



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

October 14, 2004

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

ATTN.: Mr. Michael F. Bell  
Regulatory Permits Manager

Dear Sir:

Subject: **Application for modifications to Section 404 Individual Permit and Section 401 Major Water Quality Certification for TIP No. R-2539, Section C.** NC 55 Widening From US 17 in Bridgeton to NC 304 in Bayboro, Craven and Pamlico Counties, NCDOT Division No. 2. Federal Aid Project STP-55(1). State Project No. 8.1170901. Debit \$475 for Major WQC modification from WBS Element No. 34452.1.1.

Reference: Individual Permit issued May 9, 2003. USACE Action ID 199303531  
NC WQC No. 3415, issued March 17, 2003. DWQ Project No. 021232  
CAMA Major Development Permit No. 55-03, issued April 22, 2003

The North Carolina Department of Transportation (NCDOT), Division of Highways, is requesting a permit modification to the Department of the Army Individual Permit, as well as to the NCDWQ 401 Water Quality Certification for approval of impacts associated with Section C of the project. The Section 404 and 401 permits approved the jurisdictional impacts associated with Section A of the project and gave tentative approval for Sections B and C pending submittal of the final design drawings and jurisdictional impact assessments for those sections. Modifications were received for Section B based on final design. Section C begins just east of SR 1129 (Bennett Tingle Road) and extends 5.1 miles along NC 55 to NC 304. The final permit drawings and relevant information for R-2539C are attached. Note that the revised permit drawings are stationed in metric, while the permit drawings submitted with the original permit application were stationed in English. However, for your convenience we have included a summary sheet in English units.

The completed design for R-2539C does not compromise NCDOT's compliance with the existing permit conditions. The completed design has been evaluated for compliance with the avoidance/minimization criteria and is in compliance with all previous Individual Permit factors, including the following:

- Protected Species,
- Cultural Resources,
- Aquatic Life passage,
- FEMA compliance, and
- Utilities.

Much of the general information in the original Individual Permit application remains the same and is not repeated in this modification request. Information on the purpose and need, project schedule, NEPA document status, and mitigation options is contained in the original permit application.

### Summary of Project Impacts

#### Sections A,B, and C

Impacts to jurisdictional areas of the entire R-2539 were estimated in the August 9, 2002 application to be:

- 15.69 acres of permanent wetland, (1.39 riverine and 14.3 non-riverine),
- 0.15 acres of fill in surface waters, and
- 619 linear feet of stream channels.

With the revised impacts associated with the final designs of Sections A, B, and C (Table 1), the total project impacts are now estimated to be:

- 20.72 acres of wetland impacts (1.39 riverine and 19.33 non-riverine),
- 0.29 acres of fill in surface waters, and
- 765 linear feet of stream channels.

#### Section C

The differences in wetland impacts are from wetland drainage impacts in the final design of Sections B and C and minor changes in the impact area calculations (rounding). The additional stream channel impacts are due to a slight southern shift of the road widening in the final design, as well as a more complete accounting of impacts due to culvert slopes.

Permanent impacts associated with the final design of Section C consist of:

- 9.96 acres of non-riverine wetland impacts
- 355 linear feet of stream channel impacts
- 4.95 acres of drainage impacts of non-riverine wetlands.
- 47,582 square feet (sqft) of Neuse and Tar-Pamlico Buffer impacts, 29,675 sqft in Zone 1 and 17,907 sqft in Zone 2.

**Table 1. Final Jurisdictional Stream and Wetland Impacts for R-2539 by Section**

Section	Permanent Wetland (ac)		Drainage Impacts (ac)		Channel Impacts (ft)	Surface Water impacts (ac)
	Riverine	Non-riverine	Riverine	Non-riverine		
A	0.42	4.51	0.12	2.02	114.8	0.05
B	0.85	2.78	0.00	0.06	295.2	0.15
C	0.00	5.01	0.00	4.95	354.6	0.09
Totals	1.27	12.3	0.12	7.03		
<b>TOTAL</b>	<b>1.39 riverine + 19.33 nonriverine = 20.72</b>				<b>764.6</b>	<b>0.29</b>

## Design Changes

Final design revisions resulted in several sites differing from those submitted with the original permit application. Site specific changes are as follows:

### Site 1, Permit sheet 5 of 24, Stations 153+20 to 154+20

The two small wetlands at Site 1 were originally included in Section C. After the original permit were issued, Section B project limits were extended slightly eastward and they became part of Section B. However, wetland impacts were not accounted for in the permit modification application for Section B. Therefore, we have included them as Site 1 with this permit application. Both wetlands are counted as a total take because of their small size.

**Impact change Site 1: increase of 0.15 acres of non-riverine wetland impacts.**

### Site 2, Permit Sheets 6 to 12 of 24

#### Station 161+00 to 166+00

The right of way and wetland impacts have been widened slightly, from the original submittal, on the south side of the proposed road widening.

#### Station 156+60 to 165+60

Because of the low grade and minimal drainage potential of the natural ground elevation at this site, it will be necessary to install a typical V-ditch (special cut ditch) with 6:1 and 3:1 side slopes on each side of the new road to drain the subgrade. Based on the Boussinesq equation calculations, there will be 4.95 acres of impacts resulting from the drainage impact from this ditch. The Ditch Impact Study, dated October 2004, is attached.

**Impact change Site 2: Mechanized clearing and excavation impacts have decreased (0.10 acres and 0.65 acres, respectively). However, including the drainage impacts, there is a net increase of 4.2 acres of non-riverine wetland impacts**

### Site 3, Permit Sheets 13 to 18 of 24

#### Station 195+40 to 202+60

The roadway has been widened more to the south away from the small business on the north side. This shift has increased the wetland impacts south of the existing roadway.

#### Stations 196+60 and 199+80

The widening of the roadway to the south has also increased the length of the culvert extensions for the UT-1 and UT-2 of the South Prong Bay River. The outlet ends of the culvert extensions for UT-1 and UT-2 will be sloped down to near the top of the stream bank to reduce the effect of perched culverts and enhance the movement of aquatic life. Finalizing design has resulted in slightly more mechanized clearing impacts along the length of the widening covered by this site.

**Impact change Site 3: increase of 0.60 acres of non-riverine wetland impacts and 114 linear feet stream channel.**

### Site 4, Permit Sheet 29 of 24, Station 204+40

In the original application the wetland impacts at this site were included with Site 3. However, this particular wetland is now Site 4.

**Impact change at Site 4: increase of 0.03 non-riverine wetland impacts.**

Site 5, Permit Sheet 20 of 24, Station 206+00

The stream at this site was included in Site 4 of the original permit application. It has since been separated out to be Site 5.

A preformed scour hole has been added to the outlet of the pipe carrying roadside runoff to the north side of the proposed roadway. The length of culverts impacting UT-3 has been increased. The outlet end of the culvert extensions for UT-3 will be sloped down to near the top of the stream bank to reduce the effect of perched culverts and enhance the movement of aquatic life.

**Impact change Site 5: increase of 31 linear feet of stream channel.**

**Table 2. Final Jurisdictional Wetland Impacts on R-2539C by site**

Site	Station From/To	Fill in Wetland (ac)	Excavation in Wetlands (ac)	Mechanized Clearing (ac) (Method III) <sup>1</sup>	Drainage impacts (ac)
1	153+20 to 154+20	0.0	0.01 (+0.01)	0.17 (+0.14)	0.0
2	155+40 to 166+08	0.0	1.30 (-0.10)	0.12 (-0.65)	4.95 (+4.95)
3	195+45 to 202+60	2.47 (+0.95)	0.05 (-0.51)	0.86 (+0.16)	0.0
4	202+20	0.02 (+0.02)	0.0	0.01 (+0.01)	0.0
Total R-2539C		2.49 (+0.94) <sup>2</sup>	1.36 (-0.60)	1.16 (+0.34)	4.95 (+4.95)
<b>GRAND TOTAL</b>		<b>9.96 (+5.63)</b>			

<sup>1</sup> Clearing and grubbing of vegetation to 10 feet beyond the construction limits.

<sup>2</sup> Impact increase or decrease from original IP application is denoted in parentheses.

**Table 3. Final Jurisdictional Stream Impacts on R-2539C by site**

Site	Station Number	Structure	Stream Name	DWQ Index No.	DWQ Rating	Status	Impact (ft)
3	196+60	3 RCBC 2.1 x 2.4m	UT1 to South Prong Bay River	27-150-3	SC Sw NSW	P	135.5 (+57.2)
3	199+77	2.7 x 1.8 RCBC	UT2 to South Prong Bay River	27-150-3	SC Sw NSW	P	123 (+57.2)
5	206+00	2.4 x 1.2 RCBC	UT3 to South Prong Bay River	27-150-3	SC Sw NSW	P	96.1 (+31.1)
<b>TOTAL R-2539B</b>							<b>354.6 (+145.5)</b>

<sup>1</sup> Impact increase or decrease from original IP application is denoted in parentheses.

**Utility Impacts**

Summary of Utility Impacts for Section C (see attached permit drawings for location of utility line): It will be necessary to relocate several utilities because of road widening activities. However, no additional Section 404 jurisdictional impacts are anticipated. Any required clearing

will be conducted by hand. Cleared vegetation will remain onsite. Directional boring will be utilized where necessary.

Site 2, Permit Sheets 6, 7, 9, 11, 12

Progress Energy will relocate their pole line Right of the L-Line from Station 155+43 to Station 166+31 in the wetland boundary and within the NCDOT right of way. The relocation will also require an additional 12 to 13 feet hand clearing outside the right of way.

Sprint Telephone will relocate their underground cables inside of the footprint of the project from Station 155+43 to Station 166+31. No clearing will be done in the wetland area.

Site 3, Permit Sheets 17

Sprint Telephone will relocate their underground cables inside the footprint of the road project. No additional clearing will be needed.

Tideland EMC will replace the power pole at Station 201+08, Right, for a taller pole. Their power line crosses over a part of the wetlands on Parcel 71 owned by Arther M. Kelly. No tree clearing will be needed on Parcel 71.

The existing water main and sewer lines will be relocated within the proposed impacts for the road widening. The new lines will directionally bored under the three stream channels.

**Indirect and Cumulative Effects:** The Indirect and Cumulative Effects Study for R-2539C has been completed and is included in this permit modification package. Information from the study indicates that the widening of NC 55 will allow for faster commutes between the small communities of Pamlico County and New Bern. In combination with the planned future widening of NC 55 and NC 306 to the waterfront communities will likely further stimulate growth in Oriental and Minnesott Beach as well as other waterfront areas. Pamlico County has designated the NC 55 as an Enterprise Corridor, which with the widening will continue to focus commercial development along the highway.

The ICE Study also indicates that much of the anticipated future growth will be from non-permanent seasonal residents and that poor soils and large areas of wetlands will be restrictive to growth. Existing policies and regulations on jurisdictional waters and coastal areas will manage potential indirect impacts to the area's water quality. The construction of R-2539C is not expected to result in any indirect or cumulative effects that will adversely affect water quality.

**Federally Protected Species:** As of January 29, 2003, the U.S. Fish and Wildlife Service (USFWS) lists seven federally protected species for Pamlico County. On August 18, 2003 the USFWS concurred with NCDOT's findings of No Effect for five species and May Affect, Not Likely to Adversely Affect for the rough-leaved loosestrife. The seventh species, American alligator, is Threatened due to Similarity of Appearance and does not require a Biological Conclusion. The USFWS concurrence letter is attached.

**Cultural Resources:** The reduction of the sidewalk and berm widths, and the elimination of the drainage box from the Bayboro House (historic Dr. S.E. McCotter House) property has resulted in a Section 106 conclusion of "No Adverse Effect" on the property since no right of way or construction easement will be required.

## Avoidance, Minimization and Compensatory Mitigation

Throughout the NEPA and design process this project has been designed to avoid and minimize impacts to jurisdictional areas to the greatest extent practicable. Specific strategies, detailed in the original application, remain valid for this application. Highlights include widening NC 55 along the existing roadway, using 3:1 slopes within wetland limits, use of preformed scour holes to dissipate runoff, and hand clearing in sensitive areas.

Based upon the agreements stipulated in the “Memorandum of Agreement Among the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U.S. Army Corps of Engineers, Wilmington District (MOA)”, it is understood that the North Carolina Department of Environment and Natural Resources Ecological Enhancement Program (EEP), will assume responsibility for satisfying the Section 404 compensatory mitigation requirements for NCDOT projects that are listed in Exhibit 1 of the subject MOA during the Ecological Enhancement Program (EEP) transition period which ends on July 1, 2005. Since the subject project is listed in *Exhibit 1* the necessary compensatory mitigation to offset unavoidable impacts to waters that are jurisdictional under the federal Clean Water Act will be provided by the EEP (see attached confirmation letter from EEP).

The final mitigation strategy for Sections A, B, C of R-2539 is as follows:

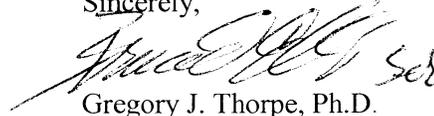
- 1.39 acres of riverine wetland impacts will be mitigated via onsite 4.23 acres of riverine wetland restoration detailed in the original permit application.
- 19.33 acres of non-riverine wetland impacts will be mitigated via the Croatan Mitigation site. Use of the Croatan Mitigation site was approved for all non-riverine wetland impacts with the initial permits. The original proposal was for 14.3 acres of impacts. Since the Croatan Mitigation site has become an EEP asset, a supplemental mitigation request was forwarded to EEP for the additional 5.03 acres of impacts. The response letter dated October 13, 2004, confirming EEP’s commitment to provide mitigation is attached.
- 765 feet of stream impacts will be mitigated via:
  - Onsite stream mitigation in Section B (Permit Site 13) will provide 135 feet of mitigation (134.5 feet @ 1:1 ratio).
  - Offsite mitigation from the Brock Stream Mitigation site in Jones County, also previously approved, will provide mitigation for the balance of 630 feet of impacts. The original proposal was for 484.5 feet of impacts. Since the Brock Stream Mitigation site has become an EEP asset, a supplemental mitigation request for the additional 145.6 feet of impacts was forwarded to EEP. The response letter dated October 13, 2004, confirming EEP’s commitment to provide mitigation is attached.

## Regulatory Approval

Application is hereby made for modification of the Department of the Army Individual 404 Permit as required for the above-described activities. We are also hereby requesting a modification of the 401 Water Quality Certification from the NCDWQ. R-2539C has been designed to comply with the Riparian Buffer Mitigation Program (15A NCAC 2B .0242) and the Neuse and Tar-Pamlico River Basin Riparian Buffer Rules (15A NCAC 2B .0233 and .0259). Therefore, as part of the Modification request, we respectfully request that the DWQ issue an Authorization Certificate pursuant to 15A NCAC 2B .0233 for the proposed use. In compliance with Section 143-215.3D(e) of the NCAA we have provided a method of debiting \$475, as noted in the subject line of this application, as payment for processing the Section 401 permit modification application. We are

providing seven copies of this application to the North Carolina Department of Environment and Natural Resources, NCDWQ, for their review. If there are any further questions, please contact Elizabeth Lusk at 919-715-1444.

Sincerely,



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

Attachments:

Tar Pamlico Buffer Addendum  
Permit Drawings and Half-size plans  
Buffer Impact Drawings  
Indirect and Cumulative Effect Study  
Ditch Impact Study, October 2004  
EEP Mitigation Confirmation letter

Cc:

w/attachment

Mr. John Hennessy, NCDWQ (7 copies)  
Mr. Travis Wilson, NCWRC  
Ms. Becky Fox, USEPA – Whittier, NC  
Mr. Ronald Mikulak, USEPA – Atlanta, GA  
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. Steve Sollod, NCDCEM  
Mr. Bill Arrington, NCDCEM  
Mr. C. E. Lassiter, P.E., 2 Engineer  
Mr. Jay Johnson, Division 2 DEO

w/o attachment

Mr. Jay Bennett, P.E., Roadway Design  
Mr. Omar Sultan, Programming and TIP  
Mr. Art McMillan, P.E., Highway Design  
Mr. Mark Staley, Roadside Environmental  
Mr. David Franklin, USACE, Wilmington  
Ms. Colista Freeman, PDEA Project Planning Engineer  
Ms. Beth Harmon, EEP  
Mr. Omar Sultan, Programming TIP  
Ms. Laurie P. Smith, CPA, Funds Administration Section

## TAR PAMLICO BUFFER ADDENDUM

The purpose of this addendum is to provide the NCDWQ with the information needed to evaluate the impacts of the project on the Tar Pamlico Buffer areas. The avoidance and minimization efforts described in the original permit application still apply. R-2539C has been designed to comply with the Riparian Buffer Mitigation Program (15A NCAC 2B .0242) and the Tar Pamlico River Basin Riparian Buffer Rules (15A NCAC 2B .0259). Therefore, as part of the Modification request, we respectfully request that the DWQ issue an Authorization Certificate pursuant to 15A NCAC 2B .0233 for the proposed use.

Tar-Pamlico Riparian Buffer Impacts: Due to the nature of this project, impacts to the riparian buffers of three UT's to the South Prong of Bay River are unavoidable. Section R-2539C has a total impact of 47,582 square feet to Tar-Pamlico Riparian Buffers. Table A-1 below specifies impacts per buffer zone and per site. The area of impact was calculated to reflect the maximum potential impact by including riparian buffers of anticipated construction access rather than stopping at the toe of the fill slopes.

Site 3: The riparian buffer impacts at Site 3 occur at 2 separate Road Crossings. However, since impacts at each crossing are greater than 0.33 acres, Site 3 impacts qualify as "Allowable with Mitigation" under the Tar-Pamlico River Basin Buffer Rules.

Site 3A: Activities at Site 3A will qualify as an "Allowable" use not requiring mitigation because the impacts are associated with a bridge.

Site 5: Activities at Site 5 qualify as an "Allowable" use not requiring mitigation because impacts are less than 0.33 acres and 150 linear feet associated with this Road Crossing.

**Table A-1. R-2539C Tar-Pamlico River Basin Buffer Impact Calculations**

Permit Site Number	Impact Type	Zone 1 (sqft)	Zone 2 (sqft)	Totals	Onsite Buffer Mitigation (Zone 1)
3	Road Crossing Allowable with mitigation	21,233	12,868	34,101	903
3A	Bridge Allowable	750	1,064	1,814	0
5	Road Crossing Allowable	8,442	5,039	13,481	283
Totals	Allowable with mitigation	21,233	12,868	34,101	
	Allowable	9,192	6,103	15,295	1,186

Compensatory Buffer Mitigation:

Onsite mitigation will be provided at Sites 3 and 5 for 1,186 sqft of Zone 1 impacts. The balance of 20,047 sq.ft. of Zone 1 impacts and 12,868 sq.ft. of Zone 2 impacts will be covered by the NC Ecological Enhancement Program (EEP). See the attached mitigation confirmation letter from the EEP.



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

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SECRETARY

October 14, 2004

Division of Coastal Management  
North Carolina Department of Environment and Natural Resources  
2877 Highway 70  
Beaufort, North Carolina, 28516

ATTN.: Mr. Bill Arrington, Transportation Projects

Dear Sir:

Subject: **Application for Division of Coastal Management Modification of the Major Development Permit No. 55-03 for TIP No. R-2539.** NC 55 Widening From US 17 in Bridgeton to NC 304 in Bayboro, Craven and Pamlico Counties, NCDOT Division No. 2. Federal Aid Project STP-55(1). State Project No. 8.1170901. Debit \$100 for CAMA Minor modification from WBS Element No. 34452.1.1.

Reference: Individual Permit issued May 9, 2003. USACE Action ID 199303531  
NC WQC No. 3415, issued March 17, 2003. DWQ Project No. 021232  
CAMA Major Development Permit No. 55-03, issued April 22, 2003

The North Carolina Department of Transportation (NCDOT), Division of Highways, is requesting a permit modification for the above referenced project. The CAMA Major Development Permit approved the jurisdictional impacts associated with Section A of the project and gave tentative approval for Sections B and C pending submittal of the final design drawings and jurisdictional impact assessments for those sections. A major modification was received for Section B based on final design.

**Section C has no CAMA Areas of Environmental Concern.** Therefore, no Major Permit (MP) forms are included with this application. However, per the original CAMA permit, the NCDOT is submitting final design plans pending DCM's approval for project construction. The purpose of this letter is to request a modification to the CAMA Major Development Permit Section C of the project. Section C begins just east of SR 1129 (Bennett Tingle Road) and extends 5.1 miles along NC 55 to NC 304. The final permit drawings and relevant information for R-2539C are attached. Note that the revised permit drawings are stationed in metric, while the permit drawings submitted with the original permit application were stationed in English. However, for your convenience we have included a summary sheet in English units. The following information is the same that was provided to the U.S. Army Corps of Engineers and the N.C. Division of Water Quality with the request to modify their respective permits.

The completed design for R-2539C does not compromise NCDOT's compliance with the existing permit conditions. The completed design has been evaluated for compliance with the avoidance/minimization criteria and is in compliance with all previous Individual Permit factors, including the following:

- Protected Species,
- Cultural Resources,
- Aquatic Life passage,
- FEMA compliance, and
- Utilities.

Much of the general information in the original Individual Permit application remains the same and is not repeated in this modification request. Information on the purpose and need, project schedule, NEPA document status, and mitigation options is contained in the original permit application.

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- 0.15 acres of fill in surface waters, and
- 619 linear feet of stream channels.

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- 20.72 acres of wetland impacts (1.39 riverine and 19.33 non-riverine),
- 0.29 acres of fill in surface waters, and
- 765 linear feet of stream channels.

#### Section C

The differences in wetland impacts are from wetland drainage impacts in the final design of Sections B and C and minor changes in the impact area calculations (rounding). The additional stream channel impacts are due to a slight southern shift of the road widening in the final design, as well as a more complete accounting of impacts due to culvert slopes.

Permanent impacts associated with the final design of Section C consist of:

- 9.96 acres of non-riverine wetland impacts
- 355 linear feet of stream channel impacts
- 4.95 acres of drainage impacts of non-riverine wetlands.
- 47,582 square feet (sqft) of Neuse and Tar-Pamlico Buffer impacts, 29,675 sqft in Zone 1 and 17,907 sqft in Zone 2.

**Table 1. Final Jurisdictional Stream and Wetland Impacts for R-2539 by Section**

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Totals	1.27	12.3	0.12	7.03		
<b>TOTAL</b>	<b>1.39 riverine + 19.33 nonriverine = 20.72</b>				<b>764.6</b>	<b>0.29</b>

## Design Changes

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### Site 1, Permit sheet 5 of 29, Stations 153+20 to 154+20

The two small wetlands at Site 1 were originally included in Section C. After the original permit were issued, Section B project limits were extended slightly eastward and they became part of Section B. However, wetland impacts were not accounted for in the permit modification application for Section B. Therefore, we have included them as Site 1 with this permit application. Both wetlands are counted as a total take because of their small size.

**Impact change Site 1: increase of 0.15 acres of non-riverine wetland impacts.**

### Site 2, Permit Sheets 6 to 15 of 32

#### Station 161+00 to 166+00

The right of way and wetland impacts have been widened slightly, from the original submittal, on the south side of the proposed road widening.

#### Station 156+60 to 165+60

Because of the low grade and minimal drainage potential of the natural ground elevation at this site, it will be necessary to install a typical V-ditch (special cut ditch) with 6:1 and 3:1 side slopes on each side of the new road to drain the subgrade. Based on the Boussinesq equation calculations, there will be 4.95 acres of impacts resulting from the drainage impact from this ditch. The Ditch Impact Study, dated October 2004, is attached.

**Impact change Site 2: Mechanized clearing and excavation impacts have decreased (0.10 acres and 0.65 acres, respectively). However, including the drainage impacts, there is a net increase of 4.2 acres of non-riverine wetland impacts**

### Site 3, Permit Sheets 15 to 18 of 32

#### Station 195+40 to 202+60

The roadway has been widened more to the south away from the small business on the north side. This shift has increased the wetland impacts south of the existing roadway.

#### Stations 196+60 and 199+80

The widening of the roadway to the south has also increased the length of the culvert extensions for the UT-1 and UT-2 of the South Prong Bay River. The outlet ends of the culvert extensions for UT-1 and UT-2 will be sloped down to near the top of the stream bank to reduce the effect of perched culverts and enhance the movement of aquatic life. Finalizing design has resulted in slightly more mechanized clearing impacts along the length of the widening covered by this site.

**Impact change Site 3: increase of 0.60 acres of non-riverine wetland impacts and 114 linear feet stream channel.**

### Site 4, Permit Sheet 21 of 32, Station 204+40

In the original application the wetland impacts at this site were included with Site 3. However, this particular wetland is now Site 4.

**Impact change at Site 4: increase of 0.03 non-riverine wetland impacts.**

Site 5, Permit Sheet 22 of 32, Station 206+00

The stream at this site was included in Site 4 of the original permit application. It has since been separated out to be Site 5.

A preformed scour hole has been added to the outlet of the pipe carrying roadside runoff to the north side of the proposed roadway. The length of culverts impacting UT-3 has been increased. The outlet end of the culvert extensions for UT-3 will be sloped down to near the top of the stream bank to reduce the effect of perched culverts and enhance the movement of aquatic life.

**Impact change Site 5: increase of 31 linear feet of stream channel.**

**Table 2. Final Jurisdictional Wetland Impacts on R-2539C by site**

Site	Station From/To	Fill in Wetland (ac)	Excavation in Wetlands (ac)	Mechanized Clearing (ac) (Method III) <sup>1</sup>	Drainage impacts (ac)
1	153+20 to 154+20	0.0	0.01 (+0.01)	0.17 (+0.14)	0.0
2	155+40 to 166+08	0.0	1.30 (-0.10)	0.12 (-0.65)	4.95 (+4.95)
3	195+45 to 202+60	2.47 (+0.95)	0.05 (-0.51)	0.86 (+0.16)	0.0
4	202+20	0.02 (+0.02)	0.0	0.01 (+0.01)	0.0
Total R-2539C		2.49 (+0.94) <sup>2</sup>	1.36 (-0.60)	1.16 (+0.34)	4.95 (+4.95)
<b>GRAND TOTAL</b>		<b>9.96 (+5.63)</b>			

<sup>1</sup> Clearing and grubbing of vegetation to 10 feet beyond the construction limits.

<sup>2</sup> Impact increase or decrease from original IP application is denoted in parentheses.

**Table 3. Final Jurisdictional Stream Impacts on R-2539C by site**

Site	Station Number	Structure	Stream Name	DWQ Index No.	DWQ Rating	Status	Impact (ft)
3	196+60	3 RCBC 2.1 x 2.4m	UT1 to South Prong Bay River	27-150-3	SC Sw NSW	P	135.5 (+57.2)
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<b>TOTAL R-2539B</b>							<b>354.6 (+145.5)</b>

<sup>1</sup> Impact increase or decrease from original IP application is denoted in parentheses.

**Utility Impacts**

Summary of Utility Impacts for Section C (see attached permit drawings for location of utility line): It will be necessary to relocate several utilities because of road widening activities. However, no additional Section 404 jurisdictional impacts are anticipated. Any required clearing will be conducted by hand. Cleared vegetation will remain onsite. Directional boring will be utilized where necessary.

Site 2, Permit Sheets 6, 7, 9, 11, 12

Progress Energy will relocate their pole line Right of the L-Line from Station 155+43 to Station 166+31 in the wetland boundary and within the NCDOT right of way. The relocation will also require an additional 12 to 13 feet hand clearing outside the right of way.

Sprint Telephone will relocate their underground cables inside of the footprint of the project from Station 155+43 to Station 166+31. No clearing will be done in the wetland area.

Site 3, Permit Sheets 17

Sprint Telephone will relocate their underground cables inside the footprint of the road project. No additional clearing will be needed.

Tideland EMC will replace the power pole at Station 201+08, Right, for a taller pole. Their power line crosses over a part of the wetlands on Parcel 71 owned by Arther M. Kelly. No tree clearing will be needed on Parcel 71.

The existing water main and sewer lines will be relocated within the proposed impacts for the road widening. The new lines will directionally bored under the three stream channels.

**Indirect and Cumulative Effects:** The Indirect and Cumulative Effects Study for R-2539C has been completed and is included in this permit modification package. Information from the study indicates that the widening of NC 55 will allow for faster commutes between the small communities of Pamlico County and New Bern. In combination with the planned future widening of NC 55 and NC 306 to the waterfront communities will likely further stimulate growth in Oriental and Minnesott Beach as well as other waterfront areas. Pamlico County has designated the NC 55 as an Enterprise Corridor, which with the widening will continue to focus commercial development along the highway.

The ICE Study also indicates that much of the anticipated future growth will be from non-permanent seasonal residents and that poor soils and large areas of wetlands will be restrictive to growth. Existing policies and regulations on jurisdictional waters and coastal areas will manage potential indirect impacts to the area's water quality. The construction of R-2539C is not expected to result in any indirect or cumulative effects that will adversely affect water quality.

**Federally Protected Species:** As of January 29, 2003, the U.S. Fish and Wildlife Service (USFWS) lists seven federally protected species for Pamlico County. On August 18, 2003 the USFWS concurred with NCDOT's findings of No Effect for five species and May Affect, Not Likely to Adversely Affect for the rough-leaved loosestrife. The seventh species, American alligator, is Threatened due to Similarity of Appearance and does not require a Biological Conclusion. The USFWS concurrence letter is attached.

**Cultural Resources:** The reduction of the sidewalk and berm widths, and the elimination of the drainage box from the Bayboro House (historic Dr. S.E. McCotter House) property has resulted in a Section 106 conclusion of "No Adverse Effect" on the property since no right of way or construction easement will be required.

**Avoidance, Minimization and Compensatory Mitigation**

Throughout the NEPA and design process this project has been designed to avoid and minimize impacts to jurisdictional areas to the greatest extent practicable. Specific strategies, detailed in the original application, remain valid for this application. Highlights include widening NC 55 along

the existing roadway, using 3:1 slopes within wetland limits, use of preformed scour holes to dissipate runoff, and hand clearing in sensitive areas.

Based upon the agreements stipulated in the “Memorandum of Agreement Among the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U.S. Army Corps of Engineers, Wilmington District (MOA)”, it is understood that the North Carolina Department of Environment and Natural Resources Ecological Enhancement Program (EEP), will assume responsibility for satisfying the Section 404 compensatory mitigation requirements for NCDOT projects that are listed in Exhibit 1 of the subject MOA during the Ecological Enhancement Program (EEP) transition period which ends on July 1, 2005. Since the subject project is listed in *Exhibit 1* the necessary compensatory mitigation to offset unavoidable impacts to waters that are jurisdictional under the federal Clean Water Act will be provided by the EEP (see attached letter to EEP).

The final mitigation strategy for Sections A, B, C of R-2539 is as follows:

- 1.39 acres of riverine wetland impacts will be mitigated via onsite 4.23 acres of riverine wetland restoration detailed in the original permit application.
- 19.33 acres of non-riverine wetland impacts will be mitigated via the Croatan Mitigation site. Use of the Croatan Mitigation site has been previously approved with original application for all R-2539 non-riverine wetland impacts. The original proposal was for 14.3 acres of impacts. Since the Croatan Mitigation site has become an EEP asset, a supplemental mitigation request was forwarded to EEP for the additional 5.03 acres of impacts. The response letter dated October 13, 2004, confirming EEP’s commitment to provide mitigation is attached.
- 765 feet of stream impacts will be mitigated via:
  - Onsite stream mitigation in Section B (Permit Site 13) will provide 135 feet of mitigation (134.5 feet @ 1:1 ratio).
- Offsite mitigation from the Brock Stream Mitigation site in Jones County, also previously approved, will provide mitigation for the balance of 630 feet of impacts. The original proposal was for 484.5 feet of impacts. Since the Brock Stream Mitigation site has become an EEP asset, a supplemental mitigation request for the additional 145.6 feet of impacts was forwarded to EEP. The response letter dated October 13, 2004, confirming EEP’s commitment to provide mitigation is attached.

#### **Regulatory Approval**

Application is hereby made for a minor modification of the Division of Coastal Management CAMA Permit as required for the above-described activities. We have provided a method of debiting \$100 to be submitted to the NC Division of Coastal Management for processing the CAMA modification application, as noted in the subject line of this application. If you have any questions or need additional information please call Elizabeth L. Lusk at (919) 715-1444.

Sincerely,



Gregory J. Thorpe, Ph.D. *SR*  
Environmental Management Director, PDEA

Attachments:

Permit Drawings and Half-size plans  
Buffer Impact Drawings  
Indirect and Cumulative Effect Study  
Ditch Impact Study, October 2004  
EEP Mitigation Confirmation letter

Cc:

w/attachment

Mr. John Hennessy, NCDWQ (7 copies)  
Mr. Travis Wilson, NCWRC  
Ms. Becky Fox, USEPA – Whittier, NC  
Mr. Ronald Mikulak, USEPA – Atlanta, GA  
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. Steve Sollod, NCDCM  
Mr. Bill Arrington, NCDCM  
Mr. C. E. Lassiter, P.E., 2 Engineer  
Mr. Jay Johnson , Division 2 DEO

w/o attachment

Mr. Jay Bennett, P.E., Roadway Design  
Mr. Omar Sultan, Programming and TIP  
Mr. Art McMillan, P.E., Highway Design  
Mr. Mark Staley, Roadside Environmental  
Mr. David Franklin, USACE, Wilmington  
Ms. Colista Freeman, PDEA Project Planning Engineer  
Ms. Beth Harmon, EEP  
Mr. Omar Sultan, Programming TIP  
Ms. Laurie P. Smith, CPA, Funds Administration Section



October 13, 2004

Mr. Gregory J. Thorpe, Ph.D.  
Environmental Management Director  
Project Development and Environmental Analysis Branch  
North Carolina Department of Transportation  
1548 Mail Service Center  
Raleigh, NC 27699-1548

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

**R-2539C, NC 55 Improvements, Craven and Pamlico Counties**

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the additional wetland and stream mitigation required for the subject project. The NCDOT previously provided wetland and stream mitigation for Sections A and B and a portion of the mitigation required for Section C at the time of the initial 404 and 401 permit issuance. The NCDOT has since completed the final design for Section C resulting in an increase of wetland and stream impacts associated with Section C and additional mitigation is required.

Based on the information supplied by you in a letter dated October 4, 2004 (Revised October 12, 2004), the impacts are located in CU 3020204 of the Neuse River Basin and CU 3020105 of the Tar Pamlico River Basin in the Southern Outer Coastal Plain Eco-Region, and are as follows:

CU 3020204: Non-Riverine Wetland Impacts: 4.40 acres  
CU 3020105: Non-Riverine Wetland Impacts: 0.63 acre;  
Stream Impacts: 145.6 feet

Also, as indicated in your letter, this project will impact buffers located in CU 3020105 of the Tar Pamlico River Basin. The buffer impacts are 29,675 square feet in Zone 1 and 17,907 square feet in Zone 2. Please note, since buffer impacts were not projected in the NCDOT's 7-year Impact Projection Database, EEP was not able to include these cost in the Biennial budget approved at the July 2004 Board of Transportation meeting. The buffer mitigation request and approval will be managed through the EEP's In-Lieu Fee Program. The NCDOT will be responsible to ensure that the appropriate compensation for the buffer mitigation will be provided in the agreed upon method of fund transfer.

As stated in your letter, the subject project is listed in Exhibit 2 of the Memorandum of Agreement among the North Carolina Department of Environment and Natural Resources, the

*Restoring... Enhancing... Protecting Our State*



North Carolina Department of Transportation, and the U. S. Army Corps of Engineers,  
Wilmington District dated July 22, 2003. The mitigation for the subject project will be provided  
in accordance with this agreement.

If you have any questions or need additional information, please contact Ms. Beth  
Harmon at 919-715-1929.

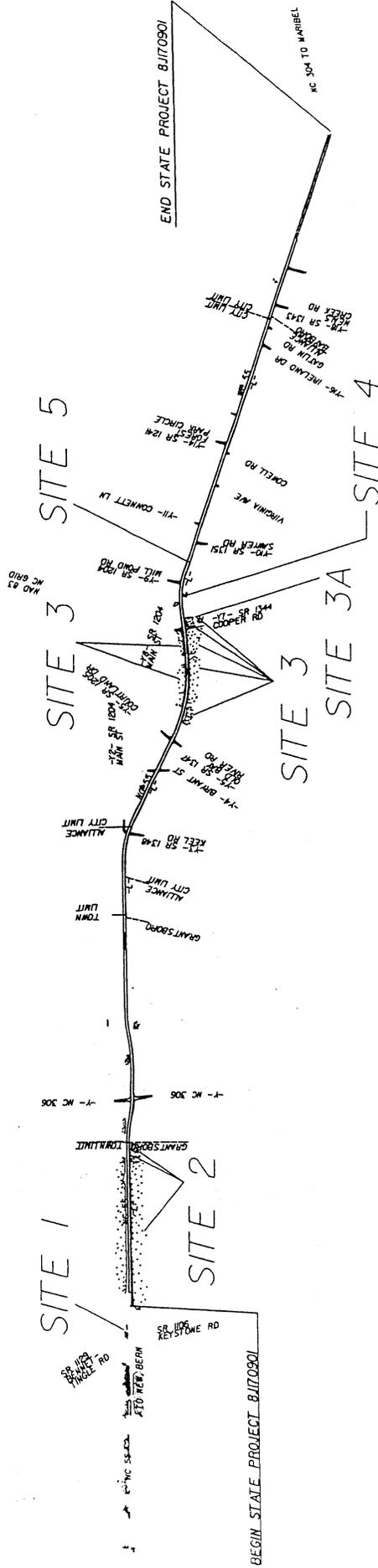
Sincerely,

A handwritten signature in black ink, appearing to read "William D. Gilmore". The signature is written in a cursive style with a large initial "W".

William D. Gilmore, P.E.  
EEP Transition Manager

cc: Michael Bell, USACE-Washington  
John Hennessy, Division of Water Quality, Wetlands/401 Unit  
Bill Arrington, Division of Coastal Management  
File: R-2539C





NCDOT

DIVISION OF HIGHWAYS

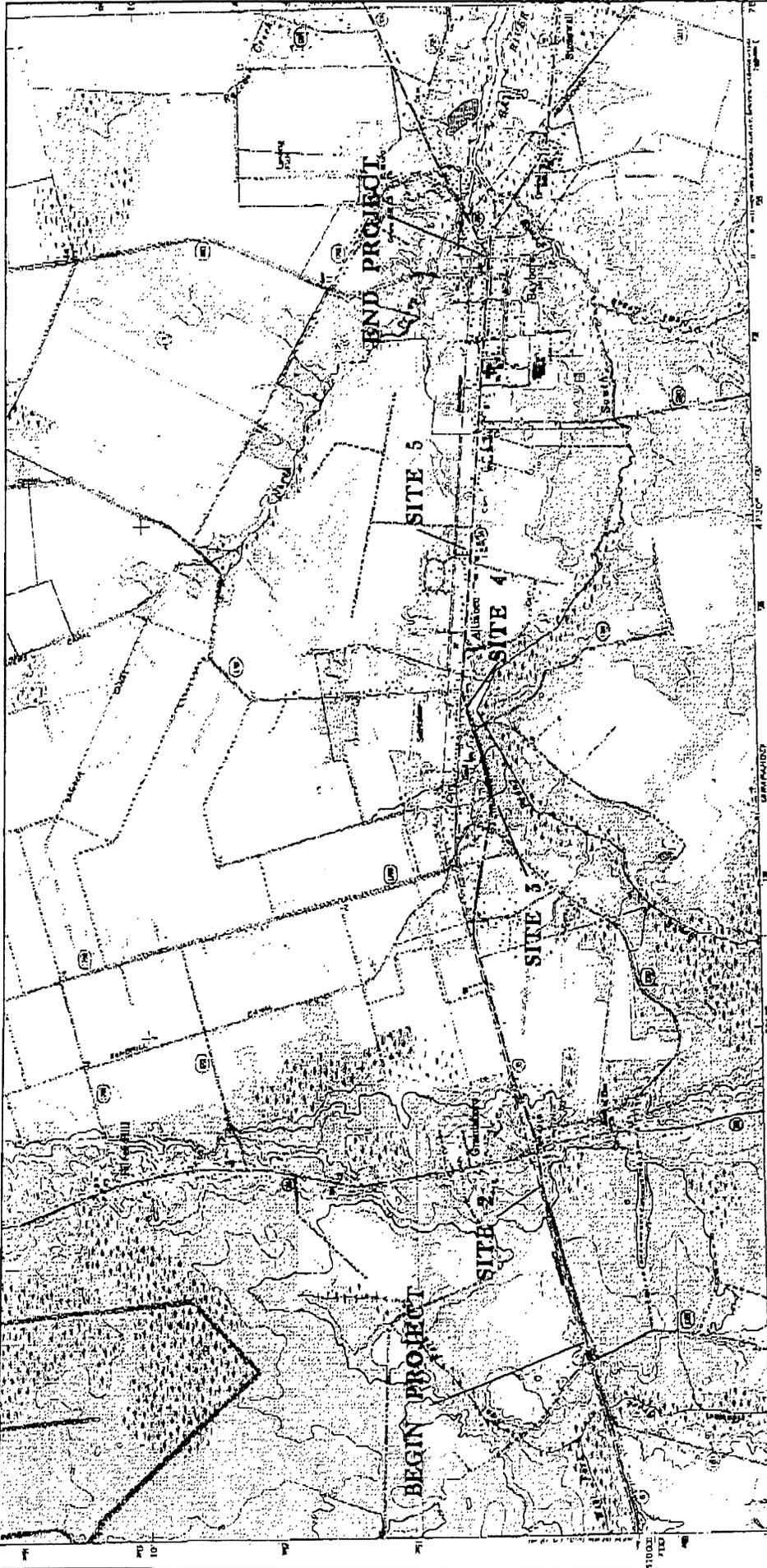
PAMLICO COUNTY

PROJECT: 8.1170901 (R-2539C)

NC 55 FROM EAST OF SR 1129

TO NC 304 IN BAYBORO

SITE MAP



NCDOT

DIVISION OF HIGHWAYS

PAMLICO COUNTY

PROJECT: 6.1170901 (R-2539C)  
NC 55 FROM EAST OF SR 1129

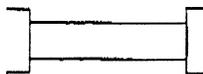
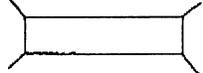
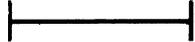
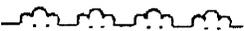
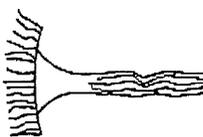
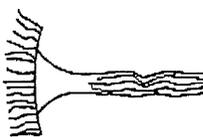
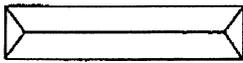
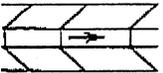
TO NC 304 IN BAYBORO

SHEET 3 OF 24 7/9/03

TOPO MAP

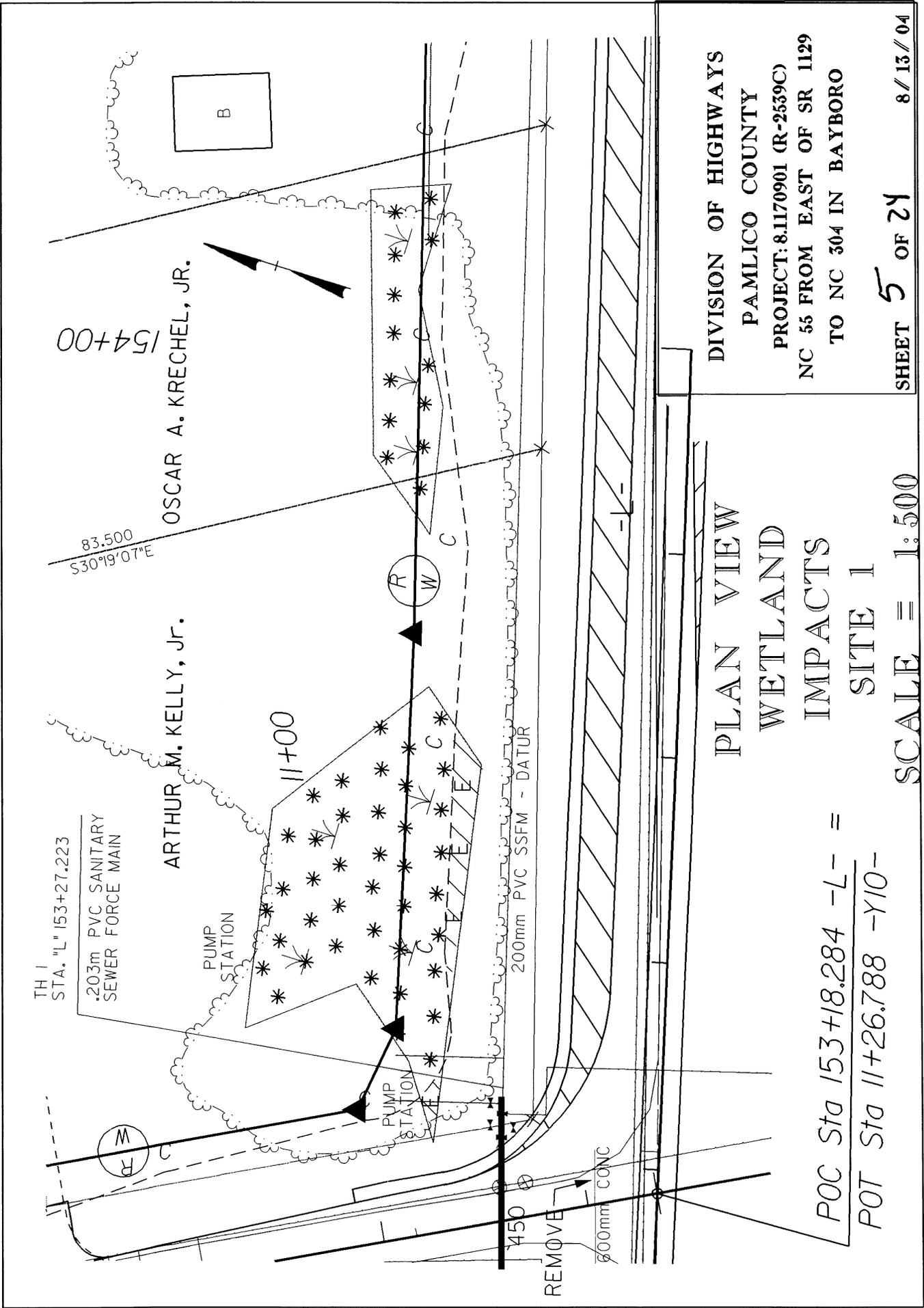
SCALE 1" = 4000'

# WETLAND LEGEND

<p>— WLB — WETLAND BOUNDARY</p> <p> WETLAND</p> <p> DENOTES FILL IN WETLAND</p> <p> DENOTES FILL IN SURFACE WATER</p> <p> DENOTES FILL IN SURFACE WATER (POND)</p> <p> DENOTES TEMPORARY FILL IN WETLAND</p> <p> DENOTES EXCAVATION IN WETLAND</p> <p> DENOTES TEMPORARY FILL IN SURFACE WATER</p> <p> DENOTES MECHANIZED CLEARING</p> <p>→ → FLOW DIRECTION</p> <p>— TB — TOP OF BANK</p> <p>— WE — EDGE OF WATER</p> <p>--- C --- PRDP. LIMIT OF CUT</p> <p>--- F --- PRDP. LIMIT OF FILL</p> <p>▲ PRDP. RIGHT OF WAY</p> <p>--- NG --- NATURAL GROUND</p> <p>--- PL --- PROPERTY LINE</p> <p>— TDE — TEMP. DRAINAGE EASEMENT</p> <p>— PDE — PERMANENT DRAINAGE EASEMENT</p> <p>-- EAB -- EXIST. ENDANGERED ANIMAL BOUNDARY</p> <p>-- EPB -- EXIST. ENDANGERED PLANT BOUNDARY</p> <p>▽ WATER SURFACE</p> <p>x x x x x x x x x x x x x x x LIVE STAKES</p> <p> BOULDER</p> <p>--- CORE FIBER ROLLS</p>	<p> PROPOSED BRIDGE</p> <p> PROPOSED BOX CULVERT</p> <p> PROPOSED PIPE CULVERT 12'-48' PIPES 54' PIPES &amp; ABOVE</p> <p>(DASHED LINES DENOTE EXISTING STRUCTURES)</p> <p> SINGLE TREE</p> <p> WOODS LINE</p> <p> DRAINAGE INLET</p> <p> ROADWAD</p> <p> RIP RAP</p> <p> ADJACENT PROPERTY OWNER OR PARCEL NUMBER IF AVAILABLE</p> <p> PREFORMED SCOUR HOLE</p> <p> LEVEL SPREADER (LS)</p> <p> DITCH / GRASS SWALE</p>
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**NCDOT**  
**DIVISION OF HIGHWAYS**  
**PAMLICO COUNTY**  
**PROJECT: 8.1170901 (R-2539C)**  
**NC 55 FROM EAST OF SR 1129**  
**TO NC 304 IN BAYBORO**

SHEET **4** OF **24** 7/9/03



TH 1  
STA. "L" 153+27.223  
203m PVC SANITARY  
SEWER FORCE MAIN

ARTHUR M. KELLY, JR.

OSCAR A. KRECHEL, JR.

154+00

11+00

PUMP  
STATION

PUMP  
STATION

200mm PVC SSFM - DATUR

450

REMOVE

600mm CONC

PLAN VIEW  
WETLAND  
IMPACTS  
SITE 1

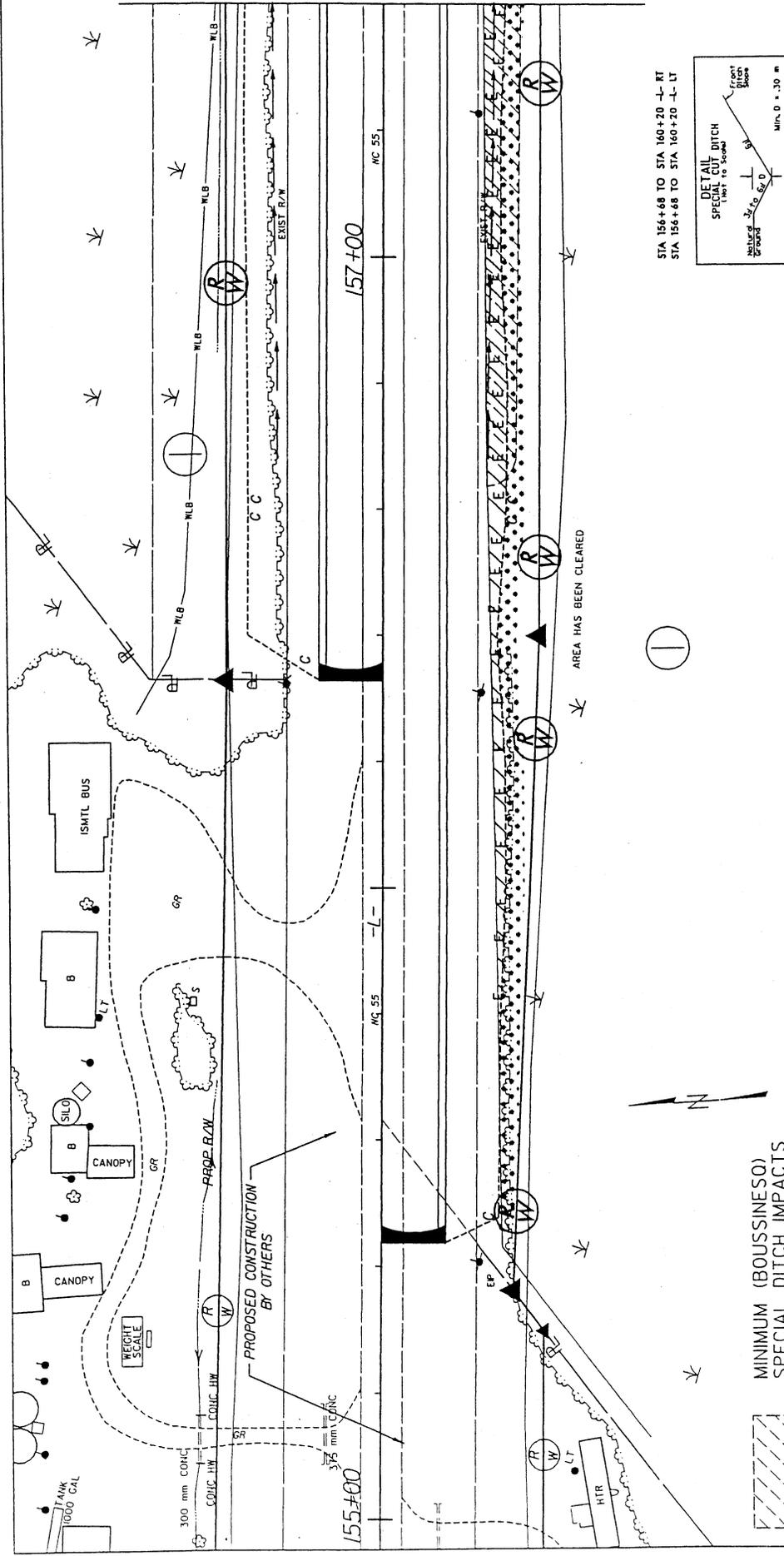
POC Sta 153+18.284 -L- =  
POT Sta 11+26.788 -Y10-

DIVISION OF HIGHWAYS  
PAMLICO COUNTY  
PROJECT: 8.1170901 (R-2539C)  
NC 55 FROM EAST OF SR 1129  
TO NC 304 IN BAYBORO

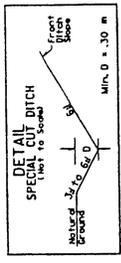
SHEET 5 OF 24 8/13/04

SCALE = 1:500

MATCH LINE 157+40



STA 156+68 TO STA 160+20 -L- RT  
 STA 156+66 TO STA 160+20 -L- LT



**NCDOT**

**DIVISION OF HIGHWAYS**  
**PAMLICO COUNTY**  
**PROJECT: 8.1170901 (R-2539C)**  
**NC 55 FROM EAST OF SR 1129**  
**TO NC 304 IN BAYBORO**

**SHEET 6 OF 24**      **Rev 10/11/04**  
**12/18/03**

**PLAN VIEW**  
**WETLAND**  
**IMPACTS**  
**SITE 2**

**SCALE = 1:1000**

MINIMUM (BOUSSINESQ)  
 SPECIAL DITCH IMPACTS

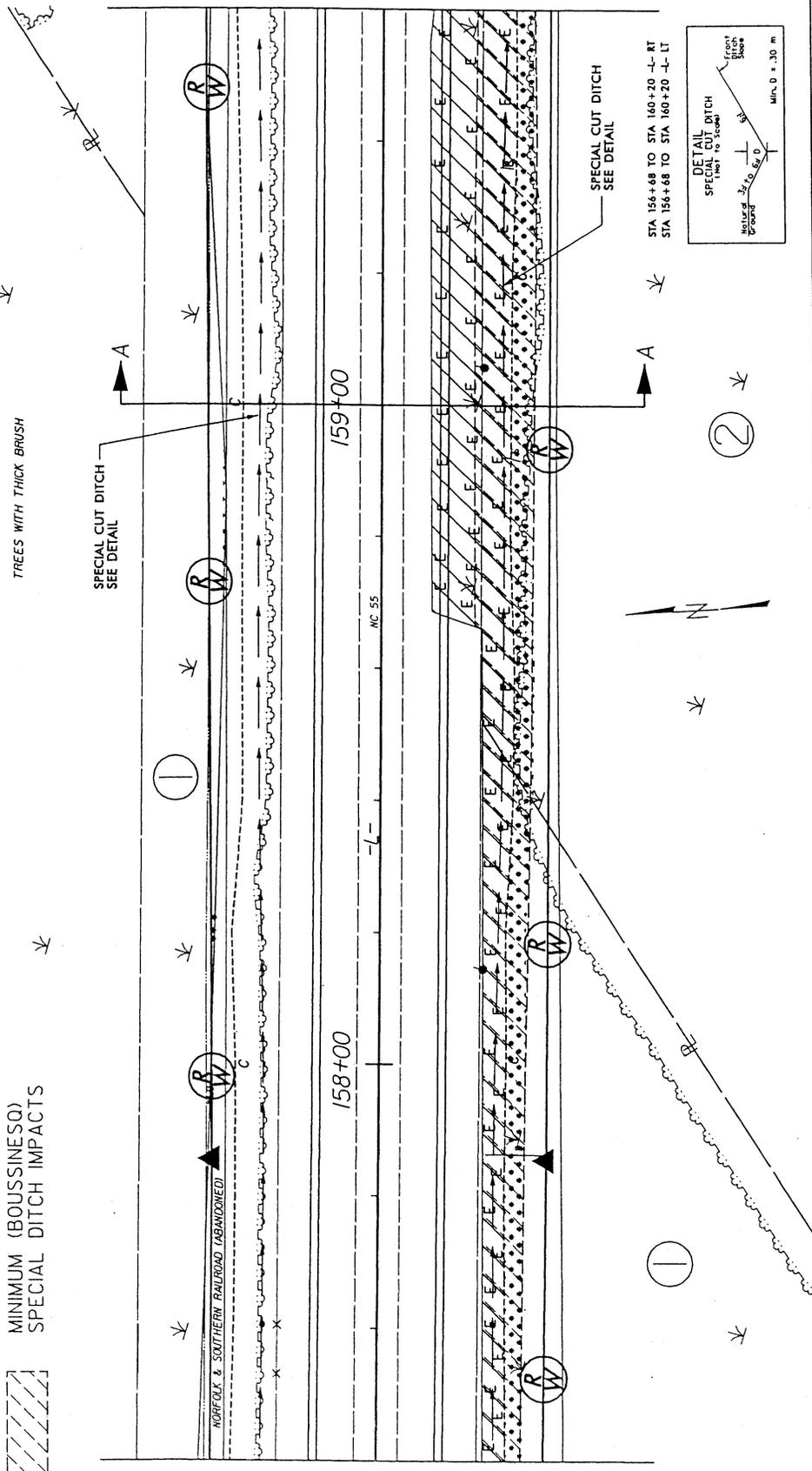


MINIMUM (BOUSSINESQ)  
SPECIAL DITCH IMPACTS

TREES WITH THICK BRUSH

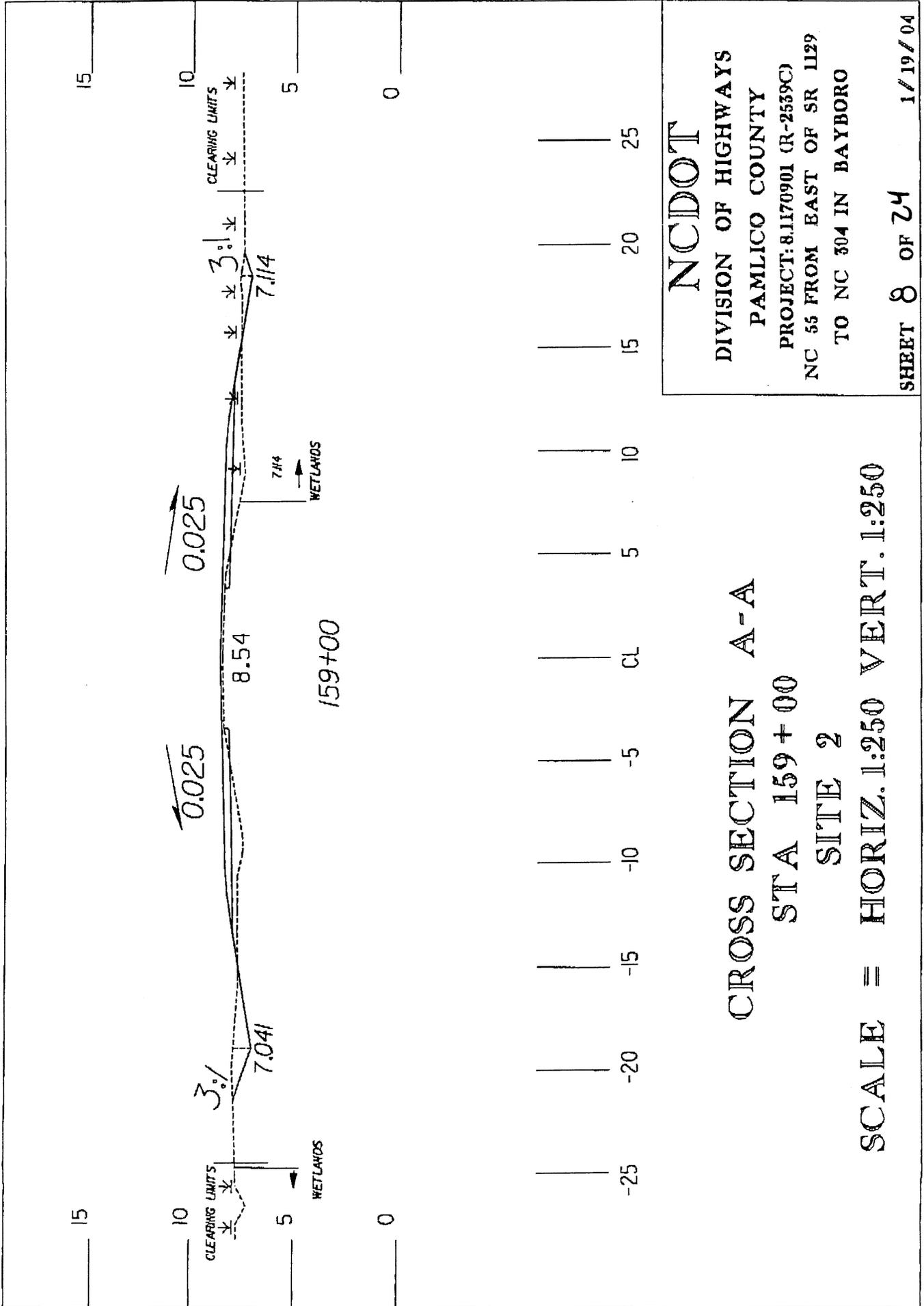
MATCH LINE 157+40

MATCH LINE 159+60



PLAN VIEW  
WETLANDS  
IMPACTS  
SITE 2  
SCALE = 1:1000

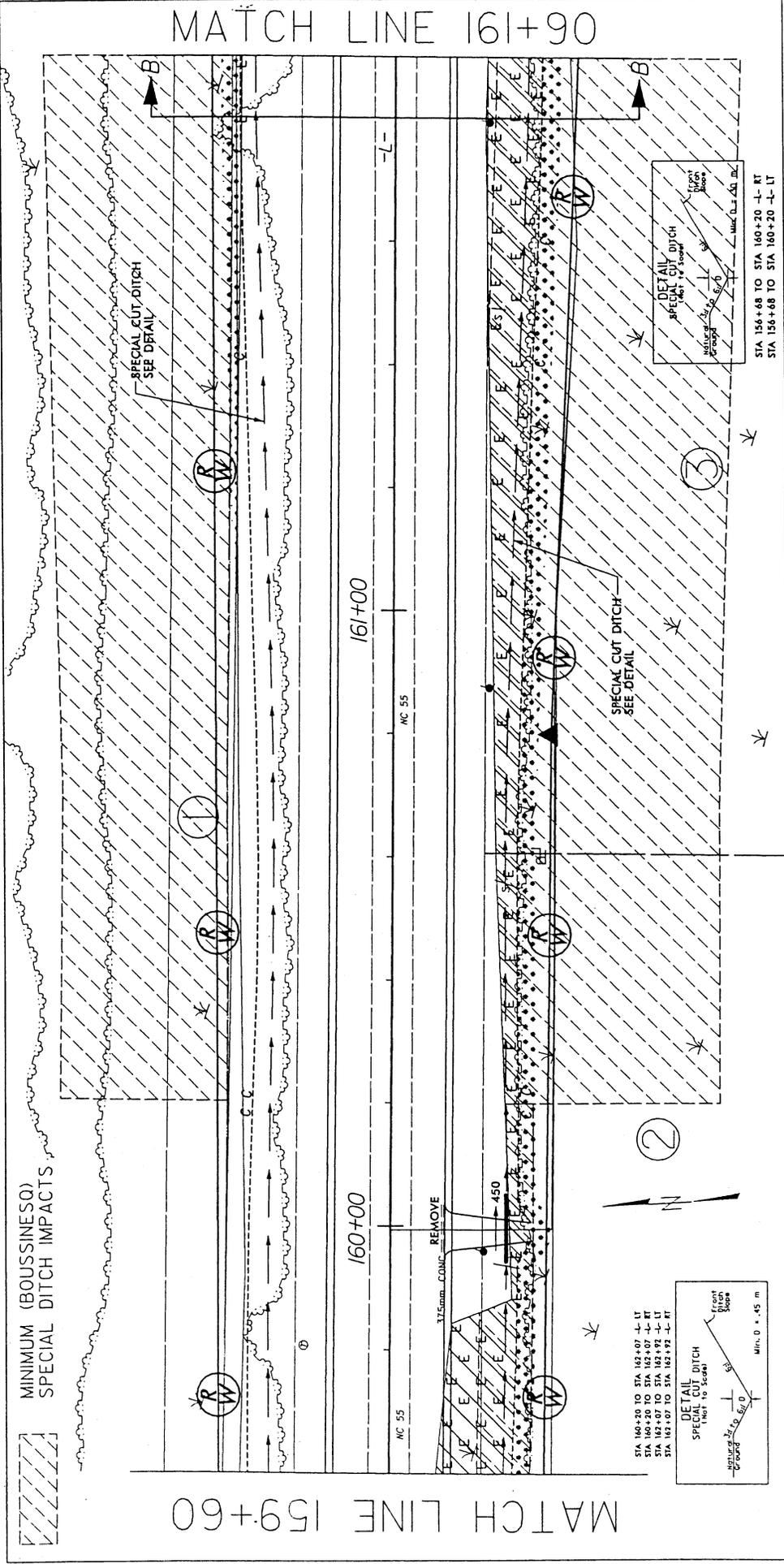
NCDOT  
DIVISION OF HIGHWAYS  
PAMLICO COUNTY  
PROJECT: 8.1170901 (R-2539C)  
NC 55 FROM EAST OF SR 1129  
TO NC 304 IN BAYBORO  
SHEET 7 OF 24  
Rev 10/11/04  
12/18/03



**NCDOT**  
 DIVISION OF HIGHWAYS  
 PAMLICO COUNTY  
 PROJECT: 8J170901 (R-2539C)  
 NC 55 FROM EAST OF SR 1129  
 TO NC 304 IN BAYBORO

SHEET 8 OF 24 1/19/04

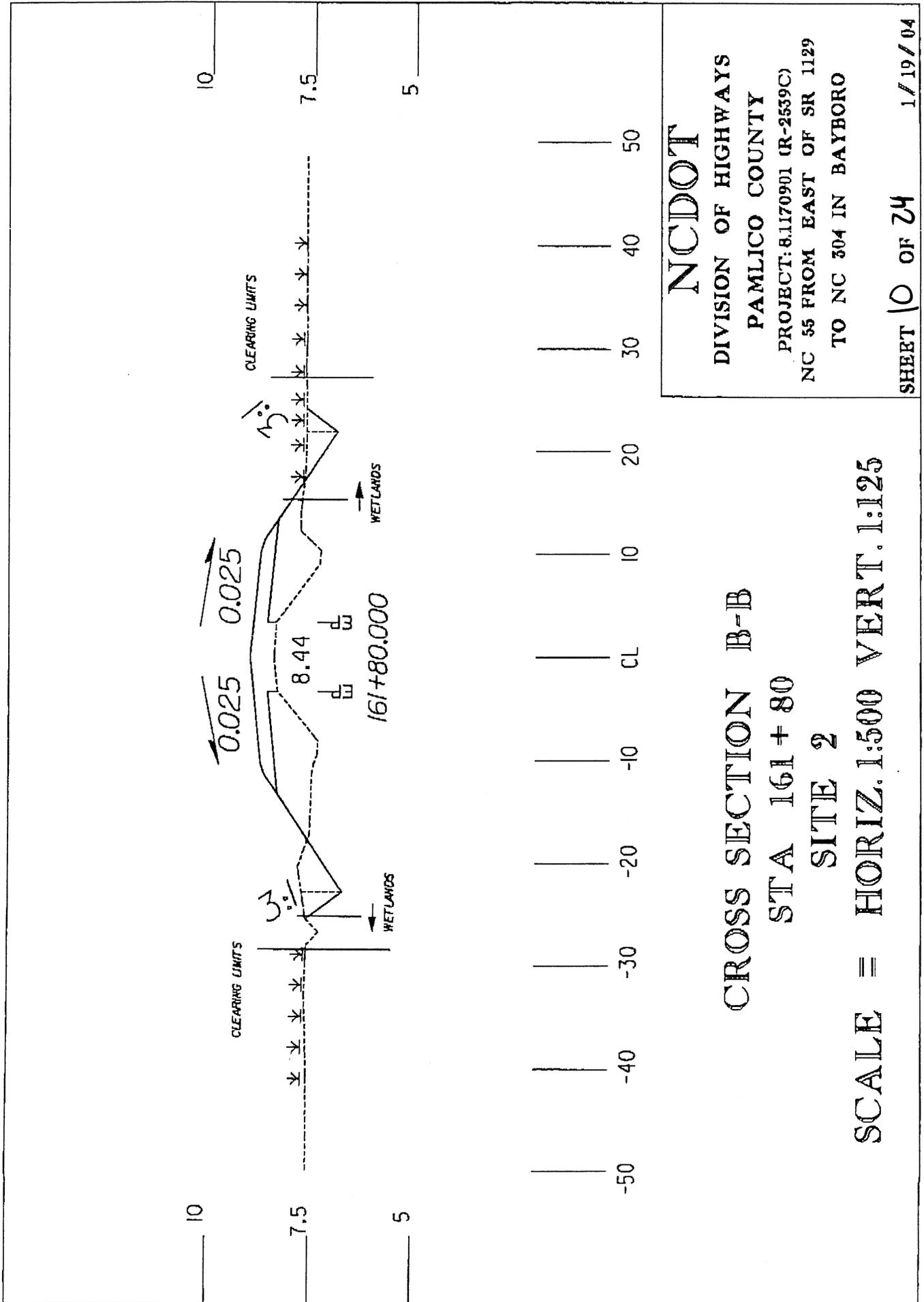
CROSS SECTION A-A  
 STA 159 + 00  
 SITE 2  
 SCALE = HORIZ. 1:250 VERT. 1:250



**NC DOT**  
 DIVISION OF HIGHWAYS  
 PAMLICO COUNTY  
 PROJECT: 8.1170901 (R-2539C)  
 NC 55 FROM EAST OF SR 1129  
 TO NC 304 IN BAYBORO

PLAN VIEW  
 WETLANDS  
 IMPACTS  
 SITE 2  
 SCALE = 1:1000

SHEET 9 OF 24      8 / 23 / 04



NCDOT

DIVISION OF HIGHWAYS  
 PAMLICO COUNTY  
 PROJECT: 8.1170901 (R-2539C)  
 NC 55 FROM EAST OF SR 1129  
 TO NC 304 IN BAYBORO

CROSS SECTION B-B

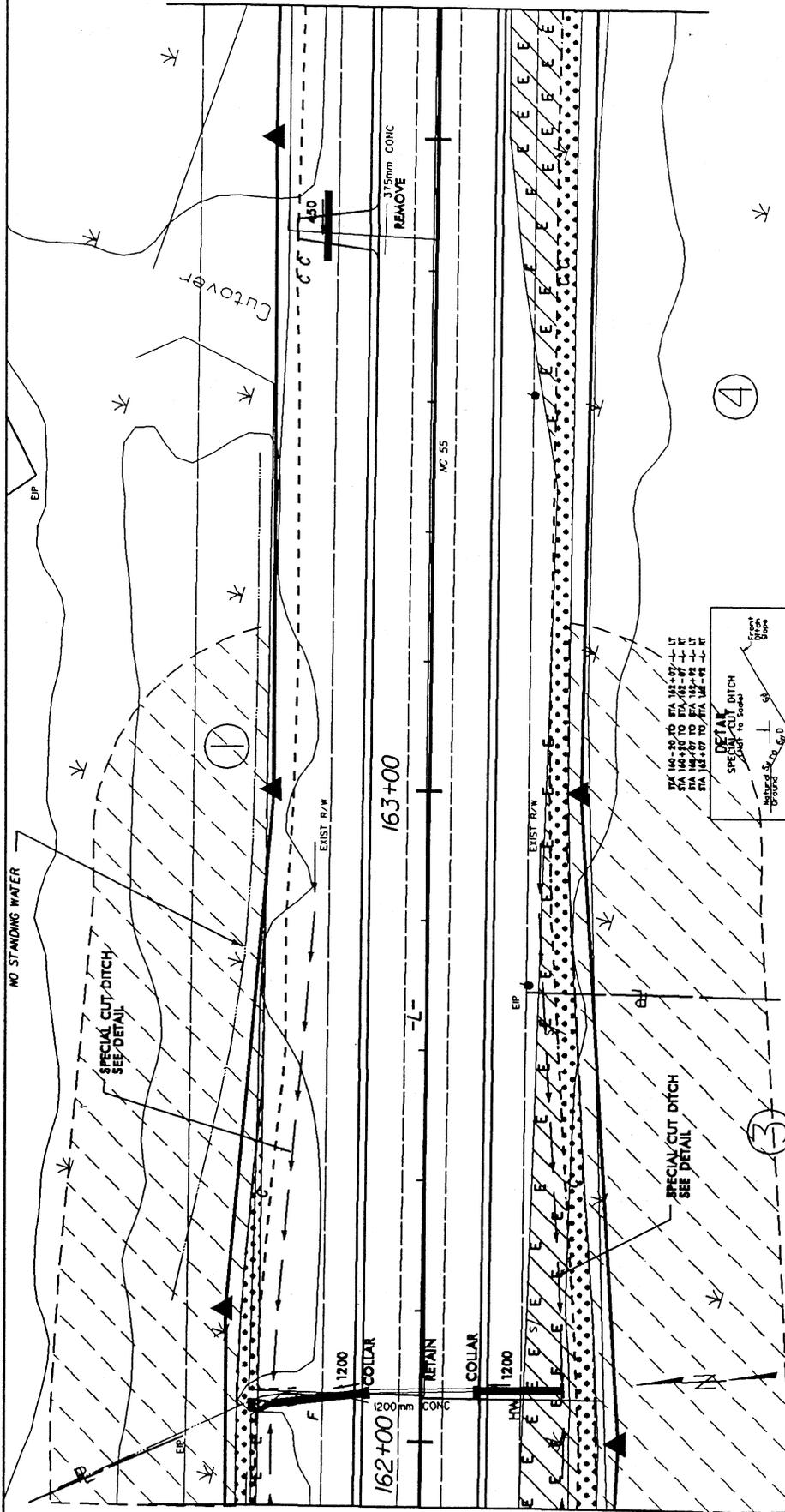
STA 161+80

SITE 2

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MATCH LINE 164+20

MATCH LINE 161+90



MINIMUM (BOUSSINESQ)  
 SPECIAL DITCH IMPACTS

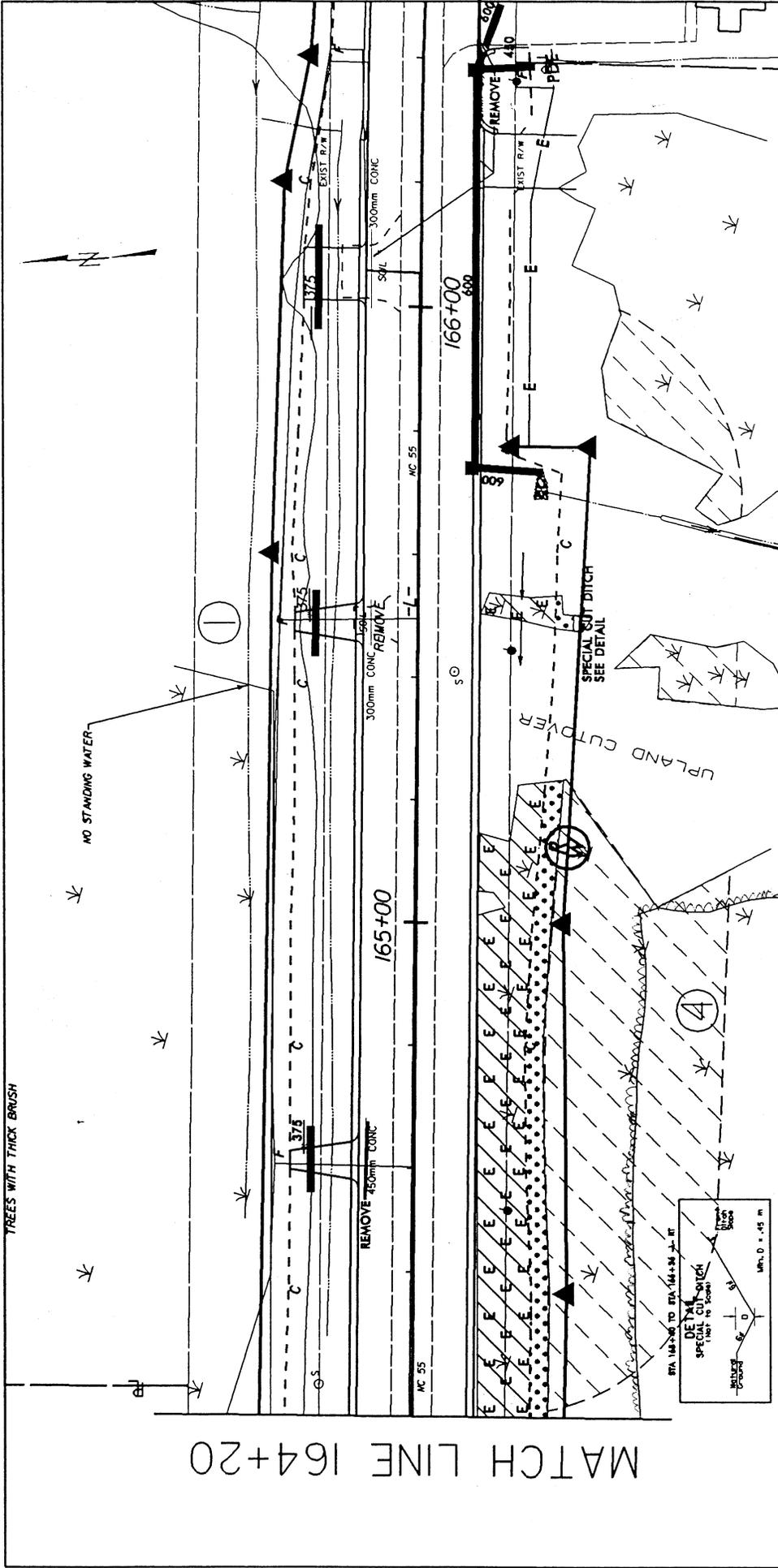
**PLAN VIEW**  
**WETLAND**  
**IMPACTS**  
**SITE 2**

