



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

September 24, 2004

U.S. Army Corps of Engineers  
Raleigh Field Office  
6508 Falls of the Neuse Road  
Suite 120  
Raleigh, NC 27615

Attention: Mr. John Thomas  
NCDOT Coordinator

Subject: **Permit Modification Request and Supplemental Information for TIP No. R-3427**, Yadkin County; the proposed widening of US 601 from the Yadkinville South City Limits to the Yadkin/Davie County line; NCDOT Division 11. Federal Project No. STP-601(6), State Project No. 8.1770801; WBS Element 34543.1.1

Reference: USACE 404 Nationwide 23 & 33 Permit Action ID 200421361 & 200421362 issued August 27, 2004.

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes to modify the construction plans for the above-mentioned project. The purpose of this letter is to request a modification to the Department of the Army Nationwide 23 and 33 Permit. Please see the attached modified permit drawing sheets; Ecosystem Enhancement Program's acceptance letter; Division of Water Quality's approval of the Natural Stream Design Plan (via email), Natural Stream Design Monitoring plan and the Indirect and Cumulative Effects Assessment Report. The NCDOT is asking for an **additional 66.5 linear feet** of impacts to the surface waters on this project and minor changes to the design and permit drawings. **Changes to the permit will be denoted in bold in this modification letter.**

The NCDOT proposes to widen US 601 to two 12-foot lanes from the Yadkinville South City limits to the Yadkin/Davie County line. The project will include turn lanes at various

intersections and the replacement of the 190 foot Bridge No. 30 over South Deep Creek with a new 210 foot 3 span pre-cast concrete girder bridge in the same location. The new bridge will span the creek with no bents in the water.

The total project length will be 5.3 miles. Traffic will remain onsite during construction of the road widening, with a temporary onsite detour bridge located approximately 100 feet west of the existing bridge. This project will impact 10 separate streams for a total of **1056** linear feet of surface waters and 7 separate wetlands for a total of 0.223 acre of wetlands. There will also be 0.07 acre of temporary impacts to the surface waters due to a causeway constructed for the removal of the existing bridge.

**Summary of Changes**

Four stream sites were recalculated for impacts to streams. Sites 1, 3, 4 and 5 have newly calculated linear feet of impacts which increases the total impacts to streams on this project. See Table 1 below.

**Table 1. Summary of Permanent Impacts to Surface Waters (changes in bold)**

Permit Drawings Site No.	CE Stream Site No.	Sheet No. of Permit Drawings	Water Body (Intermittent -I or Perennial - P)	Recalculated Surface Water Impacts	Original Surface water Impacts	Natural Channel Design
				Linear Ft.	Linear Ft.	Linear Ft.
Site 1	S2*	6 of 40	UT1 Dry Branch (P)	<b>64.0</b>	50.5	N/A
Site 2	S1*	8 of 40	Dry Branch (P)	44.0	44.0	N/A
Site 3	S3	11 of 40	UT2 Dry Branch (P)	<b>56.0</b>	31.0	N/A
Site 4	S4	11 of 40	UT3 Dry Branch (P)	<b>40.0</b>	26.0	N/A
Site 5	S5	13 of 40	UT4 Dry Branch (P)	<b>57.0</b>	43.0	N/A
Site 6	NA	13 of 40	UT4 Dry Branch (P)	190.0	190.0	N/A
			<i>Stream Relocation</i>	N/A	N/A	220.0
Site 8	S6	16 of 40	UT1 Harmon Creek (P)	49.0	49.0	N/A
10A	NA	16 of 40	UT2 Harmon Creek (P)	18.0	18.0	N/A
10B	S7	19 of 40	UT2 Harmon Creek (P)	120.0	120.0	N/A
13	S8	22 of 40	UT3 Harmon Creek (P)	38.0	38.0	N/A
14	S9	24 of 40	Harmon Creek (P)	260.0	260.0	N/A
19	S11	29 of 40	UT South Deep Creek (P)	120.0	120.0	N/A
<b>Totals</b>				<b>1056.0</b>	989.5	220.0

**The new total of stream impacts are 1056 linear feet.**

Changes to specific sites on the permit drawings:

- **Site 10B: The channel relocation is identified (Sheets 19 and 20 of 40)**
- **Site 13: the preformed scour hole will be replaced with a rip/rap pad to minimize velocity and scouring at the stream site (Sheets 22 and 23 of 40).**
- **Site 19: the ditch coming off the culvert is identified (Sheets 29 and 30 of 40).**

**Mitigation: There will be a total of 1056 linear feet of stream impacts that will require mitigation.** One natural stream design (NSD) will be constructed comprising 220 feet of onsite mitigation. **An onsite survey and monitoring schedule (see attached) for the NSD is included with this permit modification. See the Division of Water Quality approval of the NSD attached.** Further necessary compensatory mitigation to offset unavoidable impacts to surface waters will be provided by the Ecosystem Enhancement Program (EEP). **The remaining impacts of 836 linear feet of surface waters will be offset by compensatory mitigation provided by EEP.**

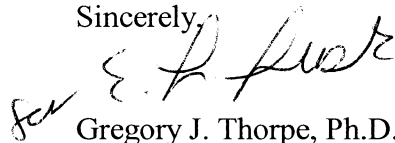
**This project has a LET date of December 21, 2004.**

### **REGULATORY APPROVALS**

The NCDOT respectfully requests that the referenced 404 Nationwide 23 and 33 Permits be modified to reflect the revisions outlined in this letter.

Thank you for your time and assistance with this project. Please contact Carla Dagnino at (919) 715-1456 if you have any questions or need any additional information.

Sincerely,



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

w/attachment

Mr. John Hennessy, Division of Water Quality  
Ms. Marla Chambers, Div 11 NCWRC  
Ms. Marella Buncick, Div. 11USFWS  
Mr. Greg Perfetti, P.E., Structure Design  
Mr. Ron Hancock, P.E., Bridge Construction

w/o attachment

Mr. David Franklin, USACE, Wilmington  
Mr. Jay Bennett, P.E., Roadway Design  
Mr. Omar Sultan, Programming and TIP  
Mr. Art McMillan, P.E., Highway Design  
Mr. David Chang, P.E., Hydraulics  
Mr. Mark Staley, Roadside Environmental  
Mr. John F. Sullivan, III, FHWA  
Mr. Michael A. Pettyjohn, P.E., Div. 11  
Mr. Heath Slaughter, Div. 11 DEO  
Ms. Jackie Obediente, PDEA Project Planning Engineer  
Ms. Beth Harmon, EEP

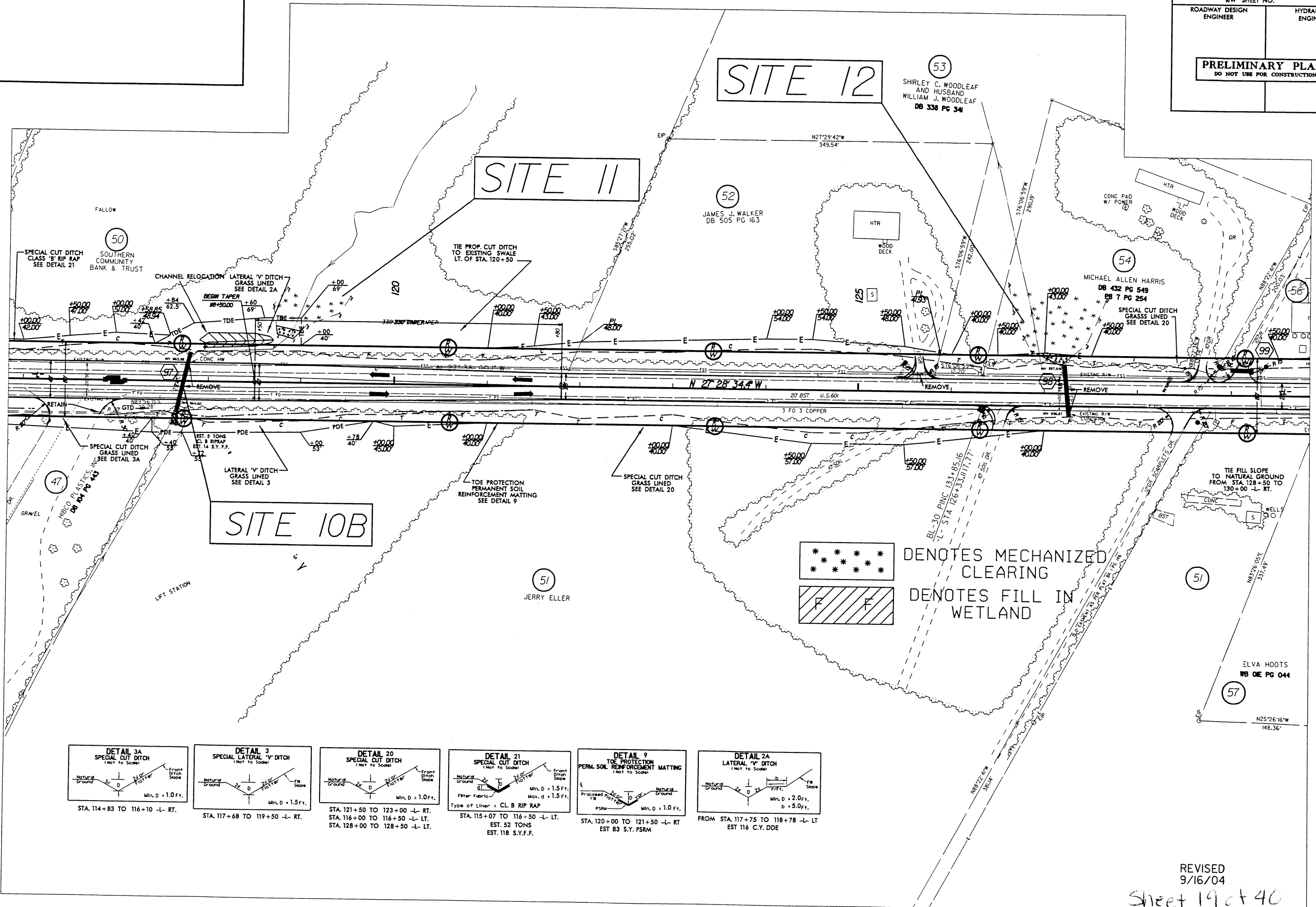
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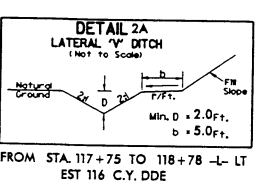
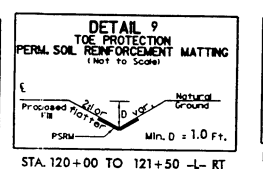
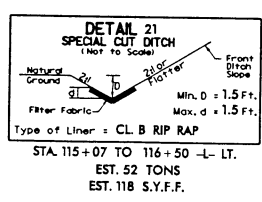
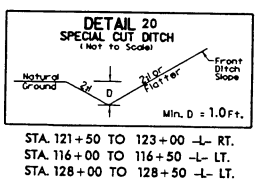
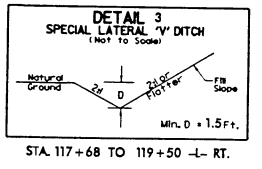
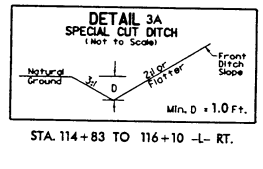
PROJECT REFERENCE NO. R-3427	SHEET NO. 19 of 40
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

