STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

January 20, 2012

U. S. Army Corps of Engineers
Raleigh Regulatory Field Office
3331 Heritage Trade Dr., Suite 105
Raleigh, NC 27587

Attn: Mr. Eric Alsmeyer
NCDOT Coordinator

Subject: **Application for Section 404 Individual Permit and Section 401 Water Quality Certification,** US 501 from NC 49 in Roxboro to SR 1602 (Jesse Banks Road) in Person County, Division 5. Federal Aid Project No. STP-501(11), WBS Element No. 34406.2.3, TIP No. R-2241A.

Debit $570.00 from WBS 34406.2.3

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes to improve US 501 to a multilane facility from Roxboro to the Virginia State line. This project has 3 sections, A, B and C. Section A has independent utility from the others so it is being permitted separately. Sections B and C are post-year lets. Section A of this project (4.46 miles) will provide a small amount of widening along NC 49 then will take off on new location until it merges with Halifax Road (SR 1521) and then with US 501 to SR 1602 (Jesse Banks Road). The widening section of NC 49 will be a 5-lane curb and gutter. The new location segment and widening of Halifax Road and US 501 to SR 1602 will be 4-lane divided with a shoulder section. Included in this application package are the following: (1) cover letter, (2) ENG Form 4345, (3) Ecosystem Enhancement Program (EEP) confirmation letter (4) concurrence letter from the North Carolina Department of Cultural Resources, (5) Hydraulic Design and Permit Drawing Review Meetings (CP 4B and 4C) minutes for Section A, (6) Stormwater Management Plan, (7) permit drawings, (8) and half-size roadway plans.

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

TELEPHONE: 919-707-6000
FAX: 919-212-5785

WEBSITE: WWW.NCDOT.ORG

LOCATION:
CENTURY CENTER B
1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610-4328

PURPOSE AND NEED

The purpose and need as stated in the document is still applicable to Section A of this project. The need for the project was to address industrial traffic, separate local and regional traffic and lessen traffic congestion on Madison Boulevard. The purpose of the project was to provide relief to the increased traffic demands along this northern portion of US 501 in Roxboro and to provide an adequate transportation system for the area by completing the "missing link" of this regional system by providing multilane from Roxboro to the Virginia line.

While completing just Section A of the project does not fully address completing the "missing link" of the transportation system from Roxboro to Virginia, it does address the other aspects of the purpose and need. It will still help separate local and regional traffic. With the additional through lanes, it will also still improve safety of the facility by reducing competition between tractor-trailers, passenger cars and school buses.

PROJECT SCHEDULE

This project has been divided into three sections, Section A, B and C. This permit application only covers Section A. Sections B and C are scheduled to let post-year. Section A is scheduled to let November 12, 2012 with a review date of October 2, 2012. However, the project may be accelerated if additional funds become available. NCDOT will submit permit applications for Sections B and C when funding and final design are complete.

NEPA DOCUMENT STATUS

An Environmental Assessment (EA) for all sections of R-2241 was approved in October 1997. The Finding of Significant Impact (FONSI) was approved April 2000. Merger Team meeting for Concurrence Points 2A and 4A was held May 13, 2004. Right of Way Consultation was approved May 2006. Additional copies are available upon request.

Concurrence was signed by the Merger Team on the following dates

- CP1- April 28, 2000
- CP2 April 28, 2000
- CP2A May 13, 2004
- CP3 April 28, 2000
- CP4A May 13, 2004

INDEPENDENT UTILITY

The subject project complies 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;

Due to Section A of the project starting at the US 501/NC 49 intersection and ending at the US 501 /SR 1521 intersection, the project meets the definition of logical termini. These are rational endpoints for both transportation improvements and for a review of the environmental impacts. The project improvement is primarily related to congestion due to traffic generators, and the choice of termini based on these generators may be appropriate.

2) The project is usable and a reasonable expenditure, even if no additional transportation improvements are made in the area;

Section A from the US 501/NC 49 intersection to the US 501/SR 1521 intersection has independent utility in that it serves as an identified need for the project area due to current congestion along existing US 501. Improvements on Section A will not force immediate transportation improvements on sections B and C, which will be constructed at future dates. Improvements on Section A are mostly on new location. The proposed improvements along Section A should not impact the operation of traffic along Sections B and C.

3) The project does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

The proposed improvements for Section A do not restrict consideration of alternatives for other reasonably foreseeable transportation improvements. Section A is the endpoint of the overall improvements which allows for a range of alternatives for the remainder of the proposed project.

RESOURCE STATUS

Wetland and stream determinations were re-verified for Section A in January 2010. NCDOT received a final JD from the U.S. Army Corps of Engineers (USACE) on December 30, 2010 and it expires December 30, 2015. Wetlands were re-verified using the field delineation method outlined in the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region. The North Carolina Division of Water Quality's (DWQ) Identification Methods for the Origins of Intermittent and Perennial Streams was used to make stream determinations.

Changes made to the jurisdictional sites from what was presented in the EA and FONSI are included in the section below. The "JD Package ID" column in the tables refer to the final JD package (January 2010) sent to the USACE for Section A.

IMPACTS TO WATERS OF THE UNITED STATES

Impacts to wetlands and streams are higher than stated in the FONSI. This is most likely due to the increase in number and size of wetlands and the increase in the number of streams delineated during the latest reverification of jurisdictional resources.

Wetlands

Wetland impacts occur in the Roanoke River Basin in HUC 03010104. Permanent riparian wetland impacts total 2.38 acres. Table 1 lists permanent impacts which include fill, excavation, and mechanized clearing.

Table 1. R-2241A Wetland Impacts

Permit Site No.	Wetland ID in EA[1]	JD package ID	Riparian or Non-riparian	Permanent Impacts (ac)
2	*	1A	Riparian	0.18
5	W-5	2A, 3A	Riparian	0.28
7	W-6	5A, 6A, 7A	Riparian	0.13
8	*	9A, 10A, 10.5A	Riparian	0.05
11	*	15A	Riparian	<0.01
12	W-20	15.5A	Riparian	0.12
13	W-13	16A	Riparian	0.24
14	W-14	17A	Riparian	0.09
15	W-15	18A, 18.5A, 19A	Riparian	0.39
17	*	1B	Riparian	0.80
19	*	2B	Riparian	0.11
Total				**2.38[2]**

*not stated in EA [1]Location IDs are a best guess based on EA map [2]Total impacts due to rounding

Surface Waters

Surface water impacts occur in the Roanoke River Basin in HUC 03010104. Permanent stream impacts are 3,832 linear feet and surface water impacts are 0.45 acres. Table 2 lists the site number, reference number, stream name, stream status and amount of permanent and temporary impacts.

Marlowe Creek and Mitchell Creek are classified as Class C streams. Marlowe Creek is listed in the Final 2010 303(d) report from its source to Mitchell Creek for ecological/biological integrity benthos. No other streams within 1.0 mile of the project area are listed as 303(d). No streams within one mile of the project are classified as ORW, HQW, WS-I or WS-II.

Utility Impacts: Impacts will occur at Site 1 from the crossing of a 10 inch sewer line and an 8 inch water line. The pipes will be trenched through the streambed but impacts will be temporary as the streambed will be restored to its original elevation and contours. These impacts are beyond any of the construction impacts at Site 1 for the box culvert. Temporary impacts to each pipe will be 3 feet for a total amount of 6 feet.

Table 2. R-2241A Streams Impacted

Permit Site No.	Stream ID in EA[1]	JD Package ID	Stream Name	Intermittent/ Perennial	Permanent Impacts		Temporary Impacts	Impacts requiring mitigation[3]
1	S-13	1A	Marlowe Creek	Perennial	Fill	138	26	138
					SBS[2]	125		
Utility Site 1	S-13	1A	Marlowe Creek	Perennial	0		6	0
3	*	2A	UT to Marlowe Creek	Intermittent	Fill	23	0	0
4	S-14	3A	UT to Marlowe Creek	Perennial	Fill	112	39	112
					SBS	59		
6	*	4A	UT to Marlowe Creek	Intermittent	Fill	23	30	0
					SBS	16		
7A	S-16	4AA	UT to Marlowe Creek	Perennial	Fill	518	108	518
					SBS	82		
7B	S-16	4AB	UT to Marlowe Creek	Intermittent	Fill	59	0	0
8	*	8A	UT to Marlowe Creek	Perennial	Fill	194	36	194
					SBS	13		
9	*	9A	UT to Marlowe Creek	Perennial	Fill	279	33	279
					SBS	16		
10	S-29	10A, 11A	UT to Mitchell Creek	Both Intermittent	Fill	92	43	0
					SBS	20		
11	S-30	12A	UT to Mitchell Creek	Perennial	Fill	282	102	282
					SBS	36		
13	S-23	14A	UT to Mitchell Creek	Perennial	Fill	246	72	246
14	S-24	15A, 16A	UT to Mitchell Creek	Both Perennial	Fill	262	23	262
					SBS	13		
15	S-25	17A	Mitchell Creek	Perennial	Fill	653	75	653
					SBS	13		
17	*	2B	UT to Mitchell Creek	Perennial	Fill	148	62	148
					SBS	36		
18	*	3B, 4B	UT to Mill Creek	Both Perennial	Fill	364	203	364**
					SBS	10		
Total					**Fill**	**3,393**	**858**	**3,196**
					SBS	**439**		

*Not stated in EA **The 10 feet of mitigation for SBS does required mitigation from DWQ but not counted here because total mitigation for the USACE exceeds DWQ mitigation

[1]Location IDs are a best guess based on EA map

[2]Stream Bank Stabilization [3]Mitigation required by USACE

PROTECTED SPECIES

The United States Fish and Wildlife Service (USFWS) list one federally protected species for Person County as of September 22, 2010 (Table 3).

Table 3. Federally Protected Species in Person County

Scientific Name	Common Name	Federal Status	Habitat Present	Biological Conclusion
Alasmidonta heterodon	Dwarf wedgemussel	E	No	No Effect

This species was not listed when the EA and FONSI were approved. Surveys were completed in March of 2002 and no habitat is present. This is explained in the Right of Way consultation, dated May 2006. There will be no effect to this species from this project.

CULTURAL RESOURCES

Archaeology

A letter dated December 7, 1995 (C-16 in EA) and a letter dated December 3, 1998 (enclosed) concur that there will be no effect upon eligible archeology sites and no additional investigations are necessary.

Historic Architecture

There are two historic properties within Section A of this project: Cal-Vel Village and the Will Walker House. Since the project does not improve existing US 501, there are no effects to either property (because both are located along existing US 501). The effects form (2006) in the EA states that there would have been adverse effects if NCDOT had chosen to Alt. 1 (Improve existing), which it did not. The other two properties listed on the form: Holloway Jones Day House and the John H. Merritt Homeplace are in Section B of this project.

FEMA COMPLIANCE

The project will be coordinated with appropriate state and local officials and the Federal Emergency Management Agency (FEMA) to assure compliance with FEMA, state, and local floodway regulations.

INDIRECT AND CULMULATIVE EFFECTS

The May 4, 2005 Qualitative Indirect and Cumulative Effects Assessment for R-2241 concluded the following:

- Despite the presence of abundant land that is or could be service by public utilities, TIP Project R-2241 has a low likelihood of influencing intraregional land development due to the availability of competing sites that are closer to interstate corridors (I-85 and I-40) and larger urban centers (particularly Durham and Raleigh).
- Development resulting from the project would likely come in the form of industrial facilities with direct access to the upgraded facility, commercial development along the five-lane portion of the new US 501 near Roxboro, or

highway commercial development at key intersections north of Roxboro. Sporadic low-density housing could take place as well, particularly along arterials feeding into US 501.

- Any indirect or cumulative growth along the new location portion of the project should be tempered by the proposed partial control of access.
- Because of the low amount of potential growth that could result from the project, the Neuse River Basin riparian buffer regulations, water supply watershed regulations, and the limited access proposed for the new location and widening sections of the project, the water quality of the area should remain relatively unharmed from any indirect or cumulative impacts associated with TIP Project R-2241.

MITIGATION OPTIONS

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide either on-site or compensatory mitigation of all remaining, unavoidable jurisdictional impacts. Avoidance measures were taken during the planning and NEPA compliance stages; minimization measures were incorporated as part of the project design.

Avoidance and Minimization

All jurisdictional features were delineated, field verified and surveyed within the right of way for R-2241A. NCDOT employs many strategies to avoid and minimize impacts to jurisdictional areas in all of its designs. Many of these strategies have been incorporated into BMP documents that have been reviewed and approved by the resource agencies and which will be followed throughout construction. Individual avoidance and minimization items are as follows:

- The project was designed to avoid or minimize disturbance to aquatic life movements.
- Wetland and stream impacts were avoided and minimized during the planning process (see EA and FONSI)
- NCDOT will minimize long-term water quality impacts using the most recent Best Management Practices for Protection of Surface Waters,
- The use of preformed scour holes were used where applicable.
- Grass swales are utilized to provide stormwater treatment. These are summarized in the Stormwater Management Plan.
- Energy dissipators were used
- The wetland impacts at Site 19 were significantly reduced due to realigning the roadway since the 4C meeting.
- The alignment was shifted further north in order to avoid several wetlands being impacted from original design (see 2A/4A concurrence packet and meeting minutes, additional copies available upon request).
- Impacts to wetlands and streams are higher than stated in the FONSI. This is most likely due to the increase in number and size of wetlands and the increase in the number of streams delineated during the latest reverification of jurisdictional resources.
- The use of 2:1 fill slopes in jurisdictional areas where possible.

Compensation

As described above and in the EA and FONSI, the NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent possible. Total riparian wetland impacts requiring mitigation are 2.38 acres. Mitigation for these impacts will come from EEP

Permanent stream impacts are 3,832 linear feet of which 439 linear feet are for streambank stabilization. NCDOT is not proposing mitigation for the streambank stabilization. Streams at Sites 3, 6, 10 and 18 did not require mitigation from the USACE based on the field visit January 25, 2010. Stream impacts at Sites 3, 6, and 10 are below 150 feet so no mitigation is proposed for these sites from DWQ. Impacts at Site 18 are greater than 150 feet so these impacts to the total stream will require mitigation from DWQ.

Total amount of stream impacts requiring mitigation from DWQ are 3,206 feet at 1:1. Total amount of stream impacts requiring mitigation from USACE are 3,196 feet at 2:1. The total amount of stream impacts that will be offset by the EEP are 3,196 feet (2:1). This amount will exceed the required amount of mitigation from DWQ so the 10 feet of mitigation required for Site 18 is not included in the total. A copy of the EEP Acceptance Letter is included with this application.

REGULATORY APPROVALS

Application is hereby made for a USACE Individual 404 Permit as required for the above-described activities. Application is hereby made for a Section 401 Water Quality Certification from the N. C. Division of Water Quality. In compliance with Section 143-215.3D(e) of the NCAC we have provided a method of debiting $570, as noted in the subject line of this application, as payment for processing the Section 401 Water Quality Certification modification application. We are providing five copies of this application to DWQ, for their use.

A copy of this permit application will be posted on the DOT website at: http://www.ncdot.org/doh/preconstruct/pe/neu/permit.html. If you have any questions or need additional information, please contact Rachelle Beauregard at rbeauregard@ncdot.gov or (919) 707-6105.

Sincerely,

E. L. Lusk

fcv Gregory J. Thorpe, Ph.D., Manager
Project Development and Environmental Analysis Unit

Cc: NCDOT Permit Application Standard Distribution List

U.S. ARMY CORPS OF ENGINEERS

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

(33 CFR 325)

OMB APPROVAL NO. 0710-0003
EXPIRES: 31 AUGUST 2012

Public reporting for this collection of information is estimated to average 11 hours per response, including 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 the collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters, Executive Services and Communications Directorate, Information Management Division and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003). 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

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. 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, and the public and may be made available as part of a public notice as required by Federal law. 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/or 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 COMPLETE

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required)
First - Gregory Middle - J. Last - Thorpe	First - Middle - Last -
Company - NCDOT-PDEA	Company -
E-mail Address -	E-mail Address -
6. APPLICANT'S ADDRESS:	**9. AGENT'S ADDRESS:**
Address- 1598 Mail Service Center	Address-
City - Raleigh State - NC Zip - 27699 Country - US	City - State - Zip - Country -
7. APPLICANT'S PHONE NOs. w/AREA CODE	**10. AGENTS PHONE NOs. w/AREA CODE**
a. Residence b. Business 919-707-6100 c. Fax	a. Residence b. Business c. Fax

STATEMENT OF AUTHORIZATION

11. 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.

_____ _____
SIGNATURE OF APPLICANT DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)
R-2241A US 501 from NC 49 in Roxboro to SR 1602 (Jesse Banks Road)

13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)
Marlowe Creek and its UTs, UTs to Mitchel and Mill Creek	Address
15. LOCATION OF PROJECT Latitude: °N Longitude: °W	City - State- Zip-

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)
State Tax Parcel ID Municipality
Section - Township - Range -

17. DIRECTIONS TO THE SITE
See Permit Drawings

18. Nature of Activity (Description of project, include all features)
The North Carolina Department of Transportation (NCDOT) proposes to improve US 501 to a multilane facility from Roxboro to the Virginia State line. This project has 3 sections, A, B and C. Section A has independent utility from the others so it is being permitted separately. Sections B and C are post year lets.Section A of this project (4.46 miles) will provide a small amount of widening along NC 49 then will take off on new location until it merges with Halifax Road (SR 1521) and then with US 501 to SR 1602 (Jesse Banks Road). The widening section of NC 49 will be a 5-lane curb and gutter. The new location segment and widening of Halifax Road and US 501 to SR 1602 will be 4 lane divided with a shoulder section.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)
The purpose and need as stated in the document is still applicable to Section A of this project. The need for the project was to address industrial traffic, separate local and regional traffic and lessen traffic congestion on Madison Boulevard. The purpose of the project was to provide relief to the increased traffic demands along this northern portion of US 501 in Roxboro and to provide an adequate transportation system for the area by completing the "missing link" of this regional system by providing multilane from Roxboro to the Virginia line.

While completing just Section A of the project does not fully address completing the "missing link" of the transportation system from Roxboro to Virginia, it does address the other aspects of the purpose and need. It will still help separate local and regional traffic. With the additional through lanes, it will also still improve safety of the facility by reducing competition between tractor-trailers, passenger cars and school buses.

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge
Roadway fill, pipe extensions and stormwater devices

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

Type	Type	Type
Amount in Cubic Yards	Amount in Cubic Yards	Amount in Cubic Yards

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

23. Description of Avoidance, Minimization, and Compensation (see instructions)
see cover letter

24. Is Any Portion of the Work Already Complete? ☐ Yes ☒ No IF YES, DESCRIBE THE COMPLETED WORK

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

a. Address- see permit drawings

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates 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

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

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this 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.

E. L. Lusk for Gregory J. Thorpe, PhD — Jan 20, 2012

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

January 17, 2012

Mr. Gregory J. Thorpe, Ph.D.
Manager, 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-2241A, Improvements to US 501 from NC 49 in Roxboro to SR 1602 (Jesse Banks Road), Person County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory stream and riparian wetland mitigation for the subject project. Based on the information supplied by you on January 12, 2012, the impacts are located in CU 03010104 of the Roanoke River basin in the Central Piedmont (CP) Eco-Region, and are as follows:

Roanoke 03010104 CP	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	0	0	3,196	2.38	0	0	0	0

This mitigation acceptance letter replaces the mitigation acceptance letters issued on November 22, 2011 and January 3, 2012. EEP commits to implementing sufficient compensatory stream and riparian wetland mitigation credits to offset the impacts associated with this project in accordance with the N.C. Department of Environment and Natural Resources' Ecosystem Enhancement Program In-Lieu Fee Instrument dated July 28, 2010. 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,

James B. Stanfill for

Michael Ellison
EEP Deputy Director

cc: Mr. Eric Alsmeyer, USACE – Raleigh Regulatory Field Office
Mr. Brian Wrenn, Division of Water Quality, Wetlands/401 Unit
File: R-2241A Revised 2

North Carolina Department of Cultural Resources

James B. Hunt Jr., Governor
Betty Ray McCain, Secretary

Division of Archives and History
Jeffrey J. Crow, Director

December 3, 1998

Nicholas L. Graf
Division Administrator
Federal Highway Administration
310 New Bern Avenue, Suite 410
Raleigh, NC 27601-1442

Re: Report on Phase II Archaeological Testing, Site 31PR89&89**, US 501, Person County, Federal-Aid Project MASTP-501(1), State Project 8.1380501, TIP Project R-2241, ER 93-7903, ER 99-7576

Dear Mr. Graf:

Thank you for your letter of October 7, 1998, transmitting the archaeological testing report by Gerold Glover of the North Carolina Department of Transportation concerning the above project.

For purposes of compliance with Section 106 of the National Historic Preservation Act, we concur that the following property is not eligible for inclusion in the National Register of Historic Places under Criterion D:

31PR89&89**

This site lacks undisturbed deposits and is unable to yield information important to history or prehistory. We do not recommend additional archaeological investigation in connection with this project as currently proposed.

In general the report meets our office's guidelines and those of the Secretary of the Interior. However, an updated site form for 31PR89&89** including information on the Phase II testing should be submitted to our office as soon as possible.

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

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763.

Sincerely,

Renee Gledhill-Earley

for David Brook
Deputy State Historic Preservation Officer

DB:slw

cc: William Gilmore
Tom Padgett
Gerold Glover

April 25, 2005

Subject: Draft Minutes Interagency Hydraulic Design 4B Review Meeting on April 20, 2005, for R-2241A, Person County.

Team Members:
Eric Alsmeyer – USACE (Present)
Nikki Thomson – NCDWQ (Present)
Travis Wilson – NCWRC (Present)
Gary Jordan – USFWS (Absent)
Chris Militscher – EPA (Present)
Jackie Obediente – NCDOT PDEA (Present)

Participants:
Marshall Clawson – NCDOT Hydraulics
T N Parrott – NCDOT Division 5 Construction
Ben Upshaw – NCDOT Division 5 Construction
John Alford – Ralph Whitehead Assoc.
Frank Fleming – Sungate Design
Chris Murray – NCDOT Division 5 DEO
Brett Feulner – NCDOT ONE
John Frye – NCDOT Structure Design
Robert Stroup – NCDOT Design Services
Clayton Walston – NCDOT Design Services
Dan Duffield – NCDOT Hydraulics
Christina Breen - NCDWQ

The project is the Roxboro bypass

The meeting began at 8:30pm.

Marshall Clawson (MC) Opens meeting allows for introductions, notes that the 4A was held 5/13/04

Sheet 4

Frank Fleming (FF) – Begins with an overview of the drainage and culvert. We are out letting close to the stream.

Nikki Thomson (NT) – No Direct Discharge

MC – No buffers

NT – Still no direct discharge per the 401 certification

FF – We have a short ditch right before entering the stream

Chris Militscher (CM) – What's the velocity?

FF – We will get it and enter it into the minutes. The velocity out of the pipe is 4.6'/sec. The outlet ditch is flat. The drainage area is .17 acre. For treatment, the grass swale requirement is 17'. We have 17.5' from the end of the pipe to the channels waters edge. The velocity in the channel is 1.5'/sec.

Sheet 5

FF – Overview, next site is 15+40 – L- Lt – wetlands

CM – Wetlands on both sides?

FF – No just on the one, continue with overview

CM – Proposed Equalizer Pipe?

FF – No existing pipe

CM – an outfall?

FF – Yes, that's were its going now, the outlet pad is in the wetlands

CM – Can we pull it back?

Eric Alsmeyer (EA) – How about angling the pipe?

FF – Not desirable, would erode the bank

CM – Wetland limits?

FF – Don't know how far they extend

- Discussion

EA – Not a whole lot of flow, not a lot we can do

CM – velocity

FF – 3 m/s 9.8 ft/sec Q10

CM – As long as there is no draining effect to the wetland

FF – Ditch is steep – will not affect the wetland

FF – Next site station 19+20 JD stream

T N Parrott (TP) – Does this flow in roadside ditch to the culvert?

FF – Yes

EA – Will look at my notes, I think this was supposed to be thrown out.

CM – Does not look like a JD call

EA – If Brett could check with ONE's consultant and double check their notes

FF – It is not on the soils or quad maps

FF- Next site sta 21+00 overview of culvert. Note missing wetlands area. FF will send wetland files to Project Services. RWA(prime) has sent the files to Project Services.

CM – Extend culvert or new culvert?

FF – New culvert, roadway is raising the grade and currently we have relief and had to resize the structure. We are burying it also.

CM – What's the Name of stream?

FF – UT to Marlow Creek

CM – As long as it is not perched

FF – It won't be perched, we are burring it 1.0'

Travis Wilson (TW) – Any sills?

FF –No, Size of the culvert matches the stream channel pretty good in the location of the inlet and outlet.

TW – As long as you are not over widening the stream

FF- We can put a note on the plans that states "NO Extra Channel Work"

<u>Sheet 8 right of sta 25+00</u>

FF – Overview of plans

NT – Is there a pipe in the stream?

FF – Yes

CM – Straightening the channel?

FF – No

Sheet 11 next site

FF – Last culvert site – overview

Brett Feulner (BF) – Is that a stream?

FF - Yes, from ONE's wetland file

CM – Total take?

FF – Yes

CM – What about a PSH?

FF – Yes

CM – What about the Rip Rap?

FF – It's toe protection. This is where we had an alignment shift

TW – What about the outlet velocity?

FF – 15 ft/sec

FF – continue the overview

CM – Fill Slopes?

FF – 2:1

TW – Outlet Protection?

FF – Only on the banks?

TW – Sills?

FF – Yes, we will add sills to hold the material in place

Chris Murray (CM-DEO) Could we get some rip rap at the inlet, say 5-10 ft at the ends of the wing walls? This is to help stabilize the fill slope

FF – We will add 5-10 ft of rip rap at the inlet of all three box culverts.

TP – Pipe or culvert at station 37+40 ?

FF –Pipe

Next Site Sta 40+40

FF – Overview of 60" pipe – JD stream

Sheet 14 Next Site Sta 11+60 Y3
FF - Overview of wetland which leads to a JD stream – 2 existing pipe converge to one stream.

CM – PSH outside of Wetlands?

FF – yes

Sheet 15

FF- Overview JD station 50+80 - 48" Pipe

- Discussion

Sheet 16

FF JD stream and wetland 30" pipe

CM – Existing channel at outlet? Can you put rip rap in the channel?

FF – Only on the banks

CM – Headwall?

FF – No, only on 30" and larger

EA – Move pipe

FF – 53+60 – The outlet end will be adjusted with a base channel connecting to the existing channel.

EA – This maybe a cross pipe we might not want to bury

CM & EA – Do not bury

CM-DEO – The remaining wetland is not going to function, it should be a total take. Therefore bury the pipe.

FINAL Call by EA, CM, CM-DEO total take

Next sheet 17 Sta 57+60

FF-Overview Discussion

Sheet 18 Next Site Sta 65+00

NT – Total take?

FF – Yes, total take

CM – What about the pond?

FF – The actual Dam portion of the pond is located within the R/W – we are taking the pond

FF – Continue with overview, ditch to 54" pipe and ditch at outlet to tie to existing channel

Sheet 20 next site Sta 68+80 JD stream

FF – Overview Replacing all with a 54" pipe

Sheet 22 Next site sta 76+60 JD stream

FF – Overview – 2 pipes at sta 76+00 and 77+00

EA – Question, where does JD start?

BF – I will get up with our consultants

CM-DEO – Impact during construction?

NT – All Stream impacts / enhancements need accounted for

EA – Not much of a stream (Brett you need to check this site as I think there was some question as to where the JD call starts).

NT – Stream U/S of 450 at Sta 77+00 ?

FF – No, no JD upstream.

Next site – wetlands on the matchline

BF – Will check to see if the channel at the end of the project is JD

- Discussion over project tie

General from CM-DEO Fill slopes in wetlands, could we get toe protection on the fill slopes in wetland areas?

FF – Yes, well add it to the plans.

The meeting adjourned at 10:15

Minutes from the Interagency 4C Hydraulic Design Review Meeting
R-2241A in Person County
May 18, 2011
9:00 am – 10:30 am

Team Members:	
Eric Alsmeyer, USACE	(absent)
Gary Jordan, USFWS	(absent)
Travis Wilson, NCWRC	(absent)
Rob Ridings, NCDWQ	(present)
Chris Militscher, EPA	(absent)
Felix Davila, FHWA	(present)
David Harris, REU	(present)
Ron McCollum, Roadway	(absent)
Betsy Cox, Structures	(present)
D. Linwood Stone, PDEA	(absent)
Rachelle L. Beauregard, NEU	(present)
Dennis Jernigan, Division 5	(present)

Participants:
Marshall Clawson, Hydraulics
Dan Duffield, Hydraulics
Will Hines, Sungate Design
James Pflaum, NEU
John Nigro, Utilities
Eugene Tarascio, PDEA
Mark Eatman, TPB
Phil Harris, NEU
Elizabeth Lusk, NEU
Mark Staley, Roadside Environmental
David Clodgo, Roadway Design
Ron McCollum, Roadway Design
Bernadette Cloninger, STV/RWA
Chris Murray, Division 5
Heather Montague, Division 5

Minutes:

General Introduction was initiated by Marshall Clawson. Introductions were made by all in attendance.

General Comments:

(Division) For culvert crossings, permanent impacts to be shown to end of riprap and temporary impacts to be show from end of riprap to R/W or easement line.

(Hydraulics) On the Summary Sheet, temporary existing channel impacts will be separated out of the permanent existing channel impacts. Stream Bank Stabilization will also be separated out.

(NEU) Mechanized Clearing impacts should be taken to the R/W or easement line.

(Division) Bury cross-pipes 20% if there is a significant channel. If no significant channel, then do not bury.

(Division) For cross-pipes with headwalls, add riprap (on banks only) at inlet. Include tonnage and linear feet.

Ditch Detail Sheet

(Division) For Detail 2, show PSRM.

(Division) Revise Toe Protection Detail to show riprap keyed in 2-feet when used in wetlands.

(Division) Update Preformed Scour Hole Detail to current Detail.

(Division) Revise Energy Dissipator Detail to show Class II Riprap.

(Division) Place note on Plan to see CSR for Riprap Detail. Also, Detail needs to show Filter Fabric under the riprap.

Sheet 4:

No Comments.

Sheet 5:

Site 1: (Division) Shorten 375 RCP to outlet at top of riprap.

(Team Member Comment) Need to add Temporary Impacts to Legend.

Sheet 6:

Site 3: (NEU) Note on Summary Sheet that stream impacts are non-mitigatable.

Site 3: (Team Member Comment) Provide Blow-up of site.

Sheet 7:

Site 4: (Division) Lateral ditch located upstream of culvert needs to be shown connecting to the channel.

Site 4: (Team Member Comment) Investigate whether Energy Dissipator is needed. If it is, then rotate Dissipator as needed.

Site 5: (Division) Currently, the stilling basin on the construction sequence has been shown in the wetland located in the southeast quadrant. Look into moving in order to reduce impacts.

Sheet 8:

Site 6: (Division) Realign Energy Dissipator. (EPA) Look at using a drop box in the 600 CSP in order to eliminate the Energy Dissipator.

Site 6: (Division) Do not bury the outlet of the 900 RCP cross-pipe.

Site 6: (Division) Use Class I Riprap at outlet of 900 RCP cross-pipe instead of Class B.

Site 6: (NEU) Note on Summary Sheet that stream impacts are non-mitigatable.

(EPA) He asked if there were any pictures. (Hydraulics) Typically, pictures are only brought to the 4B Meeting.

Sheet 11:

Site 7: (Division) On the inlet end of RCBC, extend riprap to beyond the intersection with the diversion ditch.

Site 7: (Team Member Comment) Label RCBC with Sills.

Site 7: (Division) Concern about the Preformed Scour Hole located at Station 35+10 -L- right and the possibility of stormwater flowing against fill. (Hydraulics) Suggested that storm drainage system be taken to the lateral ditch located at Station 35+20 -L- left and the Preformed Scour Hole eliminated.

Site 7: (NEU) Note on Summary Sheet that stream impacts for the short stream located at Station 35+40 -L- left are non-mitigatable.

Site 7: (NEU) Delete stream shown at Station 35+70 -L- left in order to prevent any confusion.

Site 8: (USACE by e-mail): Asked whether or not this should be a total take. (Agencies) After some discussion, it was decided that this site should not be a total take.

Sheet 12:

Site 9: (Division) Look at realigning or eliminating the Energy Dissipator.

Site 9: (Division) Why is there an endwall proposed at the outlet of the 1500 RCP cross-pipe? (Sungate) Do not know.

Site 9: (Division) Place riprap at inlet around headwall and outward for about 5 feet along banks.

Sheet 14:

Site 10: (Division) Use Class I Riprap at outlet of both 900 CSP cross-pipes instead of Class B.

Site 10: (NEU) Note on Summary Sheet that stream impacts are non-mitigatable.

(Team Member Comment) Delete the "Denotes Mechanized Clearing" symbol since there is none at this site.

Sheet 15:

Site 11: (Division) Remove the Preformed Scour Hole located at Station 50+80 -L- left. (Hydraulics) Suggested that the Preformed Scour Hole be eliminated and replaced with a ditch to pipe outlet.

Site 12: (Hydraulics) Based on the contours, it does not appear that the cross-pipe is located in the natural channel. (Sungate) The alignment will be investigated and compared with survey shots.

Sheet 16:

Site 13: (Division) He asked if the tail ditch at the outlet is shown as Fill in Wetland. (Sungate) It is difficult to see on the Permit Drawing, but it is actually shown as Excavation in Wetland.

Site 13: (Division) He asked if the headwall is located in the wetland. (Sungate) It is difficult to see on the Permit Drawing, but it is located in the wetland.

Sheet 17:

Site 14: (Team Member Comment) He asked if the JD streams were shown correctly. (NEU) Said the JD was shown correctly.

Sheet 18:

No Comments.

Sheet 19:

(Division) Confusion of which impacts belonged to Site 15 and which belonged to Site 16. (Sungate) Additional Site labels will be added to the Permit Drawing.

Site 15: (USACE by e-mail) The stream impact is missing from the Summary Sheet. (Sungate) The impact was inadvertently left off. It will be corrected.

Site 15: (USACE by e-mail) It is unclear where the stream impact ends on the downstream end and what the impact is downstream of the riprap shown on the banks. (Sungate) We will try to make the impacts more visible.

Sheet 20:

Site 17: (USACE by e-mail) The lateral ditch in the wetland located at Station 68+80 -L-right may have a lateral drainage effect on the remaining wetland; therefore, recommend eliminating the lateral ditch and take the storm drainage system out at Station 68+60 -L-left. This will eliminate the lateral drainage effect and reduce the wetland impact.

Site 17: (Division) Extend the riprap at the outlet to just past where the lateral ditch connects to the JD stream.

Sheet 22:

Site 18: (Division) Asked if the outfall ditch can be straightened and if it is possible to obtain more TDE. (Sungate) We will investigate. (Hydraulics) Hydro obtained information after the meeting that the TDE has not been obtained at this time.

Site 18: (Team Member Comment) Impact from constructed outfall ditch will be temporary. Temporary Impacts will be added to the Legend.

Site 18: (Division) He discussed the possible use of coir fiber matting and live staking along outfall. (Hydraulics) A note will be added to the Plan to see Erosion Control Plans for live staking and reforestation.

Site 18: (NEU) Note on Summary Sheet that stream impacts are non-mitigatable.

Sheet 23

Site 19: (USACE by e-mail) The wetland impact at this site should be calculated to include all (total take) of the sliver remnants of the wetland located at Station 78+50 -L-right that do not have a footprint impact.

Site 19: (Ron McCollum) Can this impact be reduced or eliminated by a roadway realignment? (Roadway) This area is currently being looked at and there will be some realignment that may reduce or eliminate the impact.

Site 19: (NEU) Note on Summary Sheet that stream impacts are non-mitigatable.

Meeting adjourned.

NCDOT Highway Stormwater Program

Released: July 2010 (DRAFT)

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

Version 1.1

General Project Information

Project No.:	R-2241A		**Date:**	10/11/2011		
City/Town:	Roxboro		**Designer:**	SDG		
County(ies):	Person County		**Project Manager:**	WHW		
River Basin(s):	Roanoke		**CAMA County?**	no	**TVA County?**	no
Primary Receiving Water:	Marlowe Creek, Mitchell Creek, Mill Creek		**NCDWQ Stream Index:**	22-58-12-6, 22-58-12-6-3, 22-58-15-2		
NCDWQ Surface Water Classification for Primary Receiving Water		**Primary:**	Class C			
		Supplemental:				
Other Stream Classification:						
303(d) Stream?	yes	**Type(s) of Impairment:**	Marlowe Creek	Ecological/ Biological	Integrity Benthos	
State Stormwater Permit Required?	no	**If yes, why?**				
Could the Project Impact Threatened or Endangered Species?			no			
Description:						
Anadromous Fish Present?	**no**					
Description:						
Buffer Rules in Effect?	no		**Buffer Rules:**			

Existing Site

Description of Existing Project Area:	Rural Farmland, Rolling Hills
Average Daily Traffic (existing):	21,725
Existing Cross Section:	2-Lane Shoulder Section
Surrounding Land Use:	Farming, Agriculture
General Comments:	

Project Description

Description of Proposed Project:	New Location 4-Lane Divided Highway				
Average Daily Traffic (proposed):	34,142				
Proposed Cross-Section:	5-Lane Curb and Gutter, 4-Lane Divided Highway				
Interchange Modification:	no	**Median Type:**	Turn Lane, Grass Median		
North Terminus:	Existing US 501				
South Terminus:	Existing US 501/NC49 Intersection				
Project Length (lin. miles/feet):	4.46 Miles	**Added Impervious Area (ac.):**	29 ac		
General Comments:					

Environmental Summary

Riparian Buffer and Jurisdictional Stream Impacts and Associated SCMs

Station	Stream Name	Stream Type	Jurisdict. Stream	Buffer?	Classific-ation?	Proposed Structure	SCM Type	Checklist Complete?	DA (ac.)	Q_2 (ft^3/s)	Q_{10} (ft^3/s)	WQv^c (ft^3)
13+28 to 13+62 -L-	Marlowe Creek	Perennial		No	Class C	3 @ 3m x 3m RCBC 450mm to PSH	preformed scour hole	no	2	6.4	8.5	
19+21 to 19+23 -L- RT	UT to Marlowe Creek			No	Class C	Fill	no	no				
20+84 to 20+89 -L-	UT to Marlowe Creek	Perennial		No	Class C	2 @ 2.4m x 2.4m RCBC	swale	no	1.4	3	3.9	
24+98 to 25+10 -L- RT	UT to Marlowe Creek			No	Class C	900mm RCP	swale	no	1.9	5.3	6.9	
34+93 to 36+38 -L-	UT to Marlowe Creek	Perennial		No	Class C	2.7m x 1.8m RCBC 400mm to PSH	preformed scour hole	no	1.8	4.3	5.7	
37+33 to 37+55 -L-	UT to Marlowe Creek			No	Class C	1050mm RCP	swale	no	2.5	5.6	7.4	
40+05 to 40+70 -L-	UT to Marlowe Creek			No	Class C	1500mm RCP	swale	no	10.1	22	29	
11+55 to 11+82 -Y13- LT	UT to Mitchell Creek			No	Class C	900mm CSP	no	no				
50+41 to 51+25 -L-	UT to Mitchell Creek			No	Class C	1200mm RCP 400mm to PSH	preformed scour hole	no	1	2.1	2.8	
53+13 to 53+79 -L-	UT to Michell Creek			No	Class C	900mm RCP	swale	no	3.3	6.4	8.5	
57+12 to 57+55 -L-	UT to Mitchell Creek			No	Class C	1200mm RCP	swale	no	8.1	15.7	20.7	
63+41 to 66+32 -L-	Mitchell Creek			No	Class C	1350mm RCP 375mm to PSH	preformed scour hole	no	0.5	1.1	1.4	
64+72 to 64+99 -L- LT	UT to Mitchell Creek			No	Class C	Pond Removal	no	no				
67+35 to 69+11 -L-	UT to Mitchell Creek			No	Class C	1350mm RCP	swale	no	10.8	22	29	
76+03 to 76+90 -L-	UT to Mill Creek			No	Class C	750mm/900mm RCP	swale	no	6.4	12.9	17	
77+72 to 79+54 -L-	UT to Mill Creek			No	Class C	Fill	no	no				

General Comments:

Jurisdictional Wetlands

Station	Type of Impact	Minimization of Impact
15+12 to 15+59 -L- LT	Fill, Excavation and Mechanized Clearing in wetland	3:1 Fill Slopes
20+89 to 21+45 -L-	Fill and Mechanized Clearing in wetland	2:1 Fill Slopes
34+93 to 36+38 -L-	Fill in wetland	2:1 Fill Slopes
37+33 to 37+55 -L-	Fill, Excavation and Mechanized Clearing in wetland	2:1 Fill Slopes
50+41 to 51+25 -L-	Fill in wetland	2:1 Fill Slopes
51+47 to 51+91 -L-	Fill in wetland	2:1 Fill Slopes
53+13 to 53+79 -L-	Fill, Excavation and Mechanized Clearing in wetland	2:1 Fill Slopes
57+12 to 57+55 -L-	Fill in wetland	2:1 Fill Slopes
63+41 to 66+32 -L-	Fill and Mechanized Clearing in wetland	2:1 Fill Slopes
67+35 to 69+11 -L-	Fill, Excavation and Mechanized Clearing in wetland	3:1 Fill Slopes
78+00 to 79+08 -L-	Fill and Mechanized Clearing in wetland	3:1 Fill Slopes
General Comments:		

TIP PROJECT: 34406.1.1 FED. PROJECT: R-2241A

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PERSON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2241A	1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
34406.1.1	MA-STP-501	PE	

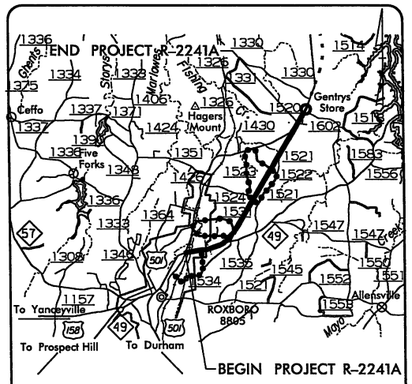
METRIC

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

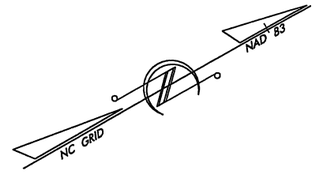
Permit Drawing Sheet 1 of 48

LOCATION: US 501 FROM NC 49 IN ROXBORO TO SOUTH OF SR 1602

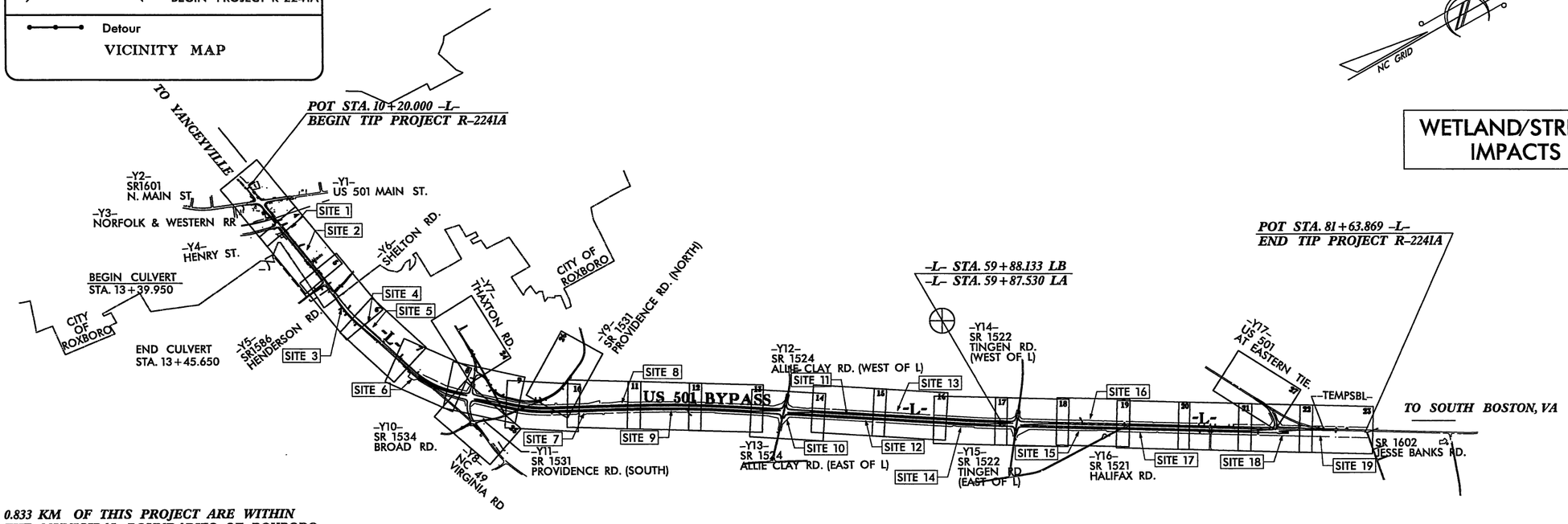
TYPE OF WORK: GRADING, DRAINAGE, PAVING, GUARDRAIL, CULVERTS, AND SIGNALS



VICINITY MAP



WETLAND/STREAM IMPACTS



0.833 KM OF THIS PROJECT ARE WITHIN THE MUNICIPAL BOUNDARIES OF ROXBORO

NCDOT CONTACT: MALCOLM WATSON, P.E. PROJECT ENGINEER (NCDOT)

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

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALE

5 0 10
PLANS
5 0 10
PROFILE (HORIZONTAL)
1 0 2
PROFILE (VERTICAL)

DESIGN DATA

	5 LANE C&G	4 LANE DIVIDED
ADT 2007 =	21,725	10,500
ADT 2027 =	34,142	17,500
DHV =	10 %	10 %
D =	60%	60 %
T =	11%*	6%**
V =	65 km/h	100 km/h

* TTST 3% + DUAL 8%
** TTST 2% + DUAL 4%

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT R-2241A = 7.138 km

LENGTH OF STRUCTURES TIP PROJECT R-2241A = 0.006 km

TOTAL LENGTH OF TIP PROJECT R-2241A = 7.144 km

Prepared In the Office of:
RALPH WHITEHEAD ASSOCIATES, INC.
FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: *OCT. 20, 2006*

LETTING DATE: *OCT. 18, 2011*

JOSEPH A. FREEMAN, P.E.
PROJECT ENGINEER

RICHARD A. ODYNSKI, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

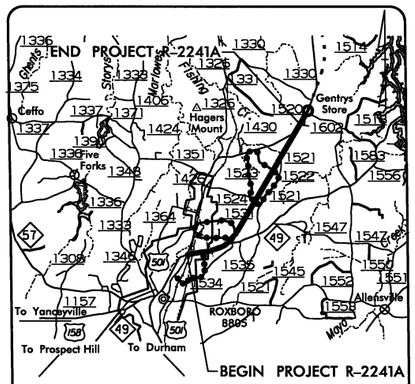
SIGNATURE: P.E.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

APPROVED P.E.
STATE HIGHWAY DESIGN ENGINEER

PROJECT: 34406.1.1 TIP PROJECT: R-2241A

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



———— Detour

VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PERSON COUNTY

LOCATION: US 501 FROM NC 49 IN ROXBORO TO SOUTH OF SR 1602

TYPE OF WORK: GRADING, DRAINAGE, PAVING, GUARDRAIL, CULVERTS, AND SIGNALS

METRIC

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

STATE	STATE PROJECT REFERENCE NO.		SHEET NO.	TOTAL SHEETS
N.C.	R-2241A		1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION		
34406.1.1	MA-STP-501	PE		

Permit Drawing
Sheet 2 of 48

WETLAND/STREAM IMPACTS

0.833 KM OF THIS PROJECT ARE WITHIN THE MUNICIPAL BOUNDARIES OF ROXBORO

NCDOT CONTACT: MALCOLM WATSON, P.E.
PROJECT ENGINEER (NCDOT)

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

THIS IS A PARTIAL CONTROLLED
ACCESS PROJECT WITH ACCESS
BEING LIMITED TO POINTS AS
SHOWN ON THE PLANS

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALE

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PLANS

5 0 10
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TOTAL LENGTH OF TIP PROJECT R-2241A = 7.144 km

Prepared In the Office of:

RALPH WHITEHEAD ASSOCIATES, INC.

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
OCT. 20, 2006

LETTING DATE:
OCT. 18, 2011

JOSEPH A. FREEMAN, P.E.
PROJECT ENGINEER

RICHARD A. ODYNSKI, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

APPROVED P.E.
STATE HIGHWAY DESIGN ENGINEER

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 36464
CHARLOTTE, NORTH CAROLINA 28236

REVISIONS

METRIC

NOT TO SCALE

CONST.REV.

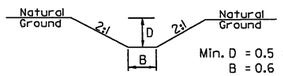
R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	2H
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

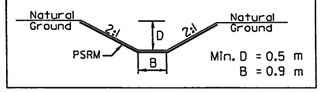
Permit Drawing Sheet 3 of 48

DETAIL 1
STANDARD BASE DITCH
(Not to Scale)



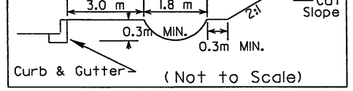
Min. D = 0.5 m
B = 0.6 m

DETAIL 2
STANDARD BASE DITCH
(Not to Scale)



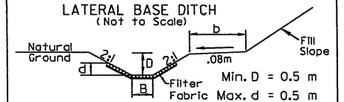
Min. D = 0.5 m
B = 0.9 m

DETAIL 3
PARABOLIC SWALE



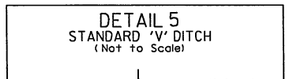
(Not to Scale)

DETAIL 4
LATERAL BASE DITCH
(Not to Scale)



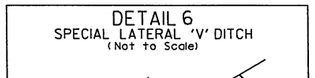
Min. D = 0.5 m
Max. d = 0.5 m
B = 0.9 m
b = 1.5 m
* When B is < 1.8m
Type of Liner = CLASS 'B' RIP RAP

DETAIL 5
STANDARD 'V' DITCH
(Not to Scale)



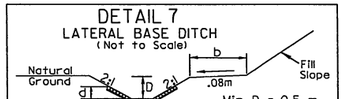
Min. D = 0.5 m

DETAIL 6
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



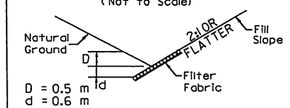
Min. D = 0.5 m

DETAIL 7
LATERAL BASE DITCH
(Not to Scale)



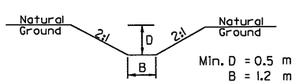
Min. D = 0.5 m
Max. d = 0.5 m
B = 0.6 m
b = 1.5 m
* When B is < 1.8m
Type of Liner = CLASS 'B' RIP RAP

DETAIL 8
TOE PROTECTION
(Not to Scale)



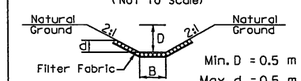
D = 0.5 m
d = 0.6 m
Type of Liner = CLASS 'B' RIP RAP

DETAIL 9
STANDARD BASE DITCH
(Not to Scale)



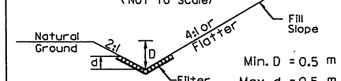
Min. D = 0.5 m
B = 1.2 m

DETAIL 10
STANDARD BASE DITCH
(Not to Scale)



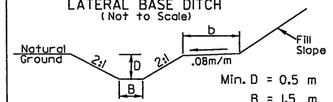
Min. D = 0.5 m
Max. d = 0.5 m
B = 0.9 m
* When B is < 1.8m
Type of Liner = CLASS 'B' RIP RAP

DETAIL 11
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



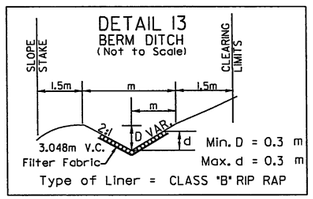
Min. D = 0.5 m
Max. d = 0.5 m
Type of Liner = CLASS "B" RIP RAP

DETAIL 12
LATERAL BASE DITCH
(Not to Scale)



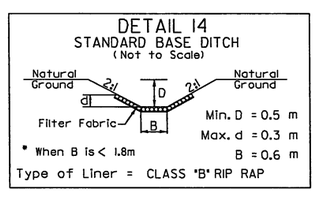
Min. D = 0.5 m
B = 1.5 m
b = 1.2 m

DETAIL 13
BERM DITCH
(Not to Scale)



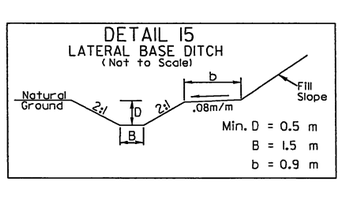
Min. D = 0.3 m
Max. d = 0.3 m
Type of Liner = CLASS "B" RIP RAP

DETAIL 14
STANDARD BASE DITCH
(Not to Scale)



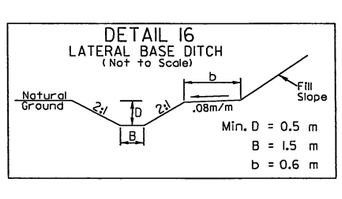
Min. D = 0.5 m
Max. d = 0.3 m
B = 0.6 m
* When B is < 1.8m
Type of Liner = CLASS "B" RIP RAP

DETAIL 15
LATERAL BASE DITCH
(Not to Scale)



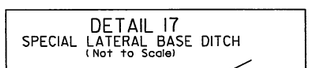
Min. D = 0.5 m
B = 1.5 m
b = 0.9 m

DETAIL 16
LATERAL BASE DITCH
(Not to Scale)



Min. D = 0.5 m
B = 1.5 m
b = 0.6 m

DETAIL 17
SPECIAL LATERAL BASE DITCH
(Not to Scale)

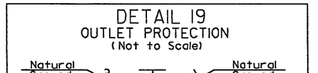


Min. D = 0.5 m
B = 0.6 m

DETAIL 18
SPECIAL CUT DITCH
(Not to Scale)

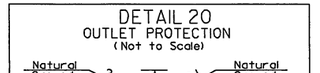
Min. D = 0.5 m

DETAIL 19
OUTLET PROTECTION
(Not to Scale)



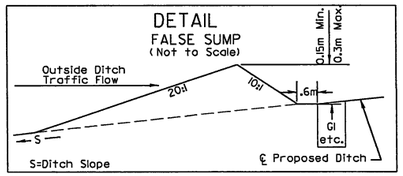
Min. D = 0.5 m
Max. d = 0.5 m
Type of Liner = CLASS 'B' RIP RAP

DETAIL 20
OUTLET PROTECTION
(Not to Scale)

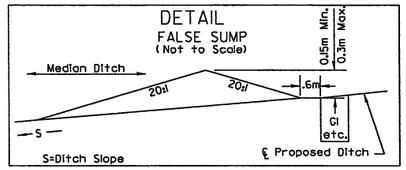


Min. D = 0.5 m
Max. d = 0.5 m
Type of Liner = CLASS 'I' RIP RAP

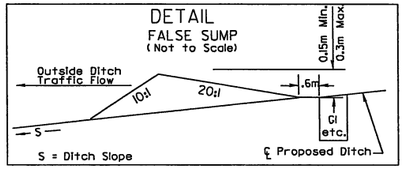
DETAIL
FALSE SUMP
(Not to Scale)



DETAIL
FALSE SUMP
(Not to Scale)

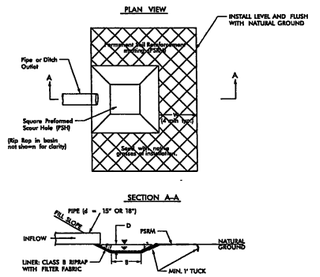


DETAIL
FALSE SUMP
(Not to Scale)



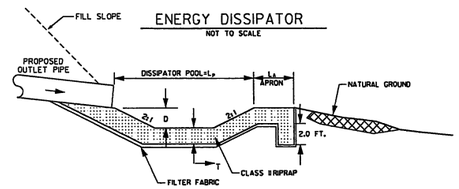
NOTE: SEE CSR FOR RIPRAP DETAIL

PREFORMED SCOUR HOLE
*NOT TO SCALE

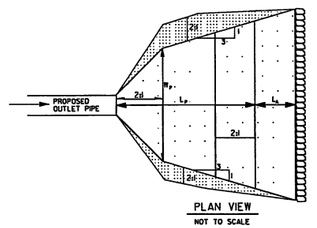


STATION	B M	D M	W_{PSR} M	d M	CLASS I RIP RAP MTONS	DDE (CU M)	FILTER FABRIC (SQ M)
13+80-L-	1.4	.5	1.5	0.15	8.2	11.5	1.2
25+80 -L-	1.4	.5	1.5	0.15	8.2	11.5	1.2
33+60 -L-	1.4	.5	1.5	0.15	8.2	11.5	1.2
35+10 -L-	1.2	.5	1.5	0.15	6.5	10.0	1.0
36+60 -L-	1.4	.5	1.5	0.15	8.2	11.5	1.2
48+30 -L-	1.8	.5	1.5	0.15	11.5	15	1.7
50+26 -L-	1.4	.5	1.5	0.15	8.2	11.5	1.2
50+80 -L-	1.2	.5	1.5	0.15	6.5	10.0	1.0
52+00 -L-	1.2	.5	1.5	0.15	6.5	10.0	1.0
66+60 -L-	1.2	.5	1.5	0.15	6.5	10.0	1.0

ENERGY DISSIPATOR
NOT TO SCALE



PROFILE
NOT TO SCALE



PLAN VIEW
NOT TO SCALE

STATION	L_P M	W_P M	L_A M	T M	D M	CLASS II RIP RAP MTONS	DDE (CU M)	FILTER FABRIC (SQ M)
20+70 -L-	8.0	5.0	1.8	.6	1.0	110	86	75
24+80 -L-	7.0	4.3	1.5	.6	1.0	105	82	65
39+80 -L-	7.0	4.3	2.0	.6	1.0	120	95	85

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1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 4 of 48

CONST. REV.

R/W REV.

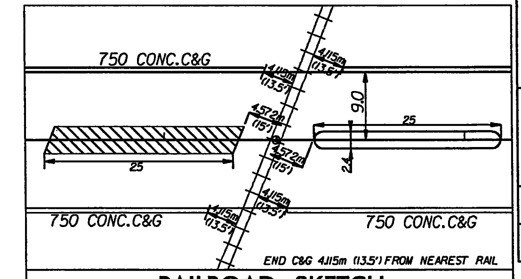
REVISIONS

Date	Revision
08-02-11-	PARCEL 16: PROPERTY LINE MODIFIED & REMOVED SHED. ADDED UNDERGROUND DRAIN LINE & MANHOLES PARCEL 16A: ADDED NEW PARCEL BETWEEN 16 & 17 REVISED OWNER NAME ON PARCELS 4,9,11,16 PARCEL 10: REVISED DRIVEWAY CONNECTION & MODIFIED PROPOSED CHAIN LINK FENCE
08-16-11-	PARCEL 12: 10.8M DRIVEWAY SHIFTED TO WEST SIDE OF PROPERTY
09-09-11-	PARCELS 8 & 8A COMBINED. REVISED OWNER NAME
10-07-11-	REVISED PARCEL BOUNDRIES FOR PARCEL 16 AND 16A
10-07-11-	ADDED SUBSURFACE DRAINAGE FOR PARCEL 16 AND 16A
10-27-11-	PARCEL 11: ADDED PDE FOR DRAINAGE STRUCTURE
10-31-11-	PARCEL 7: ADDED R/W AND MODIFIED TEMPORARY EASEMENTS

DATUM DESCRIPTION

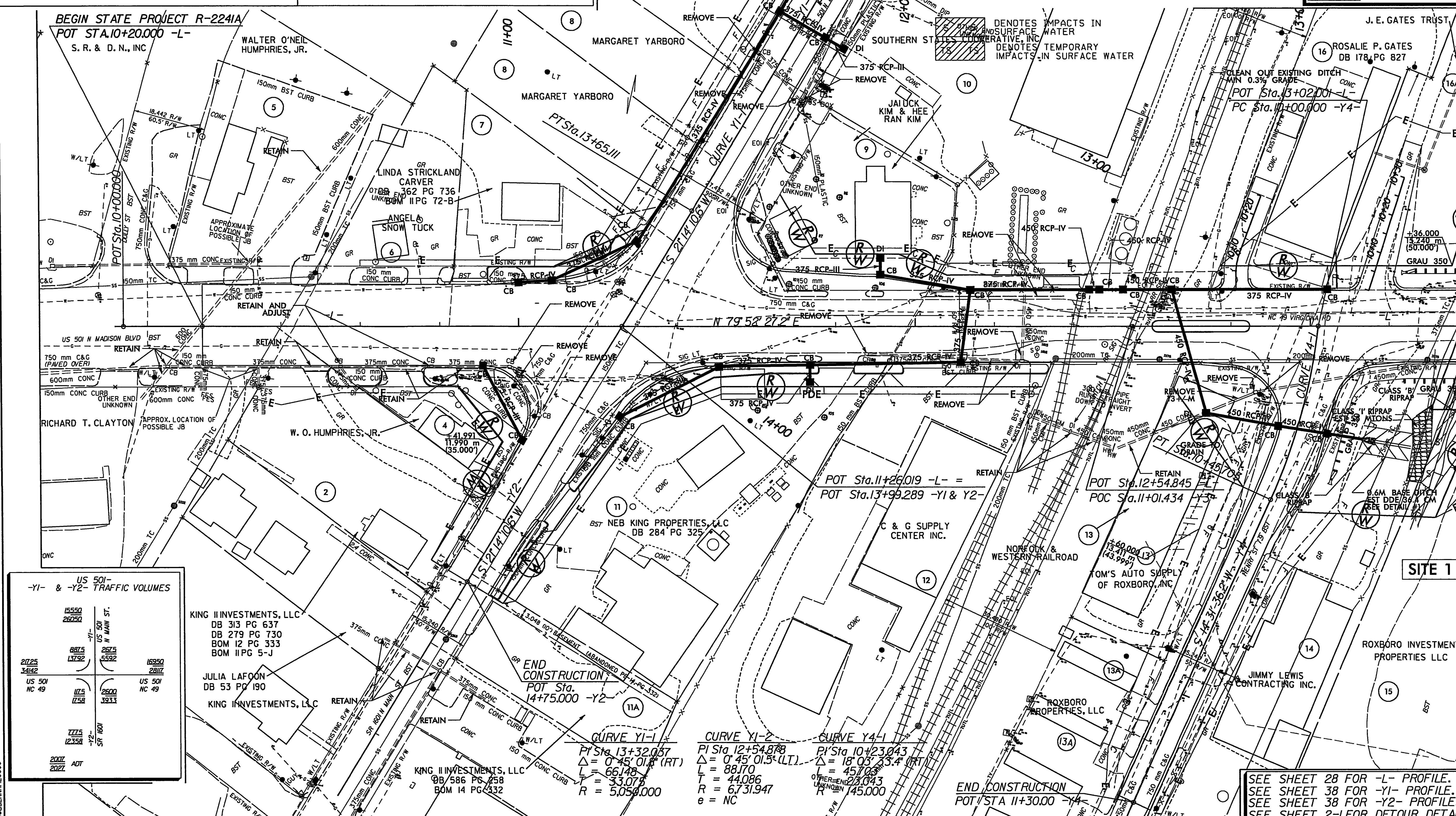
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR "JKA PANEL 13" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 300205.115(m) EASTING: 616308.868(m)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.000077057
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "JKA PANEL 13" TO -L- POT STATION 10+20.000 IS S 40° 03' 09.53" W 6729.835 (m)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

NAD 83 NC GRID



RAILROAD SKETCH

	125mm MONOLITHIC ISLAND
	FULL DEPTH PAVED SHOULDER
	PAVEMENT REMOVAL



SEE SHEET 28 FOR -L- PROFILE.
SEE SHEET 38 FOR -Y1- PROFILE.
SEE SHEET 38 FOR -Y2- PROFILE.
SEE SHEET 2-1 FOR DETOUR DETAIL

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06-25-07 - PULLED SLOPE STAKES IN.REVISED EASEMENT, AND ADDED DRIVE ON PARCEL 14
06-04-08 - MOVED DRIVEWAY ON PARCEL 10.STEEPENED FILL ON PARCEL 14.DRIVEWAY RECONNECTION ON PARCEL 16. REMOVED EASEMENT FROM PARCEL 1,8.REDUCED ROW AND TCE ON PARCEL 4.RELOCATED TCE ON PARCEL 9,13.REDUCED CONCRETE CURB.ROW & TCE ON PARCEL 11.NAME CHANCE ON PARCEL 2,3,9,19. PLACED GUARDRAIL TO PROTECT TANKS ON PARCEL 10.AND CREATED NEW PARCEL 13A
06-24-08 - MOVED ROW MONUMENTS ON PARCEL 15. TIGHTENED SLOPE STAKE LINE TO AVOID BALLARDS.
02-18-09 - REMOVED PIPE EMPTYING INTO RAILROAD DITCH. ADDED 2 PIPES AND 1CB TO CONNECT TO PIPE ON PARCEL 13
10-07-09 - ELIMINATED EASEMENT FROM WITHIN BOLLARDS AT PROPANE TANK ON PARCEL 10
06-21-10 - PARCEL 1:NO CLAIM.REMOVED PARCEL NUMBER PARCELS 6,15:REVISED PARCEL NAME PARCELS 8,9:LOCATED R/W OF ROAD BY SURVEY PARCELS 10,12:LOCATED SIGN
09-20-10 - MODIFIED RIGHT TURN LANE STORAGE LENGTH AND RAILROAD SKETCH PARCEL 9:REVISED CURB AND GUTTER.ADJUSTED RW AND EASEMENT TIE-INS PARCEL 10:ADDED A CHAIN LINK FENCE AND GATE. REDUCED GUARDRAIL LIMITS.UPDATED NOTES. UPDATED RW AND EASEMENT TIE-INS PARCEL 12:REVISED CURB AND GUTTER PARCEL 13A:UPDATED NOTES PARCEL 16:CHANGED TWO 6M DRIVEWAYS INTO TURN OUT DRIVEWAYS.UPDATED RW AND EASEMENT TIE-INS

06-21-10 - PARCEL 1:NO CLAIM.REMOVED PARCEL NUMBER PARCELS 6,15:REVISED PARCEL NAME PARCELS 8,9:LOCATED R/W OF ROAD BY SURVEY PARCELS 10,12:LOCATED SIGN
09-20-10 - MODIFIED RIGHT TURN LANE STORAGE LENGTH AND RAILROAD SKETCH PARCEL 9:REVISED CURB AND GUTTER.ADJUSTED RW AND EASEMENT TIE-INS PARCEL 10:ADDED A CHAIN LINK FENCE AND GATE. REDUCED GUARDRAIL LIMITS.UPDATED NOTES. UPDATED RW AND EASEMENT TIE-INS PARCEL 12:REVISED CURB AND GUTTER PARCEL 13A:UPDATED NOTES PARCEL 16:CHANGED TWO 6M DRIVEWAYS INTO TURN OUT DRIVEWAYS.UPDATED RW AND EASEMENT TIE-INS
09-28-10 - PARCEL 6:REVISED PARCEL INFORMATION PARCEL 16:UPDATED EASEMENT LINES

$$$$$$SYSTIME$$$$
$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

REVISIONS

08-02-11- PARCEL 16:PROPERTY LINE MODIFIED & REMOVED SHED.ADDED UNDERGROUND DRAIN LINE & MANHOLES
PARCEL 16A: ADDED NEW PARCEL BETWEEN 16 & 17 REVISED OWNER NAME ON PARCELS 4,9,11,16
PARCEL 10:REVISED DRIVEWAY CONNECTION & MODIFIED PROPOSED CHAIN LINK FENCE
08-16-11- PARCEL 12:10.8M DRIVEWAY SHIFTED TO WEST SIDE OF PROPERTY
09-09-11- PARCELS 8 & 8A COMBINED.REVISED OWNER NAME
10-07-11- REVISED PARCEL BOUNDRIES FOR PARCEL 16 AND 16A
10-07-11- ADDED SUBSURFACE DRAINAGE FOR PARCEL 16 AND 16A
10-27-11- PARCEL 11: ADDED PDE FOR DRAINAGE STRUCTURE
10-31-11- PARCEL 7: ADDED R/W AND MODIFIED TEMPORARY EASEMENTS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR "JKA PANEL 13"
WITH NAD 83 STATE PLANE GRID COORDINATES OF
NORTHING: 300205.115(m) EASTING: 616308.868(m)
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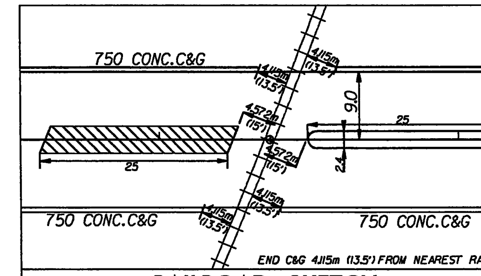
S 40° 03' 09.53" W 6729.835 (m)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29



RAILROAD SKETCH

METRIC

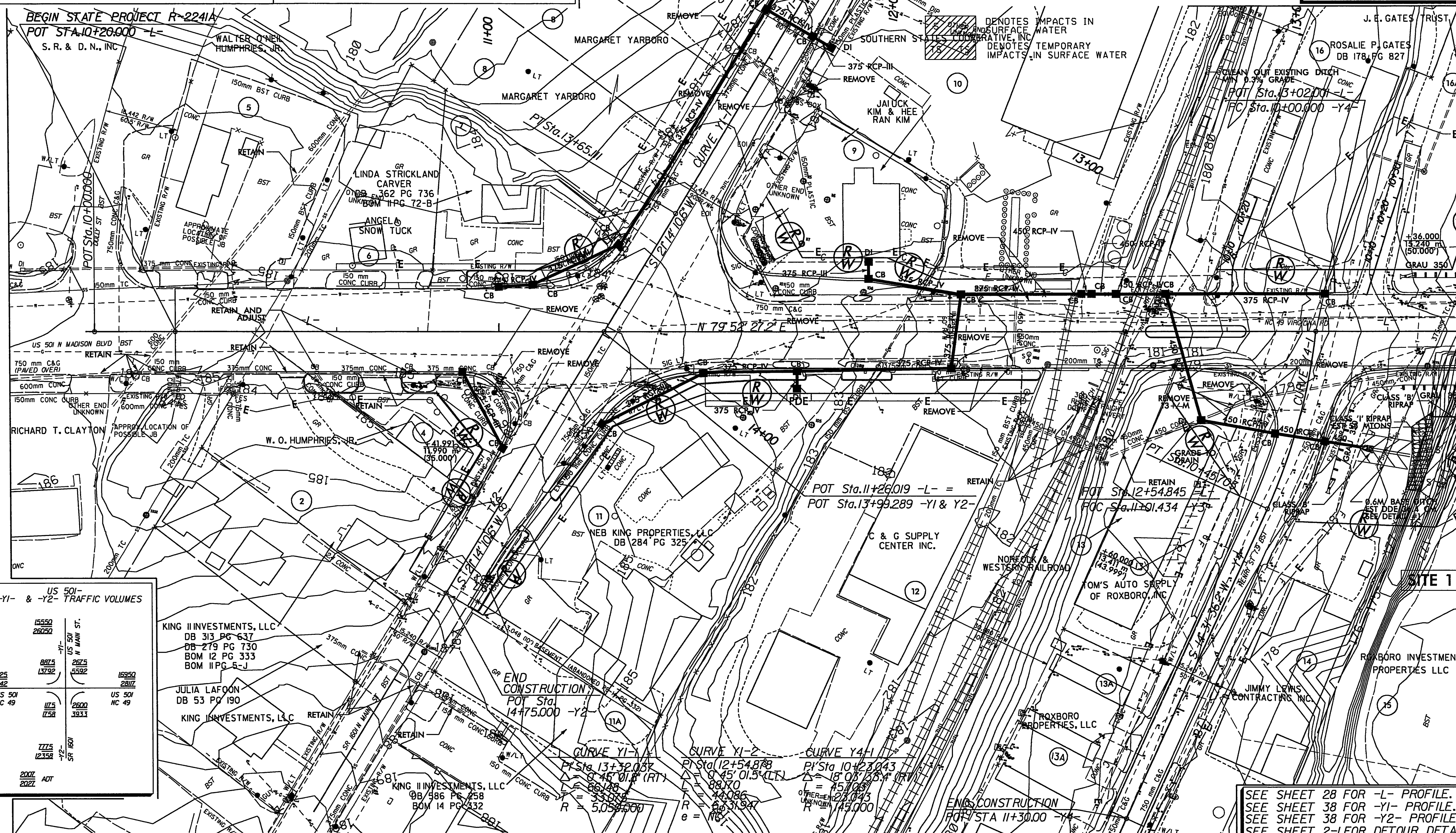
PROJECT REFERENCE NO.	SHEET NO.
R-2241A	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CONST.REV.
R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 5 of 48

	125mm MONOLITHIC ISLAND
	FULL DEPTH PAVED SHOULDER
	PAVEMENT REMOVAL



SEE SHEET 28 FOR -L- PROFILE.
SEE SHEET 38 FOR -Y1- PROFILE.
SEE SHEET 38 FOR -Y2- PROFILE.
SEE SHEET 2-1 FOR DETOUR DETAIL

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Charlotte, NC 28208
NC License Number F-0991

05-04-08 - ADDED A ROW MONUMENT & REMOVED 2 MONUMENTS. NAME CHANGE PARCELS 15,17,18. CHANGE ROW NEAR SE DRIVEWAY ON PARCEL 15. AND ESTABLISHED NEW PARCEL 20A
06-23-08 - MOVED ROW MONUMENTS ON PARCEL 15.
06-21-10 - PARCELS 15,20A: REVISED PARCEL NAME. PARCEL 20: LOCATED SECURITY PADS, SECURITY GATE ENTRANCE, SIGN, FENCE, REMOVED OLD PROPERTY LINE AND FENCE. PARCELS 20A: LOCATED CORRECT PROPERTY LINE
09-20-10 - PARCEL 15: ADJUSTED RW AND EASEMENT TIE-INS. UPDATED NOTES, MODIFIED CURB AND GUTTER. MODIFIED DRIVEWAY TIE-IN LOCATION
09-28-10 - PARCEL 20: RELOCATED DRIVEWAY ENTRANCE

REVISIONS

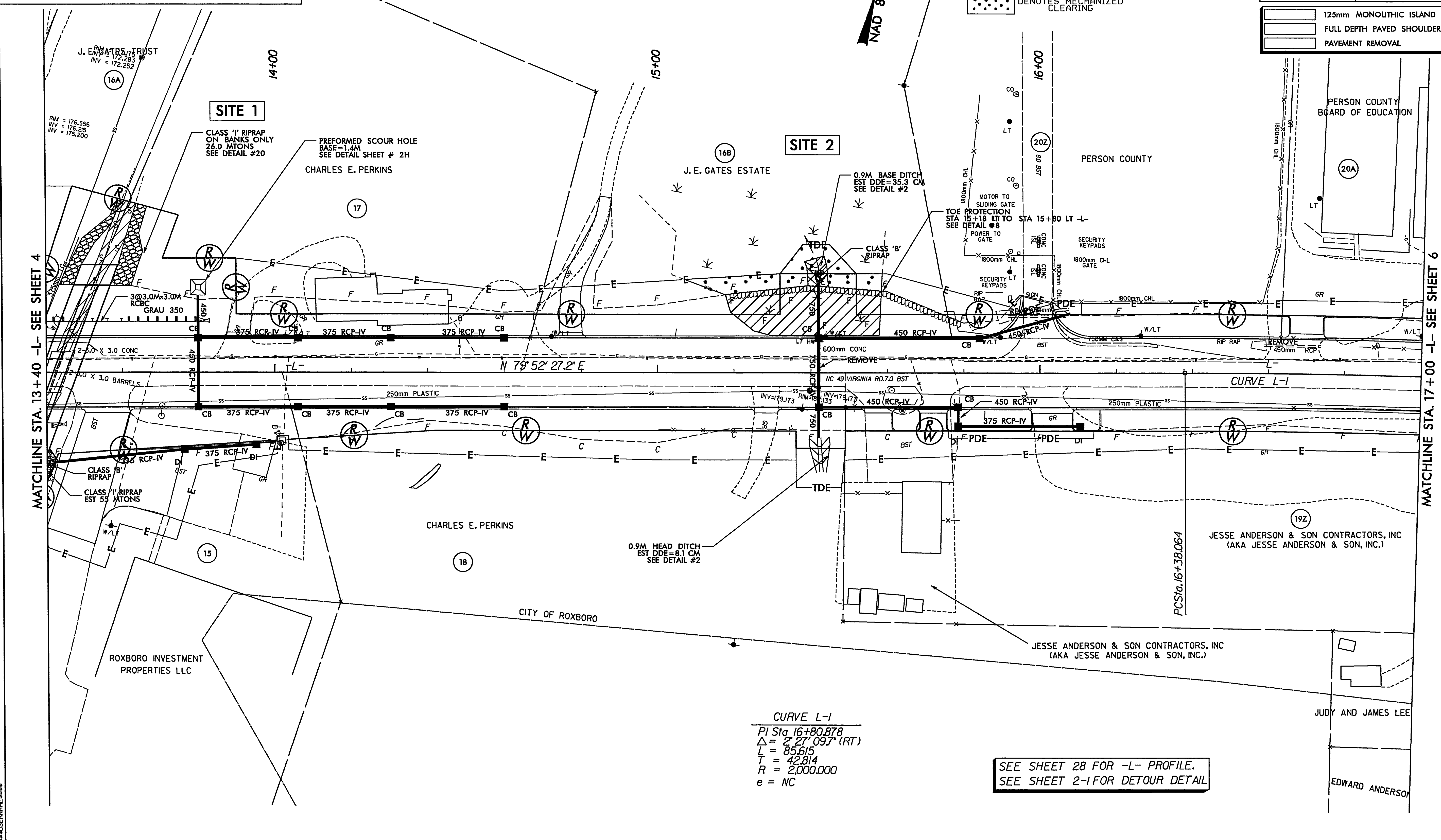
02-01-11 -	PARCEL 15: REMOVED PDE PARCEL 20: UPDATED DRAINAGE, DRIVEWAY. AND CONC.CURB. AND REDUCED LIMITS PARCEL 20A: UPDATED CONC.CURB PARCEL 20: MODIFIED DRIVEWAY. REDUCED LIMITS OF 200X450 CURB
08-02-11-	PARCEL 15: REMOVED SIGN, ELIMINATED PDE/ ADDED TCE. REDUCED ROW AROUND VAULT & SPRINKLER. ADDED NOTE DO NOT DISTURB VAULT/WL& VALVE PARCEL 16: ADDED UNDERGROUND DRAIN LINES. AND MODIFIED PARCEL TO 16B LEFT OF STA. 15+20 -L- PARCEL 16A: ADDED PARCEL 16A PARCEL 19: CHANGED PROPERTY OWNER NAME
10-07-11-	REVISED PARCEL BOUNDARIES FOR PARCEL 16 AND 16A
10-07-11-	ADDED SUBSURFACE DRAINAGE FOR PARCEL 16 AND 16A
10-27-11-	PARCEL 19Z AND PARCEL 20Z: ADDED PDE FOR DRAINAGE SYSTEM

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

CONST.REV.
R/W REV.

PRELIMINARY PLANS
Permit Drawing
Sheet 6 of 48



CURVE L-1
PI Sta 16+80.878
Δ = 2°27' 09.7" (RT)
L = 85.615
T = 42.814
R = 2,000.000
e = NC

SEE SHEET 28 FOR -L- PROFILE.
SEE SHEET 2-1 FOR DETOUR DETAIL

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

06-04-08 - ADDED A ROW MONUMENT & REMOVED 2 MONUMENTS. NAME CHANGE PARCELS 15,17,19. CHANGE ROW NEAR SE DRIVEWAY ON PARCEL 15. AND ESTABLISHED NEW PARCEL 20A

06-23-08 - MOVED ROW MONUMENTS ON PARCEL 15.

06-21-10 - PARCELS 15,20,20A;REVISED PARCEL NAME
PARCEL 20;LOCATED SECURITY PADS,SECURITY GATE ENTRANCE,SIGN,FENCE. REMOVED OLD PROPERTY LINE AND FENCE
PARCELS 20,20A;LOCATED CORRECT PROPERTY LINE

09-20-10 - PARCEL 15; ADJUSTED RW AND EASEMENT TIE-INS. UPDATED NOTES,MODIFIED CURB AND GUTTER. MODIFIED DRIVEWAY TIE-IN LOCATION

09-28-10 - PARCEL 20; RELOCATED DRIVEWAY ENTRANCE

REVISIONS

02-01-11 - PARCEL 15: REMOVED PDE
PARCEL 20: UPDATED DRAINAGE.DRIVEWAY.AND CONC.CURB.AND REDUCED LIMITS
PARCEL 20A: UPDATED CONC.CURB
PARCEL 20: MODIFIED DRIVEWAY.REDUCED LIMITS OF 200X450 CURB

08-02-11 - PARCEL 15: REMOVED SIGN.ELIMINATED PDE/ ADDED TCE.
REDUCED ROW AROUND VAULT & SPRINKLER. ADDED NOTE
DO NOT DISTURB VAULT/WL& VALVE
PARCEL 16: ADDED UNDERGROUND DRAIN LINES.AND
MODIFIED PARCEL TO 16B LEFT OF STA. 15+20 -L-
PARCEL 16A: ADDED PARCEL 16A
PARCEL 19: CHANGED PROPERTY OWNER NAME

10-07-11 - REVISED PARCEL BOUNDARIES FOR PARCEL 16 AND 16A

10-07-11 - ADDED SUBSURFACE DRAINAGE FOR PARCEL 16 AND 16A

10-27-11 - PARCEL 19Z AND PARCEL 20Z: ADDED PDE FOR DRAINAGE SYSTEM

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CONST.REV.