**SCALE = 1:1000**

**NCDOT**  
 DIVISION OF HIGHWAYS  
 PAMLICO COUNTY  
 PROJECT: 8.1170901 (R-2539C)  
 NC 55 FROM EAST OF SR 1129  
 TO NC 304 IN BAYBORO

SHEET 11 OF 24

Rev 10/11/04  
 12/18/03



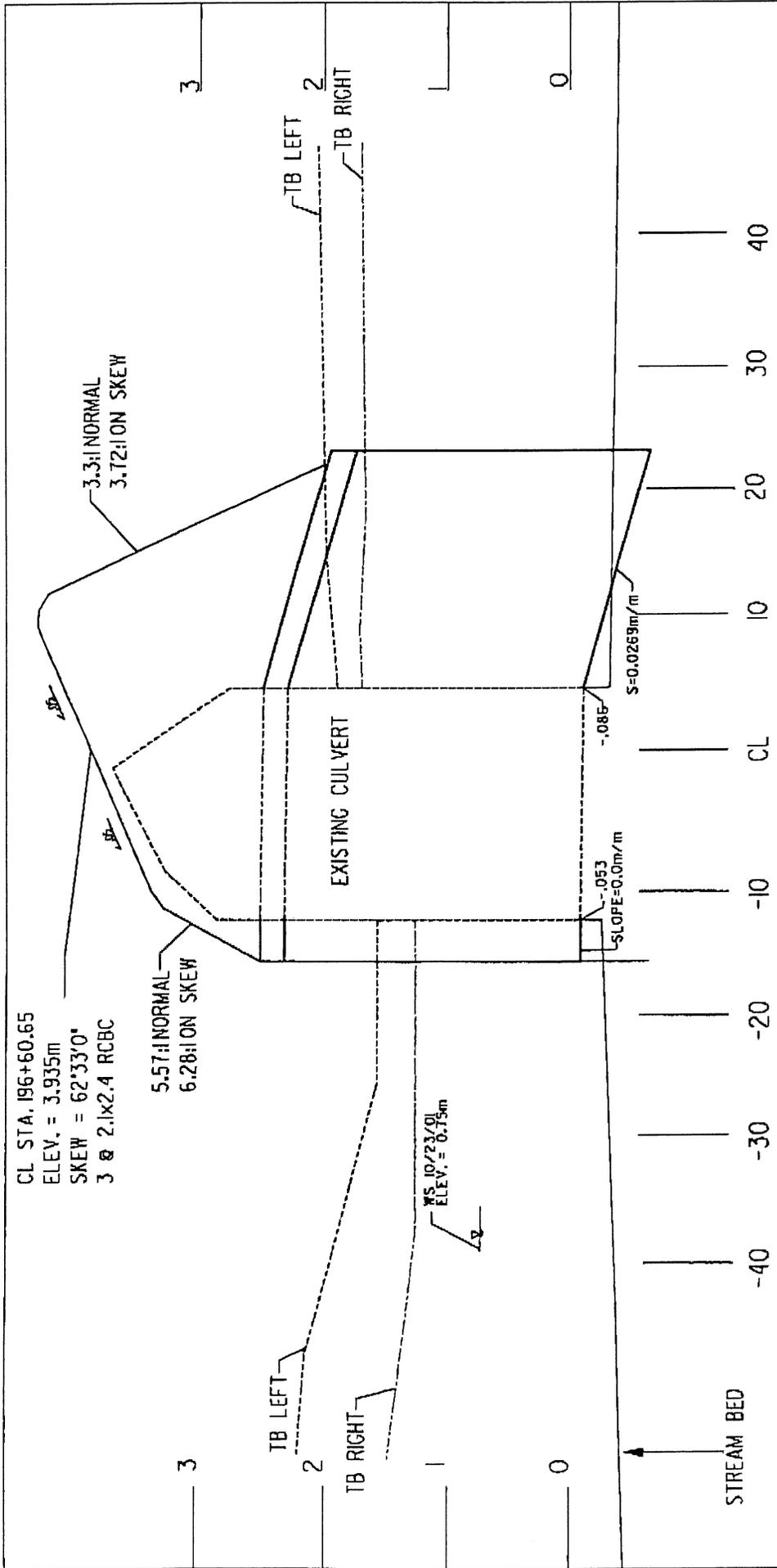
**NCDOT**  
 DIVISION OF HIGHWAYS  
 PAMLICO COUNTY  
 PROJECT: 8.1170901 (R-2539C)  
 NC 55 FROM EAST OF SR 1129  
 TO NC 304 IN BAYBORO

**MINIMUM (BOUSSINESQ) SPECIAL DITCH IMPACTS**  
**PLAN VIEW**  
**WETLAND IMPACTS**  
**SITE 2**  
**SCALE = 1:1000**

Rev 10/11/04  
 12/18/03

SHEET 12 OF 24

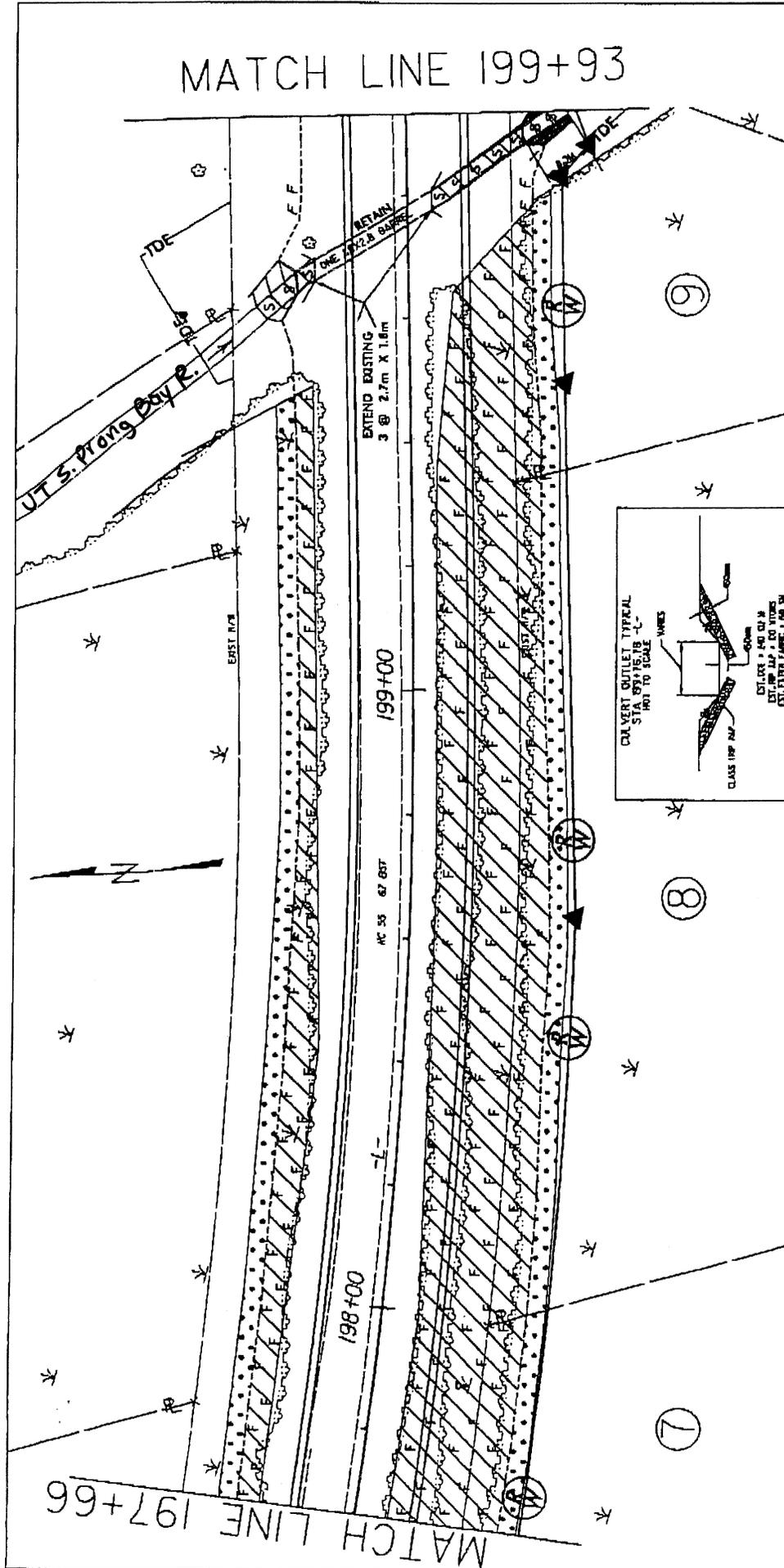




**NCDOT**  
 DIVISION OF HIGHWAYS  
 PAMLICO COUNTY  
 PROJECT: 8.1170901 (R-2539C)  
 NC 55 FROM EAST OF SR 1129  
 TO NC 304 IN BAYBORO

**CULVERT 1 PROFILE**  
**STA 196 + 60.65**  
**SITE 3**  
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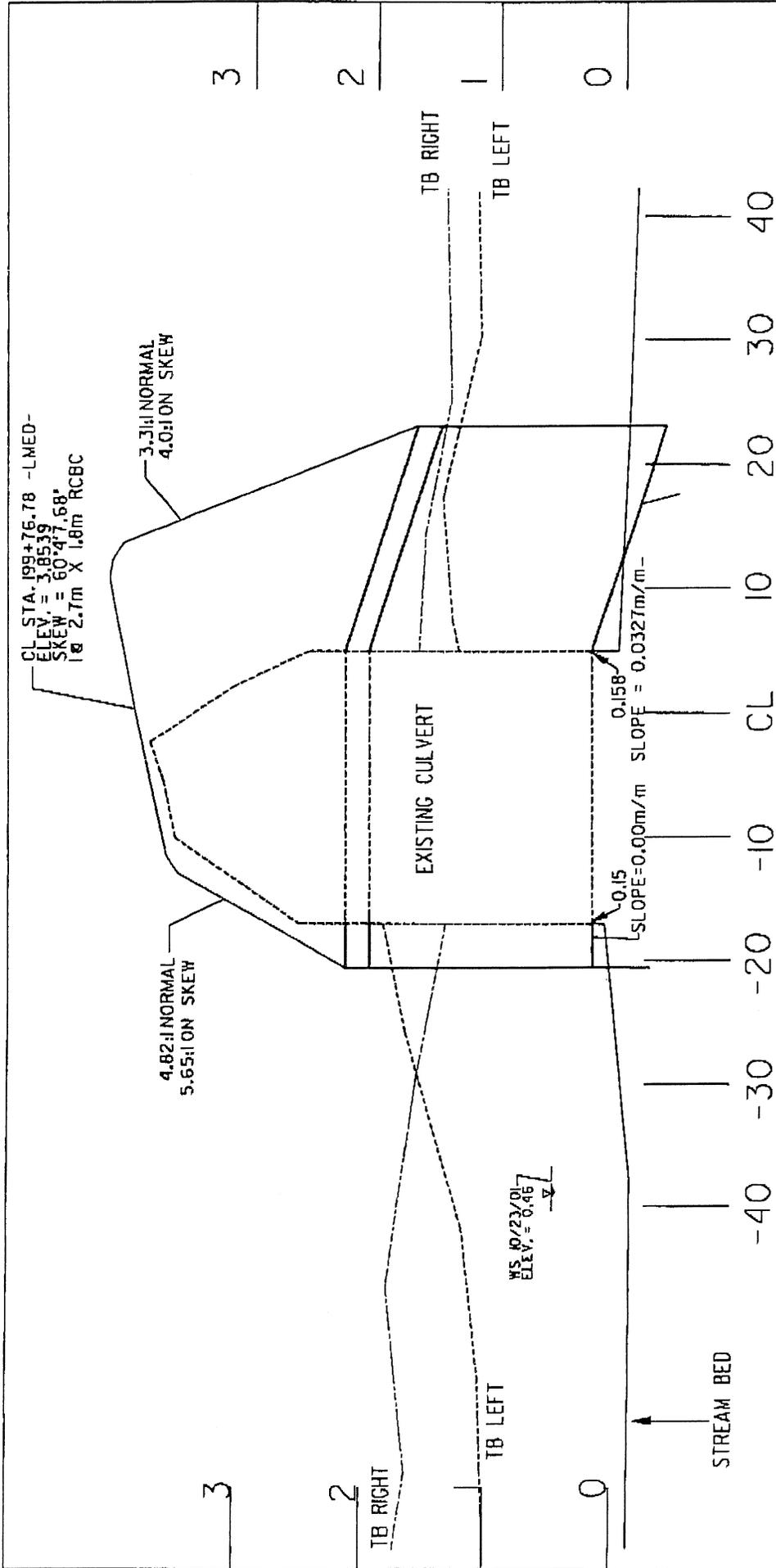
SHEET 14 OF 24 7/15/03



NCDOT  
 DIVISION OF HIGHWAYS  
 PAMLICO COUNTY  
 PROJECT: 8.1170901 (R-2539C)  
 NC 55 FROM EAST OF SR 1129  
 TO NC 304 IN BAYBORO

PLAN VIEW  
 STREAM & WETLAND  
 IMPACTS  
 SITE 3  
 SCALE = 1:1000

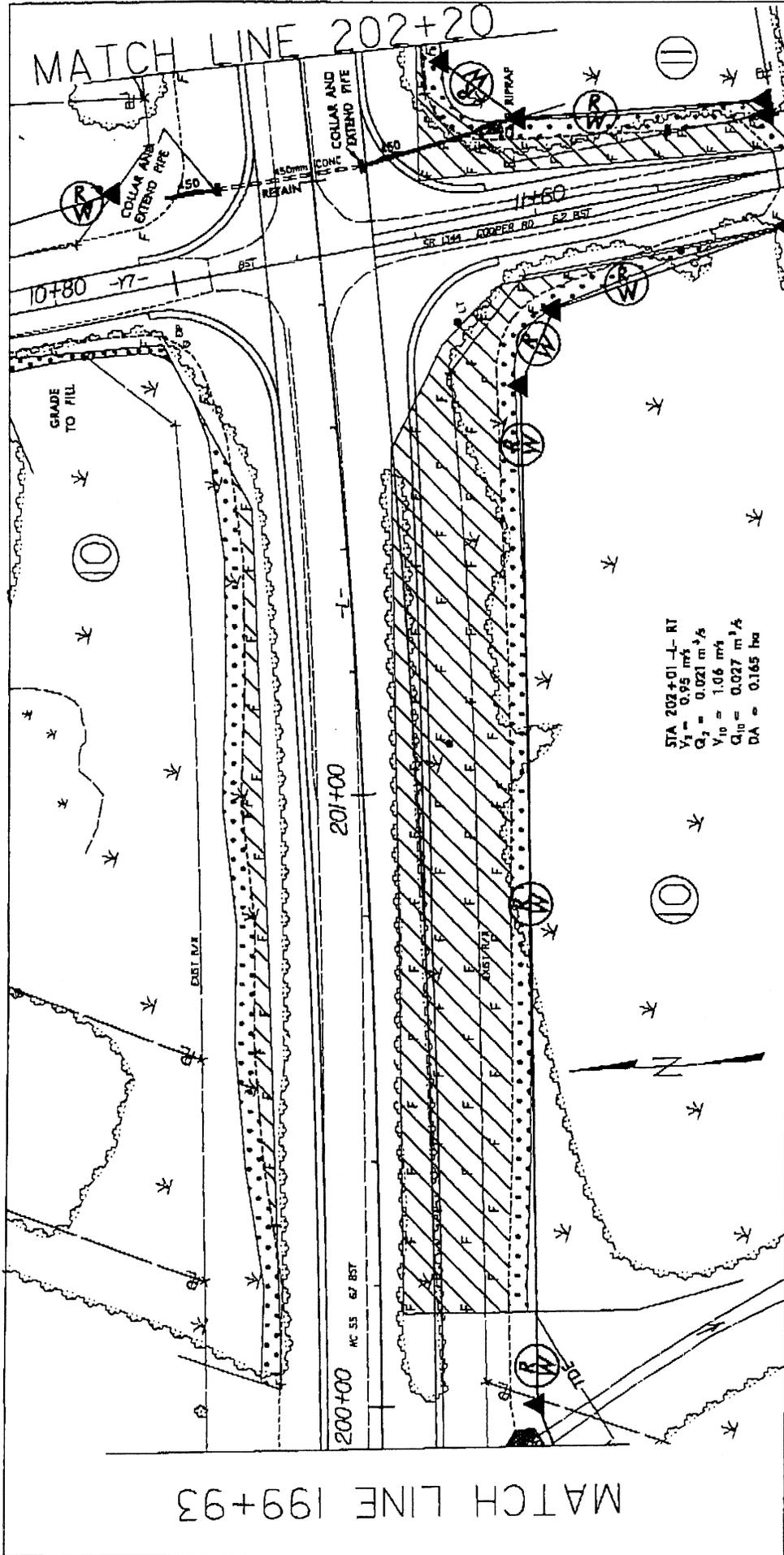
SHEET 15 OF 24 2/6/04



**NCDOT**  
 DIVISION OF HIGHWAYS  
 PAMLICO COUNTY  
 PROJECT: 8.1170901 (R-2559C)  
 NC 55 FROM EAST OF SR 1129  
 TO NC 304 IN BAYBORO

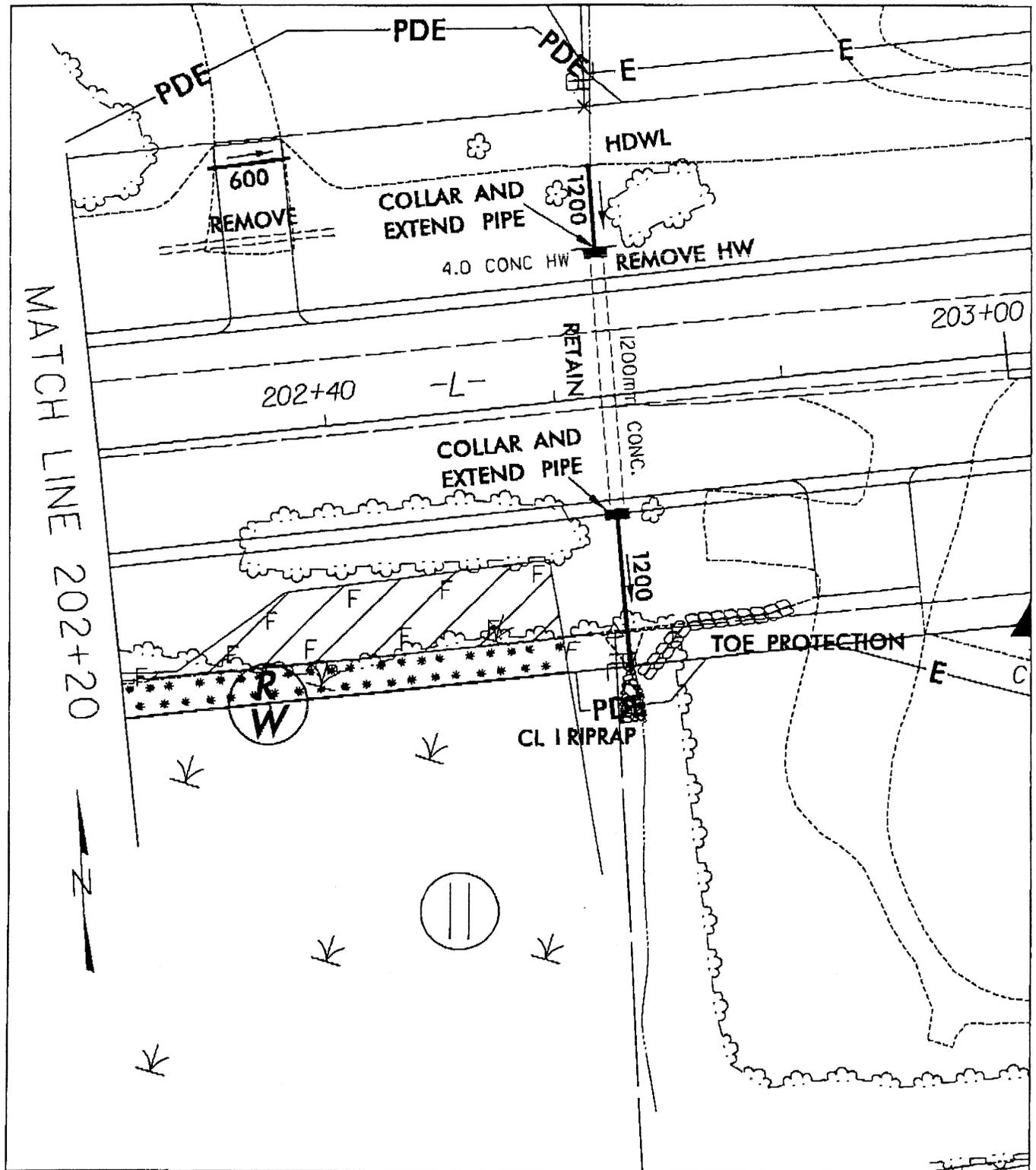
SHEET 16 OF 24 7/15/03

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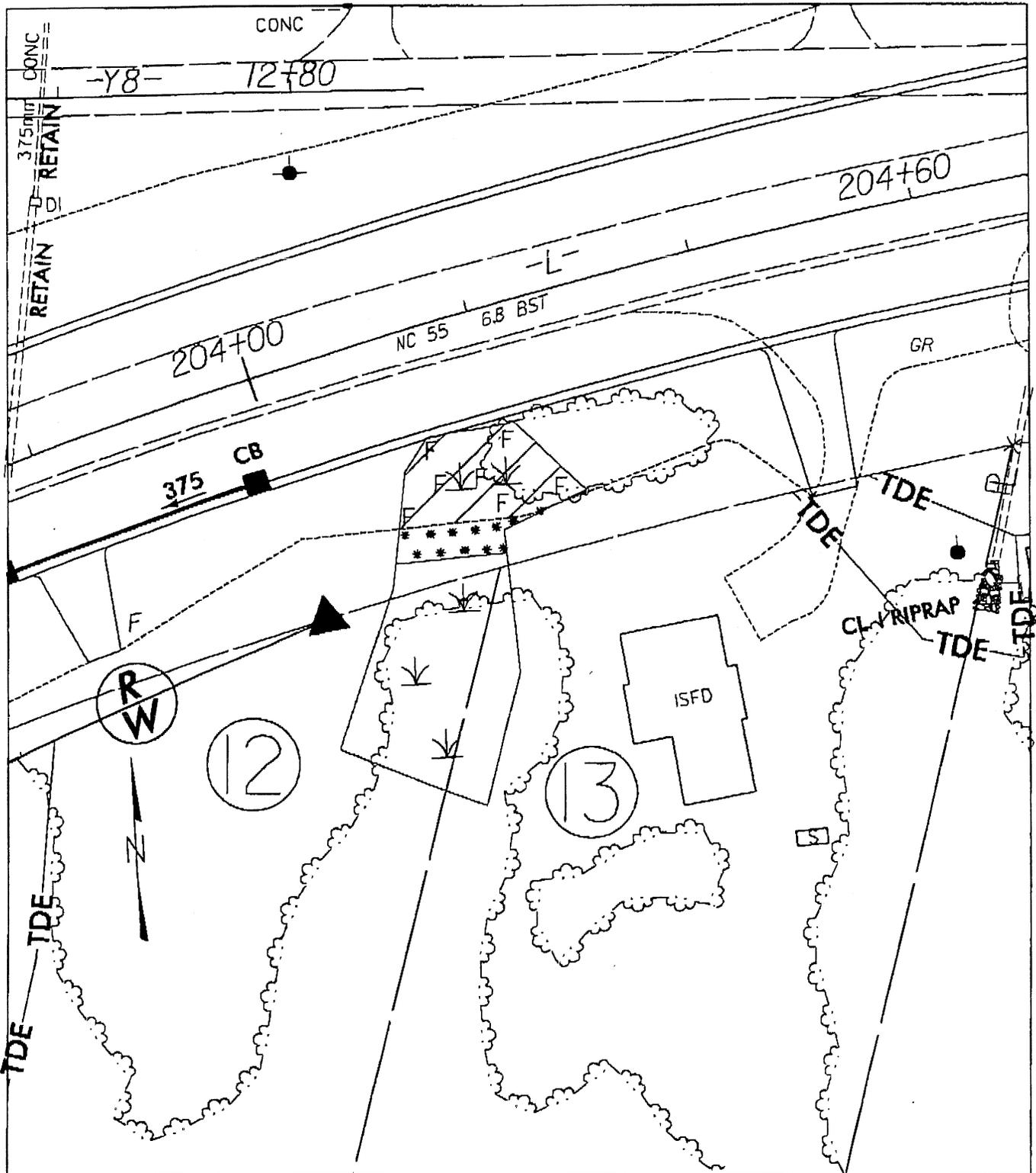
**NC DOT**  
 DIVISION OF HIGHWAYS  
 PAMLICO COUNTY  
 PROJECT: 8.1170901 (R-2539C)  
 NC 55 FROM EAST OF SR 1129  
 TO NC 304 IN BAYBORO

**PLAN VIEW**  
**STREAM & WETLAND**  
**IMPACTS**  
**SITE 3**  
**SCALE = 1:1000**



PLAN VIEW  
 WETLAND  
 IMPACTS  
 SITE 3  
 SCALE = 1:500

NCDOT  
 DIVISION OF HIGHWAYS  
 PAMLICO COUNTY  
 PROJECT: 8.1170901 (R-2539C)  
 NC 55 FROM EAST OF SR 1129  
 TO NC 304 IN BAYBORO

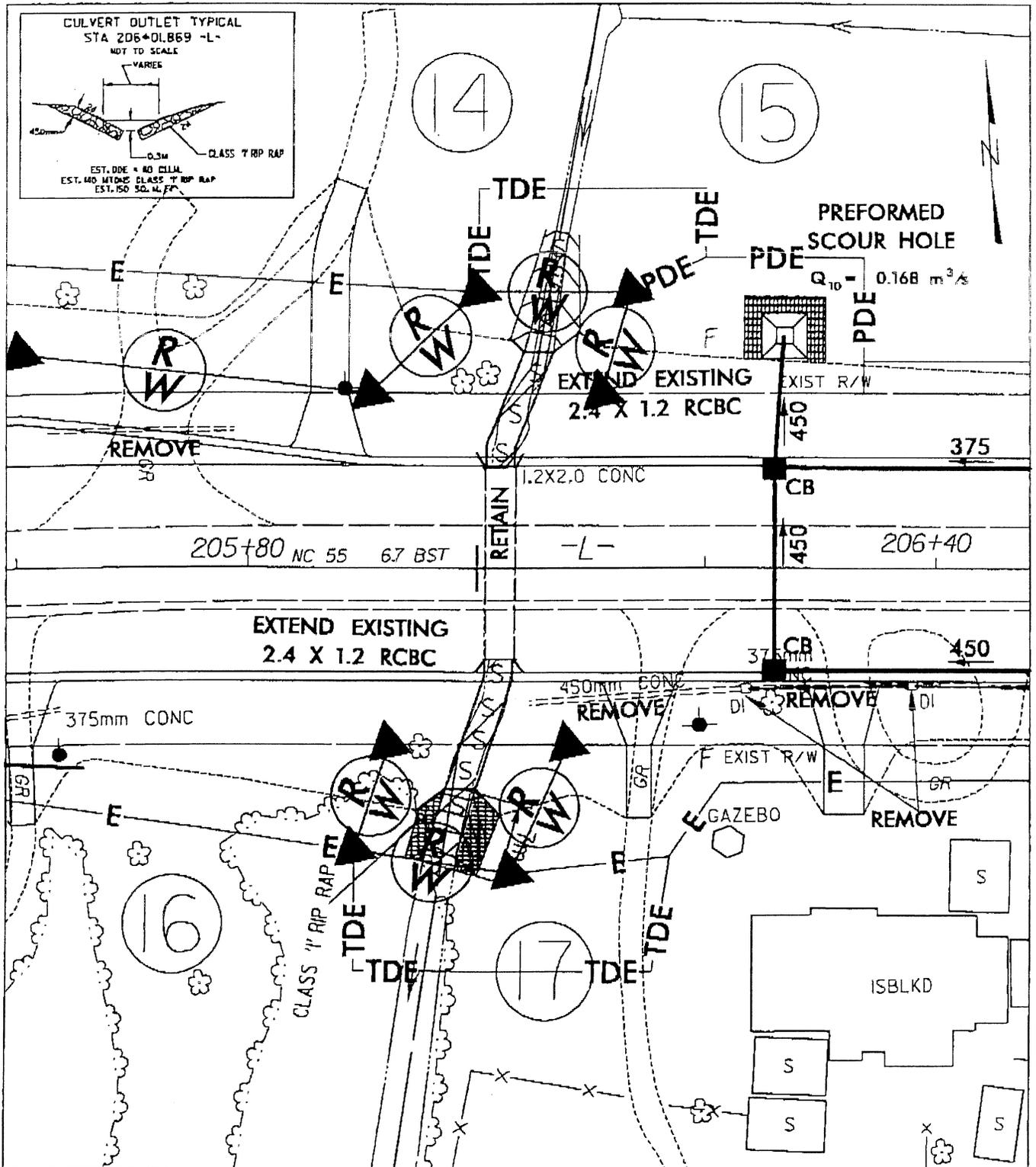


PLAN VIEW  
 WETLAND  
 IMPACTS  
 SITE 4  
 SCALE = 1:500

**NCDOT**  
 DIVISION OF HIGHWAYS  
 PAMLICO COUNTY  
 PROJECT: 8.1170901 (R-2539C)  
 NC 55 FROM EAST OF SR 1129  
 TO NC 304 IN BAYBORO

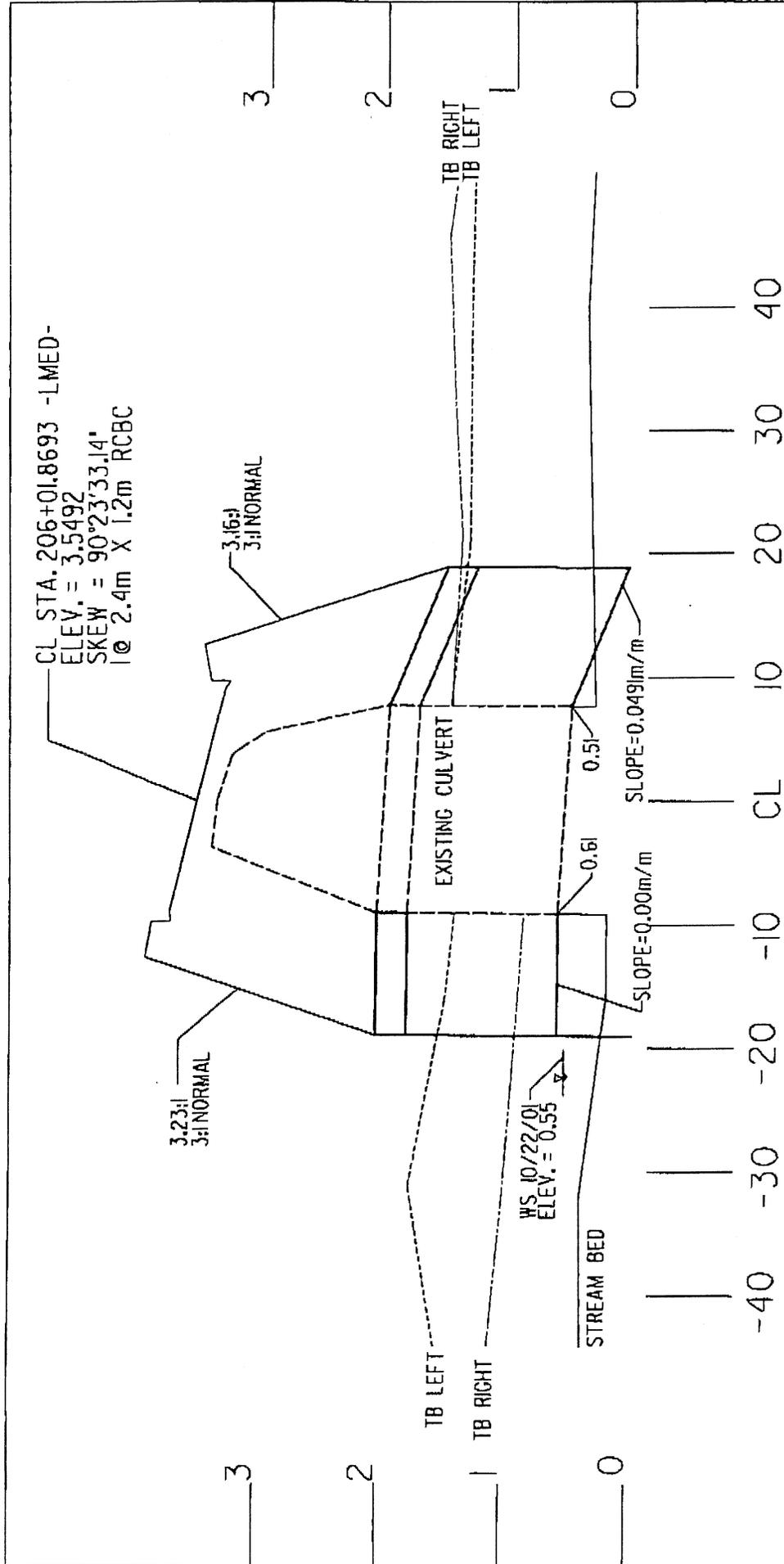
SHEET 19 OF 24

2/6/04



PLAN VIEW  
 STREAM  
 IMPACTS  
 SITE 5  
 SCALE = 1:500

**NCDOT**  
 DIVISION OF HIGHWAYS  
 PAMLICO COUNTY  
 PROJECT: 8.1170901 (R-2539C)  
 NC 55 FROM EAST OF SR 1129  
 TO NC 304 IN BAYBORO



CL STA. 206+01.8693 -LMED-  
 ELEV. = 3.5492  
 SKEW = 90°23'33.14"  
 I@ 2.4m X 1.2m RCBC

**NCDOT**  
 DIVISION OF HIGHWAYS  
 PAMLICO COUNTY  
 PROJECT: 81170901 (R-2539C)  
 NC 55 FROM EAST OF SR 1129  
 TO NC 304 IN BAYBORO

**CULVERT 3 PROFILE**  
 STA 206 + 01.87  
 SITE 5  
 SCALE = HORIZ. 1:500 VERT. 1:50

SHEET 21 OF 24 8/6/03

# PROPERTY OWNERS

## NAMES AND ADDRESSES

REFERENCE NO.	NAMES	ADDRESSES
1	WEYERHAEUSER CO.	PO BOX 1391 NEW BERN, NC 28563
2	GEORGE BRINSON	7960 NEUSE RD. GRANTSBORO, NC 28529
3	JAY BARRINGTON	904 LYNN ST. NEW BERN, NC 28562
4	SARAH HARRIS	420 NC HWY.306 SOUTH GRANTSBORO, NC 28529
5	DORIS WILLIAMS	PO BOX 294 ALLIANCE, NC 28509
6	TSUNEKO TYNDALL	233 KEEL RD. GRANTSBORO, NC 28529
7	DAVID HARRIS	188 DEER RD. HUBERT, NC 28539
8	ROBERT COURTENAY SMARIDGE	2994 WILMA EDWARDS RD. ELLABELL, GA 31308
9	ROBERT COURTENAY SMARIDGE	189 FACTORY RD. HAMSTEAD, NC 28443
10	ARTHUR KELLY, JR.	PO BOX 243 GRANTSBORO, NC 28529
11	PHOEBE CAMPEN C/O GEORGIE THOMPSON	689 LICHFIELD RD. WINSTON-SALEM, NC 27104
12	JESSE BRAXTON CAHOON	52 BRINSON DR. GRANTSBORO, NC 28529
13	PAUL LEE PEGRAM	PO BOX 274 ALLIANCE, NC 28509
14	DUDLEY PAUL, JR.	PO BOX 345 ALLIANCE, NC 28509

**NCDOT**  
 DIVISION OF HIGHWAYS  
 PAMLICO COUNTY  
 PROJECT: 8.1170901 (R-2539C)  
 NC 55 FROM EAST OF SR 1129  
 TO NC 304 IN BAYBORO

SHEET 22 OF 24 7/31/03

# PROPERTY OWNERS

## NAMES AND ADDRESSES

REFERENCE NO.	NAMES	ADDRESSES
15	HERMAN IRELAND	PO BOX 125 ALLIANCE, NC 28509
16	PEGGY WOOSTER	PO BOX 152 ALLIANCE, NC 28509
17	C. W. PHILLIPS	PO BOX 73 ALLIANCE, NC 28509

**NCDOT**  
DIVISION OF HIGHWAYS  
PAMLICO COUNTY  
PROJECT: 8.1170901 (R-2539C)  
NC 55 FROM EAST OF SR 1129  
TO NC 304 IN BAYBORO

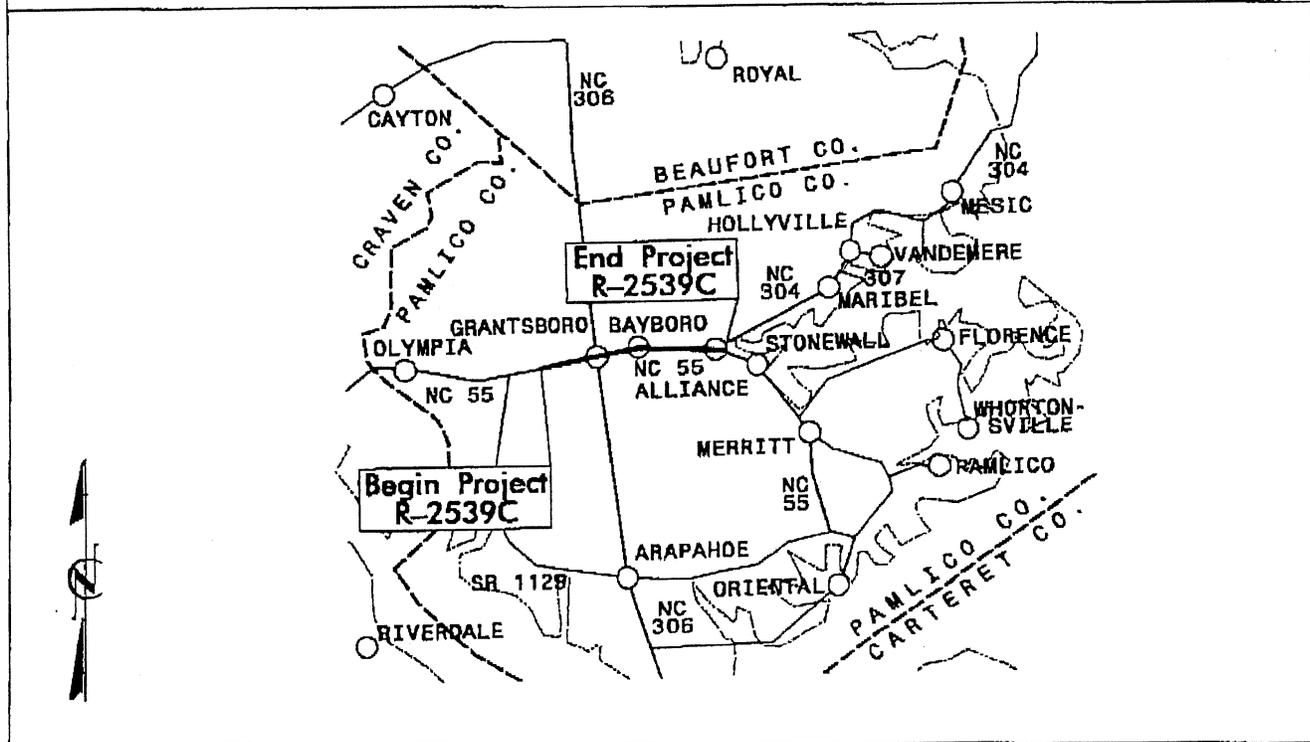
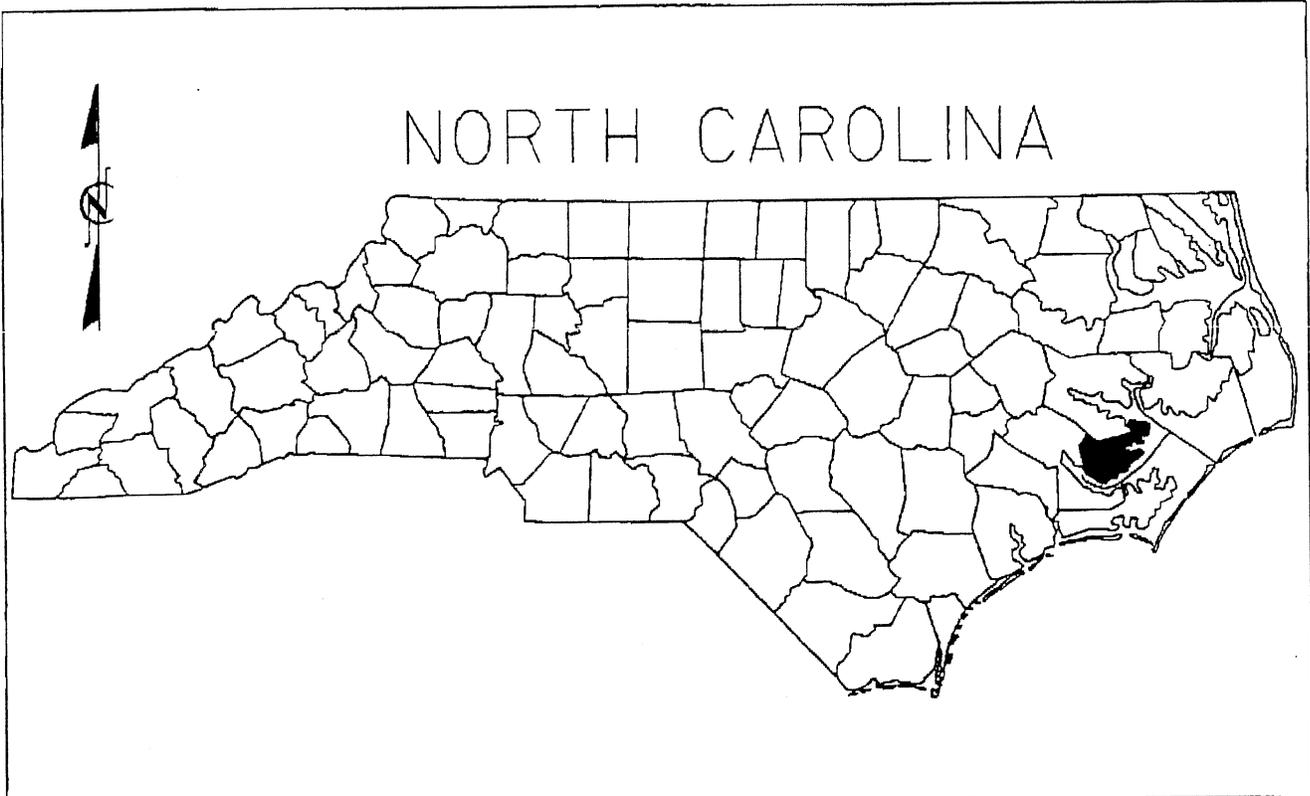
**WETLAND PERMIT IMPACT SUMMARY**

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS			SURFACE WATER IMPACTS					Natural Stream Design (ft)	
			Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation In Wetlands (ac)	Mechanized Clearing (Method III) (ac)	Fill In SW (Natural) (ac)	Fill In SW (Pond) (ac)	Temp. Fill In SW (ac)	Existing Channel Impacted (ft)		
1	153+20 to 154+20 -L-				0.01	0.17						
2	155+40 to 166+08 -L-			6.25*	0.12							
3	195+45 to 202+60 -L-		2.47		0.05	0.86						
3		3 @ 2.1 X 2.4 RCBC					0.05				135.5	
3		2 @ 2.7 X 1.8 RCBC					0.02				123	
4	202+20 -L-		0.02			0.01						
5	206+00 -L-	1 @ 2.4 x 1.2 RCBC					0.02				96.1	
<b>TOTALS:</b>			2.49	0	6.31	1.16	0.09	0	0	0	354.6	0

\* - There are 4.95 acres of Boussinesq impacts at Site No. 2.

**NCDOT**

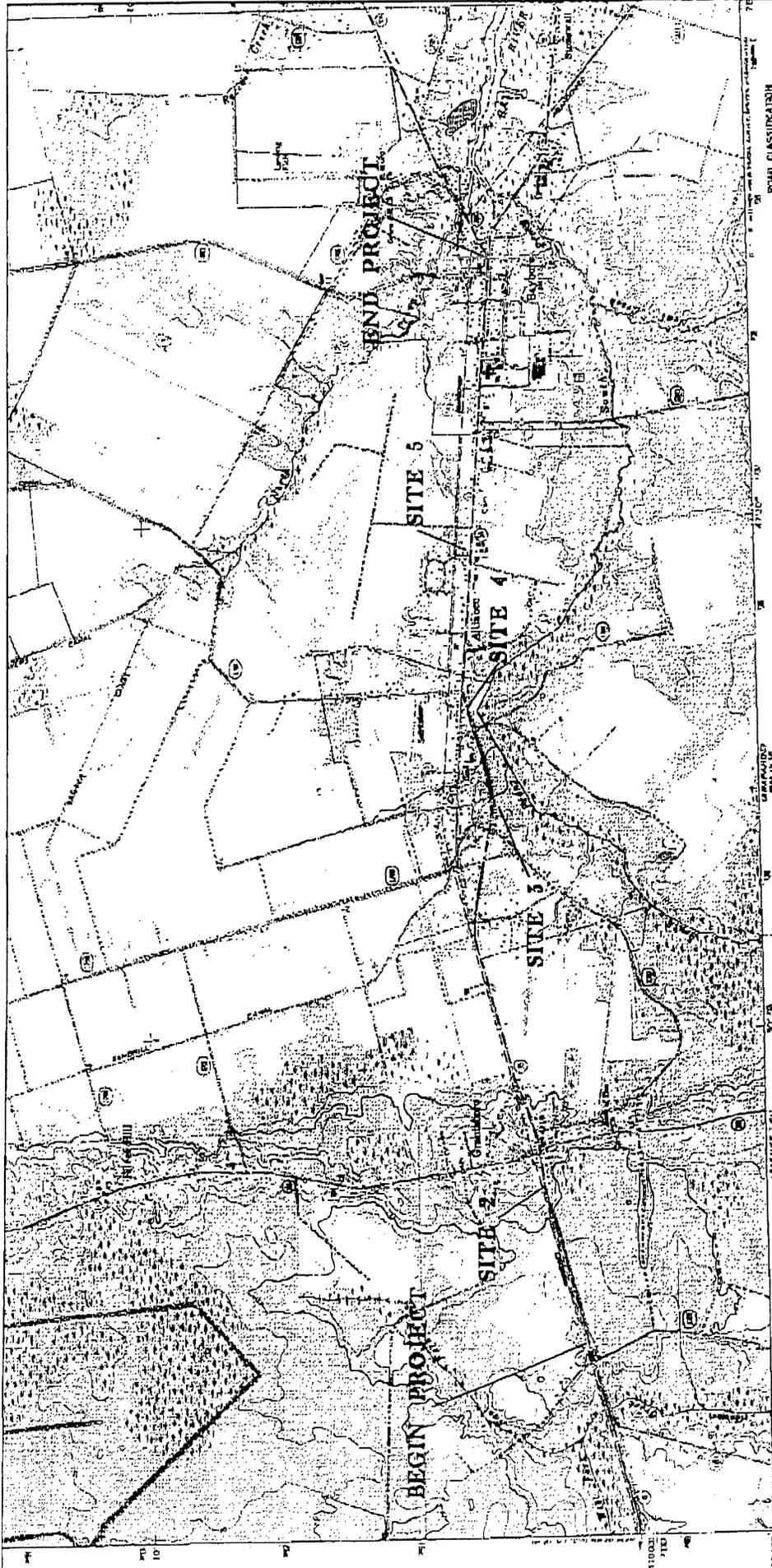
DIVISION OF HIGHWAYS  
PAMLICO COUNTY  
PROJECT 8.1170901 (R-2539C)  
NC 55 FROM EAST OF SR 1129  
TO NC 304 IN BAYBORO



**BUFFER  
VICINITY  
MAPS**

**NCDOT**  
**DIVISION OF HIGHWAYS**  
**PAMLICO COUNTY**  
**PROJECT: 8.1170901 (R-2539C)**  
**NC 55 FROM EAST OF SR 1129**  
**TO NC 304 IN BAYBORO**





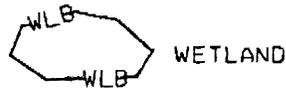
**NCDDT**  
 DIVISION OF HIGHWAYS  
 PAMLICO COUNTY  
 PROJECT: 8.1170901 (R-2539C)  
 NC 55 FROM EAST OF SR 1129  
 TO NC 304 IN BAYBORO

**TOPO MAP**  
 SCALE 1" = 4000'

**SHEET 3 OF 9**      7/9/03

# BUFFER LEGEND

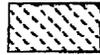
—WLB— WETLAND BOUNDARY



WETLAND



ALLOWABLE IMPACTS ZONE 1



ALLOWABLE IMPACTS ZONE 2



MITIGABLE IMPACTS ZONE 1



MITIGABLE IMPACTS ZONE 2

—BZ— RIPARIAN BUFFER ZONE

—BZ1— RIPARIAN BUFFER ZONE 1  
30 ft (9.2m)

—BZ2— RIPARIAN BUFFER ZONE 2  
20 ft (6.1m)

— FLOW DIRECTION

—TB— TOP OF BANK

—WE— EDGE OF WATER

—C— PROP. LIMIT OF CUT

—F— PROP. LIMIT OF FILL

▲ PROP. RIGHT OF WAY

—NG— NATURAL GROUND

—PL— PROPERTY LINE

—TDE— TEMP. DRAINAGE EASEMENT

—PDE— PERMANENT DRAINAGE EASEMENT

--EAB-- EXIST. ENDANGERED ANIMAL BOUNDARY

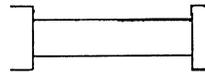
--EPB-- EXIST. ENDANGERED PLANT BOUNDARY

▽ WATER SURFACE

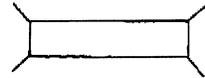
x x x x  
x x x x  
x x x x  
LIVE STAKES

○ BOULDER

— CORE FIBER ROLLS



PROPOSED BRIDGE



PROPOSED BOX CULVERT



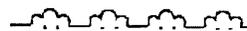
PROPOSED PIPE CULVERT

(DASHED LINES DENOTE EXISTING STRUCTURES)

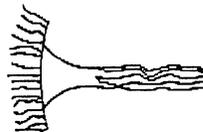
12"-48" PIPES  
54" PIPES & ABOVE



SINGLE TREE



WOODS LINE



DRAINAGE INLET



ROOTWAD

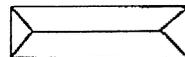
RIP RAP



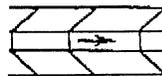
ADJACENT PROPERTY OWNER OR PARCEL NUMBER IF AVAILABLE



PREFORMED SCOUR HOLE (PSH)

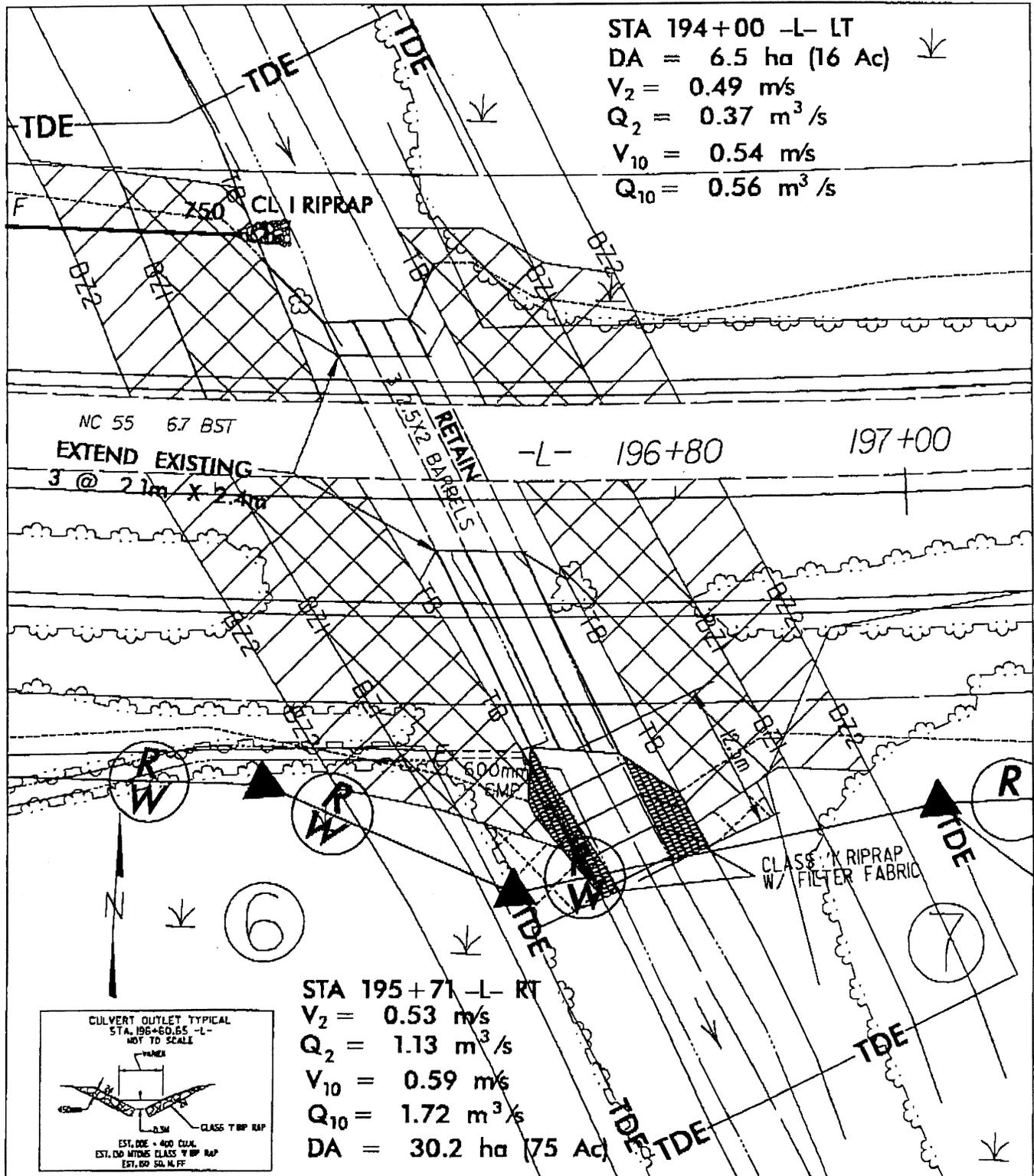


LEVEL SPREADER (LS)



GRASS SWALE

**NCDOT**  
**DIVISION OF HIGHWAYS**  
**PAMLICO COUNTY**  
**PROJECT: 8.1170901 (R-2539C)**  
**NC 55 FROM EAST OF SR 1129**  
**TO NC 304 IN BAYBORO**



PLAN VIEW  
 BUFFER  
 IMPACTS  
 SITE 3

SCALE = 1:500

NCDOT

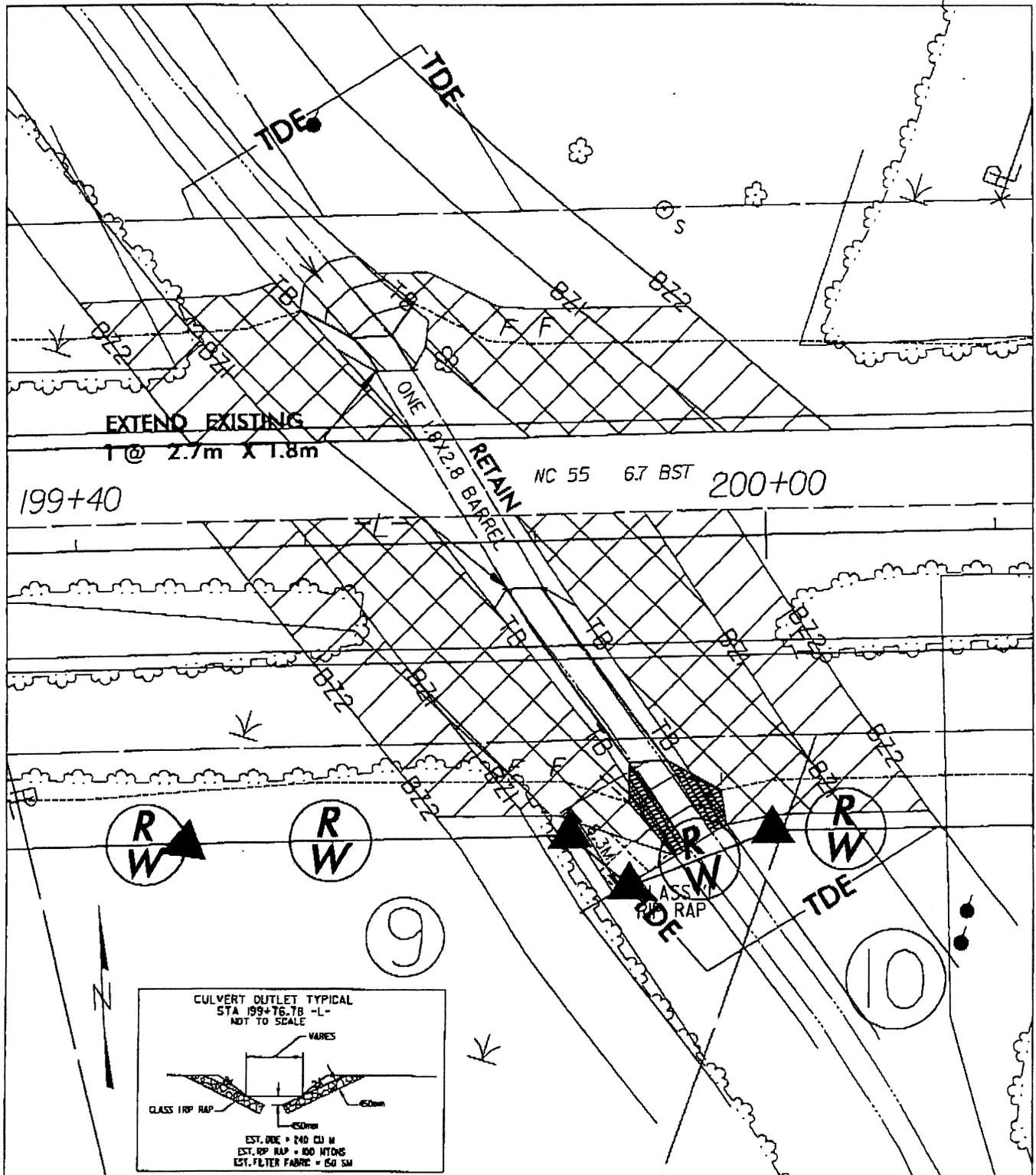
DIVISION OF HIGHWAYS

PAMLICO COUNTY

PROJECT: 8.1170901 (R-2539C)  
 NC 55 FROM EAST OF SR 1129  
 TO NC 304 IN BAYBORO

SHEET 5 OF 9

2/6/04

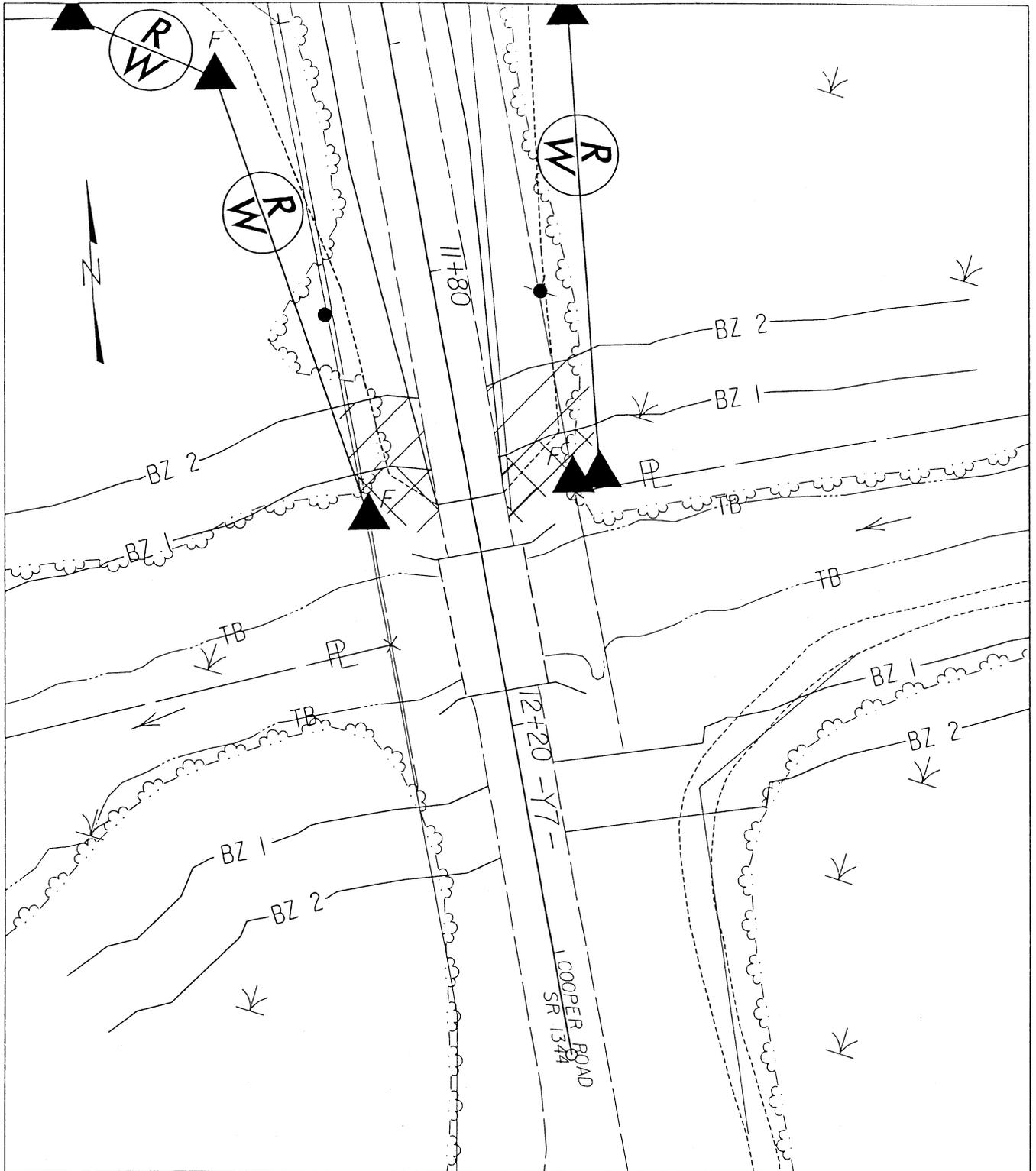


PLAN VIEW  
 BUFFER  
 IMPACTS  
 SITE 3  
 SCALE = 1:500

NCDOT  
 DIVISION OF HIGHWAYS  
 PAMLICO COUNTY  
 PROJECT: 8.1170901 (R-2539C)  
 NC 55 FROM EAST OF SR 1129  
 TO NC 304 IN BAYBORO

SHEET 6 OF 9

2/6/04

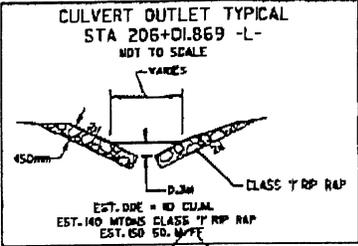
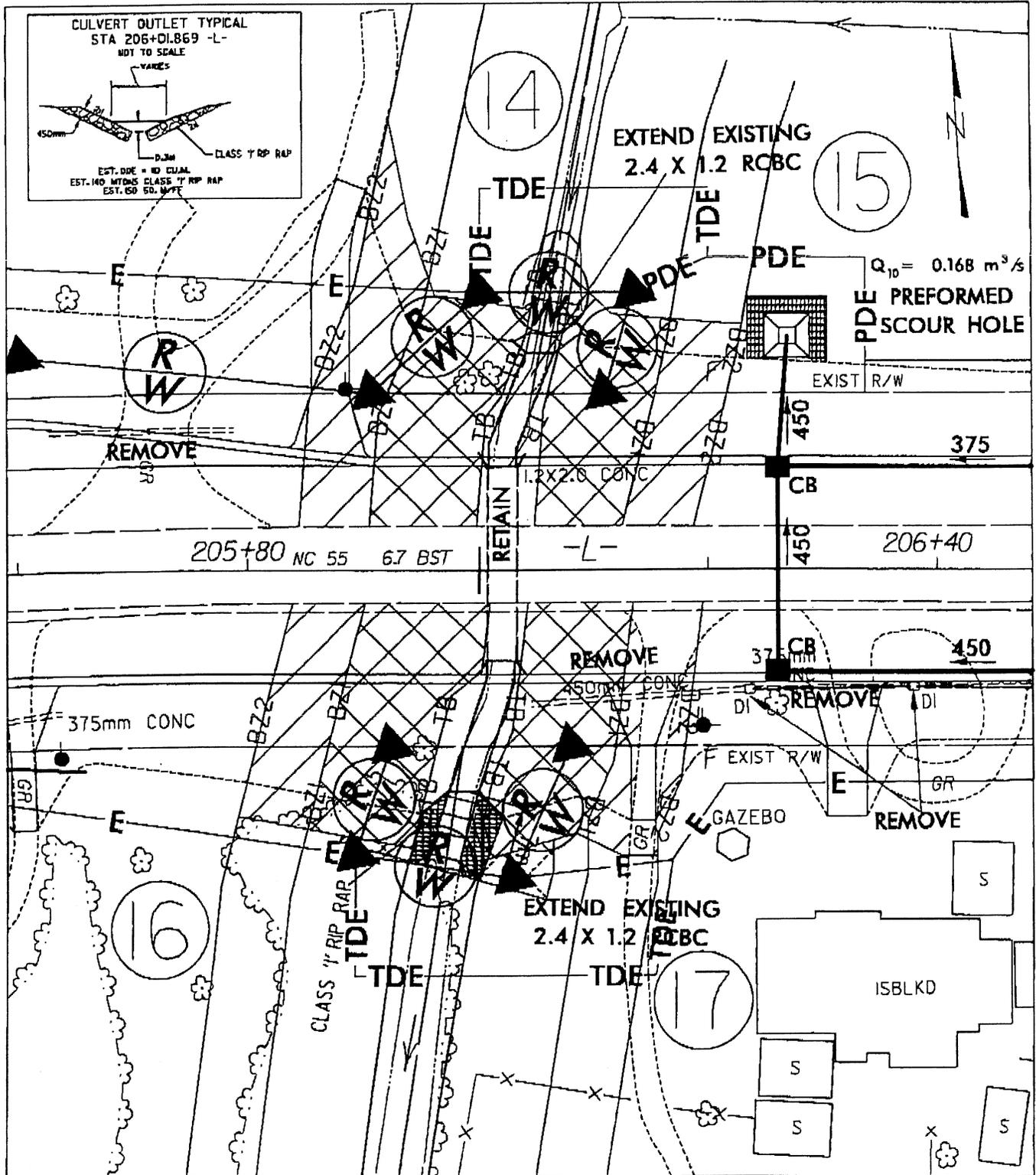


PLAN VIEW  
 BUFFER  
 IMPACTS  
 SITE 3A  
 SCALE = 1:500

NCDOT  
 DIVISION OF HIGHWAYS  
 PAMLICO COUNTY  
 PROJECT: 8.1170901 (R-2539C)  
 NC 55 FROM EAST OF SR 1129  
 TO NC 304 IN BAYBORO

SHEET 7 OF 9

7/1/04



**PLAN VIEW  
BUFFER  
IMPACTS  
SITE 5**

**SCALE = 1:500**

**NCDOT**

**DIVISION OF HIGHWAYS**

**PAMLICO COUNTY**

**PROJECT: 8.1170901 (R-2539C)**

**NC 55 FROM EAST OF SR 1129**

**TO NC 304 IN BAYBORO**

**SHEET 8 OF 9**

**2/6/04**





# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Raleigh Field Office  
Post Office Box 33726  
Raleigh, North Carolina 27636-3726

August 18, 2003

Elizabeth Lusk  
North Carolina Department of Transportation  
Project Development and Environmental Analysis  
1548 Mail Service Center  
Raleigh, North Carolina 27699-1548

Dear Ms. Lusk:

This letter is in response to your letter of July 31, 2003 which provided the U.S. Fish and Wildlife Service (Service) with the biological conclusion of the North Carolina Department of Transportation (NCDOT) that the proposed widening of NC 55 in Pamlico County (TIP No. R-2539, Sections B and C) is not likely to adversely affect the federally protected rough-leaved loosestrife (*Lysimachia asperulaefolia*) and will have no effect on the red-cockaded woodpecker (*Picoides borealis*), bald eagle (*Haliaeetus leucocephalus*), West Indian manatee (*Trichechus manatus*), shortnose sturgeon (*Acipenser brevirostrum*) and Kemp's ridley sea turtle (*Lepidochelys kempii*). These comments are provided in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

By way of a May 31, 2002 letter, the Service had previously concurred with a biological conclusion of "no effect" for all of the species stated above. Since that time, the biological conclusion for rough-leaved loosestrife was changed to "may affect, not likely to adversely affect." According to the information submitted to us, a survey was conducted for rough-leaved loosestrife on July 29, 2003 by biologists from Stantec Consulting, Inc. No populations of rough-leaved loosestrife were observed.

Based on the negative survey results, the Service concurs with your conclusion that the proposed project is not likely to adversely affect the rough-leaved loosestrife. Please note that the National Marine Fisheries Service has jurisdiction for the shortnose sturgeon. We believe that the requirements of section 7 (a)(2) of the ESA have been satisfied. We remind you that obligations under section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered in this review; (2) this action is subsequently modified in a manner that was not considered in this review; or (3) a new species is listed or critical habitat determined that may be affected by this identified action.

The Service appreciates the opportunity to review this project. If you have any questions

regarding our response, please contact Mr. Gary Jordan at (919) 856-4520 (Ext. 32).

Sincerely,

A handwritten signature in black ink that reads "Garland B. Pardue". The signature is written in a cursive style with a large initial 'G'.

Garland B. Pardue, Ph.D.  
Ecological Services Supervisor

cc: Mike Bell, USACE, Washington, NC  
David Franklin, Wilmington, NC  
John Hennessy, NCDWQ, Raleigh, NC  
Travis Wilson, NCWRC, Creedmore, NC  
Chris Militscher, USEPA, Raleigh, NC

**TECHNICAL MEMORANDUM (REVISED)**  
**DITCH IMPACT STUDY**  
**NC 55 WIDENING**  
**PAMLICO COUNTY, NORTH CAROLINA**  
**TRAFFIC IMPROVEMENT PROJECT (TIP) R-2539C**



**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION**  
**PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH**  
**RALEIGH, NORTH CAROLINA**

**OCTOBER 2004**

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**TECHNICAL MEMORANDUM**  
**DITCH IMPACT STUDY**  
**NC 55 WIDENING (R-2539C)**  
**PAMLICO COUNTY, NORTH CAROLINA**

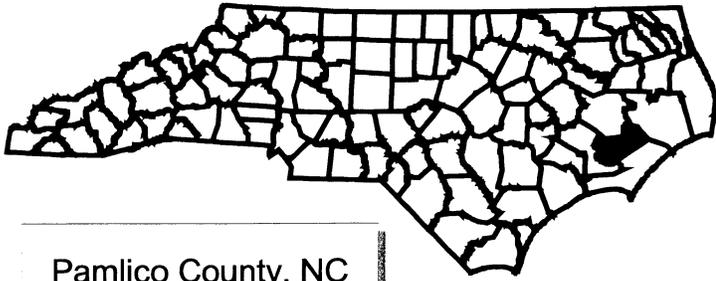
**1.0 INTRODUCTION**

The North Carolina Department of Transportation (NCDOT) is proposing to widen NC 55 east of the Neuse River in Craven and Pamlico Counties (Figure 1). The total length of the R-2539 project extends approximately 15.5 miles. The current study, which focuses on three ditches located between station numbers 156+68 and 165+77 in the Pamlico County portion of the alignment (Section C), has been undertaken to evaluate the drainage impact caused by special ditches<sup>1</sup> (hereafter referred to as the “project ditches”) constructed adjacent to the proposed facility (Figure 1). The results of this modeling effort will be used to determine the portion of wetlands permanently impacted by the project ditches through reduction in the wetland hydroperiod. This drainage impact will be considered cumulative with other filling, excavation, and mechanized clearing activities within Section 404 jurisdictional areas and is expected to be considered in the Section 404 and Section 401 permit applications. The proposed drainage impact predicted in this study may overlap with other filling, excavation, and mechanized clearing activities within jurisdictional areas. Special consideration should be given to these overlapping areas when combining these impacts to the wetland hydroperiod to avoid overestimation of jurisdictional impacts. EcoScience Corporation (ESC) has been retained to estimate the drainage influence of the project ditches, as well as determine the portion of jurisdictional wetlands impacted by these drainage influences. The locations and details of the ditches were provided by NCDOT to ESC personnel.

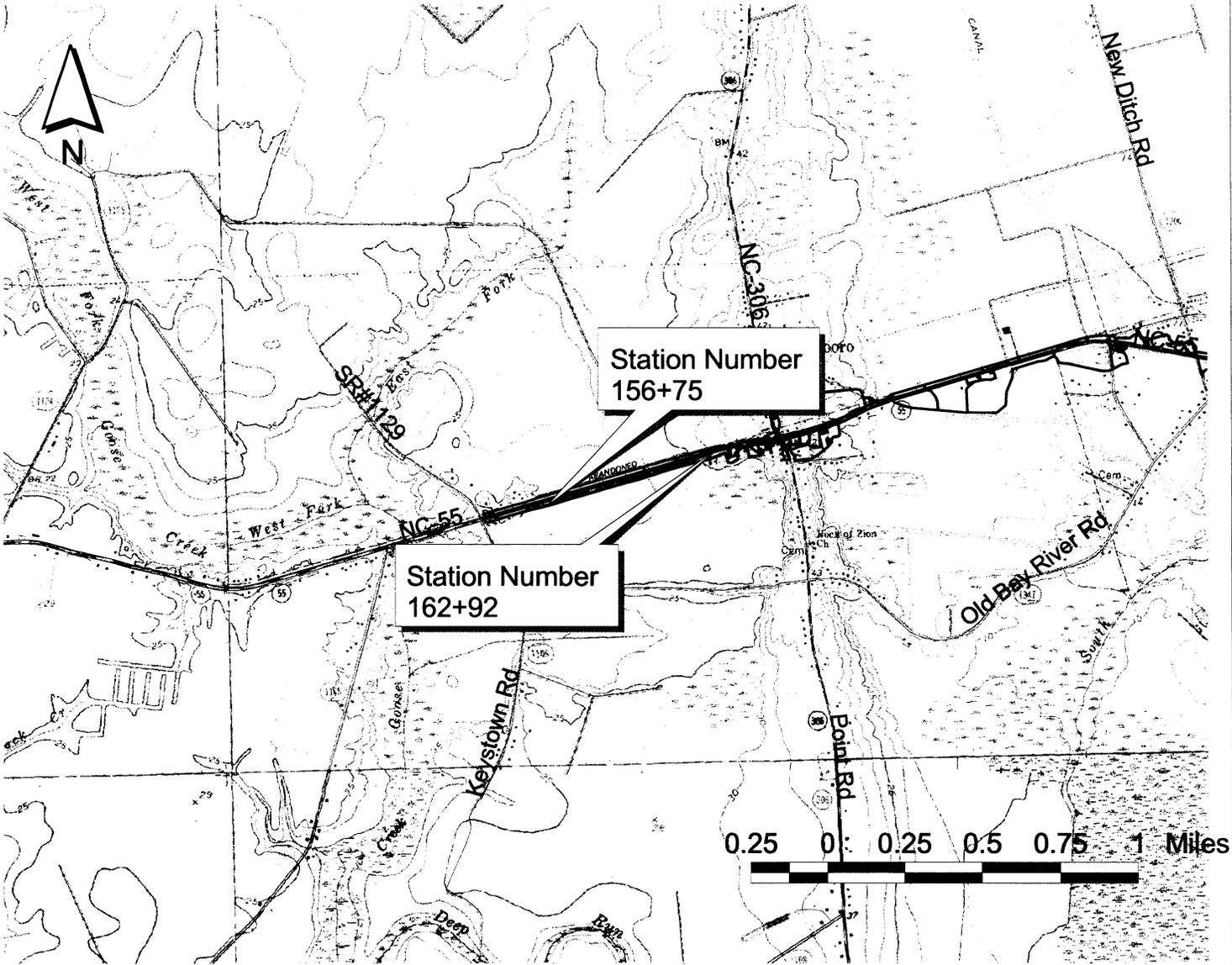
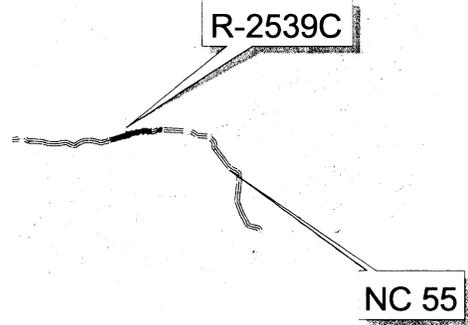
Specifically, the goal of this study is to compare the output of two models (the Boussinesq Equation and DRAINMOD) that estimate the linear distance of drainage impact to jurisdictional wetlands from the edge of each ditch. As requested by NCDOT, results from the Boussinesq Equation were supplemented by results generated by the hydraulic model DRAINMOD.

---

<sup>1</sup>Special ditches generally parallel the road corridor and are designed to induce a groundwater withdrawal gradient within adjacent fill material. The withdrawal gradient is intended to protect the roadway’s substrate from underlying water.