MATCHLINE \*\* SEE SHEET 11 \*\*

MATCHLINE \*\* SEE SHEET 13 \*\*



 DENOTES MECHANIZED CLEARING  
 DENOTES FILL IN WETLAND



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 Sheet 19 of 40

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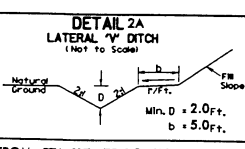
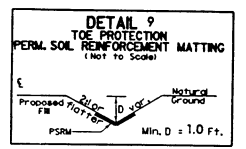
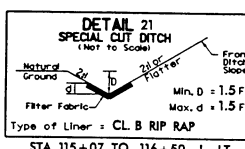
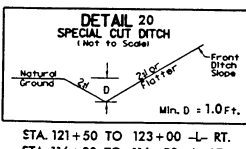
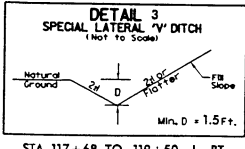
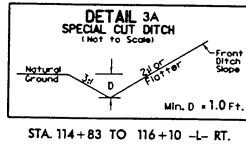
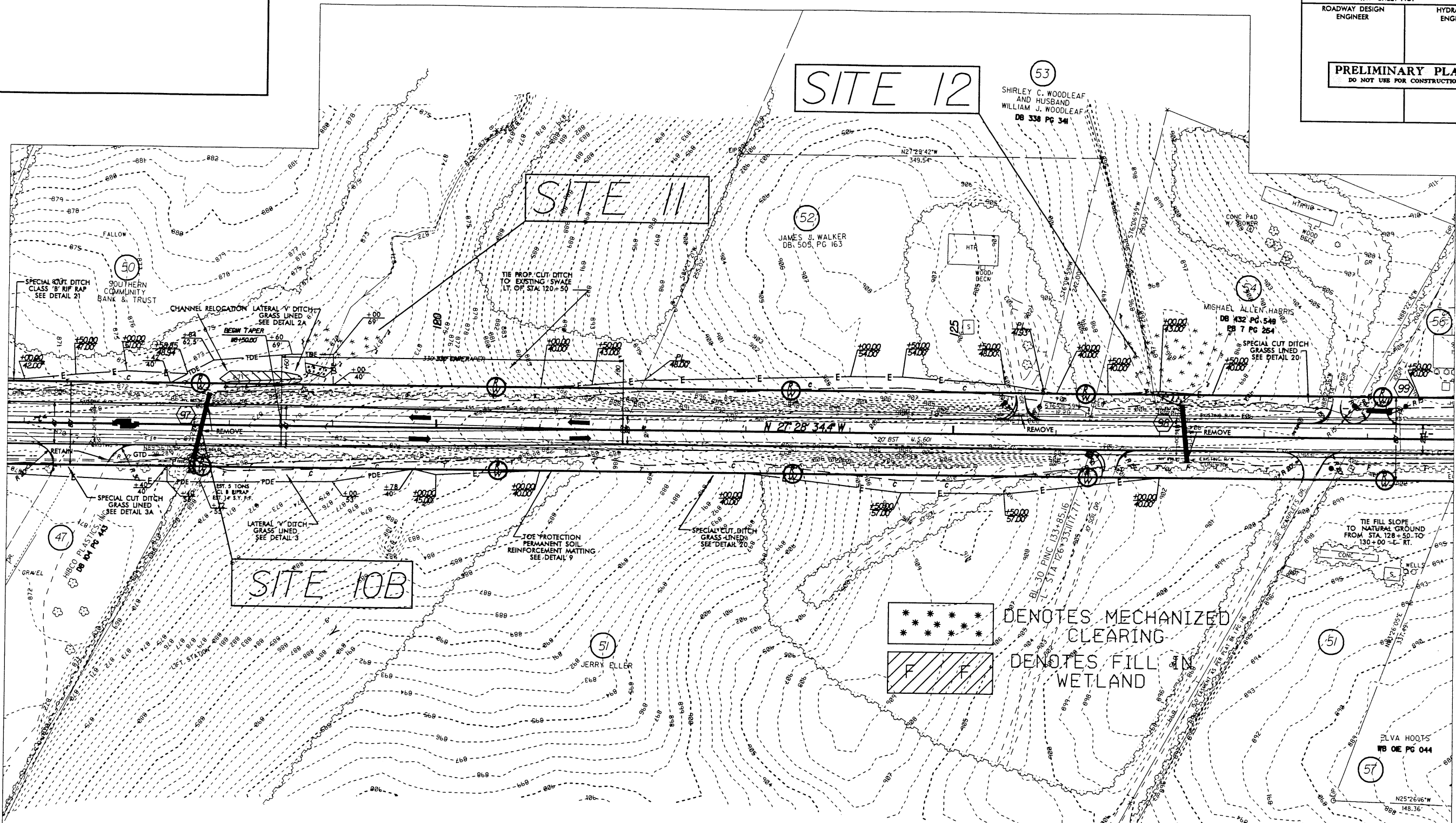
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PROJECT REFERENCE NO. R-3427	SHEET NO. 20 of 40
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

MATCHLINE \*\* SEE SHEET 11 \*\*

MATCHLINE \*\* SEE SHEET 13 \*\*



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Sheet 20 of 40

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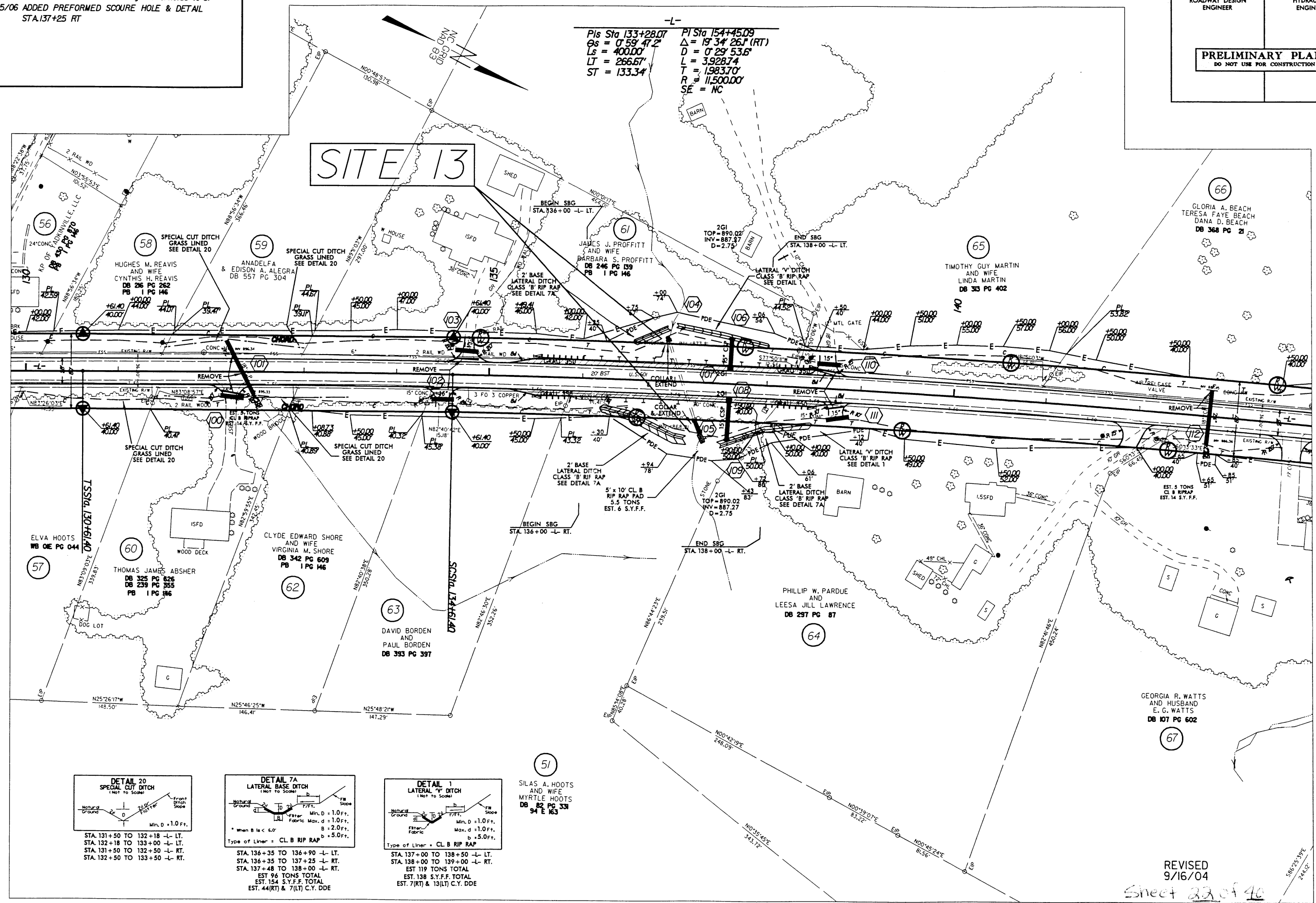
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3/3/03 - -L- Sta.143+00 Rt - Changed Prol No.68 to 67  
4/15/06 ADDED PREFORMED SCOURE HOLE & DETAIL  
STA.137+25 RT

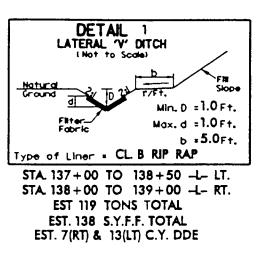
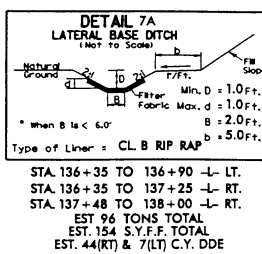
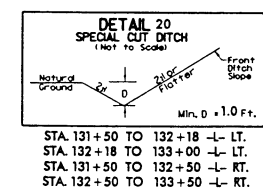
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RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

MATCHLINE \*\* SEE SHEET 12 \*\*

MATCHLINE \*\* SEE SHEET 14 \*\*



-L-  
 PIs Sta 133+28.07    PIs Sta 154+45.09  
 Os = 0'59" 47.2"    Δ = 19' 34" 26.1" (RT)  
 Ls = 400.00'        D = 0' 29" 53.6"  
 LT = 266.67'        L = 3,928.74'  
 ST = 133.34'        T = 1,983.70'  
                           R = 11,500.00'  
                           SE = NC



(51)  
 SILAS A. HOOTS  
 AND WIFE  
 MYRTLE HOOTS  
 DB 82 PG 331  
 94 E 163

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 Sheet 23 of 40

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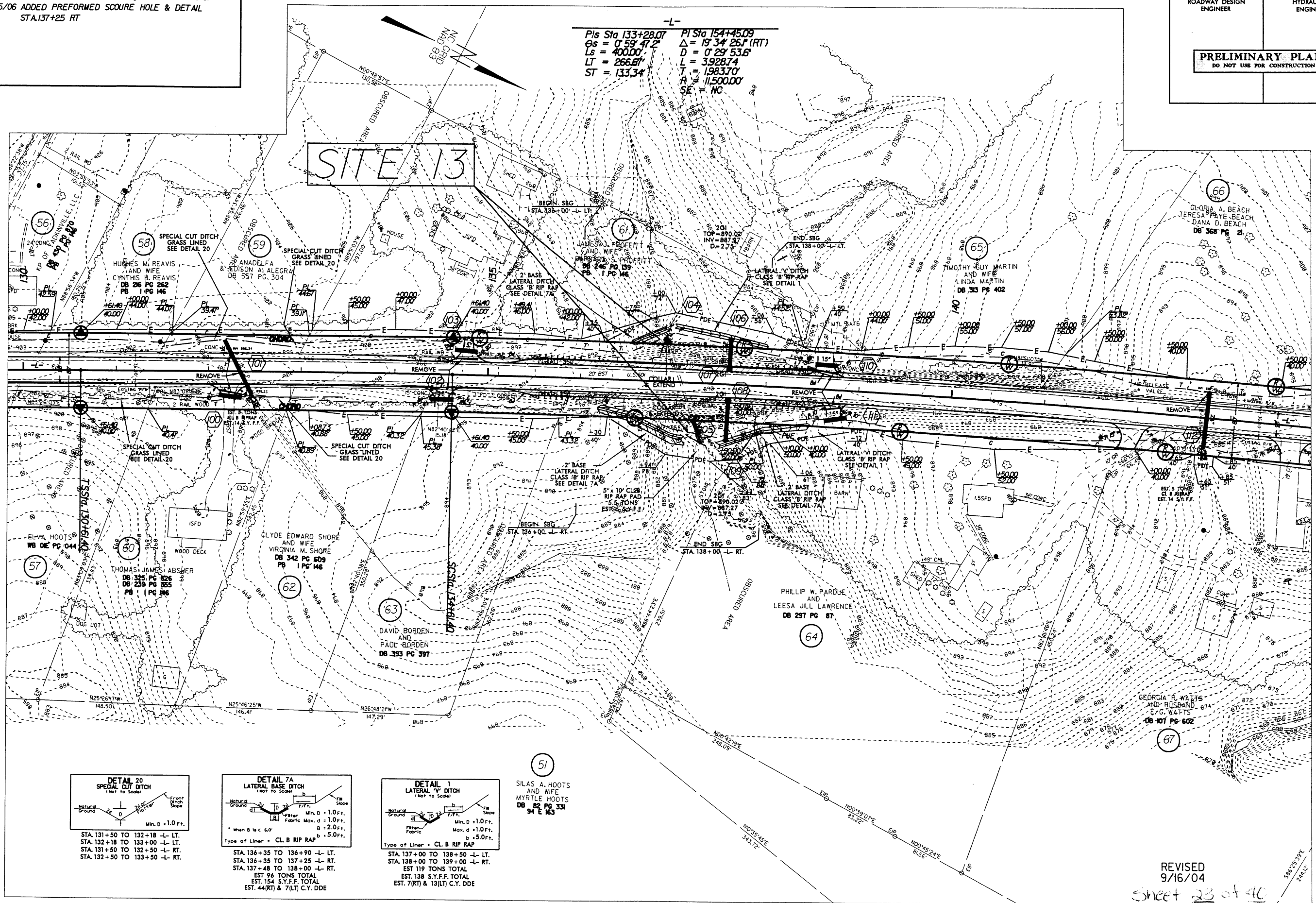
REVISIONS

