STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

May 9, 2006

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: **RE-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:

Due to additional concerns noted by the North Carolina Division of Water Quality in a Return of Application letter dated March 17, 2006, changes to the jurisdictional impacts for this project were necessary. These changes include the addition of sites that attained jurisdictional status since the original 2002 verification, and a pipe realignment request, both of which are addressed below. This application replaces the original and subsequent applications dated July 21, 2005, October 7, 2005, and February 16, 2006.

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.

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

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 0.353 acre of permanent wetland impacts, 3.202 linear feet of permanent stream impact, 910 linear feet of temporary stream impact, and 3.47 acres of permanent surface water (pond) impact.

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 and March 7, 2006. Each impact is described in detail below. Site and station numbers correspond with the permit (hydraulic) drawings included in this application. Sites with the letter "A" after the site number indicate this site was added after the March 7, 2006 verification.

Impacts to Waters of the United States

Site 1A (L 24+12)
A jurisdictional stream and wetland were identified by the NCDWQ and ACE on March 7, 2006. Project construction will result in 0.036 acre of permanent impact to wetlands and 104 feet of permanent impacts to streams. There will also be 10 feet of temporary impacts to surface waters for this site.

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 40' 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. NCDOT subtracted 39 linear feet of permanent stream impact from the total permanent stream impact for the project for removing the box culvert.

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 240' of permanent stream impact and 47' of temporary stream impacts. This system has been realigned per the request of the North Carolina Division of Water Quality in a letter dated March 17, 2006. Due to this realignment, permanent stream impacts have increased from 140' to 240' and temporary impacts have increased from 11' to 47'.

Site 6 (180+30 LT)
The proposed replacement of the 24" pipe from Site 5 will result in 0.009 acre of permanent wetland impact.

Site 7 (L 180+30 to 183+00)
Due to the encroachment of the expanded road, 215' of an unnamed tributary to Gum Log Branch (J-10) will be permanently impacted. There will be 10 feet of stream temporarily impacted to create a diversion.

Site 8A (L 206+00)
A jurisdictional stream and wetland were identified by the NCDWQ and ACE on March 7, 2006. Project construction at this location will result in 150 feet of permanent stream impact and 10 feet of temporary stream impact. The wetland located at this site is outside of the project area.

Site 8 (L 215+70)
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+20)
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. An additional wetland was located at this site by the NCDWQ and ACE on March 7, 2006. Project construction at this location will result in 0.047 acre of permanent wetland impact.

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 290' of permanent stream impact and 22' of temporary stream impacts.

Site 13 (L 281+51)
A double 8'x 7'concrete 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 40' of temporary stream impacts.

Site 14 (L 288+06.5)
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 62' 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 62' of temporary stream impacts.

Site 16 (L 315+56)
A 40 foot long double (2'x 7') concrete box culvert, carrying Wicker Branch (J-3), will be replaced with a single 16' x 8' bottomless structure. This activity will result in 25' of permanent stream impact. (Permanent stream impacts are necessary due to the difference between the existing stream location and the new channel in the bottomless structure.) There will be 240' of temporary stream impact to accommodate construction of the new structure. (NCDOT has subtracted 40 feet of permanent stream impact from the total amount of permanent 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 0.08 acre of surface water (pond) will be permanently impacted.

Site 19 (L 349+50 LT)
Due to the encroachment of the expanded roadway, 0.47 acre of surface water (pond) will be drained. This drainage will result in the dewatering of a fringe wetland to the pond. Therefore, this impact will also result in 0.04 acre of permanent wetland impact.

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 426+03 to 430+50)
A 54" reinforced concrete pipe will be installed carrying an unnamed tributary to Buck Branch resulting in 460' of permanent stream impact and 30' of temporary stream impact.

Site 23 (L 474+07 to 476+41)
A 24" pipe will be replaced with a new 24" reinforced concrete pipe, resulting in 0.115 acre of permanent wetland impact.

Site 23A (L 495+00)
A jurisdictional stream and wetland were identified by the NCDWQ and ACE on March 7, 2006. Project construction at this location will result in 160' of permanent stream impact and 30' of temporary stream 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 30' 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 watershed, a hazardous spill retention basin will be constructed at the outlet of this pipe. These activities will result in 0.057 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."

†On March 6, 2007, the USFWS has added Michaux's Sumac (*Rhus michauxii)* to the list of Federally Protected Species to Union County. A subsequent survey was conducted on April 13, 2006 by NCDOT biologists Michael Turchy, Tyler Stanton, John Merritt, and Kris Dramby. A reference population was located on in Marston, Richmond County, NC, before the project surveys were conducted. R-2616 contains several fragmented areas with potential habitat for the species. A 12 person- hour survey was conducted and no populations of Michaux's sumac were located, resulting in a biological conclusion of No Effect.

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
†Michaux's Sumac	*Rhus michauxii*	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 installation of a bottomless culvert at Wicker Branch.
- 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 in jurisdictional areas have been designed at a 2:1 slope.

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 five 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.

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

Cc list:

W/attachment
Mr. John Hennessy, NCDWQ (5 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
Dr. David Chang, P.E., Hydraulics
Mr. Greg Perfetti, P.E., Structure Design
Mr. Mark Staley, Roadside Environmental
Mr. Barry Moose, P.E., Division Engineer, Div 10
Mr. Larry Thompson, DEO, Division 10

W/o attachment
Mr. Jay Bennett, P.E., Roadway Design
Mr. Majed Alghandour, P. E., Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. Scott McLendon, USACE, Wilmington
Ms. Beth Harmon, EEP
Mr. Todd Jones, NCDOT External Audit Branch
Mr. Carl Goode, PE, Human Environment Unit Head
Mr. Mark Pierce, P.E., PDEA Project Planning Eng

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

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.

Ecosystem Enhancement PROGRAM

April 11, 2006

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 April 7, 2006, 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:	0.158 acre
Non-Riverine Wetland Impacts:	0.195 acre
Stream Impacts:	3,202 feet

This mitigation acceptance letter replaces the mitigation acceptance letters issued on July 19, 2005 and January 31, 2006. Compensatory wetland and stream mitigation for this project will be provided in accordance with the Memorandum of Agreement between the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U. S. Army Corps of Engineers, signed on July 22, 2003 (Tri-Party MOA). EEP commits to implementing sufficient compensatory wetland and stream mitigation to offset the impacts with this project as previously listed by the end of the MOA Year in which this project is permitted, in accordance with Section X of the Tri-Party MOA. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from EEP.

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 Revised-2

Ecosystem Enhancement PROGRAM

April 20, 2006

Mr. Steve Lund
U. S. Army Corps of Engineers
Asheville Regulatory Field Office
151 Patton Avenue, Room 208
Asheville, North Carolina 28801-5006

Dear Mr. Lund:

Subject: EEP Mitigation Acceptance Letter:

R-2616, US 601 Widening, Union County from the South Carolina State Line to North of SR 2105 (Marion Lee Road); Yadkin River Basin (CU 03040105); Southern Piedmont (SP) Eco-Region

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide mitigation for the unavoidable impacts associated with the above referenced project. The impacts as reported by the NCDOT in their April 7, 2006 mitigation request are as follows:

Riverine Wetland Impacts:	0.158 acre
Non-Riverine Wetland Impacts:	0.195 acre
Stream Impacts:	3,202 feet

This mitigation strategy letter replaces the mitigation strategy letters issued on July 19, 2005 and January 31, 2006. Mitigation for this project will be provided in accordance with Section X of the Memorandum of Agreement between the N. C. Department of Environment and Natural Resources, the N. C. Department of Transportation, and the U. S. Army Corps of Engineers signed on July 22, 2003. EEP commits to implement sufficient compensatory wetland and stream mitigation up to a 2:1 ratio to offset the impacts associated with this project by the end of the MOA year in which this project is permitted. If the impacts change from the above listed amount, then this mitigation strategy letter will no longer be valid and a new mitigation strategy letter will be required from EEP.

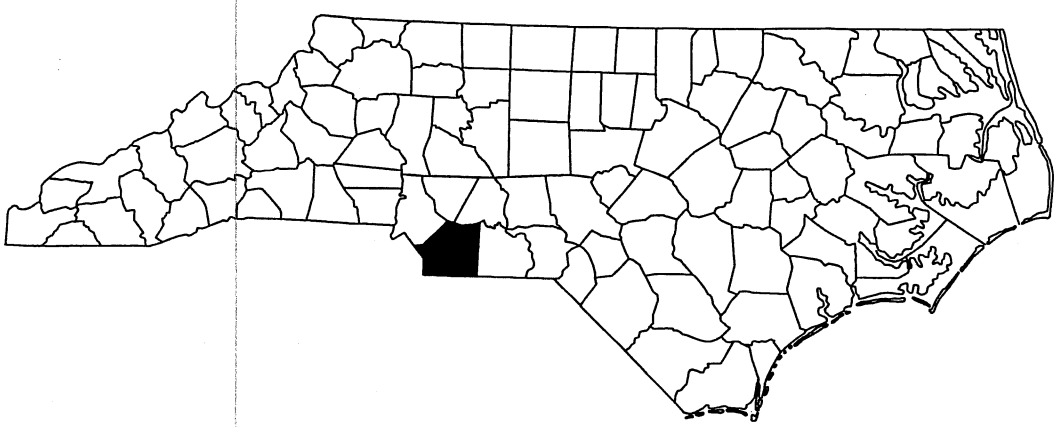
If you have any questions or need additional information, please contact Ms. Beth Harmon at 919-715-1929.

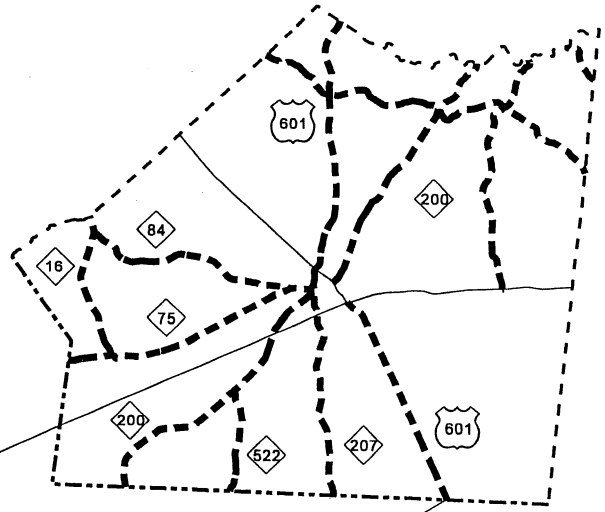
Sincerely,

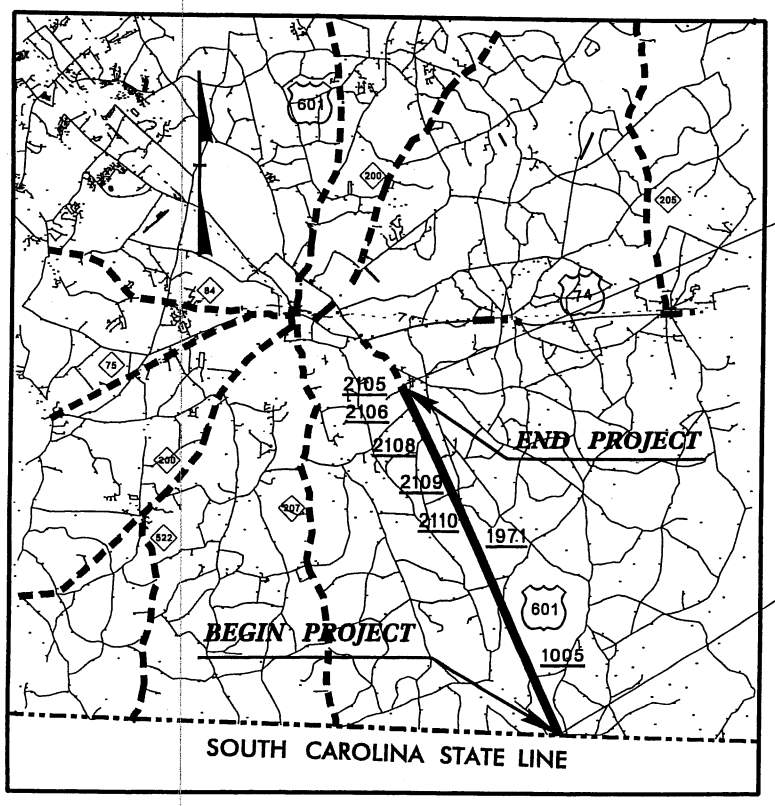
James B. Stanfill for

William D. Gilmore, P.E.
EEP Director

cc: Mr. Gregory J. Thorpe, Ph.D., NCDOT-PDEA
Mr. John Hennessy, Division of Water Quality, Wetlands/401 Unit
File: R-2616 Revised







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.)

Permit Drawings Sheet 1 of 66

WETLAND LEGEND

WLB — WETLAND BOUNDARY

WLB — WETLAND

F — DENOTES FILL IN WETLAND

S — DENOTES PERM. SURFACE WATER IMPACTS

P — DENOTES FILL IN SURFACE WATER (POND)

T — DENOTES TEMPORARY FILL IN WETLAND

E — DENOTES EXCAVATION IN WETLAND

TS — DENOTES TEMPORARY SURFACE WATER IMPACT

DENOTES MECHANIZED CLEARING

FLOW DIRECTION

TB — TOP OF BANK

WE — EDGE OF WATER

C — PROP. LIMIT OF CUT

F — PROP. LIMIT OF FILL

PROP. RIGHT OF WAY

NG — NATURAL GROUND

PL — PROPERTY LINE

TDE — TEMP. DRAINAGE EASEMENT

PDE — PERMANENT DRAINAGE EASEMENT

EAB — EXIST. ENDANGERED ANIMAL BOUNDARY

EPB — EXIST. ENDANGERED PLANT BOUNDARY

WATER SURFACE

LIVE STAKES

BOULDER

COIR FIBER ROLLS

PROPOSED BRIDGE

PROPOSED BOX CULVERT

PROPOSED PIPE CULVERT

12"-48" PIPES

54" PIPES & ABOVE

(DASHED LINES DENOTE EXISTNG STRUCTURES)

SINGLE TREE

WOODS LINE

DRAINAGE INLET

ROOTWAD

RIP RAP

5 — ADJACENT PROPERTY OWNER OR PARCEL NUMBER IF AVAILABLE

PREFORMED SCOUR HOLE

LEVEL SPREADER (LS)

DITCH / GRASS SWALE

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.)

Permit Drawings Sheet 2 of 66

IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size	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)	Exist. Chan. Impacts Permanent (ft)	Exist. Chan Impacts Temp. (ft)	Natural Stream Design (ft)
1A	L 24+12	2 @ 42" RCP	0.013			0.023		0.007	0.001	104	10	
1	L 102+00 to 106+50	2 @ 54" RCP						0.02	0.01	223	75	
2	L 119+34	3 @ 10'X8' RCBC						0.08	0.01	166	40	
3	L 129+50	(2) 2 SPAN@65' BRIDGE							0.15		150	39**
4	L 148+91 LT	42" RCP						0.003	0.001	48	10	
5	L 180+30 RT & LT	48" RCP						0.02	0.003	240	47	
6	L 180+68 LT	48" RCP	0.006			0.003						
7	L 180+30 to 183+00 LT	Earthen Fill						0.03	0.004	215	10	
8A	L 206+00	36" RCP						0.01	0.001	150	10	
8	L 215+70 RT	24" RCP	0.006			0.003						
9	L 221+70 LT	Drain Pond						0.83				
10	L 231+20	54" RCP	0.034			0.013		0.01	0.001	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	290	22	
13	L 281+51	12'X10' RCBC						0.04	0.01	128	40	
14	L 288+06.5	2 @ 8'X7' RCBC						0.04	0.01	124	62	
15	L 290+00 to 294+30	2 @ 30" RCP						0.06	0.010	466	62	
16	L 315+56 *	16'X8' Bottomless Structure						0.01	0.08	25	240	40*
17	L 342+00 LT	Drain Pond						0.31				
18	L 349+50 RT	Road Fill;Temp Drain Pond	0.040					0.08	0.81			
19	L 349+50 LT	Drain Pond			0.04***			0.47				
20	L 400+00 RT	Drain Pond						0.58				
21	L 422+00 LT	Drain Pond						0.45				
22	L 426+03 to 430+50	54" RCP						0.03	0.001	460	30	
23	L 474+07 to 476+41	24" RCP	0.110			0.005						
23A	L 495+00	42" RCP						0.01	0.001	160	30	
24	L 534+20	48" RCP						0.01	0.001	151	30	
25	L 549+60	36" RCP	0.030			0.027						
26	L 575+85 LT	24" RCP						0.29				
TOTALS:			0.24	0.00	0.00	0.07	0.00	3.47	1.11	3281	910	0

* Stream replacement by addition of bottomless culvert.

** Stream that is currently culverted that will be spanned.

*** Wetland adjacent to drained pond- dewatered wetland.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UNION COUNTY
WBS - 34485.122 (R-2616)

SHEET Apr-06

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.)

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R2616	3
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

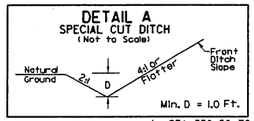
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawings Sheet 7 of 66

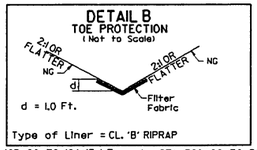
REVISIONS

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



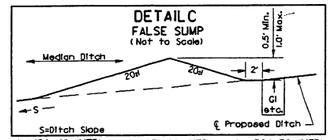
-L- STA. 39+00 TO 40+00 LT
-L- STA. 39+50 TO 41+00 RT
-L- STA. 43+00 TO 46+50 RT
-L- STA. 45+50 TO 47+50 LT
-L- STA. 48+00 TO 51+00 RT
-L- STA. 56+60 TO 57+00 RT
-L- STA. 75+00 TO 76+50 LT
-L- STA. 80+00 TO 84+00 LT
-L- STA. 80+00 TO 81+45 RT
-L- STA. 87+00 TO 87+70 LT
-L- STA. 88+50 TO 90+40 RT
-L- STA. 102+50 TO -Y2- 11+40 RT
-L- STA. 159+00 TO 160+00 LT
-L- STA. 177+00 TO 177+60 RT
-L- STA. 179+00 TO 180+68 RT
-L- STA. 187+00 TO 188+00 RT
-L- STA. 193+00 TO 194+00 RT
-L- STA. 208+50 TO 210+00 RT
-L- STA. 258+00 TO 260+00 LT
-L- STA. 263+00 TO 265+00 LT
-L- STA. 269+00 TO 271+58 LT
-L- STA. 336+50 TO 337+00 LT
-L- STA. 342+33 TO 344+00 LT
-L- STA. 380+50 TO 381+35 LT
-L- STA. 384+50 TO 385+72 LT
-L- STA. 443+50 TO 447+00 RT
-L- STA. 448+50 TO 449+70 LT
-L- STA. 449+70 TO 450+50 LT
-L- STA. 467+00 TO 469+54 RT
-L- STA. 480+00 TO 481+60 RT
-L- STA. 484+50 TO 485+00 RT
-L- STA. 516+00 TO 516+50 LT
-L- STA. 537+50 TO 538+00 RT
-L- STA. 538+00 TO 538+50 RT
-L- STA. 567+50 TO 568+16 RT
-L- STA. 568+16 TO 570+00 RT
-L- STA. 575+00 TO 575+92 RT
-Y7- STA. 26+00 TO 26+50 LT
-Y14- STA. 13+00 TO 13+60 RT
-Y16- STA. 7+50 TO 8+00 RT
-Y18- STA. 4+00 TO 4+50 LT

DETAIL B
TOE PROTECTION
(Not to Scale)



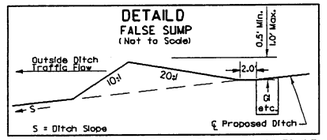
-L- STA. 103+00 TO 104+15 LT
-L- STA. 130+50 TO 135+50 LT
-L- STA. 135+13 TO 136+00 RT
-L- STA. 151+00 TO 153+50 LT
-L- STA. 167+76 TO 169+00 RT
-L- STA. 172+24 TO 173+32 RT
-L- STA. 214+50 TO 215+68 LT
-L- STA. 205+50 TO 206+21 LT
-L- STA. 230+00 TO 231+16 RT
-L- STA. 230+75 TO 233+00 LT
-L- STA. 238+36 TO 242+46 LT
-L- STA. 242+50 TO 243+50 RT
-L- STA. 250+26 TO 251+00 LT
-L- STA. 279+50 TO 281+00 RT
-L- STA. 312+00 TO 312+50 LT
-L- STA. 312+80 TO 316+50 LT
-L- STA. 331+30 TO 332+56 LT
-L- STA. 334+80 TO 335+60 LT
-L- STA. 349+00 TO 350+80 LT
-L- STA. 362+00 TO 363+00 RT
-L- STA. 362+50 TO 363+10 LT
-L- STA. 370+50 TO 372+00 LT
-L- STA. 396+80 TO 400+16 RT
-L- STA. 396+56 TO 401+50 LT
-L- STA. 430+00 TO 433+00 RT
-L- STA. 432+35 TO 433+50 LT
-L- STA. 437+46 TO 439+50 RT
-L- STA. 467+75 TO 468+80 LT
-L- STA. 516+50 TO 519+58 LT
-L- STA. 520+50 TO 524+00 RT
-L- STA. 530+78 TO 534+27 RT
-L- STA. 550+50 TO 551+25 RT
-L- STA. 552+70 TO 555+00 LT
-L- STA. 553+80 TO 555+50 RT
-L- STA. 562+00 TO 563+00 RT
-Y6- STA. 13+00 TO 15+00 RT
-Y9- STA. 11+10 TO 12+00 LT
-Y13- STA. 21+00 TO 21+74 LT

DETAIL C
FALSE SUMP
(Not to Scale)



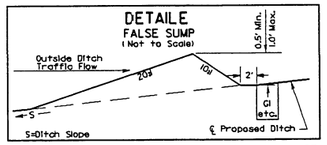
-L- 21+20 (MED)
-L- 23+00 (MED)
-L- 26+50 (MED)
-L- 31+40 (MED)
-L- 37+80 (MED)
-L- 44+00 (MED)
-L- 49+00 (MED)
-L- 57+00 (MED)
-L- 62+20 (MED)
-L- 64+50 (MED)
-L- 67+30 (MED)
-L- 70+50 (MED)
-L- 73+90 (MED)
-L- 81+62 (MED)
-L- 84+00 (MED)
-L- 87+80 (MED)
-L- 91+20 (MED)
-L- 96+61 (MED)
-L- 98+00 (MED)
-L- 115+60 (MED
-L- 120+40 (MED)
-L- 128+30 (MED)
-L- 137+35 (MED)
-L- 142+39 (MED)
-L- 146+50 (MED)
-L- 148+76 (MED)
-L- 158+70 (MED)
-L- 168+65 (MED)
-L- 173+45 (MED)
-L- 178+00 (MED)
-L- 203+61 (MED)
-L- 229+20 (MED)
-L- 234+00 (MED)
-L- 235+00 (MED)
-L- 238+90 (MED)
-L- 250+70 (MED)
-L- 258+20 (MED)
-L- 262+20 (MED)
-L- 263+20 (MED)
-L- 269+10 (MED)
-L- 271+60 (MED)
-L- 276+50 (MED)
-L- 278+50 (MED)
-L- 284+70 (MED)
-L- 288+80 (MED)
-L- 290+80 (MED)
-L- 298+20 (MED)
-L- 302+90 (MED)
-L- 304+30 (MED)
-L- 305+40 (MED)
-L- 311+50 (MED)
-L- 326+10 (MED)
-L- 327+60 (MED)
-L- 332+00 (MED)
-L- 335+50 (MED)
-L- 349+60 (MED)
-L- 352+30 (MED)
-L- 354+00 (MED)
-L- 358+50 (MED)
-L- 362+50 (MED)
-L- 364+50 (MED)
-L- 371+20 (MED)
-L- 375+80 (MED)
-L- 380+20 (MED)
-L- 393+10 (MED)
-L- 404+50 (MED)
-L- 412+00 (MED)
-L- 412+70 (MED)
-L- 414+00 (MED)
-L- 415+75 (MED)
-L- 420+20 (MED)
-L- 430+50 (MED)
-L- 436+20 (MED)
-L- 438+00 (MED)
-L- 451+80 (MED)
-L- 454+20 (MED)
-L- 460+60 (MED)
-L- 463+30 (MED)
-L- 466+50 (MED)
-L- 468+90 (MED)
-L- 485+00 (MED)
-L- 498+90 (MED)
-L- 500+10 (MED)
-L- 502+50 (MED)
-L- 505+20 (MED)
-L- 511+70 (MED)
-L- 513+40 (MED)
-L- 516+50 (MED)
-L- 522+30 (MED)
-L- 528+60 (MED)
-L- 531+50 (MED)
-L- 534+10 (MED)
-L- 541+80 (MED)
-L- 546+90 (MED)
-L- 549+30 (MED)
-L- 561+40 (MED)
-L- 568+00 (MED)
-L- 573+90 (MED)
-L- 575+80 (MED)
-L- 581+00 (MED)

DETAIL D
FALSE SUMP
(Not to Scale)



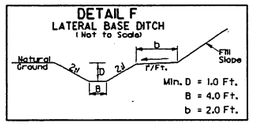
-L- 23+00 (LT)
-L- 26+50 (LT)
-L- 120+39 (LT)
-L- 128+30 (LT)
-L- 137+37 (LT)
-L- 229+00 (LT)
-L- 234+00 (LT)
-L- 244+50 (LT)
-L- 276+50 (LT)
-L- 288+80 (LT)
-L- 311+50 (LT)
-L- 324+50 (LT)
-L- 404+50 (LT)
-L- 485+00 (LT)
-L- 511+70 (LT)
-L- 516+50 (LT)
-L- 546+90 (LT)

DETAIL E
FALSE SUMP
(Not to Scale)



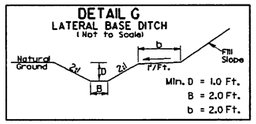
-L- 23+00 (RT)
-L- 26+50 (RT)
-L- 120+41 (RT)
-L- 128+10 (RT)
-L- 137+35 (RT)
-L- 229+50 (RT)
-L- 278+50 (RT)
-L- 285+00 (RT)
-L- 290+80 (RT)
-L- 302+90 (RT)
-L- 364+50 (RT)
-L- 502+50 (RT)
-L- 541+80 (RT)

DETAIL F
LATERAL BASE DITCH
(Not to Scale)



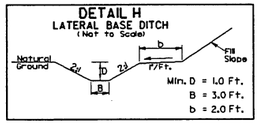
-L- STA. 37+80 TO 39+50 RT
-L- STA. 314+00 TO 316+00 LT

DETAIL G
LATERAL BASE DITCH
(Not to Scale)



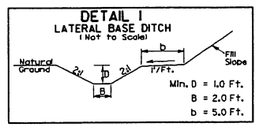
-L- STA. 149+50 TO 152+10 RT
-L- STA. 329+32 TO 331+50 RT
-L- STA. 379+20 TO 381+00 RT

DETAIL H
LATERAL BASE DITCH
(Not to Scale)



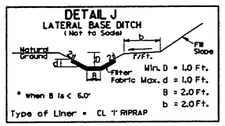
-L- STA. 70+00 TO 71+15 RT
-L- STA. 180+50 TO 182+32 LT
-L- STA. 291+50 TO 294+00 LT

DETAIL I
LATERAL BASE DITCH
(Not to Scale)



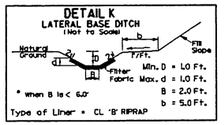
-L- STA. 426+28 TO 430+00 RT

DETAIL J
LATERAL BASE DITCH
(Not to Scale)



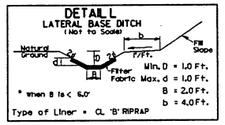
-L- STA. 40+00 TO 40+65 LT

DETAIL K
LATERAL BASE DITCH
(Not to Scale)



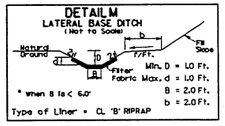
-L- STA. 249+50 TO 250+65 RT

DETAIL L
LATERAL BASE DITCH
(Not to Scale)



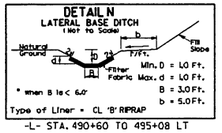
-L- STA. 360+60 TO 361+96 RT

DETAIL M
LATERAL BASE DITCH
(Not to Scale)



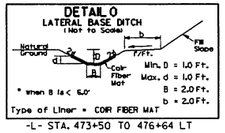
-L- STA. 393+00 TO 395+60 LT

DETAIL N
LATERAL BASE DITCH
(Not to Scale)



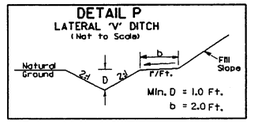
-L- STA. 490+60 TO 495+08 LT

DETAIL O
LATERAL BASE DITCH
(Not to Scale)



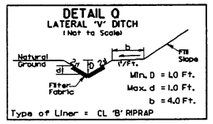
-L- STA. 473+50 TO 476+64 LT

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



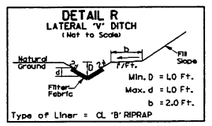
-L- STA. 116+00 TO 119+00 LT
-L- STA. 185+50 TO 187+50 LT
-L- STA 335+62 TO 336+50 LT
-L- STA. 342+85 TO 344+50 RT
-L- STA. 363+30 LT TO -Y10- 6+20 RT
-L- STA. 476+37 TO 478+00 RT
-L- STA. 538+50 TO 539+03 LT
-L- STA. 559+50 TO 561+00 RT
-Y12- STA. 17+00 TO 18+91 RT
-Y12- STA. 17+50 TO 18+91 LT
-Y14- STA. 13+00 TO 13+80 LT

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



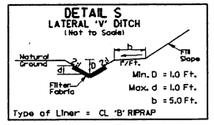
-L- STA. 356+50 TO 358+00 RT

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



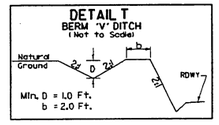
-L- STA. 205+38 TO 206+72 RT
-L- STA. 237+50 TO 238+35 LT
-L- STA. 341+50 TO 342+85 RT
-L- STA. 475+50 TO 476+37 RT
-L- STA. 548+50 TO 549+50 RT
-L- STA. 560+50 TO 561+68 LT

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



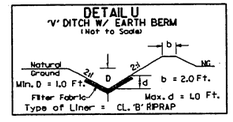
-L- STA. 492+00 TO 494+84 RT
-L- STA. 494+84 TO 498+90 RT

DETAIL T
BERM 'V' DITCH
(Not to Scale)



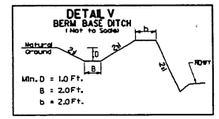
-L- STA. 292+50 TO 293+00 RT
-L- STA. 293+00 TO 296+00 RT
-L- STA. 305+00 TO 307+40 RT
-L- STA. 375+70 TO 380+50 LT
-L- STA. 508+50 TO 511+65 LT
-L- STA. 557+75 TO 560+50 LT
-L- STA. 587+00 TO 592+62 LT

DETAIL U
'V' DITCH W/ EARTH BERM
(Not to Scale)



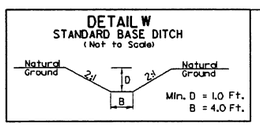
-L- STA. 559+00 TO 560+50 LT

DETAIL V
BERM BASE DITCH
(Not to Scale)



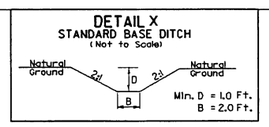
-L- STA. 220+50 TO 221+75 LT

DETAIL W
STANDARD BASE DITCH
(Not to Scale)



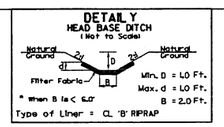
-L- STA. 35+70 TO 37+80 RT

DETAIL X
STANDARD BASE DITCH
(Not to Scale)



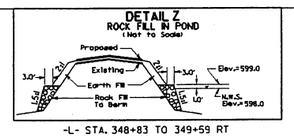
-L- STA. 73+90 TO 74+60 RT
-L- STA. 145+90 TO 146+00 RT
-L- STA. 146+20 TO 146+20 RT
-L- STA. 363+10 TO 364+20 LT

DETAIL Y
HEAD BASE DITCH
(Not to Scale)



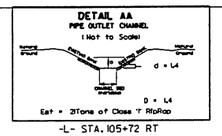
-L- STA. 56+35 TO 56+60 RT
-L- STA. 88+50 TO 90+40 RT
-L- STA. 177+60 TO 177+70 RT
-L- STA. 449+66 TO 449+70 LT
-L- STA. 476+64 TO 477+00 LT
-L- STA. 583+00 TO 538+32 RT

DETAIL Z
ROCK FILL IN POND
(Not to Scale)



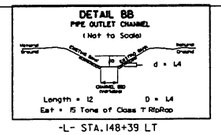
-L- STA. 348+83 TO 349+59 RT

DETAIL AA
PIPE OUTLET CHANNEL
(Not to Scale)



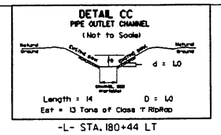
-L- STA. 105+72 RT

DETAIL BB
PIPE OUTLET CHANNEL
(Not to Scale)



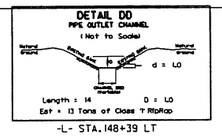
-L- STA. 148+39 LT

DETAIL CC
PIPE OUTLET CHANNEL
(Not to Scale)



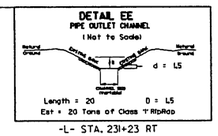
-L- STA. 180+44 LT

DETAIL DD
PIPE OUTLET CHANNEL
(Not to Scale)



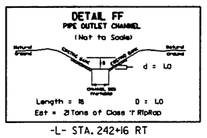
-L- STA. 148+39 LT

DETAIL EE
PIPE OUTLET CHANNEL
(Not to Scale)



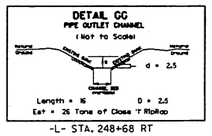
-L- STA. 231+23 RT

DETAIL FF
PIPE OUTLET CHANNEL
(Not to Scale)



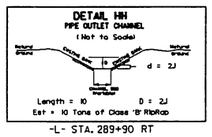
-L- STA. 242+16 RT
-L- STA. 430+11 LT

DETAIL GG
PIPE OUTLET CHANNEL
(Not to Scale)



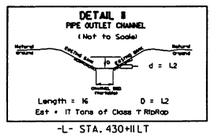
-L- STA. 248+68 RT

DETAIL HH
PIPE OUTLET CHANNEL
(Not to Scale)



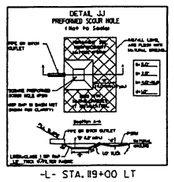
-L- STA. 289+90 RT

DETAIL II
PIPE OUTLET CHANNEL
(Not to Scale)



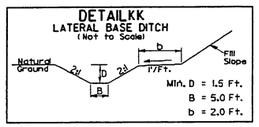
-L- STA. 430+11 LT
-L- STA. 534+25 LT

DETAIL JJ
PREFORMED SCOUR HOLE
(Not to Scale)



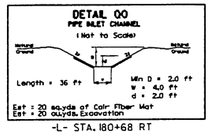
-L- STA. 119+00 LT
-L- STA. 241+40 RT
-L- STA. 249+49 RT

DETAIL KK
LATERAL BASE DITCH
(Not to Scale)



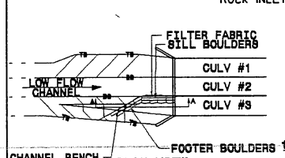
-L- STA. 149+50 TO 152+13 RT

DETAIL OO
PIPE INLET CHANNEL
(Not to Scale)

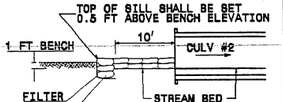


-L- STA. 180+68 RT

DETAIL PP
ROCK INLET SILL



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.

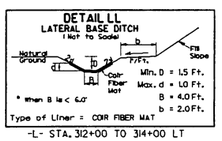


SECTION A-A

ROCK INLET SILL
SCALE: NTS

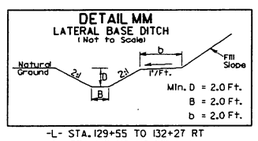
NOTES:
1. ALL STONES ARE TO BE STRUCTURE STONE.
2. GAPS BETWEEN BOULDERS SHALL BE MINIMIZED BY FITTING BOULDERS TOGETHER, PLUGGING WITH STRUCTURE STONE CLASS A AND NO.57 AND LINING WITH FILTER FABRIC.
3. DIMENSIONS AND SLOPES MAY BE ADJUSTED TO FIT BY THE ENGINEER.
4. A DOUBLE FOOTER BOULDER SHALL BE 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'.

DETAIL LL
LATERAL BASE DITCH
(Not to Scale)



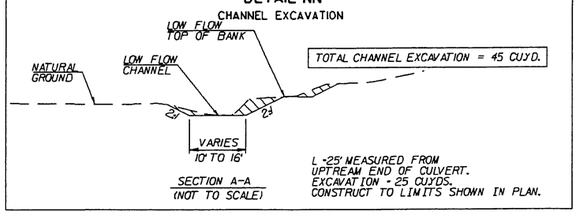
-L- STA. 312+00 TO 314+00 LT

DETAIL MM
LATERAL BASE DITCH
(Not to Scale)

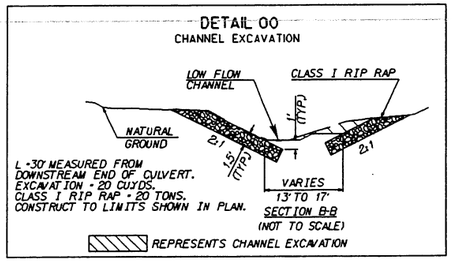


-L- STA. 129+55 TO 132+27 RT
-L- STA. 132+50 TO 135+13 RT

DETAIL NN
CHANNEL EXCAVATION



DETAIL OO
CHANNEL EXCAVATION



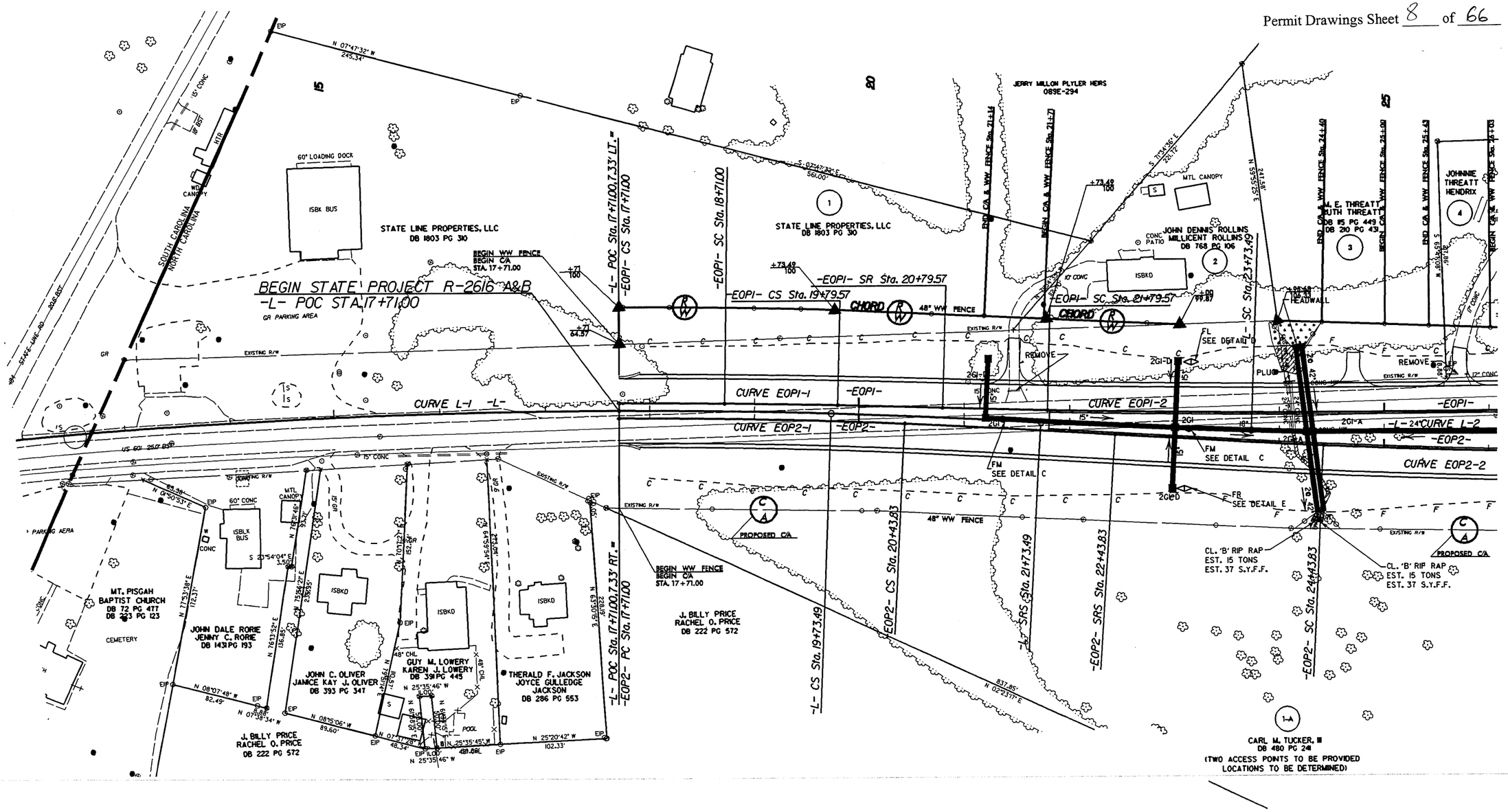
06-APR-2006 07:19
s:\engr-coord\projects\galen\r-2616a&b\design\r2616_hyd_detail.dgn
gcail AT HYDRUS4

SITE 1A -L- 24 + 12

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

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

Permit Drawings Sheet 8 of 66

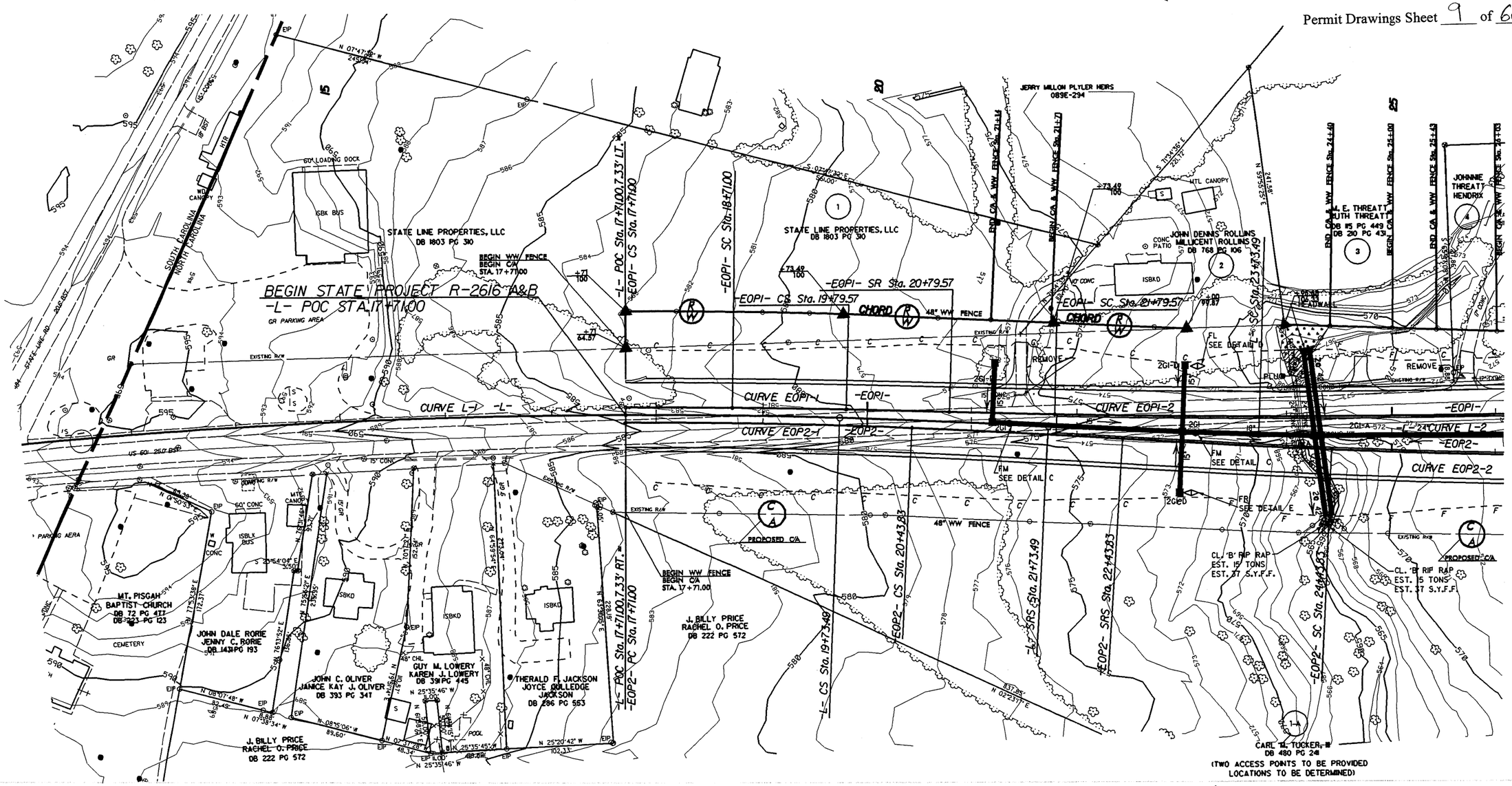


SITE 1A -L- 24 + 12

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

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

Permit Drawings Sheet 9 of 66



50' 0 100'

SCALE: 1" : 100'

FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

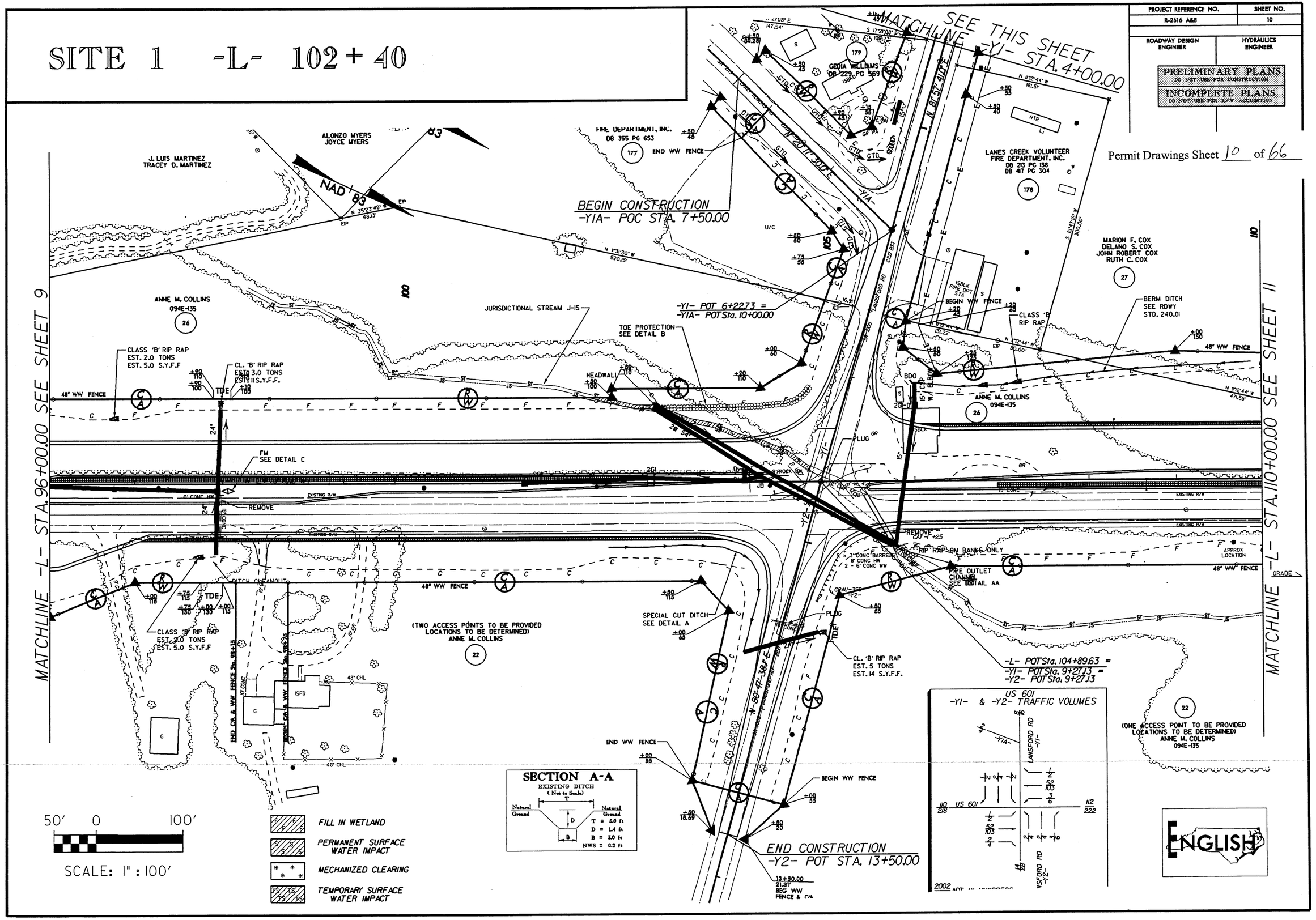
ENGLISH

SITE 1 -L- 102 + 40

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

Permit Drawings Sheet 10 of 66



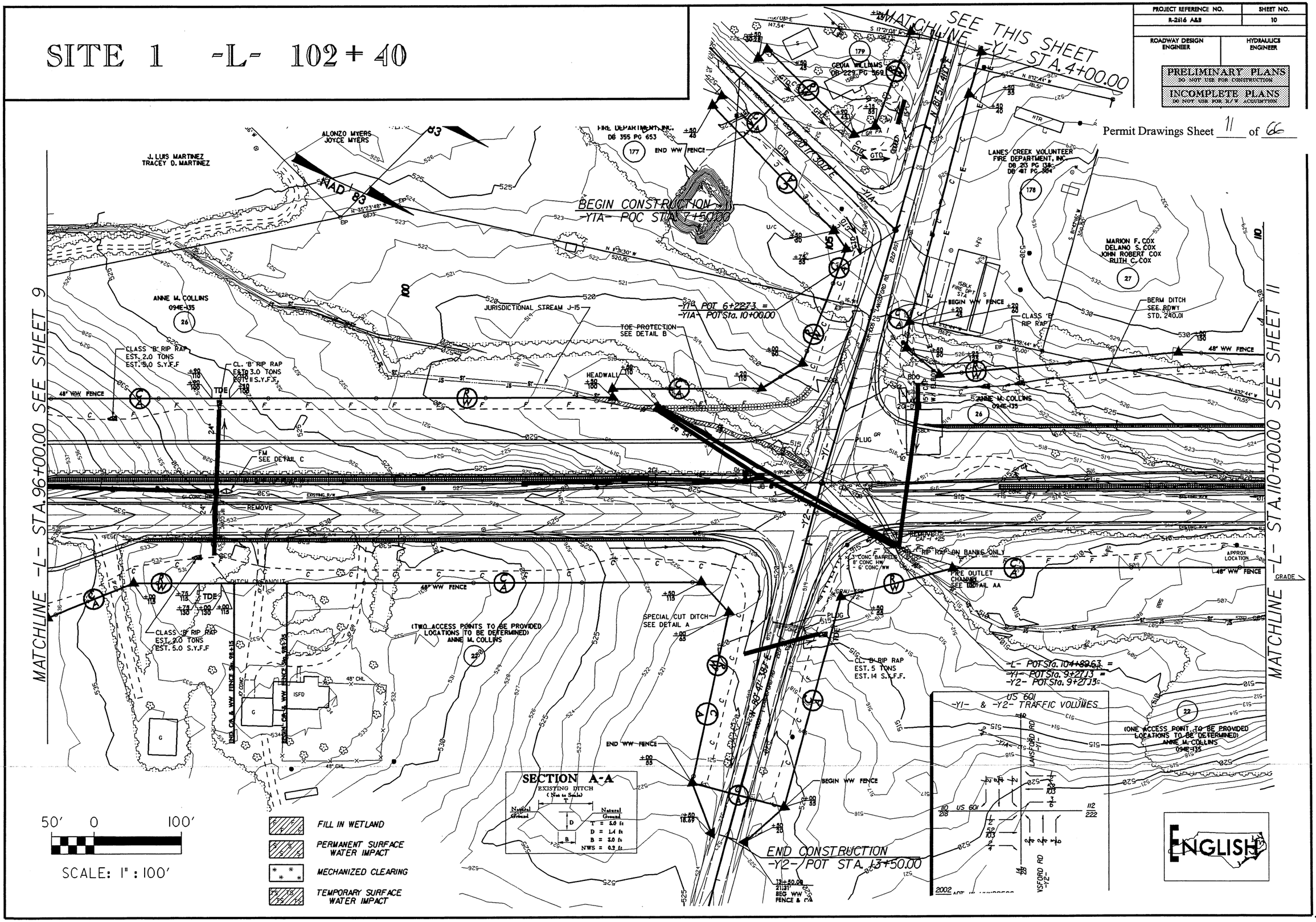
SITE 1 -L- 102 + 40

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

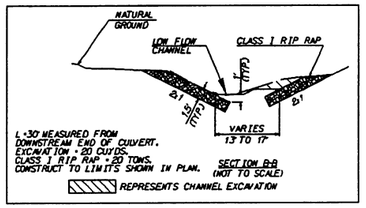
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

Permit Drawings Sheet 11 of 66



SITE 2 -L- STA 119+34



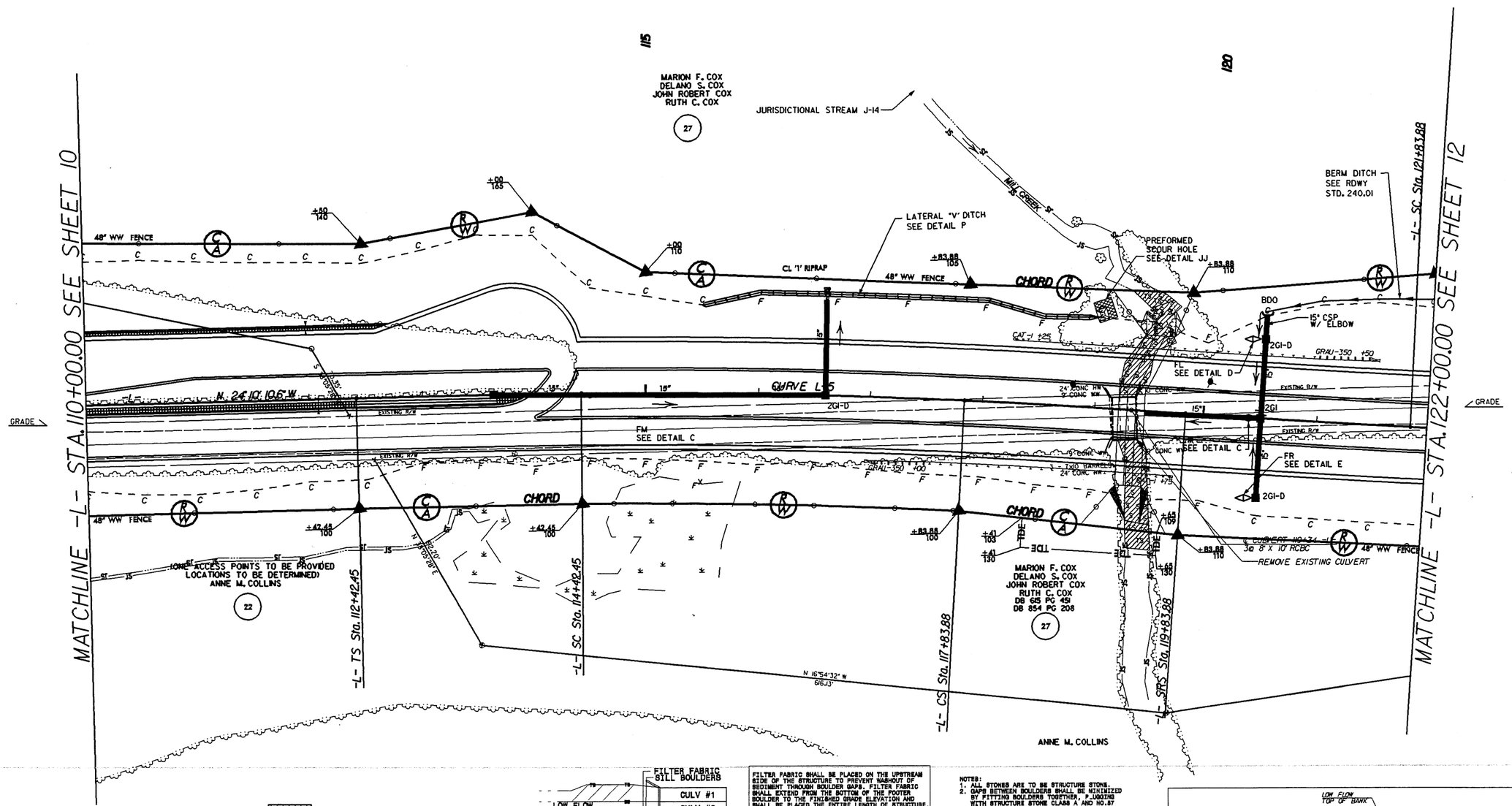
ENGLISH

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

Permit Drawings Sheet 12 of 66

SECTION A-A



50' 0 100'

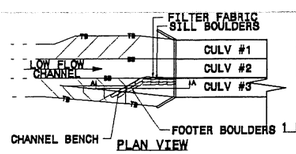
SCALE: 1" : 100'

FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

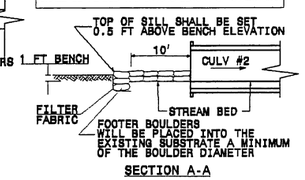


PLAN VIEW

ROCK INLET SILL

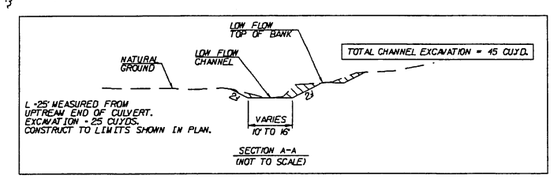
SCALE: NTS

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.



