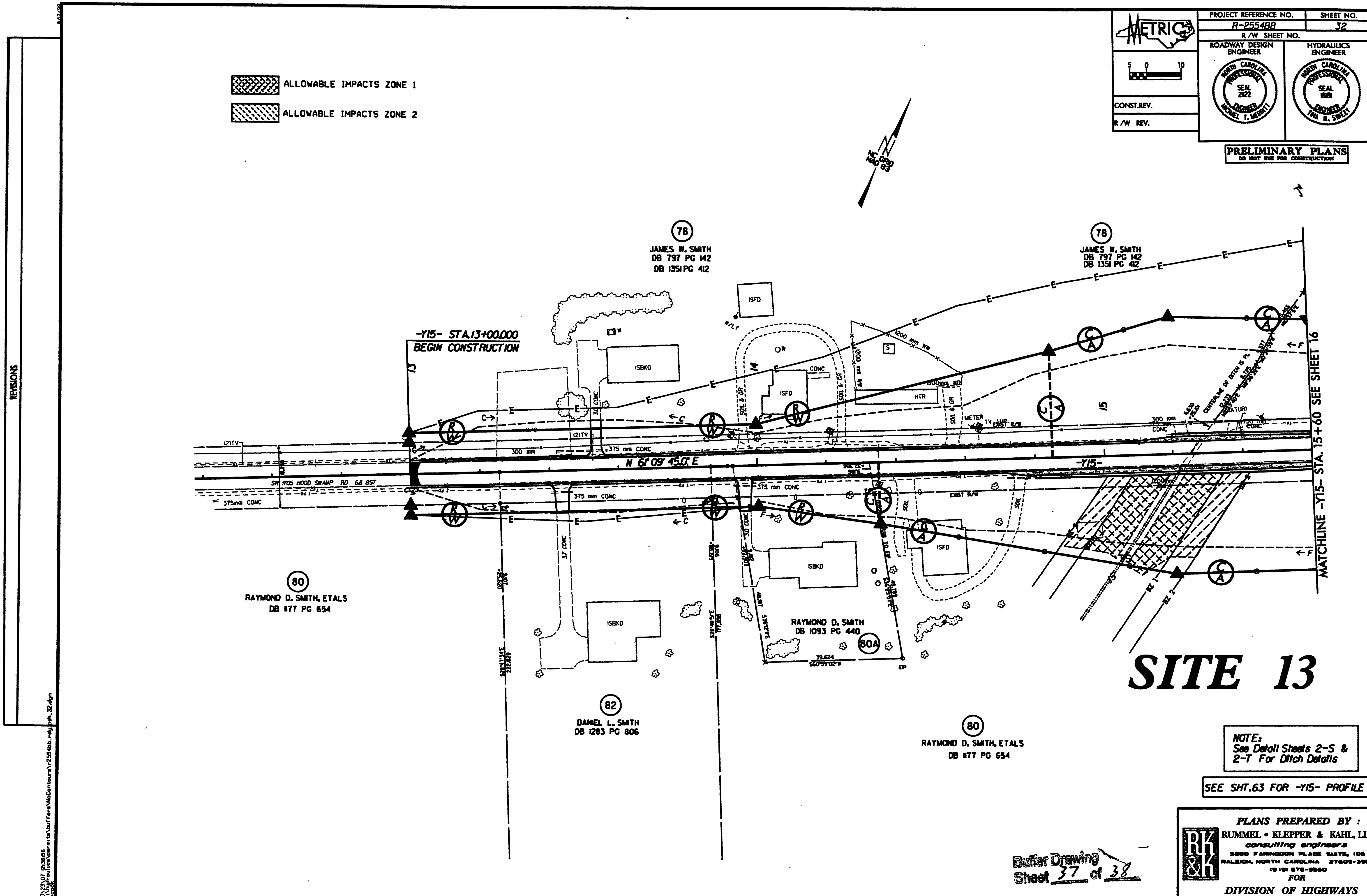

ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
PROJECT REFERENCE NO. R-2554BB
SHEET NO. 32
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CONST. REV.
R/W REV.
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
JAMES W. SMITH
DB 797 PG 142
DB 1351 PG 412
-Y15- STA.13+00.000
BEGIN CONSTRUCTION
N 61°09' 45.0" E
-Y15-
MATCHLINE -Y15- STA. 15+60 SEE SHEET 16
RAYMOND D. SMITH, ETALS
DB 1177 PG 654
RAYMOND D. SMITH
DB 1093 PG 440
DANIEL L. SMITH
DB 1283 PG 806
SITE 13
NOTE: See Detail Sheets 2-S & 2-T For Ditch Details
SEE SHT.63 FOR -Y15- PROFILE
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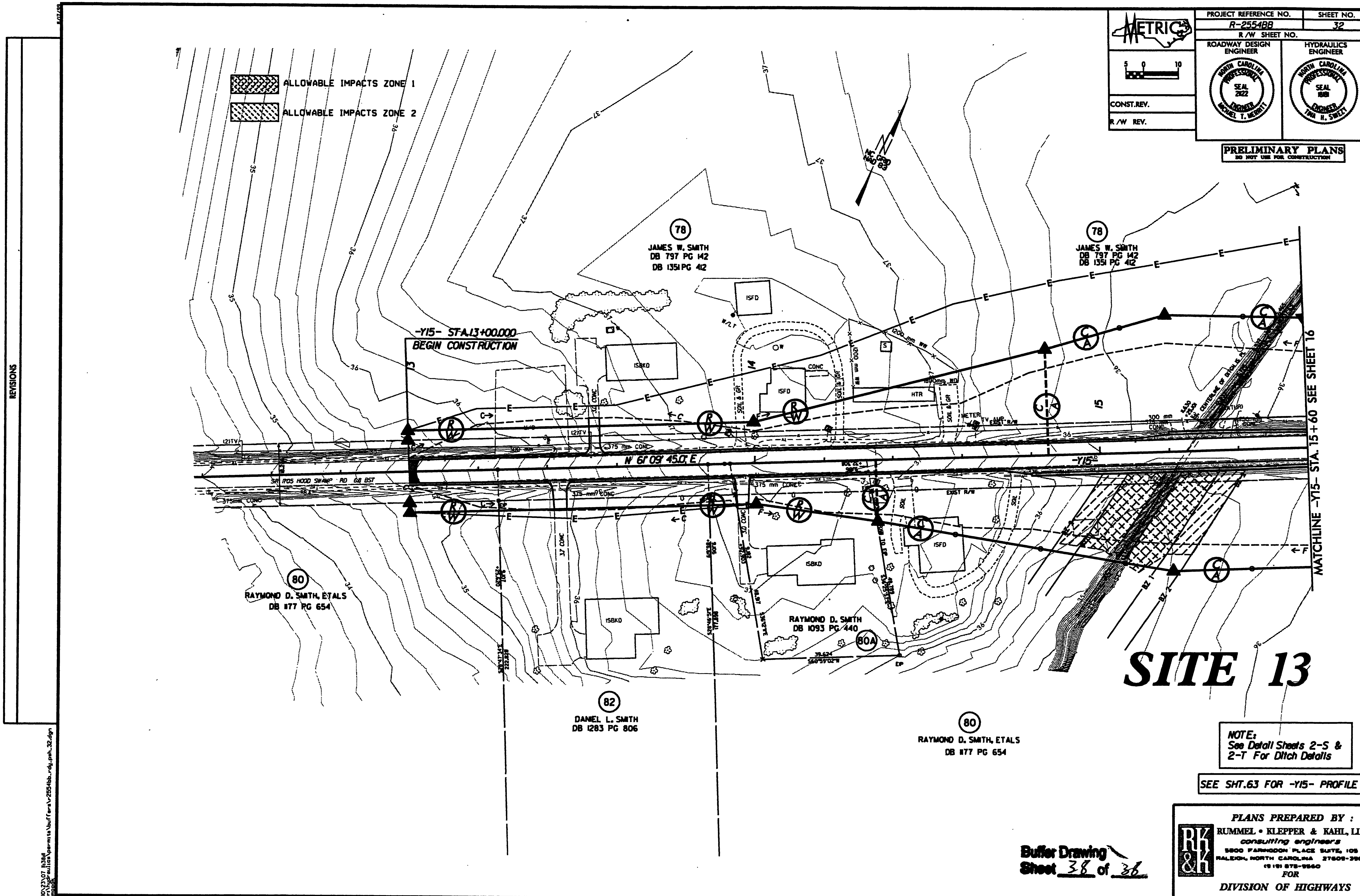
Buffer Drawing Sheet 37 of 38
REVISIONS



ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
PROJECT REFERENCE NO.
R-2554BB
SHEET NO.
32
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
78
JAMES W. SMITH
DB 797 PG 142
DB 1351 PG 412
-Y15- STA.13+00.000
BEGIN CONSTRUCTION
N 61° 09' 45.0" E
-Y15-
MATCHLINE -Y15- STA. 15+60 SEE SHEET 16
80
RAYMOND D. SMITH, ETALS
DB 177 PG 654
RAYMOND D. SMITH
DB 1093 PG 440
80A
82
DANIEL L. SMITH
DB 1283 PG 806
SITE 13
NOTE:
See Detail Sheets 2-S & 2-T For Ditch Details
SEE SHT.63 FOR -Y15- PROFILE
PLANS PREPARED BY :
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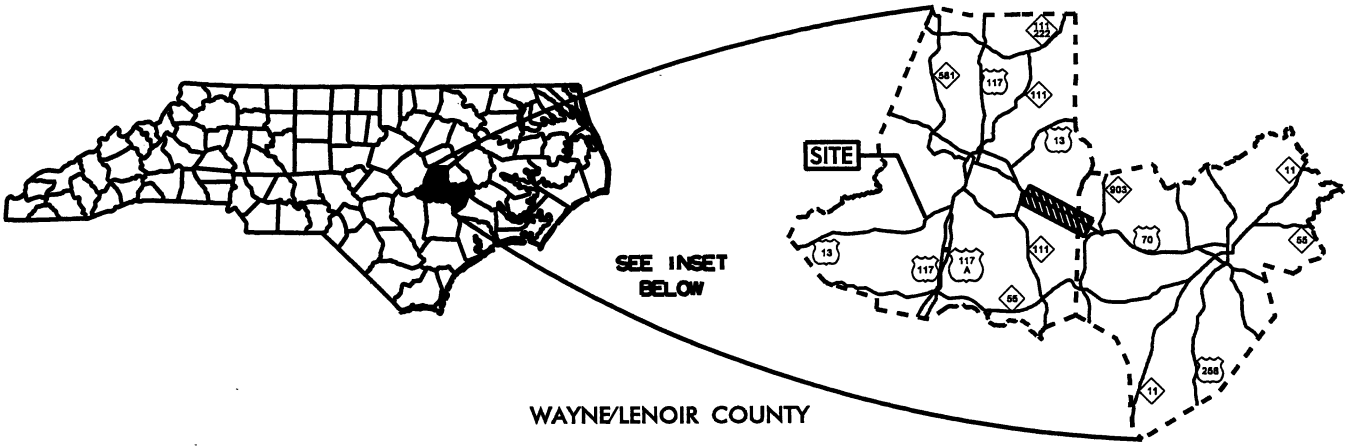
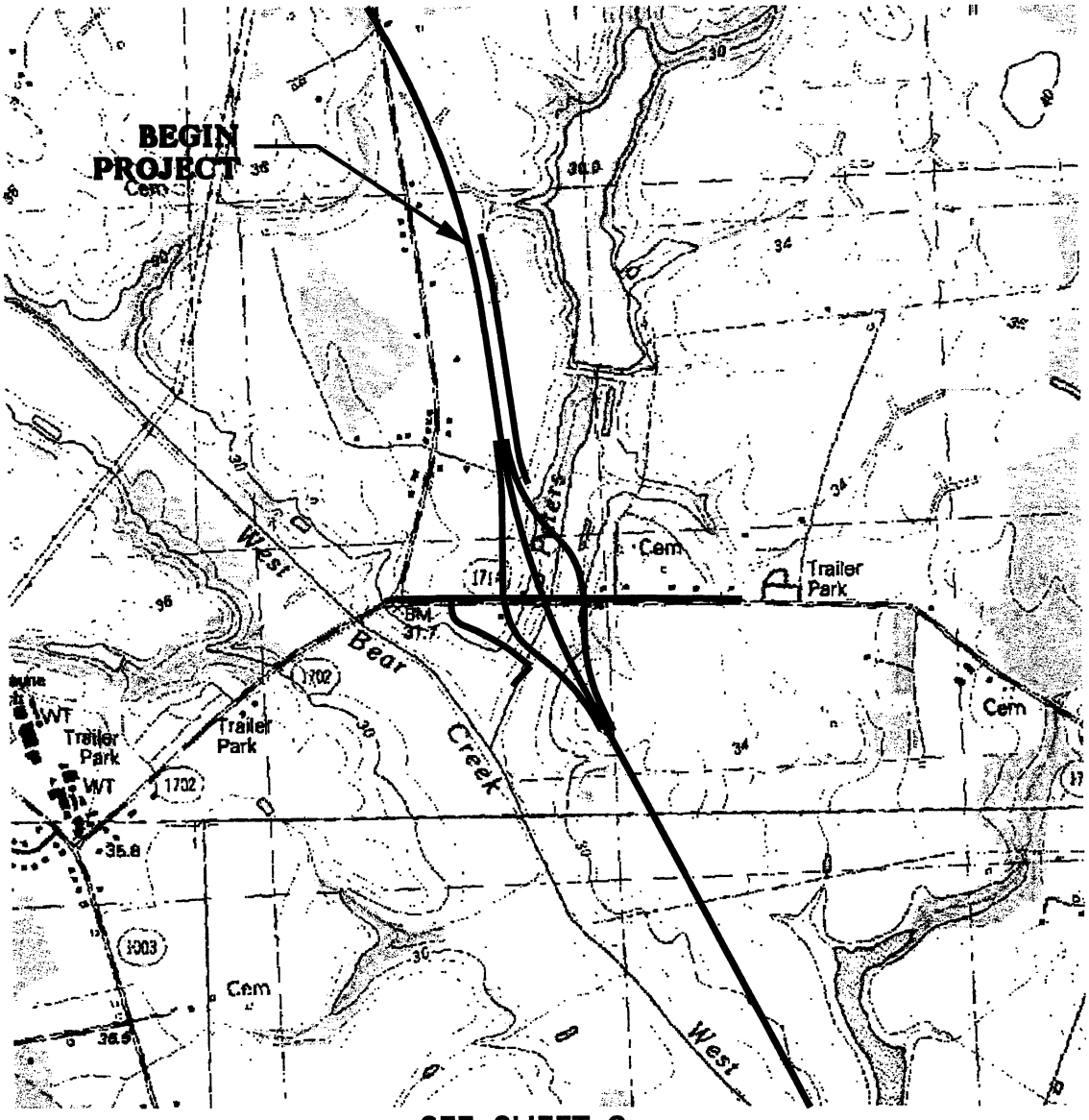
Buffer Drawing
Sheet 38 of 38



WAYNE/LENOIR COUNTY



SEE SHEET 2

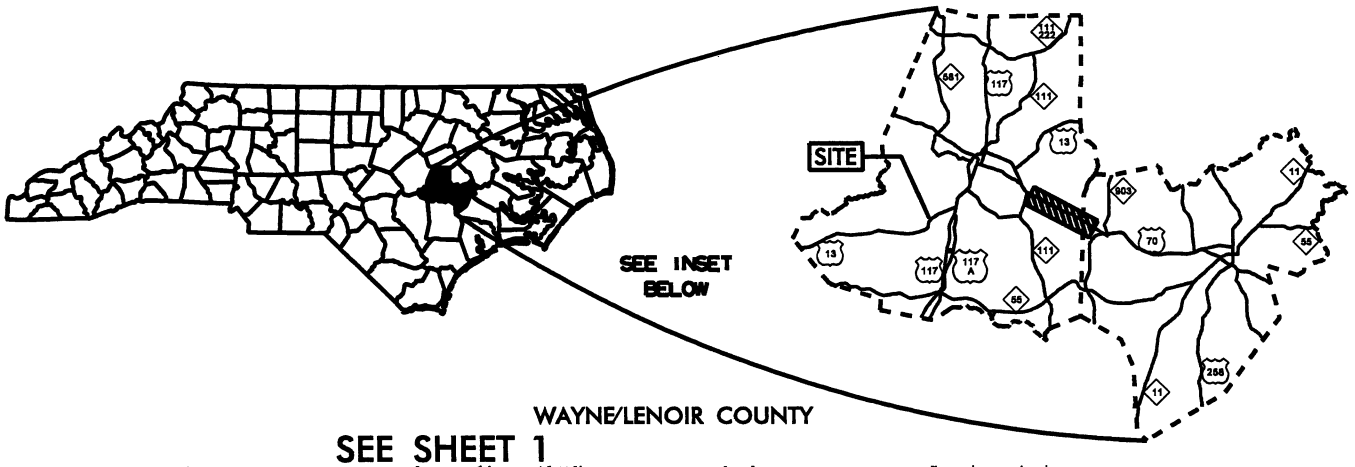
WETLAND IMPACTS
VICINITY MAP
SHEET 1 OF 4

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE/ LENOIR COUNTIES
PROJECT:34461.1.3 (R-2554C)
US 70 (GOLDSBORO BYPASS) FROM WEST OF SR 1714 TO EAST OF SR 1323 IN LENOIR COUNTY

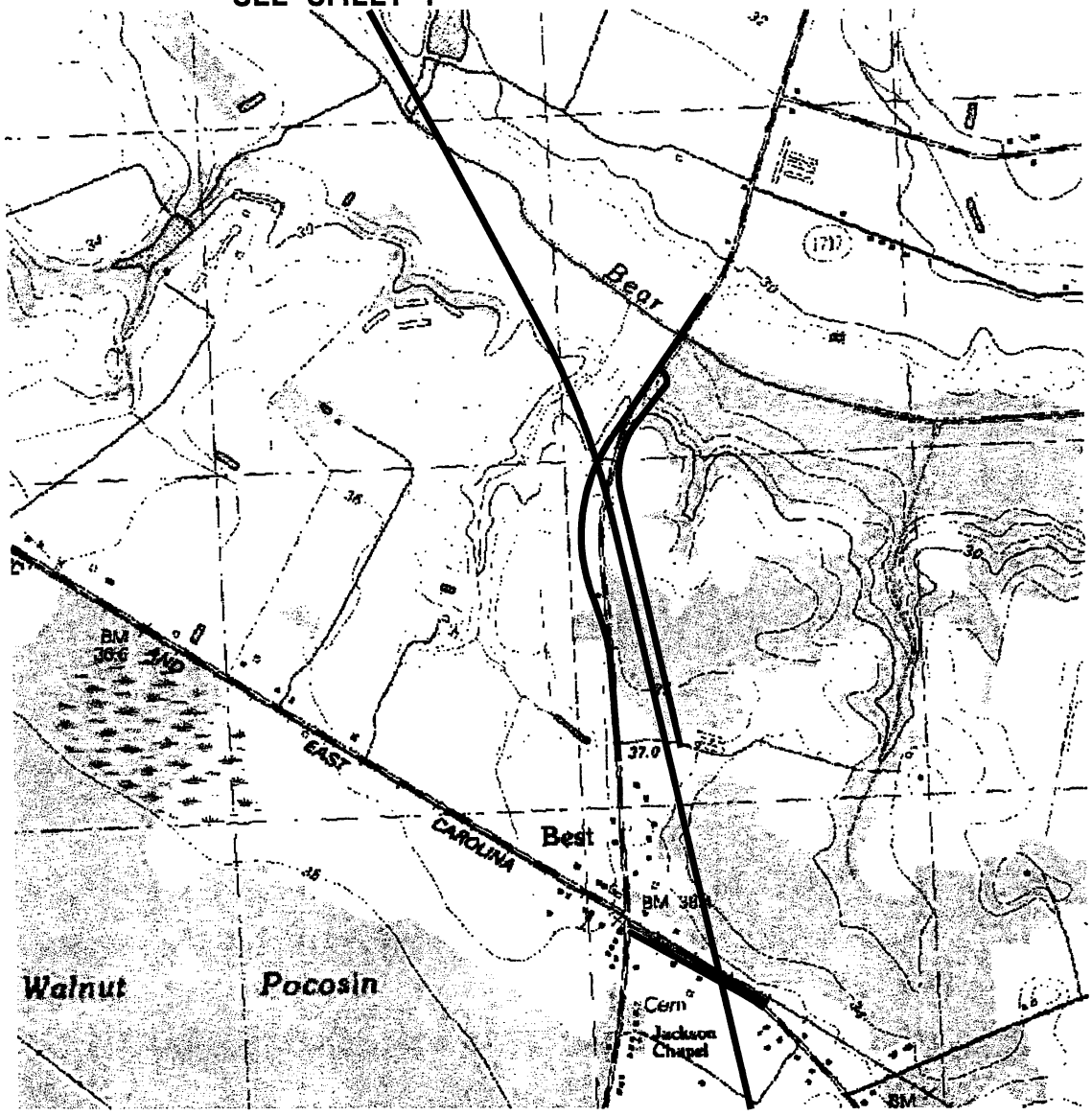
SHEET ___ OF ___ **10/30/07**

Permit Drawing
Sheet 1 of 45



WAYNE/LENOIR COUNTY

SEE SHEET 1



SEE SHEET 3

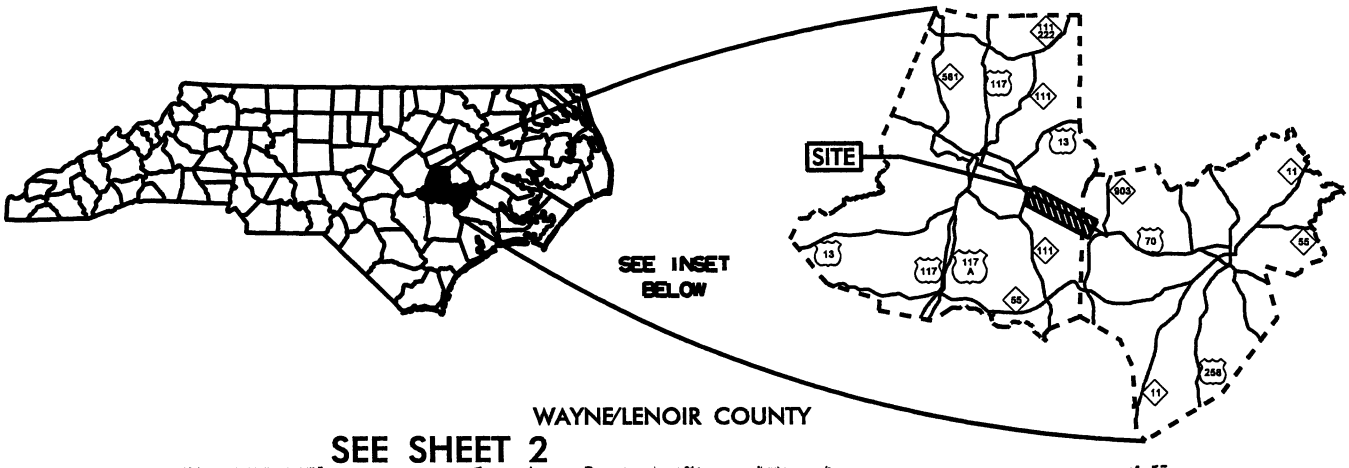
WETLAND IMPACTS
VICINITY MAP
SHEET 2 OF 4

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE/ LENOIR COUNTIES
PROJECT:34461.1.3 (R-2554C)
US 70 (GOLDSBORO BYPASS) FROM WEST OF SR 1714 TO EAST OF SR 1323 IN LENOIR COUNTY

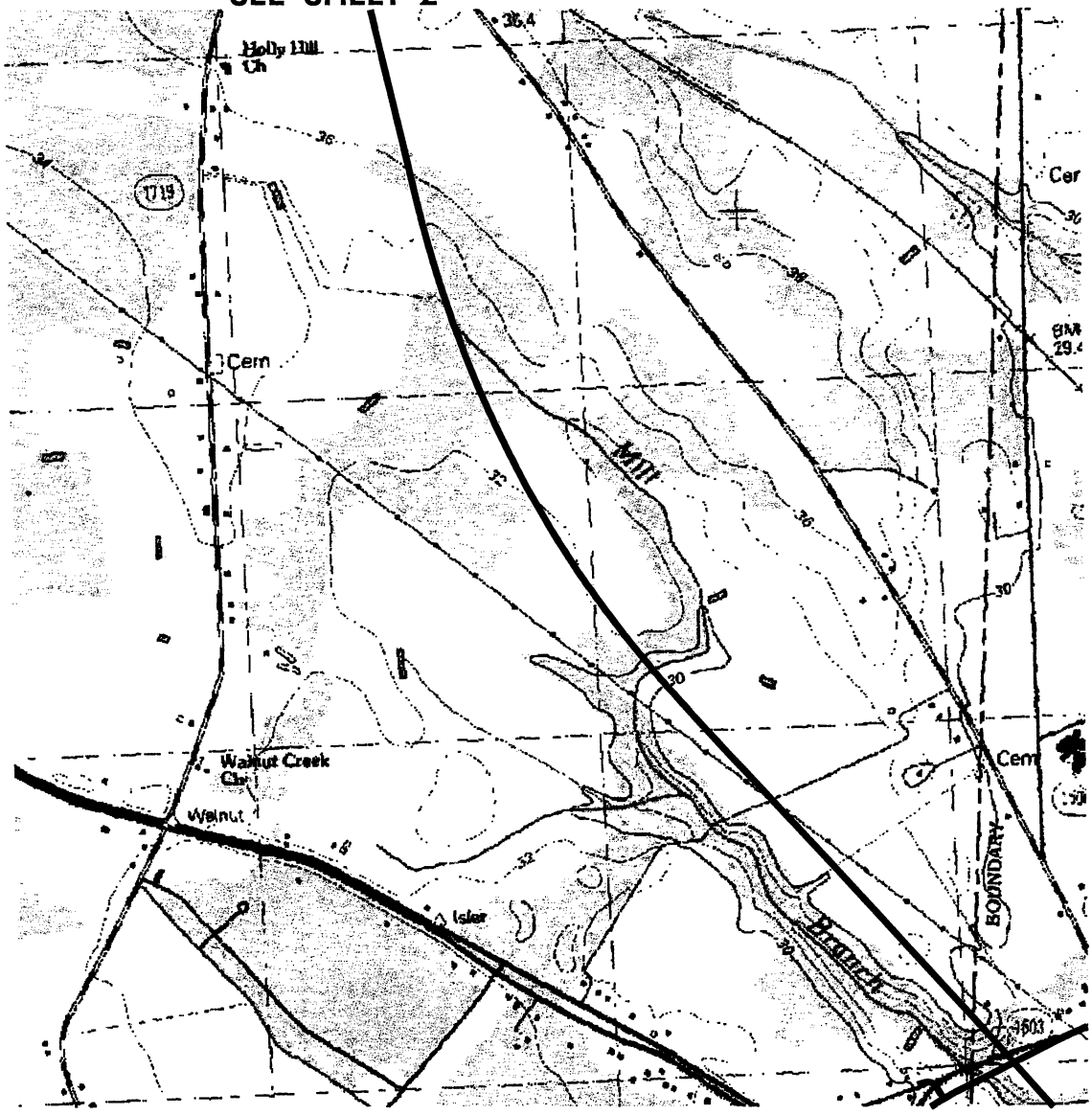
SHEET ___ OF ___ **10/30/07**

Permit Drawing



WAYNE/LENOIR COUNTY

SEE SHEET 2



SEE SHEET 4

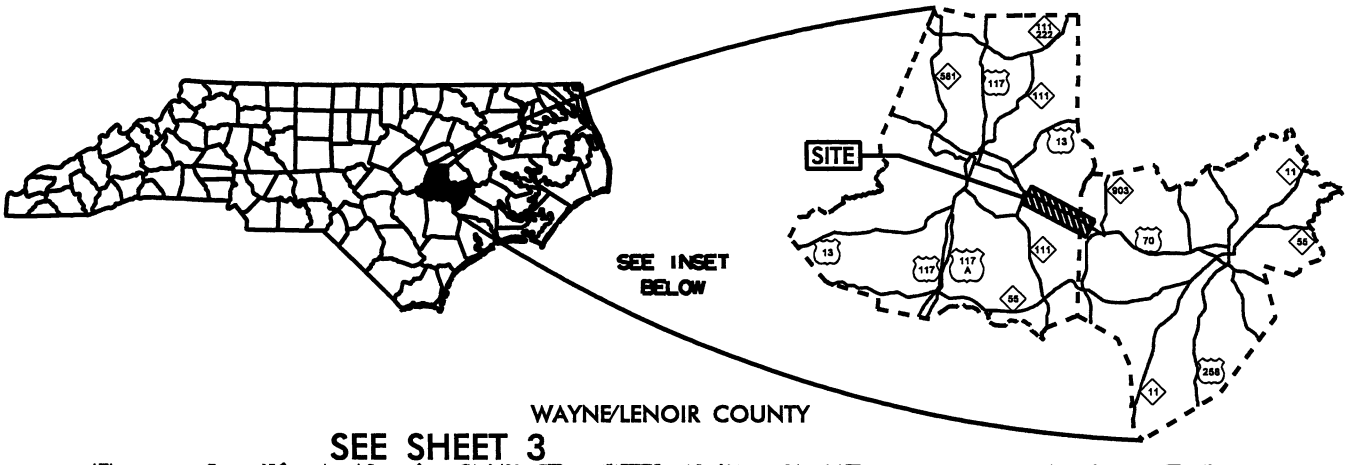
WETLAND IMPACTS
VICINITY MAP
SHEET 3 0F 4

