STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

July 21, 2005

U. S. Army Corps of Engineers
Regulatory Field Office
151 Patton Avenue, Room 208
Asheville, NC 28801-5006

ATTN.: Mr. Steve Lund
NCDOT Coordinator

Subject: **Application for Individual Section 404 and 401 permits for TIP R-2616** for the proposed widening of US 601 from the South Carolina State Line to north of Marion Lee Road (SR 2105) south of Monroe in Union County; NCDOT Division 10. Federal Project No. STP-NHS-601(4), State Project No. 8.1690303, WBS Element 34485.1.1.

Dear Sir:

The NCDOT proposes to widen US 601 from the South Carolina State Line to north of Marion Lee Road (SR 2105). The proposed project will consist of widening the existing two lane facility to a four lane grassed median facility. The total length is approximately 10.8 miles and will require approximately 200 feet of right of way. This application package consists of the cover letter, ENG Form 4345, permit (hydraulic) drawings, half size roadway plan sheets, and EEP Mitigation Acceptance Letter.

Purpose and Need: As identified in the reevaluation of the EA, the primary purpose of this action is to improve highway safety on US 601, a two-lane, undivided facility situation in rolling terrain with associate poor stopping sight distances. This section of US 601 has a history of severe crashes and a Fatal Crash Rate significantly higher than the statewide average.

The secondary purpose of this action is to increase the capacity of the facility.

Summary of Impacts: Impacts on jurisdictional areas of the proposed project consist of a total of 0.15 acre of wetland impacts, 2,969 linear feet of permanent stream impact, 464 linear feet of temporary stream impact, and 3.53 acres of surface water (pond) impact.

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1598

TELEPHONE: 919-733-3141
FAX: 919-715-1501
WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC

Summary of Mitigation: The project has been designed to avoid and minimize impacts to jurisdictional areas throughout the NEPA and design processes. Compensatory mitigation for jurisdictional streams and wetlands will be provided by the North Carolina Ecosystem Enhancement Program.

NEPA DOCUMENT STATUS

The United States Department of Transportation Federal Highway Administration (FEWA) and the North Carolina Department of Transportation (NCDOT) approve the previous administrative actions of this project including the *Environmental Assessment (EA)* on May 24, 1994 and the *Finding of No Significant Impact (FONSI)* on September 29, 1994. Section 129 (Reevaluations) of Part 771 (Environmental Impact and Related Procedures) of Title 23 (Highway) of the *Code of Federal Regulations* requires that NCDOT consult with FHWA to determine whether the approved environmental documents remain valid. FHWA and NCDOT concluded that a Reevaluation should be conducted due to the elapsed time since the *FONSI* and need for updated impacts to the human and natural environment. Copies of the EA and FONSI have been provided to regulatory review agencies involved in the approval process. Additional copies will be provided upon request.

MERGER PROCESS SUMMARY

Purpose and Need (Concurrence Point 1, signed 3/31/2003): "The primary purpose of this action is to improve highway safety on US 601. The secondary purpose is to increase the capacity of the facility."

Alternatives (Concurrence Point 2, signed 3/31/2003):
1) No-build / routine maintenance continues
2) Asymmetrical widening to a 4-lane, median divided, shoulder-section facility

Bridging Decisions (Concurrence Point 2A, signed 3/16/2004): "The Team concurs with the proposed box culvert and bridging decisions for the five major crossings on US 601 as presented during this meeting."

Least Environmentally Damaging Practicable Alternative – LEDPA (Concurrence Point 3, signed 3/16/2004): "The LEDPA is an asymmetrical, best-fit widening of US 601 to a 4-lane, median divided, shoulder-section facility."

Avoidance and minimization (Concurrence Point 4A signed 1/25/2005): "The Merger Process Team concurred that the jurisdictional impacts have been avoided and minimized to the maximum extent practicable based on current information and design available at this time."

The context of this project with respect to the remaining concurrence points was discussed at the January 25, 2005 meeting. The Merger Process Team agreed to skip Concurrence Point 4B (30 % Hydraulic Design Review) and address Concurrence Point 4C (Permit Drawings Review) at the next concurrence meeting.

100% Hydraulic Design/ Permit Drawings Review (Concurrence Point 4C): Concurrence was reached on March 16, 2005.

INDEPENDENT UTILITY

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

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

RESOURCE STATUS

Wetland delineations: Potential wetland communities were investigated pursuant to the 1987 Corps of Engineers Wetland Delineation Manual. Mr. Steve Lund of the U.S. Army Corps of Engineers verified the wetlands and surface waters on December 17, 2002. Each impact is described in detail below. Site and station numbers correspond with the permit (hydraulic) drawings included in this application.

Impacts to Waters of the United States

Site 1 (L 102+00 to 106+05)
A 5'x 3' concrete barrel culvert, carrying an unnamed tributary to Mill Creek (J-15), will be replaced with two 54" reinforced concrete pipes. This proposed activity will result in 223' of permanent stream impact and 75' of temporary stream impacts.

Site 2 (L 119+35)
A 3'x 7' triple barrel culvert, carrying Mill Creek (J-14), will be replaced with a 3'x 10' triple barrel culvert. One of the barrels will be silled to allow for natural stream dimensions to continue through the structure. This proposed activity will result in 166' of permanent stream impact and 20' of temporary stream impacts.

Site 3 (L 129+70)
A 8'x 13' sextuple barrel culvert, carrying Lanes Creek (J-13), will be replaced with two 130' bridges (2 spans @ 65'). This proposed activity will result in 150' of temporary stream impacts to construct the bridge.

Site 4 (L 145+40)
A 21" pipe, carrying an unnamed tributary to Lanes Creek (J-12), will be replaced with a 42" reinforced concrete pipe. This proposed activity will result in 48' of permanent stream impact and 10' of temporary stream impacts.

Site 5 (180+30 RT)
A 24" concrete pipe, carrying an unnamed tributary to Gum Log Branch (J-11), will be replaced with a 48" reinforced concrete pipe. This proposed activity will result in 140' of permanent stream impact and 11' of temporary stream impacts.

Site 6 (180+30 LT)
This site is across US 601 (west) of site 5. The proposed replacement of the 24" pipe will result in 0.015 acres of wetland impact and 24' of permanent stream impact.

Site 7 (L 180+30 to 183+00)
Due to the encroachment of the expanded road, 192' of an unnamed tributary to Gum Log Branch (J-10) will be permanently impacted. Ten feet of stream will be temporally impacted to create a diversion.

Site 8 (L 215+70 RT)
A 24" concrete pipe will be replaced with a new 24" reinforced concrete pipe. This proposed activity will result in 0.009 acre of wetland impact.

Site 9 (L 221+70 LT)
Due to the encroachment of the expanded roadway, 0.83 acre of surface water (pond) will be drained.

Site 10 (L 231+30)
A double 4' concrete box culvert, carrying an unnamed tributary to Wicker Branch (J-9) will be replaced with a 54" reinforced concrete pipe. This proposed activity will result in 170' of permanent stream impact and 22' of temporary stream impacts.

Site 11 (L 242+35)
A 5' double barrel culvert, carrying an unnamed tributary to Wicker Branch (J-8), will be replaced with a 66" reinforced concrete pipe. This proposed activity will result in 161' of permanent stream impact and 20' of temporary stream impacts.

Site 12 (L 248+30 to 250+09)
A 3'x 3' concrete culvert, carrying an unnamed tributary to Wicker Branch (J-7), will be replaced with a 48" reinforced concrete pipe. This proposed activity will result in 320' of permanent stream impact and 22' of temporary stream impacts.

Site 13 (L 281+50)
A double 8'x 7'concete box culvert, carrying an unnamed tributary to Wicker Branch (J-6), will be replaced with a single 12'x 10' reinforced concrete box culvert. This proposed activity will result in 128' of permanent stream impact and 20' of temporary stream impacts.

Site 14 (L 288+00)
A double 8'x 6' concrete box culvert, carrying an unnamed tributary to Cowpens Branch (J-5), will be replaced with a double barrel 8'x 7' reinforced concrete box culvert. One of the barrels will be silled to allow for natural stream dimensions to continue through the structure. This proposed activity will result in 124' of permanent stream impact and 20' of temporary stream impacts.

Site 15 (L 290+00 to 294+30)
A 30" concrete pipe, carrying an unnamed tributary to Cowpens Branch (J-4), will be replaced with two 30" reinforced concrete pipes. Also, due to the road expansion parallel to the stream, these activities will result in 466' of permanent stream impact and 24' of temporary stream impacts.

Site 16 (L 315+75)
A double 2'x 7' concrete box culvert, carrying Wicker Branch (J-3), will be replaced with a double barrel 8'x 8' reinforced concrete box culvert. This proposed activity will result in 210' of permanent stream impact and 20' of temporary stream impacts.

Site 17 (L 342+00 LT)
Due to the encroachment of the expanded roadway, 0.31 acre of surface water (pond) will be drained.

Site 18 (L 349+50 RT)
Due to the installation of a 30" reinforced concrete pipe and encroachment of the widened facility, 0.04 acre of wetland will be permanently impacted, and 0.89 acre of surface water (pond) will be drained.

Site 19 (L 349+50 LT)
Due to the encroachment of the expanded roadway, 0.47 acre of surface water (pond) will be drained.

Site 20 (L 400+00 RT)
Due to the encroachment of the expanded roadway, 0.58 acre of surface water (pond) will be drained.

Site 21 (L 422+00 RT)
Due to the encroachment of the expanded roadway, 0.45 acre of surface water (pond) will be drained.

Site 22 (L 246+03 to 430+50)
A 54" reinforced concrete pipe will be installed carrying an unnamed tributary to Buck Branch resulting in 446' of permanent stream impact and 20' of temporary impact.

Site 23 (L 474+07 to 476+41)
A 24" pipe will be replaced with a new 24" reinforced concrete pipe, resulting in 0.025 acre of permanent wetland impact.

Site 24 (L 534+20)
A 24" reinforced concrete pipe, carrying an unnamed tributary to Buck Branch, will be replaced with a 48" reinforced concrete pipe. This proposed activity will result in 151' of permanent stream impact and 20' of temporary stream impacts.

Site 25 (L 549+60)
A 24" pipe will be replaced with a 36" reinforced concrete pipe. Due to the proximity of a water supply water shed, a hazardous spill retention basin will be constructed at the outlet of this pipe. These activities will result in 0.06 acre of wetland impact.

Site 26 (L 575+85)
A 24" reinforced concrete pipe will be extended, resulting in 0.290 acre of surface water (pond) impact.

PROTECTED SPECIES

Plants and animals with Federal classification of Endangered (E) or Threatened (T) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of January 29, 2003, the U.S. Fish and Wildlife Service (FWS) lists two federally protected species for Union County (Table 1). Concurrence has been received from the USFWS in a letter dated April 1, 2004 stating, "Given the information provided, we agree that there will be no effect to federally listed species for the subject project."

Table 1. Federally Protected Species for Union County

Common Name	Scientific Name	Status	Biological Conclusion
Schweinitz's sunflower	*Helianthus schweinitzii*	Endangered	No Effect
Carolina heelsplitter	*Lasmigona decorata*	Endangered	No Effect

Endangered - A taxon "in danger of extinction throughout all or a significant portion of its range."

INDIRECT CUMULATIVE IMPACT ANALYSIS

Existing rules for the 401 Water Quality Certification Program (15A NCAC 2H .0506(b)(4) require that the DWQ determine that a project "does not result in cumulative impacts, based on past or reasonably anticipated future impacts, that cause or will cause a violation of downstream water quality standards."

An Indirect and Cumulative Effects Report (ICE) was completed for this project in 2003. Because of the rural location, and lack of other infrastructure facilities, indirect and secondary impacts attributed to this project are expected to be minimal. Copies of this report are available upon request.

There are no impaired (303d) streams in the project area.

CULTURAL RESOURCES

Archaeology & Historical Structures: Archaeological resource survey work was conducted to determine if significant archaeological resources might be disturbed. In a letter dated April 3, 1992, eleven recorded archaeological sites were studied and were all determined to be not eligible for the National Register by NCDOT archaeologists with concurrence from the SHPO. This document is found in Appendix D in the Reevaluation EA.

In a letter dated January 17, 2003, also found in the Appendix D section of the Reevaluation EA, SHPO commented that "We have conducted a review of the proposed undertaking and are aware of no historic resources which would be affected by the project."

FEMA COMPLIANCE

Union County is currently a participant in the National Flood Insurance Regular Program. The crossing of Mill Creek, Lanes Creek, Cowpens Branch and Wicker Branch are located in designated flood hazard zones.

WILD AND SCENIC RIVER SYSTEM

The project will not impact any designated Wild and Scenic Rivers or any rivers included in the list of study rivers (Public Law 90-542, as amended).

MITIGATION OPTIONS

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

Avoidance and Minimization: This project has been designed using asymmetrical widening. Using this method, the department has avoided impacting many wetlands and reduced impacts to wetlands to the greatest extent practicable. Other specific examples of avoidance and minimization measures include:

- The removal of a culvert carrying Lanes Creek and replacing the structure with two 130' bridges.

- The removal and replacement of all perched culverts. These structures will be buried a minimum of 1 foot to accommodate the passage of aquatic organisms.

- When applicable, multiple barrel culverts will be silled to continue the natural stream dimensions throughout the culvert structure, but can also accommodate larger flow during storm events.

- Fill slopes have been designed at a 2:1 ratio

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

FHWA Step Down Compliance

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

1. Consideration must be given to mitigation within the right-of-way and should include the enhancement of existing wetlands and the creation of new wetlands in the highway median, borrow pit areas, interchange areas and along the roadside.

2. Where mitigation within the right-of-way does not fully offset wetland losses, compensatory mitigation may be conducted outside the right-of-way including enhancement, creation, and preservation.

Based upon the agreements stipulated in the "Memorandum of Agreement Among the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U.S. Army Corps of Engineers, Wilmington District" (MOA), it is understood that the North Carolina Department of Environment and Natural Resources Ecosystem Enhancement Program (EEP), will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for NCDOT projects. The offsetting mitigation will derive from an inventory of assets already in existence within the same 8-digit cataloguing unit. The Department has avoided and minimized impacts to jurisdictional resources to the greatest extent possible as described above. The remaining, unavoidable impacts will be offset by compensatory mitigation provided by the EEP program. A copy of this acceptance by the EEP is included in this application package.

REGULATORY APPROVALS

Application is hereby made for a Department of the Army for a Section 404 Individual Permit and a Section 401 Water Quality Certification for the above described activities. In compliance with Section 143-215.3D(e) of the NCAC we will provide $475.00 to act as payment for processing the Section 401 permit application previously noted in this application (see Subject line). We are providing seven copies of this application to the North Carolina Department of Environment and Natural Resources, Division of Water Quality.

We also anticipate that comments from the North Carolina Wildlife Resources Commission (NCWRC) will be required prior to authorization by the Corps of Engineers. By copy of this letter and attachment, NCDOT hereby requests NCWRC review. NCDOT requests that NCWRC forward their comments to the Corps of Engineers.

Currently this project is scheduled to let on February 21, 2006.

Thank you for your assistance with this project. If you have any questions or need additional information, please contact Mr. Michael Turchy at maturchy@dot.state.nc.us or (919) 715-1468. A copy of this application will also be posted at http://www.ncdot.org/planning/pe/naturalunit/Permit.html.

Sincerely,

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

W/attachment

Mr. John Hennessy, NCDWQ (7 Copies)
Ms. Marella Buncick, USFWS
Ms. Marla Chambers, NCWRC
Ms. Becky Fox, USEPA – Whittier, NC
Mr. Ronald Mikulak, USEPA – Atlanta, GA
Mr. Clarence W. Coleman, P.E., FHWA
Mr. David Chang, P.E., Hydraulics
Mr. Greg Perfetti, P.E., Structure Design
Mr. Mark Staley, Roadside Environmental
Mr. B. G. Payne, P.E., Division Engineer
Mr. Larry Thompson, DEO

W/o attachment

Mr. Jay Bennett, P.E., Roadway Design
Mr. Omar Sultan, Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. David Franklin, USACE, Wilmington
Ms. Beth Harmon, EEP
Mr. Todd Jones, NCDOT External Audit Branch
Mr. Carl Goode, PE
Mr. Mark Pierce, P.E., PDEA

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

OMB APPROVAL NO. 0710-003
Expires December 31, 2004

Public reporting burden for this collection of information is estimated to average 10 hours per response, although the majority of applications should require 5 hours or less. This includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Service Directorate of Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302; and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003), Washington, DC 20503. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authority: Rivers and Harbors Act, Section 10, 33 USC 403: Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research and Sanctuaries Act, 33 USC 1413, Section 103. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued.

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETED

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (an agent is not required)
North Carolina Department of Transportation Project Development & Environmental Analysis	
6. APPLICANT'S ADDRESS	**9. AGENT'S ADDRESS**
1548 Mail Service Center Raleigh, NC 27699-1548	
7. APPLICANT'S PHONE NOs. W/AREA CODE	**10. AGENT'S PHONE NOs. W/AREA CODE**
a. Residence b. Business 919-733-3141	a. Residence b. Business

11. STATEMENT OF AUTHORIZATION

I hereby authorize, _____ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

_____ _____
APPLICANT'S SIGNATURE DATE

NAME, LOCATION, AND DESCRIPTION OR PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)
R-2616

13. NAME OF WATERBODY, IF KNOWN (if applicable)
Buck Branch, Wicker Branch, Cowpens Branch, Gum Log Branch, Lanes Creek, and several Unnamed tributaries systems to the aforementioned streams.

14. PROJECT STREET ADDRESS (if applicable)

15. LOCATION OF PROJECT

Union NC
COUNTY STATE

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions) **Section, Township, Range, Lat/Lon, and/or Accessors's Parcel Number, for example.**

17. DIRECTIONS TO THE SITE
Please see attached vicinity map and cover letter.

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

Widening a current US 601 from a two lane, to a 4 lane undivided facility on existing location using asymmetrical widening.

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

To increase safety and capacity of US 601.

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

20. Reason(s) for Discharge

Impacts will result from widening the shoulders, raising the grade of the highway, and lengthening/ replacing hydraulic structures.

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

See attached cover letter.

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

See attached cover letter.

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

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

Please see adjacent property landowners page attached to the permit drawing package

25. List of Other Certifications or Approvals/Denials Received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
N/A					

* Would include but is not restricted to zoning, building, and flood plain permits

26. Application is hereby made for a permit or permits to authorize the work described in this application. I certify that the information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT	DATE	SIGNATURE OF AGENT	DATE
	7/22/05		

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

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

In this case, the NCDOT has not proposed to swap this project for an appropriate project included on the Exhibit 2 list.

Currently, EEP has surplus stream mitigation with sufficient assets to cover this years projected mitigation requirements plus the mitigation for the above referenced project. EEP has a Local Watershed Plan (LWP) located within the Yadkin 03040105 and will be investigating the results of the plan to determine if any riverine or non-riverine wetland mitigation exist. If no wetland mitigation opportunities exist, EEP will issue a Full Delivery Mitigation Request for Proposals (FDM RFP) for the wetland mitigation needs for this and other projects located in the Cataloging Unit in Winter 2005-2006.

EEP will commit to implementing sufficient riverine and non-riverine compensatory wetland mitigation to offset the impacts associated with this project by the end of the MOA year in which this project is permitted, in accordance with Section X of the Tri-Party MOA signed on July 22, 2003.

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

Sincerely,

William D. Gilmore, P.E.
EEP Director

cc: Mr. Steve Lund, USACE-Asheville
Mr. John Hennessy, Division of Water Quality, Wetlands/401 Unit
File: R-2616

COMMUNITY IMPACT ASSESSMENT

US 601 Widening from US 74 to the South Carolina State Line

TIP R-2616 A&B

Union County, North Carolina

Prepared for

North Carolina Department of Transportation

Office of Human Environment

Prepared by:

HNTB North Carolina, PC

2108 South Boulevard

Suite 108

Charlotte, North Carolina 28203

April 8, 2003

Ecosystem Enhancement PROGRAM

July 19, 2005

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

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

R-2616, US 601 Widening, Union County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the riverine wetland, non-riverine wetland, and stream mitigation for the subject project. Based on the information supplied by you in a letter dated June 8, 2005, the impacts are located in CU 03040105 of the Yadkin River Basin in the Southern Piedmont (SP) Eco-Region, and are as follows:

Riverine Wetland Impacts:	0.084 acre
Non-Riverine Wetland Impacts:	0.065 acre
Stream Impacts:	2,969 feet

The subject project is <u>not</u> listed in Exhibit 2 of the Memorandum of Agreement among the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U. S. Army Corps of Engineers, Wilmington District dated July 22, 2003. This project was accelerated and included in the NCDOT's Design Build Program. The EEP is only committed to provide the mitigation needs for projects listed on Exhibit 2 during the first two years of the program; however Amendment 1 details how non-Exhibit 2 projects may be swapped for an appropriate project included on the Exhibit 2 list. Specifically, Amendment 1 states that:

> "Exhibit 2 may be modified if requested jointly by NCDENR and NCDOT, and approved in writing by the USACE. In no event may the total projected impacts of projects per cataloging unit on Exhibit 2 exceed the total projected impacts of projects per cataloging unit on Exhibit 2 as it existed at the time of the original execution of the MOA, July, 2003."

TABLE OF CONTENTS

North Carolina Department of Transportation
Office of Human Environment

Community Impact Assessment
TIP R-2616 A & B
US 601 Widening from just north of
SR 2105 (Marion Lee Rd) to South Carolina State Line
Union County, North Carolina

I. EXECUTIVE SUMMARY

Community Profile:

- TIP R-2616 A & B is located in a rural portion of Union County with minimal growth and development momentum. Most of the land along this stretch of US 601 is used for agricultural purposes.
- The total population of the demographic area, which covers nearly one-fourth of Union County, was only 9,194 in 2000.
- Most of the traffic along US 601 south of US 74 is through traffic, travelling to and from the Monroe and Charlotte areas. According to the North Carolina Department of Transportation (NCDOT), 17% of the current traffic is trucks.
- The fatal crash rate along this stretch of US 601 is 60% higher than that of the statewide average for similar roads. A total of 32 fatalities and 621 injuries have occurred between 1990 and 2002 (an average of approximately 1 fatality every 4 months).
- There is currently no water or sewer service throughout the majority of the demographic area, and public facilities are limited to a few churches, a volunteer fire station, and an elementary school.

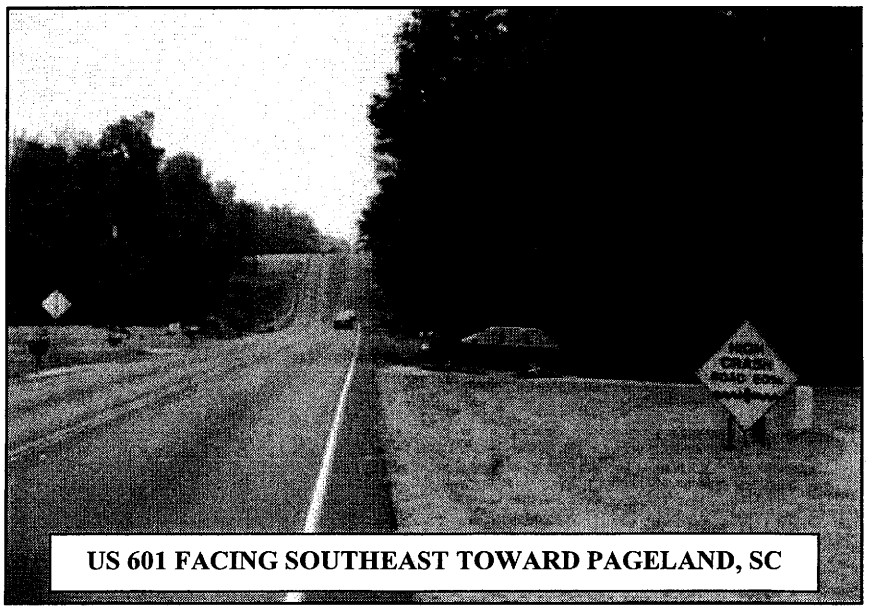
Project Impact:

- Although final design of the project is not complete, it is anticipated that the roadway will shift from being a two-lane, unlimited access rural highway to a four-lane, median-divided, limited access highway. Despite the fact that this will increase traffic capacity and improve safety, many residences and businesses along the project corridor as well as intersecting roadways will be negatively impacted with respect to accessibility.
- Because of the rural location, lack of water/sewer service, moderate travel time savings, and relatively inactive real estate market conditions, indirect and/or cumulative impacts as a result of TIP R-2616 A & B will be minimal.
- A total of 15 families and 5 businesses will need to be relocated as a result of TIP R-2616 A & B. One of the families is minority, and none of the businesses are minority-owned. It is anticipated that adequate replacement properties will be available.

- No environmental justice issues are anticipated before, during, or after the project is complete. Prime farmland and water quality impacts will be negligible.

II. PROJECT AND DEMOGRAPHIC AREA DESCRIPTION

The North Carolina Department of Transportation (NCDOT) proposes to widen a 10.8-mile segment of US 601 from just north of SR 1003 (White Store Road) to approximately 350 feet north of the South Carolina state line in Union County (see Figure 1). The existing cross section is primarily a two-lane facility with 12-foot lanes and 3-foot shoulders with left turn sections. There is currently no access control or signalized intersections. TIP R-2616 A & B involves asymmetrical widening and vertical alignment improvements. The proposed cross section is a four-lane median divided facility with 24-foot pavements separated by a 46-foot grassed median and 8-foot usable shoulders. The proposed right-of-way is between 100 to 200 feet.



US 601 FACING SOUTHEAST TOWARD PAGELAND, SC

The purpose and need of TIP R-2616 A & B is to provide safer traffic operation and increase capacity and sight distance. Total, fatal, and non-fatal injuries between 1990 and 2002 were all substantially higher than the statewide average. A total of 32 fatalities and 621 injuries have been reported during that timeframe, which is an average of about 1 fatality per every 4 months. The fatal crash rate is 60% higher than the statewide average. Traffic volumes in 2002 along the project area ranged from 11,000 to 12,000 vehicles per day (vpd). The projected average traffic volume in 2025 is between 22,000 to 24,000 vpd, which would create a LOS of E. With the proposed improvement, the LOS for the project area would improve to a B.

The demographic area is comprised of Census Tract 206/Block Group 4, Census Tract 207/Block Group 4, and Census Tract 209.01/Block Groups 1,2 & 3 (see Figure 1). This area is bounded by the South Carolina state line to the south, NC 207 to the west, Anson County border, White Store Road, and Old Pageland Road to the east, and Old Monroe Road and downtown Monroe to the north. A detailed description of demographic characteristics is included in the Community Profile section of this report.

III. METHODOLOGY

The community profile was determined by information gathered in a personal visit to the site and interviews with planners from Union County, and a planner with the City of Monroe. Demographic data was collected initially from the US Census Bureau (www.census.gov), and supplemented by information in the 1998 version of the *Union County Land Use Plan*. Income, poverty and housing figures were also obtained from the Census Bureau and the *Union County Land Use Plan*, and employment/unemployment data from the Employment Security Commission of North Carolina (www.esc.state.nc.us). Information about public facilities and services was obtained from various county websites and the City of Monroe website (www.monroenc.org). Information regarding land use was primarily acquired from the *Union County Land Use Plan,* the *Monroe Land Development Plan 2000-2010*, the field visit, the demographic area aerial photo from the North Carolina Department of Transportation, and discussions with planners.

In assessing project impacts, it was necessary to use data gathered for the community profile as a basis for evaluating the direct/indirect impacts of the project on the community. Factors analyzed for impacts include demographics, aesthetics, land use, economic conditions, mobility, access and safety, public facilities/services, displacements, farmland, and water quality/watersheds.

In addition, any indirect or cumulative impacts were addressed. The Louis Berger Group Inc.'s *Guidance for Assessing Indirect and Cumulative Impacts of Transportation Projects in North Carolina (Volumes I & II),* and *Community Impact Assessment: A Quick Reference for Transportation* published by the US Department of Transportation were helpful guides. Coordination with the NCDOT project engineer and various City and County staff members proved to be instrumental in composing the report.

IV. COMMUNITY PROFILE/DATA COLLECTION

Field Visit to Inspect Demographic Area

The area along US 601 between Marion Lee Rd. and the South Carolina State line is predominantly an agricultural corridor with sparse residences and businesses located primarily at main intersections. Most of the abundant farmland appears to be active. Heavy truck traffic was observed during the field visit. There are no major water bodies along the project corridor, and therefore, no bridges exist. The topography is rolling, causing limited sight distances for drivers. No major retail, office, industrial, or institutional destinations were observed throughout the project area.

Geographic and Political Description (Demographics)

Situated in the southern piedmont of North Carolina, Union County shares borders with four other North Carolina counties and two South Carolina counties. The North Carolina

counties include Mecklenburg, Cabarrus, Stanly and Anson, while the neighboring South Carolina counties include Lancaster and Chesterfield. Approximately 75% of Union County's land is either undeveloped or used for agricultural purposes. However, population spillover from Charlotte and the recent completion of I-485 just across the border in Mecklenburg County has created substantial development opportunities in the western portion of Union County.

There are no interstates located in Union County, which is basically subdivided into four quadrants by the north-south US 601 and the east-west US 74. These two major thoroughfares intersect with each other in the City of Monroe, which is located in the heart of Union County.

North Carolina experienced a 21.4% rate of population growth over the last decade. This was higher than the average rate of growth that occurred in the United States (13.1%). Union County grew even more substantially, with a growth rate of 46.9%, the highest growth rate in the Charlotte Metropolitan Statistical Area (MSA). Most of the population growth in Union County has been influenced by spillover momentum from the City of Charlotte. While Charlotte is located in Mecklenburg County, Union County municipalities such as Weddington and Indian Trail have become attractive bedroom communities within the larger metropolitan region. The demographic area is located in one of the slower-growing portions of Union County, evident by the 28.8% population growth rate during the 1990s, much lower than the county overall (see Table 1).

Table 1. Population Growth, 1990-2000

Area	Population		Growth	
	1990	2000	#	%
Demographic Area	7,140	9,194	2,054	28.8%
Union County	84,211	123,677	39,466	46.9%
North Carolina	6,628,637	8,049,313	1,420,676	21.4%

Source: US Census Bureau 1990, 2000
Note: Demographic Area includes CT 206/BG 4, CT 207/BG 4, CT 209.01/BG 1,2,3

The demographic area had a very similar racial balance to that of Union County in 2000, with a White population around 80% and similar percentages of both African Americans and Hispanics. There was, however, a major difference with the State of North Carolina, which had a much higher percent of African Americans (21.4%) than the demographic area (10.6%) (see Table 2).

Table 2. Population by Race, 2000

Race	Demographic Area		Union County		North Carolina	
	Population	%	Population	%	Population	%
White	7,600	82.7%	98,612	79.7%	5,647,155	70.2%
Black or African American	940	10.2%	15,312	12.4%	1,723,301	21.4%
American Indian or Alaska Native	55	0.6%	415	0.3%	95,333	1.2%
Asian	34	0.4%	705	0.6%	112,416	1.4%
Native Hawaiian and Pacific Islander	1	0.0%	26	0.0%	3,165	0.0%
Hispanic or Latino	512	5.6%	7,637	6.2%	378,963	4.7%
Other Races	1	0.0%	85	0.1%	9,015	0.1%
Two or More Races	51	0.6%	885	0.7%	79,965	1.0%
Total	**9,194**	**100.0%**	**123,677**	**100.0%**	**8,049,313**	**100.0%**

Source: US Census Bureau 2000

Note: Demographic Area includes CT 206/BG 4, CT 207/BG 4, CT 209.01/BG 1,2,3

The percentage of the 2000 population categorized as "19 years and under" was 28.4% in the demographic area, slightly lower than the county (30.6%) but slightly higher than the State (27.2%). However, the population categorized as "65 or more years" was 13.7% in the demographic area, higher than the county (9.0%) and the State (12.0%). When compared to the larger geographies, the demographic area had a relatively low percentage of residents under 45 years of age (62.8%) in 2000, and a relatively high percentage of residents over that age (37.3%), indicating the presence of an older, retired population (see Table 3).

Table 3. Population by Age, 2000

Age	Demographic Area		Union County		North Carolina	
	Population	%	Population	%	Population	%
19 years and under	2,607	28.4%	37,854	30.6%	2,193,360	27.2%
20-44 years	3,166	34.4%	48,103	38.9%	3,078,043	38.2%
45-64 years	2,166	23.6%	26,572	21.5%	1,808,862	22.5%
65 or more years	1,255	13.7%	11,148	9.0%	969,048	12.0%
Total	**9,194**	**100.0%**	**123,677**	**100.0%**	**8,049,313**	**100.0%**

Source: US Census Bureau 2000

Note: Demographic Area includes CT 206/BG 4, CT 207/BG 4, CT 209.01/BG 1,2,3

Income, Poverty Status and Unemployment

The median household income for Union County has been consistently higher than that of North Carolina. Data from the 2000 Census indicates that Union County had a median household income of $50,638 in 1999, while North Carolina's median was $35,320. As demonstrated in Table 4, the demographic area exhibited a similar growth trend to that of Union County, going from $30,930 in 1989 to $47,194 in 1999, a growth rate of 52.6%.

Table 4. Median Household Income, 1989-1999

Area	Household Income		Change, 89-99	
	1989	1999	#	%
Demographic Area	$30,930	$47,194	$16,264	52.6%
Union County	$30,957	$50,638	$19,681	63.6%
North Carolina	$26,647	$35,320	$8,673	32.5%

Source: US Census Bureau & University of Missouri
Note: Demographic Area includes CT 206/BG 4, CT 207/BG 4, CT 209.01/BG 1,2,3

In 2000, the percentage of the population that lived below the poverty level in Union County was low (8.1%) compared to the corresponding percentage in the State (12.6%). From 1990 to 2000, the percentage of County residents in this category decreased by 3.6%. In 1990, the percent of the population that lived below the poverty level in the demographic area (9.1%) was higher than Union County (8.4%) but still less than overall North Carolina (12.8%). In 2000, that percentage decreased to 8.1%, the same as Union County (see Table 5).

Table 5. % Below Poverty, 1990-2000

Area	% Below Poverty		Change, 90-00	
	1990	2000	#	%
Demographic Area	9.1%	8.1%	-1.0%	-11.0%
Union County	8.4%	8.1%	-0.3%	-3.6%
North Carolina	12.8%	12.6%	-0.2%	-1.6%

Source: US Census Bureau & University of Missouri
Note: Demographic Area includes CT 206/BG 4, CT 207/BG 4, CT 209.01/BG 1,2,3

The US Census Bureau employs a set of income thresholds that vary by the size and composition of a family to determine poverty status. These thresholds are not based on geographic boundaries but are adjusted for inflation. The thresholds are also based on income before taxes and do not include any capital gains or non-cash benefits such as public assistance. In addition, persons living in military barracks or institutional group homes are not included in the poverty statistics.

The unemployment rate for North Carolina decreased by 14.3% between 1990 and 2000, while Union County's remained level at 3%. Although the demographic area had the lowest unemployment rate among the three geographies in 1990, it had the highest in 2000, at 3.7% (see Table 6).

Table 6. Unemployment Rate, 1990-2000

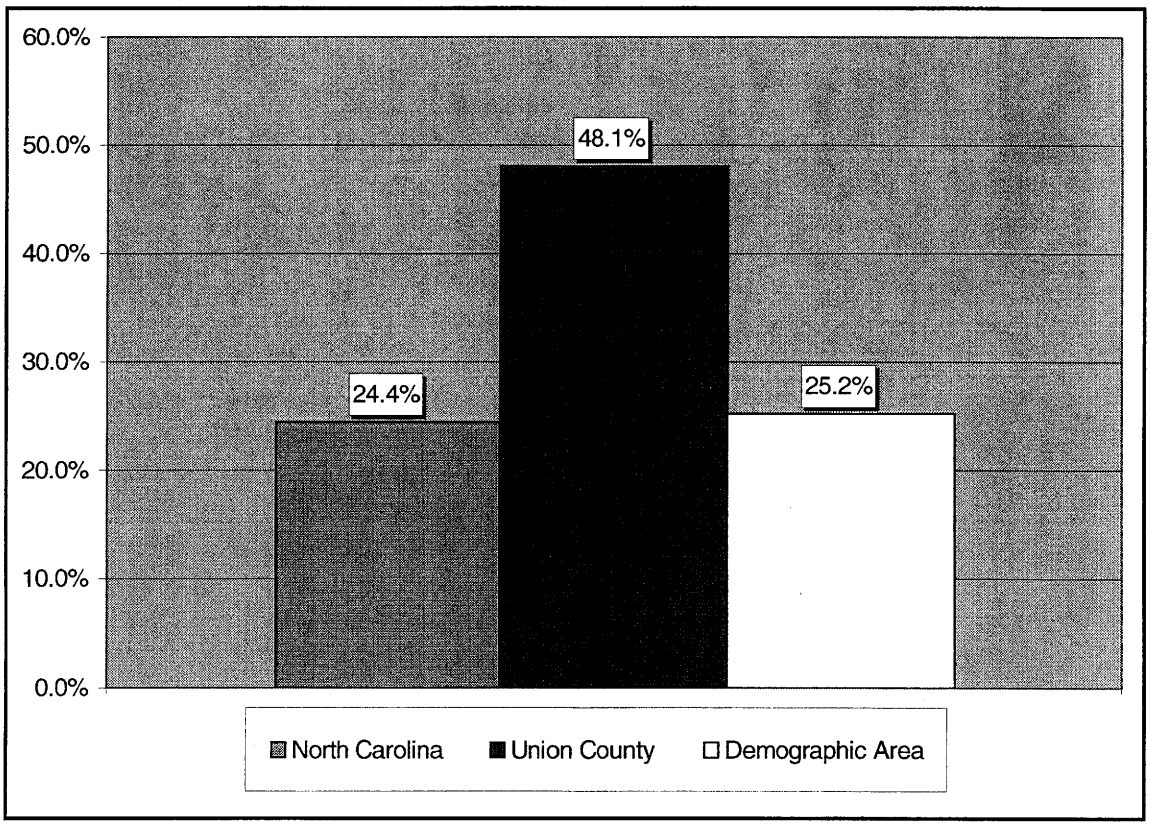
Area	Unemployment Rate		Change, 90-00	
	1990	2000	#	%
Demographic Area	2.4%	3.7%	1.3%	54.2%
Union County	3.0%	3.0%	0.0%	0.0%
North Carolina	4.2%	3.6%	-0.6%	-14.3%

Source: US Census Bureau & University of Missouri
Note: Demographic Area includes CT 206/BG 4, CT 207/BG 4, CT 209.01/BG 1,2,3

Housing Characteristics

According to the chart below, a total of 636 households were added to the demographic area between 1990 and 2000, an increase of 25.2%. Similar to the population growth rate, the household growth rate was much lower than the Union County growth rate (48.1%) but still higher than the State as a whole (24.4%). In 2000, the demographic area had a total of 3,164 households, representing 7.3% of the 43,390 total households in Union County.

Household Growth, 1990-2000



Source: US Census Bureau

Because of very similar population and household growth rates, the average household size for the demographic area and Union County remained stable between 1990 and 2000. When compared to North Carolina, there are typically more people per household in these areas, mainly because of the rural nature of development (see Table 7). Union County is still considered to be somewhat of a bedroom community to Charlotte. Generally, families are attracted to it more than young couples and singles, which tend to live in more urban communities.

Table 7. Average Household Size, 1990-2000

Area	Household Size		Change, 90-00	
	1990	2000	#	%
North Carolina	2.54	2.49	-0.05	-2.0%
Union County	2.82	2.81	-0.01	-0.4%
Demographic Area	2.79	2.80	0.01	0.4%

Source: US Census Bureau

Business Activity and Employment Centers

In 2000, the Union County Public School System was the largest employer in the county with 2,810 employees. Tyson Foods (poultry) with 1,300 employees, Allvac (alloys) with 1,000 employees, McGee Brothers (construction) with 975 employees and Pilgrim's Pride Corporation (poultry) with 920 employees round out the top five largest employers in the county. The demographic area does not include any major industries within its boundaries, but does include some scattered farming-related businesses such as landscaping equipment, greenhouses, agricultural supplies, etc. Just across the state line in Chesterfield County, South Carolina, Wal-Mart has a regional distribution center, which employs approximately 700 people within the surrounding region.

Table 8 shows employment growth figures for Union County between 1990 and 2000. It is apparent that the agricultural industry was the fastest growing during the 1990s, with over a 137% increase in employment. This is particularly true in the demographic area portion of Union County, which is predominantly rural agricultural land. By contrast, employment in finance/insurance/real estate (FIRE) and manufacturing decreased between 1990 and

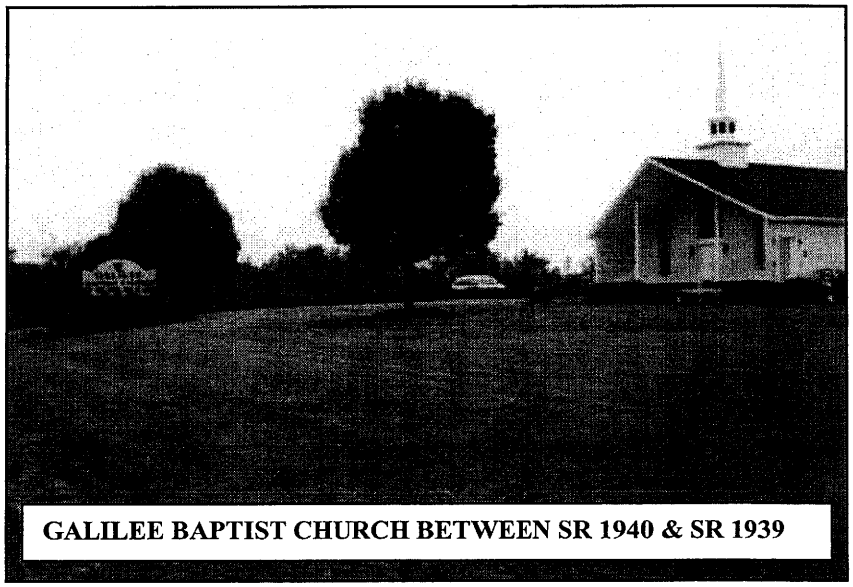
Table 8. Employment By Sector
Union County, 1990-2000

Sector	Employment		Change	
	1990	2000	#	%
Construction	4,119	7,206	3,087	74.9%
Agriculture	527	1,251	724	137.4%
Mining	N/A	N/A	N/A	N/A
Manufacturing	14,015	12,681	-1,334	-9.5%
Transportation/ Public Utilities	856	1,247	391	45.7%
Wholesale Trade	1,435	2,641	1,206	84.0%
Retail Trade	5,353	7,332	1,979	37.0%
FIRE	968	764	-204	-21.1%
Services	3,058	5,574	2,516	82.3%
Government	4,300	6,226	1,926	44.8%
Total:	**34,631**	**44,922**	**10,291**	**29.7%**

Source: North Carolina Employment Security Commission

2000. Currently, the manufacturing sector employs the most people in Union County, followed by the retail trade and construction industries. Most of the population in the demographic area is employed at various businesses and industries along the US 74 corridor in Union County or in Charlotte.

Public Facilities, Schools, Institutions, and Historic Sites



GALILEE BAPTIST CHURCH BETWEEN SR 1940 & SR 1939

Few public facilities are located along US 601 between Marion Lee Rd. and the state line (see Figure 2). A few churches and a volunteer fire station are located immediately along US 601. The population density does not yet exist in the demographic area to merit a substantial public facility presence. The nearest public school is Union Elementary at 5320 White Store Road east of US 601. In addition, Union County Regional Medical Center is located at the intersection of US 601 and US 74 just north of the demographic area boundary. There are no public parks or historic sites within the demographic area. Monroe Country Club, a semi-private golf course, is located just north of the northern boundary of the demographic area along US 601. It, along with Center United Methodist Church located at US 601 and SR 1003 (White Store Road), are identified as potentially eligible for the National Register of Historical Places.

Police, Fire, EMS, and Public Services

Union County has a Volunteer Fire Department (with a station located in the southern portion of the demographic area along US 601 at Landsford Road) and a Sheriff's Department (see Figure 2). The City of Monroe has three fire stations, located on West Crowell Street, East Roosevelt Boulevard and Williams Road Extension. The City's Police headquarters are on Franklin Street in downtown Monroe. While there is no public transportation system in place in Union County, handicapped and elderly services are available on a limited basis. The nearest hospital to the demographic area is the Union Regional Medical Center, located at Franklin Street and Hospital Drive just north of where US 74 and US 601 South split in southern Monroe.

Union County Public Works is the largest county service provider in North Carolina, supplying water to all municipalities except the City of Monroe, which operates the John Glen Water Treatment facility for its residents. There are currently no water or sewer services in the entire demographic area. Only a small northern portion of the demographic area south of Wingate is expected to have sewer service by 2010.

Local/Regional Land Use Development Plans

Existing land use in the demographic area is predominantly agricultural with some scattered large lot single-family. There are a few retail establishments (i.e. gas station, convenience store) at major intersections. Much of the remaining landscape is rolling pastureland with active farming operations and crop production. The City of Monroe currently has planning and zoning jurisdiction for the northern tip of the demographic area from US 74 to just north of Concord Avenue. As part of the *Monroe Land Development Plan 2000-2010*, adopted in May 2000, the majority of this area is proposed for low density residential with a maximum density of two dwelling units per acre. Most of the demographic area land within Monroe's existing city limits is proposed for urban residential, or a density of greater than three units per acre.

In addition to the proposed land use plan for Monroe, much of the Monroe extra territorial jurisdiction (ETJ) portion of the demographic area is within the 2,800-acre critical area of the WS-IV Richardson Creek Water Supply Watershed, which limits development to two dwelling units per acre for the low-density option or 24%-50% built upon area for the high-density option (requires controls for the 1" storm).

The *Union County Land Use Plan*, adopted in September 1998, proposes low-density residential (0-1 dwelling units per acre) for the remainder of the demographic area with small pockets of commercial uses at the following intersections (see Figure 1):

- US 601 and Mangum Dairy Road
- US 601 and Claude Austin Road
- US 601 and Hargette Road
- US 601 and Landsford Road
- US 601 and State Line Road

In addition, the plan proposes a pocket of approximately 300 acres of land for industrial park development at US 601 and Landsford Road.

It is evident by the existing zoning patterns, indicated on Figure 3, that most of the demographic area is zoned for Residential Agricultural at a density of one unit per every 40,000 square feet. Within the Monroe portion of the demographic area, the residential zoning is more dense, approaching one unit per every 10,000-20,000 square feet. There are small pockets of commercial zoning along US 601, where existing businesses are located.

Community/Neighborhood Description

Most of the residentially developed land in the demographic area is rural in nature. Neighborhoods are basically non-existent, and there are relatively no community functions other than occasional church gatherings. With a total of only 3,164 existing households within the demographic area, which represents almost one-fourth of the entire county, the area is not conducive to the generation of community or neighborhood groups. Union County foresees this portion of the US 601 corridor to remain extremely rural even after the widening project is complete. Currently, this area is a low growth area compared to the remainder of Union County.

V. PROJECT IMPACT ASSESSMENT

Demographics

Although its land area is equal to nearly one-fourth of Union County, the demographic area only comprised 7.4% of the Union County population in 2000. As mentioned before, Union County grew by 46.9% between 1990 and 2000, much higher than the 28.8% growth rate within the demographic area (see Table 1). According to the North Carolina Office of State Planning, Union County's population is expected to grow by 34.9% between 2000 and 2010, with the demographic area population forecast at 24.4% (see Table 9).

Table 9. Population Forecast, 2000-2010

Area	Population		Growth	
	2000	2010	#	%
Demographic Area*	9,194	11,440	2,246	24.4%
Union County	123,677	166,838	43,161	34.9%
North Carolina	8,049,313	9,468,787	1,419,474	17.6%

Source: NC Office of State Planning
Note: Demographic Area includes CT 206/BG 4, CT 207/BG 4, CT 209.01/BG 1,2,3
* Demographic Area forecast is based on its 1990-2000 share of Union County growth.

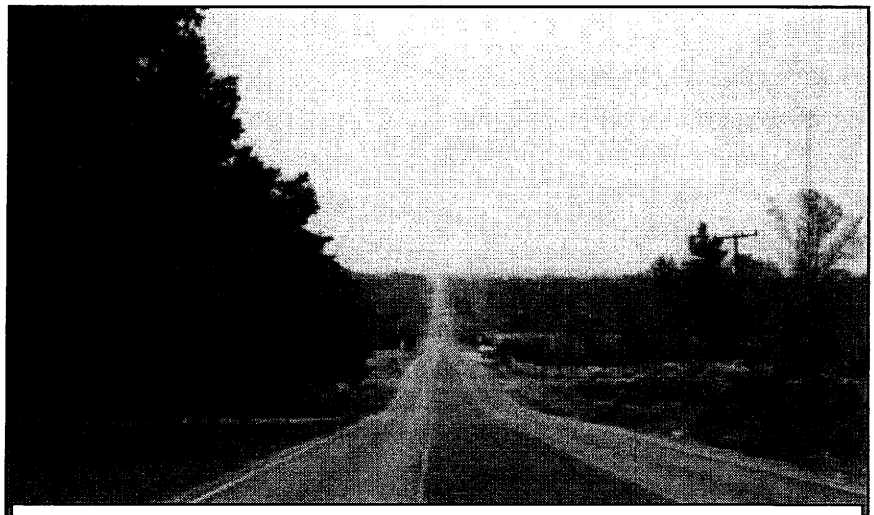
Much of the future growth in this part of the county will occur regardless of whether or not US 601 is widened to a multi-lane facility. Union County envisions US 601 south of US 74 as a rural, predominantly agricultural corridor, with very low-density residential scattered throughout the area. There is also limited water and no sewer services planned for the demographic area within the next 20 years, which will limit the potential for any type of induced residential growth. The proposed widening should only have a slight impact on future residential growth. The main impact will be on the existing population that will have their current unlimited access altered by the widened, limited access highway.

Physical and Visual Environment

There is no recorded right-of-way along the studied section of US 601. The NCDOT maintains a typical section along this route of 24 feet of pavement and two six-foot shoulders. The proposed right-of-way varies from 100-200 feet, depending on topography, soil, and existing improvements. The aesthetic character along this section of US 601 is expected to permanently change as a result of the potential widening project. What predominantly looks like a country road now will be changed to more of a freeway-type facility with design speeds of up to 60 miles per hour. The relocation of some of the utility poles along US 601 is likely to occur, and existing soft shoulders will be replaced with paved shoulders. The proposed 46-foot grassed median should improve the aesthetics of the roadway.

As part of the *Union County Land Use Plan*, one of the recommendations was to adopt supplemental zoning ordinance regulations to create a new Highway Corridor Overlay District with provisions designed to enhance the visual aspects of major thoroughfares (including US 601). These regulations would help prevent unattractive strip development, large freestanding signs, lack of landscaping, and a generally uncoordinated approach to design.

Land Use Patterns and Compatibility



LINEAR DESIGN OF US 601 LOOKING TOWARD PAGELAND

As mentioned before, the existing land use pattern along US 601 is predominantly agricultural between US 74 and the South Carolina State line. This pattern of development is unlikely to be affected by the newly widened roadway, much of which is preliminarily proposed for limited access. Most of the land use impact will be at the handful of intersections where more intense commercial development can be expected since these intersections will be where access (directional cross-overs and right-in/right-out movements) to the new US 601 South is provided. Limiting the amount of access points, as is proposed for TIP R-2616 A & B, creates more development pressure at those access points that will remain as commercial service needs become more concentrated. Gas

stations, convenience stores, restaurants, and the potential for limited grocery stores at these intersections increase because of the change in access management. The potential new households to be developed along these intersecting roadways also increases.

According to discussions with Union County planners, widening US 601 from two lanes to four lanes would be consistent with its adopted land use plan. Union County Planning Department recommends predominantly Residential Agricultural of up to one dwelling unit per acre. Pockets of convenience shopping centers are proposed at major intersections with US 601, including SR 1936, SR 1003, and the South Carolina State line, and a 300 acre industrial park is recommended at the intersection of US 601 and Landsford Road, the major east-west thoroughfare within the demographic area. It is likely that the widening of US 601 would accelerate the development of these intersections in that capacity.

The proposed project in the Monroe portion of the demographic area is not likely to affect the potential for or pace of either commercial or residential development. The majority of growth in this area is driven by the urbanization of Monroe and proximity to its services. In addition, most of the area within this jurisdiction is within the critical area of the Lake Lee Water Supply Watershed, which limits the intensity of development allowed.

Economic Conditions

A new/widened highway may reduce commuting distances/times as well as freight deliveries to and from employment destinations. Within the demographic area there are only a few small businesses; therefore, only a slight impact in this regard is anticipated as a result of the widening project. Most of the truck traffic is through traffic from Monroe and Charlotte area industries. During construction, mobility (i.e. travel times) may temporarily be hindered, as well as access for the few existing industries along the alignment.

Generally, proximity to a major highway is a stronger catalyst for commercial development than it is for residential development. US 601 is the major connector route from Union County (and US 74) to South Carolina markets. Widening the roadway from two lanes to four lanes should only have a slight impact on business attraction and growth because there are limited destination points along the corridor, there is no existing base of commercial development, and there is no current momentum for future growth. Also, as mentioned before, the new facility is preliminarily planned with right-in and right-out only movements with directional cross-overs at a few select intersections. This fact will limit the amount of induced development and focus most of the development at those intersections that have the best access points. Specific degrees of impact on economic development would require more detailed market studies which take into consideration factors such as total demand (absorption), competing supply (other sites), and estimated market capture rates.

The additional traffic volume that is expected as a result of the widening may encourage retail establishments that depend on drive-by customers to locate along US 601 within the demographic area, such as the gas stations, convenience stores and fast food restaurants. This impact should be slight in scale and focused at main intersections.

Because local and regional accessibility will be slightly enhanced for the demographic area as a result of the proposed US 601 widening, property values for land along the corridor could potentially increase. This increase, however, should not be enough to create any economic pressure on property owners to sell portions of their farmland or pastureland in order for it to be converted to either low-density residential or some type of limited non-residential development to offset the potential slight increase in property taxes.

Mobility And Access

Consistency with Thoroughfare Plans

The proposed multi-lane widening project is part of the NCDOT TIP and local *2001 Union County* and *1997 City of Monroe Thoroughfare Plans*. The proposed improvements are consistent with the *2001 Union County Thoroughfare Plan*, which identifies US 601 as a major thoroughfare. The City of Monroe's 1997 Thoroughfare Plan also refers to US 601 as a major thoroughfare and recommends widening of this facility to a five-lane section between US 74 and the South Carolina border. However, the proposed R-2616 A & B right-of-way corridor width varies between 100-200 feet, which may be inconsistent with the 120 foot corridor width shown in the city's thoroughfare plans in the section between US 74 and Macedonia Church Road.

Change in Commuting Patterns

The proposed alternative alignment will increase capacity for northbound/southbound travel in the area south of the City of Monroe. With the expansion of US 601, the facility would alleviate congestion along the corridor due to truck traffic. The proposed widening should not cause major shifts in commuting patterns for the area because of the limited number of households located along the corridor and the fact that this facility does not directly compete with other roadways in parallel.

Neighborhood Access

The project area is rural in nature, and, with the exception of a trailer park located to the north of SR 2109, residential development is sparse and mainly located along intersecting roadways. TIP R-2616 A & B proposed improvements include a 46-foot grassed median and design of directional cross-overs which will prohibit left turn movements to and from most homes along the US 601 corridor. NCDOT's preliminary access management plan recommends eliminating access to US 601 through the closing of several streets or creation of cul-de-sacs at Ervin Thomas Road, McRorie Road and McManus Circle. Although direct access to US 601 will be eliminated to the few residents located on these roads, alternative access is available via SR 2111, SR 1951 / Mountain Springs Church Road and SR 2110.

Commercial Access
The grassed median and directional cross-overs may also restrict movements for businesses along the corridor by precluding left turns and eliminating the direct access to and from commercial establishments. It is likely that future commercial development will only be focused at the intersections with US 601 which allow turning movements. Although most of the existing and future commercial development occurs at intersections, there are five properties whose direct access will be affected. These include two convenience stores, a service station, an antique store, and a video rentals store. Businesses that rely on drive-by traffic, such as the service station located to the south of Griffin Cemetery Road, may be affected by the reduction of direct access. The preliminary access plan also recommends removing the northernmost access drive to the truck stop located in the northwest quadrant of US 601 and Hargette Road. The reduction of direct access from vehicles traveling northbound on US 601 in addition to the elimination of an access drive may have a cumulative effect on the operations of the truck stop. Access from the Volunteer Fire Department located at Landsford Road will be maintained through the design of a depressed concrete median allowing for left hand turns onto US-601 from the Fire Station and modifications to the vertical alignment of the proposed improvements will improve sight distance on the approach to US 601.

The last public hearing on TIP R-2616 occurred in 1994, in which preliminary plans with four crossovers were presented to the public for comment. According to NCDOT personnel, the residents in the TIP project area may be confused between this project and the TIP R-2616D safety improvements currently under construction given the length of time that has transpired. Additional meetings with TIP area businesses, residents, and emergency responders would be beneficial to fully assess the effects of the preliminary access management plan. See the Public Involvement Plan in the Appendix.

Effects on Parking Availability
The existing road facility does not allow on-street parking, and the proposed alternative is not designed to accommodate this feature. Most of the roadways in the demographic area are rural and not designed for parking provisions (since most land in the area is low density and accommodates parking on private properties). Depending upon the setback requirements, parking spaces may be lost for some businesses along US-601 where the current facilities are close to the highway.

Pedestrian and Bicycle Access
Most higher volume rural arterial highway facilities such as US-601 were not designed to accommodate pedestrians. Even with anticipated growth as a result of the widening, the type of growth (rural residential and convenience retail) is not conducive to pedestrian access.

Existing facilities were not designed to accommodate any exclusive bike lanes or provide special provision for bicycle connectivity. The existing and proposed US-601 cross-section has 12-foot lanes and 8-foot shoulders. Due to the high design speed of 60 mph for the proposed facility, conditions would not be conducive for shared bicycle facilities.

Public Transportation

There is no current, fixed-route public transportation service in the TIP demographic area. According to their Governmental Services website, Union County provides transportation service to the clients of local human service agencies on an as-needed basis. A fleet of 13 vehicles provides this demand-responsive type service. Since routes for the service are not fixed, the proposed project would have no negative impacts on existing service. In addition, Greyhound Lines Inc. provides a scheduled service to the Monroe terminal located on US 74 in Monroe.

Provisions of Public Facilities/Services

The public facilities and services within the demographic area shown on Figure 2 are limited to a few churches and a volunteer fire station, none of which are expected to be negatively impacted by the widening project.

The limited future development resulting from the proposed US 601 widening should not result in an increased demand for public facilities and services within the demographic area. Population-serving facilities such as parks, schools, police substations, and day care centers would be more apt to locate within areas where residential and commercial growth is taking place, which is not the case along this portion of US 601.

According to the Environmental Assessment completed for TIP R-2616 A & B in 1994, there is a potential for slight impacts upon two churches along the US 601 corridor, one of which is eligible for the National Register of Historic Places. Based on the existing alignment of the widening project Galilee Baptist Church, located along US 601 between SR 1940 (Belk Mill Road) and SR 1939 (Hargette Road), may lose a small portion of its front lawn. In addition, a drainage easement may be required from the Center United Methodist Church property, located on SR 1003 (White Store Road) in the northern portion of the demographic area, as a result of a potential realignment of SR 1003 (necessitated by TIP R-2616 A & B). The State Historic Preservation Office determined that this potential easement would have no effect on the designation of this property as being historic.

Safety

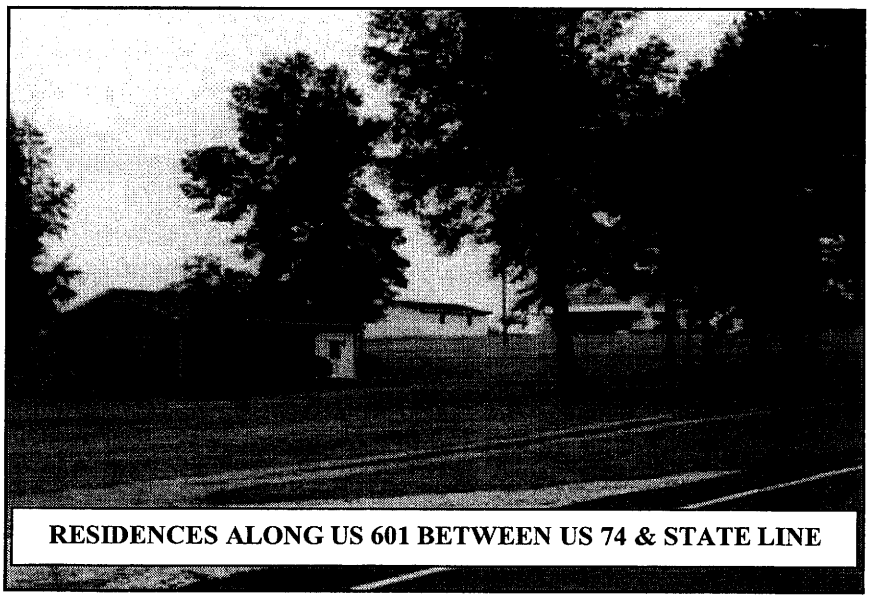
The proposed project should provide safety benefits for entire region. Nationwide automobile crash statistics routinely list rural/suburban two-lane arterial facilities as having higher accident rates than multi-lane roadways in similar areas. The reasons for this are that two-lane facilities often are over capacity, have poor geometrics, and often have many access points and high volume cross-intersections that negatively affects safety.

Along this stretch of US 601, there have been an extremely high amount of fatal and non-fatal injuries from 1990 to 2002. This accident rate is 60% higher than the statewide average. The proposed project should provide safety benefits by limiting the amount of

access points, increasing pavement width, adding paved shoulders, and improving the vertical alignment of the roadway.

Displacements

It is the policy of the NCDOT to provide assistance and counseling to those affected by transportation improvements as required under the Federal Uniform Relocation Assistance and Real Properties Acquisition Policies Act. Furthermore, the North Carolina Board of Transportation offers programs that address relocation assistance, moving payments and replacement housing payments or rent subsidies for residents and businesses that are impacted by transportation improvements.



RESIDENCES ALONG US 601 BETWEEN US 74 & STATE LINE

Findings within the 1994 Environmental Assessment indicate that fifteen residences and five businesses would be displaced as a result of TIP R-2616 A & B. It is anticipated that adequate replacement properties will be available for all relocatees. Of the 15 relocatees, 11 are owners and 4 are tenants. Fourteen of the fifteen relocatees are white with one minority. The five businesses listed below are expected to be relocated as well, none of which are minorities:

- A 400 square-foot service station totaling 3 employees
- A 1,000 square-foot convenience store totaling 5 employees
- A 400 square-foot video rentals store totaling 2 employees
- A 600 square-foot convenience store totaling 2 employees
- A 400 square-foot antique store totaling 1 employee

Determination of Potential for Indirect and Cumulative Impacts

Existing Conditions Analysis

Indirect impacts are those impacts that may come about because of an event such as this proposed transportation project. These impacts tend to occur over a longer period of time and can take place away from the immediate project area. A short-term example would

be the development of a small subdivision along a new or widened roadway that would otherwise not have occurred. Closely related is the concept of cumulative impacts, which are the collective effects of multiple events and actions, which may be dependent or independent.

The Louis Berger Group Inc., in their April 2001 handbook titled, *Guidance for Assessing Indirect and Cumulative Impacts of Transportation Projects in North Carolina*, outline a set of factors that need to be evaluated to determine whether or not a detailed indirect and cumulative impact analysis (ICI) is required for specific projects. The following is an assessment of those factors for TIP R-2616:

Conflict with local plan:
It has already been determined previously in this report the project is not in conflict with the Union County future land use plan, the Monroe land development plan, or the Union County Thoroughfare Plan.

Explicit economic development purpose:
The purpose and need of TIP R-2616 A & B is to improve safety and increase vehicle capacity along US 601. It will not serve as an economic development tool, nor will it generate any economic development momentum in the area.

Planned to serve specific development:
The US 601 widening project will mainly serve existing residents of Union County, NC and Chesterfield County, SC, as well as through traffic from the entire Piedmont region. There is very little existing development along the roadway to be served by R-2616 A & B.

Likely to stimulate land development having complementary functions:
The following is a set of factors commonly used to determine induced growth:

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

None of these factors rank highly with respect to TIP R-2616 A & B; therefore, the likelihood of it stimulating land development is low.

Likely to influence intraregional land development location decisions:
Typically, if the conditions are favorable for development, and/or a region is currently undergoing urbanization, an improvement in the transportation infrastructure is likely to influence where development will occur. In this circumstance, conditions within the demographic area are not favorable for development (i.e. no water/sewer, lack of destinations, etc.) and it is not undergoing any type of urbanization process.

Notable feature present in impact area:
Notable features relate to the natural environment, historic and cultural properties, wildlife habitat, etc. Based on the 1994 Environmental Assessment, there are no notable features present along the project corridor.

To further justify the determination that indirect and cumulative impacts are unlikely to take place as a result of this project, an analysis of a set of quantitative factors was completed. This analysis helps to determine that, if there happens to be some level of indirect and cumulative impacts related to a project, what *magnitude* they would have. Table 10 indicates the results of this rating analysis:

Table 10. Magnitude of Land Use Change, 2000-2020

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

In terms of positive indications of growth potential, the demographic area's population grew by 2.8% annually during the 1990s, ranking it near the top in terms of the magnitude of potential for land use change. However, Union County's population as a whole grew by 4.7% annually, making other areas within the county likely to attract development as a result of transportation projects more so than the demographic area of TIP R-2616 A & B. Another positive indicator of growth potential is the pro growth public policy of Union County and the City of Monroe.

Other than those two factors, the remaining five factors rank weakly with respect to the magnitude of potential land use change. Developable land is abundant within the demographic area, and at a relatively low cost compared to that of other areas within Union County. Travel time savings should slightly improve, but should not reach the 10 minute savings level. Also, property values are not expected to substantially increase; however, many properties fronting the roadway that currently have full access to US 601 would have limited access to the roadway after TIP R-2616 A & B is complete, which may actually reduce their property values.

The conditions of the physical and political environment tend to limit the magnitude of growth potential within the demographic area as well. As mentioned before, the entire demographic area is currently without sewer service and a portion of it is located within

the WS-IV Lake Lee Water Supply Watershed. Both of these situations, along with zoning and Department of Health regulations that only permit residential development of up to one county dwelling unit per acre, limit the potential for induced growth as a result of TIP R-2616 A & B.

Forecasted Development Capacity

In order to determine the potential induced development impacts of the US 601 roadway widening project, two different land use scenarios, a no build and a build, were analyzed:

No-Build Scenario:

This scenario forecasts household growth within the demographic area between 2000 and 2010 and 2010 and 2020 without the completion of TIP R-2616 A & B (see Table 11). Because of the rural nature of the demographic area and its extremely limited existing commercial development momentum, a commercial growth forecast was not conducted.