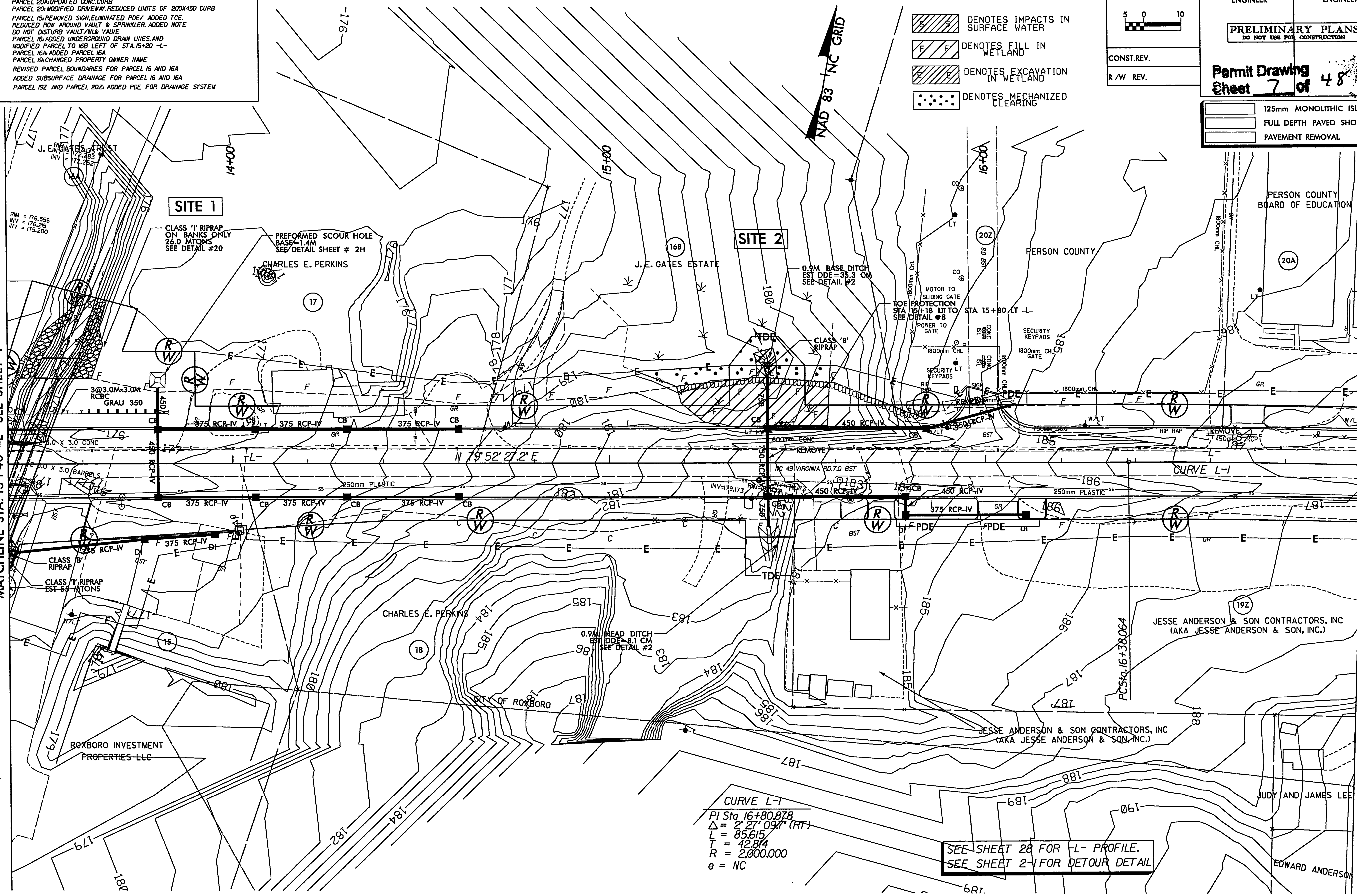
R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 7 of 48

DENOTES IMPACTS IN SURFACE WATER
DENOTES FILL IN WETLAND
DENOTES EXCAVATION IN WETLAND
DENOTES MECHANIZED CLEARING

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



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

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	28
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

HORIZ. 5 0 10 — VERT. 1 0 2

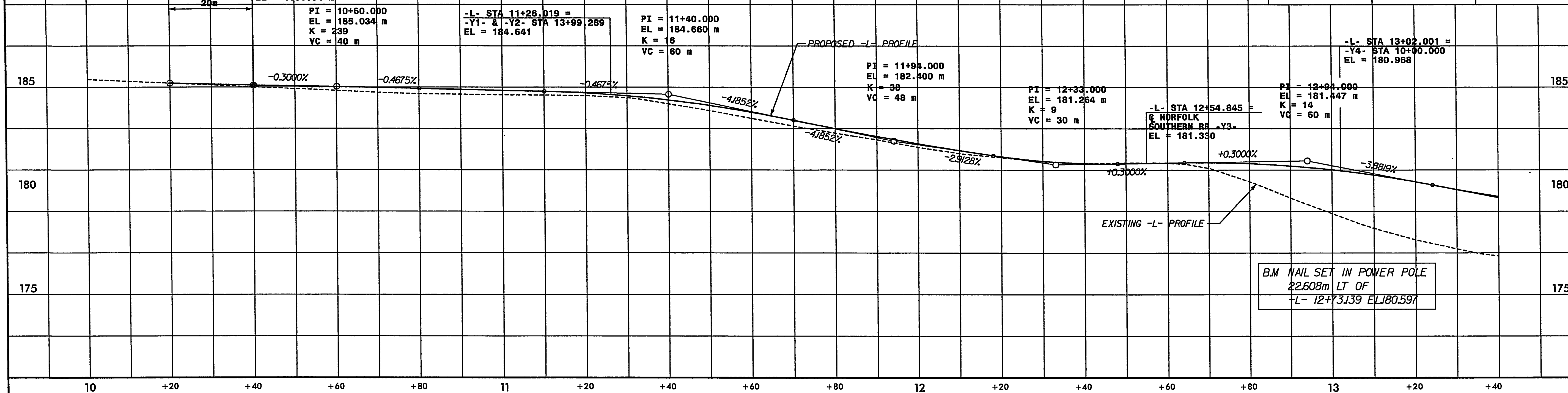
CONST.REV. ________

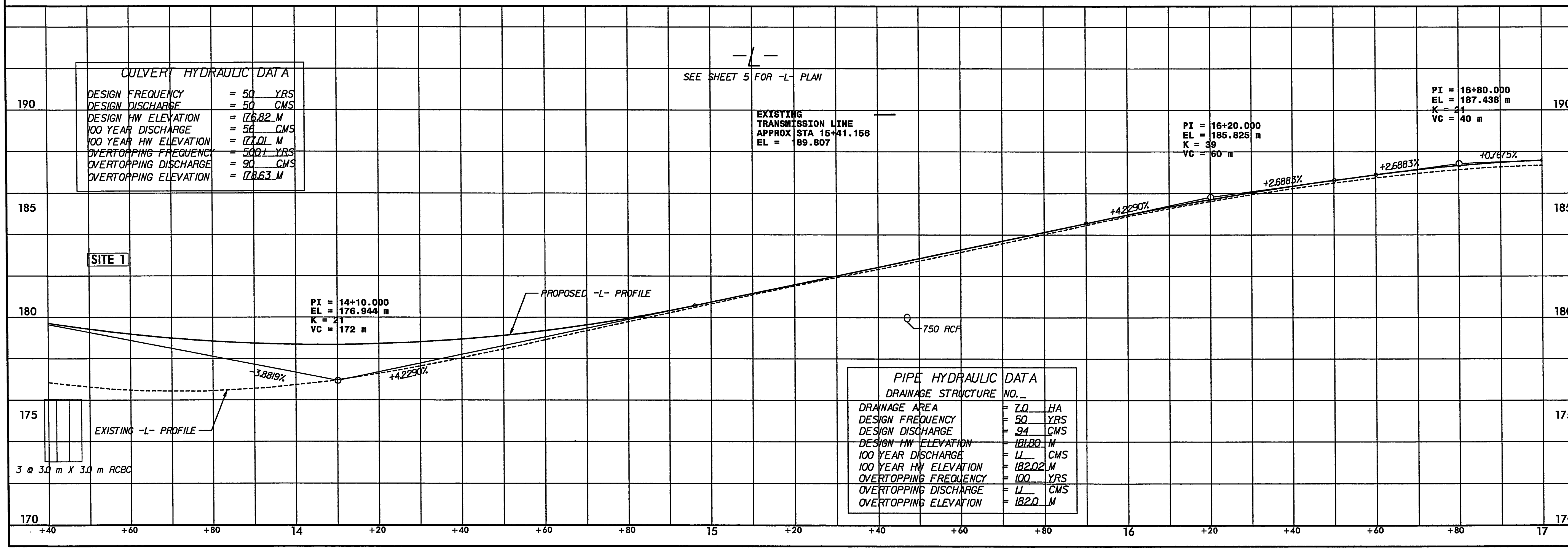
R/W REV. ________

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION.

Permit Drawing
Sheet 8 of 48

DITCH LEGEND	
LEFT DITCH	----------
MEDIAN DITCH	— — — —


-L-
SEE SHEET 4 FOR -L- PLAN
BEGIN STATE PROJECT R-2241A
BEGIN CONSTRUCTION
STA 10+20.000
EL = 185.195
FEATHER 20m
BEGIN GRADE
STA 10+40.000
EL = 185.094 m
PI = 10+60.000
EL = 185.034 m
K = 239
VC = 40 m
-L- STA 11+26.019 =
-Y1- & -Y2- STA 13+99.289
EL = 184.641
PI = 11+40.000
EL = 184.660 m
K = 16
VC = 60 m
PROPOSED -L- PROFILE
PI = 11+94.000
EL = 182.400 m
K = 38
VC = 48 m
PI = 12+33.000
EL = 181.264 m
K = 9
VC = 30 m
-L- STA 12+54.845 =
℄ NORFOLK SOUTHERN RR -Y3-
EL = 181.330
PI = 12+94.000
EL = 181.447 m
K = 14
VC = 60 m
-L- STA 13+02.001 =
-Y4- STA 10+00.000
EL = 180.968
-0.3000%
-0.4675%
-0.4675%
-4.1852%
-4.1852%
-2.9128%
+0.3000%
+0.3000%
-3.8819%
EXISTING -L- PROFILE
B.M NAIL SET IN POWER POLE
22.608m LT OF
-L- 12+73.139 EL.180.597
190
185
180
175
10
+20
+40
+60
+80
11
+20
+40
+60
+80
12
+20
+40
+60
+80
13
+20
+40


-L-
SEE SHEET 5 FOR -L- PLAN
EXISTING
TRANSMISSION LINE
APPROX STA 15+41.156
EL = 189.807
PI = 16+20.000
EL = 185.825 m
K = 39
VC = 60 m
PI = 16+80.000
EL = 187.438 m
K = 21
VC = 40 m
+4.2290%
+2.6883%
+2.6883%
+0.7675%
SITE 1
PI = 14+10.000
EL = 176.944 m
K = 21
VC = 172 m
PROPOSED -L- PROFILE
-3.8819%
+4.2290%
750 RCP
EXISTING -L- PROFILE
3 @ 3.0 m X 3.0 m RCBC
190
185
180
175
170
+40
+60
+80
14
+20
+40
+60
+80
15
+20
+40
+60
+80
16
+20
+40
+60
+80
17

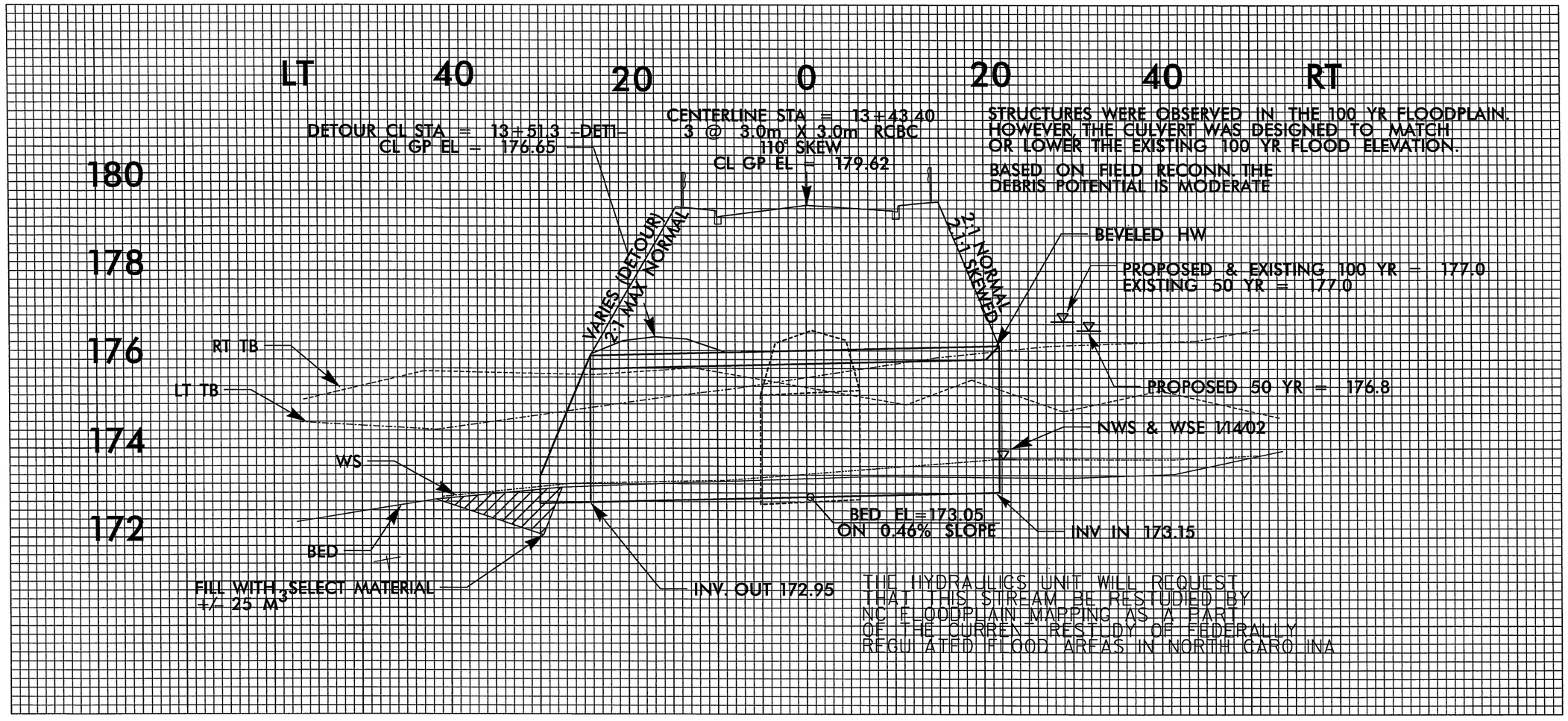
CULVERT HYDRAULIC DATA

DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 50	CMS
DESIGN HW ELEVATION	= 176.82	M
100 YEAR DISCHARGE	= 56	CMS
100 YEAR HW ELEVATION	= 177.01	M
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 90	CMS
OVERTOPPING ELEVATION	= 178.63	M

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO._

DRAINAGE AREA	= 7.0	HA
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= .94	CMS
~~DESIGN HW ELEVATION~~	= 181.80	M
100 YEAR DISCHARGE	= 1.1	CMS
100 YEAR HW ELEVATION	= 182.02	M
OVERTOPPING FREQUENCY	= 100	YRS
OVERTOPPING DISCHARGE	= 1.1	CMS
OVERTOPPING ELEVATION	= 182.0	M


LT
40
20
0
20
40
RT
DETOUR CL STA = 13+51.3 -DETI-
CL GP EL = 176.65
CENTERLINE STA = 13+43.40
3 @ 3.0m X 3.0m RCBC
110° SKEW
CL GP EL = 179.62
STRUCTURES WERE OBSERVED IN THE 100 YR FLOODPLAIN. HOWEVER, THE CULVERT WAS DESIGNED TO MATCH OR LOWER THE EXISTING 100 YR FLOOD ELEVATION.
BASED ON FIELD RECONN. THE DEBRIS POTENTIAL IS MODERATE
180
178
176
174
172
VARIES (DETOUR) 2:1 MAX NORMAL
2:1 NORMAL SKEWED
BEVELED HW
PROPOSED & EXISTING 100 YR = 177.0
EXISTING 50 YR = 177.0
PROPOSED 50 YR = 176.8
NWS & WSE 1/1402
RT TB
LT TB
WS
BED
BED EL=173.05
ON 0.46% SLOPE
INV IN 173.15
INV. OUT 172.95
FILL WITH SELECT MATERIAL
+/- 25 M3
THE HYDRAULICS UNIT WILL REQUEST THAT THIS STREAM BE RESTUDIED BY NC FLOODPLAIN MAPPING AS A PART OF THE CURRENT RESTUDY OF FEDERALLY REGULATED FLOOD AREAS IN NORTH CAROLINA

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

06-04-08 - SHOWED WELL, DRIVEWAY RECONNECTION ON PARCEL 21. PROVIDED DRIVEWAY ACCESS ON PARCEL 22A AND 34. RELABELED FILL AS CUT ON PARCEL 20A. NAME CORRECTION ON PARCELS 24, 26. NAME CHANGE 21, 22A, AND 25. SPELLING CORRECTION FOR NAME ON PARCEL 27. PROPERTY LINE CHANGE ON PARCELS 21, 22, 22A, AND 36

06-21-10 - PARCEL 20A: REVISED PARCEL NAME. LOCATED CORRECT PROPERTY LINE. PARCEL 36: REVISED PARCEL NAME. VERIFIED FIRE HYDRANT. SEWER HOLE AND WATER METER LOCATIONS.

REVISIONS

02-01-11 -	PARCEL 23: REVISED PROPERTY LINE PARCEL 24: REMOVED 200X450 CONC. CURB PARCEL 26: ADDED SEPTIC LINE PARCEL 36: ADDED SEPTIC LINE
08-02-11 -	CHANGED PROPERTY OWNERS NAME ON PARCELS 19, 22, 22A, 30, 34
09-09-11 -	PARCEL 29: ELIMINATED TCE AND CLAIM
09-09-11 -	PARCEL 35: REVISED OWNER NAME
09-27-11 -	PARCEL 26: EXTENDED TCE THROUGH EXISTING DWELLING.

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

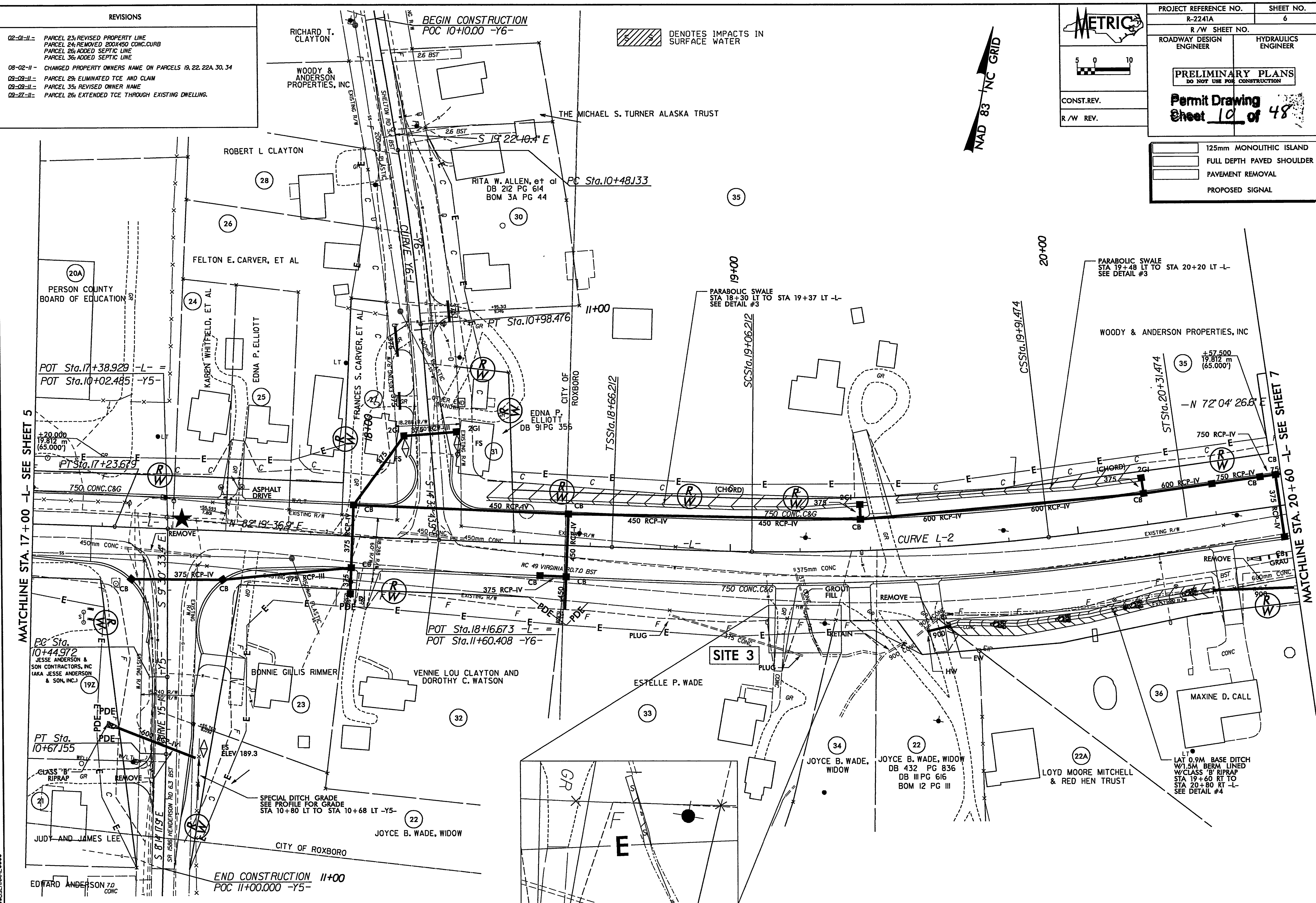
METRIC

PRELIMINARY PLANS — DO NOT USE FOR CONSTRUCTION

Permit Drawing Sheet 10 of 48

CONST. REV.

R/W REV.


BEGIN CONSTRUCTION
POC 10+10.00 -Y6-
DENOTES IMPACTS IN SURFACE WATER
NAD 83 NC GRID
125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL
PROPOSED SIGNAL
RICHARD T. CLAYTON
WOODY & ANDERSON PROPERTIES, INC
THE MICHAEL S. TURNER ALASKA TRUST
ROBERT L CLAYTON
RITA W. ALLEN, et al
DB 212 PG 614
BOM 3A PG 44
PC Sta.10+48.133
S 19° 22' 10.4" E
FELTON E. CARVER, ET AL
PERSON COUNTY BOARD OF EDUCATION
KAREN WHITFIELD, ET AL
EDNA P. ELLIOTT
FRANCES S. CARVER, ET AL
CURVE Y6-1
PT Sta.10+98.476
CITY OF ROXBORO
EDNA P. ELLIOTT
DB 91 PG 356
TSSta.18+66.212
SCSta.19+06.212
CSSta.19+91.474
STSta.20+31.474
PARABOLIC SWALE
STA 18+30 LT TO STA 19+37 LT -L-
SEE DETAIL #3
PARABOLIC SWALE
STA 19+48 LT TO STA 20+20 LT -L-
SEE DETAIL #3
WOODY & ANDERSON PROPERTIES, INC
POT Sta.17+38.929 -L- =
POT Sta.10+02.485 -Y5-
PT Sta.17+23.679
MATCHLINE STA. 17+00 -L- SEE SHEET 5
MATCHLINE STA. 20+60 -L- SEE SHEET 7
N 82° 19' 36.9" E
N 72° 04' 26.6" E
CURVE L-2
NC 49 VIRGINIA RD 7.0 BST
POT Sta.18+16.673 -L- =
POT Sta.11+60.408 -Y6-
SITE 3
PC Sta. 10+44.972
JESSE ANDERSON & SON CONTRACTORS, INC (AKA JESSE ANDERSON & SON, INC.)
PT Sta. 10+67.155
BONNIE GILLIS RIMMER
VENNIE LOU CLAYTON AND DOROTHY C. WATSON
ESTELLE P. WADE
JOYCE B. WADE, WIDOW
JOYCE B. WADE, WIDOW
DB 432 PG 836
DB 111 PG 616
BOM 12 PG 111
LOYD MOORE MITCHELL & RED HEN TRUST
MAXINE D. CALL
LAT 0.9M BASE DITCH W/1.5M BERM LINED W/CLASS 'B' RIPRAP STA 19+60 RT TO STA 20+80 RT -L- SEE DETAIL #4
SPECIAL DITCH GRADE SEE PROFILE FOR GRADE STA 10+80 LT TO STA 10+68 LT -Y5-
FS ELEV 189.3
CLASS 'B' RIPRAP
JUDY AND JAMES LEE
CITY OF ROXBORO
EDWARD ANDERSON
END CONSTRUCTION 11+00
POC 11+00.000 -Y5-
S 81° 14' 19" E
SR 1586 HENDERSON RD 6.3 BST
SHELTON RD SR BST

STV/Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

06-04-08 = SHOWED WELL,DRIVEWAY RECONNECTION ON PARCEL 21. PROVIDED DRIVEWAY ACCESS ON PARCEL 22A AND 34. RELABELED FILL AS CUT ON PARCEL 20A,NAME CORRECTION ON PARCELS 24,26,NAME CHANGE 21. 22A,AND 25.SPELLING CORRECTION FOR NAME ON PARCEL 27.PROPERTY LINE CHANGE ON PARCELS 21. 22,22A,AND 36

06-21-10 = PARCEL 20A:REVISED PARCEL NAME.LOCATED CORRECT PROPERTY LINE. PARCEL 36:REVISED PARCEL NAME.VERIFIED FIRE HYDRANT. SEWER HOLE AND WATER METER LOCATIONS.

REVISIONS

02-01-11 = PARCEL 23: REVISED PROPERTY LINE
PARCEL 24: REMOVED 200X450 CONC.CURB
PARCEL 26: ADDED SEPTIC LINE
PARCEL 36: ADDED SEPTIC LINE

08-02-11 - CHANGED PROPERTY OWNERS NAME ON PARCELS 19, 22, 22A, 30, 34

09-09-11 = PARCEL 29: ELIMINATED TCE AND CLAIM

09-09-11 = PARCEL 35: REVISED OWNER NAME

09-27-11 = PARCEL 26: EXTENDED TCE THROUGH EXISTING DWELLING.

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

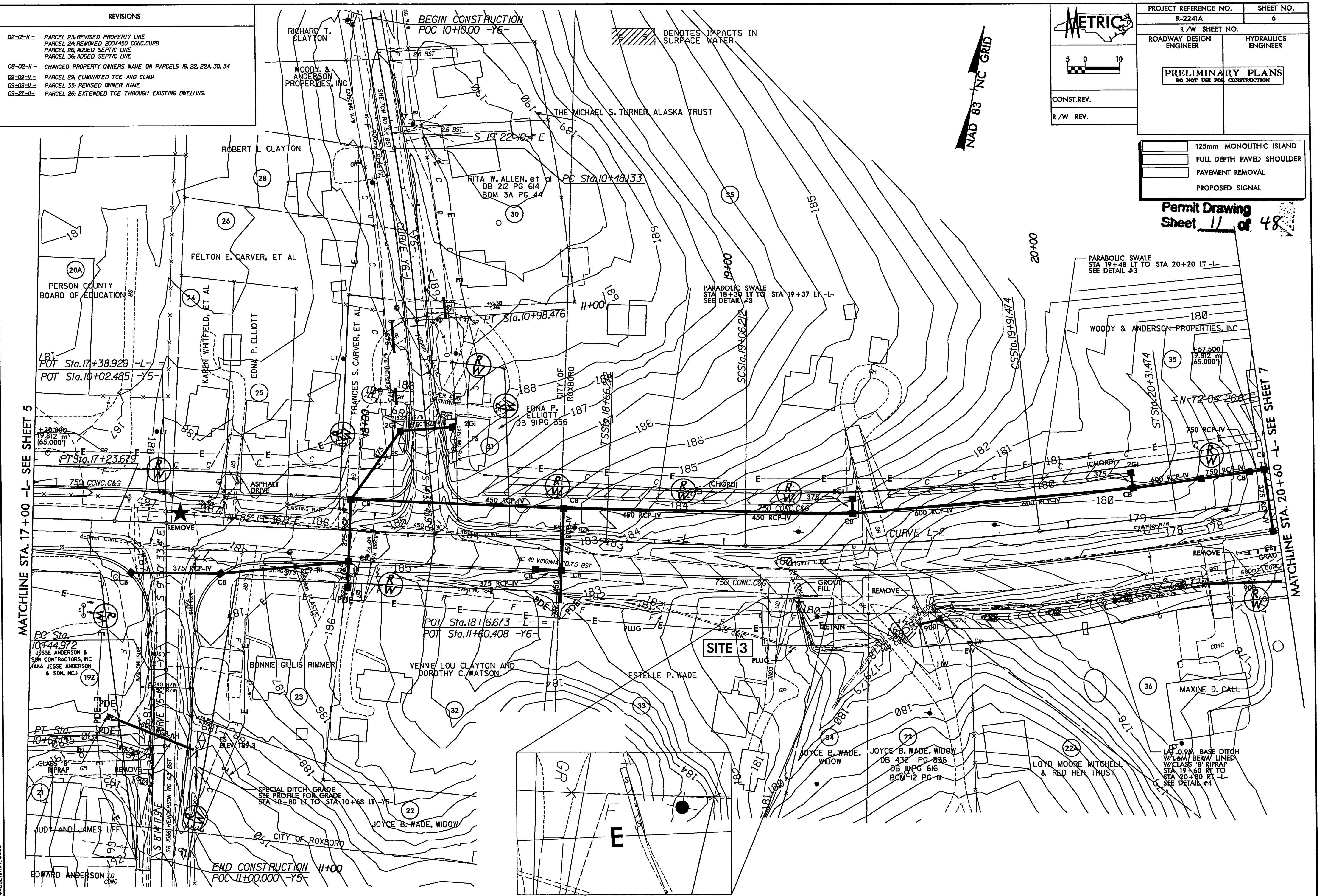
CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

	125mm MONOLITHIC ISLAND
	FULL DEPTH PAVED SHOULDER
	PAVEMENT REMOVAL
	PROPOSED SIGNAL

Permit Drawing
Sheet 11 of 48



BEGIN CONSTRUCTION
POC 10+10.00 -Y6-
DENOTES IMPACTS IN SURFACE WATER
NAD 83 NC GRID
RICHARD T. CLAYTON
WOODY & ANDERSON PROPERTIES, INC
THE MICHAEL S. TURNER ALASKA TRUST
S 19°22'10.4" E
ROBERT L CLAYTON
RITA W. ALLEN, et al
DB 212 PG 614
BOM 3A PG 44
PC Sta.10+48.133
FELTON E. CARVER, ET AL
PERSON COUNTY BOARD OF EDUCATION
KAREN WHITFIELD, ET AL
EDNA P. ELLIOTT
FRANCES S. CARVER, ET AL
PT Sta.10+98.476
CITY OF ROXBORO
EDNA P. ELLIOTT
DB 91 PG 355
PARABOLIC SWALE
STA 18+30 LT TO STA 19+37 LT -L-
SEE DETAIL #3
PARABOLIC SWALE
STA 19+48 LT TO STA 20+20 LT -L-
SEE DETAIL #3
WOODY & ANDERSON PROPERTIES, INC
POT Sta.17+38.929 -L-
POT Sta.10+02.485 -Y5-
PT Sta.17+23.679
MATCHLINE STA. 17+00 -L- SEE SHEET 5
MATCHLINE STA. 20+60 -L- SEE SHEET 7
750 CONC.C&G
ASPHALT DRIVE
REMOVE
CURVE L-2
NC 49 VIRGINIA RD.T.D BST
POT Sta.18+6.673 -L-
POT Sta.11+60.408 -Y6
SITE 3
PC Sta. 10+44.972
JESSE ANDERSON & SON CONTRACTORS, INC (AKA JESSE ANDERSON & SON, INC.)
BONNIE GILLIS RIMMER
VENNIE LOU CLAYTON AND DOROTHY C. WATSON
ESTELLE P. WADE
MAXINE D. CALL
PT Sta. 10+67.755
CLASS 'B' RIPRAP
SPECIAL DITCH GRADE
SEE PROFILE FOR GRADE
STA 10+80 LT TO STA 10+68 LT -Y5-
JOYCE B. WADE, WIDOW
JOYCE B. WADE, WIDOW
DB 432 PG 836
DB 111 PG 616
BOM 12 PG 111
LOYD MOORE MITCHELL & RED HEN TRUST
LAT 0.9M BASE DITCH W/1.5M BERM LINED W/CLASS 'B' RIPRAP
STA 19+60 RT TO STA 20+60 RT -L-
SEE DETAIL #4
JUDY AND JAMES LEE
CITY OF ROXBORO
END CONSTRUCTION 11+00
POC 11+00.000 -Y5-
EDWARD ANDERSON

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste 200
Charlotte, NC 28208
NC License Number F-0991

REVISIONS

06-04-08 -	SHIFTED ROW MONUMENT OFF OF PROPERTY LINE,AND PROPERTY LINE CHANGE PARCELS 35,36
06-21-10 -	PARCEL 35; REMOVED PARCEL AND OWNERSHIP OF PARCEL 36
02-01-11 -	PARCEL 38; UPDATED PARCEL INFORMATION
08-02-11 -	PARCEL 37; ADDED NOTE NOT TO DISTURB SEPTIC LINES PARCEL 39; REDUCED TCE 3 METERS SOUTHWARD OFF SEPTIC LINES. ADDED NOTE TO NOT DISTURB
09-09-11 -	PARCEL 35; REVISED OWNER NAME

METRIC

5 0 10

CONST.REV.	
R /W REV.	

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	7
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

Permit Drawing
Sheet 12 of 48

NAD 83 NC GRID

DENOTES IMPACTS IN SURFACE WATER
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
DENOTES TEMPORARY IMPACTS IN SURFACE WATER

21+00 22+00 23+00 24+00

MATCHLINE STA. 20+60 -L- SEE SHEET 6

MATCHLINE STA. 24+20 -L- SEE SHEET 8

SITE 4

SITE 5

ENERGY DISSIPATOR SEE DETAIL SHEET # 2H

CLASS 'I' RIPRAP ON BANKS ONLY EST 52 MTONS

TOE PROTECTION STA 19+91 LT TO STA 21+26 LT -L- SEE DETAIL #8

750 RCP-IV

450 RCP-IV

750 CONC C&G

375 RCP-IV

2-1.8 X 1.8 CONC

2-1.8 X 1.8 BARRELS

NC 49 VIRGINIA RD.7.0 BST

GRAU 350

2@2.4Mx2.4M RCBC

TOE PROTECTION STA 19+91 RT TO STA 21+40 RT -L- SEE DETAIL #8

CLASS 'I' RIPRAP EST 60 TONS

LAT .09M BASE DITCH W/1.5M BERM LINED W/CLASS 'B' RIPRAP STA 19+60 RT TO STA 20+80 RT -L- SEE DETAIL #4

MAXINE D. CALL

RONALD R. SHELTON

PROPOSED ASPHALT DRIVE

WOODY & ANDERSON PROPERTIES, INC

-L-

N 72°04'26.6" E

U.G. SEPTIC LINE AS MARKED BY PERSON COUNTY HEALTH DEPARTMENT

DO NOT DISTURB EXISTING SEPTIC LINES

TIMOTHY HARRIS
CHERYL CAVALIER
DB 305 PG 780

ROBERT W. WALKER

24 BST

SEE SHEET 29 FOR -L- PROFILE.
SEE SHEET 2-J FOR DETOUR DETAIL

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste 200
Charlotte, NC 28208
NC License Number F-0991

REVISIONS

06-04-08 -	SHIFTED ROW MONUMENT OFF OF PROPERTY LINE.AND PROPERTY LINE CHANGE PARCELS 35.36
06-21-10 -	PARCEL 35: REMOVED PARCEL AND OWNERSHIP OF PARCEL 36
02-01-11 -	PARCEL 38: UPDATED PARCEL INFORMATION
08-02-11 -	PARCEL 37: ADDED NOTE NOT TO DISTURB SEPTIC LINES PARCEL 39: REDUCED TCE 3 METERS SOUTHWARD OFF SEPTIC LINES. ADDED NOTE TO NOT DISTURB
09-09-11 -	PARCEL 35: REVISED OWNER NAME

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

5 0 10

CONST.REV.

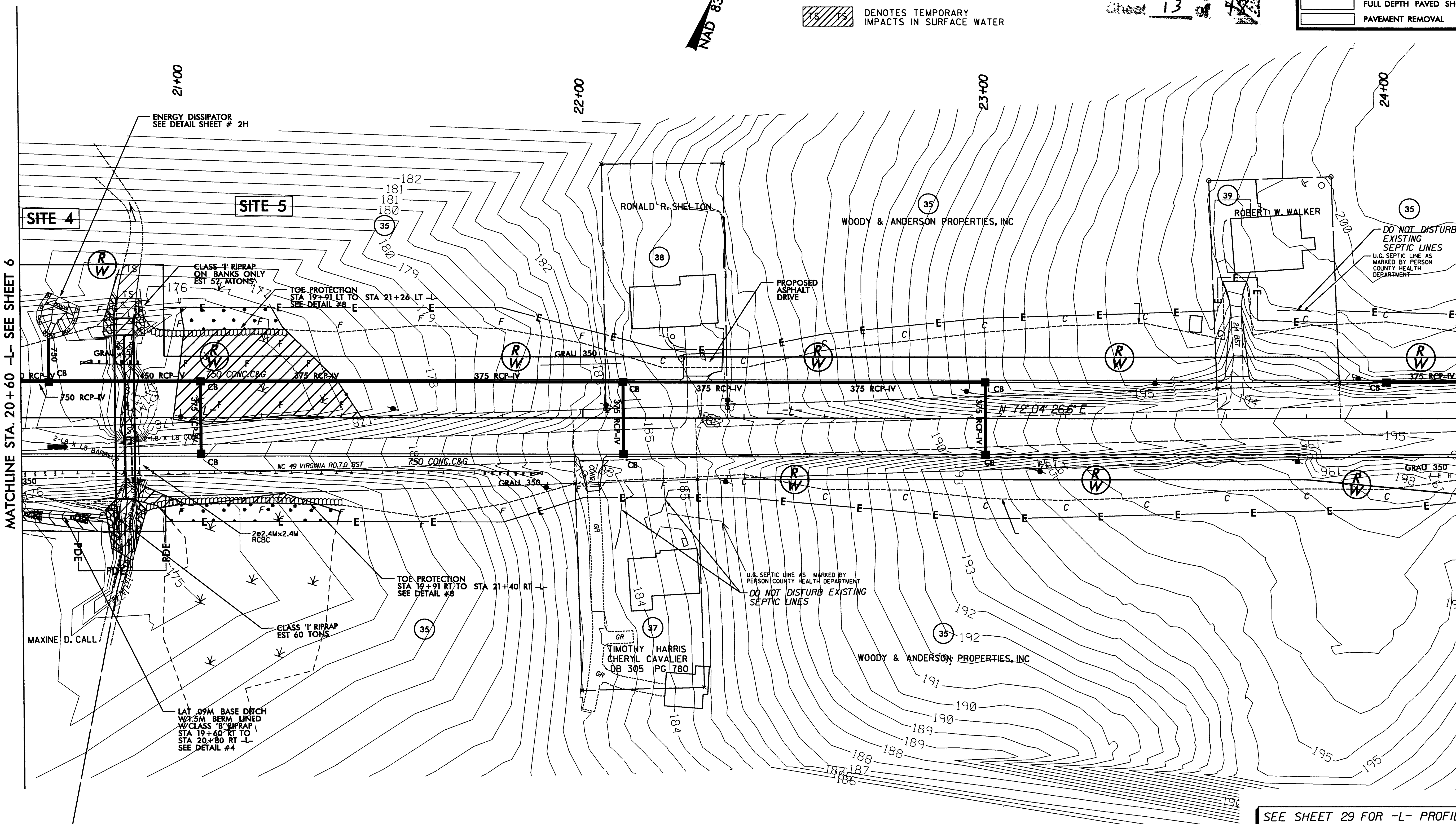
R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

- 125mm MONOLITHIC ISLAND
- FULL DEPTH PAVED SHOULDER
- PAVEMENT REMOVAL

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

Permit Drawing
Sheet 13 of 48



SEE SHEET 29 FOR -L- PROFILE.
SEE SHEET 2-J FOR DETOUR DETAIL

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35454
CHARLOTTE, NORTH CAROLINA 28235

METRIC
5 0 10 HORIZ.
1 0 2 VERT.
CONST.REV. _____
R/W REV. _____

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	29
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Permit Drawing
Sheet 14 of 48

-L- STA 17+38.929 =
-Y5- STA 10+02.485
EL = 187.470

PI = 17+20.000
EL = 187.745 m
K = 18
VC = 40 m

PI = 17+60.000
EL = 187.165 m
K = 20
VC = 40 m

-L- STA 18+16.673 =
-Y6- STA 11+60.408
EL = 185.252

PI = 18+20.000
EL = 185.098 m
K = 91
VC = 60 m

PI = 19+10.000
EL = 182.594 m
K = 78
VC = 100 m

SEE SHEET 6 FOR -L- PLAN

+0.7675%
-1.4500%
-1.4500%
-3.4450%
-3.4450%
-2.7822%
-2.7822%
-4.0639%

B.M. NAIL SET IN POWER POLE
10.243m LT OF
-L- 17+00.143 EL.187.624

PROPOSED -L- PROFILE
EXISTING -L- PROFILE

BEGIN LAT. BASE DITCH
-L- STA.19+60.00 RT
EL.177.85

(-) 5.0000%
(-) 2.7500%
(-) 0.5000%
(-) 5.0000%

PI =19+80.000
EL = 176.850

PI =20+00.000
EL = 176.300

PI =20+40.000
EL = 176.100

PI =20+60.000
EL = 175.100

190
185
180
175
17 +20 +40 +60 +80 18 +20 +40 +60 +80 19 +20 +40 +60 +80 20 +20 +40 +60

SEE SHEET 7 FOR -L- PLAN

CULVERT HYDRAULIC DATA

DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 24.3 CMS
DESIGN HW ELEVATION	= 175.59 M
100 YEAR DISCHARGE	= 28.0 CMS
100 YEAR HW ELEVATION	= 175.90 M
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING DISCHARGE	= 43.0+ CMS
OVERTOPPING ELEVATION	= 178.45 M

END LAT. BASE DITCH
-L- STA.20+80.00 RT
EL.177.70

PI = 20+90.000
EL = 175.279 m
K = 21
VC = 240 m

SITE 4
SITE 5

PROPOSED -L- PROFILE
FILL IN WETLANDS
FILL IN WETLAND
IMPACTS IN SURFACE WATER
-4.0639%
+1.5618%
EXISTING -L- PROFILE

PI =20+60.000
EL = 175.100

2 @ 2.4 m X 2.4 m RCBC

190
185
180
175
170
+60 +80 21 +20 +40 +60 +80 22 +20 +40 +60 +80 23 +20 +40 +60 +80 24 +20

SEE SHEET 7 FOR -L- PLAN

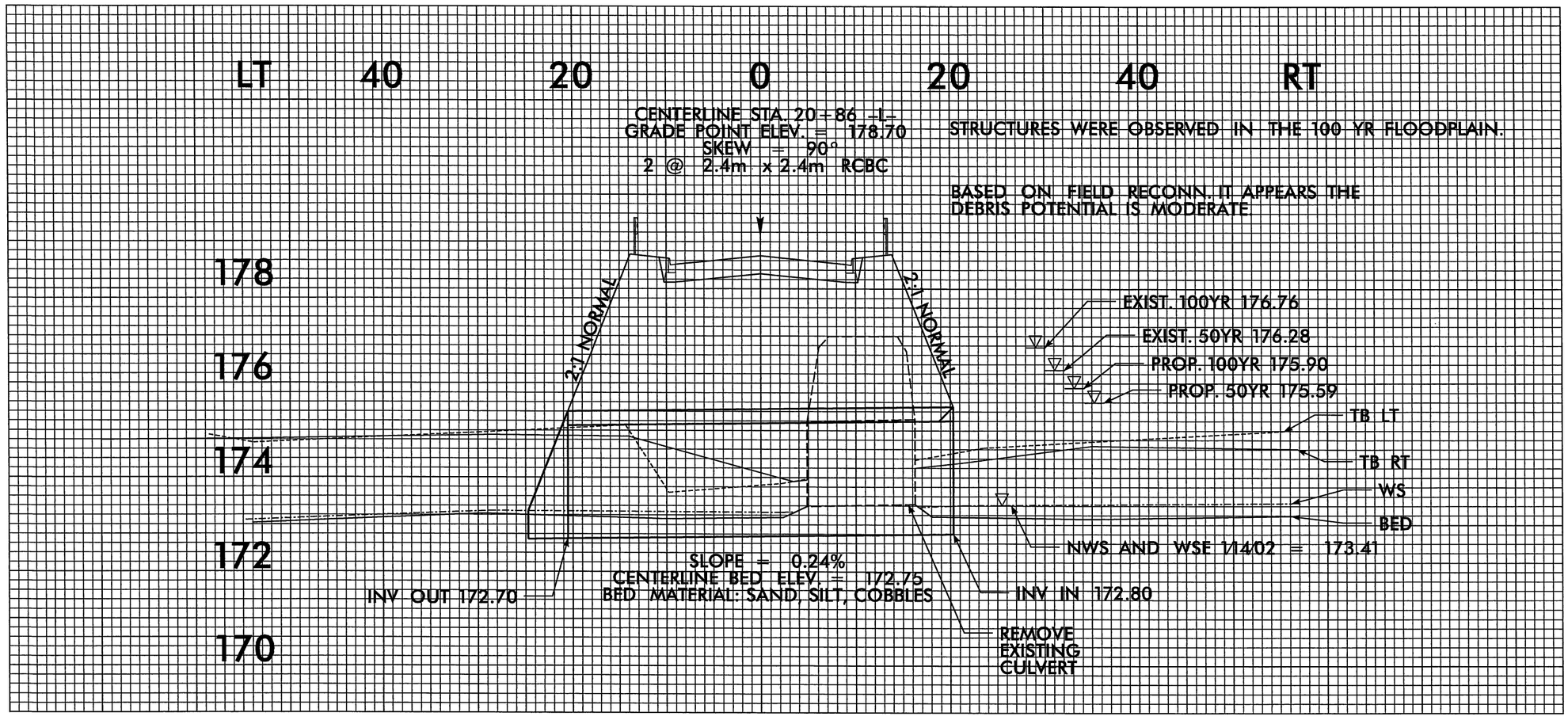
PI = 23+60.000
EL = 195.712 m
K = 24
VC = 170 m

+0.4933%
+1.5618%

PROPOSED -L- PROFILE
EXISTING -L- PROFILE

B.M. NAIL SET IN 380mm PINE
15.533m RT OF
-L- 24+10.775 EL.197.851

200
195
190
185
180


LT
40
20
0
20
40
RT
CENTERLINE STA. 20+86 -I-
GRADE POINT ELEV. = 178.70
SKEW = 90°
2 @ 2.4m x 2.4m RCBC
178
176
174
172
170
2:1 NORMAL
2:1 NORMAL
SLOPE = 0.24%
CENTERLINE BED ELEV. = 172.75
BED MATERIAL: SAND, SILT, COBBLES
INV OUT 172.70
INV IN 172.80
STRUCTURES WERE OBSERVED IN THE 100 YR FLOODPLAIN.
BASED ON FIELD RECONN. IT APPEARS THE DEBRIS POTENTIAL IS MODERATE
EXIST. 100YR 176.76
EXIST. 50YR 176.28
PROP. 100YR 175.90
PROP. 50YR 175.59
TB LT
TB RT
WS
BED
NWS AND WSE 1/14/02 = 173.41
REMOVE EXISTING CULVERT

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CONSULTING ENGINEERS
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CHARLOTTE, NORTH CAROLINA 28235

REVISIONS	
06-04-08 -	ESTABLISHED ACCESS POINT ON PARCEL 41, AND CHANGED NAME ON PARCEL 40
06-21-10 -	PARCEL 41; REVISED PARCEL NAME
09-28-10 -	PARCEL 41; REVISED PARCEL INFORMATION
02-01-11 -	PARCEL 37; ADDED SEPTIC LINE PARCEL 38; ADDED WELL PARCEL 39; ADDED SEPTIC LINE

S — DENOTES IMPACTS IN SURFACE WATER

TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

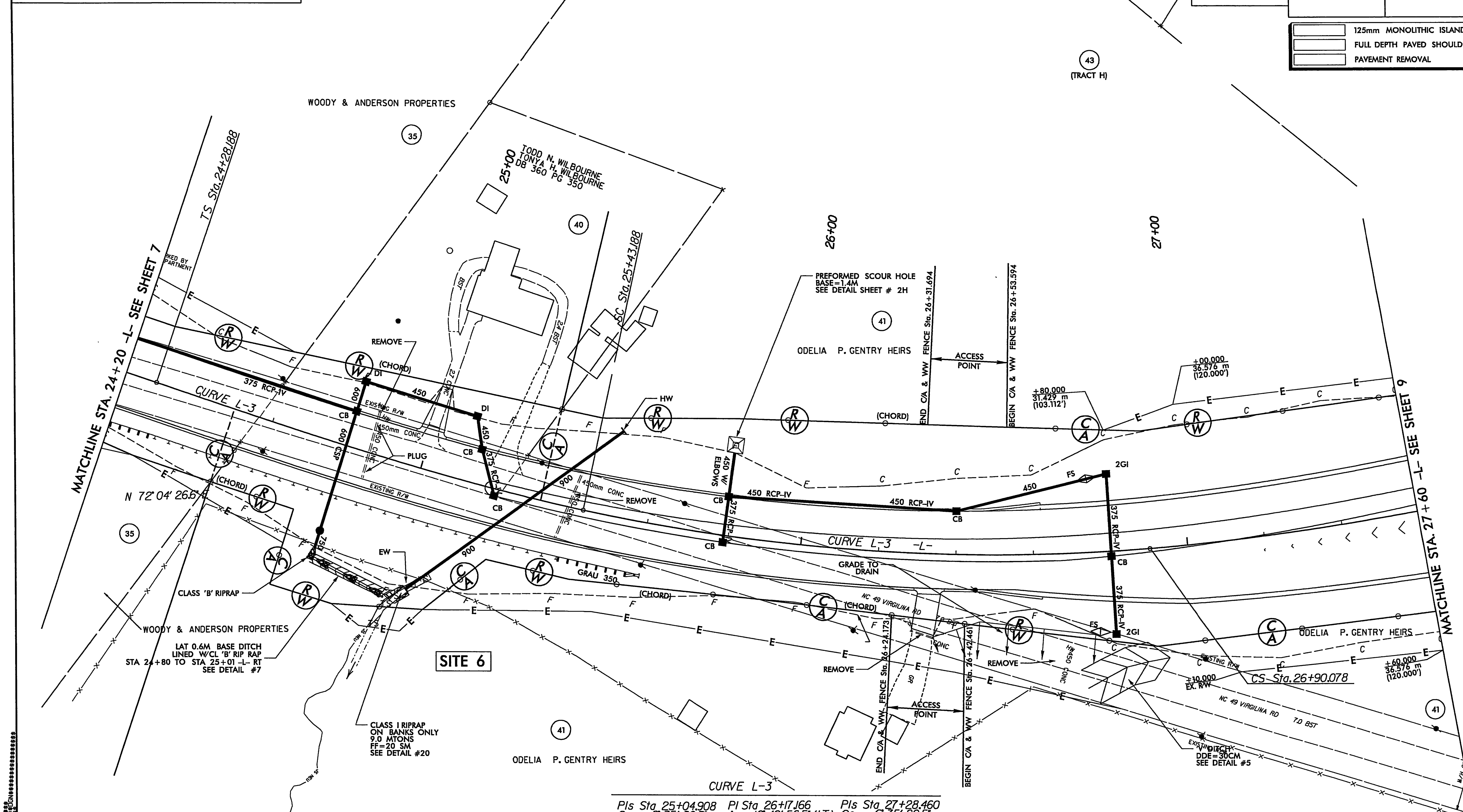
CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 16 of 48

- 125mm MONOLITHIC ISLAND
- FULL DEPTH PAVED SHOULDER
- PAVEMENT REMOVAL



CURVE L-3

PIs Sta 25+04.908	PI Sta 26+17.166	PIs Sta 27+28.460
Θs = 6° 35' 20.5"	Δ = 16° 49' 56.5" (LT)	Θs = 6° 35' 20.5"
Ls = 115.000	L = 146.890	Ls = 115.000
LT = 76.720	T = 73.978	LT = 76.720
ST = 38.382	R = 500.000	ST = 38.382
	e = 0.06	
	Runoff = 115	

SEE SHEET 30 FOR -L- PROFILE.
SEE SHEET 2-J FOR DETOUR DETAIL

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

REVISIONS
06-04-08 - ESTABLISHED ACCESS POINT ON PARCEL 41, AND CHANGED NAME ON PARCEL 40
06-21-10 - PARCEL 41: REVISED PARCEL NAME
09-28-10 - PARCEL 41: REVISED PARCEL INFORMATION
02-01-11 - PARCEL 37: ADDED SEPTIC LINE PARCEL 38: ADDED WELL PARCEL 39: ADDED SEPTIC LINE

DENOTES IMPACTS IN SURFACE WATER

TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

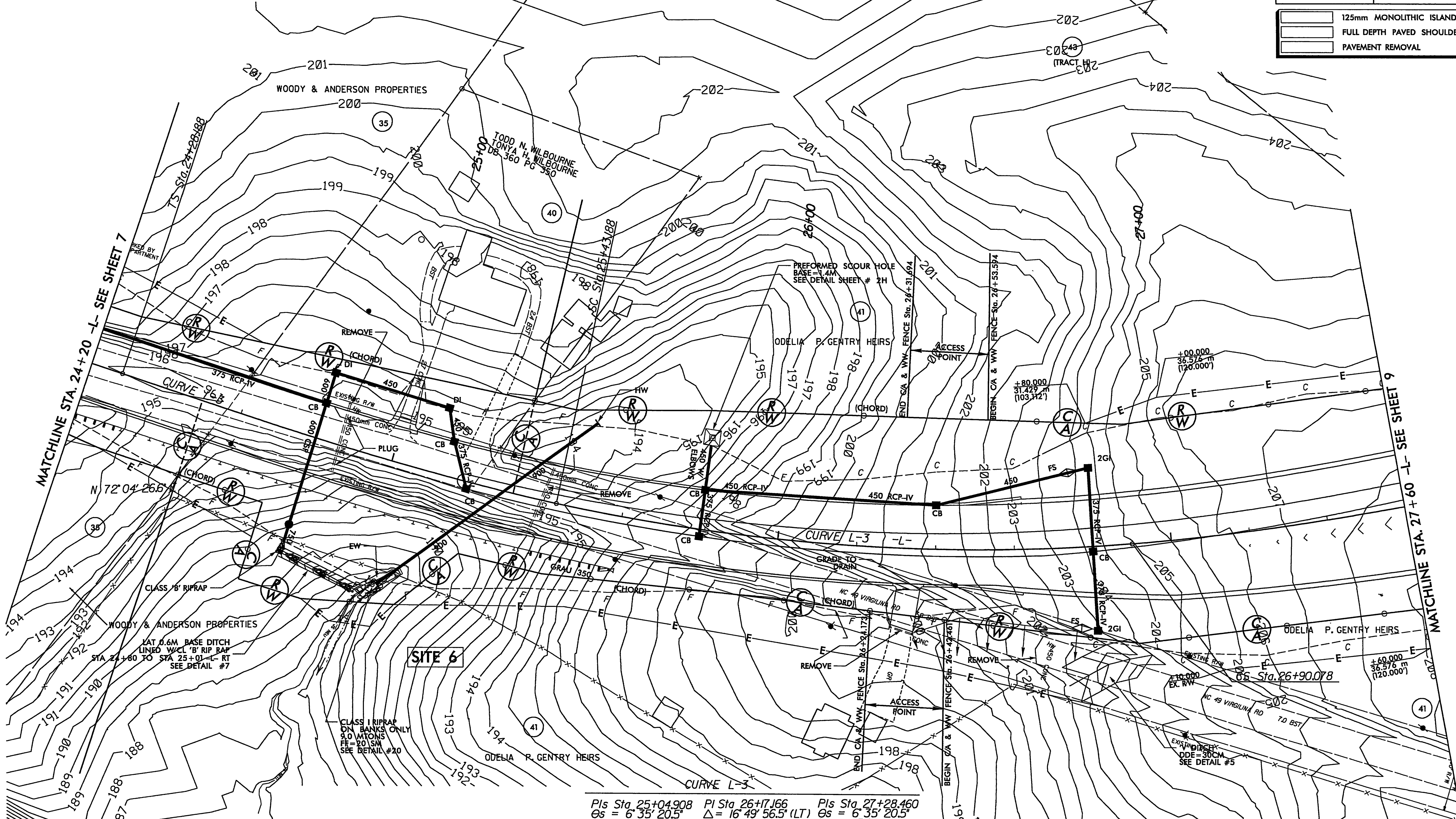
CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 17 of 48

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



PIs Sta 25+04.908	PI Sta 26+17.166	PIs Sta 27+28.460
Θs = 6° 35' 20.5"	Δ = 16° 49' 56.5" (LT)	Θs = 6° 35' 20.5"
Ls = 115.000	L = 146.890	Ls = 115.000
LT = 76.720	T = 73.978	LT = 76.720
ST = 38.382	R = 500.000	ST = 38.382
	e = 0.06	
	Runoff = 115	

SEE SHEET 30 FOR -L- PROFILE.
SEE SHEET 2-J FOR DETOUR DETAIL

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1000 West Morehead St., Ste 200
Charlotte, NC 28208
NC License Number F-0991

REVISIONS

06-04-08 -	MOVED ROW LINE ON PARCEL 63A AND ESTABLISHED ACCESS POINT ON PARCEL 62.
06-23-08 -	REMOVED ROW MONUMENTS, STRAIGHTENED CA AND WW FENCE ON PARCEL 62.
02-09-09 -	REMOVED PARCEL 63A, UPDATED DEED AND PLAT REFERENCES FOR PARCEL 63. UPDATED BEGIN C/A & WW FENCE STATION LABEL ON PARCEL 62.
08-02-11 -	CHANGED PROPERTY OWNER NAMES ON PARCELS 62 & 69.

METRIC

5 0 10

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	11
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R /W REV.

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

Permit Drawing
Sheet 18 of 48

F F DENOTES FILL IN WETLAND
S S DENOTES IMPACTS IN SURFACE WATER
E E DENOTES EXCAVATION IN WETLAND
DENOTES MECHANIZED CLEARING
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83 NC GRID

MATCHLINE STA. 34+80 -L- SEE SHEET 10

MATCHLINE STA. 38+40 -L- SEE SHEET 12

35+00 36+00 37+00 38+00

63 ELLIE R. PENTECOST

64 HOWARD T. SMITH

66 MARY P. SMITH
BOM 8 PG 72-3

67 SYBIL P. WOOTEN

62 ALMEADE G. GARRETT et al

68 MARY P. SMITH

69 CHARLES E. PERKINS

SITE 7A

SITE 7B

SITE 8

LAT 0.6M BASE DITCH W/1.5M BERM LINED W/CLASS 'B' RIPRAP STA 35+20 LR TO STA 36+17 LT -L- SEE DETAIL #7

BEGIN SHOULDER BERM GUTTER STA 35+40 LT -L-

+50.000 35.052 m (115.000')

+80.000 41.453 m (136.000')

CLASS 'I' RIPRAP 45.0 MTONS

END FENCE STA. 36+19.84

BEGIN FENCE STA. 36+30.80

CLASS 'I' RIPRAP ON BANKS ONLY 3.0 MTONS FF=26 SM SEE DETAIL #20

PREFORMED SCOUR HOLE BASE=1.4M SEE DETAIL SHEET # 2H

LAT '0.6M' BASE DITCH W/1.5M BERM LINED W/CLASS 'B' RIPRAP STA 37+40 LT TO STA 37+60 LT -L- SEE DETAIL #7

APPROXIMATE CL OF PIEDMONT EMC

APPROXIMATE CL OF CP&L

CLASS 'B' RIPRAP

END SHOULDER BERM GUTTER STA 36+60 LT -L-

2GI W/FLAT GRATE

1 @ 2.7m X 1.8m RCBC W/SILLS

CAT-1

N 27° 30' 14.1" E

375 W/ ELBOW

BDO

+60.000 30.480 m (100.000')

END SHOULDER BERM GUTTER STA 35+80 RT -L-

TOE PROTECTTION STA 35+00 RT TO STA 35+80 RT -L- SEE DETAIL #8

BEGIN FENCE STA. 35+01.24

CLASS 'I' RIPRAP EST. +/- 45 MTONS

END FENCE STA. 34+91.76

STD BERM DITCH STA 36+20 RT TO STA 36+80 RT -L-

+80.000 39.624 m (130.000')

END C/A & WW FENCE Sta. 36+97.472

ACCESS POINT

BEGIN C/A & WW FENCE Sta. 37+17.257

TRANSITION STONE CLASS 'B' RIPRAP EST 3.0 MTONS

1.2M HEAD BASE DITCH DDE=5CM SEE DETAIL #9

TOE PROTECTTION STA 37+34 RT TO STA 37+51 RT -L- SEE DETAIL #8

SPECIAL DITCH GRADE SEE PROFILE FOR GRADE STA 37+56 (SAG) TO STA 37+80 MED -L-

+80.000 32.004 m (105.000')

-L- PCSta. 37+95.343

SEE SHEET 31 FOR -L- PROFILE.

SEE SHEET 12

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1000 West Morehead St., Ste 200
Charlotte, NC 28208
NC License Number F-0991

REVISIONS

06-04-08 - MOVED ROW LINE ON PARCEL 63A, AND ESTABLISHED ACCESS POINT ON PARCEL 62.

06-23-08 - REMOVED ROW MONUMENTS, STRAIGHTENED CA AND WW FENCE ON PARCEL 62.

02-09-09 - REMOVED PARCEL 63A, UPDATED DEED AND PLAT REFERENCES FOR PARCEL 63.
UPDATED BEGIN C/A & WW FENCE STATION LABEL ON PARCEL 62.

08-02-11 - CHANGED PROPERTY OWNER NAMES ON PARCELS 62 & 69.

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

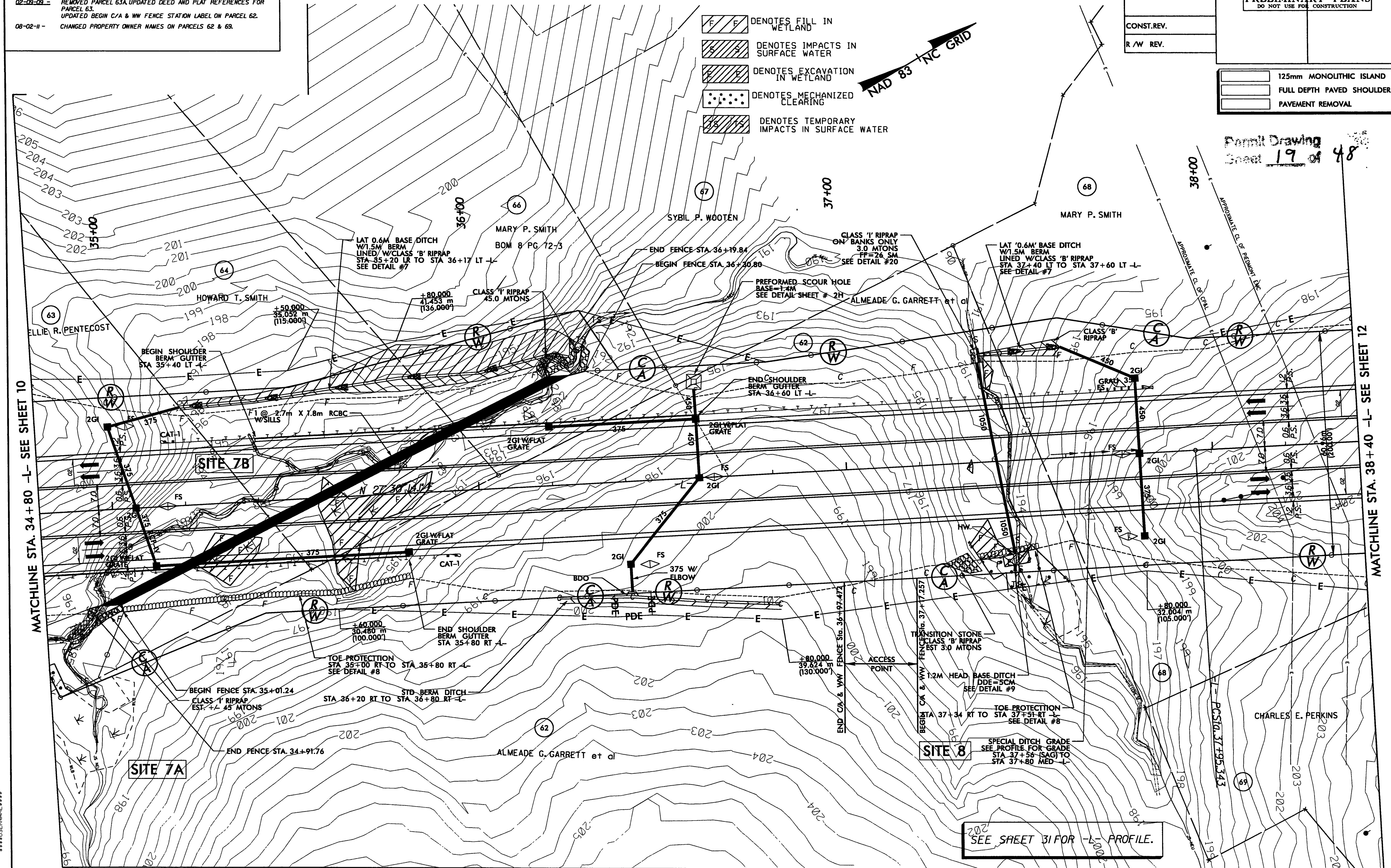
CONST. REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

Permit Drawing
Sheet 19 of 48



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CONSULTING ENGINEERS
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CHARLOTTE, NORTH CAROLINA 28235

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	31

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

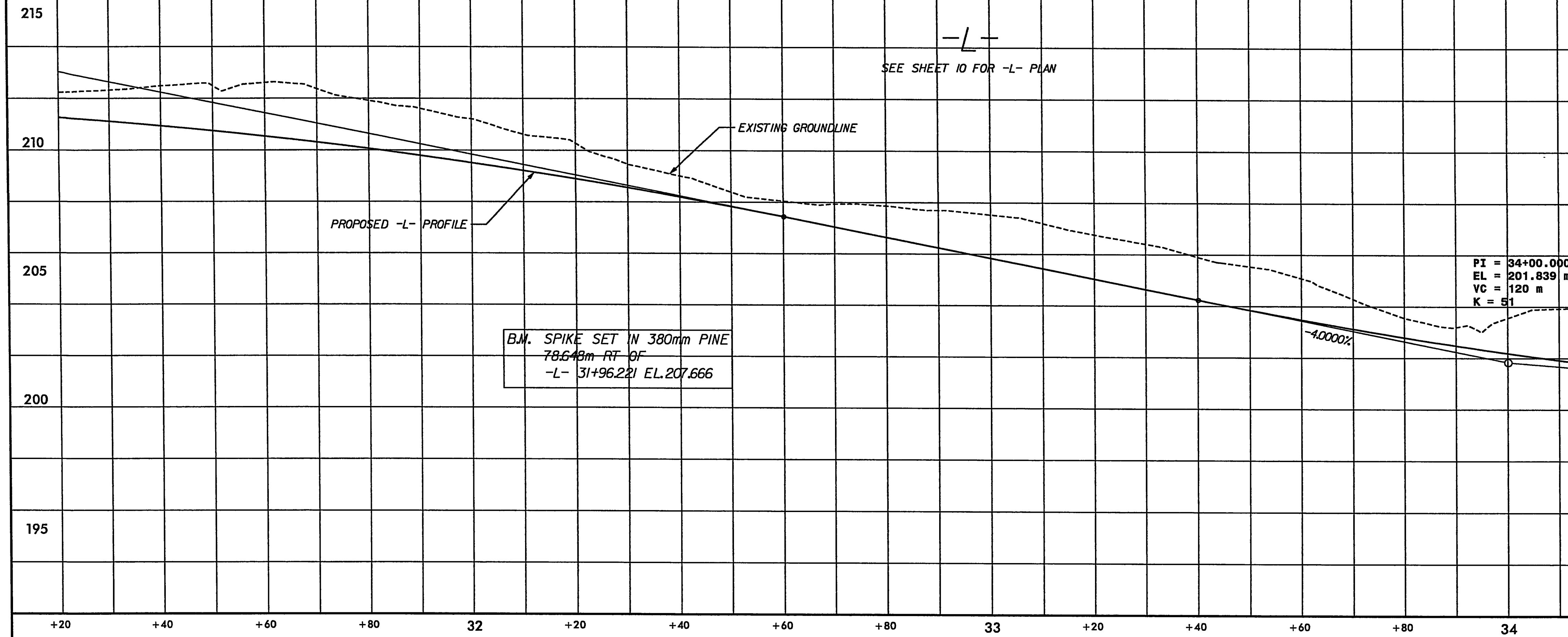
METRIC — HORIZ. 5 0 10 — VERT. 1 0 2

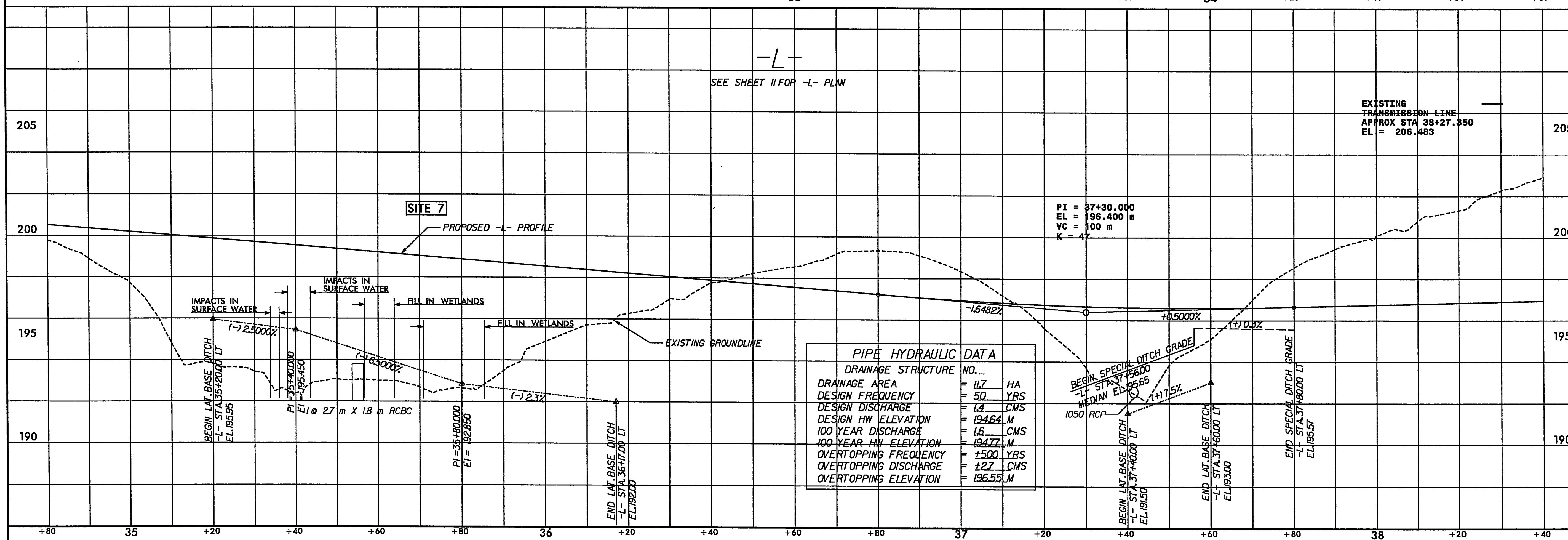
CONST.REV. ________

R /W REV. ________

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 20 of 48

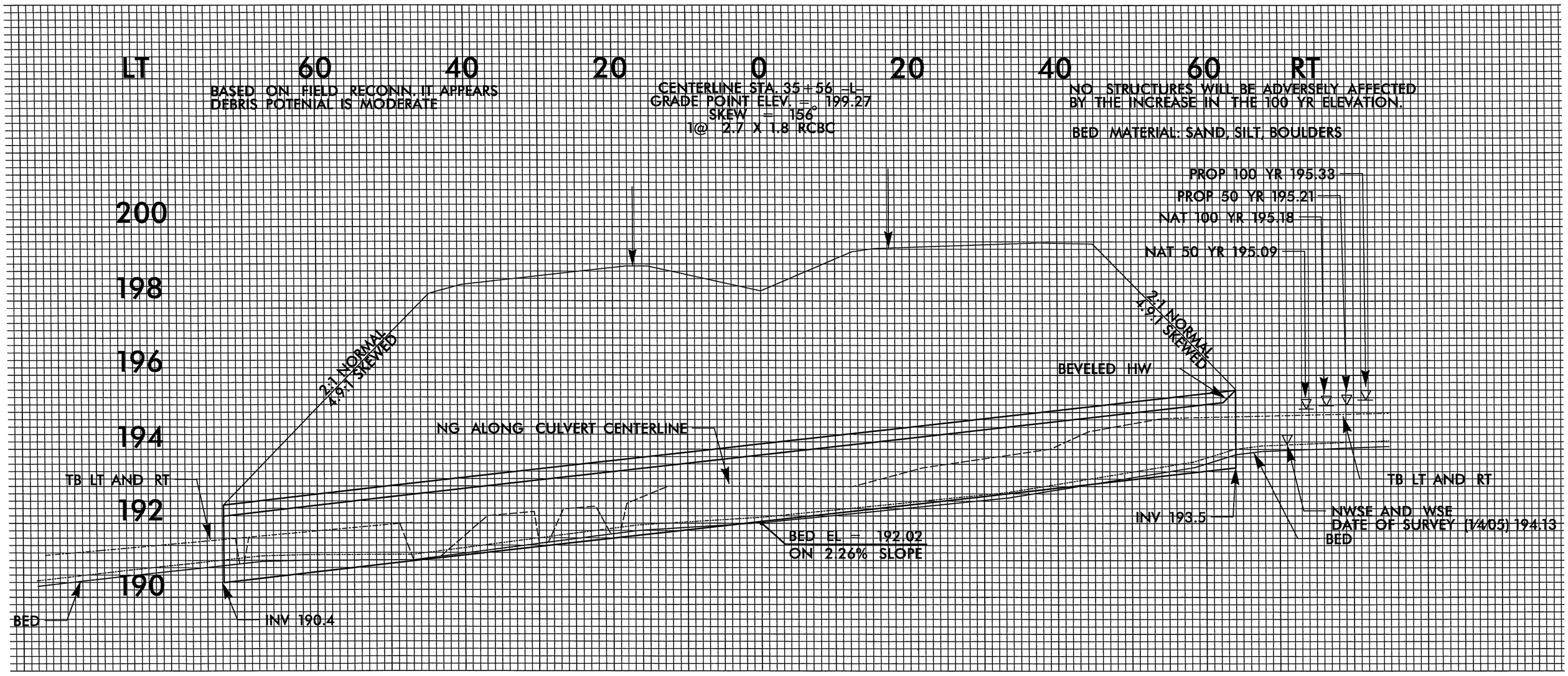



-L-
SEE SHEET 11 FOR -L- PLAN
EXISTING
TRANSMISSION LINE
APPROX STA 38+27.350
EL = 206.483
SITE 7
PROPOSED -L- PROFILE
PI = 37+30.000
EL = 196.400 m
VC = 100 m
K = 47
IMPACTS IN
SURFACE WATER
IMPACTS IN
SURFACE WATER
FILL IN WETLANDS
FILL IN WETLANDS
EXISTING GROUNDLINE
(-) 2.5000%
(-) 6.5000%
(-) 2.3%
-1.6482%
+0.5000%
(+) 0.3%
(+) 7.5%
BEGIN LAT. BASE DITCH
-L- STA.35+20.00 LT
EL.195.95
PI = 35+40.000
El = 195.450
1 @ 2.7 m X 1.8 m RCBC
PI = 35+80.000
El = 192.850
END LAT. BASE DITCH
-L- STA.36+17.00 LT
EL.192.00
BEGIN SPECIAL DITCH GRADE
-L- STA.37+56.00
MEDIAN EL.195.65
1050 RCP
BEGIN LAT. BASE DITCH
-L- STA.37+40.00 LT
EL.191.50
END LAT. BASE DITCH
-L- STA.37+60.00 LT
EL.193.00
END SPECIAL DITCH GRADE
-L- STA.37+80.00 LT
EL.195.57
205
200
195
190
+80
35
+20
+40
+60
36
37
38

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO._

DRAINAGE AREA	= 11.7	HA
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 1.4	CMS
DESIGN HW ELEVATION	= 194.64	M
100 YEAR DISCHARGE	= 1.6	CMS
100 YEAR HW ELEVATION	= 194.77	M
OVERTOPPING FREQUENCY	= +500	YRS
OVERTOPPING DISCHARGE	= +2.7	CMS
OVERTOPPING ELEVATION	= 196.55	M



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1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

REVISIONS	
06-04-08 -	ESTABLISHED ACCESS POINT PARCEL 69.ELIMINATED TCE.AND WELL SHOWN ON PARCEL 71
06-24-08 -	TIED TCE TO ROW ON PARCEL 71
06-21-10 -	PARCEL 71: REVISED PARCEL NAME
08-02-11 -	CHANGED PROPERTY OWNER INFORMATION ON PARCEL 69
10-27-11 -	PARCEL 70Z: CHANGED TCE TO PDE

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83 NC GRID

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

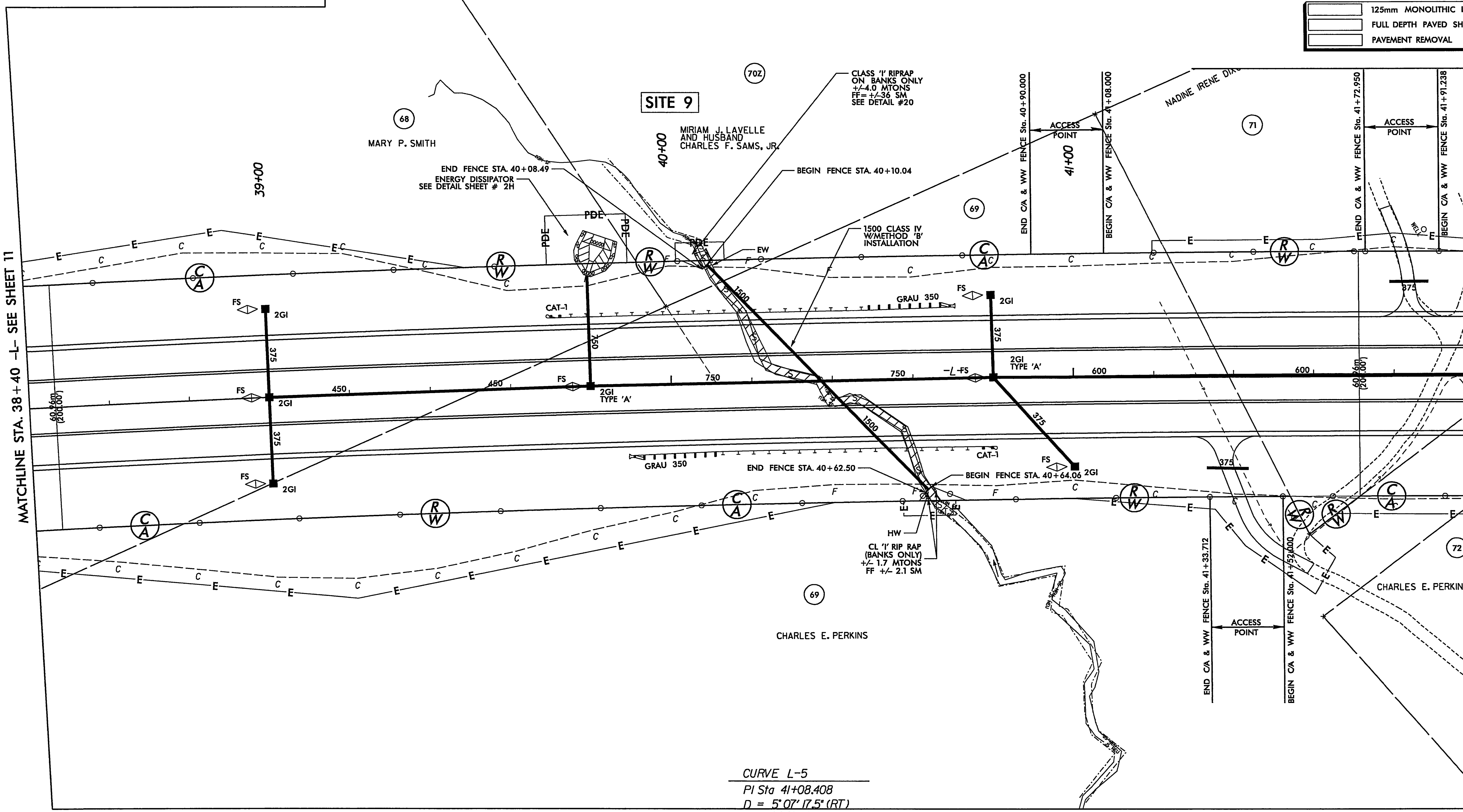
CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 22 of 48

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



CURVE L-5
PI Sta 41+08.408
D = 5° 07' 17.5" (RT)
L = 625.713
T = 313.065
R = 7,000.000
e = N.C.

SEE SHEET 32 FOR -L- PROFILE.

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NC License Number F-0991

REVISIONS

06-04-08 - ESTABLISHED ACCESS POINT PARCEL 69, ELIMINATED TCE, AND WELL SHOWN ON PARCEL 71
06-24-08 - TIED TCE TO ROW ON PARCEL 71
06-21-10 - PARCEL 71; REVISED PARCEL NAME
08-02-11 - CHANGED PROPERTY OWNER INFORMATION ON PARCEL 69
10-27-11 - PARCEL 70Z; CHANGED TCE TO PDE

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	12
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC
5 0 10

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.
R /W REV.