Pamlico County, NC



Site Location

Ditch Impact Study  
 NC 55 Widening (R-2539C)  
 Pamlico County, North Carolina

DATE:	ESC #
Apr 2004	02-133.43
SCALE:	DWN BY: DKO
As Shown	CKD BY: BA

FIGURE 1



## **2.0 METHODS**

### **MODEL DESCRIPTIONS**

The Boussinesq Equation represents a two-dimensional general flow equation for unconfined aquifers. The equation has been applied in the past to predict the decline in water table elevation near a pumping well as time progresses. The equation is based primarily on hydraulic conductivity, drainable porosity, and the saturated thickness of the aquifer. One form of the equation is as follows:

$$X = (K h_0 t/f)^{1/2} F(D,H)$$

Where:

K = hydraulic conductivity (inches/hour)

$h_0$  = depth to aquiclude (inches)

t = duration (hours)

f = drainable porosity (dimensionless ratio)

F(D,H) = profiles (graphs) relating ditch depth, water table depth, and depth to the aquiclude( $h_0$ )

X = drainage impact distance (inches)

DRAINMOD was originally developed to simulate the performance of agricultural drainage and water table control systems on sites with shallow water table conditions. DRAINMOD predicts water balances in the soil-water regime at the midpoint between two drains of equal elevation. The model is capable of calculating hourly values for water table depth, surface runoff, subsurface drainage, infiltration, and actual evapotranspiration over long periods referenced to measured climatological data. The reliability of DRAINMOD has been tested for a wide range of soil, crop, and climatological conditions. Results of tests in North Carolina (Skaggs, 1982), Ohio (Skaggs *et al.* 1981), Louisiana (Gayle *et al.* 1985; Fouss *et al.* 1987), Florida (Rogers 1985), Michigan (Belcher and Merva 1987), and Belgium (Susanto *et al.* 1987) indicate that the model can be used to reliably predict water table elevations and drain flow rates. DRAINMOD has also been used to evaluate wetland hydrology by Skaggs *et al.* (1993). Methods for evaluating water balance equations and equation variables are discussed in detail in Skaggs (1980).

DRAINMOD was modified for application in wetland studies by adding a counter that accumulates the number of events wherein the water table rises above a specified depth and remains above that threshold depth for a given duration during the growing season. Important inputs into the DRAINMOD model include rainfall data, soil and surface storage parameters, evapotranspiration rates, ditch depth and spacing, and hydraulic conductivity values.

### **MODEL APPLICATION**

The three project ditches considered in this study are: Ditch 1, from approximately station numbers 156+68 to 160+20 on both sides of the road; Ditch 2, from approximately stations 160+20 to 162+92 on both sides of the road; and Ditch 3, from approximately station numbers 164+60 to 165+77 on the south side of the road.

In this study, the Boussinesq Equation was applied to the project ditches to predict the linear distance of groundwater drawdown exceeding 1 foot for 5- and 12.5-percent of the growing season. These percentages were selected based upon guidance from the U.S. Army Corps of

Engineers Wetland Delineation Manual (DOA 1987). The equation is solved for the wetland impact distance with data for the following variables: 1) equivalent hydraulic conductivity, 2) drainable porosity, 3) an estimated depth to the impermeable layer or aquiclude, 4) the time duration of the drawdown, 5) target water table depth (1 foot below the soil surface), and 6) minimum ditch depth.

The dominant soil types along the project ditches were determined based upon the Pamlico County soil survey (USDA 1987) then verified in the field. The Leaf series was mapped at the project ditch locations and field verified to be the dominant soil. The Leaf series consists of poorly drained soils that formed in fine-textured sediment on uplands. Slopes range from 0 to 8 percent. Hydraulic conductivity (K) for the predominant soil layer was measured in the field. Conductivities for soil layers above the water table and below the auger depth were estimated from published values (USDA 1987). The soil layer depths were obtained from descriptions in the Pamlico County soil survey and field verified. Drainable porosity was determined using published data (Tweedy 1998) for the Leaf series in Craven County. Field investigations determined that the aquiclude was more than 9 feet below the surface of the soil. The depth to aquiclude was assumed to be 10 feet as a conservative estimate.

The time variable,  $t$ , is based on 5- and 12.5-percent of the Pamlico County growing season, 13 and 33 days, respectively. For the purpose of this study, the growing season is defined as the period between March 7 and November 22 (USDA 1987). Values for the function  $F(D,H)$ , defined as a function of ditch depth, water table depth, and depth to the aquiclude, were taken from plotted numerical solutions to the Boussinesq Equation (Figure 2f attached, Skaggs 1976), where  $D=d / h_0$  and  $H= h/ h_0$ . The variable  $d$  is defined as the ditch elevation above aquiclude. The variable  $h_0$  is the distance from the surface to the aquiclude. The variable  $h$  is equal to the height after drawdown for the water above the aquiclude at distance  $X$  from the ditch. For the purposes of this analysis,  $h$  was defined as the distance between the aquiclude and a point 1 foot below the surface. Minimum ditch depths at each site were provided by NCDOT.

DRAINMOD was used to model the zone of wetland loss resulting from the addition of the project ditches. This zone was estimated by determining the threshold drain spacing of parallel ditches that would result in the area adjacent to the ditches meeting the wetland hydrology criterion in just over one-half of the years simulated. Ditches spaced any closer than this threshold distance would result in the entire area between the ditches experiencing a loss of wetland hydrology. If ditches were spaced any further apart than the threshold distance, there would be a strip between the ditches which would still meet the wetland hydrology criteria. Since only one ditch exists, areas outside of one-half of the threshold distance are predicted to have wetland hydrology; therefore, one-half of this threshold spacing provides a safe-side estimate of the drainage effect that the project ditch will have. This application of the model recognizes that the water table midway between ditches spaced at the threshold spacing will be lower (i.e., the soil at that point will be drier) than would be the case at the same distance from a single ditch (i.e., at a distance of one-half the threshold spacing from a single ditch). Therefore, the width of the strip of land that would experience hydrologic conversion from wetland to upland hydraulic conditions due to a single ditch would be less than a distance equal to one-half the threshold spacings. One-half the threshold spacing is the ditch effect reported in Tables 1 and 2.

Wetland hydrology is defined for DRAINMOD as groundwater within 12 inches of the ground surface for 13 (5-percent) and 33 (12.5-percent) consecutive days during the growing season in Pamlico County. Wetland hydrology is achieved in the model if target hydroperiods are met for more than one-half of the years modeled (i.e., 23 out of 45 years).

Additional inputs for soil parameters and relationships derived from soil water characteristic data such as the water table depth/volume drained/upflux relationship, Green-ampt parameters, and the water content/matric suction relationship were obtained from published values (Tweedy 1998) for the Leaf series. Hydraulic conductivities and ditch depths were calculated as described above. Surface depressional storage was estimated from published ranges (Skaggs *et al.* 1994 and Skaggs 1980) after visiting the sites. Drainage coefficients for the ditches were calculated based on NCDOT ditch details, design plans, and formulas provided with DRAINMOD.

Weather data for a 45-year period were obtained for New Bern, NC in Craven County, approximately 12 miles from the study site. Missing measurements were estimated from data for the same date in the previous year. Potential evapotranspiration rates were calculated based on Thornthwaite's method and adjusted using monthly factors derived for Eastern North Carolina. The DRAINMOD simulation was conducted for the time period from 1949 through 1993.

### **3.0 RESULTS AND CONCLUSIONS**

Both the Boussinesq Equation and DRAINMOD have an ability to support different ditch morphology and features, suggesting that use of these methods in evaluation of drainage impacts from highway ditches is applicable with proper data inputs that fully reflect the differences between highway ditches and agricultural ditches. Comparing the output from both methods is recommended because output can be considered to predict the lower and upper limits of a range of drainage influence that is likely to occur in real-world conditions. The results are presented in Tables 1 and 2.

The Boussinesq equation predicts a zone of impact ranging from 14.3 feet to 180 feet depending on ditch depth and the wetland hydroperiod criteria used. The predicted effects to the U.S. Army Corps of Engineers verified wetland delineation as depicted on the permit drawings supplied by NCDOT resulted in total impacts of 6.6 acres (0.7 + 4.9 + 1.0, Table 1) for the project ditches throughout the entire project corridor for 5 percent of the growing season (Figures 2a – 2e) and 12.4 acres (0.9 + 9.1 + 2.4, Table 2) for 12.5 percent of the growing season.

The DRAINMOD model, believed to estimate a maximum zone of influence, predicts a zone of impact ranging from 100.1 feet to 303.5 feet depending on ditch depth and the wetland hydroperiod criteria used. Total impacts of 12.7 acres (5.5 + 5.9 + 1.3, Table 1) were predicted for the project ditches throughout the entire project corridor for 5 percent of the growing season (Figures 2a – 2e) and 35.7 acres (14.5 + 15.3 + 5.9, Table 2) for 12.5 percent of the growing season.

**Table 1. Results for 5% of the Growing Season**

Ditch	Min. Ditch Depth (feet)	Ditch Elevation Above Aquiclude, d (inches)	Surface Elevation Above Aquiclude, h <sub>0</sub> (inches)	Height After Drawdown Above Aquiclude, h (inches)	H	D	F(D,H)	Boussinesq Drainage Impact (feet)	Boussinesq Drainage Impact (acres)	Drainmod Maximum Drainage Impact (feet)	Drainmod Maximum Drainage Impact (acres)
1	1	108	120	108	0.9	0.9	15	14.3	0.7	100.1	5.5
2	1.5	102	120	108	0.9	0.85	1.9	113.0	4.9	133.4	5.9
3	1.5	102	120	108	0.9	0.85	1.9	113.0	1.0	133.4	1.3

**Table 2. Results for 12.5% of the Growing Season**

Ditch	Min. Ditch Depth (feet)	Ditch Elevation Above Aquiclude, d (inches)	Surface Elevation Above Aquiclude, h <sub>0</sub> (inches)	Height After Drawdown Above Aquiclude, h (inches)	H	D	F(D,H)	Boussinesq Drainage Impact (feet)	Boussinesq Drainage Impact (acres)	Drainmod Maximum Drainage Impact (feet)	Drainmod Maximum Drainage Impact (acres)
1	1	108	120	108	0.9	0.9	15	22.8	0.9	245.7	14.5
2	1.5	102	120	108	0.9	0.85	1.9	180.0	9.1	303.5	15.3
3	1.5	102	120	108	0.9	0.85	1.9	180.0	2.4	303.5	5.9

The largest percentage differences between lateral ditch influences predicted by the separate models were predicted for the shallowest ditch (Ditch 1). The absolute difference between the estimates by the two models for Ditch 1 at 12.5 percent of the growing season (22.8 to 245.7 feet; Table 2) was the greatest. When long periods of saturation are required for the desired wetland criteria, even the smallest drainage impact can potentially reduce the likelihood of a site staying saturated for extended periods of time (33 days in this case). When the saturation period is reduced (such as 5 percent of the growing season), the reported values between Boussinesq Equation and DRAINMOD are more similar (113 to 133.4 feet; Table 1). The percentage difference between the Boussinesq Equation and DRAINMOD estimates was relatively smaller for the deeper ditch.

This application of the Boussinesq Equation includes several simplifying assumptions. The equation does not consider the fluctuation of the water table (hydroperiod) from evapotranspiration (ET) and precipitation due to site-specific weather. Additionally, the Boussinesq Equation requires that different lateral hydraulic conductivities (K) for separate soil layers be combined to one weighted average for use in the equation. Likewise, the equation also assumes a constant drainable porosity (f). Drainable porosity and saturated hydraulic conductivity are more realistically considered a function of hydraulic head.

DRAINMOD more fully assesses wetland hydroperiods than the Boussinesq Equation. DRAINMOD considers variability in rainfall, evapotranspiration, hydraulic conductivities, drainable porosity and other hydrologic parameters. DRAINMOD simulations predict the ditch spacing required to lower the water table below 12 inches of the surface for 5- and 12.5-percent of the growing season. As discussed earlier, this spacing is a conservative estimate of the effect of a single ditch. This fact suggests that actual impacts to the wetland hydroperiod will be less than the values reported in Tables 1 and 2. Results are graphically shown in Figures 2a through 2e.

In summary, two different methods were used to simulate the drainage impacts of the project ditches on the wetland hydroperiod within jurisdictional systems adjacent to NC 55 in Pamlico County. The Boussinesq Equation and DRAINMOD model were utilized to predict the lateral extent of the ditch impact on ground or surface water within 1 foot of the land surface for two jurisdictional thresholds (i.e., 5- or 12.5-percent of the growing season). The predicted lateral effects for each ditch reported indicate the probable range of potential impacts. The predicted lateral effects for the ditches range from 14.3 to 303.5 feet.



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Raleigh, North Carolina

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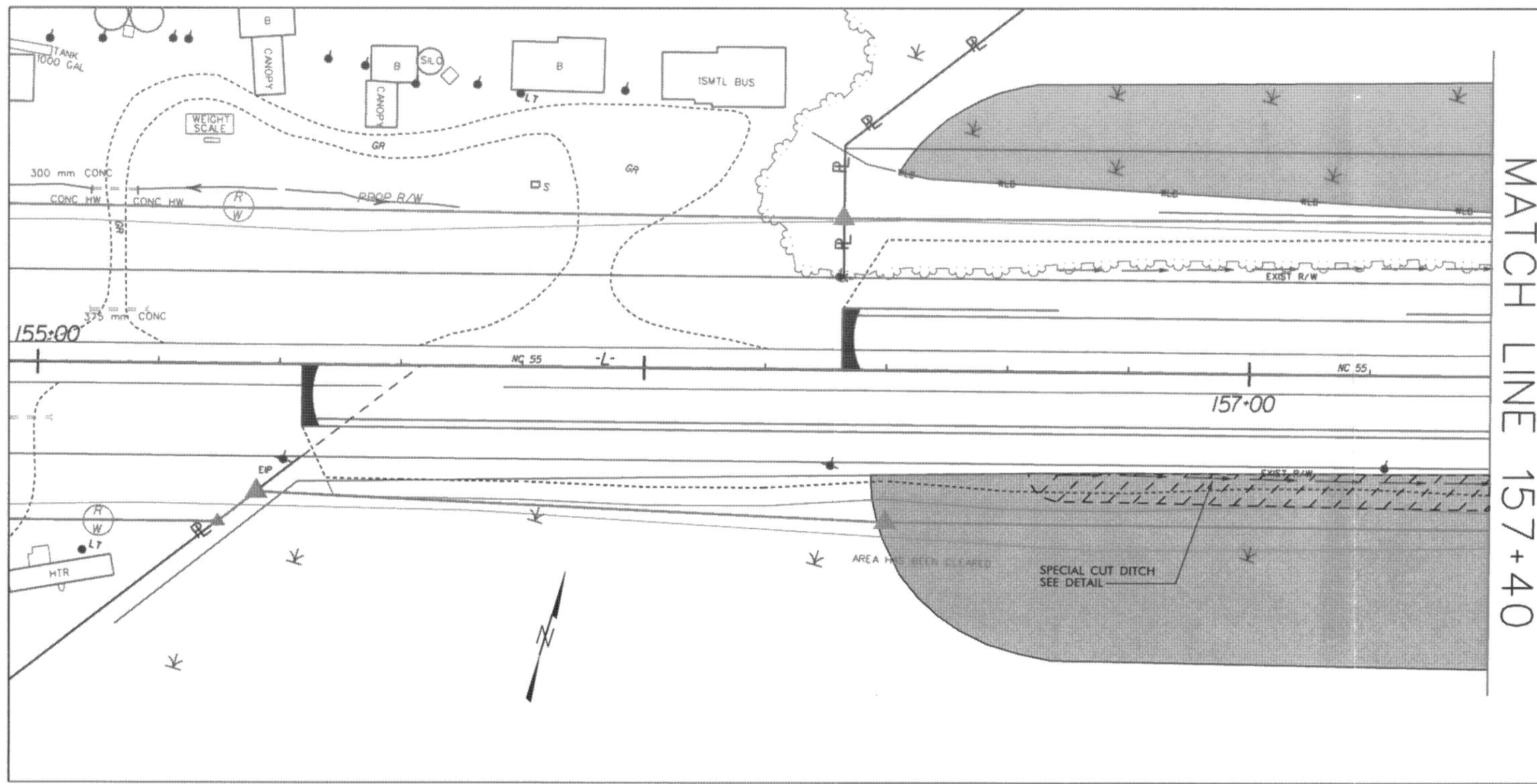
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**NCDOT**

Project:  
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PAMLICO COUNTY, NORTH CAROLINA

Title:  
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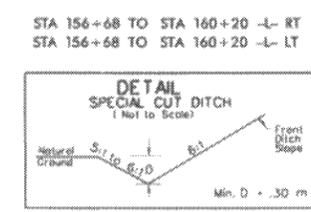
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Checked By:	Scale:
DO	1" = 20m
ESC Project No.: 02-113.43	

FIGURE  
**2A**



MATCH LINE 157+40

- MINIMUM (BOUSSINESQ) SPECIAL DITCH IMPACTS
- MAXIMUM (DRAINMOD) SPECIAL DITCH IMPACTS
- EXISTING DITCH
- SPECIAL CUT DITCH





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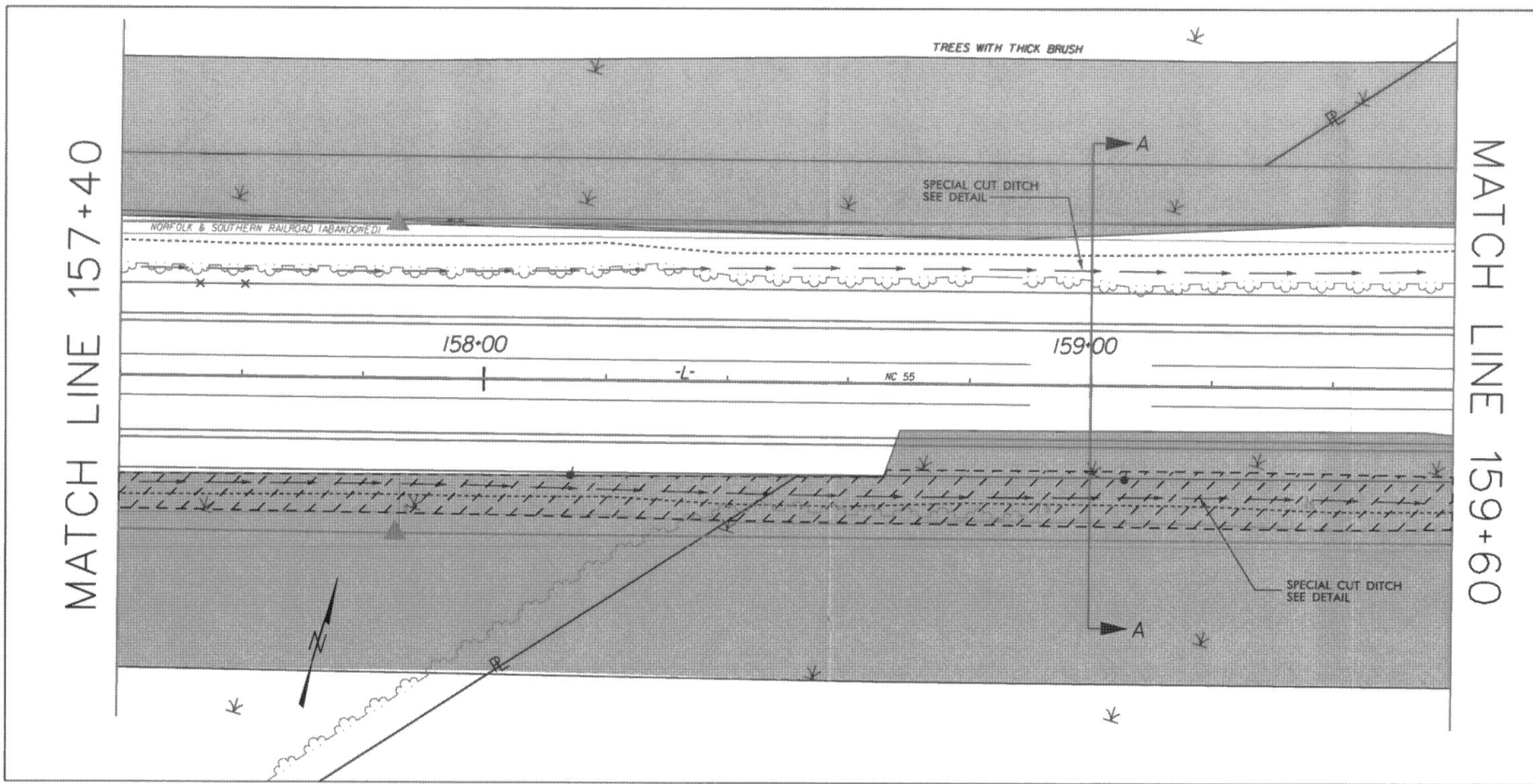
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PAMLICO COUNTY,  
NORTH CAROLINA

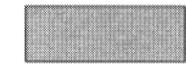
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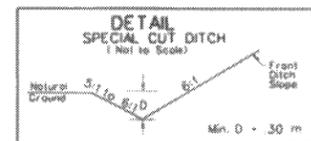
ESC Project No.:  
02-113.43

FIGURE  
**2B**



-  MINIMUM (BOUSSINESQ) SPECIAL DITCH IMPACTS
-  MAXIMUM (DRAINMOD) SPECIAL DITCH IMPACTS
-  SPECIAL CUT DITCH

STA 156+68 TO STA 160+20 -L- RT  
STA 156+68 TO STA 160+20 -L- LT





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REVISIONS	

Client:  
**NCDOT**

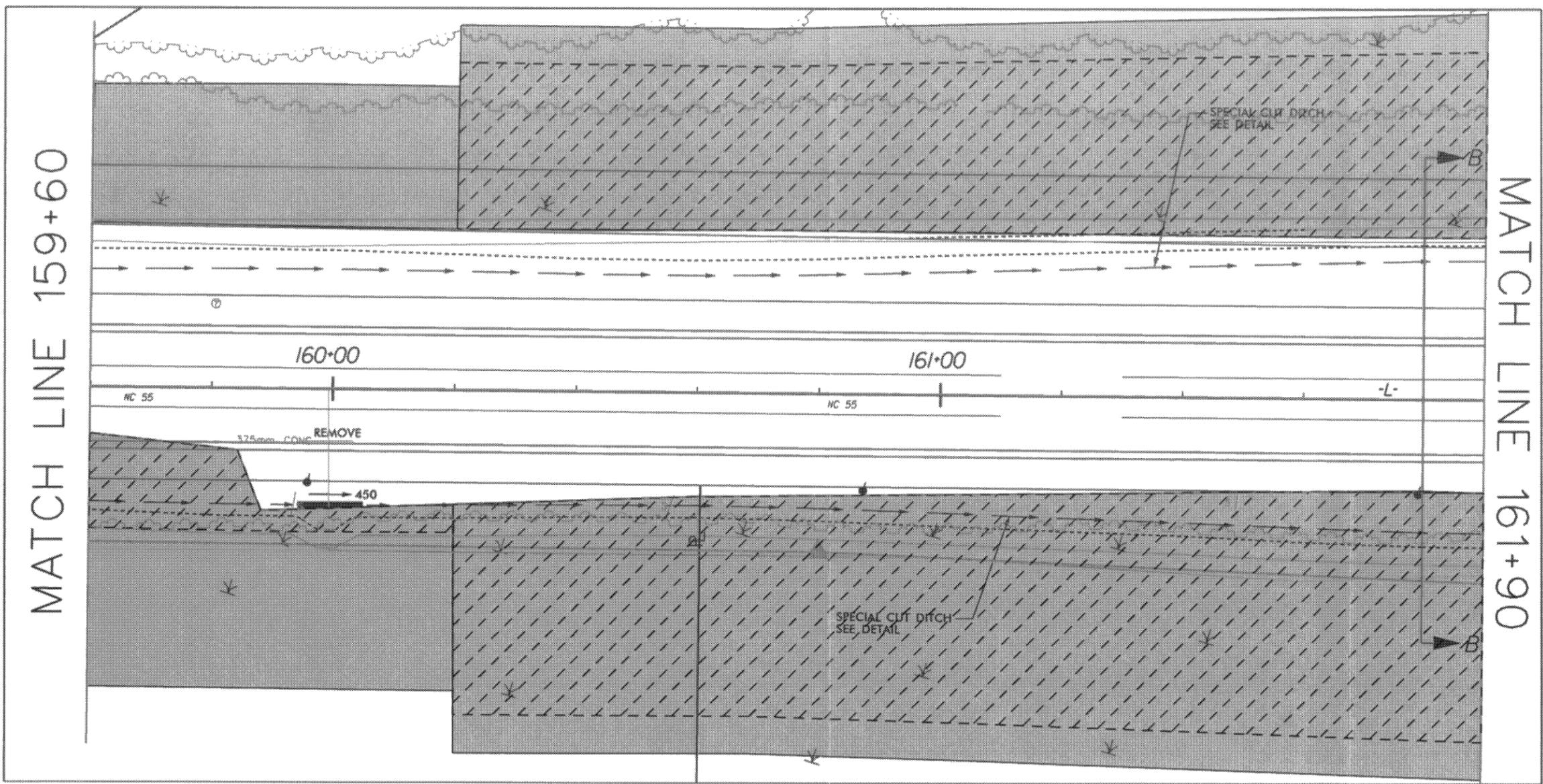
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PAMLICO COUNTY, NORTH CAROLINA

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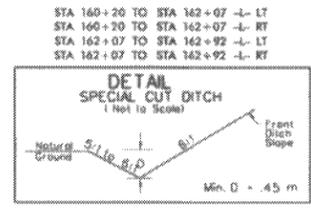
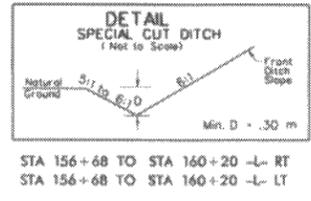
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ESC Project No.: 02-113.43

FIGURE  
**2C**



- MINIMUM (BOUSSINESQ) SPECIAL DITCH IMPACTS
- MAXIMUM (DRAINMOD) SPECIAL DITCH IMPACTS
- SPECIAL CUT DITCH





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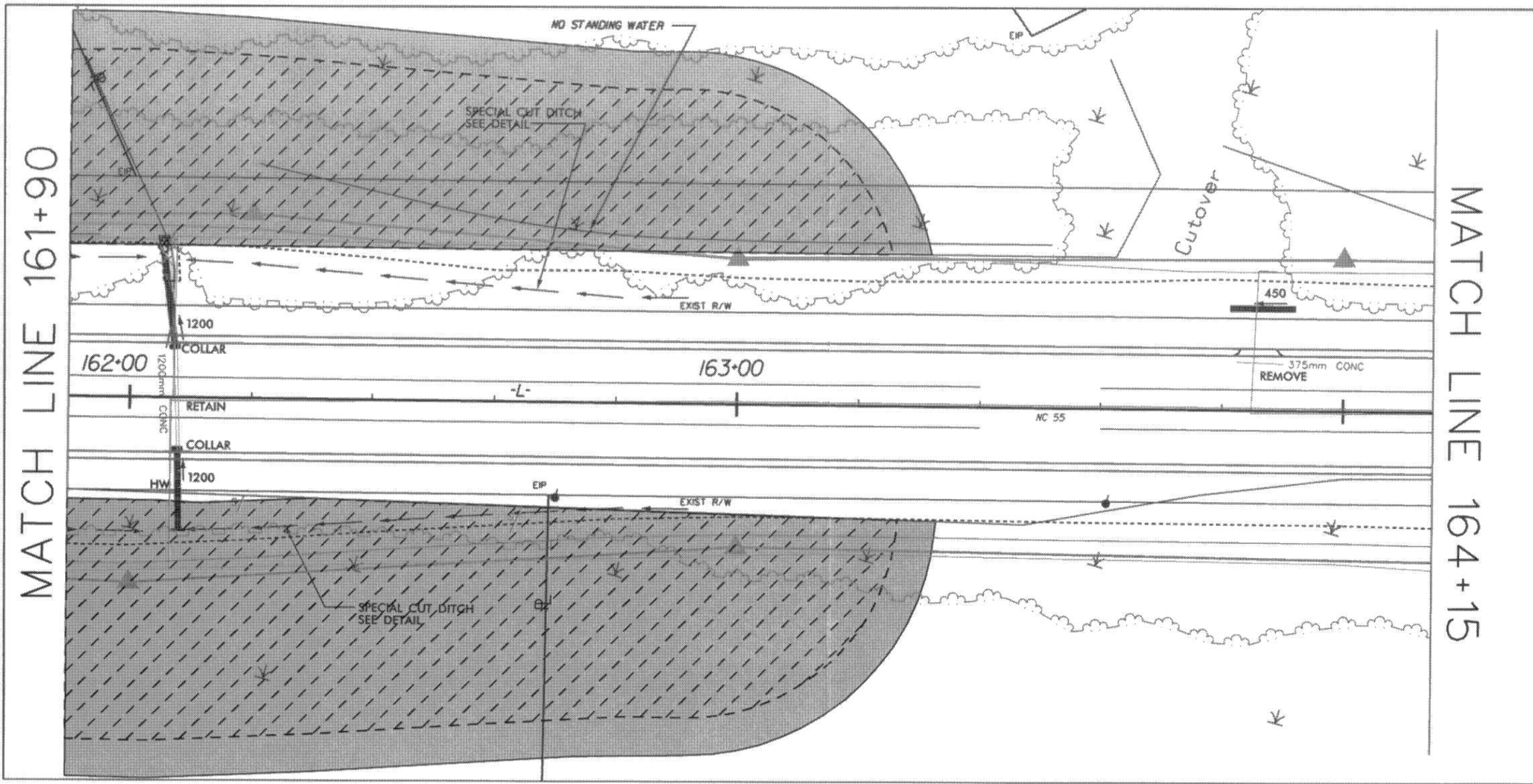
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**NC55 DRAINAGE STUDY**  
  
PAMLICO COUNTY,  
NORTH CAROLINA

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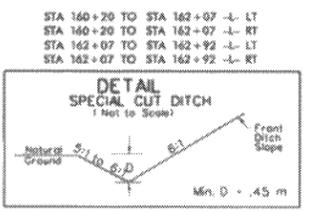
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Ckd By: DO Scale: 1" = 20m

ESC Project No.: 02-113.43

FIGURE  
**2D**



-  MINIMUM (BOUSSINESQ) SPECIAL DITCH IMPACTS
-  MAXIMUM (DRAINMOD) SPECIAL DITCH IMPACTS
-  SPECIAL CUT DITCH





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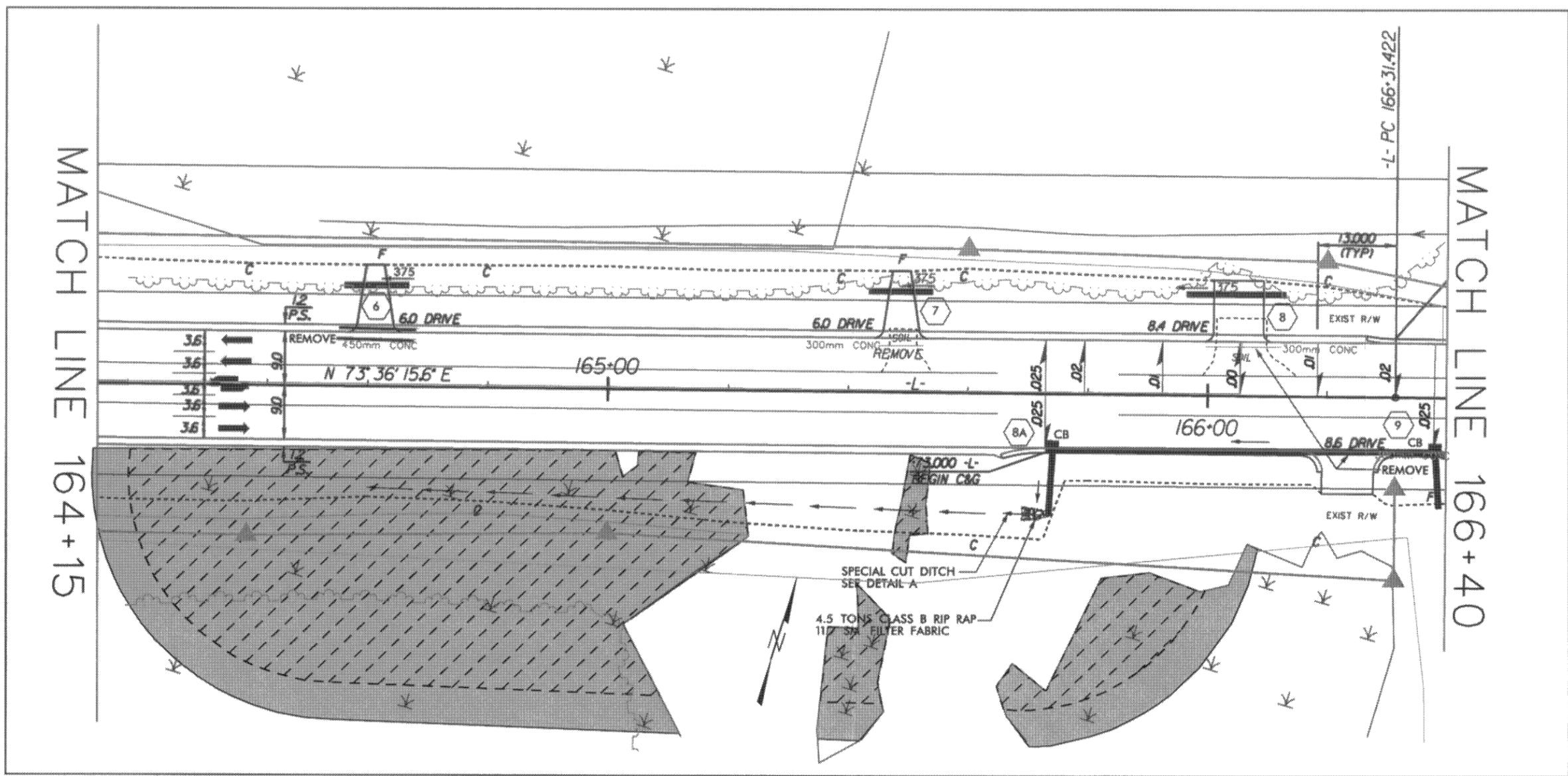
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Project:  
**NC55 DRAINAGE STUDY**  
  
PAMLICO COUNTY, NORTH CAROLINA

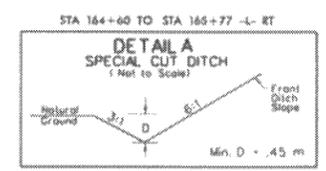
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ESC Project No.: 02-113.43	

FIGURE  
**2E**



- MINIMUM (BOUSSINESQ) SPECIAL DITCH IMPACTS
- MAXIMUM (DRAINMOD) SPECIAL DITCH IMPACTS
- SPECIAL CUT DITCH



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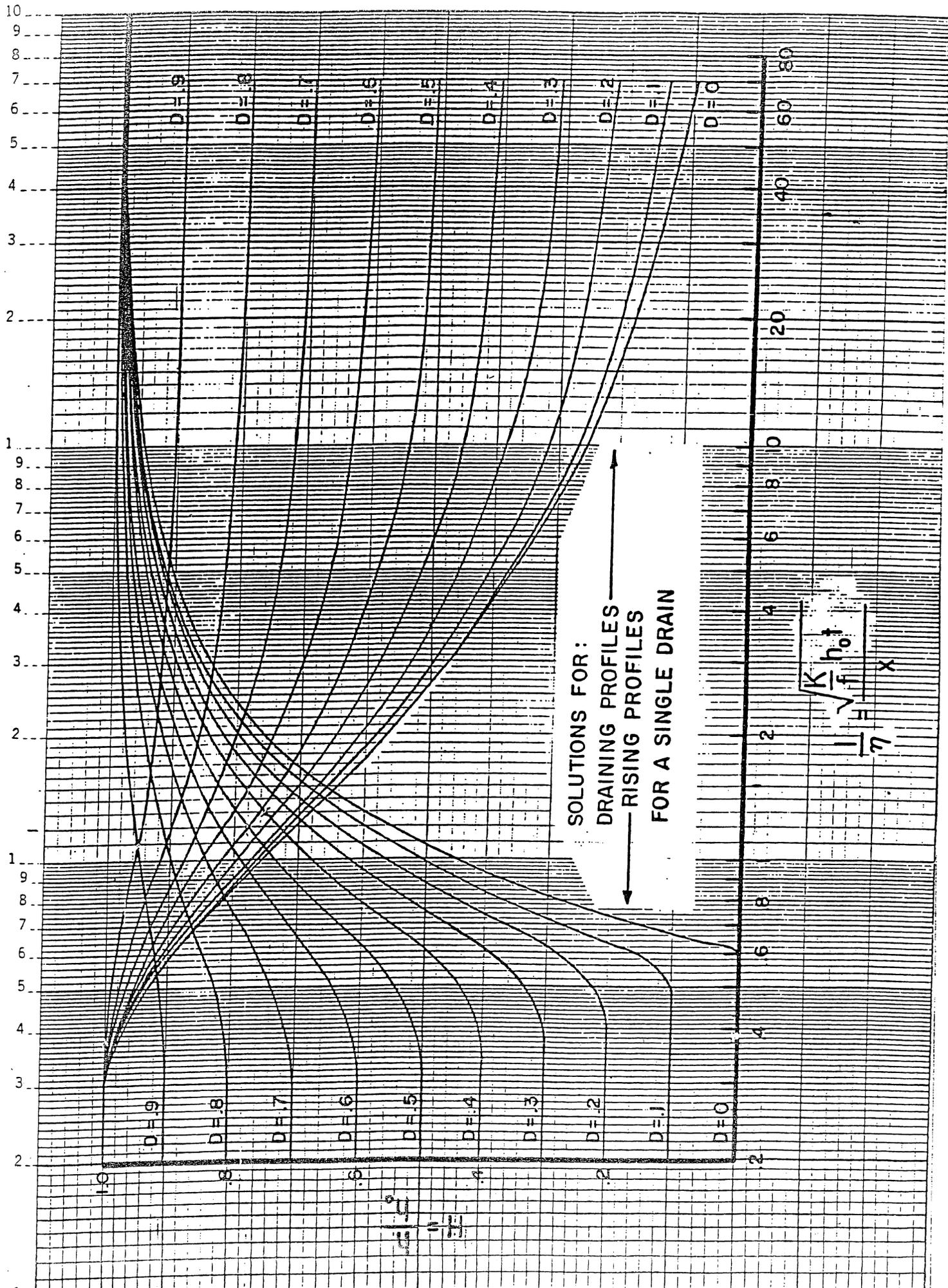


Figure 2j. - Skaggs 1976



## **INDIRECT AND CUMULATIVE EFFECTS ASSESSMENT**

**NC 55 from SR 1129 (Bennett-Tingle Rd)  
to NC 304 in Bayboro**

**TIP R-2539C**

**PAMLICO COUNTY, NORTH CAROLINA**

**PREPARED BY:**

*Steve Gurganus, AICP, Community Planner*

**The North Carolina  
Department of Transportation  
Office of Human Environment  
Public Involvement & Community Studies Unit**

**August 20, 2004**

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

**Indirect and Cumulative Effects (ICE) Assessment  
TIP No. R-2539C, Pamlico County**

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

**Indirect and Cumulative Effects (ICE) Assessment  
TIP No. R-2539C, Pamlico County**

NC 55 from SR 1129 (Bennett-Tingle Rd) to NC 304 in Bayboro

**EXECUTIVE SUMMARY**

This report evaluates the indirect and cumulative effects for Transportation Improvement Project (TIP) R-2539C Pamlico County. It supplements the Indirect and Cumulative Effects (ICE) Study for R-2539B Pamlico County prepared by Arcadis in June 2003. The focus of the evaluation is on growth effects and change in land use that may result from the road project. The project is the widening of NC 55 from two lanes to five lanes. In addition to original research, this report cites the R-2539B study and the recent draft Pamlico County Coastal Area Management Act (CAMA) Joint Land Use Plan.

**Findings**

The Indirect and Cumulative Effects Study Area includes an area generally bounded by NC 306 and the town of Grantsboro to the west, the Neuse River to the south, the towns of Vandemere and Mesic to the northeast of Bayboro, the town of Bayboro to the east, and NC 55 south to Oriental. Bayboro is the county seat.

Small towns and associated strip commercial development along the length of NC 55, and large expanses of fields, forests, and pocosin (wooded swamp), characterize the area. The natural resources and beauty draw retirees, second homeowners, as well as sailor, hunters, anglers, and kayakers. A rare and relatively pristine pocosin called Light Ground Pocosin covers a large area south of Bayboro. Upscale vacation and retirement homes characterize the communities along the river. Pamlico County is one of the ten least populated counties in the state and the growth forecast remains modest at 13% for the period 2000 to 2020.

Pamlico is one of 20 counties subject to the provisions of CAMA. It includes vast expanses of estuarine waters, which are designated as Areas of Environmental Concern.

Pamlico County provides metered water from a dozen wells to most properties in the towns and along the major roads. The supply exceeds anticipated demand in 2020. The county established a sewer utility in 1988 that serves most of the populated areas. In large areas of the county soils do not support septic systems. Stormwater management systems are weak or nonexistent. Stormwater is generally controlled by subdivision regulations.

*Indirect and Cumulative Effects Study  
R-2539C -- NC 55 Widening to NC 304*

Other environmental regulations and guidelines are relatively strong. The Pamlico County CAMA Joint Land Use Plan stipulates a 75 foot development setback (with limitations) from estuarine resources, and a 25 foot riparian buffer for paved areas. The Neuse Buffer Rules also apply.

Activities that may lead to indirect and cumulative impacts include improved mobility along NC 55. Commute times from Bayboro to New Bern may be reduced from up to 45 minutes to around 30 minutes. Craven County is the primary destination of those that commute to work out of the county. Reduced commute times sometimes stimulates new growth. New development, though, is limited. It is possible that if River Dunes, a new 600 unit development near Oriental, is successful that more development might quickly follow. Land prices in and around Oriental have increased dramatically recently.

Bayboro officials, incidentally, recently expressed unanimous opposition to the road section that NCDOT planned to construct. Locals seek to limit the section to 52 feet to reduce community character, and possibly historic property, impacts.

Other possible impacts relate to access control issues. NC 55 is designated as an Enterprise Corridor, around which local plans focus business and commerce related activities and development. There is, however, no explicit economic development purpose for the project. The five-lane section for the road may encourage strip development, but county plans call for such development to be focused around major intersections. Local planners indicated a desire for NCDOT to institute limited or full access control.

**Conclusions**

The widening of NC 55 from two lanes to five lanes will provide for additional traffic capacity for people driving between New Bern and Bayboro. The project will improve mobility, and reduce delays and backups due to logging trucks and local traffic. The project is on existing location.

The five-lane section will likely stimulate new commercial development, particularly at major road intersections. County policies discourage this type of development away from the major intersections. Extensive new commercial development will likely be limited in this sparsely populated county. Probable highway development includes tourist trade, retail, restaurant, and highway service businesses.

The county and towns should consider instituting cross-access regulations for commercial development as a small measure of access control for NC 55. If congestion were to prematurely render NC 55 obsolete for its functional classification, then a new location bypass would wreak great impacts to Pamlico's wetland and habitat resources.

Growth in Pamlico County and the Indirect and Cumulative Effects Study Area is constrained by several factors, including wetlands and septic limitations. Water supply is adequate. Areas not served by central sewer will likely experience very slow growth.

*Indirect and Cumulative Effects Study  
R-2539C -- NC 55 Widening to NC 304*

Growth that does occur in Pamlico County will likely do so along its rivers, waterfronts, and tidal creeks. CAMA and the Neuse River riparian buffer rules will help minimize impacts from such development.

A significant increase in commuting is unlikely in that New Bern is not a major employment center. The River Dunes subdivision may develop more quickly due to the faster travel times, but the natural beauty of the county is the major draw; the upscale project would likely occur regardless of the project.

The county does not have county wide zoning. The major towns use their zoning ordinances to guide types and intensities of growth. The county does, however, have a subdivision ordinance to regulate new development. The subdivision ordinance allows for officials to deny the platting of land for unsuitable purposes.

The Pamlico County Joint CAMA Land Use Plan states a vision for low density development that is sustainable in nature. Maintaining and improving water quality is a goal of the CAMA plan. Stormwater regulations, however, remain weak.

Indirect and cumulative effects resulting from R-2539C should be minimal. No further study is recommended at this time.

## **PROJECT DESCRIPTION**

Section A is a 2.7 mile segment of the NC 55 widening project that originates at US 17 in Craven County and runs to just east of SR 1127 in Pamlico County. Section B extends from just east of the border of Craven and Pamlico Counties approximately 6.2 miles. It begins at SR 1127 (Bayleaf Road) and extends to just east of SR 1129 (Bennett-Tingle Road), just west of the town of Grantsboro and NC 306. Section A and B have been let and construction has begun.

TIP R-2539C is the eastern 5.2 mile section that runs from SR 1129 to NC 304 in Bayboro, the county seat. All of the project is on existing location.

The purpose and need is to accommodate traffic growth by increasing capacity, and to increase safety.

## **STUDY AREA DESCRIPTION AND BOUNDARIES**

The study area was devised by examining the project's location in relation to political, demographic, and planning boundaries, watershed boundaries, the role the facility plays in the local transportation network, and the development patterns of the area.

Towns and municipalities along the corridor include the recently incorporated Grantsboro (at the intersection of NC 306 and NC 55), and Alliance and Bayboro (east of NC 306 to the NC 55 and NC 304 intersection). Other municipalities in the Indirect and Cumulative Effects Study Area include Arapahoe and Minnesott Beach (8-12 miles south of NC 55 on NC 306, Stonewall (just east of Bayboro on NC 55), and the sailing and retirement community of Oriental (about 8.5 miles south of Bayboro at the terminus of NC 55).

NCDOT planners toured the project June 3, 2004. Planners visited Bayboro, traveled to Vandemere on NC 304 in the northeast part of Pamlico County, to Oriental at the eastern terminus of NC 55 in the southeast part of the county, and to Minnesott Beach where NC 306 ends at the Neuse River in the south central part of the county.

### **Study Timeline**

The study timeline is 15-20 years and was determined by evaluating area current and draft future planning documents and interviews with local and county planners and officials.

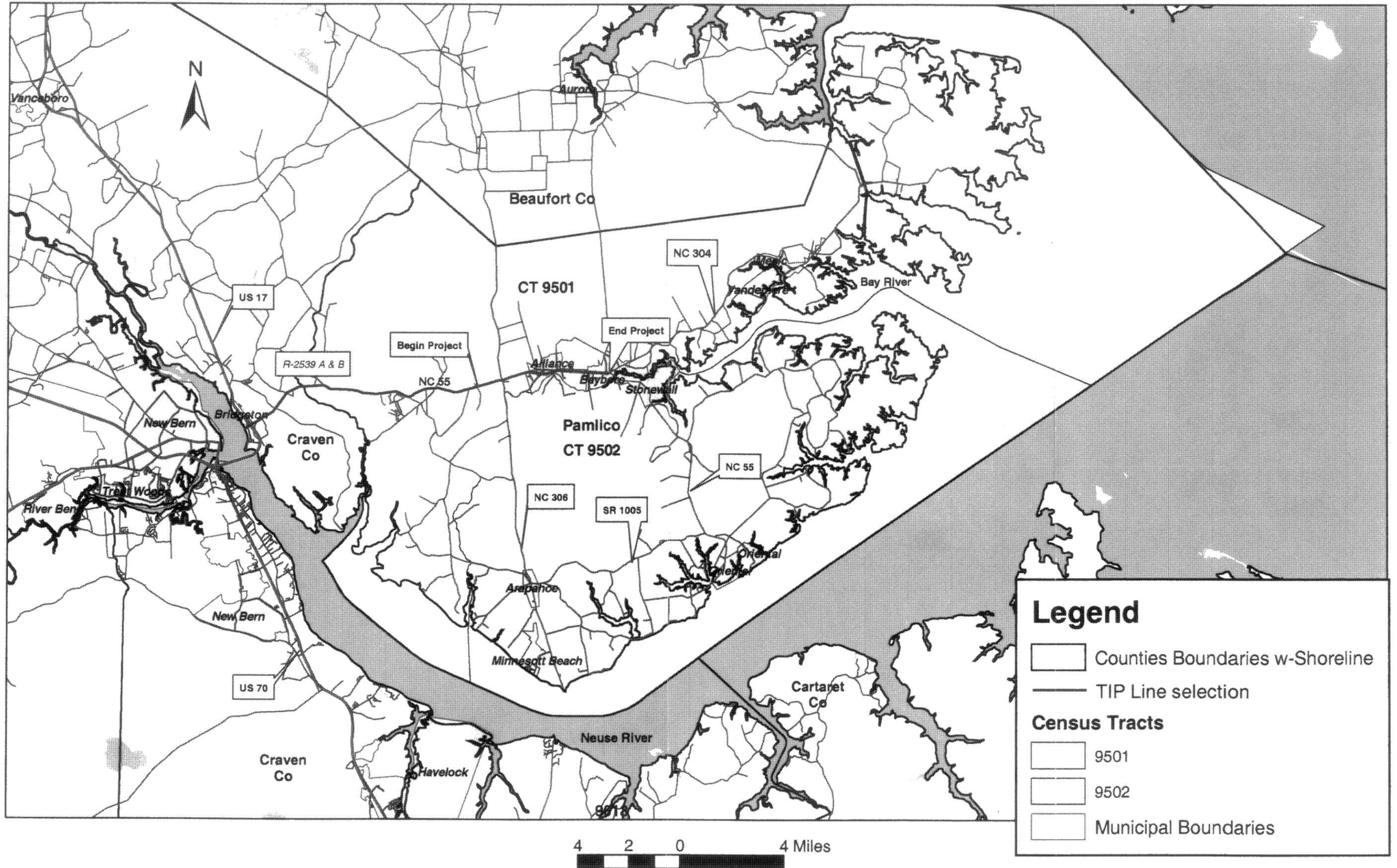
### **Demographic Study Area** *(See Figure 1)*

The two census tracts for the county define the Demographic Study Area. Because block groups changed in area between the 1990 and 2000 census, the Demographic Study area was not narrowed to block groups.

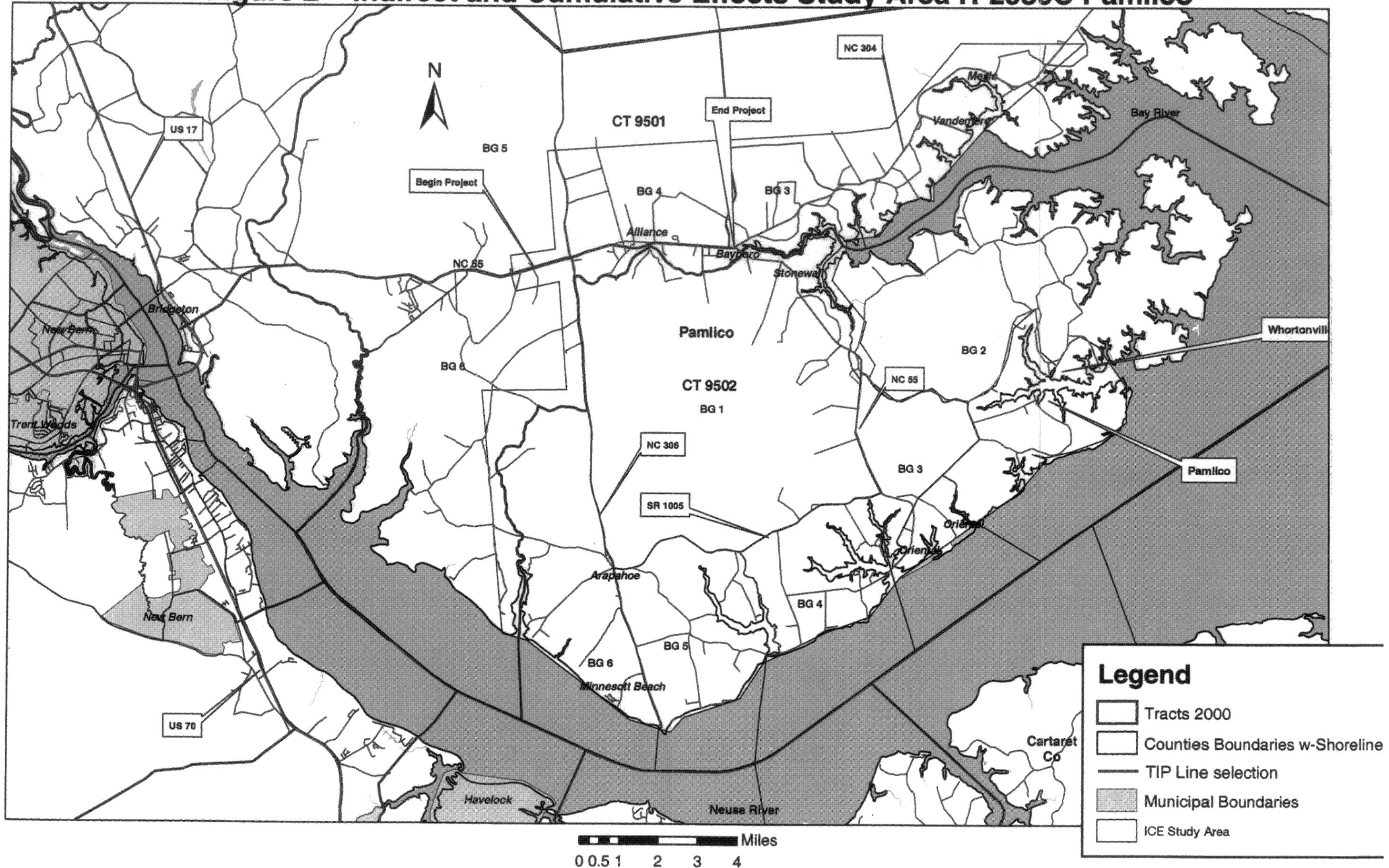
### **Indirect and Cumulative Effects Study Area** *(See Figure 2)*

The Indirect and Cumulative Effects Study Area (or growth study area) is a smaller area that is generally bounded by NC 306 to the west, an area approximately two miles north of and parallel to NC 55 to the north, from NC 306 to Vandemere northeast of Bayboro to the east, along NC 55 to Oriental to the southeast, and by the Neuse River to the south.

**Figure 1 Demographic Study Area R-2539C Pamlico**



**Figure 2 Indirect and Cumulative Effects Study Area R-2539C Pamlico**

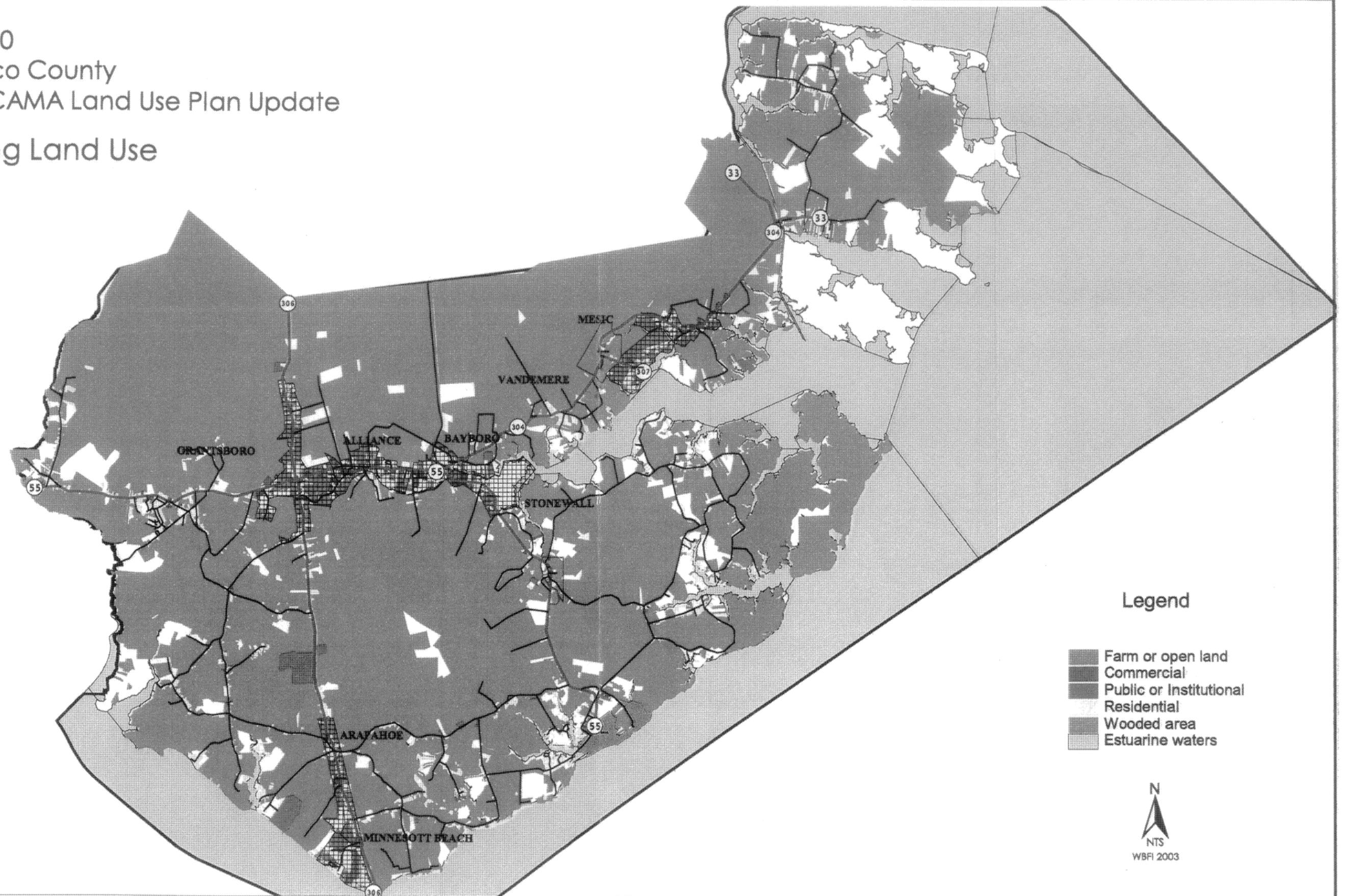


**Legend**

- Tracts 2000
- Counties Boundaries w-Shoreline
- TIP Line selection
- Municipal Boundaries
- ICE Study Area

Miles  
 0 0.5 1 2 3 4

Map 10  
Pamlico County  
Joint CAMA Land Use Plan Update  
Existing Land Use



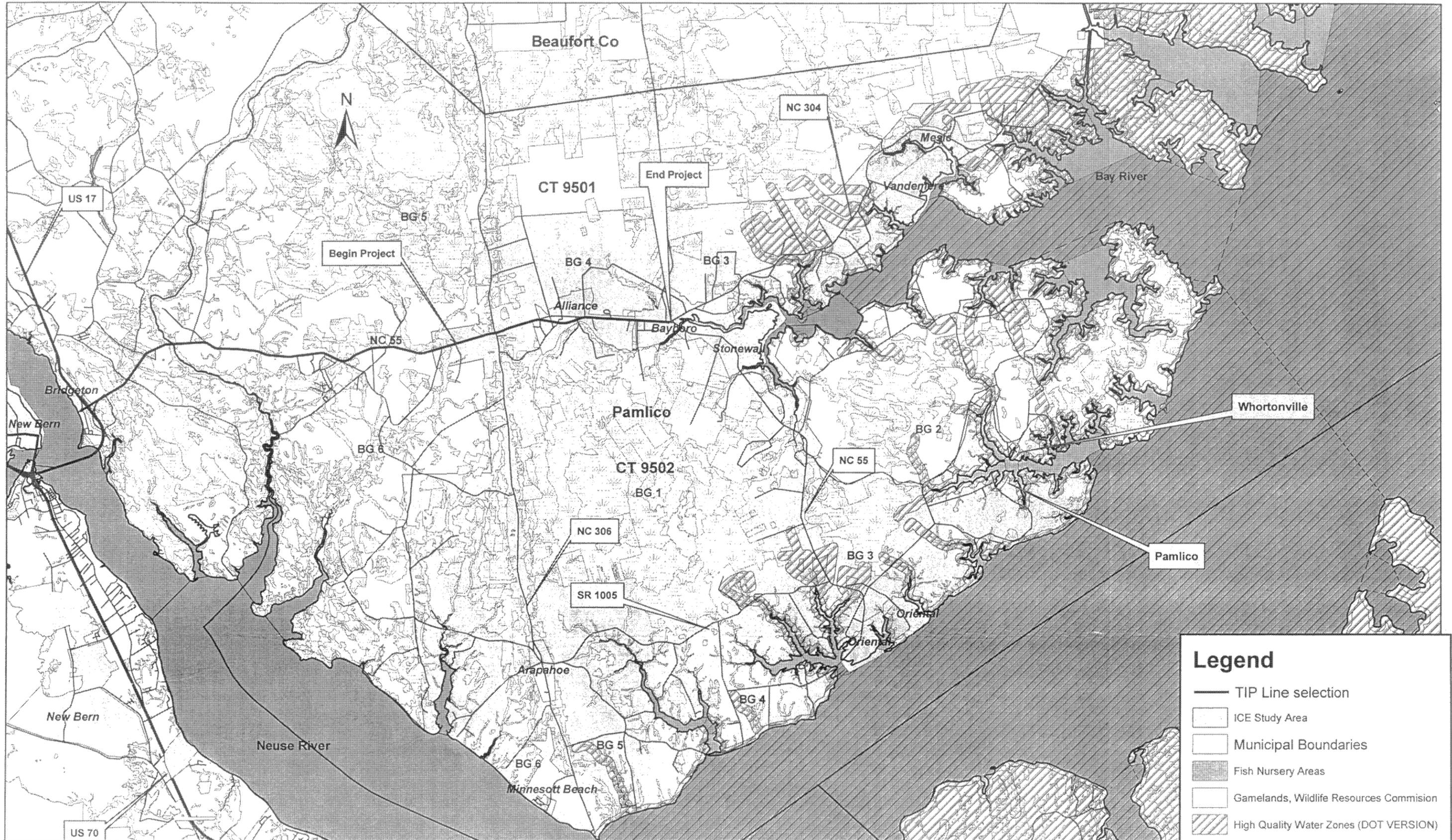
Legend

- Farm or open land
- Commercial
- Public or Institutional
- Residential
- Wooded area
- Estuarine waters



NTS  
WBFI 2003

Figure 4 Wetlands R-2539C Pamlico

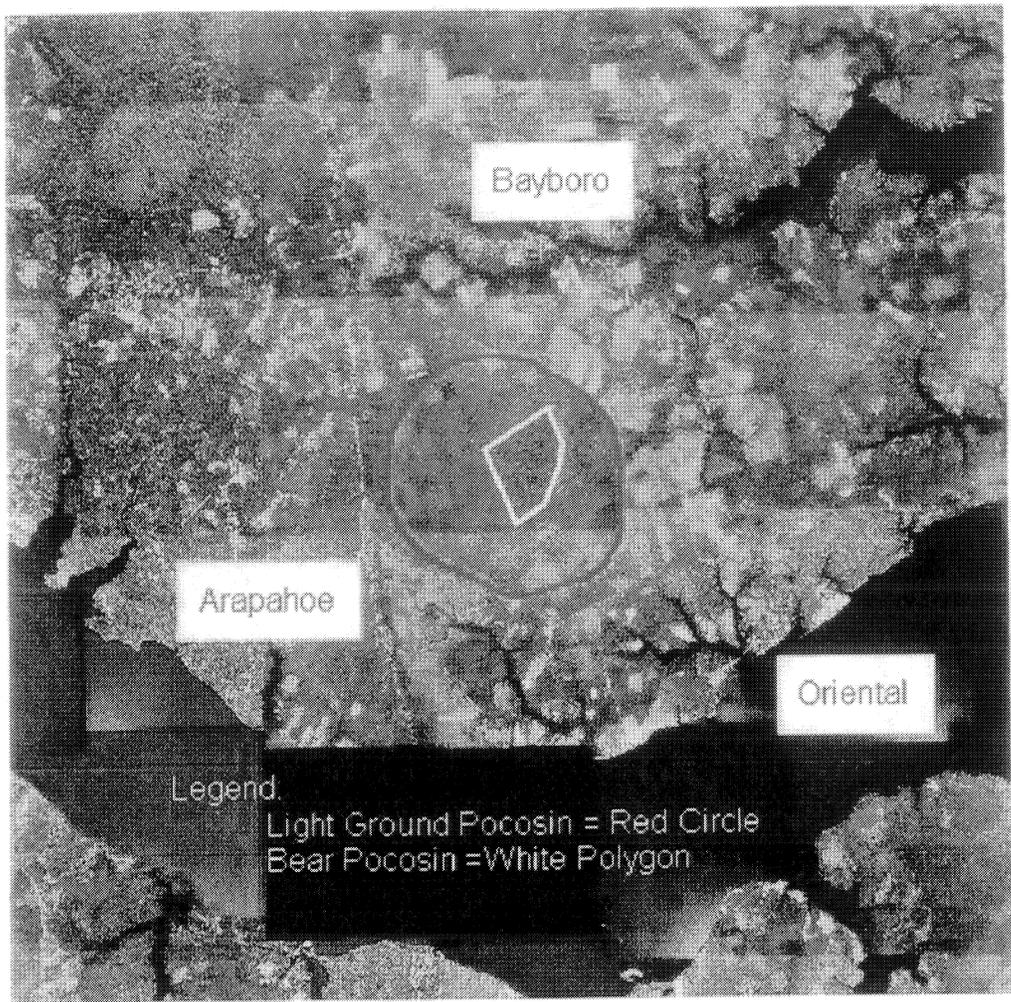


**Legend**

- TIP Line selection
- ICE Study Area
- Municipal Boundaries
- Fish Nursery Areas
- Gamelands, Wildlife Resources Commission
- ▨ High Quality Water Zones (DOT VERSION)
- ▤ National Wetlands Inventory Areas

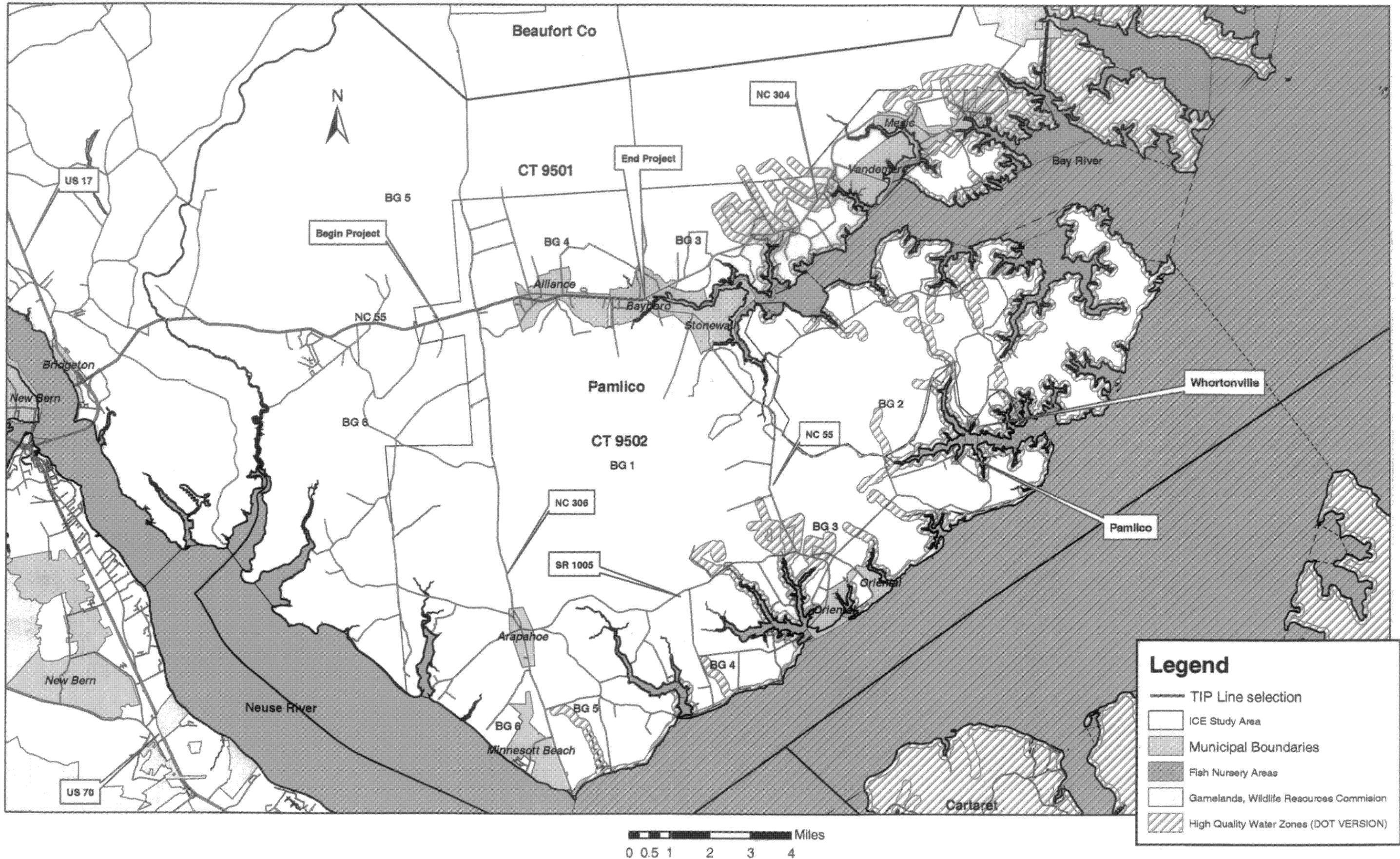


### Infrared Satellite Image of Bear Pocosin Area



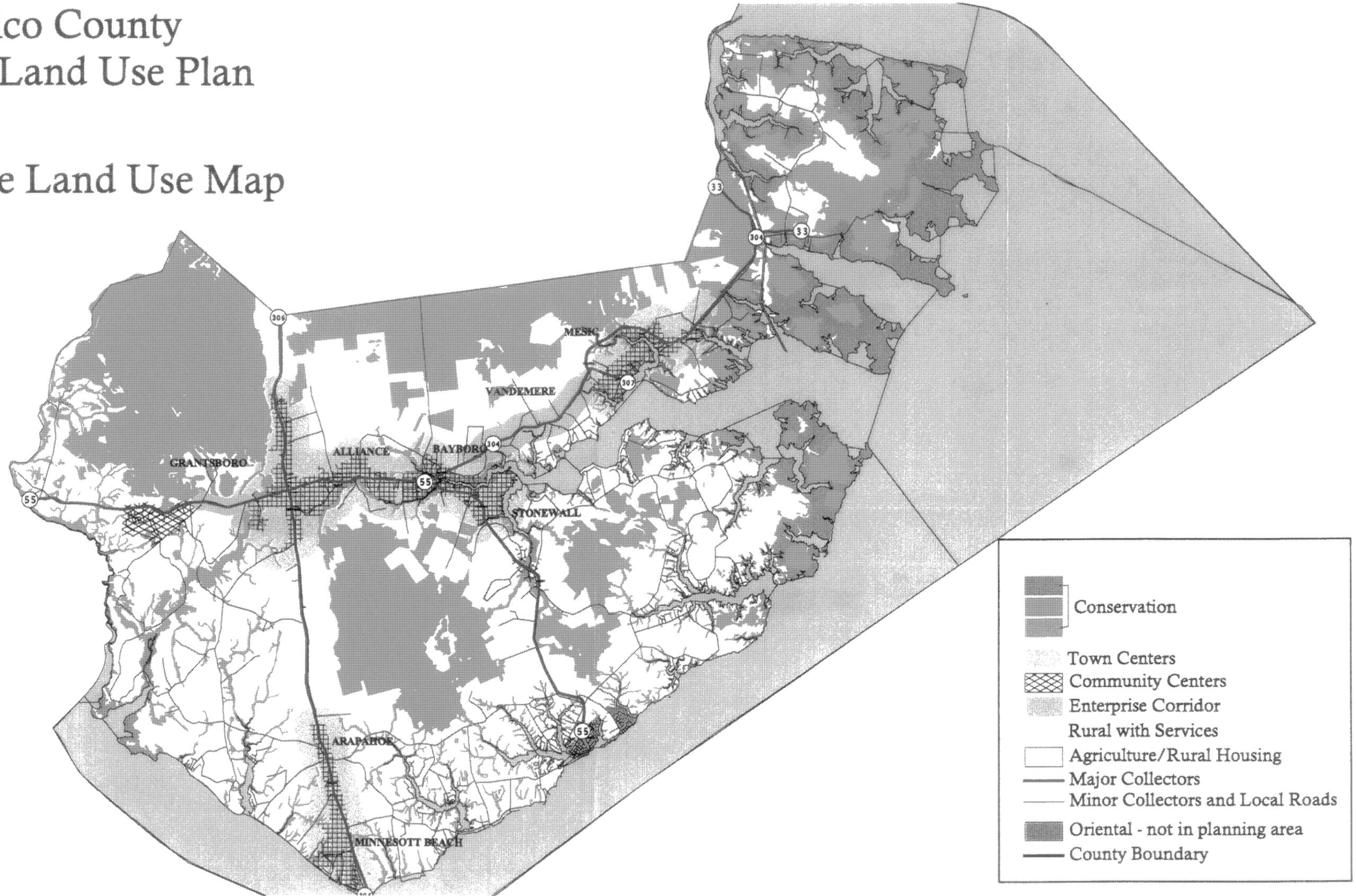
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**Figure 6 Water Resources R-2539C Pamlico**



# Pamlico County Joint Land Use Plan

## Future Land Use Map



- Conservation
- Town Centers
- Community Centers
- Enterprise Corridor
- Rural with Services
- Agriculture/Rural Housing
- Major Collectors
- Minor Collectors and Local Roads
- Oriental - not in planning area
- County Boundary

The area includes the residential communities to the west of NC 306 that make up the town of Arapahoe, which is north of Minnesott Beach. While Minnesott Beach and Oriental may be beyond the usual area of effects for a more urban project, they are included here because of their role as destination retirement and vacation communities. The ICE Study Area also includes the Pamlico/Whortonville area -- a sparsely populated, unincorporated area approximately 4.5 miles northeast of Oriental at the mouth of the Neuse River. These areas will be most subject to the growth and development effects of the widening project. *See Figure 2.*

## **STUDY AREA DIRECTION**

### **Regional Influences**

Pamlico County is one of 20 North Carolina counties that fall under CAMA jurisdiction. It is a sparsely populated county that ranks 91st out of 100 North Carolina counties for total population. It is bordered by the Neuse River to the south, the Pamlico Sound to the east, and the mouths of the Pamlico and Pungo Rivers to the northeast. The Bay River originates in Bayboro and joins the Pamlico Sound between the Neuse and Pamlico Rivers. The Pamlico and Albemarle Sound estuaries are second only to the Chesapeake Bay area in size in the United States. The rivers, sounds, and estuaries are key factors in both the past, present, and future in this area.

Because of easy access to sounds, rivers, and the Intracoastal Waterway, recreational and outdoor activities are important features of the local economy. Many visitors first become acquainted with the area when dropping off their children at one of the many summer camps. The YMCA properties Camp Sea Gull and Camp Seafarer are amongst the best known of the camps. Golfing, fishing, hunting, and kayaking are among the promoted activities. Farming and working forests remain a visual reminder of strong ties to an agricultural and logging heritage.

### **Growth Trends** *(see Table 1)*

In 2000 the county population was almost 13,000, which was about 14% more than 1990. However, the almost 1600 new residents included about 600 persons housed at the Pamlico County Corrections Facility, which is near Bayboro in Census Tract 9501. The medium custody facility opened in 1998. Absent the inmate population, the county grew at a rate of 8.4% between 1990 and 2000. The state rate between 1990 and 2000 was 21.4%. *See Table 1.*

Census Tract 9502, which includes the area along the Neuse River, grew at the faster rate of over 16%, as compared to a rate of about 12% for Census Tract 9501. The growth in Census Tract 9502 appears to be concentrated in the area between and including Minnesott Beach and Oriental.

Because block groups changed in area between the 1990 and 2000 census, block group analysis was not performed.

The North Carolina State Data Center forecasts a growth rate of about 13% between 2000 and 2020 for Pamlico County, or an increase of 1729 residents to 14,663. This growth rate continues to trail the state, which the data center forecast at a dramatic growth rate of about 36% for the same period.

**Table 1. Population Trends**

Population Trends	CT 9501, Pamlico County	CT 9502 Pamlico County	Pamlico County, North Carolina	North Carolina
<b>Total Population 2000</b>	7,305	5629	12,934	8,049,313
<b>Total Population 1990</b>	6,530	4842	11,372	6,628,631
<b>Change</b>	775	787	1562	1,420,682
<b>Percent Change</b>	11.9%	16.3%	13.7%	21.4%

**Commuting Trends**

According to the State Data Center, a little over 77% of Pamlico workers worked in county in 2000. The overwhelming destination county for workers commuting out of the county was Craven, with about 14% of commuters. This compares with just over 84% of workers employed in the county, and 9% commuting to Craven County in 1990.

Another measure of commuters are commuting ratios. The 2000 ratio for Pamlico County was 0.674. Being less than 1, this indicates that more workers were commuting out of Pamlico County than commuting in. That compares to a ratio of 0.616 in 1990, which means that about 9% more workers are commuting out in 2000 than in 1990.

State Data Center data indicates that out of 1193 residents that moved to Pamlico County from other counties between 1995 and 2000, 35% moved from Craven County.

**Local Economy and Employment by Sector**

The local economy grew modestly in the 1990's but boasts a strong tourist industry that supports related service businesses. While the employed labor force growth rate of about 20% exceeded population growth, per capita income trails the surrounding counties. Median household income ranks 50th in the state.

Construction and retail trade employment growth was about 40%, while manufacturing employment fell by 40%, and farm employment by over 58%. Wholesale trade -- mainly commercial fishing -- fell by almost 41%. Net employment, however, grew faster than population growth between 1990 and 2000.

Almost 30% of working county residents are employed in government services. Retail trade employs about 15 % of county workers, and leads private sector employment. It is

followed by construction, which employs a little over 7% of workers.

Weyerhaeuser, the huge forest product company, has numerous logging operations in the area.