SECTION A-A

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'.



SECTION A-A
(NOT TO SCALE)

SITE 2 -L- STA 119+34

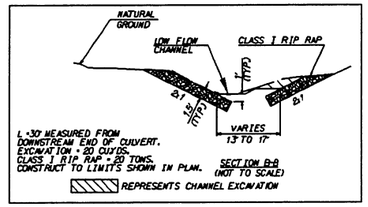
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

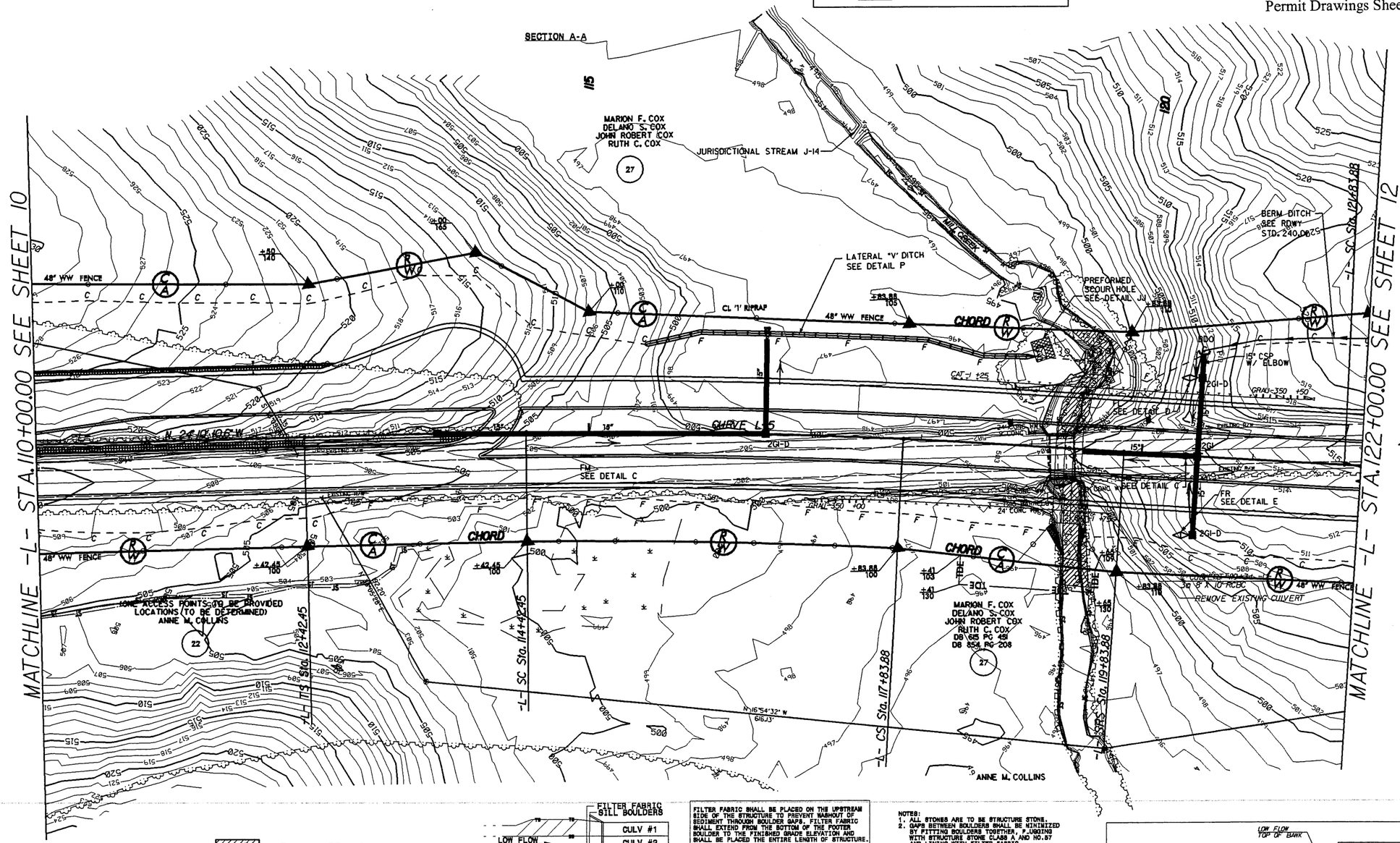
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

ENGLISH

Permit Drawings Sheet 13 of 66





50' 0 100'

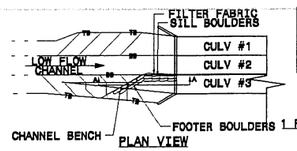
SCALE: 1" : 100'

FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

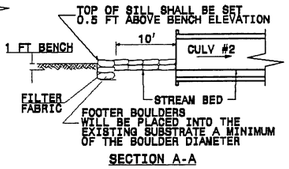
TEMPORARY SURFACE WATER IMPACT



ROCK INLET SILL

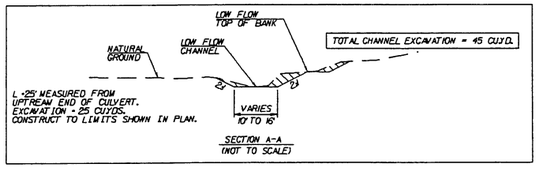
SCALE: NTS

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.



SECTION A-A

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'.

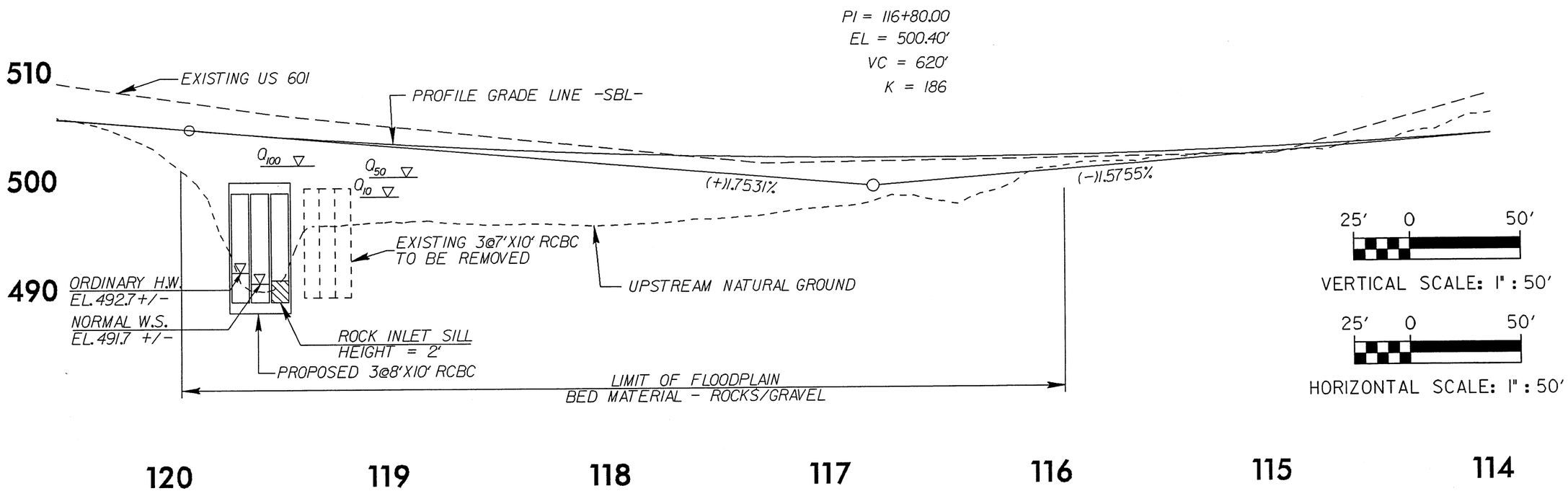


SITE 2 -L- STA 119+34

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	11A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

Permit Drawings Sheet 14 of 66

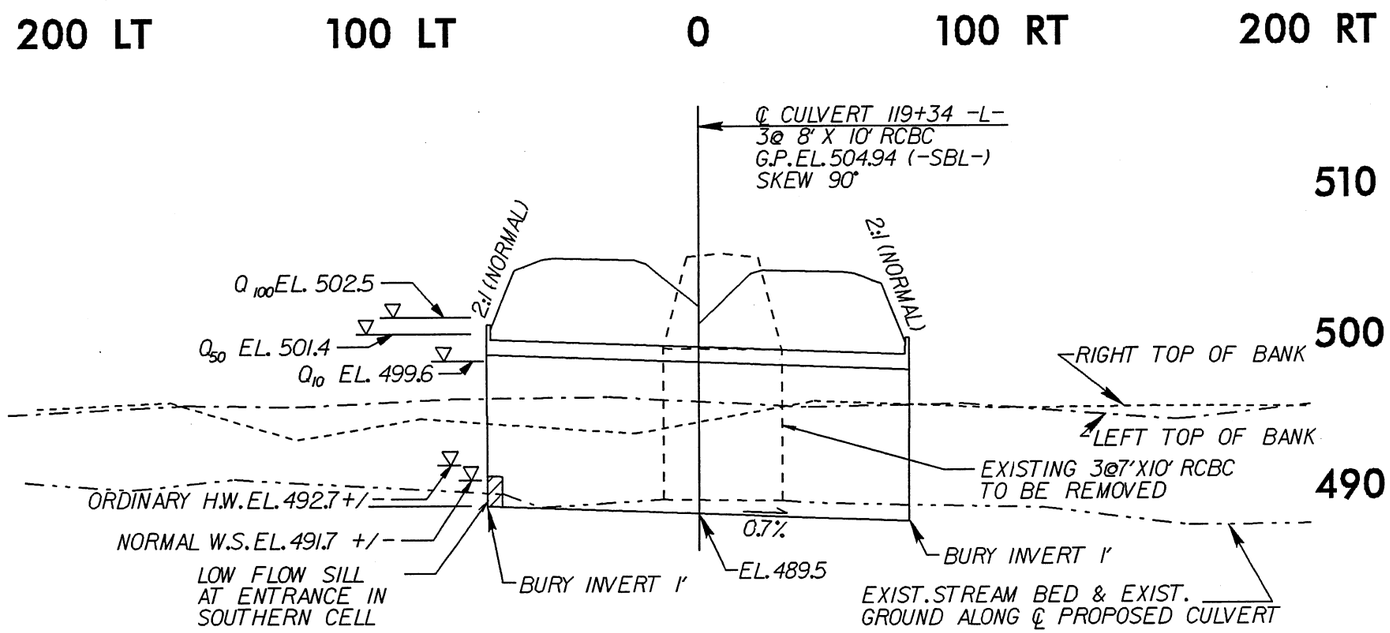


ENGLISH

SITE 2 -L- STA 119+34

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

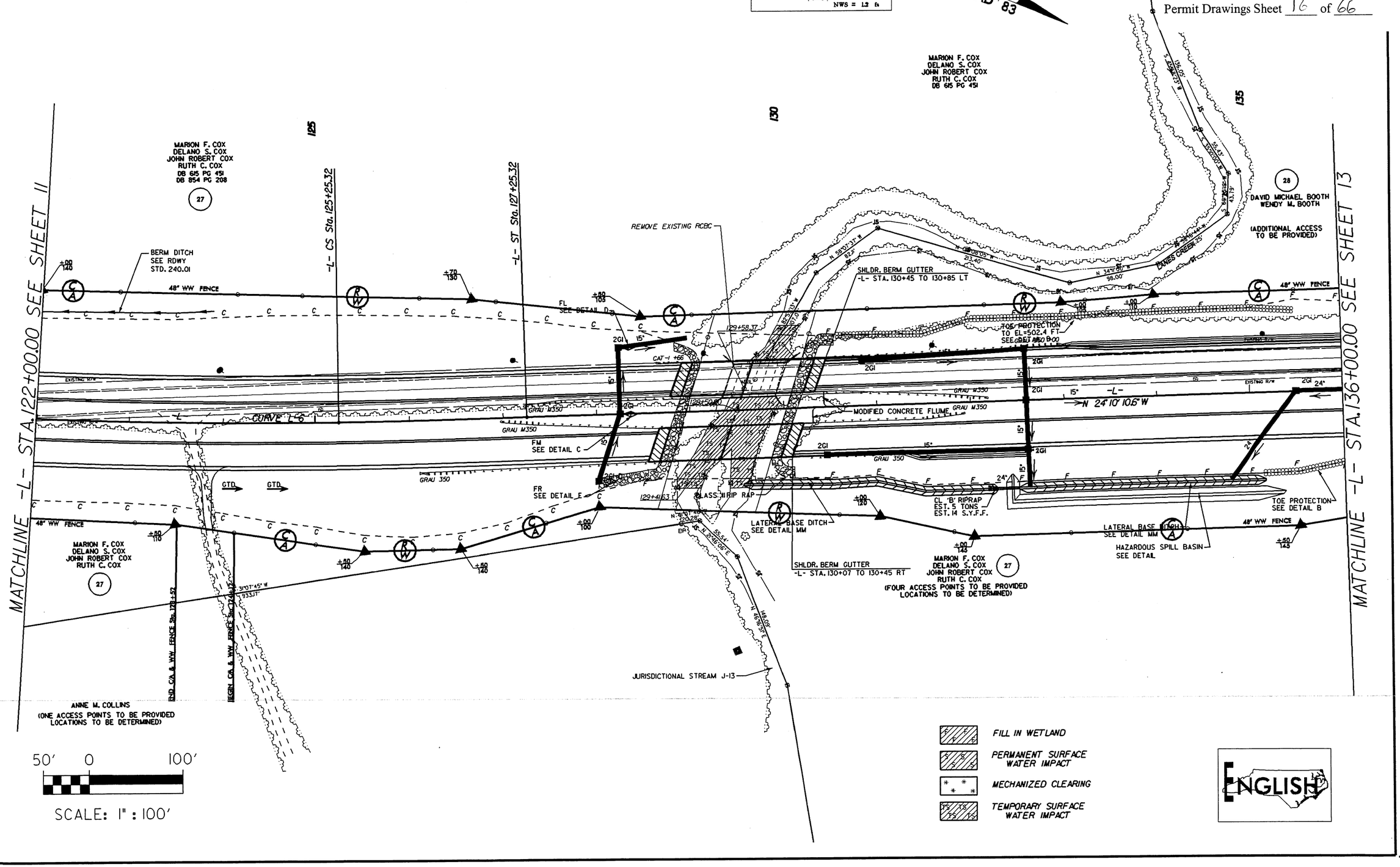
ENGLISH

SITE 3 -L- STA. 129 + 50

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

Permit Drawings Sheet 16 of 66



SITE 3 -L- STA. 129 + 50

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

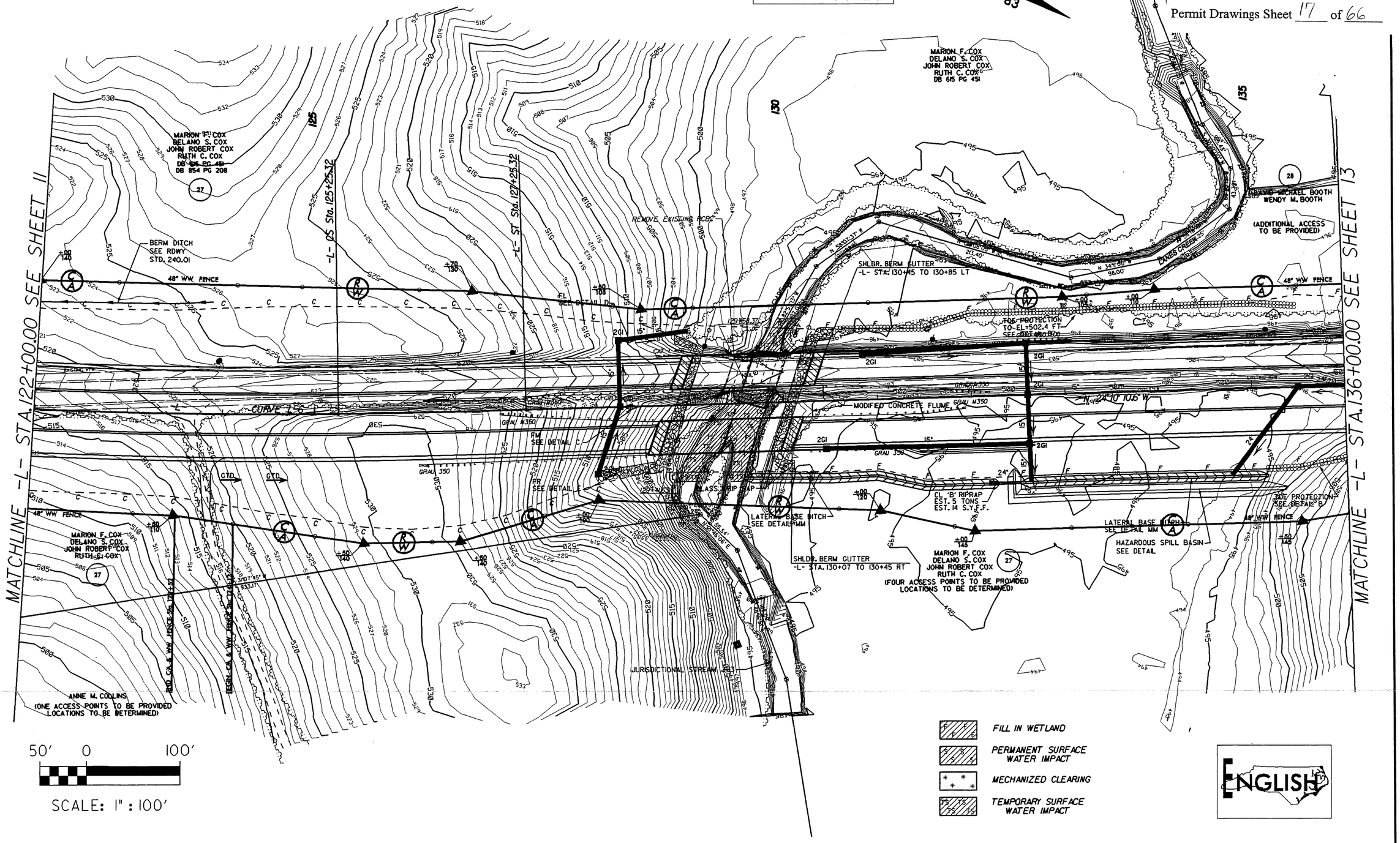
Permit Drawings Sheet 17 of 66

SECTION A-A
EXISTING DITCH
(Not to Scale)

Natural Ground — T — Natural Ground; D; B

T = 35.0 ft
D = 6.5 ft
B = 24.0 ft
NWS = 1.2 ft

NAD 83



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

ENGLISH

SITE 3 -L- STA 129 + 50

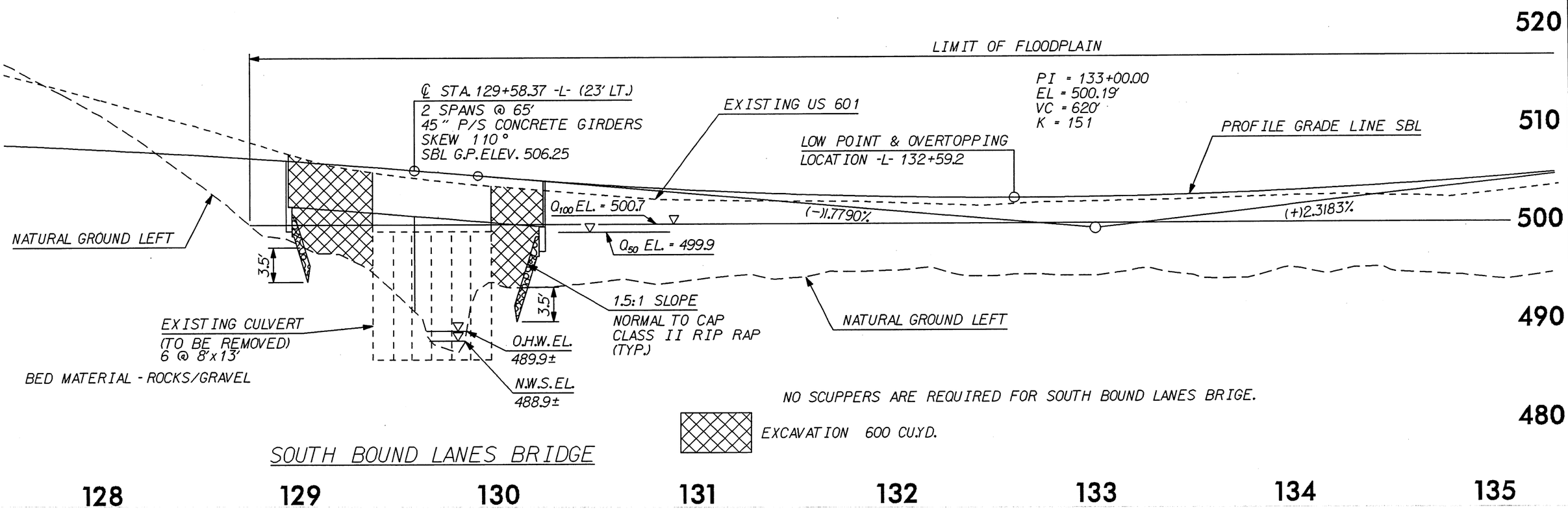
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	12A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

Permit Drawings Sheet 18 of 66

25' 0 50'
VERTICAL SCALE: 1" : 50'

25' 0 50'
HORIZONTAL SCALE: 1" : 50'



ENGLISH

SITE 3 -L- STA 129 + 50

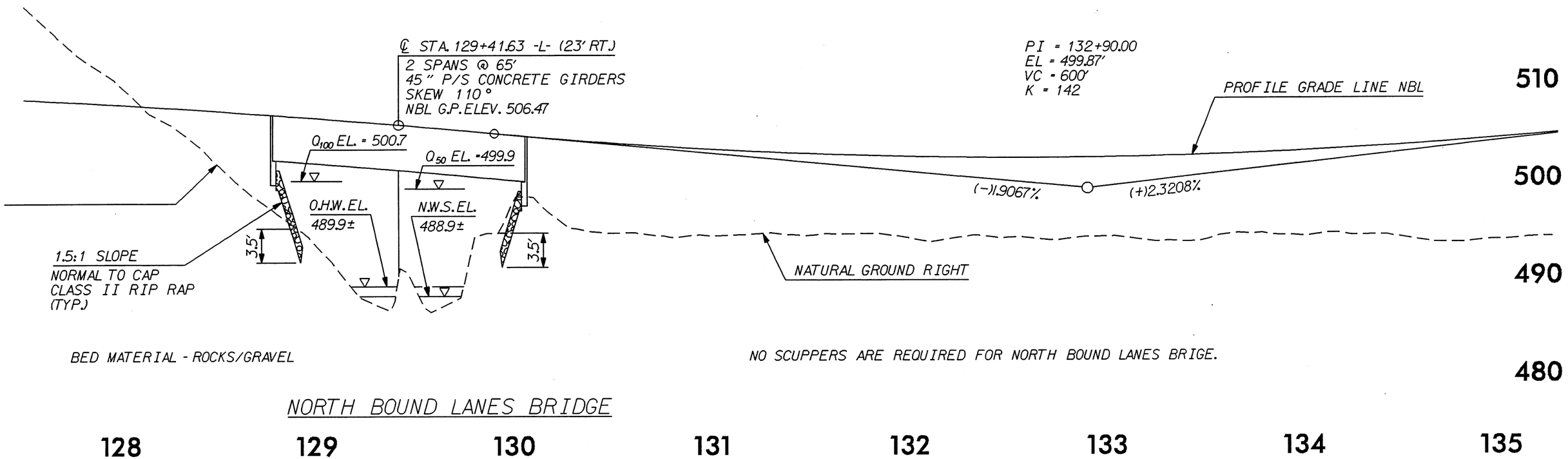
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	12B
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

Permit Drawings Sheet 19 of 66

25' 0 50'
VERTICAL SCALE: 1" : 50'

25' 0 50'
HORIZONTAL SCALE: 1" : 50'



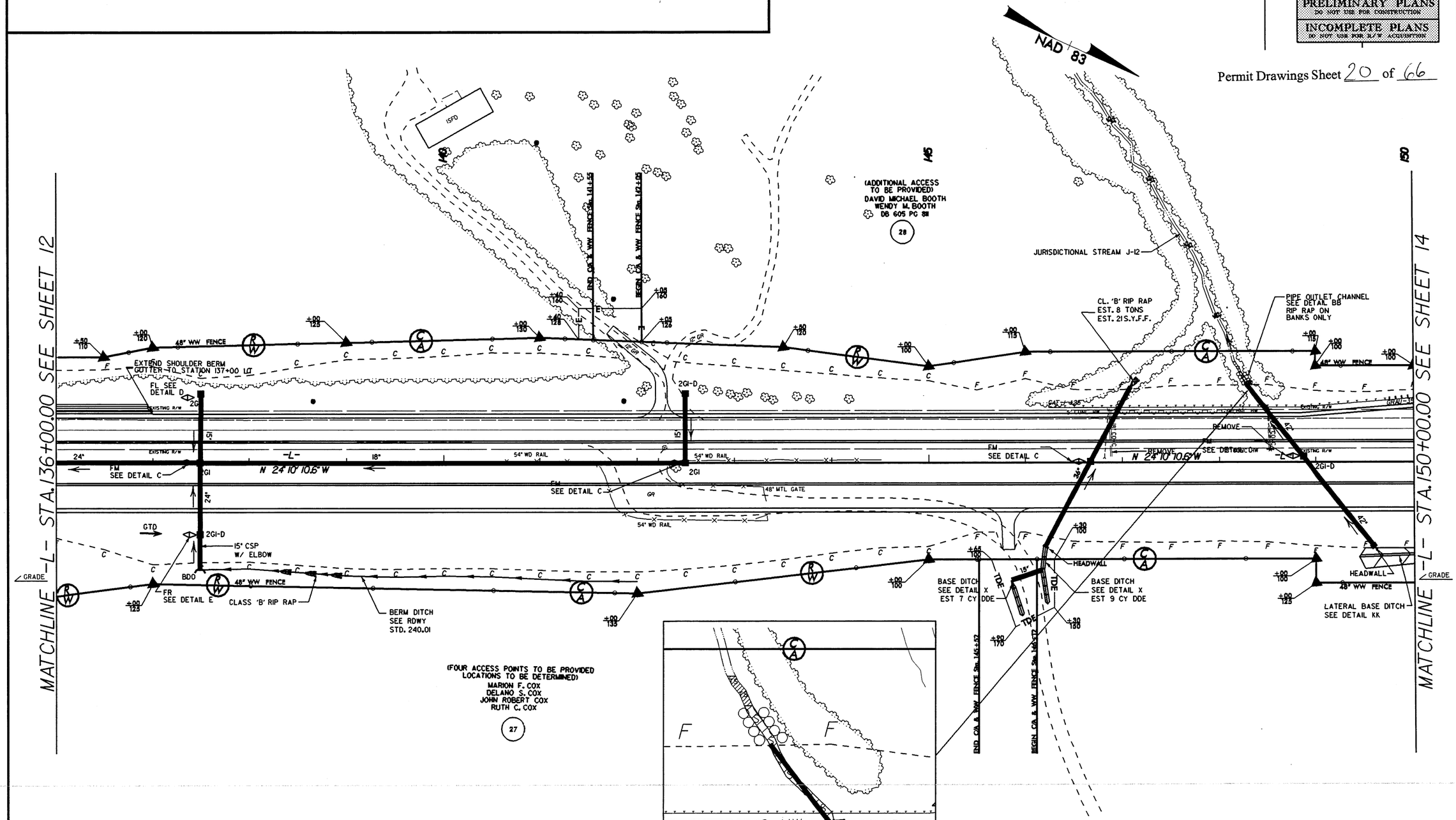
ENGLISH

SITE 4 -L- STA. 148 + 91

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

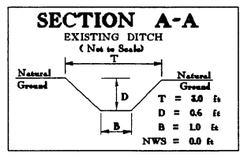
Permit Drawings Sheet 20 of 66



50' 0 100'

SCALE: 1" : 100'

SECTION A-A
EXISTING DITCH
(Not to Scale)



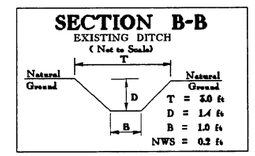
FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

SECTION B-B
EXISTING DITCH
(Not to Scale)



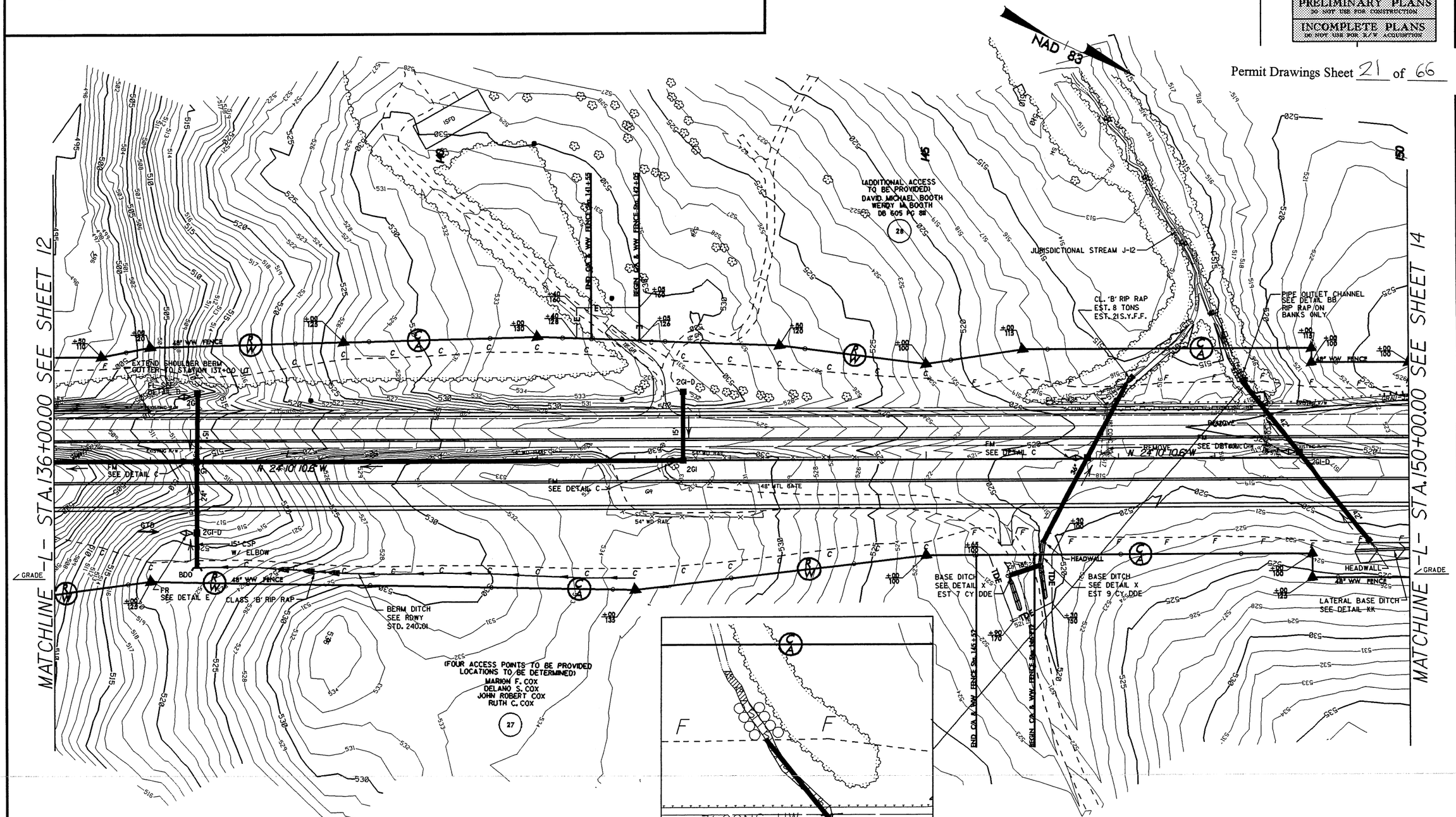
ENGLISH

SITE 4 -L- STA. 148 + 91

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

Permit Drawings Sheet 21 of 66

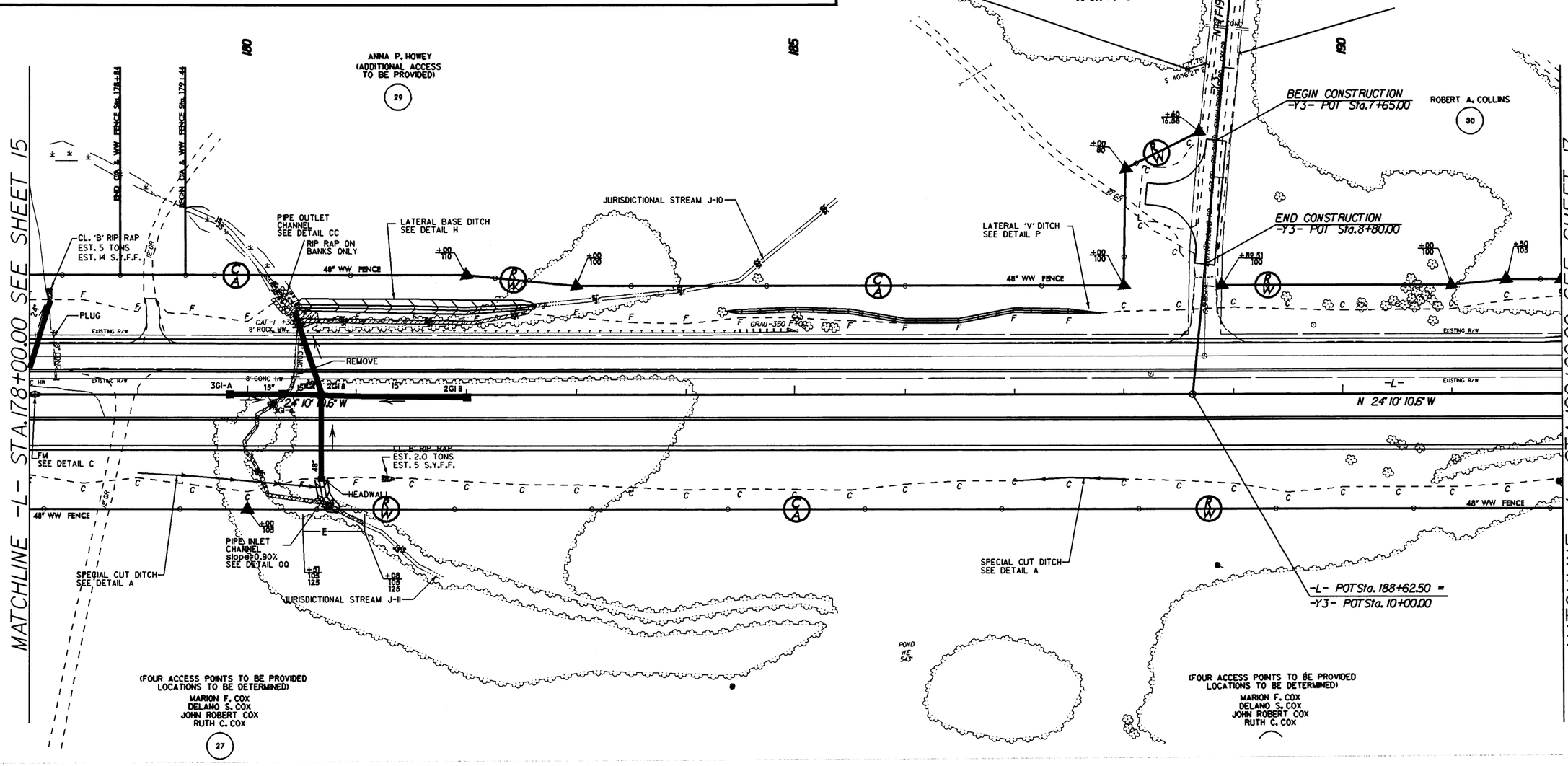


SITE 5 -L- STA. 180 + 00 (RT.)
SITE 6 -L- STA. 180 + 00 (LT.)
SITE 7 -L- STA. 183 + 00 (LT.)

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

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

Permit Drawings Sheet 22 of 66



50' 0 100'

SCALE: 1" : 100'

SECTION D-D
EXISTING DITCH
(Not to Scale)

T =	2.0 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 =	2.0 ft
NWS =	0.2 ft

SECTION C-C
EXISTING DITCH
(Not to Scale)

T =	4.0 ft
D =	1.0 ft
B =	2.0 ft
NWS =	0.2 ft

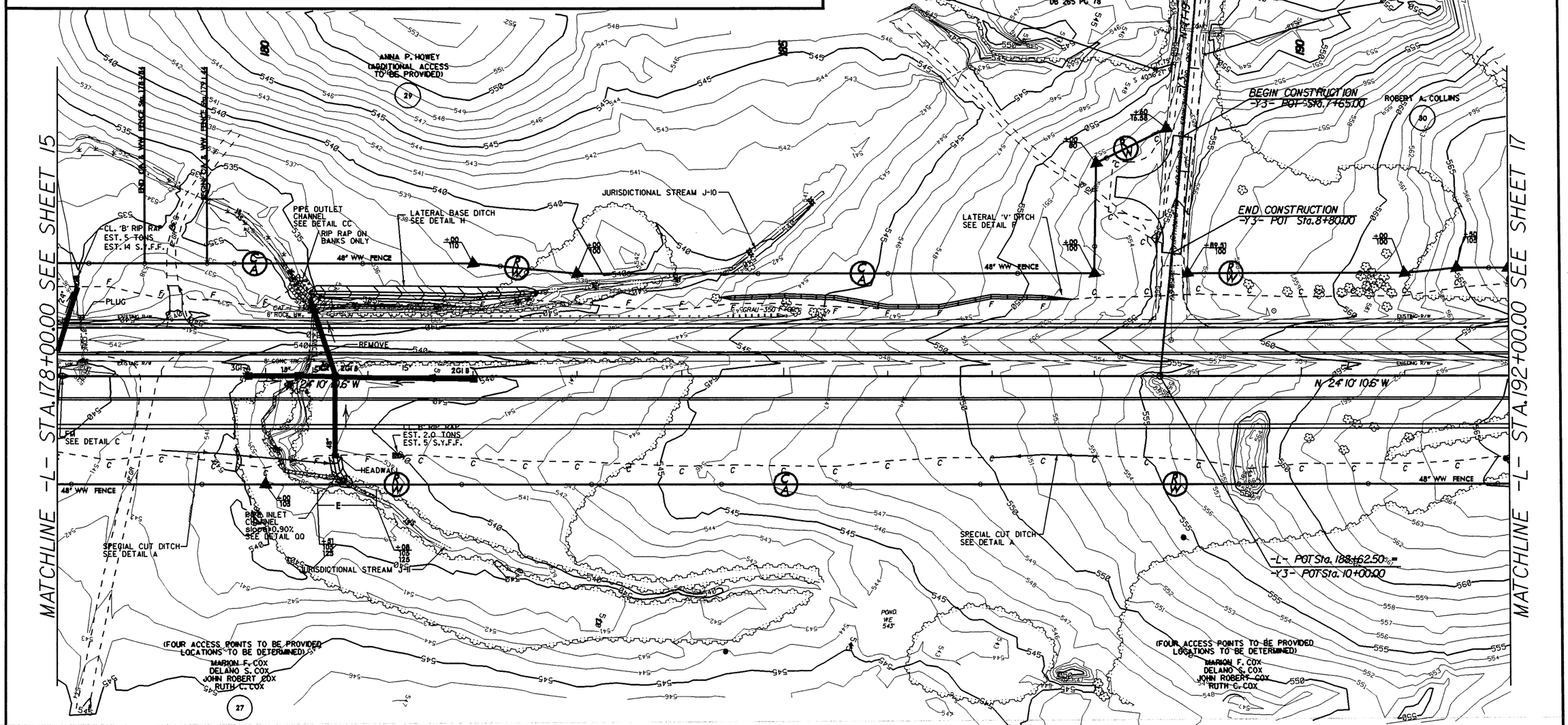
ENGLISH

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	16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

Permit Drawings Sheet 23 of 66



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

SITE 8A -L- STA. 206 + 00

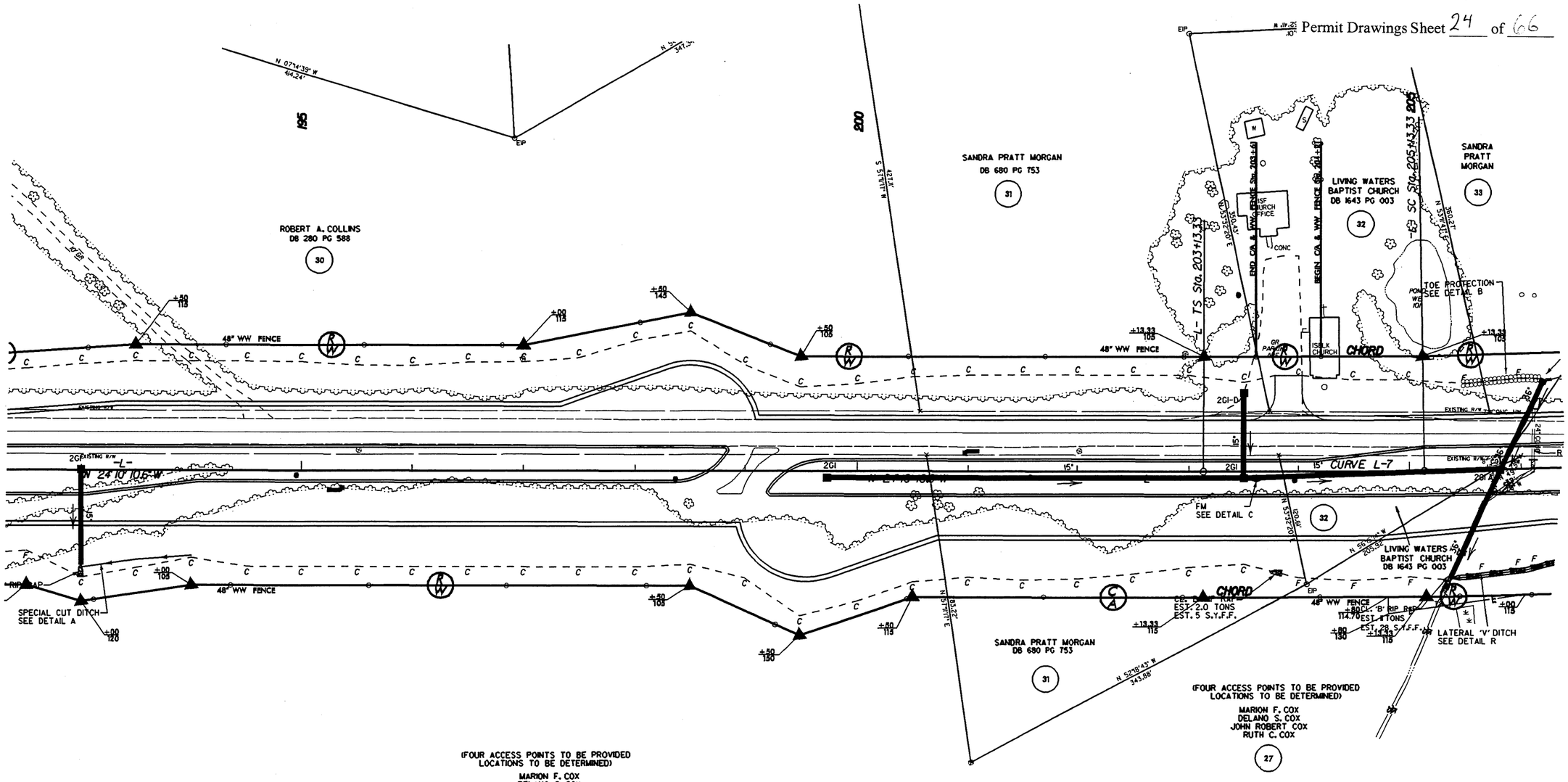
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	17

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

Permit Drawings Sheet 24 of 66



FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

50' 0 100'

SCALE: 1" : 100'

ENGLISH

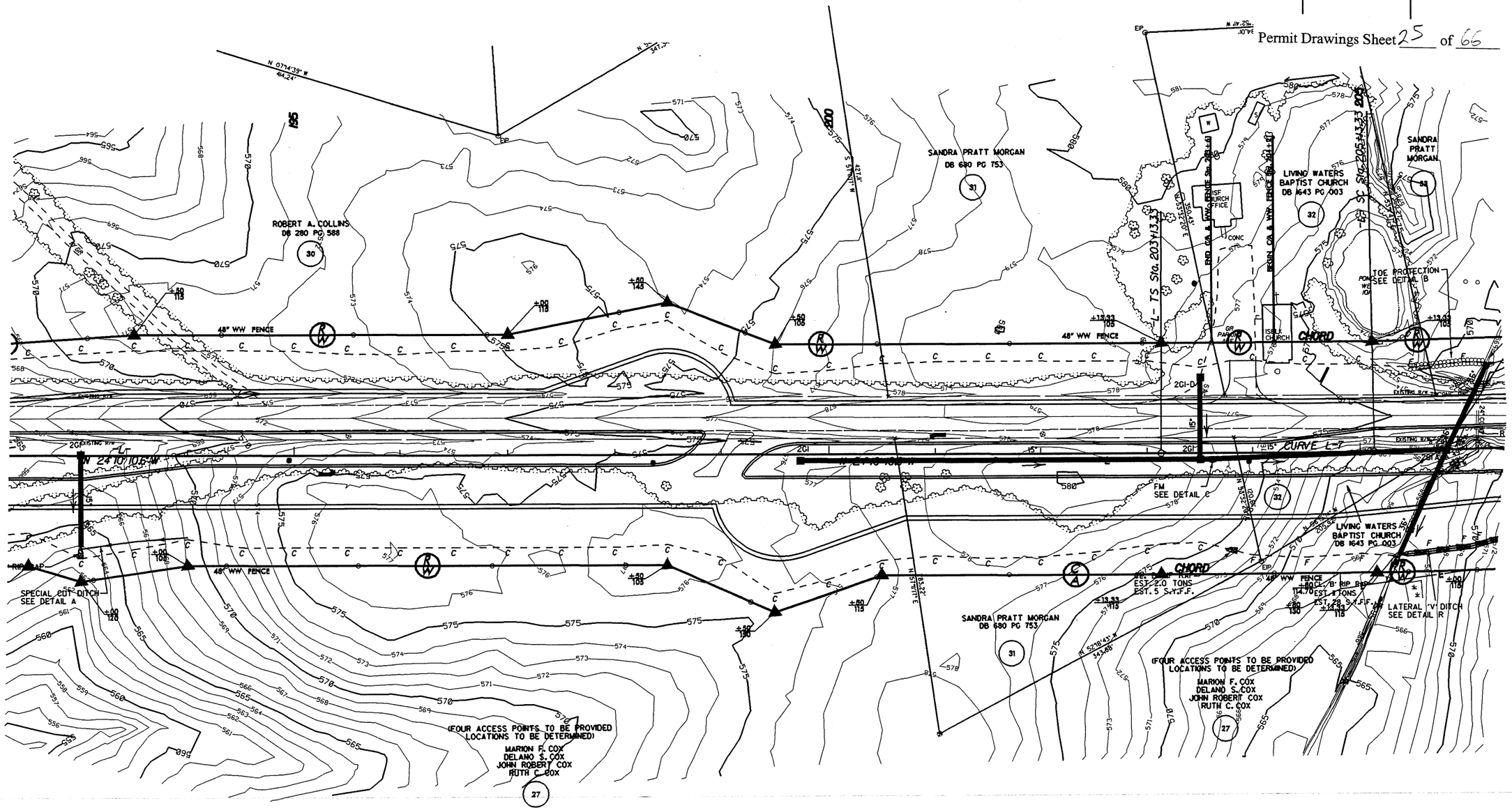
SITE 8A -L- STA. 206 + 00

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

Permit Drawings Sheet 25 of 66



FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

50' 0 100'

SCALE: 1" : 100'