Permit Drawing
Sheet 23 of 48

- 125mm MONOLITHIC ISLAND
- FULL DEPTH PAVED SHOULDER
- PAVEMENT REMOVAL

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83 NC GRID

SITE 9

CLASS 'I' RIPRAP ON BANKS ONLY +/-4.0 MTONS FF= +/-36 SM SEE DETAIL #20

MIRIAM J. LAVELLE AND HUSBAND CHARLES F. SAMS, JR.

MARY P. SMITH

END FENCE STA. 40+08.44 ENERGY DISSIPATOR SEE DETAIL SHEET # 2H

BEGIN FENCE STA. 40+10.04

1500 CLASS IV W/METHOD 'B' INSTALLATION

END C/A & WW FENCE Sta. 40+90.000

BEGIN C/A & WW FENCE Sta. 41+08.000

ACCESS POINT

END C/A & WW FENCE Sta. 41+72.950

BEGIN C/A & WW FENCE Sta. 41+91.238

NADINE IRENE DIX

END FENCE STA. 40+62.50

BEGIN FENCE STA. 40+64.06

CHARLES E. PERKINS

END C/A & WW FENCE Sta. 41+33.712

BEGIN C/A & WW FENCE Sta. 41+53.000

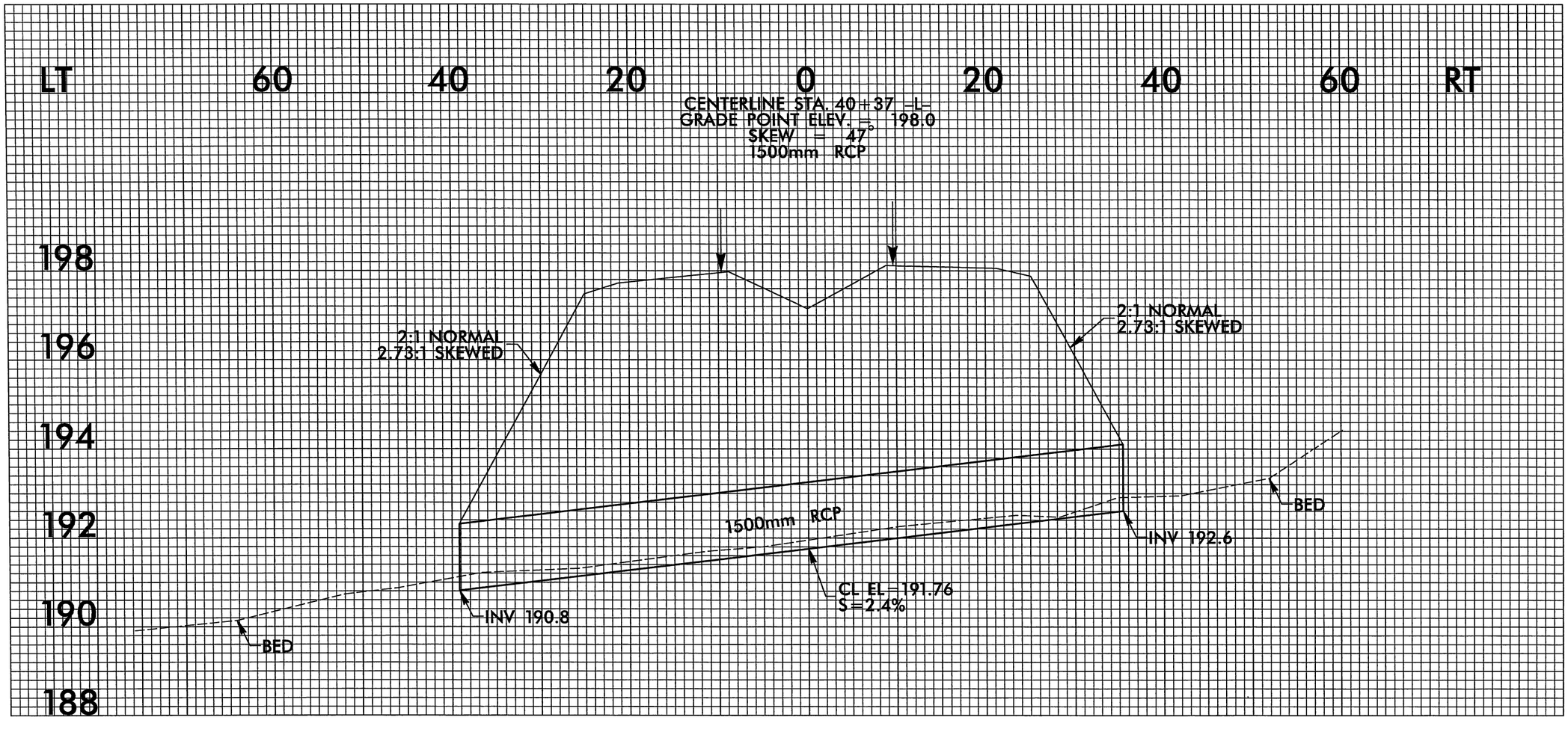
CLASS 'I' RIP RAP (BANKS ONLY) +/- 1.7 MTONS FF +/- 2.1 SM

CURVE L-5
PI Sta 41+08.408
D = 5°07' (7.5' (RT)
L = 625.713
T = 313.065
R = 7,000.000
e = N.C.

MATCHLINE STA. 38+40 -L- SEE SHEET 11

MATCHLINE STA. 42+00 -L- SEE SHEET 13

SEE SHEET 32 FOR -L- PROFILE.


LT
60
40
20
0
20
40
60
RT
CENTERLINE STA. 40+37 –L–
GRADE POINT ELEV. = 198.0
SKEW = 47°
1500mm RCP
198
196
194
192
190
188
2:1 NORMAL
2.73:1 SKEWED
2:1 NORMAL
2.73:1 SKEWED
1500mm RCP
INV 190.8
INV 192.6
CL EL=191.76
S=2.4%
BED
BED

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

REVISIONS	
06-04-08 -	ESTABLISHED ACCESS POINT ON PARCEL 76A. PROPERTY LINE CHANGE 76,76A, AND NEW PARCEL 76A
06-21-10 -	PARCEL 77; REVISED PARCEL NAME

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

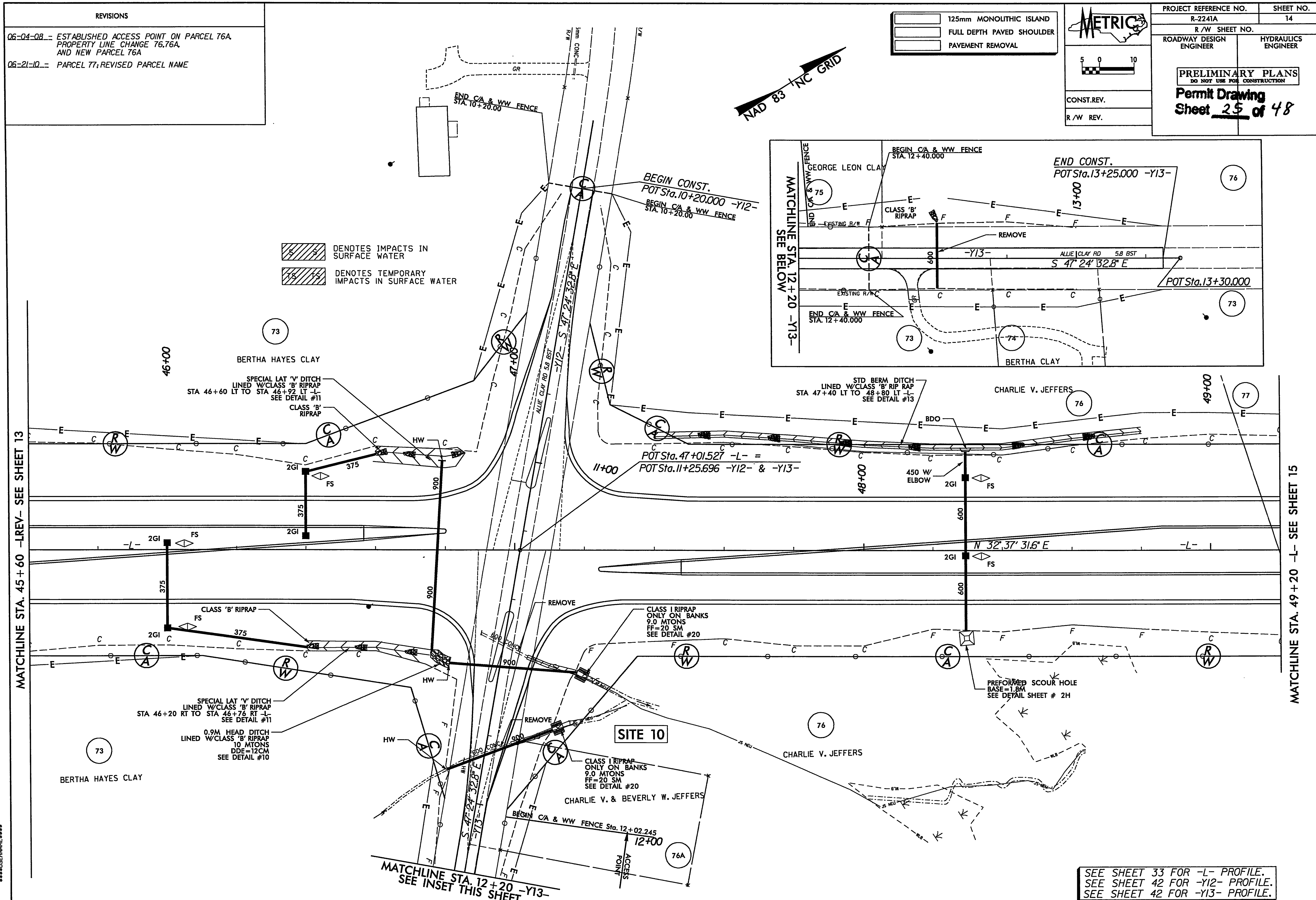
METRIC

CONST. REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 25 of 48



125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL
NAD 83 NC GRID
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
END C/A & WW FENCE STA. 10+20.00
BEGIN CONST. POT Sta. 10+20.000 -Y12-
BEGIN C/A & WW FENCE STA. 10+20.00
BEGIN C/A & WW FENCE STA. 12+40.000
GEORGE LEON CLAY
END CONST. POT Sta. 13+25.000 -Y13-
CLASS 'B' RIPRAP
REMOVE
-Y13-
ALLIE CLAY RD 5.8 BST
S 47° 24' 32.8" E
POT Sta. 13+30.000
EXISTING R/W
END C/A & WW FENCE STA. 12+40.000
BERTHA CLAY
MATCHLINE STA. 12+20 -Y13- SEE BELOW
BERTHA HAYES CLAY
SPECIAL LAT 'V' DITCH LINED W/CLASS 'B' RIPRAP STA 46+60 LT TO STA 46+92 LT -L- SEE DETAIL #11
STD BERM DITCH LINED W/CLASS 'B' RIP RAP STA 47+40 LT TO 48+80 LT -L- SEE DETAIL #13
CHARLIE V. JEFFERS
BDO
POT Sta. 47+01.527 -L- = POT Sta. 11+25.696 -Y12- & -Y13-
450 W/ ELBOW
N 32° 37' 31.6" E
MATCHLINE STA. 45+60 -LREV- SEE SHEET 13
MATCHLINE STA. 49+20 -L- SEE SHEET 15
CLASS 'B' RIPRAP
REMOVE
CLASS I RIPRAP ONLY ON BANKS 9.0 MTONS FF=20 SM SEE DETAIL #20
PREFORMED SCOUR HOLE BASE=1.8M SEE DETAIL SHEET # 2H
SPECIAL LAT 'V' DITCH LINED W/CLASS 'B' RIPRAP STA 46+20 RT TO STA 46+76 RT -L- SEE DETAIL #11
0.9M HEAD DITCH LINED W/CLASS 'B' RIPRAP 10 MTONS DDE=12CM SEE DETAIL #10
SITE 10
CHARLIE V. & BEVERLY W. JEFFERS
BEGIN C/A & WW FENCE Sta. 12+02.245
ACCESS POINT
MATCHLINE STA. 12+20 -Y13- SEE INSET THIS SHEET
SEE SHEET 33 FOR -L- PROFILE.
SEE SHEET 42 FOR -Y12- PROFILE.
SEE SHEET 42 FOR -Y13- PROFILE.

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35604
CHARLOTTE, NORTH CAROLINA 28235

REVISIONS
06-04-08 - ESTABLISHED ACCESS POINT ON PARCEL 76A. PROPERTY LINE CHANGE 76,76A. AND NEW PARCEL 76A
06-21-10 - PARCEL 77; REVISED PARCEL NAME

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

METRIC
5 0 10

CONST.REV.
R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	14
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
Permit Drawing Sheet 26 of 48

MATCHLINE STA. 45+60 -LREV- SEE SHEET 13

MATCHLINE STA. 49+20 -L- SEE SHEET 15

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83 NC GRID

BEGIN CONST. POT Sta.10+20.000 -Y12-

BEGIN C/A & WW FENCE STA. 10+20.00

END C/A & WW FENCE STA. 10+20.00

BERTHA HAYES CLAY

SPECIAL LAT 'V' DITCH LINED W/CLASS 'B' RIPRAP STA 46+60 LT TO STA 46+92 LT SEE DETAIL #11

CLASS 'B' RIPRAP

S 41° 24' 32.8" E

POT Sta.47+01.527 -L- =
POT Sta.11+25.696 -Y12- & -Y13-

SITE 10

MATCHLINE STA. 12+20 -Y13- SEE INSET THIS SHEET

BEGIN C/A & WW FENCE Sta. 12+02.245

ACCESS POINT

STD BERM DITCH LINED W/CLASS 'B' RIP RAP STA 47+40 LT TO 48+80 LT SEE DETAIL #13

CHARLIE V. JEFFERS

450 W ELBOW

N 32° 37' 31.6" E

REMOVE

CLASS I RIPRAP ONLY ON BANKS 9.0 MTONS FF=20 SM SEE DETAIL #20

CHARLIE V. & BEVERLY W. JEFFERS

PREFORMED SCOUR HOLE BASE=7.8M SEE DETAIL SHEET # 2H

SPECIAL LAT 'V' DITCH LINED W/CLASS 'B' RIPRAP STA 46+20 RT TO STA 46+76 RT -L- SEE DETAIL #11

0.9M HEAD DITCH LINED W/CLASS 'B' RIPRAP 30 MTONS DDE=12 CM SEE DETAIL #10

BERTHA HAYES CLAY

GEORGE LEON CLAY

BEGIN C/A & WW FENCE STA. 12+40.000

END C/A & WW FENCE STA. 12+40.000

END CONST. POT Sta.13+25.000 -Y13-

POT Sta.13+30.000

S 41° 24' 32.8" E

ALLIE CLAY RD SB BST

BERTHA CLAY

SEE SHEET 33 FOR -L- PROFILE.
SEE SHEET 42 FOR -Y12- PROFILE.
SEE SHEET 42 FOR -Y13- PROFILE.

STV/Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

REVISIONS

06-04-08 - NAME CHANGE ON PARCEL 79, AND ESTABLISHED ACCESS POINT ON PARCEL 77,78
06-21-10 - PARCELS 77,78; REVISED PARCEL NAME
09-28-10 - PARCEL 78; REVISED PARCEL INFORMATION
08-02-11 - CHANGED PROPERTY OWNER INFORMATION ON PARCEL 79
09-09-11 - PARCEL 76 & 78; REVISED OWNER NAME/ PARCEL INFORMATION

METRIC

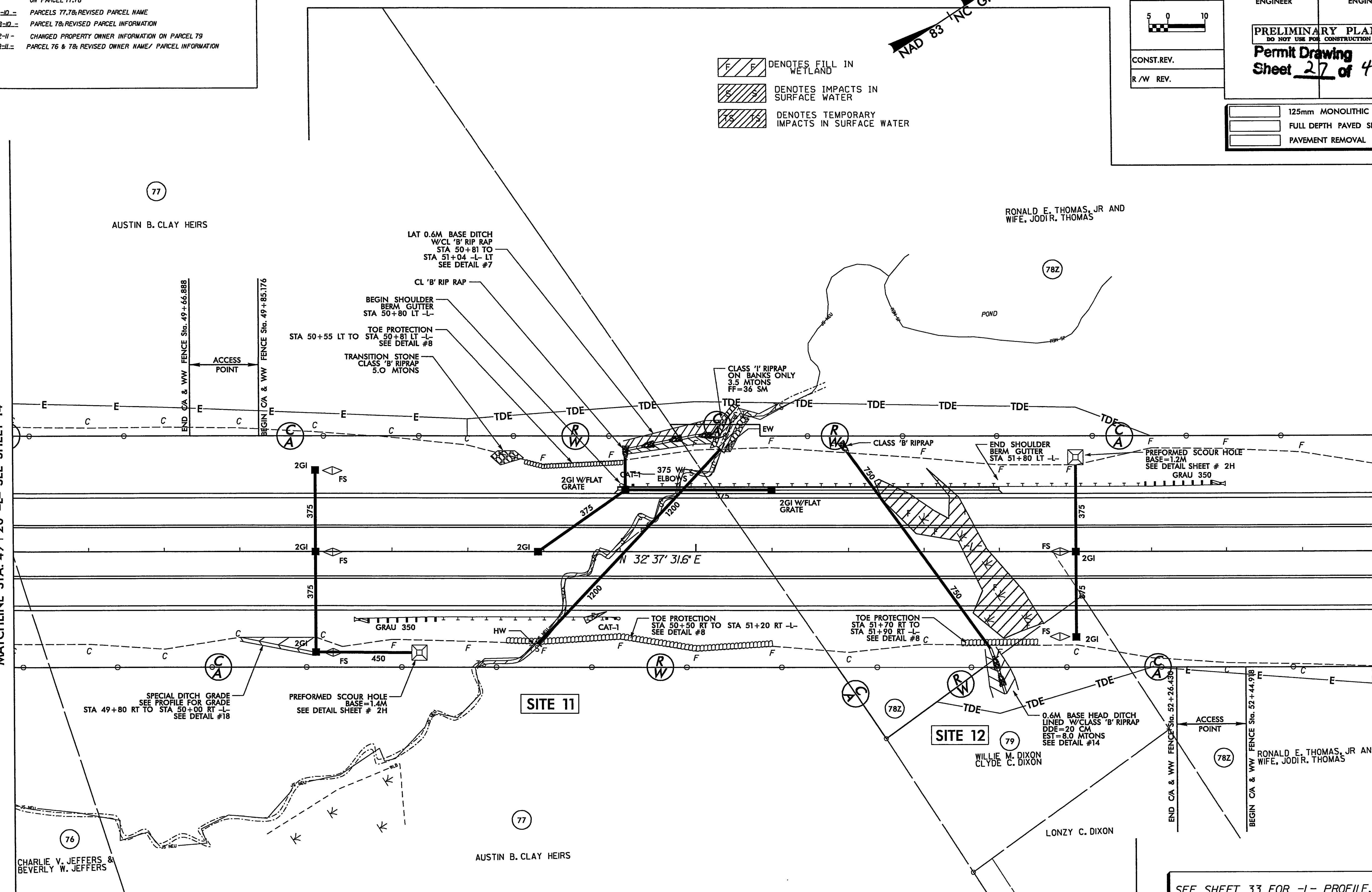
PROJECT REFERENCE NO.	SHEET NO.
R-2241A	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CONST.REV.
R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing Sheet 27 of 48

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



NAD 83 NC GRID
DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
MATCHLINE STA. 49+20 -L- SEE SHEET 14
MATCHLINE STA. 52+80 -L- SEE SHEET 16
AUSTIN B. CLAY HEIRS
RONALD E. THOMAS, JR AND WIFE, JODI R. THOMAS
POND
LAT 0.6M BASE DITCH W/CL 'B' RIP RAP STA 50+81 TO STA 51+04 -L- LT SEE DETAIL #7
CL 'B' RIP RAP
BEGIN SHOULDER BERM GUTTER STA 50+80 LT -L-
TOE PROTECTION STA 50+55 LT TO STA 50+81 LT -L- SEE DETAIL #8
TRANSITION STONE CLASS 'B' RIPRAP 5.0 MTONS
CLASS 'I' RIPRAP ON BANKS ONLY 3.5 MTONS FF=36 SM
END C/A & WW FENCE Sta. 49+66.888
BEGIN C/A & WW FENCE Sta. 49+85.176
ACCESS POINT
CLASS 'B' RIPRAP
END SHOULDER BERM GUTTER STA 51+80 LT -L-
PREFORMED SCOUR HOLE BASE=1.2M SEE DETAIL SHEET # 2H
GRAU 350
2GI W/FLAT GRATE
375 W/ ELBOWS
CAT-1
N 32° 37' 31.6" E
TOE PROTECTION STA 50+50 RT TO STA 51+20 RT -L- SEE DETAIL #8
TOE PROTECTION STA 51+70 RT TO STA 51+90 RT -L- SEE DETAIL #8
SPECIAL DITCH GRADE SEE PROFILE FOR GRADE STA 49+80 RT TO STA 50+00 RT -L- SEE DETAIL #18
PREFORMED SCOUR HOLE BASE=1.4M SEE DETAIL SHEET # 2H
SITE 11
SITE 12
0.6M BASE HEAD DITCH LINED W/CLASS 'B' RIPRAP DDE=20 CM EST=8.0 MTONS SEE DETAIL #14
WILLIE M. DIXON CLYDE C. DIXON
END C/A & WW FENCE Sta. 52+26.430
BEGIN C/A & WW FENCE Sta. 52+44.918
LONZY C. DIXON
CHARLIE V. JEFFERS & BEVERLY W. JEFFERS

SEE SHEET 33 FOR -L- PROFILE.

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1000 West Morehead St. Ste. 200
Charlotte, NC 28208
NC License Number F-0991

REVISIONS

06-04-08 -	NAME CHANGE ON PARCEL 79,AND ESTABUSHED ACCESS POINT ON PARCEL 77,78
06-21-10 -	PARCELS 77,78; REVISED PARCEL NAME
09-28-10 -	PARCEL 78; REVISED PARCEL INFORMATION
08-02-11 -	CHANGED PROPERTY OWNER INFORMATION ON PARCEL 79
09-09-11 -	PARCEL 76 & 78; REVISED OWNER NAME/ PARCEL INFORMATION

METRIC

5 0 10

CONST.REV.

R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	15
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 28 of 48

NAD 83 NC GRID

F F DENOTES FILL IN WETLAND

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

MATCHLINE STA. 49+20 -L- SEE SHEET 14

MATCHLINE STA. 52+80 -L- SEE SHEET 16

AUSTIN B. CLAY HEIRS

RONALD E. THOMAS, JR AND WIFE, JODIR. THOMAS

LAT 0.6M BASE DITCH W/CL 'B' RIP RAP STA 50+81 TO STA 51+04 -L- LT SEE DETAIL #7

CL 'B' RIP RAP

BEGIN SHOULDER BERM GUTTER STA 50+80 LT -L-

TOE PROTECTION STA 50+55 LT TO STA 50+81 LT -L- SEE DETAIL #8

TRANSITION STONE CLASS 'B' RIPRAP 5.0 MTONS

ACCESS POINT

END C/A & WW FENCE Sta. 49+64.88

BEGIN C/A & WW FENCE Sta. 49+85.176

CLASS 'I' RIPRAP ON BANKS ONLY 3.5 MTONS FF=36 SM

POND

CLASS 'B' RIPRAP

END SHOULDER BERM GUTTER STA 51+80 LT -L-

PREFORMED SCOUR HOLE BASE=1.2M SEE DETAIL SHEET # 2H GRAU 350

2GI W/FLAT GRATE

375 W ELBOWS

CAT-1

GRAU 350

HW

N 32° 37' 31.6" E

TOE PROTECTION STA 50+50 RT TO STA 51+20 RT -L- SEE DETAIL #8

TOE PROTECTION STA 51+70 RT TO STA 51+90 RT -L- SEE DETAIL #8

SPECIAL DITCH GRADE SEE PROFILE FOR GRADE STA 49+80 RT TO STA 50+00 RT -L- SEE DETAIL #18

PREFORMED SCOUR HOLE BASE=1.4M SEE DETAIL SHEET # 2H

SITE 11

SITE 12

0.6M BASE HEAD DITCH LINED W/CLASS 'B' RIPRAP DDE=20 CM EST=8.0 MTONS SEE DETAIL#14

WILLIE M. DIXON
CLYDE C. DIXON

LONZY C. DIXON

CHARLIE V. JEFFERS & BEVERLY W. JEFFERS

BEGIN C/A & WW FENCE Sta. 52+44.98

END C/A & WW FENCE Sta. 52+26.43

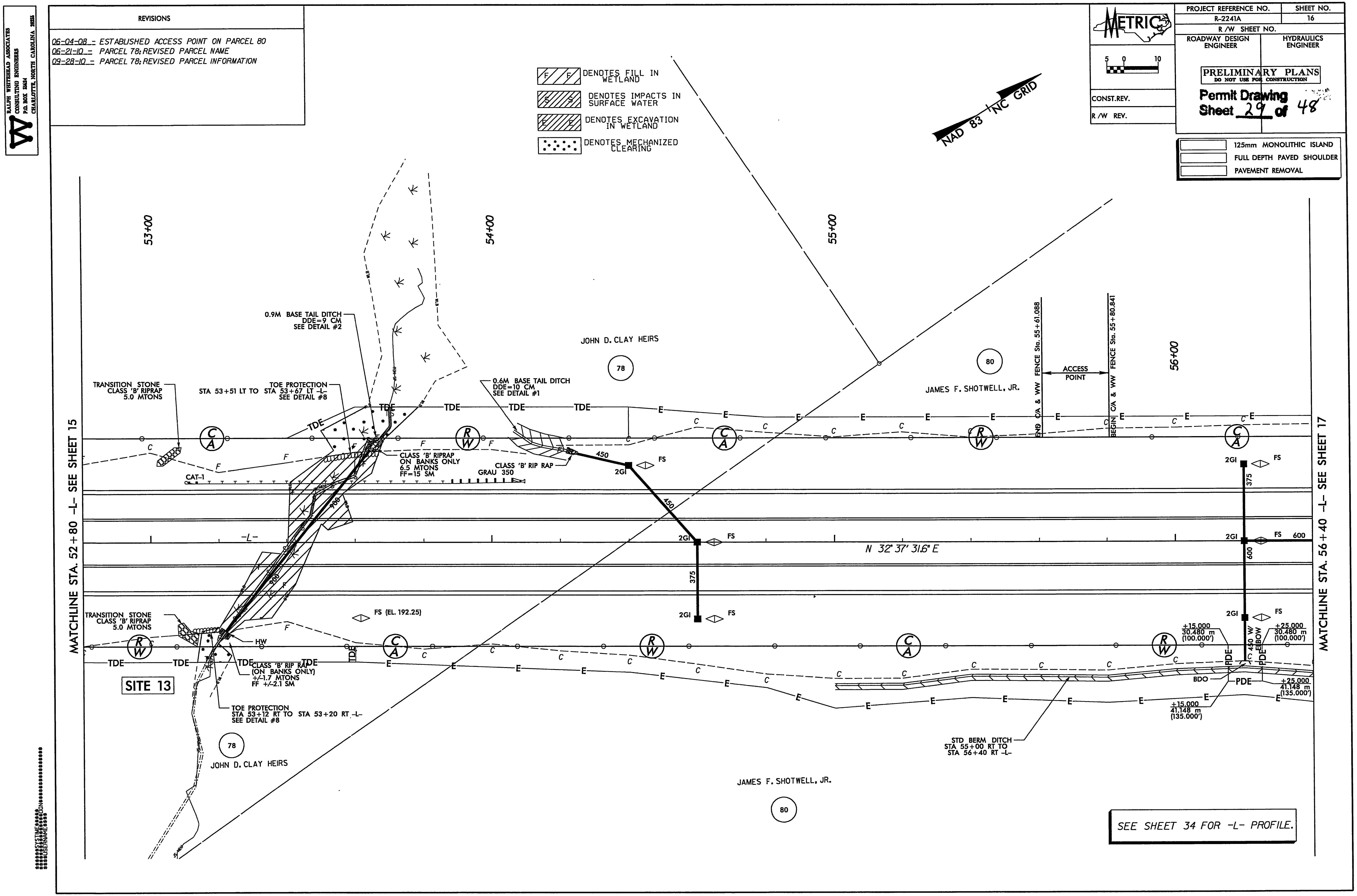
SEE SHEET 33 FOR -L- PROFILE.

REVISIONS
06-04-08 - ESTABLISHED ACCESS POINT ON PARCEL 80
06-21-10 - PARCEL 78; REVISED PARCEL NAME
09-28-10 - PARCEL 78; REVISED PARCEL INFORMATION

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 29 of 48



RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235
METRIC
CONST.REV.
R/W REV.
DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES EXCAVATION IN WETLAND
DENOTES MECHANIZED CLEARING
NAD 83 NC GRID
125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL
53+00
54+00
55+00
56+00
0.9M BASE TAIL DITCH
DDE=9 CM
SEE DETAIL #2
JOHN D. CLAY HEIRS
TRANSITION STONE
CLASS 'B' RIPRAP
5.0 MTONS
TOE PROTECTION
STA 53+51 LT TO STA 53+67 LT -L-
SEE DETAIL #8
0.6M BASE TAIL DITCH
DDE=10 CM
SEE DETAIL #1
JAMES F. SHOTWELL, JR.
ACCESS POINT
END C/A & WW FENCE Sta. 55+61.088
BEGIN C/A & WW FENCE Sta. 55+80.841
CLASS 'B' RIPRAP
ON BANKS ONLY
6.5 MTONS
FF=15 SM
CLASS 'B' RIP RAP
GRAU 350
CAT-1
MATCHLINE STA. 52+80 -L- SEE SHEET 15
MATCHLINE STA. 56+40 -L- SEE SHEET 17
N 32° 37' 31.6" E
FS (EL. 192.25)
HW
CLASS 'B' RIP RAP
(ON BANKS ONLY)
+/-1.7 MTONS
FF +/-2.1 SM
SITE 13
TOE PROTECTION
STA 53+12 RT TO STA 53+20 RT -L-
SEE DETAIL #8
STD BERM DITCH
STA 55+00 RT TO
STA 56+40 RT -L-
+15.000
30.480 m
(100.000')
+25.000
30.480 m
(100.000')
+25.000
41.148 m
(135.000')
+15.000
41.148 m
(135.000')

SEE SHEET 34 FOR -L- PROFILE.

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

REVISIONS

06-04-08 - ESTABLISHED ACCESS POINT ON PARCEL 80
06-21-10 - PARCEL 78; REVISED PARCEL NAME
09-28-10 - PARCEL 78; REVISED PARCEL INFORMATION

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

CONST. REV.

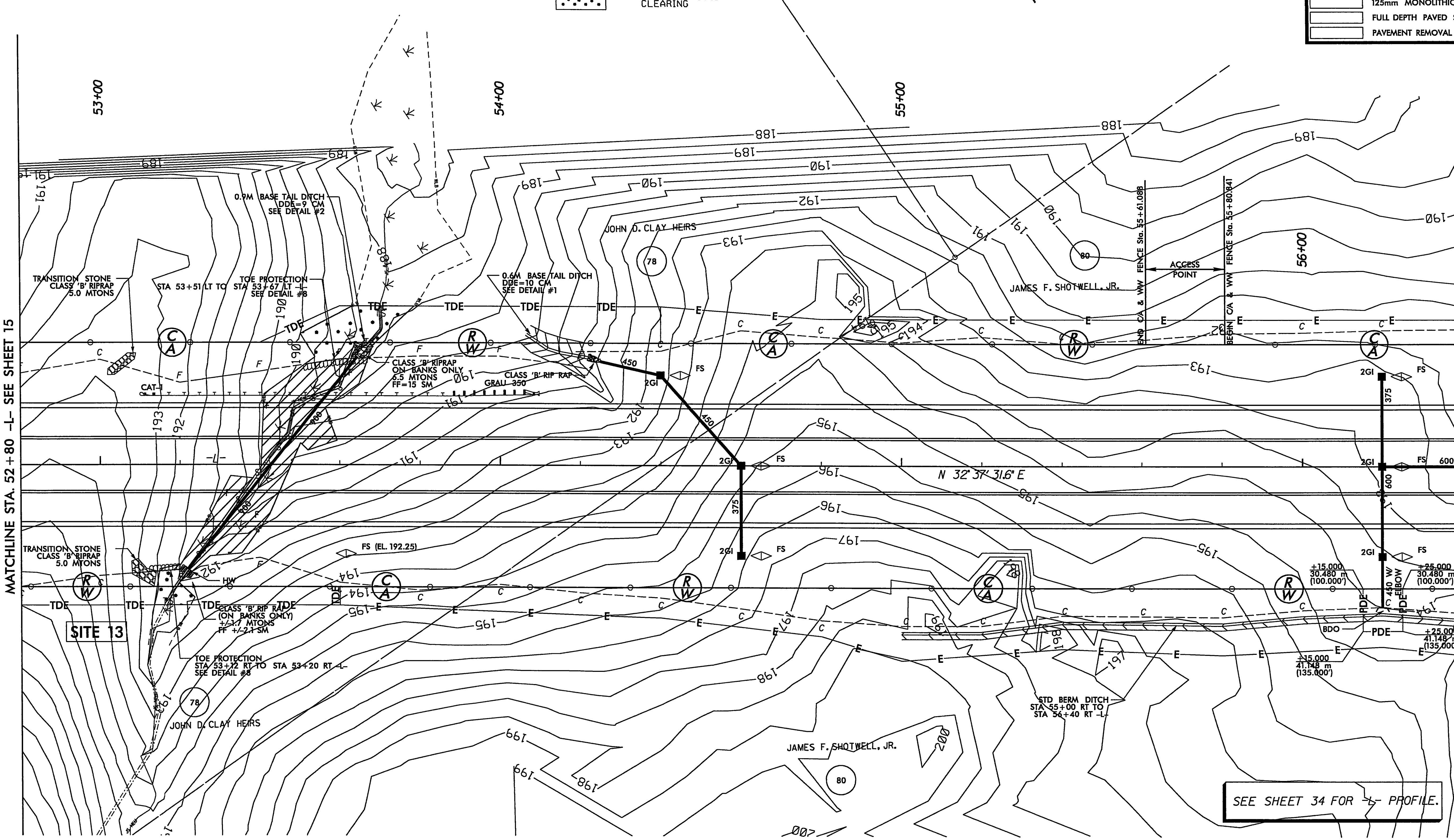
R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 30 of 48

F — DENOTES FILL IN WETLAND
S — DENOTES IMPACTS IN SURFACE WATER
E — DENOTES EXCAVATION IN WETLAND
DENOTES MECHANIZED CLEARING

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



NAD 83 NC GRID
53+00
54+00
55+00
56+00
MATCHLINE STA. 52+80 -L- SEE SHEET 15
MATCHLINE STA. 56+40 -L- SEE SHEET 17
0.9M BASE TAIL DITCH DDE=9 CM SEE DETAIL #2
JOHN D. CLAY HEIRS
TRANSITION STONE CLASS 'B' RIPRAP 5.0 MTONS
STA 53+51 LT TO STA 53+67 LT -L-
TOE PROTECTION SEE DETAIL #8
0.6M BASE TAIL DITCH DDE=10 CM SEE DETAIL #1
JAMES F. SHOTWELL, JR.
END C/A & WW FENCE Sta. 55+61.088
BEGIN C/A & WW FENCE Sta. 55+80.841
ACCESS POINT
CLASS 'B' RIPRAP ON BANKS ONLY 5.5 MTONS FF=15 SM
CLASS 'B' RIP RAP
GRAU 350
N 32° 37' 31.6" E
FS (EL. 192.25)
TRANSITION STONE CLASS 'B' RIPRAP 5.0 MTONS
CLASS 'B' RIP RAP (ON BANKS ONLY) +/-1.7 MTONS FF +/-2.1 SM
SITE 13
TOE PROTECTION STA 53+12 RT TO STA 53+20 RT -L- SEE DETAIL #8
STD BERM DITCH STA 55+00 RT TO STA 56+40 RT -L-
+15.000 30.480 m (100.000')
+25.000 30.480 m (100.000')
+35.000 41.148 m (135.000')
+25.000 41.148 m (135.000')
450 W ELBOW

SEE SHEET 34 FOR -L- PROFILE.

STV/Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

REVISIONS

06-04-08 -	ESTABLISHED ACCESS POINT ON PARCEL 80
06-21-10 -	PARCEL 81: REVISED PARCEL NAME. LOCATED WIRE FENCING. PARCEL 82: LOCATED ELECTRIC FENCE
10-31-11 -	PARCEL 80: ADDED PDE AND MODIFIED C/A FENCE. AND TEMPORARY EASEMENTS

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

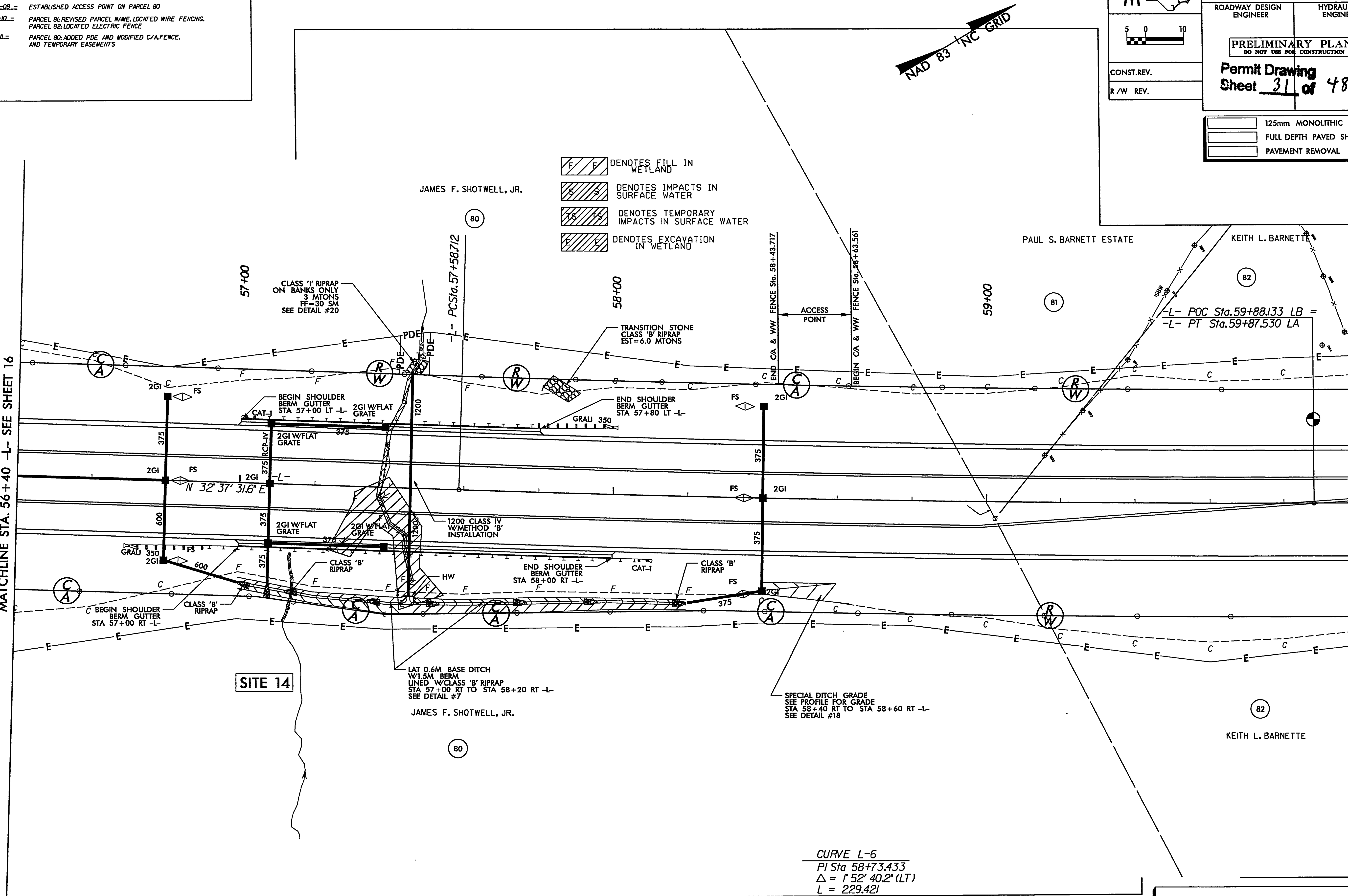
CONST. REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 31 of 48

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



NAD 83 NC GRID
DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES EXCAVATION IN WETLAND
JAMES F. SHOTWELL, JR.
80
PAUL S. BARNETT ESTATE
81
KEITH L. BARNETTE
82
-L- PCSta. 57+58.712
57+00
58+00
59+00
CLASS 'I' RIPRAP ON BANKS ONLY 3 MTONS FF=30 SM SEE DETAIL #20
TRANSITION STONE CLASS 'B' RIPRAP EST=6.0 MTONS
END C/A & WW FENCE Sta. 58+43.717
BEGIN C/A & WW FENCE Sta. 58+63.561
ACCESS POINT
-L- POC Sta. 59+88.133 LB =
-L- PT Sta. 59+87.530 LA
BEGIN SHOULDER BERM GUTTER STA 57+00 LT -L-
2GI W/FLAT GRATE
END SHOULDER BERM GUTTER STA 57+80 LT -L-
GRAU 350
N 32° 37' 31.6" E
1200 CLASS IV W/METHOD 'B' INSTALLATION
END SHOULDER BERM GUTTER STA 58+00 RT -L-
CAT-1
CLASS 'B' RIPRAP
HW
BEGIN SHOULDER BERM GUTTER STA 57+00 RT -L-
MATCHLINE STA. 56+40 -L- SEE SHEET 16
MATCHLINE STA. 60+00 -L- SEE SHEET 18
SITE 14
LAT 0.6M BASE DITCH W/1.5M BERM LINED W/CLASS 'B' RIPRAP STA 57+00 RT TO STA 58+20 RT -L- SEE DETAIL #7
SPECIAL DITCH GRADE SEE PROFILE FOR GRADE STA 58+40 RT TO STA 58+60 RT -L- SEE DETAIL #18

CURVE L-6
PI Sta 58+73.433
Δ = 1° 52' 40.2" (LT)
L = 229.421
T = 114.721
R = 7,000.000
e = N.C.

SEE SHEET 34 FOR -L- PROFILE.

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

REVISIONS

06-04-08 -	ESTABLISHED ACCESS POINT ON PARCEL 80
06-21-10 -	PARCEL 81: REVISED PARCEL NAME, LOCATED WIRE FENCING. PARCEL 82: LOCATED ELECTRIC FENCE
10-31-11 -	PARCEL 80: ADDED PDE AND MODIFIED C/A FENCE. AND TEMPORARY EASEMENTS

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

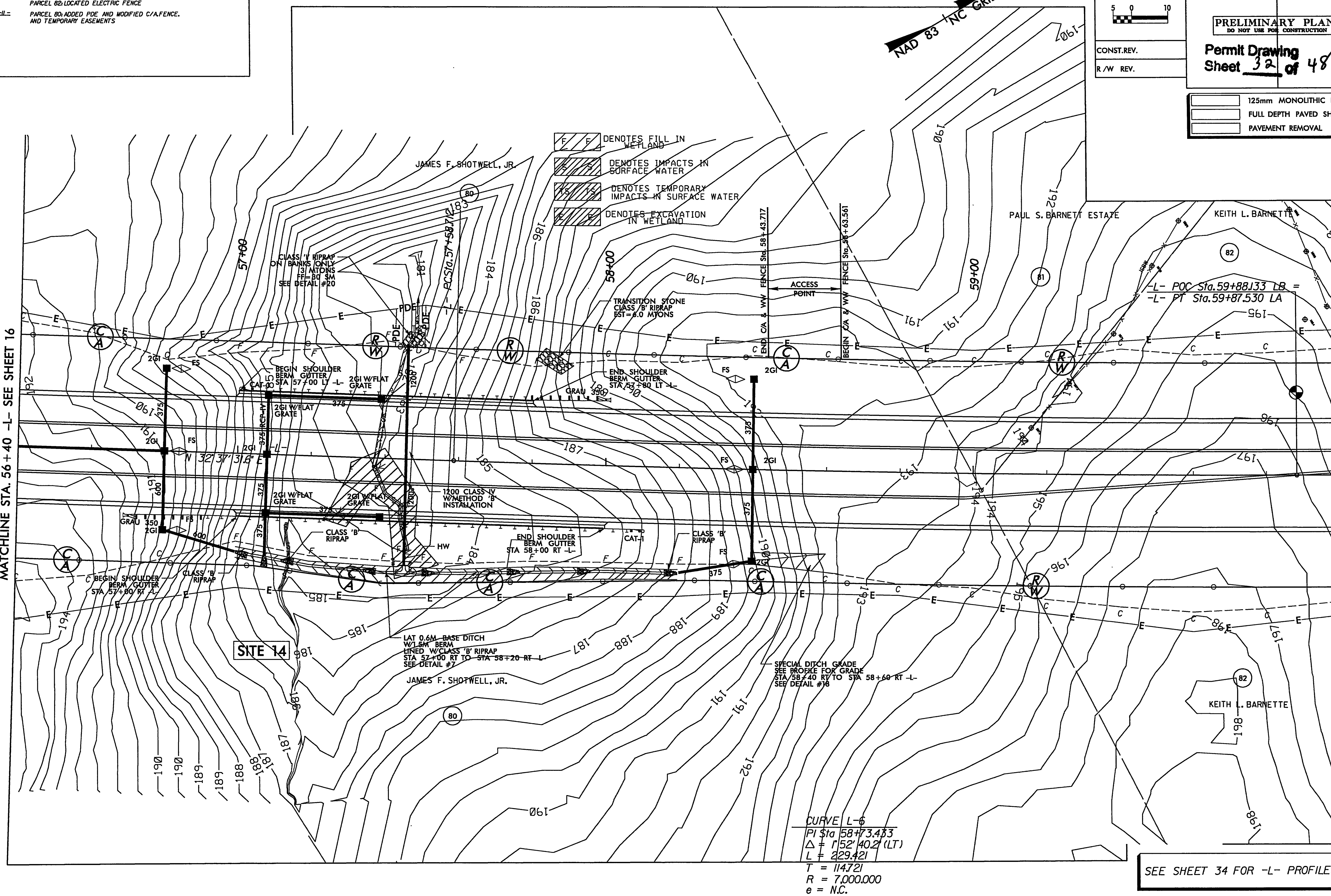
CONST. REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 32 of 48

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



NAD 83 NC GRID
DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES EXCAVATION IN WETLAND
JAMES F. SHOTWELL, JR.
PAUL S. BARNETT ESTATE
KEITH L. BARNETTE
CLASS 'I' RIPRAP ON BANKS ONLY 3 MTONS FF=30 SM SEE DETAIL #20
TRANSITION STONE CLASS 'B' RIPRAP EST=6.0 MTONS
ACCESS POINT
END C/A & WW FENCE Sta. 58+43.717
BEGIN C/A & WW FENCE Sta. 58+63.561
-L- POC Sta. 59+88.133 LB =
-L- PT Sta. 59+87.530 LA
MATCHLINE STA. 56+40 -L- SEE SHEET 16
MATCHLINE STA. 60+00 -L- SEE SHEET 18
BEGIN SHOULDER BERM GUTTER STA 57+00 LT -L-
END SHOULDER BERM GUTTER STA 57+80 LT -L-
1200 CLASS IV W/METHOD 'B' INSTALLATION
END SHOULDER BERM GUTTER STA 58+00 RT -L-
BEGIN SHOULDER BERM GUTTER STA 57+00 RT -L-
LAT 0.6M BASE DITCH W/1.5M BERM LINED W/CLASS 'B' RIPRAP STA 57+00 RT TO STA 58+20 RT -L- SEE DETAIL #7
SPECIAL DITCH GRADE SEE PROFILE FOR GRADE STA 58+40 RT TO STA 58+60 RT -L- SEE DETAIL #18
SITE 14
N 32°37'31.8" E
CURVE L-6
PI Sta 58+73.433
Δ = 1°52'40.2" (LT)
L = 229.421
T = 114.721
R = 7,000.000
e = N.C.

SEE SHEET 34 FOR -L- PROFILE.

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St. Ste. 200
Charlotte, NC 28208
NC License Number F-0991

REVISIONS	
06-04-08 -:	ESTABLISHED ACCESS POINT ON PARCEL 83. DRIVEWAY RECONNECTION ON PARCEL 84A. ESTABLISHED ACCESS POINT ON PARCEL 82. WELL SHOWN ON PARCEL 84A. NEW PARCEL 84A
06-21-10 -:	PARCEL 82: LOCATED ELECTRIC FENCE. BARN. EXISTING DRIVEWAYS PARCEL 84A, 84: LOCATED FENCE
09-20-10 -:	PARCEL 84A: MOVED RW MONUMENT AND LINE 2 FEET FROM WELL
09-28-10 -:	PARCEL 82: REMOVED C/A SYMBOL. ELIMINATED R/W CALL-OUT. RELOCATED FENCE ALONG C/A
10-27-11 -:	PARCEL 82: ADDED PDE

METRIC
5 0 10

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	18
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 33 of 48

CONST.REV.

R /W REV.

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

NAD 83 NC GRID

F F DENOTES FILL IN WETLAND

BEGIN CONSTRUCTION
POT Sta. 10+00.000 -Y14-

POT Sta. 10+00.000

10+00

U.G. SEPTIC PERSON COUNTY

'V' TAIL DITCH DDE=18 CM SEE DETAIL #5

'V' TAIL DITCH DDE=12 CM SEE DETAIL #5

CLASS 'B' RIPRAP

BEGIN C/A Sta. 10+40.000

ACCESS POINT

BEGIN WW FENCE Sta. 10+52.000

THOMAS A. PENTECOST

83

82

KEITH L. BARNETTE

CLASS 'B' RIPRAP

SR 1522 -Y14- TINDALL RD

+40.000 12.192 m (40.000')

REMOVE

61+00

62+00

63+00

KEITH L. BARNETTE

SOIL

POT Sta. 60+75.808 -Y14-

POT Sta. 11+22.580 -Y14 & Y15-

11+00

2GI FS 375 450 RCP-IV

S 52° 34' 33.0" E

-L-

N 30° 44' 51.4" E

IS RIBBON

GRAU 350

SITE 15

85 CHARLES F. BROOKS

END WW FENCE Sta. 11+97.156

END C/A Sta. 12+05.924

SR 1522 -Y15- TINDALL RD

84A ROBERT MERRITT BOWES

RETAIN

12+00

84 NORMA JEAN BOWES LIFE ESTATE

END CONSTRUCTION

MATCHLINE STA. 60+00 -L- SEE SHEET 17

MATCHLINE STA. 63+60 -L- SEE SHEET 19

SEE SHEET 35 FOR -L- PROFILE.
SEE SHEET 42 FOR -Y14- PROFILE.
SEE SHEET 42 FOR -Y15- PROFILE.

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St. Ste. 200
Charlotte, NC 28208
NC License Number F-0991

REVISIONS	
06-04-08 -	ESTABLISHED ACCESS POINT ON PARCEL 83. DRIVEWAY RECONNECTION ON PARCEL 84A. ESTABLISHED ACCESS POINT ON PARCEL 82. WELL SHOWN ON PARCEL 84A. NEW PARCEL 84A
06-21-10 -	PARCEL 82: LOCATED ELECTRIC FENCE, BARN, EXISTING DRIVEWAYS PARCEL 84A, 84: LOCATED FENCE
09-20-10 -	PARCEL 84A: MOVED RW MONUMENT AND LINE 2 FEET FROM WELL
09-28-10 -	PARCEL 82: REMOVED C/A SYMBOL, ELIMINATED R/W CALL-OUT. RELOCATED FENCE ALONG C/A
10-27-11 -	PARCEL 82: ADDED PDE

METRIC

5 0 10

CONST.REV.

R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	18
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 34 of 48

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

NAD 83 NC GRID

DENOTES FILL IN WETLAND

BEGIN CONSTRUCTION
POT Sta. 10+00.000 -Y14-

POT Sta. 10+00.000

10+00

'V' TAIL DITCH DDE=18 CM SEE DETAIL #5

'V' TAIL DITCH DDE=12 CM SEE DETAIL #5

CLASS 'B' RIPRAP

BEGIN C/A Sta. 10+40.000

+40.000 [12.192 m (40.000')]

THOMAS A. PENTECOST

ACCESS POINT

BEGIN WW FENCE Sta. 10+52.000

REMOVE

61+00

62+00

63+00

KEITH L. BARNETTE

POT Sta. 60+75.808 -L-
POT Sta. 11+22.580 -Y14 & Y15-

11+00

S 52° 34' 33.0" E

N 30° 44' 51.4" E

GRAU 350

SITE 15

CHARLES F. BROOKS

END WW FENCE Sta. 11+97.156

END C/A Sta. 12+05.924

ROBERT MERRITT BOWES

RETAIN

12+00

NORMA JEAN BOWES LIFE ESTATE

END CONSTRUCTION

MATCHLINE STA. 60+00 -L- SEE SHEET 17

MATCHLINE STA. 63+60 -L- SEE SHEET 19

SEE SHEET 35 FOR -L- PROFILE.
SEE SHEET 42 FOR -Y14- PROFILE.
SEE SHEET 42 FOR -Y15- PROFILE.

STV/Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

REVISIONS

06-04-08 -	NEW PARCEL 87A AND PROPERTY LINE CHANGE ON PARCEL 87
06-21-10 -	PARCEL 82: LOCATED FENCE PARCEL 87A: LOCATED SHED, GARAGE, MOBILE HOME, REVISED PARCEL NAME PARCEL 90: REVISED PARCEL NAME
08-02-11 -	COMBINED PARCEL 87A WITH PARCEL 87 CHANGED PROPERTY INFORMATION ON PARCEL 89
09-09-11 -	PARCEL 87: REVISED OWNER NAME
10-27-11 -	PARCEL 85, 86, 87Z AND 89Z: MODIFIED C/A, FENCE, AND TEMPORARY EASEMENTS

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

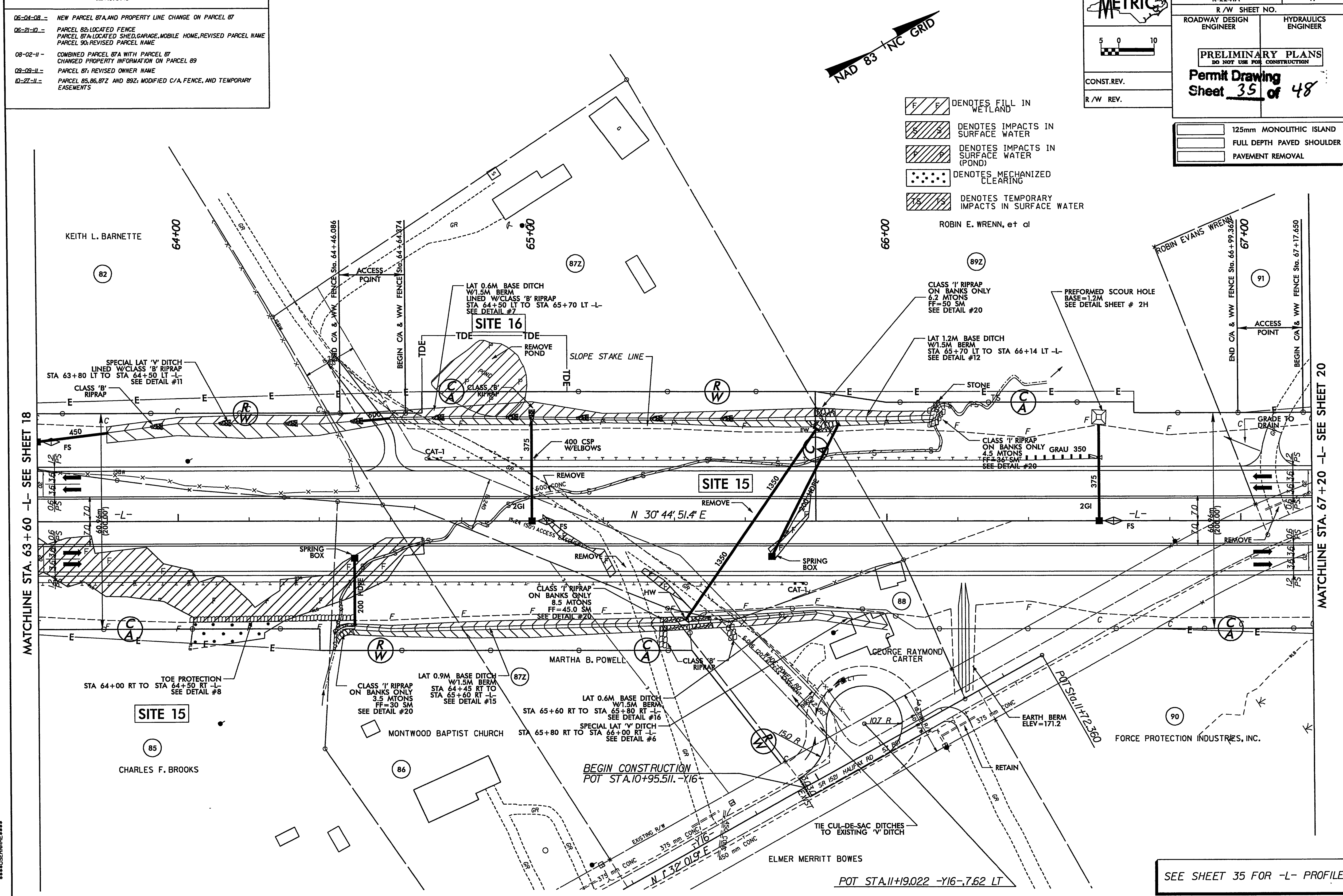
CONST. REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 35 of 48

	125mm MONOLITHIC ISLAND
	FULL DEPTH PAVED SHOULDER
	PAVEMENT REMOVAL



NAD 83 NC GRID
DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES IMPACTS IN SURFACE WATER (POND)
DENOTES MECHANIZED CLEARING
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
KEITH L. BARNETTE
ROBIN E. WRENN, et al
ROBIN EVANS WRENN
SITE 16
SITE 15
MATCHLINE STA. 63+60 -L- SEE SHEET 18
MATCHLINE STA. 67+20 -L- SEE SHEET 20
N 30° 44' 51.4" E
PREFORMED SCOUR HOLE BASE=1.2M SEE DETAIL SHEET # 2H
LAT 0.6M BASE DITCH W/1.5M BERM LINED W/CLASS 'B' RIPRAP STA 64+50 LT TO STA 65+70 LT -L- SEE DETAIL #7
SPECIAL LAT 'V' DITCH LINED W/CLASS 'B' RIPRAP STA 63+80 LT TO STA 64+50 LT -L- SEE DETAIL #11
CLASS 'I' RIPRAP ON BANKS ONLY 6.2 MTONS FF=50 SM SEE DETAIL #20
LAT 1.2M BASE DITCH W/1.5M BERM STA 65+70 LT TO STA 66+14 LT -L- SEE DETAIL #12
CLASS 'I' RIPRAP ON BANKS ONLY 4.5 MTONS FF=36 SM SEE DETAIL #20
CLASS 'I' RIPRAP ON BANKS ONLY 8.5 MTONS FF=45.0 SM SEE DETAIL #20
TOE PROTECTION STA 64+00 RT TO STA 64+50 RT -L- SEE DETAIL #8
CLASS 'I' RIPRAP ON BANKS ONLY 3.5 MTONS FF=30 SM SEE DETAIL #20
LAT 0.9M BASE DITCH W/1.5M BERM STA 64+45 RT TO STA 65+60 RT -L- SEE DETAIL #15
LAT 0.6M BASE DITCH W/1.5M BERM STA 65+60 RT TO STA 65+80 RT -L- SEE DETAIL #16
SPECIAL LAT 'V' DITCH STA 65+80 RT TO STA 66+00 RT -L- SEE DETAIL #6
MARTHA B. POWELL
GEORGE RAYMOND CARTER
MONTWOOD BAPTIST CHURCH
CHARLES F. BROOKS
FORCE PROTECTION INDUSTRIES, INC.
ELMER MERRITT BOWES
BEGIN CONSTRUCTION POT STA.10+95.511 -Y16-
POT STA.11+19.022 -Y16- 7.62 LT
POT Sta.11+72.360
EARTH BERM ELEV=171.2
TIE CUL-DE-SAC DITCHES TO EXISTING 'V' DITCH
SR 1521 HALIFAX RD
N 32° 01' 09" E

SEE SHEET 35 FOR -L- PROFILE.

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

REVISIONS

06-04-08 -	NEW PARCEL 87A AND PROPERTY LINE CHANGE ON PARCEL 87
06-21-10 -	PARCEL 82: LOCATED FENCE PARCEL 87A: LOCATED SHED, GARAGE, MOBILE HOME, REVISED PARCEL NAME PARCEL 90: REVISED PARCEL NAME
08-02-11 -	COMBINED PARCEL 87A WITH PARCEL 87 CHANGED PROPERTY INFORMATION ON PARCEL 89
09-09-11 -	PARCEL 87: REVISED OWNER NAME
10-27-11 -	PARCEL 85, 86, 87Z AND 89Z: MODIFIED C/A FENCE, AND TEMPORARY EASEMENTS

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

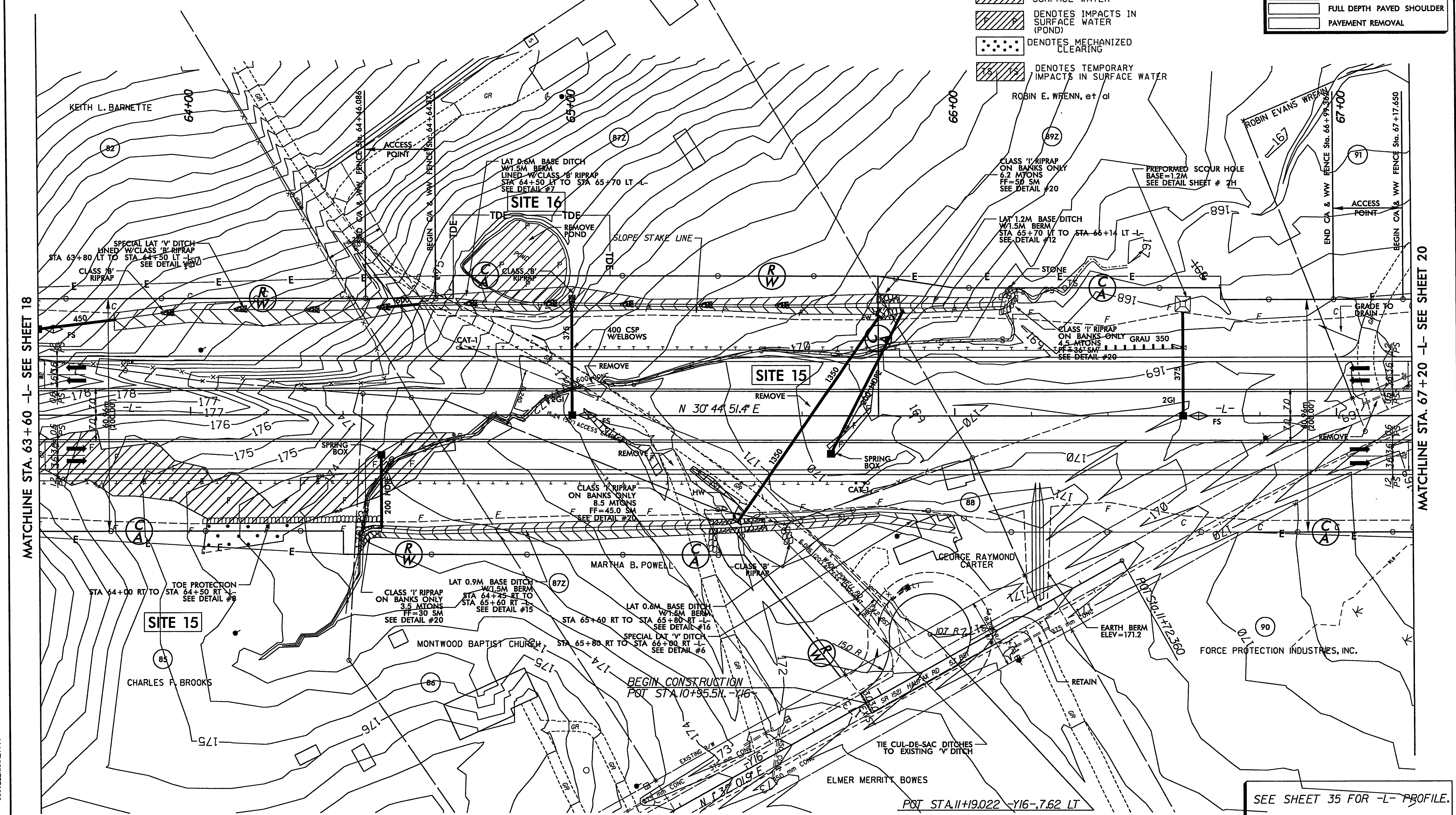
CONST. REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 36 of 48

	125mm MONOLITHIC ISLAND
	FULL DEPTH PAVED SHOULDER
	PAVEMENT REMOVAL



STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste 200
Charlotte, NC 28208
NC License Number F-0991

REVISIONS	
06-21-10 -	PARCEL 90: REVISED PARCEL NAME
08-02-11 -	CHANGED PROPERTY OWNER INFORMATION ON PARCEL 89
11-07-11 -	CHANGED PARCEL NUMBER FROM 89 TO 89Z

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

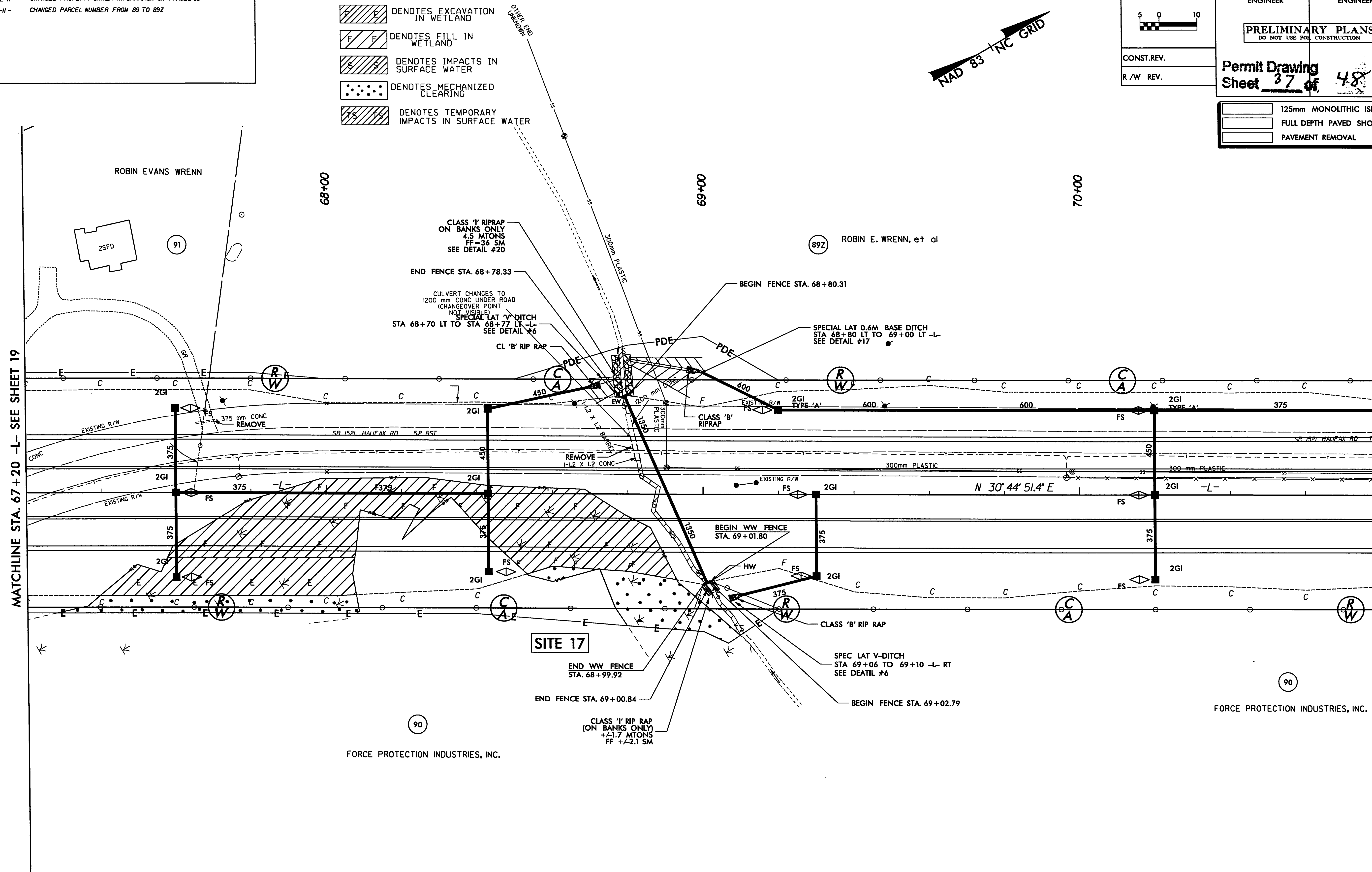
CONST. REV.

R/W REV.

Permit Drawing
Sheet 37 of 48

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

E — DENOTES EXCAVATION IN WETLAND
F — DENOTES FILL IN WETLAND
S — DENOTES IMPACTS IN SURFACE WATER
DENOTES MECHANIZED CLEARING
TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER



NAD 83 NC GRID
OTHER END UNKNOWN
ROBIN EVANS WRENN
2SFD
91
68+00
69+00
70+00
89Z
ROBIN E. WRENN, et al
CLASS 'I' RIPRAP ON BANKS ONLY 4.5 MTONS FF=36 SM SEE DETAIL #20
END FENCE STA. 68+78.33
CULVERT CHANGES TO 1200 mm CONC UNDER ROAD (CHANGEOVER POINT NOT VISIBLE)
SPECIAL LAT 'V' DITCH STA 68+70 LT TO STA 68+77 LT -L- SEE DETAIL #6
CL 'B' RIP RAP
BEGIN FENCE STA. 68+80.31
SPECIAL LAT 0.6M BASE DITCH STA 68+80 LT TO 69+00 LT -L- SEE DETAIL #17
300mm PLASTIC
PDE
EXISTING R/W
375 mm CONC REMOVE
SR 1521 HALIFAX RD
CLASS 'B' RIPRAP
REMOVE 1-1.2 X 1.2 CONC
300mm PLASTIC
N 30°44' 51.4" E
-L-
2GI
TYPE 'A'
FS
BEGIN WW FENCE STA. 69+01.80
HW
CLASS 'B' RIP RAP
SITE 17
END WW FENCE STA. 68+99.92
END FENCE STA. 69+00.84
CLASS 'I' RIP RAP (ON BANKS ONLY) +/-1.7 MTONS FF +/-2.1 SM
SPEC LAT V-DITCH STA 69+06 TO 69+10 -L- RT SEE DEATIL #6
BEGIN FENCE STA. 69+02.79
90
FORCE PROTECTION INDUSTRIES, INC.
MATCHLINE STA. 67+20 -L- SEE SHEET 19
MATCHLINE STA. 70+80 -L- SEE SHEET 21

SEE SHEET 36 FOR -L- PROFILE.

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste 200
Charlotte, NC 28208
NC License Number F-0991

REVISIONS	
06-21-10 -	PARCEL 90; REVISED PARCEL NAME
08-02-11 -	CHANGED PROPERTY OWNER INFORMATION ON PARCEL 89
11-07-11 -	CHANGED PARCEL NUMBER FROM 89 TO 89Z

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	20
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

5 0 10

CONST.REV.

R /W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 38 of 48

☐	125mm MONOLITHIC ISLAND
☐	FULL DEPTH PAVED SHOULDER
☐	PAVEMENT REMOVAL

▨ E	DENOTES EXCAVATION IN WETLAND
▨ F	DENOTES FILL IN WETLAND
▨ S	DENOTES IMPACTS IN SURFACE WATER
⁘	DENOTES MECHANIZED CLEARING
▨ TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SEE SHEET 36 FOR -L- PROFILE.

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste 200
Charlotte, NC 28208
NC License Number F-0991

REVISIONS

06-21-10 = PARCEL 98: REVISED PARCEL NAME
PARCEL 90: LOCATED BARBWIRE FENCE, REVISED PARCEL NAME

11-07-11 = PARCEL 90: MODIFIED C/A, FENCE, AND TEMPORARY EASEMENTS

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

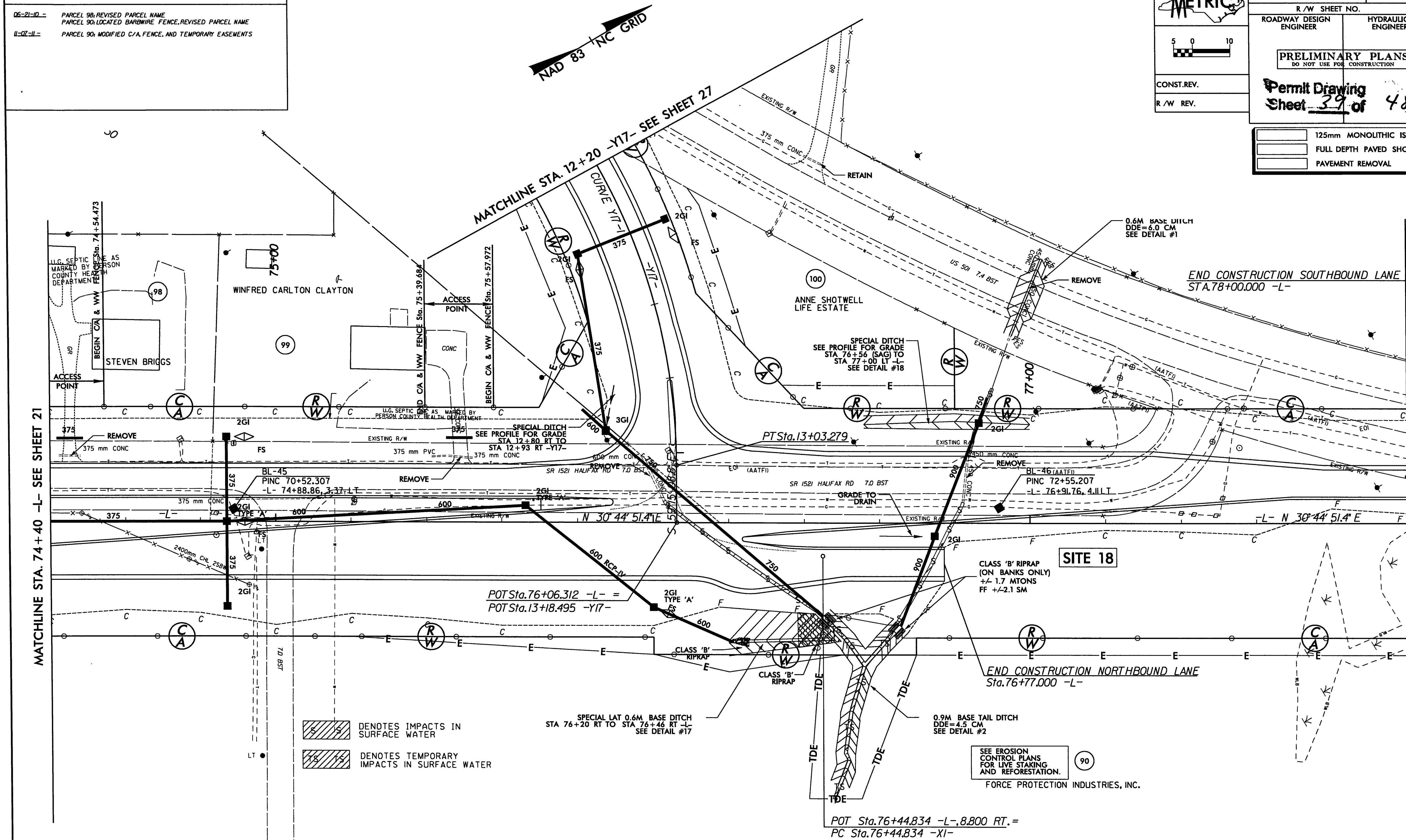
CONST. REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 39 of 48

	125mm MONOLITHIC ISLAND
	FULL DEPTH PAVED SHOULDER
	PAVEMENT REMOVAL



NAD 83 NC GRID
MATCHLINE STA. 12+20 -Y17- SEE SHEET 27
MATCHLINE STA. 74+40 -L- SEE SHEET 21
MATCHLINE STA. 78+00 -L- SEE SHEET 23
CURVE Y17-1
WINFRED CARLTON CLAYTON
STEVEN BRIGGS
ANNE SHOTWELL LIFE ESTATE
FORCE PROTECTION INDUSTRIES, INC.
SITE 18
END CONSTRUCTION SOUTHBOUND LANE STA.78+00.000 -L-
END CONSTRUCTION NORTHBOUND LANE Sta.76+77.000 -L-
PT Sta.13+03.279
POT Sta.76+06.312 -L- = POT Sta.13+18.495 -Y17-
POT Sta.76+44.834 -L-, 8.800 RT. = PC Sta.76+44.834 -X1-
BL-45 PINC 70+52.307 -L- 74+88.86, 3.37 LT
BL-46 PINC 72+55.207 -L- 76+91.76, 4.11 LT
-L- N 30° 44' 51.4" E
SR 1521 HALIFAX RD 7.0 BST
US 501 7.4 BST
SPECIAL DITCH SEE PROFILE FOR GRADE STA 12+80 RT TO STA 12+93 RT -Y17-
SPECIAL DITCH SEE PROFILE FOR GRADE STA 76+56 (SAG) TO STA 77+00 LT -L- SEE DETAIL #18
SPECIAL LAT 0.6M BASE DITCH STA 76+20 RT TO STA 76+46 RT -L- SEE DETAIL #17
0.6M BASE DITCH DDE=6.0 CM SEE DETAIL #1
0.9M BASE TAIL DITCH DDE=4.5 CM SEE DETAIL #2
CLASS 'B' RIPRAP (ON BANKS ONLY) +/- 1.7 MTONS FF +/-2.1 SM
CLASS 'B' RIPRAP
GRADE TO DRAIN
RETAIN
REMOVE
ACCESS POINT
U.G. SEPTIC TANK AS MARKED BY PERSON COUNTY HEALTH DEPARTMENT
BEGIN C/A & WW FENCE Sta. 74+54.473
BEGIN C/A & WW FENCE Sta. 75+57.972
C/A & WW FENCE Sta. 75+39.684
SEE EROSION CONTROL PLANS FOR LIVE STAKING AND REFORESTATION.
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER

CURVE Y17-1
PI Sta 12+26.836
Δ = 58° 53' 09.1" (RT)
L = 169.579
T = 93.136
R = 165.000
e = 0.08
Runoff = 50

CURVE X1-1
PI Sta 77+60.175
Δ = 4° 24' 12.8" (LT)
L = 230.570
T = 115.342
R = 3000.000
e = SEE PLANS

SEE SHEET 37 FOR -L- PROFILE.
SEE SHEET 43 FOR -Y17- PROFILE.