### **Study Area Towns and Municipalities**

Towns and municipalities along the corridor include recently incorporated Grantsboro (at the intersection of NC 306 and NC 55), Alliance, and Bayboro (east of NC 306 to the NC 55 and NC 304 intersection). Other municipalities in the Indirect and Cumulative Effects Study Area include Arapahoe and Minnesott Beach (8-12 miles south of NC 55 on NC 306, Stonewall (just southeast of Bayboro on NC 55, and the sailing community of Oriental (about 8.5 miles south of Bayboro at the terminus of NC).

The areas of Reelsboro, Grantsboro, Alliance, Oriental, and Minnesott Beach were the fastest growing areas in the county. Oriental and Vandemere, particularly, flooded from hurricanes and storms from the late 1990's and took a powerful hit from Hurricane Isabel in 2003. Nonetheless, developers are advertising a new waterfront development called River Dunes several miles to the east of Oriental. When built out, it will contain around 600 residences. By comparison, Oriental had a total of 875 residents in 2000.

The county's retirement and second home population accounts for much of the growth, and the area is further developing tourist resources and infrastructure.

### **Transportation Plans**

Major transportation corridors in the area are NC 55, which carries over 10,000 vehicles per day (Average Annual Daily Traffic - AADT) from New Bern into east Craven County and west Pamlico County. The primary north/south route is NC 306, which runs from Minnesott Beach (and from Havelock in Craven County via ferry across the Neuse River) to Washington County. NC 306 carries between 2300 (north) and 2700 vehicles (south). NC 304 travels north from Bayboro (2600 AADT) at the intersection with NC 55 in Bayboro to village of Hobucken in the northeastern part of the county. NC 55 continues almost due south from Bayboro (3500 AADT) and terminates in the sailing town of Oriental. The Ocean Highway, US 17, is just to the west of the county line in nearby Craven County.

The Rural Transportation Planning organization included the widening of NC 55 to Oriental as one of its top priorities. Other projects include widening NC 306 from NC 55 to Minnesott Beach, and SR 1005, between Arapahoe and Oriental. The latter is an oft used shortcut to Oriental by those seeking to avoid slowdowns along NC 55 through the small towns.

### **Existing Land Use** *(see Figure 3)*

Land use in the area is characterized by small towns along the length of NC 55, interspersed by primarily wooded areas and some agriculture. At the towns, relatively low intensity commercial strip development notifies the driving public that they are arriving into one of the many small communities. Upscale homes and a village

atmosphere characterize Oriental, Arapahoe, and Minnesott Beach. Sparse residential, agriculture, and forested and wetland areas characterize the rest of the study area.

The Joint CAMA Existing Land Use Map indicates the vast majority of land in the county is farmed, open, or forested. *See Figure 3.*

## **NOTABLE FEATURES**

### **Natural Environment, Areas of Environmental Concern, and Water Resources** *(See Appendix and Figure 4)*

The ICE Study Area includes large areas of agriculture, pocosin, and wooded swamps. The Goose Creek Gamelands and Island are in the northeastern most part of the county. There are 33 natural elements, or plants and animals of rare and outstanding status and listed on the North Carolina Natural Heritage Program database (*see Appendix*). Nearly 45% of the county is considered non-coastal wetlands. *See Figure 4.*

#### **Rare Pocosin** *(see Figure 5)*

A several thousand acre pocosin (accent on the second syllable) known as the Light Ground Pocosin is located in the center of the county. A pocosin is an upland swamp, or wooded wetland. Some say the Indian word translates as "swamp on a hill". It occupies almost all of Census Tract 9502, Block Group 1. Located between Bayboro and Oriental, the pocosin serves an important water quality function by slowing runoff and filtering pollutants. The 1000 acre Bear Pocosin, which is owned by the State of North Carolina is located within the Light Ground Pocosin. The Department of Administration has recently advertised the Bear Pocosin for sale, circumventing normal protocol of offering excess state property to other agencies. In this case the Clean Water Management Trust Fund is the interested party. According to an article in the *Pamlico News*, likely buyers include timber interests. The [www.bearpocosin.org](http://www.bearpocosin.org) website states, "The North Carolina Natural Heritage Program has identified approximately 60 acres of Pamlico's Light Ground Pocosin as "Nonriverine Wet Hardwood Forests". They deem this variety of forest "the most threatened of North Carolina's natural communities". The Natural Heritage Program knows a total of 24 separate sites of Nonriverine Wet Hardwood Forests in the state. Of the 24, only three sites are under any kind of protective designation. The three protected sites total less than 100 acres". *See Figure 5.*

#### **Areas of Environmental Concern in Pamlico County** *(see Figure 6)*

Estuarine shoreline and waters, and coastal wetlands, designated as Areas of Environmental Concern by the North Carolina Coastal Resources Commission, includes the Pamlico Sound (70,000 acres), which is fed by the Neuse River (42,000 acres), the Pamlico River (11,300 acres), and the Bay River (14,200 acres). The CAMA plan notes 137,500 acres of estuarine waters, and 21,700 acres of coastal wetlands in the area. *See Figure 6.*

Most of the project is within the Neuse River Subbasin 03-04-13, though the Indirect and Cumulative Effects Study Area includes parts of the county that is within Subbasin 03-

04-10. The Neuse River and Tar-Pamlico setback and riparian buffer rules apply to virtually the entire county.

### **Basin Status and Impaired Designation**

Subbasin 03-04-13 includes the Goose Creek Game Lands in the northeastern part of the county. All waters of the subbasin are considered impaired according to the Neuse River Basinwide Plan prepared by the North Carolina Division of Water Quality and are listed on the 2004 Draft 303(d) list. The Bay River, Harper Creek, Bear Creek, Bennett Creek, Gale Creek, and Bills Creek are all impaired for shellfish harvesting due to high bacteria levels. The subbasin plan notes the impact of recent hurricanes on creek and stream habitat and encourages de-snagging efforts to restore natural flow.

Subbasin 03-04-10 includes not only south Pamlico County, but also large portions of Craven county on the south bank of the Neuse, as well as northeastern Carteret County, also on the south bank. All waters in the subbasin are considered impaired. The Neuse down to Minnesott Beach is listed on the 2004 Draft 303(d) list for chlorophyll and excessive fecal coliform bacteria and is closed for shellfish harvesting. The Use Support Category is for Aquatic Life, Secondary Recreation, and Shellfish Harvesting. Similar hurricane impacts and recommendations are noted.

The project crosses the North Prong and South Prong Creeks. Other creeks in the ICE Study Area include the Beard, Dawson, Greens, Trent, and Broad Creeks.

### **High Quality Resource Waters and Primary Nursery Areas (see Figure 6)**

From Minnesott Beach and extending into the Pamlico Sound, the Neuse and Sound waters are classified as High Quality Waters. This includes the lower watersheds for each of the above creeks except the Beard. This area also includes the Bay River. There are more than 13,000 acres of Primary Nursery Areas for salt-water fish. These areas are primarily in the east and northeast of the county. *See Figure 6.*

## **INFRASTRUCTURE, REGULATIONS, ORDINANCES, PLANS AND GOALS**

### **Water and Sewer**

Pamlico County provides metered water drawn from a dozen wells to over 5000 metered connections. Most of the municipalities and large areas of the county (areas adjacent to primary and secondary roads) are served by this system. According to the CAMA Joint Land Use Plan report current use is 0.8 million gallons per day (MGD), which is expected to double by 2020. Current supply is 3.3 MGD, or over twice the expected demand in 2020. Properties must connect to public water and sewer where available. The county supports extending the water supply system to new development and unsupported areas.

In 1988 Pamlico County established the Bay River Metropolitan Sewerage District (BRMSD) to construct a municipal sewerage system for the towns of Alliance, Bayboro, Vandemere, Maribel and Mesic. In addition to the use of septic systems, the Bayboro

Wastewater Treatment Facility treated the sewer and discharged into the Bay River. The Oriental Wastewater System (serving Oriental) discharged into Smith Creek and subsequently the Neuse River. In 1998 the BRMSD, in an effort to eliminate NPDES discharges, upgraded the system to allow for surface spray irrigation. Bay River purchased the Oriental System and implemented a similar system. The two systems serve the above urbanized areas and also Grantsboro and Stonewall. It will soon serve Reelsboro. There are plans to add the community of Olympia at a later date.

The BRMSD serves about 2300 customers according to the CAMA report and is currently at 62% capacity. When Reelsboro comes on-line, the systems will likely have to be upgraded. The Oriental facility is currently at capacity (75% of 0.2 MGD capacity). Officials are exploring future extensions to the Pamlico/Whortonville area, which would require expansion or upgrades to the Oriental system. The county indicates a desire to participate in service expansion.

The draft joint CAMA plan states the county supports extensions first to existing developed areas where conditions may threaten water quality, then to towns and municipalities, and last to areas designated as "Rural With Services". More discussion on this designation in the Land Use Section below.

Septic permits are required where applicable. Where soils do not support septic systems, and where the BRMSD will not service, the county states it will support so called "packaged systems".

#### **Stormwater System**

There is no stormwater management system in the county, however, the draft Joint Use CAMA plan indicates the county will make effort to educate property owners and developers regarding stormwater threats. Further, any development that disturbs more than one acre of land must comply with approved soil erosion and sedimentation control plans. Last, the county commits to coordinate efforts between the Natural Resources Conservation Service and local landowners to address existing problem areas.

#### **Land Use Plans**

The March 2004 Draft Joint CAMA Land Use Plan for Pamlico County addresses public access to public trust waters, land use compatibility, natural hazard areas, infrastructure carrying capacity, water quality, and local concerns.

#### **Public Access**

The draft Plan emphasizes county goals to ensure public access to public trust waters in the county. This includes both public and private boat ramps, marinas, as well as canoeing and kayaking access and trails. Further, the county seeks to maintain viewsheds of public waters.

#### **Land Use Compatibility, Including 404 Wetlands and Poor Soils**

As to land use compatibility, local goals seek to discourage development and uses that threaten estuarine, wetland, or shoreline degradation. This includes a 75' setback, or

conservation zone, along shoreline, estuarine, or nursery waters, from the mean high water mark, except for structures like docks, piers, and boat ramps. This policy excludes forestry operations that implement best management practices. The county discourages any development in non-coastal, "404" wetlands, and the Plan notes many areas with soils not suitable for septic tanks. Paved areas are required to comply with a 25' riparian buffer.

#### **Infrastructure Carrying Capacity and Thoroughfare Plan**

The thoroughfare plan was last updated in 1994. The county requests in the draft CAMA plan that NCDOT update the plan. Pamlico County strongly supports the R-2539 project to widen NC 55 through the county to Bayboro.

#### **Natural Hazard Areas and Hurricane Evacuation Routes**

The draft CAMA plan includes commitments from the county to take steps to minimize and mitigate for flood risks, update hazard plans, enforce existing ordinances, and ensure hurricane evacuation route carrying capacity. NC 55, NC 306, and NC 304 are state designated evacuation routes.

A 1998 Army Corps of Engineers map called Project Impact identified almost the entire part of the county east of NC 306 as being subject to flooding from Category 4 or 5 hurricanes. The map identified areas east of a line drawn through Bayboro and Oriental as subject to flooding from Category 1 or 2 hurricanes.

#### **Water Quality**

Policies in the draft CAMA plan that the county cites as protecting water quality include the 75 foot setback (required on parcels divided after January 26, 1990), minimum one acre lots on waterfronts (required), minimum 1/2 acre lots on the interior near waterfronts (required), encouragement for cluster development, encouragement for one dwelling per two acres in non-coastal wetland areas, and best management practices for both forestry and farming operations. The 75 foot setback exceeds CAMA guidelines.

So called Phase II rules, now law, do not presently apply in Pamlico County.

#### **Additional Water Quality Rules**

Pamlico County is also subject to the December 1999 Neuse River buffer rules. The rule established 50' wide riparian buffers along waterways in the Neuse River Buffer. The Neuse Buffer Rules, as they are called, established a first buffer of 30' (from the more landward of either waterways or wetlands -- ) that is to remain undisturbed, and a second zone of 20' that is vegetated, but in which some uses are allowed. These uses are generally considered "managed vegetation". Existing uses and structures are exempt.

It is notable that in late May/early June 2004, the county commission adopted a resolution that petitions the NC Division of Water Quality (DWQ) to grandfather in all subdivision plans approved before August 2000, whether lots are built upon or not, to exempt them from the zone 2 setback requirement. DWQ regulations allow for a variance procedure, which if granted would allow for development on lots that otherwise

cannot be built upon. According to a June 2, 2004 article in the Pamlico News, the local chamber of commerce and real estate agents are pushing for the change because of costs and time delays.

Whereas the 75 foot setback applies to water, the Neuse Rules apply to wetlands adjacent to rivers and streams.

**Local Concerns, Goals, and Land Use Planning**

The draft CAMA plan includes Pamlico County goals of expanding second and retirement home communities. Consistent with earlier statements, the county commits to developing and enforcing water quality regulations, planning for supplying water to these areas, and expanding the Bay River sewer district to include these areas. Further, the county is seeking a industrial site program certification from the NC Department of Commerce, as well as pursuing other economic development opportunities. The latter includes recruiting new business and, especially, developing tourist and outdoor activity related businesses. The industrial certification program requires that wetlands be delineated, that the site be out of 100-year flood zones, and that stormwater be managed on-site.

Pamlico also seeks to retain its farming and timbering heritage by discouraging incompatible land uses. It is also considering agriculture districts that would provide these industries with additional protections.

Pamlico County also seeks to encourage redevelopment of obsolete waterfront uses and also plans to encourage junkyard operators to take steps to minimize potential environmental impacts.

Pamlico County's land use vision includes measures to reduce impacts to water quality. These include encouraging the use of pervious paving materials to reduce stormwater runoff. The draft CAMA plan also stresses the importance of wetlands, forestlands, and farmlands and commits to take steps to reduce, especially, the visual impacts of development in these areas.

In the ICE Study Area, the town of Bayboro commits to the 75' permanent conservation zone along town waterways and will control that by its zoning ordinance. It also seeks to protect historical, archeological, and historical community resources.

Minnesott Beach encourages low density development; county subdivision regulations will control. It discourages facilities for short-term visitors and tourists.

**Access Management**

The Plan also addresses access management; the county wants to encourage cross-access agreements in an effort to control access control on major roads and highways. Local planners stated that they would like to see limited access instituted by the NCDOT for NC 55.

NC 55 is designated by the county as an Enterprise Corridor. Commercial development will be focused in this area. However, the county states it will discourage strip development along this corridor. This policy may be difficult to enforce in light of the 5-lane section for NC 55. Five-lane sections often encourage strip development and eventually render expanded facilities congested and obsolete for the stated purpose and need.

**Future Land Use** (*see Figure 7*)

Pamlico County's future land use map has seven categories, four of which are conservation districts. The remaining districts are Towns and Community Centers, Rural with Service, and Agriculture and Rural Housing.

The four conservation districts address natural systems resources and constraints. They are:

- Conservation I -- estuarine and public trust waters (not keyed on Figure 6)
- Conservation II -- estuarine shoreline preservation zone (75' buffer)
- Conservation III -- coastal wetlands
- Conservation IV -- non-coastal (404) wetlands

Towns and Community Centers vary in density from 1 dwelling per 7.5 acres, or less; to 2 dwellings per acre or more (where water and sewer are available). This is the most urban designation.

Rural with Services areas are in or near low density communities with full sewer services. Density is forecast at one dwelling per 15 acres. Waterfront subdivisions in this jurisdiction may have a much higher density -- up to one dwelling per acre on the water, or two per acre off water. Retail development is encouraged, primarily, at intersections to reduce impacts to surrounding land uses.

Agriculture and Rural Housing supports farming and forestry uses. Soils support these uses but often do not well support septic systems. Sewer service is not forecast in these areas for the foreseeable future. Densities may average one dwelling per 75 acres, or even less. Development should not exceed one dwelling per 2-5 acres in these areas. *See Figure 7.*

## **IMPACT CAUSING ACTIVITIES**

### **Improved Mobility**

One local planner indicated that the widened NC 55 would especially serve vacationers and second home owners and "will change the dynamics of Pamlico County a lot." The planner indicated that the project would increase carrying capacity, reduce delays and slowdowns, and that the trip from the New Bern area to Bayboro would be cut by one third -- from about 45 minutes to 30 minutes. The current speed limit of 55 miles per hour outside of the towns will remain the same.

Future widening of NC 55 to Oriental, NC 306 to Arapahoe, and SR 1005, would further enhance mobility and reduce delays especially to the southern shores of Pamlico County along the Neuse River and Pamlico Sound.

### **Recent Trends**

Despite all Pamlico County's beauty and resources, growth has been modest. New or proposed development is limited. Planning officials indicated that developers are discussing a couple of 50-70 home developments in the Arapahoe and Minnesott Beach areas.

The most significant development is River Dunes. Towards Whortonville, River Dunes is a planned, 550 home development four to five miles outside of Oriental. Covering 1300 acres, River Dunes reportedly consulted with prominent coastal environmental non-profit organizations and set aside over 200 acres of sensitive habitat in conservation easement. A 400 slip inland basin marina is part of the plans. According to the North Carolina Citizens for Business and Industry, excavated inland marinas help conserve estuary resources. The development will supposedly be connected to the Bay River Sewer District system, which, as noted would have to be upgraded and enlarged.

Oriental Town Manager Wyatt Cutler noted that although Hurricane Isabel wreaked havoc on Oriental and southern Pamlico County that real estate prices had jumped dramatically over the past 18 months. He cited lots that had increased from \$80,000 to \$180,000 and from \$100,000 to \$250,000 during that time. He also noted that Oriental "has more condos per capital than any place in the country". He also cited *Money*, *Sailing*, *Forbes*, and *Cruising World* magazines as featuring Oriental as a quiet gem. He indicated that many that came here did so based on a "desire to get away from the traffic".

## **POTENTIAL INDIRECT AND CUMULATIVE EFFECTS FACTORS**

### **Local Plans**

The R-2539 project is part of the RPO transportation plan and the county strongly supports the widening of NC 55.

However, Bayboro town officials met with NCDOT in June 2004 and stated their opposition to the widening if it exceeded a 52 foot section for four lanes, including curb and gutter. Officials expressed concern about impacts to local businesses, historic properties including the Bayboro House Hotel. Local residents are especially concerned about additional traffic signals that they say would affect the character of the area with traffic, exhaust, and noise. The town commission voted unanimously in late June that NCDOT revert to an earlier discussed 52 foot section, which the 1997 EIS recommended. Officials stated they would seek to stop the project at the town line if the design exceeded the 52 foot section.

**Explicit Economic Development Purpose**

There is no explicit economic development purpose for R-2539C. By increasing capacity the project will support growth that may occur over time.

**Planned to Serve Specify Development**

While the project will provide faster access to and from Bayboro, as well as the Vandemere, Oriental, Arapahoe, and Minnesott Beach areas, it is not planned to serve specific development. It is intended to increase capacity, reduce delays, and minimize dangerous passing situations.

**Likely to Stimulate Land Development having Complementary (to Highway Related Travel) Functions**

The widening of NC 55, a designated Enterprise Corridor, will likely stimulate highway retail and service related businesses. As mentioned above, five lane sections encourage strip type development. Absent disciplined access management controls by municipalities, congestion could foreseeably render the thoroughfare carrying capacity deficient before its design year, 2018.

**Likely to Influence Intraregional Land Development Location Decisions**

This project is likely to impact land development decisions in the southern parts of the county along the river and sound. These areas are subject to the greatest development pressures due to their recreational value and the physical beauty of the water resources. Because vacationers and second home owners would still have lengthy 8 to 25 minute drives to the southern areas from the intersection with NC 306 or NC 304, the effect should be modest.

**Notable Feature Present in the Indirect and Cumulative Effects Study Area**

As noted above, a rare pocosin, high quality resource waters, impaired waters, and Areas of Environmental Concern are present. None are expected to be directly impacted by the project. All of these features are subject to indirect impacts in the form of land use change as a result of the project. Both state and local planning and water quality regulations are in place that will reduce the impacts of project induced development.

**INDIRECT AND CUMULATIVE EFFECTS**  
**Potential for Land Use Change Matrix**

**Potential For Land Use Change, 2000-2020**

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

As shown in the matrix above, there will be moderate stimulus for land use change as a result of change in accessibility and mobility. In this case while there is no new location and therefore no new access to areas that are not currently served, there will be an increase in mobility to such a degree that local planners forecast a 15 minute time savings from New Bern to Bayboro. Drivers turning off of NC 55 before Bayboro will experience less time savings.

Increased traffic carrying capacity will foreseeably lead to an increase in property values, especially for potential commercial properties along NC 55. Shorter commutes and vacation trips will continue to increase pressure on property values in the resort and vacation communities. Increase in property values in other part of the county will likely be modest.

Forecasted annual growth is less than 1%, as noted in the Growth Trends section above. It is probable that this figure is conservative. Areas subject to greatest increases will, again, be along the shoreline areas. Pamlico County is along a river and sound and is an attractive recreation and vacation area. It promotes sailing, kayaking, fishing, and hunting activities. While attractive to some vacationers, Pamlico will likely not have the draw that communities closer to the state's beaches have.

As for land supply, Pamlico remains among the least populated counties in the state. There are many physical and regulatory constraints to higher density development, but large areas of land in the part of the county east of NC 306 remain available for development. Population growth pressures are sufficiently low, however, to keep

pressures on available supply low as well. Further, the CAMA and Pamlico Joint Plan notes that large rural areas remain without services. As noted in the Future Land Use section and on Figure 5, about half of the county is designated as conservation districts. Including the agriculture, forestry, and rural housing areas, this figure approaches 60%.

The CAMA plan requires an evaluation of "housing accommodated", which is calculated using the extremely low densities discussed in the Future Land Use section. The vacant acres will accommodate about 1800 houses, as compared to a projected growth of only 1729 persons. Even though River Dunes will include over 500 residences, many of those will likely be seasonal in nature.

Pamlico County's progressive water and sewer management program will provide services to about 1/3 of the county over the next 20 years. The remaining 2/3 of the county will remain very low density.

Development activity is low. Beyond River Dunes and a couple of projects in the vicinity of NC 306, new residential development is quite limited. As noted, Pamlico County policies favor low density, slow growth development, and environmental conservation.

## **ANALYSIS RESULTS AND CONCLUSIONS**

### **Indirect and Cumulative Effects**

The widening of NC 55 from two lanes to five lanes will provide for additional traffic capacity for people driving between New Bern and Bayboro. The "C" section begins just west of Grantsboro and continues east through Bayboro to the intersection with NC 304. Additional lanes will reduce the risk of accidents from vehicles attempting to pass in areas where the horizontal alignment is below current standards. Further, the project will improve mobility, and reduce delays and backups due to logging trucks and local traffic. According to the Environmental Assessment for R-2539, a four-lane, median divided section was not selected because of environmental impacts in this low-lying county. The project is on existing location.

The five-lane section will likely stimulate new commercial development, particularly at major road intersections. This type of development is not only encouraged, but is planned for in that NC 55 is designated as an Enterprise Corridor for the county. County plans encourage the new development, but policies also discourage strip type development away from the major intersections. New commercial development will likely be limited in this sparsely populated county. In that the county intends to continue to promote its natural and recreational resources and to encourage more tourist traffic and trade, retail, restaurant, and highway service businesses are probable uses. The county and towns should consider instituting cross-access regulations for commercial development as a small measure of access control for NC 55. If congestion were to prematurely render NC 55 obsolete for its functional classification, then a new location bypass would wreak great impacts to Pamlico's wetland and habitat resources.

*Indirect and Cumulative Effects Study  
R-2539C -- NC 55 Widening to NC 304*

Growth in Pamlico county and the Indirect and Cumulative Effects Study Area is constrained by several factors, including wetlands and septic limitations. Water supply is adequate, but large areas of the county do not adequately perk. Poor soils and large areas of wetlands exacerbate this issue. Areas not served by central sewer will likely experience very slow growth. The infrastructure does not lend itself to densely populated and high traffic communities such as do beach and seashore communities.

Pamlico County is expected to grow at a modest rate over the next 20 years. Past and current growth trends indicate continued, but limited growth. Population growth between 2003 and 2023 is estimated to be low -- less than 1% annually.

Widening NC 55 will allow for faster commutes between, especially, the many small communities along its length to New Bern and vice-versa. In addition, the planned future widening of NC 55 to Oriental, NC 306 to Minnesott Beach, and SR 1005 from Arapahoe and Oriental will further stimulate some growth in the areas along the Neuse River. While buffer and coastal area management regulations are in effect, a large amount of growth in Pamlico County that does occur will likely do so along its rivers, waterfronts, and tidal creeks. CAMA and the Neuse River riparian buffer rules will help minimize impacts from such development.

Oriental is the best known of several Neuse shoreline villages and is one of eastern North Carolina's sailing hot spots. The new River Dunes community several miles east of Oriental will benefit from a faster travel from the New Bern, US 70, and US 17 area in Craven County. Significant commuting is unlikely in that New Bern is not a major employment center. River Dunes may develop more quickly due to the faster travel times, but the natural beauty of the county is the major draw; the upscale project would likely occur regardless of the project.

While the county does not have county wide zoning, Bayboro, Vandemere, Minnesott Beach, and Oriental do. Those towns use their zoning ordinances to guide types and intensities of growth. The county does, however, have a subdivision ordinance to regulate new development. The subdivision ordinance allows for officials to deny the platting of land for unsuitable purposes.

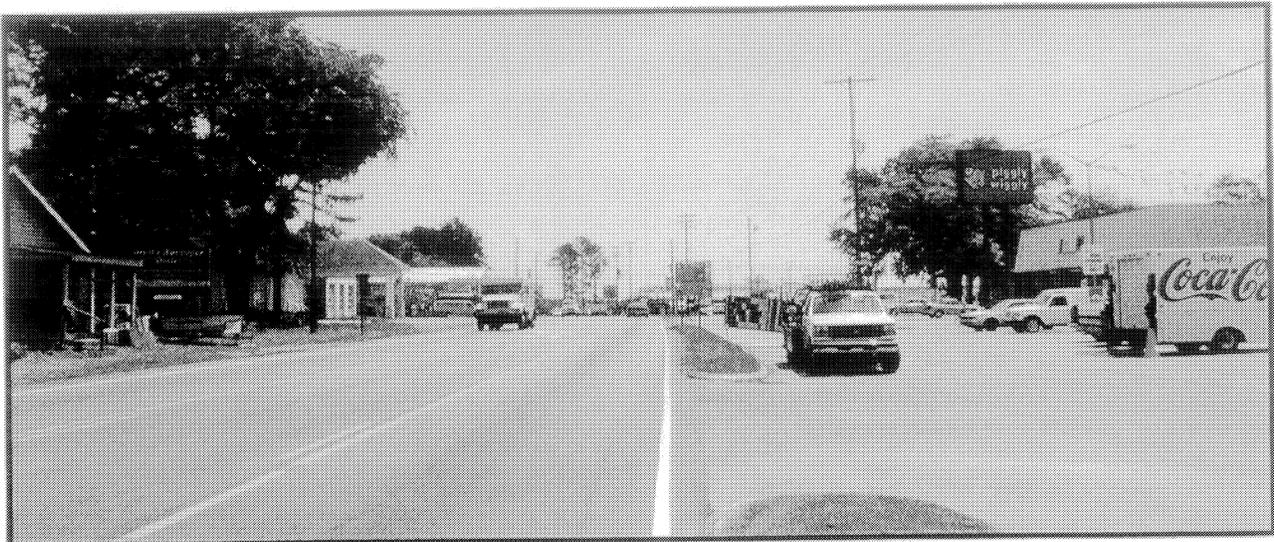
The Pamlico County Joint CAMA Land Use Plan states a vision for low density development that is sustainable in nature. Maintaining and improving water quality is a goal of the CAMA plan. Stormwater regulations, however, remain weak. The Plan serves as guidance, but is not binding.

Indirect and cumulative effects resulting from R-2539C should be minimal. No further study is recommended at this time.

## Pamlico Area Photos



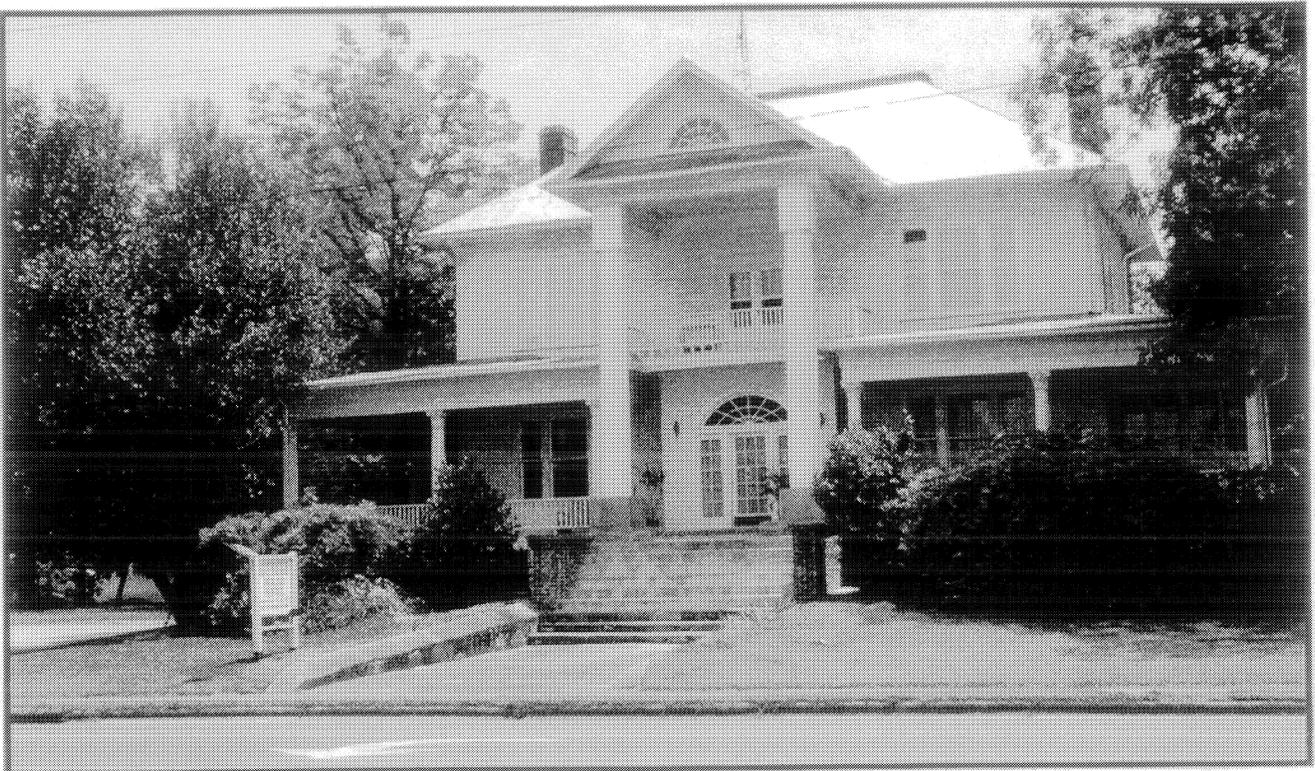
West terminus of project just outside of Grantsboro



NC 55 approaching NC 306 intersection



Commercial development outside of Bayboro



**Bayboro House Hotel**



**One of several marinas in Oriental**

## **APPENDIX**

## Search Criteria: pamlico, All Search Results: 33 records found.

Major Group	Scientific Name	Common Name	State Status	Federal Rank	Global Rank	County Status
Mammal	<i>Sciurus niger</i>	Eastern Fox Squirrel	SR	S3	G5	Obscure - Pamlico - <u>MAP - HABITAT</u>
Mammal	<i>Trichechus manatus</i>	West Indian Manatee	E	S1N	G2	Historic - Pamlico - <u>MAP - HABITAT</u>
Bird	<i>Botaurus lentiginosus</i>	American Bittern	SR	S1B, S3NG4		Current - Pamlico - <u>MAP - HABITAT</u>
Bird	<i>Dendroica virens waynei</i>	Black-throated Green Warbler - Coastal Plain Population	SR	S3B, SZNG5TU		Current - Pamlico - <u>MAP - HABITAT</u>
Bird	<i>Haliaeetus leucocephalus</i>	Bald Eagle	T	S3B, S3NG4		Current - Pamlico - <u>MAP - HABITAT</u>
Bird	<i>Himantopus mexicanus</i>	Black-necked Stilt	SR	S2B	G5	Current - Pamlico - <u>MAP - HABITAT</u>
Bird	<i>Laterallus jamaicensis</i>	Black Rail	SR	FSC S3B, S2NG4		Current - Pamlico - <u>MAP - HABITAT</u>
Bird	<i>Picoides borealis</i>	Red-cockaded Woodpecker	E	S2	G3	Historic - Pamlico - <u>MAP - HABITAT</u>
Reptile	<i>Alligator mississippiensis</i>	American Alligator	T	(S/A) S3	G5	Historic - Pamlico - <u>MAP - HABITAT</u>
Reptile	<i>Crotalus horridus</i>	Timber Rattlesnake	SC	S3	G4	Obscure - Pamlico - <u>MAP - HABITAT</u>
Reptile	<i>Lepidochelys kempii</i>	Atlantic Ridley	E	SAB, SZNG1		Current - Pamlico - <u>MAP - HABITAT</u>
Reptile	<i>Malaclemys terrapin centrata</i>	Carolina Diamondback Terrapin	SC	S3	G4T4	Current - Pamlico - <u>MAP - HABITAT</u>
Reptile	<i>Nerodia sipedon williamogensis</i>	Carolina Water Snake	SC	S3	G5T3	Current - Pamlico - <u>MAP - HABITAT</u>

Fish	Acipenser brevirostrum	Shortnose Sturgeon	E	E	S1	G3	Historic - Pamlico - MAP - <u>HABITAT</u>
Vascular Plant	Dionaea muscipula	Venus Flytrap	SR- L, SC	FSC	S3	G3	Historic - Pamlico - MAP - <u>HABITAT</u>
Vascular Plant	Ludwigia ravenii	Raven's Seedbox	SR-T	-	S2?	G2?	Historic - Pamlico - MAP - <u>HABITAT</u>
Vascular Plant	Lysimachia asperulifolia	Rough-leaf Loosestrife	E	E	S3	G3	Current - Pamlico - MAP - <u>HABITAT</u>
Vascular Plant	Platanthera integra	Yellow Fringeless Orchid	T	-	S1	G3G4	Obscure - Pamlico - MAP - <u>HABITAT</u>
Vascular Plant	Solidago verna	Spring-flowering Goldenrod	SR-L	FSC	S3	G3	Current - Pamlico - MAP - <u>HABITAT</u>
Natural Community	Brackish Marsh	-	-	-	S5	G5	Current - Pamlico - MAP
Natural Community	Coastal Fringe Evergreen Forest	-	-	-	S1	G3?	Current - Pamlico - MAP
Natural Community	Estuarine Fringe Loblolly Pine Forest	-	-	-	S3	G3?	Current - Pamlico - MAP
Natural Community	High Pocosin	-	-	-	S4	G4	Current - Pamlico - MAP
Natural Community	Low Pocosin	-	-	-	S2	G3	Current - Pamlico - MAP
Natural Community	Mesic Mixed Hardwood Forest (Coastal Plain Subtype)	-	-	-	S4	G5T5	Current - Pamlico - MAP
Natural Community	Nonriverine Swamp Forest	-	-	-	S2S3	G2G3	Current - Pamlico - MAP
Natural Community	Nonriverine Wet Hardwood Forest	-	-	-	S1	G1	Current - Pamlico - MAP
Natural Community	Pine/Scrub Oak Sandhill	-	-	-	S3	G4	Current - Pamlico - MAP
Natural Community	Pond Pine	-	-	-	-	-	Current - Pamlico -

Community	Woodland	-	-	S4	G4G5	<u>MAP</u>
Natural Community	Tidal Cypress-- Gum Swamp	-	-	S3	G4	Current - Pamlico - <u>MAP</u>
Natural Community	Wet Pine Flatwoods	-	-	S3	G3	Current - Pamlico - <u>MAP</u>
Special Habitat	Gull*Tern*Skimmer Colonial Waterbirds Nesting Colony Site	-	-	S3	G5	Historic - Pamlico - <u>MAP</u>
Special Habitat	Marsh Bird Nesting Area	-	-	S4	G5	Historic - Pamlico - <u>MAP</u>

NC NHP database updated: January, 2004. Search performed on Wednesday, August 18, 2004 at 11:06:10 Eastern Standard Time.

Total number of searches since 01/01/04: 4720

Explanation of Codes

Do NOT bookmark this search results page, instead bookmark: [www.ncsparks.net/nhp/county.html](http://www.ncsparks.net/nhp/county.html)

## EXPLANATION OF CODES FOR COUNTY AND QUAD STATUS LISTS

The county and quadrangle status lists provided by the NC Natural Heritage Program tally the elements of natural diversity (rare plants and animals, rare and exemplary natural communities, and special animal habitats) known to occur in all North Carolina counties and USGS 7.5-minute quadrangles. The information on which these lists is based comes from a variety of sources, including field surveys, museums, herbaria, scientific literature, and personal communications. These lists are dynamic, with new records continually being added and old records being revised as new information is received. As a result, a list cannot be considered a definitive record of the elements of natural diversity present in a given county or quad and should not be used as a substitute for field surveys. When this information is used in any document, we request that the date this list was compiled be given and that the NC Natural Heritage Program be credited.

### STATE STATUS

CODE	STATUS	CODE	STATUS
<b>E</b>	Endangered	<b>SR</b>	Significantly Rare
<b>T</b>	Threatened	<b>EX</b>	Extirpated
<b>SC</b>	Special Concern	<b>P_</b>	Proposed (used only as a qualifier of the ranks above)
<b>C</b>	Candidate		

NOTE: the definitions of state statuses of plants and animals differ. Below are summaries of the statuses for each group.

**Plant statuses** are determined by the Plant Conservation Program (NC Department of Agriculture) and the Natural Heritage Program (NC Department of Environment and Natural Resources). Endangered, Threatened, and Special Concern species are protected by state law (Plant Protection and Conservation Act, 1979). Candidate and Significantly Rare designations indicate rarity and the need for population monitoring and conservation action. Note that plants can have a double status, e.g., E-SC, indicates that while the plant is endangered, it is collected or sold under regulation.

## Source List

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<http://www.pamliconews.com/>

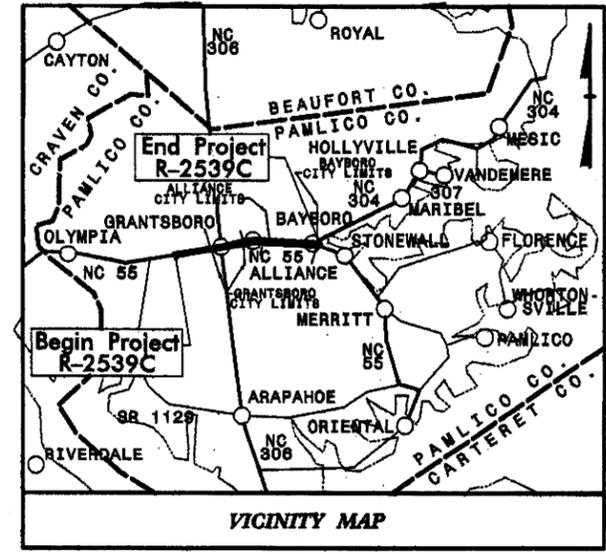
United States Army Corps of Engineers. Project Impact Hurricane Map for eastern North Carolina. Leland, NC: Hurricane Map Enterprises, 1998.

US Census Data. 1990 and 2000. <http://factfinder.census.gov>.

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**CONTRACT: C201116 TIP PROJECT: R-2539C**

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



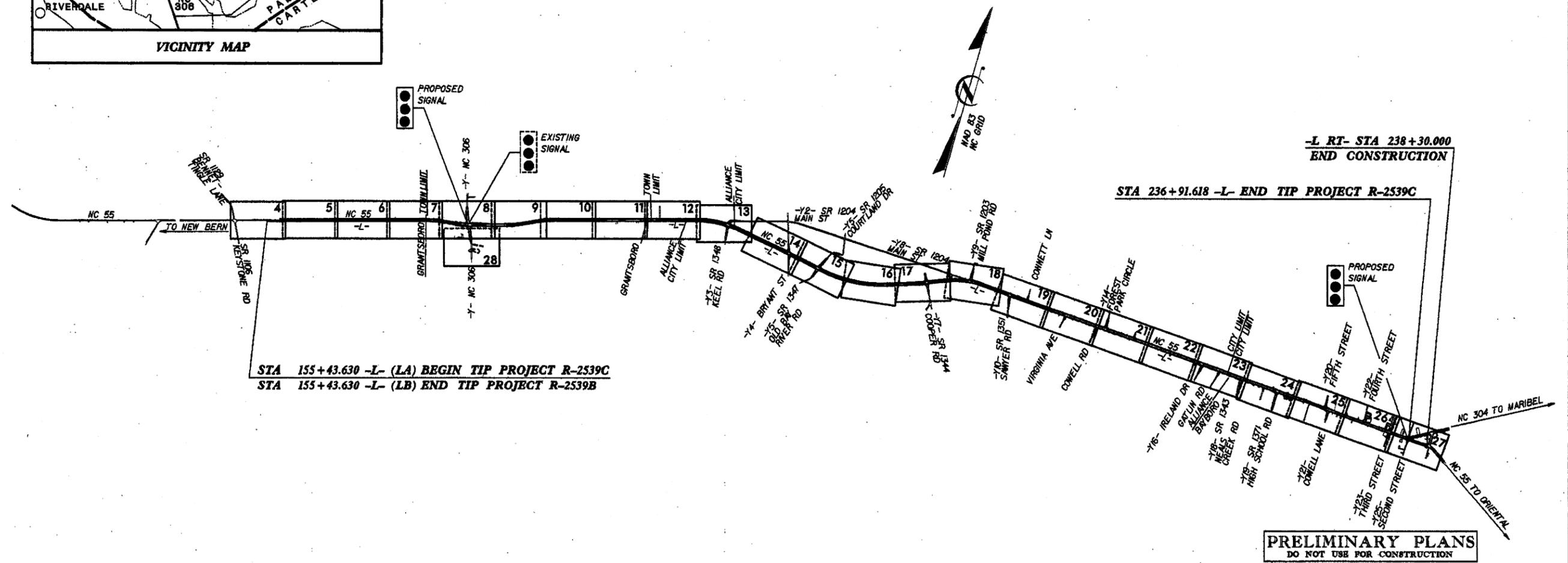
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**PAMLICO COUNTY**

**LOCATION: NC 55 FROM EAST OF SR 1129 (BENNETT-TINGLE ROAD) TO NC 304 IN BAYBORO**

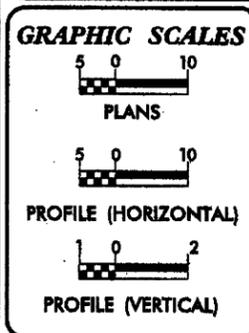
**TYPE OF WORK: GRADING, DRAINAGE, PAVING, CURB & GUTTER, CULVERTS, SIGNALS, & SIGNING**

STATE	STATE PROJECT EXPERIENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2539C	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34452.1.1	STP-55(1)	PE	
34452.2.4	STP-55(31)	RW, UTIL.	
34452.3.7	STP-55(33)	CONST.	

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



**PRELIMINARY PLANS**  
DO NOT USE FOR CONSTRUCTION



**DESIGN DATA**

ADT (2005) = 8,100-15,200
ADT (2025) = 12,800-24,100
DHV = 12%
D = 60% / 63%
T = 7% *
V = 100 km/h (SHOULDER SECTION)
V = 80 km/h (CURB & GUTTER SECTION)
* (TTST 2%+ DUAL 5%)

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT R-2539C =	8.148 Km
TOTAL LENGTH OF TIP PROJECT R-2539C =	8.148 Km

Prepared in the Office of:

**GREENHORNE & O'MARA, INC.**  
8868 CENTERVIEW DRIVE, SUITE 107  
RALPH, NORTH CAROLINA 27806  
(919) 853-9193

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2002 STANDARD SPECIFICATIONS

**RIGHT OF WAY DATE:**  
JULY 31, 2003

**LETTING DATE:**  
DECEMBER 21, 2004

NC DOT CONTACT: **TERESA BRUTON, P.E.**  
PROJECT ENGINEER - PROJECT SERVICES

**HYDRAULICS ENGINEER**

\_\_\_\_\_  
P.E.

**ROADWAY DESIGN ENGINEER**

\_\_\_\_\_  
P.E.

**DIVISION OF HIGHWAYS**  
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER

\_\_\_\_\_  
P.E.

**DEPARTMENT OF TRANSPORTATION**  
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

\_\_\_\_\_  
DIVISION ADMINISTRATOR

DATE



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

PROJ. REFERENCE NO. R-2539C SHEET NO. 1-B  
  
**PRELIMINARY PLANS**  
 DO NOT USE FOR CONSTRUCTION

**GREENHORNE & O'MARA, INC.**  
 5565 CENTERVIEW DRIVE, SUITE 107  
 RALEIGH, NORTH CAROLINA 27606  
 (919) 851-1949

\*S.U.E = SUBSURFACE UTILITY ENGINEER

# CONVENTIONAL SYMBOLS

## ROADS & RELATED ITEMS

Edge of Pavement	-----
Curb	-----
Prop. Slope Stakes Cut	----- <sup>C</sup>
Prop. Slope Stakes Fill	----- <sup>F</sup>
Prop. Woven Wire Fence	-----○-----
Prop. Chain Link Fence	-----□-----
Prop. Barbed Wire Fence	-----◇-----
Prop. Wheelchair Ramp	-----  -----
Exist. Guardrail	----- -----
Prop. Guardrail	----- -----
Equality Symbol	-----⊕-----
Pavement Removal	-----  -----

## RIGHT OF WAY

Baseline Control Point	-----◆-----
Existing Right of Way Marker	-----△-----
Exist. Right of Way Line wMarker	-----△-----
Prop. Right of Way Line with Proposed RW marker (Iron Pin & Cap)	-----▲-----
Prop. Right of Way Line with Proposed (Concrete or Granite) R/W Marker	-----▲-----
Exist. Control of Access Line	-----⊙-----
Prop. Control of Access Line	-----⊙-----
Exist. Easement Line	-----E-----
Prop. Temp. Construction Easement Line	-----E-----
Prop. Temp. Drainage Easement Line	-----TDE-----
Prop. Perm. Drainage Easement Line	-----PDE-----

## HYDROLOGY

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

## STRUCTURES

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

MINOR	
Head & End Wall	-----CONC HW-----
Pipe Culvert	-----
Footbridge	----->-----
Drainage Boxes	-----□ CB-----
Paved Ditch Gutter	-----

## UTILITIES

Exist. Pole	-----●-----
Exist. Power Pole	-----●-----
Prop. Power Pole	-----○-----
Exist. Telephone Pole	-----●-----
Prop. Telephone Pole	-----○-----
Exist. Joint Use Pole	-----●-----
Prop. Joint Use Pole	-----○-----
Telephone Pedestal	-----□-----
Cable TV Pedestal	-----□-----
Hydrant	-----◆-----
Satellite Dish	----->-----
Exist. Water Valve	-----⊗-----
Sewer Clean Out	-----⊕-----
Power Manhole	-----⊕-----
Telephone Booth	-----□-----
Water Manhole	-----⊕-----
Light Pole	-----●-----
H-Frame Pole	-----●-----
Power Line Tower	-----⊗-----
Pole with Base	-----□-----
Gas Valve	-----◇-----
Gas Meter	-----◇-----
Telephone Manhole	-----⊕-----
Power Transformer	-----⊕-----
Sanitary Sewer Manhole	-----⊕-----
Storm Sewer Manhole	-----⊕-----
Tank; Water, Gas, Oil	-----○-----
Water Tank With Legs	-----○-----
Traffic Signal Junction Box	-----⊕-----
Fiber Optic Splice Box	-----⊕-----
Television or Radio Tower	-----⊗-----
Utility Power Line Connects to Traffic Signal Lines Cut Into the Pavement	-----TS-----

Recorded Water Line	-----W-----
Designated Water Line (S.U.E.*)	-----W-----
Sanitary Sewer	-----SS-----
Recorded Sanitary Sewer Force Main	-----FSS-----
Designated Sanitary Sewer Force Main(S.U.E.*)	-----FSS-----
Recorded Gas Line	-----G-----
Designated Gas Line (S.U.E.*)	-----G-----
Storm Sewer	-----S-----
Recorded Power Line	-----P-----
Designated Power Line (S.U.E.*)	-----P-----
Recorded Telephone Cable	-----T-----
Designated Telephone Cable (S.U.E.*)	-----T-----
Recorded U/G Telephone Conduit	-----TC-----
Designated U/G Telephone Conduit (S.U.E.*)	-----TC-----
Unknown Utility (S.U.E.*)	-----?UTL-----
Recorded Television Cable	-----TV-----
Designated Television Cable (S.U.E.*)	-----TV-----
Recorded Fiber Optics Cable	-----FO-----
Designated Fiber Optics Cable (S.U.E.*)	-----FO-----
Exist. Water Meter	-----⊕-----
U/G Test Hole (S.U.E.*)	-----⊕-----
Abandoned According to U/G Record	-----ATTUR-----
End of Information	-----E.O.I-----

## BOUNDARIES & PROPERTIES

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Property Line Symbol	-----PL-----
Exist. Iron Pin	-----⊕-----
Property Corner	-----+
Property Monument	-----ECM-----
Property Number	-----123-----
Parcel Number	-----6-----
Fence Line	-----X X X----- WW & ISBW
Existing Wetland Boundaries	-----WLB-----
Proposed Wetland Boundaries	-----WLB-----
Existing Endangered Animal Boundaries	-----EAB-----
Existing Endangered Plant Boundaries	-----EPB-----

## BUILDINGS & OTHER CULTURE

Buildings	-----
Foundations	-----
Area Outline	-----
Gate	-----
Gas Pump Vent or U/G Tank Cap	-----
Church	-----
School	-----
Park	-----
Cemetery	-----
Dam	-----
Sign	-----
Well	-----
Small Mine	-----
Swimming Pool	-----

## TOPOGRAPHY

Loose Surface	-----
Hard Surface	-----
Change in Road Surface	-----
Curb	-----
Right of Way Symbol	-----R/W-----
Guard Post	-----⊕ GP-----
Paved Walk	-----
Bridge	-----
Box Culvert or Tunnel	-----
Ferry	-----
Culvert	-----
Footbridge	-----
Trail, Footpath	-----
Light House	-----

## VEGETATION

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

## RAILROADS

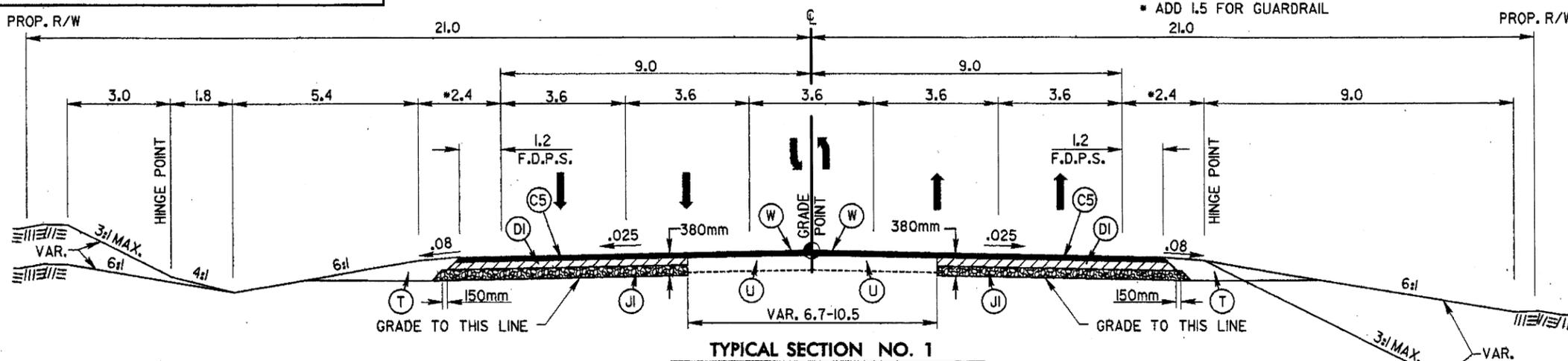
Standard Gauge	-----
RR Signal Milepost	-----
Switch	-----

REVISIONS

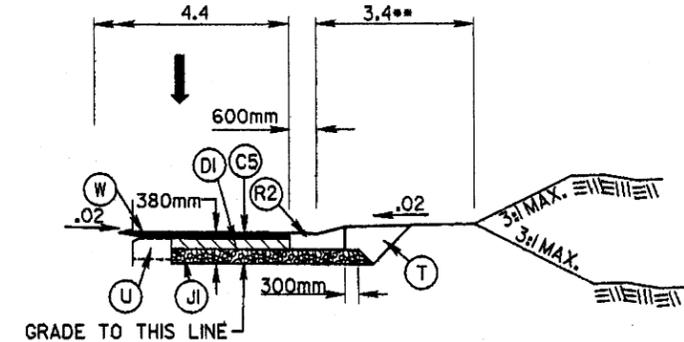
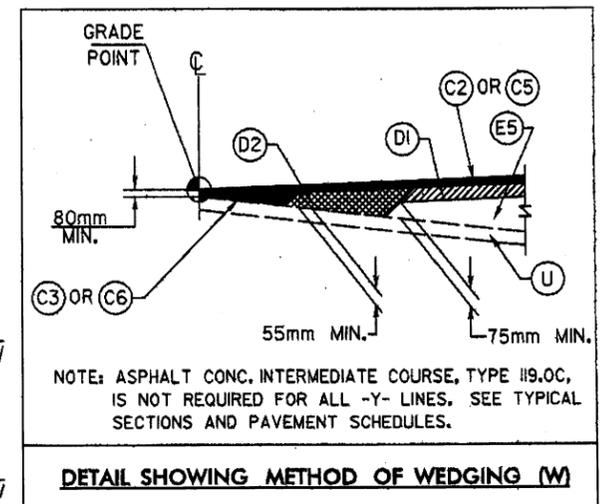
**GREENHORNE & O'MARA, INC.**  
 5555 CENTERVIEW DRIVE, SUITE 107  
 RALEIGH, NORTH CAROLINA 27606  
 (919) 851-1919



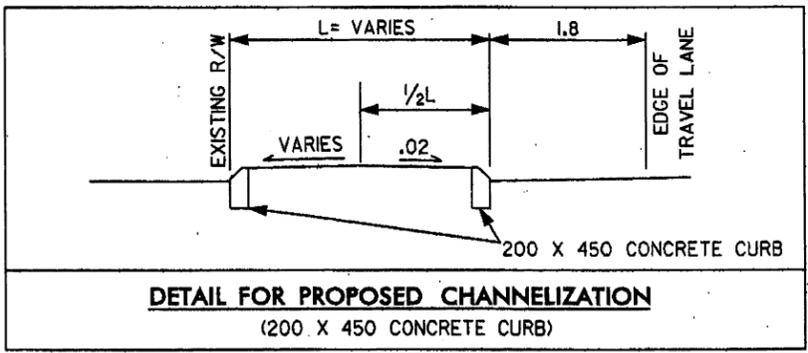
PROJECT REFERENCE NO. R-2539C	SHEET NO. 2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
CONST. REV.	
R/W REV.	



**TYPICAL SECTION NO. 1**  
 STA. 155+43.630 -L- TO STA. 165+73.000 -L- (RT. SIDE)  
 STA. 156+32.750 -L- TO STA. 166+31.422 -L- (LT. SIDE)  
 STA. 175+65.000 -L- TO STA. 203+70.816 -L-

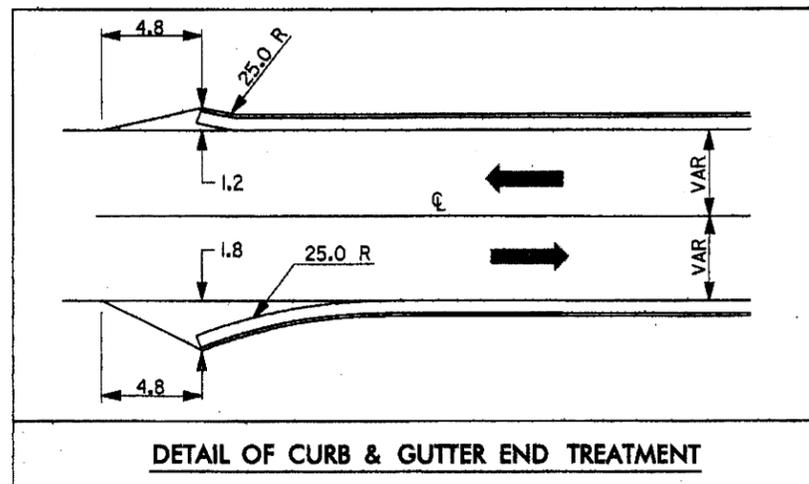


**TYPICAL SECTION NO. 1-A**  
 STA. 179+44.880 -L- TO STA. 181+55.000 -L- (RT. SIDE)  
 \*\* USE 1.8 BERM STA. 181+2.474 -L- TO STA. 181+55.000 -L-



PAVEMENT SCHEDULE	
D2	PROP. VAR. DEPTH ASPHALT CONC. INTERMEDIATE COURSE, TYPE 119.0C, AT AN AVERAGE RATE OF 2.45 KG PER SQ. METER PER 1mm DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 55mm OR GREATER THAN 110mm IN DEPTH.
E1	PROP. APPROX. 100 mm ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 245.0 kg PER SQ. METER.
E2	PROP. APPROX. 120 mm ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 294.0 kg PER SQ. METER.
E3	PROP. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 2.45 KG PER SQ. METER PER 1mm DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 75mm OR GREATER THAN 140mm IN DEPTH.
E4	PROP. APPROX. 100 mm ASPHALT CONC. BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 245.0 kg PER SQ. METER.
E5	PROP. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 2.45 KG PER SQ. METER PER 1mm DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 75mm OR GREATER THAN 140mm IN DEPTH.
J1	PROP. 200 mm AGGREGATE BASE COURSE.
J2	PROP. VARIABLE DEPTH AGGREGATE BASE COURSE.
R1	750 mm CONCRETE CURB AND GUTTER
R2	1200 mm CONCRETE EXPRESSWAY GUTTER
S	100 mm CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING (150mm)
W	WEDGING (SEE DETAIL THIS SHEET)

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 40 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 96 kg PER SQ. METER.
C2	PROP. APPROX. 80 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 96 kg PER SQ. METER IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 2.40 kg PER SQ. METER PER 1mm DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 30 mm OR GREATER THAN 40 mm IN DEPTH.
C4	PROP. APPROX. 40 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 96 kg PER SQ. METER.
C5	PROP. APPROX. 80 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 96 kg PER SQ. METER IN EACH OF TWO LAYERS.
C6	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 2.40 kg PER SQ. METER PER 1mm DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 30 mm OR GREATER THAN 40 mm IN DEPTH.
D1	PROP. APPROX. 100 mm ASPHALT CONC. INTERMEDIATE COURSE, TYPE 119.0C, AT AN AVERAGE RATE OF 245.0 kg PER SQ. METER.



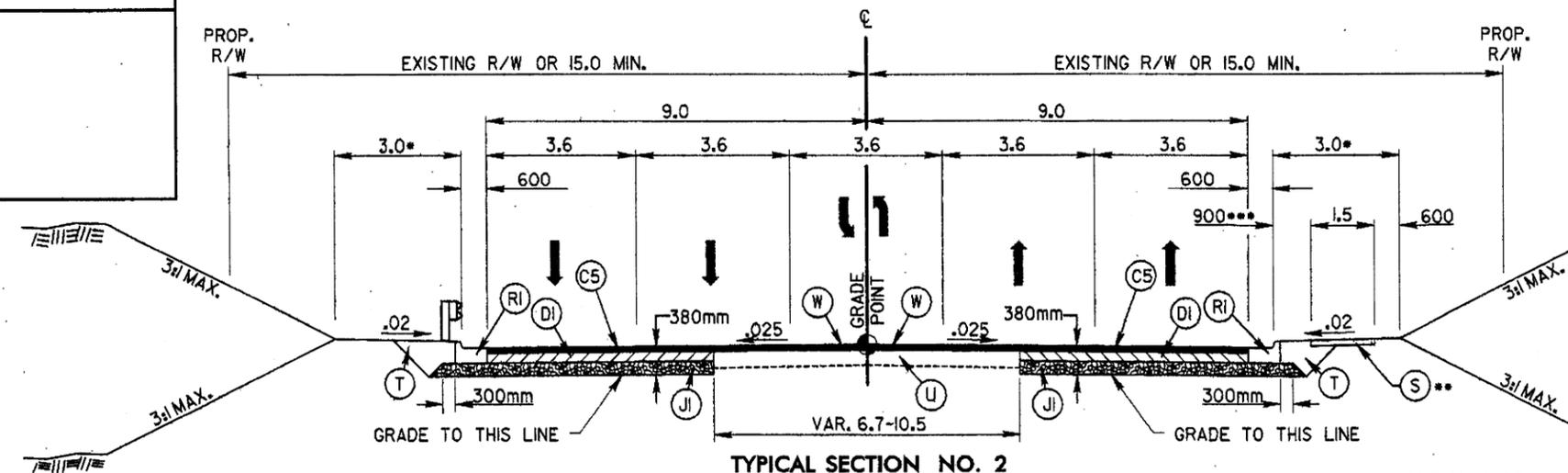
**DETAIL OF CURB & GUTTER END TREATMENT**

NOTE: ALL PAVEMENT EDGE SLOPES ARE 1% UNLESS OTHERWISE NOTED.

REVISIONS

PROJECT REFERENCE NO. R-2539C		SHEET NO. 2-A	
R/W SHEET NO.			
ROADWAY DESIGN ENGINEER		PAVEMENT DESIGN ENGINEER	
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION			
CONST. REV.			
R/W REV.			

**GREENHORNE & O'MARA, INC.**  
5665 CENTERVIEW DRIVE, SUITE 107  
RALEIGH, NORTH CAROLINA 27606  
(919) 851-1919



**TYPICAL SECTION NO. 2**

STA. 165+73.000 -L- TO STA. 168+96.471 -L- (RT SIDE)  
STA. 166+31.422 -L- TO STA. 167+55.492 -L- (LT SIDE)  
STA. 168+96.471 -L- TO STA. 175+65.000 -L-  
STA. 203+70.816 -L- TO STA. 206+20.000 -L-

PLACE GUARDRAIL AT FACE OF CURB WHERE REQUIRED.

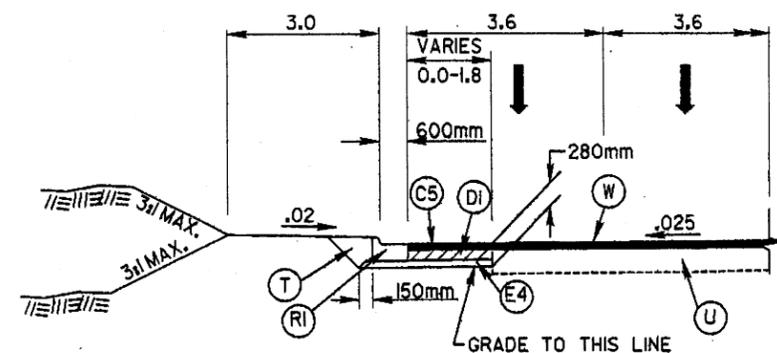
\*\* SEE PLANS FOR SIDEWALK LOCATIONS

\*\*\* SIDEWALK 1.2 FROM FACE OF CURB FROM STA. 205+62.947 TO STA. 206+11.504 (RT. SIDE)

**ABBREVIATED PAVEMENT SCHEDULE**

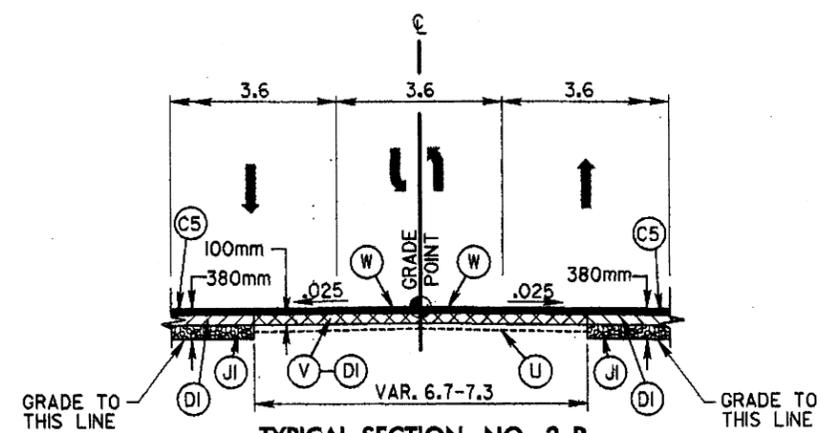
C1	40 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C2	80 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C3	VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C4	40 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
C5	80 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
C6	VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
D1	100 mm ASPHALT CONC. INTERMEDIATE COURSE, TYPE I9.0C
D2	VAR. DEPTH ASPHALT CONC. INTERMEDIATE COURSE, TYPE I9.0C
E1	100 mm ASPHALT CONC. BASE COURSE, TYPE B25.0B
E2	120 mm ASPHALT CONC. BASE COURSE, TYPE B25.0B
E3	VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B
E4	100 mm ASPHALT CONC. BASE COURSE, TYPE B25.0C
E5	VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0C
J1	200 mm AGGREGATE BASE COURSE
J2	VAR. DEPTH AGGREGATE BASE COURSE
R1	750 mm CONCRETE CURB AND GUTTER
R2	1200 mm CONCRETE EXPRESSWAY GUTTER
S	100 mm CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING (50mm)
W	WEDGING (SEE SHEET 2 FOR WEDGING DETAIL)

NOTE: SEE SHEET 2 FOR DETAILED PAVEMENT SCHEDULE



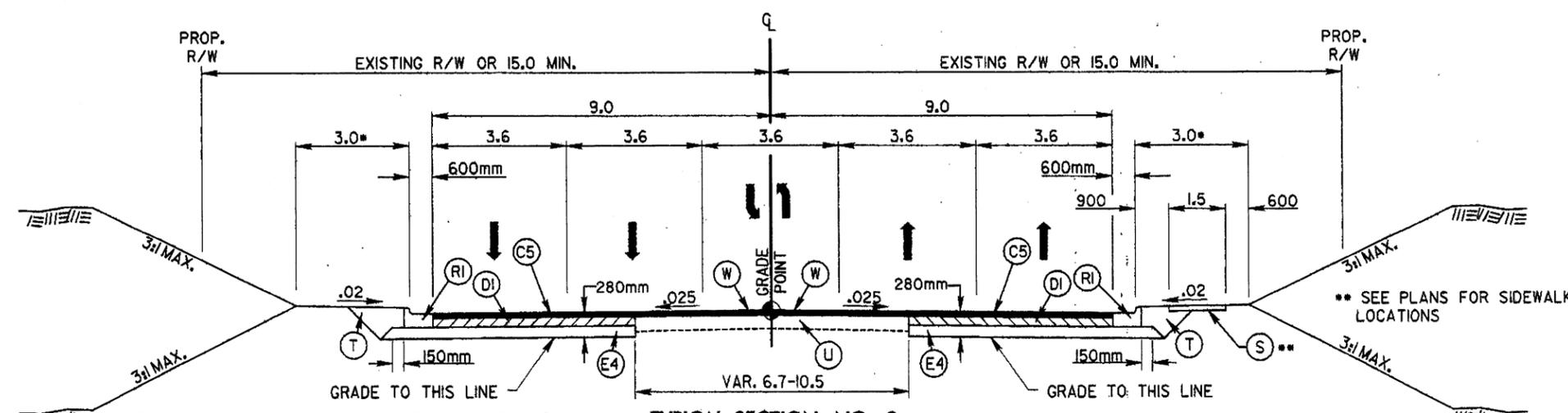
**TYPICAL SECTION NO. 2-A**  
(FOR NARROW WIDENING)

STA. 167+55.492 -L- TO STA. 168+96.471 -L- (LT. SIDE)



**TYPICAL SECTION NO. 2-B**  
(FOR MILLING OF EXISTING PAVEMENT)

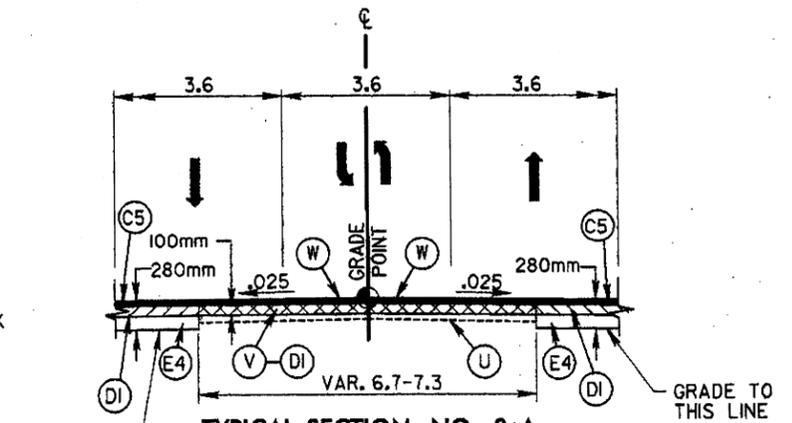
STA. 206+20.000 -L- TO STA. 207+75.000 -L-



**TYPICAL SECTION NO. 3**

STA. 209+20.000 -L- TO STA. 229+50.000 -L-

PLACE GUARDRAIL AT FACE OF CURB WHERE REQUIRED.



**TYPICAL SECTION NO. 3-A**  
(FOR MILLING OF EXISTING PAVEMENT)

STA. 207+75.000 -L- TO STA. 209+20.000 -L-

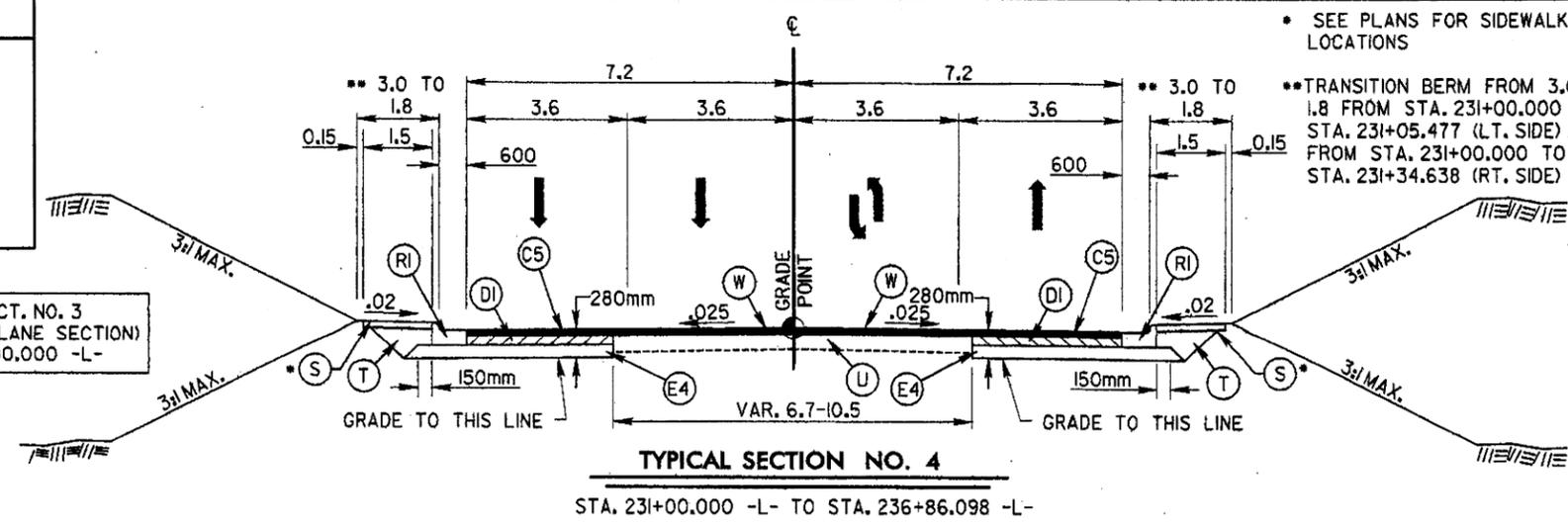
UNIFORM TRANSITION FROM TYP. SECT. NO. 3 TO TYP. SECT. NO. 4 (5-LANE TO 4-LANE SECTION)  
STA. 229+50.000 -L- TO STA. 231+00.000 -L-

REVISIONS

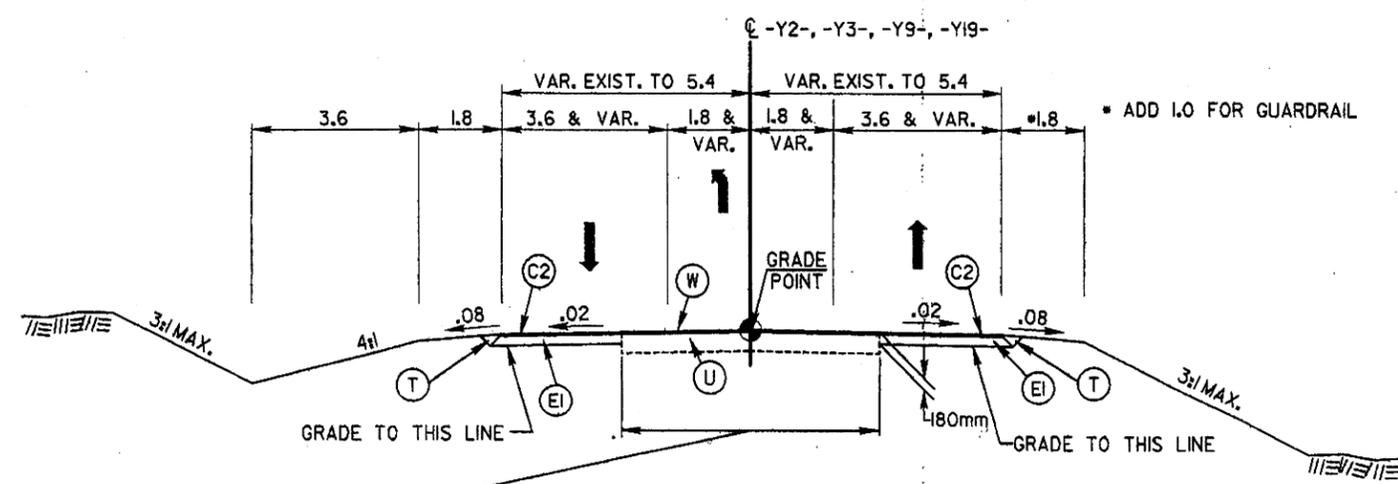
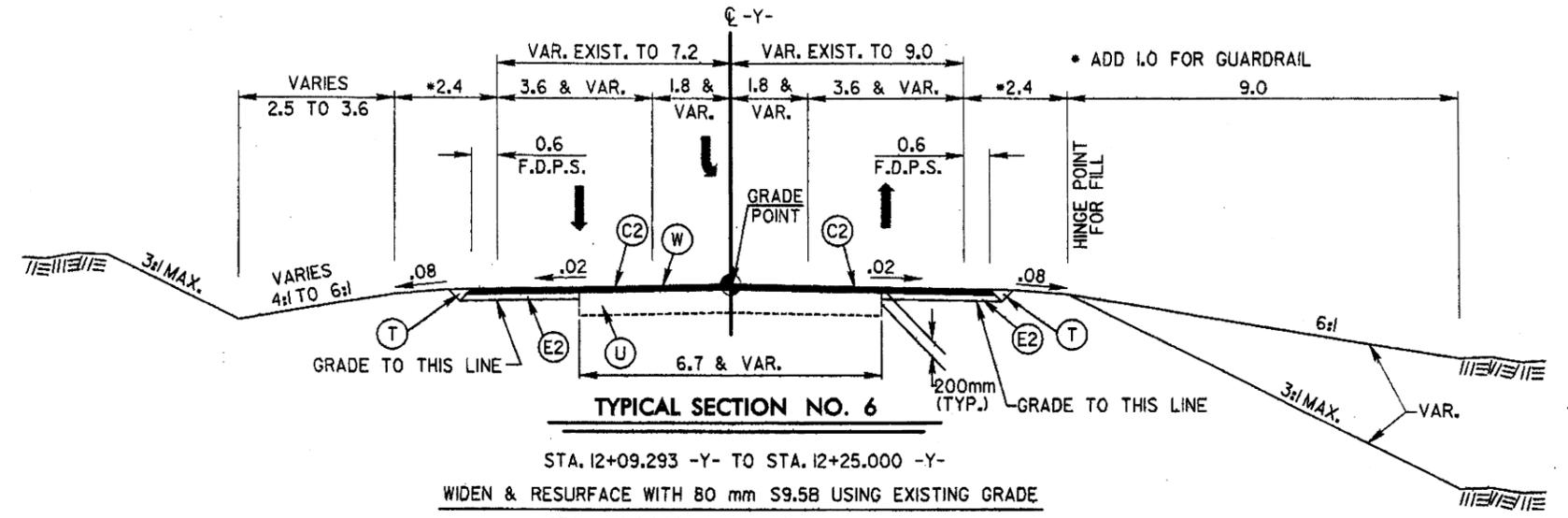
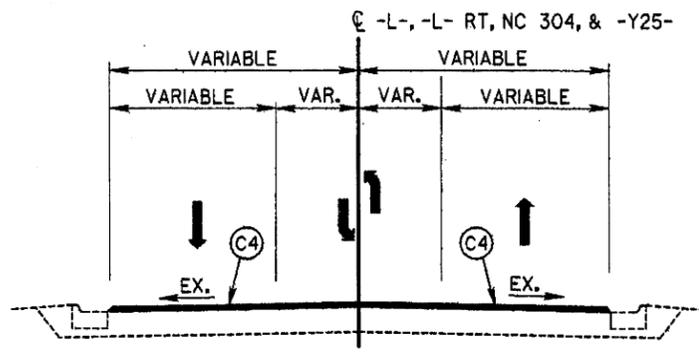
PROJECT REFERENCE NO. R-2539C		SHEET NO. 2-B	
R/W SHEET NO.			
ROADWAY DESIGN ENGINEER		PAVEMENT DESIGN ENGINEER	
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION			
CONST. REV.		R/W REV.	

