STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAT L. MCCRORY
GOVERNOR

ANTHONY J. TATA
SECRETARY

April 30, 2014

Wilmington Regulatory Field Office
US Army Corps of Engineers
69 Darlington Avenue
Wilmington, North Carolina 28403

ATTN: Ms. Liz Hair
NCDOT Coordinator

Dear Madam:

Subject: **Request for Modification to Individual Section 404 and Section 401 Water Quality Certification** for Fayetteville Outer Loop from I-95 South of Fayetteville to NC 24-87, Cumberland, Hoke, and Robeson Counties. Federal Aid Project No. NHF-DPR-0100(001), State Project No. 8.2441301, TIP Nos X-0002 B & C, and U-2519 AA, AB, BA, BB, CA, CB, DA, & E, Debit $570 from WBS 35196.3.19

References: Section 404 and 401 Individual Permit Application requested April 25, 2008
Section 404 Individual Permit issued October 23, 2008 (SAW-2008-01413)
Section 401 Water Quality Certification issued October 6, 2008 (003278)
Section 404 and 401 Modification requested May 21, 2010
Section 401 Modification issued June 3, 2010 (20080737 v.2)
Section 404 and 401 Modification requested October 7, 2010
Section 401 Modification issued December 16, 2010 (20080737 v.3)
Section 404 Modification issued December 21, 2010 (SAW-2008-01413)

The purpose of this modification request is to provide final design for U-2519 CB and a portion of DA. As you are aware, X-0002 B & C, and U-2519 DA & E are currently under construction. Additionally, we are providing updated preliminary impacts for sections AA, AB, BA, BB, and CA, which remain post year. Please see the enclosed revised permit drawings, roadway plans, utility plans, and a revised Privateer Wetland and Stream Mitigation Site Debit Ledger for section U-2519 CB. This modification request is relevant to section U-2519 CB, as well as, a portion of section U-2519 DA. U-2519 CB had preliminary design when the original permit was requested in 2008. Proposed wetland impacts have increased from the preliminary design of 5.50 acres to 5.88 acres (4.37 riparian, 1.51 non-riparian). Conversely, stream impacts have decreased from the preliminary design of 1,391 feet to 739 feet along with 40 feet of bank stabilization.

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

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

WEBSITE: NCDOT.GOV

LOCATION:
CENTURY CENTER, BUILDING B
1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610

Surveys for all federally-protected species listed for Cumberland County were conducted in 2013. A biological conclusion of "no effect" remains current for all species except the red-cockaded woodpecker (RCW). A reevaluation was conducted for the proposed impacts to RCW. The conclusions specified in the *Red-cockaded woodpecker Biological Assessment for the Fayetteville Outer Loop, Cumberland, Hoke and Robeson Counties, North Carolina*, dated September 7, 2004 and the subsequent USFWS Biological Opinion, dated April 28, 2005 remain valid.

Table 1. U-2519 CB Wetland Impacts and Descriptions

Permit Site No.	FEIS Site ID	Riverine or Non-Riverine	Permanent (ac.)	Temporary (ac.)	Mitigation Required
1	B	Riverine	0.00	0.00	N/A
2	B	Riverine	0.00	0.00	N/A
3	B	Riverine	0.37	0.00	Yes
4	B	Riverine	0.18	0.00	Yes
5	C	Riverine	0.69	0.00	Yes
6	C	Riverine	0.13	0.00	Yes
7	C	Riverine	0.08	0.00	Yes
8	C	Riverine	0.67	0.00	Yes
9	C	Riverine	0.31	0.00	Yes
10	C	Riverine	1.94	0.00	Yes
12	C2	Non-Riverine	0.01	0.00	Yes
13	U	Non-Riverine	0.27	0.00	Yes
15	S	Non-Riverine	0.50	0.00	Yes
16	T	Non-Riverine	0.20	0.00	Yes
18†	N	Non-Riverine	0.53	0.00	Yes
Total			**5.88**	**0.0**	

†Site 18 was originally included with the U-2519 DA section as "future"; however, hydraulic design was not complete.

Please note, sites 19 and 20 on the Wetland Permit Impact Summary table show the addition of work bridges associated with bridges permitted under the U-2519 DA section.

Table 2. U-2519 CB Stream Impacts and Descriptions

Permit Site No.	FEIS Site ID	Permanent (ft)	Permanent (ac.)	Temporary (ft)	Temporary (ac.)	Type of Stream	Mitigation Required
1	2UTB	0	0.00	5	0.01	Perennial	N/A
2	2UTB	69	0.01	19	0.01	Perennial	Yes
2*	2UTB	10	0.00	0	0.00	Perennial	No
13	U	80	0.01	0	0.00	Perennial	Yes
13*	U	10	0.00	0	0.00	Perennial	No
14	V	25	0.01	10	0.01	Perennial	Yes
14*	V	10	0.00	0	0.00	Perennial	No
15	S/UTS	444	0.06	40	0.01	Perennial	Yes
18†	N	121	0.02	35	0.01	Perennial	Yes
18*	N	10	0.00	0	0.00	Perennial	No
Total		**779**	**0.11**	**109**	**0.05**		

*Denotes bank stabilization; when necessary, mitigation required by the USACE exceeds the amount required by NCDWR

†Site 18 was originally include with the U-2519 DA section as "future"; however, hydraulic design was not complete.

Compensatory mitigation for the additional 0.38 acre of wetland impacts were debited from the Privateer Wetland and Stream Mitigation Site. This brings total project wetland impacts to 51.28 acres (33.76 riparian, 17.52 non-riparian). The reduction in 612 feet of stream impacts will be credited back to the the Privateer Wetland and Stream Mitigation Site, bringing and total project stream impacts to 13,030 feet.

Utility relocations will result in < 0.01 acre of wetland impacts from excavation and <0.01 acre from temporary fill for underground power-line installation and and 0.01 acre of hand clearing in wetlands.

Regulatory Approvals

The let date for this project is August 19, 2014 however the review date is May 27, 2014. As the review date for the project is quickly approaching, we respectfully request expedited issuance of the permit modification in an effort keep the project letting on schedule.

Section 404: We are hereby requesting the modifications described above and an expiration date of December 31, 2019 for the USACE Individual 404 Permit signed October 23, 2008 (SAW-2008-01413), for the above-described activities.

Section 401: We are hereby requesting a modification to the 401 Water Quality Certification from the NCDWQ issued October 6, 2008 (DWQ No. 003278). In compliance with Section 143-215.3D(e) of the NCAC, we will provide $570.00 to act as payment for processing the Section 401 permit modification.

A copy of this modification request and its distribution list will be posted on the NCDOT website at: https://connect.ncdot.gov/resources/Environmental

Thank you for your assistance with this project. If you have any questions or need additional information, please contact Tyler Stanton at 919-707-6156 or tstanton@ncdot.gov.

Sincerely,

Richard W. Hancock, P.E., Manager
Project Development and Environmental Analysis Unit

cc:

NCDOT Permit Application Standard Distribution List.

Privateer
WM 026-005

The Privateer Farms Restoration Site (Site) is located in Bladen and Cumberland Counties, North Carolina, approximately fourteen miles southeast of Fayetteville. Prior to restoration, land use on the Site over the past 20 years had been primarily row crop agriculture. Stream and riparian functions on the Site had been severely impacted as a result of agricultural conversion. Harrison Creek had historically meandered through the Site, but was channelized in the early 1980s to reduce flooding and provide a drainage outlet for the extensive network of ditches excavated across the Site. Subsequent to channelization, Harrison Creek existed as a large canal running straight through the Site.

Restoration activities for the Site involved moving the stream channel back to its historic location and elevation, and filling drainage ditches to raise the local water table and restore wetland and stream hydrology. The plan also included scarification of the fields and breaking of the local plow pan to increase surface water storage and provide a range of hydrologic conditions suitable for a variety of native wetland plant species. The restoration plan for the Site predicted the restoration of 405 acres of riverine wetlands, 25 acres of riverine wetland enhancement, and 33,985 linear feet (LF) of stream restoration. Following construction, the as-built data indicated that the total area of restored riverine wetlands was 402.5 acres (excluding 2.5 acres for road accesses), with 25 acres of enhanced riverine wetlands, and 34,005 LF of restored stream channel.

As of fall 2009, the Site has met all prescribed hydrologic and vegetative monitoring criteria and been recommended for closeout.

According to the April 2014 permit mod, there were an additional 0.38 acres of wetland impacts associated with T.I.P. U-2519CB and an excess of 612 linear feet of debits to the Privateer Mitigation Site. To offset the additional 0.38 acres of unavoidable wetland impacts, the Privateer Farms Mitigation Site will be debited at a 3:1 ratio, totaling 1.14 acres wetland debits. Privateer will be credited 918 linear feet of stream credit from the over debit of 612 linear feet at 1.5:1 ratio from preliminary design. These debits and credits are reflected in the following ledger.

HUC	Mitigation Type	Starting Amount	Additional Notes
3030004	Stream Restoration	25676	**Out of service area ratios: 1.5:1 ratio for stream impacts 3:1 for wetland impacts
3030004	Riparian Wetland Restoration	185.58	**Out of service area ratios: 1.5:1 ratio for stream impacts 3:1 for wetland impacts

Mitigation Type	Debit Amount (Ln.Ft.)	Status	Site TIP	Action ID#	Notes
Stream	18316.5	Close	U-2519	2008-01413	Debit amount includes all

Privateer
WM 026-005

Mitigation Type	Debit Amount (Ln.Ft.)	Status	Site TIP	Action ID#	Notes
Restoration		Out			modification request including U-2519CB(4/29/14)
Stream Restoration	615	Close Out	U-2519 Mod	2008-01413	

Mitigation Type	Debit Amount (Ac.)	Status	Site TIP	Action ID#	Notes
Riparian Wetland Restoration	153.84	Close Out	U-2519	2008-01413	Debit amount includes all modification request including U-2519CB(4/29/14)
Riparian Wetland Restoration	1.29	Close Out	U-2519 Mod	2008-01413	
Riparian Wetland Restoration	7.38	Close Out	R-2303A	1992-03237	

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR LINEAR ROADWAY PROJECTS

(Version 1.2; Released September 2011)

Project/TIP No.: U-2519CB **County(ies):** Cumberland

General Project Information

Project No.:	U-2519CB	**Project Type:**	New Location	**Date:**	4/23/2014
NCDOT Contact:	Vincent N. Rivers	**Contractor / Designer:**	HNTB North Carolina, P.C		
Address:	1020 Birch Ridge Rd. Raleigh, NC 27610	**Address:**	343 E. Six Forks Road, Suite 200 Raliegh, NC 27609		
Phone:	919-707-6748	**Phone:**	919-424-0437		
Email:	vrivers@ncdot.gov	**Email:**	jabyrd@hntb.com		
City/Town:	Fayetteville/Fort Bragg	**County(ies):**	Cumberland		
River Basin(s):	Cape Fear	**CAMA County?**	No		
Primary Receiving Water:	Stewarts Creek / Beaver Creek	**NCDWQ Stream Index No.:**	18-31-24-5-4 / 18-31-24-5		
NCDWQ Surface Water Classification for Primary Receiving Water	**Primary:**	Class C			
	Supplemental:	None			
Other Stream Classification:	None				
303(d) Impairments:	None				
Buffer Rules in Effect	N/A				

Project Description

Project Length (lin. Miles or feet):	6.15 Miles	**Surrounding Land Use:**	Military, Urban, Residential

	Proposed Project	**Existing Site**
Project Built-Upon Area (ac.)	120.00 ac.	22.00 ac.
Typical Cross Section Description:	4-Lane Median Divided Freeway with variable 46' to 70' median.	N/A
Average Daily Traffic (veh/hr/day):	Design/Future: 70,300 (2034)	Existing: 49,900 (2014)
General Project Narrative:	Fayetteville Outer Loop on new location from south of SR 1400 (Cliffdale Road) to east of All American Freeway	

References

North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR LINEAR ROADWAY PROJECTS

(Version 1.2; Released September 2011)

Project/TIP No.: U-2519CB **County(ies):** Cumberland

Project Environmental Summary

Surface Water Impacts

Sheet No.	Station (From / To)	Feature Impacted	Water / Wetland / Buffer Type	Receiving Surface Water Name	NRTR Map ID	NCDWQ Stream Index	NCDWQ Surface Water Classification	303(d) Impairments	Type of Impact	Existing SCM	Proposed SCM
9	821+59 830+76	Wetland		Stewarts Creek		18-31-24-5-4	C	None	Clearing	N/A	
9	825+11 825+88	Stream	Perennial	UT to Stewarts Creek		N/A	C	None	Culvert	N/A	
10	836+61 838+07	Wetland		Stewarts Creek		18-31-24-5-4	C	None	Fill	N/A	
10	838+80 841+17	Wetland		Stewarts Creek		18-31-24-5-4	C	None	Fill	N/A	
11	847+36 849+22	Wetland		Stewarts Creek		18-31-24-5-4	C	None	Fill	N/A	PFSH
11	852+83 853+64	Wetland		Stewarts Creek		18-31-24-5-4	C	None	Fill	N/A	
11/12	855+25 855+70	Wetland		Stewarts Creek		18-31-24-5-4	C	None	Fill	N/A	
12	859+50 861+81	Wetland		Stewarts Creek		18-31-24-5-4	C	None	Fill	N/A	
12	864+39 865+64	Wetland		Stewarts Creek		18-31-24-5-4	C	None	Fill	N/A	
14/15	889+04 902+62	Wetland		Stewarts Creek		18-31-24-5-4	C	None	Fill	N/A	
16	908+82 909+03	Wetland		UT to Stewarts Creek		N/A	N/A	None	Clearing	N/A	
19	958+94 959+16	Wetland		Persimmon Creek		18-31-24-5-4	C	None	Clearing	N/A	PFSH
02BD	Y2REV_LT 34+55 Y2REV_LT 36+20	Stream	Perennial	Persimmon Creek		18-31-24-5-4	C	None	Culvert	N/A	
24	TT4 54+56 TT4 58+27	Stream	Perennial	UT to Stewarts Creek		N/A	N/A	None	Culvert	N/A	
24	Y1 39+18 Y1 40+61	Wetland		UT to Stewarts Creek		N/A	N/A	None	Fill	N/A	PFSH
24	Y1 39+18 Y1 40+61	Wetland		UT to Stewarts Creek		N/A	N/A	None	Fill	N/A	PFSH

* List all stream and surface water impact locations regardless of jurisdiction or size.
Equalizer Pipes to be noted as a minimization of impacts.
All proposed SCMs listed must also be listed under Swales, Preformed Sour Holes and other Energy Dissipators, or Other Stormwater Control Measures.

Description of Minimization of Impacts or Mitigation

-Preformed scour holes have been placed near jurisdictional wetlands and streams where practical.
-Impacts from steep cross pipe slopes (discharging into jurisdictional wetlands or streams) have been reduced with the use of junction boxes, flat exit pipe slopes, and non-buried upstream inverts.
-Ditches that discharge directly into wetlands have been designed to "daylight" to zero depth just outside the wetland boundaries to difuse flow and reduce vilocities.

References

North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR LINEAR ROADWAY PROJECTS

(Version 1.2; Released September 2011)

Project/TIP No.: U-2519CB **County(ies):** Cumberland

Project Environmental Summary

Surface Water Impacts

Sheet No.	Station (From / To)	Feature Impacted	Water / Wetland / Buffer Type	Receiving Surface Water Name	NRTR Map ID	NCDWQ Stream Index	NCDWQ Surface Water Classification	303(d) Impairments	Type of Impact	Existing SCM	Proposed SCM
22C	L 49+55 L 53+92	Stream	Perennial	UT to Beaver Creek		N/A	N/A	None	Fill	N/A	N/A
22B\C	L 49+55 L 54+84	Wetland		UT to Beaver Creek		N/A	N/A	None	Fill	N/A	N/A
22B/C	L 52+52 L 54+90	Wetland		UT to Beaver Creek		N/A	N/A	None	Clearing	N/A	N/A
22E/F	L 89+00 L 93+35	Wetland		Beaver Creek		18-31-24-5	C	None	Clearing	N/A	N/A
22F	RP1C 42+50 RP1C 48+50	Wetland		Beaver Creek		18-31-24-5	C	None	Clearing	N/A	N/A

* List all stream and surface water impact locations regardless of jurisdiction or size.
Equalizer Pipes to be noted as a minimization of impacts.
All proposed SCMs listed must also be listed under Swales, Preformed Sour Holes and other Energy Dissipators, or Other Stormwater Control Measures.

Description of Minimization of Impacts or Mitigation

References

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR LINEAR ROADWAY PROJECTS

(Version 1.2; Released September 2011)

Project/TIP No.: U-2519CB **County(ies):** Cumberland

Preformed Scour Holes and Energy Dissipators

Sheet No.	Station	Energy Dissipator Type	Riprap Type	Drainage Area (ac)	Conveyance Structure	Pipe/Structure Dimensions (in)	Q10 (cfs)	V10 (fps)
9	-L- 820+50 (RT.)	PFSH	Class 'B'	0.72	Pipe	18	2.7	0.4
10	-L- 837+15 (RT.)	Riprap Apron / Pad	Class 'B'	10.42	Pipe	42	15.5	1.7
11	-L- 847+50 (RT.)	PFSH	Class 'B'	0.18	Pipe	15	1.0	0.3
11	-L- 848+65 (RT.)	Riprap Apron / Pad	Class 'B'	16.00	Pipe	36	10.5	1.6
11	-L- 850+20 (RT.)	PFSH	Class 'B'	1.22	Pipe	15	4.3	0.5
12	-L- 860+15 (RT.)	Riprap Apron / Pad	Class 'B'	21.00	Pipe	30	12.7	1.9
12	-L- 865+25 (RT.)	Riprap Apron / Pad	Class I	180.00	Pipe	54	22.5	2.0
14	-L- 891+40 (RT.)	Riprap Apron / Pad	Class I	7.00	Pipe	30	9.0	1.9
15	-L- 893+00 (RT.)	Riprap Apron / Pad	Class I	1.79	Pipe	30	7.6	2.0
24	-TT4- 55+56 (LT.)	Riprap Apron / Pad	Class I	100.00	Pipe	72	85.0	5.3
02BD	-Y2REV_LT- 35+03 (LT.)	Riprap Apron / Pad	Class I	98.00	Pipe	72	100.0	8.4
9	-TT1- 46+40 (RT)	Riprap Apron / Pad	Class 'B'	67.20	Pipe	48	13.8	1.4

☐ YES ☑ NO Have minimum design criteria, as presented in the NCDOT Best Management Practices Toolbox (2008), NCDOT Standard Details, or FHWA HEC-14 (July 2006), been met and verified, as applicable? If No, provide further explanantion of why design criteria was not met.

Additional Comments

The above noted design violation on Sheet Nos. 24 was discussed and accepted at 4C. The outlet pipes associated with the design violation shown above have been laid at reduced slopes to reduce outlet velocities.

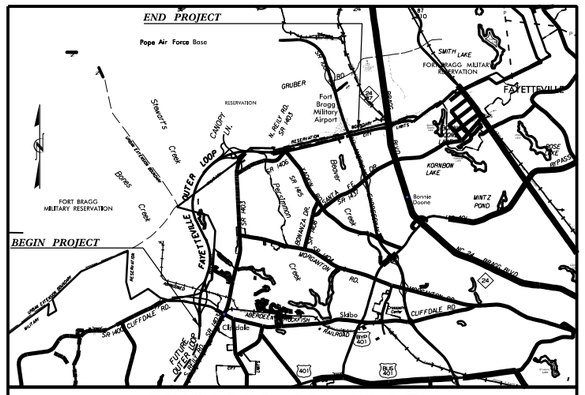
* Refer to the NCDOT Best Management Practices Toolbox, Version 1 (March 2008), NCDOT Standard Details, the Federal Highway Administration (FHWA) Hydraulic Engineering Circular No. 14 (HEC-14), Third Edition, Hydraulic Design of Energy Dissipators for Culverts and Channels (July 2006), as applicable, for design guidance and criteria.

12/24/13

TIP PROJECT: U-2519CB

CONTRACT: C203398

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

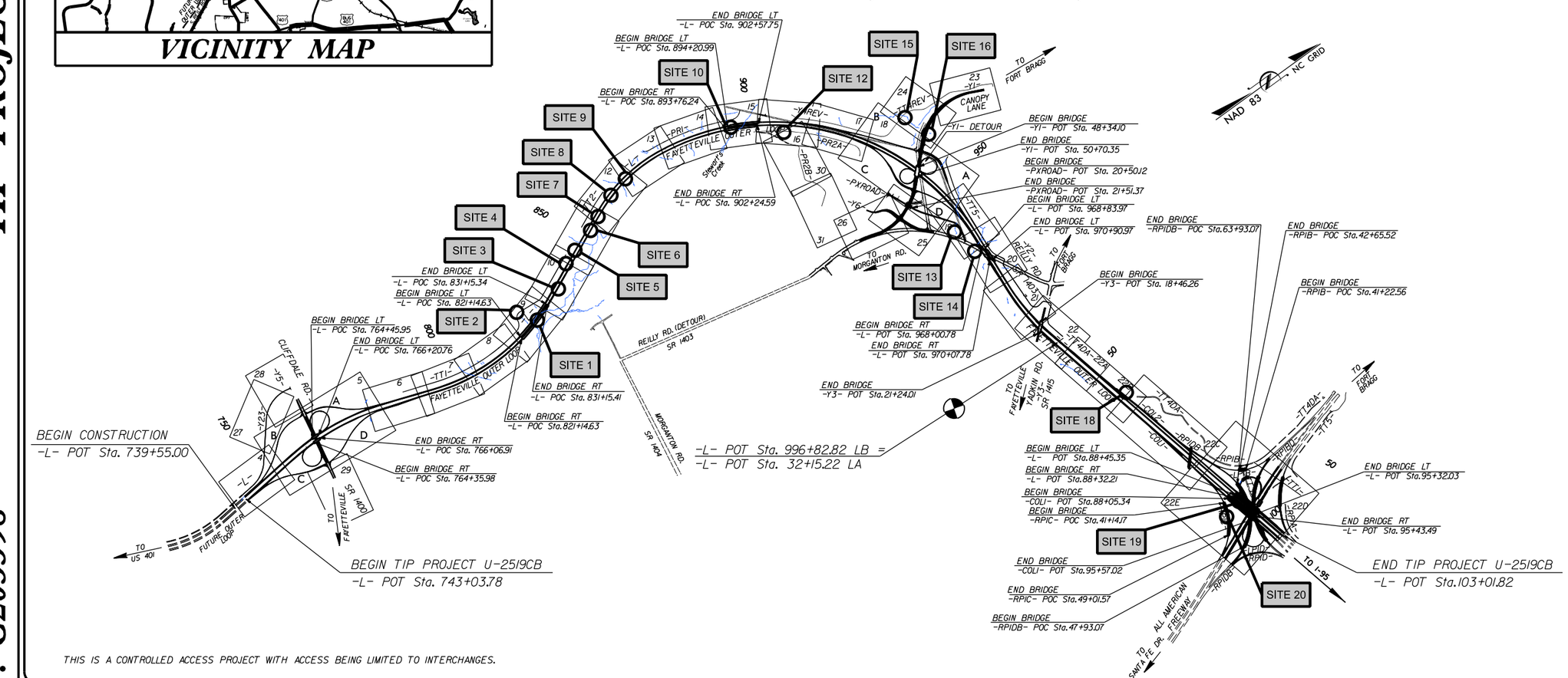
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2519CB	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34817.1.2	NHF-DPR-0100(001)	P.E.
34817.2.8	NHF-DPR-0100(001)	R/W, UTL.
34817.3.S8	NHF-DPR-0100(001)	CONST.

PERMIT DRAWINGS
SHEET 1 OF 55

LOCATION: FAYETTEVILLE OUTER LOOP
FROM SOUTH OF SR 1400 (CLIFFDALE ROAD)
TO EAST OF ALL AMERICAN FREEWAY

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES,
CULVERT, RETAINING WALLS, SIGNALS & SIGNING



THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2014 = 49,900
ADT 2034 = 70,300
DHV = 8 %
D = 55 %
T = 12 % *
V = 70 MPH
* (TTST=4 + DUAL=8)
FUNC CLASS : INTERSTATE
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-2519CB	=	5.592 MILES
LENGTH STRUCTURES TIP PROJECT U-2519CB	=	0.557 MILES
TOTAL LENGTH OF TIP PROJECT U-2519CB	=	6.149 MILES

Prepared in the Office of:
RS&H
ARCHITECTS-ENGINEERS-PLANNERS, INC.
8601 SIX FORKS RD, SUITE 260
RALEIGH, NC 27615
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JULY 31, 2006

LETTING DATE:
AUGUST 19, 2014

KENNETH HERRING, PE
PROJECT ENGINEER

JASON TALLEY, PE
PROJECT DESIGN ENGINEER

BRENDA L. MOORE, PE
NCDOT CONTACT

HYDRAULICS ENGINEER
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER
SIGNATURE: P.E.

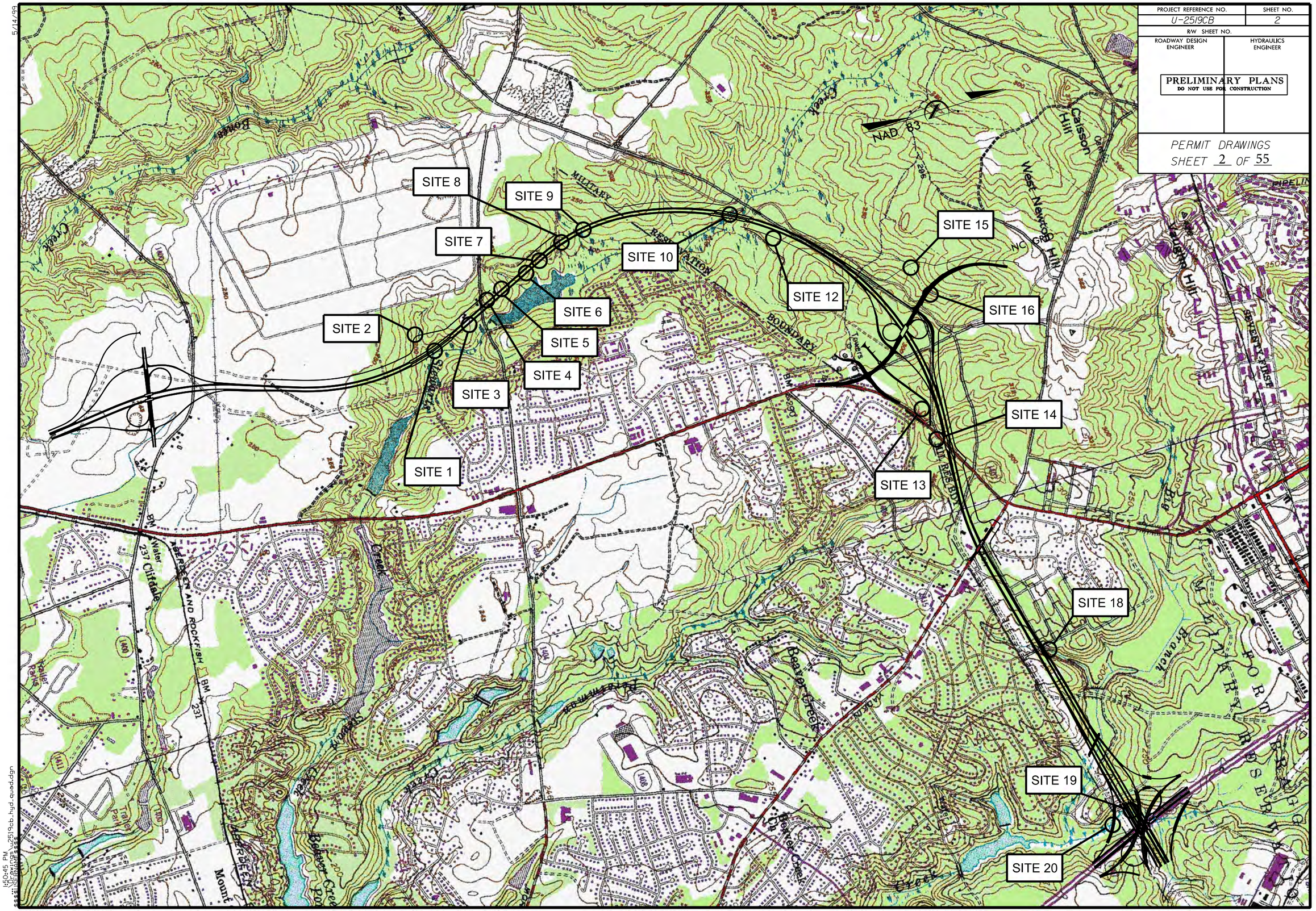
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

1:50:39 PM
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWINGS
SHEET 2 OF 55



7/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

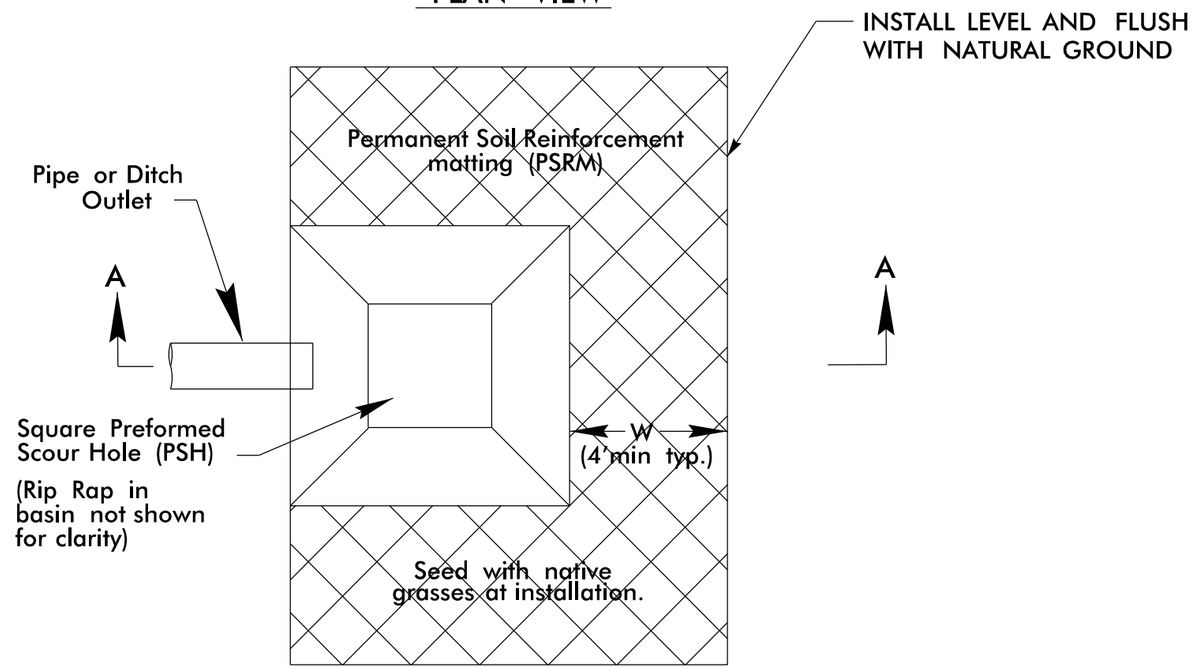
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWINGS
SHEET 3 OF 55

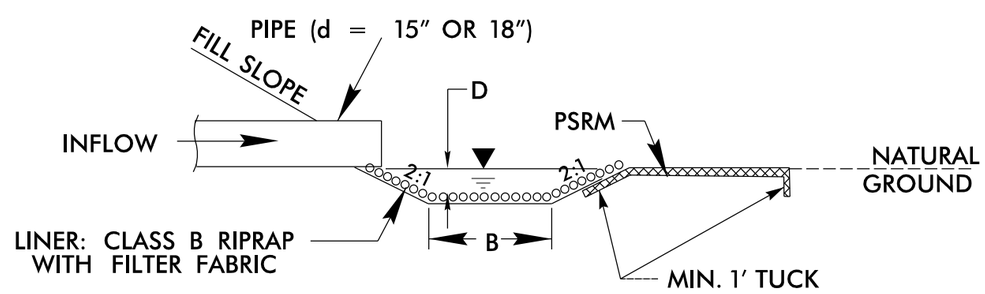
PREFORMED SCOUR HOLE

*NOT TO SCALE

PLAN VIEW



SECTION A–A



3/08

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	2-BB
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ROADWAY DESIGN ENGINEER

NAD 83

PERMIT DRAWINGS
SHEET 4 OF 55

LEGEND

- S S — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- F F — DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- HC HC — DENOTES HAND CLEARING
- E E — DENOTES EXCAVATION IN WETLAND
- DENOTES WORK BRIDGE

PAVEMENT REMOVAL

DETAIL T
STANDARD BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, B, 3:1, Natural Ground
Min. D= 1.5 Ft.
B= 2.0 Ft.
Type of Liner= CL. 'B' Rip-Rap
FROM -Y1REV_LT- STA. 33+50 TO STA. 35+50 (RT)

DETAIL AF
SPECIAL CUT BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, B, 4:1 or Flatter, Front Ditch Slope
Min. D= 1.0 Ft.
B= 2.0 Ft.
FROM -Y1REV_LT- STA. 30+00 TO STA. 33+00 (LT)

DETAIL RR
TOE PROTECTION
(Not to Scale)
Natural Ground, d, 3:1, Fill Slope, Geo-Textile
d= 1.0 Ft.
Type of Liner= CL. 'B' Rip-Rap
-TT4REV- 52+50 TO 56+05 (RT)
-TT4REV- 55+56 TO 58+50 (LT)
-Y1REV_LT- 35+00 TO 39+70 (LT)
-Y1REV_LT- 39+90 TO 41+25 (LT)

DETAIL U
LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, B, 3:1, b, 8%, Fill Slope
Min. D= 1.0 Ft.
b= 5.0 Ft.
B= 2.0 Ft.
Type of Liner= CL. 'B' Rip-Rap
FROM -Y1REV_LT- STA. 35+50 TO STA. 36+50 (RT)

DETAIL AG
STANDARD BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, B, 3:1, Natural Ground
Min. D= - Ft.
B= * Ft.
Type of Liner= CL. 'B' Rip-Rap
FROM -Y1REV_LT- STA. 36+50 TO STA. 37+00 (RT)
*B VARIES FROM 2 TO 10 FT

DETAIL AH
SPECIAL LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, B, 4:1 or Flatter, Fill Slope
Min. D= 1.0 Ft.
B= 2.0 Ft.
Type of Liner= CL. 'B' Rip-Rap
FROM -Y1REV_LT- STA. 32+00 TO STA. 33+50 (RT)

SITE 15

SITE 16

MATCHLINE -Y1REV_LT- STA. 32+50 SEE SHEET 2-BA

MATCHLINE -Y1- STA. 41+50 SEE SHEET 18

SPEC. LAT. 2' BASE DITCH
SEE DETAIL AH
CL. 'B' RIP RAP
EST. 60 TONS
EST. 150 S.Y.G.F.

STD. 2' BASE DITCH
SEE DETAIL T
CL. 'B' RIP RAP
EST. 80 TONS
EST. 200 S.Y.G.F.

LATERAL BASE DITCH
SEE DETAIL U
CL. 'B' RIP RAP
EST. 40 TONS
EST. 100 S.Y.G.F.

VAR. WIDTH BASE DITCH
SEE DETAIL AG
CL. 'B' RIP RAP
EST. 20 TONS
EST. 50 S.Y.G.F.

SPEC. CUT BASE DITCH
SEE DETAIL AF

SEE DETAIL FSR

TOE PROTECTION
SEE DETAIL RR
EST. 135 TONS
EST. 400 S.Y.G.F

TOE PROTECTION
SEE DETAIL RR
EST. 100 TONS
EST. 300 S.Y.G.F

TOE PROTECTION
SEE DETAIL RR
EST. 105 TONS
EST. 320 S.Y.G.F

PREFORMED
SCOUR HOLE
B= 5' W= 9'
D= 2' G= 0.5'

RETAIN

DANGER TREE AREA

RAISED GRASSED ISLAND

84" WM. SECURITY FENCE W/3SSW OUTRIGGER

35 (Y1REV_RT)

35 (-Y1REV_LT-)

40 (Y1REV_RT)

40 (-Y1REV_LT-)

-TT4REV-

N 74° 47' 37.01" E

S 30° 52' 54.89" E 2 449' E

S 15° 14' 27.8" E

72" RCP-III

24" RCP-III

15" RCP-IV

18" RCP-III

2GI

2GI FG

SEE DETAIL SHTS. 2-BI THRU 2-BK FOR ISLANDS AND PAVEMENT DIMENSIONS AND CONSTRUCTION DETAILS.

FOR -Y1REV_LT- PROFILE SEE SHT. 2-BE

FOR -Y1REV_RT- PROFILE SEE SHT. 2-BF

PLANS PREPARED BY :

RK&K

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PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	2-BB
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ROADWAY DESIGN ENGINEER

PERMIT DRAWINGS
SHEET 5 OF 55

NAD 83

LEGEND

- S / S — DENOTES IMPACTS IN SURFACE WATER
- TS / TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- F / F — DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- HC / HC — DENOTES HAND CLEARING
- E / E — DENOTES EXCAVATION IN WETLAND
- DENOTES WORK BRIDGE

PAVEMENT REMOVAL

DETAIL T
STANDARD BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, B, 3:1, Natural Ground
Min. D= 1.5 Ft.
B= 2.0 Ft.
Type of Liner= CL. 'B' Rip-Rap
FROM -Y1REV_LT- STA. 33+50 TO STA. 35+50 (RT)

DETAIL AF
SPECIAL CUT BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, B, 4:1 or Flatter, Front Ditch Slope
Min. D= 1.0 Ft.
B= 2.0 Ft.
FROM -Y1REV_LT- STA. 30+00 TO STA. 33+00 (LT)

DETAIL RR
TOE PROTECTION
(Not to Scale)
Natural Ground, d, 3:1, Fill Slope, Geo-Textile
d= 1.0 Ft.
Type of Liner= CL. 'B' Rip-Rap
-TT4REV- 52+50 TO 56+05 (RT)
-TT4REV- 55+56 TO 58+50 (LT)
-Y1REV_LT- 35+00 TO 39+70 (LT)
-Y1REV_LT- 39+90 TO 41+25 (LT)

DETAIL U
LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, B, 3:1, D, Fill Slope, B2
Min. D= 1.0 Ft.
D= 5.0 Ft.
B= 2.0 Ft.
Type of Liner= CL. 'B' Rip-Rap
FROM -Y1REV_LT- STA. 35+50 TO STA. 36+50 (RT)

DETAIL AG
STANDARD BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, B, 3:1, Natural Ground
Min. D= - Ft.
B= * Ft.
Type of Liner= CL. 'B' Rip-Rap
FROM -Y1REV LT- STA. 36+50 TO STA. 37+00 (RT)
*B VARIES FROM 2 TO 10 FT

DETAIL AH
SPECIAL LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, B, 4:1 or Flatter, Fill Slope
Min. D= 1.0 Ft.
B= 2.0 Ft.
Type of Liner= CL. 'B' Rip-Rap
FROM -Y1REV_LT- STA. 32+00 TO STA. 33+50 (RT)

SITE 15

SITE 16

MATCHLINE -Y1REV_LT- STA. 32+50 SEE SHEET 2-BA

MATCHLINE -Y1- STA. 41+50 SEE SHEET 18

SPEC. LAT. 2' BASE DITCH
SEE DETAIL AH
CL. 'B' RIP RAP
EST. 60 TONS
EST. 150 S.Y.G.F.

STD. 2' BASE DITCH
SEE DETAIL T
CL. 'B' RIP RAP
EST. 80 TONS
EST. 200 S.Y.G.F.

LATERAL BASE DITCH
SEE DETAIL U
CL. 'B' RIP RAP
EST. 40 TONS
EST. 100 S.Y.G.F.

VAR. WIDTH BASE DITCH
SEE DETAIL AG
CL. 'B' RIP RAP
EST. 20 TONS
EST. 50 S.Y.G.F.

SPEC. CUT BASE DITCH
SEE DETAIL AF

SEE DETAIL FSR

TOE PROTECTION
SEE DETAIL RR
EST. 135 TONS
EST. 400 S.Y.G.F.

TOE PROTECTION
SEE DETAIL RR
EST. 100 TONS
EST. 300 S.Y.G.F.

TOE PROTECTION
SEE DETAIL RR
EST. 105 TONS
EST. 320 S.Y.G.F.

TOE PROTECTION
SEE DETAIL RR
EST. 100 TONS
EST. 300 S.Y.G.F.

PREFORMED SCOUR HOLE
B= 5' W= 5'
D= 2' G= 0.5'

RETAIN

84" WH. SECURITY FENCE W/3SSW FOUTING FOOTER

DANGER TREE AREA

RAISED GRASSED ISLAND

-TT4REV-

-Y1REV-

35 (YIREV_RT)

35 (-YIREV_LT-)

40 (YIREV_RT)

40 (-YIREV_LT-)

SEE DETAIL SHTS. 2-BI THRU 2-BK FOR ISLANDS AND PAVEMENT DIMENSIONS AND CONSTRUCTION DETAILS.

FOR -Y1REV_LT- PROFILE SEE SHT. 2-BE

FOR -Y1REV_RT- PROFILE SEE SHT. 2-BF

PLANS PREPARED BY :

RK&K

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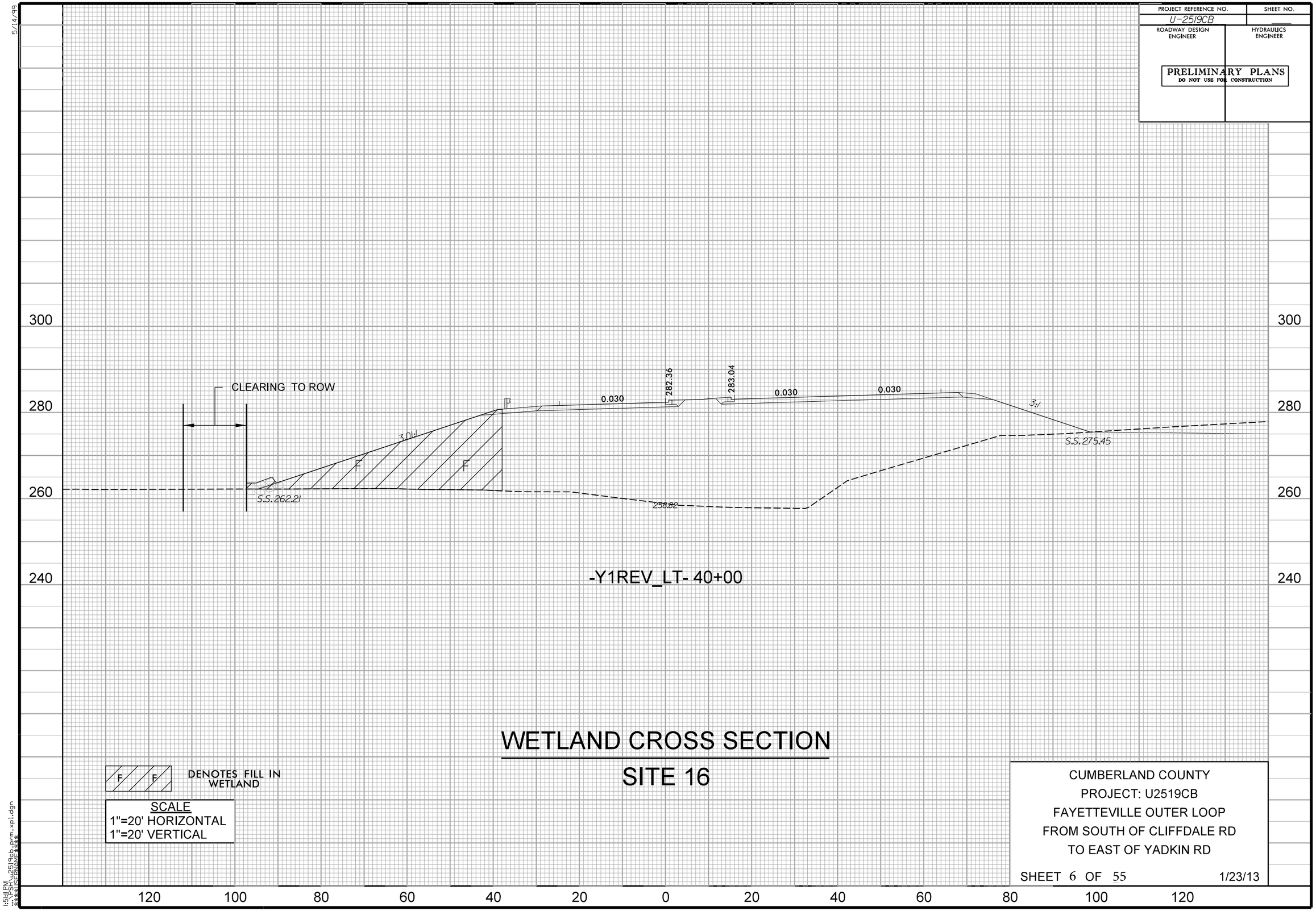
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



WETLAND CROSS SECTION

SITE 16

F F DENOTES FILL IN WETLAND

SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

CUMBERLAND COUNTY
PROJECT: U2519CB
FAYETTEVILLE OUTER LOOP
FROM SOUTH OF CLIFFDALE RD
TO EAST OF YADKIN RD

SHEET 6 OF 55 1/23/13

5/14/99

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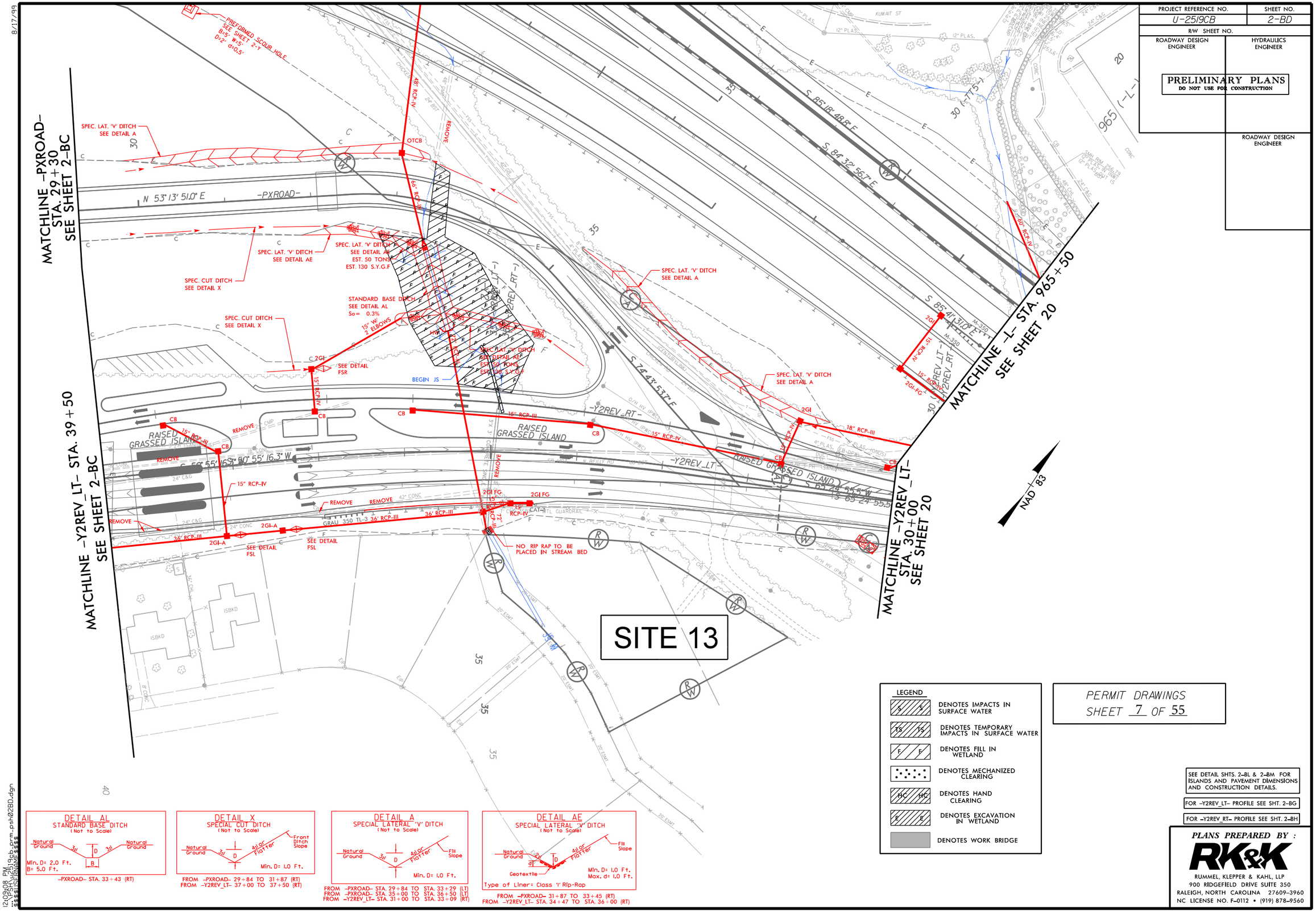
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	2-BD
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ROADWAY DESIGN ENGINEER



LEGEND

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES HAND CLEARING
- DENOTES EXCAVATION IN WETLAND
- DENOTES WORK BRIDGE

PERMIT DRAWINGS
SHEET 7 OF 55

SEE DETAIL SHTS. 2-BL & 2-BM FOR ISLANDS AND PAVEMENT DIMENSIONS AND CONSTRUCTION DETAILS.

FOR -Y2REV_LT- PROFILE SEE SHT. 2-BG

FOR -Y2REV_RT- PROFILE SEE SHT. 2-BH

DETAIL AL
STANDARD BASE DITCH
(Not to Scale)

-PXROAD- STA. 33+43 (RT)

DETAIL X
SPECIAL CUT DITCH
(Not to Scale)

FROM -PXROAD- 29+84 TO 31+87 (RT)
FROM -Y2REV_LT- 37+00 TO 37+50 (RT)

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

FROM -PXROAD- STA. 29+29 (LT)
FROM -PXROAD- STA. 35+00 TO STA. 36+50 (LT)
FROM -Y2REV_LT- STA. 31+00 TO STA. 33+09 (RT)

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

FROM -PXROAD- 31+87 TO 33+45 (RT)
FROM -Y2REV_LT- STA. 34+47 TO STA. 36+00 (RT)

PLANS PREPARED BY :
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900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
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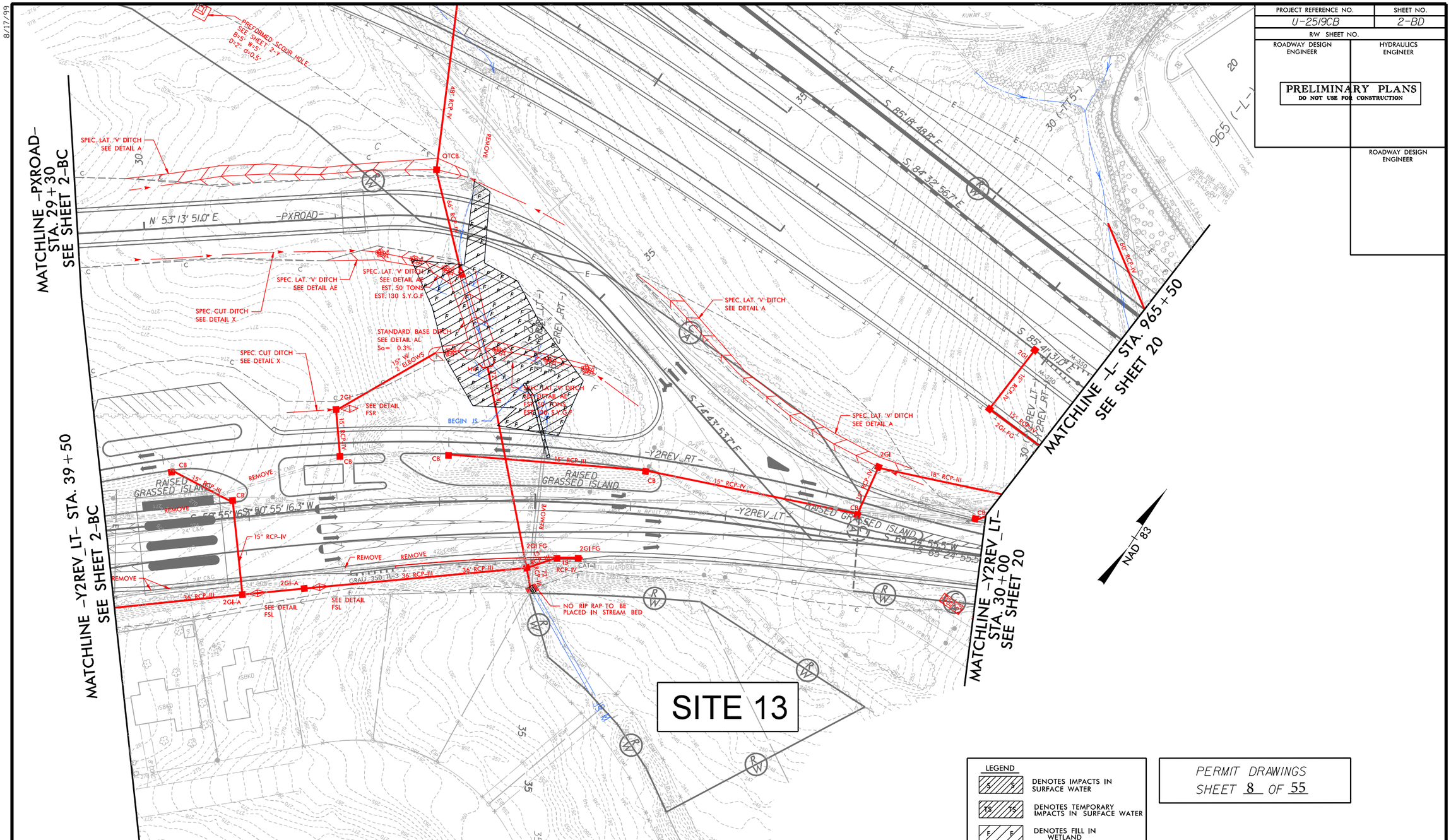
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	2-BD
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ROADWAY DESIGN ENGINEER



LEGEND	
S S	DENOTES IMPACTS IN SURFACE WATER
TS TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
F F	DENOTES FILL IN WETLAND
	DENOTES MECHANIZED CLEARING
HC HC	DENOTES HAND CLEARING
E E	DENOTES EXCAVATION IN WETLAND
	DENOTES WORK BRIDGE

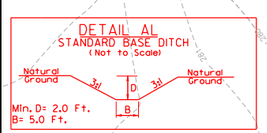
PERMIT DRAWINGS
SHEET 8 OF 55

SEE DETAIL SHTS. 2-BL & 2-BM FOR ISLANDS AND PAVEMENT DIMENSIONS AND CONSTRUCTION DETAILS.

FOR -Y2REV_LT- PROFILE SEE SHT. 2-BG

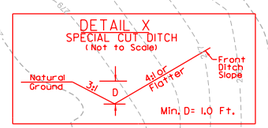
FOR -Y2REV_RT- PROFILE SEE SHT. 2-BH

DETAIL AL
STANDARD BASE DITCH
(Not to Scale)



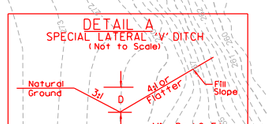
-PXROAD- STA. 33+43 (RT)

DETAIL X
SPECIAL CUT DITCH
(Not to Scale)



FROM -PXROAD- 29+84 TO 31+87 (RT)
FROM -Y2REV_LT- 37+00 TO 37+50 (RT)

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



FROM -PXROAD- STA. 29+84 TO STA. 33+29 (LT)
FROM -PXROAD- STA. 35+00 TO STA. 36+50 (LT)
FROM -Y2REV_LT- STA. 31+00 TO STA. 33+09 (RT)

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

Type of Liner= Class 'I' Rip-Rap

FROM -PXROAD- 31+87 TO 33+45 (RT)
FROM -Y2REV_LT- STA. 34+47 TO STA. 36+00 (RT)

PLANS PREPARED BY :
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RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
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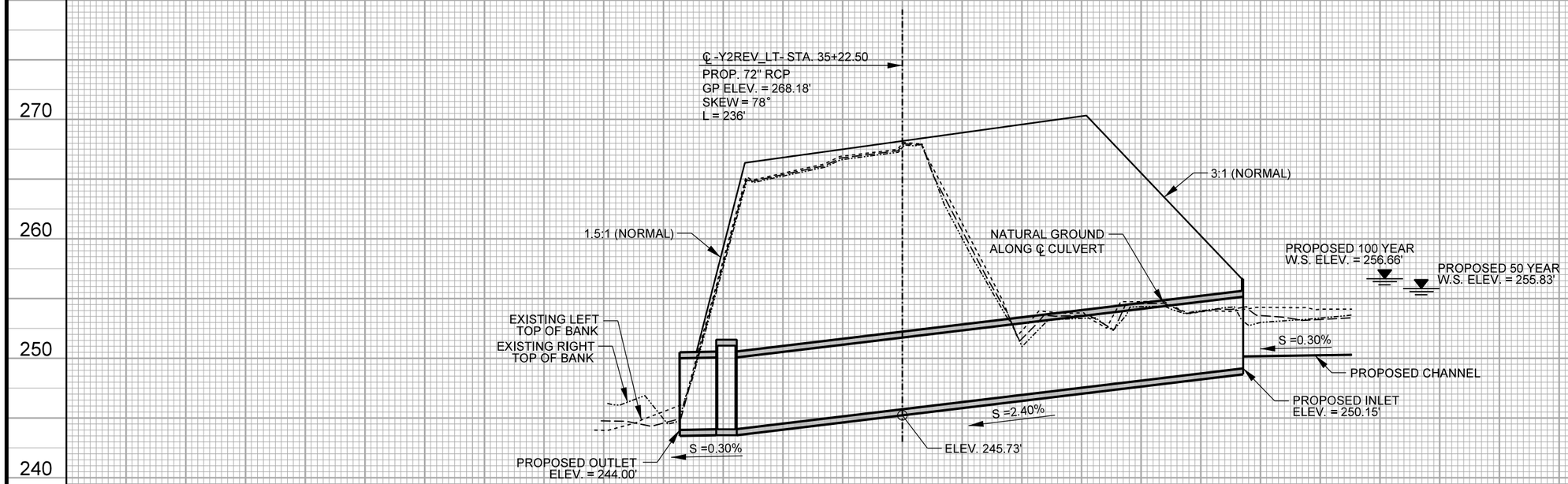
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



PROFILE ALONG STRUCTURE

SITE 13

SCALE
1"=50' HORIZONTAL
1"=10' VERTICAL

CUMBERLAND COUNTY
PROJECT: U2519CB
FAYETTEVILLE OUTER LOOP
FROM SOUTH OF CLIFFDALE RD
TO EAST OF YADKIN RD

SHEET 9 OF 55 4/17/14

5/14/99

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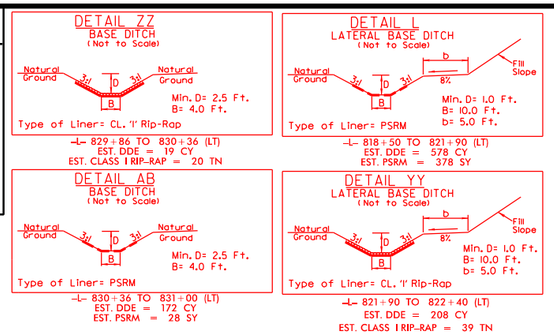
REVISIONS



NAD 83

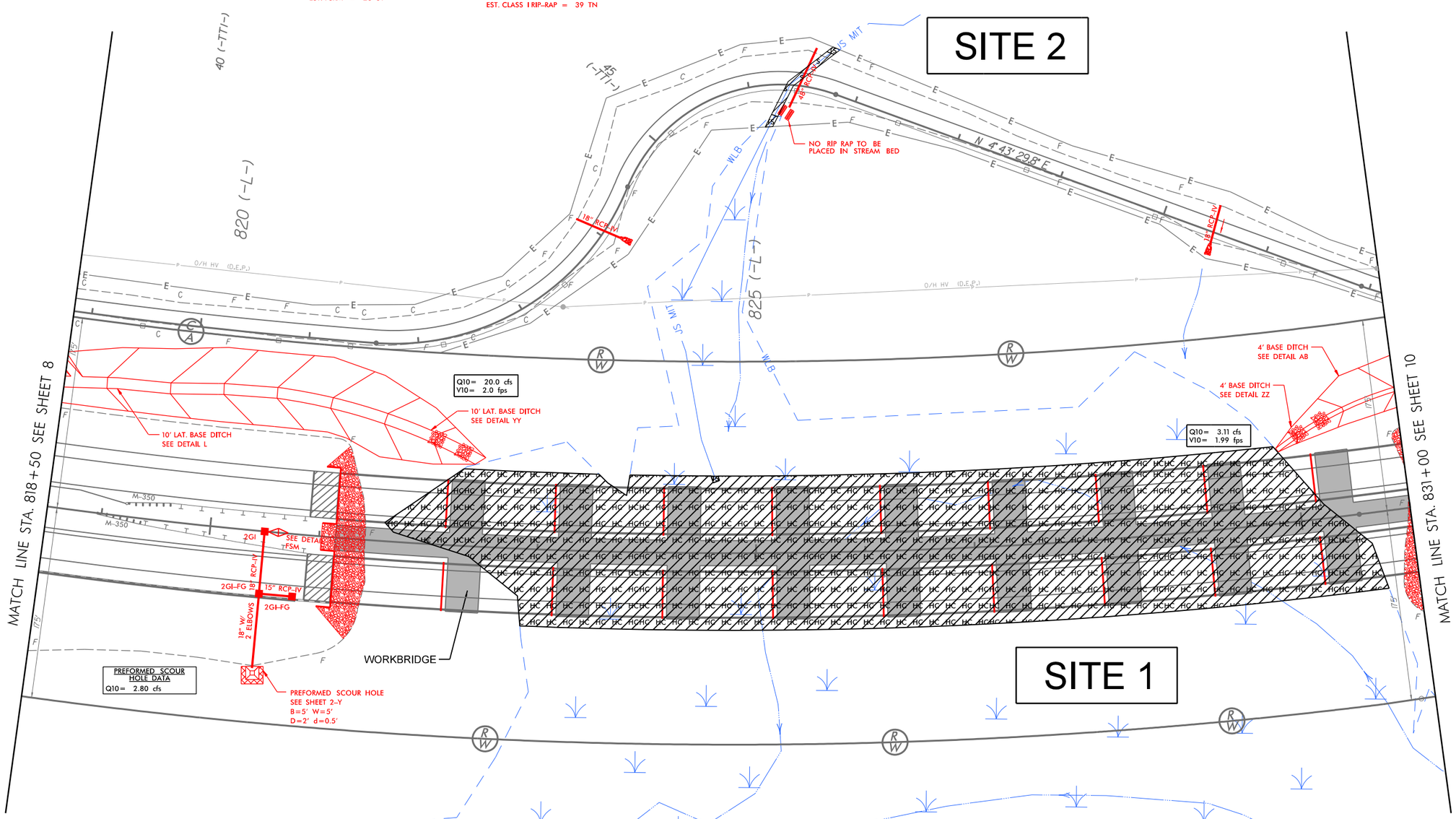
LEGEND

- S S — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- F F — DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- HC HC — DENOTES HAND CLEARING
- E E — DENOTES EXCAVATION IN WETLAND
- DENOTES WORK BRIDGE

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWINGS
SHEET 10 OF 55



SEE SHEETS 34 & 35 FOR -L- PROFILE
SEE SHEET 64 FOR -TT1- RPOFILE
SEE SHEET 2-S FOR BRIDGE SKETCH
FOR STRUCTURE PLANS, SEE SHEETS S- THRU S-

I04.001.001/U2519cb/Roadway/proj/u2519cb_rdy_psh09

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REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWINGS
SHEET 11 OF 55

LEGEND

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES HAND CLEARING
- DENOTES EXCAVATION IN WETLAND
- DENOTES WORK BRIDGE

DETAIL ZZ
BASE DITCH
(Not to Scale)

Natural Ground — 3:1 — D — B — 3:1 — Natural Ground

Min. D= 2.5 Ft.
B= 4.0 Ft.

Type of Liner= CL. 'I' Rip-Rap

-L- 829+86 TO 830+36 (LT)
EST. DDE = 19 CY
EST. CLASS I RIP-RAP = 20 TN

DETAIL L
LATERAL BASE DITCH
(Not to Scale)

Natural Ground — 3:1 — D — B — 3:1 — b — 8% — Fill Slope

Min. D= 1.0 Ft.
B= 10.0 Ft.
b= 5.0 Ft.

Type of Liner= PSRM

-L- 818+50 TO 821+90 (LT)
EST. DDE = 578 CY
EST. PSRM = 378 SY

DETAIL AB
BASE DITCH
(Not to Scale)

Natural Ground — 3:1 — D — B — 3:1 — Natural Ground

Min. D= 2.5 Ft.
B= 4.0 Ft.

Type of Liner= PSRM

-L- 830+36 TO 831+00 (LT)
EST. DDE = 172 CY
EST. PSRM = 28 SY

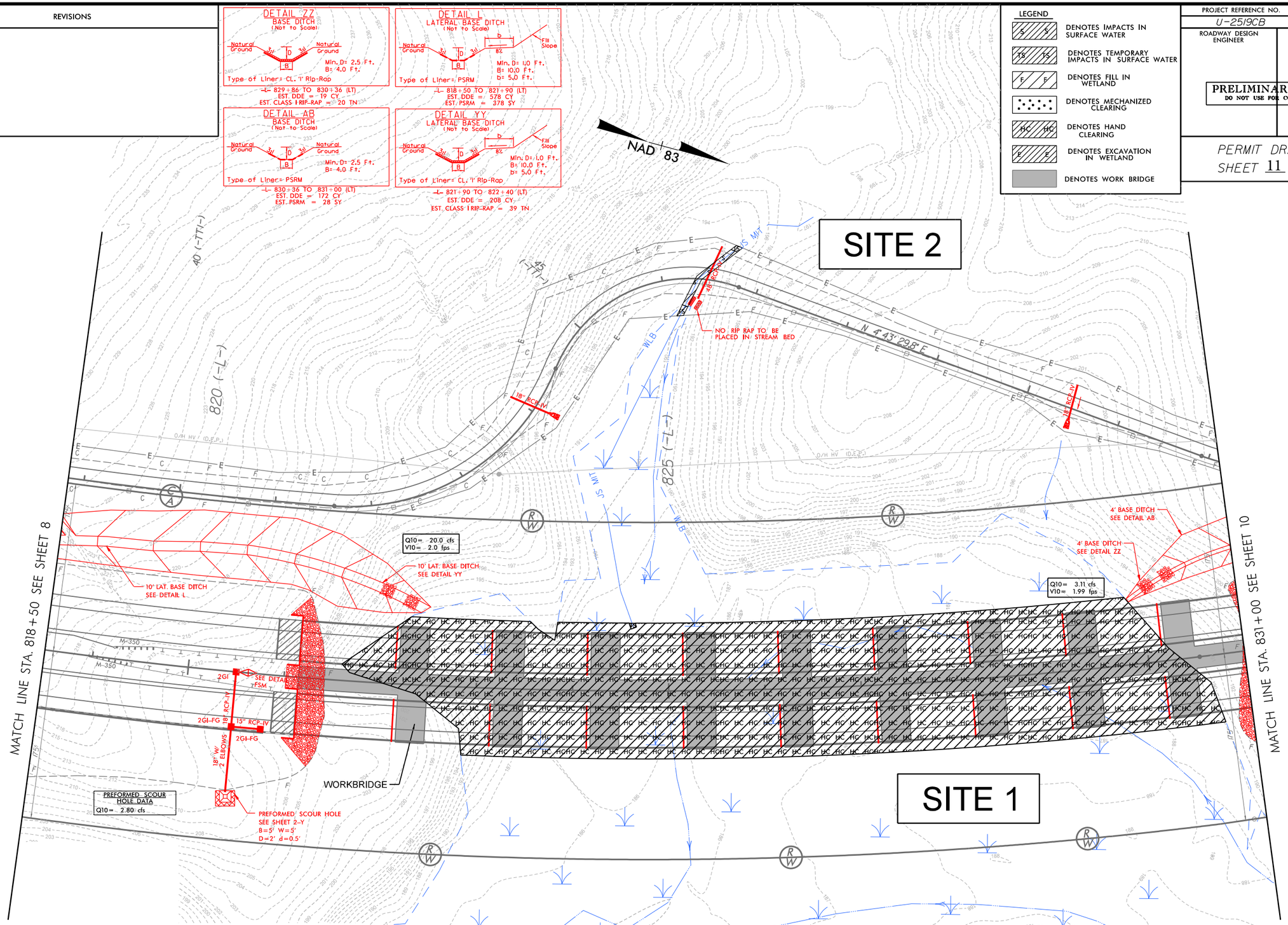
DETAIL YY
LATERAL BASE DITCH
(Not to Scale)

Natural Ground — 3:1 — D — B — 3:1 — b — 8% — Fill Slope

Min. D= 1.0 Ft.
B= 10.0 Ft.
b= 5.0 Ft.