Table 11. No Build Scenario
Demographic Area Forecasted Households

	Population		Households	
Year	Demographic Area	Union County	Demographic Area	Union County
1990	7,140	84,211	2,559	29,862
2000	9,194	123,677	3,284	44,013
2010	11,440	166,838	4,086	59,373
2020	13,831	212,811	4,939	75,733

Source: Census Bureau, Office of State Planning, HNTB

The demographic area 2000-2010 population growth was already forecasted in a previous section of this report by applying its 1990-2000 share (5.2%) of Union County population growth to the forecasted 2000-2010 Union County population growth retrieved from the Office of State Planning. Then, that forecast was converted into forecasted households using the 2000 average household size (2.8) for the demographic area. This same methodology was applied to forecast the 2010-2020 demographic area household growth. These results indicate that 1,655 households are forecasted to be added to the demographic area between 2000 and 2020.

Build Scenario:

This scenario forecasts household growth within the demographic area between 2000 and 2010 and 2010 and 2020 with the completion of TIP R-2616 A & B (see Table 12). Because of the rural nature of the demographic area and its extremely limited existing commercial development momentum, a commercial growth forecast was not conducted.

Table 12. Build Scenario
Demographic Area Forecasted Households

Year	Population		Households	
	Demographic Area	Union County	Demographic Area	Union County
1990	7,140	84,211	2,559	29,862
2000	9,194	123,677	3,284	44,013
2010	11,817	167,216	4,220	59,508
2020	14,208	213,189	5,074	75,868

Source: Census Bureau, Office of State Planning, HNTB

Using the methodology adopted by Professor Robert Cervero[1] of the University of California-Berkeley, whereby the change in average daily trips (ADT) along the new roadway is converted into induced households (see Table 13), the US 601 widening project is forecasted to add an estimated 252 households between 2000 and 2020 within the demographic area. Some of the assumptions that were made are highlighted below. The demographic area for US 601 is larger than what the typical potential growth impact area for this type of project would be, so the induced household growth may be slightly underestimated. However, this model is typically applied to new roadways on new alignment; therefore, applying it to a widening project may negate the large size of the demographic area.

Table 13. Preliminary Induced Growth, Demographic Area

ADT		
2000	2020	
11,000	22,000	
Change in ADT =		**11,000** Total Change in 2000-2020 ADT for US 601
11,000		
6.25%		Induced Growth Capture of Change in ADT
688		New Vehicle Trips Based on Induced Growth
1.1		Avg. Persons Per Vehicle
756		# of People Making New Vehicle Trips
3		Average Daily Trips on New Roadway
252		Induced Households Between 2000 and 2020
2		To estimate amount added to 2010 and 2020 in the no build scenario
126		Add to 2010 and 2020 household forecasts for no build scenario

Source: Robert Cervero, HNTB

Environmental Justice and Title VI of the Civil Rights Act of 1964

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

[1] Cervero, R. 2002 (forthcoming). Road Expansion, Urban Growth, and Induced Travel: A Path Analysis. Journal of the American Planning Association.

"directs that programs, policies, and activities not have a disproportionately high and adverse human health and environmental effect on minority and low-income populations".

The demographic area is predominantly white (82.7%), with a median household income of $47,194 in 1999, slightly lower than the Union County median household income ($50,638) but much higher than the State of North Carolina ($35,320). The proposed improvement is expected to displace 15 families and 5 businesses. Only one of the families is minority, and none of the businesses or their employees is minority. Of the 15 families, however, 11 earn incomes of $25,000 or less, well below the median household income of $47,194 within the demographic area. This situation is not atypical of homes located along a major rural highway, which usually tend to be less expensive than homes within more urban areas. Based on these findings, there could be some potential environmental justice issues related to TIP R-2616 to address.

Farmland Impacts

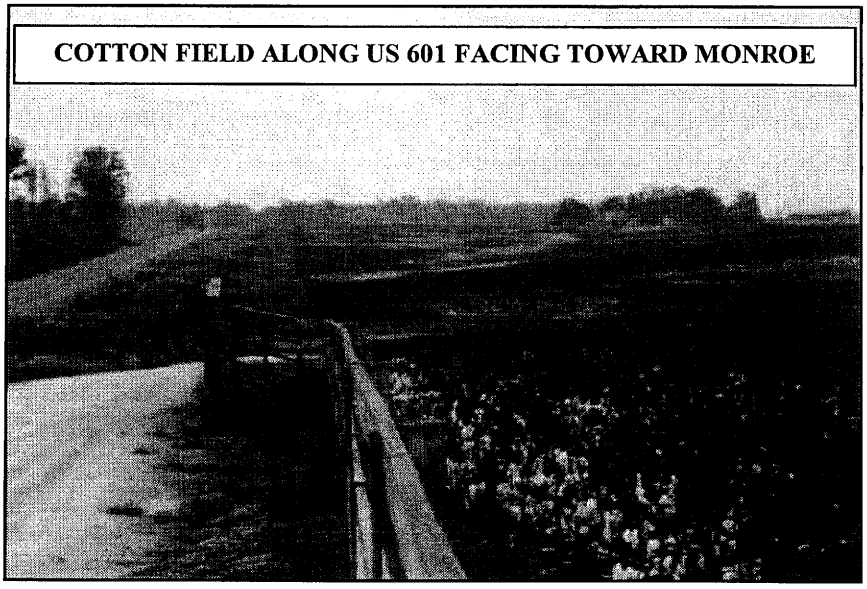
North Carolina Executive Order Number 96, *Preservation of Prime Agricultural and Forest Lands,* requires all state agencies to consider the impact of land acquisition and construction projects on prime farmland soils, as designated by the U.S. Natural Resources Conservation Service (NRCS). These soils are determined by the US Soil Conservation Service (SCS) based on criteria such as crop yield and level of input of economic resources. Based on the most recent Soil Survey of Union County issued in January 1996, the following soil types are the most prevalent within the demographic area:

- BaB (Badin channery silt loam): This type of soil is characterized by 2 to 8 percent slopes and is used mainly for crops or pasture. Some areas are wooded or used for urban development. It is moderately suited to cultivated crops, such as corn, soybeans, and small grain.
- CmB (Cid channery silt loam): This type of soil is characterized by 1 to 5 percent slopes and is used mainly for crops, pasture, or woodland. As was the case with the BaB soil type, cultivated crops typically include corn, soybeans, small grain, and milo.
- GsB (Goldston-Badin complex): This type of soil is characterized by 2 to 8 percent slopes and is used mainly for crops, hay, or pasture. Corn, soybeans, small grain, and milo are the main cultivated crops.
- TaB (Tatum gravelly silt loam): This type of soil is characterized by 2 to 8 percent slopes and is used mainly for cropland, hayland, pasture, and woodland. Cultivated crops include corn, soybeans, grain sorghum, and small grains.

About 112,600 acres, or 28% of Union County, meets the requirements for prime farmland. According to the list of soil types that are considered prime farmland within the Union County Soil Survey issued in 1996, none of the predominant soils along the US 601 corridor south of US 74 are considered prime farmland. There are, however, a few

pockets of prime farmland that could be impacted. According to the 1994 Environmental Assessment, The US SCS identified 139.2 acres of Statewide and Local Important Farmland and 46.8 acres of Prime Farmland soils will be directly impacted by TIP R-2616 A & B. This amount represents less than a tenth of a percent of the total farmland in the county.

COTTON FIELD ALONG US 601 FACING TOWARD MONROE



Based on field observations, there do not appear to be any active farming operations along this stretch of US 601. There is, however, an active poultry production facility that may be directly impacted by the road widening project in the northeast quadrant of the US 601/Hargette Road intersection. Also, there is a large cotton field along US 601 in this area. Because this is a widening of an existing, predominantly linear roadway rather than a new roadway on new alignment, no individual farm is likely to be affected, and little additional land should be converted from agricultural use due to restricted access to the roadway. As the proposed widening improvements are linear in nature, the effect upon farms in the project vicinity will be to remove small slivers of farmland along the length of the project, resulting in a relatively small amount of affected soils. In addition, without existing or planned water and sewer services along the corridor, the conversion of farmland to either residential or commercial use along intersecting roadways will be minimal.

Water Supply/Watersheds and Scenic Rivers

Union County is supplied with water by surface streams, lakes/reservoirs, and groundwater. The major sources of drinking water are Lake Twitty, Lake Lee, and Lake Monroe (see Figure 4). Lake Lee is located just west of US 601 in the northern portion of the demographic area. There are no scenic rivers within the demographic area.

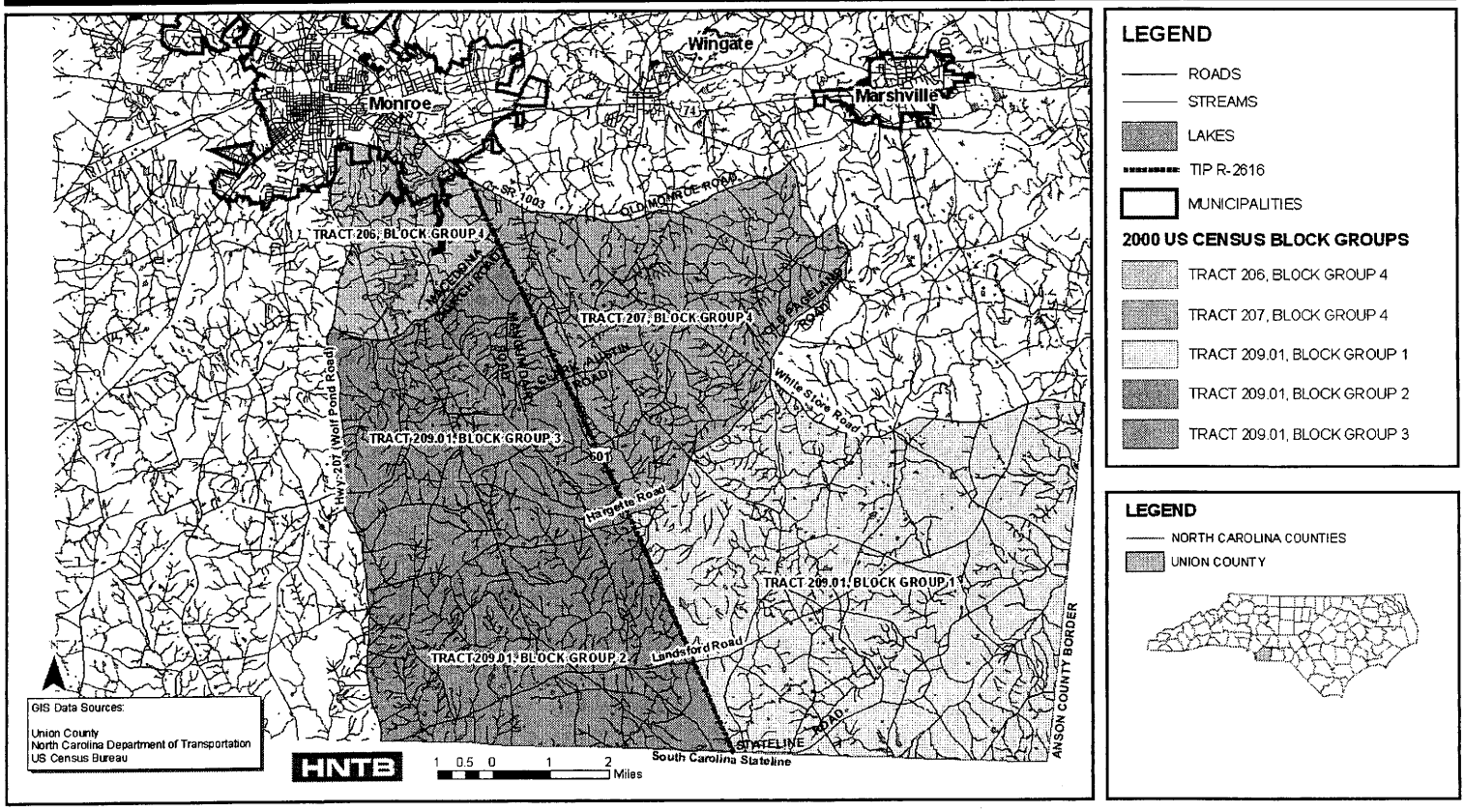
As mandated by the State of North Carolina, Union County has regulations to protect the available drinking water supply sources. These regulations include the designation of water supply watersheds. Much of the northwestern portion of the demographic area is located within the protected area of the WS-1V Lake Lee Water Supply Watershed, which limits residential development to 2 units per acre and built-upon area up to 70%

(including requirements to control for the 1" storm). The Union County Health Department further restricts watershed areas without public septic systems, such as the majority of the Lake Lee Water Supply Watershed, to one dwelling unit per acre. This regulation coincides with the density of residential development (RA-40) that is proposed within that area. The critical area of this watershed, which further limits built-upon area to 50%, is also within the demographic area.

According to the indirect and cumulative impact analysis of this report, there is a low potential for induced growth as a result of TIP R-2616 A & B. If residential development does takes place, it will be low-density in nature. If non-residential development takes place, it will also be low-density and focused at major intersections. In addition, future land use plans recommend that the demographic area remain predominantly low-density residential. Therefore, any new growth within the demographic area should have a minimal impact upon the quality of water resources.

APPENDIX

FIGURE I. DEMOGRAPHIC AREA



LEGEND

- ROADS
- STREAMS
- LAKES
- TIP R-2616
- MUNICIPALITIES

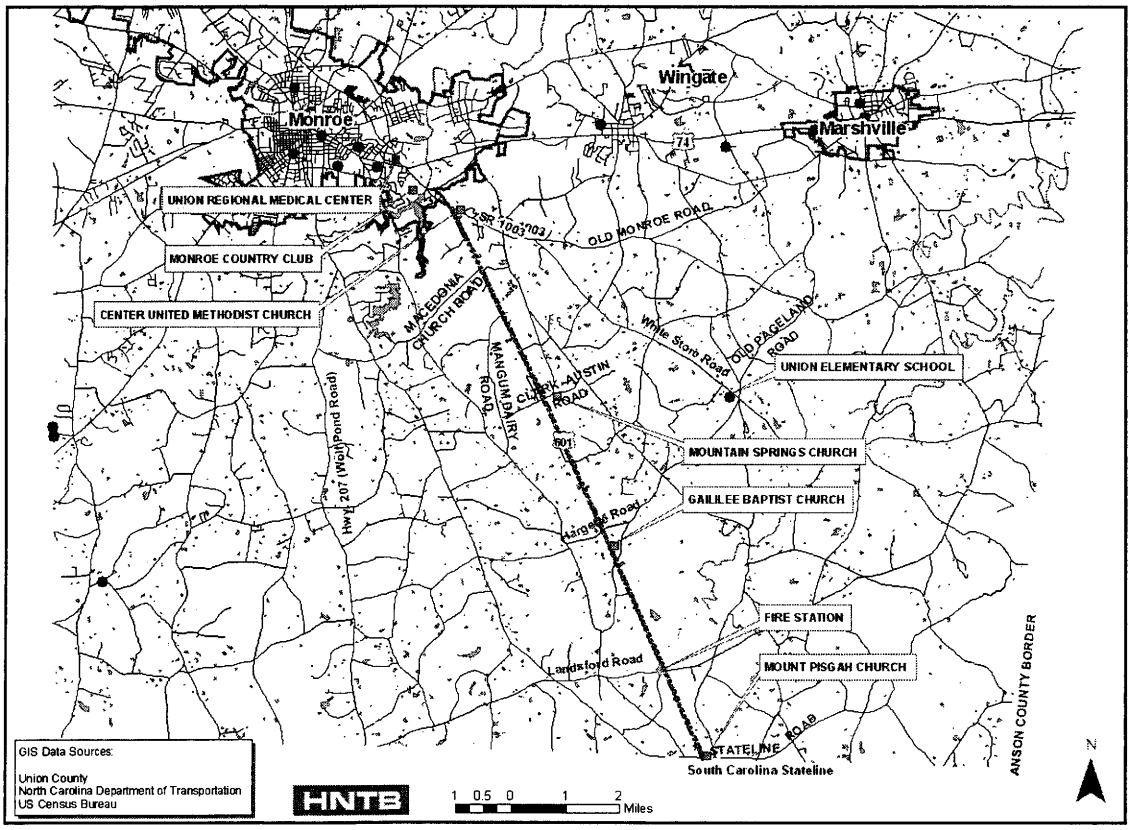
2000 US CENSUS BLOCK GROUPS

- TRACT 206, BLOCK GROUP 4
- TRACT 207, BLOCK GROUP 4
- TRACT 209.01, BLOCK GROUP 1
- TRACT 209.01, BLOCK GROUP 2
- TRACT 209.01, BLOCK GROUP 3

LEGEND

- NORTH CAROLINA COUNTIES
- UNION COUNTY

FIGURE II. PUBLIC FACILITIES



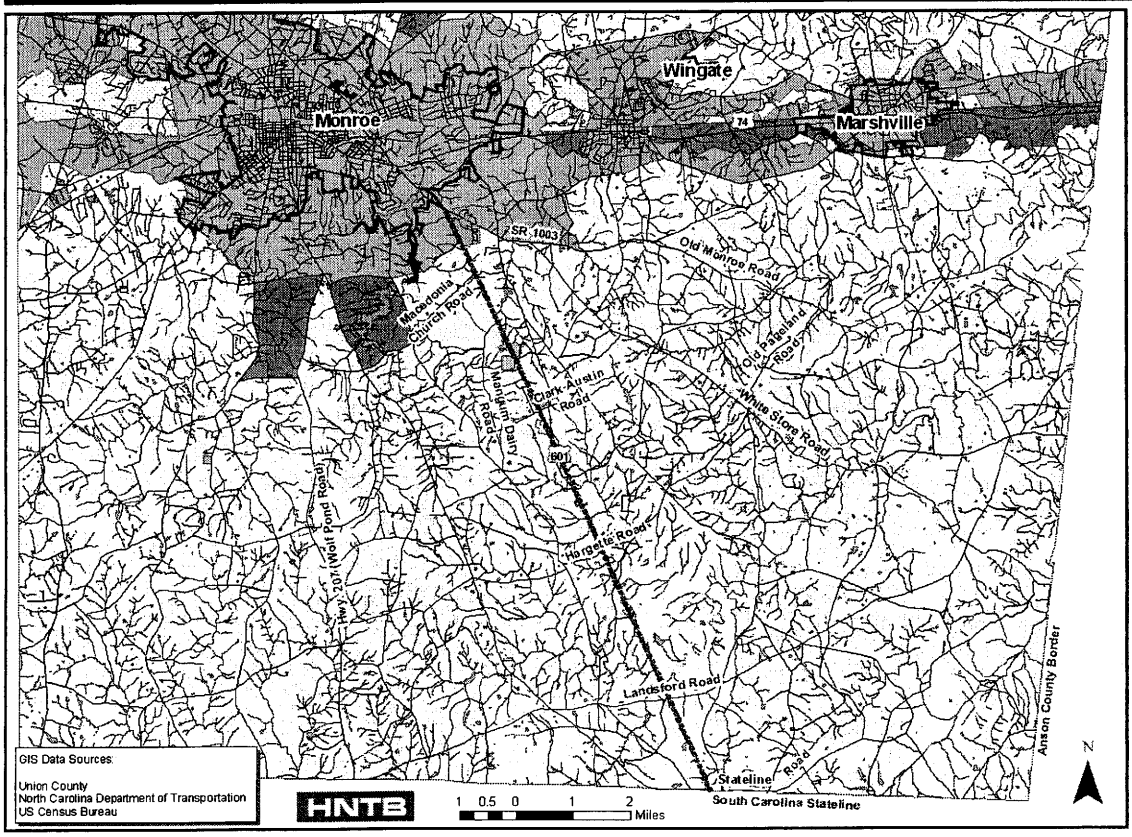
LEGEND

- HOSPITALS
- COUNTRY CLUB
- CHURCHES
- FIRE DEPARTMENTS
- SCHOOLS
- LIBRARIES
- MUNICIPALITIES
- TIP R-2616
- ROADS
- LAKES

LEGEND

- NORTH CAROLINA COUNTIES
- UNION COUNTY

FIGURE III. EXISTING ZONING



LEGEND

- MUNICIPALITIES
- TIP R-2616
- LAKES
- STREAMS
- ROADS

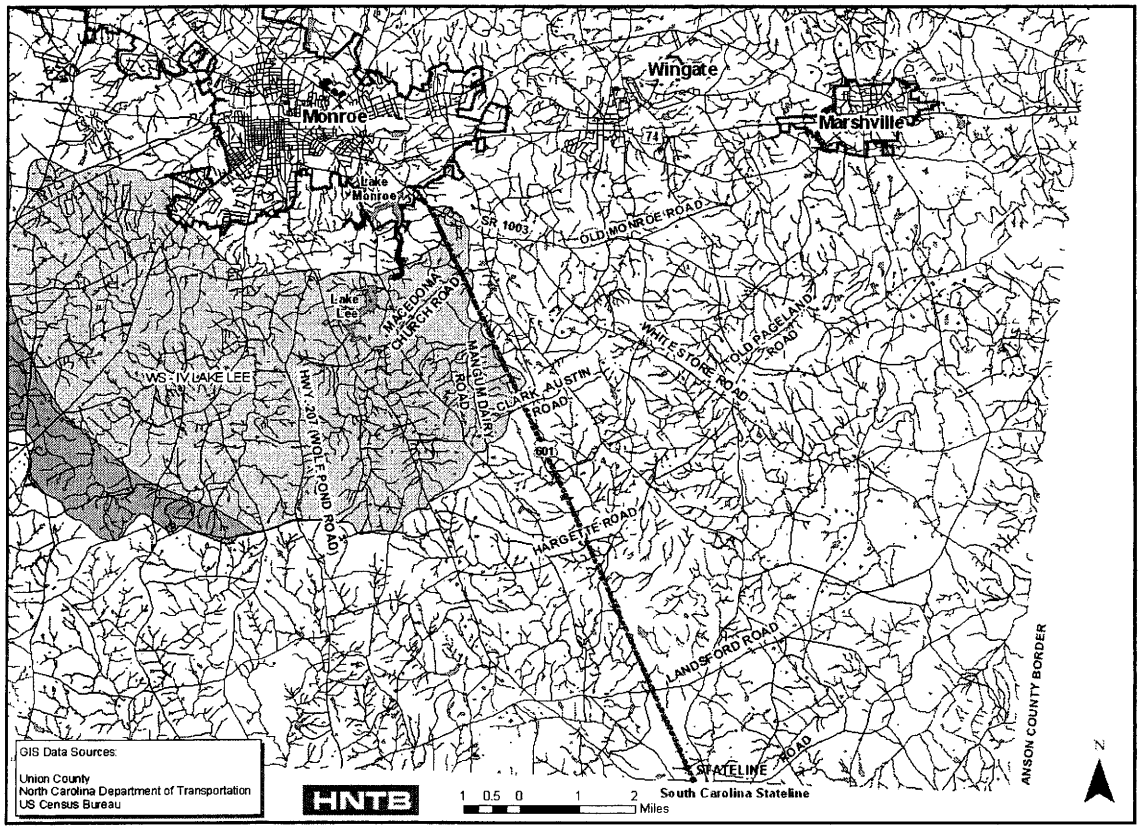
ZONING

- B-2
- B-4
- B-6
- CITY
- HC
- HI
- LI
- R-10
- R-20
- R-40
- R-6
- R-8
- RA-20
- RA-40

LEGEND

- NORTH CAROLINA COUNTIES
- UNION COUNTY

FIGURE IV. WATER SUPPLY WATERSHEDS



LEGEND

- MUNICIPALITIES
- TIP R-2616
- ROADS
- LAKES
- STREAMS

CATEGORIES

- Lake Lee Critical Area
- Lake Lee Protected 5 Mile Area
- Lake Lee Watershed

LEGEND

- NORTH CAROLINA COUNTIES
- UNION COUNTY

Public Involvement Plan
US 601 Widening, Union County
TIP R-2616 A&B

Submitted to
The North Carolina Department of Transportation
Office of Human Environment

Submitted by:
HNTB NORTH CAROLINA, PC

April 8, 2003

INTRODUCTION

The North Carolina Department of Transportation (NCDOT) is conducting an Environmental Assessment re-evaluation for a 10.8-mile length improvement project on US 601 in Union County, North Carolina, to the south and east of Monroe, NC. The project is identified on the state Transportation Improvement Program as R-2616A and R-2616B, and involves widening US 601 to a multi-lane facility.

The existing roadway traverses through a rural area where large agricultural tracts are located. US 601 carries a large amount of truck traffic and the accident rate is 60 percent higher than the statewide average. Studies to determine what improvements would reduce the rate of accidents have occurred in the past. The Environmental Assessment begun previously on proposed improvements was for the purpose of identifying what impacts those improvements would have on the social and natural environments adjacent to the roadway.

HNTB Corporation is conducting a Community Impact Assessment (CIA) for the EA re-evaluation and public involvement is an integral part of that process. The public involvement program would help elected officials, residents and business owners along US 601 to understand the improvements and provide opportunities to obtain input for inclusion in the CIA and re-evaluation.

GOALS

Establishing goals for the public involvement effort would help to ensure that activities are purposeful and provide usable input. The following goals would serve as principles that guide public involvement activities as they are carried out.

- Engage all audiences that should be informed about the study, particularly those with special concerns or possible impacts.
- Employ communications tools that most effectively deliver information to those audiences.
- Provide opportunities for input as strategies are developed – while there is still time to affect the project's direction.
- Ensure that public input is systematically integrated into the decision-making process.

ISSUES

Direct Impacts

The improvement strategies identified in this project would have direct impacts on an estimated 15 residences and five businesses. It will be critical to ensure communications take place with those directly impacted to answer their questions and to fully inform them about property acquisition and relocation procedures.

Access Management
All residences or businesses adjacent to US 601 would likely see some impact to the current access they have to US 601. This, more than any other issue, has the potential to create misunderstandings and frustration. It is suggested that, if possible, discussions with local residents, elected leaders, emergency responders and others with an interest in the project take place before completing the initial access management plan. This will provide NCDOT will valuable input from local users of the roadway about access points and demonstrate the desire of NCDOT to consider the publics' concerns while developing the plan.

Varying Communications
When improvements to this highway were discussed previously, elected officials in the area indicated support for the project in the past. Elected officials likely have received updates on the project in the course of their public service. However, the people living along US 601 and using US 601 have not had any recent information about this specific project made available to them.

Rural Audience
The area in which the improvements are planned is mostly rural and audiences are dispersed throughout the corridor. The public involvement program should provide a wide range of opportunities to provide input.

PUBLIC INVOLVEMENT ACTIVITIES

The following activities would be employed to involve interested parties and encourage their acceptance of the identified improvements:

Database / Mailing List
A database would be established and maintained that includes the names and addresses of elected officials in the area, key stakeholders and anyone known to have an interest in the project. The database would serve as a mailing list for study-related materials and notification of public meetings, workshops or forums.

Public Contact Points
A variety of methods would be employed to allow residents, business owners, elected officials or others to obtain information and provide input. This could include a telephone hot line, U.S. Post Office box or other mailing address and e-mail address.

Public Officials Communications
In order to keep elected officials within the project corridor informed and prevent any undue surprises, correspondence would be mailed to all officials informing them of the project and the CIA. Additional correspondence would be mailed as appropriate, and in particular, advance notice of any public gatherings.

Residential/Business/Community Outreach
Small-group or one-on-one meetings would be held with residential, business, civic, elected official and other groups along the corridor immediately. These meetings would be held to inform people about the project and to gather input, particularly on the access management plan. Meetings would be held with the following entities:

- Union County
- City of Monroe
- Monroe Country Club
- Mount Pisgah Baptist Church
- Galilee Baptist Church
- Mountain Springs Church
- House of God

In addition to these meetings, up to four meetings would be held with other entities identified as critical stakeholders.

Public Workshop/Meeting/Forum
A public workshop, meeting or forum would be held midway through the CIA and after small group and one-on-one meetings have been conducted. This meeting would be for the purpose of bringing information about the proposed improvements and controlled access plan. It would be important at this gathering to demonstrate how previous input was used when the access plan was developed. This gathering could be held as an informal workshop or more formal meeting or even held as an ultra-informal "open house" at one of the convenience stores along US 601 or other gathering place of local citizens. Whatever form, the gathering would be widely publicized in the Enquirer-Journal and through posters put up at businesses along US 601.

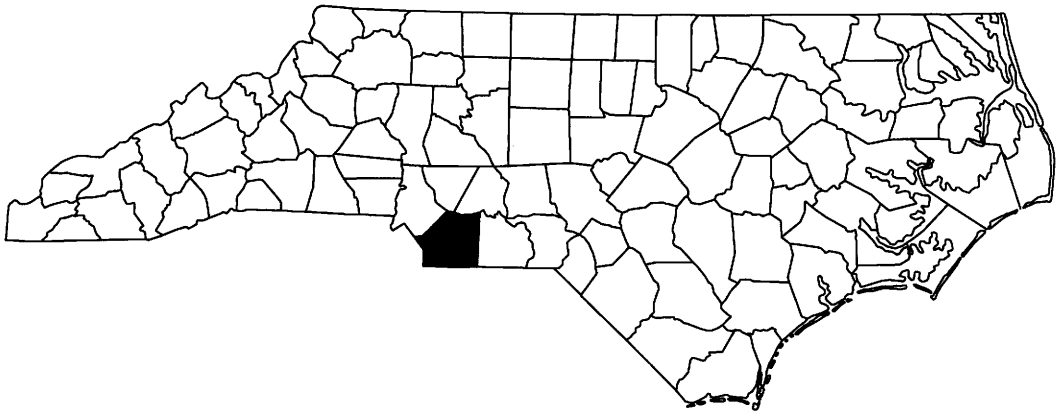
Information Fact Sheet
A fact sheet that discusses US 601, the accident rate, truck volumes and other information would be developed for distribution at small group meetings and public workshops, meetings or forums or for mailing to interested parties.

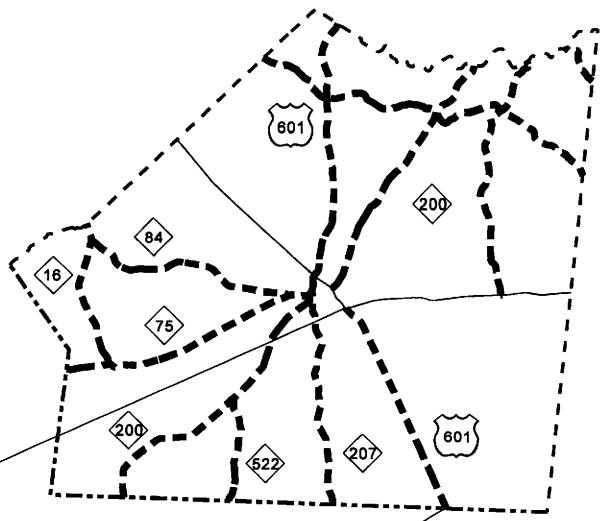
Media Activity
An information packet about the project would be sent to the Enquirer-Journal as well as media releases when appropriate. Media releases would focus on making people aware of the public contact points and public workshops, meetings or forums. Display advertising would be purchased to advertise the project hot line and contact addresses.

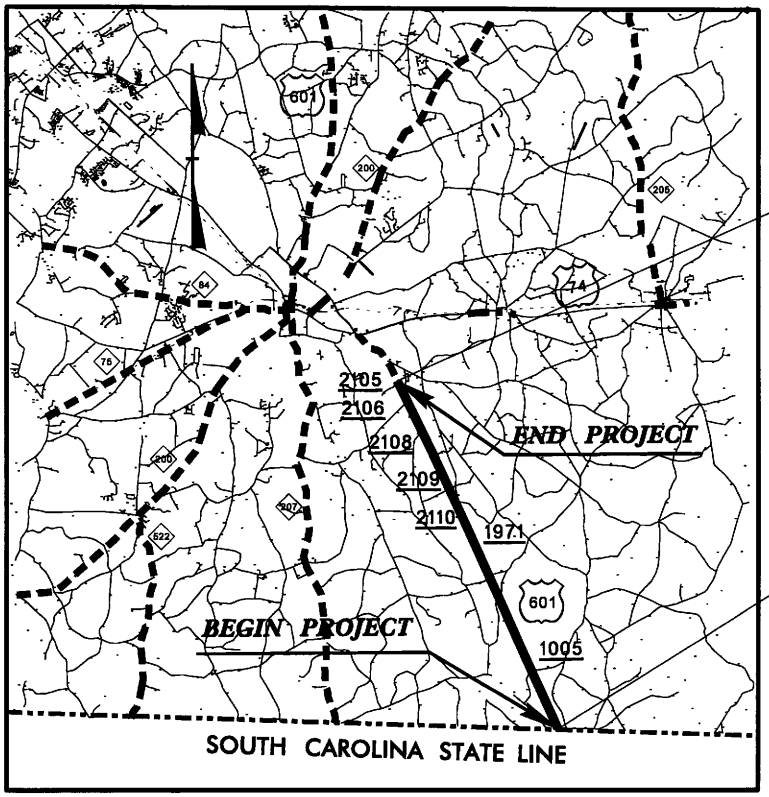
Public Involvement Documentation
All public involvement activities and results would be documented for inclusion in the CIA.

BIBLIOGRAPHY

- **US Census Bureau, www.census.gov, 1990 and 2000**
- **Office of State Planning, www.ospl.state.nc.us, 2000, 2010, 2020 County and State Population Data/Forecasts**
- **US Department of Transportation, Federal Highway Administration, Community Impact Assessment: A Quick Reference for Transportation, Washington D.C., 1996, Publication No. FHWA-PD-96-036**
- **US Department of Agriculture, "Farmland Protection Policy Act", US Department of Agriculture on-line; Available from www.info.usda.gov**
- **"Guidance for Assessing Indirect and Cumulative Impacts of Transportation Projects in North Carolina", The Louis Berger Group, Inc., Volume II Practitioner's Handbook, p. III-56–III-64, issued November 2001**
- **North Carolina Employment Security Commission, www.ncesc.com, 1990 and 2000**
- **Monroe Land Development Plan, 2000-2010, www.monroenc.org**
- **Union County Land Use Plan, 1998, www.co.union.nc.us**
- **Union County Thoroughfare Plan, 2001**
- **City of Monroe Thoroughfare Plan, 1997**
- **ECONorthwest and Portland State University: "A Guidebook for evaluating the Indirect Land use and Growth Impacts of highway Improvements, Final Report", for Oregon Department of Transportation, Salem, Oregon, and Federal Highway Administration, Washington, D.C., March 2001 (ECONorthwest)**
- **National Cooperative Highway Research Program (NCHRP) Report 456: "Guidebook for Assessing the Social and Economic Effects of Transportation Projects", Transportation Research Board – National Research Council, National Academy Press, Washington, D.C., 2001**
- **Cervero, R. and M. Hansen. 2002 (forthcoming). Induced Travel Demand and Induced Road Investment: A Simultaneous-Equation Analysis. Journal of Transport Economics and Policy**
- **Cervero, R. 2002 (forthcoming). Road Expansion, Urban Growth, and Induced Travel: A Path Analysis. Journal of American Planning Association**







N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
UNION COUNTY
PROJECT 34485.1.2 (R-2616 A&B)

US 601 FROM THE SOUTH
CAROLINA STATE LINE
TO NORTH OF
SR 2105 (MARION LEE RD.)

SHEET 1 OF 59 APRIL 21, 2005

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	L 102+00 to 106+05	2@54" RCP						0.02	0.01	223	75	
2	L 119+35	3@10'X8' RCBC						0.08	0.009	166	20	
3	L 129+70	(2) 2 SPANS@65' BRIDGE						0.01	0.15		150	
4	L 145+40	42" RCP						0.003	0.001	48	10	
5	L 180+30 RT	48" RCP						0.005	0.001	140	11	
6	L 180+30 LT	48" RCP	0.011			0.004				24		
7	L 180+30 TO 183+00	Earthen Fill						0.03	0.004	192	10	
8	L 215+70 RT	24" RCP	0.006			0.003						
9	L 221+70 LT	Drain Pond						0.83				
10	L 231+30	54" RCP						0.02	0.003	170	22	
11	L 242+35	66" RCP						0.04	0.003	161	20	
12	L 248+30 TO 251+09	48" RCP						0.04	0.003	320	22	
13	L 281+50	12'x10' RCBC						0.04	0.005	128	20	
14	L 288+00	2@8'x7' RCBC						0.04	0.007	124	20	
15	L290+00 to 294+30	2@30" RCP						0.06	0.005	466	24	
16	L 315+75	2@8'x8' RCBC						0.08	0.004	210	20	
17	L 342+00 LT	Drain Pond						0.31				
18	L 349+50 RT	Earthen Fill & Drain Pond	0.04					0.89				
19	L 349+50 LT	Drain Pond						0.47				
20	L 400+00 RT	Drain Pond						0.58				
21	L 422+00 RT	Drain Pond						0.45				
22	L 426+03 to 430+50	54" RCP						0.03	0.001	446	20	
23	L 474+07 to 476+41	24" RCP	0.02			0.005						
24	L 534+20	48" RCP						0.007	0.001	151	20	
25	L 549+60	36" RCP	0.03			0.03						
26	L 575+85	24" RCP						0.290				
TOTALS:			0.11	0.00	0.00	0.04	0.00	4.33	0.21	2969.00	464.00	

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

UNION COUNTY
WBS - 34485.121 (R-2616)

SHEET 2 5/20/2005

ATN Revised 3/31/05

PROPERTY OWNERS

PARCEL NO.	NAMES	ADDRESSES
26	ANNE M. COLLINS	
27	MARION F. COX DELANO. S. COX JOHN ROBERT COX RUTH C. COX	
28	DAVID MICHAEL BOOTH WENDY M. BOOTH	
29	ANNL P. H;OWEY	
36	JERRY E. THOMAS ELSIE L. THOMAS	
39	WILLIAM HOLT EARNHART JANET GODWIN EARNHART	
37	TRUSTEES OF GALILEE BAPTIST CHRCH	
40	MILDRED S. SUTTON	
44	PHILLIP EDWARD DEESE	
46	BURL H. GRIFFIN DOROTHY H. GRIFFIN	
47	GERALD K. HARGETT DIANE R. HARGETT	
56	ROY L. WALTERS ELAINE R. WALTERS	
55	ANNE M. BAUCOM	
58	CAROL B. INGRAM	

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
UNION COUNTY
PROJECT 34485.1.2 (R-2616 A&B)

US 601 FROM THE SOUTH
CAROLINA STATE LINE
TO NORTH OF
SR 2105 (MARION LEE RD.)

PROPERTY OWNERS

PARCEL NO.	NAMES	ADDRESSES
57	MANGUM FAMILY PARTNERSHIP, L.P.	
59	CARL W. MANGUM, JR.	
69	ROGER V. LANE JEANETTE F. LANE	
70	BUDDY HOWELL DYER	
71	B.D. PARKER LOIS L. PARKER	
72	BETTY R. KRIMMINGER	
82	WALTER E. ALBRIGHT CAROL J. ALBRIGHT	
83	HUBER DRAKE	
97	TAE HYUN CHUN IN SOOK CHUN	
115	DELORES P. PEREZ	
114	JOHNNY R. WALKER JULIE WALKER	
136	JAMES W. SELF NANCY W. SELF	
135	CELESTE A. BRYCHEK	
137	WILLIAM B. MULDROW BETTY W. MULDROW	
159	STEPHANIE M. CRIPE THOMAS JOSEPH CRIPE	

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
UNION COUNTY
PROJECT 34485.1.2 (R-2616 A&B)

US 601 FROM THE SOUTH
CAROLINA STATE LINE
TO NORTH OF
SR 2105 (MARION LEE RD.)

PROPERTY OWNERS

PARCEL NO.	NAMES	ADDRESSES
161	GARREN BLAIR DEAN PEGGY R. DEAN	
160	DENNIS M. SUTTON REBECCA M. SUTTON	
162	FRANCES C. VICK	
167	THOMAS F. RITZ BARBARA A. RITZ	
168	AADELADE C. CLAWSON	
173	FRANCES C. VICK	

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
UNION COUNTY
PROJECT 34485.1.2 (R-2616 A&B)

US 601 FROM THE SOUTH
CAROLINA STATE LINE
TO NORTH OF
SR 2105 (MARION LEE RD.)

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2616A&B	6

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

*S.U.E = SUBSURFACE UTILITY ENGINEER

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL SYMBOLS

ROADS & RELATED ITEMS

- Edge of Pavement
- Curb
- Prop. Slope Stakes Cut — C
- Prop. Slope Stakes Fill — F
- Prop. Woven Wire Fence
- Prop. Chain Link Fence
- Prop. Barbed Wire Fence
- Prop. Wheelchair Ramp — WCR
- Curb Cut for Future Wheelchair Ramp — CCFR
- Exist. Guardrail
- Prop. Guardrail
- Equality Symbol
- Pavement Removal

RIGHT OF WAY

- Baseline Control Point
- Existing Right of Way Marker
- Exist. Right of Way Line w/Marker
- Prop. Right of Way Line with Proposed R/W Marker (Iron Pin & Cap)
- Prop. Right of Way Line with Proposed (Concrete or Granite) R/W Marker
- Exist. Control of Access Line — CA
- Prop. Control of Access Line — CA
- Exist. Easement Line — E
- Prop. Temp. Construction Easement Line — E
- Prop. Temp. Drainage Easement Line — TDE
- Prop. Perm. Drainage Easement Line — PDE

HYDROLOGY

- Stream or Body of Water
- River Basin Buffer — BZ
- Flow Arrow
- Disappearing Stream
- Spring
- Swamp Marsh
- Shoreline
- Falls, Rapids
- Prop Lateral, Tail, Head Ditches — FLOW

STRUCTURES

MAJOR

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

MINOR

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

UTILITIES

- Exist. Pole
- Exist. Power Pole
- Prop. Power Pole
- Exist. Telephone Pole
- Prop. Telephone Pole
- Exist. Joint Use Pole
- Prop. Joint Use Pole
- Telephone Pedestal — T
- U/G Telephone Cable Hand Hold — HH
- Cable TV Pedestal — C
- U/G TV Cable Hand Hold — HH
- U/G Power Cable Hand Hold — HH
- Hydrant
- Satellite Dish
- Exist. Water Valve
- Sewer Clean Out
- Power Manhole
- Telephone Booth
- Cellular Telephone Tower
- Water Manhole — W
- Light Pole
- H-Frame Pole
- Power Line Tower
- Pole with Base
- Gas Valve
- Gas Meter
- Telephone Manhole — T
- Power Transformer
- Sanitary Sewer Manhole
- Storm Sewer Manhole — S
- Tank; Water, Gas, Oil
- Water Tank With Legs
- Traffic Signal Junction Box — S
- Fiber Optic Splice Box — F
- Television or Radio Tower
- Utility Power Line Connects to Traffic Signal Lines Cut Into the Pavement — TS — TS

- Recorded Water Line — W — W
- Designated Water Line (S.U.E.*) — W — W
- Sanitary Sewer — SS — SS
- Recorded Sanitary Sewer Force Main — FSS — FSS
- Designated Sanitary Sewer Force Main(S.U.E.*) — FSS — FSS
- Recorded Gas Line — G — G
- Designated Gas Line (S.U.E.*) — G — G
- Storm Sewer — S — S
- Recorded Power Line — P — P
- Designated Power Line (S.U.E.*) — P — P
- Recorded Telephone Cable — T — T
- Designated Telephone Cable (S.U.E.*) — T — T
- Recorded U/G Telephone Conduit — TC — TC
- Designated U/G Telephone Conduit (S.U.E.*) — TC — TC
- Unknown Utility (S.U.E.*) — ?UTL — ?UTL
- Recorded Television Cable — TV — TV
- Designated Television Cable (S.U.E.*) — TV — TV
- Recorded Fiber Optics Cable — FO — FO
- Designated Fiber Optics Cable (S.U.E.*) — FO — FO
- Exist. Water Meter — 0
- U/G Test Hole (S.U.E.*) — ATTUR
- Abandoned According to U/G Record — E.O.I.
- End of Information

BOUNDARIES & PROPERTIES

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Property Line Symbol — PL
- Exist. Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Property Number — 123
- Parcel Number — 6
- Fence Line — WW & ISBW
- Existing Wetland Boundaries — WLB
- High Quality Wetland Boundary — HQ WLB
- Medium Quality Wetland Boundaries — MQ WLB
- Low Quality Wetland Boundaries — LQ WLB
- Proposed Wetland Boundaries — WLB
- Existing Endangered Animal Boundaries — EAB
- Existing Endangered Plant Boundaries — EPB

BUILDINGS & OTHER CULTURE

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

TOPOGRAPHY

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

VEGETATION

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

RAILROADS

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH

revised 02/02/00

04/08/2005
P:\Roadway\Proj\R2616_RDY_typ.dgn
jonathan.reiner

SITE 1 -L- 102+40

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	7

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

MATCHLINE -L- STA. 96+00.00 SEE SHEET 9

MATCHLINE -L- STA. 110+00.00 SEE SHEET 11

MATCHLINE -Y1- STA. 4+00.00 SEE THIS SHEET

NAD 83

BEGIN CONSTRUCTION
-Y1A- POC STA. 7+50.00

-Y1- POT 6+22.73 =
-Y1A- POT Sta. 10+00.00

JURISDICTIONAL STREAM J-15

TOE PROTECTION
SEE DETAIL B

HEADWALL

CLASS 'B' RIP RAP
EST. 2.0 TONS
EST. 5.0 S.Y.F.F

CL. 'B' RIP RAP
EST. 3.0 TONS
EST. 11 S.Y.F.F.

FM
SEE DETAIL C

REMOVE

(TWO ACCESS POINTS TO BE PROVIDED
LOCATIONS TO BE DETERMINED)

SPECIAL CUT DITCH
SEE DETAIL A

CL. 'B' RIP RAP
EST. 5 TONS
EST. 14 S.Y.F.F.

-L- POT Sta. 104+89.63 =
-Y1- POT Sta. 9+27.13 =
-Y2- POT Sta. 9+27.13

(ONE ACCESS POINT TO BE PROVIDED
LOCATIONS TO BE DETERMINED)

BERM DITCH
SEE RDWY
STD. 240.01

CLASS 'B'
RIP RAP

RIP RAP ON BANKS ONLY

PIPE OUTLET
CHANNEL
SEE DETAIL AA

PLUG

END CONSTRUCTION
-Y2- POT STA. 13+50.00

SECTION A-A
EXISTING DITCH
(Not to Scale)

T = 5.0 ft
D = 1.4 ft
B = 3.0 ft
NWS = 0.2 ft

50' 0 100'

SCALE: 1" : 100'

FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

ENGLISH

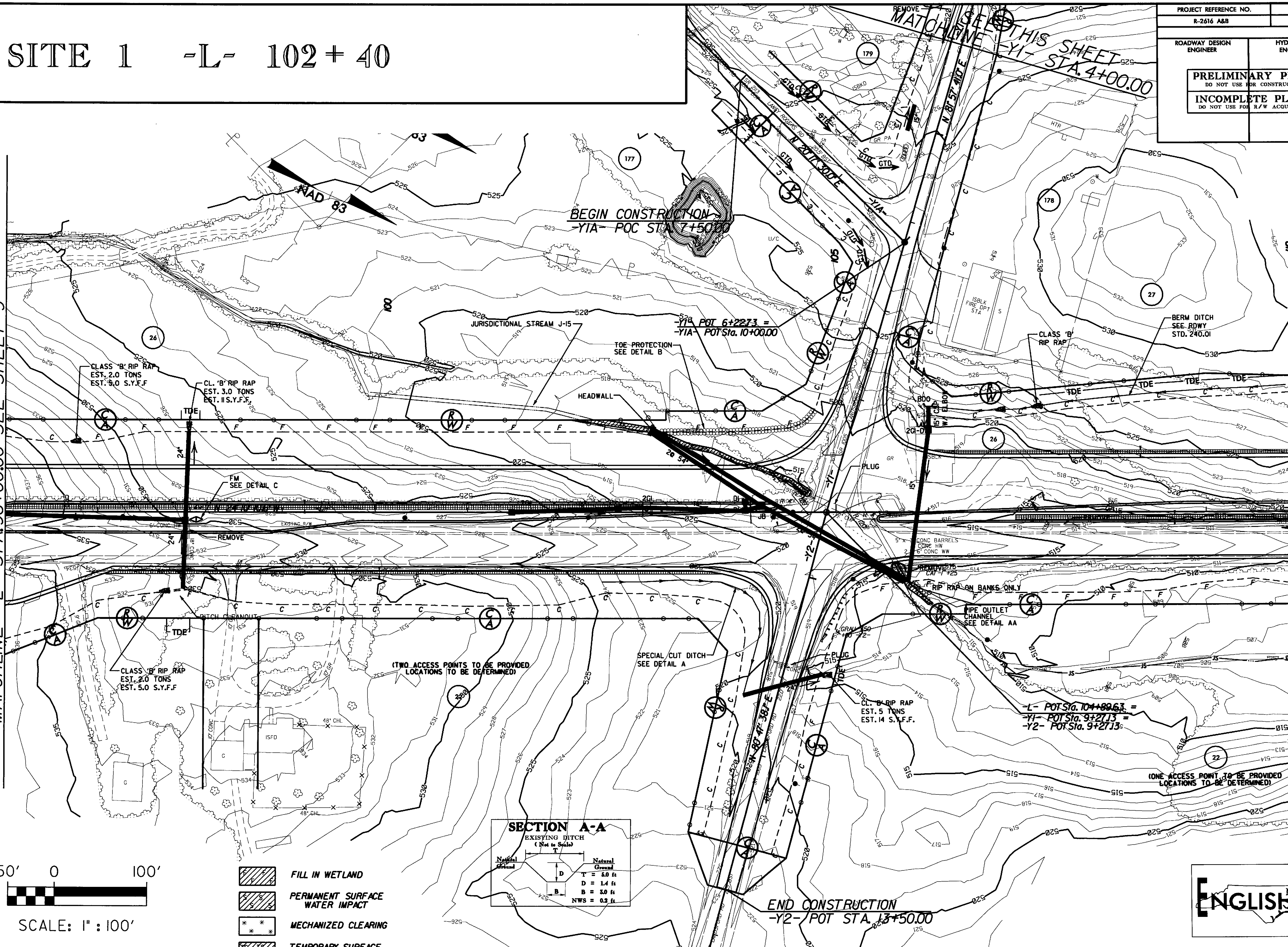
SITE 1 -L- 102+40

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	8

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



MATCHLINE -L- STA. 96+00.00 SEE SHEET 9
MATCHLINE -L- STA. 110+00.00 SEE SHEET 11
MATCHLINE -Y1- STA. 4+00.00 SEE THIS SHEET
BEGIN CONSTRUCTION -Y1A- POC STA. 7+50.00
END CONSTRUCTION -Y2- POT STA. 13+50.00
-Y1- POT 6+22.73 = -Y1A- POT Sta. 10+00.00
-L- POT Sta. 104+89.63 = -Y1- POT Sta. 9+27.13 = -Y2- POT Sta. 9+27.13
JURISDICTIONAL STREAM J-15
TOE PROTECTION SEE DETAIL B
HEADWALL
CLASS 'B' RIP RAP EST. 2.0 TONS EST. 5.0 S.Y.F.F
CL. 'B' RIP RAP EST. 3.0 TONS EST. 11 S.Y.F.F
FM SEE DETAIL C
REMOVE
DITCH CLEANOUT
CLASS 'B' RIP RAP EST. 2.0 TONS EST. 5.0 S.Y.F.F
(TWO ACCESS POINTS TO BE PROVIDED LOCATIONS TO BE DETERMINED)
SPECIAL CUT DITCH SEE DETAIL A
CL. 'B' RIP RAP EST. 5 TONS EST. 14 S.Y.F.F.
PIPE OUTLET CHANNEL SEE DETAIL AA
RIP RAP ON BANKS ONLY
CLASS 'B' RIP RAP
BERM DITCH SEE RDWY STD. 240.01
(ONE ACCESS POINT TO BE PROVIDED LOCATIONS TO BE DETERMINED)
PLUG
NAD 83

SECTION A-A
EXISTING DITCH
(Not to Scale)

T	= 5.0 ft
D	= 1.4 ft
B	= 3.0 ft
NWS	= 0.2 ft

50' 0 100'

SCALE: 1" : 100'

FILL IN WETLAND

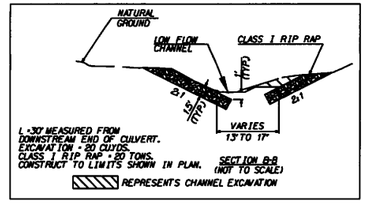
PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

ENGLISH

SITE 2 -L- STA 119+35



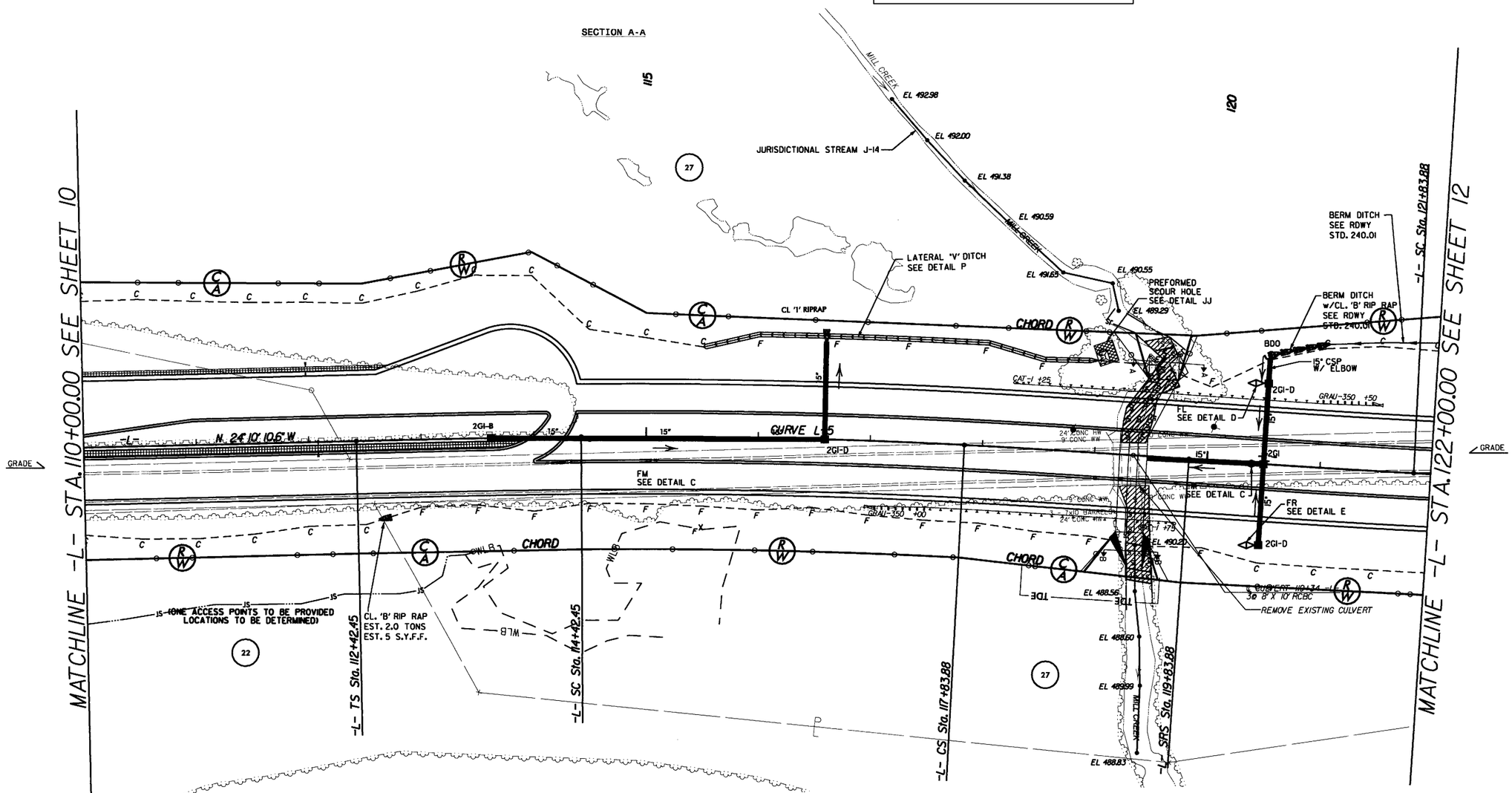
ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

SECTION A-A



50' 0 100'

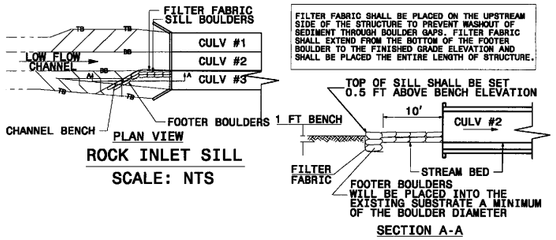
SCALE: 1" : 100'

FILL IN WETLAND

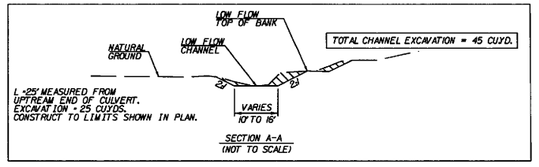
PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT



NOTES:
1. ALL STONES ARE TO BE STRUCTURE STONE.
2. GAPS BETWEEN BOULDERS SHALL BE MINIMIZED BY FITTING BOULDERS TOGETHER, PLUGGING WITH STRUCTURE STONE CLASS A AND NO.57 AND LINING WITH FILTER FABRIC.
3. DIMENSIONS AND SLOPES MAY BE ADJUSTED TO FIT BY THE ENGINEER.
4. A DOUBLE FOOTER BOULDER SHALL BE UTILIZED IN SAND BED MATERIAL.
5. FOOTER BOULDERS AND SILL BOULDERS SHALL BE NATIVE STONE OR SHOT ROCK, CUBICAL OR RECTANGULAR IN NATURE.
6. ACCEPTABLE BOULDERS SHALL HAVE THE FOLLOWING MINIMUM DIMENSIONS; 3' x 2 'x 1'.



SITE 2 -L- STA 119+35

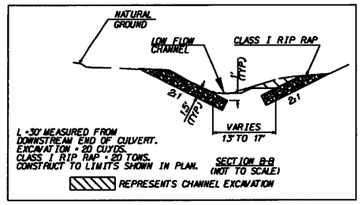
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	10

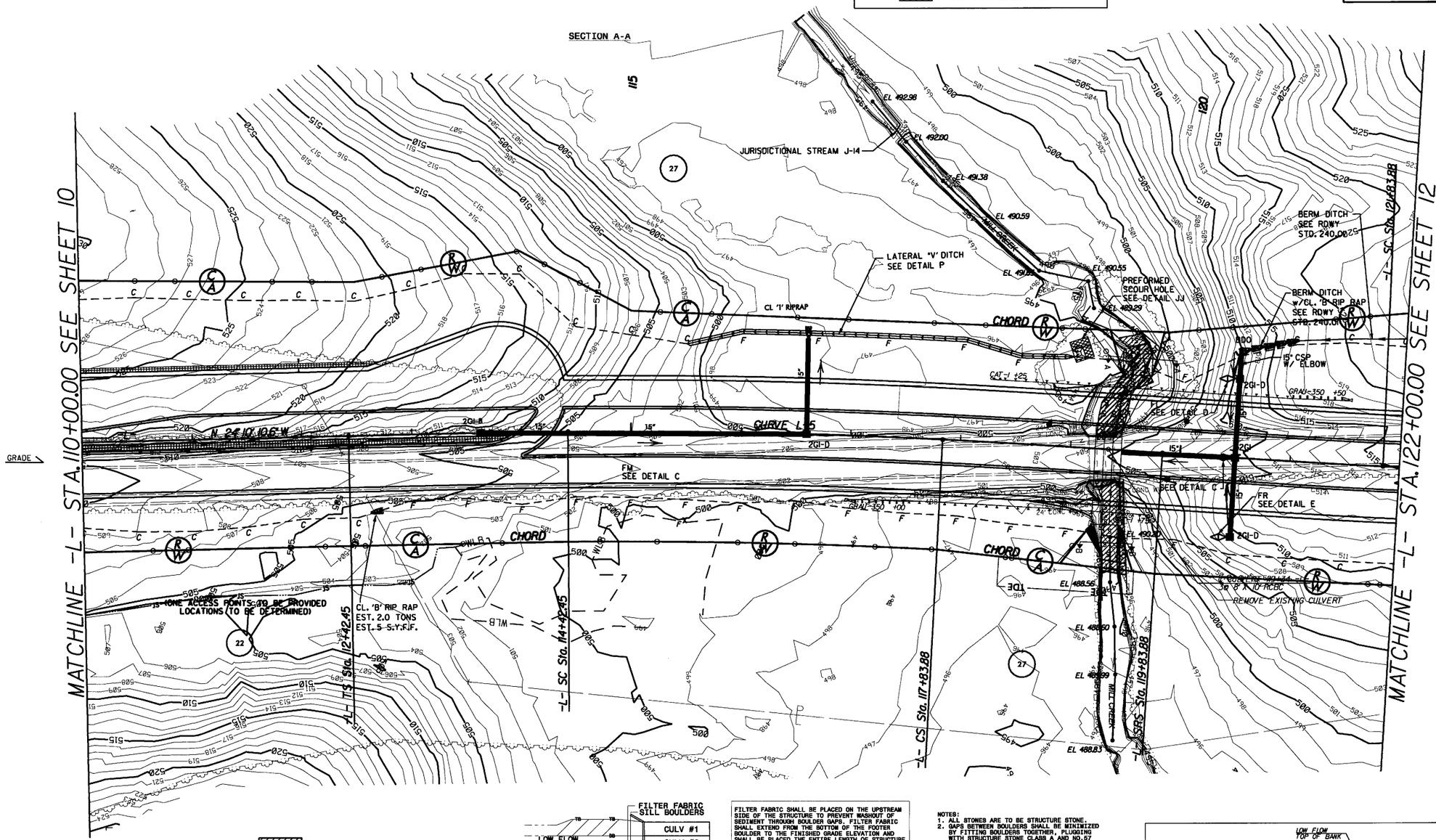
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

ENGLISH





50' 0 100'

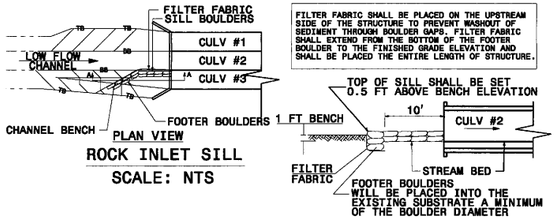
SCALE: 1" : 100'

FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

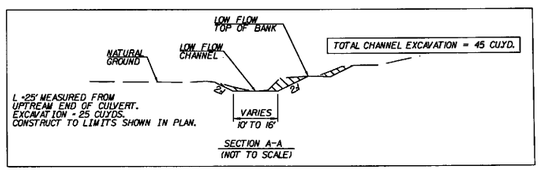
TEMPORARY SURFACE WATER IMPACT



ROCK INLET SILL
SCALE: NTS

FILTER FABRIC SHALL BE PLACED ON THE UPSTREAM SIDE OF THE STRUCTURE TO PREVENT WASHOUT OF SEDIMENT THROUGH BOULDER GAPS. FILTER FABRIC SHALL EXTEND FROM THE BOTTOM OF THE FOOTER BOULDER TO THE FINISHED GRADE ELEVATION AND SHALL BE PLACED THE ENTIRE LENGTH OF STRUCTURE.

NOTES:
1. ALL STONES ARE TO BE STRUCTURE STONE.
2. GAPS BETWEEN BOULDERS SHALL BE MINIMIZED BY FITTING BOULDERS TOGETHER, PLUGGING WITH STRUCTURE STONE CLASS A AND NO.57 AND LINING WITH FILTER FABRIC.
3. DIMENSIONS AND SLOPES MAY BE ADJUSTED TO FIT BY THE ENGINEER.
4. A DOUBLE FOOTER BOULDER SHALL BE UTILIZED IN SAND BED MATERIAL.
5. FOOTER BOULDERS AND SILL BOULDERS SHALL BE NATIVE STONE OR SHOT ROCK, CUBICAL OR RECTANGULAR IN NATURE.
6. ACCEPTABLE BOULDERS SHALL HAVE THE FOLLOWING MINIMUM DIMENSIONS; 3' x 2 'x 1'.