**GREENHORNE & O'MARA, INC.**  
5565 CENTERVIEW DRIVE, SUITE 107  
RALEIGH, NORTH CAROLINA 27606  
(919) 851-1919

UNIFORM TRANSITION FROM TYP. SECT. NO. 3 TO TYP. SECT. NO. 4 (5-LANE TO 4-LANE SECTION) STA. 229+50.000 -L- TO STA. 231+00.000 -L-



• SEE PLANS FOR SIDEWALK LOCATIONS  
• TRANSITION BERM FROM 3.0 TO 1.8 FROM STA. 231+00.000 TO STA. 231+05.477 (LT. SIDE) AND FROM STA. 231+00.000 TO STA. 231+34.638 (RT. SIDE)



-Y2- 5.2 & VAR.  
-Y3- 6.0 & VAR.  
-Y9- 4.8 & VAR.  
-Y19- 6.1 & VAR.

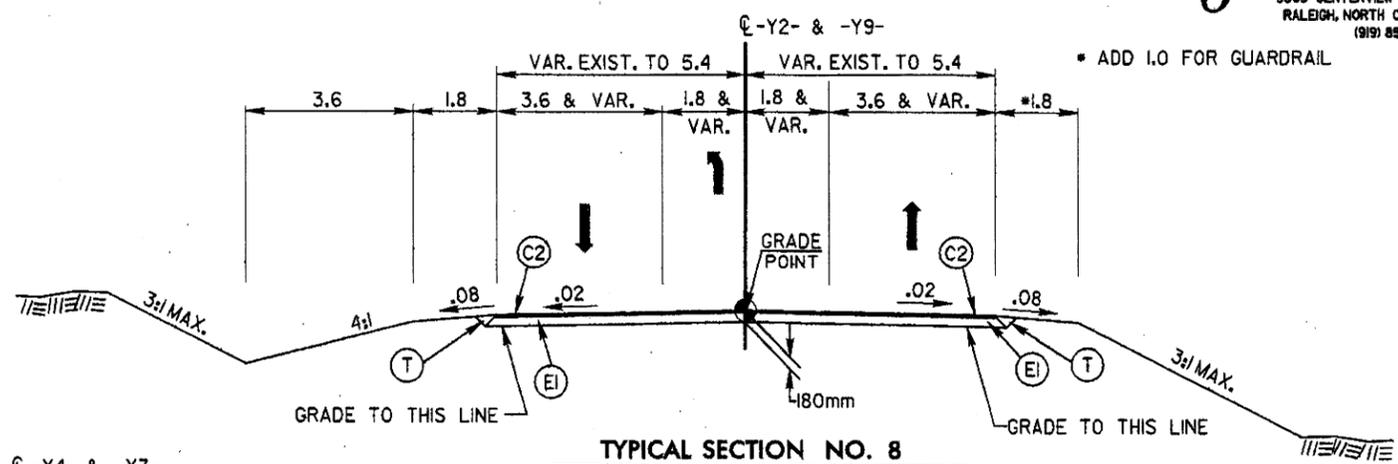
ABBREVIATED PAVEMENT SCHEDULE	
C1	40 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C2	80 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C3	VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C4	40 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
C5	80 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
C6	VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
D1	100 mm ASPHALT CONC. INTERMEDIATE COURSE, TYPE 119.0C
D2	VAR. DEPTH ASPHALT CONC. INTERMEDIATE COURSE, TYPE 119.0C
E1	100 mm ASPHALT CONC. BASE COURSE, TYPE B25.0B
E2	120 mm ASPHALT CONC. BASE COURSE, TYPE B25.0B
E3	VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B
E4	100 mm ASPHALT CONC. BASE COURSE, TYPE B25.0C
E5	VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0C
J1	200 mm AGGREGATE BASE COURSE
J2	VAR. DEPTH AGGREGATE BASE COURSE
R1	750 mm CONCRETE CURB AND GUTTER
R2	1200 mm CONCRETE EXPRESSWAY GUTTER
S	100 mm CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING (50mm)
W	WEDGING (SEE SHEET 2 FOR WEDGING DETAIL)

NOTE: SEE SHEET 2 FOR DETAILED PAVEMENT SCHEDULE

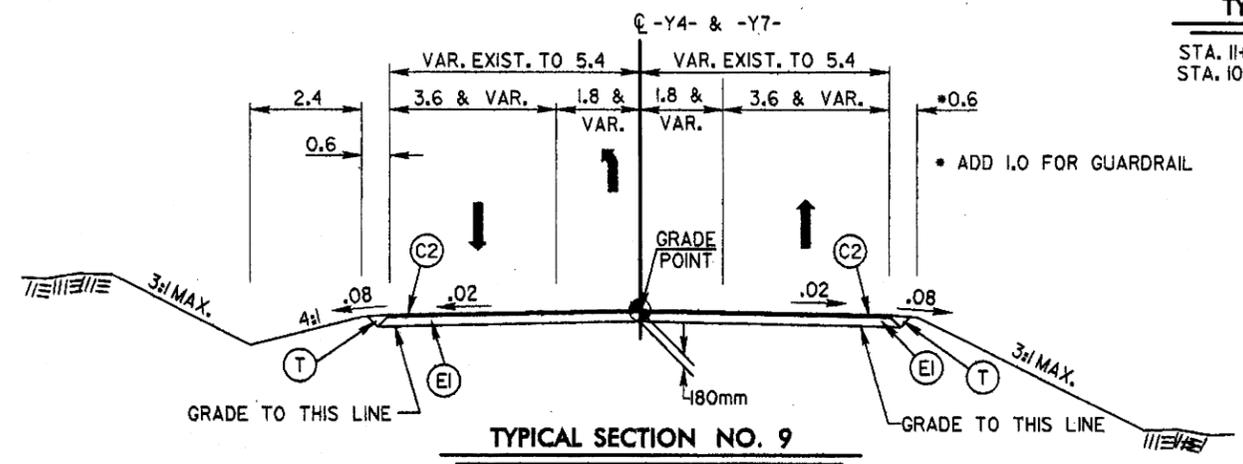
REVISIONS

**GREENHORNE & O'MARA, INC.**  
 5565 CENTERVIEW DRIVE, SUITE 107  
 RALEIGH, NORTH CAROLINA 27606  
 (919) 851-1919

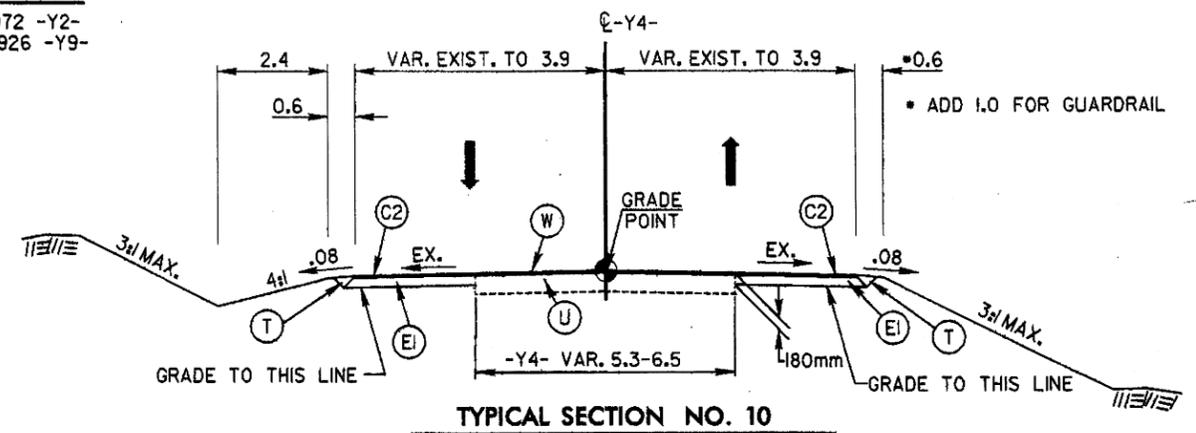
PROJECT REFERENCE NO. R-2539C		SHEET NO. 2-C	
R/W SHEET NO.			
ROADWAY DESIGN ENGINEER		PAVEMENT DESIGN ENGINEER	
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION			
CONST. REV.			
R/W REV.			



**TYPICAL SECTION NO. 8**  
 STA. 11+97.900 -Y2- TO 12+57.072 -Y2-  
 STA. 10+42.400 -Y9- TO 10+68.926 -Y9-

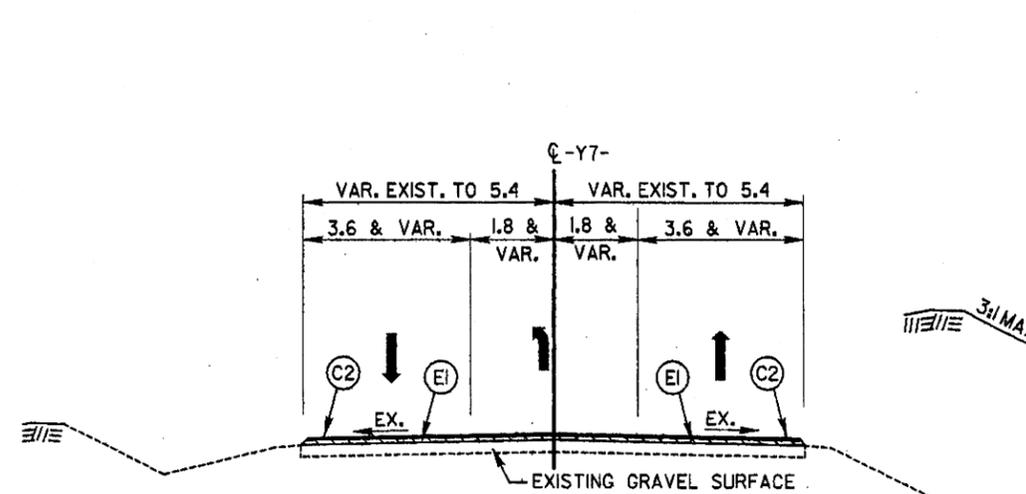


**TYPICAL SECTION NO. 9**  
 STA. 10+80.000 -Y4- TO 11+06.909 -Y4-  
 STA. 10+60.000 -Y7- TO 10+94.812 -Y7-

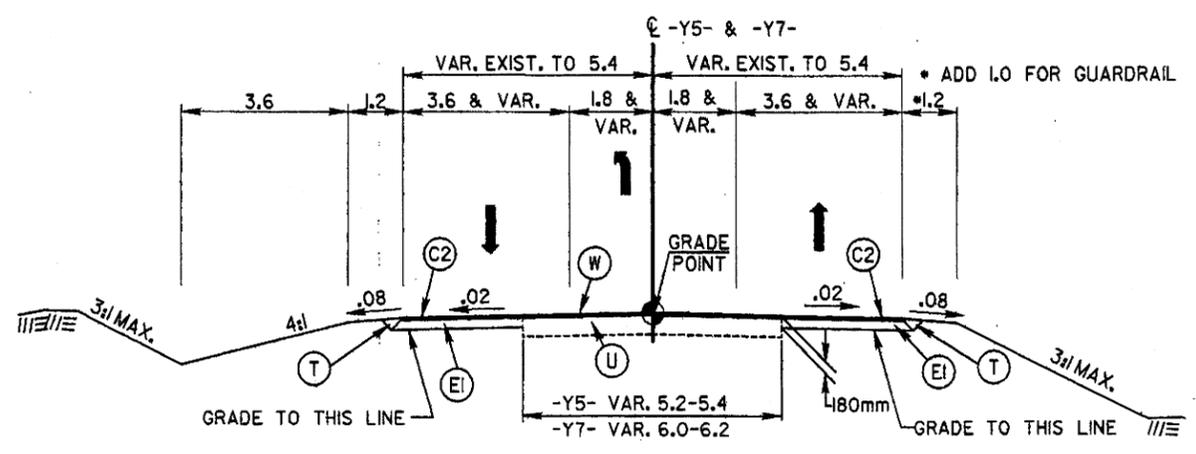


**TYPICAL SECTION NO. 10**  
 STA. 11+72.930 -Y4- TO 11+80.000 -Y4-

WIDEN & RESURFACE WITH 40 mm S9.5B USING EXISTING GRADE  
 STA. 11+80.000 TO STA. 12+20.000



**TYPICAL SECTION NO. 11**  
 -Y4- FROM MAIN ST. TO STA. 10+80.00 (APPROX. 159 METERS)  
 STA. 10+00.981 -Y7- TO 10+60.000 -Y7-



**TYPICAL SECTION NO. 12**  
 STA. 10+65.000 -Y5- TO 10+82.019 -Y5-  
 STA. 11+52.620 -Y7- TO 12+00.000 -Y7-  
 WIDEN & RESURFACE WITH 40 mm S9.5B USING EXISTING GRADE  
 STA. 10+20.000 -Y5- TO STA. 10+65.000 -Y5-

**ABBREVIATED PAVEMENT SCHEDULE**

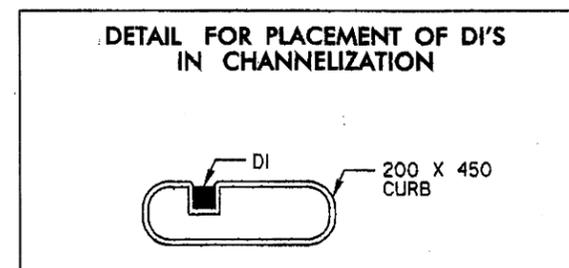
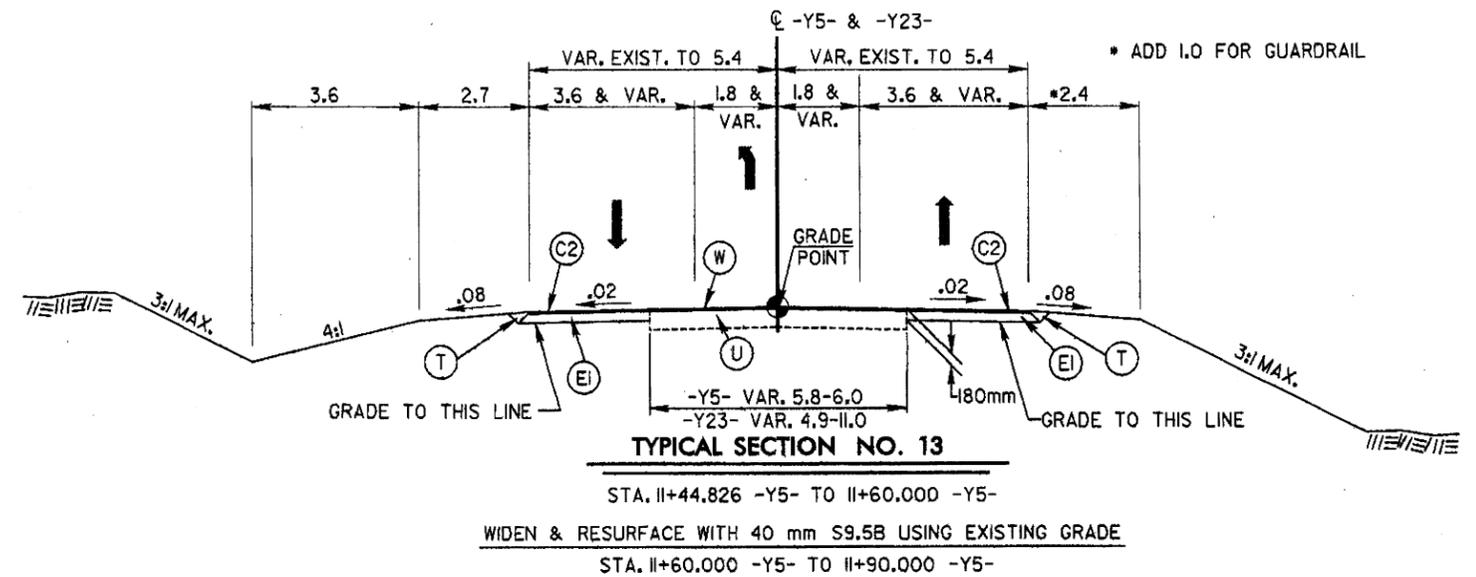
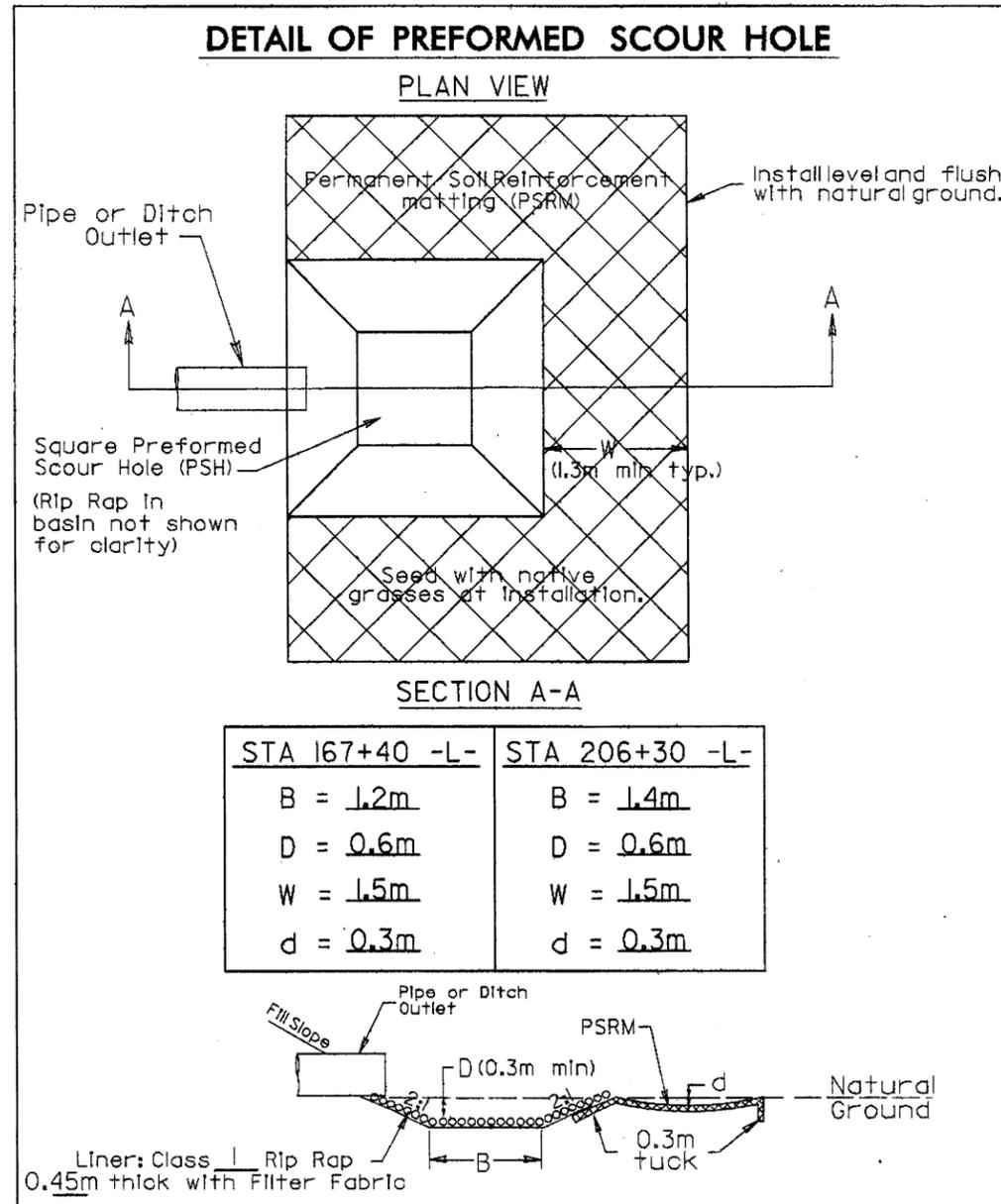
C1	40 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C2	80 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C3	VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C4	40 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
C5	80 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
C6	VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
D1	100 mm ASPHALT CONC. INTERMEDIATE COURSE, TYPE 119.0C
D2	VAR. DEPTH ASPHALT CONC. INTERMEDIATE COURSE, TYPE 119.0C
E1	100 mm ASPHALT CONC. BASE COURSE, TYPE B25.0B
E2	120 mm ASPHALT CONC. BASE COURSE, TYPE B25.0B
E3	VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B
E4	100 mm ASPHALT CONC. BASE COURSE, TYPE B25.0C
E5	VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0C
J1	200 mm AGGREGATE BASE COURSE
J2	VAR. DEPTH AGGREGATE BASE COURSE
R1	750 mm CONCRETE CURB AND GUTTER
R2	1200 mm CONCRETE EXPRESSWAY GUTTER
S	100 mm CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING (50mm)
W	WEDGING (SEE SHEET 2 FOR WEDGING DETAIL)

NOTE: SEE SHEET 2 FOR DETAILED PAVEMENT SCHEDULE

REVISIONS

**GREENHORNE & O'MARA, INC.**  
 5965 CENTERVIEW DRIVE, SUITE 107  
 RALEIGH, NORTH CAROLINA 27606  
 (919) 851-1919

PROJECT REFERENCE NO. R-2539C		SHEET NO. 2-D	
R/W SHEET NO.			
ROADWAY DESIGN ENGINEER		PAVEMENT DESIGN ENGINEER	
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION			
CONST. REV.			
R/W REV.			



### ABBREVIATED PAVEMENT SCHEDULE

C1	40 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C2	80 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C3	VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C4	40 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
C5	80 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
C6	VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
D1	100 mm ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C
D2	VAR. DEPTH ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C
E1	100 mm ASPHALT CONC. BASE COURSE, TYPE B25.0B
E2	120 mm ASPHALT CONC. BASE COURSE, TYPE B25.0B
E3	VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B
E4	100 mm ASPHALT CONC. BASE COURSE, TYPE B25.0C
E5	VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0C
J1	200 mm AGGREGATE BASE COURSE
J2	VAR. DEPTH AGGREGATE BASE COURSE
R1	750 mm CONCRETE CURB AND GUTTER
R2	1200 mm CONCRETE EXPRESSWAY GUTTER
S	100 mm CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING (50mm)
W	WEDGING (SEE SHEET 2 FOR WEDGING DETAIL)

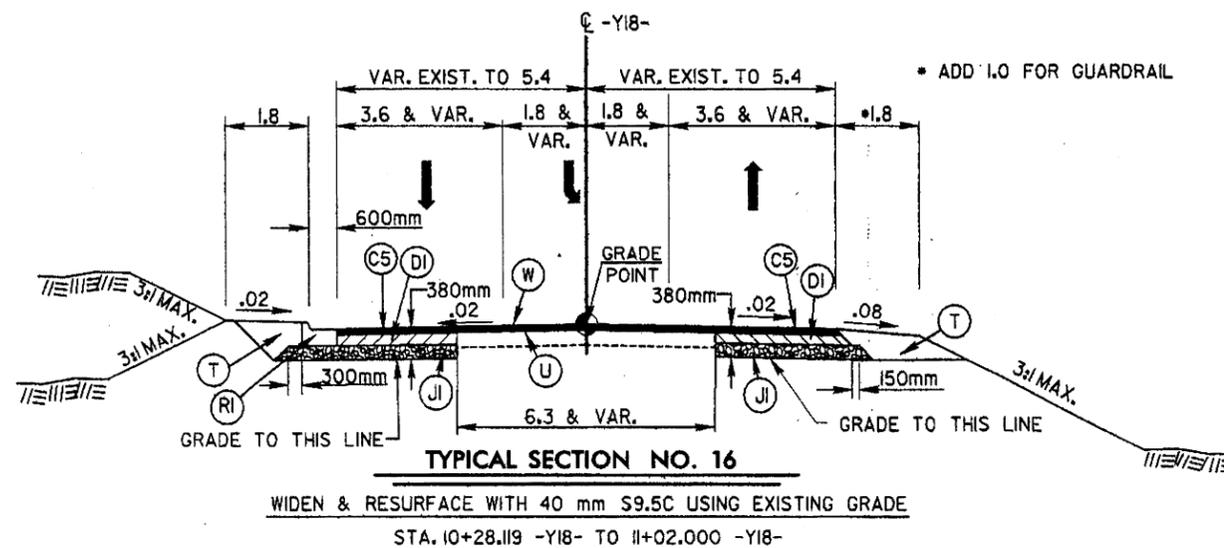
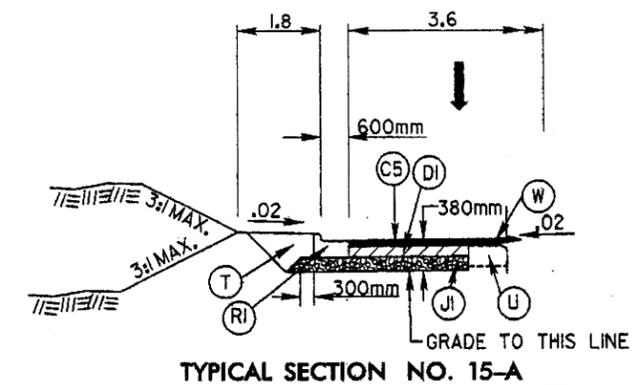
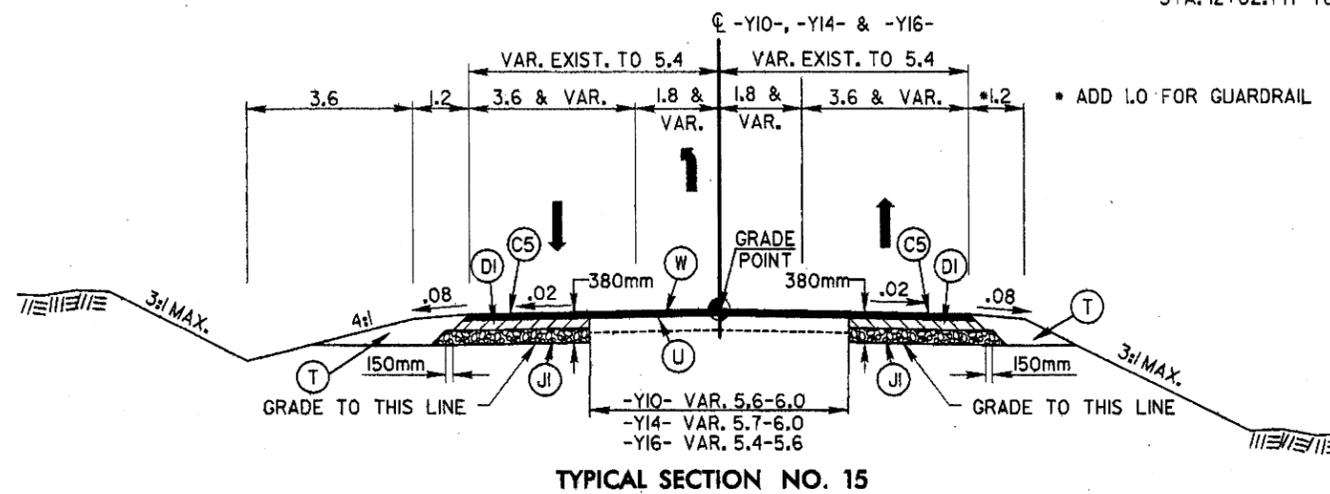
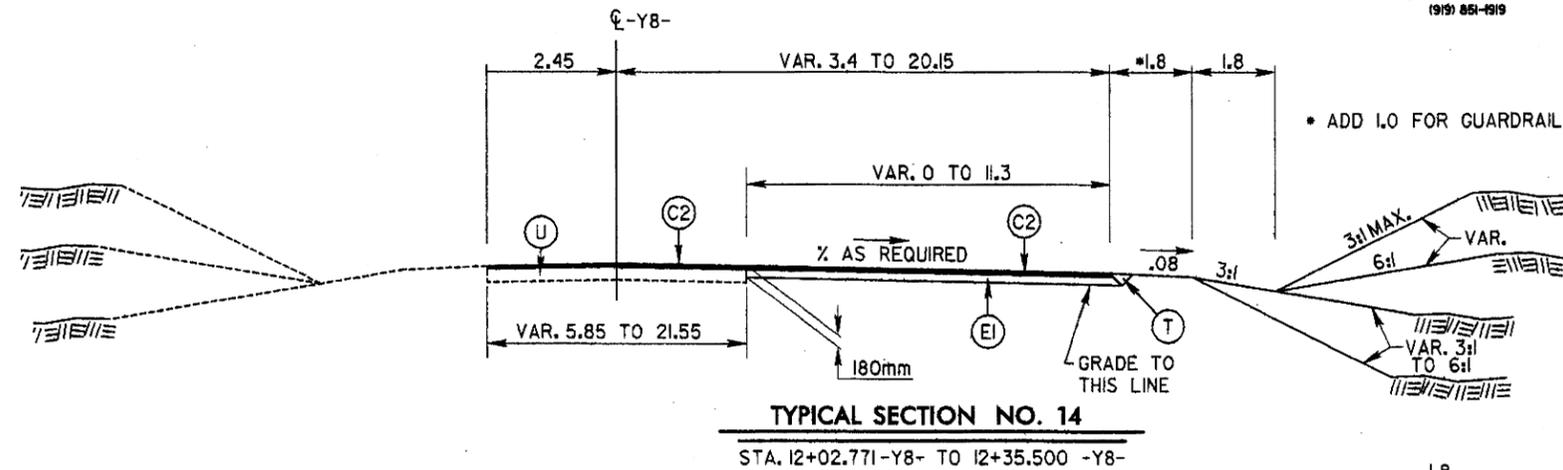
NOTE: SEE SHEET 2 FOR DETAILED PAVEMENT SCHEDULE

REVISIONS

**GREENHORNE & O'MARA, INC.**  
 5565 CENTERVIEW DRIVE, SUITE 107  
 RALEIGH, NORTH CAROLINA 27606  
 (919) 881-1919



PROJECT REFERENCE NO. R-2539C	SHEET NO. 2-E
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
CONST. REV.	
R/W REV.	



**ABBREVIATED PAVEMENT SCHEDULE**

C1	40 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C2	80 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C3	VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C4	40 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
C5	80 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
C6	VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
D1	100 mm ASPHALT CONC. INTERMEDIATE COURSE, TYPE 119.0C
D2	VAR. DEPTH ASPHALT CONC. INTERMEDIATE COURSE, TYPE 119.0C
E1	100 mm ASPHALT CONC. BASE COURSE, TYPE B25.0B
E2	120 mm ASPHALT CONC. BASE COURSE, TYPE B25.0B
E3	VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B
E4	100 mm ASPHALT CONC. BASE COURSE, TYPE B25.0C
E5	VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0C
J1	200 mm AGGREGATE BASE COURSE
J2	VAR. DEPTH AGGREGATE BASE COURSE
R1	750 mm CONCRETE CURB AND GUTTER
R2	1200 mm CONCRETE EXPRESSWAY GUTTER
S	100 mm CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING (50mm)
W	WEDGING (SEE SHEET 2 FOR WEDGING DETAIL)

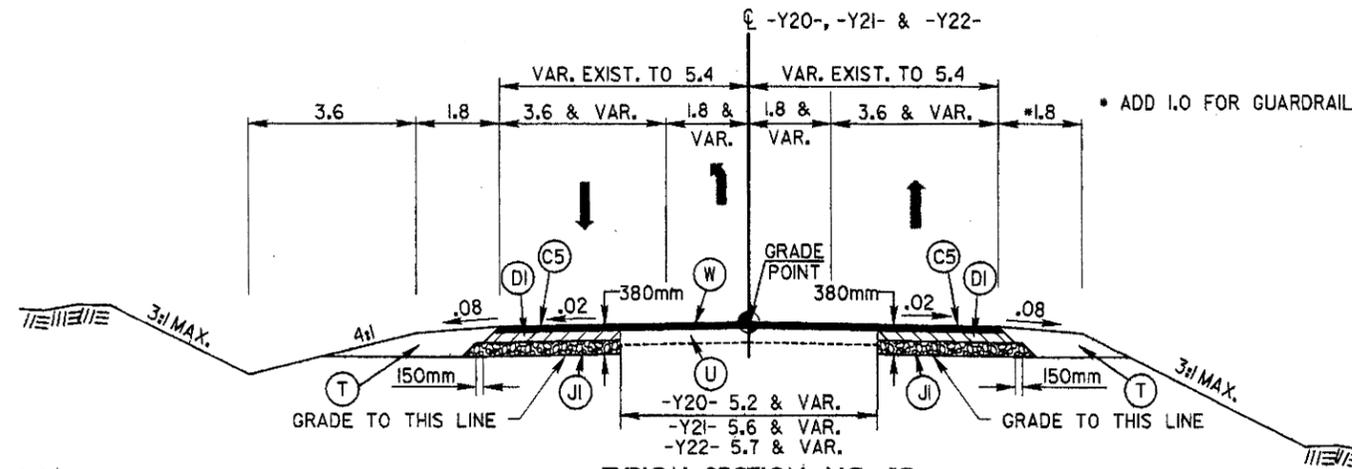
NOTE: SEE SHEET 2 FOR DETAILED PAVEMENT SCHEDULE

REVISIONS

**GREENHORNE & O'MARA, INC.**  
 5565 CENTERVIEW DRIVE, SUITE 107  
 RALEIGH, NORTH CAROLINA 27606  
 (919) 851-1919

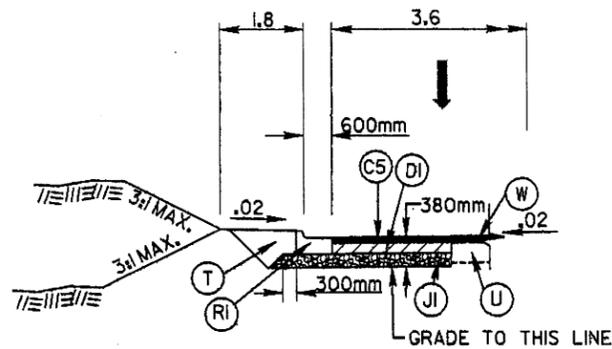


PROJECT REFERENCE NO. R-2539C	SHEET NO. 2-F
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
CONST. REV.	
R/W REV.	



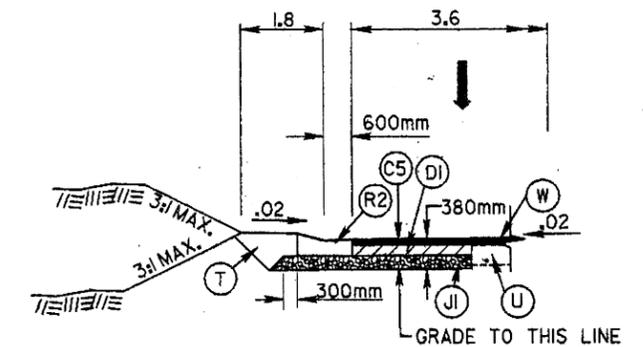
**TYPICAL SECTION NO. 17**

WIDEN & RESURFACE WITH 40 mm S9.5C USING EXISTING GRADE  
 STA. 10+13.000 -Y20- TO 10+15.755 LT.  
 (STA. 10+22.399 RT.) -Y20-  
 STA. 10+70.389 LT. (STA. 10+73.320 RT.) TO 10+76.000 -Y21-



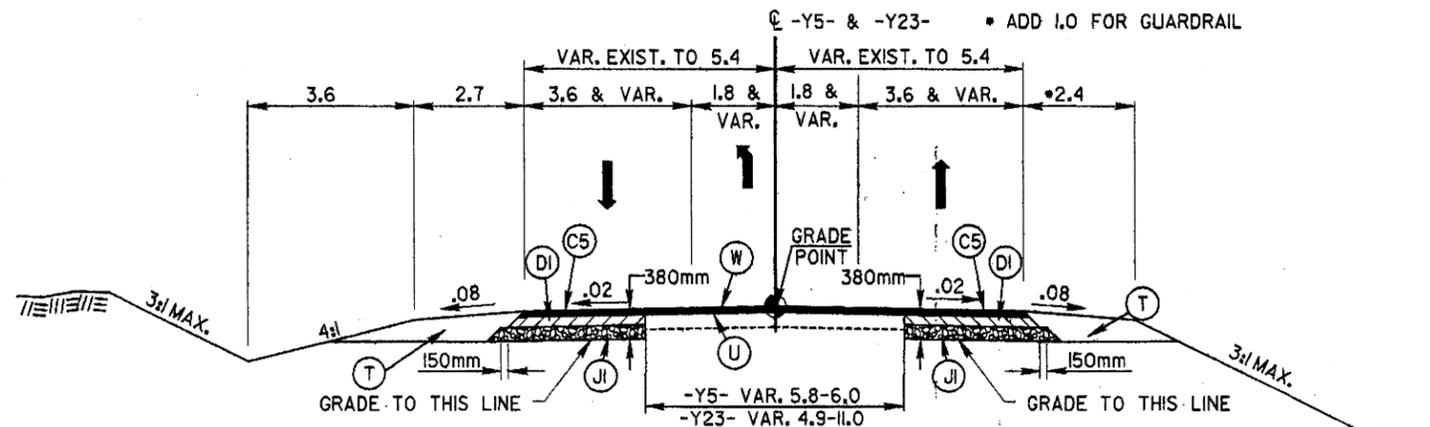
**TYPICAL SECTION NO. 17-A**

WIDEN & RESURFACE WITH 40 mm S9.5C USING EXISTING GRADE  
 STA. 10+25.787 -Y21- TO STA. 10+70.389 -Y21- LT.  
 (STA. 10+73.320 RT.)



**TYPICAL SECTION NO. 17-B**

STA. 10+75.000 -Y20- TO STA. 10+77.986 -Y20-  
 WIDEN & RESURFACE WITH 40 mm S9.5C USING EXISTING GRADE  
 STA. 10+15.755 LT. -Y20- (STA. 10+22.399 RT.)  
 TO STA. 10+75+000 -Y20-  
 STA. 10+48.000 RT. (10+48.805 LT.) -Y22-  
 TO STA. 10+73.692 -Y22-



**TYPICAL SECTION NO. 18**

STA. 10+93.317 -Y23- TO 11+00.000 -Y23-  
 WIDEN & RESURFACE WITH 40 mm S9.5C USING EXISTING GRADE  
 STA. 11+00.000 -Y23- TO STA. 11+40.000 -Y23-

**ABBREVIATED PAVEMENT SCHEDULE**

C1	40 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C2	80 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C3	VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5B
C4	40 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
C5	80 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
C6	VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5C
DI	100 mm ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C
D2	VAR. DEPTH ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C
E1	100 mm ASPHALT CONC. BASE COURSE, TYPE B25.0B
E2	120 mm ASPHALT CONC. BASE COURSE, TYPE B25.0B
E3	VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B
E4	100 mm ASPHALT CONC. BASE COURSE, TYPE B25.0C
E5	VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0C
J1	200 mm AGGREGATE BASE COURSE
J2	VAR. DEPTH AGGREGATE BASE COURSE
R1	750 mm CONCRETE CURB AND GUTTER
R2	1200 mm CONCRETE EXPRESSWAY GUTTER
S	100 mm CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING (50mm)
W	WEDGING (SEE SHEET 2 FOR WEDGING DETAIL)

NOTE: SEE SHEET 2 FOR DETAILED PAVEMENT SCHEDULE

REVISIONS



PROJECT REFERENCE NO. R-2539C SHEET NO. 2-6



R/W SHEET NO.

ROADWAY DESIGN ENGINEER

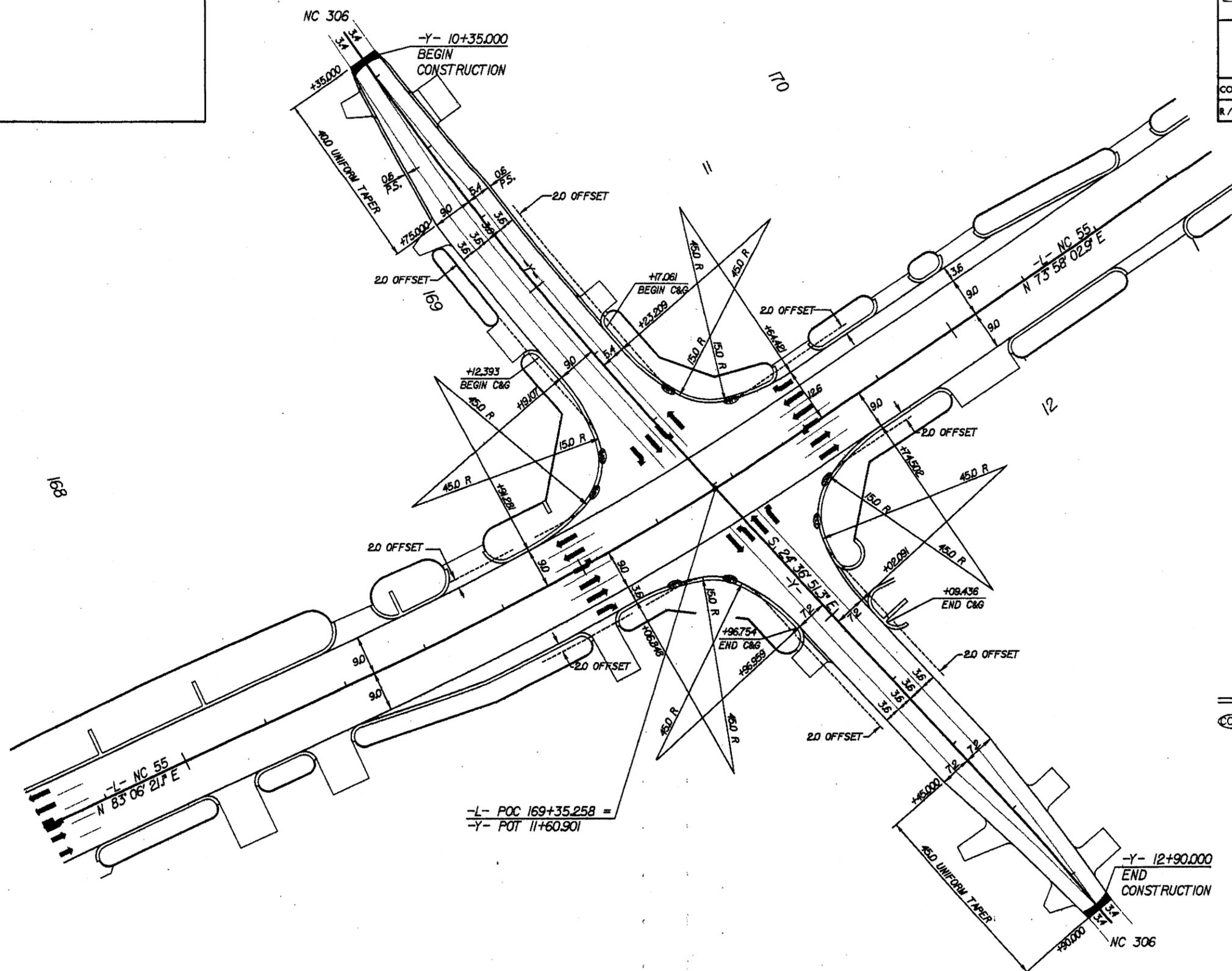
HYDRAULICS ENGINEER

PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R/W REV.

**GREENHORNE & O'MARA, INC.**  
5565 CENTERVIEW DRIVE, SUITE 107  
RALEIGH, NORTH CAROLINA 27606  
(919) 851-1919



**LEGEND**

CURB CUT FOR FUTURE RAMP

**INTERSECTION DETAIL FOR  
-L- AND -Y-  
SEE PLAN SHEET No. 8**

NOTE:  
SEE SHEET 2 FOR DETAIL  
OF CURB & GUTTER END TREATMENT.  
NON-STANDARD CURB & GUTTER RADII  
ARE SHOWN ON PLAN SHEETS.

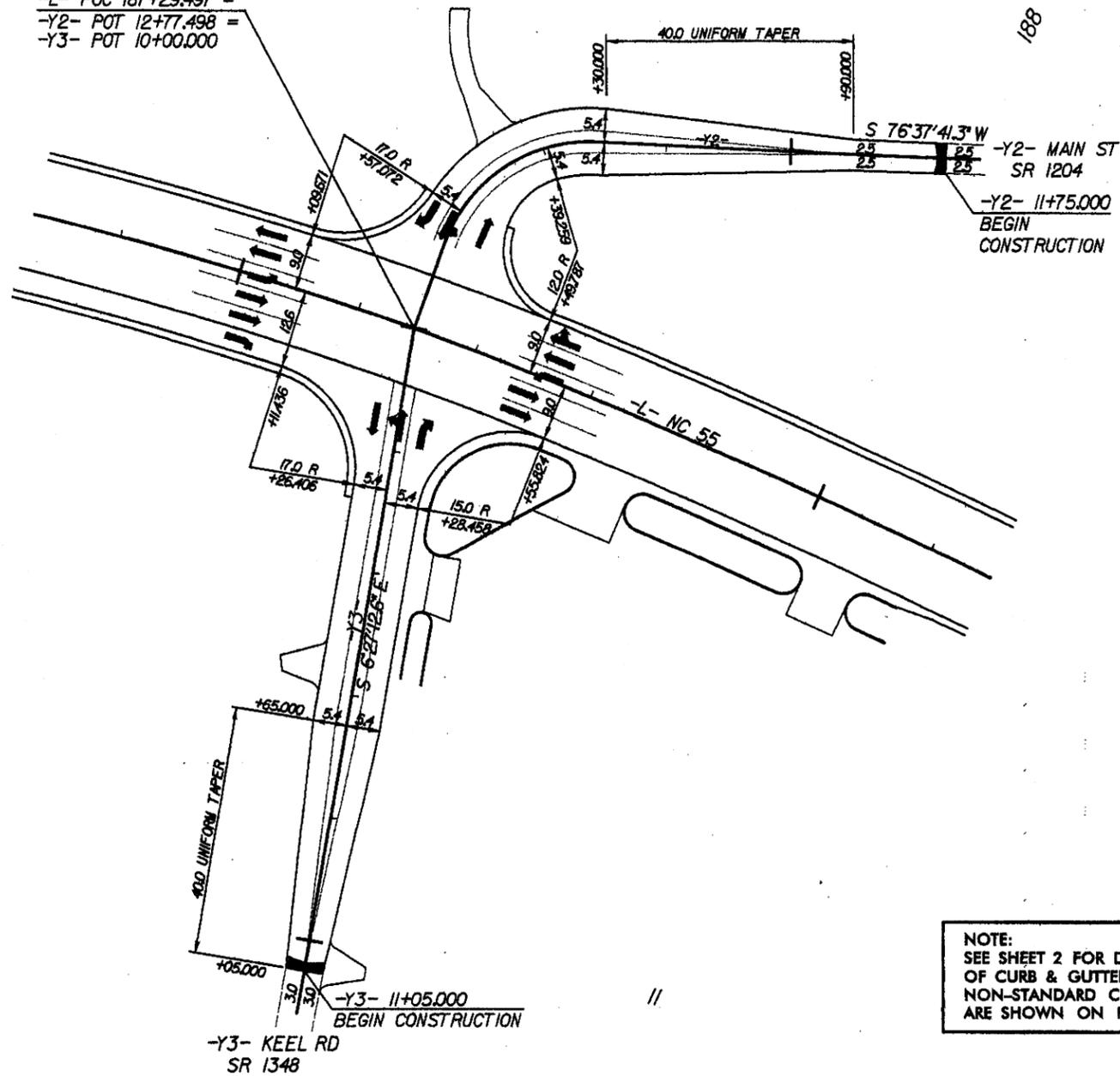
PLANNING SYSTEMS, INC.

REVISIONS

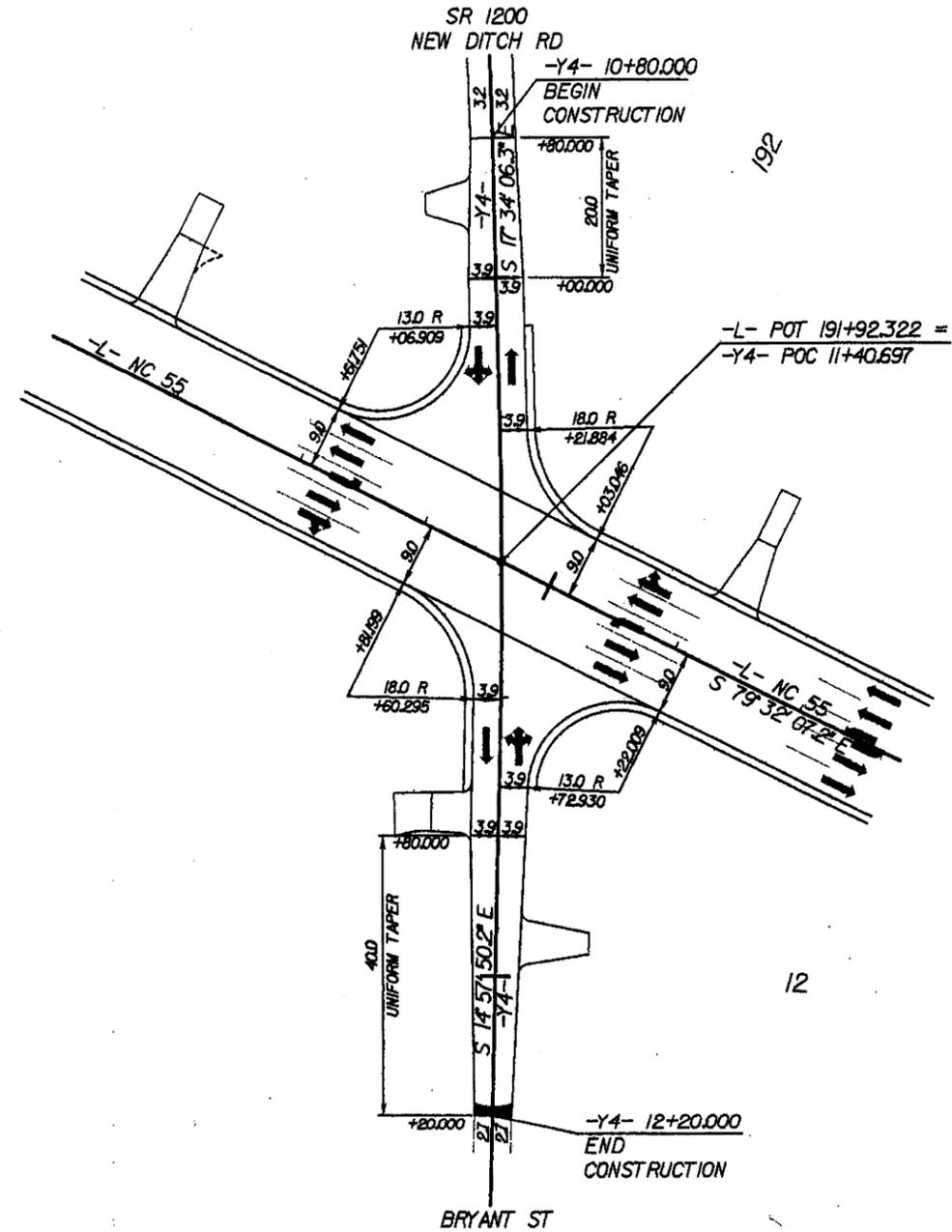
### INTERSECTION DETAIL FOR -L- AND -Y2- & -Y3- SEE PLAN SHEET No. 13



-L- POC 187+29.497 =  
-Y2- POT 12+77.498 =  
-Y3- POT 10+00.000



### INTERSECTION DETAIL FOR -L- AND -Y4- SEE PLAN SHEET No. 14



NOTE:  
SEE SHEET 2 FOR DETAIL  
OF CURB & GUTTER END TREATMENT.  
NON-STANDARD CURB & GUTTER RADII  
ARE SHOWN ON PLAN SHEETS.

PROJECT REFERENCE NO. R-2539C		SHEET NO. 2-H	
R/W SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
CONST. REV.			
R/W REV.			

**GREENHORNE & O'MARA, INC.**  
5965 CENTERVIEW DRIVE, SUITE 107  
RALEIGH, NORTH CAROLINA 27606  
(919) 851-1919

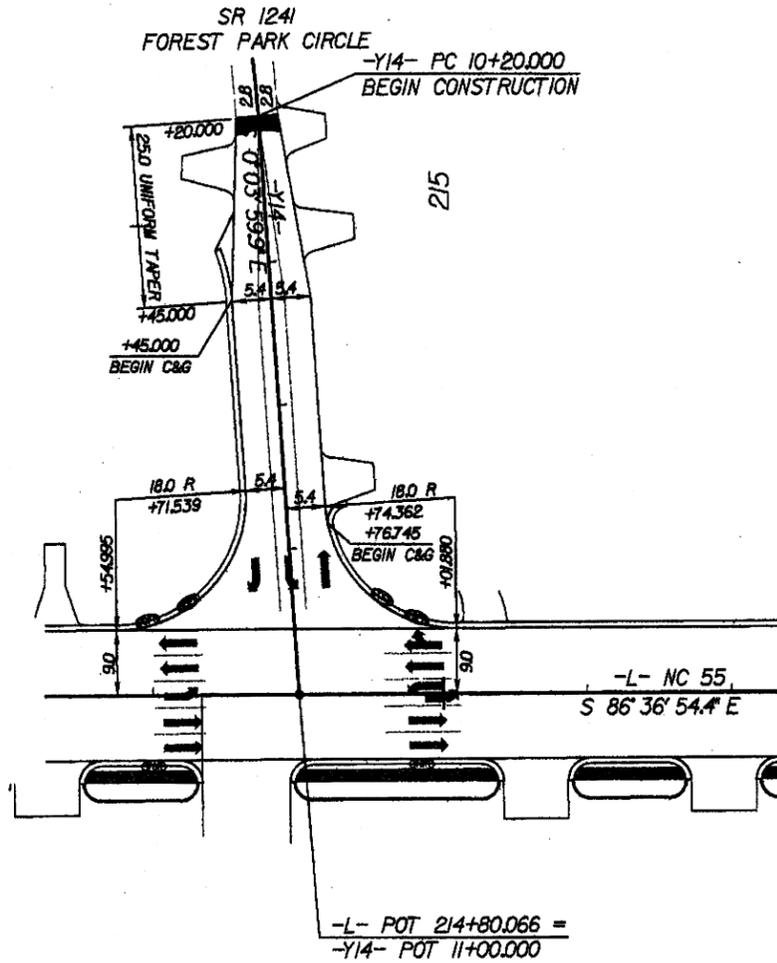
DATE PLOTTED: 11/11/03 10:58 AM  
PLOTTER: HP DesignJet 5000  
SCALE: 1/8" = 1'-0"



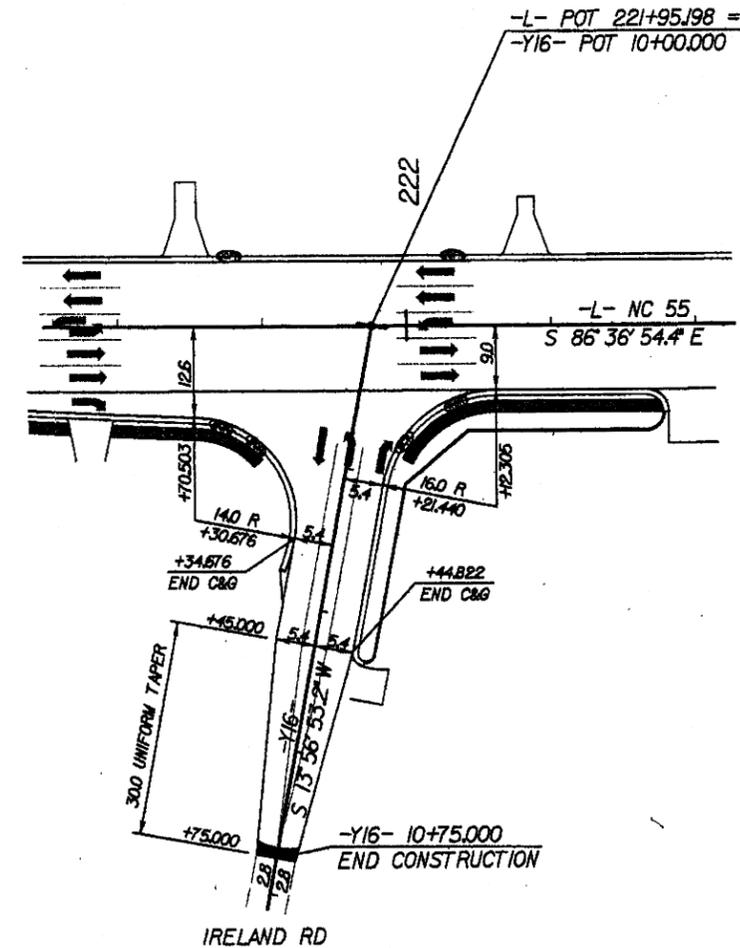


REVISIONS

INTERSECTION DETAIL FOR  
-L- AND -Y14-  
SEE PLAN SHEET No. 21



INTERSECTION DETAIL FOR  
-L- AND -Y16-  
SEE PLAN SHEET No. 23



**METRIC**

5 0 10

CONST. REV.

R/W REV.

PROJECT REFERENCE NO. R-2539C	SHEET NO. 2-K
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

**GREENHORNE & O'MARA, INC.**  
5565 CENTERVIEW DRIVE, SUITE 107  
RALEIGH, NORTH CAROLINA 27605  
(919) 851-1919

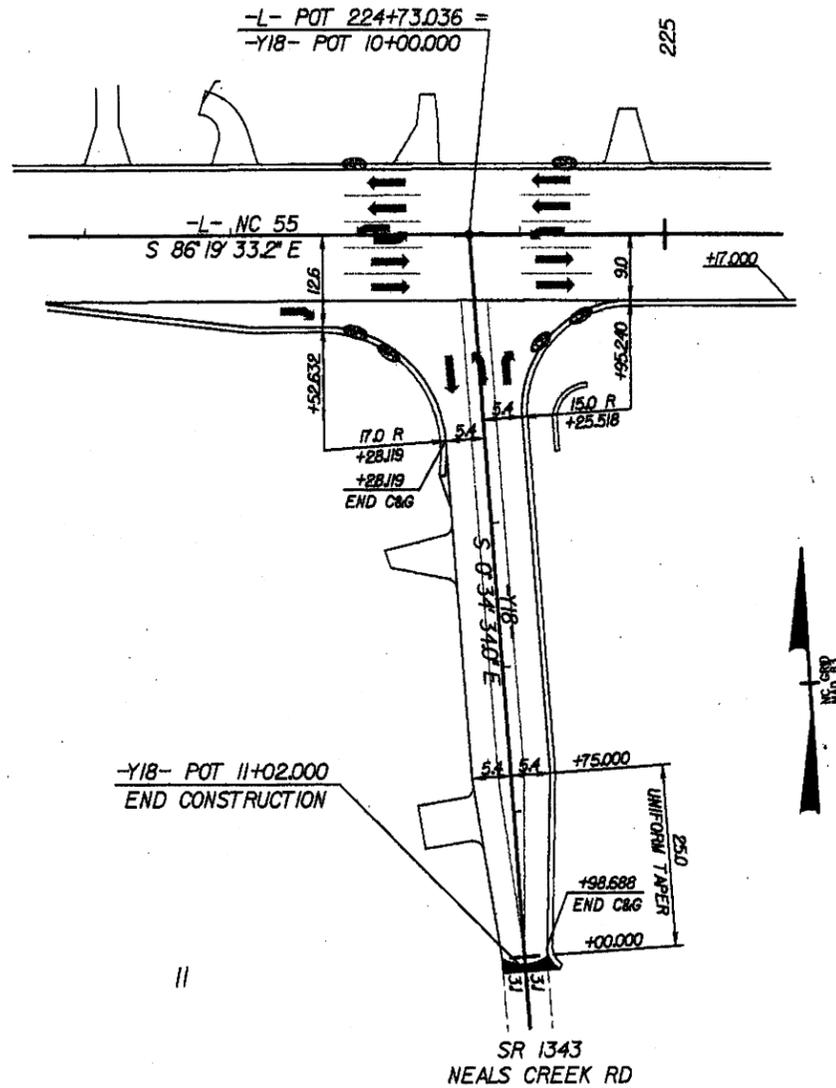
NOTE:  
SEE SHEET 2 FOR DETAIL  
OF CURB & GUTTER END TREATMENT.  
NON-STANDARD CURB & GUTTER RADII  
ARE SHOWN ON PLAN SHEETS.

LEGEND

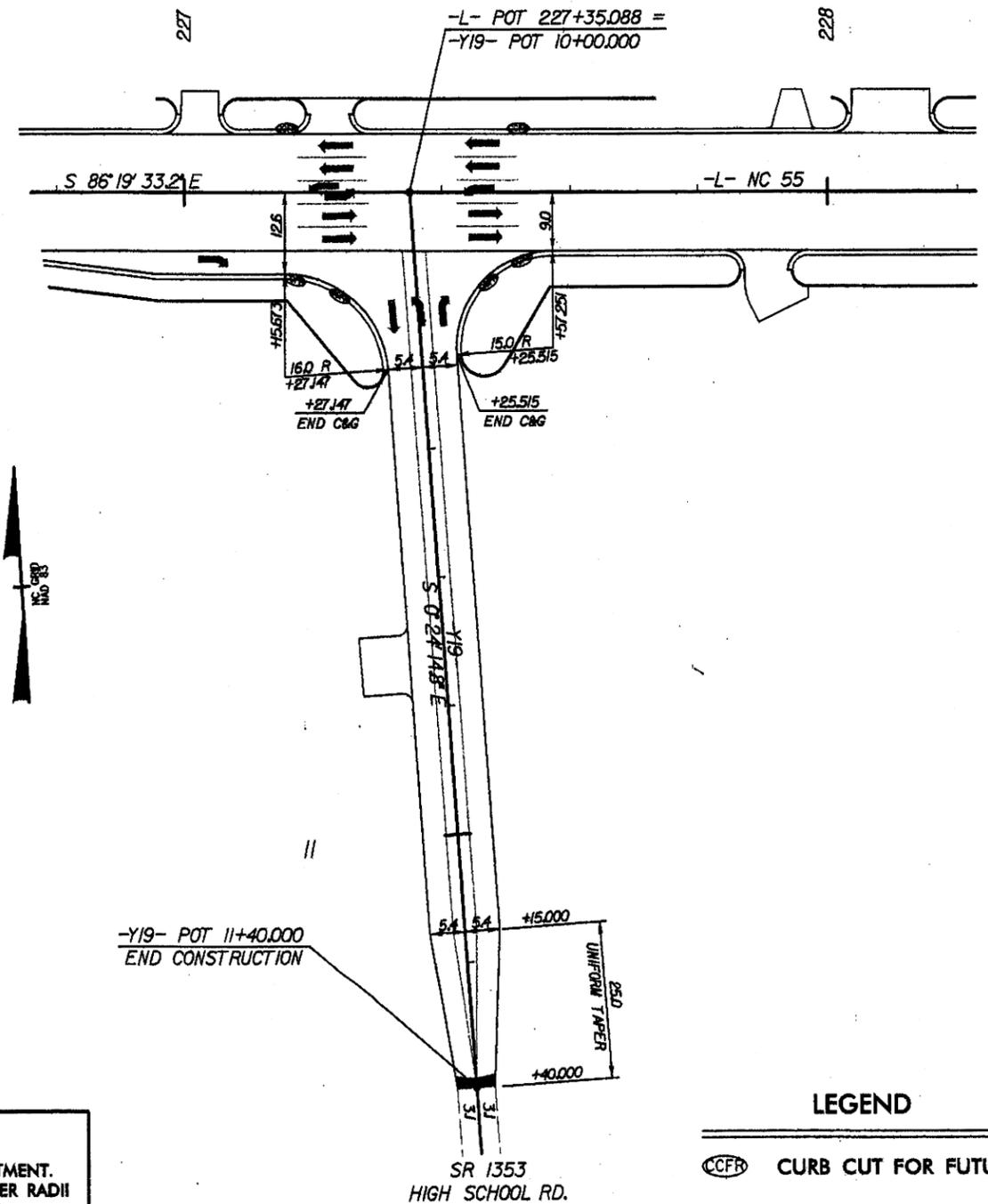
- CCFR CURB CUT FOR FUTURE RAMP
- WCR WHEELCHAIR RAMP

REVISIONS

### INTERSECTION DETAIL FOR -L- AND -Y18- SEE PLAN SHEET No. 23



### INTERSECTION DETAIL FOR -L- AND -Y19- SEE PLAN SHEET No. 24



NOTE:  
SEE SHEET 2 FOR DETAIL  
OF CURB & GUTTER END TREATMENT.  
NON-STANDARD CURB & GUTTER RADII  
ARE SHOWN ON PLAN SHEETS.

**METRIC**

5 0 10

CONST. REV.

R/W REV.

PROJECT REFERENCE NO. R-2539C	SHEET NO. 2-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
CONST. REV.	
R/W REV.	

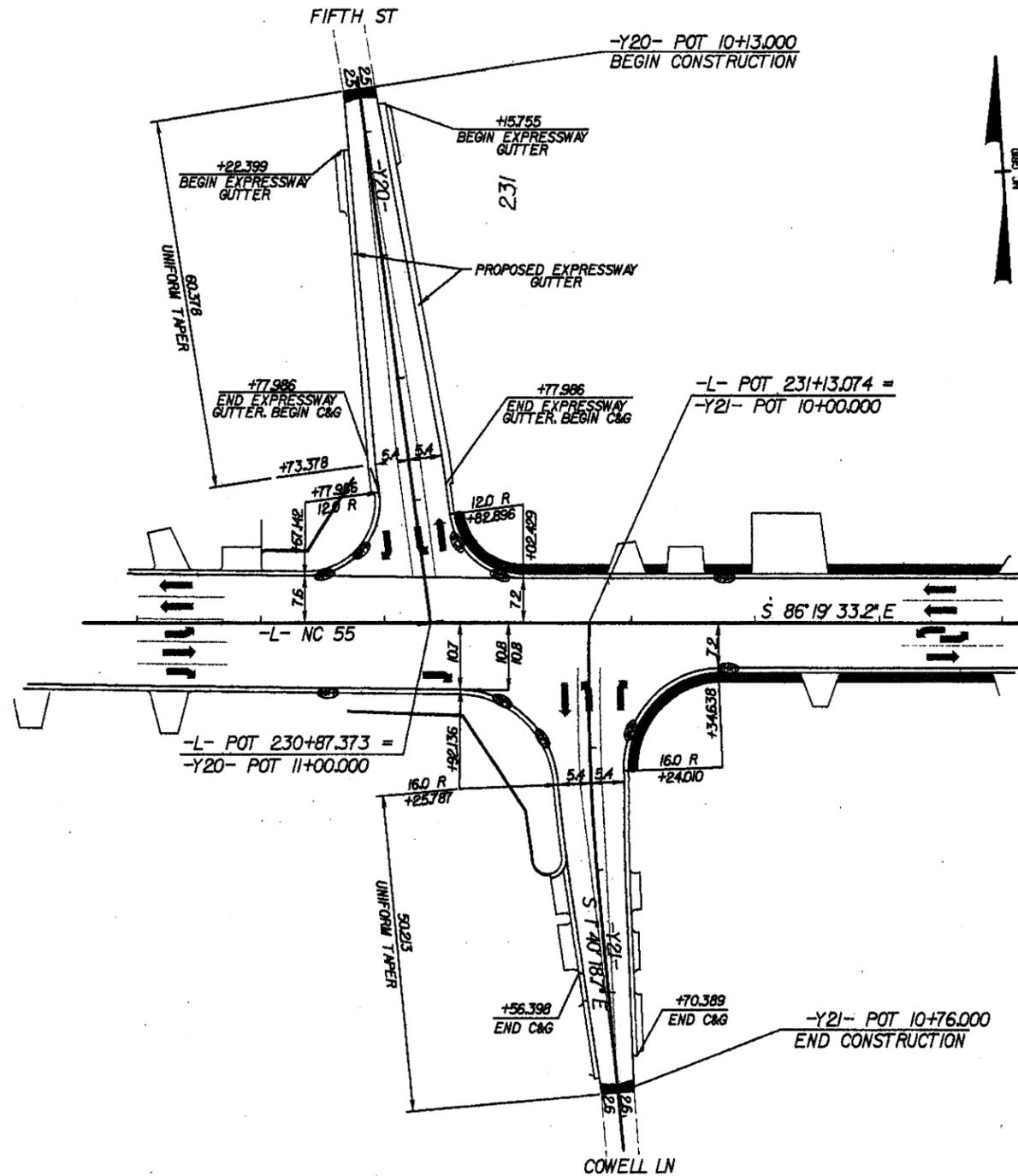
**GREENHORNE & O'MARA, INC.**  
5565 CENTERVIEW DRIVE, SUITE 107  
RALEIGH, NORTH CAROLINA 27606  
(919) 851-1319

#### LEGEND

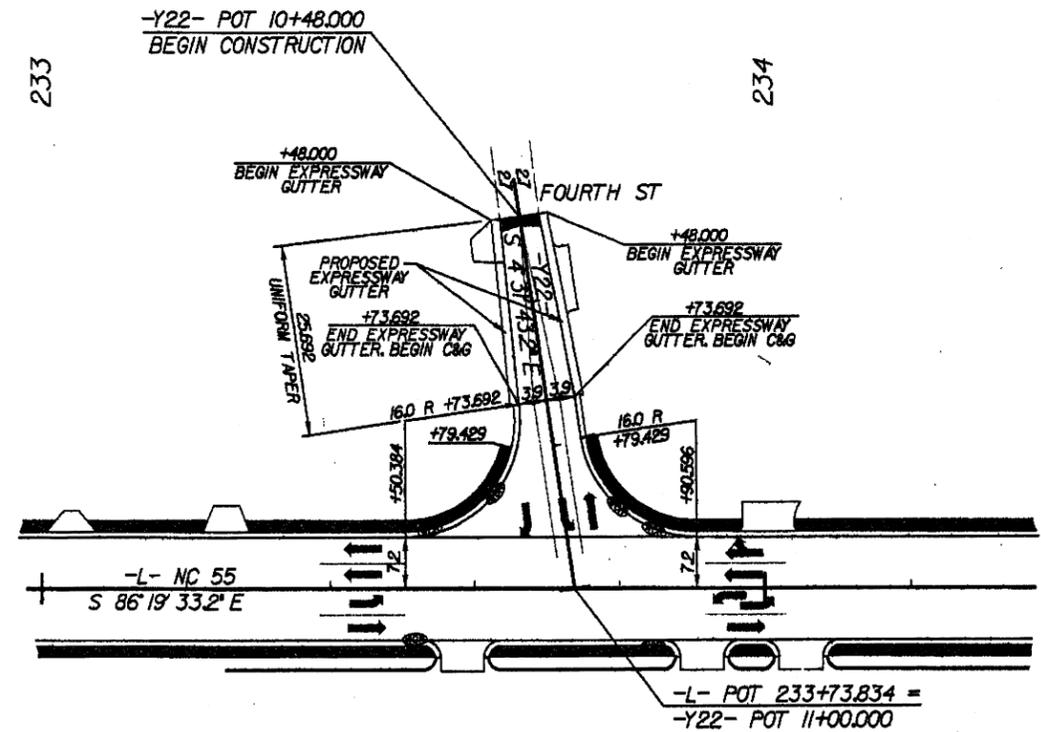
CCFR CURB CUT FOR FUTURE RAMP

REVISIONS

### INTERSECTION DETAIL FOR -L- AND -Y20- & -L- AND -Y21- SEE PLAN SHEET No. 25



### INTERSECTION DETAIL FOR -L- AND -Y22- SEE PLAN SHEET No. 26



**METRIC**

5 0 10

CONST. REV.

R/W REV.

PROJECT REFERENCE NO. R-2539C	SHEET NO. 2-11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

**GREENHORNE & O'MARA, INC.**  
5565 CENTERVIEW DRIVE, SUITE 107  
RALEIGH, NORTH CAROLINA 27606  
(919) 851-1919

NOTE:  
SEE SHEET 2 FOR DETAIL  
OF CURB & GUTTER END TREATMENT.  
NON-STANDARD CURB & GUTTER RADII  
ARE SHOWN ON PLAN SHEETS.

#### LEGEND

- CCFR CURB CUT FOR FUTURE RAMP
- WCR WHEELCHAIR RAMP

REVISIONS

# INTERSECTION DETAILS FOR -L- AND -Y23- & -L- AND -Y24-/-Y25- NC 304-L- RT. SEE PLAN SHEET NOS. 26 AND No. 27

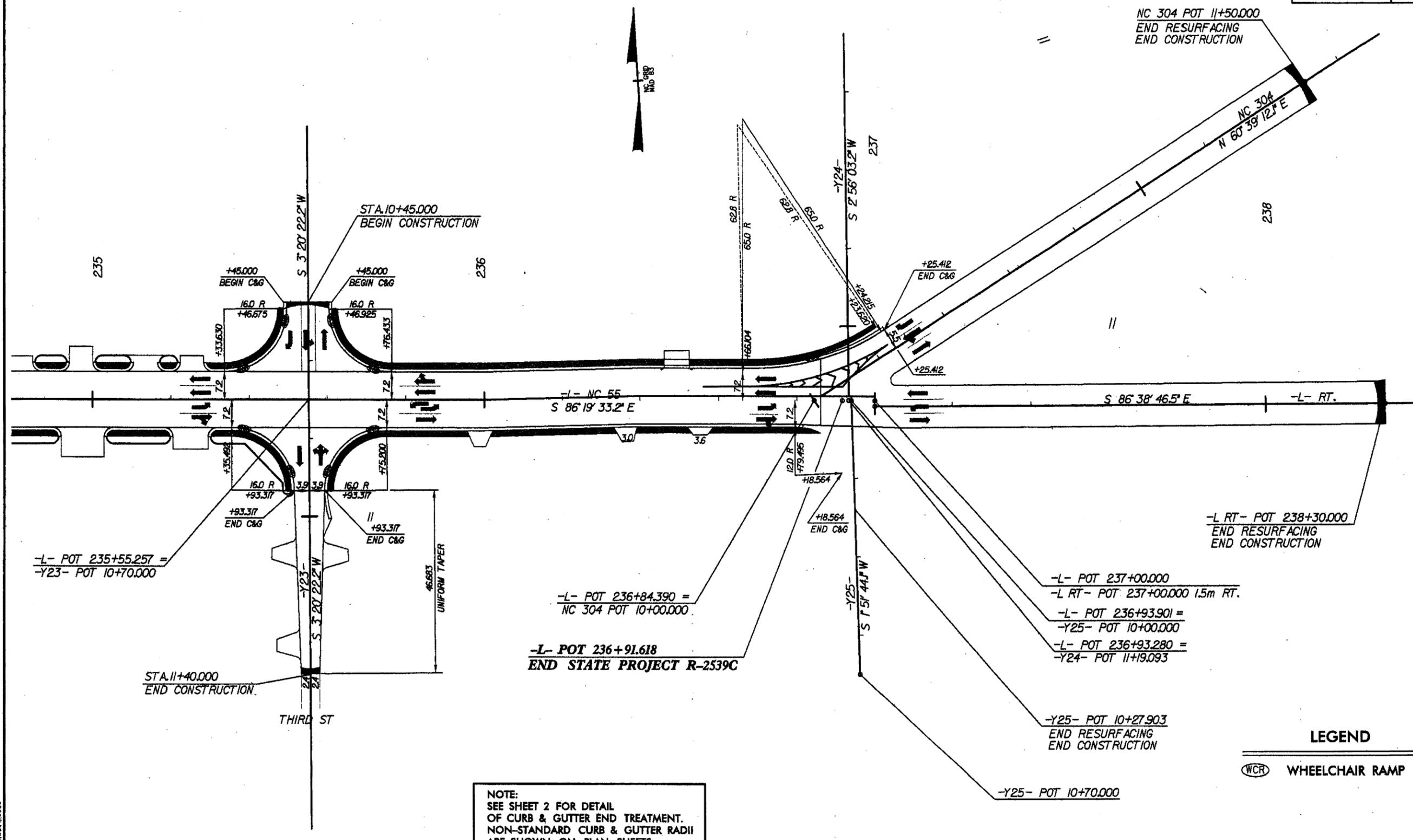
**GREENHORNE & O'MARA, INC.**  
5565 CENTERVIEW DRIVE, SUITE 107  
RALEIGH, NORTH CAROLINA 27606  
(919) 851-1989



CONST. REV.

R/W REV.

PROJECT REFERENCE NO. R-2539C	SHEET NO. 2-N
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	



**NOTE:**  
SEE SHEET 2 FOR DETAIL  
OF CURB & GUTTER END TREATMENT.  
NON-STANDARD CURB & GUTTER RADII  
ARE SHOWN ON PLAN SHEETS.