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE/ LENOIR COUNTIES
PROJECT:34461.1.3 (R-2554C)
US 70 (GOLDSBORO BYPASS) FROM WEST OF SR 1714 TO EAST OF SR 1323 IN LENOIR COUNTY

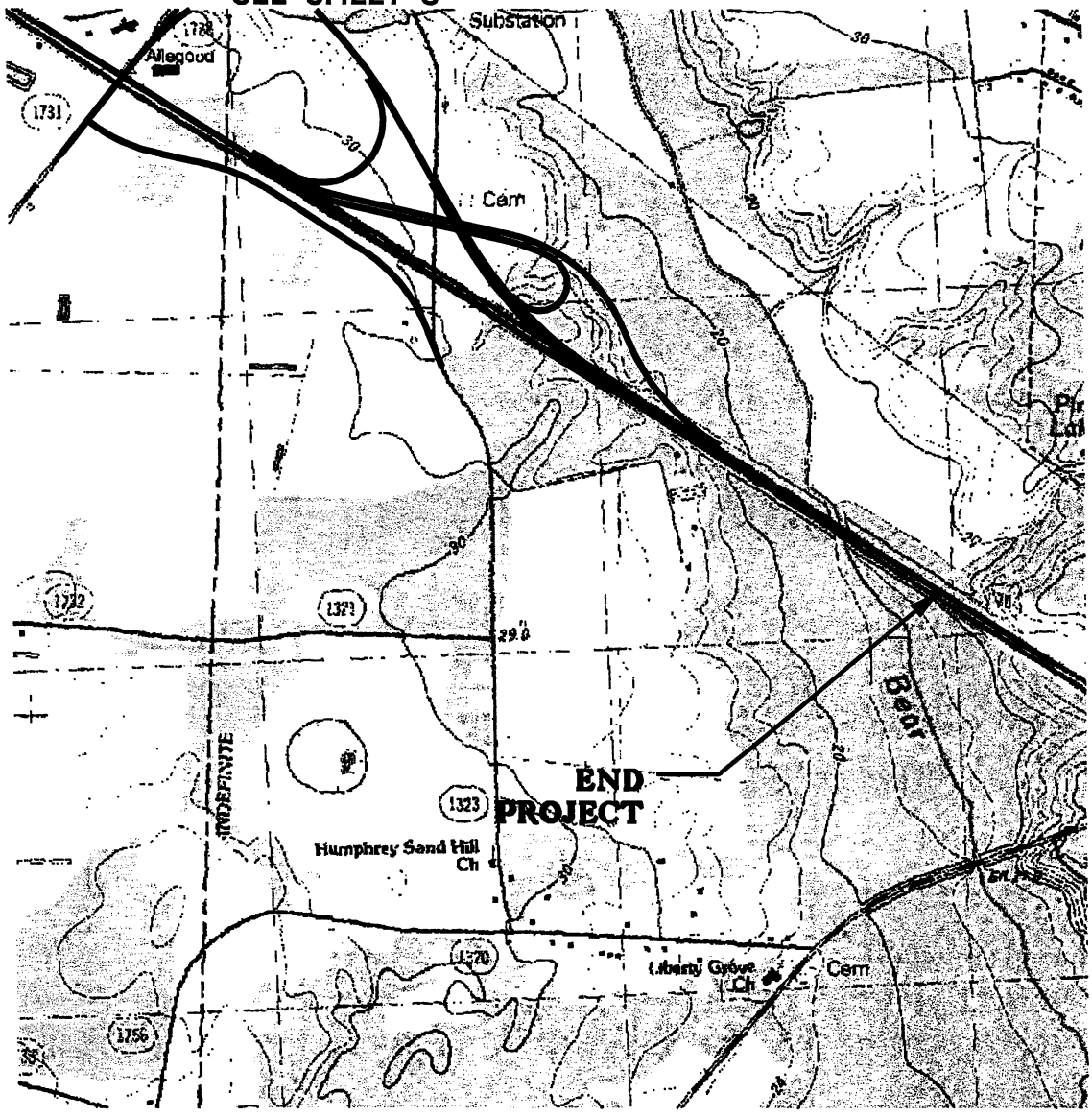
SHEET ___ OF ___ **10/30/07**

Permit Drawing



WAYNE/LENOIR COUNTY

SEE SHEET 3



WETLAND IMPACTS
VICINITY MAP
SHEET 4 OF 4

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE/ LENOIR COUNTIES
PROJECT:34461.1.3 (R-2554C)
US 70 (GOLDSBORO BYPASS) FROM WEST OF SR 1714 TO EAST OF SR 1323 IN LENOIR COUNTY

SHEET ___ OF ___ **10/30/07**

Permit Drawing
Sheet 4 of 45

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS			
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Natural Stream Design (ft)
1	230+00to234+00 L	Box Culvert(Stream & Pond)						0.42	0.06	1395	
2	12+20 -RpB-	Fill (Pond)						0.05			
3	12+65-RpA	Pipe(Stream & Pond)						0.15	0.00	660	
4	251+40-L-	Fill	0.30					0.04		378	
5	260+85-L-	Box Culvert						0.04	0.01	328	
6	269+20-L-	Pipe	1.71			0.10					
7	273+80to276+00 L	Fill	3.09			0.25					
8	268+80to269+50 L	Fill	0.22		0.01	0.06					
9	291+00to293+00 L	Box Culvert/Pipe	1.97			0.13		0.59			
10	302+20to303+00 L	Box Culvert	1.09			0.14		0.21	0.00	338	
11	320+20-L-	Box Culvert/Pipe	1.66			0.18		0.15		427	
12	11+20to17+40-Fly-	Fill/Pipe	4.65			0.55		0.05	0.00	483	
13	336+80to341+20 L	Fill	0.62			0.22					
14	11+20-Y26-	Box Culvert	2.03			0.16		0.09	0.01	407	
TOTALS:			17.32		0.01	1.79		1.78	0.09	4416	

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

COUNTY

PROJECT: 34461.1.1 (R-2554C)

10/17/07

SHEET ########

JMD Revised 2/03/05

Permit Drawing
Sheet 5 of 45

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS			
			Permanent Fill In Wetlands (ha)	Temp. Fill In Wetlands (ha)	Excavation in Wetlands (ha)	Mechanized Clearing in Wetlands (ha)	Hand Clearing in Wetlands (ha)	Permanent SW impacts (ha)	Temp. SW impacts (ha)	Existing Channel Impacts Permanent (m)	Natural Stream Design (m)
1	230+00to234+00 L	Box Culvert(Stream & Pond)						0.168	0.025	425	
2	12+20 -RpB-	Fill (Pond)						0.022			
3	12+65-RpA	Pipe(Stream & Pond)						0.059	0.001	201	
4	251+40-L-	Fill	0.120					0.018		115	
5	260+85-L-	Box Culvert						0.016	0.002	100	
6	269+20-L-	Pipe	0.692			0.040					
7	273+80to276+00 L	Fill	1.250			0.103					
8	268+80to269+50 L	Fill	0.090		0.006	0.025					
9	291+00to293+00 L	Box Culvert/Pipe	0.798			0.054		0.237			
10	302+20to303+00 L	Box Culvert	0.441			0.057		0.083	0.001	103	
11	320+20-L-	Box Culvert/Pipe	0.670			0.071		0.062		130	
12	11+20to17+40-Fly-	Fill/Pipe	1.880			0.222		0.019	0.001	147	
13	336+80to341+20 L	Fill	0.250			0.089					
14	11+20-Y26-	Box Culvert	0.820			0.065		0.035	0.006	124	
TOTALS:			7.011	0.000	0.006	0.726	0.000	0.719	0.036	1345	0

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
PROJECT: 34461.1.1 (R-2554C)

10/17/07
SHEET ########

JMD Revised 2/03/05

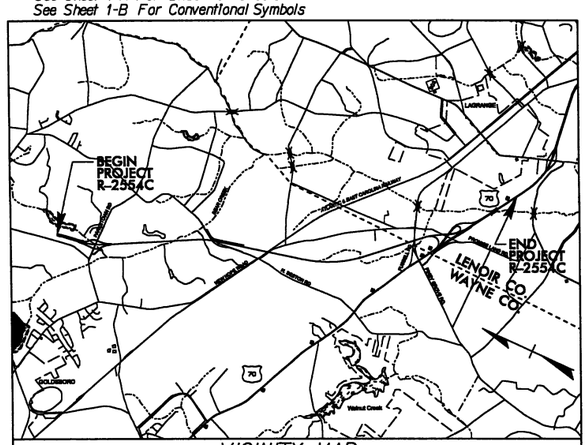
Permit Drawing
Sheet 6 of 45

9/09/05

CONTRACT: TIP PROJECT: R-2554C

FILE: $FILE$ STAMES
DATE: $DATE$

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAYNE–LENOIR COUNTIES

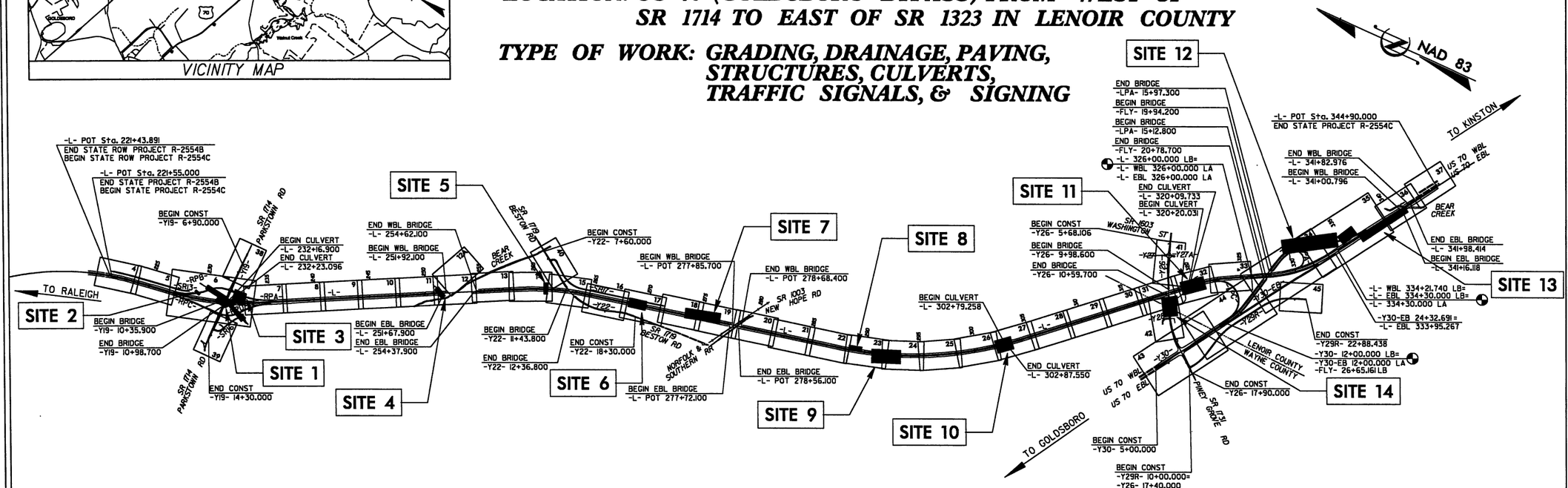
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2554C	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34461.1.3	NHF-70(30)	P.E.
34461.2.5	NHS-70(69)	R/W & UTIL.

METRIC
ALL DIMENSIONS IN THESE PLANS ARE IN METERS

LOCATION: US 70 (GOLDSBORO BYPASS) FROM WEST OF SR 1714 TO EAST OF SR 1323 IN LENOIR COUNTY

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, CULVERTS, TRAFFIC SIGNALS, & SIGNING



WETLAND/STREAM IMPACTS

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III
THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS LIMITED TO INTERCHANGES.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

PLANS 5 0 10
PROFILE (HORIZONTAL) 5 0 10
PROFILE (VERTICAL) 1 0 2

DESIGN DATA

ADT 2006 = 18,100
ADT 2026 = 33,100
DHV = 10 %
D = 55 %
T = 10 % *
V = 110 km/h
FUNC CLASS = FREEWAY
* TTST 6 % DUAL 4 %

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2554C	11.884	KM.
LENGTH STRUCTURES TIP PROJECT R-2554C	0.369	KM.
TOTAL LENGTH TIP PROJECT R-2554C	12.253	KM.

NOTE: EB LANE USED TO DETERMINE PROJECT LENGTH

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4030 WESTCHASE BLVD. SUITE 475
RALEIGH, NC 27607
PREPARED FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: DECEMBER 23, 2002

LETTING DATE: PY

DENNIS MORY, PE — *PROJECT ENGINEER*

CLAUDETTE M.K. ROQUE, PE — *PROJECT DESIGN ENGINEER*

NCDOT CONTACT: DOUG TAYLOR, PE — *PROJECT ENGINEER*

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER P.E.

Permit Drawing
Sheet 7 of 45

1 | 8/21/03 | REV. PARCEL 6, ADDED PARCEL 10A

SR 1714 PARKSTOWN RD.
-Y19-

LEGEND
2004 ADT
2025 ADT

BEGIN BRIDGE
-Y19- STA ID+35.900

END BRIDGE
-Y19- STA ID+98.700

PAINTED ISLAND
N 89°55'00" W

BRIDGE SKETCH
-Y19- OVER -L-

SITE #1
(PETER CREEK)

SITE #2

SITE #3

NAD 83

MATCH LINE -Y19- 8+80 SEE SHEET 38

MATCH LINE -L- 227+20 SEE SHEET 5

MATCH LINE -L- 234+00 SEE SHEET 7

MATCH LINE -RPA- 12+25 SEE SHEET 7

MATCH LINE -Y19- 12+20 SEE SHEET 39

MATCH LINE -RPD- 12+10 SEE SHEET 7

A

B

C

D

DENOTES IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER (POND)

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PLANS PREPARED BY:
FLOWERS & HUTCHESON, INC.
CONSULTING CIVIL ENGINEERS
4601 SIX FORKS ROAD, SUITE 401
RALEIGH, NORTH CAROLINA 27609

SHEET 47 FOR -L- PROFILE
SHEET 68 & 69 FOR -Y19- PROFILE
SHEET 71 FOR -RPA- PROFILE
SHEET 72 FOR -RPB- PROFILE
SHEET 73 FOR -RPC- PROFILE
SHEET 74 FOR -RPD- PROFILE
SHEET 69 A, 70 FOR -SR 16- PROFILE
SHEET 75 FOR -SR 16- PROFILE
SHEET 76 FOR -SR 16A- PROFILE
SHEETS 2-A FOR DOWEL DETAILS
SHEET 2-H FOR ISLAND DETAILS
SHEETS 5-F THRU 5-H FOR DRAINAGE DETAILS

METRIC

PROJECT REFERENCE NO. | SHEET NO.
R/W SHEET NO.
ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

CONTR. NO.
R/W REV.

LOCATION:
US 70 (GOLDSBORO BYPASS)
FROM WEST OF SR 1714 TO
EAST OF SR 1323 IN LENOIR COUNTY

TIP NO.: R-2554C | COUNTY: WAYNE-LENOIR

DESIGNED BY: | DATE:

LOCATION:
TIP NO.:
DESIGNED BY: | DATE:
CHECKED BY: | DATE:

Permit Drawing
Sheet 8 of 45

SITE #1
(PETER CREEK)

SITE #2

SITE #3

A

B

C

D

NAD 83

MATCH LINE -Y19- 8+80 SEE SHEET 3B

MATCH LINE -L- 227+20 SEE SHEET 5

MATCH LINE -Y19- 12+20 SEE SHEET 3B

MATCH LINE -L- 214+00 SEE SHEET 7

MATCH LINE -RPA- 12+25 SEE SHEET 7

MATCH LINE -Y19- 12+20 SEE SHEET 3B

DENOTES IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER (POND)

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SR 1714 PARKSTOWN RD.
-Y19-

LEGEND
2006 ADT
2032 ADT

BEGIN BRIDGE
-Y19- STA 10+35.900

END BRIDGE
-Y19- STA 10+98.700

PAINTED ISLAND
N 89°55'00" W

BRIDGE SKETCH
-Y19- over -L-

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
AND SURVEYORS

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS

CONSTRUCT.

R/W REV.

LOCATION:
US 70 (GOLDSBORO BYPASS)
FROM WEST OF SR 1714 TO
EAST OF SR 1323 IN LENOIR COUNTY

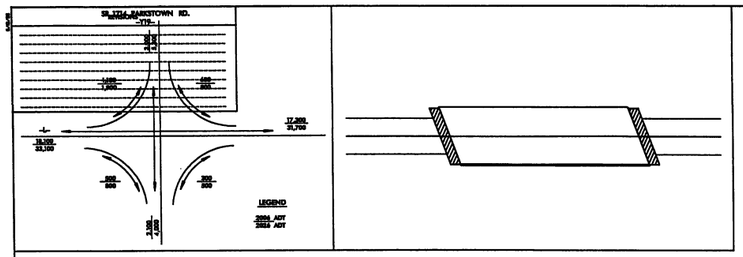
TIP NO.: R-2554C COUNTY: WAYNE-LENOIR

DESIGNED BY: DATE:

CHECKED BY: DATE:

1 | 8/27/03 | REV PARCEL 5, ADDED PARCEL 10A

Permit Drawing
Sheet 9 of 45



DENOTES IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER (POND)

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
3000 CHARLOTTE PLAZA, CHARLOTTE, NC 28244

PROJECT REFERENCE NO.	SHEET NO.
B-2554C	6A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT TO BE USED FOR CONSTRUCTION

CONSTRUCTION

R/W SHEET

LOCATION:
US 70 (GOLDSBORO BYPASS)
FROM WEST OF SR 1714 TO
EAST OF SR 1323 IN LENOIR COUNTY

TIP NO.: B-2554C COUNTY: WAYNE-LENOIR

DESIGNED BY: DATE:

CHECKED BY: DATE:

SITE #1
(PETER CREEK)

SITE #2

(34.600m LT - 111.55')

900.0m WD RAIL

PROP R/W
PROP 1.2m WW

+30.918 -RPB-
32.994m LT

(CHORD)
+25.681 -RPB-
18.709m LT
BEG FENCE

+15.177 -RPB-
18.765m LT
END FENCE

(33.600m LT - 110.24')

PROP GUARDRAIL

+50.000 -RPB-
30.000m LT
(98.43')

+110.338 -RPB-
20.435m LT

+58.900 -RPB-
20.900m LT
(68.57')

+53.000 -RPB-
40.500m LT
(132.87')

+53.000 -RPB-
30.000m LT
(98.43')

PROP GUARDRAIL
BARRIER WITH
TERMINAL SECTIONS

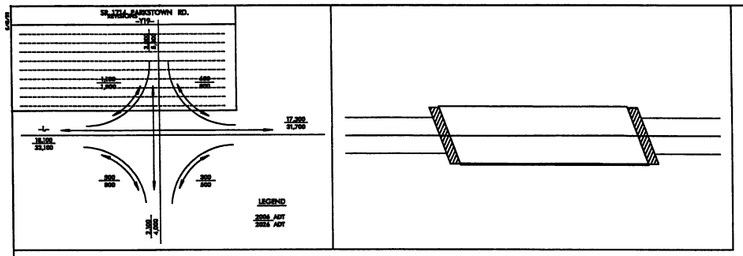
+76.881 -L-
48.290m LT
(158.43')

CAT-1

-RPB-

229

Permit Drawing
Sheet 16 of 45



S S DENOTES IMPACTS IN SURFACE WATER

P P DENOTES IMPACTS IN SURFACE WATER (POND)

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
RALEIGH, NORTH CAROLINA

SHEET 47 FOR -L- PROFILE
SHEET 68 & 69 FOR -Y10- PROFILE
SHEET 71 FOR -SP5- PROFILE
SHEET 73 FOR -SP6- PROFILE
SHEET 74 FOR -SP3- PROFILE
SHEET 69 & 70 FOR -SR 13- PROFILE
SHEET 75 FOR -SR 16- PROFILE
SHEET 76 FOR -SR 1464- PROFILE
SHEET 3-E FOR CORE DETAILS
SHEET 3-I FOR ISLAND DETAILS
SHEETS 3-F THRU 3-H FOR DRAINAGE DETAILS

METRIC

PROJECT REFERENCE NO. R-2554C
SHEET NO. 6A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

CONSTR.
R/W SEC.

LOCATION:
US 70 (GOLDSBORO BYPASS)
FROM WEST OF SR 1714 TO
EAST OF SR 1323 IN LENOIR COUNTY

TIP NO.: R-2554C COUNTY: WAYNE-LENOIR

DESIGNED BY: DATE:

CHECKED BY: DATE:

SITE #1
(PETER CREEK)

SITE #2

(34.000m LT - 111.55')

+30.918 -RPB-
32.994m LT

(CHORD)

+25.681 -RPB-
18.709m LT
BEG FENCE

+15.177 -RPB-
18.765m LT
END FENCE

(33.600m LT - 110.24')

PROP GUARDRAIL

+50.000 -RPB-
30.000m LT
(98.43')

+10.338 -RPB-
20.435m LT

+50.000 -RPB-
20.900m LT
(68.57')

+53.900 -RPB-
40.500m LT
(132.87')

+53.000 -RPB-
40.000m LT
(98.43')

PROP GUARDRAIL
BARRIER WITH
TERMINAL SECTIONS

+76.881 -L-
48.290m LT
(158.43')

CAT-1

RPB

Permit Drawing
Sheet 11 of 15

SR 1714 PARKSTOWN RD.

LEGEND
2006 ADT
2025 ADT

SITE #3

DENOTES IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER (POND)

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SITE #1
(PETER CREEK)

GOLDSBORO BYPASS

SLOPE STAKES

MATCH LINE -Y19- 8+80 SEE SHEET 3B

OUT TO PETERS CREEK

PROP CABLE GUIDE RAIL

TYPE-III MOD ATTENUATOR

"DRY FH" USED BY WAYNE COUNTY FIRE PERSONNEL

FLORENCE & HUTCHESON INC.

PROJECT REFERENCE NO. B-2554C

SHEET NO. 2.1

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS

LOCATION: US 70 (GOLDSBORO BYPASS) FROM WEST OF SR 1714 TO EAST OF SR 1323 IN LENOIR COUNTY

TIP NO.: B-2554C COUNTY: WAYNE-LENOIR

DESIGNED BY: DATE:

CHECKED BY: DATE:

Permit Drawing
Sheet 12 of 45

SITE #3

SITE #1
(PETER CREEK)

DENOTES IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER (POND)

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SR 1714 PARKSTOWN RD.

LEGEND
2006 ADT
3025 ADT

PLANS PREPARED BY: FLORENCE & HUTCHESON, INC.

