



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

May 1, 2007

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

ATTENTION: Mr. William Wescott  
NCDOT Coordinator

Dear Sir:

Subject: **Nationwide 3 Permit Application and Neuse Riparian Buffer Authorization Request** for the Widening of SR 1178 (Keen Rd.) from US 301 to Allendale Road in Four Oaks and Improvement of Existing Transportation Facility Drainage; Johnston County; TIP Project R-4071; Federal Aid Project No. STP-1178(2); State Project No.8.2313201; Debit \$200 from WBS 34612.1.1.

Please find enclosed the Preconstruction Notification (PCN), permit drawings, half-size plans, and the Categorical Exclusion (CE) for the above-mentioned project. The North Carolina Department of Transportation proposes to widen SR 1178 (Keen Rd.) to a multi-lane facility from US 301 (Wellons St.) to Allendale Road in Four Oaks. The project involves adding a third lane to allow left turns and constructing a curb and gutter system along Keen Rd. The new road will feature two 12-foot travel lanes in each direction, a 12-foot center turn lane, and 4 foot paved shoulders. This project will also involve improving an existing drainage system that carries water from both on- and off-site. Temporary surface water and permanent buffer impacts arise from the replacement of existing pipes and placement of rip-rap for bank stabilization. Proposed impacts include 0.01 acre of temporary surface water impacts and 1,936 square feet of Neuse riparian buffer impacts.

### Impacts to Water of the United States

General Description: The surface water receiving impacts on this project is an unnamed tributary (UT) to Juniper Swamp, which is located in the 03020201 CU of the Neuse River Basin. The NC Division of Water Quality (NCDWQ) has assigned Juniper Swamp a Stream Index Number of 27-52-6-6 and a best usage classification of C NSW.

Juniper Swamp is not designated as a North Carolina Natural or Scenic River, or as a National Wild and Scenic River, nor is it listed as a 303(d) stream. No designated Outstanding Resource Waters (ORW), High Quality Waters (HQW), Water Supply I (WS-I), or Water Supply II (WS-II) waters occur within 1.0 mile of the project study area.

Permanent Impacts: There are no proposed permanent impacts resulting from the proposed pipe placement.

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

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

WEBSITE: [WWW.NCDOT.ORG](http://WWW.NCDOT.ORG)

LOCATION:  
TRANSPORTATION BUILDING  
1 SOUTH WILMINGTON STREET  
RALEIGH NC

Temporary Impacts: As stated above, there is a total of 0.01 acre of temporary surface water impacts for this project. The first pipe, which occurs at the junction of the UT and road drainage being carried down Keen St., is now 24” and will be replaced with a 54” reinforced concrete pipe. The second pipe, which carries the Juniper Swamp UT under Main St., is now 36” and will be replaced with a 95x67” corrugated metal pipe. Headwalls will be constructed to prevent having to lengthen the replacement pipes.

In order to replace the pipe that carries the jurisdictional UT under Main St., the site will have to be de-watered temporarily. De-watering will occur using the pump around method, using sheet piles to isolate the work area. This method involves pumping the work area dry and discharging the downstream flow either in a silt bag or in a vegetated area outside the buffer.

Utility Impacts: There are no proposed impacts to jurisdictional resources due to utilities.

**Neuse Riparian Buffer Rules**

This project lies within the Neuse River Basin; therefore, the regulations pertaining to the Neuse River Buffer Rules will apply. There are 1,401 square feet of impacts to Zone 1 and 535 square feet of impacts to Zone 2. Impacts at sites 1 and 2 are considered exempt because they are less than 40 linear feet and associated with a road crossing. Impacts at site 3, which result from bank stabilization, are considered allowable.

**Avoidance and Minimization**

Avoidance examines all appropriate and practicable possibilities of averting impacts to "Waters of the United States". Due to the presence of surface waters within the project study area, avoidance of all impacts is not possible. The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts. Minimization measures were incorporated as part of the project design, including:

- The implementation of Best Management Practices for Protection of Surface Waters;
- The use of headwalls to minimize replacement pipe length, thereby avoiding permanent stream impacts;
- The use of rip-rap to tie the stream banks into the headwall, reducing bank scour and sedimentation effects; and
- The construction of a storm-water retention basin (in addition to grass swales) at the northern corner of Boyette Rd. and Keen St. to treat runoff from both on- and off-site that will eventually enter the Juniper Swamp UT.

**Mitigation**

Impacts to surface waters will be temporary, therefore compensatory mitigation is not proposed for this project. Additionally, all riparian buffer impacts are considered exempt or allowable and do not require mitigation.

**Federally Protected Species**

As of January 29, 2007 the US Fish and Wildlife Service (USFWS) lists five federally protected species for Johnston County. The following table lists these species.

Common Name	Scientific Name	Status	Habitat	Biological Conclusion
Red-cockaded woodpecker	<i>Picoides borealis</i>	E	No	No Effect
Bald Eagle	<i>Haliaeetus leucocephalus</i>	T*	No	No Effect
Dwarf wedge mussel	<i>Alasmidonta heterodon</i>	E	No	No Effect
Tar spiny mussel	<i>Elliptio steinstansana</i>	E	No	No Effect
Michaux’s sumac	<i>Rhus michauxii</i>	E	No	No Effect

On-site habitat descriptions and corresponding biological conclusions for these species were given in the October, 2001 Natural Resources Technical Report for this project. Site conditions stated in the NRTR have not changed; therefore, the biological conclusions are still valid.

### **Project Schedule**

The project has a scheduled let of August 21, 2007 with a review date of July 3, 2007.

### **Regulatory Approvals**

Section 404 Permit: This project is being processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance with 23 CFR 771.115(b). Therefore, we do not anticipate requesting an individual permit but propose to proceed under a Nationwide Permit 3 (67 FR 2020; January 15, 2002).

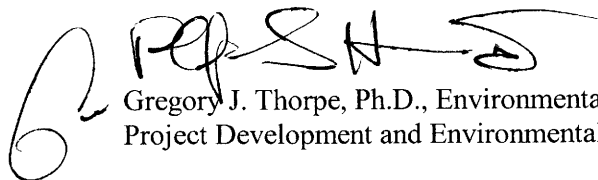
Section 401 Permit: We anticipate 401 General Certification number 3624 will apply to this project. In accordance with 15A NCAC 2H, Section .0500(a) we are providing five copies of this application to the NCDWQ for their review. In accordance with North Carolina General Statute Section 143-215.3D(e), we are providing a payment of \$200 for the processing of the 401 Water Quality Certification.

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

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

If you have any questions or need additional information, please contact Amy James at (919) 715-7216.

Sincerely,



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

#### **W/attachment:**

- Mr. John Hennessy, NCDWQ (5 copies)
- Mr. Travis Wilson, NCWRC
- Mr. Gary Jordan, USFWS
- Mr. Ron Sechler, NMFS
- Mr. Michael Street, NCDMF
- Dr. David Chang, P.E., Hydraulics
- Mr. Greg Perfetti, P.E., Structure Design
- Mr. Victor Barbour, P.E., Project Services Unit
- Mr. Mark Staley, Roadside Environmental
- Mr. Richard E. Green, Jr., P.E., Division 4 Engineer
- Mr. Jamie Guerrero, Division 4 Environmental Officer

#### **W/o attachment**

- Mr. Scott McLendon, USACE, Wilmington
- Mr. Jay Bennett, P.E., Roadway Design
- Mr. Majed Alghandour, P. E., Programming and TIP
- Mr. Art McMillan, P.E., Highway Design
- Ms. Stephanie Caudill, Planning Engineer

USACE Action ID No. \_\_\_\_\_ DWQ No. \_\_\_\_\_

(If any particular item is not applicable to this project, please enter "Not Applicable" or "N/A".)

**I. Processing**

- 1. Check all of the approval(s) requested for this project:
 

<input checked="" type="checkbox"/> Section 404 Permit	<input checked="" type="checkbox"/> Riparian or Watershed Buffer Rules
<input type="checkbox"/> Section 10 Permit	<input type="checkbox"/> Isolated Wetland Permit from DWQ
<input checked="" type="checkbox"/> 401 Water Quality Certification	<input type="checkbox"/> Express 401 Water Quality Certification
- 2. Nationwide, Regional or General Permit Number(s) Requested: NWP 3
- 3. If this notification is solely a courtesy copy because written approval for the 401 Certification is not required, check here:
- 4. If payment into the North Carolina Ecosystem Enhancement Program (NCEEP) is proposed for mitigation of impacts, attach the acceptance letter from NCEEP, complete section VIII, and check here:
- 5. If your project is located in any of North Carolina's twenty coastal counties (listed on page 4), and the project is within a North Carolina Division of Coastal Management Area of Environmental Concern (see the top of page 2 for further details), check here:

**II. Applicant Information**

- 1. Owner/Applicant Information
 

Name: Gregory J. Thorpe, Ph.D., Environmental Management Director

Mailing Address: 1598 Mail Service Center  
Raleigh, NC 27699-154

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Telephone Number: (919) 733-3141 Fax Number: (919) 733-9794

E-mail Address: \_\_\_\_\_
- 2. Agent/Consultant Information (A signed and dated copy of the Agent Authorization letter must be attached if the Agent has signatory authority for the owner/applicant.)
 

Name: N/A

Company Affiliation: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

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Telephone Number: \_\_\_\_\_ Fax Number: \_\_\_\_\_

E-mail Address: \_\_\_\_\_



### III. Project Information

Attach a **vicinity map** clearly showing the location of the property with respect to local landmarks such as towns, rivers, and roads. Also provide a detailed **site plan** showing property boundaries and development plans in relation to surrounding properties. Both the vicinity map and site plan must include a scale and north arrow. The specific footprints of all buildings, impervious surfaces, or other facilities must be included. If possible, the maps and plans should include the appropriate USGS Topographic Quad Map and NRCS Soil Survey with the property boundaries outlined. Plan drawings, or other maps may be included at the applicant's discretion, so long as the property is clearly defined. For administrative and distribution purposes, the USACE requires information to be submitted on sheets no larger than 11 by 17-inch format; however, DWQ may accept paperwork of any size. DWQ prefers full-size construction drawings rather than a sequential sheet version of the full-size plans. If full-size plans are reduced to a small scale such that the final version is illegible, the applicant will be informed that the project has been placed on hold until decipherable maps are provided.

1. Name of project: Widening of SR 1178 (Keen Rd.) from US 301 to Allendale Road and improvement of existing drainage associated with the transportation facility and surrounding land uses
2. T.I.P. Project Number or State Project Number (NCDOT Only): R-4071
3. Property Identification Number (Tax PIN): N/A
4. Location  
County: Johnston Nearest Town: Four Oaks  
Subdivision name (include phase/lot number): \_\_\_\_\_  
Directions to site (include road numbers/names, landmarks, etc.): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
5. Site coordinates (For linear projects, such as a road or utility line, attach a sheet that separately lists the coordinates for each crossing of a distinct waterbody.)  
Decimal Degrees (6 digits minimum): -78.423774 °N 35.443449 °W
6. Property size (acres): N/A
7. Name of nearest receiving body of water: Juniper Swamp
8. River Basin: Neuse  
(Note – this must be one of North Carolina's seventeen designated major river basins. The River Basin map is available at <http://h2o.enr.state.nc.us/admin/maps/>.)
9. Describe the existing conditions on the site and general land use in the vicinity of the project at the time of this application: This project is located within the town of Four Oaks, in close proximity to I-95. Surrounding land use is mostly light commercial and medium to high density residential.

10. Describe the overall project in detail, including the type of equipment to be used: SR 1178 (Keen Rd.) will be widened from two to three lanes and given a curb and gutter system. The existing drainage system that originates in the project area will also be improved. Heavy duty excavation equipment, such as trucks and bulldozers, will be used as well as various other equipment necessary for roadway construction.

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11. Explain the purpose of the proposed work: To allow left-turning movements into the residential areas along Keen Rd. as well as into the Four Oaks town center along US 301, and to improve a long-standing drainage issue.

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#### **IV. Prior Project History**

If jurisdictional determinations and/or permits have been requested and/or obtained for this project (including all prior phases of the same subdivision) in the past, please explain. Include the USACE Action ID Number, DWQ Project Number, application date, and date permits and certifications were issued or withdrawn. Provide photocopies of previously issued permits, certifications or other useful information. Describe previously approved wetland, stream and buffer impacts, along with associated mitigation (where applicable). If this is a NCDOT project, list and describe permits issued for prior segments of the same T.I.P. project, along with construction schedules. N/A

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#### **V. Future Project Plans**

Are any future permit requests anticipated for this project? If so, describe the anticipated work, and provide justification for the exclusion of this work from the current application.

N/A

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#### **VI. Proposed Impacts to Waters of the United States/Waters of the State**

It is the applicant's (or agent's) responsibility to determine, delineate and map all impacts to wetlands, open water, and stream channels associated with the project. Each impact must be listed separately in the tables below (e.g., culvert installation should be listed separately from riprap dissipater pads). Be sure to indicate if an impact is temporary. All proposed impacts, permanent and temporary, must be listed, and must be labeled and clearly identifiable on an accompanying site plan. All wetlands and waters, and all streams (intermittent and perennial) should be shown on a delineation map, whether or not impacts are proposed to these systems. Wetland and stream evaluation and delineation forms should be included as appropriate. Photographs may be included at the applicant's discretion. If this proposed impact is strictly for wetland or stream mitigation, list and describe the impact in Section VIII below. If additional space is needed for listing or description, please attach a separate sheet.

Provide a written description of the proposed impacts: Temporary surface water impacts are anticipated to an unnamed tributary of Juniper Swamp, where two existing pipes are replaced. The replacement pipes are larger, but of similar length. Impacts will be for construction access only.

1. Individually list wetland impacts. Types of impacts include, but are not limited to mechanized clearing, grading, fill, excavation, flooding, ditching/drainage, etc. For dams, separately list impacts due to both structure and flooding.

Wetland Impact Site Number (indicate on map)	Type of Impact	Type of Wetland (e.g., forested, marsh, herbaceous, bog, etc.)	Located within 100-year Floodplain (yes/no)	Distance to Nearest Stream (linear feet)	Area of Impact (acres)
N/A					
Total Wetland Impact (acres)					

2. List the total acreage (estimated) of all existing wetlands on the property: \_\_\_\_\_

3. Individually list all intermittent and perennial stream impacts. Be sure to identify temporary impacts. Stream impacts include, but are not limited to placement of fill or culverts, dam construction, flooding, relocation, stabilization activities (e.g., cement walls, rip-rap, crib walls, gabions, etc.), excavation, ditching/straightening, etc. If stream relocation is proposed, plans and profiles showing the linear footprint for both the original and relocated streams must be included. To calculate acreage, multiply length X width, then divide by 43,560.

Stream Impact Number (indicate on map)	Stream Name	Type of Impact	Perennial or Intermittent?	Average Stream Width Before Impact	Impact Length (linear feet)	Area of Impact (acres)
1	UT to Juniper Swamp	Temporary	Perennial	6'	33	.012
Total Stream Impact (by length and acreage)					33	.012

4. Individually list all open water impacts (including lakes, ponds, estuaries, sounds, Atlantic Ocean and any other water of the U.S.). Open water impacts include, but are not limited to fill, excavation, dredging, flooding, drainage, bulkheads, etc.

Open Water Impact Site Number (indicate on map)	Name of Waterbody (if applicable)	Type of Impact	Type of Waterbody (lake, pond, estuary, sound, bay, ocean, etc.)	Area of Impact (acres)
N/A				
Total Open Water Impact (acres)				

5. List the cumulative impact to all Waters of the U.S. resulting from the project:

Stream Impact (acres):	.012
Wetland Impact (acres):	N/A
Open Water Impact (acres):	N/A
Total Impact to Waters of the U.S. (acres)	.012
Total Stream Impact (linear feet):	33

6. Isolated Waters

Do any isolated waters exist on the property?  Yes  No

Describe all impacts to isolated waters, and include the type of water (wetland or stream) and the size of the proposed impact (acres or linear feet). Please note that this section only applies to waters that have specifically been determined to be isolated by the USACE.

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7. Pond Creation

If construction of a pond is proposed, associated wetland and stream impacts should be included above in the wetland and stream impact sections. Also, the proposed pond should be described here and illustrated on any maps included with this application.

Pond to be created in (check all that apply):  uplands  stream  wetlands

Describe the method of construction (e.g., dam/embankment, excavation, installation of draw-down valve or spillway, etc.): \_\_\_\_\_

Proposed use or purpose of pond (e.g., livestock watering, irrigation, aesthetic, trout pond, local stormwater requirement, etc.): \_\_\_\_\_

Current land use in the vicinity of the pond: \_\_\_\_\_

Size of watershed draining to pond: \_\_\_\_\_ Expected pond surface area: \_\_\_\_\_

**VII. Impact Justification (Avoidance and Minimization)**

Specifically describe measures taken to avoid the proposed impacts. It may be useful to provide information related to site constraints such as topography, building ordinances, accessibility, and financial viability of the project. The applicant may attach drawings of alternative, lower-impact site layouts, and explain why these design options were not feasible. Also discuss how impacts were minimized once the desired site plan was developed. If applicable, discuss construction techniques to be followed during construction to reduce impacts. Please refer to the attached cover letter

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**VIII. Mitigation**

DWQ - In accordance with 15A NCAC 2H .0500, mitigation may be required by the NC Division of Water Quality for projects involving greater than or equal to one acre of impacts to freshwater wetlands or greater than or equal to 150 linear feet of total impacts to perennial streams.

USACE – In accordance with the Final Notice of Issuance and Modification of Nationwide Permits, published in the Federal Register on January 15, 2002, mitigation will be required when necessary to ensure that adverse effects to the aquatic environment are minimal. Factors including size and type of proposed impact and function and relative value of the impacted

aquatic resource will be considered in determining acceptability of appropriate and practicable mitigation as proposed. Examples of mitigation that may be appropriate and practicable include, but are not limited to: reducing the size of the project; establishing and maintaining wetland and/or upland vegetated buffers to protect open waters such as streams; and replacing losses of aquatic resource functions and values by creating, restoring, enhancing, or preserving similar functions and values, preferable in the same watershed.

If mitigation is required for this project, a copy of the mitigation plan must be attached in order for USACE or DWQ to consider the application complete for processing. Any application lacking a required mitigation plan or NCEEP concurrence shall be placed on hold as incomplete. An applicant may also choose to review the current guidelines for stream restoration in DWQ's Draft Technical Guide for Stream Work in North Carolina (see DWQ website for most current version.).

1. Provide a brief description of the proposed mitigation plan. The description should provide as much information as possible, including, but not limited to: site location (attach directions and/or map, if offsite), affected stream and river basin, type and amount (acreage/linear feet) of mitigation proposed (restoration, enhancement, creation, or preservation), a plan view, preservation mechanism (e.g., deed restrictions, conservation easement, etc.), and a description of the current site conditions and proposed method of construction. Please attach a separate sheet if more space is needed.

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2. Mitigation may also be made by payment into the North Carolina Ecosystem Enhancement Program (NCEEP). Please note it is the applicant's responsibility to contact the NCEEP at (919) 715-0476 to determine availability, and written approval from the NCEEP indicating that they are will to accept payment for the mitigation must be attached to this form. For additional information regarding the application process for the NCEEP, check the NCEEP website at <http://www.nceep.net/pages/inlieureplace.htm>. If use of the NCEEP is proposed, please check the appropriate box on page five and provide the following information:

Amount of stream mitigation requested (linear feet): \_\_\_\_\_

Amount of buffer mitigation requested (square feet): \_\_\_\_\_

Amount of Riparian wetland mitigation requested (acres): \_\_\_\_\_

Amount of Non-riparian wetland mitigation requested (acres): \_\_\_\_\_

Amount of Coastal wetland mitigation requested (acres): \_\_\_\_\_

## **IX. Environmental Documentation (required by DWQ)**

1. Does the project involve an expenditure of public (federal/state/local) funds or the use of public (federal/state) land? Yes  No
2. If yes, does the project require preparation of an environmental document pursuant to the requirements of the National or North Carolina Environmental Policy Act (NEPA/SEPA)?  
Note: If you are not sure whether a NEPA/SEPA document is required, call the SEPA coordinator at (919) 733-5083 to review current thresholds for environmental documentation.  
Yes  No

3. If yes, has the document review been finalized by the State Clearinghouse? If so, please attach a copy of the NEPA or SEPA final approval letter. Yes  No

**X. Proposed Impacts on Riparian and Watershed Buffers (required by DWQ)**

It is the applicant's (or agent's) responsibility to determine, delineate and map all impacts to required state and local buffers associated with the project. The applicant must also provide justification for these impacts in Section VII above. All proposed impacts must be listed herein, and must be clearly identifiable on the accompanying site plan. All buffers must be shown on a map, whether or not impacts are proposed to the buffers. Correspondence from the DWQ Regional Office may be included as appropriate. Photographs may also be included at the applicant's discretion.

1. Will the project impact protected riparian buffers identified within 15A NCAC 2B .0233 (Neuse), 15A NCAC 2B .0259 (Tar-Pamlico), 15A NCAC 02B .0243 (Catawba) 15A NCAC 2B .0250 (Randleman Rules and Water Supply Buffer Requirements), or other (please identify \_\_\_\_\_)? Yes  No
2. If "yes", identify the square feet and acreage of impact to each zone of the riparian buffers. If buffer mitigation is required calculate the required amount of mitigation by applying the buffer multipliers.

Zone*	Impact (square feet)	Multiplier	Required Mitigation
1	1401	3 (2 for Catawba)	none
2	535	1.5	none
Total	1936		none

\* Zone 1 extends out 30 feet perpendicular from the top of the near bank of channel; Zone 2 extends an additional 20 feet from the edge of Zone 1.

3. If buffer mitigation is required, please discuss what type of mitigation is proposed (i.e., Donation of Property, Riparian Buffer Restoration / Enhancement, or Payment into the Riparian Buffer Restoration Fund). Please attach all appropriate information as identified within 15A NCAC 2B .0242 or .0244, or .0260. N/A
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**XI. Stormwater (required by DWQ)**

Describe impervious acreage (existing and proposed) versus total acreage on the site. Discuss stormwater controls proposed in order to protect surface waters and wetlands downstream from the property. If percent impervious surface exceeds 20%, please provide calculations demonstrating total proposed impervious level. In addition to grass swales, a stormwater retention basin is to be built upstream of impacted surface waters.

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**XII. Sewage Disposal (required by DWQ)**

Clearly detail the ultimate treatment methods and disposition (non-discharge or discharge) of wastewater generated from the proposed project, or available capacity of the subject facility.

N/A

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**XIII. Violations (required by DWQ)**

Is this site in violation of DWQ Wetland Rules (15A NCAC 2H .0500) or any Buffer Rules?

Yes  No

Is this an after-the-fact permit application? Yes  No

**XIV. Cumulative Impacts (required by DWQ)**

Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality? Yes  No

If yes, please submit a qualitative or quantitative cumulative impact analysis in accordance with the most recent North Carolina Division of Water Quality policy posted on our website at <http://h2o.enr.state.nc.us/ncwetlands>. If no, please provide a short narrative description: \_\_\_\_\_

N/A

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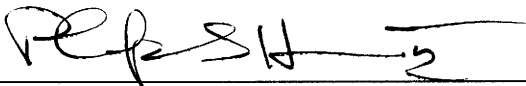
**XV. Other Circumstances (Optional):**

It is the applicant's responsibility to submit the application sufficiently in advance of desired construction dates to allow processing time for these permits. However, an applicant may choose to list constraints associated with construction or sequencing that may impose limits on work schedules (e.g., draw-down schedules for lakes, dates associated with Endangered and Threatened Species, accessibility problems, or other issues outside of the applicant's control).

N/A

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Applicant/Agent's Signature

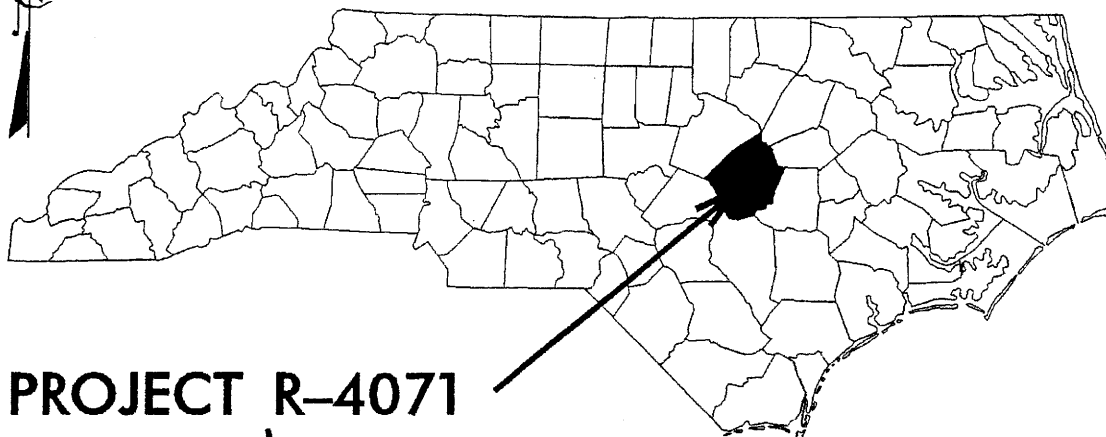
5/1/07

Date

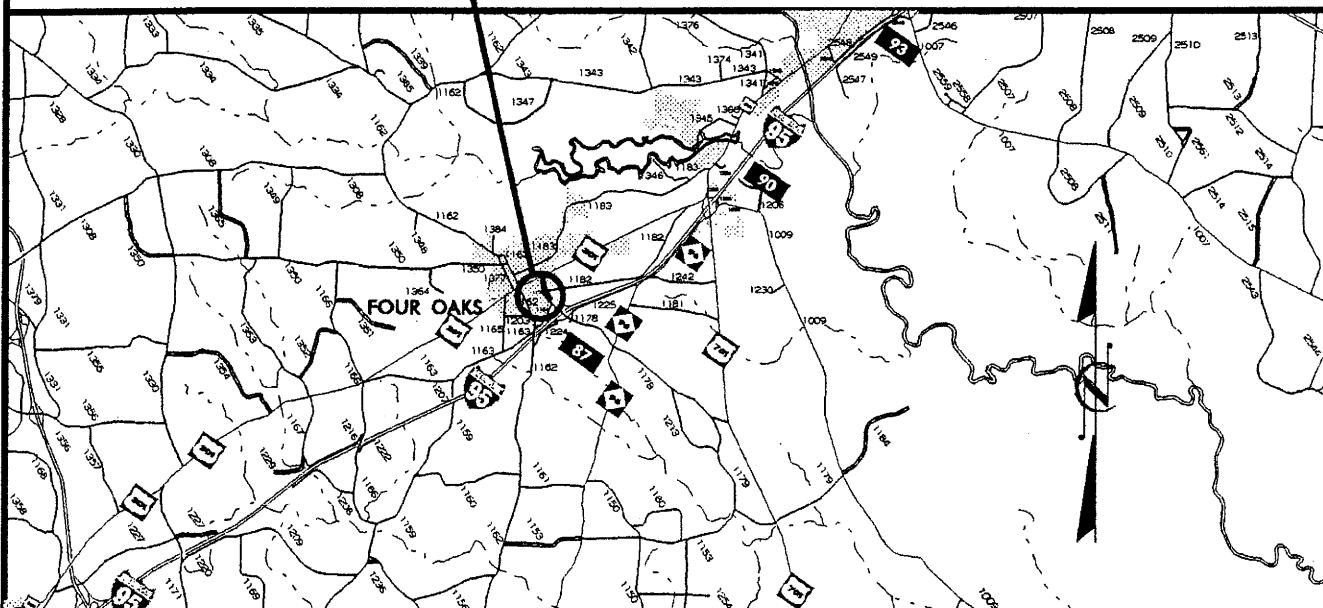
(Agent's signature is valid only if an authorization letter from the applicant is provided.)