SITE 2 -L- STA 119+35

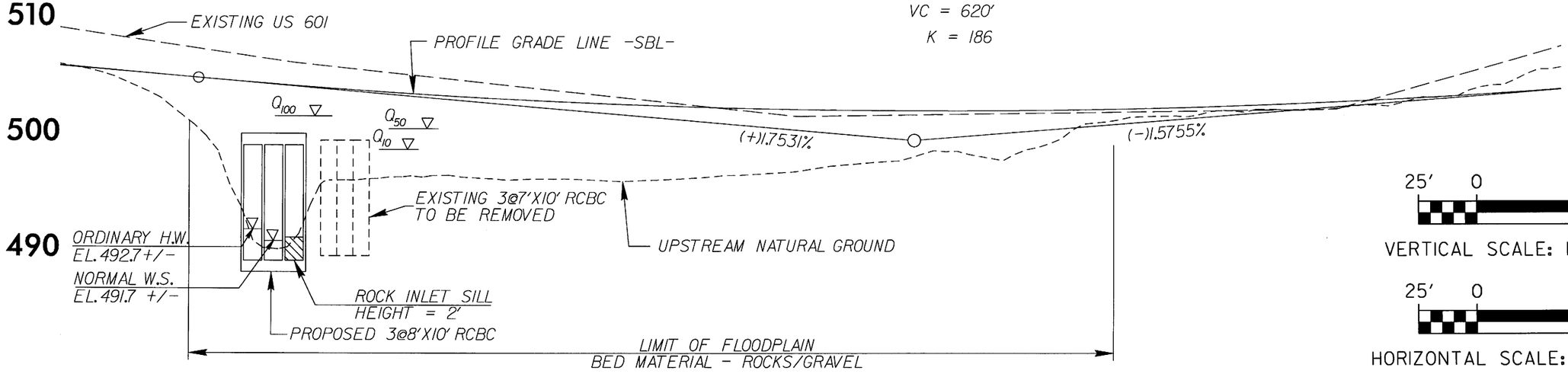
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	11

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PI = 116+80.00
EL = 500.40'
VC = 620'
K = 186



25' 0 50'

VERTICAL SCALE: 1" : 50'

25' 0 50'

HORIZONTAL SCALE: 1" : 50'

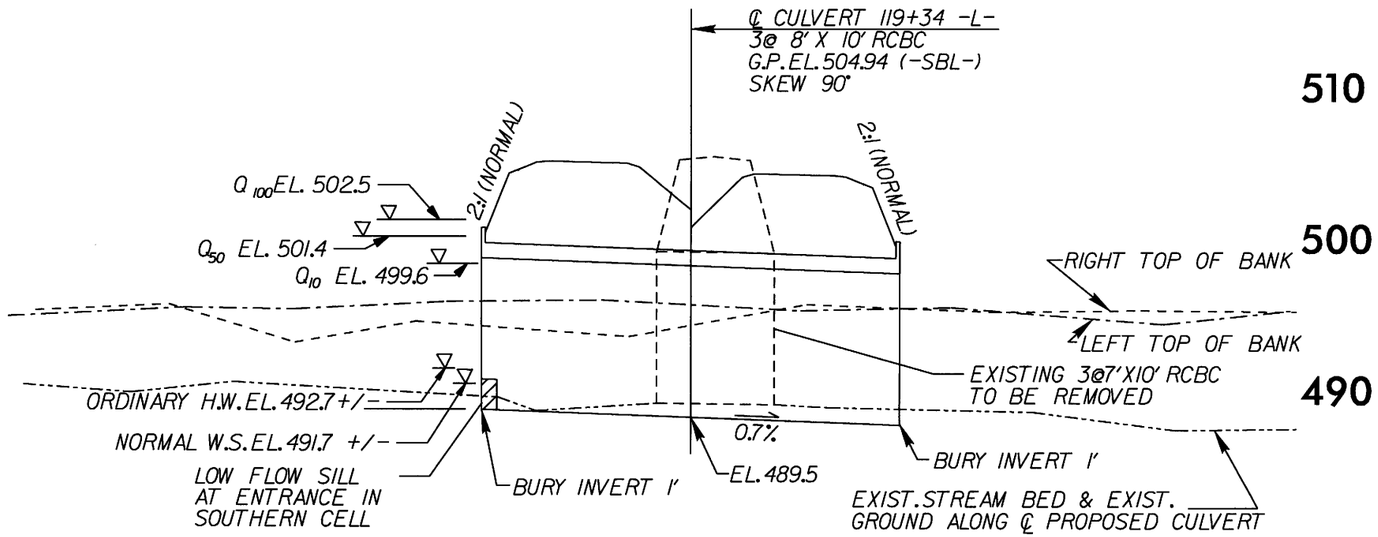
ENGLISH

SITE 2 -L- STA 119+35

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	12
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



25' 0 50'

VERTICAL SCALE: 1" : 50'

25' 0 50'

HORIZONTAL SCALE: 1" : 50'

ENGLISH

SITE 3 -L- STA. 129+70

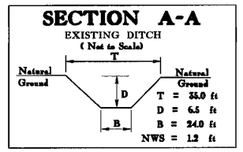
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	13

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

SECTION A-A
EXISTING DITCH
(Not to Scale)



NAD 83

MATCHLINE -L- STA. 122+00.00 SEE SHEET 11

MATCHLINE -L- STA. 136+00.00 SEE SHEET 13

-L- CS Sta. 125+25.32

-L- ST Sta. 127+25.32

125

130

135

27

28

BERM DITCH SEE RDWY STD. 240.01

REMOVE EXISTING RCBC

CL. 'B' RIP RAP EST. 10 TONS EST. 5 S.Y.F.F.

LANES CREEK

SHLDR. BERM GUTTER -L- STA. 130+45 TO 130+85 LT

(ADDITIONAL ACCESS TO BE PROVIDED)

CL. 'B' RIP RAP EST. 10 TONS EST. 5 S.Y.F.F.

FL SEE DETAIL D

129+58.37

2GI 15"

CAT -1 456

TOE PROTECTION TO EL=502.4 FT SEE DETAIL B

EXISTING R/W

-L- CURVE L-6

GRAU M350

129+50.00

MODIFIED CONCRETE FLUME

-L-

N 24° 10' 10.6" W

24"

FM SEE DETAIL C

GTD

GRAU 350

FR SEE DETAIL E

129+41.63

CLASS II RIP RAP

CL. 'B' RIPRAP EST. 5 TONS EST. 14 S.Y.F.F.

CL. 'B' RIP RAP EST. 2 TONS EST. 7 S.Y.F.F.

CL. 'B' RIP RAP EST. 5 TONS EST. 14 S.Y.F.F.

TOE PROTECTION SEE DETAIL B

LATERAL BASE DITCH SEE DETAIL MM

LATERAL BASE DITCH SEE DETAIL MM

HAZARDOUS SPILL BASIN SEE DETAIL

SHLDR. BERM GUTTER -L- STA. 130+07 TO 130+45 RT

(FOUR ACCESS POINTS TO BE PROVIDED LOCATIONS TO BE DETERMINED)

JURISDICTIONAL STREAM J-13

(ONE ACCESS POINTS TO BE PROVIDED LOCATIONS TO BE DETERMINED)

50' 0 100'

SCALE: 1" : 100'

FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	14

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

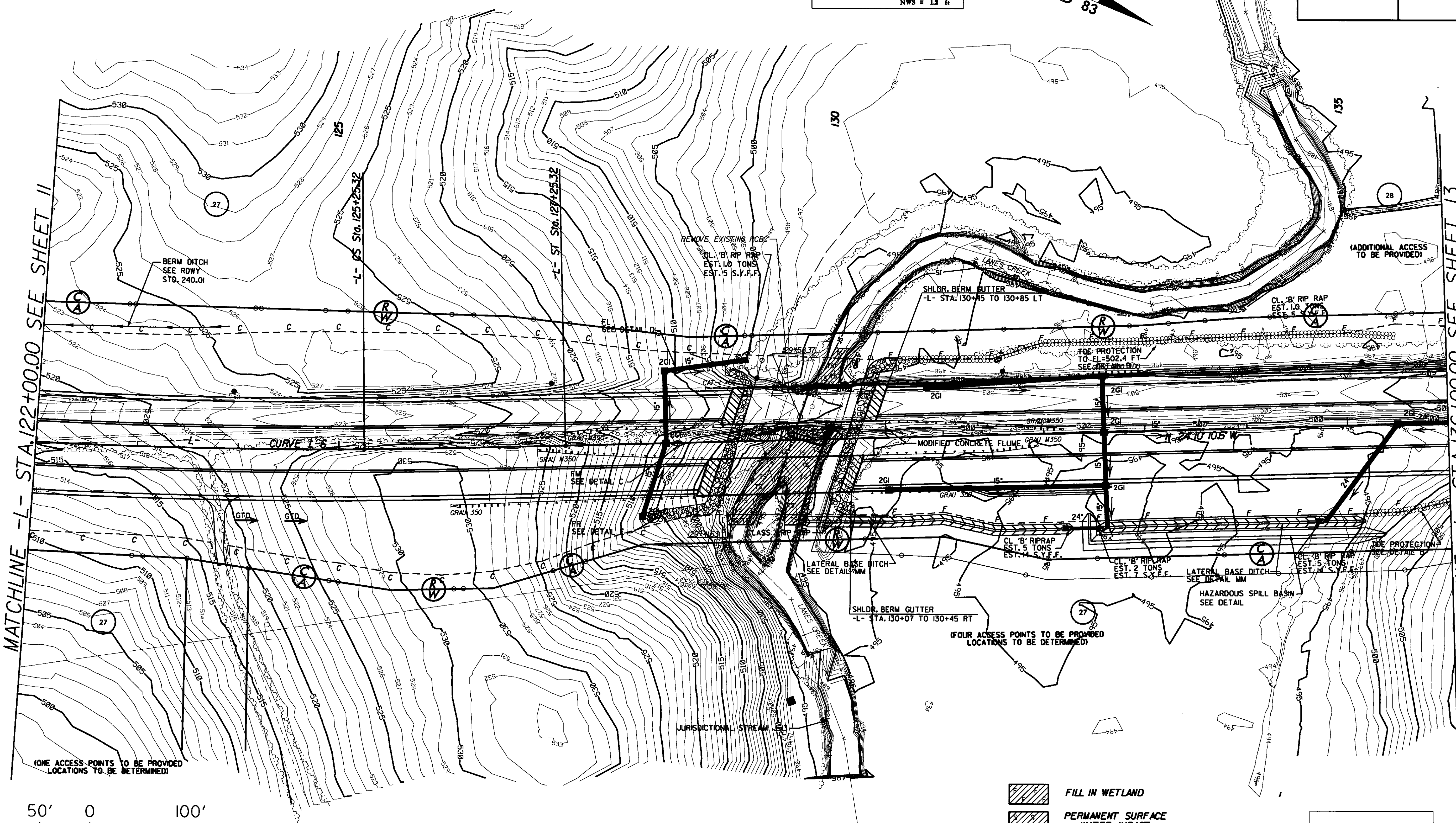
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

SITE 3 -L- STA. 129+70

SECTION A-A
EXISTING DITCH
(Not to Scale)

Natural Ground — Natural Ground
T = 35.0 ft
D = 6.5 ft
B = 24.0 ft
NWS = 1.2 ft

NAD 83



MATCHLINE -L- STA. 122+00.00 SEE SHEET 11
MATCHLINE -L- STA. 136+00.00 SEE SHEET 13
BERM DITCH SEE RDWY STD. 240.01
-L- ST Sta. 127+25.32
REMOVE EXISTING RCBC
CL. 'B' RIP RAP EST. 1.0 TONS EST. 5 S.Y.F.F.
SHLDR. BERM GUTTER -L- STA. 130+85 TO 130+85 LT
LANES CREEK
(ADDITIONAL ACCESS TO BE PROVIDED)
CL. 'B' RIP RAP EST. 1.0 TONS EST. 5 S.Y.F.F.
TOE PROTECTION TO EL=502.4 FT SEE DETAIL B
CURVE L-6
MODIFIED CONCRETE FLUME
FM SEE DETAIL C
FR SEE DETAIL C
CLASS I RIP RAP
CL. 'B' RIPRAP EST. 5 TONS EST. 14 S.Y.F.F.
CL. 'B' RIPRAP EST. 2 TONS EST. 7 S.Y.F.F.
LATERAL BASE DITCH SEE DETAIL MM
CL. 'B' RIP RAP EST. 5 TONS EST. 14 S.Y.F.F.
TOE PROTECTION SEE DETAIL B
HAZARDOUS SPILL BASIN SEE DETAIL
SHLDR. BERM GUTTER -L- STA. 130+07 TO 130+45 RT
(FOUR ACCESS POINTS TO BE PROVIDED LOCATIONS TO BE DETERMINED)
JURISDICTIONAL STREAM
(ONE ACCESS POINTS TO BE PROVIDED LOCATIONS TO BE DETERMINED)

FILL IN WETLAND
PERMANENT SURFACE WATER IMPACT
MECHANIZED CLEARING
TEMPORARY SURFACE WATER IMPACT

50' 0 100'
SCALE: 1" : 100'

ENGLISH

SITE 3 -L- STA 129+70

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	15

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

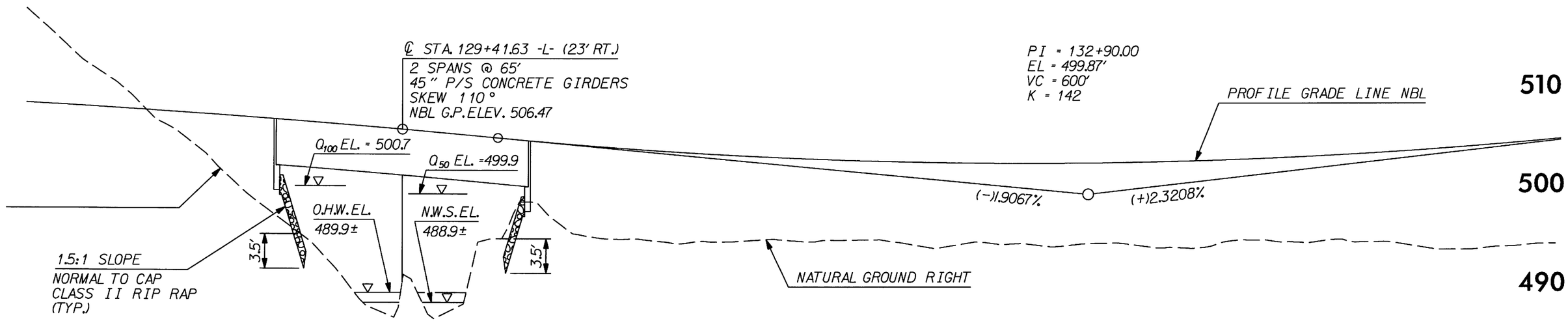
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

25′ 0 50′

VERTICAL SCALE: 1" : 50′

25′ 0 50′

HORIZONTAL SCALE: 1" : 50′



BED MATERIAL - ROCKS/GRAVEL

NO SCUPPERS ARE REQUIRED FOR NORTH BOUND LANES BRIGE.

NORTH BOUND LANES BRIDGE

ENGLISH

SITE 3 -L- STA 129+70

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

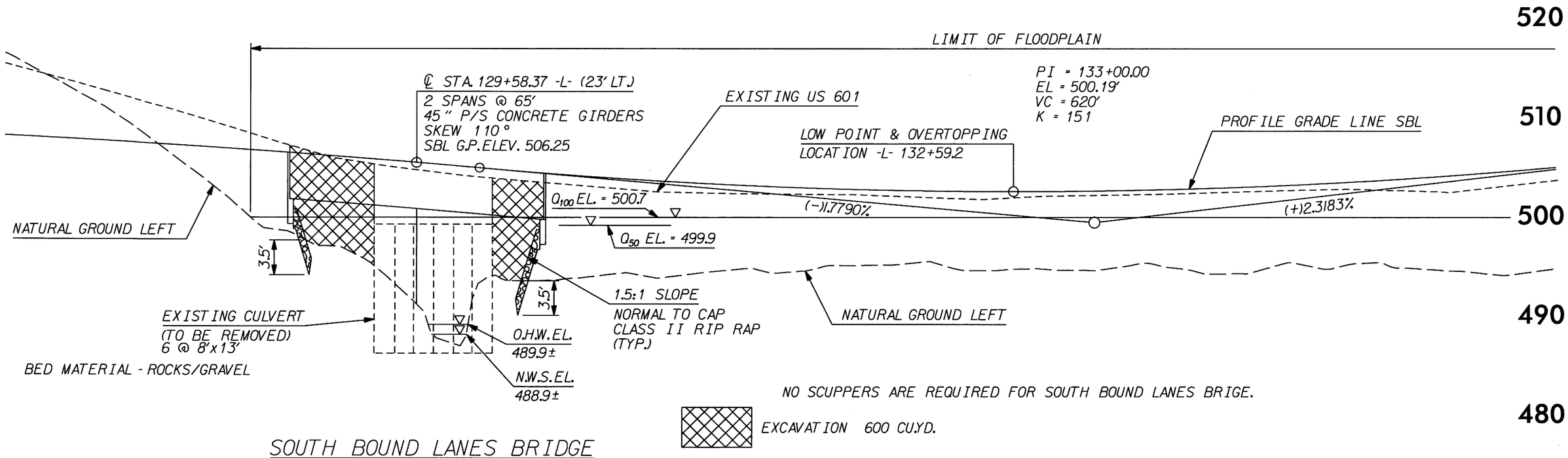
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

25′ 0 50′

VERTICAL SCALE: 1" : 50′

25′ 0 50′

HORIZONTAL SCALE: 1" : 50′



ENGLISH

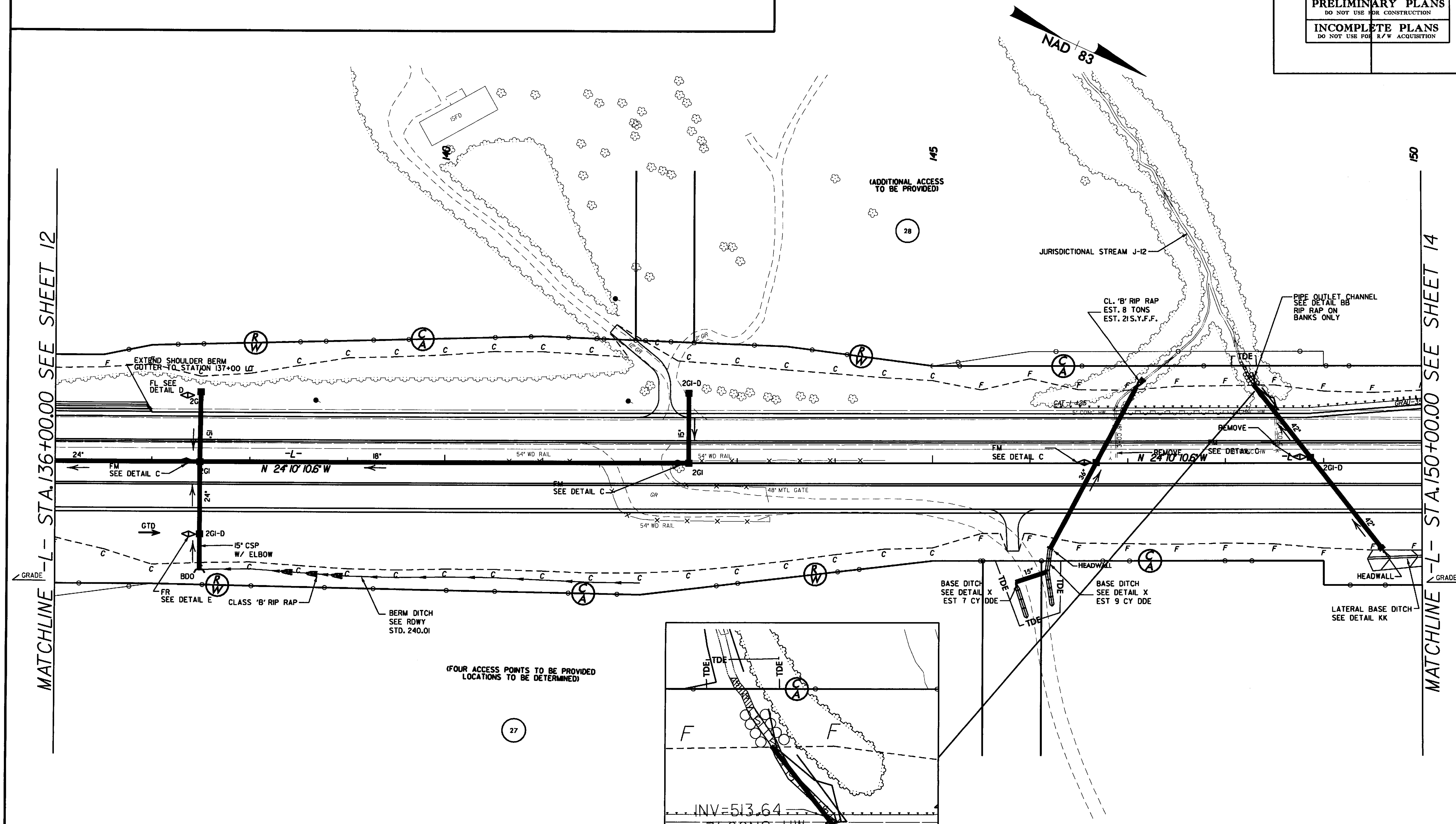
SITE 4 -L- STA. 145 + 50

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	17

ROADWAY DESIGN ENGINEER — HYDRAULICS ENGINEER

PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION



NAD 83
MATCHLINE -L- STA.136+00.00 SEE SHEET 12
MATCHLINE -L- STA.150+00.00 SEE SHEET 14
140
145
150
(ADDITIONAL ACCESS TO BE PROVIDED)
28
27
JURISDICTIONAL STREAM J-12
CL. 'B' RIP RAP EST. 8 TONS EST. 21 S.Y.F.F.
PIPE OUTLET CHANNEL SEE DETAIL BB RIP RAP ON BANKS ONLY
EXTEND SHOULDER BERM GUTTER TO STATION 137+00 LT
FL SEE DETAIL D
FM SEE DETAIL C
N 24°10'10.6" W
54" WD RAIL
48" MTL GATE
GTD
2GI-D
2GI
15" CSP W/ ELBOW
BDO
FR SEE DETAIL E
CLASS 'B' RIP RAP
BERM DITCH SEE RDWY STD. 240.01
(FOUR ACCESS POINTS TO BE PROVIDED LOCATIONS TO BE DETERMINED)
REMOVE
HEADWALL
BASE DITCH SEE DETAIL X EST 7 CY DDE
BASE DITCH SEE DETAIL X EST 9 CY DDE
LATERAL BASE DITCH SEE DETAIL KK
GRADE
TDE
INV=513.64
7' CONC HW

50' 0 100'

SCALE: 1" : 100'

SECTION A-A
EXISTING DITCH
(Not to Scale)

Natural Ground — T — Natural Ground

T = 3.0 ft
D = 0.6 ft
B = 1.0 ft
NWS = 0.0 ft

FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

SECTION B-B
EXISTING DITCH
(Not to Scale)

Natural Ground — T — Natural Ground

T = 3.0 ft
D = 1.4 ft
B = 1.0 ft
NWS = 0.2 ft

ENGLISH

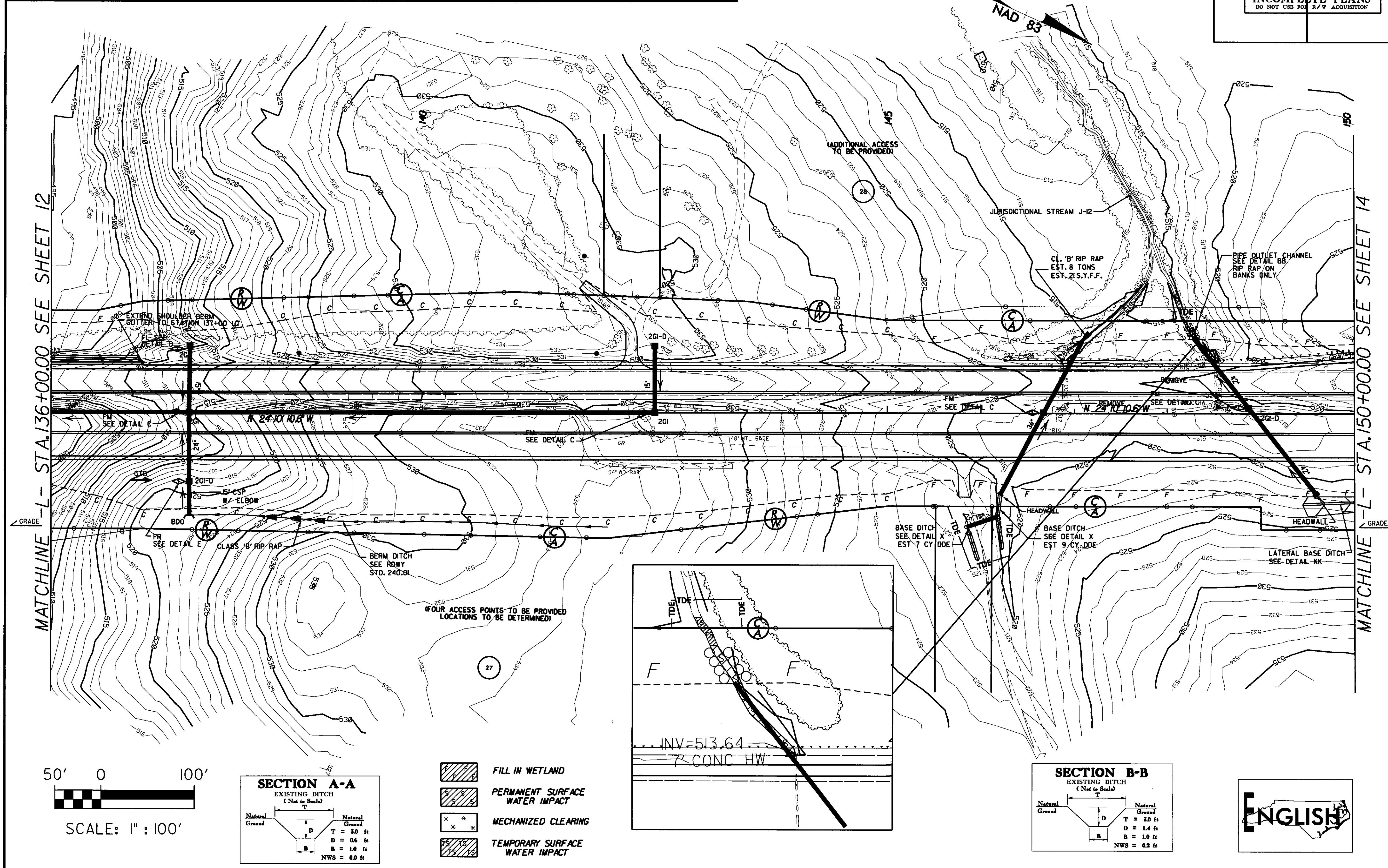
SITE 4 -L- STA. 145+50

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	18

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



NAD 83
MATCHLINE -L- STA.136+00.00 SEE SHEET 12
MATCHLINE -L- STA.150+00.00 SEE SHEET 14
EXTEND SHOULDER BERM GUTTER TO STATION 137+00 LT
(ADDITIONAL ACCESS TO BE PROVIDED)
JURISDICTIONAL STREAM J-12
CL. 'B' RIP RAP
EST. 8 TONS
EST. 21 S.Y.F.F.
PIPE OUTLET CHANNEL
SEE DETAIL BB
RIP RAP ON BANKS ONLY
N 24°10'10.6" W
FM SEE DETAIL C
2GI-D
2GI
15" CSP W/ ELBOW
BDO
FR SEE DETAIL E
CLASS 'B' RIP RAP
BERM DITCH SEE RDWY STD. 240.01
(FOUR ACCESS POINTS TO BE PROVIDED LOCATIONS TO BE DETERMINED)
BASE DITCH SEE DETAIL X EST 7 CY DDE
BASE DITCH SEE DETAIL X EST 9 CY DDE
HEADWALL
LATERAL BASE DITCH SEE DETAIL KK
REMOVE
GRADE
INV=513.64
7' CONC HW
SCALE: 1" : 100'
50' 0 100'
SECTION A-A
EXISTING DITCH
(Not to Scale)
T = 3.0 ft
D = 0.6 ft
B = 1.0 ft
NWS = 0.0 ft
FILL IN WETLAND
PERMANENT SURFACE WATER IMPACT
MECHANIZED CLEARING
TEMPORARY SURFACE WATER IMPACT
SECTION B-B
EXISTING DITCH
(Not to Scale)
T = 3.0 ft
D = 1.4 ft
B = 1.0 ft
NWS = 0.2 ft
ENGLISH

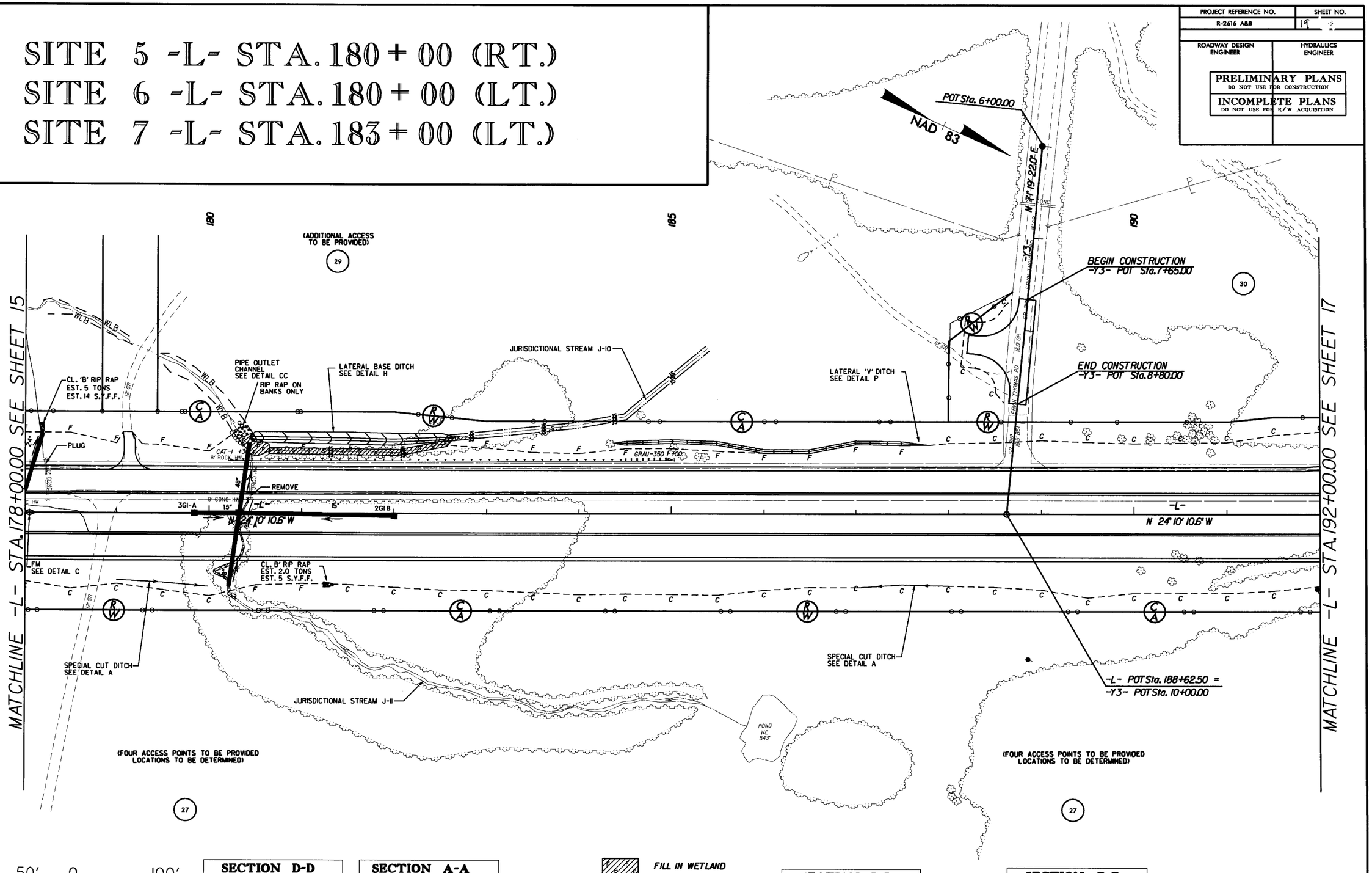
SITE 5 -L- STA. 180 + 00 (RT.)
SITE 6 -L- STA. 180 + 00 (LT.)
SITE 7 -L- STA. 183 + 00 (LT.)

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	19

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



50' 0 100'

SCALE: 1" : 100'

SECTION D-D
EXISTING DITCH
(Not to Scale)

T =	3.0 ft
D =	1.0 ft
B =	2.0 ft
NWS =	0.2 ft

SECTION A-A
EXISTING DITCH
(Not to Scale)

T =	2.7 ft
D =	0.6 ft
B =	2.9 ft
NWS =	0.0 ft

FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

SECTION B-B
EXISTING DITCH
(Not to Scale)

T =	4.0 ft
D =	1.0 ft
B =	3.0 ft
NWS =	0.2 ft

SECTION C-C
EXISTING DITCH
(Not to Scale)

T =	4.0 ft
D =	1.0 ft
B =	3.0 ft
NWS =	0.2 ft

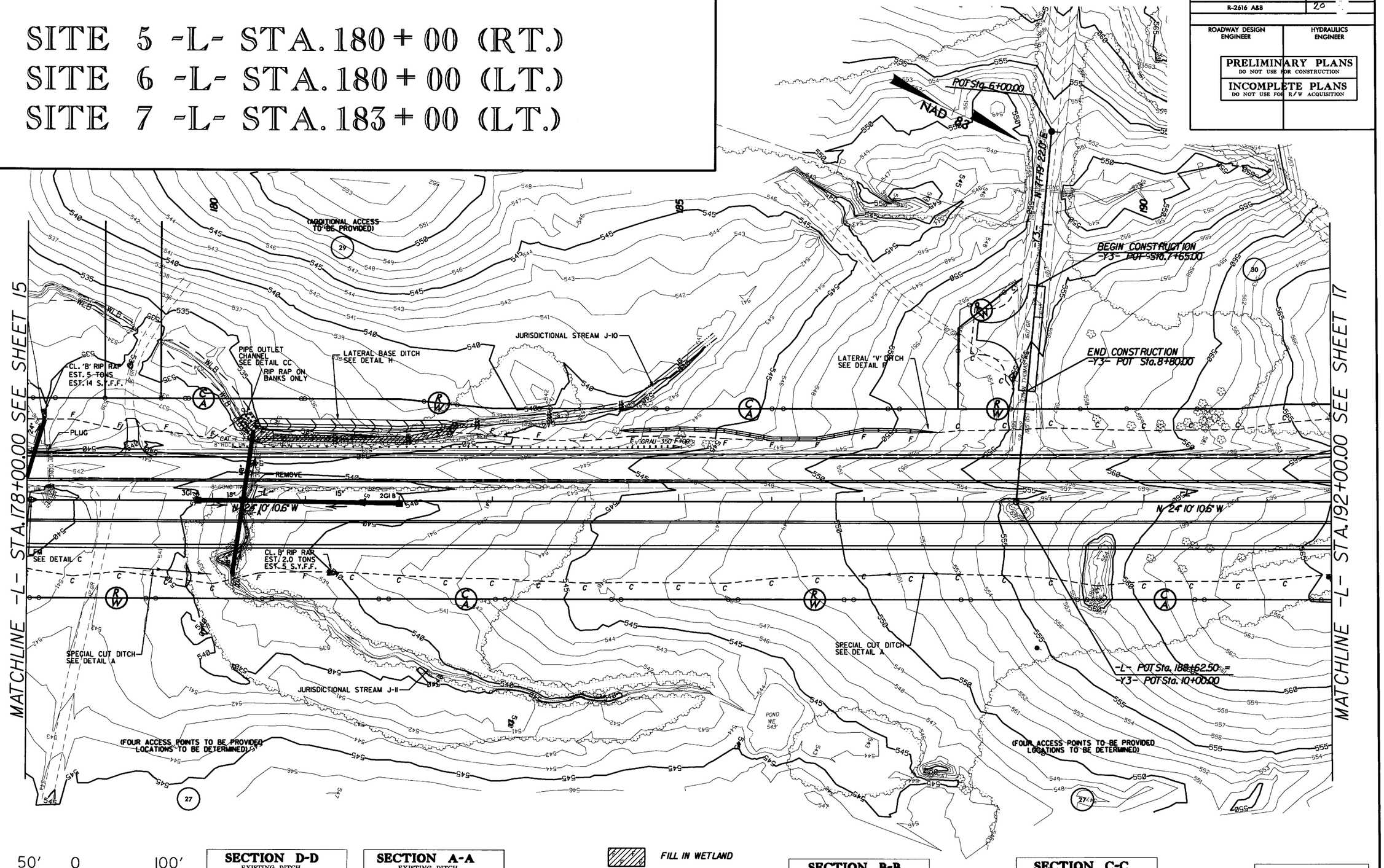
ENGLISH

SITE 5 -L- STA. 180 + 00 (RT.)
SITE 6 -L- STA. 180 + 00 (LT.)
SITE 7 -L- STA. 183 + 00 (LT.)

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	25
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



50' 0 100'

SCALE: 1" : 100'

SECTION D-D
EXISTING DITCH
(Not to Scale)

T =	3.0 ft
D =	1.0 ft
B =	2.0 ft
NWS =	0.2 ft

SECTION A-A
EXISTING DITCH
(Not to Scale)

T =	3.7 ft
D =	0.6 ft
B =	2.9 ft
NWS =	0.0 ft

FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

SECTION B-B
EXISTING DITCH
(Not to Scale)

T =	4.0 ft
D =	1.0 ft
B =	3.0 ft
NWS =	0.2 ft

SECTION C-C
EXISTING DITCH
(Not to Scale)

T =	4.0 ft
D =	1.0 ft
B =	3.0 ft
NWS =	0.2 ft

ENGLISH

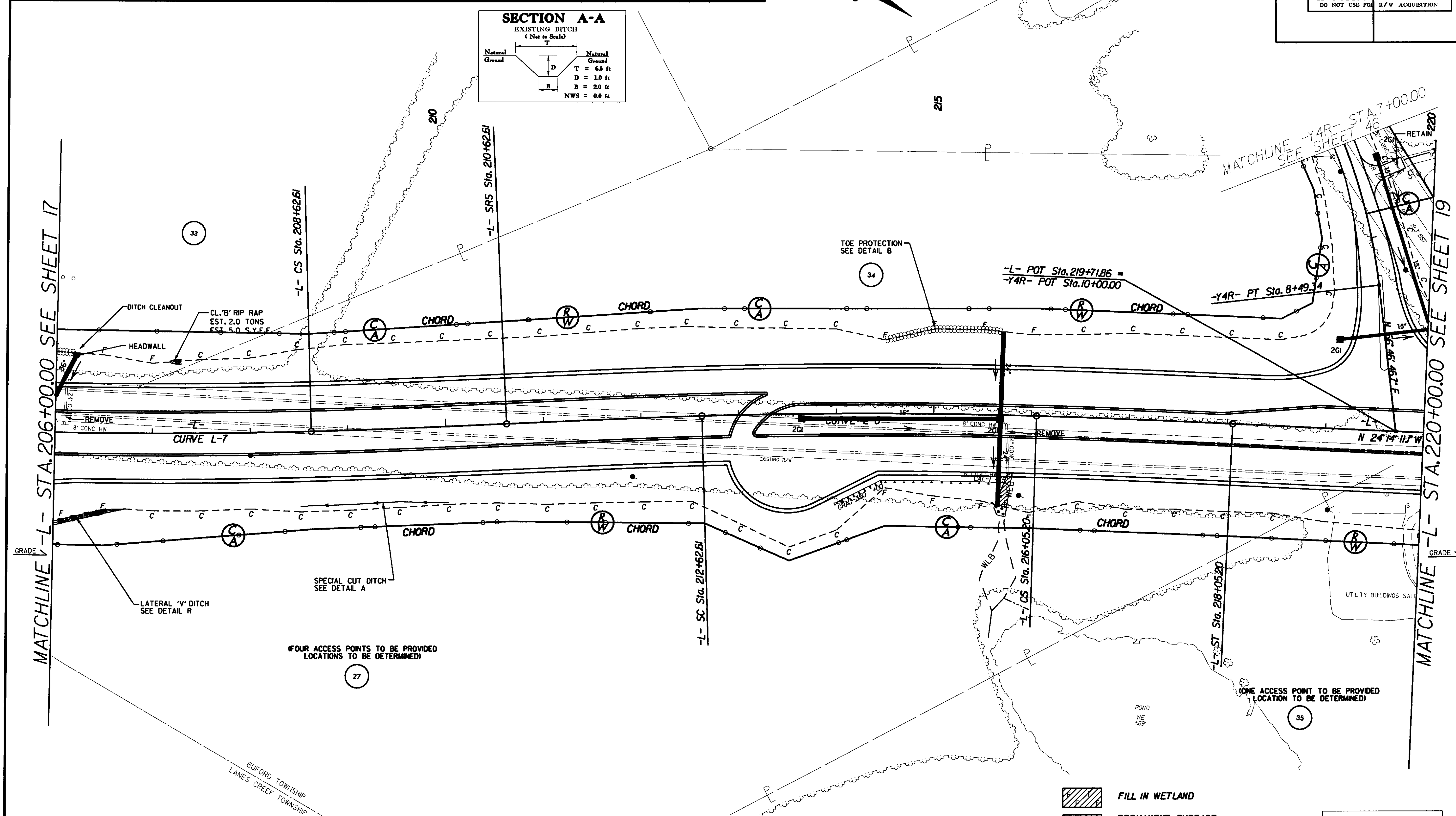
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	21

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

SITE 8 -L- STA. 215 + 70



NAD 83
SECTION A-A
EXISTING DITCH
(Not to Scale)
Natural Ground
T = 6.5 ft
D = 1.0 ft
B = 2.0 ft
NWS = 0.0 ft
MATCHLINE -L- STA. 206+00.00 SEE SHEET 17
MATCHLINE -L- STA. 220+00.00 SEE SHEET 19
MATCHLINE -Y4R- STA. 7+00.00 SEE SHEET 46
-L- CS Sta. 208+62.61
-L- SRS Sta. 210+62.61
-L- SC Sta. 212+62.61
-L- CS Sta. 216+05.20
-L- ST Sta. 218+05.20
-L- POT Sta. 219+71.86 =
-Y4R- POT Sta. 10+00.00
-Y4R- PT Sta. 8+49.34
DITCH CLEANOUT
CL.'B' RIP RAP
EST. 2.0 TONS
EST. 5.0 S.Y.F.F.
HEADWALL
REMOVE
CURVE L-7
CURVE L-8
N 24° 14' 11.3" W
TOE PROTECTION
SEE DETAIL B
SPECIAL CUT DITCH
SEE DETAIL A
LATERAL 'V' DITCH
SEE DETAIL R
(FOUR ACCESS POINTS TO BE PROVIDED
LOCATIONS TO BE DETERMINED)
(ONE ACCESS POINT TO BE PROVIDED
LOCATION TO BE DETERMINED)
CHORD
EXISTING R/W
UTILITY BUILDINGS SAL
RETAIN
2GI
WLB
POND
WE 569'
BUFORD TOWNSHIP
LANES CREEK TOWNSHIP
GRADE
33
34
27
35

50' 0 100'

SCALE: 1" : 100'

CURVE L-7		
PIs Sta 204+46.67	PI Sta 206+88.03	PIs Sta 209+29.28
Θs = 1° 00' 00.0"	Δ = 3° 29' 33.8" (LT)	Θs = 1° 00' 00.0"
Ls = 200.00'	D = 1° 00' 00.0"	Ls = 200.00'
LT = 133.34'	T = 174.69'	LT = 133.34'
ST = 66.67'	L = 349.27'	ST = 66.67'
	R = 5,729.58'	
	SE = 0.03 FT/FT	

CURVE L-8		
PIs Sta 211+95.94	PI Sta 214+33.96	PIs Sta 216+71.87
Θs = 1° 00' 00.0"	Δ = 3° 25' 33.4" (RT)	Θs = 1° 00' 00.0"
Ls = 200.00'	D = 1° 00' 00.0"	Ls = 200.00'
LT = 133.34'	T = 171.35'	LT = 133.34'
ST = 66.67'	L = 342.59'	ST = 66.67'
	R = 5,729.58'	
	SE = 0.03 FT/FT	

CURVE Y4R-1
PI Sta 7+16.97
Δ = 26° 59' 06.7" (RT)
D = 10° 00' 00"
L = 269.85'
T = 137.48'
R = 572.96'
e = 05

FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

ENGLISH

SITE 8 -L- STA. 215+70

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	22

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

NAD 83

SECTION A-A
EXISTING DITCH
(Not to Scale)

Natural Ground — T — Natural Ground; D; B

T = 6.5 ft
D = 1.0 ft
B = 2.0 ft
NWS = 0.0 ft

MATCHLINE -L- STA. 206+00.00 SEE SHEET 17

MATCHLINE -L- STA. 220+00.00 SEE SHEET 19

MATCHLINE -Y4R- STA. 7+00.00 SEE SHEET 46

-L- CS Sta. 208+62.61

-L- SRS Sta. 210+62.61

-L- SC Sta. 212+62.61

-L- CS Sta. 216+05.20

-L- ST Sta. 218+05.20

-L- POT Sta. 219+71.86 = -Y4R- POT Sta. 10+00.00

-Y4R- PT Sta. 8+49.14

TOE PROTECTION SEE DETAIL B

DITCH CLEANOUT

CL. 'B' RIP RAP EST. 2.0 TONS FS3 5.0 S.Y.E.F.

HEADWALL

REMOVE -L-

CURVE L-7

CURVE L-8

CURVE Y4R-1

N 24° 14' 11" W

SPECIAL CUT DITCH SEE DETAIL A

LATERAL 'V' DITCH SEE DETAIL R

(FOUR ACCESS POINTS TO BE PROVIDED LOCATIONS TO BE DETERMINED)

(ONE ACCESS POINT TO BE PROVIDED LOCATION TO BE DETERMINED)

RETAIN

UTILITY BUILDINGS SALES

POND WE 569

EXISTING R/W

GRADE

BUFORD TOWNSHIP
LANES CREEK TOWNSHIP

50' 0 100'

SCALE: 1" : 100'

CURVE L-7

PIs Sta 204+46.67
Θs = 1°00'00.0"
Ls = 200.00'
LT = 133.34'
ST = 66.67'

PI Sta 206+88.03
Δ = 3°29'33.8" (LT)
D = 1°00'00.0"
T = 174.69'
L = 349.27'
R = 5,729.58'
SE = 0.03 FT/FT

PIs Sta 209+29.28
Θs = 1°00'00.0"
Ls = 200.00'
LT = 133.34'
ST = 66.67'

CURVE L-8

PIs Sta 211+95.94
Θs = 1°00'00.0"
Ls = 200.00'
LT = 133.34'
ST = 66.67'

PI Sta 214+33.96
Δ = 3°25'33.4" (RT)
D = 1°00'00.0"
T = 171.35'
L = 342.59'
R = 5,729.58'
SE = 0.03 FT/FT

PIs Sta 216+71.87
Θs = 1°00'00.0"
Ls = 200.00'
LT = 133.34'
ST = 66.67'

CURVE Y4R-1

PI Sta 7+16.97
Δ = 26°59'06.7" (RT)
D = 10°00'00"
L = 269.85'
T = 137.48'
R = 572.96'
e = 05

FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

ENGLISH

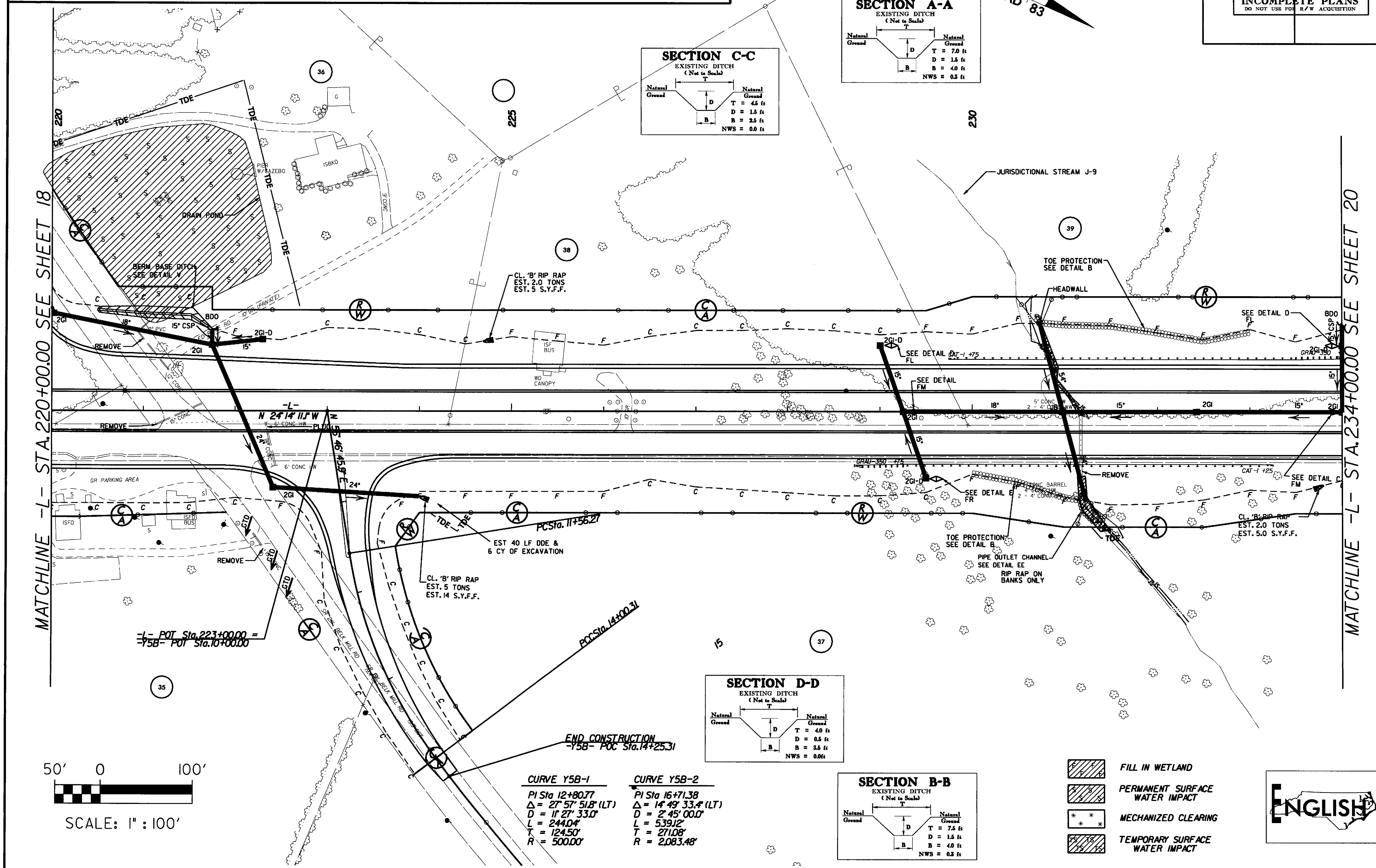
SITE 9 -L- STA. 221+00 LT.
SITE 10 -L- STA. 231+20

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	23

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION



NAD 83
MATCHLINE -L- STA. 220+00.00 SEE SHEET 18
MATCHLINE -L- STA. 234+00.00 SEE SHEET 20
SECTION A-A
EXISTING DITCH
(Not to Scale)
T = 7.0 ft
D = 1.5 ft
B = 4.0 ft
NWS = 0.5 ft
SECTION C-C
EXISTING DITCH
(Not to Scale)
T = 4.5 ft
D = 1.5 ft
B = 2.5 ft
NWS = 0.0 ft
SECTION D-D
EXISTING DITCH
(Not to Scale)
T = 4.0 ft
D = 0.5 ft
B = 3.5 ft
NWS = 0.0ft
SECTION B-B
EXISTING DITCH
(Not to Scale)
T = 7.5 ft
D = 1.5 ft
B = 4.0 ft
NWS = 0.5 ft
Natural Ground
JURISDICTIONAL STREAM J-9
TOE PROTECTION SEE DETAIL B
HEADWALL
SEE DETAIL D
BERM BASE DITCH SEE DETAIL V
DRAIN POND
CL. 'B' RIP RAP EST. 2.0 TONS EST. 5 S.Y.F.F.
CL. 'B' RIP RAP EST. 5 TONS EST. 14 S.Y.F.F.
CL. 'B' RIP RAP EST. 2.0 TONS EST. 5.0 S.Y.F.F.
EST 40 LF DDE & 6 CY OF EXCAVATION
N 24° 14' 11.5" W
N 46' 45.9" E
-L- POT Sta. 223+00.00 = -Y5B- POT Sta. 10+00.00
PCSta. 11+56.27
PCCSta. 14+00.31
END CONSTRUCTION -Y5B- POC Sta. 14+25.31
TOE PROTECTION SEE DETAIL B
PIPE OUTLET CHANNEL SEE DETAIL EE
RIP RAP ON BANKS ONLY
REMOVE
50' 0 100'
SCALE: 1" : 100'
CURVE Y5B-1
PI Sta 12+80.77
Δ = 27° 57' 51.8" (LT)
D = 11° 27' 33.0"
L = 244.04'
T = 124.50'
R = 500.00'
CURVE Y5B-2
PI Sta 16+71.38
Δ = 14° 49' 33.4" (LT)
D = 2° 45' 00.0"
L = 539.12'
T = 271.08'
R = 2,083.48'
FILL IN WETLAND
PERMANENT SURFACE WATER IMPACT
MECHANIZED CLEARING
TEMPORARY SURFACE WATER IMPACT
ENGLISH

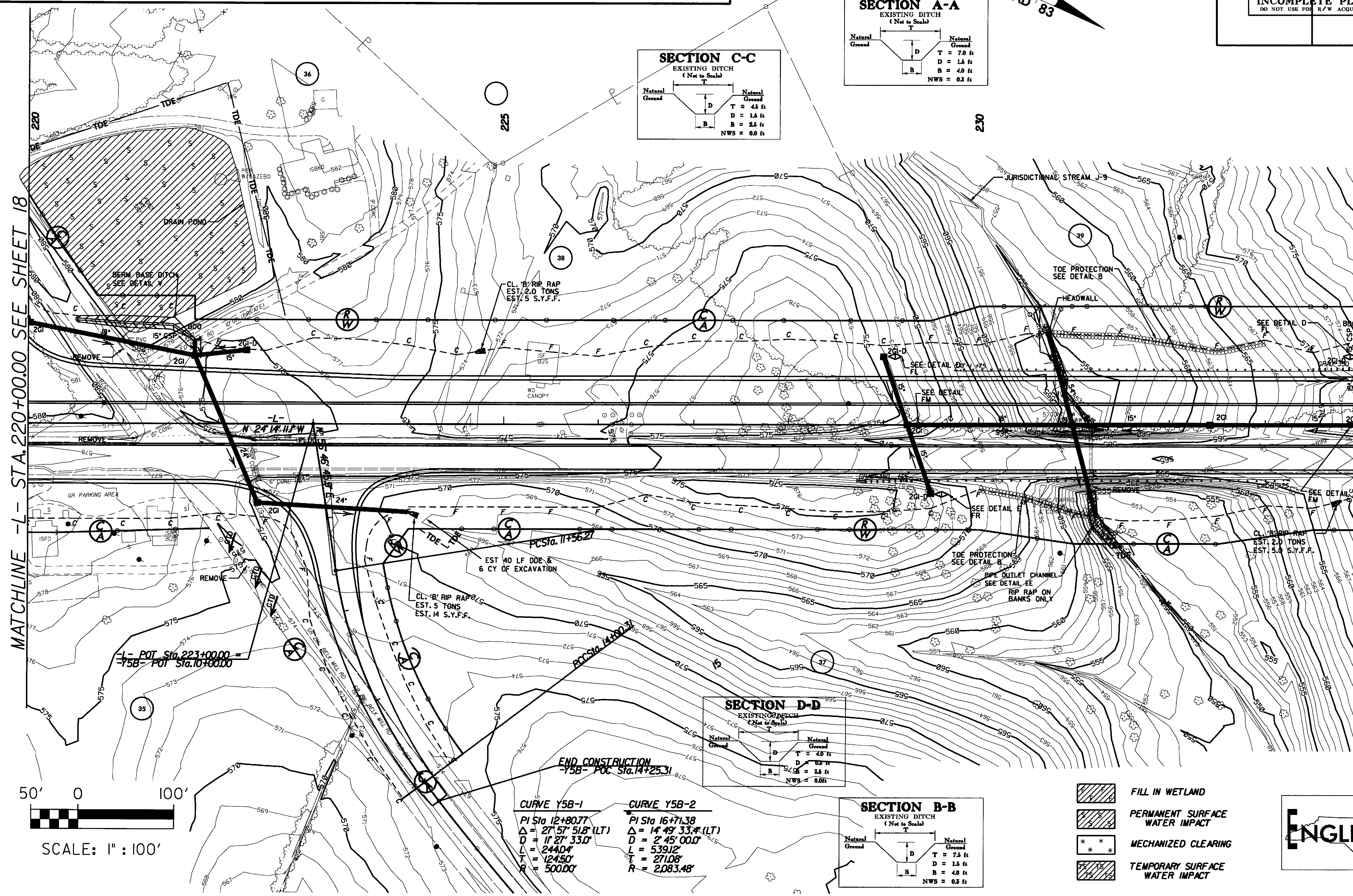
SITE 9 -L- STA. 221 + 00 LT.
SITE 10 -L- STA. 231 + 20

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	24

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION



NAD 83
SECTION A-A
EXISTING DITCH
(Not to Scale)
T = 7.0 ft
D = 1.5 ft
B = 4.0 ft
NWS = 0.5 ft
SECTION C-C
EXISTING DITCH
(Not to Scale)
T = 4.5 ft
D = 1.5 ft
B = 2.5 ft
NWS = 0.0 ft
SECTION D-D
EXISTING DITCH
(Not to Scale)
T = 4.0 ft
D = 0.5 ft
B = 3.5 ft
NWS = 0.0ft
SECTION B-B
EXISTING DITCH
(Not to Scale)
T = 7.5 ft
D = 1.5 ft
B = 4.0 ft
NWS = 0.5 ft
MATCHLINE -L- STA. 220+00.00 SEE SHEET 18
MATCHLINE -L- STA. 234+00.00 SEE SHEET 20
DRAIN POND
BERM BASE DITCH SEE DETAIL V
CL. 'B' RIP RAP EST. 2.0 TONS EST. 5 S.Y.F.F.
JURISDICTIONAL STREAM J-9
TOE PROTECTION SEE DETAIL B
HEADWALL
SEE DETAIL D
EST 40 LF DDE & 6 CY OF EXCAVATION
CL. 'B' RIP RAP EST. 5 TONS EST. 14 S.Y.F.F.
PCSta. 11+56.27
PCCSta. 14+00.31
-L- POT Sta. 223+00.00 = -Y5B- POT Sta. 10+00.00
END CONSTRUCTION -Y5B- POC Sta. 14+25.31
TOE PROTECTION SEE DETAIL B
PIPE OUTLET CHANNEL SEE DETAIL EE
RIP RAP ON BANKS ONLY
CL. 'B' RIP RAP EST. 2.0 TONS EST. 5.0 S.Y.F.F.
N 24°14'11" W

50' 0 100'

SCALE: 1" : 100'

CURVE Y5B-1
PI Sta 12+80.77
Δ = 27° 57' 51.8" (LT)
D = 11° 27' 33.0"
L = 244.04'
T = 124.50'
R = 500.00'

CURVE Y5B-2
PI Sta 16+71.38
Δ = 14° 49' 33.4" (LT)
D = 2° 45' 00.0"
L = 539.12'
T = 271.08'
R = 2,083.48'

- FILL IN WETLAND
- PERMANENT SURFACE WATER IMPACT
- MECHANIZED CLEARING
- TEMPORARY SURFACE WATER IMPACT

ENGLISH

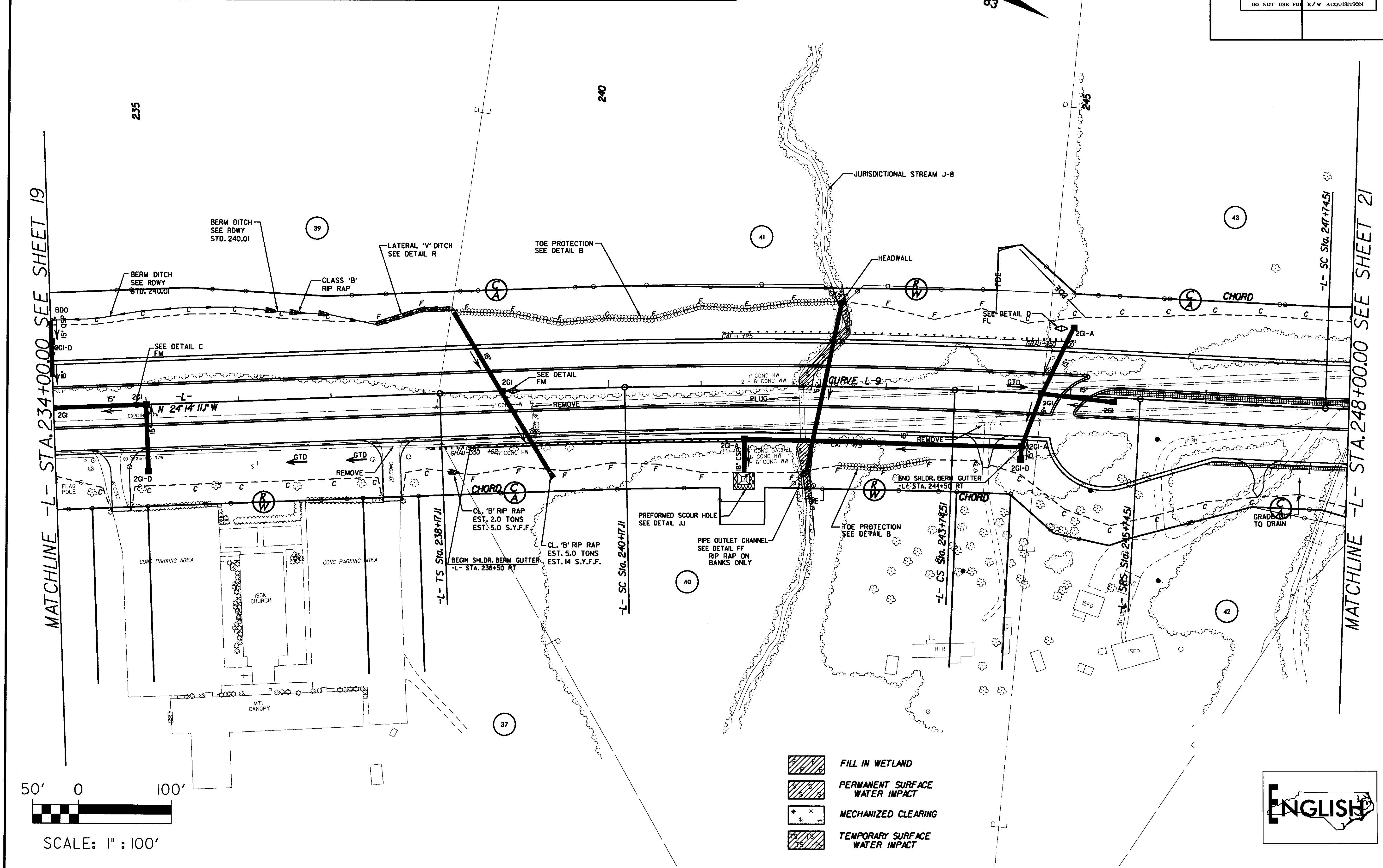
SITE 11 -L- STA. 242 + 35

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	25

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



NAD 83
MATCHLINE -L- STA. 234+00.00 SEE SHEET 19
MATCHLINE -L- STA. 248+00.00 SEE SHEET 21
JURISDICTIONAL STREAM J-8
BERM DITCH SEE RDWY STD. 240.01
LATERAL 'V' DITCH SEE DETAIL R
TOE PROTECTION SEE DETAIL B
HEADWALL
CLASS 'B' RIP RAP
SEE DETAIL C FM
SEE DETAIL FM
SEE DETAIL D FL
CURVE L-9
CHORD
REMOVE
PLUG
GTD
N 24°14'11.5" W
CL. 'B' RIP RAP EST. 2.0 TONS EST. 5.0 S.Y.F.F.
CL. 'B' RIP RAP EST. 5.0 TONS EST. 14 S.Y.F.F.
BEGIN SHLDR. BERM GUTTER -L- STA. 238+50 RT
END SHLDR. BERM GUTTER -L- STA. 244+50 RT
PREFORMED SCOUR HOLE SEE DETAIL JJ
PIPE OUTLET CHANNEL SEE DETAIL FF RIP RAP ON BANKS ONLY
TOE PROTECTION SEE DETAIL B
GRADE DITCH TO DRAIN
-L- TS Sta. 238+17.11
-L- SC Sta. 240+17.11
-L- CS Sta. 243+74.51
-L- ST Sta. 245+74.51
-L- SC Sta. 247+74.51
CONC PARKING AREA
ISBK CHURCH
MTL CANOPY
FLAG POLE
ISFD
HTR
FILL IN WETLAND
PERMANENT SURFACE WATER IMPACT
MECHANIZED CLEARING
TEMPORARY SURFACE WATER IMPACT
50' 0 100'
SCALE: 1" : 100'
ENGLISH

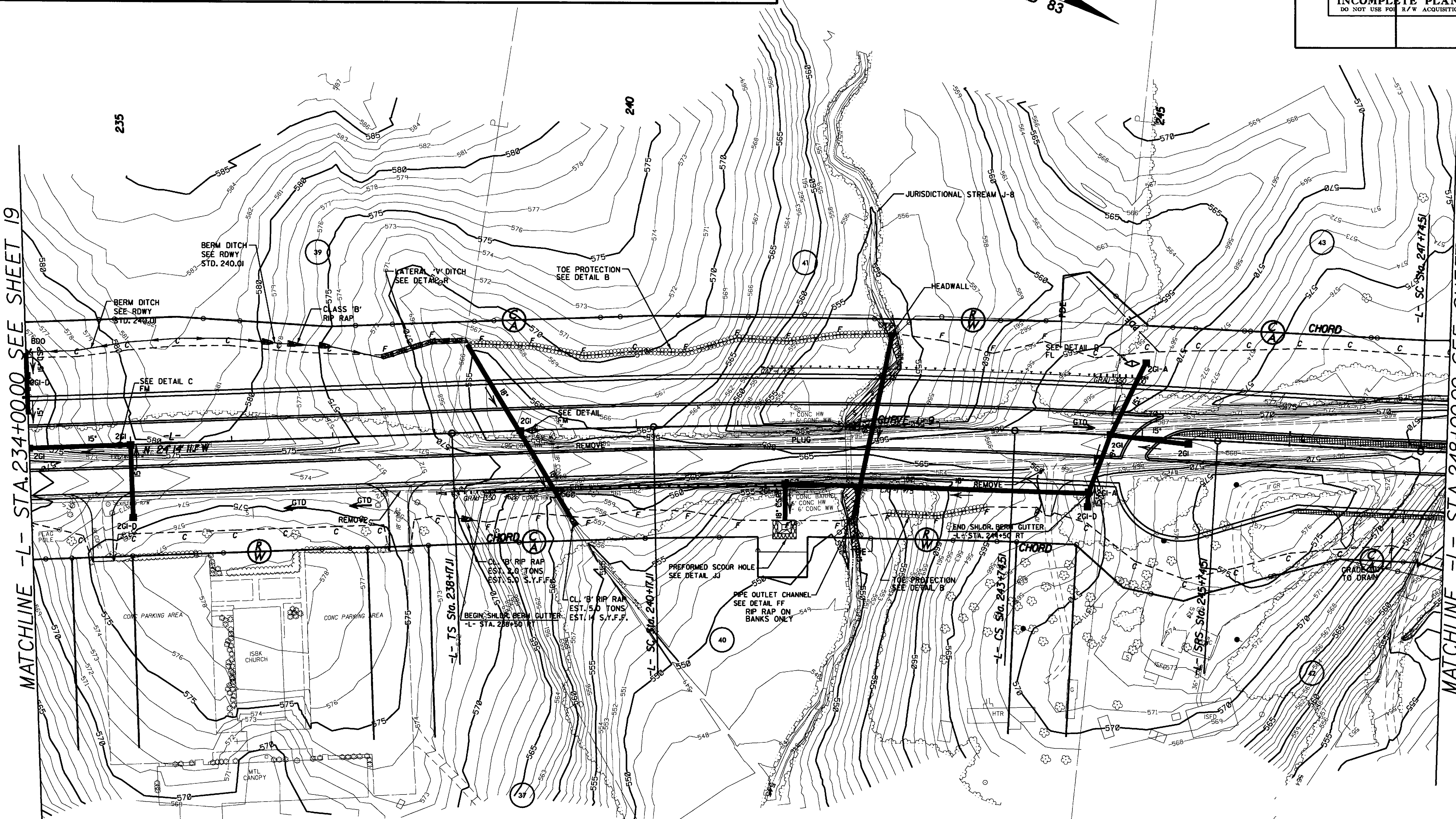
SITE 11 -L- STA. 242 + 35

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	26

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



NAD 83
MATCHLINE -L- STA. 234+00.00 SEE SHEET 19
MATCHLINE -L- STA. 248+00.00 SEE SHEET 21
JURISDICTIONAL STREAM J-8
HEADWALL
TOE PROTECTION SEE DETAIL B
BERM DITCH SEE RDWY STD. 240.01
LATERAL 'V' DITCH SEE DETAIL R
CLASS 'B' RIP RAP
SEE DETAIL C
SEE DETAIL D
CHORD
REMOVE
PLUG
PREFORMED SCOUR HOLE SEE DETAIL JJ
PIPE OUTLET CHANNEL SEE DETAIL FF RIP RAP ON BANKS ONLY
CL. 'B' RIP RAP EST. 2.0 TONS EST. 5.0 S.Y.F.F.
CL. 'B' RIP RAP EST. 5.0 TONS EST. 14 S.Y.F.F.
BEGIN SHLDR. BERM GUTTER -L- STA. 238+50 RT
END SHLDR. BERM GUTTER -L- STA. 244+50 RT
TOE PROTECTION SEE DETAIL B
GRADE DITCH TO DRAIN
-L- TS Sta. 238+17.11
-L- SC Sta. 240+17.11
-L- CS Sta. 243+74.51
-L- ST Sta. 245+74.51
-L- SC Sta. 247+74.51
CONC PARKING AREA
ISSK CHURCH
MTL CANOPY
FLAG POLE
235
240
245

Symbol	Description
F	FILL IN WETLAND
S	PERMANENT SURFACE WATER IMPACT
*	MECHANIZED CLEARING
TS	TEMPORARY SURFACE WATER IMPACT

50′ 0 100′

SCALE: 1" : 100′

ENGLISH

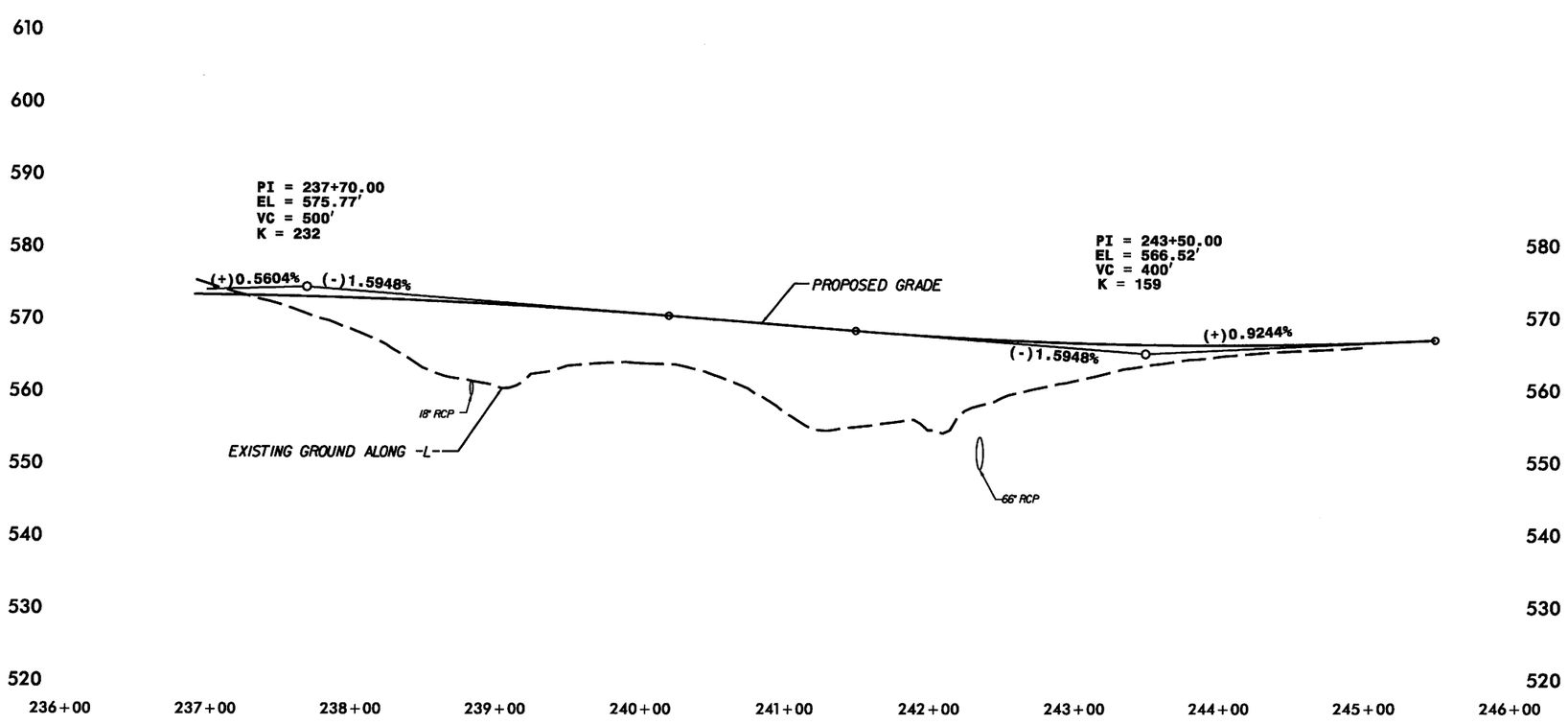
SITE 11 -L- STA. 242 + 35

25 0 50 HORIZ.
5 0 10 VERT.