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	6 B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

CONSULTANT

NO. REVISIONS

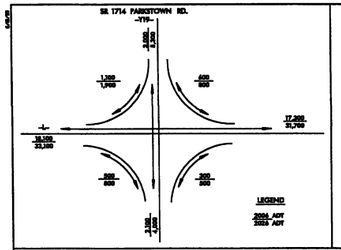
LOCATION:
US 70 (GOLDSBORO BYPASS)
FROM WEST OF SR 1714 TO
EAST OF SR 1323 IN LENOIR COUNTY

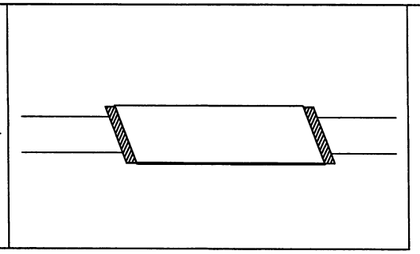
TIP NO.: R-2554C COUNTY: WAYNE-LENOIR

DESIGNED BY: DATE:

CHECKED BY: DATE:

Permit Drawing
Sheet 13 of 45





PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
AND CONSTRUCTION SPECIALISTS
ATLANTA, GEORGIA

SEE SHEET 47 FOR -L- PROFILE	
SEE SHEET 68 & 69 FOR -Y19- PROFILE	
SEE SHEET 71 FOR -RPA- PROFILE	
SEE SHEET 72 FOR -RPB- PROFILE	
SEE SHEET 73 FOR -RPC- PROFILE	
SEE SHEET 74 FOR -RPD- PROFILE	
SEE SHEET 69 & 70 FOR -SR 13- PROFILE	
SEE SHEET 75 FOR -SR 14- PROFILE	
SEE SHEET 76 FOR -SR 14A- PROFILE	
SEE SHEET 5-E FOR GORE DETAILS	
SEE SHEET 5-F FOR ISLAND DETAILS	
SEE SHEETS 5-F THRU 5-H FOR DRAINAGE DETAILS	

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	6 C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT TO BE USED FOR CONSTRUCTION

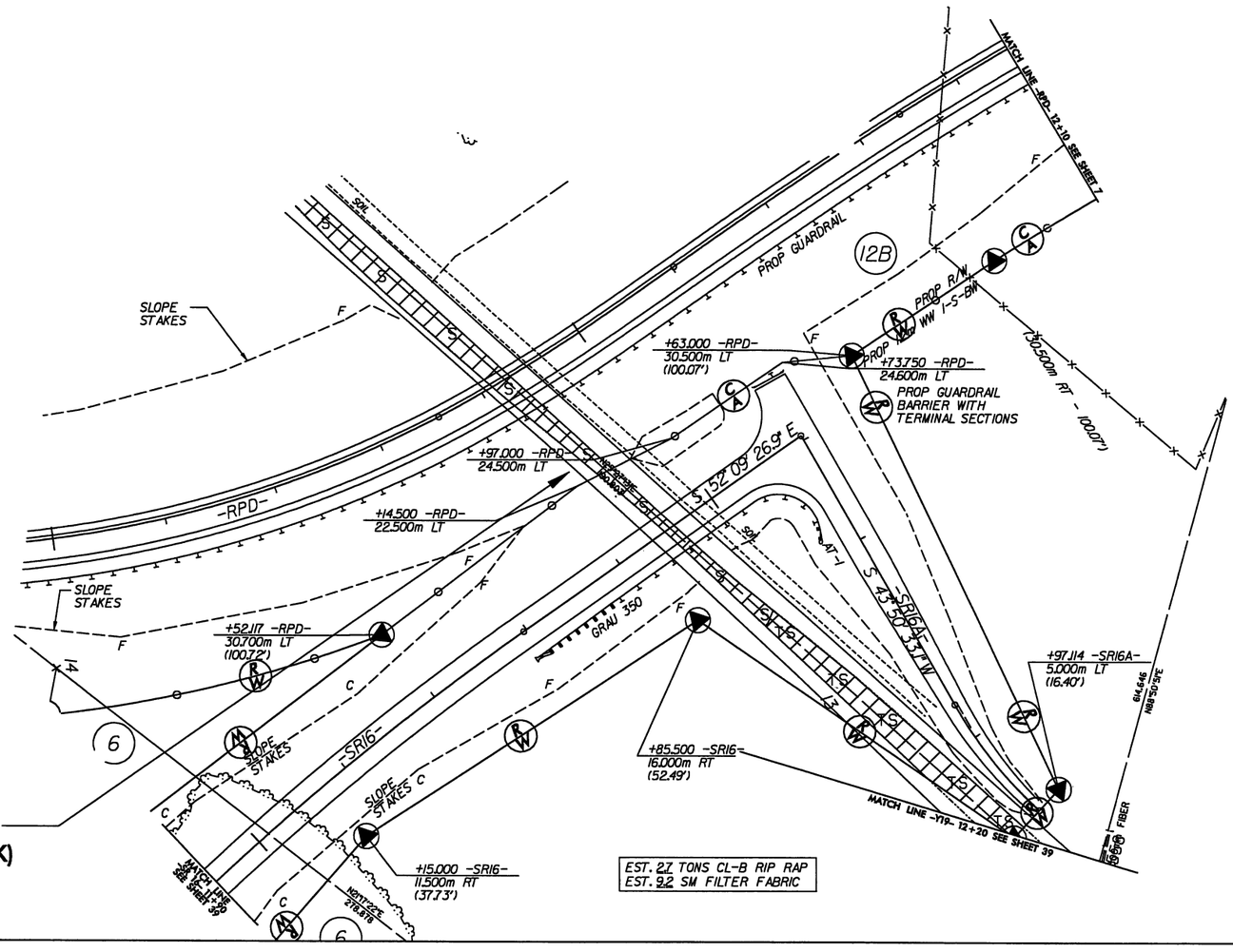
CONTR.
DW REV.

LOCATION:
US 70 (GOLDSBORO BYPASS)
FROM WEST OF SR 1714 TO
EAST OF SR 1323 IN LENOIR COUNTY

TIP NO.: R-2554C COUNTY: WAYNE-LENOIR

DESIGNED BY: DATE:

CHECKED BY: DATE:



DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

Permit Drawing
Sheet 14 of 45

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
AND GEOLOGISTS
ASHEVILLE, N.C. 28803
AND CHARLOTTE, N.C. 28202

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	4 C
F.A.P. SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

0m 5 10m
SCALE

PRELIMINARY PLANS
NO RIGHT OF WAY OR CONSTRUCTION

CONT. SEC.

TIP NO.

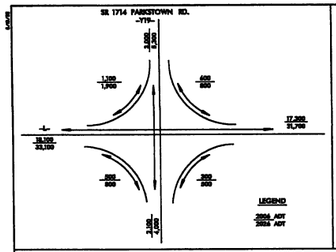
SEE SHEET 47 FOR -L- PROFILE
SEE SHEET 68 & 69 FOR -Y19- PROFILE
SEE SHEET 71 FOR -RPA- PROFILE
SEE SHEET 72 FOR -RPB- PROFILE
SEE SHEET 73 FOR -RPC- PROFILE
SEE SHEET 74 FOR -RPD- PROFILE
SEE SHEET 69 & 70 FOR -SR 15- PROFILE
SEE SHEET 75 FOR -SR 16- PROFILE
SEE SHEET 76 FOR -SR 16A- PROFILE
SEE SHEET 3-E FOR GORE DETAILS
SEE SHEET 3-I FOR ISLAND DETAILS
SEE SHEETS 3-F THRU 3-H FOR DRAINAGE DETAILS

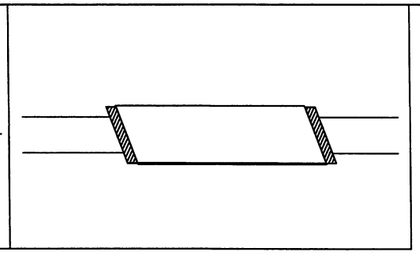
LOCATION:
US 70 (GOLDSBORO BYPASS)
FROM WEST OF SR 1714 TO
EAST OF SR 1323 IN LENOIR COUNTY

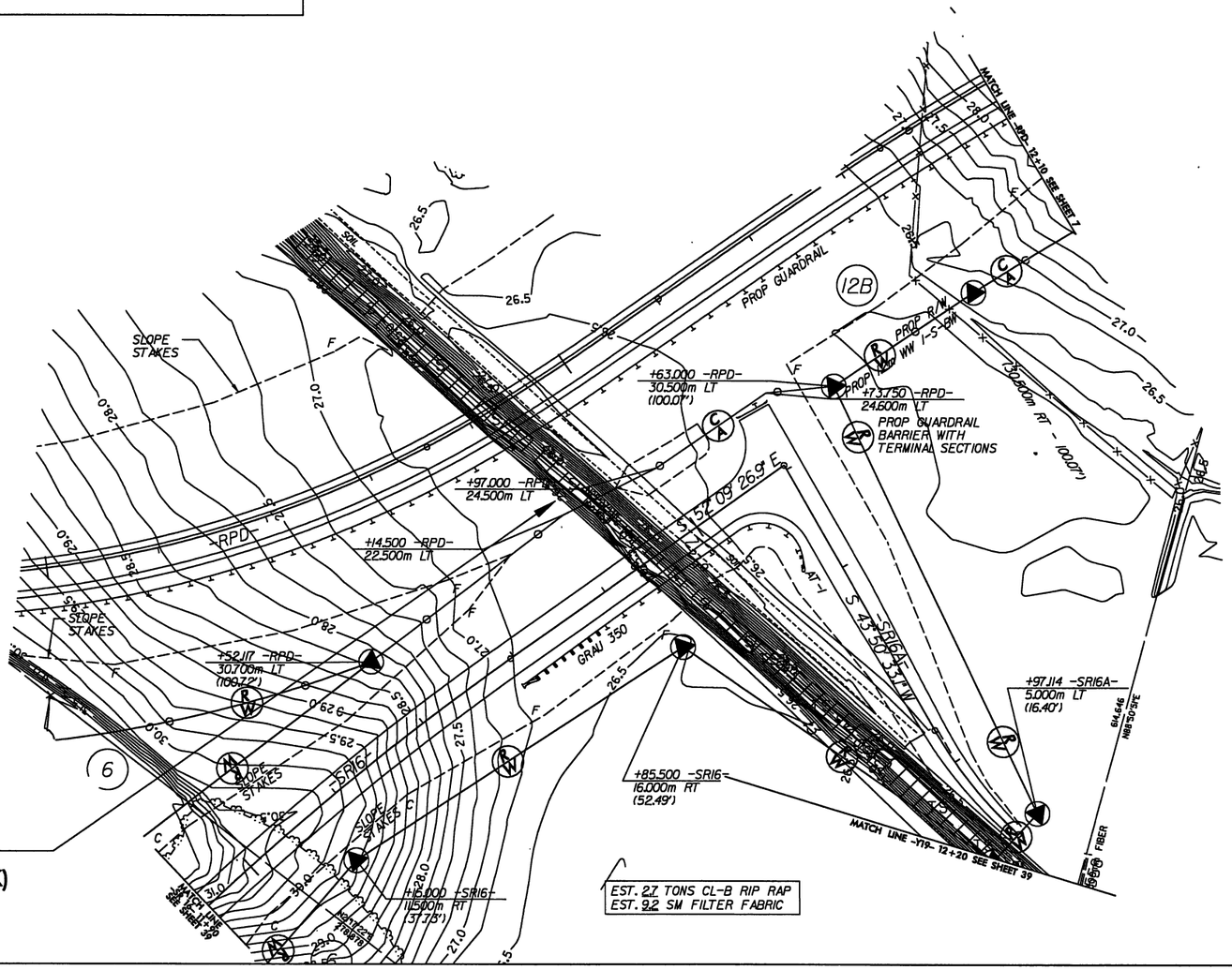
TIP NO.: R-2554C COUNTY: WAYNE-LENOIR

DESIGNED BY: DATE:

CHECKED BY: DATE:







DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

Permit Drawing
Sheet 15 of 45

R/W REV. - 3/01/07
PROPOSED FENCE FOR MITIGATION AREA
ON PARCEL 27

R/W REV. - 10/01/07
REVISED MITIGATION AREA
ON PARCELS 26 & 27

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4030 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

F/F DENOTES FILL IN WETLAND

MATCH LINE -L- 247+60 SEE SHEET 10

MATCH LINE -L- 251+00 SEE SHEET 12

248

249

251

26

POND

27

375mm CMP

SITE #4

+60.000 -L-
45.000m LT
(147.64')

PROP R/W
PROP 1.2m WW 1-S-BW

SLOPE STAKES

24

CAT-I

PROP GUARDRAIL

PROP CABLE GUIDE RAIL

GOLDSBORO BYPASS -L- S 27° 40' 21.0" E

BORROW PIT

+51.63
74.762m

+60.000 -L-
45.000m RT
(147.64')

375 mm RCP CLASS

SOIL

WEST BEAR CREEK

25

SEE SHEET 50 FOR -L- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

FILE: $FILE$
DATE: $DATE$
DGN FILE: $DGNFILE$
PLT TABLE: $PENTBL$

Permit Drawing

R/W REV. - 3/01/07
PROPOSED FENCE FOR MITIGATION AREA
ON PARCEL 27

R/W REV. - 10/01/07
REVISED MITIGATION AREA
ON PARCELS 26 & 27

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.

R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	11
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

F/F DENOTES FILL IN WETLAND

NAD 83

SITE #4

MATCH LINE -L- 247+60 SEE SHEET 10

MATCH LINE -L- 251+00 SEE SHEET 12

GOLDSBORO BYPASS -L- S 27° 40' 21.0" E

PROP CABLE GUIDE RAIL

PROP GUARDRAIL

PROP R/W

PROP 12m WW 1-S-BW

SLOPE STAKES

POND

BORROW PIT

WEST BEAR CREEK

SOIL

+60.000 -L- 45.000m RT (147.64')

+45.63 -L- 74.182m

FILE: $FILE$
DATE: $DATE$
PLOT DRIVER: $PLOTDRIVER$
PEN TABLE: $PENTABLE$

SEE SHEET 50 FOR -L- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

Permit Drawing

R/W REV. - 3/01/07
PROPOSED FENCE FOR MITIGATION AREA
ON PARCEL 27

R/W REV. - 10/01/07
REVISED MITIGATION AREA
ON PARCELS 26 & 27

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4130 WESTCHASE BLVD. SUITE 475
RALEIGH, NC 27607

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	12
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

5m 0 10m

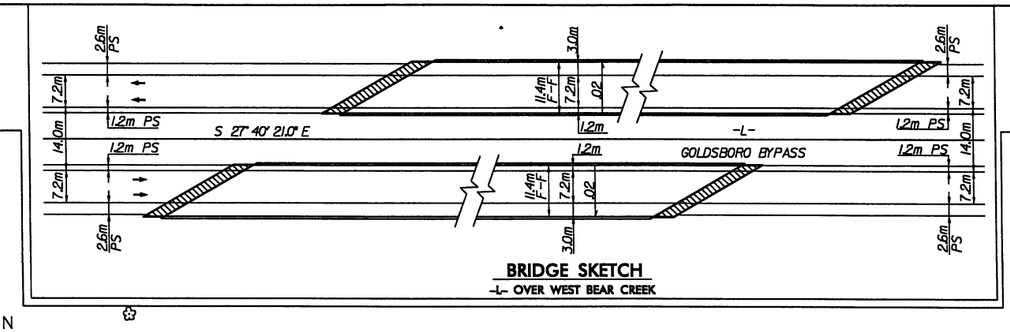
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R /W REV.

MATCH LINE SEE SHEET 12A

MATCH LINE SEE SHEET 12A



NAD 83

S DENOTES IMPACTS IN SURFACE WATER

F DENOTES FILL IN WETLAND

MATCH LINE -L- 251+00 SEE SHEET 11

MATCH LINE -L- 254+40 SEE SHEET 13

GOLDSBORO BYPASS -L- S 27° 40' 21.0" E

WEST BEAR CREEK

PROP R/W
PROP 1.2m WW 1-S-BW

SLOPE STAKES

+05.717 -L-
45.000m LT

+40.000 -L-
45.000m LT
(147.64')

+05.716 -L-
17.670m LT
END FENCE

PROP GUARDRAIL

TYPE-III

PROP CABLE GUIDE RAIL
TYPE M350

+45.164 -L-
17.670m RT
END FENCE

500mm CMP

1450mm CMP

+40.000 -L-
45.000m RT
(147.64')

+45.164 -L-
45.000m RT

+24.293 -L-
17.670m RT
BEG FENCE

+24.292 -L-
45.000m RT

50%

25 26 27 28 29

SITE #4

SEE SHEET 50 FOR -L- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

Permit Drawing

FILE:
DATE:
PLOT DRIVER: STIMES
PEN TABLE: SPENTBILLS

R/W REV. - 3/01/07
PROPOSED FENCE FOR MITIGATION AREA
ON PARCEL 27

R/W REV. - 10/01/07
REVISED MITIGATION AREA
ON PARCELS 26 & 27

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

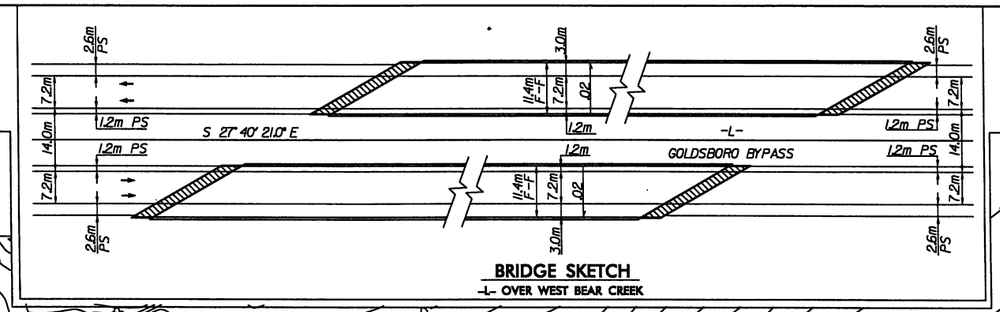
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

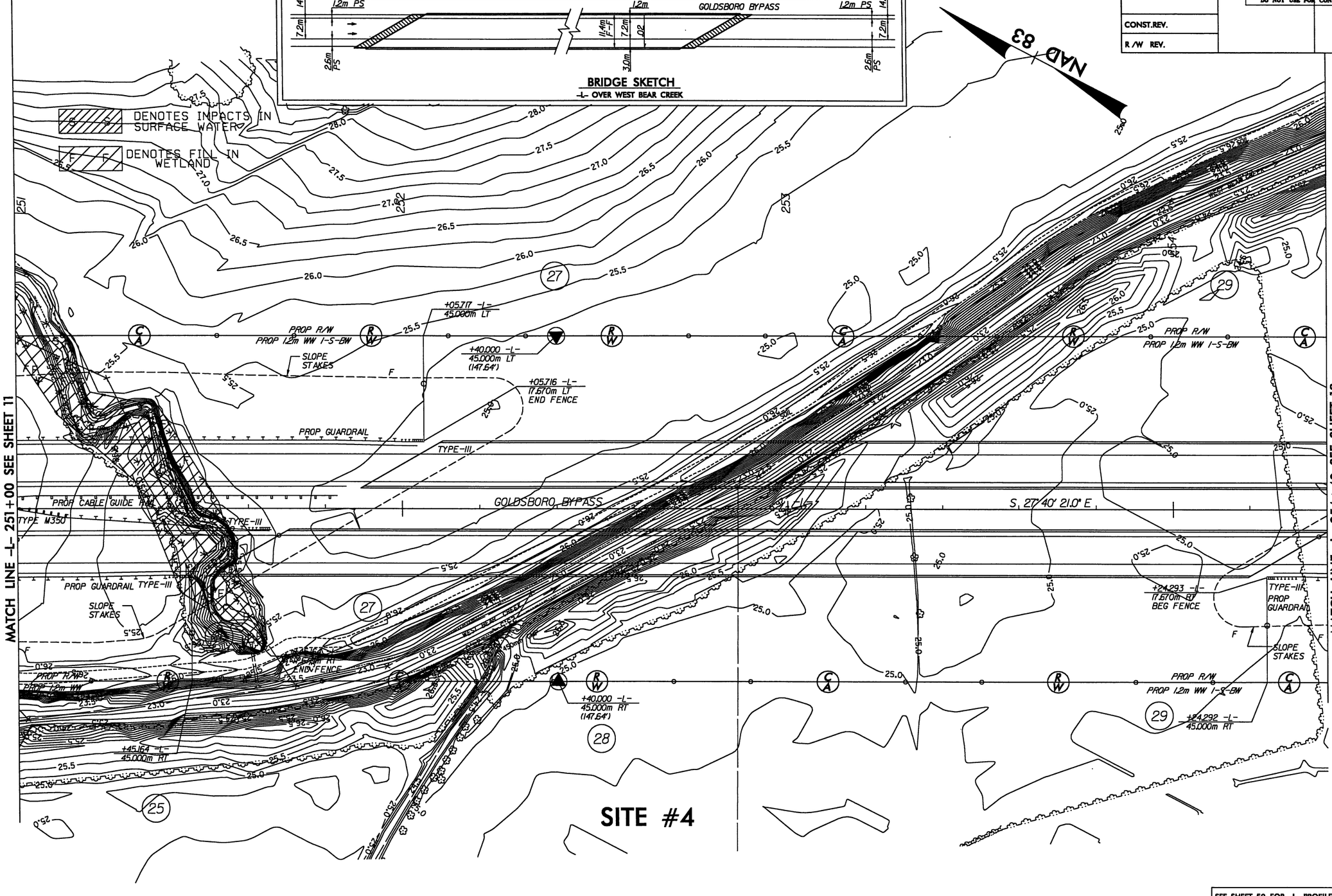
CONST.REV.

R/W REV.

MATCH LINE SEE SHEET 12A

MATCH LINE SEE SHEET 12A





SEE SHEET 50 FOR -L- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

Permit Drawing

FILE:
DATE:
PLOT DRIVER:
PEN TABLE:
SPILES
SLOPES
BATTERS
SPRINTRILLS
STAKES

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4030 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	14
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.
R /W REV.

NAD 83

75 75 DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

31

258 259 260 261

UT TO WEST BEAR CREEK

45.000m LT - (147.64')

45.000m LT - (147.64')

(CHORD)

PROP R/W
PROP 1.2m WW 1-S-BW

SLOPE STAKES

F C

PROP GUARDRAIL

PROP CABLE GUIDE RAIL

-L- GOLDSBORO BYPASS

S 27° 40' 21.0" E

GRAU 350

+60.000 -L-
60.000m LT
(196.85')

+60.000 -L-
45.000m LT
(147.64')

+55.500 -L-
45.000m LT

+68.311 -L-
33.973m LT
END FENCE

+75.000 -L-
60.000m LT
(196.85')

+85.000 -L-
45.000m LT
(147.64')

+92.500 -L-
45.000m LT

+81.169 -L-
33.552m LT
BEG FENCE

+94.586 -L-
29.115m RT
BEG FENCE

+87.777 -L-
28.743m RT
END FENCE

+17.000 -L-
45.000m RT

+21.147 -L-
45.000m RT
(147.64')

+81.147 -L-
45.000m RT
(147.64')

+73.000 -L-
45.000m RT

SOIL

PDE

MATCH LINE -L- 257+80 SEE SHEET 13

MATCH LINE -L- 261+20 SEE SHEET 15

SITE #5

SEE SHEET 51 FOR -L- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

Permit Drawing

FILE: $FILE$ $STAMES$
DATE: $DATE$ $STAMES$
PLOT DRIVER: $PLOTDRVR$ $STAMES$
PEN TABLE: $PENTBLL$ $STAMES$

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R/W REV.

NAD 83

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER

MATCH LINE -L- 257+80 SEE SHEET 13

MATCH LINE -L- 261+20 SEE SHEET 15

UT TO WEST FORK CREEK

GOLDSBORO BYPASS

S 27° 40' 21.0" E

PROP GUARDRAIL

PROP CABLE GUIDE RAIL

SLOPE STAKES

PROP R/W

PROP 1.2m WW 1-S-BW

(CHORD)

45.000m LT - (147.64')

45.000m RT - (147.64')

+60.000 -L- 45.000m LT (147.64')

+55.500 -L- 45.000m LT

+68.314 -L- 33.973m LT END FENCE

+75.000 -L- 60.000m LT (196.85')

+85.000 -L- 45.000m LT (147.64')

+92.500 -L- 45.000m LT

+81.165 -L- 33.552m LT BEG FENCE

+94.586 -L- 29.158m RT BEG FENCE

+87.773 -L- 28.243m RT END FENCE

+17.000 -L- 45.000m RT

+73.000 -L- 45.000m RT

+81.147 -L- 45.000m RT (147.64')

GRAU 350

SITE #5

SEE SHEET 51 FOR -L- PROFILE

SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

Permit Drawing

FILE: $FILE$
DATE: $DATE$ $TIME$
PLOT DRIVER: $PLOTDRIVE$
PEN TABLE: $PENTABLE$

1	7/28/03	ADDED OWNER UNKNOWN - PARCEL 89 REV TDE ON PARCEL 34, ADDED TDE PARCEL 35

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4030 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.

R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	17
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

F/F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

NAD 83

MATCH LINE -L- 268+00 SEE SHEET 16

MATCH LINE -Y22- 17+10 SEE SHEET 16

MATCH LINE -L- 271+40 SEE SHEET 18

INSET MATCH LINE

SITE #6

+20.000 -SR17-
11.000m LT
(36.09')

+98.000 -SR17-
11.000m LT
(36.09')

+11.500 -SR17-
11.000m LT
(36.09')

+20.000 -L-
45.000m RT
(147.64')

+66.000 -Y22-
19.300m LT
(63.32')

+75.000 -Y22-
23.620m LT
(77.49')

+77.403 -Y22-
23.822m LT
(78.16')

+64.414 -Y22-
13.126m LT
(43.07')

+18.800 -Y22-
13.589m LT
(44.58')

+63.499 -Y22-
9.625m LT
(31.58')

+85.00 -Y22-
16.800m LT
(55.12')

+79.308 -Y22-
13.08m LT
(42.92')

+73.500 -Y22-
9.34lm LT
(30.65')

+30.000 -Y22-
9.144m LT
(30.00')

+30.000 -Y22-
9.144m RT
(30.00')

(113.500m RT - 44.29')

PROP R/W

PROP 1.2m WW I-S-BW

SLOPE STAKES

PROP CABLE GUIDE RAIL

EXIST. R/W

SR 1719 BESTON RD 5.5 BST

300 mm

375mm CONC

450mm CONC

HTR

SOIL

PDE

34

35

32

18

19

20

268

269

270

271

SEE SHEET 53 FOR -L- PROFILE
SEE SHEET 76 & 77 FOR -Y22- PROFILE
SEE SHEET 78 & 79 FOR -SR17- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

FILE: $FILES
DATE: $DATES $TIMES
PLOT DRIVER: $PLTDRVLS
PEN TABLE: $PENTBLLS

Permit Drawing

1	7/28/03	ADDED OWNER UNKNOWN - PARCEL 89 REV TDE ON PARCEL 34, ADDED TDE PARCEL 35

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD. SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	17
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R /W REV.

F/F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

NAD 83

INSET MATCH LINE

MATCH LINE -L- 268+00 SEE SHEET 16

MATCH LINE -L- 271+40 SEE SHEET 18

MATCH LINE -Y22- 17+10 SEE SHEET 16

SITE #6

SLOPE STAKES

PROP R/W

PROP 1.2m WW I-S-BW

PROP CABLE GUIDE RAIL

+20.000 -SR17-
11.000m LT
(36.09')

+98.000 -SR17-
11.000m LT
(36.09')

+66.000 -Y22-
19.300m LT
(63.32')

+64.414 -Y22-
13.126m LT
(43.91')

+18.800 -Y22-
13.569m LT
(44.58')

+63.499 -Y22-
9.625m LT
(31.58')

+77.403 -Y22-
23.822m LT
(78.16')

+75.000 -Y22-
23.580m LT
(77.49')

+85.00 -Y22-
16.800m LT
(55.12')

+79.308 -Y22-
13.081m LT
(42.92')

+73.500 -Y22-
9.341m LT
(30.65')

+30.000 -Y22-
9.144m LT
(30.00')

+20.000 -L-
45.000m RT
(147.64')

+30.000 -Y22-
9.144m RT
(30.00')

(13.500m RT - 44.29')

EXIST. R/W

SR 1719 BESTON RD. SS BST

375mm CONC

450mm CONC

300 mm

SOIL

PDE

SEE SHEET 53 FOR -L- PROFILE
SEE SHEET 76 & 77 FOR -Y22- PROFILE
SEE SHEET 78 & 79 FOR -SR17- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

FILE: $FILES$ STIMES
DATE: $DATES$
PLOT DRIVER: $PLTDRV$
PEN TABLE: $PENTBL$

Permit Drawing

1	7/28/03	ADDED PERMANENT DRAINAGE EASEMENT - PARCEL 36

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4030 WESTCHASE BLVD. SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	18
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R /W REV.