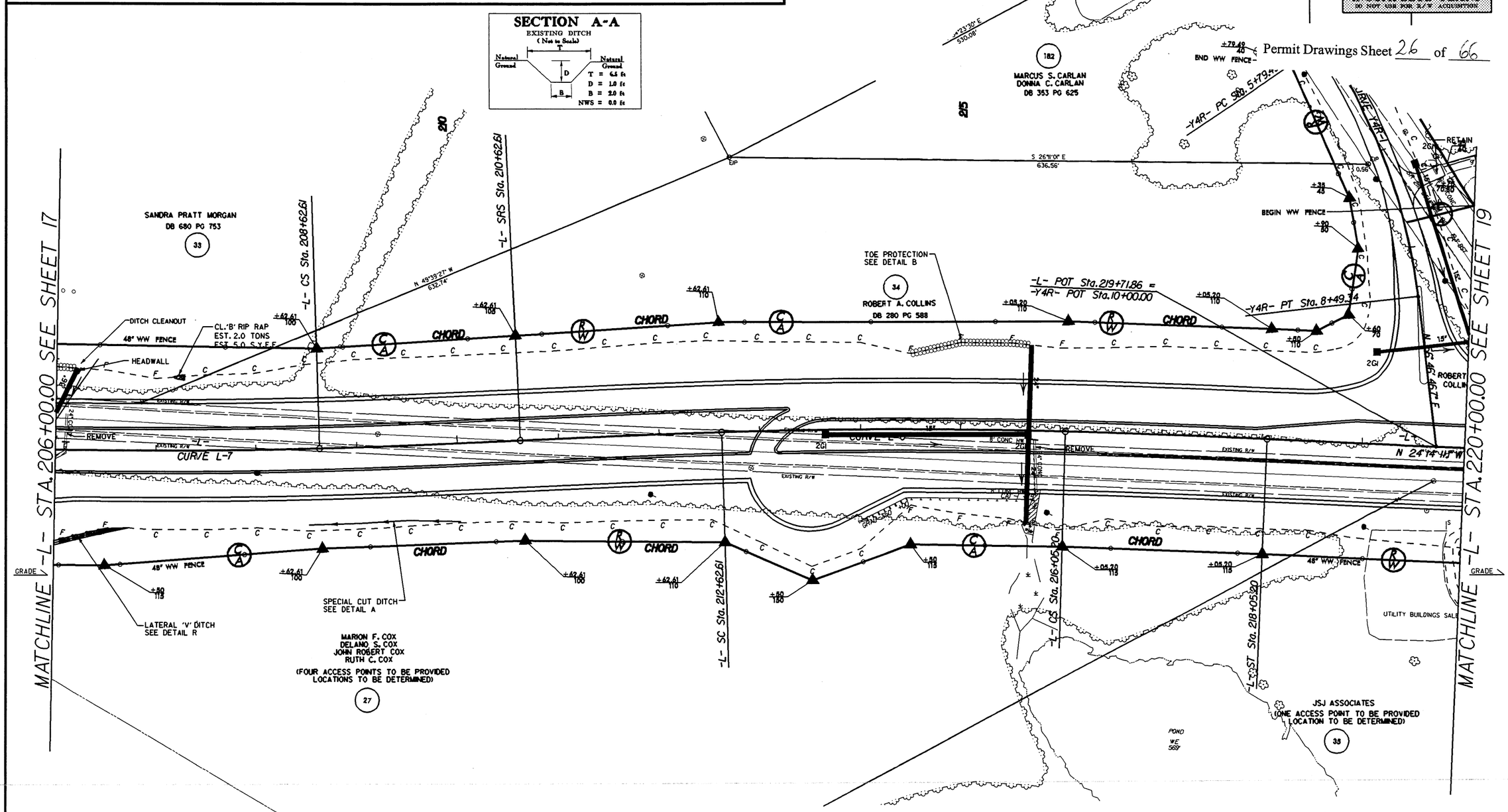
ENGLISH

SITE 8 -L- STA. 215 + 70

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

Permit Drawings Sheet 26 of 66

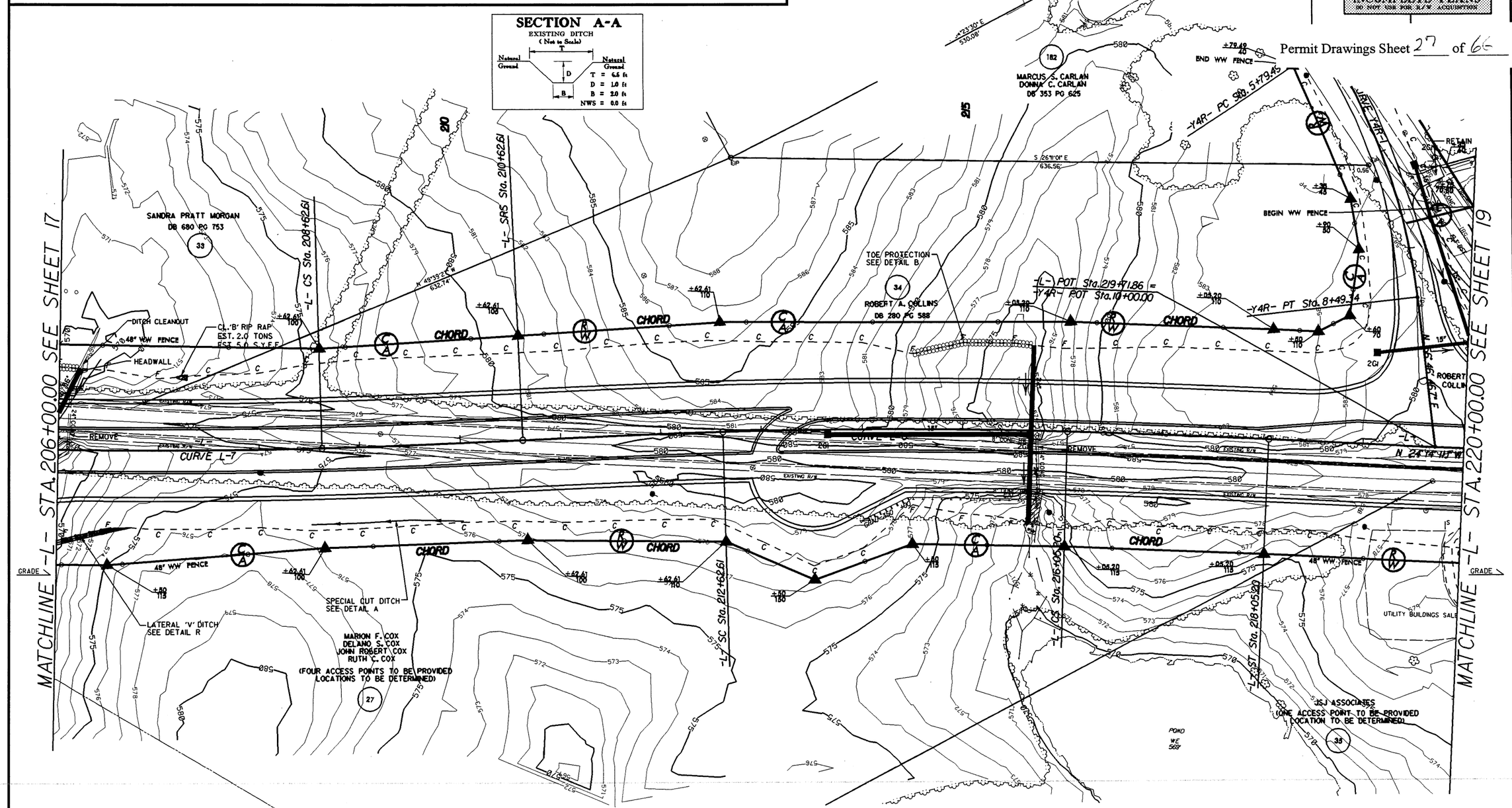


SITE 8 -L- STA. 215 + 70

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

Permit Drawings Sheet 27 of 66

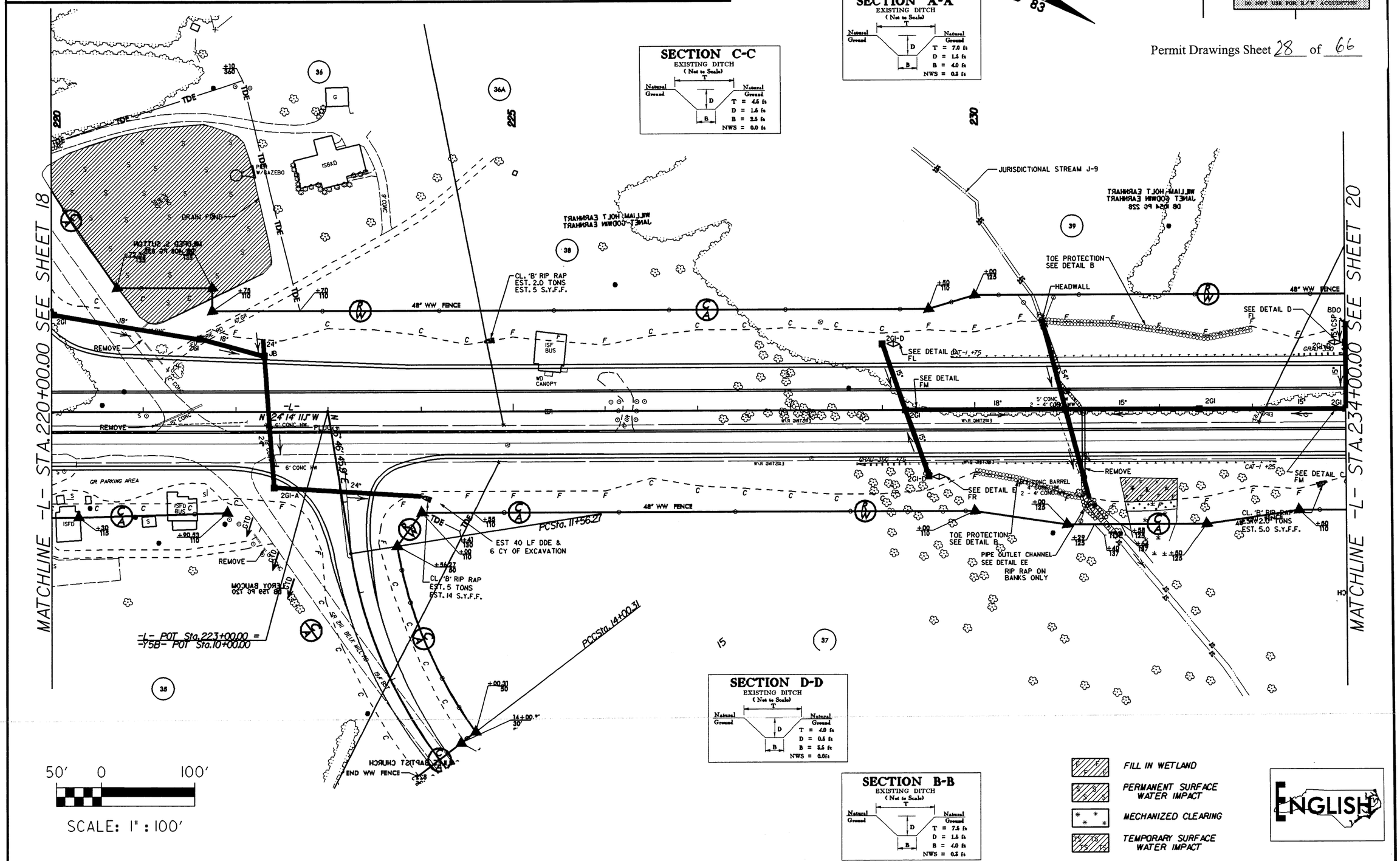


SITE 9 -L- STA. 221 + 00 LT.
SITE 10 -L- STA. 231 + 20

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

Permit Drawings Sheet 28 of 66



SECTION A-A
EXISTING DITCH
(Not to Scale)

Natural Ground — T — Natural Ground; D; B

T = 7.0 ft
D = 1.5 ft
B = 4.0 ft
NWS = 0.5 ft

SECTION C-C
EXISTING DITCH
(Not to Scale)

Natural Ground — T — Natural Ground; D; B

T = 4.5 ft
D = 1.5 ft
B = 2.5 ft
NWS = 0.0 ft

SECTION D-D
EXISTING DITCH
(Not to Scale)

Natural Ground — T — Natural Ground; D; B

T = 4.0 ft
D = 0.5 ft
B = 3.5 ft
NWS = 0.0ft

SECTION B-B
EXISTING DITCH
(Not to Scale)

Natural Ground — T — Natural Ground; D; B

T = 7.5 ft
D = 1.5 ft
B = 4.0 ft
NWS = 0.5 ft

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

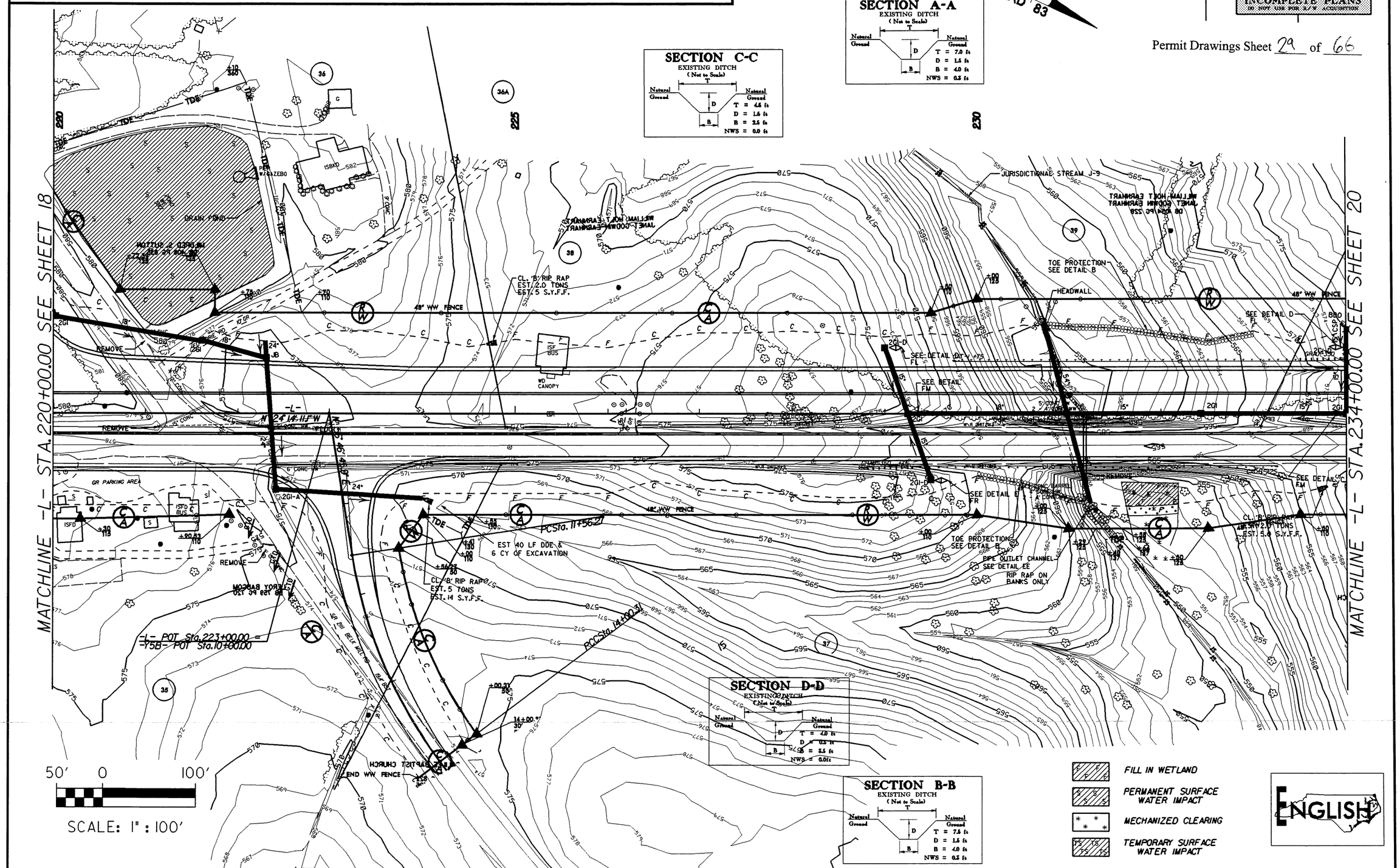
ENGLISH

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

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

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

Permit Drawings Sheet 29 of 66

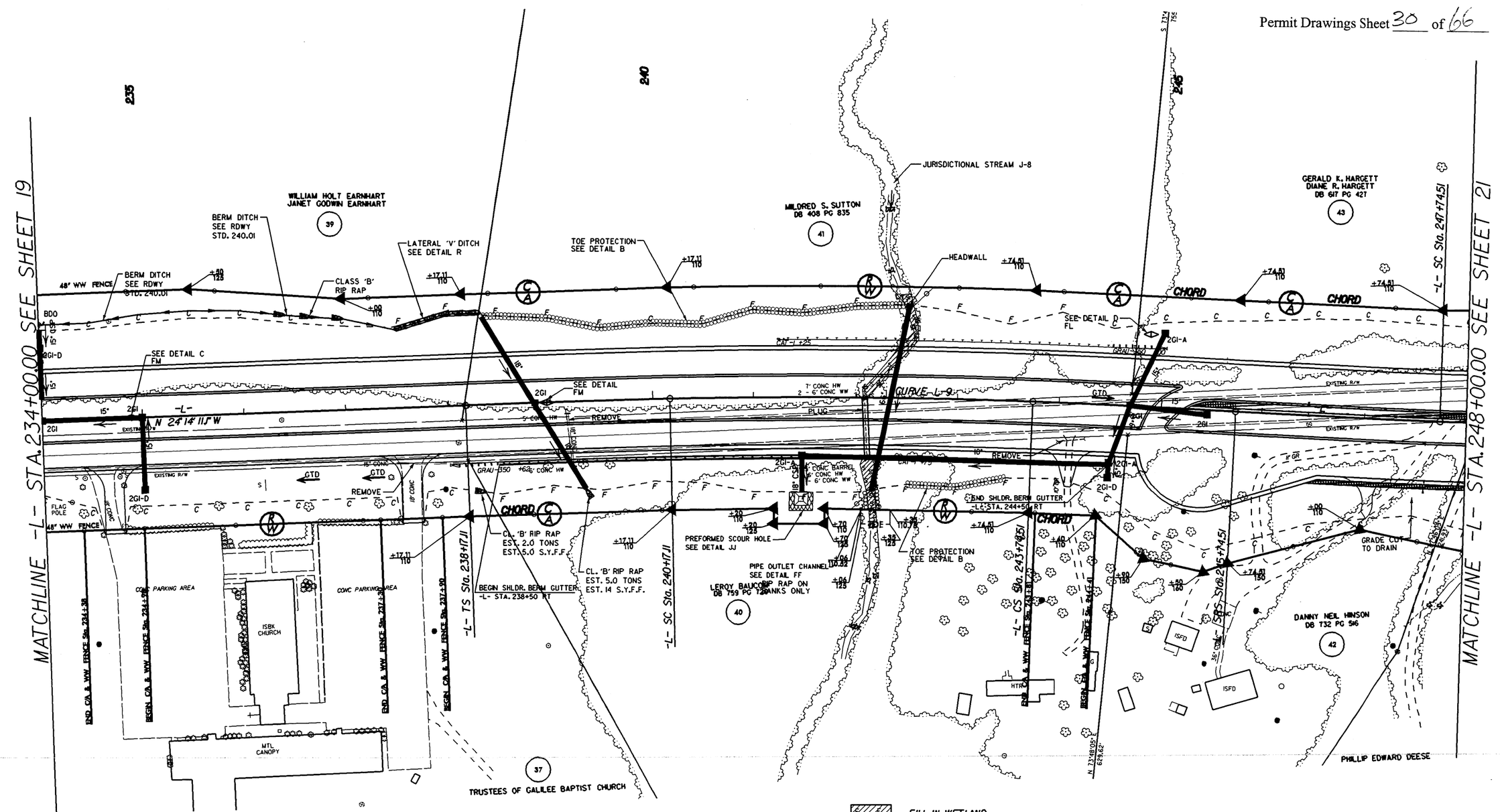


SITE 11 -L- STA. 242 + 35

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

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

Permit Drawings Sheet 30 of 66

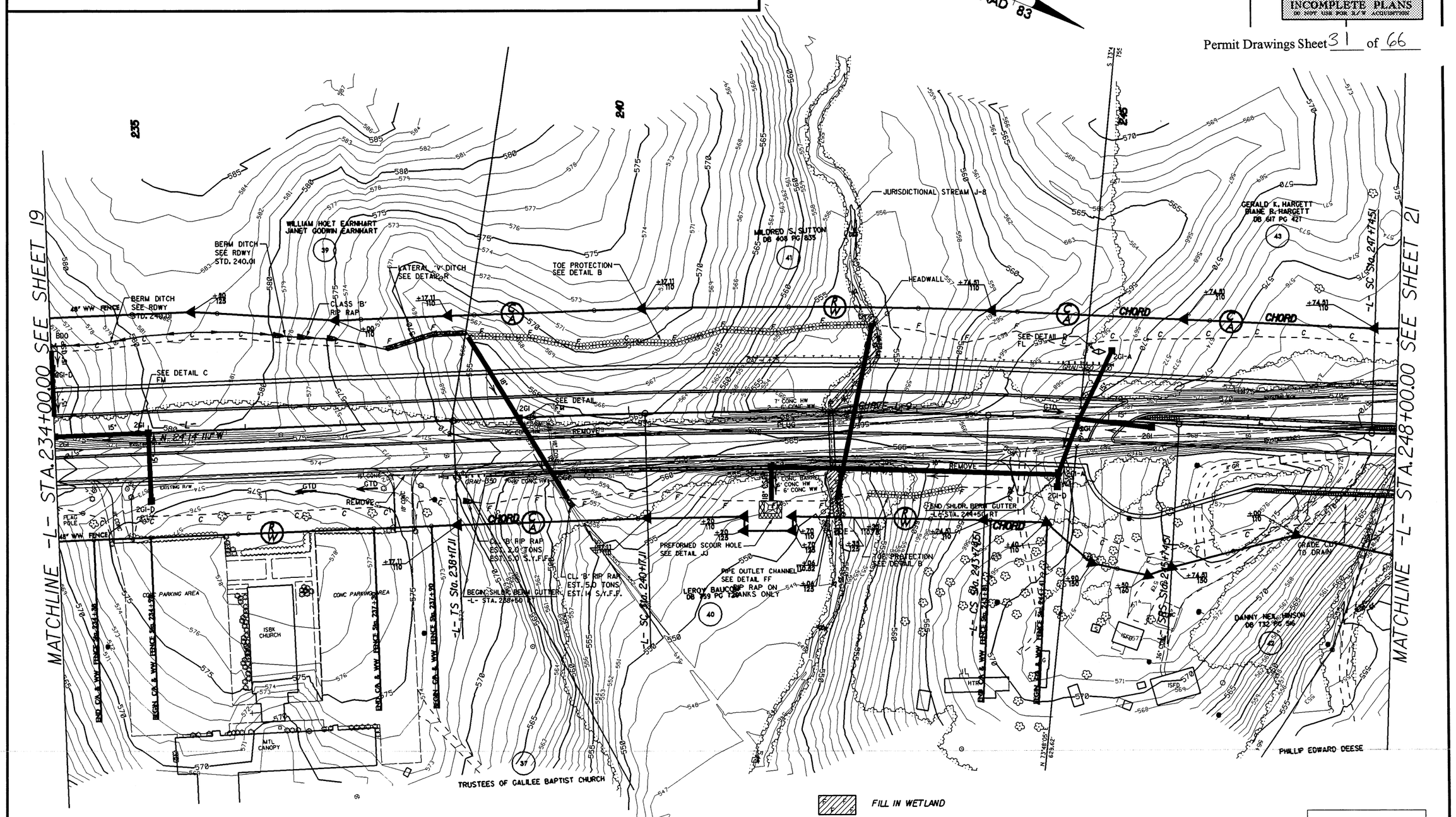


SITE 11 -L- STA. 242+35

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

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

Permit Drawings Sheet 31 of 66



SITE 11 -L- STA. 242 + 35

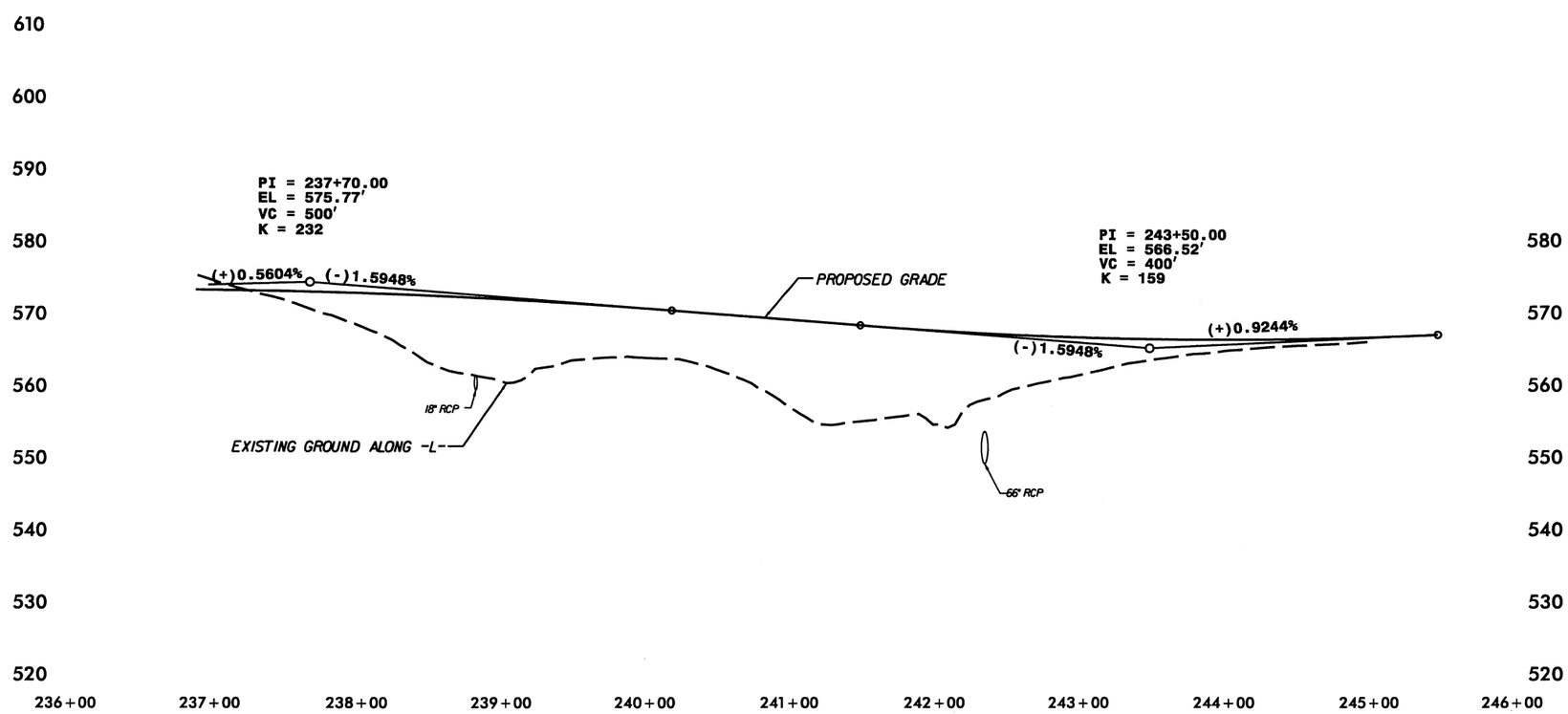
25 0 50 HORIZ.
5 0 10 VERT.

PROJECT REFERENCE NO.	SHEET NO.
R-2616A&B	63
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

Permit Drawings Sheet 32 of 66



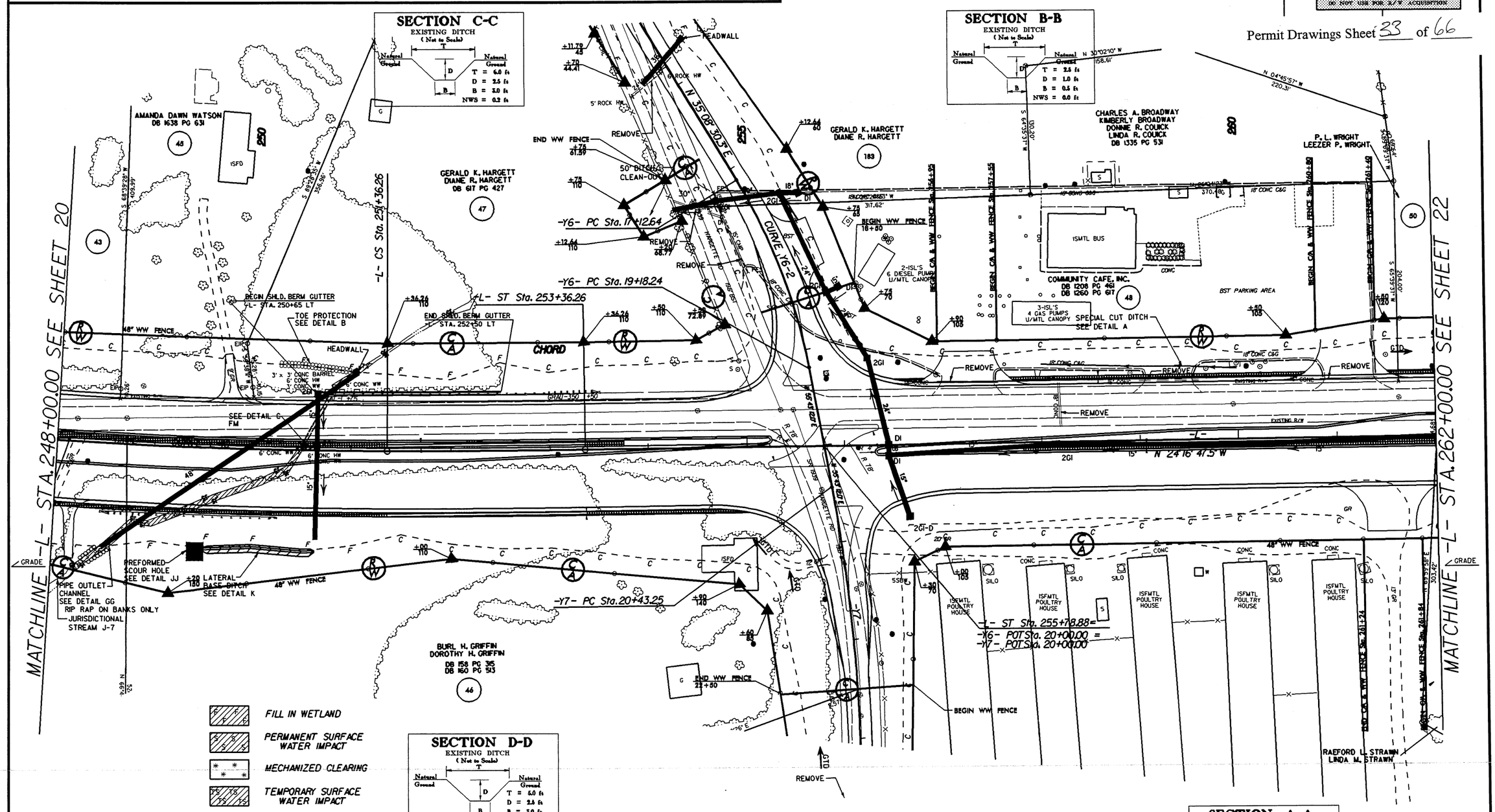
ENGLISH

SITE 12 -L- STA. 250 + 00

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

Permit Drawings Sheet 33 of 66

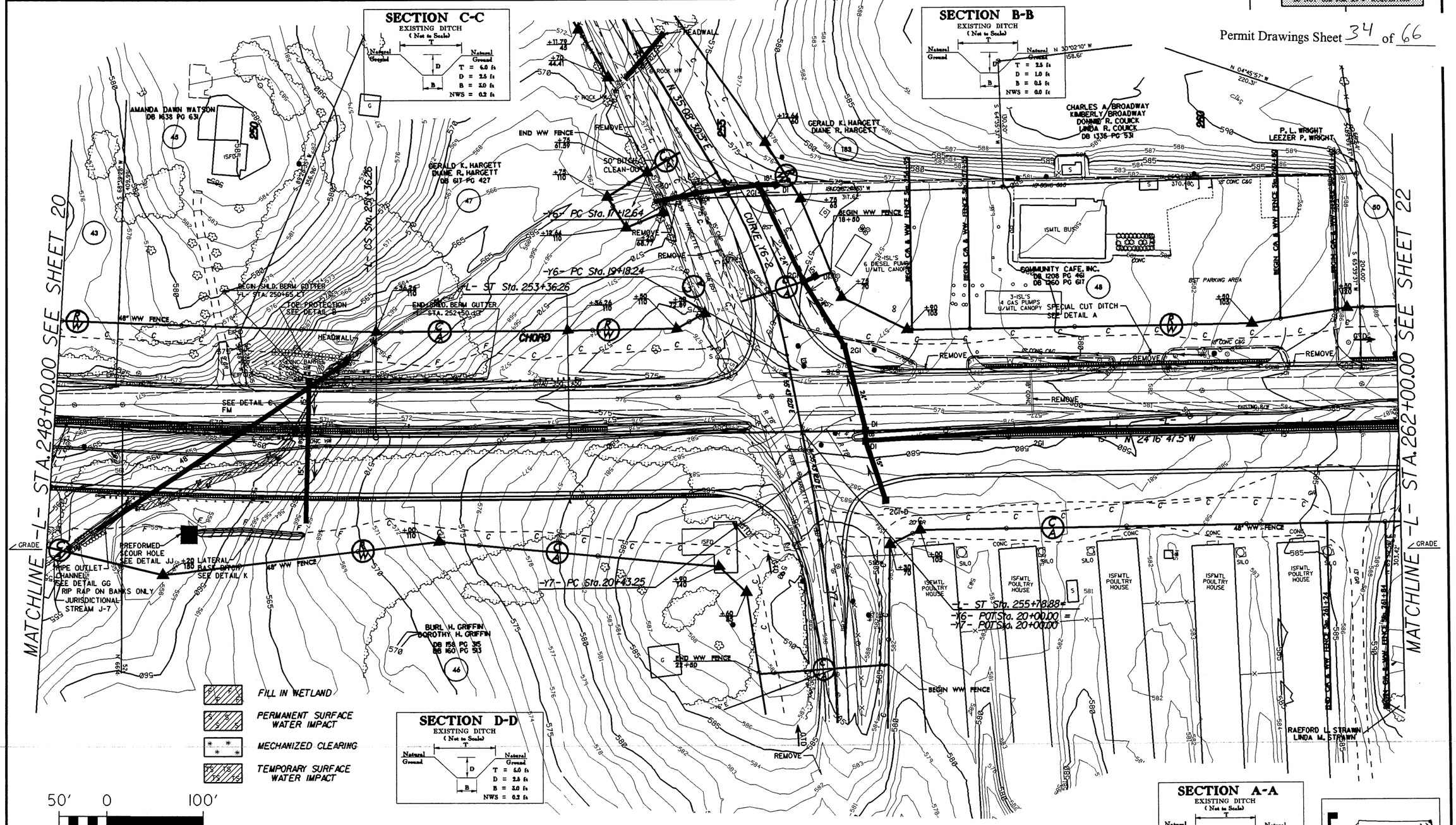


SITE 12 -L- STA. 250 + 00

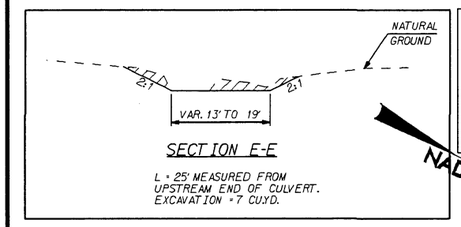
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

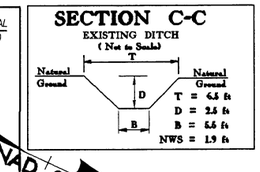
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

Permit Drawings Sheet 34 of 66



SITE 13 -L- STA. 281 + 51
SITE 14 -L- STA. 288 + 06.5
SITE 15 -L- STA. 290 + 00 - 294 + 30



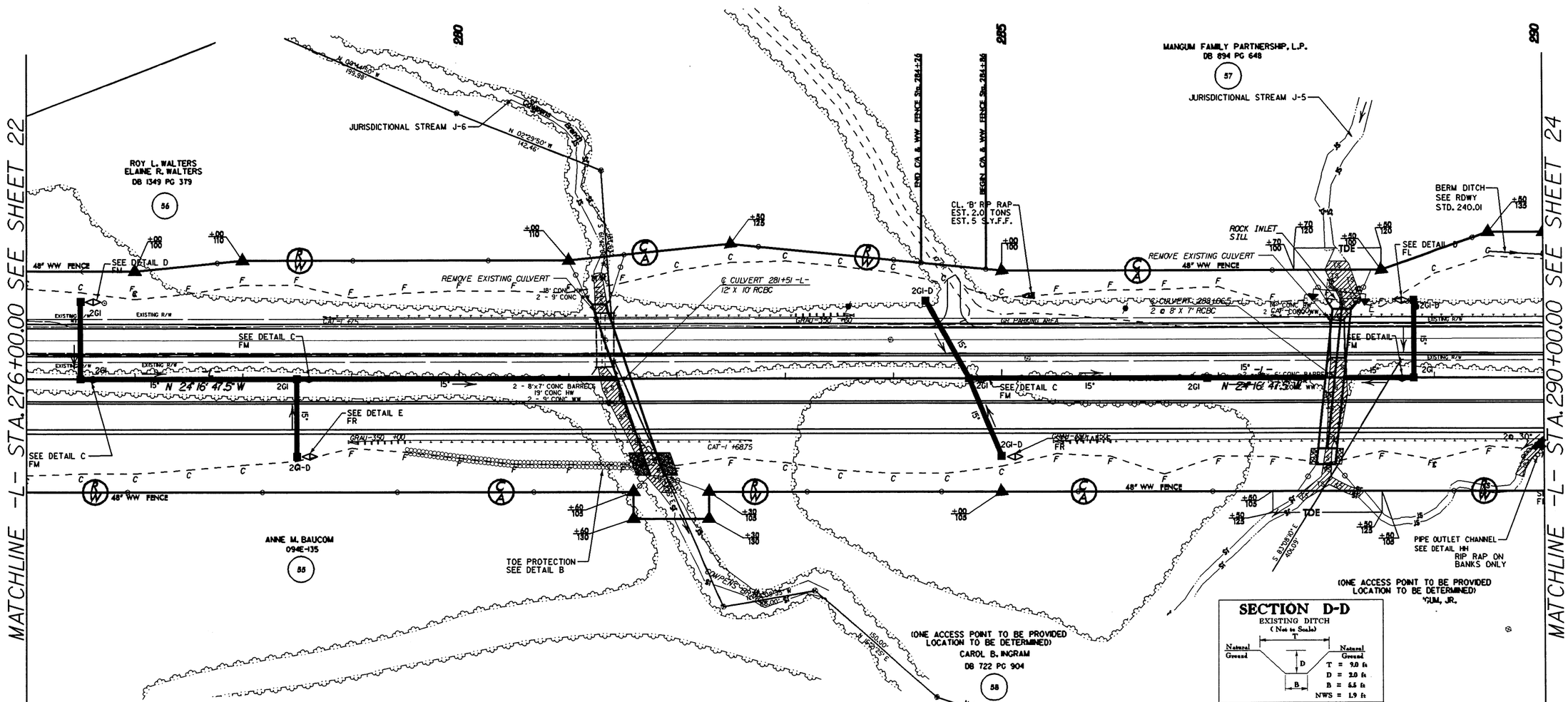


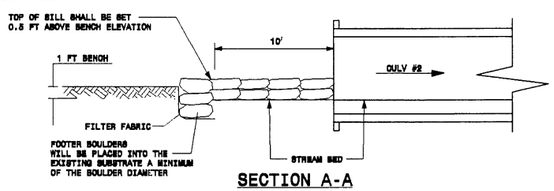
NAD 83

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

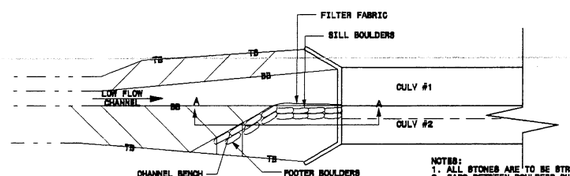
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

Permit Drawings Sheet 35 of 66





SECTION A-A



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.

PLAN VIEW

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'

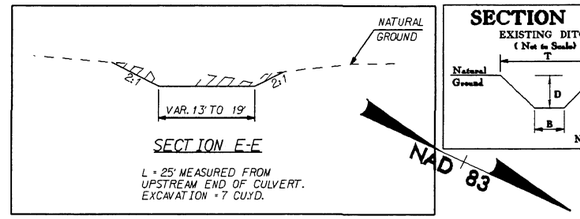
ENGLISH

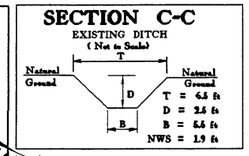
SITE 13 -L- STA. 281 + 51
SITE 14 -L- STA. 288 + 06.5
SITE 15 -L- STA. 290 + 00 - 294 + 30

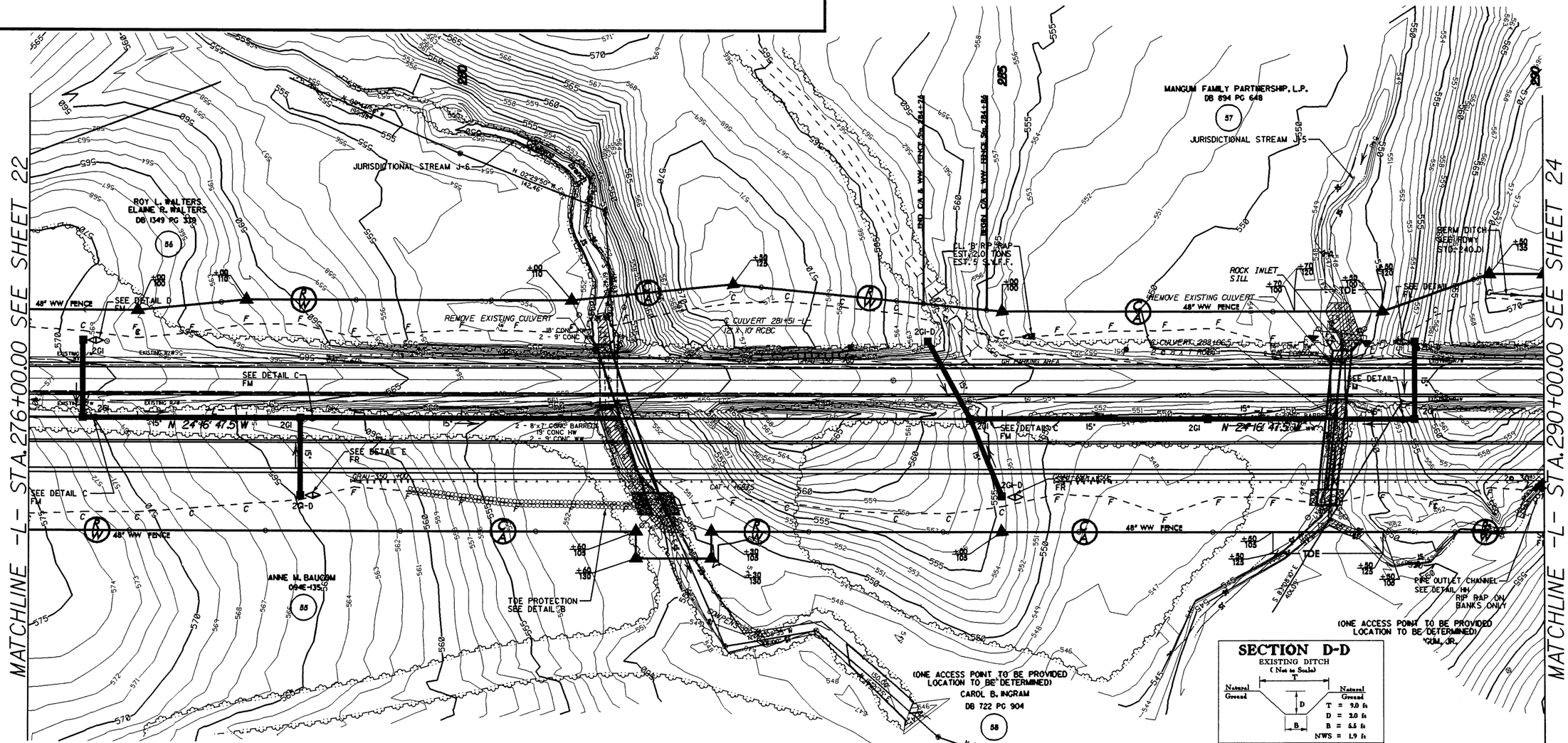
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

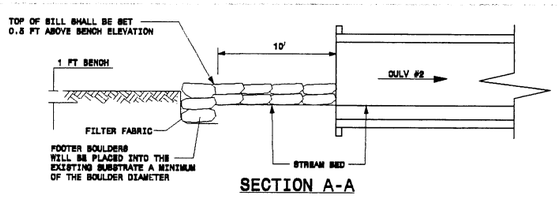
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

Permit Drawings Sheet 36 of 66

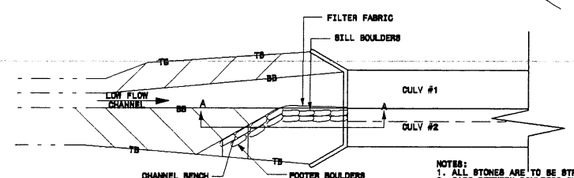








SECTION A-A



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:
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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'

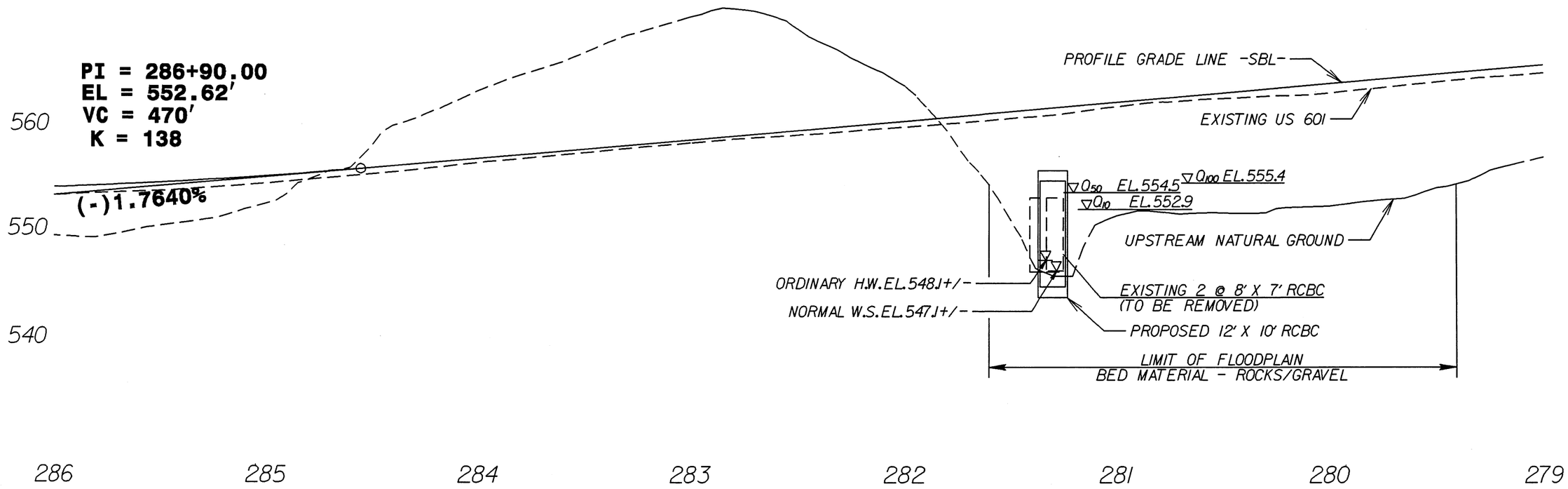
ENGLISH

SITE 13 -L- STA 281 + 51

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

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

Permit Drawings Sheet 37 of 66



25' 0 50'

VERTICAL SCALE: 1" : 50'

25' 0 50'

HORIZONTAL SCALE: 1" : 50'

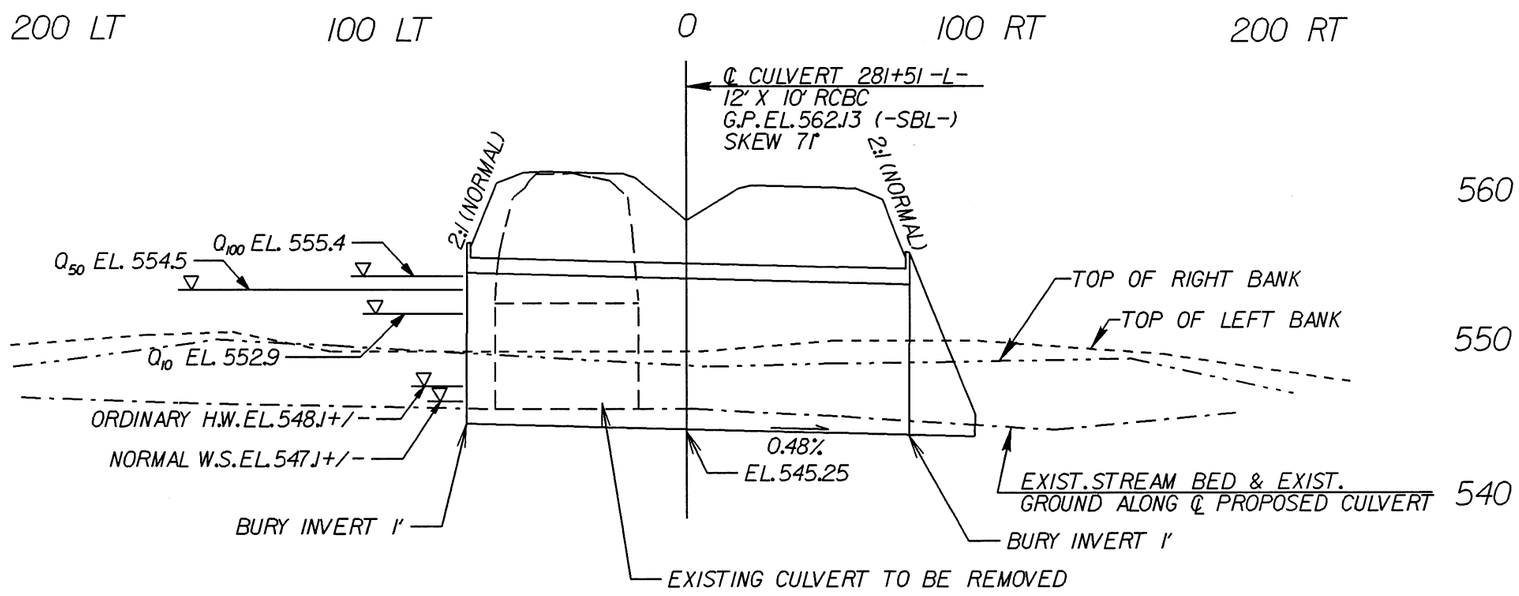
ENGLISH

SITE 13 -L- STA 281 + 51

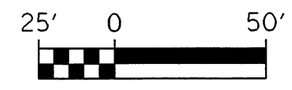
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	23B
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

Permit Drawings Sheet 38 of 66



VERTICAL SCALE: 1" : 50'



HORIZONTAL SCALE: 1" : 50'

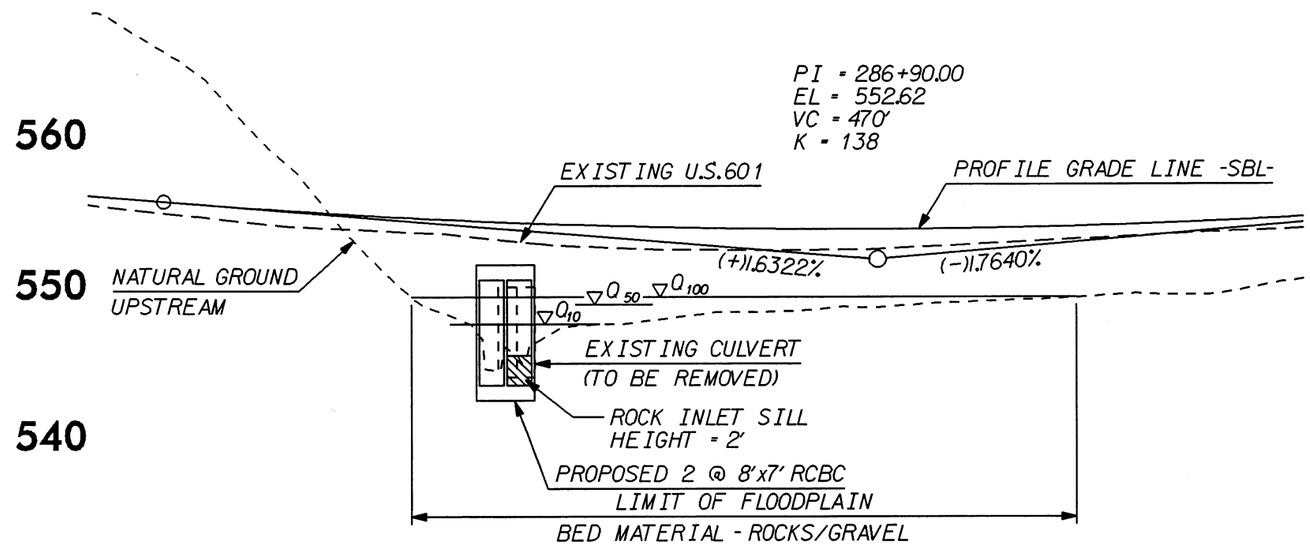
ENGLISH

SITE 14 -L- STA 288 + 06.5

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

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

Permit Drawings Sheet 39 of 66



25' 0 50'

VERTICAL SCALE: 1" : 50'

25' 0 50'

HORIZONTAL SCALE: 1" : 50'

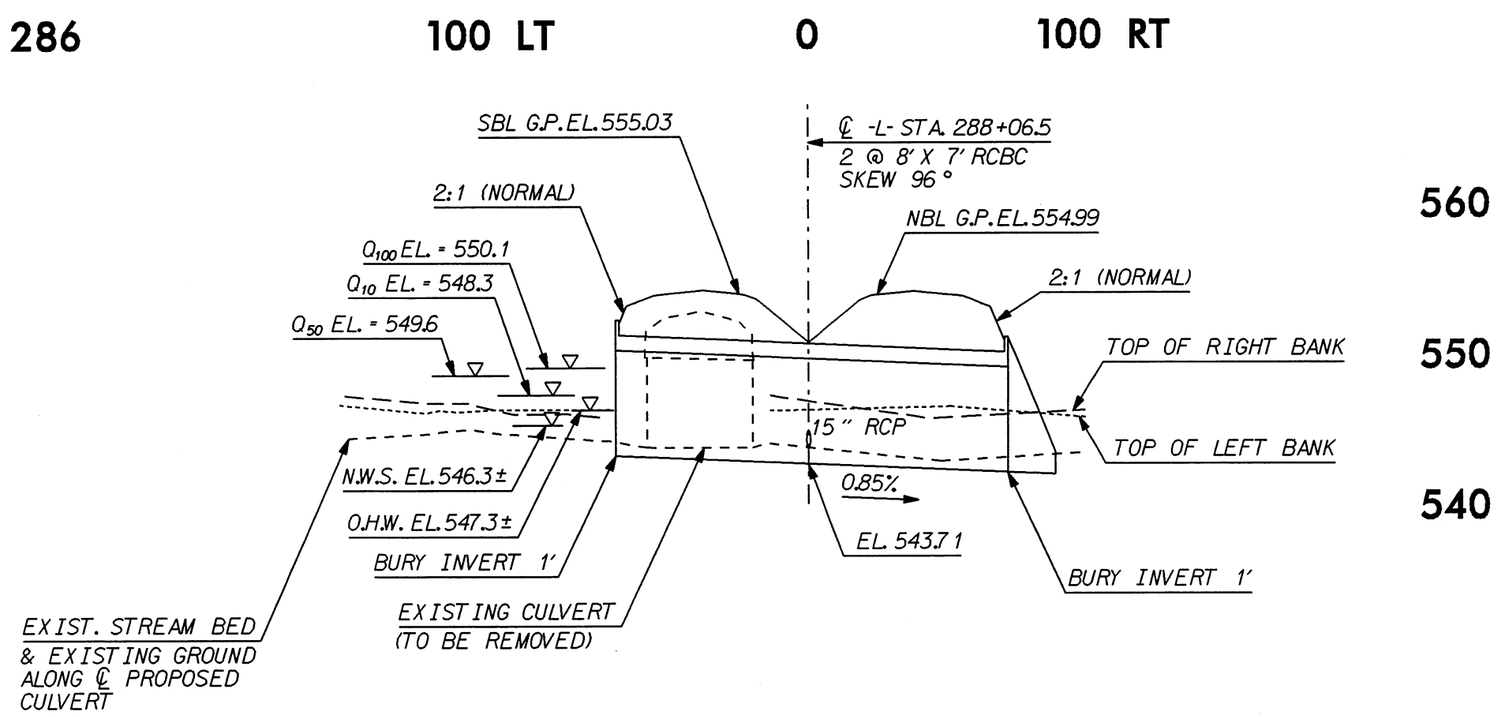
ENGLISH

SITE 14 -L- STA 288 + 06.5

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

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

Permit Drawings Sheet 40 of 66



25' 0 50'

VERTICAL SCALE: 1" : 50'

25' 0 50'

HORIZONTAL SCALE: 1" : 50'