REVISIONS	
06-21-10 -	PARCEL 98: REVISED PARCEL NAME PARCEL 90: LOCATED BARBWIRE FENCE, REVISED PARCEL NAME
11-07-11 -	PARCEL 90: MODIFIED C/A, FENCE, AND TEMPORARY EASEMENTS

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St. Ste 200
Charlotte, NC 28208
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

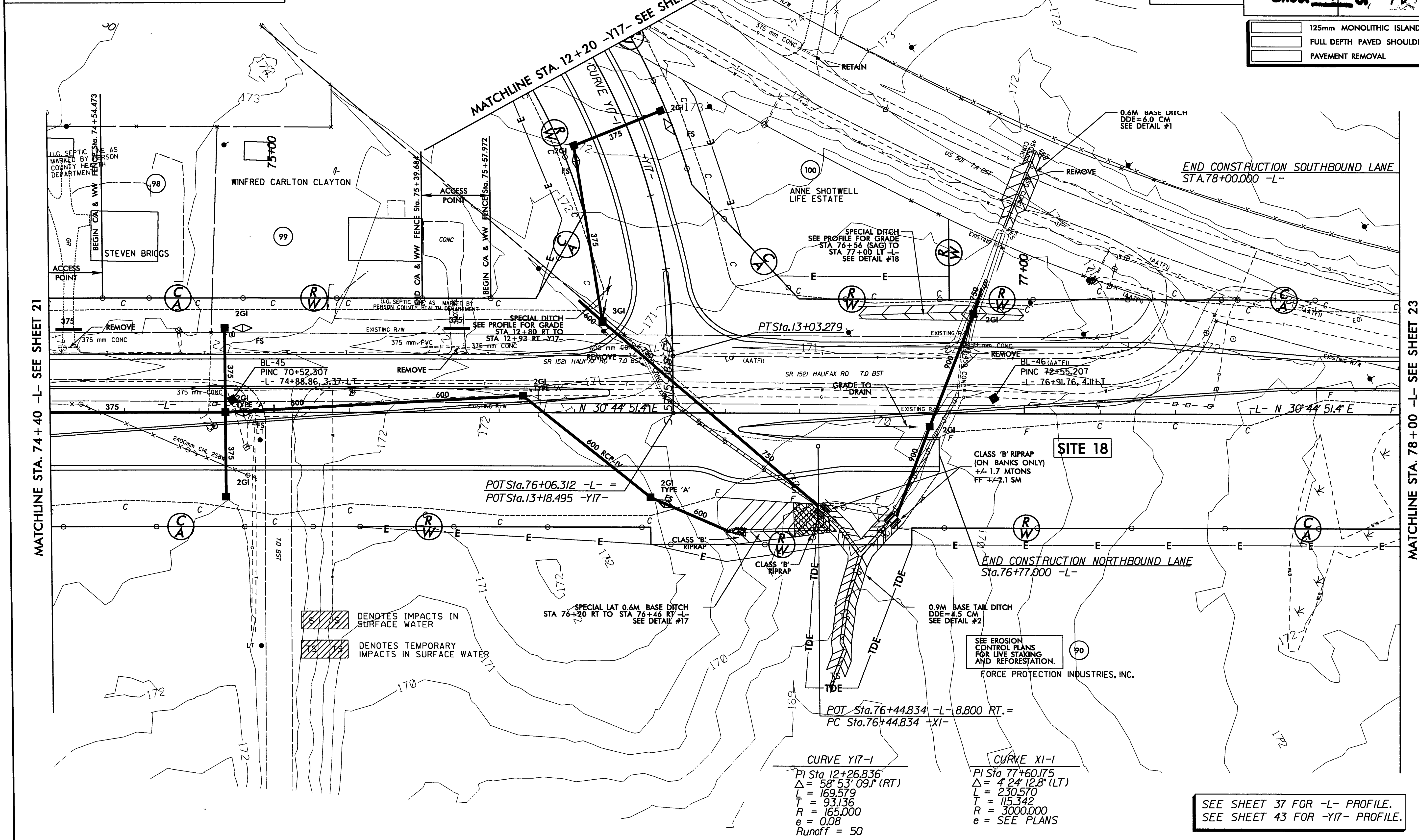
CONST. REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 40 of 48

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL


NAD 83 NC GRID
MATCHLINE STA. 12+20 -Y17- SEE SHEET 27
MATCHLINE STA. 74+40 -L- SEE SHEET 21
MATCHLINE STA. 78+00 -L- SEE SHEET 23
WINFRED CARLTON CLAYTON
STEVEN BRIGGS
ANNE SHOTWELL LIFE ESTATE
FORCE PROTECTION INDUSTRIES, INC.
SITE 18
SR 1521 HALIFAX RD 7.0 BST
US 501 7.4 BST
END CONSTRUCTION SOUTHBOUND LANE
STA 78+00.000 -L-
END CONSTRUCTION NORTHBOUND LANE
Sta. 76+77.000 -L-
PT Sta. 13+03.279
POT Sta. 76+06.312 -L- =
POT Sta. 13+18.495 -Y17-
POT Sta. 76+44.834 -L- 8.800 RT. =
PC Sta. 76+44.834 -X1-
-L- N 30° 44' 51.4" E
BL-45
PINC 70+52.307
-L- 74+88.86, 3.37 LT
BL-46
PINC 72+55.207
-L- 76+91.76, 4.11 LT
0.6M BASE DITCH
DDE=6.0 CM
SEE DETAIL #1
SPECIAL DITCH
SEE PROFILE FOR GRADE
STA 76+56 (SAG) TO
STA 77+00 LT -L-
SEE DETAIL #18
SPECIAL DITCH
SEE PROFILE FOR GRADE
STA 12+80 RT TO
STA 12+93 RT -Y17-
CLASS 'B' RIPRAP
(ON BANKS ONLY)
+/- 1.7 MTONS
FF +/- 2.1 SM
SPECIAL LAT 0.6M BASE DITCH
STA 76+20 RT TO STA 76+46 RT -L-
SEE DETAIL #17
0.9M BASE TAIL DITCH
DDE=4.5 CM
SEE DETAIL #2
SEE EROSION CONTROL PLANS FOR LIVE STAKING AND REFORESTATION.
U.G. SEPTIC LINE AS MARKED BY PERSON COUNTY HEALTH DEPARTMENT
BEGIN C/A & WW FENCE Sta. 74+54.473
END C/A & WW FENCE Sta. 75+39.684
BEGIN C/A & WW FENCE Sta. 75+57.972
ACCESS POINT
GRADE TO DRAIN
RETAIN
REMOVE
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
CURVE Y17-1
PI Sta 12+26.836
Δ = 58° 53' 09.1" (RT)
L = 169.579
T = 93.136
R = 165.000
e = 0.08
Runoff = 50
CURVE X1-1
PI Sta 77+60.175
Δ = 4° 24' 12.8" (LT)
L = 230.570
T = 115.342
R = 3000.000
e = SEE PLANS

SEE SHEET 37 FOR -L- PROFILE.
SEE SHEET 43 FOR -Y17- PROFILE.

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste 200
Charlotte, NC 28208
NC License Number F-0991

REVISIONS

06-04-08 -	DRIVEWAY RECONNECTION ON PARCELS 100,101,103,105,106,107,108 SHIFTED ACCESS POINT ON PARCEL 107. PROPERTY LINE CHANGES ON PARCELS 101,102,103,104,108 AND NAME CHANGE ON PARCELS 101,103,108
06-24-08 -	PROVIDED ACCESS ON PARCEL 102.
06-21-10 -	PARCEL 90; LOCATED BARBWIRE FENCE, REVISED PARCEL NAME PARCEL 108; REVISED PARCEL NAME
08-02-11 -	CHANGED PROPERTY OWNER INFORMATION ON PARCELS 101,106,108
09-09-11 -	PARCEL 102 & 107; REVISED OWNER NAMES

METRIC

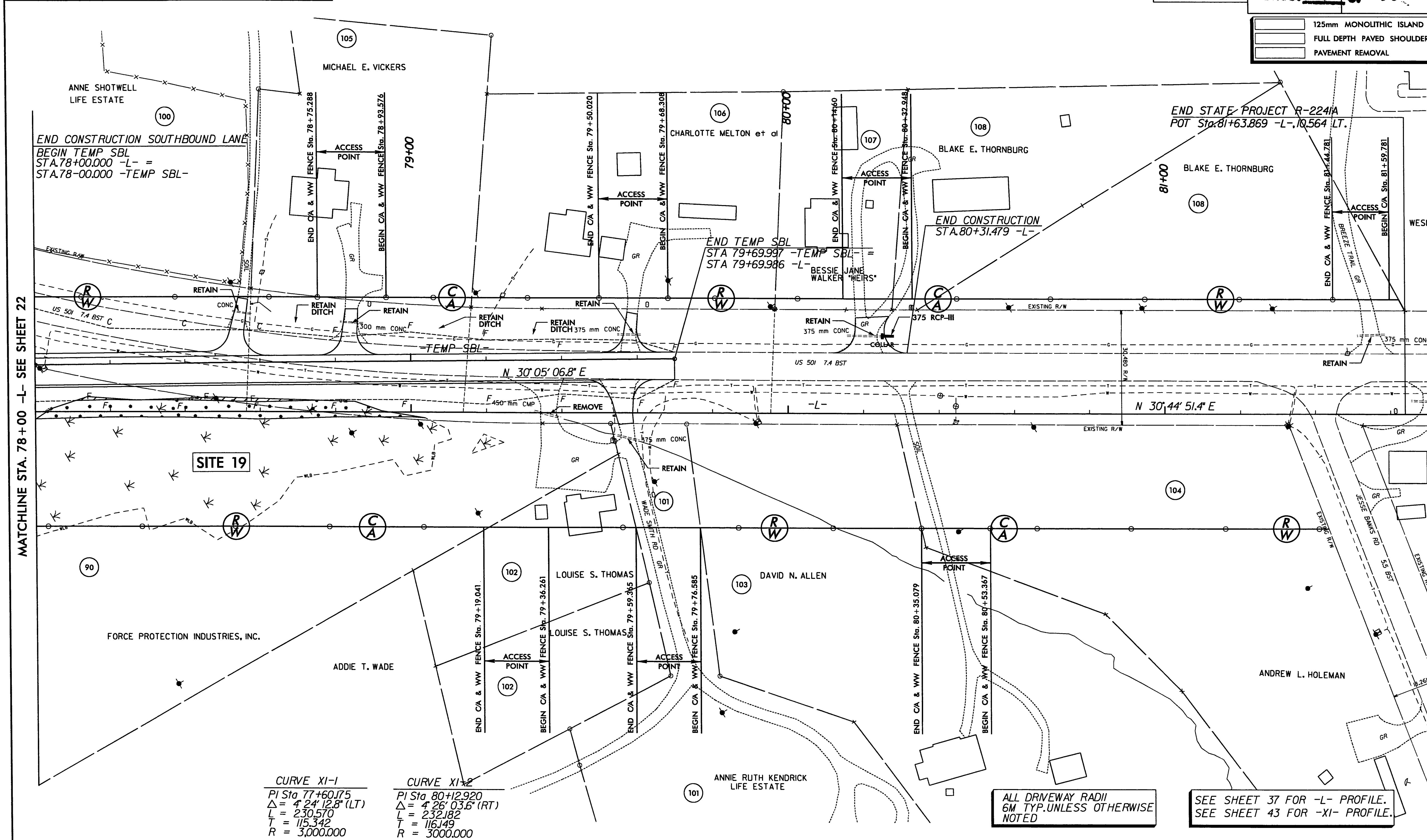
PROJECT REFERENCE NO.	SHEET NO.
R-2241A	23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CONST. REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 41 of 48


NAD 83 NC GRID
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL
MICHAEL E. VICKERS
ANNE SHOTWELL LIFE ESTATE
END CONSTRUCTION SOUTHBOUND LANE
BEGIN TEMP SBL
STA.78+00.000 -L- =
STA.78-00.000 -TEMP SBL-
CHARLOTTE MELTON et al
BLAKE E. THORNBURG
END STATE PROJECT R-2241A
POT Sta.81+63.869 -L-, 10.564 LT.
END CONSTRUCTION
STA.80+31.479 -L-
END TEMP SBL
STA 79+69.997 -TEMP SBL- =
STA 79+69.986 -L-
BESSIE JANE WALKER "HEIRS"
ACCESS POINT
RETAIN
RETAIN DITCH
375 RCP-III
US 501 7.4 BST
-TEMP SBL-
N 30° 05' 06.8" E
N 30° 44' 51.4" E
REMOVE
SITE 19
WADE SMITH RD
JESSE BANKS RD
LOUISE S. THOMAS
DAVID N. ALLEN
FORCE PROTECTION INDUSTRIES, INC.
ADDIE T. WADE
ANDREW L. HOLEMAN
ANNIE RUTH KENDRICK LIFE ESTATE
MATCHLINE STA. 78+00 -L- SEE SHEET 22
CURVE XI-1
PI Sta 77+60.175
Δ = 4° 24' 12.8" (LT)
L = 230.570
T = 115.342
R = 3,000.000
CURVE XI-2
PI Sta 80+12.920
Δ = 4° 26' 03.6" (RT)
L = 232.182
T = 116.149
R = 3000.000
ALL DRIVEWAY RADII 6M TYP. UNLESS OTHERWISE NOTED
SEE SHEET 37 FOR -L- PROFILE.
SEE SHEET 43 FOR -XI- PROFILE.

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste 200
Charlotte, NC 28208
NC License Number F-0991

REVISIONS	
06-04-08 -	DRIVEWAY RECONNECTION ON PARCELS 100,101,103,105,106,107,108 SHIFTED ACCESS POINT ON PARCEL 107. PROPERTY LINE CHANGES ON PARCELS 101,102,103,104,108 AND NAME CHANGE ON PARCELS 101,103,108
06-24-08 -	PROVIDED ACCESS ON PARCEL 102.
06-21-10 -	PARCEL 90: LOCATED BARBWIRE FENCE, REVISED PARCEL NAME PARCEL 108: REVISED PARCEL NAME
08-02-11 -	CHANGED PROPERTY OWNER INFORMATION ON PARCELS 101,106,108
09-09-11 -	PARCEL 102 & 107: REVISED OWNER NAMES

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	23
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CONST. REV.

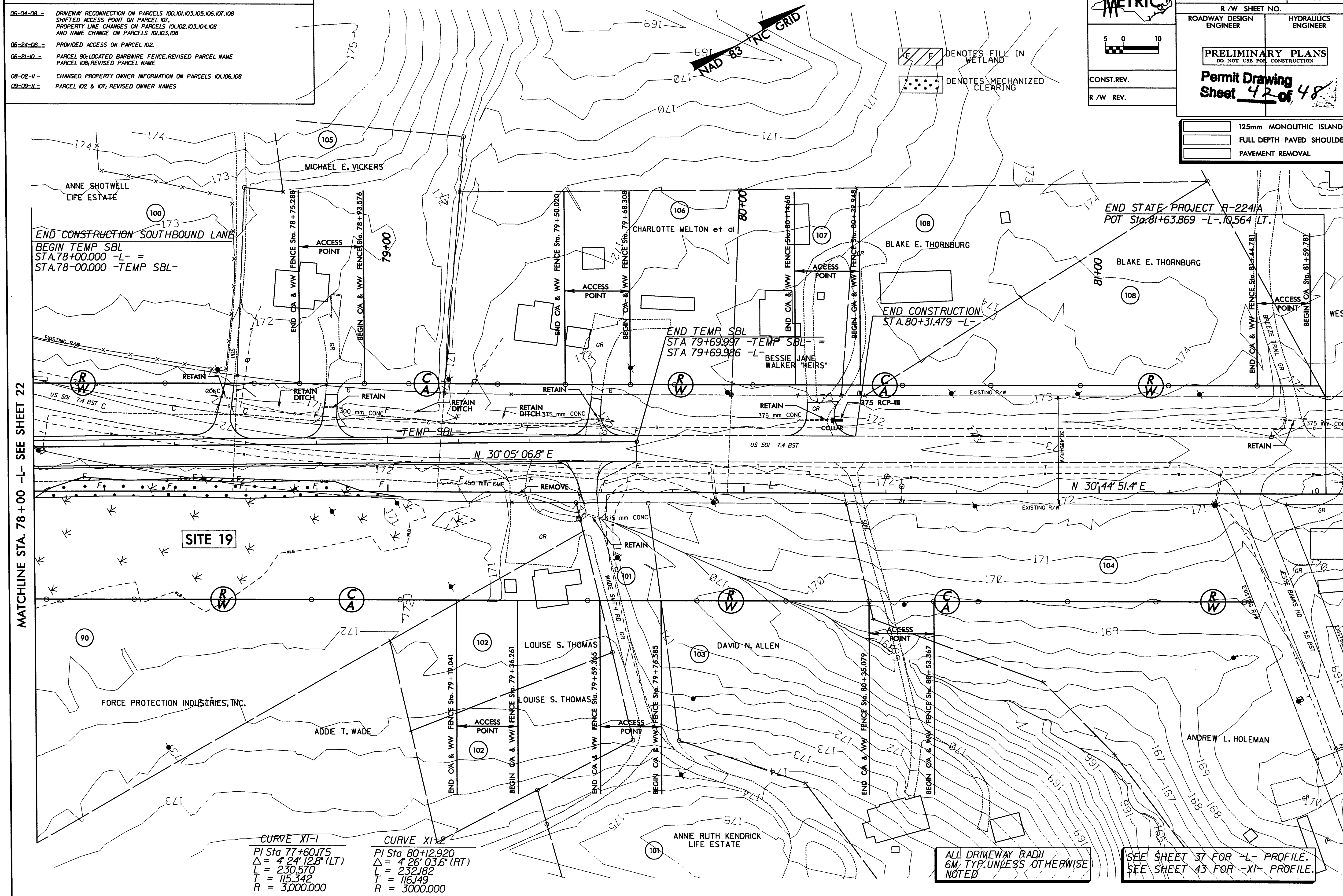
R /W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 42 of 48

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING



NAD 83 NC GRID
MATCHLINE STA. 78+00 -L- SEE SHEET 22
MICHAEL E. VICKERS
ANNE SHOTWELL LIFE ESTATE
END CONSTRUCTION SOUTHBOUND LANE
BEGIN TEMP SBL
STA.78+00.000 -L- =
STA.78-00.000 -TEMP SBL-
CHARLOTTE MELTON et al
BLAKE E. THORNBURG
END STATE PROJECT R-2241A
POT Sta.81+63.869 -L-,10.564 LT.
END TEMP SBL
STA 79+69.997 -TEMP SBL- =
STA 79+69.986 -L-
BESSIE JANE WALKER "HEIRS"
END CONSTRUCTION
STA.80+31.479 -L-
ACCESS POINT
RETAIN
RETAIN DITCH
REMOVE
375 RCP-III
-TEMP SBL-
N 30° 05' 06.8" E
N 30° 44' 51.4" E
US 501 7.4 BST
EXISTING R/W
SITE 19
WADE SMITH RD
JESSE BANKS RD
LOUISE S. THOMAS
DAVID N. ALLEN
FORCE PROTECTION INDUSTRIES, INC.
ADDIE T. WADE
ANDREW L. HOLEMAN
ANNIE RUTH KENDRICK LIFE ESTATE
CURVE XI-1
PI Sta 77+60.175
Δ = 4° 24' 12.8" (LT)
L = 230.570
T = 115.342
R = 3,000.000
CURVE XI-2
PI Sta 80+12.920
Δ = 4° 26' 03.6" (RT)
L = 232.182
T = 116.149
R = 3000.000
ALL DRIVEWAY RADII 6M TYP. UNLESS OTHERWISE NOTED
SEE SHEET 37 FOR -L- PROFILE.
SEE SHEET 43 FOR -XI- PROFILE.

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES		
14	Jimmy Lewis Contracting, Inc.	3068 Chub Lake Rd.		
		Roxboro	NC	27574
15	Roxboro Properties LLC	PO Box 190138		
		Dallas	TX	75219
16	Gates, J.E.	Drawer 720		
	Rosalie Gate	Roxboro	NC	27573
16A	J. E. Gates Trust	PO Box 720		
		Roxboro	NC	27573
16B	J. E. Gates Estate	PO Box 720		
		Roxboro	NC	27573
17	Perkins, Charles E.	PO Box F		
		Roxboro	NC	27573
33	Wade, Estelle P.	490 Virgilina Rd		
		Roxboro	NC	27573
35	Woody & Anderson Properties Inc.	112 S. Main St.		
		Roxboro	NC	27573
36	Call, Nathaniel	570 Virgilina Rd.		
		Roxboro	NC	27573
41	Gentry, Odelia P.	285 Adcock Rd.		
	Heirs	Lillington	NC	27546
63	Pentecost, Nellie R.	1065 Providence Rd.		
		Roxboro	NC	27573
64	Smith, Howard	1031 Providence Rd.		
		Roxboro	NC	27573
66	Smith, Mary P.	1031 Providence Rd.		
		Roxboro	NC	27573
62	Garrett, Almeade G.	1899 Virgilina Rd.		
		Roxboro	NC	27573
69	Perkins, Charles	P.O. Box F		
	Wanda H. Perkins	Roxboro	NC	27573
70Z	Miriam J. Lavelle	525 Mill Hill Rd.		
	Charles F. Sams, Jr.	Roxboro	NC	27574
76	Jeffers, Charlie V.	1108 Semora Rd.		
		Roxboro	NC	27573
76A	Jeffers, Charlie V.	1108 Semora Rd.		
	Beverly W. Jeffers	Roxboro	NC	27573

NCDOT

DIVISION OF HIGHWAYS

PERSON COUNTY

PROJECT: 34 4069.1.1 (R-2241A)

US 501 FROM NC 49

IN ROXBORO TO

SOUTH OF SR 1602

11/02/11

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
77	Clay, Austin B.	204 Hill St.
	Heirs	Roxboro NC 27573
78	Clay, John D.	701 Patterson Dr.
	Heirs	Roxboro NC 27573
78Z	Ronald E. Thomas, Jr.	948 Semora Rd.
	Jodi R. Thomas	Roxboro NC 27574
80	Shotwell, Jr. James	509 Meherrin Lane
		Murfreesboro NC 27855
85	Brooks, Charles F.	3875 Halifax Rd
	Wilma Brooks	Roxboro NC 27574
86	Montwood Baptist Church	4416 Boston Rd.
		Roxboro NC 27573
87	Powell, Roy R.	4431 Halifax Rd
		Roxboro NC 27573
87A	Wade, Racheal D.	124 Wade Powell Rd
		Roxboro NC 27574
87Z	Martha B. Powell	150 Wade Powell Rd.
		Roxboro NC 27574
89Z	Robin E. Wrenn	8101 Slatesville Rd.
		Keeling VA 24566
90	Force Protection Industries, Inc.	9801 Highway 78
		Ladson SC 29456
103	Allen, David N.	33 Kendrick Dr.
	Elizabeth Allen	Roxboro NC 27574

NCDOT

DIVISION OF HIGHWAYS

PERSON COUNTY

PROJECT: 344069.1.1 (R-2241A)

US 501 FROM NC 49

IN ROXBORO TO

SOUTH OF SR 1602

SHEET 44 OF 48 11/02/11

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ha)	Temp. Fill In Wetlands (ha)	Excavation in Wetlands (ha)	Mechanized Clearing in Wetlands (ha)	Hand Clearing in Wetlands (ha)	Permanent SW impacts (ha)	Temp. SW impacts (ha)	Existing Channel Impacts Permanent (m)	Existing Channel Impacts Temp. (m)	Natural Stream Design (m)
1	13+28/13+62 -L-	3@3mx3m RCBC						0.012	0.002	42	8	
	Stream Bank Stabilization							0.013		38		
2	15+12/15+59 -L- LT	750mm CSP	0.045		0.004	0.025						
3 *	19+21/19+23 -L- RT	Fill						<0.001		7		
4	20+84/20+89 -L-	2@2.4mx2.4m RCBC						0.010	0.005	34	12	
	Stream Bank Stabilization							0.010		18		
5	20+89/21+45 -L-	Fill	0.089			0.023						
6 *	24+98/25+10 -L- RT	900mm RCP						0.001	0.001	7	9	
	Stream Bank Stabilization							0.002		5		
7A	34+93/36+38 -L-	2.7mx1.8m RCBC	0.051			0.002		0.012	0.003	158	33	
	Stream Bank Stabilization							0.007		25		
7B *	35+38/35+51 -L- LT	Fill						0.001		18		
8	37+33/37+55 -L-	1050mm RCP	0.008		0.002	0.012		0.004	0.001	59	11	
	Stream Bank Stabilization							0.001		4		
9	40+05/40+70 -L-	1500mm RCP						0.017	0.002	85	10	
	Stream Bank Stabilization							0.002		5		
10 *	11+55/11+82 -Y13- LT	900mm CSP						0.003	0.002	28	13	
	Stream Bank Stabilization							0.001		6		
11	50+41/51+25 -L-	1200mm RCP	0.001					0.008	0.004	86	31	
	Stream Bank Stabilization							0.003		11		
12	51+47/51+91 -L-	750mm RCP	0.047									
13	53+13/53+79 -L-	900mm RCP	0.070		0.001	0.027		0.005	0.001	75	22	
TOTALS:			0.311		0.007	0.089		0.112	0.021	711	149	

* Note: Stream Impacts are Non-Mitigatable.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PERSON COUNTY
WBS - 34406.1.1 (R-2241A)

12/21/2011

WHE Revised 5/21/2008

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ha)	Temp. Fill In Wetlands (ha)	Excavation in Wetlands (ha)	Mechanized Clearing in Wetlands (ha)	Hand Clearing in Wetlands (ha)	Permanent SW impacts (ha)	Temp. SW impacts (ha)	Existing Channel Impacts Permanent (m)	Existing Channel Impacts Temp. (m)	Natural Stream Design (m)
14	57+12/57+55 -L-	1200mm RCP	0.036		0.002			0.007	0.001	80	7	
	Stream Bank Stabilization							0.002		4		
15	63+41/66+32 -L-	1350mm RCP	0.144			0.013		0.012	0.001	199	23	
	Stream Bank Stabilization							0.002		4		
16	64+72/64+99 -L- LT	Pond Removal						0.041				
17	67+35/69+11 -L-	1350 RCP	0.191		0.061	0.074		0.005	0.002	45	19	
	Stream Bank Stabilization							0.006		11		
18 *	76+03/76+90 -L-	750mm/900mm RCP						0.009	0.005	111	62	
	Stream Bank Stabilization							<0.001		3		
19	77+72/79+54 -L-	Fill	0.003			0.039						
TOTALS:			0.374		0.063	0.126		0.084	0.009	457	111	
TOTALS:			0.685		0.070	0.215		0.196	0.030	1168	260	

* Note: Stream Impacts are Non-Mitigatable.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PERSON COUNTY
WBS - 34406.1.1 (R-2241A)

SHEET 46 of 48 12/22/2011

WHE Revised 5/21/2008

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	13+28/13+62 -L-	3@3mx3m RCBC						0.03	<0.01	138	26	
	Stream Bank Stabilization							0.03		125		
2	15+12/15+59 -L- LT	750mm CSP	0.11		0.01	0.06						
3 *	19+21/19+23 -L- RT	Fill						<0.01		23		
4	20+84/20+89 -L-	2@2.4mx2.4m RCBC						0.02	0.01	112	39	
	Stream Bank Stabilization							0.02		59		
5	20+89/21+45 -L-	Fill	0.22			0.06						
6 *	24+98/25+10 -L- RT	900mm RCP						<0.01	<0.01	23	30	
	Stream Bank Stabilization							<0.01		16		
7A	34+93/36+38 -L-	2.7mx1.8m RCBC	0.13			<0.01		0.03	0.01	518	108	
	Stream Bank Stabilization							0.02		82		
7B *	35+38/35+51 -L- LT	Fill						<0.01		59		
8	37+33/37+55 -L-	1050mm RCP	0.02		<0.01	0.03		0.01	<0.01	194	36	
	Stream Bank Stabilization							<0.01		13		
9	40+05/40+70 -L-	1500mm RCP						0.04	<0.01	279	33	
	Stream Bank Stabilization							<0.01		16		
10 *	11+55/11+82 -Y13- LT	900mm CSP						0.01	<0.01	92	43	
	Stream Bank Stabilization							<0.01		20		
11	50+41/51+25 -L-	1200mm RCP	<0.01					0.02	0.01	282	102	
	Stream Bank Stabilization							0.01		36		
12	51+47/51+91 -L-	750mm RCP	0.12									
13	53+13/53+79 -L-	900mm RCP	0.17		<0.01	0.07		0.01	<0.01	246	72	
SUB TOTALS:			0.77		0.01	0.21		0.26	0.03	2333	489	

* Note: Stream Impacts are Non-Mitigatable.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PERSON COUNTY
WBS - 34406.1.1 (R-2241A)

SHEET 47 of 48 11/15/2011

ATN Revised 3/31/05

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
14	57+12/57+55 -L-	1200mm RCP	0.09		<0.01			0.02	<0.01	262	23	
	Stream Bank Stabilization							<0.01		13		
15	63+41/66+32 -L-	1350mm RCP	0.36			0.03		0.03	<0.01	653	75	
	Stream Bank Stabilization							<0.01		13		
16	64+72/64+99 -L- LT	Pond Removal						0.10				
17	67+35/69+11 -L-	1350 RCP	0.47		0.15	0.18		0.01	<0.01	148	62	
	Stream Bank Stabilization							0.01		36		
18 *	76+03/76+90 -L-	750mm/900mm RCP						0.02	0.01	364	203	
	Stream Bank Stabilization							<0.01		10		
19	77+72/79+54 -L-	Fill	0.01			0.10						
SUB TOTALS:			0.92		0.15	0.31		0.20	0.01	1499	363	
TOTALS:			1.69		0.16	0.53		0.45	0.04	3832	852	

* Note: Stream Impacts are Non-Mitigatable.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PERSON COUNTY
WBS - 34406.1.1 (R-2241A)

SHEET 48 of 48

12/22/2011

ATN Revised 3/31/05

UTILITY IMPACTS PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	13+50/13+67	10" SEWER									3.000	
1	13+50/13+67	8" WATER									3.000	
TOTALS:			0.00		0.00	0.00					6	

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PERSON COUNTY
WBS - 34406.1.1 (R-2241A)

SHEET 1 of 2 #########

ATN Revised 3/31/05

REVISIONS

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	5
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R /W REV.

Utility Permit Drawing
Sheet 2 of 2

UTILITY IMPACTS SITE 1

DENOTES IMPACTS IN SURFACE WATER
DENOTES FILL IN WETLAND
DENOTES EXCAVATION IN WETLAND
DENOTES MECHANIZED CLEARING

NAD 83 NC GRID

SITE 1

STREAM CROSSING SITE 1
10" SANITARY SEWER LINE
8" WATER LINE

CLASS 'I' RIPRAP ON BANKS ONLY 26.0 MTONS SEE DETAIL #20

PREFORMED SCOUR HOLE BASE=1.4M SEE DETAIL SHEET # 2H

J. E. GATES TRUST

CHARLES E. PERKINS

J. E. GATES ESTATE

0.9M BASE DITCH EST DDE=35.3 CMS SEE DETAIL #2

CLASS 'B' RIPRAP

TOE PROTECTION STA 16+18 LT TO STA 15+80 LT -L- SEE DETAIL #8

PERSON COUNTY

PERSON COUNTY BOARD OF EDUCATION

MOTOR TO SLIDING GATE

POWER TO GATE

SECURITY KEYPADS

1800mm CMP

600mm CONC

REMOVE 450mm RCP

N 79°52'27.2"E

MATCHLINE STA. 13+40 -L- SEE SHEET 4

MATCHLINE STA. 17+00 -L- SEE SHEET 6

CURVE L-I

CLASS 'B' RIPRAP

CLASS 'I' RIPRAP EST 55 MTONS

0.9M HEAD DITCH EST DDE=8.1 CMS SEE DETAIL #2

CHARLES E. PERKINS

JESSE ANDERSON & SON CONTRACTORS, INC (AKA JESSE ANDERSON & SON, INC.)

PCSta.16+38.064

SITE 1

CITY OF ROXBORO

ROXBORO INVESTMENT PROPERTIES LLC

JUDY AND JAMES LEE

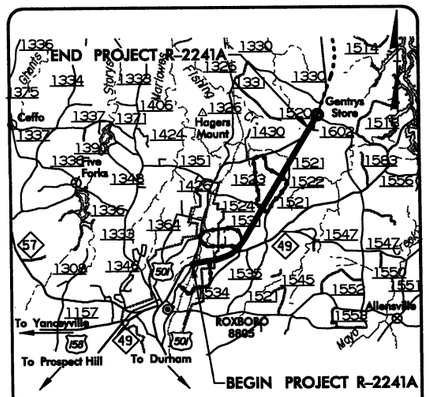
EDWARD ANDERSON

CURVE L-I
PI Sta 16+80.878
Δ = 2°27'09.7" (RT)
L = 85.615
T = 42.814
R = 2,000.000
e = NC

SEE SHEET 28 FOR -L- PROFILE.
SEE SHEET 2-I FOR DETOUR DETAIL

PROJECT: 34406.1.1 TIP PROJECT: R-2241A

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PERSON COUNTY

LOCATION: US 501 FROM NC 49 IN ROXBORO TO SOUTH OF SR 1602

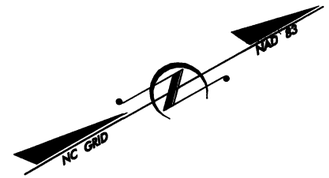
TYPE OF WORK: GRADING, DRAINAGE, PAVING, GUARDRAIL, CULVERTS, AND SIGNALS

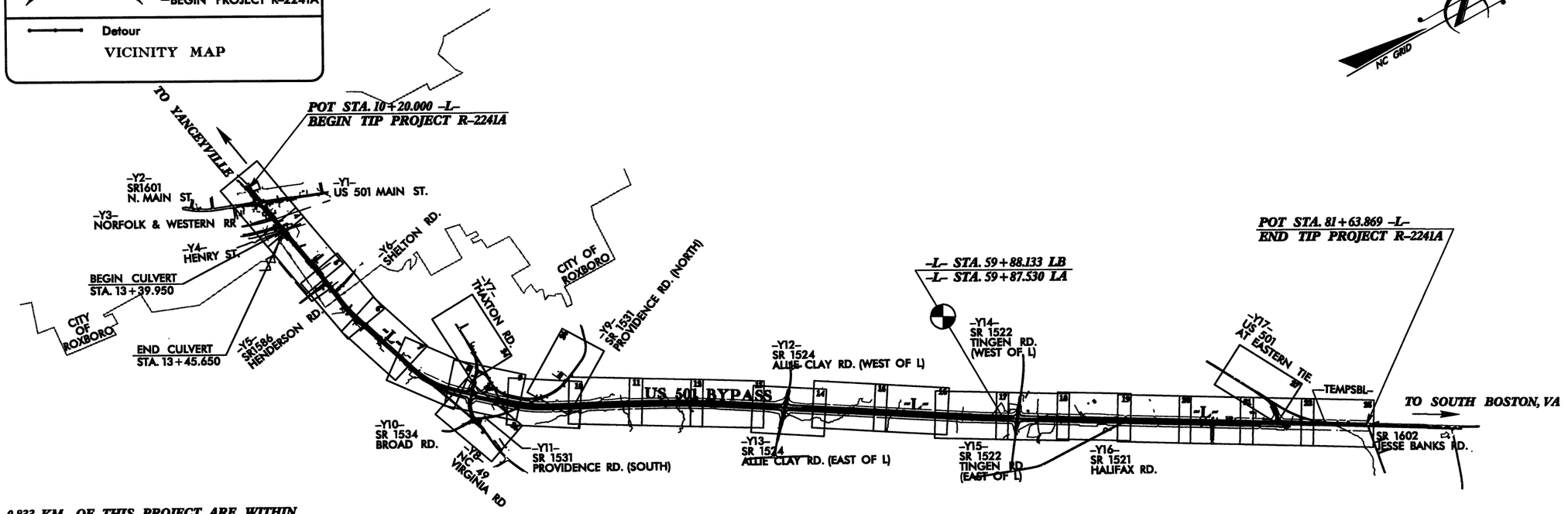
METRIC

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2241A	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34406.1.1	MA-STP-501	PE





0.833 KM OF THIS PROJECT ARE WITHIN THE MUNICIPAL BOUNDARIES OF ROXBORO

NCDOT CONTACT: CLAYTON WALSTON, P.E.
PROJECT ENGINEER (NCDOT)

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

THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALE

5 0 10
PLANS
5 0 10
PROFILE (HORIZONTAL)
1 0 2
PROFILE (VERTICAL)

DESIGN DATA

	5 LANE C&G	4 LANE DIVIDED
ADT 2007 =	21,725	10,500
ADT 2027 =	34,142	17,500
DHV =	10%	10 %
D =	60%	60 %
T =	11%*	6%**
V =	65 km/h	100 km/h

* TTST 3% + DUAL 8%
** TTST 2% + DUAL 4%

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT R-2241A = 7.138 km

LENGTH OF STRUCTURES TIP PROJECT R-2241A = 0.006 km

TOTAL LENGTH OF TIP PROJECT R-2241A = 7.144 km

Prepared In the Office of:
RALPH WHITEHEAD ASSOCIATES, INC.
FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: *OCT. 20, 2006*

LETTING DATE: *OCT. 18, 2011*

JOSEPH A. FREEMAN, P.E.
PROJECT ENGINEER

RICHARD A. ODYNSKI, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

APPROVED P.E.
STATE HIGHWAY DESIGN ENGINEER

11/2/2011
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dgnlib

Note: Not to Scale

***S.U.E. = Subsurface Utility Engineering**

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJ. REFERENCE NO.	SHEET NO.
R-2241A	1-B

METRIC

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin
- Property Corner
- Property Monument
- Parcel/Sequence Number
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary
- Proposed Wetland Boundary
- Existing Endangered Animal Boundary
- Existing Endangered Plant Boundary

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign
- Well
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream — JS
- Buffer Zone 1 — BZ 1
- Buffer Zone 2 — BZ 2
- Flow Arrow
- Disappearing Stream
- Spring
- Swamp Marsh
- Proposed Lateral, Tail, Head Ditch
- False Sump

RAILROADS:

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

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line
- Proposed Right of Way Line with Iron Pin and Cap Marker
- Proposed Right of Way Line with Concrete or Granite Marker
- Existing Control of Access
- Proposed Control of Access
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Utility Easement — PUE

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Wheel Chair Ramp — WCR
- Curb Cut for Future Wheel Chair Ramp — CCFR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H-Frame Pole
- Recorded U/G Power Line — P
- Designated U/G Power Line (S.U.E.*) — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole
- Telephone Booth
- Telephone Pedestal
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole
- Recorded U/G Telephone Cable — T
- Designated U/G Telephone Cable (S.U.E.*) — T
- Recorded U/G Telephone Conduit — TC
- Designated U/G Telephone Conduit (S.U.E.*) — TC
- Recorded U/G Fiber Optics Cable — T FO
- Designated U/G Fiber Optics Cable (S.U.E.*) — T FO

WATER:

- Water Manhole
- Water Meter
- Water Valve
- Water Hydrant
- Recorded U/G Water Line — W
- Designated U/G Water Line (S.U.E.*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Satellite Dish
- TV Pedestal
- TV Tower
- U/G TV Cable Hand Hole
- Recorded U/G TV Cable — TV
- Designated U/G TV Cable (S.U.E.*) — TV
- Recorded U/G Fiber Optic Cable — TV FO
- Designated U/G Fiber Optic Cable (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- Recorded U/G Gas Line — G
- Designated U/G Gas Line (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- Recorded SS Forced Main Line — FSS
- Designated SS Forced Main Line (S.U.E.*) — FSS

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box
- Utility Unknown U/G Line — ?UTL
- U/G Tank; Water, Gas, Oil
- A/G Tank; Water, Gas, Oil
- U/G Test Hole (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

8/2/2011
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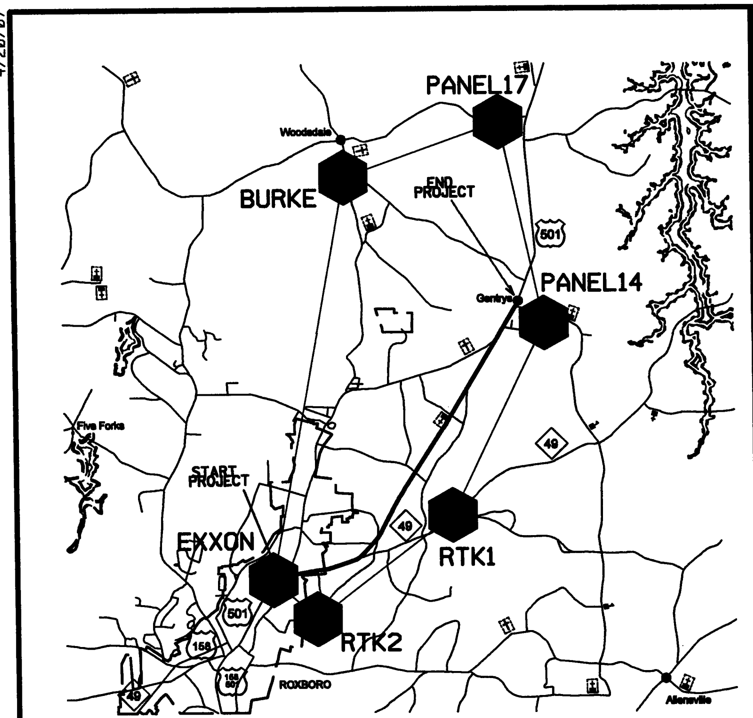
PROJECT REFERENCE NO.	SHEET NO.
R2241A	1C
Location and Surveys	

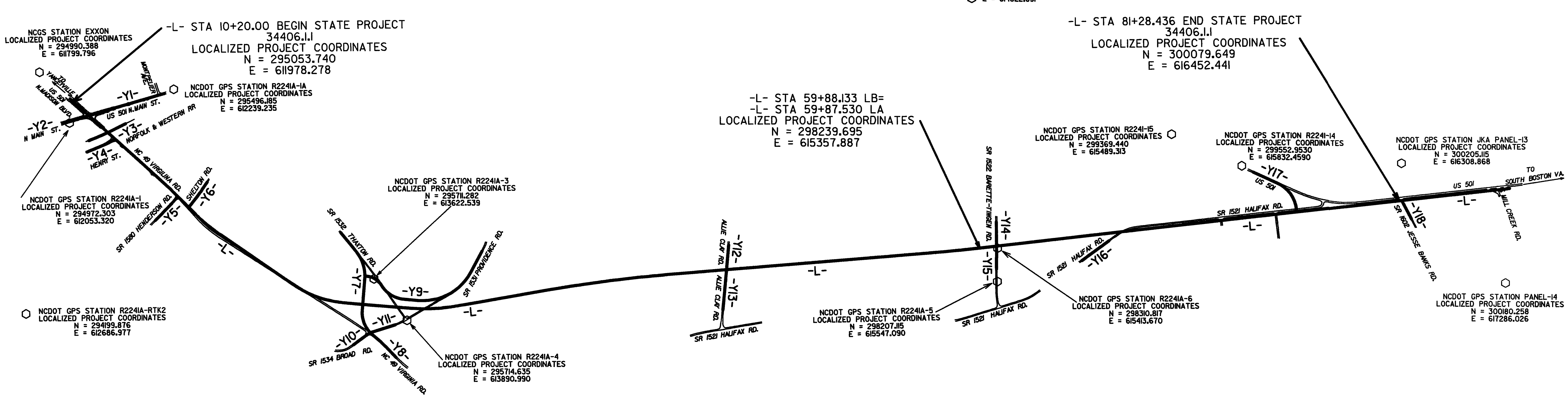
SURVEY CONTROL SHEET R-2241-A

4/20/07



GPS CONTROL NETWORK

NOT TO SCALE



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "JKA PANEL 13" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 300205.115(m) EASTING: 616308.868(m)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.000077057

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "JKA PANEL 13" TO -L- STATION 10+20.000 IS S40°03'09.54"W 6729.835

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES

VERTICAL DATUM USED IS NGVD 29

NOTE: DRAWING NOT TO SCALE

NOTES:

THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:

HTTP:\WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT

R2241A_LS_GPSCALIB_050112.HTML
R2241A_LS_WGS84_050112.TXT
R2241A_LS_LOCAL_050112.TXT
R2241A_LS_CONTROL_070420.TXT

IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

⊙ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

1/2/2011
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4/20/07

PROJECT REFERENCE NO.	SHEET NO.
R2241A	1D
Location and Surveys	

SURVEY CONTROL SHEET R-2241-A

GPS Calibration Report

Project : 34406.1.1 TIP Number: R2241A

User name A.K. ALFORD Date & Time 3:00:41 PM 12/9/04
Coordinate System US State Plane 1983(at ground) Zone North Carolina 3200
Horizontal Datum NAD 1983 (Conus)
Vertical Datum Geoid Model Geoid99 NC Sub Grid
Coordinate Units Meters
Distance Units Meters
Height Units Meters

LOCAL SITE INFORMATION
Localized around
Latitude 36727'21.65218"N
Longitude 78755'30.64699"W
Site Scale Factor 0.9999229490
Height ?

The North Carolina Department of Transportation uses a Localized Coordinate System which is very similar to North Carolina Zone 3200 from which it is derived. Please take care in utilizing these coordinates to eliminate confusion of the two systems. This file is to aid in the use of Real Time Kinematic (RTK) GPS during construction layout.

Datum Transformation Parameters

Datum Transformation computation not requested

Updated Default Projection (Transverse Mercator) Definition

Updated default projection not requested

Horizontal Adjustment Parameters

Northing coordinate of rotation center 298012.185m
Easting coordinate of rotation center 614319.267m
Rotation about the center point 0°00'01"
Translation north 0.011m
Translation east -0.014m
Scale factor 1.00000246

Vertical Adjustment Parameters

Northing coordinate of origin point 304242.368m
Easting coordinate of origin point 616411.587m
Vertical seperation at origin -0.027m
Slope north 0.974ppm
Slope east 0.981ppm

Geoid Model Definition

Geoid99 NC Sub Grid

Residual Differences Between GPS (WGS84) And Local Coordinates

Summary

	Maximum error	Root Mean Square error	Point
Horizontal	0.047m	0.032	R2241A-1 - WGS84
Vertical	0.057m	0.028	RTK1 - WGS84
Three-dimensional	0.067m	0.042	PANEL17 - WGS84

Point Residuals

WGS84 Coordinates	Calculated point FOR DISPLAY ONLY	Local Coordinates
Point PANEL17 - WGS84 Latitude 36729'32.62191"N Longitude 78755'26.39854"W Height 144.794m	Northing 304242.368m Easting 616411.587m Elevation 175.832m Horz error 0.044m Vert error 0.050m 3D error 0.067m	Point PANEL17 - Local Northing 304242.382m Easting 616411.545m Elevation 175.882m Utilized Horz and Vert Quality Survey quality
Point BURKE - WGS84 Latitude 36728'56.67474"N Longitude 78757'31.41250"W Height 137.656m	Northing 303132.458m Easting 613300.488m Elevation 168.669m Horz error 0.028m Vert error 0.012m 3D error 0.030m	Point BURKE - Local Northing 303132.431m Easting 613300.481m Elevation 168.681m Utilized Horz and Vert Quality Survey quality
Point PANEL14 - WGS84 Latitude 36727'20.81927"N Longitude 78754'51.40479"W Height 142.845m	Northing 300180.234m Easting 617286.059m Elevation 173.849m Horz error 0.041m Vert error ? 3D error 0.041m	Point PANEL14 - Local Northing 300180.258m Easting 617286.826m Elevation 173.953m Utilized Horizontal Quality Survey quality
Point R2241D-14 - WGS8 Latitude 36727'00.50625"N Longitude 78755'49.79893"W Height 144.014m	Northing 299552.958m Easting 615832.429m Elevation 174.998m Horz error 0.039m Vert error 0.040m 3D error 0.056m	Point R2241D-14 - Local Northing 299552.953m Easting 615832.459m Elevation 174.958m Utilized Horz and Vert Quality Survey quality

Point Residuals

WGS84 Coordinates	Calculated point FOR DISPLAY ONLY	Local Coordinates
Point R2241D-15 - WGS8 Latitude 36726'54.56836"N Longitude 78756'03.58333"W Height 136.926m	Northing 299369.445m Easting 615489.271m Elevation 167.906m Horz error 0.042m Vert error 0.032m 3D error 0.053m	Point R2241D-15 - Local Northing 299369.440m Easting 615489.313m Elevation 167.874m Utilized Horz and Vert Quality Survey quality
Point R2241A-6 - WGS84 Latitude 36726'20.21850"N Longitude 78756'06.64752"W Height 159.109m	Northing 298310.819m Easting 615413.649m Elevation 190.088m Horz error 0.021m Vert error 0.015m 3D error 0.026m	Point R2241A-6 - Local Northing 298310.817m Easting 615413.670m Elevation 190.065m Utilized Horz and Vert Quality Survey quality
Point R2241A-5 - WGS84 Latitude 36726'16.85095"N Longitude 78756'01.29273"W Height 161.347m	Northing 298207.103m Easting 615547.085m Elevation 192.318m Horz error 0.013m Vert error 0.008m 3D error 0.015m	Point R2241A-5 - Local Northing 298207.115m Easting 615547.090m Elevation 192.326m Utilized Horz and Vert Quality Survey quality
Point B3013-1 - WGS84 Latitude 36726'41.91138"N Longitude 78756'58.42933"W Height 132.694m	Northing 298978.854m Easting 614322.856m Elevation 163.662m Horz error 0.038m Vert error 0.031m 3D error 0.049m	Point B3013-1 - Local Northing 298978.838m Easting 614322.891m Elevation 163.631m Utilized Horz and Vert Quality Survey quality
Point NORFOLK - WGS84 Latitude 36726'37.66990"N Longitude 78757'11.68214"W Height 139.708m	Northing 298847.849m Easting 613793.629m Elevation 170.672m Horz error 0.047m Vert error 0.038m 3D error 0.060m	Point NORFOLK - Local Northing 298847.826m Easting 613793.670m Elevation 170.634m Utilized Horz and Vert Quality Survey quality
Point RTK1 - WGS84 Latitude 36725'14.60765"N Longitude 78756'06.52324"W Height 187.819m	Northing 296288.403m Easting 615418.056m Elevation 218.771m Horz error 0.023m Vert error 0.057m 3D error 0.061m	Point RTK1 - Local Northing 296288.412m Easting 615418.035m Elevation 218.828m Utilized Horz and Vert Quality Survey quality
Point R2241A-3 - WGS84 Latitude 36724'55.91670"N Longitude 78757'18.60076"W Height 177.441m	Northing 295711.284m Easting 613622.525m Elevation 208.369m Horz error 0.014m Vert error 0.013m 3D error 0.019m	Point R2241A-3 - Local Northing 295711.282m Easting 613622.539m Elevation 208.356m Utilized Horz and Vert Quality Survey quality
Point R2241A-4 - WGS84 Latitude 36724'56.02115"N Longitude 78757'07.83307"W Height 182.894m	Northing 295714.628m Easting 613890.984m Elevation 213.025m Horz error 0.009m Vert error 0.003m 3D error 0.010m	Point R2241A-4 - Local Northing 295714.635m Easting 613890.990m Elevation 213.028m Utilized Horz and Vert Quality Survey quality
Point R2241A-1A - WGS8 Latitude 36724'48.95501"N Longitude 78758'14.13387"W Height 144.020m	Northing 295496.184m Easting 612239.262m Elevation 174.933m Horz error 0.027m Vert error 0.003m 3D error 0.027m	Point R2241A-1A - Local Northing 295496.185m Easting 612239.235m Elevation 174.936m Utilized Horz and Vert Quality Survey quality
Point EXXON - WGS84 Latitude 36724'32.54982"N Longitude 78758'31.77764"W Height 156.711m	Northing 294990.391m Easting 611799.805m Elevation 187.613m Horz error 0.010m Vert error 0.001m 3D error 0.010m	Point EXXON - Local Northing 294990.388m Easting 611799.796m Elevation 187.614m Utilized Horz and Vert Quality Survey quality
Point R2241A-1 - WGS84 Latitude 36724'31.96042"N Longitude 78758'21.60106"W Height 156.807m	Northing 294972.288m Easting 612053.365m Elevation 187.712m Horz error 0.047m Vert error 0.018m 3D error 0.051m	Point R2241A-1 - Local Northing 294972.303m Easting 612053.328m Elevation 187.730m Utilized Horz and Vert Quality Survey quality
Point RTK2 - WGS84 Latitude 36724'06.89535"N Longitude 78757'56.18059"W Height 172.226m	Northing 294199.875m Easting 612686.995m Elevation 203.128m Horz error 0.018m Vert error 0.017m 3D error 0.025m	Point RTK2 - Local Northing 294199.876m Easting 612686.977m Elevation 203.145m Utilized Horz and Vert Quality Survey quality

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "JKA PANEL 13" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 300205.115(m) EASTING: 616308.868(m) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.000077057 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "JKA PANEL 13" TO -L- STATION 10+20.000 IS S40°03'09.54"W 6729.835 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NGVD 29

NOTES

1. THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 83/95 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAYBE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.

2. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

   THE FILES TO BE FOUND ARE AS FOLLOWS:

   R2241A_LS_GPSCALIB_050112.HTML
   R2241A_LS_WGS84_050112.TXT
   R2241A_LS_LOCAL_050112.TXT
   R2241A_LS_CONTROL_070420.TXT

   THE WGS84 AND LOCAL FILES ARE COMMA DELIMITED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

4/2/20|| r:\roadway\proj\r-2241a_ls_id_070420.dgn

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
R-2241-A	1 E
Location and Surveys	

SURVEY CONTROL SHEET R-2241A

CONTROL DATA

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
101	R2241-A BL-1	295027.2218	611912.4296	185.659	OUTSIDE PROJECT LIMITS	
102	R2241-A BL-2	295060.2648	612093.3620	184.627	11+34.439	13.809 RT
103	R2241-A BL-3	295089.5978	612243.8971	178.950	12+87.786	11.399 RT
104	R2241-A BL-4	295122.8096	612405.2369	178.646	14+52.452	7.869 RT
105	R2241-A BL-5	295151.3298	612557.2856	185.032	16+07.068	5.711 RT
106	R2241-A BL-6	295173.4547	612705.0044	186.706	17+56.796	6.672 RT
107	R2241-A BL-7	295202.9046	612942.2921	177.798	19+93.610	17.694 RT
108	R2241-A BL-8	295296.3316	613171.0973	186.698	22+39.613	1.103 LT
109	R2241-A BL-9	295337.4862	613326.6968	194.993	24+00.326	7.632 RT
110	R2241-A BL-10	295431.2322	613494.9323	197.394	25+93.857	17.433 LT
111	R2241-A BL-11	295510.5525	613604.6543	206.555	27+33.424	11.798 LT
112	R2241-A BL-12	295565.6544	613654.8884	207.382	28+07.991	13.861 LT
113	R2241-A BL-13	295714.4582	613777.7756	209.765	30+01.328	20.927 LT
114	R2241-A BL-14	295784.4188	613890.0341	212.558	31+27.775	16.681 RT
115	R2241-A BL-15	295826.6986	613949.7535	207.560	31+95.595	38.398 RT
116	R2241-A BL-16	295943.9798	614001.0048	203.610	33+19.061	21.592 RT
117	R2241-A BL-17	296049.8994	614055.6388	199.795	34+36.935	20.659 RT
118	R2241-A BL-18	296139.7099	614108.7771	194.969	35+41.845	25.947 RT
119	R2241-A BL-19	296258.6454	614177.4699	200.579	36+79.061	31.951 RT
120	R2241-A BL-20	296383.3132	614251.8494	200.824	38+23.779	39.584 RT
121	R2241-A BL-21	296469.8177	614303.6803	206.967	39+24.792	45.556 RT
122	R2241-A BL-22	296544.3318	614345.1867	200.614	40+11.349	45.469 RT
123	R2241-A BL-23	296606.8985	614383.9037	195.141	40+85.389	48.261 RT
124	R2241-A BL-24	296665.4499	614428.2446	202.791	41+54.741	50.263 RT
125	R2241-A BL-25	296929.6667	614524.1180	210.421	43+59.016	48.574 RT
126	R2241-A BL-26	296976.8966	614605.7687	210.126	45+19.041	43.621 RT
127	R2241-A BL-27	297131.8453	614698.0460	200.189	46+99.296	37.805 RT
128	R2241-A BL-28	297230.8963	614756.8655	197.788	48+14.431	33.941 RT
129	R2241-A BL-29	297445.5857	614887.1390	189.300	50+65.481	27.910 RT
130	R2241-A BL-30	297574.1622	614959.2263	193.043	52+12.636	19.302 RT
131	R2241-A BL-31	297737.3398	615057.5745	193.063	54+03.090	14.156 RT
132	R2241-A BL-32	297814.8447	615103.9836	195.809	54+93.387	11.456 RT
133	R2241-A BL-33	297971.4728	615197.7027	190.931	56+75.829	5.942 RT
134	R2241-A BL-34	298052.2877	615246.8933	184.939	57+69.977	3.135 RT
135	R2241-A BL-35	298126.9152	615294.8828	192.284	58+58.653	4.022 RT
136	R2241-A BL-36	298217.1965	615357.7820	196.880	59+68.775	11.439 RT
6	GPS R2241A-6	298310.8170	615413.6700	198.065	60+77.173	11.580 RT
137	R2241-A BL-37	298382.9643	615445.3117	198.639	61+55.356	1.888 RT
138	R2241-A BL-38	298431.8083	615478.7966	188.296	62+14.453	5.694 RT
139	R2241-A BL-39	298516.9128	615524.3892	182.787	63+10.984	1.367 RT
140	R2241-A BL-40	298619.8961	615584.1951	175.319	64+29.300	0.525 RT
141	R2241-A BL-41	298749.8958	615666.2124	169.468	65+82.096	5.060 RT
142	R2241-A BL-42	298830.7248	615709.9227	168.953	66+75.458	0.381 RT
143	R2241-A BL-43	299011.8942	615805.8989	166.797	68+79.820	10.446 LT
144	R2241-A BL-44	299288.0772	615975.5485	173.494	72+04.322	5.158 LT
145	R2241-A BL-45	299531.6992	616122.5571	171.855	74+88.857	3.368 LT
146	R2241-A BL-46	299706.4575	616225.6506	170.304	76+91.757	4.113 LT
172	R2241-A BY17-2	299830.4890	616270.7940	171.212	78+21.433	28.727 LT
4000	BL-4 (R2241B)	299948.0810	616353.6110	171.738	79+64.835	17.672 LT
182	R2241-A BY18-2	300090.6100	616438.5380	171.652	81+30.748	17.552 LT
3000	BL-3 (R2241B)	300321.5770	616576.1270	170.010	83+99.591	17.388 LT
191	R2241-A BY19-1	300529.0970	616697.4810	170.502	86+39.983	19.189 LT

BY1

POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
208	R2241-A BY1-1	295349.0473	612195.7253	175.970	11+00.444	6.198 LT
201	R2241-A BY1-2	295205.4643	612142.7886	180.755	12+53.507	8.729 LT
					Y2 STATION	OFFSET
102	R2241-A BL-2	295060.2648	612093.3620	184.627	14+06.700	14.376 LT
202	R2241-A BY1-3	294938.3536	612038.9173	189.091	OUTSIDE PROJECT LIMITS	
205	R2241-A BY1-4	294789.9469	611963.8065	194.524	OUTSIDE PROJECT LIMITS	

BY2

POINT	DESC.	NORTH	EAST	ELEVATION	Y3 STATION	OFFSET
384	R2241-A BY2-1	295242.4296	612234.5414	178.233	OUTSIDE PROJECT LIMITS	
380	R2241-A BY2-2	295100.4855	612207.7279	181.143	10+96.447	2.827 RT
385	R2241-A BY2-3	294946.9319	612160.2306	183.026	OUTSIDE PROJECT LIMITS	

BY3

POINT	DESC.	NORTH	EAST	ELEVATION	Y4 STATION	OFFSET
103	R2241-A BL-3	295089.5978	612243.8971	178.950	10+14.165	12.179 RT
381	R2241-A BY3-1	294937.6018	612213.2083	177.858	OUTSIDE PROJECT LIMITS	

BY4

POINT	DESC.	NORTH	EAST	ELEVATION	Y5 STATION	OFFSET
106	R2241-A BL-6	295173.4547	612705.0044	186.706	10+09.726	17.643 LT
388	R2241-A BY4-1	295092.7840	612694.8031	190.797	10+87.721	5.044 RT
391	R2241-A BY4-2	295014.0935	612706.2553	193.170	11+67.241	4.986 RT

BY5

POINT	DESC.	NORTH	EAST	ELEVATION	Y6 STATION	OFFSET
395	R2241-A BY5-1	295340.9703	612721.0415	188.804	10+01.811	3.400 LT
393	R2241-A BY5-2	295262.0301	612748.2722	189.144	10+85.088	4.053 LT
389	R2241-A BY5-3	295191.0252	612766.5154	185.006	11+58.309	3.707 LT
106	R2241-A BL-6	295173.4547	612705.0044	186.706	11+59.850	60.246 RT

BY6

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
313	R2241-A BY6-1	295334.0086	613311.0560	194.399	23+84.372	6.134 RT
109	R2241-A BL-9	295337.4862	613326.6968	194.993	24+00.326	7.632 RT
302	R2241-A BY6-2	295423.8871	613557.5869	200.894	26+42.895	22.971 RT
304	R2241-A BY6-3	295468.6278	613691.7541	206.795	27+62.458	80.140 RT
					Y8 STATION	OFFSET
306	R2241-A BY6-4	295517.0847	613826.2920	206.583	15+55.389	12.441 RT
308	R2241-A BY6-5	295542.5770	613929.3724	208.864	16+60.694	4.978 RT
311	R2241-A BY6-6	295568.0034	614112.4937	210.894	OUTSIDE PROJECT LIMITS	

BY7

POINT	DESC.	NORTH	EAST	ELEVATION	Y9 STATION	OFFSET
327	R2241-A BY7-1	296277.3170	613824.7521	211.189	OUTSIDE PROJECT LIMITS	
325	R2241-A BY7-2	296164.7030	613876.7607	211.732	16+79.532	4.087 RT
323	R2241-A BY7-3	296014.9294	613921.9036	209.912	15+23.635	5.154 RT
316	R2241-A BY7-4	295898.9426	613910.8106	212.052	14+03.779	17.788 RT
					L STATION	OFFSET
114	R2241-A BL-14	295784.4188	613890.0341	212.558	31+27.775	16.681 RT
					Y11 STATION	OFFSET
4	R2241A 4	295714.6340	613898.9898	213.828	OUTSIDE PROJECT LIMITS	
319	R2241-A BY7-5	295629.4373	613868.8619	212.015	10+09.237	4.455 LT
					Y10 STATION	OFFSET
306	R2241-A BY6-4	295517.0847	613826.2920	206.583	10+12.478	0.490 LT

BY8

POINT	DESC.	NORTH	EAST	ELEVATION	Y10 STATION	OFFSET
306	R2241-A BY6-4	295517.0847	613826.2920	206.583	10+12.478	0.490 LT
309	R2241-A BY8-1	295396.2589	613828.1209	202.121	OUTSIDE PROJECT LIMITS	

BY9

POINT	DESC.	NORTH	EAST	ELEVATION	Y7 STATION	OFFSET
334	R2241-A BY9-1	295715.7226	613368.4024	197.893	10+26.998	4.059 RT
332	R2241-A BY9-2	295720.0852	613500.9663	202.302	11+67.982	0.375 RT
					Y9 STATION	OFFSET
3	R2241A 3	295711.2810	613622.5380	208.356	10+50.035	2.823 RT
					L STATION	OFFSET
113	R2241-A BL-13	295714.4582	613777.7756	209.765	30+01.328	20.927 LT

BY10

POINT	DESC.	NORTH	EAST	ELEVATION	Y12 STATION	OFFSET
345	R2241-A BY10-1	297315.1979	614450.9719	206.922	OUTSIDE PROJECT LIMITS	
337	R2241-A BY10-2	297244.3135	614575.6465	207.632	OUTSIDE PROJECT LIMITS	
					Y13 STATION	OFFSET
127	R2241-A BL-27	297131.8453	614698.0460	200.189	11+63.317	4.345 LT
338	R2241-A BY10-3	297038.2923	614799.5555	201.965	13+01.362	4.168 LT
340	R2241-A BY10-4	296950.3055	614896.6015	205.799	OUTSIDE PROJECT LIMITS	

BY11

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
343	R2241-A BY11-1	297091.4500	614970.8134	204.011	48+12.336	289.312 RT
340	R2241-A BY10-4	296950.3055	614896.6015	205.799	46+53.451	302.907 RT
342	R2241-A BY11-2	296817.2632	614831.8933	209.966	45+06.514	320.138 RT

BY12

POINT	DESC.	NORTH	EAST	ELEVATION	Y14 STATION	OFFSET
356	R2241-A BY12-1	298500.3103	615153.5071	180.777	OUTSIDE PROJECT LIMITS	
348	R2241-A BY12-2	298406.7418	615287.9504	184.218	OUTSIDE PROJECT LIMITS	
					Y15 STATION	OFFSET
6	R2241A 6	298310.8170	615413.6700	198.065	11+33.574	5.682 LT
5	R2241A 5	298207.1150	615547.8980	192.326	OUTSIDE PROJECT LIMITS	
351	R2241-A BY12-3	298127.0775	615658.9970	192.600	OUTSIDE PROJECT LIMITS	

BY13

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
354	R2241-A BY13-1	298276.1547	615710.5199	186.132	61+99.150	284.422 RT
351	R2241-A BY12-3	298127.0775	615658.9970	192.600	60+44.688	316.359 RT
353	R2241-A BY13-2	297988.0993	615608.5592	196.946	59+04.193	344.593 RT

BY14

POINT	DESC.	NORTH	EAST	ELEVATION	Y16 STATION	OFFSET
142	R2241-A BL-42	298830.7248	615709.9227	168.953	OUTSIDE PROJECT LIMITS	
361	R2241-A BY14-1	298729.7618	615728.5459	171.624	11+18.134	4.076 RT
363	R2241-A BY14-2	298613.1908	615725.2755	174.903	10+01.518	3.927 RT

BY17

POINT	DESC.	NORTH	EAST	ELEVATION	Y17 STATION	OFFSET
14	R2241-14	299552.9520	615832.4590	174.958	OUTSIDE PROJECT LIMITS	
171	R2241-A BY17-1	299674.5660	616059.4740	173.314	11+88.405	14.957 LT
172	R2241-A BL-172	299830.4890	616270.7940	171.212	12+97.417	215.361 LT

BY18

POINT	DESC.	NORTH	EAST	ELEVATION	Y18 STATION	OFFSET
182	R2241-A BY18-2	300090.610	616438.538	169.107	OUTSIDE PROJECT LIMITS	
181	R2241-A BY18-1	300072.809	616538.617	171.652	10+81.400	4.409RT

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489 ELEVATION - 206.080
N 296961 E 614684
L STATION 45+48 118 RIGHT
SPIKE SET IN A 380MM PINE

410 ELEVATION - 205.102
N 297179 E 614627
L STATION 47+01 47 LEFT
SPIKE SET IN A 355MM PINE

411 ELEVATION - 198.075
N 297591 E 614928
L STATION 52+05 23 LEFT
SPIKE SET IN A 305MM GUM

412 ELEVATION - 197.374
N 298209 E 615489
L STATION 59+08 59 RIGHT
SPIKE SET IN A 355MM TWIN CHERRY

413 ELEVATION - 171.375
N 298765 E 615615
L STATION 65+78 47 LEFT
SPIKE SET IN A 710MM OAK

414 ELEVATION - 178.089
N 298814 E 615753
L STATION 66+83 46 RIGHT
SPIKE SET IN A 480MM OAK

415 ELEVATION - 172.493
N 299473 E 616116
L STATION 74+35 21 RIGHT
SPIKE SET IN A 355MM OAK

416 ELEVATION - 173.944
N 299888 E 616232
L STATION 78+51 92 LEFT
SPIKE SET IN A 810MM OAK

401 ELEVATION - 185.993
N 295822 E 611984
L STATION 9+98
S 61° 36' 27.6" W DIST 59.592
NAIL SET IN POWER POLE

402 ELEVATION - 180.597
N 295121 E 612224
L STATION 12+73 23 LEFT
NAIL SET IN POWER POLE

403 ELEVATION - 187.624
N 295183 E 612647
L STATION 17+00 18 LEFT
NAIL SET IN POWER POLE

404 ELEVATION - 197.581
N 295333 E 613339
L STATION 24+10 16 RIGHT
NAIL SET IN A 380MM PINE

405 ELEVATION - 204.997
N 295495 E 613987
L STATION 28+58 148 RIGHT
NAIL SET IN A 430MM GUM

406 ELEVATION - 214.894
N 295706 E 613899
L STATION 30+76 75 RIGHT
NAIL SET IN A 455MM PINE

407 ELEVATION - 207.666
N 295884 E 613983
L STATION 31+96 79 RIGHT
NAIL SET IN A 380MM PINE

408 ELEVATION - 284.273
N 296423 E 614232
L STATION 38+58 4 RIGHT
SPIKE SET IN A 510MM OAK

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "JKA PANEL 13" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 300205.115(m) EASTING: 616308.868(m) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.000077057 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "JKA PANEL 13" TO -L- STATION 10+20.000 IS S40°03'09.54"W 6,729.835 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NGVD 29

NOTES

1. THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 83/95 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAYBE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.

2. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

   THE FILES TO BE FOUND ARE AS FOLLOWS:

   R2241A_LS_GPSCALIB_050112.HTML
   R2241A_LS_WGS84_050112.TXT
   R2241A_LS_LOCAL_050112.TXT
   R2241A_LS_CONTROL_070420.TXT

   THE WGS84 AND LOCAL FILES ARE COMMA DELIMITED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

11/2/20ll
i:\roadway\proj\r2241a_ls_e_070420.dgn

RALPH WHITEHEAD ASSOCIATES
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P.O. BOX 34624
CHARLOTTE, NORTH CAROLINA 28234

REVISIONS

METRIC	PROJECT REFERENCE NO. R-2241A / SHEET NO. 1-F
NOT TO SCALE	R /W SHEET NO.
CONST.REV.	ROADWAY DESIGN ENGINEER / PAVEMENT DESIGN ENGINEER
R /W REV.	PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION

CENTERLINE COORDINATE LIST

Disclaimer: This coordinate list is provided for the convenience of interested contractors and is intended for use during the project bidding process only. Coordinates are localized to this particular project and any conversion to state grid coordinates or other formats will be the responsibility of the recipient. While every effort has been made to provide up-to-date, accurateinformation, NCDOT makes no express guarantee as to the validity or potential for revision of this information prior to project letting.

Point #	Chain	Station	Northing(Y)	Easting(X)
1	L	10+00.000	295050.2234	611958.5896
2	L	10+40.000	295057.2558	611997.9666
3	L	10+80.000	295064.2882	612037.3436
4	L	11+20.000	295071.3205	612076.7205
5	L	11+60.000	295078.3529	612116.0975
6	L	12+00.000	295085.3853	612155.4745
7	L	12+40.000	295092.4177	612194.8514
8	L	12+80.000	295099.4501	612234.2284
9	L	13+20.000	295106.4825	612273.6054
10	L	13+60.000	295113.5149	612312.9823
11	L	14+00.000	295120.5472	612352.3593
12	L	14+40.000	295127.5796	612391.7363
13	L	14+80.000	295134.6120	612431.1132
14	L	15+20.000	295141.6444	612470.4902
15	L	15+60.000	295148.6768	612509.8672
16	L	16+00.000	295155.7092	612549.2441
17	L	16+40.000	295162.7406	612588.6213
18	L	16+80.000	295169.3406	612628.0723
19	L	17+20.000	295175.1503	612667.6475
20	L	17+60.000	295180.4945	612707.2889
21	L	18+00.000	295185.8353	612746.9307
22	L	18+40.000	295191.1761	612786.5726
23	L	18+80.000	295196.5324	612826.2123
24	L	19+20.000	295202.7584	612865.7212
25	L	19+60.000	295211.1254	612904.8307
26	L	20+00.000	295221.7089	612943.3997
27	L	20+40.000	295233.8435	612981.5141
28	L	20+80.000	295246.1550	613019.5723
29	L	21+20.000	295258.4665	613057.6305
30	L	21+60.000	295270.7780	613095.6887
31	L	22+00.000	295283.0895	613133.7469
32	L	22+40.000	295295.4010	613171.8051
33	L	22+80.000	295307.7125	613209.8633
34	L	23+20.000	295320.0240	613247.9215
35	L	23+60.000	295332.3355	613285.9797
36	L	24+00.000	295344.6470	613324.0379
37	L	24+40.000	295356.9630	613362.0947
38	L	24+80.000	295369.6527	613400.0276
39	L	25+20.000	295383.6998	613437.4754
40	L	25+60.000	295400.0936	613473.9510
41	L	26+00.000	295419.3178	613509.0164
42	L	26+40.000	295441.2827	613542.4333
43	L	26+80.000	295465.8479	613573.9880
44	L	27+20.000	295492.8001	613603.5324
45	L	27+60.000	295521.4545	613631.4367
46	L	28+00.000	295550.9718	613658.4308
47	L	28+40.000	295580.6676	613685.2293
48	L	28+80.000	295610.3636	613712.0275
49	L	29+20.000	295640.0596	613738.8258
50	L	29+60.000	295669.7557	613765.6240
51	L	30+00.000	295699.4517	613792.4223
52	L	30+40.000	295729.1477	613819.2205
53	L	30+80.000	295758.8889	613845.9685
54	L	31+20.000	295789.0835	613872.2016
55	L	31+60.000	295820.2424	613897.2788
56	L	32+00.000	295852.4836	613920.9482
57	L	32+40.000	295885.7446	613943.1618
58	L	32+80.000	295919.9596	613963.8757
59	L	33+20.000	295954.9795	613983.2010
60	L	33+60.000	295990.4001	614001.7851
61	L	34+00.000	296025.8793	614020.2574
62	L	34+40.000	296061.3584	614038.7298
63	L	34+80.000	296096.8376	614057.2022
64	L	35+20.000	296132.3168	614075.6745
65	L	35+60.000	296167.7960	614094.1469
66	L	36+00.000	296203.2751	614112.6193
67	L	36+40.000	296238.7543	614131.0916
68	L	36+80.000	296274.2335	614149.5640
69	L	37+20.000	296309.7127	614168.0363
70	L	37+60.000	296345.1918	614186.5087
71	L	38+00.000	296380.6703	614204.9825
72	L	38+40.000	296416.0841	614223.5797
73	L	38+80.000	296451.3911	614242.3789
74	L	39+20.000	296486.5901	614261.3796
75	L	39+60.000	296521.6799	614280.5811
76	L	40+00.000	296556.6595	614299.9829
77	L	40+40.000	296591.5276	614319.5842
78	L	40+80.000	296626.2831	614339.3844
79	L	41+20.000	296660.9250	614359.3829
80	L	41+60.000	296695.4519	614379.5790
81	L	42+00.000	296729.8629	614399.9721
82	L	42+40.000	296764.1569	614420.5615
83	L	42+80.000	296798.3326	614441.3465
84	L	43+20.000	296832.3889	614462.3265
85	L	43+60.000	296866.3249	614483.5007
86	L	44+00.000	296900.1393	614504.8685
87	L	44+40.000	296933.8448	614526.4076
88	L	44+80.000	296967.5334	614547.9734
89	L	45+20.000	297001.2219	614569.5392
90	L	45+60.000	297034.9104	614591.1050
91	L	46+00.000	297068.5989	614612.6708
92	L	46+40.000	297102.2875	614634.2365
93	L	46+80.000	297135.9760	614655.8023
94	L	47+20.000	297169.6645	614677.3681
95	L	47+60.000	297203.3530	614698.9339
96	L	48+00.000	297237.0415	614720.4997
97	L	48+40.000	297270.7301	614742.0655
98	L	48+80.000	297304.4186	614763.6313
99	L	49+20.000	297338.1071	614785.1971
100	L	49+60.000	297371.7956	614806.7629
101	L	50+00.000	297405.4842	614828.3287
102	L	50+40.000	297439.1727	614849.8945
103	L	50+80.000	297472.8612	614871.4602
104	L	51+20.000	297506.5497	614893.0260
105	L	51+60.000	297540.2383	614914.5918
106	L	52+00.000	297573.9268	614936.1576
107	L	52+40.000	297607.6153	614957.7234
108	L	52+80.000	297641.3038	614979.2892
109	L	53+20.000	297674.9924	615000.8550
110	L	53+60.000	297708.6809	615022.4208
111	L	54+00.000	297742.3694	615043.9866
112	L	54+40.000	297776.0579	615065.5524
113	L	54+80.000	297809.7465	615087.1181
114	L	55+20.000	297843.4350	615108.6839
115	L	55+60.000	297877.1235	615130.2497
116	L	56+00.000	297910.8120	615151.8155
117	L	56+40.000	297944.5006	615173.3813
118	L	56+80.000	297978.1891	615194.9471
119	L	57+20.000	298011.8776	615216.5129
120	L	57+60.000	298045.5662	615238.0786
121	L	58+00.000	298079.3201	615259.5418
122	L	58+40.000	298113.1961	615280.8118
123	L	58+80.000	298147.1931	615301.8878
124	L	59+20.000	298181.3100	615322.7693
125	L	59+60.000	298215.5456	615343.4554
126	L	59+99.397	298249.8937	615363.9543
127	L	60+39.397	298284.2709	615384.4046
128	L	60+79.397	298318.6480	615404.8548
129	L	61+19.397	298353.0251	615425.3051
130	L	61+59.397	298387.4022	615445.7554
131	L	61+99.397	298421.7793	615466.2057
132	L	62+39.397	298456.1564	615486.6560
133	L	62+79.397	298490.5335	615507.1063
134	L	63+19.397	298524.9106	615527.5566
135	L	63+59.397	298559.2877	615548.0069
136	L	63+99.397	298593.6649	615568.4571
137	L	64+39.397	298628.0420	615588.9074
138	L	64+79.397	298662.4191	615609.3577
139	L	65+19.397	298696.7962	615629.8080
140	L	65+59.397	298731.1733	615650.2583
141	L	65+99.397	298765.5504	615670.7086
142	L	66+39.397	298799.9275	615691.1589
143	L	66+79.397	298834.3046	615711.6091
144	L	67+19.397	298868.6818	615732.0594
145	L	67+59.397	298903.0589	615752.5097
146	L	67+99.397	298937.4360	615772.9600
147	L	68+39.397	298971.8131	615793.4103
148	L	68+79.397	299006.1902	615813.8606
149	L	69+19.397	299040.5673	615834.3109
150	L	69+59.397	299074.9444	615854.7611
151	L	69+99.397	299109.3215	615875.2114
152	L	70+39.397	299143.6986	615895.6617
153	L	70+79.397	299178.0758	615916.1120
154	L	71+19.397	299212.4529	615936.5623
155	L	71+59.397	299246.8300	615957.0126
156	L	71+99.397	299281.2071	615977.4629
157	L	72+39.397	299315.5842	615997.9131
158	L	72+79.397	299349.9613	616018.3634
159	L	73+19.397	299384.3384	616038.8137
160	L	73+59.397	299418.7155	616059.2640
161	L	73+99.397	299453.0926	616079.7143
162	L	74+39.397	299487.4698	616100.1646
163	L	74+79.397	299521.8469	616120.6149
164	L	75+19.397	299556.2240	616141.0651
165	L	75+59.397	299590.6011	616161.5154
166	L	75+99.397	299624.9782	616181.9657
167	L	76+39.397	299659.3553	616202.4160
168	L	76+79.397	299693.7324	616222.8663
169	L	77+19.397	299728.1095	616243.3166
170	L	77+59.397	299762.4867	616263.7669
171	L	77+99.397	299796.8638	616284.2171
172	L	78+39.397	299831.2409	616304.6674
173	L	78+79.397	299865.6180	616325.1177
174	L	79+19.397	299899.9951	616345.5680
175	L	79+59.397	299934.3722	616366.0183
176	L	79+99.397	299968.7493	616386.4686
177	L	80+39.397	300003.1264	616406.9189
178	L	80+79.397	300037.5035	616427.3691
179	L	81+19.397	300071.8807	616447.8194
180	L	81+59.397	300106.2578	616468.2697
181	L	81+99.397	300140.6349	616488.7200
182	L	82+39.397	300175.0120	616509.1703
183	L	82+79.397	300209.3891	616529.6206
184	L	83+19.397	300243.7662	616550.0709
185	L	83+59.397	300278.1433	616570.5211
186	L	83+99.397	300312.5204	616590.9714
187	L	84+39.397	300346.8976	616611.4217
188	L	84+79.397	300381.2747	616631.8720
189	L	85+19.397	300415.6518	616652.3223
190	L	85+59.397	300450.0289	616672.7726
191	L	85+99.397	300484.4060	616693.2229
192	L	86+39.397	300518.7831	616713.6731
193	L	86+79.397	300553.1602	616734.1234
194	L	86+93.317	300565.1236	616741.2402
195	L	86+93.317	300565.1236	616741.2402

11/2/2011
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dgnuser

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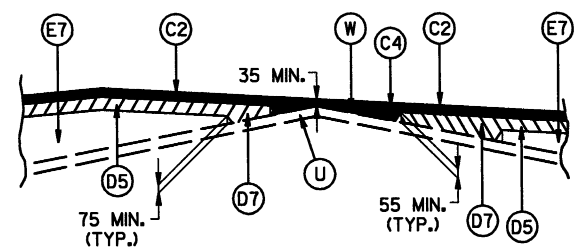
CHARLOTTE, NORTH CAROLINA 28235

REVISIONS

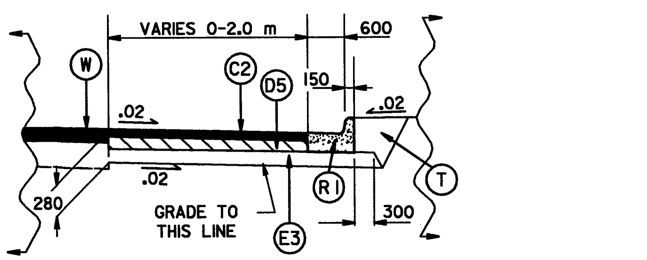
PROJECT REFERENCE NO.	SHEET NO.
R-2241A	2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

METRIC

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



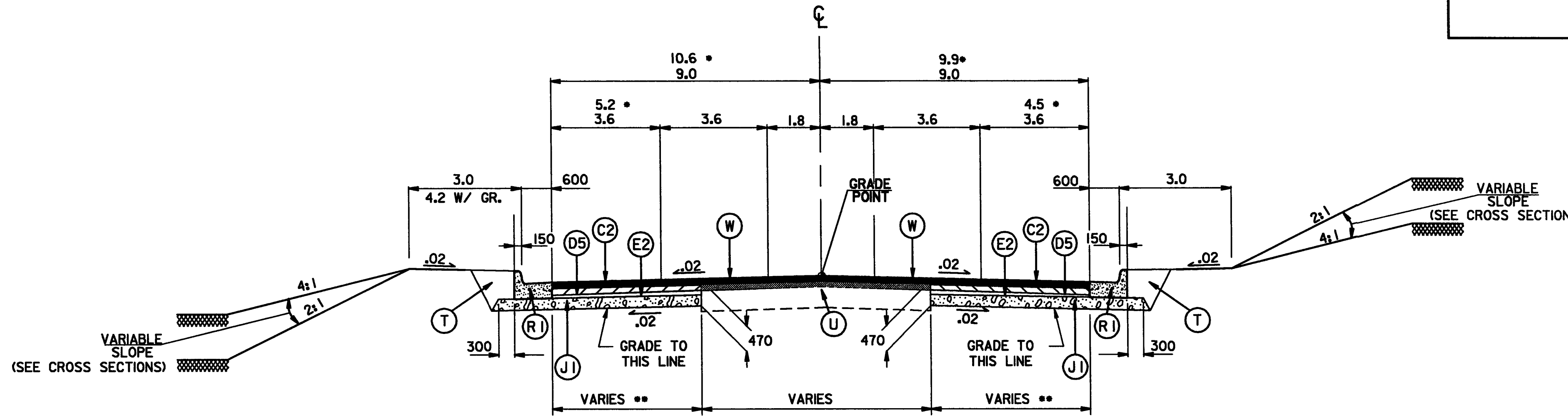
WEDGING DETAIL



NARROW WIDENING DETAIL

LT -L- STA. 10+92.902 TO RT -Y1- STA. 12+15.158
RT -L- STA. 10+90.888 TO RT -Y2- STA. 14+52.500
LT -Y2- STA. 14+60.000 TO RT -L- STA. 12+20.000
RT -L- STA. 17+80.000 TO RT -L- STA. 18+24.000
LT -Y1- STA. 12+05.000 TO LT -Y1- STA. 12+90.000

ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS NOTED OTHERWISE



TYPICAL SECTION NO. 1

-L- STA. 10+20.000 TO 12+20.000
-L- STA. 14+60.000 TO 18+40.000
-L- STA. 21+80.000 TO 24+50.000

* MATCH EXISTING PAVEMENT WIDTH FROM -L- STA 10+20.000 TO 11+00.000

** LOCATION OF EXISTING PAVEMENT VARIES WITHIN THE WIDENING AREAS OF -L-. SEE PLANS AND CROSS SECTIONS FOR LOCATION.

PAVEMENT SCHEDULE			
C1	PROP. APPROX. 80 mm ASPH. CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 96 kg. PER SQ. M. IN EACH OF TWO LAYERS.	E3	PROP. APPROX. 100 mm ASPH. CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 245 kg PER SQ. M.
C2	PROP. APPROX. 80 mm ASPH. CONC. SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 96 kg. PER SQ. M. IN EACH OF TWO LAYERS.	E4	PROP. APPROX. 110 mm ASPH. CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 270 kg PER SQ. M.
C3	PROP. VAR. DEPTH ASPH. CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 2.4 kg. PER SQ. M. PER 1 mm DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 40 mm OR GREATER THAN 50 mm DEPTH.	E5	PROP. APPROX. 130 mm ASPH. CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 319 kg PER SQ. M.
C4	PROP. VAR. DEPTH ASPH. CONC. SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 2.4 kg. PER SQ. M. PER 1 mm DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 40 mm OR GREATER THAN 50 mm DEPTH.	E6	PROP. APPROX. 150 mm ASPH. CONC. BASE COURSE TYPE B25.0B AT AN AVERAGE RATE OF 368 kg PER SQ. M.
D2	PROP. APPROX. 70 mm ASPH. CONC. INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 172 kg. PER SQ. M.	E7	PROP. VAR. DEPTH ASPH. CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 2.45 kg. PER SQ. M. PER 1 mm DEPTH. TO BE PLACED IN LAYERS NOT GREATER THAN 140 mm DEPTH OR LESS THAN 75 mm DEPTH.
D4	PROP. APPROX. 100 mm ASPH. CONC. INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 245 kg. PER SQ. M.	J1	PROP. 200 mm AGGREGATE BASE COURSE.
D5	PROP. APPROX. 100 mm ASPH. CONC. INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 245 kg. PER SQ. M.	J2	PROP. 250 mm AGGREGATE BASE COURSE.
D6	PROP. VAR. DEPTH ASPH. CONC. INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 2.45 kg. PER SQ. M. PER 1 mm DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 55 mm OR GREATER THAN 110 mm DEPTH.	R1	750 CONCRETE CURB AND GUTTER.
D7	PROP. VAR. DEPTH ASPH. CONC. INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 2.45 kg. PER SQ. M. PER 1 mm DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 55 mm OR GREATER THAN 110 mm DEPTH.	T	EARTH MATERIAL.
E1	PROP. APPROX. 80 mm ASPH. CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 196 kg PER SQ. M.	U	EXISTING PAVEMENT.
E2	PROP. APPROX. 90 mm ASPH. CONC. BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 221 kg PER SQ. M.	W	VARIABLE DEPTH BITUMINOUS PAVEMENT. (SEE WEDGING DETAIL THIS SHEET)

11/2/2011
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cgroves

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CHARLOTTE, NORTH CAROLINA 28216

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	2A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

METRIC

NOT TO SCALE

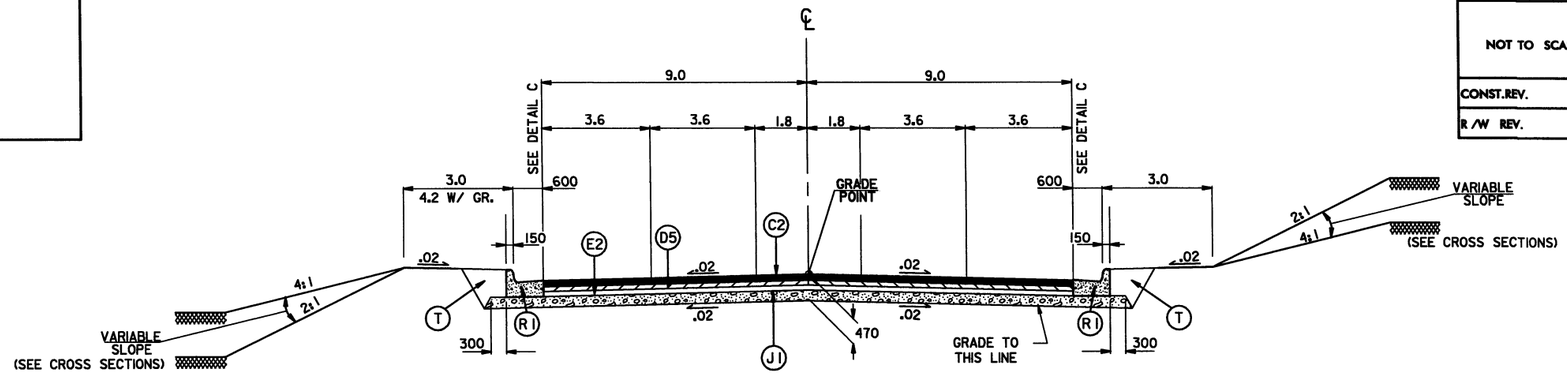
CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PAVEMENT SCHEDULE	
C1	80 mm, TYPE S9.5B
C2	80 mm, TYPE S9.5C
D2	70 mm , TYPE 119.0B
D5	100 mm , TYPE 119.0C
E2	90 mm , TYPE B25.0C
J1	200 mm ABC
J2	250 mm ABC
R1	750 mm C & G
T	EARTH MATERIAL.

ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS NOTED OTHERWISE

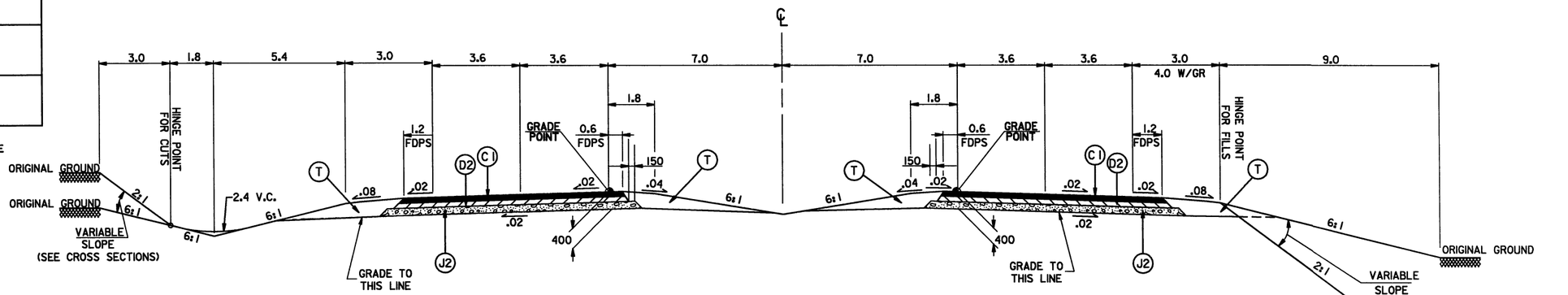


TYPICAL SECTION NO. 2

-L- STA. 12+20.000 TO 14+60.000
-L- STA. 18+40.000 TO 21+80.000
-L- STA. 24+50.000 TO 26+62.078

TRANSITION FROM T.S. NO. 2 TO T.S. NO. 3

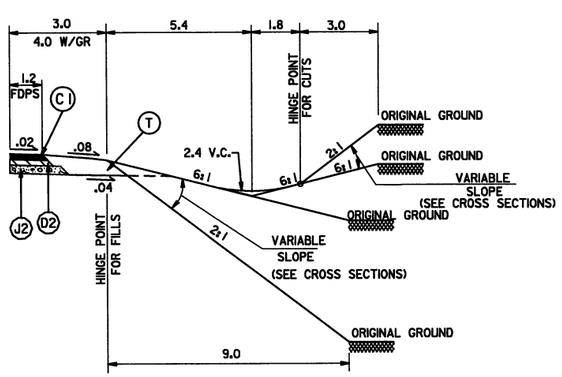
-L- STA. 26+62.078 TO 28+47.500
SEE PLANS FOR PAVEMENT WIDTHS AND CONCRETE ISLAND LOCATIONS



TYPICAL SECTION NO. 3

-L- STA. 28+47.500 TO 59+88.133 LB
-L- STA. 59+87.530 LA TO 67+30.000
-L- STA. 77+40.000 TO 78+60.000 *

* SOUTHBOUND LANE CONSTRUCTION ENDS AT STA 78+00.000
NORTHBOUND LANE CONSTRUCTION ENDS AT STA 76+77.000



TEMPORARY SLOPE DETAIL

USE IN CONJUNCTION WITH T.S. #2
STA. 18+60.000 TO 21+80.000
STA. 24+60.000 TO 26+40.000

RALPH WHITEHEAD ASSOCIATES
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CHARLOTTE, NORTH CAROLINA 28235

REVISIONS

METRIC

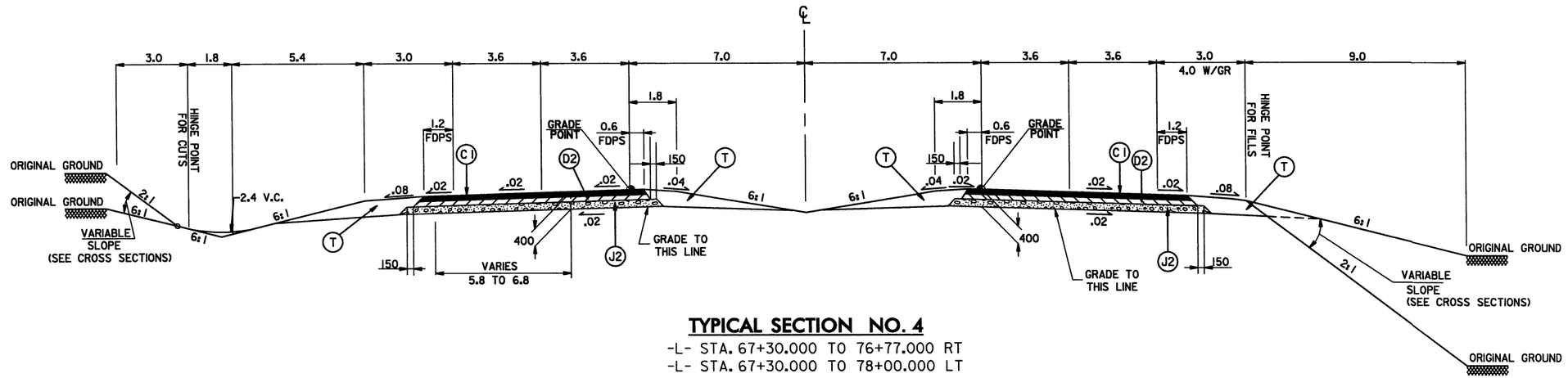
PROJECT REFERENCE NO.	SHEET NO.
R-2241A	2B
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

NOT TO SCALE

CONST.REV.

R /W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



TYPICAL SECTION NO. 4

-L- STA. 67+30.000 TO 76+77.000 RT
-L- STA. 67+30.000 TO 78+00.000 LT

PAVEMENT SCHEDULE	
C1	80 mm, TYPE S9.5B
D2	70 mm , TYPE 119.0B
J2	PROP. 250 mm ABC
T	EARTH MATERIAL.

ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS NOTED OTHERWISE

11/2/2011
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cgroves

RALPH WHITEHEAD ASSOCIATES
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REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	2C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

METRIC

NOT TO SCALE

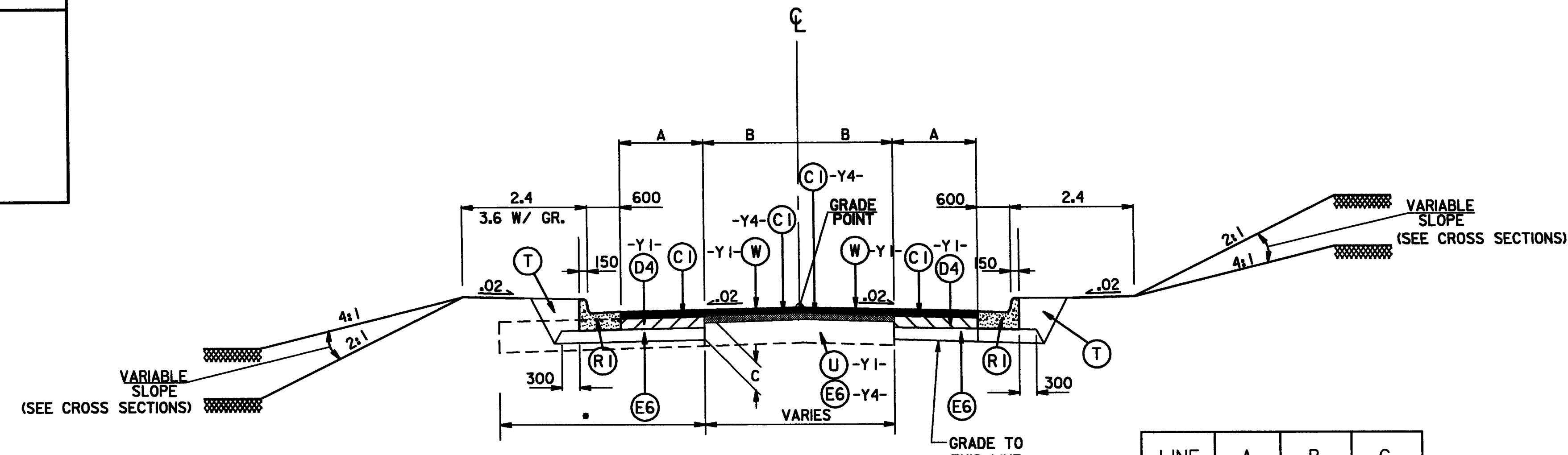
CONST. REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PAVEMENT SCHEDULE	
C1	80 mm, TYPE S9.5B.
C2	80 mm, TYPE S9.5C
C4	VAR. DEPTH, TYPE S9.5A
D4	100 mm, TYPE I19.0B
D5	100 mm , TYPE I19.0C
D7	VAR. DEPTH, TYPE I19.0C
E3	100 mm, TYPE B25.0B
E4	110 mm, TYPE B25.0B
E6	100 mm, TYPE B25.0B
E7	VAR. DEPTH, B25.0B
R1	750 mm C & G
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VAR. DEPTH BITUMINOUS PAVEMENT. (SEE WEDGING DETAIL THIS SHEET)

ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS NOTED OTHERWISE

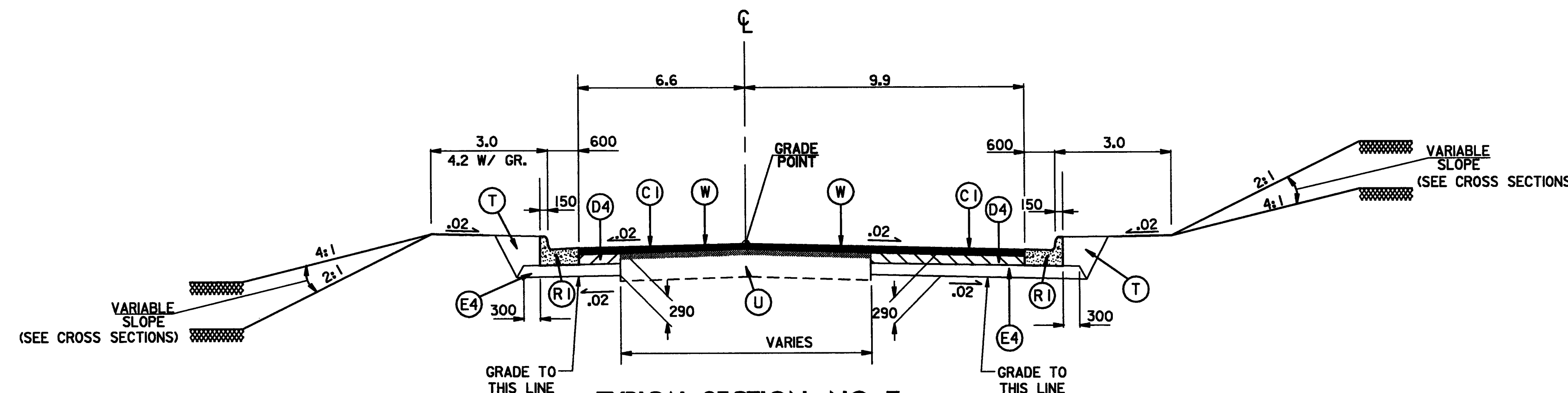


• REMOVE EXISTING PAVEMENT AS REQUIRED TO ALLOW CONSTRUCTION OF THE NEW CURB & GUTTER.

TYPICAL SECTION NO. 6

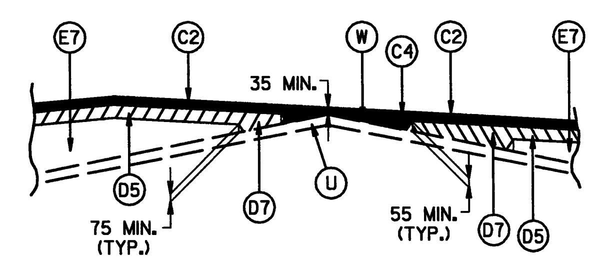
-Y1- STA. 12+15.158 TO 13+53.504
-Y4- STA. 10+30.718 TO 11+20.000

LINE	A (m)	B (m)	C (mm)
-Y1-	3.3	3.3	280
-Y4-	0-3.2	4.0	230

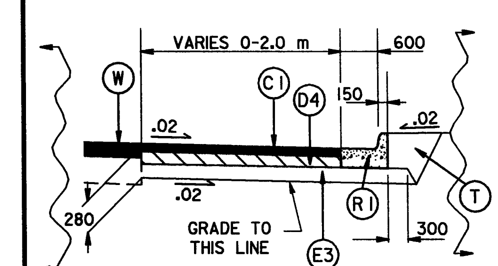


TYPICAL SECTION NO. 7

-Y2- STA. 14+36.273 TO 14+60.000



WEDGING DETAIL



NARROW WIDENING DETAIL

SEE PLANS FOR LOCATION(S) OF NARROW WIDENING

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cgroves

RALPH WHITEHEAD ASSOCIATES
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CHARLOTTE, NORTH CAROLINA 28235

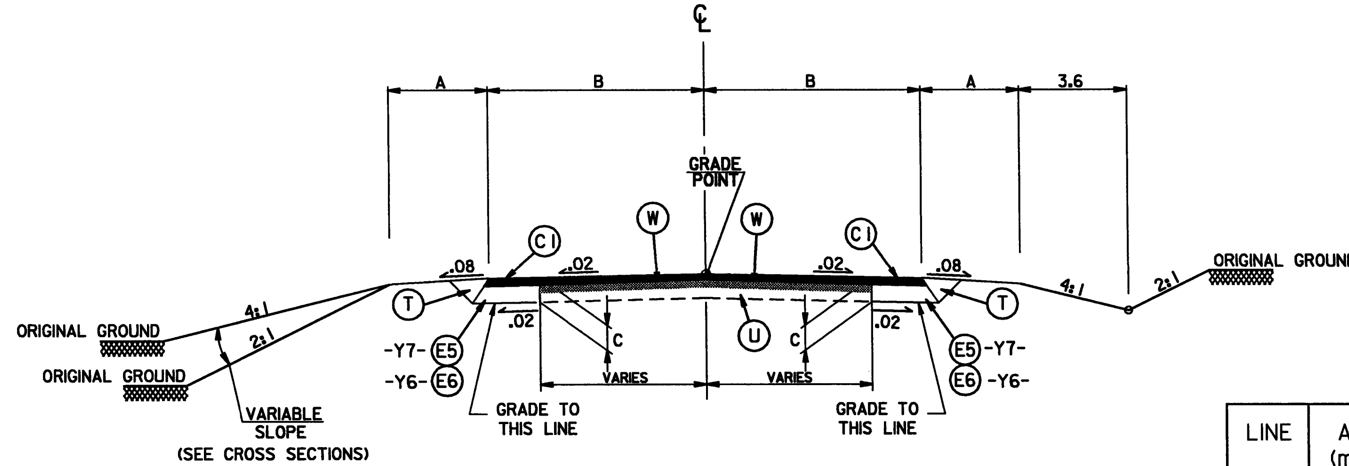
REVISIONS

METRIC	PROJECT REFERENCE NO.	SHEET NO.
	R-2241A	2D
	R/W SHEET NO.	
NOT TO SCALE	ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
CONST.REV.		
R/W REV.		

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PAVEMENT SCHEDULE	
C1	80 mm, TYPE S9.5B
C2	80 mm, TYPE S9.5C
C4	VAR. DEPTH, TYPE S9.5B
D5	100 mm , TYPE I19.0C
D7	VAR. DEPTH, TYPE I19.0C
E5	130 mm, TYPE B25.0B
E6	150 mm, TYPE B25.0B
E7	VAR. DEPTH, B25.0B
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VAR. DEPTH BITUMINOUS PAVEMENT. (SEE WEDGING DETAIL THIS SHEET)

ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS NOTED OTHERWISE

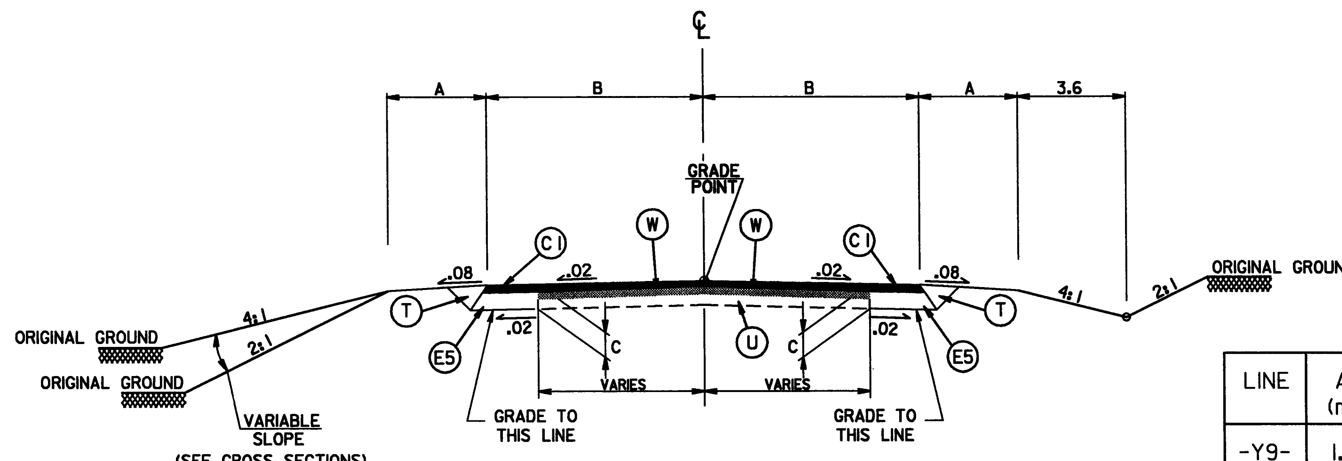


TYPICAL SECTION NO. 8

-Y6- STA. 10+20.000 TO 11+40.646
-Y7- STA. 10+75.000 TO 11+77.350

LINE	A (m)	A (W/GR) (m)	B (m)	C (mm)
-Y6-	1.8	2.8	VARIES 2.8 TO 6.1*	230
-Y7-	1.5	2.5	VARIES 2.8 TO 4.8*	210

* SEE PLAN SHEETS FOR PAVEMENT WIDTHS AND TAPER LOCATIONS



TYPICAL SECTION NO. 9

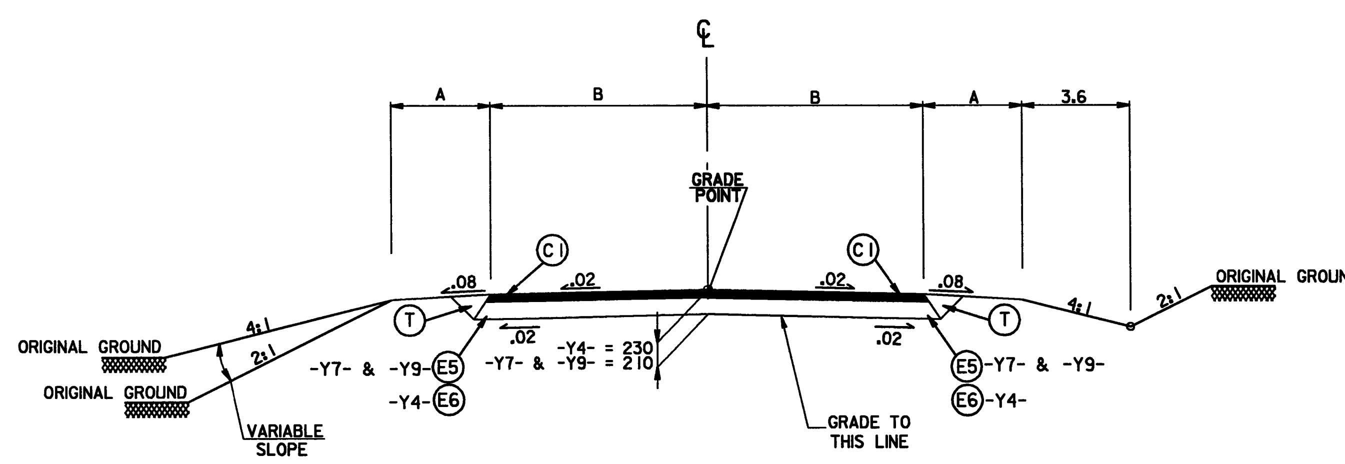
-Y9- STA. 10+64.153 TO 11+62.148
-Y9- STA. 14+34.923 TO 16+75.000
-Y10- STA. 10+20.714 TO 10+76.000
-Y11- STA. 10+40.000 TO 10+93.412

LINE	A (m)	A (W/GR) (m)	B (m)	C (mm)
-Y9-	1.5	2.5	VARIES 2.9 TO 3.3*	210
-Y10-	1.8	2.8	VARIES 3.0 TO 3.3*	210
-Y11-	1.2	2.2	3.0	210

* SEE PLAN SHEETS FOR PAVEMENT WIDTHS AND TAPER LOCATIONS

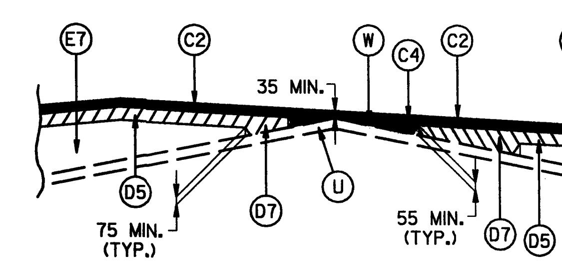
LINE	A (m)	A (W/GR) (m)	B (m)
-Y4-	1.8	2.8	VARIES 3.6 TO 5.4*
-Y7-	1.5	2.5	VARIES 3.3 TO 7.8*
-Y9-	1.5	2.5	VARIES 3.3 TO 4.5*

* SEE PLAN SHEETS FOR PAVEMENT WIDTHS AND TAPER LOCATIONS



TYPICAL SECTION NO. 10

-Y4- STA. 10+20.000 TO 11+00.000
-Y7- STA. 11+77.350 TO 13+66.462
-Y9- STA. 10+26.540 TO 10+64.153
-Y9- STA. 11+62.148 TO 14+34.923



WEDGING DETAIL

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ogroves

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 26424
CHARLOTTE, NORTH CAROLINA 28221

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	2E
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

METRIC

NOT TO SCALE

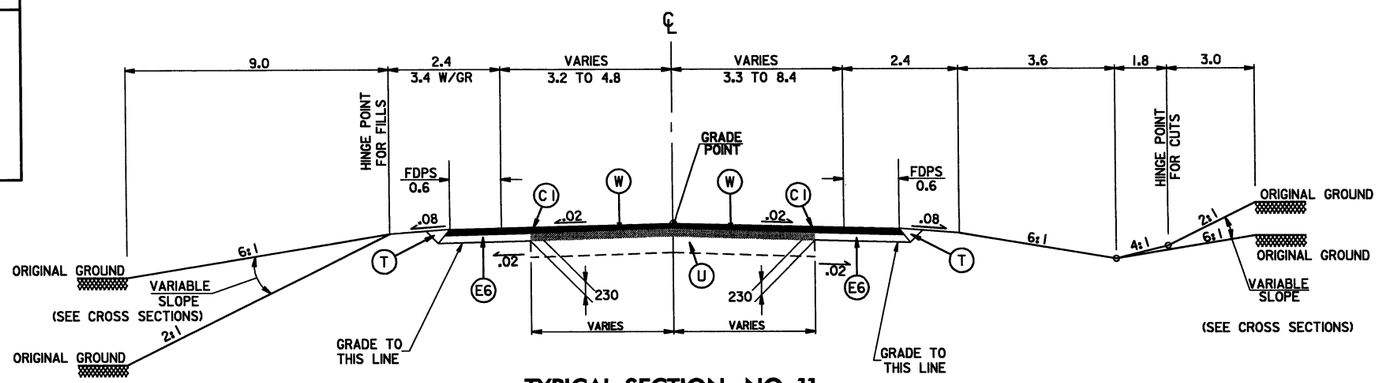
CONST.REV.

R /W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

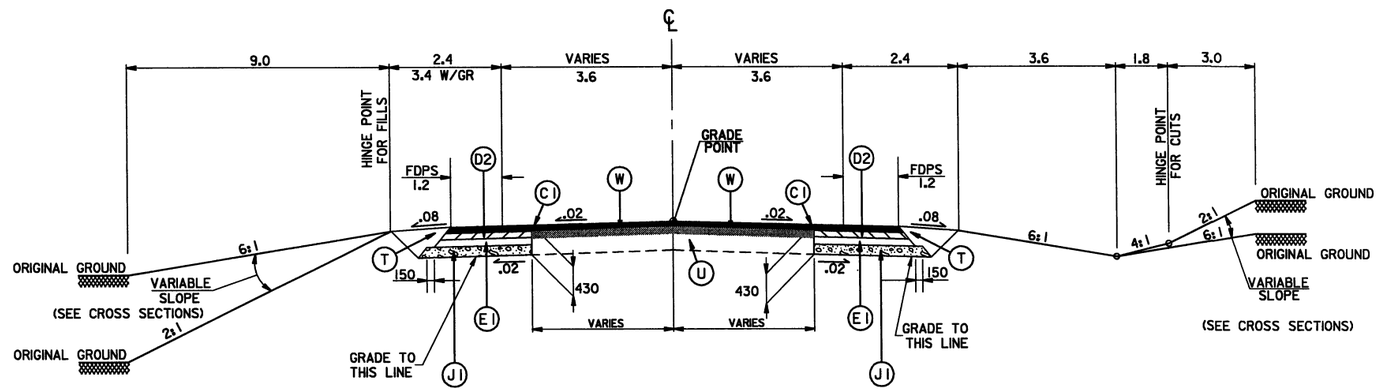
PAVEMENT SCHEDULE	
C1	80 mm, TYPE S9.5B
C2	80 mm, TYPE S9.5C
C4	VAR. DEPTH, TYPE S9.5A
D2	70 mm, TYPE 119.0B
D5	100 mm , TYPE 119.0C
D7	VAR. DEPTH, TYPE 119.0C
E1	80 mm, TYPE B25.0B
E6	150 mm, TYPE B25.0B
E7	VAR. DEPTH, TYPE B25.0B
J1	200mm, ABC
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VAR. DEPTH BITUMINOUS PAVEMENT. (SEE WEDGING DETAIL THIS SHEET)

ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS NOTED OTHERWISE



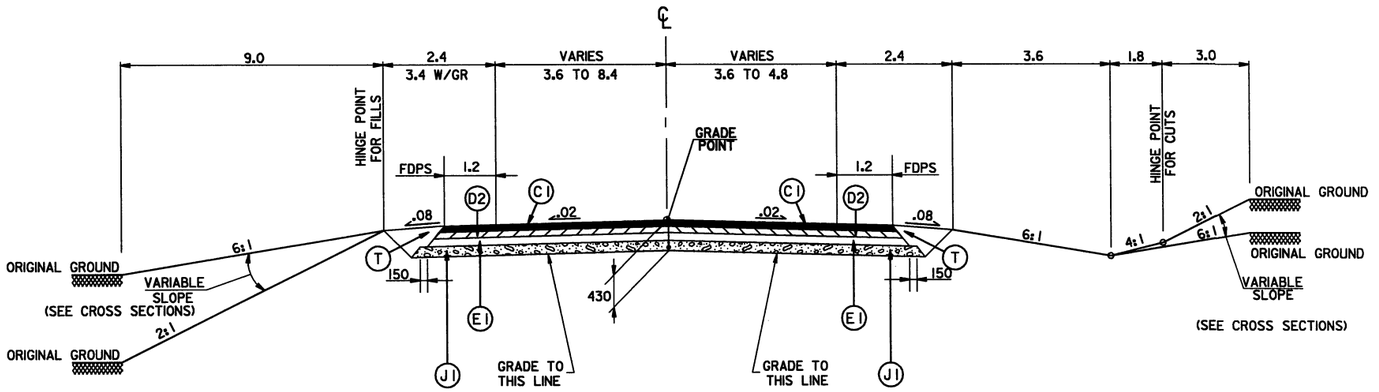
TYPICAL SECTION NO. 11

-Y5- STA. 10+31.546 TO 10+90.000



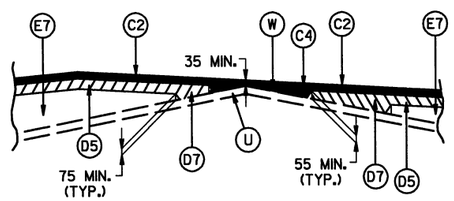
TYPICAL SECTION NO. 12

-Y8- STA. 15+43.660 TO 16+40.000



TYPICAL SECTION NO. 13

-Y8- STA. 14+39.538 TO 15+43.660



WEDGING DETAIL

11/2/2011
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cgroves

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 36434
CHARLOTTE, NORTH CAROLINA 28236

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	2F
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

METRIC

NOT TO SCALE

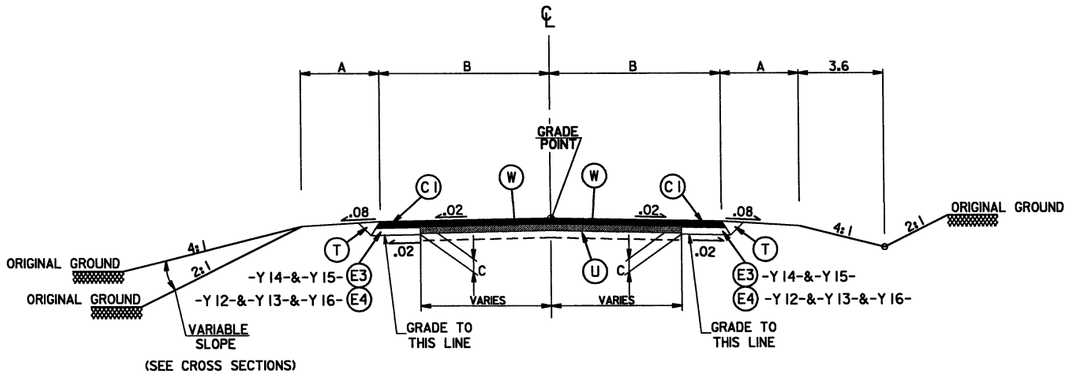
CONST.REV.

R /W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

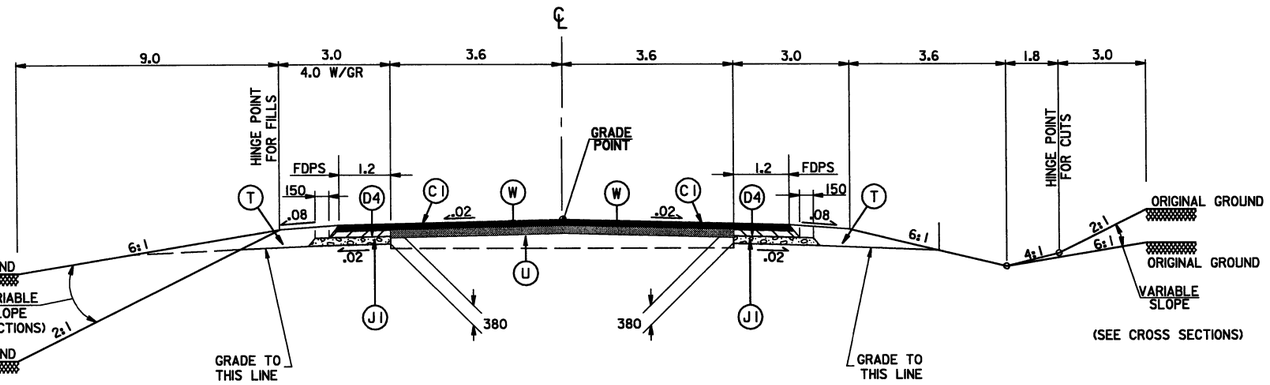
LINE	A (m)	A (W/GR) (m)	B (m)	C (mm)
-Y12-	1.5	2.5	VARIES 3.3 TO 9.0*	190
-Y13-	1.5	2.5	VARIES 3.0 TO 8.4*	190
-Y14-	1.5	2.5	VARIES 3.0 TO 8.4*	180
-Y15-	1.5	2.5	VARIES 3.0 TO 8.4*	180
-Y16-	1.8	2.8	VARIES 3.0 TO 10.7*	190

* SEE PLAN SHEETS FOR PAVEMENT WIDTHS AND TAPER LOCATIONS



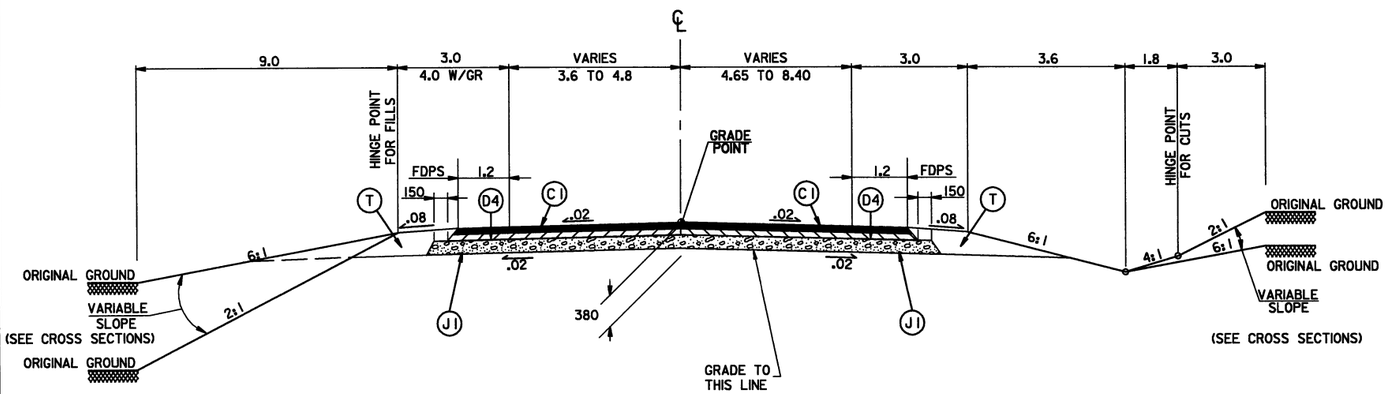
TYPICAL SECTION NO. 14

-Y12- STA. 10+30.000 TO 10+86.933
-Y13- STA. 11+64.504 TO 12+00.000
-Y14- STA. 10+14.000 TO 10+86.318
-Y15- STA. 11+58.842 TO 12+10.000
-Y16- STA. 10+95.511 TO 11+29.722



TYPICAL SECTION NO. 15

-Y17- STA. 10+80.000 TO 11+82.169

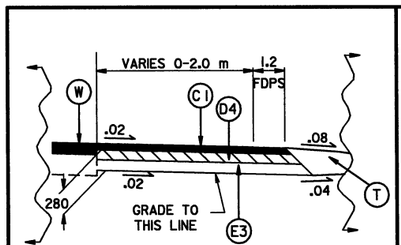


TYPICAL SECTION NO. 16

-Y17- STA. 11+82.169 TO 12+81.569

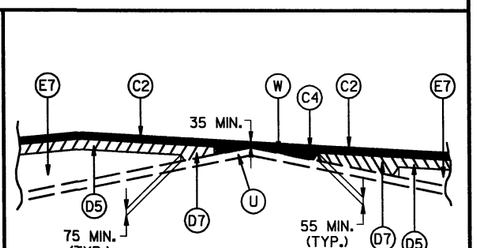
PAVEMENT SCHEDULE	
C1	80 mm, TYPE S9.5B
C2	80 mm, TYPE S9.5C
C4	VAR. DEPTH, TYPE S9.5A
D4	100mm, TYPE 119.0B
D5	100 mm , TYPE 119.0C
D7	VAR. DEPTH, TYPE 119.0C
E3	100 mm, TYPE B25.0B
E4	110 mm, TYPE B25.0B
E7	VAR. DEPTH, TYPE B25.0B
J1	200 mm ABC
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VAR. DEPTH BITUMINOUS PAVEMENT. (SEE WEDGING DETAIL THIS SHEET)

ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS NOTED OTHERWISE



NARROW WIDENING DETAIL

SEE PLANS FOR LOCATION(S) OF NARROW WIDENING



WEDGING DETAIL

11/2/200
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dgrove

RALPH WHITEHEAD ASSOCIATES
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CHARLOTTE, NORTH CAROLINA 28235

REVISIONS

09-17-10 – REVISED -DETI- STATION RANGES, ADDED I METER OF PAVEMENT TO -DETI- TYPICAL, REDUCED SHOULDER WITH GR WIDTH

03-25-11 – ADDED TYPICAL SECTION FOR -DETI- OVER CULVERT

METRIC

NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	2G
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

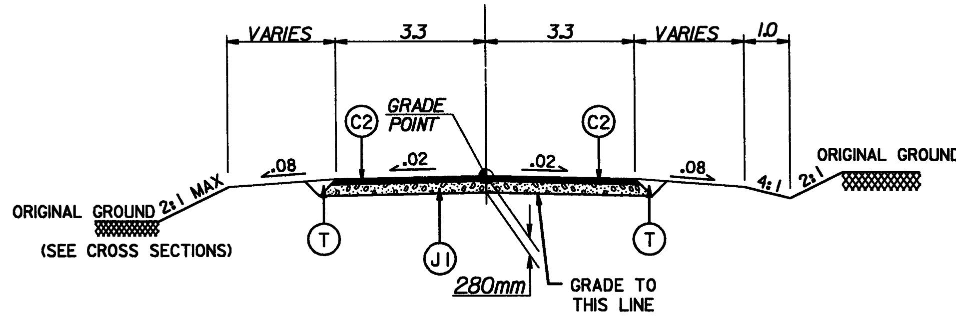
CONST. REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

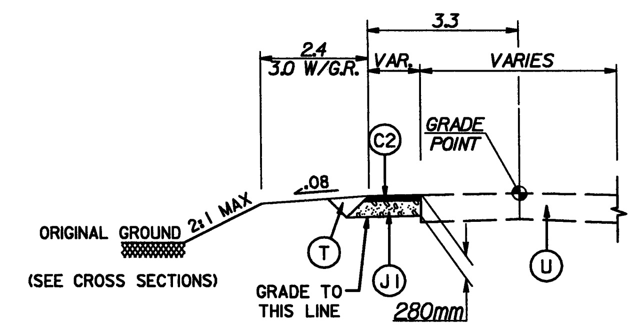
PAVEMENT SCHEDULE	
C1	60 mm, TYPE S9.5A
C2	80 mm, TYPE S9.5C
C4	VAR. DEPTH, TYPE S9.5A
D4	100mm, TYPE 119.0B
D5	100 mm, TYPE 119.0C
D7	VAR. DEPTH, TYPE 119.0C
E3	100 mm, TYPE B25.0B
E7	VAR. DEPTH, TYPE B25.0B
J1	200 mm ABC
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VAR. DEPTH BITUMINOUS PAVEMENT. (SEE WEDGING DETAIL THIS SHEET)

ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS NOTED OTHERWISE



TYPICAL SECTION NO. 17

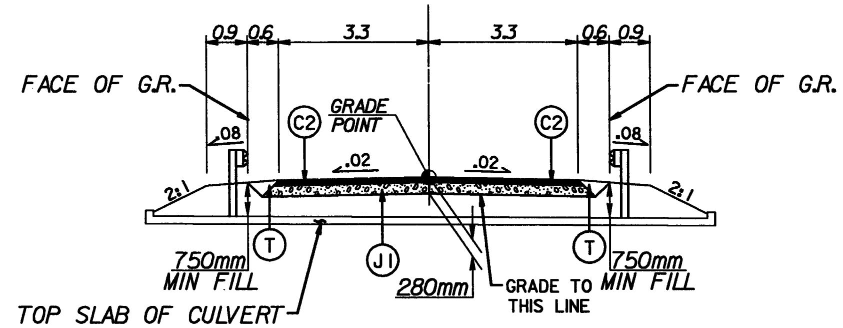
-DETI- Sta. 12+99.745 TO Sta.13+45.520
-DETI- Sta. 13+55.260 TO Sta.14+44.101



NOTE: -DET I- SHOWN, MIRROR FOR -DET2-

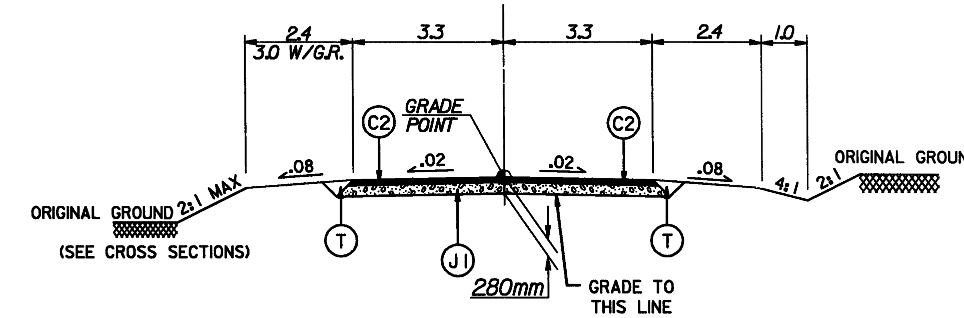
TYPICAL SECTION NO. 19

-DETI- Sta. 12+66.000 TO Sta. 12+99.745
-DETI- Sta. 14+44.101 TO Sta. 15+21.386
-DET2- Sta.10+13.253 TO Sta. 10+57.907
-DET2- Sta. 12+04.291 TO Sta. 13+19.977



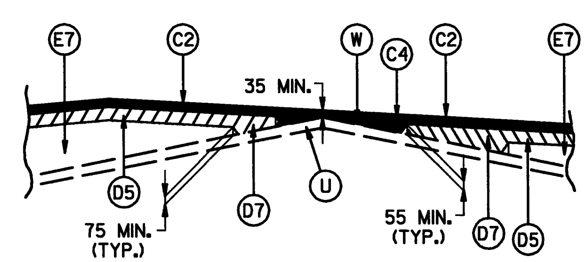
TYPICAL SECTION NO. 18

-DETI- Sta. 13+45.520 TO Sta.13+55.260

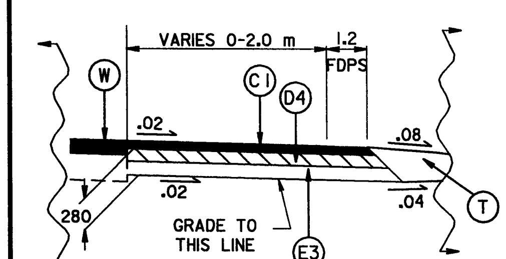


TYPICAL SECTION NO. 20

-DET2- Sta. 10+57.907 TO Sta. 12+04.291



WEDGING DETAIL



NARROW WIDENING DETAIL

SEE PLANS FOR LOCATION(S) OF NARROW WIDENING

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agroves

RALPH WHITEHEAD ASSOCIATES
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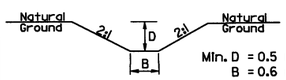
P.O. BOX 36654
CHARLOTTE, NORTH CAROLINA 28236

REVISIONS

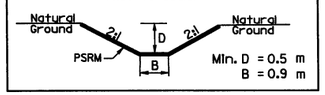
METRIC	PROJECT REFERENCE NO.	SHEET NO.
	R-2241A	2H
	R /W SHEET NO.	
NOT TO SCALE	ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
CONST.REV.	PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
R /W REV.		

DETAIL 1
STANDARD BASE DITCH
(Not to Scale)



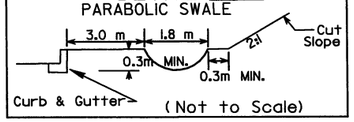
Min. D = 0.5 m
B = 0.6 m

DETAIL 2
STANDARD BASE DITCH
(Not to Scale)



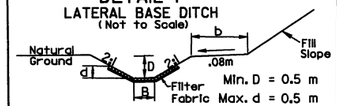
Min. D = 0.5 m
B = 0.9 m

DETAIL 3
PARABOLIC SWALE



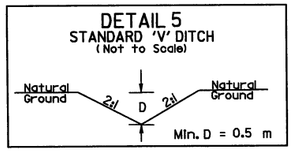
(Not to Scale)

DETAIL 4
LATERAL BASE DITCH
(Not to Scale)



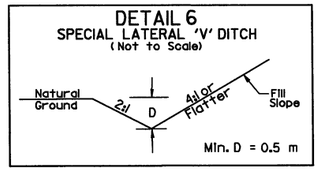
Min. D = 0.5 m
Max. d = 0.5 m
B = 0.9 m
b = 1.5 m
* When B is < 1.8m
Type of Liner = CLASS 'B' RIP RAP

DETAIL 5
STANDARD 'V' DITCH
(Not to Scale)



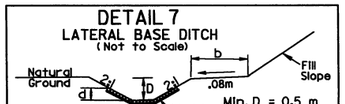
Min. D = 0.5 m

DETAIL 6
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D = 0.5 m

DETAIL 7
LATERAL BASE DITCH
(Not to Scale)

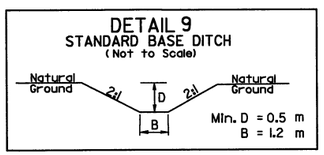


Min. D = 0.5 m
Max. d = 0.5 m
B = 0.6 m
b = 1.5 m
* When B is < 1.8m
Type of Liner = CLASS 'B' RIP RAP

DETAIL 8
TOE PROTECTION
(Not to Scale)

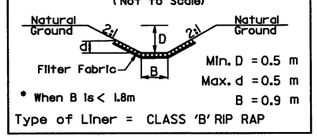
D = 0.5 m
d = 0.6 m
Type of Liner = CLASS 'B' RIP RAP

DETAIL 9
STANDARD BASE DITCH
(Not to Scale)



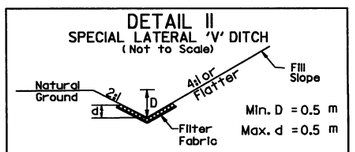
Min. D = 0.5 m
B = 1.2 m

DETAIL 10
STANDARD BASE DITCH
(Not to Scale)



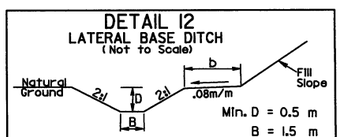
Min. D = 0.5 m
Max. d = 0.5 m
B = 0.9 m
* When B is < 1.8m
Type of Liner = CLASS 'B' RIP RAP

DETAIL 11
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



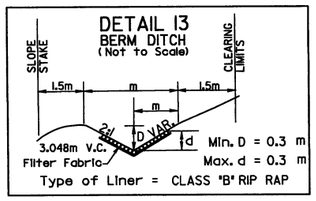
Min. D = 0.5 m
Max. d = 0.5 m
Type of Liner = CLASS 'B' RIP RAP

DETAIL 12
LATERAL BASE DITCH
(Not to Scale)



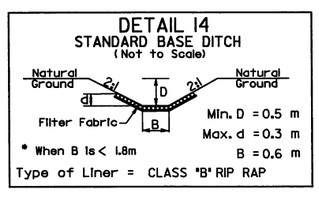
Min. D = 0.5 m
B = 1.5 m
b = 1.2 m

DETAIL 13
BERM DITCH
(Not to Scale)



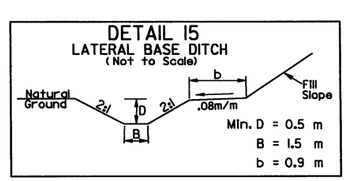
Min. D = 0.3 m
Max. d = 0.3 m
Type of Liner = CLASS 'B' RIP RAP

DETAIL 14
STANDARD BASE DITCH
(Not to Scale)



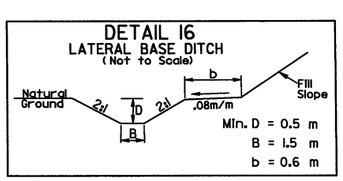
Min. D = 0.5 m
Max. d = 0.3 m
B = 0.6 m
* When B is < 1.8m
Type of Liner = CLASS 'B' RIP RAP

DETAIL 15
LATERAL BASE DITCH
(Not to Scale)



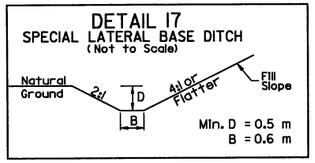
Min. D = 0.5 m
B = 1.5 m
b = 0.9 m

DETAIL 16
LATERAL BASE DITCH
(Not to Scale)



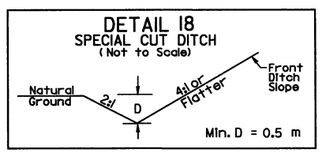
Min. D = 0.5 m
B = 1.5 m
b = 0.6 m

DETAIL 17
SPECIAL LATERAL BASE DITCH
(Not to Scale)



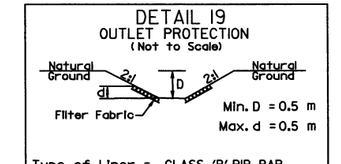
Min. D = 0.5 m
B = 0.6 m

DETAIL 18
SPECIAL CUT DITCH
(Not to Scale)



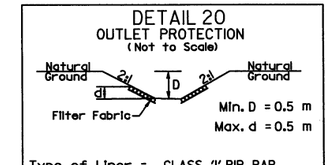
Min. D = 0.5 m

DETAIL 19
OUTLET PROTECTION
(Not to Scale)



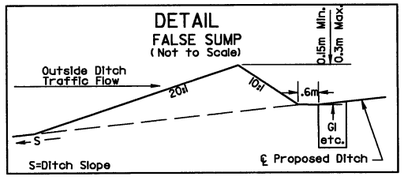
Min. D = 0.5 m
Max. d = 0.5 m
Type of Liner = CLASS 'B' RIP RAP

DETAIL 20
OUTLET PROTECTION
(Not to Scale)

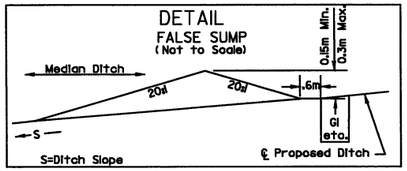


Min. D = 0.5 m
Max. d = 0.5 m
Type of Liner = CLASS 'I' RIP RAP

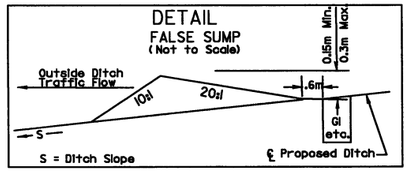
DETAIL
FALSE SUMP
(Not to Scale)



DETAIL
FALSE SUMP
(Not to Scale)

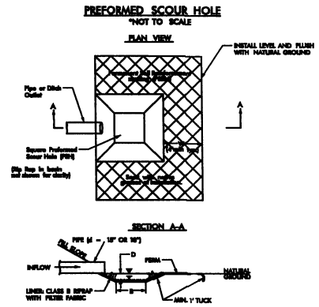


DETAIL
FALSE SUMP
(Not to Scale)



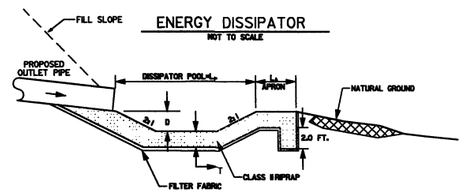
NOTE: SEE CSR FOR RIPRAP DETAIL

PREFORMED SCOUR HOLE
*NOT TO SCALE

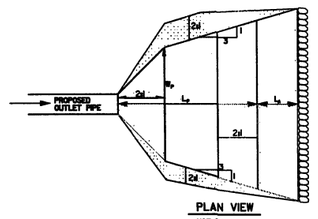


STATION	B M	D M	W_{PSR} M	d M	CLASS I RIP RAP MTONS	DDE (CU M)	FILTER FABRIC (SQ M)
13+80-L-	1.4	.5	1.5	0.15	8.2	11.5	1.2
25+80 -L-	1.4	.5	1.5	0.15	8.2	11.5	1.2
33+60 -L-	1.4	.5	1.5	0.15	8.2	11.5	1.2
35+10 -L-	1.2	.5	1.5	0.15	6.5	10.0	1.0
36+60 -L-	1.4	.5	1.5	0.15	8.2	11.5	1.2
48+30 -L-	1.8	.5	1.5	0.15	11.5	15	1.7
50+26 -L-	1.4	.5	1.5	0.15	8.2	11.5	1.2
50+80 -L-	1.2	.5	1.5	0.15	6.5	10.0	1.0
52+00 -L-	1.2	.5	1.5	0.15	6.5	10.0	1.0
66+60 -L-	1.2	.5	1.5	0.15	6.5	10.0	1.0

ENERGY DISSIPATOR
NOT TO SCALE



PROFILE
NOT TO SCALE



PLAN VIEW
NOT TO SCALE

STATION	L_P M	W_P M	L_A M	T M	D M	CLASS II RIP RAP MTONS	DDE (CU M)	FILTER FABRIC (SQ M)
20+70 -L-	8.0	5.0	1.8	.6	1.0	110	86	75
24+80 -L-	7.0	4.3	1.5	.6	1.0	105	82	65
39+80 -L-	7.0	4.3	2.0	.6	1.0	120	95	85

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cgroves

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

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	21

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

METRIC

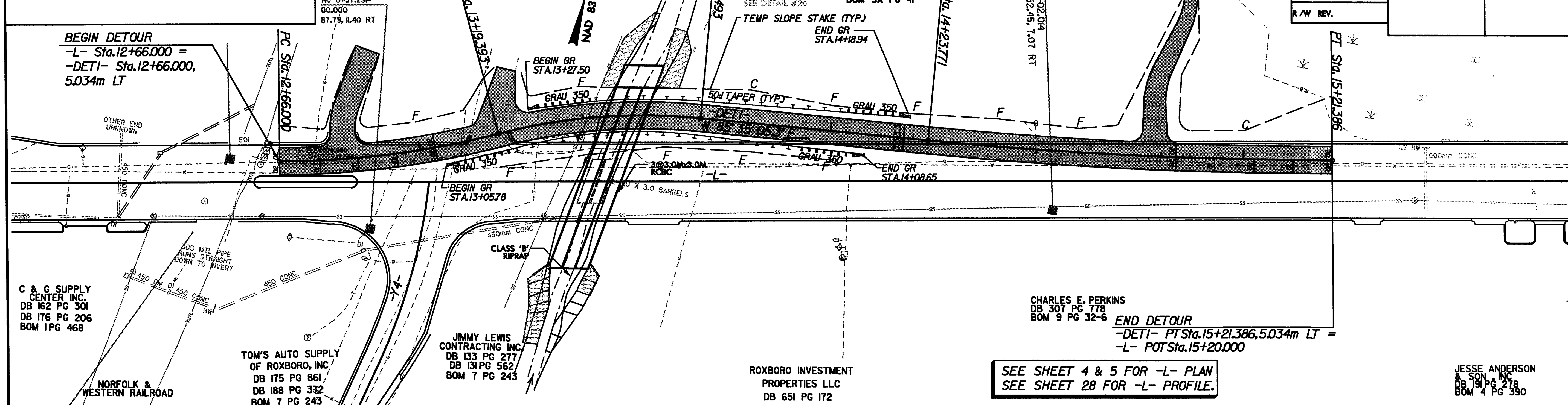
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST. REV.

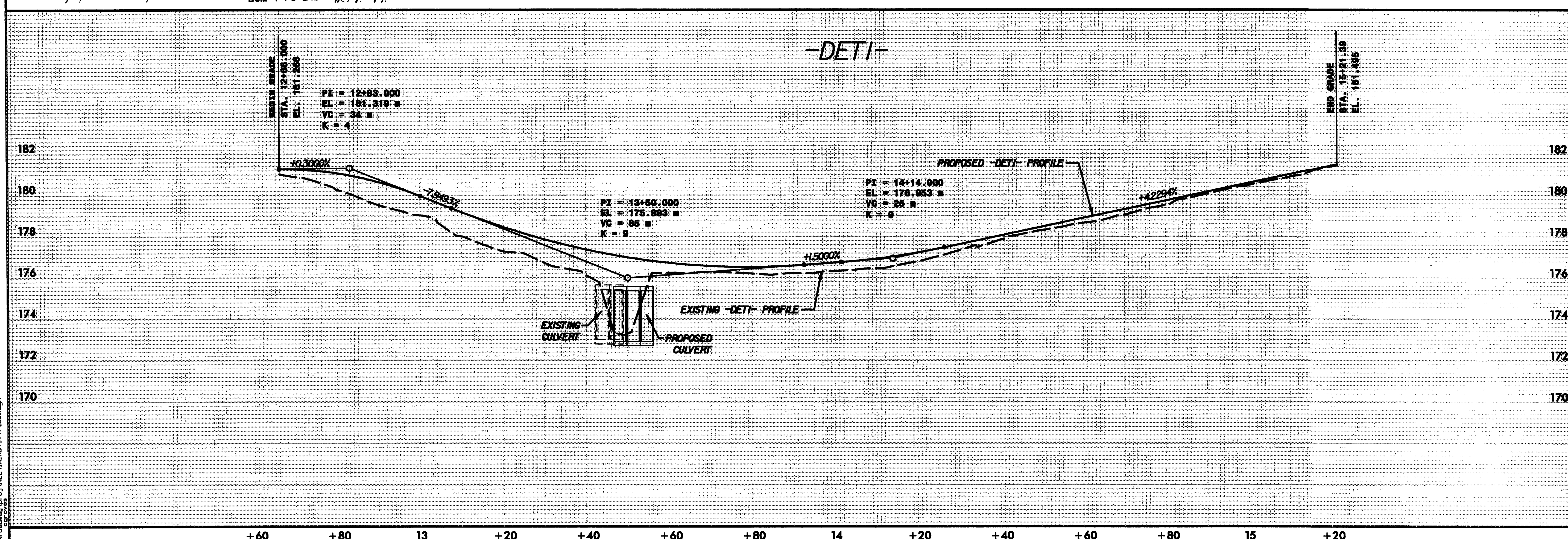
R/W REV.

REVISIONS

09-17-10 - REVISED -DETI- ALIGNMENT AND PROFILE
03-25-11 - REVISED -DETI- DESIGN



-CURVE DETI-1-
PI Sta 12+92.84
Δ = 14° 23' 02.6" (LT)
L = 53.393
T = 26.837
R = 212.678
e = 0.02
Runoff = 9.4 m
-CURVE DETI-2-
PI Sta 13+44.20
Δ = 20° 05' 40.6" (RT)
L = 49.101
T = 24.805
R = 140.001
e = 0.02
Runoff = 9.4 m
-CURVE DETI-3-
PI Sta 14+72.62
Δ = 5° 42' 38.1" (LT)
L = 97.615
T = 48.848
R = 979.398
e = 0.02
Runoff = 9.4 m
J. E. GATES & ROSALIE GATES
DB 178 PG 827
J. E. GATES
DB 155 PG 335
CHARLES E. PERKINS
DB 581 PG 828
BOM 3A PG 41
NAD 83 NC GRID
NC 8+37.291=
00.000
87.79, 11.40 RT
BEGIN DETOUR
-L- Sta.12+66.000 =
-DETI- Sta.12+66.000,
5.034m LT
PC Sta. 12+66.000
PRC Sta. 13+19.393
PT Sta. 13+68.493
PC Sta. 14+23.771
PT Sta. 15+21.386
PINC 10+02.014
-L- 14+52.45, 7.07 RT
BL-4
BEGIN GR
STA.13+27.50
GRAU 350
TEMP SLOPE STAKE (TYP)
END GR
STA.14+18.94
50:1 TAPER (TYP)
-DETI-
N 85° 35' 05.3" E
OTHER END
UNKNOWN
EOI
GRAU 350
BEGIN GR
STA.13+05.78
3@3.0M×3.0M
RCBC
2 @ 4.0 X 3.0 BARRELS
END GR
STA.14+08.65
-L-
450mm CONC
600mm CONC
CLASS 'B'
RIPRAP
-Y4-
200 MTL PIPE
RUNS STRAIGHT
DOWN TO INVERT
450 CONC
C & G SUPPLY
CENTER INC.
DB 162 PG 301
DB 176 PG 206
BOM 1 PG 468
TOM'S AUTO SUPPLY
OF ROXBORO, INC
DB 175 PG 861
DB 188 PG 372
BOM 7 PG 243
NORFOLK &
WESTERN RAILROAD
JIMMY LEWIS
CONTRACTING INC.
DB 133 PG 277
DB 131 PG 562
BOM 7 PG 243
ROXBORO INVESTMENT
PROPERTIES LLC
DB 651 PG 172
CHARLES E. PERKINS
DB 307 PG 778
BOM 9 PG 32-6
END DETOUR
-DETI- PT Sta.15+21.386, 5.034m LT =
-L- POT Sta.15+20.000
SEE SHEET 4 & 5 FOR -L- PLAN
SEE SHEET 28 FOR -L- PROFILE.
JESSE ANDERSON
& SON, INC
DB 191 PG 278
BOM 4 PG 390



-DETI-
BEGIN GRADE
STA. 12+66.000
EL. 181.268
PI = 12+83.000
EL = 181.319 m
VC = 34 m
K = 4
PI = 13+50.000
EL = 175.993 m
VC = 85 m
K = 9
PI = 14+14.000
EL = 176.953 m
VC = 25 m
K = 8
END GRADE
STA. 15+21.39
EL. 181.495
+0.3000%
-7.9493%
+1.5000%
+4.2294%
PROPOSED -DETI- PROFILE
EXISTING -DETI- PROFILE
EXISTING CULVERT
PROPOSED CULVERT
182
180
178
176
174
172
170
+60
+80
13
+20
+40
+60
+80
14
+20
+40
+60
+80
15
+20

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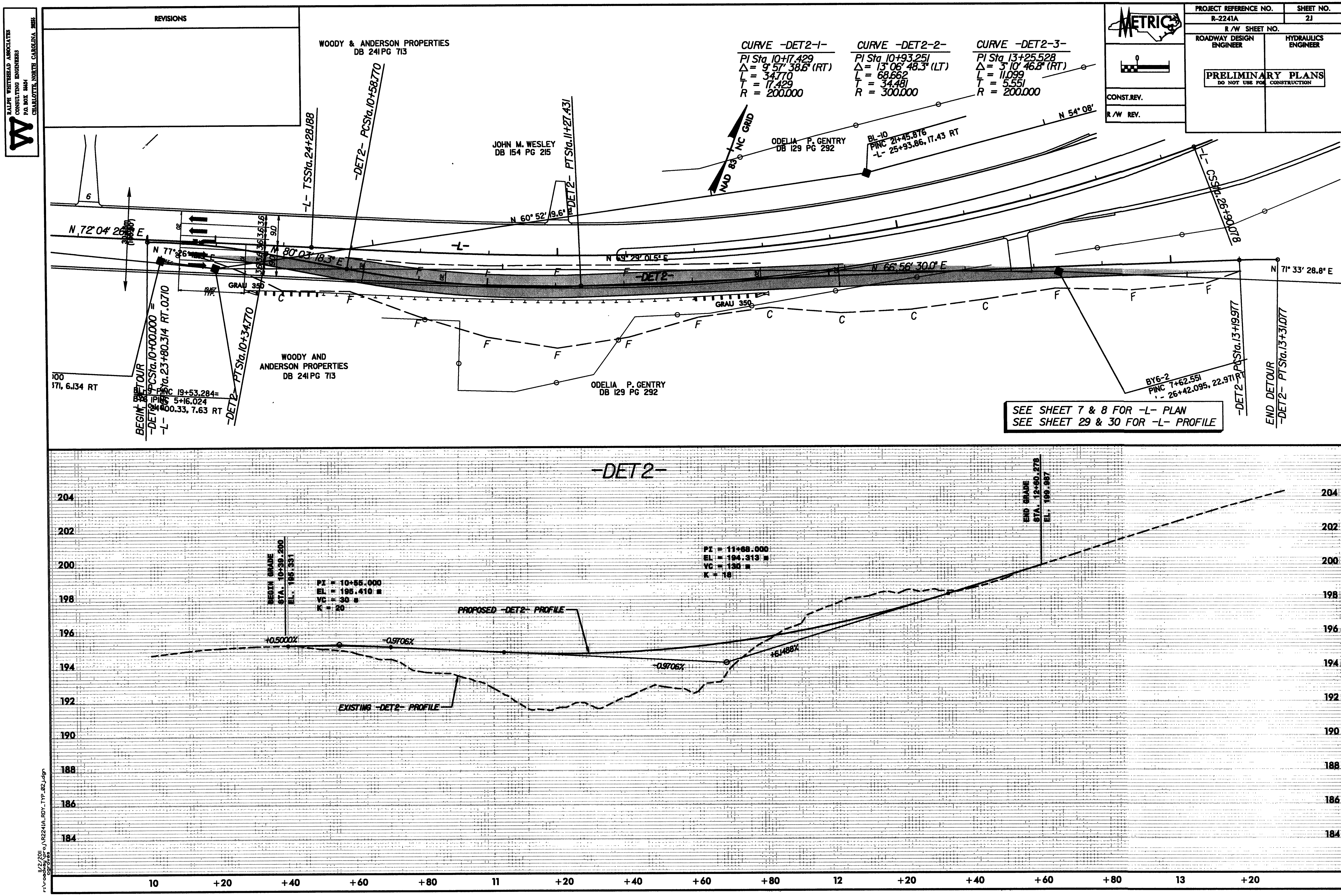

RALPH WHITEHEAD ASSOCIATES
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P.O. BOX 35624
CHARLOTTE, NORTH CAROLINA 28235
REVISIONS
METRIC
PROJECT REFERENCE NO.
SHEET NO.
R-2241A
2J
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
CONST.REV.
R/W REV.
CURVE -DET2-1-
PI Sta 10+17.429
Δ = 9° 57' 38.6" (RT)
L = 34.770
T = 17.429
R = 200.000
CURVE -DET2-2-
PI Sta 10+93.251
Δ = 13° 06' 48.3" (LT)
L = 68.662
T = 34.481
R = 300.000
CURVE -DET2-3-
PI Sta 13+25.528
Δ = 3° 10' 46.8" (RT)
L = 11.099
T = 5.551
R = 200.000
WOODY & ANDERSON PROPERTIES
DB 241 PG 713
JOHN M. WESLEY
DB 154 PG 215
ODELIA P. GENTRY
DB 129 PG 292
NAD 83 NC GRID
BL-10
PINC 21+45.876
-L- 25+93.86, 17.43 RT
N 54° 08'
-L- TSSta.24+28.188
-DET2- PCSta.10+58.770
-DET2- PTSta.11+27.431
-L- CSSta.26+90.078
N 60° 52' 19.6" E
N 72° 04' 26.6" E
N 77° 26'
N 80° 03' 18.3" E
N 69° 29' 01.5" E
N 66° 56' 30.0" E
N 71° 33' 28.8" E
-L-
-DET2-
GRAU 350
WOODY AND ANDERSON PROPERTIES
DB 241 PG 713
ODELIA P. GENTRY
DB 129 PG 292
BEGIN DETOUR
-DET2- PCSta.10+00.000 =
-L- Sta.23+80.314 RT.0.710
-DET2- PTSta.10+34.770
BL-9 PINC 19+53.284=
BY6 IPINC 5+16.024
-L- 24+00.33, 7.63 RT
371, 6.134 RT
BY6-2
PINC 7+62.551
-L- 26+42.095, 22.971 RT
-DET2- PCSta.13+19.977
END DETOUR
-DET2- PTSta.13+31.077
SEE SHEET 7 & 8 FOR -L- PLAN
SEE SHEET 29 & 30 FOR -L- PROFILE
-DET2-
BEGIN GRADE
STA. 10+39.200
EL. 195.331
PI = 10+55.000
EL = 195.410 m
VC = 30 m
K = 20
PI = 11+68.000
EL = 194.313 m
VC = 130 m
K = 18
END GRADE
STA. 12+60.278
EL. 199.987
+0.5000%
-0.9706%
-0.9706%
+6.1488%
PROPOSED -DET2- PROFILE
EXISTING -DET2- PROFILE
204
202
200
198
196
194
192
190
188
186
184
10
+20
+40
+60
+80
11
+20
+40
+60
+80
12
+20
+40
+60
+80
13
+20
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CHARLOTTE, NORTH CAROLINA 28235

11/2/20#
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approves

REVISIONS

SUMMARY OF EARTHWORK

IN CUBIC METERS

	FROM STATION	TO STATION	SIDE	TOTAL UNCLASSIFIED EXCAVATION	ROCK	UNDERCUT	EMBANKMENT +20%	BORROW	WASTE
–L–	10+40.000	19+40.000	LT & RT	4 464	0	0	19864	15400	0
–Y1–	12+20.000	13+80.000	LT & RT	249	0	0	330	81	0
–Y2–	14+20.000	14+60.000	LT & RT	26	0	0	83	57	0
–Y4–	10+20.000	10+80.000	LT & RT	41	0	0	1 985	1 944	0
–Y5–	10+20.000	10+80.000	LT & RT	159	0	0	454	295	0
–Y6–	10+20.000	11+40.000	LT & RT	2 307	0	0	8	0	2 299
SUBTOTAL SUMMARY No. 1				7 246	0	0	22 724	17 777	2 299
–L–	19+40.000	28+40.000	LT & RT	19 425	0	0	19 426	1	0
–Y7–	10+80.000	13+80.000	LT & RT	1 391	0	0	2 460	1 069	0
–Y8–	14+40.000	16+40.000	LT & RT	6 220	0	0	1 073	0	5 147
–Y9–	10+20.000	11+40.000	LT & RT	2 581	0	0	72	0	2 509
–Y9–	14+90.000	16+60.000	LT & RT	557	0	0	207	0	350
–Y10–	10+20.000	10+60.000	LT & RT	98	0	0	326	228	0
–Y11–	10+40.000	11+00.000	LT & RT	844	0	0	1	0	843
SUBTOTAL SUMMARY No. 2				31 116	0	0	23 565	1 298	8 849
–L–	28+40.000	37+40.000	LT & RT	65466	0	0	44269	0	21197
SUBTOTAL SUMMARY No. 3				65466	0	0	44269	0	21197
–L–	37+40.000	46+40.000	LT & RT	134694	0	0	19940	0	114754
–Y12–	10+20.000	10+80.000	LT & RT	201	0	0	321	120	0
–Y13–	11+20.000	12+00.000	LT & RT	105	0	0	1 078	973	0
SUBTOTAL SUMMARY No. 4				135 000	0	0	21 339	1 093	114754
–L–	46+40.000	55+40.000	LT & RT	53 248	0	0	38 506	0	14 742
SUBTOTAL SUMMARY No. 5				53 248	0	0	38 506	0	14 742
–L–	55+40.000	64+40.000	LT & RT	95 447	0	0	46 560	0	48 887
–Y14–	10+20.000	10+40.000	LT & RT	125	0	0	1	0	124
–Y15–	11+40.000	12+00.000	LT & RT	800	0	0	10	0	790
SUBTOTAL SUMMARY No. 6				96 372	0	0	46 571	0	49 801
–L–	64+40.000	73+40.000	LT & RT	7 011	0	0	46 588	39 577	0
–Y17–	10+80.000	12+60.000	LT & RT	2 517	0	0	170	0	2 347
SUBTOTAL SUMMARY No. 7				9 528	0	0	46 758	39577	2 347
–L–	73+40.000	81+20.000	LT & RT	5 063	0	0	6 234	1 171	0
SUBTOTAL SUMMARY No. 8				5 063	0	0	6 234	1 171	0
–L–	12+80.000	14+40.000	LT	1	0	0	6 553	6 552	0
–L–	18+40.000	22+00.000	RT	8	0	0	7 153	7 145	0
–L–	24+60.000	26+40.000	RT	14	0	0	4 130	4 116	0
SUBTOTAL SUMMARY No. 9				23	0	0	17 836	17 813	0
SUBTOTAL SUMMARIES 1–9				403 062	0	0	267 802	78 729	213 989
				.	.	.	.	.	.
ESTIMATE LOSS DUE TO CLEARING AND GRUBBING				.	.	.	.	.	.
ESTIMATE FOR DRIVEWAYS				.	.	.	.	.	
ADJUSTMENT FOR PAVEMENT REMOVAL				.	.	.	.	.	.
ADDITIONAL UNDERCUT				.	.	.	.	.	.
SHOULDER CONSTRUCTION				.	.	.	.	.	.
SELECT BORROW MATERIAL				.	.	.	.	.	.
EARTH TO REPLACE BORROW				.	.	.	.	–78729	–78729
PROJECT TOTAL				403 062	0	0	267 802	0	135 260
ESTIMATE 5% FOR TOPSOIL ON BORROW PITS				.		.	.	.	.
GRAND TOTAL				403 062	0	0	267 802	0	135 260
SAY				404 000	0	0	268 000	0	136 000

• EARTHWORK FOR TRAFFIC PHASING.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONST. REV.
R/W REV.