NAD 83

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

MATCH LINE -L- 271+40 SEE SHEET 17

MATCH LINE -L- 274+80 SEE SHEET 19

SILO
ISFM'TL POUL TRY HOUSE
SILO
SOIL
SLOPE STAKES
+20.000 -SR17-
11.000m LT
(36.09')
SR17
PROP R/W
PROP 12m WW I-S-BW
SLOPE STAKES
CAT-I PROP GUARDRAIL
PROP CABLE GUIDE RAIL
S 12° 45' 09.0" E
-L-
GOLDSBORO BYPASS
PROP GUARDRAIL
PROP CABLE GUIDE RAIL
GRAU 350
25 ELEC
SLOPE STAKES
PROP R/W
PROP 12m WW I-S-BW
+85.000 -L-
45.000m RT
(147.64')
25 ELEC
+65.000 -L-
45.000m LT
(147.64')
+17.000 -L-
48.336m LT
(158.58')
PDE
PROP R/W
PROP 12m WW I-S-BW
SLOPE STAKES
+17.000 -L-
51.620m LT
(169.34')
+29.000 -L-
51.620m LT
(169.34')
+29.000 -L-
49.106m LT
(161.11')
PROP GUARDRAIL
PROP CABLE GUIDE RAIL
ISFD
ISFD
W/LT
HTR
SITE #7

35 36 37 38 272 273 274

SEE SHEET 53 FOR -L- PROFILE
SEE SHEET 78 & 79 FOR -SR17- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

FILE: $FILE$
DATE: $DATE$ $TIME$
PLOT DRIVER: $PLTDRVR$
PEN TABLE: $PENTBL$

Permit Drawing

1	7/28/03	ADDED PERMANENT DRAINAGE EASEMENT - PARCEL 36

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R/W REV.

NAD 83

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

MATCH LINE -L- 271+40 SEE SHEET 17

MATCH LINE -L- 274+80 SEE SHEET 19

SITE #7

GOLDSBORO BYPASS

PROP CABLE GUIDE RAIL

PROP GUARDRAIL

PROP R/W

PROP 1.2m WW I-S-BW

SLOPE STAKES

-SR17-

+20.000 -SR17-
11.000m LT
(36.09')

+65.000 -L-
45.009m LT
(147.64')

+17.008 -L-
51.620m LT
(169.34')

+17.000 -L-
48.336m LT
(158.58')

+29.000 -L-
51.620m LT
(169.34')

+29.000 -L-
49.106m LT
(161.11')

+85.000 -L-
45.008m RT
(147.64')

S 12° 45' 09.0" E

GRAU 350

SFMTL POULTRY HOUSE

SILO

SOIL

ISFD

W/LT

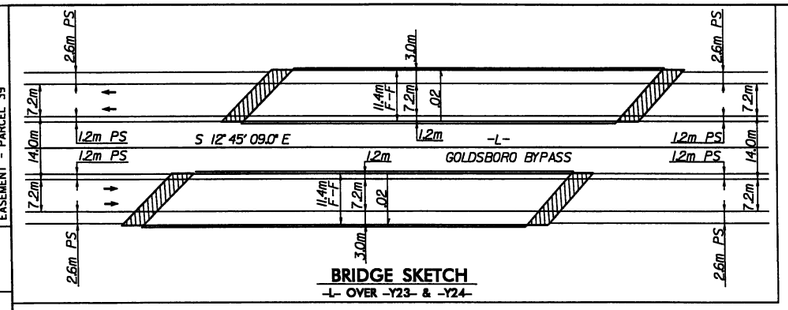
HYDRANT

SEE SHEET 53 FOR -L- PROFILE
SEE SHEET 78 & 79 FOR -SR17- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

Permit Drawing

FILE:
DATE: 9/16/03 STIMES
PLOT DRIVER: $PLTDRVR$
PEN TABLE: $PENTBLS

1	7/28/03	ADDED PERMANENT DRAINAGE EASEMENT - PARCEL 39



BRIDGE SKETCH
-L- OVER -Y23- & -Y24-

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

SEE SHEET 54 FOR -L- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

METRIC
5m 0 10m

CONST.REV.

R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	19
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

F/F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

NAD 83

SITE #7

MATCH LINE -L- 274+80 SEE SHEET 18

MATCH LINE -L- 278+20 SEE SHEET 20

+26.000 -L- 59.597m LT (195.53')
+26.000 -L- 55.328m LT (181.52')
+39.000 -L- 59.597m LT (195.53')
+39.000 -L- 56.098m LT (184.049')
+30.000 -L- 62.000m LT (203.41')
+40.000 -L- 64.000m LT (209.97')
+91.086 -L- 60.724m LT
+91.087 -L- 17.670m LT END FENCE
+57.173 -L- 17.670m RT END FENCE
+40.000 -L- 59.000m RT (193.57')
+23.869 -L- 58.000m RT (190.29')
+00.738 -L- 52.000m RT (170.60')

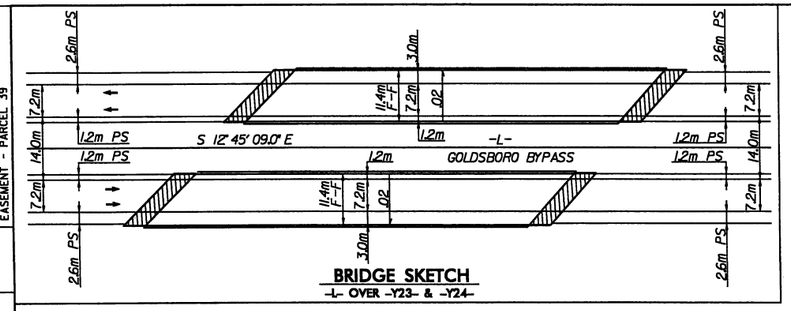
PDE
PROP R/W
PROP 1.2m WW I-S-BW
SLOPE STAKES
PROP GUARDRAIL
PROP CABLE GUIDE RAIL
TYPE-III
TYPE M350
S 12° 45' 09.0" E
GOLDSBORO BYPASS
-L-
-Y23-
-Y24-
N 58° 37' 20.5" W
N 61° 16' 03.3" W
35 ELEC
300 mm CONC
600mm CONC
375 mm CONC
SOIL
GATE
158KD
ISFD
SR 1003 NEW HOPE RD
NORFOLK & SOUTHERN RR
NO ASSOCIATED PIPING FOUND THIS LOC
61.85'
RW
CA

36 38 39 40 41 42 43 44

FILE:
DATE:
PLOT DRIVER:
PEN TABLE:
$FILE$
$DATE$
$PLOTDRIVER$
$PENTABLE$
$TIMES$

Permit Drawing

1	7/28/03	ADDED PERMANENT DRAINAGE EASEMENT - PARCEL 39



BRIDGE SKETCH
-L- OVER -Y23- & -Y24-

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4630 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

SEE SHEET 54 FOR -L- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

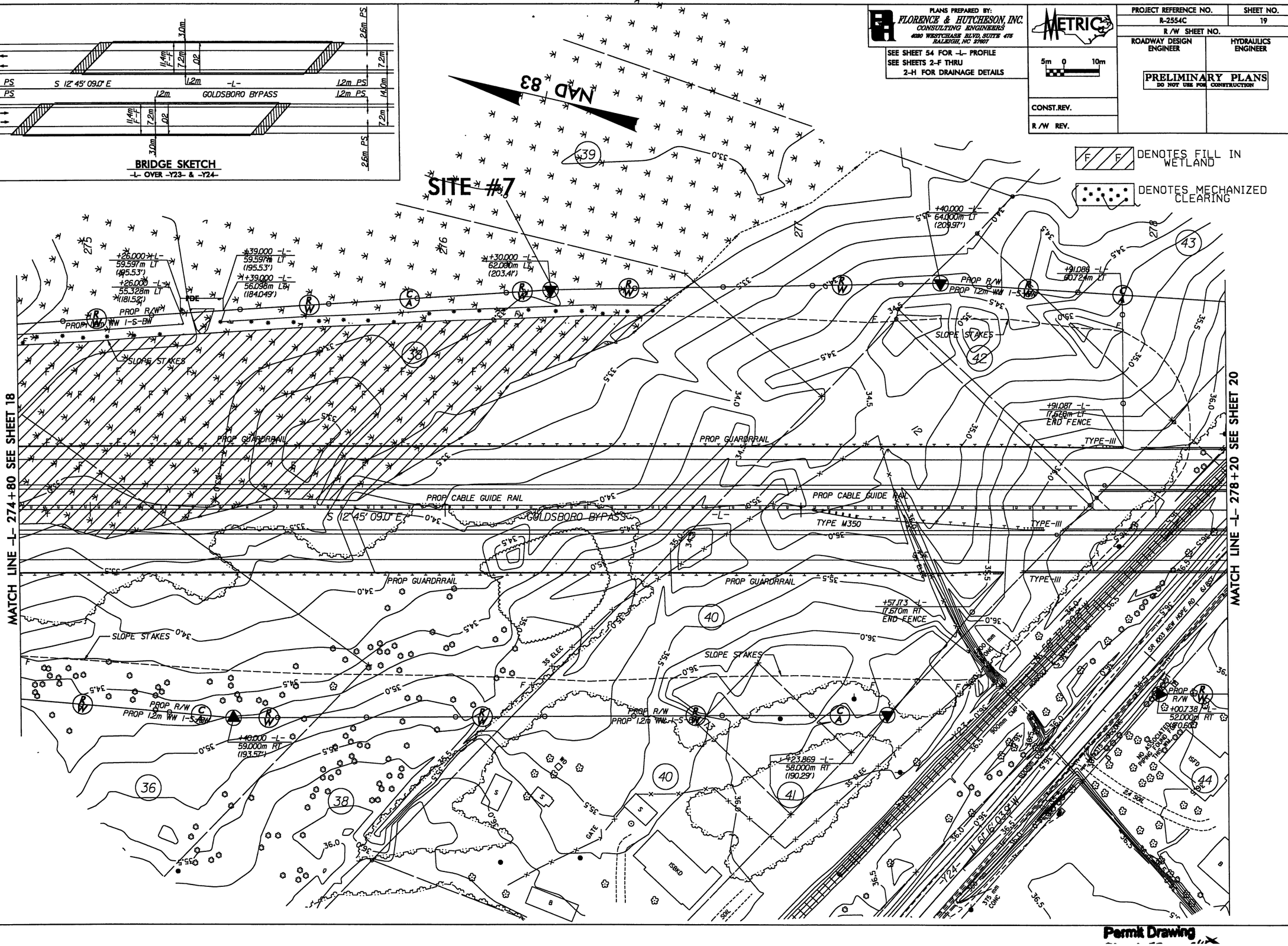
METRIC
5m 0 10m

CONST.REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



FILE: $FILES STIMES
DATE: $DATES
PLOT DRIVER: $PLTDRVLS
PEN TABLE: $PENTBLLS

Permit Drawing

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4630 WESTGATE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.	
R/W REV.	

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

DENOTES IMPACTS IN SURFACE WATER (POND)

DENOTES FILL IN WETLAND

DENOTES EXCAVATION IN WETLAND

DENOTES MECHANIZED CLEARING

SITE #8

57

289

290

291

SITE #9

57

PROP R/W
PROP 1.2m WW 1-S-BW

SLOPE STAKES

PROP GUARDRAIL

GRAU 350

CAT-1

-L-

GOLDSBORO BYPASS

PROP CABLE GUIDE RAIL

MATCH LINE -L- 288+40 SEE SHEET 22

MATCH LINE -L- 291+80 SEE SHEET 24

59

+77.00 -L-
45.000m RT
(147.64')

POND

TDE

+00.00 -L-
45.000m RT
(147.64')

+00.00 -L-
55.000m RT
(180.45')

+77.00 -L-
62.492m RT
(205.03')

+48.00 -L-
80.000m RT
(262.47')

56

58

SEE SHEET 56 FOR -L- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

Permit Drawing

FILE: $FILE$ $TIMES
DATE: $DATE$
PLOT DRIVER: $PLTDRV$
PEN TABLE: $PENTBL$

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4030 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	23
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

5m 0 10m

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R /W REV.

NAD 83

DENOTES IMPACTS IN SURFACE WATER (POND)

DENOTES FILL IN WETLAND

DENOTES EXCAVATION IN WETLAND

DENOTES MECHANIZED CLEARING

SITE #8

SITE #9

MATCH LINE -L- 288+40 SEE SHEET 22

MATCH LINE -L- 291+80 SEE SHEET 24

GOLDSBORO BYPASS

PROP R/W
PROP 1.2m WW 1-S-BW

SLOPE STAKES

PROP GUARDRAIL

PROP CABLE GUIDE RAIL

GRAU 350

CAT-1

TDE

POND

+00.00 -L-
45.000m RT
(147.64')

+00.00 -L-
55.000m RT
(180.45')

+48.00 -L-
80.000m RT
(262.47')

+77.00 -L-
62.492m RT
(205.03')

SEE SHEET 56 FOR -L- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

Permit Drawing
Sheet 25 of 45

FILE: $FILE$
DATE: $DATE$
PLOT DRIVER: $PLOTDRVR$
PEN TABLE: $PENTBL$

NO.	DATE	REV NAME - PARCEL 59
1	04/05/05	

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	24
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

F/F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

NAD 83

SITE #9

292 293 294 295

57 59

+00.000 -L-
45.000m LT
(147.64')

PROP R/W
PROP 12m WW I-S-BW

SLOPE STAKES

GRAU 350

-L-

GOLDSBORO BYPASS

PROP CABLE GUIDE RAIL

CA

33.5

34.0

MATCH LINE -L- 291+80 SEE SHEET 23

MATCH LINE -L- 295+20 SEE SHEET 25

SOIL

SEE SHEET 57 FOR -L- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

FILE: SFILE$ STIMES
DATE: $DATE$
PLOT DRIVER: $PLTDRV$
PEN TABLE: $PENTBL$

Permit Drawing

1	04/05/05	REV NAME - PARCEL 59

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	24
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R/W REV.

NAD 83

F/F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

SITE #9

292 293 294 295

57 59 58

+00.000 -L-
45.000m LT
(147.64')

+00.000 -L-
45.000m RT
(147.64')

PROP R/W
PROP 1.2m WW I-S-BW

SLOPE STAKES

GRAU 350

-L-

GOLDSBORO BYPASS

PROP CABLE GUIDE RAIL

CAT-1

SOIL

MATCH LINE -L- 291+80 SEE SHEET 23

MATCH LINE -L- 295+20 SEE SHEET 25

SEE SHEET 57 FOR -L- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

FILE:
DATE: $FILES $STIMES
PLOT DRIVER: $DATES $PLTDRVR$
PEN TABLE: $PENTBLS

Permit Drawing

NO.	DATE	REVISION
1	04/05/05	REV NAME - PARCELS 59 & 60 REV PROPERTY LINE BETWEEN PARCELS 59 & 61

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DENOTES IMPACTS IN SURFACE WATER

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83

60

61

304

305

307

MEB CREEK

MATCH LINE -L- 302+00 SEE SHEET 26

MATCH LINE -L- 305+40 SEE SHEET 28

+70.000 -L-
45.000m LT

+83.917 -L-
26.132m LT
END FENCE

+96.500 -L-
25.559m LT
BEG FENCE

+22.000 -L-
45.000m LT

(45.000m LT - 147.64')

(CHORD)

PROP R/W
PROP 1.2m WW 1-S-BW

SLOPE STAKES
CAT-1

PROP GUARDRAIL GRAU 350

PROP CABLE GUIDE RAIL

-L-
GOLDSBORO BYPASS

S 42° 13' 47.0" E

CAT-1

+70.041 -L-
27.330m RT
END FENCE

+82.436 -L-
27.852m RT
BEG FENCE

+95.000 -L-
45.000m RT

+48.000 -L-
45.000m RT

+73.000 -L-
45.000m RT
(147.64')

+77.000 -L-
54.000m RT
(177.18')

+84.000 -L-
45.000m RT
(147.64')

+84.000 -L-
50.500m RT
(165.68')

+98.279 -L-
45.000m RT
(147.64')

+58.279 -L-
45.000m RT
(147.64')

TBE

SITE #10

SEE SHEET 58 FOR -L- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

Permit Drawing

FILE: $FILE$ $TIME$
DATE: $DATE$
PLOT DRIVER: $PLTDRVR$
PEN TABLE: $PENTBL$

NO.	DATE	REV NAME - PARCELS 59 & 60 REV PROPERTY LINE BETWEEN PARCELS 59 & 61
1	04/05/05	

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R/W REV.

DENOTES IMPACTS IN SURFACE WATER

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83

MATCH LINE -L- 302+00 SEE SHEET 26

MATCH LINE -L- 305+40 SEE SHEET 28

GOLDSBORO BYPASS

S 42° 13' 47.0" E

PROP R/W
PROP 1.2m WW I-S-BW

PROP GUARDRAIL GRAU 350

PROP CABLE GUIDE RAIL

SLOPE STAKES

CAT-I

TBE

+70.041 -L-
27.430m RT
END FENCE

+70.000 -L-
45.000m LT

+83.911 -L-
26.132m LT
END FENCE

+96.536 -L-
25.539m LT
BEG FENCE

+122.000 -L-
45.000m LT

+82.436 -L-
27.852m RT
BEG FENCE

+95.000 -L-
45.000m RT

+48.000 -L-
45.000m RT

+73.000 -L-
45.000m RT
(147.64')

+77.000 -L-
54.000m RT
(177.15')

+84.000 -L-
45.000m RT
(147.64')

+84.000 -L-
50.500m RT
(165.68')

+98.279 -L-
45.000m RT
(147.64')

+58.279 -L-
45.000m RT
(147.64')

(45.000m LT - 147.64')

(CHORD)

SITE #10

SEE SHEET 58 FOR -L- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

Permit Drawing

FILE: $FILE$
DATE: $DATE$ $TIME$
PLOT DRIVER: $PLTDRV$
PEN TABLE: $PENTBL$

2	4-4-06	REV NAME, DEED BOOK AND PAGE NUMBER FOR PARCELS 63 AND 77, AND NAME FOR PARCEL 64
1	1-29-03	REV NAME, PARCEL 63, AND ADD PARCEL 63A

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	31
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

MATCH LINE -Y26- 9+35 SEE SHEET 41

MATCH LINE -L- 315+60 SEE SHEET 30

MATCH LINE -L- 319+00 SEE SHEET 32

MATCH LINE -Y26- 11+00 SEE SHEET 42

63 64 77 63A

ISFD

TYNDALL LEWIS OF WAYNE CO. AND FORK TOWNSHIP WATER HAS INDICATED THAT THIS 200 mm WATER LINE WILL BE EXTENDED SOUTH TO WASHINGTON RD, THEN EAST TOWARD NEW HOPE RD. THE 200 mm WATER LINE WILL THEN BE CONNECTED TO THE EXISTING 300 mm WATER LINE AT THE INTERSECTION OF NEW HOPE RD. AND WASHINGTON RD.

PROP R/W
PROP 1.2m WW 1-S-BW

SLOPE STAKES

PROP CABLE GUIDE RAIL

200 mm

50 mm

20 mm
40 mm

PUMP HOUSE

GRAU 350

PROPOSED GUARDRAIL

1200 mm WW

SOIL

PROP 1.2m WW 1-S-BW

375 mm CONC

SLOPE STAKES

PROPOSED GUARDRAIL

SLOPE STAKES

PROP 1.2m WW 1-S-BW

+99.079 -L-
45.000m LT
(147.64')

SR 1603 WASHINGTON ST

+96.971 -Y26-
6.470m RT
END FENCE

TYPE-III

+93.431 -Y26-
6.470m LT
BEG FENCE

+75.000 -L-
45.000m LT
(147.64')

PROP R/W
PROP 1.2m
WW 1-S-BW

SLOPE STAKES

TYPE-XIMOD

TYPE-XIMOD ATTENUATOR

+92.152
END CABLE GUIDE RAIL

TYPE-XIMOD

TYPE-XIMOD ATTENUATOR

+64.143
BEG CABLE GUIDE RAIL

CAT-I

+64.838 -Y26-
6.470m RT
END FENCE

+61.292 -Y26-
6.470m LT
BEG FENCE

GRAU 350

SLOPE STAKES

PROP R/W
PROP 1.2m WW 1-S-BW

+66.477 -L-
45.000m RT
(147.64')

PROP 1.2m WW 1-S-BW

PROPOSED GUARDRAIL

SLOPE STAKES

PROP 1.2m WW 1-S-BW
PROP R/W

+70.000 -L-
45.000m RT
(147.64')

PROP R/W

BRIDGE SKETCH
-Y26- OVER -L-

3.6m 1.2m PS 12.0m F-F 6.0m 0.2 0.2 -Y26- S 63° 32' 12.8" W 3.6m 1.2m PS

$FILES $STIMES
$DATES
$PLTDRVR$
$PENTBL$

FILE:
DATE:
PLOT DRIVER:
PEN TABLE:

F/F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

OBLITERATE EXISTING PAVEMENT

SITE #14

SEE SHEET 60 FOR -L- PROFILE
SEE SHEET 80 FOR -Y26- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

Permit Drawing

2	4-4-06	REV NAME, DEED BOOK, AND PAGE NUMBER FOR PARCELS 63 AND 77 AND NAME FOR PARCEL 64
1	1-29-03	REV NAME PARCEL 63, AND ADD PARCEL 63A

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4030 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

CONST.REV.

R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	31
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

MATCH LINE -Y26- 9+35 SEE SHEET 41

MATCH LINE -L- 315+60 SEE SHEET 30

MATCH LINE -L- 319+00 SEE SHEET 32

MATCH LINE -Y26- 11+00 SEE SHEET 42

TYNDALL LEWIS OF WAYNE CO. AND FORT SUMMIT WATER HAS INDICATED THAT THIS 200 mm WATER LINE WILL BE EXTENDED SOUTH TO WASHINGTON RD. THEN EAST TOWARD NEW HOPE RD. THE 200 mm WATER LINE WILL THEN BE CONNECTED TO THE EXISTING 300 mm WATER LINE AT THE INTERSECTION OF NEW HOPE RD. AND WASHINGTON RD.

PROP R/W
PROP 1.2m WW I-S-BW

SLOPE STAKES

PROP CABLE GUIDE RAIL

PROPOSED GUARDRAIL

GRAU 350

ISFD

20 mm
40 mm
BK HOUSE
PUMP HOUSE

200 mm
50 mm
50 mm

+99.079 -L-
45.000m LT
(147.64')

+75.000 -L-
45.000m LT
(147.64')

+86.617 -Y26-
6.470m RT
BEG FENCE

+93.431 -Y26-
6.470m LT
BEG FENCE

+92.152
END CABLE GUIDE RAIL

+64.143
BEG CABLE GUIDE RAIL

+64.938 -Y26-
6.470m RT
END FENCE

+61.292 -Y26-
6.470m LT
BEG FENCE

+86.477 -L-
45.000m RT
(147.64')

+70.000 -L-
45.000m RT
(147.64')

TYPE-XIMOD ATTENUATOR

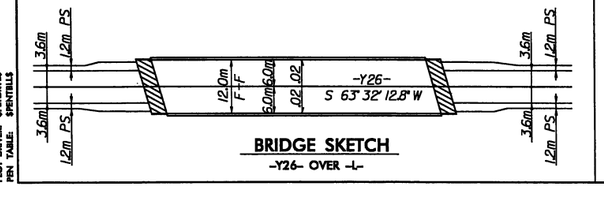
TYPE-III

SOIL

SAT-1

SR 1003 WASHINGTON ST

63 63A 64 77 84



BRIDGE SKETCH
-Y26- OVER -L-

SITE #14

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

OBLITERATE EXISTING PAVEMENT

SEE SHEET 60 FOR -L- PROFILE
SEE SHEET 80 FOR -Y26- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

FILE: $FILES$
DATE: $DATES$
PLOT DRIVER: $PLOTDRIVER$
PEN TABLE: $PENTABLE$

Permit Drawing

NO.	DATE	REV NAME, DEED BOOK AND PAGE NUMBER FOR PARCEL 63 AND NAME FOR PARCEL 64
1	4-4-06	

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.	
R/W REV.	

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	32
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

NAD 83

64

MILL CREEK

POND

+45.000m LT - (1H:6V)

+45.000m LT - (1H:6V)

+32.347 -L-
45.000m LT

+35.923 -L-
32.359m LT
END FENCE

+80.000 -L-
44.709m LT

+58.980 -L-
32.050m RT
BEG FENCE

+194.158 -L-
32.050m RT
BEG FENCE

+96.960 -L-
45.000m RT

+56.038 -L-
45.000m RT
(147.64')

+46.038 -L-
45.000m RT
(147.64')

+45.220 -L-
45.000m RT

+73.845 -L-
31.950m RT
END FENCE

(CHORD)

PROP R/W
PROP 1.2m
WW 1-S-BW

PROP R/W
PROP 1.2m WW 1-S-BW

SLOPE STAKES

PROPOSED GUARDRAIL

GRAU 350

PROP CABLE GUIDE RAIL

CAT-1

MATCH LINE -L- 319+00 SEE SHEET 31

MATCH LINE -L- 322+40 SEE SHEET 33

SITE #11

SEE SHEET 61 FOR -L- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

Permit Drawing
Sheet 1 of 1

FILE: $FILE$ $TIMES
DATE: $DATE$
PLOT DRIVER: $PLOTDRIVE$
PEN TABLE: $PENTABLE$

NO.	DATE	REV NAME, DEED BOOK AND PAGE NUMBER FOR PARCEL 63 AND NAME FOR PARCEL 64
1	4-4-06	

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4230 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.

R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	32
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

NAD 83

MILL CREEK

POND

PROP R/W
PROP 12m WW 1-S-BW

SLOPE STAKES

+32.547 -L-
45.000m LT

+35923 -L-
32.359m LT
END FENCE

+80.000 -L-
44.769m LT

+81.150 -L-
32.057m LT
BEG FENCE

PROPOSED GUARDRAIL

PROP CABLE GUIDE RAIL

GRAU 350

(CHORD)

+46.038 -L-
45.000m RT
(147.64')

+94.158 -L-
32.050m RT
BEG FENCE

+96.960 -L-
45.000m RT

+56.038 -L-
45.000m RT
(147.64')

+45.220 -L-
45.000m RT

+73.845 -L-
31.950m RT
END FENCE

SITE #11

MATCH LINE -L- 319+00 SEE SHEET 31

MATCH LINE -L- 322+40 SEE SHEET 33

SEE SHEET 61 FOR -L- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

FILE: $FILE$
DATE: $DATE$ $TIME$
PLOT DRIVER: $PLOTDRV$
PEN TABLE: $PENTBL$

Permit Drawing
Sheet 32 of 45

SITE #12

PLANS PREPARED BY: FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS 1000 WESTHALL EXECUTIVE DR. RALEIGH, NC 27615

METRIC

PROJECT REFERENCE NO. R-2554C | SHEET NO. 38

R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS NOT FOR CONSTRUCTION

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83

DENOTES FILL IN WETLAND

BRIDGE SKETCH -FLY- & -LPA- OVER -L- NBL & SBL

DENOTES MECHANIZED CLEARING

DENOTES IMPACTS IN SURFACE WATER

OBLITERATE EXISTING PAVEMENT

SEE SHEET 42 FOR -L- PROFILE
SEE SHEET 42,43 & 44 FOR -L- NBL PROFILE
SEE SHEET 93 FOR -129- SBV PROFILE
SEE SHEET 84 & 85 FOR -730- SB PROFILE
SEE SHEET 86, 87 & 88 FOR -FLY- PROFILE
SEE SHEET 89 & 90 FOR -LPA- PROFILE
SEE SHEET 3-H FOR CORE DETAILS
SEE SHEETS 3-F THRU 3-H FOR DRAINAGE DETAILS

LOCATION: US 70 (GOLDSBORO BYPASS) FROM WEST OF SR 1714 TO EAST OF SR 1323 IN LENOIR COUNTY

TIP NO.: R-2554C | COUNTY: WAYNE-LENOIR

DESIGNED BY: | DATE:

CHECKED BY: | DATE:

Permit Drawing
Sheet 38 of 45

SITE #12

PLANS PREPARED BY: FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS

PROJECT REFERENCE NO. R-2554C | SHEET NO. 34

R/W SHEET NO. | ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS

NOT FOR CONSTRUCTION, BIDDING OR RECORDATION

CONST. | R/W SEC.