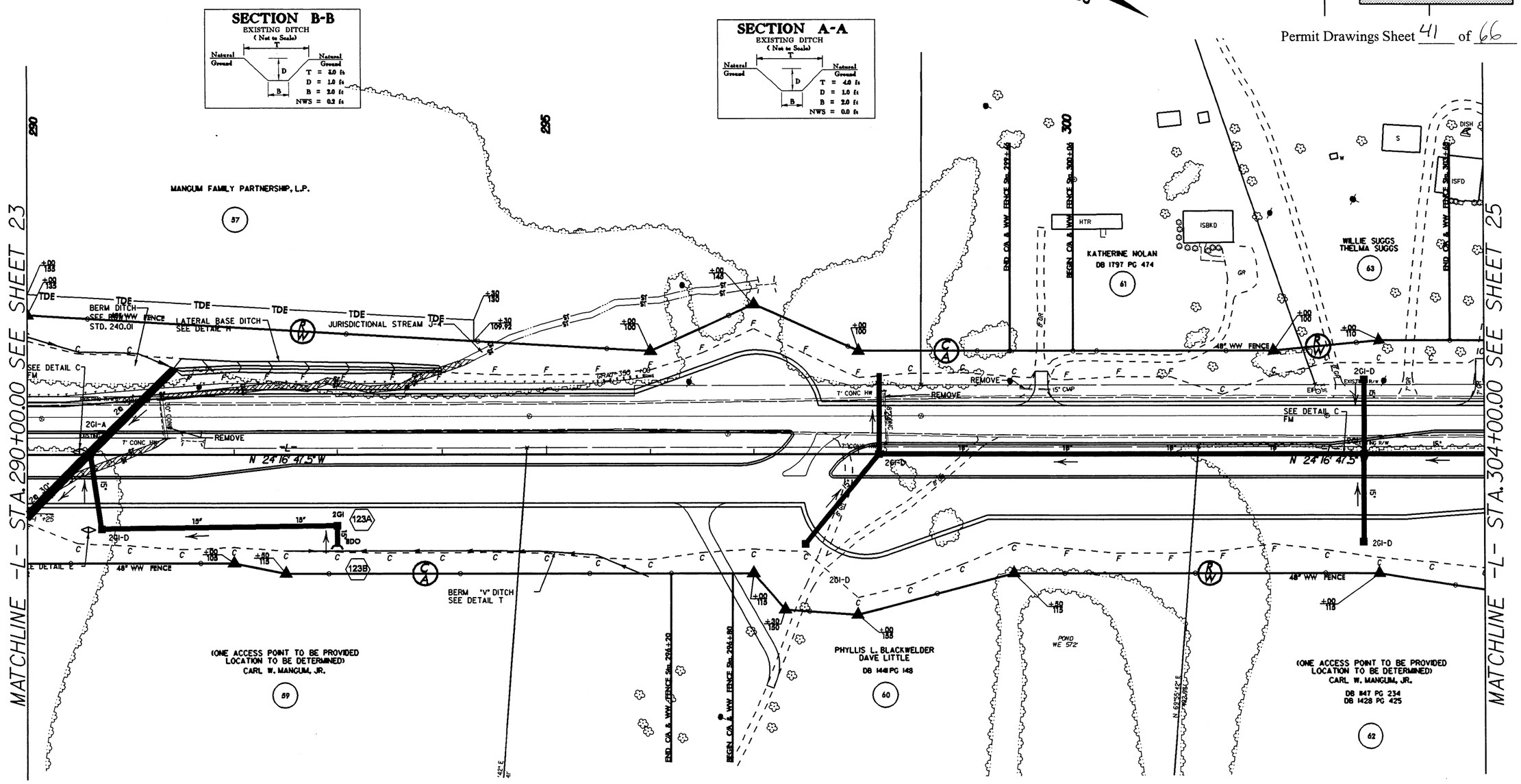
ENGLISH

SITE 15 -L- STA. 290 + 00 RT - 294 + 30 LT

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

Permit Drawings Sheet 41 of 66

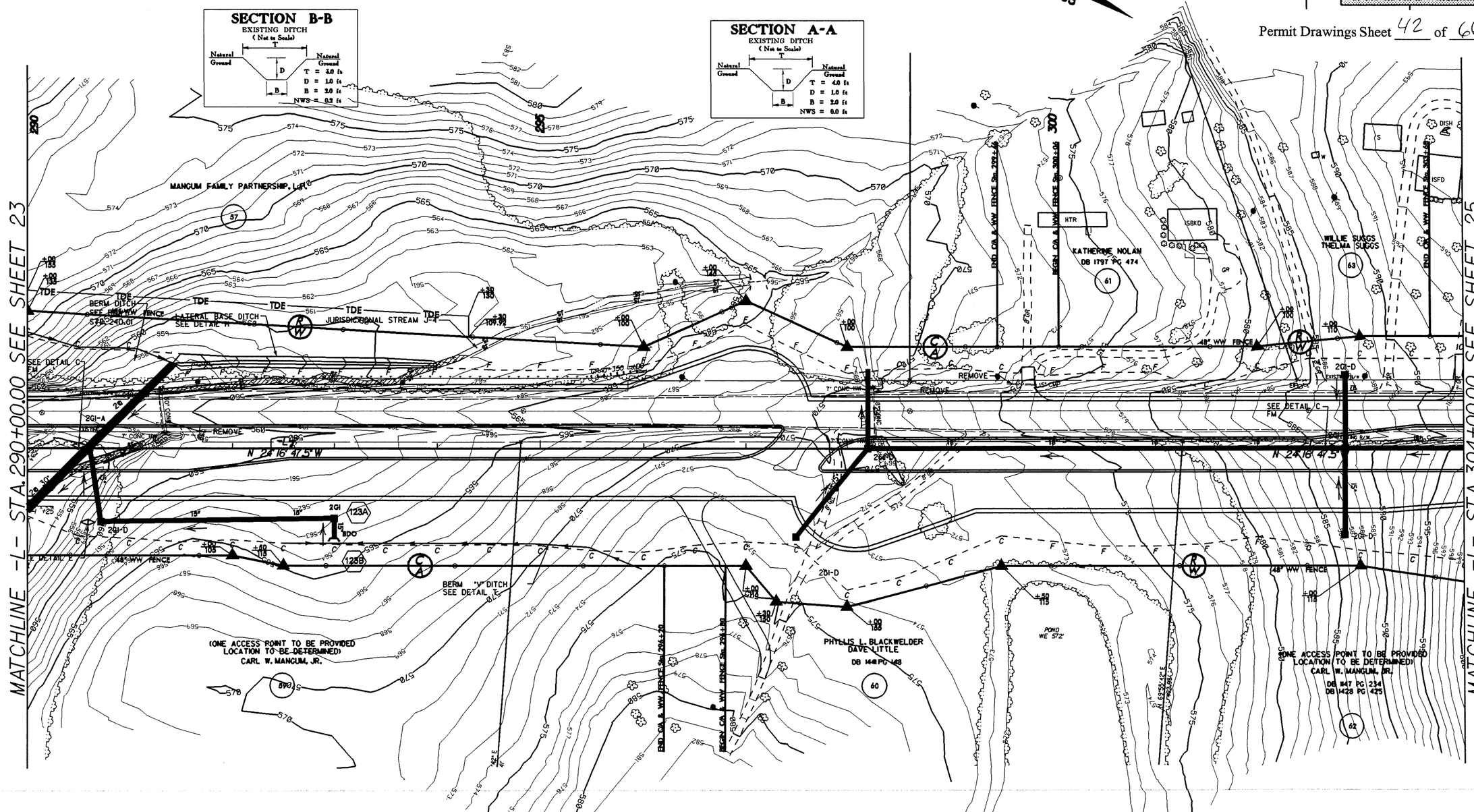


SITE 15 -L- STA. 290+00 RT - 294+30 LT

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

Permit Drawings Sheet 42 of 66

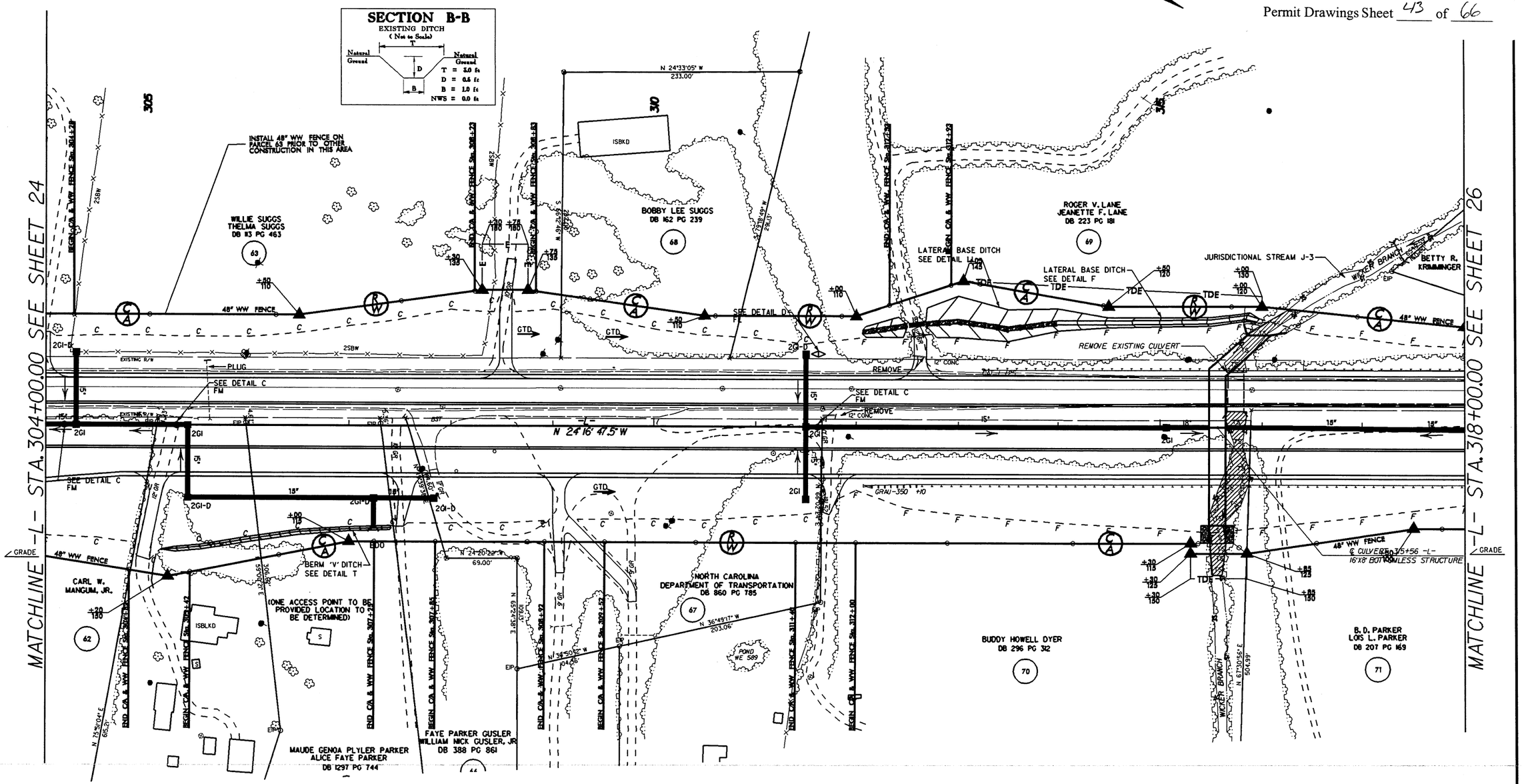


SITE 16 -L- STA. 315+56

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

Permit Drawings Sheet 43 of 66

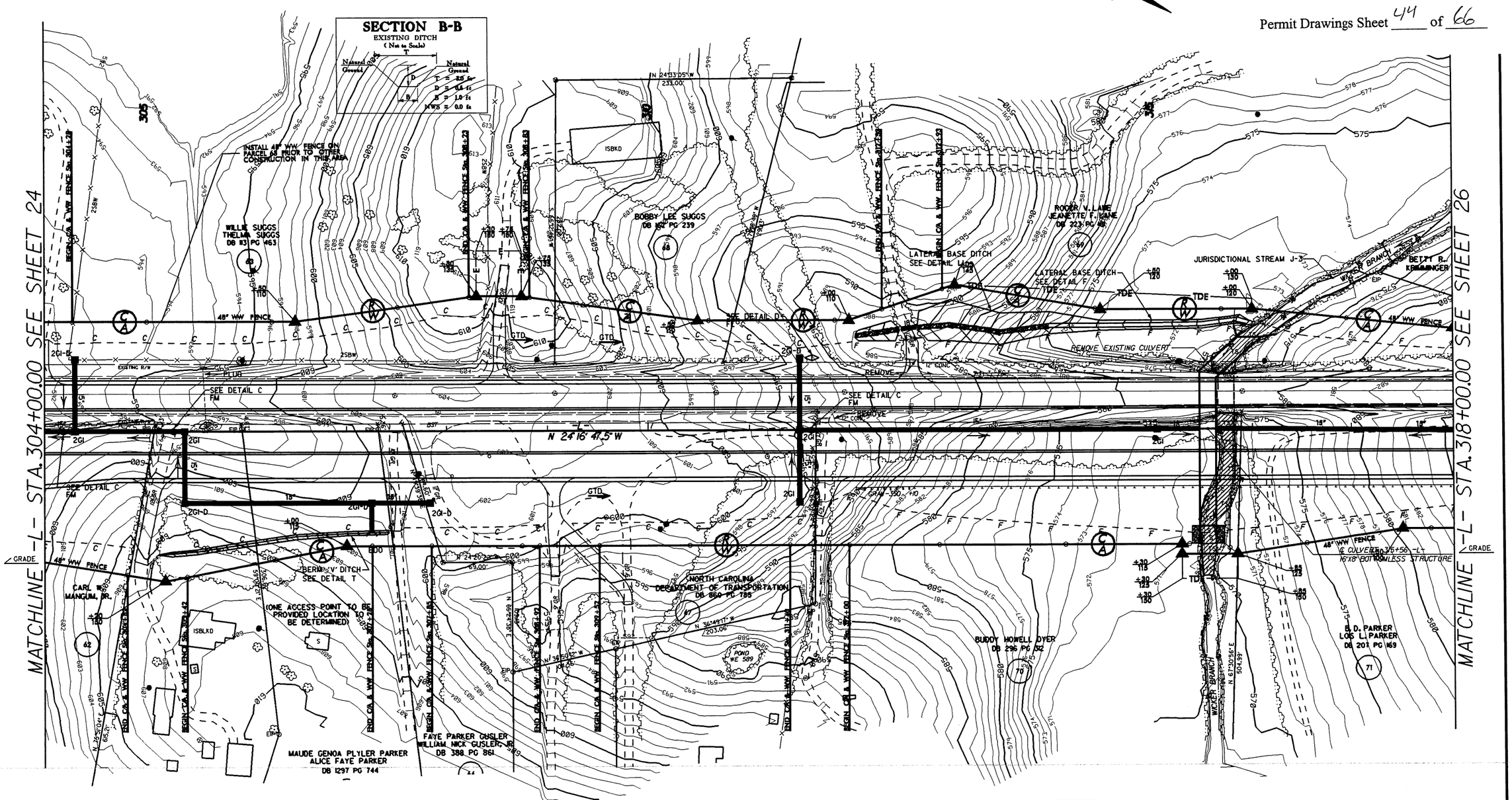


SITE 16 -L- STA. 315 + 56

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

Permit Drawings Sheet 44 of 66



SECTION A-A
EXISTING DITCH
(Not to Scale)

T =	12.0 ft
D =	4.0 ft
B =	11.0 ft
NWS =	1.5 ft

FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

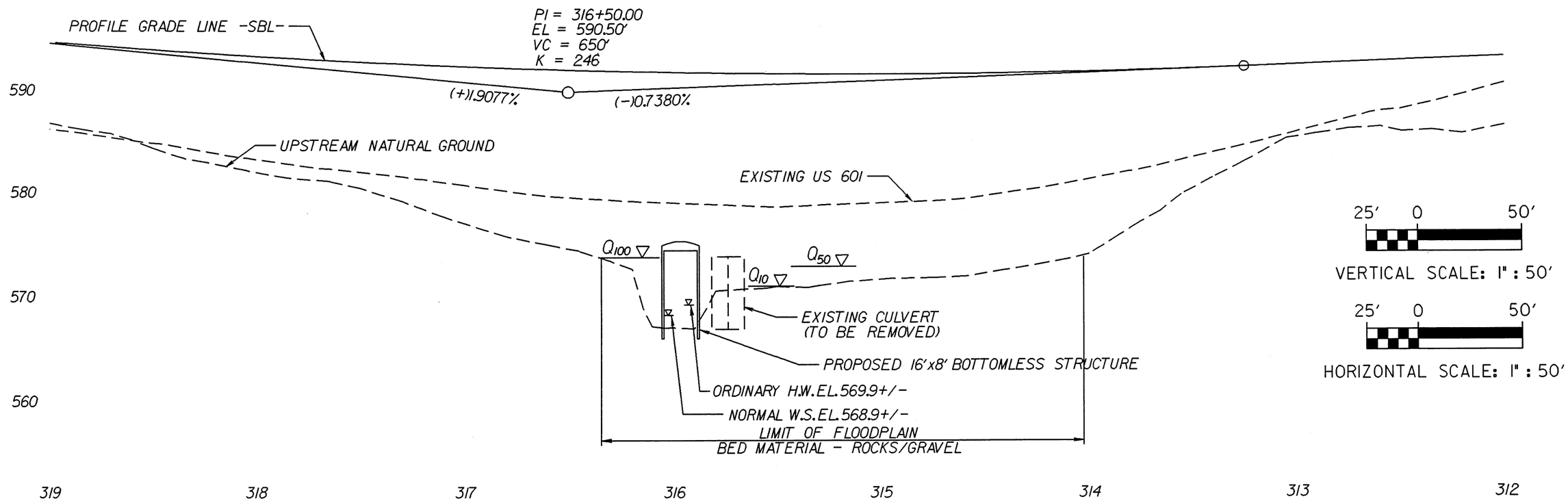
ENGLISH

SITE 16 -L- STA 315 + 56

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

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

Permit Drawings Sheet 45 of 66



SITE 16 -L- STA 315 + 56

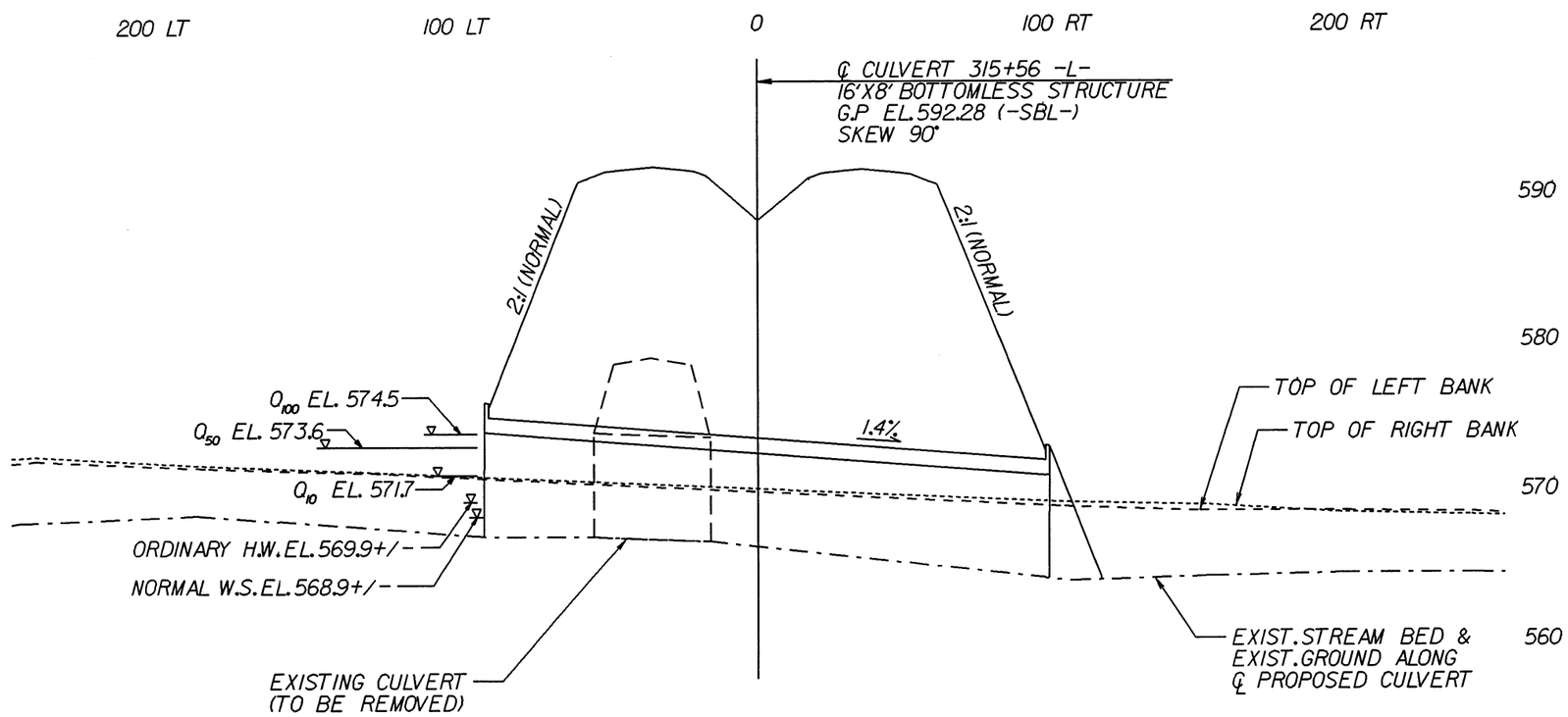
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	25B

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

Permit Drawings Sheet 46 of 66



25' 0 50'

VERTICAL SCALE: 1" : 50'

25' 0 50'

HORIZONTAL SCALE: 1" : 50'

ENGLISH

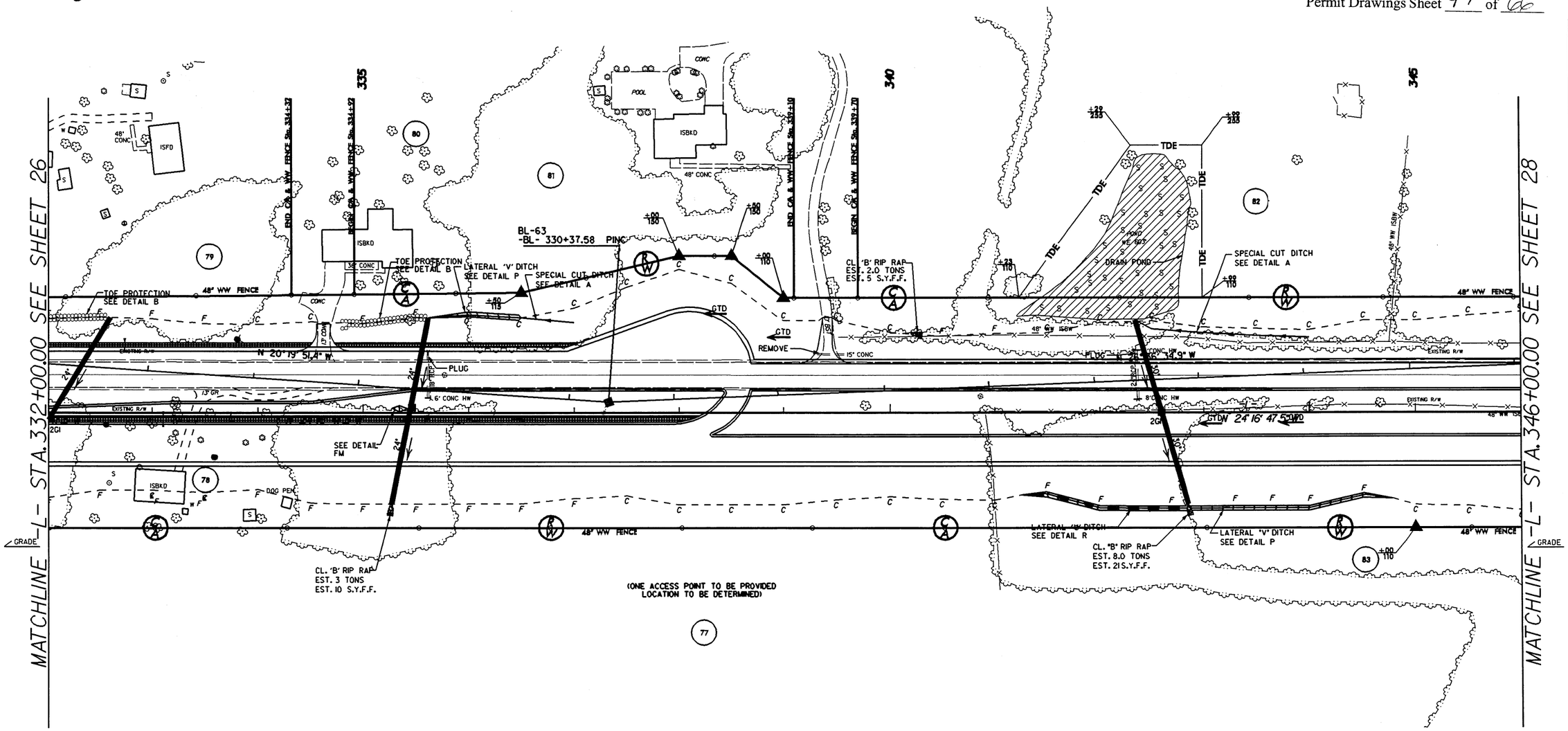
SITE 17 -L- STA. 342 + 00

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

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

19.99

Permit Drawings Sheet 47 of 66



FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

50' 0 100'

SCALE: 1" : 100'

ENGLISH

8/17/99

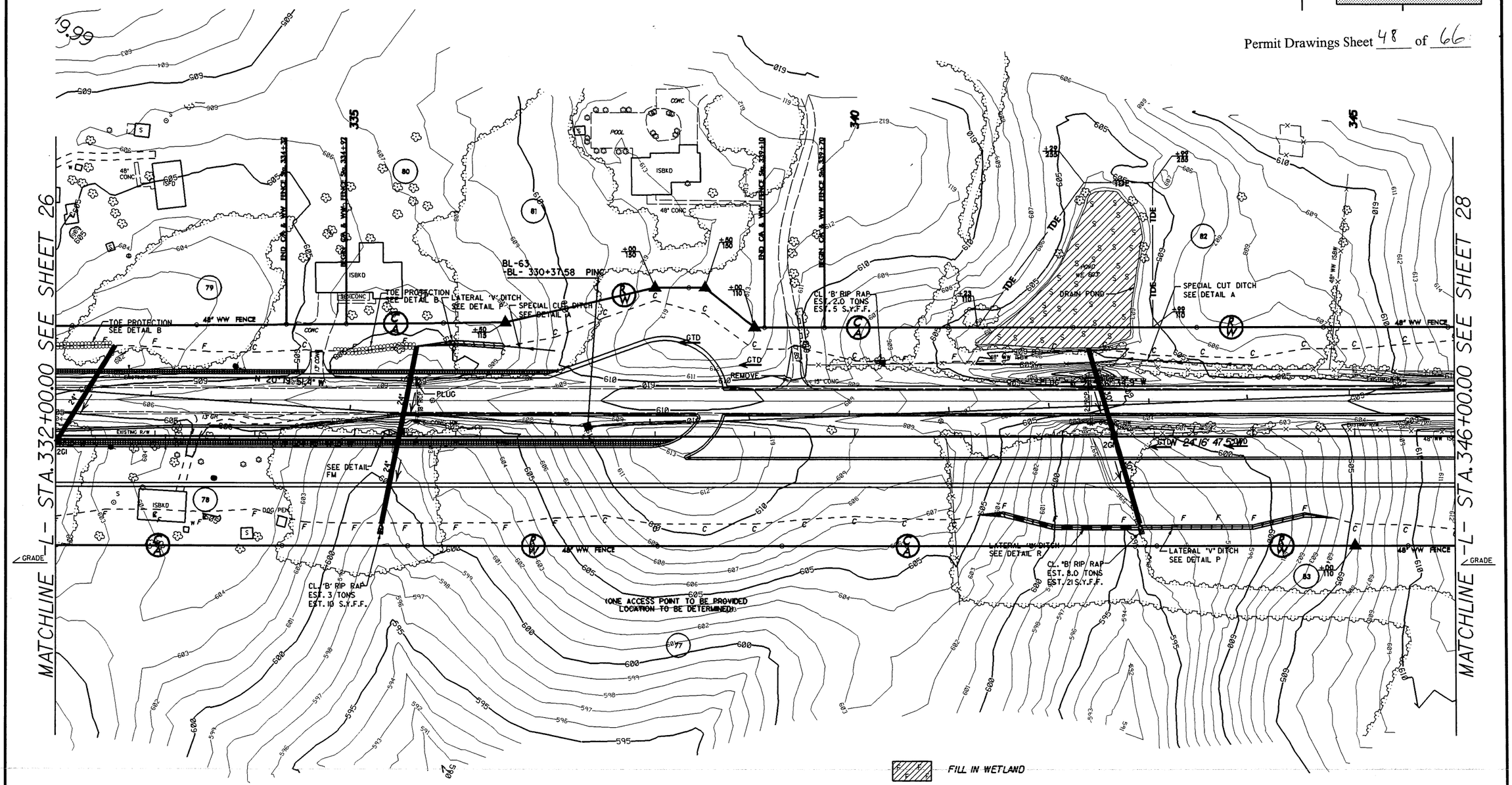
pgal AT HY221524

SITE 17 -L- STA. 342 + 00

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

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

Permit Drawings Sheet 48 of 66



8/17/99

ocal: QT HY221524

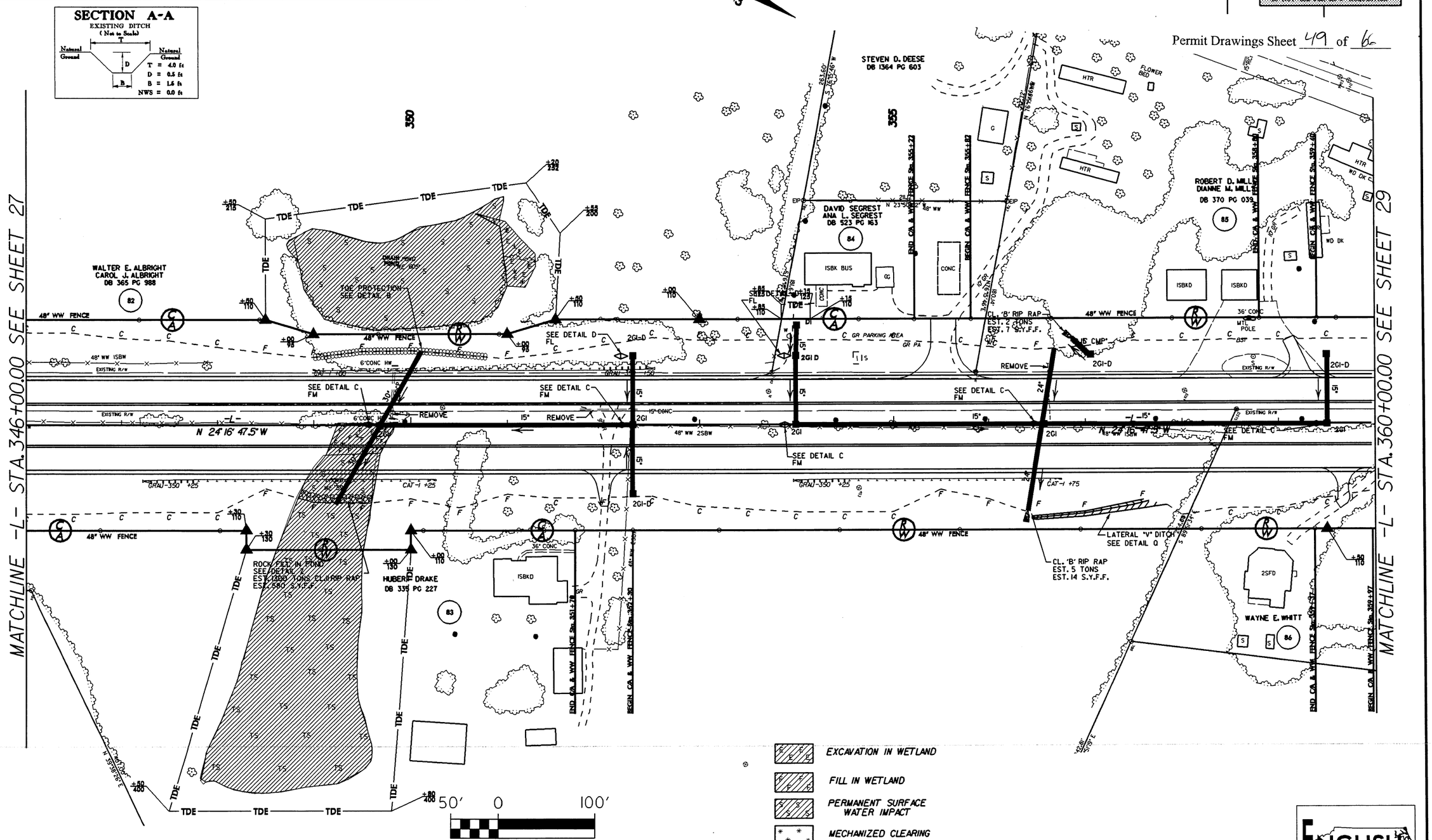
SITE 18 -L- STA. 349 + 50 RT
SITE 19 -L- STA. 349 + 50 LT

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	28

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

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

Permit Drawings Sheet 49 of 66

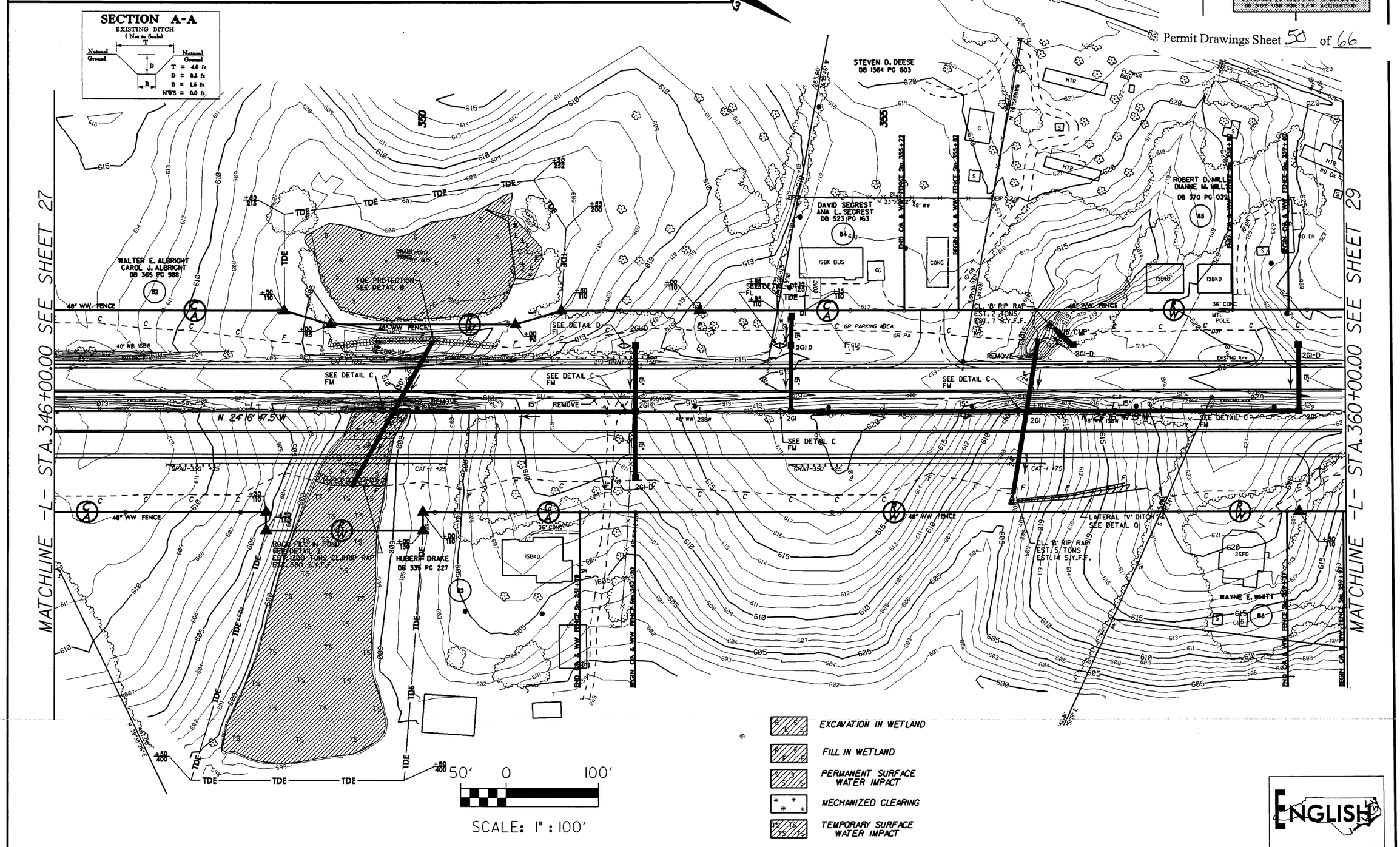


SITE 18 -L- STA. 349 + 50 RT
SITE 19 -L- STA. 349 + 50 LT

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

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

Permit Drawings Sheet 50 of 66



8/17/99

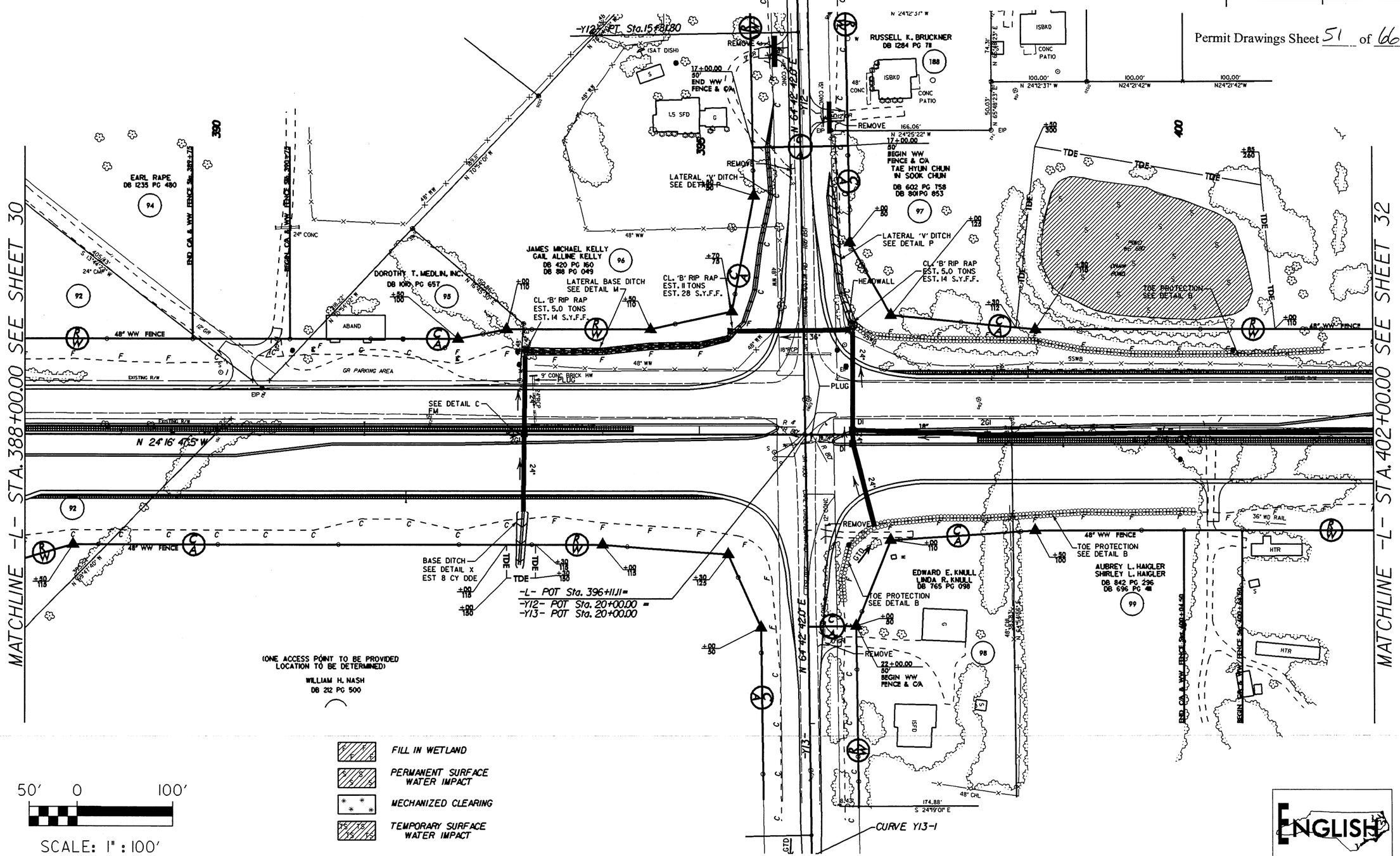
SITE 20 -L- STA. 400 + 00

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

Permit Drawings Sheet 51 of 66



8/17/99

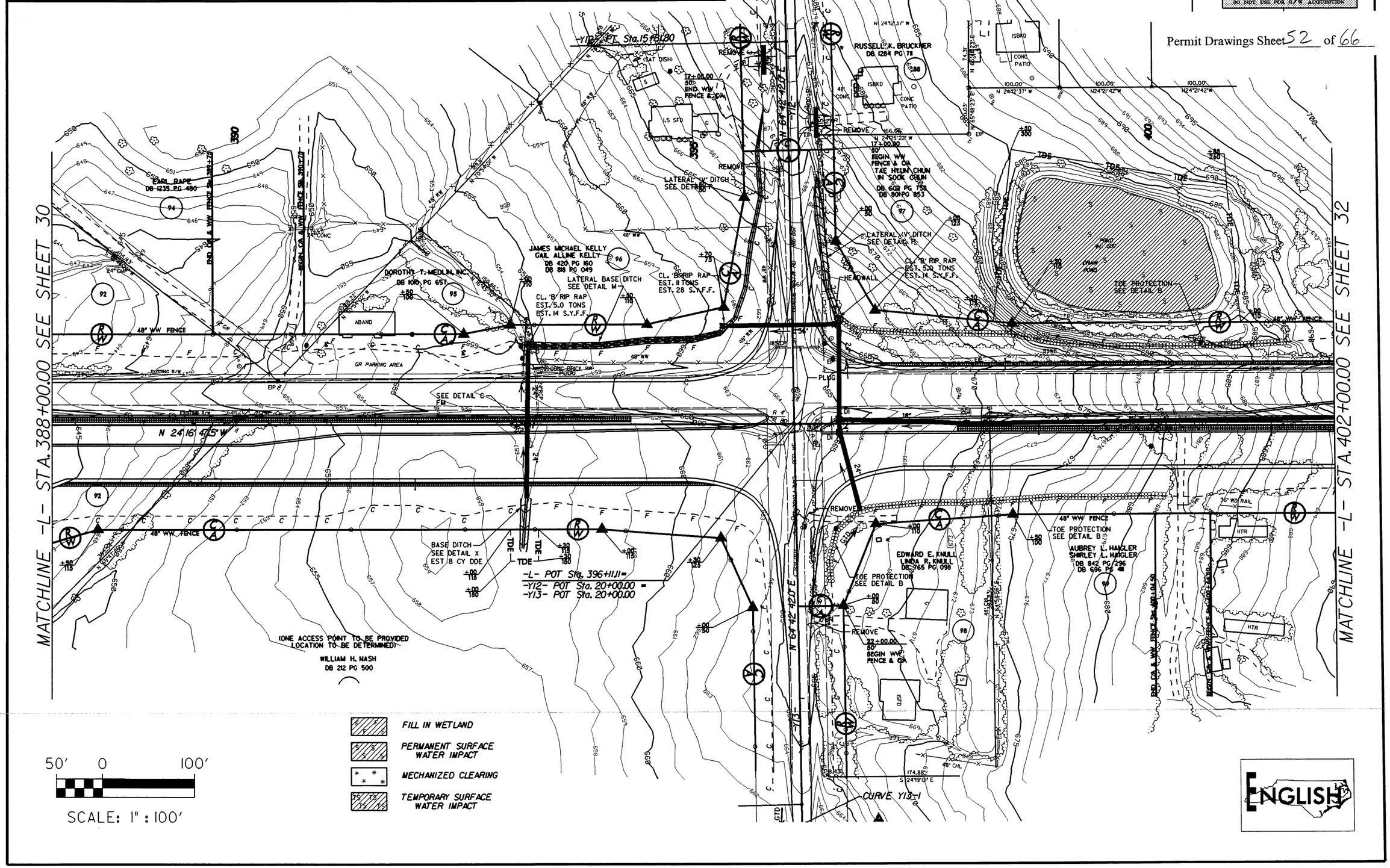
SITE 20 -L- STA. 400 + 00

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

Permit Drawings Sheet 52 of 66

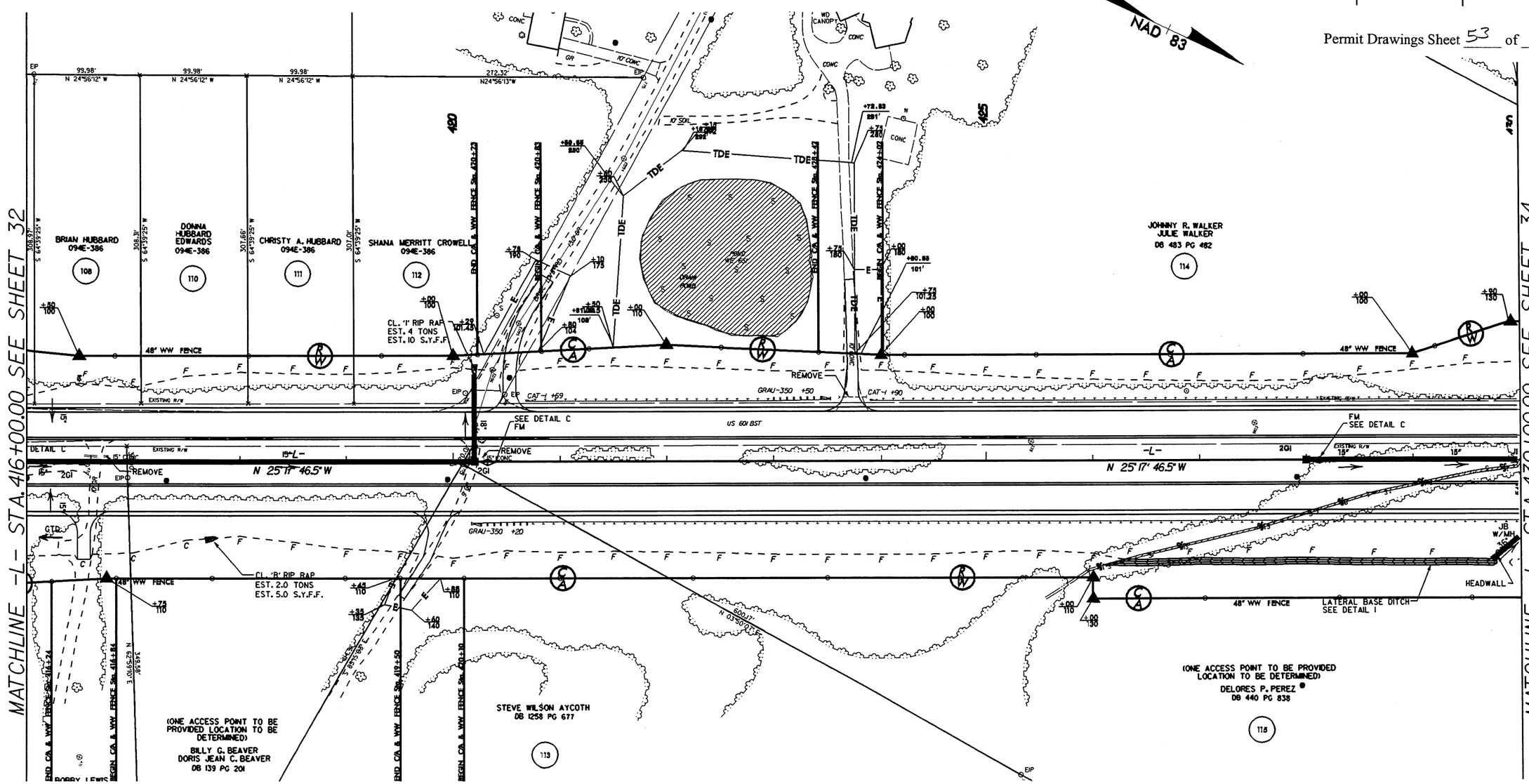


SITE 21 -L- STA. 422 + 00 LT.
SITE 22 -L- STA. 426 + 03 RT - 430 + 50 LT

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

Permit Drawings Sheet 53 of 66



50' 0 100'

SCALE: 1" : 100'

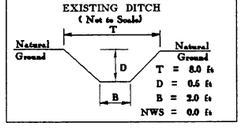
FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

SECTION A-A
EXISTING DITCH
(Not to Scale)



ENGLISH

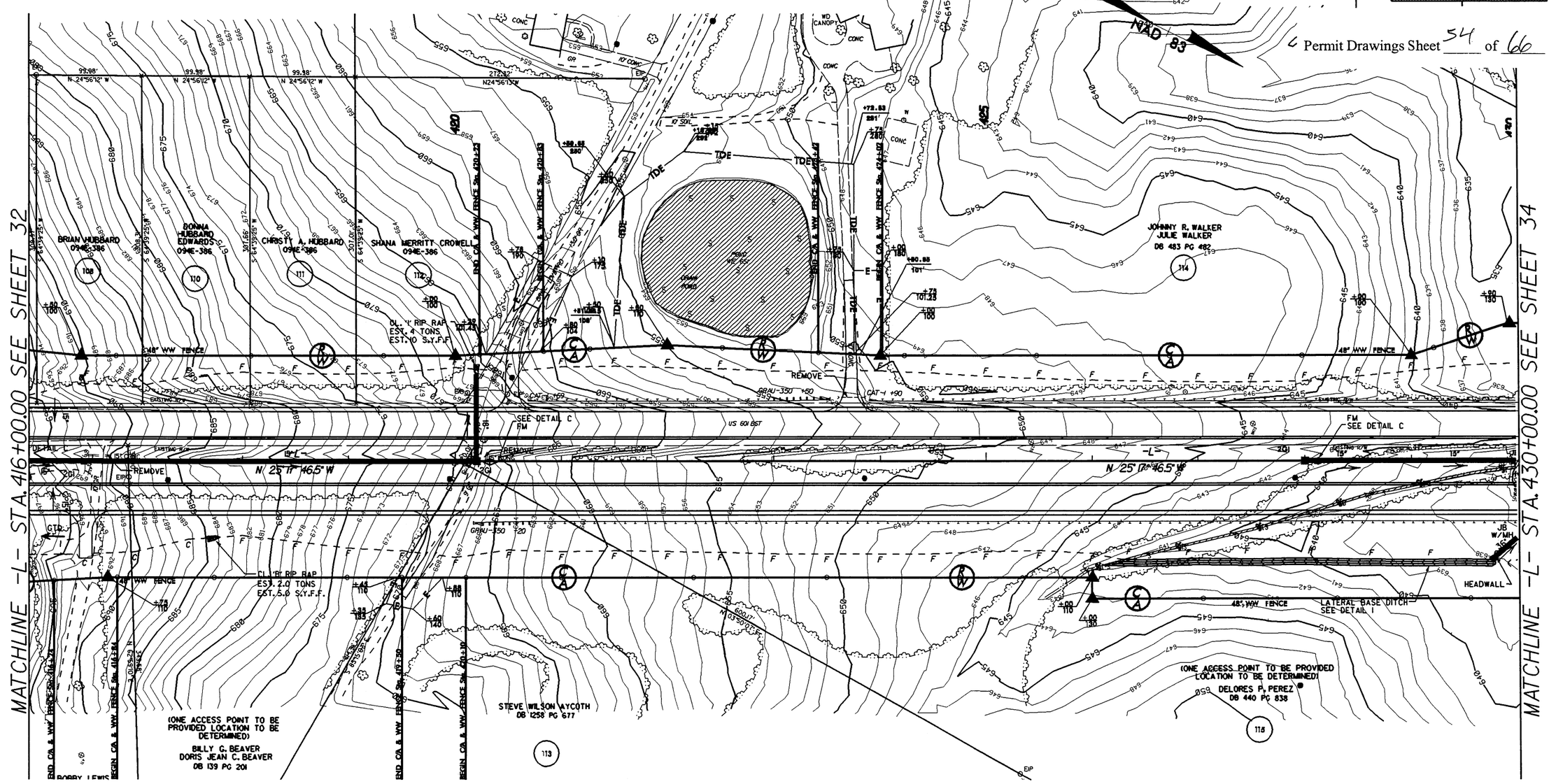
SITE 21 -L- STA. 422+00 LT.
SITE 22 -L- STA. 426+03 RT - 430+50 LT

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

Permit Drawings Sheet 54 of 66



50' 0 100'

SCALE: 1" : 100'

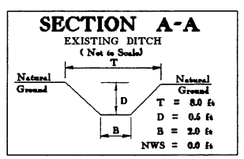
FILL IN WETLAND

PERMANENT SURFACE WATER IMPACT

MECHANIZED CLEARING

TEMPORARY SURFACE WATER IMPACT

SECTION A-A
EXISTING DITCH
(Not to Scale)



T = 8.0 ft
D = 0.6 ft
B = 2.0 ft
NWS = 0.0 ft

ENGLISH

SITE 22 -L- STA. 430 + 50

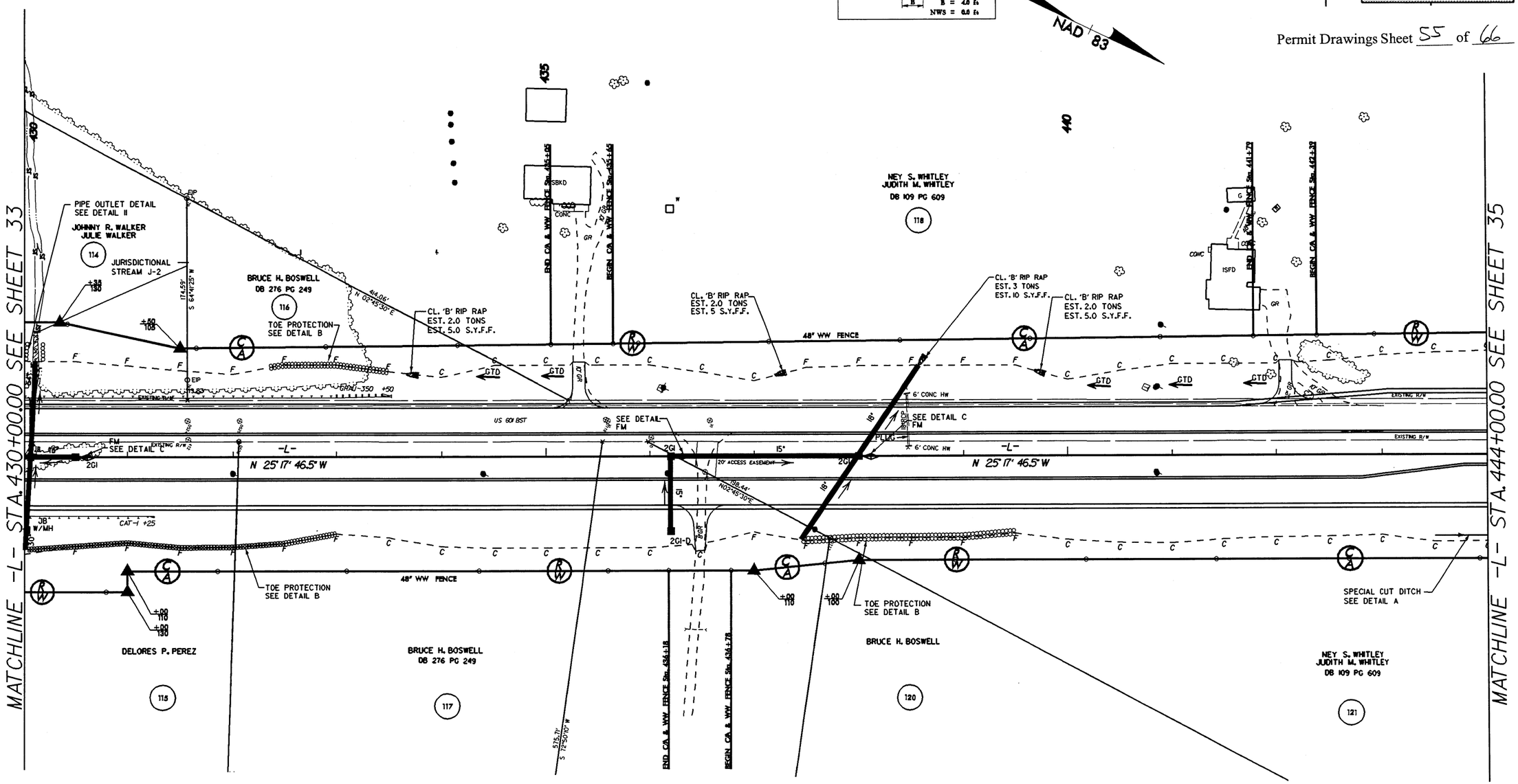
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

Permit Drawings Sheet 55 of 66

SECTION A-A
EXISTING DITCH
(Not to Scale)
Natural Ground — T — Natural Ground; D; B
T = 8.0 ft
D = 1.5 ft
B = 4.0 ft
NWS = 0.0 ft

NAD 83



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

SECTION C-C
EXISTING DITCH
(Not to Scale)
Natural Ground — T — Natural Ground; D; B
T = 8.0 ft
D = 1.0 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 = 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 22 -L- STA. 430 + 50