# WETLAND DRAWINGS

## NORTH CAROLINA



**PROJECT R-4071**

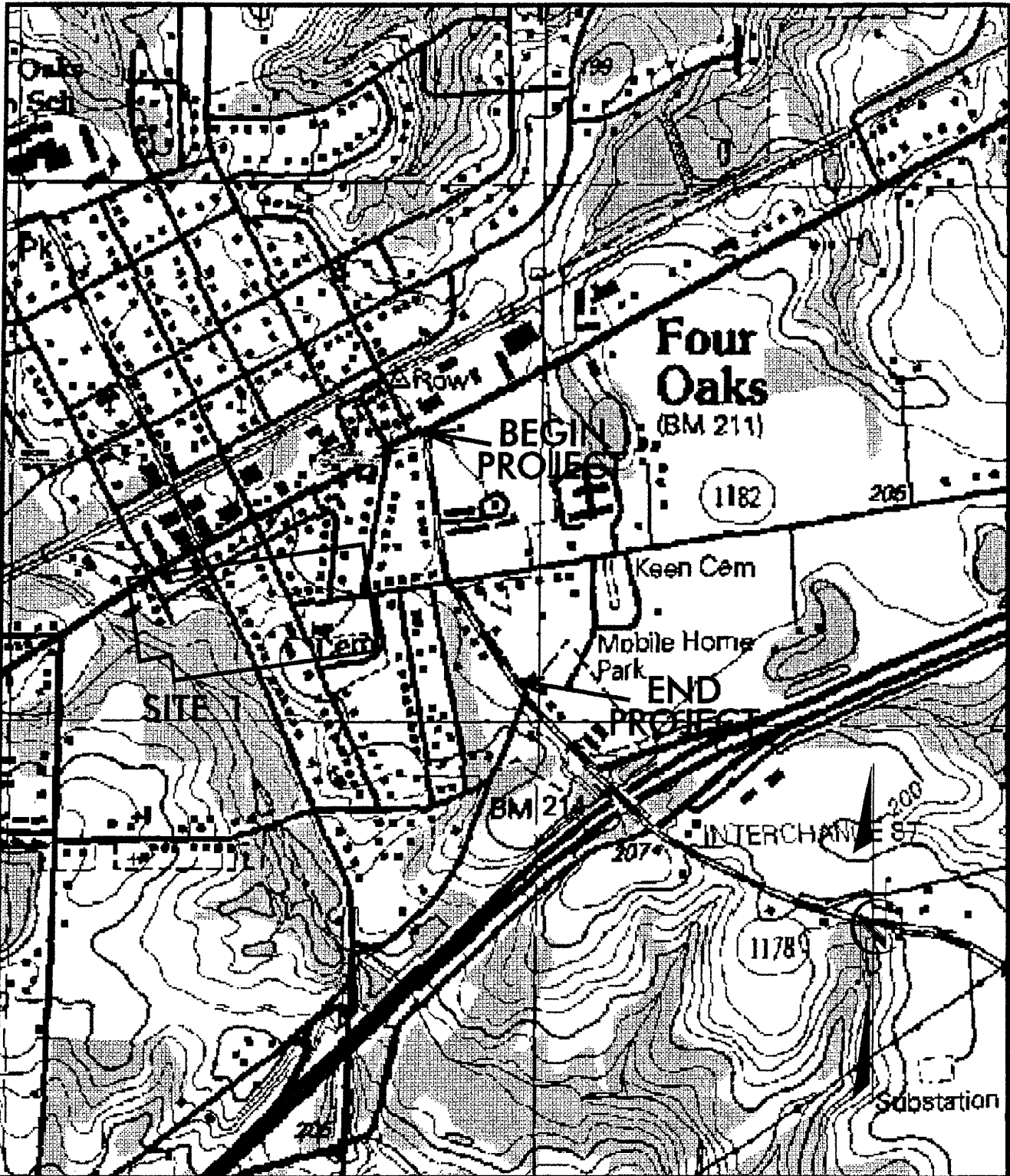


### VICINITY MAP

N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
JOHNSTON COUNTY  
R-4071

SR 1178 (KEEN ROAD) FROM  
US-301 TO 164' NORTH WEST  
OF SR 1164 (ALLENDALE ROAD).  
DATE: APRIL 2007  
SHEET 1 OF 5





**VICINITY  
MAP**

N.C. DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 JOHNSTON COUNTY  
 R-4071  
 SR 1178 (KEEN ROAD) FROM  
 US-301 TO 164' NORTH WEST  
 OF SR 1164 (ALLENDALE ROAD).  
 DATE: APRIL 2006  
 SHEET 2 OF 5





**PROPERTY OWNERS  
NAMES AND ADDRESSES**

<b>PARCEL NO.</b>	<b>NAMES</b>	<b>ADDRESSES</b>
23	JAMES E. BAREFOOT	PO BOX 253 FOUR OAKS, NC 27524
24	HICO PROPERTIES, LLC	
25	GENIA LYNN STANLEY, ET AL	213 S MAIN ST FOUR OAKS, NC 27524
26	RAMON MONTOYO	PO BOX 1010 FOUR OAKS, NC 27524
27	TERRY BROWN	6436 CARDINAL WAY MECHANICSVILLE, VA 23111-4419

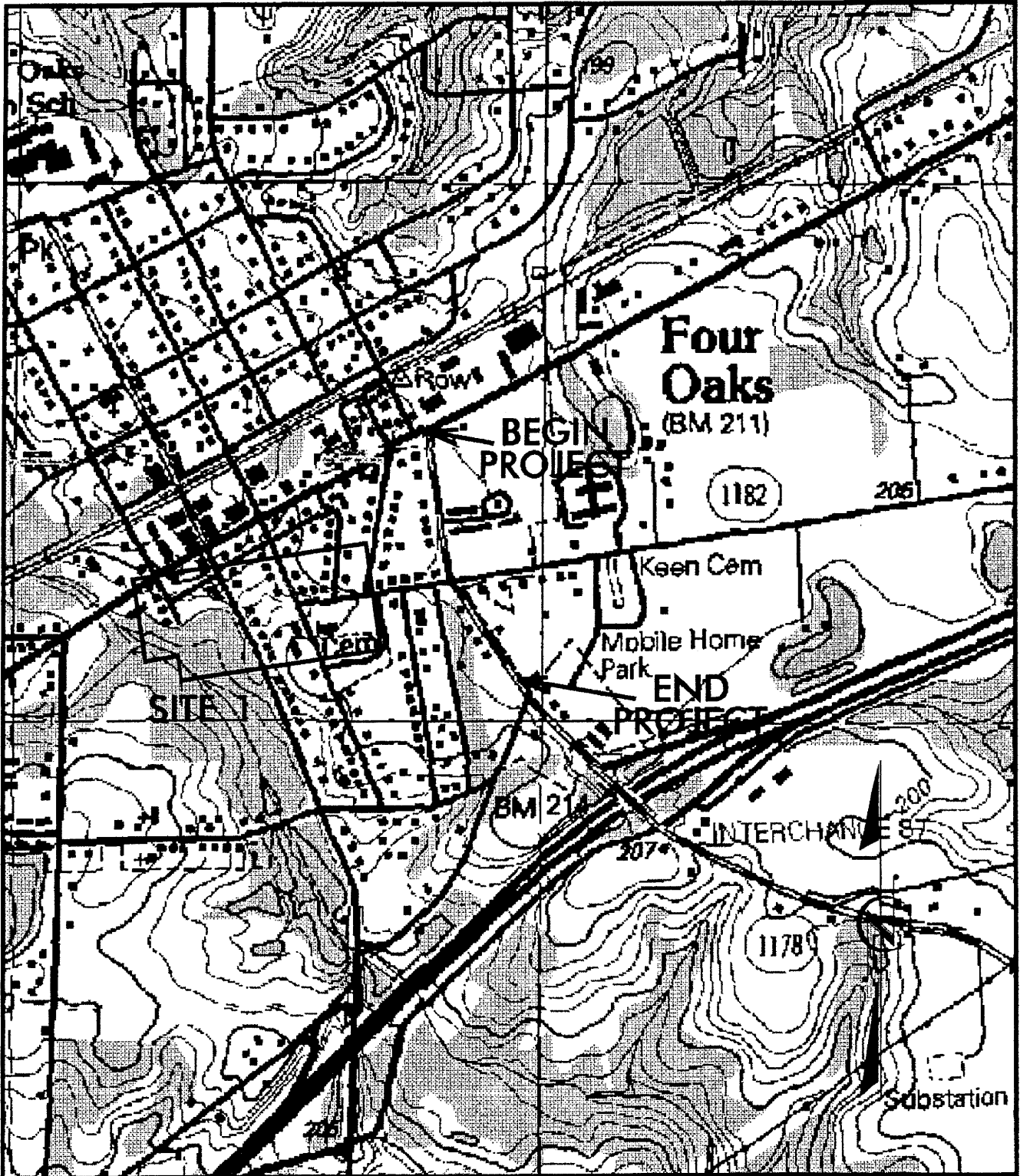
N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
JOHNSTON COUNTY  
R-4071

SR 1178 (KEEN ROAD) FROM  
US-301 TO 164' NORTH WEST  
OF SR 1164 (ALLENDALE ROAD).

DATE: APRIL 2007

SHEET 5 OF 5





**VICINITY  
MAP**

N.C. DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 JOHNSTON COUNTY  
 R-4071  
 SR 1178 (KEEN ROAD) FROM  
 US-301 TO 164' NORTH WEST  
 OF SR 1164 (ALLENDALE ROAD).  
 DATE: APRIL 2007  
 SHEET 2 OF 6











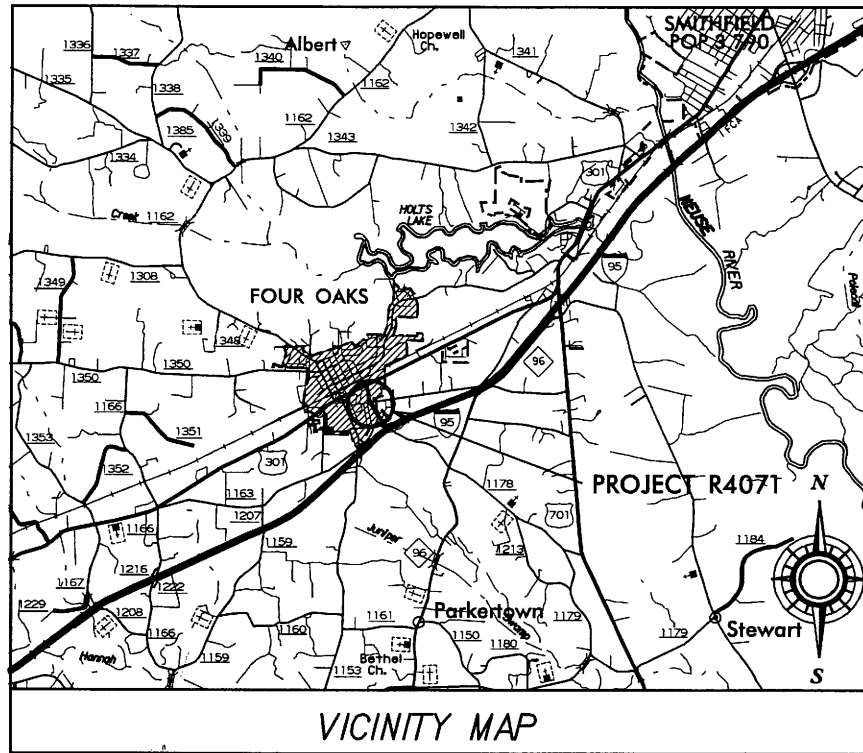
**PROPERTY OWNERS  
NAMES AND ADDRESSES**

PARCEL NO.	NAMES	ADDRESSES
23	JAMES E. BAREFOOT	PO BOX 253 FOUR OAKS, NC 27524
24	HICO PROPERTIES, LLC	
25	GENIA LYNN STANLEY, ET AL	213 S MAIN ST FOUR OAKS, NC 27524
26	RAMON MONTOYO	PO BOX 1010 FOUR OAKS, NC 27524
27	TERRY BROWN	6436 CARDINAL WAY MECHANICSVILLE, VA 23111-4419

N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
JOHNSTON COUNTY  
R-4071  
SR 1178 (KEEN ROAD) FROM  
US-301 TO 164' NORTH WEST  
OF SR 1164 (ALLENDALE ROAD).  
DATE: APRIL 2007  
SHEET 6 OF 6

**TIP PROJECT: R-4071**

See Sheet 1-A For Index of Sheets

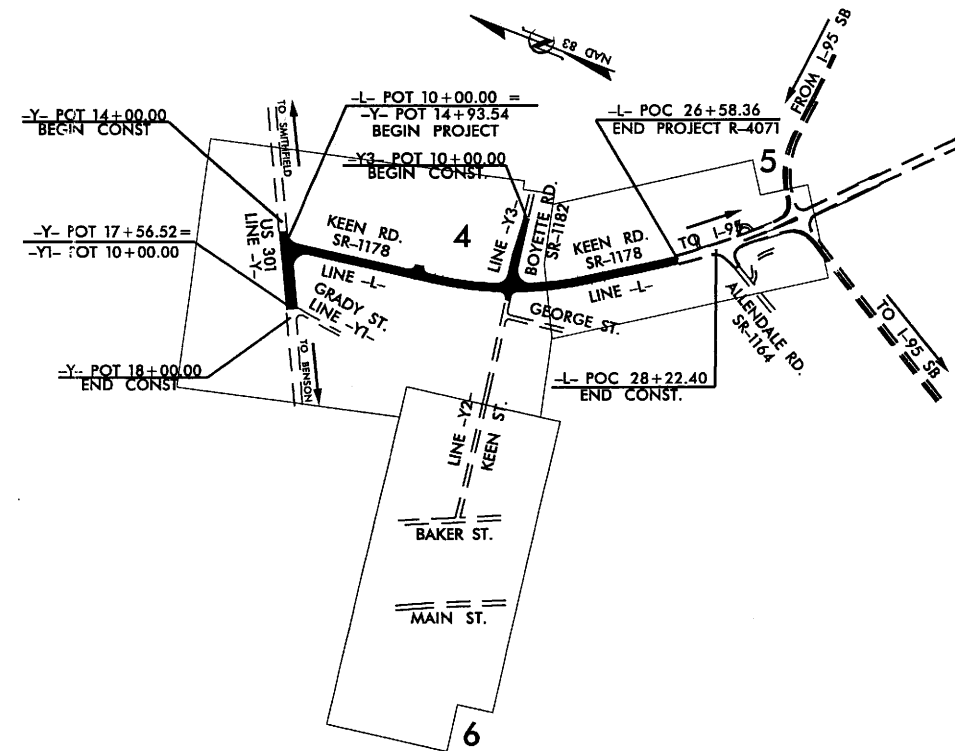


STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**JOHNSTON COUNTY**

**LOCATION: SR 1178 (KEEN ROAD) FROM US-301 TO 164' NORTH WEST OF SR 1164 (ALLENDALE ROAD).**

**TYPE OF WORK: GRADING, DRAINAGE, PAVING, CURB & GUTTER AND TRAFFIC SIGNAL.**



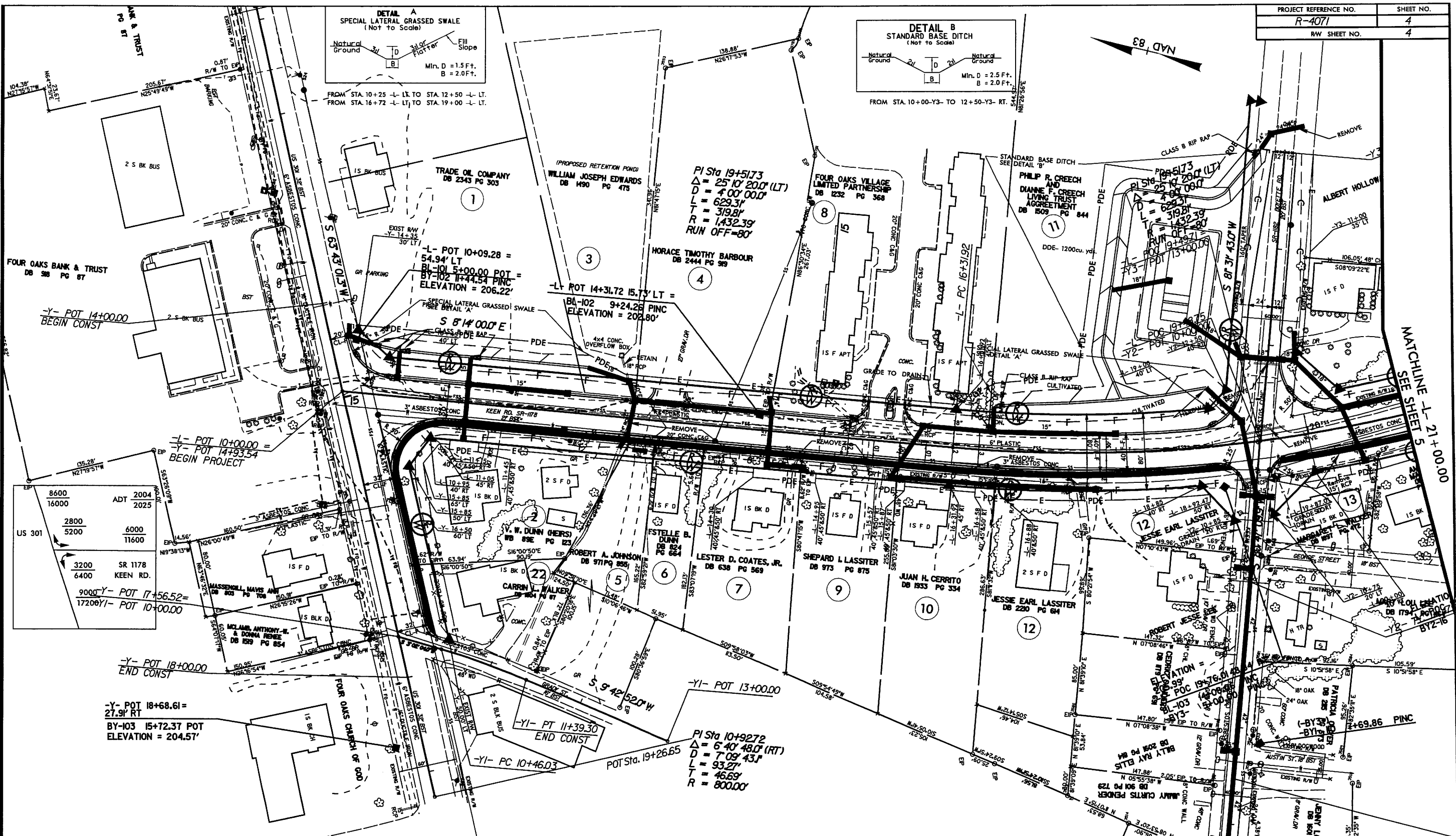
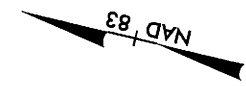
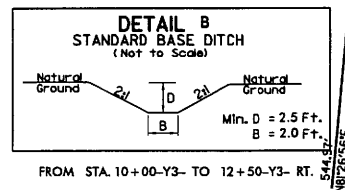
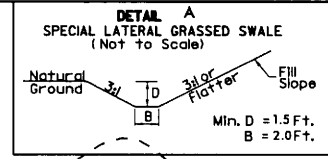
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-4071	1	
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
34612.1.1	STP-1178(2)	PE	

**CONTRACT:**

**CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD 3  
THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF FOUR OAKS**

**INCOMPLETE PLANS**  
DO NOT USE FOR R/W ACQUISITION  
**PRELIMINARY PLANS**  
DO NOT USE FOR CONSTRUCTION

<p><b>GRAPHIC SCALES</b></p> <p>50 25 0 50 100 PLANS</p> <p>50 25 0 50 100 PROFILE (HORIZONTAL)</p> <p>10 5 0 10 20 PROFILE (VERTICAL)</p>	<p><b>DESIGN DATA</b></p> <p>ADT 2001 = 2600 ADT 2025 = 5800 DHV = 10 % D = 60 % T = 4 % * V = 40 MPH * TTST 1 % DUAL 3 %</p>	<p><b>PROJECT LENGTH</b></p> <p>TOTAL LENGTH OF TIP PROJECT R-4071 = 0.314 MILES</p>	<p>Prepared In the Office of: <b>DIVISION OF HIGHWAYS</b> Division 4 DDC 509 Ward Blvd., Wilson NC, 27895</p>	<p><b>HYDRAULICS ENGINEER</b></p> <p>_____ SIGNATURE: P.E.</p>	<p><b>DIVISION OF HIGHWAYS</b> STATE OF NORTH CAROLINA</p>
			<p>2002 STANDARD SPECIFICATIONS</p> <p><b>RIGHT OF WAY DATE:</b> R.E. GREENE, JR., PE PROJECT ENGINEER</p> <p><b>LETTING DATE:</b> J.C. CAULEY, PLS PROJECT DESIGN ENGINEER</p>	<p><b>ROADWAY DESIGN ENGINEER</b></p> <p>_____ SIGNATURE: P.E.</p>	<p>STATE DESIGN ENGINEER P.E. <b>DEPARTMENT OF TRANSPORTATION</b> <b>FEDERAL HIGHWAY ADMINISTRATION</b></p> <p>APPROVED DIVISION ADMINISTRATOR DATE</p>



**DATUM DESCRIPTION**  
 THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY MCOOT FOR MONUMENT "12704-1" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 6125085189(1) EASTING: 2169588322(1) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99987440 THE N. C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "12704-1" TO ± STATION 10+00.00 IS N19°58'48"E 5,448.74' ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NGVD 29

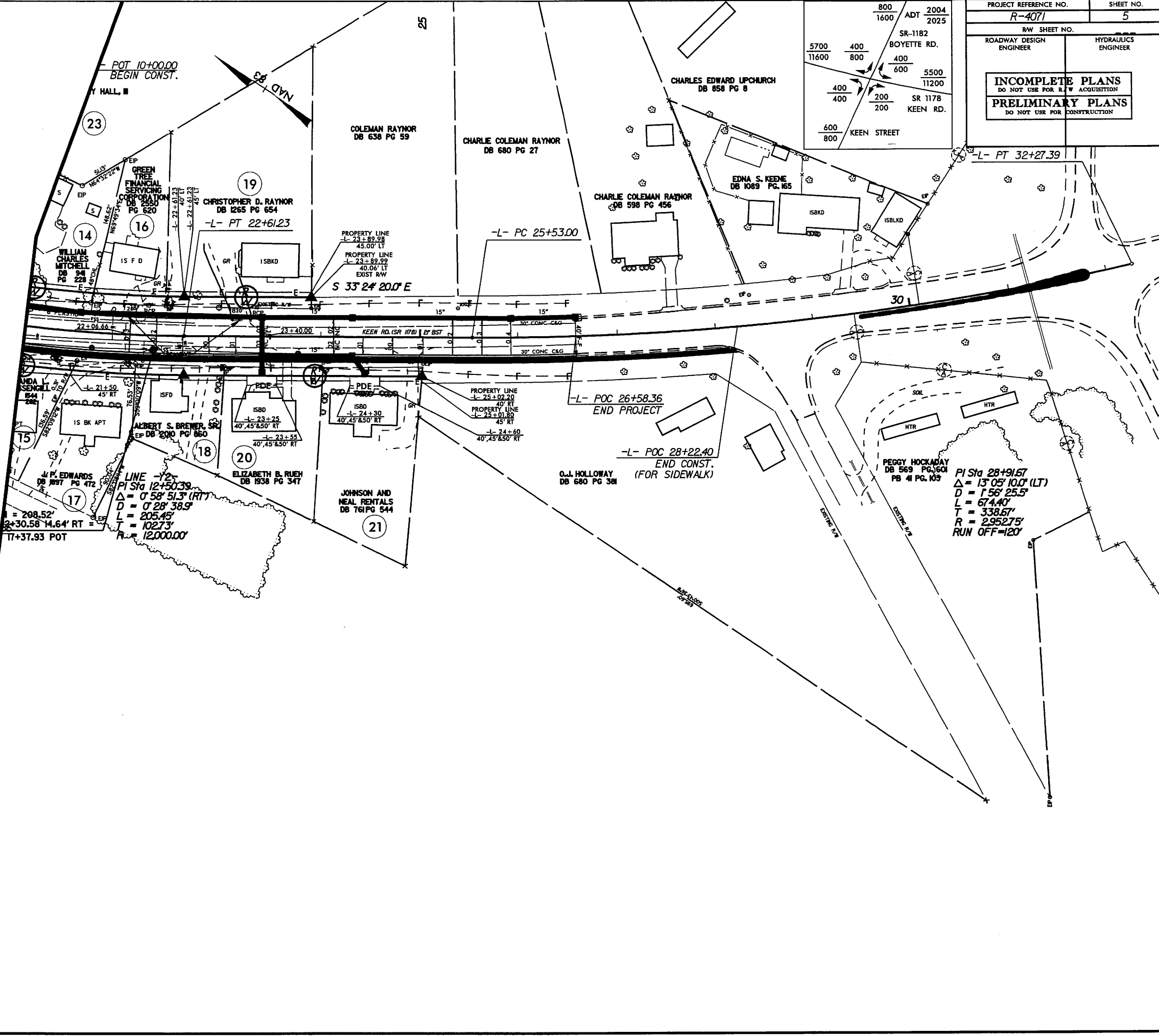
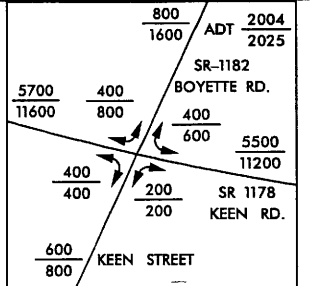
ROADWAY DESIGN ENGINEER  
 HYDRAULICS ENGINEER

**INCOMPLETE PLANS**  
 DO NOT USE FOR R/W ACQUISITION

**PRELIMINARY PLANS**  
 DO NOT USE FOR CONSTRUCTION

MATCHLINE -Y2- 15+00.00 SEE SHEET 6

MATCHLINE -L- 21+00.00 SEE SHEET 5



LINE -Y2  
 PI Sta 12+50.39  
 $\Delta = 0^{\circ} 58' 51.3''$  (RT)  
 $D = 0^{\circ} 28' 38.9''$   
 $L = 205.45'$   
 $T = 102.73'$   
 $R = 12,000.00'$

PEGGY HOCKADAY  
 DB 569 PG. 104  
 PB 41 PG. 105  
 PI Sta 28+91.67  
 $\Delta = 13^{\circ} 05' 10.0''$  (LT)  
 $D = 1^{\circ} 56' 25.5''$   
 $L = 674.40'$   
 $T = 338.67'$   
 $R = 2,952.75'$   
 RUN OFF=120'

POT 10+00.00  
BEGIN CONST.



23

19

14

16

15

17

18

20

21

25

30

TT+37.93 POT

-L- PT 22+61.23

-L- PC 25+53.00

-L- POC 26+58.36  
END PROJECT

-L- POC 28+22.40  
END CONST.  
(FOR SIDEWALK)

PROPERTY LINE  
-L- 23+89.98  
45.00' LT

PROPERTY LINE  
-L- 25+02.20  
40' RT

PROPERTY LINE  
-L- 25+01.80  
45' RT

PROPERTY LINE  
-L- 24+60  
40' 45' 8.50' RT

PROPERTY LINE  
-L- 24+30  
40' 45' 8.50' RT

PROPERTY LINE  
-L- 23+25  
40' 45' 8.50' RT

PROPERTY LINE  
-L- 23+55  
40' 45' 8.50' RT

PROPERTY LINE  
-L- 23+40.00  
45.00' LT

PROPERTY LINE  
-L- 23+89.98  
45.00' LT

PROPERTY LINE  
-L- 23+89.98  
45.00' LT

PROPERTY LINE  
-L- 23+89.98  
45.00' LT

PROPERTY LINE  
-L- 23+89.98  
45.00' LT

PROPERTY LINE  
-L- 23+89.98  
45.00' LT



Johnston County  
Widening of SR 1178 (Keen Road)  
From US 301 to Allendale Road in Four Oaks  
Federal Aid Project STP-1178(2)  
State Project No. 8.2313201  
TIP No. R-4071

CATEGORICAL EXCLUSION

U. S. Department Of Transportation  
Federal Highway Administration  
And  
N. C. Department Of Transportation  
Division Of Highways

2/27/03 CD Schauer for  
Date Gregory J. Thorpe, Ph.D, Manager  
Project Development and Environmental Analysis Branch

2/28/03 Ronald J. Voelker  
Date Donald J. Voelker  
Acting Division Administrator, FHWA

Johnston County  
Widening of SR 1178 (Keen Road)  
From US 301 to Allendale Road in Four Oaks  
Federal Aid Project STP-1178(2)  
State Project No. 8.2313201  
TIP No. R-4071

CATEGORICAL EXCLUSION

February 2003

Documentation Prepared in  
Project Development and Environmental Analysis Branch By:

2/20/03

*Stephanie L. Caudill*

Date

Stephanie Ledbetter Caudill, Project Development Engineer  
Project Development and Environmental Analysis Branch

2/20/03

*Cynthia D. Sharer*

Date

Cynthia D. Sharer, P. E., Project Development Unit Head  
Project Development and Environmental Analysis Branch





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# **Project Commitments**

Johnston County  
Widening of SR 1178 (Keen Road)  
From US 301 to Allendale Road in Four Oaks  
Federal Aid Project STP-1178(2)  
State Project No. 8.2313201  
TIP No. R-4071

## **Highway Division 4, NCDOT Right of Way Branch, NCDOT Geotechnical Unit**

Any unregulated Underground Storage Tanks (UST's) will be identified by the Right of Way Branch during initial contacts and the NC DOT Geotechnical Unit will be notified of their presence prior to acquisition in order to determine if the tanks have leaked.

## **PD&EA, Highway Division 4, NCDOT Geotechnical Unit**

Groundwater resources will be evaluated in the final design to ensure that measures are taken, if necessary to avoid groundwater contamination.