**LEGEND**  
WCR WHEELCHAIR RAMP

COMPUTED BY: M. WARD      DATE: 7-23-03  
 CHECKED BY: D. KEENER      DATE: 7-23-03  
 REVISED BY: M. WARD/S. BAILEY      DATE: 4-8-04

STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS



Project Reference No. R-2539C      Sheet No. 3-Z  
**PRELIMINARY PLANS**  
 DO NOT USE FOR CONSTRUCTION

88

Greenhome & O'Mara, Inc.  
 5585 Centerview Drive, Suite 107  
 Raleigh, NC 27606

**RIGHT OF WAY AREA DATA SHEET**

PARCEL NO.	PROPERTY OWNERS NAME	TOTAL AREA	AREA TAKEN	AREA REMAINING RIGHT	AREA REMAINING LEFT	CONSTR. EASEMENT (SM) (SF)	PERMANENT DRAINAGE EASEMENT (SM) (SF)	TEMPORARY DRAINAGE EASEMENT (SM) (SF)
1	WEYERHAEUSER CO.	171.182 ha	0.283 ha	165.226	5.674 ha			
		423.000 ac	0.700 ac	406.280	14.020 ac			
2	GEORGE R. BRINSON, ET UX	22.193 ha	0.223 ha	21.970 ha				
		54.840 ac	0.550 ac	54.290 ac				
3	ROSALIE BANKS PEACOCK, ET VIR	5.552 ha	4031.509 sm		5.149 ha			
		13.719 ac	43394.802 sf		12.723 ac			
4	JAY F. BARRINGTON, ET UX	22.193 ha	0.263 ha	21.930 ha				
		54.840 ac	0.650 ac	54.190 ac				
5	JEANNETTE BANKS HUDSON, ET VIR	3.893 ha	2333.571 sm		3.660 ha			
		9.620 ac	25118.344 sf		9.043 ac			
6	SARAH ALICE HARRIS	29.396 ha	0.368 ha	29.028 ha			37.626	
		72.640 ac	0.910 ac	71.730 ac			405.000	
6A	TOWN OF GRANTSBORO	0.559 ha		0.559 ha		191.467	19.738	
		1.360 ac		1.360 ac		2080.928	212.459	
7	MYRON M. BANKS, JR., ET UX	12.367 ha	1859.175 sm		12.181 ha			
		30.560 ac	20011.995 sf		30.100 ac			
8	PAMLICO COUNTY CHAMBER OF COMMERCE	0.186 ha		0.186 ha			16.568	
		0.460 ac		0.460 ac			199.868	
9	ARFEGUS JOYNER, SR., ET UX	0.200 ha	77.154 sm		1922.846 sm			
		0.494 ac	830.483 sf		20697.338 sf			
9A	LAWRENCE GARY NORMAN, ET UX	1.445 ha	20.903 sm		1.444 ha	9.290		
		3.570 ac	225.000 sf		3.560 ac	100.000		
11	CLIFTON E. STOWE, ET UX	0.275 ha	148.338 sm	2601.682 sm			245.242	
		0.680 ac	1566.701 sf	28004.052 sf			2639.766	
12	GWSJ, LLC	1.311 ha	827.117 sm	1.228 ha		378.395	79.252	171.438
		3.240 ac	8903.013 sf	3.035 ac		4073.010	853.065	1845.341
13	BOBBY JAMES CUTHRELL, ET UX	0.110 ha			1100.000 sm	319.618		
		0.272 ac			11840.301 sf	3440.340		
14	JULIAN A. SCOTT	0.079 ha	18.845 sm		771.155 sm	36.823	26.947	
		0.195 ac	202.845 sf		8300.644 sf	396.361	290.054	
15	ALFREDO G. MOLLANO	0.037 ha	391.518 sm		UNKNOWN sm	122.337		
		0.091 ac	4214.299 sf		UNKNOWN sf	1316.827		
16	MYRON M. BANKS (HEIRS)	0.132 ha	142.859 sm	1177.140 sm		171.302		
		0.326 ac	1537.719 sf	12670.630 sf		1843.880		
18	DR. JOHN C. ABBOTT	0.208 ha	80.699 sm		1999.301 sm	109.880		
		0.514 ac	868.634 sf		21520.300 sf	1182.522		
19	JEFF SAWYER, ET UX	0.087 ha	253.998 sm		616.003 sm	189.831		
		0.215 ac	2734.006 sf		6630.596 sf	2043.321		

PARCEL NO.	PROPERTY OWNERS NAME	TOTAL AREA	AREA TAKEN	AREA REMAINING RIGHT	AREA REMAINING LEFT	CONSTR. EASEMENT (SM) (SF)	PERMANENT DRAINAGE EASEMENT (SM) (SF)	TEMPORARY DRAINAGE EASEMENT (SM) (SF)
20	AMICUS INVESTMENTS, LLC	0.458 ha	102.647 sm	0.46 ha		323.871		18.338
		1.132 ac	1104.878 sf	1.10 ac		2815.000		197.383
21	GRANTSBORO-SILVERHILL VOLUNTEER FIRE DEPARTMENT	0.472 ha		4720.000 sm		2.413	22.202	
		1.166 ac		50805.657 sf		25.973	238.984	
22	ARCHIE C. WILLIAMS, ET UX	0.067 ha	103.059 sm		766.941 sm	89.340		
		0.215 ac	1109.320 sf		8255.282 sf	961.649		
23	J. T. HERRING	0.058 ha	51.152 sm		527.550 sm	38.128		
		0.143 ac	550.597 sf		5678.508 sf	410.402		
24	FAITH CHRISTIAN CHURCH	0.364 ha	47.752 sm		0.359 ha	288.776		
		0.900 ac	514.000 sf		0.890 ac	3218.000		
25	BREW-MAR PROPERTIES, LLC	0.372 ha		0.372 ha		53.307		30.079
		0.919 ac		0.919 ac		573.795		323.770
26	PAMLICO PACKING COMPANY, INC.	4.840 ha	110.000 sm		4.83 ha	522.580		
		11.960 ac	1184.000 sf		11.930 ac	5625.000		
27	TIDELAND ELECTRIC MEMBERSHIP CORP.	1.716 ha		1.716 ha		204.287	92.827	
		4.240 ac		4.240 ac		2198.924	989.182	
28	STEVE T. DIXON, ET UX	0.190 ha			0.190 ha	207.174		
		0.470 ac			0.470 ac	2230.000		
29	BENDERS GEORGE GOLDEN, III, ET UX	0.403 ha	1250.441 sm		2779.559 sm	131.073		
		0.986 ac	13459.637 sf		29918.922 sf	1410.854		
30	H. CURTIS POTTER, III, ET UX	2.432 ha		2.432 ha		673.241	8.501	
		6.010 ac		6.010 ac		7246.702	91.508	
31	NEW LIFE PRAISE AND WORSHIP MINISTRIES, INC.	1.716 ha	816.159 sm		1.634 ha			
		4.240 ac	8785.083 sf		4.039 ac			
32	ROLAND J. WARD, JR., ET UX	0.688 ha	28.424 sm		6851.577 sm	84.417	157.627	
		1.700 ac	305.948 sf		73749.756 sf	908.652	1696.684	
33	ROGER W. MCDANIEL, ET UX	0.235 ha		2350.000 sm		282.787		
		0.581 ac		25295.189 sf		3043.892		
34	HERMAN L. IRELAND	5.318 ha			5.318 ha	36.214		
		13.140 ac			13.140 ac	389.801		
35	ERIC DWYER, ET UX	0.558 ha	33.660 sm		5546.340 sm	154.987		
		1.379 ac	362.312 sf		59700.308 sf	1668.266		
36	ALFRED E. CAHOON, ET UX	2.080 ha	0.259 ha	1.821 ha		149.388		
		5.140 ac	0.640 ac	4.500 ac		1608.000		
37	HERMAN L. IRELAND, ET UX	12.962 ha	2467.646 sm		12.715 ha	98.880		
		32.030 ac	26561.523 sf		31.420 ac	1084.339		
38	JAMES A. TINGLE, ET UX	10.117 ha	3031.823 sm		9.814 ha	688.925		
		25.000 ac	32634.267 sf		24.250 ac	7415.525		
39	BAGWELL HOLDINGS OF VIRGINIA, LLC	3.739 ha	0.121 ha	3.618 ha		0.308 ha		
		9.240 ac	0.300 ac	8.940 ac		0.76 ac		

COMPUTED BY: M. WARD DATE: 7-23-03  
 CHECKED BY: D. KEENER DATE: 7-23-03  
 REVISED BY: M. WARD/S. BAILEY DATE: 4-8-04

STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS



Project Reference No. R-2539C Sheet No. 3-AA  
**PRELIMINARY PLANS**  
 DO NOT USE FOR CONSTRUCTION



Greenhorne & O'Mara, Inc.  
 5555 Centerview Drive, Suite 107  
 Raleigh, NC 27606

**RIGHT OF WAY AREA DATA SHEET**

PARCEL NO.	PROPERTY OWNERS NAME	TOTAL AREA	AREA TAKEN	AREA REMAINING RIGHT	AREA REMAINING LEFT	CONSTR. EASEMENT (8M) (8F)	PERMANENT DRAINAGE EASEMENT (8M) (8F)	TEMPORARY DRAINAGE EASEMENT (8M) (8F)
39A	BAGWELL HOLDINGS OF VIRGINIA, LLC	0.854 ha	0.227 ha	0.627 ha				
		2.110 ac	0.560 ac	1.550 ac				
40	JESSE R. BOYD	9.595 ha	0.720 ha	8.875 ha				
		23.710 ac	1.780 ac	21.930 ac				
41	PAMLICO COUNTY LODGE NO. 2216, LOYAL ORDER OF THE MOOSE	2.104 ha	676.065 sm		2.036 ha			
		5.199 ac	7277.107 sf		5.032 ac			
42	BENNIE RAY PAUL	7.240 ha	2593.953 sm		6.981 ha			
		17.890 ac	27921.078 sf		17.249 ac			
43	LOIS MAYO JONES	7.769 ha	2722.226 sm		7.497 ha	220.718		
		19.198 ac	29301.798 sf		18.525 ac	2375.788		
44	DONNA H. BUCK	0.445 ha	1095.975 sm	3354.025 sm		112.355		
		1.100 ac	11798.972 sf	38102.429 sf		1209.383		
45	GARY J. BRINSON, ET UX	0.306 ha	21.828 sm	3038.172 sm		49.083		
		0.756 ac	234.959 sf	32702.607 sf		528.320		
46	JAMES NOBLES, ET UX	0.405 ha	837.987 sm		3212.033 sm	675.998		
		1.001 ac	9019.800 sf		34574.038 sf	7275.307		
47	E. J. POPE & SON, INC.	0.255 ha	51.201 sm	2498.799 sm		30.417	38.977	
		0.630 ac	551.122 sf	26896.850 sf		327.408	419.543	
48	ROBERT G. SPENCER AND LYNETTE HUNNINGS	0.757 ha	841.005 sm	6728.995 sm				
		1.871 ac	9052.500 sf	72430.302 sf				
49	GRADY A. SIMPSON, ET UX	0.356 ha	58.358 sm	3501.642 sm		133.420	25.370	
		0.880 ac	628.182 sf	37691.359 sf		1436.117	273.077	
50	J. ALFRED MAYO, JR., ET UX	7.284 ha			7.284 ha	181.080		
		17.999 ac			17.999 ac	1733.640		
51	MARANATHA BAPTIST CHURCH, INC.	0.938 ha	311.921 sm		0.907 ha	587.811		
		2.318 ac	3357.490 sf		2.240 ac	8109.718		
52	JESSE R. BOYD	0.883 ha	0.089 ha	0.795 ha				
		2.108 ac	0.170 ac	1.940 ac				
53	PATRICK K. BRYANT	2.739 ha	0.198 ha	2.541 ha		125.335		
		6.770 ac	0.490 ac	6.280 ac		1349.093		
54	ERNEST L. RIGGS	3237.485 sm	235.418 sm		3002.069 sm	549.991		
		34848.000 sf	2534.000 sf		32314.000 sf	5918.982		
55	ERNEST LEE RIGGS	425.968 sm	220.645 sm		205.223 sm			
		4584.000 sf	2375.000 sf		2209.000 sf			
56	PATRICK K. BRYANT	0.267 ha	803.983 sm	0.187 ha				
		0.680 ac	8654.000 sf	0.481 ac				
57	HERBERT RILEY DIXON, ET UX	1.214 ha	0.089 ha		1.125 ha			
		3.000 ac	0.220 ac		2.780 ac			
58	ALFREDO G. MOLLANO, ET UX	0.590 ha	483.541 sm	0.542 ha				
		1.458 ac	5204.787 sf	1.340 ac				

PARCEL NO.	PROPERTY OWNERS NAME	TOTAL AREA	AREA TAKEN	AREA REMAINING RIGHT	AREA REMAINING LEFT	CONSTR. EASEMENT (8M) (8F)	PERMANENT DRAINAGE EASEMENT (8M) (8F)	TEMPORARY DRAINAGE EASEMENT (8M) (8F)
59	WILMA DORIS WILLIAMS	0.159 ha	484.927 sm	0.109 ha				
		0.393 ac	5219.711 sf	0.270 ac				
60	MARGRETT ANNE & ARNOLD SANDERS	0.619 ha	47.380 sm	0.615 ha		68.640		
		1.630 ac	510.000 sf	1.520 ac		741.000		
60A	CLIFTON LEE ARNOLD	1884.073 sm	39.855 sm	1844.218 sm		107.953		
		20280.000 sf	429.000 sf	19851.000 sf		1162.000		
61	TSUNEKO TYNDALL	8.336 ha	0.271 ha	8.065 ha		17.762		
		20.800 ac	0.670 ac	19.930 ac		191.191		3040.000
62	DAVID G. SPENCER	0.673 ha	57.414 sm		0.667 ha	268.910		
		1.660 ac	618.000 sf		1.650 ac	2894.525		
63	DORIS WILLIAMS	0.270 ha	1118.946 sm	1581.054 sm				
		0.667 ac	12044.237 sf	17018.321 sf				
64	KEVIN LEWIS	0.405 ha			4050.000 sm	118.881		117.787
		1.001 ac			43593.637 sf	1279.407		1267.845
65	WILLIAM MANUEL, III, ET UX	2.396 ha			2.396 ha			202.237
		5.921 ac			5.921 ac			2176.865
66	DAVID W. HARRIS	1.194 ha	1280.199 sm	1.086 ha				
		2.950 ac	13779.943 sf	2.634 ac				
67	ROBERT COURTENAY SMARIDGE	1.804 ha	1207.422 sm	1.483 ha				
		3.984 ac	12996.585 sf	3.685 ac				
68	UNKNOWN	1580.771 sm		1580.771 sm				50.979
		16800.000 sf		16800.000 sf				548.736
69	UNKNOWN	3971.605 sm	602.383 sm	3369.222 sm				79.025
		42750.000 sf	6484.000 sf	36266.000 sf				850.620
70	PAMLICO COUNTY	1.418 ha			1.418 ha			188.688
		3.499 ac			3.499 ac			2031.133
71	ARTHUR M. KELLY, JR., ET UX	3.450 ha	1746.111 sm	UNKNOWN sm	3.450 ha			69.809
		8.525 ac	18794.978 sf	UNKNOWN sf	8.525 ac			751.417
72	THE TOWN OF ALLIANCE	0.243 ha	148.881 sm		2281.119 sm			
		0.600 ac	1602.542 sf		24553.781 sf			
73	PHOEBE H. CAMPEN (ESTATE)	0.299 ha	440.370 sm	2554.316 sm			12.318	
		0.740 ac	4740.099 sf	27494.430 sf			132.586	
74	JASON LEE HANNAH, ET UX	0.202 ha			2020.000 sm		305.085	
		0.499 ac			21743.099 sf		3283.903	
75	STATE OF NORTH CAROLINA	0.235 ha	155.989 sm	2194.031 sm		110.871	21.310	
		0.581 ac	1678.840 sf	23816.350 sf		1191.247	229.381	
76	PAUL W. HOLTEN, ET UX	0.231 ha			2310.000 sm	194.760	5.712	
		0.571 ac			24864.633 sf	2096.381	61.486	
77	JESSE BRAXTON CAHOON, ET UX	0.195 ha	159.040 sm	1790.980 sm				235.398
		0.482 ac	1711.891 sf	19277.734 sf				2533.805

COMPUTED BY: M. WARD DATE: 7-23-03  
 CHECKED BY: D. KEENER DATE: 7-23-03  
 REVISED BY: M. WARD/S. BAILEY DATE: 4-8-04

STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS



Project Reference No. R-2539C Sheet No. 3-AB  
**PRELIMINARY PLANS**  
 DO NOT USE FOR CONSTRUCTION



Greenhorne & O'Mara, Inc.  
 5566 Centerview Drive, Suite 107  
 Raleigh, NC 27606

**RIGHT OF WAY AREA DATA SHEET**

PARCEL NO.	PROPERTY OWNERS NAME	TOTAL AREA	AREA TAKEN	AREA REMAINING RIGHT	AREA REMAINING LEFT	CONSTR. EASEMENT (SM) (SF)	PERMANENT DRAINAGE EASEMENT (SM) (SF)	TEMPORARY DRAINAGE EASEMENT (SM) (SF)
78	JESSE B. CAHOON	0.328 ha	49,178 sm	3230,822 sm				317,546
		0.811 ac	529,345 sf	34776,281 sf				3418,040
79	PAUL LEE PEGRAM, ET UX	0.303 ha		3030,000 sm				138,387
		0.749 ac		32614,649 sf				1489,590
80	THELMA MARIE IRELAND SPENCER	0.305 ha	359,999 sm		2882,810 sm	553,702		
		0.754 ac	3875,000 sf		0.710 ac	5960,000		
81	BERTHA A. SIMMONS, ET VIR	0.647 ha		6470,000 sm				36,545
		1.599 ac	150,000	69642,500 sf				393,371
82	GLADYS BUNN	0.324 ha	0.037 ha		0.287 ha	553,702	97,864	
		0.800 ac	0.090 ac		0.710 ac	5960,000	1053,397	
82A	ROBERT & JEAN PEGRAM	1880,848 sm	13,935 sm		1846,913 sm	72,464		
		20030,000 sf	150,000 sf		19880,000 sf	780,000		
83	PEGGY S. WOOSTER	1.461 ha	0.004 ha	1,457 ha		395,860		69,770
		3.61 ac	0.010 ac	3.60 ac		4261		751
84	DUDLEY A. PAUL, JR., ET UX	0.51 ha	0.02 ha		0.49 ha	360,159	17,202	63,576
		1.25 ac	0.04 ac		1.21 ac	3877	185	684
85	C. W. PHILLIPS	1.214 ha	0.008 ha	1,206 ha		247,958		180,418
		3.00 ac	0.02 ac	2.98 ac		2869		1942
86	HERMAN L. IRELAND	4.856 ha	0.008 ha		4,848 ha	330,06	283,666	178,65
		12.000 ac	0.02 ac		11.98 ac	3553	3161	1923
87	FDI POSTAL PROPERTIES I, INC.	0.652 ha		0,652 ha		129,135		
		1.61 ac		1.61 ac		1390		
88	MARGUERITE LOUISE SAWYER	2428,11 sm		2428,11 sm		86,68		
		26136,000 sf		26136,000 sf		933		
89	CECIL H. WILLIAMS, ET UX	0.732 ha	0.040 ha	0,692 ha		35,117		
		1.81 ac	0.10 ac	1.71 ac		378		
90	ROYSTER-CLARK REALTY LLC	0.550 ha			0,550 ha	150,5		44,13
		1.36 ac			1.36 ac	1620		475
91	NORA S. SCHOLL	0.943 ha	0.024 ha	0,919 ha		240,71		162,77
		2.33 ac	0.06 ac	2,27 ac		2591		1752
92	KYLE F. SODOMA, ET UX	0.466 ha	48,31 sm		0,462 ha	248,79	22,11	
		1.15 ac	520 sf		1,14 ac	2678	238	
93	ROBERT W. SADLER	1.428 ha	0.012 ha	1,416 ha				820,33
		3.53 ac	0.03 ac	3,50 ac				8830
94	RUBY H. JONES	0.466 ha	0.008 ha		0,458 ha	188,15	63,450	
		1.15 ac	0.02 ac		1,13 ac	1810	683	
95	GLADYS LEE	0.842 ha	0.085 ha	0,757 ha		152,360	17,01	69,68
		2.080 ac	0.21 ac	1,87 ac		1640	183	750
96	LOUIS EARL DANIELS, ET UX	0.518 ha			5180,000 sm	102,120	68,957	
		1.280 ac			55757,056 sf	1099,211	720,721	

PARCEL NO.	PROPERTY OWNERS NAME	TOTAL AREA	AREA TAKEN	AREA REMAINING RIGHT	AREA REMAINING LEFT	CONSTR. EASEMENT (SM) (SF)	PERMANENT DRAINAGE EASEMENT (SM) (SF)	TEMPORARY DRAINAGE EASEMENT (SM) (SF)
97	H. TALMADGE COWELL	0.259 ha			0,259 ha	113,620	29,543	
		0.64 ac			0,64 ac	1223	318	
98	HERBERT E. WOOSTER, ET AL	1.222 ha		1,222 ha		143,907	20,610	34,932
		3.020 ac		3,020 ac		1549	224	376
99	H. TALMADGE COWELL	0.158 ha			0,158 ha	60,944	22,111	
		0.390 ac			0,390 ac	656	238	
100	ALLIANCE DEVELOPMENT, LLC	0.538 ha			0,538 ha	76,738	35,489	28,428
		1.330 ac			1,330 ac	826	382	306
101	FRANKLIN T. WILLIS	0.202 ha		2020,000 sm		59,219	26,446	88,350
		0.499 ac		21743,099 sf		637,430	284,663	950,989
102	SANTA M. KLOTZ	0.154 ha		1538,000 sm		53,580	21,987	65,180
		0.380 ac		16554,894 sf		578,735	238,669	701,373
103	PAMLICO COUNTY	0.283 ha			2630,000 sm	46,919	37,159	50,482
		0.650 ac			2,179 ac	506,039	399,978	543,170
104	LUTHER HOYT PAUL	0.116 ha	95,918 sm	1084,082 sm		18,043		15,064
		12486,000 sf	1032,453 sf	11453,683 sf		194,211		162,150
105	DIXIE CHEMICAL CORP.	0.882 ha			0,882 ha	122,818	18,395	143,814
		2.18 ac			2,180 ac	1322	198	1548
106	JOSEPH A. PRICE	2020,084 sm	75,769 sm	1944,231 sm		117,058		42,457
		21744,000 sf	816 sf	20628 sf		1260		457
107	HARDISON PROPERTIES	0.405 ha		4046,873 sm		146,715		51,882
		1.000 ac		1,001 ac		1579,227		558,456
108	MAGNOLIA INVESTORS, LLC	0.271 ha			2710,000 sm	132,474	8,910	8,255
		0.670 ac			29170,197 sf	1425,934	95,904	88,856
109	J. ELDON HARDISON, ET UX	0.405 ha		4050,000 sm		143,450		55,142
		1.001 ac		43593,837 sf		1544,083		593,539
110	JAMMIE CARAWAN TYNDALL, ET VIR	0.303 ha			3030,000 sm	30,358	61,601	
		0.749 ac			32614,649 sf	326,768	663,067	
111	FRANKLIN T. WILLIS	0.202 ha		2020,000 sm		67,232	40,934	
		0.499 ac		21743,099 sf		723,879	440,610	
112	FRANKLIN T. WILLIS, ET AL	0.405 ha	15,879 sm	4034,121 sm		149,449	11,901	33,128
		1.001 ac	170,923 sf	43422,914 sf		1608,656	128,098	358,586
113	FRANKLIN T. WILLIS ET UX	0.202 ha			2020,000 sm	45,196	37,445	
		0.499 ac			21743,099 sf	486,486	403,055	
114	JOHN M. WILLIS, ET UX	0.202 ha	78,771 sm		1943,229 sm	178,984	59,973	
		0.499 ac	826,368 sf		20916,741 sf	1905,040	645,543	
114A	FRANKLIN T. WILLIS	3200,881 sm			3200,881 sm	32,692		
		34454,000 sf			34454,000 sf	354,043		
115	VIRGINIA HOOKER WATSON, ET VIR	636,557 sm		636,557 sm		47,620		
		6851,843 sf		6851,843 sf		512,577		

COMPUTED BY: M. WARD      DATE: 7-23-03  
 CHECKED BY: D. KEENER      DATE: 7-23-03  
 REVISED BY: M.WARD/S. BAILEY      DATE: 4-8-04

STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS



Project Reference No. R-2539C      Sheet No. 3-AC  
**PRELIMINARY PLANS**  
 DO NOT USE FOR CONSTRUCTION

88

Greenhorne & O'Mara, Inc.  
 5555 Centerview Drive, Suite 107  
 Raleigh, NC 27608

**RIGHT OF WAY AREA DATA SHEET**

PARCEL NO.	PROPERTY OWNERS NAME	TOTAL AREA	AREA TAKEN	AREA REMAINING RIGHT	AREA REMAINING LEFT	CONSTR. EASEMENT (SM) (SF)	PERMANENT DRAINAGE EASEMENT (SM) (SF)	TEMPORARY DRAINAGE EASEMENT (SM) (SF)
115A	RANDOLPH EARL WATSON	1480.511 sm		1480.511 sm		54.455		28.061
		15936.088 sf		15936.088 sf		586.149		280.738
115B	VIRGINIA HOOKER WATSON, ET VIR	801.855 sm		801.855 sm		33.572		
		6478.313 sf		6478.313 sf		361.366		
116	PAMLICO COUNTY FARM BUREAU, INC.	0.101 ha		1010.000 sm		20.521		24.286
		0.250 ac		10871.550 sf		220.684		261.414
117	HAZEL W. TYNDALL, ET AL	2.299 ha		2.299 ha		123.888		76.831
		5.681 ac		5.681 ac	1.440 ac	1333.519		827.003
118	WESLEY J. ROBINSON	0.405 ha	79.361 sm		3970.639 sm	279.111	78.915	
		1.001 ac	854.239 sf		42739.598 sf	3004.328	849.437	
119	CARL S. RUSS	0.583 ha			0.975 ha	122.812	66.379	
		1.440 ac			2.410 ac	1321.937	714.499	
120	DALTON C. HARDISON, ET UX	2541.363 sm		2541.363 sm		84.787		41.553
		27355.000 sf		27355.000 sf		912.419		447.277
121	FRANKLIN T. WILLIS	0.975 ha			9753.000 sm	198.598	264.139	
		2.410 ac			104980.418 sf	2137.690	2843.171	
122	KEITH D. COWELL, ET UX	0.285 ha		2850.000 sm		108.870		30.165
		0.704 ac		30677.145 sf		1171.867		324.891
123	PAMLICO COUNTY	0.178 ha		1780.000 sm		80.223		8.234
		0.440 ac		19159.781 sf		863.511		88.628
124	ZANE GREY RICE	2.428 ha		2.428 ha		148.711	50.906	
		6.000 ac		6.000 ac		1579.188	547.942	
125	WEYERHAEUSER CO.	169.392 ha			169.392 ha	75.823		
		418.577 ac			418.577 ac	814.000		
126	WILKES PROPERTIES, INC.	1.598 ha		1.598 ha		381.371		
		3.949 ac		3.949 ac		4105.045		
127	ROY FRED NOBLE	1.370 ha		1.370 ha		134.480	19.105	
		3.385 ac		3.385 ac		1447.311	205.845	
128	R. W. WALKER, ET UX	8.209 ha		8.209 ha		199.268	62.971	
		20.285 ac		20.285 ac		2144.908	677.811	
129	GOLDEN ARCH LIMITED PARTNERSHIP	0.498 ha			4980.000 sm	98.099		
		1.231 ac			53604.274 sf	1034.398		
130	LEASED TO WADE-CARY ENTERPRISES, INC.	0.889 ha		8890.000 sm		158.627	189.937	
		2.197 ac		95891.184 sf		1885.919	2152.104	
131	ELIZABETH HARGROVE JONES	1.311 ha			1.311 ha	60.498	14.079	
		3.240 ac			3.240 ac	651.180	151.546	
132	CURNIE LEE JONES	0.405 ha			4050.000 sm	100.597	26.080	
		1.001 ac			43583.837 sf	1082.817	280.721	
133	PAMLICO COUNTY ABC	0.223 ha		2230.000 sm		95.600	21.674	
		0.651 ac		24003.520 sf		1029.029	233.294	

PARCEL NO.	PROPERTY OWNERS NAME	TOTAL AREA	AREA TAKEN	AREA REMAINING RIGHT	AREA REMAINING LEFT	CONSTR. EASEMENT (SM) (SF)	PERMANENT DRAINAGE EASEMENT (SM) (SF)	TEMPORARY DRAINAGE EASEMENT (SM) (SF)
134	UNKNOWN	2.859 ha			2.859 ha	122.854	10.838	
		6.571 ac			6.571 ac	1322.384	116.656	
135	GEORGE RODGERS	0.621 ha			6207.900 sm	101.080	20.381	
		1.594 ac			66821.279 sf	1087.805	219.375	
135A	BILL PLUMLEE	0.672 ha			6721.900 sm	96.800	21.020	
		1.661 ac			72353.929 sf	1039.794	226.257	
136	GARLAND A GIBBS	0.152 ha			1520.000 sm	61.400	19.242	
		0.376 ac			16361.144 sf	680.899	207.115	
137	UNKNOWN	1.416 ha			1.416 ha	84.358		
		3.499 ac			3.499 ac	907.997		
138	RUFUS GIBBS, JR.	4.474 ha			4.474 ha	270.739	15.606	
		11.055 ac			11.055 ac	2914.212	167.981	
139	NANCY CAYTON IRELAND	0.607 ha	8.483 sm	6061.537 sm		83.531	17.768	12.303
		1.500 ac	91.091 sf	65245.846 sf		899.118	191.254	132.427
140	BARBARA I. CUNIO	0.259 ha	57.854 sm	2532.146 sm		77.463		7.179
		0.640 ac	622.731 sf	27255.797 sf		833.804		77.273
141	MAURICE W. BENTON, ET UX	670.000 sm	184.285 sm	485.715 sm		147.744		
		7211.620 sf	1983.626 sf	5228.194 sf		1590.307		
142	ANGELA I. CAMPEN	0.257 ha		2570.000 sm		131.558		
		0.635 ac		27863.250 sf		1418.076		
143	BEULAH GIBBS	3.698 ha			3.698 ha	248.889	126.788	
		9.138 ac			9.138 ac	2879.019	1384.735	
144	W. CLOYCE ANDERS, ET UX	0.187 ha	86.425 sm	1783.575 sm		261.226	7.573	
		0.482 ac	930.271 sf	19198.242 sf		2811.813	81.510	
145	THOMAS W. BOYD	0.219 ha		2190.000 sm		65.199	34.507	17.963
		0.541 ac		23572.964 sf	13608.000	701.798	371.429	193.351
146	ROY H. LUPTON, ET UX	0.332 ha	112.189 sm	3207.811 sm		96.872		8.117
		0.820 ac	1207.596 sf	10.079 sf		1043.797		87.367
147	MABEL HARGROVE JONES ESTATE	1264.225 sm			1264.225 sm	93.480	30.079	
		13808.000 sf			13808.000 sf	1006.209	323.768	
148	GATLIN OIL COMPANY, INC.	4.083 ha	44.501 sm	4.079 ha		238.817		28.088
		10.089 ac	479.000 sf	10.079 ac		2570.806		302.339
149	FORMERLY ANNIE M. GIBBS (LE) CLAIMED BY VERTA MAE BOWKS ESTATES	2.428 ha			2.428 ha	126.345		
		6.000 ac			6.000 ac	1359.962		
150	RONALD BOWKS, ET AL	1.574 ha			1.574 ha	126.274	38.160	
		3.889 ac			3.889 ac	1359.202	410.748	
151	CARRIE B. CREDLE	1408.596 sm			1408.596 sm	25.951	58.205	
		15162.000 sf			15162.000 sf	279.337	626.518	
152	GARFIELD CREDLE ESTATE	3953.675 sm	195.326 sm	3758.349 sm		436.827	48.026	10.901
		42557.000 sf	2102.474 sf	40454.530 sf		4701.999	516.946	117.341

COMPUTED BY: M. WARD DATE: 7-23-03  
 CHECKED BY: D. KEENER DATE: 7-23-03  
 REVISED BY: M.WARD/S. BAILEY DATE: 4-8-04

STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS



Project Reference No. R-2539C Sheet No. 3-AD  
**PRELIMINARY PLANS**  
 DO NOT USE FOR CONSTRUCTION



Greenhome & O'Mara, Inc.  
 5565 Centerville Drive, Suite 107  
 Raleigh, NC 27606

**RIGHT OF WAY AREA DATA SHEET**

PARCEL NO.	PROPERTY OWNERS NAME	TOTAL AREA	AREA TAKEN	AREA REMAINING RIGHT	AREA REMAINING LEFT	CONSTR. EASEMENT (SM) (SF)	PERMANENT DRAINAGE EASEMENT (SM) (SF)	TEMPORARY DRAINAGE EASEMENT (SM) (SF)
153	EVELYN T. NILES, ET AL	1678.015 sm			1678.015 sm	45.971	36.029	
		18062.000 sf			18062.000 sf	494.832	409.344	
154	FORMERLY DELILAH BESS CLAIMED BY VERTA MAE BOWKS ESTATES	3.237 ha			3.237 ha	178.011	62.672	
		7.999 ac			7.999 ac	1916.084	674.591	
155	WACHOVIA BANK & TRUST COMPANY	1.295 ha		1.295 ha		230.101	19.269	42.157
		3.200 ac		3.200 ac		2476.791	207.410	453.775
156	A. B. HARDY SR., ET UX	1.148 ha	113.470 sm	1.137 ha		222.092	21.876	38.858
		2.897 ac	1221.382 sf	2.809 ac		2390.473	235.471	418.264
157	ALBERT R. GIBBS, JR.	2.918 ha	315.656 sm		2.918 ha	277.194	54.732	
		7.210 ac	0.078 ac		7.211 ac	2983.687	589.125	
158	STEPHEN E. PERTZ	2.311 ha			2.311 ha	157.952	3.462	
		5.711 ac			5.711 ac	1700.177	37.264	
159	PAMLICO COUNTY RESCUE SQUAD, INC.	1.364 ha	314.984 sm	1.333 ha				
		3.371 ac	3390.463 sf	3.293 ac				
160	PAMLICO COMMUNITY COLLEGE	1.109 ha	0.016 ha	1.093 ha		116.500		22.204
		2.74 ac	0.04 ac	2.70 ac		1254		239
161	PAMLICO COMMUNITY COLLEGE	0.223 ha	293.016 sm	1932.755 sm		329.9		21.275
		0.55 ac	3154 sf	20804.000 sf		3551		229
162	PAMLICO COUNTY BOARD OF EDUCATION	2.258 ha	68.022 sm	2.250 ha		244.451		
		5.580 ac	0.220 ac	5.559 ac		2631.251		
163	EVA E. HUMPHREY AND BONNIE W. HUMPHREY	0.947 ha		0.947 ha		179.743	36.059	670.325
		2.340 ac		2.340 ac		1934.738	368.139	9368.095
164	PAMLICO COUNTY BOARD OF EDUCATION	13.933 ha	890.312 sm	13.844 ha		485.726	22.079	178.277
		34.430 ac	9563.239 sf	34.210 ac		5228.311	237.656	1918.958
165	JESSE BRAXTON CAHOON	607.029 sm			607.029 sm	55.835	17.187	138.240
		6534.000 sf			6534.000 sf	601	185	1488
166	ROBERT RAY SANDERS, ET UX	0.488 ha		0.488 ha		97.503		629.577
		1.208 ac		1.208 ac		1049.517		6776.712
167	ELIZABETH GASKILL CUMMINGS	3366.992 sm			3366.992 sm	62.363		13.580
		36242.000 sf			36242.000 sf	871.485		145.955
169	PAMLICO MEDICAL PROPERTIES	0.536 ha			0.536 ha	61.942		91.612
		1.324 ac			1.324 ac	666.736		988.099
170	LLOYD H. WILLIS, ET UX	0.405 ha			0.405 ha	85.584	2.137	9.383
		1.000 ac			1.000 ac	921	23	101
171	MAURICE W. BENTON, ET UX	3079.658 sm	135.614 sm		2944.043 sm	71.756	13.162	19.309
		33149.160 sf	1459.741 sf		31889.419 sf	772.375	141.670	207.841
172	SYLVIA H. BUCK	1900.063 sm	109.442 sm	1790.621 sm		174.000		
		20452.108 sf	1178.027 sf	19274.081 sf		1872.919		
173	RUTH I. BLANDFORD	1080.035 sm	131.470 sm		948.565 sm	83.254	32.917	
		11625.404 sf	1415.135 sf		10210.270 sf	896.135	354.319	

PARCEL NO.	PROPERTY OWNERS NAME	TOTAL AREA	AREA TAKEN	AREA REMAINING RIGHT	AREA REMAINING LEFT	CONSTR. EASEMENT (SM) (SF)	PERMANENT DRAINAGE EASEMENT (SM) (SF)	TEMPORARY DRAINAGE EASEMENT (SM) (SF)
174	ORVAL H. SADLER	2018.381 sm	122.651 sm	1896.731 sm		146.701	16.586	
		21736.440 sf	1320.203 sf	20416.237 sf		1579.072	199.845	
175	CLIFTON E. GASKILL, SR., ET UX	2420.020 sm			2420.020 sm	51.840	18.823	
		26048.880 sf			26048.880 sf	558.000	202.807	
176	CHARLES A. EARNEST, JR.	1620.053 sm	178.638 sm	1441.415 sm		89.926	71.040	
		17438.104 sf	1922.846 sf	15515.258 sf		967.960	764.666	
177	FORREST FARM SUPPLY, INC.	3844.514 sm	234.766 sm		3609.748 sm	327.112	13.285	
		41382.000 sf	2527 sf		38855 sf	3521	143	
178	CHARLES R. FOREST, II	1335.482 sm	356.748 sm	978.734 sm		233.26		
		14375.000 sf	3840 sf	10535 sf		2511		
179	RUSSELL EARL HUDSON, ET UX	1580.000 sm		1580.000 sm		107.853		
		17008.978 sf		17008.978 sf		1180.923		
180	FOREST FARM SUPPLY, INC.	1537.824 sm			1537.824 sm	139.447		
		16553.000 sf			16553.000 sf	1601		
180A	LLOYD H. WILLIS	1517.571 sm	259.571 sm		1258.000 sm	229.563		
		16335.000 sf	2794 sf		13541.000 sf	2471		
181	LLOYD H. WILLIS, ET UX	2019.991 sm	274.529 sm	1745.462 sm		211.54		
		21743.000 sf	2955 sf	18788 sf		2277		
183	DEBORAH VOLIVA EDWARDS	1979.465 sm	71.437 sm	1908.028 sm		50.252		
		21307.000 sf	788.941 sf	20538.059 sf		540.912		
184	MARTHA PRESCOTT GASKILL	0.700 ha	43.775 sm		696.225 sm	83.255		
		1.730 ac	471.190 sf		74676.183 sf	896.153		
185	ANGELIA L. HARRIS, ET VIR	1739.256 sm	78.052 sm	1661.204 sm		54.658		
		18721.200 sf	840.146 sf	17881.054 sf		568.331		
186	EVELYN BRICKHOUSE MCKINNEY	3390.000 sm	79.654 sm	3310.346 sm		55.706		
		36489.656 sf	857.387 sf	35632.269 sf		599.618		
187	CHERYL P. TAYLOR	1923.000 sm	91.398 sm		1831.602 sm	48.060		
		20699.000 sf	983.800 sf		19715.200 sf	517.318		
188	EVELYN B. MCKINNEY	1712.948 sm	77.755 sm	1635.191 sm		54.536		
		18438.000 sf	836.946 sf	17601.054 sf		587.021		
189	RANDOLPH EARL WATSON A/K/A R.E. WATON, JR.	0.441 ha	101.172 sm		4309.828 sm	52.198		
		1.080 ac	1089.004 sf		46390.605 sf	561.854		
190	MAVIS REEDER O'NEAL	3127.302 sm	76.503 sm	3048.799 sm		54.813		
		33862.000 sf	845.000 sf	32817.000 sf		590.000		
191	THEA L. MCLEAN (LE) ET AL	2768.046 sm	116.734 sm	2651.312 sm		83.214		
		29796.000 sf	1256.514 sf	28538.486 sf		895.712		
192	ROBERT G. JOHNSTON, JR., ET UX	1380.000 sm	63.068 sm		1316.932 sm	33.097		
		14854.196 sf	678.860 sf		14175.336 sf	356.254		
193	ROBERT G. JOHNSTON, JR.	3850.000 sm	261.406 sm		3588.595 sm	186.295	32.000	
		41441.055 sf	2813.742 sf		38627.313 sf	2005.264	344.444	



PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**PARCEL INDEX SHEET**

PROJ. REFERENCE NO.  
R-2538C

SHEET NO.  
3-AF

 Greenhorne & O'Mara, Inc.  
5555 Centerview Drive, Suite 107  
Raleigh, NC 27608

RAL-R-41

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4, 5	WEYERHAEUSER CO.
2	5, 6	GEORGE R. BRINSON, ET UX
3	5, 6	ROSALIE BANKS PEACOCK, ET VIR
4	6	JAY F. BARRINGTON, ET UX
5	6, 7	JEANNETTE BANKS HUDSON, ET VIR
6	6, 7, 8, 28	SARAH ALICE HARRIS
6A	7	TOWN OF GRANTSBORO
7	7	MYRON M. BANKS, JR., ET UX
8	7	PAMLICO COUNTY CHAMBER OF COMMERCE
9	7	ARFEGUS JOYNER, SR., ET UX
9A	7, 8	LAWRENCE GARY NORMAN, ET UX
11	7, 8	CLIFTON E. STOWE, ET UX
12	8, 28	AURORA FOODS, INC.
13	8	BOBBY JAMES CUTHRELL, ET UX
14	8	JULIAN A. SCOTT
15	8	ALFREDO G. MOLLANO
16	8	MYRON M. BANKS (HEIRS)
17	8	MYRON M. BANKS, JR.
18	8	DR. JOHN C. ABBOTT
19	8	JEFF SAWYER, ET UX
20	8	E & D INVESTMENT COMPANY, LLC
21	8, 28	GRANTSBORO-SILVERHILL VOLUNTEER FIRE DEPARTMENT
22	8	ARCHIE C. WILLIAMS, ET UX
23	8	J. T. HERRING
24	8, 9	FAITH CHRISTIAN CHURCH
25	8, 9	WESTWIND GROUP NORTH CAROLINA, INC.
26	8, 9	PAMLICO PACKING COMPANY, INC.
27	9	TIDELAND ELECTRIC MEMBERSHIP CORP.
28	9	STEVE T. DIXON, ET UX
29	9	BENDERS GEORGE GOLDEN, III, ET UX
30	9	H. CURTIS POTTER, III, ET UX
31	9	NEW LIFE PRAISE AND WORSHIP MINISTRIES, INC.
32	9, 10	ROLAND J. WARD, JR., ET UX
33	9, 10	ROGER W. MCDANIEL, ET UX
34	10	ELIZABETH W. BYNUM
35	10	ERIC DWYER, ET UX
36	10, 11	ALFRED E. CAHOON, ET UX
37	10, 11	HERMAN L. IRELAND, ET UX
38	11, 12	JAMES A. TINGLE, ET UX

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
39A	11	BAGWELL HOLDINGS OF VIRGINIA, LLC
39B	11	BAGWELL HOLDINGS OF VIRGINIA, LLC
40	11, 12, 13, 14, 15	JESSE R. BOYD
41	12	PAMLICO COUNTY LODGE NO. 2216, LOYAL ORDER OF THE MOOSE
42	12	BENNIE RAY PAUL
43	12, 13	LOIS MAYO JONES
44	13	DONNA H. BUCK
45	13	GARY J. BRINSON, ET UX
46	13	JAMES NOBLES, ET UX
47	13	E. J. POPE & SON, INC.
48	13, 14	ROBERT G. SPENCER AND LYNETTE HUNNINGS
49	13	GRADY A. SIMPSON, ET UX
50	13	J. ALFRED MAYO, JR., ET UX
51	13, 14	MARANATHA BAPTIST CHURCH, INC.
52	14	JESSE R. BOYD
53	14	PATRICK K. BRYANT
54	14	ERNEST L. RIGGS
55	14	ERNEST LEE RIGGS
56	14, 15	PATRICK K. BRYANT
57	14, 15	HERBERT RILEY DIXON, ET UX
58	15	ALFREDO G. MOLLANO, ET UX
59	15	WILMA DORIS WILLIAMS
60	15	MARGRETT ANNE & ARNOLD SANDERS
60A	15	CLIFTON LEE ARNOLD
61	15, 16	TSUNEKO TYNDALL
62	15	DAVID G. SPENCER
63	15	DORIS WILLIAMS
64	15, 16	KEVIN LEWIS
65	16	WILLIAM MANUEL, III, ET UX
66	16	DAVID W. HARRIS
67	16	ROBERT COURTENAY SMARIDGE
68	16	UNKNOWN
69	16, 17	ROBERT C. SMARIDGE
70	16, 17	PAMLICO COUNTY
71	17	ARTHUR M. KELLY, JR., ET UX
72	17	THE TOWN OF ALLIANCE
73	17	PHOEBE H. CAMPEN (ESTATE)
74	17	JASON LEE HANNAH, ET UX
75	17	STATE OF NORTH CAROLINA

PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**PARCEL INDEX SHEET**

PROJ. REFERENCE NO. R-2539C SHEET NO. 3-AG

 Greenhome & O'Mara, Inc.  
5585 Centerville Drive, Suite 107  
Raleigh, NC 27608

RAL-R-41

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
76	17	PAUL W. HOLTEN, ET UX
77	17,18	JESSE BRAXTON CAHOON, ET UX
78	17,18	JESSE B. CAHOON
79	18	PAUL LEE PEGRAM, ET UX
80	18	THELMA MARIE IRELAND SPENCER
81	18	BERTHA A. SIMMONS, ET VIR
82	18	GLADYS BUNN
82A	18	ROBERT & JEAN PEGRAM
83	18	PEGGY S. WOOSTER
84	18	DUDLEY A. PAUL, JR., ET UX
85	18	C. W. PHILLIPS
86	18,19	HERMAN L. IRELAND
87	18,19	FDI POSTAL PROPERTIES I, INC.
88	19	MARGUERITE LOUISE SAWYER
89	19	CECIL H. WILLIAMS, ET UX
90	19	ROYSTER-CLARK REALTY LLC
91	19	NORA S. SCHOLL
92	19	KYLE F. SODOMA, ET UX
93	19	ROBERT W. SADLER
94	19	RUBY H. JONES
95	19, 20	GLADYS LEE
96	19	LOUIS EARL DANIELS, ET UX
97	19,20	H. TALMADGE COWELL
98	19,20	HERBERT E. WOOSTER, ET AL
99	20	H. TALMADGE COWELL
100	20	ALLIANCE DEVELOPMENT, LLC
101	20	FRANKLIN T. WILLIS
102	20	SANTA M. KLOTZ
103	20	PAMLICO COUNTY
104	20	LUTHER HOYT PAUL
105	20	DIXIE CHEMICAL CORP.
106	20	JOSEPH A. PRICE
107	20	HARDISON PROPERTIES
108	20	MAGNOLIA INVESTORS, LLC
109	20	J. ELDON HARDISON, ET UX
110	20	JAMMIE CARAWAN TYNDALL, ET VIR
111	20	FRANKLIN T. WILLIS
112	20	FRANKLIN T. WILLIS, ET AL
113	20,21	FRANKLIN T. WILLIS ET UX

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
114	21	JOHN M. WILLIS, ET UX
114A	21	FRANKLIN T. WILLIS
115	21	VIRGINIA HOOKER WATSON, ET VIR
115A	21	RANDOLPH EARL WATSON
115B	21	VIRGINIA HOOKER WATSON, ET VIR
116	21	PAMLICO COUNTY FARM BUREAU, INC.
117	21	HAZEL W. TYNDALL, ET AL
118	21	WESLEY J. ROBINSON
119	21	CARL S. RUSS
120	21	DALTON C. HARDISON, ET UX
121	21	FRANKLIN T. WILLIS
122	21	KEITH D. COWELL, ET UX
123	21	PAMLICO COUNTY
124	21	ZANE GREY RICE
125	21	WEYERHAEUSER CO.
126	21,22	WILKES PROPERTIES, INC.
127	21	ROY FRED NOBLE
128	21,22	R. W. WALKER, ET UX
129	22	GOLDEN ARCH LIMITED PARTNERSHIP
130	22	LEASED TO WADE-CARY ENTERPRISES, INC.
131	22	ELIZABETH HARGROVE JONES
132	22	CURNIE LEE JONES
133	22	PAMLICO COUNTY ABC
134	22	UNKNOWN
135	22	GEORGE RODGERS
135A	22	BILL PLUMLEE
136	22	GARLAND A GIBBS
137	22	UNKNOWN
138	22,23	RUFUS GIBBS, JR.
139	22	NANCY CAYTON IRELAND
140	22,23	BARBARA I. CUNIO
141	23	MAURICE W. BENTON, ET UX
142	22,23	ANGELA I. CAMPEN
143	23	BEULAH GIBBS
144	23	W. CLOYCE ANDERS, ET UX
145	23	THOMAS W. BOYD
146	23	ROY H. LUPTON, ET UX
147	23	MABEL HARGROVE JONES ESTATE
148	23	GATLIN OIL COMPANY, INC.

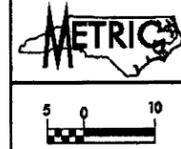


REVISIONS

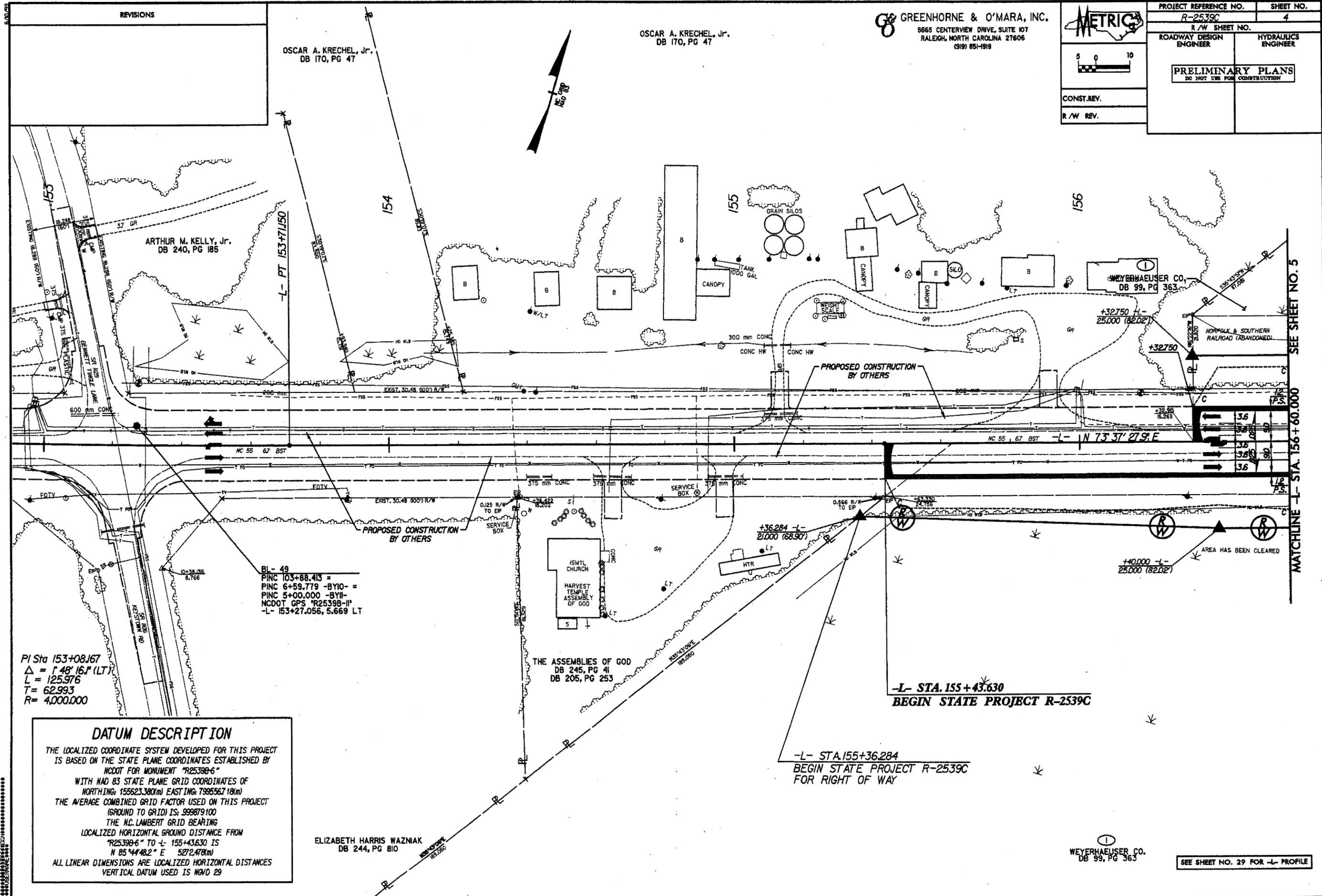
OSCAR A. KRECHEL, Jr.  
DB 170, PG 47

OSCAR A. KRECHEL, Jr.  
DB 170, PG 47

**GREENHORNE & O'MARA, INC.**  
6665 CENTERVIEW DRIVE, SUITE 107  
RALEIGH, NORTH CAROLINA 27606  
(919) 851-1919



PROJECT REFERENCE NO. R-2539C	SHEET NO. 4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
CONST. REV.	
R/W REV.	



PI Sta 153+08J67  
Δ = 1' 48" 16.1" (LT)  
L = 125.976  
T = 62.993  
R = 4,000.000

BL - 49  
PINC 103+88.413 =  
PINC 6+59.779 -BY10- =  
PINC 5+00.000 -BYH-  
NCDOT GPS "R2539B-II"  
-L- 153+27.056, 5.669 LT

**DATUM DESCRIPTION**  
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "R2539B-6" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 155623.380(m) EASTING: 799556.718(m) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 999879100 THE N.C. LAMBERT GRID BEARING LOCALIZED HORIZONTAL GROUND DISTANCE FROM "R2539B-6" TO -L- 155+43.630 IS N 85°44'48.2" E 5272.478(m) ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NGVD 29

ELIZABETH HARRIS WAZNIAK  
DB 244, PG 810

-L- STA. 155+43.630  
BEGIN STATE PROJECT R-2539C

-L- STA. 155+36.284  
BEGIN STATE PROJECT R-2539C  
FOR RIGHT OF WAY

WEYERHAEUSER CO.  
DB 99, PG 363

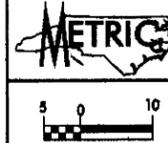
SEE SHEET NO. 29 FOR -L- PROFILE

MATCHLINE -L- STA. 156+60.000 SEE SHEET NO. 5

REVISIONS

WEYERHAEUSER COMPANY  
DB 133 - PG 494

GREENHORNE & O'MARA, INC.  
5565 CENTERVIEW DRIVE, SUITE 107  
RALEIGH, NORTH CAROLINA 27606  
(919) 851-1919



PROJECT REFERENCE NO. R-2539C	SHEET NO. 5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
CONST. REV.	
R/W REV.	

OSCAR A. KRECHEL, Jr.  
DB 170, PG 47

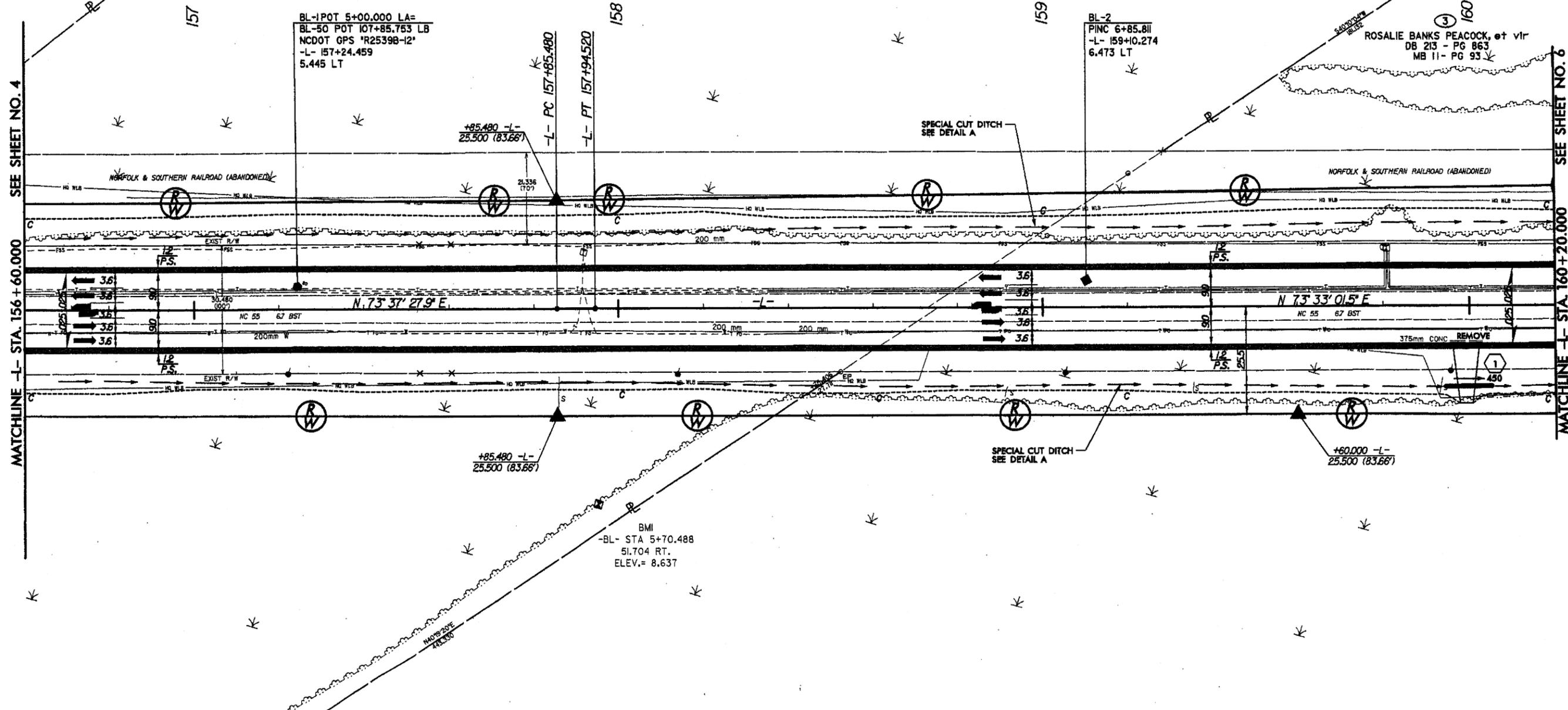
U/G UTILITIES DRAWN FROM PLANS SUPPLIED  
BY UTILITY OWNER  
AND FIELD LOCATIONS  
DONE BY SUE FIRM

SEE SHEET NO. 4

MATCHLINE -L- STA 156+60.000

SEE SHEET NO. 6

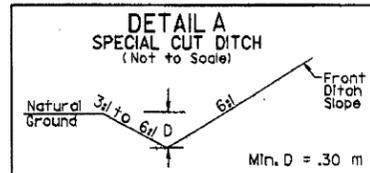
MATCHLINE -L- STA 160+20.000



WEYERHAEUSER COMPANY  
DB 133 - PG 494

-L-  
PI Sta 157+90.000  
 $\Delta = 0^{\circ}04'26.4"$  (LT)  
L = 9.039  
T = 4.520  
R = 7000.000  
S.E. = N C

STA 156+68 TO STA 160+20 -L- RT  
STA 156+68 TO STA 160+20 -L- LT



GEORGE R. BRINSON, ET UX  
DB 303 - PG 766  
PC A - SLIDE 87-4

SEE SHEET NO. 29 FOR -L- PROFILE

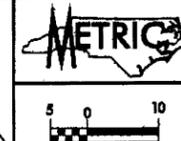
NOTES:  
1. DRIVES IN SHOULDER SECTION, RADIUS = 1.5m @ E.O.P.  
(UNLESS OTHERWISE NOTED ON PLANS).

REVISIONS

③  
ROSALIE BANKS PEACOCK, et vir  
DB 213 - PG 863  
MB 11 - PG 93

GREENHORNE & O'MARA, INC.  
5565 CENTERVIEW DRIVE, SUITE 107  
RALEIGH, NORTH CAROLINA 27606  
(919) 851-1919

⑤  
JEANNETTE BANKS HUDSON, et vir  
DB 213 - PG 853  
MB 11 - PG 93



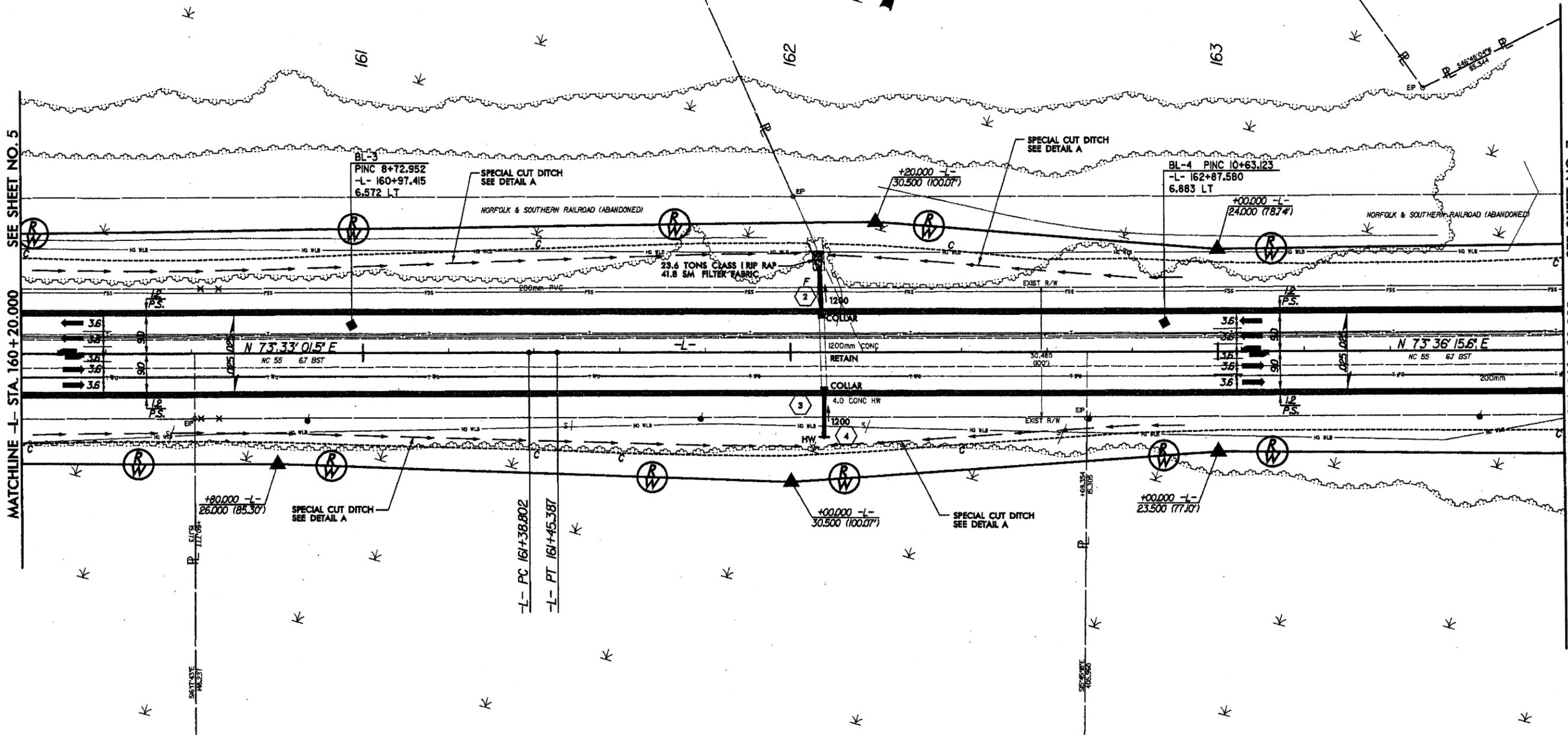
PROJECT REFERENCE NO. R-2539C		SHEET NO. 6	
R/W SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
CONST. REV.		UNKNOWN	
R/W REV.		UNKNOWN	

SEE SHEET NO. 5

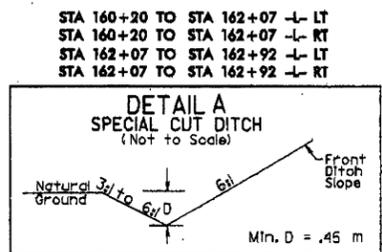
MATCHLINE -L- STA. 160+20.000

SEE SHEET NO. 7

MATCHLINE -L- STA. 163+80.000



②  
GEORGE R. BRINSON, ET UX  
DB 303 - PG 766  
PC A - SLIDE 87-4



-L-  
PI Sta 161+42.094  
 $\Delta = 0^{\circ} 03' 14.0''$  (RT)  
L = 6.585  
T = 3.292  
R = 7000.000  
S.E. = N C

④  
JAY F. BARRINGTON, et ux  
DB 303 - PG 764  
PC A - SLIDE 87-4

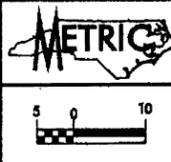
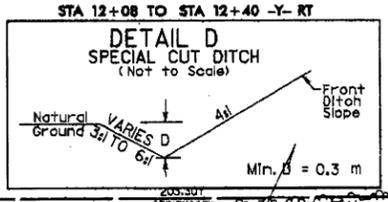
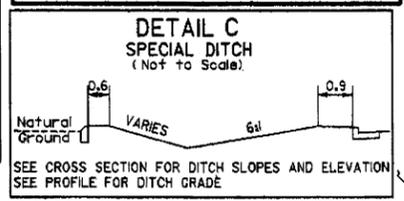
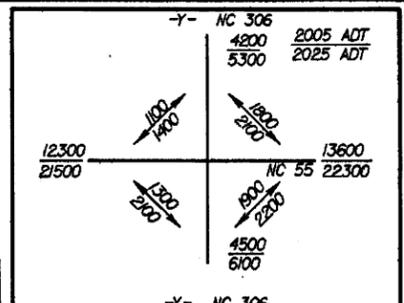
⑥  
SARAH ALICE HARRIS  
DB 209 - PG 146

SEE SHEET NO. 30 FOR -L- PROFILE



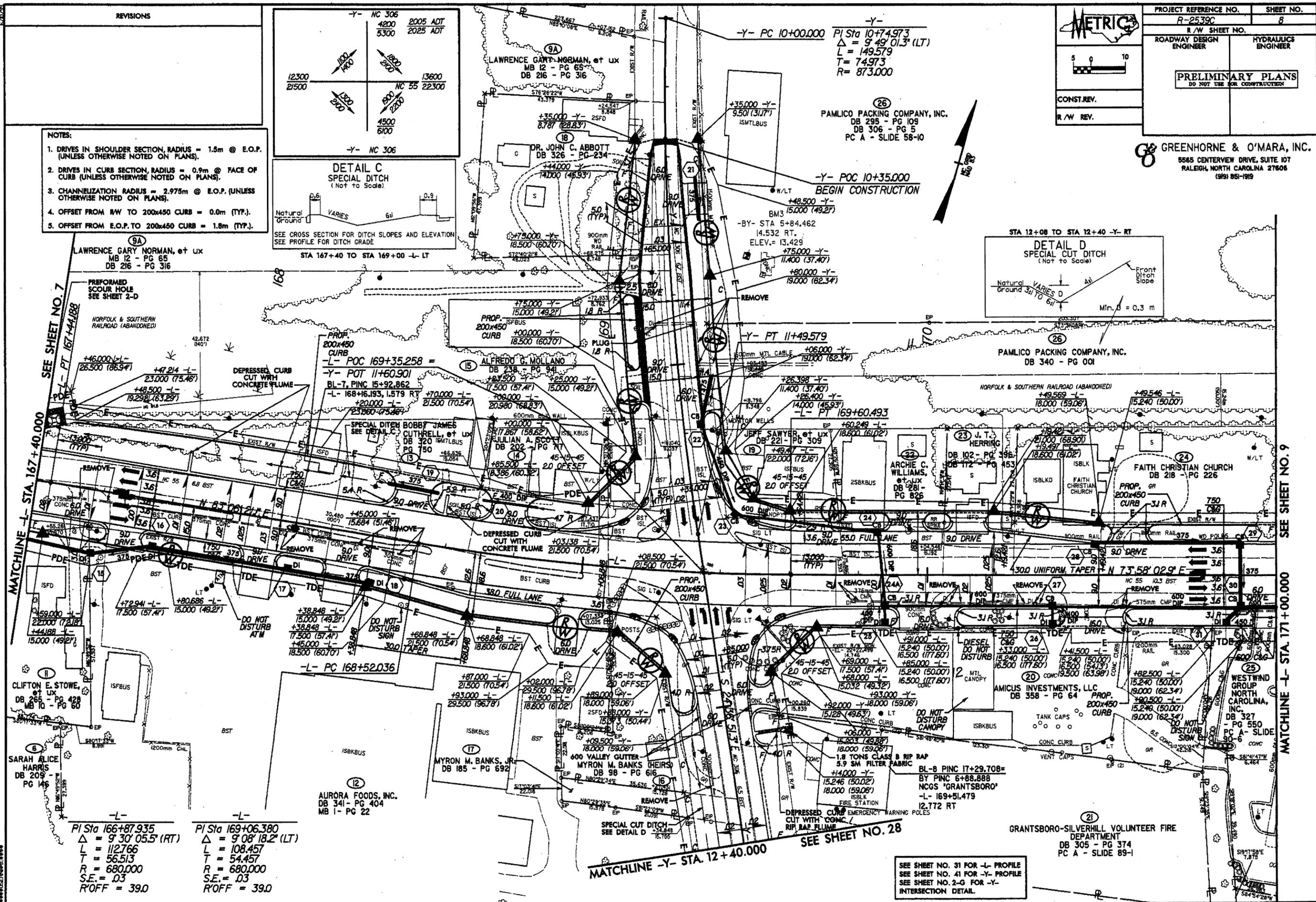
REVISIONS

- NOTES:
1. DRIVES IN SHOULDER SECTION, RADIUS = 1.5m @ E.O.P. (UNLESS OTHERWISE NOTED ON PLANS).
  2. DRIVES IN CURB SECTION, RADIUS = 0.9m @ FACE OF CURB (UNLESS OTHERWISE NOTED ON PLANS).
  3. CHANNELIZATION RADIUS = 2.975m @ E.O.P. (UNLESS OTHERWISE NOTED ON PLANS).
  4. OFFSET FROM RW TO 200x450 CURB = 0.0m (TYP.).
  5. OFFSET FROM E.O.P. TO 200x450 CURB = 1.8m (TYP.).



PROJECT REFERENCE NO. R-2539C	SHEET NO. 8
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

**GREENHORNE & O'MARA, INC.**  
5565 CENTERVIEW DRIVE, SUITE 107  
RALEIGH, NORTH CAROLINA 27605  
(919) 851-1919



PI Sta 166+87.935 $\Delta = 9' 30'' 05.5''$ (RT) $L = 112.766$ $T = 56.513$ $R = 680.000$ $S.E. = .03$ $R/OFF = 39.0$	PI Sta 169+06.380 $\Delta = 9' 08'' 18.2''$ (LT) $L = 108.457$ $T = 54.457$ $R = 680.000$ $S.E. = .03$ $R/OFF = 39.0$
---	---

SEE SHEET NO. 31 FOR -L- PROFILE  
SEE SHEET NO. 41 FOR -Y- PROFILE  
SEE SHEET NO. 2-G FOR -Y- INTERSECTION DETAIL.

MATCHLINE -L- STA. 167 + 40.000  
SEE SHEET NO. 7  
P-L- PT 167+44.188

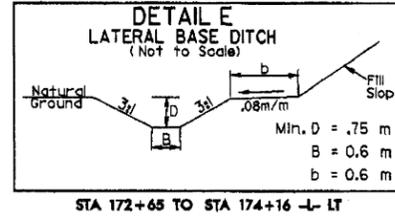
MATCHLINE -L- STA. 171 + 00.000  
SEE SHEET NO. 9

MATCHLINE -Y- STA. 12 + 40.000  
SEE SHEET NO. 28

REVISIONS

-L-  
 PI Sta 172+51.886  
 $\Delta = 10' 40' 26.8" (LT)$   
 L = 171.395  
 T = 85.946  
 R = 920.000  
 S.E. = .03  
 R'OFF = 39.0

-L-  
 PI Sta 174+62.032  
 $\Delta = 10' 16' 30.8" (RT)$   
 L = 159.609  
 T = 80.019  
 R = 890.000  
 S.E. = .03  
 R'OFF = 39.0

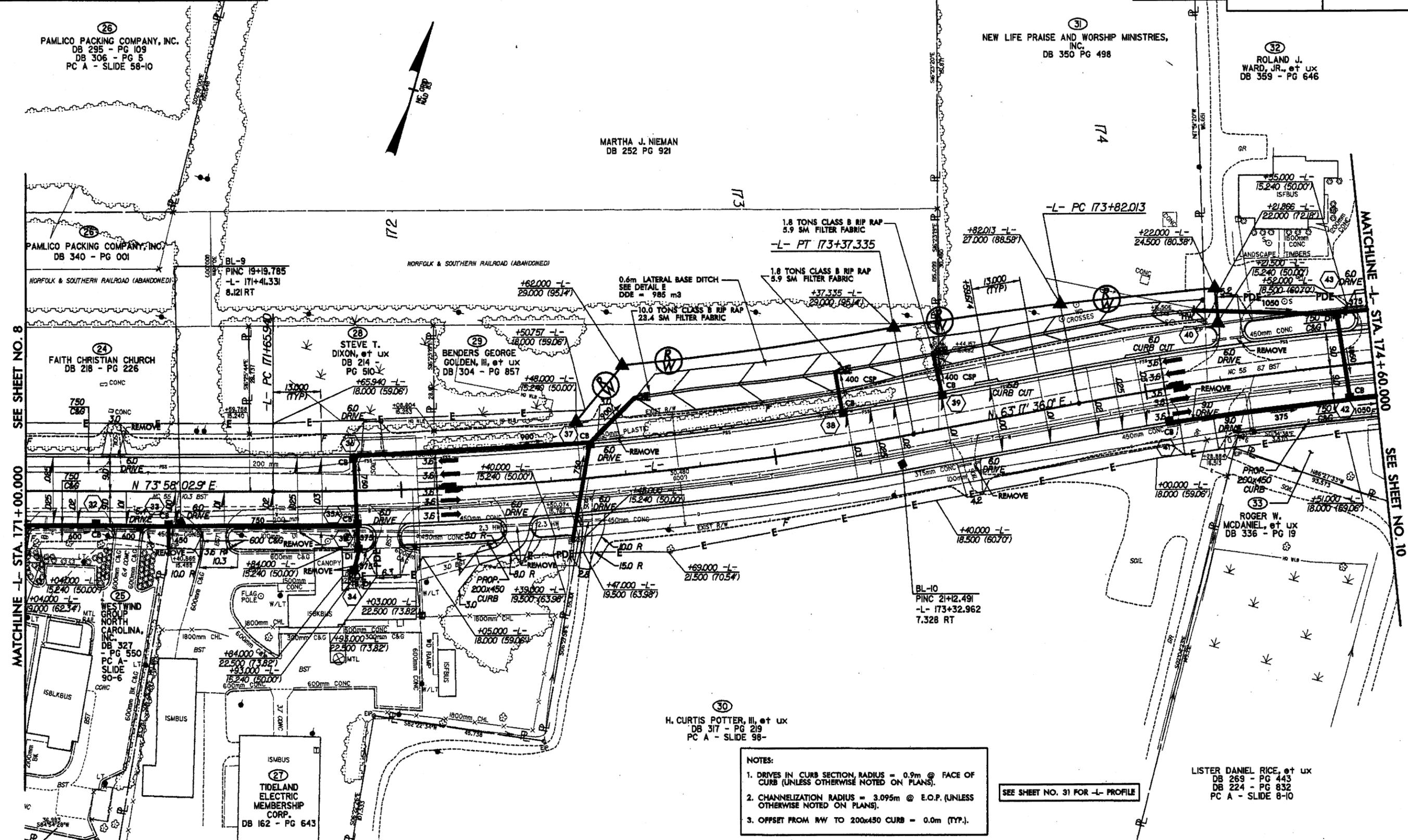


GREENHORNE & O'MARA, INC.  
 5665 CENTERVIEW DRIVE, SUITE 107  
 RALEIGH, NORTH CAROLINA 27606  
 (919) 851-1919

METRIC

CONST. REV.  
 R/W REV.

PROJECT REFERENCE NO. R-2539C	SHEET NO. 9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	



SEE SHEET NO. 8  
 MATCHLINE -L- STA 171+00.000

MATCHLINE -L- STA 174+60.000  
 SEE SHEET NO. 10

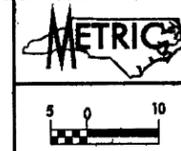
- NOTES:
1. DRIVES IN CURB SECTION, RADIUS = 0.9m @ FACE OF CURB (UNLESS OTHERWISE NOTED ON PLANS).
  2. CHANNELIZATION RADIUS = 3.095m @ E.O.P. (UNLESS OTHERWISE NOTED ON PLANS).
  3. OFFSET FROM RW TO 200x450 CURB = 0.0m (TYP).

SEE SHEET NO. 31 FOR -L- PROFILE

LISTER DANIEL RICE, et ux  
 DB 269 - PG 443  
 DB 224 - PG 832  
 PC A - SLIDE 8-10

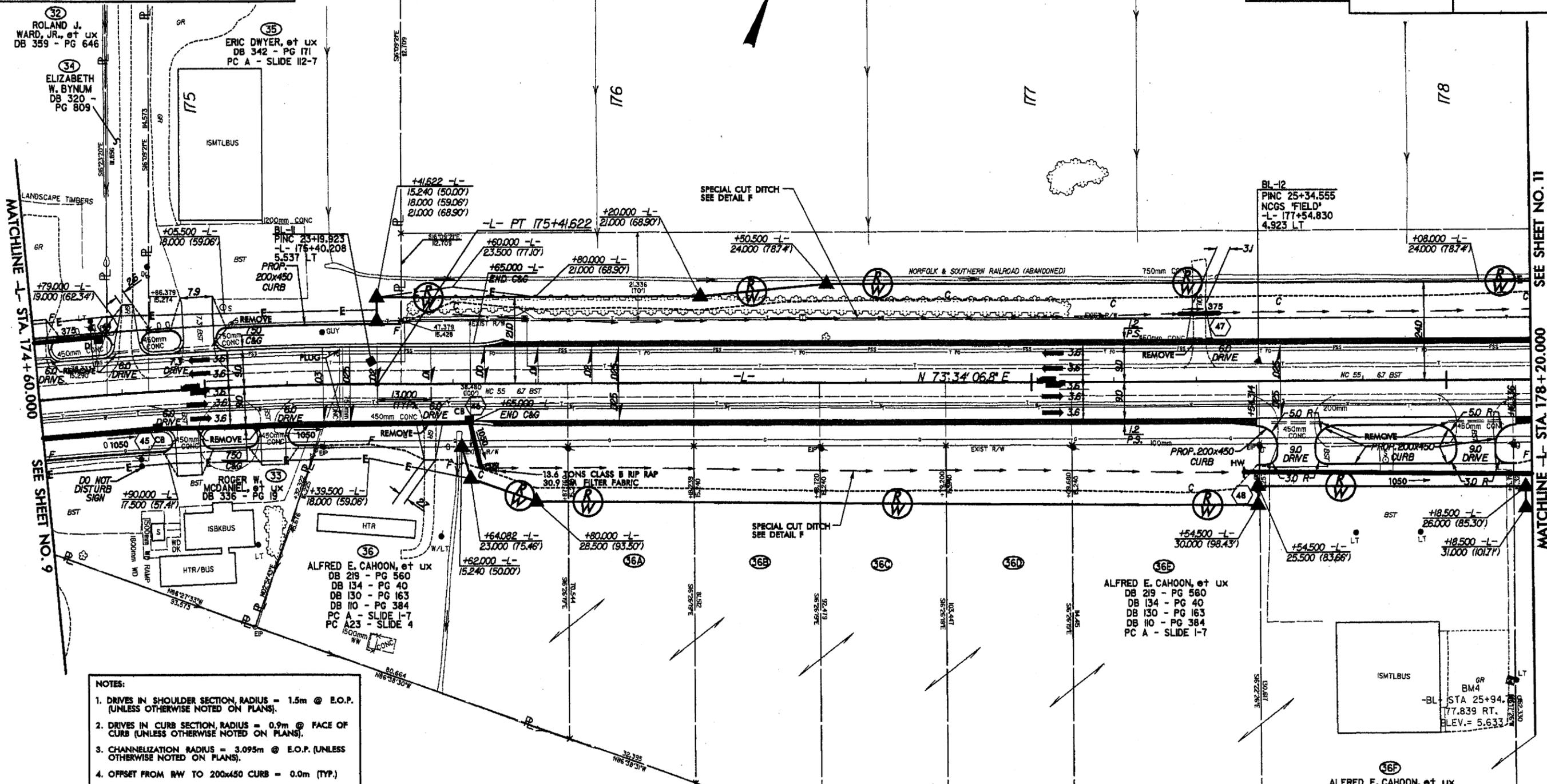
REVISIONS

**GREENHORNE & O'MARA, INC.**  
 5665 CENTERVIEW DRIVE, SUITE 107  
 RALEIGH, NORTH CAROLINA 27806  
 (919) 851-1919



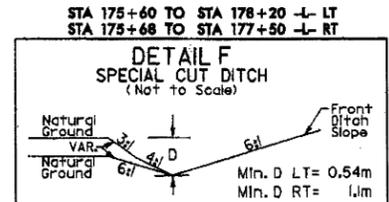
PROJECT REFERENCE NO. R-2539C		SHEET NO. 10	
R/W SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION			
CONST. REV.			
R/W REV.			