5 0 10

METRIC

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ROADWAY DESIGN ENGINEER
R/W SHEET NO.
HYDRAULICS ENGINEER

PROJECT REFERENCE NO. R-2241A
SHEET NO. 3A

PROJ. REFERENCE NO.	SHEET NO.
R-2241A	3-B

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4	NO CLAIM
2	4	KING II INVESTMENTS, LLC
4	4	W.O. HUMPHRIES, JR.
6	4	ANGELA SNOW TUCK
7	4	LINDA STRICKLAND CARVER
8	4	MARGARET YARBORO
8A	4	MARGARET DAVIS
8B	4	NEW TOP INVESTMENTS, INC.
8C	24	KELLY PROPERTIES OF ROXBORO, LLC
8D	24	JODY LONG AND STEVEN WILSON
9	4	JAI UCK KIM AND HEE RAN KIM
10	4	SOUTHERN STATES COOPERATIVE, INC
11	4	NEB KING PROPERTIES, LLC
11A	4	KING II INVESTMENTS, LLC
12	4	C & G SUPPLY CENTER INC.
13	4	TOM'S AUTO SUPPLY OF ROXBORO, INC.
13A	4	ROXBORO PROPERTIES, LLC
14	4	JIMMY LEWIS CONTRACTING INC.
15	4, 5	ROXBORO INVESTMENT PROPERTIES, LLC
16	4	ROSALIE P. GATES
16A	4,5	J.E. GATES TRUST
16B	5	J.E. GATES ESTATE
17	5	CHARLES E. PERKINS
18	5	CHARLES E. PERKINS
19Z	5, 6	JESSE ANDERSON & SON CONTRACTORS, INC (AKA JESSE ANDERSON & SON, INC.)
20Z	5	PERSON COUNTY
20A	5, 6	PERSON COUNTY BOARD OF EDUCATION
21	5, 6	JUDY & JAMES LEE
22	6	JOYCE B. WADE, WIDOW
23	6	BONNIE GILLIS RIMMER
24	6	KAREN WHITFIELD ETAL
25	6	EDNA P. ELLIOTT
26	6	FELTON E. CARVER, ET AL
27	6	FRANCES S. CARVER, ET AL
28	6	ROBERT L CLAYTON
29	6	WOODY & ANDERSON PROPERTIES
30	6	RITA W. ALLEN, ET AL
31	6	EDNA P. ELLIOTT
32	6	VENNIE LOU CLAYTON AND DOROTHY C. WATSON
33	6	ESTELLE P. WADE
34	6	JOYCE B. WADE, WIDOW
35	6, 7, 8	WOODY & ANDERSON PROPERTIES
36	6, 7	MAXINE D. CALL
37	7	TIMOTHY HARRIS AND CHERYL CAVALIER
38	7	RONALD R. SHELTON
39	7	ROBERT W. WALKER
40	8	TODD N. WILBOURNE AND TONYA H. WILBOURNE
41	8, 9, 25	ODELIA P. GENTRY HEIRS
42	9, 25	GEORGE E. DICKERSON
43	8,9, 24, 25	BOBBY HICKS AND DELORES C. HICKS (TRACKS A-I)
44	9, 25	RACHEL P. ROYSTER, ET AL
45	9, 25	BRIAN C. HICKS AND JENNY HICKS
47	25	BONNIE SOLOMON
48	25	BONNIE LUNSFORD DUNEVANAT
49	25	TIMOTHY HARRIS AND CHERYL CAVALIER
50	25	BRIAN C. HICKS AND JENNY HICKS
51	25	BURLEY W. DUNN

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
53	9, 10	MARIAN CLAYTON WHITT
54	9, 10, 26	BURLEY W. DUNN
54A	26	JERRY F & ANGELA BARBAR
55	10	TROY L. CAMPBELL AND ERNESTINE H. CAMPBELL
56	10	STEPHEN D. GARRETT
57	9, 24	CHRISTINE P WHITT
58	24	ROBERT BEAM WILBORN AND MICHAEL BEAM WILBORN
59	24	BERNARD LOWERY, JR., RAMONA HOLT LOWERY
60	24	ELEANOR HAMLIN DUNN
61	24	ROBERT E. WINSTEAD, SHARON L. WINSTEAD
62	10, 11	ALMEADE G. GARRETT, ET AL
63	11	NELLIE R. PENTECOST
64	11, 26	HOWARD T. SMITH
65	26	SHELBY O. CASTLE
66	11, 26	MARY P. SMITH
67	11	SYBIL P. WOOTEN
68	11, 12	MARY P. SMITH
69	11, 12, 13	CHARLES E. PERKINS
70Z	12, 13	MIRIAM J. LAVELLE AND HUSBAND, CHARLES F. SAMS, JR.
71	12, 13	NADINE IRENE DIXON, ET AL
72	12, 13	CHARLES E. PERKINS
73	13, 14	BERTHA HAYES CLAY
74	14	BERTHA CLAY
75	14	GEORGE LEON CLAY
76	14, 15	CHARLIE V. JEFFERS & BEVERLY W. JEFFERS
76A	14	CHARLIE V. & BEVERLY W. JEFFERS
77	14, 15	AUSTIN B. CLAY HEIRS
78Z	15, 16	RONALD E. THOMAS, JR. & WIFE, JODI R. THOMAS
79	15	WILLIE M. DIXON AND CLYDE C. DIXON
80	16, 17	JAMES F. SHOTWELL, JR.
81	17	PAUL S. BARNETT ESTATE
82	17, 18, 19	KEITH L. BARNETTE
83	18	THOMAS A. PENTECOST
84	18	NORMA JEAN BOWES ESTATE
84A	18	ROBERT MERRITT BOWES
85	18, 19	CHARLES F. BROOKS
86	19	MONTWOOD BAPTIST CHURCH
87Z	19	MARTHA B. POWELL
88	19	GEORGE RAYMOND CARTER
89Z	19, 20, 21	ROBIN E. WRENN, ET AL
90	19, 20, 21, 22, 23	FORCE PROTECTION INDUSTRIES, INC.
91	19, 20	ROBIN EVANS WRENN
92	21	KILLIS LOFTIS, ET AL
93	21	ALISSA K. CHAPMAN
94	21	FITZGERALD T. BOWES LIFE ESTATE
95	21	FRIENDSHIP FREEWILL BAPTIST CHURCH
96	21	MARTHA B. POWELL
97	21, 27	RICKY D. WILSON AND TONYA R. WILSON
98	21, 22	STEVEN BRIGGS
99	22	WINFRED CARLTON CLAYTON
100	22, 27	ANNE SHOTWELL LIFE ESTATE
101	23	ANNIE RUTH KENDRICK LIFE ESTATE
102	23	LOUISE S. THOMAS
103	23	DAVID N. ALLEN
104	23	ANDREW L. HOLEMAN
105	23	MICHAEL E. VICKERS
106	23	CHARLOTTE MELTON, ET AL
107	23	BESSIE JANE WALKER "HEIRS"
108	23	BLAKE E. THORNBURG

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NC License Number F-0991

REVISIONS

08-02-11-	PARCEL 16: PROPERTY LINE MODIFIED & REMOVED SHED, ADDED UNDERGROUND DRAIN LINE & MANHOLES PARCEL 16A: ADDED NEW PARCEL BETWEEN 16 & 17 REVISED OWNER NAME ON PARCELS 4,9,11,16 PARCEL 10: REVISED DRIVEWAY CONNECTION & MODIFIED PROPOSED CHAIN LINK FENCE
08-16-11-	PARCEL 12: 10.8M DRIVEWAY SHIFTED TO WEST SIDE OF PROPERTY
09-09-11-	PARCELS 8 & 8A COMBINED, REVISED OWNER NAME
10-07-11-	REVISED PARCEL BOUNDRIES FOR PARCEL 16 AND 16A
10-07-11-	ADDED SUBSURFACE DRAINAGE FOR PARCEL 16 AND 16A
10-27-11-	PARCEL 11: ADDED PDE FOR DRAINAGE STRUCTURE
10-31-11-	PARCEL 7: ADDED R/W AND MODIFIED TEMPORARY EASEMENTS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR "JKA PANEL 13"
WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 300205.115(m) EASTING: 616308.868(m)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.00007057
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "JKA PANEL 13" TO -L- POT STATION 10+20.000 IS
S 40° 03' 09.53" W 6729.835 (m)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

RAILROAD SKETCH

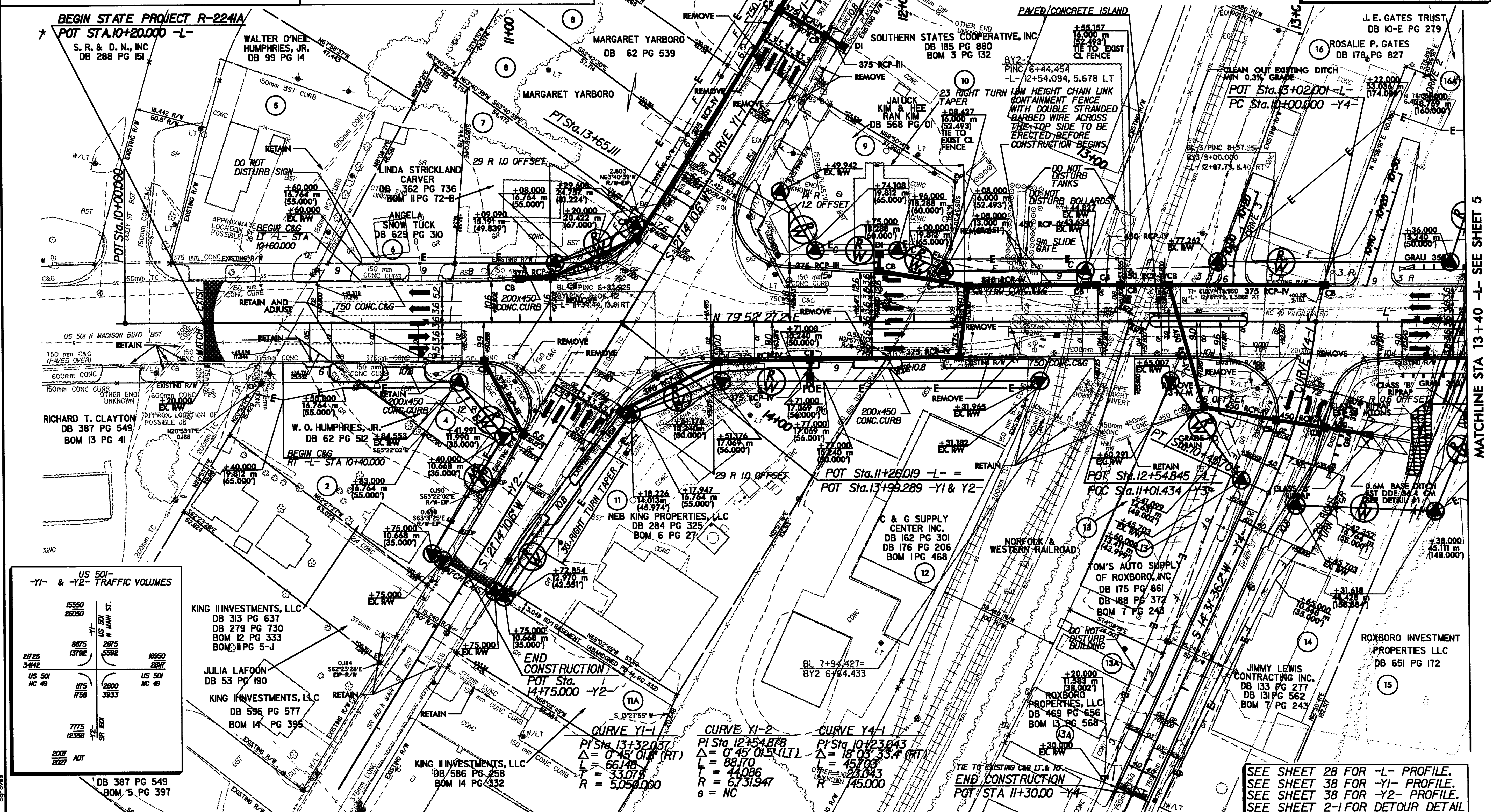
PROJECT REFERENCE NO.	SHEET NO.
R-2241A	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST. REV.
R/W REV.

- 125mm MONOLITHIC ISLAND
- FULL DEPTH PAVED SHOULDER
- PAVEMENT REMOVAL



SEE SHEET 28 FOR -L- PROFILE.
SEE SHEET 38 FOR -Y1- PROFILE.
SEE SHEET 38 FOR -Y2- PROFILE.
SEE SHEET 2-1 FOR DETOUR DETAIL

06-04-08 - ADDED A ROW MONUMENT & REMOVED 2 MONUMENTS. NAME CHANGE PARCELS 15,17,19. CHANGE ROW NEAR SE DRIVEWAY ON PARCEL 15, AND ESTABLISHED NEW PARCEL 20A

06-23-08 - MOVED ROW MONUMENTS ON PARCEL 15.

06-21-10 - PARCELS 15,20,20A: REVISED PARCEL NAME
PARCEL 20: LOCATED SECURITY PADS, SECURITY GATE ENTRANCE, SIGN, FENCE. REMOVED OLD PROPERTY LINE AND FENCE
PARCELS 20,20A: LOCATED CORRECT PROPERTY LINE

09-20-10 - PARCEL 15: ADJUSTED RW AND EASEMENT TIE-INS. UPDATED NOTES, MODIFIED CURB AND GUTTER. MODIFIED DRIVEWAY TIE-IN LOCATION

09-28-10 - PARCEL 20: RELOCATED DRIVEWAY ENTRANCE

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11/2/2011
r:\roadway\proj\R2241A_RDY_psh05.dgn
cgroves

REVISIONS

02-01-11 - PARCEL 15: REMOVED PDE
PARCEL 20: UPDATED DRAINAGE, DRIVEWAY, AND CONC. CURB, AND REDUCED LIMITS
PARCEL 20A: UPDATED CONC. CURB
PARCEL 20: MODIFIED DRIVEWAY. REDUCED LIMITS OF 200X450 CURB

08-02-11- PARCEL 15: REMOVED SIGN, ELIMINATED PDE/ ADDED TCE, REDUCED ROW AROUND VAULT & SPRINKLER. ADDED NOTE DO NOT DISTURB VAULT/WL & VALVE
PARCEL 16: ADDED UNDERGROUND DRAIN LINES, AND MODIFIED PARCEL TO 16B LEFT OF STA. 15+20 -L-
PARCEL 16A: ADDED PARCEL 16A
PARCEL 19: CHANGED PROPERTY OWNER NAME

10-07-11- REVISED PARCEL BOUNDARIES FOR PARCEL 16 AND 16A

10-07-11- ADDED SUBSURFACE DRAINAGE FOR PARCEL 16 AND 16A

10-27-11- PARCEL 19Z AND PARCEL 20Z: ADDED PDE FOR DRAINAGE SYSTEM

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

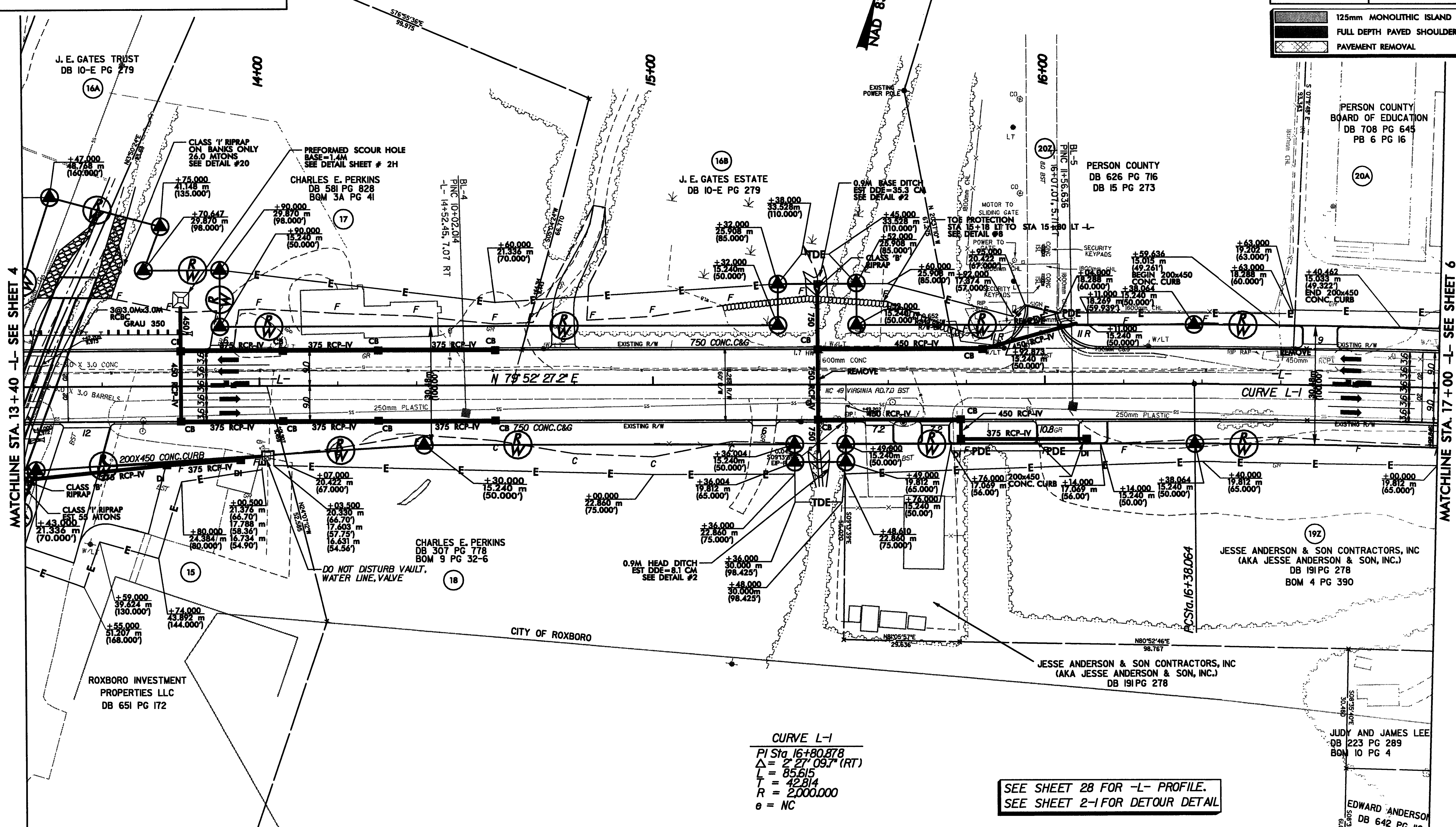
5 0 10

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST. REV.

R/W REV.

- 125mm MONOLITHIC ISLAND
- FULL DEPTH PAVED SHOULDER
- PAVEMENT REMOVAL



CURVE L-1
PI Sta 16+80.878
Δ = 2° 27' 09.7" (RT)
L = 85.615
T = 42.814
R = 2,000.000
e = NC

SEE SHEET 28 FOR -L- PROFILE.
SEE SHEET 2-1 FOR DETOUR DETAIL

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NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

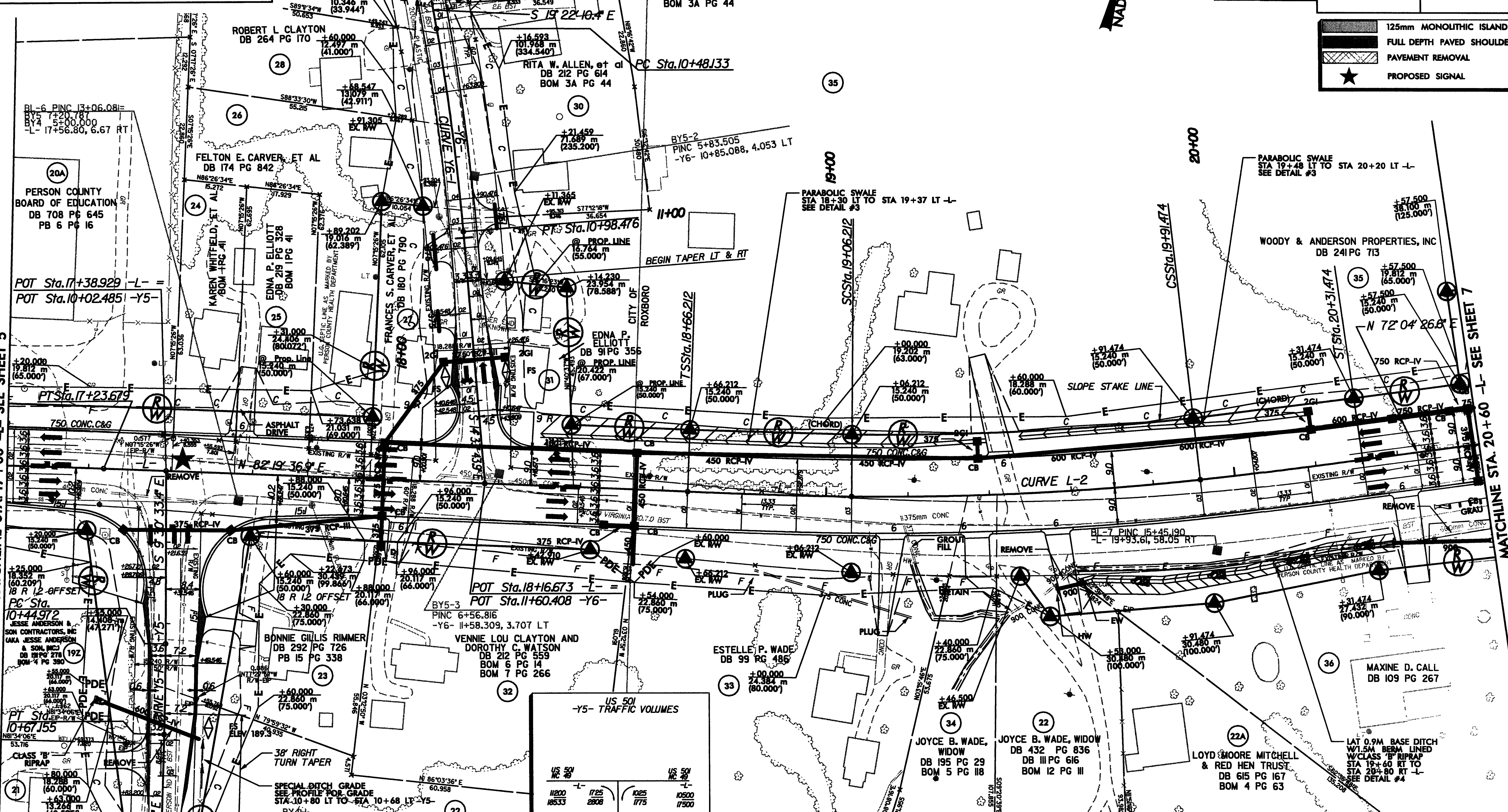
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST. REV.
R/W REV.

REVISIONS

02-01-11 -	PARCEL 23; REVISED PROPERTY LINE PARCEL 24; REMOVED 200X450 CONC. CURB PARCEL 26; ADDED SEPTIC LINE PARCEL 36; ADDED SEPTIC LINE
08-02-11 -	CHANGED PROPERTY OWNERS NAME ON PARCELS 19, 22, 22A, 30, 34
09-09-11 -	PARCEL 29; ELIMINATED TCE AND CLAIM
09-09-11 -	PARCEL 35; REVISED OWNER NAME
09-27-11 -	PARCEL 26; EXTENDED TCE THROUGH EXISTING DWELLING.

	125mm MONOLITHIC ISLAND
	FULL DEPTH PAVED SHOULDER
	PAVEMENT REMOVAL
★	PROPOSED SIGNAL



NAD 83 NC GRID
BEGIN CONSTRUCTION
POC 10+10.00 -Y6-
END CONSTRUCTION
POC 11+00.000 -Y5-
MATCHLINE STA. 17+00 -L- SEE SHEET 5
MATCHLINE STA. 20+60 -L- SEE SHEET 7
POT Sta. 17+38.929 -L- =
POT Sta. 10+02.485 -Y5-
POT Sta. 18+16.673 -L- =
POT Sta. 11+60.408 -Y6-
CURVE L-2
CURVE Y6-1
CURVE Y5-1
PC Sta. 10+48.133
PT Sta. 10+98.476
PT Sta. 17+23.679
N 82°19' 36.9" E
N 72°04' 26.8" E
S 19°22' 10.4" E
THE MICHAEL S. TURNER ALASKA TRUST
DB 528 PG 736
BOM 3A PG 44
RICHARD T. CLAYTON
DB 249 PG 282
BOM 9 PG 65-4
WOODY & ANDERSON PROPERTIES, INC
DB 241 PG 713
ROBERT L CLAYTON
DB 264 PG 170
RITA W. ALLEN, et al
DB 212 PG 614
BOM 3A PG 44
FELTON E. CARVER, ET AL
DB 174 PG 842
PERSON COUNTY BOARD OF EDUCATION
DB 708 PG 645
PB 6 PG 16
EDNA P. ELLIOTT
DB 219 PG 328
BOM 1 PG 41
EDNA P. ELLIOTT
DB 91 PG 356
CITY OF ROXBORO
BONNIE GILLIS RIMMER
DB 292 PG 726
PB 15 PG 338
VENNIE LOU CLAYTON AND DOROTHY C. WATSON
DB 212 PG 559
BOM 6 PG 14
BOM 7 PG 266
ESTELLE P. WADE
DB 99 PG 486
JOYCE B. WADE, WIDOW
DB 195 PG 29
BOM 5 PG 118
JOYCE B. WADE, WIDOW
DB 432 PG 836
DB 111 PG 616
BOM 12 PG 111
LOYD MOORE MITCHELL & RED HEN TRUST
DB 615 PG 167
BOM 4 PG 63
MAXINE D. CALL
DB 109 PG 267
JUDY AND JAMES LEE
DB 223 PG 289
BOM 10 PG 4
EDWARD ANDERSON
DB 642 PG 110
JOYCE B. WADE, WIDOW
DB 432 PG 836
BOM 12 PG 111
WOODY & ANDERSON PROPERTIES, INC
DB 241 PG 713
PARABOLIC SWALE
STA 18+30 LT TO STA 19+37 LT -L-
SEE DETAIL #3
PARABOLIC SWALE
STA 19+48 LT TO STA 20+20 LT -L-
SEE DETAIL #3
LAT 0.9M BASE DITCH
W/1.5M BERM LINED
W/CLASS "B" RIPRAP
STA 19+60 RT TO
STA 20+80 RT -L-
SEE DETAIL #4
SPECIAL DITCH GRADE
SEE PROFILE FOR GRADE
STA 10+80 LT TO STA 10+68 LT -Y5-
38' RIGHT TURN TAPER
BEGIN TAPER LT & RT
SLOPE STAKE LINE
CITY OF ROXBORO
US 501
-Y5- TRAFFIC VOLUMES

CURVE L-2

PIs Sta 18+92.879	PI Sta 19+48.895	PIs Sta 20+04.808
Θs = 1° 38' 13.3"	Δ = 6° 58' 43.7" (LT)	Θs = 1° 38' 13.3"
Ls = 40.000	L = 85.262	Ls = 40.000
LT = 26.668	T = 42.684	LT = 26.668
ST = 13.334	R = 700.000	ST = 13.334
	e = 0.03	
	Runoff = 40	

CURVE Y5-1

PI Sta 10+56.064
Δ = 1° 16' 15.5" (RT)
L = 22.183
T = 11.092
R = 1,000.000
e = N.C.

CURVE Y6-1

PI Sta 10+73.319
Δ = 4° 48' 26.5" (RT)
L = 50.343
T = 25.186
R = 600.000
e = 0.04
Runoff = 40

SEE SHEET 29 FOR -L- PROFILE.
SEE SHEET 39 FOR -Y5- PROFILE.
SEE SHEET 39 FOR -Y6- PROFILE.

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1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

REVISIONS

06-04-08 – SHIFTED ROW MONUMENT OFF OF PROPERTY LINE, AND PROPERTY LINE CHANGE PARCELS 35,36

06-21-10 – PARCEL 35: REMOVED PARCEL AND OWNERSHIP OF PARCEL 36

02-01-11 – PARCEL 38: UPDATED PARCEL INFORMATION

08-02-11 – PARCEL 37: ADDED NOTE NOT TO DISTURB SEPTIC LINES
PARCEL 39: REDUCED TCE 3 METERS SOUTHWARD OFF SEPTIC LINES, ADDED NOTE TO NOT DISTURB

09-09-11 – PARCEL 35: REVISED OWNER NAME

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

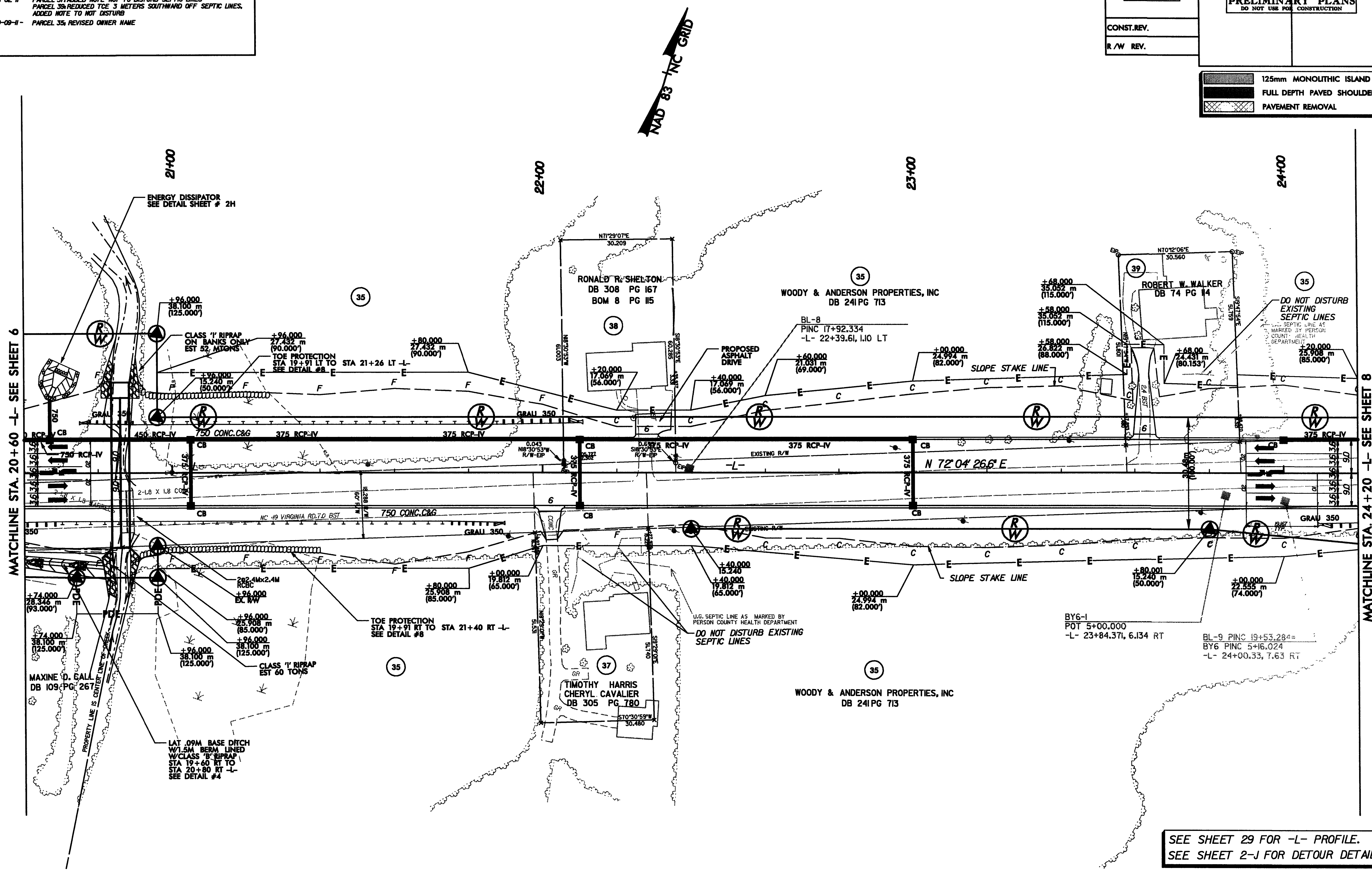
5 0 10

CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



NAD 83 NC GRID
21+00
22+00
23+00
24+00
MATCHLINE STA. 20+60 -L- SEE SHEET 6
MATCHLINE STA. 24+20 -L- SEE SHEET 8
ENERGY DISSIPATOR SEE DETAIL SHEET # 2H
CLASS 'I' RIPRAP ON BANKS ONLY EST 52 MTONS
TOE PROTECTION STA 19+91 LT TO STA 21+26 LT -L- SEE DETAIL #8
RONALD R. SHELTON DB 308 PG 167 BOM 8 PG 115
WOODY & ANDERSON PROPERTIES, INC DB 241 PG 713
BL-8 PINC 17+92.334 -L- 22+39.61, 1.10 LT
PROPOSED ASPHALT DRIVE
SLOPE STAKE LINE
ROBERT W. WALKER DB 74 PG 114
DO NOT DISTURB EXISTING SEPTIC LINES
375 RCP-IV
750 CONC.C&G
N 72° 04' 26.6" E
NC 49 VIRGINIA RD.7.0 BST
GRAU 350
TOE PROTECTION STA 19+91 RT TO STA 21+40 RT -L- SEE DETAIL #8
CLASS 'I' RIPRAP EST 60 TONS
MAXINE D. GALL DB 109 PG 267
LAT .09M BASE DITCH W/1.5M BERM LINED W/CLASS 'B' RIPRAP STA 19+60 RT TO STA 20+80 RT -L- SEE DETAIL #4
TIMOTHY HARRIS CHERYL CAVALIER DB 305 PG 780
U.G. SEPTIC LINE AS MARKED BY PERSON COUNTY HEALTH DEPARTMENT
DO NOT DISTURB EXISTING SEPTIC LINES
BY6-1 POT 5+00.000 -L- 23+84.371, 6.134 RT
BL-9 PINC 19+53.284 BY6 PINC 5+16.024 -L- 24+00.33, 7.63 RT

SEE SHEET 29 FOR -L- PROFILE.
SEE SHEET 2-J FOR DETOUR DETAIL

11/2/2011 R2241A_RDY_psh07.dgn agroves

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NC License Number F-0991

REVISIONS

06-04-08 –	ESTABLISHED ACCESS POINT ON PARCEL 41, AND CHANGED NAME ON PARCEL 40
06-21-10 –	PARCEL 41; REVISED PARCEL NAME
09-28-10 –	PARCEL 41; REVISED PARCEL INFORMATION
02-01-11 –	PARCEL 37; ADDED SEPTIC LINE PARCEL 38; ADDED WELL PARCEL 39; ADDED SEPTIC LINE
08-02-11 –	COMBINED PARCELS 43A-43G INTO TRACTS (A-I), DENOTING EACH ACCORDINGLY
09-09-11 –	PARCEL 35; REVISED OWNER NAME

METRIC

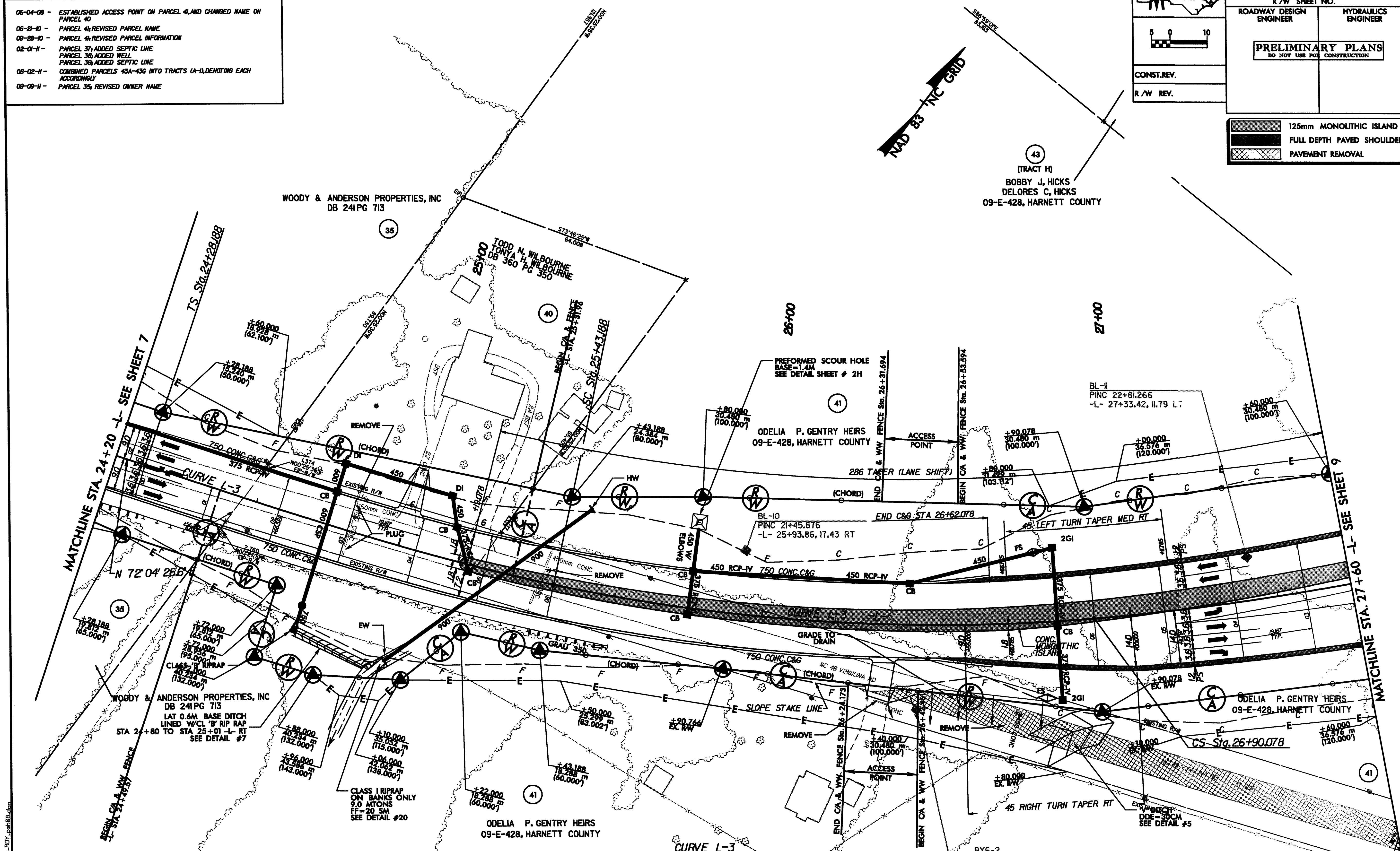
PROJECT REFERENCE NO.	SHEET NO.
R-2241A	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

(shaded)	125mm MONOLITHIC ISLAND
(solid)	FULL DEPTH PAVED SHOULDER
(hatched)	PAVEMENT REMOVAL


NAD 83 NC GRID
MATCHLINE STA. 24+20 -L- SEE SHEET 7
MATCHLINE STA. 27+60 -L- SEE SHEET 9
WOODY & ANDERSON PROPERTIES, INC
DB 241 PG 713
TODD N. WILBOURNE
TONYA H. WILBOURNE
DB 360 PG 350
BOBBY J. HICKS
DELORES C. HICKS
09-E-428, HARNETT COUNTY
(TRACT H)
ODELIA P. GENTRY HEIRS
09-E-428, HARNETT COUNTY
TS Sta. 24+28.188
SC Sta. 25+43.188
CS Sta. 26+90.078
CURVE L-3
PREFORMED SCOUR HOLE
BASE=1.4M
SEE DETAIL SHEET # 2H
BL-10
PINC 21+45.876
-L- 25+93.86, 17.43 RT
BL-11
PINC 22+81.266
-L- 27+33.42, 11.79 LT
BY6-2
PINC 7+62.551
-L- 26+42.095, 22.971 RT
ACCESS POINT
286 TAPER (LANE SHIFT)
END C&G STA 26+62.078
48 LEFT TURN TAPER MED RT
45 RIGHT TURN TAPER RT
750 CONC.C&G
450 RCP-IV
GRADE TO DRAIN
SLOPE STAKE LINE
CONC. MONOLITHIC ISLAND
V DITCH
DDE=30CM
SEE DETAIL #5
CLASS I RIPRAP
ON BANKS ONLY
9.0 MTONS
FF=20 SM
SEE DETAIL #20
LAT 0.6M BASE DITCH
LINED W/CL 'B' RIP RAP
STA 24+80 TO STA 25+01 -L- RT
SEE DETAIL #7
CLASS 'B' RIPRAP
REMOVE
N 72° 04' 26.6"

CURVE L-3

PIs Sta 25+04.908	PI Sta 26+17.166	PIs Sta 27+28.460
θs = 6° 35' 20.5"	Δ = 16° 49' 56.5" (LT)	θs = 6° 35' 20.5"
Ls = 115.000	L = 146.890	Ls = 115.000
LT = 76.720	T = 73.978	LT = 76.720
ST = 38.382	R = 500.000	ST = 38.382
	e = 0.06	
	Runoff = 115	

SEE SHEET 30 FOR -L- PROFILE.
SEE SHEET 2-J FOR DETOUR DETAIL

STV / Ralph Whitehead Associates, Inc.
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Charlotte, NC 28208
NC License Number F-0991

REVISIONS

06-04-08 - SHOWED DRIVEWAY PIPE ON PARCEL 55, AND CREATED NEW PARCELS: 43A,43B,43C,43D,43E,43F,43G
07-24-08 - NAME CHANGE AND PROPERTY LINE CHANGE ON PARCEL 53
01-13-09 - OWNERSHIP CHANGE ON PARCELS: 43,43B,43C,43D,43E,43F
06-21-10 - PARCEL 41: REVISED PARCEL NAME, LOCATED PROPANE TANK
09-28-10 - PARCEL 41: REVISED PARCEL INFORMATION
09-09-11 - PARCEL 43: SHIFTED TRACT C LABEL TO PROPER LOCATION
10-27-11 - PARCEL 43 TRACT C: ADDED PDE AND MODIFIED TCE FOR DRAINAGE OUTLET
10-27-11 - PARCEL 43 TRACT H: CHANGED TCE TO PDE FOR DRAINAGE OUTLET

02-01-11 - PARCEL 43: ADDED SEPTIC REPAIR AREA
PARCEL 43A: MOVED PARCEL INFORMATION AND ADDED SEPTIC LINE
PARCEL 43C: ADDED DRIVEWAY RECONNECTION, PIPE, AND SEPTIC LINE
PARCEL 53: UPDATED PARCEL INFORMATION
08-02-11 - COMBINED PARCELS 43A-43G, 46 INTO TRACTS (A-I), DENOTING EACH ACCORDINGLY
08-02-11 - PARCEL 52: REMOVED CLAIM

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

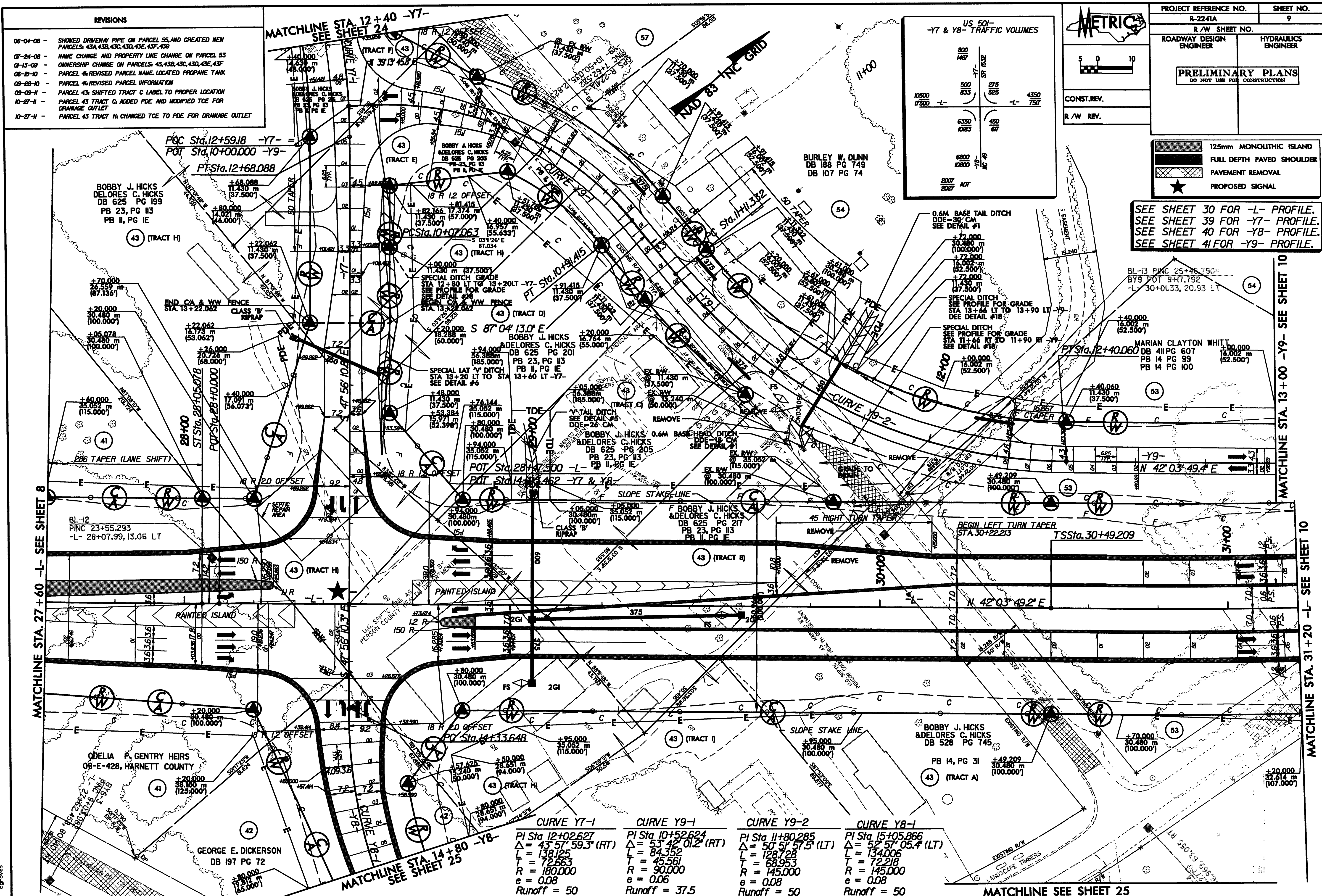
METRIC

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.
R/W REV.

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL
PROPOSED SIGNAL

SEE SHEET 30 FOR -L- PROFILE.
SEE SHEET 39 FOR -Y7- PROFILE.
SEE SHEET 40 FOR -Y8- PROFILE.
SEE SHEET 41 FOR -Y9- PROFILE.



CURVE Y7-1	CURVE Y9-1	CURVE Y9-2	CURVE Y8-1
PI Sta 12+02.627	PI Sta 10+52.624	PI Sta 11+80.285	PI Sta 15+05.866
Δ = 43° 57' 59.3" (RT)	Δ = 53° 42' 01.2" (RT)	Δ = 50° 51' 57.5" (LT)	Δ = 52° 57' 05.4" (LT)
L = 138.125	L = 84.352	L = 128.728	L = 134.006
T = 72.663	T = 45.561	T = 68.953	T = 72.218
R = 180.000	R = 90.000	R = 145.000	R = 145.000
e = 0.08	e = 0.06	e = 0.08	e = 0.08
Runoff = 50	Runoff = 37.5	Runoff = 50	Runoff = 50

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REVISIONS

06-04-08 -	SHOW DRIVEWAY PIPE ON PARCEL 55
07-24-08 -	NAME CHANGE AND PROPERTY LINE CHANGE ON PARCEL 53
09-19-08 -	EASEMENT REMOVED FROM PARCEL 55
02-09-09 -	REMOVED PARCEL 63A, UPDATED DEED AND PLAT REFERENCES FOR PARCEL 63
06-21-10 -	PARCEL 55: REVISED PARCEL NAME
02-01-11 -	PARCEL 53: UPDATED PARCEL INFORMATION PARCEL 55: UPDATED PARCEL INFORMATION
02-10-11 -	PARCEL 55: ELIMINATED PARCEL ACCESS, DRIVEWAY AND PIPE
08-02-11 -	PARCEL 52: ELIMINATED CLAIM PARCEL 62: CHANED PROPERTY OWNER INFORMATION

METRIC

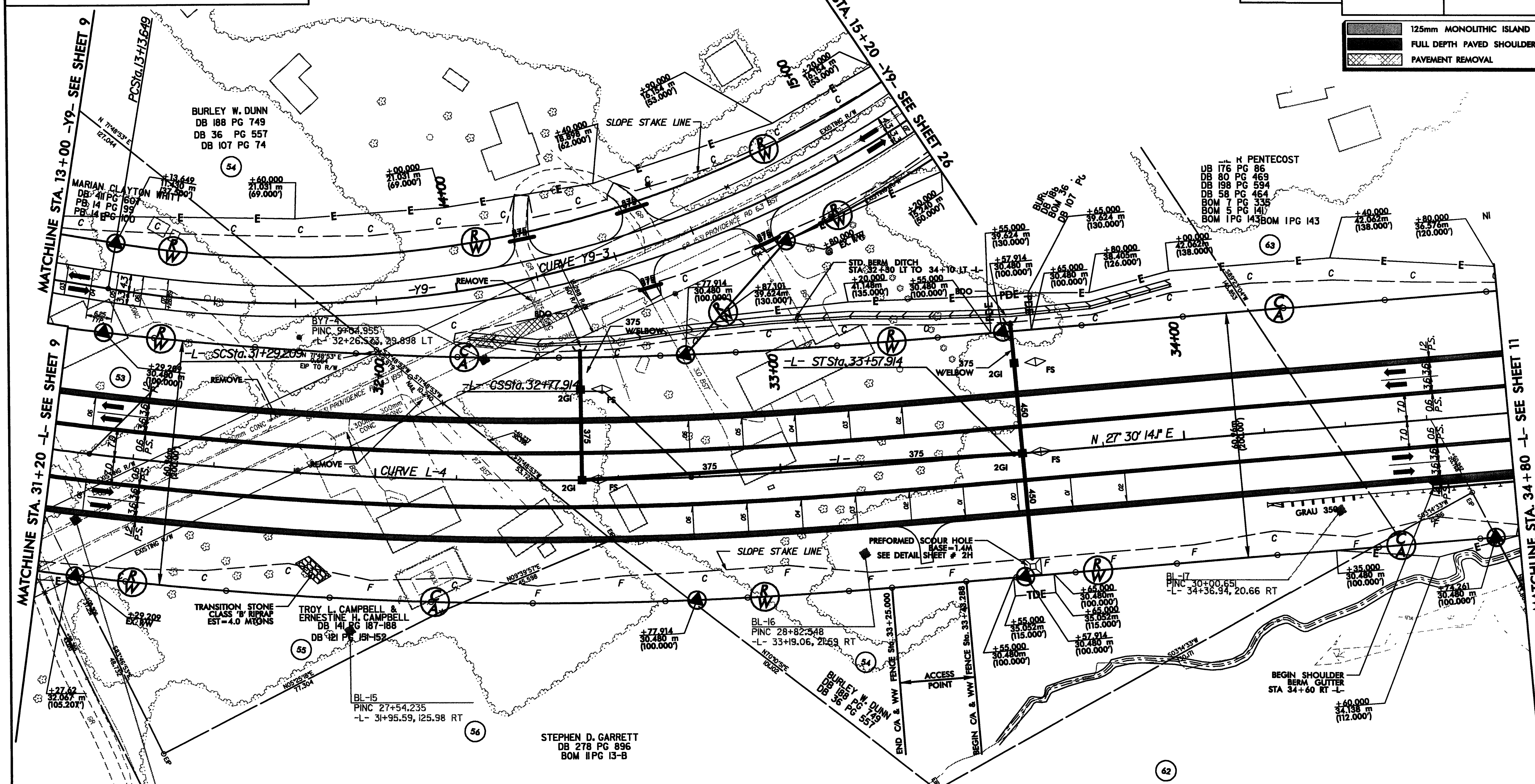
PROJECT REFERENCE NO.	SHEET NO.
R-2241A	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CONST. REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

- 125mm MONOLITHIC ISLAND
- FULL DEPTH PAVED SHOULDER
- PAVEMENT REMOVAL



CURVE L-4

PIs Sta 31+02.548	PI Sta 32+03.731	PIs Sta 33+04.585
θ s = 2° 32' 47.3"	Δ = 9° 28' 00.5" (LT)	θ s = 2° 32' 47.3"
Ls = 80.000	L = 148.704	Ls = 80.000
LT = 53.339	T = 74.522	LT = 53.339
ST = 26.672	R = 900.000	ST = 26.672
	e = 0.06	
	Runoff = 80	

CURVE Y9-3

PI Sta 14+93.398
Δ = 66° 20' 23.7" (LT)
L = 318.409
T = 179.749
R = 275.000
e = 0.07
Runoff = 43.75

SEE SHEET 31 FOR -L- PROFILE.
SEE SHEET 41 FOR -Y9- PROFILE.

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REVISIONS

06-04-08 -	MOVED ROW LINE ON PARCEL 63A AND ESTABLISHED ACCESS POINT ON PARCEL 62.
06-23-08 -	REMOVED ROW MONUMENTS, STRAIGHTENED CA AND WW FENCE ON PARCEL 62.
02-09-09 -	REMOVED PARCEL 63A, UPDATED DEED AND PLAT REFERENCES FOR PARCEL 63. UPDATED BEGIN C/A & WW FENCE STATION LABEL ON PARCEL 62.
08-02-11 -	CHANGED PROPERTY OWNER NAMES ON PARCELS 62 & 69.

METRIC

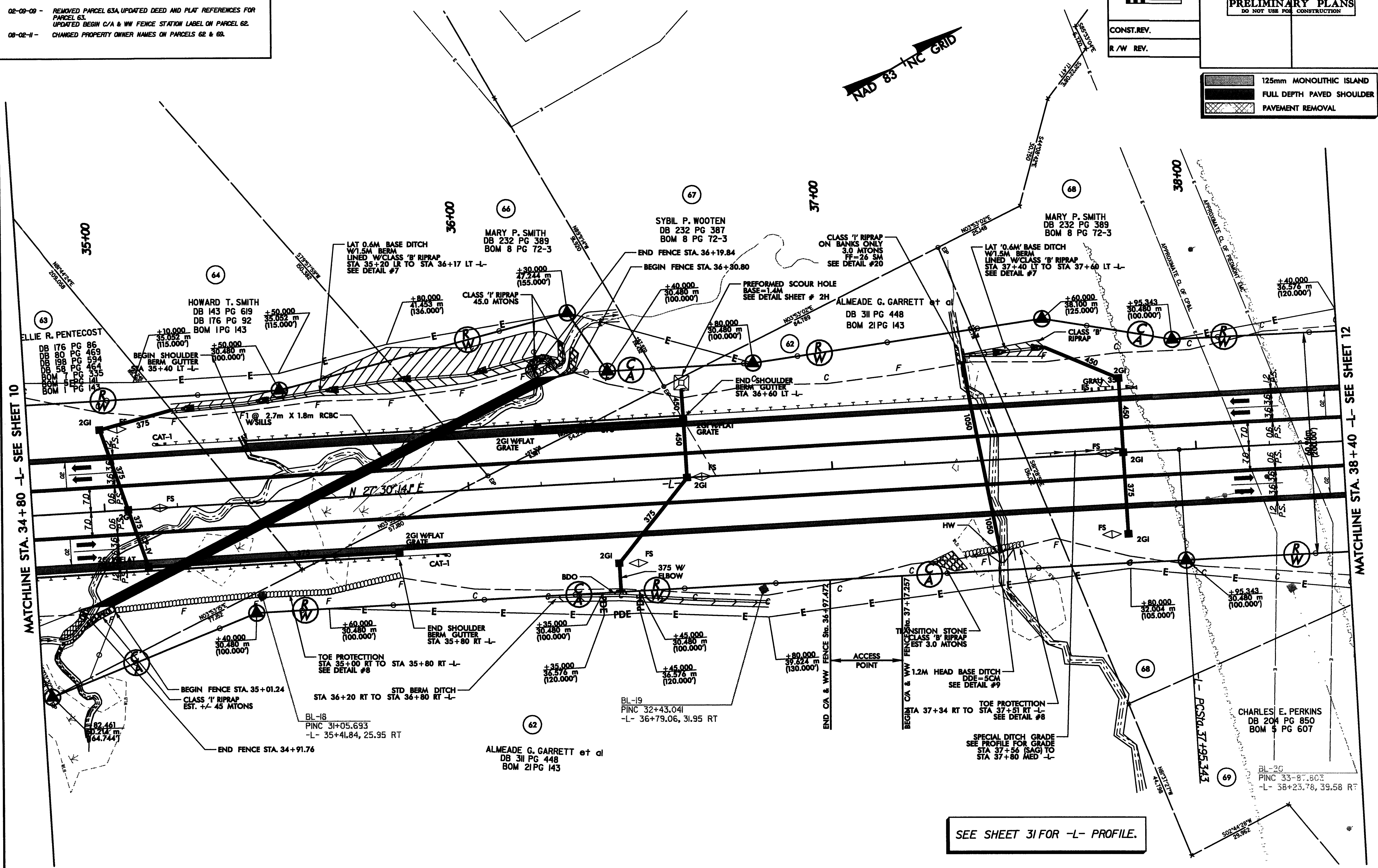
PROJECT REFERENCE NO.	SHEET NO.
R-2241A	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CONST. REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL


NAD 83 NC GRID
35+00
36+00
37+00
38+00
MATCHLINE STA. 34+80 -L- SEE SHEET 10
MATCHLINE STA. 38+40 -L- SEE SHEET 12
ELLIE R. PENTECOST
DB 176 PG 86
DB 80 PG 469
DB 198 PG 594
DB 58 PG 464
BOM 7 PG 335
BOM 5 PG 141
BOM 1 PG 143
HOWARD T. SMITH
DB 143 PG 619
DB 176 PG 92
BOM 1 PG 143
MARY P. SMITH
DB 232 PG 389
BOM 8 PG 72-3
SYBIL P. WOOTEN
DB 232 PG 387
BOM 8 PG 72-3
ALMEADE G. GARRETT et al
DB 311 PG 448
BOM 21 PG 143
CHARLES E. PERKINS
DB 204 PG 850
BOM 5 PG 607
LAT 0.6M BASE DITCH W/1.5M BERM LINED W/CLASS 'B' RIPRAP STA 35+20 LT TO STA 36+17 LT -L- SEE DETAIL #7
CLASS 'I' RIPRAP 45.0 MTONS
END FENCE STA. 36+19.84
BEGIN FENCE STA. 36+30.80
PREFORMED SCOUR HOLE BASE=1.4M SEE DETAIL SHEET # 2H
CLASS 'I' RIPRAP ON BANKS ONLY 3.0 MTONS FF=26 SM SEE DETAIL #20
LAT 0.6M BASE DITCH W/1.5M BERM LINED W/CLASS 'B' RIPRAP STA 37+40 LT TO STA 37+60 LT -L- SEE DETAIL #7
BEGIN SHOULDER BERM GUTTER STA 35+40 LT -L-
END SHOULDER BERM GUTTER STA 36+60 LT -L-
CLASS 'B' RIPRAP
1 @ 2.7m X 1.8m RCBC W/SILLS
2GI W/FLAT GRATE
N 27°30'14.1" E
END SHOULDER BERM GUTTER STA 35+80 RT -L-
TOE PROTECTION STA 35+00 RT TO STA 35+80 RT -L- SEE DETAIL #8
BEGIN FENCE STA. 35+01.24
CLASS 'I' RIPRAP EST. +/- 45 MTONS
END FENCE STA. 34+91.76
STD BERM DITCH STA 36+20 RT TO STA 36+80 RT -L-
BL-18 PINC 31+05.693 -L- 35+41.84, 25.95 RT
BL-19 PINC 32+43.041 -L- 36+79.06, 31.95 RT
BL-20 PINC 33-87.603 -L- 38+23.78, 39.58 RT
375 W/ ELBOW
END C/A & WW FENCE Sta. 36+97.472
BEGIN C/A & WW FENCE Sta. 37+17.257
ACCESS POINT
TRANSITION STONE CLASS 'B' RIPRAP EST 3.0 MTONS
1.2M HEAD BASE DITCH DDE=5CM SEE DETAIL #9
TOE PROTECTION STA 37+34 RT TO STA 37+51 RT -L- SEE DETAIL #8
SPECIAL DITCH GRADE SEE PROFILE FOR GRADE STA 37+56 (SAG) TO STA 37+80 MED -L-
-L- PC Sta. 37+95.343
APPROXIMATE CL OF PIEDMONT EMC
APPROXIMATE CL OF CP&L
SEE SHEET 31 FOR -L- PROFILE.

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REVISIONS

06-04-08 -	ESTABLISHED ACCESS POINT PARCEL 69, ELIMINATED TCE, AND WELL SHOWN ON PARCEL 71
06-24-08 -	TIED TCE TO ROW ON PARCEL 71
06-21-10 -	PARCEL 71; REVISED PARCEL NAME
08-02-11 -	CHANGED PROPERTY OWNER INFORMATION ON PARCEL 69
10-27-11 -	PARCEL 70Z; CHANGED TCE TO PDE

METRIC

5 0 10

CONST.REV.

R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	12
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

NAD 83 NC GRID

MATCHLINE STA. 38+40 -L- SEE SHEET 11

MATCHLINE STA. 42+00 -L- SEE SHEET 13

68

MARY P. SMITH
DB 232 PG 389
BOM 8 PG 72-3

69

CHARLES E. PERKINS
DB 204 PG 850
BOM 5 PG 607

70Z

MIRIAM J. LAVELLE
AND HUSBAND
CHARLES F. SAMS, JR.
DB 215 PG 757
BOM 4 PG 597

71

NADINE IRENE DIXON
DB 266 PG 148
PB 6 PG 91-1
DB 680 PG 810

72

CHARLES E. PERKINS
DB 337 PG 519
BOM 8 PG 22-5

39+00

40+00

41+00

SLOPE STAKE LINE

END FENCE STA. 40+08.49

ENERGY DISSIPATOR
SEE DETAIL SHEET # 2H

BEGIN FENCE STA. 40+10.04

CLASS 'I' RIPRAP
ON BANKS ONLY
+/-4.0 MTONS
FF= +/-36 SM
SEE DETAIL #20

1500 CLASS IV
W/METHOD '8'
INSTALLATION

END FENCE STA. 40+62.50

BEGIN FENCE STA. 40+64.06

CL 'I' RIP RAP
(BANKS ONLY)
+/- 1.7 MTONS
FF +/- 2.1 SM

END C/A & WW FENCE Sta. 40+90.000

ACCESS POINT

BEGIN C/A & WW FENCE Sta. 41+08.000

END C/A & WW FENCE Sta. 41+72.950

ACCESS POINT

BEGIN C/A & WW FENCE Sta. 41+91.238

END C/A & WW FENCE Sta. 41+33.712

ACCESS POINT

BEGIN C/A & WW FENCE Sta. 41+50.000

PROP. LINE @ 30.48m (100')

PROPERTY CORNER @ Approx. 39.950m (131.068')

BL-21
PINC 34+88.377
-L- 39+24.79, 45.56 RT

BL-22
PINC 35+74.372
-L- 40+11.35, 45.47 RT

BL-23
PINC 36+47.949
-L- 40+85.37, 48.26 RT

BL-24
PINC 37+16.86
-L- 41+54.74 50.26 RT

CAT-1

GRAU 350

2GI

2GI TYPE 'A'

FS

CURVE L-5

PI Sta 41+08.408
D = 5°07' 17.5" (RT)
L = 625.713
T = 313.065
R = 7,000.000
e = N.C.

SEE SHEET 32 FOR -L- PROFILE.

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REVISIONS

06-04-08 - ESTABLISHED ASSESS POINT ON PARCEL 69
06-21-10 - PARCEL 74 REVISED PARCEL NAME
08-02-11 - CHANGED PROPERTY OWNER INFORMATION ON PARCEL 69

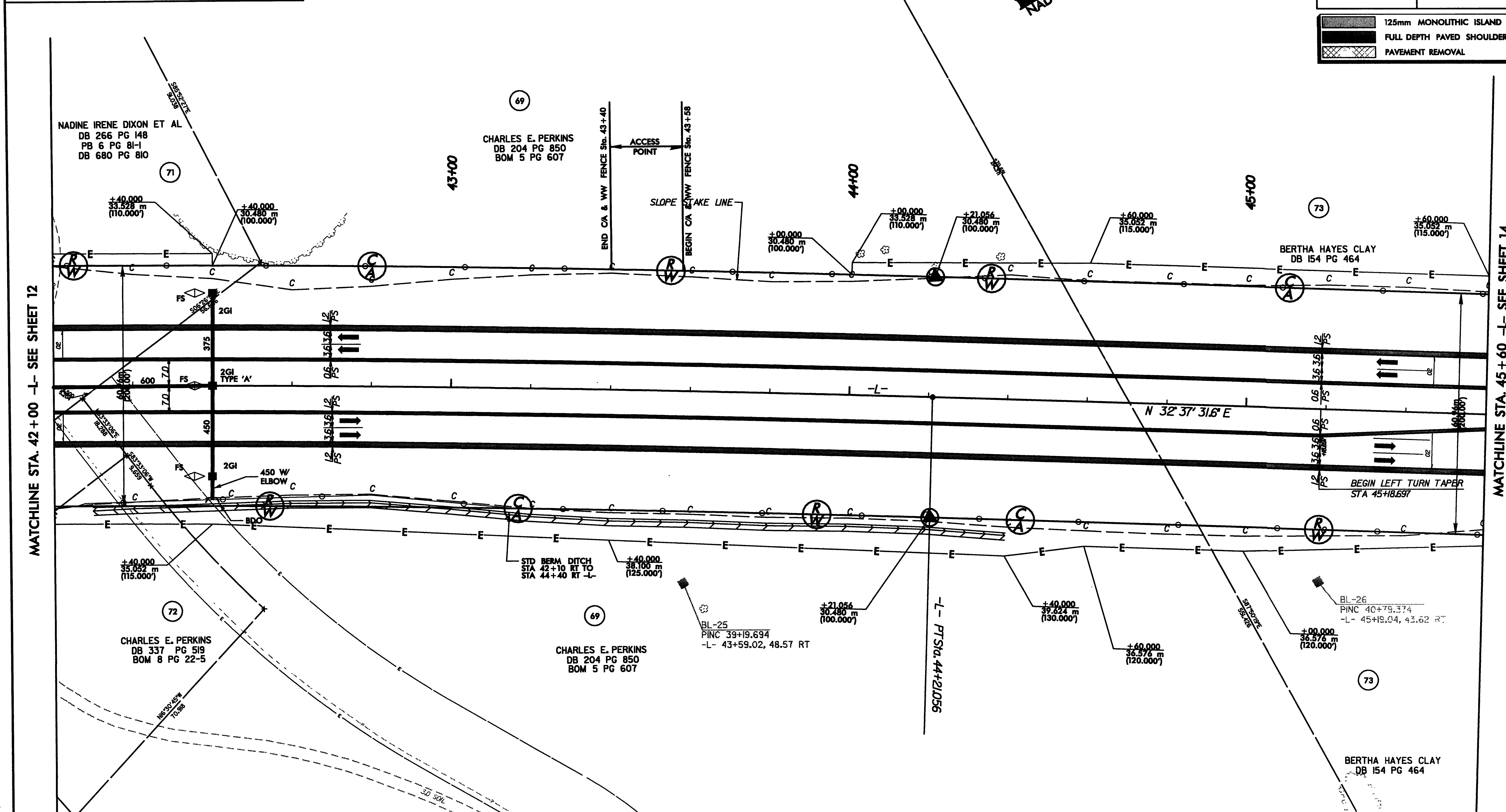
METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	13
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.
R /W REV.

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



NAD 83 NC GRID
NADINE IRENE DIXON ET AL
DB 266 PG 148
PB 6 PG 81-1
DB 680 PG 810
71
69
CHARLES E. PERKINS
DB 204 PG 850
BOM 5 PG 607
43+00
44+00
45+00
END C/A & WW FENCE Sta. 43+40
BEGIN C/A WW FENCE Sta. 43+58
ACCESS POINT
SLOPE STAKE LINE
73
BERTHA HAYES CLAY
DB 154 PG 464
MATCHLINE STA. 42+00 -L- SEE SHEET 12
MATCHLINE STA. 45+60 -L- SEE SHEET 14
2GI
2GI TYPE 'A'
450 W/ ELBOW
-L-
N 32° 37' 31.6" E
BEGIN LEFT TURN TAPER
STA 45+18.697
STD BERM DITCH
STA 42+10 RT TO
STA 44+40 RT -L-
72
CHARLES E. PERKINS
DB 337 PG 519
BOM 8 PG 22-5
BL-25
PINC 39+19.694
-L- 43+59.02, 48.57 RT
BL-26
PINC 40+79.374
-L- 45+19.04, 43.62 RT
-L- PT Sta. 44+21.056

SEE SHEET 32 FOR -L- PROFILE.

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REVISIONS

06-04-08 - ESTABLISHED ACCESS POINT ON PARCEL 76A, PROPERTY LINE CHANGE 76,76A, AND NEW PARCEL 76A

06-21-10 - PARCEL 77; REVISED PARCEL NAME

09-09-11 - PARCEL 76; REVISED OWNER NAME

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

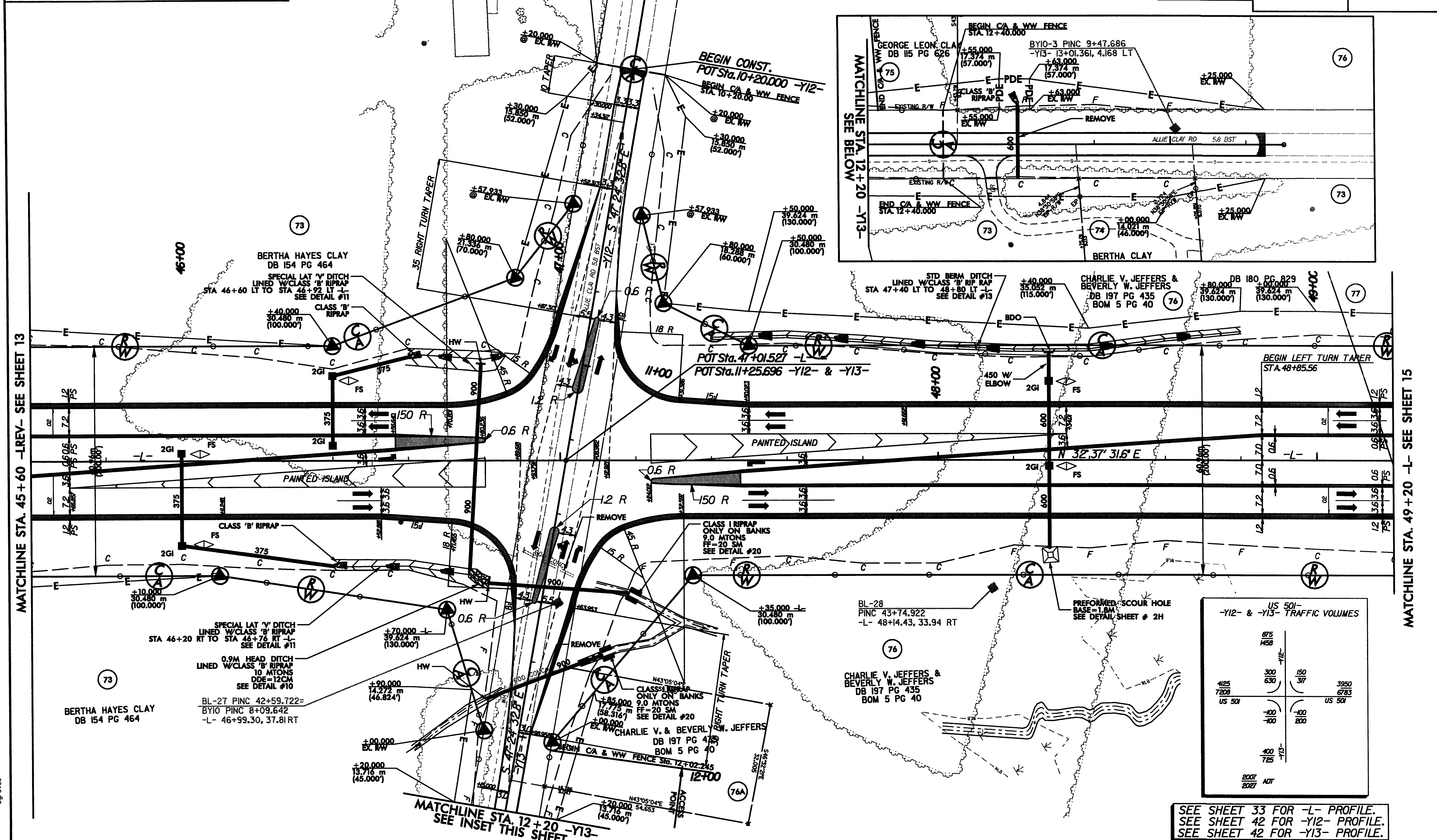
METRIC

CONST. REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



NAD 83 NC GRID
BEGIN CONST. POT Sta. 10+20.000 -Y12-
BEGIN C/A & WW FENCE STA. 10+20.00
END C/A & WW FENCE STA. 10+20.00
BY10-2 PINC 6+43.417
BERTHA HAYES CLAY DB 154 PG 464
CHARLIE V. JEFFERS & BEVERLY W. JEFFERS DB 197 PG 435 BOM 5 PG 40
GEORGE LEON CLAY DB 115 PG 626
BERTHA CLAY
DB 180 PG 829
POT Sta. 47+01.527 -L-
POT Sta. 11+25.696 -Y12- & -Y13-
N 32°37' 31.6" E
PAINTED ISLAND
BEGIN LEFT TURN TAPER STA. 48+85.56
BL-27 PINC 42+59.722= BY10 PINC 8+09.642 -L- 46+99.30, 37.81 RT
BL-28 PINC 43+74.922 -L- 48+14.43, 33.94 RT
BY10-3 PINC 9+47.686 -Y13- 13+01.361, 4.168 LT
PREFORMED SCOUR HOLE BASE=1.8M SEE DETAIL SHEET # 2H
MATCHLINE STA. 45+60 -LREV- SEE SHEET 13
MATCHLINE STA. 49+20 -L- SEE SHEET 15
MATCHLINE STA. 12+20 -Y13- SEE INSET THIS SHEET
MATCHLINE STA. 12+20 -Y13- SEE BELOW
US 501- -Y12- & -Y13- TRAFFIC VOLUMES

SEE SHEET 33 FOR -L- PROFILE.
SEE SHEET 42 FOR -Y12- PROFILE.
SEE SHEET 42 FOR -Y13- PROFILE.

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REVISIONS

06-04-08 -	NAME CHANGE ON PARCEL 79, AND ESTABLISHED ACCESS POINT ON PARCEL 77,78
06-21-10 -	PARCELS 77,78; REVISED PARCEL NAME
09-28-10 -	PARCEL 78; REVISED PARCEL INFORMATION
08-02-11 -	CHANGED PROPERTY OWNER INFORMATION ON PARCEL 79
09-09-11 -	PARCEL 76 & 78; REVISED OWNER NAME/ PARCEL INFORMATION
10-27-11 -	PARCEL 78Z; MODIFIED C/A AND FENCE

METRIC

5 0 10

CONST.REV.

R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	15
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

NAD 83 NC GRID

MATCHLINE STA. 49+20 -L- SEE SHEET 14

MATCHLINE STA. 52+80 -L- SEE SHEET 16

77
AUSTIN B. CLAY HEIRS
DB 180 PG 829

RONALD E. THOMAS, JR AND WIFE, JODI R. THOMAS
DB 775 PG 607

78Z

POND

LAT 0.6M BASE DITCH W/CL 'B' RIP RAP STA 50+81 TO STA 51+04 -L- LT SEE DETAIL #7

CL 'B' RIP RAP

BEGIN SHOULDER BERM GUTTER STA 50+80 LT -L-

TOE PROTECTION STA 50+55 LT TO STA 50+81 LT -L- SEE DETAIL #8

TRANSITION STONE CLASS 'B' RIPRAP 5.0 MTONS

CLASS 'I' RIPRAP ON BANKS ONLY 3.5 MTONS FF=36 SM

END C/A & WW FENCE Sta. 49+66.888

BEGIN C/A & WW FENCE Sta. 49+85.176

ACCESS POINT

+60.000 38.100 m (125.000')

+00.000 30.480 m (100.000')

+40.000 35.052m (115.000')

+40.000 30.480 m (100.000')

+93.383 33.528 m (110.000')

+00.000 39.624m (130.000')

+17.000 33.528 m (110.000')

+00.000 38.100m (125.000')

+20.000 30.480m (100.000')

+95.457 30.480 m (100.000')

+17.000 33.480 m (110.000')

CLASS 'B' RIPRAP

END SHOULDER BERM GUTTER STA 51+80 LT -L-

PREFORMED SCOUR HOLE BASE=1.2M SEE DETAIL SHEET # 2H GRAU 350

2GI W/FLAT GRATE

375 W ELBOWS

CAT-1

HW

GRAU 350

TOE PROTECTION STA 50+50 RT TO STA 51+20 RT -L- SEE DETAIL #8

TOE PROTECTION STA 51+70 RT TO STA 51+90 RT -L- SEE DETAIL #8

@ PROP. LINE 30.48m (100')

SPECIAL DITCH GRADE SEE PROFILE FOR GRADE STA 49+80 RT TO STA 50+00 RT -L- SEE DETAIL #18

PREFORMED SCOUR HOLE BASE=1.4M SEE DETAIL SHEET # 2H

BL-29
PINC 46+26.044
-L- 50+65.48, 27.91 RT

BL-30
PINC 47+73.450
-L- 52+12.64, 19.30 RT

+36.92 PROP. LINE

+49.78 PROPERTY CORNER

0.6M BASE HEAD DITCH LINED W/CLASS 'B' RIPRAP DDE=20 CM EST=8.0 MTONS SEE DETAIL #14

+80.000 42.672m (140.000')

+63.156 39.624m (130.000')

79
WILLIE M. DIXON
CLYDE C. DIXON
DB 154 PG 437
BOM 21 PG 272

LONZY C. DIXON
DB 154 PG 439
BOM 21 PG 272

END C/A & WW FENCE Sta. 52+26.436

BEGIN C/A & WW FENCE Sta. 52+44.978

+20.000 30.480m (100.000') ACCESS POINT

+80.000 30.480m (100.000')

+80.000 35.052 m (115.000')

RONALD E. THOMAS, JR AND WIFE, JODI R. THOMAS
DB 775 PG 607

76
CHARLIE V. JEFFERS & BEVERLY W. JEFFERS
DB 197 PG 435
BOM 5 PG 40

77
AUSTIN B. CLAY HEIRS
DB 180 PG 829

N 32° 37' 31.6" E

SEE SHEET 33 FOR -L- PROFILE.

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Charlotte, NC 28208
NC License Number F-0991

REVISIONS

06-04-08 - ESTABLISHED ACCESS POINT ON PARCEL 80
06-21-10 - PARCEL 78; REVISED PARCEL NAME
09-28-10 - PARCEL 78; REVISED PARCEL INFORMATION
09-09-11 - PARCEL 78; REVISED OWNER NAME/ PARCEL INFORMATION

METRIC
5 0 10

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	16
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.
R /W REV.

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

NAD 83 NC GRID

MATCHLINE STA. 52+80 -L- SEE SHEET 15

MATCHLINE STA. 56+40 -L- SEE SHEET 17

53+00 54+00 55+00 56+00

0.9M BASE TAIL DITCH DDE=9 CM SEE DETAIL #2

0.6M BASE TAIL DITCH DDE=10 CM SEE DETAIL #1

TRANSITION STONE CLASS 'B' RIPRAP 5.0 MTONS

TOE PROTECTION STA 53+67 LT -L- SEE DETAIL #8

STA 53+51 LT TO +40.000 30.480m (100.000') TOE PROTECTION

CLASS 'B' RIPRAP ON BANKS ONLY 6.5 MTONS FF=15 SM

CLASS 'B' RIP RAP GRAU 350

CAT-1

TRANSITION STONE CLASS 'B' RIPRAP 5.0 MTONS

CLASS 'B' RIP RAP (ON BANKS ONLY) +/-1.7 MTONS FF +/-2.1 SM

TOE PROTECTION STA 53+12 RT TO STA 53+20 RT -L- SEE DETAIL #8

FS (EL. 192.25)

HW

RONALD E. THOMAS, JR AND WIFE, JODI R. THOMAS DB 775 PG 607 (78Z)

JAMES F. SHOTWELL, JR. DB 136 PG 469 (80)

BL-31
PINC 49+63.974
-L- 54+03.09, 14.16 RT

BL-32
PINC 50+54.311
-L- 54+93.39, 11.46 RT

N 32° 37' 31.6" E

ACCESS POINT

FENCE Sta. 55+61.088

FENCE Sta. 55+80.841

STD BERM DITCH STA 55+00 RT TO STA 56+40 RT -L-

SEE SHEET 34 FOR -L- PROFILE.

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REVISIONS	
06-04-08 -	ESTABLISHED ACCESS POINT ON PARCEL 80
06-21-10 -	PARCEL 81: REVISED PARCEL NAME. LOCATED WIRE FENCING. PARCEL 82: LOCATED ELECTRIC FENCE
10-31-11 -	PARCEL 80: ADDED PDE AND MODIFIED C/A, FENCE, AND TEMPORARY EASEMENTS

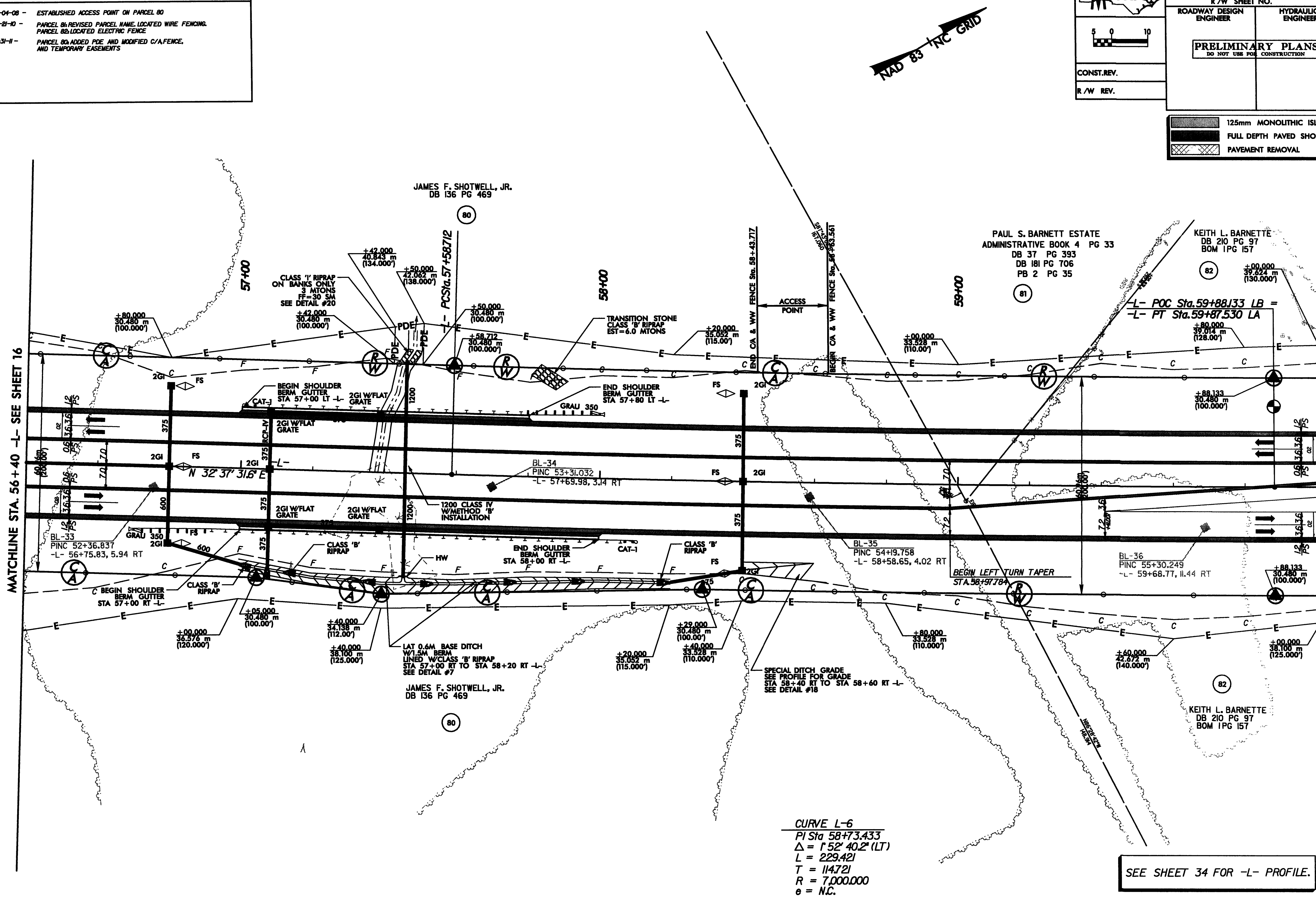
METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST. REV.
R/W REV.