## **PD&EA, Highway Division 4**

The NC Geodetic Survey will be contacted prior to construction, due to the presence of one Geodetic Marker within the vicinity of an adjacent project, TIP No. I-2704.

## **PD&EA, Highway Division 4**

The North Carolina Department of Transportation will coordinate with the Town of Four Oaks concerning a municipal agreement for sidewalk construction.

Categorical Exclusion, revised Commitments  
January 2003

Johnston County  
Widening of SR 1178 (Keen Road)  
From US 301 to Allendale Road in Four Oaks  
Federal Aid Project STP-1178(2)  
State Project No. 8.2313201  
TIP No. R-4071

Prepared by the Project Development and Environmental Analysis Branch  
Division of Highways  
North Carolina Department of Transportation

SUMMARY

1. Description of Action - The North Carolina Department of Transportation, Division of Highways, proposes to widen SR 1175 (Keen Road) to a multi-lane facility from I-95 to US 301 in Four Oaks (please see figure 1). The proposed project length is approximately .4 miles. This project has an estimated cost of \$317,000 for right of way acquisition and \$1,100,000 for construction.
2. Project Benefits - The proposed project will have a positive impact by improving the level of service and safety along Keen Road. Keen road is a two-lane section from I-95 to US 301. The addition of a third lane will promote efficiency by removing left turns from through traffic along Keen Road. This project will also improve traffic flow to the North of the project limits at the intersection of Keen Road with US 301, and to the south of the project limits at the intersection of Keen Road with I-95.
3. Environmental Effects- There are no substantial natural environmental effects caused by the project. No residences will be relocated as a result of this project. There will be no effect to architectural and historical resources listed in or eligible for the National Register of Historic Places. There will be no significant impact to air quality and traffic noise increases are expected to be minimal.
4. Environmental Commitments Project Commitments are listed on the preceding page. All standard guidelines and recommendations apply. No wetlands or surface waters are present within the project area (please see figure 2). Consequently, a section 404 permit and corresponding Section 401 water quality certification are not required for the proposed project.

The North Carolina Department of Transportation will implement all practical measures to minimize and avoid impacts to the natural and human environment. NCDOT best management practices for protection of surface waters will be followed during the construction of this project.

5. Coordination - Several federal, state and local agencies were consulted during preparation of this document. Written comments were received from the following agencies.

U.S. Army Corps of Engineers  
U.S. Fish and Wildlife Service  
N. C. Department of Cultural Resources  
N. C. Wildlife Resources Commission  
Johnston County Schools  
Town of Four Oaks

Johnston County  
Widening of SR 1178 (Keen Road)  
From US 301 to Allendale Road in Four Oaks  
Federal Aid Project STP-1178(2)  
State Project No. 8.2313201  
TIP No. R-4071

I. PROJECT DESCRIPTION

The North Carolina Department of Transportation, Division of Highways, proposes to construct a three-lane roadway on existing location from SR 1164 (Allendale Road) to US 301 (Wellons Street) in Johnston County for a length of 0.4 miles (0.6 kilometers). Please refer to figure 3 for an aerial view of the project. A new interchange project is proposed to begin approximately 150 feet(45.7 meters) south of SR 1164 (Allendale Road) at I-95. Keen Road will be widened to three lanes at the new interchange with widening extending to the north of SR 1164 approximately 150 feet(45.7 meters). This project has an estimated cost of \$1,417,000 including \$317,000 for right of way acquisition and \$1,100,000 for construction.

The proposed project is included in the 2002-2008 Transportation Improvement Program (TIP) with right of way acquisition scheduled to begin in federal fiscal year 2003 and construction in federal fiscal year 2005. The total estimated cost included in the TIP is \$1,410,000. This estimate includes \$ 360,000 for right of way and \$ 1,050,000 for construction.

A three-lane shoulder section within a 60 foot (18 meter) wide right of way is proposed for the new roadway (please see figure 4). This will consist of a 12 foot (3.6 meter) travel lane in each direction, a 12 foot (3.6 meter) center turn lane, and 4 foot (1.2 meter) paved shoulders. The proposed improvements are anticipated to occur predominantly within existing right of way.

II. NEED FOR THE PROPOSED ACTION

A. General

The purpose of the project is to allow left turning movements into the residential areas along Keen Road as well as into the Four Oaks town center along US-301. This will be accomplished by adding a center turn lane, which will also serve as a left turn lane for traffic turning east from Keen Road toward the town center. Upon completion of the new interchange much of the traffic using the roadway is expected to come from I-95. Johnston County's Comprehensive Plan that outlines a proposed land use strategy establishes goals and objectives that focus on the provision of public utilities that "responds to and facilitates desired growth" and "allows growth while preserving the rural character of the county". Any residential or non-residential growth that occurs as a

result of the widening project will be minimal, and should not affect the rural character of the county.

B. Transportation Plan

The mutually adopted August 12, 1991 Four Oaks Thoroughfare plan designates Keen Road as a major thoroughfare. Also, in the project vicinity, Allendale Road (SR 1164) is designated as a minor thoroughfare. The proposed project, along with the adjacent project, TIP No. I-2704, was added to the TIP after the thoroughfare plan was adopted (see figure 6).

This project will improve access to the businesses along US 301 and will reduce congestion along existing SR 1178 (Keen Road). In addition, the project will connect US 301 to the proposed I-95 interchange improvement project, I-2704, currently under construction.

C. Traffic Volumes and Capacity

Projected traffic volumes anticipated for the new facility are as follows: \*

2001 Average Daily Traffic = 5300 Vehicles per day (vpd), 212 trucks per day  
2025 Average Daily Traffic = 11,600 vpd, 464 trucks per day

\* See Figures 5a and 5b for additional traffic information.

A capacity analysis was performed to predict the level of service for the project. Level of Service is an engineering term used to describe the operation conditions of vehicles in a traffic stream. Operation conditions are based on such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety. Six levels of service are defined and are designated with letters from A to F. Level A represents the best operating conditions with free flow and virtually no delay at signalized intersections. Level of service F represents the worst operating conditions and occurs when traffic volumes exceed the capacity of a facility. At level of service F, long queues of traffic tend to form and delay at signalized intersections tends to exceed sixty seconds.

Interchange Analysis

	2001	2025
Existing Facility(LOS)	C	F
Proposed Facility(LOS)	B	C



The intersection of US 301 and Keen Road (SR 1178) is currently signalized. Given the length of the project (.4 miles), the signalized intersection will dictate the level of service at which SR 1178 (Keen Road) operates. The proposed third lane is expected to allow this signalized intersection to operate more efficiently both in year 2001 and in the design year 2025. Based upon a design speed of 35 miles per hour and the projected traffic volumes, the mainline will operate at a LOS E throughout the project area both in 2001 and 2025 design year for both existing and proposed conditions. The reason that there is no difference between the build and no build level of service is due to the fact that the Highway Capacity Manual provides no quantitative method for determining the operational difference between a two-lane and three-lane section with a center left-turn lane. However, the three-lane section is expected to operate more efficiently based upon its capability to remove left turn lanes from through traffic.

D. Safety

The project will provide additional capacity for SR 1178 (Keen Road) with the addition of a third lane for turning movements. The additional turn lane will reduce traffic congestion all along Keen Road and improve traffic flow between the proposed I-95 intersection and US 301 (Wellons Street). A third lane will improve the overall safety of the facility by helping to eliminate the stop and go conditions caused by left turns.

### III. PROPOSED IMPROVEMENTS

A. Length of Project

The subject project is 0.4 miles (0.6 kilometers) in length.

B. Project Termini

The project's southern terminus is SR 1165 (Allendale Road). The project's northern terminus is the intersection of the proposed road with US 301 (Wellons Street). Due to the new I-95 interchange at the project's southern terminus, the addition of a third lane will be necessary along SR 1178 (Keen Road) to remove left turns from through traffic.

The project limits discussed in this document are considered logical termini. The project completes a link between the new I-95 interchange, US 301, and the Town of Four Oaks. This interchange project is currently under construction. The proposed project is not included in the Four Oaks Thoroughfare plan, and the Johnston County Thoroughfare Plan that was scheduled for update in 2001 was never completed. However, providing a center turn lane along Keen Road between I-95 and US-301 should not drastically impact the potential transportation plan within the study area.

C. Typical Section

The proposed cross-section for the new facility is a three-lane shoulder section which has a paved width of 44 feet (13.2 meters). This will consist of a 12 foot (3.6 meter) travel lane in each direction, a 12 foot (3.6 meter) center turn lane, and 4 foot (1.2 meter) paved shoulders.

D. Right of Way

The proposed project will be constructed predominantly within existing right-of-way (ROW). Additional temporary construction easements of varying widths may also be required. Additional ROW may be purchased at the intersection of Keen Road and US 301 to the east of Keen Road prior to construction.

E. Design Speed

An 50 mph design speed is recommended.

F. Access Control

No control of access is proposed along the new facility.

G. Bicycle and Pedestrian Facilities

Sidewalks are recommended to the east of Keen Road between US 301 and SR 1182 (Boyette Road) in accordance with a request from the Town of Four Oaks. The NCDOT will coordinate with the Town of Four Oaks concerning a municipal agreement for sidewalk construction.

H. Structures

There are no existing or proposed structures in the project vicinity.

I. Anticipated Design Exceptions

It is anticipated that no design exceptions will be required for this project.

J. Intersecting Roads and Type of Control

US 301 -signalized  
SR 1182 (Boyette Road) –stop sign controlled

K. Utility Conflicts

The overall degree of utility conflicts of this project is expected to be low. Water lines, fiber optic cable, and sewer lines are located along the proposed project.

L. Traffic Control

During construction, SR 1178 (Keen Road) will close one lane to through traffic while maintaining traffic on the other lane.

#### IV. ALTERNATIVES CONSIDERED

A. Design Alternatives

1. Alignment

The alignment of the roadway was selected to minimize impacts to residences located along SR 1178 (Keen Road) and to tie into the intersection with US 301 and Four Oaks Bank and Trust located at that intersection. Other alternatives would have impacted these facilities.

2. Typical Section

One alternative section was considered during project. A three-lane section, consistent with the section at the I-95 interchange, will adequately handle the traffic projected in the design year 2025 for the proposed facility by providing a left turn lane to relieve congestion along the mainline and at the US-301 intersection.

B. Public Transportation Alternative

No public transportation is available in Johnston County. Furthermore, since highway transportation is the dominant mode of transportation and residential densities are low in this area, a public transportation alternative would not be a feasible alternative to improving the subject roadway.

C. "No-Build" Alternative

The "no-build" alternative is the least expensive alternative from a construction cost standpoint. This alternative also avoids the effects of the proposed project on homes, utilities, and undeveloped lands in the project area. However, the "no-build" alternative would provide no positive effect on safety and capacity of Keen Road. The improved

efficiency provided by adding a third lane to remove left turn lanes from through traffic would not be possible with the “no-build” alternative.

## VI. SOCIAL, ECONOMIC, AND ENVIRONMENTAL IMPACTS

### A. Land Use Planning

#### 1. Local Planning Status

The project occurs within the planning and zoning jurisdiction of the Town of Four Oaks. While the town does not have a current thoroughfare plan, they developed one in 1991. The town also established goals and objectives that focus on the provision of public utilities that “responds to and facilitates desired growth” and “allows growth while preserving the rural character of the county”. Any residential or non-residential growth that occurs as a result of the widening project will be minimal, and should not affect the rural character of the county.

#### 2. Existing Land Use

Four Oaks is a small but rapidly growing town within the greater metropolitan region surrounding the Triangle. In addition, Four Oaks is adjacent to the I-95 corridor and within a few miles of the I-40 corridor. The Four Oaks interchange is the first exit northbound on I-95 after the interchange with I-40. Along I-95, the town is between Smithfield to the north and Benson to the south. Existing land uses include two gas stations/convenience stores on either side of Keen and a mix of single family and residential uses.

Four Oaks Bank and trust is another commercial facility existing along the proposed project. This Bank is located at the intersection of Keen Road and US 301 to the north of where the project begins.

#### 3. Zoning

Land development along both sides of SR-1178 is predominantly low-density, single-family residential. There are two retirement communities located along the eastern side of the roadway, whereas more established single-family neighborhoods are focused along the western side. Other than the retirement centers and a mobile home park, most of the area east of Keen Road (SR 1178) is agricultural. Established neighborhoods exist to the north of US-301. Land along US-301 is generally developed with population-serving office and retail, including bank branches, service stations, and local retail shops. South of I-95, land use along SR 1178 becomes much more rural. There are no major employment centers within the study area.

#### 4. Future Land Use

The SR 1178 widening project is located within the Town of Four Oaks, which does not have an adopted land use or development plan that would include recommendations for future development patterns. Johnston County, however, completed a "Proposed Strategical Plan" in March 1999 that evaluated the existing conditions within the entire county, established goals and objectives, and identified several building blocks for addressing the issues. Strategies that address land use, transportation, economic development and public utilities/facilities are included.

In addition, the North Carolina Department of Transportation updated the Johnston County Thoroughfare Plan in March 2001, detailing current and future transportation issues and prioritizing improvement projects. Dwelling unit and employment by category projections between 1995 and 2020 were included by transportation analysis zones (TAZs).

#### 5. Farmland

The North Carolina Executive Order No. 96, Conservation of Agricultural and Forest Lands, requires all state agencies to consider the impact of construction projects on prime farmland. Prime and important farmland soils are defined by the US Soil Conservation Service. According to a soil survey completed in 1994 by the United States Department of Agriculture, there are three main types of soil within the study area:

- 1) Ly, or Lynchburg sandy loam
- 2) NoA, or Norfolk loamy sand
- 3) WaB, or Wagram loamy sand

The Ly and WaB soils are located closer to Keen Road, while the NoA soil is located in the more rural area to the east. The Ly soil type typically has slopes between 0 to 2 percent, and is mostly used as woodland. The soil is also well suited to corn, soybeans, and small grain yields. It is poorly suited to most urban and recreational uses because of the wetness. The WaB soil type is located in areas with 0 to 6 percent slopes, and is mostly used as cropland. It is also well suited for woodlands and urban uses. Lastly, the NoA soil is typically located in areas with 0 to 2 percent slopes, and is mostly used as cropland. It is well suited for most any type of development including cropland, woodland, and urban uses.

If additional right-of-way is acquired as a result of the widening project, there would be some minimal impact on farmland since all three types of soil are conducive to crop yields. However, most potential impact upon the farmland within the study area will

result because of induced development, not right-of-way acquisition. As previously mentioned, the widening project should not induce additional residential or commercial development. In addition, storm water runoff as a result of the project may slightly impact the poorly drained Ly soil type located along the eastern edge of the roadway closer to US-301.

B. Community and Relocation Impacts

No residences or businesses will be relocated as a result of this project. A complete Community Impact Assessment (CIA) report is located in the appendix of this document.

C. Cultural Resources

1. Archaeological Resources

The State Historic Preservation Office (SHPO) has reviewed the project and is aware of no properties of historic or archeological importance within the proposed project area (See Appendix). No archaeological survey was recommended.

2. Historic Architectural Resources

The State Historic Preservation Office (SHPO) has reviewed the project and is aware of no historic architectural sites within the proposed project area (See Appendix).

D. Natural Resources

Summary

No wetlands have been identified within the project vicinity, however, the project is located in the Neuse River Basin. There are no stream crossings in the project area and the nearest water body is located 1600 feet east of the study area. Additionally, no endangered species will be effected by construction within the project area. Please see appendix for a full natural resources technical report.

E. Highway Traffic Noise Analysis

The noise analysis for the proposed project was conducted under a worst-case scenario. The analysis determined that no receptors are to be impacted by highway traffic noise. The project is located in Johnston County which has been determined to be in compliance with the National Ambient Air Quality Standards.

Noise levels could increase during construction but will be temporary. This evaluation completes the assessment requirement for highway traffic noise (Title 23 CFR Part 772). Please refer to the appendix of this document for a complete Noise Analysis report.

F. Air Quality Analysis

The proposed project is located in Johnston County, which has been determined to be in compliance with the National Ambient Air Quality Standards. 40 CFR, Part 51 is not applicable, because this project is located in an attainment area. This project is not anticipated to create any adverse effect on air quality in this attainment area. If any vegetation is disposed of by burning during construction, the burning shall be done in accordance with applicable local laws and regulations of the North Carolina SIP for air quality in compliance with 15 NCAC 2D.0520.

G. Hazardous Materials Involvement

Representatives of the NCDOT Geotechnical Unit - Environmental Section performed a field reconnaissance along the project corridor and found three UST (Underground Storage Tank) sites within the project area. Two of the sites are active gas stations that will be total takes under I-2704, which is currently under construction. Since right-of-way for R-4071 is not scheduled to begin until April of 2003, these two sites will have already been taken care of. The third UST site, Paul's Restaurant and former gas station, is located approximately 200 feet east of SR 1178 (Keen Road) on the south side of US 301 (Wellons Street). The UST registry shows that three tanks were removed from the site in December of 1993. It does not appear that the former UST system area will be impacted by this project. Please note that this evaluation mainly covers regulated (commercial) UST's and that there is still the possibility of unregulated UST's (farm tanks or home heating oil tanks) being impacted by the project. These unregulated UST's will be identified by Right-of Way during initial contacts and the NCDOT Geotechnical Unit will be notified of their presence prior to acquisition so in order to determine if the tanks have leaked.

H. Flood Hazard Evaluation and Hydraulic Concerns

Four Oaks is not located in a section of Johnston County in which flood hazards have been identified. There are no major rivers or creeks within the study area. According to the Division of Water Quality, the entire roadway project is not located within either a critical or protected watershed area. Therefore, no impacts upon watersheds or water supply are anticipated. Existing drainage patterns will be maintained to the best extent practicable. Groundwater resources will be evaluated in the final design to ensure that measures are taken, if necessary, to avoid groundwater contamination.

## I. Geodetic Markers

There is one Geodetic marker located within the project's general vicinity (see Appendix). While it is not anticipated that this project will impact the marker, as the marker is located within the project limits of an adjacent project TIP No. I-2704, the NC Geodetic Survey will be contacted prior to construction.

## VII. AGENCY AND PUBLIC INVOLVEMENT

On January 11, 2002, a letter was mailed to the following state and local agencies to solicit suggestions and receive environmental input concerning the proposed project (Note: an asterisk indicates those agencies which responded to this letter):

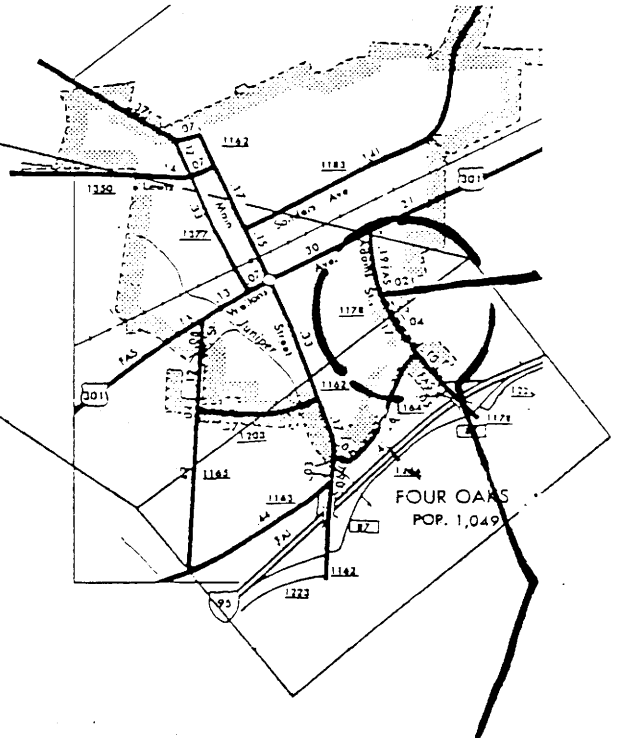
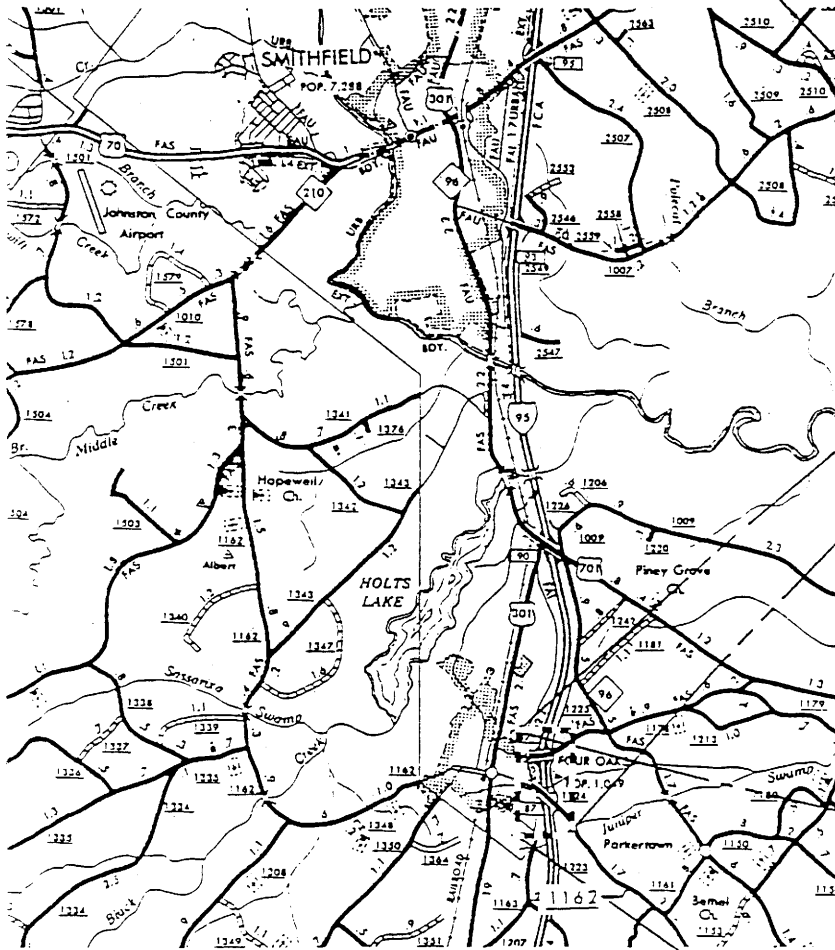
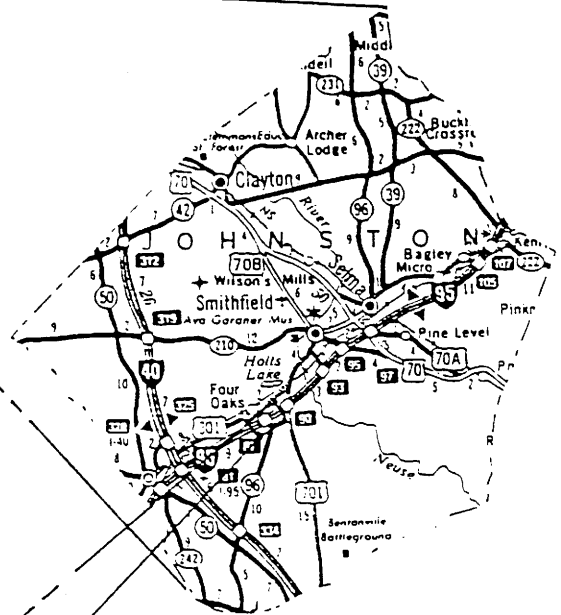
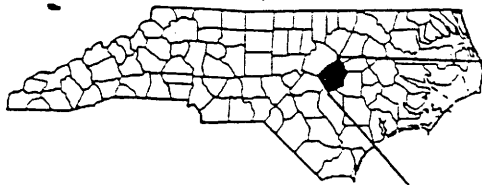
- \*U. S. Fish and Wildlife Service
- \*Army Corps of Engineers  
N. C. State Clearinghouse
- \*N. C. Department of Env. Health and Natural Resources  
NC Division of Water Quality
- \*N. C. Department of Cultural Resources
- \*N. C. Wildlife Resources Commission
- \*N. C. Department of Public Instruction

Citizen comments and concerns have been taken into consideration during the planning stage of this project. Citizens and businesses in the project vicinity were sent a newsletter in November of 2001 to inform them of the proposal (see Appendix). The newsletter generated one response from a citizen concerned with the relocation of a home pertaining to an adjacent proposed project.

A small group meeting will be conducted, in place of a public hearing, to allow further public comment on the project once a preliminary design is available.



## FIGURES

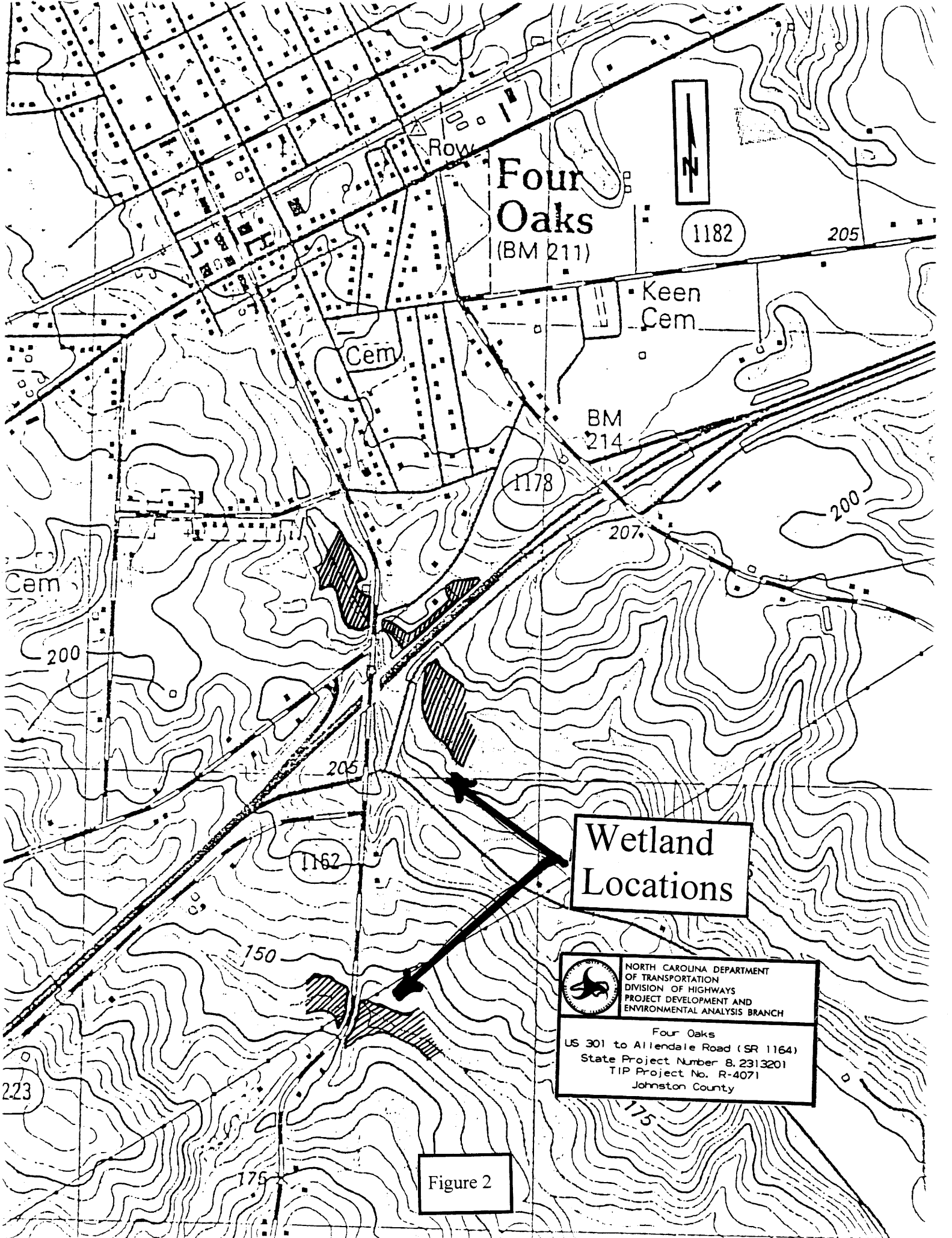


NORTH CAROLINA DEPARTMENT  
OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
PROJECT DEVELOPMENT AND  
ENVIRONMENTAL ANALYSIS BRANCH

FIGURE 1- VICINITY MAP  
I-95 INTERCHANGE TO US 301  
AT FOUR OAKS, JOHNSTON COUNTY  
STATE PROJECT NO. 8.2313201  
TIP NO. R-4071

Figure 1

Project Widening



Four Oaks  
(BM 211)



1182

205

Keen Cem

Cem

BM 214

1178

207

200

Cem

200

205

1162

150

Wetland Locations



NORTH CAROLINA DEPARTMENT  
OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
PROJECT DEVELOPMENT AND  
ENVIRONMENTAL ANALYSIS BRANCH