METRIC

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83

DENOTES FILL IN WETLAND

BRIDGE SKETCH
-FLY- & -LPA- OVER -L- PROP. & SEL

DENOTES MECHANIZED CLEARING

DENOTES IMPACTS IN SURFACE WATER

OBLITERATE EXISTING PAVEMENT

LOCATION: US 70 (GOLDSBORO BYPASS) FROM WEST OF SR 1714 TO EAST OF SR 1323 IN LENOIR COUNTY

TIP NO.: R-2554C | COUNTY: WAYNE-LENOIR

DESIGNED BY: | DATE:

CHECKED BY: | DATE:

SEE SHEET 43 FOR -L- PROFILE
SEE SHEET 43,43 A, 44 FOR -L- WBL PROFILE
SEE SHEET 43,43 A, 44 FOR -L- EBL PROFILE
SEE SHEET 93 FOR -Y2S- REV. PROFILE
SEE SHEET 84 & 85 FOR -Y3B- EB PROFILE
SEE SHEET 84, 87 & 88 FOR -FLY- PROFILE
SEE SHEET 89 & 90 FOR -LPA- PROFILE
SEE SHEET 3-44 FOR CORE DETAILS
SEE SHEETS 3-F THRU 3-N FOR DRAINAGE DETAILS

LEGEND
2006 ADT
2035 ADT

Permit Drawing
Sheet 39 of 45

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
AND SURVEYORS WITH OFFICES AT RALEIGH, NC 27607

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	35
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

CONSTR.
R/W REV.

SITE #12

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

NAD 83

MATCH LINE -L- STA. 14+50 SEE SHEET 34

MATCH LINE -Y30- STA 23+00 SEE SHEET 34

MATCH LINE -L- WBL 332+54.000 SEE SHEET 34

MATCH LINE -L- 339+40.000 SEE SHEET 36

SITE #12

SITE #13

PAVEMENT RESURFACING & WIDENING

PROP CABLE GUIDE RAIL

SLOPE STAKES

PROP R/W

PROP LOOP RAMP

CHORD

CONC DITCH

SHOULDER BERM GUTTER

SHOULDER BERM GUTTER

64 65 66 67 68

SEE SHEET 64-66 FOR -L- WBL PROFILE	
SEE SHEET 64-66 FOR -L- EBL PROFILE	
SEE SHEET 64-68 FOR -PLY- PROFILE	
SEE SHEET 64-65 FOR -Y30- EB PROFILE	
SEE SHEET 3-H FOR GORE DETAILS	
SEE SHEETS 3-F THRU 3-H FOR DRAINAGE DETAILS	

LOCATION:
US 70 (GOLDSBORO BYPASS)
FROM WEST OF SR 1714 TO
EAST OF SR 1323 IN LENOIR COUNTY

TIP NO.: R-2554C	COUNTY: WAYNE-LENOIR
DESIGNED BY:	DATE:
CHECKED BY:	DATE:

Permit Drawing
Sheet 40 of 45

SITE #12

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

NAD 83

SITE #12

SITE #13

MATCH LINE -Y30- EB 23+00 SEE SHEET 34

MATCH LINE -L- WBL 332+56.000 SEE SHEET 34

MATCH LINE -L- 339+40.000 SEE SHEET 36

PAVEMENT RESURFACING & WIDENING

PAVEMENT RESURFACING & WIDENING

PLANS PREPARED BY: FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS & PLANNERS 4000 HEDGEMORE DRIVE, SUITE 300 RALEIGH, NC 27615

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	35
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

0m 5 10m

PRELIMINARY PLANS

NOT FOR CONSTRUCTION

CONST.DIV.

DIV. ENG.

SEE SHEET 64-66 FOR -L- WBL PROFILE	
SEE SHEET 64-66 FOR -L- EBL PROFILE	
SEE SHEET 84-86 FOR -Y3/-Y- PROFILE	
SEE SHEET 84-86 FOR -Y30- EB PROFILE	
SEE SHEET 2-48 FOR DOWE DETAILS	
SEE SHEETS 3-F THRU 3-H FOR DRAINAGE DETAILS	

LOCATION: US 70 (GOLDSBORO BYPASS) FROM WEST OF SR 1714 TO EAST OF SR 1323 IN LENOIR COUNTY

TIP NO.: R-2554C COUNTY: WAYNE-LENOIR

DESIGNED BY: DATE:

CHECKED BY: DATE:

Permit Drawing
Sheet 41 of 45

1	4/4/06	REV NAME, DEED BOOK, AND PAGE NUMBER FOR PARCELS 66

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	36
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R/W REV.

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

NAD 83

66 69 66 69

BEAR CREEK

+60.000 -L-
40133m LT
(131.67')

PROP R/W

PROP 12m WW-1-S-BW

1500 mm WW&ISBW

SLOPE STAKES

TIE TO EXIST

PROP GUARDRAIL

+91.334 -L-
20.17m LT
END FENCE

RIP RAP

300

MTL

0.6 BST

EOP EOT

DI

US 70 WBL 7.3 BST

US 70 EBL 7.3 BST

CONC

1500 mm WW&ISBW

1.6 CONC HW

RIP RAP

300mm CMP

PROP CABLE GUIDE RAIL

AUXILIARY LANE

PROP GUARDRAIL

SLOPE STAKES

BEAR CREEK

MATCH LINE -L- 339+40.000 SEE SHEET 35

MATCH LINE -L- 342+80.000 SEE SHEET 37

68 68

SITE #13

SEE SHEET 66 & 67 FOR -L- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

Permit Drawing

FILE:
DATE:
PLOT DRIVER: SPLOTDRV.S STIMES
PEN TABLE: SPENTBLS.S

NO.	DATE	REV NAME, DEED BOOK, AND PAGE NUMBER FOR PARCELS 66
1	4/4/06	

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.	
R /W REV.	

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	36
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

F/F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

NAD 83

MATCH LINE -L- 339+40.000 SEE SHEET 35

MATCH LINE -L- 342+80.000 SEE SHEET 37

SITE #13

SEE SHEET 66 & 67 FOR -L- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

Permit Drawing

FILE: SFIELS
DATE: SDATES STIMES
PLOT DRIVER: SPLTDRVLS
PEN TABLE: SPENTBLLS

NO.	DATE	REV NAME FOR PARCEL 64 & REV NAME, DEED BOOK AND PAGE NUMBER FOR PARCEL 80
1	4-4-06	

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4030 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.	
R /W REV.	

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	42
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SEE SHEET 81 FOR -Y26- PROFILE
SEE SHEET 83 FOR -Y28- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

OBLITERATE EXISTING PAVEMENT

NAD 83

MATCH LINE -Y26- 11+00 SEE SHEET 31

MATCH LINE -Y26- 14+05 SEE SHEET 43

+00.000 -Y26- 65.000m LT (213.25')
+07.000 -Y26- 70.000m LT (229.66')
+25.000 -Y26- 46.041m LT (151.05')
+33.000 -Y26- 45.233m LT
+65.000 -Y26- 42.000m LT (137.80')
+08.473 -Y26- 38.178m LT END FENCE
+21.171 -Y26- 37.481m LT BEG FENCE
+33.338 -Y26- 28.386m RT END FENCE
+49.562 -Y26- 38.137m RT BEG FENCE
PROP 1.2m WW 1-S-BW
PROP R/W
TS Sta.11+89.133
SC Sta.12+34.133 (21.500m LT (70.54')) END FENCE END C/A
R=678.500m
PROP R/W
SLOPE STAKES
PAINTED ISLAND
GRAU 350
-Y26-
5.1 CONC WW
4.4 HW
1.83' X 1.35' BARREL
PC Sta.10+39.420
N 30°25' 19.4" W
+15.000 -Y26- 50.551m RT (165.85')
+26.000 -Y26- 52.011m RT
EXCAVATE EXISTING ROADWAY EMBANKMENT TO NATURAL GROUND
+90.00 -Y26- 60.501m RT (198.49')
+34.133 -Y26- 67.157m RT (220.33') END FENCE END C/A
+65.00 -Y26- 75.000m RT (246.06')
1350mm CONC DITCH
SR 1603 WASHINGTON ST 7.3 BST
300mm CONC
1200 mm WD RAIL
+81.435 -Y28- 21.500m LT (70.54')
+88.760 -Y28- 25.974m LT (85.22')
+00.000 -Y28- 10.005m LT (32.83')
CONC ISD
-Y28-
+65.000 -Y28- 14.077m RT (46.18')
+80.000 -Y28- 14.800m RT (48.56')
+00.000 -Y28- 8.283m RT (27.18')
SR 1708 FUSSELL RD 7.3 BST
PT Sta.10+80.469
POT Sta.11+00.000 END CONST
ISFD
POOL
PUMP HOUSE
MTL 450 mm
3.4 CONC
SOIL

64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SITE #14

DENOTES MECHANIZED CLEARING

DENOTES FILL IN SURFACE WATER

DENOTES FILL IN WETLAND

FILE: $FILE$ $STAKES
DATE: $DATE$ $SDATES
PLOT DRIVER: $PLOTDRIVE$ $STAKES
PEN TABLE: $PENTABLE$ $SDATES

Permit Drawing
111 of 115

NO.	DATE	REVISION
1	4-4-06	REV NAME FOR PARCEL 64 & REV NAME, DEED BOOK AND PAGE NUMBER FOR PARCEL 80

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.

R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	42
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SEE SHEET 81 FOR -Y26- PROFILE
SEE SHEET 83 FOR -Y28- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

OBLITERATE EXISTING PAVEMENT

NAD 83

MATCH LINE -Y26- 11+00 SEE SHEET 31

MATCH LINE -Y26- 14+05 SEE SHEET 43

EXCAVATE EXISTING ROADWAY EMBANKMENT TO NATURAL GROUND

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

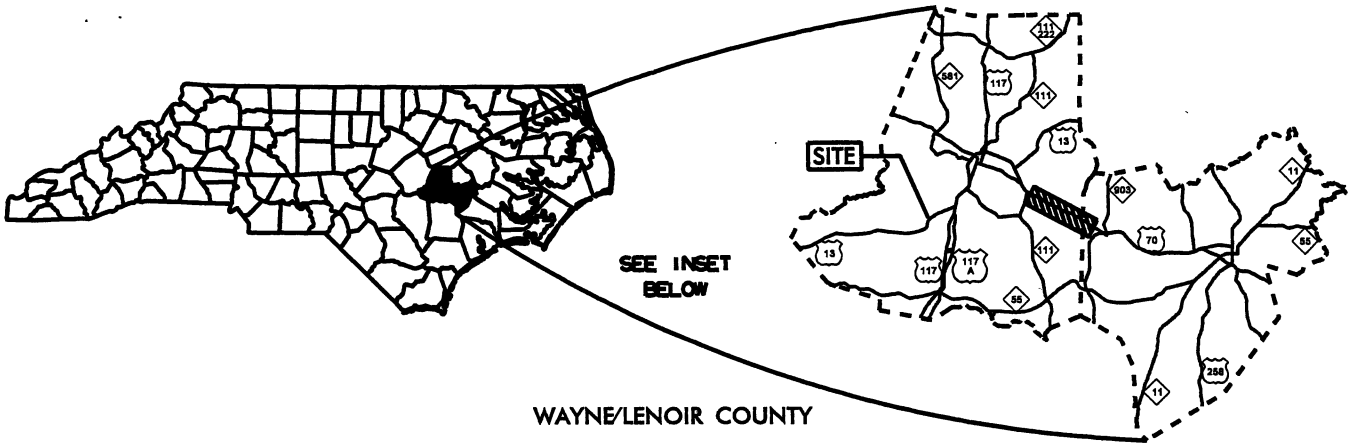
DENOTES FILL IN SURFACE WATER

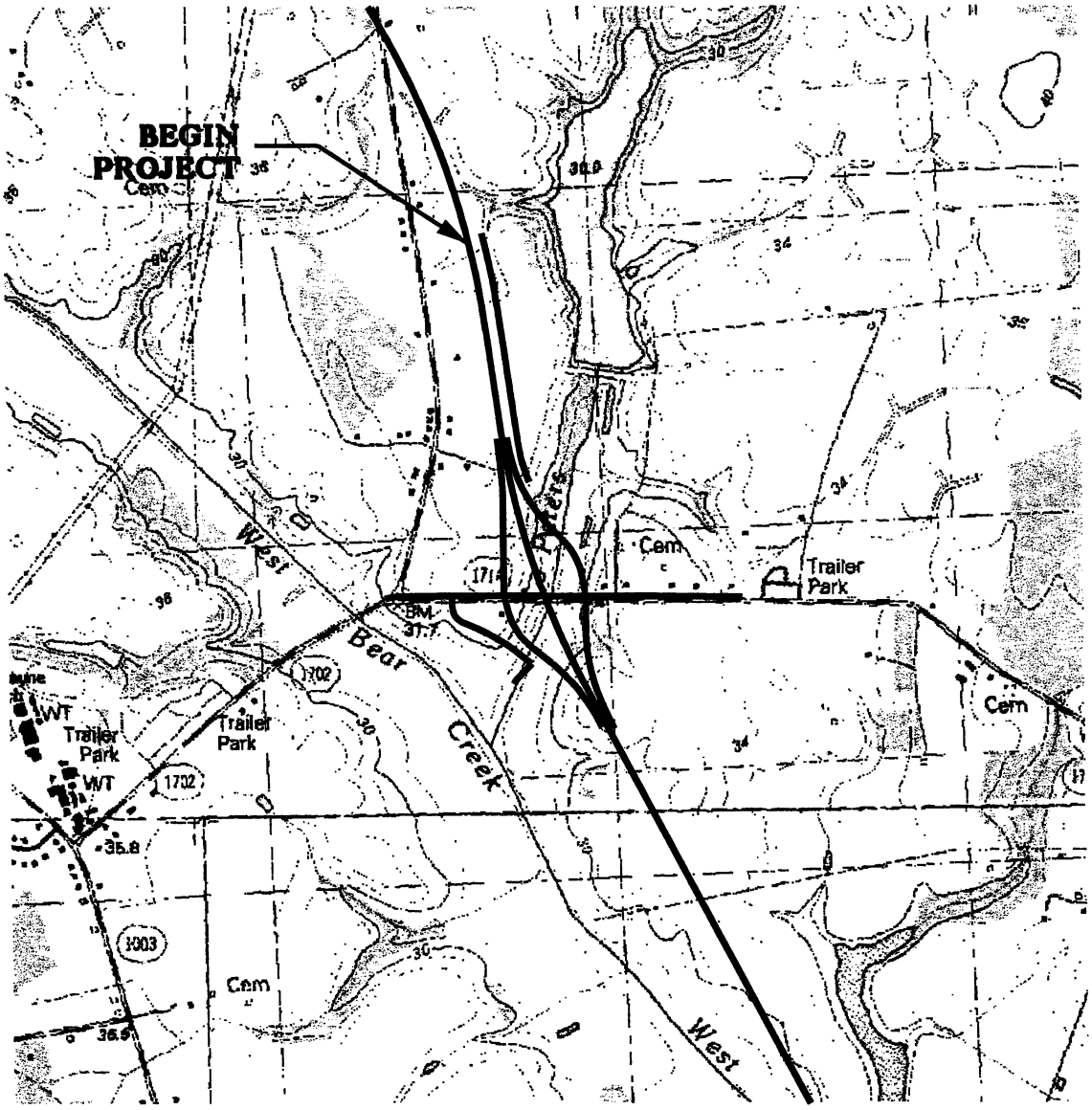
DENOTES FILL IN WETLAND

SITE #14

FILE: $FILE$
DATE: $DATE$ $TIME$
PLOT DRIVER: $PLOTDRIVE$
PEN TABLE: $PENTABLE$

Permit Drawing





SEE SHEET 2

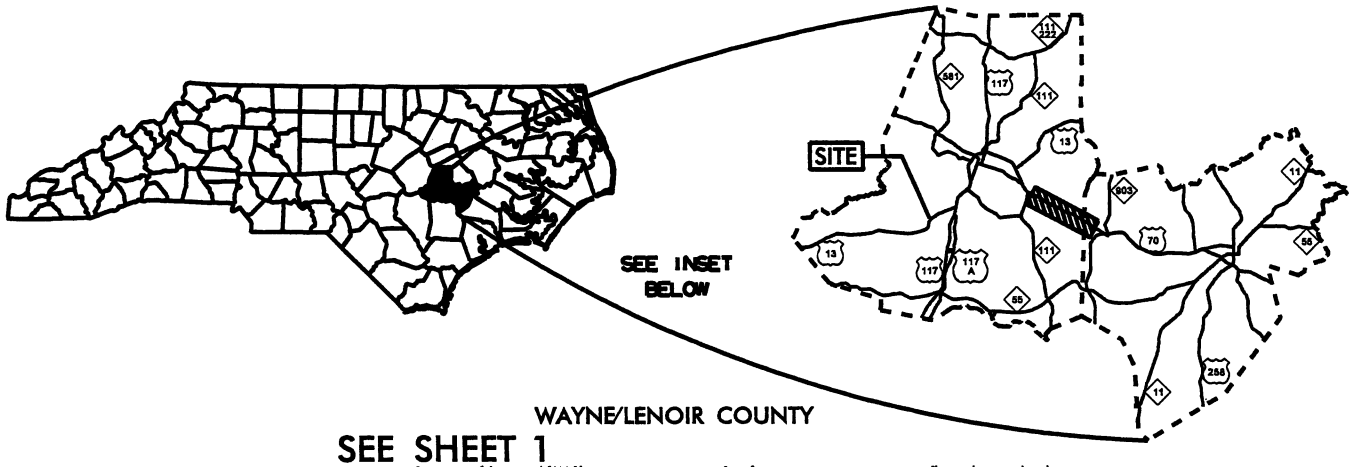
Buffer Drawing
Sheet 1 of 30

BUFFER IMPACTS
VICINITY MAP
SHEET 1 OF 4

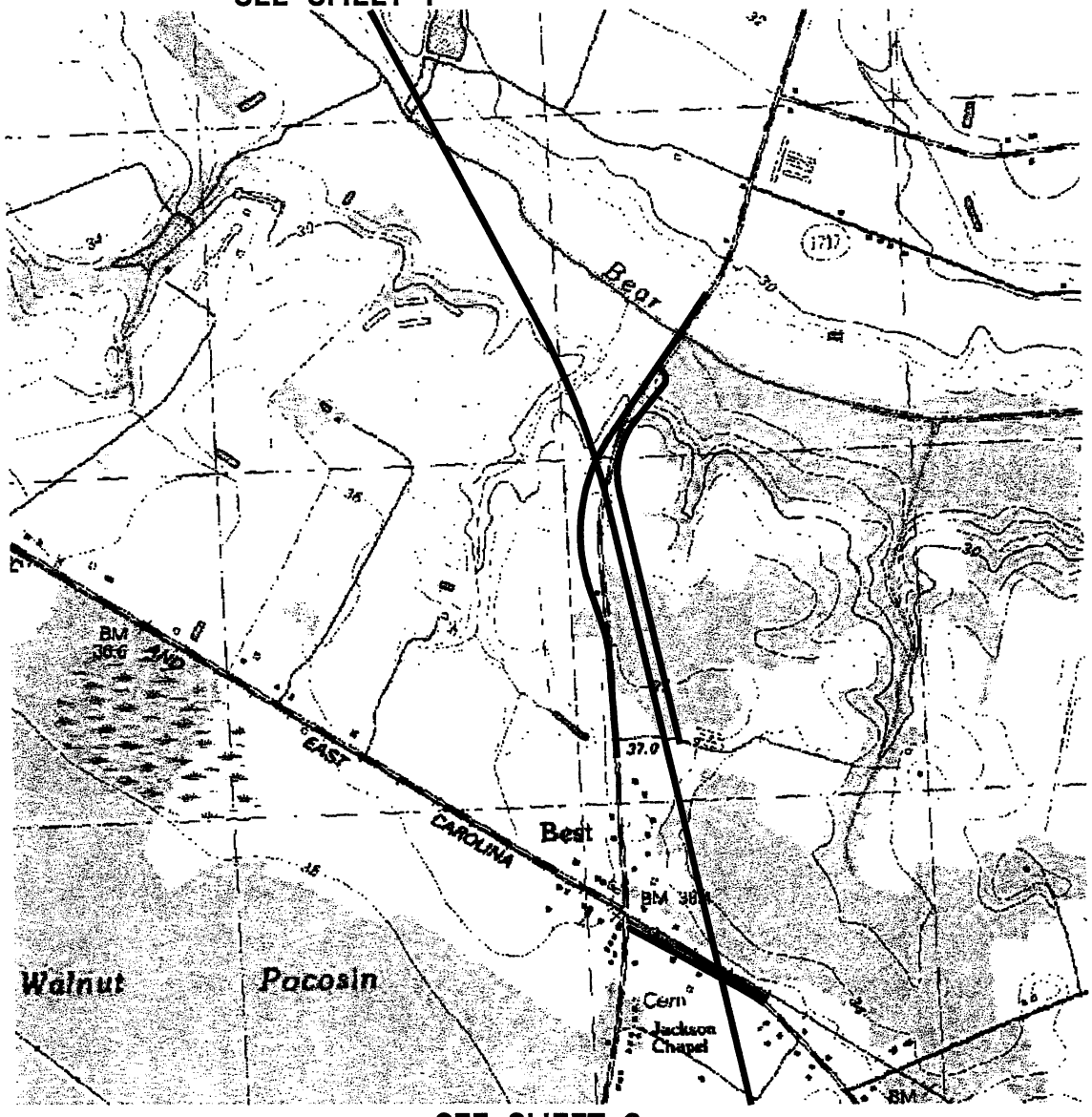
N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE/ LENOIR COUNTIES
PROJECT:34461.1.3 (R-2554C)
US 70 (GOLDSBORO BYPASS) FROM WEST OF SR 1714 TO EAST OF SR 1323 IN LENOIR COUNTY

SHEET ___ OF ___ **10/30/07**



SEE SHEET 1



SEE SHEET 3

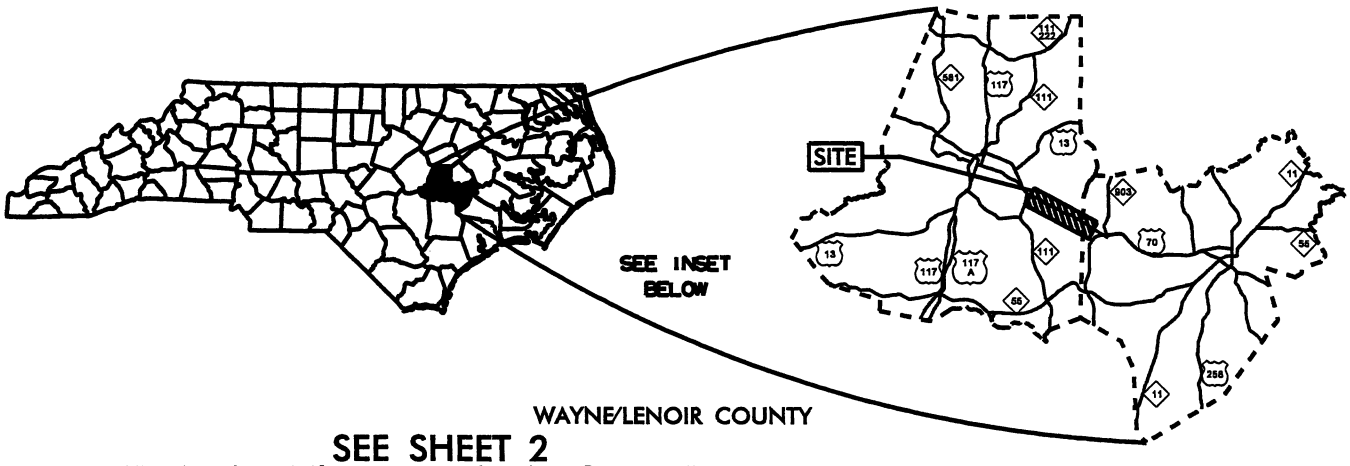
Buffer Drawing
Sheet 2 of 30

BUFFER IMPACTS
VICINITY MAP
SHEET 2 OF 4

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

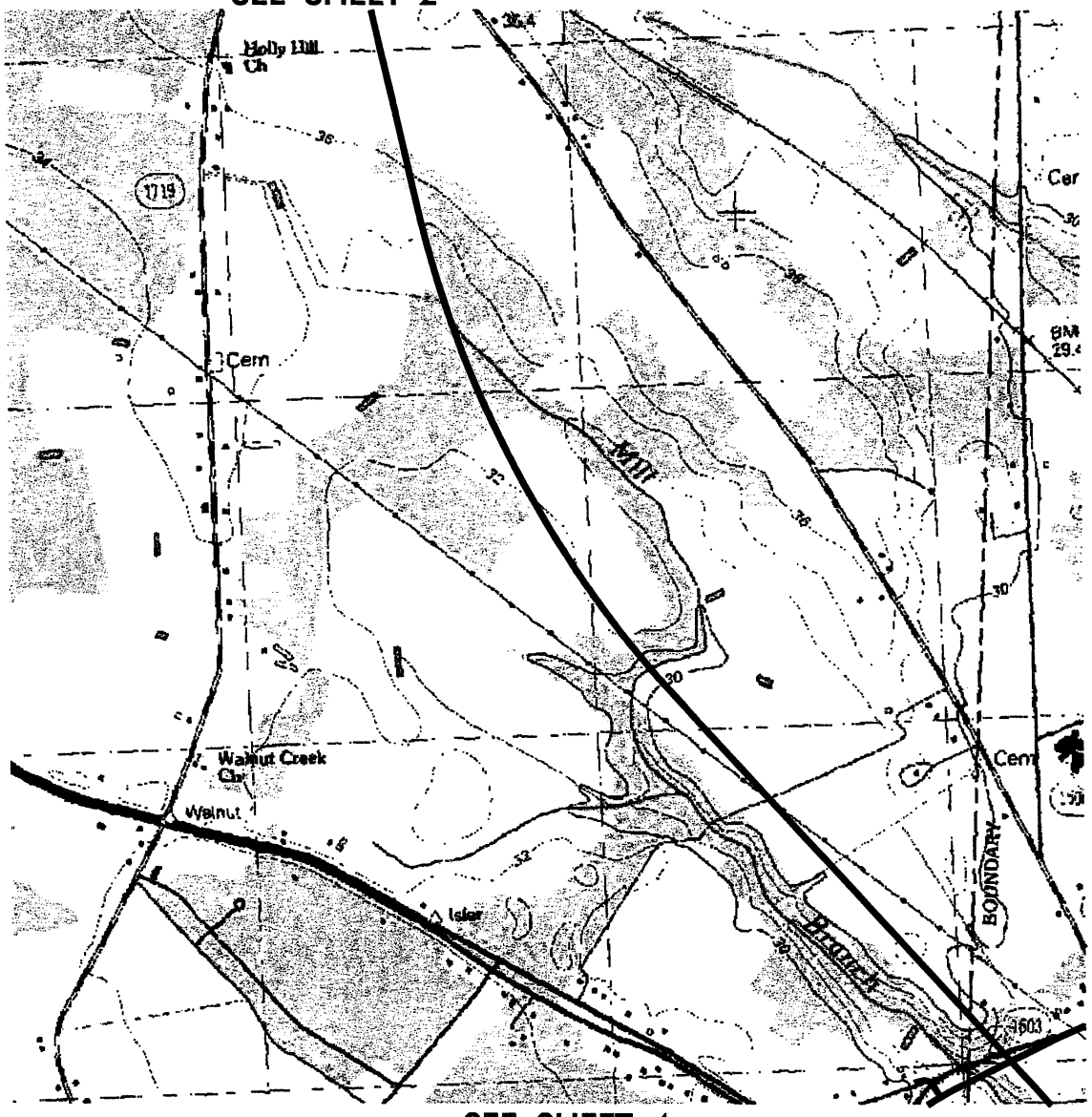
WAYNE/ LENOIR COUNTIES
PROJECT:34461.1.3 (R-2554C)
US 70 (GOLDSBORO BYPASS) FROM WEST OF SR 1714 TO EAST OF SR 1323 IN LENOIR COUNTY