PROJECT REFERENCE NO.	SHEET NO.
R-2616A&B	27
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



ENGLISH

SITE 12 -L- STA. 250 + 00

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	29
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

NAD 83

CURVE Y6-2
PI Sta 18+16.65
Δ= 20° 34' 41.7" (RT)
D = 10° 00' 00.0"
T = 104.01'
L = 205.78'
R = 572.96'
SE = 0.04 FT/FT

SECTION C-C
EXISTING DITCH
(Not to Scale)
Natural Ground — Natural Ground
T = 6.0 ft
D = 2.5 ft
B = 3.0 ft
NWS = 0.2 ft

SECTION B-B
EXISTING DITCH
(Not to Scale)
Natural Ground — Natural Ground
T = 2.5 ft
D = 1.0 ft
B = 0.5 ft
NWS = 0.0 ft

MATCHLINE -L- STA. 248+00.00 SEE SHEET 20

MATCHLINE -L- STA. 262+00.00 SEE SHEET 22

-L- CS Sta. 251+36.26

-L- ST Sta. 253+36.26

-Y6- PC Sta. 17+12.64

-Y6- PC Sta. 19+18.24

-Y7- PC Sta. 20+43.25

-L- ST Sta. 255+78.88 =
-Y6- POT Sta. 20+00.00 =
-Y7- POT Sta. 20+00.00

BEGIN SHLD. BERM GUTTER
-L- STA. 250+65 LT

TOE PROTECTION
SEE DETAIL B

END SHLD. BERM GUTTER
STA. 252+50 LT

CL. 'B' RIP RAP
EST. 2.0 TONS
EST. 5 S.Y.F.F.

CHORD

L 'B' RIP RAP
ST. 11 TONS
ST. 28 S.Y.F.F.

CL. 'B' RIP RAP
EST. 8 TONS
EST. 21 S.Y.F.F.

50' DITCH CLEAN-OUT

HEADWALL

3' x 3' CONC BARREL
6' CONC HW
3' CONC WW

SEE DETAIL G
FM

PREFORMED SCOUR HOLE
SEE DETAIL JJ

LATERAL BASE DITCH
SEE DETAIL K

PIPE OUTLET CHANNEL
SEE DETAIL GG
RIP RAP ON BANKS ONLY

JURISDICTIONAL STREAM J-7

CL. 'I' RIP RAP
EST. 3 TONS
EST. 7 S.Y.F.F.

CL. 'B' RIP RAP
EST. 2.0 TONS
EST. 5 S.Y.F.F.

REMOVE

SEE DETAIL FL

SPECIAL CUT DITCH
SEE DETAIL A

ISMTL BUS

BST PARKING AREA

2-ISL'S
4 GAS PUMPS
U/MTL CANOPY

3-ISL'S
4 GAS PUMPS
U/MTL CANOPY

ISFMTL POULTRY HOUSE

SILO

CONC

FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

SECTION D-D
EXISTING DITCH
(Not to Scale)
Natural Ground — Natural Ground
T = 8.0 ft
D = 2.5 ft
B = 4.0 ft
NWS = 0.2 ft

SECTION A-A
EXISTING DITCH
(Not to Scale)
Natural Ground — Natural Ground
T = 4.0 ft
D = 0.5 ft
B = 1.0 ft
NWS = 0.0 ft

50' 0 100'

SCALE: 1" : 100'

CURVE L-10
PI Sta 247+07.85
Θs = 1° 00' 00.0"
Ls = 200.00'
LT = 133.34'
ST = 66.67'

CURVE L-10
PI Sta 249+55.45
Δ= 3° 37' 03.0" (LT)
D = 1° 00' 00.0"
T = 180.94'
L = 361.75'
R = 5729.58'

CURVE L-10
PI Sta 252+02.93
Θs = 1° 00' 00.0"
Ls = 200.00'
LT = 133.34'
ST = 66.67'

CURVE Y7-1
PI Sta 23+67.50
Δ= 21° 21' 55.0" (RT)
D = 3° 20' 00.0"
T = 324.24'
L = 640.96'
R = 1718.87'

MATCHLINE -Y7- STA. 24+00.00
SEE SHEET 46

ENGLISH

SITE 12 -L- STA. 250 + 00

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	29
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

NAD 83

SECTION C-C
EXISTING DITCH
(Not to Scale)

Natural Ground — T — Natural Ground; D; B

T = 6.0 ft
D = 2.5 ft
B = 2.0 ft
NWS = 0.2 ft

SECTION B-B
EXISTING DITCH
(Not to Scale)

Natural Ground — T — Natural Ground; D; B

T = 2.5 ft
D = 1.0 ft
B = 0.5 ft
NWS = 0.0 ft

CURVE Y6-2
PI Sta 18+16.65
Δ = 20° 34' 41.7" (RT)
D = 10° 00' 00.0"
T = 104.01'
L = 205.78'
R = 572.96'
SE = 0.04 FT/FT

MATCHLINE -L- STA. 248+00.00 SEE SHEET 20

MATCHLINE -L- STA. 262+00.00 SEE SHEET 22

MATCHLINE -Y7- STA. 24+00.00 SEE SHEET 46

-Y6- PC Sta. 17+12.64

-Y6- PI Sta. 19+18.24

-L- ST Sta. 253+36.26

-L- CS Sta. 251+36.26

-Y7- PC Sta. 20+43.25

-L- ST Sta. 255+78.88+
-Y6- POT Sta. 20+00.00 =
-Y7- POT Sta. 20+00.00

REMOVE

50' DITCH CLEAN-OUT

CL. 'B' RIP RAP
EST. 8 TONS
EST. 21 S.Y.F.F.

CL. 'B' RIP RAP
EST. 20 TONS
EST. 5 S.Y.F.F.

CL. 'B' RIP RAP
EST. 20 TONS
EST. 5 S.Y.F.F.

CL. 'I' RIP RAP
EST. 3 TONS
EST. 7 S.Y.F.F.

CL. 'B' RIP RAP
EST. 8 TONS
EST. 28 S.Y.F.F.

BEGIN SHLD. BERM GUTTER
-L- STA. 250+65.00

END SHLD. BERM GUTTER
-L- STA. 252+50.33

TOE PROTECTION
SEE DETAIL B

SEE DETAIL C
FM

PREFORMED SCOUR HOLE
SEE DETAIL JJ

LATERAL BASE DITCH
SEE DETAIL K

PIPE OUTLET CHANNEL
SEE DETAIL GG
RIP RAP ON BANKS ONLY

JURISDICTIONAL STREAM J-7

SPECIAL CUT DITCH
SEE DETAIL A

SEE DETAIL D
FL

3-ISL'S
4 GAS PUMPS
W/MTL CANOPY

ISMTL BUSES

BST PARKING AREA

ISFMTL POULTRY HOUSE

SILO

CONC

HEADWALL

FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

SECTION D-D
EXISTING DITCH
(Not to Scale)

Natural Ground — T — Natural Ground; D; B

T = 4.0 ft
D = 2.5 ft
B = 2.0 ft
NWS = 0.2 ft

SECTION A-A
EXISTING DITCH
(Not to Scale)

Natural Ground — T — Natural Ground; D; B

T = 4.0 ft
D = 0.5 ft
B = 1.0 ft
NWS = 0.0 ft

50' 0 100'

SCALE: 1" : 100'

CURVE L-10
PI Sta 247+07.85
Θs = 1° 00' 00.0"
Ls = 200.00'
LT = 133.34'
ST = 66.67'

CURVE L-10
PI Sta 249+55.45
Δ = 3° 37' 03.0" (LT)
D = 1° 00' 00.0"
T = 180.94'
L = 361.75'
R = 5729.58'

CURVE L-10
PI Sta 252+02.93
Θs = 1° 00' 00.0"
Ls = 200.00'
LT = 133.34'
ST = 66.67'

CURVE Y7-1
PI Sta 23+67.50
Δ = 21° 21' 55.0" (RT)
D = 3° 20' 00.0"
T = 324.24'
L = 640.96'
R = 1718.87'

ENGLISH

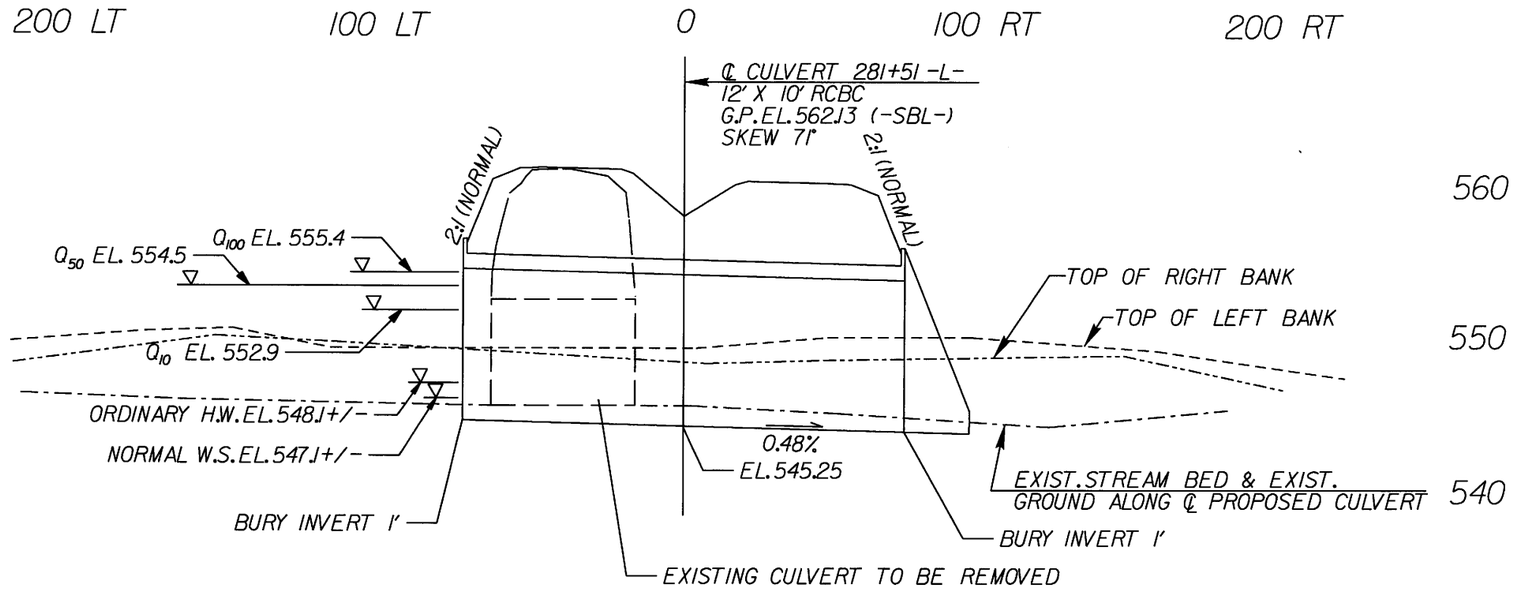
SITE 12 -L- STA 281 + 50

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	30

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



25' 0 50'

VERTICAL SCALE: 1" : 50'

25' 0 50'

HORIZONTAL SCALE: 1" : 50'

ENGLISH

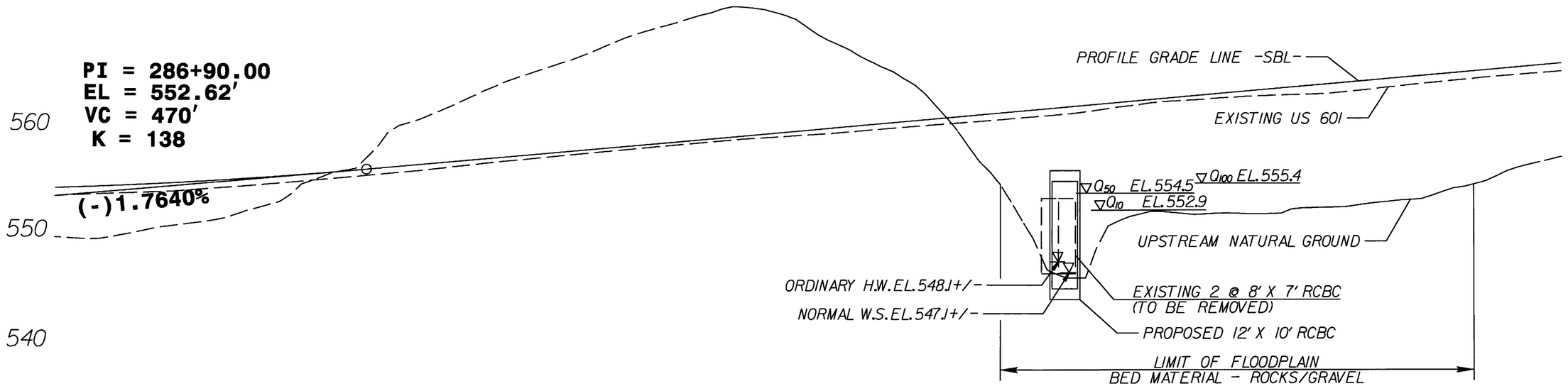
SITE 12 -L- STA 281 + 50

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	31

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



25' 0 50'

VERTICAL SCALE: 1" : 50'

25' 0 50'

HORIZONTAL SCALE: 1" : 50'

ENGLISH

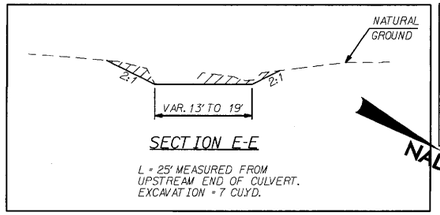
SITE 13 -L- STA. 281 + 50
SITE 14 -L- STA. 288 + 00
SITE 15 -L- STA. 290 + 00 - 294 + 30

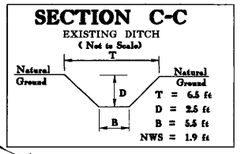
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	32

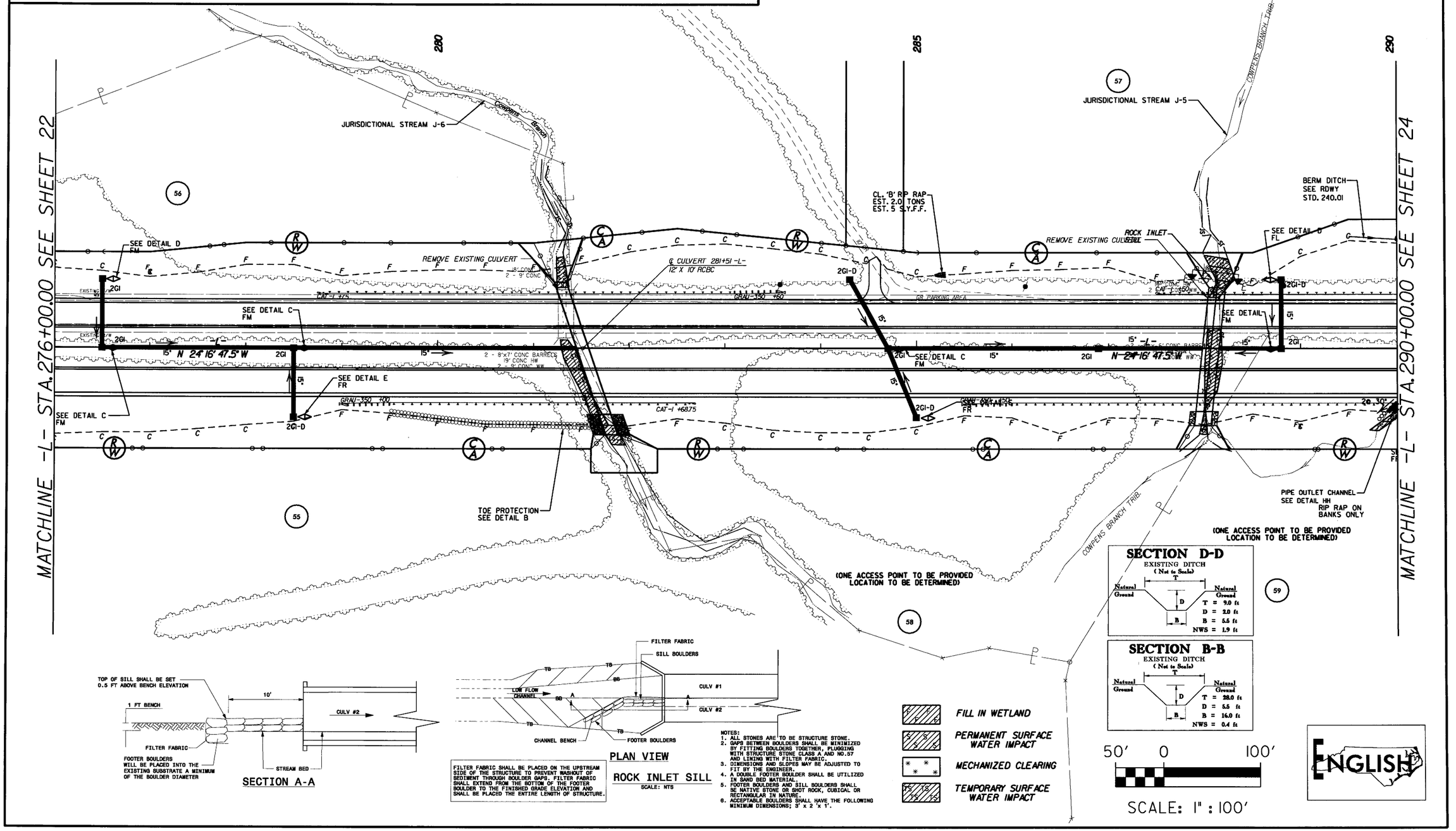
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION







SECTION A-A

PLAN VIEW

ROCK INLET SILL
SCALE: NTS

FILTER FABRIC SHALL BE PLACED ON THE UPSTREAM SIDE OF THE STRUCTURE TO PREVENT WASHOUT OF SEDIMENT THROUGH BOULDER GAPS. FILTER FABRIC SHALL EXTEND FROM THE BOTTOM OF THE FOOTER BOULDER TO THE FINISHED GRADE ELEVATION AND SHALL BE PLACED THE ENTIRE LENGTH OF STRUCTURE.

NOTES:
1. ALL STONES ARE TO BE STRUCTURE STONE.
2. GAPS BETWEEN BOULDERS SHALL BE MINIMIZED BY FITTING BOULDERS TOGETHER, PLUGGING WITH STRUCTURE STONE CLASS A AND NO.57 AND LINING WITH FILTER FABRIC.
3. DIMENSIONS AND SLOPES MAY BE ADJUSTED TO FIT BY THE ENGINEER.
4. A DOUBLE FOOTER BOULDER SHALL BE UTILIZED IN SAND BED MATERIAL.
5. FOOTER BOULDERS AND SILL BOULDERS SHALL BE NATIVE STONE OR SHOT ROCK, CUBICAL OR RECTANGULAR IN NATURE.
6. ACCEPTABLE BOULDERS SHALL HAVE THE FOLLOWING MINIMUM DIMENSIONS; 3' x 2' x 1'.

FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

50' 0 100'

SCALE: 1" : 100'

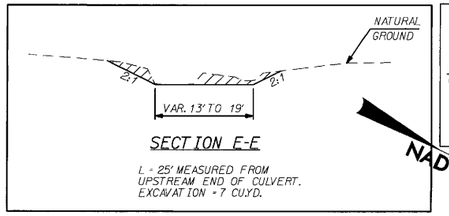
ENGLISH

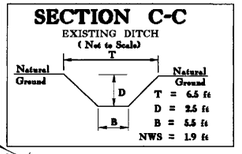
SITE 13 -L- STA. 281 + 50
SITE 14 -L- STA. 288 + 00
SITE 15 -L- STA. 290 + 00 - 294 + 30

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	33
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

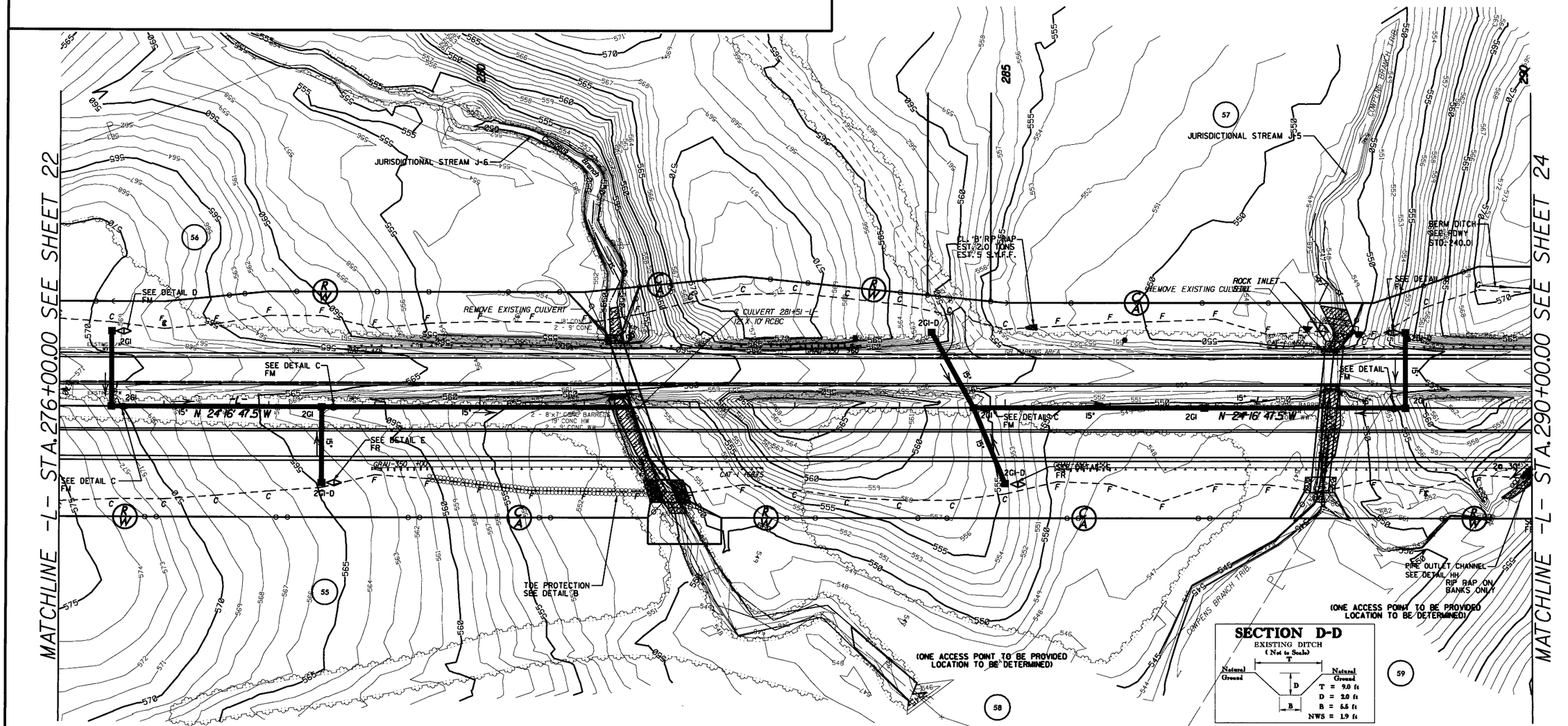
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

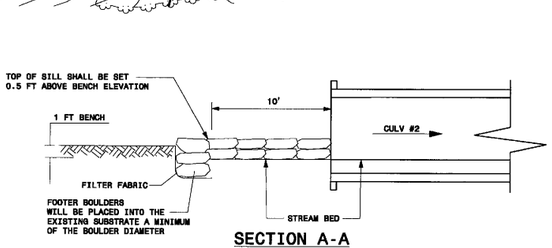
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



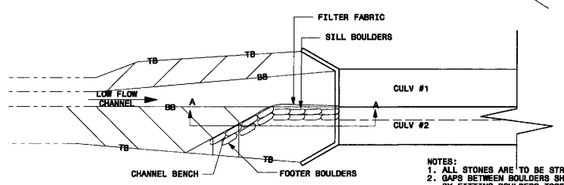


NAD 83





SECTION A-A



PLAN VIEW

FILTER FABRIC SHALL BE PLACED ON THE UPSTREAM SIDE OF THE STRUCTURE TO PREVENT WASHOUT OF SEDIMENT THROUGH BOULDER GAPS. FILTER FABRIC SHALL EXTEND FROM THE BOTTOM OF THE FOOTER BOULDER TO THE FINISHED GRADE ELEVATION AND SHALL BE PLACED THE ENTIRE LENGTH OF STRUCTURE.

ROCK INLET SILL
SCALE: NTS

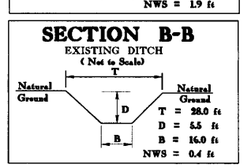
NOTES:
1. ALL STONES ARE TO BE STRUCTURE STONE.
2. GAPS BETWEEN BOULDERS SHALL BE MINIMIZED BY FITTING BOULDERS TOGETHER, PLUGGING WITH STRUCTURE STONE CLASS A AND NO.57 AND LINING WITH FILTER FABRIC.
3. DIMENSIONS AND SLOPES MAY BE ADJUSTED TO FIT BY THE ENGINEER.
4. A DOUBLE FOOTER BOULDER SHALL BE UTILIZED IN SAND BED MATERIAL.
5. FOOTER BOULDERS AND SILL BOULDERS SHALL BE NATIVE STONE OR SHOT ROCK, CUBICAL OR RECTANGULAR IN NATURE.
6. ACCEPTABLE BOULDERS SHALL HAVE THE FOLLOWING MINIMUM DIMENSIONS; 3' x 2' x 1'.

FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT



50' 0 100'

SCALE: 1" : 100'

ENGLISH

SITE 14 -L- STA 288+00

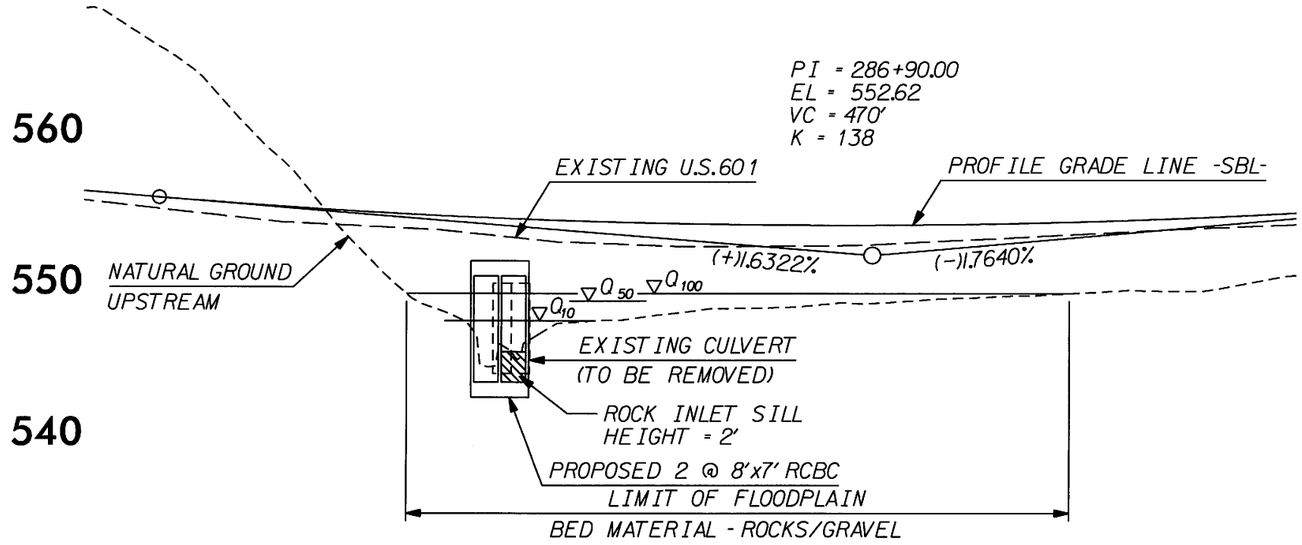
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	34

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



25' 0 50'

VERTICAL SCALE: 1" : 50'

25' 0 50'

HORIZONTAL SCALE: 1" : 50'

ENGLISH

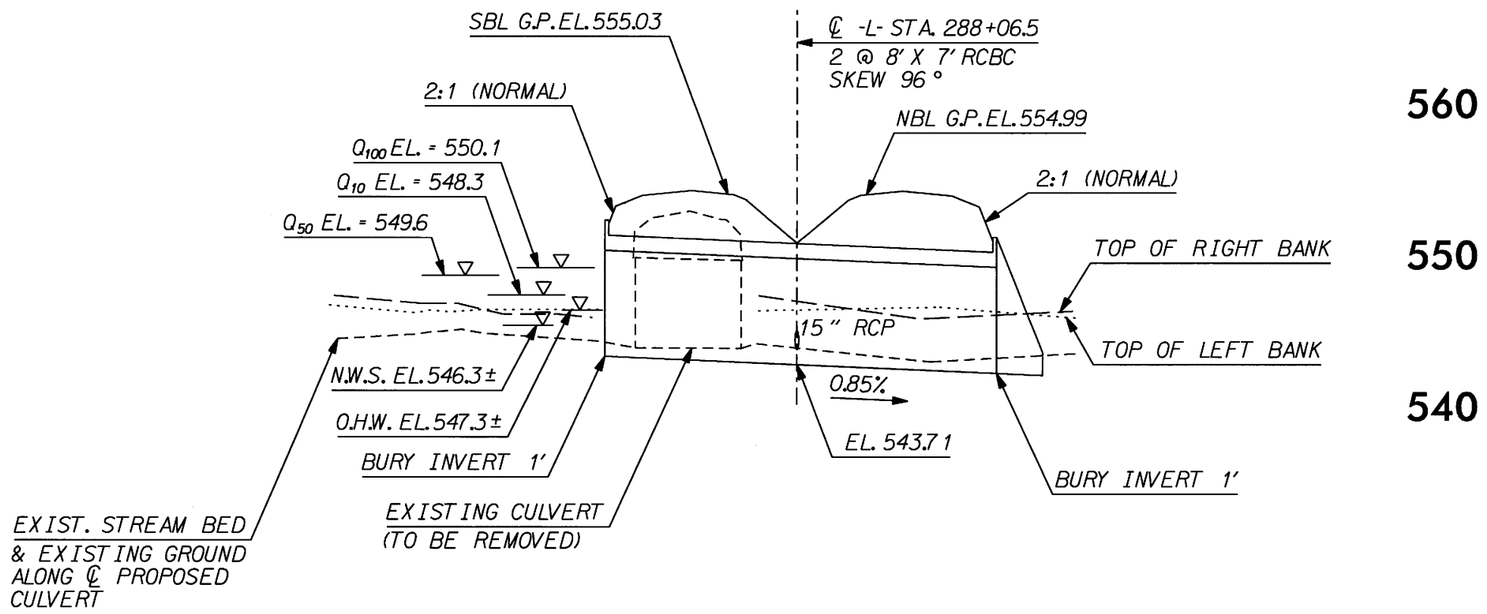
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	35
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

SITE 14 -L- STA 288+00

286 100 LT 0 100 RT



25' 0 50'

VERTICAL SCALE: 1" : 50'

25' 0 50'

HORIZONTAL SCALE: 1" : 50'

ENGLISH

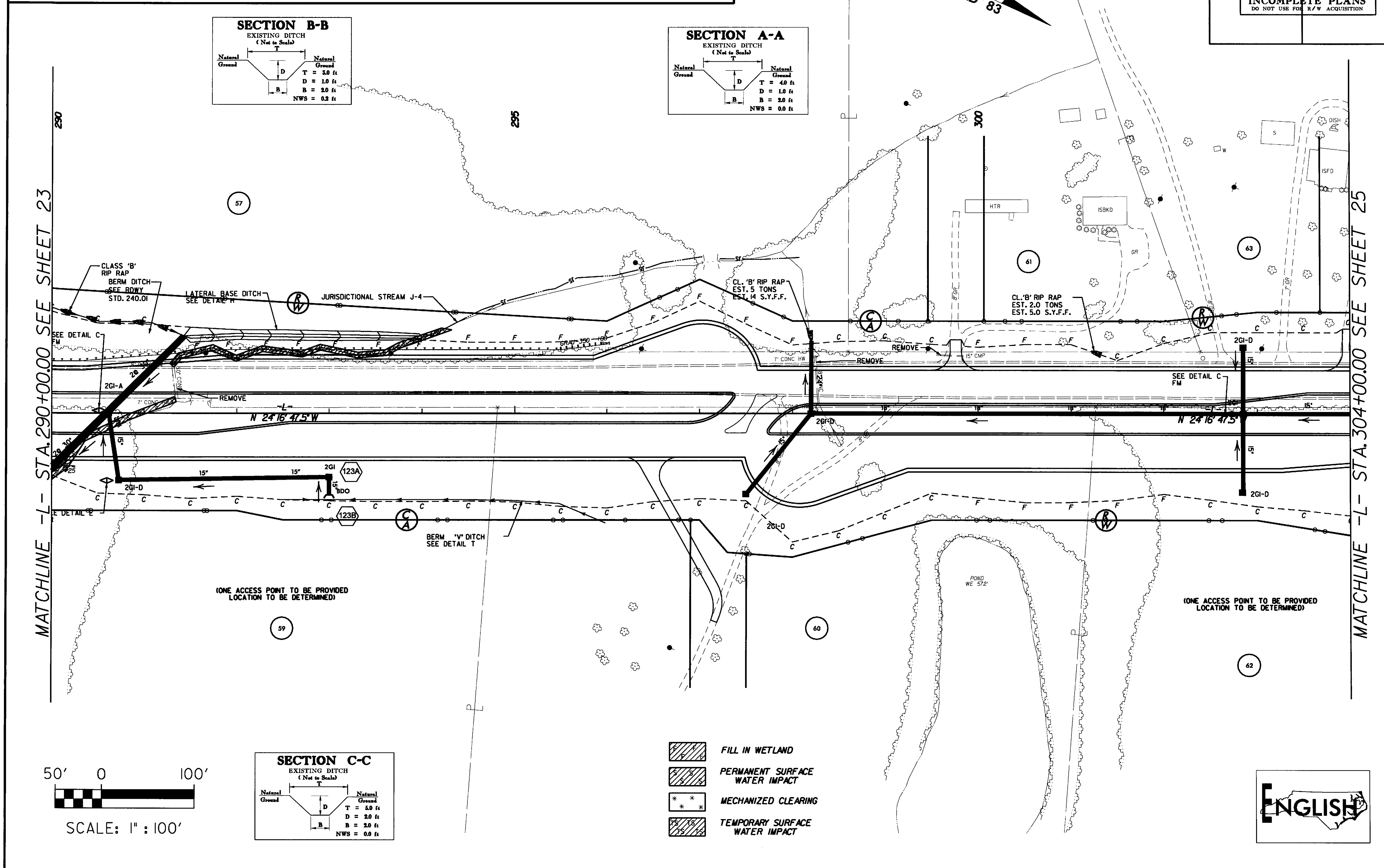
SITE 15 -L- STA. 290+55

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	36

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



NAD 83
SECTION B-B
EXISTING DITCH
(Not to Scale)
Natural Ground
T = 3.0 ft
D = 1.0 ft
B = 2.0 ft
NWS = 0.2 ft
SECTION A-A
EXISTING DITCH
(Not to Scale)
T = 4.0 ft
D = 1.0 ft
B = 2.0 ft
NWS = 0.0 ft
MATCHLINE -L- STA. 290+00.00 SEE SHEET 23
MATCHLINE -L- STA. 304+00.00 SEE SHEET 25
CLASS 'B' RIP RAP
BERM DITCH SEE RDWY STD. 240.01
LATERAL BASE DITCH SEE DETAIL H
JURISDICTIONAL STREAM J-4
CL. 'B' RIP RAP EST. 5 TONS EST. 14 S.Y.F.F.
CL. 'B' RIP RAP EST. 2.0 TONS EST. 5.0 S.Y.F.F.
SEE DETAIL C FM
REMOVE
N 24°16' 47.5" W
2GI-A
2GI-D
2GI
123A
123B
BDO
BERM "V" DITCH SEE DETAIL T
(ONE ACCESS POINT TO BE PROVIDED LOCATION TO BE DETERMINED)
POND WE 572'
HTR
ISBKD
ISFD
DISH
57
59
60
61
62
63
290
295
300
50' 0 100'
SCALE: 1" : 100'
SECTION C-C
EXISTING DITCH
(Not to Scale)
T = 5.0 ft
D = 2.0 ft
B = 2.0 ft
NWS = 0.0 ft
FILL IN WETLAND
PERMANENT SURFACE WATER IMPACT
MECHANIZED CLEARING
TEMPORARY SURFACE WATER IMPACT
ENGLISH

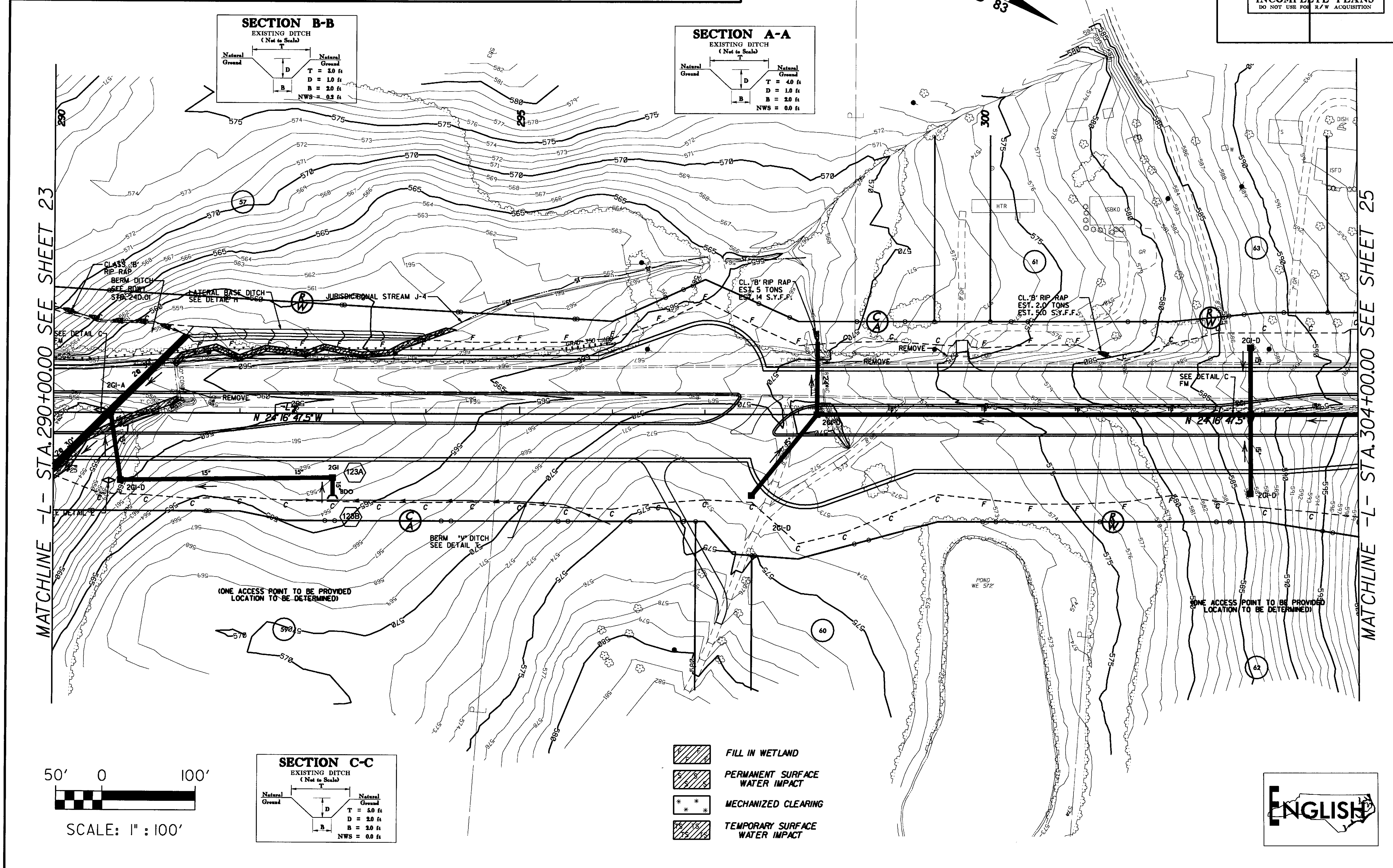
SITE 15 -L- STA. 290+55

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	37

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



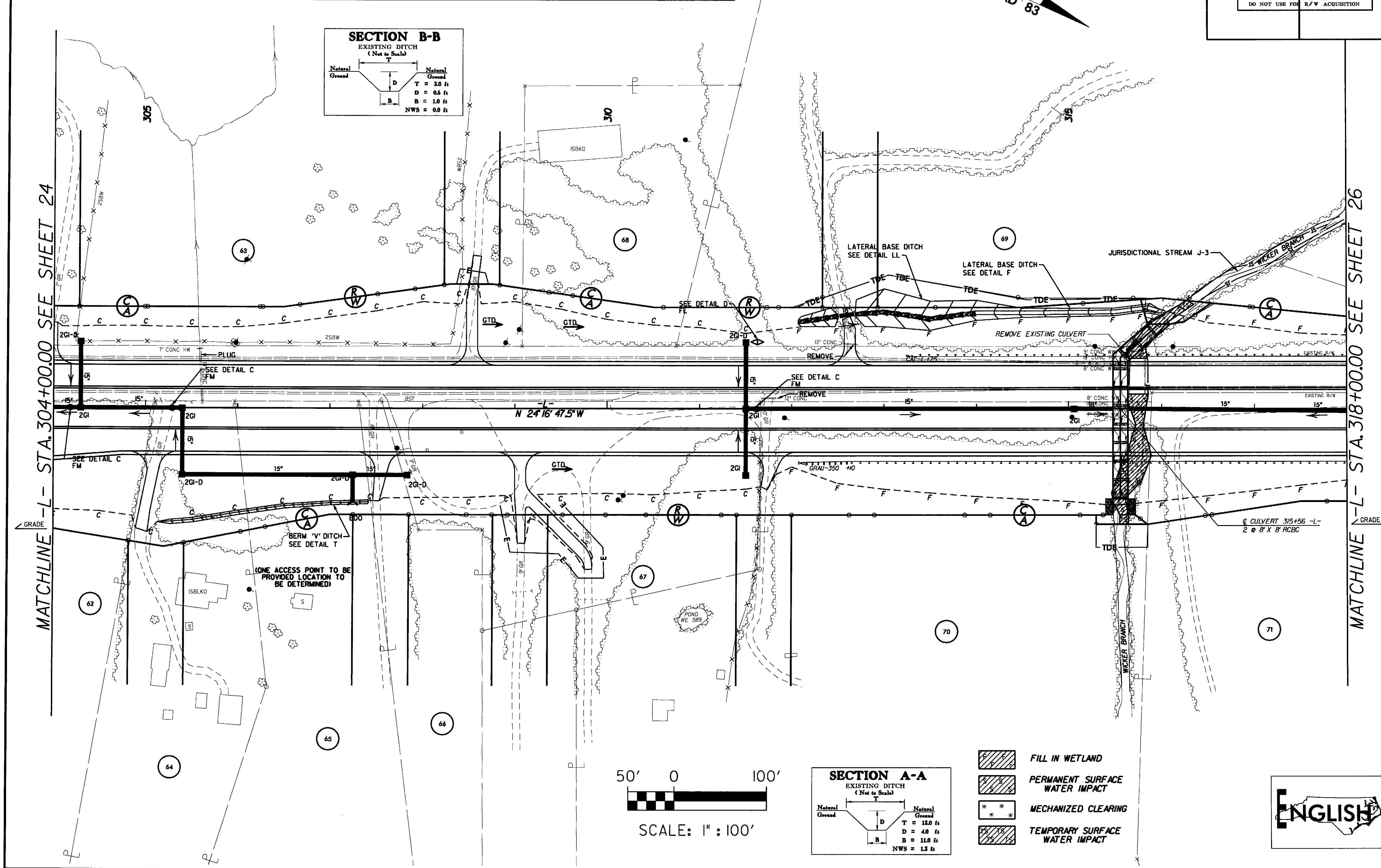
SECTION B-B
EXISTING DITCH
(Not to Scale)
Natural Ground
T = 3.0 ft
D = 1.0 ft
B = 2.0 ft
NWS = 0.2 ft
SECTION A-A
EXISTING DITCH
(Not to Scale)
T = 4.0 ft
D = 1.0 ft
B = 2.0 ft
NWS = 0.0 ft
SECTION C-C
EXISTING DITCH
(Not to Scale)
T = 5.0 ft
D = 2.0 ft
B = 2.0 ft
NWS = 0.0 ft
NAD 83
MATCHLINE -L- STA. 290+00.00 SEE SHEET 23
MATCHLINE -L- STA. 304+00.00 SEE SHEET 25
CLASS 'B' RIP RAP
BERM DITCH SEE RDWY STA. 240.01
LATERAL BASE DITCH SEE DETAIL H
JURISDICTIONAL STREAM J-4
SEE DETAIL C FM
REMOVE
N 24°16'47.5" W
2GI-A
2GI-D
2GI
123A
123B
BDO
CL. 'B' RIP RAP EST. 5 TONS EST. 14 S.Y.F.F.
CL. 'B' RIP RAP EST. 2.0 TONS EST. 5.0 S.Y.F.F.
SEE DETAIL C FM
BERM "V" DITCH SEE DETAIL F
(ONE ACCESS POINT TO BE PROVIDED LOCATION TO BE DETERMINED)
POND WE 572'
HTR
ISBKO
ISFD
DISH
FILL IN WETLAND
PERMANENT SURFACE WATER IMPACT
MECHANIZED CLEARING
TEMPORARY SURFACE WATER IMPACT
50' 0 100'
SCALE: 1" : 100'
ENGLISH

SITE 16 -L- STA. 315+75

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	38
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



NAD 83
SECTION B-B
EXISTING DITCH
(Not to Scale)
Natural Ground
T = 3.0 ft
D = 0.5 ft
B = 1.0 ft
NWS = 0.0 ft
MATCHLINE -L- STA. 304+00.00 SEE SHEET 24
MATCHLINE -L- STA. 318+00.00 SEE SHEET 26
N 24°16' 47.5" W
LATERAL BASE DITCH SEE DETAIL LL
LATERAL BASE DITCH SEE DETAIL F
JURISDICTIONAL STREAM J-3
WICKER BRANCH
REMOVE EXISTING CULVERT
SEE DETAIL C FM
SEE DETAIL D FL
BERM 'V' DITCH SEE DETAIL T
(ONE ACCESS POINT TO BE PROVIDED LOCATION TO BE DETERMINED)
℄ CULVERT 315+56 -L- 2 @ 8' X 8' RCBC
POND WE 589
GRAU-350 +10
SECTION A-A
EXISTING DITCH
(Not to Scale)
T = 13.0 ft
D = 4.0 ft
B = 11.0 ft
NWS = 1.5 ft
50' 0 100'
SCALE: 1" : 100'
FILL IN WETLAND
PERMANENT SURFACE WATER IMPACT
MECHANIZED CLEARING
TEMPORARY SURFACE WATER IMPACT
ENGLISH

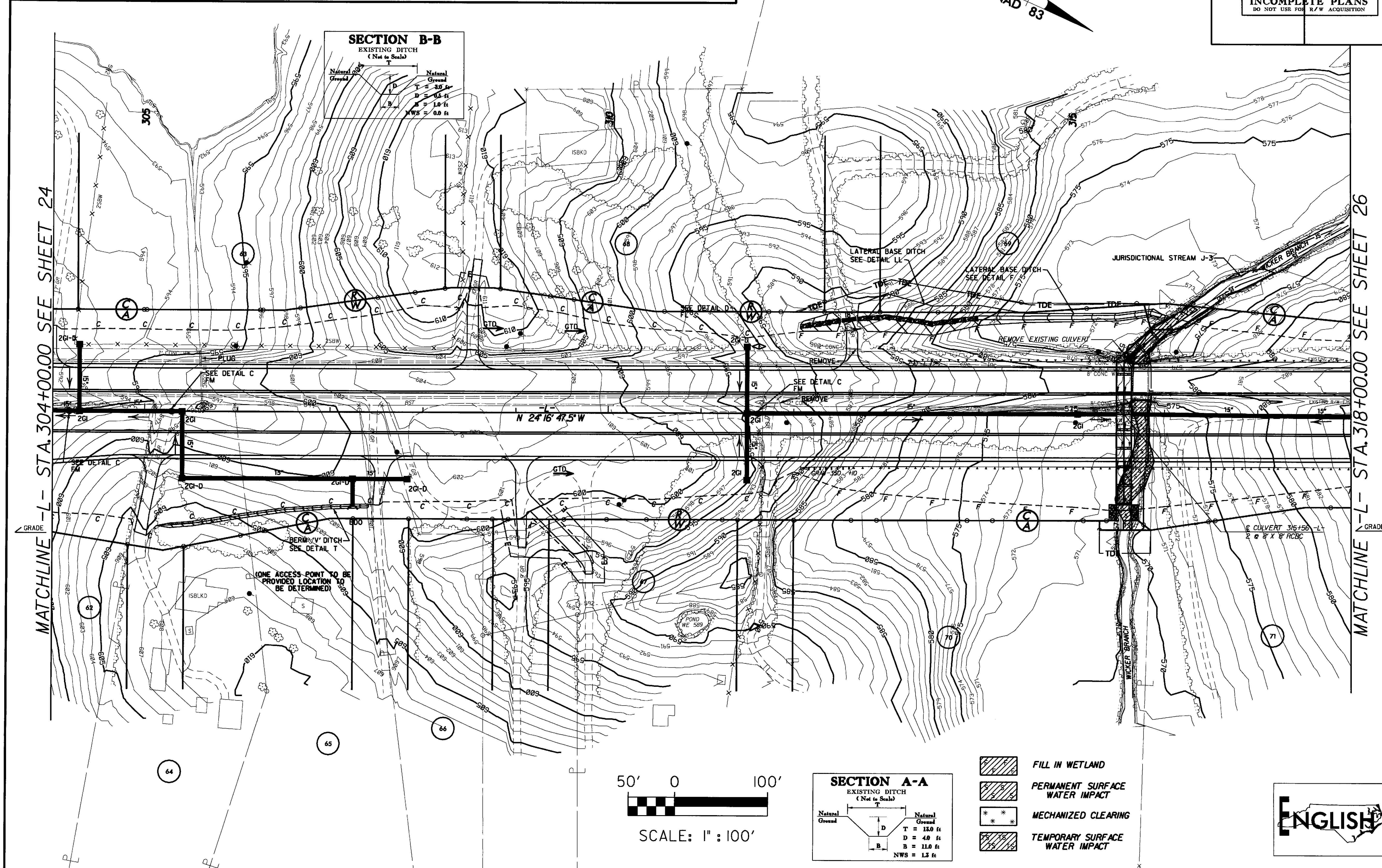
SITE 16 -L- STA. 315 + 75

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	39 25

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



NAD 83
SECTION B-B
EXISTING DITCH
(Not to Scale)
Natural Ground
T = 3.0 ft
D = 0.5 ft
B = 1.0 ft
NWS = 0.0 ft
MATCHLINE -L- STA. 304+00.00 SEE SHEET 24
MATCHLINE -L- STA. 318+00.00 SEE SHEET 26
N 24°16' 47.5" W
LATERAL BASE DITCH SEE DETAIL LL
LATERAL BASE DITCH SEE DETAIL F
JURISDICTIONAL STREAM J-3
WICKER BRANCH
REMOVE EXISTING CULVERT
SEE DETAIL C
SEE DETAIL D
REMOVE
PLUG
BERM 'V' DITCH SEE DETAIL T
(ONE ACCESS POINT TO BE PROVIDED LOCATION TO BE DETERMINED)
POND WE 589
℄ CULVERT 315+56 -L- 2 @ 8' X 8' RCBC
GRADE
50' 0 100'
SCALE: 1" : 100'
SECTION A-A
EXISTING DITCH
(Not to Scale)
Natural Ground
T = 13.0 ft
D = 4.0 ft
B = 11.0 ft
NWS = 1.3 ft
FILL IN WETLAND
PERMANENT SURFACE WATER IMPACT
MECHANIZED CLEARING
TEMPORARY SURFACE WATER IMPACT
ENGLISH

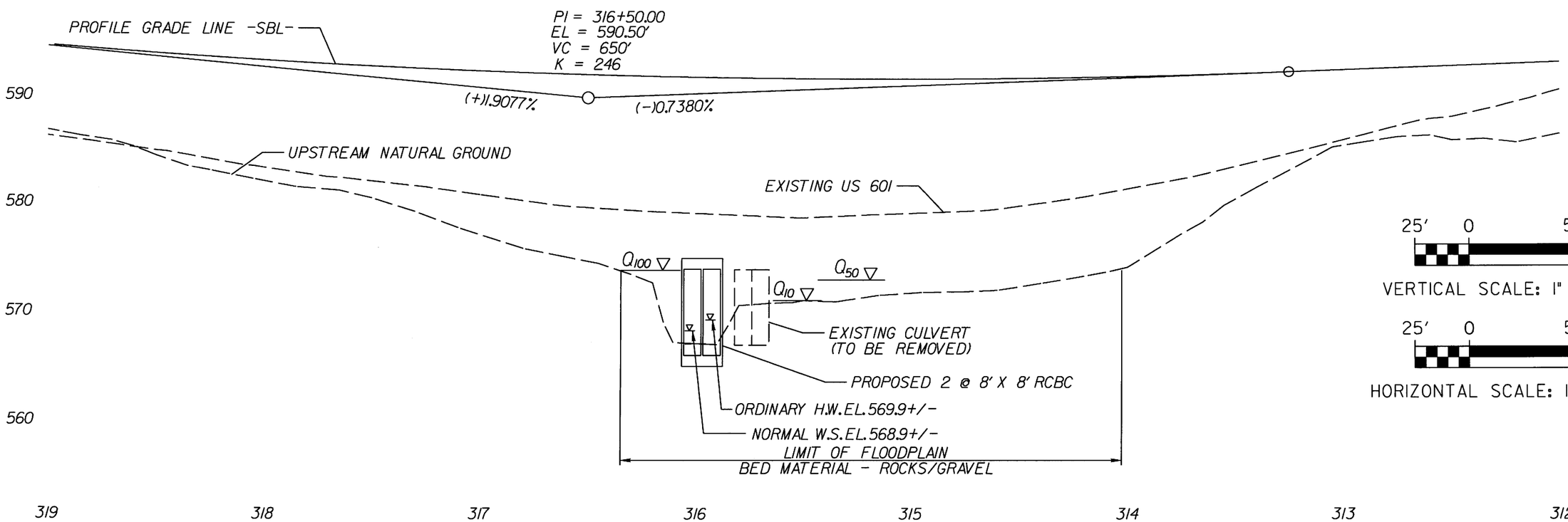
SITE 16 -L- STA 315+75

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	40

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



25' 0 50'

VERTICAL SCALE: 1" : 50'

25' 0 50'

HORIZONTAL SCALE: 1" : 50'

ENGLISH

SITE 16 -L- STA 315+75

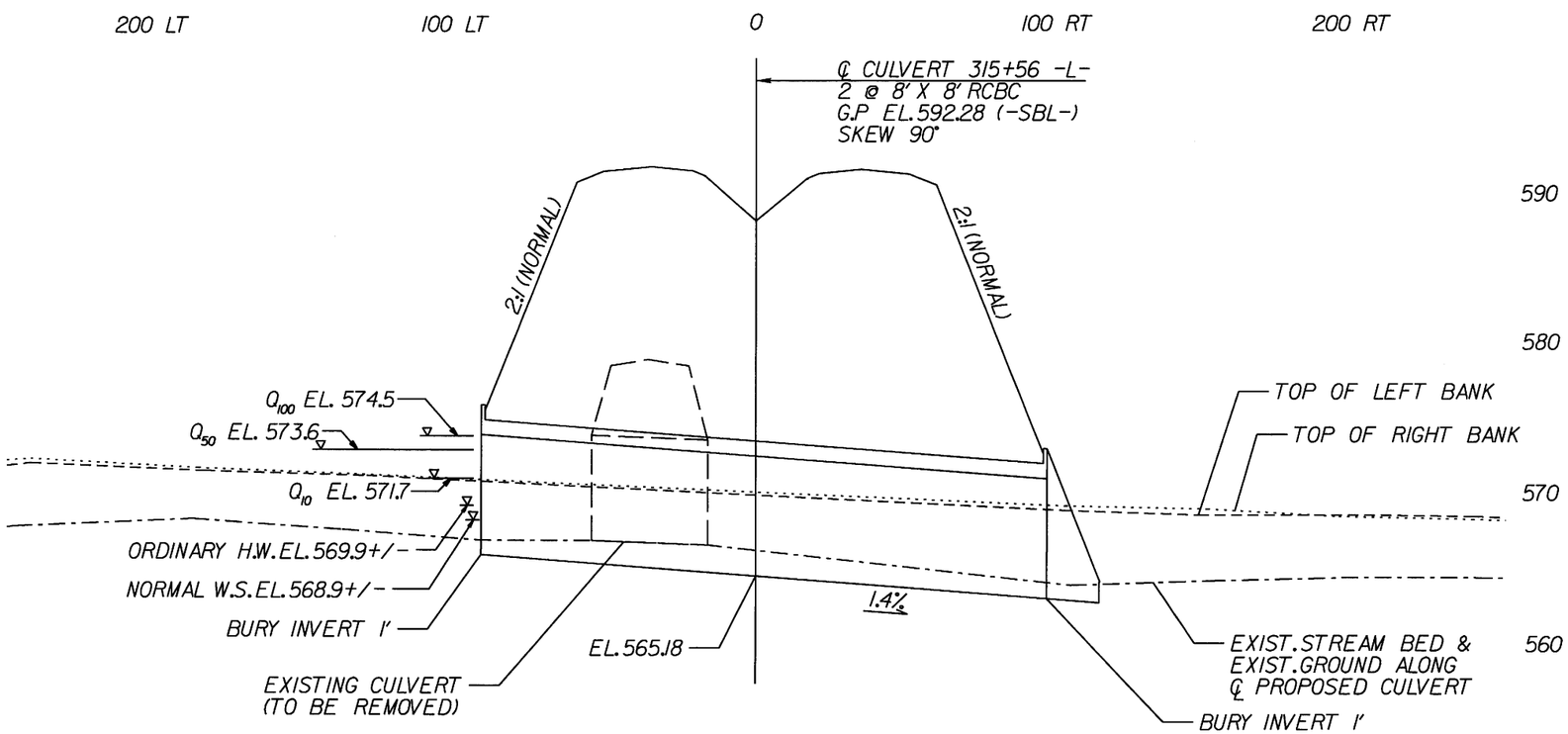
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	41

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



25' 0 50'

VERTICAL SCALE: 1" : 50'

25' 0 50'

HORIZONTAL SCALE: 1" : 50'

ENGLISH

8/17/99

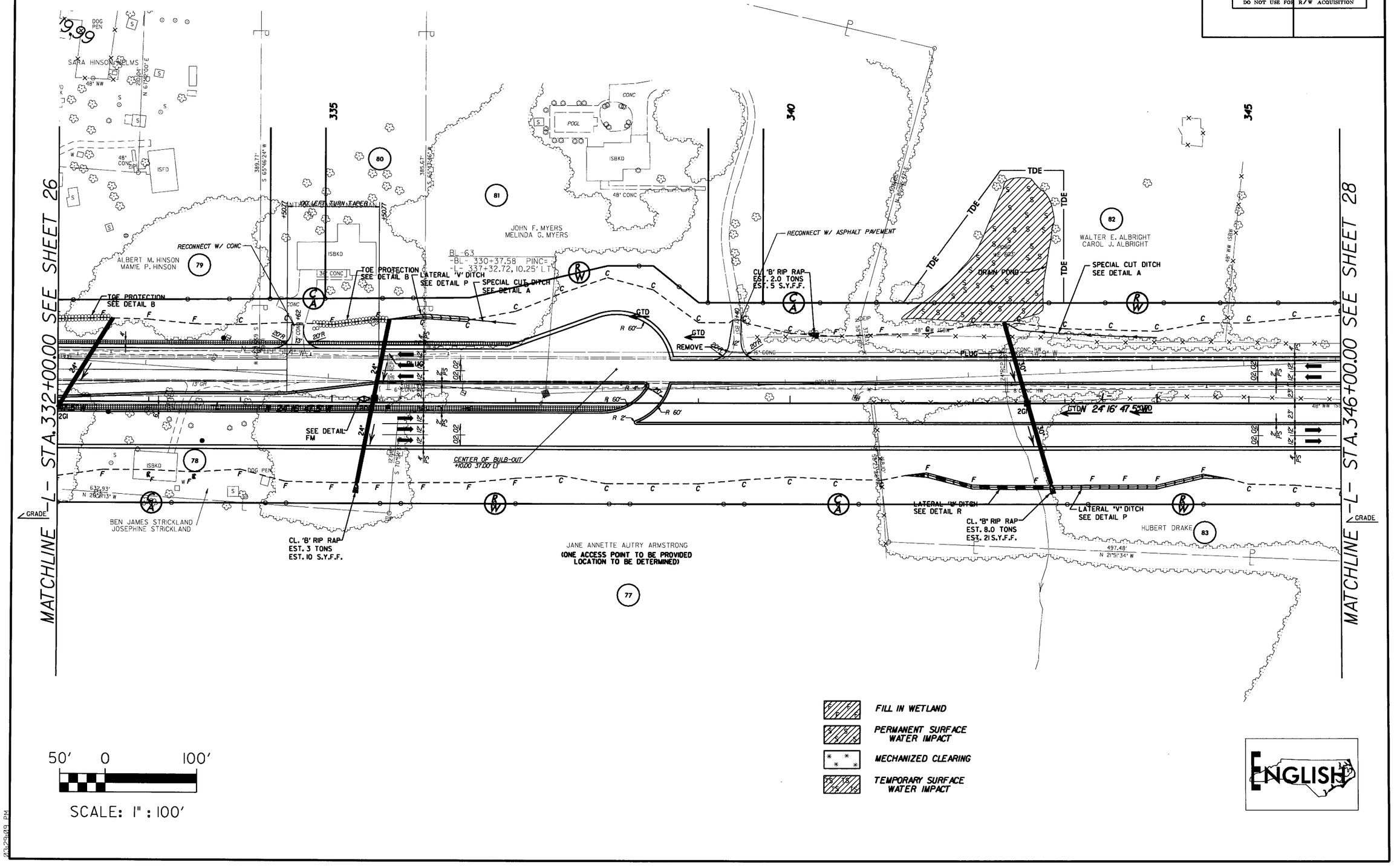
SITE 17 -L- STA. 342+00

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	42

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



03:29:09 PM

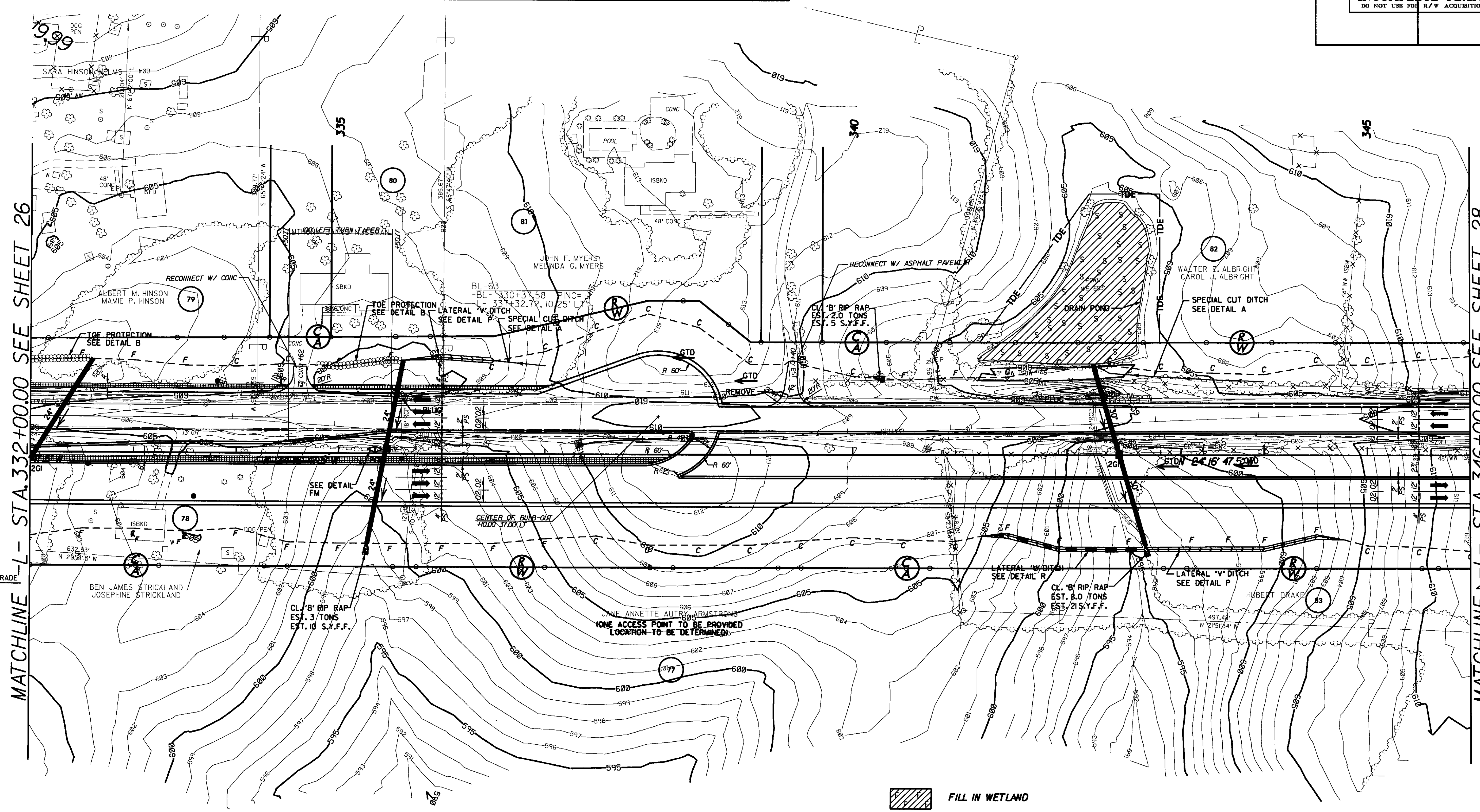
SITE 17 -L- STA. 342+00

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	43

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

50' 0 100'