Type of Liner= CL. 'I' Rip-Rap

-L- 821+90 TO 822+40 (LT)
EST. DDE = 208 CY
EST. CLASS I RIP-RAP = 39 TN



SEE SHEETS 34 & 35 FOR -L- PROFILE
SEE SHEET 64 FOR -TT1- RPOFILE
SEE SHEET 2-S FOR BRIDGE SKETCH
FOR STRUCTURE PLANS, SEE SHEETS S- THRU S-

I04.001.001/U2519cb/Roadway/proj/u2519cb_rdy_psh09

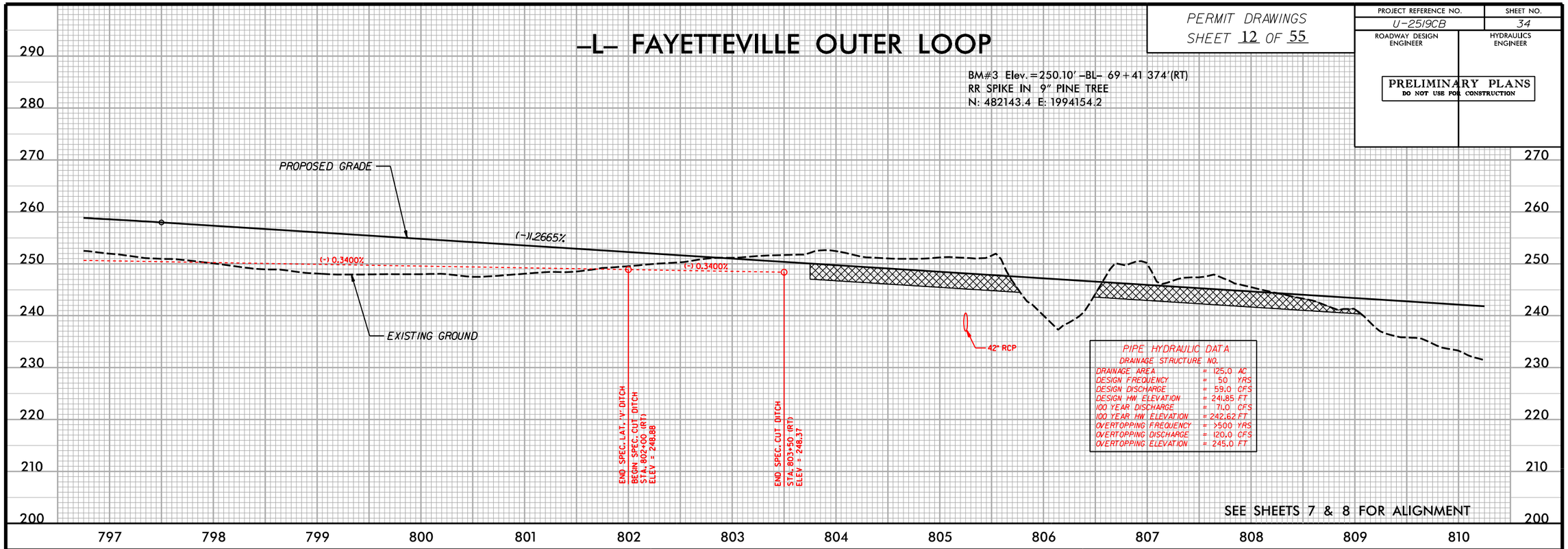
PERMIT DRAWINGS
SHEET 12 OF 55

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L- FAYETTEVILLE OUTER LOOP

BM#3 Elev. = 250.10' -BL- 69 + 41 374' (RT)
RR SPIKE IN 9" PINE TREE
N: 482143.4 E: 1994154.2



PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

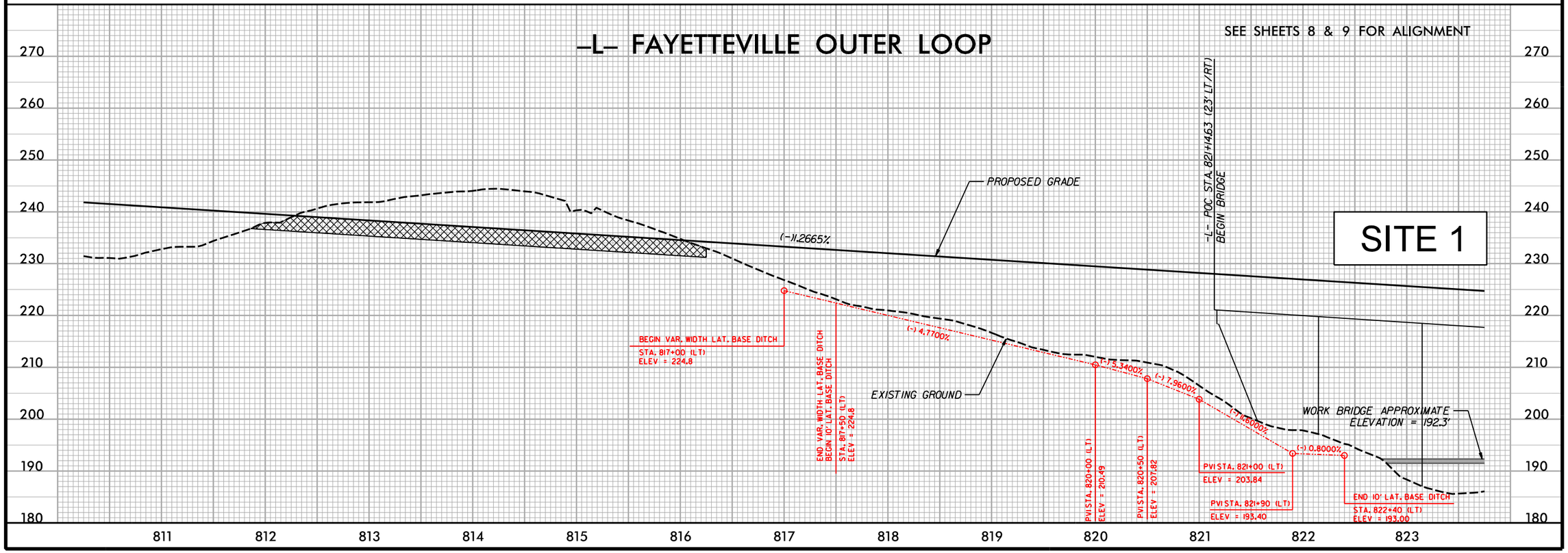
DRAINAGE AREA	=	125.0 AC
DESIGN FREQUENCY	=	50 YRS
DESIGN DISCHARGE	=	59.0 CFS
DESIGN HW ELEVATION	=	241.85 FT
100 YEAR DISCHARGE	=	71.0 CFS
100 YEAR HW ELEVATION	=	242.62 FT
OVERTOPPING FREQUENCY	=	>500 YRS
OVERTOPPING DISCHARGE	=	120.0 CFS
OVERTOPPING ELEVATION	=	245.0 FT

SEE SHEETS 7 & 8 FOR ALIGNMENT

-L- FAYETTEVILLE OUTER LOOP

SEE SHEETS 8 & 9 FOR ALIGNMENT

SITE 1



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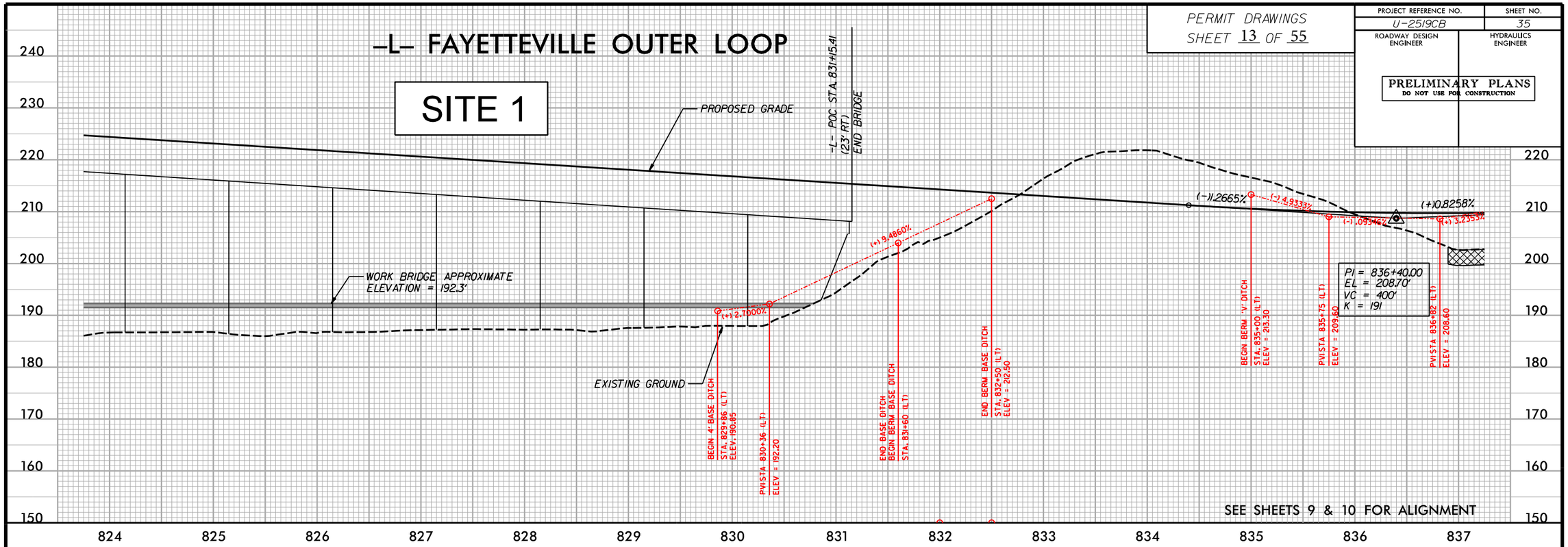
PERMIT DRAWINGS
SHEET 13 OF 55

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	35
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

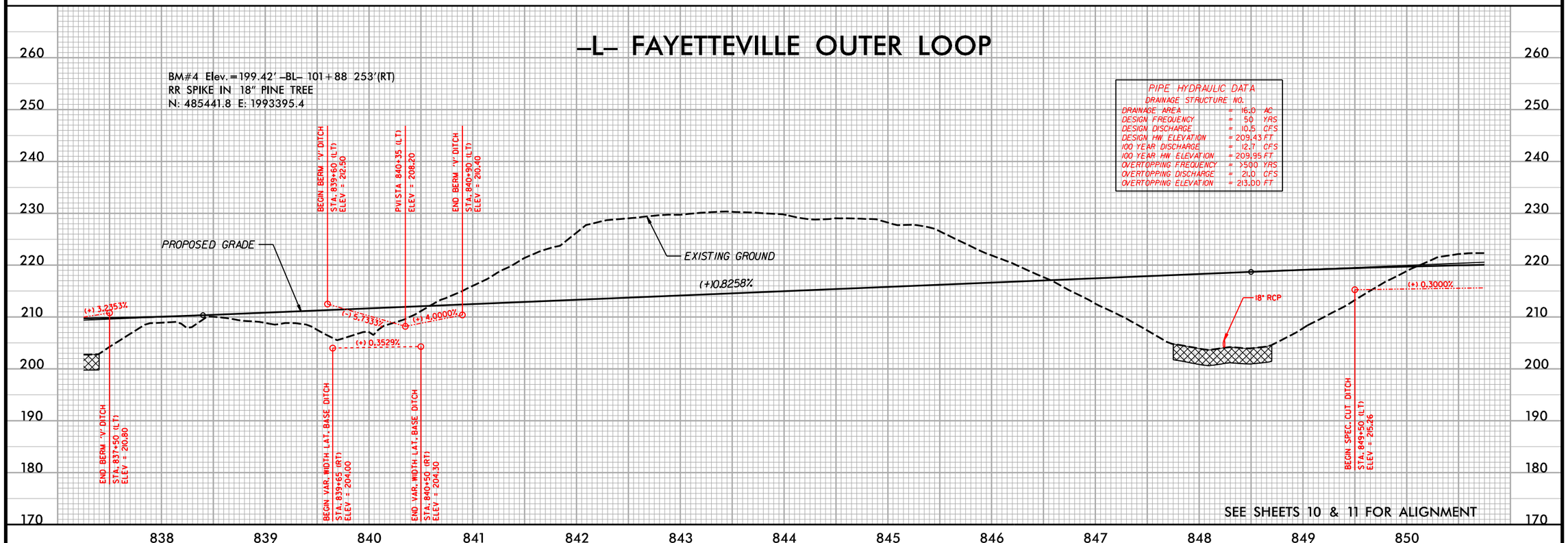
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L- FAYETTEVILLE OUTER LOOP

SITE 1



-L- FAYETTEVILLE OUTER LOOP



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REVISIONS

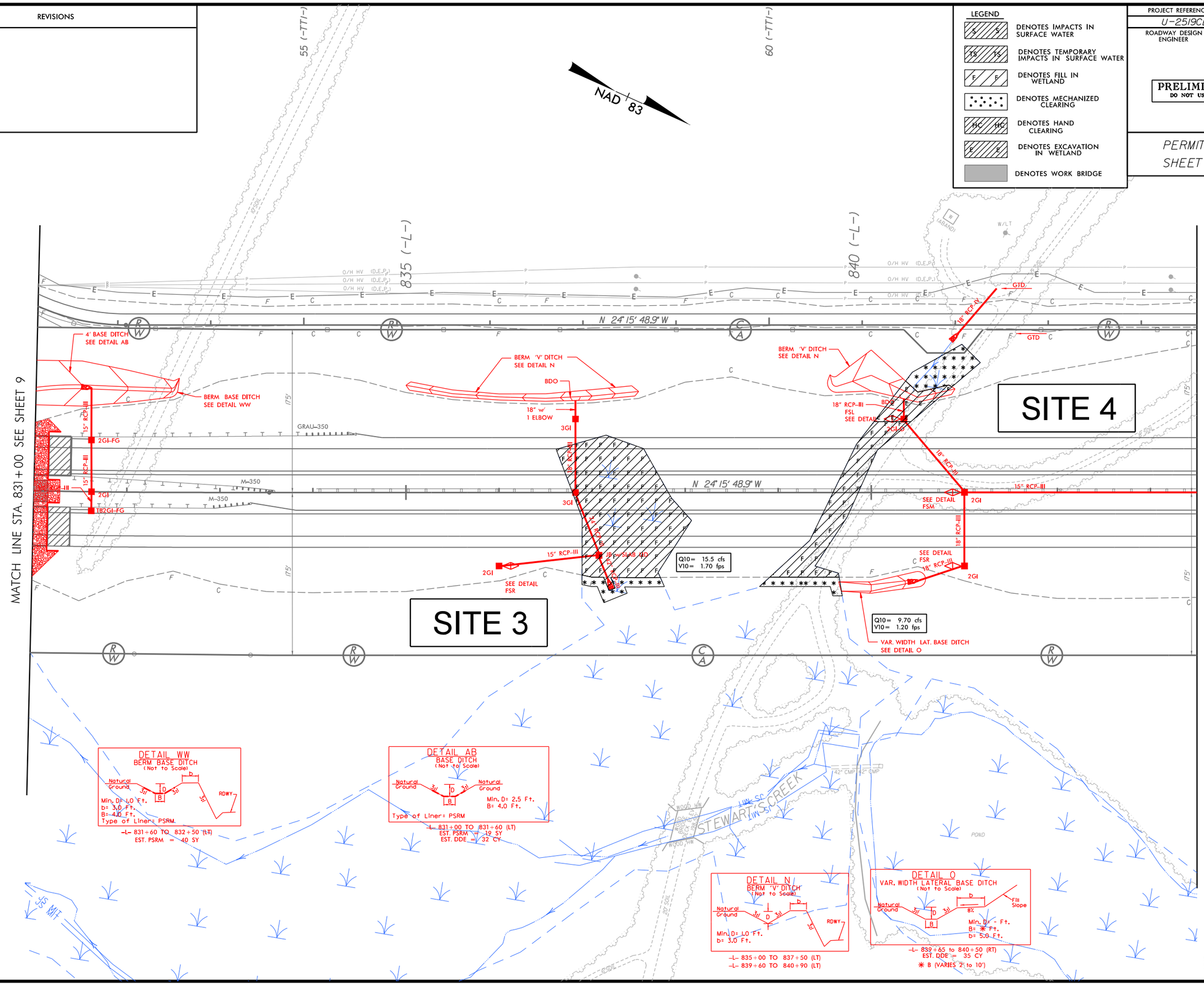
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWINGS
SHEET 14 OF 55

LEGEND

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES HAND CLEARING
- DENOTES EXCAVATION IN WETLAND
- DENOTES WORK BRIDGE



SEE SHEET 35 FOR -L- PROFILE
SEE SHEET 64 -TTI- FOR PROFILE

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy.pshl0

7/2/99

REVISIONS

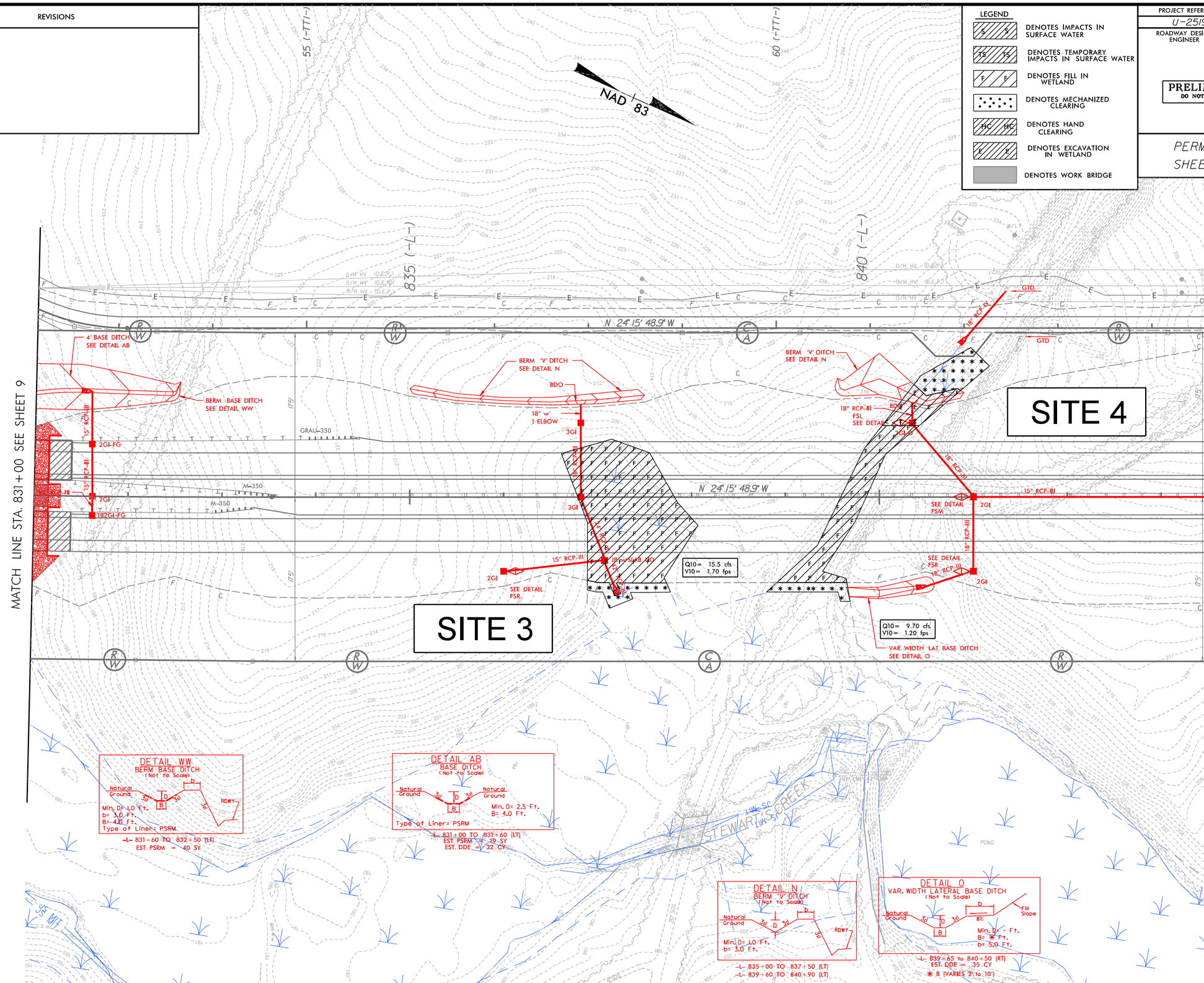
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWINGS
SHEET 15 OF 55

LEGEND

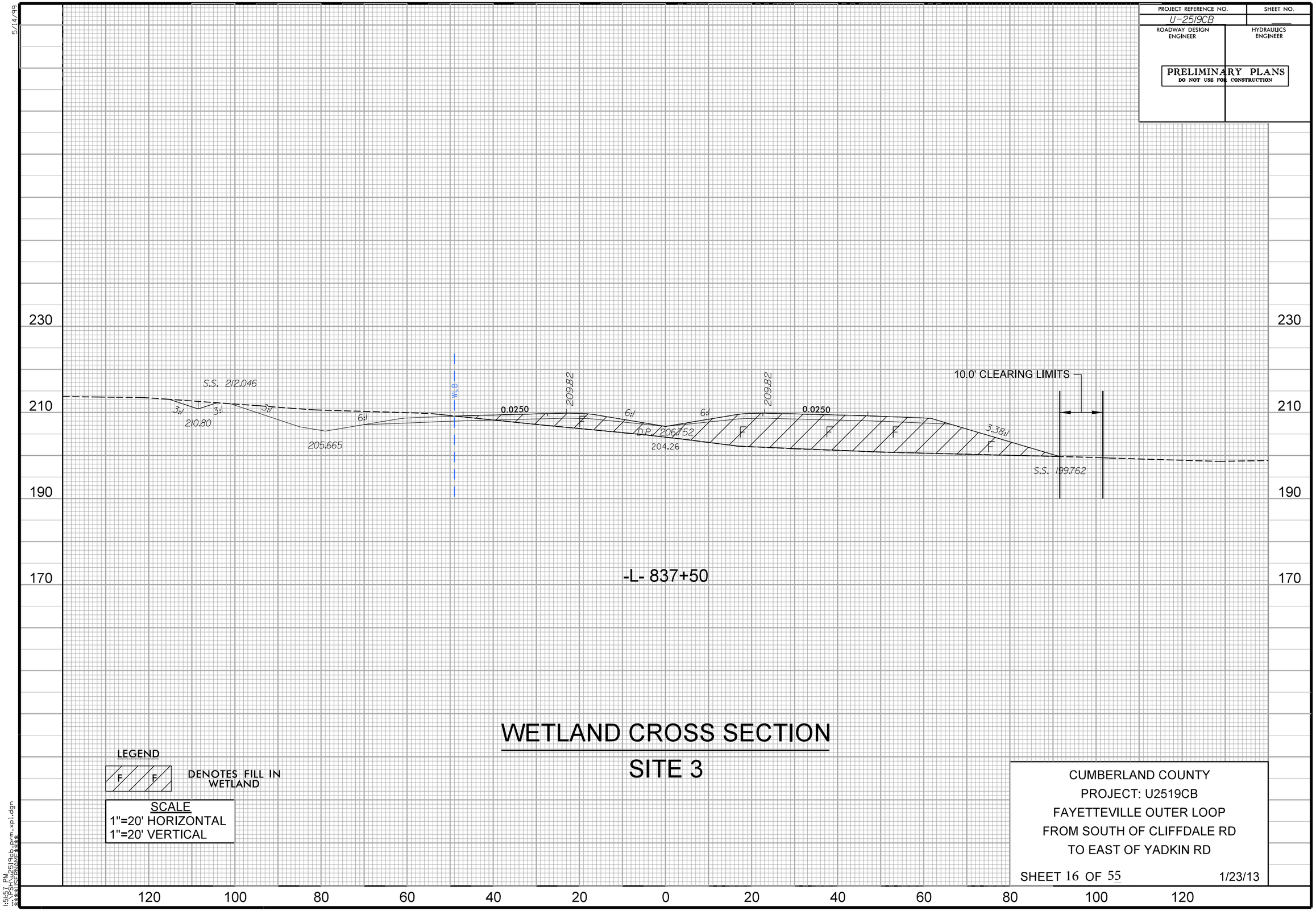
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES HAND CLEARING
- DENOTES EXCAVATION IN WETLAND
- DENOTES WORK BRIDGE



104.001.001/u2519cb/Roadway/proj/u2519cb_rdy.pshl0

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



WETLAND CROSS SECTION

SITE 3

LEGEND

F F DENOTES FILL IN WETLAND

SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

CUMBERLAND COUNTY
PROJECT: U2519CB
FAYETTEVILLE OUTER LOOP
FROM SOUTH OF CLIFFDALE RD
TO EAST OF YADKIN RD

SHEET 16 OF 55 1/23/13

5/14/99

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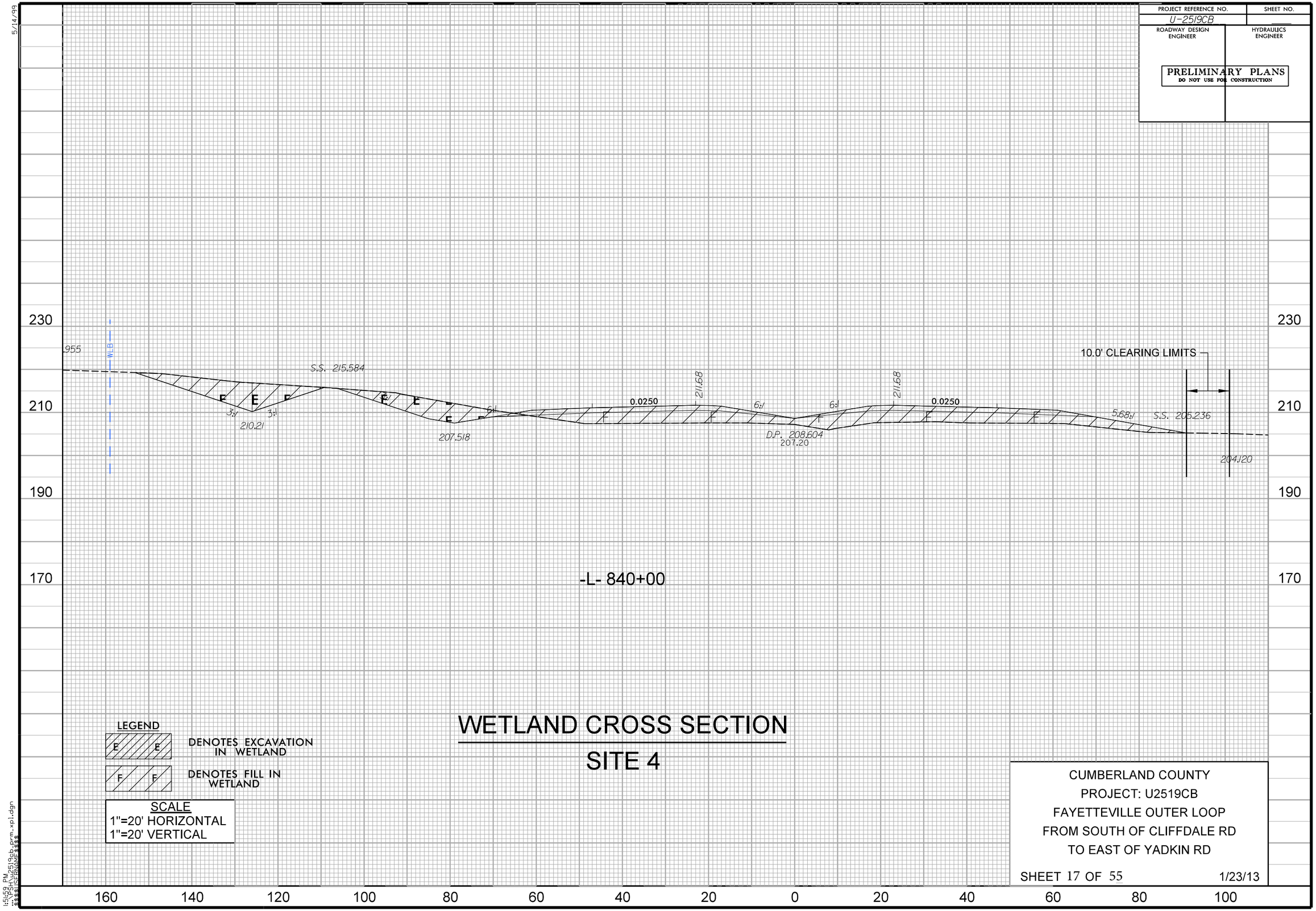
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



WETLAND CROSS SECTION

SITE 4

LEGEND

E E — DENOTES EXCAVATION IN WETLAND

F F — DENOTES FILL IN WETLAND

SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

CUMBERLAND COUNTY
PROJECT: U2519CB
FAYETTEVILLE OUTER LOOP
FROM SOUTH OF CLIFFDALE RD
TO EAST OF YADKIN RD

SHEET 17 OF 55 1/23/13

5/14/99

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7/2/99

REVISIONS

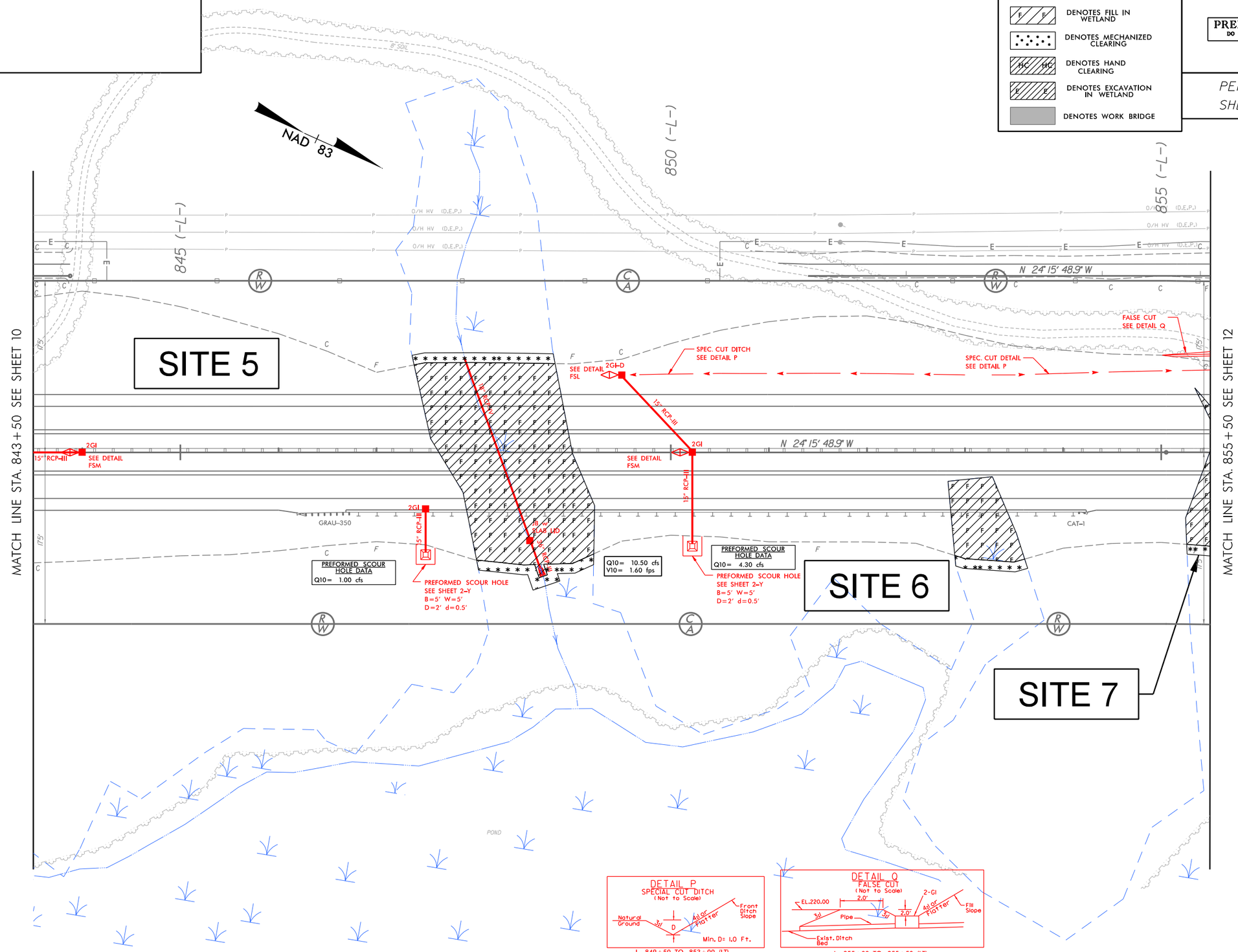
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWINGS
SHEET 18 OF 55

LEGEND

- S S — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- F F — DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- HC HC — DENOTES HAND CLEARING
- E E — DENOTES EXCAVATION IN WETLAND
- DENOTES WORK BRIDGE



SEE SHEETS 35 & 36 FOR -L- PROFILE
SEE SHEET 64 FOR -TT1- PROFILE
SEE SHEET 65 FOR -TT2- PROFILE

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy.pshll

7/2/99

REVISIONS

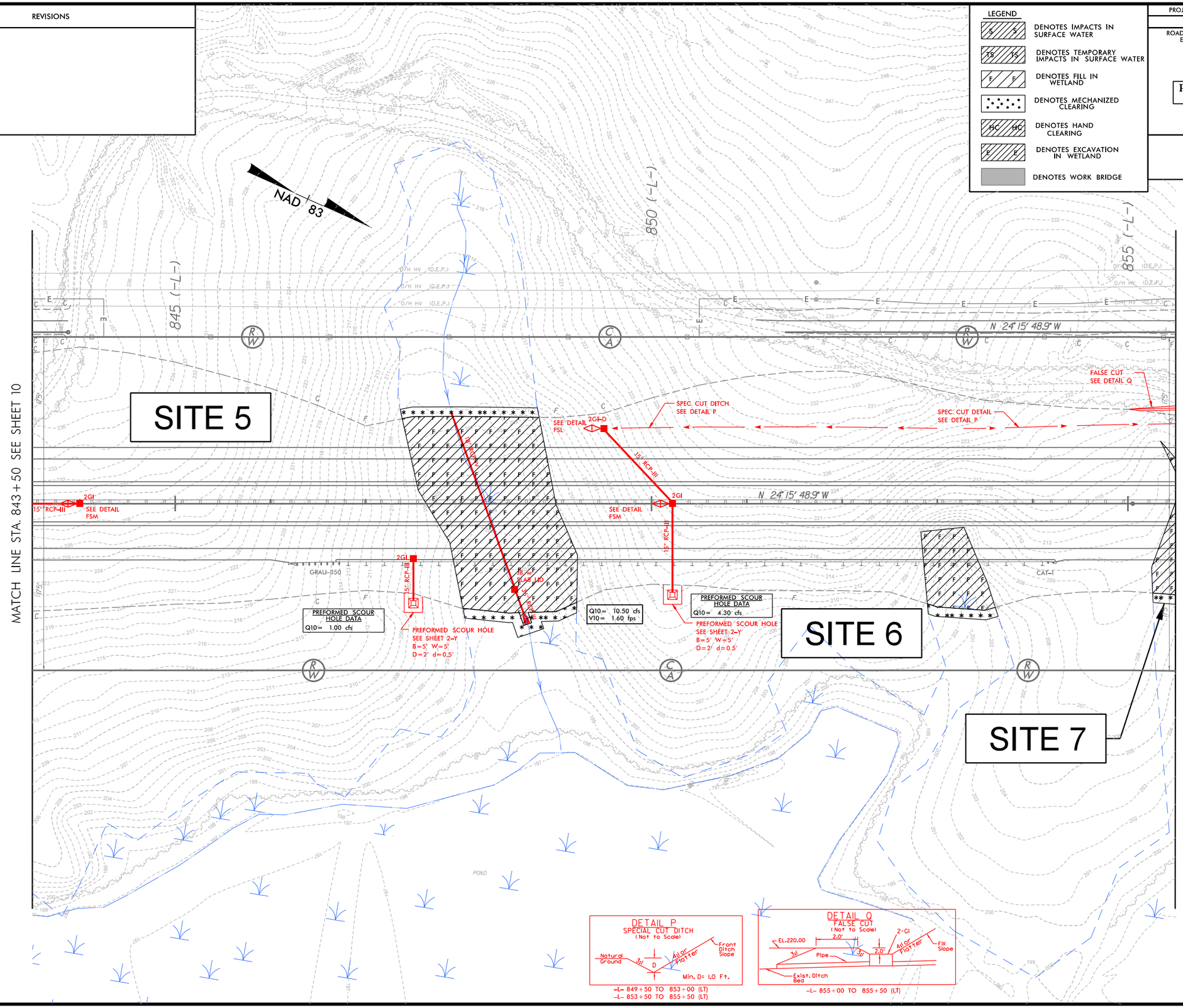
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWINGS
SHEET 19 OF 55

LEGEND

- S S — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- F F — DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- HC HC — DENOTES HAND CLEARING
- E E — DENOTES EXCAVATION IN WETLAND
- DENOTES WORK BRIDGE

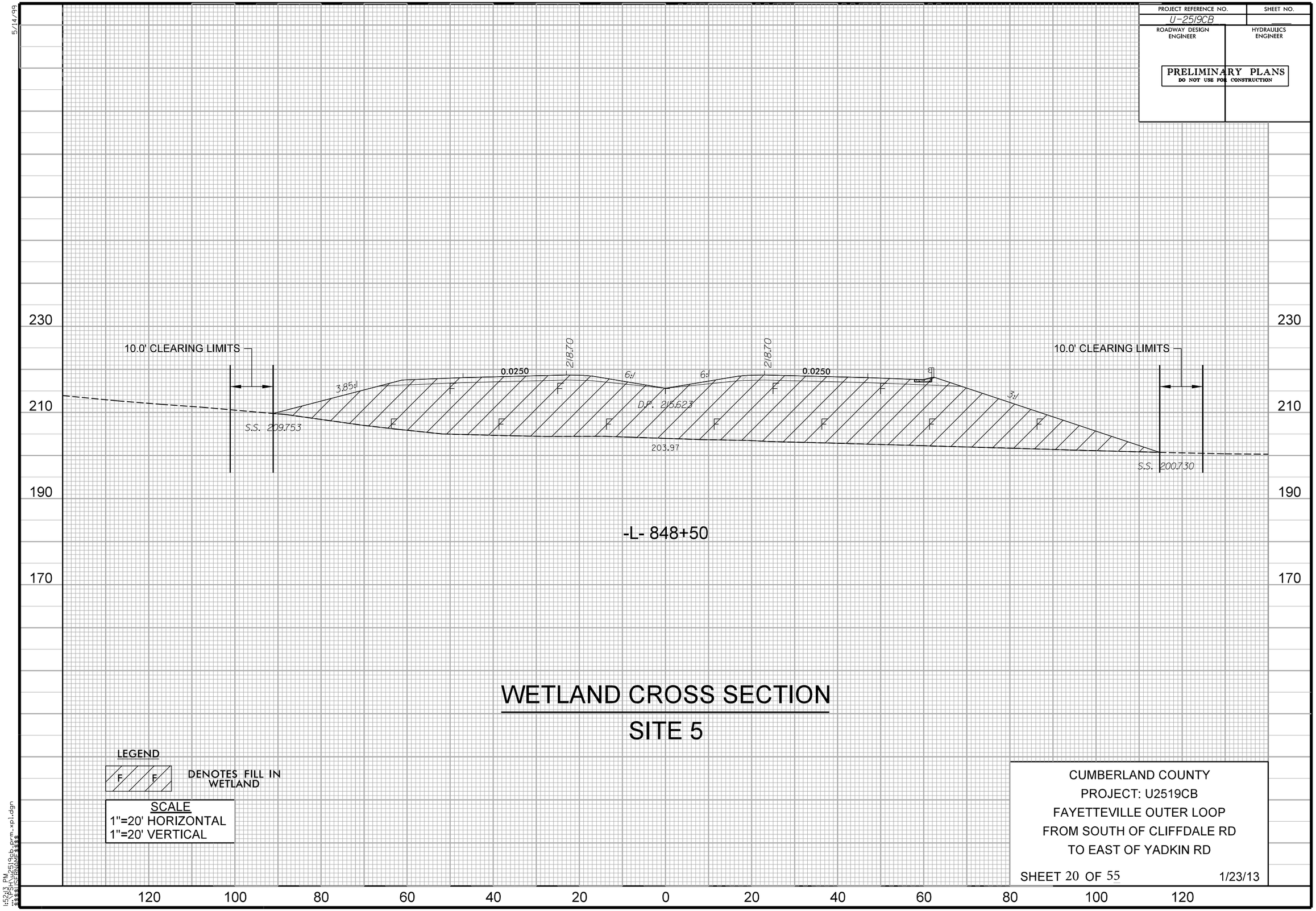


SEE SHEETS 35 & 36 FOR -L- PROFILE
SEE SHEET 64 FOR -TT1- PROFILE
SEE SHEET 65 FOR -TT2- PROFILE

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy.pshll

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



WETLAND CROSS SECTION

SITE 5

LEGEND

F F DENOTES FILL IN WETLAND

SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

CUMBERLAND COUNTY
PROJECT: U2519CB
FAYETTEVILLE OUTER LOOP
FROM SOUTH OF CLIFFDALE RD
TO EAST OF YADKIN RD

SHEET 20 OF 55 1/23/13

5/14/99

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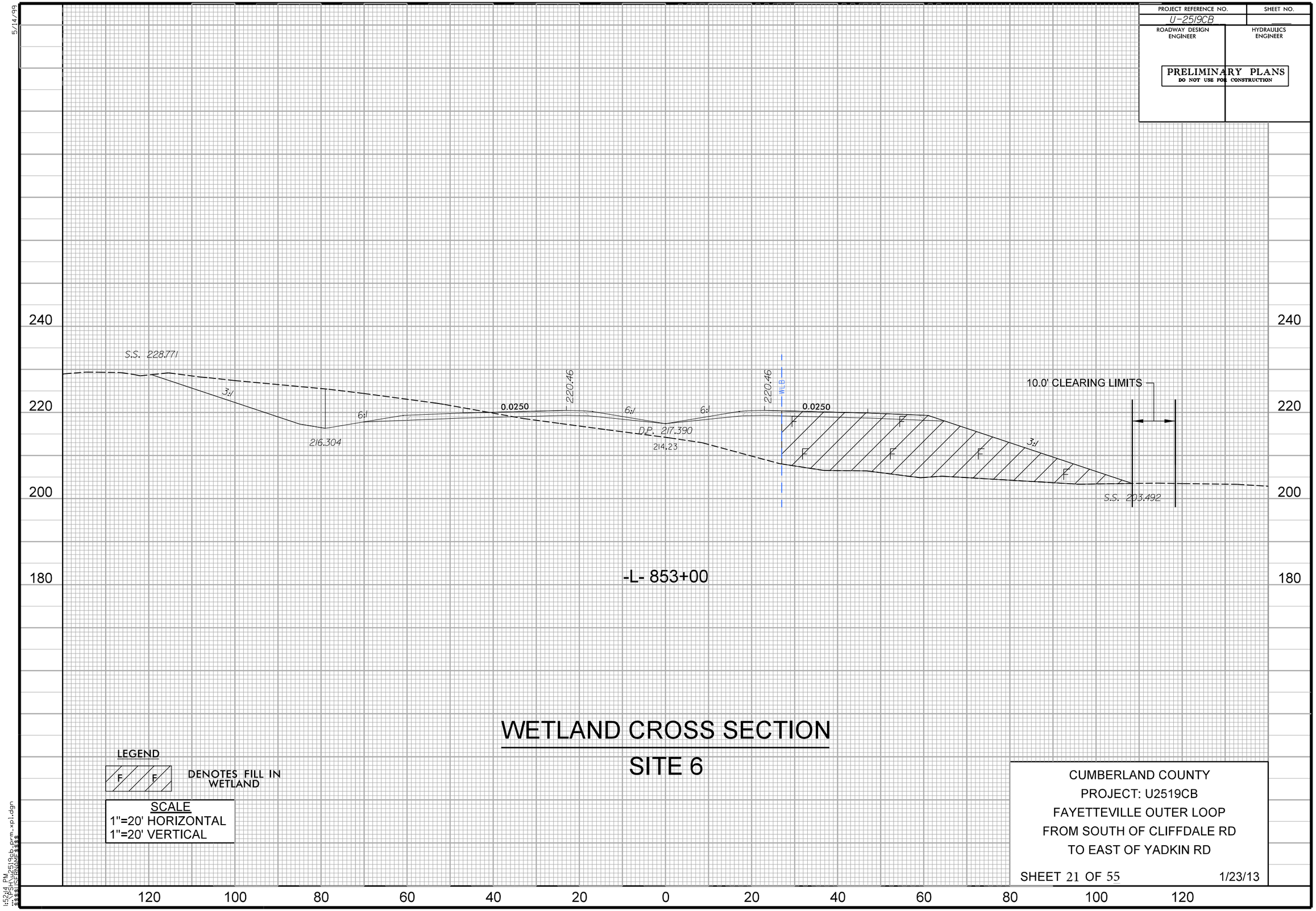
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



WETLAND CROSS SECTION

SITE 6

LEGEND

F F DENOTES FILL IN WETLAND

SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

CUMBERLAND COUNTY
PROJECT: U2519CB
FAYETTEVILLE OUTER LOOP
FROM SOUTH OF CLIFFDALE RD
TO EAST OF YADKIN RD

SHEET 21 OF 55 1/23/13

5/14/99

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7/2/99

REVISIONS

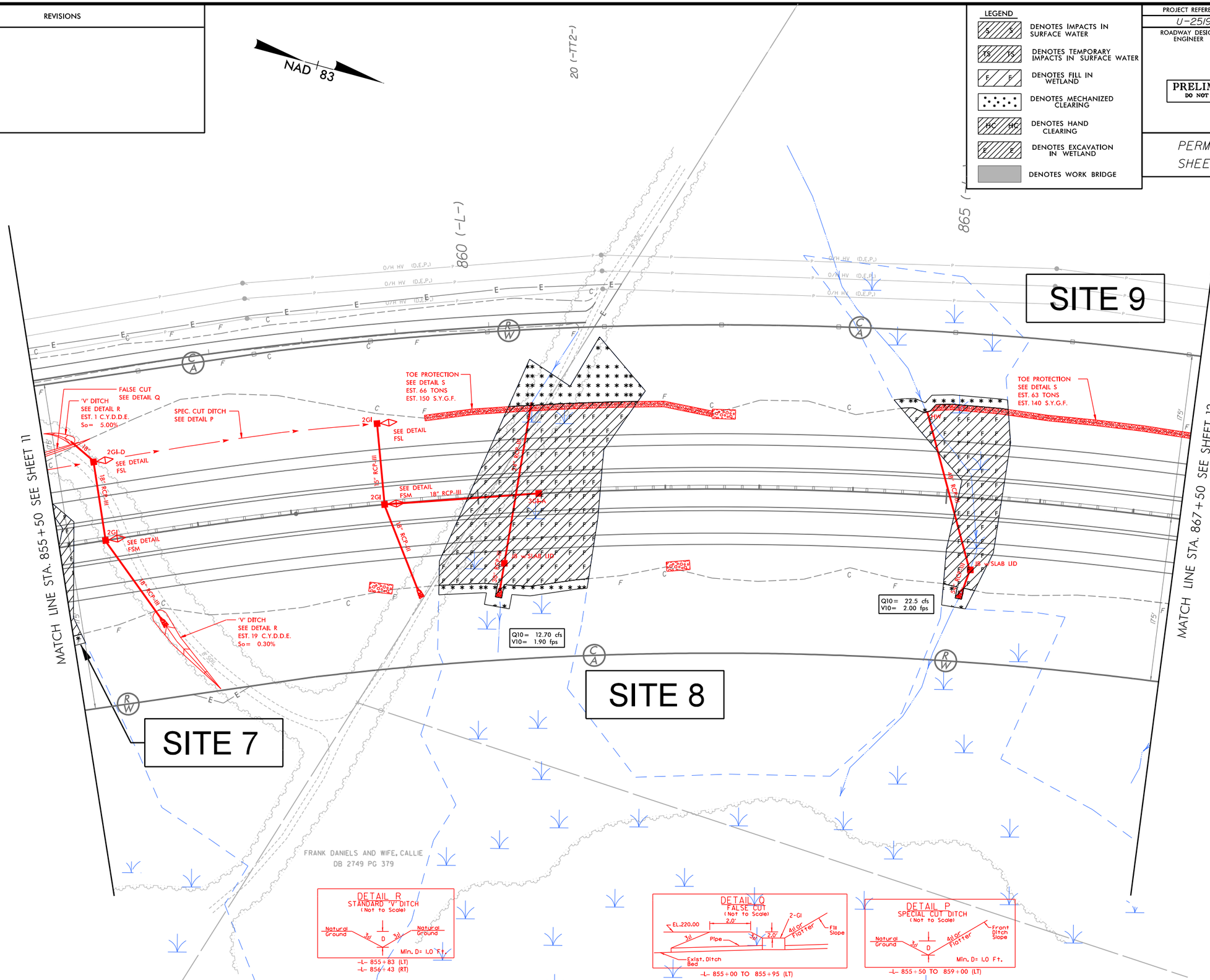
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	12
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWINGS
SHEET 22 OF 55

LEGEND

- S S — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- F F — DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- HC HC — DENOTES HAND CLEARING
- E E — DENOTES EXCAVATION IN WETLAND
- DENOTES WORK BRIDGE



SEE SHEET 36 FOR -L- PROFILE
SEE SHEET 65 FOR -TT2- PROFILE

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy_pshl2

7/2/99

REVISIONS

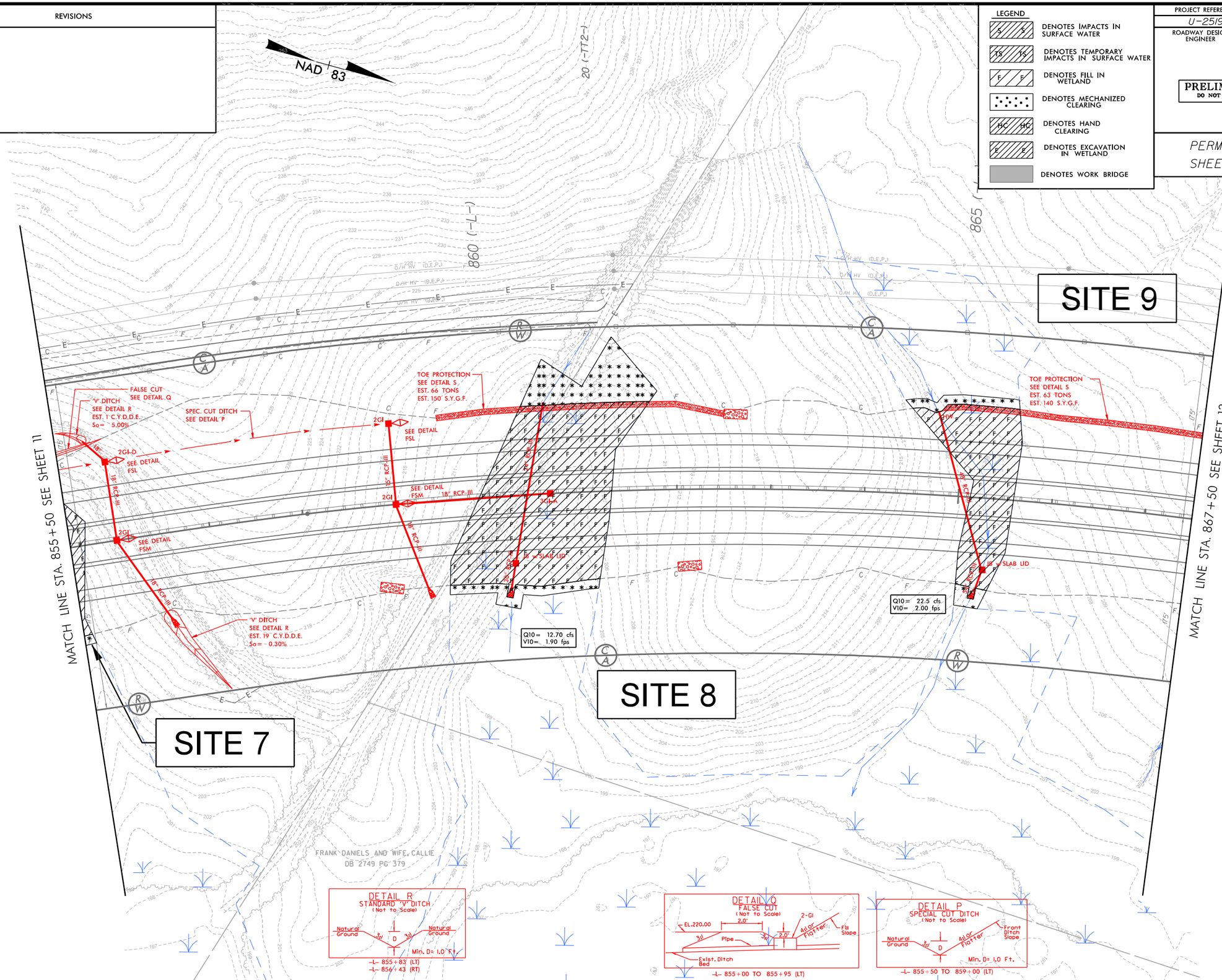
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	12
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWINGS
SHEET 23 OF 55

LEGEND

- S — DENOTES IMPACTS IN SURFACE WATER
- TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- F — DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- HC — DENOTES HAND CLEARING
- E — DENOTES EXCAVATION IN WETLAND
- DENOTES WORK BRIDGE

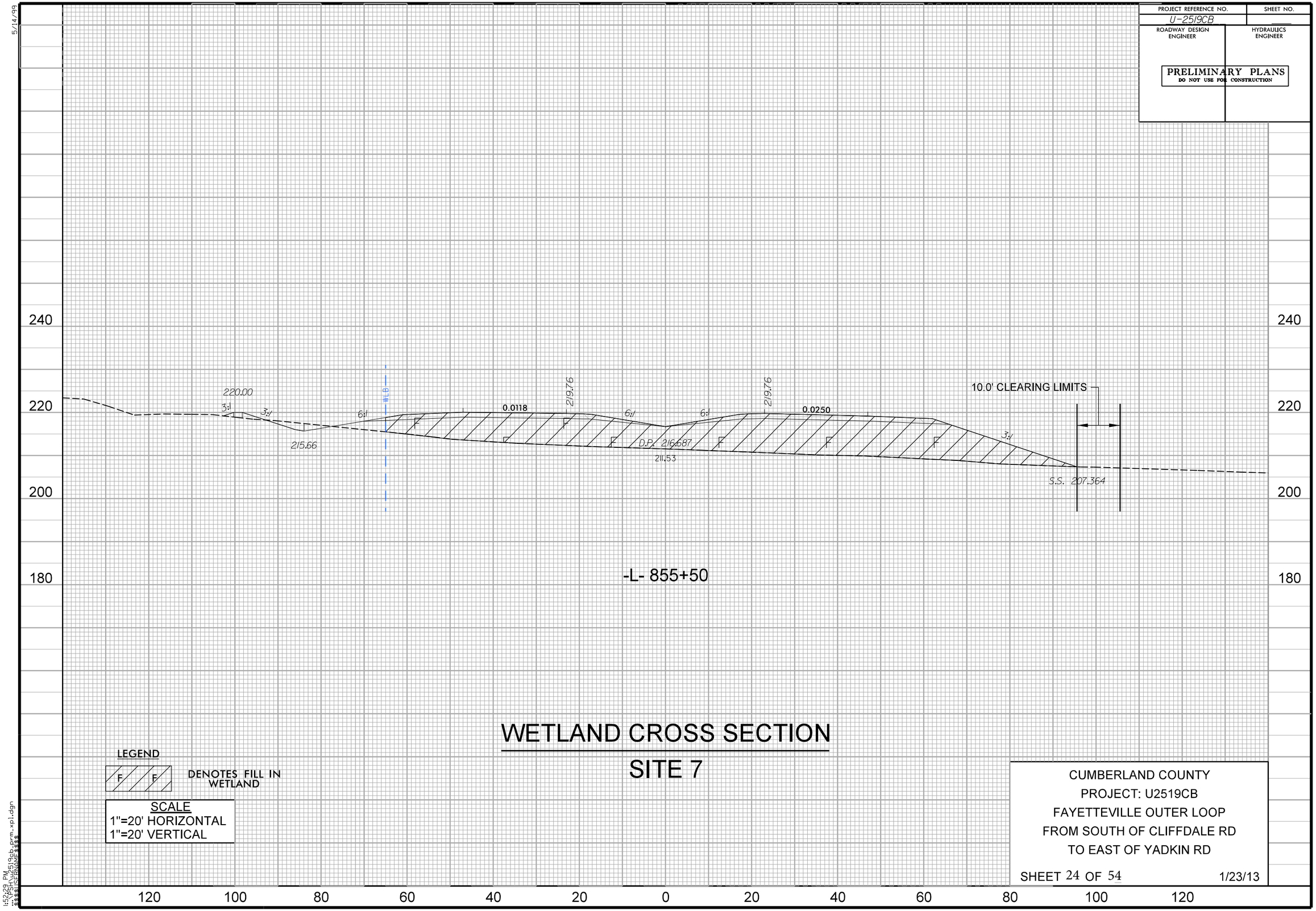


SEE SHEET 36 FOR -L- PROFILE
SEE SHEET 65 FOR -TT2- PROFILE

I04.001.001/u2519cb/Roadway/proj/u2519cb_rdy_pshl2

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



WETLAND CROSS SECTION

SITE 7

LEGEND

F F DENOTES FILL IN WETLAND

SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

CUMBERLAND COUNTY
PROJECT: U2519CB
FAYETTEVILLE OUTER LOOP
FROM SOUTH OF CLIFFDALE RD
TO EAST OF YADKIN RD

SHEET 24 OF 54 1/23/13

5/14/99

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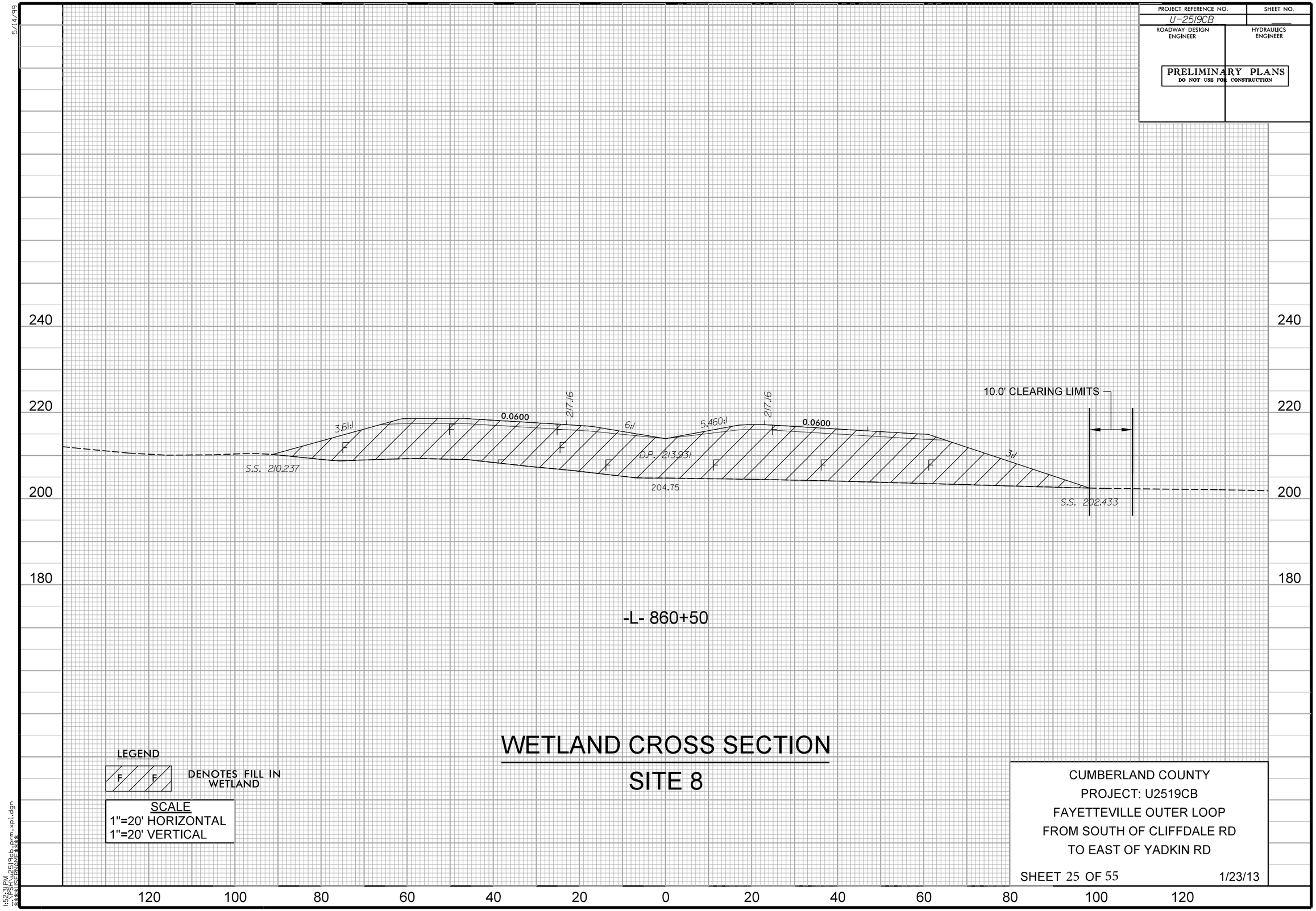
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



LEGEND

F F DENOTES FILL IN WETLAND

SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

WETLAND CROSS SECTION

SITE 8

CUMBERLAND COUNTY
PROJECT: U2519CB
FAYETTEVILLE OUTER LOOP
FROM SOUTH OF CLIFFDALE RD
TO EAST OF YADKIN RD

SHEET 25 OF 55 1/23/13

5/14/99

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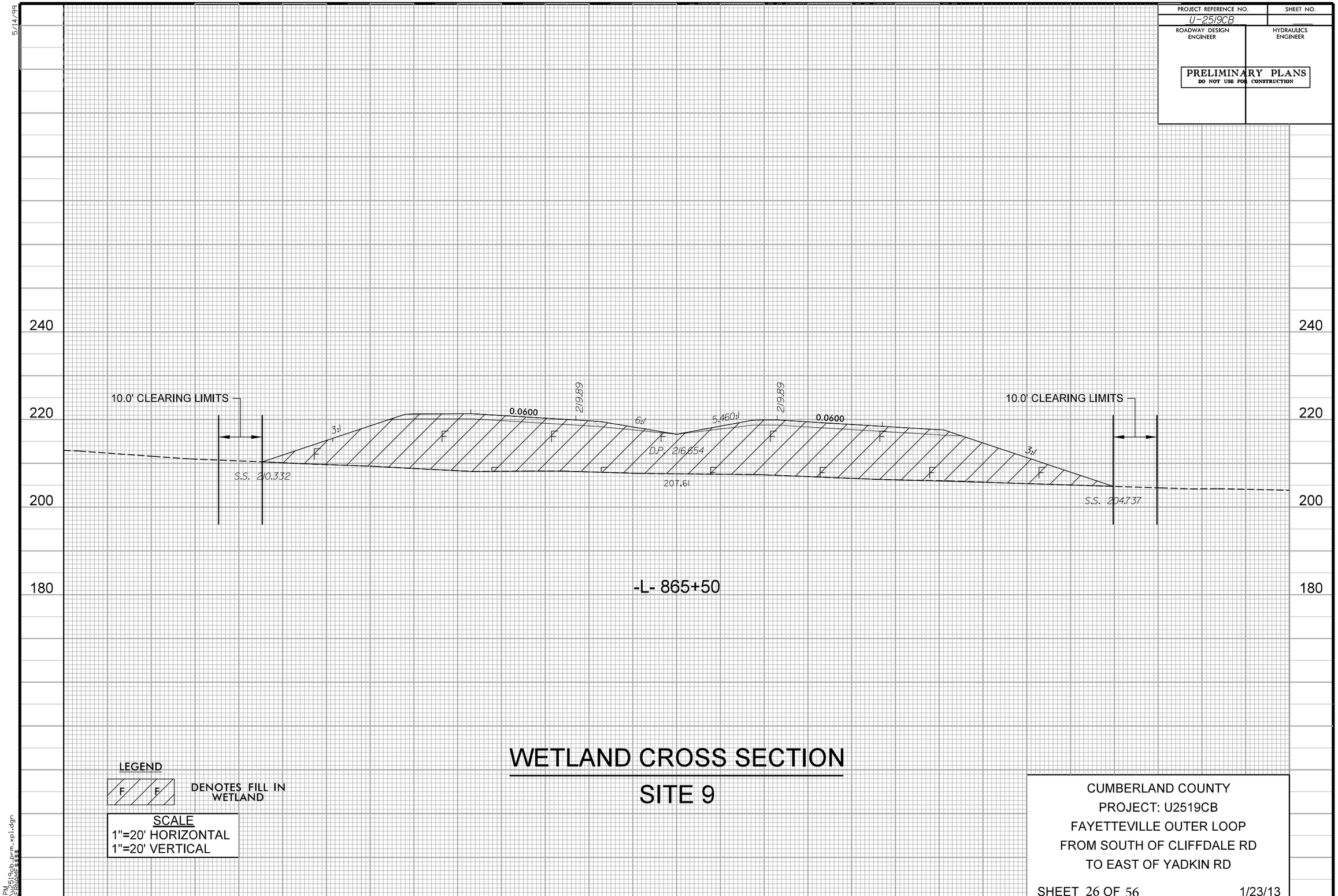
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



WETLAND CROSS SECTION

SITE 9

LEGEND

F F DENOTES FILL IN WETLAND

SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

CUMBERLAND COUNTY
PROJECT: U2519CB
FAYETTEVILLE OUTER LOOP
FROM SOUTH OF CLIFFDALE RD
TO EAST OF YADKIN RD

SHEET 26 OF 56 1/23/13

5/14/99

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7/2/99

REVISIONS

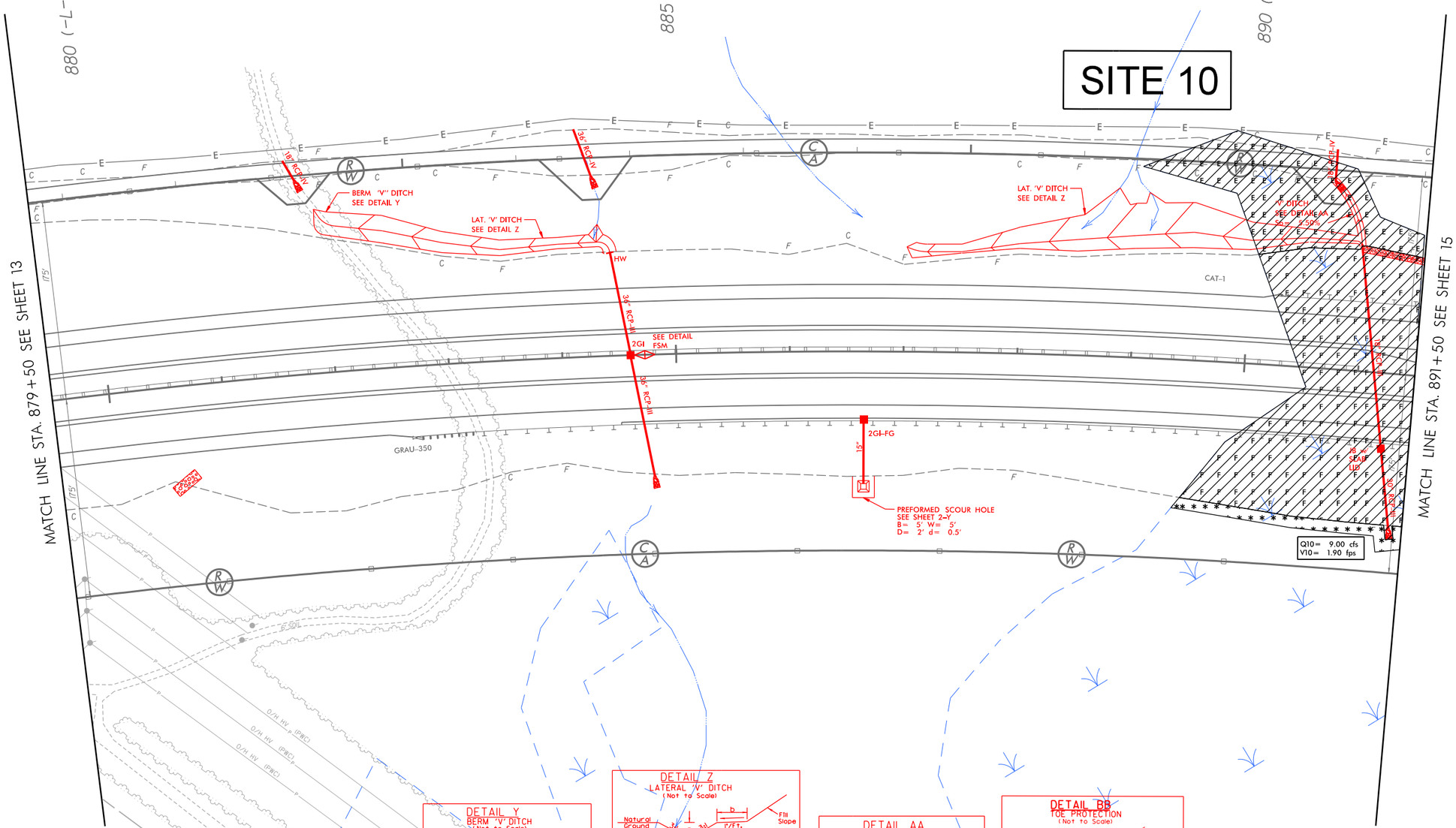
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	14
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWINGS
SHEET 27 OF 55

LEGEND

- S S — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- F F — DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- HC HC — DENOTES HAND CLEARING
- E E — DENOTES EXCAVATION IN WETLAND
- DENOTES WORK BRIDGE



SEE SHEET 37 FOR -L- PROFILE
SEE SHEET 59 FOR -PRI- PROFILE

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy_psh14

7/2/99

REVISIONS

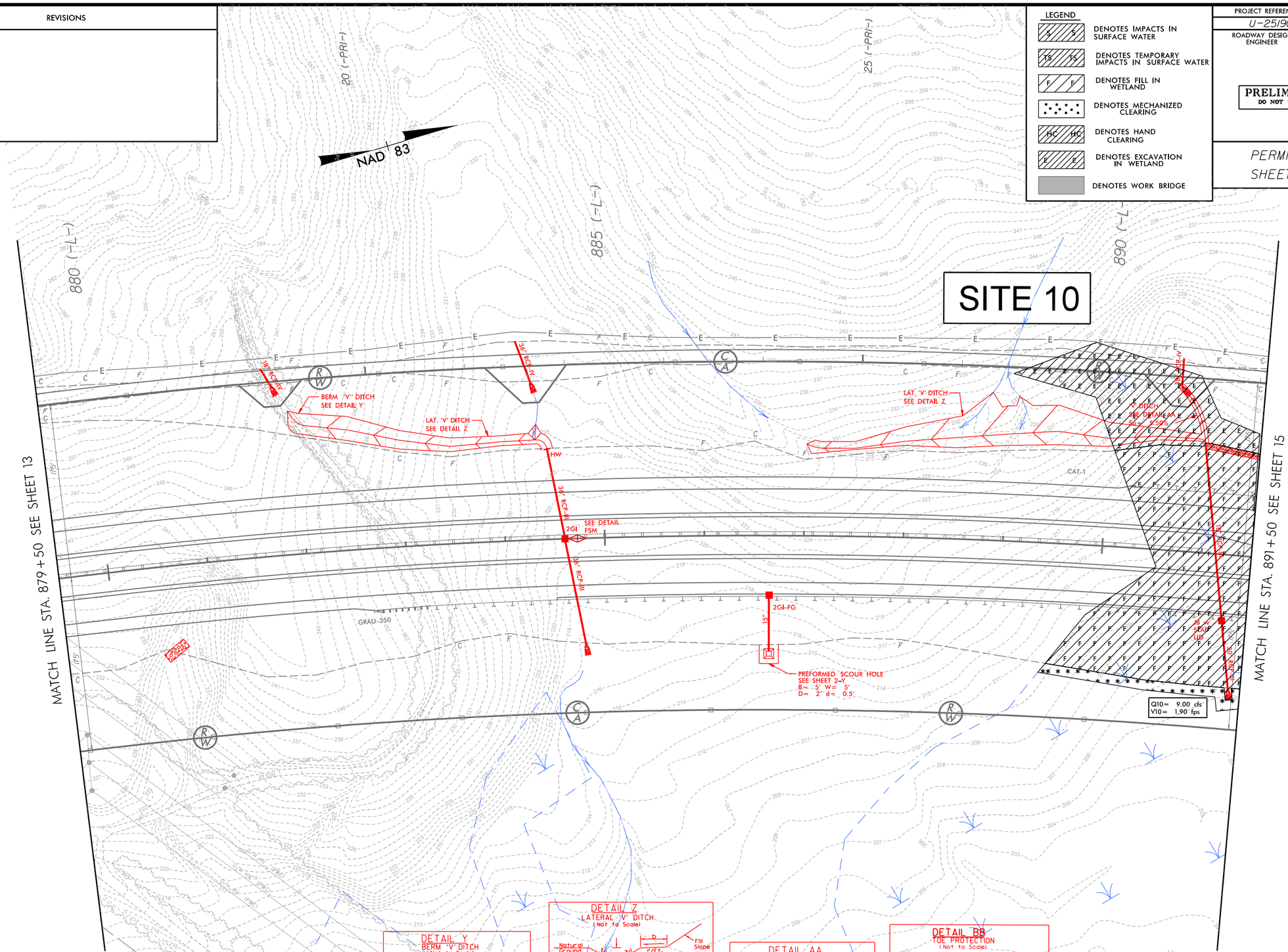
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	14
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWINGS
SHEET 28 OF 55