SHEET ___ OF___ **10/30/07**



WAYNE/LENOIR COUNTY

SEE SHEET 2



SEE SHEET 4

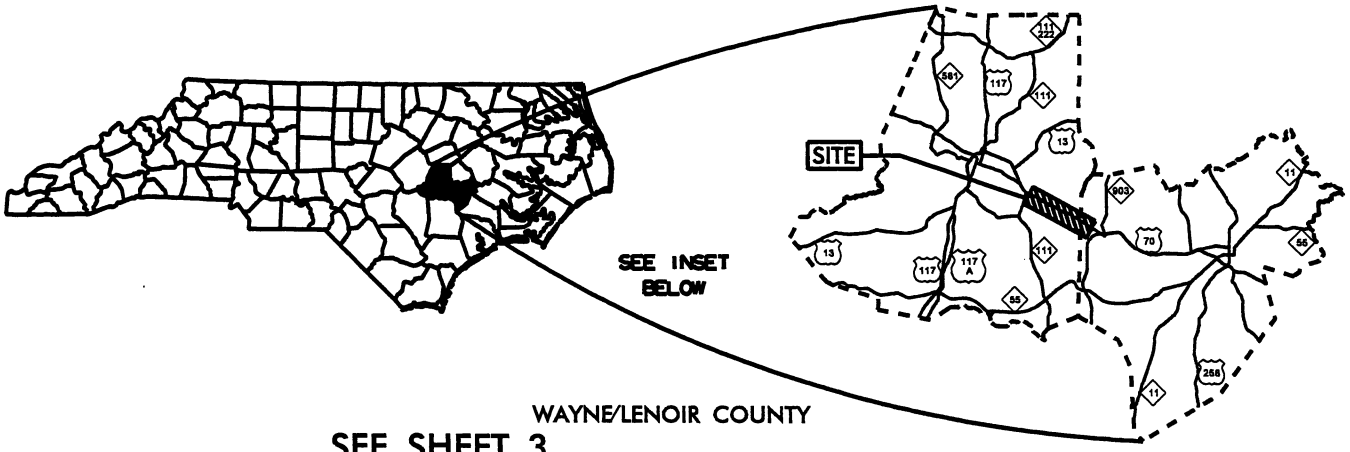
Buffer Drawing
Sheet 3 of 30

BUFFER IMPACTS
VICINITY MAP
SHEET 3 OF 4

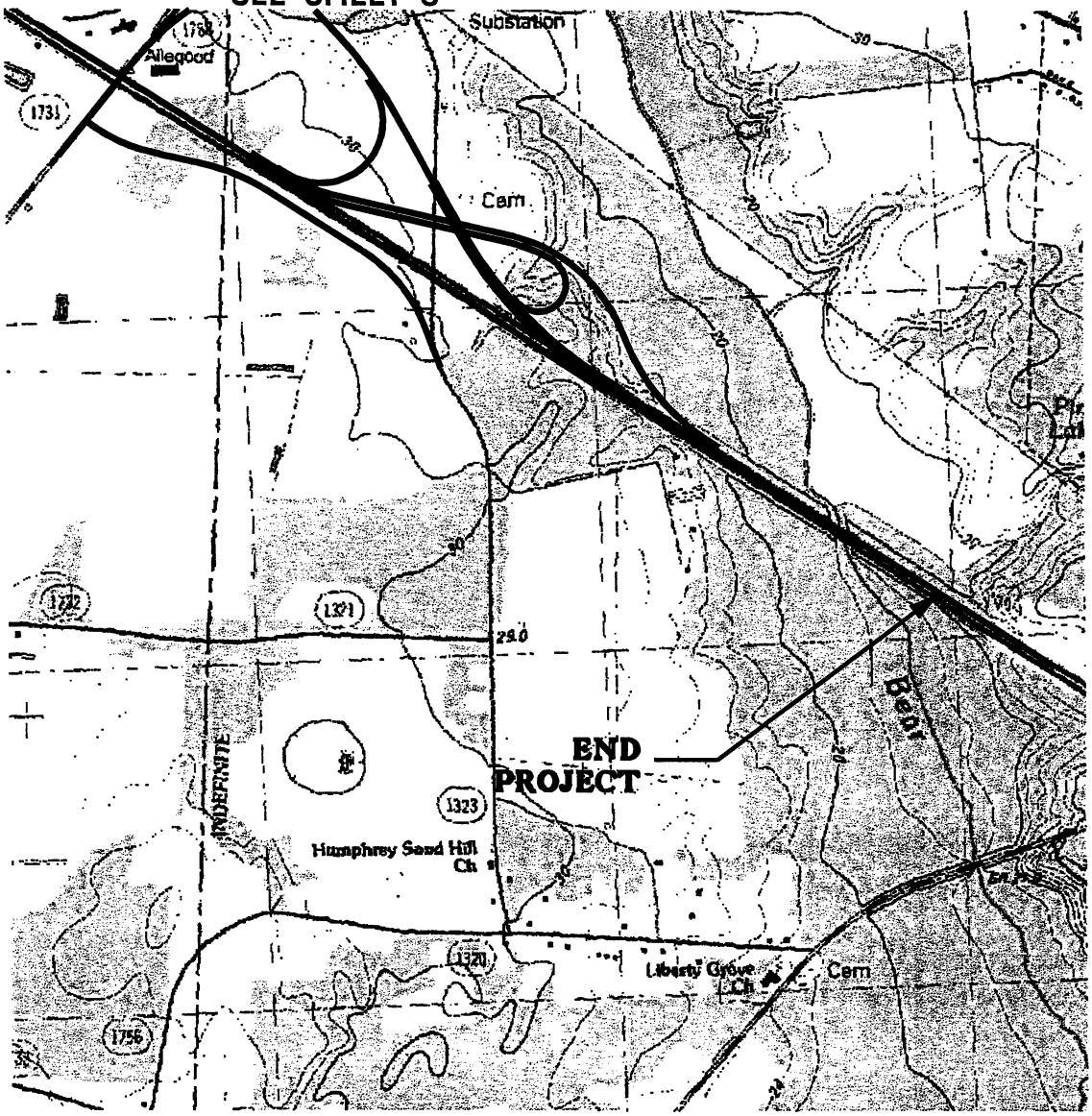
N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE / LENOIR COUNTIES
PROJECT:34461.1.3 (R-2554C)
US 70 (GOLDSBORO BYPASS) FROM WEST OF SR 1714 TO EAST OF SR 1323 IN LENOIR COUNTY

SHEET ___ OF ___ **10 / 30 / 07**



SEE SHEET 3



Buffer Drawing
Sheet 4 of 30

BUFFER IMPACTS
VICINITY MAP
SHEET 4 OF 4

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE / LENOIR COUNTIES
PROJECT:34461.1.3 (R-2554C)
US 70 (GOLDSBORO BYPASS) FROM WEST OF SR 1714 TO EAST OF SR 1323 IN LENOIR COUNTY

SHEET ___ OF ___ **10/30/07**

BUFFER IMPACTS SUMMARY

			IMPACT								BUFFER REPLACEMENT	
			TYPE		ALLOWABLE			MITIGABLE				
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	ROAD CROSSING	Bridge	ZONE 1 (m^2)	ZONE 2 (m^2)	TOTAL (m^2)	ZONE 1 (m^2)	ZONE 2 (m^2)	TOTAL (m^2)	ZONE 1 (m^2)	ZONE 2 (m^2)
1	Box Culvert	230+00to234+00 L	X				0.0	7969.8	3181.7	11151.5		
2	Pipe	12+65-RPA-	X				0.0	3801.8	2500.0	6301.8		
3	Bridge	253+00-L-		X			0.0	2739.7	2357.9	5097.6		
4	Box Culvert	260+80-L-	X				0.0	1954.3	1125.6	3079.9		
5	Box Culvert	302+80-L-	X				0.0	1888.5	1203.2	3091.7		
6	Box Culvert	320+20-L-	X				0.0	2363.3	1614.4	3977.7		
7	Pipe	17+30-FLY-	X				0.0	2694.7	1710.4	4405.1		
8	Box Culvert	11+30-Y26-	X				0.0	2583.4	1293.1	3876.5		
							0.0			0.0		
							0.0			0.0		
							0.0			0.0		
							0.0			0.0		
							0.0			0.0		
							0.0			0.0		
							0.0			0.0		
							0.0			0.0		
							0.0			0.0		
							0.0			0.0		
							0.0			0.0		
							0.0			0.0		
							0.0			0.0		
TOTAL:					0.0	0.0	0.0	25995.5	14986.3	40981.8		

Buffer Drawing
Sheet 5 of 30

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

Wayne County
PROJECT: 34461.1.3 (R-2554C)

10/17/2007
SHEET OF

BUFFER IMPACTS SUMMARY

SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	IMPACT TYPE: ROAD CROSSING	IMPACT TYPE: Bridge	IMPACT ALLOWABLE: ZONE 1 (ft^2)	IMPACT ALLOWABLE: ZONE 2 (ft^2)	IMPACT ALLOWABLE: TOTAL (ft^2)	IMPACT MITIGABLE: ZONE 1 (ft^2)	IMPACT MITIGABLE: ZONE 2 (ft^2)	IMPACT MITIGABLE: TOTAL (ft^2)	BUFFER REPLACEMENT: ZONE 1 (ft^2)	BUFFER REPLACEMENT: ZONE 2 (ft^2)
1	Box Culvert	230+00to234+00 L	X				0	85786	34248	120034		
2	Pipe	12+65-RPA-	X				0	40922	26910	67832		
3	Bridge	253+00-L-		X			0	29490	25380	54870		
4	Box Culvert	260+80-L-	X				0	21036	12116	33152		
5	Box Culvert	302+80-L-	X				0	20328	12951	33279		
6	Box Culvert	320+20-L-	X				0	25438	17377	42816		
7	Pipe	17+30-FLY-	X				0	29006	18411	47416		
8	Box Culvert	11+30-Y26-	X				0	27808	13919	41727		
							0			0		
							0			0		
							0			0		
							0			0		
							0			0		
							0			0		
							0			0		
							0			0		
							0			0		
							0			0		
							0			0		
							0			0		
							0			0		
TOTAL:					0	0	0	279814	161311	441125		

Buffer Drawing
Sheet 6 of 30

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

Wayne County
PROJECT: 34461.1.3 (R-2554C)

10/17/2007
SHEET OF

BUFFER IMPACTS SUMMARY

		WETLANDS IN BUFFER	
Site	Station	ZONE 1 (ft^2)	ZONE 2 (ft^2)
3	253+00-L-	6129	0
5	302+80-L-	20328	12360
6	320+20-L-	12401	8424
7	17+30 -FLY-	7158	4429
8	11+30-Y26-	23507	11729
	TOTAL	69524	36942

Buffer Drawing
Sheet 7 of 30

NC DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

WAYNE COUNTY

PROJECT:34461.1.3 (R-2554C)

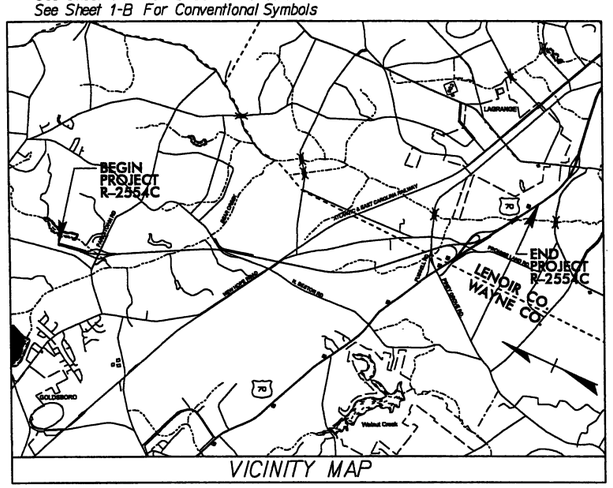
11/2/2007

66/68/6

CONTRACT: TIP PROJECT: R-2554C

FILE: SPRESS
DATE: 5DATES 5TIMES

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2554C	1	

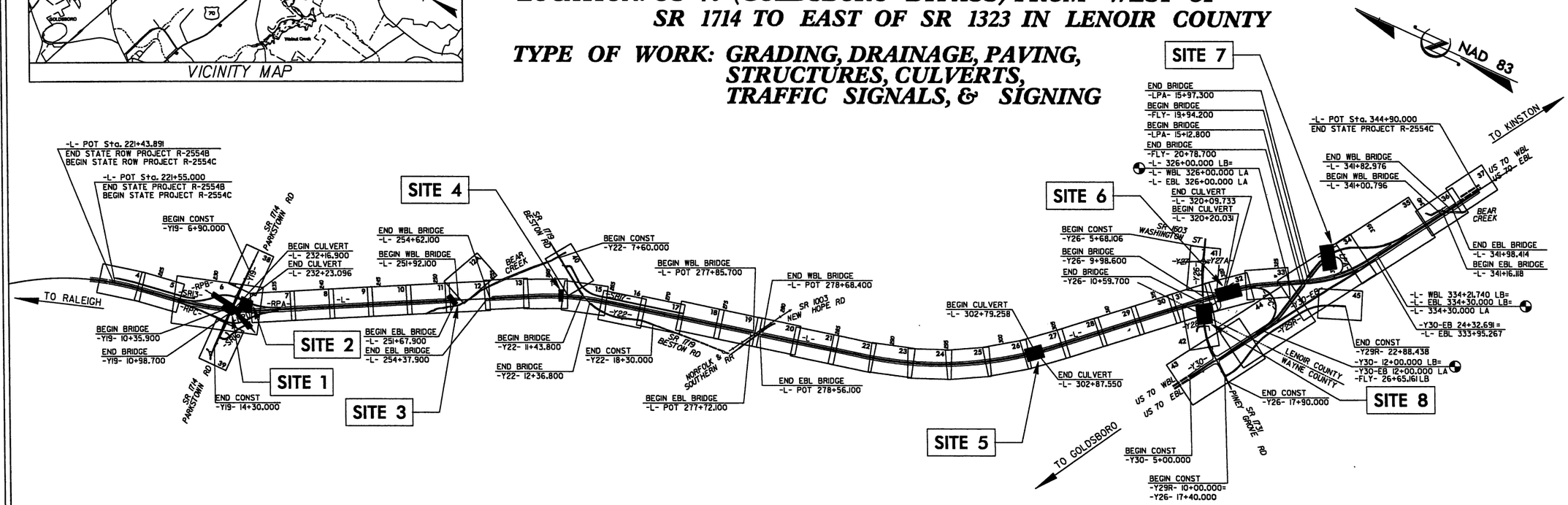
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34461.1.3	NHF-70(30)	P.E.
34461.2.5	NHS-70(69)	R/W & UTIL.

METRIC
ALL DIMENSIONS IN THESE PLANS ARE IN METERS

WAYNE–LENOIR COUNTIES

LOCATION: US 70 (GOLDSBORO BYPASS) FROM WEST OF SR 1714 TO EAST OF SR 1323 IN LENOIR COUNTY

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, CULVERTS, TRAFFIC SIGNALS, & SIGNING



Buffer Drawing Sheet 8 of 30

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III
THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS LIMITED TO INTERCHANGES.

BUFFER IMPACTS

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

5 0 10
PLANS

5 0 10
PROFILE (HORIZONTAL)

1 0 2
PROFILE (VERTICAL)

DESIGN DATA

ADT 2006 = 18,100
ADT 2026 = 33,100
DHV = 10 %
D = 55 %
T = 10 % *
V = 110 km/h
FUNC CLASS = FREEWAY
* TTST 6 % DUAL 4 %

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2554C	11.884	KM.
LENGTH STRUCTURES TIP PROJECT R-2554C	0.369	KM.
TOTAL LENGTH TIP PROJECT R-2554C	12.253	KM.

NOTE: EB LANE USED TO DETERMINE PROJECT LENGTH

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4030 WESTCHASE BLVD., SUITE 475
RALEIGH, NC 27607

PREPARED FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: DECEMBER 23, 2002

LETTING DATE: PY

DENNIS MORY, PE
PROJECT ENGINEER

CLAUDETTE M.K. ROQUE, PE
PROJECT DESIGN ENGINEER

NCDOT CONTACT: DOUG TAYLOR, PE
PROJECT ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

1 | 9/27/03 | REV PARCEL 6, ADDED PARCEL 10A

SR 1714 FARMTOWN RD.
-Y19-

LEGEND
2004 ADT
2024 ADT

BEGIN BRIDGE
-Y19- STA 10+35.900

END BRIDGE
-Y19- STA 10+98.700

PAINTED ISLAND

N 89°55'00" W

BRIDGE SKETCH
-Y19- ONE -L-

NAD '83

SITE #1
(PETER CREEK)

SITE #2

MATCH LINE -Y19- 8+80 SEE SHEET 38

MATCH LINE -Y19- 227+20 SEE SHEET 5

MATCH LINE -Y19- 12+20 SEE SHEET 39

MATCH LINE -RPA- 12+25 SEE SHEET 7

MATCH LINE -L- 234+00 SEE SHEET 7

MATCH LINE -RPD- 13+10 SEE SHEET 7

PROP GUARDRAIL BARRIER WITH TERMINAL SECTIONS

PROP CABLE GUIDE RAIL

SLOPE STAKES

A

B

C

D

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
AND SURVEYORS
RALEIGH, NORTH CAROLINA

SEE SHEET 47 FOR -L- PROFILE
SEE SHEET 68 & 69 FOR -Y19- PROFILE
SEE SHEET 71 FOR -RPA- PROFILE
SEE SHEET 72 FOR -RPB- PROFILE
SEE SHEET 73 FOR -RPC- PROFILE
SEE SHEET 74 FOR -RPD- PROFILE
SEE SHEET 69 & 70 FOR -SR 10- PROFILE
SEE SHEET 75 FOR -SR 16A- PROFILE
SEE SHEET 76 FOR -SR 16A- PROFILE
SEE SHEET 3-E FOR GORE DETAILS
SEE SHEET 3-I FOR ISLAND DETAILS
SEE SHEETS 3-F THRU 3-H FOR DRAINAGE DETAILS

METRIC

PROJECT REFERENCE NO.: 6
SHEET NO.:
R/W SHEET NO.:
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

CONST.
R/W

LOCATION:
US 70 (GOLDSBORO BYPASS)
FROM WEST OF SR 1714 TO
EAST OF SR 1223 IN LENOIR COUNTY

TIP NO.: R-2554C
COUNTY: WAYNE-LENOIR

DESIGNED BY:
DATE:
CHECKED BY:
DATE:

Buffer Drawing
Sheet 9 of 30

1 | 9/27/03 | REV PARCEL 6, ADDED PARCEL 10A

SR 1714 FAIRSTOWN RD.
-Y19-

LEGEND
3006 ADT
2028 ADT

BEGIN BRIDGE
-Y19- STA 10+35.900

END BRIDGE
-Y19- STA 10+98.700

PAINTED ISLAND
N 89° 55' 00" W

BRIDGE SKETCH
-Y19- over -L-

SITE #1
(PETER CREEK)

SITE #2

NAD 83

MATCH LINE -Y19- 8+80 SEE SHEET 38

MATCH LINE -L- 227+20 SEE SHEET 5

MATCH LINE -L- 214+00 SEE SHEET 7

MATCH LINE -RPA- 12+25 SEE SHEET 7

MATCH LINE -RPB- 12+10 SEE SHEET 7

MATCH LINE -Y19- 12+20 SEE SHEET 39

MATCH LINE -L- 214+50 SEE SHEET 39

A

B

C

D

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
AND SURVEYORS

SHEET 47 FOR -L- PROFILE
SHEET 68 & 69 FOR -Y19- PROFILE
SHEET 71 FOR -RPA- PROFILE
SHEET 72 FOR -RPB- PROFILE
SHEET 73 FOR -RPC- PROFILE
SHEET 74 FOR -RPD- PROFILE
SHEET 69 & 70 FOR -SR 15- PROFILE
SHEET 75 FOR -SR 16- PROFILE
SHEET 76 FOR -SR 1446 PROFILE
SHEET 3-A FOR GORE DETAILS
SHEET 3-J FOR ISLAND DETAILS
SHEETS 3-F THRU 3-H FOR DRAINAGE DETAILS

METRIC

PROJECT REFERENCE NO. | SHEET NO.
R-2554C | 4

R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

CONFERS:

R/W SRV.

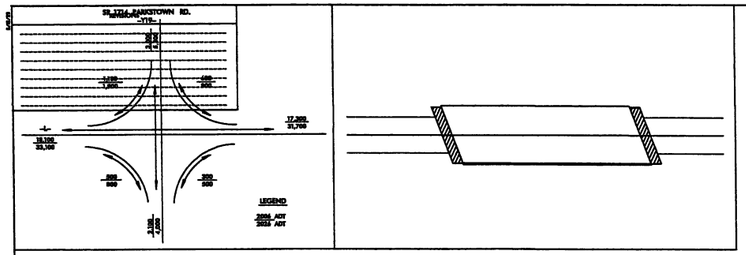
LOCATION:
US 70 (GOLDSBORO BYPASS)
FROM WEST OF SR 1714 TO
EAST OF SR 1323 IN LENOIR COUNTY

TIP NO.: R-2554C
COUNTY: WAYNE-LENOIR

DESIGNED BY:
DATE:

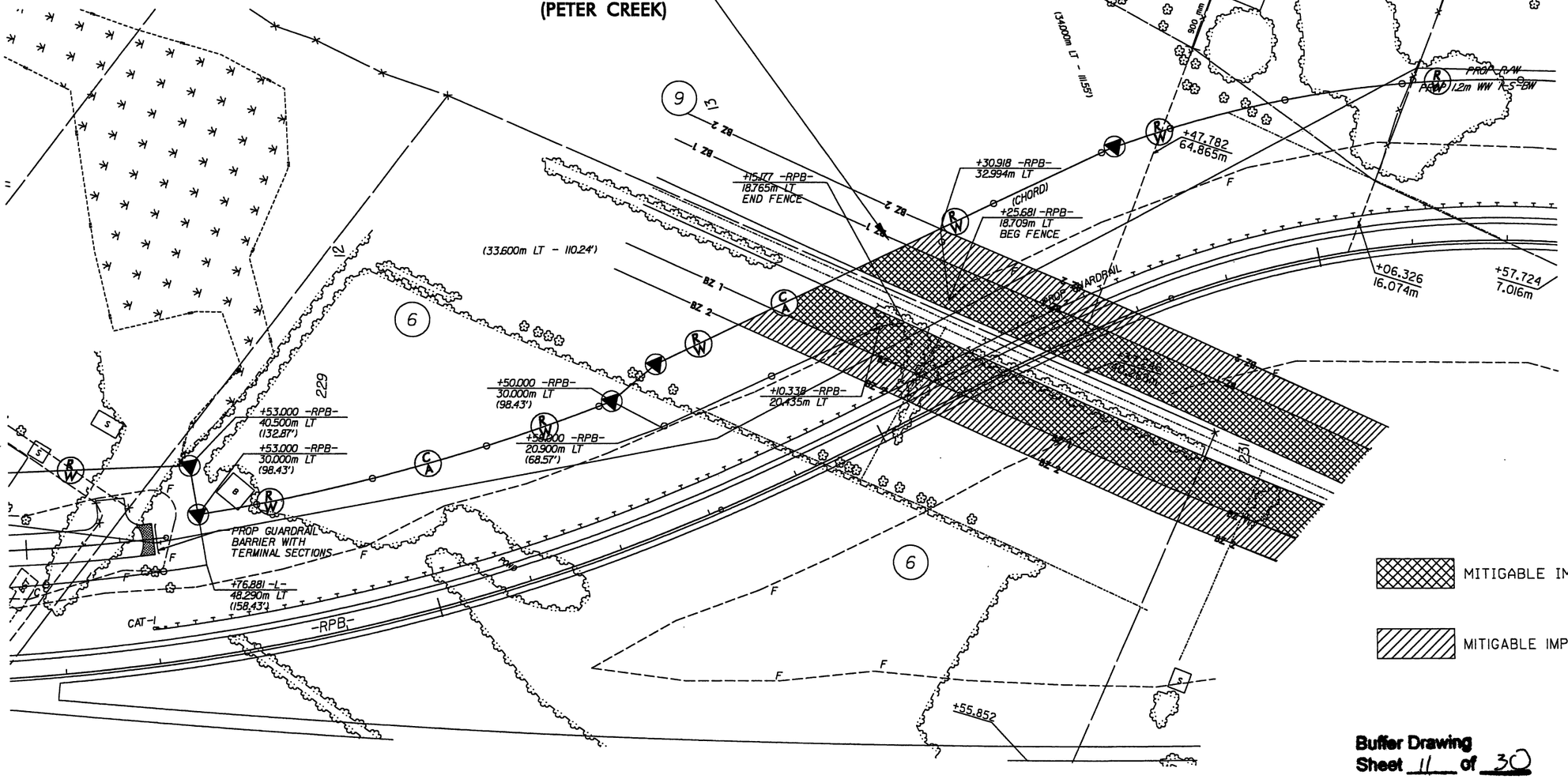
CHECKED BY:
DATE:

Buffer Drawing
Sheet 10 of 30



NAD 83

SITE #1
(PETER CREEK)



FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS

SEE SHEET 47 FOR -L- PROFILE
SEE SHEET 68 & 69 FOR -Y7- PROFILE
SEE SHEET 71 FOR -SP4- PROFILE
SEE SHEET 72 FOR -SP5- PROFILE
SEE SHEET 73 FOR -SP6- PROFILE
SEE SHEET 74 FOR -SP7- PROFILE
SEE SHEET 69 & 70 FOR -SR 15- PROFILE
SEE SHEET 75 FOR -SR 16- PROFILE
SEE SHEET 75 FOR -SR 16A- PROFILE
SEE SHEET 2-E FOR GORE DETAILS
SEE SHEET 3-I FOR ISLAND DETAILS
SEE SHEETS 2-F THRU
2-H FOR DRAINAGE DETAILS

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	6A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

LOCATION:
US 70 (GOLDSBORO BYPASS)
FROM WEST OF SR 1714 TO
EAST OF SR 1323 IN LENOIR COUNTY

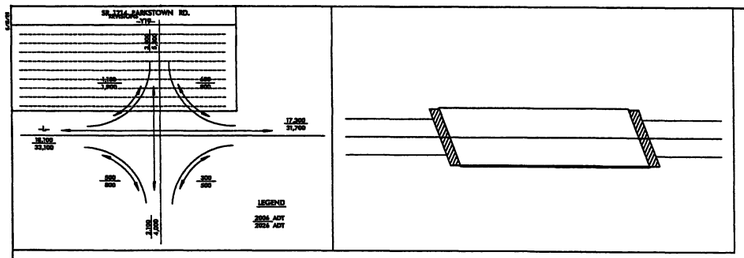
TIP NO.: R-2554C COUNTY: WAYNE-LENOIR

DESIGNED BY: DATE:

CHECKED BY: DATE:

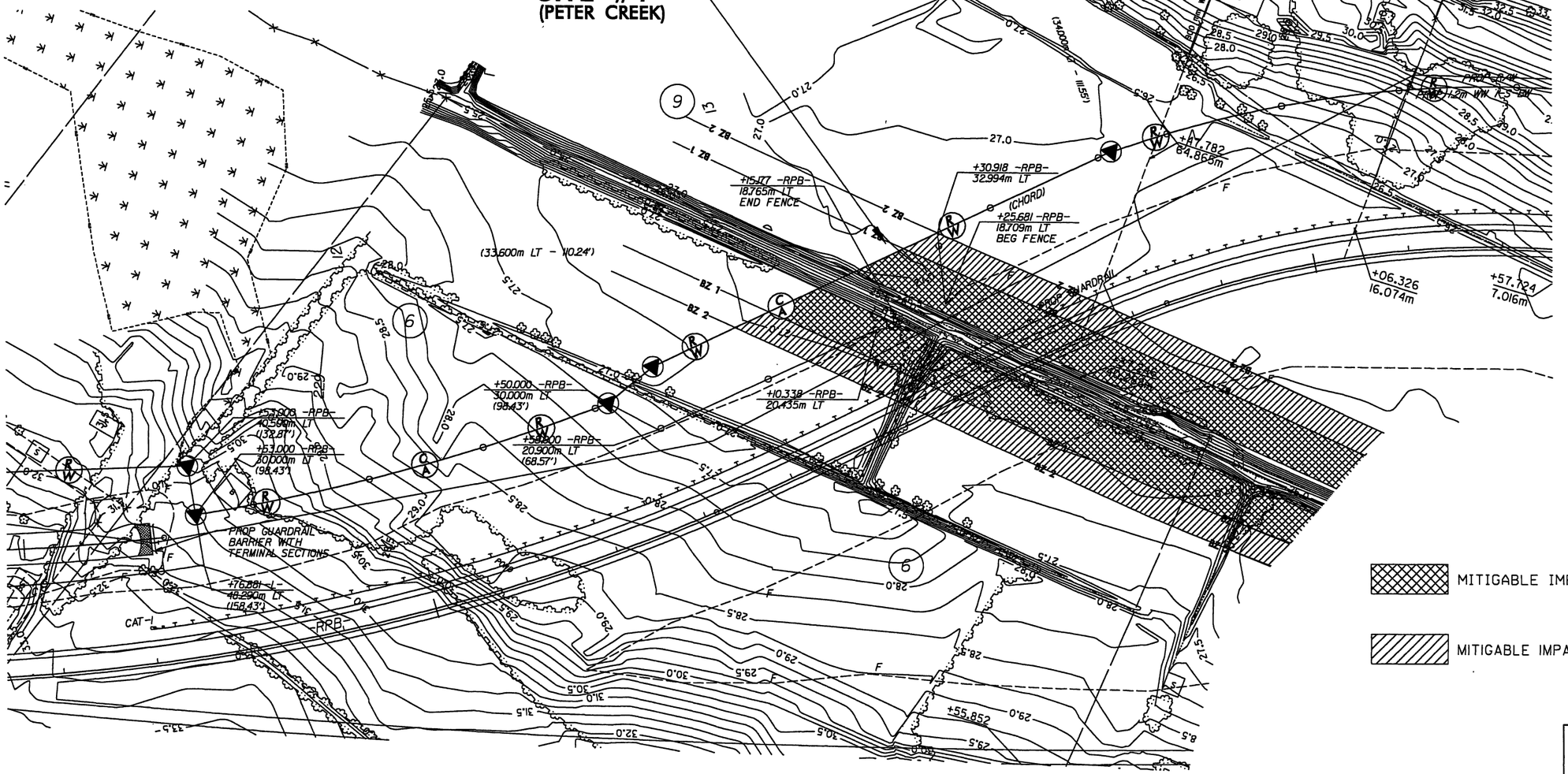
Buffer Drawing
Sheet 11 of 30

Buffer Drawing
Sheet ____ of ____



NAD 83

SITE #1
(PETER CREEK)



MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
RALEIGH, N.C.

SEE SHEET 47 FOR -L- PROFILE
SEE SHEET 68 & 69 FOR -Y19- PROFILE
SEE SHEET 71 FOR -SR1- PROFILE
SEE SHEET 72 FOR -SR2- PROFILE
SEE SHEET 73 FOR -SR3- PROFILE
SEE SHEET 74 FOR -SR5- PROFILE
SEE SHEET 69 & 70 FOR -SR 13- PROFILE
SEE SHEET 75 FOR -SR 16- PROFILE
SEE SHEET 75 FOR -SR 164- PROFILE
SEE SHEET 5-A FOR CURB DETAILS
SEE SHEET 5-I FOR ISLAND DETAILS
SEE SHEETS 5-P THRU 5-T FOR DRAINAGE DETAILS

METRIC

PROJECT REFERENCE NO. 8-2554C
SHEET NO. 4A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

CONCUR.
DIV. ENG.

LOCATION: US 70 (GOLDSBORO BYPASS) FROM WEST OF SR 1714 TO EAST OF SR 1323 IN LENOIR COUNTY
TIP NO.: R-2554C
COUNTY: WAYNE-LENOIR

DESIGNED BY: DATE:
CHECKED BY: DATE:

Buffer Drawing
Sheet 12 of 30

SR 1714 PARKSTOWN RD.
-Y19-

LEGEND
2004 ADT
2024 ADT

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

SITE #2

SITE #1
(PETER CREEK)

MATCH LINE -Y19- 8+80 SEE SHEET 38

UT TO PETERS CREEK

POND

SLOPE STAKES

"DRY FH" USED BY WAYNE COUNTY FIRE PERSONNEL.

TYPE-XI MOD ATTENUATOR

VINEYARD

PROP CABLE GUIDE RAIL

ISBW ELEC

GRAU 350

TYPE-III

EXIST R/W

PROP R/W

FLORENCE & HUTCHESON, INC.

PRELIMINARY PLANS

LOCATION:
US 70 (GOLDSBORO BYPASS)
FROM WEST OF SR 1714 TO
EAST OF SR 1323 IN LENOIR COUNTY

TIP NO. R-2554C COUNTY WAYNE-LENOIR

DESIGNED BY: DATE:

CHECKED BY: DATE:

Buffer Drawing
Sheet 13 of 30

SITE #2

SITE #1
(PETER CREEK)

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

SR 1714 PARKSTOWN RD. -Y19-

LEGEND

PRELIMINARY PLANS

LOCATION
US 70 (GOLDSBORO BYPASS)
FROM WEST OF SR 1714 TO
EAST OF SR 1323 IN LENOIR COUNTY

TIP NO. R-2554C COUNTY WAYNE-LENOIR

DESIGNED BY: DATE:

CHECKED BY: DATE:

PROJECT REFERENCE NO. R-2554C

SHEET NO. 4B

R/W SHEET NO.

HYDRAULIC ENGINEER

ROADWAY DESIGN ENGINEER

CONTR. ENV.

R/W ENV.

SHEET 4B

MATCH LINE -Y19- 8+80 SEE SHEET 3B

OUT TO PETERS CREEK

SLOPE STAKES

POND

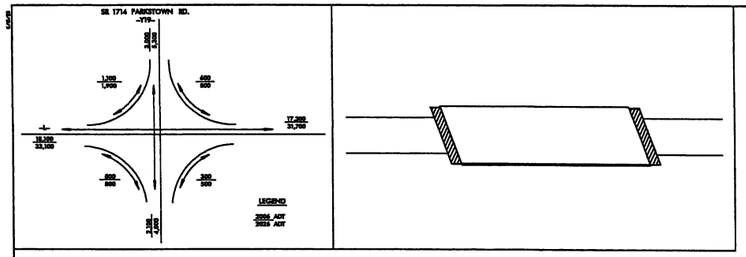
"DRY FH" USED BY WAYNE COUNTY FIRE PERSONNEL

TYPE-III MOD ATTENUATOR

TYPE-III MOD

PROP CABLE GUIDE RAIL

Buffer Drawing
Sheet 14 of 30



NAD 83

FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS

PLANS PREPARED BY:

SEE SHEET 47 FOR -L- PROFILE
SEE SHEET 68 & 69 FOR -Y19- PROFILE
SEE SHEET 71 FOR -SP1- PROFILE
SEE SHEET 72 FOR -SP5- PROFILE
SEE SHEET 73 FOR -SP7- PROFILE
SEE SHEET 74 FOR -SP3- PROFILE
SEE SHEET 69 & 70 FOR -SR 13- PROFILE
SEE SHEET 75 FOR -SR 16- PROFILE
SEE SHEET 76 FOR -SR 14A- PROFILE
SEE SHEET 3-C FOR GORE DETAILS
SEE SHEET 3-I FOR INLAND DETAILS
SEE SHEETS 3-F THRU
3-H FOR DRAINAGE DETAILS

METRIC

5m 0 10m

CONSTR.

SW. MK.

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	4 C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

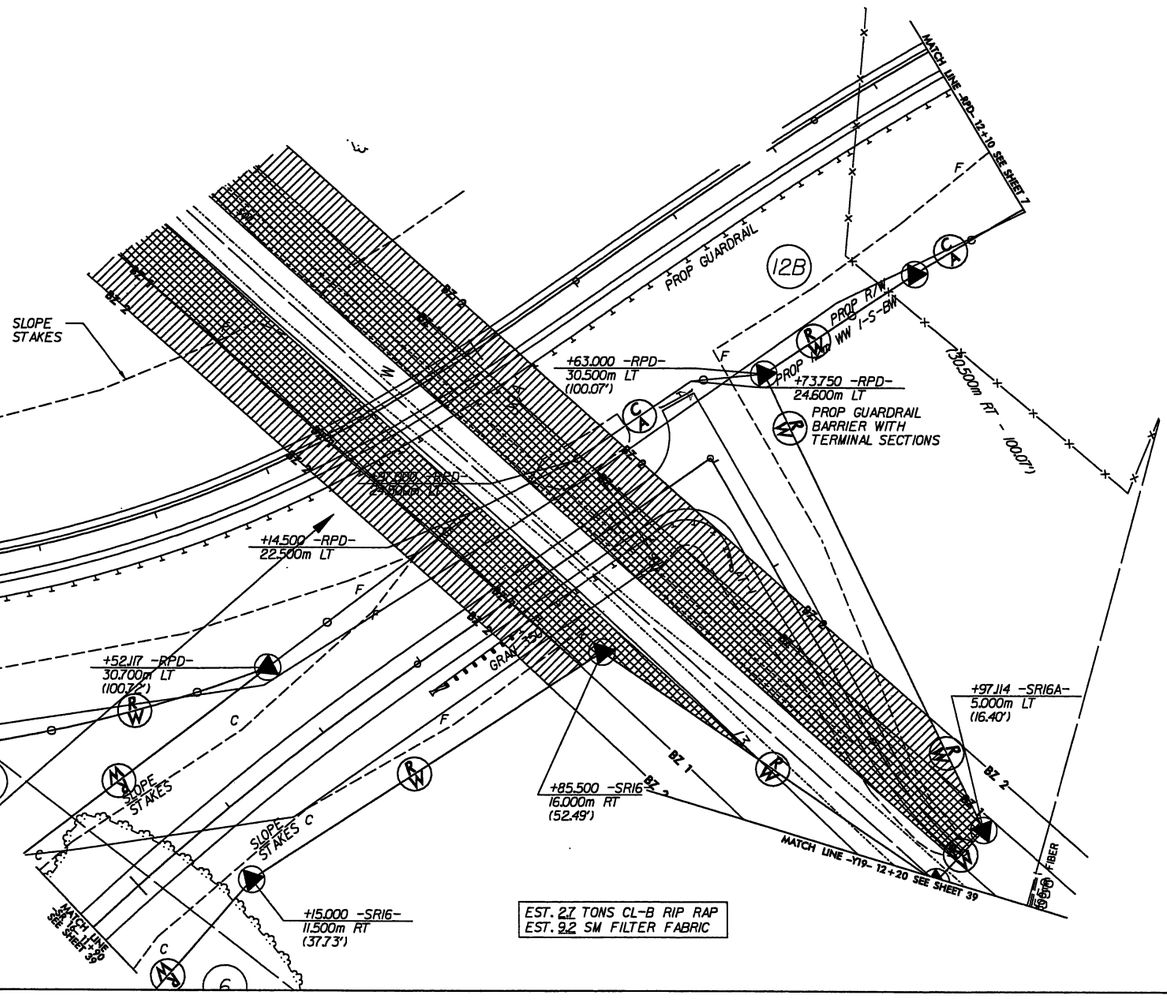
PRELIMINARY PLANS
NOT FOR CONSTRUCTION

LOCATION:
US 70 (GOLDSBORO BYPASS)
FROM WEST OF SR 1714 TO
EAST OF SR 1323 IN LENOIR COUNTY

TIP NO.: R-2554C COUNTY: WAYNE-LENOIR

DESIGNED BY: DATE:

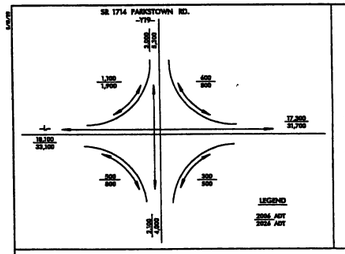
CHECKED BY: DATE:

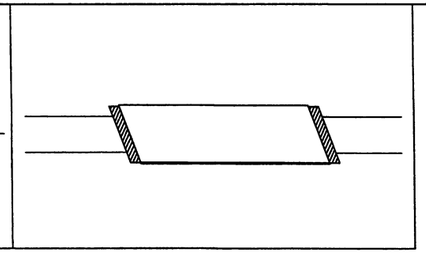


MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

Buffer Drawing
Sheet 15 of 30





NAD 83

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
AND SURVEYORS, P.A.
RALEIGH, N.C. 27609

SEE SHEET 47 FOR -L- PROFILE
SEE SHEET 68 & 69 FOR -Y19- PROFILE
SEE SHEET 71 FOR -SR14- PROFILE
SEE SHEET 72 FOR -SR6- PROFILE
SEE SHEET 73 FOR -SR7- PROFILE
SEE SHEET 74 FOR -SR1- PROFILE
SEE SHEET 69 & 70 FOR -SR 13- PROFILE
SEE SHEET 75 FOR -SR 16- PROFILE
SEE SHEET 75 FOR -SR 16A- PROFILE
SEE SHEET 2-C FOR CORE DETAILS
SEE SHEET 2-I FOR ISLAND DETAILS
SEE SHEETS 2-F THRU
2-H FOR DRAINAGE DETAILS

METRIC

Sm 0 10m
1:200

CONST.ENR.
SW ENR.

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	6 C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

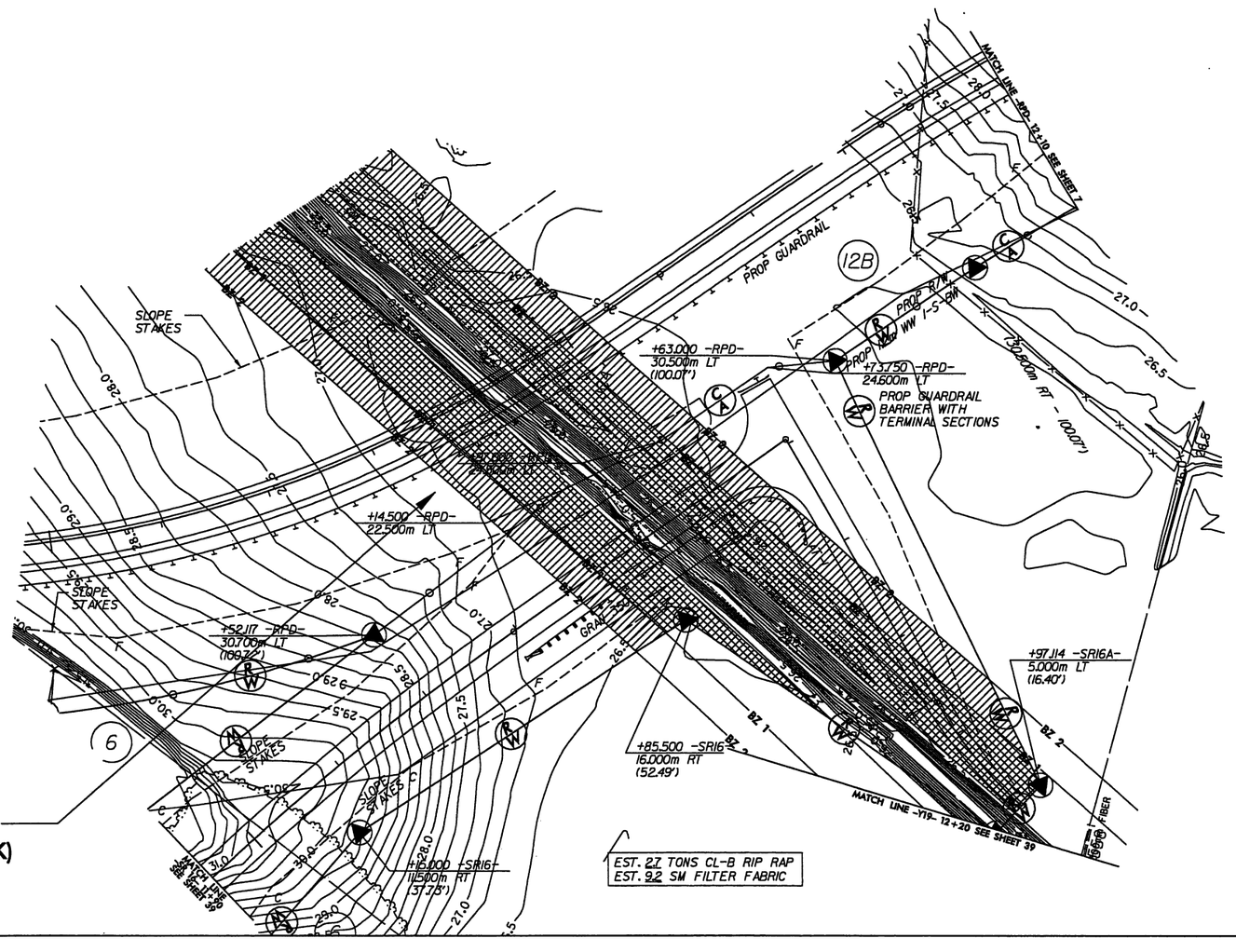
PRELIMINARY PLANS
NOT FOR CONSTRUCTION

LOCATION:
US 70 (GOLDSBORO BYPASS)
FROM WEST OF SR 1714 TO
EAST OF SR 1323 IN LENOIR COUNTY

TIP NO.: R-2554C COUNTY: WAYNE-LENOIR

DESIGNED BY: DATE:

CHECKED BY: DATE:



MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

Buffer Drawing
Sheet 16 of 30

R/W REV. - 3/01/07
PROPOSED FENCE FOR MITIGATION AREA
ON PARCEL 27

R/W REV. - 10/01/07
REVISED MITIGATION AREA
ON PARCELS 25 & 27

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4030 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

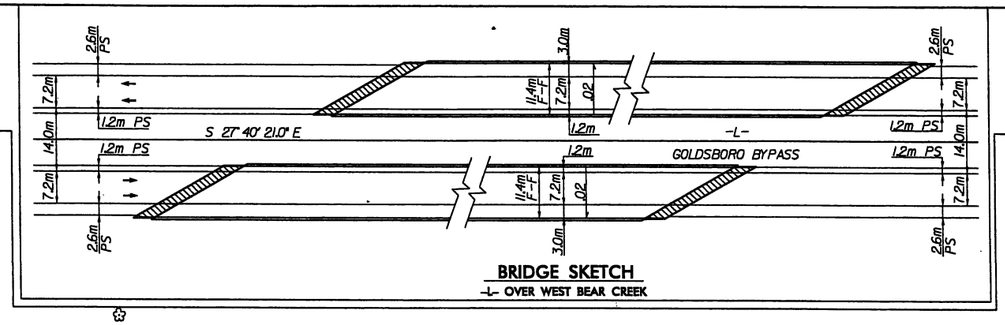
CONST.REV.

R/W REV.

MATCH LINE SEE SHEET 12A

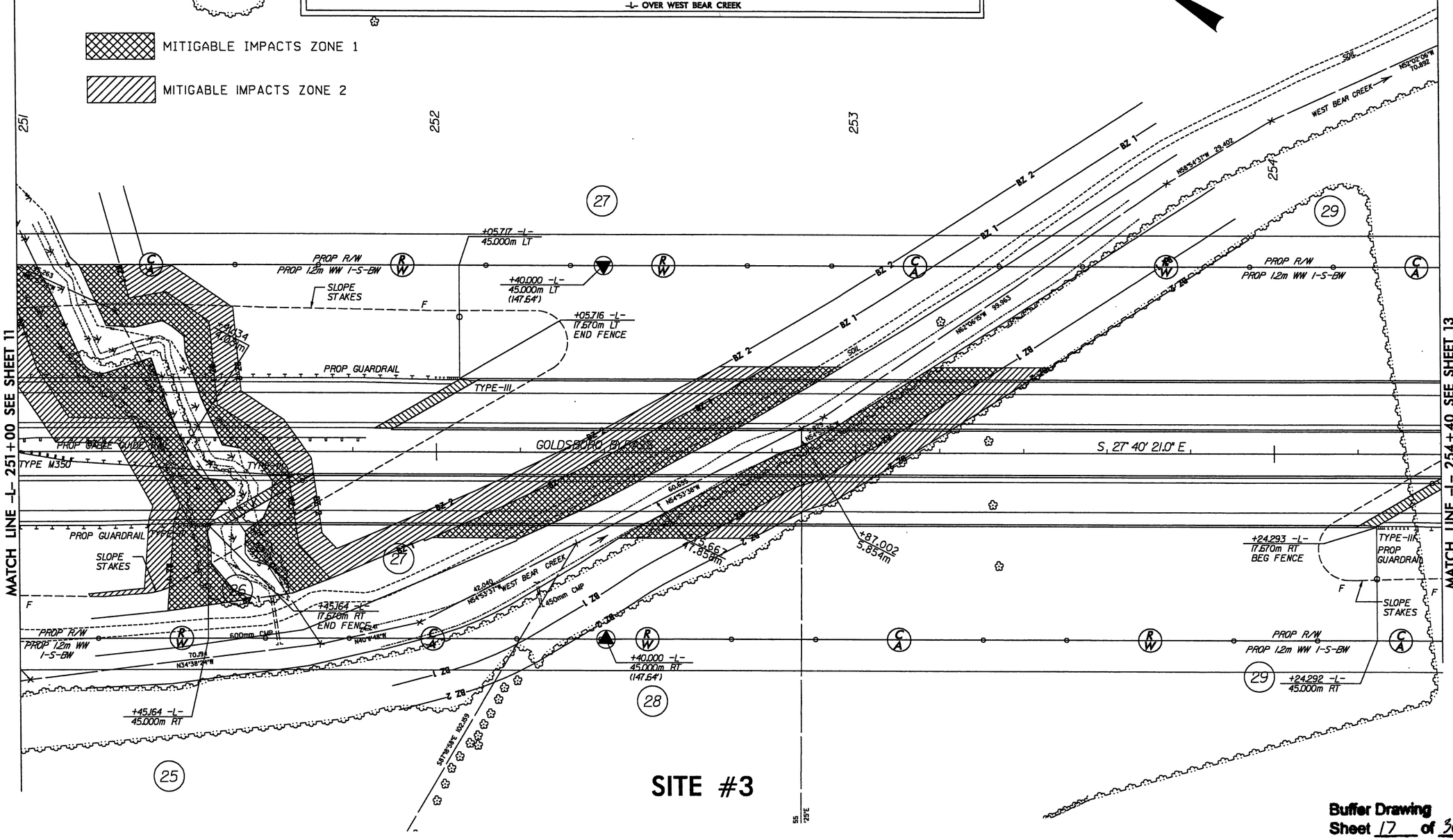
MATCH LINE SEE SHEET 12A

NAD 83



MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2



SITE #3

Buffer Drawing
Sheet 17 of 30

SEE SHEET 50 FOR -L- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

FILE:
DATE:
PLOT DRIVER: STIMES
PEN TABLES: SPENTBLLS
SPILES
STAKES
SKETCHES

R/W REV. - 3/01/07
PROPOSED FENCE FOR MITIGATION AREA
ON PARCEL 27

R/W REV. - 10/01/07
REVISED MITIGATION AREA
ON PARCELS 26 & 27

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4030 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

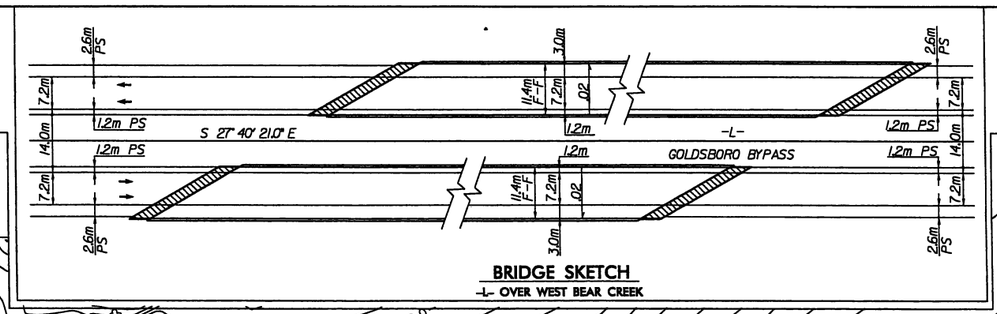
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

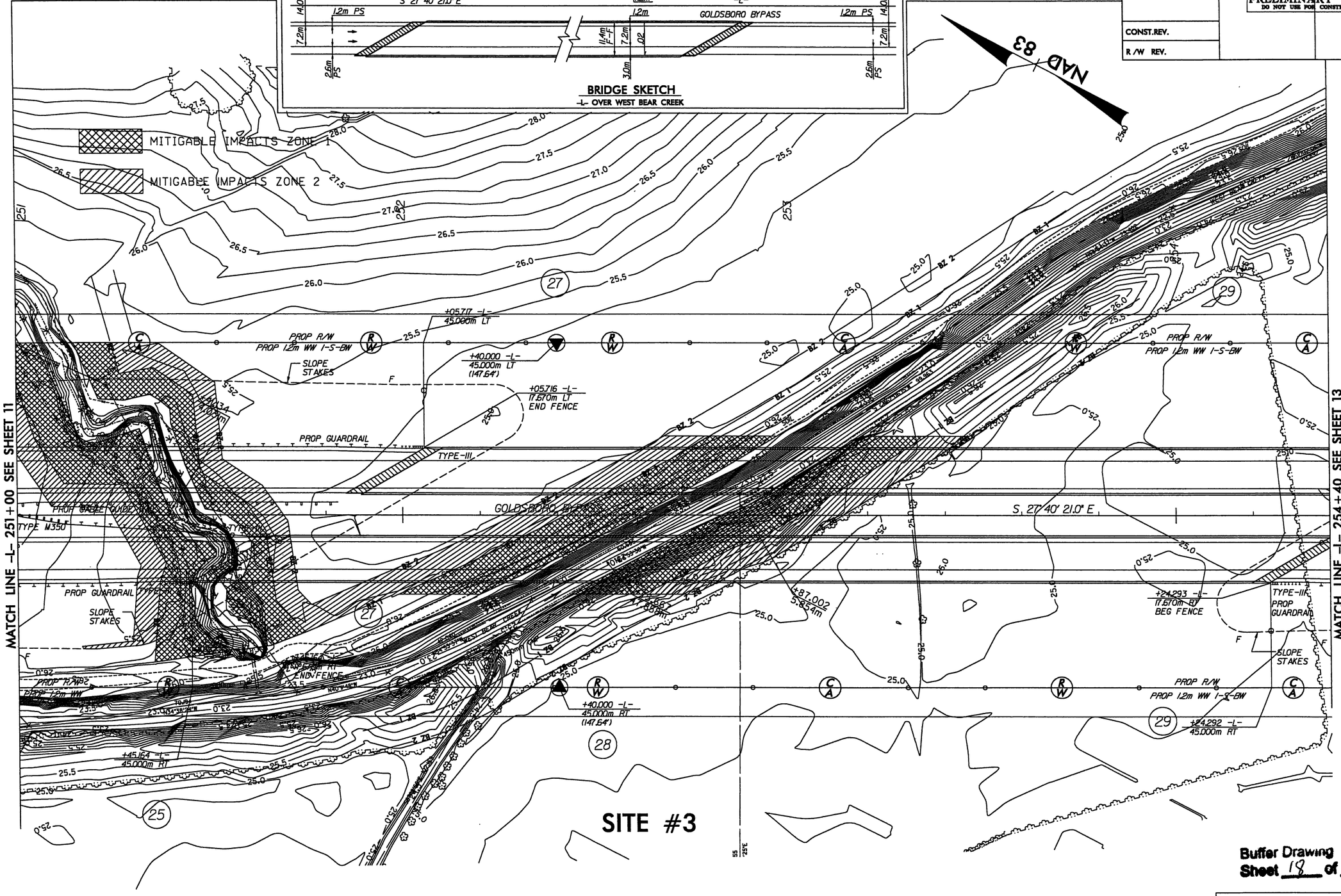
R/W REV.