SCALE: 1" : 100'

ENGLISH

SITE 18 -L- STA. 349+50 RT
SITE 19 -L- STA. 349+50 LT

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	44

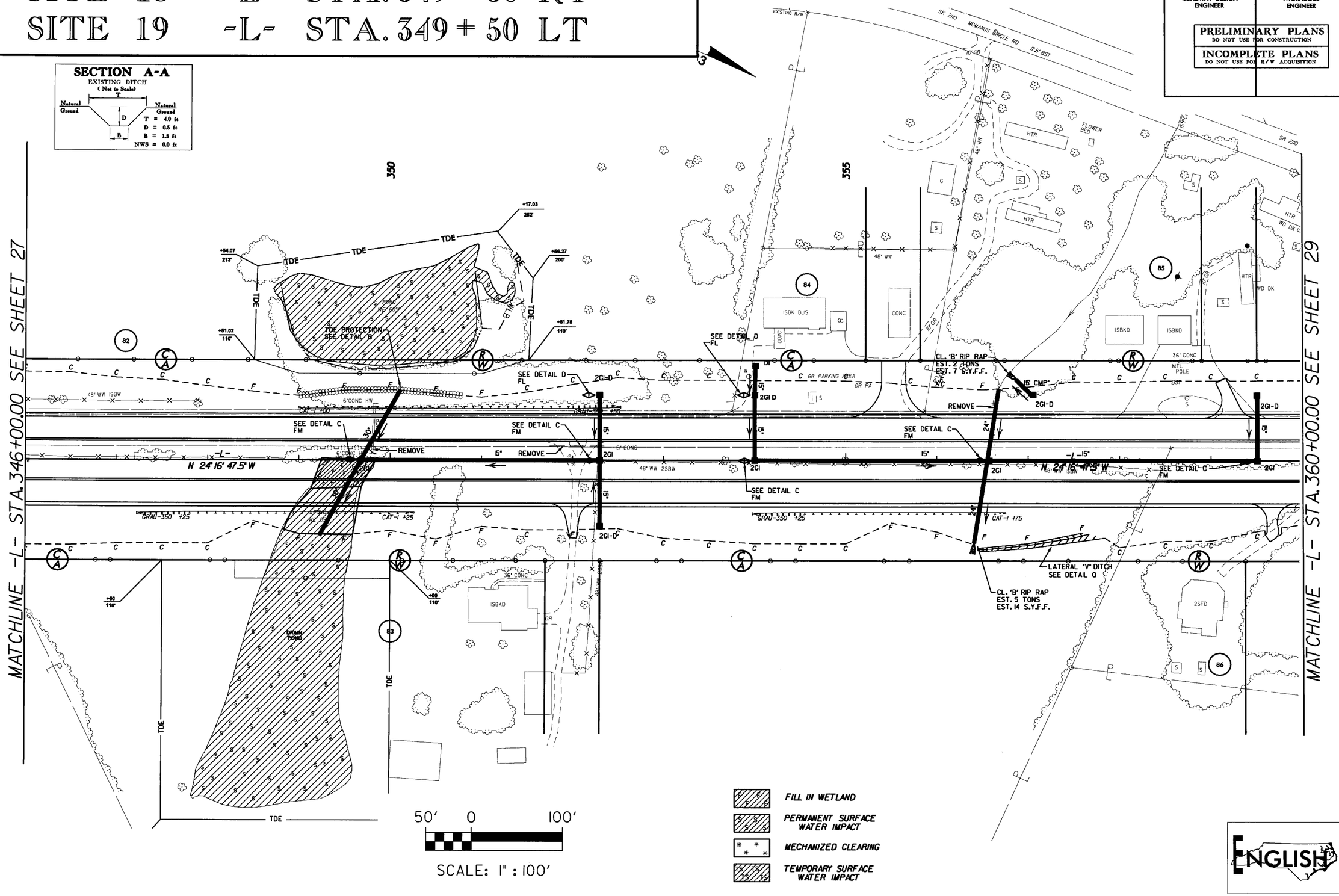
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

SECTION A-A
EXISTING DITCH
(Not to Scale)

T = 4.0 ft
D = 0.5 ft
B = 1.5 ft
NWS = 0.0 ft



ENGLISH

SITE 18 -L- STA. 349+50 RT
SITE 19 -L- STA. 349+50 LT

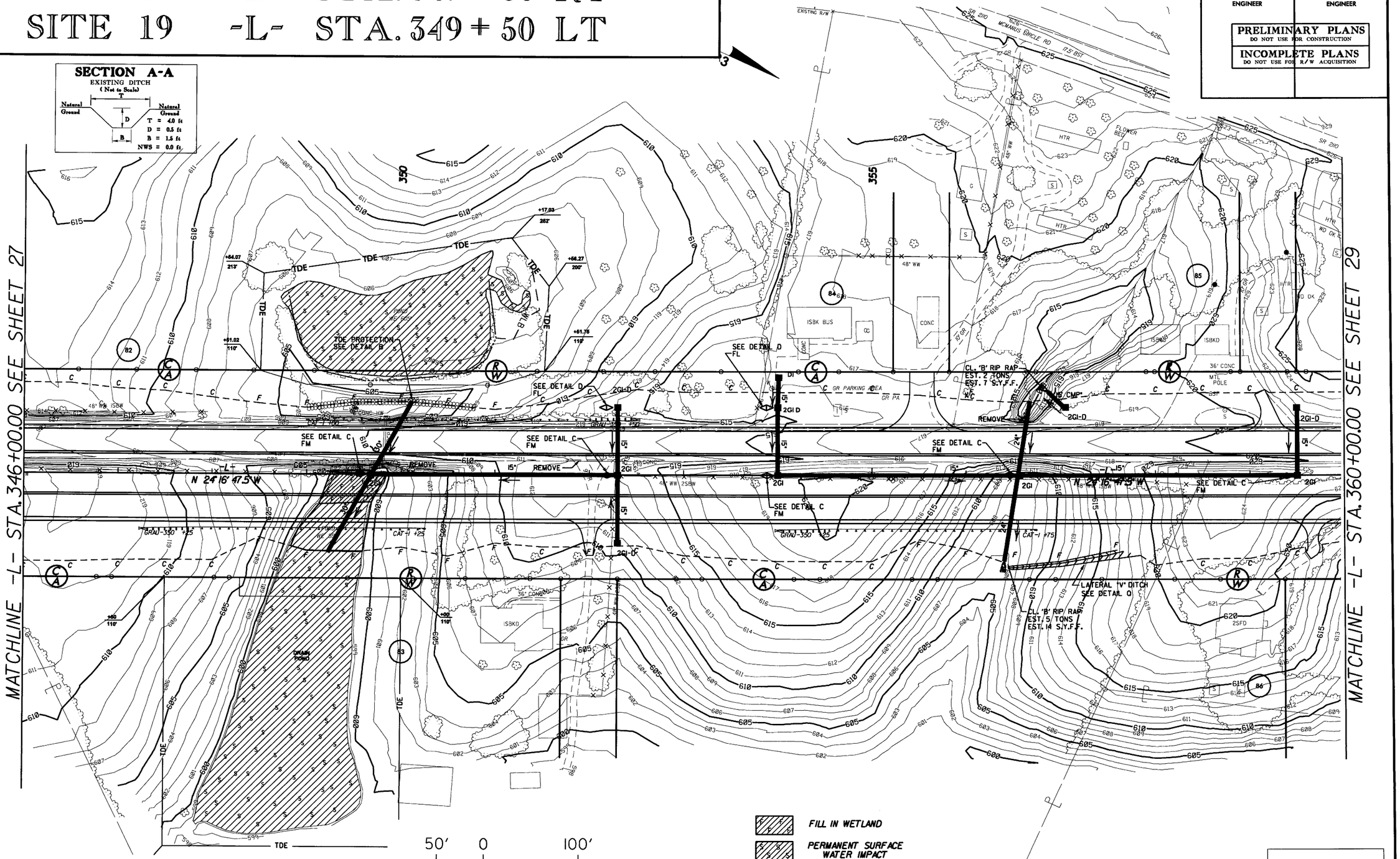
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	45

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

SECTION A-A
EXISTING DITCH
(Not to Scale)



50′ 0 100′

SCALE: 1" : 100′

FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

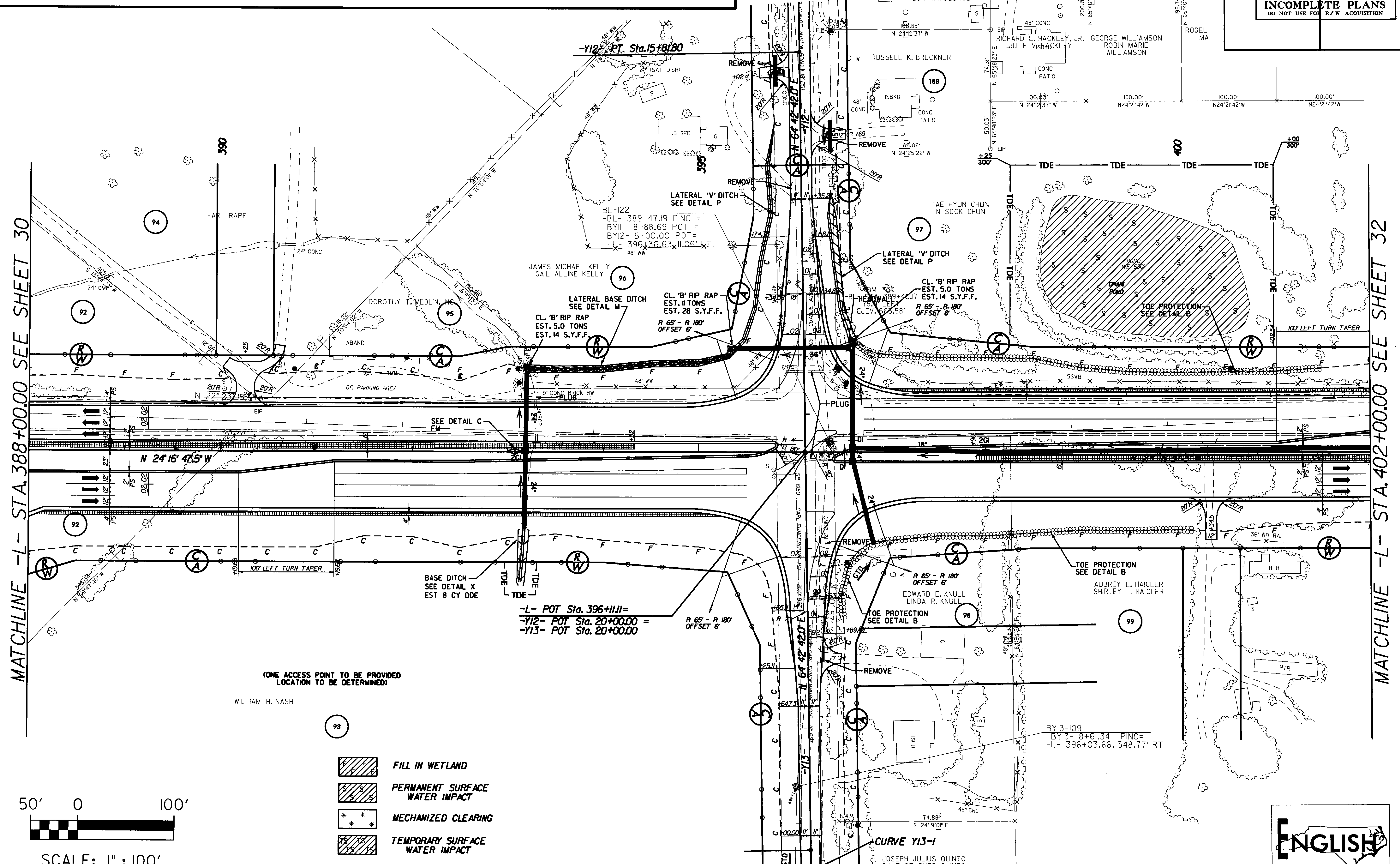
ENGLISH

SITE 20 -L- STA. 400 + 00

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	46
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



MATCHLINE -L- STA. 388+00.00 SEE SHEET 30
MATCHLINE -L- STA. 402+00.00 SEE SHEET 32
-Y12- PT Sta. 15+81.80
-L- POT Sta. 396+11.11=
-Y12- POT Sta. 20+00.00 =
-Y13- POT Sta. 20+00.00
N 24°16' 47.5" W
EARL RAPE
JAMES MICHAEL KELLY
GAIL ALLINE KELLY
DOROTHY T. MEDLIN, INC.
RUSSELL K. BRUCKNER
TAE HYUN CHUN
IN SOOK CHUN
WILLIAM H. NASH
EDWARD E. KNULL
LINDA R. KNULL
AUBREY L. HAIGLER
SHIRLEY L. HAIGLER
JOSEPH JULIUS QUINTO
DALE STARNES QUINTO
LATERAL 'V' DITCH SEE DETAIL P
LATERAL BASE DITCH SEE DETAIL M
CL. 'B' RIP RAP EST. 5.0 TONS EST. 14 S.Y.F.F.
CL. 'B' RIP RAP EST. 11 TONS EST. 28 S.Y.F.F.
BASE DITCH SEE DETAIL X EST 8 CY DDE
TOE PROTECTION SEE DETAIL B
SEE DETAIL C
100' LEFT TURN TAPER
(ONE ACCESS POINT TO BE PROVIDED LOCATION TO BE DETERMINED)
CURVE Y13-1
REMOVE
PLUG

FIL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

50' 0 100'

SCALE: 1" : 100'

ENGLISH

8/17/99

SITE 20 -L- STA. 400+00

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	47

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

MATCHLINE -L- STA. 388+00.00 SEE SHEET 30

MATCHLINE -L- STA. 402+00.00 SEE SHEET 32

-Y12- PT Sta. 15+81.80

-L- POT Sta. 396+11.11 =
-Y12- POT Sta. 20+00.00 =
-Y13- POT Sta. 20+00.00

BL-122
-BL- 389+47.19 PINC =
-BY1- 8+88.69 POT =
-BY12- 6+00.00 POT =
-L- 396+36.63, 11.06' LT

BY3-109
-BY13- 8+61.34 PINC=
-L- 396+03.66, 648.77' RT

CURVE Y13-1

LATERAL 'V' DITCH SEE DETAIL A

LATERAL 'V' DITCH SEE DETAIL P

LATERAL BASE DITCH SEE DETAIL M

CL. 'B' RIP RAP EST. 11 TONS EST. 28 S.Y.F.F. R 65' - R 180' OFFSET 6'

CL. 'B' RIP RAP EST. 5.0 TONS EST. 14 S.Y.F.F. R 65' - R 180' OFFSET 6'

CL. 'B' RIP RAP EST. 5.0 TONS EST. 14 S.Y.F.F. R 65' - R 180' OFFSET 6'

TOE PROTECTION SEE DETAIL B

TOE PROTECTION SEE DETAIL B

BASE DITCH SEE DETAIL X EST. 8 CY DDE

SEE DETAIL C FM

100' LEFT TURN TAPER

100' LEFT TURN TAPER

(ONE ACCESS POINT TO BE PROVIDED LOCATION TO BE DETERMINED)

EARL RAPE

DOROTHY T. MEDLIN, HEIRS

JAMES MICHAEL KELLY
GAIL ALLINE KELLY

WILLIAM H. NASH

RUSSELL K. BRUCKNER

LORA A. MCQUAGE

RICHARD L. HACKLEY, JR.
JULIE HACKLEY

GEORGE WILLIAMSON
ROBIN MARIE WILLIAMSON

ROGEL MA

TAE HYUN CHUN
IN SOOK CHUN

EDWARD E. KNULL
LINDA R. KNULL

AUBREY L. HAIGLER
SHIRLEY L. HAIGLER

JOSEPH JULIUS QUINTO
STARNES QUINTO

FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

50' 0 100'

SCALE: 1" : 100'

ENGLISH

SITE 21 -L- STA. 422+00 LT.
SITE 22 -L- STA. 430+50 RT.

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	48

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

NAD 83

MATCHLINE -L- STA. 416+00.00 SEE SHEET 32

MATCHLINE -L- STA. 430+00.00 SEE SHEET 34

CONC
GR
10' CONC
BRICK LATE ROAD 11' GRAVEL
10' SOIL
48' WD
POOL
25BKD
WD CANOPY
CONC
420
425
+59.65 250'
+16.24 292'
+72.83 281'
+80.85 101'
+51.06 108'
TDE
DRAIN POND
POND WC 65'
108
110
111
112
114
CL. 'I' RIP RAP
EST. 4 TONS
EST. 10 S.Y.F.F.
RW
CA
REMOVE
GRAU-350 +50
CAT-1 +69
CAT-1 +90
US 601 BST
SEE DETAIL C
FM
DETAIL C
15" CONC
15"
2GI
N 25°17' 46.5" W
GTD.
GRAU-350 +20
CL. 'B' RIP RAP
EST. 2.0 TONS
EST. 5.0 S.Y.F.F.
JB W/MH
HEADWALL
LATERAL BASE DITCH
SEE DETAIL I
(ONE ACCESS POINT TO BE PROVIDED LOCATION TO BE DETERMINED)
113
115
109
107

50' 0 100'

SCALE: 1" : 100'

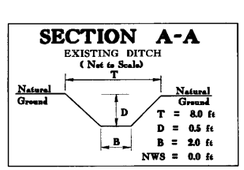
FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

SECTION A-A
EXISTING DITCH
(Not to Scale)



ENGLISH

SITE 21 -L- STA. 422+00 LT.
SITE 22 -L- STA. 430+50 RT.

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	44
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

NAD 83

MATCHLINE -L- STA. 416+00.00 SEE SHEET 32

MATCHLINE -L- STA. 430+00.00 SEE SHEET 34

CL 'A' RIP RAP
EST. 4 TONS
EST. 10 S.Y.F.F.

CL 'B' RIP RAP
EST. 2.0 TONS
EST. 5.0 S.Y.F.F.

SEE DETAIL C

REMOVE

(ONE ACCESS POINT TO BE PROVIDED LOCATION TO BE DETERMINED)

HEADWALL

LATERAL BASE DITCH
SEE DETAIL I

50' 0 100'

SCALE: 1" : 100'

FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

SECTION A-A
EXISTING DITCH
(Not to Scale)

Natural Ground — T — Natural Ground

D

B

T = 8.0 ft
D = 0.5 ft
B = 2.0 ft
NWS = 0.0 ft

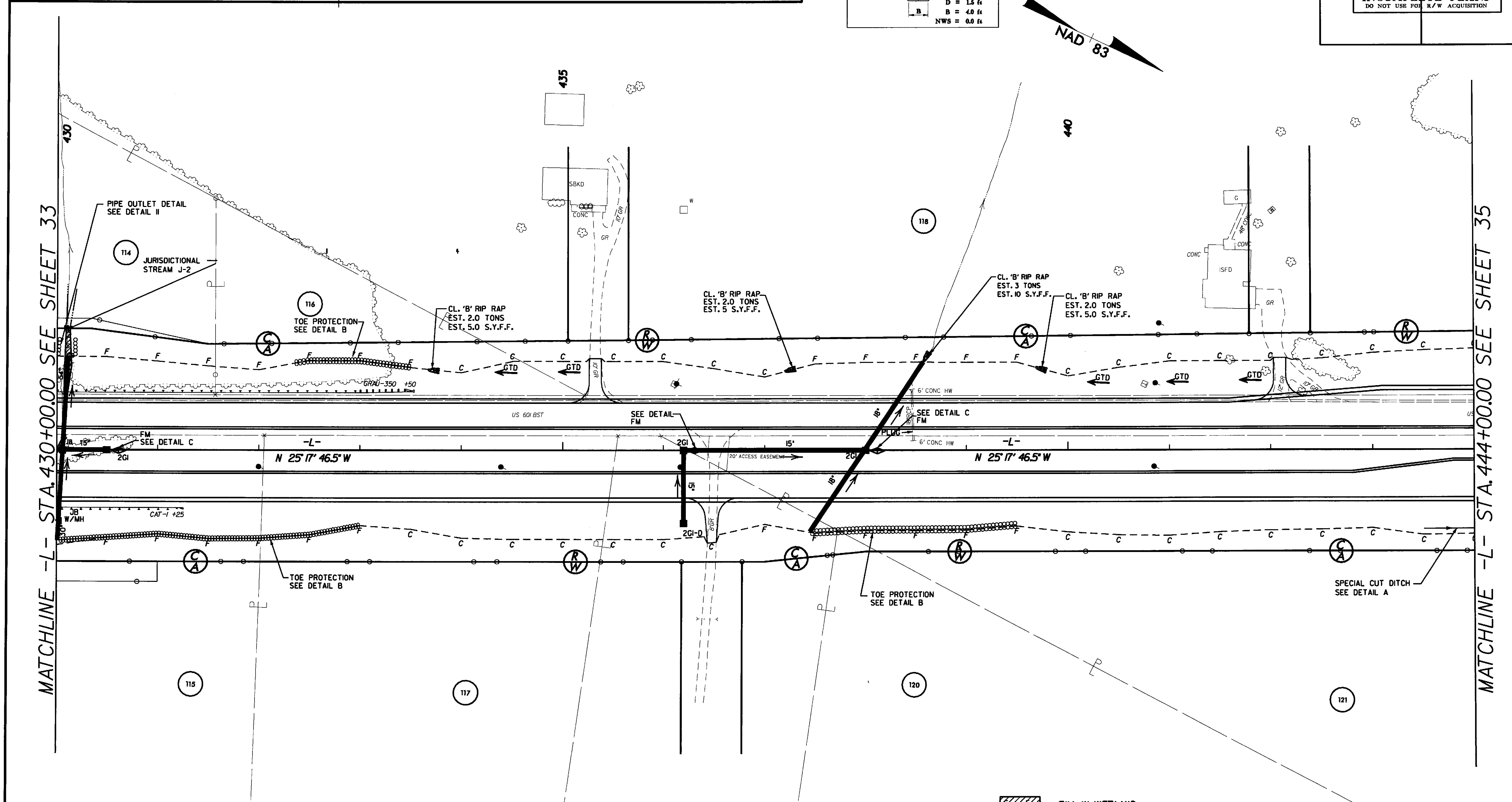
ENGLISH

SITE 22 -L- STA. 430 + 50

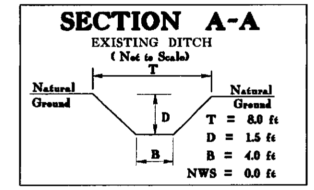
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	50
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

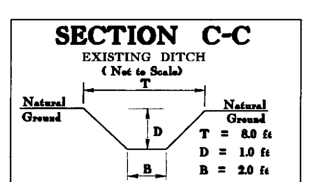
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

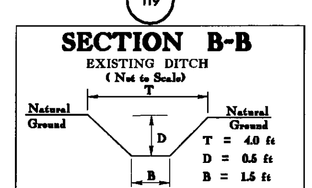


NAD 83
MATCHLINE -L- STA. 430+00.00 SEE SHEET 33
MATCHLINE -L- STA. 444+00.00 SEE SHEET 35
PIPE OUTLET DETAIL SEE DETAIL II
JURISDICTIONAL STREAM J-2
TOE PROTECTION SEE DETAIL B
CL. 'B' RIP RAP EST. 2.0 TONS EST. 5.0 S.Y.F.F.
CL. 'B' RIP RAP EST. 2.0 TONS EST. 5 S.Y.F.F.
CL. 'B' RIP RAP EST. 3 TONS EST. 10 S.Y.F.F.
CL. 'B' RIP RAP EST. 2.0 TONS EST. 5.0 S.Y.F.F.
SEE DETAIL FM
SEE DETAIL C FM
FM SEE DETAIL C
N 25° 17' 46.5" W
-L-
US 601 BST
6' CONC HW
PLUG
20' ACCESS EASEMENT
2GI
2GI-D
JB W/MH
CAT-1 +25
GRAU-350 +50
SBKD
ISFD
CONC
TOE PROTECTION SEE DETAIL B
SPECIAL CUT DITCH SEE DETAIL A
114
115
116
117
118
120
121
430
435
440





119



50' 0 100'

SCALE: 1" : 100'

- FILL IN WETLAND
- PERMANENT SURFACE WATER IMPACT
- MECHANIZED CLEARING
- TEMPORARY SURFACE WATER IMPACT

ENGLISH

SITE 22 -L- STA. 430 + 50

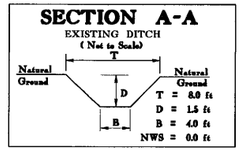
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	51

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

SECTION A-A
EXISTING DITCH
(Not to Scale)



T = 8.0 ft
D = 1.5 ft
B = 4.0 ft
NWS = 0.0 ft

NAD 83

MATCHLINE -L- STA. 430+00.00 SEE SHEET 33

MATCHLINE -L- STA. 444+00.00 SEE SHEET 35

PIPE OUTLET DETAIL SEE DETAIL M

JURISDICTIONAL STREAM J-2

TOE PROTECTION SEE DETAIL B

CL. 'B' RIP RAP EST. 2.0 TONS EST. 5.0 S.Y.F.F.

CL. 'B' RIP RAP EST. 2.0 TONS EST. 5 S.Y.F.F.

CL. 'B' RIP RAP EST. 3 TONS EST. 10 S.Y.F.F.

CL. 'B' RIP RAP EST. 2.0 TONS EST. 5.0 S.Y.F.F.

SEE DETAIL FM

SEE DETAIL C FM

N 25° 17' 46.5" W

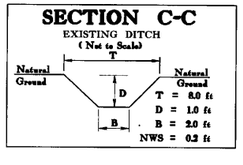
SPECIAL CUT DITCH SEE DETAIL A

114 115 116 117 118 119 120 121

50' 0 100'

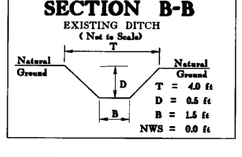
SCALE: 1" : 100'

SECTION C-C
EXISTING DITCH
(Not to Scale)



T = 8.0 ft
D = 1.0 ft
B = 2.0 ft
NWS = 0.2 ft

SECTION B-B
EXISTING DITCH
(Not to Scale)



T = 4.0 ft
D = 0.5 ft
B = 1.5 ft
NWS = 0.0 ft

FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

ENGLISH

SITE 23 -L- STA. 476 + 50

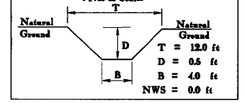
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	52

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

SECTION E-E
EXISTING DITCH
(Not to Scale)



SECTION B-B
EXISTING DITCH
(Not to Scale)

FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

MATCHLINE -L- STA. 472+00.00 SEE SHEET 36

MATCHLINE -L- STA. 486+00.00 SEE SHEET 38

-L- SRS Sta. 473+45.10

-L- SC Sta. 475+45.10

-L- CS Sta. 479+49.47

-L- ST Sta. 481+77.77

BL-77
-BL- 474+14.58 PINC=
-L- 480+97.84, 54.93' RT

M. WAYNE MANGUM
MARY JANE D. MANGUM

DAVID WILSON

JAMES W. SELF
NANCY W. SELF

CELESTE A. BRYCHEK

WILLIAM B. MULDROW
BETTY W. MULDROW

MARY ALICE BRASWELL FAGG

SAREM VONG

ROBERT L. MASHBURN
ALICE S. MASHBURN

LATERAL BASE DITCH SEE DETAIL O

LATERAL BASE DITCH SEE DETAIL G

HEAD BASE DITCH SEE DETAIL K
EST. 5 C.Y. DDE

CL. 'B' RIP RAP EST. 5 TONS EST. 14 S.Y.F.F.

LATERAL 'V' DITCH SEE DETAIL P

LATERAL 'V' DITCH SEE DETAIL R

SPECIAL CUT DITCH SEE DETAIL A

CL. 'B' RIP RAP EST. 10 TONS EST. 5 S.Y.F.F.

RECONNECT W/ ASPHALT PAVEMENT

REMOVE

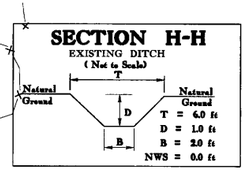
CURVE L-12

CURVE L-13

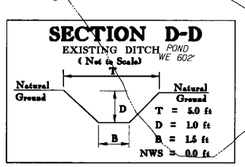
-L- N 25°23'22.7"W

US 601 BST

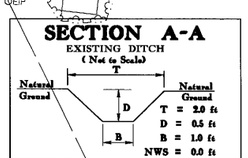
SECTION H-H
EXISTING DITCH
(Not to Scale)



SECTION D-D
EXISTING DITCH POND WE 602'
(Not to Scale)



SECTION A-A
EXISTING DITCH
(Not to Scale)



50' 0 100'

SCALE: 1" : 100'

a 472+11.77
0° 45' 00.0"
200.00'
133.33'
66.67'

CURVE L-13

Pls Sta 474+78.43	Pl Sta 477+61.49	Pls Sta 480+44.44
Θs = 0° 45' 00.0"	Δ= 3° 14' 42.2" (RT)	Θs = 0° 45' 00.0"
Ls = 200.00'	D = 0° 45' 00.0"	Ls = 200.00'
LT = 133.33'	T = 216.39'	LT = 133.33'
ST = 66.67'	L = 432.67'	ST = 66.67'
	R = 7,639.44'	
	SE = 0.03 FT/FT	

ENGLISH

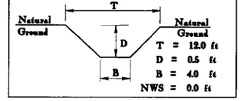
SITE 23 -L- STA. 476 + 50

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	53
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

SECTION E-E
EXISTING DITCH
(Not to Scale)



SECTION B-B
EXISTING DITCH
(Not to Scale)

FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

MATCHLINE -L- STA. 472+00.00 SEE SHEET 36

MATCHLINE -L- STA. 486+00.00 SEE SHEET 38

M. WAYNE MANGUM
MARY JANE D. MANGUM

DAVID WILSON

JAMES W. SELF
NANCY W. SELF

MARY ALICE BRASWELL FAGG

CELESTE A. BRYCHEK

WILLIAM B. MULDROW
BETTY W. MULDROW

SAREM VONG

ROBERT L. MASHBURN
ALICE S. MASHBURN

-L- SRS Sta. 473+45.10

-L- SC Sta. 475+45.10

-L- CS Sta. 479+11.77

-L- ST Sta. 481+77.77

-BL- 474+14.58 PINC=
-L- 480+97.84, 54.93' RT

LATERAL BASE DITCH
SEE DETAIL O

LATERAL BASE DITCH
SEE DETAIL G

HEAD BASE DITCH
SEE DETAIL K
EST. 15 C.Y. DDE

TDE

CHORD

CURVE L-12

CURVE L-13

RECONNECT W/ ASPHALT PAVEMENT

REMOVE

SPECIAL CUT DITCH
SEE DETAIL A

LATERAL 'V' DITCH
SEE DETAIL R

LATERAL 'V' DITCH
SEE DETAIL P

CL. 'B' RIP RAP
EST. 5 TONS
EST. 14 S.Y.F.F.

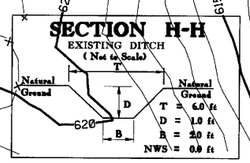
CL. 'B' RIP RAP
EST. 10 TONS
EST. 5 S.Y.F.F.

FL
SEE DETAIL D

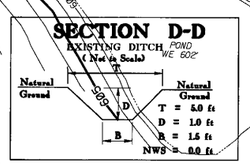
FM
SEE DETAIL C

-L- N 25°23'22.7" W

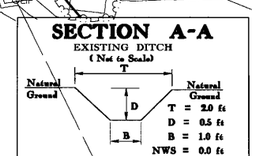
SECTION H-H
EXISTING DITCH
(Not to Scale)



SECTION D-D
EXISTING DITCH POND WE 602
(Not to Scale)



SECTION A-A
EXISTING DITCH
(Not to Scale)



50' 0 100'

SCALE: 1" : 100'

-L- 472+11.77
0° 45' 00.0"
200.00'
133.33'
66.67'

CURVE L-13

PIs Sta 474+78.43
Δs = 0° 45' 00.0"
Ls = 200.00'
LT = 133.33'
ST = 66.67'

PI Sta 477+61.49
Δ = 3° 14' 42.2" (RT)
D = 0° 45' 00.0"
T = 216.39'
L = 432.67'
R = 7,639.44'
SE = 0.03 FT/FT

PIs Sta 480+44.44
Δs = 0° 45' 00.0"
Ls = 200.00'
LT = 133.33'
ST = 66.67'

ENGLISH

SITE 24 -L- STA. 534 + 20

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	S4

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

FILL IN WETLAND
PERMANENT SURFACE WATER IMPACT
MECHANIZED CLEARING
TEMPORARY SURFACE WATER IMPACT

EXISTING DITCH (Not to Scale)
T = 9.8 ft
D = 1.2 ft
B = 4.6 ft
NWS = 6.2 ft

-Y17- POT Sta. 5+00.00
BEGIN CONSTRUCTION
-Y17- POT Sta. 5+25.00

NAD 83

MATCHLINE -L- STA. 528+00.00 SEE SHEET 40

MATCHLINE -L- STA. 542+00.00 SEE SHEET 42

-Y17- N 46°02'53.9" E

-L- N 25°23'22.7" W

-L- POT Sta. 537+60.67 =
-Y17- POT Sta. 10+00.00

JURISDICTIONAL STREAM J-1

PIPE CHANNEL OUTLET SEE DETAIL II
* RIP RAP ON BANKS ONLY
TOE

CL. 'B' RIP RAP
EST. 2.0 TONS
EST. 5 S.Y.F.F.

CL. 'B' RIP RAP
EST. 11 TONS
EST. 28 S.Y.F.F.

CL. 'I' RIP RAP
EST. 2 TONS
EST. 6 S.Y.F.F.

LATERAL 'V' DITCH
SEE DETAIL P

SEE DETAIL C
FM

SEE DETAIL B
FR

REMOVE

PLUG

HEADWALL

TOE PROTECTION
SEE DETAIL B

SPECIAL CUT DITCH
SEE DETAIL A

HEAD BASE DITCH
SEE DETAIL Y
EST. 45 C.Y. DDE

WILMETH RAY WATSON
MARY A. WATSON

US 601 BST

POOL
CONC
ISBKD
HTR
ISFD
WD DECK

158 159 160 161 162 163 164 195 157

50' 0 100'

SCALE: 1" : 100'

ENGLISH

SITE 24 -L- STA. 534 + 20

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	55

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

EXISTING DITCH (Not to Scale)
T = 9.8 ft
D = 1.3 ft
B = 6.5 ft
NWS = 0.2 ft

-Y17- POT Sta. 5+00.00

BEGIN CONSTRUCTION
-Y17- POT Sta. 5+25.00

-Y17- N 46°02'53.9"E

-L- N 25°23'22.7"W

-L- POT Sta. 537+60.67 =
-Y17- POT Sta. 10+00.00

MATCHLINE -L- STA. 528+00 SEE SHEET 40

MATCHLINE -L- STA. 542+00.00 SEE SHEET 42

PIPE CHANNEL OUTLET SEE DETAIL II
RIP RAP ON BANKS ONLY

JURISDICTIONAL STREAM J-1

CL. 'B' RIP RAP EST. 2.0 TONS EST. 5 S.Y.F.F.

CL. 'B' RIP RAP EST. 11 TONS EST. 28 S.Y.F.F.

CL. 'I' RIP RAP EST. 2 TONS EST. 6 S.Y.F.F.

LATERAL 'V' DITCH SEE DETAIL P

SEE DETAIL C FM

SEE DETAIL B FR

REMOVE

TOE PROTECTION SEE DETAIL B

HEADWALL

SPECIAL CUT DITCH SEE DETAIL A

HEAD BASE DITCH SEE DETAIL Y EST. 45 C.Y. DDE

WILMETH RAY WATSON
MARY A. WATSON

US 601 BST

50' 0 100'

SCALE: 1" : 100'

ENGLISH

SITE 25 -L- STA. 549+60

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	56

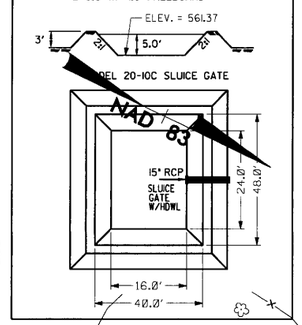
ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

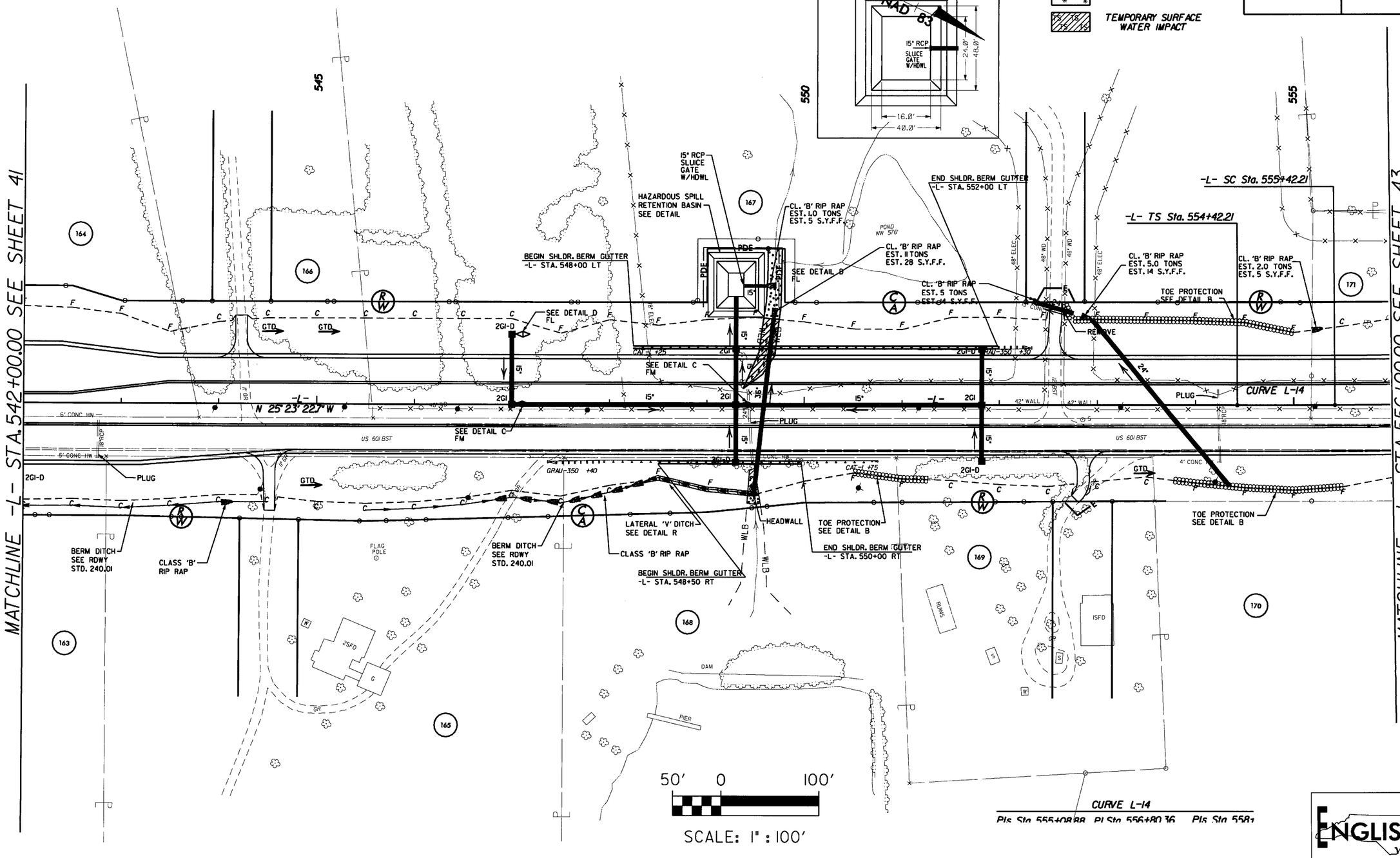
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

FILL IN WETLAND
PERMANENT SURFACE WATER IMPACT
MECHANIZED CLEARING
TEMPORARY SURFACE WATER IMPACT

DETAIL OF HAZARDOUS SPILL RETENTION BASIN
TOTAL CAPACITY REQUIRED : 4789 cu. ft.
TOTAL CAPACITY PROVIDED : 4920 cu. ft.
@ 6.0' W/ 1.0' FREEBOARD





ENGLISH

SITE 25 -L- STA. 549+60

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	57

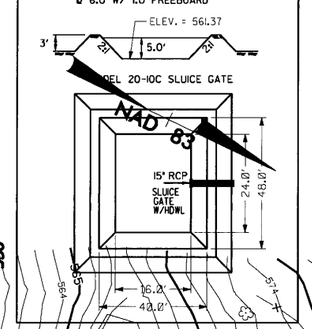
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

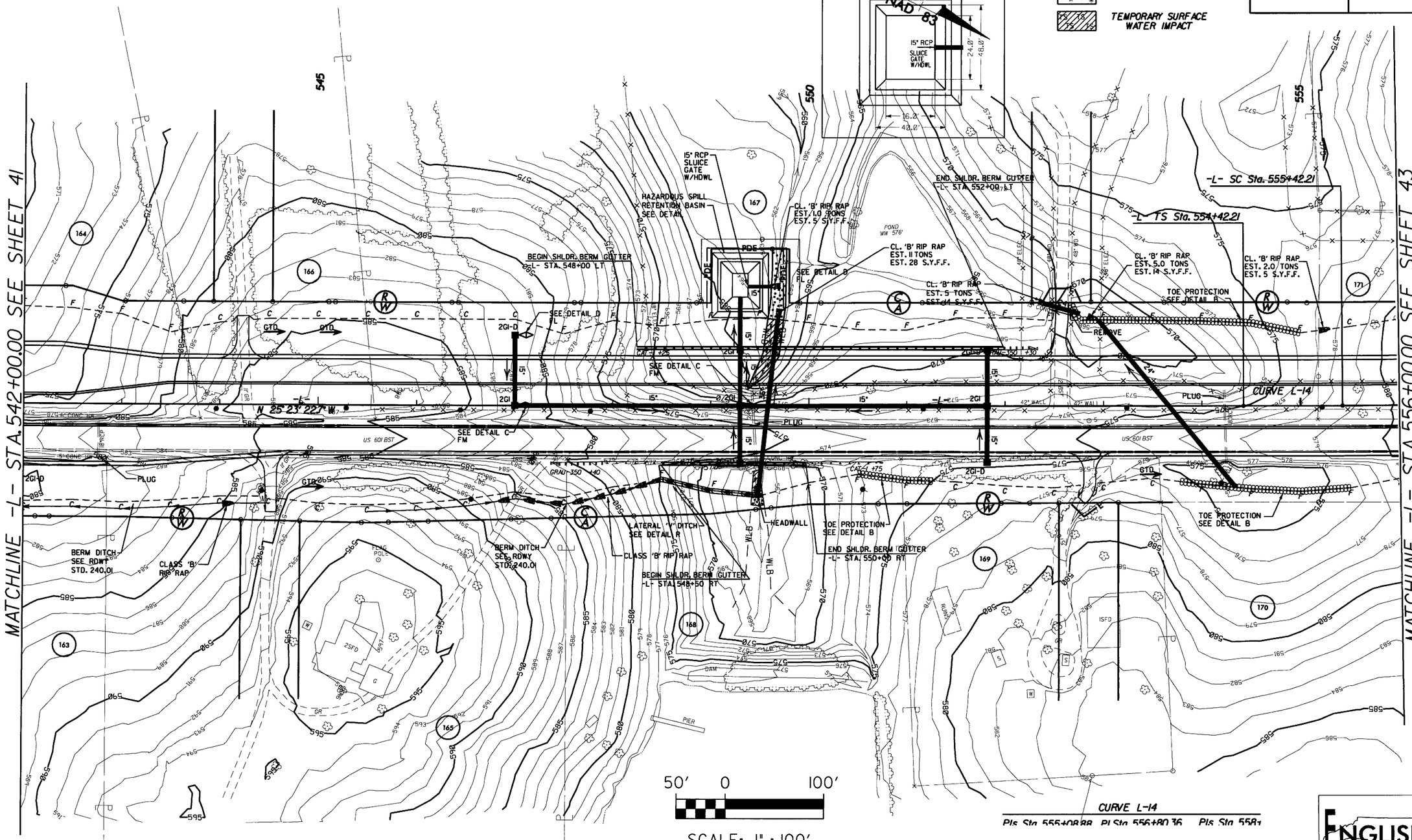
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

FILL IN WETLAND
PERMANENT SURFACE WATER IMPACT
MECHANIZED CLEARING
TEMPORARY SURFACE WATER IMPACT

DETAIL OF HAZARDOUS SPILL RETENTION BASIN
TOTAL CAPACITY REQUIRED : 4789 cu. ft.
TOTAL CAPACITY PROVIDED : 4920 cu. ft.
@ 6.0' W/ 1.0' FREEBOARD





50' 0 100'

SCALE: 1" : 100'

CURVE L-14
PIs Sta 555+08.88 PI Sta 556+80.36 PIs Sta 558+

ENGLISH

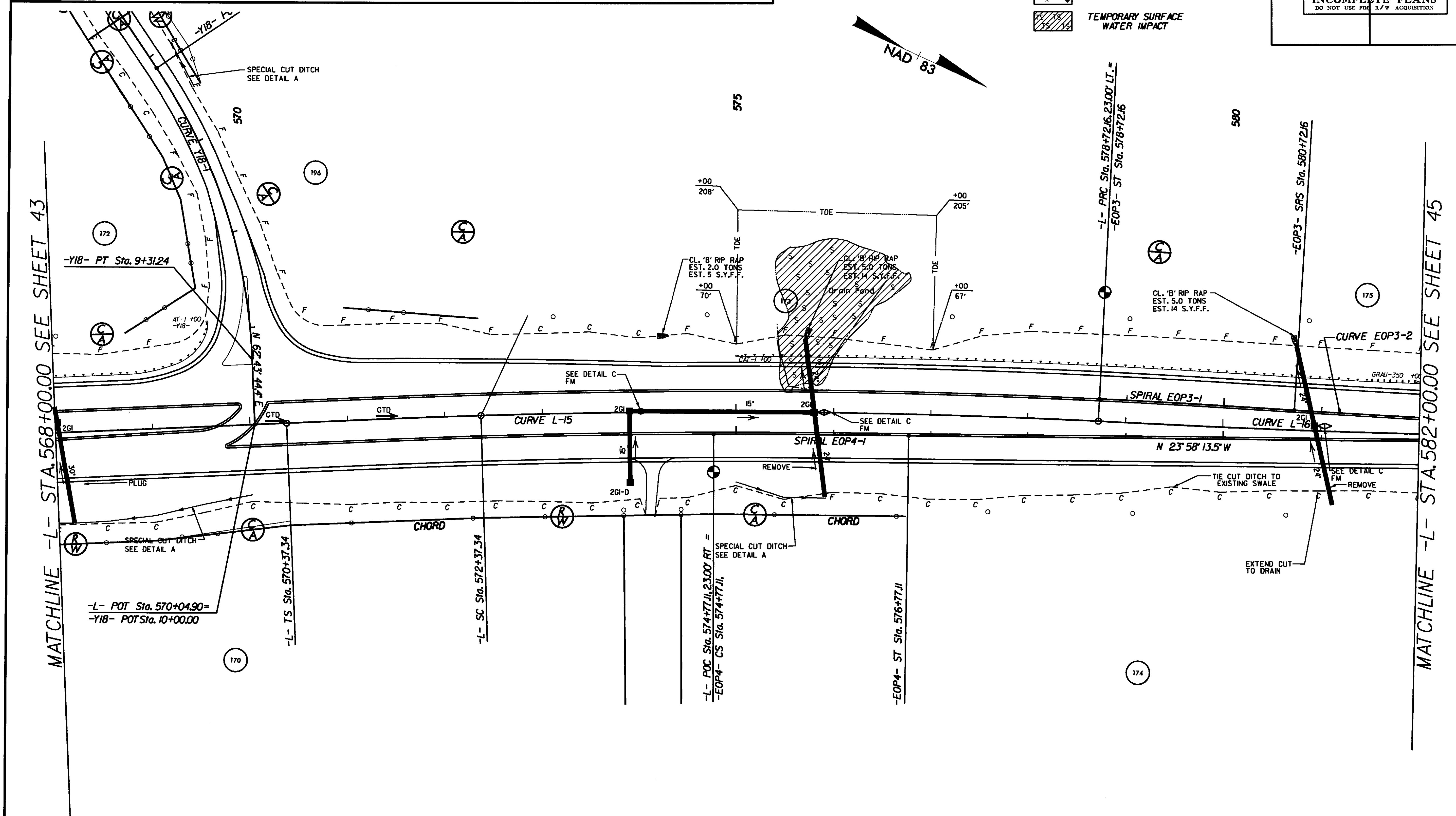
SITE 26 -L- STA. 575 + 85

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	58

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



FILL IN WETLAND
PERMANENT SURFACE WATER IMPACT
MECHANIZED CLEARING
TEMPORARY SURFACE WATER IMPACT
NAD 83
MATCHLINE -L- STA.568+00.00 SEE SHEET 43
MATCHLINE -L- STA.582+00.00 SEE SHEET 45
SPECIAL CUT DITCH SEE DETAIL A
-Y18- PT Sta. 9+31.24
CURVE -Y18-1
TDE
CL. 'B' RIP RAP EST. 2.0 TONS EST. 5 S.Y.F.F.
CL. 'B' RIP RAP EST. 5.0 TONS EST. 14 S.Y.F.F.
Drain Pond
-L- PRC Sta. 578+72.16,23.00' LT. =
-EOP3- ST Sta. 578+72.16
-EOP3- SRS Sta. 580+72.16
CURVE EOP3-2
SPIRAL EOP3-1
CURVE L-15
CURVE L-16
SPIRAL EOP4-1
N 23° 58' 13.5" W
N 62° 43' 44.6" E
SEE DETAIL C FM
REMOVE
PLUG
TIE CUT DITCH TO EXISTING SWALE
EXTEND CUT TO DRAIN
CHORD
-L- POT Sta. 570+04.90=
-Y18- POT Sta. 10+00.00
-L- TS Sta. 570+37.34
-L- SC Sta. 572+37.34
-L- POC Sta. 574+77.11,23.00' RT =
-EOP4- CS Sta. 574+77.11
-EOP4- ST Sta. 576+77.11

50' 0 100'

SCALE: 1" : 100'

ENGLISH

SITE 26 -L- STA. 575 + 85

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	59
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

NAD 83

MATCHLINE -L- STA. 568+00.00 SEE SHEET 43

MATCHLINE -L- STA. 582+00.00 SEE SHEET 45

-Y18- PT Sta. 9+31.24

SPECIAL CUT DITCH SEE DETAIL A

CURVE Y18

CL. 'B' RIP RAP EST. 2.0 TONS EST. 5 S.Y.F.F.

CL. 'B' RIP RAP EST. 5.0 TONS EST. 14 S.Y.F.F.

Drain Pond

CL. 'B' RIP RAP EST. 5.0 TONS EST. 14 S.Y.F.F.

-EOP3- PRC Sta. 578+72.16 = -EOP3- ST Sta. 578+72.16

-EOP3- SRS Sta. 580+72.16

CURVE EOP3-2

SPIRAL EOP3-1

CURVE L-76

SEE DETAIL C FM

SPIRAL EOP4-1

N 23° 58' 13.5" W

REMOVE

TIE CUT DITCH TO EXISTING SWALE

EXTEND CUT TO DRAIN

CURVE L-75

CHORD

-L- POT Sta. 570+04.90 = -Y18- POT Sta. 10+00.00

-L- TS Sta. 570+37.34

-L- SC Sta. 572+37.34

-L- POC Sta. 574+27.11 = -EOP4- CS Sta. 574+77.11

-EOP4- ST Sta. 576+77.11

SPECIAL CUT DITCH SEE DETAIL A

PLUG

50' 0 100'

SCALE: 1" : 100'

ENGLISH

TIP PROJECT R-2616A&B

CONTRACT:

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UNION COUNTY

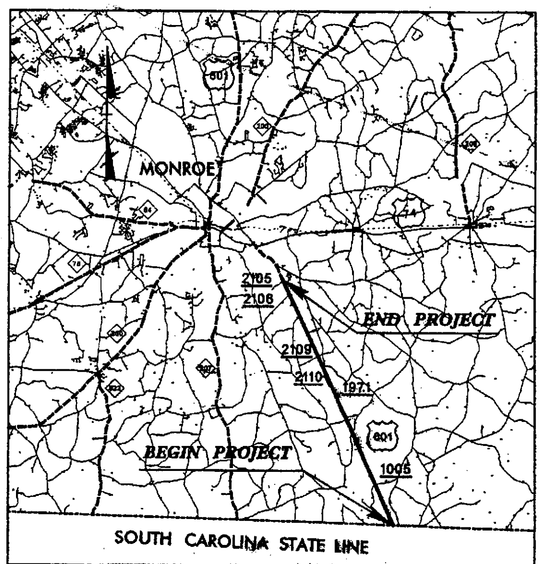
RECEIVED
MAY 18 2005
DIVISION OF HIGHWAYS
PDEA-OFFICE OF NATURAL ENVIRONMENT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2616A&B	1	46

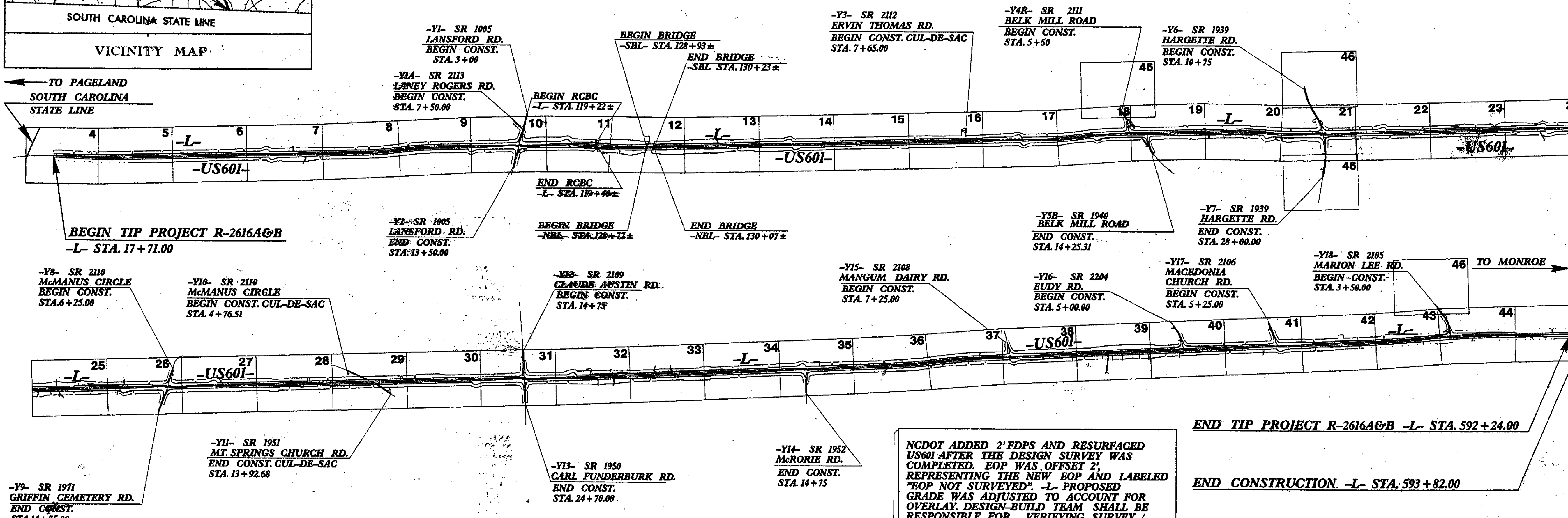
WBS NO.	F.A. PROJ. NO.	DESCRIPTION
34485.1.2	STP-NHS-601(4)	P.E.

LOCATION: US 601 FROM NORTH OF THE SOUTH CAROLINA STATE LINE TO NORTH OF SR 2105 (MARION LEE RD.)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, WIDENING, SIGNING, GUARDRAIL, CULVERTS AND STRUCTURE



VICINITY MAP



NCDOT ADDED 2' FDPS AND RESURFACED US601 AFTER THE DESIGN SURVEY WAS COMPLETED. EOP WAS OFFSET 2', REPRESENTING THE NEW EOP AND LABELED "EOP NOT SURVEYED". -L- PROPOSED GRADE WAS ADJUSTED TO ACCOUNT FOR OVERLAY. DESIGN-BUILD TEAM SHALL BE RESPONSIBLE FOR VERIFYING SURVEY / ADJUSTING GRADES AS REQUIRED.

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

PROPERTIES WITH GREATER THAN 2000' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

NCDOT CONTACT: DAVIDIAN BYRD
ROADWAY DESIGN UNIT - ENGINEERING COORDINATION

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS
50 25 0 50 100
PROFILE (HORIZONTAL)
10 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2002 = 12,000
ADT 2025 = 23,800
DHV = 10 %
D = 60 %
T = 24 % *
V = 60 MPH
* TTST 17 % + DUAL 7 %

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2616A&B = 10.852± MI.
LENGTH OF STRUCTURES, TIP PROJECT R-2616A&B = 0.029± MI.
TOTAL LENGTH OF TIP PROJECT R-2616A&B* = 10.881 MI.

*NOTE: LENGTH BASED ON NBL -L-

Prepared In the Office of:
RALPH WHITEHEAD ASSOCIATES, INC.
for the North Carolina Department of Transportation

2002 STANDARD SPECIFICATIONS

PRODUCTION DATES
RIGHT OF WAY JULY 15, 2005 — LETTING SEPTEMBER 20, 2005

TIP DATES
RIGHT OF WAY MARCH 31, 2005 — LETTING SEPTEMBER 2005

JOHN N. JOHNSON, P.E.
PROJECT ENGINEER

GERALD BARBOUR
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER
SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER P.E.

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR DATE

04/08/2005
r:\Roadway\Proj\R2616_RDY_tsh.dgn

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2616A&B	1-B

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

*S.U.E = SUBSURFACE UTILITY ENGINEER

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL SYMBOLS

ROADS & RELATED ITEMS

- Edge of Pavement
- Curb
- Prop. Slope Stakes Cut — C
- Prop. Slope Stakes Fill — F
- Prop. Woven Wire Fence
- Prop. Chain Link Fence
- Prop. Barbed Wire Fence
- Prop. Wheelchair Ramp — WCR
- Curb Cut for Future Wheelchair Ramp — CCFR
- Exist. Guardrail
- Prop. Guardrail
- Equality Symbol
- Pavement Removal

RIGHT OF WAY

- Baseline Control Point
- Existing Right of Way Marker
- Exist. Right of Way Line w/Marker
- Prop. Right of Way Line with Proposed R/W Marker (Iron Pin & Cap)
- Prop. Right of Way Line with Proposed (Concrete or Granite) R/W Marker
- Exist. Control of Access Line — CA
- Prop. Control of Access Line — CA
- Exist. Easement Line — E
- Prop. Temp. Construction Easement Line — E
- Prop. Temp. Drainage Easement Line — TDE
- Prop. Perm. Drainage Easement Line — PDE

HYDROLOGY

- Stream or Body of Water
- River Basin Buffer — BZ
- Flow Arrow
- Disappearing Stream
- Spring
- Swamp Marsh
- Shoreline
- Falls, Rapids
- Prop Lateral, Tail, Head Ditches — FLOW

STRUCTURES

MAJOR

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

MINOR

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

UTILITIES

- Exist. Pole
- Exist. Power Pole
- Prop. Power Pole
- Exist. Telephone Pole
- Prop. Telephone Pole
- Exist. Joint Use Pole
- Prop. Joint Use Pole
- Telephone Pedestal — T
- U/G Telephone Cable Hand Hold — HH
- Cable TV Pedestal — C
- U/G TV Cable Hand Hold — HH
- U/G Power Cable Hand Hold — HH
- Hydrant
- Satellite Dish
- Exist. Water Valve
- Sewer Clean Out
- Power Manhole — P
- Telephone Booth
- Cellular Telephone Tower
- Water Manhole — W
- Light Pole
- H-Frame Pole
- Power Line Tower
- Pole with Base
- Gas Valve
- Gas Meter
- Telephone Manhole — T
- Power Transformer
- Sanitary Sewer Manhole — S
- Storm Sewer Manhole — S
- Tank; Water, Gas, Oil
- Water Tank With Legs
- Traffic Signal Junction Box — S
- Fiber Optic Splice Box — F
- Television or Radio Tower
- Utility Power Line Connects to Traffic Signal Lines Cut Into the Pavement — TS — TS

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

BOUNDARIES & PROPERTIES

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Property Line Symbol — PL
- Exist. Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Property Number — 123
- Parcel Number — 6
- Fence Line — WW & ISBW
- Existing Wetland Boundaries — WLB
- High Quality Wetland Boundary — HQ WLB
- Medium Quality Wetland Boundaries — MQ WLB
- Low Quality Wetland Boundaries — LQ WLB
- Proposed Wetland Boundaries — WLB
- Existing Endangered Animal Boundaries — EAB
- Existing Endangered Plant Boundaries — EPB

BUILDINGS & OTHER CULTURE

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

TOPOGRAPHY

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

VEGETATION

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

RAILROADS

- Standard Gauge
- RR Signal Milepost — CSX TRANSPORTATION — MILEPOST 35
- Switch — SWITCH

8/17/99

REVISIONS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "R2616-13"
WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 418037.380(ft) EASTING: 1562547.518(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99986650
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "R2616-13" TO -L- STATION POC 17+71.00 IS S 23°56'23.87" E 29,167.77'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

THE DESIGN BUILD TEAM WILL COORDINATE THE ALIGNMENT OF R-2616 WITH THE EXISTING ALIGNMENT OF SCDOT PROJECT NO.BNH-PDCB(004)

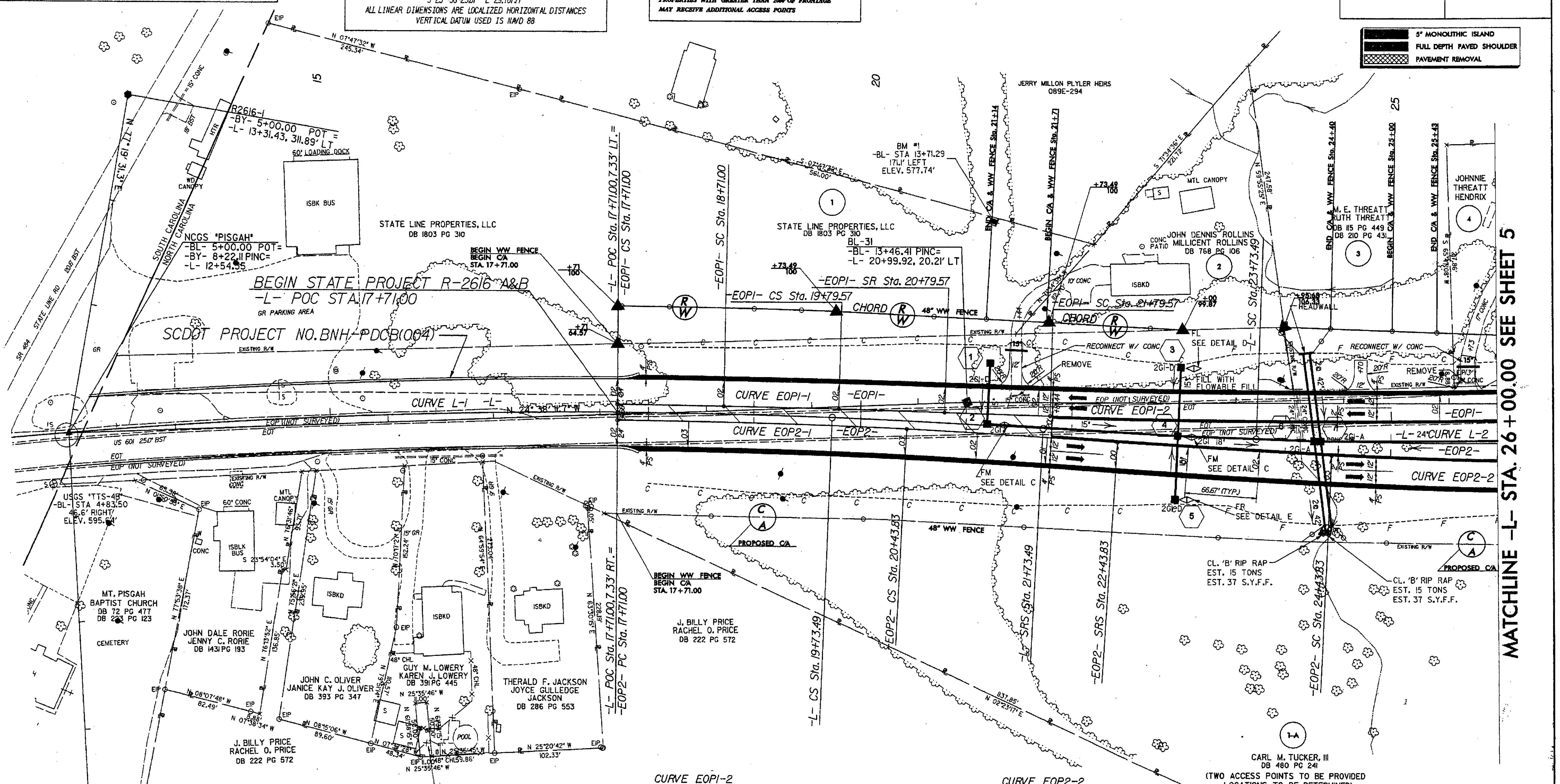
THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

PROPERTIES WITH GREATER THAN 300' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



JOHN C. OLIVER
JANICE KAY J. OLIVER
DB 393 PG 347

CURVE EOP1-2

PIs Sta 21+46.23	PI Sta 24+35.54	PIs Sta 27+24.74
Θs = 0° 17' 11.3"	Δ = 2° 55' 57.5" (LT)	Θs = 0° 17' 11.3"
Ls = 100.00'	D = 0° 34' 22.6"	Ls = 100.00'
LT = 66.67'	L = 511.84'	LT = 66.67'
ST = 33.33'	T = 255.98'	ST = 33.33'
	SE = 0.02 FT./FT.	