3/3/03 - -L- Sta.143+00 Rt - Changed Prcl No.68 to 67  
4/15/06 ADDED PREFORMED SCORE HOLE & DETAIL  
STA.137+25 RT

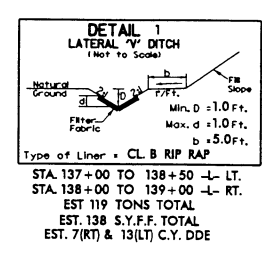
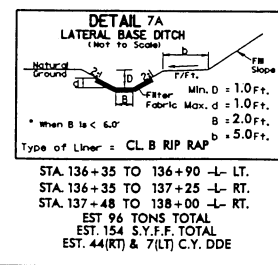
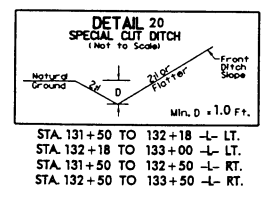
PROJECT REFERENCE NO. R-3427	SHEET NO. 23 of 40
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

MATCHLINE \*\* SEE SHEET 12 \*\*

MATCHLINE \*\* SEE SHEET 14 \*\*



-L-  
 PIs Sta 133+28.07 PIs Sta 154+45.09  
 Gs = 0'59'47.2" Δ = 19'34'26.1" (RT)  
 Ls = 400.00' D = 0'29'53.6"  
 LT = 266.67' L = 3.92874  
 ST = 133.34' T = 1.98370  
 R = 11,500.00'  
 SE = NC



(51)  
 SILAS A. HOOTS  
 AND WIFE  
 MYRTLE HOOTS  
 DB 82 PG 331  
 94 E 163

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 Sheet 23 of 40

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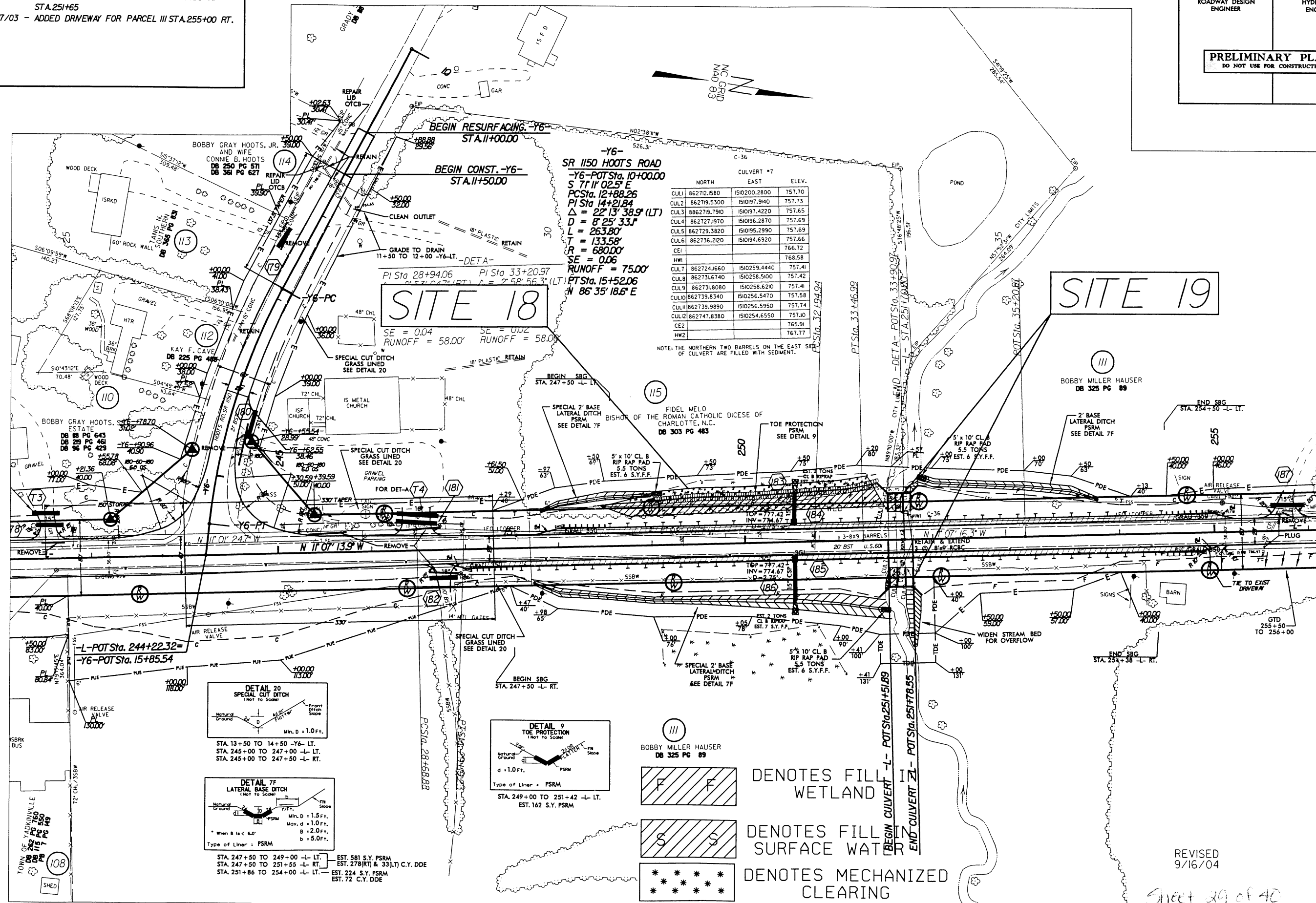
REVISIONS

4/15/03 - EXTENDED BOX CULVERT ON BOTH ENDS AT STA.251+65  
7/17/03 - ADDED DRIVEWAY FOR PARCEL III STA.255+00 RT.

PROJECT REFERENCE NO. R-3427	SHEET NO. 29 of 40
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

MATCHLINE \*\* SEE SHEET 20 \*\*

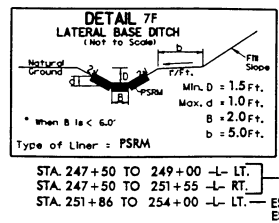
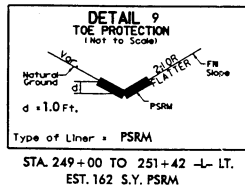
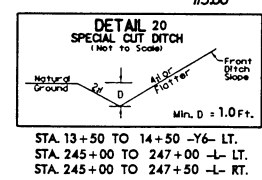
MATCHLINE \*\* SEE SHEET 22 \*\*



-Y6-  
SR 1150 HOOTS ROAD  
-Y6- POT Sta. 10+00.00  
S 71° 11' 02.5" E  
PC Sta. 12+88.26  
PI Sta. 14+21.84  
Δ = 22° 13' 38.9" (LT)  
D = 8' 25' 33.3"  
L = 263.80'  
T = 133.58'  
R = 680.00'  
SE = 0.06  
RUNOFF = 75.00'  
PTS. 15+52.06  
N 86° 35' 18.6" E

	NORTH	EAST	ELEV.
CUL1	862712.1580	1510200.2800	757.70
CUL2	862719.5300	1510197.9140	757.73
CUL3	862719.7910	1510197.4220	757.65
CUL4	862727.1970	1510196.2870	757.69
CUL5	862729.3820	1510195.2990	757.69
CUL6	862736.2120	1510194.6920	757.66
CE1			766.72
HW1			768.58
CUL7	862724.6660	1510259.4440	757.41
CUL8	862731.6740	1510258.5100	757.42
CUL9	862731.8080	1510258.6210	757.41
CUL10	862739.8340	1510256.5470	757.58
CUL11	862739.9890	1510256.5950	757.74
CUL12	862747.8380	1510254.6550	757.10
CE2			765.91
HW2			767.77

NOTE: THE NORTHERN TWO BARRELS ON THE EAST SIDE OF CULVERT ARE FILLED WITH SEDIMENT.



III BOBBY MILLER HAUSER DB 325 PG 89

DENOTES FILL WETLAND

DENOTES FILL SURFACE WATER

DENOTES MECHANIZED CLEARING

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Sheet 29 of 40

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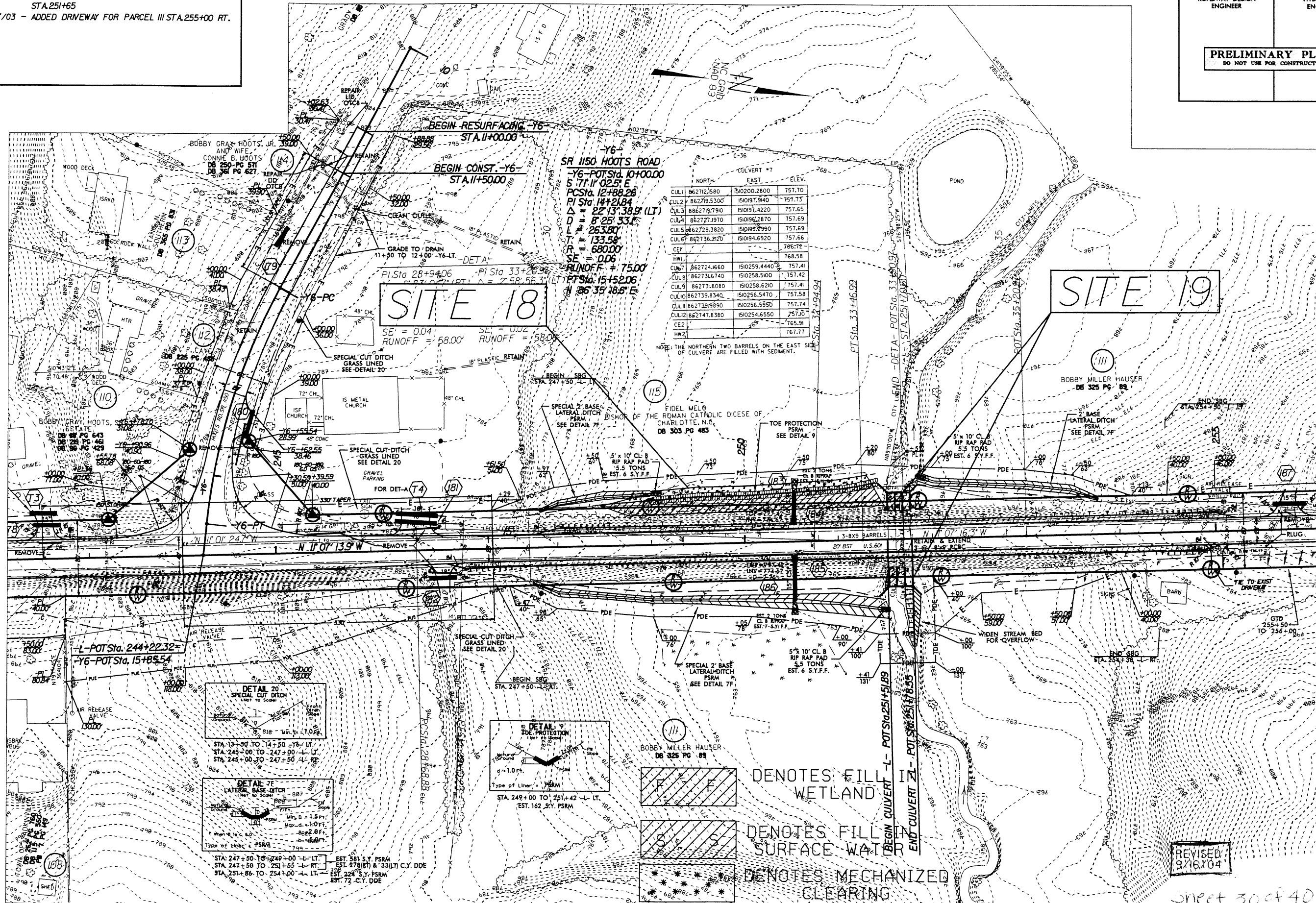


7/12/99

REVISIONS

4/15/03 - EXTENDED BOX CULVERT ON BOTH ENDS AT STA.251+65  
7/17/03 - ADDED DRIVEWAY FOR PARCEL III STA.255+00 RT.