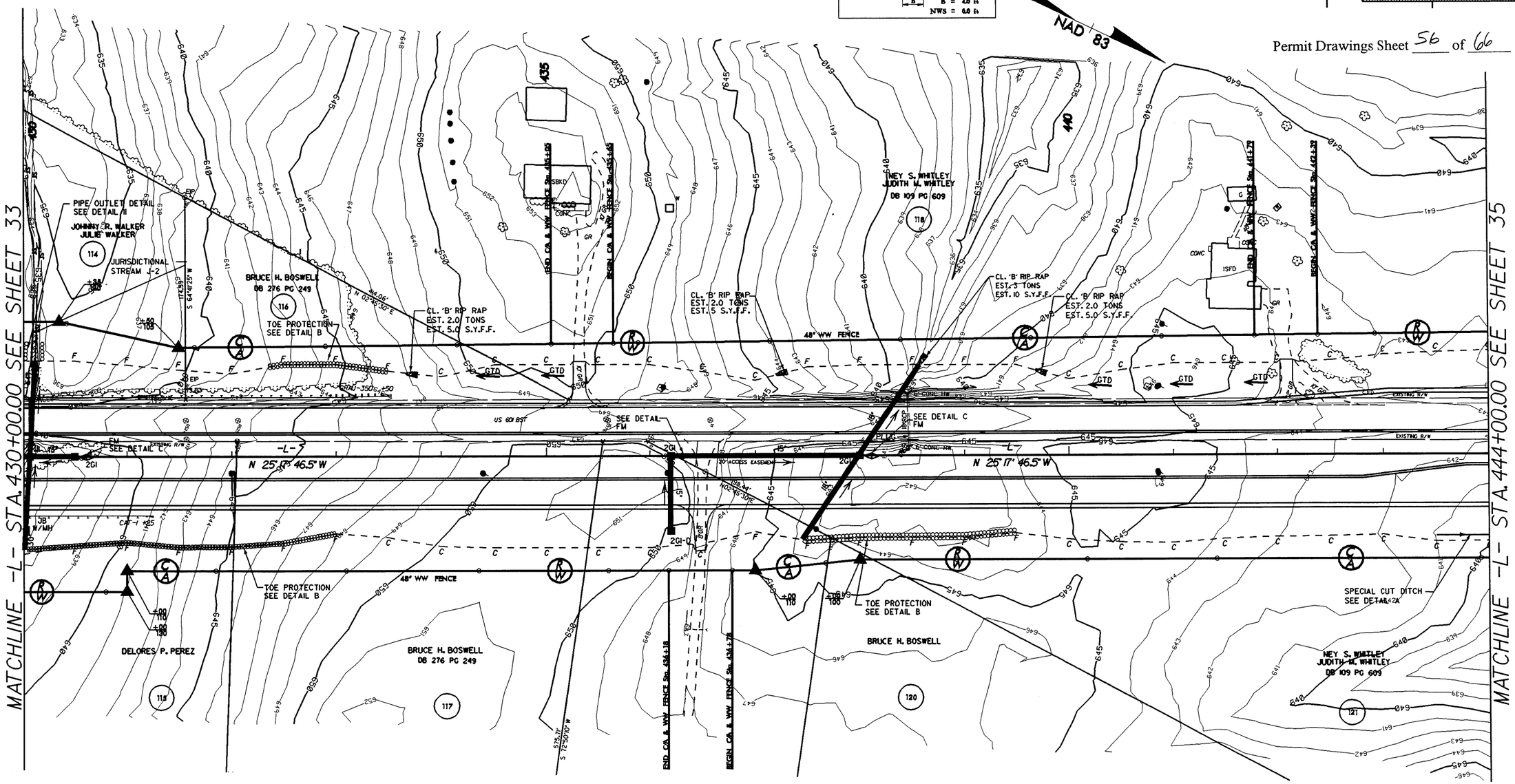
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

Permit Drawings Sheet 56 of 66

SECTION A-A
EXISTING DITCH
(Not to Scale)

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



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. 474 + 07 - STA. 476 + 41

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	37
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

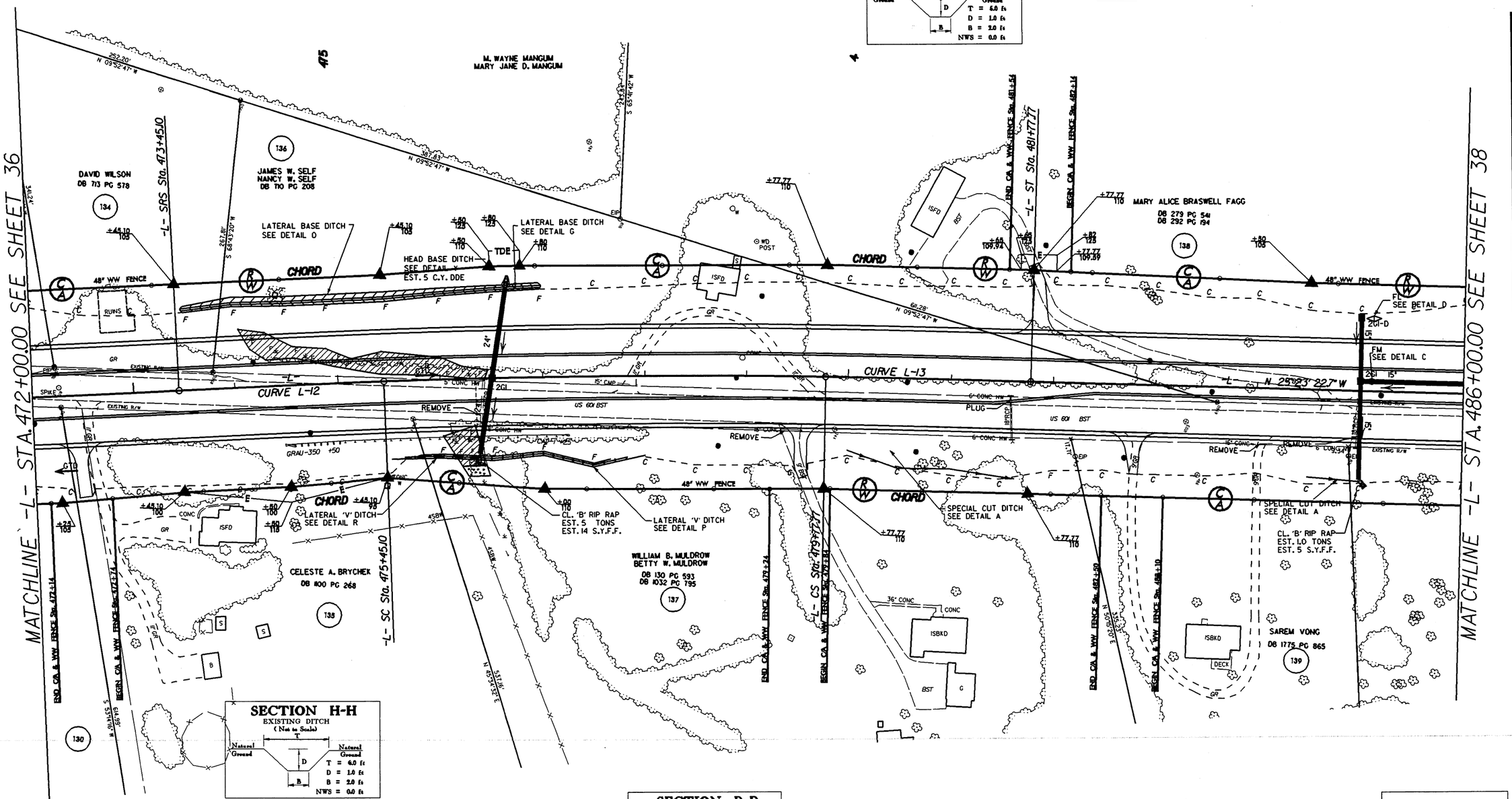
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

Permit Drawings Sheet 57 of 66

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

SECTION E-E
EXISTING DITCH
(Not to Scale)
T = 12.0 ft
D = 0.5 ft
B = 4.0 ft
NWS = 0.0 ft

SECTION B-B
EXISTING DITCH
(Not to Scale)
T = 6.0 ft
D = 1.0 ft
B = 2.0 ft
NWS = 0.0 ft



SITE 23 -L- STA. 474 + 07 - STA. 476 + 41

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	37
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

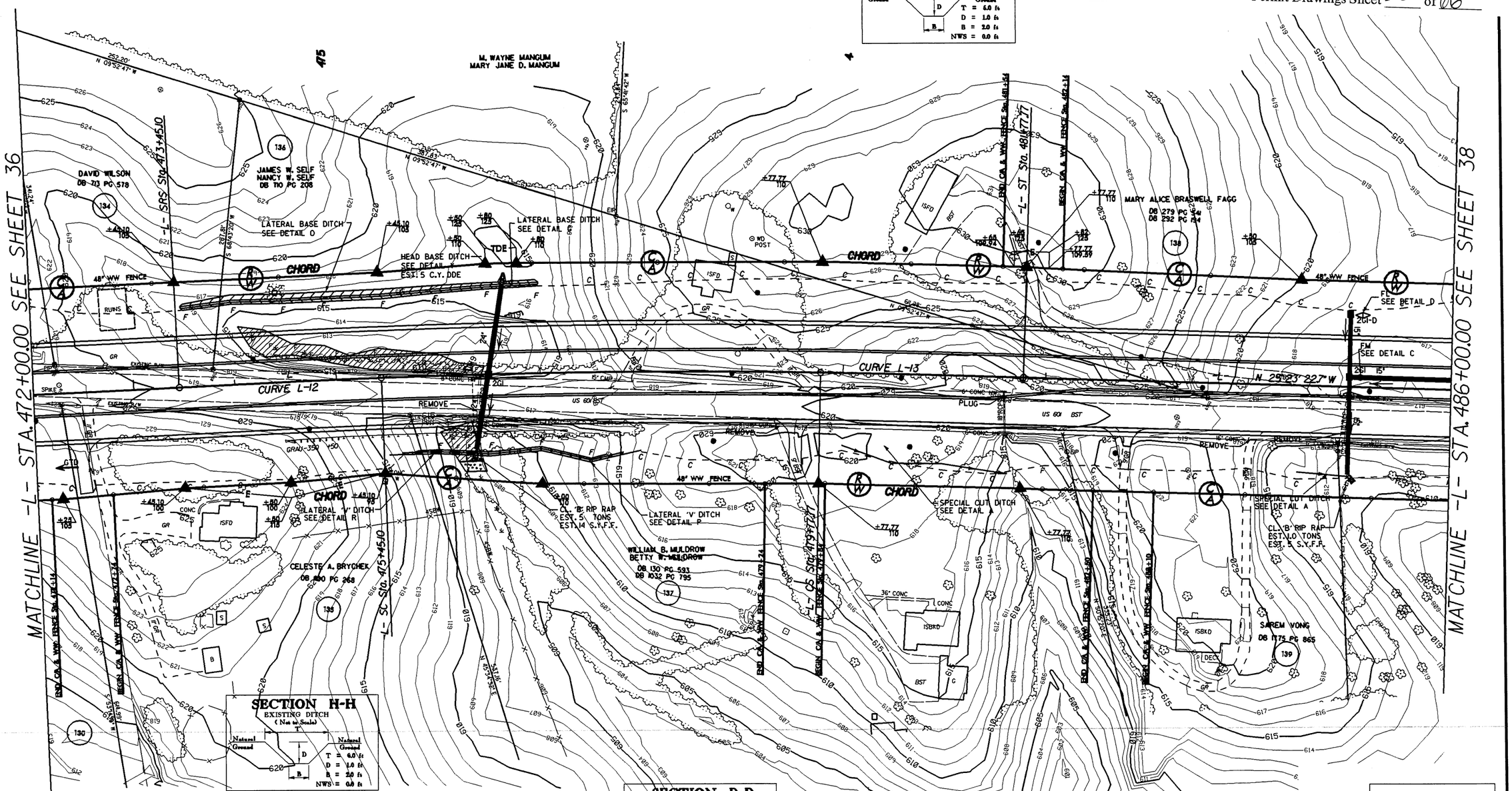
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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

Permit Drawings Sheet 58 of 66

SECTION E-E
EXISTING DITCH
(Not to Scale)
T = 12.0 ft
D = 0.5 ft
B = 4.0 ft
NWS = 0.0 ft

SECTION B-B
EXISTING DITCH
(Not to Scale)
T = 6.0 ft
D = 1.0 ft
B = 2.0 ft
NWS = 0.0 ft



SECTION H-H
EXISTING DITCH
(Not to Scale)
T = 6.0 ft
D = 1.0 ft
B = 2.0 ft
NWS = 0.0 ft

SECTION D-D
EXISTING DITCH
(Not to Scale)
T = 6.0 ft
D = 1.0 ft
B = 1.5 ft
NWS = 0.0 ft

SECTION A-A
EXISTING DITCH
(Not to Scale)
T = 2.0 ft
D = 0.5 ft
B = 1.0 ft
NWS = 0.0 ft

ENGLISH

SITE 23A -L- STA. 495 + 00

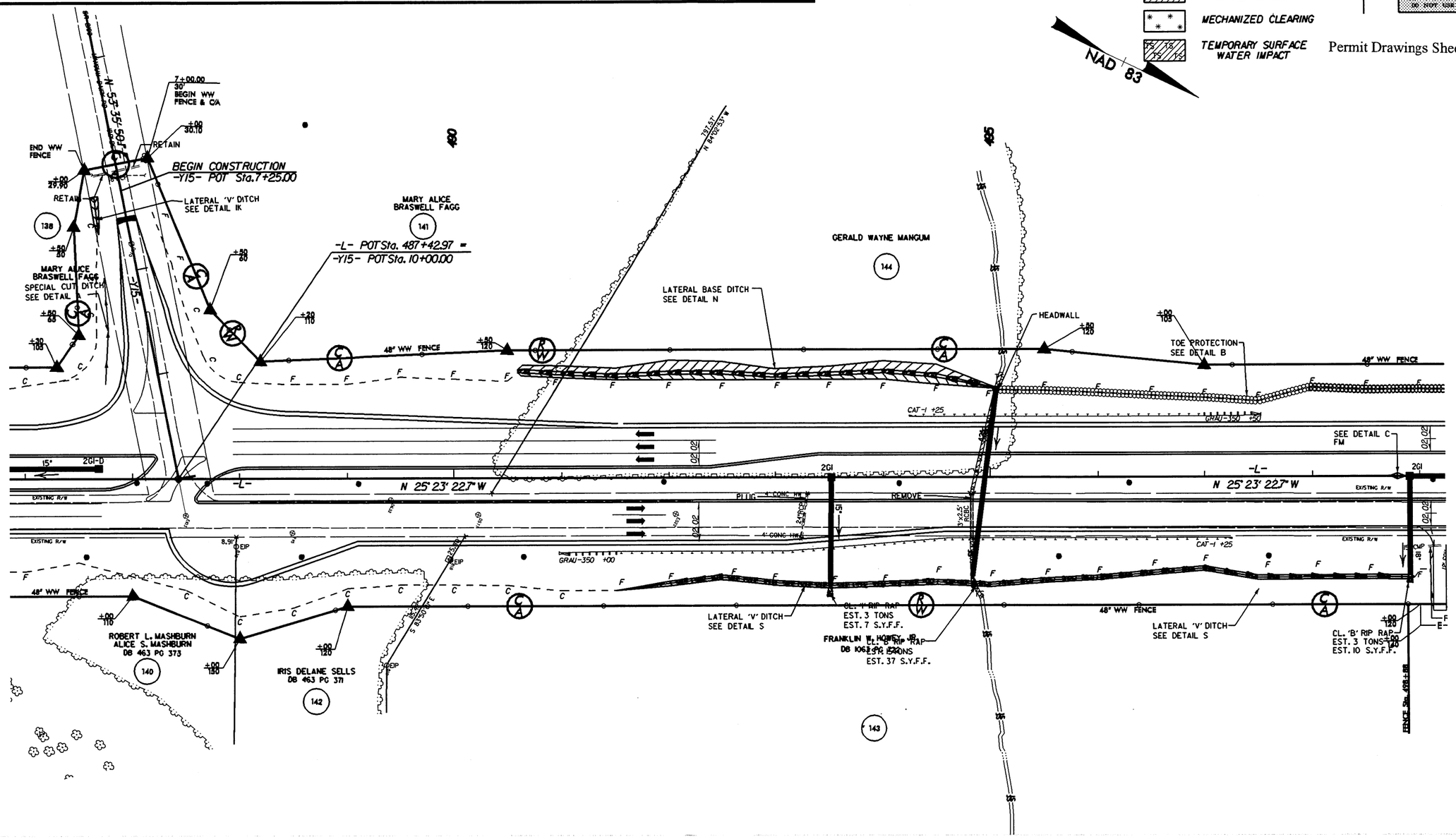
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	38
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

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

NAD 83

Permit Drawings Sheet 59 of 66



50' 0 100'

SCALE: 1" : 100'

ENGLISH

SITE 23A -L- STA. 495 + 00

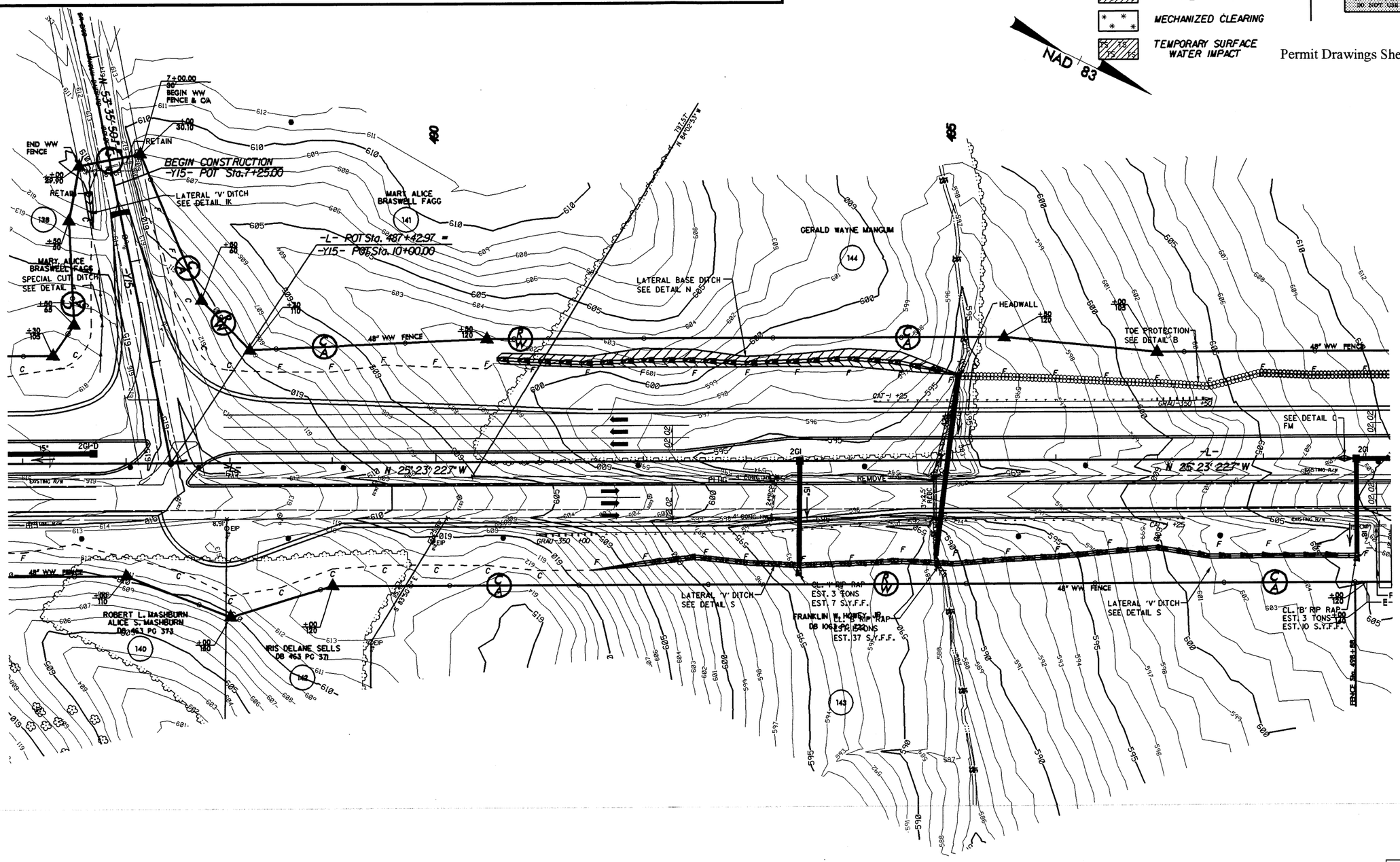
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	38
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

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

NAD 83

Permit Drawings Sheet 60 of 66



50' 0 100'

SCALE: 1" : 100'

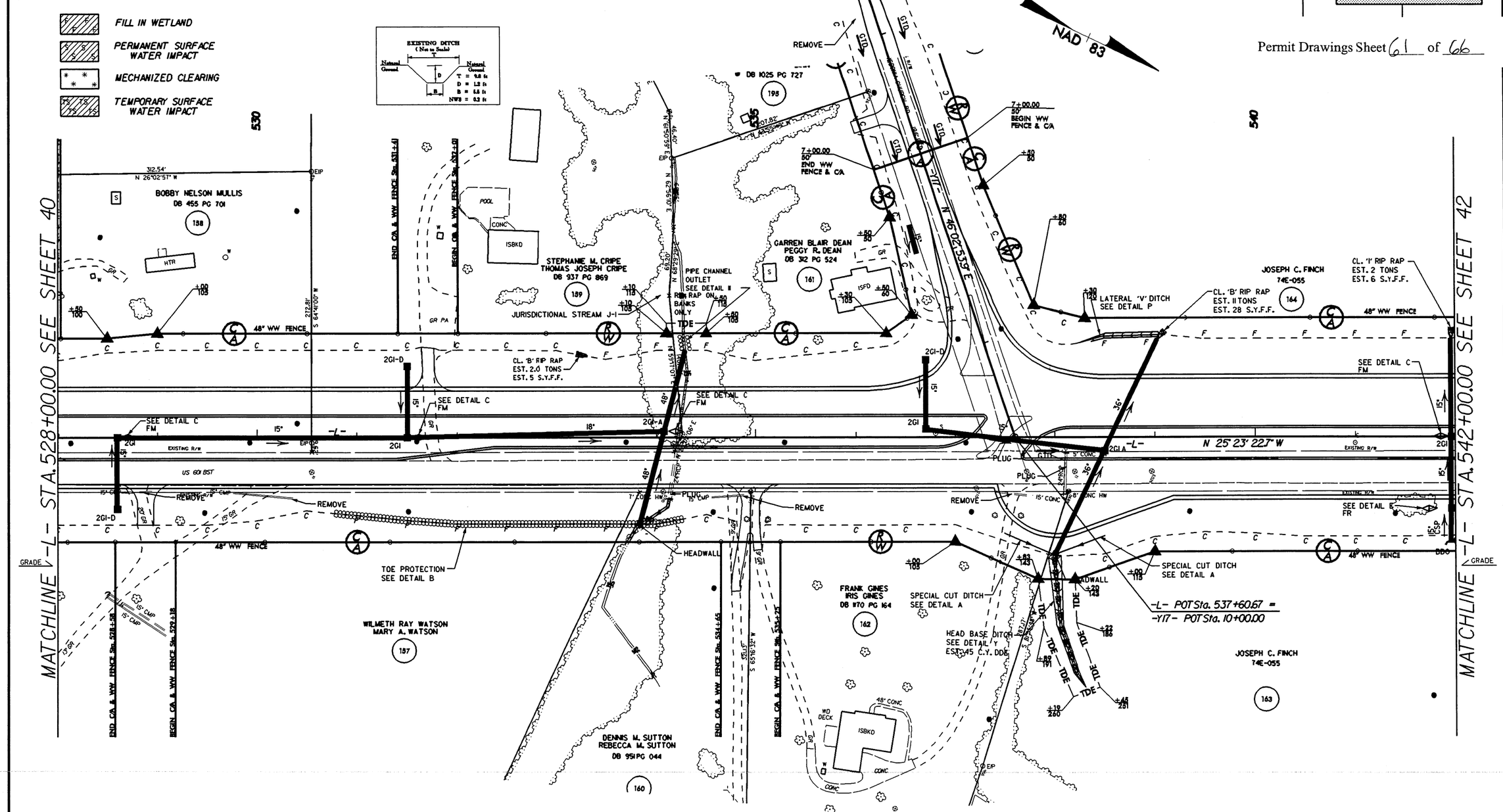
ENGLISH

SITE 24 -L- STA. 534 + 20

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

Permit Drawings Sheet 61 of 66

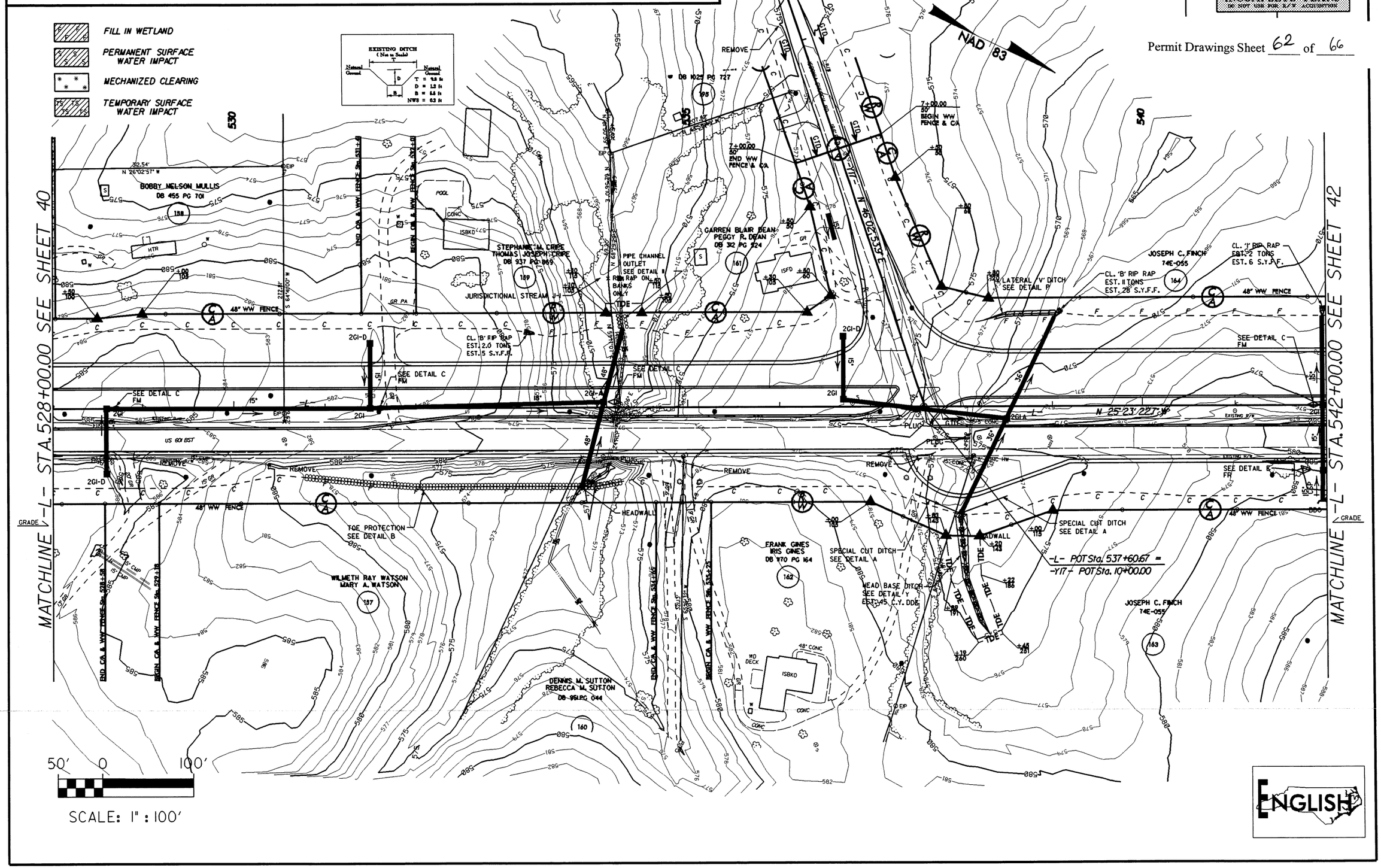


SITE 24 -L- STA. 534 + 20

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

Permit Drawings Sheet 62 of 66



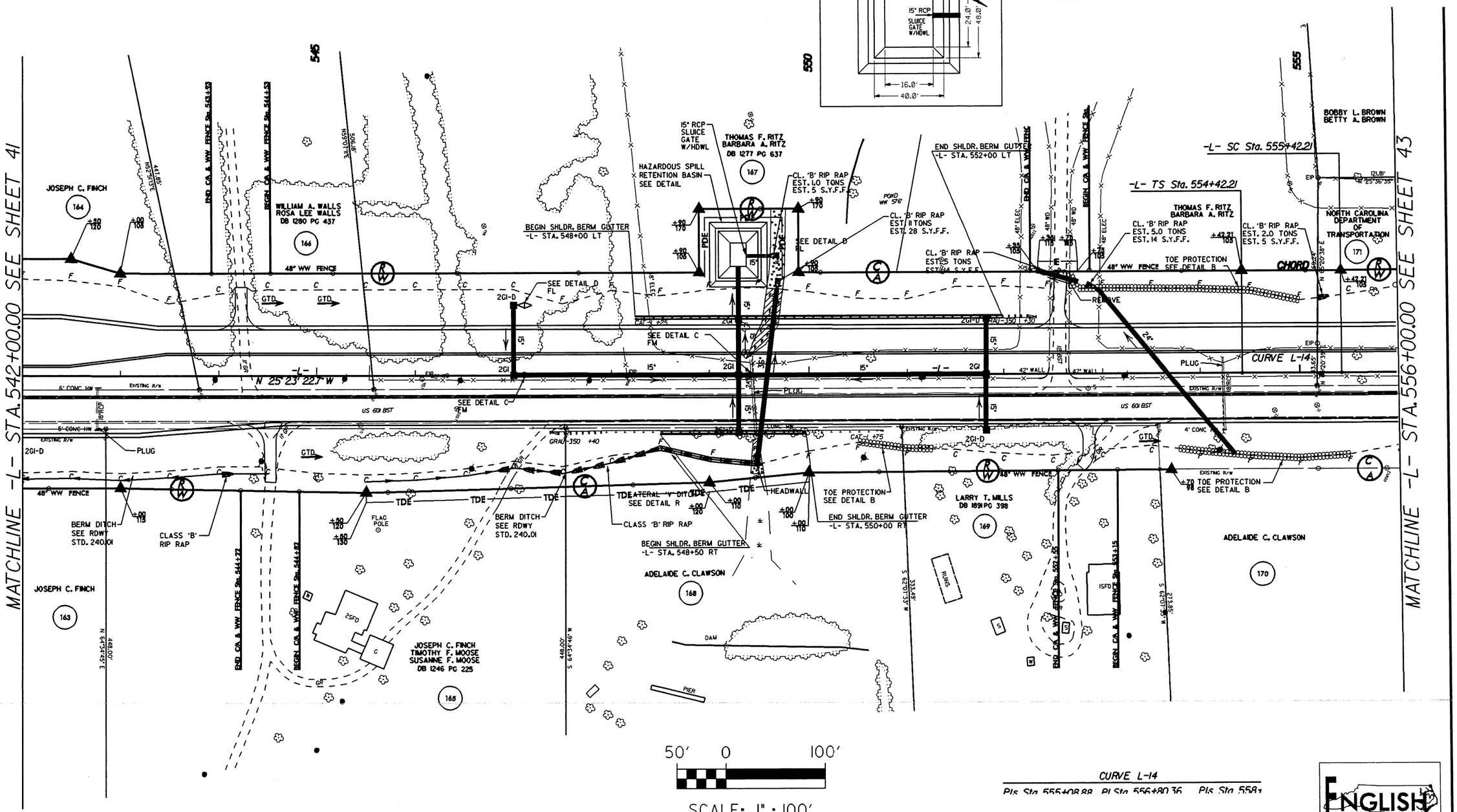
SITE 25 -L- STA. 549+60

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

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

Permit Drawings Sheet 63 of 66



CURVE L-14

PI Sta 555+08.88 PI Sta 556+80.36 PI Sta 558+

ENGLISH

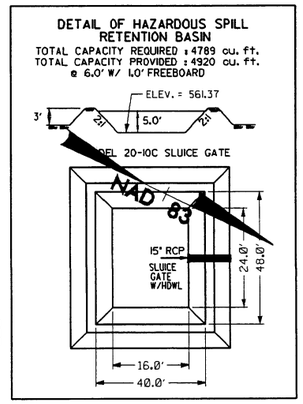
SITE 25 -L- STA. 549+60

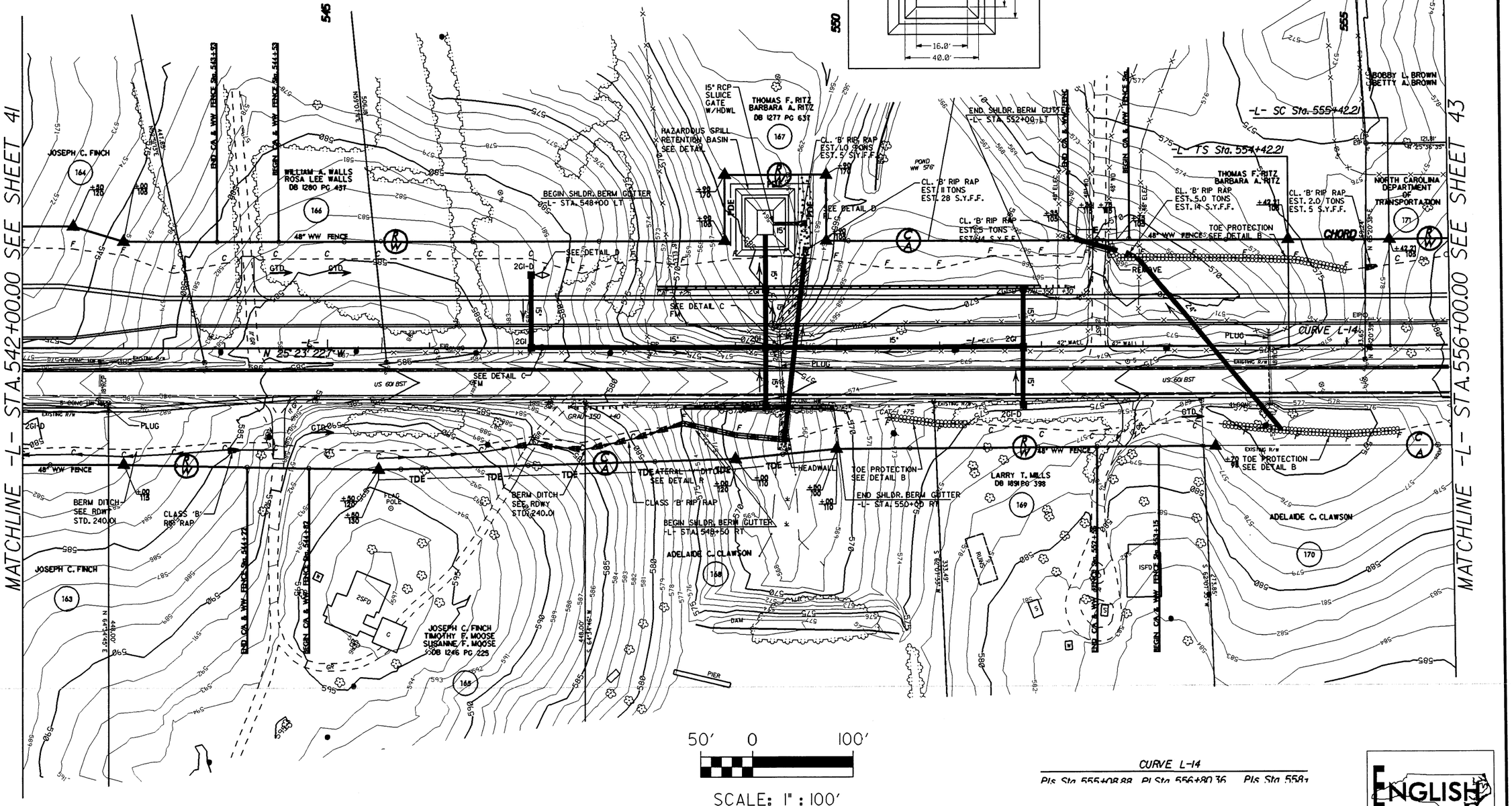
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	42
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

Permit Drawings Sheet 64 of 66

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





CURVE L-14

PIs Sta 555+08.88 PI Sta 556+80.36 PIs Sta 558+

ENGLISH

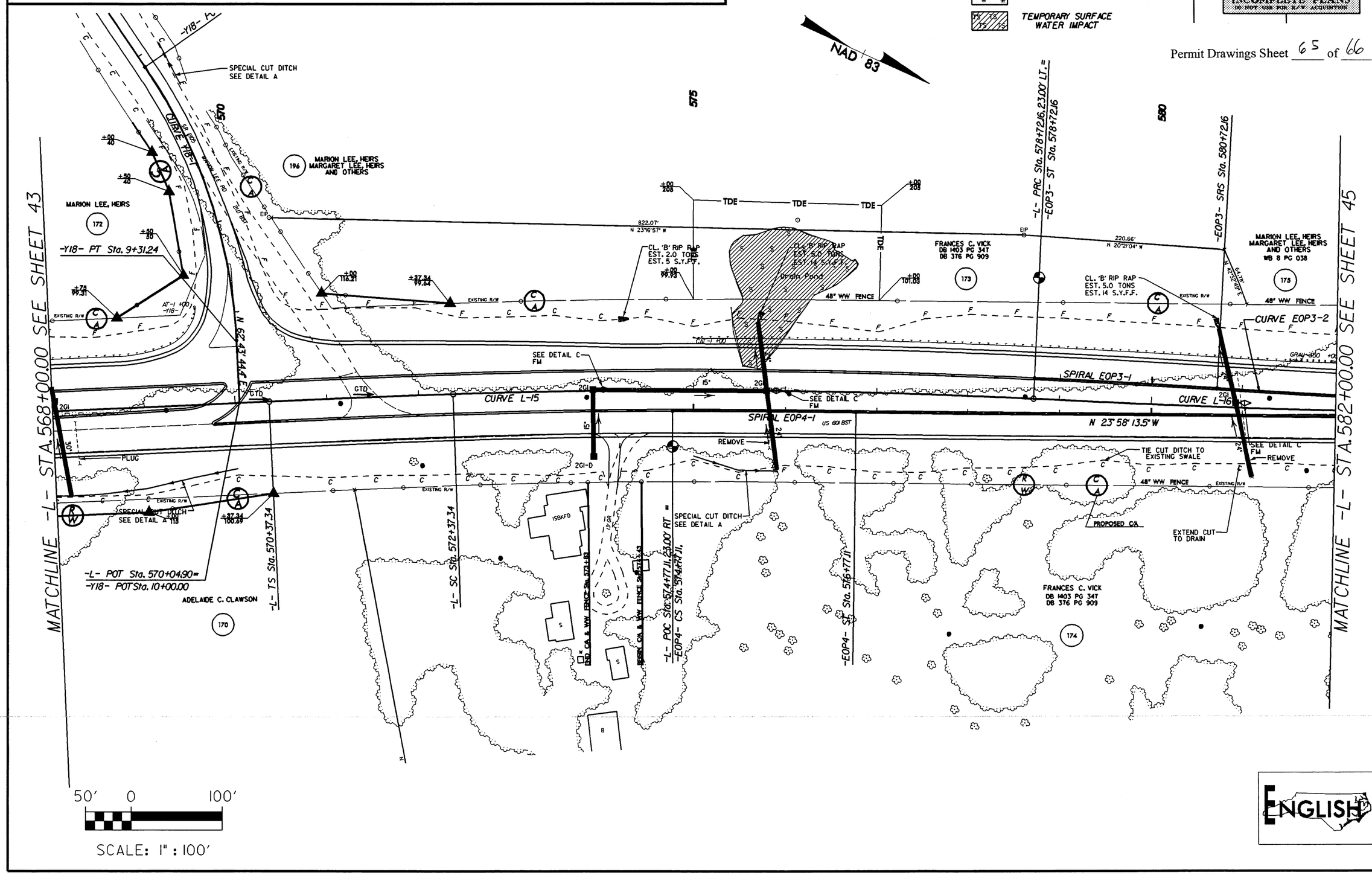
SITE 26 -L- STA. 575 + 85

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

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

Permit Drawings Sheet 65 of 66

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



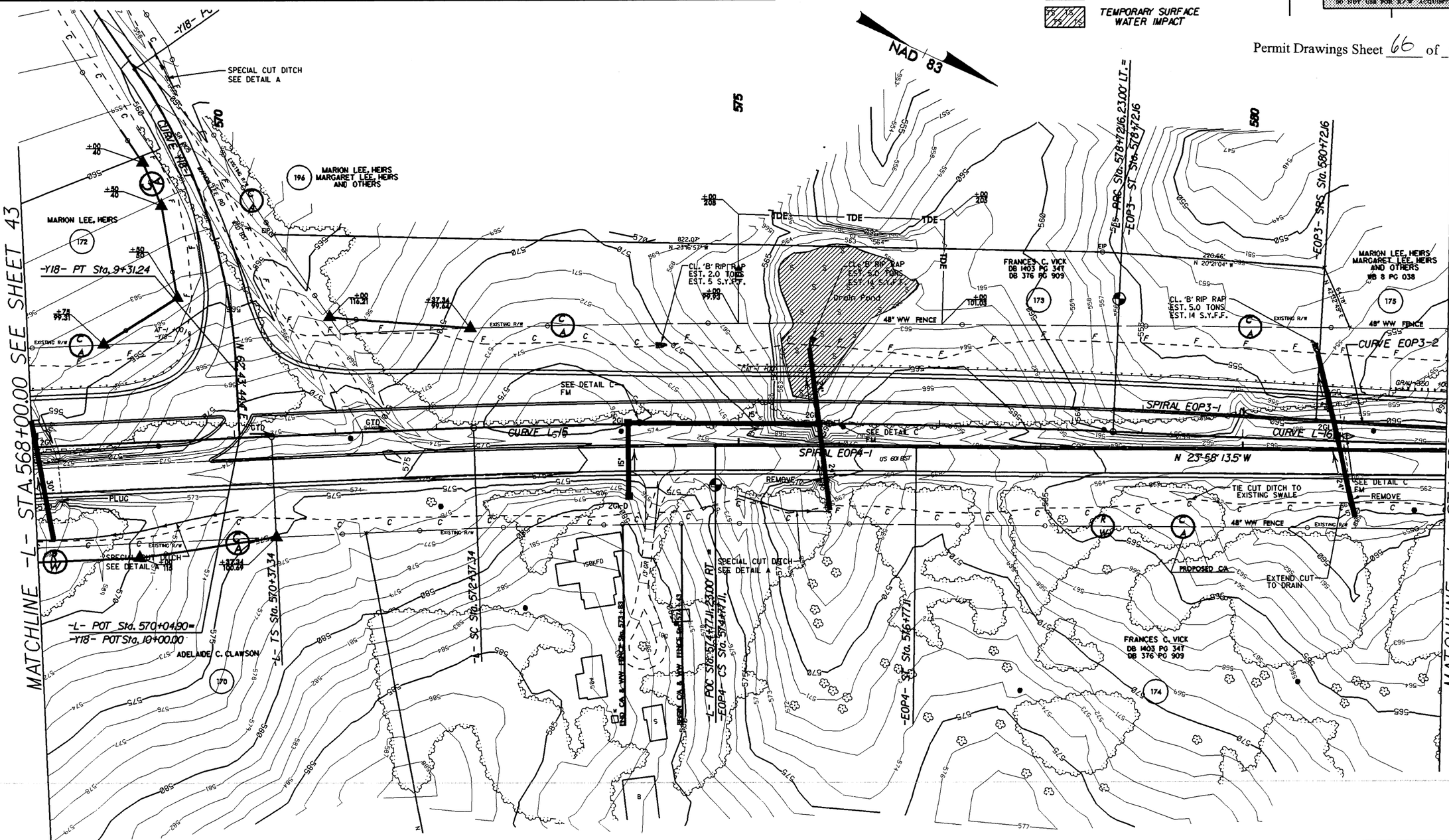
SITE 26 -L- STA. 575 + 85

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

Permit Drawings Sheet 66 of 66

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



ENGLISH

09/08/99

CONTRACT: TIP PROJECT: R-2616

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UNION COUNTY

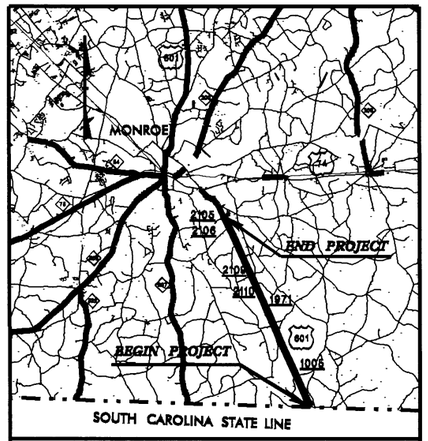
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2616	1	

W.B.S. NO.	F.A. PROJ. NO.	DESCRIPTION
34485.1.2	STP-NHS-601(4)	P.E.
34485.2.4	STP-601(18)	R/W, Utilities

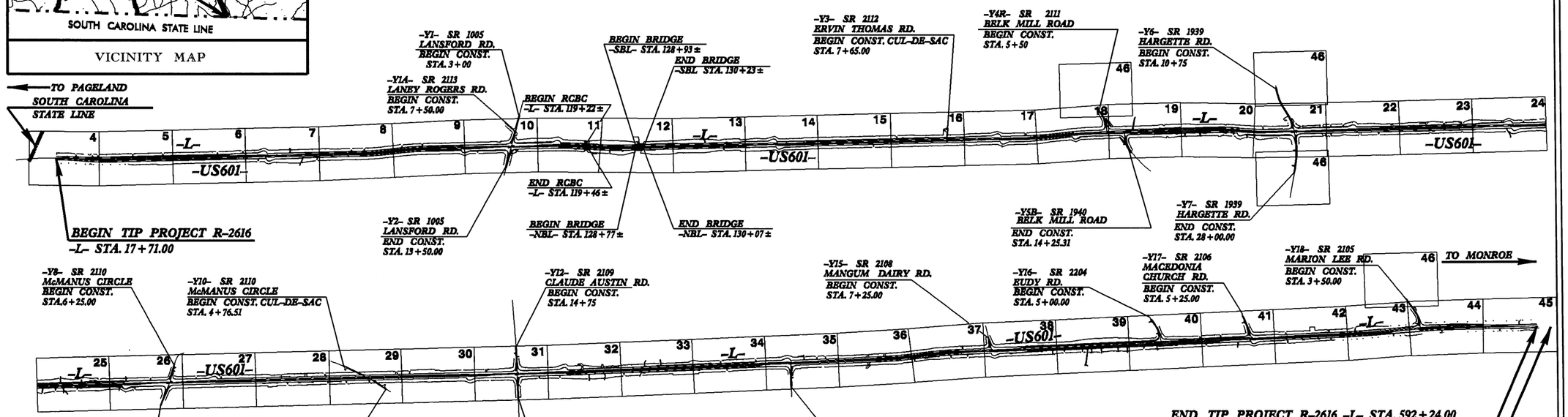
LOCATION: US 601 FROM NORTH OF THE SOUTH CAROLINA STATE LINE TO NORTH OF SR 2105 (MARION LEE RD.)

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

NAD 83 NC GRID



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

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

NCDOT CONTACT: Doug Taylor, PE
ROADWAY DESIGN UNIT - ENGINEERING COORDINATION

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

RIGHT OF WAY DATE: October 3, 2005

LETTING DATE: June 20, 2006

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 OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
P.E.
STATE HIGHWAY DESIGN ENGINEER

03-MAY-2006 08:07
s:\roadway\proj\2616_rdy_tsh.dgn
$$$$USERNAME$$$$

8/17/99

REVISIONS
32406: PARCEL 3, NAME CHANGED

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

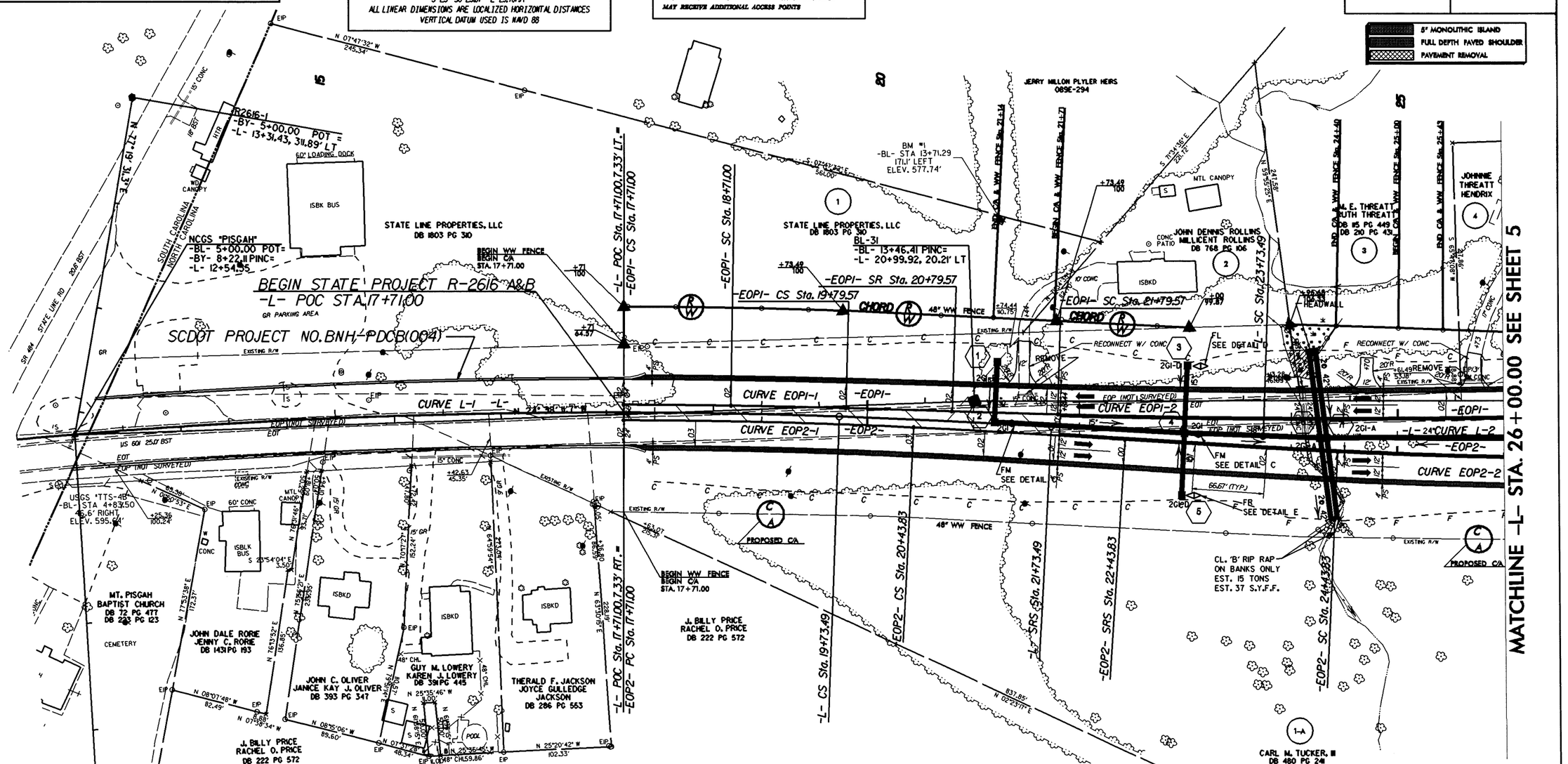
RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 33624
CHARLOTTE, NORTH CAROLINA 28235

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

PRELIMINARY PLANS

NAD 83

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



CURVE EOP1-2

Pls Sta 21+46.23	Pi Sta 24+35.54	Pls 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

Pls Sta 23+77.16	Pi Sta 26+25.99	Pls 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

Pls Sta 18+16.87	Pi Sta 19+25.28	Pls 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	Pls 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	Pls Sta 20+40.15
Δ = 7°40' 37.3" (RT)	Θs = 0°57' 06.5"
D = 0°57' 06.5"	Ls = 200.00'
T = 403.94'	LT = 133.34'
L = 806.66'	ST = 66.67'
R = 6,020.33'	

CURVE L-2

Pls Sta 23+06.82	Pi Sta 25+09.22	Pls 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'	

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$$$$SCHEMATIC$$$$

8/17/99

REVISIONS
3/24/06: PARCEL 3, NAME CHANGED & PARCEL NO. CHANGE

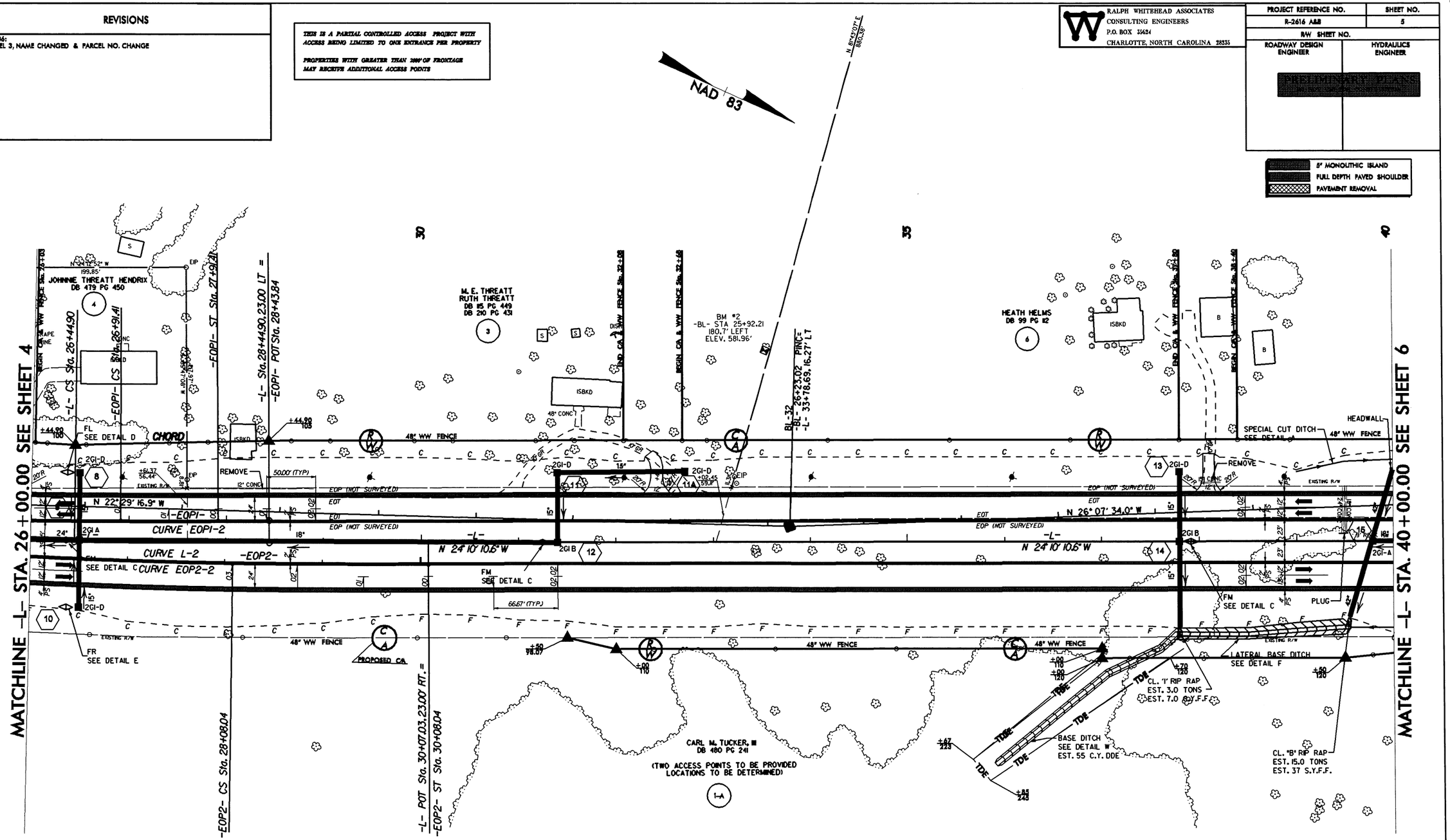
THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

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	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS	

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



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.