CURVE EOP2-2

PIs Sta 23+77.16	PI Sta 26+25.99	PIs Sta 28+74.71
Θs = 0° 57' 17.7"	Δ = 3° 28' 40.8" (LT)	Θs = 0° 57' 17.7"
Ls = 200.00'	D = 0° 57' 17.7"	Ls = 200.00'
LT = 133.34'	T = 182.16'	LT = 133.34'
ST = 66.67'	L = 364.22'	ST = 66.67'
	R = 6,000.00'	
	SE = 0.03 FT./FT.	

CURVE EOP1-1

PIs Sta 18+16.87	PI Sta 19+25.28	PIs Sta 20+12.90
Θs = 0° 17' 11.3"	Δ = 0° 37' 19.3" (RT)	Θs = 0° 17' 11.3"
Θs = 0° 28' 31.0"	D = 0° 34' 22.6"	Ls = 100.00'
Ls = 100.00'	L = 108.57'	LT = 66.67'
LT = 54.13'	T = 54.28'	ST = 33.33'
ST = 45.87'	R = 10,000.00'	
	SE = NC (MATCH SCDOT)	

CURVE EOP2-1

PI Sta 19+07.44	PIs Sta 20+10.49
Δ = 2° 35' 58.8" (RT)	Θs = 0° 57' 10.3"
D = 0° 57' 10.3"	Ls = 200.00'
T = 136.44'	LT = 133.34'
L = 272.83'	ST = 66.67'
R = 6,013.00'	
SE = 0.03 FT./FT.	

CURVE L-1

PI Sta 15+70.76	PIs Sta 20+40.15
Δ = 7° 40' 37.3" (RT)	Θs = 0° 57' 06.1"
D = 0° 57' 06.1"	Ls = 200.00'
T = 403.94'	LT = 133.34'
L = 806.66'	ST = 66.67'
R = 6,020.33'	

CURVE L-2

PIs Sta 23+06.82	PI Sta 25+09.22	PIs Sta 27+11.56
Θs = 1° 00' 00.0"	Δ = 2° 42' 50.8" (LT)	Θs = 1° 00' 00.0"
Ls = 200.00'	D = 1° 00' 00.0"	Ls = 200.00'
LT = 133.34'	T = 135.73'	LT = 133.34'
ST = 66.67'	L = 271.41'	ST = 66.67'
	R = 5,729.58'	

SEE SHEET 47 FOR -L- PROFILE.

1/08/2005
...\R2616_RDY_psh04.dgn

8/17/99

REVISIONS

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

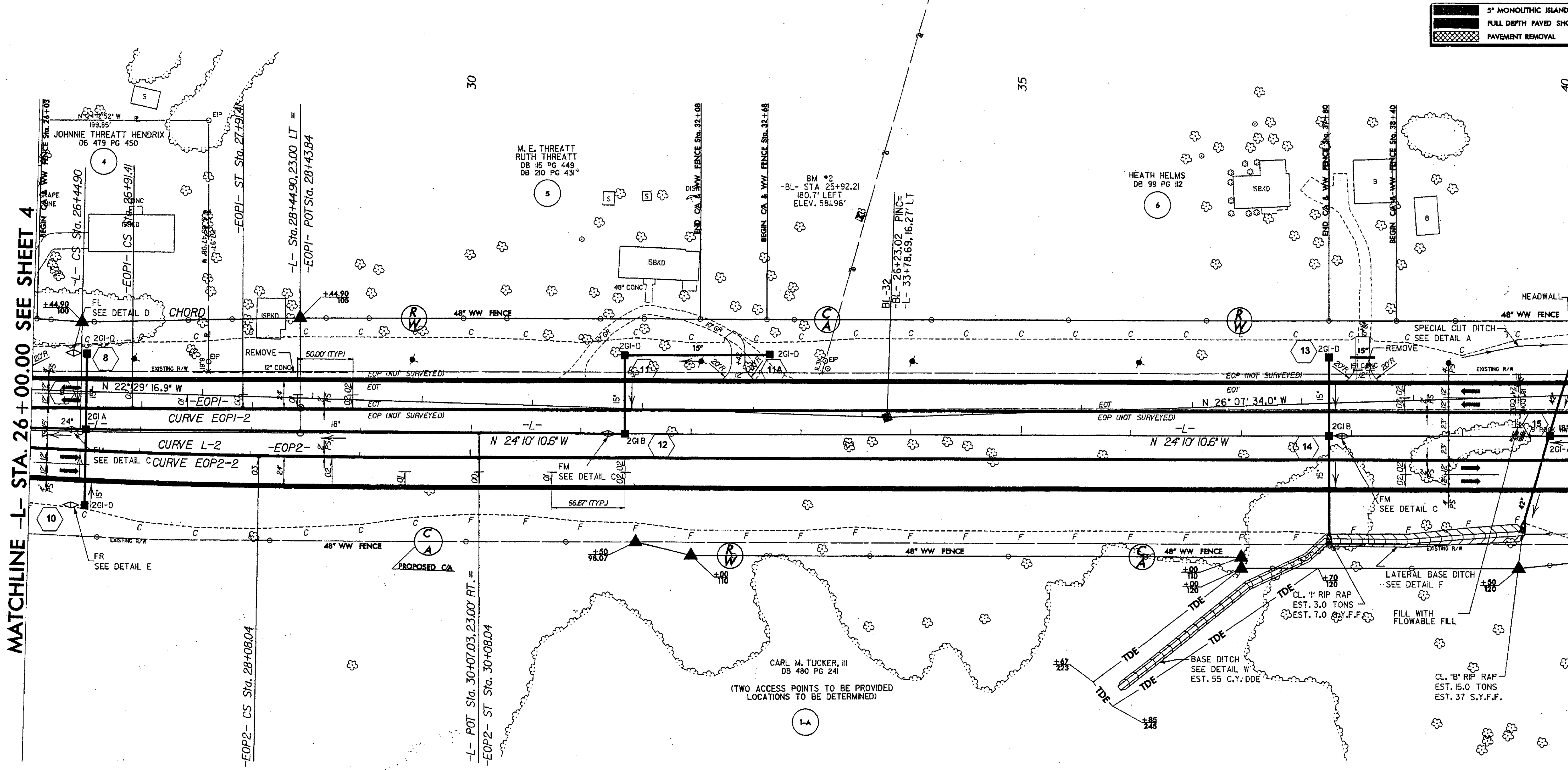
PROPERTIES WITH GREATER THAN 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



NAD 83
MATCHLINE -L- STA. 26+00.00 SEE SHEET 4
MATCHLINE -L- STA. 40+00.00 SEE SHEET 6
JOHNNIE THREATT HENDRIX
DB 479 PG 450
M. E. THREATT
RUTH THREATT
DB 115 PG 449
DB 210 PG 431
HEATH HELMS
DB 99 PG 112
CARL M. TUCKER, III
DB 480 PG 241
(TWO ACCESS POINTS TO BE PROVIDED LOCATIONS TO BE DETERMINED)
BM #2
-BL- STA 25+92.21
180.7' LEFT
ELEV. 581.96'
N 22° 29' 16.9" W
N 24°10' 10.6" W
N 26° 07' 34.0" W
CURVE EOP1-2
CURVE L-2
CURVE EOP2-2
48" WW FENCE
SEE DETAIL D
SEE DETAIL C
SEE DETAIL E
SEE DETAIL A
SEE DETAIL F
SPECIAL CUT DITCH
LATERAL BASE DITCH
FILL WITH FLOWABLE FILL
BASE DITCH SEE DETAIL W EST. 55 C.Y. DDE
CL. 'I' RIP RAP EST. 3.0 TONS EST. 7.0 S.Y.F.F.
CL. 'B' RIP RAP EST. 15.0 TONS EST. 37 S.Y.F.F.
HEADWALL
PROPOSED C/A

CURVE EOP1-2

PIs Sta 21+46.23	PI Sta 24+35.54	PIs Sta 27+24.74
Θs = 0° 17' 11.3"	Δ = 2° 55' 57.5" (LT)	Θs = 0° 17' 11.3"
Ls = 100.00'	D = 0° 34' 22.6"	Ls = 100.00'
LT = 66.67'	L = 511.84'	LT = 66.67'
ST = 33.33'	T = 255.98'	ST = 33.33'
	R = 10,000.00'	
	SE = 0.02 FT./FT.	

CURVE EOP2-2

PIs Sta 23+77.16	PI Sta 26+25.99	PIs Sta 28+74.71
Θs = 0° 57' 17.7"	Δ = 3° 28' 40.8" (LT)	Θs = 0° 57' 17.7"
Ls = 200.00'	D = 0° 57' 17.7"	Ls = 200.00'
LT = 133.34'	T = 182.16'	LT = 133.34'
ST = 66.67'	L = 364.22'	ST = 66.67'
	R = 6,000.00'	
	SE = 0.03 FT./FT.	

CURVE L-2

PIs Sta 23+06.82	PI Sta 25+09.22	PIs Sta 27+11.56
Θs = 1° 00' 00.0"	Δ = 2° 42' 50.8" (LT)	Θs = 1° 00' 00.0"
Ls = 200.00'	D = 1° 00' 00.0"	Ls = 200.00'
LT = 133.34'	T = 135.73'	LT = 133.34'
ST = 66.67'	L = 271.41'	ST = 66.67'
	R = 5,729.58'	

SEE SHEET 48 FOR -L- PROFILE.

8/17/99

REVISIONS

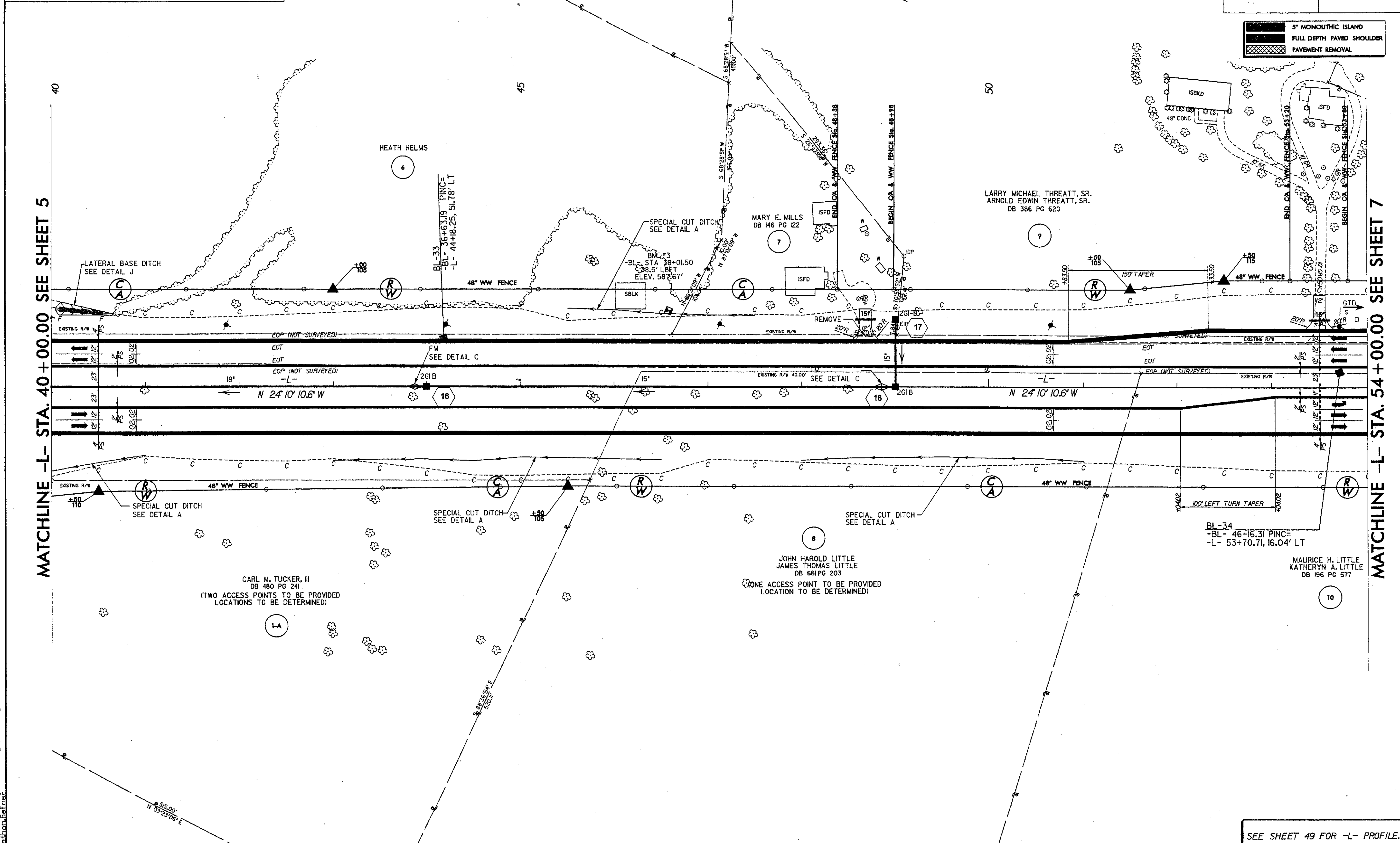
THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

PROPERTIES WITH GREATER THAN 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION


5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL
NAD 83
40
45
50
MATCHLINE -L- STA. 40+00.00 SEE SHEET 5
MATCHLINE -L- STA. 54+00.00 SEE SHEET 7
HEATH HELMS
6
BL-33
-BL- 36+63.19 PINC=
-L- 44+18.25, 51.78' LT
LATERAL BASE DITCH
SEE DETAIL J
48" WW FENCE
SPECIAL CUT DITCH
SEE DETAIL A
BM #3
-BL- STA 39+01.50
38.5' LEFT
ELEV. 587.67'
MARY E. MILLS
DB 146 PG 122
7
ISFD
ISBLK
END C/A & WW FENCE Sta. 48+38
BEGIN C/A & WW FENCE Sta. 48+98
REMOVE
2GI-B
17
LARRY MICHAEL THREATT, SR.
ARNOLD EDWIN THREATT, SR.
DB 386 PG 620
9
150' TAPER
ISBKD
48" CONC
ISFD
END C/A & WW FENCE Sta. 53+20
BEGIN C/A & WW FENCE Sta. 53+80
EXISTING R/W
EOP (NOT SURVEYED)
EOT
FM
SEE DETAIL C
2GIB
16
18
-L-
N 24°10'10.6" W
GTD
CARL M. TUCKER, III
DB 480 PG 241
(TWO ACCESS POINTS TO BE PROVIDED
LOCATIONS TO BE DETERMINED)
1-A
JOHN HAROLD LITTLE
JAMES THOMAS LITTLE
DB 661 PG 203
(ONE ACCESS POINT TO BE PROVIDED
LOCATION TO BE DETERMINED)
8
100' LEFT TURN TAPER
BL-34
-BL- 46+16.31 PINC=
-L- 53+70.71, 16.04' LT
MAURICE H. LITTLE
KATHERYN A. LITTLE
DB 196 PG 577
10

SEE SHEET 49 FOR -L- PROFILE.

4/06/2005
:\roadway\proj\r2616_rdy_psh06.dgn

8/17/99

REVISIONS

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

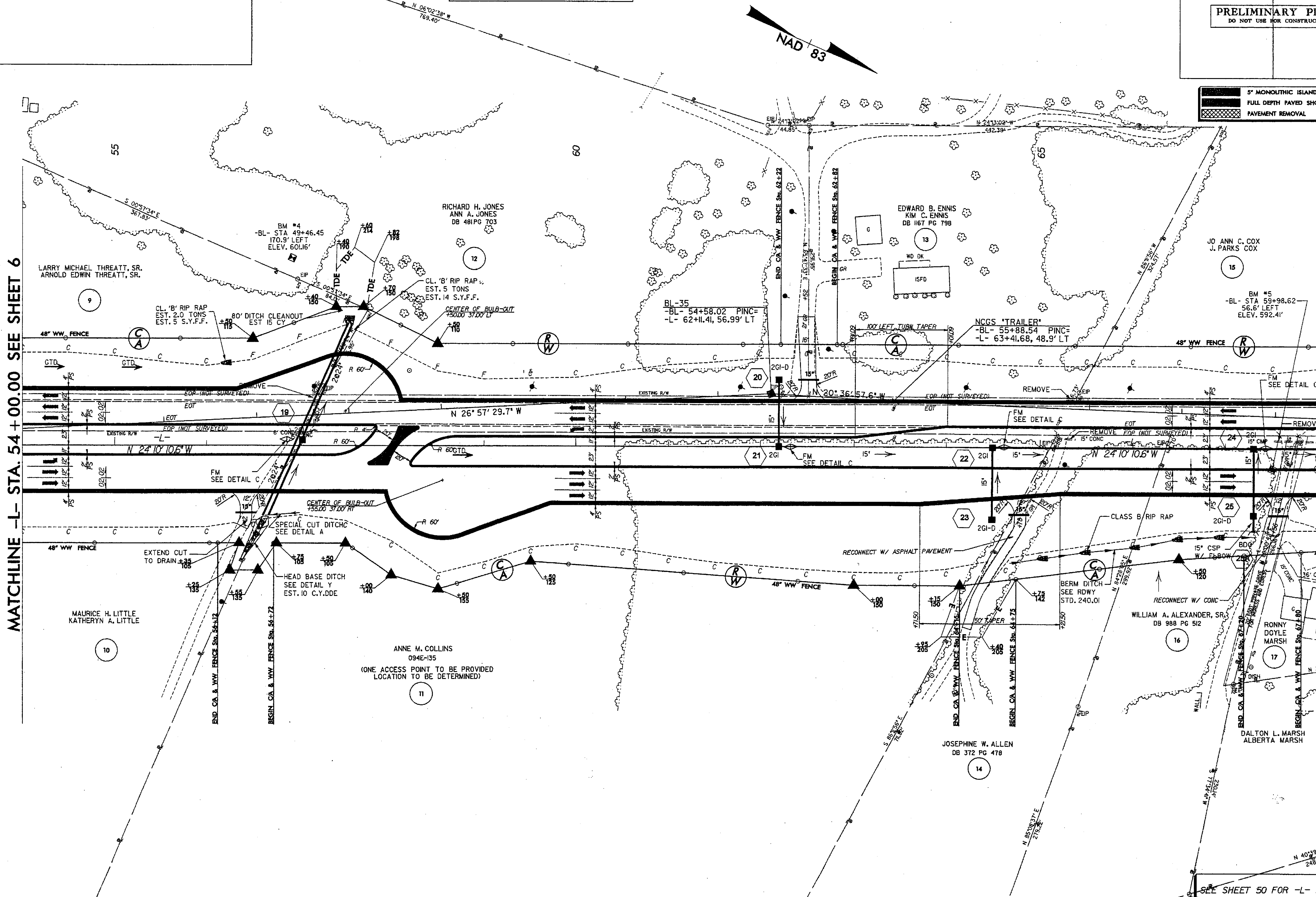
PROPERTIES WITH GREATER THAN 2000' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Legend
5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



NAD 83
MATCHLINE -L- STA. 54+00.00 SEE SHEET 6
MATCHLINE -L- STA. 68+00.00 SEE SHEET 8
LARRY MICHAEL THREATT, SR.
ARNOLD EDWIN THREATT, SR.
RICHARD H. JONES
ANN A. JONES
DB 481 PG 703
EDWARD B. ENNIS
KIM C. ENNIS
DB 1167 PG 798
JO ANN C. COX
J. PARKS COX
MAURICE H. LITTLE
KATHERYN A. LITTLE
ANNE M. COLLINS
094E-135
(ONE ACCESS POINT TO BE PROVIDED LOCATION TO BE DETERMINED)
JOSEPHINE W. ALLEN
DB 372 PG 478
WILLIAM A. ALEXANDER, SR.
DB 988 PG 512
RONNY DOYLE MARSH
DALTON L. MARSH
ALBERTA MARSH
BM #4
-BL- STA 49+46.45
170.9' LEFT
ELEV. 601.16'
BM #5
-BL- STA 59+98.62
56.6' LEFT
ELEV. 592.41'
BL-35
-BL- 54+58.02 PINC=
-L- 62+11.41, 56.99' LT
NCGS "TRAILER"
-BL- 55+88.54 PINC=
-L- 63+41.68, 48.9' LT
CL. 'B' RIP RAP
EST. 2.0 TONS
EST. 5 S.Y.F.F.
80' DITCH CLEANOUT
EST 15 CY
CL. 'B' RIP RAP
EST. 5 TONS
EST. 14 S.Y.F.F.
CENTER OF BULB-OUT
+50.00 37.00' LT
CENTER OF BULB-OUT
+55.00 37.00' RT
N 26° 57' 29.7" W
N 24° 10' 10.6" W
N 20° 36' 57.6" W
SPECIAL CUT DITCH
SEE DETAIL A
EXTEND CUT TO DRAIN
HEAD BASE DITCH
SEE DETAIL Y
EST. 10 C.Y.DDE
FM SEE DETAIL C
100' LEFT TURN TAPER
50' TAPER
CLASS B RIP RAP
RECONNECT W/ ASPHALT PAVEMENT
RECONNECT W/ CONC
BERM DITCH
SEE RDWY
STD. 240.01
15" CSP W/ ELBOW
48" WW FENCE
END C/A & WW FENCE Sta. 56+12
BEGIN C/A & WW FENCE Sta. 56+72
END C/A & WW FENCE Sta. 62+22
BEGIN C/A & WW FENCE Sta. 62+82

04/06/2005
r:\roadway\proj\r2616_rdy_psh07.dgn

8/17/99

REVISIONS

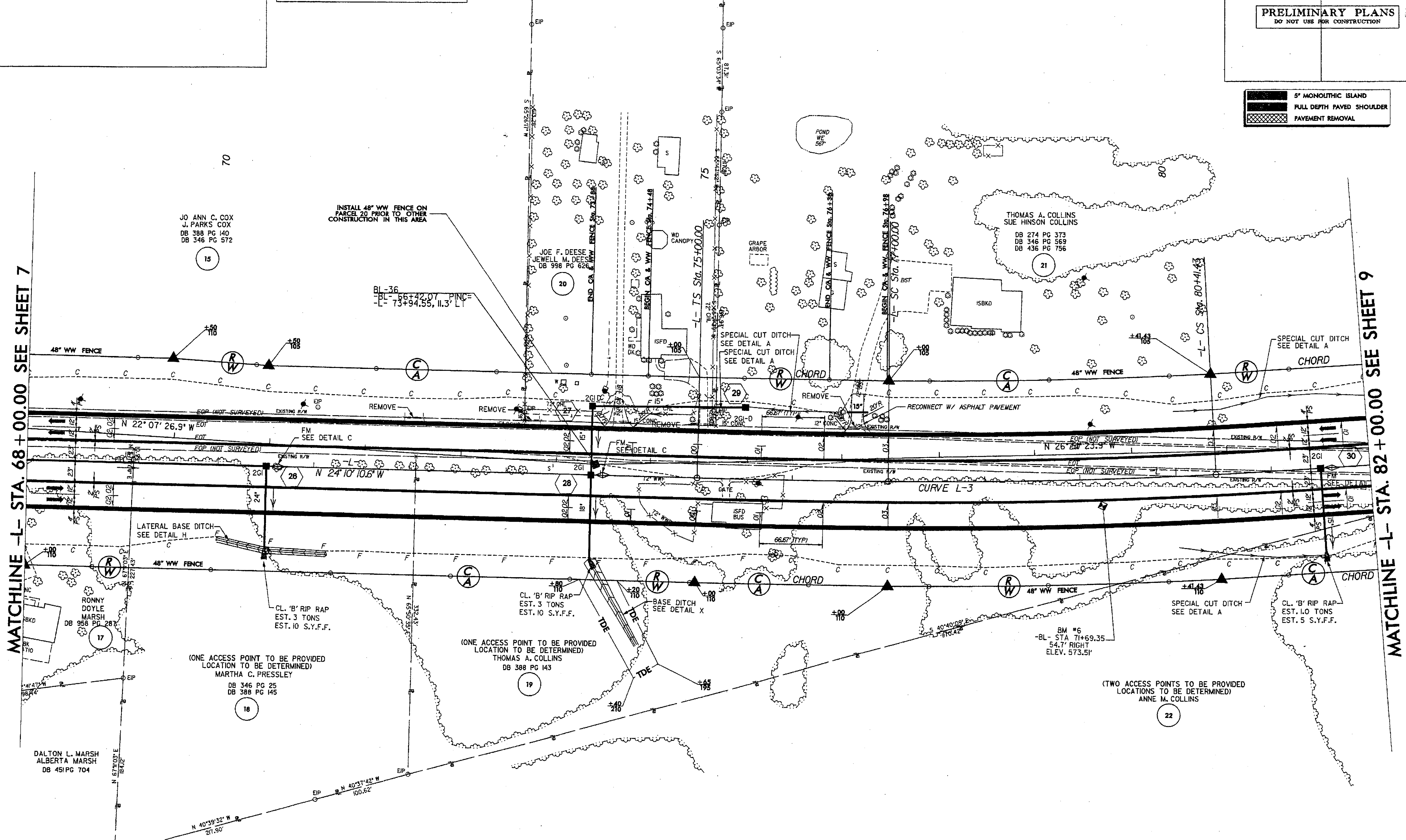
THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

PROPERTIES WITH GREATER THAN 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL
MATCHLINE -L- STA. 68+00.00 SEE SHEET 7
MATCHLINE -L- STA. 82+00.00 SEE SHEET 9
JO ANN C. COX
J. PARKS COX
DB 388 PG 140
DB 346 PG 572
INSTALL 48" WW FENCE ON PARCEL 20 PRIOR TO OTHER CONSTRUCTION IN THIS AREA
BL-36
-BL- 66+42.07 PINC=
-L- 73+94.55, 11.3' LT
JOE F. DEESE
JEWELL M. DEESE
DB 998 PG 626
THOMAS A. COLLINS
SUE HINSON COLLINS
DB 274 PG 373
DB 346 PG 569
DB 436 PG 756
-L- TS Sta. 75+00.00
-L- SC Sta. 77+00.00
-L- CS Sta. 80+41.43
SPECIAL CUT DITCH SEE DETAIL A
48" WW FENCE
N 22° 07' 26.9" W
N 24° 10' 10.6" W
N 26° 24' 23.9" W
FM SEE DETAIL C
CURVE L-3
CHORD
RECONNECT W/ ASPHALT PAVEMENT
REMOVE
LATERAL BASE DITCH SEE DETAIL H
CL. 'B' RIP RAP EST. 3 TONS EST. 10 S.Y.F.F.
BASE DITCH SEE DETAIL X
CL. 'B' RIP RAP EST. 1.0 TONS EST. 5 S.Y.F.F.
BM #6
-BL- STA 71+69.35
54.7' RIGHT
ELEV. 573.51'
RONNY DOYLE MARSH DB 956 PG 287
(ONE ACCESS POINT TO BE PROVIDED LOCATION TO BE DETERMINED)
MARTHA C. PRESSLEY
DB 346 PG 25
DB 388 PG 145
(ONE ACCESS POINT TO BE PROVIDED LOCATION TO BE DETERMINED)
THOMAS A. COLLINS
DB 388 PG 143
(TWO ACCESS POINTS TO BE PROVIDED LOCATIONS TO BE DETERMINED)
ANNE M. COLLINS
DALTON L. MARSH
ALBERTA MARSH
DB 451 PG 704
N 40°37'42" W 100.62'
N 40°39'32" W 211.90'

CURVE L-3		
PIs Sta 76+33.34	PI Sta 78+70.77	PIs Sta 81+08.10
Θs = 1° 00' 00.0"	Δ = 3° 24' 51.6" (LT)	Θs = 1° 00' 00.0"
Ls = 200.00'	D = 1° 00' 00.0"	Ls = 200.00'
LT = 133.34'	T = 170.77'	LT = 133.34'
	L = 341.43'	ST = 66.67'
	R = 5,729.58'	
	SE = 0.03 FT./FT.	

SEE SHEET 51 FOR -L- PROFILE.

04/06/2005
r:\roadway\proj\r2616_rdy_psh08.dgn

8/17/99

REVISIONS

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

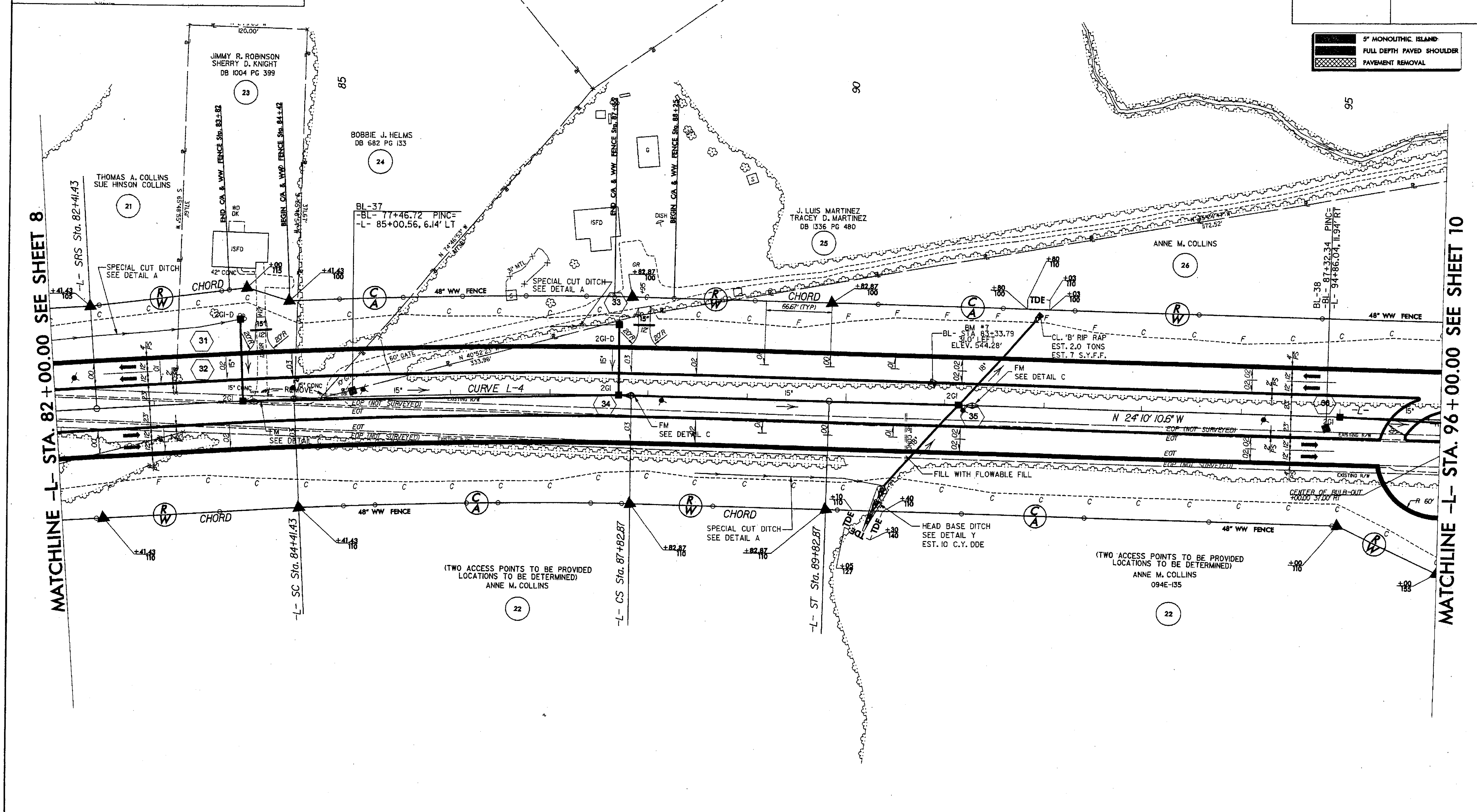
PROPERTIES WITH GREATER THAN 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



CURVE L-3

PIs Sta 76+33.34	PI Sta 78+70.77	PIs Sta 81+08.10
θs = 1° 00' 00.0"	Δ = 3° 24' 51.6" (LT)	θs = 1° 00' 00.0"
Ls = 200.00'	D = 1° 00' 00.0"	Ls = 200.00'
LT = 133.34'	T = 170.77'	LT = 133.34'
	L = 341.43'	ST = 66.67'
	R = 5,729.58'	
	SE = 0.03	

CURVE L-4

PIs Sta 83+74.77	PI Sta 86+12.20	PIs Sta 88+49.53
θs = 1° 00' 00.0"	Δ = 3° 24' 51.6" (RT)	θs = 1° 00' 00.0"
Ls = 200.00'	D = 1° 00' 00.0"	Ls = 200.00'
LT = 133.34'	T = 170.77'	LT = 133.34'
ST = 66.67'	L = 341.43'	ST = 66.67'
	R = 5,729.58'	
	SE = 0.03	

SEE SHEET 52 FOR -L- PROFILE.

04/07/2005
r:\roadway\proj\r-2616_rdy_psh09.dgn
jonathan.heltner

REVISIONS

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

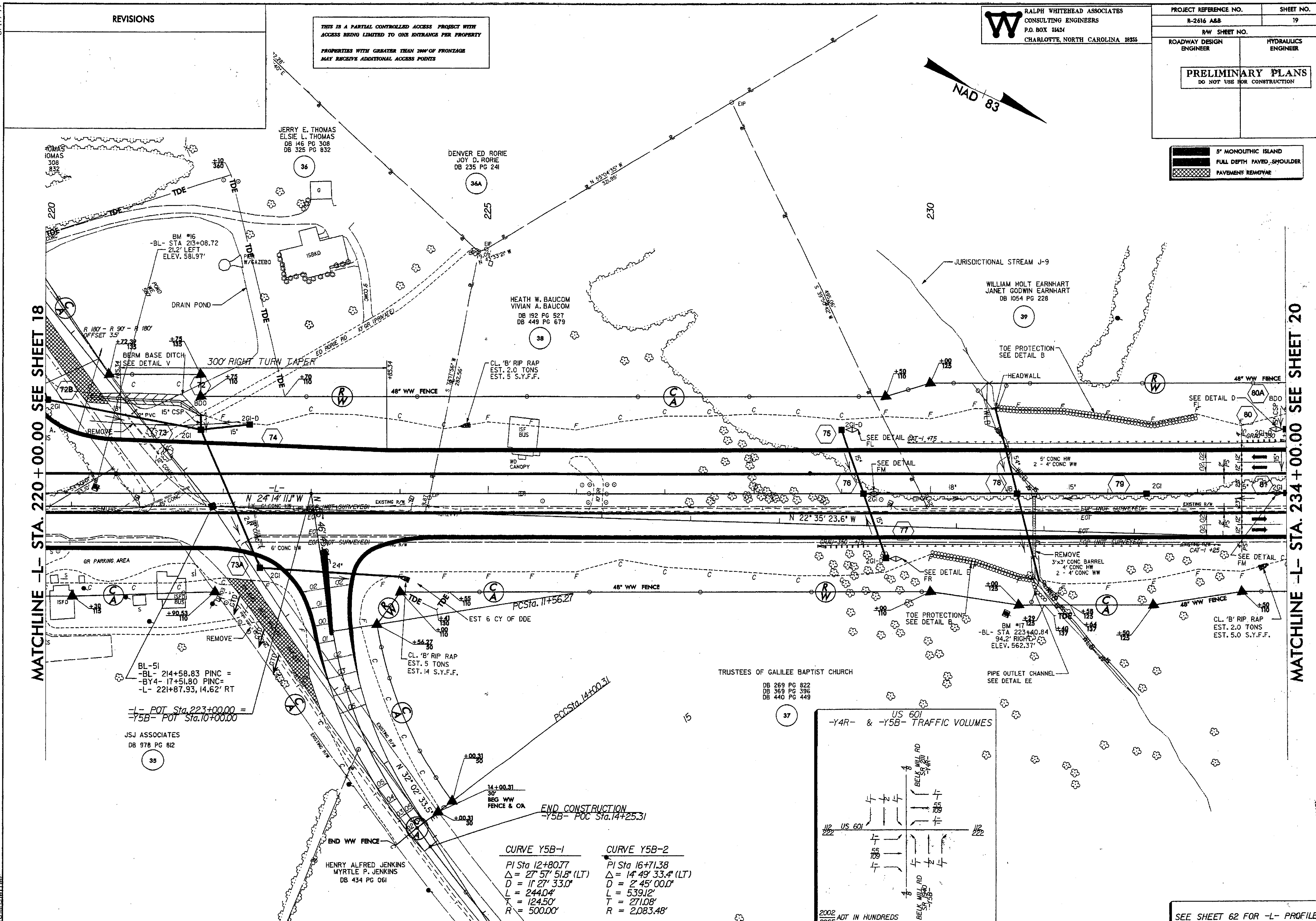
PROPERTIES WITH GREATER THAN 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

	5' MONOLITHIC ISLAND
	FULL DEPTH PAVED SHOULDER
	PAVEMENT REMOVAL


NAD 83
MATCHLINE -L- STA. 220+00.00 SEE SHEET 18
MATCHLINE -L- STA. 234+00.00 SEE SHEET 20
JERRY E. THOMAS
ELSIE L. THOMAS
DB 146 PG 308
DB 325 PG 832
DENVER ED RORIE
JOY D. RORIE
DB 235 PG 241
HEATH W. BAUCOM
VIVIAN A. BAUCOM
DB 192 PG 527
DB 449 PG 679
WILLIAM HOLT EARNHART
JANET GODWIN EARNHART
DB 1054 PG 228
JURISDICTIONAL STREAM J-9
TOE PROTECTION SEE DETAIL B
HEADWALL
300' RIGHT TURN TAPER
BERM BASE DITCH SEE DETAIL V
DRAIN POND
BM #16
-BL- STA 213+08.72
21.2' LEFT
ELEV. 581.97'
CL. 'B' RIP RAP
EST. 2.0 TONS
EST. 5 S.Y.F.F.
48" WW FENCE
N 24° 14' 11.1" W
N 22° 35' 23.6" W
REMOVE
3'x3' CONC BARREL
4' CONC HW
2 - 4' CONC WW
BM #17
-BL- STA 223+40.84
94.2' RIGHT
ELEV. 562.37'
PIPE OUTLET CHANNEL SEE DETAIL EE
TRUSTEES OF GALILEE BAPTIST CHURCH
DB 269 PG 822
DB 369 PG 396
DB 440 PG 449
BL-51
-BL- 214+58.83 PINC =
-BY4- 17+51.80 PINC=
-L- 221+87.93, 14.62' RT
-L- POT Sta.223+00.00 =
-Y5B- POT Sta.10+00.00
JSJ ASSOCIATES
DB 978 PG 812
CL. 'B' RIP RAP
EST. 5 TONS
EST. 14 S.Y.F.F.
EST 6 CY OF DDE
PCSta. 11+56.27
PCCSta. 14+00.31
N 32° 02' 33.5" W
14+00.31
30'
BEG WW
FENCE & C/A
END CONSTRUCTION
-Y5B- POC Sta.14+25.31
END WW FENCE
HENRY ALFRED JENKINS
MYRTLE P. JENKINS
DB 434 PG 061
CL. 'B' RIP RAP
EST. 2.0 TONS
EST. 5.0 S.Y.F.F.

CURVE Y5B-1
PI Sta 12+80.77
Δ = 27° 57' 51.8" (LT)
D = 11° 27' 33.0"
L = 244.04'
T = 124.50'
R = 500.00'

CURVE Y5B-2
PI Sta 16+71.38
Δ = 14° 49' 33.4" (LT)
D = 2° 45' 00.0"
L = 539.12'
T = 271.08'
R = 2,083.48'

US 601
-Y4R- & -Y5B- TRAFFIC VOLUMES

BELK MILL RD
SR 1611
US 601
112
222
55
109
2002
2025
ADT IN HUNDREDS

SEE SHEET 62 FOR -L- PROFILE.

8/17/99
1/08/2005
r2616_rdy_psh19.dgn

8/17/99

REVISIONS

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

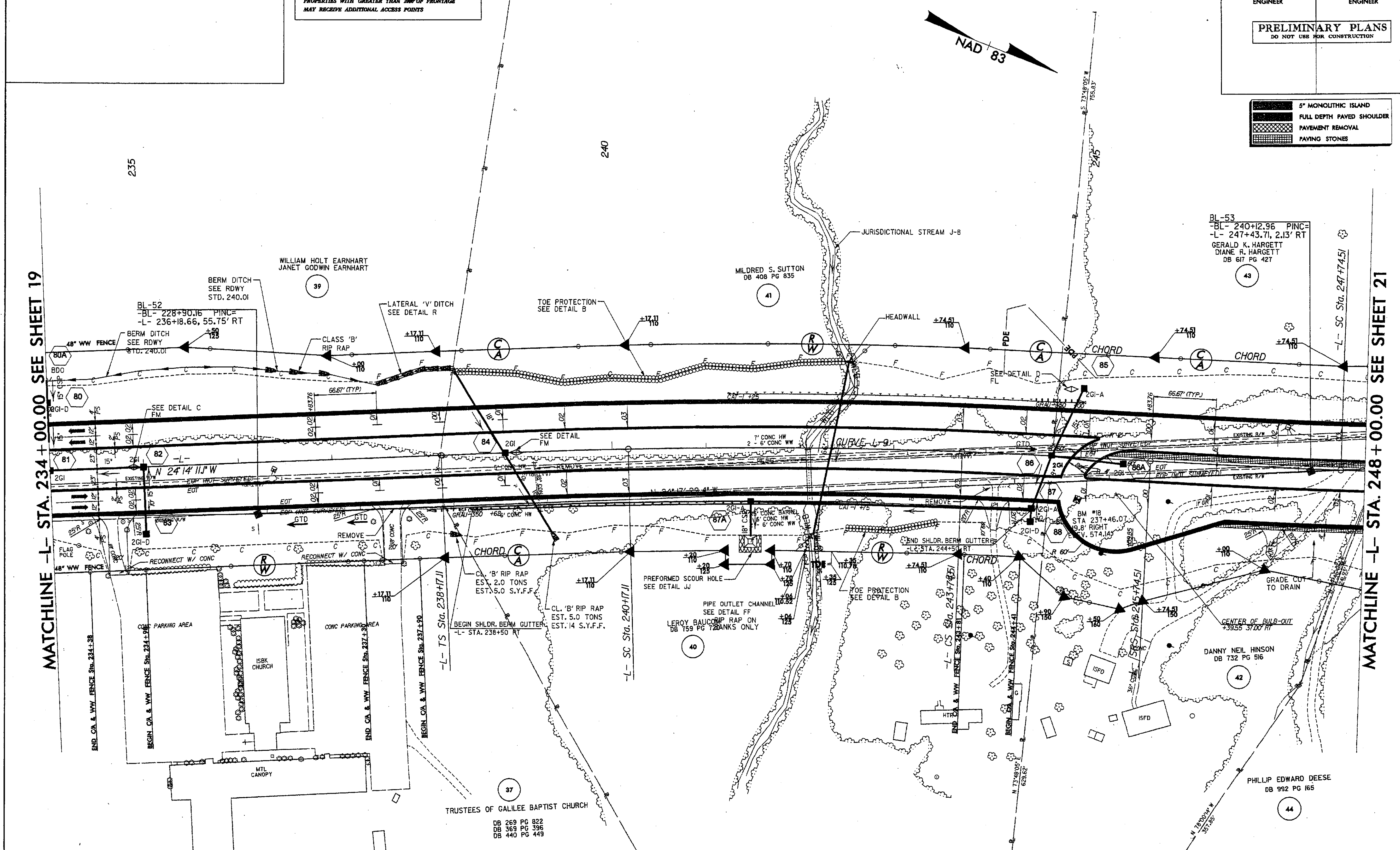
PROPERTIES WITH GREATER THAN 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	20
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

- 5" MONOLITHIC ISLAND
- FULL DEPTH PAVED SHOULDER
- PAVEMENT REMOVAL
- PAVING STONES



NAD 83
MATCHLINE -L- STA. 234+00.00 SEE SHEET 19
MATCHLINE -L- STA. 248+00.00 SEE SHEET 21
235
240
245
WILLIAM HOLT EARNHART
JANET GODWIN EARNHART
BERM DITCH SEE RDWY STD. 240.01
BL-52
-BL- 228+90.16 PINC=
-L- 236+18.66, 55.75' RT
LATERAL 'V' DITCH SEE DETAIL R
CLASS 'B' RIP RAP
TOE PROTECTION SEE DETAIL B
MILDRED S. SUTTON
DB 408 PG 835
JURISDICTIONAL STREAM J-B
HEADWALL
BL-53
-BL- 240+12.96 PINC=
-L- 247+43.71, 2.13' RT
GERALD K. HARGETT
DIANE R. HARGETT
DB 617 PG 427
48" WW FENCE
SEE DETAIL C
SEE DETAIL FM
N 24°14' 11.1" W
CURVE L-9
REMOVE
BM #18
STA 237+46.07
CL. 'B' RIP RAP EST. 2.0 TONS EST. 5.0 S.Y.F.F.
CL. 'B' RIP RAP EST. 5.0 TONS EST. 14 S.Y.F.F.
BEGIN SHLDR. BERM GUTTER -L- STA. 238+50 RT
END SHLDR. BERM GUTTER -L- STA. 244+50 RT
PREFORMED SCOUR HOLE SEE DETAIL JJ
PIPE OUTLET CHANNEL SEE DETAIL FF RIP RAP ON BANKS ONLY
LEROY BAUCOM
DB 759 PG 72
TOE PROTECTION SEE DETAIL B
GRADE CUT TO DRAIN
CENTER OF BULB-OUT
DANNY NEIL HINSON
DB 732 PG 516
ISBK CHURCH
CONC PARKING AREA
MTL CANOPY
TRUSTEES OF GALILEE BAPTIST CHURCH
DB 269 PG 822
DB 369 PG 396
DB 440 PG 449
PHILLIP EDWARD DEESE
DB 992 PG 165

CURVE L-9

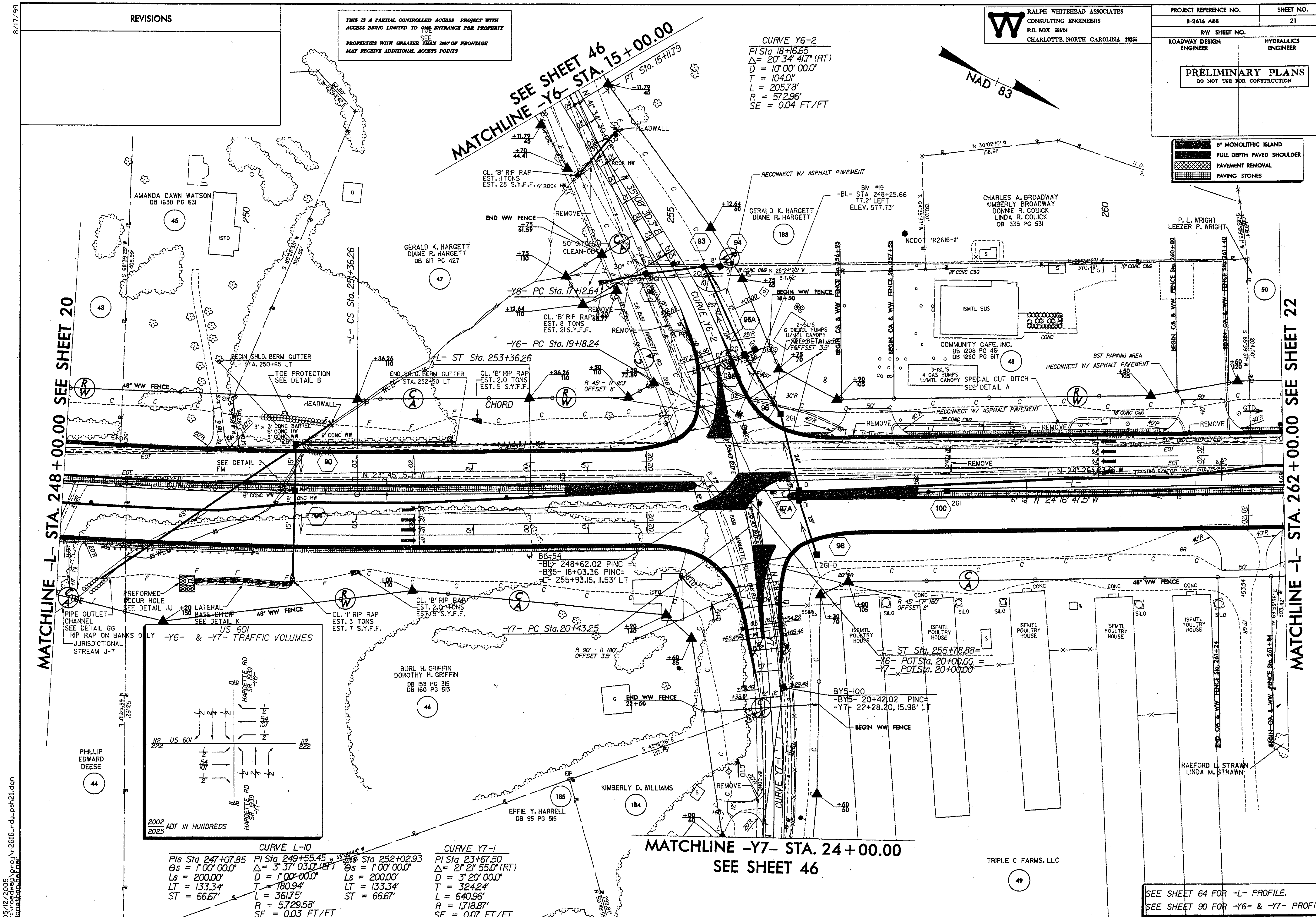
PIs Sta 239+50.44	PI Sta 241+95.87	PIs Sta 244+41.18
Θs = 1°00' 00.0"	Δ = 3° 34' 26.5" (RT)	Θs = 1°00' 00.0"
Ls = 200.00'	D = 1°00' 00.0"	Ls = 200.00'
LT = 133.34'	T = 178.76'	LT = 133.34'
ST = 66.67'	L = 357.40'	ST = 66.67'
	R = 5,729.58'	
	SE = 0.03	

CURVE L-10

PIs Sta 247+07.85	PI Sta 249+55.45	PIs Sta 252+02.93
Θs = 1°00' 00.0"	Δ = 3° 37' 03.0" (LT)	Θs = 1°00' 00.0"
Ls = 200.00'	D = 1°00' 00.0"	Ls = 200.00'
LT = 133.34'	T = 180.94'	LT = 133.34'
ST = 66.67'	L = 361.75'	ST = 66.67'
	R = 5,729.58'	
	SE = 0.03 FT/FT	

SEE SHEET 63 FOR -L- PROFILE.

5/12/2005
r2616_rdy_psh20.dgn



8/17/99
REVISIONS
THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY
PROPERTIES WITH GREATER THAN 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS
RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235
PROJECT REFERENCE NO. R-2616 A&B
SHEET NO. 21
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
NAD 83
5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL
PAVING STONES
CURVE Y6-2
PI Sta 18+16.65
Δ = 20° 34' 41.7" (RT)
D = 10° 00' 00.0"
T = 104.01'
L = 205.78'
R = 572.96'
SE = 0.04 FT/FT
SEE SHEET 46
MATCHLINE -Y6- STA. 15+00.00
MATCHLINE -L- STA. 248+00.00 SEE SHEET 20
MATCHLINE -L- STA. 262+00.00 SEE SHEET 22
MATCHLINE -Y7- STA. 24+00.00
SEE SHEET 46
AMANDA DAWN WATSON
DB 1638 PG 631
GERALD K. HARGETT
DIANE R. HARGETT
DB 617 PG 427
CHARLES A. BROADWAY
KIMBERLY BROADWAY
DONNIE R. COUICK
LINDA R. COUICK
DB 1335 PG 531
P. L. WRIGHT
LEEZER P. WRIGHT
COMMUNITY CAFE, INC.
DB 1208 PG 461
DB 1260 PG 617
BURL H. GRIFFIN
DOROTHY H. GRIFFIN
DB 158 PG 315
DB 160 PG 513
PHILLIP EDWARD DEESE
KIMBERLY D. WILLIAMS
EFFIE Y. HARRELL
DB 95 PG 515
TRIPLE C FARMS, LLC
RAEFORD L. STRAWN
LINDA M. STRAWN
BM #19
-BL- STA 248+25.66
77.2' LEFT
ELEV. 577.73'
-Y6- PC Sta. 17+12.64
-Y6- PC Sta. 19+18.24
-L- ST Sta. 253+36.26
-L- CS Sta. 251+36.26
-Y7- PC Sta. 20+43.25
-L- ST Sta. 255+78.88 =
-Y6- POT Sta. 20+00.00 =
-Y7- POT Sta. 20+00.00
BL-54
-BL- 248+62.02 PINC =
-BY5- 18+03.36 PINC =
-L- 255+93.15, 11.53' LT
BY5-100
-BY5- 20+42.02 PINC =
-Y7- 22+28.20, 15.98' LT
US 601
-Y6- & -Y7- TRAFFIC VOLUMES
HARGETTE RD SR 1939 -Y6-
HARGETTE RD SR 1939 -Y7-
2002
2025
ADT IN HUNDREDS
CURVE L-10
PIs Sta 247+07.85
Θs = 1° 00' 00.0"
Ls = 200.00'
LT = 133.34'
ST = 66.67'
PI Sta 249+55.45
Δ = 3° 37' 03.0" (LT)
D = 1° 00' 00.0"
T = 180.94'
L = 361.75'
R = 5,729.58'
SE = 0.03 FT/FT
PIs Sta 252+02.93
Θs = 1° 00' 00.0"
Ls = 200.00'
LT = 133.34'
ST = 66.67'
CURVE Y7-1
PI Sta 23+67.50
Δ = 21° 21' 55.0" (RT)
D = 3° 20' 00.0"
T = 324.24'
L = 640.96'
R = 1,718.87'
SE = 0.07 FT/FT
SEE SHEET 64 FOR -L- PROFILE.
SEE SHEET 90 FOR -Y6- & -Y7- PROFILE.
05/12/2005
r2616_rdy_psh21.dgn

8/17/99

REVISIONS

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

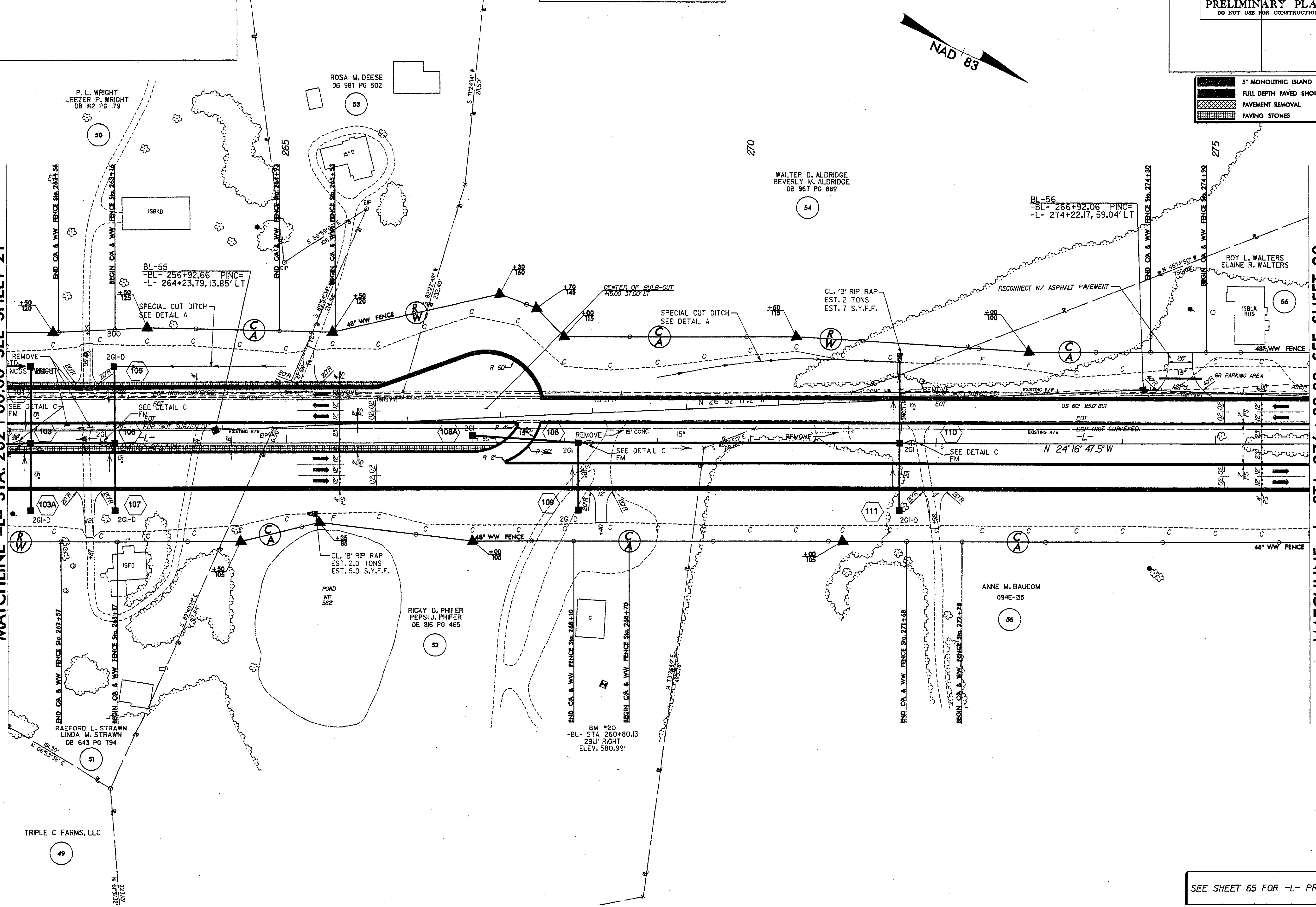
PROPERTIES WITH GREATER THAN 300' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

	5" MONOLITHIC ISLAND
	FULL DEPTH PAVED SHOULDER
	PAVEMENT REMOVAL
	PAVING STONES


NAD 83
MATCHLINE -L- STA. 262+00.00 SEE SHEET 21
MATCHLINE -L- STA. 276+00.00 SEE SHEET 23
P. L. WRIGHT
LEEZER P. WRIGHT
DB 162 PG 179
50
ROSA M. DEESE
DB 987 PG 502
53
WALTER D. ALDRIDGE
BEVERLY M. ALDRIDGE
DB 967 PG 889
54
ROY L. WALTERS
ELAINE R. WALTERS
56
RAEFORD L. STRAWN
LINDA M. STRAWN
DB 643 PG 794
51
TRIPLE C FARMS, LLC
49
RICKY D. PHIFER
PEPSI J. PHIFER
DB 816 PG 465
52
ANNE M. BAUCOM
094E-135
55
BL-55
-BL- 256+92.66 PINC=
-L- 264+23.79, 13.85' LT
BL-56
-BL- 266+92.06 PINC=
-L- 274+22.17, 59.04' LT
SPECIAL CUT DITCH
SEE DETAIL A
CENTER OF BULB-OUT
CL. 'B' RIP RAP
EST. 2 TONS
EST. 7 S.Y.F.F.
CL. 'B' RIP RAP
EST. 2.0 TONS
EST. 5.0 S.Y.F.F.
RECONNECT W/ ASPHALT PAVEMENT
48" WW FENCE
SEE DETAIL C
REMOVE
N 24°16' 47.5" W
US 601
POND
BM #20
-BL- STA 260+80.13
29.1' RIGHT
ELEV. 580.99'
265
270
275

5/12/2005

SEE SHEET 65 FOR -L- PROFILE.

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	23
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

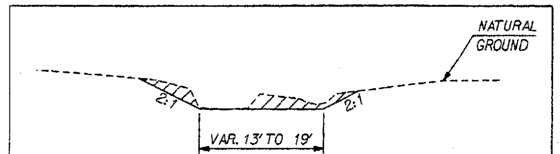
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

REVISIONS

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

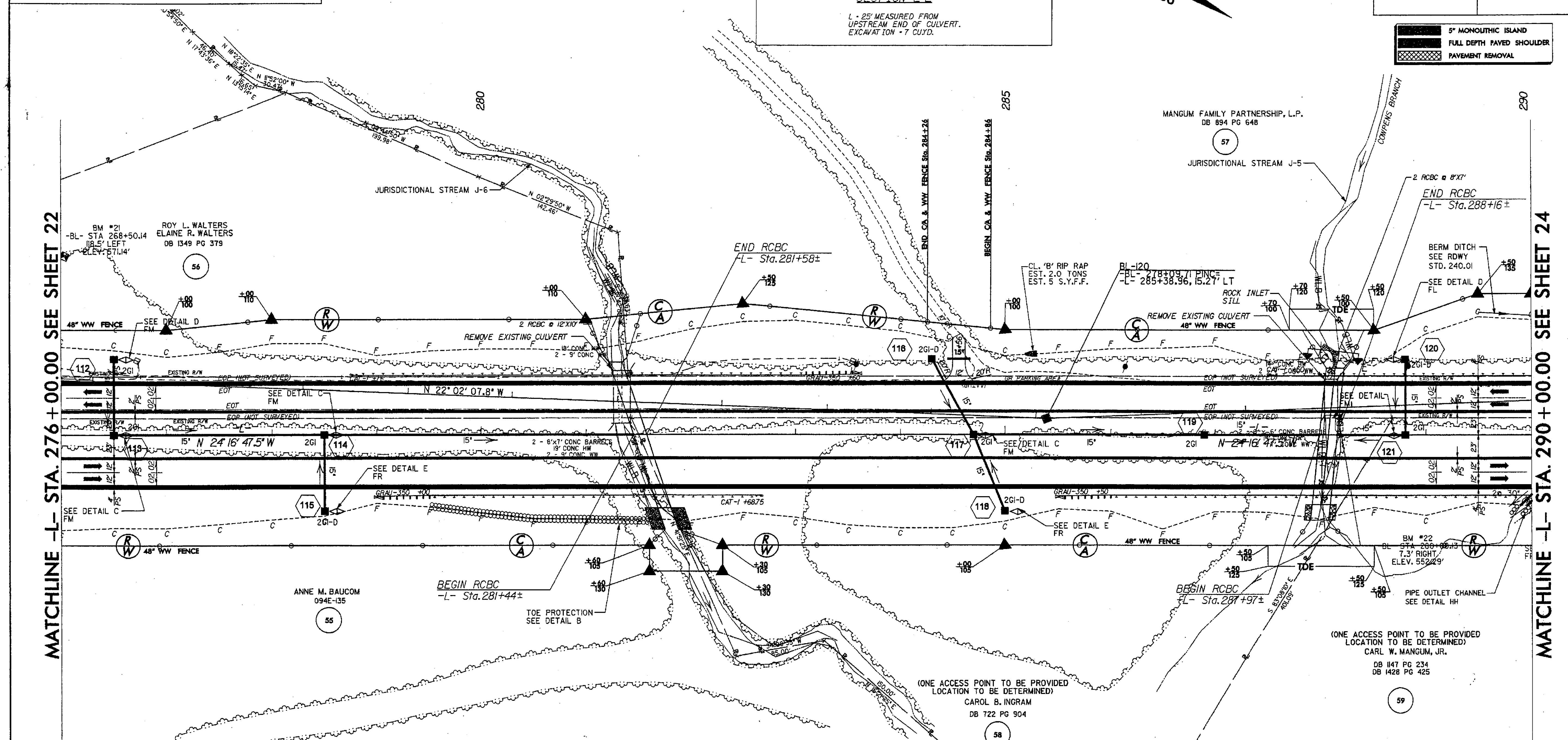
PROPERTIES WITH GREATER THAN 2000' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

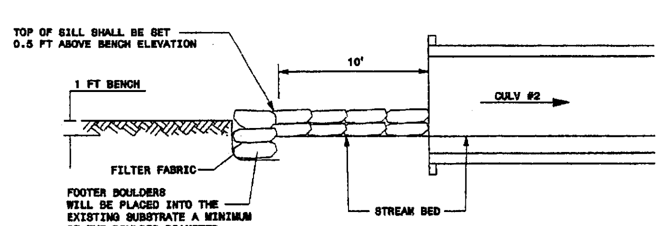


SECTION E-E

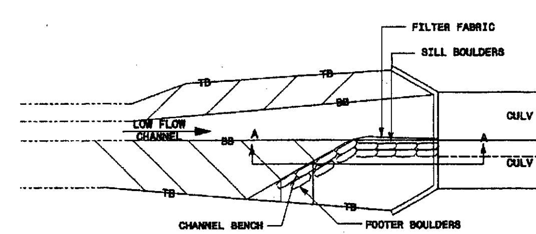
L - 25' MEASURED FROM UPSTREAM END OF CULVERT.
EXCAVATION - 7 CU.YD.

	5" MONOLITHIC ISLAND
	FULL DEPTH PAVED SHOULDER
	PAVEMENT REMOVAL





SECTION A-A



PLAN VIEW

FILTER FABRIC SHALL BE PLACED ON THE UPSTREAM SIDE OF THE STRUCTURE TO PREVENT WASHOUT OF SEDIMENT THROUGH BOULDER GAPS. FILTER FABRIC SHALL EXTEND FROM THE BOTTOM OF THE FOOTER BOULDER TO THE FINISHED GRADE ELEVATION AND SHALL BE PLACED THE ENTIRE LENGTH OF STRUCTURE.