- 125mm MONOLITHIC ISLAND
- FULL DEPTH PAVED SHOULDER
- PAVEMENT REMOVAL



NAD 83 NC GRID
JAMES F. SHOTWELL, JR.
DB 136 PG 469
80
PAUL S. BARNETT ESTATE
ADMINISTRATIVE BOOK 4 PG 33
DB 37 PG 393
DB 181 PG 706
PB 2 PG 35
81
KEITH L. BARNETTE
DB 210 PG 97
BOM 1PG 157
82
57+00
58+00
59+00
-L- PCSta. 57+58.712
-L- POC Sta. 59+88.133 LB =
-L- PT Sta. 59+87.530 LA
MATCHLINE STA. 56+40 -L- SEE SHEET 16
MATCHLINE STA. 60+00 -L- SEE SHEET 18
CLASS 'I' RIPRAP ON BANKS ONLY 3 MTONS FF=30 SM SEE DETAIL #20
TRANSITION STONE CLASS 'B' RIPRAP EST=6.0 MTONS
ACCESS POINT
END C/A & WW FENCE Sta. 58+43.717
BEGIN C/A & WW FENCE Sta. 58+63.561
BEGIN SHOULDER BERM GUTTER STA 57+00 LT -L-
END SHOULDER BERM GUTTER STA 57+80 LT -L-
N 32° 37' 31.6" E
BL-33 PINC 52+36.837 -L- 56+75.83, 5.94 RT
BL-34 PINC 53+31.032 -L- 57+69.98, 3.14 RT
BL-35 PINC 54+19.758 -L- 58+58.65, 4.02 RT
BL-36 PINC 55+30.249 -L- 59+68.77, 11.44 RT
1200 CLASS IV W/METHOD 'B' INSTALLATION
BEGIN SHOULDER BERM GUTTER STA 57+00 RT -L-
END SHOULDER BERM GUTTER STA 58+00 RT -L-
LAT 0.6M BASE DITCH W/1.5M BERM LINED W/CLASS 'B' RIPRAP STA 57+00 RT TO STA 58+20 RT -L- SEE DETAIL #7
SPECIAL DITCH GRADE SEE PROFILE FOR GRADE STA 58+40 RT TO STA 58+60 RT -L- SEE DETAIL #18
BEGIN LEFT TURN TAPER STA. 58+97.784

CURVE L-6
PI Sta 58+73.433
Δ = 1° 52' 40.2" (LT)
L = 229.421
T = 114.721
R = 7,000.000
e = N.C.

SEE SHEET 34 FOR -L- PROFILE.

8/2/2011
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STV/Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

REVISIONS

06-04-08 -	ESTABLISHED ACCESS POINT ON PARCEL 83. DRIVEWAY RECONNECTION ON PARCEL 84A. ESTABLISHED ACCESS POINT ON PARCEL 82. WELL SHOWN ON PARCEL 84A. NEW PARCEL 84A
06-21-10 -	PARCEL 82: LOCATED ELECTRIC FENCE, BARN, EXISTING DRIVEWAYS PARCEL 84A, 84: LOCATED FENCE
09-20-10 -	PARCEL 84A: MOVED RW MONUMENT AND LINE 2 FEET FROM WELL
09-28-10 -	PARCEL 82: REMOVED C/A SYMBOL, ELIMINATED R/W CALL-OUT. RELOCATED FENCE ALONG C/A
10-27-11 -	PARCEL 82: ADDED PDE

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

5 0 10

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R/W REV.

▨	125mm MONOLITHIC ISLAND
■	FULL DEPTH PAVED SHOULDER
▩	PAVEMENT REMOVAL

SEE SHEET 35 FOR -L- PROFILE.
SEE SHEET 42 FOR -Y14- PROFILE.
SEE SHEET 42 FOR -Y15- PROFILE.

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REVISIONS

06-04-08 –	NEW PARCEL 87A AND PROPERTY LINE CHANGE ON PARCEL 87
06-21-10 –	PARCEL 82: LOCATED FENCE PARCEL 87A: LOCATED SHED, GARAGE, MOBILE HOME, REVISED PARCEL NAME PARCEL 90: REVISED PARCEL NAME
08-02-11 –	COMBINED PARCEL 87A WITH PARCEL 87 CHANGED PROPERTY INFORMATION ON PARCEL 89
09-09-11 –	PARCEL 87: REVISED OWNER NAME
10-27-11 –	PARCEL 85, 86, 87Z AND 89Z: MODIFIED C/A, FENCE, AND TEMPORARY EASEMENTS

METRIC

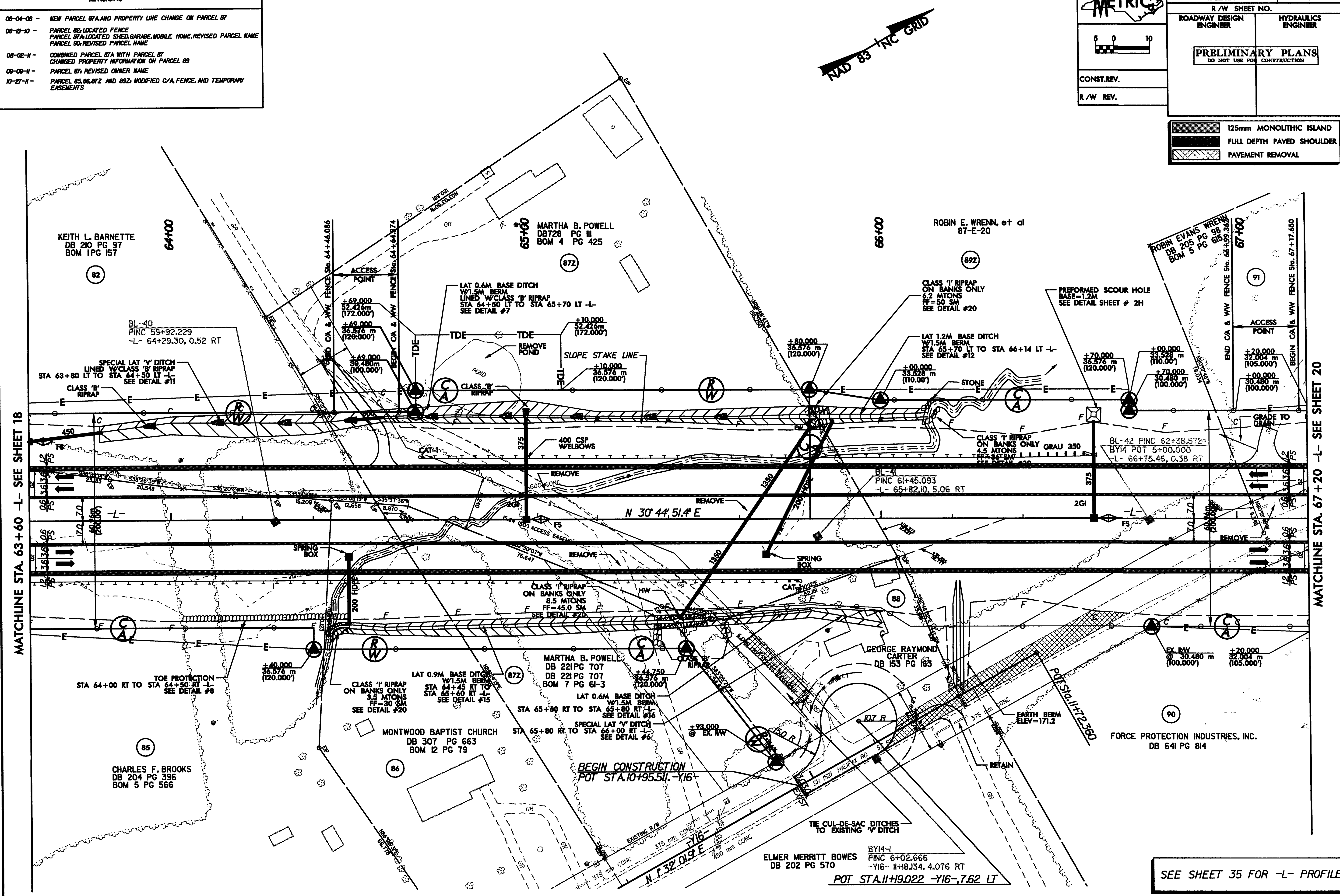
PROJECT REFERENCE NO.	SHEET NO.
R-2241A	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST. REV.

R/W REV.

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



NAD 83 NC GRID
MATCHLINE STA. 63+60 -L- SEE SHEET 18
MATCHLINE STA. 67+20 -L- SEE SHEET 20
64+00
65+00
66+00
67+00
KEITH L. BARNETTE
DB 210 PG 97
BOM 1 PG 157
MARTHA B. POWELL
DB728 PG 111
BOM 4 PG 425
ROBIN E. WRENN, et al
87-E-20
ROBIN EVANS WRENN
DB 205 PG 98
BOM 5 PG 61
ACCESS POINT
LAT 0.6M BASE DITCH
W/1.5M BERM
LINED W/CLASS 'B' RIPRAP
STA 64+50 LT TO STA 65+70 LT -L-
SEE DETAIL #7
CLASS 'I' RIPRAP
ON BANKS ONLY
6.2 MTONS
FF=50 SM
SEE DETAIL #20
PREFORMED SCOUR HOLE
BASE=1.2M
SEE DETAIL SHEET # 2H
BL-40
PINC 59+92.229
-L- 64+29.30, 0.52 RT
REMOVE POND
SLOPE STAKE LINE
LAT 1.2M BASE DITCH
W/1.5M BERM
STA 65+70 LT TO STA 66+14 LT -L-
SEE DETAIL #12
SPECIAL LAT 'V' DITCH
LINED W/CLASS 'B' RIPRAP
STA 63+80 LT TO STA 64+50 LT -L-
SEE DETAIL #11
CLASS 'B' RIPRAP
STONE
GRADE TO DRAIN
400 CSP
W/ELBOWS
CLASS 'I' RIPRAP
ON BANKS ONLY
4.5 MTONS
BL-42 PINC 62+38.572=
BY14 POT 5+00.000
-L- 66+75.46, 0.38 RT
BL-41
PINC 61+45.093
-L- 65+82.10, 5.06 RT
REMOVE
N 30° 44' 51.4" E
ACCESS EASEMENT
SPRING BOX
CLASS 'I' RIPRAP
ON BANKS ONLY
8.5 MTONS
FF=45.0 SM
SEE DETAIL #20
TOE PROTECTION
STA 64+00 RT TO STA 64+50 RT -L-
SEE DETAIL #8
CLASS 'I' RIPRAP
ON BANKS ONLY
3.5 MTONS
FF=30 SM
SEE DETAIL #20
LAT 0.9M BASE DITCH
W/1.5M BERM
STA 64+45 RT TO STA 65+60 RT -L-
SEE DETAIL #15
MARTHA B. POWELL
DB 221 PG 707
DB 221 PG 707
BOM 7 PG 61-3
LAT 0.6M BASE DITCH
W/1.5M BERM
STA 65+60 RT TO STA 65+80 RT -L-
SEE DETAIL #16
SPECIAL LAT 'V' DITCH
STA 65+80 RT TO STA 66+00 RT -L-
SEE DETAIL #6
GEORGE RAYMOND CARTER
DB 153 PG 183
EARTH BERM
ELEV=171.2
RETAIN
POT Sta. 11+72.360
MONTWOOD BAPTIST CHURCH
DB 307 PG 663
BOM 12 PG 79
CHARLES F. BROOKS
DB 204 PG 396
BOM 5 PG 566
BEGIN CONSTRUCTION
POT STA. 10+95.511 -Y16-
TIE CUL-DE-SAC DITCHES
TO EXISTING 'V' DITCH
FORCE PROTECTION INDUSTRIES, INC.
DB 641 PG 814
ELMER MERRITT BOWES
DB 202 PG 570
BY14-1
PINC 6+02.666
-Y16- 11+18.134, 4.076 RT
POT STA. 11+19.022 -Y16- 7.62 LT
SR 1521 HALIFAX RD
-Y16-

SEE SHEET 35 FOR -L- PROFILE.

8/2/2011
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REVISIONS	
06-21-10 -	PARCEL 90, REVISED PARCEL NAME
08-02-11 -	CHANGED PROPERTY OWNER INFORMATION ON PARCEL 89

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

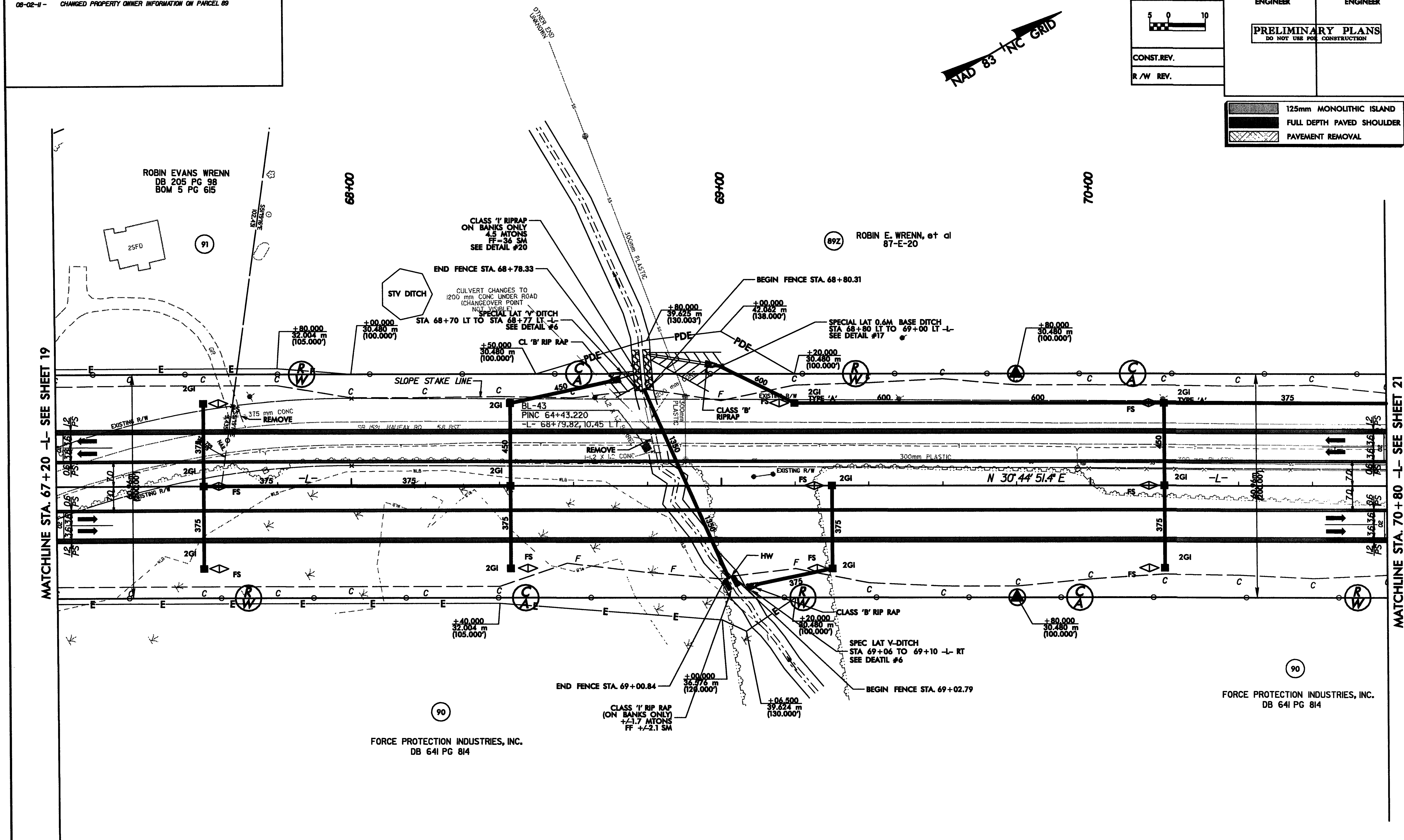
METRIC

CONST. REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL



NAD 83 NC GRID
MATCHLINE STA. 67+20 -L- SEE SHEET 19
MATCHLINE STA. 70+80 -L- SEE SHEET 21
68+00
69+00
70+00
ROBIN EVANS WRENN
DB 205 PG 98
BOM 5 PG 615
ROBIN E. WRENN, et al
87-E-20
FORCE PROTECTION INDUSTRIES, INC.
DB 641 PG 814
STV DITCH
CULVERT CHANGES TO 1200 mm CONC UNDER ROAD (CHANGEOVER POINT NOT VISIBLE)
CLASS 'I' RIPRAP ON BANKS ONLY 4.5 MTONS FF=36 SM SEE DETAIL #20
END FENCE STA. 68+78.33
SPECIAL LAT 'V' DITCH STA 68+70 LT TO STA 68+77 LT -L- SEE DETAIL #6
CL 'B' RIP RAP
BEGIN FENCE STA. 68+80.31
SPECIAL LAT 0.6M BASE DITCH STA 68+80 LT TO 69+00 LT -L- SEE DETAIL #17
SLOPE STAKE LINE
BL-43
PINC 64+43.220
-L- 68+79.82, 10.45 LT
REMOVE
375 mm CONC REMOVE
CLASS 'B' RIPRAP
N 30°44' 51.4" E
SR 1521 HALIFAX RD.
EXISTING R/W
HW
CLASS 'B' RIP RAP
SPEC LAT V-DITCH STA 69+06 TO 69+10 -L- RT SEE DEATIL #6
END FENCE STA. 69+00.84
BEGIN FENCE STA. 69+02.79
CLASS 'I' RIP RAP (ON BANKS ONLY) +/-1.7 MTONS FF +/-2.1 SM
OTHER END UNKNOWN
300mm PLASTIC

SEE SHEET 36 FOR -L- PROFILE.

11/2/2011
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Charlotte, NC 28208
NC License Number F-0991

REVISIONS

06-04-08 -	ESTABLISHED ACCESS POINT ON PARCEL 90
06-21-10 -	PARCEL 90; LOCATED BARBWIRE FENCE, REVISED PARCEL NAME PARCEL 91; LOCATED ISBK BUSINESS PARCEL 96; REVISED PARCEL NAME
08-02-11 -	CHANGED PROPERTY OWNER INFORMATION ON PARCELS 89,92,94,97
09-09-11 -	PARCEL 96; REVISED OWNER NAME

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	21
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC 5 0 10

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R /W REV.

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

NAD 83 NC GRID

EMILY BOHANNON
DB 138 PG 399
BOM 11 PG 34

LILLIS LOFTIS et al
DB 340 PG 113

ALISSA K. CHAPMAN
DB 119 PG 313
BOM 11 PG 34

FITZGERALD T. BOWES
LIFE ESTATE
DB 661 PG 440
BOM 11 PG 34

FRIENDSHIP FREEWILL BAPTIST CHURCH
DB 145 PG 69
BOM 11 PG 34

MARTHA B. POWELL
DB 123 PG 462
BOM 11 PG 34

ROBIN E. WRENN, et al
87-E-20

RICKY D. WILSON
TONYA R. WILSON
DB 668 PG 634
BOM 11 PG 34

STEVEN BRIGGS
DB 150 PG 38
BOM 10 PG 70
WILL BOOK 07-E-265

FORCE PROTECTION INDUSTRIES, INC.
DB 641 PG 814

NOTE: DO NOT DISTURB TREE

SLOPE STAKE LINE

ACCESS POINT

END C/A & WW FENCE Sta. 71+40.697
END C/A Sta. 71+78.440
BEGIN C/A & WW FENCE Sta. 71+58.585
BEGIN C/A Sta. 71+90.000
END C/A Sta. 72+04.71
BEGIN C/A Sta. 72+23.00
END C/A Sta. 72+39.031
BEGIN C/A Sta. 72+57.000
END C/A Sta. 73+20.545
BEGIN C/A Sta. 73+38.833
END C/A Sta. 73+44.762
BEGIN C/A & WW FENCE Sta. 73+63.044
END C/A & WW FENCE Sta. 74+36.185

+00.000
30.480 m
(100.000')

U/G SEPTIC LINE AS MARKED BY PERSON COUNTY HEALTH DEPARTMENT

REMOVE

375 mm CONC

375 RCP-V

300 mm PLASTIC

2400mm CHL 2SRW

BL-44
PINC 67+67.766
-L- 72+04.32, 5.16 LT

N 36° 44' 51.4" E

SR 1521 HALIFAX RD T.D BST

BEGIN LEFT TURN TAPER
STA.74+32.612

220 MERGE TAPER LT

MATCHLINE STA. 70+80 -L- SEE SHEET 20

MATCHLINE STA. 74+40 -L- SEE SHEET 22

SEE SHEET 36 FOR -L- PROFILE.

11/2/2011
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1000 Westmoreland St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

REVISIONS

06-21-10 – PARCEL 98: REVISED PARCEL NAME
PARCEL 90: LOCATED BARBWIRE FENCE, REVISED PARCEL NAME

10-27-11 – PARCEL 90: MODIFIED C/A, FENCE, AND TEMPORARY EASEMENTS

METRIC

5 0 10

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST. REV.

R/W REV.

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

NAD 83 NC GRID

MATCHLINE STA. 12+20 -Y17- SEE SHEET 27

MATCHLINE STA. 74+40 -L- SEE SHEET 21

MATCHLINE STA. 78+00 -L- SEE SHEET 23

WINFRED CARLTON CLAYTON
DB 155 PG 140
DB 120 PG 46
BOM 10 PG 70

STEVEN BRIGGS
DB 150 PG 38
BOM 10 PG 70
WILL BOOK 07-E-265

ANNE SHOTWELL LIFE ESTATE
DB 261 PG 486
BOM 12 PG 337

FORCE PROTECTION INDUSTRIES, INC.
DB 641 PG 814

U.G. SEPTIC TANK AS MARKED BY PERSON COUNTY HEALTH DEPARTMENT

BEGIN CA & WW FENCE Sta. 74+54.473

BEGIN CA & WW FENCE Sta. 75+39.684

ACCESS POINT

SLOPE STAKE LINE

REMOVE 375 mm CONC

EXISTING R/W

375 mm PVC

375 mm CONC

SPECIAL DITCH SEE PROFILE FOR GRADE STA 12+80 RT TO STA 12+93 RT -Y17-

BL-45 PINC 70+52.307 -L- 74+88.86, 3.37 LT

REMOVE

2GI TYPE 'A'

FUTURE PAINTED ISLAND

600 RCP

POT Sta.76+06.312 -L- =
POT Sta.13+18.495 -Y17-

END LEFT TURN TAPER STA 74+84.22

END CONSTRUCTION SOUTHBOUND LANE STA.78+00.000 -L-

RETAIN

0.6M BASE DITCH DDE=6.0 CM SEE DETAIL #1

REMOVE

45 RIGHT TURN TAPER

SPECIAL DITCH SEE PROFILE FOR GRADE STA 76+56 (SAG) TO STA 77+00 LT -L- SEE DETAIL #18

PT Sta.13+03.279

BL-46 (AATFI) PINC 72+55.207 -L- 76+91.76, 4.11 LT

GRADE TO DRAIN

FUTURE PAINTED ISLAND

-L- N 30° 44' 51.4" E

SPECIAL LAT 0.6M BASE DITCH STA 76+20 RT TO STA 76+46 RT -L- SEE DETAIL #17

CLASS 'B' RIPRAP

0.9M BASE TAIL DITCH DDE=4.5 CM SEE DETAIL #2

SEE EROSION CONTROL PLANS FOR LIVE STAKING AND REFORESTATION. (90)

END CONSTRUCTION NORTHBOUND LANE Sta.76+77.000 -L-

POT Sta.76+44.834 -L-, 8.800 RT. =
PC Sta.76+44.834 -XI-

US 501
-Y17- TRAFFIC VOLUMES

4550 / 9050 / -Y17- / 1300 / 2967 / 3250 / 6083 / 4650 / 8117 / 6900 / 11233 / -L- / -L- / 2007 / 2027 ADT

CURVE Y17-I
PI Sta 12+26.836
Δ = 58° 53' 09.1" (RT)
L = 169.579
T = 93.136
R = 165.000
e = 0.08
Runoff = 50

CURVE XI-I
PI Sta 77+60.175
Δ = 4° 24' 12.8" (LT)
L = 230.570
T = 115.342
R = 3000.000
e = SEE PLANS

SEE SHEET 37 FOR -L- PROFILE.
SEE SHEET 43 FOR -Y17- PROFILE.

STV/Ralph Whitehead Associates, Inc.
1000 West Morehead St. Ste. 200
Charlotte, NC 28208
NC License Number F-0991

REVISIONS

06-04-08 -	DRIVEWAY RECONNECTION ON PARCELS 100,101,103,105,106,107,108 SHIFTED ACCESS POINT ON PARCEL 107, PROPERTY LINE CHANGES ON PARCELS 101,102,103,104,108 AND NAME CHANGE ON PARCELS 101,103,108
06-24-08 -	PROVIDED ACCESS ON PARCEL 102.
06-21-10 -	PARCEL 90 LOCATED BARBWIRE FENCE, REVISED PARCEL NAME PARCEL 108, REVISED PARCEL NAME
08-02-11 -	CHANGED PROPERTY OWNER INFORMATION ON PARCELS 101,106,108
09-09-11 -	PARCEL 102 & 107, REVISED OWNER NAMES

METRIC

5 0 10

CONST.REV.

R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL

NAD 83 NC GRID

MATCHLINE STA. 78+00 -L- SEE SHEET 22

ANNE SHOTWELL
LIFE ESTATE
DB 261 PG 486
BOM 12 PG 337
100

MICHAEL E. VICKERS
DB 214 PG 647
BOM 4 PG 794
105

CHARLOTTE MELTON et al
DB 429 PG 161
BOM 34 PG 34
106

BESSIE JANE WALKER "HEIRS"
DB 121 PG 68
107

BLAKE E. THORNBURG
DB 645 PG 331
108

LOUISE S. THOMAS
DB 146 PG 645
102

LOUISE S. THOMAS
DB 179 PG 749
102

FORCE PROTECTION INDUSTRIES, INC.
DB 641 PG 814
90

ADDIE T. WADE
DB 179 PG 387

DAVID N. ALLEN
DB 559 PG 281
103

ANDREW L. HOLEMAN
DB 157 PG 164
BOM 23 PG 102
104

ANNIE RUTH KENDRICK
LIFE ESTATE
DB 532 PG 412
101

END CONSTRUCTION SOUTHBOUND LANE
BEGIN TEMP SBL
STA.78+00.000 -L- =
STA.78-00.000 -TEMP SBL-

END TEMP SBL
STA 79+69.997 -TEMP SBL- =
STA 79+69.986 -L-

END CONSTRUCTION
STA.80+31.479 -L-

END STATE PROJECT R-2241A
POT Sta.81+63.869 -L-, 10.564 LT.

BL-172
PINC 73+87.199=
BY17-2 PINC 10+20.156
-L- 78+21.43, 28.73 LT

BL-4000
PINC 75+31.027
-L- 79+64.84, 17.67 LT

BL-182
PINC 76+96.940=
BY18-2 POT 5+00.000
-L- 81+30.75, 17.55 LT

-TEMP SBL-
TEMP ALIGNMENT
-L-
N 30° 05' 06.8" E
N 30° 44' 51.4" E
US 501 T.A BST
EXISTING R/W
ACCESS POINT
RETAIN
RETAIN DITCH
REMOVE
COLLAR
375 RCP-III
300 mm CONC
375 mm CONC
450 mm CMP
575 mm CONC
END CA & WW FENCE EX. R/W
END C/A STA. 81+63.869 @ EX. R/W
+40.000 30.480 m (100.000')
+62.256 30.480 m (100.000')
+28.953 30.480 m (100.000')
+37.000 30.480 m (100.000')
+43.452

CURVE XI-1
PI Sta 77+60.175
Δ = 4° 24' 12.8" (LT)
L = 230.570
T = 115.342
R = 3,000.000

CURVE XI-2
PI Sta 80+12.920
Δ = 4° 26' 03.6" (RT)
L = 232.182
T = 116.149
R = 3000.000

ALL DRIVEWAY RADII 6M TYP. UNLESS OTHERWISE NOTED

SEE SHEET 37 FOR -L- PROFILE.
SEE SHEET 43 FOR -XI- PROFILE.

STV/Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

REVISIONS

06-04-08 –	DRIVEWAY RECONNECTIONS PARCELS 60,58,59 MOVED ROW MONUMENT ON PARCEL 58, WELL SHOWN ON PARCEL 59
01-13-09 –	OWNERSHIP CHANGE PARCEL 43G
06-21-10 –	PARCEL 43F; LOCATED PROPANE TANK
02-01-11 –	PARCEL 59: UPDATED PARCEL INFORMATION ADDED PARCELS 8B,8C AND 8D. ADDED EASEMENT TO PARCELS PARCEL 60: ADDED SEPTIC LINE PARCEL 8B: ADDED PARCEL INFORMATION PARCELS 8C,8D: UPDATED EASEMENT LINE
08-02-11 –	PARCEL 10: RECONNECTED DRIVEWAY COMBINED PARCELS 43A-43G,46 INTO TRACTS (A-I), DENOTING EACH ACCORDINGLY

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	24
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

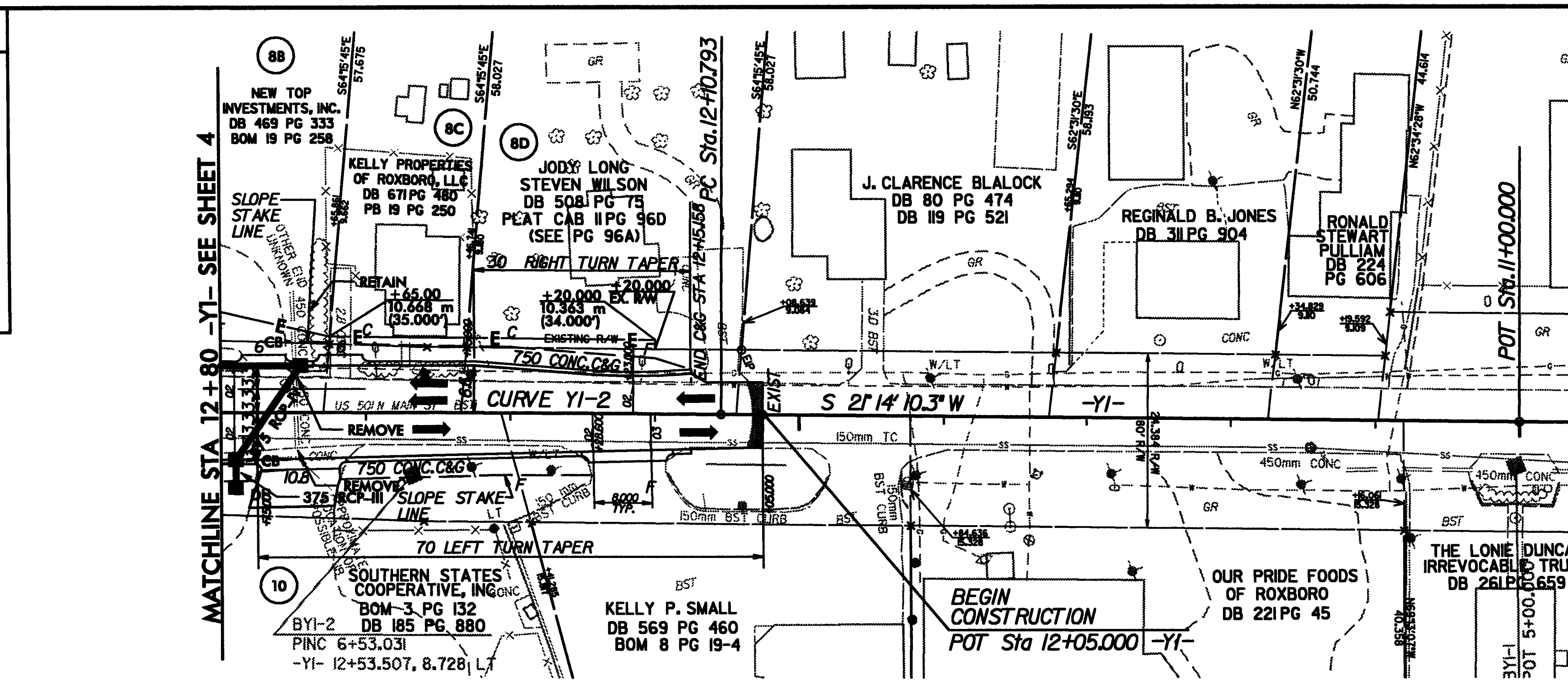
METRIC

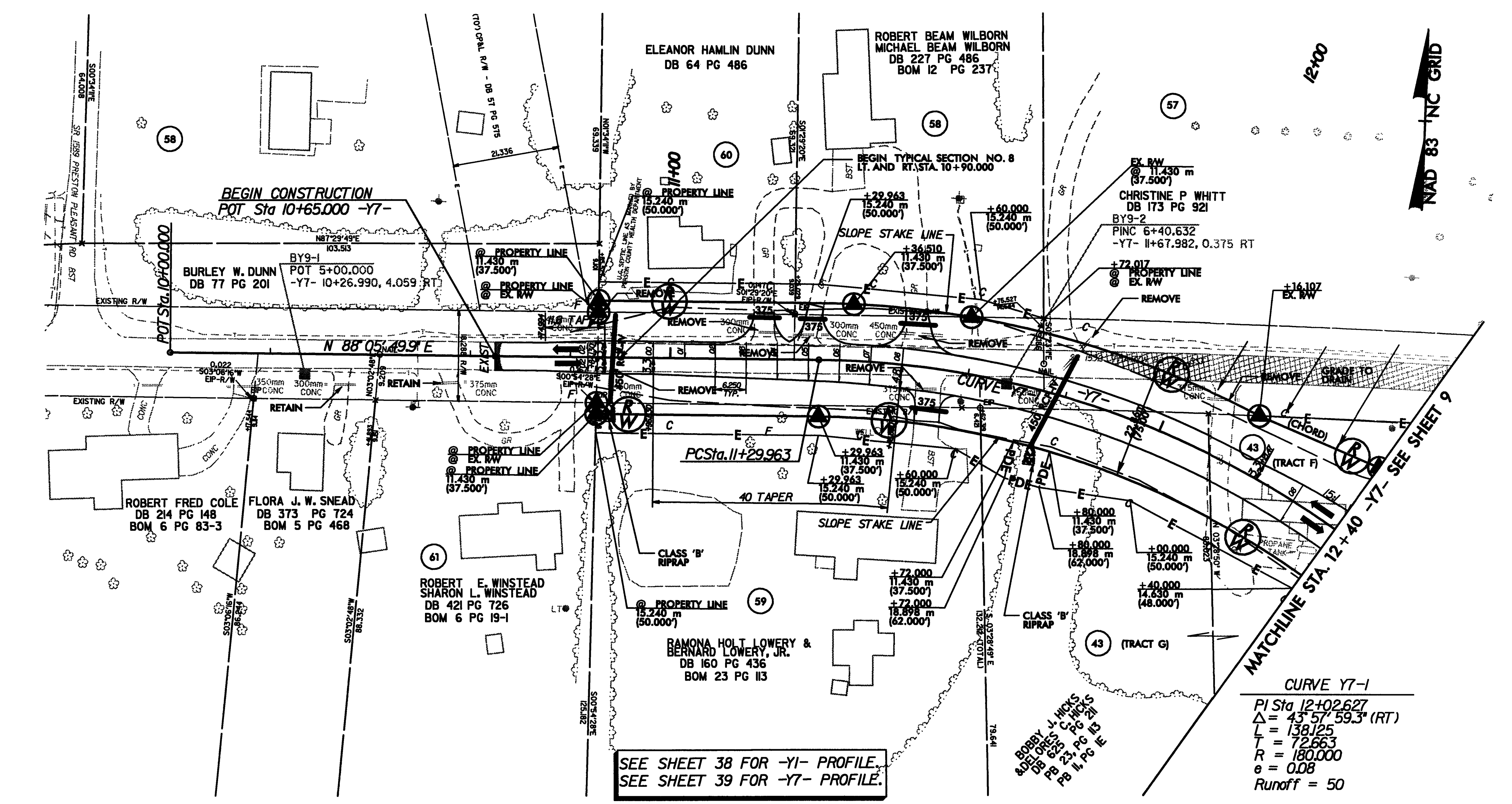
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST. REV.
R/W REV.

- 125mm MONOLITHIC ISLAND
- FULL DEPTH PAVED SHOULDER
- PAVEMENT REMOVAL

CURVE Y1-2
PI Sta 12+54.878
Δ = 0° 45' 01.5" (LT)
L = 88.170
T = 44.086
R = 6731.947
e = NC


MATCHLINE STA. 12+80 -Y1- SEE SHEET 4
NEW TOP INVESTMENTS, INC. DB 469 PG 333 BOM 19 PG 258
KELLY PROPERTIES OF ROXBORO, LLC DB 671 PG 480 PB 19 PG 250
JODY LONG STEVEN WILSON DB 508 PG 75 PLAT CAB II PG 96D (SEE PG 96A)
J. CLARENCE BLALOCK DB 80 PG 474 DB 119 PG 521
REGINALD B. JONES DB 311 PG 904
RONALD STEWART PULLIAM DB 224 PG 606
CURVE Y1-2
S 2° 14' 10.3" W
-Y1-
30 RIGHT TURN TAPER
70 LEFT TURN TAPER
SOUTHERN STATES COOPERATIVE, INC BOM 3 PG 132 DB 185 PG 880
KELLY P. SMALL DB 569 PG 460 BOM 8 PG 19-4
BEGIN CONSTRUCTION POT Sta 12+05.000 -Y1-
OUR PRIDE FOODS OF ROXBORO DB 221 PG 45
THE LONIE DUNCAN IRREVOCABLE TRUST DB 261 PG 659
BY1-2 PINC 6+53.031 -Y1- 12+53.507, 8.728 LT
PC Sta. 12+10.793
POT Sta. 11+00.000
NAD 83 NC GRID


ELEANOR HAMLIN DUNN DB 64 PG 486
ROBERT BEAM WILBORN MICHAEL BEAM WILBORN DB 227 PG 486 BOM 12 PG 237
BEGIN CONSTRUCTION POT Sta 10+65.000 -Y7-
BURLEY W. DUNN DB 77 PG 201
BY9-1 POT 5+00.000 -Y7- 10+26.990, 4.059 RT
BEGIN TYPICAL SECTION NO. 8 LT. AND RT. STA. 10+90.000
CHRISTINE P WHITT DB 173 PG 921
BY9-2 PINC 6+40.632 -Y7- 11+67.982, 0.375 RT
N 88° 05' 49.9" E
POT Sta. 10+00.000
PC Sta. 11+29.963
40 TAPER
SLOPE STAKE LINE
CLASS 'B' RIPRAP
ROBERT FRED COLE DB 214 PG 148 BOM 6 PG 83-3
FLORA J. W. SNEAD DB 373 PG 724 BOM 5 PG 468
ROBERT E. WINSTEAD SHARON L. WINSTEAD DB 421 PG 726 BOM 6 PG 19-1
RAMONA HOLT LOWERY & BERNARD LOWERY, JR. DB 160 PG 436 BOM 23 PG 113
BOBBY J. HICKS & DELORES C. HICKS DB 625 PG 211 PB 23, PG 113 PB 11, PG 1E
MATCHLINE STA. 12+40 -Y7- SEE SHEET 9
NAD 83 NC GRID

SEE SHEET 38 FOR -Y1- PROFILE.
SEE SHEET 39 FOR -Y7- PROFILE.

CURVE Y7-1
PI Sta 12+02.627
Δ = 43° 57' 59.3" (RT)
L = 138.125
T = 72.663
R = 180.000
e = 0.08
Runoff = 50

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06-04-08 -	SHIFTED ROW MONUMENT OFF OF PROPERTY LINE ON PARCEL 44, CO-LOCATED ROW AND SE PROPERTY CORNER OF PARCEL 45, DRIVEWAY RECONNECTION PARCEL 41, RELOCATED TCE ON PARCEL 48, REDUCED ROW ON PARCEL 50, NAME CHANGE ON PARCELS 48,49
06-24-08 -	EXTENDED ROW AND RELOCATED ROW MONUMENT ON PARCEL 44 TO EXISTING ROW.
01-13-09 -	OWNERSHIP CHANGE: PARCELS 45,46,50, PROPERTY LINE CHANGE BETWEEN PARCELS 48 AND 49
06-21-10 -	PARCEL 41: REVISED PARCEL NAME

REVISIONS

09-20-10 -	PARCEL 48: ADDED LIMITS OF DRIVE CONSTRUCTION OFF -Y10-, ADDED A DRIVE OFF -Y8-, ADDED PAVEMENT REMOVAL
02-01-11 -	PARCEL 45: ADDED DRIVEWAY RECONNECTION AND PIPE. PARCEL 47: UPDATED PARCEL INFORMATON. PARCEL 49: ADDED DRIVEWAY RECONNECTION. PARCEL 48: UPDATED DRAINAGE, CONC. CURB R/W LINE, AND EASEMENTS. PARCEL 50: UPDATED DRAINAGE.
08-02-11-	COMBINED PARCELS 43A-43G,46 INTO TRACTS (A-I), DENOTING EACH ACCORDINGLY PARCEL 44: CHANGED PROPERTY OWNER NAME PARCEL 52: ELIMINATED CLAIM

METRIC

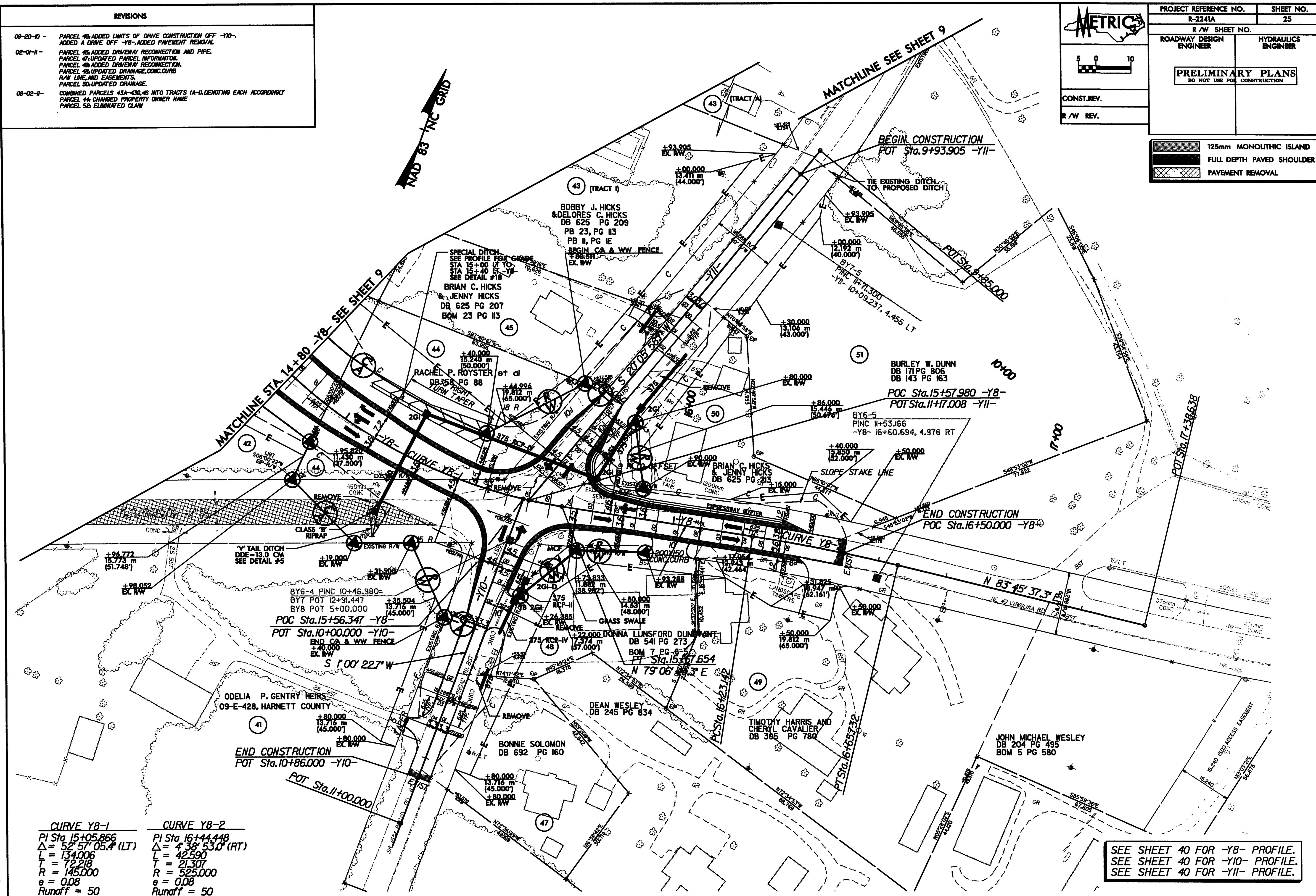
PROJECT REFERENCE NO.	SHEET NO.
R-2241A	25
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST. REV.

R/W REV.

- 125mm MONOLITHIC ISLAND
- FULL DEPTH PAVED SHOULDER
- PAVEMENT REMOVAL



CURVE Y8-1	CURVE Y8-2
PI Sta 15+05.866	PI Sta 16+44.448
Δ = 52° 57' 05.4" (LT)	Δ = 4° 38' 53.0" (RT)
L = 134.006	L = 42.590
T = 72.218	T = 21.307
R = 145.000	R = 525.000
e = 0.08	e = 0.08
Runoff = 50	Runoff = 50

SEE SHEET 40 FOR -Y8- PROFILE.
SEE SHEET 40 FOR -Y10- PROFILE.
SEE SHEET 40 FOR -Y11- PROFILE.

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REVISIONS	
06-04-08 -	DRIVEWAY RECONNECTION ON PARCEL 64, NEW PARCELS 54A, 54B, PROPERTY LINE CHANGE PARCELS 54, 63
02-09-09 -	REMOVED PARCEL 63A, UPDATED DEED AND PLAT REFERENCES FOR PARCEL 63, UPDATED OWNERSHIP INFORMATION FOR PARCEL 54
06-21-10 -	PARCEL 54B, NO CLAIM
02-01-11 -	PARCEL 54A, LOCATED WELL

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	26
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

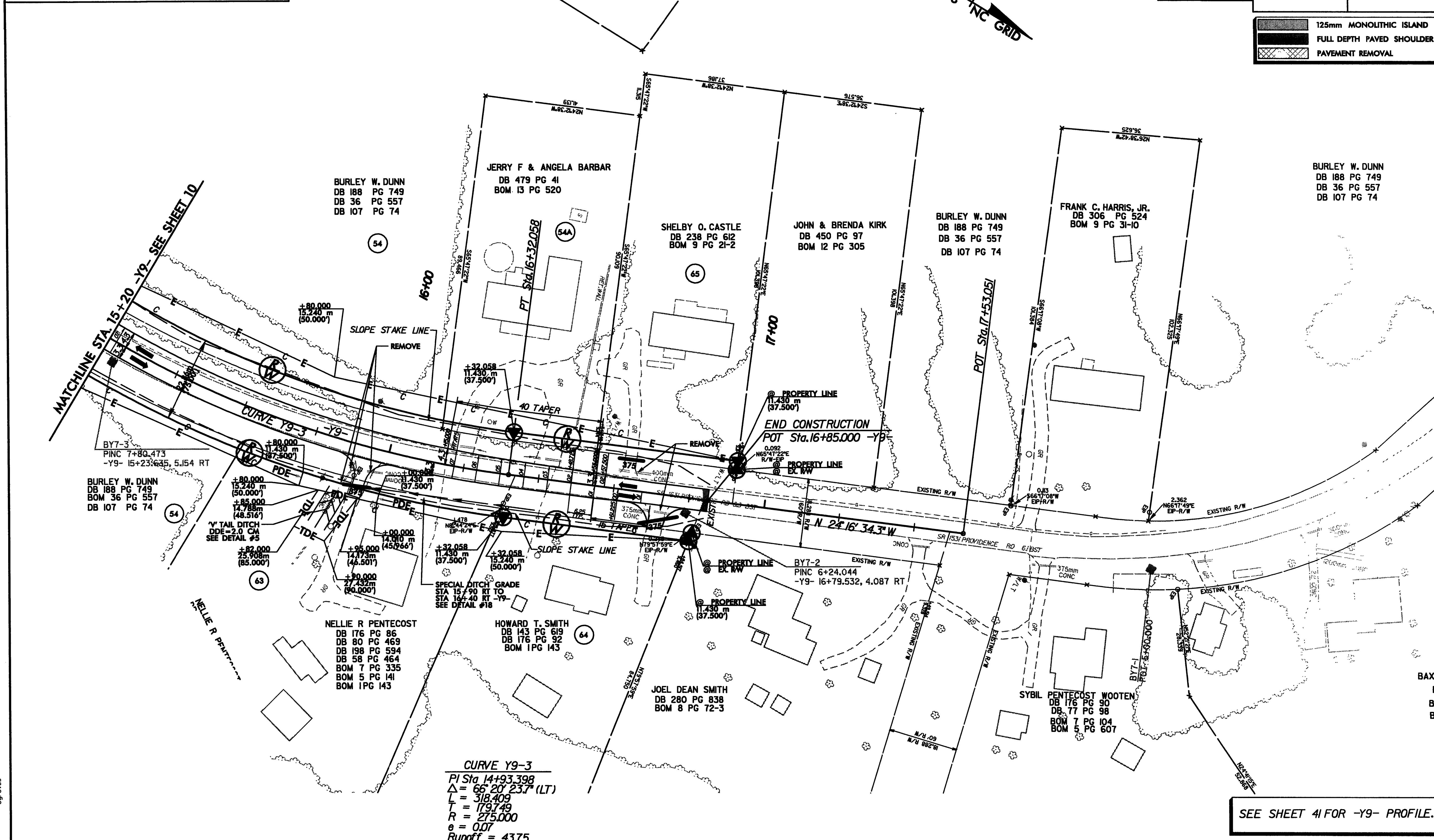
METRIC

CONST. REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

- 125mm MONOLITHIC ISLAND
- FULL DEPTH PAVED SHOULDER
- PAVEMENT REMOVAL



CURVE Y9-3
PI Sta 14+93.398
Δ = 66° 20' 23.7" (LT)
L = 318.409
T = 179.749
R = 275.000
e = 0.07
Runoff = 43.75

SEE SHEET 41 FOR -Y9- PROFILE.

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REVISIONS

08-02-11- CHANGED PROPERTY OWNER NAME, OUTSIDE CONSTRUCTION LIMITS.

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

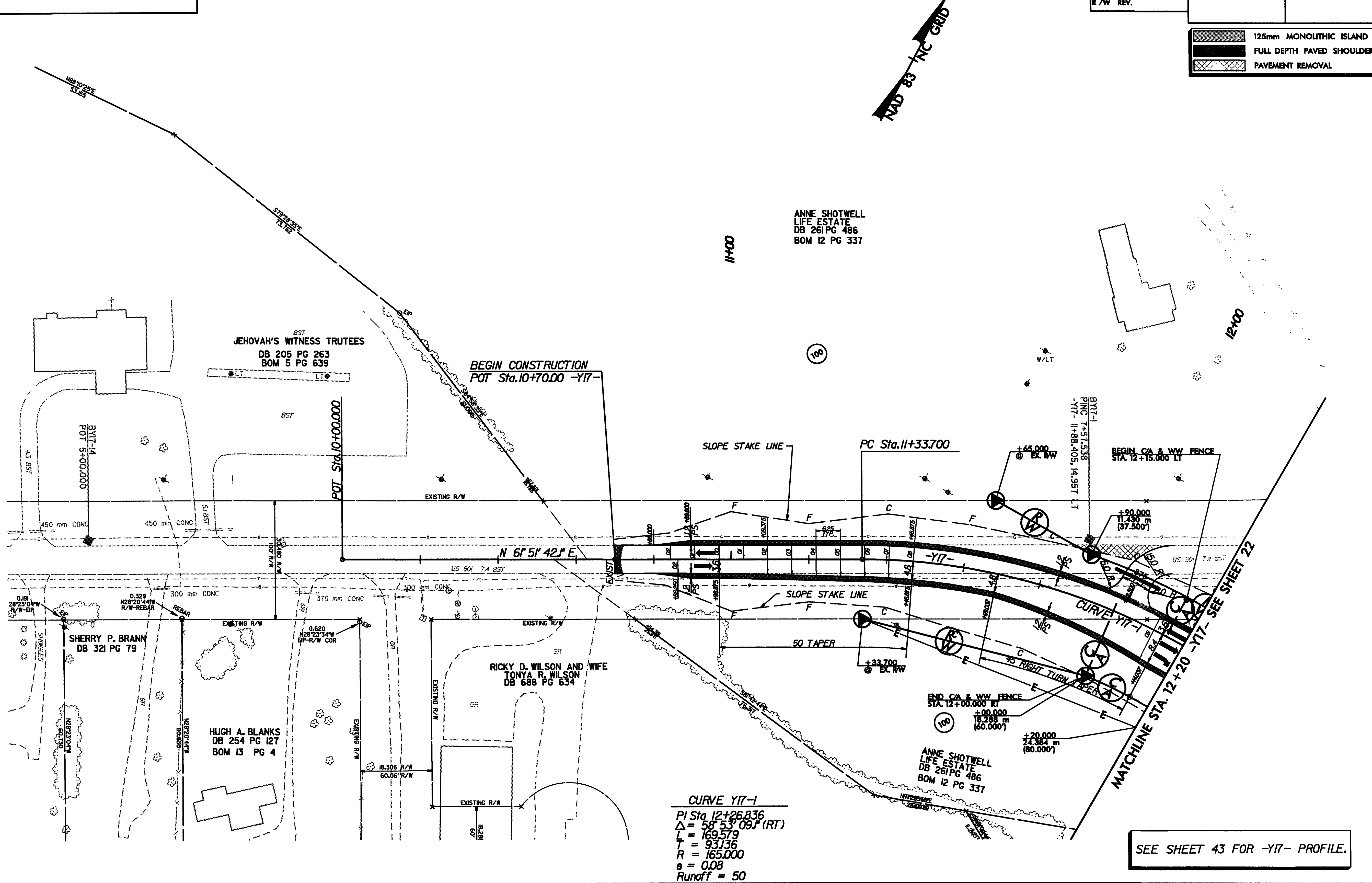
METRIC

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R/W REV.

125mm MONOLITHIC ISLAND
FULL DEPTH PAVED SHOULDER
PAVEMENT REMOVAL


NAD 83 NC GRID
ANNE SHOTWELL
LIFE ESTATE
DB 261 PG 486
BOM 12 PG 337
JEHOVAH'S WITNESS TRUTEES
DB 205 PG 263
BOM 5 PG 639
BEGIN CONSTRUCTION
POT Sta.10+70.00 -Y17-
POT Sta.10+00.000
BY17-14
POT 5+00.000
SLOPE STAKE LINE
PC Sta.11+33.700
BY17-1
PINC 7+57.538
-Y17- 11+88.405, 14.957 LT
BEGIN C/A & WW FENCE
STA. 12+15.000 LT
N 61° 51' 42.1" E
-Y17-
US 501 7.4 BST
EXISTING R/W
50 TAPER
45 RIGHT TURN TAPER
CURVE Y17-1
END C/A & WW FENCE
STA. 12+00.000 RT
SHERRY P. BRANN
DB 321 PG 79
RICKY D. WILSON AND WIFE
TONYA R. WILSON
DB 688 PG 634
HUGH A. BLANKS
DB 254 PG 127
BOM 13 PG 4
MATCHLINE STA. 12+20 -Y17- SEE SHEET 22

CURVE Y17-1
PI Sta 12+26.836
Δ = 58° 53' 09.1" (RT)
L = 169.579
T = 93.136
R = 165.000
e = 0.08
Runoff = 50

SEE SHEET 43 FOR -Y17- PROFILE.

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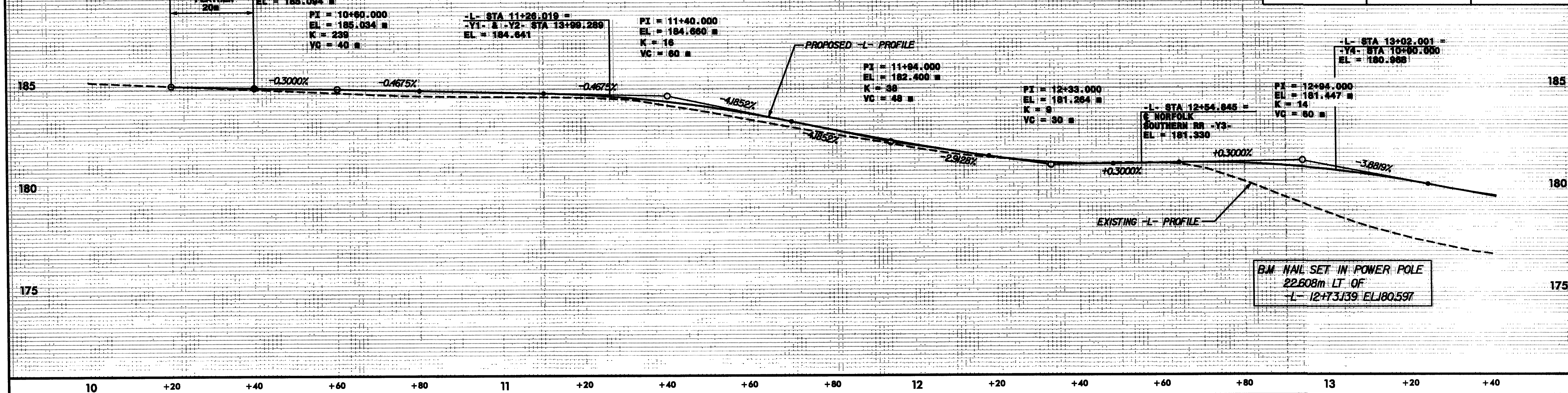
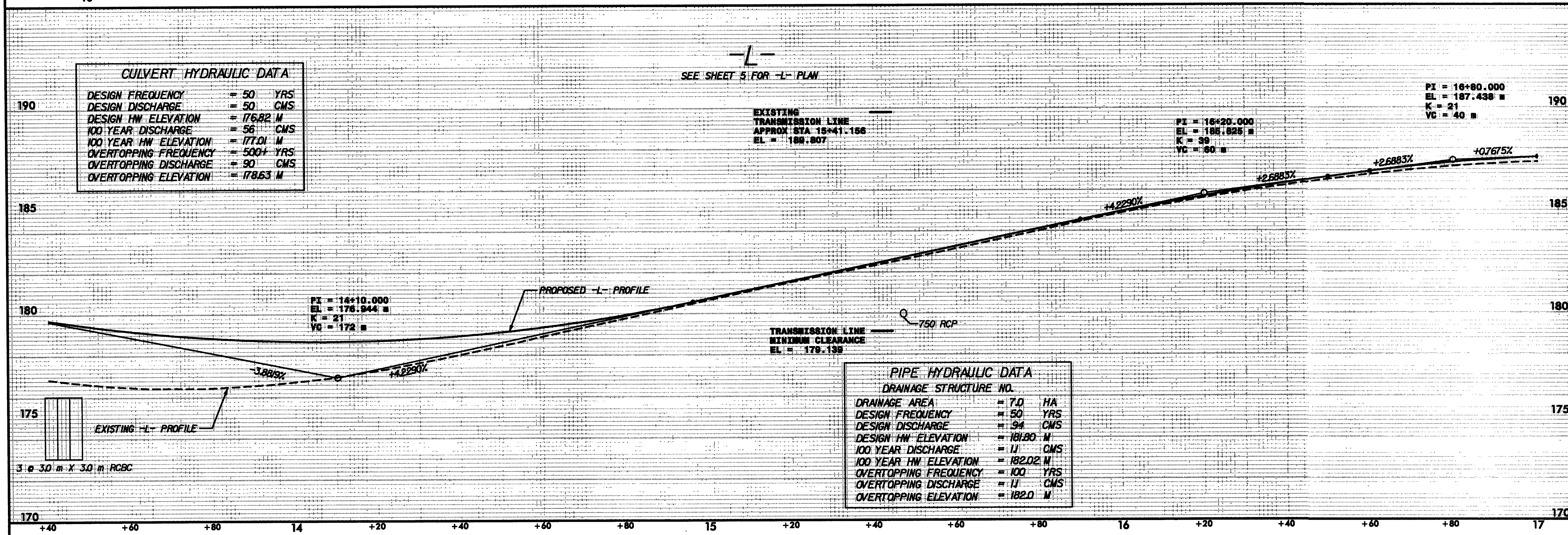
PROJECT REFERENCE NO.	SHEET NO.
R-2241A	28

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.
R /W REV.


METRIC
5 0 10 HORIZ.
1 0 2 VERT.
DITCH LEGEND
LEFT DITCH
MEDIAN DITCH
-L-
SEE SHEET 4 FOR -L- PLAN
BEGIN STATE PROJECT R-2241A
BEGIN CONSTRUCTION
STA 10+20.000
EL = 185.195
FEATHER 20m
BEGIN GRADE
STA 10+40.000
EL = 185.094 m
PI = 10+60.000
EL = 185.034 m
K = 239
VC = 40 m
-L- STA 11+26.019 =
-Y1- & -Y2- STA 13+99.289
EL = 184.641
PI = 11+40.000
EL = 184.660 m
K = 16
VC = 60 m
PROPOSED -L- PROFILE
PI = 11+94.000
EL = 182.400 m
K = 38
VC = 48 m
PI = 12+33.000
EL = 181.264 m
K = 8
VC = 30 m
-L- STA 12+54.845 =
℄ NORFOLK
SOUTHERN RR -Y3-
EL = 181.330
PI = 12+94.000
EL = 181.447 m
K = 14
VC = 60 m
-L- STA 13+02.001 =
-Y4- STA 10+00.000
EL = 180.968
-0.3000%
-0.4675%
-0.4675%
-4.1852%
-4.1852%
-2.9128%
+0.3000%
+0.3000%
-3.8819%
EXISTING -L- PROFILE
BM NAIL SET IN POWER POLE
22.608m LT OF
-L- 12+73.139 EL.180.597
190
185
180
175
10 +20 +40 +60 +80 11 +20 +40 +60 +80 12 +20 +40 +60 +80 13 +20 +40


-L-
SEE SHEET 5 FOR -L- PLAN
EXISTING
TRANSMISSION LINE
APPROX STA 15+41.156
EL = 189.807
PI = 16+20.000
EL = 185.825 m
K = 39
VC = 60 m
PI = 16+80.000
EL = 187.438 m
K = 21
VC = 40 m
+4.2290%
+2.5883%
+2.5883%
+0.7675%
PI = 14+10.000
EL = 176.944 m
K = 21
VC = 172 m
PROPOSED -L- PROFILE
-3.8819%
+4.2290%
TRANSMISSION LINE
MINIMUM CLEARANCE
EL = 179.139
750 RCP
EXISTING -L- PROFILE
3 @ 3.0 m X 3.0 m RCBC
190
185
180
175
170
+40 +60 +80 14 +20 +40 +60 +80 15 +20 +40 +60 +80 16 +20 +40 +60 +80 17

CULVERT HYDRAULIC DATA

DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 50	CMS
DESIGN HW ELEVATION	= 176.82	M
100 YEAR DISCHARGE	= 56	CMS
100 YEAR HW ELEVATION	= 177.01	M
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 90	CMS
OVERTOPPING ELEVATION	= 178.63	M

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 7.0	HA
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= .94	CMS
DESIGN HW ELEVATION	= 181.80	M
100 YEAR DISCHARGE	= 1.1	CMS
100 YEAR HW ELEVATION	= 182.02	M
OVERTOPPING FREQUENCY	= 100	YRS
OVERTOPPING DISCHARGE	= 1.1	CMS
OVERTOPPING ELEVATION	= 182.0	M

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PROJECT REFERENCE NO.	SHEET NO.
R-2241A	29
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.
R/W REV.

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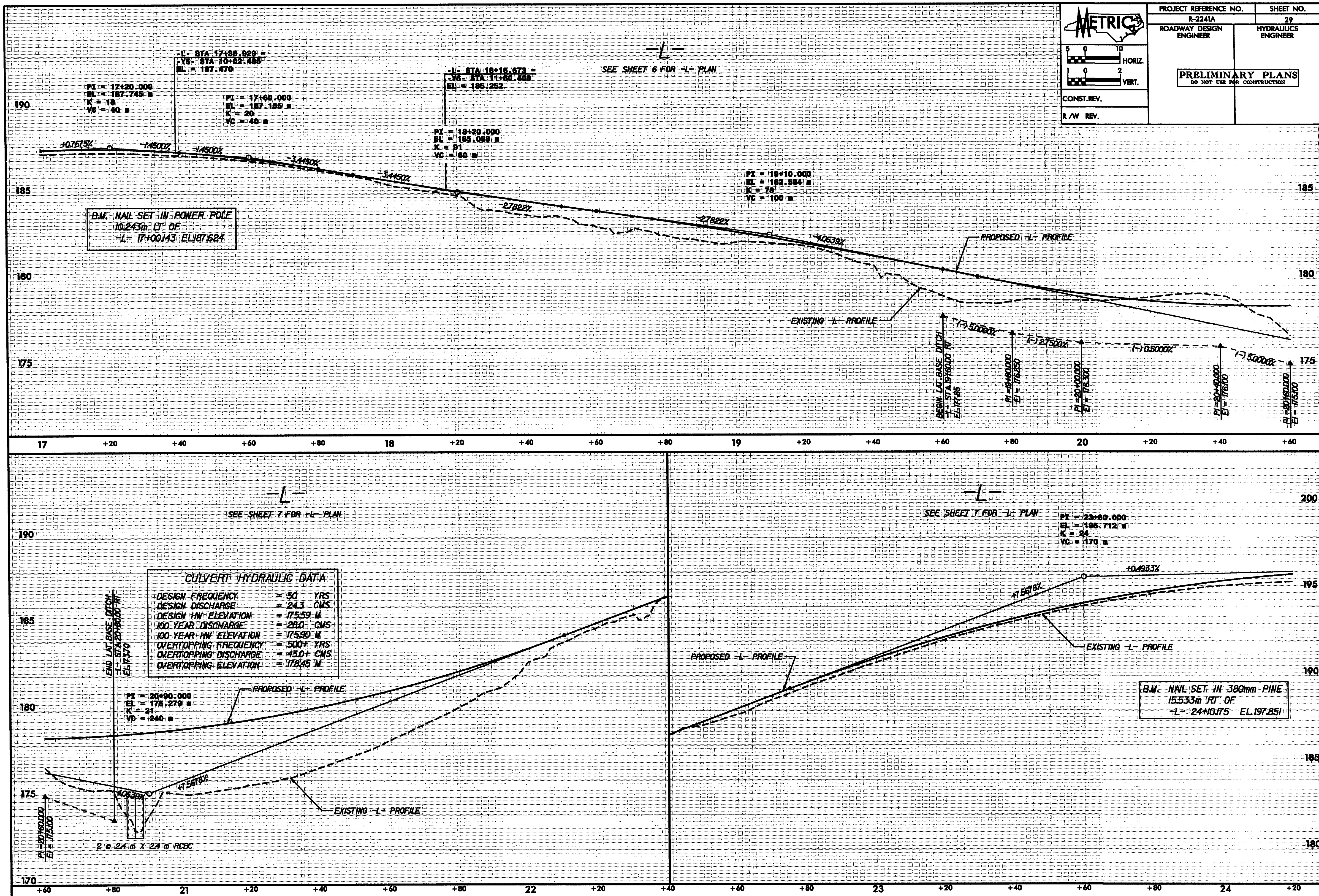

METRIC
HORIZ.
VERT.
-L-
SEE SHEET 6 FOR -L- PLAN
-L- STA 17+38.929 = -Y5- STA 10+02.485 EL = 187.470
PI = 17+20.000 EL = 187.745 m K = 18 VC = 40 m
PI = 17+60.000 EL = 187.165 m K = 20 VC = 40 m
-L- STA 18+16.673 = -Y6- STA 11+60.408 EL = 185.252
PI = 18+20.000 EL = 185.098 m K = 91 VC = 60 m
PI = 19+10.000 EL = 182.594 m K = 78 VC = 100 m
+0.7675%
-1.4500%
-3.4450%
-2.7822%
-4.0639%
B.M. NAIL SET IN POWER POLE 10.243m LT OF -L- 17+00.143 EL.187.624
PROPOSED -L- PROFILE
EXISTING -L- PROFILE
(-) 5.0000%
(-) 2.7500%
(-) 0.5000%
BEGIN LAT. BASE DITCH -L- STA 19+60.00 RT EL.177.85
PI =19+80.000 El = 176.850
PI =20+00.000 El = 176.300
PI =20+40.000 El = 176.00
PI =20+60.000 El = 175.000
-L-
SEE SHEET 7 FOR -L- PLAN
CULVERT HYDRAULIC DATA
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 24.3 CMS
DESIGN HW ELEVATION = 175.59 M
100 YEAR DISCHARGE = 28.0 CMS
100 YEAR HW ELEVATION = 175.90 M
OVERTOPPING FREQUENCY = 500+ YRS
OVERTOPPING DISCHARGE = 43.0+ CMS
OVERTOPPING ELEVATION = 178.45 M
END LAT. BASE DITCH -L- STA 20+80.00 RT EL.173.70
PI = 20+90.000 EL = 175.279 m K = 21 VC = 240 m
+1.5618%
2 @ 2.4 m X 2.4 m RCBC
PI =20+60.000 El = 175.000
PI = 23+60.000 EL = 195.712 m K = 24 VC = 170 m
+0.4933%
B.M. NAIL SET IN 380mm PINE 15.533m RT OF -L- 24+10.175 EL.197.851

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METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10 HORIZ.	R-2241A	30
1 0 2 VERT.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CONST.REV.	PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
R /W REV.		

-L-

SEE SHEET 8 FOR -L- PLAN

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 3.0	HA
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 0.56	CMS
DESIGN HW ELEVATION	= 193.65	M
100 YEAR DISCHARGE	= 0.60	CMS
100 YEAR HW ELEVATION	= 193.68	M
OVERTOPPING FREQUENCY	= +100	YRS
OVERTOPPING DISCHARGE	= +0.60	CMS
OVERTOPPING ELEVATION	= 195.3	M

PI = 25+40.000
EL = 196.800 m
K = 23
VC = 80 m

PROPOSED -L- PROFILE
+0.49333%
+3.92782%
EXISTING GROUNDLINE

210 205 200 195

+20 +40 +60 +80 25 +20 +40 +60 +80 26 +20 +40 +60 +80 27 +20 +40 +60

900 RCP

190 220 215 210 205 200

-L-

SEE SHEET 9 FOR -L- PLAN

PI = 30+40.000
EL = 216.239 m
K = 56
VC = 440 m

+3.92782%

-L- STA 28+47.500 =
-Y7- & -Y8- STA 14+03.462
EL = 208.610

PROPOSED -L- PROFILE
EXISTING GROUNDLINE

B.M. NAIL SET IN 455mm PINE
74.78m RT OF
-L- 30+75.894 EL. 214.094

B.M. NAIL SET IN 430mm GUM
147.96m RT OF
-L- 28+57.981 EL. 214.094

220 215 210 205 200

+60 +80 28 +20 +40 +60 +80 29 +20 +40 +60 +80 30 +20 +40 +60 +80 31 +20

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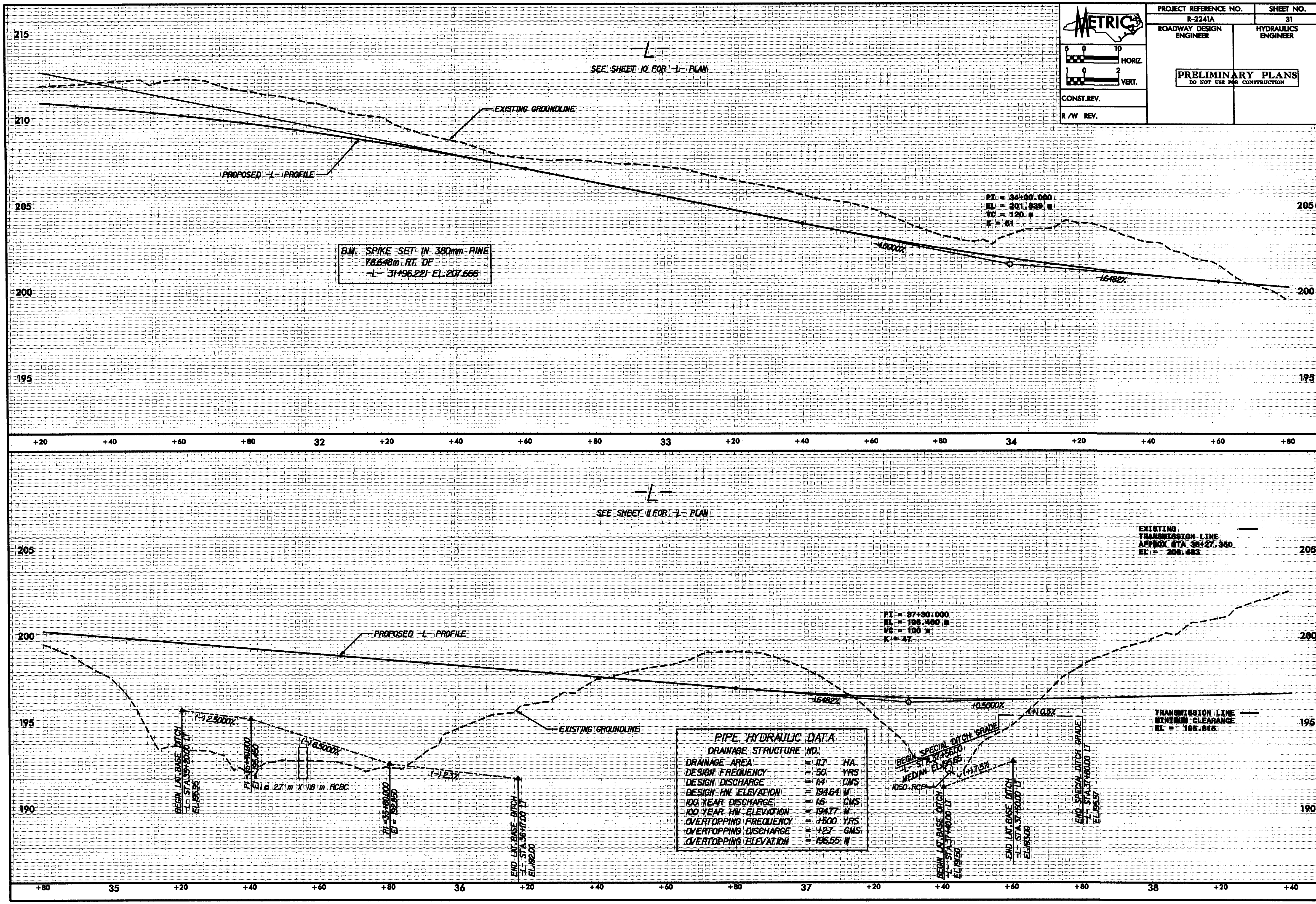
METRIC
5 0 10 HORIZ.
1 0 2 VERT.
CONST.REV.
R /W REV.
PROJECT REFERENCE NO.
R-2241A
SHEET NO.
31
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
-L-
SEE SHEET 10 FOR -L- PLAN
EXISTING GROUNDLINE
PROPOSED -L- PROFILE
B.M. SPIKE SET IN 380mm PINE
78.648m RT OF
-L- 31+96.221 EL.207.666
PI = 34+00.000
EL = 201.839 m
VC = 120 m
K = 51
-4.0000%
-1.6482%
215
210
205
200
195
+20 +40 +60 +80 32 +20 +40 +60 +80 33 +20 +40 +60 +80 34 +20 +40 +60 +80
-L-
SEE SHEET 11 FOR -L- PLAN
EXISTING
TRANSMISSION LINE
APPROX STA 38+27.350
EL = 206.483
PI = 37+30.000
EL = 196.400 m
VC = 100 m
K = 47
PROPOSED -L- PROFILE
EXISTING GROUNDLINE
-1.6482%
+0.5000%
TRANSMISSION LINE
MINIMUM CLEARANCE
EL = 195.815
(-) 2.5000%
(-) 6.5000%
(-) 2.3%
BEGIN LAT. BASE DITCH
-L- STA.35+20.00 LT
EL.195.95
PI = 35+40.000
EI = 195.450
1 @ 2.7 m X 1.8 m RCBC
PI = 35+80.000
EI = 192.850
END LAT. BASE DITCH
-L- STA.36+17.00 LT
EL.192.00
PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.
DRAINAGE AREA = 11.7 HA
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 1.4 CMS
DESIGN HW ELEVATION = 194.64 M
100 YEAR DISCHARGE = 1.6 CMS
100 YEAR HW ELEVATION = 194.77 M
OVERTOPPING FREQUENCY = +500 YRS
OVERTOPPING DISCHARGE = +2.7 CMS
OVERTOPPING ELEVATION = 196.55 M
BEGIN SPECIAL DITCH GRADE
-L- STA.37+56.00
MEDIAN EL.195.65
1050 RCP
(+) 7.5%
(+) 0.3%
BEGIN LAT. BASE DITCH
-L- STA.37+40.00 LT
EL.191.50
END LAT. BASE DITCH
-L- STA.37+60.00 LT
EL.193.00
END SPECIAL DITCH GRADE
-L- STA.37+80.00 LT
EL.195.57
205
200
195
190
+80 35 +20 +40 +60 +80 36 +20 +40 +60 +80 37 +20 +40 +60 +80 38 +20 +40

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PROJECT REFERENCE NO.	SHEET NO.
R-2241A	32
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC
5 0 10 HORIZ.
1 0 2 VERT.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

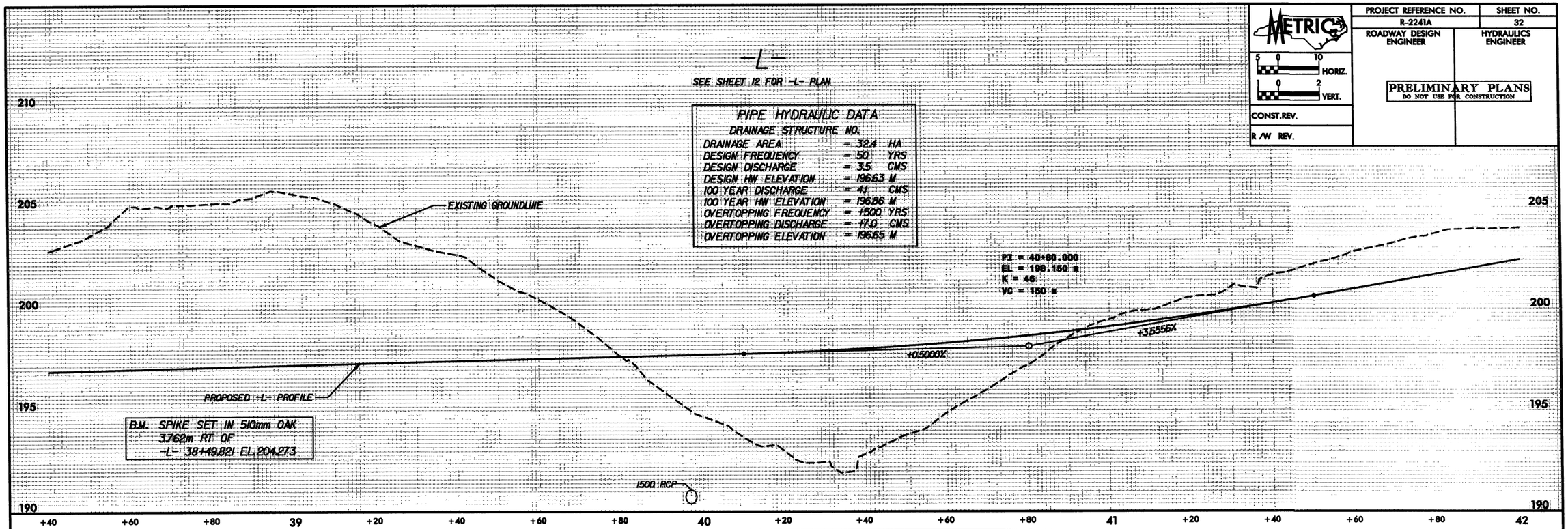
R /W REV.