09-MAY-2006 07:58
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8/17/99

REVISIONS

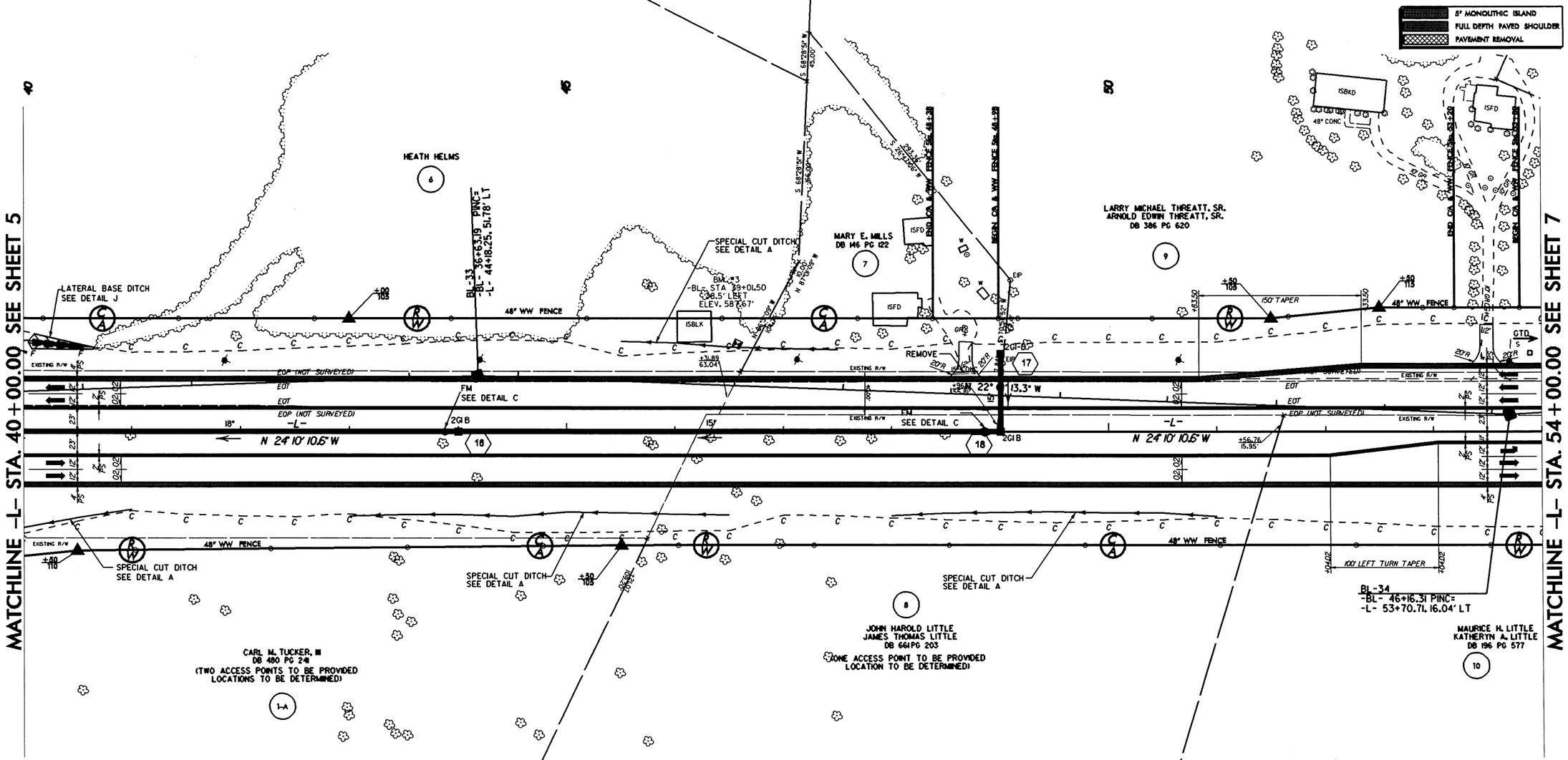
THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

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	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS	

5' MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



SEE SHEET 49 FOR -L- PROFILE.

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8/17/99

REVISIONS

3/24/06:
PARCEL 9, NAME CHANGE
PARCEL 10, NAME CHANGE
PARCEL 17, NAME CHANGE
PARCEL 22, NAME CHANGE

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

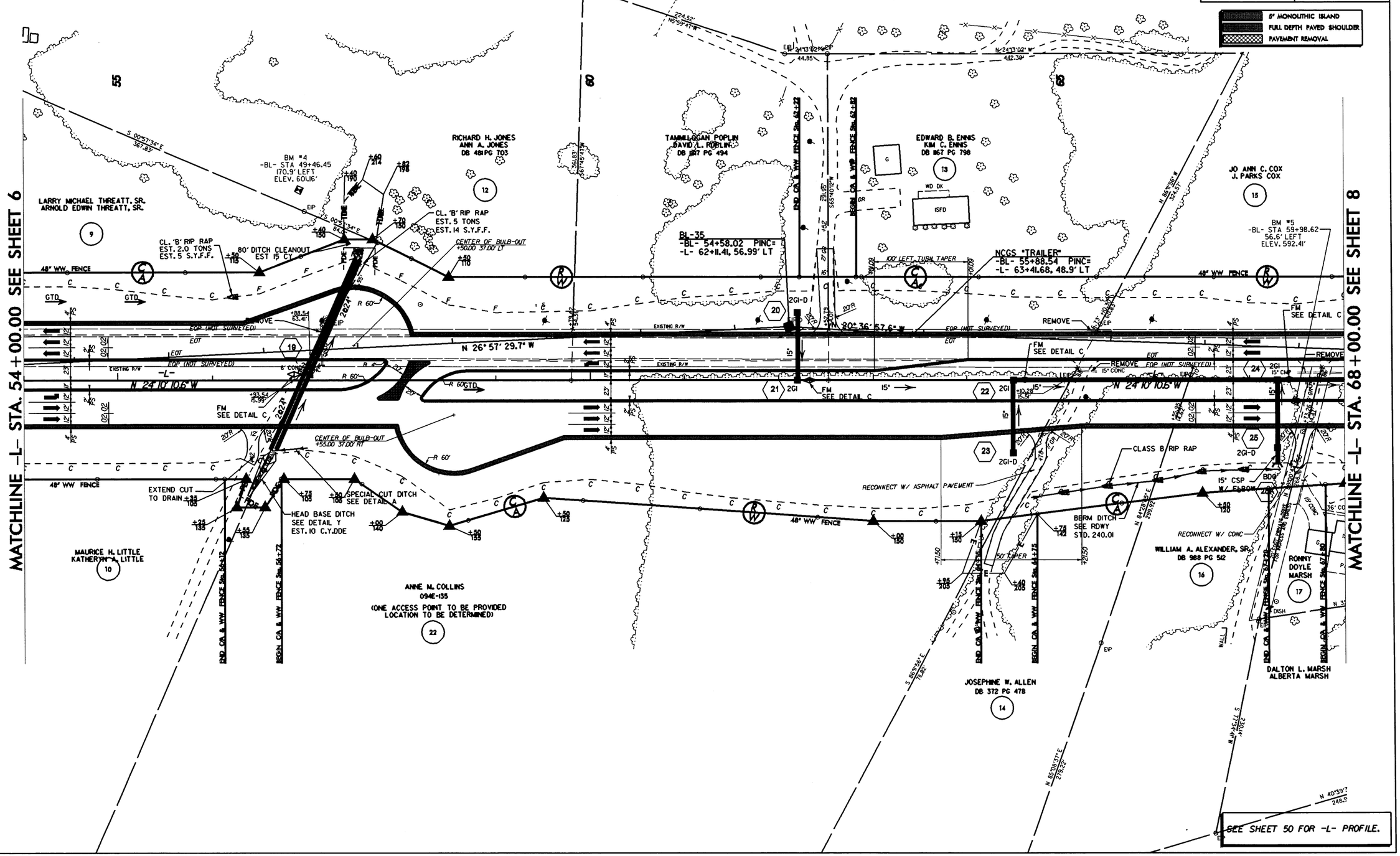
PROPERTIES WITH GREATER THAN 2000' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

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

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



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8/17/99

REVISIONS

32406:
PARCEL 17 NAME CHANGE
PARCEL 18 NAME CHANGE & PROP. LINE CHANGE
PARCEL 18A NAME CHANGE & PROP. LINE ADDITION
PARCEL 22 NAME CHANGE

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

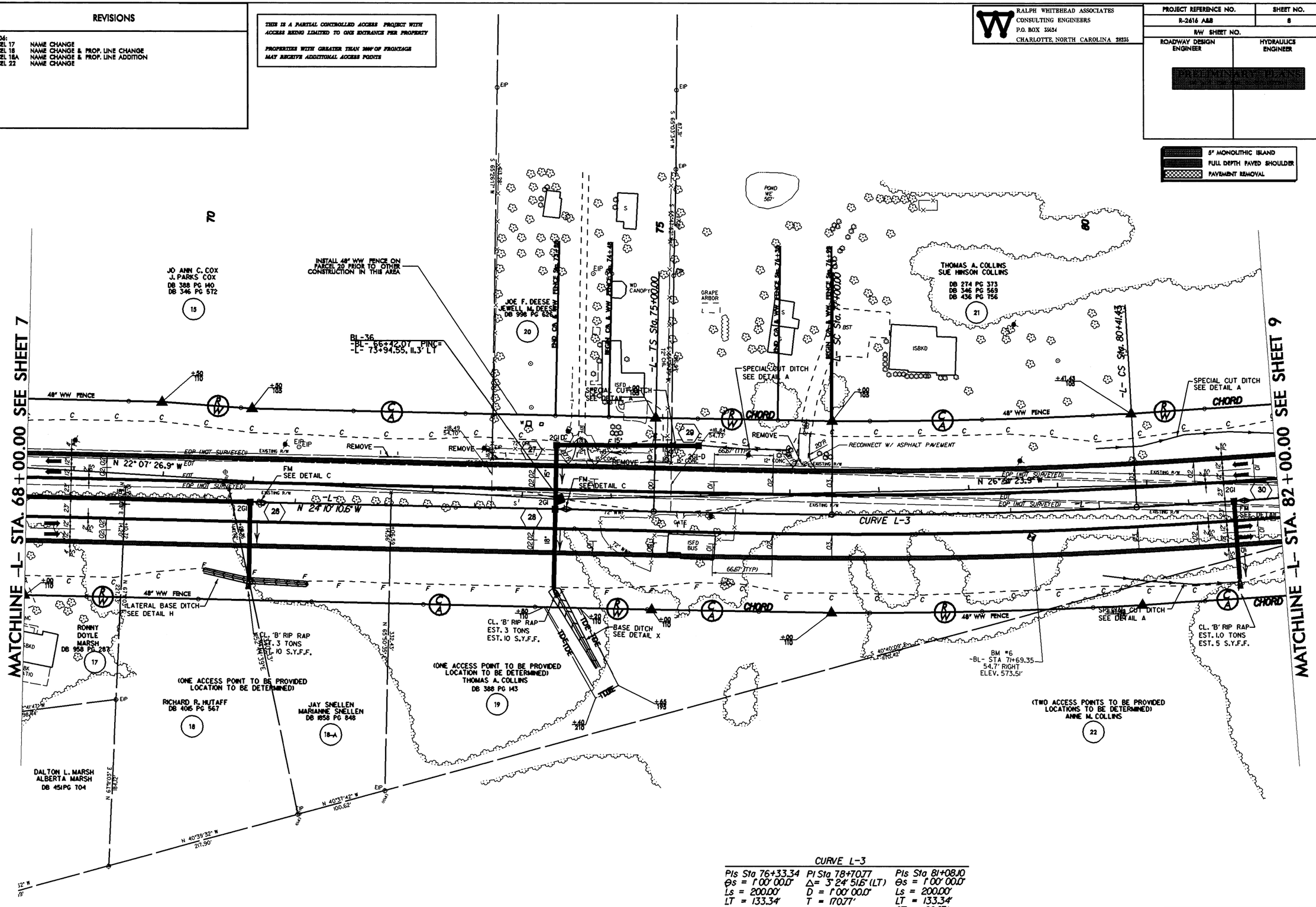
PROPERTIES WITH GREATER THAN 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

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

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 FT./FT.	

SEE SHEET 51 FOR -L- PROFILE.

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8/17/99

REVISIONS

3/2406
PARCEL 22 NAME CHANGE & PROP. LINE ADDITION
PARCEL 22B NAME & PROP. LINE ADDITION
PARCEL 26A NAME CHANGE

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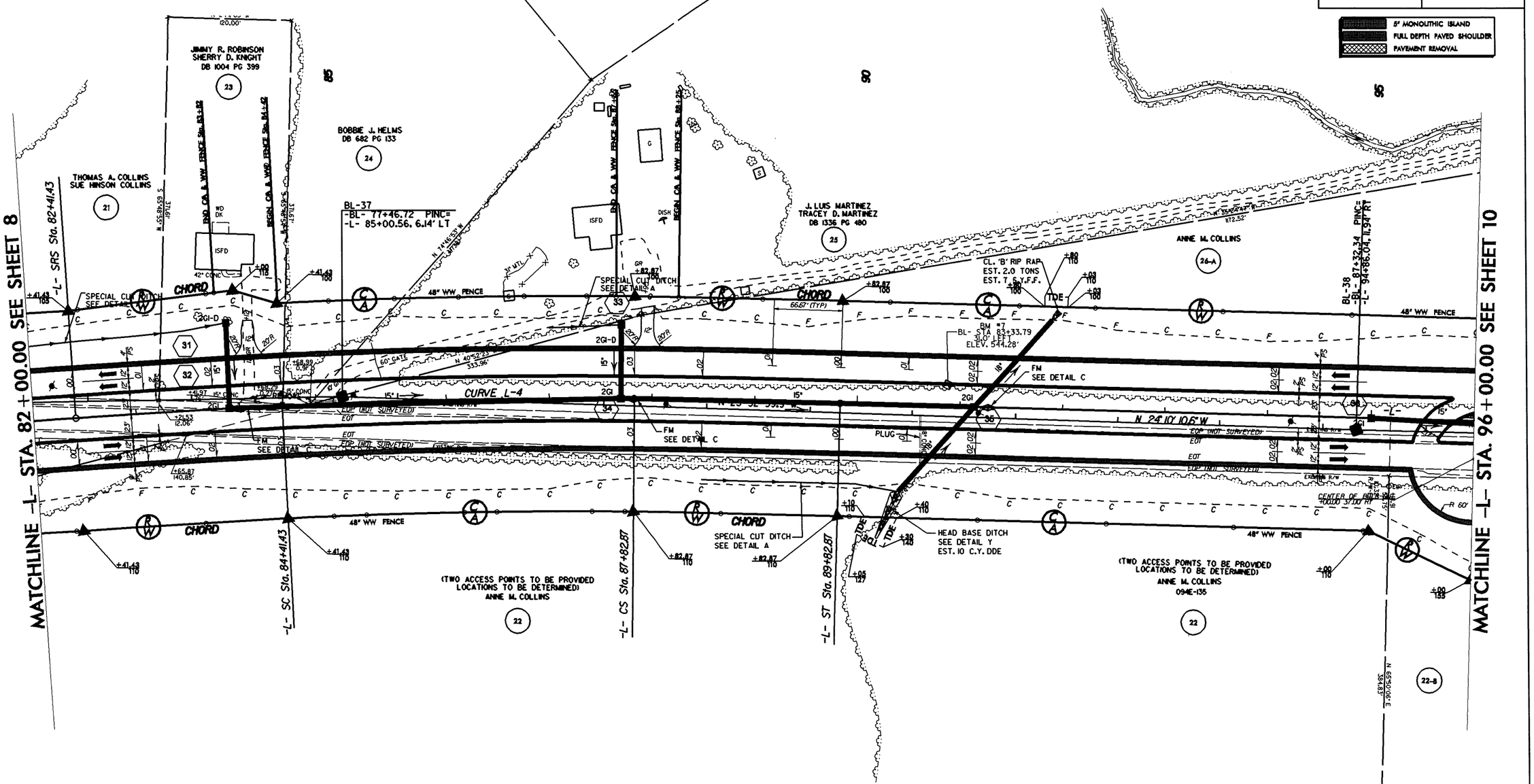
PROPERTIES WITH GREATER THAN 2000' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

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

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

PRELIMINARY PLANS

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



SEE SHEET 52 FOR -L- PROFILE.

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	

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PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS

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

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 33624
CHARLOTTE, NORTH CAROLINA 28235

8/17/99

REVISIONS

3/2406 PARCEL 22C NAME CHANGE
PARCEL 26 NAME CHANGE

3/2406 PARCEL 22 & PROP. LINE ADDITION
PARCEL 22A NAME CHANGE
PARCEL 22B NAME CHANGE
PARCEL 22 NAME CHANGE

POT Sta. 6+50.00

NAD 83

CAROL JENKINS COURTNEY
JOHN MICHAEL JENKINS
DB 1908 PG 343
180

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

BEGIN CONSTRUCTION
-Y1- POC STA. 3+00.00

REMOVE

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

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

SUBSTATION

RETAIN

-Y1A- POT Sta. 6+50.00

GEORIA WILLIAMS
DB 229 PG 369
179

LANES CREEK VOLUNTEER
FIRE DEPARTMENT, INC.
DB 355 PG 653
177

END WW FENCE

BEGIN CONSTRUCTION
-Y1A- POC STA. 7+50.00

LANES CREEK VOLUNTEER
FIRE DEPARTMENT, INC.
DB 213 PG 136
DB 417 PG 304
178

-BY1-90
-BY1- 16+79.71 PINC =
-BY2- 11+71.01 POT=
-Y1- 6+31.08, 25.27' RT

RECONNECT W/ ASPHALT PAVEMENT

MARION F. COX
DELANO S. COX
JOHN ROBERT COX
RUTH C. COX
27

BERM DITCH
SEE RDWY
STD. 240.01

CLASS 'B'
RIP RAP

48" WW FENCE

ANNE M. COLLINS
094E-135

JURISDICTIONAL STRICOOT EXB.NO.852.02 FOR
NOTE: THESE 2 DIRECTIONAL ISLANDS
SHALL BE CONSTRUCTED USING
CONCRETE MOUNTABLE MEDIAN

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

TOE PROTECTION
SEE DETAIL B

R 90' - R 180'
3.5' OFFSET

HEADWALL

26-A

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.

TOE

48" WW FENCE

FM
SEE DETAIL C

39A 39B 39D 39C

N 24° 21' 18.7" W

EOP (NOT SURVEYED)
EOT
REMOVE

ANNE M. COLLINS
094E-135
26

BM #8-B
-BL- STA 99+93.39
40.6' LEFT
ELEV. 517.04'

PLUG

RIP RAP ON BANKS ONLY

PIPE OUTLET
CHANNEL
SEE DETAIL AA

-BL-39
-BL- 97+99.12 PINC =
-BY1- 19+79.65 PINC=
-L- 105+52.82, 8.48' RT

48" WW FENCE

DITCH CLEANOUT

100' LEFT TURN TAPER

MARY CAYLA TAYLOR and husband DON E. TAYLOR
DB 3572 PG 180
EST. 2.0 TONS
EST. 5.0 S.Y.F.F

ANNE M. COLLINS

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

22

ISFD

48' CHL

22-B

SPECIAL CUT DITCH
SEE DETAIL A

R 90' - R 180'
OFFSET 3.5'

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

22-C

(ONE ACCESS POINT TO BE PROVIDED
LOCATIONS TO BE DETERMINED)
ANNE M. COLLINS
094E-135

END WW FENCE

BEGIN WW FENCE

END CONSTRUCTION
-Y2- POT STA. 13+50.00

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

SEE SHEET 53 FOR -L- PROFILE.
SEE SHEET 89 FOR -Y1- & -Y2- PROFILE.

US 601
-Y1- & -Y2- TRAFFIC VOLUMES

LANSFORD RD -Y1-
US 601
LANSFORD RD -Y2-
2002/2025 ADT IN HUNDREDS

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

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

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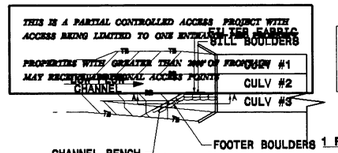
RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235
8/17/99

REVISIONS

3/2406		
PARCEL 22A	NAME CHANGE & PARCEL NO. ADDITION	
PARCEL 22C	NAME CHANGE & PROP. LINE ADDITION	

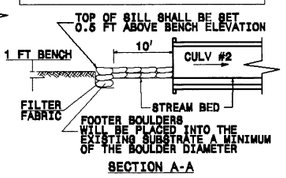


PLAN VIEW

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.



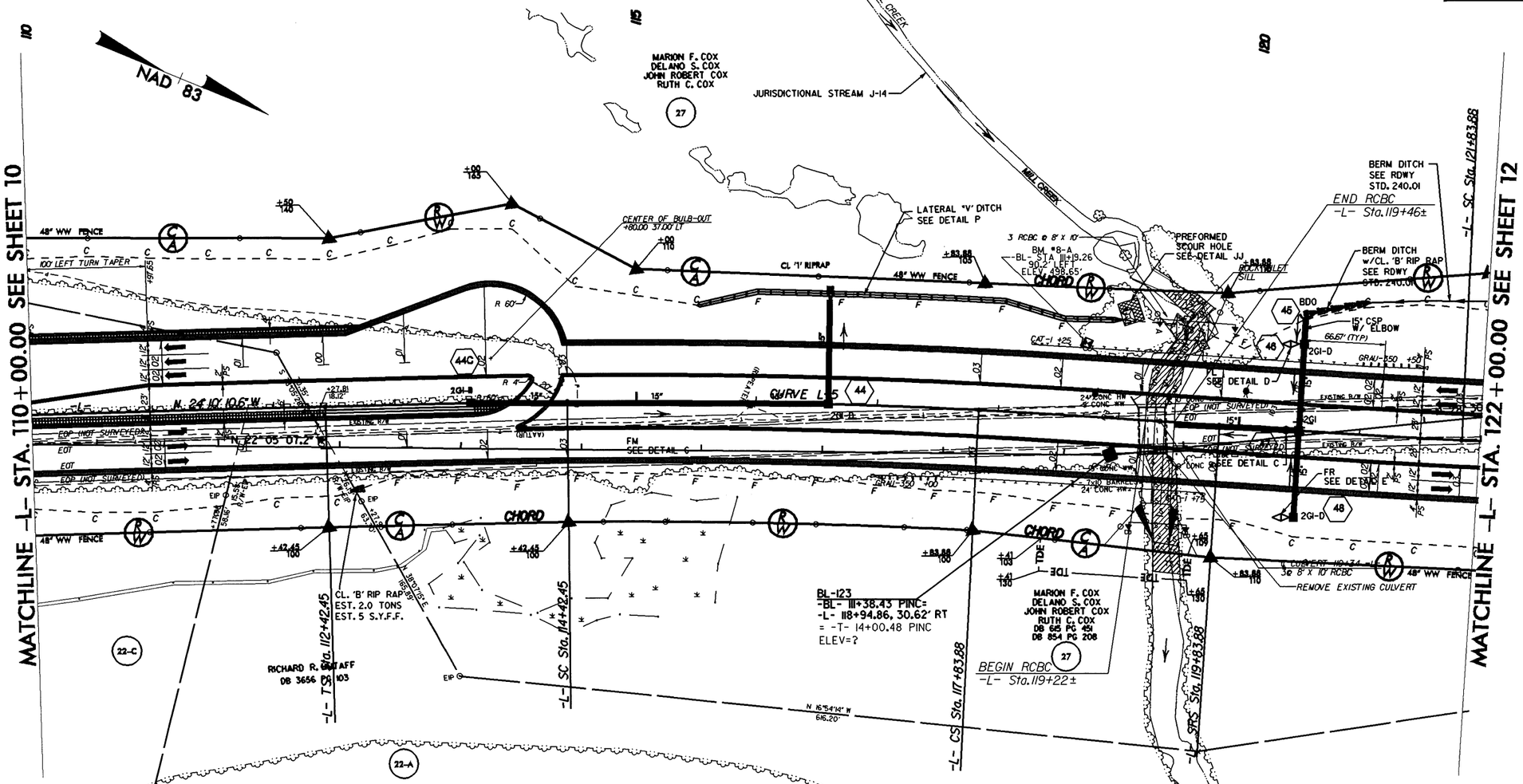
SECTION A-A

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; 8' x 2' x 1'.

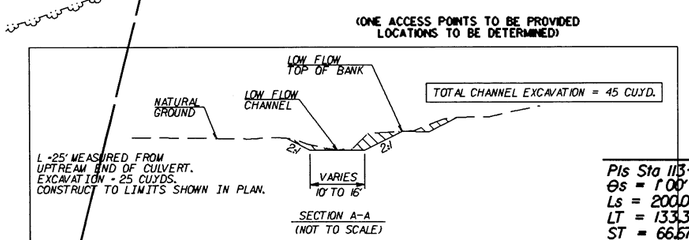
RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS	

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



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

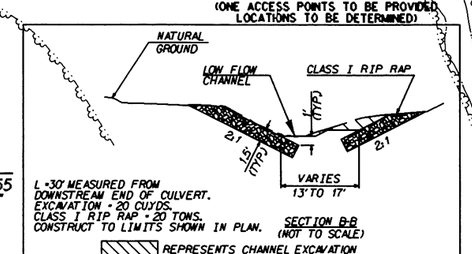


SECTION A-A
(NOT TO SCALE)

CURVE L-5

PIs Sta 113+75.79	PI Sta 116+13.22	PIs Sta 118+50.55
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 FT/FT	

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



SECTION B-B
(NOT TO SCALE)

SEE SHEET 54 FOR -L- PROFILE.

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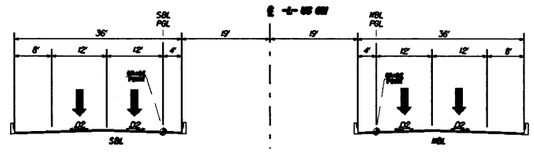
8/17/99

REVISIONS
32406 PARCEL 22A NAME CHANGE & PARCEL NO. ADDITION

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



TYPICAL SECTION ON STRUCTURES

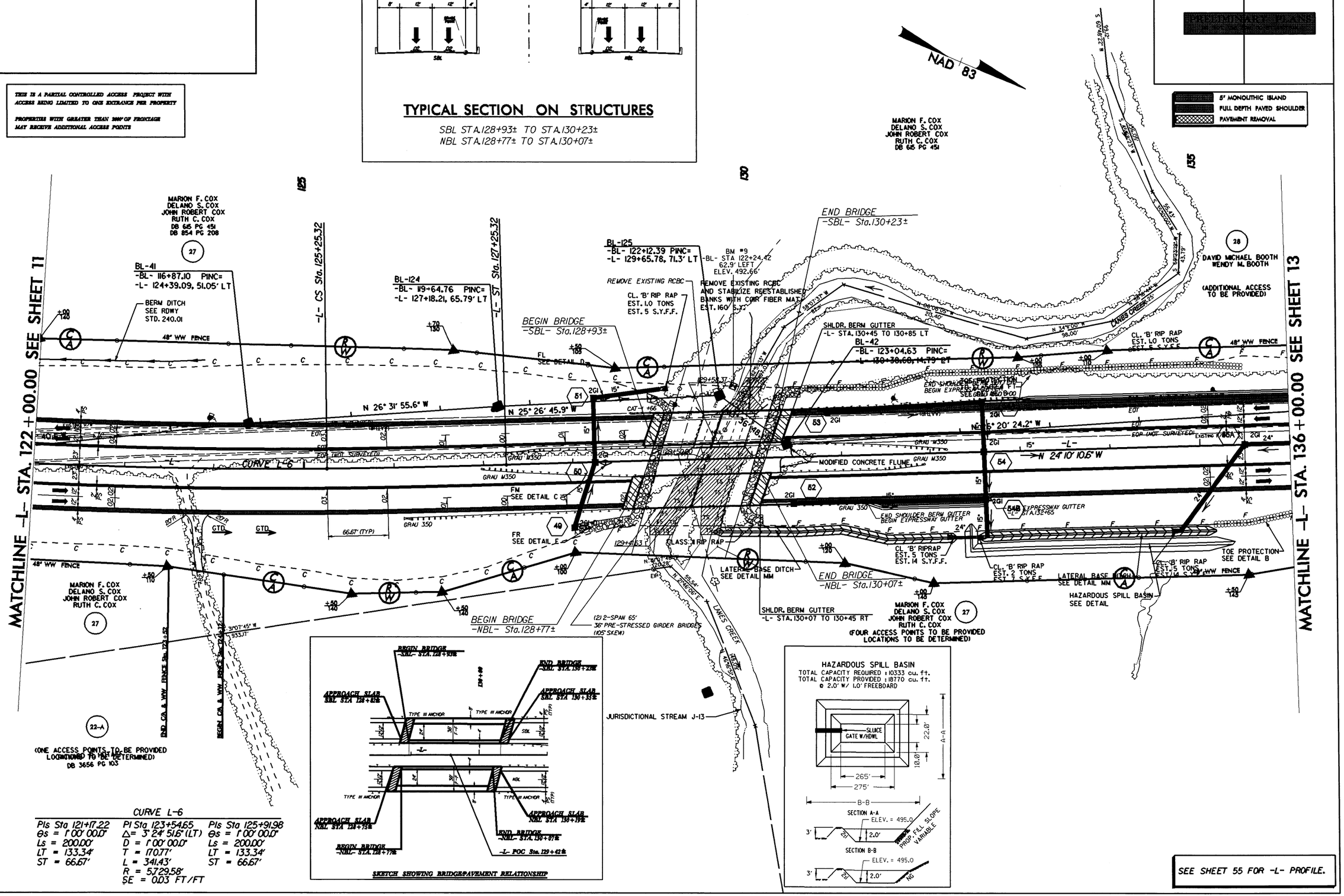
SBL STA.128+93± TO STA.130+23±
NBL STA.128+77± TO STA.130+07±

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

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

PRELIMINARY PLANS

5' MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



CURVE L-6

PIs Sta 121+17.22	PI Sta 123+54.65	PIs Sta 125+91.98
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'
ST = 66.67'	L = 341.43'	ST = 66.67'
	R = 5729.58'	
	SE = 0.03 FT/FT	

SEE SHEET 55 FOR -L- PROFILE.

09-MAY-2006 08:00
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8/17/99

REVISIONS

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

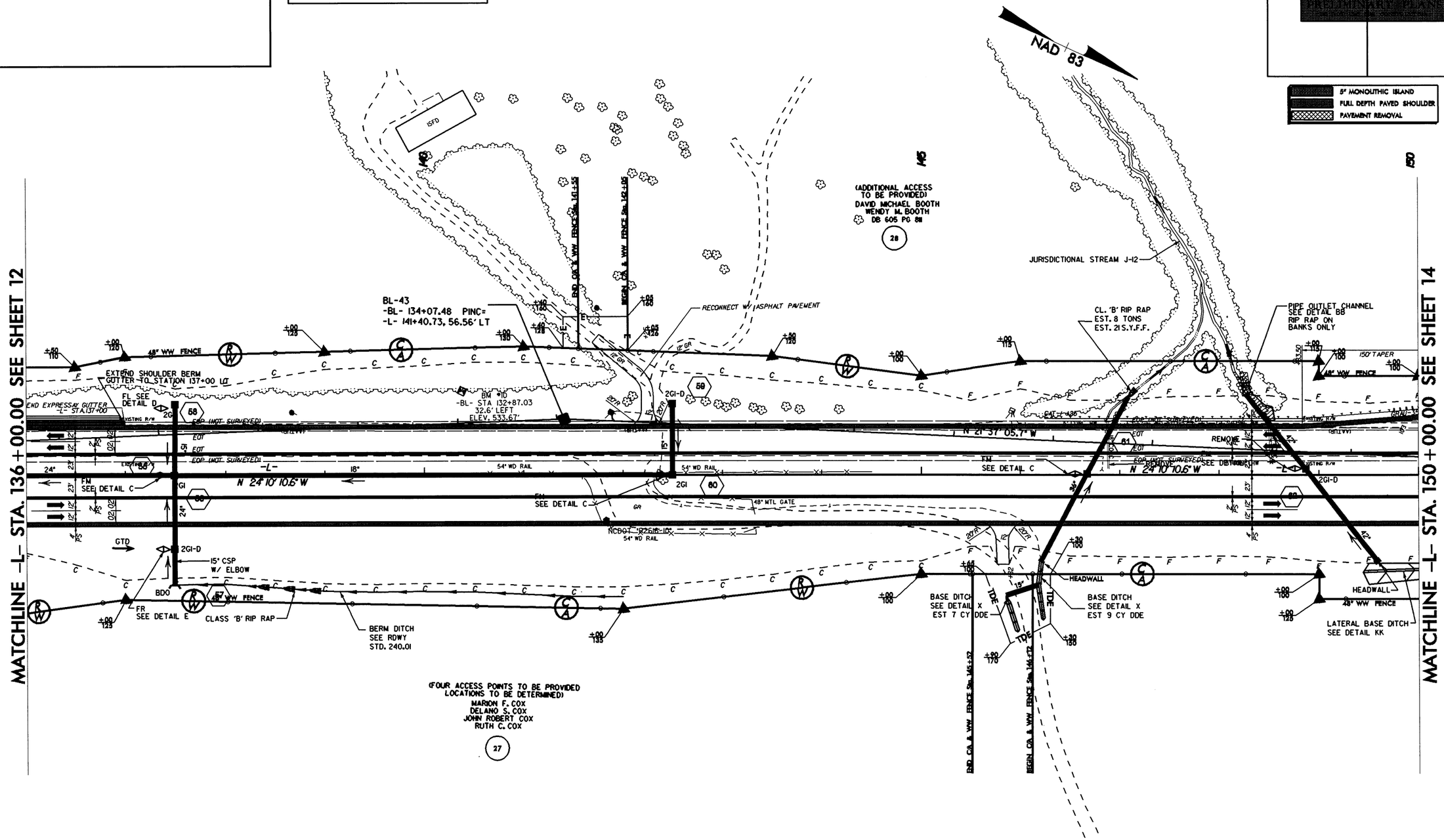
PROPERTIES WITH GREATER THAN 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

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

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



SEE SHEET 56 FOR -L- PROFILE.

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8/17/99

REVISIONS

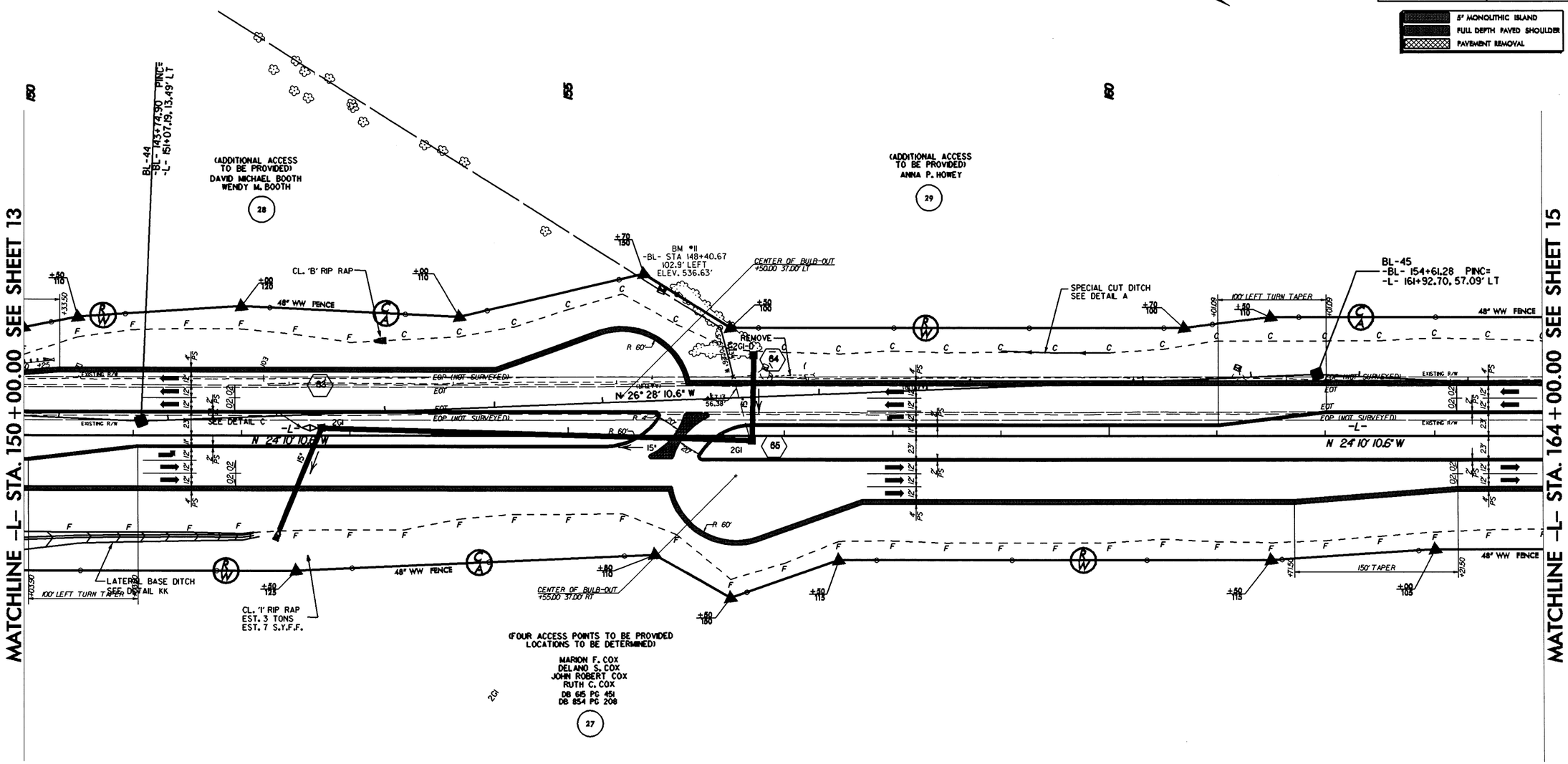
THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

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	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS	

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



SEE SHEET 57 FOR -L- PROFILE.

03-MAY-2006 08:00
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8/17/99

REVISIONS

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

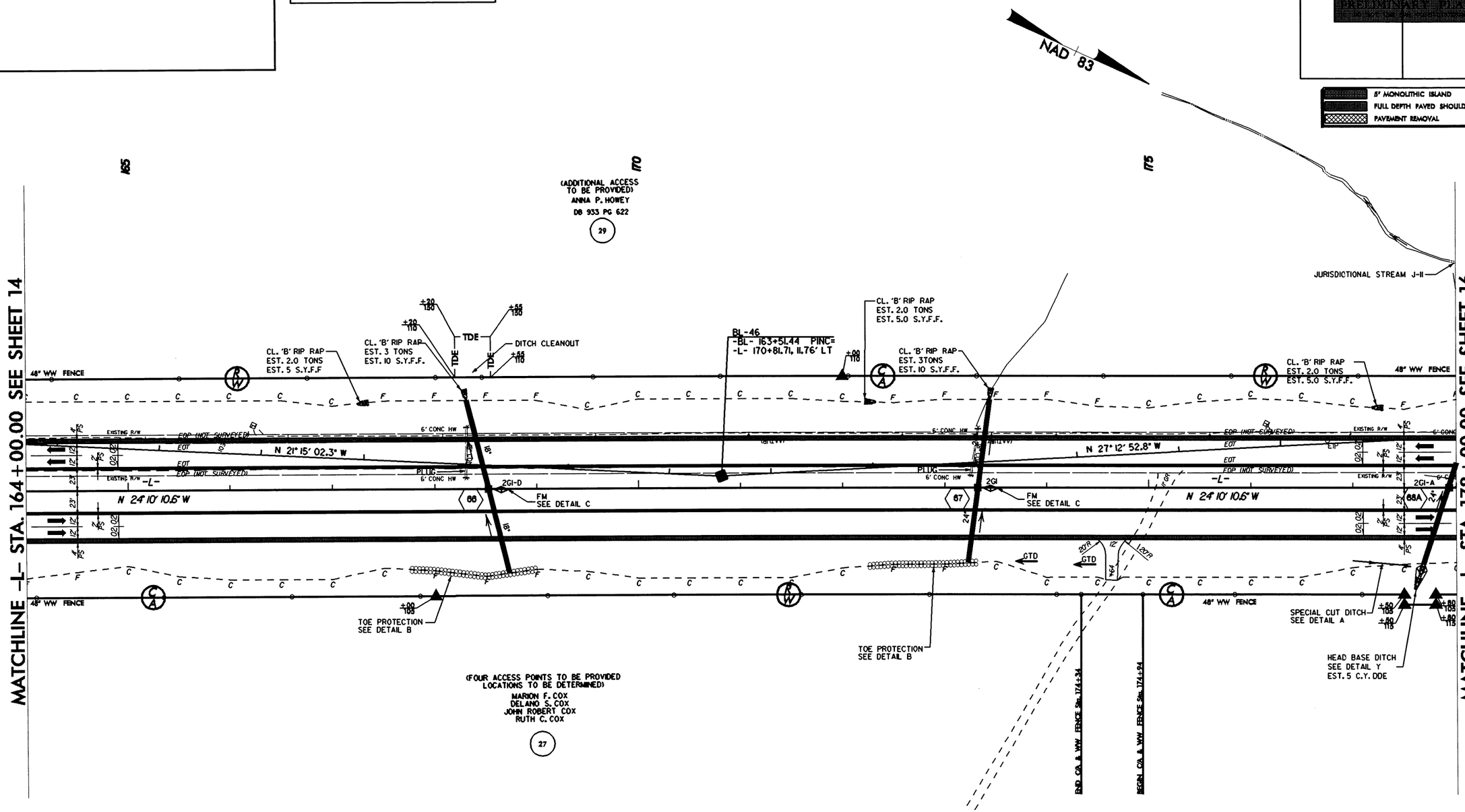
PROPERTIES WITH GREATER THAN 300' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

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

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



BM #12
-BL- STA 169+92.53
480.5' RIGHT
ELEV. 549.45'

SEE SHEET 58 FOR -L- PROFILE.

09-MAY-2006 08:00
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$$$$USERNAME$$$$

8/17/99

REVISIONS

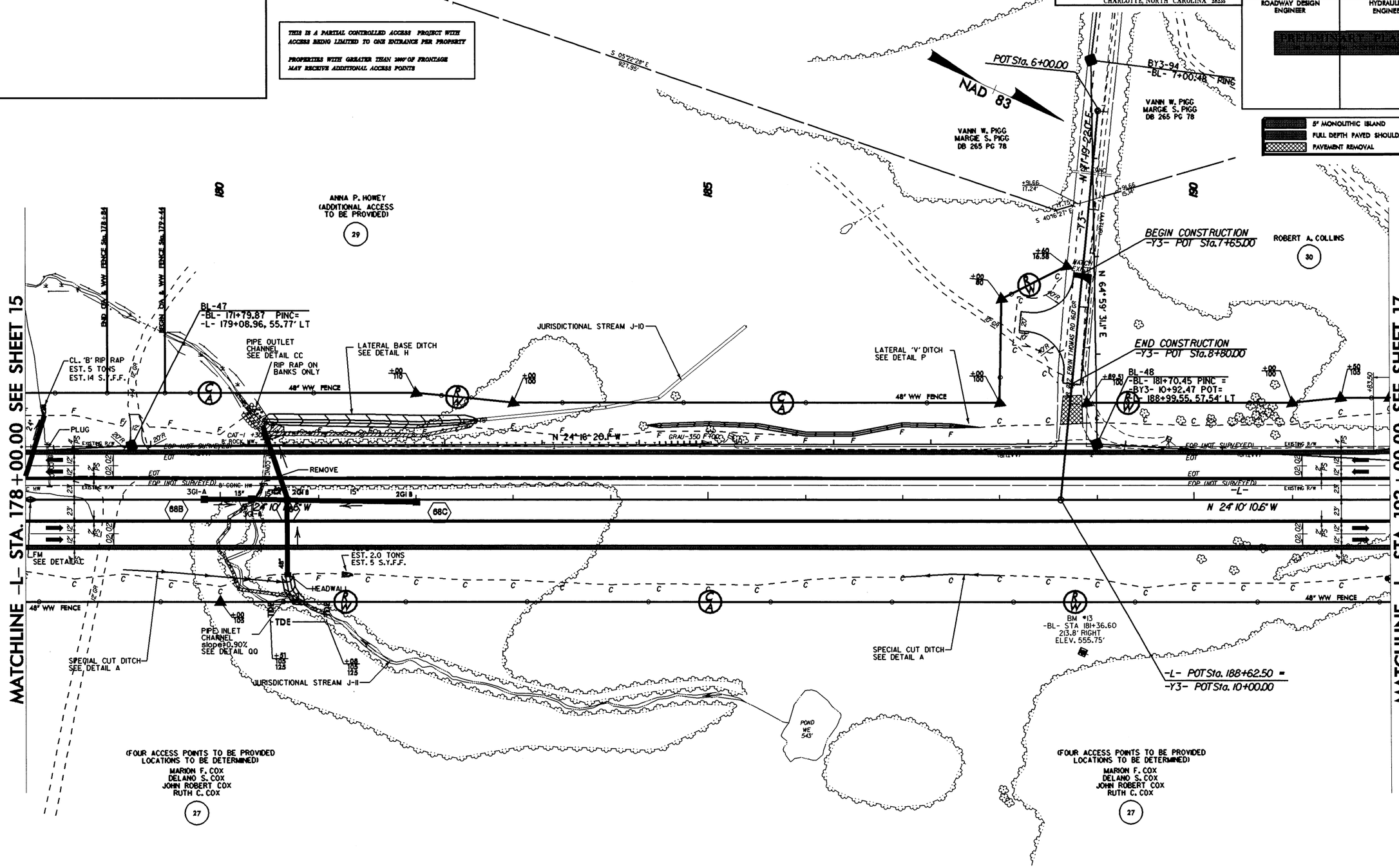
RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

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

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

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



SEE SHEET 59 FOR -L- PROFILE.

09-MAY-2006 08:00
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8/17/99

REVISIONS

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

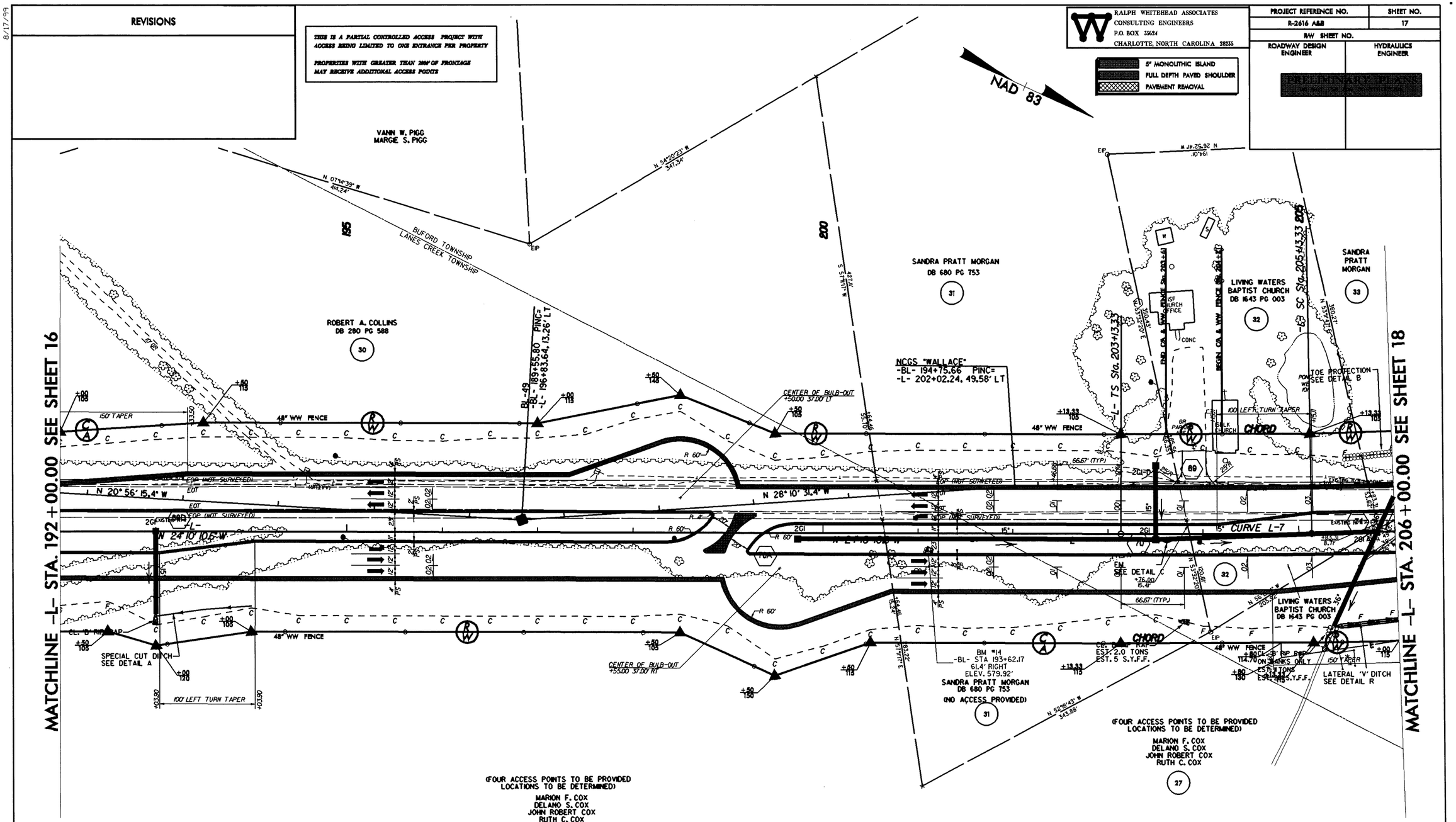
PROPERTIES WITH GREATER THAN 2000' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 33624
CHARLOTTE, NORTH CAROLINA 28235

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS



CURVE L-7

Pls Sta 204+46.67	Pi Sta 206+88.03	Pls 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	

SEE SHEET 60 FOR -L- PROFILE.

09-MAY-2006 08:01
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$$$$USERNAME$$$$

8/17/99

REVISIONS

40606
PARCEL 36 REMOVED PROP. R/W LINE ALONG -Y4R-

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

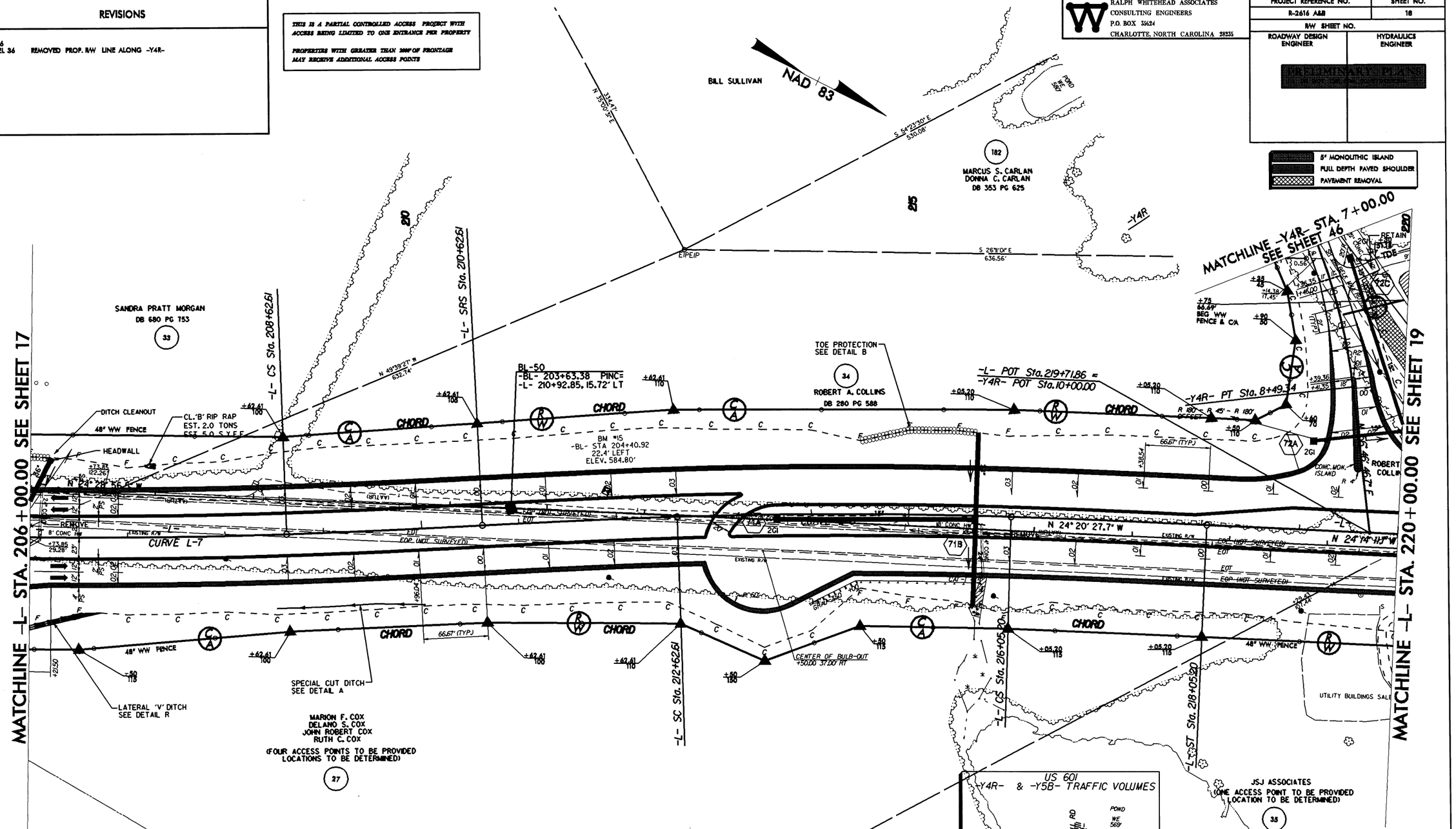
PROPERTIES WITH GREATER THAN 2000' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

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

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



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

SEE SHEET 61 FOR -L- PROFILE.