PROJECT REFERENCE NO. R-3427	SHEET NO. 30 of 40
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	



MATCHLINE \*\* SEE SHEET 20 \*\*

MATCHLINE \*\* SEE SHEET 22 \*\*

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9/16/04

Sheet 30 of 40

# WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure (Size/Type)	WETLAND IMPACTS			SURFACE WATER IMPACTS						
			Fill In Wetlands (Ac)	Temp. Fill In Wetlands (Ac)	Excavation In Wetlands (Ac)	Mechanized Clearing (Method III) (Ac)	Fill In SW (Natural) (Ac)	Temp Exist Channel Impact (Ft)	Temp Fill In SW (Ac)	Existing Channel Impact (Ft)	Natural Stream Design (Ft)	
1	-L- 16+91	36" RCP EXTENSION					0.007	102			64	
2	-L- 25+91	6X6 RCBC EXTENSION					0.012	56			44	
3	-L- 47+48	24" RCP EXTENTION					0.003	35			56	
4	-L- 51+95	3X4 RCBC EXTEND W/ 48" RCP					0.003	56			40	
5	-L- 63+91	3X4 RCBC EXTEND W/ 48" RCP					0.004	18			57	
6	-L- 64+20 RT	NATURAL CHANNEL RELOCATION					0.015				190	220
7	-L- 66+08 RT	LATERAL ENCROACHMENT										
8	-L- 103+08	5X4 RCBC EXTEND W/ 60" RCP					0.004	59			49	
9	-L- 103+54 RT	LATERAL ENCROACHMENT (ROADWAY FILL)	0.005									
10 A	-L- 103+94 RT											
10 B	-L- 117+73	RIP RAP IN DITCH 24" RCP & DITCH CONST.					0.004	20	5		18	
PAGE TOTAL:			0.005				0.052	351			638	220

**DIVISION OF HIGHWAYS**  
**N. C. DEPT. OF TRANSPORTATION**  
**YADKIN COUNTY**  
**PROJECT: R-3427**  
**IMPROVEMENT OF US 601 FROM**  
**THE DAVIE COUNTY LINE TO +/-**  
**0.15 MILE SOUTH OF US 421**  
**SHEET 39 OF 40 REVISED 9/16/04**

# WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure (Size/Type)	WETLAND IMPACTS			SURFACE WATER IMPACTS								
			Fill In Wetlands (Ac)	Temp. Fill In Wetlands (Ac)	Excavation In Wetlands (Ac)	Mechanized Clearing (Method III) (Ac)	Fill In SW (Natural) (Ac)	Temp Exist Channel Impact (Ft)	Temp Fill In SW (Ac)	Existing Channel Impact (Ft)	Natural Stream Design (Ft)			
11	-L- 118+71 LT	LATERAL ENCROACHMENT				0.005								
	-L- 119+00 LT													
12	-L- 126+90 LT	LATERAL ENCROACHMENT (ROADWAY FILL)	0.0002			0.006								
	-L- 127+31 LT													
13	-L- 137+08	30" RCP EXTENSION						0.002	35			38		
14	-L- 148+02	4X4 RCBC EXTEND W/ 54" RCP / LAT. DITCH CONST.						0.003	17			260		
15	-L- 235+70 LT	LATERAL ENCROACHMENT (ROADWAY FILL)	0.003											
	-L- 236+09 LT													
16	-L- 236+57	TEMPORARY RIP-RAP CAUSEWAY									0.07			
	-L- 237+23													
17	-L- 237+23 RT	LATERAL ENCROACHMENT (ROADWAY CUT)			0.001	0.002								
	-L- 237+31 RT													
18	-L- 248+46 LT	LATERAL ENCROACHMENT (ROADWAY FILL)	0.114			0.057								
	-L- 251+51 LT													
19	-L- 251+65	36X9 RCBC EXTENSION						0.014	29			120		
PAGE TOTAL:			0.117	0	0.001	0.070		0.019	81		0.07	418		0
PREVIOUS PAGE TOTAL:			0.005	0	0	0.027		0.052	351		0	638		220
PROJECT TOTAL:			0.122	0	0.001	0.097		0.071	432		0.07	1056		220

NOTES: 1) PROPOSED STRUCTURE TO BE 1665'; 1680'; 1665' 54" PPC GIRDERS  
 2) TEMPORARY RIP-RAP CAUSEWAY FOR DEMOLITION OF EXISTING BRIDGE

**DIVISION OF HIGHWAYS**  
**N. C. DEPT. OF TRANSPORTATION**  
**YADKIN COUNTY**

PROJECT: R-3427

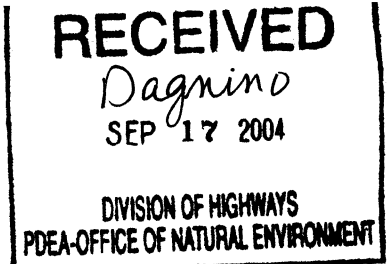
IMPROVEMENT OF US 601 FROM  
 THE DAVIE COUNTY LINE TO +/-  
 0.15 MILE SOUTH OF US 421  
 SHEET 40 OF 40 REVISED 9/16/04



North Carolina Department of Environment and Natural Resources

Michael F. Easley, Governor

William G. Ross Jr., Secretary



September 15, 2004

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

Dear Dr. Thorpe:

Subject: US 601 Widening, Yadkin and Davie Counties, TIP R-3427

Reference: EEP Mitigation Acceptance Letter dated 8/30/2004

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide appropriate compensation for the subject project. Based on the information supplied by you in a letter dated September 9, 2004, the stream impacts were increased due to a change requested by the NCDWQ. The revised stream impact requiring off site stream mitigation is 836 feet. There was no change in the riverine wetland impact amount of 0.171 acre. The impacts are located in CU 3040101 of the Yadkin River Basin in the Central Piedmont Plain Eco-Region.

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 North Carolina Department of Transportation, and the U. S. Army Corps of Engineers, Wilmington District dated July 22, 2003. The stream and riverine wetland mitigation for the subject project will be provided in accordance with this agreement. This letter replaces the mitigation acceptance letter issued on August 30, 2004.

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

Sincerely,

William D. Gilmore, P.E.  
Transition Manager

cc: John Thomas, USACE-Raleigh  
John Hennessy, Division of Water Quality, Wetlands/401 Unit  
File: R-3427, Amended

NC DENR Ecosystem Enhancement Program  
1652 Mail Service Center, Raleigh, North Carolina 27699-1652  
Phone: 919-715-1413 \ FAX: 919-715-2219 \ Internet: h2o.enr.state.nc.us/wrp/

One  
North Carolina  
*Naturally*



North Carolina Department of Environment and Natural Resources  
Division of Ecosystem Enhancement

Michael F. Easley, Governor

William G. Ross Jr., Secretary

September 15, 2004

Mr. John T. Thomas, Jr.  
US Army Corps of Engineers  
Raleigh Regulatory Field Office  
6508 Falls of the Neuse Road, Suite 120  
Raleigh, North Carolina 27615

Dear Mr. Thomas:

Project: US 601 Widening  
DOT ID #: R-3427  
County: Yadkin County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide compensatory mitigation for the 836 feet of unavoidable stream impacts and 0.171 acre of unavoidable non-riverine wetland impacts associated with the above referenced project. This letter replaces the mitigation confirmation letter issued on August 30, 2004.

The subject project is listed in Exhibit 2 of 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 dated July 22, 2003; however, EEP intends to provide compensatory stream and non-riverine wetland mitigation at a ratio up to 2:1 in Cataloging Unit 3040101 of the Yadkin River Basin.

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

Sincerely,

William D. Gilmore, P.E.  
Transition Manager

cc: Phil Harris, P.E., Office of Natural Environment, NCDOT  
John Hennessy, Division of Water Quality, Wetlands/401 Unit  
File: R-3427, Amended

**Subject: Re: R-3427 Natural Stream Design (NSD)**

**Date:** Tue, 07 Sep 2004 13:39:38 -0400

**From:** Brian Wrenn <brian.wrenn@ncmail.net>

**To:** "Carla S. Dagnino" <cdagnino@dot.state.nc.us>

Thanks for the information Carla. The attached monitoring data is sufficient.

Brian

Carla S. Dagnino wrote:

>Hi Brian,  
>Please see the attachment. This monitoring plan will be included  
>in the new permit application. We have used this plan for NSD  
>projects recently. Please let me know if it fits what you have  
>in mind for this project.  
>Also, your request for specifics on the NSD are incorporated in  
>the morphological table that was submitted with the permit  
>drawings. The table notes at the bottom that the existing channel  
>is a roadside ditch. Variables are listed for the proposed reach  
>and reference reach.  
>I will be getting some information from our hydro folks to  
>hopefully answer some of your questions about the ditches and  
>slowing down velocity.  
>  
>Please let me know if you need additional information for NSD on  
>this project.  
>Thanks.  
>Carla  
>



**Subject: NSD plan**

**Date:** Thu, 16 Sep 2004 14:44:56 -0400

**From:** Brian Wrenn <brian.wrenn@ncmail.net>

**To:** "Carla S. Dagnino" <cdagnino@dot.state.nc.us>

Carla,  
what you have provided on the NSD plan is adequate. Thanks  
B

## UT Dry Branch, TIP No. R-3427

AS-BUILT SURVEY: The permittee shall complete an as-built channel survey for the site within sixty days of completion of the stream mitigation construction. The permittee shall document changes in the dimension, pattern, profile, vegetation plantings, and structures installed, of the constructed channel from the proposed design. The permittee shall also include in the as-built surveys: photo documentation at representative segments and structures; and plan view diagrams.

MONITORING SCHEDULE: The permittee shall perform the following components of Level I monitoring each year of a 5-year monitoring period: Reference photos; plant survival (i.e., identify specific problem areas (missing, stressed, damaged or dead plantings), estimated causes, and proposed/required remedial action); visual inspection of channel stability. Physical measurement of channel stability/morphology will not be required. The permittee shall submit the monitoring reports to the Corps of Engineers, Raleigh Regulatory Field Office Project Manager, within sixty days after completing the monitoring. If less than two bankfull events occur on either site during the first 5 years, the permittee shall continue monitoring that site until the second bankfull event is documented. The bankfull events must occur during separate monitoring years for each site. In the event that the required bankfull events do not occur during the five-year monitoring period, the Corps of Engineers, in consultation with the resource agencies, may determine that further monitoring is not required. It is suggested that all bankfull occurrences be monitored and reported through the required monitoring period. The permittee shall perform and submit photo documentation for each site twice each year (summer and winter) for the 5-year monitoring period, and for any subsequently required monitoring period.

MONITORING DATA REPORT: The permittee shall include the following information in the Level I monitoring report for each site: reference photos; plant survival notes and recommendations, as appropriate; and a report on the visual inspection of channel stability. Physical measurements of channel stability/morphology will not be required. The permittee shall complete the Monitoring Data Record, Sections 1, 2, and 3 (pages 1, 2, and 3 attached), for each representative segment of the channels, and for each year of monitoring (twice each year for each site, summer and winter, for reference photos). The permittee shall include in the monitoring reports a discussion of any deviations from as-built and an evaluation of the significance of these deviations and whether they are indicative of a stabilizing or destabilizing situations.

STREAM MITIGATION SUCCESS CRITERIA: The mitigation success criteria, and required remediation actions, will be generally based on the attached Appendix II, and the Photo Documentation, Ecological Function, and Channel Stability criteria in the “Stream Mitigation Guidelines”, dated April, 2003 (available on the internet at [http://www.saw.usace.army.mil/wetlands/Mitigation/stream\\_mitigation.html](http://www.saw.usace.army.mil/wetlands/Mitigation/stream_mitigation.html)), pages 24 and 25 under “Success Criteria”.