LEGEND

- S S — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- F F — DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- HC HC — DENOTES HAND CLEARING
- E E — DENOTES EXCAVATION IN WETLAND
- DENOTES WORK BRIDGE

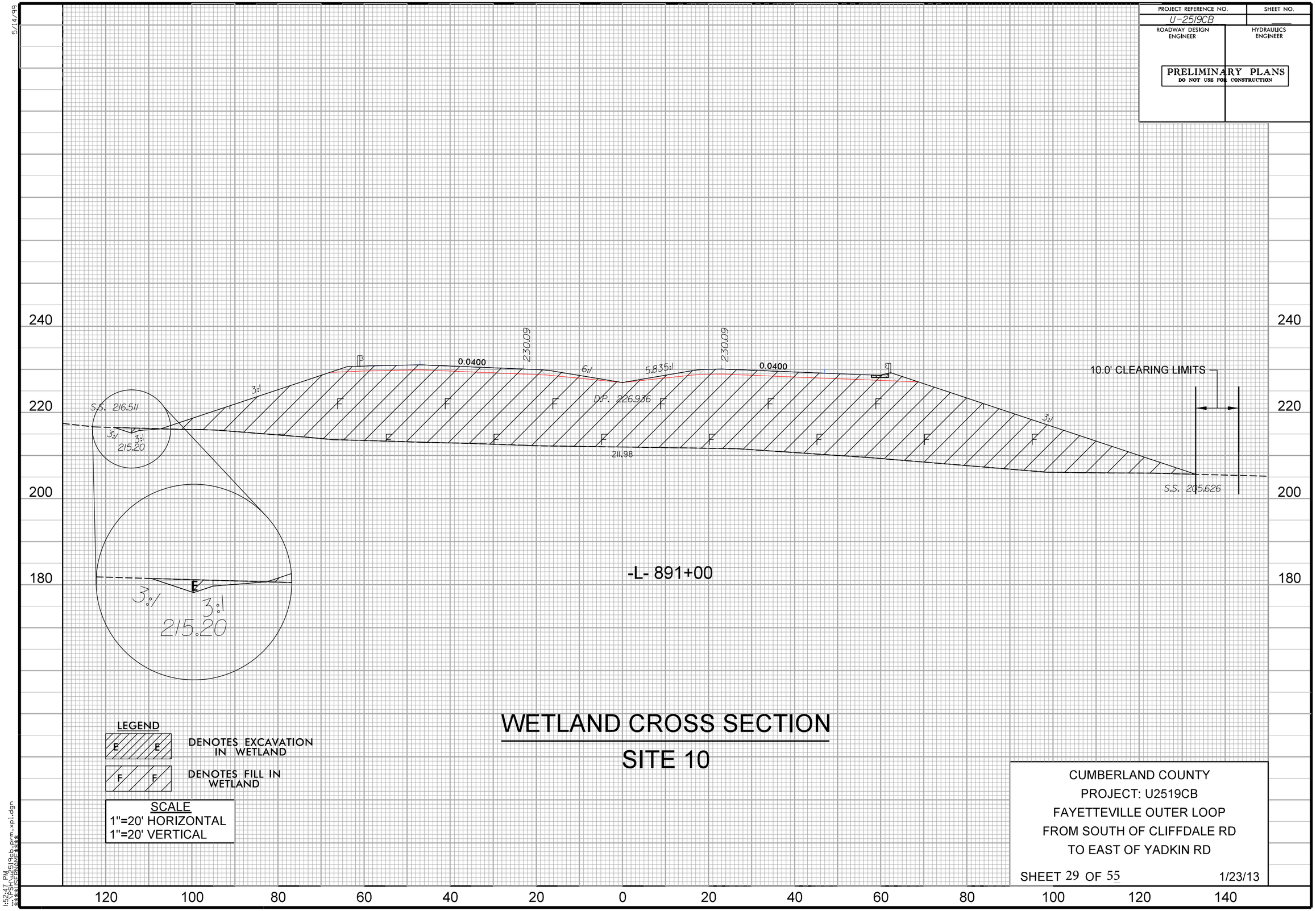


SEE SHEET 37 FOR -L- PROFILE
SEE SHEET 59 FOR -PRI- PROFILE

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy_psh14

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



LEGEND

E E DENOTES EXCAVATION IN WETLAND

F F DENOTES FILL IN WETLAND

SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

WETLAND CROSS SECTION

SITE 10

CUMBERLAND COUNTY
PROJECT: U2519CB
FAYETTEVILLE OUTER LOOP
FROM SOUTH OF CLIFFDALE RD
TO EAST OF YADKIN RD

SHEET 29 OF 55 1/23/13

5/14/99

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7/2/99

REVISIONS

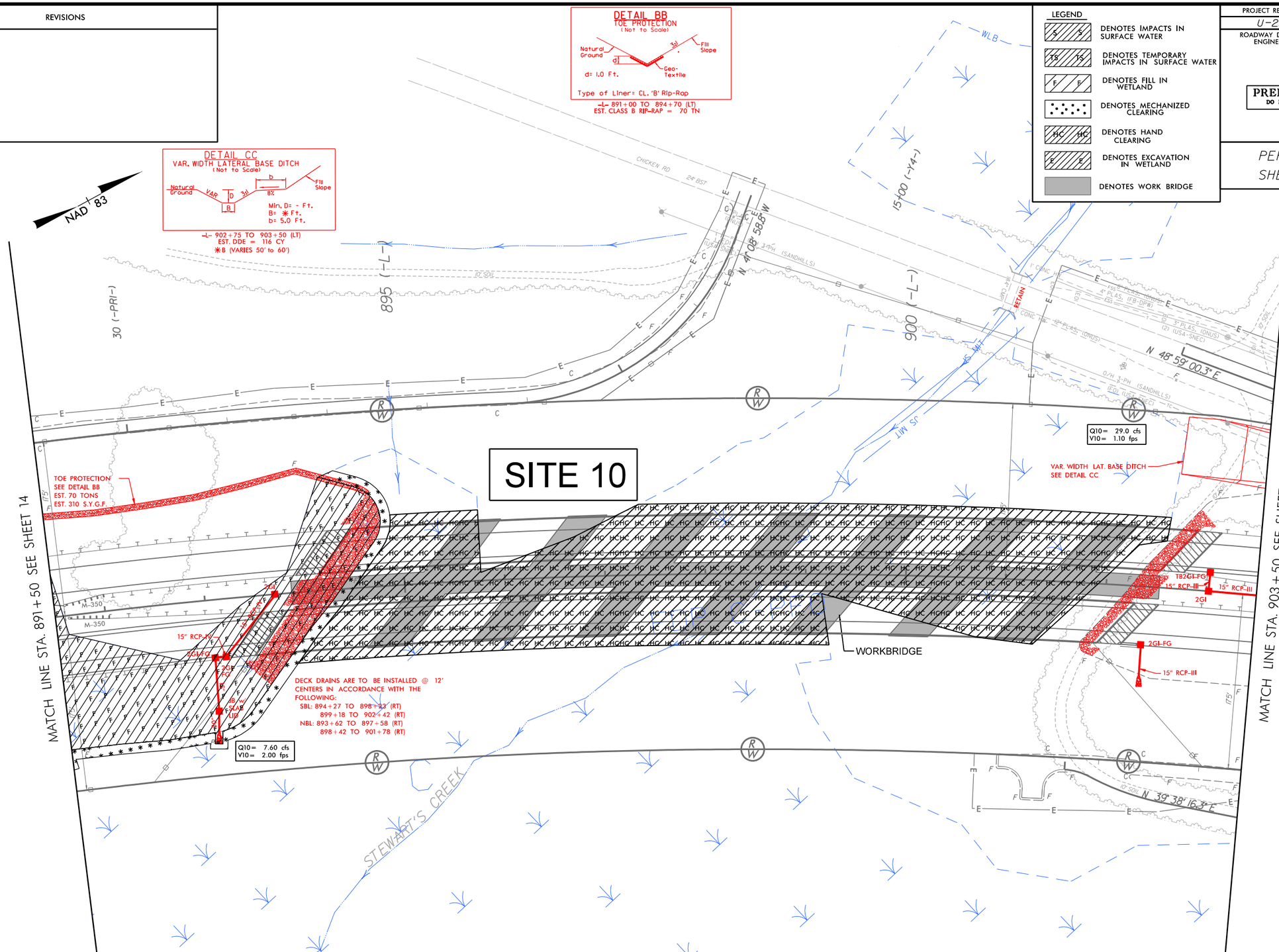
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWINGS
SHEET 30 OF 55

LEGEND

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES HAND CLEARING
- DENOTES EXCAVATION IN WETLAND
- DENOTES WORK BRIDGE



SEE SHEET 37 FOR -L- PROFILE
SEE SHEET 59 FOR -PR1- PROFILE
SEE SHEET 60 FOR -PR2A- PROFILE
SEE SHEET 2-5 FOR BRIDGE SKETCH
FOR STRUCTURE PLANS, SEE SHEET S- THRU S-

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy_psh15

7/2/99

REVISIONS

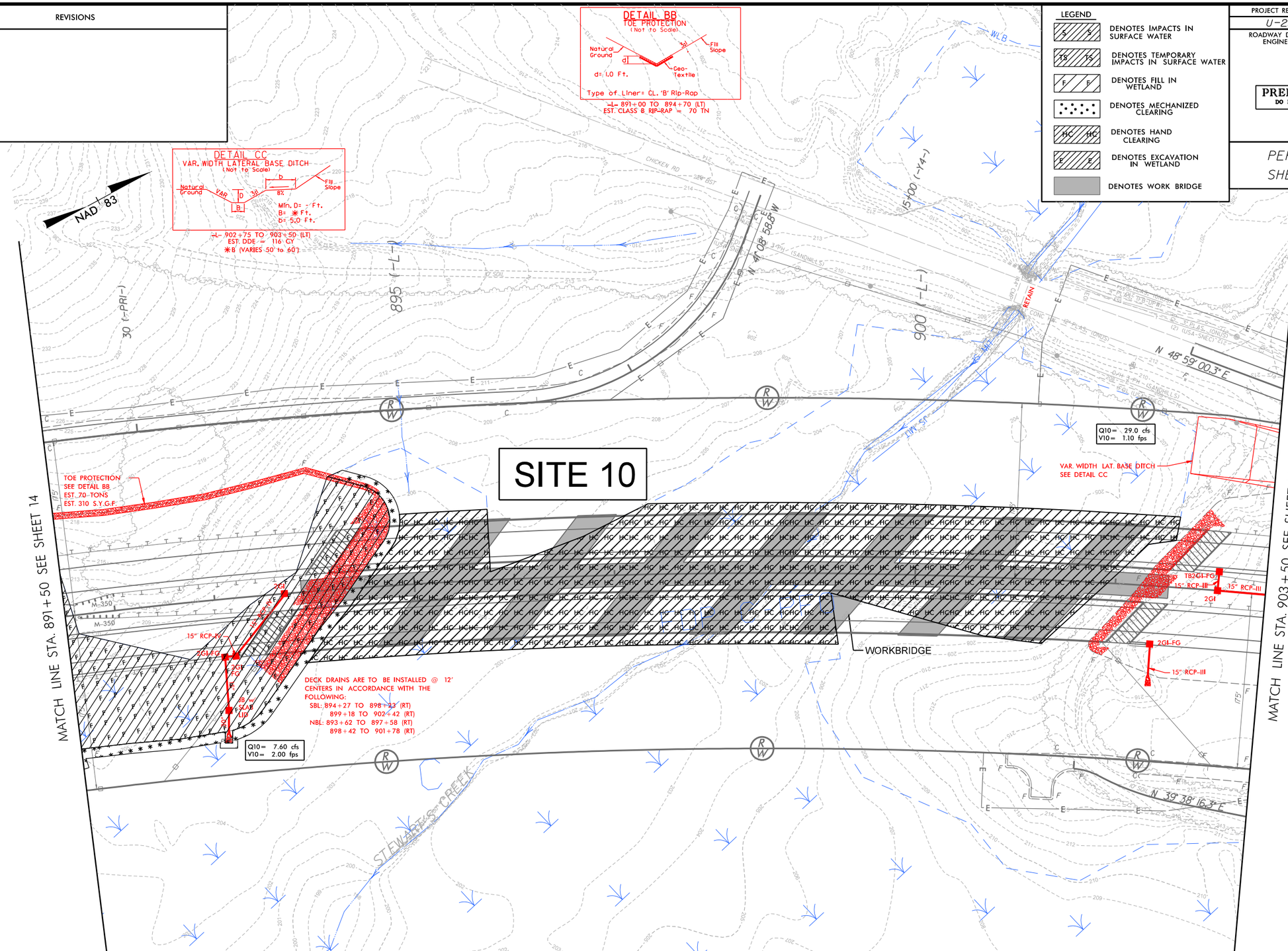
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWINGS
SHEET 31 OF 55

LEGEND

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES HAND CLEARING
- DENOTES EXCAVATION IN WETLAND
- DENOTES WORK BRIDGE



SEE SHEET 37 FOR -L- PROFILE
SEE SHEET 59 FOR -PR1- PROFILE
SEE SHEET 60 FOR -PR2A- PROFILE
SEE SHEET 2-5 FOR BRIDGE SKETCH
FOR STRUCTURE PLANS, SEE SHEET S- THRU S-

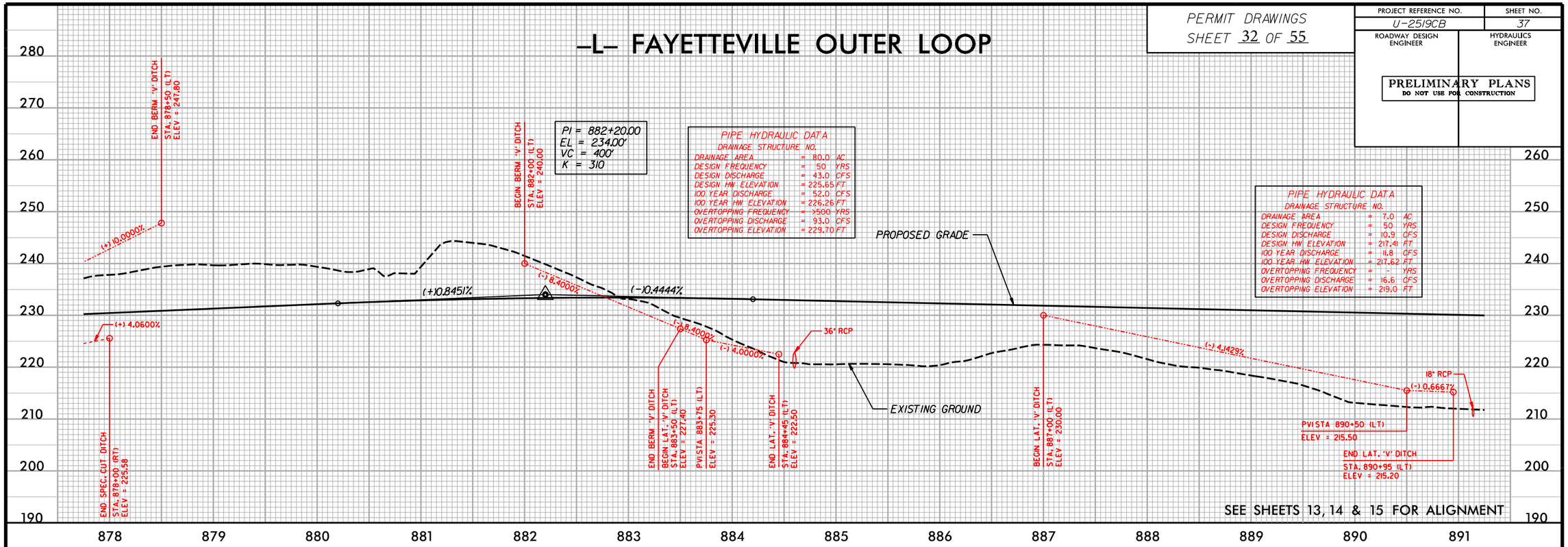
104.001.001/u2519cb/Roadway/proj/u2519cb_rdy_psh15

PERMIT DRAWINGS
SHEET 32 OF 55

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	37
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L- FAYETTEVILLE OUTER LOOP



PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 80.0	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 43.0	CFS
DESIGN HW ELEVATION	= 225.65	FT
100 YEAR DISCHARGE	= 52.0	CFS
100 YEAR HW ELEVATION	= 226.26	FT
OVERTOPPING FREQUENCY	= >500	YRS
OVERTOPPING DISCHARGE	= 93.0	CFS
OVERTOPPING ELEVATION	= 229.70	FT

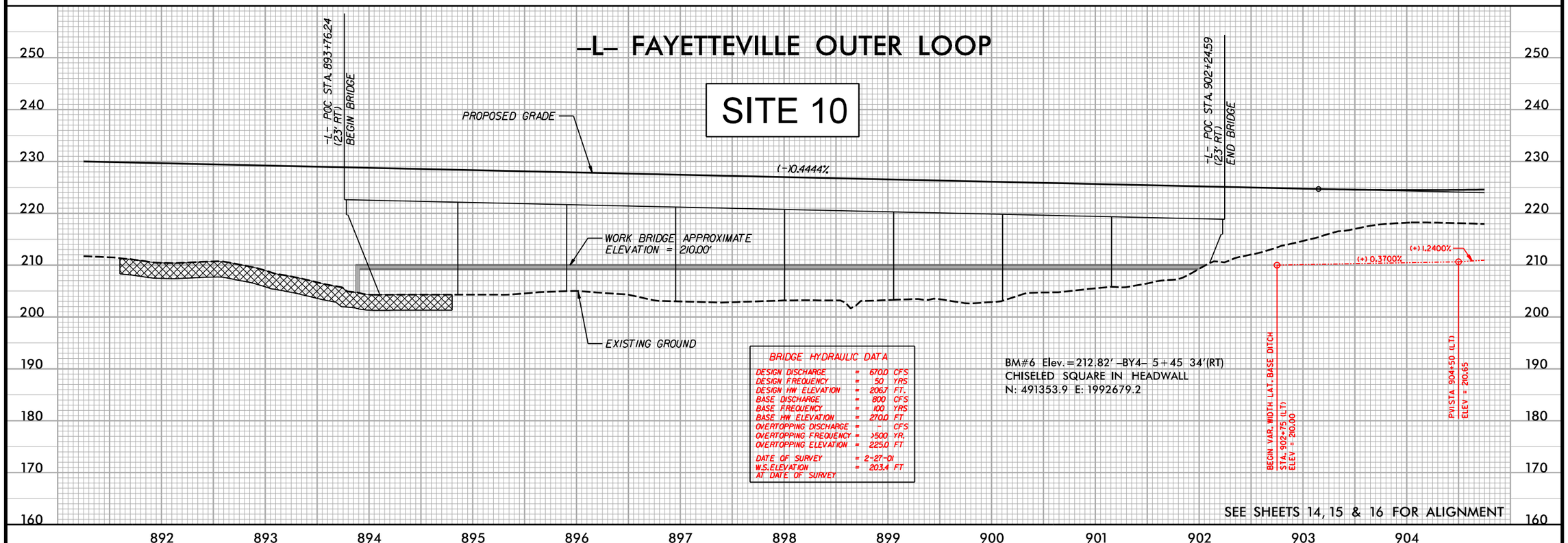
PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 7.0	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 10.9	CFS
DESIGN HW ELEVATION	= 217.41	FT
100 YEAR DISCHARGE	= 11.8	CFS
100 YEAR HW ELEVATION	= 217.62	FT
OVERTOPPING FREQUENCY	= -	YRS
OVERTOPPING DISCHARGE	= 16.6	CFS
OVERTOPPING ELEVATION	= 219.0	FT

SEE SHEETS 13, 14 & 15 FOR ALIGNMENT

-L- FAYETTEVILLE OUTER LOOP

SITE 10



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 670.0	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 206.7	FT.
BASE DISCHARGE	= 800	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 210.0	FT.
OVERTOPPING DISCHARGE	= -	CFS
OVERTOPPING FREQUENCY	= >500	YR.
OVERTOPPING ELEVATION	= 225.0	FT
DATE OF SURVEY	= 2-27-01	
W.S. ELEVATION AT DATE OF SURVEY	= 203.4	FT

BM#6 Elev. = 212.82' -BY4- 5 + 45 34'(RT)
CHISELED SQUARE IN HEADWALL
N: 491353.9 E: 1992679.2

SEE SHEETS 14, 15 & 16 FOR ALIGNMENT

104.00L001/u2519cb/Roadway/proj/u2519cb_rdy_pro37

7/2/99

REVISIONS

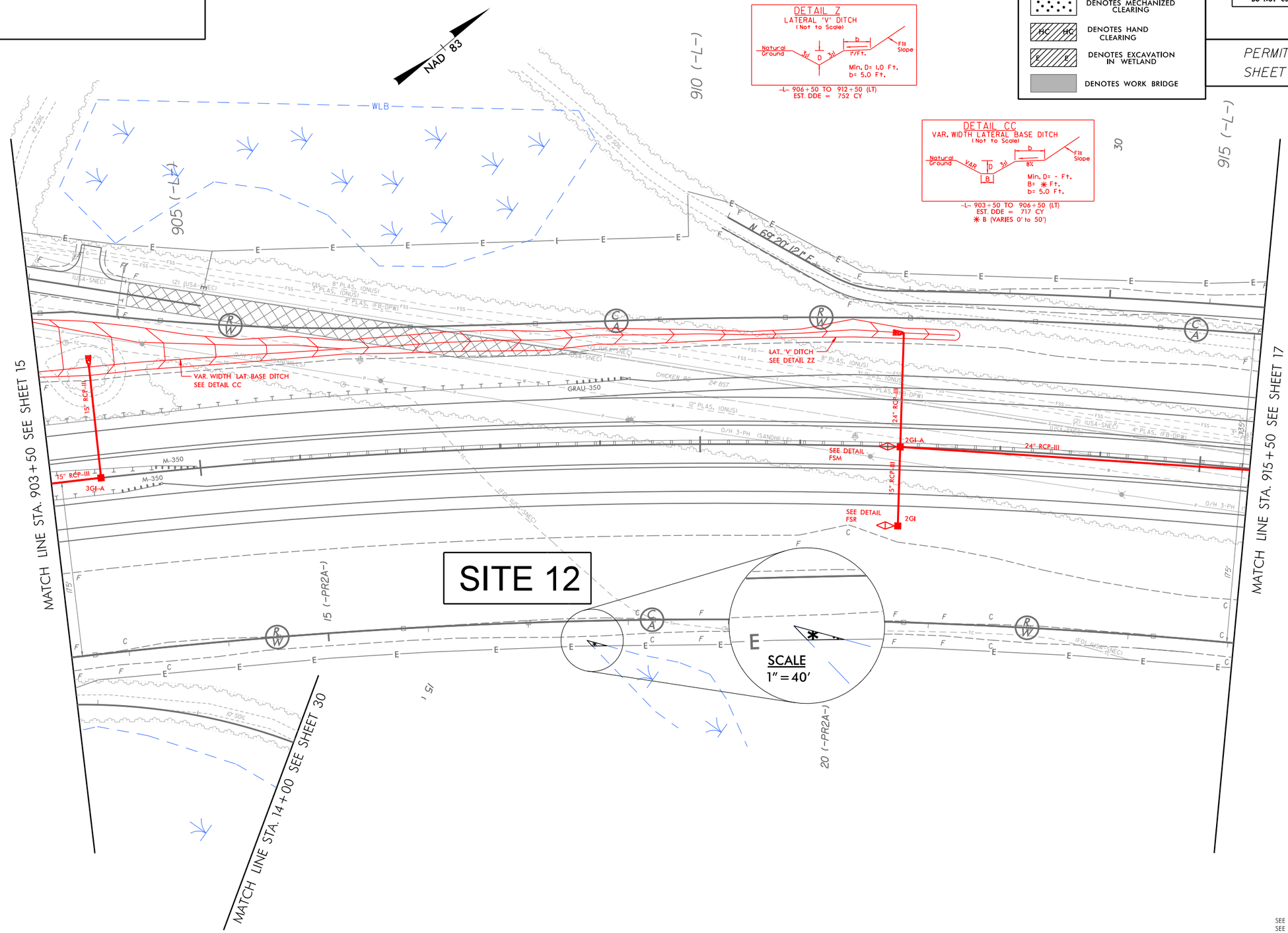
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWINGS
SHEET 33 OF 55

LEGEND

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES HAND CLEARING
- DENOTES EXCAVATION IN WETLAND
- DENOTES WORK BRIDGE



SEE SHEET 37 & 38 FOR -L- PROFILE
SEE SHEET 60 FOR -PR2A- PROFILE
SEE SHEET 65 FOR -TT4REV- PROFILE

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy_psh16

7/2/99

REVISIONS

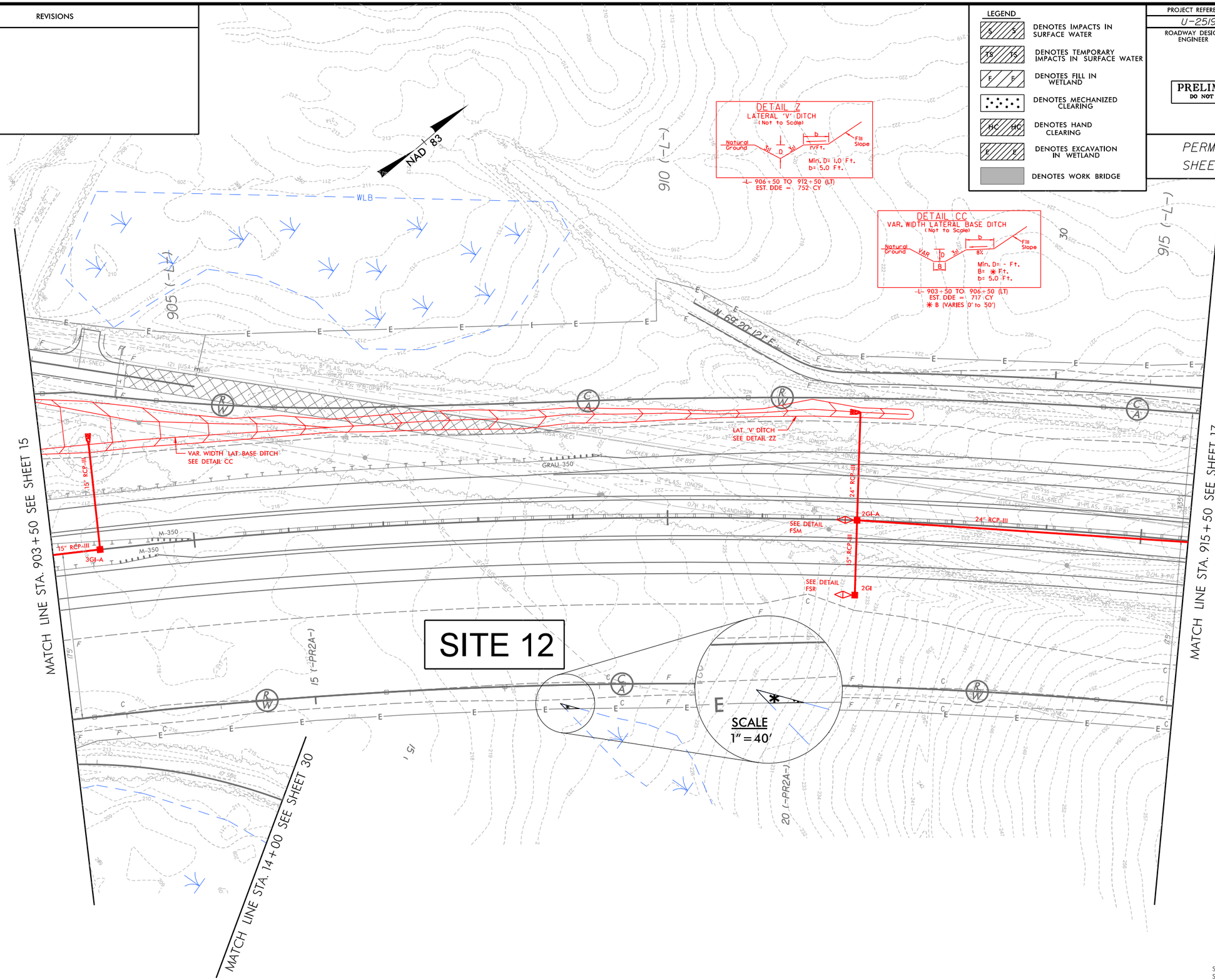
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWINGS
SHEET 34 OF 55

LEGEND

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES HAND CLEARING
- DENOTES EXCAVATION IN WETLAND
- DENOTES WORK BRIDGE



SEE SHEET 37 & 38 FOR -L- PROFILE
SEE SHEET 60 FOR -PR2A- PROFILE
SEE SHEET 65 FOR -TT4REV- PROFILE

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy_psh16

7/2/99

REVISIONS

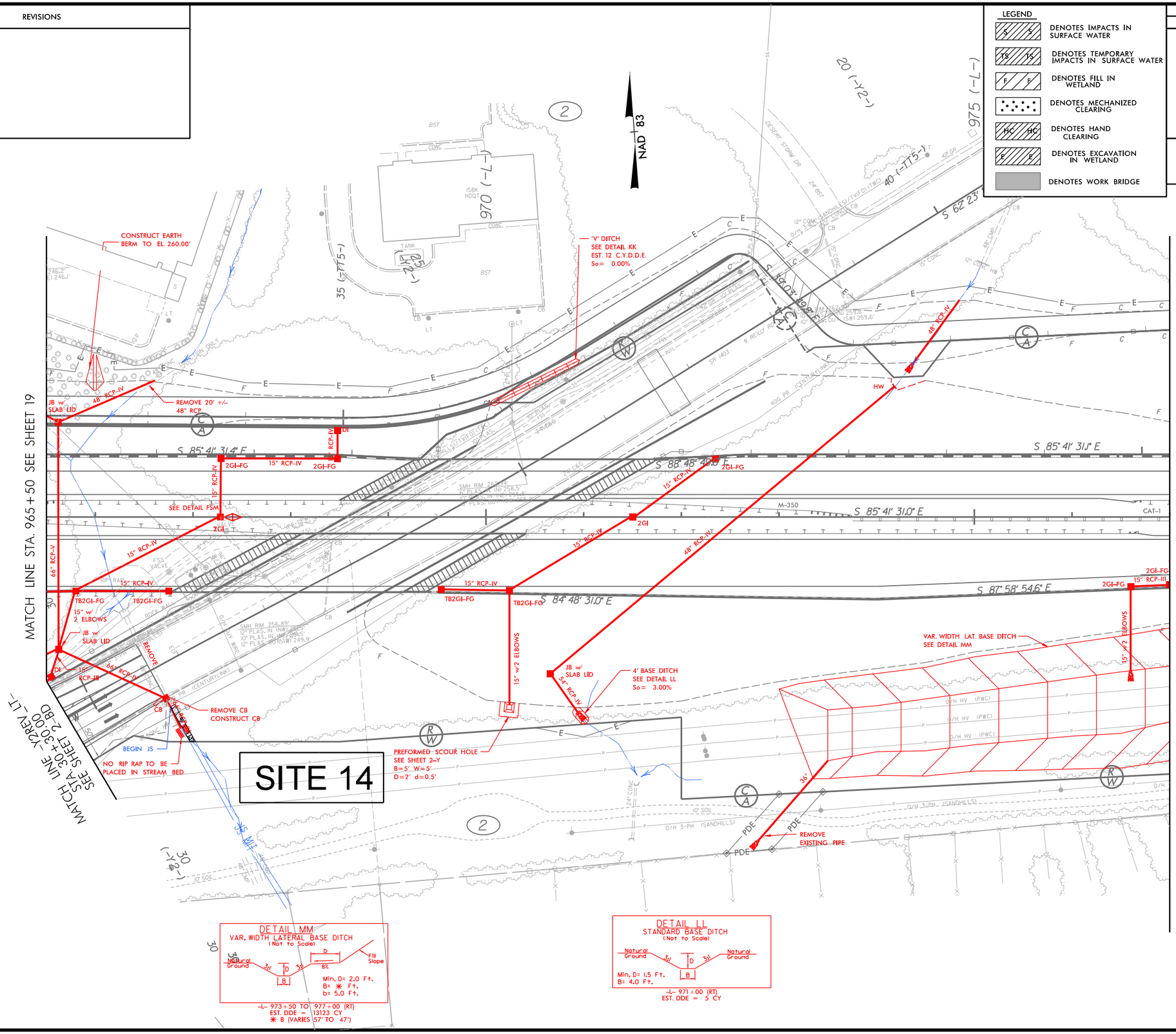
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	20
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWINGS
SHEET 35 OF 55

LEGEND

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES HAND CLEARING
- DENOTES EXCAVATION IN WETLAND
- DENOTES WORK BRIDGE



SEE SHEET 40 FOR -L- PROFILE
SEE SHEET 68 FOR -TT5- PROFILE
SEE SHEET 2-T FOR BRIDGE SKETCH
FOR STRUCTURE PLANS, SEE SHEET S- THRU S-

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy.psh20

7/2/99

REVISIONS

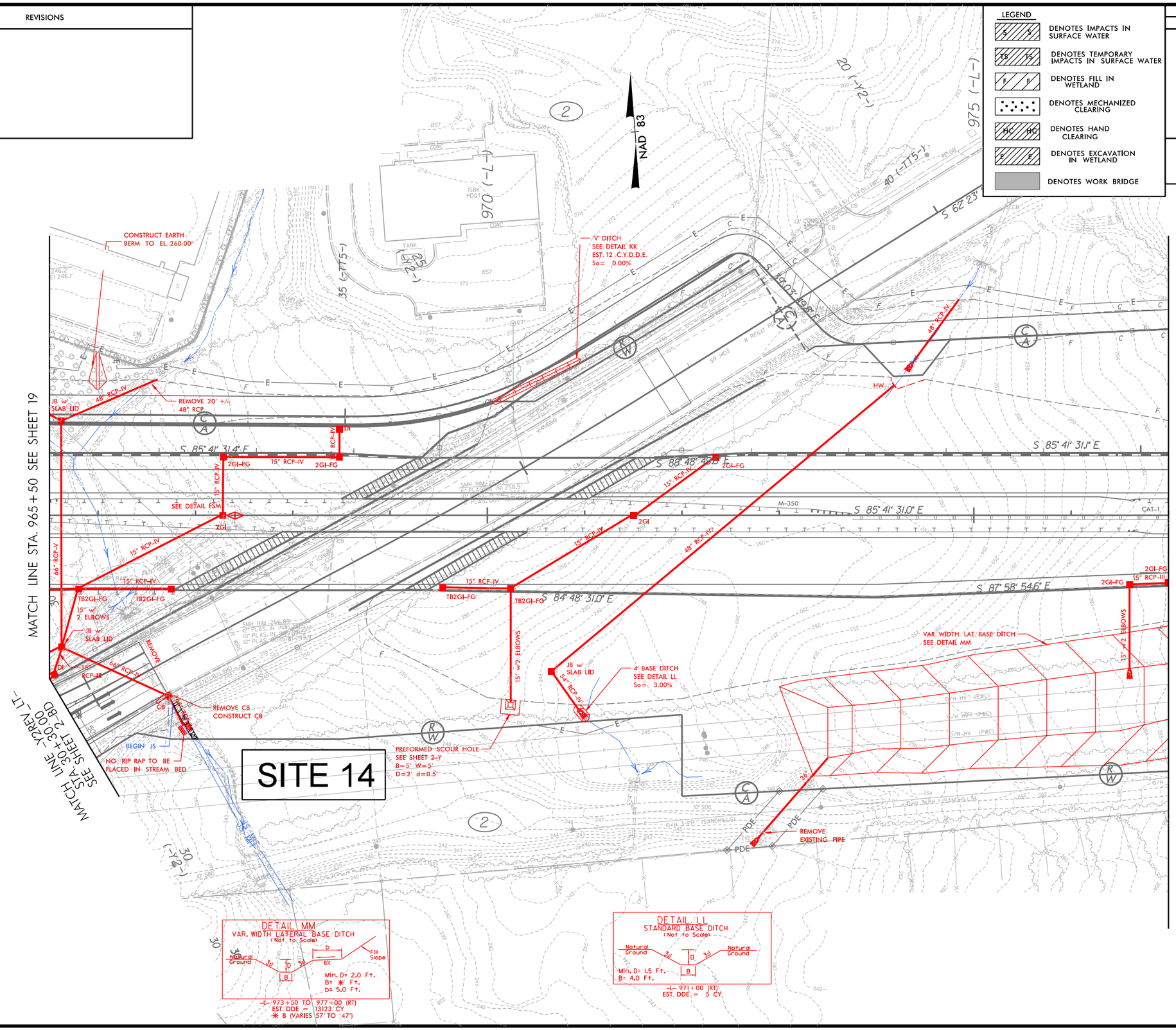
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	20
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWINGS
SHEET 36 OF 55

LEGEND

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES HAND CLEARING
- DENOTES EXCAVATION IN WETLAND
- DENOTES WORK BRIDGE

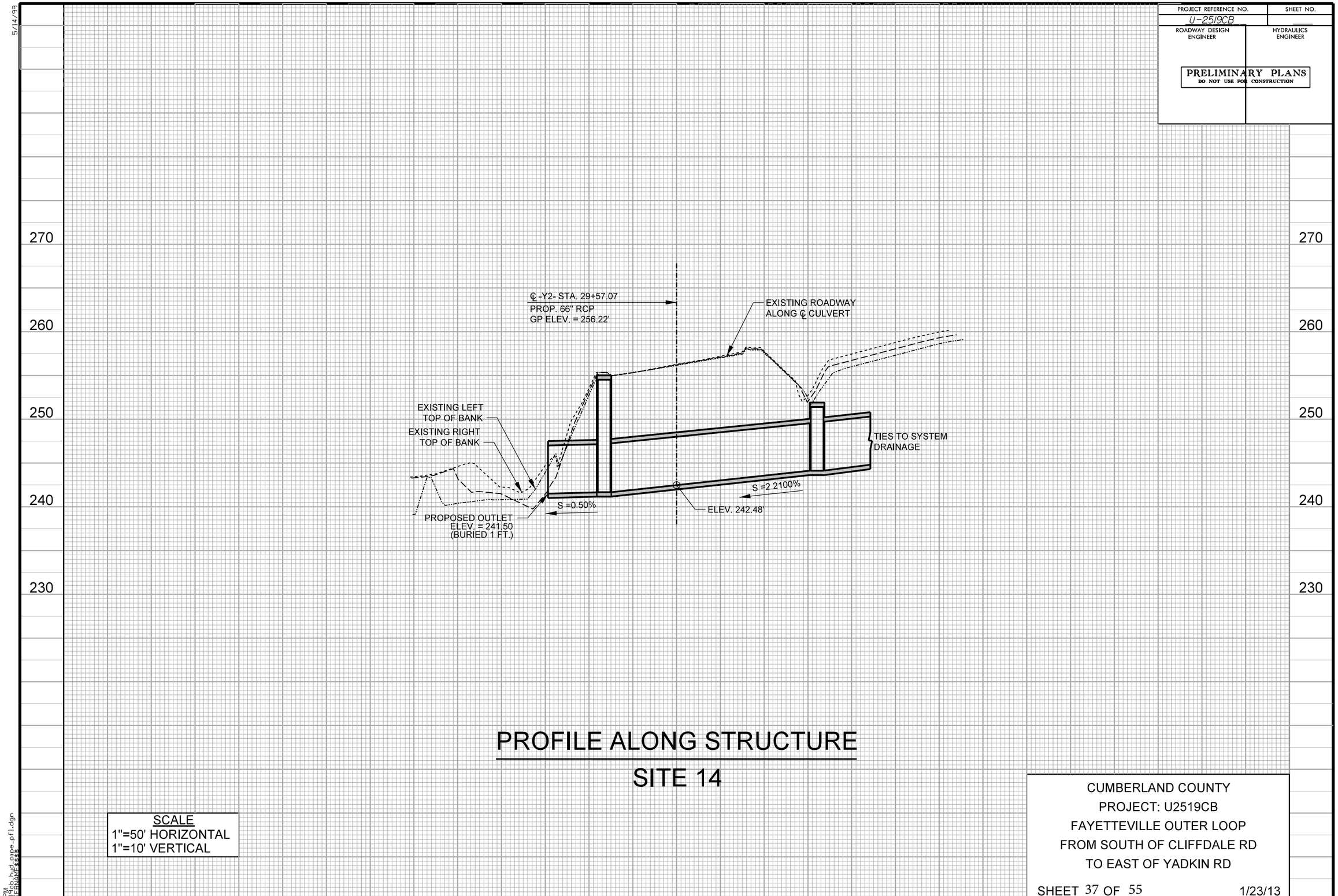


SEE SHEET 40 FOR -L- PROFILE
SEE SHEET 68 FOR -TT5- PROFILE
SEE SHEET 2-T FOR BRIDGE SKETCH
FOR STRUCTURE PLANS, SEE SHEET S- THRU S-

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy.psh20

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



PROFILE ALONG STRUCTURE

SITE 14

SCALE
1"=50' HORIZONTAL
1"=10' VERTICAL

CUMBERLAND COUNTY
PROJECT: U2519CB
FAYETTEVILLE OUTER LOOP
FROM SOUTH OF CLIFFDALE RD
TO EAST OF YADKIN RD

SHEET 37 OF 55 1/23/13

5/14/99

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u2519cb_hyd_pipe_pfl.dgn
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7/2/99

REVISIONS

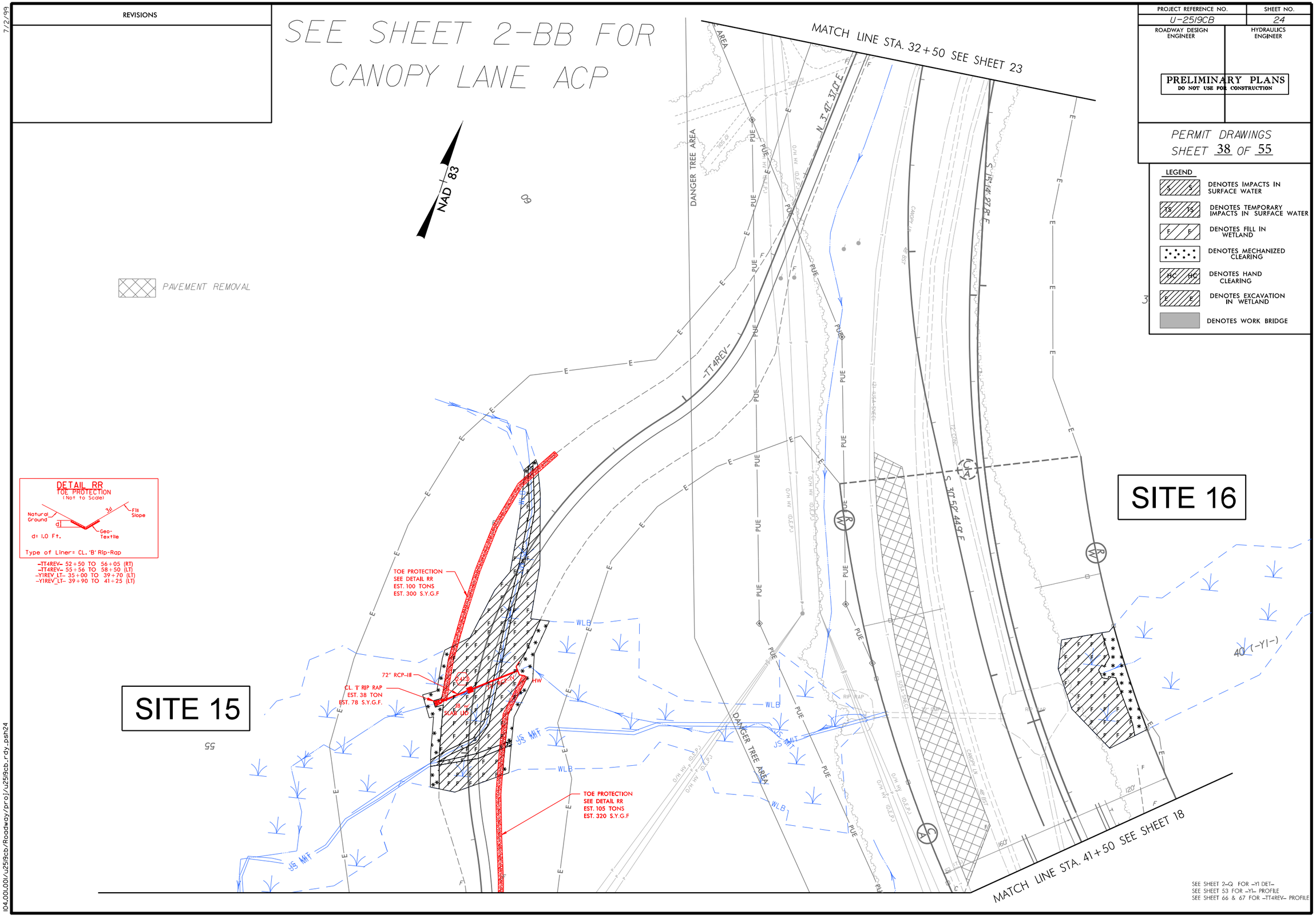
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	24
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWINGS
SHEET 38 OF 55

LEGEND

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES HAND CLEARING
- DENOTES EXCAVATION IN WETLAND
- DENOTES WORK BRIDGE



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7/2/99

REVISIONS

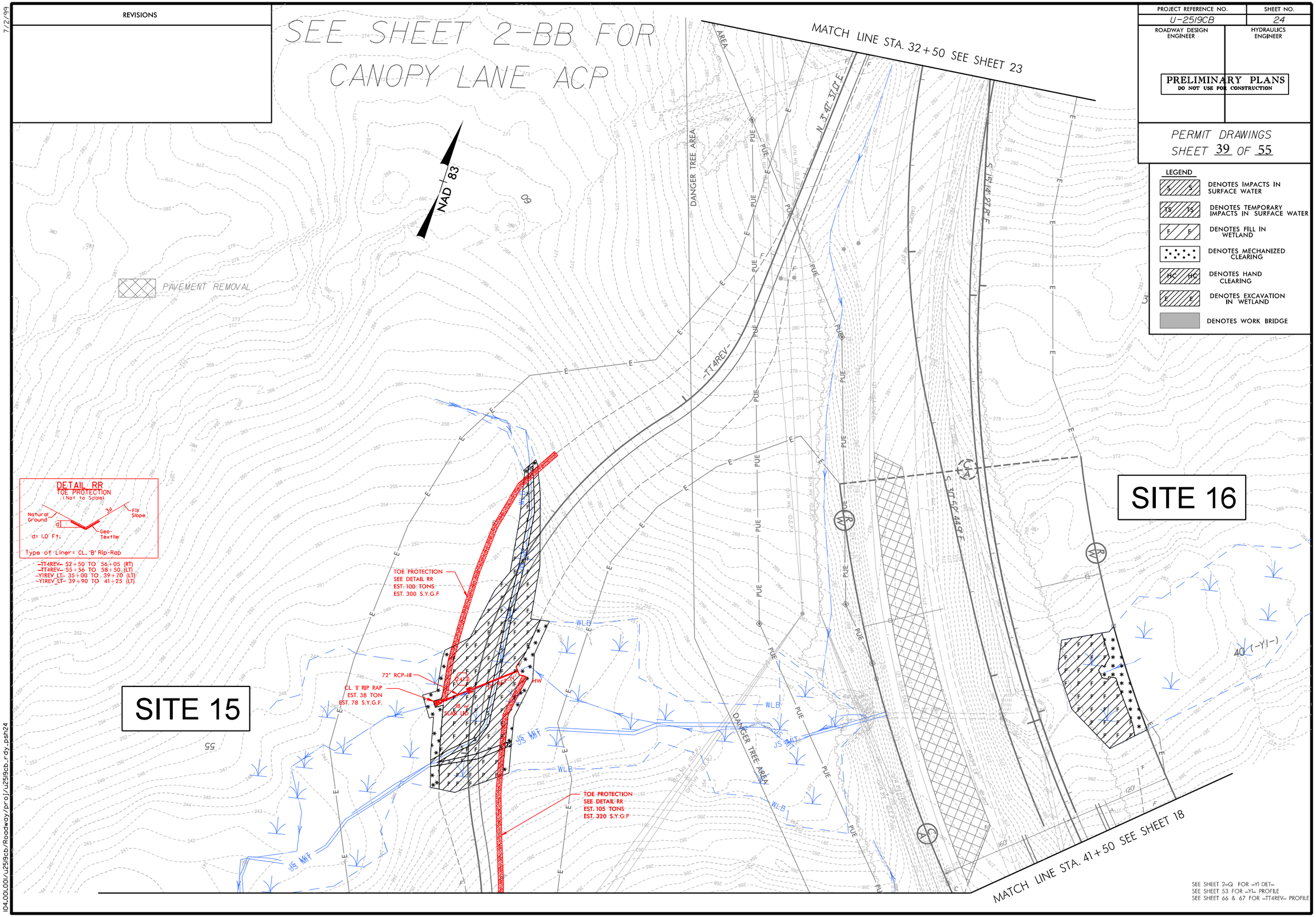
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	24
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PERMIT DRAWINGS
SHEET 39 OF 55

LEGEND

- S S — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- F F — DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- HC HC — DENOTES HAND CLEARING
- E E — DENOTES EXCAVATION IN WETLAND
- DENOTES WORK BRIDGE



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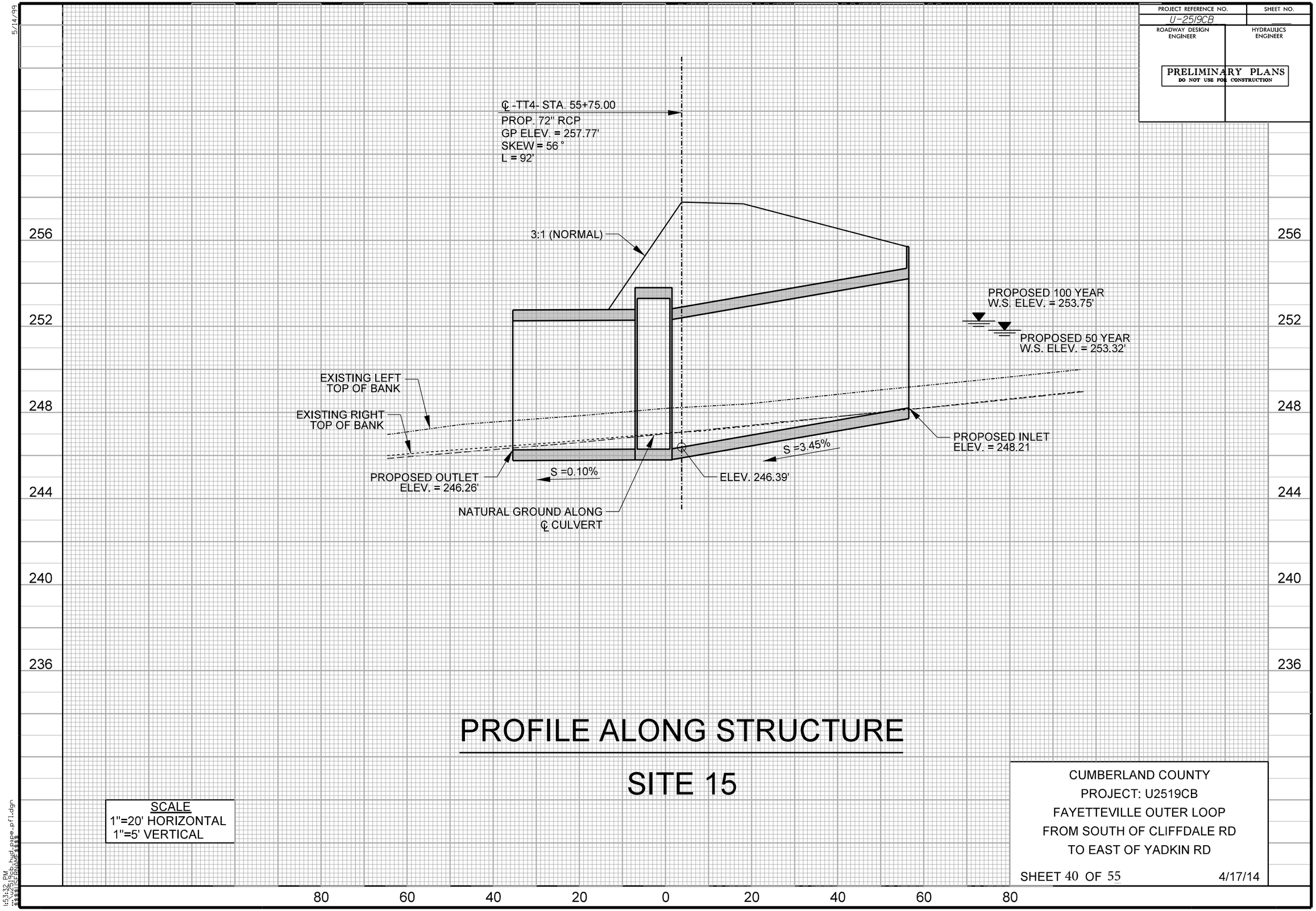
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



PROFILE ALONG STRUCTURE

SITE 15

SCALE
1"=20' HORIZONTAL
1"=5' VERTICAL

CUMBERLAND COUNTY
PROJECT: U2519CB
FAYETTEVILLE OUTER LOOP
FROM SOUTH OF CLIFFDALE RD
TO EAST OF YADKIN RD

SHEET 40 OF 55 4/17/14

5/14/99

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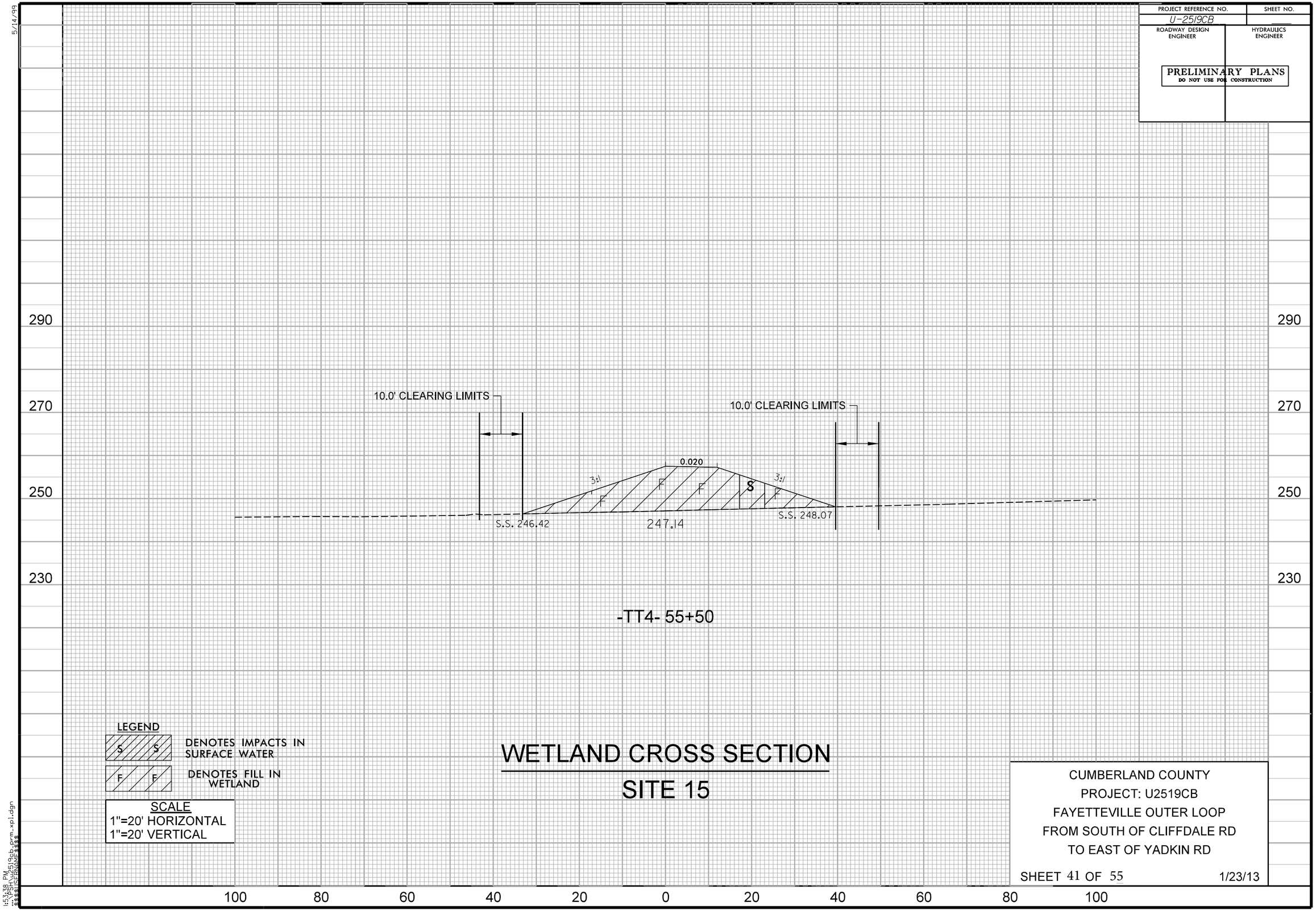
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



LEGEND

S S DENOTES IMPACTS IN SURFACE WATER

F F DENOTES FILL IN WETLAND

SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

WETLAND CROSS SECTION
SITE 15

CUMBERLAND COUNTY
PROJECT: U2519CB
FAYETTEVILLE OUTER LOOP
FROM SOUTH OF CLIFFDALE RD
TO EAST OF YADKIN RD

SHEET 41 OF 55 1/23/13

5/14/99

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u2519cb_prm_xpl.dgn

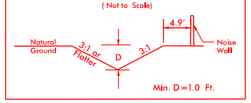
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	22B
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NOT A CERTIFIED DOCUMENT AS TO THE ORIGINAL DOCUMENT BUT ONLY AS TO THE REVISIONS.	NOT A CERTIFIED DOCUMENT AS TO THE ORIGINAL DOCUMENT BUT ONLY AS TO THE REVISIONS.
THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY : DENNIS JAMES MORY 20031 ON 8-29-08	THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY : W. HENRY WELLS JR. 9334 ON 8-29-08
THIS DOCUMENT IS ONLY CERTIFIED AS TO THE REVISIONS.	THIS DOCUMENT IS ONLY CERTIFIED AS TO THE REVISIONS.

8/17/99

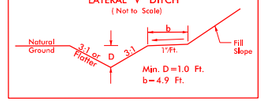
REVISIONS

DETAIL 17
SPECIAL 'V' DITCH
(Not to Scale)



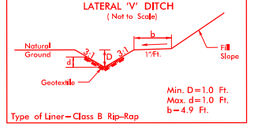
FROM STA. 41+01 TO STA. 47+24 RT
EST. DDE =_ CY

DETAIL 8
LATERAL 'V' DITCH
(Not to Scale)



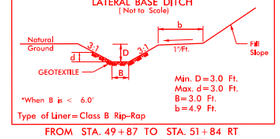
FROM STA. 47+24 TO STA. 48+98 RT
EST. DDE =_ CY

DETAIL 7
LATERAL 'V' DITCH
(Not to Scale)



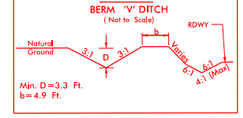
FROM STA. 49+31 TO STA. 49+74 RT
EST. CLASS B RIP-RAP=_ TN
EST. FILTER FABRIC=_ SY
EST. DDE=_ CY
FROM STA. 53+97 TO STA. 54+46 LT
EST. CLASS B RIP-RAP=_ TN
EST. FILTER FABRIC=_ SY
EST. DDE=_ CY

DETAIL 4
LATERAL BASE DITCH
(Not to Scale)

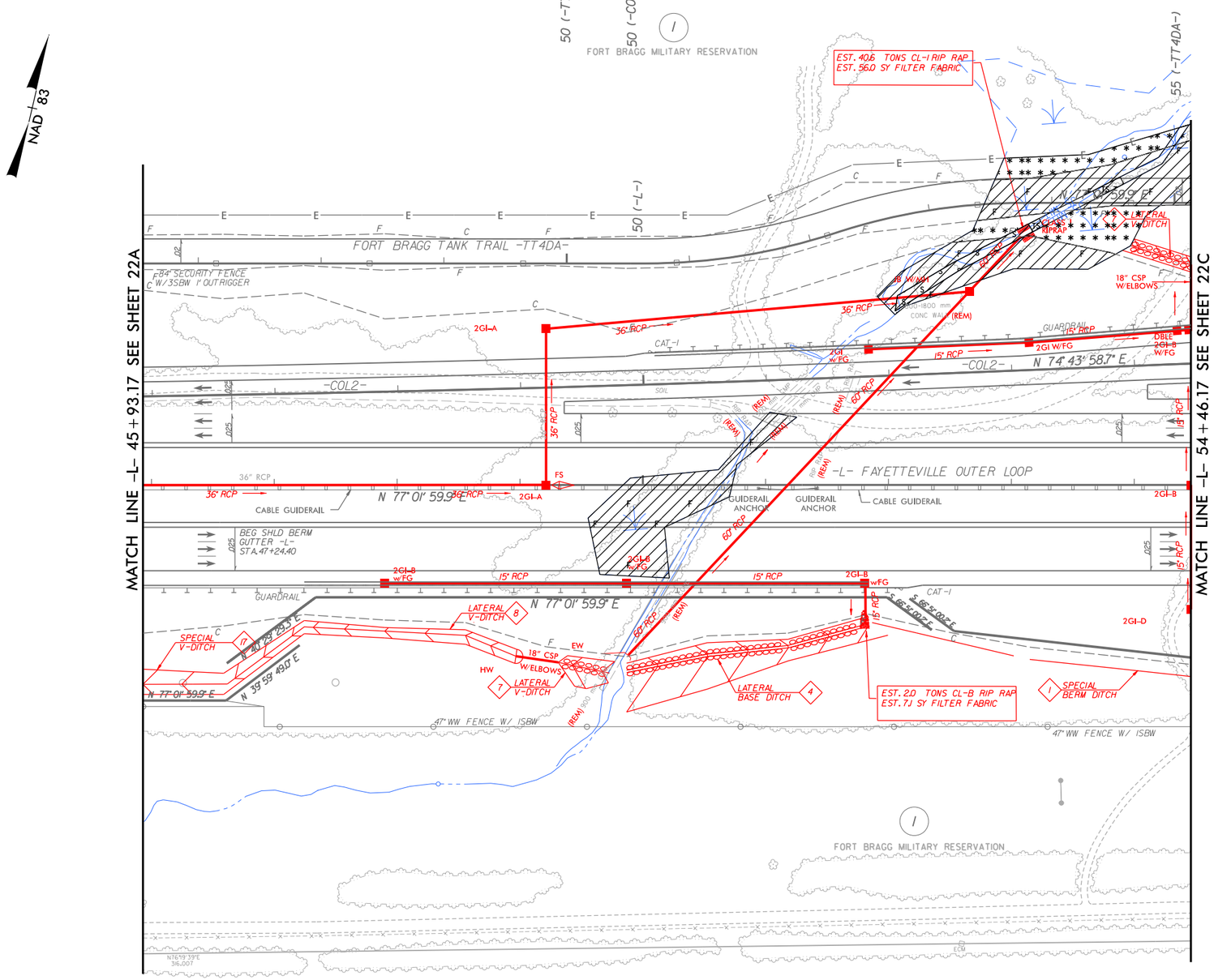


FROM STA. 49+87 TO STA. 51+84 RT
EST. CLASS B RIP-RAP=_ TN
EST. FILTER FABRIC=_ SY
EST. DDE=_ CY

DETAIL 1
BERM 'V' DITCH
(Not to Scale)



FROM STA. 53+15 TO STA. 56+43 RT
EST. DDE =_ CY



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LEGEND

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES HAND CLEARING
- DENOTES EXCAVATION IN WETLAND
- DENOTES WORK BRIDGE

PERMIT DRAWINGS
SHEET 42 OF 55

SITE 18

SEE SHEET 41A FOR -L- PROFILE
SEE SHEET 74 FOR -COL2- PROFILE
SEE SHEET 70 FOR -TT4DA- PROFILE

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11/21/2011
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U2519CB_Rdy_psh_22B.dgn

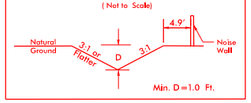
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	22B
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NOT A CERTIFIED DOCUMENT AS TO THE ORIGINAL DOCUMENT BUT ONLY AS TO THE REVISIONS.	NOT A CERTIFIED DOCUMENT AS TO THE ORIGINAL DOCUMENT BUT ONLY AS TO THE REVISIONS.
THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY : DENNIS JAMES MORY 20031 ON 8-29-08	THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY : W. HENRY WELLS JR. 9334 ON 8-29-08
THIS DOCUMENT IS ONLY CERTIFIED AS TO THE REVISIONS.	THIS DOCUMENT IS ONLY CERTIFIED AS TO THE REVISIONS.

8/17/99

REVISIONS

DETAIL 17
SPECIAL 'V' DITCH
(Not to Scale)

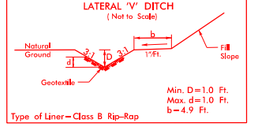


FROM STA. 41+01 TO STA. 47+24 RT
EST. DDE =_ CY

DETAIL 8
LATERAL 'V' DITCH
(Not to Scale)

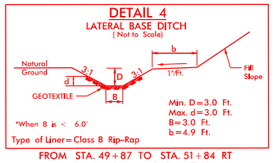
FROM STA. 47+24 TO STA. 48+98 RT
EST. DDE =_ CY

DETAIL 7
LATERAL 'V' DITCH
(Not to Scale)



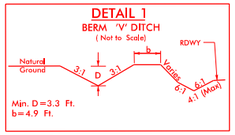
FROM STA. 49+31 TO STA. 49+74 RT
EST. CLASS B RIP-RAP=_ TN
EST. FILTER FABRIC=_ SY
EST. DDE=_ CY
FROM STA. 53+97 TO STA. 54+46 LT
EST. CLASS B RIP-RAP=_ TN
EST. FILTER FABRIC=_ SY
EST. DDE=_ CY

DETAIL 4
LATERAL BASE DITCH
(Not to Scale)

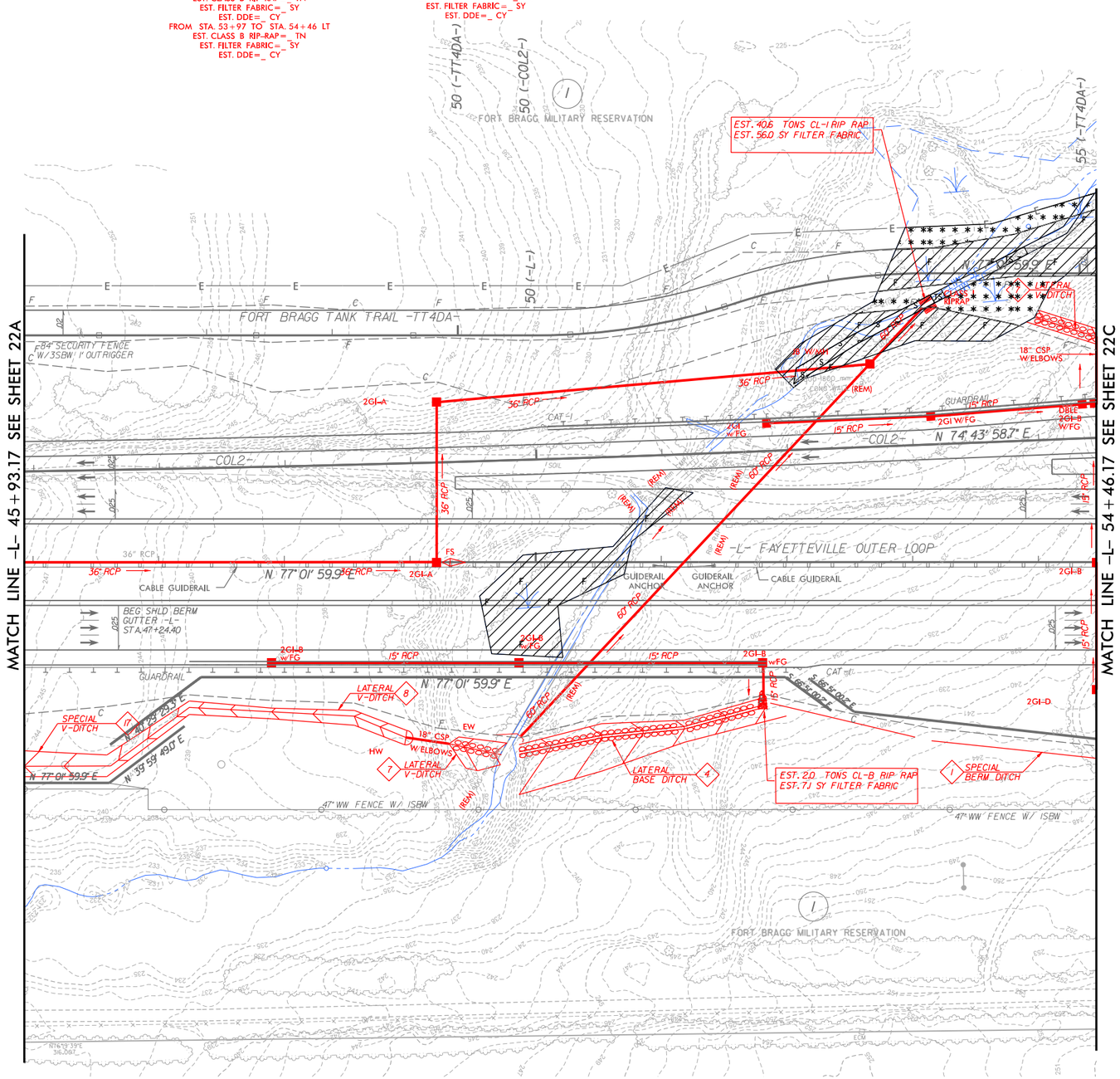


FROM STA. 49+87 TO STA. 51+84 RT
EST. CLASS B RIP-RAP=_ TN
EST. FILTER FABRIC=_ SY
EST. DDE=_ CY

DETAIL 1
BERM 'V' DITCH
(Not to Scale)



FROM STA. 53+15 TO STA. 56+43 RT
EST. DDE =_ CY



Right of Way for this Plan Sheet has been acquired under metric TIP Project U-2519DA. Right of Way authorization was May 19, 2006. Right of Way shown is for information purposes only.