03-MAY-2006 08:01
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8/17/99

REVISIONS

32406
PARCEL 36A — NAME CHANGE & ADDITIONAL PROP. LINES
PARCEL 38 — ADDED R/W LINES FOR ACCESS ROAD
40606
PARCEL 36 — REVISED PROP. R/W LINES

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

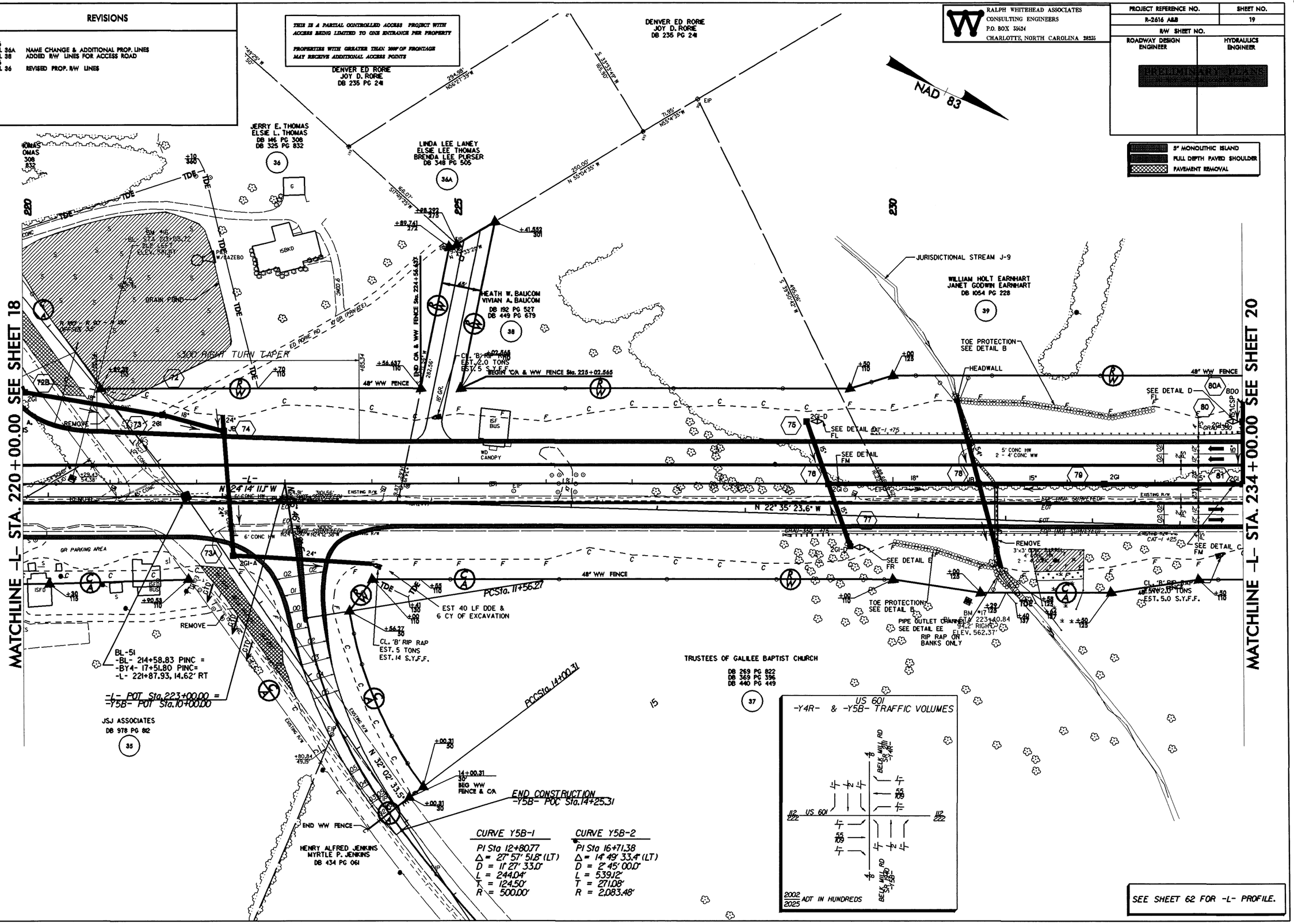
PROPERTIES WITH GREATER THAN 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

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

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



CURVE Y5B-1	CURVE Y5B-2
PI Sta 12+80.77	PI Sta 16+71.38
Δ = 27° 57' 51.8" (LT)	Δ = 14° 49' 33.4" (LT)
D = 11° 27' 33.0"	D = 2° 45' 00.0"
L = 244.04'	L = 539.12'
T = 124.50'	T = 271.08'
R = 500.00'	R = 2,083.48'

SEE SHEET 62 FOR -L- PROFILE.

09-MAY-2006 08:01
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8/17/99

REVISIONS

3/24/06
PARCEL 42 ADDED C/A BREAK

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

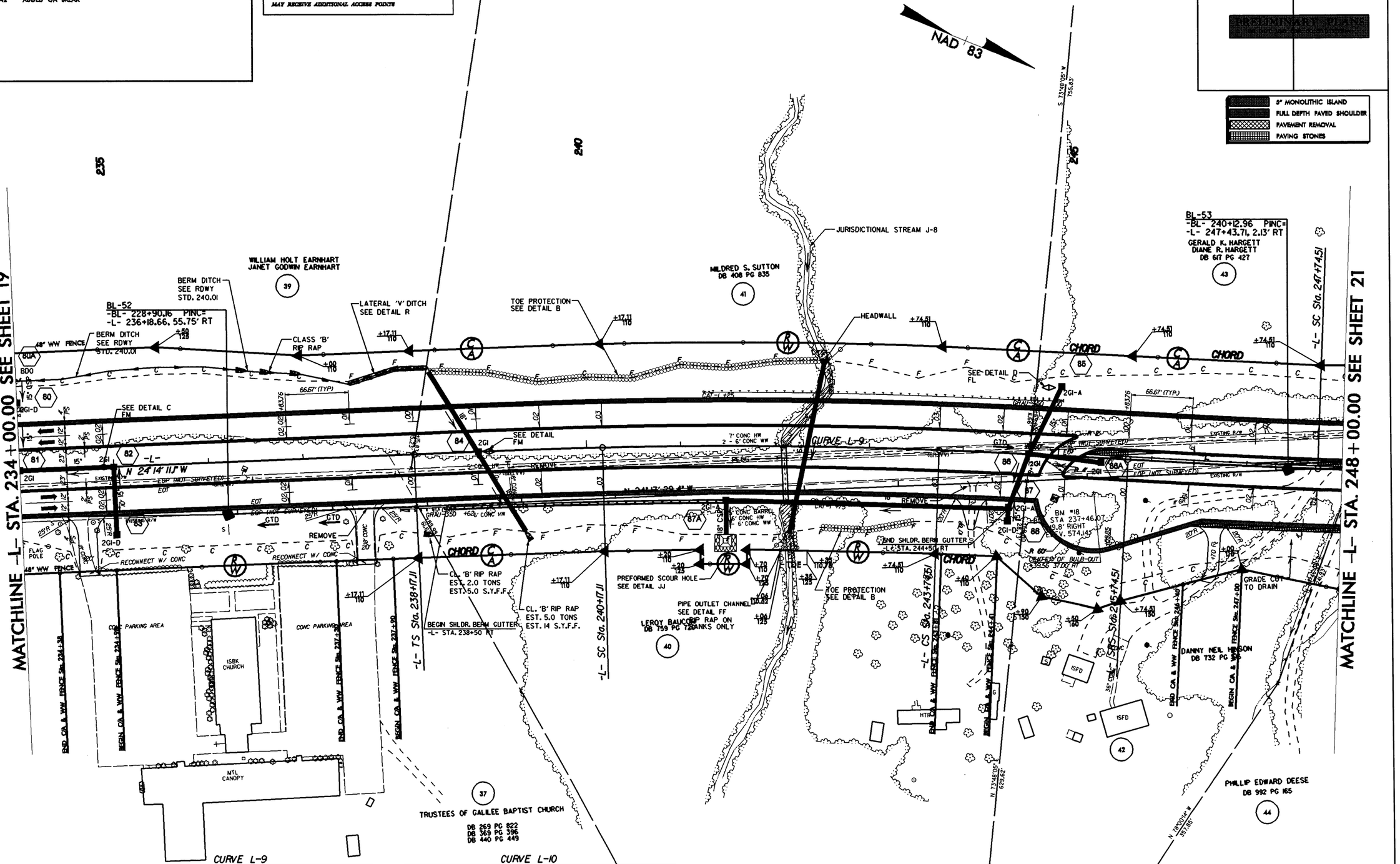
PROPERTIES WITH GREATER THAN 300' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35634
CHARLOTTE, NORTH CAROLINA 28235

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

PRELIMINARY PLANS

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



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.

09-MAY-2006 08:01
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8/17/99

REVISIONS

3/24/06
PARCEL 45 NAME CHANGE
PARCEL 44 REMOVED TDE LABEL & ADDED C/A BREAK
PARCEL 46 NAME CHANGE & ADDED C/A BREAK

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

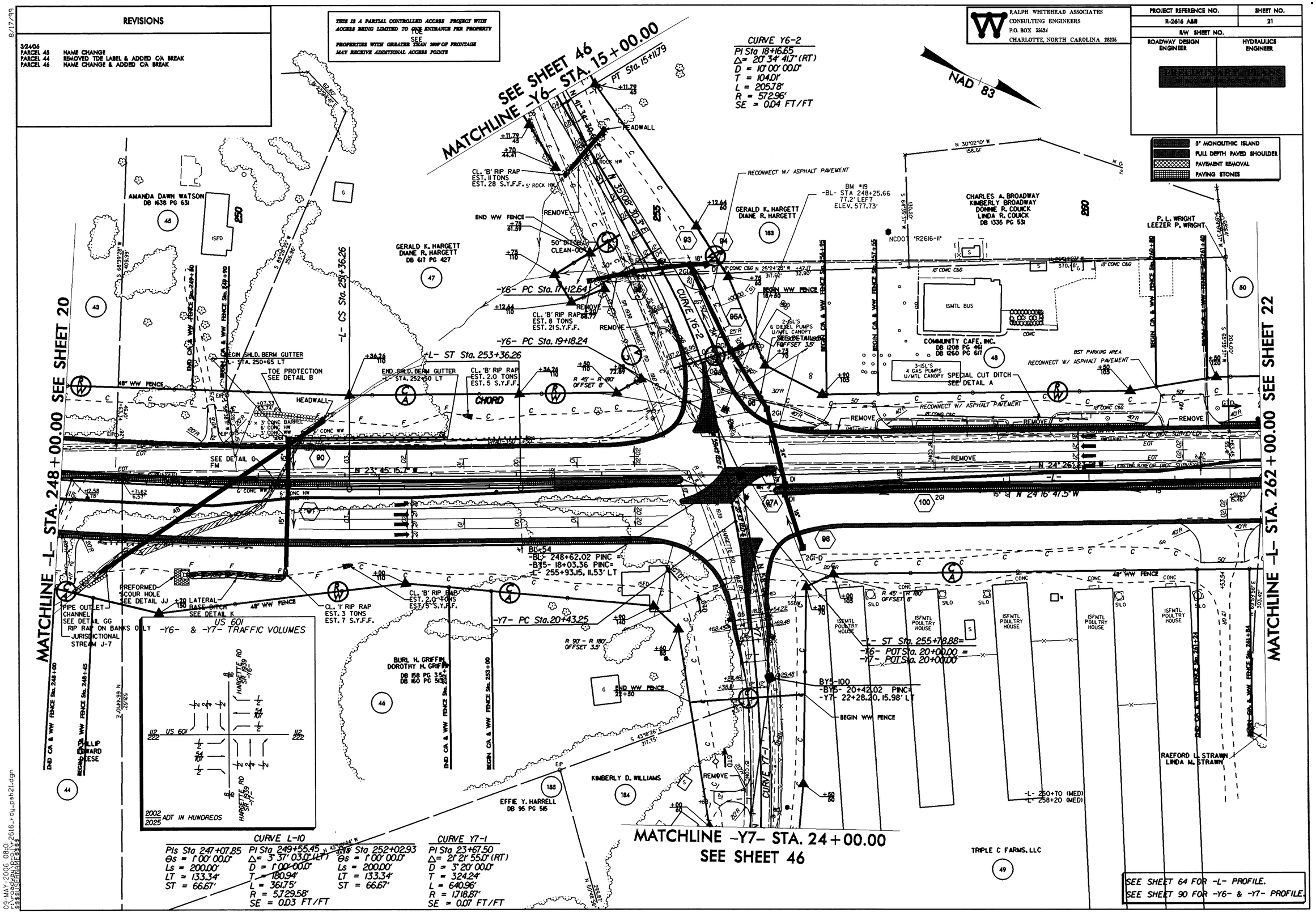
PROPERTIES WITH GREATER THAN 300' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

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

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS

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



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8/17/99

REVISIONS	
32406	
PARCEL 52	NAME CHANGE & INCREASED DRIVE TO 32'
PARCEL 54	ADDED C/A BREAK

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

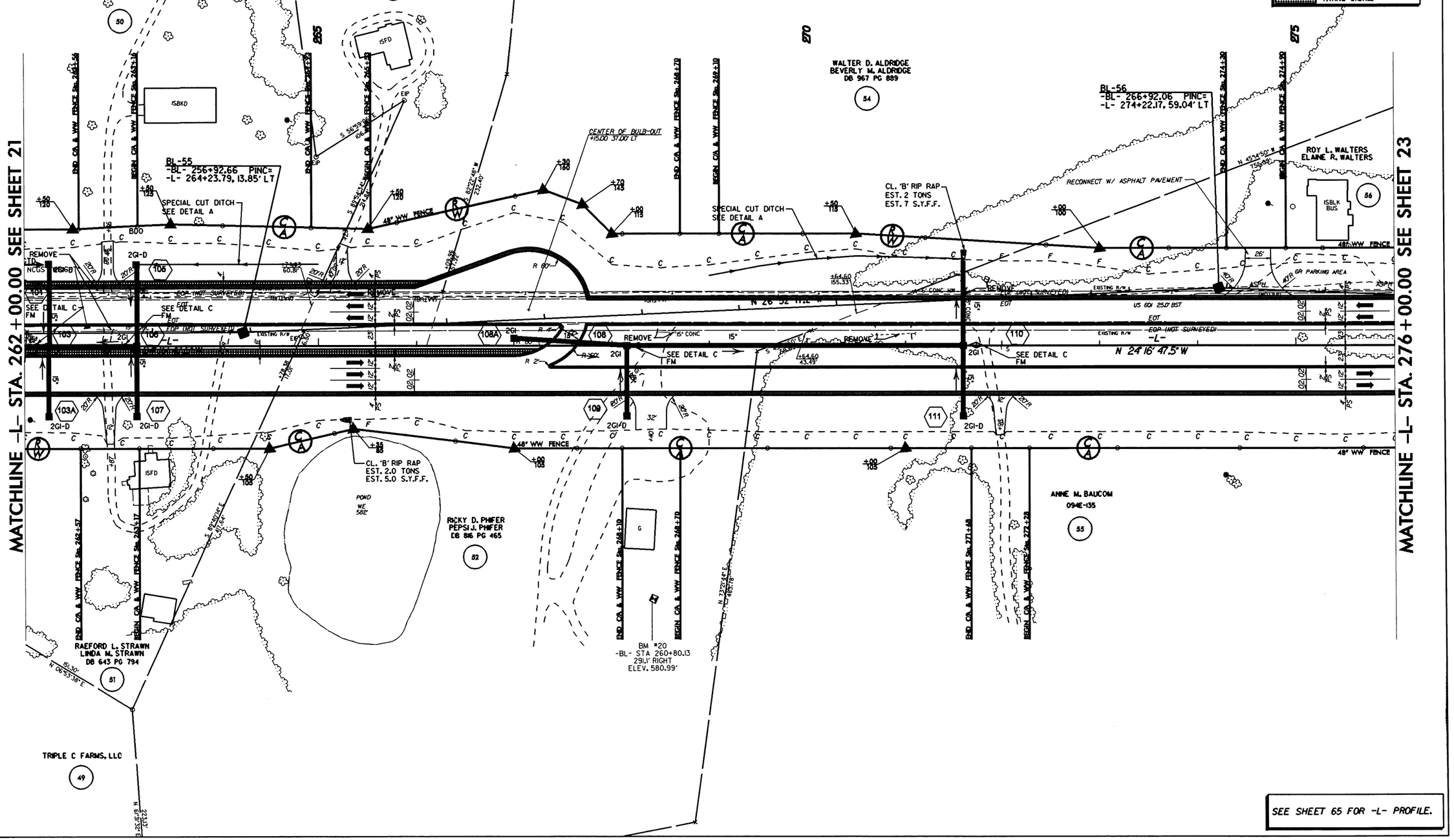
RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

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

PRELIMINARY PLANS

NAD 83

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



SEE SHEET 65 FOR -L- PROFILE.

09-MAY-2006 08:02
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8/17/99

REVISIONS

3/2406
PARCEL 57 INCREASED DRIVE WIDTH TO 25'

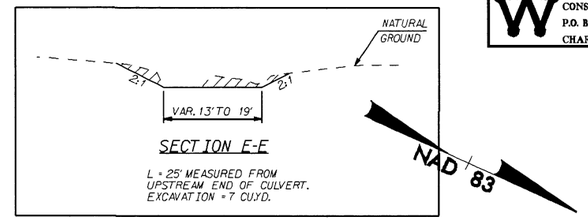
THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

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	23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS



5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

MATCHLINE -L- STA. 276+00.00 SEE SHEET 22

MATCHLINE -L- STA. 290+00.00 SEE SHEET 24

JURISDICTIONAL STREAM J-6

JURISDICTIONAL STREAM J-5

ROY L. WALTERS
ELAINE R. WALTERS
DB 1349 PG 379
56

MANGUM FAMILY PARTNERSHIP, L.P.
DB 894 PG 648
57

ANNE M. BAUCOM
094E-135
55

(ONE ACCESS POINT TO BE PROVIDED LOCATION TO BE DETERMINED)
CAROL B. INGRAM
DB 722 PG 904
58

(ONE ACCESS POINT TO BE PROVIDED LOCATION TO BE DETERMINED)
CARL W. MANGUM, JR.
DB 847 PG 234
DB 1428 PG 425
59

BM #21
-BL- STA 268+50.14
18.5' LEFT
ELEV. 571.14'

BM #22
-BL- STA 288+66.13
7.3' RIGHT
ELEV. 552.29'

REMOVE EXISTING CULVERT

2 RCBC @ 12'X10'

℄ CULVERT 281+51 -L-
12' X 10' RCBC

℄ CULVERT 288+06.5 -L-
2 @ 8' X 7' RCBC

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

BL-120
-BL- 278+09.71 PINC=
-L- 285+38.96, 15.27' LT

BERM DITCH
SEE RDWY
STD. 240.01

ROCK INLET SILL

TOE PROTECTION
SEE DETAIL B

PIPE OUTLET CHANNEL
SEE DETAIL HH
RIP RAP ON BANKS ONLY

48" WW FENCE

SEE DETAIL D FM

SEE DETAIL C FM

SEE DETAIL E FR

SEE DETAIL D FL

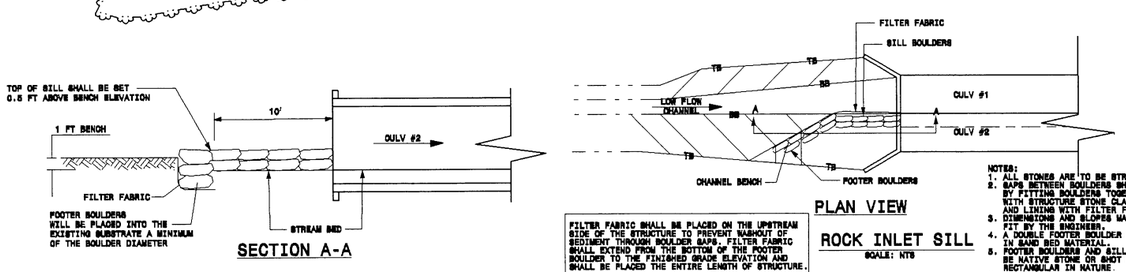
SEE DETAIL FM1

N 22° 02' 07.8" W

N 24° 16' 47.5" W

2 - 8'x7' CONC BARRELS
19' CONC HW
2 - 9' CONC WW

CAT-I +6875



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'.

SEE SHEET 66 FOR -L- PROFILE.

09-MAY-2006 08:02
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8/17/99

REVISIONS

32406	
PARCEL 57	ADDED C/A BREAK LT. OF STA. 298+30
PARCEL 61	NAME CHANGE
PARCEL 59	PARCEL NO. CHANGE
PARCEL 63	NAME CHANGE
PARCEL 63A	NAME & PARCEL NO. ADDITION

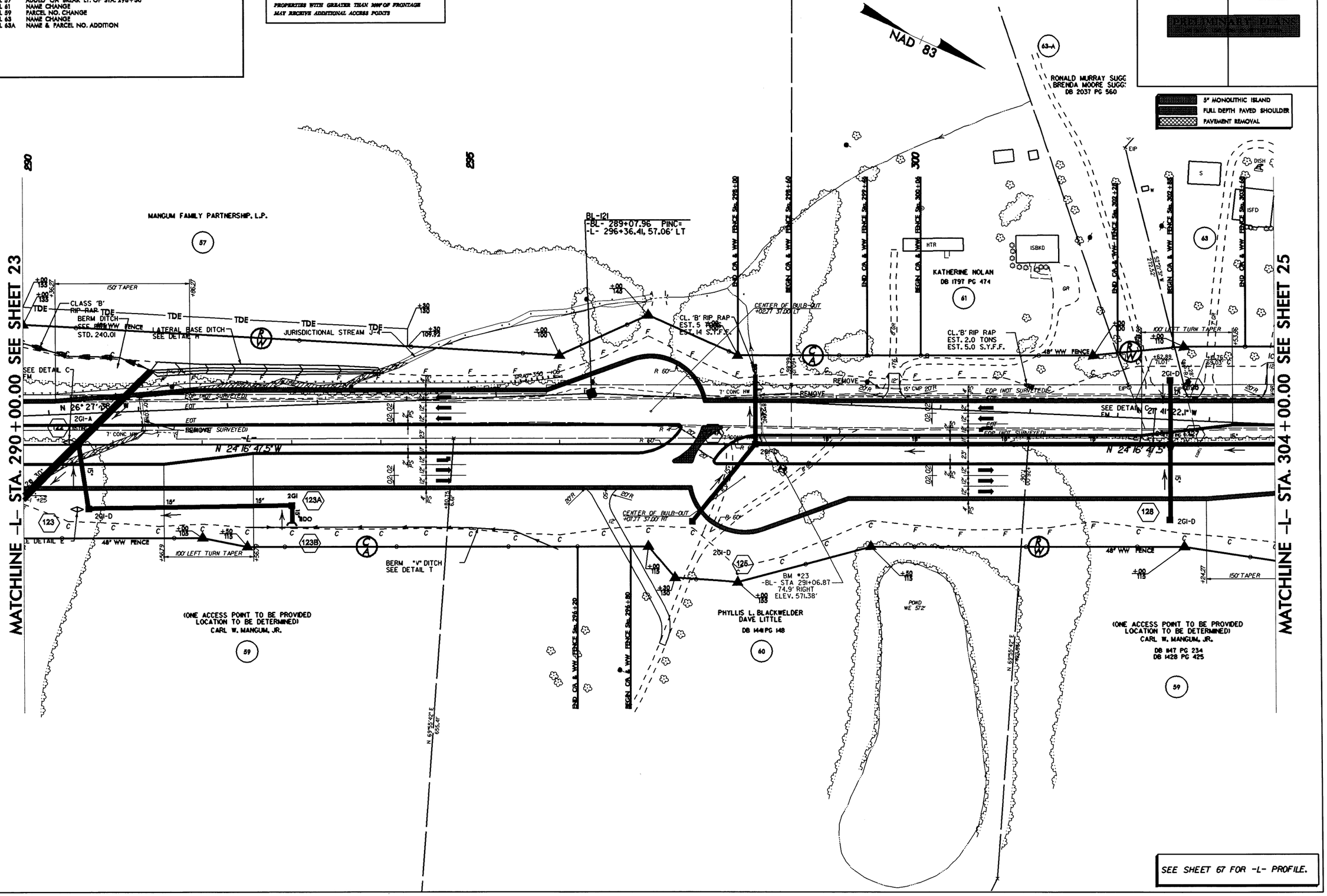
THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

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

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 33624
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 AAB	24
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS	

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



SEE SHEET 67 FOR -L- PROFILE.

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8/17/99

REVISIONS

32406
PARCEL 63 NAME CHANGE & PROP. LINE ADDITION

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

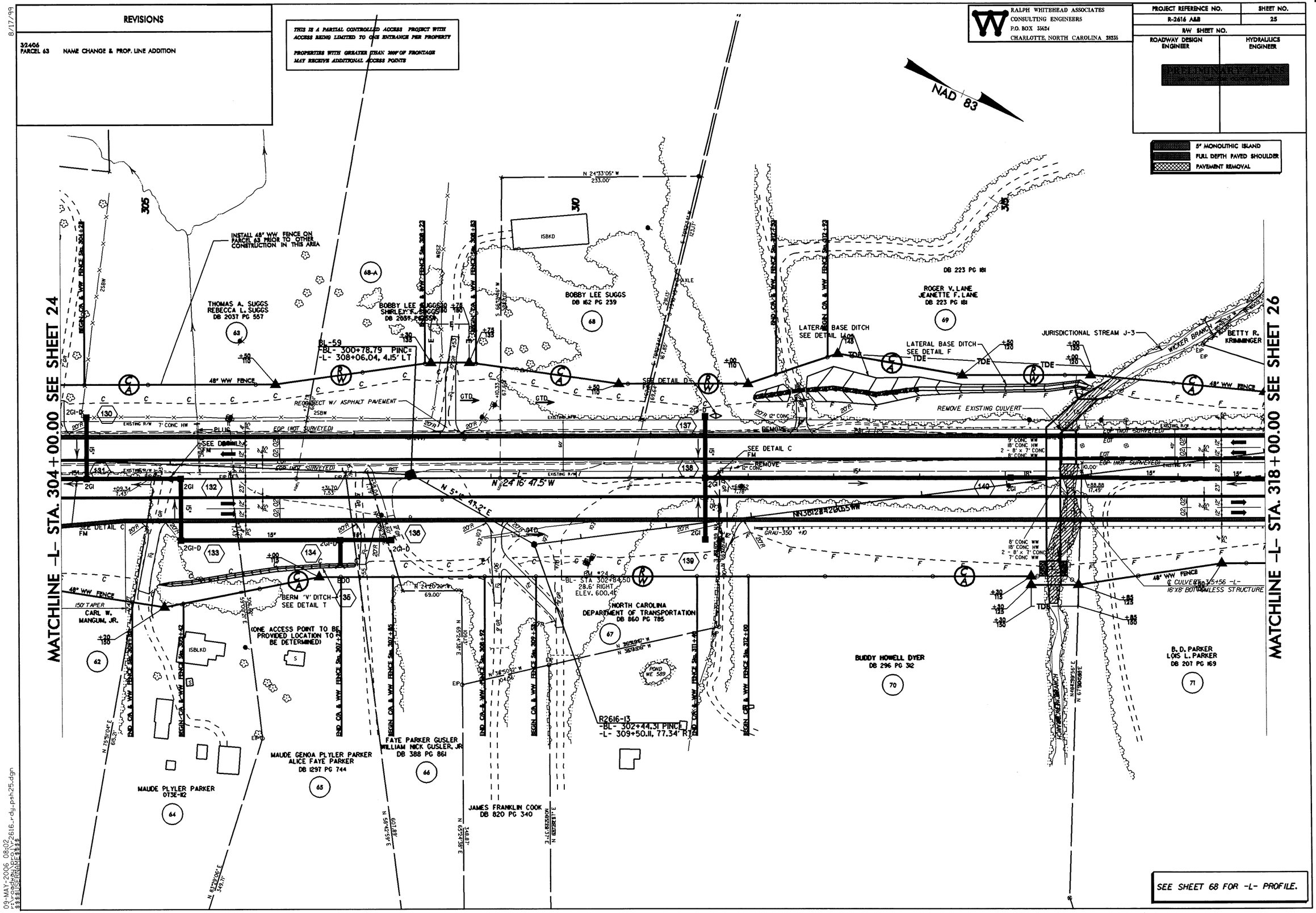
PROPERTIES WITH GREATER THAN 2000' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

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

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

PRELIMINARY PLANS

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



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8/17/99

REVISIONS

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.	SHEET NO.
R-2616 A&B	26
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS	

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

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-61
-BL- 318+62.82 PINC=
-L- 325+59.93, 55.28' LT

BL-54
-BL- 248+62.02 PINC =
-BY6- 5+00.00 POT=
-BY7- 12+59.19 POT=
-L- 329+47.57, 64.45' LT

BL-60
-BL- 313+64.37 PINC=
-L- 320+61.53, 61.6' 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- POT Sta. 329+39.03 =
-Y9- POT Sta. 10+00.00

-L- POT Sta. 329+44.76 =
-Y8- POT Sta. 10+00.00

BETTY R. KRIMMINGER
DB 188 PG 629
72

DARREN N. KRIMMINGER
DB 801 PG 488
74

C. RICHARD ROWELL
DB 382 PG 265
DB 464 PG 556
76

SARA HINSON HELMS
DB 263 PG 134
187

ALBERT M. HINSON
MAME P. HINSON
79

B. D. PARKER
LOIS L. PARKER
DB 207 PG 169
71

JOHNNY MITCHELL STARNES
JANET P. STARNES
DB 332 PG 242
73

JANE ANNETTE AUTRY ARMSTRONG
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
75

JANE ANNETTE AUTRY ARMSTRONG
(ONE ACCESS POINT TO BE PROVIDED LOCATION TO BE DETERMINED)
77

78

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'

POND
WE 584'

CENTER OF BULB-OUT
+00.00 37.00' RT

100' LEFT TURN TAPER

RECONNECT W/ ASPHALT PAVEMENT

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.

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

(ONE ACCESS POINT TO BE PROVIDED LOCATION TO BE DETERMINED)
EST. 14 S.Y.F.F.

LATERAL BASE DITCH
SEE DETAIL G

END CONSTRUCTION
-Y9- POT Sta. 14+75.00

13+50.00
END WW FENCE & C/A

13+50.00
BEGIN WW FENCE & C/A

SEE DETAIL C
FM

SEE DETAIL D
FL

TOE PROTECTION
SEE DETAIL B

BEGIN WW FENCE & C/A

48" WW FENCE

REMOVE

N 23° 33' 10.4" W

N 25° 38' 06.7" W

N 88° 03' 28.0" E

US 601
-Y8- & -Y9- TRAFFIC VOLUMES

US 601
112/122
114/124
MCMANUS CIRCLE RD
SR 1810
GRIFFIN CEMETERY RD
SR 1811
55/110
2002/2025 ADT IN HUNDREDS

SEE SHEET 69 FOR -L- PROFILE.
SEE SHEET 89 FOR -Y8- PROFILE.
SEE SHEET 91 FOR -Y9- PROFILE.

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8/17/99

REVISIONS

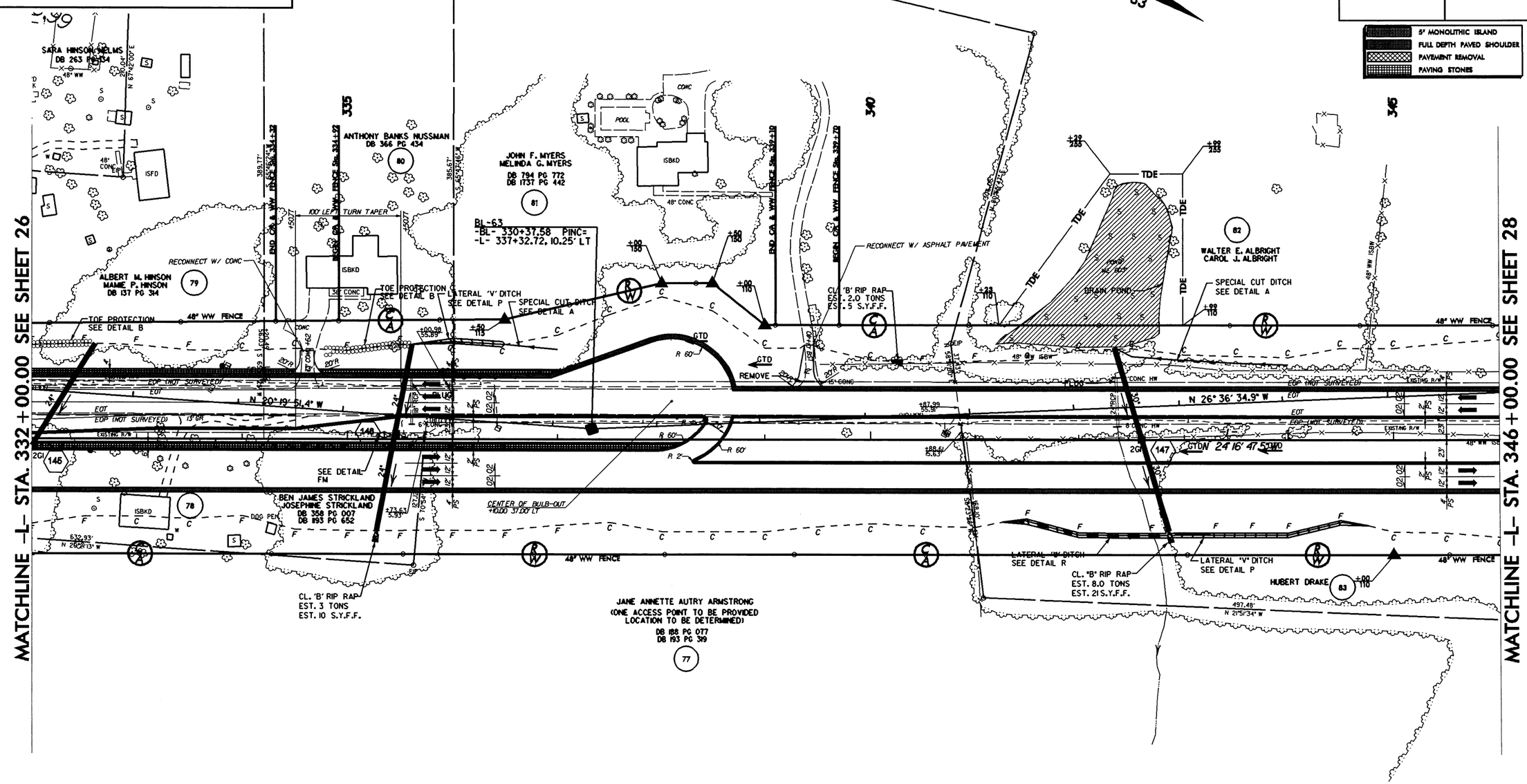
RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235

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

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

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



SEE SHEET 70 FOR -L- PROFILE.

03-MAY-2006 08:03
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REVISIONS

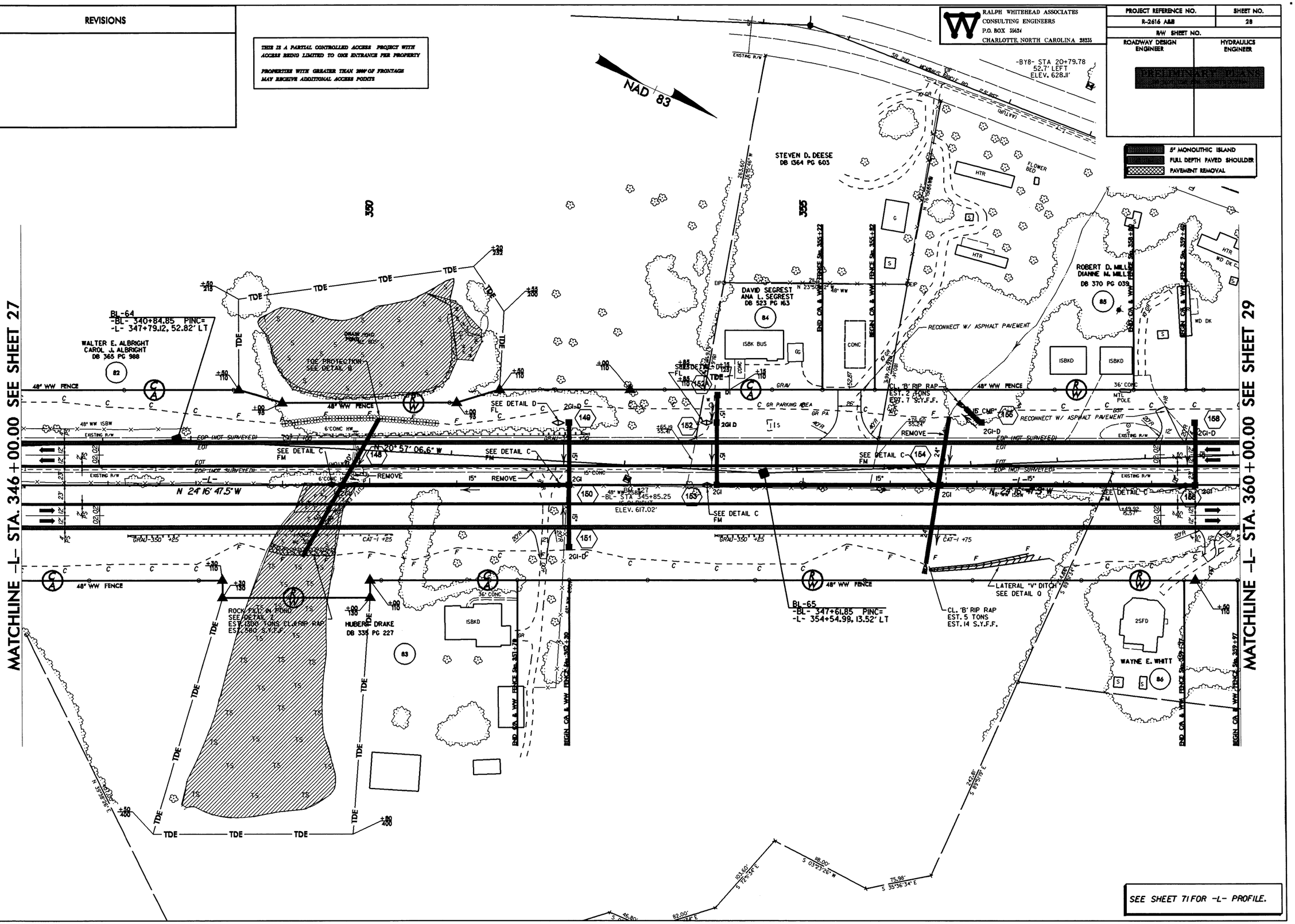
THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

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	28
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS	

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



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REVISIONS
32406 PARCEL 91 NAME CHANGE PARCEL 92 NAME CHANGE

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

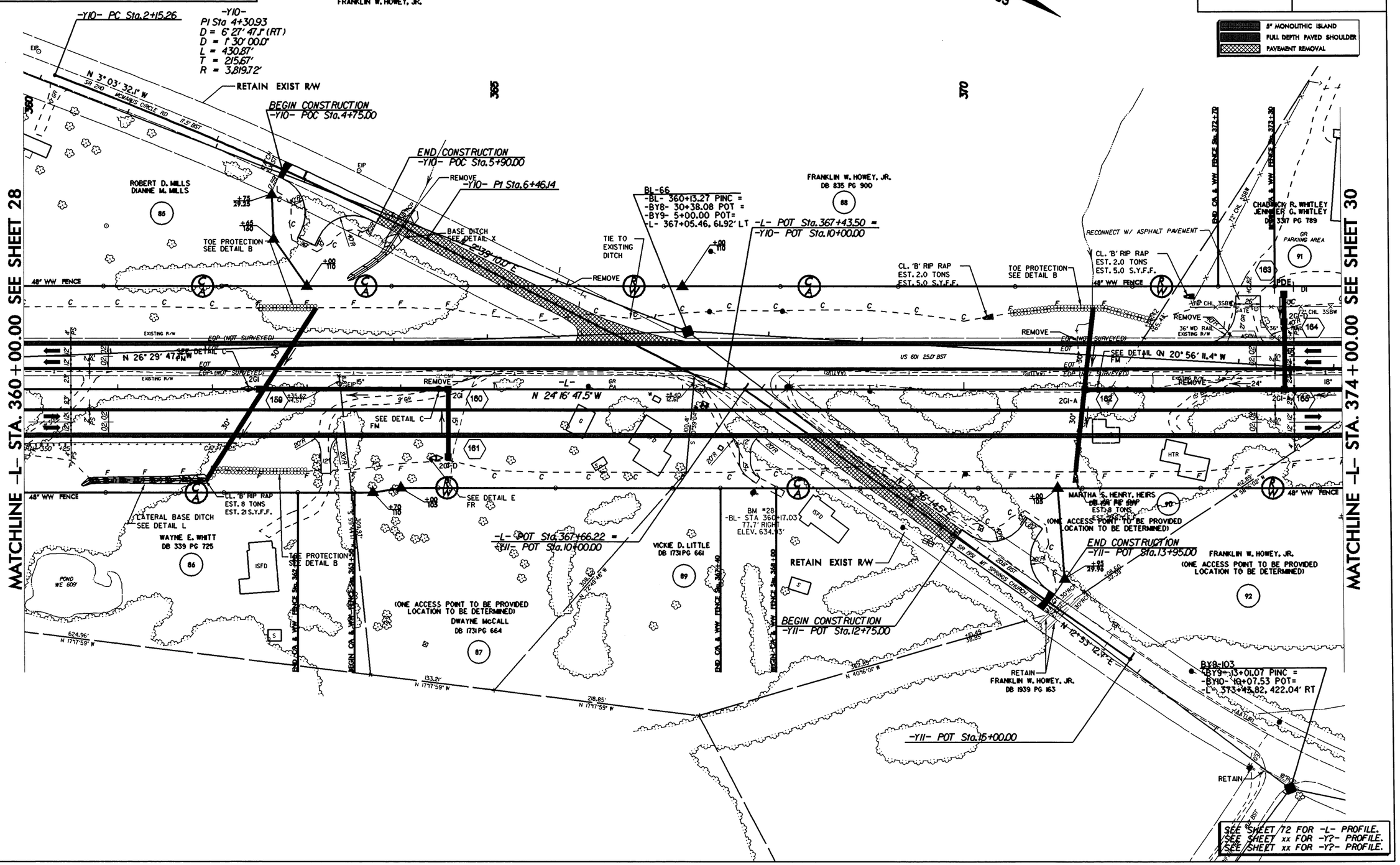
PROPERTIES WITH GREATER THAN 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 33624
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

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



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8/17/99

8/17/99

REVISIONS

3/2406
PARCEL 91 NAME CHANGE
PARCEL 92A NAME CHANGE, ADDITIONAL PROP. LINE, & ADDED C/A BREAK

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

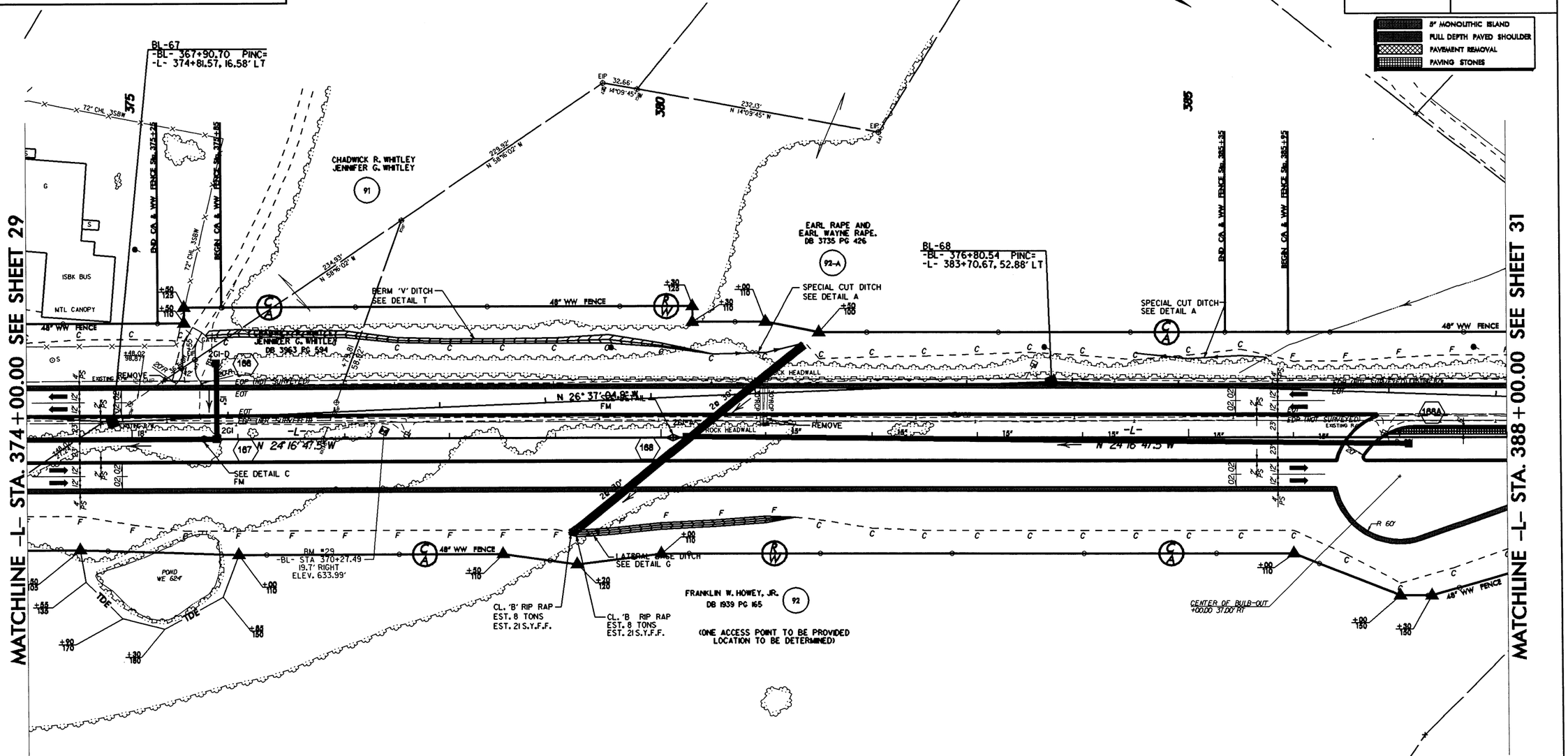
PROPERTIES WITH GREATER THAN 300' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

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

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

PRELIMINARY PLANS

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



SEE SHEET 73 FOR -L- PROFILE.

09-MAY-2006 08:03
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8/17/99

REVISIONS	
3/24/06 PARCEL 93	ADDED C/A BREAK

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

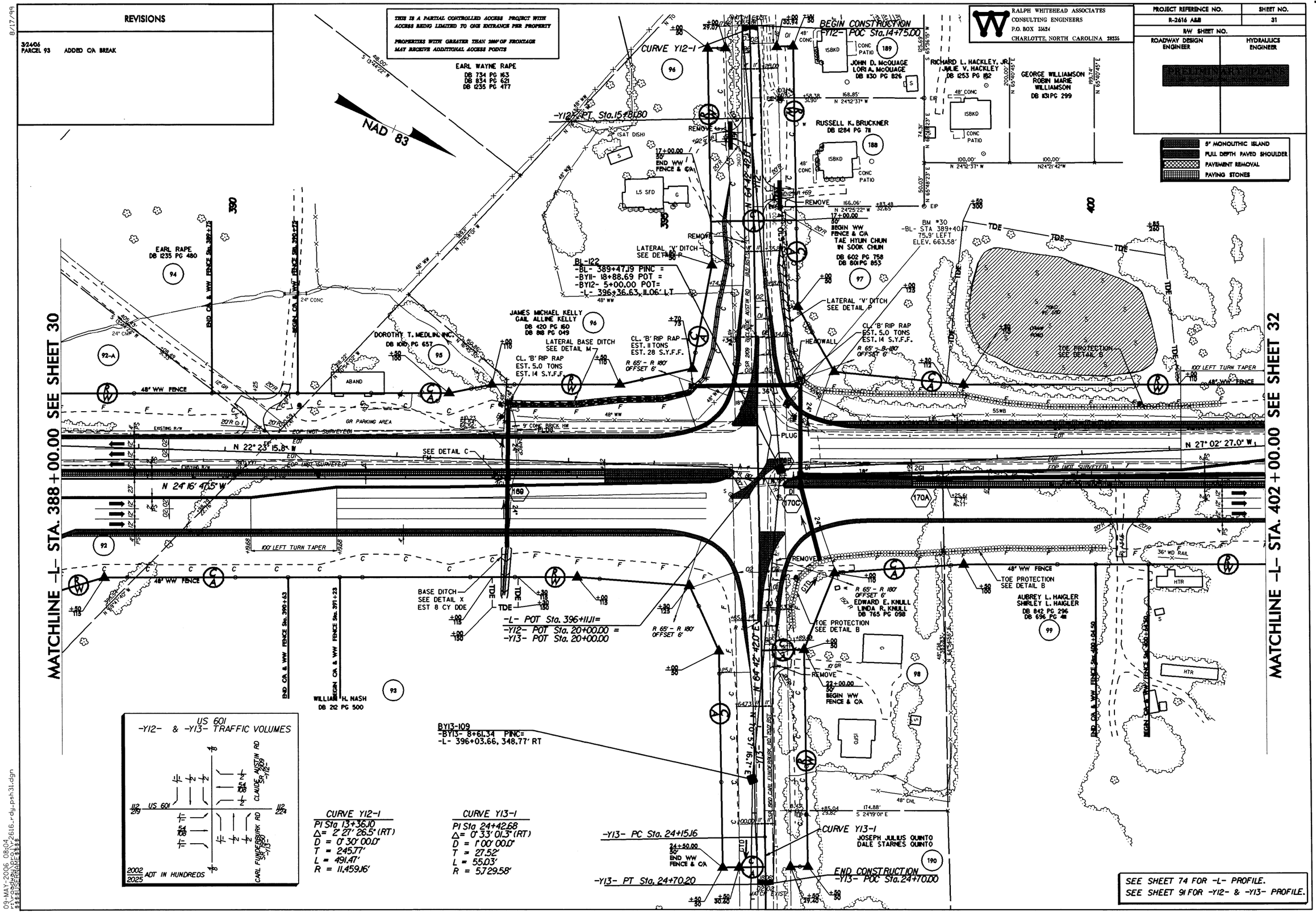
PROPERTIES WITH GREATER THAN 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

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

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	31
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS

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



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REVISIONS
3/24/06 PARCEL 100 NAME CHANGE PARCEL 100A NEW NAME & ADDITIONAL PROP. LINE

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 33654
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

NOTE TO CONTRACTOR:
THIS WELL IS REQUIRED TO BE PROTECTED FROM DAMAGES BY ANY CONSTRUCTION ACTIVITIES

NAD 83

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

MATCHLINE -L- STA. 402+00.00 SEE SHEET 31

MATCHLINE -L- STA. 416+00.00 SEE SHEET 33

-L- PC Sta. 403+04.84

BL-70
-BL- 400+59.82 PINC=
-L- 407+48.77, 61.79' LT

-L- PT Sta. 409+14.67

BL-71
-BL- 405+16.91 PINC=
-L- 412+02.16, 1.78' LT

TAE HYUN CHUN
IN SOOK CHUN
97

ALH SERVICES
DB 3022 PG 250
100

JIM L. STEGALL
CYNTHIA H. STEGALL
DB 2061 PG 279
410

ALAN FISHER
ROBBIE FISHER
DB 355 PG 295
102

CROWN ATLANTIC COMPANY, LLC
DB 1276 PG 210
104

MICHAEL J. HUBBARD
094E-386
(ACCESS TO BE PROVIDED)
106

AUBREY L. HAIGLER
SHIRLEY L. HAIGLER
99

CYNTHIA C. ZIPP, TRUSTEE UNDER
THE GREEN MOUNTAIN TRUST
DB 545 PG 810
101

JOHNNY A. BEAVER
SUSAN H. BEAVER
DB 364 PG 241
DB 555 PG 107
DB 572 PG 325
103

(ONE ACCESS POINT TO BE PROVIDED LOCATION TO BE DETERMINED)
BILLY G. BEAVER
DORIS JEAN C. BEAVER
DB 139 PG 201
105

107

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

CURVE L-11
PI Sta 406+09.76
Δ= 1° 00' 59.0" (LT)
D = 0° 10' 00.0"
T = 304.92'
L = 609.83'
R = 34,377.41'
SE = NC

SEE SHEET 75 FOR -L- PROFILE.

8/17/95

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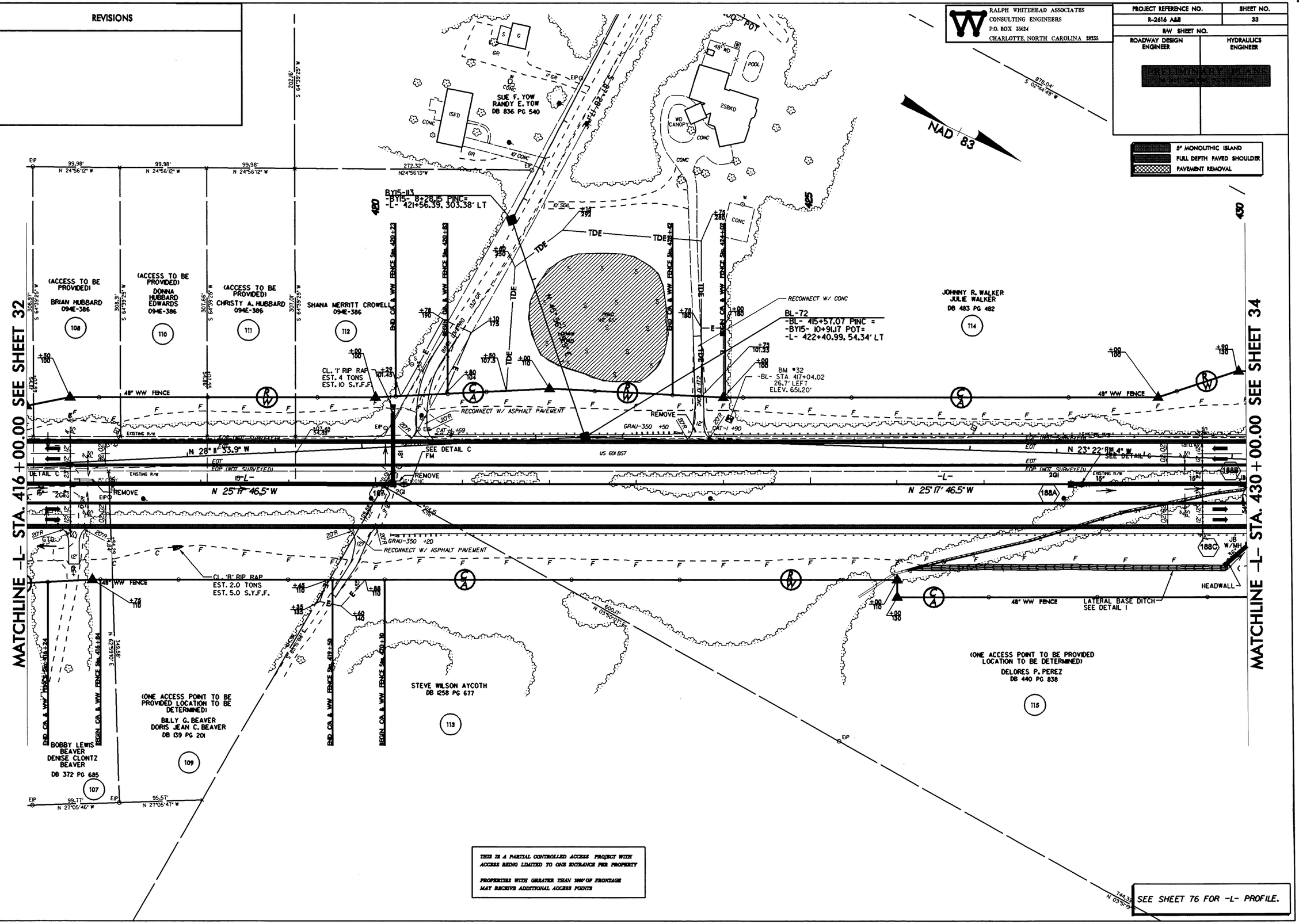
8/17/99

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	

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 300' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

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REVISIONS

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

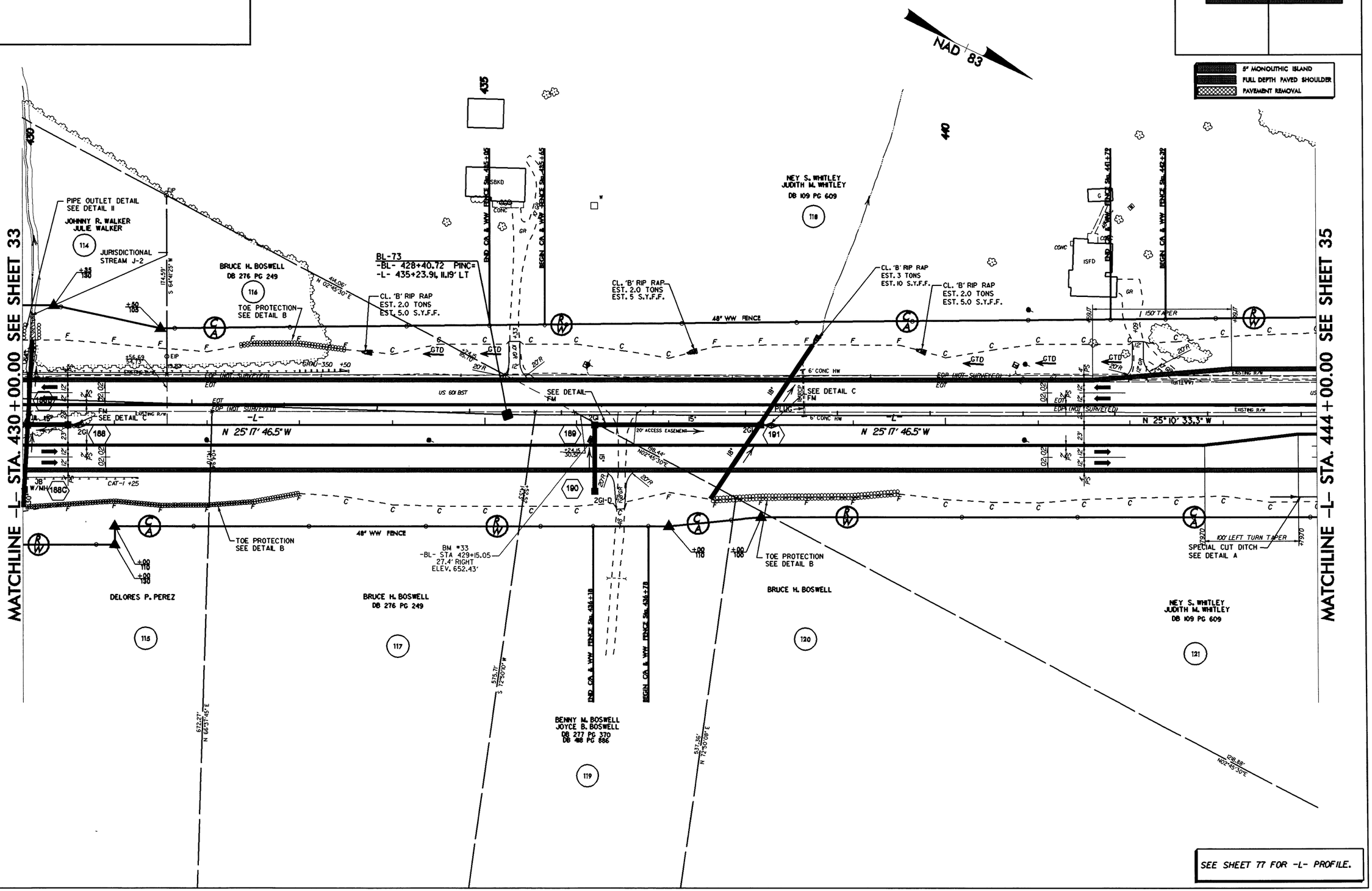
PROPERTIES WITH GREATER THAN 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

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

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



SEE SHEET 77 FOR -L- PROFILE.