ROCK INLET SILL

SCALE: NTS

NOTES:
1. ALL STONES ARE TO BE STRUCTURE STONE.
2. GAPS BETWEEN BOULDERS SHALL BE MINIMIZED BY FITTING BOULDERS TOGETHER, PLUGGING WITH STRUCTURE STONE CLASS A AND NO.57 AND LINING WITH FILTER FABRIC.
3. DIMENSIONS AND SLOPES MAY BE ADJUSTED TO FIT BY THE ENGINEER.
4. A DOUBLE FOOTER BOULDER SHALL BE UTILIZED IN SAND BED MATERIAL.
5. FOOTER BOULDERS AND SILL BOULDERS SHALL BE NATIVE STONE OR SHOT ROCK, CUBICAL OR RECTANGULAR IN NATURE.
6. ACCEPTABLE BOULDERS SHALL HAVE THE FOLLOWING MINIMUM DIMENSIONS; 3' x 2' x 1'.

SEE SHEET 66 FOR -L- PROFILE.

8/17/99

8/17/99

REVISIONS

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

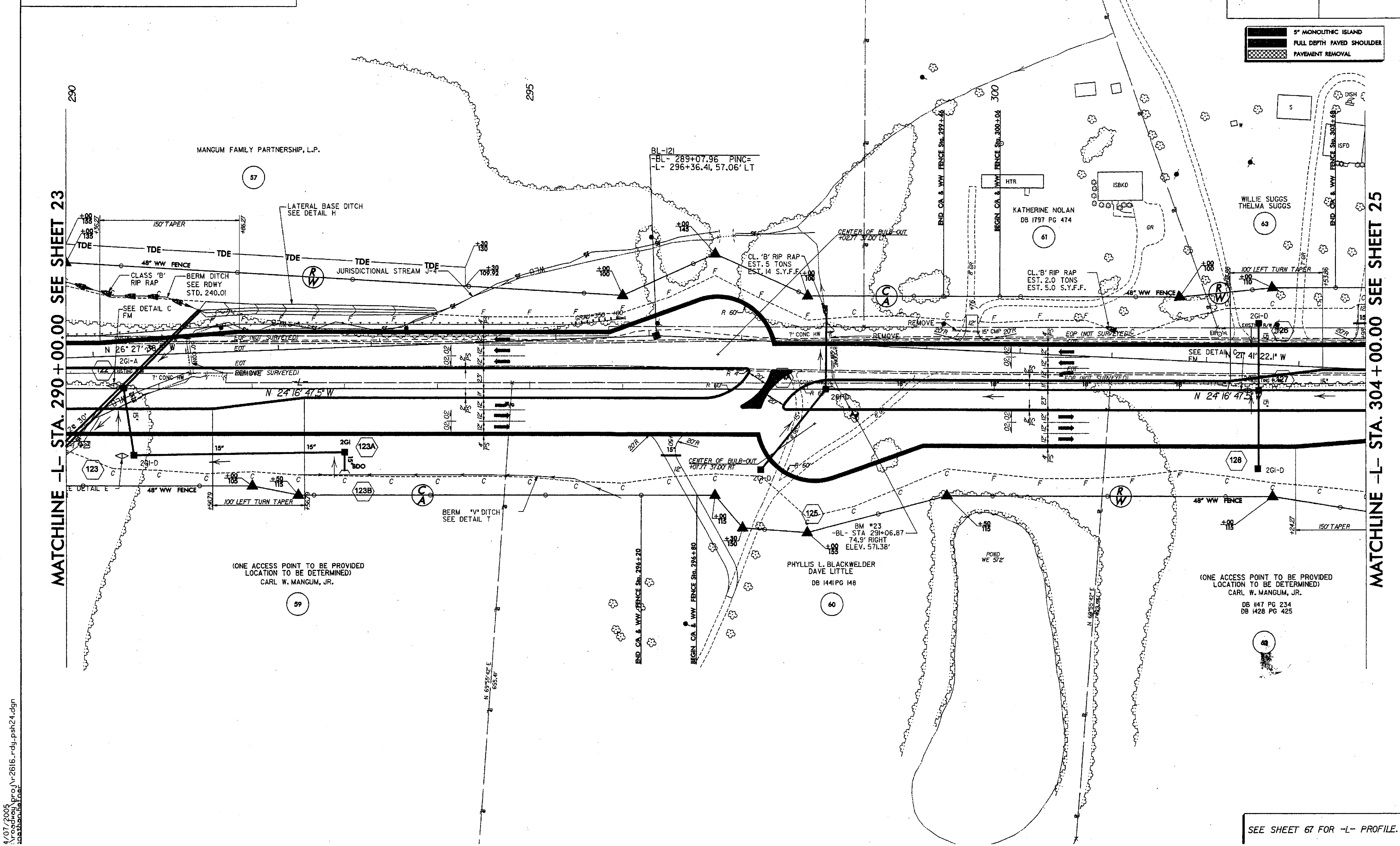
PROPERTIES WITH GREATER THAN 2000' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	24
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



NAD 83
MATCHLINE -L- STA. 290+00.00 SEE SHEET 23
MATCHLINE -L- STA. 304+00.00 SEE SHEET 25
290
295
300
MANGUM FAMILY PARTNERSHIP, L.P.
57
BL-121
-BL- 289+07.96 PINC=
-L- 296+36.41, 57.06' LT
LATERAL BASE DITCH
SEE DETAIL H
150' TAPER
TDE
48" WW FENCE
JURISDICTIONAL STREAM J-4
CLASS 'B' RIP RAP
BERM DITCH
SEE RDWY
STD. 240.01
SEE DETAIL C
FM
N 26° 27' 38.8" W
N 24° 16' 47.5" W
N 21° 41' 22.1" W
2GI-A
2GI-D
2GI
2GI-D
123
123A
123B
122
125
126
127
128
100' LEFT TURN TAPER
BERM "V" DITCH
SEE DETAIL T
CENTER OF BULB-OUT
CL. 'B' RIP RAP
EST. 5 TONS
EST. 14 S.Y.F.F.
CL.'B' RIP RAP
EST. 2.0 TONS
EST. 5.0 S.Y.F.F.
REMOVE
7' CONC HW
15" CMP
EOP (NOT SURVEYED)
SEE DETAIL C
FM
END C/A & WW FENCE Sta. 299+66
BEGIN C/A & WW FENCE Sta. 300+06
END C/A & WW FENCE Sta. 296+20
BEGIN C/A & WW FENCE Sta. 296+80
KATHERINE NOLAN
DB 1797 PG 474
61
HTR
ISBKD
WILLIE SUGGS
THELMA SUGGS
63
ISFD
DISH
BM #23
-BL- STA 291+06.87
74.9' RIGHT
ELEV. 571.38'
(ONE ACCESS POINT TO BE PROVIDED
LOCATION TO BE DETERMINED)
CARL W. MANGUM, JR.
59
PHYLLIS L. BLACKWELDER
DAVE LITTLE
DB 1441 PG 148
60
POND
WE 572'
(ONE ACCESS POINT TO BE PROVIDED
LOCATION TO BE DETERMINED)
CARL W. MANGUM, JR.
DB 1147 PG 234
DB 1428 PG 425
N 69°55'42" E
655.41'
150' TAPER

SEE SHEET 67 FOR -L- PROFILE.

4/07/2005
r2616_rdy_psh24.dgn

8/17/99

REVISIONS

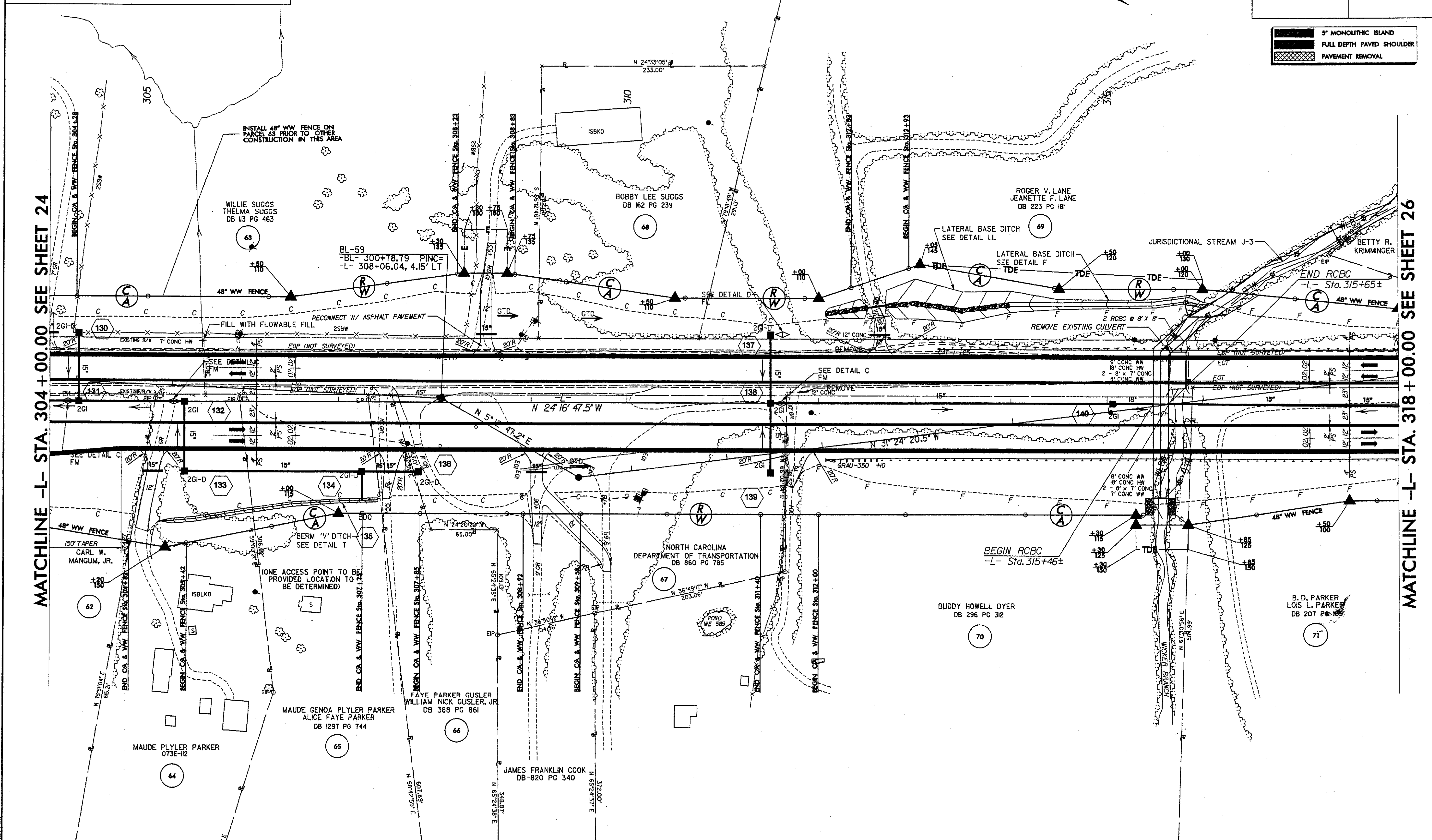
THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

PROPERTIES WITH GREATER THAN 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	25
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

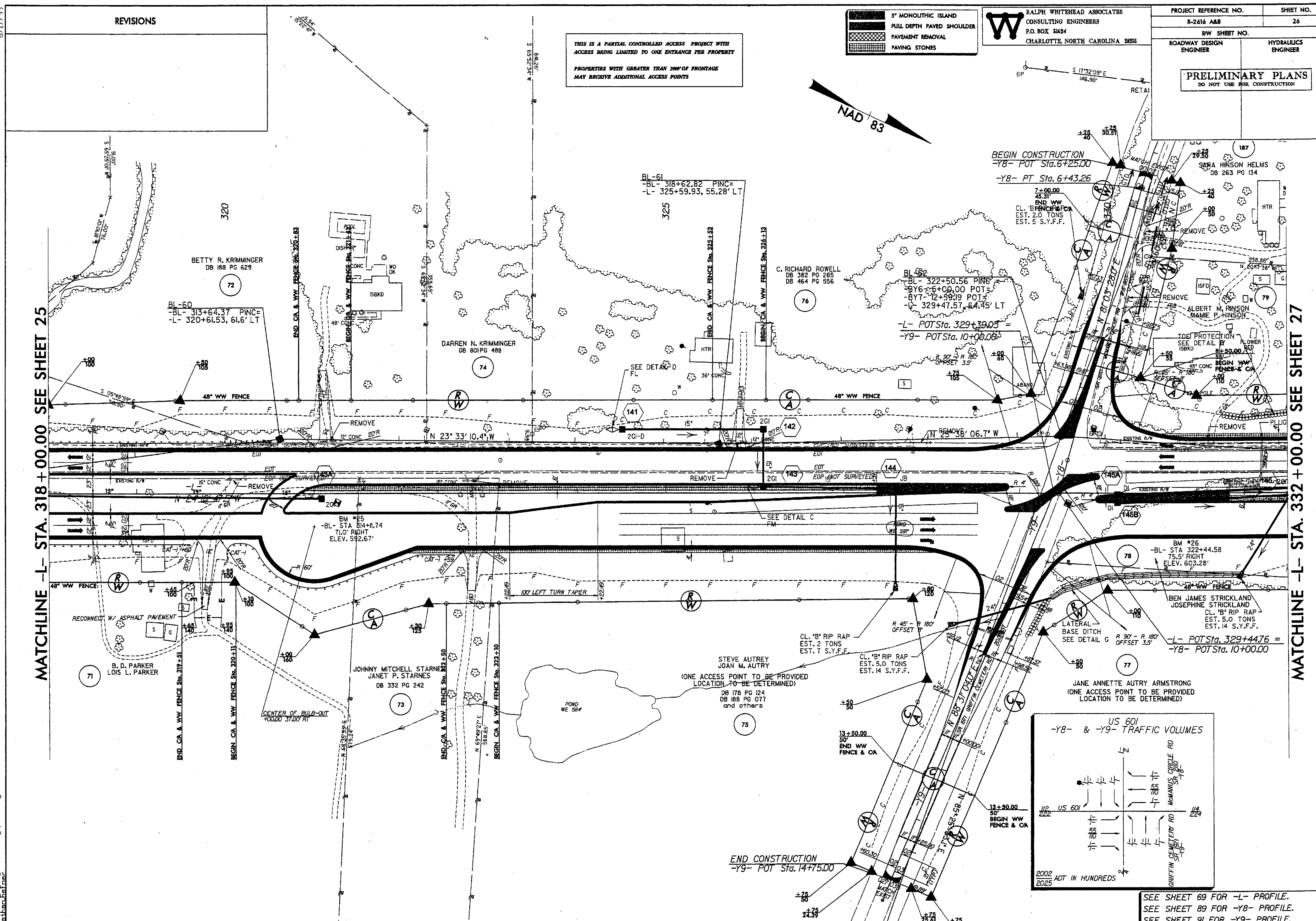
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



NAD 83
5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL
MATCHLINE -L- STA. 304+00.00 SEE SHEET 24
MATCHLINE -L- STA. 318+00.00 SEE SHEET 26
INSTALL 48" WW FENCE ON PARCEL 63 PRIOR TO OTHER CONSTRUCTION IN THIS AREA
WILLIE SUGGS
THELMA SUGGS
DB 113 PG 463
BOBBY LEE SUGGS
DB 162 PG 239
ROGER V. LANE
JEANETTE F. LANE
DB 223 PG 181
BETTY R. KRIMMINGER
BL-59
-BL- 300+78.79 PINC=
-L- 308+06.04, 4.15' LT
N 24°33'05" W
233.00'
LATERAL BASE DITCH SEE DETAIL LL
LATERAL BASE DITCH SEE DETAIL F
JURISDICTIONAL STREAM J-3
END RCBC
-L- Sta. 315+65±
2 RCBC @ 8' X 8'
REMOVE EXISTING CULVERT
48" WW FENCE
RECONNECT W/ ASPHALT PAVEMENT
FILL WITH FLOWABLE FILL
SEE DETAIL C
SEE DETAIL D
N 24°16'47.5" W
N 31°24'20.5" W
N 5°12'47.2" E
BERM 'V' DITCH SEE DETAIL T
(ONE ACCESS POINT TO BE PROVIDED LOCATION TO BE DETERMINED)
CARL W. MANGUM, JR.
150' TAPER
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DB 860 PG 785
BEGIN RCBC
-L- Sta. 315+46±
BUDDY HOWELL DYER
DB 296 PG 312
B. D. PARKER
LOIS L. PARKER
DB 207 PG 169
MAUDE GENOA PLYLER PARKER
ALICE FAYE PARKER
DB 1297 PG 744
FAYE PARKER GUSLER
WILLIAM NICK GUSLER, JR
DB 388 PG 861
MAUDE PLYLER PARKER
073E-112
JAMES FRANKLIN COOK
DB 820 PG 340
N 36°49'17" W
203.06'
POND
WE 589
WICKER BRANCH

SEE SHEET 68 FOR -L- PROFILE.

4/08/2005
...\roadway\proj\r-2616_rdy_psh25.dgn


8/17/99
REVISIONS
THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY
PROPERTIES WITH GREATER THAN 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS
5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL
PAVING STONES
RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235
PROJECT REFERENCE NO.
R-2616 A&B
SHEET NO.
26
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
NAD 83
MATCHLINE -L- STA. 318+00.00 SEE SHEET 25
MATCHLINE -L- STA. 332+00.00 SEE SHEET 27
BEGIN CONSTRUCTION
-Y8- POT Sta.6+25.00
-Y8- PT Sta. 6+43.26
BL-60
-BL- 313+64.37 PINC=
-L- 320+61.53, 61.6' LT
BL-61
-BL- 318+62.82 PINC=
-L- 325+59.93, 55.28' LT
BL-62
-BL- 322+50.56 PINC
-BY6- 5+00.00 POT=
-BY7- 12+59.19 POT=
-L- 329+47.57, 64.45' LT
-L- POTSta. 329+39.05 =
-Y9- POTSta. 10+00.00
-L- POTSta. 329+44.76 =
-Y8- POTSta. 10+00.00
BETTY R. KRIMMINGER
DB 188 PG 629
DARREN N. KRIMMINGER
DB 601 PG 488
C. RICHARD ROWELL
DB 382 PG 265
DB 464 PG 556
SARA HINSON HELMS
DB 263 PG 134
ALBERT M. HINSON
MAMIE P. HINSON
B. D. PARKER
LOIS L. PARKER
JOHNNY MITCHELL STARNES
JANET P. STARNES
DB 332 PG 242
STEVE AUTREY
JOAN M. AUTRY
(ONE ACCESS POINT TO BE PROVIDED LOCATION TO BE DETERMINED)
DB 178 PG 124
DB 188 PG 077
and others
BEN JAMES STRICKLAND
JOSEPHINE STRICKLAND
JANE ANNETTE AUTRY ARMSTRONG
(ONE ACCESS POINT TO BE PROVIDED LOCATION TO BE DETERMINED)
48" WW FENCE
N 23° 33' 10.4" W
N 23° 38' 06.7" W
BM #25
-BL- STA 314+11.74
71.0' RIGHT
ELEV. 592.67'
BM #26
-BL- STA 322+44.58
75.5' RIGHT
ELEV. 603.28'
100' LEFT TURN TAPER
CENTER OF BULB-OUT
CL. 'B' RIP RAP
EST. 2 TONS
EST. 7 S.Y.F.F.
CL. 'B' RIP RAP
EST. 5.0 TONS
EST. 14 S.Y.F.F.
LATERAL BASE DITCH SEE DETAIL G
TOE PROTECTION SEE DETAIL B
SEE DETAIL C
SEE DETAIL D
RECONNECT W/ ASPHALT PAVEMENT
POND
WE 584'
END CONSTRUCTION
-Y9- POT Sta. 14+75.00
13+50.00
50'
END WW FENCE & C/A
13+50.00
50'
BEGIN WW FENCE & C/A
US 601
-Y8- & -Y9- TRAFFIC VOLUMES
McMANUS CIRCLE RD SR 1110 -Y8-
GRIFFIN CEMETERY RD SR 1191 -Y9-
2002
2025 ADT IN HUNDREDS
SEE SHEET 69 FOR -L- PROFILE.
SEE SHEET 89 FOR -Y8- PROFILE.
SEE SHEET 91 FOR -Y9- PROFILE.
5/12/2005
r2616_rdy_psh26.dgn

8/17/99

REVISIONS

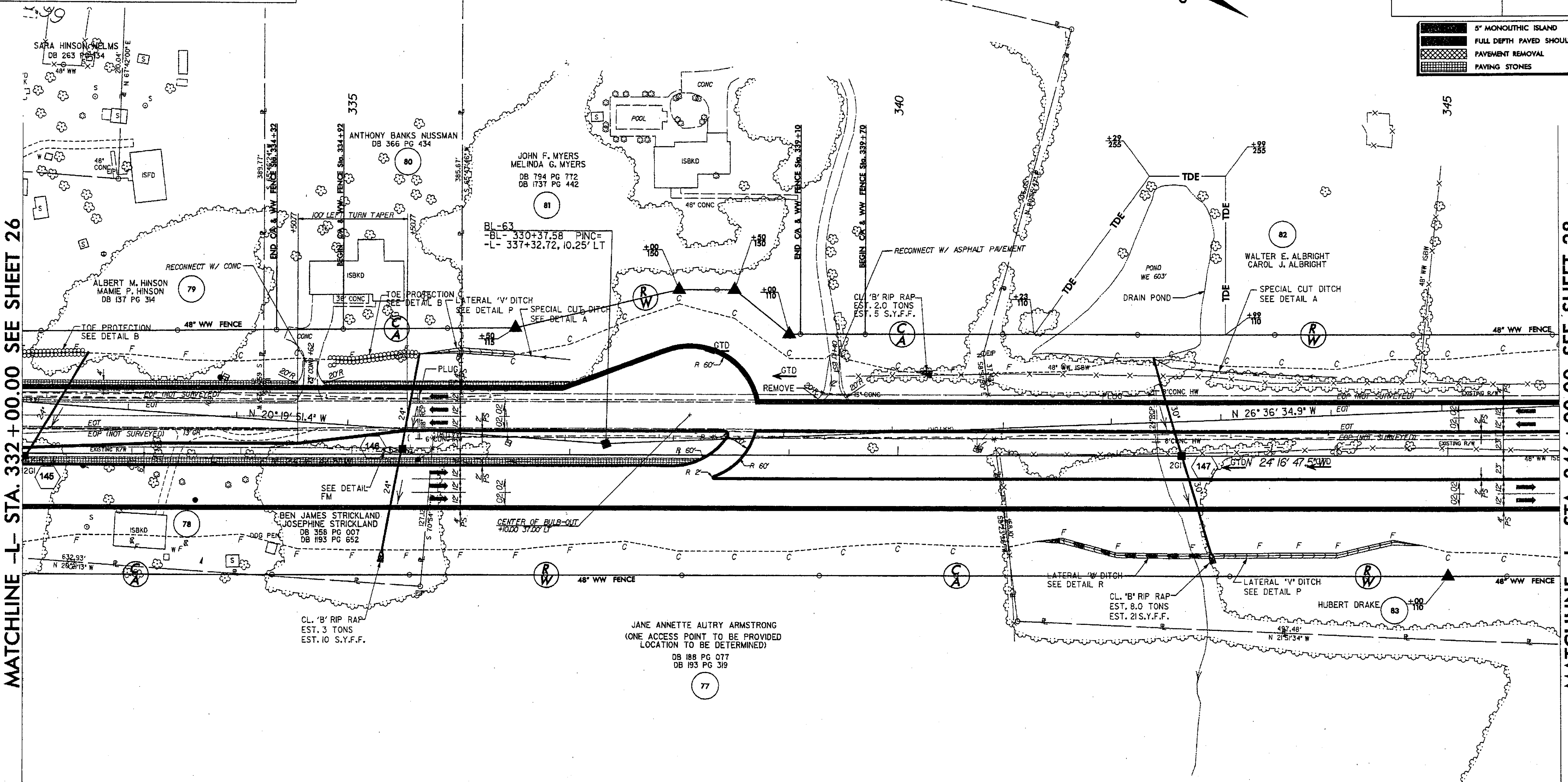
RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

PROPERTIES WITH GREATER THAN 2600' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS



NAD 83
5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL
PAVING STONES
MATCHLINE -L- STA. 332+00.00 SEE SHEET 26
MATCHLINE -L- STA. 346+00.00 SEE SHEET 28
SAM H. McMANUS
DORIS DEAS McMANUS
DB 425 PG 603
SARA HINSON HELMS
DB 263 PG 134
ANTHONY BANKS NUSSMAN
DB 366 PG 434
JOHN F. MYERS
MELINDA G. MYERS
DB 794 PG 772
DB 1737 PG 442
ALBERT M. HINSON
MAMIE P. HINSON
DB 137 PG 314
WALTER E. ALBRIGHT
CAROL J. ALBRIGHT
BEN JAMES STRICKLAND
JOSEPHINE STRICKLAND
DB 358 PG 007
DB 1193 PG 652
JANE ANNETTE AUTRY ARMSTRONG
(ONE ACCESS POINT TO BE PROVIDED
LOCATION TO BE DETERMINED)
DB 188 PG 077
DB 193 PG 319
HUBERT DRAKE
BL-63
-BL- 330+37.58 PINC=
-L- 337+32.72, 10.25' LT
N 20° 19' 51.4" W
N 26° 36' 34.9" W
100' LEFT TURN TAPER
TOE PROTECTION
SEE DETAIL B
LATERAL 'V' DITCH
SEE DETAIL P
SPECIAL CUT DITCH
SEE DETAIL A
RECONNECT W/ CONC
RECONNECT W/ ASPHALT PAVEMENT
CL. 'B' RIP RAP
EST. 2.0 TONS
EST. 5 S.Y.F.F.
CL. 'B' RIP RAP
EST. 3 TONS
EST. 10 S.Y.F.F.
CL. 'B' RIP RAP
EST. 8.0 TONS
EST. 21 S.Y.F.F.
LATERAL 'B' DITCH
SEE DETAIL R
DRAIN POND
POND
CENTER OF BULB-OUT
+10.00 37.00' LT
SEE DETAIL FM
48" WW FENCE
REMOVE
PLUG
GTD
335
340
345

SEE SHEET 70 FOR -L- PROFILE.

05/12/2005
r:\roadway\proj\r2616_rdy_psh27.dgn
jonathan.hefner

REVISIONS

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

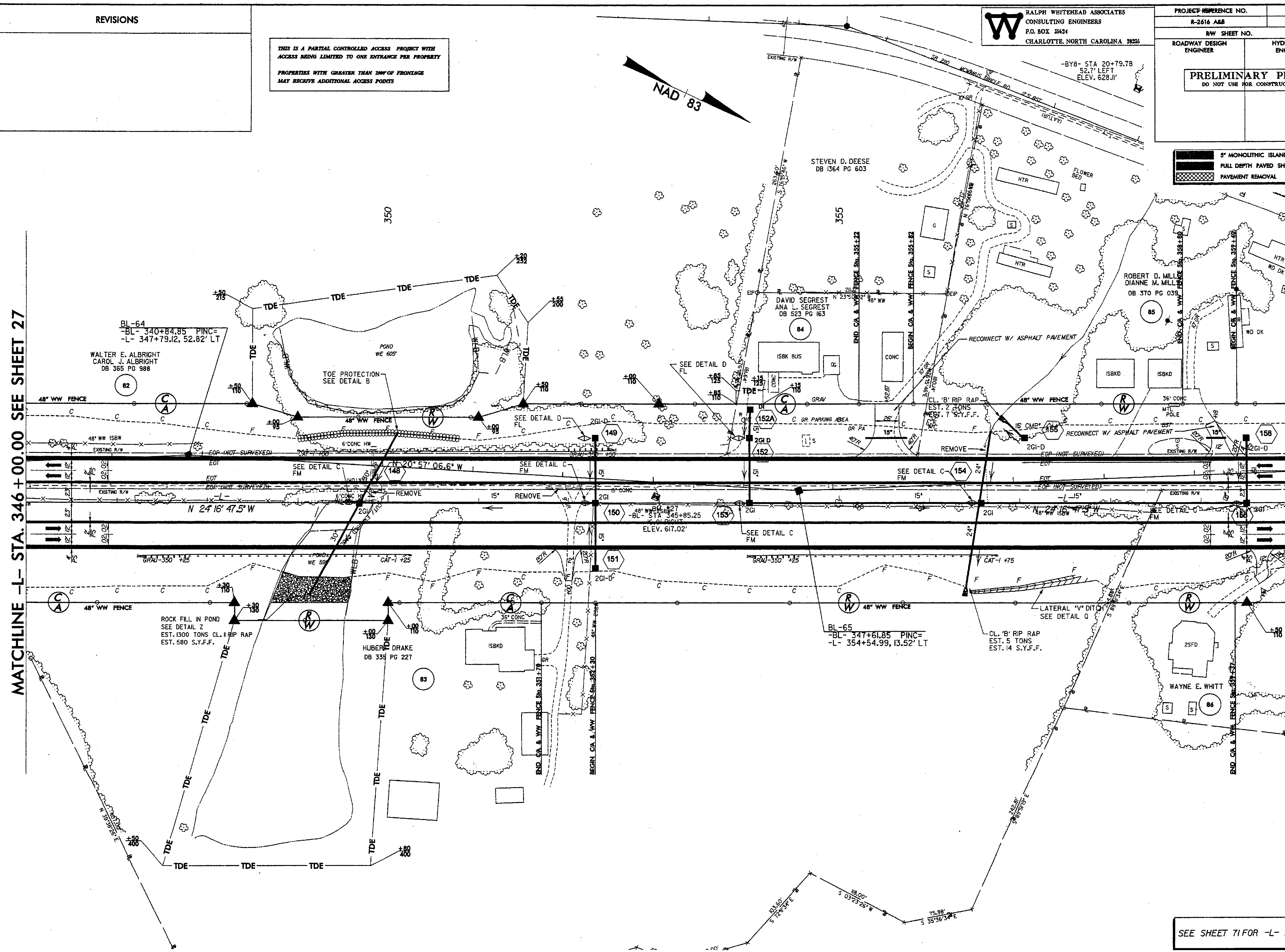
PROPERTIES WITH GREATER THAN 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	28
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

	5" MONOLITHIC ISLAND
	FULL DEPTH PAVED SHOULDER
	PAVEMENT REMOVAL



NAD 83
MATCHLINE -L- STA. 346+00.00 SEE SHEET 27
MATCHLINE -L- STA. 360+00.00 SEE SHEET 29
-BY8- STA 20+79.78
52.7' LEFT
ELEV. 628.11'
SR 2110 MCMANUS CIRCLE RD
STEVEN D. DEESE
DB 1364 PG 603
WALTER E. ALBRIGHT
CAROL J. ALBRIGHT
DB 365 PG 988
BL-64
-BL- 340+84.85 PINC=
-L- 347+79.12, 52.82' LT
POND
WE 605'
TOE PROTECTION
SEE DETAIL B
DAVID SEGREST
ANA L. SEGREST
DB 523 PG 163
ROBERT D. MILLS
DIANNE M. MILLS
DB 370 PG 039
RECONNECT W/ ASPHALT PAVEMENT
CL. 'B' RIP RAP
EST. 2 TONS
EST. 7 S.Y.F.F.
N 20° 57' 06.6" W
N 24° 16' 47.5" W
-BL- STA 345+85.25
ELEV. 617.02'
ROCK FILL IN POND
SEE DETAIL Z
EST. 1300 TONS CL. II RIP RAP
EST. 580 S.Y.F.F.
HUBERT DRAKE
DB 335 PG 227
BL-65
-BL- 347+61.85 PINC=
-L- 354+54.99, 13.52' LT
LATERAL "V" DITCH
SEE DETAIL Q
CL. 'B' RIP RAP
EST. 5 TONS
EST. 14 S.Y.F.F.
WAYNE E. WHITT
48" WW FENCE
SEE DETAIL C
SEE DETAIL D
REMOVE

SEE SHEET 71 FOR -L- PROFILE.

8/17/99

4/07/2005
r2616_rdy_psh28.dgn

8/17/99

REVISIONS

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

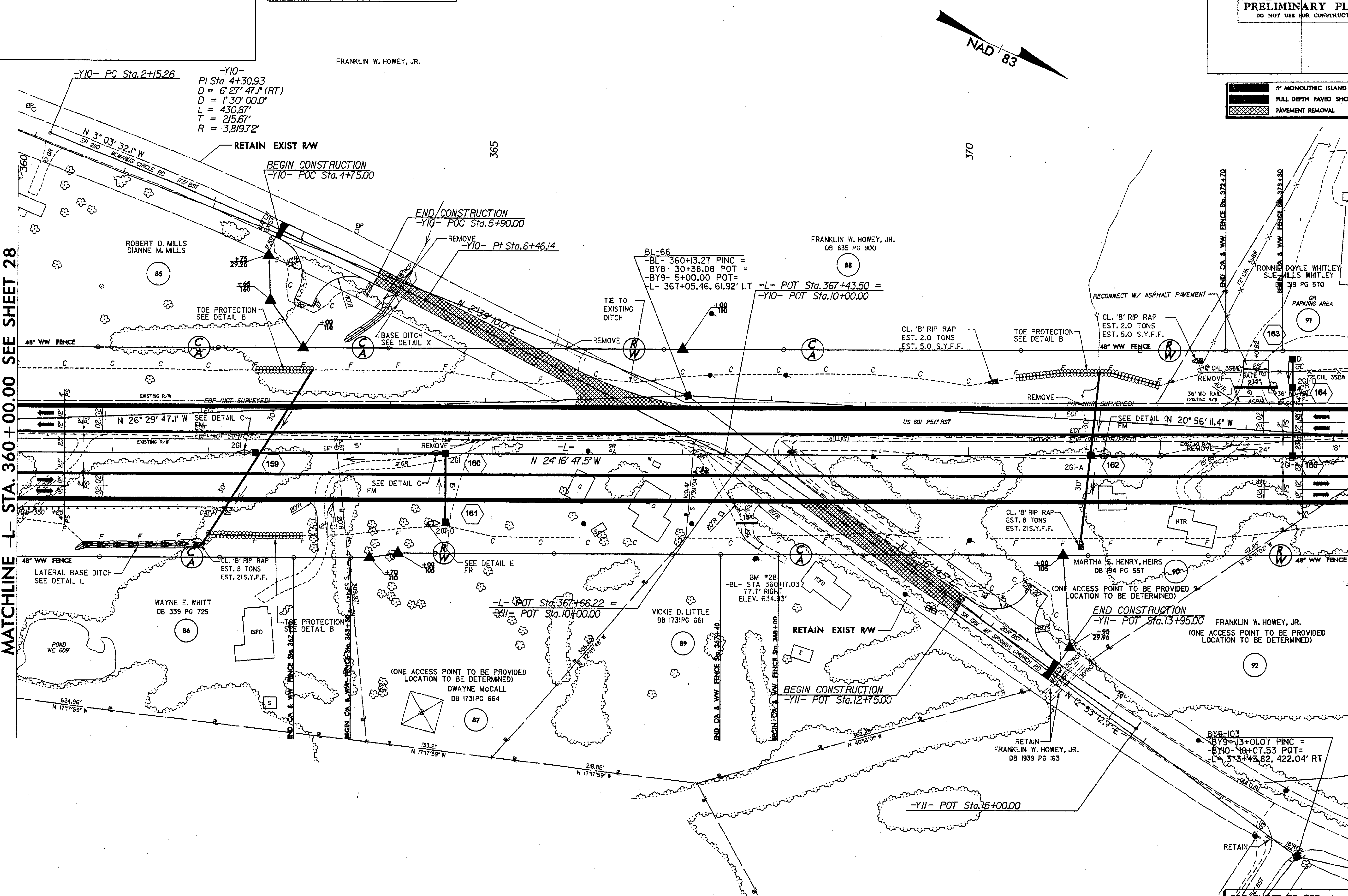
PROPERTIES WITH GREATER THAN 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	29
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



NAD 83
FRANKLIN W. HOWEY, JR.
-Y10- PC Sta.2+15.26
-Y10-
PI Sta 4+30.93
D = 6° 27' 47.1" (RT)
D = 1° 30' 00.0"
L = 430.87'
T = 215.67'
R = 3,819.72'
RETAIN EXIST R/W
N 3° 03' 32.1" W
SR 2110 McMANUS CIRCLE RD
BEGIN CONSTRUCTION
-Y10- POC Sta.4+75.00
END CONSTRUCTION
-Y10- POC Sta.5+90.00
REMOVE
-Y10- PT Sta.6+46.14
365
370
ROBERT D. MILLS
DIANNE M. MILLS
85
TOE PROTECTION
SEE DETAIL B
BASE DITCH
SEE DETAIL X
48" WW FENCE
BL-66
-BL- 360+13.27 PINC =
-BY8- 30+38.08 POT =
-BY9- 5+00.00 POT=
-L- 367+05.46, 61.92' LT
-L- POT Sta.367+43.50 =
-Y10- POT Sta.10+00.00
TIE TO
EXISTING
DITCH
FRANKLIN W. HOWEY, JR.
DB 835 PG 900
88
CL. 'B' RIP RAP
EST. 2.0 TONS
EST. 5.0 S.Y.F.F.
RECONNECT W/ ASPHALT PAVEMENT
RONNIE DOYLE WHITLEY
SUE MILLS WHITLEY
DB 319 PG 570
PARKING AREA
91
163
164
165
END C/A & WW FENCE Sta.372+70
BEGIN C/A & WW FENCE Sta.373+30
MATCHLINE -L- STA. 360+00.00 SEE SHEET 28
MATCHLINE -L- STA. 374+00.00 SEE SHEET 30
N 26° 29' 47.1" W
SEE DETAIL C
N 24° 16' 47.5" W
-L-
US 601 25.0' BST
SEE DETAIL N 20° 56' 11.4" W
159
160
161
162
SEE DETAIL C
SEE DETAIL E
LATERAL BASE DITCH
SEE DETAIL L
CL. 'B' RIP RAP
EST. 8 TONS
EST. 21 S.Y.F.F.
WAYNE E. WHITT
DB 339 PG 725
86
POND
WE 609'
TOE PROTECTION
SEE DETAIL B
-L- POT Sta.367+66.22 =
-Y11- POT Sta.10+00.00
(ONE ACCESS POINT TO BE PROVIDED
LOCATION TO BE DETERMINED)
DWAYNE McCALL
DB 1731 PG 664
87
END C/A & WW FENCE Sta.362+50
BEGIN C/A & WW FENCE Sta.363+50
VICKIE D. LITTLE
DB 1731 PG 661
89
BM #28
-BL- STA 360+17.03
77.7' RIGHT
ELEV. 634.93'
RETAIN EXIST R/W
END C/A & WW FENCE Sta.367+40
BEGIN C/A & WW FENCE Sta.368+00
BEGIN CONSTRUCTION
-Y11- POT Sta.12+75.00
SR 1151 MT SPRINGS CHURCH RD
CL. 'B' RIP RAP
EST. 8 TONS
EST. 21 S.Y.F.F.
MARTHA S. HENRY, HEIRS
DB 194 PG 557
90
(ONE ACCESS POINT TO BE PROVIDED
LOCATION TO BE DETERMINED)
END CONSTRUCTION
-Y11- POT Sta.13+95.00
FRANKLIN W. HOWEY, JR.
(ONE ACCESS POINT TO BE PROVIDED
LOCATION TO BE DETERMINED)
92
HTR
48" WW FENCE
RETAIN
FRANKLIN W. HOWEY, JR.
DB 1939 PG 163
BY8-103
-BY9- 13+01.07 PINC =
-BY10- 10+07.53 POT=
-L- 373+43.82, 422.04' RT
-Y11- POT Sta.15+00.00
RETAIN
624.96'
N 17°17'59" W
133.21'
N 17°17'59" W
218.85'
N 17°17'59" W

SEE SHEET 72 FOR -L- PROFILE.
SEE SHEET xx FOR -Y?- PROFILE.
SEE SHEET xx FOR -Y?- PROFILE.

/08/2005
\roadway\proj\r2616_rdy_psh29.dgn
nathan.belner

8/17/99

REVISIONS

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

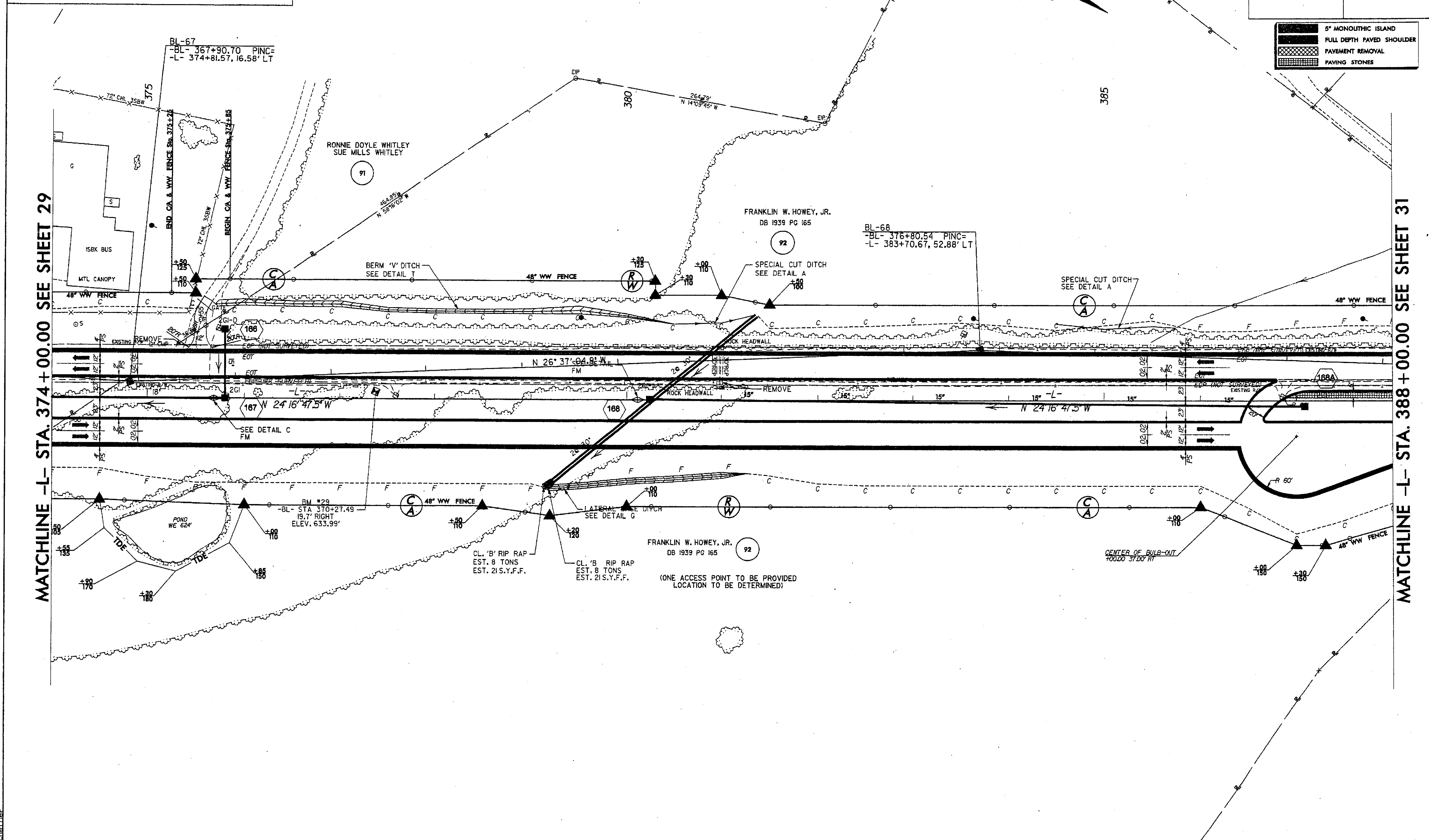
PROPERTIES WITH GREATER THAN 2000' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	30
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

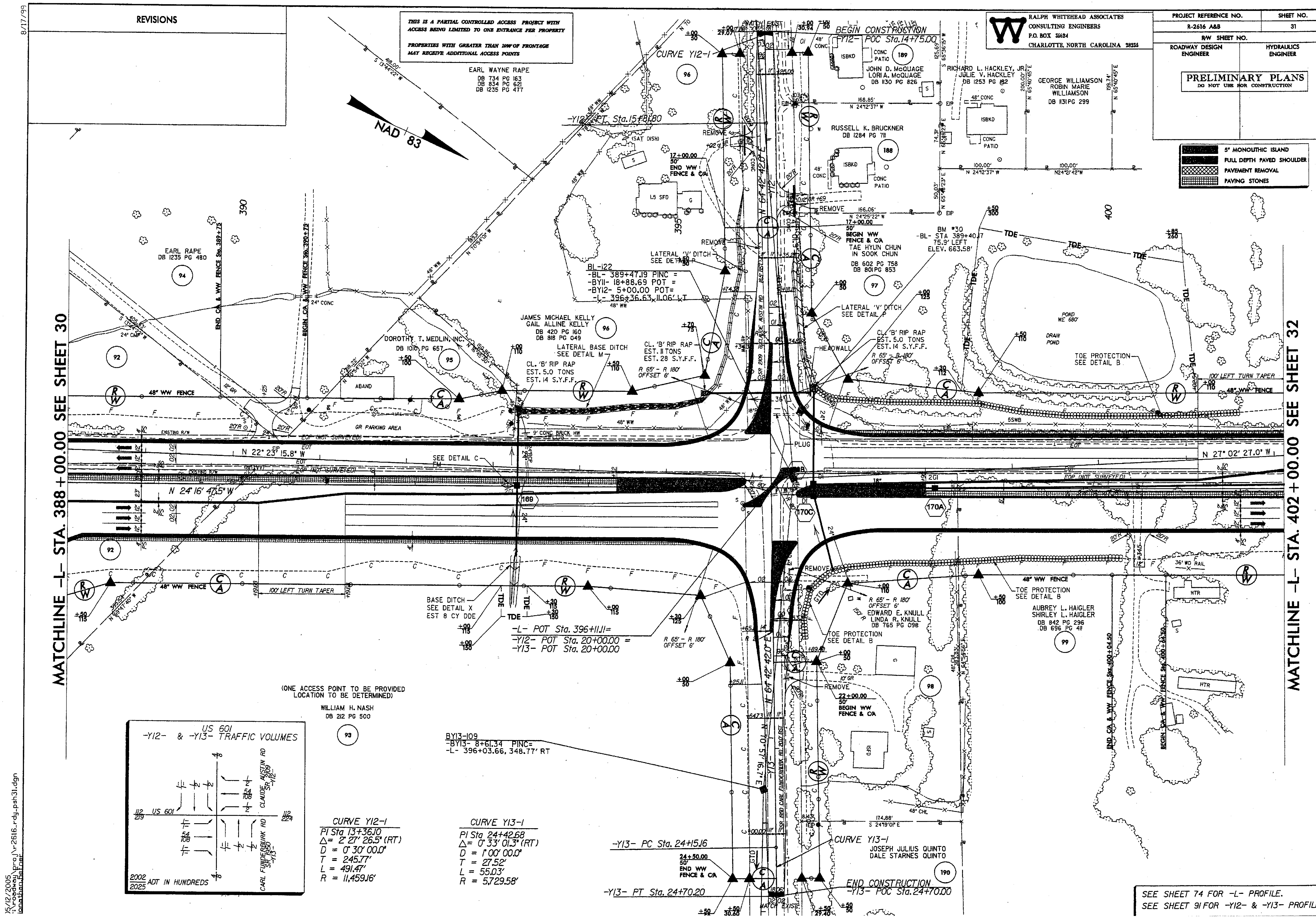
- 5" MONOLITHIC ISLAND
- FULL DEPTH PAVED SHOULDER
- PAVEMENT REMOVAL
- PAVING STONES



NAD 83
MATCHLINE -L- STA. 374+00.00 SEE SHEET 29
MATCHLINE -L- STA. 388+00.00 SEE SHEET 31
BL-67
-BL- 367+90.70 PINC=
-L- 374+81.57, 16.58' LT
BL-68
-BL- 376+80.54 PINC=
-L- 383+70.67, 52.88' LT
RONNIE DOYLE WHITLEY
SUE MILLS WHITLEY
91
FRANKLIN W. HOWEY, JR.
DB 1939 PG 165
92
END C/A & WW FENCE Sta. 375+12
BEGIN C/A & WW FENCE Sta. 374+85
15BK BUS
MTL CANOPY
48" WW FENCE
BERM 'V' DITCH
SEE DETAIL T
SPECIAL CUT DITCH
SEE DETAIL A
N 26° 37' 04.8" W
N 24°16' 47.5" W
ROCK HEADWALL
REMOVE
SEE DETAIL C
BM #29
-BL- STA 370+27.49
19.7' RIGHT
ELEV. 633.99'
POND
WE 624'
CL. 'B' RIP RAP
EST. 8 TONS
EST. 21 S.Y.F.F.
LATERAL BASE DITCH
SEE DETAIL G
(ONE ACCESS POINT TO BE PROVIDED
LOCATION TO BE DETERMINED)
CENTER OF BULB-OUT
+00.00 37.00' RT
R 60'
166
167
168
168A
380
385
375

SEE SHEET 73 FOR -L- PROFILE.

05/12/2005
r:\roadway\proj\r2616_rdy_psh30.dgn



REVISIONS
8/17/99
THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY
PROPERTIES WITH GREATER THAN 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS
RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235
PROJECT REFERENCE NO. R-2616 A&B
SHEET NO. 31
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL
PAVING STONES
NAD 83
MATCHLINE -L- STA. 388+00.00 SEE SHEET 30
MATCHLINE -L- STA. 402+00.00 SEE SHEET 32
BEGIN CONSTRUCTION
-Y12- POC Sta.14+75.00
CURVE Y12-1
-Y12- PT Sta.15+81.80
EARL WAYNE RAPE
DB 734 PG 163
DB 834 PG 621
DB 1235 PG 477
EARL RAPE
DB 1235 PG 480
JOHN D. McQUAGE
LORI A. McQUAGE
DB 1130 PG 826
RICHARD L. HACKLEY, JR
JULIE V. HACKLEY
DB 1253 PG 182
GEORGE WILLIAMSON
ROBIN MARIE WILLIAMSON
DB 1131 PG 299
RUSSELL K. BRUCKNER
DB 1284 PG 711
TAE HYUN CHUN
IN SOOK CHUN
DB 602 PG 758
DB 801 PG 853
BM #30
-BL- STA 389+40.17
75.9' LEFT
ELEV. 663.58'
JAMES MICHAEL KELLY
GAIL ALLINE KELLY
DB 420 PG 160
DB 818 PG 049
DOROTHY T. MEDLIN, INC.
DB 1010 PG 657
BL-122
-BL- 389+47.19 PINC =
-BY11- 18+88.69 POT =
-BY12- 5+00.00 POT=
-L- 396+36.63, 11.06' LT
LATERAL 'V' DITCH SEE DETAIL P
LATERAL BASE DITCH SEE DETAIL M
CL. 'B' RIP RAP EST. 5.0 TONS EST. 14 S.Y.F.F.
CL. 'B' RIP RAP EST. 11 TONS EST. 28 S.Y.F.F.
TOE PROTECTION SEE DETAIL B
100' LEFT TURN TAPER
N 22° 23' 15.8" W
N 24° 16' 47.5" W
N 27° 02' 27.0" W
SEE DETAIL C
BASE DITCH SEE DETAIL X EST 8 CY DDE
-L- POT Sta. 396+11.11=
-Y12- POT Sta. 20+00.00 =
-Y13- POT Sta. 20+00.00
EDWARD E. KNULL
LINDA R. KNULL
DB 765 PG 098
AUBREY L. HAIGLER
SHIRLEY L. HAIGLER
DB 842 PG 296
DB 696 PG 411
(ONE ACCESS POINT TO BE PROVIDED LOCATION TO BE DETERMINED)
WILLIAM H. NASH
DB 212 PG 500
BY13-109
-BY13- 8+61.34 PINC=
-L- 396+03.66, 348.77' RT
US 601 -Y12- & -Y13- TRAFFIC VOLUMES
2002 2025 ADT IN HUNDREDS
CURVE Y12-1
PI Sta 13+36.10
Δ = 2° 27' 26.5" (RT)
D = 0° 30' 00.0"
T = 245.77'
L = 491.47'
R = 11,459.16'
CURVE Y13-1
PI Sta 24+42.68
Δ = 0° 33' 01.3" (RT)
D = 1° 00' 00.0"
T = 27.52'
L = 55.03'
R = 5,729.58'
-Y13- PC Sta. 24+15.16
-Y13- PT Sta. 24+70.20
CURVE Y13-1
JOSEPH JULIUS QUINTO
DALE STARNES QUINTO
END CONSTRUCTION
-Y13- POC Sta.24+70.00
SEE SHEET 74 FOR -L- PROFILE.
SEE SHEET 91 FOR -Y12- & -Y13- PROFILE.
05/12/2005
r2616_rdy_psh31.dgn

8/17/99

REVISIONS

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

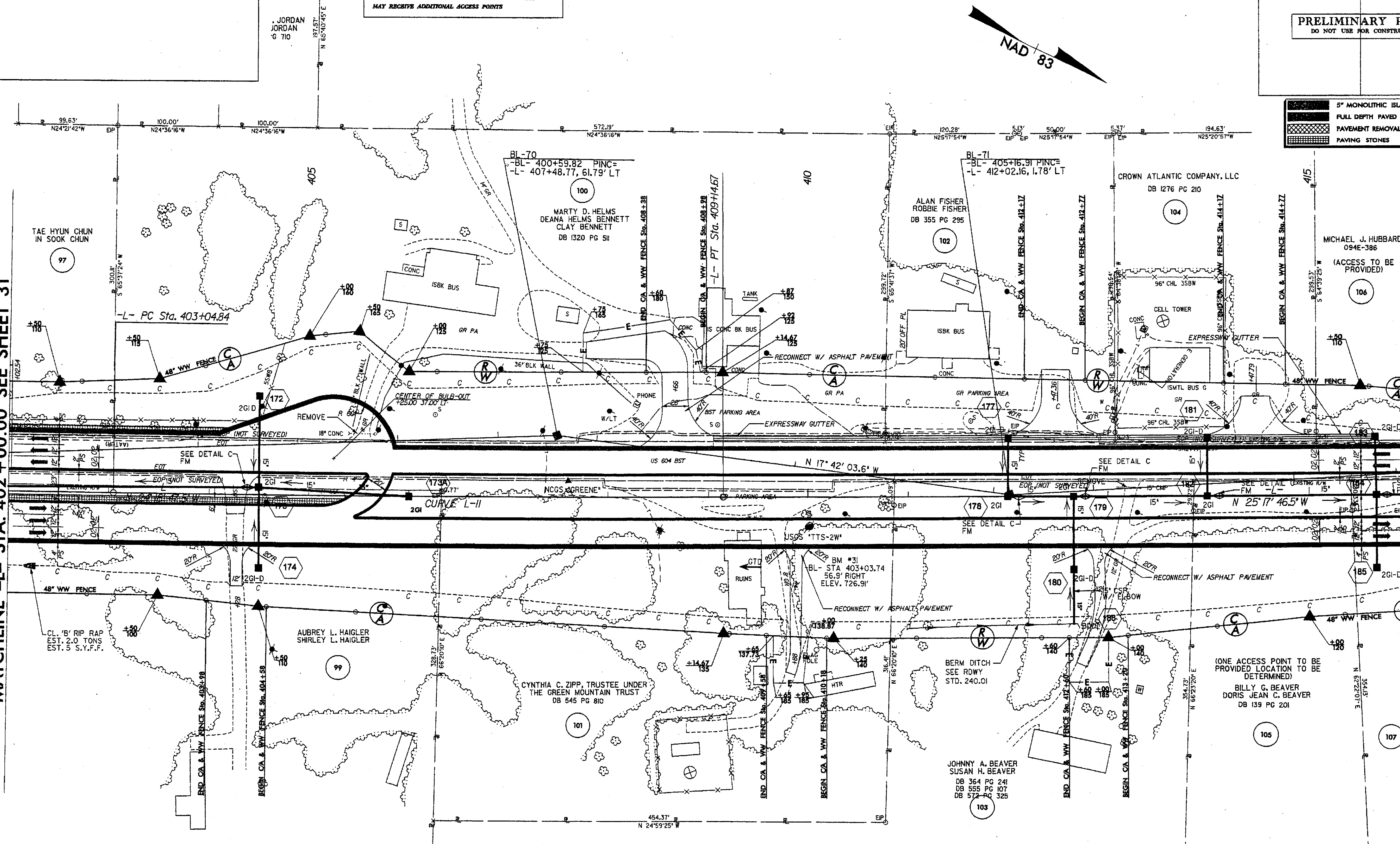
PROPERTIES WITH GREATER THAN 300' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	32
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

- 5" MONOLITHIC ISLAND
- FULL DEPTH PAVED SHOULDER
- PAVEMENT REMOVAL
- PAVING STONES



CURVE L-11
PI Sta 406+09.76
△ = 1° 00' 59.0" (LT)
D = 0° 10' 00.0"
T = 304.92'
L = 609.83'
R = 34,377.47'
SE = NC

SEE SHEET 75 FOR -L- PROFILE.

5/12/2005
r:\roadway\proj\r2616_rdy_psh32.dgn

8/17/99

REVISIONS

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	33
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

NAD 83

MATCHLINE -L- STA. 416+00.00 SEE SHEET 32

MATCHLINE -L- STA. 430+00.00 SEE SHEET 34

SUE F. YOW
RANDY E. YOW
DB 836 PG 540

BRIAN HUBBARD (ACCESS TO BE PROVIDED) 108

DONNA HUBBARD EDWARDS (ACCESS TO BE PROVIDED) 110

CHRISTY A. HUBBARD (ACCESS TO BE PROVIDED) 111

SHANA MERRITT CROWELL 094E-386 112

JOHNNY R. WALKER
JULIE WALKER
DB 483 PG 482 114

BOBBY LEWIS BEAVER
DENISE CLONTZ BEAVER
DB 372 PG 685 107

(ONE ACCESS POINT TO BE PROVIDED LOCATION TO BE DETERMINED)
BILLY G. BEAVER
DORIS JEAN C. BEAVER
DB 139 PG 201 109

STEVE WILSON AYCOTH
DB 1258 PG 677 113

(ONE ACCESS POINT TO BE PROVIDED LOCATION TO BE DETERMINED)
DELORES P. PEREZ
DB 440 PG 838 115

BY15-113
-BY15- 8+28.15 PINC=
-L- 421+56.39, 303.38' LT

BL-72
-BL- 415+57.07 PINC =
-BY15- 10+91.17 POT=
-L- 422+40.99, 54.34' LT

BM #32
-BL- STA 417+04.02
26.7' LEFT
ELEV. 651.20'

CL. 'I' RIP RAP
EST. 4 TONS
EST. 10 S.Y.F.F.

CL. 'B' RIP RAP
EST. 2.0 TONS
EST. 5.0 S.Y.F.F.

LATERAL BASE DITCH
SEE DETAIL I

HEADWALL

POND
WE 65'

48" WW FENCE

RECONNECT W/ ASPHALT PAVEMENT

RECONNECT W/ CONC

REMOVE

SEE DETAIL C

US 601 BST

N 28° 11' 53.9" W

N 25° 11' 46.5" W

N 23° 22' 14.4" W

N 45° 56' 29.9" E

N 03° 30' 01" E

N 03° 31' 18" E

744.39'

878.04'
S 02° 41' 49" W

202.16'
S 64° 39' 25" W

278.32'
N 24° 56' 13" W

99.98'
N 24° 56' 12" W

95.57'
N 21° 05' 47" W

99.77'
N 27° 05' 46" W

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

PROPERTIES WITH GREATER THAN 2000' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

SEE SHEET 76 FOR -L- PROFILE.

04/07/2005
J:\projects\r-2616_rdy_psh\r2616_r-dy_psh33.dgn
jonathan.joiner

8/17/99

REVISIONS

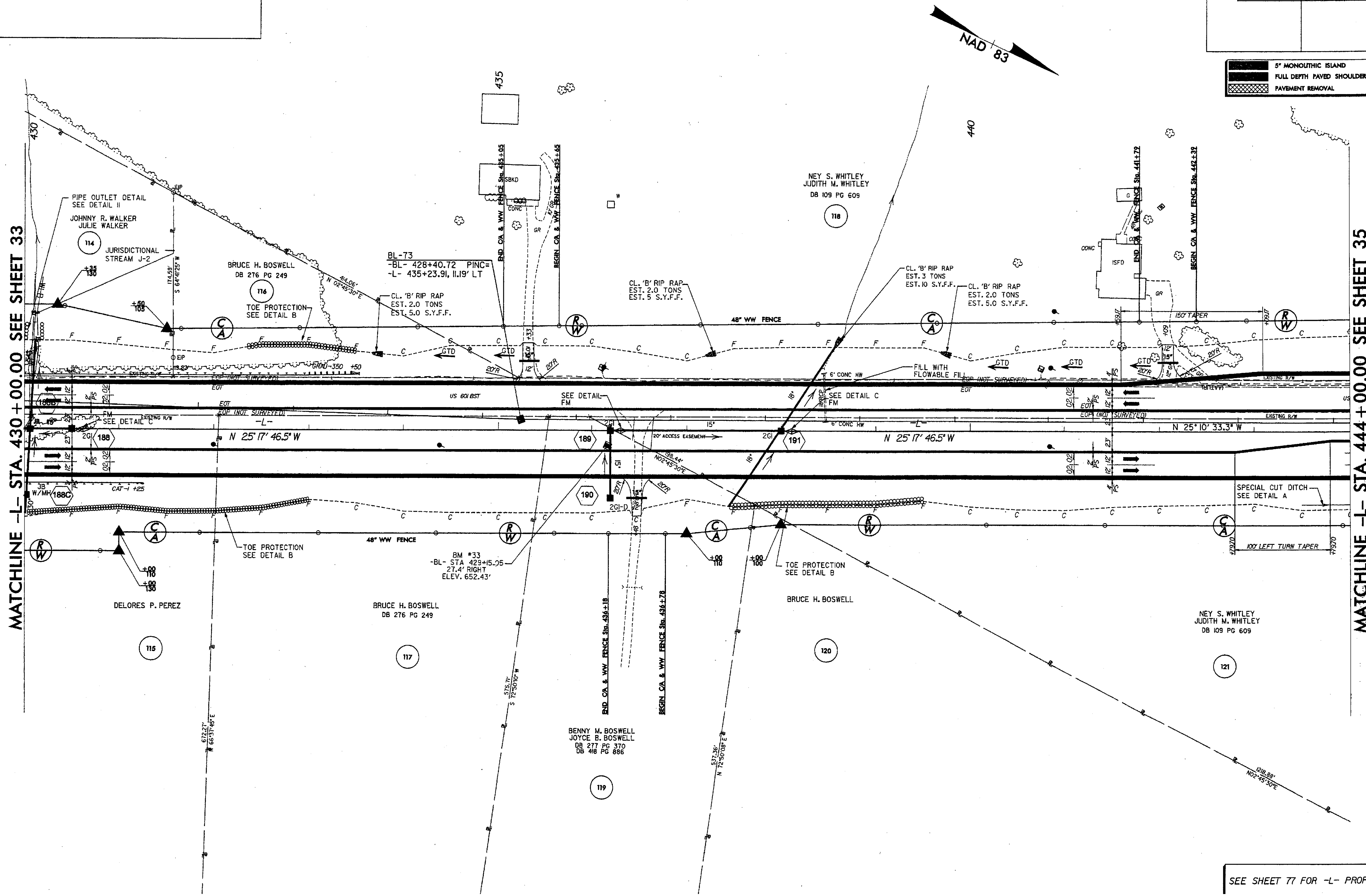
THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

PROPERTIES WITH GREATER THAN 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	34
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



NAD 83
5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL
MATCHLINE -L- STA. 430+00.00 SEE SHEET 33
MATCHLINE -L- STA. 444+00.00 SEE SHEET 35
PIPE OUTLET DETAIL SEE DETAIL II
JOHNNY R. WALKER
JULIE WALKER
JURISDICTIONAL STREAM J-2
BRUCE H. BOSWELL
DB 276 PG 249
TOE PROTECTION SEE DETAIL B
CL. 'B' RIP RAP EST. 2.0 TONS EST. 5.0 S.Y.F.F.
BL-73
-BL- 428+40.72 PINC=
-L- 435+23.91, 11.19' LT
END C/A & WW FENCE Sta. 435+05
BEGIN C/A & WW FENCE Sta. 435+65
CL. 'B' RIP RAP EST. 2.0 TONS EST. 5 S.Y.F.F.
NEY S. WHITLEY
JUDITH M. WHITLEY
DB 109 PG 609
CL. 'B' RIP RAP EST. 3 TONS EST. 10 S.Y.F.F.
CL. 'B' RIP RAP EST. 2.0 TONS EST. 5.0 S.Y.F.F.
END C/A & WW FENCE Sta. 441+72
BEGIN C/A & WW FENCE Sta. 442+32
150' TAPER
48" WW FENCE
FILL WITH FLOWABLE FILL
6" CONC HW
US 601 BST
SEE DETAIL FM
SEE DETAIL C FM
SEE DETAIL C
N 25° 17' 46.5" W
N 25° 10' 33.3" W
20' ACCESS EASEMENT
SPECIAL CUT DITCH SEE DETAIL A
100' LEFT TURN TAPER
TOE PROTECTION SEE DETAIL B
BM #33
-BL- STA 429+15.05
27.4' RIGHT
ELEV. 652.43'
DELORES P. PEREZ
BRUCE H. BOSWELL
DB 276 PG 249
END C/A & WW FENCE Sta. 436+18
BEGIN C/A & WW FENCE Sta. 436+78
BENNY M. BOSWELL
JOYCE B. BOSWELL
DB 277 PG 370
DB 418 PG 886
NEY S. WHITLEY
JUDITH M. WHITLEY
DB 109 PG 609
114
115
116
117
118
119
120
121
188
188B
188C
189
190
191

SEE SHEET 77 FOR -L- PROFILE.