Four Oaks  
US 301 to Allendale Road (SR 1164)  
State Project Number B. 2313201  
TIP Project No. R-4071  
Johnston County

223

175

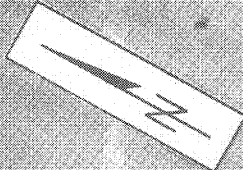
Figure 2



301

FOUR OAKS  
BANK AND TRUST

BEGIN PROJECT



BOYETTE ROAD (SR 1182)

KEEN ROAD (SR 1178)

END PROJECT

ALLENDALE ROAD (SR 1146)

BP

TEXACO

95

NORTH CAROLINA DEPARTMENT OF  
TRANSPORTATION  
PROJECT DEVELOPMENT AND  
ENVIRONMENTAL ANALYSIS BRANCH

FOUR OAKS  
US 301 TO ALLENDALE ROAD (SR 1146)  
STATE PROJECT NUMBER R2913201  
TIP PROJECT NO. R-4971  
JOHNSTON COUNTY

SCALE: 1" = 400'      FIGURE 3



See Sheet 1-A For Index of Sheets

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**JOHNSTON COUNTY**

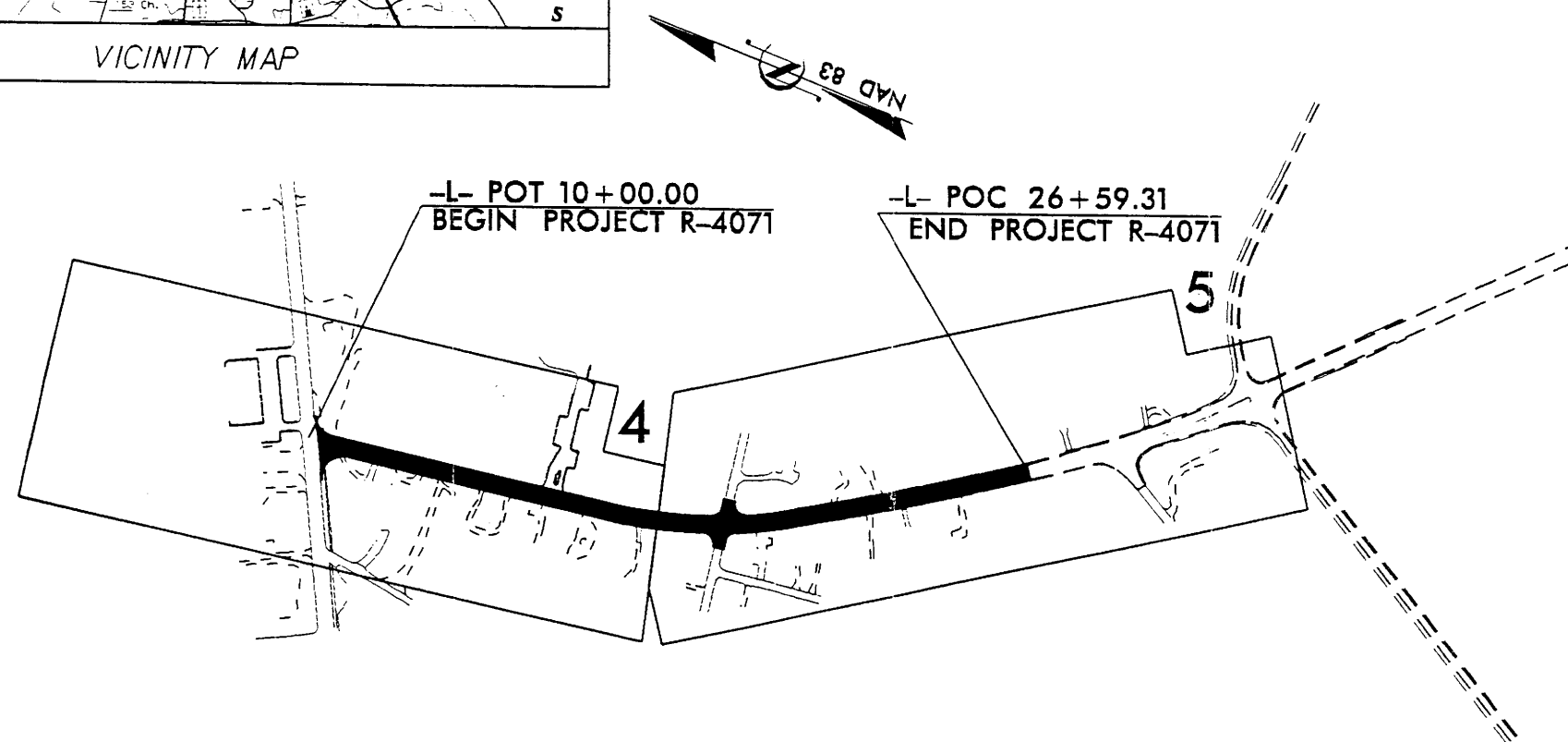
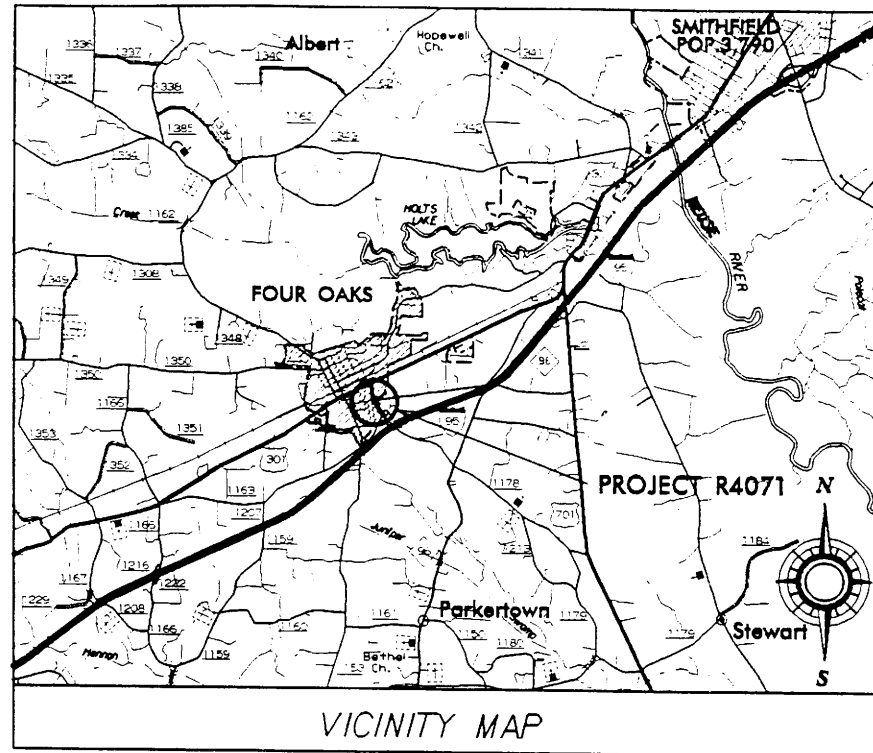
LOCATION: SR 1178 (KEEN ROAD) FROM I-95 TO I-2407 PROJECT

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND TRAFFIC SIGNAL.

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-4071	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
8.2313201	STP-1178(2)	PE	

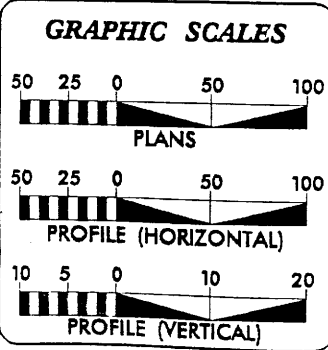
PROJECT: R-4071

PROJECT: 8.2313201



**PRELIMINARY PLANS**  
SUBJECT TO CHANGE WITHOUT NOTICE  
DATE PRINTED 07-OCT-2002 14:05  
TRANSMITTED BY  
DIVISION FOUR DDC

**INCOMPLETE PLANS**  
DO NOT USE FOR R/W ACQUISITION  
**PRELIMINARY PLANS**  
DO NOT USE FOR CONSTRUCTION



**DESIGN DATA**

ADT 2001 =	2600
ADT 2025 =	5800
DHV =	10 %
D =	60 %
T =	4 % *
V =	MPH
* TTST 1	DUAL 3

**PROJECT LENGTH**

LENGTH OF ROADWAY F.A. PROJECT STP-1178(2) = 0.314 MILES  
TOTAL LENGTH STATE PROJECT 8.2313201 = 0.314 MILES

Figure 4

Prepared in the Office of:  
**DIVISION OF HIGHWAYS**  
1000 Birch Ridge Dr., NC, 27610

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: \_\_\_\_\_

LETTING DATE: \_\_\_\_\_

PROJECT ENGINEER: \_\_\_\_\_

PROJECT DESIGN ENGINEER: \_\_\_\_\_

**HYDRAULICS ENGINEER**

SIGNATURE: \_\_\_\_\_

**ROADWAY DESIGN ENGINEER**

SIGNATURE: \_\_\_\_\_

**DIVISION OF HIGHWAYS**  
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER: \_\_\_\_\_

DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

APPROVED: \_\_\_\_\_

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

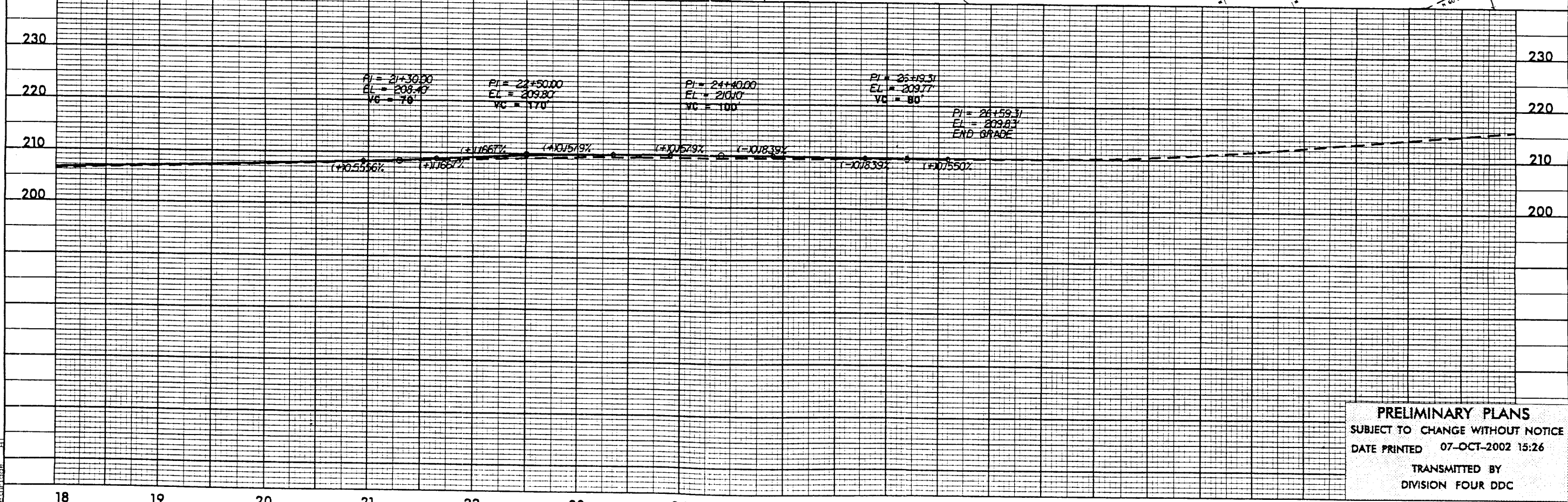
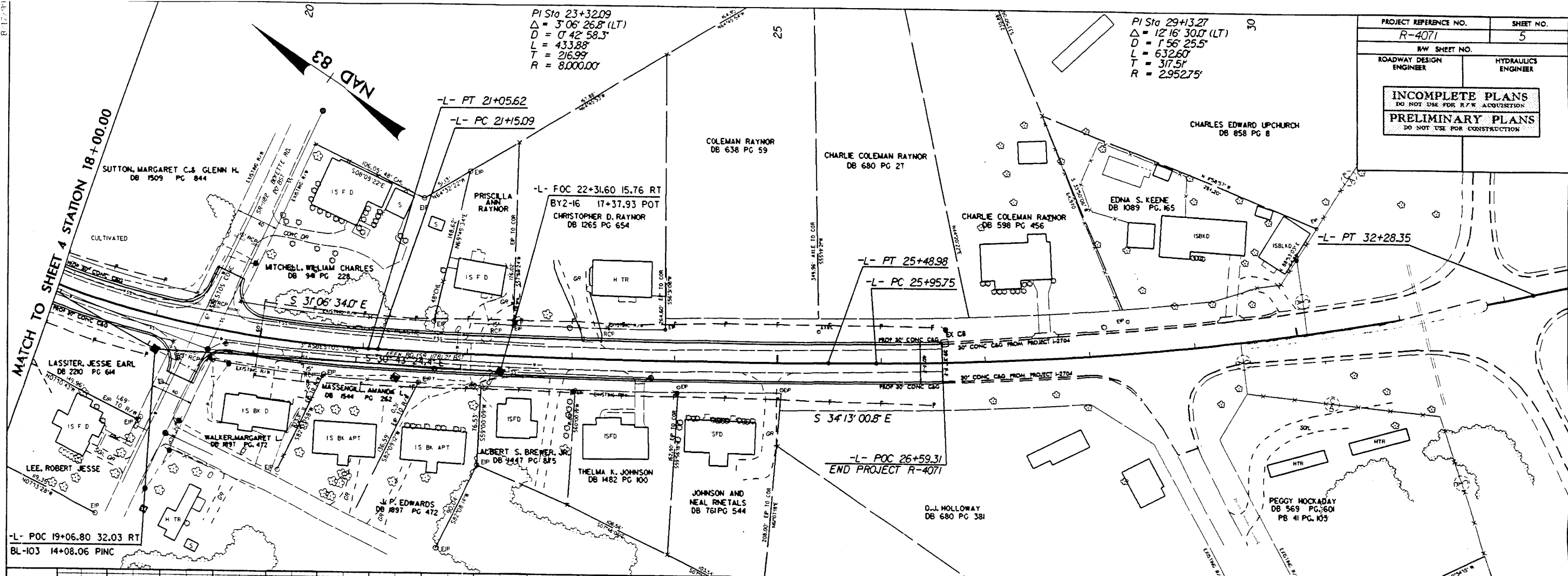
DATE: \_\_\_\_\_

07-OCT-2002 14:05  
P:\PROJECTS\8.2313201\8.2313201.TSH  
deltridg



R-17-431

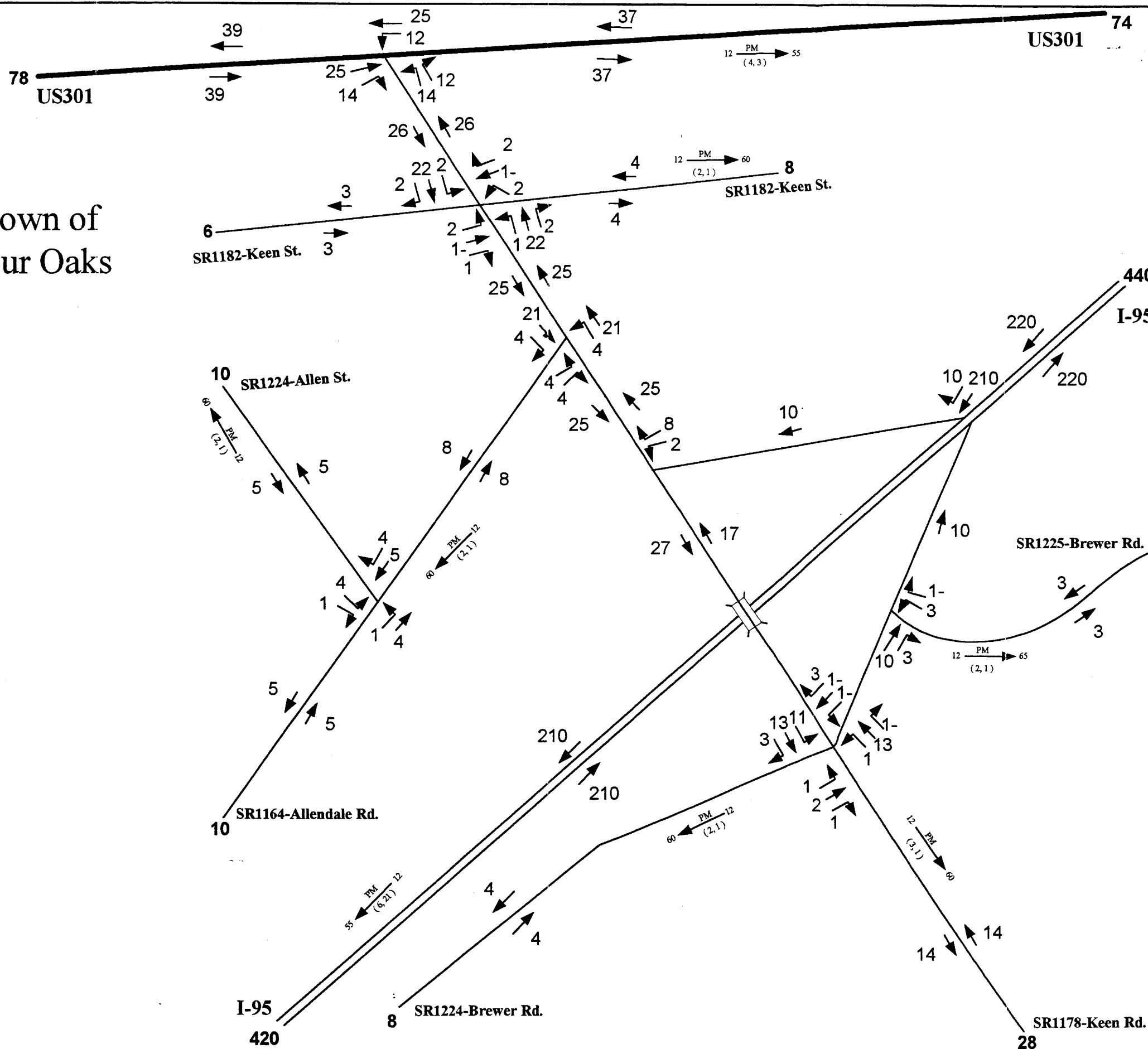
PROJECT REFERENCE NO. R-4071	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R.F.W. ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	



**PRELIMINARY PLANS**  
 SUBJECT TO CHANGE WITHOUT NOTICE  
 DATE PRINTED 07-OCT-2002 15:26  
 TRANSMITTED BY  
 DIVISION FOUR DDC

07-OCT-2002 15:26  
P:\div\4071\1071\_05.P511  
dclm

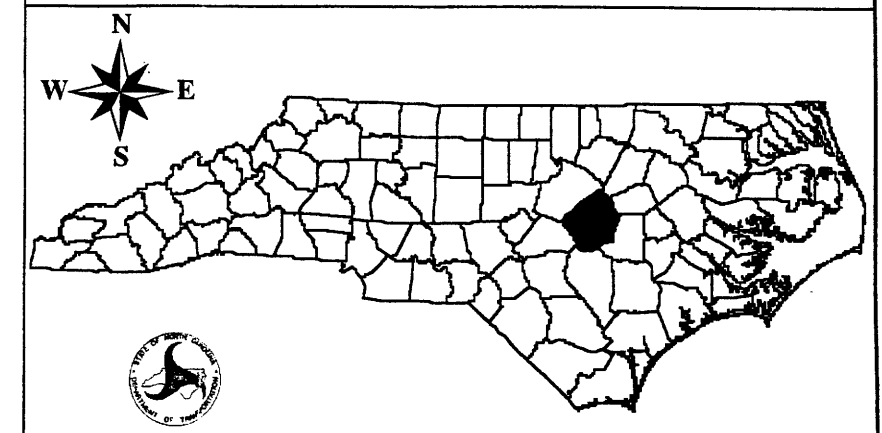
Town of Four Oaks



LEGEND

- ### VPD— # OF VEHICLES PER DAY
- ###- MUCH LESS THAN ### VPD
- X MOVEMENT PROHIBITED
- DHV DESIGN HOURLY VOLUME (%)= K30
- K30 = 30<sup>TH</sup> HIGHEST HOURLY VOLUME
- PM PM PEAK PERIOD
- D DIRECTIONAL SPLIT (%)
- INDICATES DIRECTION OF D
- ← REVERSE FLOW FOR AM PEAK
- (d,t) DUALS, TT-ST'S (%)
- CUL DE SAC

Drawing not to scale



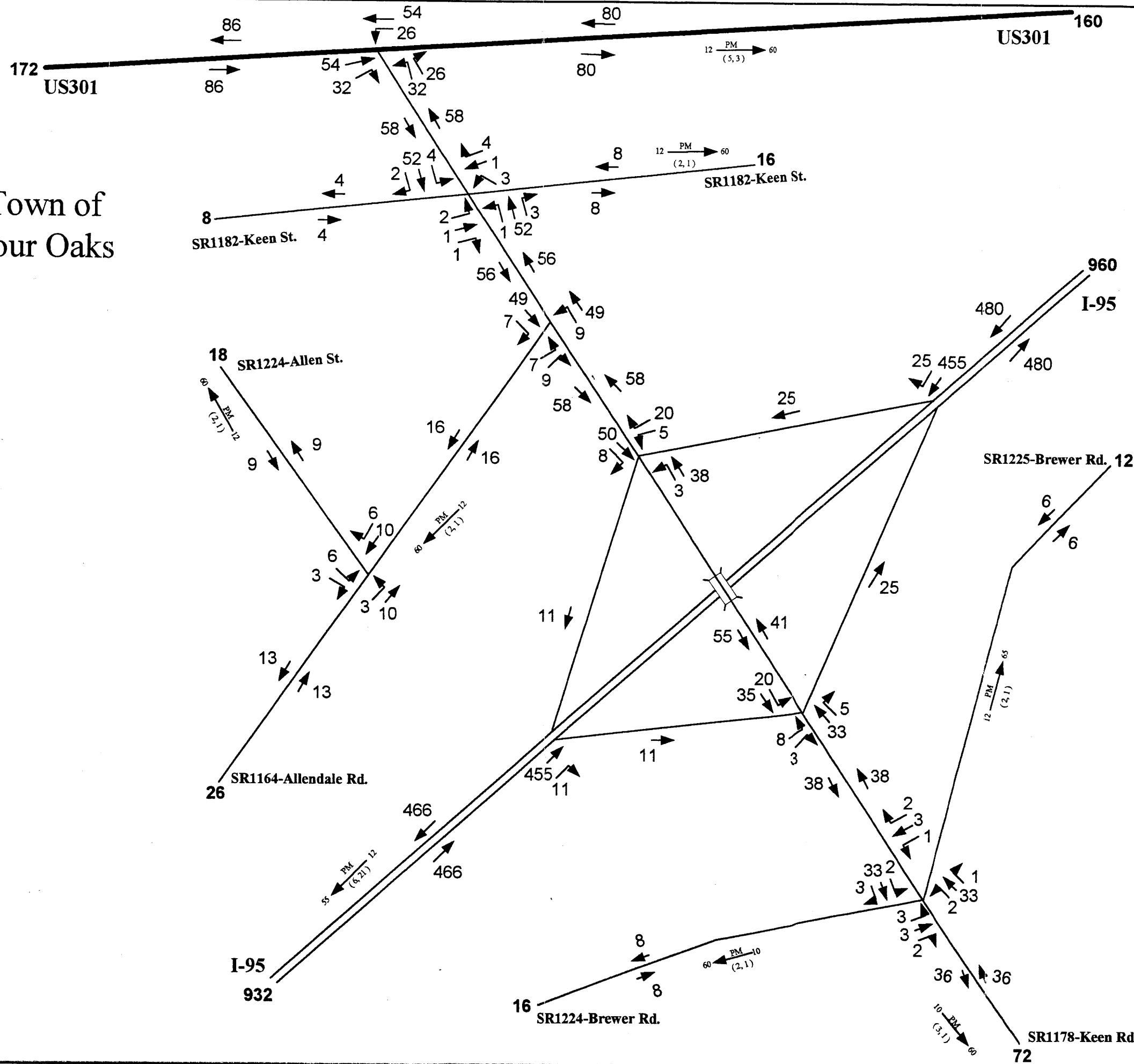
Location:	SR1178 from I-95 Interchange to US301-Wellons Street		
Project:	Widen to three lanes with curb and gutter		
County:	Johnston		
Div. :	4	Date:	March, 2001
Tip#:	R-4071	W. O. #:	8.1572101
Drawing By:	JU		

**2001 ESTIMATED ADT**  
**I-95 Interchange as half-diamond.**

Figure 5a



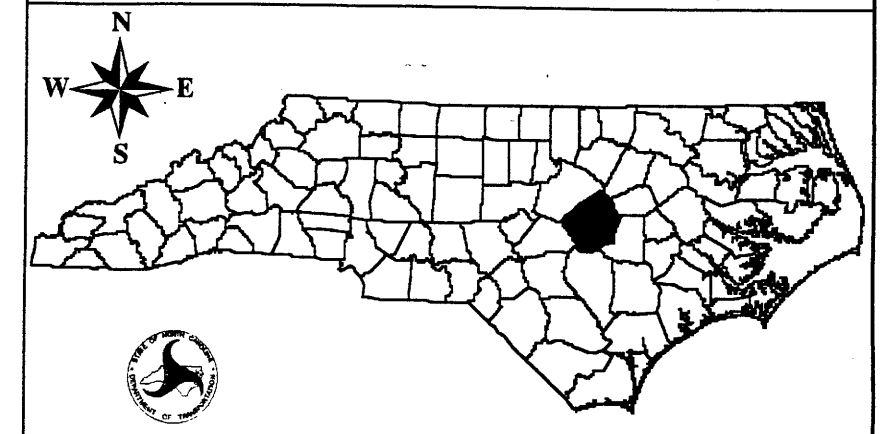
# Town of Four Oaks



## LEGEND

- ### VPD— # OF VEHICLES PER DAY
- ###- MUCH LESS THAN ### VPD
- X MOVEMENT PROHIBITED
- DHV DESIGN HOURLY VOLUME (%) = K30
- K30 = 30<sup>TH</sup> HIGHEST HOURLY VOLUME
- PM PM PEAK PERIOD
- D DIRECTIONAL SPLIT (%)
- INDICATES DIRECTION OF D
- ← REVERSE FLOW FOR AM PEAK
- (d,t) DUALS, TT-ST'S (%)
- CUL DE SAC

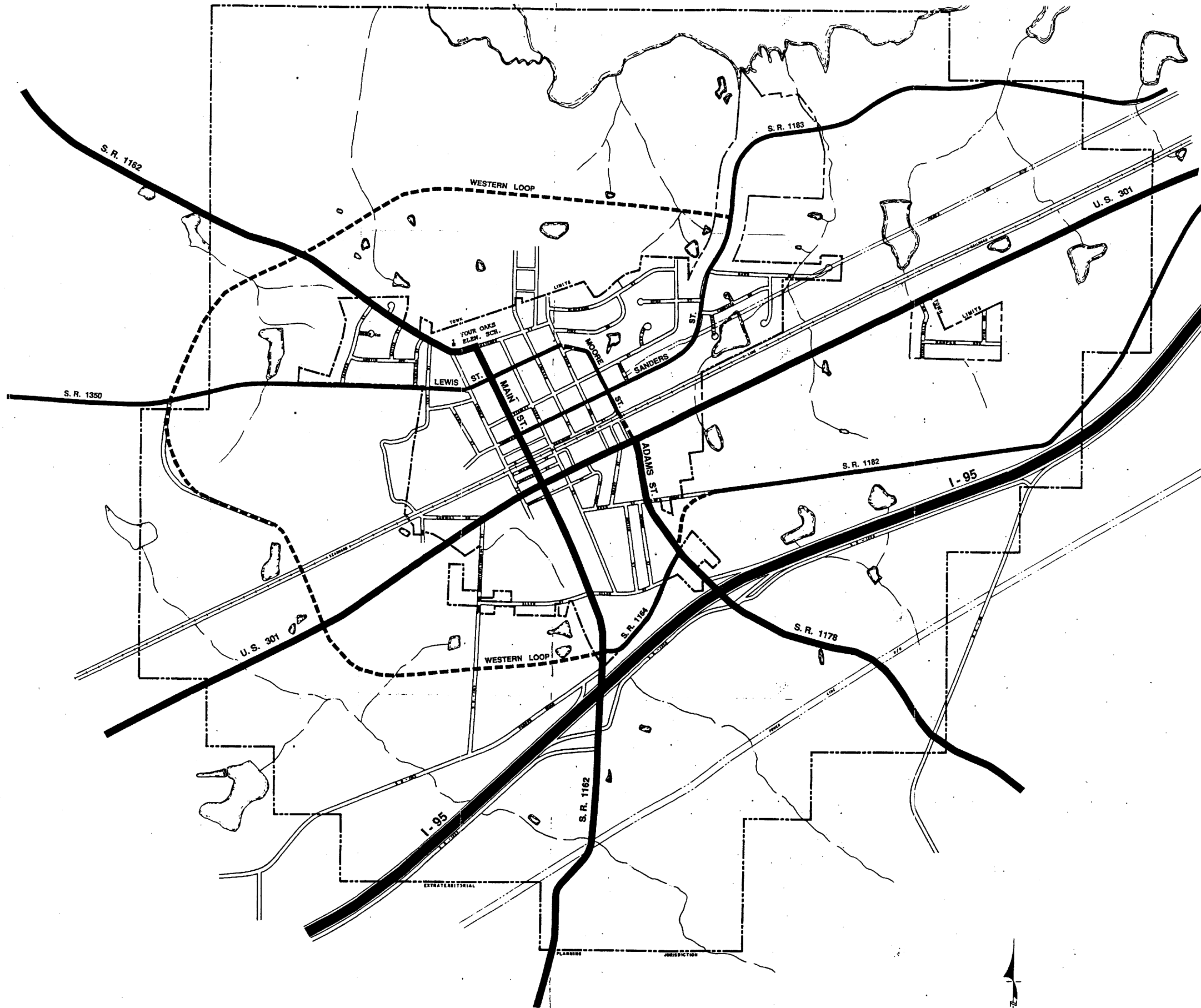
Drawing not to scale



Location:	SR1178 from I-95 Interchange to US301-Wellons Street		
Project:	Widen to three lanes with curb and gutter		
County:	Johnston		
Div. :	4	Date:	March, 2001
Tip#:	R-4071	W. O. #:	8.1572101
Drawing By:	JU		

## 2025 ESTIMATED ADT I-95 Interchange as full-diamond.

Figure 5b



**LEGEND**

	EXISTING	PROPOSED
MAJOR THOROUGHFARE		
FREWAYS		
OTHER		
MINOR THOROUGHFARE		

**ADOPTED BY:**

TOWN OF FOUR OAKS SEPTEMBER 9, 1991

PLANNING AND ENVIRONMENTAL BRANCH SEPTEMBER 16, 1991 *m.R.R.R.*

N. C. DEPARTMENT OF TRANSPORTATION OCTOBER 11, 1991

PUBLIC HEARING DATE SEPTEMBER 9, 1991

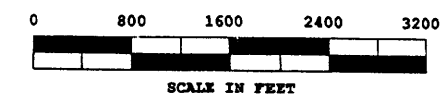
**REVISIONS**

TOWN OF FOUR OAKS	PLANNING AND ENVIRONMENTAL	N. C. DEPARTMENT OF TRANSPORTATION

**THOROUGHFARE PLAN  
FOUR OAKS  
JOHNSTON COUNTY  
NORTH CAROLINA**

PREPARED BY THE  
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS-PLANNING AND ENVIRONMENTAL BRANCH  
IN COOPERATION WITH  
U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION  
**AUGUST 12, 1991**

Figure 6



JULY 11, 1991

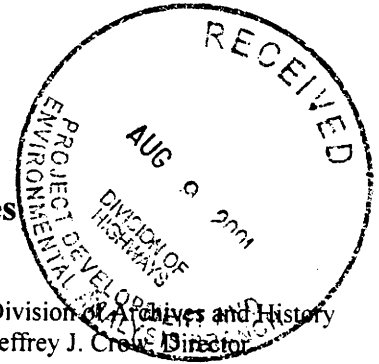
## APPENDIX

Stephanie Ledbetter



North Carolina Department of Cultural Resources  
State Historic Preservation Office

David L. S. Brook, Administrator



Michael F. Easley, Governor  
Lisbeth C. Evans, Secretary

Division of Archives and History  
Jeffrey J. Crowe, Director

August 6, 2001

MEMORANDUM

To: William D. Gilmore, P.E., Manager  
NCDOT, Project Development & Environmental Analysis Branch

From: David Brook *for David Brook*  
Deputy State Historic Preservation Officer

Re: Review of Scoping Sheets for Four Oaks, Widening of SR 1178 (Keen Road) from I-95 to US 301, STP-1178(2), 8.2313201, R-4071, Johnston County, ER 02-7081

Thank you for your memorandum of July 9, 2001, concerning the above project.