(37)  
 HERMAN L. IRELAND, et ux  
 DB 138 - PG 297  
 DB 152 - PG 262



LISTER DANIEL RICE, et ux  
 DB 269 - PG 443  
 DB 224 - PG 832  
 PC A - SLIDE 8-10

-L-  
 PI Sta 174+62.032  
 $\Delta = 10' 16' 30.8''$  (RT)  
 L = 159.609  
 T = 80.019  
 R = 890.000  
 S.E. = 03  
 R/OFF = 39.0



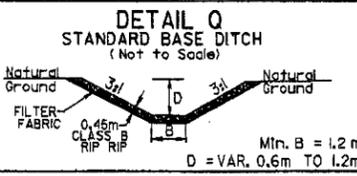
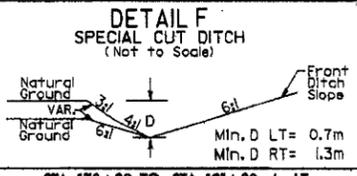
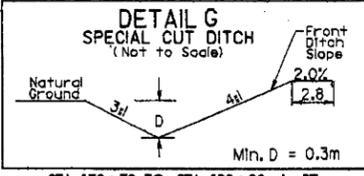
(36F)  
 ALFRED E. CAHOON, et ux  
 DB 219 - PG 560  
 DB 134 - PG 40  
 DB 130 - PG 163  
 DB 110 - PG 384  
 PC A - SLIDE 1-7  
 PC A23 - SLIDE 3

SEE SHEET NO. 32 FOR -L- PROFILE

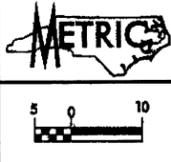
SEE SHEET NO. 11  
 MATCHLINE -L- STA 178+20.000

MATCHLINE -L- STA 174+60.000  
 SEE SHEET NO. 9

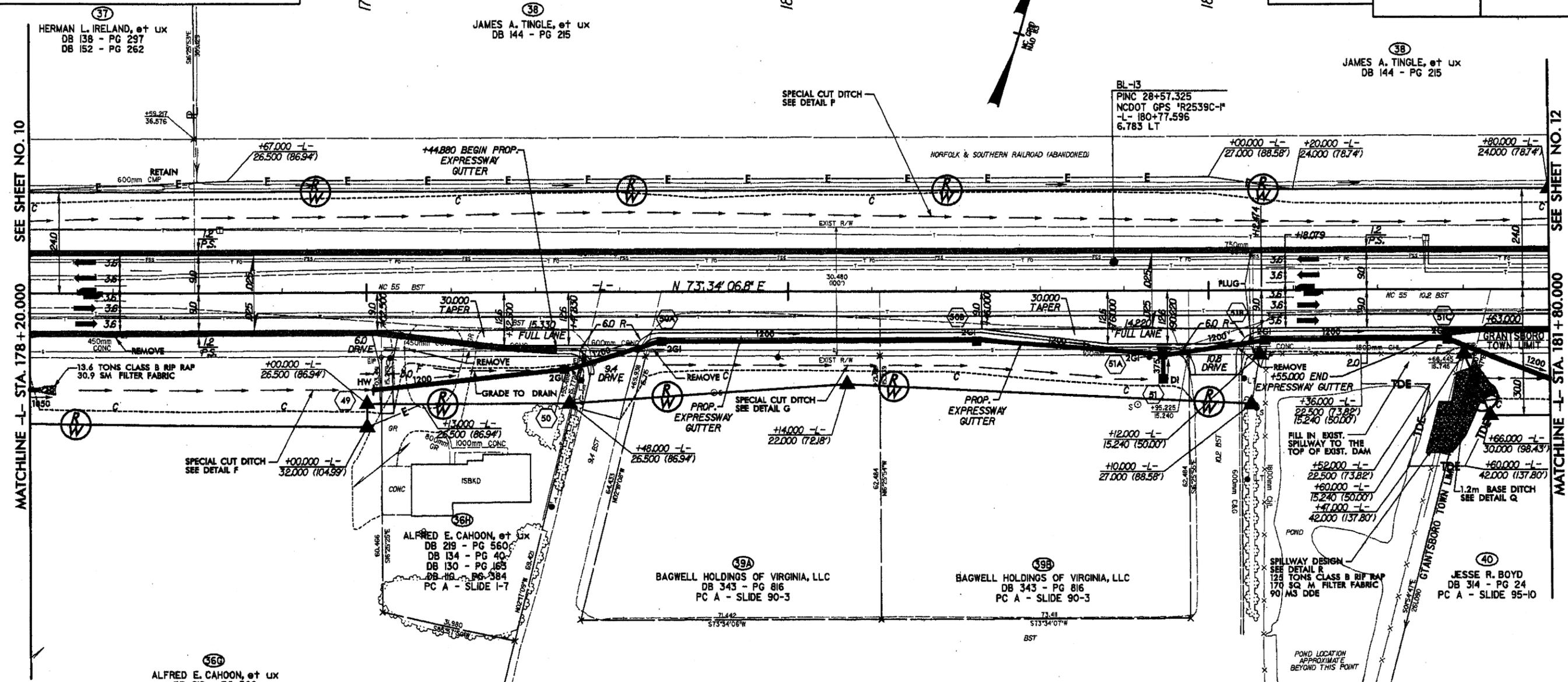
REVISIONS



**GREENHORNE & O'MARA, INC.**  
5565 CENTERVIEW DRIVE, SUITE 107  
RALEIGH, NORTH CAROLINA 27606  
(919) 851-1999



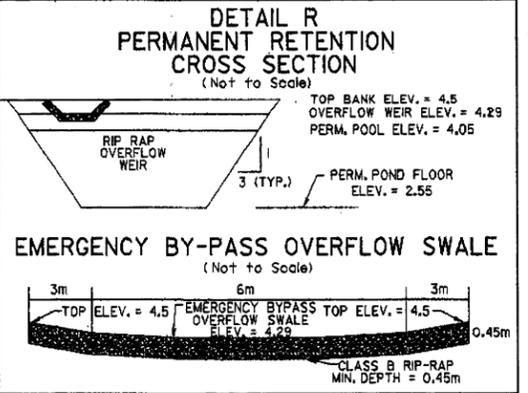
PROJECT REFERENCE NO. R-2539C	SHEET NO. 11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
CONST. REV.	
R/W REV.	



MATCHLINE -L- STA. 178+20.000 SEE SHEET NO. 10

MATCHLINE -L- STA. 181+80.000 SEE SHEET NO. 12

- NOTES:**
1. DRIVES IN SHOULDER SECTION, RADIUS = 1.5m @ E.O.P. (UNLESS OTHERWISE NOTED ON PLANS).
  2. OFFSET FROM E.O.P. TO 200x450 CURB = 1.8m (TYP.).
  3. RESET PENCE ALONG THE POND IN THE AREA OF THE TDE ONCE WORK ON THE SPILLWAY IS COMPLETED.



SEE SHEET NO. 32 FOR -L- PROFILE

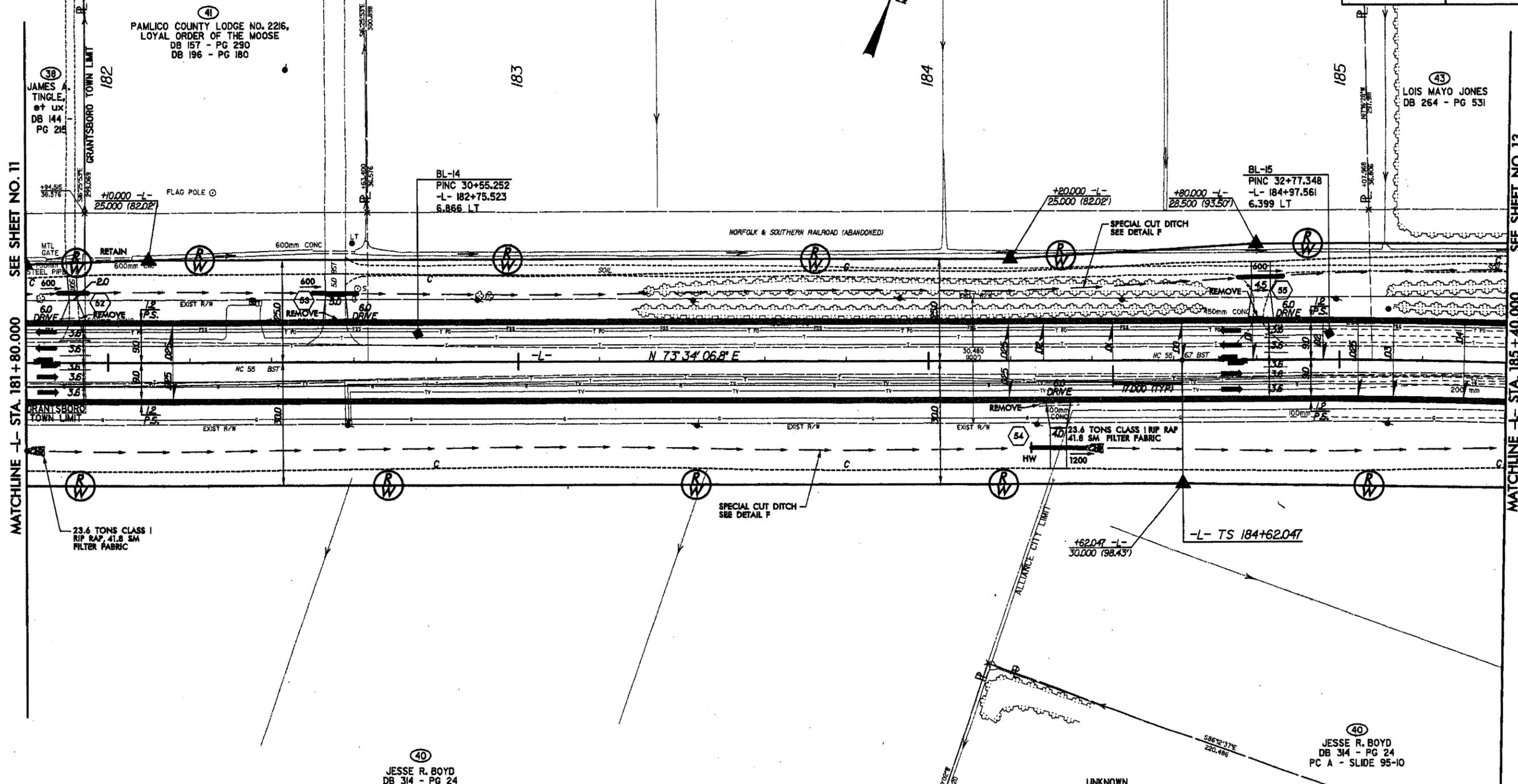
REVISIONS

**GREENHORNE & O'MARA, INC.**  
 5565 CENTERVIEW DRIVE, SUITE 107  
 RALEIGH, NORTH CAROLINA 27606  
 (919) 851-1919

**METRIC**

CONST. REV.  
R/W REV.

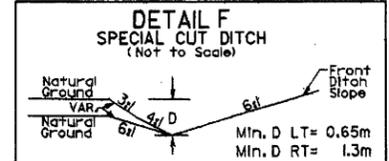
PROJECT REFERENCE NO. R-2539C	SHEET NO. 12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	



SEE SHEET NO. 11  
MATCHLINE -L- STA. 181+80.000

SEE SHEET NO. 13  
MATCHLINE -L- STA. 185+40.000

STA 181+80 TO STA 185+40 -L- LT  
 STA 181+80 TO STA 185+40 -L- RT



-L-

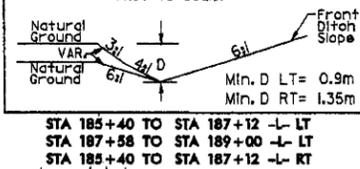
PIs Sta 185+41.421	PI Sta 186+58.383	PIs Sta 187+74.574
$\theta_s = 5^\circ 40' 54.6''$ (RT)	$\Delta = 14^\circ 41' 20.7''$ (RT)	$\theta_s = 5^\circ 40' 54.6''$ (RT)
$L_s = 119.000$	$L = 153.824$	$L_s = 119.000$
$LT = 79.374$	$T = 77.336$	$LT = 79.374$
$ST = 39.704$	$R = 600.000$	$ST = 39.704$
	$S.E. = .07$	

NOTES:  
 1. DRIVES IN SHOULDER SECTION, RADIUS = 1.5m @ E.O.P.  
 (UNLESS OTHERWISE NOTED ON PLANS).

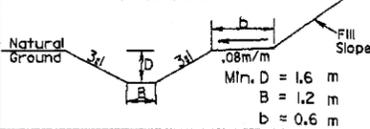
SEE SHEET NO. 33 FOR -L- PROFILE

REVISIONS

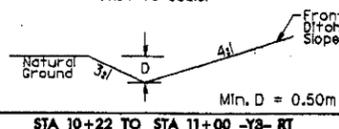
DETAIL F  
SPECIAL CUT DITCH  
(Not to Scale)



DETAIL H  
LATERAL BASE DITCH  
(Not to Scale)



DETAIL D  
SPECIAL CUT DITCH  
(Not to Scale)



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METRIC logo and scale bar (0 to 10). Text: CONST. REV., R/W REV.

PROJECT REFERENCE NO. R-2539C	SHEET NO. 13
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

-Y2-  
PI Sta 12+49.645  
Δ = 73° 09' 59.3" (LT)  
L = 31.925  
T = 18.555  
R = 25.000  
S.E. = D4  
R'OFF = 20.0

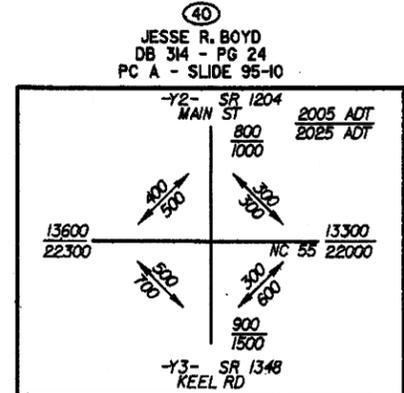
-Y2-  
PI Sta 11+55.525  
Δ = 3° 00' 09.8" (RT)  
L = 87.520  
T = 43.770  
R = 1670.000  
S.E. = N C

(50)  
J. ALFRED MAYO, JR., et ux  
DB 308 - PG 21

HALLETT W. MAYO  
DB 264 - PG 520

MATCHLINE -L- STA 185+40.000  
SEE SHEET NO. 12

MATCHLINE -L- STA 189+00.000  
SEE SHEET NO. 14



- NOTES:
- DRIVES IN SHOULDER SECTION, RADIUS = 1.5m @ E.O.P. (UNLESS OTHERWISE NOTED ON PLANS).
  - OFFSET FROM RW TO 200x450 CURB = 0.0m (TYP.).
  - OFFSET FROM E.O.P. TO 200x450 CURB = 1.8m (TYP.).
  - DO NOT DISTURB UNDERGROUND STORAGE TANK ON PARCEL 47.

-L-  
PIs Sta 185+41.421  
Os = 5° 40' 54.6" (RT)  
Ls = 119.000  
LT = 79.374  
ST = 39.704

PI Sta 186+58.383  
Δ = 14° 41' 20.7" (RT)  
L = 153.824  
T = 77.336  
R = 600.000  
S.E. = D7

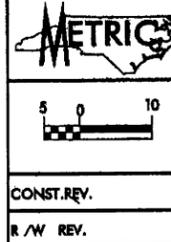
PIs Sta 187+74.574  
Os = 5° 40' 54.6" (RT)  
Ls = 119.000  
LT = 79.374  
ST = 39.704

-Y3- POT 11+05.000  
END CONSTRUCTION  
BY3-49 POT 6+33.51  
11+6.446  
5.524 RT

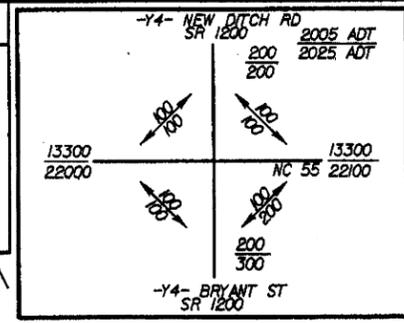
SEE SHEET NO. 33 FOR -L- PROFILE  
SEE SHEET NO. 41 FOR -Y2- PROFILE  
SEE SHEET NO. 41 FOR -Y3- PROFILE  
SEE SHEET NO. 2-H FOR -Y2- & -Y3- INTERSECTION DETAILS.

REVISIONS

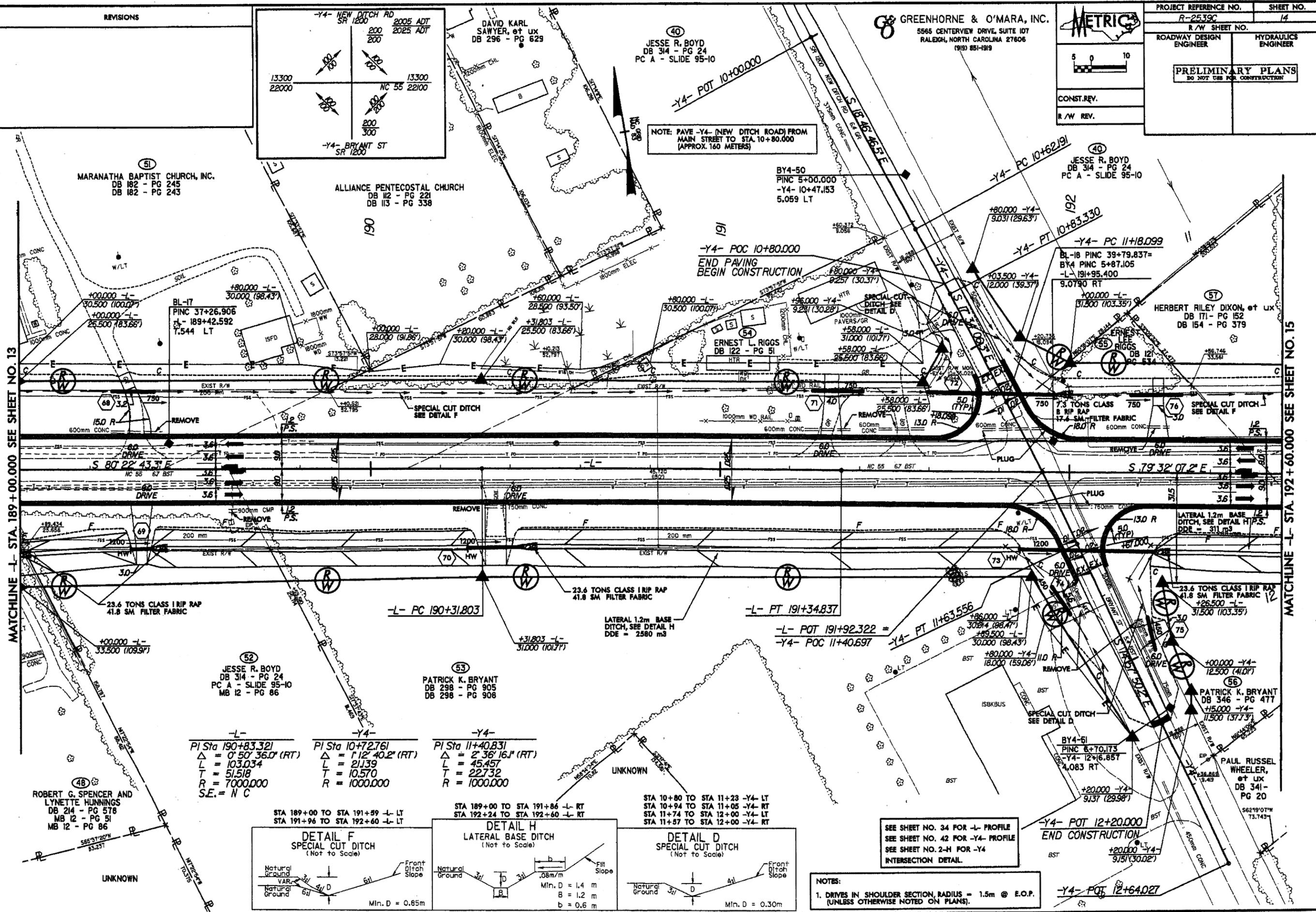
PROJECT REFERENCE NO. R-2539C		SHEET NO. 14	
R/W SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION			
CONST. REV.		R/W REV.	



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NOTE: PAVE -Y4- (NEW DITCH ROAD) FROM MAIN STREET TO STA. 10+80.000 (APPROX. 160 METERS)



MATCHLINE -L- STA. 189+00.000 SEE SHEET NO. 13

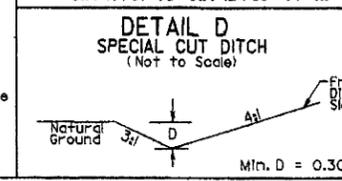
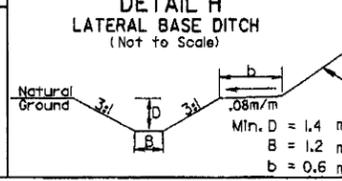
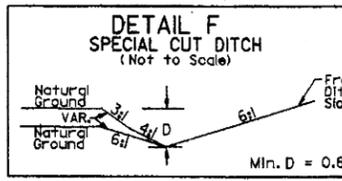
MATCHLINE -L- STA. 192+60.000 SEE SHEET NO. 15

-L-	-Y4-	-Y4-
PI Sta 190+83.321	PI Sta 10+72.761	PI Sta 11+40.831
$\Delta = 0^\circ 50' 36.0"$ (RT)	$\Delta = 1^\circ 12' 40.2"$ (RT)	$\Delta = 2^\circ 36' 16.1"$ (RT)
L = 103.034	L = 21.139	L = 45.457
T = 51.518	T = 10.570	T = 22.732
R = 7000.000	R = 1000.000	R = 1000.000
S.E. = N C		

STA 189+00 TO STA 191+59 -L- LT  
STA 191+96 TO STA 192+60 -L- LT

STA 189+00 TO STA 191+86 -L- RT  
STA 192+24 TO STA 192+60 -L- RT

STA 10+80 TO STA 11+23 -Y4- LT  
STA 10+94 TO STA 11+05 -Y4- RT  
STA 11+74 TO STA 12+00 -Y4- LT  
STA 11+57 TO STA 12+00 -Y4- RT



SEE SHEET NO. 34 FOR -L- PROFILE  
SEE SHEET NO. 42 FOR -Y4- PROFILE  
SEE SHEET NO. 2-H FOR -Y4- INTERSECTION DETAIL.

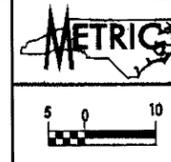
NOTES:  
1. DRIVES IN SHOULDER SECTION, RADIUS = 1.5m @ E.O.P. (UNLESS OTHERWISE NOTED ON PLANS).

REVISIONS

-Y5-  
 PI Sta 10+94.810  
 $\Delta = 7' 58'' 16.7''$  (LT)  
 $L = 62.607$   
 $T = 31.354$   
 $R = 450.000$

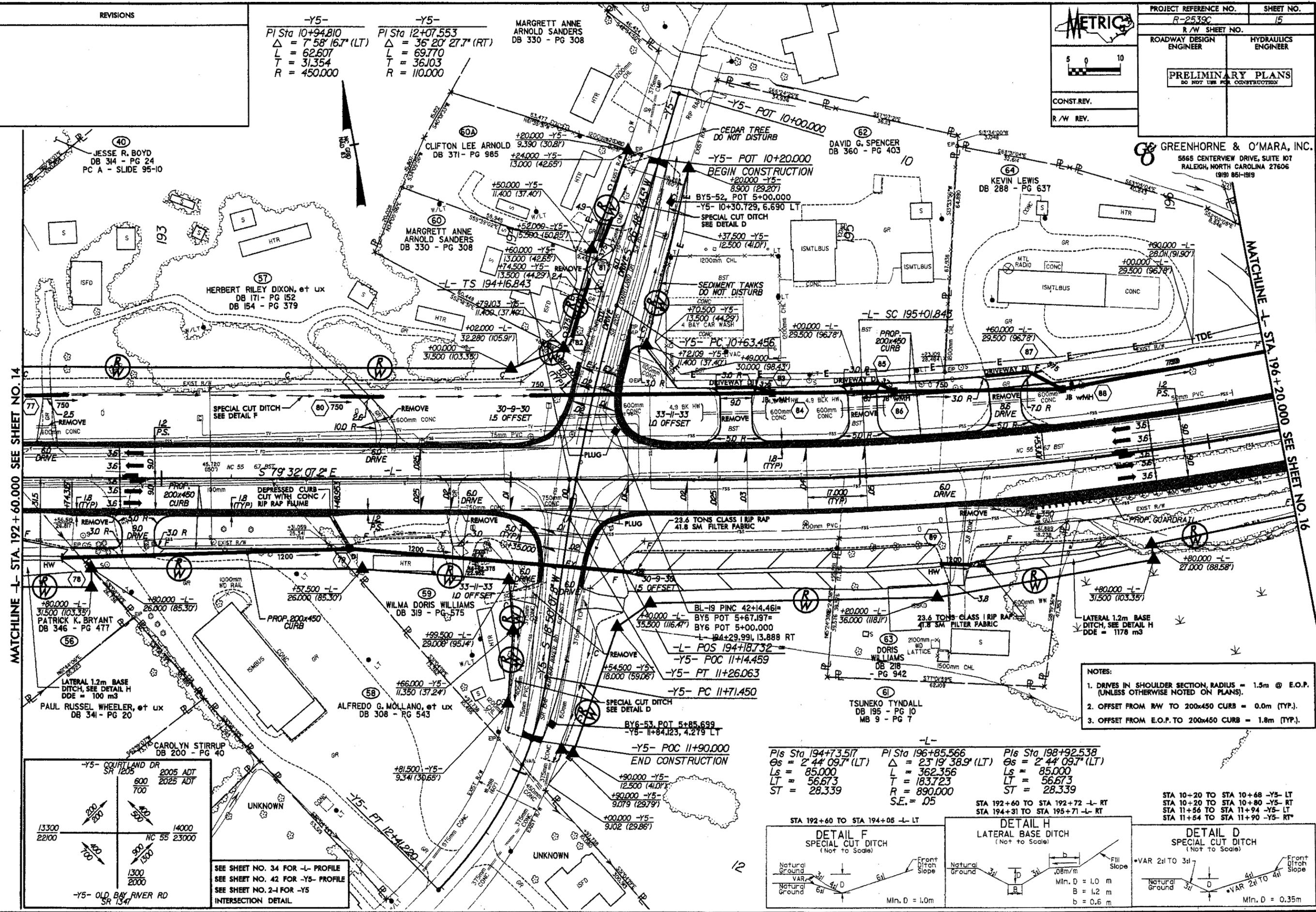
-Y5-  
 PI Sta 12+07.553  
 $\Delta = 36' 20'' 27.7''$  (RT)  
 $L = 69.770$   
 $T = 36.103$   
 $R = 110.000$

MARGRETT ANNE  
 ARNOLD SANDERS  
 DB 330 - PG 308



PROJECT REFERENCE NO. R-2539C	SHEET NO. 15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
CONST. REV.	
R/W REV.	

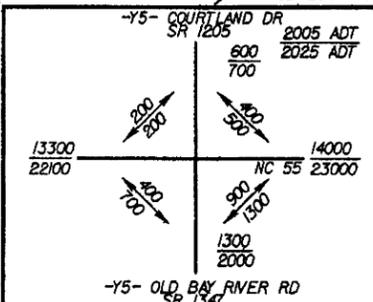
**GREENHORNE & O'MARA, INC.**  
 5865 CENTERVIEW DRIVE, SUITE 107  
 RALEIGH, NORTH CAROLINA 27606  
 (919) 851-1919



MATCHLINE -L- STA. 192 + 60.000 SEE SHEET NO. 14

MATCHLINE -L- STA. 196 + 20.000 SEE SHEET NO. 16

- NOTES:
1. DRIVES IN SHOULDER SECTION, RADIUS = 1.5m @ E.O.P. (UNLESS OTHERWISE NOTED ON PLANS).
  2. OFFSET FROM RW TO 200x450 CURB = 0.0m (TYP.).
  3. OFFSET FROM E.O.P. TO 200x450 CURB = 1.8m (TYP.).

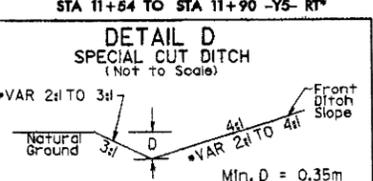
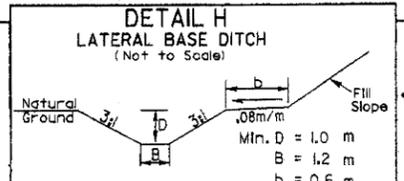
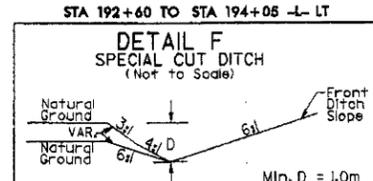


SEE SHEET NO. 34 FOR -L- PROFILE  
 SEE SHEET NO. 42 FOR -Y5- PROFILE  
 SEE SHEET NO. 24 FOR -Y5 INTERSECTION DETAIL

PIs Sta 194+73.517  
 $\Theta_s = 2' 44'' 09.7''$  (LT)  
 $L_s = 85.000$   
 $LT = 56.673$   
 $ST = 28.339$

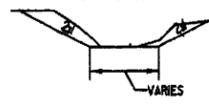
PI Sta 196+85.566  
 $\Theta_s = 23' 19'' 38.9''$  (LT)  
 $L = 362.356$   
 $LT = 183.723$   
 $R = 890.000$   
 $S.E. = .05$

PIs Sta 198+92.538  
 $\Theta_s = 2' 44'' 09.7''$  (LT)  
 $L_s = 85.000$   
 $LT = 56.673$   
 $ST = 28.339$



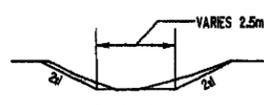
REVISIONS

CULVERT INLET TYPICAL  
STA. 196+60.65 -L- LT.  
NOT TO SCALE



EST. DDE = 165 CU.M.

CULVERT INLET TYPICAL  
STA. 199+76.78 -L- LT.  
NOT TO SCALE

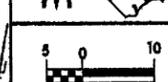


EST. DDE = 35 CU M

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UNKNOWN



CONST. REV.

R/W REV.

PROJECT REFERENCE NO. R-2539C SHEET NO. 16

R/W SHEET NO.

ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER

PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION

JOHN H. HADEN, III, P.E.  
DB 290 - PG 691

WILLIAM MANUEL, III, P.E.  
DB 235 - PG 89

KEVIN LEWIS  
DB 288 - PG 63T

PAMLICO COUNTY  
DB 229 - PG 334

NOTE: SEE CULVERT PLANS FOR SPACING OF GUARDRAIL POSTS.

BL-21  
PINC 46+35.133  
-L- 198+52.051  
1,883 RT

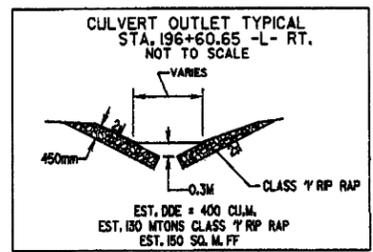
BL-22  
PINC 47+61.127  
-L- 199+77.961  
1,020 RT

BM6  
-BL- STA 44+49.815  
35.950 RT  
ELEV. = 2.735

DAVID W. HARRIS  
DB 246 - PG 30

ROBERT COURTENAY SMARIDGE  
DB 244 - PG 141

TSUNEKO TYNDALL  
DB 195 - PG 10  
MB 9 - PG 7



Sta	PI	Sta	PI	Sta	PI
194+73.57	196+85.566	198+92.538			
$\theta_s = 2' 44' 09.7''$ (LT)	$\Delta = 23' 19' 38.9''$ (LT)	$\theta_s = 2' 44' 09.7''$ (LT)			
$L_s = 85.000$	$L = 362.356$	$L_s = 85.000$			
$LT = 56.673$	$T = 183.723$	$LT = 56.673$			
$ST = 28.339$	$R = 890.000$	$ST = 28.339$			
	$S.E. = .05$				

SEE SHEET NO. 35 FOR -L- PROFILE

UNKNOWN

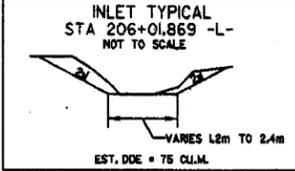
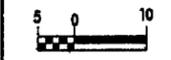


REVISIONS

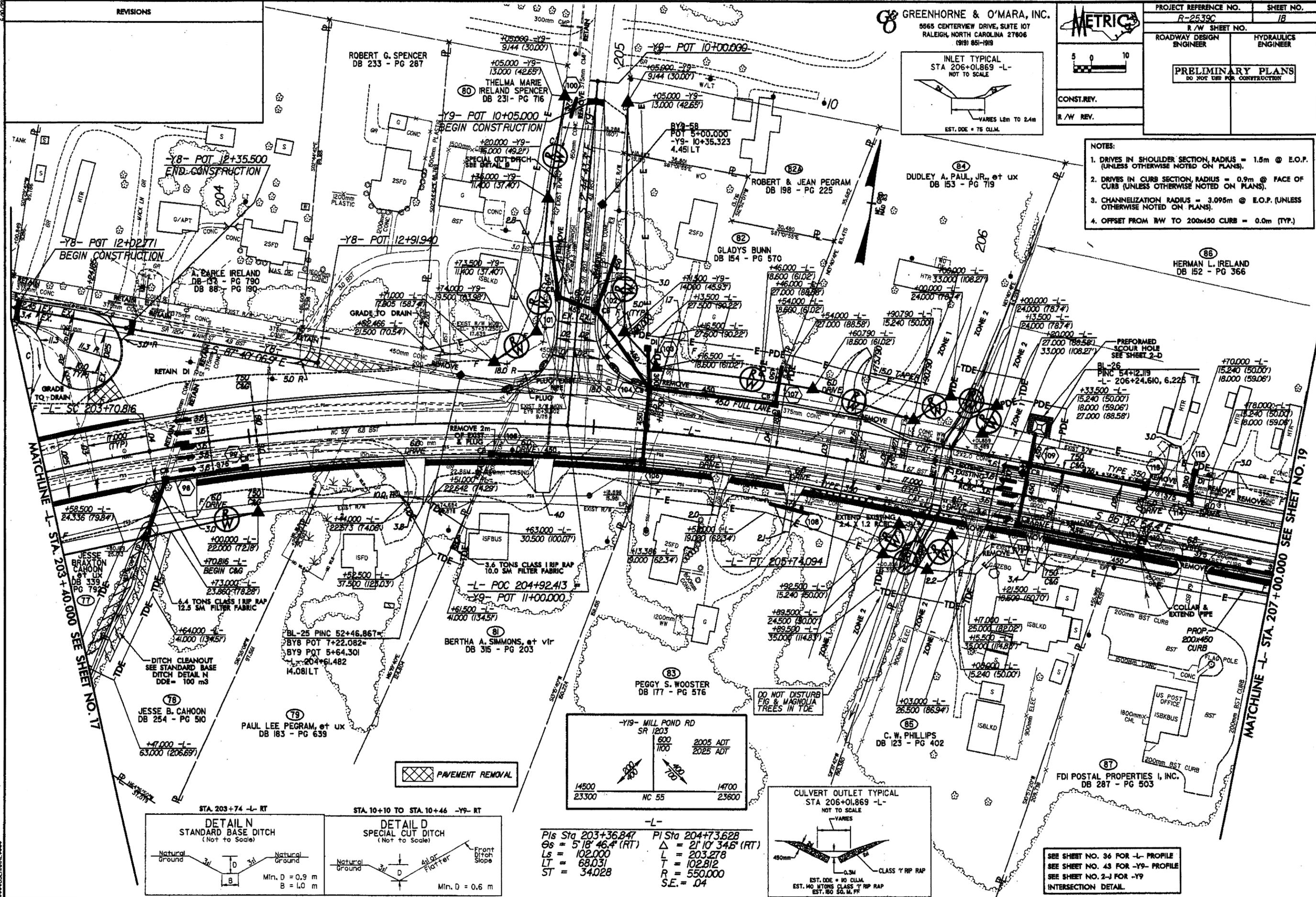
**GREENHORNE & O'MARA, INC.**  
 5565 CENTERVIEW DRIVE, SUITE 107  
 RALEIGH, NORTH CAROLINA 27606  
 (919) 851-1919



PROJECT REFERENCE NO. R-2539C	SHEET NO. 18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
CONST. REV.	
R/W REV.	

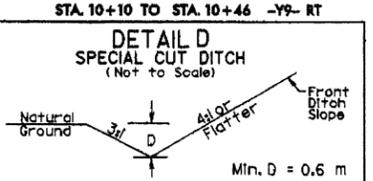
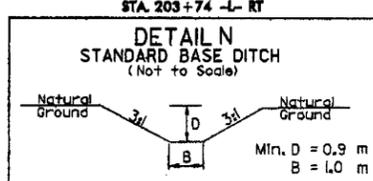


- NOTES:
1. DRIVES IN SHOULDER SECTION, RADIUS = 1.5m @ E.O.P. (UNLESS OTHERWISE NOTED ON PLANS).
  2. DRIVES IN CURB SECTION, RADIUS = 0.9m @ FACE OF CURB (UNLESS OTHERWISE NOTED ON PLANS).
  3. CHANNELIZATION RADIUS = 3.095m @ E.O.P. (UNLESS OTHERWISE NOTED ON PLANS).
  4. OFFSET FROM RW TO 200x450 CURB = 0.0m (TYP.)



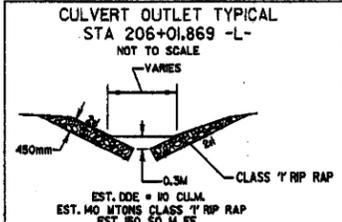
MATCHLINE -L- STA. 203+40.000 SEE SHEET NO. 17

MATCHLINE -L- STA. 207+00.000 SEE SHEET NO. 19



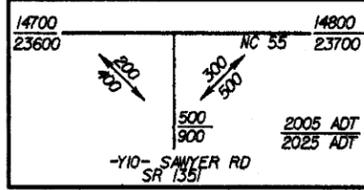
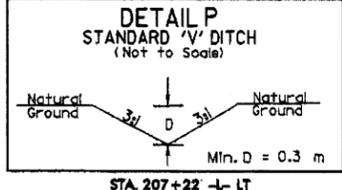
-L-  
 PIs Sta 203+36.847  
 Gs = 5'18" 46.4" (RT)  
 Ls = 102.000  
 LT = 68.031  
 ST = 34.028

PI Sta 204+73.628  
 Δ = 2'10" 34.6" (RT)  
 L = 203.278  
 T = 102.812  
 R = 550.000  
 S.E. = 04



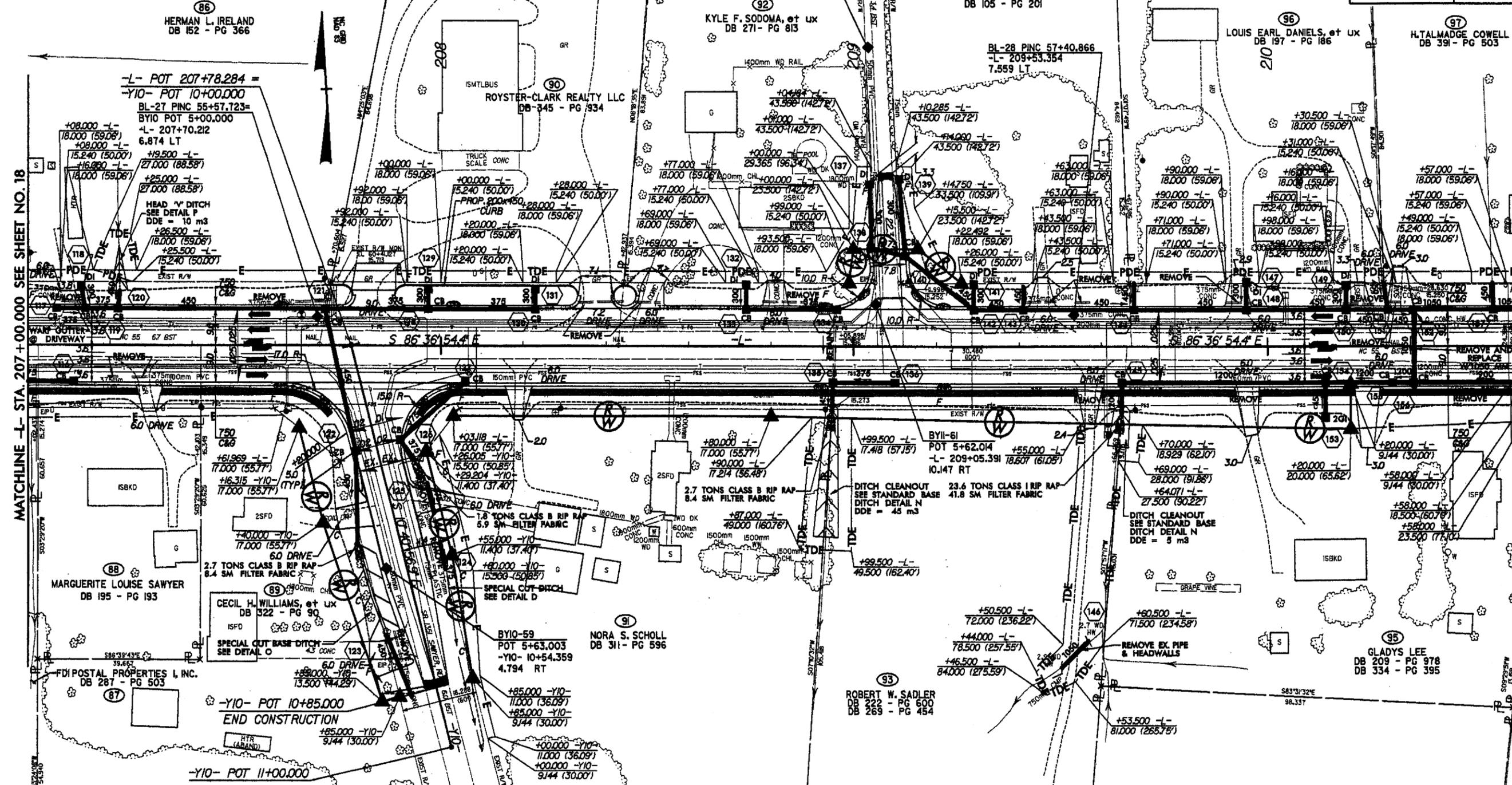
SEE SHEET NO. 36 FOR -L- PROFILE  
 SEE SHEET NO. 43 FOR -Y9- PROFILE  
 SEE SHEET NO. 2-J FOR -Y9 INTERSECTION DETAIL.

REVISIONS



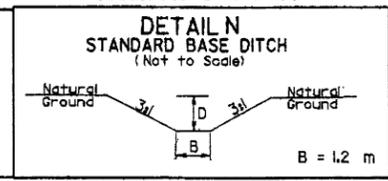
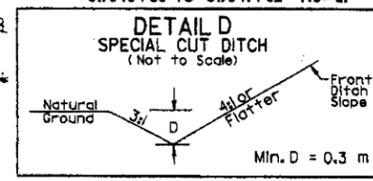
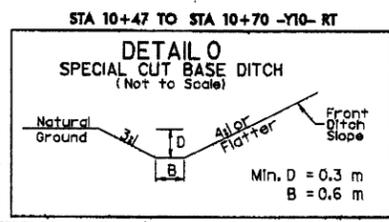
GREENHORNE & O'MARA, INC. 5565 CENTERVIEW DRIVE, SUITE 107 RALEIGH, NORTH CAROLINA 27605 (919) 881-1919

PROJECT REFERENCE NO. R-2539C SHEET NO. 19 ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION



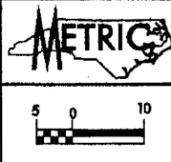
MATCHLINE -L- STA. 207+00.000 SEE SHEET NO. 18

MATCHLINE -L- STA. 210+60.000 SEE SHEET NO. 20

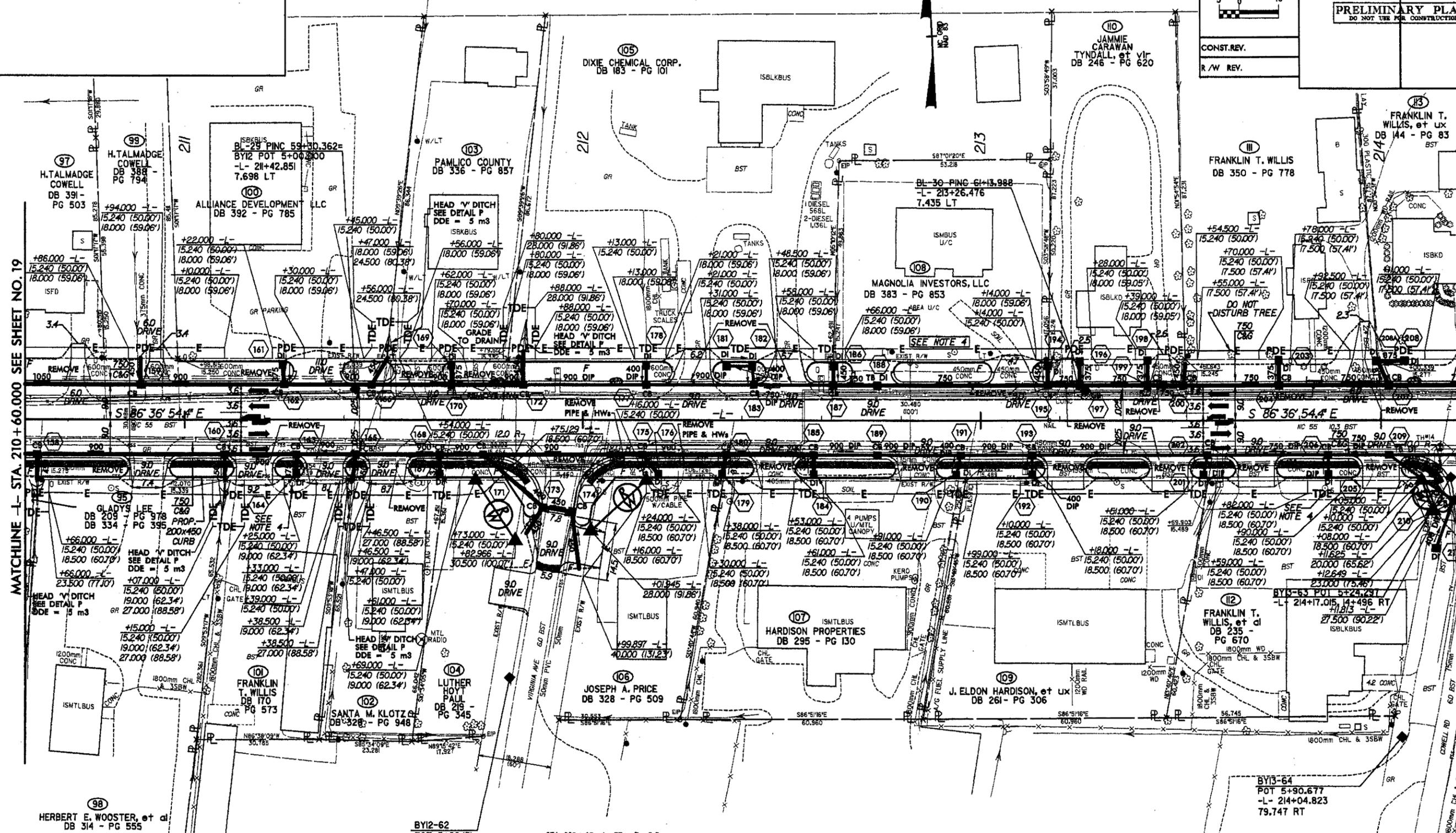


- NOTES: 1. DRIVES IN SHOULDER SECTION, RADIUS = 1.5m @ E.O.P. (UNLESS OTHERWISE NOTED ON PLANS). 2. DRIVES IN CURB SECTION, RADIUS = 0.9m @ FACE OF CURB (UNLESS OTHERWISE NOTED ON PLANS). 3. CHANNELIZATION RADIUS = 3.095m @ E.O.P. (UNLESS OTHERWISE NOTED ON PLANS). 4. OFFSET FROM RW TO 200x450 CURB = 0.0m (TYP.)

SEE SHEET NO. 36 FOR -L- PROFILE SEE SHEET NO. 43 FOR -Y10- PROFILE SEE SHEET NO. 2-J FOR -Y10 INTERSECTION DETAIL



PROJECT REFERENCE NO. R-2539C	SHEET NO. 20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
CONST. REV.	
R/W REV.	



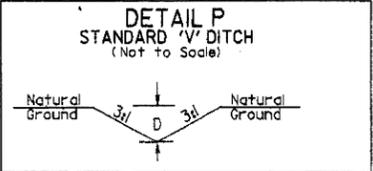
MATCHLINE L- STA. 210 + 60.000 SEE SHEET NO. 19

MATCHLINE L- STA. 214 + 20.000 SEE SHEET NO. 21

98 HERBERT E. WOOSTER, et al  
DB 314 - PG 555

BY12-62  
POT 5+82.151  
-L- 211+81.520  
64.783 RT

STA. 210+63 -L- RT D=0.3m  
 STA. 211+10 -L- RT D=0.6m  
 STA. 211+43 -L- RT D=0.6m  
 STA. 211+51 -L- LT D=0.3m  
 STA. 211+85 -L- LT D=0.6m

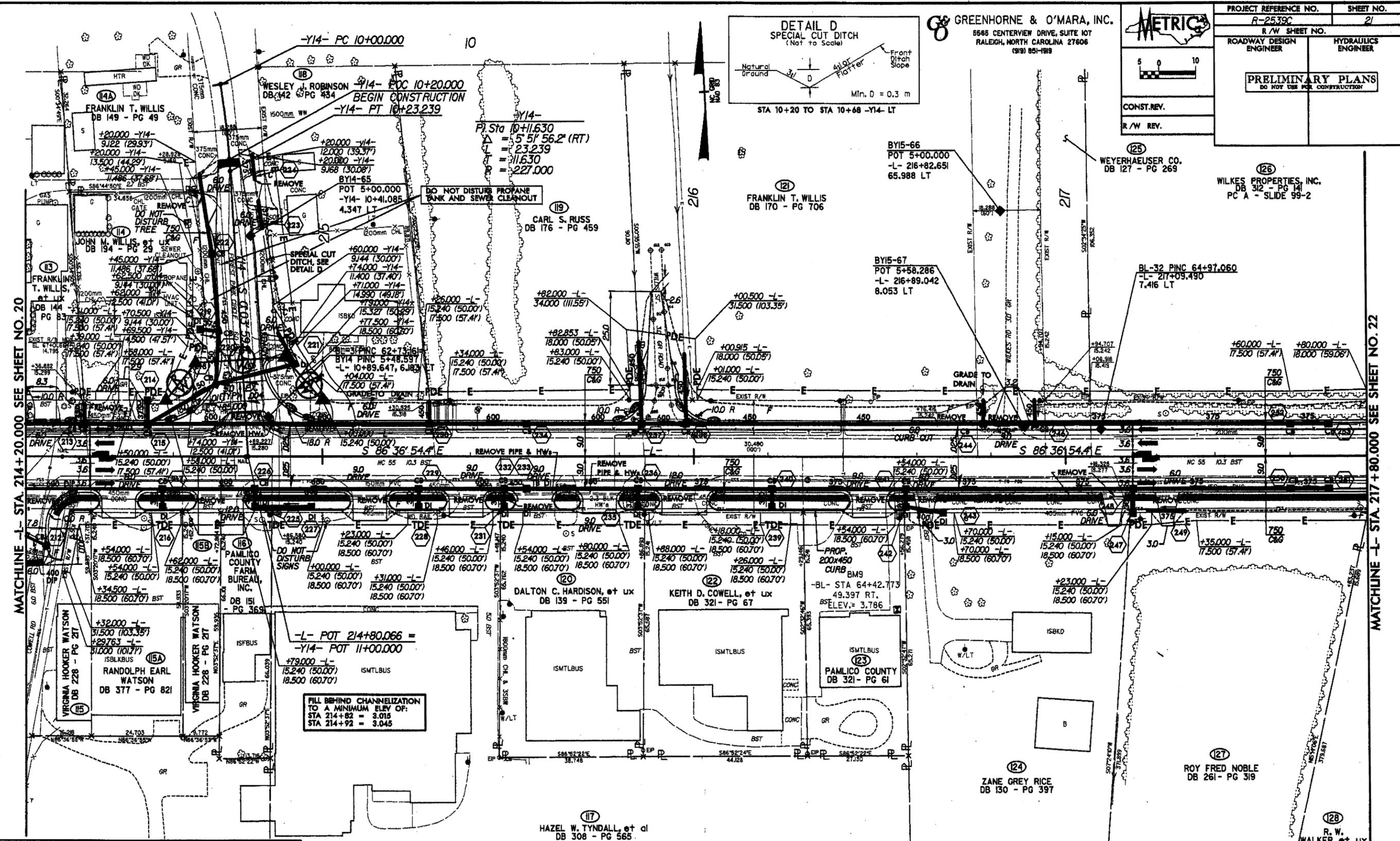
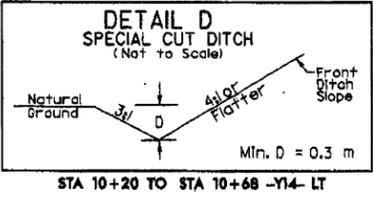
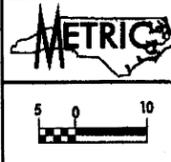


- NOTES:**
1. DRIVES IN CURB SECTION, RADIUS = 0.9m @ FACE OF CURB (UNLESS OTHERWISE NOTED ON PLANS).
  2. CHANNELIZATION RADIUS = 3.095m @ E.O.P. (UNLESS OTHERWISE NOTED ON PLANS).
  3. OFFSET FROM RW TO 200x450 CURB = 0.0m (TYP.)
  4. DO NOT DISTURB SIGN OR ANY AREA LIGHTS.

SEE SHEET NO. 37 FOR -L- PROFILE

PROJECT REFERENCE NO.	SHEET NO.
R-2539C	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b>	
DO NOT USE FOR CONSTRUCTION	
CONST. REV.	
R/W REV.	

**GREENHORNE & O'MARA, INC.**  
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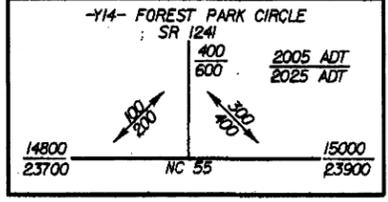


MATCHLINE -L- STA 214+20.000 SEE SHEET NO. 20

MATCHLINE -L- STA 217+80.000 SEE SHEET NO. 22

**REVISIONS**


- NOTES:**
1. DRIVES IN SHOULDER SECTION, RADIUS = 1.5m @ E.O.P. (UNLESS OTHERWISE NOTED ON PLANS).
  2. DRIVES IN CURB SECTION, RADIUS = 0.9m @ FACE OF CURB (UNLESS OTHERWISE NOTED ON PLANS).
  3. CHANNELIZATION RADIUS = 3.095m @ E.O.P. (UNLESS OTHERWISE NOTED ON PLANS).
  4. OFFSET FROM RW TO 200x450 CURB = 0.0m (TYP.)



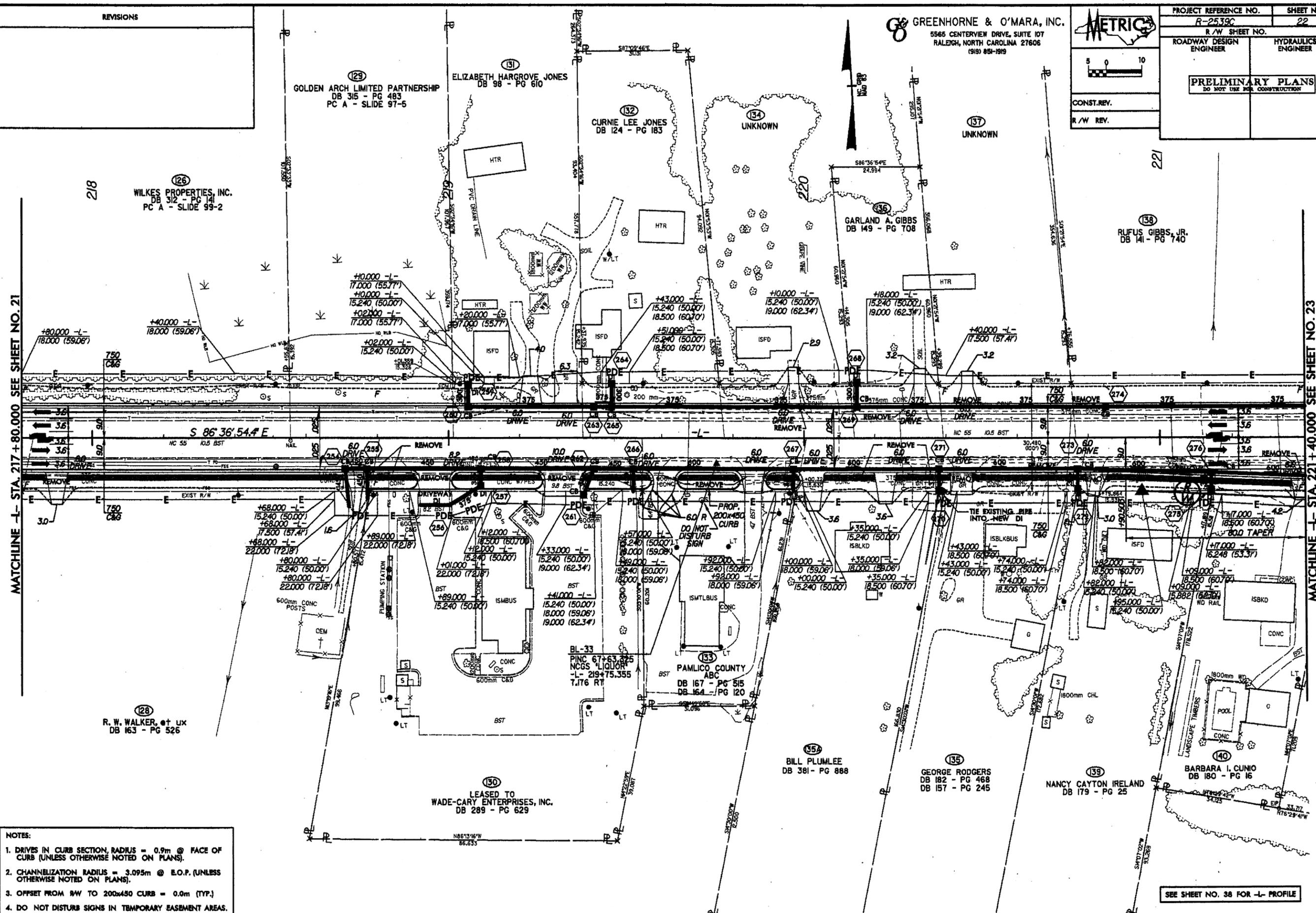
SEE SHEET NO. 37 FOR -L- PROFILE  
 SEE SHEET NO. 43 FOR -Y14- PROFILE  
 SEE SHEET NO. 2-K FOR -Y14 INTERSECTION DETAIL.

REVISIONS

GREENHORNE & O'MARA, INC.  
5565 CENTERVIEW DRIVE, SUITE 107  
RALEIGH, NORTH CAROLINA 27606  
(919) 851-1919



PROJECT REFERENCE NO. R-2539C	SHEET NO. 22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
CONST. REV.	
R/W REV.	



MATCHLINE -L- STA. 217 + 80.000 SEE SHEET NO. 21

MATCHLINE -L- STA. 221 + 40.000 SEE SHEET NO. 23

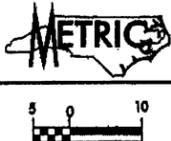
- NOTES:
1. DRIVES IN CURB SECTION RADIUS = 0.9m @ FACE OF CURB (UNLESS OTHERWISE NOTED ON PLANS).
  2. CHANNELIZATION RADIUS = 3.095m @ E.O.P. (UNLESS OTHERWISE NOTED ON PLANS).
  3. OFFSET FROM R/W TO 200x450 CURB = 0.0m (TYP.)
  4. DO NOT DISTURB SIGNS IN TEMPORARY EASEMENT AREAS.

SEE SHEET NO. 38 FOR -L- PROFILE

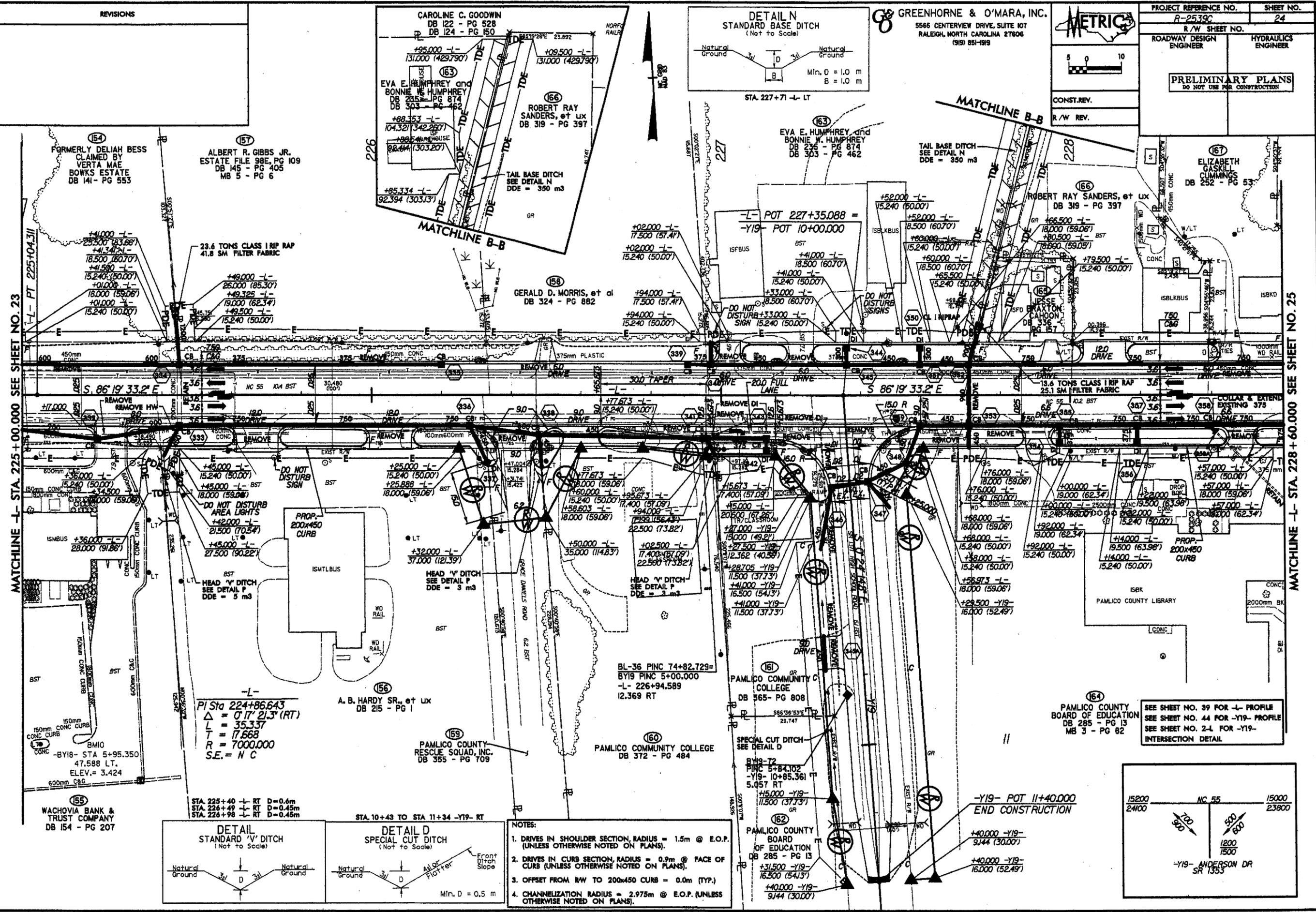
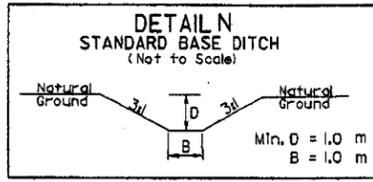


REVISIONS

GREENHORNE & O'MARA, INC.  
5565 CENTERVIEW DRIVE, SUITE 107  
RALEIGH, NORTH CAROLINA 27606  
(919) 851-1919

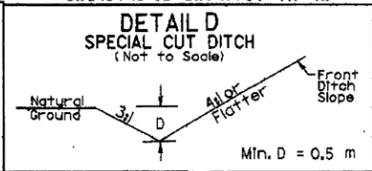
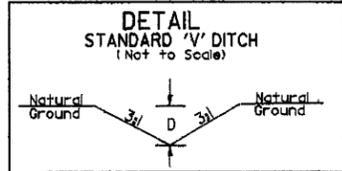


PROJECT REFERENCE NO. R-2539C	SHEET NO. 24
R/W SHEET NO.	ROADWAY DESIGN ENGINEER
	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



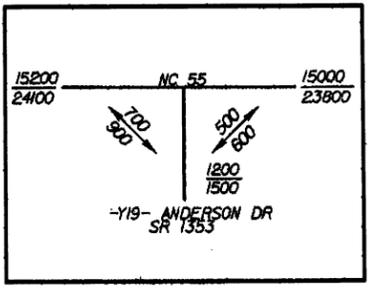
MATCHLINE -L- STA. 225+00.000 SEE SHEET NO. 23

MATCHLINE -L- STA. 228+60.000 SEE SHEET NO. 25



- NOTES:
1. DRIVES IN SHOULDER SECTION, RADIUS = 1.5m @ E.O.P. (UNLESS OTHERWISE NOTED ON PLANS).
  2. DRIVES IN CURB SECTION, RADIUS = 0.9m @ FACE OF CURB (UNLESS OTHERWISE NOTED ON PLANS).
  3. OFFSET FROM RW TO 200x450 CURB = 0.0m (TYP.).
  4. CHANNELIZATION RADIUS = 2.975m @ E.O.P. (UNLESS OTHERWISE NOTED ON PLANS).

SEE SHEET NO. 39 FOR -L- PROFILE  
SEE SHEET NO. 44 FOR -Y19- PROFILE  
SEE SHEET NO. 2-L FOR -Y19- INTERSECTION DETAIL



PI Sta 224+86.643  
Δ = 0' 17" 21.3' (RT)  
L = 35.337  
T = 17.668  
R = 7000.000  
S.E. = N C

WACHOVIA BANK & TRUST COMPANY  
DB 154 - PG 207

STA. 225+40 -L- RT D=0.6m  
STA. 226+49 -L- RT D=0.45m  
STA. 226+98 -L- RT D=0.45m

STA. 10+43 TO STA 11+34 -Y19- RT

A. B. HARDY SR., et ux  
DB 215 - PG 1

PAMLICO COUNTY RESCUE SQUAD, INC.  
DB 355 - PG 709

PAMLICO COUNTY COLLEGE  
DB 372 - PG 484

BL-36 PINC 74+82.729=  
BY19 PINC 5+00.000  
-L- 226+94.589  
12.369 RT

PAMLICO COMMUNITY COLLEGE  
DB 365 - PG 808

SPECIAL CUT DITCH  
SEE DETAIL D

PAMLICO COUNTY BOARD OF EDUCATION  
DB 285 - PG 13

PAMLICO COUNTY BOARD OF EDUCATION  
DB 285 - PG 13  
MB 3 - PG 82

-Y19- POT 11+40.000  
END CONSTRUCTION

+40.000 -Y19-  
9.444 (30.00')

+40.000 -Y19-  
16.000 (52.49')

+40.000 -Y19-  
9.444 (30.00')

15200  
24100

NC 55

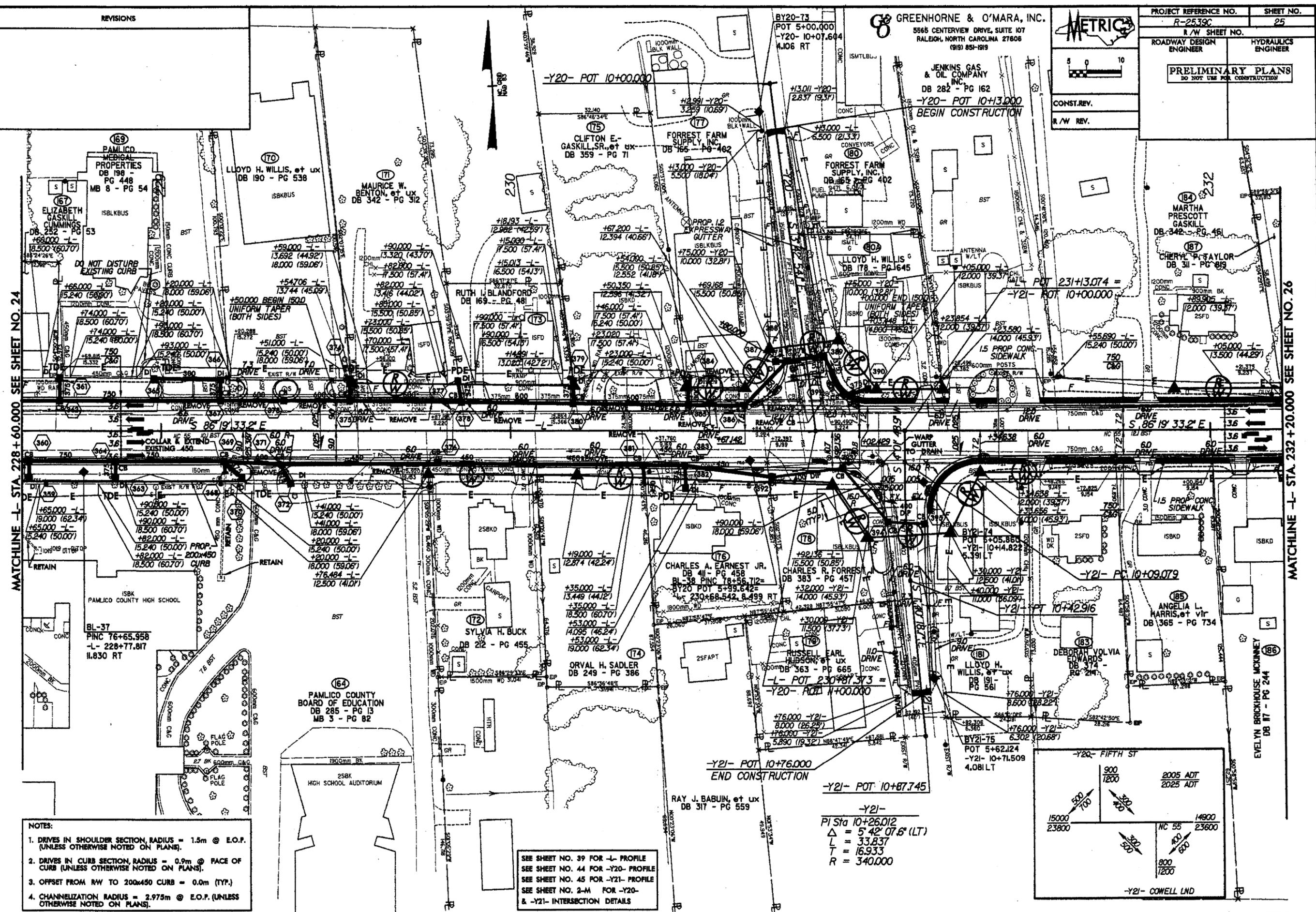
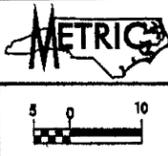
15000  
23800

1200  
1500

-Y19- ANDERSON DR  
SR 1353

REVISIONS

PROJECT REFERENCE NO. R-2539C	SHEET NO. 25
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
CONST. REV.	
R/W REV.	



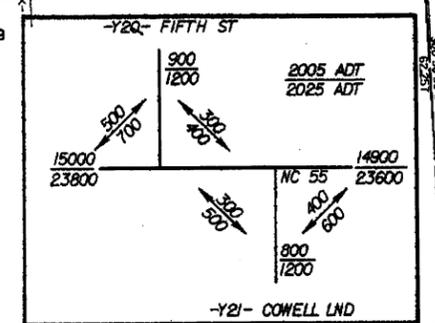
MATCHLINE -L- STA. 228 + 60.000 SEE SHEET NO. 24

MATCHLINE -L- STA. 232 + 20.000 SEE SHEET NO. 26

- NOTES:
1. DRIVES IN SHOULDER SECTION, RADIUS = 1.5m @ E.O.P. (UNLESS OTHERWISE NOTED ON PLANS).
  2. DRIVES IN CURB SECTION, RADIUS = 0.9m @ FACE OF CURB (UNLESS OTHERWISE NOTED ON PLANS).
  3. OFFSET FROM R/W TO 200x450 CURB = 0.0m (TYP.)
  4. CHANNELIZATION RADIUS = 2.975m @ E.O.P. (UNLESS OTHERWISE NOTED ON PLANS).

SEE SHEET NO. 39 FOR -L- PROFILE  
 SEE SHEET NO. 44 FOR -Y20- PROFILE  
 SEE SHEET NO. 45 FOR -Y21- PROFILE  
 SEE SHEET NO. 2-M FOR -Y20- & -Y21- INTERSECTION DETAILS

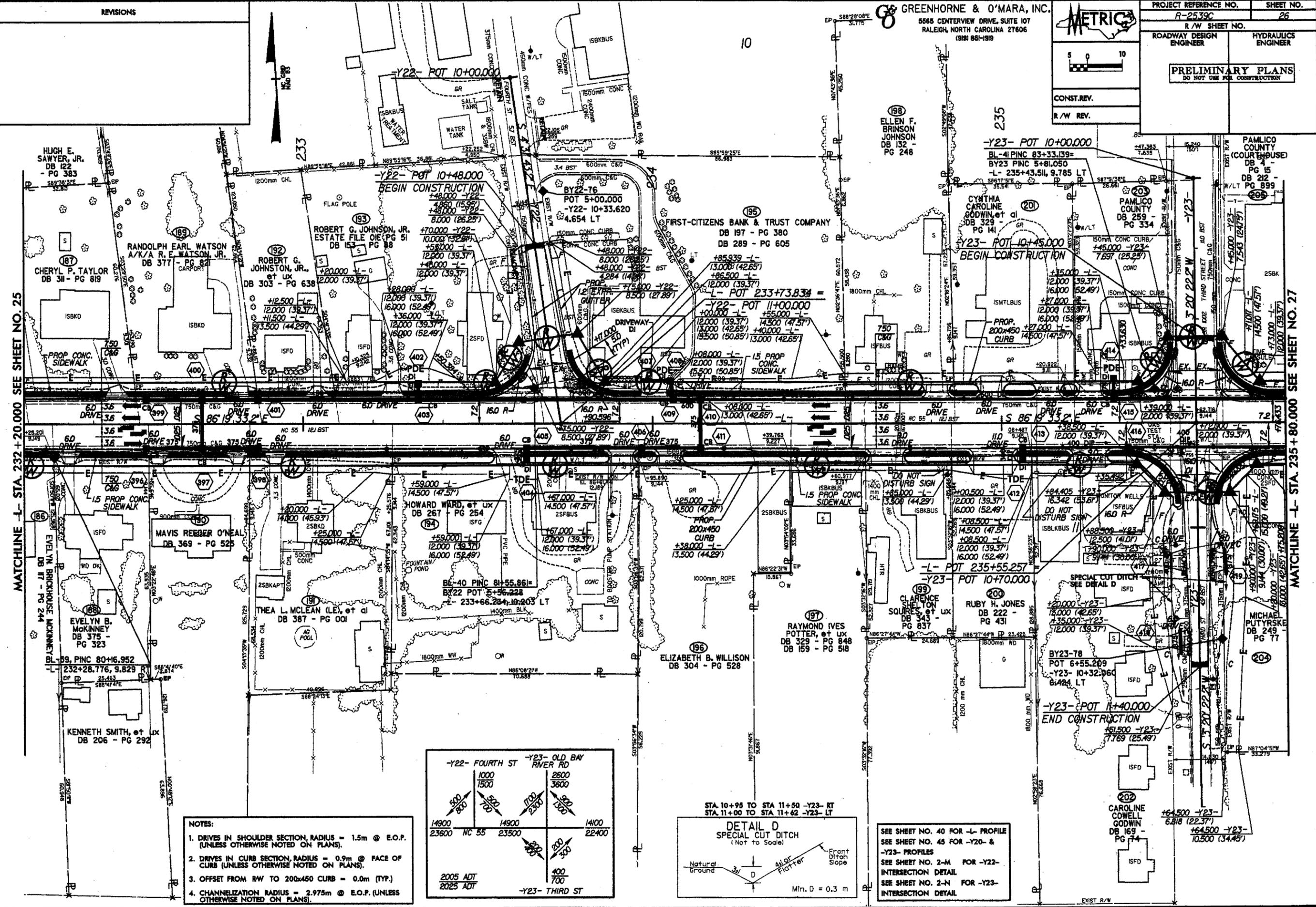
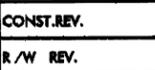
-Y21-  
 PI Sta 10+26.012  
 $\Delta = 5^{\circ} 42' 07.6''$  (LT)  
 $L = 33.837$   
 $T = 16.933$   
 $R = 340.000$



REVISIONS

GREENHORNE & O'MARA, INC.  
5565 CENTERVIEW DRIVE, SUITE 107  
RALEIGH, NORTH CAROLINA 27606  
(919) 851-1919

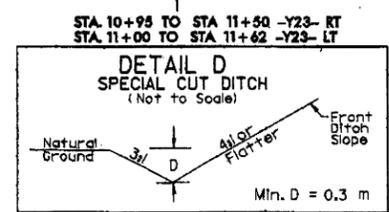
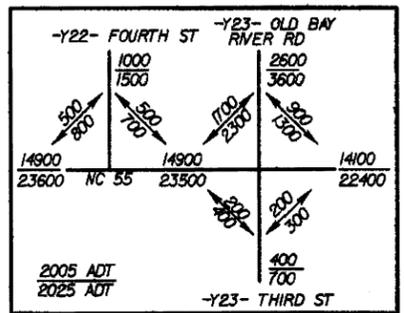
PROJECT REFERENCE NO.	R-2539C	SHEET NO.	26
R/W SHEET NO.			
ROADWAY DESIGN ENGINEER			
HYDRAULICS ENGINEER			
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION			



MATCHLINE -L- STA. 232+20.000 SEE SHEET NO. 25

MATCHLINE -L- STA. 235+80.000 SEE SHEET NO. 27

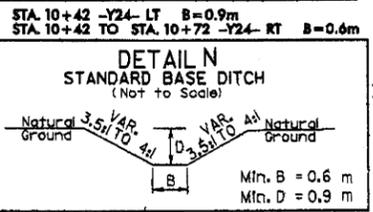
- NOTES:**
1. DRIVES IN SHOULDER SECTION, RADIUS = 1.5m @ E.O.P. (UNLESS OTHERWISE NOTED ON PLANS).
  2. DRIVES IN CURB SECTION, RADIUS = 0.9m @ FACE OF CURB (UNLESS OTHERWISE NOTED ON PLANS).
  3. OFFSET FROM RW TO 200x450 CURB = 0.0m (TYP.)
  4. CHANNELIZATION RADIUS = 2.975m @ E.O.P. (UNLESS OTHERWISE NOTED ON PLANS).