LEGEND

- S S — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- F F — DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- HC HC — DENOTES HAND CLEARING
- E E — DENOTES EXCAVATION IN WETLAND
- DENOTES WORK BRIDGE

PERMIT DRAWINGS
SHEET 43 OF 55

SITE 18

SEE SHEET 41A FOR -L- PROFILE
SEE SHEET 74 FOR -COL2- PROFILE
SEE SHEET 70 FOR -TT4DA- PROFILE

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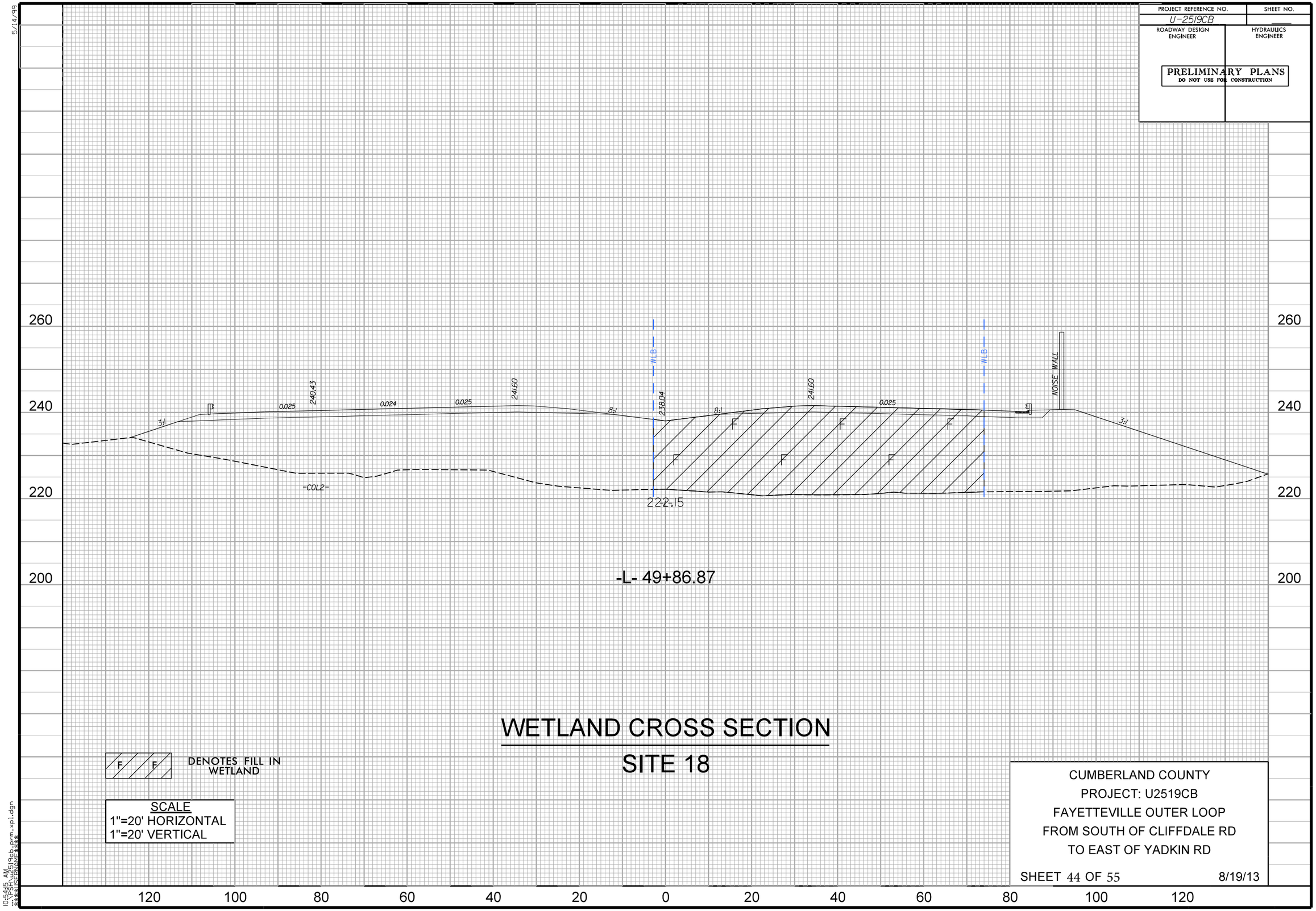
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



WETLAND CROSS SECTION

SITE 18

F F DENOTES FILL IN WETLAND

SCALE
1"=20' HORIZONTAL
1"=20' VERTICAL

CUMBERLAND COUNTY
PROJECT: U2519CB
FAYETTEVILLE OUTER LOOP
FROM SOUTH OF CLIFFDALE RD
TO EAST OF YADKIN RD

SHEET 44 OF 55 8/19/13

5/14/99

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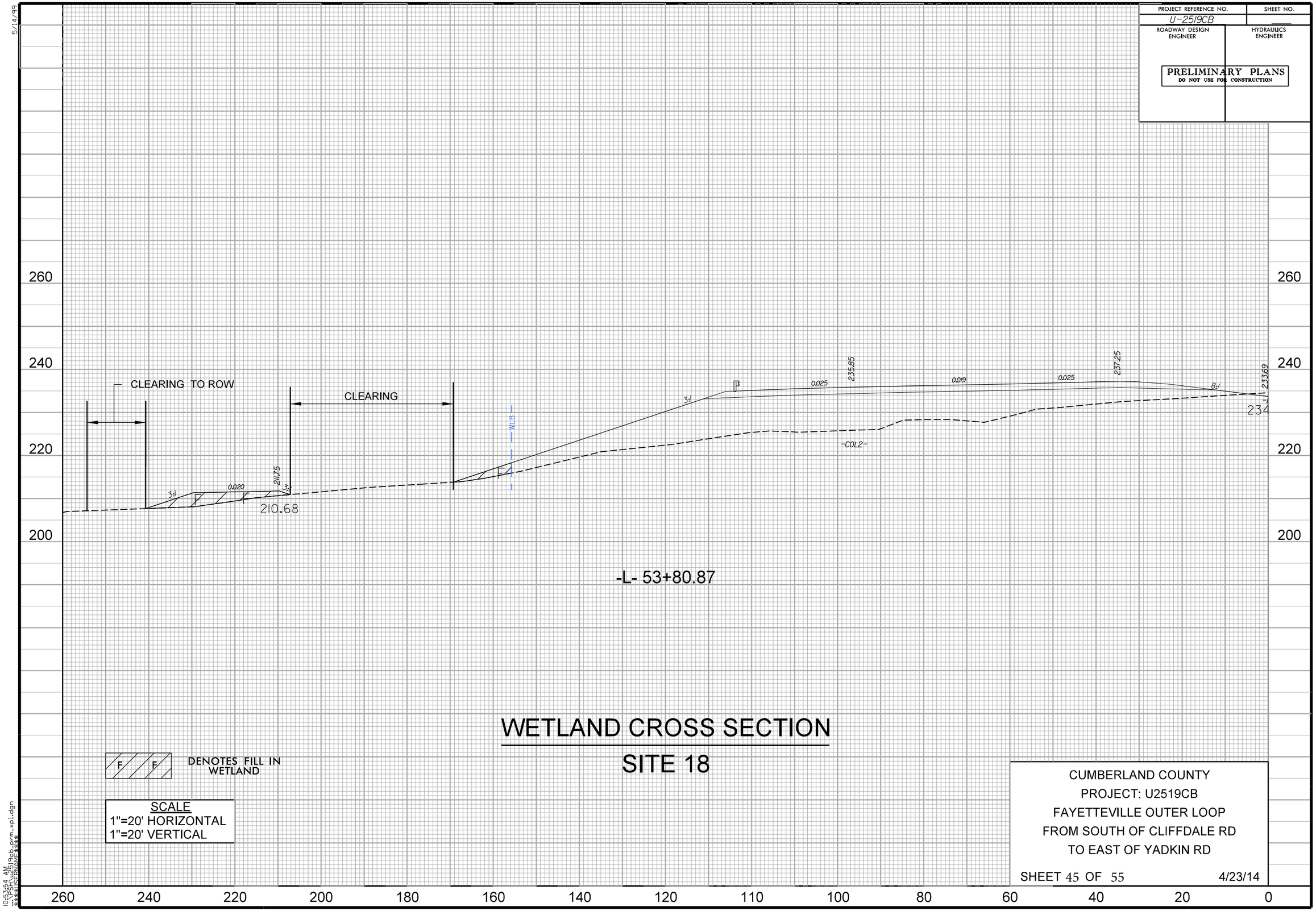
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



WETLAND CROSS SECTION

SITE 18

CUMBERLAND COUNTY
PROJECT: U2519CB
FAYETTEVILLE OUTER LOOP
FROM SOUTH OF CLIFFDALE RD
TO EAST OF YADKIN RD

SHEET 45 OF 55 4/23/14

5/14/99

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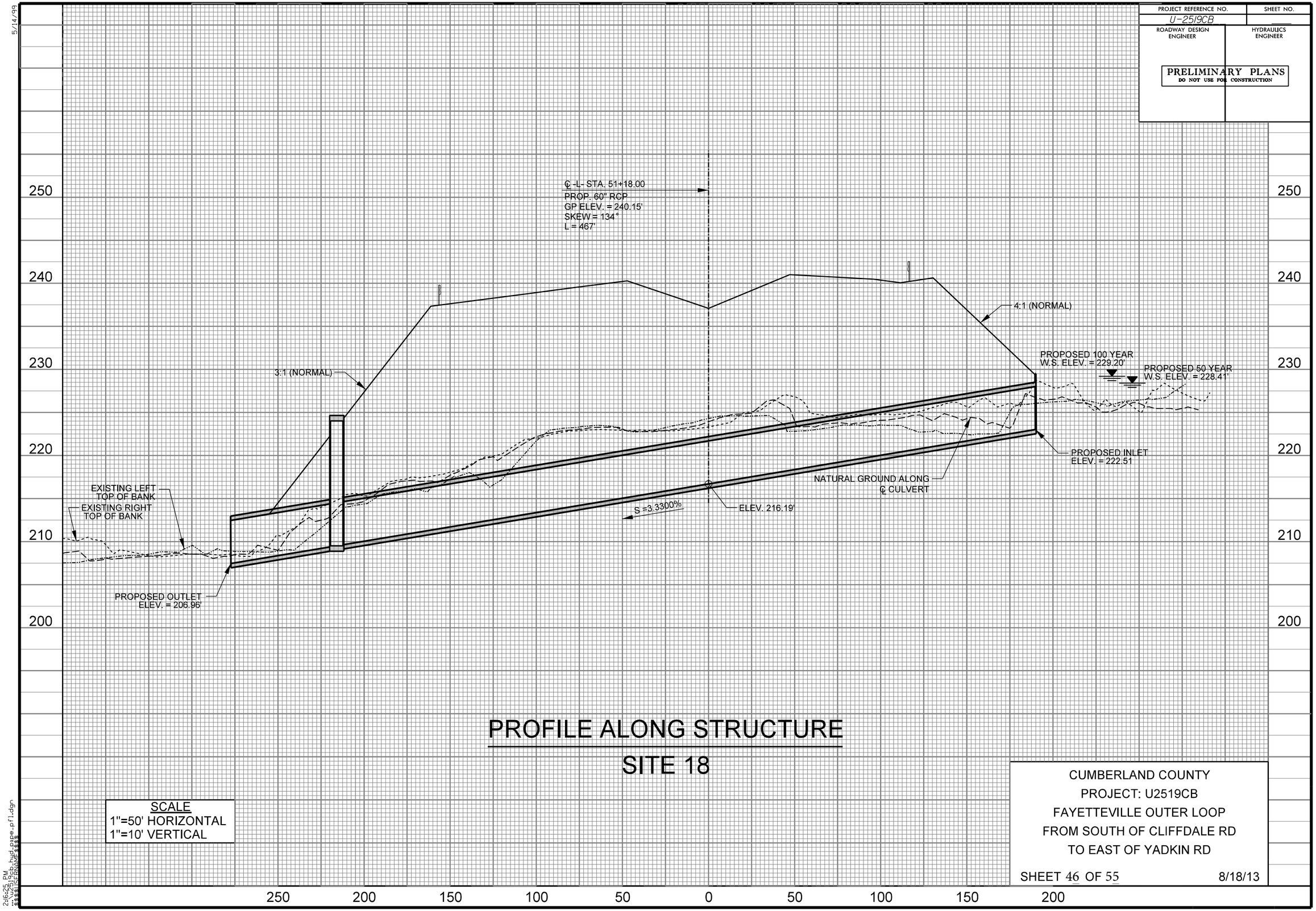
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



PROFILE ALONG STRUCTURE

SITE 18

SCALE
1"=50' HORIZONTAL
1"=10' VERTICAL

CUMBERLAND COUNTY
PROJECT: U2519CB
FAYETTEVILLE OUTER LOOP
FROM SOUTH OF CLIFFDALE RD
TO EAST OF YADKIN RD

SHEET 46 OF 55 8/18/13

5/14/99

2:16:25 PM
12/12/2012
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REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	22C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SEE SHEETS 41A-41B FOR -L- PROFILE
SEE SHEET 72 FOR -COL1- PROFILE
SEE SHEETS 74-75 FOR -COL2- PROFILE
SEE SHEET 80 FOR -RPIDB- PROFILE
SEE SHEET 70 FOR -TT4DA- PROFILE

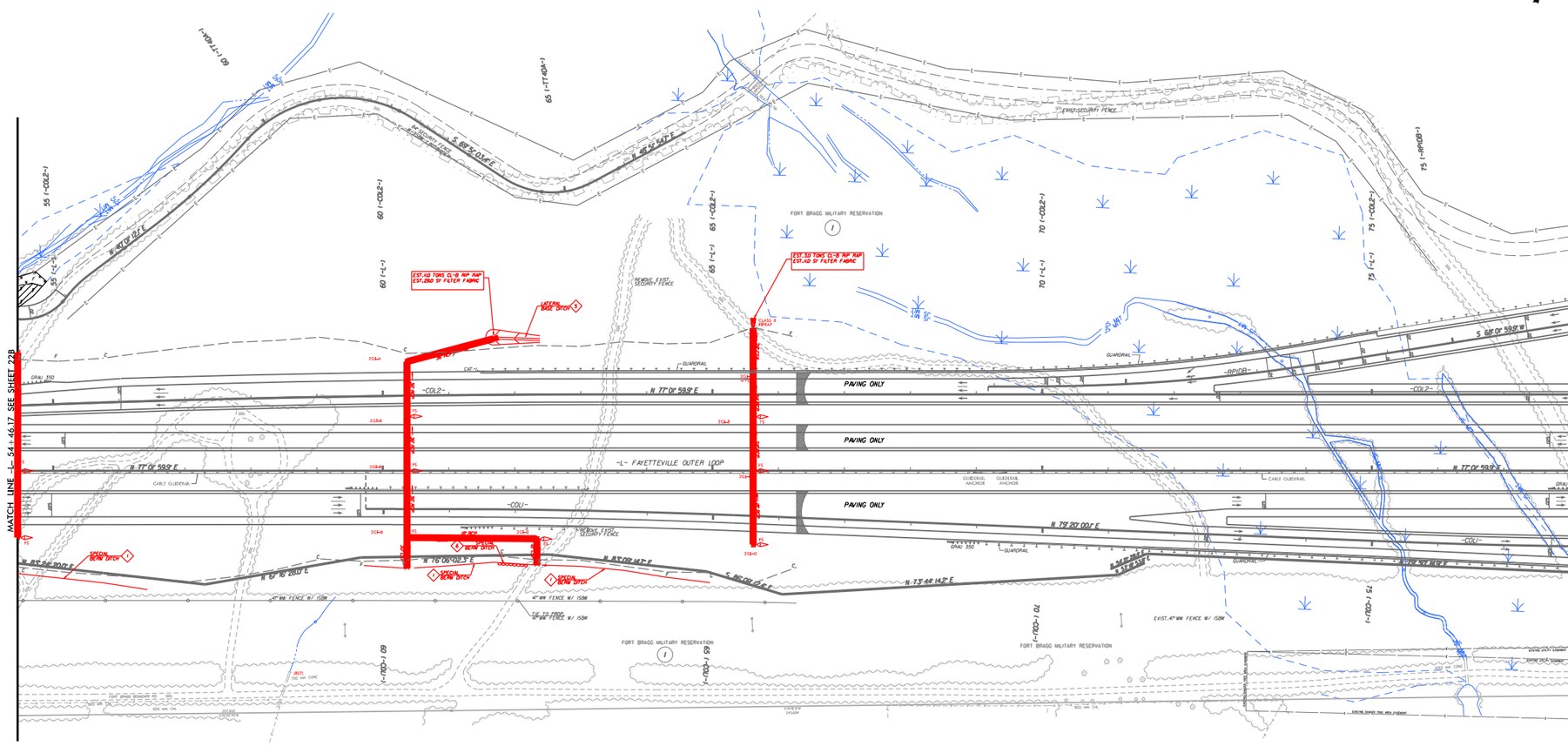
Right of Way for this Plan Sheet has been acquired under metric TIP Project U-2519DA. Right of Way authorization was May 19, 2006. Right of Way shown is for information purposes only.

NAD 83

LEGEND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES HAND CLEARING
- DENOTES EXCAVATION IN WETLAND
- DENOTES WORK BRIDGE

PERMIT DRAWINGS
SHEET 47 OF 55

SITE 18



LOCATION: FAYETTEVILLE OUTER LOOP FROM SOUTH OF SR 1400 (CLIFFDALE RD.) TO EAST OF ALL AMERICAN FREEWAY

TIP NO. U-2519CB COUNTY: CUMBERLAND

GRAPHIC SCALE
50 25 0 50 100
PLANS

DESIGNED BY:
CHECKED BY: DATE:

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	22C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SEE SHEETS 41A-41B FOR -L- PROFILE
SEE SHEET 72 FOR -COL1- PROFILE
SEE SHEETS 74-75 FOR -COL2- PROFILE
SEE SHEET 80 FOR -RPIDB- PROFILE
SEE SHEET 70 FOR -TT4DA- PROFILE

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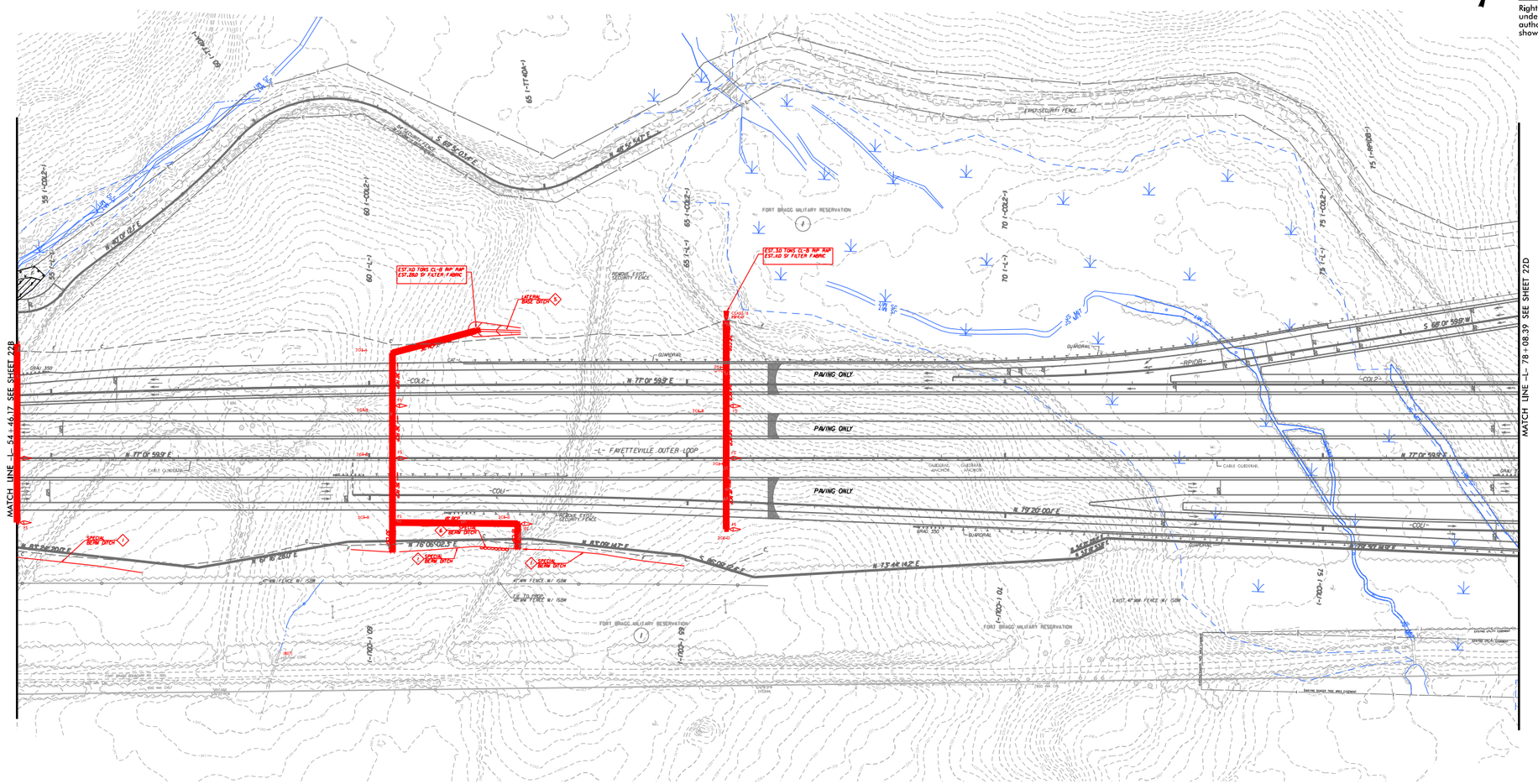
NAD 83

LEGEND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES HAND CLEARING
- DENOTES EXCAVATION IN WETLAND
- DENOTES WORK BRIDGE

PERMIT DRAWINGS
SHEET 48 OF 55

SITE 18



GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION: FAYETTEVILLE OUTER LOOP FROM SOUTH OF SR 1400 (CLIFFDALE RD.) TO EAST OF ALL AMERICAN FREEWAY

TIP NO. U-2519CB COUNTY: CUMBERLAND

DESIGNED BY:
CHECKED BY: DATE:

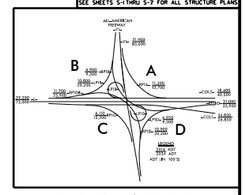
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	22D
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
HOT A CERTIFIED DOCUMENT AS TO THE CONTENTS OF THIS DOCUMENT EXCEPT AS TO THE HYDRAULIC
THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY:
DENNIS JAMES MOORE
2/22/21 (SEAL)
THIS DOCUMENT IS ONLY CERTIFIED AS TO THE HYDRAULIC

HYDRAULICS ENGINEER
HOT A CERTIFIED DOCUMENT AS TO THE CONTENTS OF THIS DOCUMENT EXCEPT AS TO THE HYDRAULIC
THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY:
W. HERVEY WELLS JR.
7/23/21 (SEAL)
THIS DOCUMENT IS ONLY CERTIFIED AS TO THE HYDRAULIC

SEE SHEETS 4B-4C FOR -L- PROFILE
SEE SHEET 8A FOR -RPDB- PROFILE
SEE SHEET 8B FOR -FTBD- PROFILE
SEE SHEETS 5-1 THRU 5-7 FOR ALL STRUCTURE PLANS



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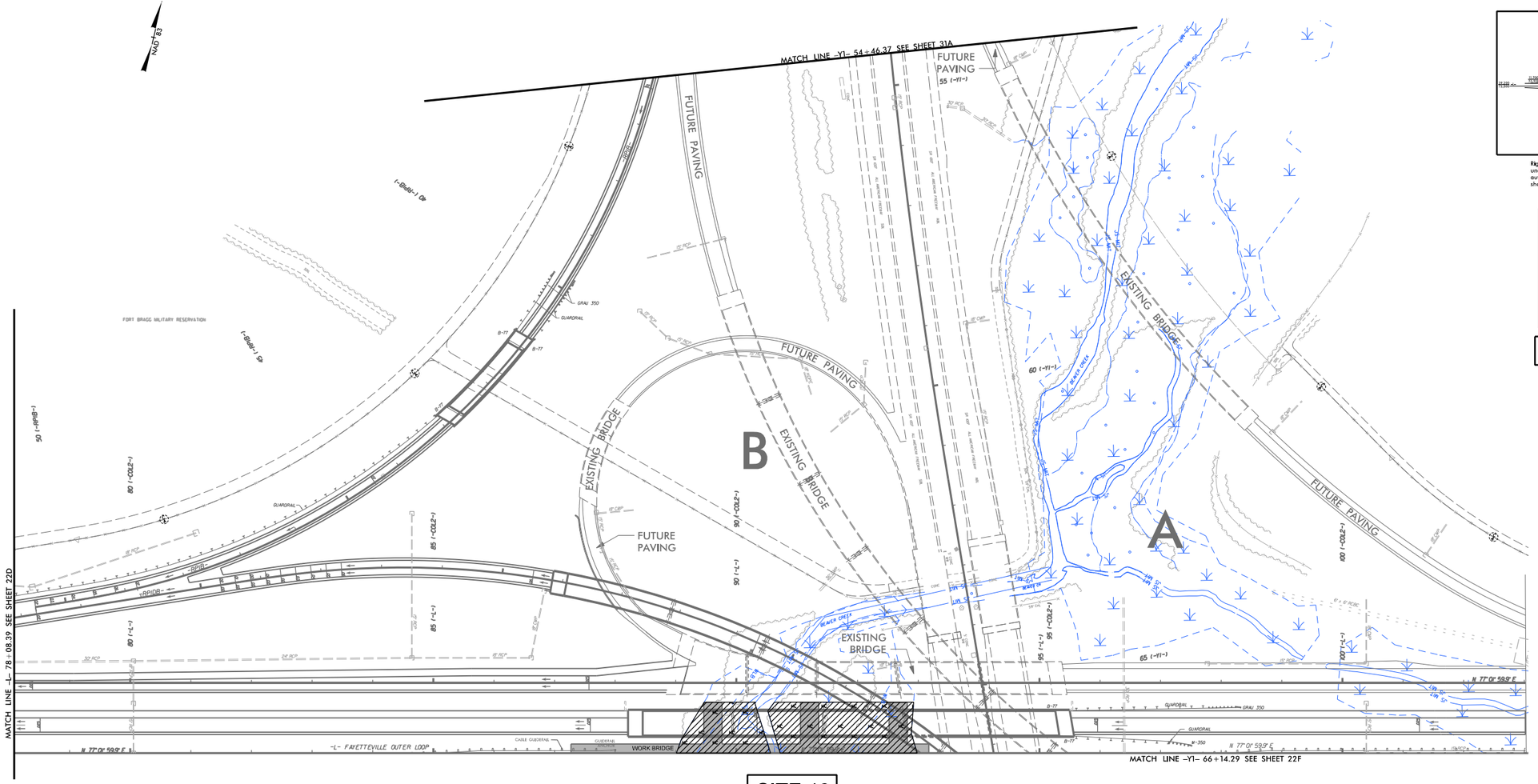
LEGEND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES HAND CLEARING
- DENOTES EXCAVATION IN WETLAND
- DENOTES WORK BRIDGE

PERMIT DRAWINGS
SHEET 49 OF 55



SITE 19

GRAPHIC SCALE
0
PLANS

LOCATION: FAYETTEVILLE OUTER LOOP FROM SOUTH OF SR 1400 (CLIFFDALE RD.) TO EAST OF ALL AMERICAN FREEWAY

TIP NO.: U-2519CB COUNTY: CUMBERLAND

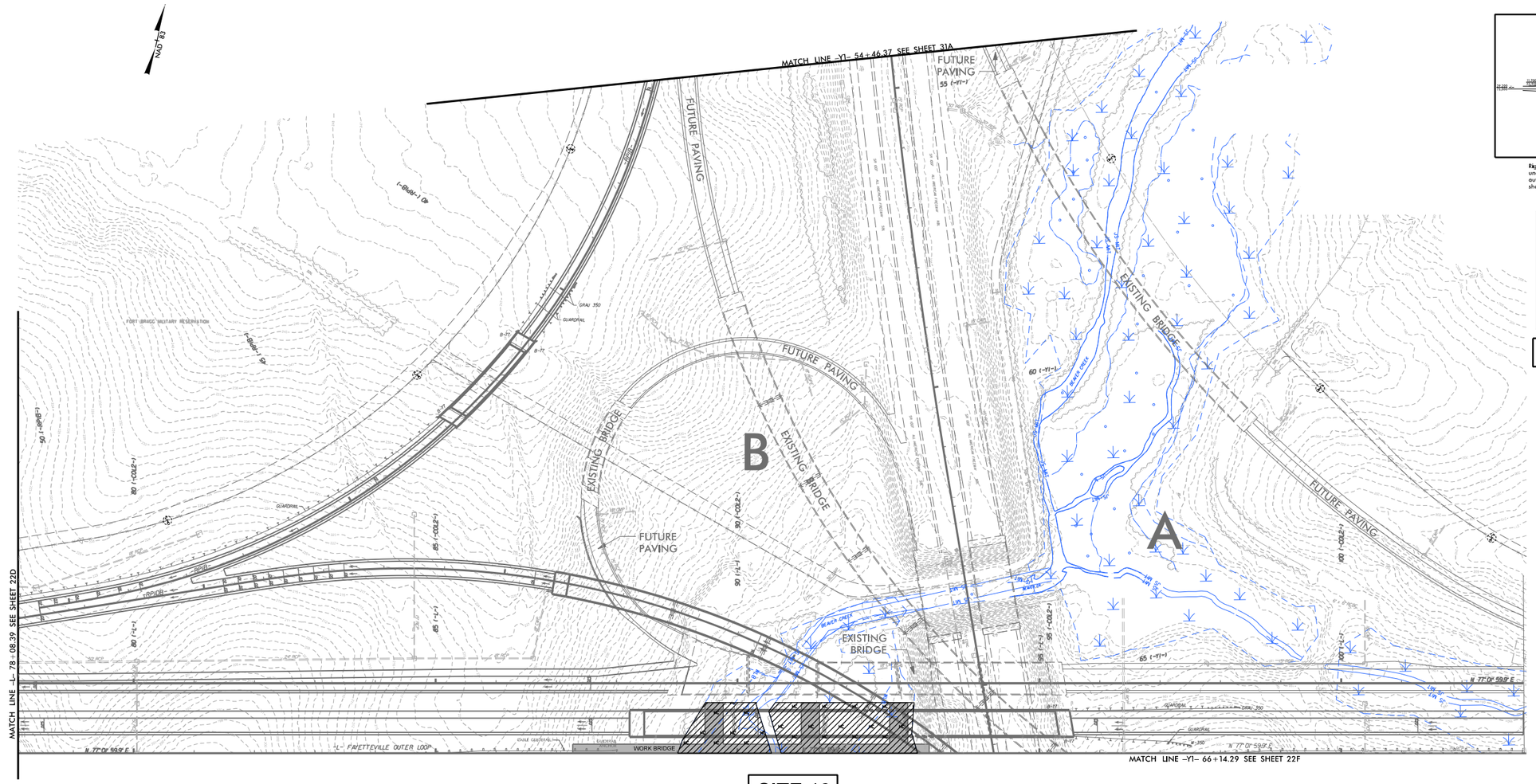
DESIGNED BY:

CHECKED BY: DATE:

REVISIONS

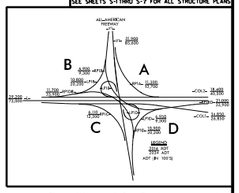
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	22D
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER



SITE 19

SEE SHEETS 4B-4C FOR -L- PROFILE
SEE SHEET 8A FOR -RPOB- PROFILE
SEE SHEET 8B FOR -Y1B- PROFILE
SEE SHEET 8C FOR -Y1C- PROFILE
SEE SHEETS 5-1 THRU 5-7 FOR ALL STRUCTURE PLANS



Right of Way for this Plan Sheet has been acquired under metric TIP Project U-2519DA. Right of Way authorization was May 19, 2006. Right of Way shown is for information purposes only.

LEGEND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING
- DENOTES HAND CLEARING
- DENOTES EXCAVATION IN WETLAND
- DENOTES WORK BRIDGE

PERMIT DRAWINGS
SHEET 50 OF 55

GRAPHIC SCALE
0 1 2
PLANS

LOCATION: FAYETTEVILLE OUTER LOOP FROM SOUTH OF SR 1400 (CLIFFDALE RD.) TO EAST OF ALL AMERICAN FREEWAY

TIP NO.: U-2519CB COUNTY: CUMBERLAND

DESIGNED BY:

CHECKED BY: DATE:

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	22E
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NOT A CERTIFIED DOCUMENT AS TO THE ORIGINAL DOCUMENT BUT ONLY AS TO THE REVISIONS.	NOT A CERTIFIED DOCUMENT AS TO THE ORIGINAL DOCUMENT BUT ONLY AS TO THE REVISIONS.
THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY :	THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY :
DENNIS JAMES MORY	W. HENRY WELLS JR.
20031 ON 8-19-11	9334 ON 8-19-11
THIS DOCUMENT IS ONLY CERTIFIED AS TO THE REVISIONS.	THIS DOCUMENT IS ONLY CERTIFIED AS TO THE REVISIONS.

SEE SHEETS 41B-41C FOR -L- PROFILE
SEE SHEETS 75-76 FOR -COLI- PROFILE
SEE SHEET 83 FOR -RPIDB- PROFILE
SEE SHEET 81 FOR -RPIC- PROFILE
SEE SHEET 82 FOR -LPID- PROFILE
SEE SHEETS S-1 THRU S-? FOR ALL STRUCTURE PLANS

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LEGEND

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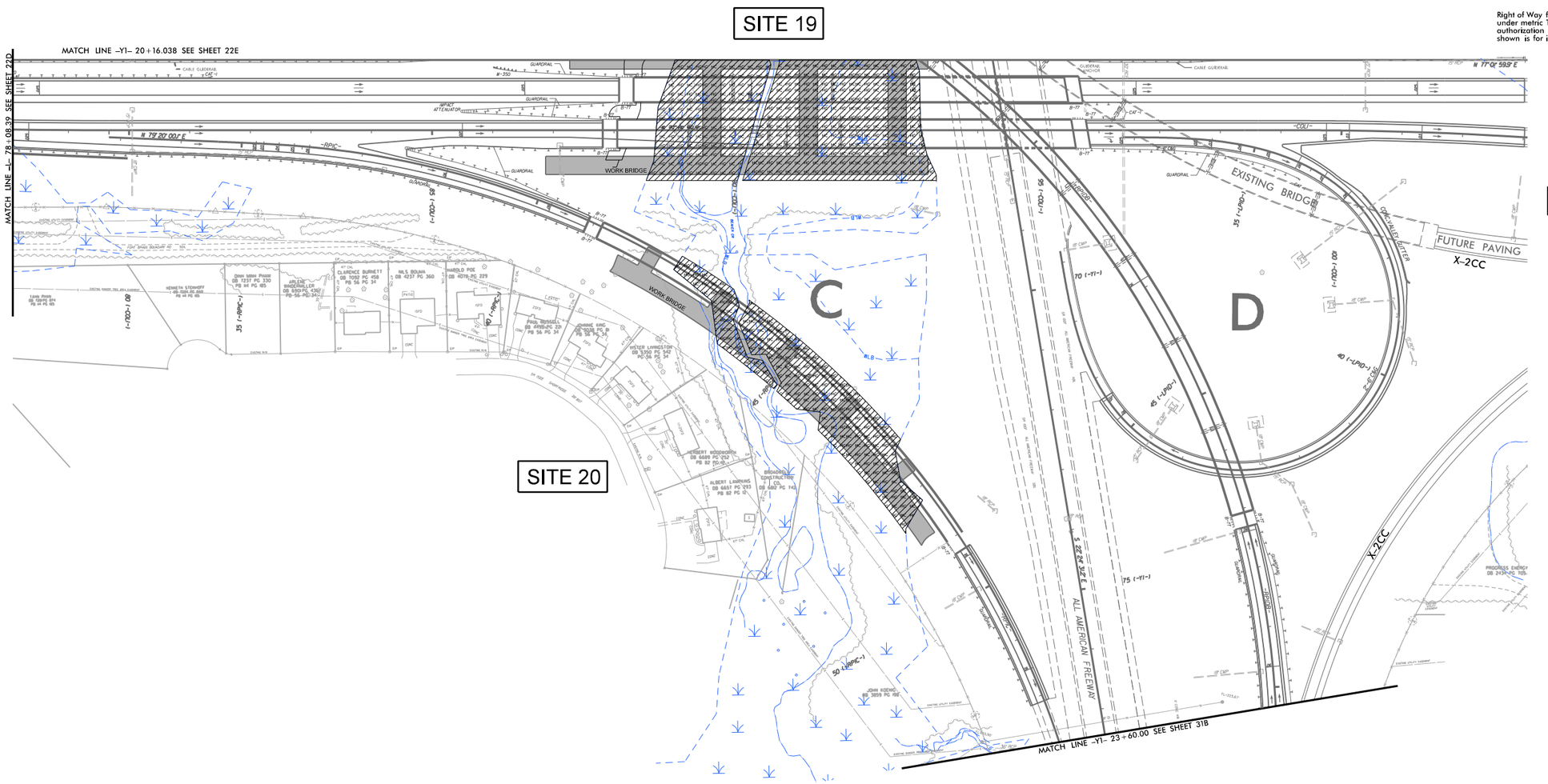
▨ TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
▨ F	DENOTES FILL IN WETLAND
⁘	DENOTES MECHANIZED CLEARING
▨ HC	DENOTES HAND CLEARING
▨ E	DENOTES EXCAVATION IN WETLAND
▩	DENOTES WORK BRIDGE

PERMIT DRAWINGS
SHEET 51 OF 55



GRAPHIC SCALE
0
PLANS

LOCATION: FAYETTEVILLE OUTER LOOP FROM
SOUTH OF SR 1400 (CLIFFDALE RD.)
TO EAST OF ALL AMERICAN FREEWAY

TIP NO.: U–2519CB
COUNTY: CUMBERLAND
DESIGNED BY:
CHECKED BY:
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REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	22E
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
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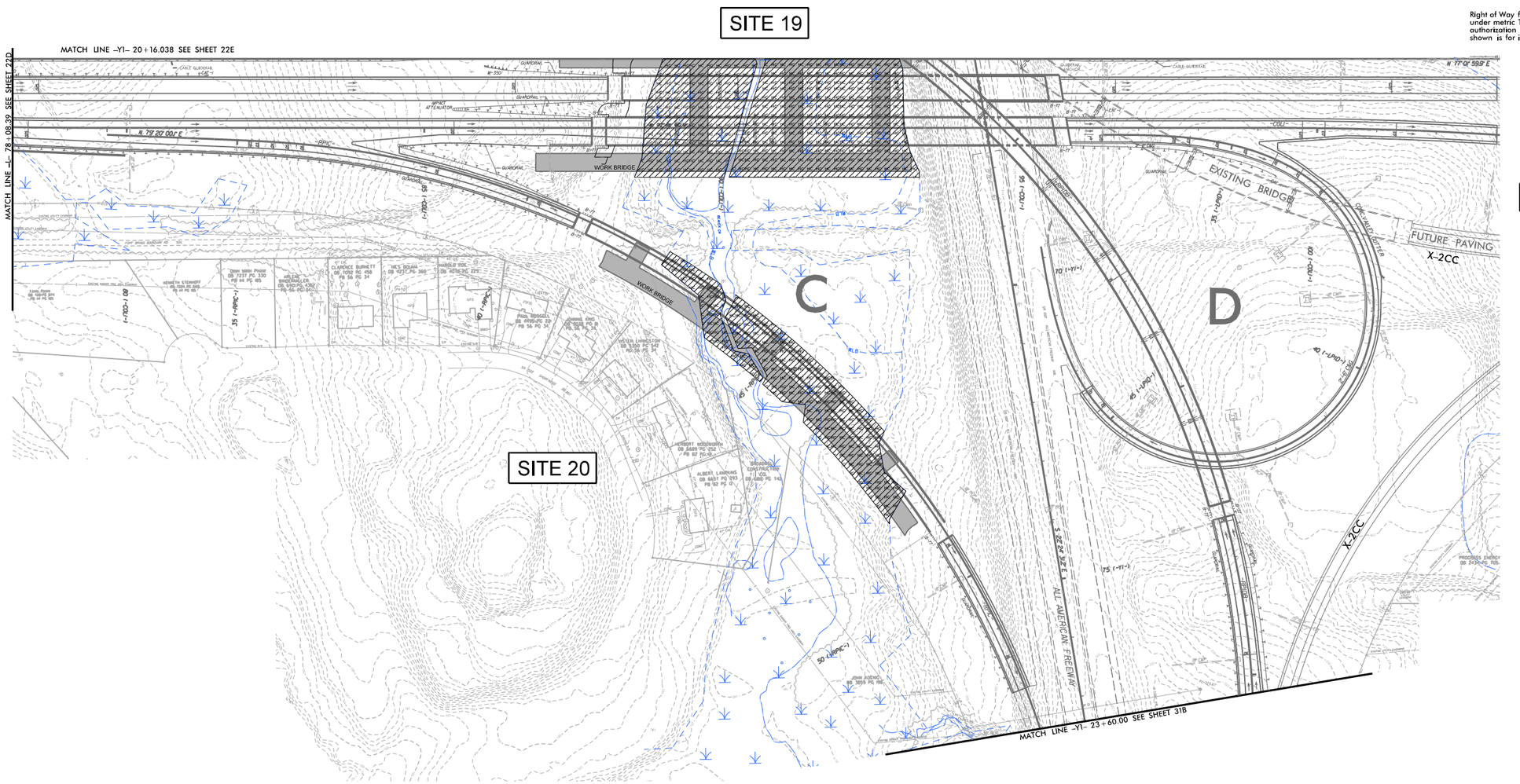

LEGEND

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▩	DENOTES WORK BRIDGE

PERMIT DRAWINGS
SHEET 52 OF 55

GRAPHIC SCALE
0
PLANS

LOCATION: FAYETTEVILLE OUTER LOOP FROM
SOUTH OF SR 1400 (CLIFFDALE RD.)
TO EAST OF ALL AMERICAN FREEWAY

TIP NO.: U-2519CB COUNTY: CUMBERLAND

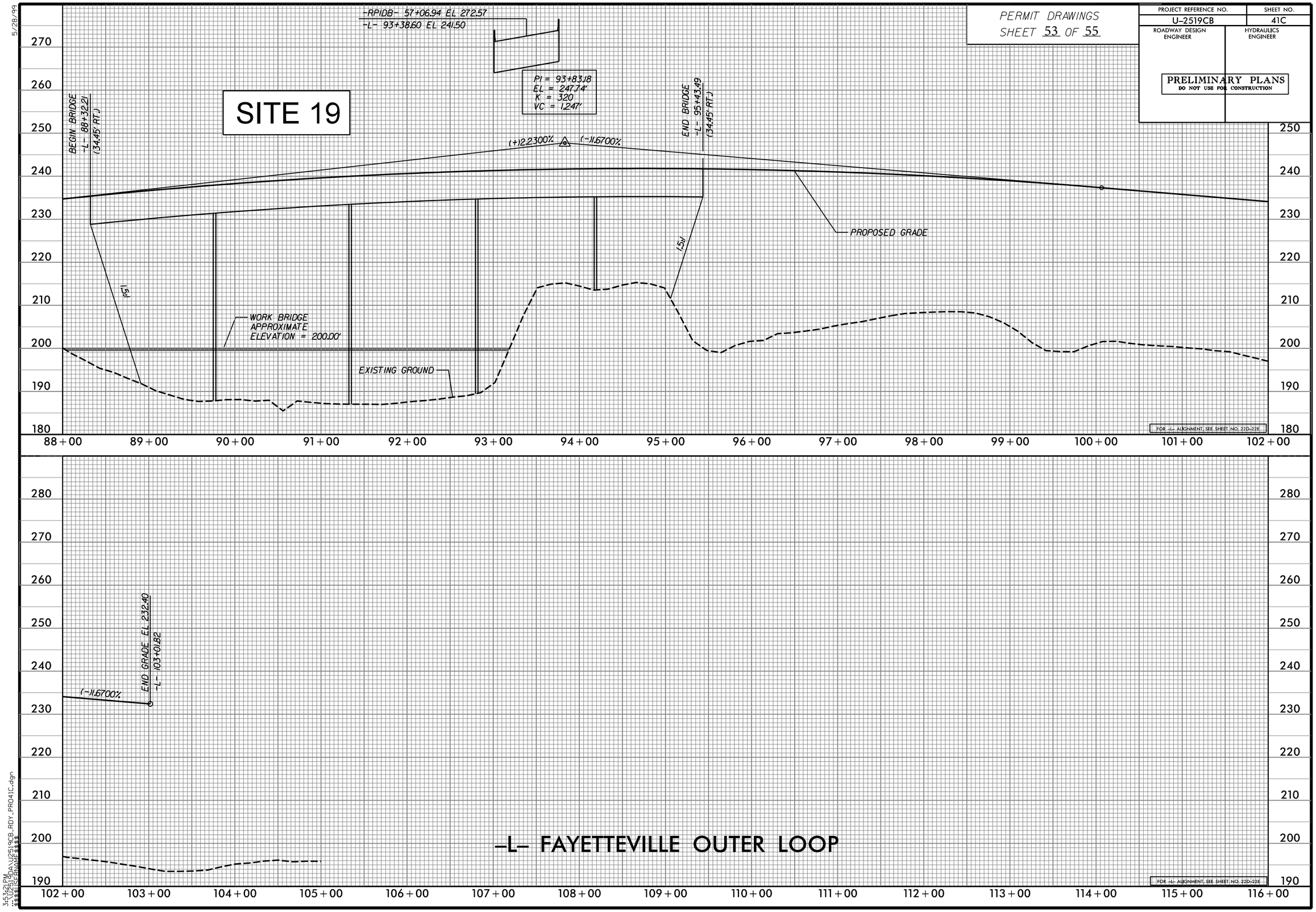
DESIGNED BY:

CHECKED BY: DATE:

PERMIT DRAWINGS
SHEET 53 OF 55

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	41C
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



5/28/99

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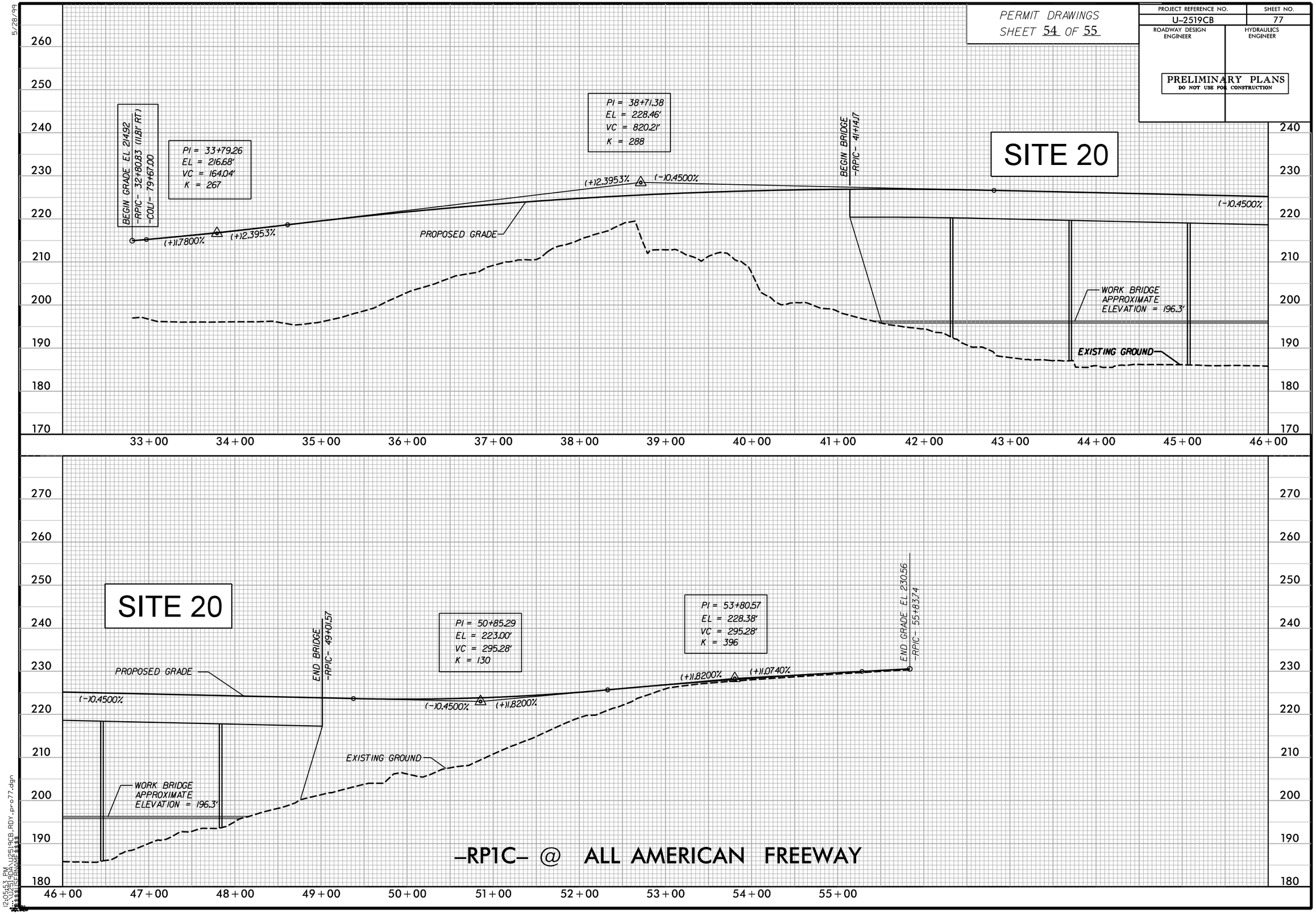
PERMIT DRAWINGS
SHEET 54 OF 55

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	77
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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WETLAND 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	-L- 821+59 TO 830+76	Bridge	-	-	-	-	2.60	-	0.01	-	5	-
2	-TT1- 46+10 TO 46+73	48" CSP	-	-	-	-	-	0.01	0.01	69	19	-
	-TT1- 46+29	Bank Stabilization	-	-	-	-	-	-	-	10	-	-
3	-L- 836+61 TO 838+07	Roadway & 42" RCP	0.34	-	-	0.03	-	-	-	-	-	-
4	-L- 838+80 TO 841+17	Roadway	0.12	-	0.04	0.02	-	-	-	-	-	-
5	-L- 847+36 TO 849+22	Roadway & 36" RCP	0.63	-	-	0.06	-	-	-	-	-	-
6	-L- 852+83 TO 853+64	Roadway	0.11	-	-	0.02	-	-	-	-	-	-
7	-L- 855+25 TO 855+70	Roadway	0.07	-	-	0.01	-	-	-	-	-	-
8	-L- 859+50 TO 861+81	Roadway & 30" RCP	0.63	-	-	0.04	-	-	-	-	-	-
9	-L- 864+39 TO 865+64	Roadway & 54" RCP	0.27	-	-	0.04	-	-	-	-	-	-
10	-L- 889+04 TO 902+62	Roadway & Bridge	1.47	-	0.30	0.17	2.18	-	-	-	-	-
11	SITE ELIMINATED	N/A	-	-	-	-	-	-	-	-	-	-
12	-L- 908+82 TO 909+03	Roadway	-	-	-	0.01	-	-	-	-	-	-
13	-Y2REV_LT- 34+55 TO 36+20	Roadway	0.27	-	-	-	-	0.01	-	80	-	-
	-Y2REV_LT- 35+03	Bank Stabilization	-	-	-	-	-	-	-	10	-	-
14	-Y2REV_LT- 29+32 TO 29+33	66" RCP	-	-	-	-	-	0.01	0.01	25	10	-
	-Y2REV_LT- 29+33	Bank Stabilization	-	-	-	-	-	-	-	10	-	-
15	-TT4- 54+56 TO 58+27	Roadway & 72" RCP	0.42	-	-	0.08	-	0.06	0.01	444	40	-
16	-Y1- 39+18 TO 40+61	Roadway & 72" RCP	0.15	-	-	0.05	-	-	-	-	-	-
17	SITE ELIMINATED	N/A	-	-	-	-	-	-	-	-	-	-
18	-L- 49+55 TO 53+31	Roadway & 60" RCP	0.39	-	-	0.14	-	0.02	0.01	121	35	-
	-L- 53+08	Bank Stabilization	-	-	-	-	-	-	-	10	-	-
19	-L- 89+00 TO 93+35	Bridge	-	-	-	-	2.62	-	-	-	-	-
20	-RP1C- 42+50 TO 48+50	Bridge	-	-	-	-	0.89	-	-	-	-	-
TOTALS:			4.87	0.00	0.34	0.67	8.29	0.11	0.05	779	109	0

Notes:
1. Total for "Existing Channel Impacts - Permanent" includes 40' of Bank Stabilization at culvert outlets.
2. Site 4 includes 0.05 acres of "Total Take"
3. Site 8 includes 0.12 acres of "Total Take"
4. Site 13 includes 0.18 acres of "Total Take"
5. Permanent Wetland Impacts from bridge pier installation = 0.03
6. Temporary Wetland Impacts from work bridge pier installation = 0.02
7. No permanent stream crossing is proposed for Site 18 at TT4DA, therefore no Permanent Stream Impacts were included.
8. All impacts at Sites 19 & 20 other than those associated with the Bridge Construction shown, were permitted under Project U-2519DA.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY
U-2519CB

PERMIT DRAWINGS
SHEET 55 OF 55

Rev. 4/28/2014
10/8/2013

U-2519CB NEU Narrative

Utility Owners:

- **Power:** Duke Progress Energy - Contact: Mr. Jamie Loy (919) 546-6034
- **Power:** PWC (Distribution) - Contact: Mr. Rick Anderson (919) 223-4517
- **Power:** PWC (Transmission)- Contact: Mr. Rick Anderson (919) 223-4517
- **Power:** Sandhills Utility Services - Contact: Mr. Bill Cannon (910) 497-7399
- **Telephone:** Century Link - Contact: Mr. Kevin Godwin (910) 366-2142
- **Water:** PWC - Contact: Mr. Chris Rainey (910) 223-4370
- **Water:** Old North Utility Services- Contact: Mr. Pat Jennings (910) 495-1311
- **Sewer:** Old North Utility Services- Contact: Mr. Pat Jennings (910) 495-1311
- **CATV:** Time Warner - Contact: Mr. Jack Crabb (910) 401-5034
- **Gas:** Fort Bragg DPW- Contact: Mrs. Peggy (910) 396-0325
- **Telephone:** USA-SENC –Contact: Mrs. Peggy (910) 396-0325

General Utility Relocation:

All utility lines inside the project limits will be adjusted as necessary or relocated away from construction.

Existing Utilities:

- **Power (Duke Energy Progress Distribution):**
  - Joint use poles containing power, Telephone (PWC) and TV (TWC) runs along the north side of Y-5.

- **Power (PWC Transmission):**
  - Existing transmission line to be relocated begins at Y-5 sta. 240+00 and continues until it crosses the L line at sta. 779+62.42 and continues until it reaches the substation

- **Power (PWC Distribution):**
  - Existing overhead power runs parallel to Y-5 on the south side, power will be relocated due to conflicts with the proposed ramp, loop, and bridge.

- **Power (Sandhills Utility Services):**
  - Overhead power on the south side of Y-4 begins at sta. 12+82.31 and ends at sta. 51+87.46

  - Overhead power begins on the north side of L sta. 928+12.51 and crosses the L line and runs 411ft to a transformer

  - Overhead power begins on the south side of Y-4 at sta. 50+23.49 continues for 857ft and crosses RPC2 at sta. 15+60 and continues for another 50ft

  - An existing line begins south of RPC2 sta. 14+35.45 and connects to a transformer located at RPC2 sta. 17+25.85

- Power leaves the transformer located south of RPC2 sta. 14+35.45 on the south eastern side and continues 698ft where it crosses Y-1 at sta. 59+05.60 and continues for another 46ft before making a 60 degree turn in the north eastern direction where the line then continues for 2874ft running alongside Y-2

- Power line begins on the north side of Y-2 at sta. 34+39.20 and crosses Y-2 at sta. 33+72.28 and continues for 2185ft and turns northeast 49 degrees and continues for 485ft

- Existing power located 111.4ft to the east of Y-3 sta. 25+94.21 and continues 145.5 degrees southeast for 350ft the line then makes a 75 degree turn northeast and continues in that direction for 507ft

- **Telephone (Century Link):**
  - Existing fiber optic line runs along the south side of Y-5 beginning at sta. 229+32.28 and ending at sta. 268+08.06.

  - Existing telephone cable located on the south side of Y-2 portion of line to relocated begins at Y-2 sta. 36+19.26 and ends at sta. 18+29.23

  - Two existing line one fiber optic and one telephone line along Y-3 between sta. 12+97.06 and sta. 24+69.31 will be abandoned due to conflicts. These two lines run parallel to each other on the north side of Y-3

  - Existing telephone lines along the south and north side of Y-1 and also along the south side of existing Reilly Rd.

- **Telephone (USA SENC):**
  - Two Existing telephone lines run parallel to each other and begin at Y-4 sta. 22+13.31 and continues in a southeastern direction, the line continues in this direction until it reaches RPB2 where it then begins to run parallel with the ramp. The telephone line eventually crosses RPB2 at sta. 16+92.28 and sta. 17+58.17 and continues to run parallel with RPB2 on the north side until it reaches the intersection of RPB2 and Y-1. One of the telephone lines stop while the other one turns north and continues to run parallel with Y-1

- **Water (PWC):**
  - Existing 16" water line begins at sta. 230+03.29 for 45.32ft south of Y-5 and continues to run parallel until sta. 263+27.69, where it makes a 90 degree turn and crosses Y-5 and continues to run parallel to Y-5 for 335.6 ft

  - Existing 8" water line begins at sta. 263+27.69 runs parallel to Y-5 45.3 ft from the centerline until it ends at sta. 266+53.52

- **Water (Old North Utility Services):**
  - Existing water line to be relocated begins at Y-4 sta. 19+51.49 and runs parallel to Chicken Foot Rd on the south side and branches off at Ramp A2 at sta. 14+19.98 to the north and to the south

- **Sewer (Old North Utility Services):**
  - Existing sewer line to be relocated runs parallel to Chicken Foot Rd on the north side, the sewer line relocation ends at L sta. 964+64.97

- **Time Warner Cable:**
  - Existing TV (TWC) runs along the north side of Y-5 on joint use poles with power and telephone.

- **Gas (FB-DPW):**
  - Existing gas line begins at Y-4 sta. 22+94.67 and continues in a southeastern direction, the line continues in this direction until it reaches RPB2 where it then begins to run parallel with the ramp/ the gas line eventually crosses RPB2 at sta. 16+14.02 and continues to run parallel with RPB2 on the north side until it reaches the intersection of RPB2 and Y-1. Here the gas line crosses the intersection and continues alongside RPA2 and continues down Chicken Foot Rd. until it reaches Reilly Rd and begins to run parallel with Y-2. The portion of the line stated above will be abandoned and relocated

Proposed Utility Relocation:

- **Power (Duke Energy Progress Distribution):**
  - Proposed overhead power will be located on the north side of Y-5; part of the line will remain overhead while the portion under the proposed bridge will be placed underground

- **Power (PWC Transmission):**
  - A portion of the existing transmission line will be relocated inside the proposed utility easement that has been acquired; the transmission line will leave the substation crossing the L line and then continue southwest inside the easement until the existing line is reached.

- **Power (PWC Distribution):**
  - The proposed overhead power will be relocated out and around by means of a PUE that is located outside the right of way line along Y-23 and RPC1. The existing line will be abandoned along Y-5 in between Y-23 and RPC1

- **Power (Sandhills Utility Service):**
  - Proposed underground power will begin at Y-4 sta. 12+82.31 and run along the north side of Y-4 until sta. 23+81.10; at this station the power crosses Y -4 and runs parallel to PR2A beginning at sta. 23+81.08 on the south side and ending at sta. 34+86.52

  - 2 proposed underground power lines branche off of a proposed underground power line at PR2A sta. 36+13.24 and PR2A sta. 36+16 and run parallel to each other for 187ft and connect to an existing transformer

  - Proposed underground power beginning on the north side of the L line and crosses at sta. 928+67016 and continues for 453ft

- Proposed underground power beginning 60ft north of RPA2 and crossing at RPA2 sta. 21+42.96 and continuing 943ft running parallel to Y-1

- Proposed underground power begins at PR2A sta. 22+05.50 and runs parallel to the CA fence for 674ft where it continues to run parallel outside the RW/CA fence for 432ft. the line then make a 45 degree turn to the south east for 812ft and makes a 95degree turn to the northeast and continues in that direction for another 455ft

- Underground power begins 56ft to the west of Y-6 and runs northeast 67.5 degrees for 604ft until it crosses Y-2 at sta. 48+35.40 and continues along the north side of Y-2 for 2636ft

- Begin power at the coordinates 1995684.74, 493023.18 in the direction of 58.2 degrees northeast for 311ft, the line then makes a 82 degree turn northeast and continues 215ft, the direction changes once more to 54 degrees northeast for 447ft, before ending at another proposed power line

- Proposed power begins 60ft to the east of Y-3 sta. 28+12.29 and runs 42.5 degrees to the northeast for 168ft from here the line tees off; to the west the line continues 334ft and to the east it continues for 25ft before taking a 76 degree turn to the northeast and continues for 160ft and then makes another turn 43 degrees to the north east for 183ft , the line then makes a 108.5 degree turn to the south east and continues in that direction for 177.5ft the line then turns northeast 35 degrees and continues in that direction for 44ft and connect to a transformer

- **Telephone (Century Link):**
  - The existing telephone line running parallel to -Y5-on the south side will be relocated on the same side to avoid conflicts. The proposed fiber optic line will begin at sta. 229+32.28 and will be relocated 1ft inside and parallel to the right of way until sta. 242+80.51 is reached. At this location the fiber optic line makes a 90 degree turn and continues to run along this direction until sta. 257+82.99 is reached. This is where the line will resume the location of 1ft inside and parallel to the right of way line until it reconnects to the existing line at sat. 268+08.06. The existing line between stations 229+32.28 through 268+08.06 will be abandoned.

  - The existing telephone line located on Y-2 will be relocated to on the same side of the existing line beginning at sta. 36+19.26 and ending at sta. 18+29.23; the relocation will be located further away from Y-2 on the south side to avoid conflicts. The existing line between the beginning and ending stations will be abandoned

  - The two existing lines will be abandoned and replaced with one single fiber optic line. The proposed line will begin at Y-3 sta. 12+97.06 and continue through 24+69.31 where it will cross Y-3 and end at a hand hole.

  - Proposed telephone will be relocated on the south side of Y-1 and along the existing Reilly Rd to avoid conflicts. The telephone lines will also be relocated

out and around the intersection of Y-1 and Y-6. Parts of the existing lines will be abandoned while other sections will remain.

- **Telephone (USA-SENC):**
  - Two proposed telephone lines run parallel to each other and begin at Y-4 sta. 22+13.31, both of these lines run parallel with the right of way line until the intersection of RPB2 and Y-1, at this location one of the telephone lines ends and the other continues parallel to the right of way line to the north of Y-1 until the right of way line ends and the proposed line ties back in to the existing at Y-1 sta. 36+60.47; the existing telephone line will be abandoned.

  - Two proposed telephone lines run parallel to each other and connect to the existing line at RPA2 sta. 14+40.24 and sta. 14+36.69 and continue to run parallel to the right of way line. Once the lines reach L sta. 964+07.42 they make a 90 degree turn and cross the L line until they reach Y-2 and continue parallel until they reach Y-2 sta. 40+92.11 where they reconnect with an existing pedestal

- **Water (PWC):**
  - The existing 16" water line will be relocated to the south side of Y-5 starting at Sta. 231+00 and ending at Sta. 231+20. The existing line between those stationing will be removed and a down and under will be installed to avoid conflict with drainage

  - Proposed 16" water line will connect to existing 16" at sta. 238+84.76 and will be located 5ft inside the right of way and will reconnect to the existing water line at sta. 244+12.45. The existing line between those stationing will be abandoned

  - Connect to existing 16" water line at sta. 247+85.92 proposed line will cross Y-5 and run line parallel to Y-5 for 1125.3ft where it sta. 259+93.42 a 45 degree bend will be used to cross back over Y-5 and connect back to the existing 16" water line at sta. 260+83.68. Existing line to be abandoned between the stations.

- **Water (Old North Utility Services):**
  - Proposed 12" water line begins at Y-4 sta. 19+51.49 and runs parallel with the right of way line until the intersection of RPB2 and Y-1where the water line crosses the intersection and continues to run parallel to the right of way line until it reconnects with the existing water line to the north of RPA2 sta. 14+26.31; existing water line will be abandoned between the two stations.

- **Sewer (Old North Utility Services):**
  - Proposed 8"and 4" sewer lines begin at Y-4 sta. 23+60.94 and run parallel with the right of way line until the intersection of RPB2 and Y-1where the sewer lines cross this intersection and continue to run parallel to the right of way line until it reaches L sta. 964+68.90 and makes a 90 degree turn and continues in that direction until the lines reach the lift station

- **Time Warner Cable:**
  - Proposed cable TV lines will be relocated to avoid conflicts with the proposed construction

- **Gas (FB-DPW):**
  - Proposed 4" gas line begins at Y-4 sta. 22+94.67 and runs parallel with the right of way line until the intersection of RPB2 and Y-1where the gas line crosses the intersection and continues to run parallel to the right of way line until it reconnects with the existing gas line to the north of Y-2 sta. 24+63.68. Existing gas line will be abandoned between the two stations.