Monitoring Data Record

Project Title: \_\_\_\_\_ COE Action ID: 200221216  
Stream Name: \_\_\_\_\_ DWQ Number: \_\_\_\_\_  
City, County and other Location Information: \_\_\_\_\_  
Date Construction Completed: \_\_\_\_\_ Monitoring Year: ( ) of 5  
Ecoregion: \_\_\_\_\_ 8 digit HUC unit \_\_\_\_\_  
USGS Quad Name and Coordinates: \_\_\_\_\_

**Rosgen Classification:** \_\_\_\_\_

Length of Project: \_\_\_\_\_ Urban or Rural: \_\_\_\_\_ Watershed Size: \_\_\_\_\_  
Monitoring DATA collected by: \_\_\_\_\_ Date: \_\_\_\_\_

**Applicant Information:**

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Telephone Number: \_\_\_\_\_ Email address: \_\_\_\_\_

**Consultant Information:**

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Telephone Number: \_\_\_\_\_ Email address: \_\_\_\_\_

**Project Status:** \_\_\_\_\_  
\_\_\_\_\_

---

---

**Monitoring Level required by COE and DWQ (404 permit/ 401 Cert.):** Level 1 2 3  
Monitoring Level 1 requires completion of *Section 1, Section 2 and Section 3*

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Section 1. PHOTO REFERENCE SITES  
(Monitoring at all levels must complete this section)

**Attach site map showing the location and angle of all reference photos with a site designation (name, number, letter, etc.)** assigned to each reference photo location. Photos should be provided for all structures and cross section locations, should show both banks and include an upstream and downstream view. Photos taken to document physical stability should be taken in winter. Photos taken to document vegetation should be taken in summer (at representative locations). Attach photos and a description of each reference photo or location. We recommend the use of a photo identification board in each photo to identify location.

**Total number of reference photo locations at this site:** \_\_\_\_\_  
**Dates reference photos have been taken at this site:** \_\_\_\_\_

**Individual from whom additional photos can be obtained (name, address, phone):** \_\_\_\_\_

Other Information relative to site photo reference: \_\_\_\_\_

---

If required to complete Level 3 monitoring only stop here; otherwise, complete section 2.

**Section 2. PLANT SURVIVAL**

**Attach plan sheet indicating reference photos.**

Identify specific problem areas (missing, stressed, damaged or dead plantings):

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---

---

Estimated causes, and proposed/required remedial action: \_\_\_\_\_

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ADDITIONAL COMMENTS: \_\_\_\_\_

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If required to complete Level 1 and Level 2 monitoring only stop here; otherwise, complete section 3.

**Section 3. CHANNEL STABILITY**

**Visual Inspection:** The entire stream project as well as each in-stream structure and bank stabilization/revetment structure must be evaluated and problems addressed.

Report on the visual inspection of channel stability. Physical measurements of channel stability/morphology will not be required. Include a discussion of any deviations from as-built and an evaluation of the significance of these deviations and whether they are indicative of a stabilizing or destabilizing situation.

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Date Inspected	Station Number	Station Number	Station Number	Station Number	Station Number
Structure Type					
Is water piping through or around structure?					
Head cut or down cut present?					
Bank or scour erosion present?					
Other problems noted?					

**NOTE:** Attach separate narrative sheets to each monitoring report describing/discussing the overall monitoring results. Include the identification of specific problem areas/channel failures, estimated cause and proposed/required remedial action. This should include a brief discussion of any parameter that has changed significantly from as-built.

**QUALITATIVE INDIRECT AND  
CUMULATIVE EFFECTS ASSESSMENT**

**US 601 Widening**

**TIP R-3427**

**Yadkin County, North Carolina**

Prepared for  
North Carolina Department of Transportation  
Office of Human Environment

***Prepared by:***

***HNTB North Carolina, PC***

*2108 South Boulevard  
Suite 108  
Charlotte, North Carolina 28203*

September 15, 2004





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**North Carolina Department of Transportation  
Office of Human Environment****Qualitative Indirect and Cumulative Effects (ICE)  
TIP R-3427, Yadkin County****I. EXECUTIVE SUMMARY**

The NCDOT proposes to widen the two-lane US 601 facility from the southern limits of Yadkinville to the Davie County border. Lane widths are proposed to be increased from 10 feet to 12 feet throughout the project corridor. A short portion of the roadway will be widened to three lanes in the vicinity of the US 601/Courtney-Huntsville Road intersection. Turn lanes will be added to US 601 at the Hoots Road, Old Stage Road, and Courtney-Huntsville Road intersections. In addition, Bridge No. 30 over South Deep Creek will be replaced.

**Existing Conditions**

- Land along US 601 between Yadkinville and Davie County is predominantly rural with a combination of scattered single-family residential and agricultural uses. A few industries are located between the Foster Road and Courtney-Huntsville Road intersections.
- Population in the Demographic Area grew by 10.2% between 1990 and 2000, less than Yadkinville (11.6%), Yadkin County (19.2%), and the State of North Carolina (21.4%).
- According to data from the North Carolina Employment Security Commission, employment in Yadkin County increased by 29.2% (2,165 jobs) between 1990 and 2003. Most of the growth was experienced in the Health Care and Social Assistance employment sector (634 jobs).
- Recent commercial development activity in Yadkin County has been taking place along the US 421 corridor near I-77, while residential development is more prominent in eastern Yadkin County because of its proximity to Winston-Salem.
- The critical area of the WS-III South Deep Creek watershed intersects US 601 where it meets South Deep Creek just south of Hoots Road. Based on the Yadkin County Watershed Protection Ordinance, development within this critical area is limited to 1 dwelling unit per acre or 12% built-upon area.

**Potential Indirect and Cumulative Effects**

- Any intraregional land development location decisions should take place more as a result of the physical location of this portion of US 601 (proximity to interstates, Winston-Salem, etc.) and not because of three new turn lanes and an additional two feet of pavement being added to each travel lane.
- Since TIP R-3427 does not add any traffic capacity to US 601 (widening of existing lanes), it should create little, if any, travel time savings.

- According to the local planning community in Yadkin County, as well as the analysis of demographic characteristics, employment trends, local land use and transportation plans, and a qualitative/quantitative assessment of impact-causing conditions, it was determined that the construction of TIP R-3427 has a low potential for generating induced growth.
- Potential water quality effects from TIP R-3427 will be minimized since future development along Hoots Road and along US 601 just south of the Hoots Road and US 601 intersection is restricted by the development regulations stipulated in Yadkin County's Watershed Protection Ordinance.

## **II. PROJECT DOCUMENTATION AND BACKGROUND**

TIP R-3427 is a proposed upgrade to the two-lane US 601 facility in Yadkin County from the southern town limits of Yadkinville to the Davie County border. The project consists of widening the existing 10-foot lanes to 12-foot lanes throughout the project corridor, and widening to three lanes in the Courtney Huntsville Road (SR 1001) vicinity (see Figure 1). Turn lanes are proposed at the intersections of US 601 and Lone Hickory Road (SR 1002), US 601 and Old Stage Road (SR 1733), US 601 and Courtney Huntsville Road, and US 601 and Hoots Road (SR 1150). In addition, Bridge No. 30 over South Deep Creek will be replaced, and a temporary onsite detour will be constructed adjacent to the existing bridge, 100 feet west of US 601.

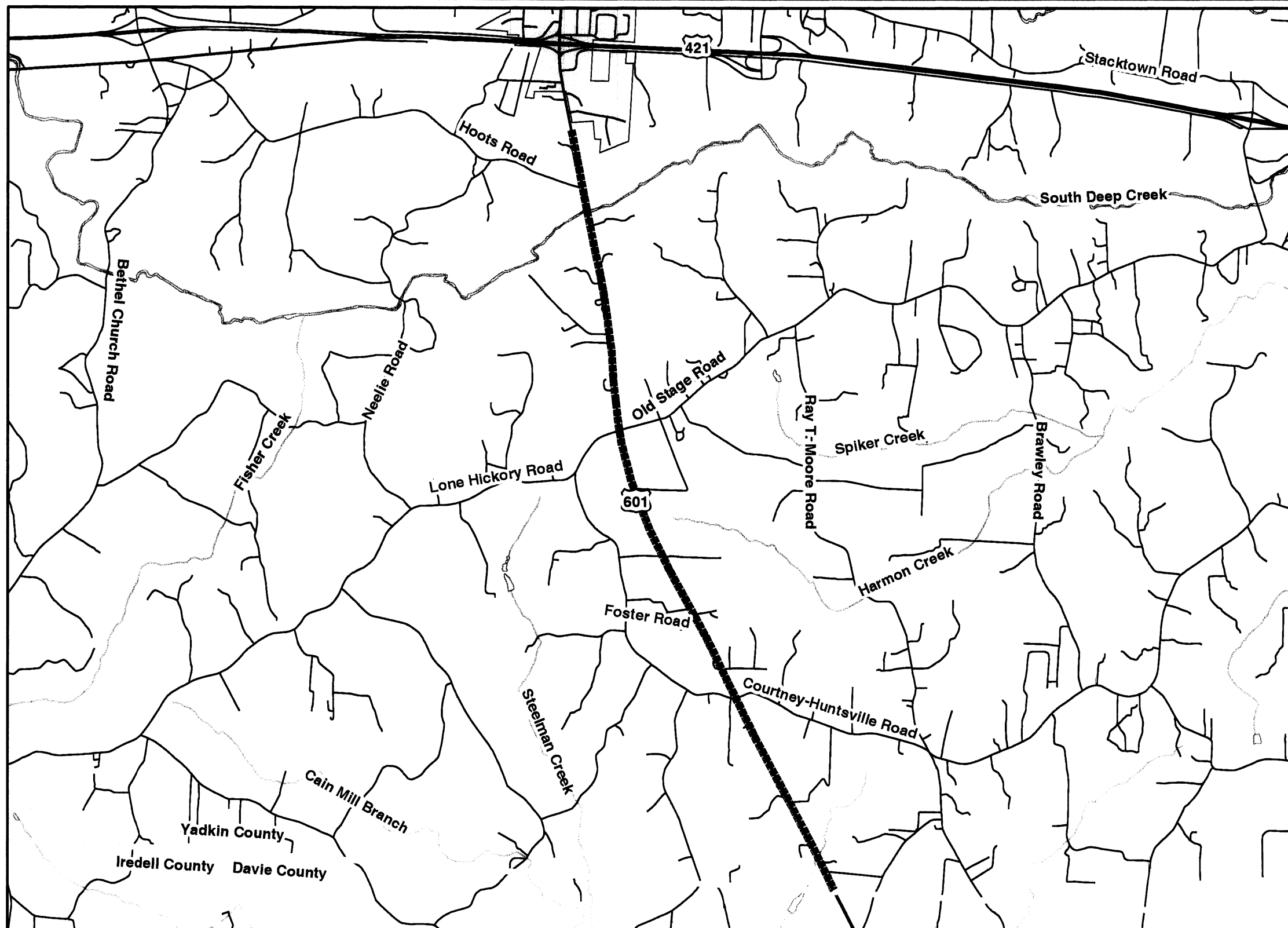
Existing US 601 in this area consists of poor vertical alignment and hilly terrain, contributing to 272 accidents per 100 million vehicle miles traveled, according to data compiled by the NCDOT between 1995 and 1998. The average statewide accident rate per 100 million vehicle miles traveled on rural, two-lane US routes was 193. The purpose of TIP R-3427 is to improve safety along this section of US 601.

The project is included in the NCDOT 2004-2010 Transportation Improvement Program (TIP). Total length of the project is approximately 5 miles. The existing right-of-way is 36 feet, while the proposed right-of-way is approximately 80 feet, an additional 22 feet on each side of the roadway. Access control along this section of US 601 currently does not exist, nor is it proposed as part of TIP R-3427. The posted speed limit, which varies between 35 mph and 55 mph, will not change. Right-of-way acquisition is currently taking place, with construction scheduled for FFY 2004.