We have conducted a review of the project and are aware of no properties of architectural, historic, or archaeological significance, which would be affected by the project. Therefore, we have no comment on the project as currently proposed.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, Environmental Review Coordinator, at 919/733-4763.

DB:kgc

cc: Mary Pope Furr, NCDOT  
T. Padgett, NCDOT

	Location	Mailing Address	Telephone/Fax
Administration	507 N. Blount St, Raleigh, NC	4617 Mail Service Center, Raleigh 27699-4617	(919) 733-4763 • 733-8653
Restoration	515 N. Blount St, Raleigh, NC	4613 Mail Service Center, Raleigh 27699-4613	(919) 733-6547 • 715-4801
Survey & Planning	515 N. Blount St, Raleigh, NC	4618 Mail Service Center, Raleigh 27699-4618	(919) 733-4763 • 715-4801



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

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

January 23, 2002

Mr. William D. Gilmore, P.E., Manager  
NCDOT  
Project Development and Environmental Analysis Branch  
1548 Mail Service Center  
Raleigh, North Carolina 27699-1548

Dear Mr. Gilmore:

Thank you for your letter of January 11, 2002, requesting information from the U.S. Fish and Wildlife Service (Service) for the purpose of evaluating the potential environmental impacts of the proposed widening of SR 1178 (Keen Road) from I-95 to US 301, Four Oaks, Johnston County, North Carolina (TIP No. R-4071). This report provides scoping information and is provided in accordance with provisions of the Fish and Wildlife Coordination Act (FWCA) (16 U.S.C. 661-667d) and section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543). This report also serves as initial scoping comments to federal and state resource agencies for use in their permitting and/or certification processes for this project.

The North Carolina Department of Transportation (NCDOT) proposes to widen SR 1178 from I-95 to US 301 to three lanes. The following recommendations are provided to assist you in your planning process and to facilitate a thorough and timely review of the project.

Generally, the Service recommends that wetland impacts be avoided and minimized to the maximum extent practical as outlined in Section 404 (b)(1) of the Clean Water Act Amendments of 1977. In regard to avoidance and minimization of impacts, we recommend that proposed highway projects be aligned along or adjacent to existing roadways, utility corridors, or previously developed areas in order to minimize habitat fragmentation and encroachment. Areas exhibiting high biodiversity or ecological value important to the watershed and region should be avoided. Crossings of streams and associated wetland systems should use existing crossings and/or occur on a structure wherever feasible. Where bridging is not feasible, culvert structures that maintain natural water flows and hydraulic regimes without scouring, or impeding fish and wildlife passage, should be employed. Highway shoulder and median widths should be reduced through wetland areas. Roadway embankments and fill areas should be stabilized by using appropriate erosion control devices and techniques. Wherever appropriate, construction in sensitive areas should occur outside fish spawning and migratory bird nesting seasons.

The National Wetlands Inventory (NWI) map of the Four Oaks 7.5 Minute Quadrangle does not show significant wetland resources in the specific work area. However, while the NWI maps are useful for providing an overview of a given area, they should not be relied upon in lieu of a detailed wetland delineation by trained personnel using an acceptable wetland classification methodology.

We reserve the right to review any federal permits that may be required for this project, at the public notice stage. Therefore, it is important that resource agency coordination occur early in the planning process in order to resolve any conflicts that may arise and minimize delays in project implementation.

In addition to the above guidance, we recommend that the environmental documentation for this project include the following in sufficient detail to facilitate a thorough review of the action:

1. A clearly defined and detailed purpose and need for the proposed project, supported by tabular data, if available, and including a discussion of the project's independent utility;
2. A description of the proposed action with an analysis of all alternatives being considered, including the upgrading of existing roads and a "no action" alternative;
3. A description of the fish and wildlife resources, and their habitats, within the project impact area that may be directly or indirectly affected;
4. The extent and acreage of waters of the U.S., including wetlands, that are to be impacted by filling, dredging, clearing, ditching, or draining. Acres of wetland impact should be differentiated by habitat type based on the wetland classification scheme of the National Wetlands Inventory (NWI). Wetland boundaries should be determined by using the 1987 Corps of Engineers Wetlands Delineation Manual and verified by the U.S. Army Corps of Engineers (Corps);
5. The anticipated environmental impacts, both temporary and permanent, that would be likely to occur as a direct result of the proposed project. The assessment should also include the extent to which the proposed project would result in secondary impacts to natural resources, and how this and similar projects contribute to cumulative adverse effects;
6. Design features and construction techniques which would be employed to avoid or minimize the fragmentation or direct loss of wildlife habitat value;
7. Design features, construction techniques, or any other mitigation measures which would be employed at wetland crossings and stream channel relocations to avoid or minimize impacts to waters of the United States; and,

8. If unavoidable wetland impacts are proposed, we recommend that every effort be made to identify compensatory mitigation sites in advance. Project planning should include a detailed compensatory mitigation plan for offsetting unavoidable wetland impacts. Opportunities to protect mitigation areas in perpetuity, preferably via conservation easement, should be explored at the outset.

The enclosed list identifies the federally-listed endangered and threatened species, and Federal Species of Concern (FSC) that are known to occur in Johnston County. The Service recommends that habitat requirements for these federally-listed species be compared with the available habitat at the project site. If suitable habitat is present within the action area of the project, biological surveys for the listed species should be conducted. Environmental documentation should include survey methodologies and results.

FSC's are those plant and animal species for which the Service remains concerned, but further biological research and field study are needed to resolve the conservation status of these taxa. Although FSC's receive no statutory protection under the ESA, we would encourage the NCDOT to be alert to their potential presence, and to make every reasonable effort to conserve them if found. The North Carolina Natural Heritage Program should be contacted for information on species under state protection.

The Service appreciates the opportunity to comment on this project. Please continue to advise us during the progression of the planning process, including your official determination of the impacts of this project. If you have any questions regarding these comments, please contact Tom McCartney at 919-856-4520, (Ext. 32).

Sincerely,



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

Enclosure

cc: COE, Raleigh, NC (Eric Alsmeyer)  
NCDWQ, Raleigh, NC (John Hennessy)  
NCDNR, Creedmoor, NC (David Cox)  
EPA, Atlanta, GA (Ted Bisterfeld)

FWS/R4:TMcCartney:TM:01/23/02:919/856-4520 extension 32:\R-4071.tip

COMMON NAME	SCIENTIFIC NAME	STATUS
-------------	-----------------	--------

## JACKSON COUNTY

### Vertebrates

Green salamander	<i>Aneides aeneus</i>	FSC
Hellbender	<i>Cryptobranchus alleganiensis</i>	FSC
Peregrine falcon	<i>Falco peregrinus anatum</i>	Endangered
Carolina northern flying squirrel	<i>Glaucomys sabrinus coloratus</i>	Endangered
Indiana bat	<i>Myotis sodalis</i>	Endangered
Olive darter	<i>Percina squamata</i>	FSC
Northern pine snake	<i>Pituophis melanoleucus melanoleucus</i>	FSC

### Invertebrates

Appalachian elktoe	<i>Alasmidonta raveneliana</i>	Endangered
French Broad crayfish	<i>Cambarus reburus</i>	FSC
Whitewater crayfish ostracod	<i>Dactyloctythere prinsi</i>	FSC
Tawny crescent butterfly	<i>Phycoides batesii maconensis</i>	FSC
Diana fritillary butterfly	<i>Speyeria diana</i>	FSC

### Vascular Plants

Fraser fir	<i>Abies fraseri</i>	FSC
Mountain bittercress	<i>Cardamine clematitis</i>	FSC
Manhart's sedge	<i>Carex manhartii</i>	FSC
Tall larkspur	<i>Delphinium exaltatum</i>	FSC
Glade spurge	<i>Euphorbia purpurea</i>	FSC
Swamp pink	<i>Helonias bullata</i>	Threatened
Small-whorled pogonia	<i>Isotria medeoloides</i>	Threatened
Butternut	<i>Juglans cinerea</i>	FSC
Fraser's loosestrife	<i>Lysimachia fraseri</i>	FSC
Sweet pinesap	<i>Monotropsis odorata</i>	FSC
Carolina saxifrage	<i>Saxifraga caroliniana</i>	FSC
Divided-leaf ragwort	<i>Senecio millefolium</i>	FSC
Mountain catchfly	<i>Silene ovata</i>	FSC

### Nonvascular Plants

Gorge moss	<i>Bryocrumia vivicolor</i>	FSC
Rock gnome lichen	<i>Gymnoderma lineare</i>	Endangered
A liverwort	<i>Plagiochila sullivantii</i> var. <i>spinigera</i>	FSC
A liverwort	<i>Plagiochila sullivantii</i> var. <i>sullivantii</i>	FSC
A liverwort	<i>Plagiochila virginica</i> var. <i>caroliniana</i>	FSC
Carolina star-moss	<i>Plagiomnium carolinianum</i> (= <i>Mnium carolinianum</i> )	FSC
A liverwort	<i>Sphenobolopsis pearsonii</i>	FSC

## JOHNSTON COUNTY

### Vertebrates

Red-cockaded woodpecker	<i>Picoides borealis</i>	Endangered
-------------------------	--------------------------	------------



COMMON NAME	SCIENTIFIC NAME	STATUS
<b>Invertebrates</b>		
Dwarf wedge mussel	<i>Alasmidonta heterodon</i>	Endangered
Tar spiny mussel	<i>Elliptio steinstansana</i>	Endangered
Yellow lance	<i>Elliptio lanceolata</i>	FSC
Atlantic pigtoe	<i>Fusconaia masoni</i>	FSC
Yellow lamp mussel	<i>Lampsilis cariosa</i>	FSC
Green floater	<i>Lasmigona subviridis</i>	FSC
Tar River crayfish	<i>Procambarus medialis</i>	FSC

<b>Vascular Plants</b>		
Michaux's sumac	<i>Rhus michauxii</i>	Endangered*
Spring-flowering goldenrod	<i>Solidago verna</i>	FSC
Carolina asphodel	<i>Tofieldia glabra</i>	FSC*
Carolina least trillium	<i>Trillium pusillum</i> var. <i>pusillum</i>	FSC

## JONES COUNTY

<b>Vertebrates</b>		
American alligator	<i>Alligator mississippiensis</i>	T(S/A)
Southern hognose snake	<i>Heterodon simus</i>	FSC*
Red-cockaded woodpecker	<i>Picoides borealis</i>	Endangered
Carolina gopher frog	<i>Rana capito capito</i>	FSC

<b>Invertebrates</b>		
Croatan crayfish	<i>Procambarus plumimanus</i>	FSC

<b>Vascular Plants</b>		
Carolina spleenwort	<i>Asplenium heteroresiliens</i>	FSC
Chapman's sedge	<i>Carex chapmanii</i>	FSC
Venus flytrap	<i>Dionea muscipula</i>	FSC
Carolina bogmint	<i>Macbridea caroliniana</i>	FSC**
Godfrey's sandwort	<i>Minuartia godfreyi</i>	FSC
Savanna cowbane	<i>Oxypolis ternata</i>	FSC
Carolina goldenrod	<i>Solidago pulchra</i>	FSC
Spring-flowering goldenrod	<i>Solidago verna</i>	FSC

## LEE COUNTY

### Critical Habitat Designation:

**Cape Fear shiner, *Netropis mekistocholas*** - Approximately 0.5 river mile of Bear Creek, from Chatham County Road 2156 Bridge downstream to the Rocky River, then downstream in the Rocky River (approximately 4.2 river miles) to the Deep River, then downstream in the Deep River (approximately 2.6 river miles) to a point 0.3 river mile below the Moncure, North Carolina, U.S. Geological Survey Gaging Station. Constituent elements include clean streams with gravel, cobble, and boulder substrates with pools, riffles, shallow runs and slackwater areas with large rock outcrops and side channels and pools with water of good quality with relatively low silt loads.

*Lead better*

OCT 25 2001

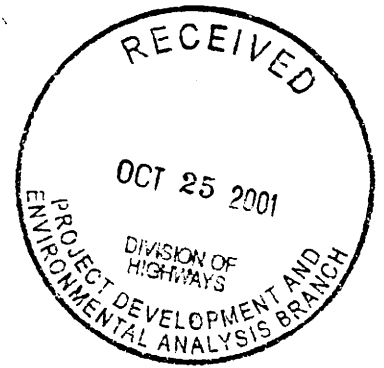


DEPARTMENT OF THE ARMY  
WILMINGTON DISTRICT, CORPS OF ENGINEERS

P.O. BOX 1890  
WILMINGTON, NORTH CAROLINA 28402-1890

October 16, 2001

IN REPLY REFER TO



Regulatory Division

Action ID. 200121158; Widening of SR 1178 (Keen Road) from I-95 to US 301, Johnston County, F.A. Project No. STP-1178(2), State Project No. 8.2313201, North Carolina, TIP No. R-4071.

William D. Gilmore, P.E., Manager  
Planning and Environmental Branch  
North Carolina Department of Transportation  
Division of Highways  
1548 Mail Service Center  
Raleigh, North Carolina 27699-1548

Dear Mr. Gilmore:

This is in response to your letter dated July 9, 2001, requesting input on the proposed widening of SR 1178 (Keen Road) from I-95 to US 301, in Four Oaks, Johnston County, North Carolina (TIP No. R-4071).

Prior Department of the Army permit authorization, pursuant to Section 404 of the Clean Water Act of 1977, as amended, will be required for the discharge of excavated or fill material into waters and/or wetlands in conjunction with this project, including temporary impacts for construction access or bridge demolition, and the disposal of construction debris.

Based upon our review of the project and associated maps, our review indicates that the proposed work may not involve the discharge of excavated or fill material into waters and wetlands. However, we strongly suggest that you review the project corridor to determine the presence of waters of the United States, including wetlands, subject to our regulatory authority pursuant to Section 404 of the Clean Water Act, which might be impacted by the subject project. Once final plans are completed, including the extent and location of any work within waters of the United States and wetlands, our Regulatory Division would appreciate the opportunity to review these plans for a project-specific determination of Department of the Army permit requirements. These plans should include temporary impacts from any necessary construction access or bridge demolition. Bridge demolition work should be planned in strict accordance with the latest NCDOT Policy: Bridge Demolition and Removal in Waters of the United States (BDR Policy), including the Best Management Practices for Bridge Demolition and Removal. If there are only minor impacts to waters, including wetlands, the work might be authorized under one or more nationwide or regional general permits provided avoidance and minimization are adequately addressed.

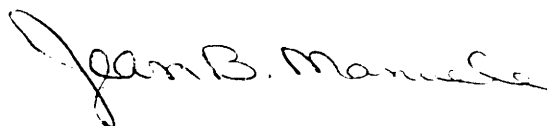
The Corps of Engineers must assess the impacts of such activities on the aquatic environment prior to issuing Department of the Army permits. Authorization of aquatic fill activities requires that the project be water dependent and/or that no practicable alternatives are available. Our initial review emphasis for North Carolina Department of Transportation (NCDOT) projects will focus on the impacts to waters and/or wetlands. However, if degradation to other aspects of the natural environment (e.g., habitat of endangered species) is considered to be of greater concern, an alternative resulting in greater aquatic losses may be chosen as preferred.

In all cases, and in accordance with the Memorandum of Agreement between the U.S. Environmental Protection Agency and the Corps, the sequencing process of avoidance, minimization, and compensatory mitigation of unavoidable wetland impacts will be satisfied prior to the final permit decision. A Department of the Army permit will not be issued until a final plan for compensatory mitigation is approved. Mitigation for stream impacts may also be required.

Regarding the alternatives to be studied, the Corps recommends that NCDOT study an alternative to replace the structure on existing location, and detour traffic on existing roads. This alternative would likely reduce temporary and permanent impacts to the stream and its stable bank.

Questions or comments pertaining to permits may be directed to me, at telephone (919) 876-8441, extension 24.

Sincerely,

A handwritten signature in cursive script that reads "Jean B. Manuele".

Jean B. Manuele  
Project Manager,  
Raleigh Regulatory Field Office

Copy Furnished:

Ms. Emily Lawton  
Federal Highway Administration  
310 New Bern Ave., Rm 410  
Raleigh, North Carolina 27601-1442

# North Carolina Geodetic Survey

[www.ncgs.state.nc.us/](http://www.ncgs.state.nc.us/)

- Digital Control Maps
- Database Search (NCGS & NGS)
- GPS Base Station Files
- County & State Boundary Information
- NC Floodplain Mapping
- EDM Calibration Baseline Data
- Geodetic Toolkit



## Division of Land Resources

### North Carolina Geodetic Survey

**Mailing Address:**

NCGS  
 20323 Mail Service Center  
 Raleigh, NC 27699-0323

**Office Location:**

NCGS  
 Elks Building/121 W. Jones St.  
 Raleigh, NC 27603-1334

Phone: (919) 733-3856

Fax: (919) 733-4407

Email: [gary.thompson@ncmail.net](mailto:gary.thompson@ncmail.net)

To: Stephanie Caudell

Number of pages: 3

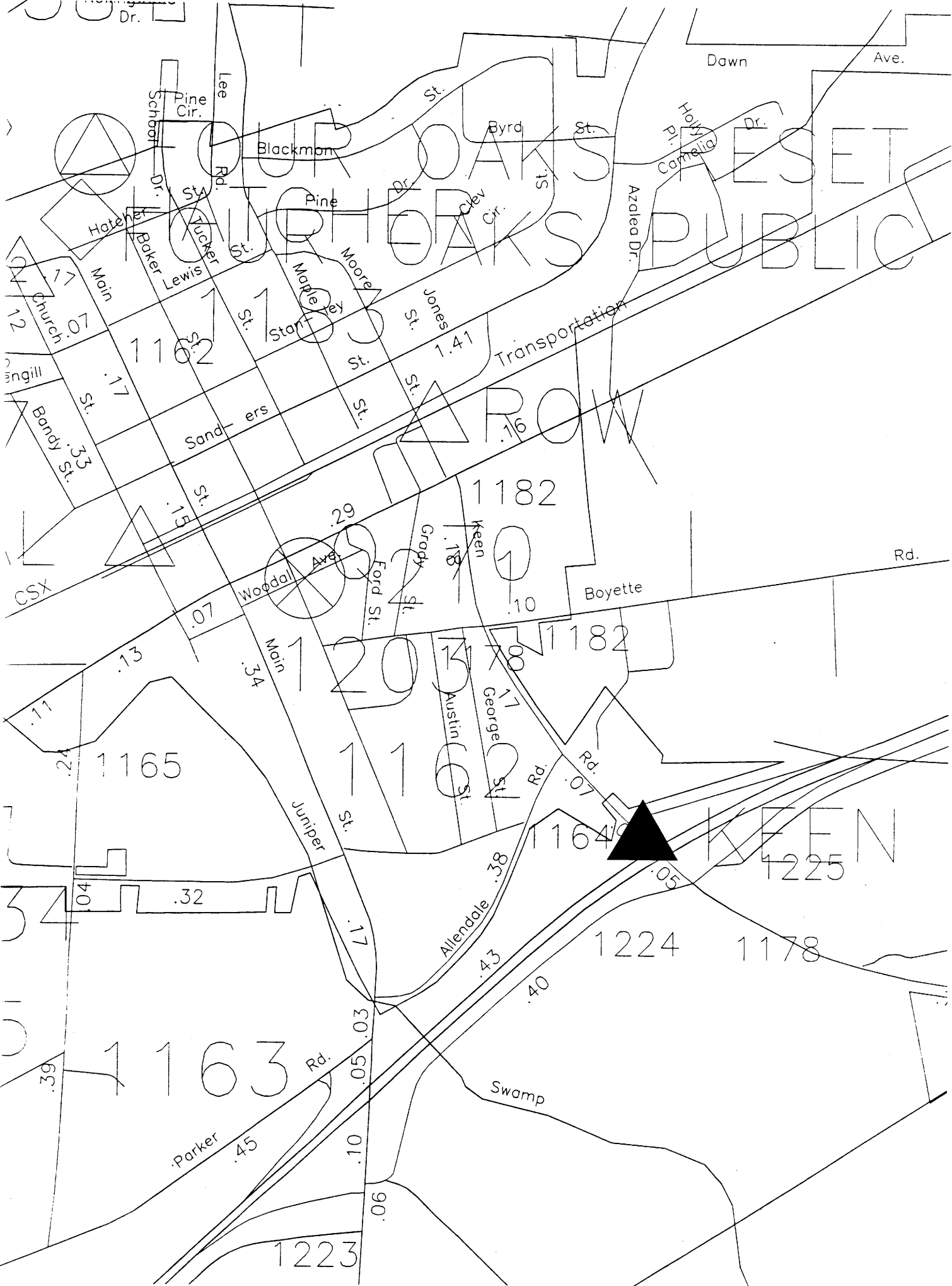
From: Ginger

Fax #: 919-733-9764

Phone #: \_\_\_\_\_

Comments: \_\_\_\_\_

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973-9794

J.P. Austin Mayor  
Phone 919-969-3112

P.O. Box 610  
Four Oaks, North Carolina 27520

January 15, 2003

Mr. Gregory Thorp

X Ms. Stephanie Caldwell

NC Department of Transportation

1548 Mail Service Center

Raleigh, NC 27699-1548

Dear Mr. Thorp and Ms. Caldwell:

I am writing you concerning the widening project of Keen Road located in our jurisdiction. The Town Board of Commissioners discussed this project and would like to make a few requests. The first request would be that this area would be curbed and guttered. In addition to this request the Town Board would like to see sidewalks on the north side of Keen Road since this area already has numerous people walking along the edge. There are currently development projects that will increase traffic along this stretch of Keen Road, which will make sidewalks even more important. Along with the above requests, the Town would like to see some landscaping included with this project. The Town adopted a landscape ordinance approximately 2 years ago to help improve the aesthetics of the Town.

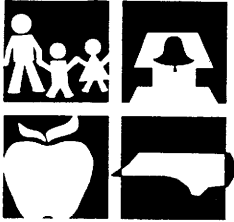
One other item I would like to mention is a stoplight at the intersection of Boyette Road. I requested a traffic study in August 2002 and the report from the Wilson office stated there was not enough traffic to place a stoplight at this intersection. The Town disagrees with this assessment. I would request that your office review this request as you make plans to widened Keen Road.

If you should have any questions regarding the foregoing please do not hesitate to contact me at (919) 963-3112 ext. 24.

Sincerely,

Amy Dunn-McLamb  
Town Clerk/Finance Officer

cc: Mayor & Board of Commissioners



# Public Schools of North Carolina

*Lead better*

State Board of Education  
Phillip J. Kirk, Jr., Chairman

www.ncpublicschools.org


Department of Public Instruction  
Michael E. Ward, State Superintendent



February 4, 2002

## MEMORANDUM

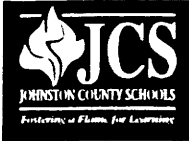
**TO:** William D. Gilmore, P.E., Manager

**FROM:** Gerald H. Knott, Section Chief, School Planning 

**SUBJECT:** Widening of SR 1178 (Keen Road) from I-95 to US 301, Johnston County, Federal-Aid Project No. STP-1178(2), State Project No. 8.2313201, TIP No. R-4071

Enclosed is the response from Johnston County Schools to our impact inquiry.

/ed  
Enclosure



# JOHNSTON COUNTY SCHOOLS

(919) 934-6031

P.O. Box 1336 Smithfield, NC 27577

(919) 934-2586 Fax

January 31, 2002

FEB - 4

Mr. Gerald H. Knott, AIA  
NC Dept. of Public Instruction  
301 N. Wilmington Street  
Raleigh, NC 27601-2825

Dear Mr. Knott:

Mr. John Evans, Director of Transportation for Johnston County Schools, has reviewed the information regarding "widening of SR 1178 (Keen Road) from I-95 to US 301, Johnston County, Federal-Aid Project No. STP-1178(2), State Project No. 8.2313201, TIP No. R-4071". He reports that this project will not have any impact on a proposed school site or any bus routes in the school system at this time.

If you have any questions, please feel free to give me a call.

Sincerely,

Dwight A. Hinnant  
Associate Superintendent

DAH/dh

C: Dr. James Causby, Superintendent  
John Evans, Director of Transportation  
Ann Williams, Assistant Superintendent for Facility Services

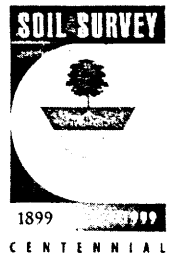




United States  
Department of  
Agriculture

Natural  
Resources  
Conservation  
Service

4405 Bland Road,  
Suite 205  
Raleigh, NC 27609  
(919) 873-2171  
(919) 873-2181 (FAX)  
mcortes@nc.nrcs.usda.gov



Subject: Farmland Information

Date: February 8, 2002

To: William D. Gilmore, P.E., Manager Project  
Development and Environmental Analysis Branch  
State Of North Carolina  
Department Of Transportation

File Code: 310-11-11

FEB 12

The following information is in response to your request inquiring comments regarding widening of SR 1178 (Keen Rd) from I-95 to US 301, Johnston County, Federal Aid Project No. STP-1178(2), State Project No. 8.2313201, TIP No. R-4071.