TIP PROJECT: U-2519CB

T.I.P. NO.	SHEET NO.
U-2519CB	UC-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY AGREEMENT PLANS

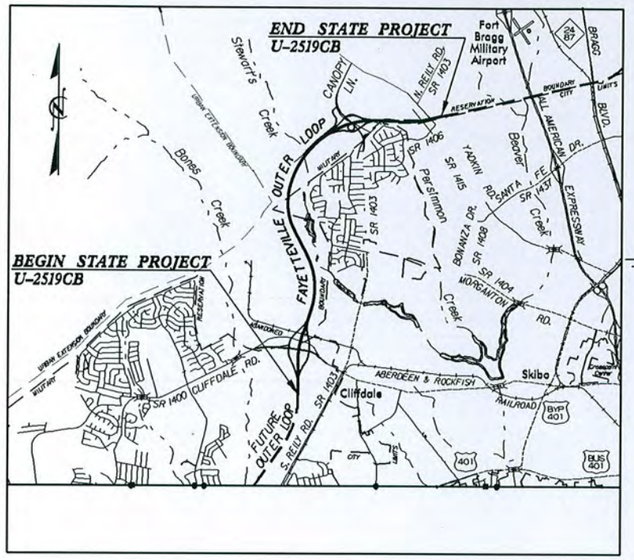
REVISED NEU PERMIT
JANUARY 2, 2013

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

Utility Permit Drawing
Sheet 1 of 18

LOCATION: FAYETTEVILLE OUTER LOOP FROM SOUTH OF SR 1400 (CLIFFDALE RD) TO EAST OF SR 1415 (YADKIN ROAD)

TYPE OF WORK: RELOCATION OF WATER



NAD 83 NC GRID

BEGIN CONSTRUCTION -PRI- POC Sta. 10+00.00
END CONSTRUCTION -PRI- POC Sta. 37+23.85
END CONSTRUCTION -TT2- POT Sta. 20+03.77
BEGIN CONSTRUCTION -TT2- POT Sta. 10+00.00
END CONSTRUCTION -TT1- POT Sta. 64+97.43
-L- POC Sta. 765+26.95= -Y5- POT Sta. 250+09.54
BEGIN CONSTRUCTION -Y5- POT Sta. 238+90.00
BEGIN CONSTRUCTION -TT1- POT Sta. 10+00.00
BEGIN CONSTRUCTION -Y4- POT Sta. 17+00.00
BEGIN CONSTRUCTION -TT4- POT Sta. 10+00.00
END CONSTRUCTION -Y4- POT Sta. 62+94.10
BEGIN CONSTRUCTION -Y1- POT Sta. 21+30.00
-Y1- POT Sta. 19+00.00= -TT4- POT Sta. 63+39.95
TO FORT BRAGG
END CONSTRUCTION -TT4- POT Sta. 64+25.51
BEGIN CONSTRUCTION -TT5- POT Sta. 10+00.00
BEGIN BRIDGE -Y1- POT Sta. 48+32+/- -L- POC Sta. 943+21.58= -Y1- POT Sta. 49+48.10
END BRIDGE -Y1- POT Sta. 50+82+/-
BEGIN BRIDGE -L- POT Sta. 967+84+/-
END BRIDGE -L- POT Sta. 971+10+/-
BEGIN BRIDGE -L- POC Sta. 894+00+/-
BEGIN CONSTRUCTION -PR2A- POC Sta. 10+00.00
END BRIDGE -L- POC Sta. 902+40+/-
BEGIN CONSTRUCTION -PR2B- POC Sta. 10+00.00
END CONSTRUCTION -PR2B- POT Sta. 38+55.81
END CONSTRUCTION -PR2A- POT Sta. 38+54.40
BEGIN CONSTRUCTION -Y6- POT Sta. 12+57.74
END CONSTRUCTION -Y1- POC Sta. 73+00.00
END CONSTRUCTION -Y2- POT Sta. 48+68.63 -Y6- POT Sta. 20+85.69
BEGIN CONSTRUCTION -Y2- POC Sta. 40+00.00
-L- POT Sta. 969+51.52= -Y2- POC Sta. 25+98.54
END BRIDGE -Y3- POT Sta. 21+31+/-
END CONSTRUCTION -Y3- POT Sta. 23+75.00
-L- POT Sta. 996+86.94
END STATE PROJECT U-2519CB LB
F.A. PROJECT NHF-DPR 0100(001) =
-L- POT Sta. 9+80.000 (METRIC)
BEGIN STATE PROJECT U-2519DA LA
BEGIN CONSTRUCTION -Y3- DETOUR
BEGIN CONSTRUCTION -Y3- POT Sta. 17+50.00
BEGIN BRIDGE -Y3- POT Sta. 18+45+/-
-L- POC Sta. 991+28.13= -Y3- POT Sta. 19+89.51
END CONSTRUCTION -TT5- POT Sta. 67+81.00
-L- Sta. 997+70.94 END CONSTRUCTION U-2519CB
END BRIDGE -L- POC Sta. 766+16+/-
BEGIN BRIDGE -L- POC Sta. 764+43+/-
END CONSTRUCTION -Y5- POS Sta. 261+30.00
END BRIDGE -L- POC Sta. 831+15+/-
BEGIN BRIDGE -L- POC Sta. 821+15+/-
BEGIN CONSTRUCTION -Y6A- POT Sta. 10+73.88
-L- POT Sta. 743+03.78
BEGIN STATE PROJECT U-2519CB
-L- POT Sta. 743+03.78 BEGIN
F.A. PROJECT NHF-DPR 0100(001)
BEGIN CONSTRUCTION
-SR- POc Sta. 63+37.88 (LT)
-L- POc Sta. 718+60.99 (RT)
BEGIN STATE PROJECT U-2519CB
F.A. PROJECT NHF-DPR 0100(001)
BEGIN R/W
PAVING
THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III EXCEPT IN -TT- & -PR- LINE AREAS WHERE METHOD II IS TO BE USED

GRAPHIC SCALES

PLANS: 50 25 0 50 100
PROFILE (HORIZONTAL): 50 25 0 50 100
PROFILE (VERTICAL): 10 5 0 10 20

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
UC-1	TITLE SHEET
UC-5 THRU UC-29	PLAN SHEETS

WATER AND SEWER OWNERS ON PROJECT

(1) WATER- PUBLIC WORKS COMISSION

SEAL

PREPARED IN THE OFFICE OF:
DIVISION OF HIGHWAYS
UTILITIES UNIT
UTILITIES ENGINEERING

1555 MAIL SERVICES CENTER
RALEIGH NC 27699-1555
PHONE (919) 707-6690
FAX (919) 250-4151

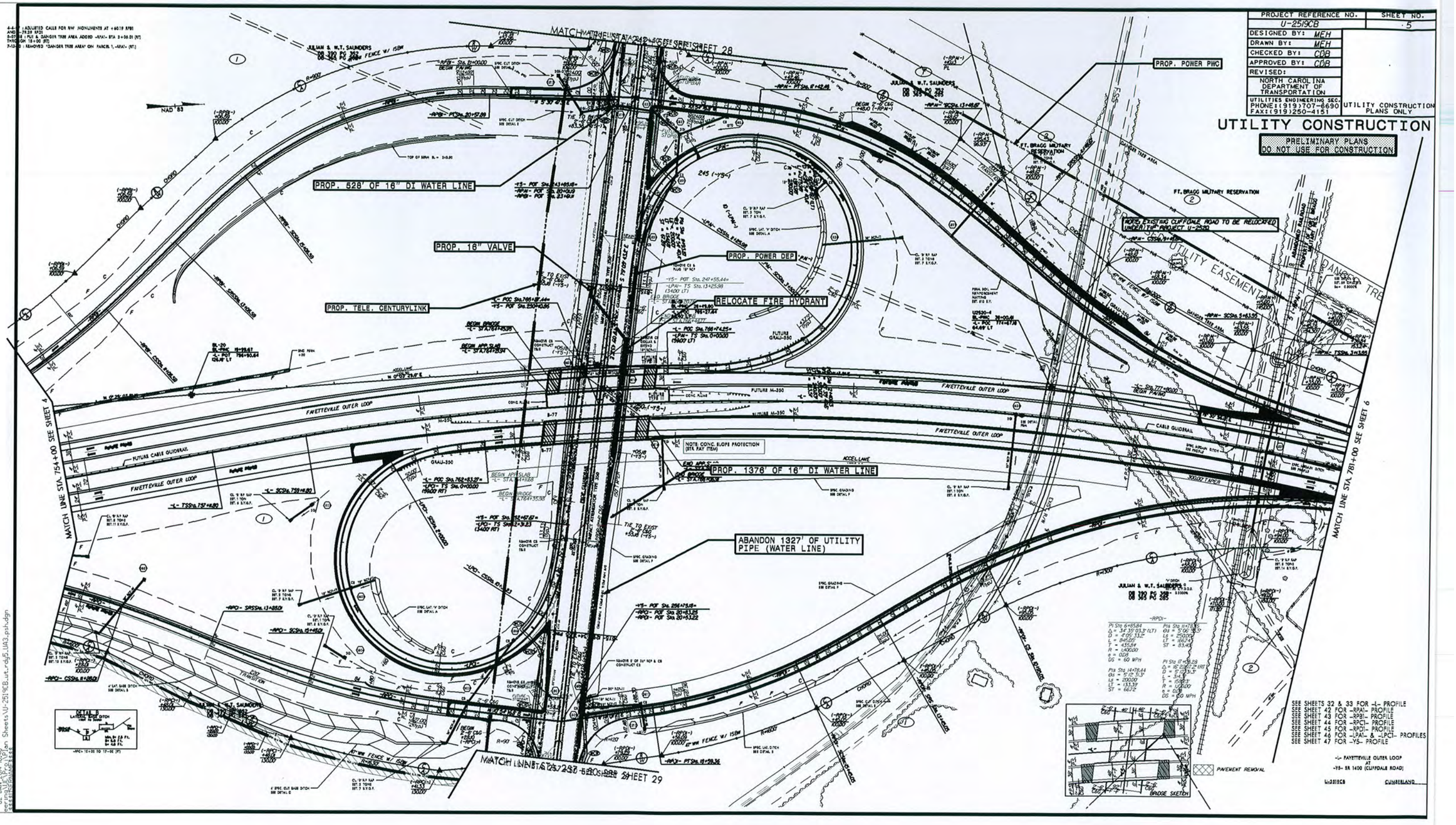
Roger Worthington, P.E. — UTILITIES SECTION ENGINEER
Corey Bousquet, P.E. — UTILITIES SQUAD LEADER PROJECT ENGINEER
Mariko Hafeez — UTILITIES PROJECT DESIGNER

Utility Permit Drawing
Sheet 2 of 18

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	5
DESIGNED BY: MEH	
DRAWN BY: MEH	
CHECKED BY: CDB	
APPROVED BY: CDB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



5-07-08 : PUE & DANGER TREE AREA ADDED, -RPAI- STA 0+47.24 (RT) TO 3+05.01 (RT) AND -L- STA 784+20.38 (RT) TO 786+08.51 (RT)

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	6
DESIGNED BY: MEH	
DRAWN BY: MEH	
CHECKED BY: CDB	
APPROVED BY: CDB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919)707-6690 FAX: (919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

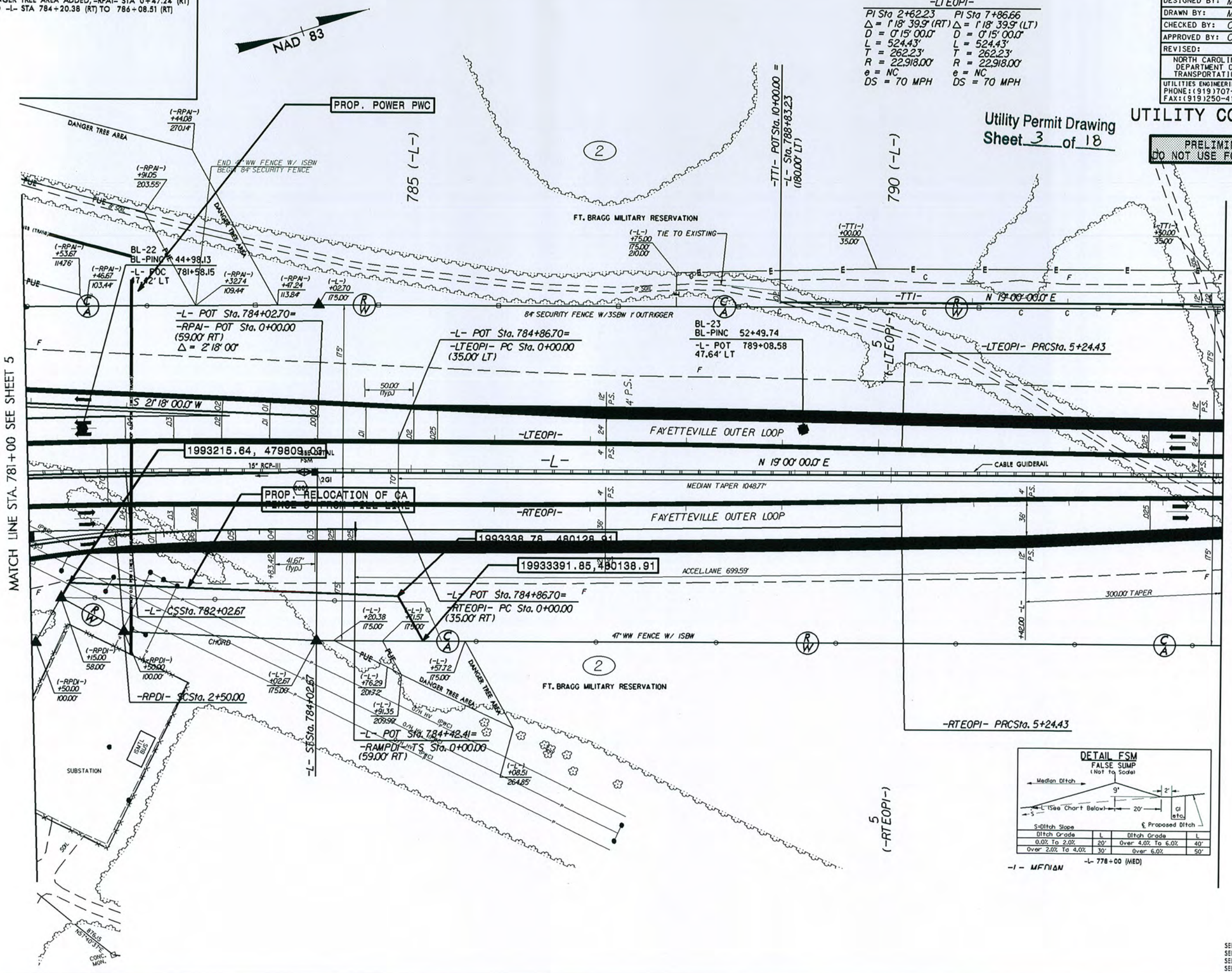
UTILITY CONSTRUCTION

Utility Permit Drawing
Sheet 3 of 18

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L- MEDIAN
-LTEOPI-

PI Sta 2+62.23	PI Sta 7+86.66
Δ = 1° 18' 39.9" (RT)	Δ = 1° 18' 39.9" (LT)
D = 0° 15' 00.0"	D = 0° 15' 00.0"
L = 524.43'	L = 524.43'
T = 262.23'	T = 262.23'
R = 22,918.00'	R = 22,918.00'
e = NC	e = NC
DS = 70 MPH	DS = 70 MPH



DETAIL FSM
FALSE SUMP
(Not to Scale)

S=Ditch Slope

Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

-L- 778+00 (MED)

SEE SHEET 33 FOR -L- PROFILE
SEE SHEET 42 FOR -RPAI- PROFILE
SEE SHEET 45 FOR -RPDI- PROFILE
SEE SHEET 65 FOR -TTI- PROFILE

5/14/99

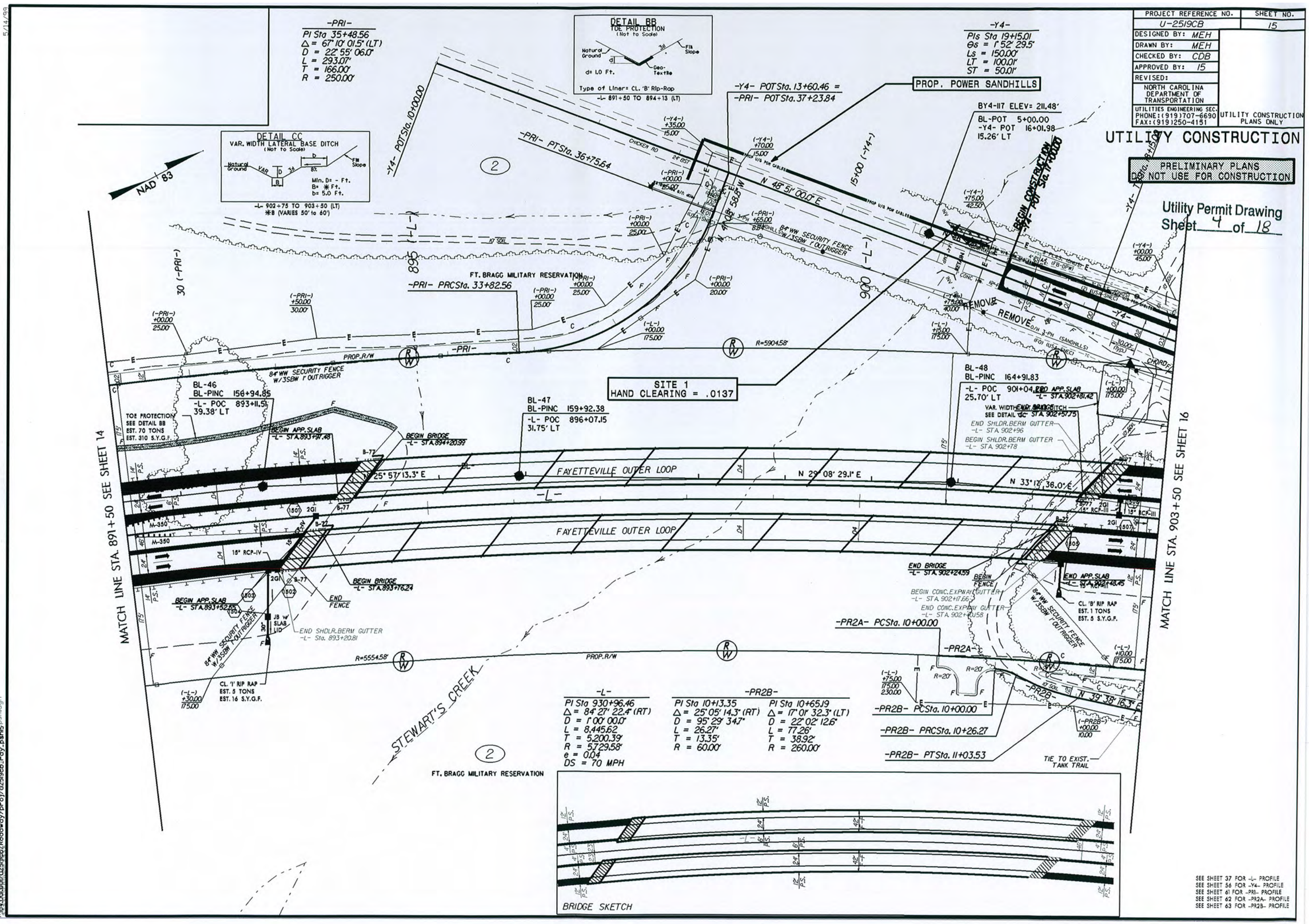
02-JAN-2014 16:50
jmeerin109 OK
K:\Proj\Plan Sheets\U-2519CB_Ut_rdy6_psh.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	15
DESIGNED BY: MEH	
DRAWN BY: MEH	
CHECKED BY: CDB	
APPROVED BY: 15	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Utility Permit Drawing
Sheet 4 of 18



SEE SHEET 37 FOR -L- PROFILE
SEE SHEET 56 FOR -Y4- PROFILE
SEE SHEET 61 FOR -PRI- PROFILE
SEE SHEET 62 FOR -PR2A- PROFILE
SEE SHEET 63 FOR -PR2B- PROFILE

5/14/99

02-JAN-2014 16:10

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	16

DESIGNED BY: MEH
DRAWN BY: MEH
CHECKED BY: CDB
APPROVED BY: CDB
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

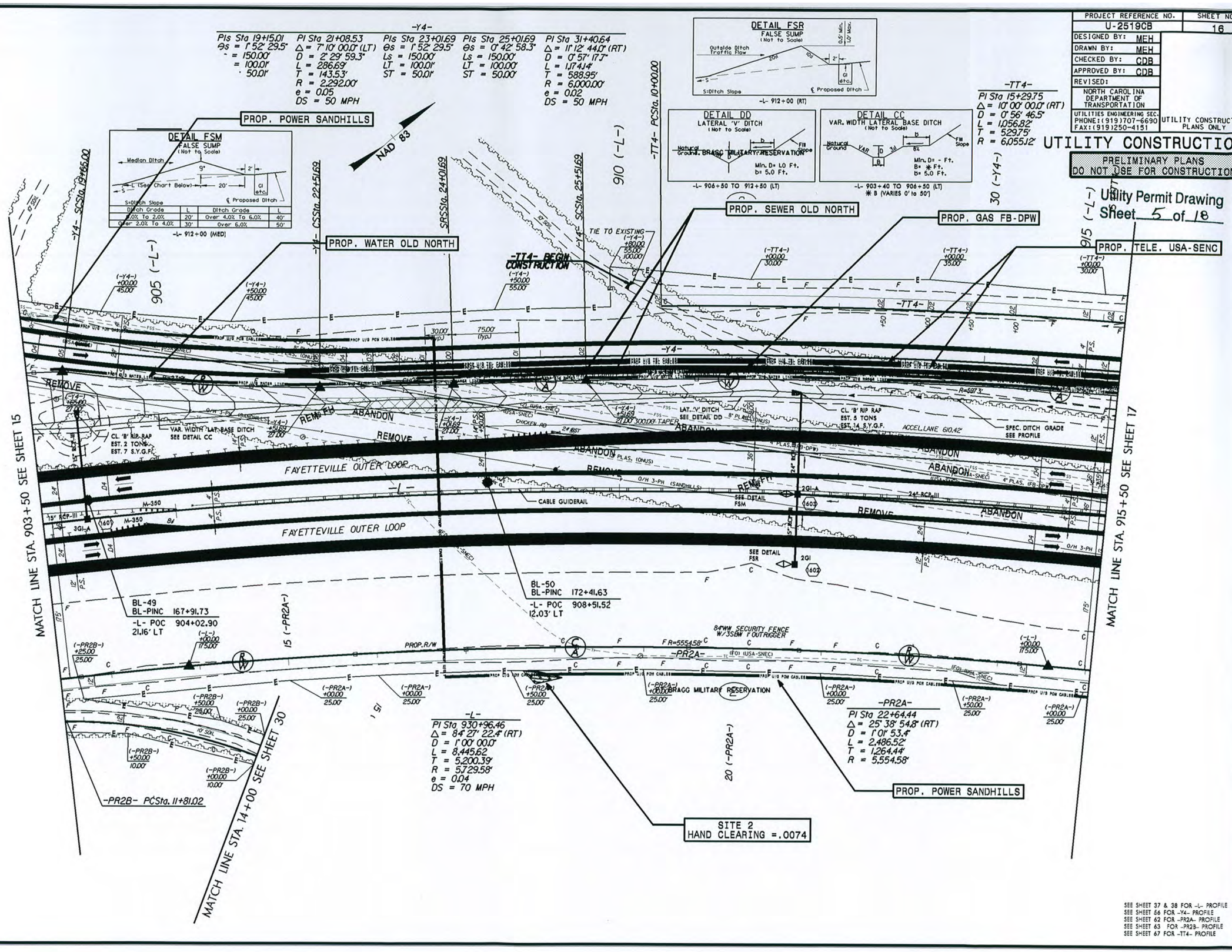
UTILITIES ENGINEERING SEC.
PHONE: (919)707-6690
FAX: (919)250-4151

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Utility Permit Drawing
Sheet 5 of 18



SEE SHEET 37 & 38 FOR -L- PROFILE
SEE SHEET 56 FOR -Y4- PROFILE
SEE SHEET 62 FOR -PR2A- PROFILE
SEE SHEET 63 FOR -PR2B- PROFILE
SEE SHEET 67 FOR -TT4- PROFILE

5/14/99

02-JAN-2014 16:03

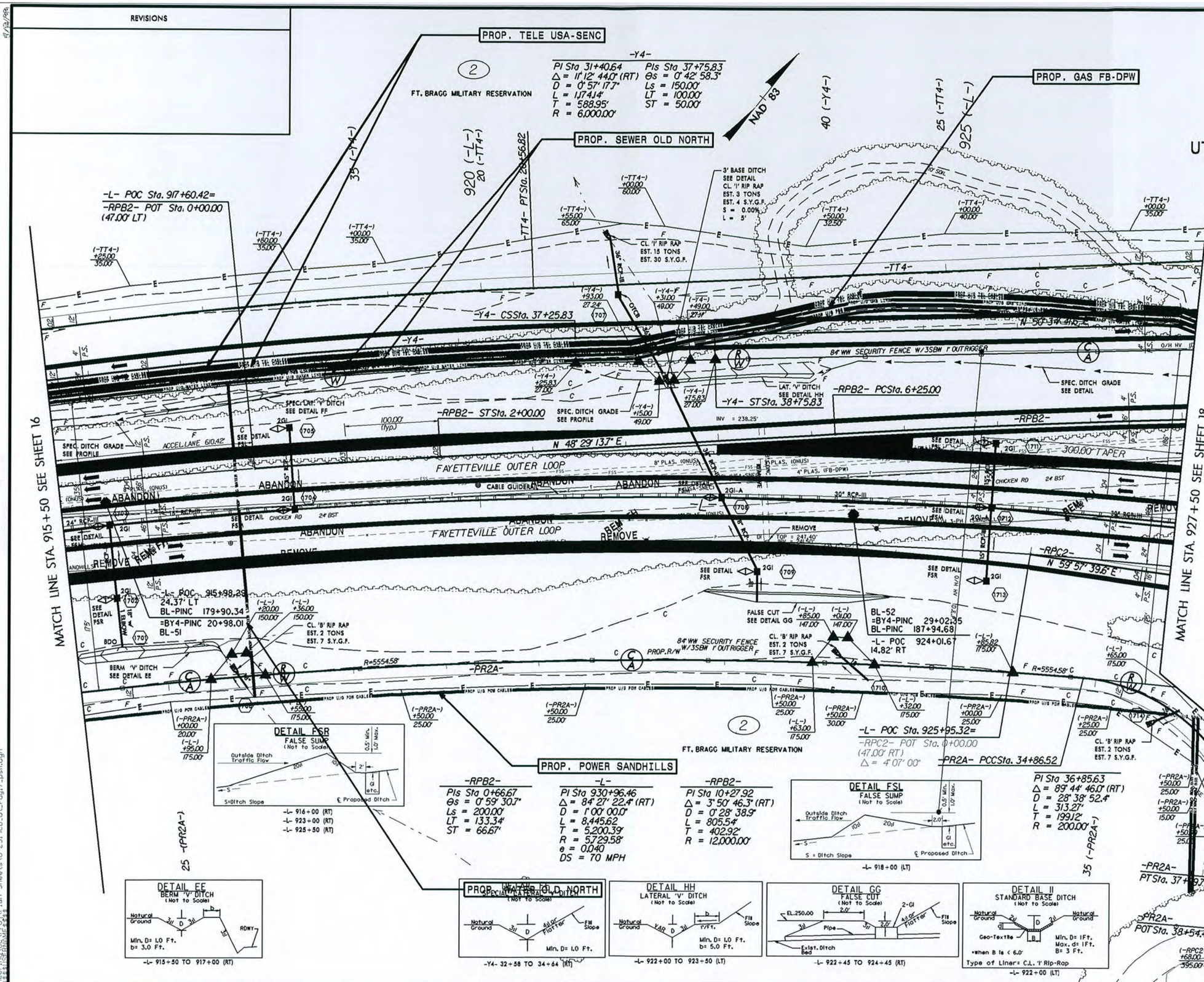
REVISIONS

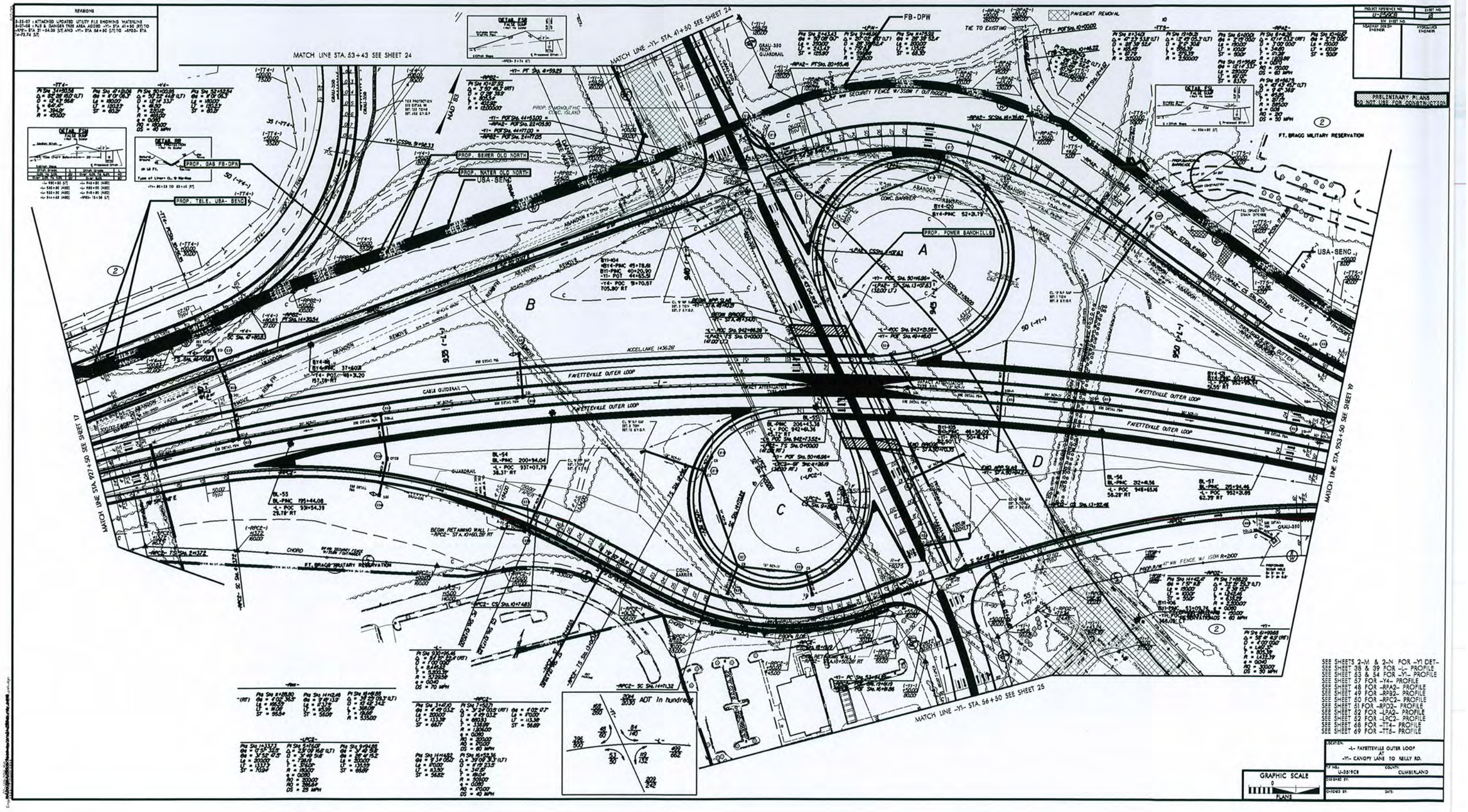
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	17
DESIGNED BY: MEH	
DRAWN BY: MEH	
CHECKED BY: CDB	
APPROVED BY: CDB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919)707-6690 FAX: (919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Utility Permit Drawing
Sheet 6 of 18



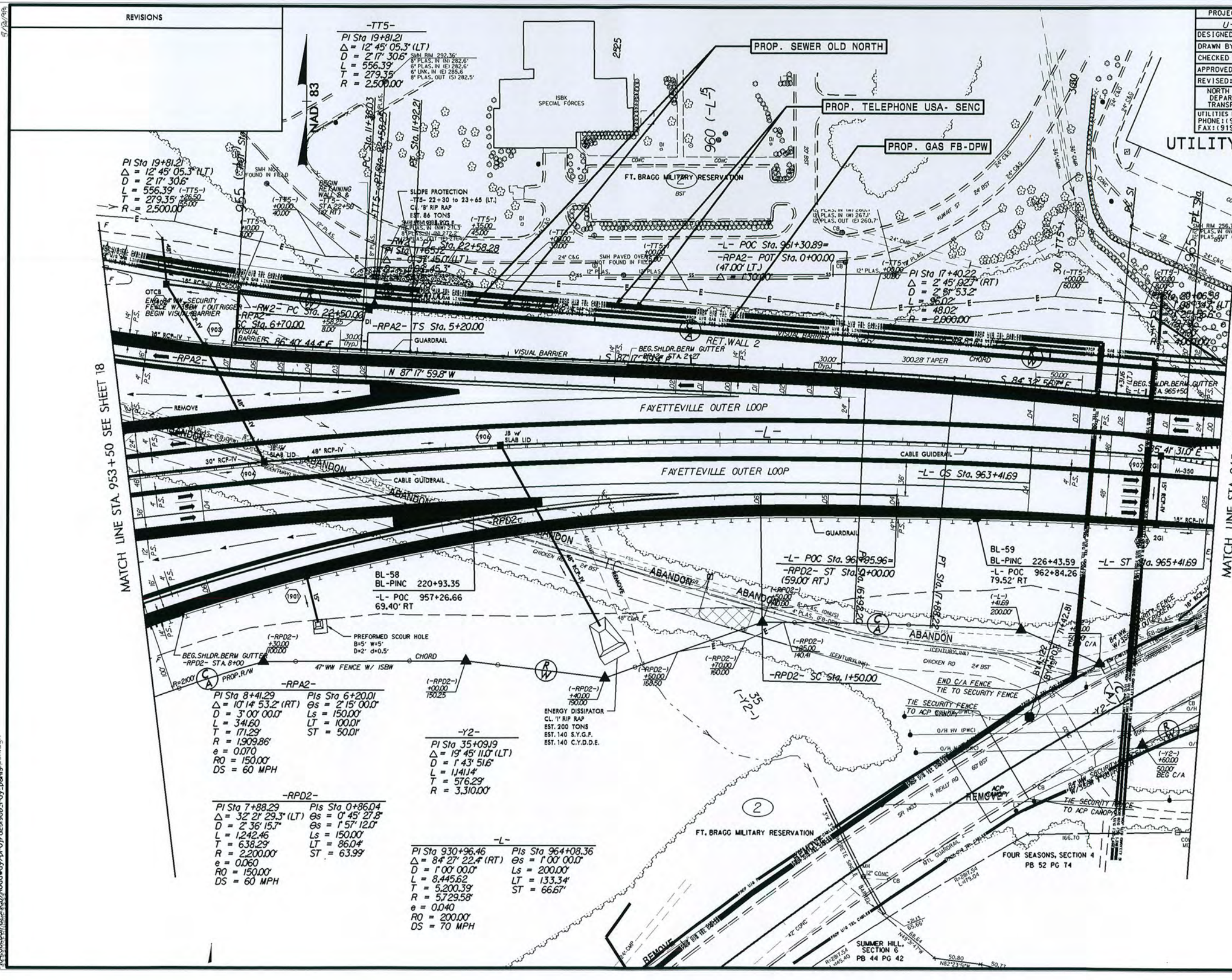

REMARKS
MATCH LINE STA. 53+43 SEE SHEET 24
MATCH LINE -Y1- STA. 41+50 SEE SHEET 24
MATCH LINE STA. 122+69 SEE SHEET 17
MATCH LINE STA. 56+50 SEE SHEET 25
MATCH LINE STA. 503+50 SEE SHEET 19
PRELIMINARY PLANS NOT FOR CONSTRUCTION
FB-DPW
PAVEMENT REMOVAL
TIE TO EXISTING
FT. BRAGG MILITARY RESERVATION
PROP. GAS FB-DPW
PROP. SEWER OLD NORTH
PROP. WATER OLD NORTH
USA-SENC
PROP. TELE. USA- SENC
PROP. POWER BANDHILL
FAYETTEVILLE OUTER LOOP
ACCELLANE
CABLE GUIDERAIL
GUARDRAIL
IMPACT ATTENUATOR
ABANDON
REMOVE
CONC. BARRIER
CHORD
BEGIN RETAINING WALL
SECURITY FENCE W/ 3SSW 1' OUTRIGGER
AOT in hundreds
SEE SHEETS 2-M & 2-N FOR -Y1 DET-
SEE SHEET 38 & 39 FOR -L- PROFILE
SEE SHEET 53 & 54 FOR -Y1- PROFILE
SEE SHEET 57 FOR -Y4- PROFILE
SEE SHEET 48 FOR -RPA2- PROFILE
SEE SHEET 49 FOR -RPB2- PROFILE
SEE SHEET 50 FOR -RPC2- PROFILE
SEE SHEET 51 FOR -RPD2- PROFILE
SEE SHEET 52 FOR -LPA2- PROFILE
SEE SHEET 52 FOR -LPC2- PROFILE
SEE SHEET 68 FOR -TT4- PROFILE
SEE SHEET 69 FOR -TT5- PROFILE
LOCATION: -L- FAYETTEVILLE OUTER LOOP AT -Y1- CANOPY LANE TO KELLY RD.
TIP NO. U-2519CB
COUNTY CUMBERLAND
DESIGNED BY:
CHECKED BY:
DATE:
GRAPHIC SCALE
PLANS

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	19
DESIGNED BY: MEH	
DRAWN BY: MEH	
CHECKED BY: CDB	
APPROVED BY: CDB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

Utility Permit Drawing
Sheet 8 of 18



02-JAN-2014 14:22
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REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	20

DESIGNED BY: MEH
DRAWN BY: MEH
CHECKED BY: CDB
APPROVED BY: CDB
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

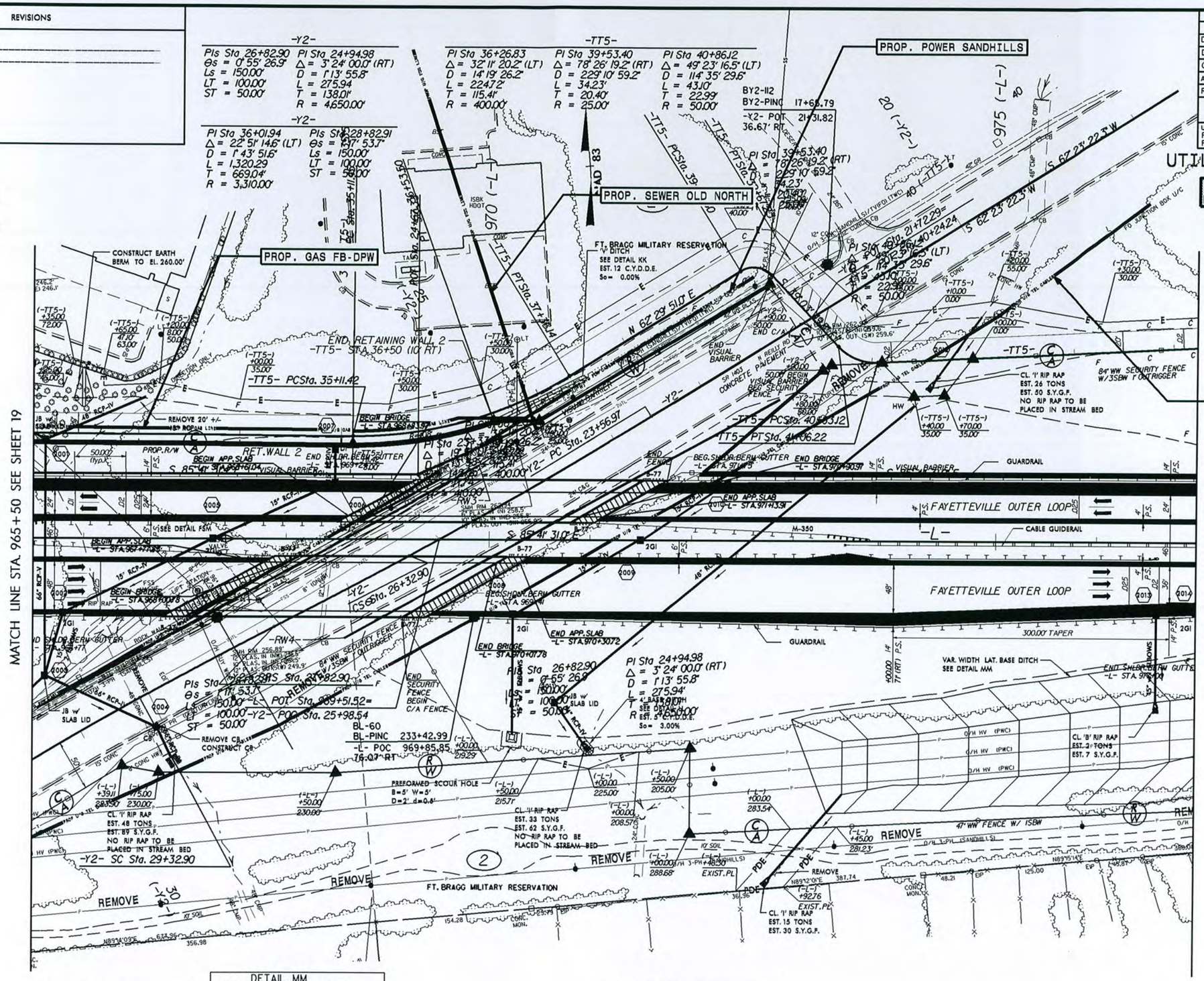
UTILITIES ENGINEERING SEC.
PHONE: (919) 707-6690
FAX: (919) 250-4151

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Utility Permit Drawing
Sheet 9 of 18



DETAIL KK
STANDARD "V" DITCH
(Not to Scale)
Natural Ground 3:1 D 3:1 Natural Ground
Min. D= 1.0 Ft.
-Y2 REV- 24+50 (RT)

DETAIL MM
VAR. WIDTH LATERAL BASE DITCH
(Not to Scale)
Natural Ground 3:1 D 3:1 Fill Slope
B 8% D
Min. D= 2.0 Ft.
B= ✱ Ft.
D= 5.0 Ft.
-L- 973+50 TO 977+00 (RT)
✱ B (VARIES 57' TO 47')

DETAIL LL
STANDARD BASE DITCH
(Not to Scale)
Natural Ground 3:1 D 3:1 Natural Ground
B
Min. D= 1.5 Ft.
B= 4.0 Ft.
-L- 971+00 (RT)

SEE SHEET 40 FOR -L- PROFILE
SEE SHEET 55 FOR -Y2- PROFILE
SEE SHEET 70 FOR -TT5- PROFILE

02-JAN-2014 14:14
Engineering\Roadway\Plan Sheets\U-2519CB_Ut_rdy20_psh.dgn

REVISIONS
DATE: R/W REVISION: MODIFIED THE TEMPORARY CONSTRUCTION EASEMENT ON PARCEL 2 TO AVOID THE APARTMENT BUILDING.

FOR CONTINUATION SEE SHEET 2-0

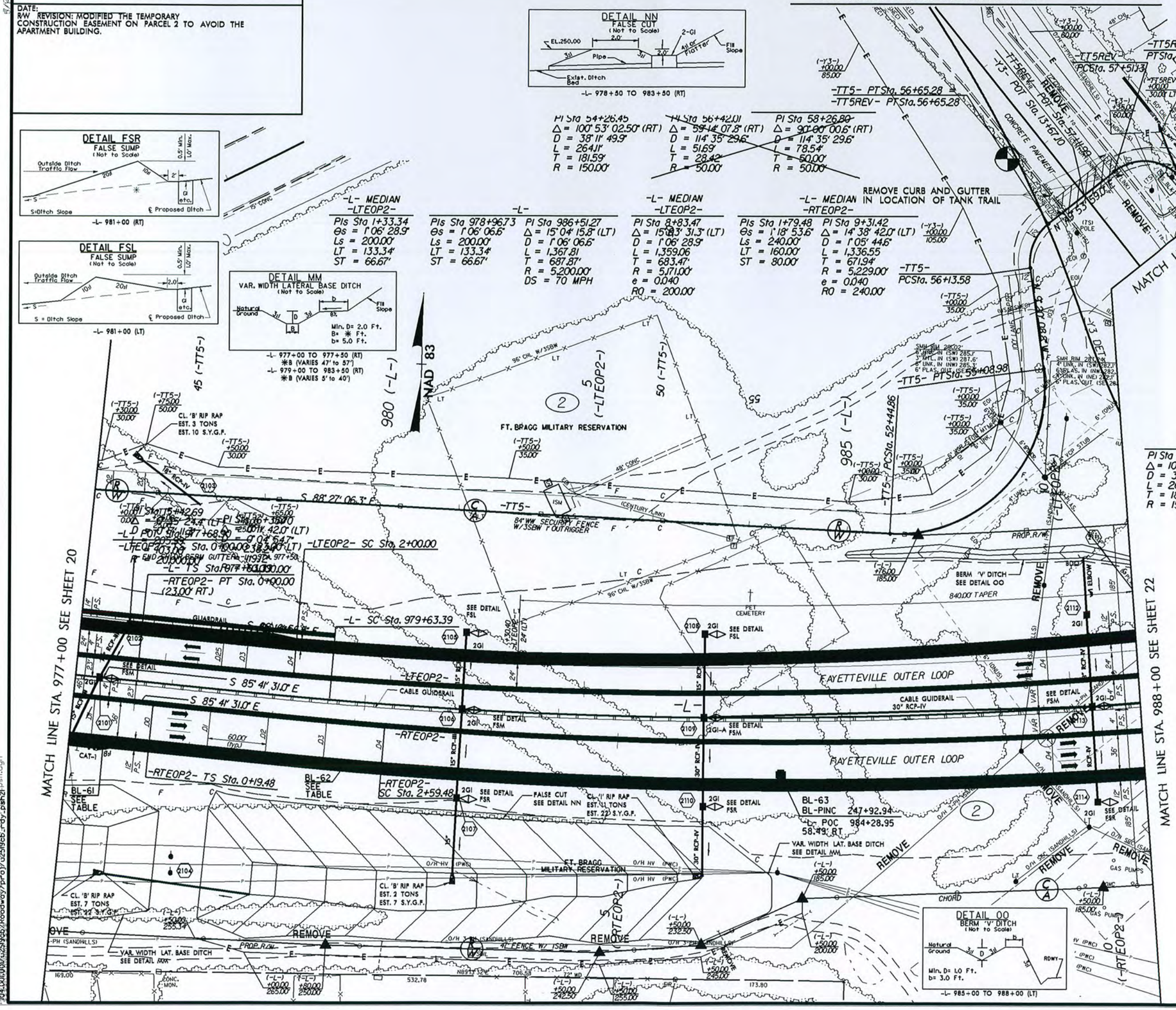
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	21
DESIGNED BY: MEH	
DRAWN BY: MEH	
CHECKED BY: CDB	
APPROVED BY: CDB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919)707-6690 FAX: (919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Utility Permit Drawing
Sheet 16 of 18

PROP. U/G TELE. CENTURYLINK



-TT5REV-

PI Sta 54+26.45	PI Sta 56+42.01	PI Sta 58+26.80
Δ = 100°53' 02.50" (RT)	Δ = 59°14' 07.8" (RT)	Δ = 90°00' 00.6" (RT)
D = 38°11' 49.9"	D = 114°35' 29.6"	D = 63°39' 43.1"
L = 264.11'	L = 51.69'	L = 141.37'
T = 181.59'	T = 28.42'	T = 90.00'
R = 150.00'	R = 50.00'	R = 90.00'

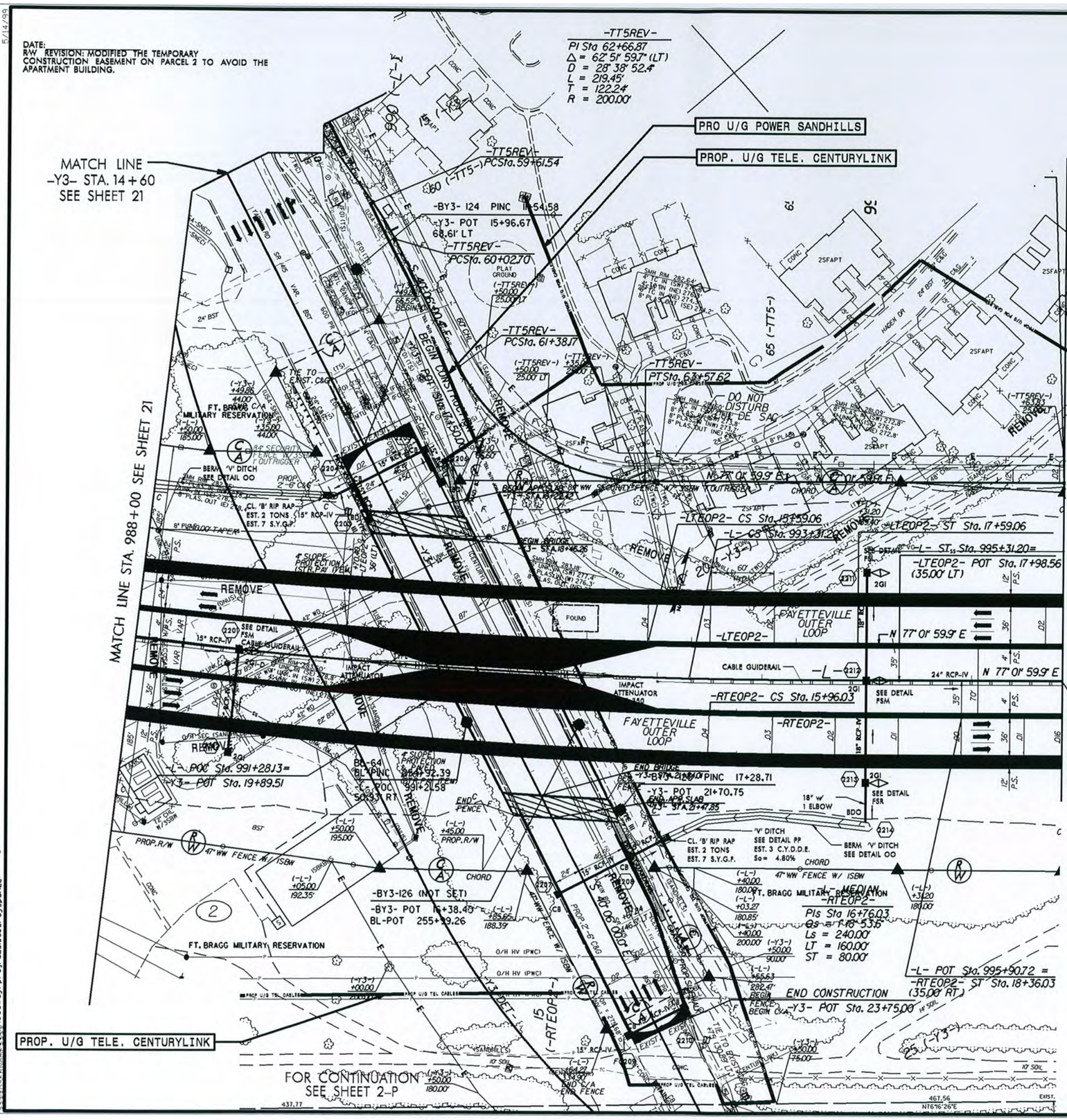
SEE SHEETS 2-0 & 2-P FOR -Y3 DET-
SEE SHEETS 40 & 41 FOR -L- PROFILE
SEE SHEET 70 & 71 FOR -TT5- PROFILE

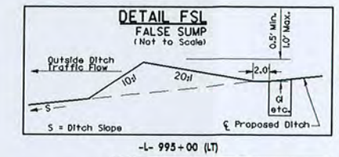
DATE:
RW REVISION: MODIFIED THE TEMPORARY CONSTRUCTION EASEMENT ON PARCEL 2 TO AVOID THE APARTMENT BUILDING.

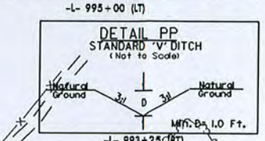
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	22
DESIGNED BY: MEH	
DRAWN BY: MEH	
CHECKED BY: CDB	
APPROVED BY: CDB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY

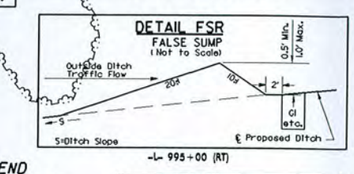
UTILITY CONSTRUCTION

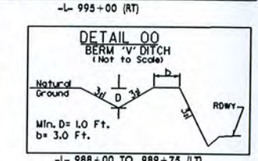






Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'





Utility Permit Drawing
Sheet 11 of 18

SEE SHEETS 2-O & 2-P FOR -Y3 DET-
SEE SHEET 41 FOR -L- PROFILE
SEE SHEET 55 FOR -Y3- PROFILE
SEE SHEET 71 FOR -TT5- PROFILE

5/14/99

30-DEC-2013 14:40

REVISIONS
5-07-08 : PUE & DANGER TREE AREA ADDED -Y1- STA 32+50 (RT) TO 41+50 (RT)

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	24
DESIGNED BY: MEH	
DRAWN BY: MEH	
CHECKED BY: CDB	
APPROVED BY: CDB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Utility Permit Drawing
Sheet 12 of 18

-TT4-

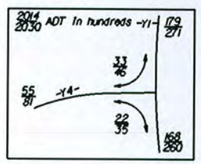
PI Sta 39+66.30	PI Sta 42+85.94	PI Sta 45+16.35
Δ = 60° 30' 30.7" (RT)	Δ = 14° 33' 19.3" (RT)	Δ = 38° 17' 05.9" (LT)
D = 12° 43' 56.6"	D = 12° 43' 56.6"	D = 11° 27' 33.0"
L = 475.23'	L = 114.32'	L = 334.10'
T = 262.48'	T = 57.47'	T = 173.56'
R = 450.00'	R = 450.00'	R = 500.00'

-Y4-

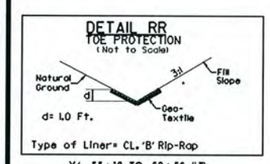
PIs Sta 52+52.54	PIs Sta 54+92.57	PI Sta 59+54.30
θs = 11° 01' 06.3"	θs = 11° 01' 06.3"	Δ = 81° 19' 05.9" (RT)
Ls = 180.00'	Ls = 180.00'	D = 12° 14' 33.7"
LT = 120.23'	LT = 120.23'	L = 664.22'
ST = 60.21'	ST = 60.21'	T = 401.96'
		R = 468.00'

-Y1-

PI Sta 34+22.94
Δ = 68° 22' 18.4" (LT)
D = 4° 00' 00.0"
L = 1,709.29'
T = 972.94'
R = 1,432.39'
e = 0.040
RO = 300.00'
DS = 50 MPH



PAVEMENT REMOVAL



-Y4- 55+12 TO 58+50 (LT)
-Y4- 53+40 TO 55+98 (RT)

MATCH LINE STA. 32+50 SEE SHEET 23

MATCH LINE STA. 53+43 SEE SHEET 18

MATCH LINE STA. 41+50 SEE SHEET 18

NAD 83

FT. BRAGG MILITARY RESERVATION

PROP. U/G TELE. USA-SENC

-TT4- PTSta. 46+76.89

-TT4- PRCSta. 43+42.79

-TT4- PCSta. 42+28.48

-TT4- PTSta. 41+79.05

N 27° 31' 23.6" E

N 70° 19' 44.9" E

-Y4- PTSta. 62+15.16

-Y1- POC Sta. 35+70.00=
-Y4- POT Sta. 63+38.10

BYI-103
BYI-PINC 32+64.11
-Y1- POC 37+45.40
126.71' RT

-Y4- SCSSta. 55+52.33

-Y4- SCSSta. 53+72.33

-TT4- PRCSta. 37+03.82

TOE PROTECTION
SEE DETAIL RR
EST. 90 TONS
EST. 350 S.Y.G.F

TOE PROTECTION
SEE DETAIL RR
EST. 123 TONS
EST. 485 S.Y.G.F

CL. 'I' RIP RAP
EST. 57 TONS
EST. 104 S.Y.G.F.

CL. 'B' RIP RAP
EST. 3 TON
EST. 11 S.Y.G.F.

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

TIE SECURITY FENCE TO ACP CANOPY

TIE SECURITY FENCE TO C/A FENCE

PREFORMED SCOUR HOLE
B= 5' W= 5'
D= 2' d= 0.5'

DANGER TREE AREA

REMOVE

DETAIL FSR
FALSE SUMP
(Not to Scale)
Outside Ditch Traffic Flow
S=Ditch Slope
℄ Proposed Ditch
-RPD2- 9+74 (LT)

SEE SHEETS 2-L & 2-M FOR -Y1 DET-
SEE SHEET 53 FOR -Y1- PROFILE
SEE SHEET 57 FOR -Y4- PROFILE
SEE SHEET 68 FOR -TT4- PROFILE

30-DEC-2013 13:44

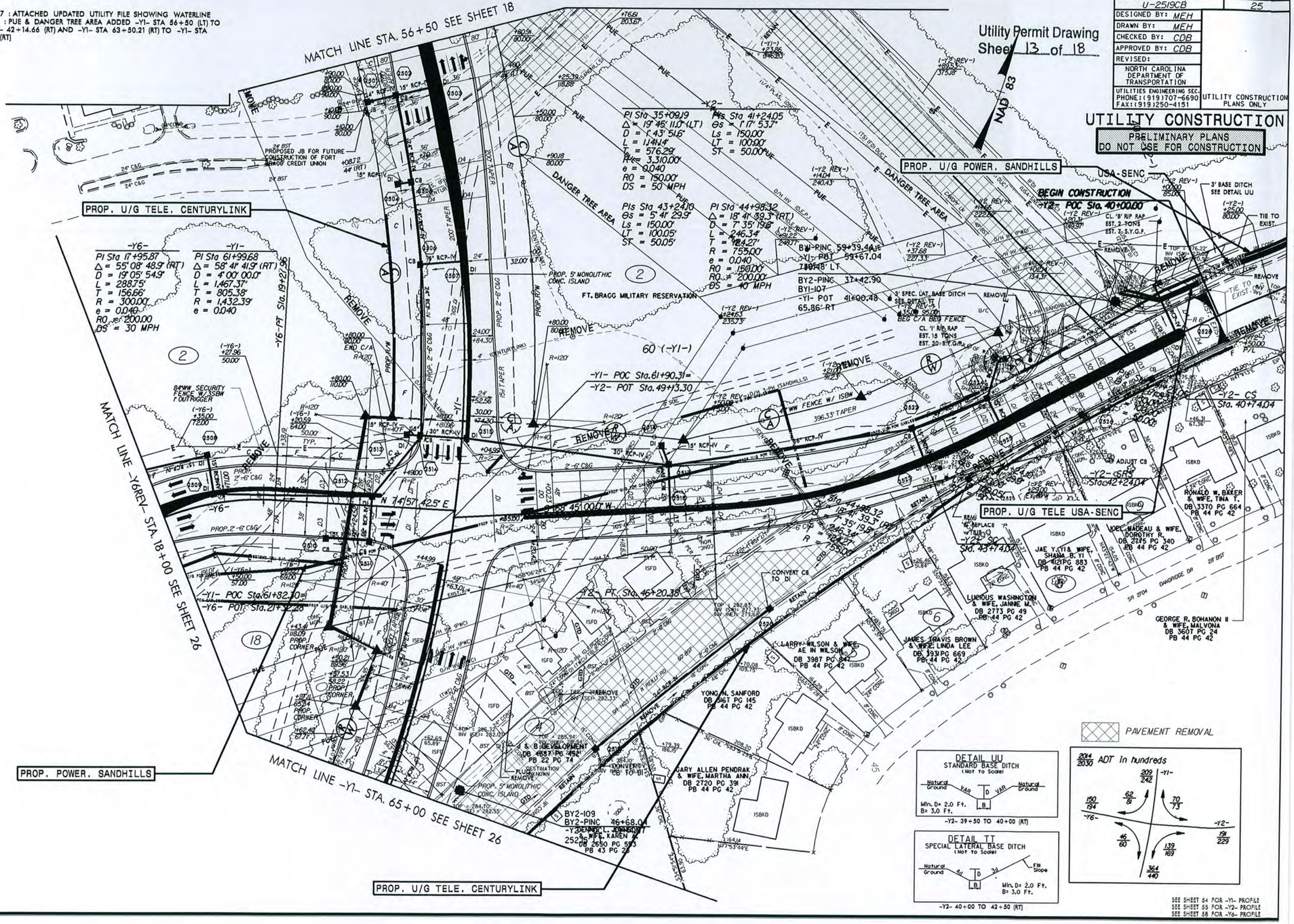
05-22-07 : ATTACHED UPDATED UTILITY FILE SHOWING WATERLINE
5-07-08 : PUE & DANGER TREE AREA ADDED -Y1- STA 56+50 (LT) TO -Y2 REV- 42+14.66 (RT) AND -Y1- STA 63+50.21 (RT) TO -Y1- STA 65+00 (RT)

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	25
DESIGNED BY: MEH	
DRAWN BY: MEH	
CHECKED BY: CDB	
APPROVED BY: CDB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919)707-6690 FAX: (919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

Utility Permit Drawing
Sheet 13 of 18

UTILITY CONSTRUCTION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



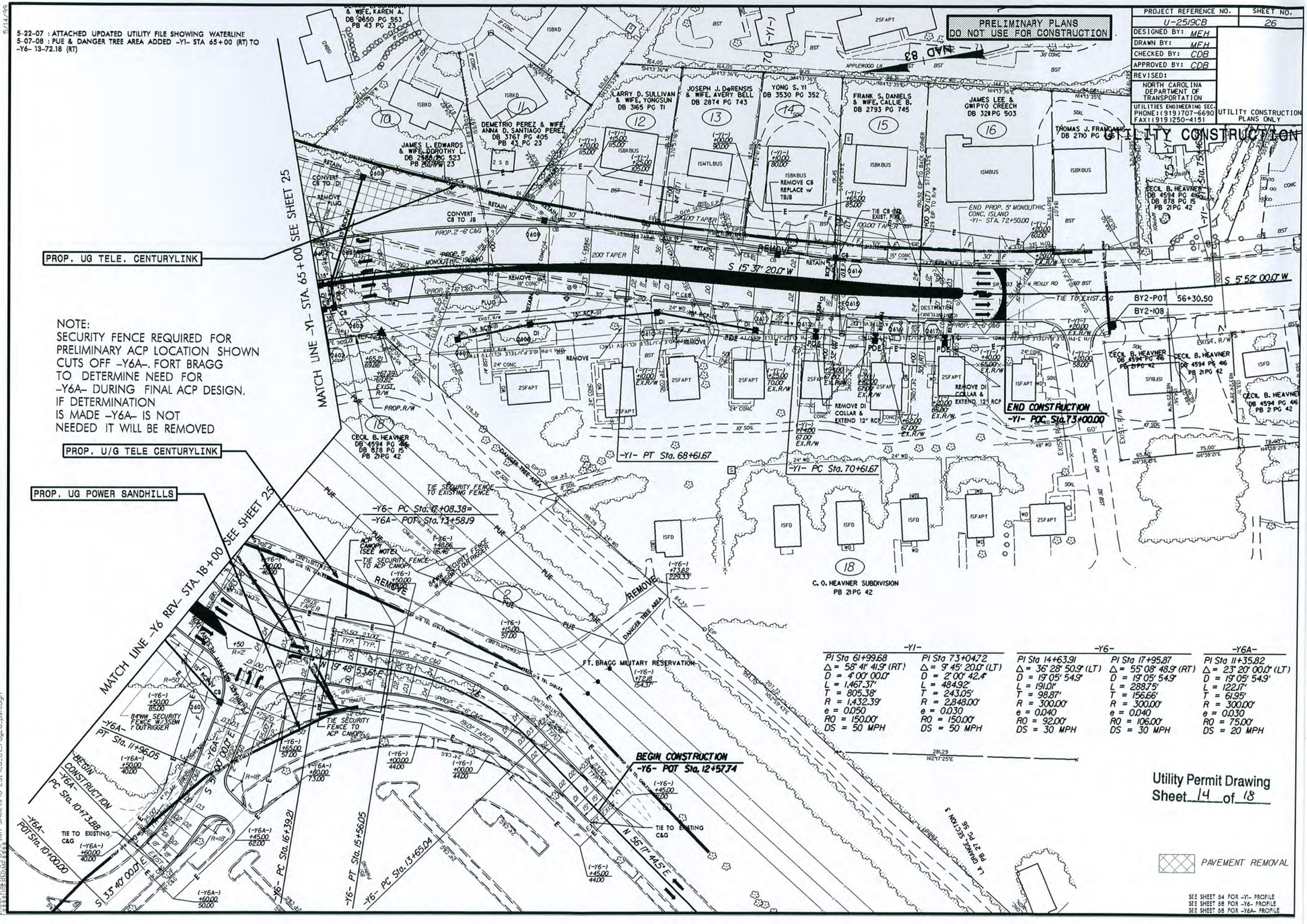
02-JAN-2014 16:51

5-22-07 : ATTACHED UPDATED UTILITY FILE SHOWING WATERLINE
5-07-08 : PUE & DANGER TREE AREA ADDED -Y1- STA 65+00 (RT) TO -Y6- 13-72.18 (RT)

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	26
DESIGNED BY: MEH	
DRAWN BY: MEH	
CHECKED BY: CDB	
APPROVED BY: CDB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

UTILITY CONSTRUCTION



-Y1-		-Y6-		-Y6A-
PI Sta 61+99.68	PI Sta 73+04.72	PI Sta 14+63.91	PI Sta 17+95.87	PI Sta 11+35.82
Δ = 58° 41' 41.9" (RT)	Δ = 9° 45' 20.0" (LT)	Δ = 36° 28' 50.9" (LT)	Δ = 55° 08' 48.9" (RT)	Δ = 23° 20' 00.0" (LT)
D = 4° 00' 00.0"	D = 2° 00' 42.4"	D = 19° 05' 54.9"	D = 19° 05' 54.9"	D = 19° 05' 54.9"
L = 1,467.37'	L = 484.92'	L = 191.01'	L = 288.75'	L = 122.17'
T = 805.38'	T = 243.05'	T = 98.87'	T = 156.66'	T = 61.95'
R = 1,432.39'	R = 2,848.00'	R = 300.00'	R = 300.00'	R = 300.00'
e = 0.050	e = 0.030	e = 0.040	e = 0.040	e = 0.030
R0 = 150.00'	R0 = 150.00'	R0 = 92.00'	R0 = 106.00'	R0 = 75.00'
DS = 50 MPH	DS = 50 MPH	DS = 30 MPH	DS = 30 MPH	DS = 20 MPH

Utility Permit Drawing
Sheet 14 of 18

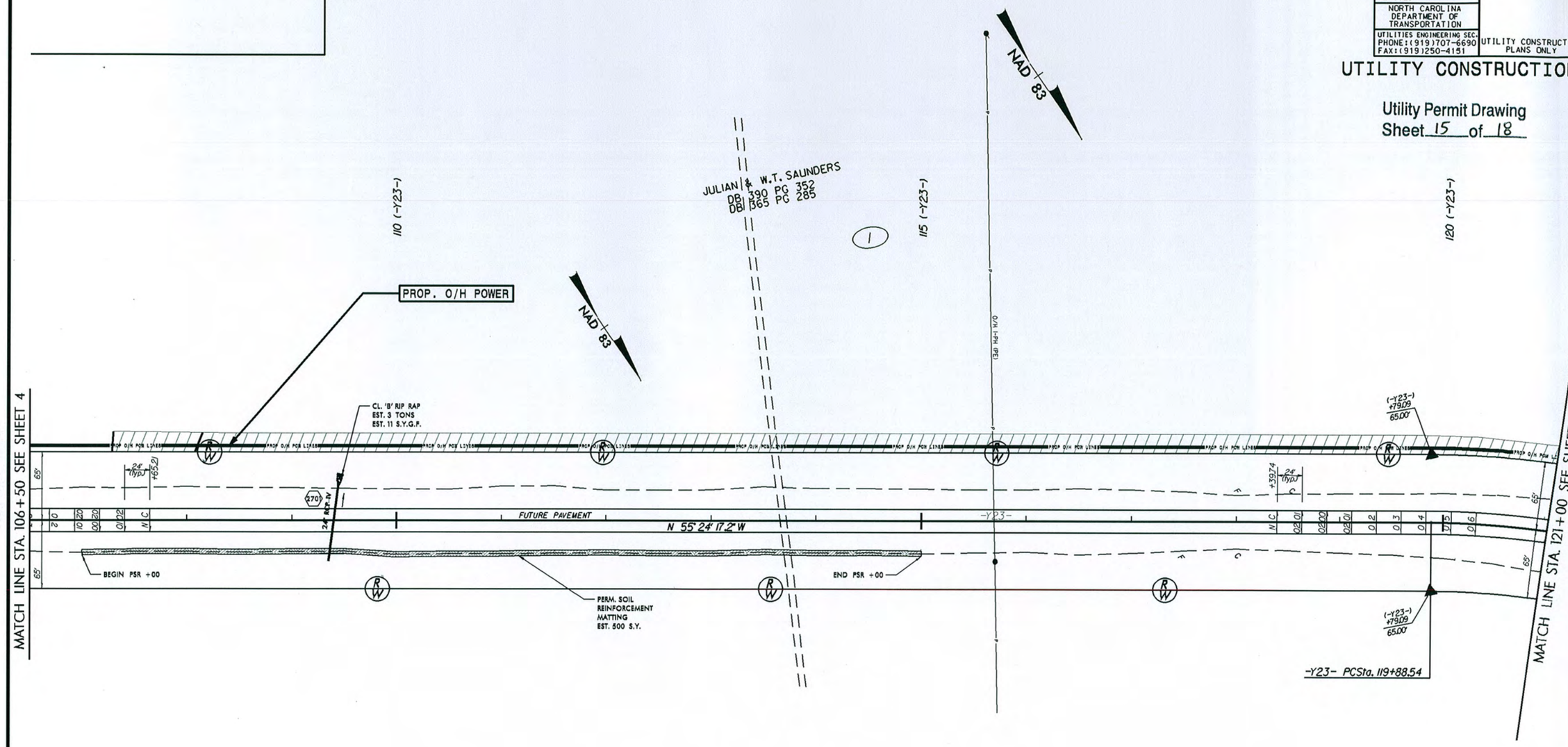
SEE SHEET 54 FOR -Y1- PROFILE
SEE SHEET 58 FOR -Y6- PROFILE
SEE SHEET 58 FOR -Y6A- PROFILE

30-DEC-2008 13:18
mesteins:/home/mesteins/Plan Sheets/U-2519CB_Ut_rdy26_psh.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	27
DESIGNED BY: MEH	
DRAWN BY: MEH	
CHECKED BY: CDB	
APPROVED BY: CDB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919)707-6690 FAX: (919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

Utility Permit Drawing
Sheet 15 of 18



JULIAN & W.T. SAUNDERS
DB 390 PG 352
DB 365 PG 285

SEE SHEET 59 & 60 FOR -Y23- PROFILE

REVISIONS

4-4-07 : ADJUSTED R/W MONUMENTS FOR -Y5- REVISED ALIGNMENT
5-07-08 : PUE & DANGER TREE AREA ADDED -Y5- STA 239+30.37 (LT) TO 240+77.73 (LT)
7-12-10 : REMOVED "DANGER TREE AREA" ON PARCEL 1 -Y5- (LT.)

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	28

DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

Utility Permit Drawing
Sheet 16 of 18

-Y23- PT Sta. 129+41.56
-Y5- POC Sta. 231+65.43

-Y23- POT Sta. 126+23.74 =
-Y5- POT Sta. 235+82.01

PROP. POWER DEP

BEGIN CONSTRUCTION
-Y5- Sta. 238+90.00 (RT.)

-Y5- PT Sta. 238+19.21

JULIAN & W.T. SAUNDERS
DB 390 PG 352
DB 365 PG 285

Sta. 129+05.00
END PAVING

Sta. 126+00.00
BEGIN PAVING

PROP. 20' OF 16" DI WATER LINE

PC Sta. 229+61.73

-Y23- PT Sta. 128+43.05

-Y23- PT Sta. 124+70.34

SPECIAL CUT DITCH
SEE DETAIL C

-Y23-
PI Sta 120+72.47
Δ = 61° 09' 21.0" (RT)
D = 6° 51' 42.4"
L = 891.25'
T = 493.38'
R = 835.00'

PROP. O/H POWER PWC

RELOCATE FIRE HYDRANT

PROP. 528' OF 16" DI WATER LINE

ABANDON 534' OF UTILITY PIPE (WATER LINE)

MATCH LINE STA. 242+50 SEE SHEET 5

NAD 83

CULTIVATED

-Y5-
PI Sta 202+92.12
Δ = 5° 49' 37.3" (LT)
D = 2° 10' 58.7"
L = 266.93
T = 133.58'
R = 2,624.67'
e = EXIST.
RO = EXIST.
DS = 50 MPH

PI Sta 233+91.56
Δ = 9° 58' 59.5" (RT)
D = 1° 09' 51.3"
L = 857.48
T = 429.83'
R = 4,921.25'
e = EXIST.
RO = EXIST.
DS = 50 MPH

-Y23-
PI Sta 124+57.45
Δ = 58° 38' 04.6" (RT)
D = 6° 51' 42.4"
L = 854.51
T = 468.91'
R = 835.00'
e = 0.06
RO = 143.93'
DS = 50 MPH

SEE SHEET 60 FOR -Y23- PROFILE
SEE SHEET 47 FOR -Y5- PROFILE

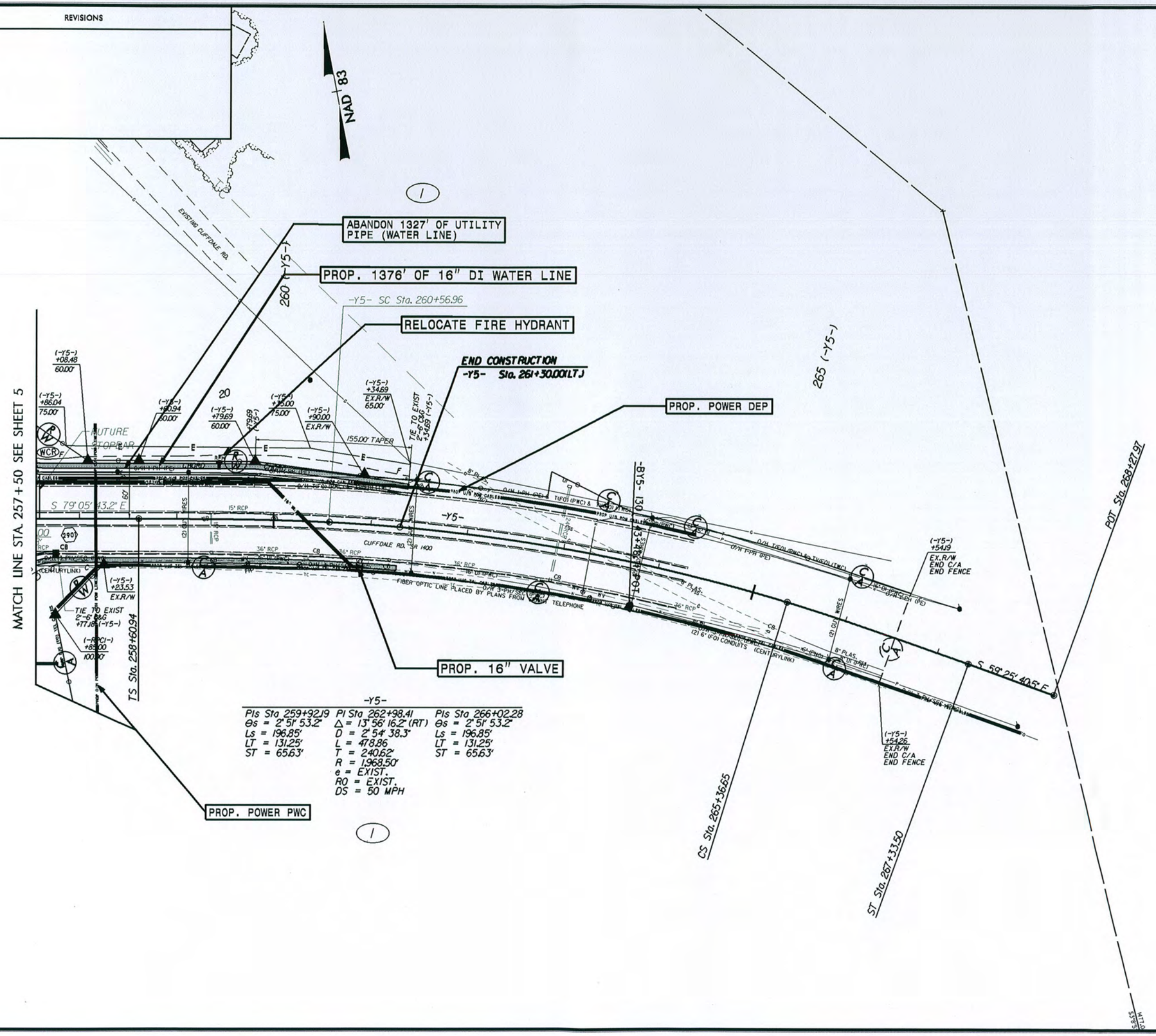
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	29
DESIGNED BY: MEH	
DRAWN BY: MEH	
CHECKED BY: CDB	
APPROVED BY: CDB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Utility Permit Drawing
Sheet 17 of 18

REVISIONS



			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	Y4 16+36 TO 16+66	U/G Power by Open Cut		<0.01	<0.01		0.01					
2	PR2A 17+68 TO 17+94	U/G Power by Open Cut		<0.01	<0.01		<0.01					
TOTALS:				<0.01	<0.01		0.01					

Note:

Utility Permit Drawing
Sheet 18 of 18

Revised 8/1/13

ATN Revised 3/31/05

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY
WBS - 34817.1.1 (U-2519CB)

SHEET 1 OF 1 1/13/2014

12/24/13

TIP PROJECT: U-2519CB

CONTRACT: C203398

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

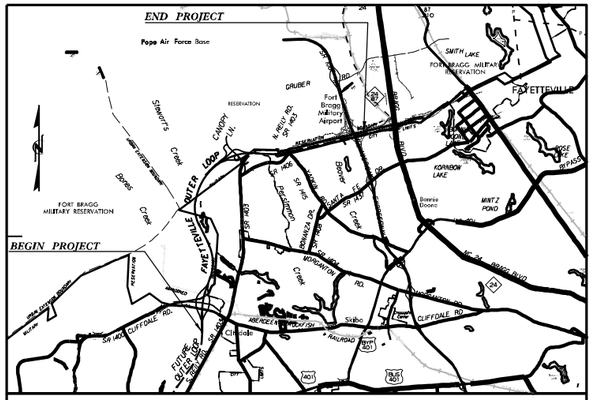
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2519CB	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34817.1.2	NHF-DPR-0100(001)	P.E.
34817.2.8	NHF-DPR-0100(001)	R/W, UTL.
34817.3.S8	NHF-DPR-0100(001)	CONST.