## **III. STUDY AREA BOUNDARIES**

### **Identification of Demographic Area**

TIP R-3427 is located in Yadkin County in northern North Carolina. A Demographic Area for the project was delineated in order to analyze the population growth trends surrounding the project (see Figure 2). This area is generally bounded to the south by Courtney Huntsville Road, SR 1727, the Yadkin County border with Davie County, Rome Anthony Road, and Lone Hickory Road, to the west by Bethel Church Road and Reavis Road, to the north by SR 1314, Main Street, and SR 1605, and to the east by



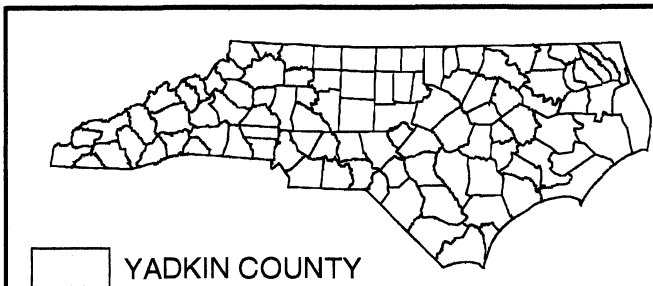
**FIGURE 1 - TIP R-3427**

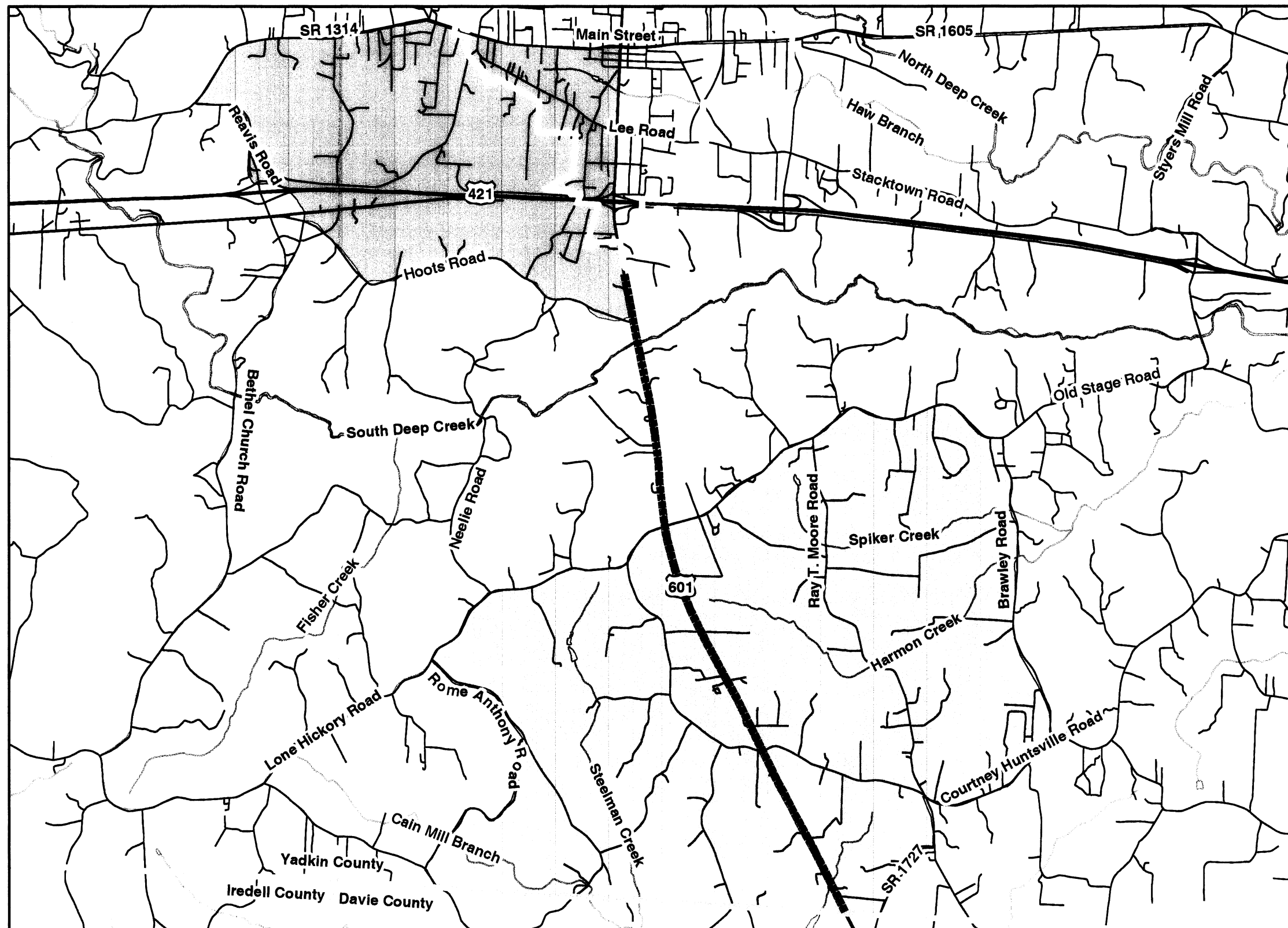
- TIP R-3427
- HIGHWAYS
- ROADS
- RAILROAD
- WATER BODIES
- RIVERS/CREEKS
- YADKINVILLE

0 0.375 0.75 1.5 Miles

N

MAP SOURCES:  
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
ENVIRONMENTAL SYSTEMS RESEARCH INSTITUTE (ESRI)  
HNTB



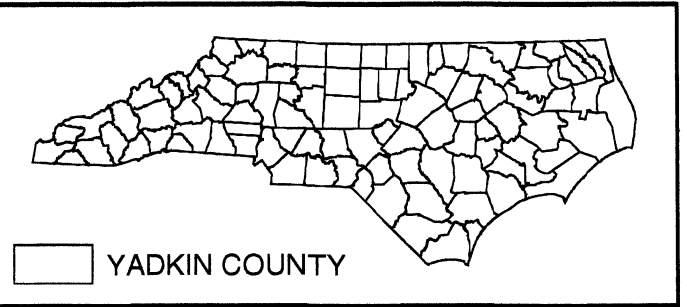


### FIGURE 2 - TIP R-3427 DEMOGRAPHIC AREA

- TIP R-3427
- HIGHWAYS
- ROADS
- RAILROAD
- WATER BODIES
- RIVERS/CREEKS
- YADKINVILLE
- CT 505, BG 13
- CT 505, BG 14
- CT 505, BG 15
- CT 505, BG 23



MAP SOURCES:  
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
ENVIRONMENTAL SYSTEMS RESEARCH INSTITUTE (ESRI)  
US CENSUS BUREAU  
HNTB



Styers Mill Road, Old Stage Road, and Brawley Road. Based on the 2000 Census, Census Tract 505, Block Groups 13, 14, 15, and 23 have been included in the Demographic Area for TIP R-3427.

#### IV. STUDY AREA DIRECTION AND GOALS

##### Regional Location

Yadkin County is located in northern North Carolina, with its eastern boundary approximately 15 miles west of downtown Winston-Salem. The north-south I-77 traverses the western portion of the county, with east-west US 421 connecting I-77 to I-40 in Winston-Salem. Yadkinville, located in the heart of the county at the intersection of US 421 and US 601, is the county seat. With the convenient interstate access and proximity to urban centers such as Charlotte, Winston-Salem, and Greensboro, Yadkin County is a prime location for distribution-oriented industries as well as commuters that work in Winston Salem.

Historically, the Yadkin River has had a major influence on development patterns in Yadkin County. Forming the northern and eastern border of Yadkin County, the river eventually flows into High Rock Lake in Davidson County before it changes names to the Pee Dee River south of Lake Tillery in Stanly County. It is one of the longest rivers in the State of North Carolina.

##### Demographic and Employment Trends

Table 1 shows population growth trends for the Demographic Area, Yadkinville, Yadkin County, and North Carolina. Population in the Demographic Area grew by 10.2% between 1990 and 2000, slightly less than the Town of Yadkinville (11.6%) and much less than Yadkin County (19.2%) and the State of North Carolina (21.4%). According to local planners, much of the growth that occurred in Yadkin County during this timeframe was located in eastern Yadkin County, where residents can take advantage of the close proximity to Winston-Salem.

**Table 1. Population Growth, 1990-2000**

Area	Population		Growth, 90-00	
	1990	2000	#	%
Demographic Area	4,578	5,043	465	10.2%
Yadkinville	2,525	2,818	293	11.6%
Yadkin County	30,488	36,348	5,860	19.2%
North Carolina	6,628,637	8,049,313	1,420,676	21.4%

Source: US Census Bureau





According to data from the North Carolina Employment Security Commission, employment in Yadkin County increased by 29.2% (2,165 jobs) between 1990 and 2003 (see Table 2). The Administrative and Waste Services and the Transportation and Warehousing employment sectors experienced the largest percentage increases at 434.2% and 374.5%, respectively. The Health Care and Social Assistance sector added the most jobs (634) to the economy of all sectors. Only the Manufacturing sector lost employment during this time frame. As mentioned earlier, Yadkin County's location provides distribution-oriented industry good proximity to urban centers and interstates, which may explain the large increase in transportation and warehousing jobs.

**Table 2. Employment By Sector Growth, Yadkin County**

Sector	Employment		Change, '90-'03	
	1990	2003	#	%
Agriculture, Forestry, Fishing & Hunting	48	59	11	22.9%
Mining	N/A	N/A	N/A	N/A
Utilities	N/A	N/A	N/A	N/A
Construction	424	575	151	35.6%
Manufacturing	2,852	2,367	-485	-17.0%
Wholesale Trade	136	276	140	102.9%
Retail Trade	734	1,139	405	55.2%
Transportation and Warehousing	94	446	352	374.5%
Information	137	221	84	61.3%
Finance and Insurance	113	171	58	51.3%
Real Estate and Rental and Leasing	28	33	5	17.9%
Professional and Technical Services	101	167	66	65.3%
Management of Companies and Enterprises	*	*	N/A	N/A
Administrative and Waste Services	38	203	165	434.2%
Educational Services	N/A	N/A	N/A	N/A
Health Care and Social Assistance	448	1,082	634	141.5%
Arts, Entertainment, and Recreation	47	*	N/A	N/A
Accommodation and Food Services	599	929	330	55.1%
Other Services, Ex. Public Administration	102	201	99	97.1%
Unclassified	N/A	7	N/A	N/A
Government	1,515	1,621	106	7.0%
<b>Total**</b>	<b>7,421</b>	<b>9,586</b>	<b>2,165</b>	<b>29.2%</b>

Source: North Carolina Employment Security Commission (NCESC)

\* - Indicates disclosure suppression

N/A - Not Applicable

\*\* - Totals include data for \* sectors

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

Sector	Employment		Change, '90-'03	
	1990	2003	#	%
Agriculture, Forestry, Fishing & Hunting	21,827	30,422	8,595	39.4%
Mining	3,993	3,976	-17	-0.4%
Utilities	26,626	14,112	-12,514	-47.0%
Construction	166,733	211,121	44,388	26.6%
Manufacturing	820,239	602,017	-218,222	-26.6%
Wholesale Trade	139,697	162,750	23,053	16.5%
Retail Trade	377,026	431,925	54,899	14.6%
Transportation and Warehousing	82,772	108,410	25,638	31.0%
Information	57,615	75,357	17,742	30.8%
Finance and Insurance	102,412	137,797	35,385	34.6%
Real Estate and Rental and Leasing	32,488	47,143	14,655	45.1%
Professional and Technical Services	89,618	145,953	56,335	62.9%
Management of Companies and Enterprises	35,104	61,193	26,089	74.3%
Administrative and Waste Services	108,590	211,244	102,654	94.5%
Educational Services	22,091	46,339	24,248	109.8%
Health Care and Social Assistance	203,641	363,400	159,759	78.5%
Arts, Entertainment, and Recreation	27,952	45,594	17,642	63.1%
Accommodation and Food Services	205,943	291,530	85,587	41.6%
Other Services, Ex. Public Administration	77,172	96,446	19,274	25.0%
Unclassified	*	7,943	N/A	N/A
Government	476,906	625,966	149,060	31.3%
<b>Total**</b>	<b>3,079,017</b>	<b>3,720,638</b>	<b>641,621</b>	<b>20.8%</b>

Source: North Carolina Employment Security Commission (NCESC)

\* - Indicates disclosure suppression

N/A - Not Applicable

\*\* - 1990 total does include data for \* sectors

When compared to the State as a whole, Yadkin County employment grew at a faster pace between 1990 and 2003. A larger percentage (26.6%) of manufacturing jobs were lost throughout North Carolina, and the State's high growth sectors, such as Educational Services (109.8% growth) and Administrative and Waste Services (95.6% growth), did not grow as rapidly as Yadkin County's high growth sectors.

### **Existing Land Use**

Land along the TIP R-3427 portion of US 601 is predominantly rural with a combination of large lot single-family residential uses and agricultural uses (farms, pasture land, crop fields). The Yadkinville Water/Wastewater Treatment Plant is located at US 601 and Hoots Road. South of the US 601 and Old Stage Road intersection, particularly surrounding the US 601 and Foster Road intersection, a few light industrial businesses exist, including HIBCO Plastics and Reavis Welding. A couple small businesses also exist surrounding the US 601 and Courtney-Hunstville Road intersection, including the Steelman Milling Company and a locally-owned gas station. Between that intersection and the Davie County border, land is mostly forested with some sporadic single-family homes and agricultural uses.