-L-

SEE SHEET 12 FOR -L- PLAN

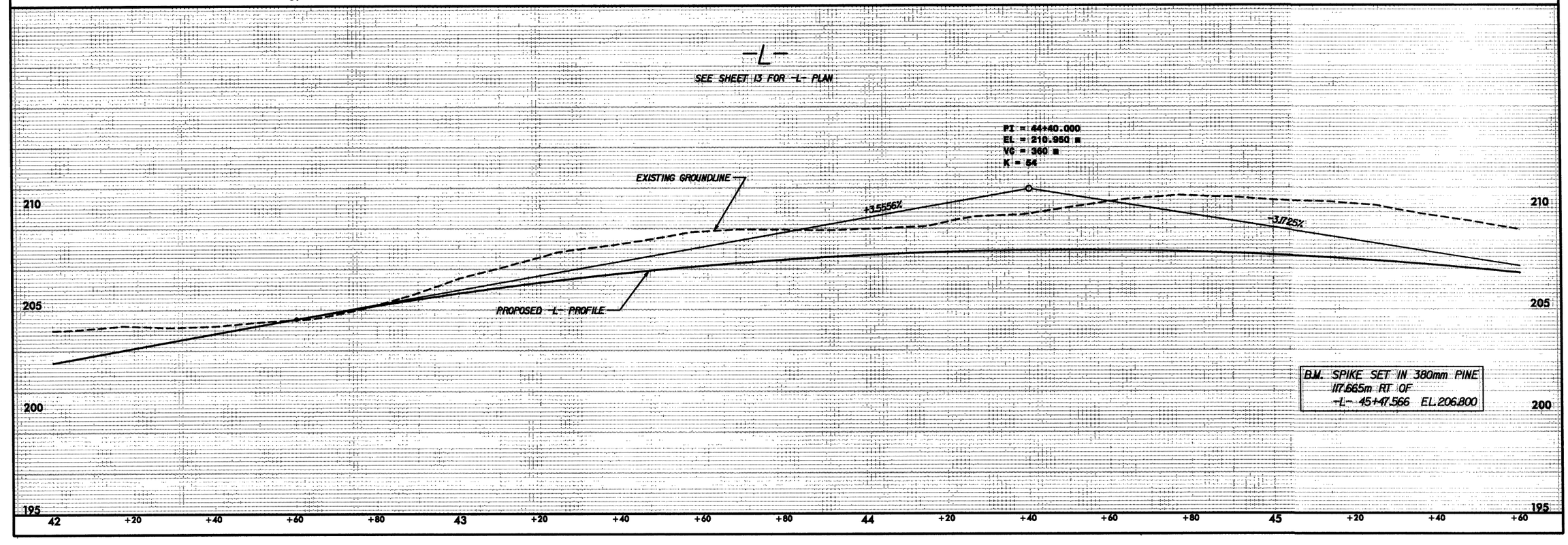
PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 32.4	HA
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 3.5	CMS
DESIGN HW ELEVATION	= 196.63	M
100 YEAR DISCHARGE	= 4.1	CMS
100 YEAR HW ELEVATION	= 196.86	M
OVERTOPPING FREQUENCY	= 1500	YRS
OVERTOPPING DISCHARGE	= 17.0	CMS
OVERTOPPING ELEVATION	= 196.65	M



-L-

SEE SHEET 13 FOR -L- PLAN



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PROJECT REFERENCE NO.	SHEET NO.
R-2241A	33
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC
5 0 10 HORIZ.
1 0 2 VERT.
CONST.REV.
R /W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SEE SHEET 14 FOR -L- PLAN

PROPOSED -L- PROFILE

BEGIN LAT. BASE DITCH -L- STA. 46+60.00 LT EL. 201.80

PI = 46+90.000
EL = 201.400

END LAT. BASE DITCH -L- STA. 46+92.00 LT EL. 201.45

-L- STA 47+01.527 = -Y12- & -Y13- STA 11+25.696
EL = 202.653

PI = 47+40.000
EL = 201.432 M
VC = 60 M
K = 73

EXISTING TRANSMISSION LINE
APPROX STA 48+35.565
EL = 208.373

-3.1725%

-4.0000%

(-) 2.00%

(+) 0.42%

(-) 5.25%

(-) 1.06%

900 RCP

BEGIN SPECIAL LAT. "V" DITCH -L- STA. 46+40.00 RT EL. 201.50

PI = 46+60.000
EL = 200.450

END SPECIAL LAT. "V" DITCH -L- STA. 46+76.00 RT EL. 198.80

TRANSMISSION LINE MINIMUM CLEARANCE
EL = 197.705

EXISTING GROUNDLINE

B.M. SPIKE SET IN 355mm PINE
47.454m LT OF
-L- 47+00.707 EL. 190.875

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO. 6.0

DRAINAGE AREA	= 6.0	HA
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 1.02	CMS
DESIGN HW ELEVATION	= 202.21	M
100 YEAR DISCHARGE	= 1.18	CMS
100 YEAR HW ELEVATION	= 202.30	M
OVERTOPPING FREQUENCY	= 100	YRS
OVERTOPPING DISCHARGE	= 1.18	CMS
OVERTOPPING ELEVATION	= 202.38	M

210 205 200 195 190

+60 +80 46 +20 +40 +60 +80 47 +20 +40 +60 +80 48 +20 +40 +60 +80 49 +20

SEE SHEET 15 FOR -L- PLAN

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO. 14.2

DRAINAGE AREA	= 14.2	HA
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 1.96	CMS
DESIGN HW ELEVATION	= 188.61	M
100 YEAR DISCHARGE	= 2.28	CMS
100 YEAR HW ELEVATION	= 188.82	M
OVERTOPPING FREQUENCY	= +500	YRS
OVERTOPPING DISCHARGE	= +3.89	CMS
OVERTOPPING ELEVATION	= 192.47	M

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO. 4.2

DRAINAGE AREA	= 4.2	HA
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 0.79	CMS
DESIGN HW ELEVATION	= 191.83	M
100 YEAR DISCHARGE	= .91	CMS
100 YEAR HW ELEVATION	= 191.95	M
OVERTOPPING FREQUENCY	= 100	YRS
OVERTOPPING DISCHARGE	= 0.91	CMS
OVERTOPPING ELEVATION	= 191.97	M

PI = 49+80.000
EL = 191.832 M
VC = 220 M
K = 47

PI = 52+80.000
EL = 193.865 M
VC = 120 M
K = 62

PROPOSED -L- PROFILE

-1.0000%

(-) 4.79%

+0.6775%

+0.6775%

BEGIN SPECIAL DITCH GRADE -L- STA. 49+80.00 RT EL. 191.81

END SPECIAL DITCH GRADE -L- STA. 50+40.00 RT EL. 190.95

750 RCP

1200 RCP

EXISTING GROUNDLINE

B.M. SPIKE SET IN 305mm GUM
22.544m LT OF
-L- 52+05.247 EL. 190.875

200 195 190 185 180

+20 +40 +60 +80 50 +20 +40 +60 +80 51 +20 +40 +60 +80 52 +20 +40 +60 +80

11/2/2016
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METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

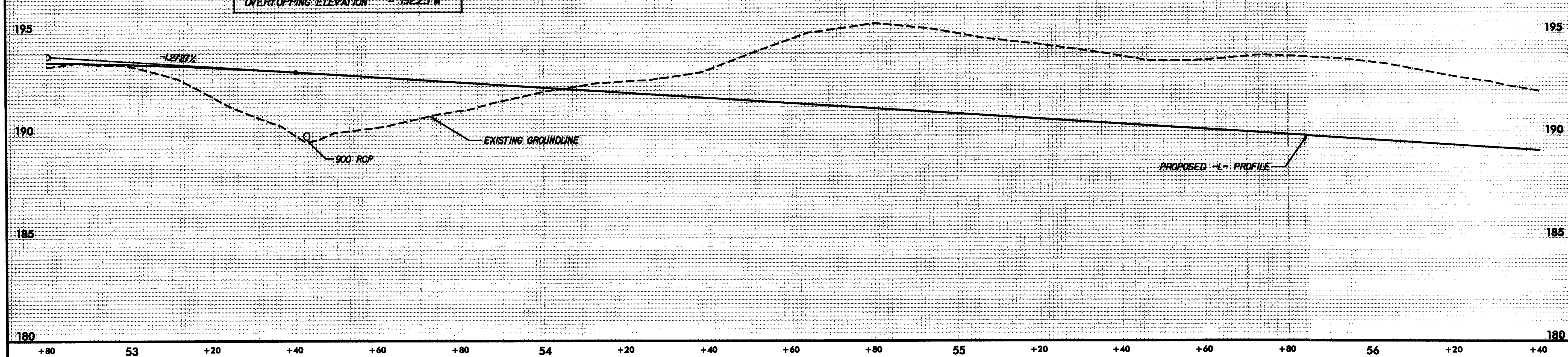
HORIZ. 5 0 10
VERT. 1 0 2
CONST.REV.
R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.		
DRAINAGE AREA	= 5.0	HA
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 0.55	CMS
DESIGN HW ELEVATION	= 192.04	M
100 YEAR DISCHARGE	= 0.88	CMS
100 YEAR HW ELEVATION	= 192.22	M
OVERTOPPING FREQUENCY	= 100	YRS
OVERTOPPING DISCHARGE	= 0.88	CMS
OVERTOPPING ELEVATION	= 192.25	M

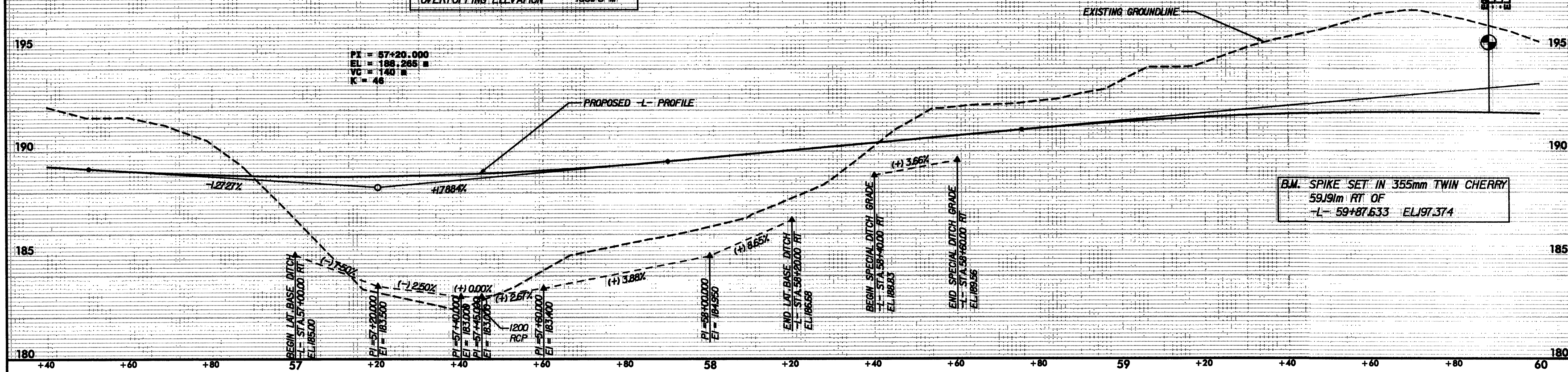
-L-
SEE SHEET 16 FOR -L- PLAN



PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.		
DRAINAGE AREA	= 15.4	HA
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 2.0	CMS
DESIGN HW ELEVATION	= 184.46	M
100 YEAR DISCHARGE	= 2.37	CMS
100 YEAR HW ELEVATION	= 184.57	M
OVERTOPPING FREQUENCY	= +500	YRS
OVERTOPPING DISCHARGE	= +2.37	CMS
OVERTOPPING ELEVATION	= 188.75	M

-L-
SEE SHEET 17 FOR -L- PLAN



B.M. SPIKE SET IN 355mm TWIN CHERRY
59.191m RT OF
-L- 59+87.633 EL.197.374

8/2/2001
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cgroves

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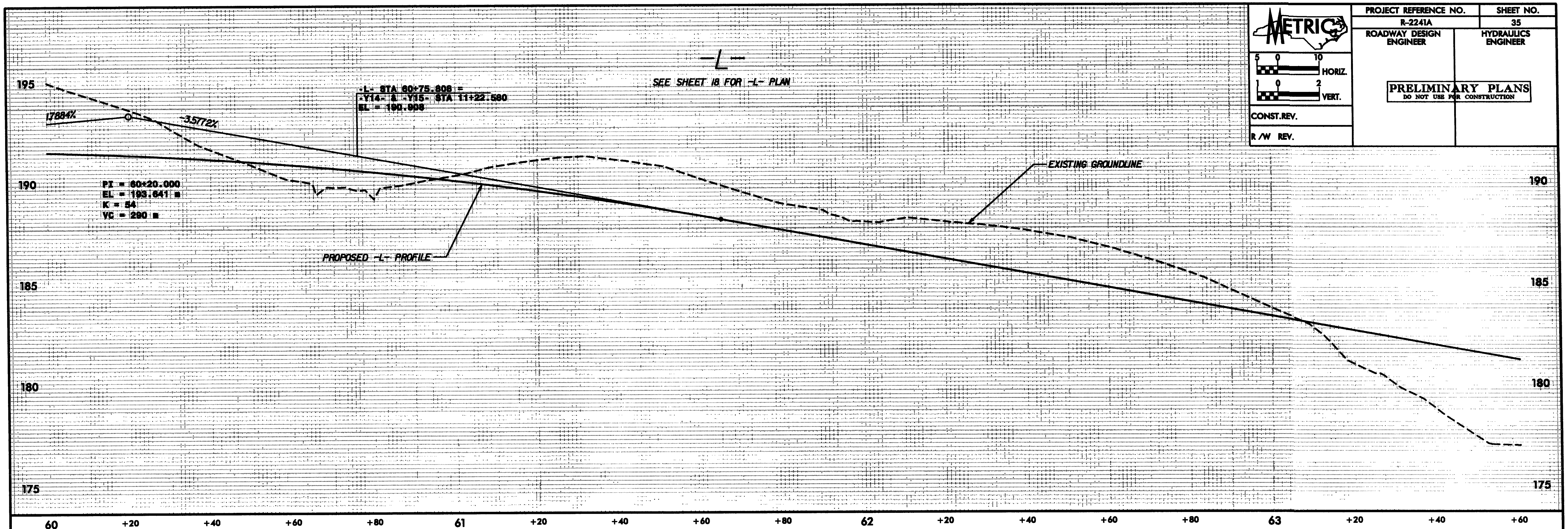
PROJECT REFERENCE NO.	SHEET NO.
R-2241A	35

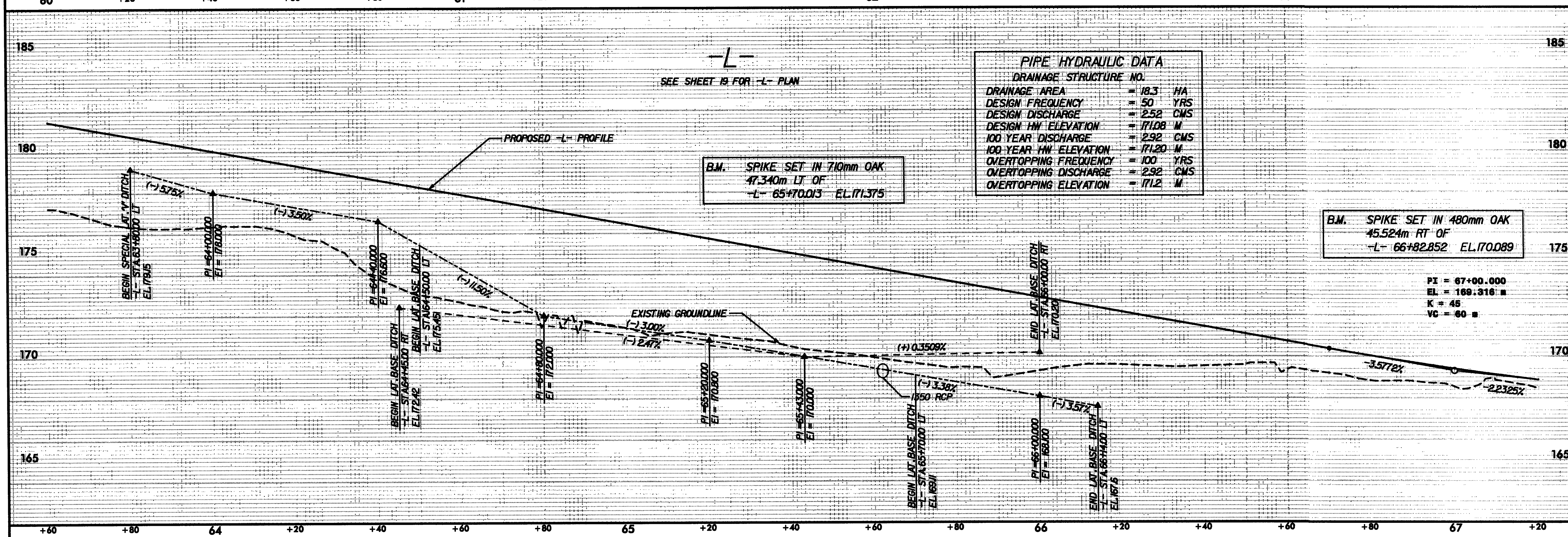
ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

METRIC

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.
R/W REV.




-L-
SEE SHEET 19 FOR -L- PLAN
PROPOSED -L- PROFILE
PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.
DRAINAGE AREA = 18.3 HA
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 2.52 CMS
DESIGN HW ELEVATION = 171.08 M
100 YEAR DISCHARGE = 2.92 CMS
100 YEAR HW ELEVATION = 171.20 M
OVERTOPPING FREQUENCY = 100 YRS
OVERTOPPING DISCHARGE = 2.92 CMS
OVERTOPPING ELEVATION = 171.2 M
B.M. SPIKE SET IN 710mm OAK
47.340m LT OF
-L- 65+70.013 EL.171.375
B.M. SPIKE SET IN 480mm OAK
45.524m RT OF
-L- 66+82.852 EL.170.089
PI = 67+00.000
EL = 169.316 m
K = 45
VC = 60 m
BEGIN SPECIAL LAT. "V" DITCH -L- STA.63+80.00 LT EL.178.15
PI = 64+00.000 El = 178.000
PI = 64+40.000 El = 176.500
BEGIN LAT. BASE DITCH -L- STA.64+45.00 RT EL.172.48
BEGIN LAT. BASE DITCH -L- STA.64+50.00 LT EL.175.451
PI = 64+80.000 El = 172.000
PI = 65+20.000 El = 170.800
PI = 65+43.000 El = 170.000
BEGIN LAT. BASE DITCH -L- STA.65+70.00 LT EL.169.11
PI = 66+00.000 El = 169.000
END LAT. BASE DITCH -L- STA.66+00.00 RT EL.170.20
END LAT. BASE DITCH -L- STA.66+14.00 LT EL.167.6
(-) 5.75%
(-) 3.50%
(-) 11.50%
(-) 3.00%
(-) 2.47%
(+) 0.3509%
(-) 3.39%
(-) 3.57%
1350 RCP
EXISTING GROUNDLINE
-3.5772%
-2.2325%
185
180
175
170
165
64
65
66
67

11/2/2011
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dgroves

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PROJECT REFERENCE NO.	SHEET NO.
R-2241A	36

METRIC

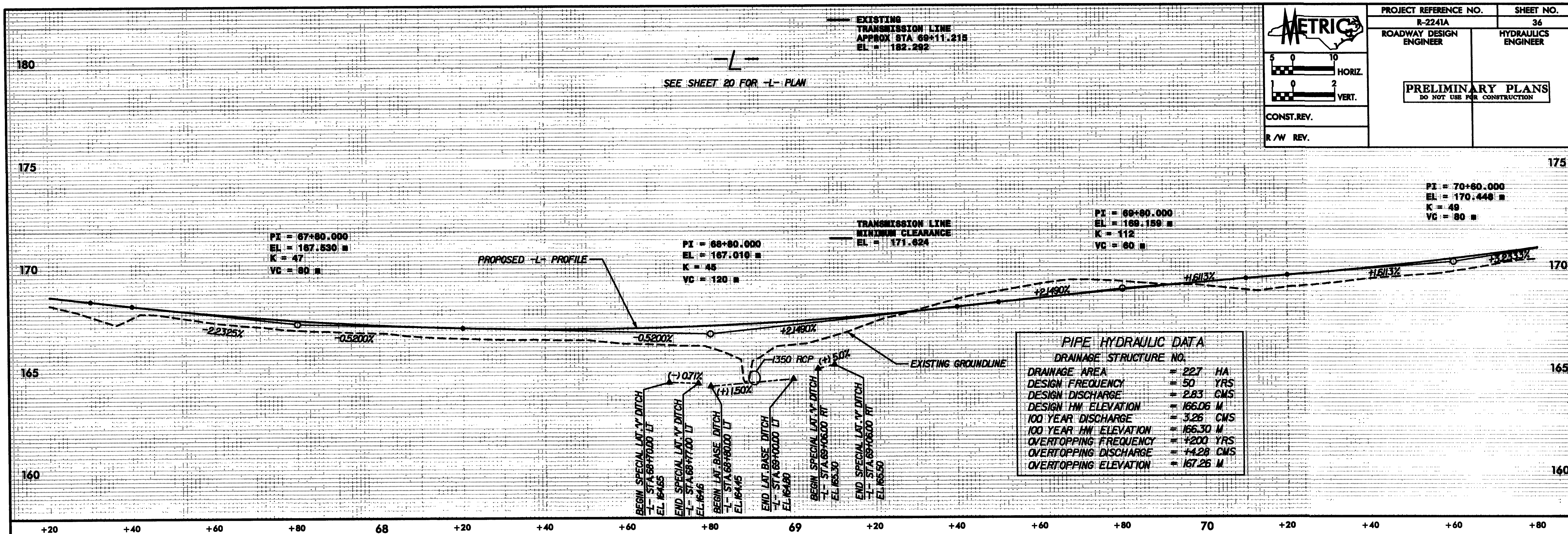
ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R /W REV.

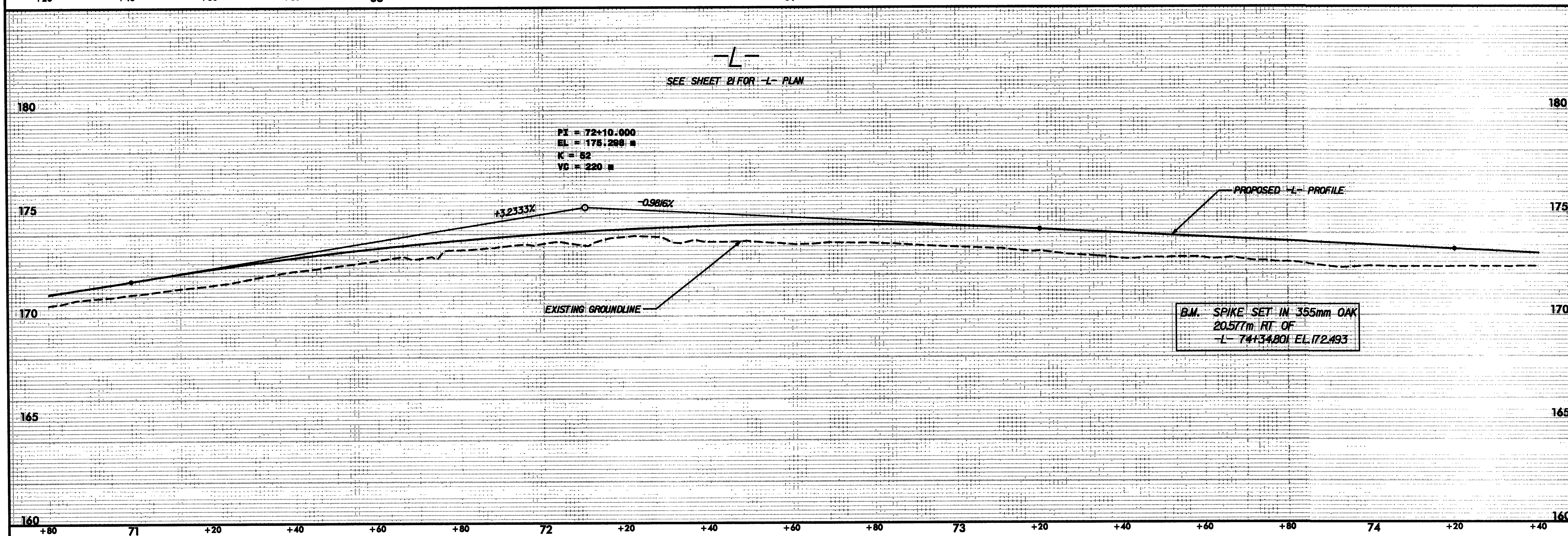


5 0 10 HORIZ.
1 0 2 VERT.
-L-
SEE SHEET 20 FOR -L- PLAN
EXISTING TRANSMISSION LINE APPROX STA 69+11.215 EL = 182.292
TRANSMISSION LINE MINIMUM CLEARANCE EL = 171.624
PI = 67+80.000
EL = 167.530 m
K = 47
VC = 80 m
PI = 68+80.000
EL = 167.010 m
K = 45
VC = 120 m
PI = 69+80.000
EL = 169.159 m
K = 112
VC = 60 m
PI = 70+60.000
EL = 170.448 m
K = 49
VC = 80 m
PROPOSED -L- PROFILE
EXISTING GROUNDLINE
-2.2325%
-0.5200%
-0.5200%
+2.1490%
+2.1490%
+1.6113%
+1.6113%
+3.2333%
1350 RCP
(-) 0.71%
(+) 1.50%
(+) 1.50%
BEGIN SPECIAL LAT. 'V' DITCH -L- STA. 68+70.00 LT EL. 164.55
END SPECIAL LAT. 'V' DITCH -L- STA. 68+77.00 LT EL. 164.6
BEGIN LAT. BASE DITCH -L- STA. 68+80.00 LT EL. 164.45
END LAT. BASE DITCH -L- STA. 69+00.00 LT EL. 164.80
BEGIN SPECIAL LAT. 'V' DITCH -L- STA. 69+06.00 RT EL. 165.30
END SPECIAL LAT. 'V' DITCH -L- STA. 69+06.00 RT EL. 165.50
180
175
170
165
160
+20
+40
+60
+80
68
69
70

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.

DRAINAGE AREA	=	22.7	HA
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	2.83	CMS
DESIGN HW ELEVATION	=	166.06	M
100 YEAR DISCHARGE	=	3.26	CMS
100 YEAR HW ELEVATION	=	166.30	M
OVERTOPPING FREQUENCY	=	+200	YRS
OVERTOPPING DISCHARGE	=	+4.28	CMS
OVERTOPPING ELEVATION	=	167.26	M



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agroves

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METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10 HORIZ.	R-2241A	37
1 0 2 VERT.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CONST.REV.	PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
R /W REV.		

SEE SHEET 22 FOR -L- PLAN

PI = 74+60.000
EL = 172.844 m
K = 294
VC = 80 m

PROPOSED -L- PROFILE

-0.98I6%

+1.2533%

PI = 75+80.000
EL = 171.340 m
K = 88
VC = 60 m

-L- STA 76+08.312 =
-Y17- STA 13+18.496
EL = 171.190

PI = 76+60.000
EL = 170.880 m
K = 54
VC = 70 m

END CONSTRUCTION TEMPORARY SOUTHBOUND LANE
-L- STA. 76+77.000
EL = 171.031

END CONSTRUCTION PERM. SOUTHBOUND LANE
-L- STA. 76+00.000
EL = 171.881

-1.2533%

-0.5750%

-0.5750%

+0.7150%

+0.7150%

(+) 2.00%

(-) 0.33%

0.00%

EXISTING GROUNDLINE

BEGIN LAT. BASE DITCH
-L- STA 76+20.00 RT
EL 168.45

END LAT. BASE DITCH
-L- STA 76+46.00 RT
EL 168.45

BEGIN SPECIAL DITCH GRADE
-L- STA 76+56.00 LT
EL 169.70

PI = 76+96.000
EL = 169.600

END SPECIAL DITCH GRADE
-L- STA 77+40.00 LT
EL 169.88

B.M. SPIKE SET IN 810mm OAK
91.90m RT OF
-L- 78+50.770 EL 173.944

SEE SHEET 23 FOR -L- PLAN

END CONSTRUCTION TEMPORARY SOUTHBOUND LANE
-L- STA. 78+00.000
EL = 171.881

PROPOSED -L- PROFILE
PI = 78+40.000
EL = 172.059 m
VC = 80 m
K = 61

PI = 79+10.000
EL = 171.641 m
VC = 60 m
K = 43

-0.5964%

+0.6550%

TEMPORARY SBL PROFILE

EXISTING GROUNDLINE

TEMPORARY PROFILE SOUTHBOUND LANE

BEGIN CONSTRUCTION TEMPORARY SOUTHBOUND LANE
-TEMP. SBL- STA 78+00.000 =
-L- STA 78+00.000 OFF 12.4 LT
EL = 171.73

END GRADE TEMPORARY SOUTHBOUND LANE
-TEMP. SBL- STA 79+93.887 =
-L- STA 79+93.886 OFF 14.365
EL = 172.034

-L-

SEE SHEET 23 FOR -L- PLAN

-DRI- STA. 10+34.00
EL 196.76

-DRI- STA. 10+08.6 =
-L- STA. 23+82.716
Rt. 25.00
EL 196.25

+3.00%

PI = 10+28.900
EL = 197.710 m

+2.00%

-0.02%

+2.5%

+3.5%

PI = 10+12.900
EL = 194.510 m
PI = 10+11.400
EL = 194.270 m
PI = 10+10.500
EL = 194.247 m

-DRI-

DRIVEWAY GRADE LT.-L- STA 23+62.719

SEE SHEET 7 FOR -DRI- PLAN

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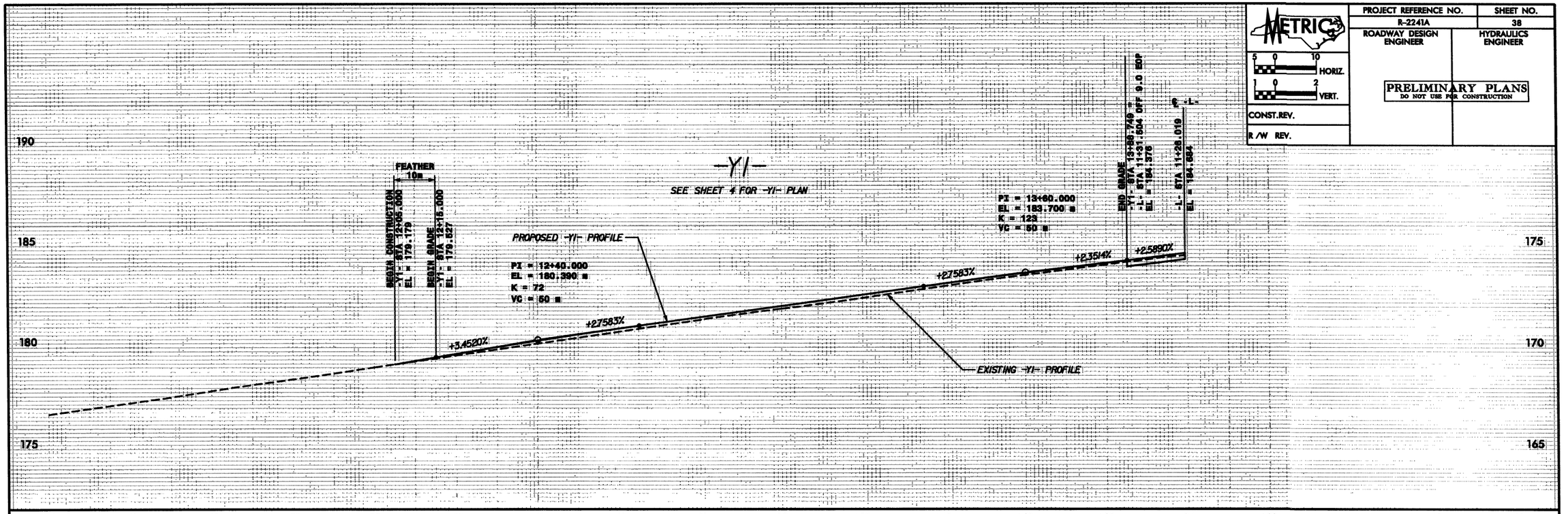
METRIC	PROJECT REFERENCE NO.	SHEET NO.
5 0 10 HORIZ.	R-2241A	38
1 0 2 VERT.	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CONST.REV.	PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
R /W REV.		



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METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	39

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Scale: 5 0 10 HORIZ.; 1 0 2 VERT.

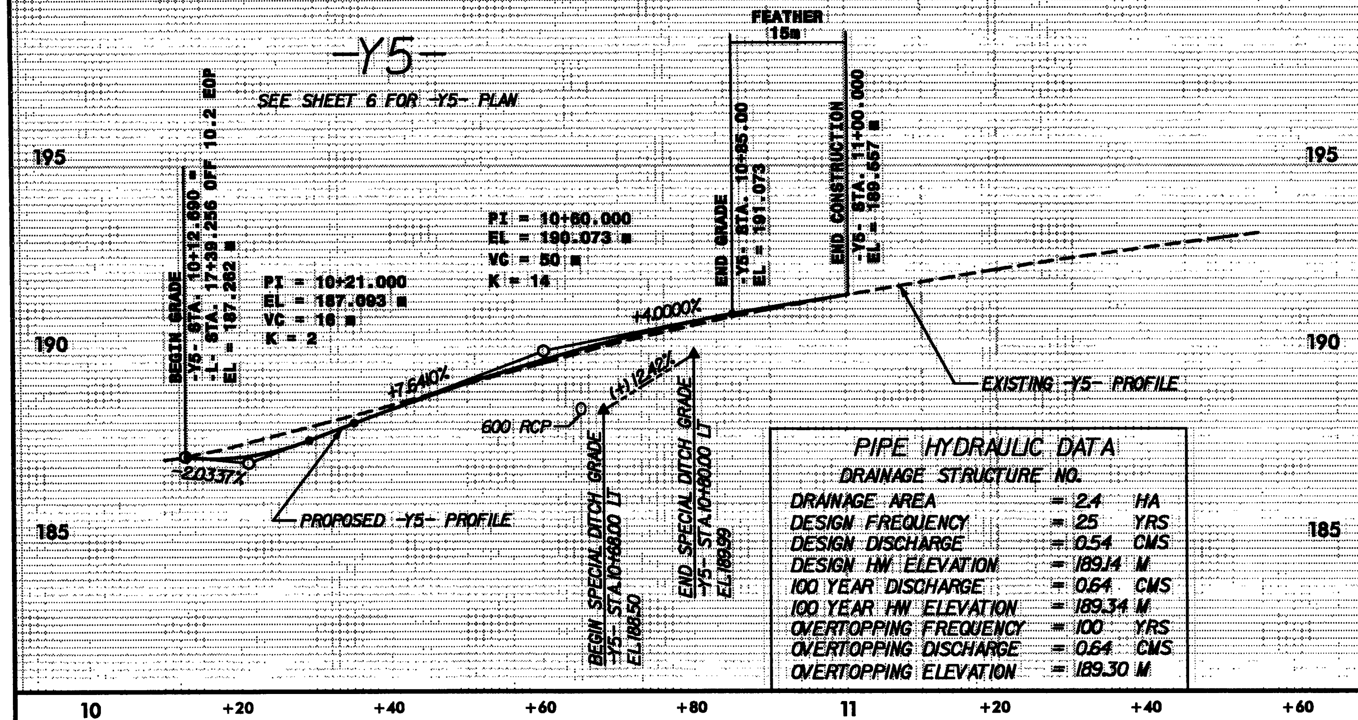
CONST.REV.

R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y5-

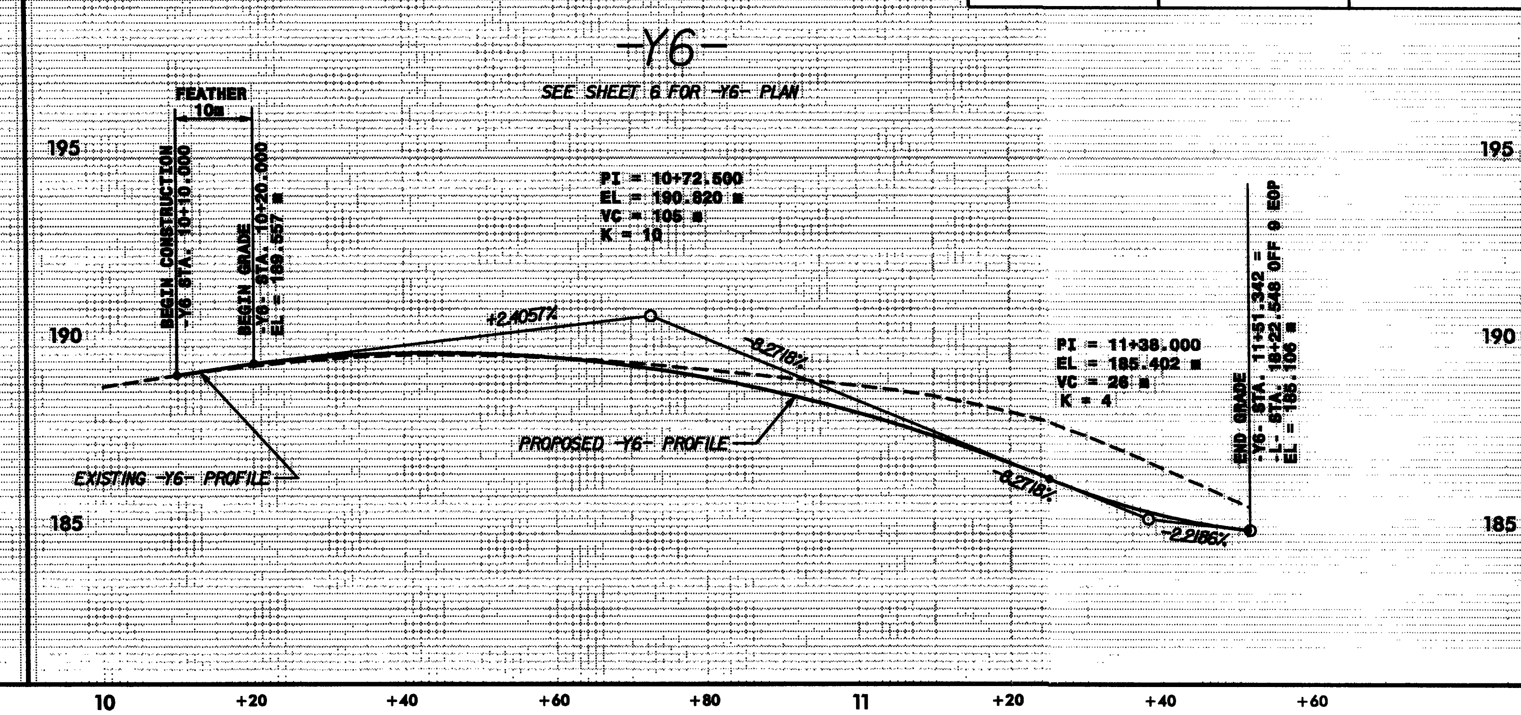
SEE SHEET 6 FOR -Y5- PLAN



PIPE HYDRAULIC DATA		
DRAINAGE STRUCTURE NO.		
DRAINAGE AREA	= 2.4	HA
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 0.54	CMS
DESIGN HW ELEVATION	= 189.14	M
100 YEAR DISCHARGE	= 0.64	CMS
100 YEAR HW ELEVATION	= 189.34	M
OVERTOPPING FREQUENCY	= 100	YRS
OVERTOPPING DISCHARGE	= 0.64	CMS
OVERTOPPING ELEVATION	= 189.30	M

-Y6-

SEE SHEET 6 FOR -Y6- PLAN



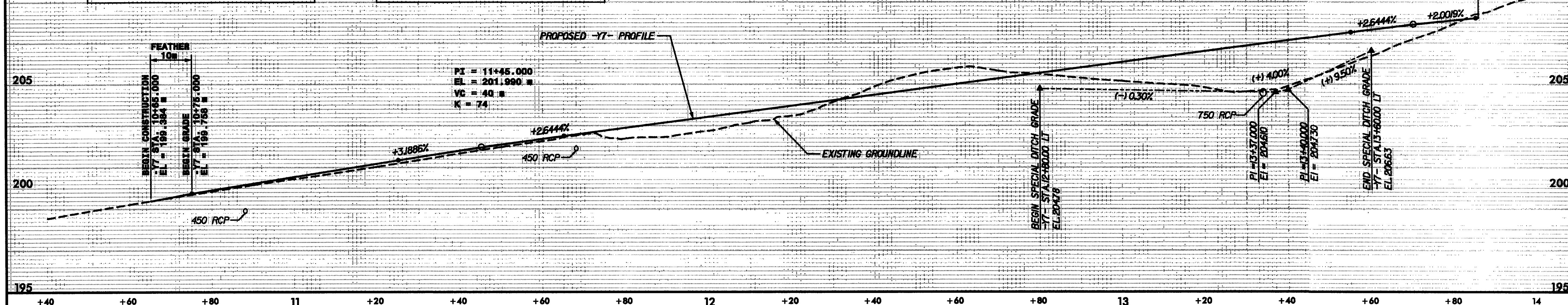
-Y7-

SEE SHEET 9 & 24 FOR -Y7- PLAN

PIPE HYDRAULIC DATA		
DRAINAGE STRUCTURE NO.		
DRAINAGE AREA	= 0.44	HA
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 0.10	CMS
DESIGN HW ELEVATION	= 199.16	M
100 YEAR DISCHARGE	= 0.12	CMS
100 YEAR HW ELEVATION	= 199.22	M
OVERTOPPING FREQUENCY	= +100	YRS
OVERTOPPING DISCHARGE	= +0.12	CMS
OVERTOPPING ELEVATION	= 200.00	M

PIPE HYDRAULIC DATA		
DRAINAGE STRUCTURE NO.		
DRAINAGE AREA	= 0.8	HA
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 0.21	CMS
DESIGN HW ELEVATION	= 202.69	M
100 YEAR DISCHARGE	= 0.25	CMS
100 YEAR HW ELEVATION	= 202.72	M
OVERTOPPING FREQUENCY	= +100	YRS
OVERTOPPING DISCHARGE	= +0.25	CMS
OVERTOPPING ELEVATION	= 202.90	M

PIPE HYDRAULIC DATA		
DRAINAGE STRUCTURE NO.		
DRAINAGE AREA	= 2.6	HA
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 0.77	CMS
DESIGN HW ELEVATION	= 205.39	M
100 YEAR DISCHARGE	= 0.90	CMS
100 YEAR HW ELEVATION	= 205.52	M
OVERTOPPING FREQUENCY	= 100	YRS
OVERTOPPING DISCHARGE	= 0.90	CMS
OVERTOPPING ELEVATION	= 205.52	M



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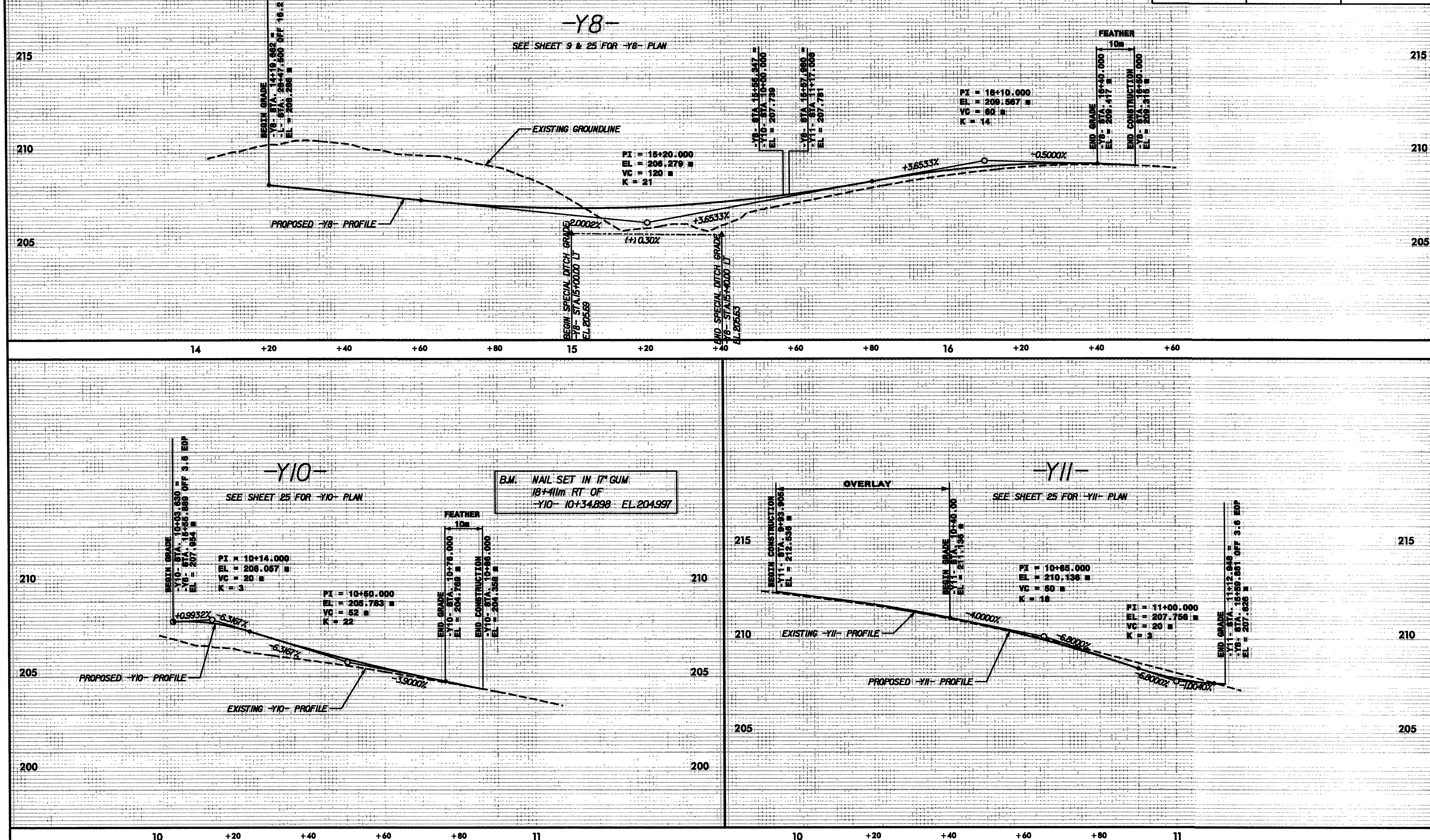
PROJECT REFERENCE NO.	SHEET NO.
R-2241A	40
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

HORIZ. 5 0 10
VERT. 1 0 2

CONST.REV.
R/W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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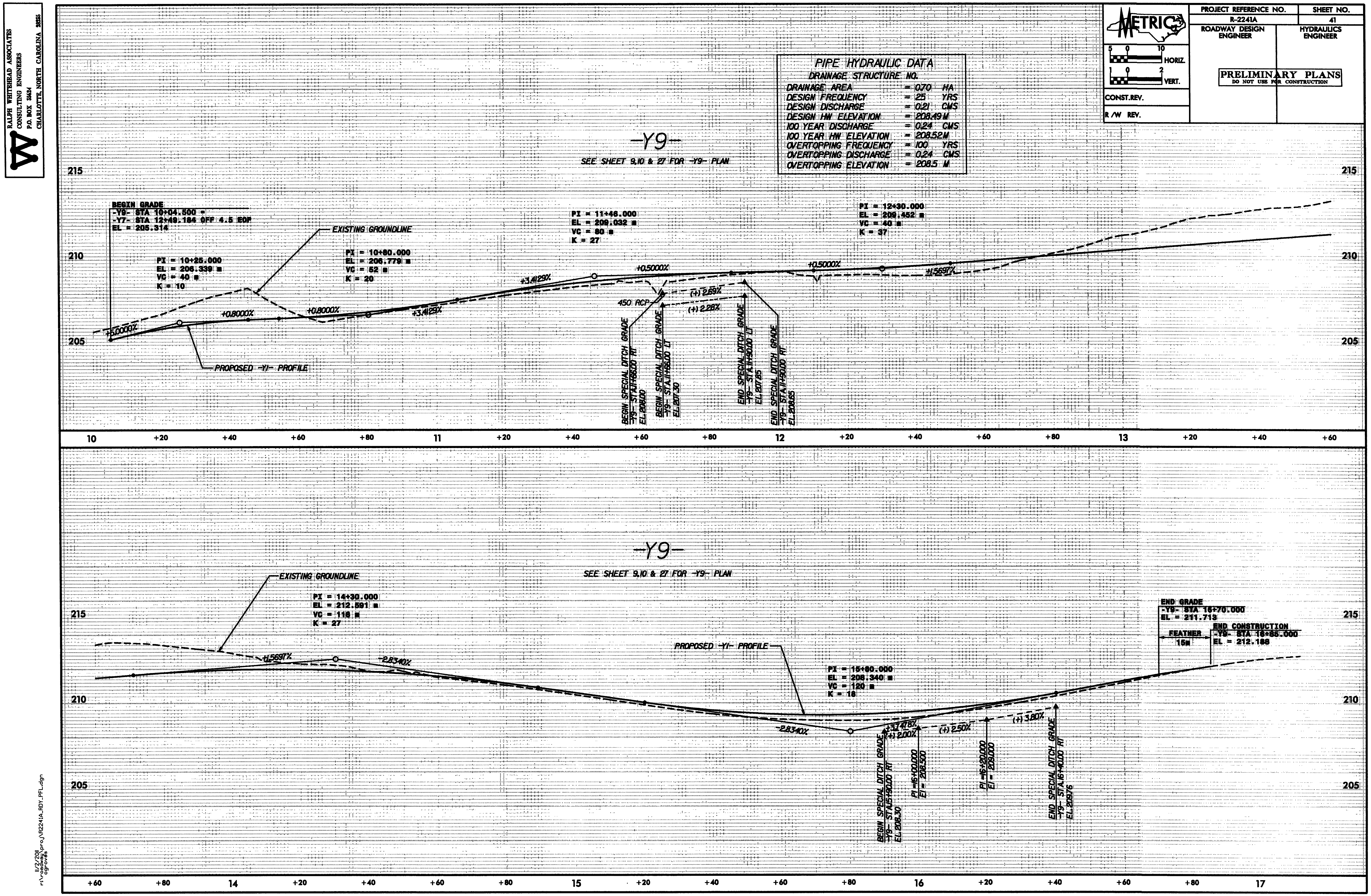
8/2/200
ogroves



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METRIC
PROJECT REFERENCE NO. R-2241A
SHEET NO. 41
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
HORIZ.
VERT.
CONST.REV.
R/W REV.
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.
DRAINAGE AREA = 0.70 HA
DESIGN FREQUENCY = 25 YRS
DESIGN DISCHARGE = 0.21 CMS
DESIGN HW ELEVATION = 208.49 M
100 YEAR DISCHARGE = 0.24 CMS
100 YEAR HW ELEVATION = 208.52 M
OVERTOPPING FREQUENCY = 100 YRS
OVERTOPPING DISCHARGE = 0.24 CMS
OVERTOPPING ELEVATION = 208.5 M
-Y9-
SEE SHEET 9,10 & 27 FOR -Y9- PLAN
BEGIN GRADE
-Y9- STA 10+04.500 =
-Y7- STA 12+49.184 OFF 4.5 EOP
EL = 205.314
EXISTING GROUNDLINE
PI = 10+25.000
EL = 206.339 m
VC = 40 m
K = 10
PI = 10+80.000
EL = 206.779 m
VC = 52 m
K = 20
PI = 11+46.000
EL = 209.032 m
VC = 80 m
K = 27
PI = 12+30.000
EL = 209.452 m
VC = 40 m
K = 37
+5.0000%
+0.8000%
+0.8000%
+3.4129%
+3.4129%
+0.5000%
+0.5000%
+1.5697%
450 RCP
(+) 2.69%
(+) 2.26%
PROPOSED -Y1- PROFILE
BEGIN SPECIAL DITCH GRADE -Y9- STA.11+66.00 RT EL 206.00
BEGIN SPECIAL DITCH GRADE -Y9- STA.11+66.00 LT EL 207.30
END SPECIAL DITCH GRADE -Y9- STA.11+90.00 LT EL 207.85
END SPECIAL DITCH GRADE -Y9- STA.11+90.00 RT EL 208.65
215
210
205
10 +20 +40 +60 +80 11 +20 +40 +60 +80 12 +20 +40 +60 +80 13 +20 +40 +60
-Y9-
SEE SHEET 9,10 & 27 FOR -Y9- PLAN
EXISTING GROUNDLINE
PI = 14+30.000
EL = 212.591 m
VC = 118 m
K = 27
+1.5697%
-2.8340%
-2.8340%
PROPOSED -Y1- PROFILE
PI = 15+80.000
EL = 208.340 m
VC = 120 m
K = 18
+3.2418%
(+) 2.00%
(+) 2.50%
(+) 3.80%
BEGIN SPECIAL DITCH GRADE -Y9- STA.15+90.00 RT EL 208.30
PI =16+00.000 EL = 208.500
PI =16+20.000 EL = 209.000
END SPECIAL DITCH GRADE -Y9- STA.16+40.00 RT EL 209.76
END GRADE
-Y9- STA 16+70.000
EL = 211.713
FEATHER 15m
END CONSTRUCTION
-Y9- STA 16+85.000
EL = 212.188
215
210
205
+60 +80 14 +20 +40 +60 +80 15 +20 +40 +60 +80 16 +20 +40 +60 +80 17
8/2/2011
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ogroves

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METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	42

ROADWAY DESIGN ENGINEER

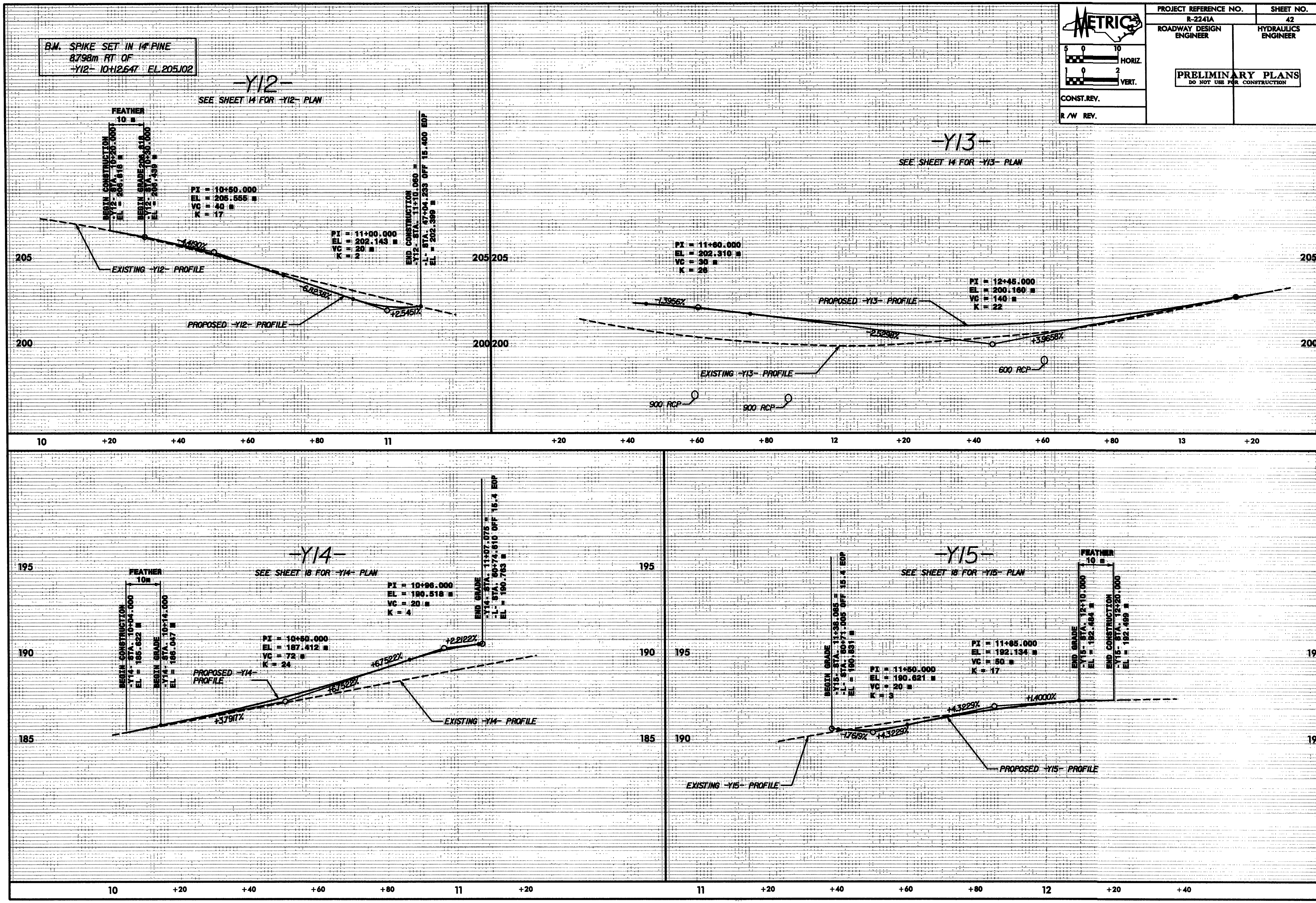
HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

5 0 10 HORIZ.
1 0 2 VERT.

CONST.REV.

R /W REV.



B.M. SPIKE SET IN 14" PINE
8.798m RT OF
-Y12- 10+12.647 EL.205.102
-Y12-
SEE SHEET 14 FOR -Y12- PLAN
FEATHER
10 m
BEGIN CONSTRUCTION -Y12- STA. 10+20.000 EL = 206.818 m
BEGIN GRADE -Y12- STA. 10+30.000 EL = 206.439 m
PI = 10+50.000
EL = 205.555 m
VC = 40 m
K = 17
PI = 11+00.000
EL = 202.143 m
VC = 20 m
K = 2
END CONSTRUCTION -Y12- STA. 11+10.060 = -L- STA. 47+04.233 OFF 15.400 EOP EL = 202.399 m
-4.4190%
-6.8238%
+2.5451%
EXISTING -Y12- PROFILE
PROPOSED -Y12- PROFILE
205
200
-Y13-
SEE SHEET 14 FOR -Y13- PLAN
PI = 11+60.000
EL = 202.310 m
VC = 30 m
K = 26
PI = 12+45.000
EL = 200.160 m
VC = 140 m
K = 22
-1.3956%
-2.5298%
+3.9658%
PROPOSED -Y13- PROFILE
EXISTING -Y13- PROFILE
600 RCP
900 RCP
900 RCP
10 +20 +40 +60 +80 11 +20 +40 +60 +80 12 +20 +40 +60 +80 13 +20
-Y14-
SEE SHEET 18 FOR -Y14- PLAN
FEATHER
10m
BEGIN CONSTRUCTION -Y14- STA. 10+04.000 EL = 185.622 m
BEGIN GRADE -Y14- STA. 10+14.000 EL = 186.047 m
PI = 10+50.000
EL = 187.412 m
VC = 72 m
K = 24
PI = 10+96.000
EL = 190.518 m
VC = 20 m
K = 4
END GRADE -Y14- STA. 11+07.075 = -L- STA. 60+74.610 OFF 15.4 EOP EL = 190.763 m
+3.7917%
+6.7522%
+6.7522%
+2.2122%
PROPOSED -Y14- PROFILE
EXISTING -Y14- PROFILE
195
190
185
-Y15-
SEE SHEET 18 FOR -Y15- PLAN
BEGIN GRADE -Y15- STA. 11+38.085 = -L- STA. 60+71.005 OFF 15.4 EOP EL = 190.831 m
PI = 11+50.000
EL = 190.621 m
VC = 20 m
K = 3
PI = 11+85.000
EL = 192.134 m
VC = 50 m
K = 17
FEATHER
10 m
END GRADE -Y15- STA. 12+10.000 EL = 192.484 m
END CONSTRUCTION -Y15- STA. 12+20.000 EL = 192.499 m
-1.7619%
+4.3229%
+4.3229%
+1.4000%
PROPOSED -Y15- PROFILE
EXISTING -Y15- PROFILE
10 +20 +40 +60 +80 11 +20
11 +20 +40 +60 +80 12 +20 +40

8/2/2001
r:\roadway\proj\R2241A_RDY_PFL.dgn
agroves

RALPH WHITEHEAD ASSOCIATES
CONSULTING ENGINEERS
P.O. BOX 4424
CHARLOTTE, NORTH CAROLINA 28225

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	43
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10 HORIZ.

1 0 2 VERT.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R /W REV.

FEATHER 10 m

BEGIN CONSTRUCTION -Y17- STA. 10+70.00 EL = 174.380 m

BEGIN GRADE -Y17- STA. 10+80.00 EL = 174.345 m

-Y17-

SEE SHEET 22 FOR -Y17- PLAN

PROPOSED -Y- PROFILE

PI = 11+85.000
EL = 173.875 m
VC = 92 m
K = 27

-0.4476%

-0.7944%

EXISTING GROUNDLINE

PI = 12+75.000
EL = 170.460 m
VC = 50 m
K = 9

-3.7944%

+2.0004%

(+) 0.35%

END GRADE -Y17- STA. 13+03.095 m
-L- STA. 76+06.312 OFF 15.4 EOP
EL = 171.022 m

BEGIN SPECIAL DITCH GRADE -Y17- STA. 12+49.000 RT EL. 169.78

END SPECIAL DITCH GRADE -Y17- STA. 12+95.00 RT EL. 169.73

175 170 165

+40 +60 +80 11 +20 +40 +60 +80 12 +20 +40 +60 +80 13 +20

-XI-

SEE SHEET 23 FOR -XI- PLAN

BEGIN GRADE -XI- STA. 77+84.868 m
-L- STA. 77+84.868 OFF 6.4 EOP NORTHBOUND LANE
EL = 171.642 m

PROPOSED -XI- PROFILE

PI = 78+40.000
EL = 172.110 m
VC = 70 m
K = 61

+0.6229%

-0.5333%

PI = 79+30.000
EL = 171.630 m
VC = 100 m
K = 82

-0.5333%

+0.6889%

EXISTING GROUNDLINE

PI = 80+84.000
EL = 172.691 m
VC = 60 m
K = 26

+0.6869%

-1.6169%

END GRADE -XI- STA. 81+26.863 m
-L- STA. 81+26.863 OFF 10.652 EOP
EL = 171.964 m

175 170 165

+60 +80 78 +20 +40 +60 +80 79 +20 +40 +60 +80 80 +20 +40 +60 +80 81 +20

11/22/2011
r:\projects\proj\R2241A_RDY_PFL.dgn
cgroves

5 0 5 10

METRIC

[redacted]

100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100

190
185
180

185.505 185.709 185.506
4:1 0.0200 0.0200
S.S. 185.139
185.520
16+20.000

185
180

184.366 184.762
15:1 4.0% 2.0% 0.0200 0.0200 DRIVEWAY
S.S. 184.868
184.691
16+00.000

185
180

183.929 184.133 183.929
4:1 0.0200 0.0200
S.S. 184.023
184.023
15+80.000

185
180

183.084 183.288 183.084
3:1 0.0200 0.0200
S.S. 180.909
183.162
15+60.000

EXCAVATION IN WETLAND
FILL IN WETLAND
MECHANIZED CLEARING

185
180

182.238 182.442 182.238
3:1 0.0200 0.0200 4:1
S.S. 179.042
S.S. 181.833
182.340
15+40.000

SITE 2

-L-

100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100

10:26:48
USERNAME

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	X-12

5 0 5 10

METRIC

Revised Drawing Sheet 1 of 1

SITE 5

FILL IN WETLAND

FILL IN WETLAND

MECHANIZED CLEARING

MECHANIZED CLEARING

S.S. 175.418

179.308 179.512 179.308

0.0200 0.0200

2:1 2:1

1.5:1

TEMP. SLOPE

175.760
21+20.000

S.S. 175.836

S.S. 175.19

178.764 178.968 178.764

0.0200 0.0200

2:1 2:1

1.5:1

TEMP. SLOPE

175.215
21+00.000

S.S. 175.133

S.S. 174.084

178.414 178.618 178.414

0.0200 0.0200

2:1 2:1

1.5:1

TEMP. SLOPE

0.9

2:1 2:1

173.70

175.243
20+80.000

S.S. 176.795

178.257 178.461 178.257

0.0200 0.0200

3:1

1.5:1

TEMP. SLOPE

0.9

2:1 2:1

175.10

176.739
20+60.000

S.S. 179.585

TEMP. SLOPE

178.294 178.498 178.425

0.0200 0.0064

3:1

0.9

2:1 2:1

176.10

179.029
20+40.000

L

100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100

180 175 170

10.25.39

SYSTEM FILE
USER NAME

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	X-27

5 0 5 10

METRIC

Permit Drawing
Sheet of

SITE 7

IMPACTS IN SURFACE WATER

FILL IN WETLAND

36+20.000
S.S. 191.093
198.213
0.0200
6:1
6:1
198.213
0.0200
S.S. 199.506
2:1
2:1
D.P. 197.310
196.27
197.001

36+00.000
198.543
0.0200
6:1
6:1
198.543
0.0200
S.S. 198.396
3.92
2:1
2:1
D.P. 197.640
194.90
197.331

35+80.000
198.872
0.0200
6:1
6:1
198.872
0.0200
2:1
2:1
D.P. 197.970
192.64
196.191

35+60.000
199.202
0.0200
6:1
6:1
199.202
0.0200
2:1
2:1
D.P. 198.299
193.01
194.775

35+40.000
199.532
0.0200
6:1
6:1
199.532
0.0200
2:1
2:1
D.P. 198.629
192.40
195.298

-L-

100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100

200 195 190

10/25/38

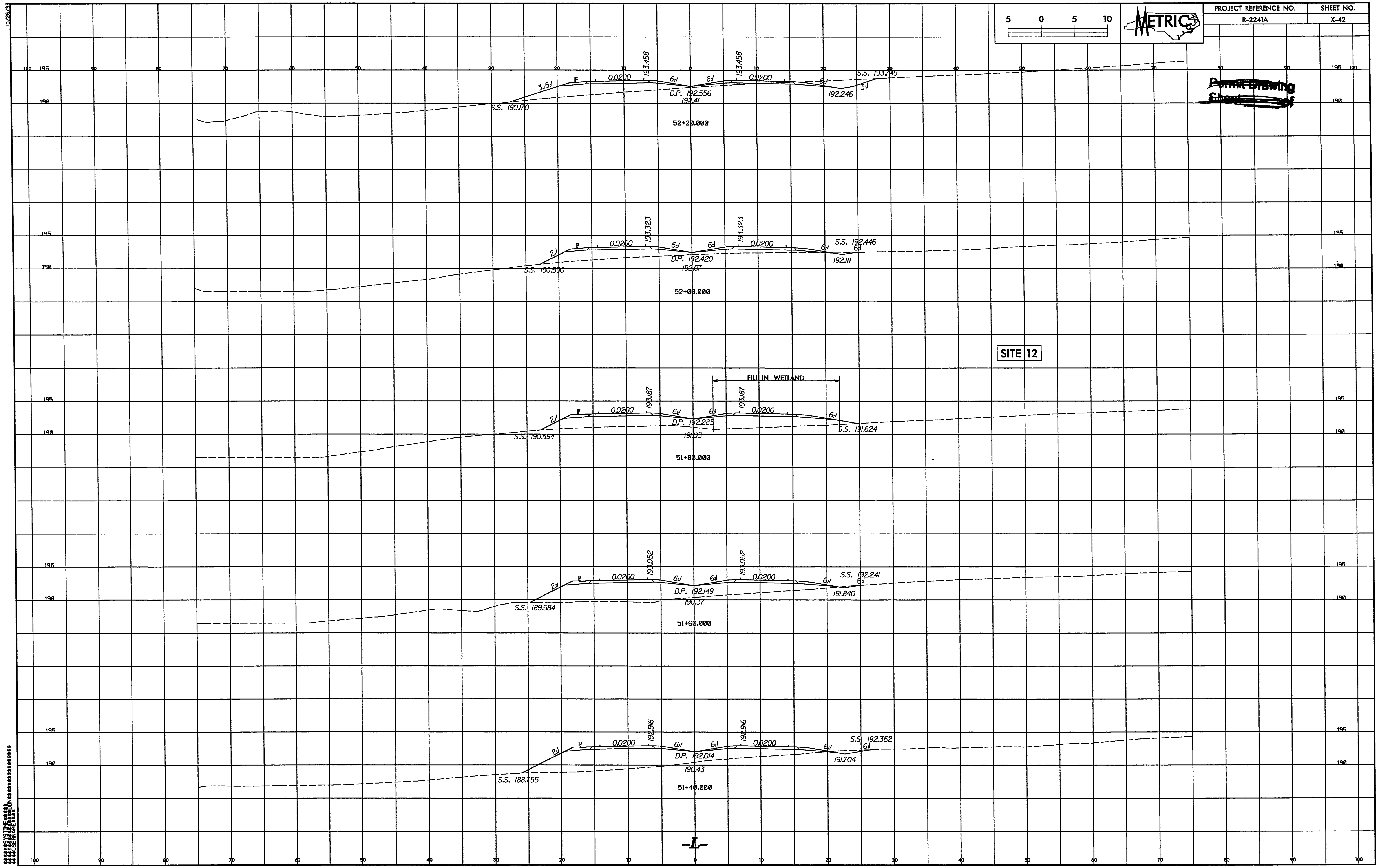
SYSTEM FILE NAME
USER NAME

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	X-29

METRIC

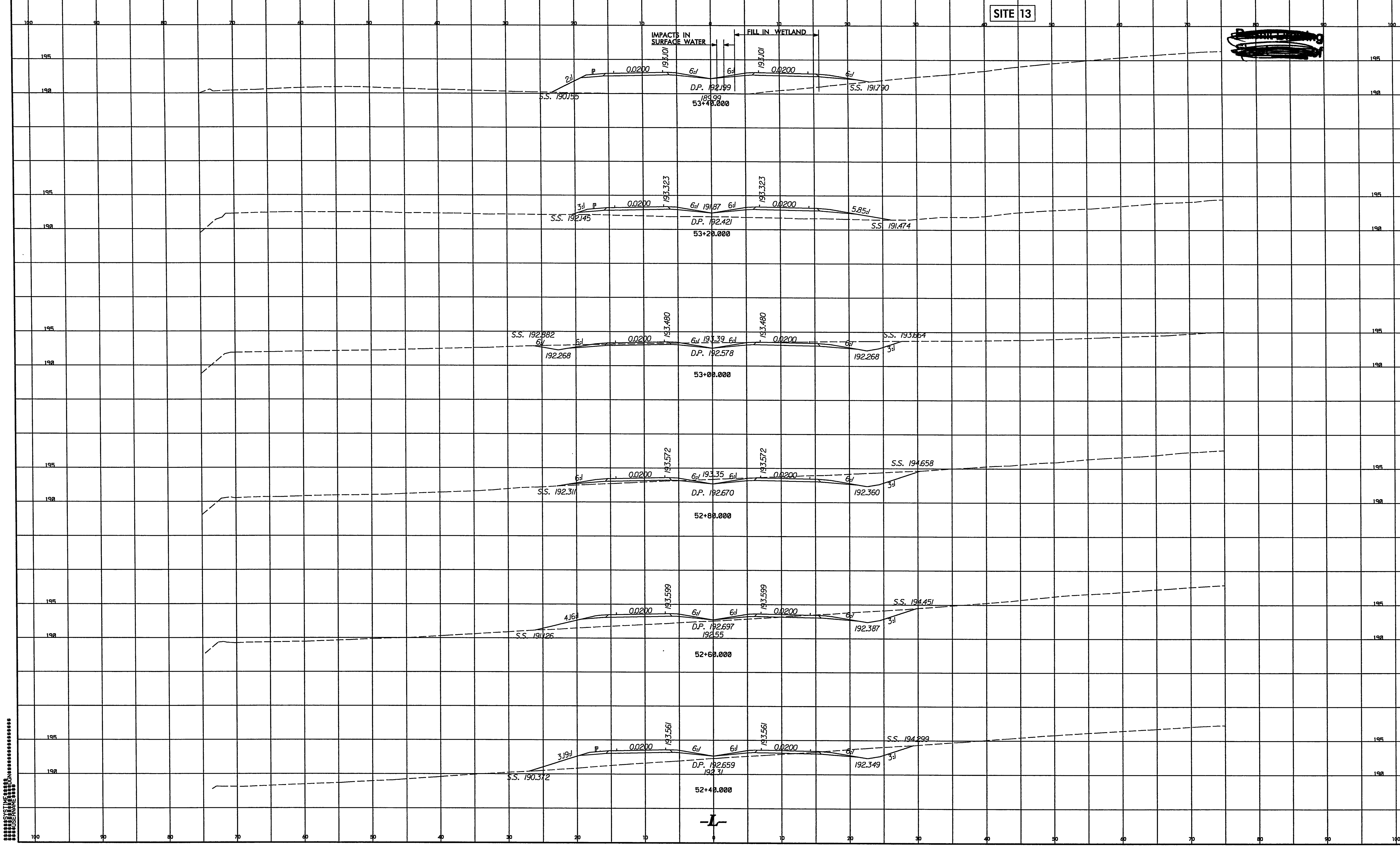
~~Permit Drawing~~
~~Sheet~~ of

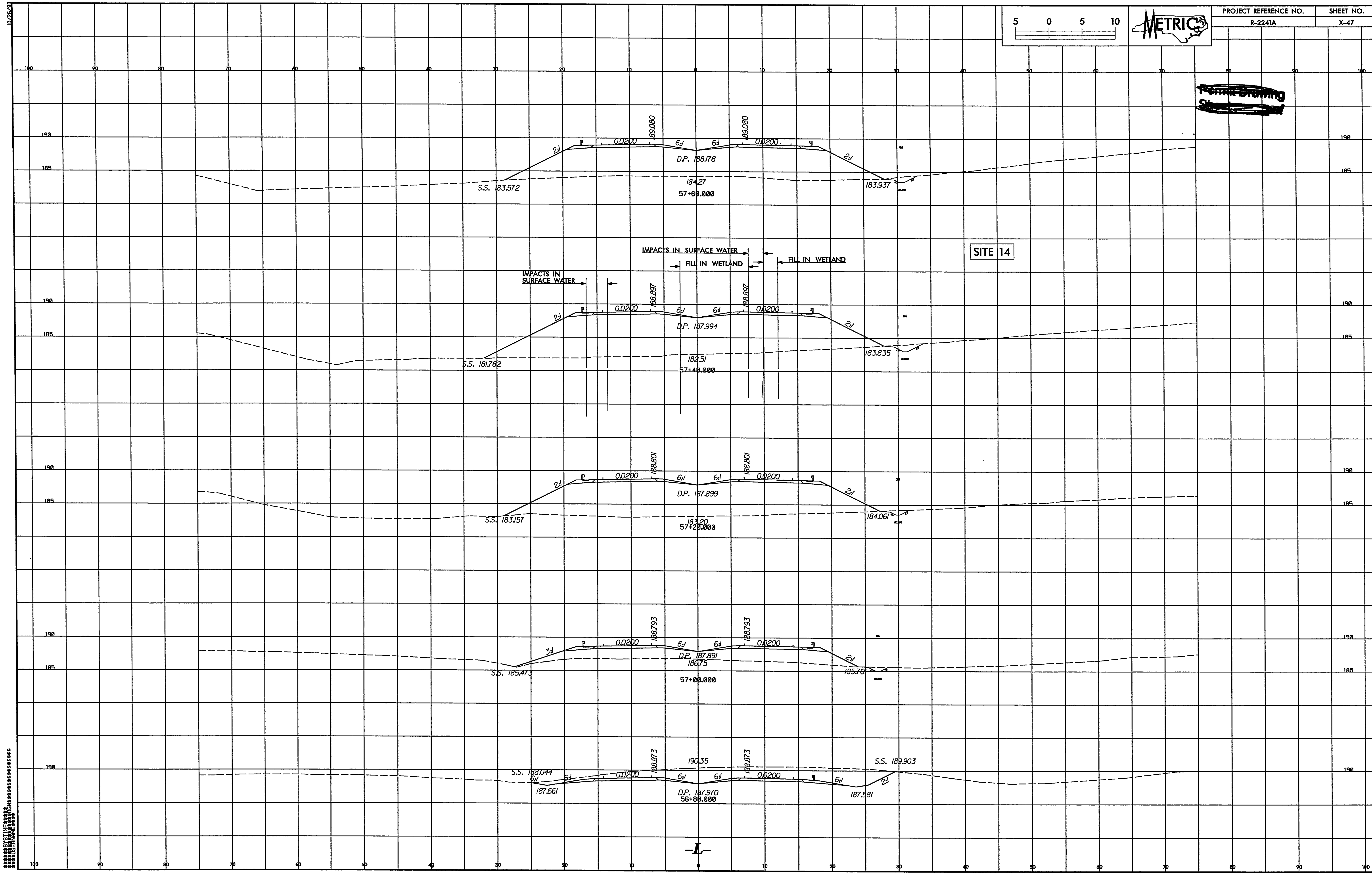
SITE 8

 PROJECT REFERENCE NO.
R-2241A
SHEET NO.
X-42
METRIC
5 0 5 10
Permit Drawing
Sheet of
SITE 12
FILL IN WETLAND
52+20.000
52+00.000
51+80.000
51+60.000
51+40.000
S.S. 190.170
D.P. 192.556
192.41
192.246
S.S. 193.749
193.458
S.S. 190.550
D.P. 192.420
192.07
192.111
S.S. 192.446
193.323
S.S. 190.594
D.P. 192.285
191.03
S.S. 191.624
193.187
S.S. 189.584
D.P. 192.149
190.57
191.840
S.S. 192.241
193.052
S.S. 188.755
D.P. 192.014
190.43
191.704
S.S. 192.362
192.916
0.0200
-L-

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	X-43

METRIC


SITE 13
5 0 5 10
IMPACTS IN SURFACE WATER
FILL IN WETLAND
193.101
0.0200
6:1
2:1
D.P. 192.199
189.99
S.S. 190.155
S.S. 191.790
53+40.000
193.323
3:1
5.85:1
S.S. 192.145
D.P. 192.421
S.S. 191.474
191.87
53+20.000
193.480
S.S. 192.882
193.39
192.268
D.P. 192.578
S.S. 193.664
53+00.000
193.572
193.35
S.S. 192.311
D.P. 192.670
192.360
S.S. 194.658
52+80.000
193.599
4.16:1
S.S. 191.126
D.P. 192.697
192.55
192.387
S.S. 194.451
52+60.000
193.561
3.19:1
S.S. 190.372
D.P. 192.659
192.31
192.349
S.S. 194.299
52+40.000
-L-
195
190



METRIC
PROJECT REFERENCE NO.
R-2241A
SHEET NO.
X-47
5 0 5 10
SITE 14
IMPACTS IN SURFACE WATER
FILL IN WETLAND
FILL IN WETLAND
IMPACTS IN SURFACE WATER
57+60.000
D.P. 188.178
184.27
S.S. 183.572
183.937
57+40.000
D.P. 187.994
182.51
S.S. 181.782
183.835
57+20.000
D.P. 187.899
183.20
S.S. 183.157
184.061
57+00.000
D.P. 187.891
186.75
S.S. 185.473
185.70
56+80.000
D.P. 187.970
190.35
S.S. 188.044
S.S. 189.903
187.661
187.581
0.0200
6:1
2:1
3:1
-L-

10/26/98

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	X-53

5 0 5 10

METRIC

100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100

180
175

2:1 6:1 0.0200 6:1 6:1 0.0200 2:1

178.617 178.617

D.P. 177.714

176.60

173.84

64+40.000

S.S. 173.235

179.332 179.332

D.P. 178.430

177.30

175.91

64+20.000

S.S. 173.801

SITE 15

FILL IN WETLAND

180.048 180.048

D.P. 179.145

178.00

176.37

64+00.000

S.S. 174.467

180.763 180.763

D.P. 179.860

179.15

176.35

63+80.000

S.S. 175.500

S.S. 181.618

3:1

181.479 181.479

D.P. 180.576

180.267

177.26

63+60.000

S.S. 176.724

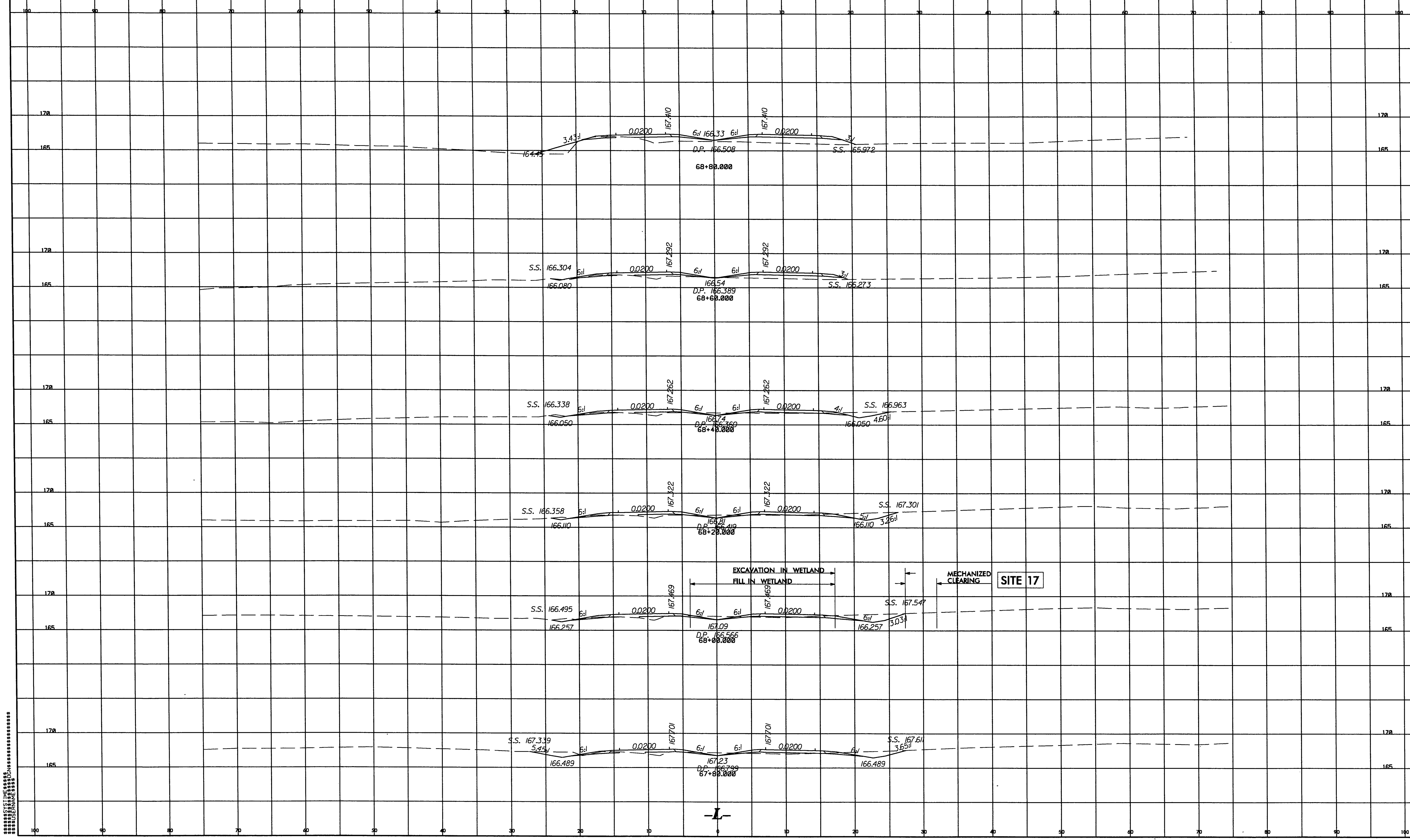
—L—

$$USERNAME$$
$$SYSTIME$$

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	X-57

5 0 5 10

METRIC



10/26/98

PROJECT REFERENCE NO.	SHEET NO.
R-2241A	X-65

5 0 5 10

METRIC

EXIST. 6.01%
171.656
79+60.000

-TEMP
171.83:
6:1 MATCH EXIST 5:1
S.S. 171.553
79+40.000

-TEMF
171.74:
6:1 0.041 4:1
S.S. 171.958
79+20.000

-TEMF
171.74:
6:1 0.041 3:1
S.S. 171.44
79+00.000

-TEMF
171.82:
10.4:1 0.039 3:1
S.S. 171.250
78+80.000

FILL IN WETLAND
MECHANIZED CLEARING

-TEMF
171.907
S.S. 171.330 3:1 6:1 0.028 3:1
S.S. 171.112
78+60.000

SITE 19

-TEMF
171.928
S.S. 171.480 3:1 6:1 0.0200 3:1
S.S. 171.253
78+40.000

-TEMPS
171.283
S.S. 171.653 3:1 6:1 0.0200 3:1
S.S. 171.314
78+20.000

-L-

SYSTIME
USERNAME