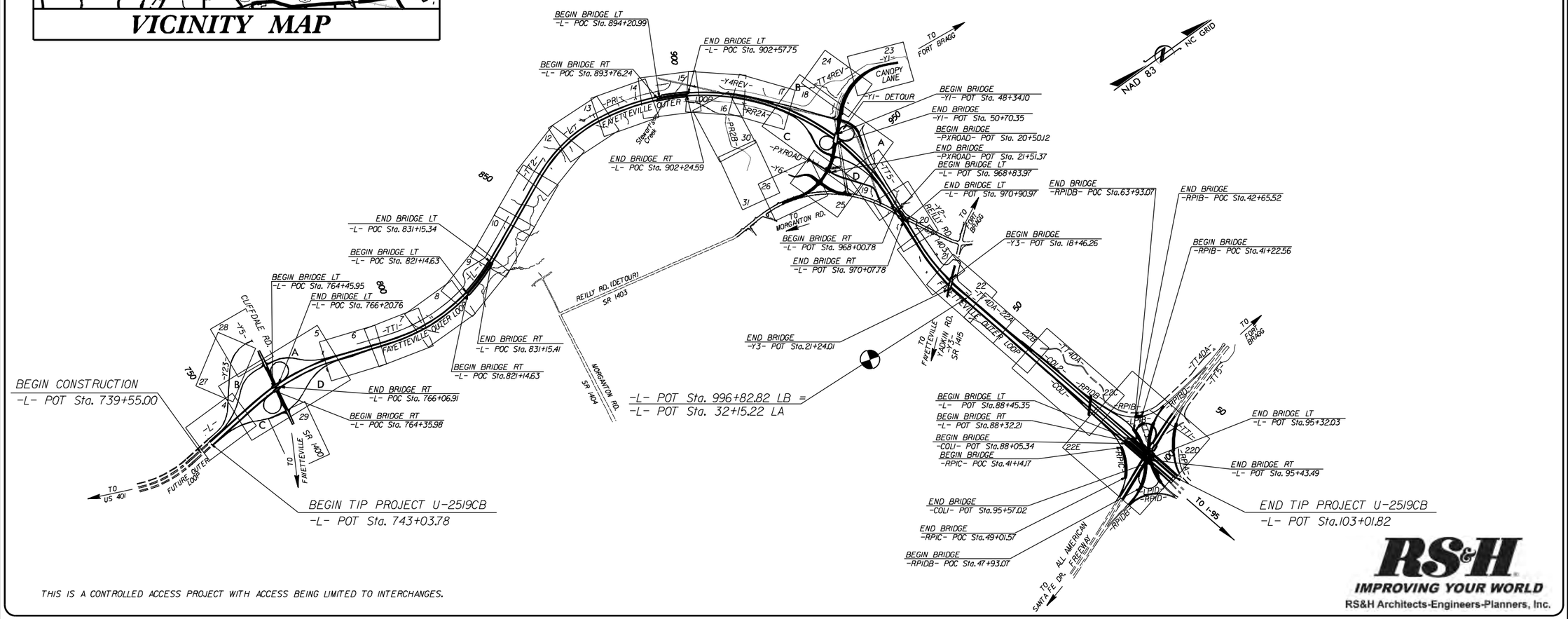
CUMBERLAND COUNTY

LOCATION: FAYETTEVILLE OUTER LOOP FROM SOUTH OF SR 1400 (CLIFFDALE ROAD) TO EAST OF ALL AMERICAN FREEWAY

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, CULVERT, RETAINING WALLS, SIGNALS & SIGNING



VICINITY MAP



THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

RS&H
IMPROVING YOUR WORLD
RS&H Architects-Engineers-Planners, Inc.

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2014 = 49,900
ADT 2034 = 70,300
DHV = 8 %
D = 55 %
T = 12 % *
V = 70 MPH
* (TTST=4 + DUAL=8)
FUNC CLASS : INTERSTATE
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-2519CB	=	5.592 MILES
LENGTH STRUCTURES TIP PROJECT U-2519CB	=	0.557 MILES
TOTAL LENGTH OF TIP PROJECT U-2519CB	=	6.149 MILES

Prepared in the Office of:
RS&H
ARCHITECTS-ENGINEERS-PLANNERS, INC.
8601 SIX FORKS RD, SUITE 260
RALEIGH, NC 27615
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JULY 31, 2006

LETTING DATE:
AUGUST 19, 2014

KENNETH HERRING, PE
PROJECT ENGINEER

JASON TALLEY, PE
PROJECT DESIGN ENGINEER

BRENDA L. MOORE, PE
NCDOT CONTACT

HYDRAULICS ENGINEER
SEAL 15764
P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER
SEAL 029473
P.E.
SIGNATURE:

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

4/22/2014
W:\Roadway\Proj\u2519cb_rdy_tsh_new.dgn
9:28:21 AM

12/05/11

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	1-B

Note: Not to Scale

S.U.E. = Subsurface Utility Engineering

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Known Soil Contamination: Area or Site
- Potential Soil Contamination: Area or Site

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- 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
- Wetland
- Proposed Lateral, Tail, Head Ditch — FLOW
- 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 — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite R/W Marker — RW
- Proposed Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage / Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- 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 — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- 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 — T
- Telephone Booth
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- 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 — W
- 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 — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- 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 — S
- Utility Unknown U/G Line — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
U-2519CB	X-0	X-581

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CROSS SECTION INDEX

ALIGNMENT	SHEET NUMBERS
-L- SBL (LEFT)	X-1 THRU X-138
-L- SBL (LEFT), -COL2-	X-139 THRU X-154
-L- NBL (RIGHT)	X-155 THRU X-287
-L- NBL (RIGHT), -COL2-	X-288 THRU X-302
-RPA1-	X-303 THRU X-309
-RPB1-	X-310 THRU X-316
-RPC1-	X-317 THRU X-324
-RPD1-	X-325 THRU X-330
-RPD1- (ADDITIONAL GRADING)	X-331 THRU X-333
-LPA1-	X-334 THRU X-339
-LPC1-	X-340 THRU X-344
-Y5-	X-345 THRU X-352
-RPA2-	X-353 THRU X-362
-RPB2-	X-363 THRU X-371
-RPC2-	X-372 THRU X-380
-RPD2-	X-381 THRU X-387
-LPA2-	X-388 THRU X-394
-LPC2-	X-395 THRU X-403
-Y1-	X-404 THRU X-425 (REVISIONS ANTICIPATED)
-Y2-	X-426 THRU X-435 (REVISIONS ANTICIPATED)
-Y3-	X-436 THRU X-438
-Y4-	X-439 THRU X-463
-Y6-	X-464 THRU X-466 (REVISIONS ANTICIPATED)
-Y6A-	X-467 (REVISIONS ANTICIPATED)
-Y23-	X-468 THRU X-477
-PR1-	X-478 THRU X-489
-PR2A-	X-490 THRU X-500
-PR2B-	X-501 THRU X-510
-TT1-	X-511 THRU X-530
-TT4-	X-531 THRU X-551
-TT5-	X-552 THRU X-568
-TT5REV-	X-569 THRU X-572
-TT4DA-	X-573 THRU X-581
-Y1- DETOUR	REVISIONS ANTICIPATED
-Y3- DETOUR	REVISIONS ANTICIPATED

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	2-BA
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

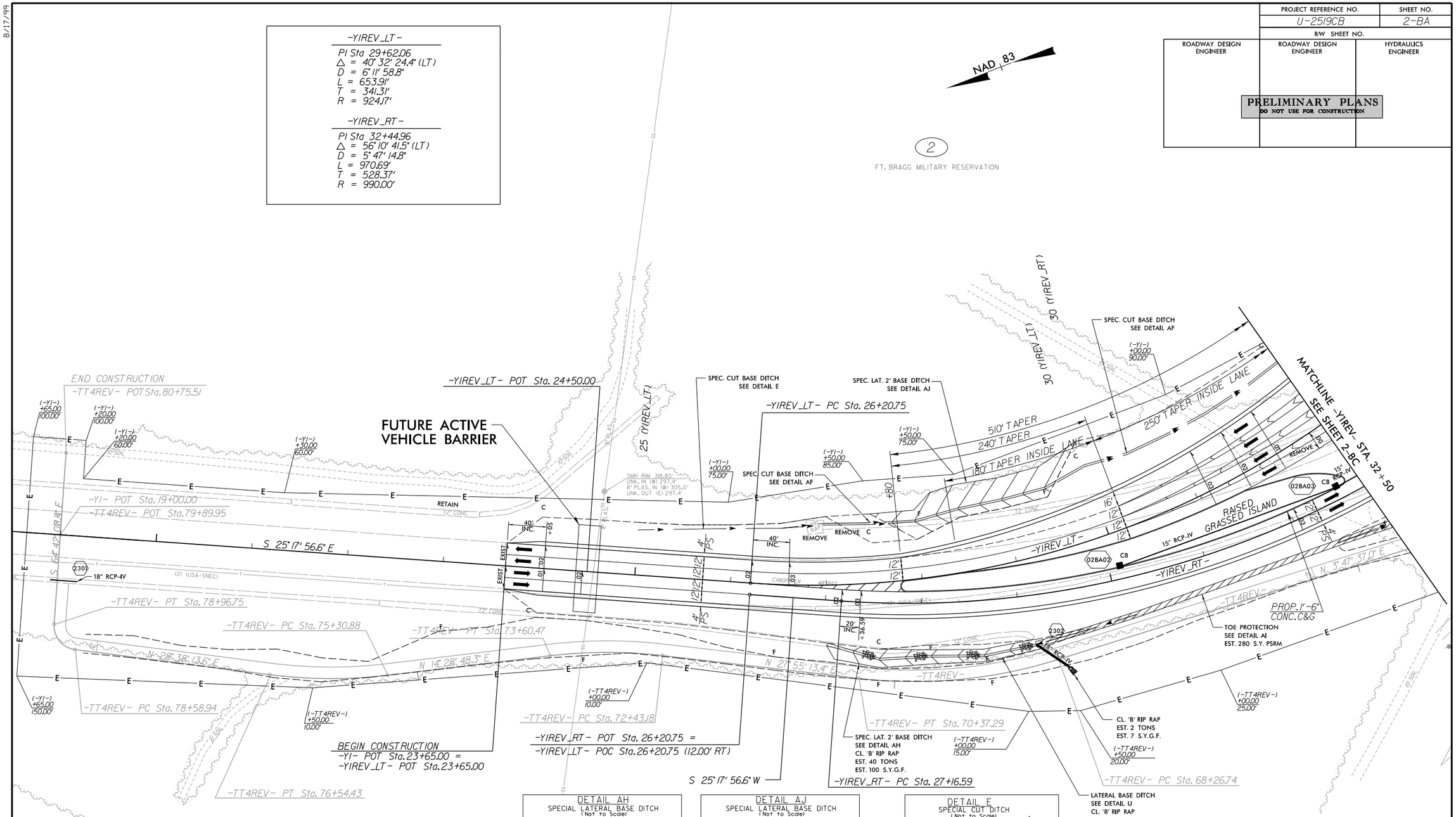
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

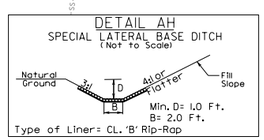
-YIREV_LT-

PI Sta 29+62.06
△ = 40° 32' 24.4" (LT)
D = 6° 11' 58.8"
L = 653.91'
T = 341.31'
R = 924.17'

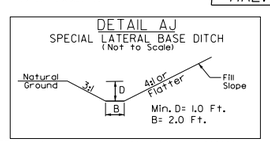
-YIREV_RT-

PI Sta 32+44.96
△ = 56° 10' 41.5" (LT)
D = 5° 47' 14.8"
L = 970.69'
T = 528.37'
R = 990.00'

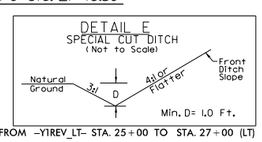




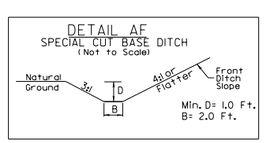
FROM -YIREV_LT- STA. 27+00 TO STA. 28+00 (RT)



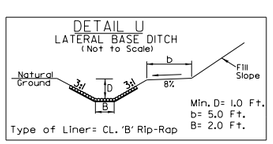
FROM -YIREV_LT- STA. 28+00 TO STA. 30+00 (LT)



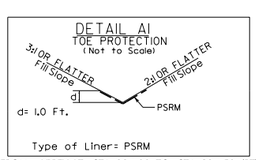
FROM -YIREV_LT- STA. 25+00 TO STA. 27+00 (LT)



FROM -YIREV_LT- STA. 27+00 TO STA. 28+00 (LT)
FROM -YIREV_LT- STA. 30+00 TO STA. 33+00 (LT)



FROM -YIREV_LT- STA. 28+00 TO STA. 29+00 (RT)



FROM -YIREV_LT- STA. 29+00 TO STA. 32+50 (RT)

-TT4REV-

PI Sta 78+82.53	PI Sta 75+92.97	PI Sta 73+02.10	PI Sta 69+33.60
△ = 86° 39' 43.9" (RT)	△ = 14° 09' 25.4" (RT)	△ = 13° 26' 25.1" (LT)	△ = 24° 07' 36.4" (RT)
D = 229° 10' 59.2"	D = 11° 27' 33.0"	D = 11° 27' 33.0"	D = 11° 27' 33.0"
L = 37.81'	L = 123.54'	L = 117.29'	L = 210.55''
T = 23.58'	T = 62.09'	T = 58.91'	T = 106.86'
R = 25.00'	R = 500.00'	R = 500.00'	R = 500.00'

SEE DETAIL SHTS. 2-B1 THRU 2-BK FOR ISLANDS AND PAVEMENT DIMENSIONING AND CONSTRUCTION DETAILS.

FOR -YIREV_LT- PROFILE SEE SHT. 2-BE

FOR -YIREV_RT- PROFILE SEE SHT. 2-BF

NOTE: ALL CSP OR CAAP WILL BE ROD LUG AND GASKET CONNECTOR

PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

4/17/2014
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ahefler

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	2-BB
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ROADWAY DESIGN ENGINEER

NAD 83

-YIREV_LT-

PI Sta 36+10.62	PI Sta 39+17.88
△ = 9° 24' 20.1" (LT)	△ = 16° 41' 39.0" (LT)
D = 4° 46' 28.7"	D = 4° 01' 20.9"
L = 196.99'	L = 415.02'
T = 98.72'	T = 208.99'
R = 1,200.00'	R = 1,424.39'

-YIREV_RT-

PI Sta 32+44.96	PI Sta 40+50.46
△ = 56° 10' 41.5" (LT)	△ = 10° 27' 42.5" (LT)
D = 5° 47' 14.8"	D = 3° 54' 45.3"
L = 970.69'	L = 267.39'
T = 528.37'	T = 134.07'
R = 990.00'	R = 1,464.39'

-TT4REV-

PI Sta 50+97.78	PI Sta 57+26.17	PI Sta 60+49.42
△ = 79° 09' 52.3" (LT)	△ = 69° 26' 20.3" (RT)	△ = 37° 01' 12.4" (LT)
D = 10° 27' 19.6"	D = 12° 14' 33.7"	D = 23° 52' 23.7"
L = 757.16'	L = 567.19'	L = 155.07'
T = 453.06'	T = 324.29'	T = 80.35'
R = 548.00'	R = 468.00'	R = 240.00'

PAVEMENT REMOVAL

2
FT. BRAGG MILITARY RESERVATION

NOTE: ALL CSP OR CAAP WILL BE ROD LUG AND GASKET CONNECTOR

DETAIL T
STANDARD BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, 3:1, Natural Ground, B
Min. D= 1.5 Ft.
B= 2.0 Ft.
Type of Liner= CL. 'B' Rip-Rap
FROM -YIREV_LT- STA. 33+50 TO STA. 35+50 (RT)

DETAIL AF
SPECIAL CUT BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, 4:1 or Flatter, Front Ditch Slope, B
Min. D= 1.0 Ft.
B= 2.0 Ft.
FROM -YIREV_LT- STA. 30+00 TO STA. 33+00 (LT)

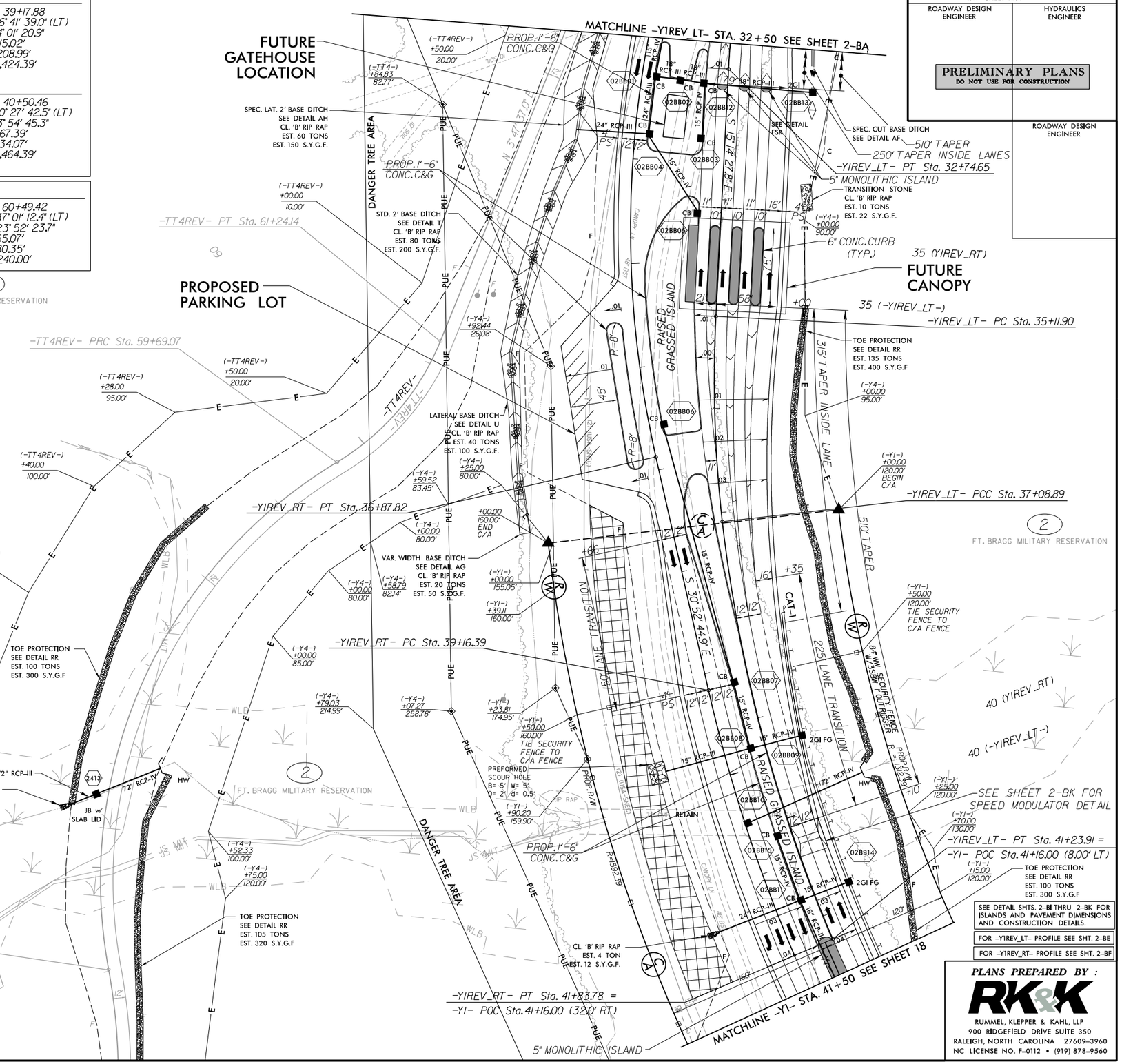
DETAIL FSR
FALSE SUMP
(Not to Scale)
0.5' Min., 1.0' Max., Outside Ditch Traffic Flow, 20:1, 10:1, 2', GI etc., S, S=Ditch Slope, ℄ Proposed Ditch
-Y1REV_LT- 33+10 (LT)

DETAIL RR
TOE PROTECTION
(Not to Scale)
Natural Ground, 3:1, Fill Slope, d, Geo-Textile
d= 1.0 Ft.
Type of Liner= CL. 'B' Rip-Rap
-TT4REV- 52+50 TO 56+05 (RT)
-TT4REV- 55+56 TO 58+50 (LT)
-Y1REV_LT- 35+00 TO 39+70 (LT)
-YIREV_LT- 39+90 TO 41+25 (LT)

DETAIL U
LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, 3:1, b, 8%, Fill Slope, B
Min. D= 1.0 Ft.
b= 5.0 Ft.
B= 2.0 Ft.
Type of Liner= CL. 'B' Rip-Rap
FROM -Y1REV_LT- STA. 35+50 TO STA. 36+50 (RT)

DETAIL AG
STANDARD BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, 3:1, Natural Ground, B
Min. D= - Ft.
B= * Ft.
Type of Liner= CL. 'B' Rip-Rap
FROM -Y1REV_LT- STA. 36+50 TO STA. 37+00 (RT)
*B VARIES FROM 2 TO 10 FT

DETAIL AH
SPECIAL LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, 4:1 or Flatter, Fill Slope, B
Min. D= 1.0 Ft.
B= 2.0 Ft.
Type of Liner= CL. 'B' Rip-Rap
FROM -Y1REV_LT- STA. 32+00 TO STA. 33+50 (RT)



SEE DETAIL SHTS. 2-BI THRU 2-BK FOR ISLANDS AND PAVEMENT DIMENSIONS AND CONSTRUCTION DETAILS.

FOR -Y1REV_LT- PROFILE SEE SHT. 2-BE

FOR -Y1REV_RT- PROFILE SEE SHT. 2-BF

PLANS PREPARED BY :
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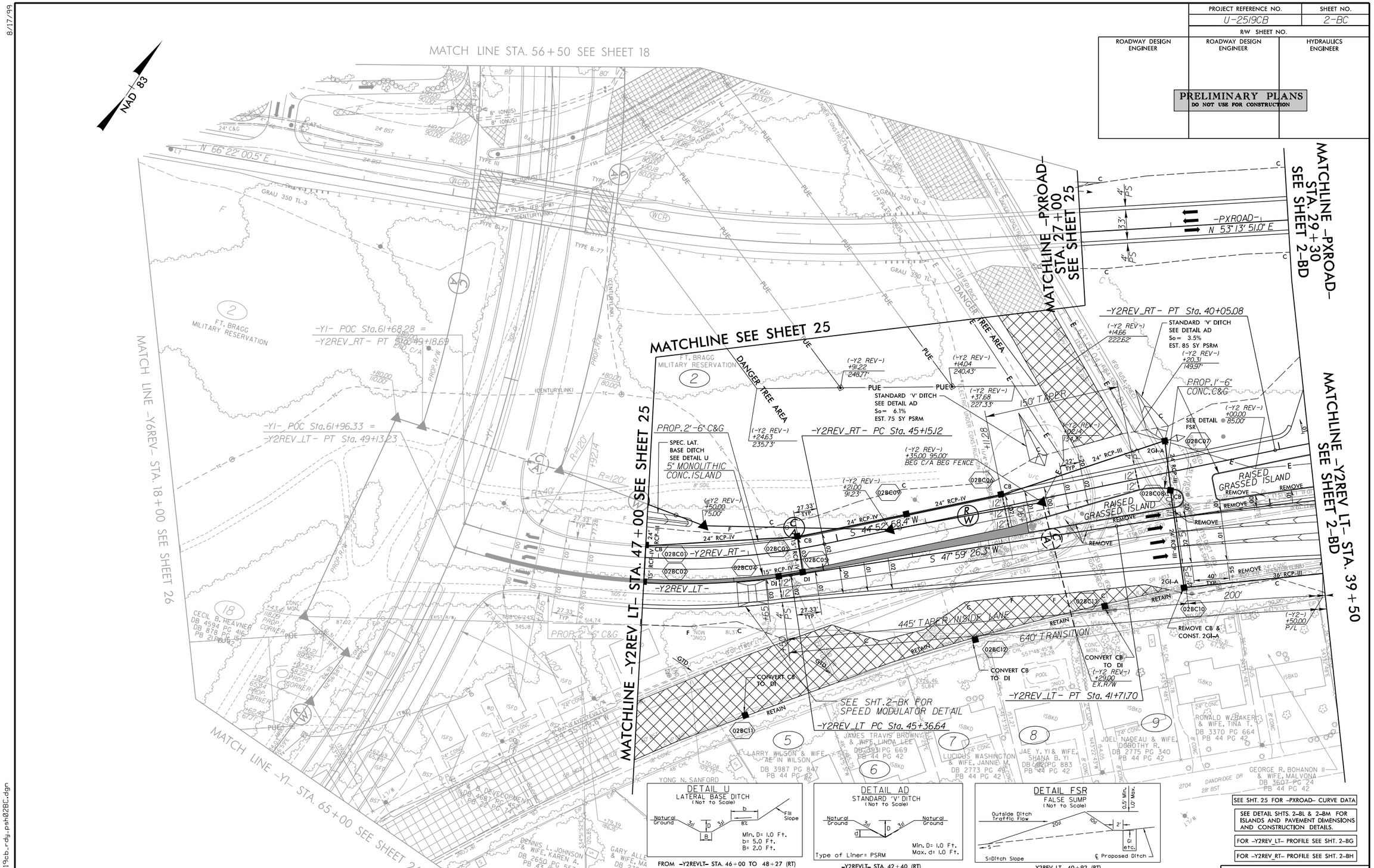
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	2-BC
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
	PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



SEE SHT. 25 FOR -PXROAD- CURVE DATA

SEE DETAIL SHTS. 2-BL & 2-BM FOR ISLANDS AND PAVEMENT DIMENSIONS AND CONSTRUCTION DETAILS.

FOR -Y2REV_LT- PROFILE SEE SHT. 2-BG

FOR -Y2REV_RT- PROFILE SEE SHT. 2-BH

-Y2REV_LT-		-Y2REV_RT-	
PI Sta 40+43.86	PI Sta 47+28.49	PI Sta 35+76.70	PI Sta 47+21.63
Δ = 2° 55' 50.0" (LT)	Δ = 26° 58' 16.4" (RT)	Δ = 28° 04' 34.3" (LT)	Δ = 29° 57' 08.5" (RT)
D = 1° 08' 45.3"	D = 7° 09' 43.1"	D = 3° 12' 35.5"	D = 7° 25' 18.2"
L = 255.74'	L = 376.59'	L = 874.69'	L = 403.58'
T = 127.90'	T = 191.85'	T = 446.31'	T = 206.51'
R = 5,000.00'	R = 800.00'	R = 1,785.00'	R = 772.00'

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4/17/2014
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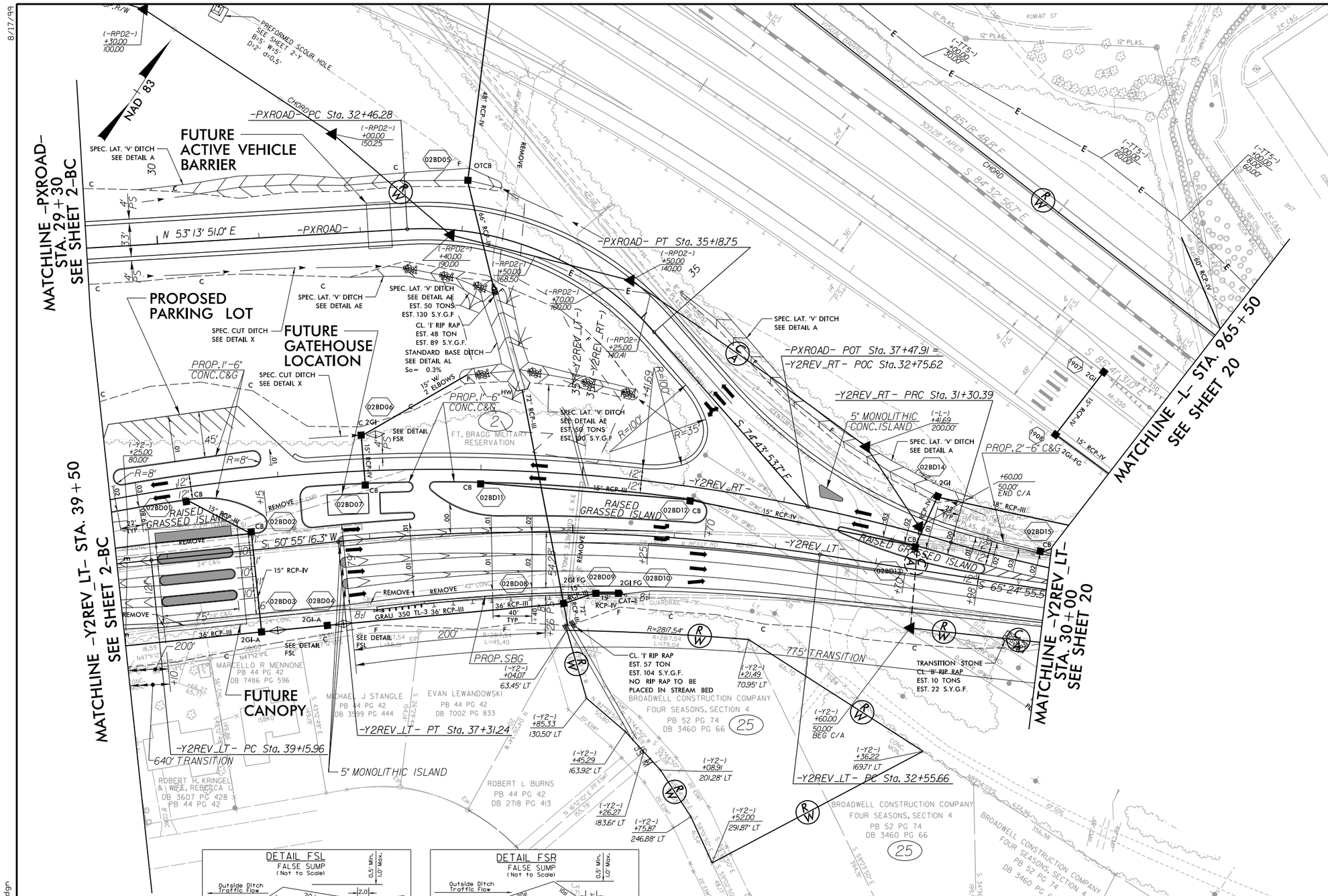
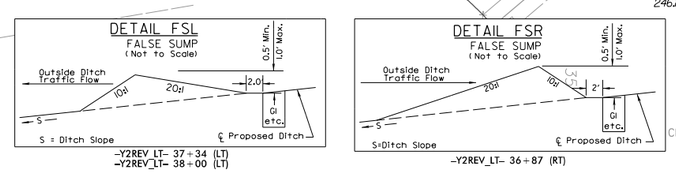
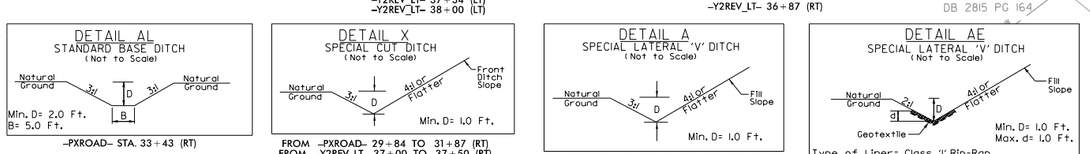
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	2-BD
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ROADWAY DESIGN ENGINEER







-PXROAD-

PI Sta 33+92.73
Δ = 52° 02' 15.3" (RT)
D = 19° 05' 54.9"
L = 272.47'
T = 146.44'
R = 300.00'

-Y2REV_LT-		-Y2REV_RT-	
PI Sta 34+94.73	PI Sta 40+43.86	PI Sta 30+31.79	PI Sta 35+76.70
Δ = 14° 29' 39.2" (LT)	Δ = 2° 55' 50.0" (LT)	Δ = 7° 32' 37.2" (RT)	Δ = 28° 04' 34.3" (LT)
D = 3° 02' 51.5"	D = 1° 08' 45.3"	D = 3° 49' 11.0"	D = 3° 12' 35.5"
L = 475.59'	L = 255.74'	L = 197.49'	L = 874.69'
T = 239.07'	T = 127.90'	T = 98.89'	T = 446.31'
R = 1,880.00'	R = 5,000.00'	R = 1,500.00'	R = 1,785.00'

SEE DETAIL SHTS. 2-BL & 2-BM FOR ISLANDS AND PAVEMENT DIMENSIONS AND CONSTRUCTION DETAILS.

FOR -Y2REV_LT- PROFILE SEE SHT. 2-BG

FOR -Y2REV_RT- PROFILE SEE SHT. 2-BH

PLANS PREPARED BY :
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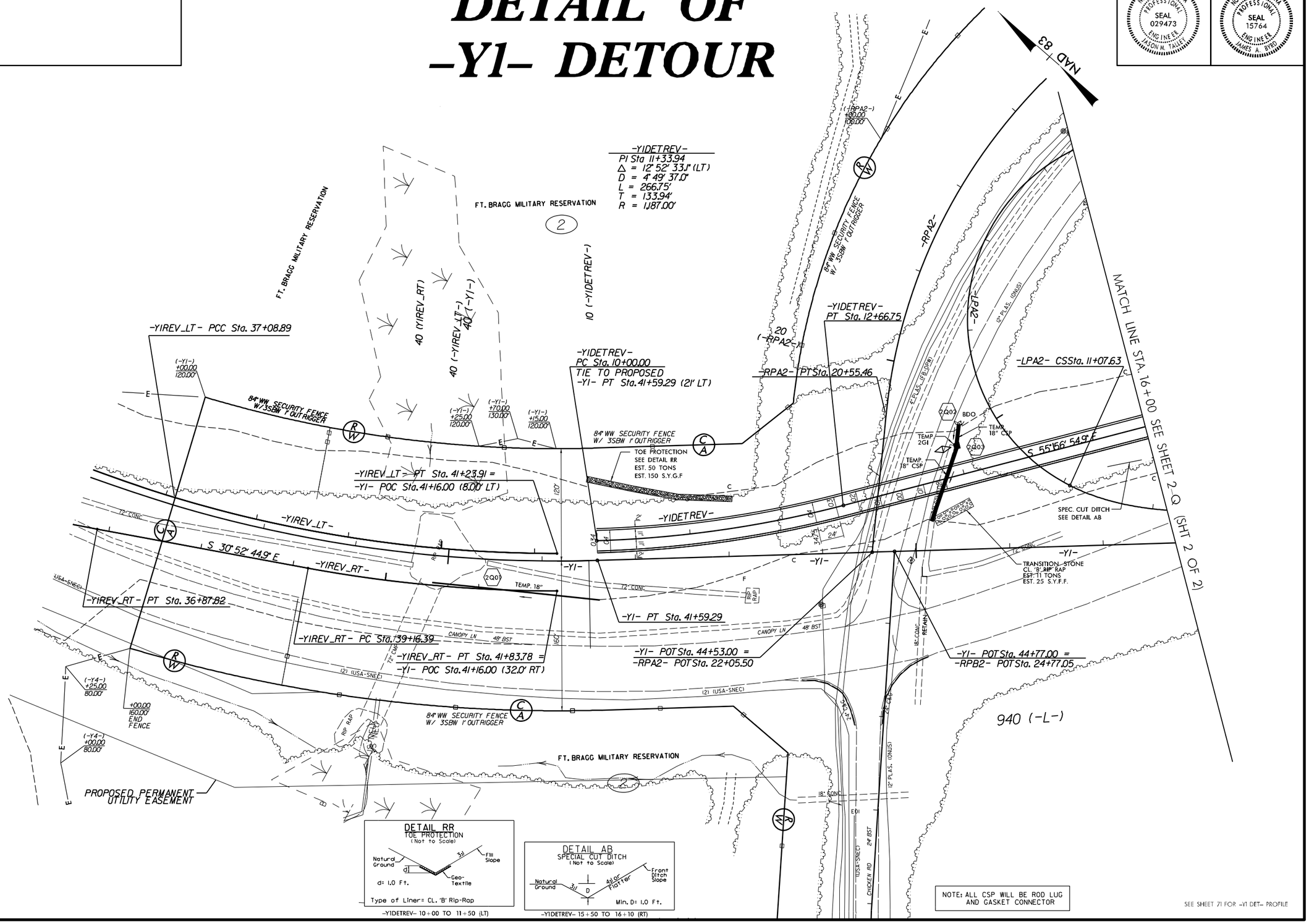
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	2-Q (1 of 2)
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TAILEY	NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYRD

DETAIL OF -Y1- DETOUR



-Y1DETREV- 10+00 TO 11+50 (LT)

-Y1DETREV- 15+50 TO 16+10 (RT)

NOTE: ALL CSP WILL BE ROD LUG AND GASKET CONNECTOR

SEE SHEET 71 FOR -Y1 DET- PROFILE

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104.001.001/u2519cb/Roadway/proj/u2519cb_rdy_psh02-n

7/2/99

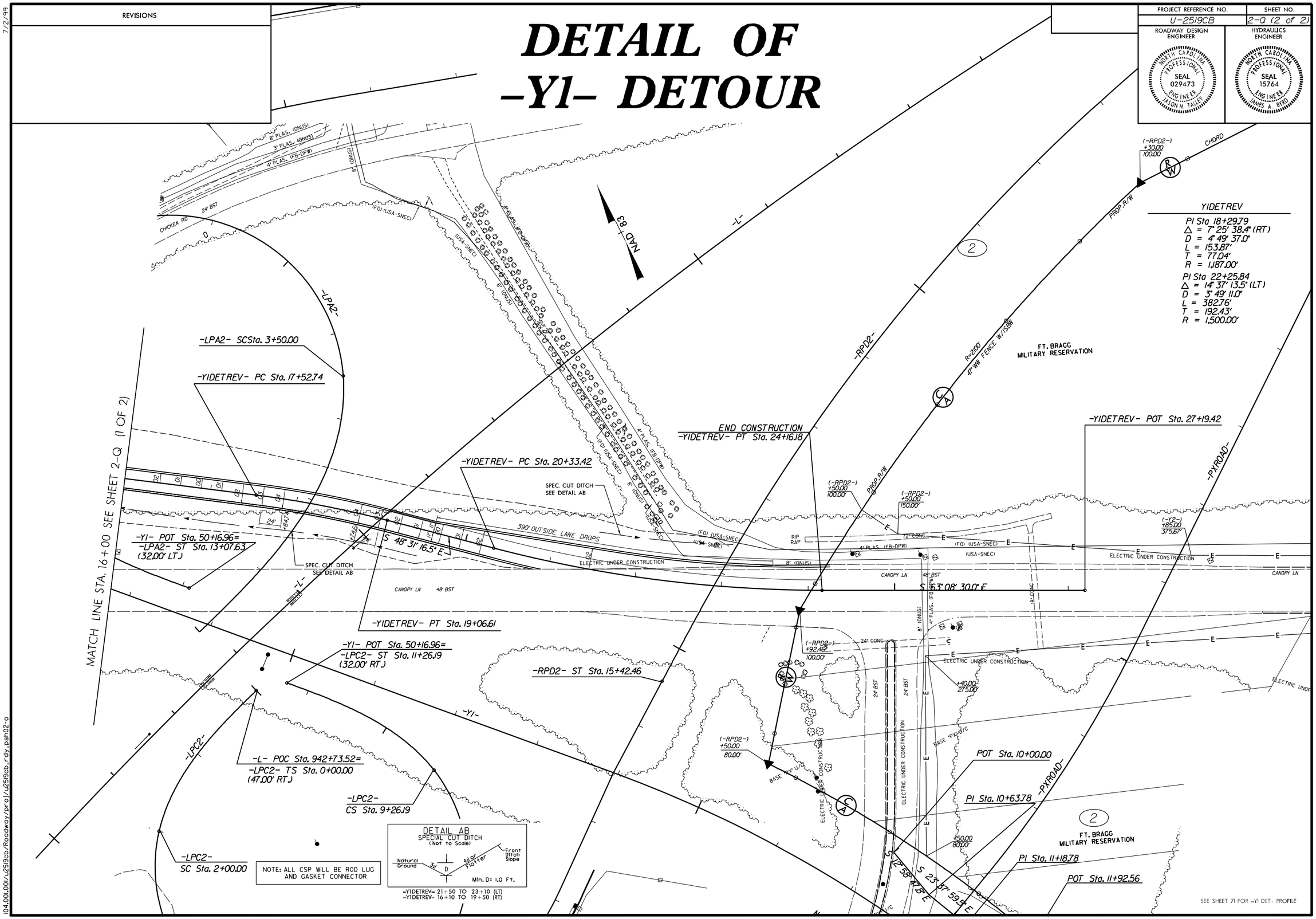
REVISIONS

DETAIL OF -Y1- DETOUR

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	2-0 (2 of 2)

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYRD



104.001.001/u2519cb/Roadway/proj/u2519cb_rdy_psh02-o

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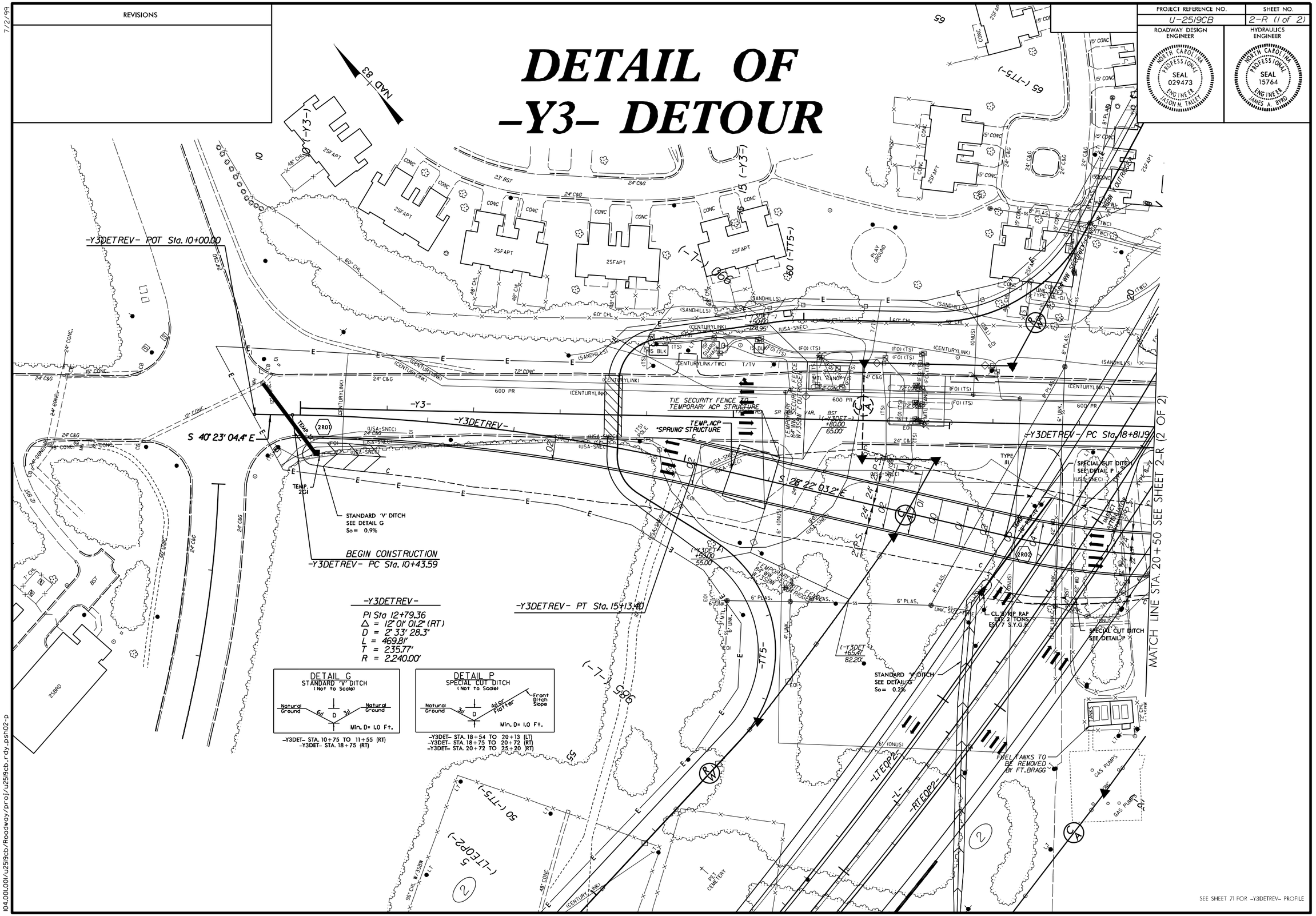
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	2-R (1 of 2)

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TAILEY

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYRD

DETAIL OF -Y3- DETOUR



SEE SHEET 71 FOR -Y3DETREV- PROFILE

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy.psh02-p

7/2/99

REVISIONS

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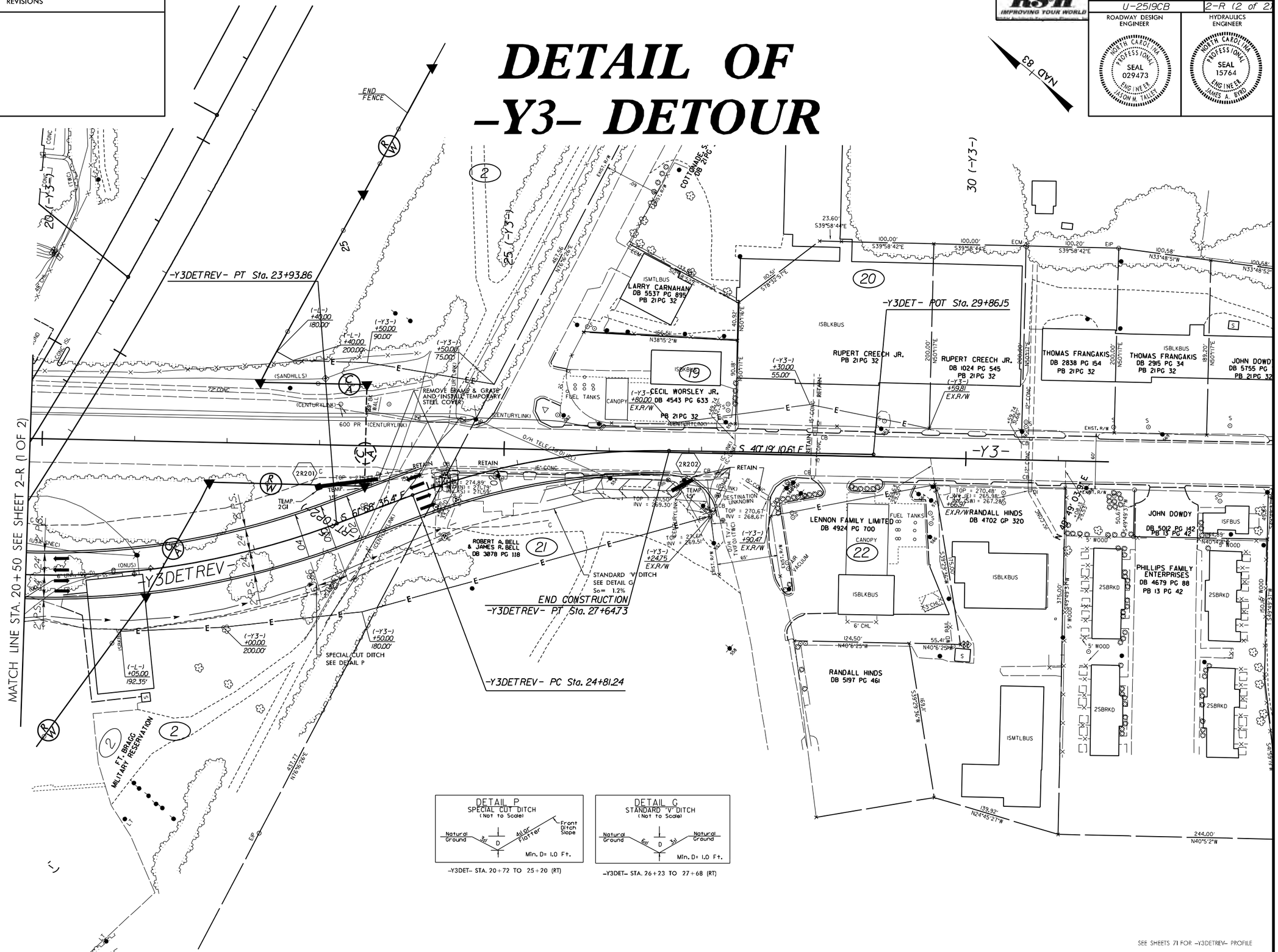
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	2-R (2 of 2)
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY	NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYRD

DETAIL OF -Y3- DETOUR



SEE SHEETS 71 FOR -Y3DETREV- PROFILE

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy_psh02-q

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REVISIONS

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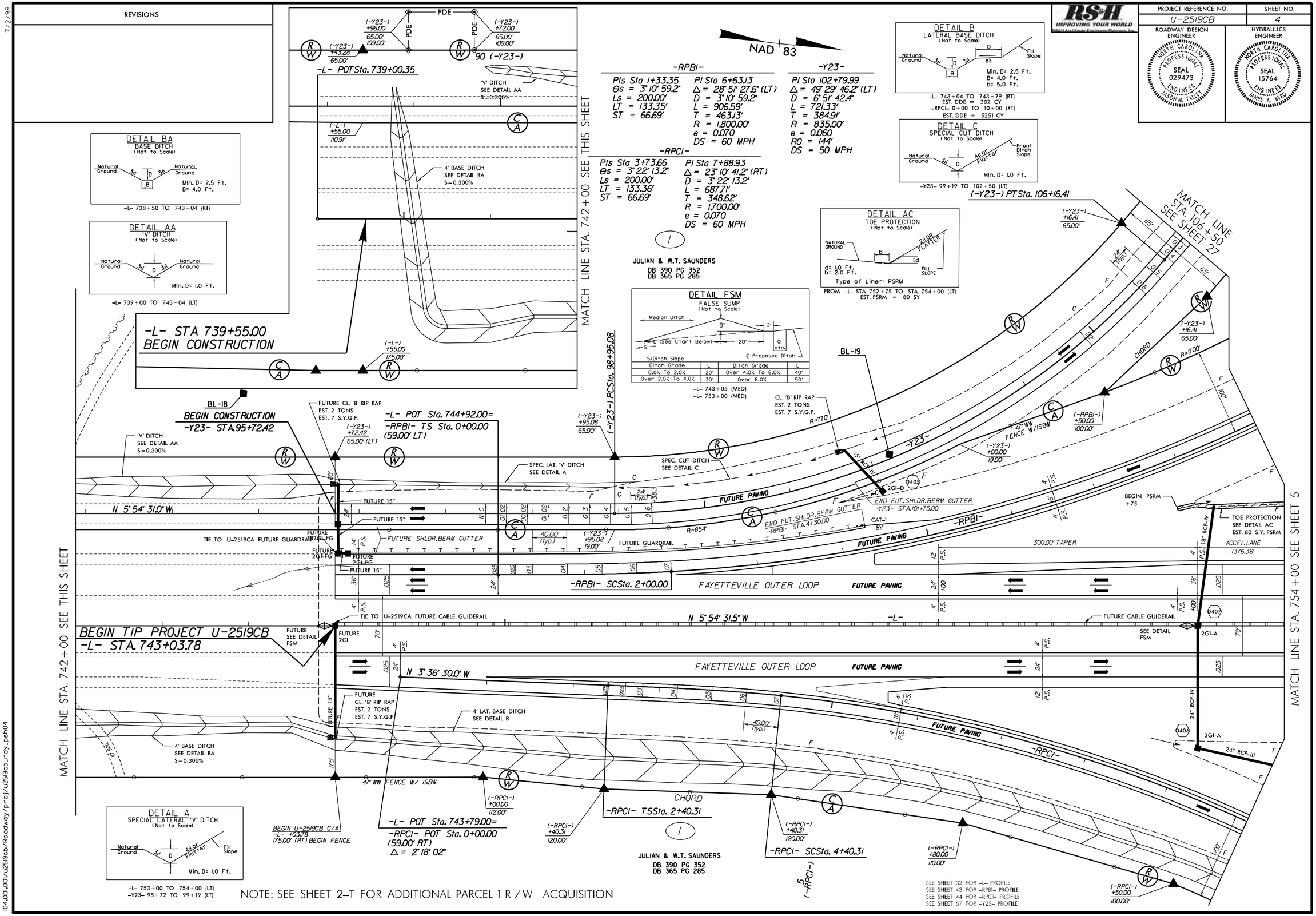
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	4

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYRD



104.001.001/u2519cb/Roadway/proj/u2519cb_rdy.psh04

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — SEAL 029473

HYDRAULICS ENGINEER — SEAL 15764

REVISIONS

NAD 83

2014 / 2034 ADT In hundreds

-Y5- 243 / 322 — 88 / 127 — 120 / 159 — 396 / 526 — 330 / 455 — 94 / 134 — 129 / 173 — 258 / 363

-L-

MATCH LINE STA. 242+50 SEE SHEET 28

MATCH LINE STA. 754+00 SEE SHEET 4

MATCH LINE STA. 781+00 SEE SHEET 6

MATCH LINE STA. 257+50 SEE SHEET 29

JULIAN & W.T. SAUNDERS DB 320 PG 292 DB 365 PG 285

FT. BRAGG MILITARY RESERVATION

FAYETTEVILLE OUTER LOOP

FUTURE PAVING

FUTURE CABLE GUIDERAIL

CABLE GUIDERAIL

47" WW FENCE W/ 15BW

DANGER TREE AREA

NOTE: CONC. SLOPE PROTECTION (STR. PAY ITEM)

NOTE: ALL CSP OR CAAP WILL BE ROD LUG AND GASKET CONNECTOR

★ TRAFFIC SIGNAL

SEE SHEET 2-5 FOR BRIDGE SKETCH
SEE SHEETS 32 & 33 FOR -L- PROFILE
SEE SHEET 42 FOR -RPAI- PROFILE
SEE SHEET 43 FOR -RPBI- PROFILE
SEE SHEET 44 FOR -RPCI- PROFILE
SEE SHEET 45 FOR -RPDI- PROFILE
SEE SHEET 46 FOR -LPAI- & -LPCI- PROFILES
SEE SHEET 47 FOR -Y5- PROFILE
FOR STRUCTURE PLANS,
SEE SHEET 5- THRU' 5-

PAVEMENT REMOVAL

GRAPHIC SCALE — 0 — PLANS

LOCATION: -L- FAYETTEVILLE OUTER LOOP AT -Y5- SR 1400 (CLIFFDALE ROAD)

TIP NO.: U-2519CB — COUNTY: CUMBERLAND

DESIGNED BY:

CHECKED BY: — DATE:

7/2/99

REVISIONS

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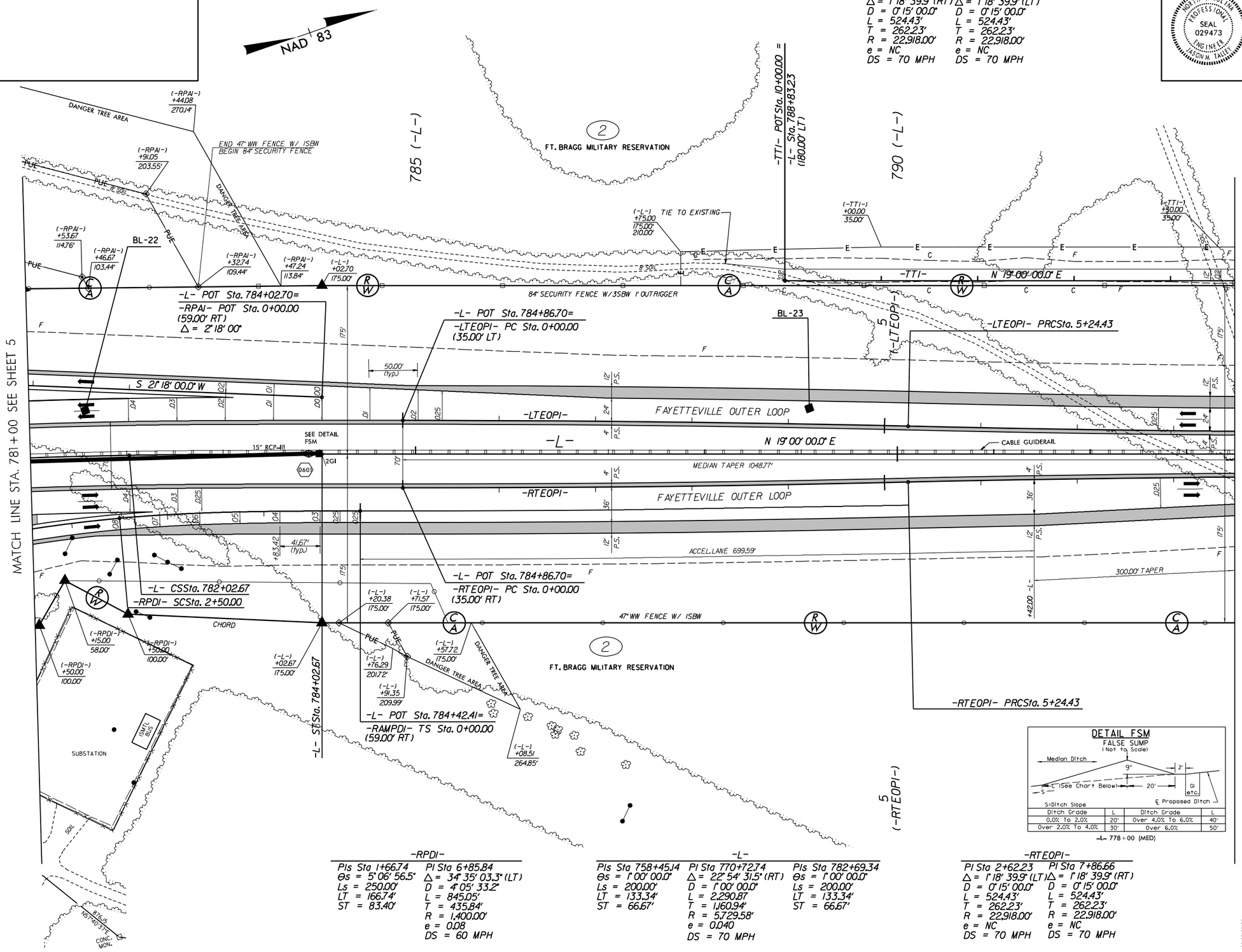
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	6

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYRD



-RPDI-

PIs Sta 1+66.74
Θs = 5° 06' 56.5"
Ls = 250.00'
LT = 166.74'
ST = 83.40'

PI Sta 6+85.84
Δ = 34° 35' 03.3" (LT)
D = 4° 05' 33.2"
L = 845.05'
T = 435.84'
R = 1,400.00'
e = 0.08
DS = 60 MPH

-L-

PIs Sta 758+45.14
Θs = 1° 00' 00.0"
Ls = 200.00'
LT = 133.34'
ST = 66.67'

PI Sta 770+72.74
Δ = 22° 54' 31.5" (RT)
D = 1° 00' 00.0"
L = 2,290.87'
T = 1,160.94'
R = 5,729.58'
e = 0.040
DS = 70 MPH

PIs Sta 782+69.34
Θs = 1° 00' 00.0"
Ls = 200.00'
LT = 133.34'
ST = 66.67'

-RTEOPI-

PI Sta 2+62.23
Δ = 1° 18' 39.9" (LT)
D = 0° 15' 00.0"
L = 524.43'
T = 262.23'
R = 22,918.00'
e = NC
DS = 70 MPH

PI Sta 7+86.66
Δ = 1° 18' 39.9" (RT)
D = 0° 15' 00.0"
L = 524.43'
T = 262.23'
R = 22,918.00'
e = NC
DS = 70 MPH

SEE SHEET 33 FOR -L- PROFILE
SEE SHEET 42 FOR -RPAI- PROFILE
SEE SHEET 45 FOR -RPDI- PROFILE
SEE SHEET 62 FOR -TTI- PROFILE

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PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	7

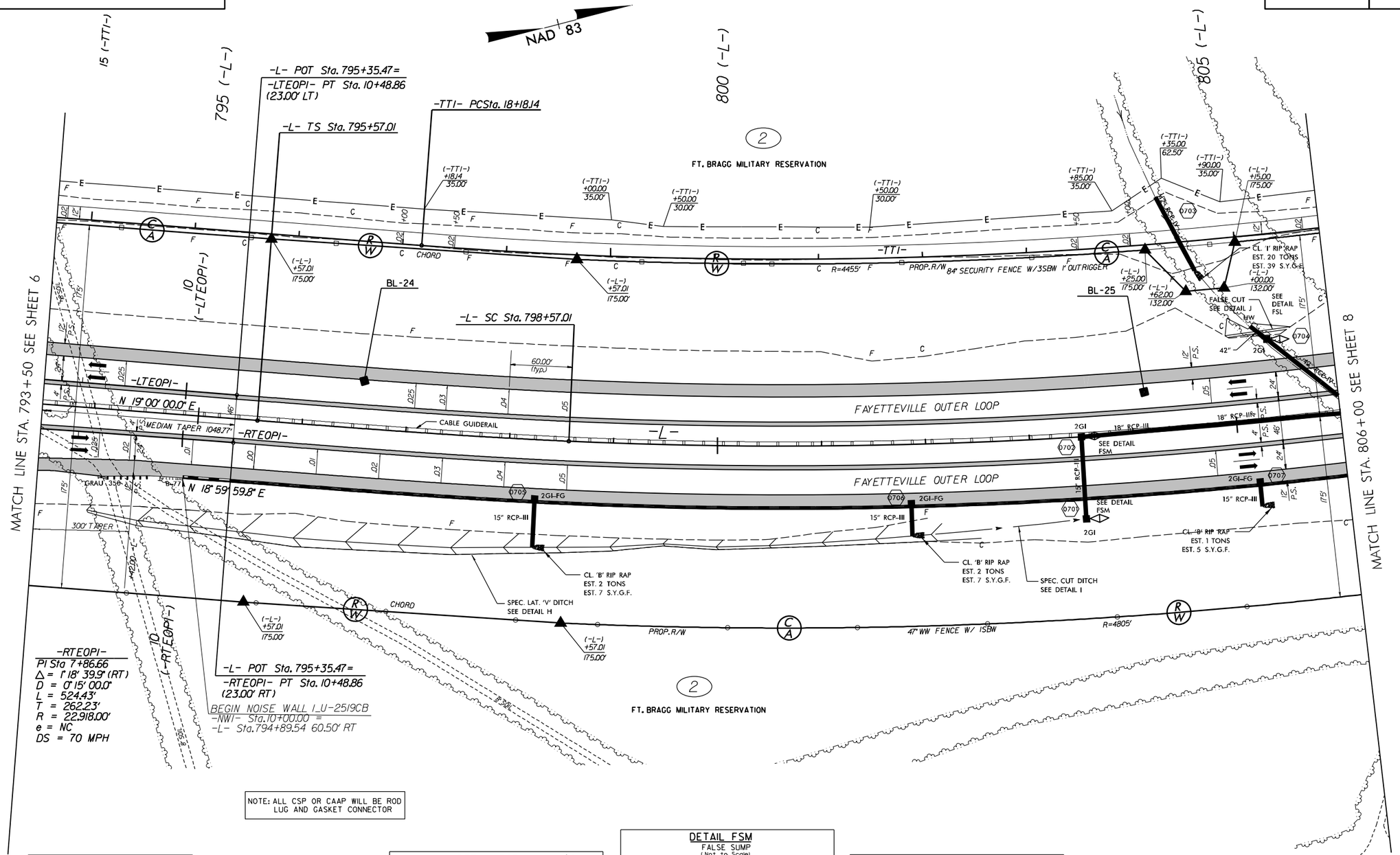
ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BIVID

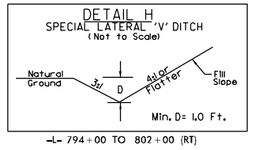
-LTEOPI-
PI Sta 7+86.66
Δ = 1° 18' 39.9" (LT)
D = 0° 15' 00.0"
L = 524.43'
T = 262.23'
R = 22,918.00'
e = NC
DS = 70 MPH

-L-
PIs Sta 797+57.02 PI Sta 815+21.68
θs = 1° 51' 22.4"
Ls = 300.00'
LT = 200.01'
ST = 100.01'
Δ = 39° 33' 04.0" (LT)
D = 1° 14' 15.0"
L = 3,196.08
T = 1,664.67'
R = 4,630.00'
e = 0.050
DS = 70 MPH

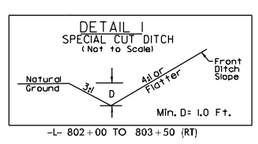
-TTI-
PI Sta 30+17.35
Δ = 30° 04' 02.0" (LT)
D = 1° 16' 59.6"
L = 2,343.11'
T = 1,199.20'
R = 4,465.00'



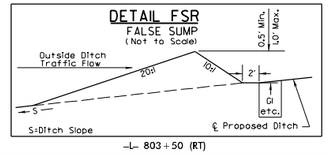
NOTE: ALL CSP OR CAAP WILL BE ROD LUG AND GASKET CONNECTOR



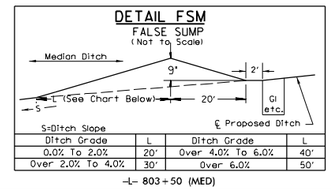
-L- 794+00 TO 802+00 (RT)



-L- 802+00 TO 803+50 (RT)

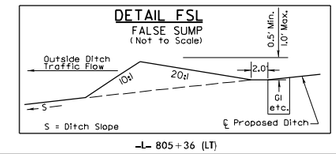


-L- 803+50 (RT)

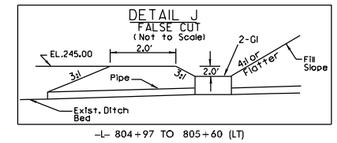


Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

-L- 803+50 (MED)



-L- 805+36 (LT)



-L- 804+97 TO 805+60 (LT)

SEE SHEETS 33 & 34 FOR -L- PROFILE
SEE SHEET 62 & 63 FOR -TTI- PROFILE

104.00.001/u2519cb/Roadway/proj/u2519cb_rdy.psh07

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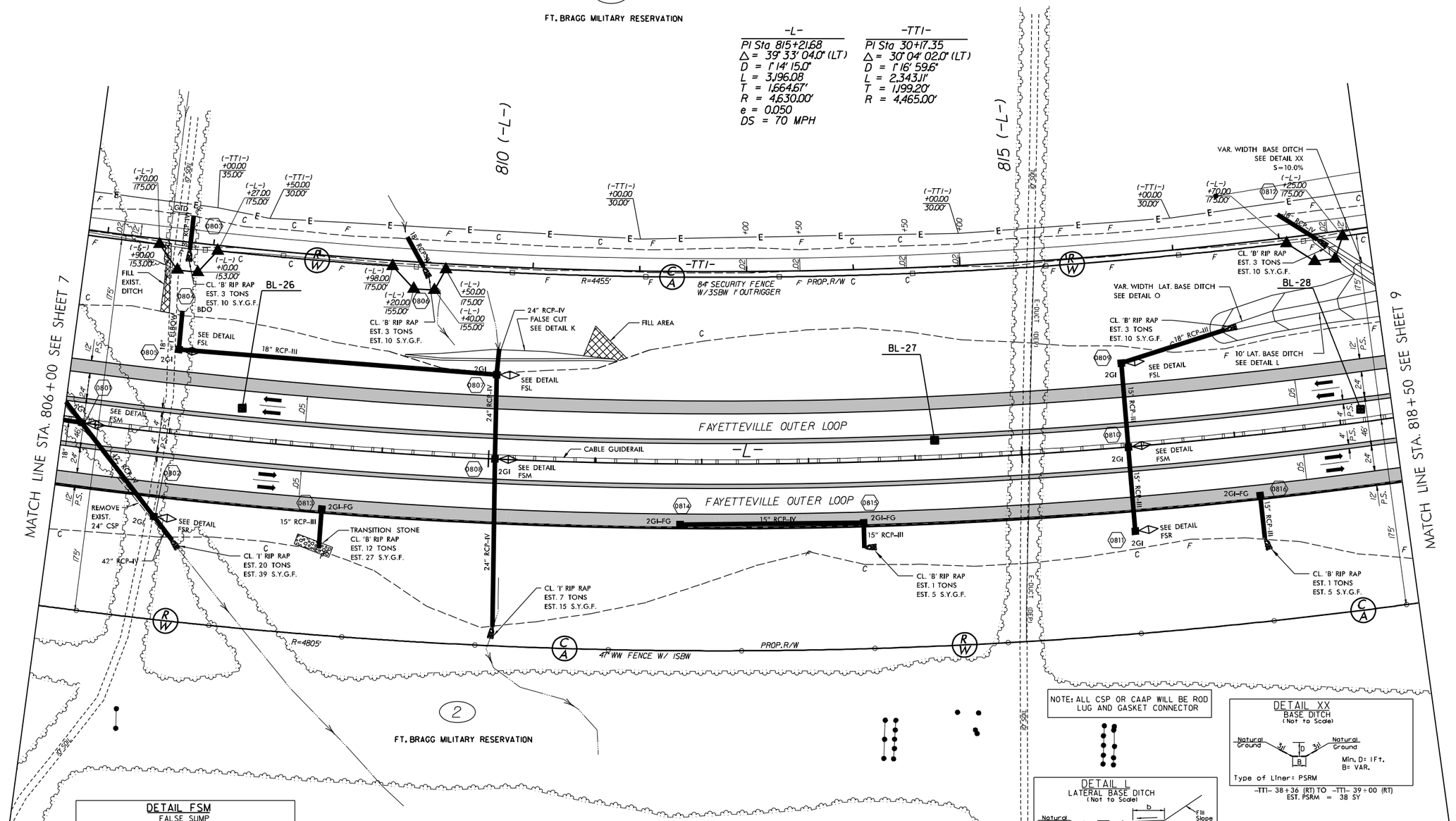
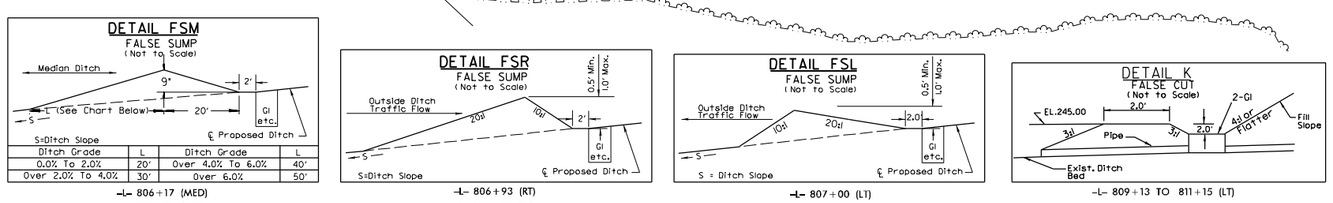
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	8

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYRD



NOTE: ALL CSP OR CAAP WILL BE ROD LUG AND GASKET CONNECTOR



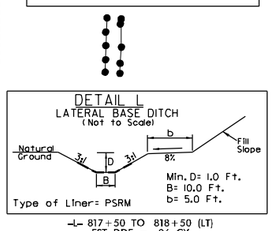
Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

-L- 806+17 (MED)
-L- 810+06 (MED)
-L- 816+00 (MED)

-L- 806+93 (RT)
-L- 816+00 (RT)

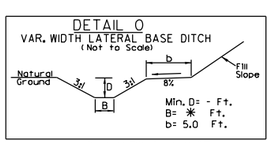
-L- 807+00 (LT)
-L- 810+04 (LT)
-L- 816+00 (LT)

-L- 809+13 TO 811+15 (LT)



-L- 817+50 TO 818+50 (LT)
EST. DDE = 96 CY
EST. PSRM = 111 SY

-TTI- 38+36 (RT) TO -TTI- 39+00 (RT)
EST. PSRM = 38 SY



-L- 817+00 TO 817+50 (LT)
EST. DDE = 41 CY
* B VARIES (2' TO 10')

SEE SHEET 34 FOR -L- PROFILE
SEE SHEET 63 & 64 FOR -TTI- PROFILE

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy_psh08

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REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	9

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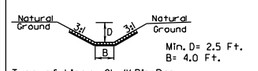
ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON W. TALLEY

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYRD

DETAIL ZZ
BASE DITCH
(Not to Scale)

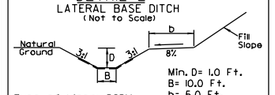


Min. D= 2.5 Ft.
B= 4.0 Ft.