### **Local Plans and Regulations**

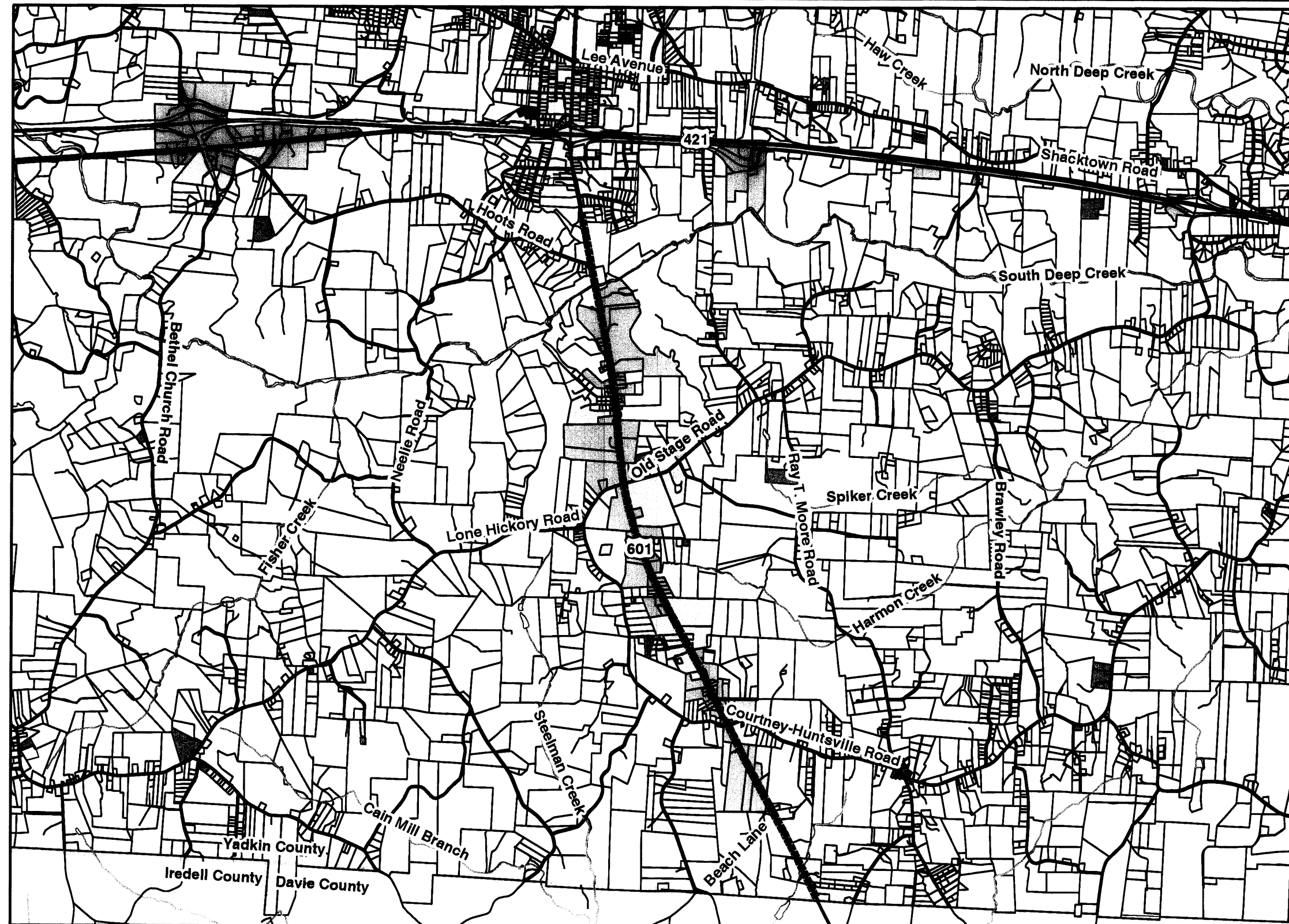
#### **Land Use**

The Yadkin County Land Use Plan was adopted in August 2001. Of the top ten land use concerns, three related to growth issues: availability of water and sewer services, maintaining a strong commitment to protecting farmland, and slower to moderate population growth. The majority of the US 601 corridor between Yadkinville and the Davie County border is designated as a Transition Area for Yadkin County, which is defined as providing for future intensive urban development on lands that are most likely to be scheduled for the provision of necessary public utilities and services. The characteristics of Transition Areas include land necessary to accommodate population growth for the next ten to fifteen year period. The future residential population density for this corridor is characterized as moderate to high density.

#### **Zoning**

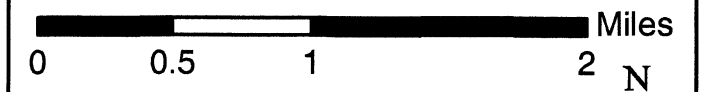
Although most of the land along US 601 between Yadkinville and the Davie County border is currently being used as agriculture and single-family residential, the highway business and manufacturing zoning districts dominate the corridor (see Figure 3). In fact, all of the parcels, except maybe two or three, which front US 601 between South Deep Creek and a little over a half mile from the Davie County border are zoned for commercial or industrial use.

Zoning south of Beach Road is Residential Agriculture, while zoning between South Deep Creek and the Yadkinville town limits, which actually is considered to be within Yadkinville's extra territorial jurisdiction (ETJ), is depicted as Residential Agriculture by Yadkin County, but in essence is more commercial-based according to the site visit in Yadkinville (no zoning GIS data was available for Yadkinville).

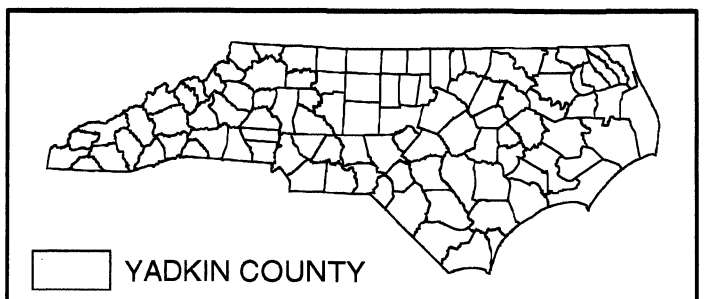


### FIGURE 3 - TIP R-3427 YADKIN COUNTY ZONING

- TIP R-3427
- HIGHWAYS
- ROADS
- RAILROAD
- WATER BODIES
- RIVERS/CREEKS
- YADKINVILLE
- CONSERVATION
- RESIDENTIAL AGRICULTURE
- MEDIUM-DENSITY HOUSING
- MULTI-FAMILY HOUSING
- MOBILE HOME PARK
- COMMUNITY BUSINESS
- HIGHWAY BUSINESS
- MANUFACTURING



MAP SOURCES:  
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
ENVIRONMENTAL SYSTEMS RESEARCH INSTITUTE (ESRI)  
YADKIN COUNTY  
HNTB



### **Environmental Regulations (Water Resources)**

The TIP R-3427 portion of US 601 is located within the Yadkin River basin. According to the March 2003 Yadkin River Basinwide Plan, the project is located within the 03-07-02 Subbasin. This subbasin extends from the North Carolina-Virginia border to Davidson County, just south of the Town of Clemmons. According to the plan, there are no impaired surface waters within the entire subbasin. This finding was also confirmed by conducting an inventory of 303(d) impaired water bodies listed within the NC Department of Environment and Natural Resources Draft 2004 Impaired Waters list.

According to the Basinwide Plan, North Deep Creek is impacted by habitat degradation, primarily sedimentation, elevated turbidity, and high concentrations of fecal coliform, predominantly north of the Yadkinville Waste Water Treatment Plant. The plan also mentions that the recent widening of US 421 through Yadkinville possibly negatively impacted South Deep Creek mainly through increased sedimentation.

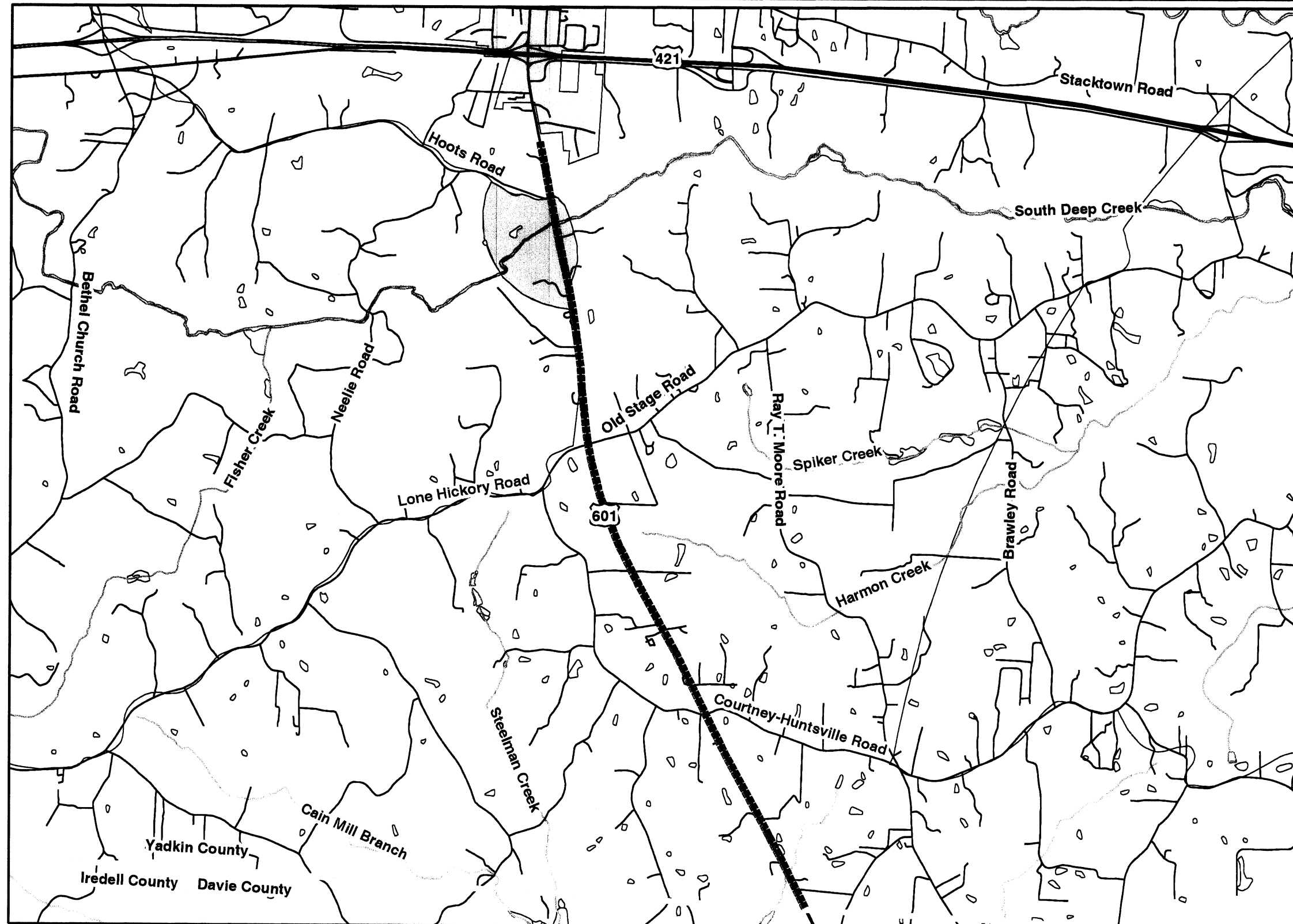
US 21 and US 601 also traverse the South Deep Creek watershed boundaries. Moderate habitat degradation was observed in this watershed by the North Carolina Department of Environment and Natural Resources (DENR) Division of Water Quality (DWQ) staff, mostly in the form of stream bank erosion. Turbidity was also elevated. The plan specified that local actions are needed to reduce sedimentation, turbidity, and fecal coliform and to promote the production of in stream habitat by restoring riparian vegetation throughout the watershed.

According to the DWQ, as a result of new stormwater rules enacted by EPA in 1999, construction or land development activities that disturb one acre of land or more require a Phase II NPDES stormwater permit and a site plan. An erosion and sediment control plan must also be developed for these sites under the state's Sedimentation Pollution Control Act (SPCA) administered by the NC Division of Land Resources. Best Management Practices (BMPs), which include activities, practices, and procedures undertaken to prevent or reduce water pollution, such as: on-site detention areas, vegetative buffers, culverts, and erosion control, are required for future development that disturbs less than one acre.

There are two water supply watersheds located in the area surrounding TIP R-3427. The South Deep Creek WS-III watershed encompasses much of the southeastern portion of Yadkin County west of US 601 (see Figure 4). The critical area of this watershed actually intersects US 601 where it meets South Deep Creek. According to DWQ, development within this critical area is limited to 1 dwelling unit per acre or 12% built-upon area for the low-density option. For the high-density option, which requires developers to control for the 1" storm, between 12% and 30% built-upon area is allowable. However, within Yadkin County's 1994 Watershed Protection Ordinance, the high-density option is not permitted. Therefore, only the low-density option is applicable to the critical area of WS-III watersheds in Yadkin County.