In most cases where federal funds (monies) are involved, an AD-1006 Farmland Conversion Impact Rating form is required. The AD-1006 should be originated by the corresponding federal agency who will provide the permits and/or funds, according to Federal Register 7CFR Part 658, Farmland Protection Policy Act; 1-1-99 Edition. USDA NRCS does not originate the form AD-1006. The corresponding federal agency must complete Parts I and III, in order to perform the evaluation of the project. Otherwise, we will NOT be able to evaluate your project. USDA NRCS is responsible for completion of Parts II, IV and V. Thereafter the federal agency, which originally generated the form, will complete Parts VI and VII.

If you are required to submit an AD-1006, once the federal agency involved originates the form with Sections I and III adequately completed, you will have to send us the form for our evaluation. Please send it to any Resource Soil Scientist shown on the attached map, according to the project location. Any request received in our office will be forwarded to the corresponding Resource Soil Scientist, delaying the evaluation process.

Along with your request you must enclosed the following documents. Failing to do so will cause delays in the evaluation process.

1. Project description. Brief description of proposed activities.
2. Copy of the USDA NRCS soil survey map with corridor and/or project boundary drawn on the maps. If you need to change the scale of the soils map by enlarging the copy, please advise us of the scale being used. If you submit a GIS product please advise us of the scale being used. Copies of the soil maps can be obtained in any USDA-NRCS field office according to the project location. Prepare a map unit inventory and the total acreage inventory by map units that will be affected by the project. You must submit the amount of acres by map units that will be affected. (e.g. CeC = 20 acres, CuC = 2,000 acres, etc.).

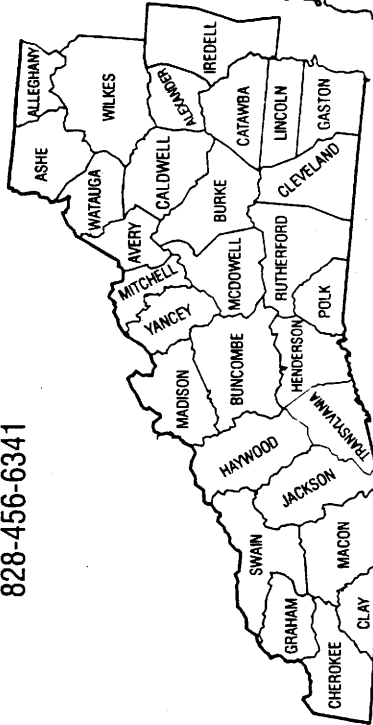
If you have any questions, please feel free to contact the corresponding Resource Soil Scientist.

Milton Cortés  
Assistant State Soil Scientist

# North Carolina Area Resource Soil Scientists

## Area 1

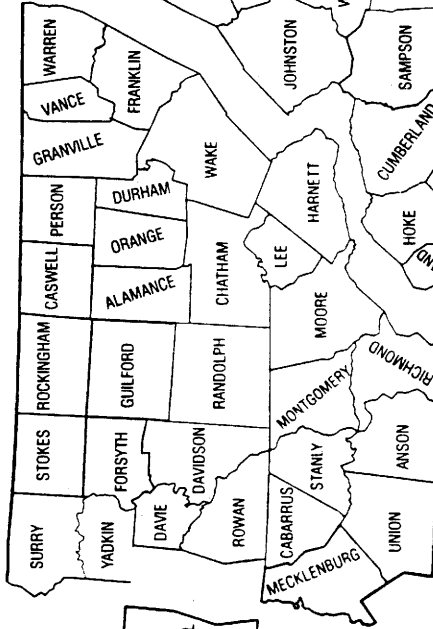
Michael L. Sherrill  
 Resource Soil Scientist  
 NRCS, P. O. Box 1109  
 Waynesville, NC 28786-1109  
 828-456-6341



## Area 2

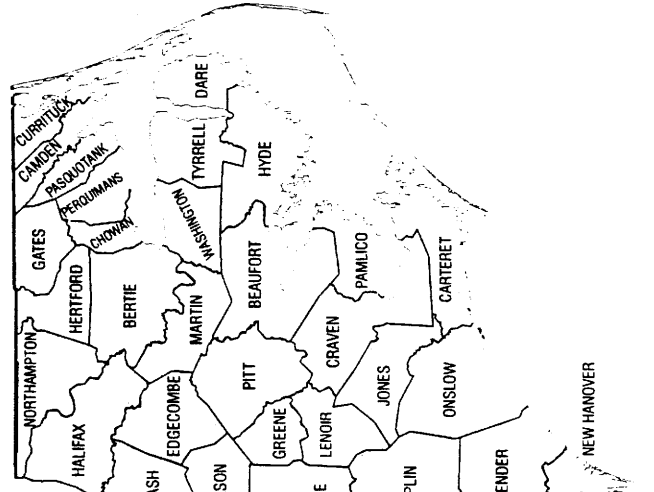
*Alan Walters*

Resource Soil Scientist  
 NRCS, 600 West Innes Street  
 Salisbury, NC 28144  
 704-637-2400



## Area 3

John A. Gagnon  
 Resource Soil Scientist  
 NRCS, 730 N. Granville St.  
 Edenton, NC 27932-1735  
 252-482-7437 Ext. 113



## Area 3

Willie E. Spruill  
 Resource Soil Scientist  
 NRCS, P. O. Box 545  
 Whiteville, NC 28472-0545  
 910-642-2196 Ext. 118



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

July 30, 2001

**Memorandum**

**To:** Mr. William D. Gilmore, PE, Manager  
Project Development and Environmental Analysis Branch

**Attn:** Ms. Stephanie Ledbetter

**From:** Arthur H. Petteway, PE, Senior Project Engineer  
Rail Division

Handwritten signature of Arthur H. Petteway in black ink.

**State Project:** 8.2313201 (R-4071)

**F/A Project:** STP-1178(2)

**County:** Johnston

**Description:** Widening of SR 1178 from I-95 to US 301

**Subject:** Review of Scoping Sheets

---

Your memorandum dated July 9, 2001 transmitted for our review scoping sheets for the above-mentioned project. After reviewing the information, our office finds no rail interaction anticipated on this project.

Thank you for your continued assistance in notifying the Rail Division of these upcoming projects.

If we can be of further assistance, please contact me at (919) 715-3689.

AHP/JKR

Cc: James B. Harris, PE

**MAILING ADDRESS:**  
RAIL DIVISION  
ENGINEERING & SAFETY BRANCH  
1556 MSC  
RALEIGH NC 27699-1556

TELEPHONE: 919-715-8803  
FAX: 919-715-8804

WEBSITE: [www.bytrain.org](http://www.bytrain.org)

**LOCATION:**  
CAPITAL YARD  
862 CAPITAL BOULEVARD  
RALEIGH, NC 27603



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

September 4, 2001

MEMORANDUM TO: Stephanie Ledbetter  
Project Development Engineer

FROM: Stephen Walker  
Traffic Noise/Air Quality Section

SUBJECT: CE Report for SR 1178 (Keen Road) From the I-95 Interchange  
to US 301 (Wellons Road), Johnston County, F.A. Project  
# STP-1178(2), State Project # 8.2313201, TIP # R-4071

The project is located in Johnston County, which has been determined to be in compliance with the National Ambient Air Quality Standards. 40 CFR part 51 is not applicable, because the proposed project is located in an attainment area. This project is not anticipated to create any adverse effects on the air quality of this attainment area.

The project proposes the construction of a 3-lane curb and gutter section for this section of SR 1178 (Keen Road). The existing roadway is currently a 2-lane, two-way facility. For the year of 2025, the maximum distances to the 72-dBA and 67-dBA noise level contours are located within the right-of-way. Hence, no receptors are anticipated to approach or exceed the FHWA Noise Abatement Criteria and no noise sensitive receptors would experience a substantial change in exterior noise levels per NCDOT Noise Abatement Policy. Based on past project experience and low traffic volumes, air quality is not expected to exceed the National Ambient Air Quality Standards. Therefore, the project's impact on noise and air quality will not be significant.

If vegetation is disposed of by burning, all burning shall be done in accordance with applicable local laws and regulations of the North Carolina SIP for air quality in compliance with 15 NCAC 2D.0520. This evaluation completes the assessment requirements for highway traffic noise of Title 23 of the Code of Federal Regulations, Part 772, and for air quality of the 1990 Clean Air Act Amendments and the NEPA process, and no additional reports are necessary.

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

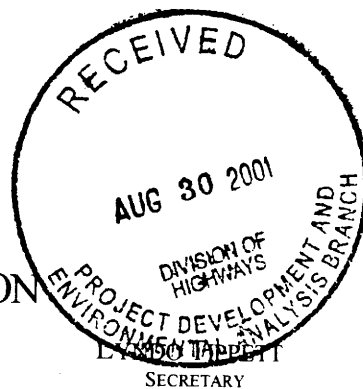
TELEPHONE: 919-733-3141  
FAX: 919-733-9794

WEBSITE: [WWW.DOH.DOT.STATE.NC.US](http://WWW.DOH.DOT.STATE.NC.US)

LOCATION:  
TRANSPORTATION BUILDING  
1 SOUTH WILMINGTON STREET  
RALEIGH NC



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION



MICHAEL F. EASLEY  
GOVERNOR

August 07, 2001

**MEMORANDUM TO:** Mr. C. W. Brown, P.E., P.L.S.  
State Location and Surveys Engineer

**FROM:** J. Derek Bradner, P.E., P.L.S. *JDB*  
Area Locating Engineer

**SUBJECT:** Scoping Comments for Widening of SR 1178  
(Keen Road) from I-95 to US 301  
Tip No. R-4071 Johnston County

**Utilities:**

Overhead utilities are located on the north side of Keen Road near I-95. The overhead utilities cross to the south side west of Allendale Road before crossing back to the north side near SR 1182 (Boyete Road). The Town of Four Oaks has a 4" force main located beneath Keen Road, an 8" sanitary sewer line and a 6" water line located on the south side of Keen Road. Pedestals indicate underground telephone throughout the project. Multiple utilities are located along US 301. There is no gas service within the Four Oaks Town limits.

**Existing Conditions:**

SR 1178 is a two-lane facility connecting I-95 to US 301 in Four Oaks. It has a posted speed limit of 35 mph. The roadway is mostly residential. 4 Oaks Village Apartments Complex is located on the north side of Keen Road near the intersection with US 301.

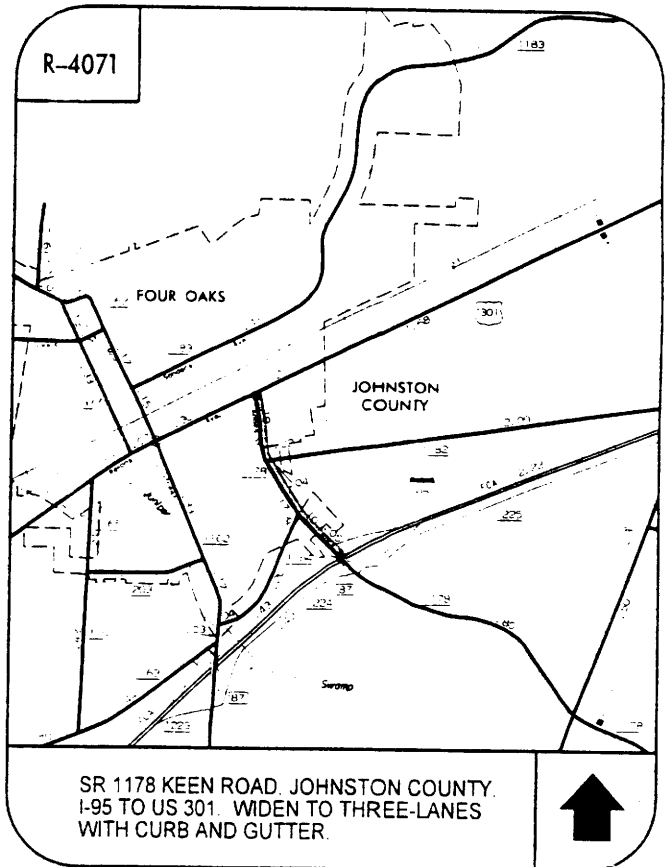
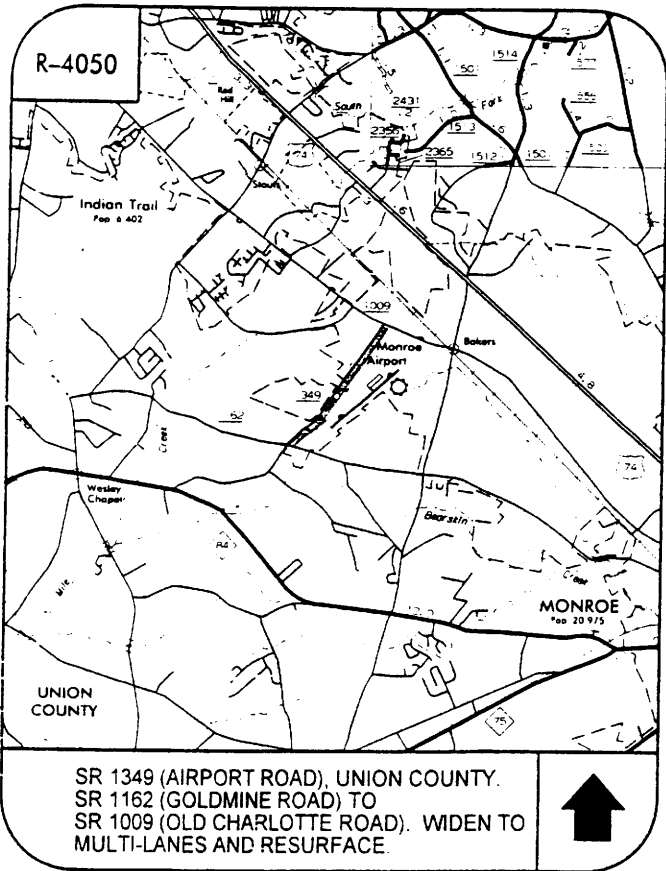
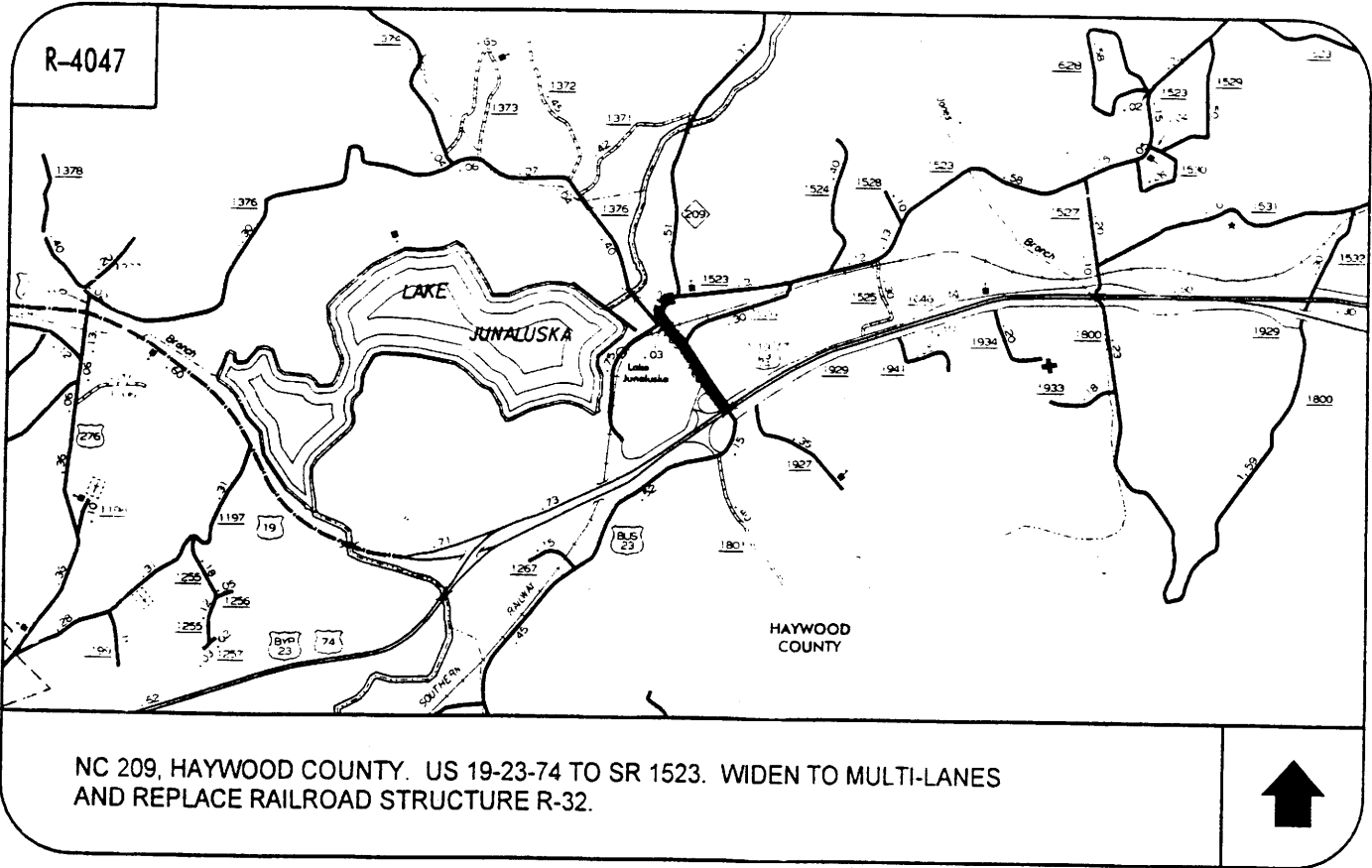
**Additional comments:**

Tip no. I-2704, upgrade of the Keen Road – I-95 interchange is schedule to be let in August of 2002. I-2704 is located at the east end of the subject project.

If additional information is required, please advise.

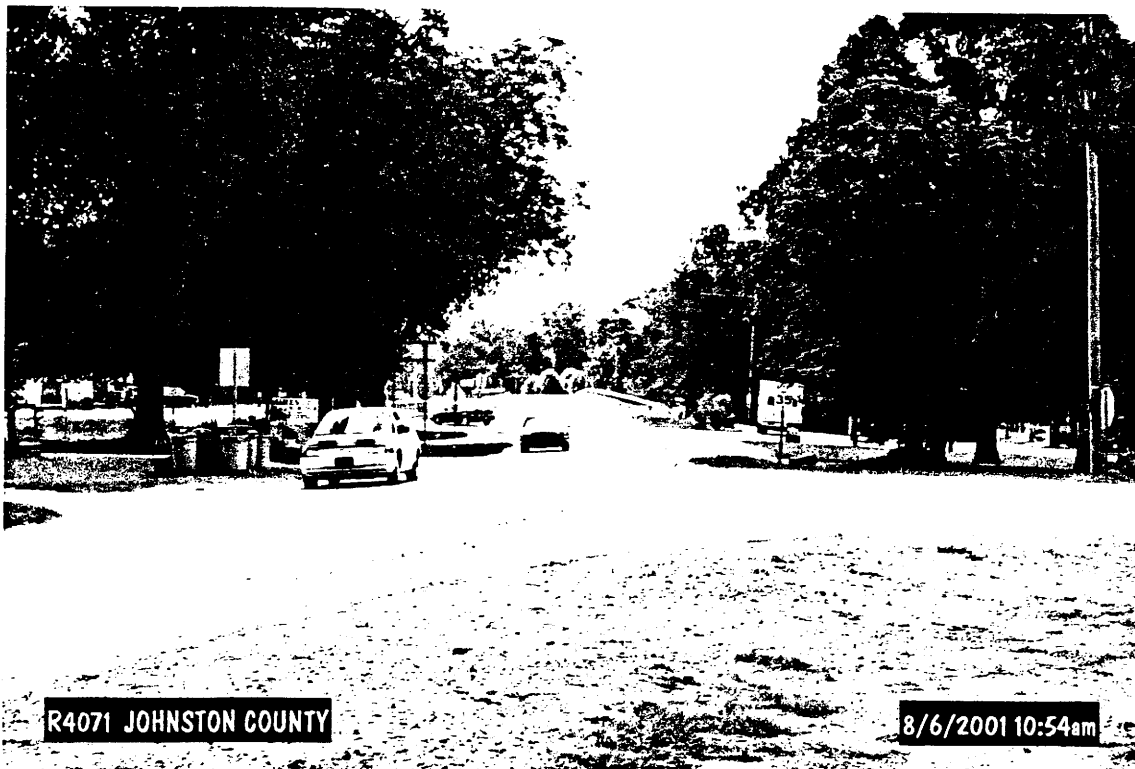
JDB

attachments





SR 1178 (Keen Road) Looking east towards existing bridge over I-95



SR 1178 (Keen Road) – SR 1164 (Allendale Road) Looking east



Keen Road – Looking east



Keen Road – Looking west towards US 301





R4071 JOHNSTON COUNTY

8/6/2001 10:48am

US 301 – SR 1178 Intersection (Looking east)



R4071 JOHNSTON COUNTY

8/6/2001 10:31am

US 301 looking south at intersection with SR 1178

## NATURAL RESOURCES

### 1.0 INTRODUCTION

The following Natural Resources Technical Report is submitted to assist in the preparation of a Categorical Exclusion (CE) for the proposed project. The project is located in the south-central portion of Johnston County (Figure 1).

#### 1.1 Project Description

The proposed project calls for the widening of the existing two-lane road, SR 1178 to three lanes from the Interstate 95 interchange to US 301 (Wellons Street). The existing right-of-way (ROW) is 60.0 ft (18.3 m), and the proposed ROW is 90.0 feet (24 m). The existing cross section is a two-way facility with a 24-foot (7.2 meters) total pavement width. The proposed cross section is a three-lane curb and gutter facility with a symmetrical 40-foot (12.2 m) total pavement width. Project length is approximately 0.47 miles (0.76 km).

#### 1.2 Environmental Commitments

There are not any site specific environmental commitments at this time. All standard guidelines and recommendations apply.

#### 1.3 Purpose

The purpose of this technical report is to inventory, catalog and describe the various natural resources likely to be impacted by the proposed action. This report also attempts to identify and estimate the probable consequences of the anticipated impacts to these resources. Recommendations are made for measures which will minimize resource impacts. **These descriptions and estimates are relevant only in the context of existing preliminary design concepts. If design parameters and criteria change, additional field investigations will need to be conducted.**

#### 1.4 Methodology

Research was conducted prior to field investigations. Information sources used in this pre-field investigation of the study area include: U.S. Geological Survey (USGS) quadrangle map for Johnston County (Four Oaks, NC, 1986), U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory Map (Four Oaks), Natural Resources Conservation Service (NRCS, formerly the Soil Conservation Service) soil information

for Johnston County and NCDOT aerial photographs of project area (1:1200). Water resource information was obtained from publications of the Department of Environment, Health and Natural Resources (DEHNR, 1992, 1993), DENR 1998, DENR Internet Page 2001, and from the NC Center for Geographic Information and Analysis (Environmental Sensitivity Base Map of Johnston County, 1995). Information concerning the occurrence of federal and state protected species in the study area was gathered from the USFWS list of protected species and species of concern and the NC Natural Heritage Program (NCNHP) database of rare species and unique habitats.

General field surveys were conducted along the proposed widening by NCDOT biologist Lynn Smith and consultant biologist Harold Brady on 4 October 2001. Plant communities and their associated wildlife were identified and recorded. Wildlife identification involved using one or more of the following observation techniques: active searching and capture, visual observations (binoculars) and identifying characteristic signs of wildlife (sounds, scat, tracks and burrows). Jurisdictional wetland determinations were performed utilizing delineation criteria prescribed in the "Corps of Engineers Wetland Delineation Manual" (Environmental Laboratory, 1987). Jurisdictional surface water determinations were performed using guidance provided by NC Division of Water Quality [(DWQ), formerly known as the Division of Environmental Management (DEM)], "Field Location of Streams, Ditches, and Ponding" (Environmental Sciences Lab, 1997).

### 1.5 Qualifications of Investigators

- 1) Investigator: Harold M. Brady, biologist, ARCADIS G&M  
Education: B.S. Natural Resources, NC State University, 1998  
Experience: ARCADIS G&M, January 2000-present  
Expertise: Natural system classification, Section 7 surveys, wetland delineations
  
- 2) Investigator: A. Lynn Smith, Natural Systems Specialist, NCDOT.  
Education: BS Environmental Science/Geology Concentration, North Carolina State University, 1998.  
Experience: NC Department of Transportation/ Project Development and Environmental Analysis Branch, January 1999 – present.

### 1.6 Definitions

Definitions for area descriptions used in this report are as follows: **Project Study Area** denotes the area bounded by proposed construction limits; **Project Vicinity** describes an area extending 0.5 mi (0.8 km) on all sides of the project study area; and

**Project Region** is equivalent to an area represented by a 7.5 minute USGS quadrangle map with the project occupying the central position.

## 2.0 PHYSICAL RESOURCES

Soil and water resources, which occur in the study area, are discussed below. Soils and availability of water directly influence composition and distribution of flora and fauna in any biotic community.

The project study area lies within the Coastal Plain physiographic region of North Carolina. The topography in this section of Johnston County is nearly level with little relief. Project elevation is approximately 211.0 ft (64.3 m) above mean sea level (msl).

### 2.1 Soils

Five soil mapping units occur within the project vicinity: Gilead sandy loam (GeB), Lynchburg sandy loam (Ly), Norfolk-Urban land complex (NuA), Udorthents (Ud), and Wagram loamy sand (WaB). Table 1 lists study area soils and their characteristics.

**Table 1. Soils within the Project Study Area**

Map Unit	Soil Series	Percent Slope	Drainage Class	Hydric Classification
GeB	Gilead sandy loam	2-8	Moderately Well	Non-hydric
Ly	Lynchburg sandy loam	0-2	Somewhat Poorly	known to contain hydric inclusions
NuA	Norfolk-Urban land complex	0-3	Well	Non-hydric
Ud	Udorthents	unknown	Well	Non-hydric
WaB	Wagram loamy sand	0-6	Excessively	Non-hydric

Gilead sandy loam consists of moderately well drained soils occurring on side slopes in the uplands in the Coastal Plain. A perched water table is at a depth of approximately 1.5 to 2.5 feet (0.46 to 0.76 m) during the early spring. Permeability is slow to moderately slow and surface runoff is rapid. The steep slope, rapid surface

runoff, and clayey subsurface texture are the main limitations. The Gilead series is listed as non-hydric. Common soil inclusions found within this mapping unit include Cowarts, Nankin, and Uchee soils.

Lynchburg sandy loam is a somewhat poorly drained soil located on broad smooth flats and in shallow depressions in the uplands. The subsoil is light yellowish brown to light brownish grey sandy clay loam with common mottles. The permeability is moderate, surface runoff is slow, and the seasonally high water table is approximately 0.5 to 1.5 ft (0.15 to 0.46) from the soil surface. The seasonally high water table is the main limitation. Lynchburg is not listed as a hydric soil; however, it is listed as containing inclusions of hydric soils. Hydric soil inclusions found within Lynchburg soil mapping units include Toisnot, Grantham, and Rains, and are located in depressional areas.

The Norfolk-Urban land complex with a 0 to 3 percent slope is a well drained soil, with moderate permeability, and slow surface runoff. Within this mapping unit, Norfolk soils and urban land are so intricately mixed due to recent land development that it was difficult to map them separately. The subsoil is yellowish brown to yellowish red sandy clay loam. The seasonal high water table is at a depth of 4 to 6 ft (1.2 to 1.8 m). Neither this mapping unit nor Norfolk soils are listed as hydric soils. Common soil inclusions found within the Norfolk-Urban land complex include Goldsboro, Lynchburg, Wagram, Cecil, Wedowee, Marlboro, and Bonneau soils.

The Udorthents mapping unit consists of areas in which the natural soils have been altered due to digging, grading, or filling. The area within the study area mapped as a Udorthent is an area which has had cut and fill activities associated with Interstate 95. Revegetation of these areas is a primary concern due to the severe erosion hazard associated.

Wagram loamy sand with a 0 to 6 percent slope is a well drained soil located on slightly convex uplands. The subsoil is strong brown sandy clay loam with common mottles in the lower portions. Wagram soils have moderate permeability and slow surface runoff. The thick, sandy surface layer is the main limitation. Wagram soils are listed as non-hydric. Common soil inclusions found within this mapping unit include Norfolk and Blanton soils.

According to NRCS, Lynchburg sandy loam contains inclusions of hydric soils in depressional areas. The hydric inclusions noted are Toisnot, Grantham, and Rains. Subsurface investigations found none of these inclusions within the project study area.