Type of Liner= CL. 'I' Rip-Rap

-L- 829+86 TO 830+36 (LT)
EST. DDE = 19 CY
EST. CLASS I RIP-RAP = 20 TN

DETAIL L
LATERAL BASE DITCH
(Not to Scale)

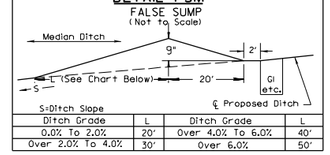


Min. D= 1.0 Ft.
B= 10.0 Ft.
b= 5.0 Ft.

Type of Liner= PSRM

-L- 818+50 TO 821+90 (LT)
EST. DDE = 578 CY
EST. PSRM = 378 SY

DETAIL FSM
FALSE SUMP
(Not to Scale)

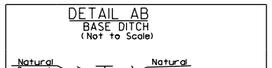


S=Ditch Slope

Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

-L- 820+50 (MED)

DETAIL AB
BASE DITCH
(Not to Scale)

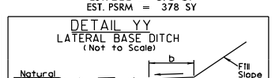


Min. D= 2.5 Ft.
B= 4.0 Ft.

Type of Liner= PSRM

-L- 830+36 TO 831+00 (LT)
EST. DDE = 172 CY
EST. PSRM = 28 SY

DETAIL YY
LATERAL BASE DITCH
(Not to Scale)



Min. D= 1.0 Ft.
B= 10.0 Ft.
b= 5.0 Ft.

Type of Liner= CL. 'I' Rip-Rap

-L- 821+90 TO 822+40 (LT)
EST. DDE = 208 CY
EST. CLASS I RIP-RAP = 39 TN

NOTE: ALL CSP OR CAAP WILL BE ROD LUG AND GASKET CONNECTOR

-L-

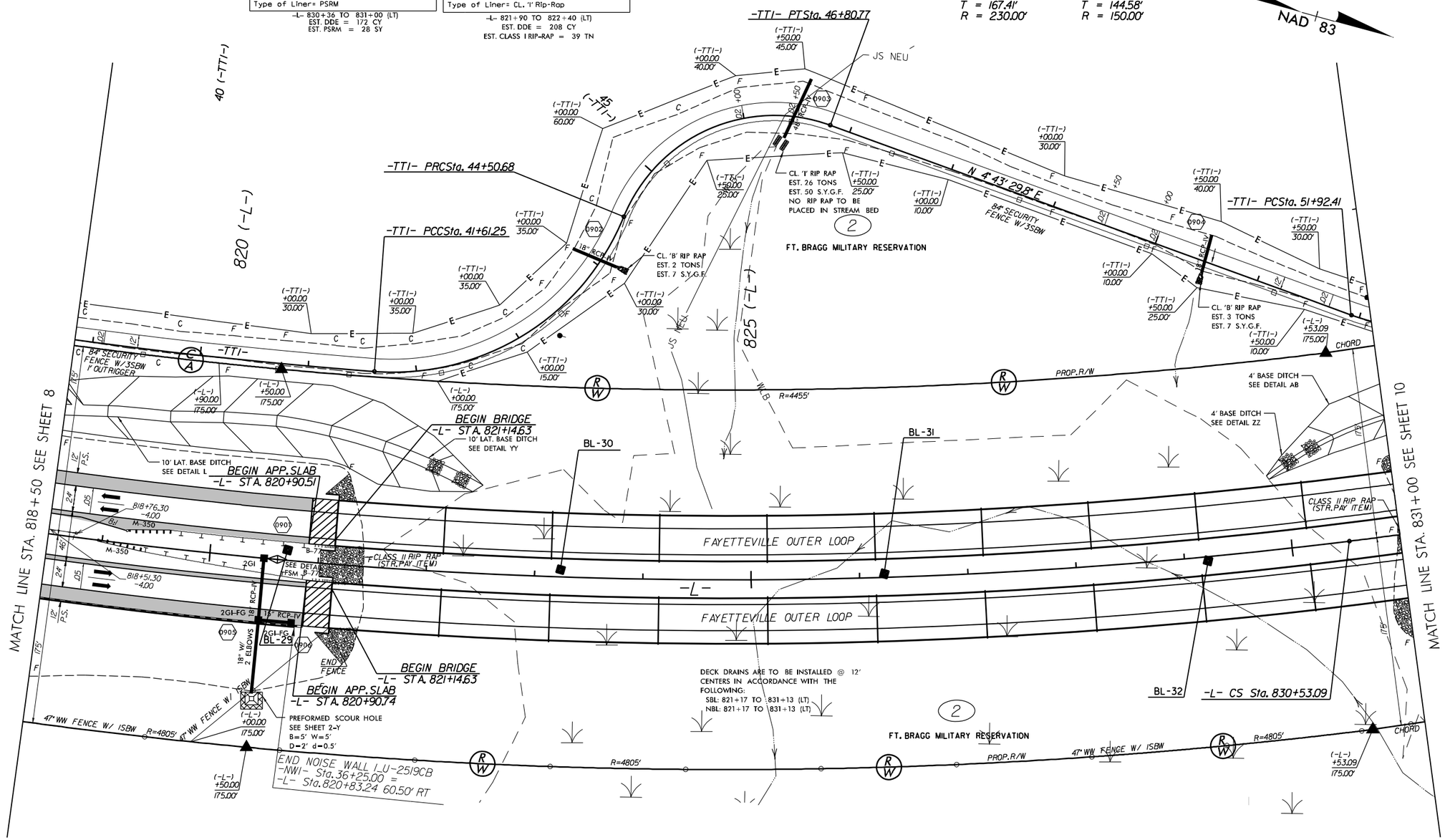
PIs Sta 831+53.10
Θs = 1° 51' 22.4"
Ls = 300.00'
LT = 200.01'
ST = 100.01'

PI Sta 815+21.68
Δ = 39° 33' 04.0" (LT)
D = 1° 14' 15.0"
L = 3,196.08
T = 1,664.67'
R = 4,630.00'
e = 0.050
DS = 70 MPH

-TTI-

PI Sta 43+28.66
Δ = 72° 05' 56.3" (LT)
D = 24° 54' 40.4"
L = 289.42'
T = 167.41'
R = 230.00'

PI Sta 45+95.25
Δ = 87° 53' 28.1" (RT)
D = 38° 11' 49.9"
L = 230.10'
T = 144.58'
R = 150.00'



SEE SHEETS 34 & 35 FOR -L- PROFILE
SEE SHEET 64 FOR -TTI- RPOFILE
SEE SHEET 2-S FOR BRIDGE SKETCH
FOR STRUCTURE PLANS, SEE SHEETS S- THRU S-

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy_psh09

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REVISIONS

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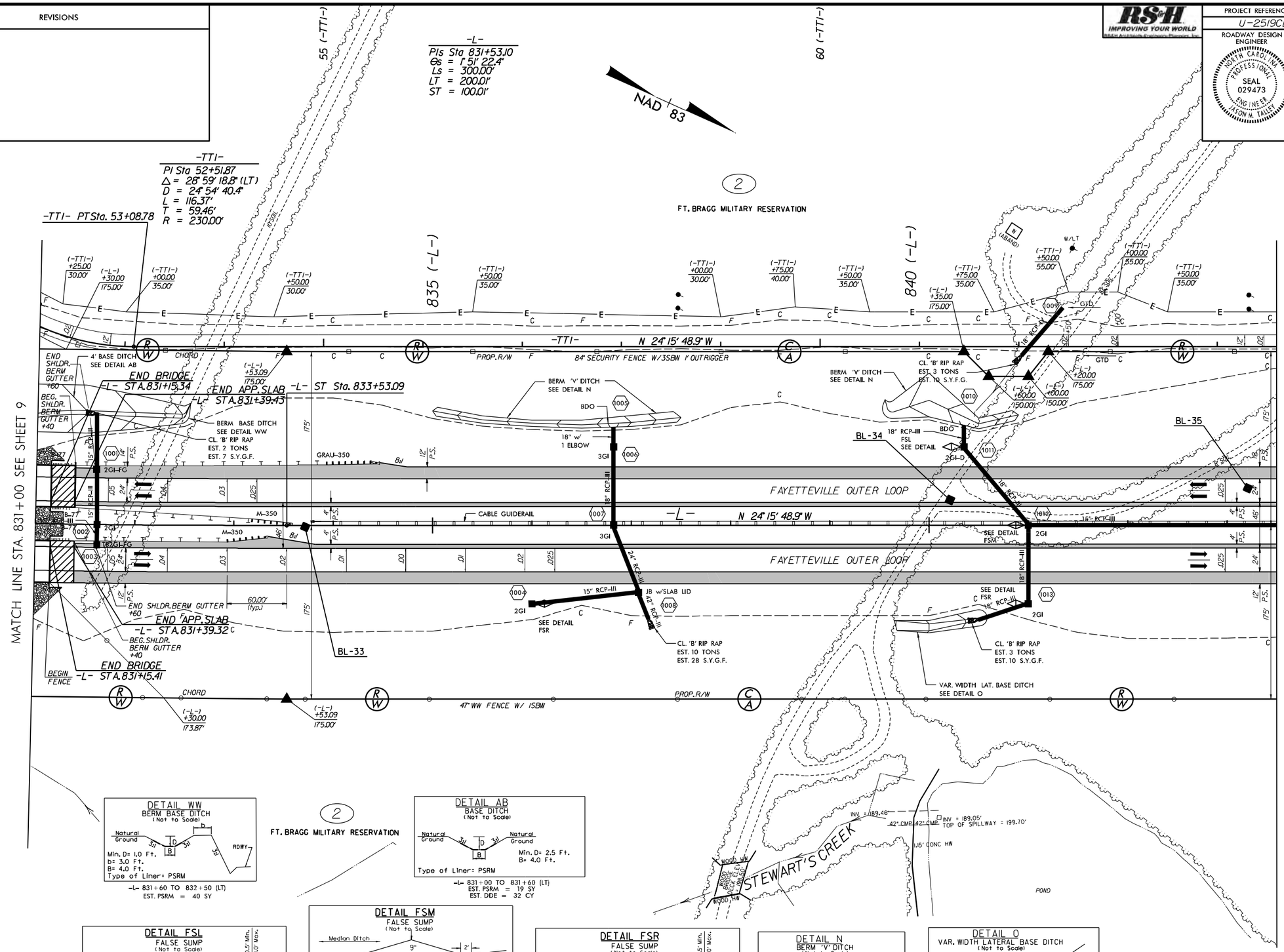
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	10

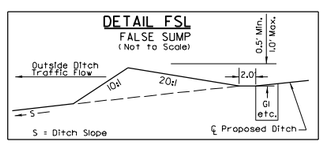
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TAILLE

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYRD

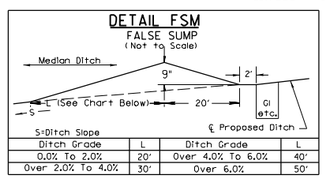


-L- 831+60 TO 832+50 (LT)
EST. PSRM = 40 SY

-L- 831+00 TO 831+60 (LT)
EST. PSRM = 19 SY
EST. DDE = 32 CY

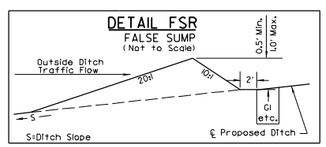


-L- 840+35 (LT)

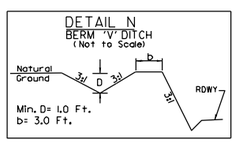


Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

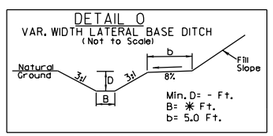
-L- 841+00 (MED)



-L- 836+00 (RT)



-L- 835+00 TO 837+50 (LT)
-L- 839+60 TO 840+90 (LT)



-L- 839+65 to 840+50 (RT)
EST. DDE = 35 CY
✳ B (VARIES 2' to 10')

NOTE: ALL CSP OR CAAP WILL BE ROD LUG AND GASKET CONNECTOR

SEE SHEET 35 FOR -L- PROFILE
SEE SHEET 64 -TT1- FOR PROFILE

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REVISIONS

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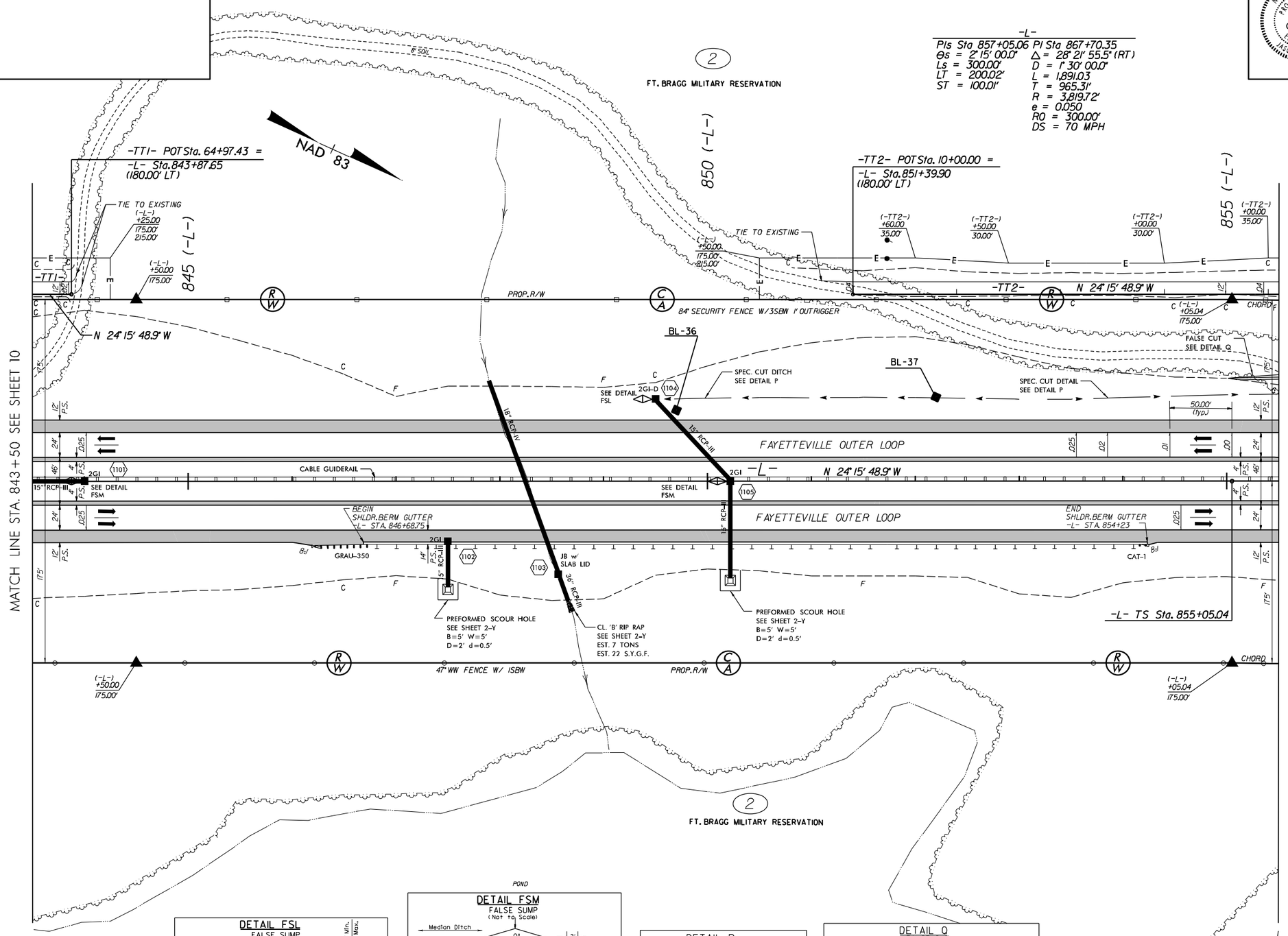
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY

NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYRD



SEE SHEETS 35 & 36 FOR -L- PROFILE
SEE SHEET 64 FOR -TT1- PROFILE
SEE SHEET 65 FOR -TT2- PROFILE

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy_pshll

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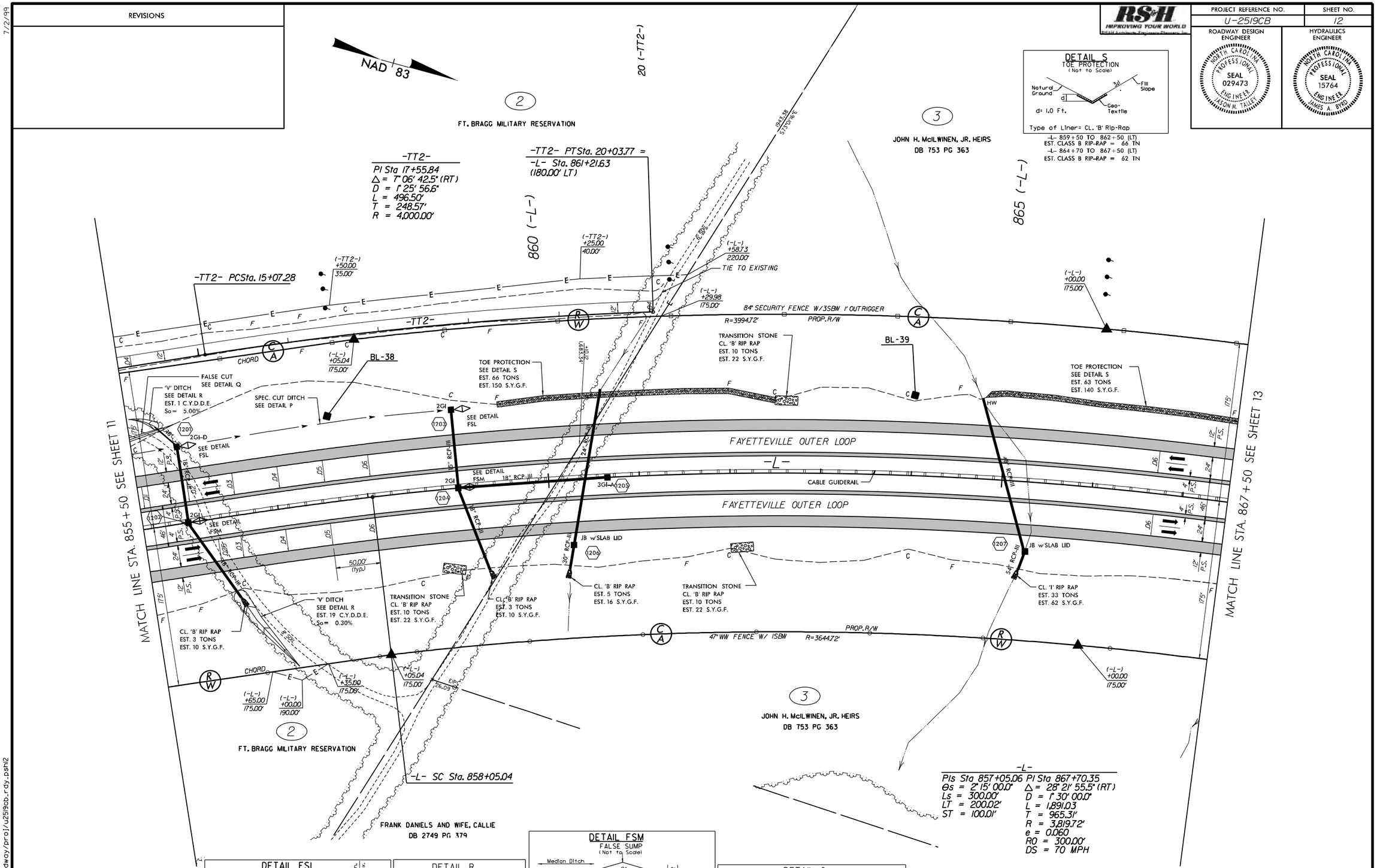
REVISIONS

RS&H IMPROVING YOUR WORLD

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	12

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON W. FAILEY

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYRD

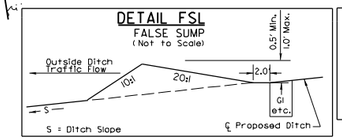


DETAIL S
TOE PROTECTION
(Not to Scale)

Type of Liner= CL. 'B' Rip-Rap

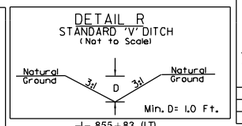
-L- 859+50 TO 862+50 (LT)
EST. CLASS B RIP-RAP = 66 TN
-L- 864+70 TO 867+50 (LT)
EST. CLASS B RIP-RAP = 62 TN

DETAIL FSL
FALSE SUMP
(Not to Scale)



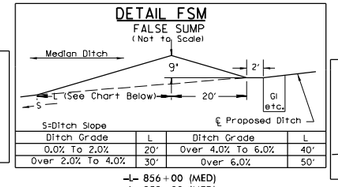
-L- 856+00 (LT)
-L- 859+00 (LT)

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



-L- 855+83 (LT)
-L- 856+43 (RT)

DETAIL FSM
FALSE SUMP
(Not to Scale)

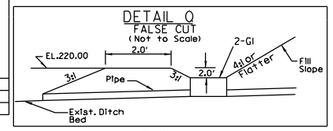


S=Ditch Slope

Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

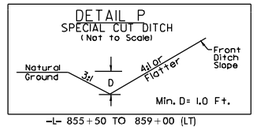
-L- 856+00 (MED)
-L- 859+00 (MED)

DETAIL Q
FALSE CUT
(Not to Scale)



-L- 855+00 TO 855+95 (LT)

DETAIL P
SPECIAL CUT DITCH
(Not to Scale)



-L- 855+50 TO 859+00 (LT)

NOTE: ALL CSP OR CAAP WILL BE ROD LUG AND GASKET CONNECTOR

SEE SHEET 36 FOR -L- PROFILE
SEE SHEET 65 FOR -TT2- PROFILE

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy.psh12

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	13

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BIRD

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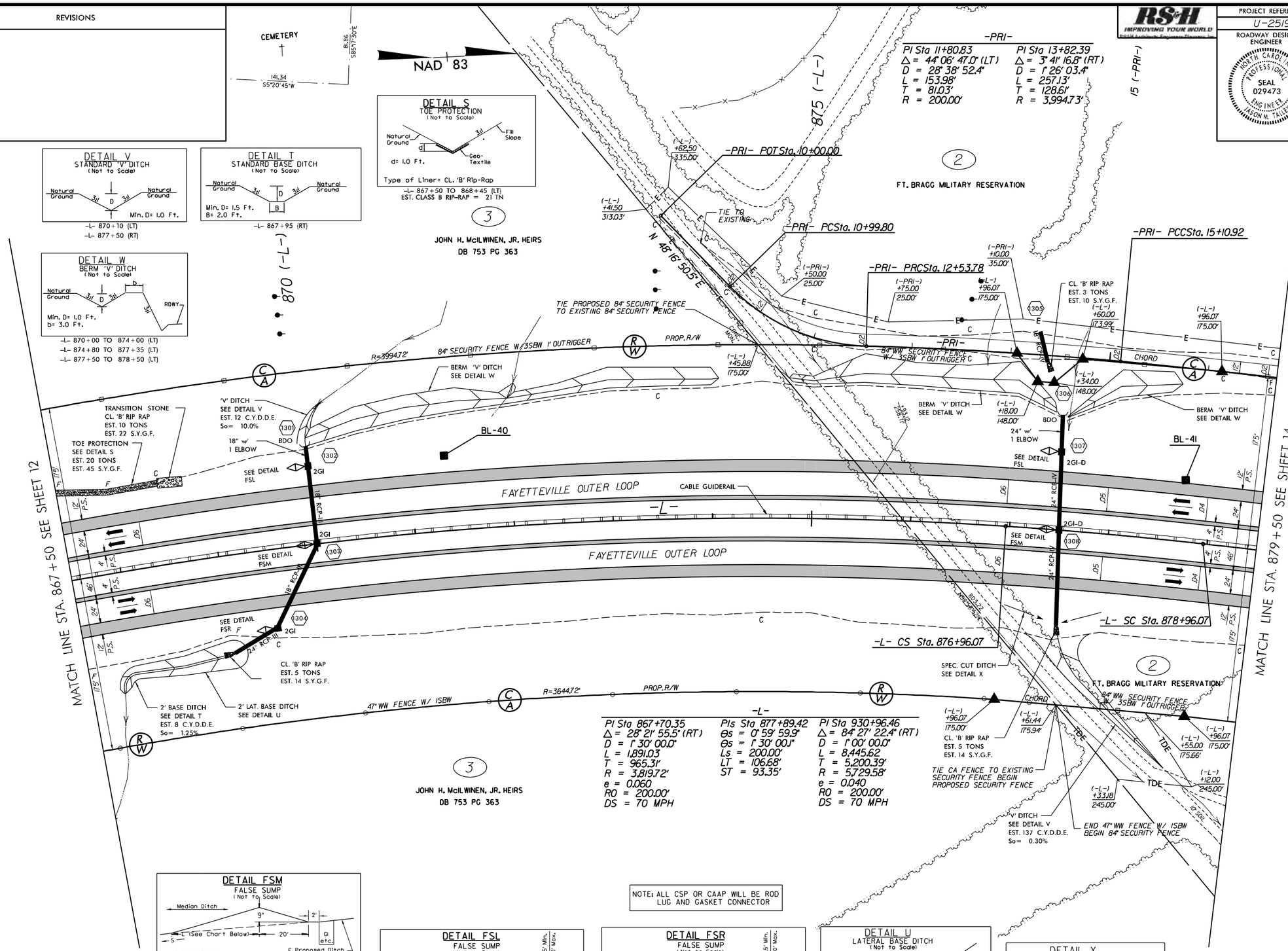

NOTE: ALL CSP OR CAAP WILL BE ROD LUG AND GASKET CONNECTOR

SEE SHEETS 36 & 37 FOR -L- PROFILE
SEE SHEET 59 FOR -PRI- PROFILE

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REVISIONS

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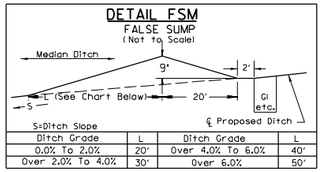
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	14
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY

NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYRD

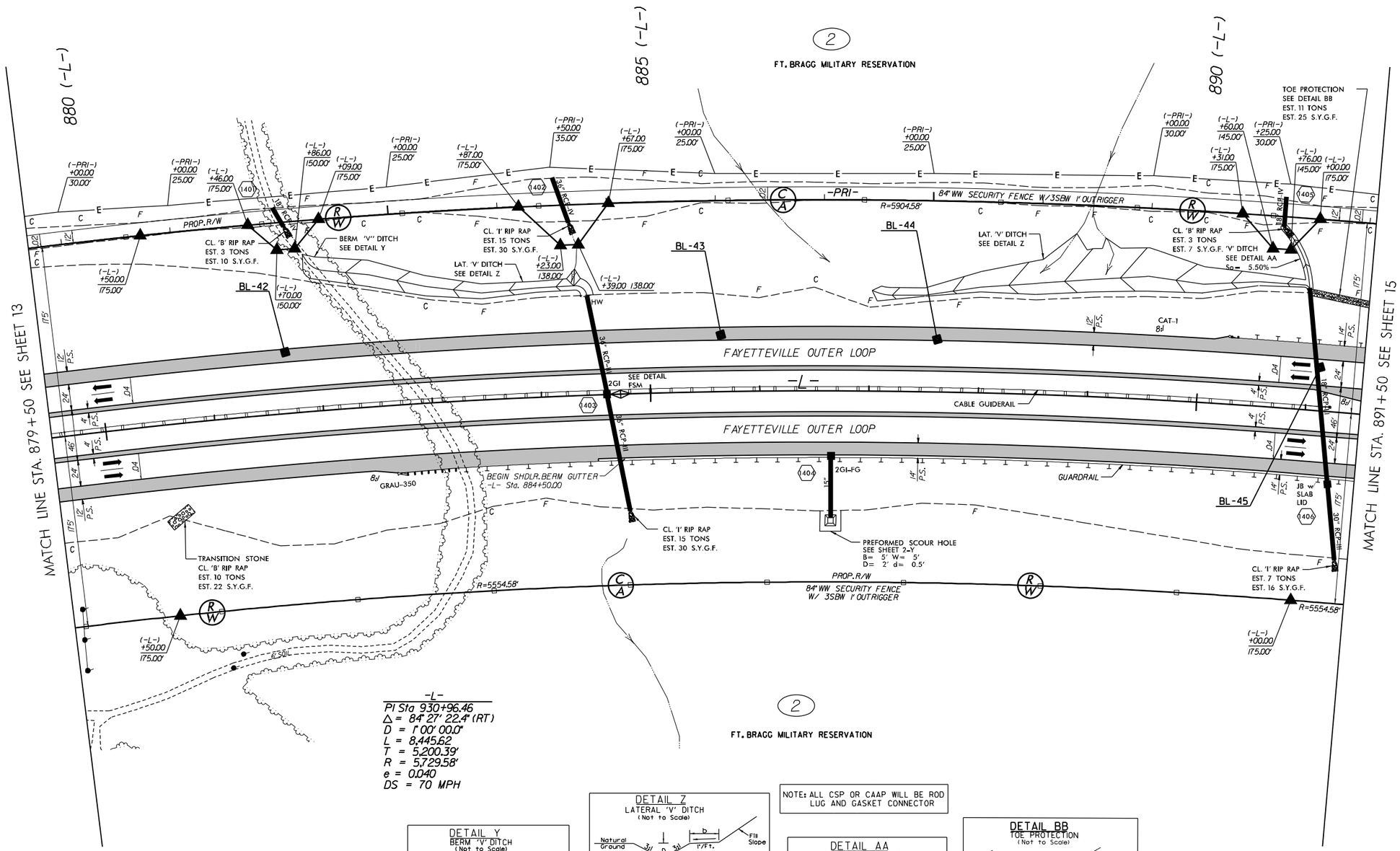
DETAIL FSM
FALSE SUMP
(Not to Scale)



S=Ditch Slope

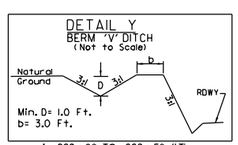
Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

-L- 884+60 (MED)



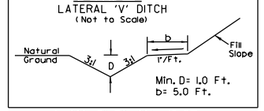
NOTE: ALL CSP OR CAAP WILL BE ROD LUG AND GASKET CONNECTOR

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



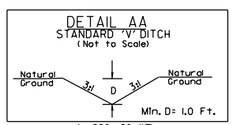
-L- 882+00 TO 883+50 (LT)

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



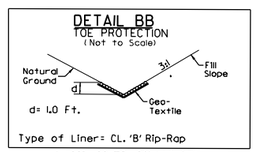
-L- 883+50 TO 884+45 (LT)
EST. DDE = 56 CY
-L- 887+00 TO 890+95 (LT)
EST. DDE = 923 CY

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



-L- 890+90 (LT)

DETAIL BB
TOE PROTECTION
(Not to Scale)



-L- 891+00 TO 891+50 (LT)
EST. CLASS B RIP-RAP = 11 TN

SEE SHEET 37 FOR -L- PROFILE
SEE SHEET 59 FOR -PRI- PROFILE

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I04.001.001/u2519cb/Roadway/proj/u2519cb_rdy.pshl4

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 029473 ENGINEER JASON M. TALLEY	SEAL 15764 ENGINEER JAMES A. BYRD

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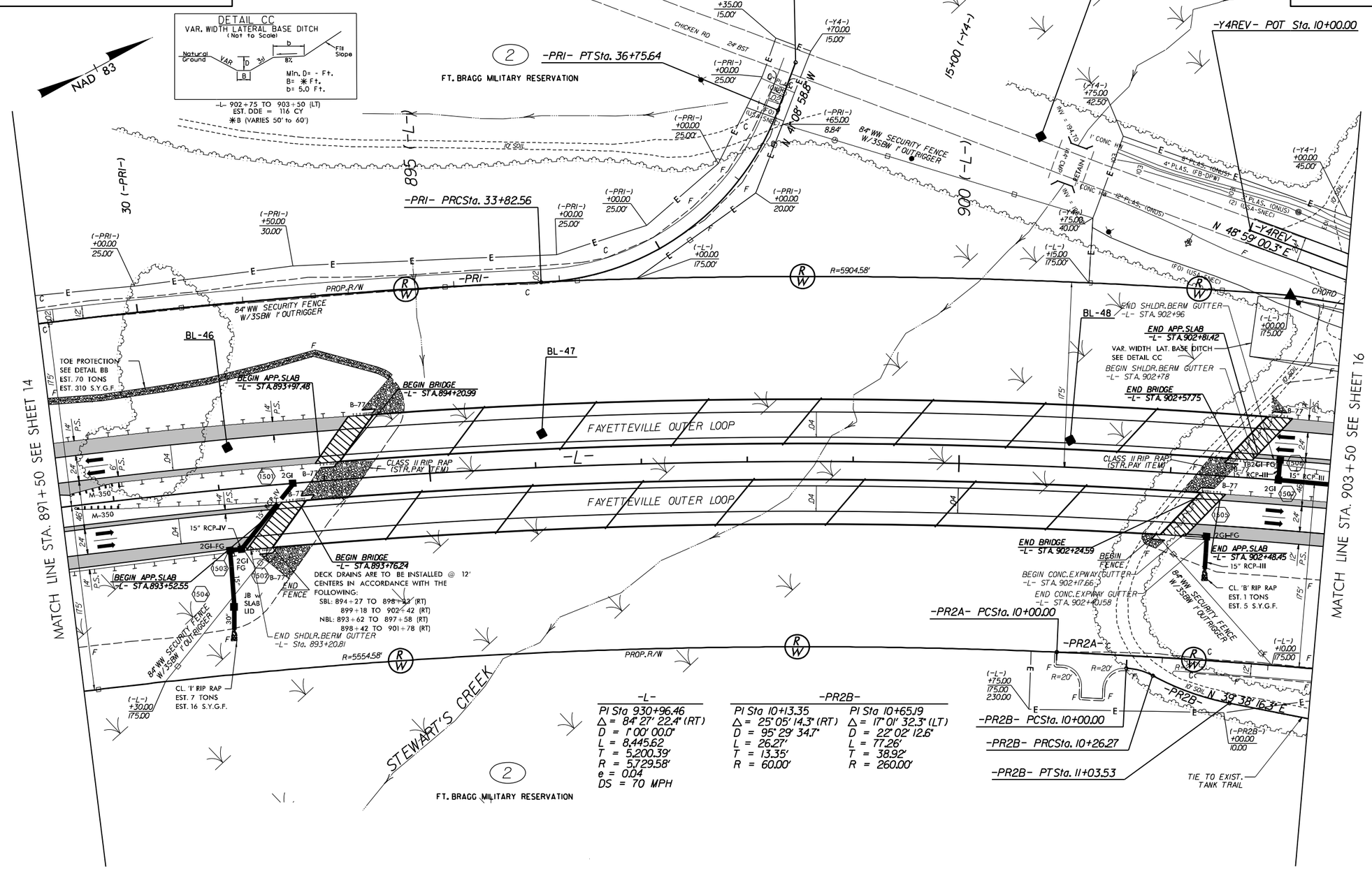
NOTE: ALL CSP OR CAAP WILL BE ROD LUG AND GASKET CONNECTOR

-PRI-
PI Sta 35+48.56
Δ = 67° 10' 01.5" (LT)
D = 22° 55' 06.0"
L = 293.07'
T = 166.00'
R = 250.00'

DETAIL BB
TOE PROTECTION
(Not to Scale)
Natural Ground, d, 3:1, Fill Slope, Geo-Textile
d= 1.0 Ft.
Type of Liner= CL. 'B' Rip-Rap
-L- 891+00 TO 894+70 (LT)
EST. CLASS B RIP-RAP = 70 TN

DETAIL CC
VAR. WIDTH LATERAL BASE DITCH
(Not to Scale)
Natural Ground, VAR, D, 3:1, b, 8%, B, Fill Slope
Min. D= - Ft.
B= ✱ Ft.
b= 5.0 Ft.
-L- 902+75 TO 903+50 (LT)
EST. DDE = 116 CY
✱B (VARIES 50' to 60')



-L-
PI Sta 9.30+96.46
Δ = 84° 27' 22.4" (RT)
D = 1° 00' 00.0"
L = 8,445.62
T = 5,200.39'
R = 5,729.58'
e = 0.04
DS = 70 MPH

-PR2B-
PI Sta 10+13.35
Δ = 25° 05' 14.3" (RT)
D = 95° 29' 34.7"
L = 26.27'
T = 13.35'
R = 60.00'

PI Sta 10+65.19
Δ = 17° 01' 32.3" (LT)
D = 22° 02' 12.6"
L = 77.26'
T = 38.92'
R = 260.00'

SEE SHEET 37 FOR -L- PROFILE
SEE SHEET 59 FOR -PRI- PROFILE
SEE SHEET 60 FOR -PR2A- PROFILE
SEE SHEET 2-5 FOR BRIDGE SKETCH
FOR STRUCTURE PLANS, SEE SHEET S- THRU S-

7/2/99

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy_pshl5

7/2/99

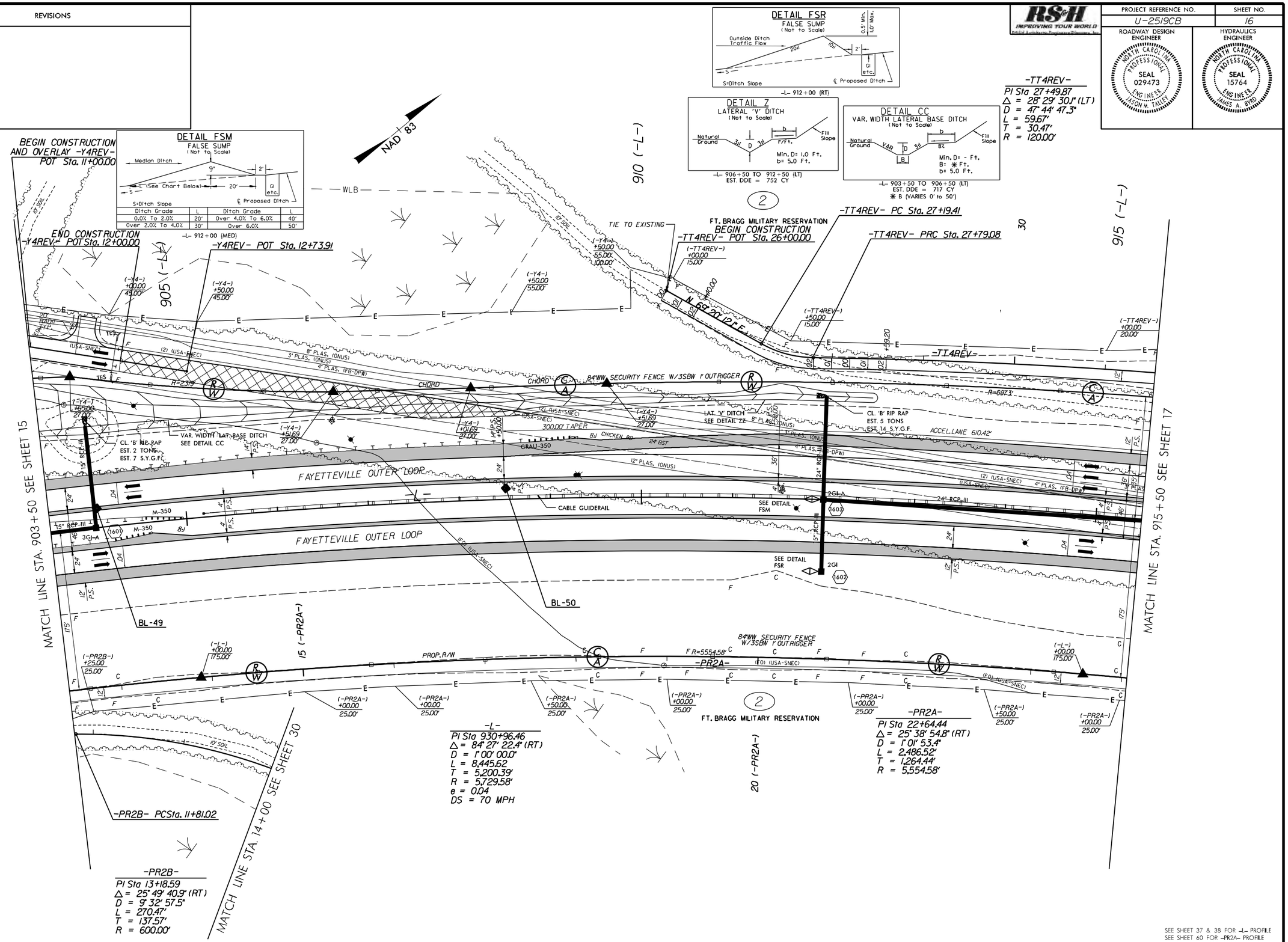
REVISIONS

RS&H IMPROVING YOUR WORLD

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TAILLEY

NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYRD



SEE SHEET 37 & 38 FOR -L- PROFILE
SEE SHEET 60 FOR -PR2A- PROFILE
SEE SHEET 65 FOR -TT4REV- PROFILE

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy.pshl6

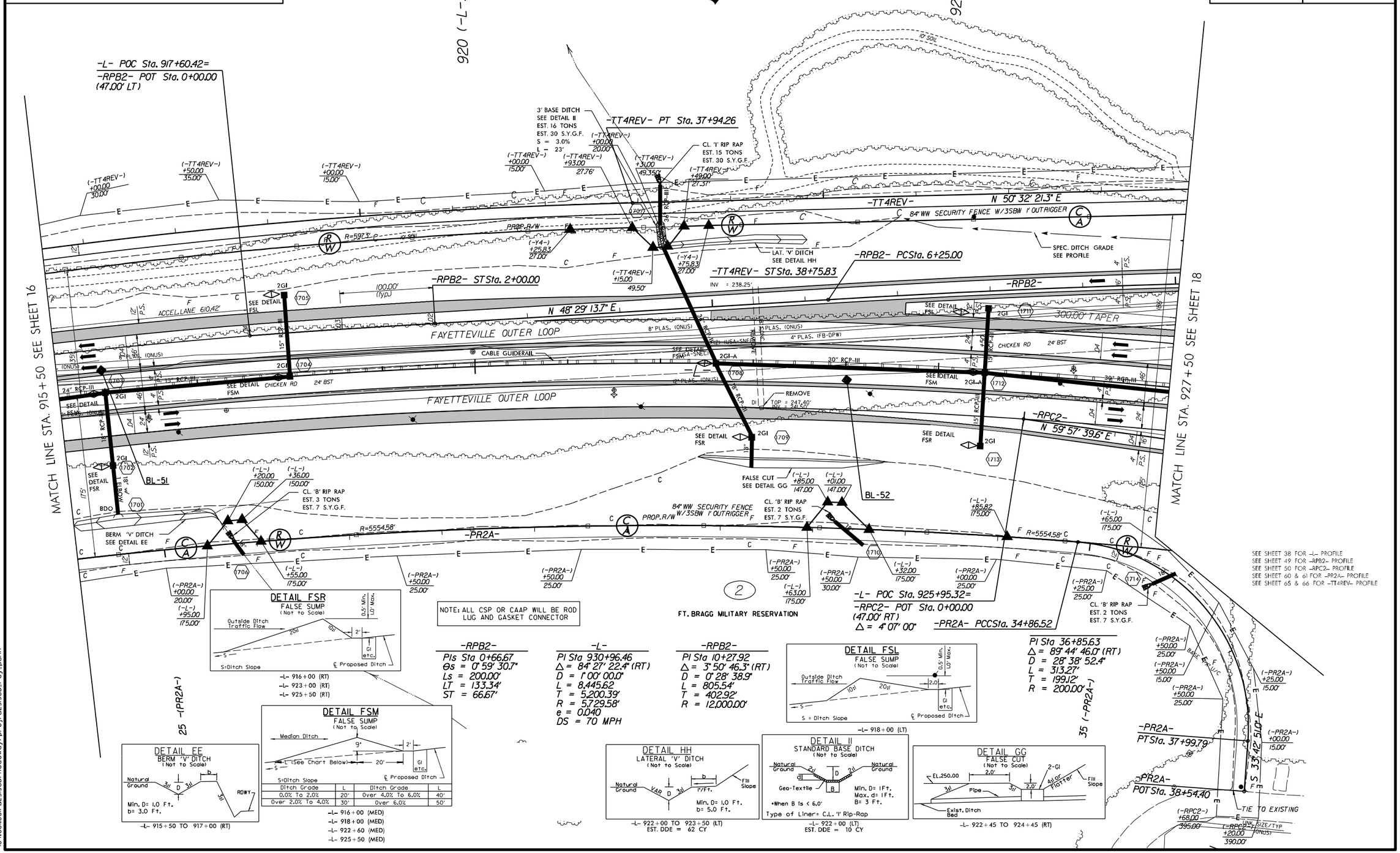
REVISIONS

RS&II IMPROVING YOUR WORLD

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	17
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TAILEY

NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BIRD



7/2/99

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy.pshl7

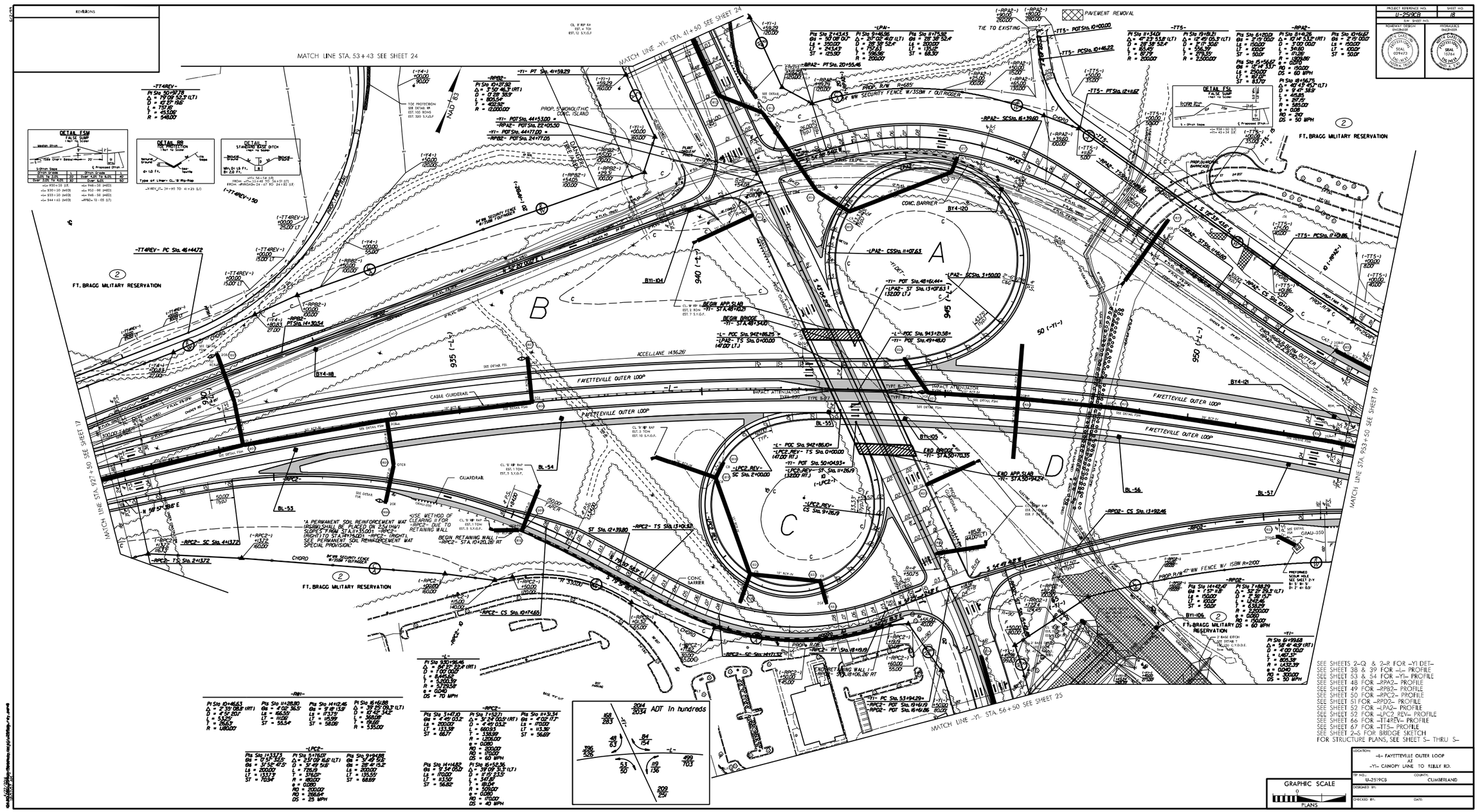
5-22-07 : ATTACHED UPDATED UTILITY ISLE SHOWING WATERLINE
5-07-06 : PUE & DANGER TREE AREA ADDED -Y1- STA 41+50 (RT) TO -RP1- STA 21+54.05 (LT) AND -Y1- STA 56+50 (LT) TO -RP02- STA 14+72.74 (LT)

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	18
S.P. SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 029423 ENGINEER

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 13764 ENGINEER



LOCATION: -L- FAYETTEVILLE OUTER LOOP AT -Y1- CANOPY LANE TO REILLY RD.

TIP NO.	COUNTY
U-2519CB	CUMBERLAND

DESIGNED BY: | CHECKED BY: | DATE:

GRAPHIC SCALE 0 — PLANS

7/2/99

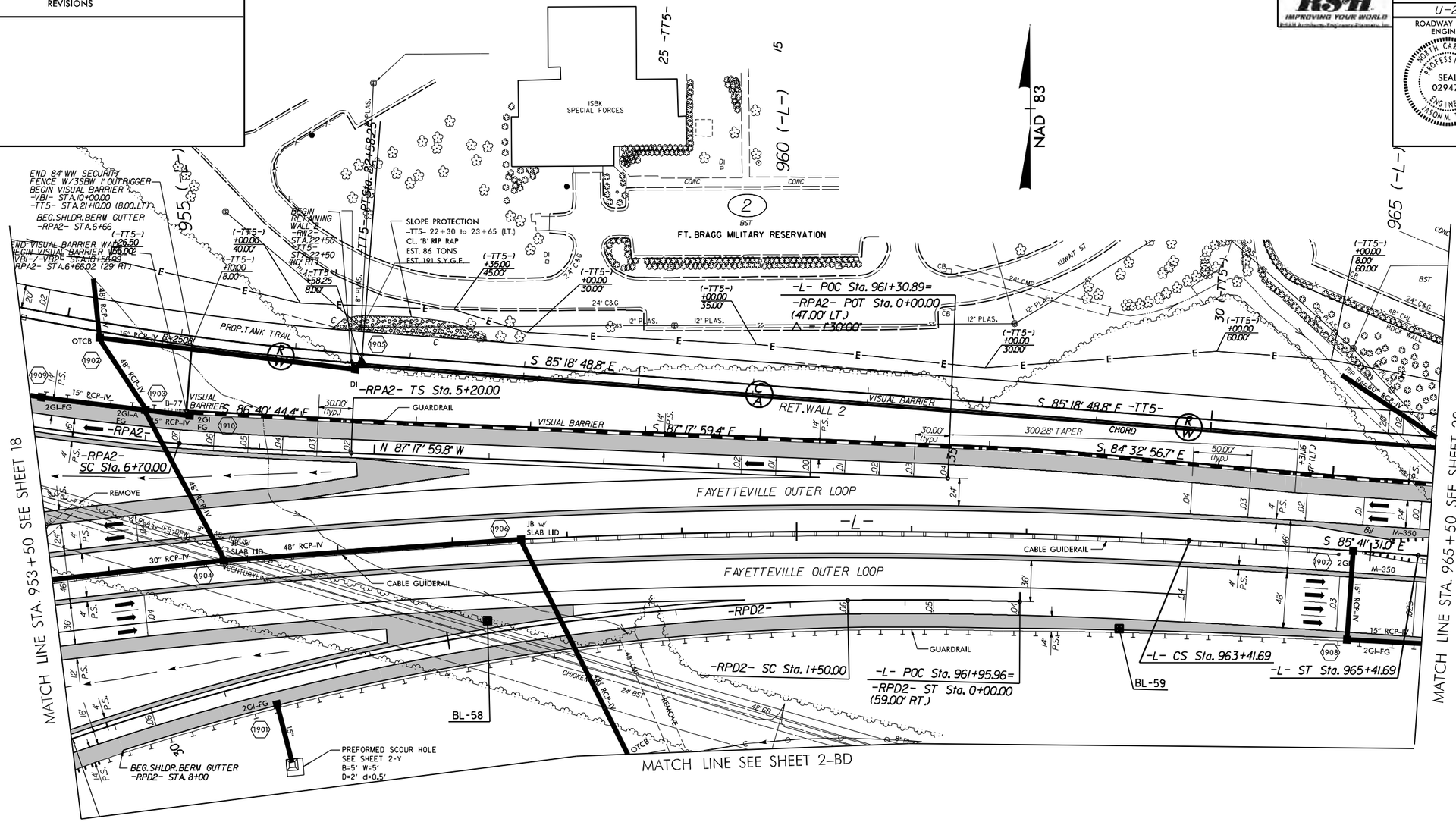
REVISIONS

RS&H IMPROVING YOUR WORLD

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	19

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON W. TALLEY

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYRD



-RPA2-

PI Sta 8+41.29	PIs Sta 6+20.01
Δ = 10° 14' 53.2" (RT)	θs = 2° 15' 00.0"
D = 3° 00' 00.0"	Ls = 150.00'
L = 341.60	LT = 100.01'
T = 171.29'	ST = 50.01'
R = 1,909.86'	
e = 0.070	
R0 = 150.00'	
DS = 60 MPH	

-RPD2-

PI Sta 7+88.29	PIs Sta 0+86.04
Δ = 32° 21' 29.3" (LT)	θs = 0° 45' 27.8"
D = 2° 36' 15.7"	θs = 1° 57' 12.0"
L = 1,242.46	Ls = 150.00'
T = 638.29'	LT = 86.04'
R = 2,200.00'	ST = 63.99'
e = 0.060	
R0 = 150.00'	
DS = 60 MPH	

-L-

PI Sta 930+96.46	PIs Sta 964+08.36
Δ = 84° 27' 22.4" (RT)	θs = 1° 00' 00.0"
D = 1° 00' 00.0"	Ls = 200.00'
L = 8,445.62	LT = 133.34'
T = 5,200.39'	ST = 66.67'
R = 5,729.58'	
e = 0.040	
R0 = 200.00'	
DS = 70 MPH	

SEE SHEETS 39 & 40 FOR -L- PROFILE
SEE SHEET 48 FOR -RPA2- PROFILE
SEE SHEET 51 FOR -RPD2- PROFILE
SEE SHEET 67 & 68 FOR -TT5- PROFILE

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy_psh19

7/2/99

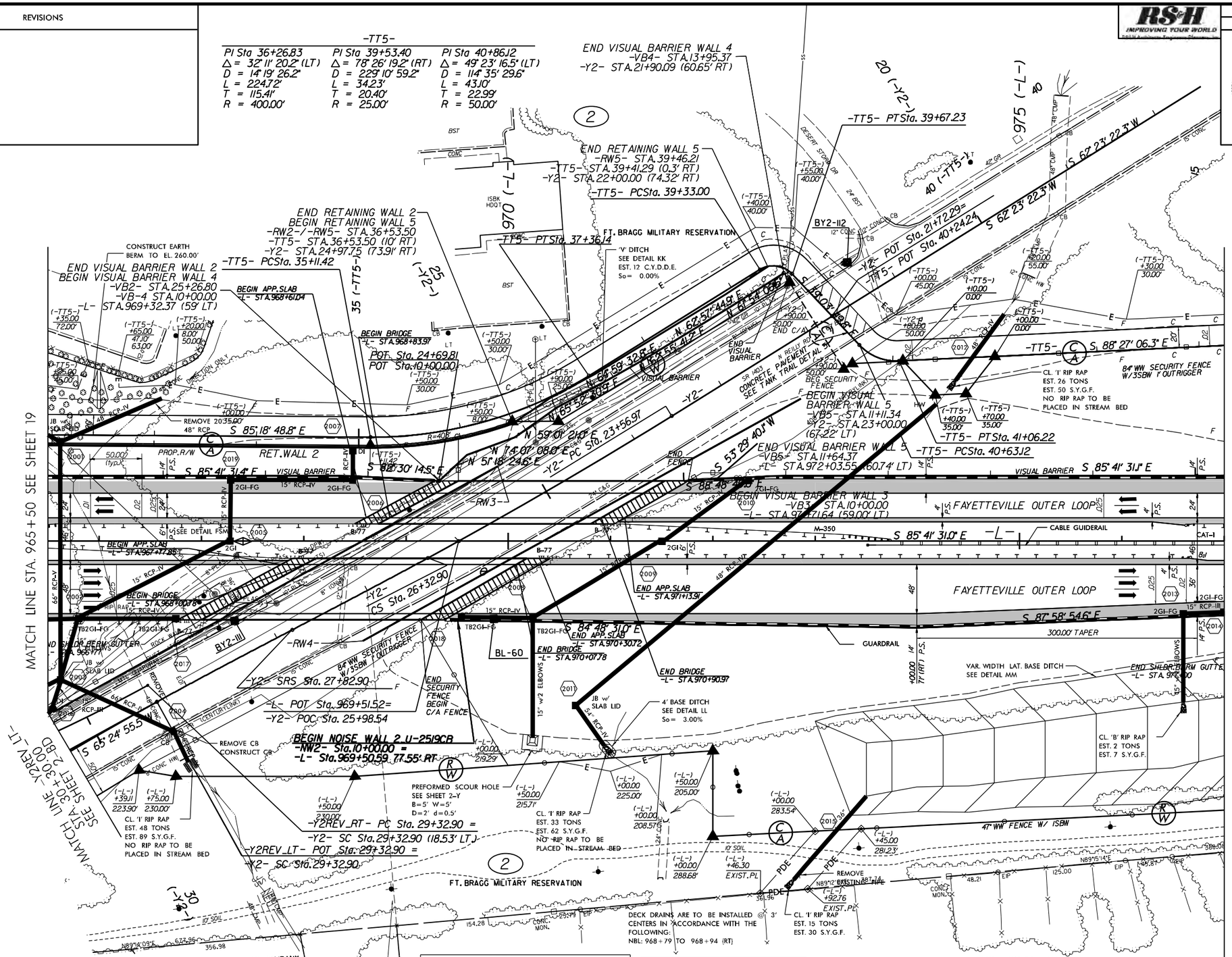
REVISIONS

RS&H IMPROVING YOUR WORLD

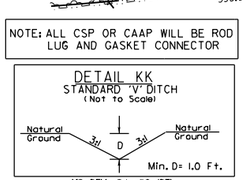
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	20

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY

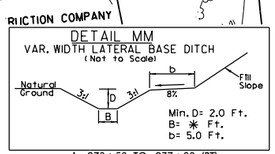
HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYRD



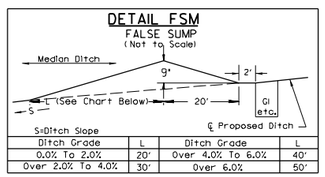
NOTE: ALL CSP OR CAAP WILL BE ROD LUG AND GASKET CONNECTOR



-Y2 REV- 24+50 (RT)

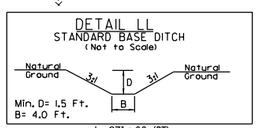


-L- 973+50 TO 977+00 (RT)
EST. DDE = 13123 CY
✳ B (VARIES 57' TO 47')



Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

-L- 870+00 (MED)



-L- 971+00 (RT)
EST. DDE = 5 CY

-Y2- CURVE DATA

PI Sta 24+94.98	PIs Sta 26+82.90	PIs Sta 28+82.91
Δ = 3° 24' 00.0" (RT)	Θs = 0° 55' 26.9"	Θs = 1° 17' 53.7"
D = 1° 13' 55.8"	Ls = 150.00'	Ls = 150.00'
L = 275.94'	LT = 100.00'	LT = 100.00'
T = 138.01'	ST = 50.00'	ST = 50.00'
R = 4,650.00'		

SEE SHEET 40 FOR -L- PROFILE
SEE SHEET 68 FOR -TT5- PROFILE
SEE SHEET 2-T FOR BRIDGE SKETCH
FOR STRUCTURE PLANS, SEE SHEET S- THRU S-

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy.psh20

7/2/99

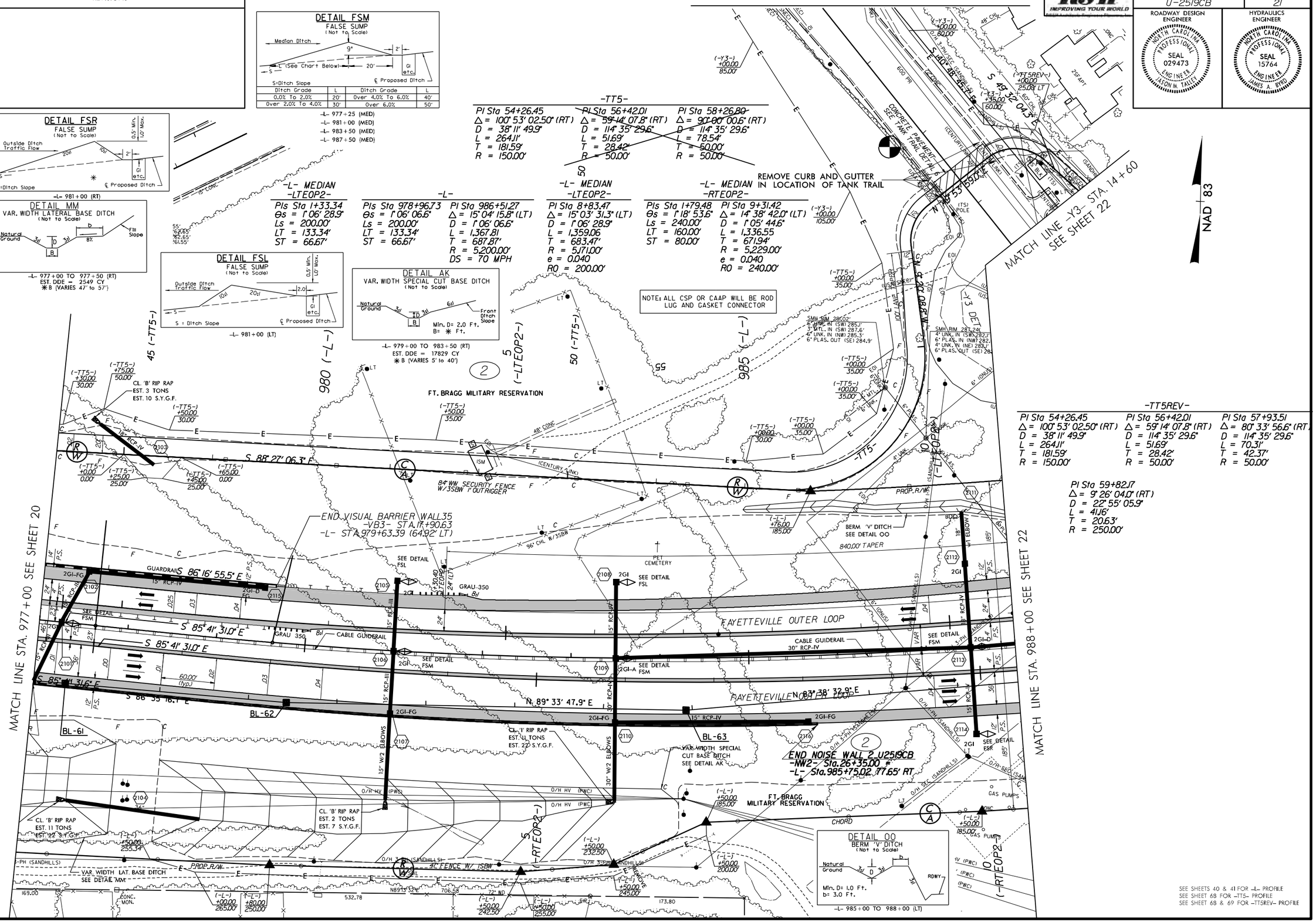
REVISIONS

RS&H IMPROVING YOUR WORLD

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	21

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON W. TALLEY

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYRD



104.001.001/u2519cb/roadway/proj/u2519cb_rdy.psh21

7/2/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	22

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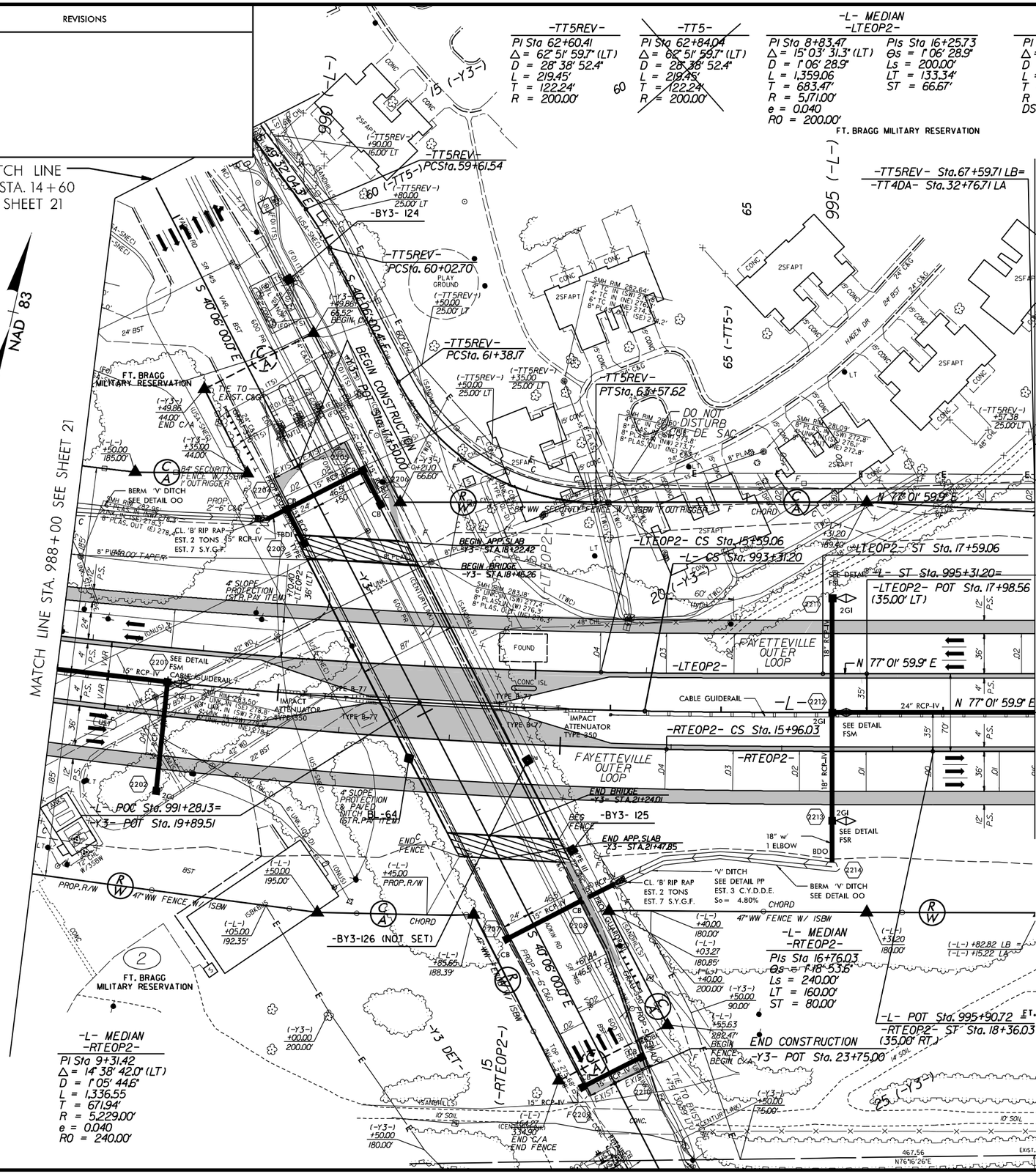
ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYRD



SEE SHEET 41 FOR -L- PROFILE
SEE SHEET 55 FOR -Y3- PROFILE
SEE SHEET 69 FOR -TT5REV- PROFILE
SEE SHEET 2-T FOR BRIDGE SKETCH
FOR STRUCTURE PLANS, SEE SHEETS S- THRU S-

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy.psh22

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	22A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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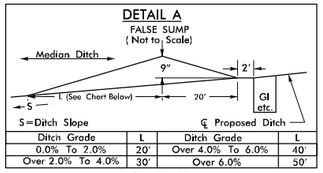
RS&H Architects-Engineers-Planners, Inc.