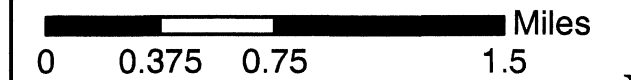
The same is the case with the balance of the watershed (green-shaded area on Figure 4). According to DWQ, a total of 2 dwelling units per acre or 24% built-upon area is



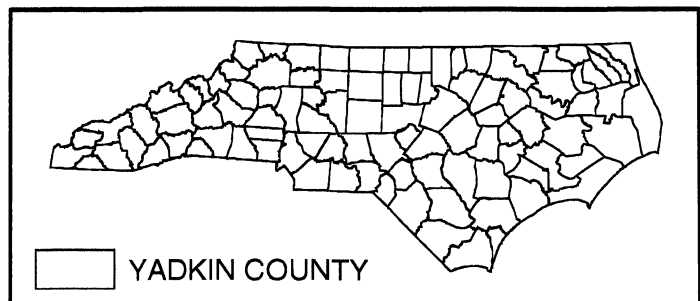


**FIGURE 4 - TIP R-3427  
 WATER RESOURCES**

- TIP R-3427
- HIGHWAYS
- ROADS
- +— RAILROAD
- WATER BODIES
- RIVERS/CREEKS
- YADKINVILLE
- SOUTH DEEP CREEK WS-III
- YADKIN RIVER WS-IV
- WS-III CRITICAL AREA
- WETLANDS



MAP SOURCES:  
 NC DEPARTMENT OF TRANSPORTATION  
 ENVIRONMENTAL SYSTEMS RESEARCH INSTITUTE (ESRI)  
 NC DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES  
 NATIONAL WETLANDS INVENTORY  
 HNTB



permitted for the low-density option, with 24% to 50% built-upon area allowable for the high-density option. However, Yadkin County only permits the low-density option. In addition, the 10/70 Provision, which permits 10% of the balance of the watershed to be developed at 70% built-upon area on a project by project basis, is allowed by both the State and Yadkin County.

The Yadkin River WS-IV watershed is located to the east of US 601 and is highlighted in yellow on Figure 4. There is no critical area identified for this particular water supply watershed. Based on Yadkin County's Watershed Protection Ordinance, development within the balance of the watershed is limited to 2 dwelling units per acre or 24% built-upon area, with 36% built-upon area allowable for development projects without a curb and gutter street system. Similar to WS-III watersheds, the 10/70 Provision is allowed within the balance of this watershed.

Other water-oriented environmental regulations potentially applicable to TIP R-3427 include wetlands protection. As can be seen on Figure 4, there are a limited number of wetlands surrounding the project. All wetlands are protected by the provisions of Section 404 of the Clean Water Act. As part of this Act, a permit will be required from the U.S. Army Corps of Engineers for any potential discharge of dredged or fill material into "Waters of the United States" (which includes wetlands). In addition, BMPs would be required for any new development resulting from TIP R-3427 that could potentially have wetland impacts.

### **Transportation**

The NCDOT is currently working in conjunction with local planners to adopt a local transportation plan. The plan is anticipated to be adopted later this year, and includes the US 601 widening as a necessary project. In addition, the adopted Yadkin County Land Use Plan (August, 2001) lists TIP R-3427 as a project included in the 2004-2010 NCDOT Transportation Improvement Program. According to the NCDOT website, there are no other TIP projects in the area surrounding TIP R-3427. The only thoroughfare plan for the area is the Yadkinville Thoroughfare Plan, which was adopted in 1983. It does not identify the US 601 widening as a needed project.

## **V. ACTIVITIES THAT CAUSE EFFECTS**

### **Previous Report Conclusions**

#### **2002 Categorical Exclusion**

In terms of potential indirect and cumulative effects, the 2002 Categorical Exclusion concludes the following:

- TIP R-3427 could spur economic development along the US 601 corridor, particularly surrounding the US 601/US 421 interchange.
- Yadkin County should consider the cumulative effects of development related to TIP R-3427, particularly along US 601 from US 421 to Old Stage Road, on the South Deep Creek watershed and the water supply reservoir.

- Although TIP R-3427 is consistent with the Yadkin County Land Use Plan, it may conflict with the County's proposed goals of maintaining open space and rural character if future development is not controlled with progressive land use policies.

### **Recent Development Activity**

According to local planners, most of the recent development within Yadkin County has been occurring along US 421 near I-77 (particularly commercial) and in eastern Yadkin County in close proximity to Winston-Salem (particularly residential). These areas provide industry more convenient access to the interstate network and Winston-Salem commuters less travel time to and from employment destinations.

According to the 2002 Categorical Exclusion and local planners, the relocation of the UNIFI plant to northern Davie County may affect the US 601 corridor in Yadkin County, as truckers and other business people will travel along the TIP R-3427 portion of US 601 to and from US 421 to get to the new facility. It could also create an attractive market for UNIFI suppliers to locate in the vicinity.

## **VI. POTENTIAL INDIRECT AND CUMULATIVE EFFECTS FOR ANALYSIS**

The North Carolina DOT, in their April 2001 handbook titled *Guidance for Assessing Indirect and Cumulative Impacts of Transportation Projects in North Carolina*, outlines a set of factors that need to be evaluated to determine whether or not a more detailed indirect and cumulative impact analysis (ICI) may be necessary for specific projects. The following is an assessment of those factors as they relate to TIP R-3427.

### **Conflict with local plan:**

As was mentioned before, TIP R-3427 is identified as a necessary project within the transportation section of the Yadkin County Land Use Plan, adopted in August 2001. It is also included as a necessary project in the soon to be adopted Yadkin County Transportation Plan.

### **Explicit economic development purpose:**

TIP R-3427 should improve safety along US 601 from the Davie County border to the Yadkinville southern city limits. Based on the site visit and conversations with local planners with respect to county growth patterns, the project does not seem to have an explicit economic development purpose.

### **Planned to serve specific development:**

There is minimal development located along the TIP R-3427 portion of US 601. Most of the traffic along the route seems to be through-traffic destined for US 421 and/or I-40 in Davie County. It is anticipated that the newly relocated UNIFI plant along US 601 in northern Davie County should generate more traffic along US 601. However, the above average accident rates seem to be more than enough justification to widen US 601 strictly from a safety perspective.

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

The assessment of this factor involves an evaluation of a subset of factors commonly used to determine the potential for growth resulting from transportation projects surrounding rural interchanges including:

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

The TIP R-3427 portion of US 601 is predominantly located within a rural area of Yadkin County, although it is only an estimated 10-minute drive to I-77 and a 20-minute drive to downtown Winston-Salem, the closest urban center to the project. Vehicles per day (VPD) forecasted growth along intersecting roadways (see Figure 1) is as follows:

- | <u>1999</u>                            | <u>2025</u>                            |
|--|--|
| • <b>Courtney-Huntsville Rd:</b> 2,500 | • <b>Courtney-Huntsville Rd:</b> 5,400 |
| • <b>Old Stage Rd:</b> 2,000           | • <b>Old Stage Rd:</b> 4,300           |
| • <b>Lone Hickory Rd:</b> 2,000        | • <b>Lone Hickory Rd:</b> 4,300        |
| • <b>Hoots Road:</b> 1,000             | • <b>Hoots Road:</b> 2,200             |

These traffic growth forecasts indicate that most volumes along intersecting roadways are expected to at least double over the next twenty five years. However, according to typical capacity levels of two-lane, rural highways, these traffic volumes seem relatively low.

There are no frontage/service roads proposed as part of TIP R-3427.

As was mentioned before, there is an existing Yadkinville sewer trunk line that provides service along both sides of US 601 from Yadkinville to Courtney-Huntsville Road. Yadkin County has plans to install a water line in the same area. No public water service is currently available outside of the ETJ of Yadkinville. GIS data for water and sewer lines was not available.

**Likely to influence intraregional land development location decisions:**

Typically, if the conditions are favorable for development and/or a region is currently undergoing urbanization, a modification to the transportation infrastructure is likely to influence where development will occur. As a result of sewer service, convenient access to federal highways and interstates, close proximity to Winston-Salem, and high traffic volumes (currently operating at a level of service C and E, depending on the location), conditions within the majority of the area surrounding TIP R-3427 are favorable for development.

However, travel time savings will be very minimal as a result of the project, and this portion of US 601 is not currently undergoing urbanization, as is evident by the lower than the State average population growth rate between 1990 and 2000. Any intraregional land development location decisions should take place more as a result of the physical location of this portion of US 601, and not because of three new turn lanes and an additional two feet of pavement being added to each travel lane.

**Notable features present:**

The critical area of the South Deep Creek Water Supply Watershed surrounds much of the intersection of US 601 and Hoots Road along the northern section of TIP R-3427. Also present along the project corridor is the John H. Hauser Farmstead, eligible for listing in the National Register of Historic Places. It is located along the eastern side of US 601 just south of the Yadkinville Water/Wastewater Treatment Plant. According to the 2002 Categorical Exclusion, through right-of-way acquisition, TIP R-3427 will require 1.32 acres of the farmstead property. However, the State Historic Preservation Officer concurred with the determination of no effect in the concurrence form dated March 19, 2002.

**VII. INDIRECT AND CUMULATIVE EFFECTS**

**Potential For Land Use Change**

To further evaluate whether indirect and cumulative effects would likely result from TIP R-3427, an analysis of a set of quantitative factors was completed. This analysis helps to determine the potential for land use change as a result of the project. Table 4 on the following page indicates the results of this rating analysis.

Since TIP R-3427 does not add any traffic capacity to US 601 (widening of existing lanes), it should also not create travel time savings. Because this is a widening project and not a new location project, and the fact that access to land along US 601 is not being altered, property value fluctuations as a result of the project are also expected to be minimal. The rural nature of this portion of US 601 and low growth rates for the Demographic Area, Yadkinville, and Yadkin County (when compared to North Carolina as a whole) translate into ample land available for development along the US 601 corridor.

**Table 4. Potential For Land Use Change**

Rating	Change in Accessibility	Change in Property Values	Forecasted Growth	Land Supply vs. Land Demand	Water/Sewer Availability	Market For Development	Public Policy
<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

Sewer service is available along US 601 from Yadkinville to Courtney-Huntsville Road, with plans for water service for that same area. In terms of the market for development, there is minimal development activity taking place and this portion of US 601 is not considered a growth area for Yadkin County. Growth management strategies such as zoning ordinances and land use plans are in place as part of local planning policies.

**VIII. ANALYSIS RESULTS**

**Indirect Effects**

According to the local planning community in Yadkin County, as well as the analysis of demographic characteristics, employment trends, local land use and transportation plans, and a qualitative/quantitative assessment of impact-causing conditions, it was determined that the construction of TIP R-3427 has a low potential for generating induced growth and related effects.

Although land use plans and zoning designate this portion of US 601 as a commercial/industrial corridor, it is not located within any of the current growth areas of Yadkin County. There are only a handful of small commercial facilities located along this 5-mile corridor that could potentially attract additional development of its kind. Most of the commercial development momentum is located in western Yadkin County along US 421 near I-77 and to the south in Davie County closer to I-40. Regardless, any new businesses that may decide to locate along the R-3427 portion of US 601 are not likely to do so solely because of TIP R-3427.

The addition of turn lanes at the three major intersections (Hoots Road, Old Stage Road, and Courtney-Huntsville Road) along US 601 in southern Yadkin County may slightly

improve the marketability of land in those areas, but not necessarily to the degree at which it affects location decisions for businesses or residential developers.

**Cumulative Effects**

In order to prevent potential water quality cumulative effects that could be related to R-3427, future development along Hoots Road and along US 601 just south of the Hoots Road and US 601 intersection needs to be managed properly. Topography issues and the presence of the Yadkinville Water/Wastewater Treatment Plant limit development opportunities along the east side of US 601 near Hoots Road, but the northwest and southwest quadrants of the intersection have future development potential.

South Deep Creek and its WS-III Watershed critical area are located along the west side of US 601 from Hoots Road to the entrance to the Hauser Family Cemetery just north of Sesame Drive. The south side of Hoots Road from US 601 to US 421 is bounded by the critical area and balance of this water supply watershed. Any development related to TIP R-3427 that locates in these areas has the potential to cumulatively affect the quality of South Deep Creek. However, the potential for growth resulting from TIP R-3427 is very minimal.

Industry relocations such as the UNIFI plant in Davie County have the potential to create a market for commercial development along US 601 between US 421 and I-40. However, there were no announced industrial relocations/expansions at the time of this assessment.

Other than TIP R-3427, there are no other proposed TIP projects of any consequence within Yadkin County, Forsyth County, Davie County, or Iredell County that could potentially contribute to any cumulative development and/or water quality effects along this portion of US 601.