## 2.2 Water Resources

This section contains information concerning those water resources likely to be impacted by the project. Water resource information encompasses physical aspects of the resource, its relationship to major water systems, Best Usage Standards and water quality

of the resources. Probable impacts to these water bodies are also discussed, as are means to minimize impacts.

### 2.2.1 Waters Impacted and Characteristics

No surface waters will be directly impacted; however, negligible indirect impacts may occur as a result of the proposed project.

The project study area is located in the south-central portion of the Neuse River Basin, in sub-basin 03-04-04. The nearest water body, an unnamed tributary of Juniper Swamp, is located approximately 1,600 feet east of the study area (Figure 1). Juniper Swamp is a tributary of Hannah Creek, which empties into the Neuse River near the intersection of the Johnston and Wayne County boundary lines.

### 2.2.2 Best Usage Classification

Streams are assigned a best usage classification by the DWQ. The classification of Juniper Swamp [Index no. 27-52-6-6] is **C NSW**. Class **C** uses include aquatic life propagation and survival, fishing, wildlife, secondary recreation and agriculture. The supplemental classification of **NSW** denotes Nutrient Sensitive Waters which require limitations on nutrient inputs.

**Neither High Quality Waters (HQW), Water Supplies (WS-I: undeveloped watersheds or WS-II: predominately undeveloped watersheds) nor Outstanding Resource Waters (ORW) occur within 1.0 mi (1.6 km) of project study area.**

Figure 1. Vicinity Map

### 2.2.3 Water Quality

Water quality of streams is assessed in North Carolina by the DWQ using benthic macroinvertebrates as a water quality indicator. Many benthic macroinvertebrates have stages in their life cycle that can last from six months to a year, therefore, the adverse effects of a toxic spill will not be overcome until the next generation. Different taxa of macroinvertebrates have different tolerances to pollution, thereby, long term changes in water quality conditions can be identified by population shifts from pollution sensitive to pollution tolerant organisms (and vice versa). Overall, the species present, the population diversity and the biomass are reflections of long term water quality conditions.

The DWQ has initiated a whole basin approach to water quality management for the 17 river basins within the state. To accomplish this goal the DWQ collects biological, chemical and physical data that can be used in basinwide assessment and planning. All basins are reassessed every five years. Prior to the implementation of the basinwide approach to water quality management, the Benthic Macroinvertebrate Ambient Network (managed by the DEM) assessed water quality by sampling for benthic macroinvertebrate organisms at fixed monitoring sites throughout the state. **There are not any biological sampling sites located within 1.0 mi (1.6 km) of the proposed Keen Road widening project.** The nearest BMAN sampling site is located on Hannah Creek approximately 4.5 miles southeast and downstream from the project area. This sampling site was given a biological classification of **Good-Fair**.

The North Carolina Index of Biotic Integrity (NCIBI) was developed for assessing the biological integrity of streams by examining the structure and health of its fish community. The NCIBI scores are used to determine the ecological integrity class of the stream from which the sample was collected. However, the scores may not necessarily directly correlate to water quality (DWQ, 1998). One fish community assessment has been conducted within the Hannah Creek watershed. This site is located approximately 1.5 miles south of the project area, and is upstream of the confluence of Juniper Swamp and Hannah Creek. Hannah Creek received an NCIBI score of 50, thus rating the stream as **Good**. A nearby fish community assessment site at Holts Lake located approximately 1.5 miles northeast of the project area was assessed in 1995. Holts Lake was determined to be a fully supporting eutrophic lake. Holts Lake is not in the Hannah Creek watershed.

Point source dischargers located throughout North Carolina are permitted through the National Pollutant Discharge Elimination System (NPDES) Program. Any discharger is required to register for a permit. **There are no permitted dischargers located within 3.0 mi (4.8 km) of the project area or within the Hannah Creek watershed.**

Nonpoint source discharge refers to runoff that enters surface waters through stormwater or snowmelt. Agricultural activities may serve as a source for various forms of nonpoint source pollutants. Land clearing and plowing disturb soils to a degree where they are susceptible to erosion, which can lead to sedimentation in streams. Sediment is the most widespread cause of nonpoint source pollution in North Carolina. Pesticides, chemical fertilizers and land application of animal wastes can be transported via runoff to receiving streams and potentially elevate concentrations of toxic compounds and nutrients. Animal wastes can also be a source of bacterial contamination and can elevate biochemical oxygen demand (BOD). Drainage ditches on poorly drained soils enhance the transportation of stormwater into surface waters (DEHNR, 1993).

#### 2.2.4 Summary of Anticipated Impacts

No direct impacts to surface waters are anticipated as a result of this widening project; however, Best Management Practices (BMP's) for stormwater management should be followed.

Precautions must be taken to minimize impacts to water resources in the study area, NCDOT's BMP's for the Protection of Surface Waters must be strictly enforced during the construction stage of the project. Guidelines for these BMP's include, but are not limited to: minimizing built upon area and diversion of stormwater away from surface waters as much as possible. Provisions to preclude contamination by toxic substances during the construction interval must also be strictly enforced.

### 3.0 BIOTIC RESOURCES

Biotic resources include aquatic and terrestrial ecosystems. This section describes those ecosystems encountered in the study area, as well as the relationships between fauna and flora within these ecosystems. Composition and distribution of biotic communities throughout the project area are reflective of topography, hydrologic influences and past and present land uses in the study area. Descriptions of the terrestrial systems are presented in the context of plant community classifications and follow descriptions presented by Schafale and Weakley (1990) where possible. Dominant flora and fauna observed, or likely to occur, in each community are described and discussed.

Scientific nomenclature and common names (when applicable) are provided for each animal and plant species described. Plant taxonomy generally follows Radford, et al. (1968). Animal taxonomy follows Martof, et al. (1980), Menhinick (1991), Potter, et al. (1980), and Webster, et al. (1985). Subsequent references to the same organism will include the common name only. Fauna observed during the site visit are denoted with an asterisk (\*). Published range distributions and habitat analysis are used in estimating fauna expected to be present within the project area.

#### 3.1 Terrestrial Communities

One distinct terrestrial community is present in the project study area: maintained urban and agricultural disturbed. Community boundaries within the study area are generally well defined without a significant transition zone between them. Many faunal species likely to occur within the study area may exploit all communities for shelter and foraging opportunities, or as movement corridors.

##### 3.1.1 Maintained Urban and Agricultural Disturbed Community

This community has been divided into two separate sub-communities, maintained urban disturbed and maintained agricultural disturbed. The maintained urban disturbed



community includes highly maintained road shoulders and residential yards along Keen Road that are present along the entire length of the project and less intensively managed areas that grade into the surrounding natural communities. The agricultural disturbed sub-community consists of areas which are currently or have been used recently for agricultural cultivation.

Significant soil disturbance and compaction, along with frequent mowing or herbicide application, keep the urban disturbed sub-community in an early successional state. This sub-community consists predominately of road shoulders and residential yards. Road shoulders act as buffers between the roadway and surrounding communities by filtering stormwater runoff and reducing runoff velocities. The width of the road shoulder is approximately 10.0 ft (3.1 m). Vegetation occurring along the road shoulder include low growing species such as: fescue grass (*Festuca* sp.), vetch (*Vicia* spp.), chickweed (*Stellaria* sp.), Carolina geranium (*Geranium carolinianum*), horse nettle (*Solanum carolinensis*), white clover (*Trifolium repens*), wild onion (*Allium canadense*), common dandelion (*Taraxacum officinale*), and pigweed (*Amaranthus* spp.). Ragweed (*Ambrosia artemisiifolia*), cross vine (*Anisostichus capreolata*), grape (*Vitis* sp.) and Chinese privet (*Ligustrum sinense*) occur along the perimeter.

Residential yards and asphalt-pavement associated with driveways and parking lots include many different types of native and non-native horticultural species, and have a groundlayer dominated by fescue grass. Large widely spaced shade trees within this area include southern red oak (*Quercus falcata*), pecan (*Carya illinoensis*), loblolly pine (*Pinus taeda*), sycamore (*Platanus occidentalis*), catalpa tree (*Catalpa speciosa*), and flowering dogwood (*Cornus florida*). Other smaller vegetation observed within this sub-community include box holly (*Ilex* spp.), crepe myrtle (*Lagerstromia indica*), and wax myrtle (*Myrica cerifera*).

The agricultural disturbed sub-community is present at two locations within the project study area. An active soybean field located approximately 150 feet (46.3 m) south of the US Highway 301 and Keen Road intersection, and a fallow field located approximately 100 feet (30.8 m) north of the Allendale Road and Keen Road intersection. The soybean field contained a drainage ditch which was dry and overgrown with vegetation similar to what was observed along the roadside. Evidence of any recent flow was not observed within the drainage ditch. The fallow field is dominated by the same low grass and herbaceous vegetation described in the road shoulder description.

### 3.2 Wildlife

Wildlife associated with the communities present within the project vicinity may include: white-tailed deer (*Odocoileus virginianus*), eastern mole (*Scalopus aquaticus*), opossum (*Didelphis virginiana*), meadow vole (*Microtus pennsylvanicus*), muskrat (*Ondatra zibethicus*), gray squirrel (*Sciurus carolinensis*), and raccoon (*Procyon lotor*).

The roadside ditches and land immediately surrounding may be inhabited by reptiles and amphibians such as eastern box turtle (*Terrapene carolina*), ground skink (*Sincella lateralis*), Eastern garter snake (*Thamnophis sirtalis*), and spring peeper (*Hyla crucifer*).

Avian species utilizing the project vicinity include blue jay (*Cyanocitta cristata*), northern cardinal (*Cardinalis cardinalis*), tufted titmouse (*Parus bicolor*), common grackle (*Quiscalus quiscula*), brown-headed cowbird (*Molothrus ater*), Carolina wren (*Thryothorus ludovicianus*), and northern mockingbird (*Mimus polyglottos*).

Extensive agricultural areas with a few forested areas surround the project area, and represent a minor constituent of a larger community structure within the project vicinity. Therefore, faunal species frequenting the project study area will be largely those species inhabiting the adjacent communities.

### 3.3 Aquatic Communities

No aquatic communities will be directly impacted by the proposed project; however, an unnamed tributary of Juniper Swamp is located approximately 1,600 feet west of the project area. Physical characteristics of the water body and condition of the water resource influence faunal composition of aquatic communities. Terrestrial communities adjacent to a water resource also greatly influence aquatic communities.

Fauna associated with the aquatic community associated with Juniper Swamp, include various invertebrate and vertebrate species. Fish species likely to occur in Juniper Swamp include golden shiner (*Notemigonus crysoleucas*), margined madtom (*Noturus insignis*), black crappie (*Pomoxis nigromaculatus*) and tessellated darter (*Etheostoma olmstedii*). Invertebrates that would be present include: various species of caddisflies (Trichoptera), mayfly (Ephemeroptera), crayfish (Decapoda), water striders (*Aquarius* sp.), whirligig beetles (Gyrinidae) and dragonflies and damselflies (Odonata). The snapping turtle (*Chelydra serpentina*), pickerel frog (*Rana palustris*), and northern water snake (*Nerodia sipedon*) are common permanent residents in this community.

### 3.4 Summary of Anticipated Impacts

Construction of the subject project will have various impacts on the biotic resources described. Any construction related activities in or near these resources have the potential to impact biological functions. This section quantifies and qualifies impacts to the natural resources in terms of area impacted and ecosystems affected. Temporary and permanent impacts are considered here as well.

Calculated impacts to terrestrial resources reflect the relative abundance of each community present within the study area. Project construction will result in clearing and degradation of portions of these communities. Table 2 summarizes potential quantitative losses to these biotic communities, resulting from project construction. Estimated impacts for the proposed widening project are derived using the proposed ROW width of 90.0 ft (27.8 m). Usually, project construction does not require the entire ROW; therefore, actual impacts may be considerably less.

**Table 2. Anticipated Impacts to Biotic Communities**

Community	IMPACTS
Maintained Urban and Agricultural Disturbed	3.07 (1.24)
<b>Totals:</b>	<b>3.07 (1.24)</b>

Note: Values cited are in acres (hectares).

Plant communities found within the proposed project area serve as nesting and sheltering habitat for various wildlife. The widening of Keen Road and its associated improvements will reduce habitat for faunal species, thereby diminishing faunal numbers. However, due to the size and scope of this project, it is anticipated that impacts to fauna will be minimal.

Areas modified by construction (but not paved) will become road shoulders and early successional habitat. Reduced habitat will displace some wildlife further from the roadway while attracting other wildlife by the creation of more early successional habitat. Animals temporarily displaced by construction activities will repopulate areas suitable for the species.

#### 4.0 JURISDICTIONAL TOPICS

This section provides descriptions, inventories and impact analysis pertinent to two important issues--Waters of the United States and rare and protected species.

##### 4.1 Waters of the United States

Surface waters and wetlands fall under the broad category of "Waters of the United States," as defined in Section 33 of the Code of Federal Register (CFR) Part 328.3. Wetlands, defined in 33 CFR 328.3, are those areas that are inundated or saturated

by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated conditions. Any action that proposes to place fill into these areas falls under the jurisdiction of the U.S. Army Corps of Engineers (COE) under Section 404 of the Clean Water Act (33 U.S.C. 1344).

#### 4.1.1 Characteristics of Wetlands and Surface Waters

Potential wetland communities were investigated pursuant to the 1987 "Corps of Engineers Wetland Delineation Manual". The three parameter approach is used where hydric soils, hydrophytic vegetation and prescribed hydrologic characteristics must **all** be present for an area to be considered a wetland. No jurisdictional wetlands were observed within the project study area.

#### 4.1.2 Neuse River Buffers

As the project is located in the Neuse River Basin, Riparian Area Rules for Nutrient Sensitive Waters apply. The rules state that roads, bridges, stormwater management facilities, ponds and utilities may be allowed where no practical alternative exists. They also state that these structures shall be located, designed, constructed and maintained to have minimal disturbance, to provide maximum erosion protection, to have the least adverse effects on aquatic life and habitat and to protect water quality to the maximum extent practical through the use of best management practices. No impacts to riparian buffers are expected within the project study area.

#### 4.1.3 Permits

Encroachment into jurisdictional surface water because of project construction is often times inevitable. Factors that determine Section 404 Nationwide Permit (NWP) applicability include hydrology, juxtaposition with a major resource, whether the impacts occur as part of the widening of an existing facility, or as the result of new location construction. Although an individual site may qualify under NWP authorizations, overall, cumulative impacts from a single and complete project may require authorization under an Individual Permit (IP).

A North Carolina Division of Water Quality (DWQ) Section 401 Water Quality Certification is required prior to the issuance of the section 404 permit. **No wetlands or surface waters are present within the project area. Consequently, a section 404 permit and corresponding 401 water quality certification are not required for the proposed project.**

#### 4.1.3.1 Mitigation

The COE has adopted, through the Council on Environmental Quality (CEQ), a wetland mitigation policy which embraces the concept of "no net loss of wetlands" and sequencing. The purpose of this policy is to restore and maintain the chemical, biological and physical integrity of Waters of the United States, specifically wetlands. Mitigation of wetland impacts has been defined by the CEQ to include: avoiding impacts (to wetlands), minimizing impacts, rectifying impacts, reducing impacts over time and compensating for impacts (40 CFR 1508.20). Each of these three aspects (avoidance, minimization and compensatory mitigation) must be considered sequentially.

#### 4.1.3.2 Avoidance

Avoidance mitigation examines all appropriate and practicable possibilities of averting impacts to Waters of the United States. According to a 1990 Memorandum of Agreement (MOA) between the Environmental Protection Agency (EPA) and the COE, in determining "appropriate and practicable" measures to offset unavoidable impacts, such measures should be appropriate to the scope and degree of those impacts and practicable in terms of cost, existing technology and logistics in light of overall project purposes.

#### 4.1.3.3 Minimization

Minimization includes the examination of appropriate and practicable steps to reduce the adverse impacts to Waters of the United States. Implementation of these steps will be required through project modifications and permit conditions. Minimization typically focuses on decreasing the footprint of the proposed project through the reduction of median widths, ROW widths, fill slopes and/or road shoulder widths. Other practical mechanisms to minimize impacts to Waters of the United States crossed by the proposed project include: strict enforcement of sedimentation control BMP's for the protection of surface waters during the entire life of the project; reduction of clearing and grubbing activity; reduction/elimination of direct discharge into streams; reduction of runoff velocity; re-establishment of vegetation on exposed areas, judicious pesticide and herbicide usage; minimization of "in-stream" activity; and litter/debris control.

#### 4.1.3.4 Compensatory Mitigation

Compensatory mitigation is not normally considered until anticipated impacts to Waters of the United States have been avoided **and** minimized to the maximum extent possible. It is recognized that "no net loss of wetlands" functions and values may not be achieved in each and every permit action. Appropriate and practicable compensatory mitigation is required for unavoidable adverse impacts which remain after all appropriate and practicable minimization has been required. Compensatory actions often include restoration, creation and enhancement of Waters of the United States. Such actions should be undertaken in areas adjacent to or contiguous to the discharge site.

#### 4.2 Rare and Protected Species

Some populations of fauna and flora have been in, or are in, the process of decline either due to natural forces or their inability to coexist with human activities. Federal law (under the provisions of the Endangered Species Act of 1973, as amended requires that any action, likely to adversely affect a species classified as federally-protected, be subject to review by the USFWS. Other species may receive additional protection under separate state laws.

##### 4.2.1 Federally-Protected Species

Plants and animals with federal classifications of Endangered, Threatened, Proposed Endangered and Proposed Threatened are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended February 26, 2001, the USFWS lists the following federally-protected species for Johnston County (Table 3). A brief description of each species' characteristics and habitat follows.

**Table 3. Federally-Protected Species for Johnston County**

Scientific Name	Common Name	Status
<i>Picoides borealis</i>	Red-cockaded woodpecker	Endangered
<i>Alasmidonta heterodon</i>	Dwarf wedge mussel	Endangered
<i>Elliptio steinstansana</i>	Tar spiny mussel	Endangered
<i>Rhus michauxii</i>	Michaux's sumac	Endangered*

Endangered is defined as a species that is threatened with extinction throughout all or a significant portion of its range.  
 \*\*\* Indicates the species was last observed in the county more than 50 years ago.

***Picoides borealis*** (red-cockaded woodpecker) **Endangered**  
 Animal Family: Picidae  
 Date Listed: 13 October 1970

The adult red-cockaded woodpecker (RCW) has a plumage that is entirely black and white except for small red streaks on the sides of the nape in the male. The back of the RCW is black and white with horizontal stripes. The breast and underside of this

woodpecker are white with streaked flanks. The RCW has a large white cheek patch surrounded by the black cap, nape and throat.

The RCW uses open old growth stands of southern pines, particularly longleaf pine (*Pinus palustris*), for foraging and nesting habitat. A forested stand must contain at least 50% pine, lack a thick understory and be contiguous with other stands to be appropriate habitat for the RCW. These birds nest exclusively in trees that are  $\geq 60$  years old and are contiguous with pine stands at least 30 years of age. The foraging range of the RCW is up to 500.0 acres (200.0 hectares). This acreage must be contiguous with suitable nesting sites.

These woodpeckers nest exclusively in living pine trees and usually in trees that are infected with the fungus that causes red-heart disease. Cavities are located in colonies from 12.0-100.0 ft (3.6-30.3 m) above the ground and average 30.0-50.0 ft (9.1- 15.7 m) high. They can be identified by a large incrustation of running sap that surrounds the tree.

#### **BIOLOGICAL CONCLUSION**

#### **NO EFFECT**

Suitable nesting habitat in the form of large pine trees with little understory is not present within the project vicinity. The project vicinity primarily consists of maintained/disturbed areas and agricultural lands with few and widely spaced pine trees. A review of the NCNHP database of rare species and unique habitats on 3 October 2001 has no record for the presence of red-cockaded woodpecker within the project vicinity. Therefore, project construction will not affect the red-cockaded woodpecker.

#### ***Alasmidonta heterodon* (dwarf wedge mussel) Endangered**

Animal Family: Unionidae

Date Listed: 14 March 1990

The dwarf wedge mussel is a small mussel ranging in size from 2.5 cm to 3.8 cm in length. It has a distinguishable shell noted by two lateral teeth on the right half and one on the left half. The periostracum (outer shell) is olive green to dark brown in color and the nacre (inner shell) is bluish to silvery white.

Successful reproduction is dependent on the attachment of larval mussels to a host fish. It is not known what the host fish is but evidence suggests that it is either an anadromous or catadromous species. Known populations of the dwarf wedge mussel in North Carolina are found in Middle Creek and the Little River of the Neuse River Basin and in the upper Tar River and Cedar, Crooked, and Stony Creeks of the Tar River system. This mussel is sensitive to agricultural, domestic, and industrial pollutants and requires a stable silt free streambed with well oxygenated water to survive.

#### **BIOLOGICAL CONCLUSION**

#### **NO EFFECT**

Suitable habitat for the dwarf wedge mussel consisting of perennial streams within the Neuse and Upper Tar River Basins does not exist within the project study area. A review of the NCNHP database on 3 October 2001 indicated that there are no known occurrences of dwarf wedge mussel within the project study area. Therefore, this project will not affect dwarf wedge mussel.

***Elliptio steinstansana* (Tar spiny mussel) Endangered**

Animal Family: Unionidae

Date Listed: 29 July 1985

This mussel requires a stream with fast flowing, well oxygenated, circumneutral pH water. The bottom is composed of uncompacted gravel and coarse sand. The water needs to be relatively silt-free. It is known to rely on a species of freshwater fish to act as an intermediate host for its larvae.

The Tar River spiny mussel is a very small mussel. This mussel is named for its spines which project perpendicularly from the surface and curve slightly ventrally. As many as 12 spines can be found on the shell which is generally smooth in texture. The nacre is pinkish (anterior) and bluish-white (posterior).

**BIOLOGICAL CONCLUSION**

**NO EFFECT**

Suitable habitat for Tar River spiny mussel consisting of a perennial stream with a sandy or gravelly bed and little to no contamination within the Tar River Basin is not available within the project study area. A review of the NCNHP database on 3 October 2001 indicated that there are no known occurrences of Tar River spiny mussel within the project study area. Therefore, this project will not affect Tar River spiny mussel.

***Rhus michauxii* (Michaux's sumac) Endangered**

Family: Cashew (Anacardiaceae)

Federally Listed: September 28, 1989

Best Search Time: During the growing season (June - September)

Michaux's sumac is a dioecious shrub growing to a height of 1.0 – 2.0 ft (0.3–0.6 m). Plants flower in June, producing a terminal, erect, dense cluster of 4-5 parted greenish-yellow to white flowers. Fruits, produced from August through September, are red, densely short-pubescent drupes, 0.25 in (5-6 mm) across. Most populations, however, are single sexed and reproduce only by rhizomes. The entire plant is densely pubescent. The deciduous leaves are composed of 9-13 sessile, oblong leaflets on a narrowly winged or wingless rachis. The acute to acuminate leaflets have rounded bases and are 1.5-3.5 in (4-9 cm) long and 1.0-2.0 in (2-5 cm) wide. They are simply or doubly serrate. Distinctive characteristics include short stature, densely pubescent throughout, evenly serrate leaflets.



This species prefers sandy, rocky, open woods and roadsides. Its survival is dependent on disturbance (mowing, clearing, fire) to maintain an open habitat. It is often found with other members of its genus as well as with poison ivy (*Toxicodendron radicans*). There is no longer believed to be an association between this species and specific soil types.

Michaux's sumac is endemic to the inner Coastal Plain and Piedmont physiographic provinces of Virginia, North Carolina, South Carolina and Georgia. Most populations occur in North Carolina. This species is threatened by loss of habitat. Since its discovery, 50 percent of Michaux's sumac habitat has been lost due to its conversion to silvicultural and agricultural purposes and development. Fire suppression and herbicide drift have also negatively impacted this species.

## **BIOLOGICAL CONCLUSION**

## **NO EFFECT**

Potential habitat for Michaux's sumac is present only within the road shoulder portions of the project area. A plant by plant survey for Michaux's sumac, within areas of potential habitat was conducted on 4 October 2001 by NCDOT biologist Lynn Smith and consultant biologist Harold Brady. No Michaux's sumac was observed during the survey. A review of the NCNHP database on 3 October 2001 indicated that there are no known occurrences of Michaux's sumac within the project study area. Therefore, project construction will not affect Michaux's sumac.

### 4.2.2 Federal Species of Concern and State Listed Species

There are nine Federal Species of Concern (FSC) listed for Johnston County. Federal Species of Concern are not afforded federal protection under the ESA and are not subject to any of its provisions, including Section 7, until they are formally proposed or listed as Threatened or Endangered. Federal Species of Concern are defined as those species which may or may not be listed in the future. These species were formally candidate species, or species under consideration for listing for which there was insufficient information to support a listing of Endangered, Threatened, Proposed Endangered and Proposed Threatened. Organisms which are listed as Endangered (E), Threatened (T), Significantly Rare (SR) or Special Concern (SC) by the North Carolina Natural Heritage Program (NCNHP) list of rare plant and animal species are afforded state protection under the State Endangered Species Act and the North Carolina Plant Protection and Conservation Act of 1979.

Table 4 lists Federal Candidate and State listed species, the species state status and the existence of suitable habitat for each species in the study area. This species list is

provided for information purposes as the status of these species may be upgraded in the future.

**Table 4. Federal Species of Concern for Johnston County**

Scientific Name	Common Name	State Status	Habitat
<i>Lythrurus matutinus</i>	Pinewoods shiner	SR	No
<i>Elliptio lanceolata</i>	Yellow lance	T (PE)	No
<i>Fusconaia masoni</i>	Atlantic pigtoe	T (PE)	No
<i>Lampsilis cariosa</i>	Yellow lampmussel	T (PE)	No
<i>Lasmigona subviridis</i>	Green floater	E	No
<i>Procambarus medialis</i>	Tar River crayfish	W3	No
<i>Solidago verna</i>	Spring-flowering goldenrod	T	No
<i>Tofieldia glabra</i>	Carolina asphodel	C*	No
<i>Trillium pusillum</i> var. <i>pusillum</i>	Carolina least trillium	E	No

"\*"-----Historic record (Last observed in Johnston County more than twenty years ago.)

"E"-----An Endangered species is one whose continued existence as a viable component of the State's fauna or flora is determined to be in jeopardy.

"T"----- A Threatened species is one which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

"C"----- A Candidate species is one which is very rare in North Carolina, generally with 1-20 populations in the state, generally substantially reduced in numbers by habitat destruction, direct exploitation or disease. The species is also either rare throughout its range or disjunct in North Carolina from a main range in a different part of the country or the world.

"SR"----- A Significantly Rare species is one which has not been listed by the N.C. Wildlife Resources Commission as an Endangered, Threatened, or Special Concern species, but which exists in the state in small numbers and has been determined by the N.C. Natural Heritage Program to need monitoring.

"(PE)"-----Species has been proposed by a Scientific Council as a status that is different from the current status, but the status has not yet been adopted by the WRC and by the General Assembly as law.

"W3" A Watch Category 3 (rare, but uncertain documentation) includes species which have been reported from N.C. without adequate documentation.

Surveys for these species were not conducted during the site visit, nor were any of these species observed. A review of the NCNHP database of rare species and unique habitats on 3 October 2001 revealed no records of North Carolina rare and/or protected species in or near the project study area.

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**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
OFFICE OF HUMAN ENVIRONMENT**

**Attention:** Stephanie Ledbetter, PDEA Engineer, NCDOT  
**From:** Kevin Hall, Senior Planner, HNTB & Bob Deaton, NCDOT  
**Through:** Leigh Lane, Public Involvement & Community Studies, NCDOT  
**Contract:** A303954  
**Re:** TIP R-4071, SR 1178 Widening - Johnston County

**I. EXECUTIVE SUMMARY**

The North Carolina Department of Transportation proposes widening Keen Road (SR 1178) between US-301 and I-95 in Four Oaks, North Carolina from two lanes to three lanes, including a center turn lane. Four Oaks is located in Johnston County, which is one of the six counties include in the Raleigh-Durham MSA. The following is a brief summary of the findings and conclusions within both the Community Profile and the Project Impact sections:

**Community Profile:**

- Population growth in the study area grew by only 15.6% between 1990 and 2000, compared to 50% in Johnston County and 21% in North Carolina.
- Johnston County's population is forecasted to grow by 35.4% between 2000 and 2010, the highest growth rate of any county in the state.
- The project is located in a low- to medium-density residential area with close proximity to the Four Oaks town center and I-95.
- The majority of the population in the study area is white (70%), between the ages of 20 and 44 (35.6%).
- Employment in Johnston County increased by 43.5% between 1990 and 2000, compared to 26.0% for the State of North Carolina.