SEE SHEET NO. 40 FOR -L- PROFILE  
SEE SHEET NO. 45 FOR -Y20- & -Y23- PROFILES  
SEE SHEET NO. 2-M FOR -Y22- INTERSECTION DETAIL  
SEE SHEET NO. 2-N FOR -Y23- INTERSECTION DETAIL

EXIST. R/W

REVISIONS

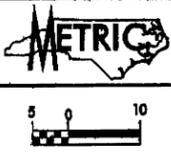


MATCHLINE -L- STA. 235+80.000 SEE SHEET NO. 26

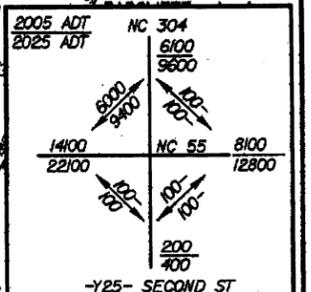
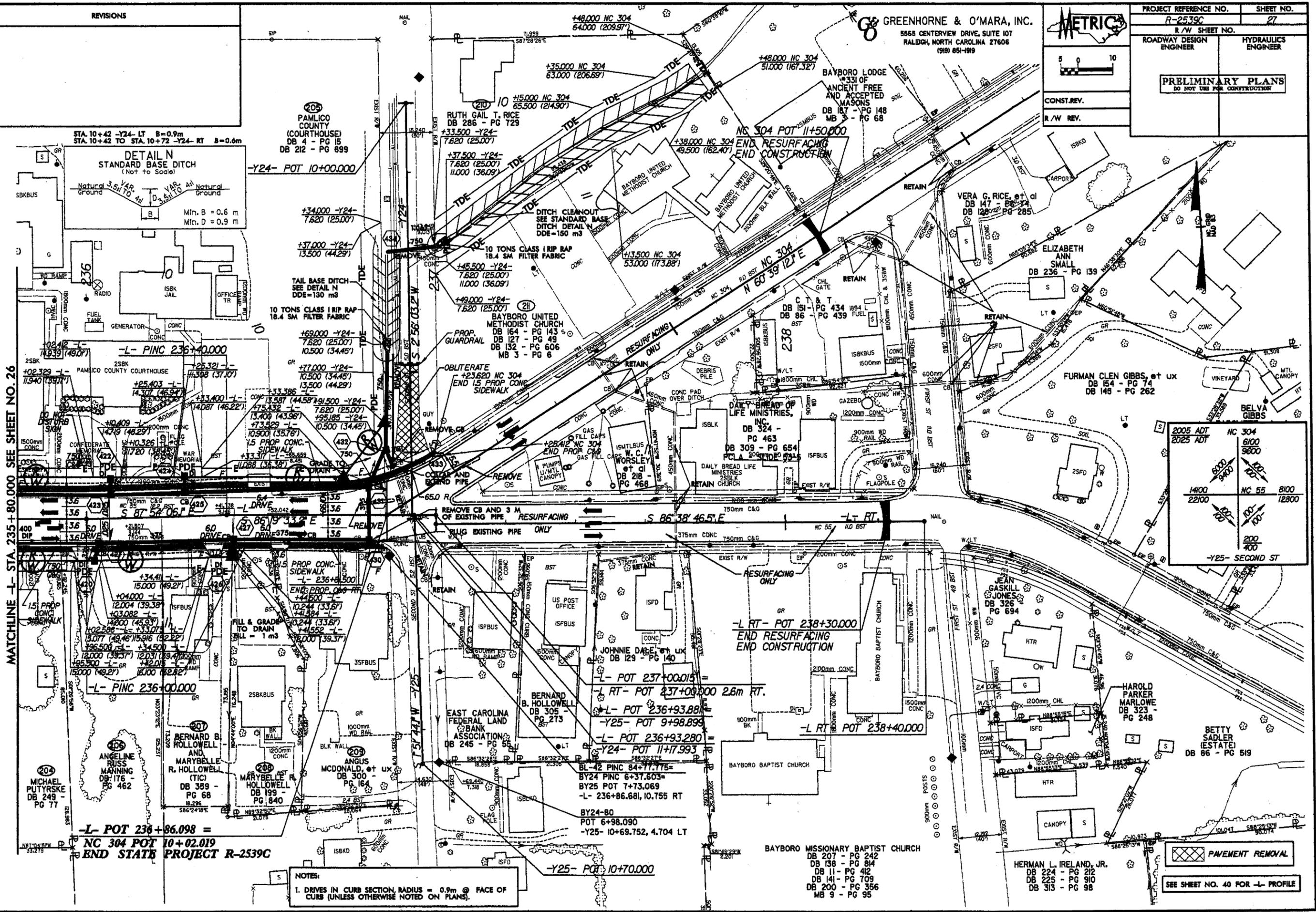
-L- POT 236+86.098 = NC 304 POT 10+02.019 END STATE PROJECT R-2539C

NOTES: 1. DRIVES IN CURB SECTION, RADIUS = 0.9m @ FACE OF CURB (UNLESS OTHERWISE NOTED ON PLANS).

GREENHORNE & O'MARA, INC. 5565 CENTVIEW DRIVE, SUITE 107 RALPH, NORTH CAROLINA 27605 (919) 851-1919



PROJECT REFERENCE NO.	R-2539C	SHEET NO.	27
R/W SHEET NO.			
ROADWAY DESIGN ENGINEER			
HYDRAULICS ENGINEER			
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
CONST. REV.			
R/W REV.			



PAVEMENT REMOVAL SEE SHEET NO. 40 FOR -L- PROFILE



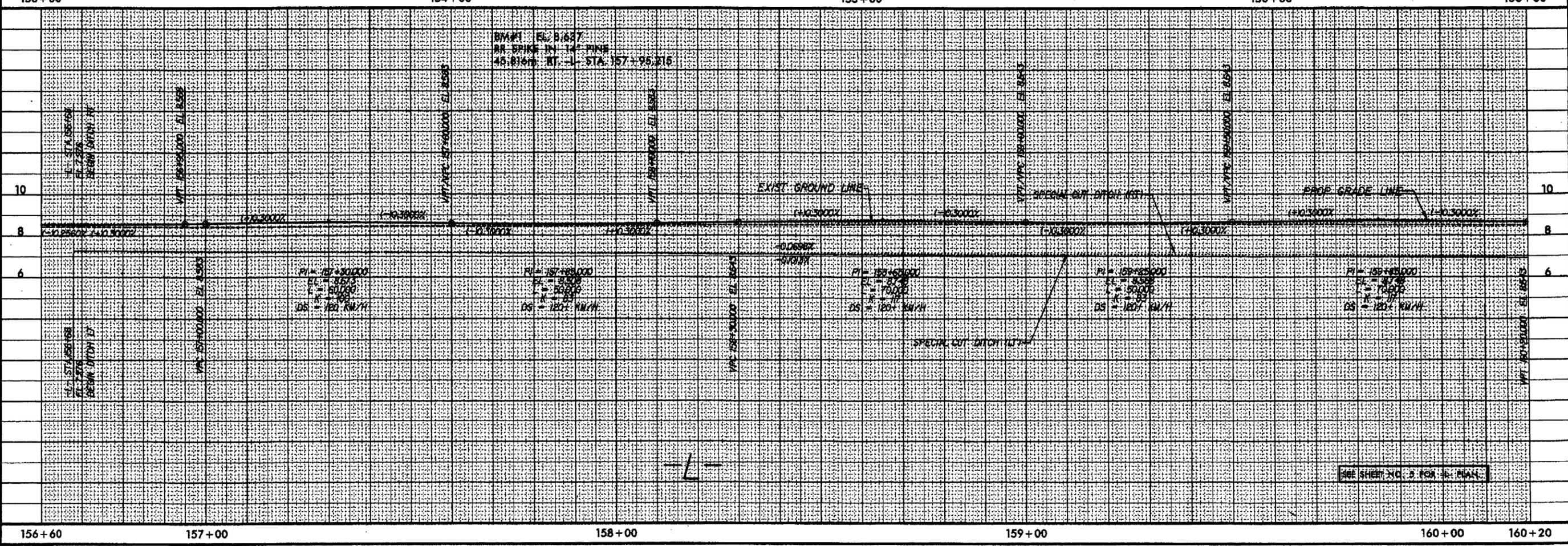
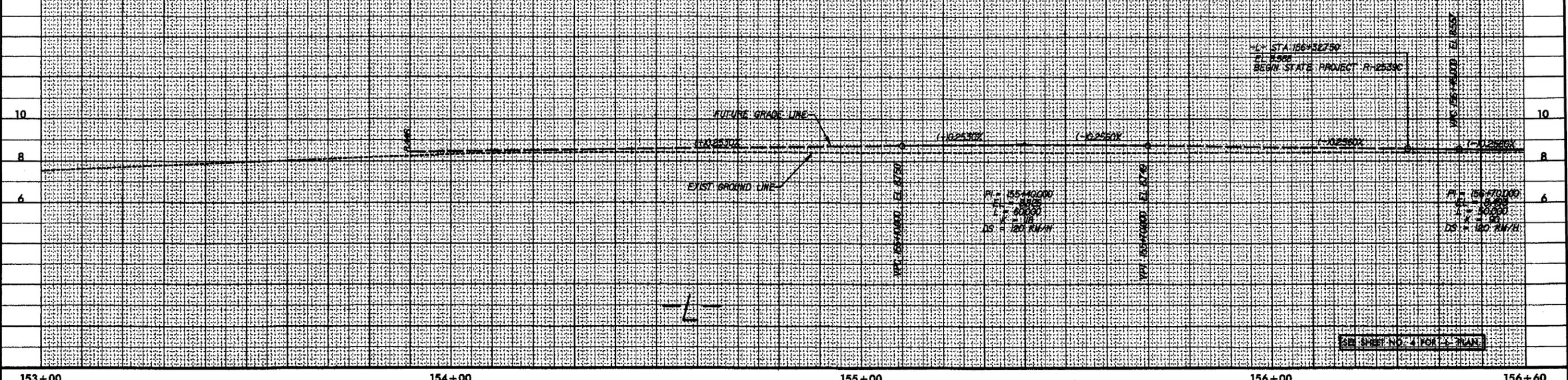
8/10/14

BENCHMARK EL. 8.687  
RR SPIKE IN 14" PIPE  
45.816m RT. L. STA. 157+95.216

GREENHORNE & O'MARA, INC.  
1988 CENTERVIEW DRIVE, SUITE 107  
RALEIGH, NORTH CAROLINA 27606  
919.491.1910



PROJECT REFERENCE NO. R-2539C	SHEET NO. 29
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
CONST. REV.	
R/W REV.	



11/18/2014 10:00:00 AM

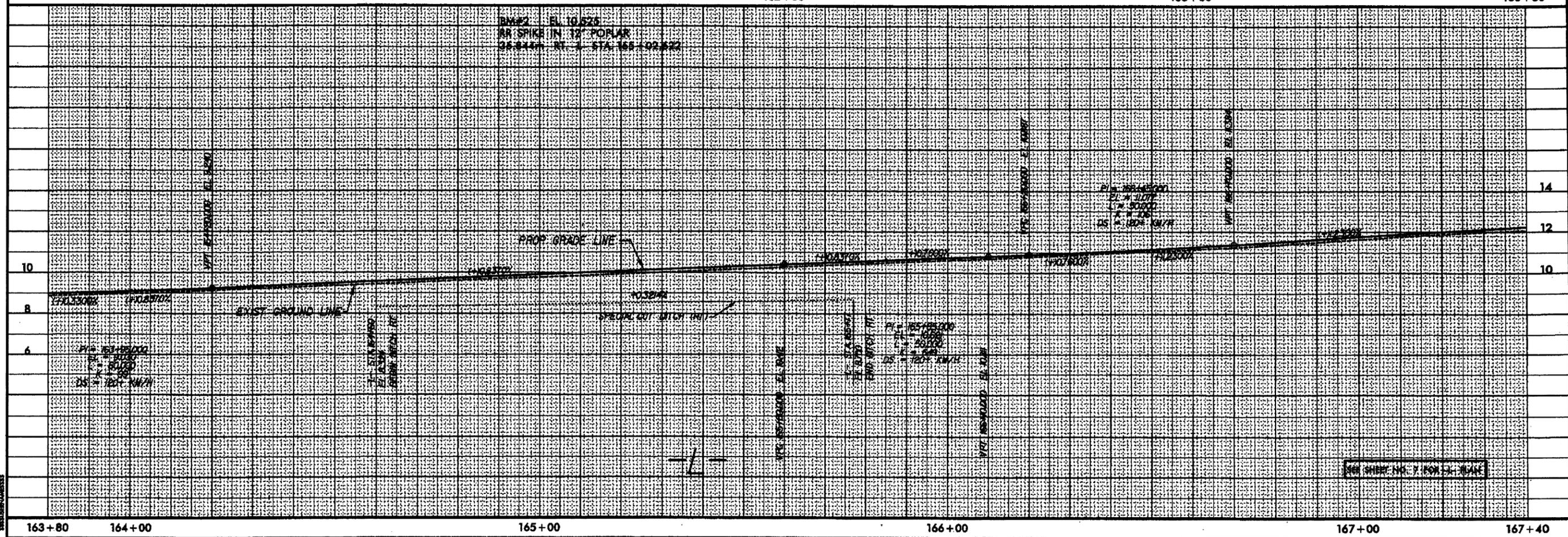
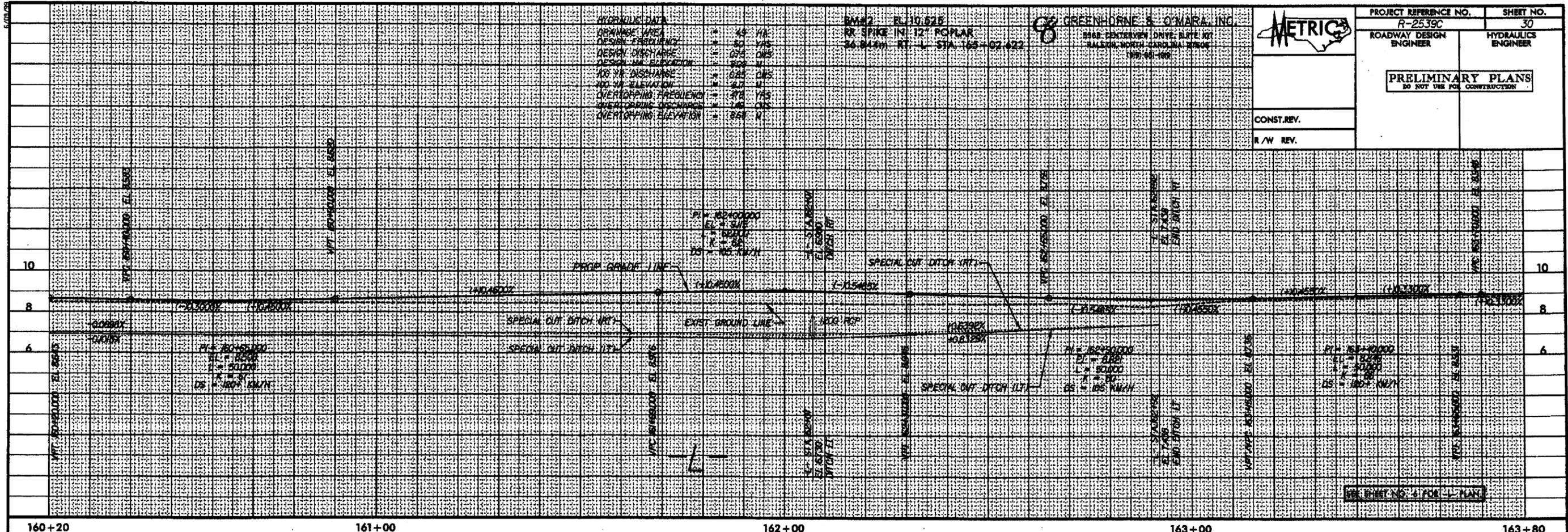
HYDRAULIC DATA  
 CHANNEL AREA = 45 SQ FT  
 DESIGN FREQUENCY = 50 YRS  
 DESIGN DISCHARGE = 674 CFS  
 DESIGN WAVE ELEVATION = 860 FT  
 100 YR DISCHARGE = 825 CFS  
 100 YR ELEVATION = 877 FT  
 OVERTOPPING FREQUENCY = 275 YRS  
 OVERTOPPING DISCHARGE = 740 CFS  
 OVERTOPPING ELEVATION = 868 FT

BMP#2 EL 10.625  
 RR SPIKE IN 12" POPLAR  
 26.844H RT. L. STA. 163+02.622

GREENHORNE & O'MARA, INC.  
 3908 ESTABLISH DRIVE, SUITE 107  
 RALEIGH, NORTH CAROLINA 27607  
 919.487.1100



PROJECT REFERENCE NO. R-2539C	SHEET NO. 30
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
CONST. REV.	
R/W REV.	

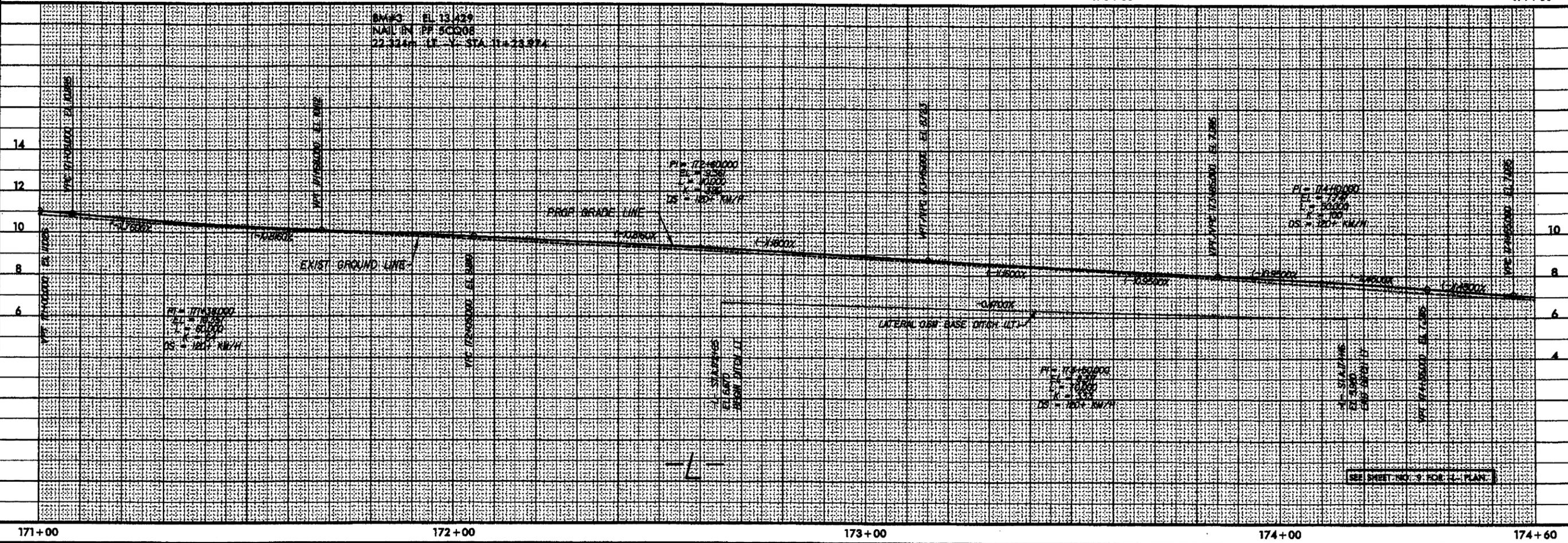
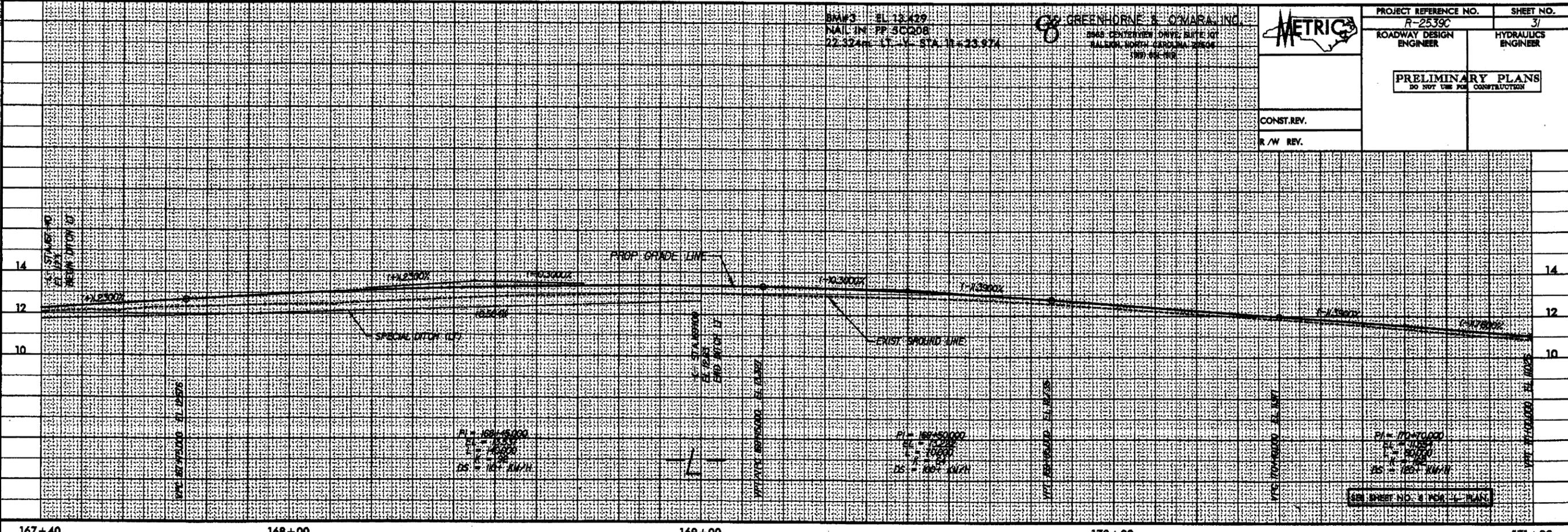


B.M. 3 EL. 13.429  
NAIL IN: PP 50008  
27.324m LT V STA 11+23.974

GREENHORNE & O'NEAL, INC.  
2048 CENTERVIEW DRIVE, SUITE 101  
RALEIGH, NORTH CAROLINA 27604  
(919) 488-1100

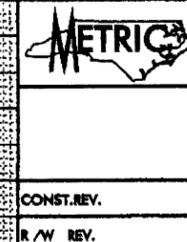


PROJECT REFERENCE NO. R-2539C	SHEET NO. 3/
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
CONST. REV.	
R/W REV.	

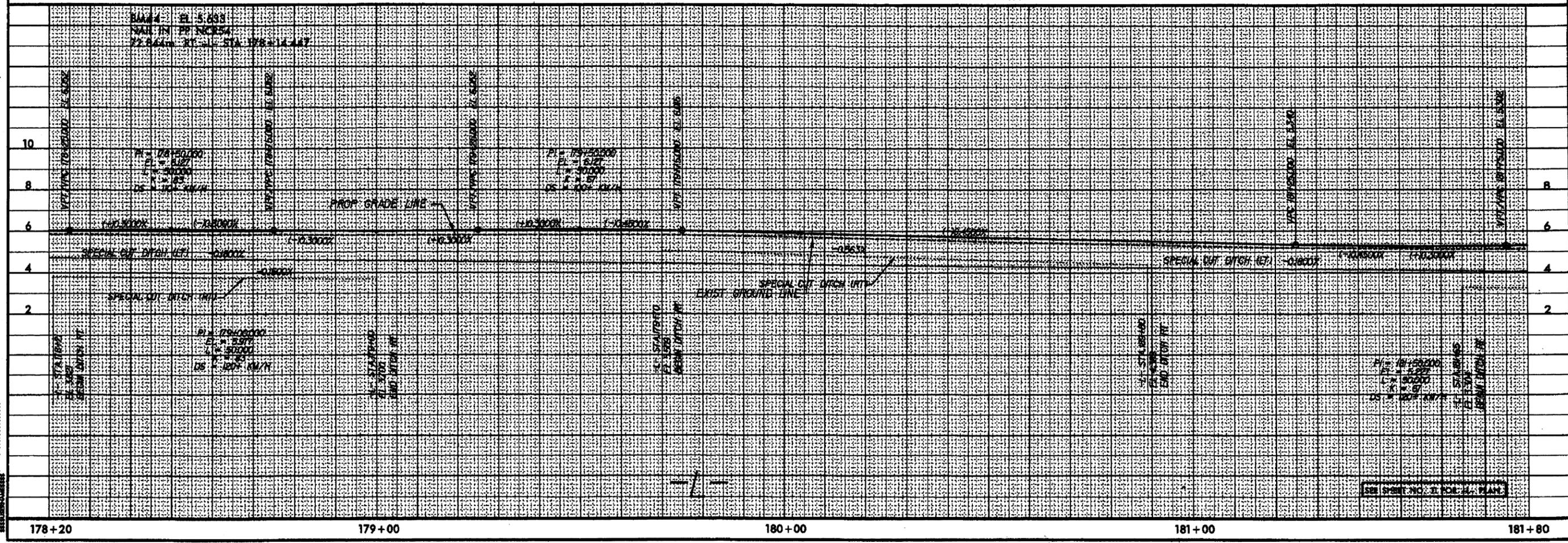
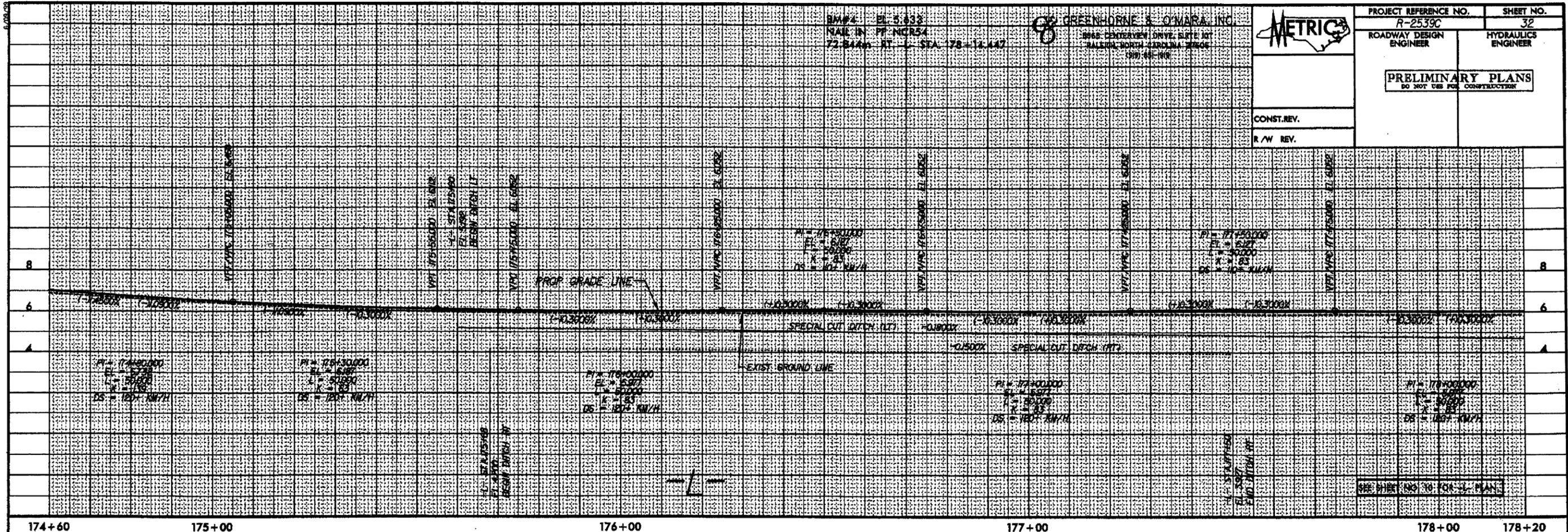


BM#4 EL. 5.838  
NAILED IN PP NGR54  
72-8446 RT - STA. 72-14.447

GREENHORNE & O'MARA, INC.  
3945 CENTERVIEW DRIVE, SUITE 107  
RALEIGH, NORTH CAROLINA 27609  
(919) 485-9100



PROJECT REFERENCE NO. R-2539C	SHEET NO. 32
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
CONST. REV.	
R/W REV.	



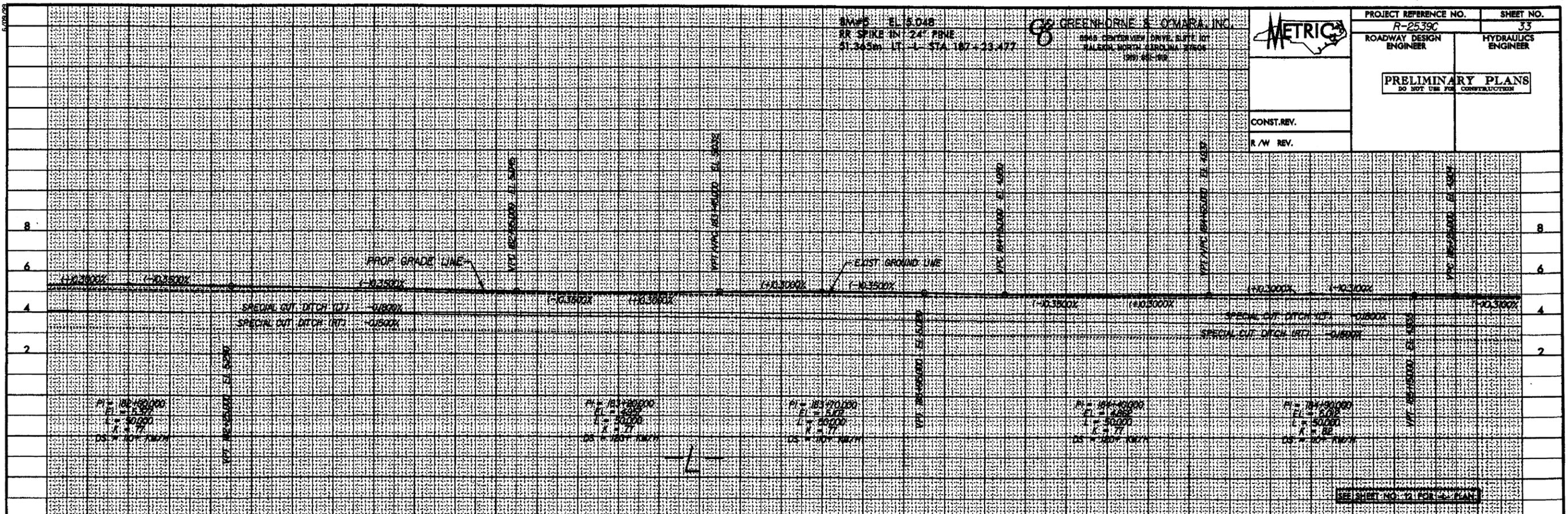
BANKS EL 5.048  
RR SPIKE IN 24" PINE  
ST 345m LT -L STA 187+23.477

GREENHORNE & O'NEAL, INC.  
2048 DEVERVIEW DRIVE, SUITE 101  
HALEBORO, NORTH CAROLINA 27638  
PH: 919-485-1418

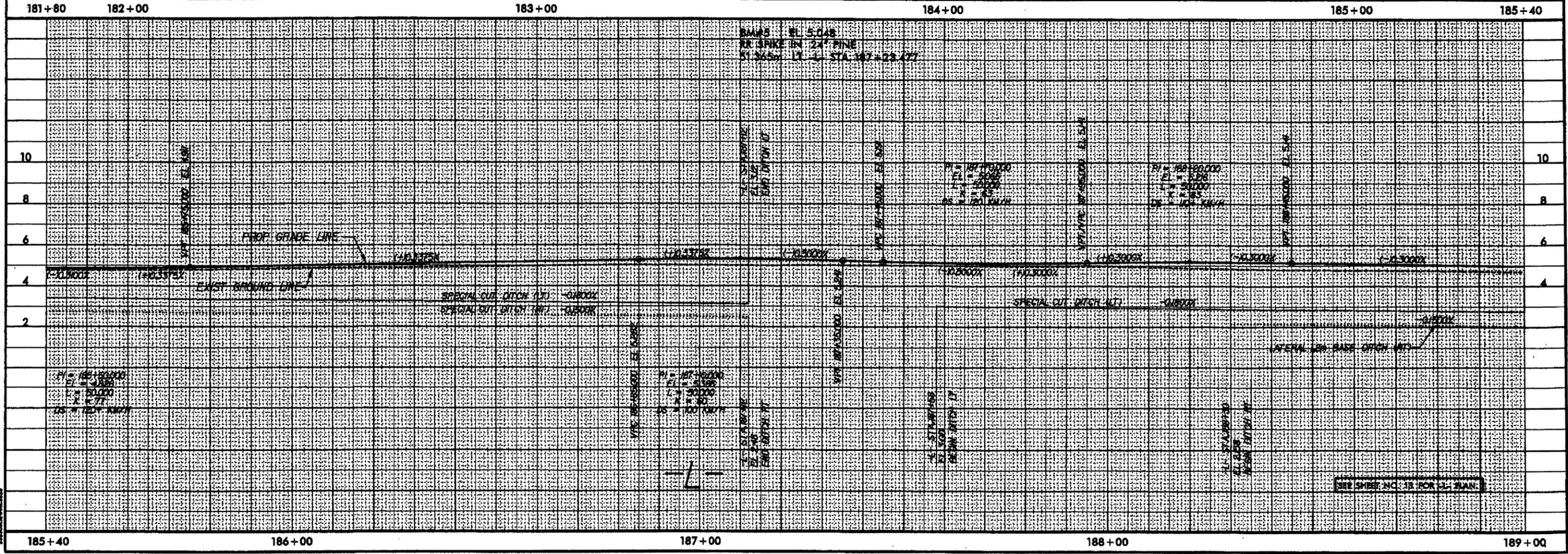


PROJECT REFERENCE NO. R-2539C	SHEET NO. 33
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

CONST. REV.  
R/W REV.



SEE SHEET NO. 32 FOR PLAN



SEE SHEET NO. 34 FOR PLAN





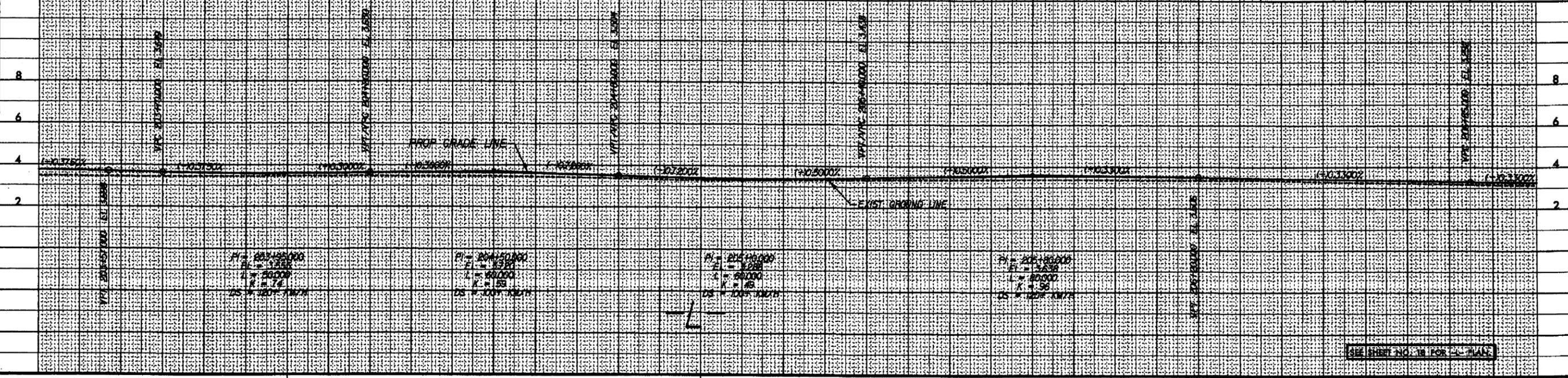
BM#8 EL. 1.793  
RR SPIKE OVER PIPE - Y10  
128.241m RT - STA 208+10.131

GREENHORNE & OMARA, INC.  
5808 CENTERVIEW DRIVE SUITE 101  
FALCON NORTH-CAROLINA 27008  
(919) 485-1000

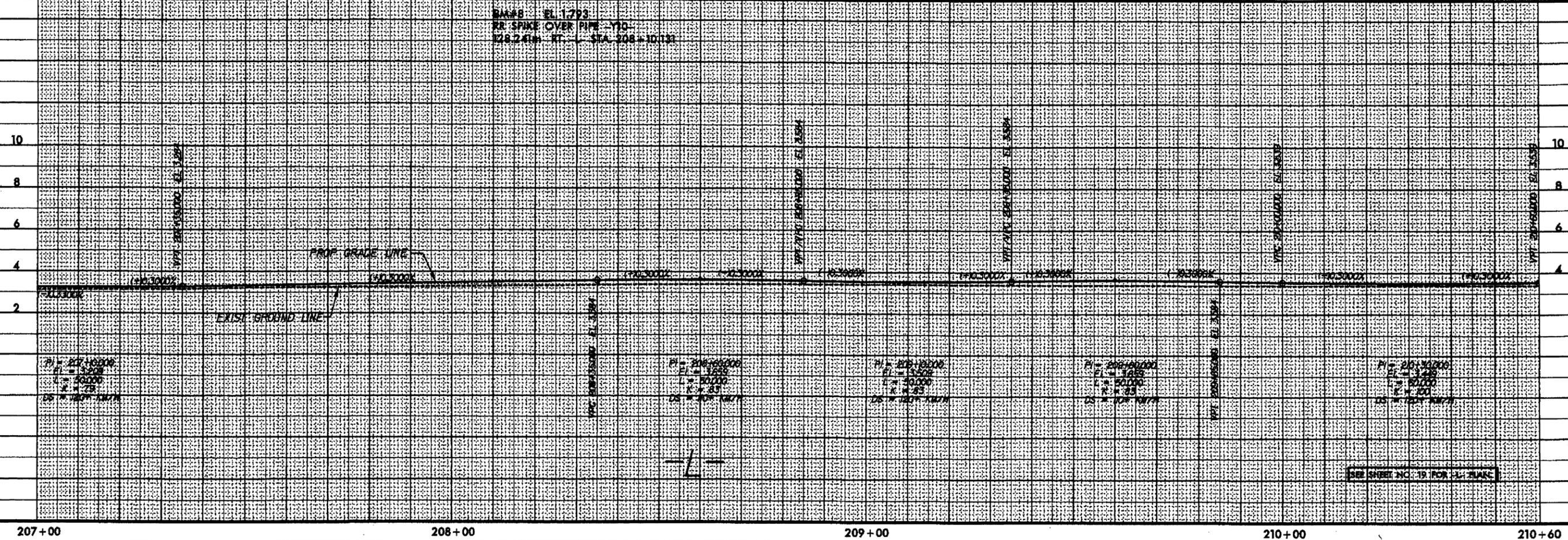


PROJECT REFERENCE NO. R-2539C	SHEET NO. 36
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

CONST. REV.  
R/W REV.



BM#8 EL. 1.793  
RR SPIKE OVER PIPE - Y10  
128.241m RT - STA 208+10.131



BM#8 EL. 1.793  
RR SPIKE OVER PIPE - Y10  
128.241M RT - 1 - STA. 208+10.131

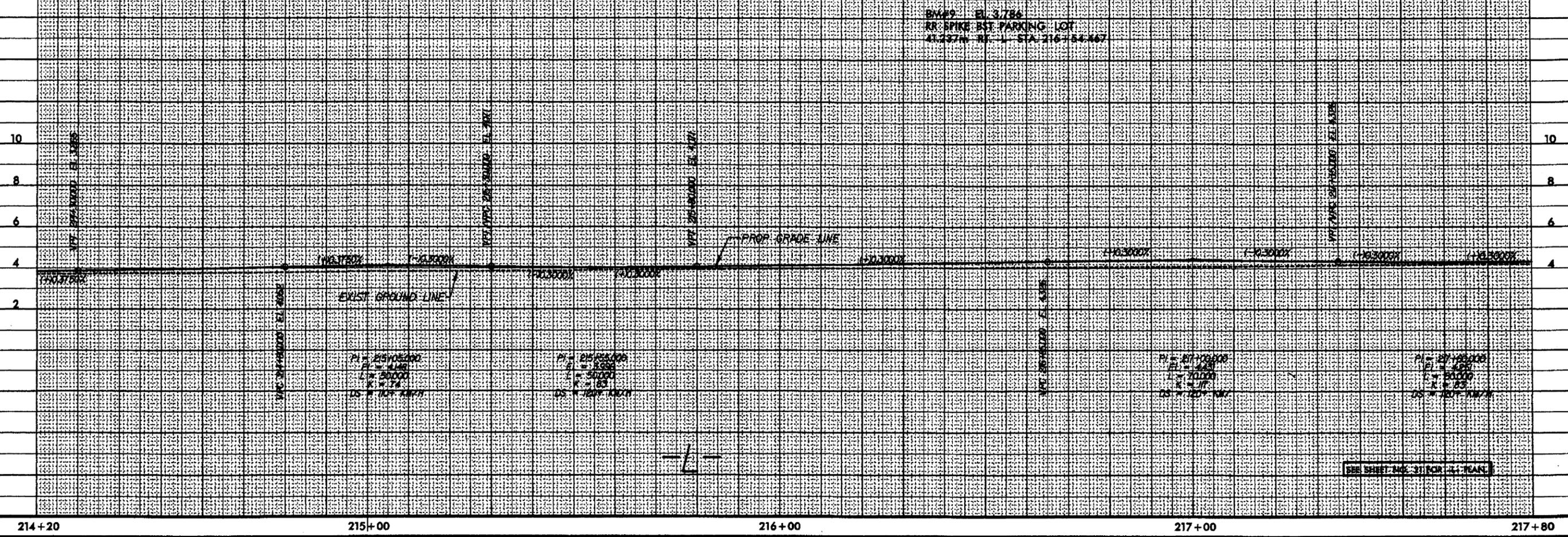
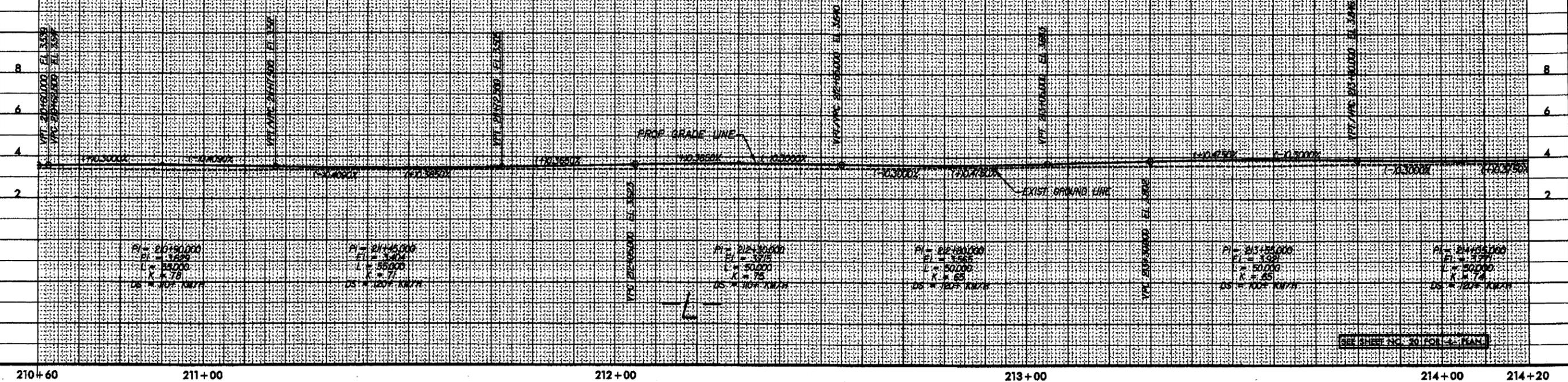
GREENHORNE & O'MARA, INC.  
8888 CENTERVIEW DRIVE, SUITE 107  
TALSON, NORTH CAROLINA 27584  
(919) 491-1998



PROJECT REFERENCE NO. R-2539C  
ROADWAY DESIGN ENGINEER  
SHEET NO. 37  
HYDRAULICS ENGINEER

PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION

CONST. REV.  
R/W REV.



BM#9 EL. 3.786  
RR SPIKE BST PARKING LOT  
41.237M RT. STA. 217+54.467

GREENHORNE & O'MARA, INC.  
3945 CENTERVIEW DRIVE, SUITE 107  
RALEIGH, NORTH CAROLINA 27606  
(919) 482-9100

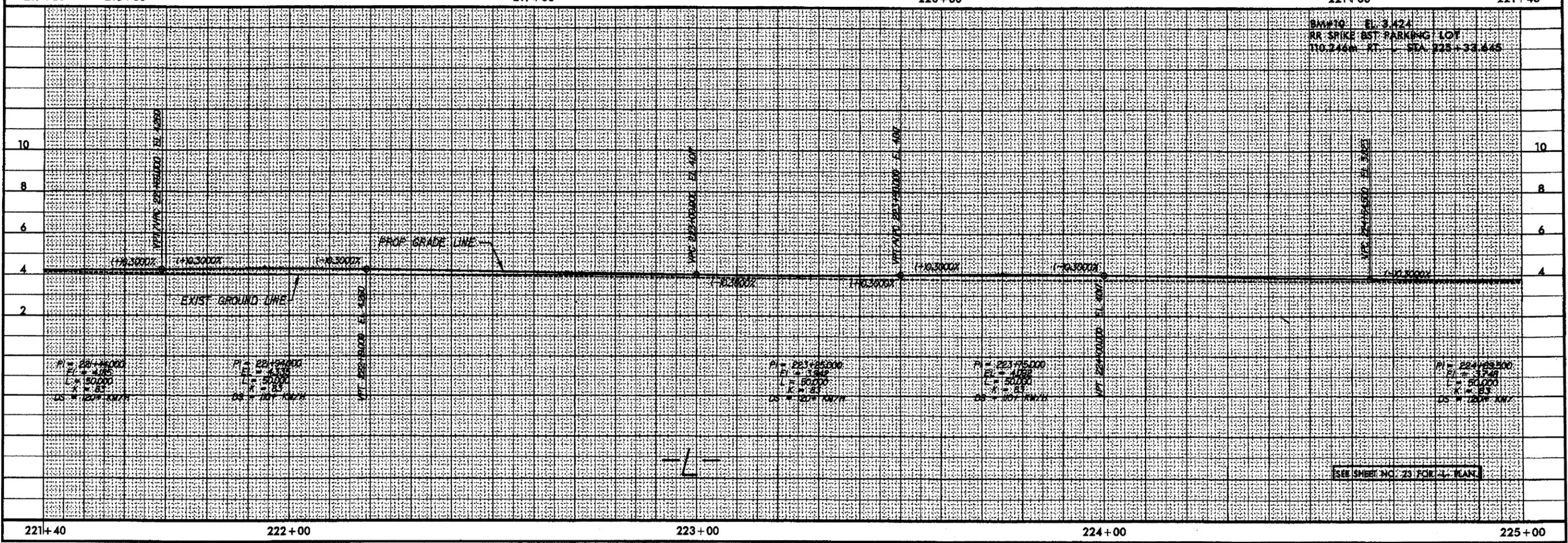
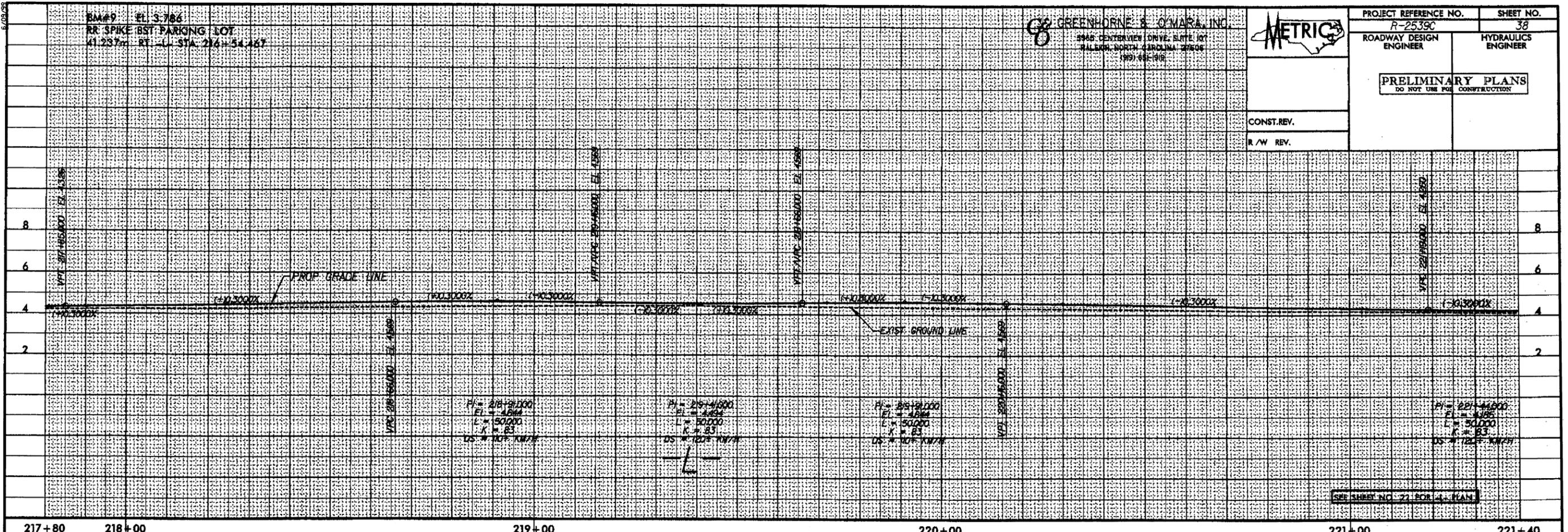


PROJECT REFERENCE NO. R-2539C SHEET NO. 38

ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER

PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION

CONST. REV.  
R/W REV.

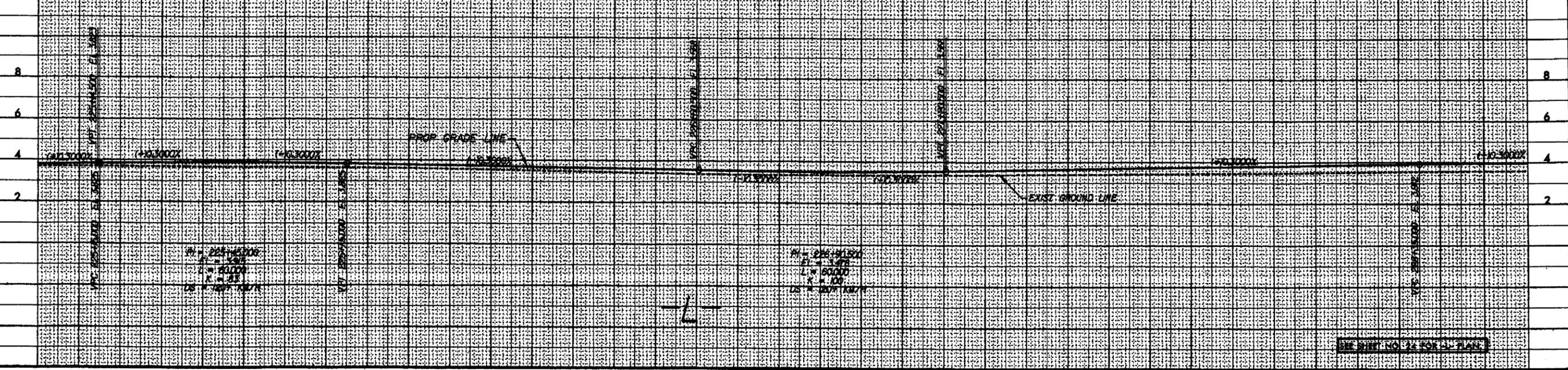


BM#10 EL 3.424  
RR SPIKE B&T MARKING LOT  
100.246H RT. 1 STA 225+33.648

GREENHORNE & O'MARA, INC.  
2548 CENTERVIEW DRIVE SUITE 100  
DALLAS, NORTH CAROLINA 27603  
(919) 455-0100



PROJECT REFERENCE NO. R-2539C	SHEET NO. 39
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
CONST.REV.	
R/W REV.	

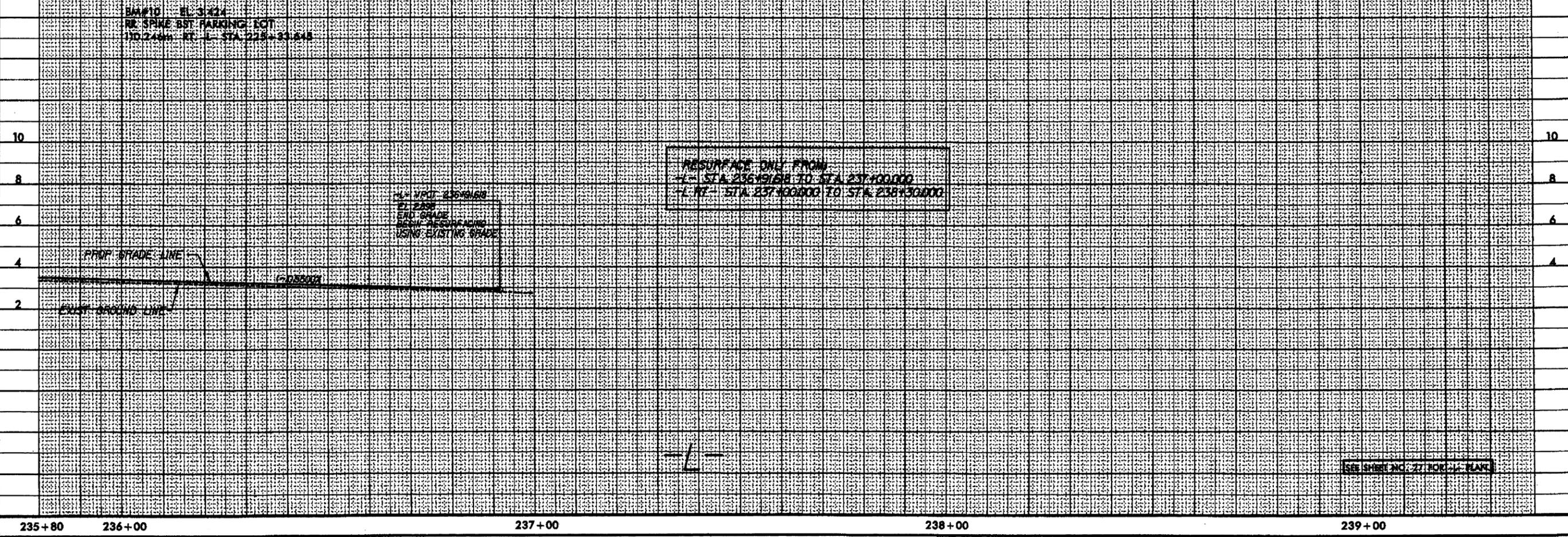
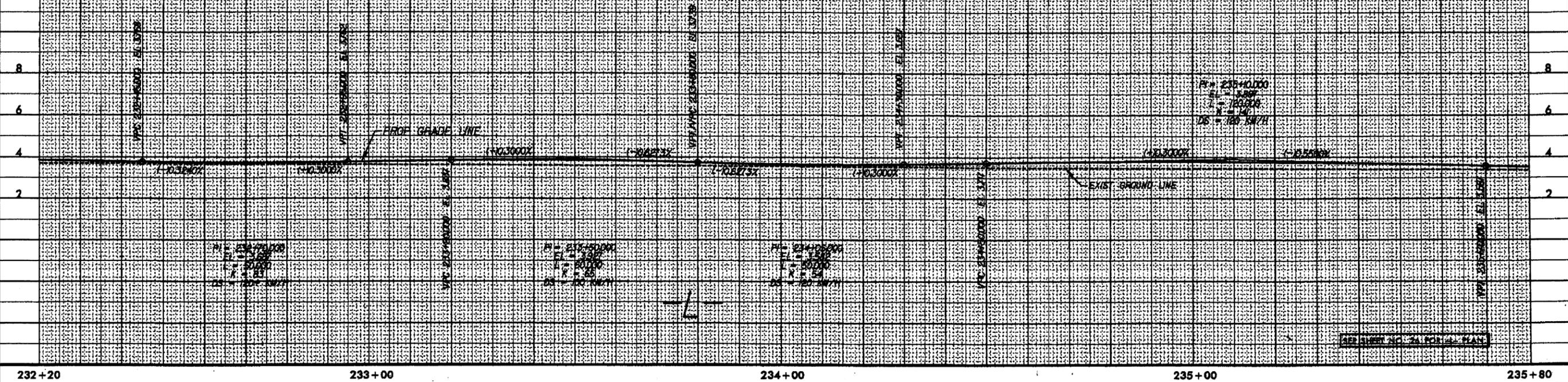


BA#10 EL 3.424  
RR SPINE BST PARKING LOT  
110 244th ST L STA 228+31.648

GREENHORNE & O'MARA, INC.  
5555 CENTERVIEW DRIVE SUITE 107  
RALEIGH, NORTH CAROLINA 27608  
(919) 481-1000



PROJECT REFERENCE NO. R-2539C	SHEET NO. 40
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
CONST. REV.	
R/W REV.	





BLANK E 2.736  
RR SPIKE IN 24" GUM  
27.045m FT L STA 196 - 24.699

GREINHORNE & O'MARA, INC.  
3948 CENTURION DRIVE, SUITE 101  
FALLS CHURCH, VIRGINIA 22034  
(703) 441-1100

**METRIX**

PROJECT REFERENCE NO. R-2539C SHEET NO. 42  
ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER

**PRELIMINARY PLANS**  
DO NOT USE FOR CONSTRUCTION

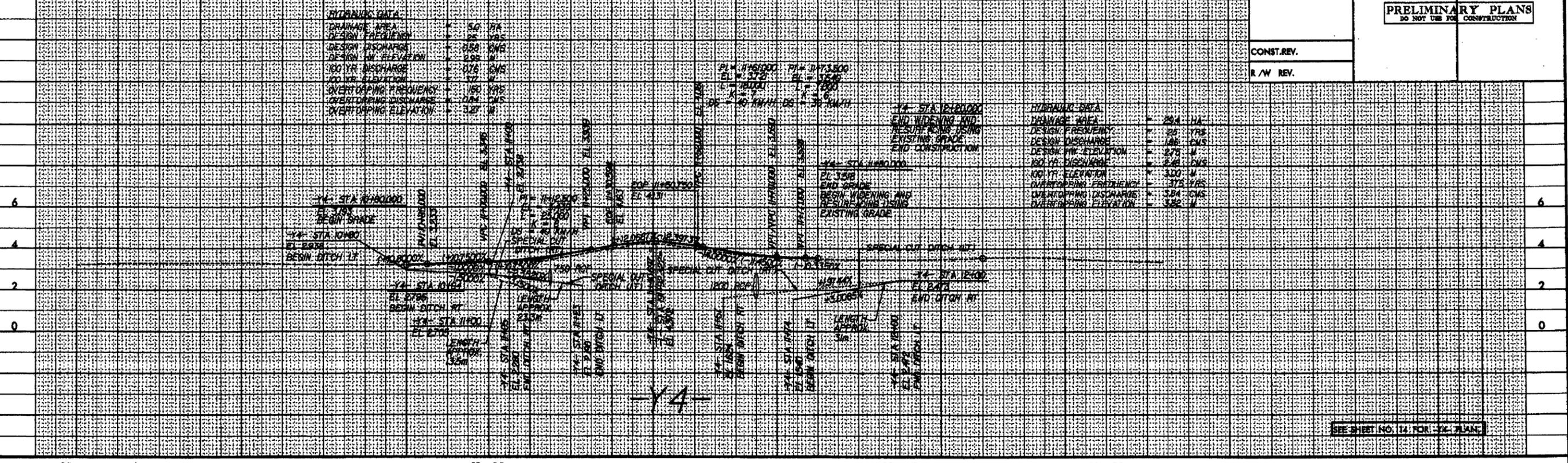
CONST. REV.  
R/W REV.

**HYDRAULIC DATA**

DRAINAGE AREA	50 HA
DESIGN FREQUENCY	25 YRS
DESIGN DISCHARGE	158 CMS
DESIGN HW ELEVATION	2.98 M
100 YR DISCHARGE	175 CMS
100 YR ELEVATION	3.17 M
OVERTOPPING FREQUENCY	150 YRS
OVERTOPPING DISCHARGE	184 CMS
OVERTOPPING ELEVATION	3.27 M

**HYDRAULIC DATA**

DRAINAGE AREA	254 HA
DESIGN FREQUENCY	25 YRS
DESIGN DISCHARGE	146 CMS
DESIGN HW ELEVATION	2.75 M
100 YR DISCHARGE	166 CMS
100 YR ELEVATION	3.00 M
OVERTOPPING FREQUENCY	150 YRS
OVERTOPPING DISCHARGE	184 CMS
OVERTOPPING ELEVATION	3.27 M



SEE SHEET NO. 14 FOR Y4 PLAN

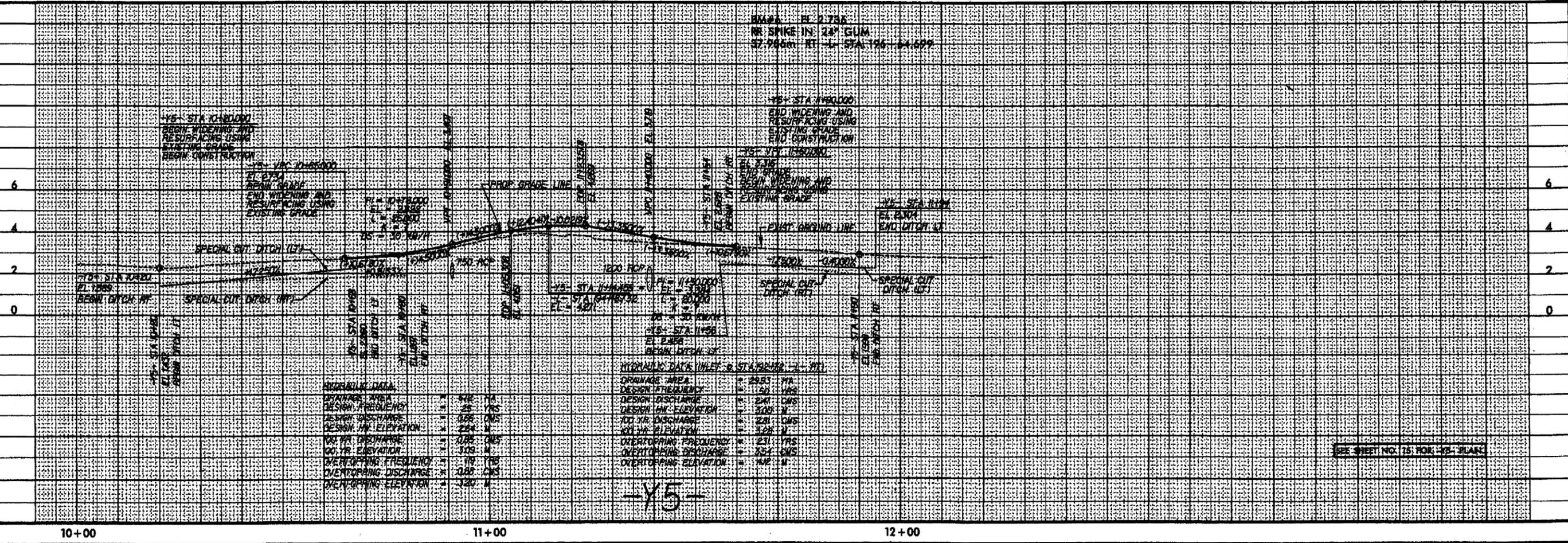
BLANK E 2.736  
RR SPIKE IN 24" GUM  
27.045m FT L STA 196 - 24.699

**HYDRAULIC DATA**

DRAINAGE AREA	516 HA
DESIGN FREQUENCY	25 YRS
DESIGN DISCHARGE	166 CMS
DESIGN HW ELEVATION	2.94 M
100 YR DISCHARGE	186 CMS
100 YR ELEVATION	3.19 M
OVERTOPPING FREQUENCY	150 YRS
OVERTOPPING DISCHARGE	195 CMS
OVERTOPPING ELEVATION	3.29 M

**HYDRAULIC DATA (INLET @ STA 1968 - L-RT)**

DRAINAGE AREA	2583 HA
DESIGN FREQUENCY	25 YRS
DESIGN DISCHARGE	241 CMS
DESIGN HW ELEVATION	3.00 M
100 YR DISCHARGE	281 CMS
100 YR ELEVATION	3.28 M
OVERTOPPING FREQUENCY	150 YRS
OVERTOPPING DISCHARGE	354 CMS
OVERTOPPING ELEVATION	3.46 M



SEE SHEET NO. 15 FOR Y5 PLAN



BM#10 EL. 3.424  
RR SPIKE B&T PARKING LOT  
110.246m RT L. STA 225+33.645

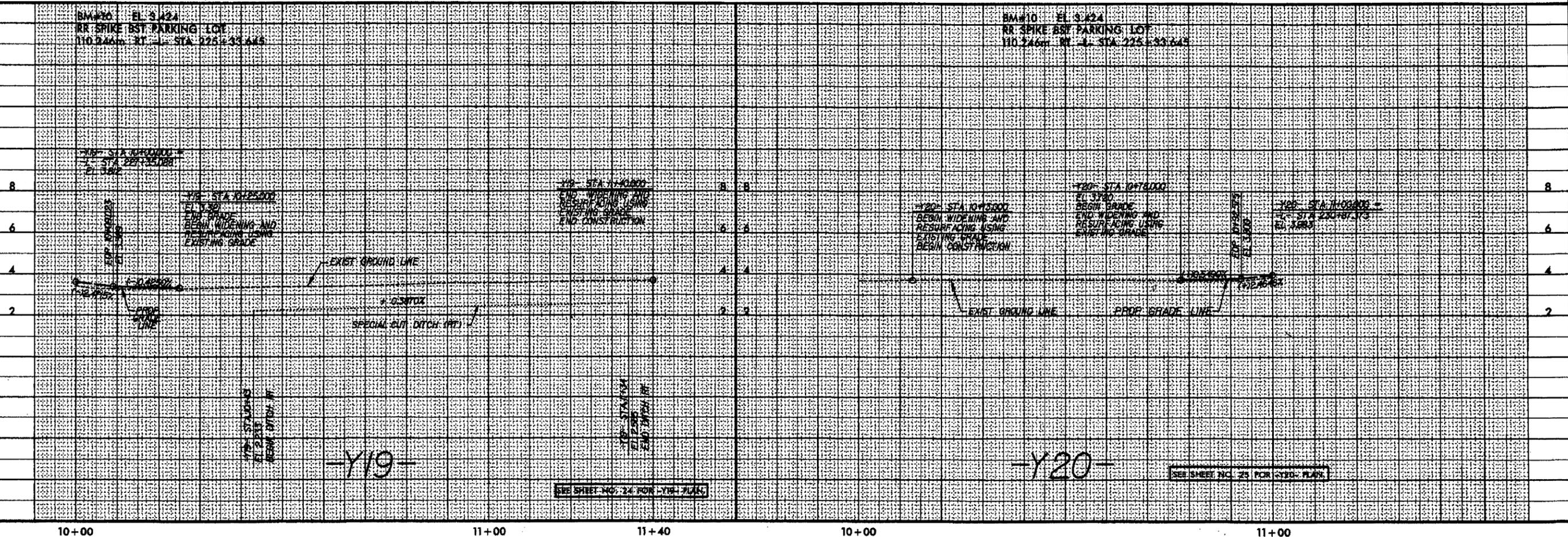
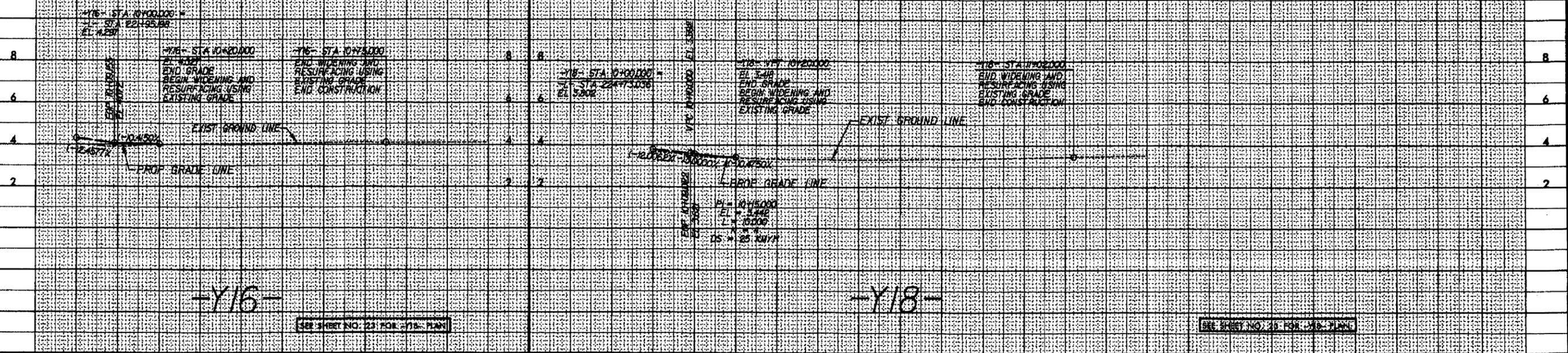
BM#10 EL. 3.424  
RR SPIKE B&T PARKING LOT  
110.246m RT L. STA 225+33.645

GREENHORNE & O'MARA, INC.  
3808 CENTERVIEW DRIVE, SUITE 101  
RALEIGH, NORTH CAROLINA 27606  
(919) 481-1818



PROJECT REFERENCE NO. R-2539C	SHEET NO. 44
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

CONST. REV.  
R/W REV.



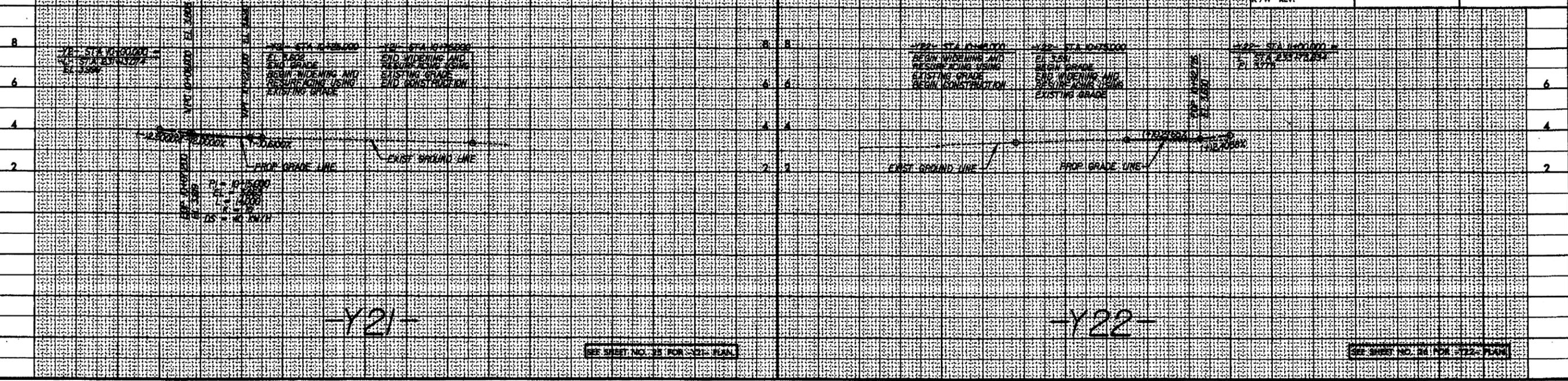
BM10 EL 3.424  
RR SPIKE BKT PARKING LOT  
116.242m RT STA 225+89.625

GREENHORNE & O'MARA, INC.  
3868 CENTERVIEW DRIVE, SUITE 101  
RALEIGH, NORTH CAROLINA 27606  
(919) 481-1800  
BRM10 EL 3.424  
RR SPIKE BKT PARKING LOT  
116.242m RT STA 225+89.625



PROJECT REFERENCE NO. R-2539C	SHEET NO. 45
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

CONST. REV.  
R/W REV.



-Y21-

-Y22-

SEE SHEET NO. 44 FOR Y21 PLAN

SEE SHEET NO. 44 FOR Y22 PLAN

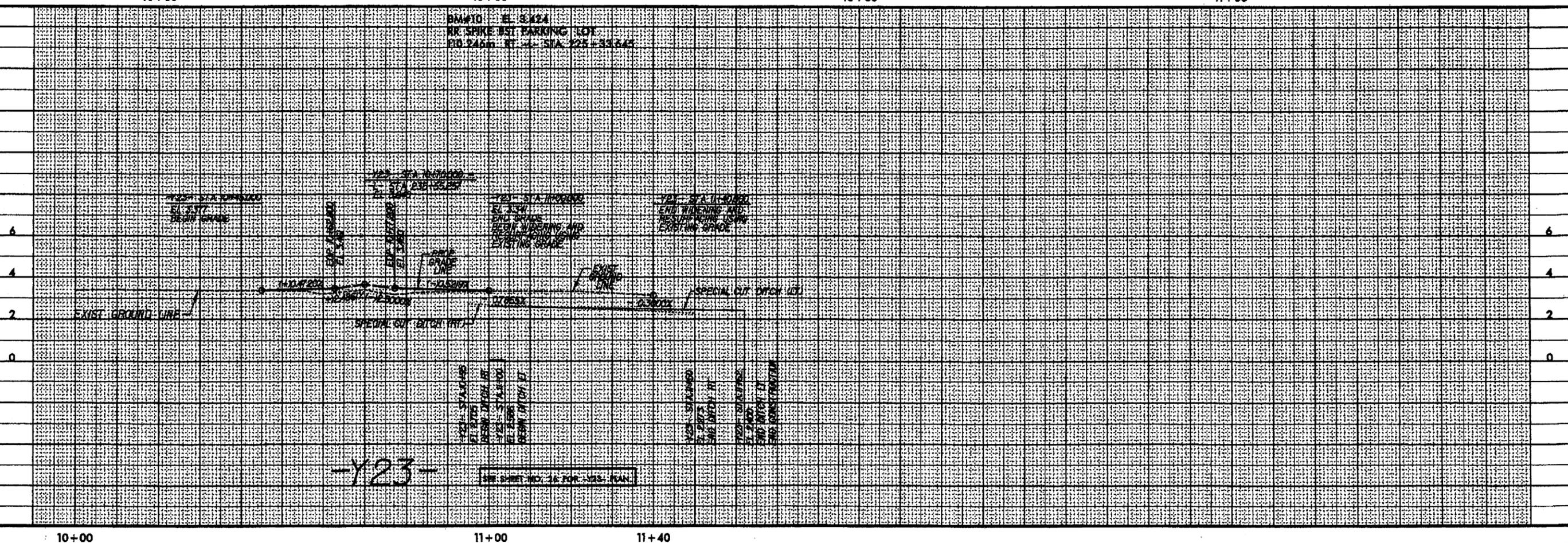
10+00

10+80

10+00

11+00

BRM10 EL 3.424  
RR SPIKE BKT PARKING LOT  
116.242m RT STA 225+89.625



-Y23-

SEE SHEET NO. 44 FOR Y23 PLAN

10+00

11+00

11+40