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8/17/95

8/17/99

REVISIONS

32406
PARCEL 121 REDUCED R/W AT -Y14-
PARCEL 122 REDUCED R/W AND C/A AT -Y14-
PARCEL 191 REDUCED R/W AND C/A AT -Y14-
PARCEL 123 ADDED C/A BREAK
ELIMINATED PROPOSED CROSS DRAIN PIPE AT -Y14- STA. 13+70

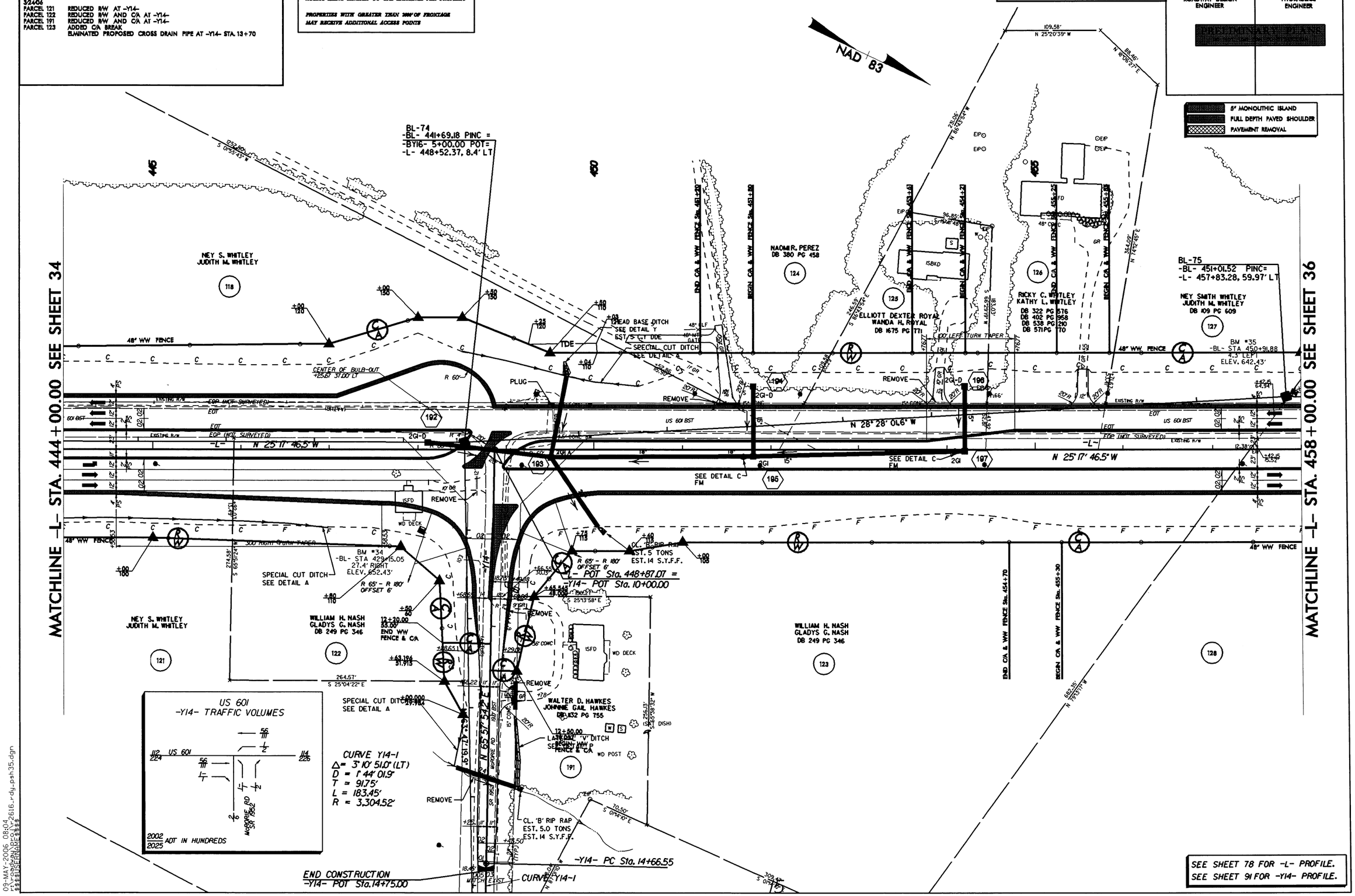
THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

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

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 33624
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	

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



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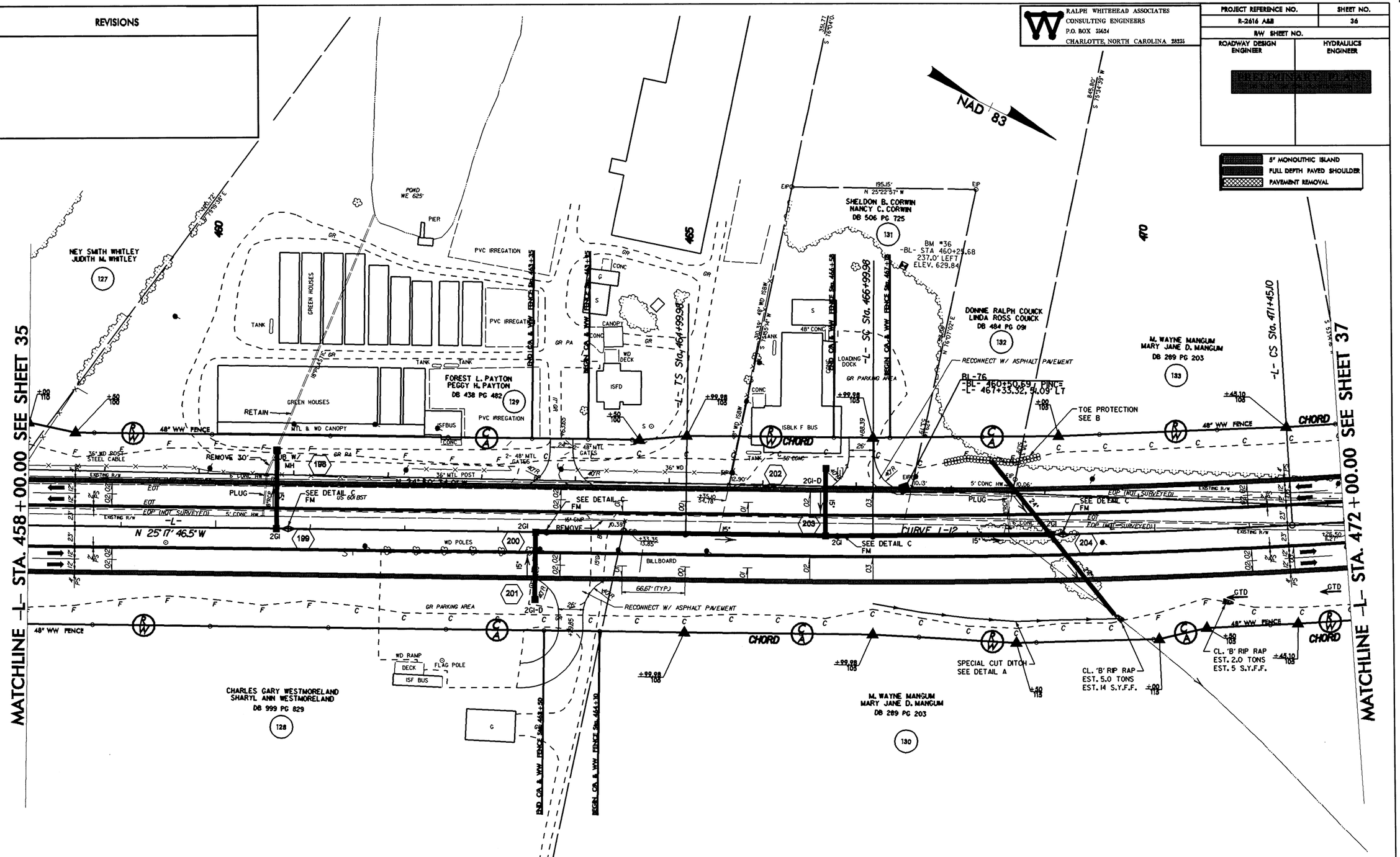
8/17/99

REVISIONS

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

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

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 300' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

SEE SHEET 79 FOR -L- PROFILE.

03-MAY-2006 08:04
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8/17/99

REVISIONS
3/2406 PARCEL 136A ADDITIONAL NAME & PROP. LINE

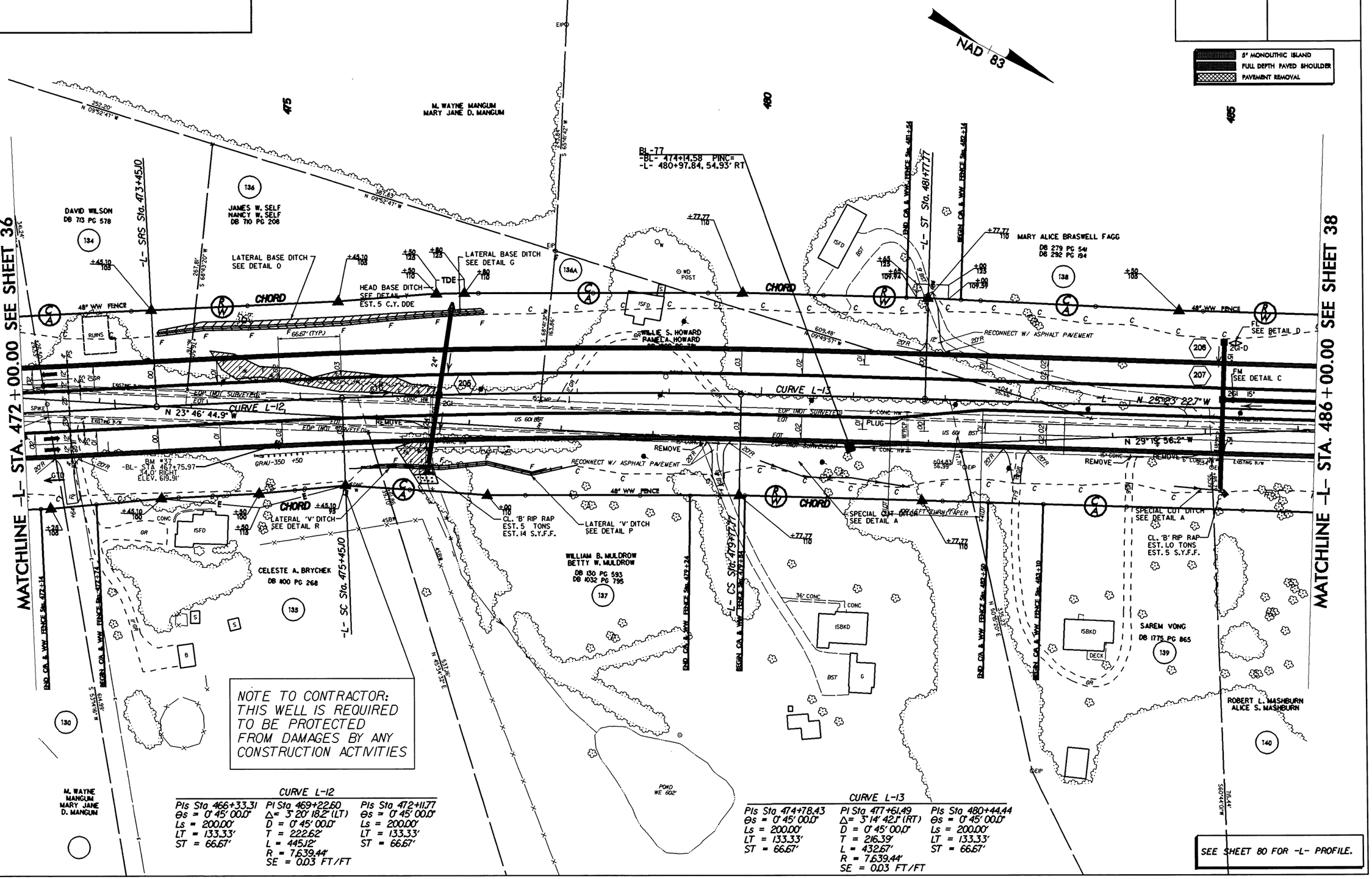
THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE ENTRANCE PER PROPERTY

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	37
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS	

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	

CURVE L-13

PIs Sta 474+78.43	PI Sta 477+61.49	PIs Sta 480+44.44
θs = 0° 45' 00.0"	Δ= 3° 14' 42.5" (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	

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8/17/99

REVISIONS

32406
PARCEL 138 PARCEL NO. CHANGE
PARCEL 142 NAME CHANGE

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

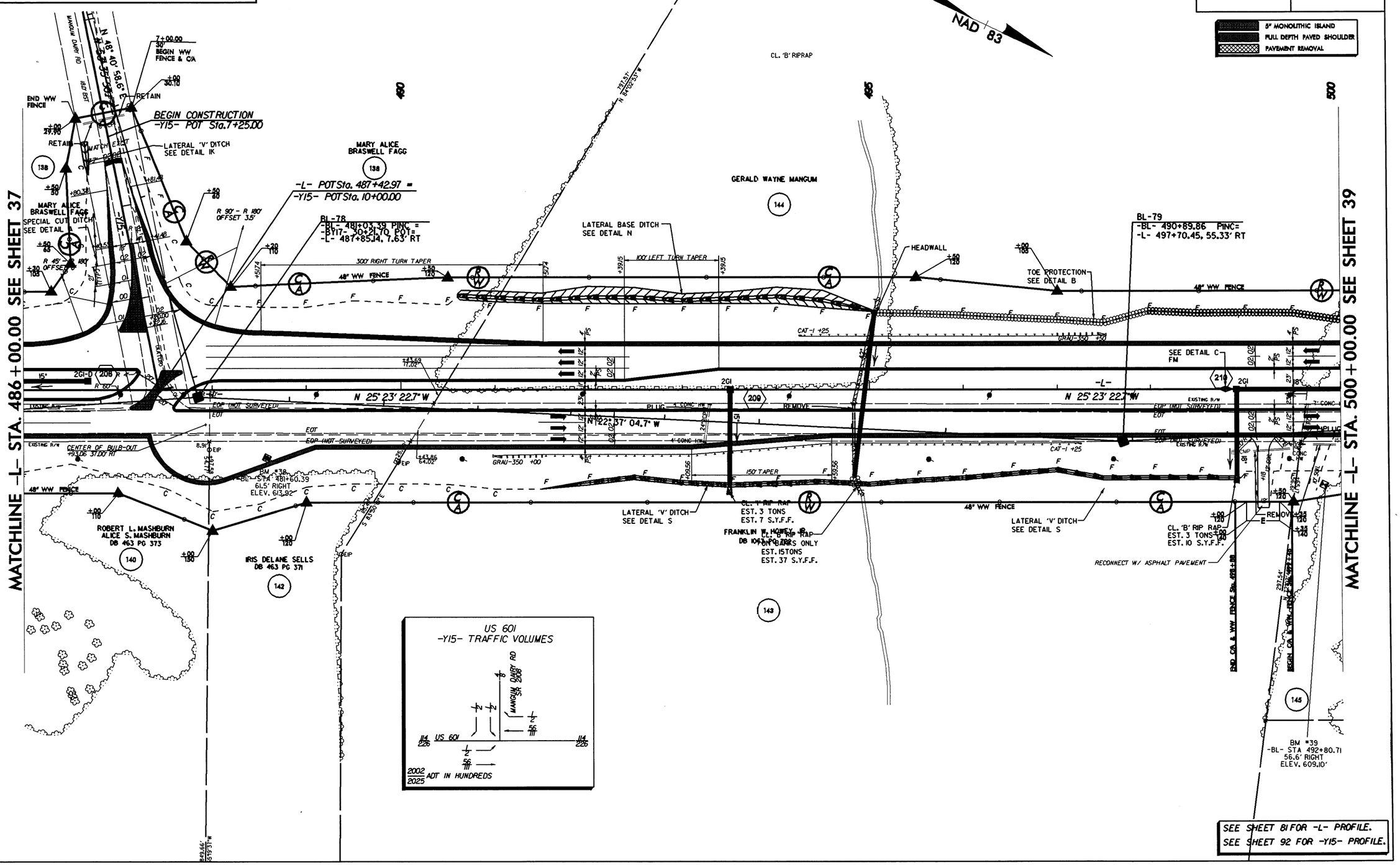
PROPERTIES WITH GREATER THAN 2000' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

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

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

PRELIMINARY PLANS

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



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8/17/99

REVISIONS
32406 PARCEL 192 NAME CHANGE

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

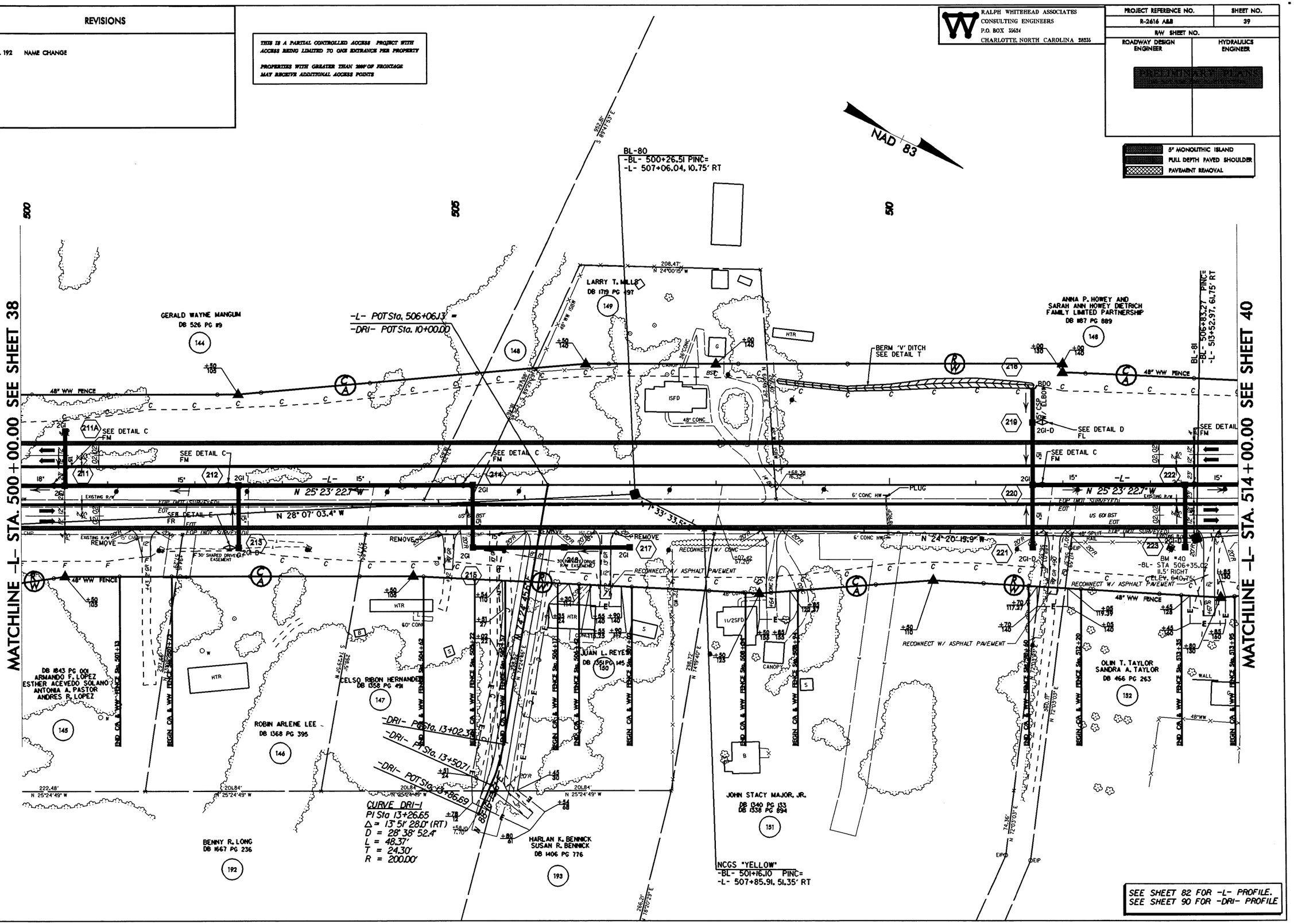
PROPERTIES WITH GREATER THAN 2000' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

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

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

PRELIMINARY PLANS

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



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

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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	40
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY	

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 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

NAD 83

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

BEGIN CONSTRUCTION
-Y16- POT Sta. 5+00.00

-Y16- PC Sta. 6+23.85

BY18-115
-BY18- 7+76.98 PINC =
-Y16- 6+48.05, 11.96' LT

-Y16- PT Sta. 8+73.74

-L- POT Sta. 520+22.06 =
-Y16- POT Sta. 10+00.00

BL-82
-BL- 513+78.34 PINC
-BY18- 11+46.58 POT =
-L- 520+46.22, 11.39' RT

MATCHLINE -L- STA. 514+00.00 SEE SHEET 39

MATCHLINE -L- STA. 528+00.00 SEE SHEET 41

KENNETH M. BROWN
SUE H. BROWN
DB 377 PG 818

ALICE B. FREEMAN
DB 156 PG 435

ANNA P. HOWEY AND
SARAH ANN HOWEY DIETRICH
FAMILY LIMITED PARTNERSHIP

MARCIE G. EUDY
DB 294 PG 289

GREGORY S. OGLESBY
RENE M. OGLESBY
DB 774 PG 660

PARKS P. MANGUM, JR.
ANN B. MANGUM
DB 364 PG 460

OLIN T. TAYLOR
SANDRA A. TAYLOR

WILMETH RAY WATSON
MARY A. WATSON
DB 984 PG 721

RECONNECT W/ ASPHALT PAVEMENT

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

CL. 'I' RIP RAP
EST. 4.0 TONS
EST. 10 S.Y.F.F.

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

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

SPECIAL CUT DITCH
SEE DETAIL A

TOE PROTECTION
SEE DETAIL B
SEE DETAIL D

SEE DETAIL FM

SEE DETAIL C FM

INSTALL 48" WW FENCE ON PARCEL 156 PRIOR TO OTHER CONSTRUCTION IN THIS AREA

300' RIGHT TURN TAPER

US 601
-Y16- TRAFFIC VOLUMES

2002 / 2025 ADT IN HUNDREDS

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

09-MAY-2006 08:05
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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
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS	

5

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 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

NAD 83

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

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

BL-83
-BL- 530+38.89 PINC=
-L- 530+25.35, 56.08' RT

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

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

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

JURISDICTIONAL STREAM J-1

PIPE CHANNEL OUTLET SEE DETAIL II
RIP RAP ON BANKS ONLY

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

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

SPECIAL CUT DITCH
SEE DETAIL A

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

TOE PROTECTION
SEE DETAIL B

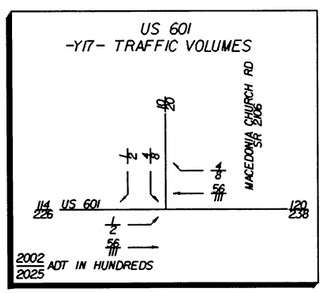
BEGIN WW FENCE & C/A
END WW FENCE & C/A

BEGIN CA & WW FENCE Sta. 531+41
END CA & WW FENCE Sta. 531+41
BEGIN CA & WW FENCE Sta. 532+40
END CA & WW FENCE Sta. 528+58
BEGIN CA & WW FENCE Sta. 529+18
END CA & WW FENCE Sta. 534+45
BEGIN CA & WW FENCE Sta. 535+25

48" WW FENCE

SEE DETAIL C FM
SEE DETAIL E FR
SEE DETAIL K FM

REMOVE
PLUG
HEADWALL
CENTER OF CULDE-SAC
EXISTING R/W
EOP (NOT SURVEYED)
US 601 BST
N 29° 29' 48.3" W
N 25° 23' 22.7" W
N 43° 37' 18.5" E
N 46° 02' 53.9" E



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

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8/17/99

REVISIONS
32406 PARCEL 171A PARCEL NO. ADDITION

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

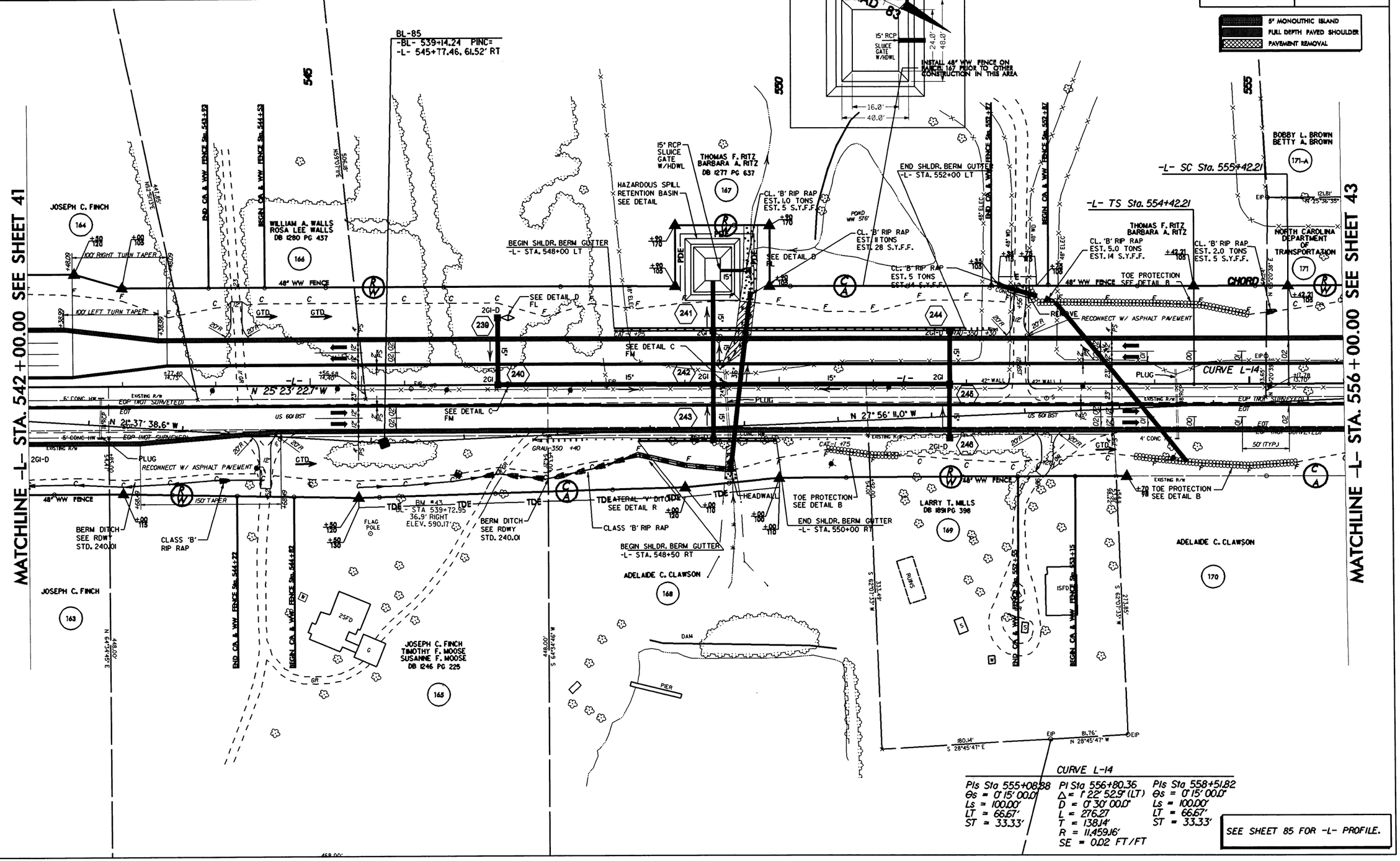
PROPERTIES WITH GREATER THAN 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

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

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

PRELIMINARY PLANS

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



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8/17/99

REVISIONS
3/2406 PARCEL 171A PARCEL NO. ADDITION

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

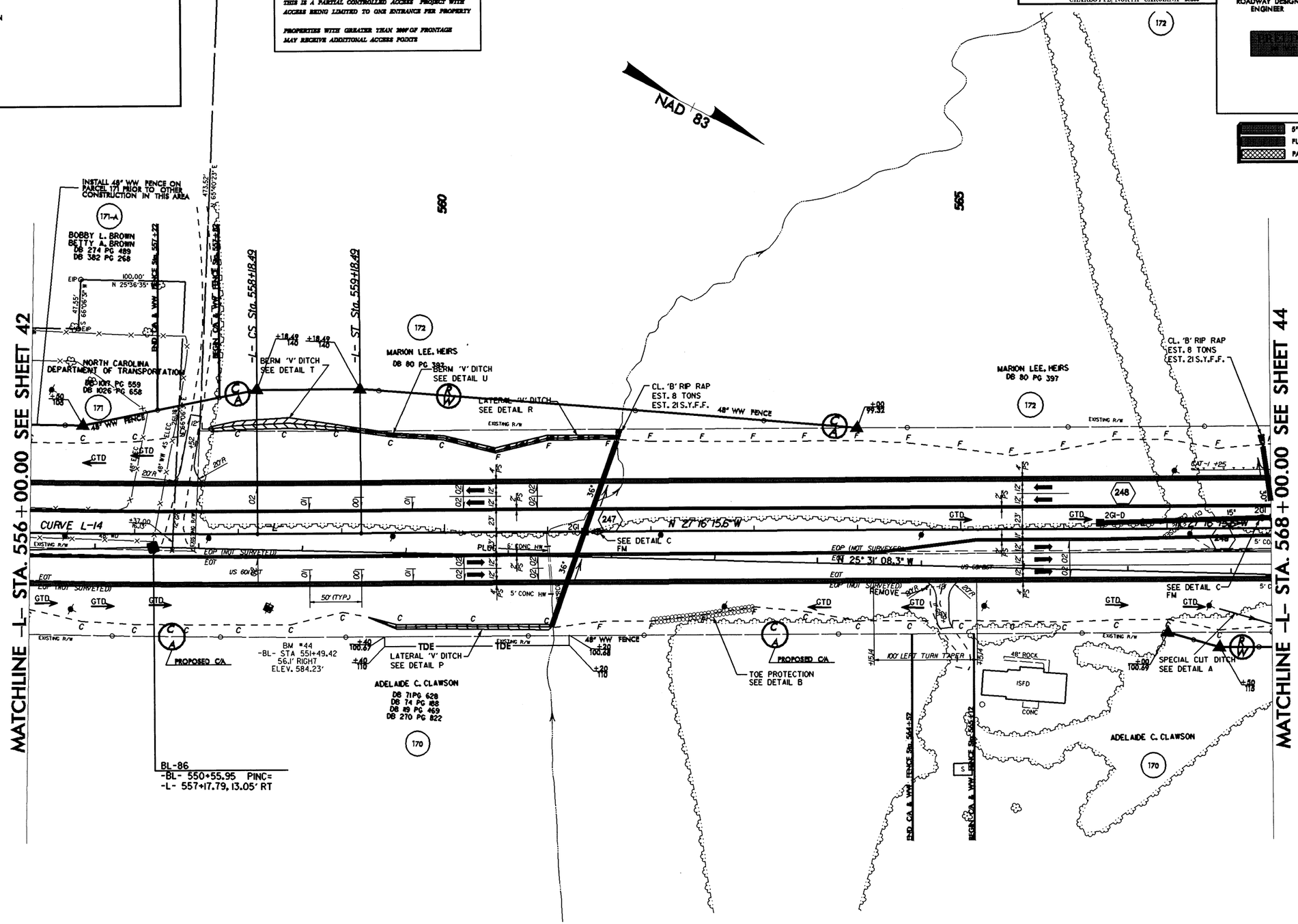
PROPERTIES WITH GREATER THAN 200' OF FRONTAGE MAY RECEIVE ADDITIONAL ACCESS POINTS

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

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 86 FOR -L- PROFILE.

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8/17/99

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P.O. BOX 33624
CHARLOTTE, NORTH CAROLINA 28235

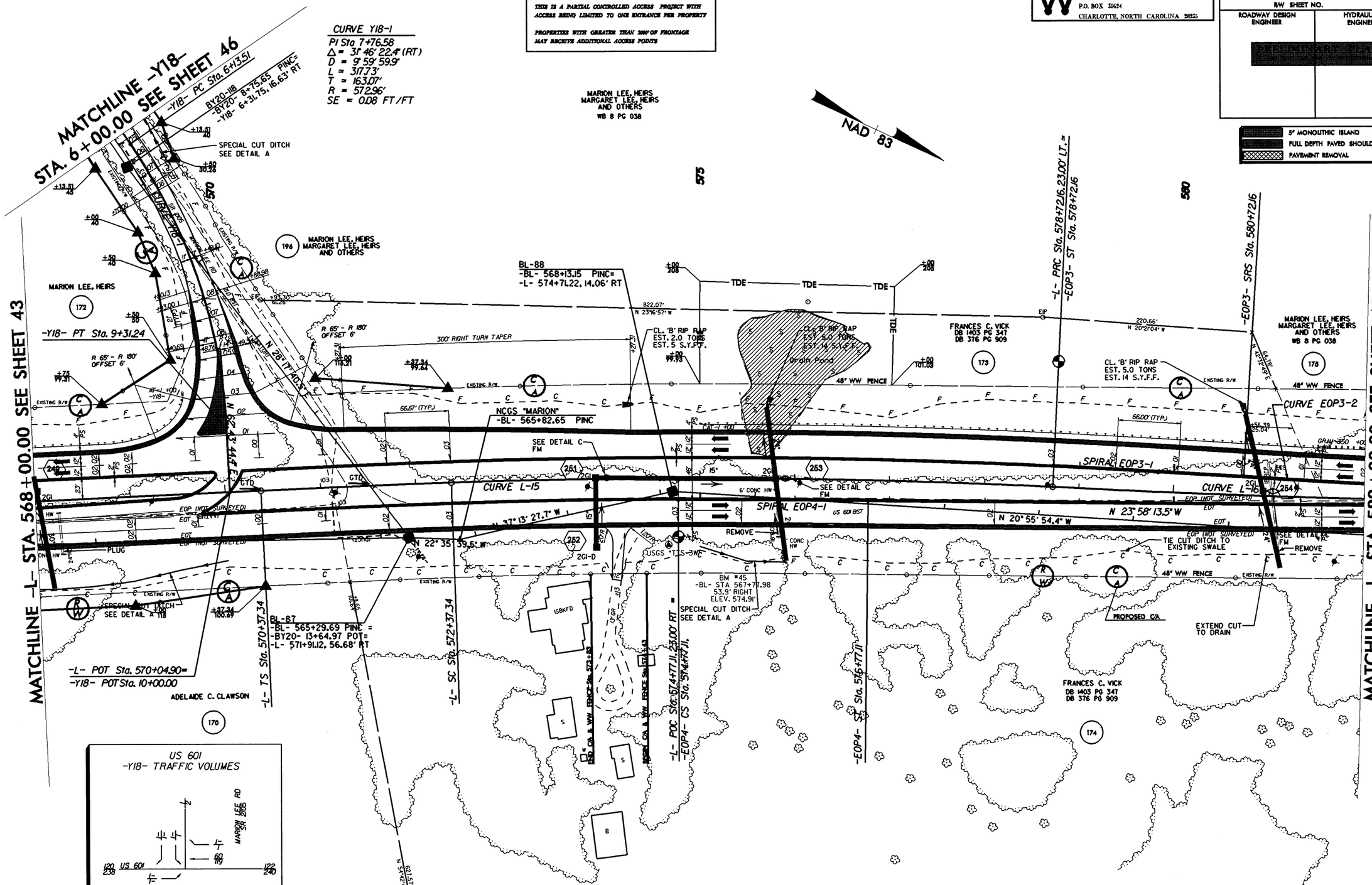
PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	44
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS

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

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



CURVE L-15	SPIRAL EOP4-1	CURVE L-16	SPIRAL EOP3-1	CURVE EOP3-2	
PIs Sta 571+70.67	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
Θs = 0° 45' 00.0"	Θs = 0° 45' 08.2"	Δ = 2° 24' 07.5" (LT)	Θs = 0° 44' 51.9"	Θs = 0° 19' 30.0"	Δ = 2° 18' 30.1" (LT)
Ls = 200.00'	Ls = 200.00'	D = 0° 30' 00.0"	Ls = 200.00'	Ls = 130.00'	D = 0° 30' 00.0"
LT = 133.33'	LT = 133.33'	T = 240.24'	LT = 133.33'	LT = 86.67'	L = 461.67'
ST = 66.67'	ST = 66.67'	L = 480.42'	ST = 66.67'	ST = 43.33'	T = 230.87'
Δ = 4° 57' 09.5" (RT)		R = 11,459.16'			R = 11,459.16'
D = 0° 45' 00.0"					SE = 0.02 FT/FT
T = 330.38'					Ls = 130.00'
L = 660.35'					LT = 86.67'
R = 7,639.44'					ST = 43.33'
SE = 0.03 FT/FT					

SEE SHEET 87 FOR -L- PROFILE.
SEE SHEET 92 FOR -Y18- PROFILE.

REVISIONS

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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
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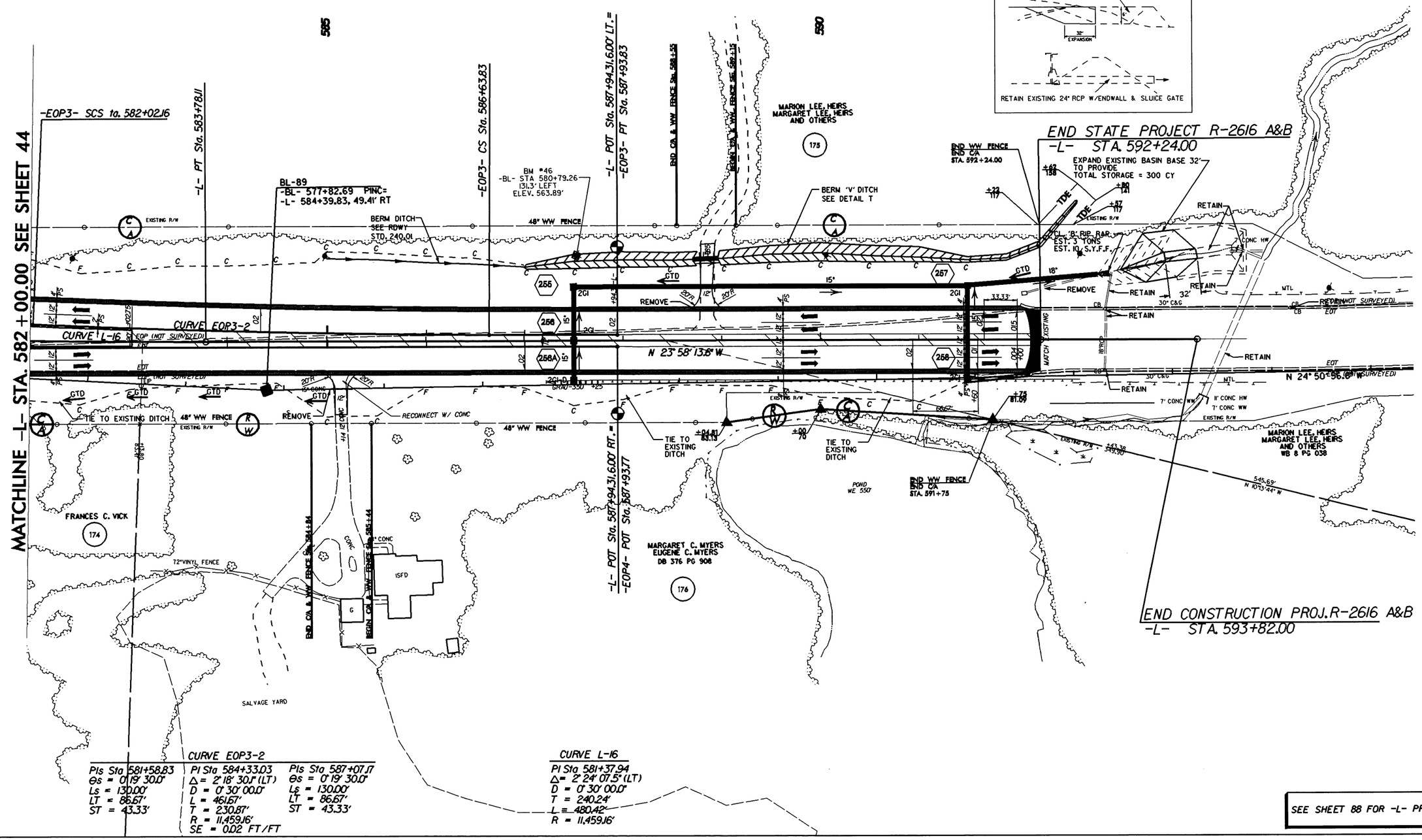
CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2616 A&B	45
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS	

5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



CURVE EOP3-2

PIs Sta 581+58.83	PI Sta 584+33.03	PIs Sta 587+07.11
θs = 0°19' 30.0"	Δ = 2°18' 30.0" (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'	
	SE = 0.02 FT/FT	

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.

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

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

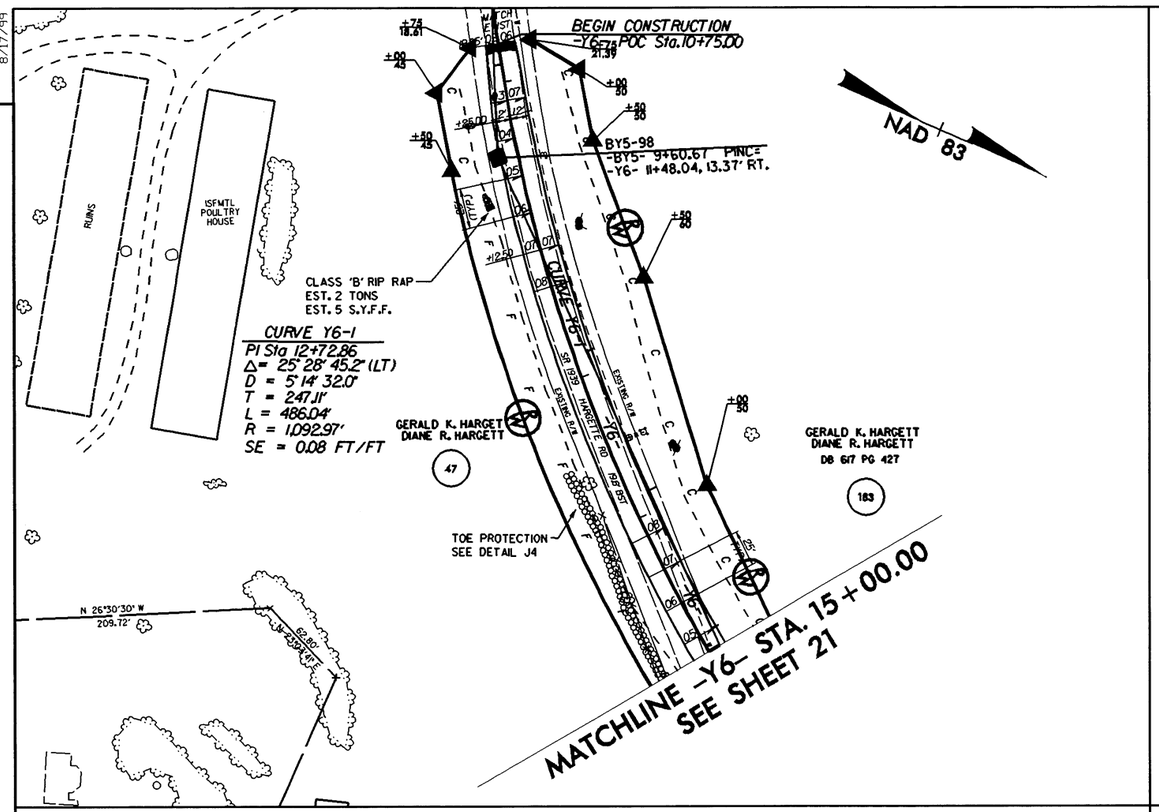
PRELIMINARY PLANS

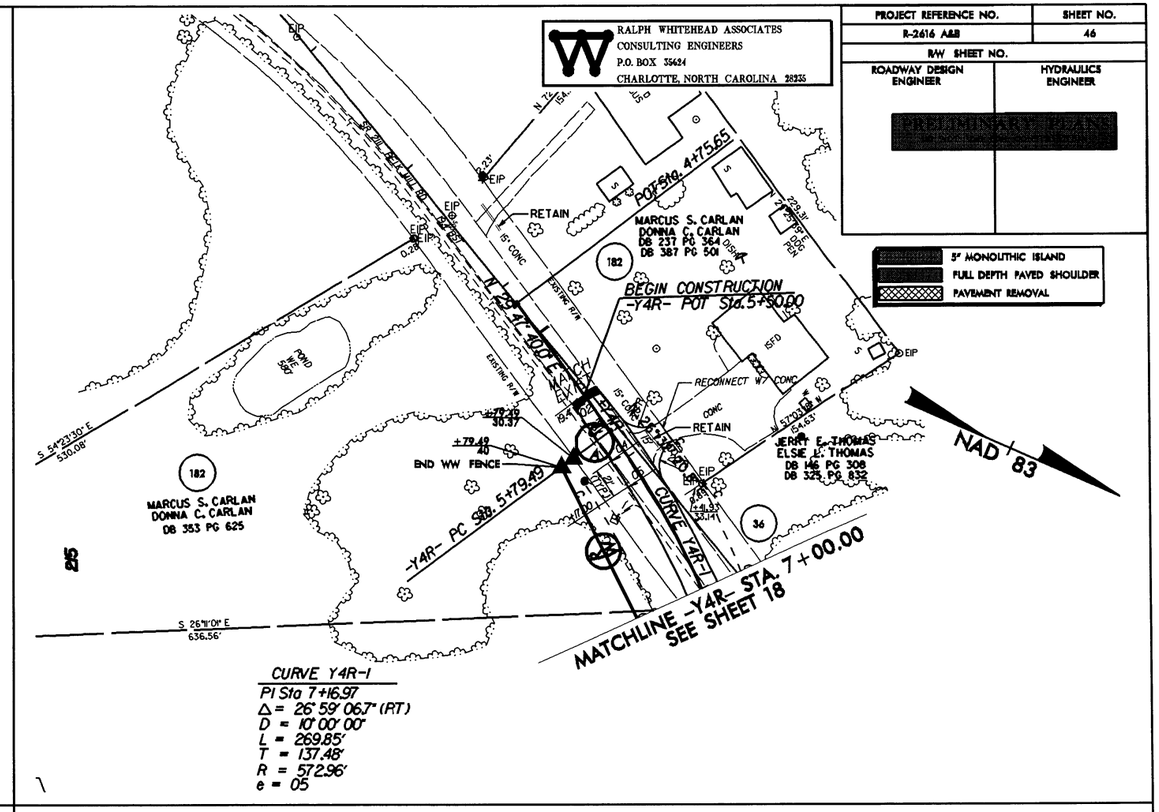
5" MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

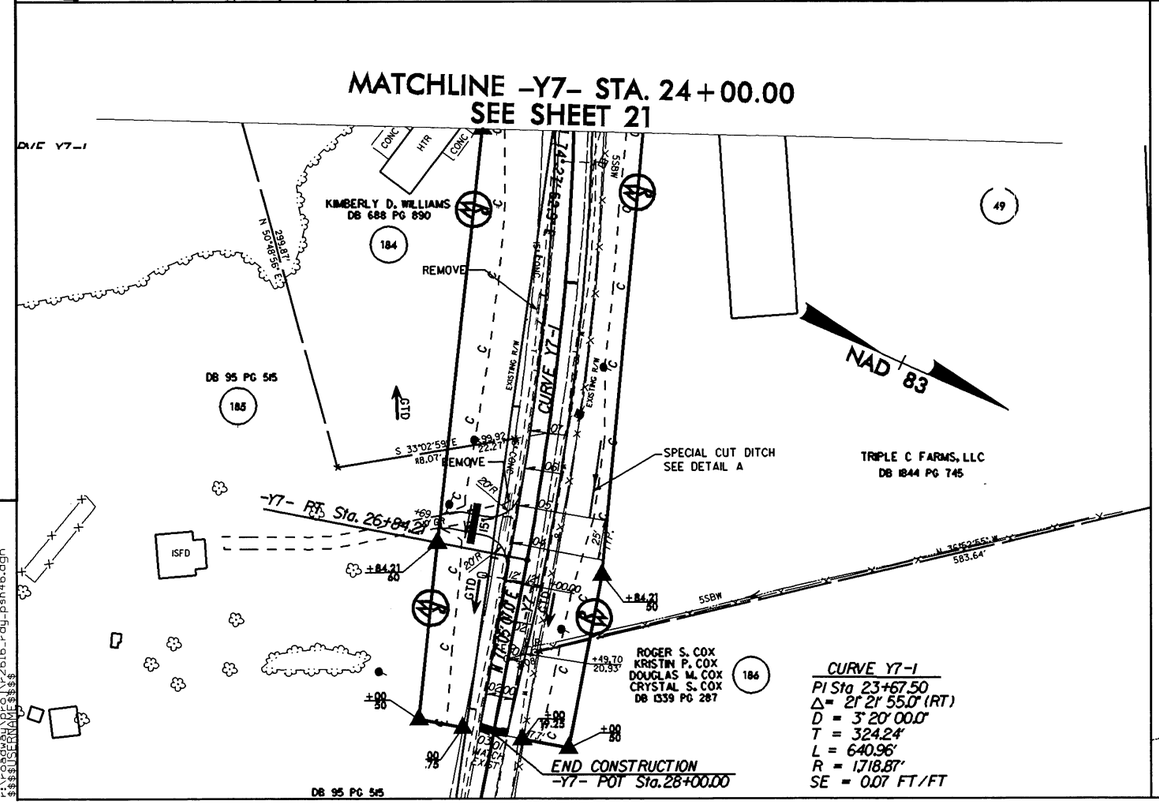
8/17/99

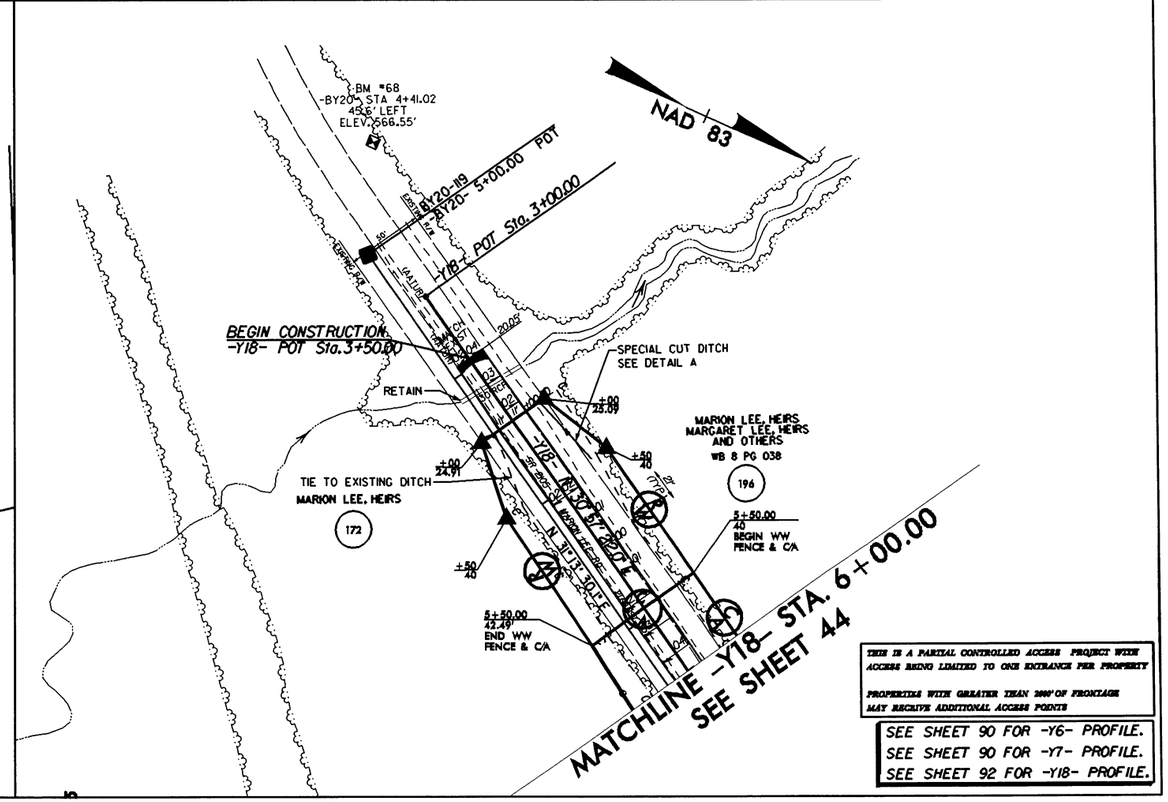
REVISIONS

4-26-04 REMOVED PROP. R/W LINE
PARCEL 36 REMOVED PROP. R/W LINE
PARCEL 182









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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.

09-MAY-2006 08:06
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