**Project Impact:**

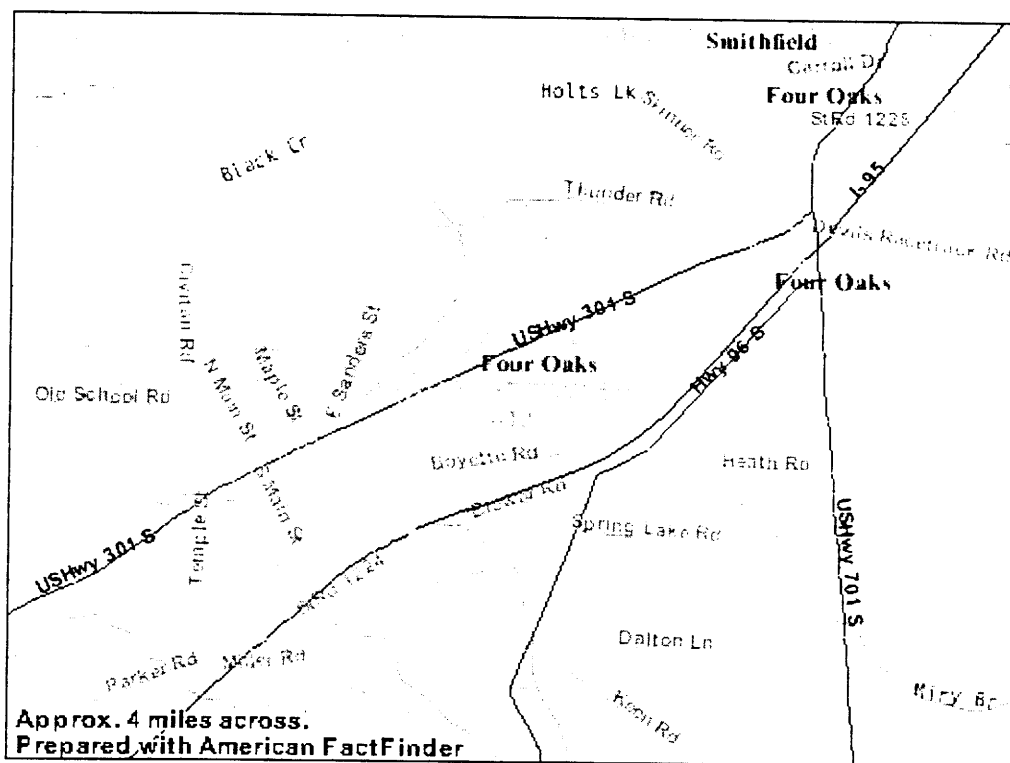
- According to forecasts included in the Johnston County Thoroughfare Plan, it is anticipated that the Transportation Analysis Zone (TAZ) that includes the Keen Road widening project will only add 100 people and 33 jobs between 1995 and 2020.
- The project should improve accessibility to the surrounding land uses but not increase the carrying capacity of Keen Road, thus having no impact on travel times.
- Widening Keen Road should not induce much commercial or residential development within the study area.
- Potential impact upon farmland within the study area would result because of induced development, not right-of-way acquisition. Thus, with minimal impact upon the commercial or residential environment expected, farmland should not be affected.
- No impacts upon watersheds or water supply are anticipated.

**II. PROJECT AND STUDY AREA DESCRIPTION**

The North Carolina Department of Transportation is proposing to widen a 0.4-mile stretch of SR 1008 from US-301 to I-95 from a two-lane, 24-foot cross section to a three-lane, 40-foot cross section including a center turn lane. The proposed facility will include curb and gutter within its 40-foot cross-section. As part of the project, the right-of-way will have to be expanded from 60 feet to 90 feet, with minimal encroachment upon the adjacent land uses. Some of the additional right-of-way will be reserved for future sidewalk construction if it is deemed necessary.

The purpose of the project is to allow left turning movements into the residential areas along Keen Road as well as into the Four Oaks town center along US-301 without causing traffic congestion. This should be accomplished by adding a center turn lane, which would also serve as a left turn lane for traffic turning east from Keen Road toward the town center. Right-of-way acquisition is expected to start in 2003 with construction scheduled to begin in 2005.

The project is located in western Johnston County, approximately 30 miles southeast of downtown Raleigh. Based on the project specifications provided by the North Carolina Department of Transportation, a study area boundary was defined using census tract boundaries for data collection purposes. The project extends through Census Tract 412. Much of this census tract includes areas that will not be directly or indirectly impacted by the widening project. Therefore, we only used the boundaries of Block Group 4 for the study area boundary (see map below).



Land development along both sides of SR-1178 is predominantly low-density, single-family residential. There are a couple of retirement communities located along the eastern side of the roadway, whereas more established single-family neighborhoods are focused along the western side.

### **III. METHODOLOGY**

After defining the study area, data was collected from a number of sources. Demographic data by census tract was retrieved from the US Census Bureau in order to assist in developing a community profile for the study area. These statistics were compared with the county within which the project is located as well as with the state as a whole. Interviews were conducted with relevant staff from Johnston County to determine local growth patterns. Land use and transportation plans, development policies, and various ordinances were obtained.

Various web sites were used for gathering information regarding potential impacts on rivers and watershed areas, farmland soils, vegetation, lower income neighborhoods, provision of public services/facilities, residences and businesses, and the transportation infrastructure. A site visit was conducted in order to assess the surrounding environment with respect to these and other issues.

### **IV. COMMUNITY PROFILE/DATA COLLECTION**

#### **Field Visit**

A thorough study area inspection was conducted by driving the length of the project and identifying both roadside land uses as well as surrounding development within the boundaries of the study area. The street traverses predominantly through a middle-income residential area, connecting the main arterial (US-301) through the Town of Four Oaks with I-95. Other than the retirement centers and a mobile home park, most of the area east of Keen Road (SR 1178) is agricultural.

Established neighborhoods exist to the north of US-301. Land along US-301 is generally developed with population-serving office and retail, including bank branches, service stations, and local retail shops. South of I-95, land use along SR 1178 becomes much more rural. There are no major employment centers within the study area.

#### **Geographic And Political Location**

Keen Road (SR 1178) is located in rural Johnston County, which is one of six counties included in the Raleigh-Durham MSA. Similar to the other counties in the metropolitan area, Johnston County's population has significantly grown over the last decade. According to the US Census, the population in Johnston County grew by 50% between 1990 and 2000, from 81,306 to 121,965 persons. North Carolina's population as a whole only grew by 21.4% during the same time frame, going from 6.6 million to 8.0 million.

The population in the study area, which includes Census Tract 412, Block Group 4 as illustrated in the map on page 2, grew by only 15.6% from 1,125 persons to 1,301 persons between 1990 and 2000, a much slower pace than Johnston County and the State of North Carolina.

Population Growth, 1990-2000

Area	Population		Growth	
	1990	2000	#	%
Study Area	1,125	1,301	176	15.6%
Johnston County	81,306	121,965	40,659	50.0%
North Carolina	6,628,637	8,049,313	1,420,676	21.4%

Source: US Census Bureau 1990, 2000

Note: Study Area includes Census Tract 412 - Block Group 4

The majority of the population in all three geographies is white, ranging from 70.2% in both the study area and North Carolina as a whole to 75.3% in Johnston County. African Americans are the second largest race, although the percentage in both the study area and Johnston County (14.7%-15.6%) is less than the percent in North Carolina (21.4%). Hispanics and Latinos also have a presence in the study area, representing 14.5% of the 2000 population, a much higher percentage than both Johnston County (7.7%) and North Carolina (4.7%).

Population by Race, 2000

Race	Study Area		Johnston County		North Carolina	
	Population	%	Population	%	Population	%
White	913	70.2%	91,870	75.3%	5,647,155	70.2%
Black or African American	191	14.7%	18,971	15.6%	1,723,301	21.4%
American Indian or Alaska Native	5	0.4%	417	0.3%	95,333	1.2%
Asian	0	0.0%	355	0.3%	112,416	1.4%
Native Hawaiian and Other Pacific Islander	0	0.0%	27	0.0%	3,165	0.0%
Hispanic or Latino	189	14.5%	9,440	7.7%	378,963	4.7%
Other Race	0	0.0%	96	0.1%	9,015	0.1%
Two or More Races	3	0.2%	789	0.6%	79,965	1.0%
<b>Total</b>	<b>1,301</b>	<b>100.0%</b>	<b>121,965</b>	<b>100.0%</b>	<b>8,049,313</b>	<b>100.0%</b>

Source: US Census Bureau 2000

Note: Study Area includes Census Tract 412 - Block Group 4

The study area predominantly consists of working-age persons (35.6%) between 20 and 44 years of age. However, this percentage is similar to that of Johnston County (40.2%) and North Carolina (38.2%). Mainly due to the rural location and lack of proximity to any major employment centers, approximately 16.0% of the study area population in 2000 was 65 years of age or older, compared to only 9.8% in overall Johnston County and 12.0% in the State of North Carolina.

Population by Age, 2000

Age	Study Area		Johnston County		North Carolina	
	Pop.	%	Pop.	%	Pop.	%
19 years and under	326	25.1%	34,468	28.3%	2,193,360	27.2%
20-44 years	463	35.6%	49,045	40.2%	3,078,043	38.2%
45-64 years	304	23.4%	26,479	21.7%	1,808,862	22.5%
65 or more years	208	16.0%	11,973	9.8%	969,048	12.0%
<b>Total</b>	<b>1,301</b>	<b>100.0%</b>	<b>121,965</b>	<b>100.0%</b>	<b>8,049,313</b>	<b>100.0%</b>

Source: US Census Bureau 2000

Note: Study Area includes Census Tract 412 - Block Group 4

**Income, Poverty Status, And Unemployment**

Socioeconomic data was obtained from the US Census Bureau for both North Carolina and Johnston County. This type of data has not yet been made available at the census tract level, and therefore the study area is not included as part of the analysis. Also, 2000 values have not yet been released, therefore 1997 Census estimates have been used.

In 1990, the State of North Carolina had a higher median income value than Johnston County. However, seven years later, Johnston

Median Household Income, 1990-1997

Area	Median Household Income		Change, 90-97	
	1990	1997*	#	%
Johnston County	\$25,169	\$36,406	\$11,237	44.6%
North Carolina	\$26,647	\$35,320	\$8,673	32.5%

\*Estimate

Source: US Census Bureau

County's median income of \$36,406 surpassed North Carolina's value of \$35,320. This trend seems to reflect the influence of living in a metropolitan county and commuting to the City of Raleigh and Research Triangle Park, both of which are significantly growing in terms of employment and wages.

The same trend exists with respect to the poverty level. In 1990, 14.3% of Johnston County residents were below the poverty level,

% Below Poverty, 1990-1997

Area	% Below Poverty		Change, 90-97	
	1990	1997*	#	%
Johnston County	14.3%	12.3%	-2.0%	-14.0%
North Carolina	13.0%	12.6%	-0.4%	-3.1%

\*Estimate

Source: US Census Bureau

compared to 13.0% in the State of North Carolina. During the next seven years, the percent of people below the poverty level in Johnston County decreased two percentage points to 12.3%, a much larger decline than that of North Carolina, which improved by less than a half of a percentage point. Again, this trend most likely reflects the suburbanization of new Wake and Durham County employees.

Lastly, as is the case with median household income and the percent of persons below the poverty level, unemployment rate trends reflect the growing number of workers in Johnston County. According to the North Carolina Employment Security Commission,



unemployment in Johnston County declined by two percentage points between 1990 and 2000, going from 4.2% to 2.2%. The

**Unemployment Rate, 1990-2000**

Area	Unemployment Rate		Change, 90-00	
	1990	2000	#	%
Johnston County	4.2%	2.2%	-2.0%	-47.6%
North Carolina	4.2%	3.6%	-0.6%	-14.3%

Source: North Carolina Employment Security Commission

The unemployment rate in North Carolina as a whole improved from 4.2% to 3.6% during the same timeframe.

The study area is located along I-95, which provides easy access for the labor force to jobs within the county. The study area seems to have more of a blue-collar, low- to middle-income workforce. Therefore, commutes to either downtown Raleigh or Research Triangle Park are probably minimal if non-existent. There are a number of industrial facilities located along I-95 and US-70 that most likely generate the majority of commutes from within the study area.

**Housing Characteristics**

North Carolina had a total of 3.5 million housing units in 2000, approximately 1.5% of which, or 50,196 units, were located in Johnston County. Despite this fairly low share, the housing stock in Johnston County grew by 46.9% between 1990 and 2000, a growth rate almost twice that of North Carolina (25.0%). Most of the household growth in Johnston County over the last decade has taken place in the northeast and northwest portions of the county.

The study area had a total of 544 housing units in 2000, only 48 units more than it did in 1990, representing a 9.7% growth rate. Most of the household growth between Smithfield and Four Oaks was

**Housing Units, 1990-2000**

Area	Housing Units		Change, 90-00	
	1990	2000	#	%
North Carolina	2,818,193	3,523,944	705,751	25.0%
Johnston County	34,172	50,196	16,024	46.9%
Study Area	496	544	48	9.7%

focused around Holts Lake, which is located just north of the study area (see map on page 2). The I-95 corridor, within which the study area is located, has experienced less residential growth and more employment growth.

Of the 50,196 total housing units in Johnston County in 2000, approximately 93%, or 46,595 units, were occupied. A total of 73.4% of the occupied housing units were occupied by the owners, with the remaining 26.6% occupied by renters. Although 92% of the study area's 544 total housing units in 2000 were occupied, only 54.2% of them were inhabited by the owner, indicating a less stable and more mobile surrounding community.

The 2000 median home values have yet to be released by the US Census, but according to 1990 statistics, the average value of a North Carolinian home was \$65,800, compared to \$59,400 in Johnston County. However, based on data retrieved from the Smithfield-Selma Chamber of Commerce, the average selling price for a home in Johnston County in 1998 was \$125,793. This value was much higher than the estimated 2000 median home value of \$108,356 for North Carolina.

**Business Activity And Employment Centers**

Based on data by transportation analysis zones (TAZs) provided by the NCDOT, much of the existing employment within Johnston County is located along the I-95 corridor between the towns of Micro and Four Oaks and along the US-70 corridor between Smithfield and Clayton. These areas have easy access to both I-95 and I-40, as well as the surrounding labor force.

Employment in Johnston County increased by 43.5% between 1990 and 2000. Although it only grew by 3.4% during the last decade, the manufacturing sector still led the way with a total of 7,996 employees in 2000. Retail trade was close behind with 7,928. The services sector grew by 98.3% during the time frame, the highest growth rate of any sector. The only sector to lose employment in Johnston County between 1990 and 2000 was mining.

**Employment By Sector  
Johnston County, 1990-2000**

Sector	Employment		Change	
	1990	2000	#	%
Construction	1,879	3,048	1,169	62.2%
Mining	55	41	-14	-25.5%
Manufacturing	7,735	7,996	261	3.4%
Transportation/ Public Utilities	766	953	187	24.4%
Wholesale Trade	1,079	1,725	646	59.9%
Retail Trade	4,822	7,928	3,106	64.4%
FIRE	550	912	362	65.8%
Services	2,899	5,749	2,850	98.3%
Government	4,303	6,211	1,908	44.3%
<b>Total:</b>	<b>24,088</b>	<b>34,563</b>	<b>10,475</b>	<b>43.5%</b>

The State of North Carolina indicated similar employment trends as Johnston County, although its total employment only grew by 26.6%. Services had the most employees (1,033,700) in 2000 in addition to the highest growth rate (74.1%) between 1990 and 2000. The construction and FIRE sectors had the second and third highest growth rates at 42.8% and 38.8%, respectively. Both the mining and manufacturing sectors lost employment in North Carolina during the last decade.

**Public Utilities/Facilities & Schools**

The widening project along Keen Road (SR 1178) is located entirely within the Town of Four Oaks, and therefore land uses along both sides of the roadway are serviced by county water and sewer systems. The 1996 estimated population in Johnston County served by the public water system was 30,500 persons. About 57 private community water systems served an additional population of 5,700 system was 30,500 persons. About 57 private community water systems served an additional population of 5,700

persons. The portion of the study area to the east of Keen Road is within Four Oaks extra territorial jurisdiction (ETJ), and is therefore scheduled to receive public water and sewer service upon annexation.

The nearest schools are Four Oaks Elementary and Middle schools, which are located on the north side of Four Oaks along Black Creek Road less than one mile from the US-301/Keen Road intersection. The nearest high school is South Johnston High School, located along US-301 approximately five miles to the west of Keen Road.

### **Local/Regional Land Use Or Development Plans**

The SR 1178 widening project is located within the Town of Four Oaks, which does not have an adopted land use or development plan that would include recommendations for future development patterns. Johnston County, however, completed a "Proposed Strategic Plan" in March 1999 that evaluated the existing conditions within the entire county, established goals and objectives, and identified several building blocks for addressing the issues. Strategies that address land use, transportation, economic development and public utilities/facilities are included.

In addition, the North Carolina Department of Transportation recently updated the Johnston County Thoroughfare Plan in March 2001, detailing current and future transportation issues and prioritizing improvement projects. Dwelling unit and employment by category projections between 1995 and 2020 were included by transportation analysis zones (TAZs).

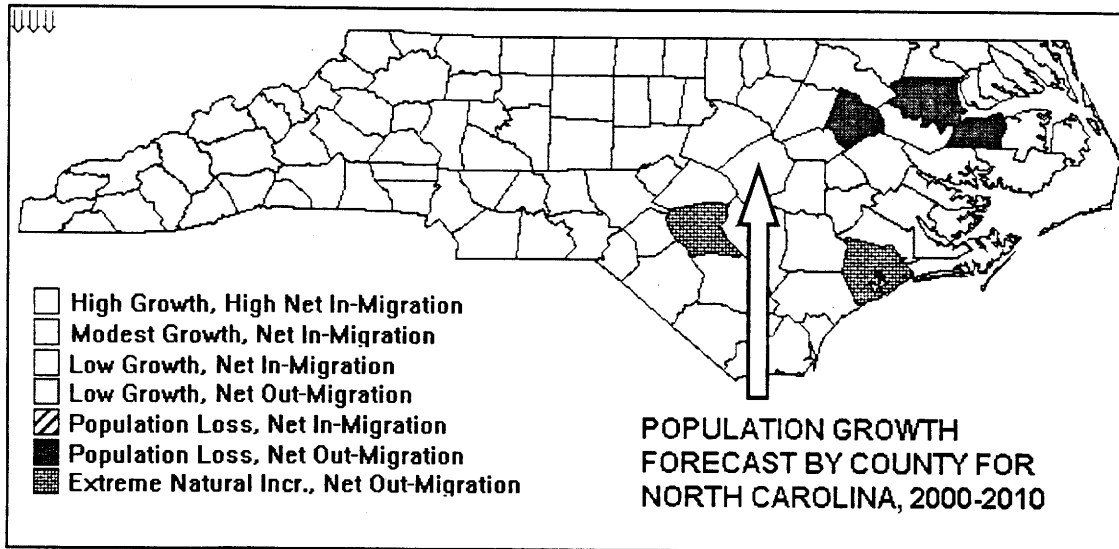
## **V. PROJECT IMPACT ASSESSMENT**

### **Demographic Impact**

According to population projections conducted by the Office of State Planning in North Carolina, Johnston County is expected to grow by 35.4% between 2000 and 2010, the highest growth rate of any county in the state. The North Carolina population growth rate forecast is 17.6% during the same time frame. The map on the following page indicates the anticipated distribution of population growth by county during this decade, with an arrow pointing toward Johnston County. In reference to the map, high growth is greater than a 23.5% increase, modest growth is between a 11.8% and 23.5% increase, and low growth is between a 0.0% and 11.8% increase.

According to forecasts included in the Johnston County Thoroughfare Plan, it is anticipated that the TAZ that includes the SR 1178 widening project will only add 100 people and 33 jobs between 1995 and 2020. Based on these forecasts, as well as recent demographic and employment trends, providing a center turn lane along Keen Road between I-95 and US-301 should not drastically impact the potential of residential and non-residential development within the study area. If any new residential development should take place, it will most likely be limited single-family infill as opposed to high-density single family or multi-family development. Most of the impact, however, will be

on the accessibility the improved roadway provides for existing households within the study area.



**Consistency With Adopted Plans**

As was mentioned before, Johnston County does not have a Comprehensive Plan that outlines a proposed land use strategy. However, they have established goals and objectives that focus on the provision of public utilities that “responds to and facilitates desired growth” and “allows growth while preserving the rural character of the county”. Any residential or non-residential growth that occurs as a result of the widening project will be minimal, and should not affect the rural character of the county.

The land fronting both sides of Keen Road between I-95 and US-301 is included in the Town of Four Oaks, which allows higher residential densities than does unincorporated portions of Johnston County. However, minimal land is available for additional development. Most of the vacant land within the study area is located within unincorporated Johnston County, which allows between 1 to 1.5 residential units per acre depending on whether or not public water service is available. If land within this portion of the study area is developed upon in the future, it will not be due to the addition of a center turn lane along Keen Road.

**Physical And Visual Impacts**

The physical impact of a roadway being widened is typically negative because a portion of the natural environment is being paved over for traffic circulation purposes. With respect to this project, yard sizes of residences will be diminished because of additional right of way being taken, contributing to a less desirable physical landscape and increased traffic noise. However, there will be minimal impact on utility lines and mature trees that line the roadway. The paved right-of-way will only increase from 24 feet to 40 feet with

a 12-foot center turn lane and 4 feet of curb and gutter. The addition of curb and gutter should have a positive visual impact when compared to the existing shoulders, as seen in the picture below.

### **Economic Impacts**

Other than improved access to interstate-related commercial uses at the I-95 interchange, the impact on the existing business community within the study area as a result of the proposed widening is minimal. There are a limited amount of businesses located within the study area, which is predominantly single-family residential and agricultural.

Commercial development tends to locate at major intersections, of which there are none along the project area. There are a few businesses located across US-301 at its intersection with Keen Road, but their presence at that location is more so due to the traffic along US-301 than it is the traffic along Keen Road. Because Keen Road connects a heavily traveled roadway with I-95, there is potential for some commercial development to take place, particularly along the eastside of the roadway because of available land and redevelopment opportunities. These potential developments would be population-serving such as professional offices (dentists, real estate, law firms) and convenience retailers (grocers, restaurants, dry cleaners, drug stores). Therefore, modest increases in the residential market within the study area, as well as increased traffic along this section of I-95, could increase the demand for these types of services along the project area.

Except for some of the property immediately fronting Keen Road, land throughout the scope of the project should become slightly more valuable because of improved access resulting from the widening project. According to the Office of State Planning, Johnston County had a total of \$35.5 million in property tax levies and \$23.0 million in sales tax levies in 1995. Property tax levies increased at a faster rate each year between 1991 and 1995, averaging about a 10% annual increase.

### **Mobility And Access Impacts**

Based on discussions with local planning and transportation staff, we were able to determine that most of the residents in the study area work at industrial locations along the I-95 and US-70 corridor. Very few residents commute into Raleigh or Research Triangle Park, which are 20 miles and 30 miles away, respectively. These commuting patterns should not be affected because of the roadway widening.

Vehicular access to the surrounding land uses, particularly residences west of Keen Road, will be improved as a result of the center turn lane. In addition, the center turn lane will also serve as a left turn lane for traffic turning east from Keen Road toward the town center. This should help alleviate traffic congestion at the US-301/Keen Road intersection. Minimal impact on travel times is expected.

There are currently no sidewalks and no bicycle lanes along Keen Road, and none are planned in conjunction with the widening project. There are currently no pedestrian destinations along this section of Keen Road that would merit the construction of sidewalks. With an average speed limit of 45 mph, none are recommended. Public transportation is also not available mainly because of the lack of workplace and other destinations in the immediate area.

### **Public Utilities/Services Impacts**

There are minimal expected impacts upon the provision of public utilities/facilities and services within the study area. It will be slightly easier for emergency vehicles to get to and from their destinations as a result of the center turn lane. As mentioned before, it will not be necessary to relocate any utility line poles. Existing public water and sewer service will not be disrupted. There are currently no public facilities located along this section of Keen Road, and access to these facilities in the surrounding area should not be impacted.

### **Safety Impacts**

Currently, there is no access control along Keen Road, allowing development to have direct driveway access to the roadway. This situation increases the likelihood of accidents because of vehicles more frequently braking for turning movements, especially for left turns, and accelerating to enter the traffic flow. The construction of a center turn lane should help traffic flow and reduce the possibility of accidents occurring as a result of suddenly braking vehicles in travel lanes.

It takes more time for a pedestrian to cross a three-lane roadway than it does a two-lane roadway. Thus, pedestrian safety will be slightly impacted. However, there are currently no pedestrian destinations along this section of Keen Road, and therefore the likelihood of a pedestrian being struck is minimal. In addition, vehicular lanes need to be made wide enough to permit bicyclists without jeopardizing their safety. Currently, the standard 12-foot travel lanes would not be able to accommodate both modes of transportation.

### **Displacement Impacts**

Based on conversations with the NCDOT project engineer in addition to a field visit, there does not seem to be any residential or commercial improvements within the proposed right-of-way, eliminating the possibility of any potential displacements needed to complete the widening project. There will, however, be some yard reductions as a result of the paved roadway being increased from 24 feet to 40 feet. Driveway lengths of residences along the roadway will also have to be reduced.

### **Secondary And Cumulative Impacts**

Travel lanes will not be increased as part of the widening project and therefore carrying capacity should not be affected. However, the purpose of this roadway project is not to

increase the carrying capacity of the roadway because of traffic congestion or anticipated household growth, but rather to improve accessibility to existing households and the Four Oaks town center.

There should be minimal induced residential or commercial development as a result of improved vehicular access and mobility along Keen Road. The land along the eastside of the roadway is in a prime location for in-fill single-family residential, population-serving retail or office, or an apartment community. However, any additional development along this section of Keen Road will most likely occur due to easy interstate access (both I-95 and I-40) and not from the addition of a center turn lane. I-95 is planned for widening from four lanes to six lanes throughout Johnston County, which could induce additional development at various interchanges, including Keen Road.

### **Environmental Justice Impacts**

Federal programs, under the statutes of Title VI of the Civil Rights Act of 1964, have requirements to protect individuals from discrimination on the basis of race, color, national origin, age, sex, disability, and religion. Furthermore, Executive Order 12898 "directs that programs, policies, and activities not have a disproportionately high and adverse human health and environmental effect on minority and low-income populations"<sup>1</sup>

Although the Keen Road widening project is located in a low- to middle-income area, it does not discriminate against any specific subgroups, particularly low-income or minority populations. In fact, the road widening is intended to provide better access and mobility to the surrounding residential community, not to decrease travel times for traffic traveling through the project area at the expense of surrounding land uses.

### **Farmland Impacts**

North Carolina Executive Order Number 96, Preservation of Prime Agricultural and Forest Lands, requires all state agencies to consider the impact of land acquisition and construction projects on prime farmland soils, as designated by the US Natural Resources Conservation Service (NRCS). These soils are determined by the SCS based on criteria such as crop yield and level of input of economic resources.

According to a soil survey completed in 1994 by the United States Department of Agriculture, there are three main types of soil within the study area:

- 1) Ly, or Lynchburg sandy loam
- 2) NoA, or Norfolk loamy sand
- 3) WaB, or Wagram loamy sand

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<sup>1</sup> Title VI of the Civil Rights Act of 1964, and Executive Order 12898 on Environmental Justice. Community Impact Assessment: A Quick Reference for Transportation. US Department of Transportation. Federal Highway Administration. Publication No. FHWA-PD-96-036. September 1996.

The Ly and WaB soils are located closer to Keen Road, while the NoA soil is located in the more rural area to the east. The Ly soil type typically has slopes between 0 to 2 percent, and is mostly used as woodland. The soil is also well suited to corn, soybeans, and small grain yields. It is poorly suited to most urban and recreational uses because of the wetness. The WaB soil type is located in areas with 0 to 6 percent slopes, and is mostly used as cropland. It is also well suited for woodlands and urban uses. Lastly, the NoA soil is typically located in areas with 0 to 2 percent slopes, and is mostly used as cropland. It is well suited for most any type of development including cropland, woodland, and urban uses.

With an additional 30 feet or right-of-way being acquired as a result of the widening project, there should be some minimal impact on farmland since all three types of soil are conducive to crop yields. However, most potential impact upon the farmland within the study area will result because of induced development, not right-of-way acquisition. As previously mentioned, the widening project should not induce additional residential or commercial development. In addition, storm water runoff as a result of the project may slightly impact the poorly drained Ly soil type located along the eastern edge of the roadway closer to US-301. However, the addition of curb and gutter along the entire length of the project should limit the amount of runoff into these adjacent farmland areas.

#### **Water Supply/Watersheds And Scenic Rivers Impacts**

There are no major rivers or creeks within the study area. According to Johnston County, the entire roadway project is not located within either a critical or protected watershed area. Therefore, no impacts upon watersheds or water supply is anticipated.

In addition, the United States government regulates certain selected rivers and their immediate environments because they possess "outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values". Legislation dictates that these rivers "shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations"<sup>2</sup>. With no such rivers within the study area, development regulations with respect to scenic rivers do not apply to the Keen Road widening project.

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<sup>2</sup> Wild and Scenic Rivers Act. <http://www.nps.gov/rivers/wsract.html>. Accessed on 2 October 2001.