1/07/2005
\roadway\proj\r2616_rdy_psh34.dgn

8/17/99

REVISIONS

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

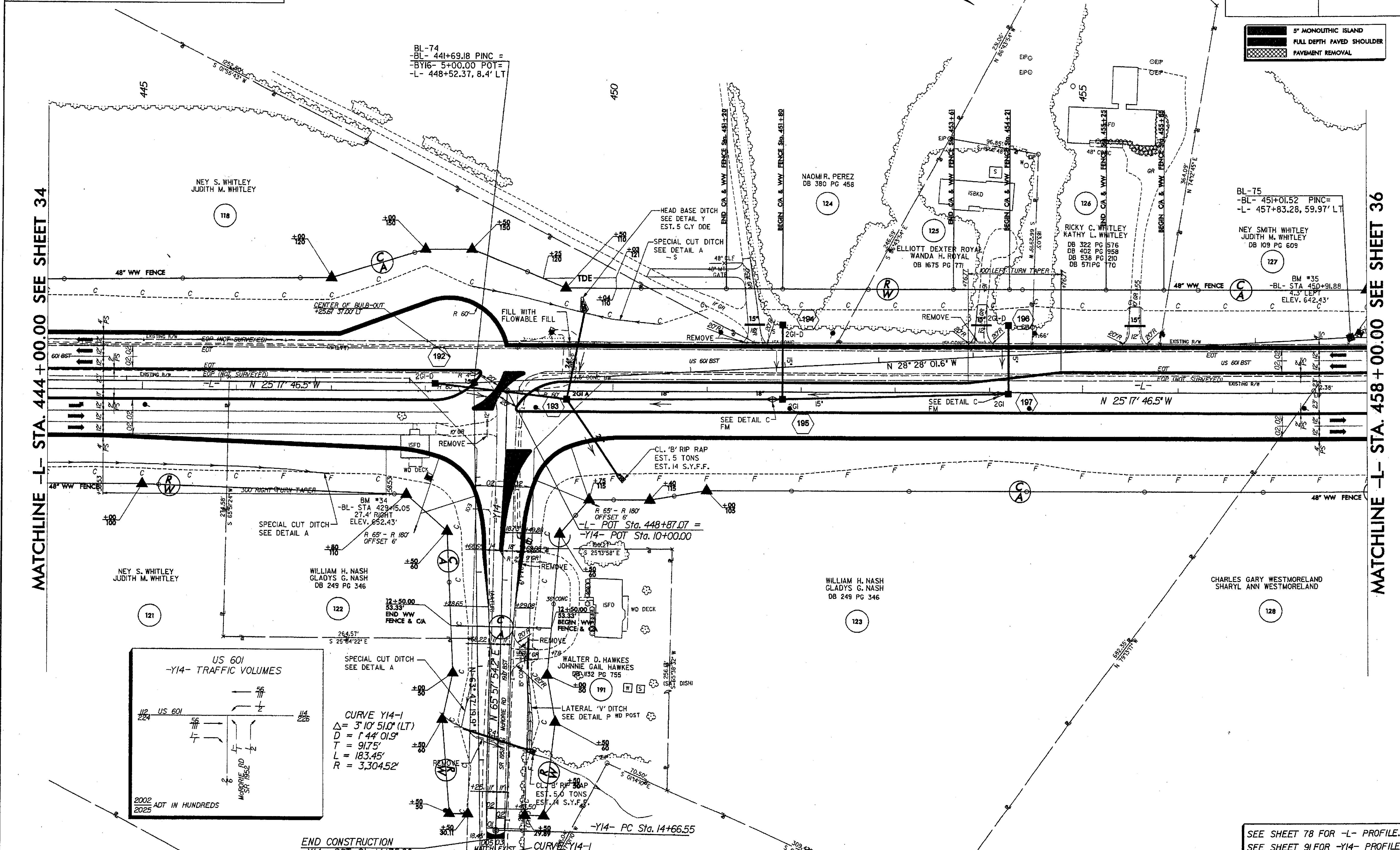
PROPERTIES WITH GREATER THAN 300' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	35
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



NAD 83
MATCHLINE -L- STA. 444+00.00 SEE SHEET 34
MATCHLINE -L- STA. 458+00.00 SEE SHEET 36
BL-74
-BL- 441+69.18 PINC =
-BY16- 5+00.00 POT=
-L- 448+52.37, 8.4' LT
BL-75
-BL- 451+01.52 PINC=
-L- 457+83.28, 59.97' LT
NEY S. WHITLEY
JUDITH M. WHITLEY
NAOMI R. PEREZ
DB 380 PG 458
ELLIOTT DEXTER ROYAL
WANDA H. ROYAL
DB 1675 PG 771
RICKY C. WHITLEY
KATHY L. WHITLEY
NEY SMITH WHITLEY
JUDITH M. WHITLEY
DB 109 PG 609
BM #35
-BL- STA 450+91.88
4.3' LEFT
ELEV. 642.43'
BM #34
-BL- STA 429+15.05
27.4' RIGHT
ELEV. 652.43'
HEAD BASE DITCH
SEE DETAIL Y
SPECIAL CUT DITCH
SEE DETAIL A
CENTER OF BULB-OUT
FILL WITH FLOWABLE FILL
REMOVE
US 601 BST
N 28° 28' 01.6" W
N 25° 17' 46.5" W
SEE DETAIL C
CL. 'B' RIP RAP
EST. 5 TONS
EST. 14 S.Y.F.F.
48" WW FENCE
300' RIGHT TURN TAPER
-L- POT Sta. 448+87.07 =
-Y14- POT Sta. 10+00.00
WILLIAM H. NASH
GLADYS G. NASH
DB 249 PG 346
CHARLES GARY WESTMORELAND
SHARYL ANN WESTMORELAND
WALTER D. HAWKES
JOHNNIE GAIL HAWKES
LATERAL 'V' DITCH
SEE DETAIL P
US 601
-Y14- TRAFFIC VOLUMES
MCRORIE RD
SR 1952
2002
2025 ADT IN HUNDREDS
CURVE Y14-1
Δ= 3° 10' 51.0" (LT)
D = 1° 44' 01.9"
T = 91.75'
L = 183.45'
R = 3,304.52'
-Y14- PC Sta. 14+66.55
END CONSTRUCTION
-Y14- POT Sta. 14+75.00

SEE SHEET 78 FOR -L- PROFILE.
SEE SHEET 91 FOR -Y14- PROFILE.

01/07/2005
r2616_rdy_psh35.dgn

REVISIONS

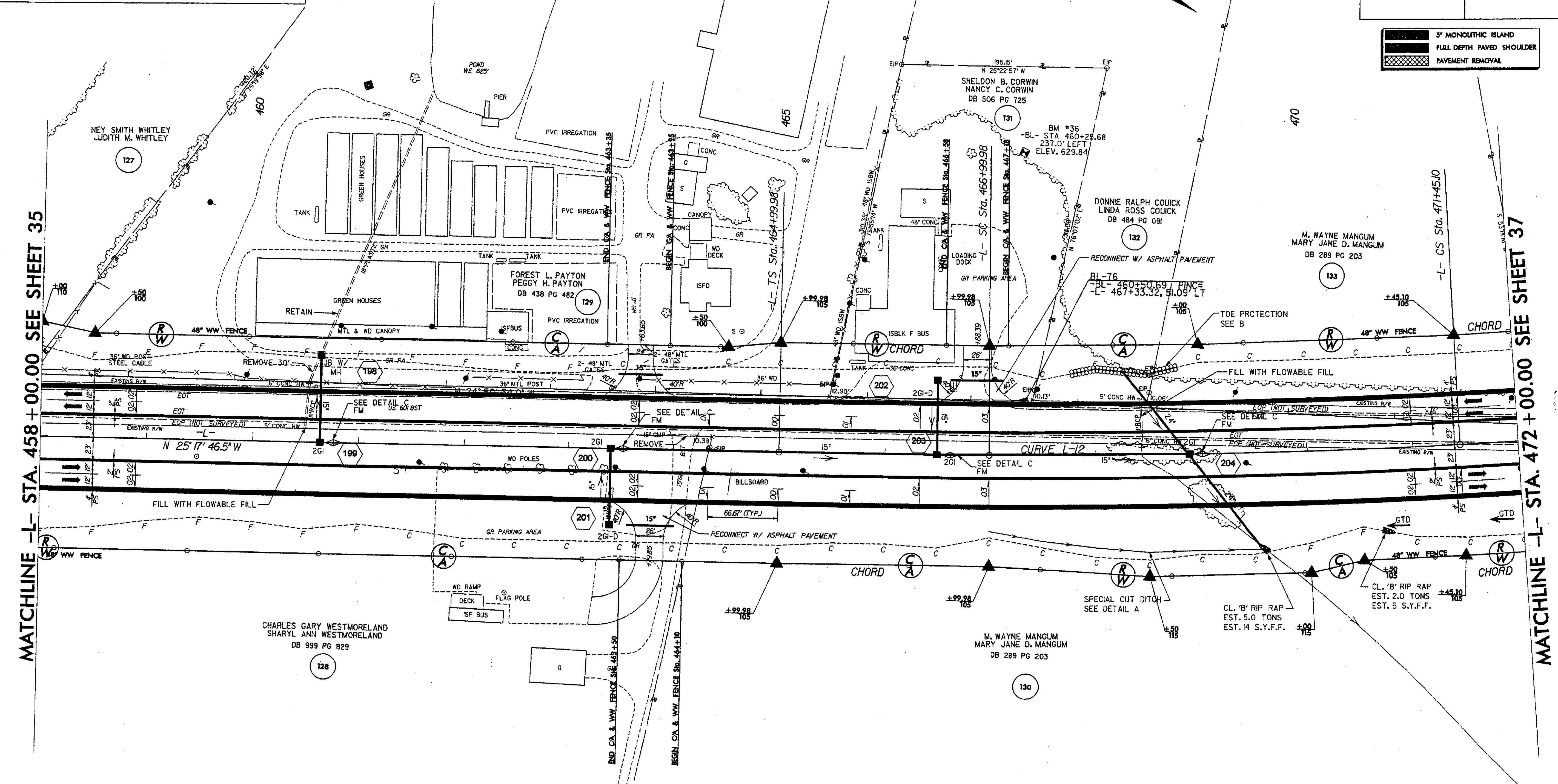
8/17/99

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	36
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

- 5" MONOLITHIC ISLAND
- FULL DEPTH PAVED SHOULDER
- PAVEMENT REMOVAL



CURVE L-12

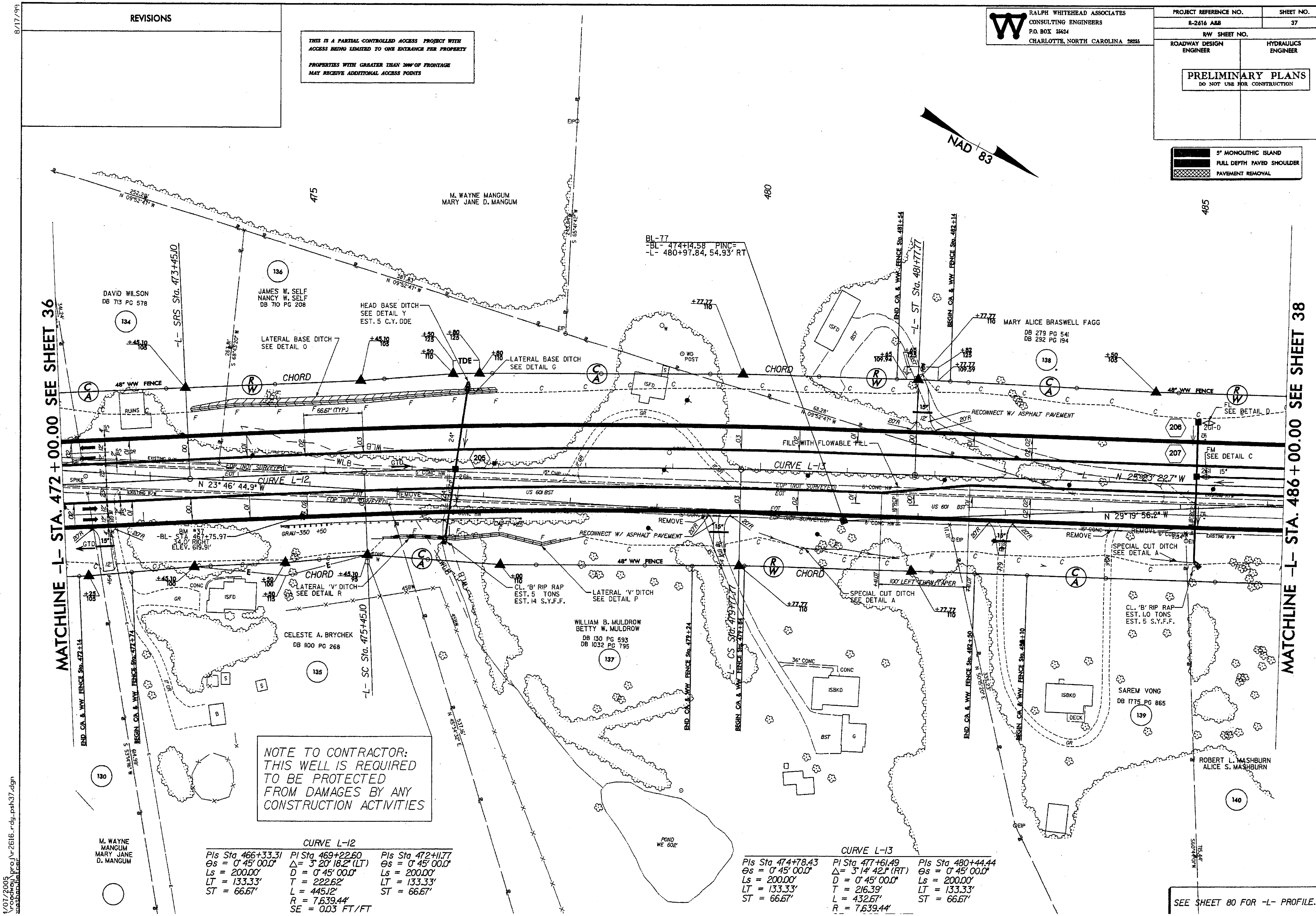
PIs Sta 466+33.31	PI Sta 469+22.60	PIs Sta 472+11.77
Θs = 0° 45' 00.0"	Δ = 3° 20' 18.2" (LT)	Θs = 0° 45' 00.0"
Ls = 200.00'	D = 0° 45' 00.0"	Ls = 200.00'
LT = 133.33'	T = 222.62'	LT = 133.33'
ST = 66.67'	L = 445.12'	ST = 66.67'
	R = 7,639.44'	
	SE = 0.03 FT/FT	

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

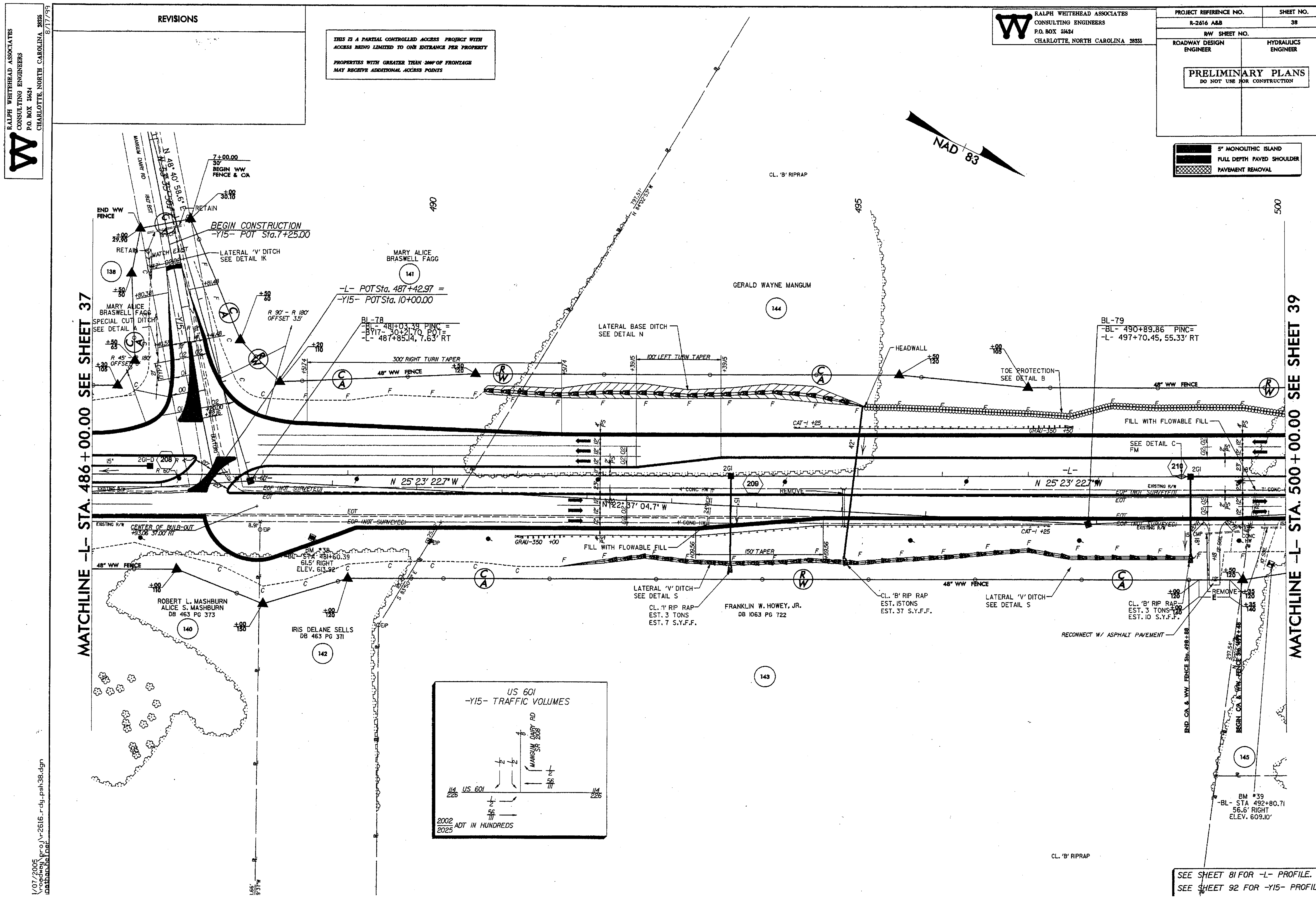
PROPERTIES WITH GREATER THAN 2000' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

SEE SHEET 79 FOR -L- PROFILE.

4/07/2005
...\roadway\proj\r2616_rdy_psh36.dgn



REVISIONS
8/17/99
THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY
PROPERTIES WITH GREATER THAN 2000' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS
RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235
PROJECT REFERENCE NO.
R-2616 A&B
SHEET NO.
37
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
NAD 83
5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL
MATCHLINE -L- STA. 472+00.00 SEE SHEET 36
MATCHLINE -L- STA. 486+00.00 SEE SHEET 38
M. WAYNE MANGUM
MARY JANE D. MANGUM
DAVID WILSON
DB 713 PG 578
JAMES W. SELF
NANCY W. SELF
DB 710 PG 208
MARY ALICE BRASWELL FAGG
DB 279 PG 541
DB 292 PG 194
CELESTE A. BRYCHEK
DB 1100 PG 268
WILLIAM B. MULDROW
BETTY W. MULDROW
DB 130 PG 593
DB 1032 PG 795
SAREM VONG
DB 1775 PG 865
ROBERT L. MASHBURN
ALICE S. MASHBURN
BL-77
-BL- 474+14.58 PINC=
-L- 480+97.84, 54.93' RT
HEAD BASE DITCH
SEE DETAIL Y
EST. 5 C.Y. DDE
LATERAL BASE DITCH
SEE DETAIL O
LATERAL BASE DITCH
SEE DETAIL G
FILL WITH FLOWABLE FILL
RECONNECT W/ ASPHALT PAVEMENT
CURVE L-12
CURVE L-13
N 23° 46' 44.9" W
N 25°23' 22.7" W
N 29°19' 56.2" W
US 601 BST
SEE DETAIL D
SEE DETAIL C
SPECIAL CUT DITCH
SEE DETAIL A
CL. 'B' RIP RAP
EST. 1.0 TONS
EST. 5 S.Y.F.F.
CL. 'B' RIP RAP
EST. 5 TONS
EST. 14 S.Y.F.F.
LATERAL 'V' DITCH
SEE DETAIL P
LATERAL 'V' DITCH
SEE DETAIL R
100' LEFT TURN TAPER
BM #37
-BL- STA 467+75.97
34.0' RIGHT
ELEV. 619.91'
NOTE TO CONTRACTOR:
THIS WELL IS REQUIRED
TO BE PROTECTED
FROM DAMAGES BY ANY
CONSTRUCTION ACTIVITIES
POND
WE 602'
CURVE L-12
PIs Sta 466+33.31 | θs = 0° 45' 00.0" | Ls = 200.00' | LT = 133.33' | ST = 66.67'
PI Sta 469+22.60 | Δ = 3° 20' 18.2" (LT) | D = 0° 45' 00.0" | T = 222.62' | L = 445.12' | R = 7,639.44' | SE = 0.03 FT/FT
PIs Sta 472+11.77 | θs = 0° 45' 00.0" | Ls = 200.00' | LT = 133.33' | ST = 66.67'
CURVE L-13
PIs Sta 474+78.43 | θs = 0° 45' 00.0" | Ls = 200.00' | LT = 133.33' | ST = 66.67'
PI Sta 477+61.49 | Δ = 3° 14' 42.1" (RT) | D = 0° 45' 00.0" | T = 216.39' | L = 432.67' | R = 7,639.44'
PIs Sta 480+44.44 | θs = 0° 45' 00.0" | Ls = 200.00' | LT = 133.33' | ST = 66.67'
SEE SHEET 80 FOR -L- PROFILE.
r2616_rdy_psh37.dgn



RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235
8/17/99
REVISIONS
THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY
PROPERTIES WITH GREATER THAN 2000' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS
PROJECT REFERENCE NO.
SHEET NO.
R-2616 A&B
38
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
NAD 83
5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL
CL. 'B' RIPRAP
MATCHLINE -L- STA. 486+00.00 SEE SHEET 37
MATCHLINE -L- STA. 500+00.00 SEE SHEET 39
7+00.00
30'
BEGIN WW FENCE & C/A
END WW FENCE
BEGIN CONSTRUCTION
-Y15- POT Sta.7+25.00
LATERAL 'V' DITCH SEE DETAIL 1K
MARY ALICE BRASWELL FAGG
141
138
MARY ALICE BRASWELL FAGG
SPECIAL CUT DITCH SEE DETAIL A
-L- POTSta. 487+42.97 =
-Y15- POTSta. 10+00.00
R 90' - R 180' OFFSET 3.5'
BL-78
-BL- 481+03.39 PINC =
-BY17- 30+21.70 POT=
-L- 487+85.14, 7.63' RT
300' RIGHT TURN TAPER
48" WW FENCE
GERALD WAYNE MANGUM
144
LATERAL BASE DITCH SEE DETAIL N
100' LEFT TURN TAPER
HEADWALL
TOE PROTECTION SEE DETAIL B
BL-79
-BL- 490+89.86 PINC=
-L- 497+70.45, 55.33' RT
FILL WITH FLOWABLE FILL
SEE DETAIL C FM
N 25°23' 22.7" W
N 22°37' 04.7" W
208
209
210
2GI
REMOVE
CENTER OF BULB-OUT +93.06 37.00' RT
BM #38
-BL- STA 481+60.39
61.5' RIGHT
ELEV. 613.92'
FILL WITH FLOWABLE FILL
150' TAPER
ROBERT L. MASHBURN
ALICE S. MASHBURN
DB 463 PG 373
140
IRIS DELANE SELLS
DB 463 PG 371
142
LATERAL 'V' DITCH SEE DETAIL S
CL. 'I' RIP RAP EST. 3 TONS EST. 7 S.Y.F.F.
FRANKLIN W. HOWEY, JR.
DB 1063 PG 722
CL. 'B' RIP RAP EST. 15TONS EST. 37 S.Y.F.F.
LATERAL 'V' DITCH SEE DETAIL S
CL. 'B' RIP RAP EST. 3 TONS EST. 10 S.Y.F.F.
RECONNECT W/ ASPHALT PAVEMENT
143
145
BM #39
-BL- STA 492+80.71
56.6' RIGHT
ELEV. 609.10'
US 601
-Y15- TRAFFIC VOLUMES
MANGUM DAIRY RD SR 208
2002/2025 ADT IN HUNDREDS
SEE SHEET 81 FOR -L- PROFILE.
SEE SHEET 92 FOR -Y15- PROFILE.

8/17/99

REVISIONS

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

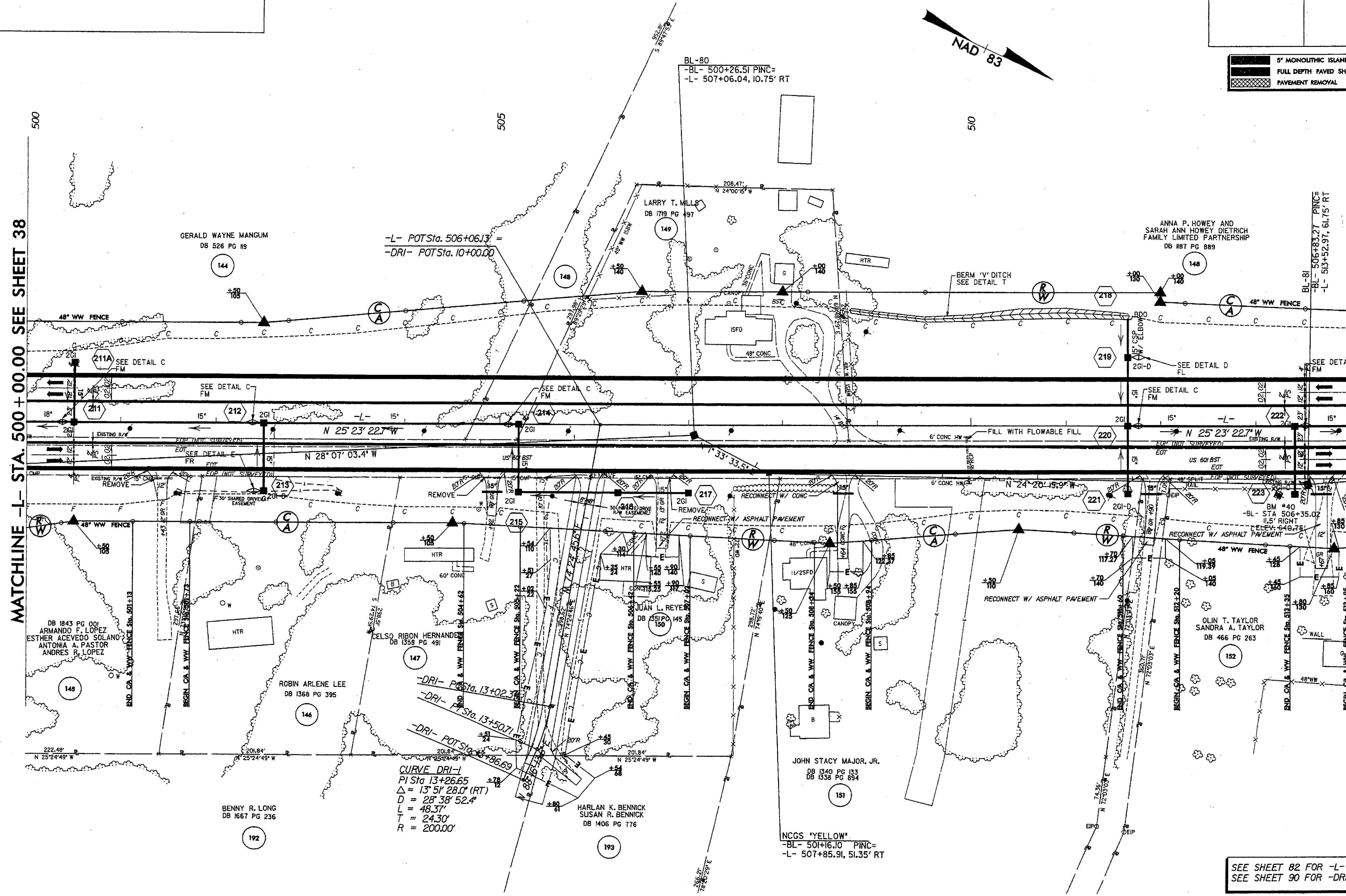
PROPERTIES WITH GREATER THAN 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	39
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

- 5" MONOLITHIC ISLAND
- FULL DEPTH PAVED SHOULDER
- PAVEMENT REMOVAL



NAD 83
500
505
510
MATCHLINE -L- STA. 500+00.00 SEE SHEET 38
MATCHLINE -L- STA. 514+00.00 SEE SHEET 40
BL-80
-BL- 500+26.51 PINC=
-L- 507+06.04, 10.75' RT
BL-81
-BL- 506+83.27 PINC=
-L- 513+52.97, 61.75' RT
-L- POT Sta. 506+06.13 =
-DRI- POT Sta. 10+00.00
GERALD WAYNE MANGUM
DB 526 PG 119
LARRY T. MILLS
DB 1719 PG 497
ANNA P. HOWEY AND
SARAH ANN HOWEY DIETRICH
FAMILY LIMITED PARTNERSHIP
DB 1187 PG 889
BERM 'V' DITCH
SEE DETAIL T
48" WW FENCE
SEE DETAIL C
SEE DETAIL D
SEE DETAIL E
N 25° 23' 22.7" W
N 28° 07' 03.4" W
N 24° 20' 19.9" W
FILL WITH FLOWABLE FILL
REMOVE
REMOVE
RECONNECT W/ CONC
RECONNECT W/ ASPHALT PAVEMENT
BM #40
-BL- STA 506+35.02
11.5' RIGHT
ELEV. 640.76'
DB 1843 PG 001
ARMANDO F. LOPEZ
ESTHER ACEVEDO SOLANO
ANTONIA A. PASTOR
ANDRES R. LOPEZ
ROBIN ARLENE LEE
DB 1368 PG 395
CELSO RIBON HERNANDEZ
DB 1358 PG 491
JUAN L. REYES
DB 1351 PG 145
JOHN STACY MAJOR, JR.
DB 1340 PG 133
DB 1338 PG 894
OLIN T. TAYLOR
SANDRA A. TAYLOR
DB 466 PG 263
BENNY R. LONG
DB 1667 PG 236
HARLAN K. BENNICK
SUSAN R. BENNICK
DB 1406 PG 776
-DRI- PC Sta. 13+02.35
-DRI- PI Sta. 13+26.65
-DRI- PT Sta. 13+50.71
-DRI- POT Sta. 13+86.69
CURVE DRI-1
PI Sta 13+26.65
Δ = 13° 51' 28.0" (RT)
D = 28° 38' 52.4"
L = 48.37'
T = 24.30'
R = 200.00'
NCGS "YELLOW"
-BL- 501+16.10 PINC=
-L- 507+85.91, 51.35' RT

SEE SHEET 82 FOR -L- PROFILE.
SEE SHEET 90 FOR -DRI- PROFILE

04/07/2005
r:\roadway\proj\r2616_rdy_psh39.dgn

REVISIONS

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	40
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

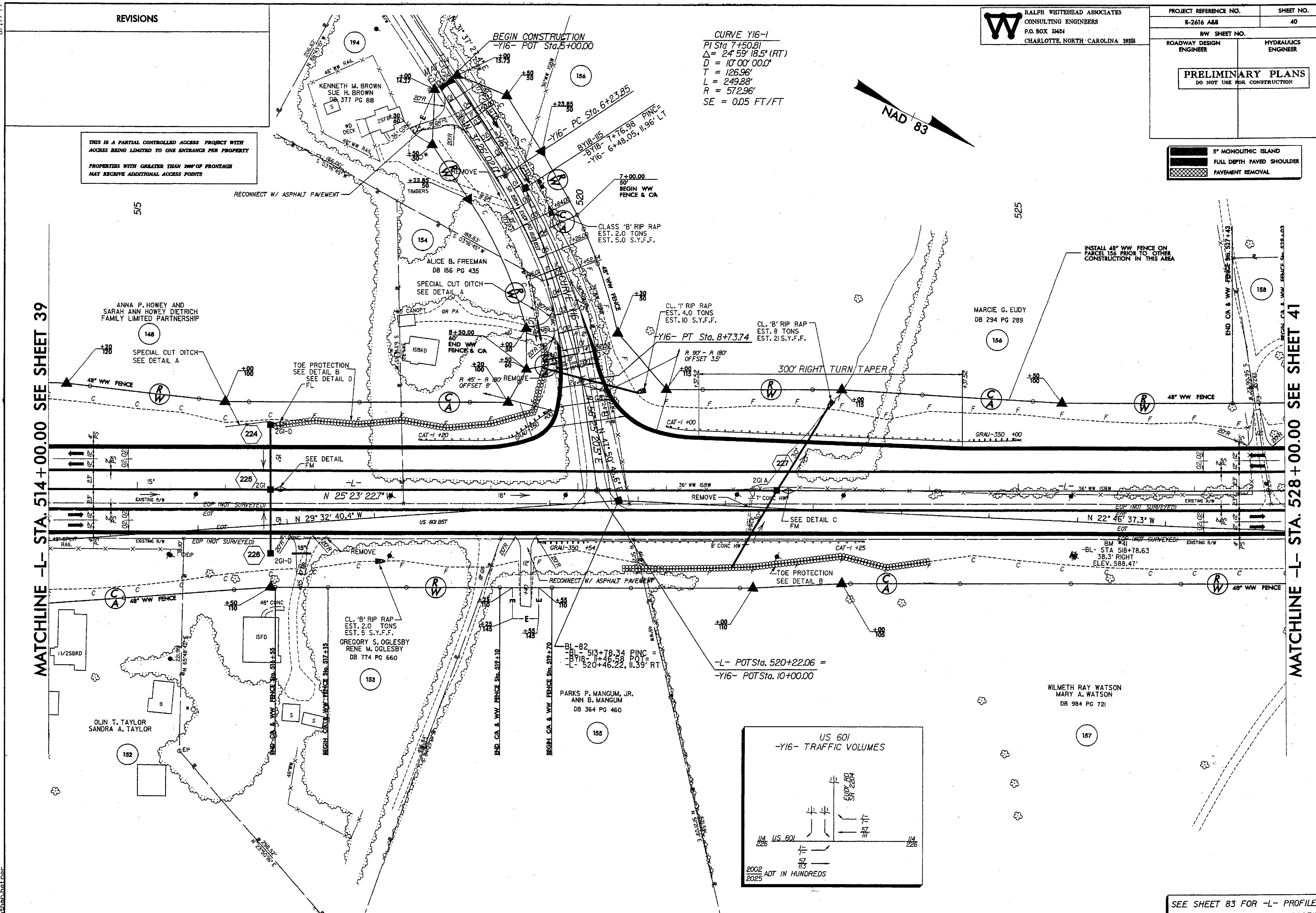
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

PROPERTIES WITH GREATER THAN 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

- 5" MONOLITHIC ISLAND
- FULL DEPTH PAVED SHOULDER
- PAVEMENT REMOVAL

CURVE Y16-1
PI Sta 7+50.81
Δ = 24° 59' 18.5" (RT)
D = 10° 00' 00.0"
T = 126.96'
L = 249.88'
R = 572.96'
SE = 0.05 FT/FT



US 601
-Y16- TRAFFIC VOLUMES

EUDY RD SR 2204

2002 / 2025 ADT IN HUNDREDS

SEE SHEET 83 FOR -L- PROFILE.
SEE SHEET 92 FOR -Y16- PROFILE.

8/17/99

REVISIONS

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	41
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

PROPERTIES WITH GREATER THAN 2000' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

MATCHLINE -L- STA. 528+00.00 SEE SHEET 40

MATCHLINE -L- STA. 542+00.00 SEE SHEET 42

-Y17- POT Sta. 5+00.00

BEGIN CONSTRUCTION
-Y17- POT Sta.5+25.00

NAD 83

R2616-25
-BY19- 32+70.20 PINC=
-Y17- 6+41.63, 10.86' RT

BL-84
-BL- 530+62.79 PINC =
-BY19- 36+24.17 POT=
-L- 537+27.85, 5.65' RT

-L- POT Sta. 537+60.67 =
-Y17- POT Sta. 10+00.00

BM #42
-BL- STA 530+27.20
105.3' LEFT
ELEV. 579.14'

BL-83
-BL- 523+85.69 PINC=
-L- 530+25.55, 56.08' RT

THOMAS PATRICK LINN
JULIE MEDLIN LINN
DB 1025 PG 727
195

BOBBY NELSON MULLIS
DB 455 PG 701
158

STEPHANIE M. CRIPE
THOMAS JOSEPH CRIPE
DB 937 PG 869
159

GARREN BLAIR DEAN
PEGGY R. DEAN
DB 312 PG 524
161

JOSEPH C. FINCH
74E-055
164

WILMETH RAY WATSON
MARY A. WATSON
157

FRANK GINES
IRIS GINES
DB 1170 PG 164
162

DENNIS M. SUTTON
REBECCA M. SUTTON
DB 951 PG 044
160

JOSEPH C. FINCH
74E-055
163

US 601
-Y17- TRAFFIC VOLUMES

MACEDONIA CHURCH RD SR 2106

US 601

2002 ADT IN HUNDREDS
2025

SEE SHEET 84 FOR -L- PROFILE.
SEE SHEET 92 FOR -Y17- PROFILE.

4/08/2005
\roadway_proj\r2616_rdy_psh41.dgn
jonathan.reiner

8/17/99

REVISIONS

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

PROPERTIES WITH GREATER THAN 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

DETAIL OF HAZARDOUS SPILL RETENTION BASIN
TOTAL CAPACITY REQUIRED : 4789 cu. ft.
TOTAL CAPACITY PROVIDED : 4920 cu. ft.
@ 6.0' W/ 1.0' FREEBOARD

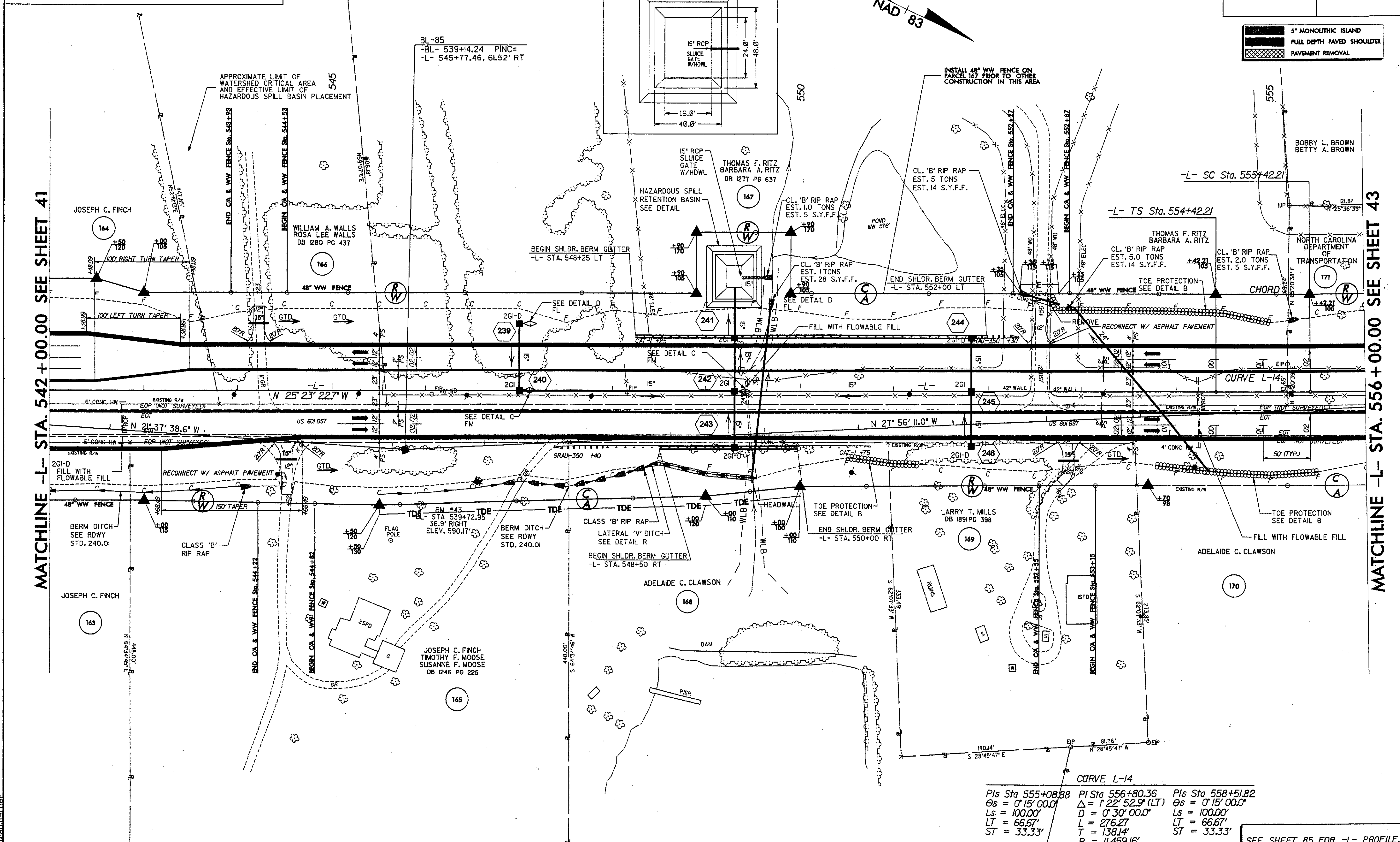
ELEV. = 561.37
MODEL 20-10C SLUICE GATE
15" RCP
SLUICE GATE W/HDWL
24.0'
48.0'
16.0'
40.0'

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	42
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



CURVE L-14

PIs Sta 555+08.88	PI Sta 556+80.36	PIs Sta 558+51.82
θs = 0° 15' 00.0"	Δ = 1° 22' 52.9" (LT)	θs = 0° 15' 00.0"
Ls = 100.00'	D = 0° 30' 00.0"	Ls = 100.00'
LT = 66.67'	L = 276.27	LT = 66.67'
ST = 33.33'	T = 138.14'	ST = 33.33'
	R = 11,459.16'	
	SE = 0.02 FT/FT	

SEE SHEET 85 FOR -L- PROFILE.

/08/2005
r2616.rdy_psh42.dgn

8/17/99

REVISIONS

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

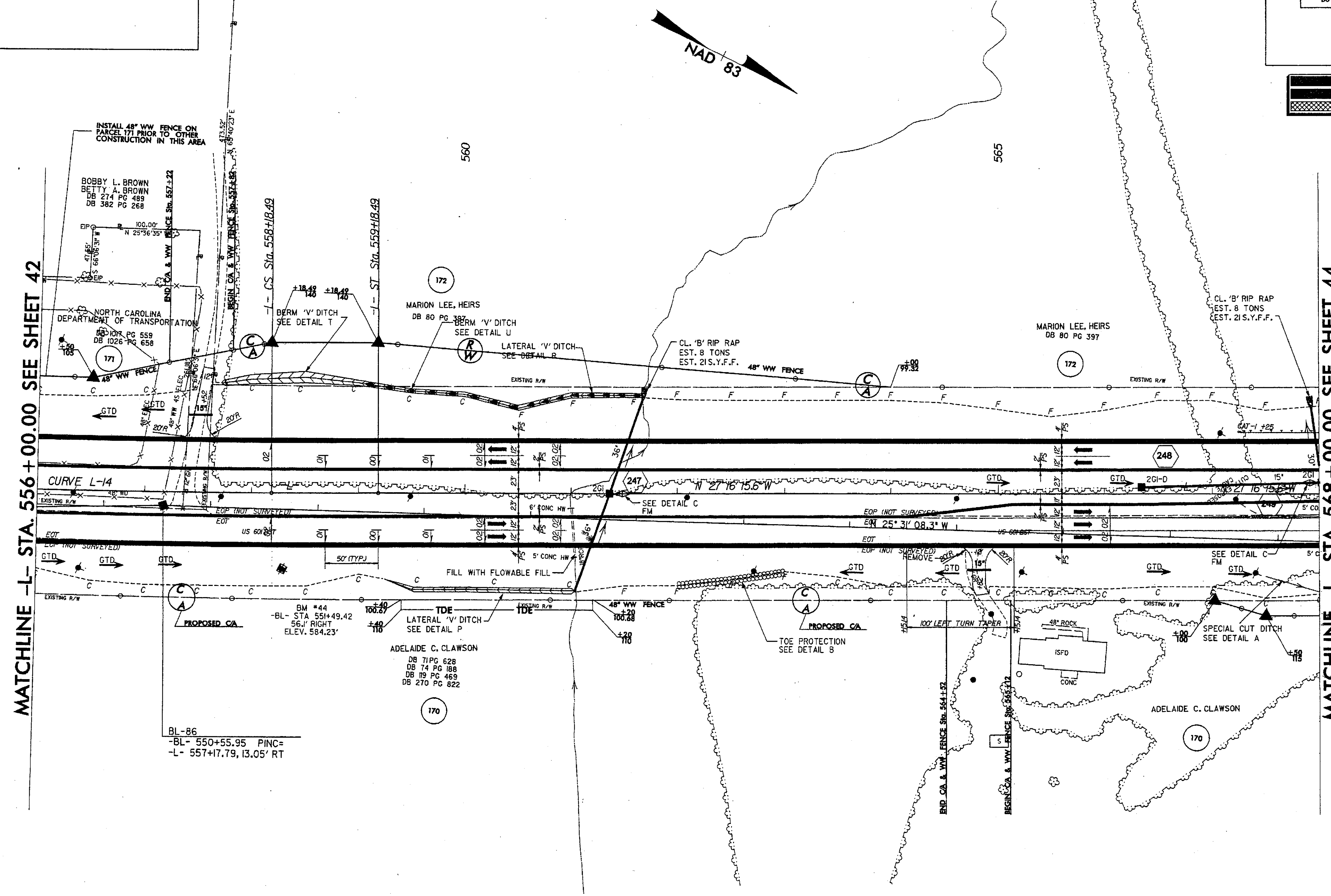
PROPERTIES WITH GREATER THAN 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	43
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



CURVE L-14

PIs Sta 555+08.88	PI Sta 556+80.36	PIs Sta 558+51.82
θs = 0° 15' 00.0"	Δ = 1° 22' 52.9" (LT)	θs = 0° 15' 00.0"
Ls = 100.00'	D = 0° 30' 00.0"	Ls = 100.00'
LT = 66.67'	L = 276.27	LT = 66.67'
ST = 33.33'	T = 138.14'	ST = 33.33'
	R = 11,459.16'	
	SE = 0.02 FT/FT	

14/07/2005
r:\roadway\proj\r2616_rdy_psh43.dgn

SEE SHEET 86 FOR -L- PROFILE.

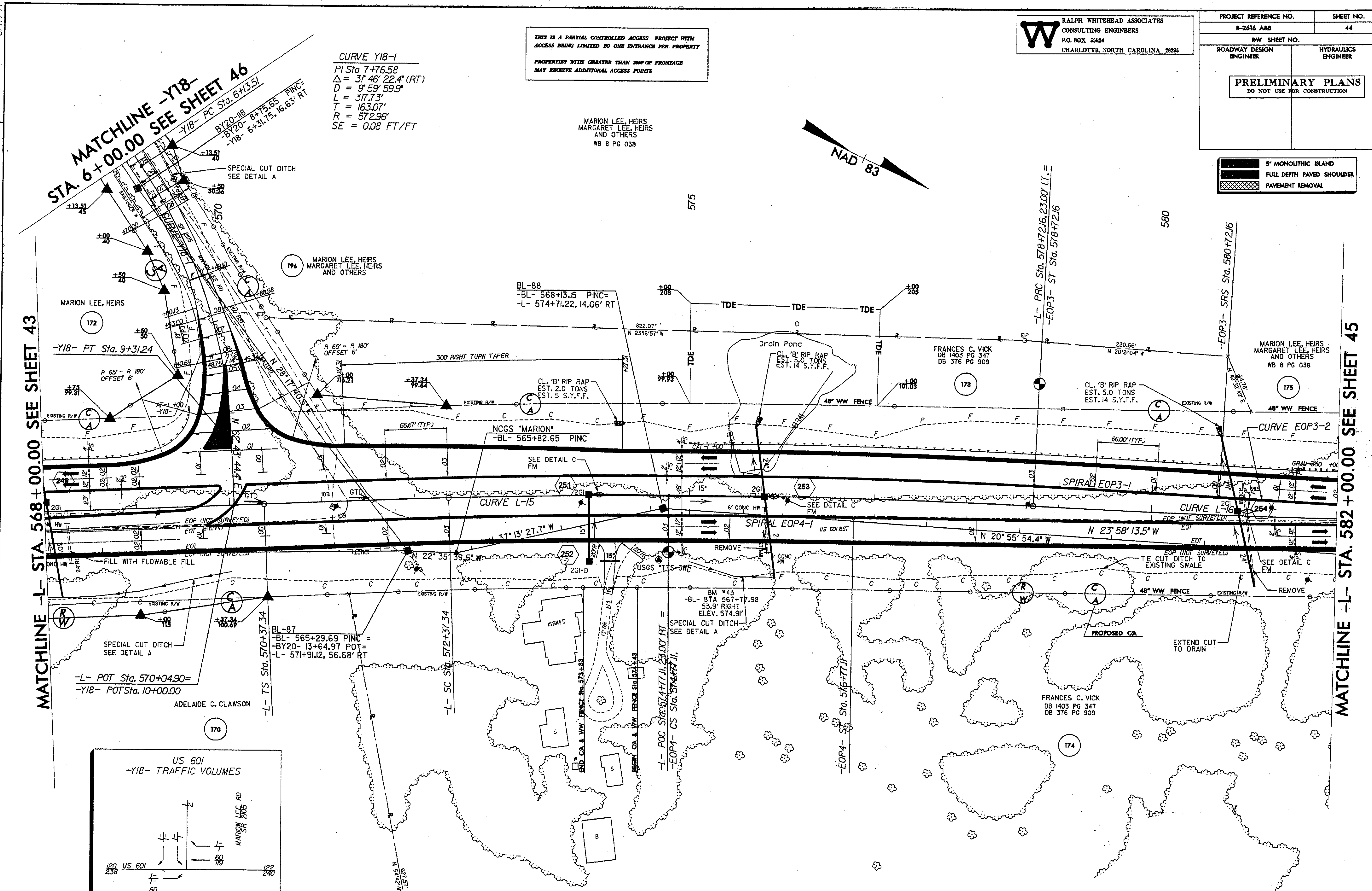
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	44
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

PROPERTIES WITH GREATER THAN 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS



MATCHLINE -Y18- STA. 6+00.00 SEE SHEET 46
MATCHLINE -L- STA. 568+00.00 SEE SHEET 43
MATCHLINE -L- STA. 582+00.00 SEE SHEET 45
CURVE Y18-1
PI Sta 7+76.58
△= 31° 46' 22.4" (RT)
D = 9° 59' 59.9"
L = 317.73'
T = 163.07'
R = 572.96'
SE = 0.08 FT/FT
MARION LEE, HEIRS
MARGARET LEE, HEIRS
AND OTHERS
WB 8 PG 038
NAD 83
5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL
BL-88
-BL- 568+13.15 PINC=
-L- 574+71.22, 14.06' RT
NCGS "MARION"
-BL- 565+82.65 PINC
BL-87
-BL- 565+29.69 PINC =
-BY20- 13+64.97 POT=
-L- 571+91.12, 56.68' RT
-Y18- PT Sta. 9+31.24
-L- POT Sta. 570+04.90=
-Y18- POTSta. 10+00.00
SPECIAL CUT DITCH
SEE DETAIL A
FILL WITH FLOWABLE FILL
CURVE L-15
CURVE L-16
SPIRAL EOP4-1
SPIRAL EOP3-1
CURVE EOP3-2
FRANCES C. VICK
DB 1403 PG 347
DB 376 PG 909
ADELAIDE C. CLAWSON
BM #45
-BL- STA 567+77.98
53.9' RIGHT
ELEV. 574.91'
CL. 'B' RIP RAP
EST. 5.0 TONS
EST. 14 S.Y.F.F.
TIE CUT DITCH TO EXISTING SWALE
EXTEND CUT TO DRAIN
PROPOSED C/A
48" WW FENCE
US 601
-Y18- TRAFFIC VOLUMES
MARION LEE RD SR 2055
2002
2025 ADT IN HUNDREDS

CURVE L-15		SPIRAL EOP4-1	CURVE L-16	SPIRAL EOP3-1	CURVE EOP3-2		
PIs Sta 571+70.67	△= 4° 57' 09.5" (RT)	PIs Sta 575+43.78	PI Sta 581+37.94	PIs Sta 579+38.83	PIs Sta 581+58.83	PI Sta 584+33.03	PIs Sta 587+07.17
θs = 0° 45' 00.0"	D = 0° 45' 00.0"	θs = 0° 45' 08.2"	△= 2° 24' 07.5" (LT)	θs = 0° 44' 51.9"	θs = 0° 19' 30.0"	△= 2° 18' 30.1" (LT)	θs = 0° 19' 30.0"
Ls = 200.00'	T = 330.38'	Ls = 200.00'	D = 0° 30' 00.0"	Ls = 200.00'	Ls = 130.00'	D = 0° 30' 00.0"	Ls = 130.00'
LT = 133.33'	L = 660.35'	LT = 133.33'	T = 240.24'	LT = 133.33'	LT = 86.67'	L = 461.67'	LT = 86.67'
ST = 66.67'	R = 7,639.44'	ST = 66.67'	L = 480.42'	ST = 66.67'	ST = 43.33'	T = 230.87'	ST = 43.33'
	SE = 0.03 FT/FT		R = 11,459.16'			R = 11,459.16'	

SEE SHEET 87 FOR -L- PROFILE.
SEE SHEET 92 FOR -18- PROFILE.

8/17/99
04/08/2005
r2616_psh44.dgn

8/17/99

REVISIONS

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

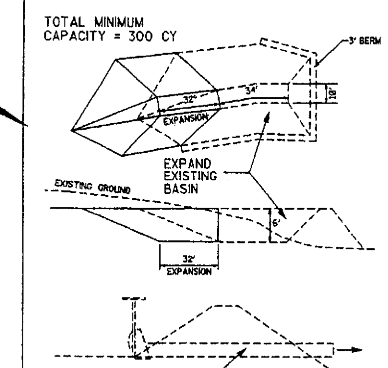
PROPERTIES WITH GREATER THAN 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

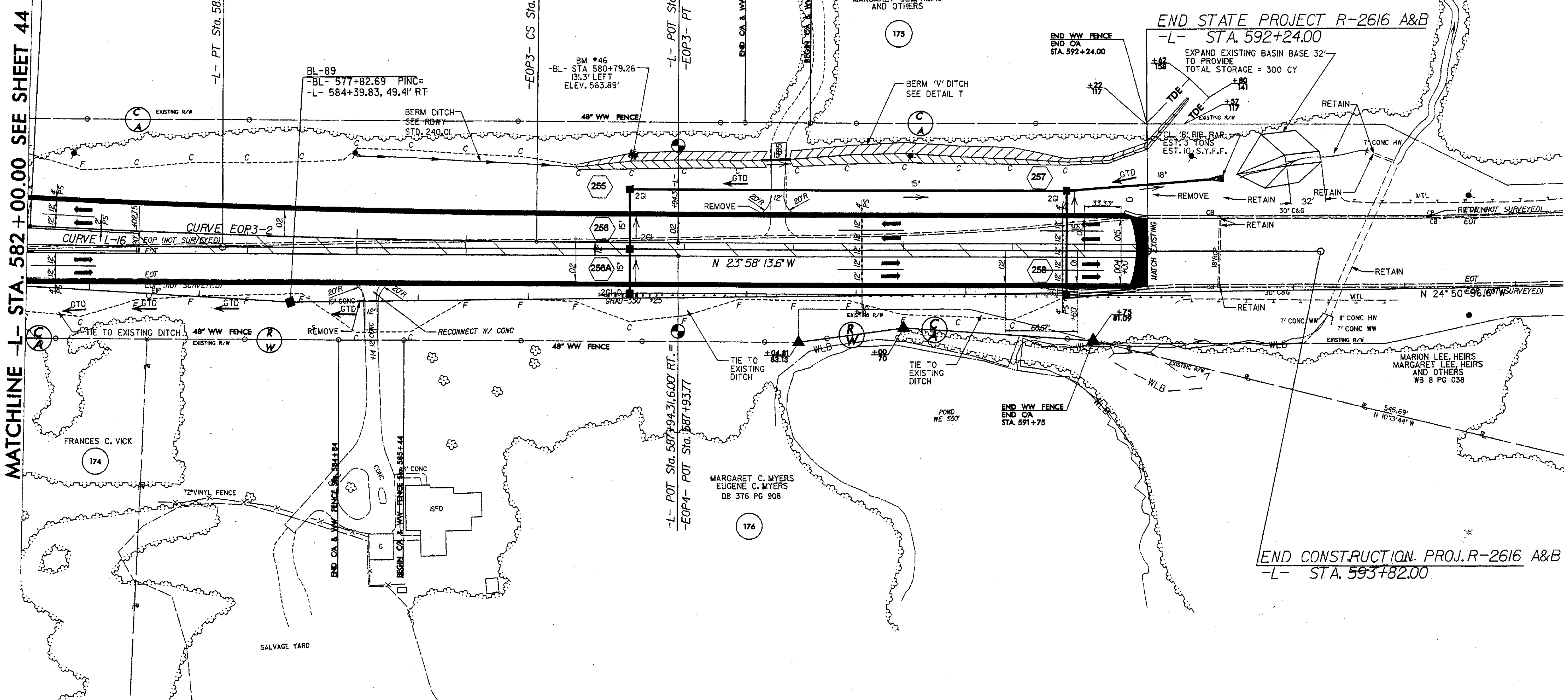
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	45
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DETAIL OF HAZARDOUS SPILL RETENTION BASIN
TOTAL CAPACITY REQUIRED : 8098 cu. ft.
TOTAL CAPACITY PROVIDED : 8100 cu. ft.
@ 6.0' W/ 1.0' FREEBOARD



(solid)	5" MONOLITHIC ISLAND
(dark)	FULL DEPTH PAVED SHOULDER
(hatched)	PAVEMENT REMOVAL



NAD 83
585
590
MATCHLINE -L- STA. 582+00.00 SEE SHEET 44
-EOP3- SCS Sta. 582+02.16
-L- PT Sta. 583+78.11
-EOP3- CS Sta. 586+63.83
-L- POT Sta. 587+94.31, 6.00' LT.=
-EOP3- PT Sta. 587+93.83
END C/A & WW FENCE Sta. 588+55
BEGIN C/A & WW FENCE Sta. 589+15
BL-89
-BL- 577+82.69 PINC=
-L- 584+39.83, 49.41' RT
BM #46
-BL- STA 580+79.26
131.3' LEFT
ELEV. 563.89'
BERM DITCH
SEE RDWY STD. 240.01
48" WW FENCE
EXISTING R/W
BERM 'V' DITCH SEE DETAIL T
MARION LEE, HEIRS
MARGARET LEE, HEIRS
AND OTHERS
175
END WW FENCE
END C/A
STA. 592+24.00
END STATE PROJECT R-2616 A&B
-L- STA. 592+24.00
EXPAND EXISTING BASIN BASE 32'
TO PROVIDE
TOTAL STORAGE = 300 CY
CL 'B' RIP RAP
EST. 3 TONS
EST. 10 S.Y.F.F.
RETAIN
REMOVE
255
256
256A
257
258
CURVE EOP3-2
CURVE L-16
N 23° 58' 13.6" W
N 24° 50' 56.6" W
TIE TO EXISTING DITCH
RECONNECT W/ CONC
TIE TO EXISTING DITCH
POND WE 550'
END WW FENCE
END C/A
STA. 591+75
MARION LEE, HEIRS
MARGARET LEE, HEIRS
AND OTHERS
WB 8 PG 038
545.69'
N 10°13'44" W
FRANCES C. VICK
174
72" VINYL FENCE
ISFD
SALVAGE YARD
END C/A & WW FENCE Sta. 584+84
BEGIN C/A & WW FENCE Sta. 585+44
-L- POT Sta. 587+94.31, 6.00' RT.=
-EOP4- POT Sta. 587+93.77
MARGARET C. MYERS
EUGENE C. MYERS
DB 376 PG 908
176
END CONSTRUCTION PROJ. R-2616 A&B
-L- STA. 593+82.00

CURVE EOP3-2

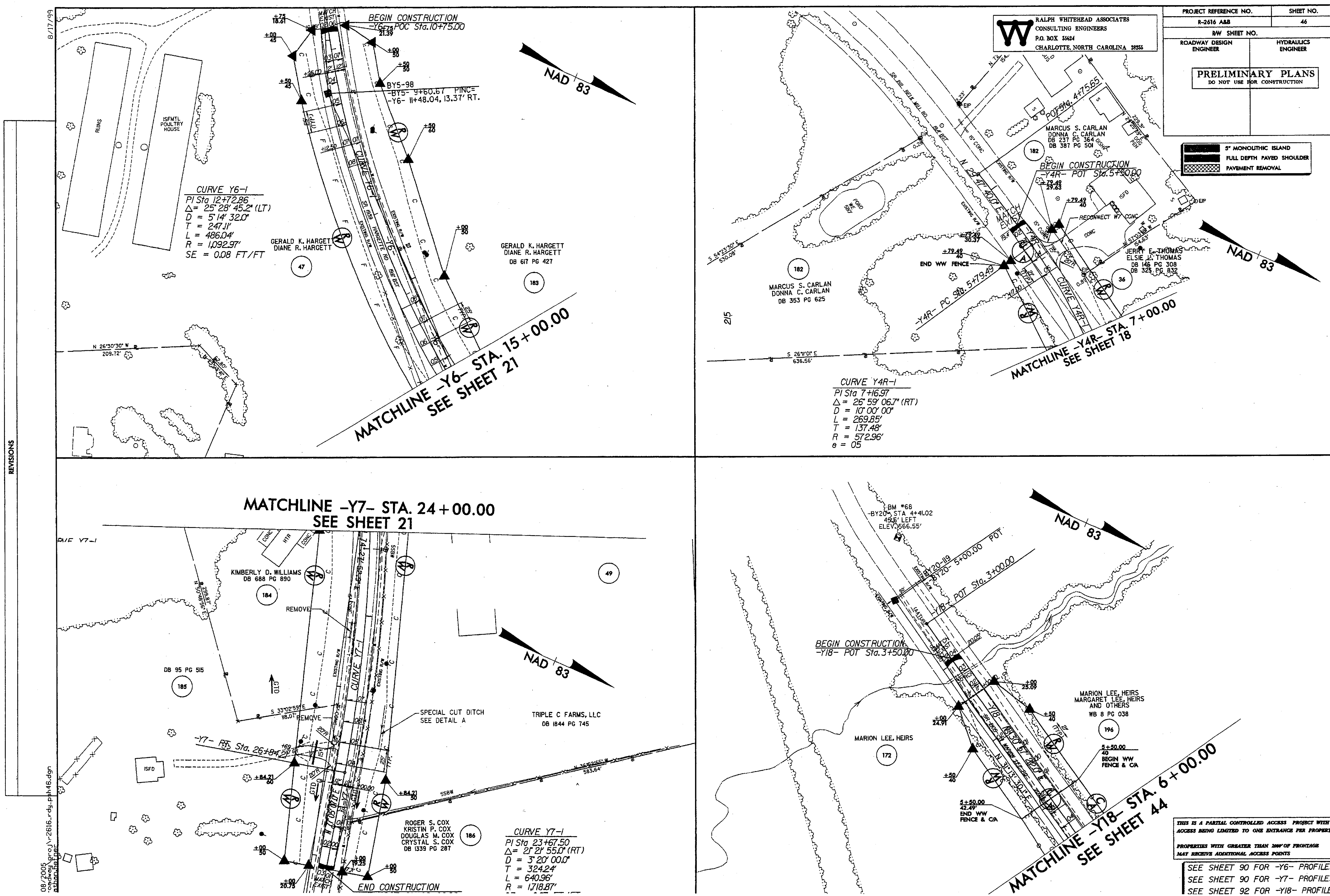
PIs Sta 581+58.83	PI Sta 584+33.03	PIs Sta 587+07.17
θs = 0°19' 30.0"	Δ = 2° 18' 30.1" (LT)	θs = 0°19' 30.0"
Ls = 130.00'	D = 0° 30' 00.0"	Ls = 130.00'
LT = 86.67'	L = 461.67'	LT = 86.67'
ST = 43.33'	T = 230.87'	ST = 43.33'
	R = 11,459.16'	

CURVE L-16

PI Sta 581+37.94
Δ = 2° 24' 07.5" (LT)
D = 0° 30' 00.0"
T = 240.24'
L = 480.42'
R = 11,459.16'

SEE SHEET 88 FOR -L- PROFILE.

1/08/2005
\roadway\proj\r2616_rdy_psh45.dgn
nathan.helmer



PROJECT REFERENCE NO. R-2616 A&B
SHEET NO. 46
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL
REVISIONS
8/17/99
BEGIN CONSTRUCTION
-Y6- POC Sta.10+75.00
-BY5- 9+60.67 PINC=
-Y6- 11+48.04, 13.37' RT.
NAD 83
RUINS
ISFMTL POULTRY HOUSE
CURVE Y6-1
PI Sta 12+72.86
△= 25° 28' 45.2" (LT)
D = 5° 14' 32.0"
T = 247.11'
L = 486.04'
R = 1,092.97'
SE = 0.08 FT/FT
GERALD K. HARGETT
DIANE R. HARGETT
47
GERALD K. HARGETT
DIANE R. HARGETT
DB 617 PG 427
183
N 26°30'30" W
209.72'
MATCHLINE -Y6- STA. 15+00.00
SEE SHEET 21
SR 1539 HARGETTE RD
MARCUS S. CARLAN
DONNA C. CARLAN
DB 237 PG 364
DB 387 PG 501
182
BEGIN CONSTRUCTION
-Y4R- POT Sta.5+50.00
RECONNECT W/ CONC
END WW FENCE
-Y4R- PC Sta. 5+79.49
JERRY E. THOMAS
ELSIE H. THOMAS
DB 146 PG 308
DB 325 PG 832
36
MARCUS S. CARLAN
DONNA C. CARLAN
DB 353 PG 625
S 54°23'30" E
530.08'
S 26°11'00" E
636.56'
CURVE Y4R-1
PI Sta 7+16.97
△= 26° 59' 06.7" (RT)
D = 10° 00' 00"
L = 269.85'
T = 137.48'
R = 572.96'
e = 05
MATCHLINE -Y4R- STA. 7+00.00
SEE SHEET 18
MATCHLINE -Y7- STA. 24+00.00
SEE SHEET 21
KIMBERLY D. WILLIAMS
DB 688 PG 890
184
REMOVE
49
DB 95 PG 515
185
S 33°02'59" E
118.07'
-Y7- RT. Sta. 26+84.21
SPECIAL CUT DITCH
SEE DETAIL A
TRIPLE C FARMS, LLC
DB 1844 PG 745
ROGER S. COX
KRISTIN P. COX
DOUGLAS M. COX
CRYSTAL S. COX
DB 1339 PG 287
186
CURVE Y7-1
PI Sta 23+67.50
△= 21° 21' 55.0" (RT)
D = 3° 20' 00.0"
T = 324.24'
L = 640.96'
R = 1,718.87'
END CONSTRUCTION
BM #68
-BY20- STA 4+41.02
49.5' LEFT
ELEV. 566.55'
-BY20- 5+00.00 POT
-Y18- POT Sta. 3+00.00
BEGIN CONSTRUCTION
-Y18- POT Sta.3+50.00
MARION LEE, HEIRS
MARGARET LEE, HEIRS
AND OTHERS
WB 8 PG 038
196
MARION LEE, HEIRS
172
5+50.00
40
BEGIN WW
FENCE & C/A
5+50.00
42.49'
END WW
FENCE & C/A
MATCHLINE -Y18- STA. 6+00.00
SEE SHEET 44
THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY
PROPERTIES WITH GREATER THAN 2000' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS
SEE SHEET 90 FOR -Y6- PROFILE.
SEE SHEET 90 FOR -Y7- PROFILE.
SEE SHEET 92 FOR -Y18- PROFILE.