MATCH LINE SEE SHEET 12A

MATCH LINE SEE SHEET 12A



BRIDGE SKETCH
-L- OVER WEST BEAR CREEK



SITE #3

Buffer Drawing
Sheet 18 of 30

SEE SHEET 50 FOR -L- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

FILE: SFIELDS
DATE: SDAVIES
PLOT DRIVER: STIMES
PEN TABLE: SPRINTBW.TBL

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R/W REV.

NAD 83

MATCH LINE -L- 257+80 SEE SHEET 13

MATCH LINE -L- 261+20 SEE SHEET 15

258 259 260 261

31

45.000m LT - (147.64')

(CHORD)

PROP R/W
PROP 1.2m WW 1-S-BW

SLOPE STAKES

PROP GUARDRAIL

PROP CABLE GUIDE RAIL

SOIL

+21.147 -L-
45.000m RT
(147.64')

+81.147 -L-
45.000m RT
(147.64')

+60.000 -L-
60.000m LT
(196.85')

+60.000 -L-
45.000m LT
(147.64')

+55.500 -L-
45.000m LT

+68.311 -L-
33.973m LT
END FENCE

+75.000 -L-
60.000m LT
(196.85')

+85.000 -L-
45.000m LT
(147.64')

+92.500 -L-
45.000m LT

+81.169 -L-
33.552m LT
BEG FENCE

+87.777 -L-
28.743m RT
END FENCE

+17.000 -L-
45.000m RT

+73.000 -L-
45.000m RT

GRAD 350

PDE

SITE #4

Buffer Drawing
Sheet 19 of 20

SEE SHEET 51 FOR -L- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

FILE: $FILE$ $TIME$
DATE: $DATE$
PLOT DRIVER: $PLTDRV$
PEN TABLE: $PENTBL$

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R/W REV.

NAD 83

MATCH LINE -L- 257+80 SEE SHEET 13

MATCH LINE -L- 261+20 SEE SHEET 15

SITE #4

Buffer Drawing
Sheet 20 of 30

SEE SHEET 51 FOR -L- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

FILE: SPIKLES STINES
DGN: SPIKLES STINES
PLOT DRIVER: SPKTDRV$
PEN TABLE: SPKNTBL$

1	04/05/05	REV NAME - PARCELS 59 & 60 REV PROPERTY LINE BETWEEN PARCELS 59 & 61

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

NAD 83

60

61

303

304

305

BZ 2

BZ 1

MILL CREEK

-L-

(145.000m LT - 147.64')

(145.000m LT - 147.64')

+70.000 -L-
45.000m LT

+83.917 -L-
26.132m LT
END FENCE

+96.584 -L-
25.553m LT
BEG FENCE

+22.000 -L-
45.000m LT

PROP R/W
PROP 1.2m WW 1-S-BW

(CHORD)

PROP R/W
PROP 1.2m WW 1-S-BW

SLOPE STAKES
CAT-1

PROP GUARDRAIL GRAU 350

SLOPE STAKES

MATCH LINE -L- 302+00 SEE SHEET 26

PROP CABLE GUIDE RAIL

GOLDSBORO BYPASS

PROP CABLE GUIDE RAIL

S 42° 13' 47.0" E

MATCH LINE -L- 305+40 SEE SHEET 28

PROP GUARDRAIL

SLOPE STAKES
CAT-1

+70.041 -L-
27.330m RT
END FENCE

+82.436 -L-
27.852m RT
BEG FENCE

PROP R/W
PROP 1.2m WW 1-S-BW

(CHORD)

PROP R/W
PROP 1.2m WW 1-S-BW

+48.000 -L-
45.000m RT

+73.000 -L-
45.000m RT
(147.64')

+95.000 -L-
45.000m RT

+98.279 -L-
45.000m RT
(147.64')

+58.279 -L-
45.000m RT
(147.64')

+77.000 -L-
54.000m RT
(177.16')

+84.000 -L-
45.000m RT
(147.64')

+84.008 -L-
50.500m RT
(165.88')

SITE #5

Buffer Drawing
Sheet 21 of 30

SEE SHEET 58 FOR -L- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

FILE: $FILE$ $STAKES$
DATE: $DATE$
PLOT DRIVER: $PLOTDRVR$
PEN TABLE: $PENTABLE$

NO.	DATE	REVISION
1	04/05/05	REV NAME - PARCELS 59 & 60 REV PROPERTY LINE BETWEEN PARCELS 59 & 61

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

5m 0 10m

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R/W REV.

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

NAD 83

MATCH LINE -L- 302+00 SEE SHEET 26

MATCH LINE -L- 305+40 SEE SHEET 28

GOLDSBORO BYPASS

S 42°13'47.0"E

PROP GUARDRAIL

PROP CABLE GUIDE RAIL

SLOPE STAKES

PROP R/W
PROP 12m WW 1-S-BW

(CHORD)

(45.000m LT - 147.64')

+70.000 -L-
45.000m LT

+83.917 -L-
26.132m LT
END FENCE

+96.556 -L-
25.553m LT
BEG FENCE

+22.000 -L-
45.000m LT

+70.041 -L-
27.430m RT
END FENCE

+82.436 -L-
27.852m RT
BEG FENCE

+95.000 -L-
45.000m RT

+18.000 -L-
45.000m RT

+75.000 -L-
45.000m RT
(147.64')

+77.000 -L-
54.000m RT
(177.18')

+84.000 -L-
45.000m RT
(147.64')

+84.006 -L-
50.500m RT
(165.88')

+98.279 -L-
45.000m RT
(147.64')

+58.279 -L-
45.000m RT
(147.64')

SITE #5

Buffer Drawing
Sheet 22 of 30

SEE SHEET 58 FOR -L- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

FILE: $FILE$ $TIME$
DATE: $DATE$
PLOT DRIVER: $PLTDRVR$
PEN TABLE: $PENTBL$

2	4-4-06	REV NAME, DEED BOOK, AND PAGE NUMBER FOR PARCELS 63 AND 77 AND NAME FOR PARCEL 64
1	1-29-03	REV NAME PARCEL 63, AND ADD PARCEL 63A

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	31
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.
R/W REV.

NAD 83

MATCH LINE -Y26- 9+35 SEE SHEET 41

MATCH LINE -L- 315+60 SEE SHEET 30

MATCH LINE -L- 319+00 SEE SHEET 32

MATCH LINE -Y26- 11+00 SEE SHEET 42

63 63A 64 77

ISFD

TYNDALL LEWIS OF WAYNE CO. AND FORK TOWNSHIP WATER HAS INDICATED THAT THIS 200 mm WATER LINE WILL BE EXTENDED SOUTH TO WASHINGTON RD. THEN EAST TOWARD NEW HOPE RD. THE 200 mm WATER LINE WILL THEN BE CONNECTED TO THE EXISTING 300 mm WATER LINE AT THE INTERSECTION OF NEW HOPE RD. AND WASHINGTON RD.

PROP R/W
PROP 1.2m WW 1-S-BW

SLOPE STAKES

PROP CABLE GUIDE RAIL

200 mm
50 mm
20 mm
40 mm
BK
PARK HOUSE
EOS

GRAU 350

PROPOSED GUARDRAIL

1200 mm WW

SOIL

PROP 1.2m WW 1-S-BW

375 mm CONC

SR 1603 WASHINGTON ST

+99.079 -L-
45.000m LT
(147.64')

+75.000 -L-
45.000m LT
(147.64')

PROP R/W
PROP 1.2m WW 1-S-BW

+96.977 -Y26-
6.470m RT
END FENCE

+93.431 -Y26-
6.470m LT
BEG FENCE

TYPE-III

TYPE-XIMOD
TYPE-XIMOD ATTENUATOR

+92.152
END CABLE GUIDE RAIL

+64.143
BEG CABLE GUIDE RAIL

CAT-I

+64.838 -Y26-
6.470m RT
END FENCE

+61.292 -Y26-
6.470m LT
BEG FENCE

TYPE-IIIW

+66.477 -L-
45.000m RT
(147.64')

PROP 1.2m WW 1-S-BW

+70.000 -L-
45.000m RT
(147.64')

MITIGABLE IMPACTS ZONE 2

OBLITERATE EXISTING PAVEMENT

SPLICES
SOILS
SOIL CONVER-SATIONS
PEN TABLE:
STUMPS
SPENTHILLS

FILE:
DATE:

BRIDGE SKETCH
-Y26- OVER -L-

3.6m
1.2m PS
12.0m F-F
6.0m
0.2
-Y26-
S 63° 32' 12.8" W

SITE #8

SEE SHEET 60 FOR -L- PROFILE
SEE SHEET 80 FOR -Y26- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

Buffer Drawing
Sheet 23 of 30

2	4-4-06	REV NAME, DEED BOOK, AND PAGE NUMBER FOR PARCELS 63 AND 77 AND NAME FOR PARCEL 64
1	1-29-03	REV NAME PARCEL 63, AND ADD PARCEL 63A

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4030 WESTCHASE BLVD, SUITE 476
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	31
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

MATCH LINE -Y26- 9+35 SEE SHEET 41

MATCH LINE -L- 315+60 SEE SHEET 30

MATCH LINE -L- 319+00 SEE SHEET 32

MATCH LINE -Y26- 11+00 SEE SHEET 42

PROP R/W
PROP 1.2m WW 1-S-BW

TYNDALL LEWIS OF WAYNE CO. AND FORK TOWNSHIP WATER HAS INDICATED THAT THIS 200 mm WATER LINE WILL BE EXTENDED SOUTH TO WASHINGTON RD. THEN EAST TOWARD NEW HOPE RD. THE 200 mm WATER LINE WILL THEN BE CONNECTED TO THE EXISTING 300 mm WATER LINE AT THE INTERSECTION OF NEW HOPE RD. AND WASHINGTON RD.

SLOPE STAKES

PROP CABLE GUIDE RAIL

PROPOSED GUARDRAIL

GRAU 350

ISFD

PUMP HOUSE

+99.079 -L-
45.000m LT
(147.64')

+75.000 -L-
45.000m LT
(147.64')

+96.117 -Y26-
6.470m RT
BEG FENCE

+93.431 -Y26-
6.470m LT
BEG FENCE

+92.52
END CABLE GUIDE RAIL

+64.143
BEG CABLE GUIDE RAIL

+66.328 -Y26-
6.470m RT
END FENCE

+61.292 -Y26-
6.470m LT
BEG FENCE

+66.477 -L-
45.000m RT
(147.64')

+70.000 -L-
45.000m RT
(147.64')

TYPE-XIMOD ATTENUATOR

TYPE-H

PROP 1.2m WW 1-S-BW

PROP 2.0m WW 1-S-BW

PROP R/W

SR 1243 WASHINGTON ST

SOIL

63 63A 64 77 84

MITIGABLE IMPACTS ZONE 2

Buffer Drawing
Sheet 24 of 30

SITE #8

OBLITERATE EXISTING PAVEMENT

SEE SHEET 60 FOR -L- PROFILE
SEE SHEET 80 FOR -Y26- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

BRIDGE SKETCH
-Y26- OVER -L-

-Y26-
S 63° 32' 12.8" W

12.0m F-F
6.0m
92.02

3.6m
1.2m PS

FILE: $FILE$
DATE: $DATE$
PLOT DRIVER: $PLOTDRIVE$
PEN TABLE: $PENTABLE$

NO.	DATE	REV NAME, DEED BOOK AND PAGE NUMBER FOR PARCEL 63 AND NAME FOR PARCEL 64
1	4-4-06	

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	32
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

5m 0 10m

CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

NAD 83

MATCH LINE -L- 319+00 SEE SHEET 31

MATCH LINE -L- 322+40 SEE SHEET 33

MILL CREEK

POND

(45.000m LT - (147.64')

(45.000m LT - (147.64')

(CHORD)

(CHORD)

64

64

64

64

PROP R/W
PROP 1.2m WW I-S-BW

PROP R/W
PROP 1.2m WW I-S-BW

PROP R/W
PROP 1.2m WW I-S-BW

PROP R/W
PROP 1.2m WW I-S-BW

SLOPE STAKES

SLOPE STAKES

SLOPE STAKES

SLOPE STAKES

+32.347 -L-
45.000m LT

+35.923 -L-
32.359m LT
END FENCE

+80.000 -L-
44.709m LT

+34.158 -L-
22.050m RT
BEG FENCE

+96.950 -L-
45.000m RT

+56.038 -L-
45.000m RT
(147.64')

+46.038 -L-
45.000m RT
(147.64')

+45.220 -L-
45.000m RT

+73.845 -L-
31.950m RT
END FENCE

PROPOSED GUARDRAIL

PROPOSED GUARDRAIL

GRAU 350

PROP CABLE GUIDE RAIL

CAT-I

SITE #6

Buffer Drawing
Sheet 25 of 30

SEE SHEET 61 FOR -L- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

FILE: SFILES STIMES
DATE: SDATES
PLOT DRVR: SDRIVERS
PEN TABLE: SPENTABLES

1	4-4-06	REV NAME, DEED BOOK AND PAGE NUMBER FOR PARCEL 63 AND NAME FOR PARCEL 64

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.

R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	32
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

NAD 83

MILL CREEK

POND

SLOPE STAKES

PROP R/W
PROP 1.2m WW I-S-BW

+32.547 -L-
45.000m LT
+35.927 -L-
32.559m LT
END FENCE

+80.000 -L-
44.709m LT

+32.150 -L-
22.087m LT
BEG FENCE

PROPOSED GUARDRAIL

GRAU 350

PROP CABLE GUIDE RAIL

+34.158 -L-
22.050m RT
BEG FENCE

+96.960 -L-
45.000m RT

+56.038 -L-
45.000m RT
(147.64')

+45.220 -L-
45.000m RT

+73.845 -L-
31.950m RT
END FENCE

CAT 1

+46.038 -L-
45.000m RT
(147.64')

MATCH LINE -L- 319+00 SEE SHEET 31

MATCH LINE -L- 322+40 SEE SHEET 33

SITE #6

Buffer Drawing
Sheet 26 of 30

SEE SHEET 61 FOR -L- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

FILE:
DATE:
PLOT DRIVER:
PEN TABLE:

SFILES
SDATES
SPLOTDRVRS
SPENTABLES

STAMES

PLANS PREPARED BY: FLORENCE & HUTCHESON, INC. CONSULTING ENGINEERS AND SURVEYORS

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	34
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
NO RIGHT OF WAY OR CONSTRUCTION

CONSTR.
R/W DEV.

1 | 1-4-05 | REV. BASE FOR PARCEL 64

MATCH LINE -L- 372+60.000 SEE SHEET 33

MATCH LINE -FLY- 21+00 SEE SHEET 43

MATCH LINE -Y30- EB 16+70 SEE SHEET 44

MATCH LINE -Y29- REV. 19+25 SEE SHEET 44

MATCH LINE -Y29- REV. 20+80 SEE SHEET 45

MATCH LINE -L- REV. 15+80 SEE SHEET 35

MATCH LINE -L- WBL 372+56.000 SEE SHEET 35

MATCH LINE -Y30- EB 23+00 SEE SHEET 35

NAD 83

BRIDGE SKETCH
-FLY- & -LPA- OVER -L- NBL & SBL

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

SITE #7

OBLITERATE EXISTING PAVEMENT

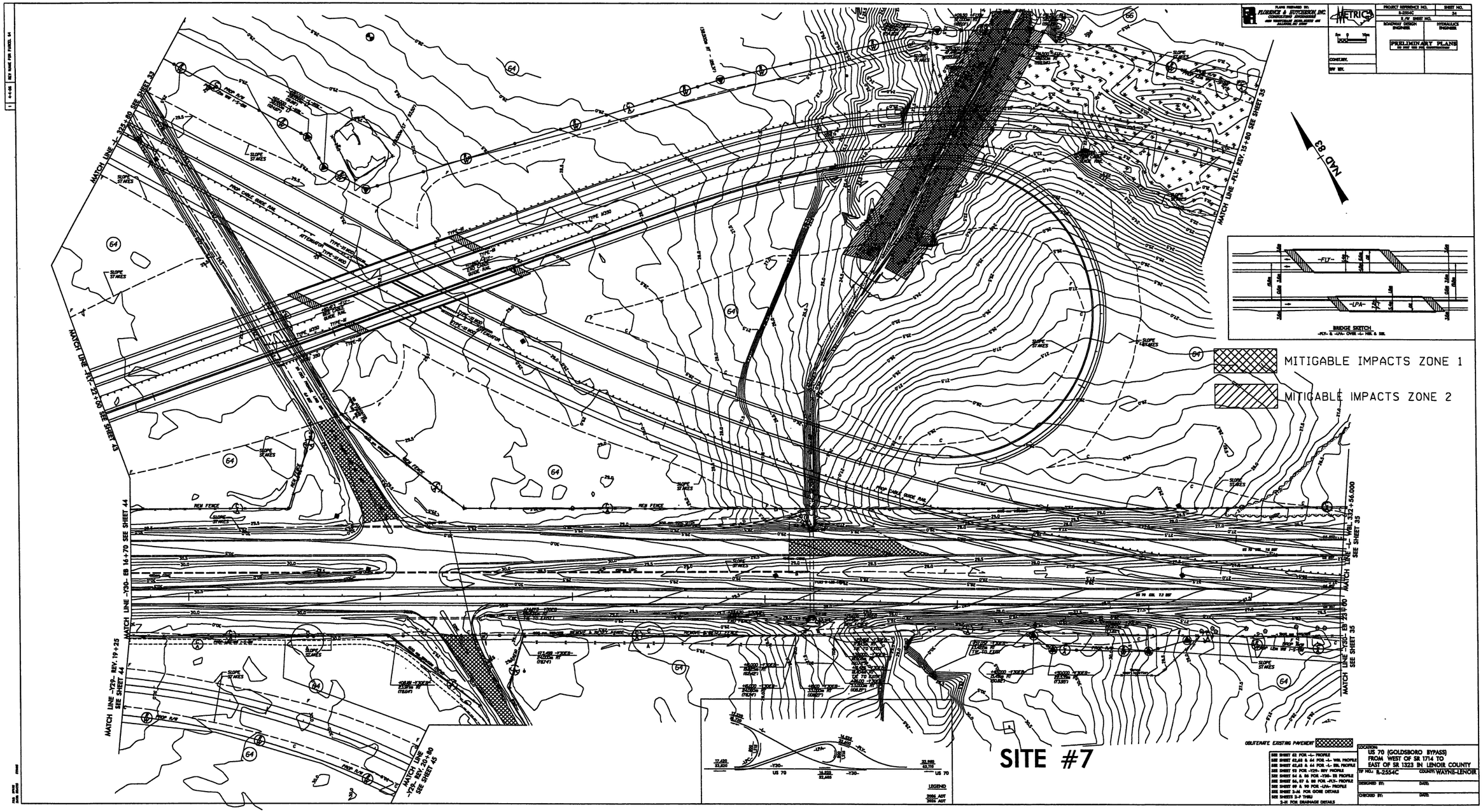
SEE SHEET 42 FOR -L- PROFILE
SEE SHEET 42,43 & 44 FOR -L- WBL PROFILE
SEE SHEET 42,43 & 44 FOR -L- EBL PROFILE
SEE SHEET 93 FOR -Y29- REV PROFILE
SEE SHEET 94 & 95 FOR -Y30- EB PROFILE
SEE SHEET 96, 97 & 98 FOR -FLY- PROFILE
SEE SHEET 99 & 99 FOR -LPA- PROFILE
SEE SHEET 2-H, FOR CORE DETAILS
SEE SHEETS 3-F THRU 3-H FOR DRAINAGE DETAILS

LOCATION:
US 70 (GOLDSBORO BYPASS)
FROM WEST OF SR 1714 TO
EAST OF SR 1323 IN LENOIR COUNTY

TIP NO.: R-2554C COUNTY: WAYNE-LENOIR

DESIGNED BY: DATE:
CHECKED BY: DATE:

Buffer Drawing
Sheet 27 of 30



Buffer Drawing
Sheet 29 of 30

1	4-4-06	REV NAME FOR PARCEL 64 & REV NAME, DEED BOOK AND PAGE NUMBER FOR PARCEL 80

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC
5m 0 10m

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	42
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.
R/W REV.

SEE SHEET 81 FOR -Y26- PROFILE
SEE SHEET 83 FOR -Y28- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

OBLITERATE EXISTING PAVEMENT

MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2

NAD 83

MATCH LINE -Y26- 11+00 SEE SHEET 31

MATCH LINE -Y26- 14+05 SEE SHEET 43

MILL CREEK

+47.000 -Y26-
70.000m LT
(229.68')

+00.000 -Y26-
65.000m LT
(213.25')

+25.000 -Y26-
46.041m LT
(151.05')

+33.000 -Y26-
45.233m LT

+65.000 -Y26-
42.000m LT
(137.80')

TS Sta.11+89.133

SC Sta.12+34.133
(21.500m LT - (70.54')
END FENCE
END C/A

PROP R/W
PROP 1.2m WW 1-S-BW

SLOPE STAKES

+08.000 -Y26-
38.81m RT
BEG FENCE

+49.562 -Y26-
38.137m RT
BEG FENCE

SLOPE STAKES

4.4 HW

1.83 X 3.35 BARREL

PC Sta.10+39.420

+15.000 -Y26-
50.551m RT
(165.85')

+26.000 -Y26-
52.011m RT

EXCAVATE EXISTING ROADWAY EMBANKMENT TO NATURAL GROUND

TDE

PROP 1.2m WW 1-S-BW

+90.00 -Y26-
60.501m RT
(198.49')

+34.133 -Y26-
67.157m RT
(220.33')
END FENCE
END C/A

+65.00 -Y26-
75.000m RT
(246.06')

SITE #8

64

78

80

79

81

R=678.500m

PROP R/W

SLOPE STAKES

PAINTED ISLAND

GRAU 350

-Y26-

1350mm CONC DITCH

300mm CONC

1200 mm WD RAIL

+81.435 -Y28-
21.500m LT
(70.54')

+88.760 -Y28-
25.974m LT
(85.22')

+00.000 -Y28-
10.005m LT
(32.83')

ISFD

SOIL

CONC ISA

-Y28-

+65.000 -Y28-
14.077m RT
(46.18')

+80.000 -Y28-
14.800m RT
(48.56')

PT Sta.10+80.469

+00.000 -Y28-
8.283m RT
(27.18')

SR 1788 FUSSELL RD 7.3 BST

EMD-69WST
POT Sta.11+00.000

1500 mm WD

POOL

CONC

PUMP HOUSE

CANAL

1.4 CONC

MH 450 mm

FILE: SFILES
DATE: SDATES
PLOT DRIVER: SPLTDRVRS
PEN TABLE: SPENTBLS
STIMES

Buffer Drawing
Sheet 29 of 30

NO.	DATE	REV NAME FOR PARCEL 64 & REV NAME, DEED BOOK AND PAGE NUMBER FOR PARCEL 80
1	4-4-06	

PLANS PREPARED BY:
FLORENCE & HUTCHESON, INC.
CONSULTING ENGINEERS
4020 WESTCHASE BLVD, SUITE 475
RALEIGH, NC 27607

METRIC

5m 0 10m

CONST.REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2554C	42
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SEE SHEET 81 FOR -Y26- PROFILE
SEE SHEET 83 FOR -Y28- PROFILE
SEE SHEETS 2-F THRU 2-H FOR DRAINAGE DETAILS

OBLITERATE EXISTING PAVEMENT

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

NAD 83

MATCH LINE -Y26- 11+00 SEE SHEET 31

MATCH LINE -Y26- 14+05 SEE SHEET 43

SITE #8

Buffer Drawing
Sheet 30 of 30

FILE: SFILES STIMES
DATE: SDATES
PLOT DRIVER: SPLOTDRVS
PEN TABLE: SPENTBLS