Right of Way for this Plan Sheet has been acquired under metric TIP Project U-2519DA. Right of Way authorization was May 19, 2006. Right of Way shown is for information purposes only.

NAD 83

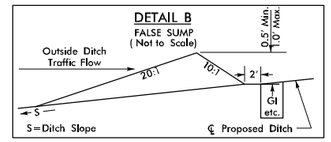
DETAIL A
FALSE SUMP
(Not to Scale)



Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

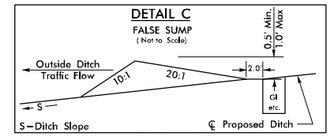
STA. 35+48
STA. 39+41
STA. 44+01

DETAIL B
FALSE SUMP
(Not to Scale)



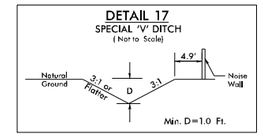
STA. 35+67 RT
STA. 39+60 RT
STA. 44+19 RT

DETAIL C
FALSE SUMP
(Not to Scale)



STA. 35+50 LT
STA. 39+41 LT
STA. 44+01 LT

DETAIL 17
SPECIAL 'V' DITCH
(Not to Scale)

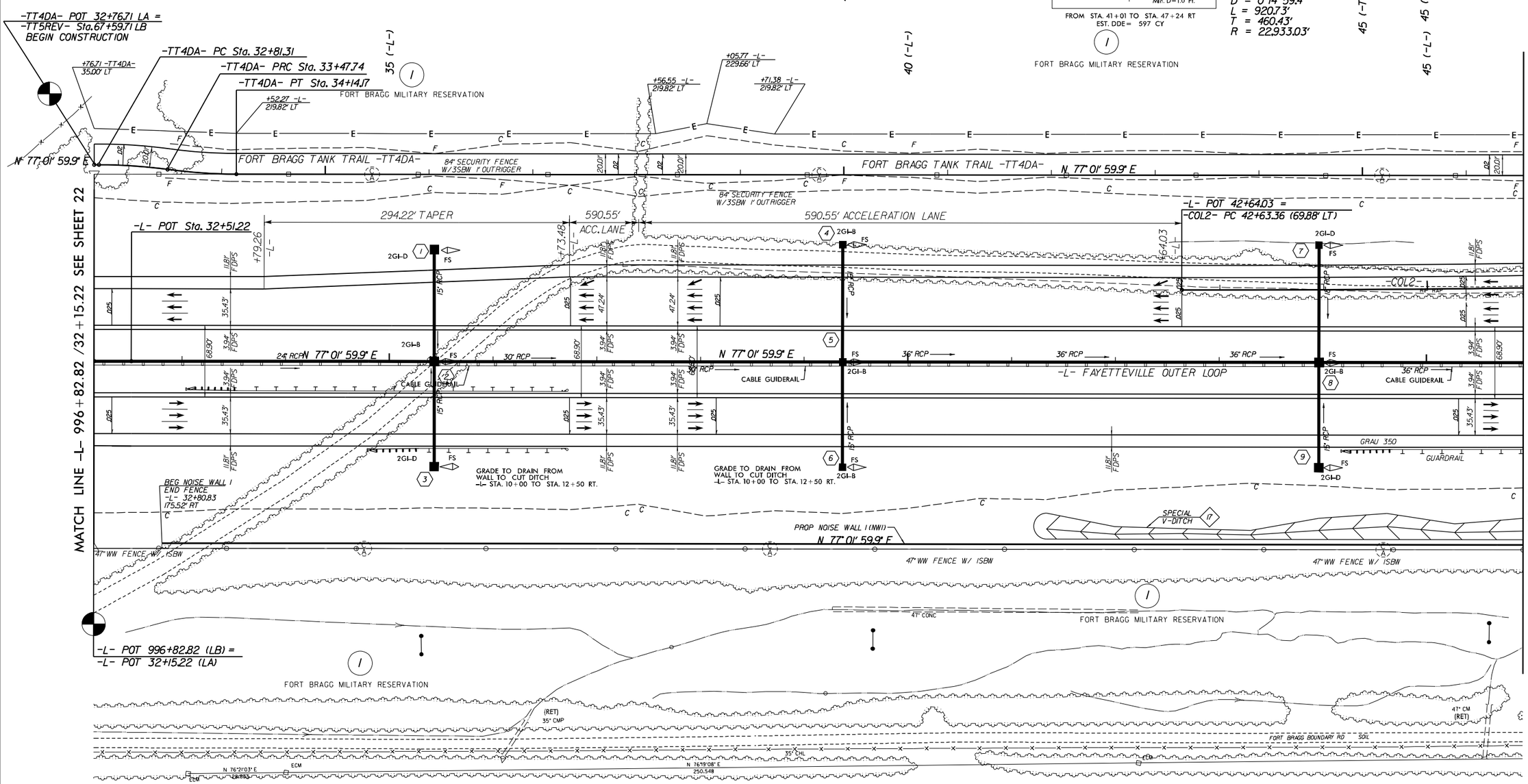


FROM STA. 41+01 TO STA. 47+24 RT
EST. DDE= 597 CY

-TT4DA-
PI Sta 33+14.58
Δ = 7° 44' 02.7" (RT)
D = 11° 38' 33.1"
L = 66.43'
T = 33.27'
R = 492.13'

PI Sta 33+81.01
Δ = 7° 44' 02.7" (LT)
D = 11° 38' 33.1"
L = 66.43'
T = 33.27'
R = 492.12'

-COL2-
PI Sta 47+23.78
Δ = 2° 18' 01.2" (LT)
D = 0° 14' 59.4"
L = 920.73'
T = 460.43'
R = 22,933.03'



SEE SHEET 41A FOR -L- PROFILE
SEE SHEET 70 FOR -TT4DA- PROFILE
SEE SHEET 74 FOR -COL2- PROFILE

REVISIONS

4/22/2014
W:\Roadway\Proj\U2519DA_Rdy_psh_22A.dgn
10:17:22 AM

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	22B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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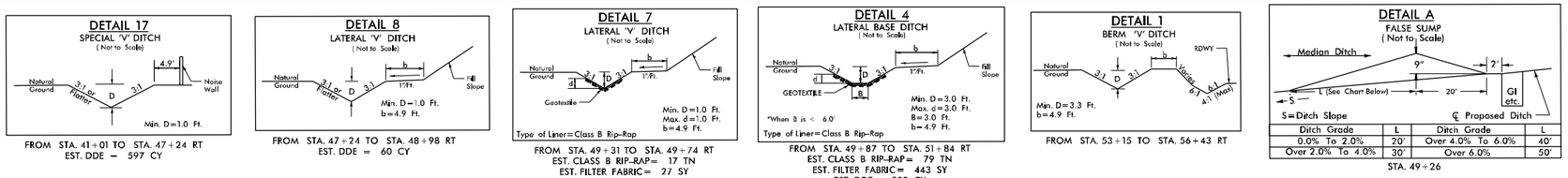
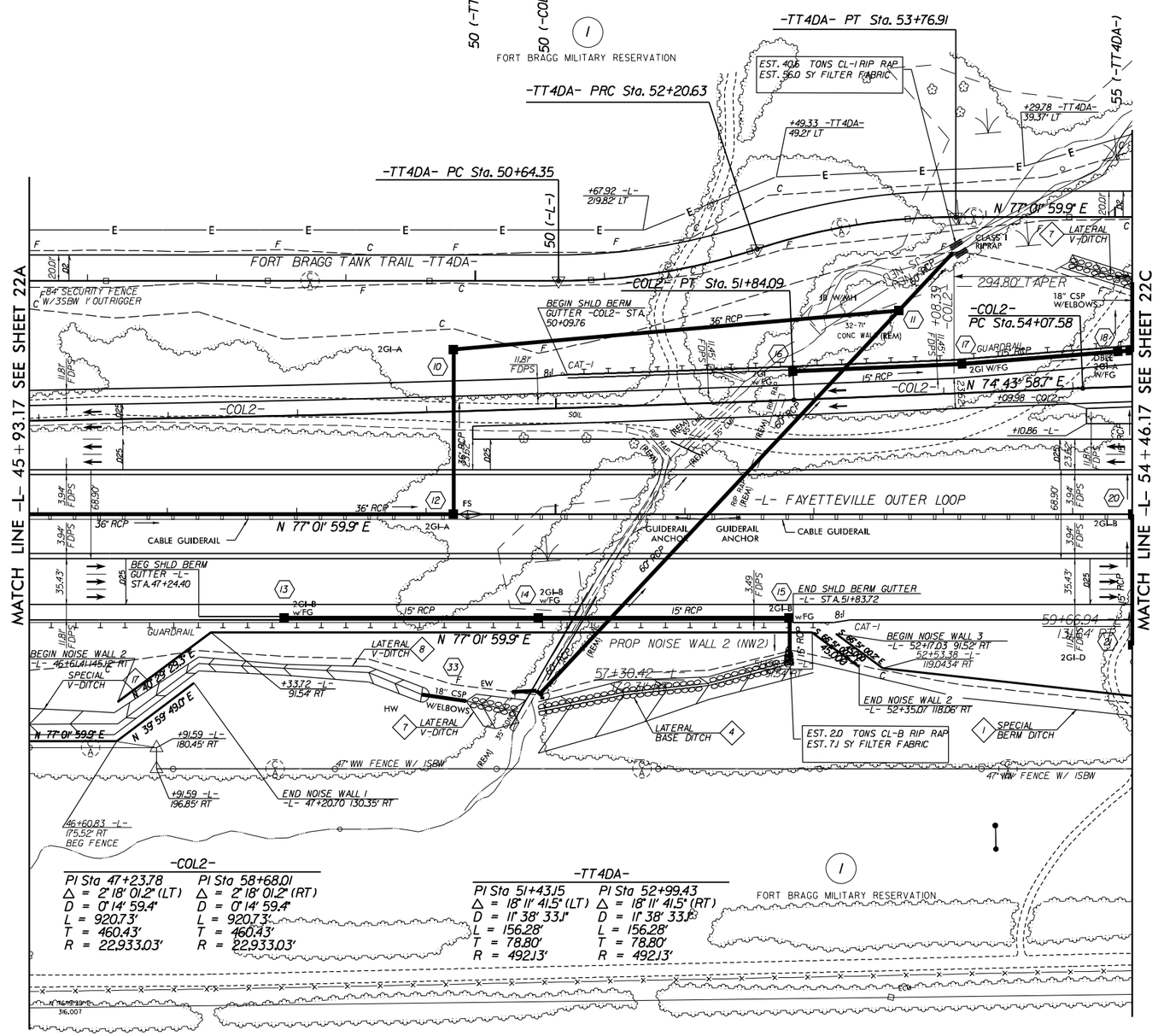
RS&H Architects-Engineers-Planners, Inc.



Right of Way for this Plan Sheet has been acquired under metric TIP Project U-2519DA. Right of Way authorization was May 19, 2006. Right of Way shown is for information purposes only.



SEE SHEET 41A FOR -L- PROFILE
SEE SHEET 74 FOR -COL2- PROFILE
SEE SHEET 70 FOR -TT4DA- PROFILE

4/22/2014
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10:29:15 AM

REVISIONS

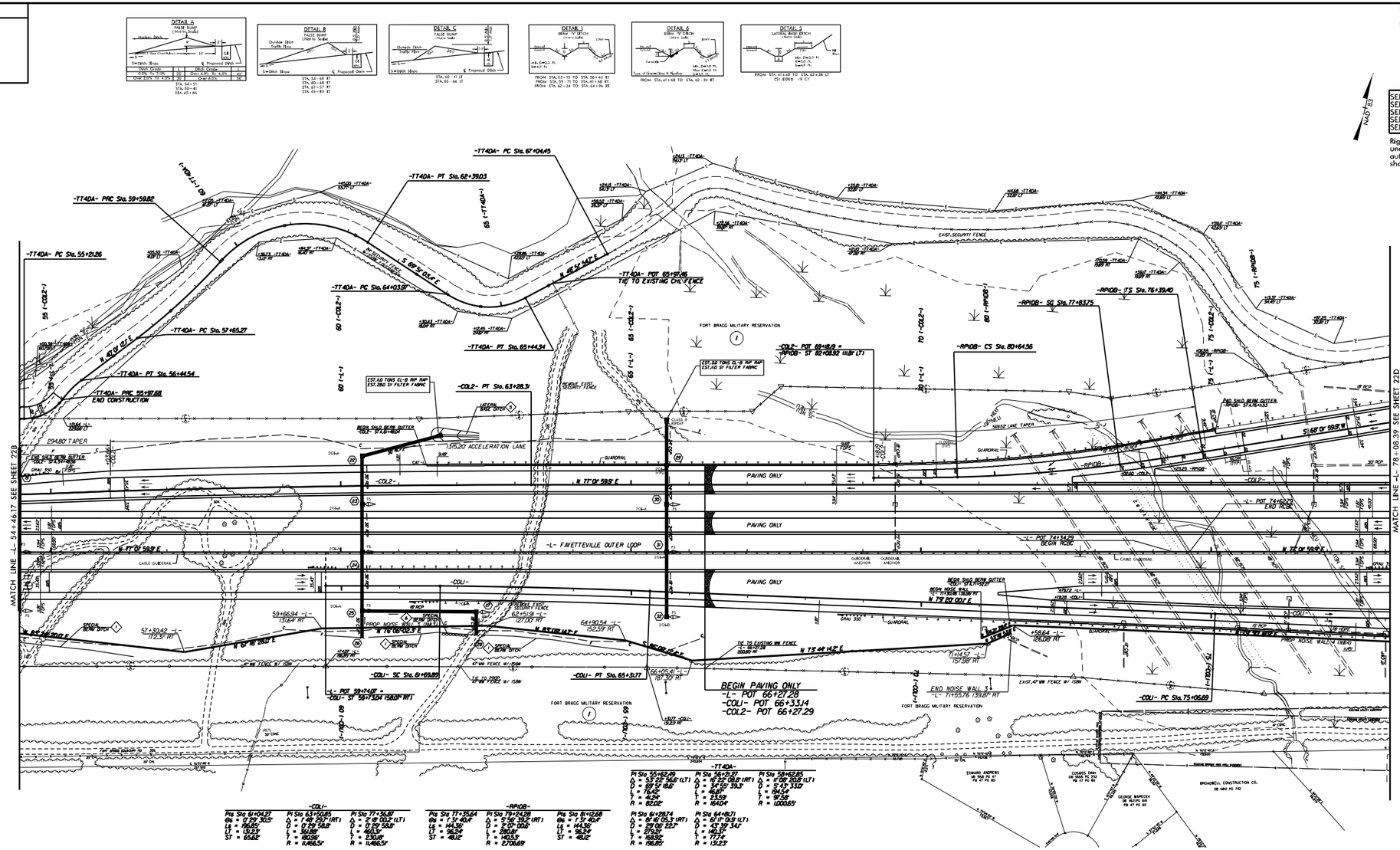
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	22C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

R&H

SEE SHEETS 41A-41B FOR -L- PROFILE
SEE SHEET 72 FOR -COL1- PROFILE
SEE SHEETS 74-75 FOR -COL2- PROFILE
SEE SHEET 80 FOR -RPIDB- PROFILE
SEE SHEET 70 FOR -TT4DA- PROFILE

Right of Way for this Plan Sheet has been acquired under metric TIP Project U-2519DA. Right of Way authorization was May 19, 2006. Right of Way shown is for information purposes only.

NAD 1983



-COLI-

PI Sta 61+04.27	PI Sta 63+50.85	PI Sta 77+36.87
Δ = 17° 29' 30.5"	Δ = 7° 49' 20.7" (RT)	Δ = 2° 18' 00.2" (LT)
D = 8° 59' 16.6"	D = 0° 29' 58.8"	D = 0° 29' 58.8"
L = 196.85'	L = 356.88'	L = 460.5'
T = 99.23'	T = 180.96'	T = 230.18'
R = 637.00'	R = 11,466.55'	R = 11,466.55'

-RPIDB-

PI Sta 77+35.64	PI Sta 79+24.28	PI Sta 81+12.58
Θs = 1° 31' 40.4"	Δ = 2° 56' 39.2" (RT)	Θs = 1° 31' 40.4"
Ls = 144.36'	D = 2° 07' 00.6"	Ls = 144.36'
LT = 96.24'	L = 280.18'	LT = 96.24'
ST = 48.12'	T = 140.15'	ST = 48.12'
	R = 2,706.69'	

-TT4DA-

PI Sta 55+62.49	PI Sta 56+21.27	PI Sta 58+62.85
Δ = 63° 28' 34.6" (LT)	Δ = 16° 27' 08.8" (RT)	Δ = 11° 08' 30.0" (LT)
D = 69° 52' 18.6"	D = 34° 55' 39.3"	D = 5° 43' 11.0"
L = 176.42'	L = 46.81'	L = 194.54'
T = 98.24'	T = 23.59'	T = 97.58'
R = 82.02'	R = 164.04'	R = 1,000.65'

PI Sta 61+29.74	PI Sta 64+18.71	
Δ = 81° 16' 05.3" (RT)	Δ = 67° 17' 04.8" (LT)	
D = 29° 06' 22.7"	D = 43° 39' 34.1"	
L = 279.22'	L = 140.37'	
T = 169.92'	T = 77.74'	
R = 196.85'	R = 131.23'	

EDWARD ANDREWS
DB 1668 PG 37
PB 47 PG 80

COUNTY OF CUMBERLAND
DB 1668 PG 130
PB 47 PG 80

GEORGE WARECK
DB 1668 PG 126
PB 47 PG 80

BROADWELL CONSTRUCTION CO.
DB 1668 PG 142

GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION: FAYETTEVILLE OUTER LOOP FROM SOUTH OF SR 1400 (CLIFFDALE RD.) TO EAST OF ALL AMERICAN FREEWAY

TIP NO.: U-2519CB COUNTY: CUMBERLAND

DESIGNED BY:

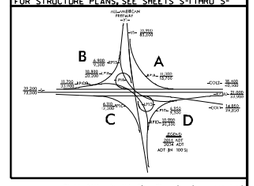
CHECKED BY: DATE:

4/27/2011
W:\Projects\U2519CB\U2519CB_Rdwy_prelim_22C.dgn

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	22D
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SEE SHEETS 4B-4C FOR -L- PROFILE
SEE SHEET 75 FOR -COL2- PROFILE
SEE SHEET 80 FOR -RPIB- PROFILE
SEE SHEET 76 FOR -RPIB- PROFILE
SEE SHEET 2-T & 2-U FOR BRIDGE SKETCHES
FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-



Right of Way for this Plan Sheet has been acquired under metric TIP Project U-2519DA. Right of Way authorization was May 19, 2006. Right of Way shown is for information purposes only.

NAD 1983

-RPIB- POT Sta. 32+80.83
-RPIB- TS Sta. 34+86.18
-RPIB- POT 35+72.05 BEGIN CONSTRUCTION
-RPIB- SC Sta. 35+88.78
FUTURE PAVING
35 (-RPIB-)
-Y1- (ALL AMERICAN FREEWAY)
PI Sta 56+07.76
Δ = 5°24'52.2" (LT)
D = 0°29'58.8"
L = 1,083.63'
T = 542.25'
R = 11,466.54'
-RPIB-
PI Sta 43+02.10
Δ = 64°24'53.1" (RT)
D = 4°59'22.8"
L = 1,288.68'
T = 723.32'
R = 1146.29'
PI Sta 49+56.64
Θs = 4°15'22.5"
Ls = 170.67'
LT = 113.77'
ST = 56.80'
-RPIB-
PI Sta 60+03.91
Δ = 96°59'15.1" (LT)
D = 3°48'08.6"
L = 2,443.60'
T = 1,631.90'
R = 1,443.50'
PI Sta 68+66.53
Θs = 9°59'42.17"
Ls = 200.00'
LT = 170.63'
ST = 50.32'
FORT BRAGG MILITARY RESERVATION
MATCH LINE -L- 78+08.39 SEE SHEET 22C
-RPIB- POT 72+74.49 = -RPIB- ST 50+50.35 (0.39' RT)
-RPIB- BG Sta. 48+73.75
-RPIB- CS Sta. 68+16.21
-RPIB- ST Sta. 69+67.13
656.17' LANE TAPER
PAVING ONLY
-L- FAYETTEVILLE OUTER LOOP
N 77°01'59.9" E
BEGIN APP SLAB -RPIB- ST A.4+98.58
BEGIN BRIDGE -RPIB- ST A.4+99.56
-RPIB- PCC 42+10.23 = -Y1- POT 35+86.34
END BRIDGE -RPIB- ST A.4+16.52
END APP SLAB -RPIB- ST A.4+15.48
END BRIDGE -RPIB- ST A.6.3+93.07
END APP SLAB -RPIB- ST A.6.4+17.01
BEGIN BRIDGE -L- ST A.6.8+45.35
BEGIN APP SLAB -L- ST A.6.9+70.35
-COL2- POT 69+12.63 END PAVING
EXISTING BRIDGE
B
A
FUTURE PAVING
55 (-Y1-)
60 (-Y1-)
65 (-Y1-)
-Y1- (All American Freeway) PT Sta. 65+95.35
END BRIDGE -L- ST A.9.5+73.03
END APP SLAB -L- ST A.9.5+75.03
-L- POT 103+01.82
-COL1- POT 103+02.06
TIE TO EXISTING GUIDERAIL (3.94' LT)
END PAVING
END TIP PROJECT U-2519CB
MATCH LINE -Y1- 66+14.29 SEE SHEET 22E

GRAPHIC SCALE
50 25 0 50 100
PLANS

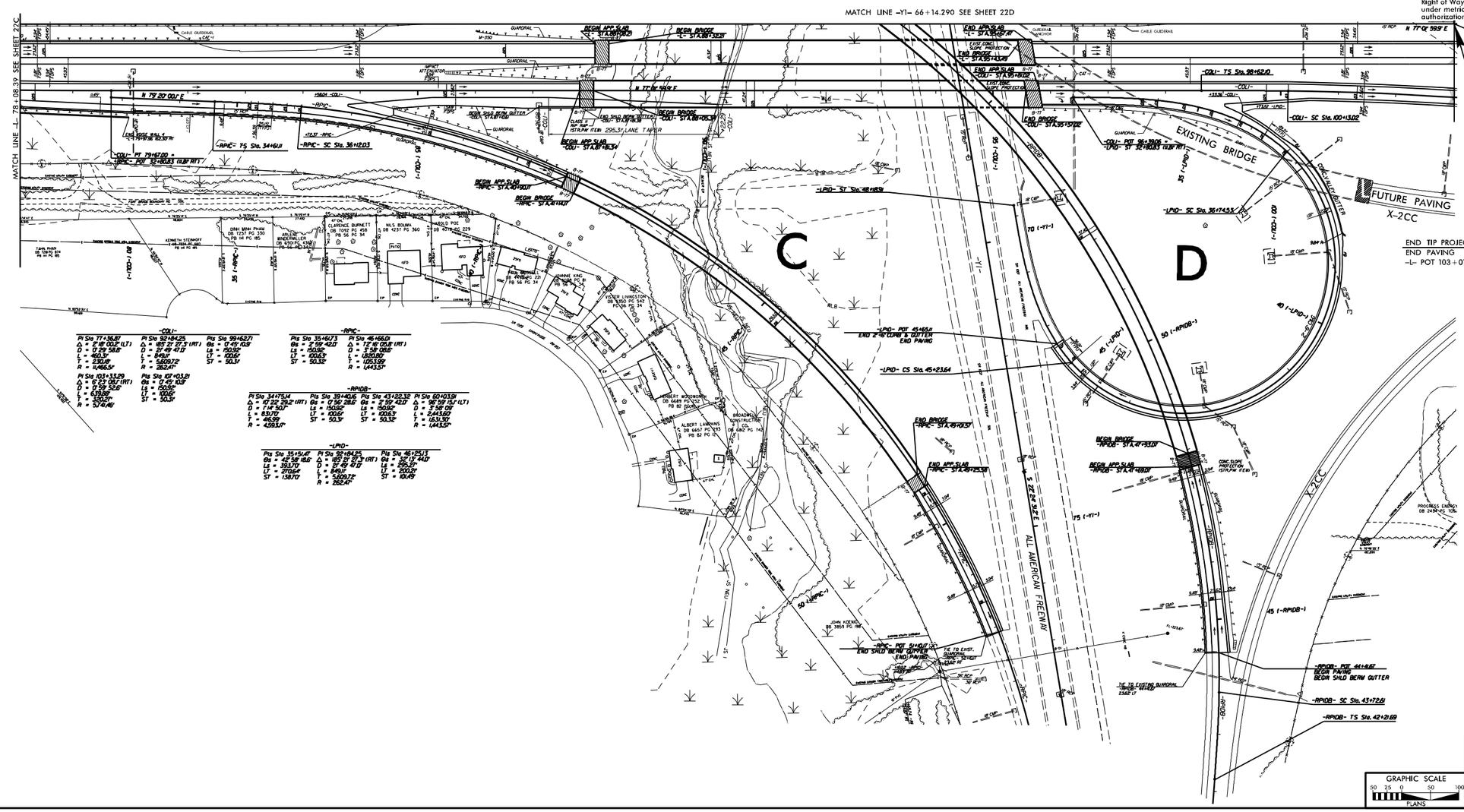
LOCATION: FAYETTEVILLE OUTER LOOP FROM SOUTH OF SR 1400 (CLIFFDALE RD.) TO EAST OF ALL AMERICAN FREEWAY
TIP NO.: U-2519CB
COUNTY: CUMBERLAND
DESIGNED BY:
CHECKED BY:
DATE:

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	22E
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SEE SHEETS 4B-4IC FOR -L- PROFILE
SEE SHEETS 72-T3 FOR -COLI- PROFILE
SEE SHEET 79 FOR -RPIDB- PROFILE
SEE SHEET 77 FOR -RPIC- PROFILE
SEE SHEET 78 FOR -LPID- PROFILE
SEE SHEET 2-T & 2-U FOR BRIDGE SKETCHES
FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-

Right of Way for this Plan Sheet has been acquired under metric TIP Project U-2519DA. Right of Way authorization was May 19, 2006.



GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION: FAYETTEVILLE OUTER LOOP FROM SOUTH OF SR 1400 (CLIFFDALE RD.) TO EAST OF ALL AMERICAN FREEWAY

TIP NO.: U-2519CB COUNTY: CUMBERLAND

DESIGNED BY:

CHECKED BY: DATE:

4/22/2009
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7/2/99

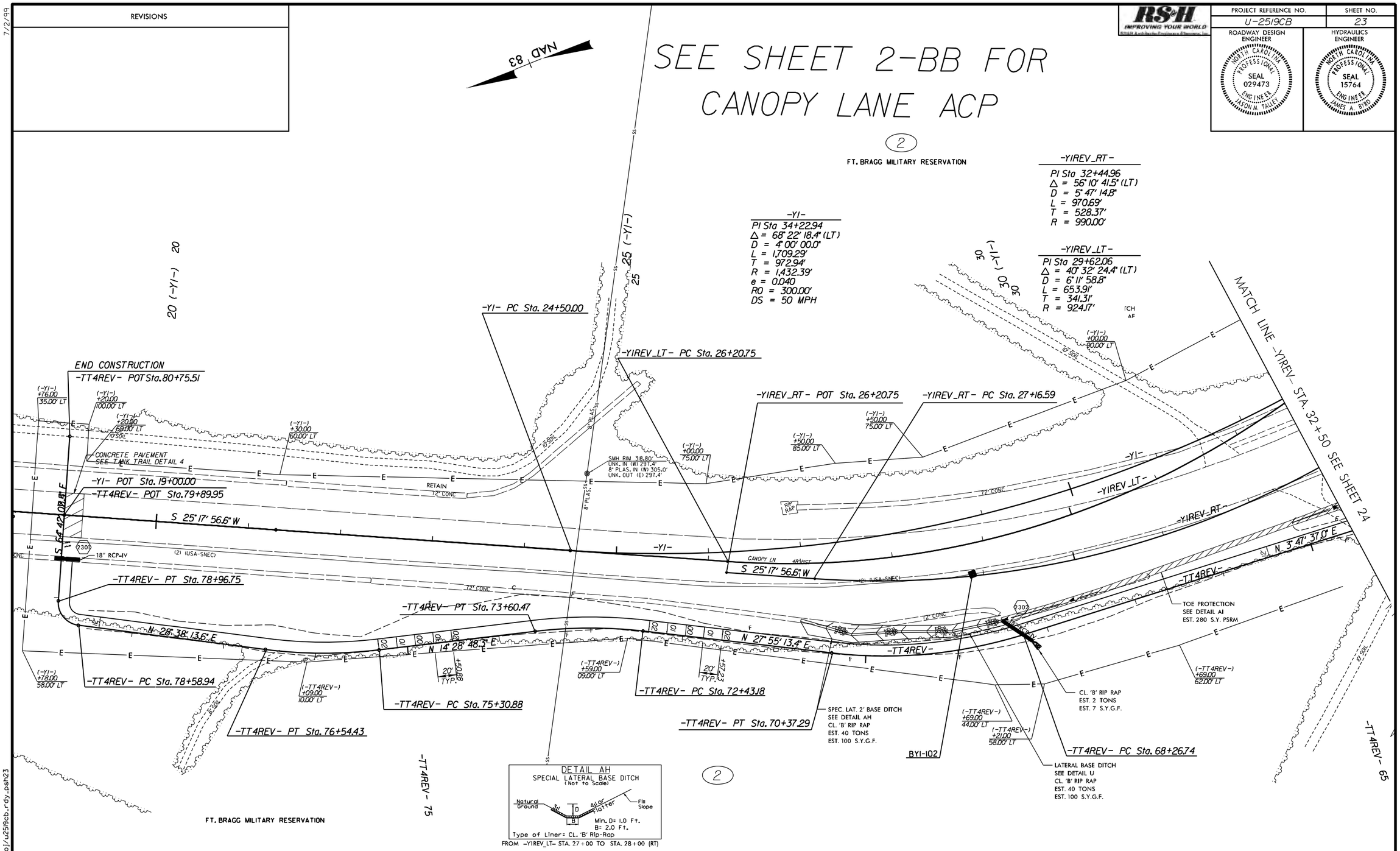
REVISIONS

RS&H IMPROVING YOUR WORLD

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	23

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TAILLE

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BIRD



-TT4REV-

PI Sta 78+82.53	PI Sta 75+92.97	PI Sta 73+02.10	PI Sta 69+33.60
Δ = 86° 39' 43.9" (RT)	Δ = 14° 09' 25.4" (RT)	Δ = 13° 26' 25.1" (LT)	Δ = 24° 07' 36.4" (RT)
D = 229° 10' 59.2"	D = 11° 27' 33.0"	D = 11° 27' 33.0"	D = 11° 27' 33.0"
L = 37.81'	L = 123.54'	L = 117.29'	L = 210.55'
T = 23.58'	T = 62.09'	T = 58.91'	T = 106.86'
R = 25.00'	R = 500.00'	R = 500.00'	R = 500.00'

NOTE: ALL CSP OR CAAP WILL BE ROD LUG AND GASKET CONNECTOR

SEE SHEET 2-Q FOR -Y1 DET-
SEE SHEET 53 FOR -Y1- PROFILE
SEE SHEET 66 & 67 FOR -TT4REV- PROFILE

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy.psh23

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REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	24

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ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYRD

SEE SHEET 2-BC FOR CANOPY LANE ACP

MATCH LINE -Y1REV- STA. 32+50 SEE SHEET 23

NAD 83

-TT4REV-

PI Sta 57+26.17	PI Sta 60+49.42
Δ = 69° 26' 20.3" (RT)	Δ = 37° 01' 12.4" (LT)
D = 12° 14' 33.7"	D = 23° 52' 23.7"
L = 567.19'	L = 155.07'
T = 324.29'	T = 80.35'
R = 468.00'	R = 240.00'

-Y1-

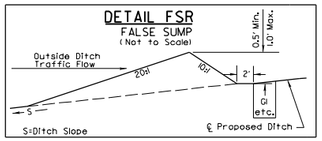
PI Sta 34+22.94
Δ = 68° 22' 18.4" (LT)
D = 4° 00' 00.0"
L = 1,709.29'
T = 972.94'
R = 1,432.39'
e = 0.040
R0 = 300.00'
DS = 50 MPH

PAVEMENT REMOVAL

FT. BRAGG MILITARY RESERVATION

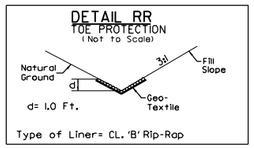
NOTE: ALL CSP OR CAAP WILL BE ROD LUG AND GASKET CONNECTOR

DETAIL FSR
FALSE SUMP
(Not to Scale)



-Y1REV_LT- 33+10 (LT)

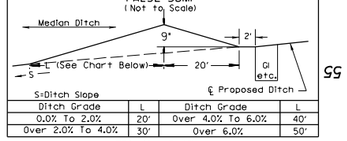
DETAIL RR
TOE PROTECTION
(Not to Scale)



Type of Liner= CL. 'B' Rip-Rap

-TT4REV- 52+50 TO 56+05 (RT)
-TT4REV- 55+56 TO 58+50 (LT)
-Y1REV_LT- 35+00 TO 39+70 (LT)
-Y1REV_LT- 39+90 TO 41+25 (LT)

DETAIL FSM
FALSE SUMP
(Not to Scale)



Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

-TT4- 61+65 (LT)

-TT4REV- PT Sta. 61+24.14

-TT4REV- PRC Sta. 59+69.07

-TT4REV- PRC Sta. 54+01.88

-Y1REV_LT- PT Sta. 32+74.65

-Y1REV_LT- PC Sta. 35+11.90

-Y1REV_RT- PT Sta. 36+87.82

-Y1REV_LT- PCC Sta. 37+08.89

-Y1REV_RT- PC Sta. 39+16.39

-Y1REV_LT- PT Sta. 41+23.91 =
-Y1- POC Sta. 41+16.00 (8.00' LT)

-Y1REV_RT- PT Sta. 41+83.78 =
-Y1- POC Sta. 41+16.00 (32.0' RT)

(-TT4REV-) +69.00 37.00' LT
(-TT4REV-) +03.00 60.00' LT
(-TT4REV-) +84.00 131.00' LT
(-TT4REV-) +02.00 138.00' LT
(-TT4REV-) +10.00 136.00' LT
(-TT4REV-) +80.00 144.00' LT
(-TT4REV-) +55.00 160.00' LT
(-TT4REV-) +52.00 152.00' LT

TOE PROTECTION
SEE DETAIL RR
EST. 100 TONS
EST. 300 S.Y.G.F

72" RCP-III
CL. 'I' RIP RAP
EST. 38 TON
EST. 78 S.Y.G.F.
JB w/ SLAB LID

TIE SECURITY FENCE TO ACP CANOPY

TIE SECURITY FENCE TO C/A FENCE

84" WM SECURITY FENCE W/ 3 SSW Y OUTRIGGER

BY1-103

DANGER TREE AREA

CANOPY LN

FT. BRAGG MILITARY RESERVATION

MATCH LINE STA. 53+43 SEE SHEET 18

MATCH LINE STA. 41+50 SEE SHEET 18

SEE SHEET 2-Q FOR -Y1 DET-
SEE SHEET 53 FOR -Y1- PROFILE
SEE SHEET 66 & 67 FOR -TT4REV- PROFILE

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy.psh24

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REVISIONS

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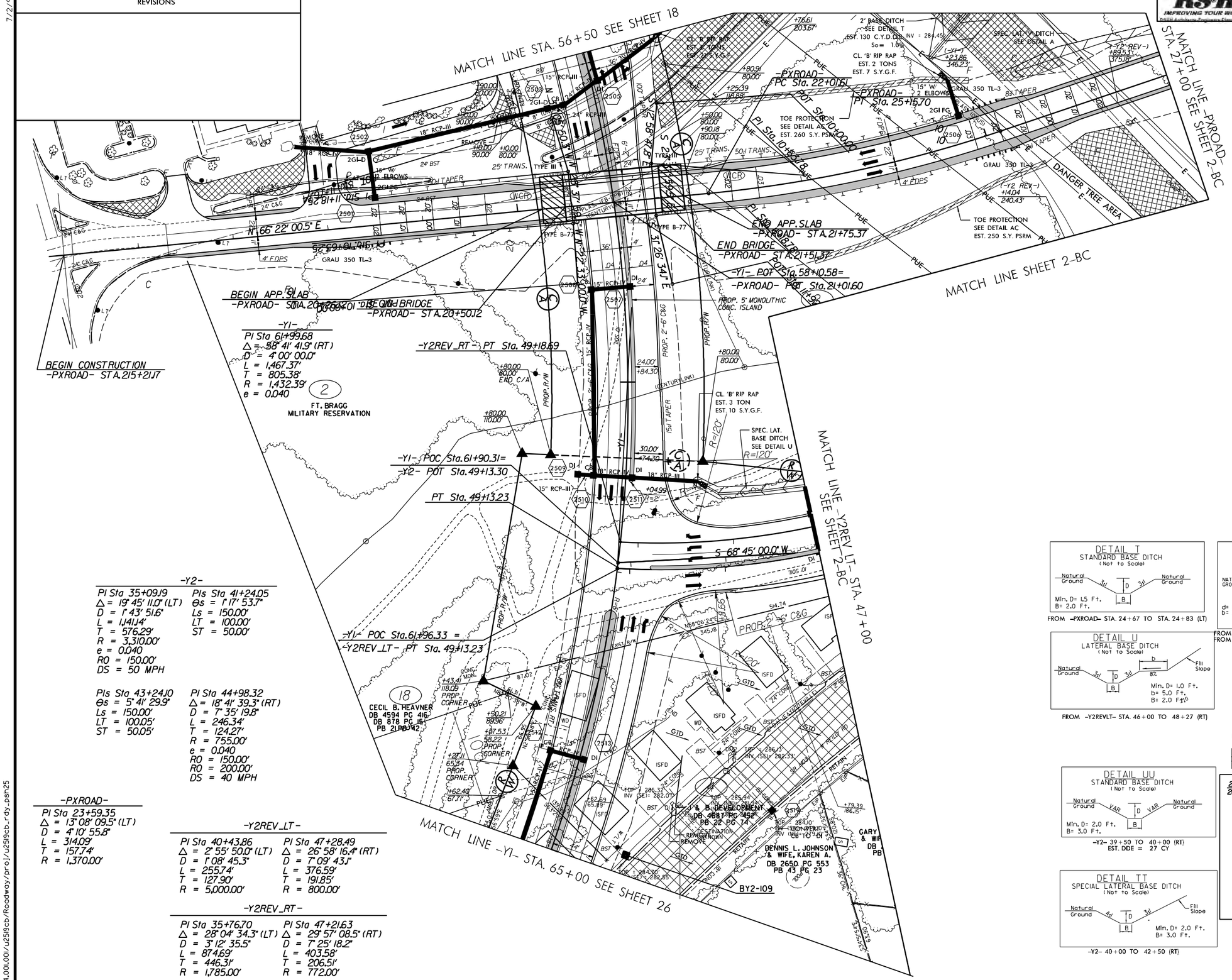
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	25

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYRD



-Y2-

PI Sta 35+09.19	PIs Sta 41+24.05
Δ = 19° 45' 11.0" (LT)	θs = 1° 17' 53.7"
D = 1° 43' 51.6"	Ls = 150.00'
L = 1,141.14'	LT = 100.00'
T = 576.29'	ST = 50.00'
R = 3,310.00'	
e = 0.040	
R0 = 150.00'	
DS = 50 MPH	

PIs Sta 43+24.10	PI Sta 44+98.32
θs = 5° 41' 29.9"	Δ = 18° 41' 39.3" (RT)
Ls = 150.00'	D = 7° 35' 19.8"
LT = 100.05'	L = 246.34'
ST = 50.05'	T = 124.27'
	R = 755.00'
	e = 0.040
	R0 = 150.00'
	R0 = 200.00'
	DS = 40 MPH

-PXROAD-

PI Sta 23+59.35
Δ = 13° 08' 09.5" (LT)
D = 4° 10' 55.8"
L = 314.09'
T = 157.74'
R = 1,370.00'

-Y2REV_LT-

PI Sta 40+43.86	PI Sta 47+28.49
Δ = 2° 55' 50.0" (LT)	Δ = 26° 58' 16.4" (RT)
D = 1° 08' 45.3"	D = 7° 09' 43.1"
L = 255.74'	L = 376.59'
T = 127.90'	T = 191.85'
R = 5,000.00'	R = 800.00'

-Y2REV_RT-

PI Sta 35+76.70	PI Sta 47+21.63
Δ = 28° 04' 34.3" (LT)	Δ = 29° 57' 08.5" (RT)
D = 3° 12' 35.5"	D = 7° 25' 18.2"
L = 874.69'	L = 403.58'
T = 446.31'	T = 206.51'
R = 1,785.00'	R = 772.00'

DETAIL T
STANDARD BASE DITCH
(Not to Scale)
Natural Ground — 3:1 — D — 3:1 — Natural Ground — B
Min. D= 1.5 Ft.
B= 2.0 Ft.
FROM -PXROAD- STA. 24+67 TO STA. 24+83 (LT)

DETAIL AC
TOE PROTECTION
(Not to Scale)
NATURAL GROUND — b — d — 2:1 OR FLATTER — FILL SLOPE
d= 1.0 Ft.
b= 3.0 Ft.
Type of Liner= PSRM
FROM -PXROAD- STA. 22+00 TO STA. 25+00 (LT)
FROM -PXROAD- STA. 23+00 TO STA. 25+50 (RT)

DETAIL U
LATERAL BASE DITCH
(Not to Scale)
Natural Ground — 3:1 — D — 3:1 — b — 8% — Fill Slope — B
Min. D= 1.0 Ft.
b= 5.0 Ft.
B= 2.0 Ft.
FROM -Y2REVLT- STA. 46+00 TO 48+27 (RT)

DETAIL A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground — 3:1 — D — 4:1 or Flatter — Fill Slope
Min. D= 1.0 Ft.
FROM -PXROAD- STA. 25+50 TO STA. 27+25 (LT)

PAVEMENT REMOVAL

DETAIL UU
STANDARD BASE DITCH
(Not to Scale)
Natural Ground — VAR — D — VAR — Natural Ground — B
Min. D= 2.0 Ft.
B= 3.0 Ft.
-Y2- 39+50 TO 40+00 (RT)
EST. DDE = 27 CY

DETAIL TT
SPECIAL LATERAL BASE DITCH
(Not to Scale)
Natural Ground — 4:1 — D — 3:1 — Fill Slope — B
Min. D= 2.0 Ft.
B= 3.0 Ft.
-Y2- 40+00 TO 42+50 (RT)

2014 / 2034 ADT in hundreds

-Y1-: 209/250 — 72/108
-Y2-: 413/530 — 277/384 — 392/443

SEE SHEET 54 FOR -Y1- PROFILE
SEE SHEET 56 FOR -PXROAD- PROFILE
SEE SHEET 2-U FOR BRIDGE SKETCH

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy_psh25

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	26

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. SYRON

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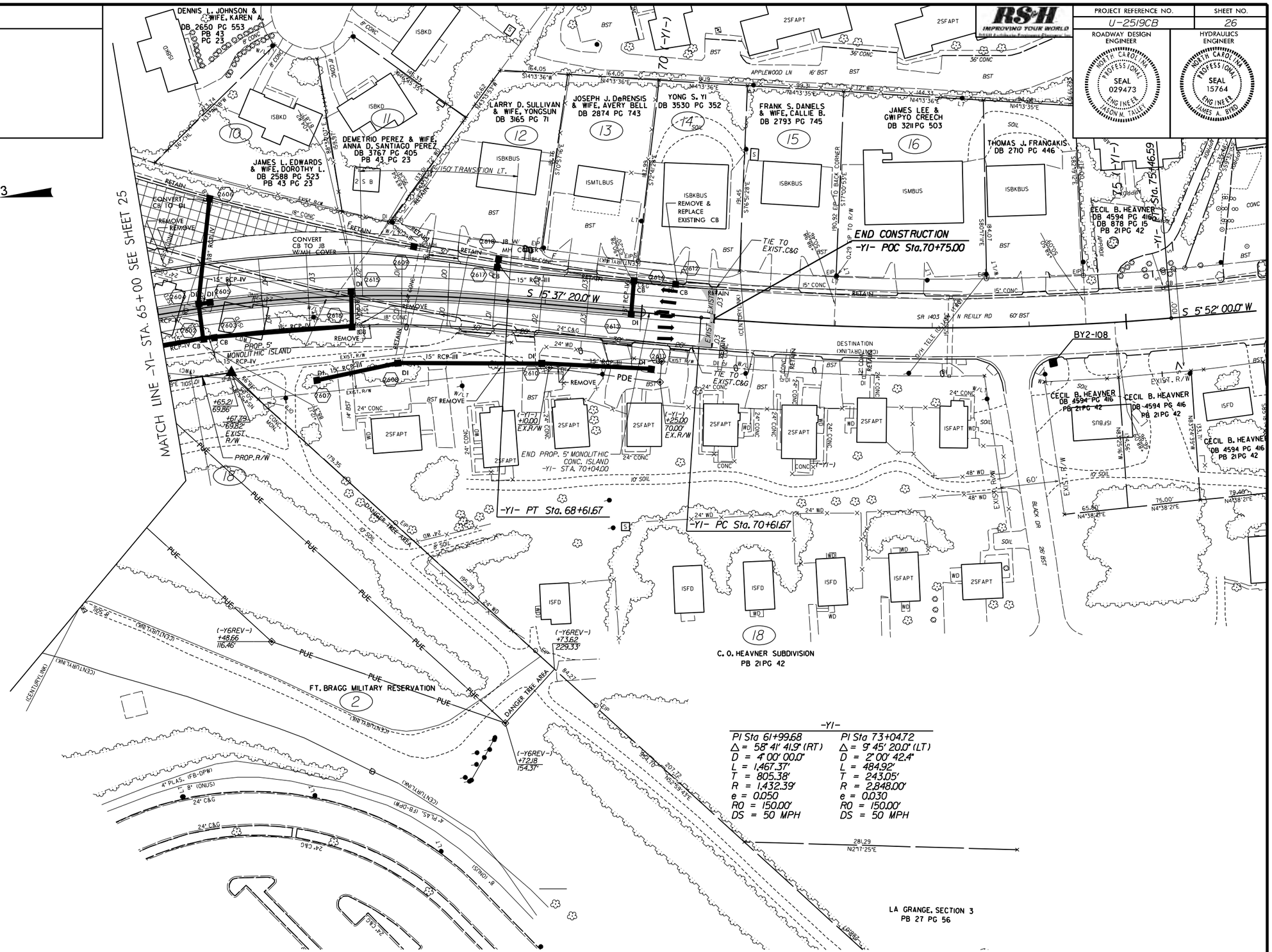

SEE SHEET 54 FOR -Y1- PROFILE

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REVISIONS

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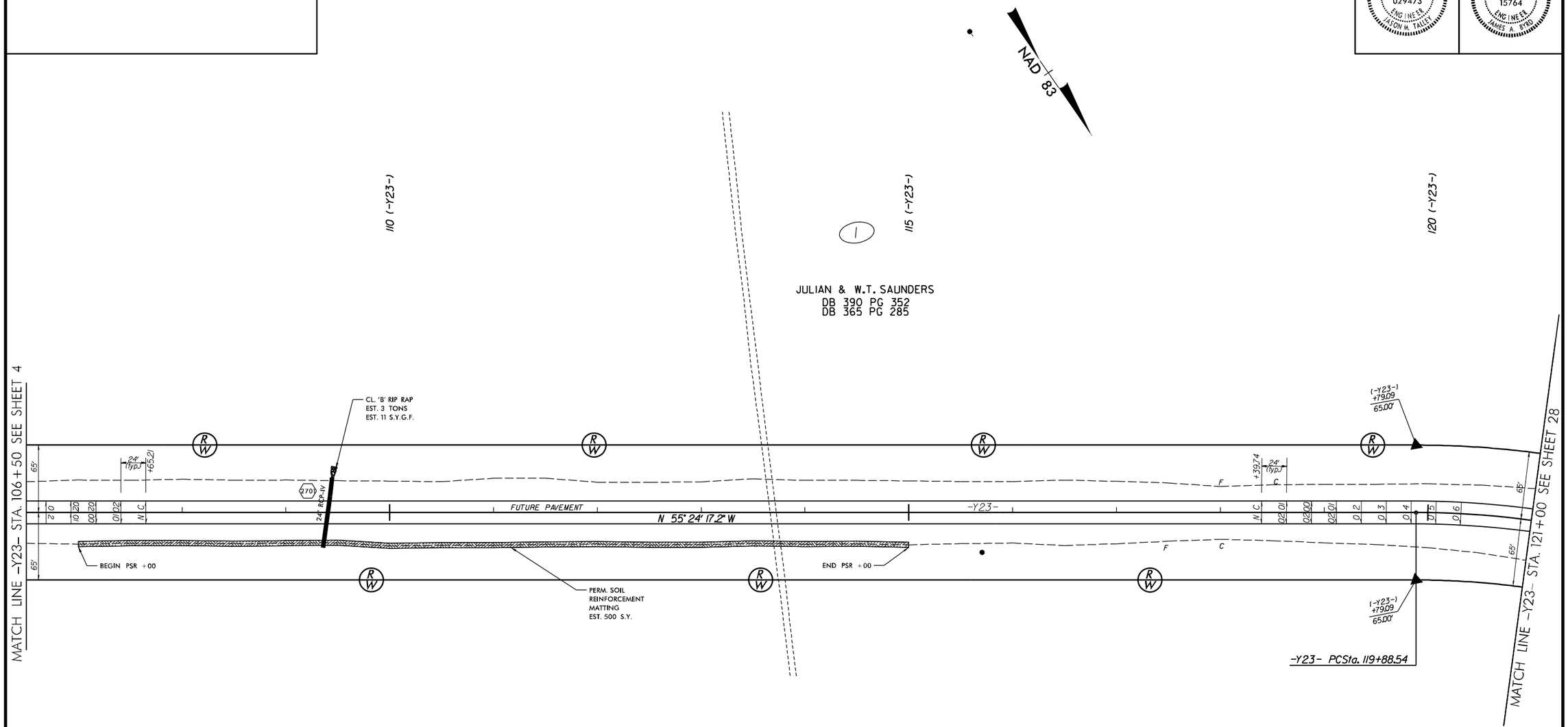
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	27

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYRD



1

JULIAN & W.T. SAUNDERS
DB 390 PG 352
DB 365 PG 285

SEE SHEET 57 & 58 FOR -Y23- PROFILE

104.001.001/u2519cb/Roadway/proj/u2519cb rdy pshs27

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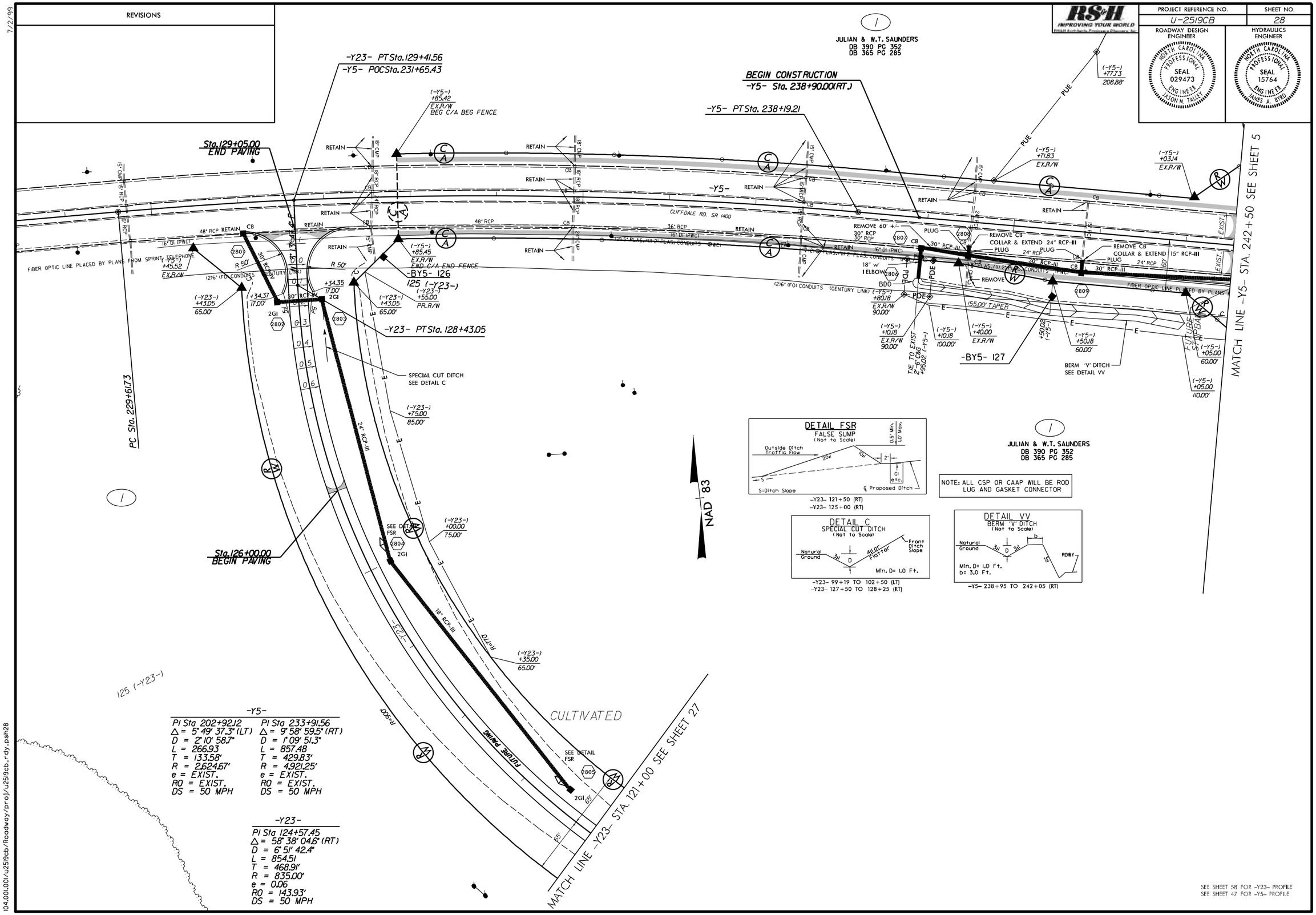
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	28

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYRD



DETAIL FSR
FALSE SUMP
(Not to Scale)

-Y23- 121+50 (RT)
-Y23- 125+00 (RT)

NOTE: ALL CSP OR CAAP WILL BE ROD LUG AND GASKET CONNECTOR

DETAIL C
SPECIAL CUT DITCH
(Not to Scale)

-Y23- 99+19 TO 102+50 (LT)
-Y23- 127+50 TO 128+25 (RT)

DETAIL VV
BERM "V" DITCH
(Not to Scale)

-Y5- 238+95 TO 242+05 (RT)

-Y5-

PI Sta 202+92.12	PI Sta 233+91.56
Δ = 5° 49' 37.3" (LT)	Δ = 9° 58' 59.5" (RT)
D = 2° 10' 58.7"	D = 1° 09' 51.3"
L = 266.93	L = 857.48
T = 133.58'	T = 429.83'
R = 2,624.67'	R = 4,921.25'
e = EXIST.	e = EXIST.
RO = EXIST.	RO = EXIST.
DS = 50 MPH	DS = 50 MPH

-Y23-

PI Sta 124+57.45
Δ = 58° 38' 04.6" (RT)
D = 6° 51' 42.4"
L = 854.51
T = 468.91'
R = 835.00'
e = 0.06
RO = 143.93'
DS = 50 MPH

SEE SHEET 58 FOR -Y23- PROFILE
SEE SHEET 47 FOR -Y5- PROFILE

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REVISIONS

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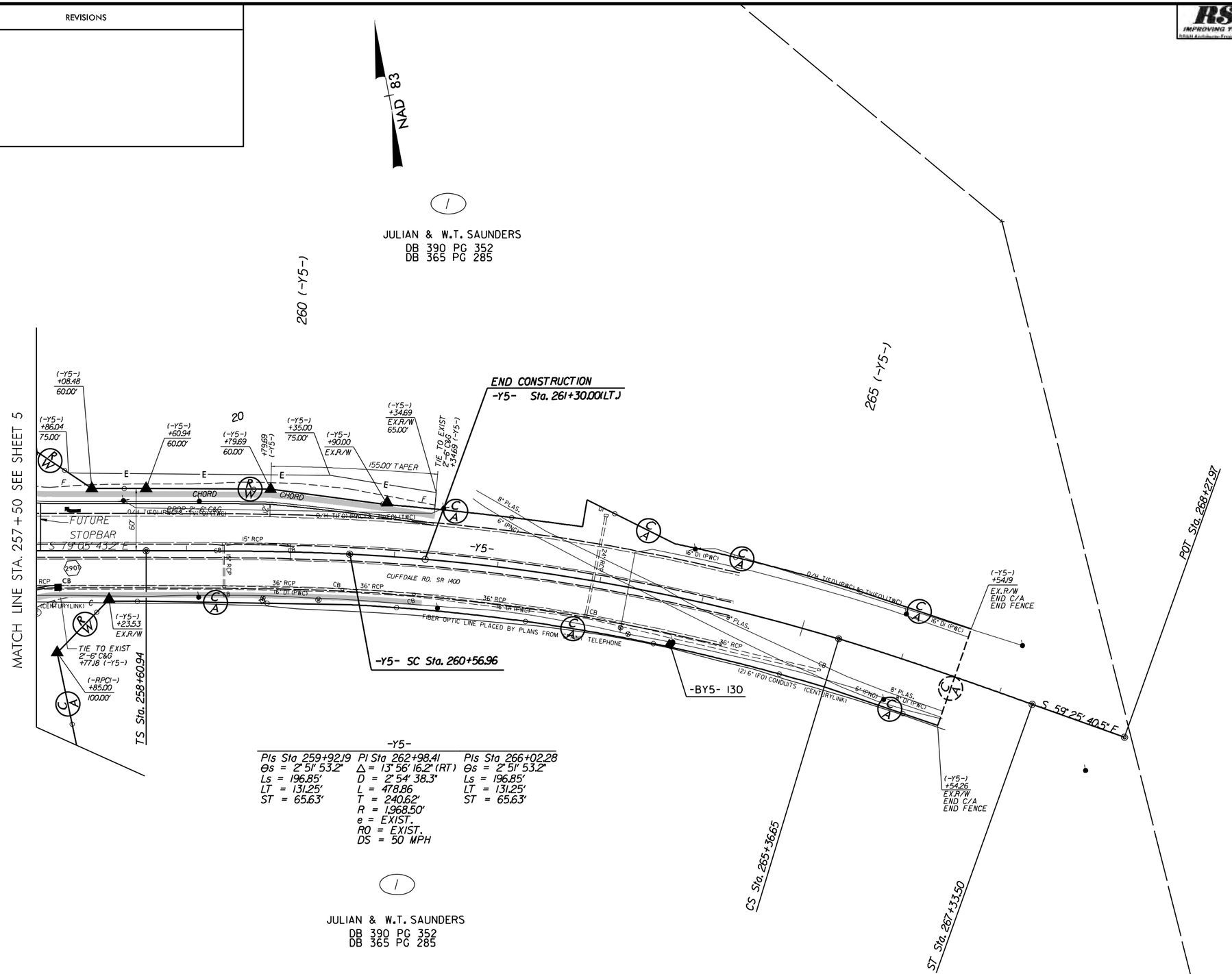
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	29

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYRD



-Y5-

PIs Sta 259+92.19	PI Sta 262+98.41	PIs Sta 266+02.28
Θs = 2° 51' 53.2"	Δ = 13° 56' 16.2" (RT)	Θs = 2° 51' 53.2"
Ls = 196.85'	D = 2° 54' 38.3"	Ls = 196.85'
LT = 131.25'	L = 478.86	LT = 131.25'
ST = 65.63'	T = 240.62'	ST = 65.63'
	R = 1,968.50'	
	e = EXIST.	
	RO = EXIST.	
	DS = 50 MPH	

JULIAN & W.T. SAUNDERS
DB 390 PG 352
DB 365 PG 285

SEE SHEET 47 FOR -Y5- PROFILE

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy_psh29

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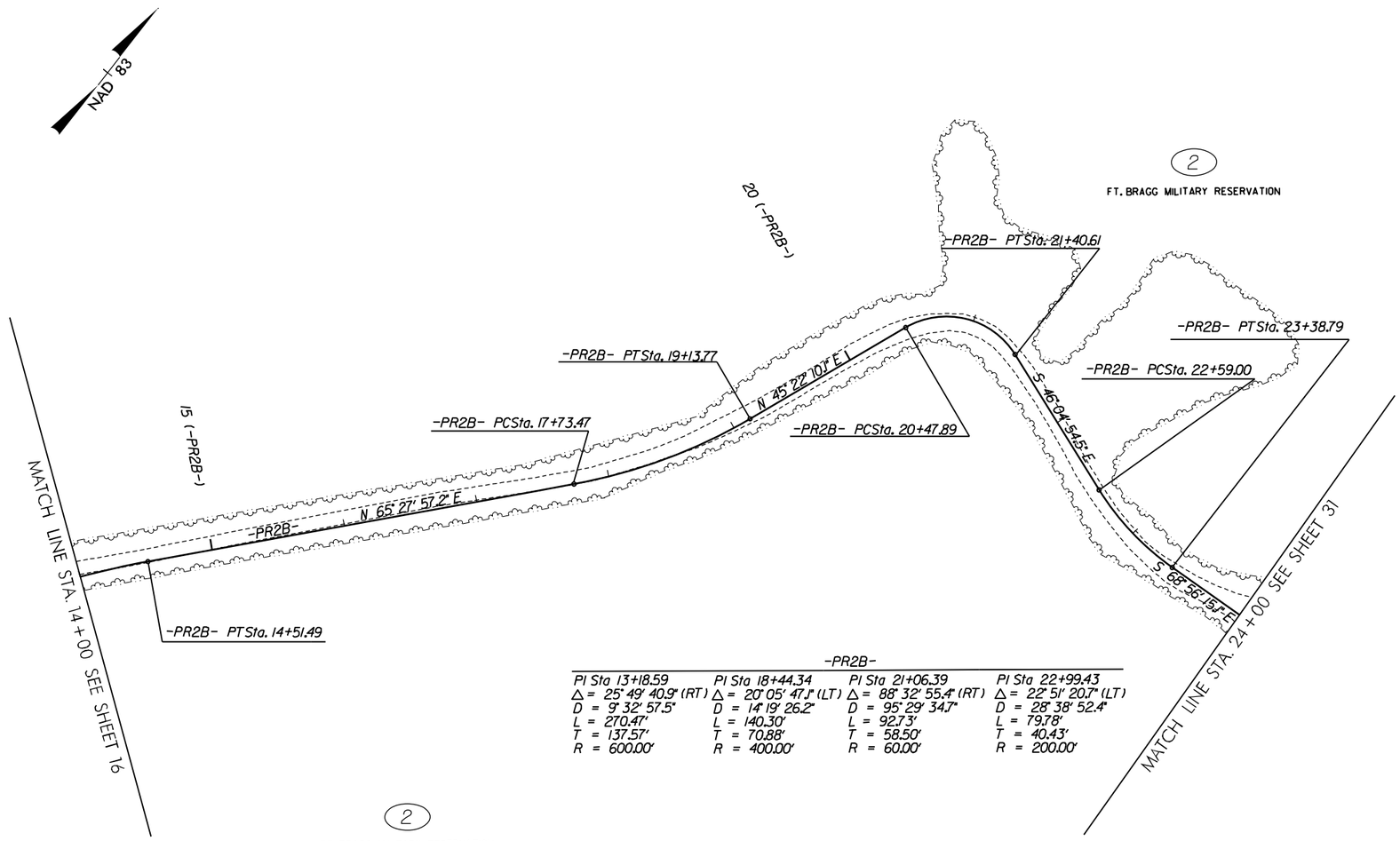
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	30

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYRD



-PR2B-

PI Sta 13+18.59	PI Sta 18+44.34	PI Sta 21+06.39	PI Sta 22+99.43
Δ = 25° 49' 40.9" (RT)	Δ = 20° 05' 47.1" (LT)	Δ = 88° 32' 55.4" (RT)	Δ = 22° 51' 20.7" (LT)
D = 9° 32' 57.5"	D = 14° 19' 26.2"	D = 95° 29' 34.7"	D = 28° 38' 52.4"
L = 270.47'	L = 140.30'	L = 92.73'	L = 79.78'
T = 137.57'	T = 70.88'	T = 58.50'	T = 40.43'
R = 600.00'	R = 400.00'	R = 60.00'	R = 200.00'

THIS PAGE IS FOR INFORMATIONAL PURPOSES ONLY

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REVISIONS

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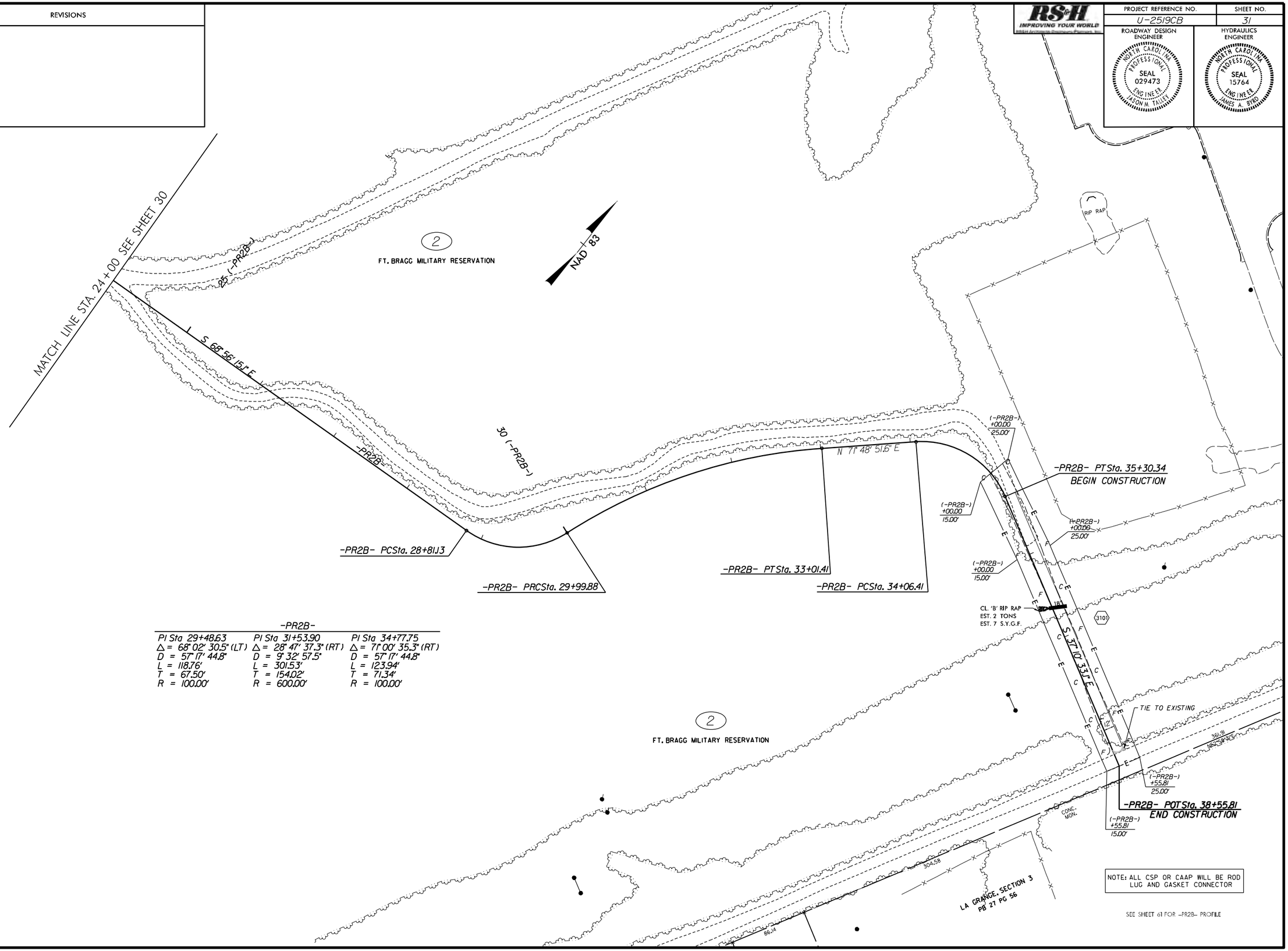
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	31

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON W. TALLEY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYRD



-PR2B-

PI Sta 29+48.63	PI Sta 31+53.90	PI Sta 34+77.75
Δ = 68° 02' 30.5" (LT)	Δ = 28° 47' 37.3" (RT)	Δ = 71° 00' 35.3" (RT)
D = 57° 17' 44.8"	D = 9° 32' 57.5"	D = 57° 17' 44.8"
L = 118.76'	L = 301.53'	L = 123.94'
T = 67.50'	T = 154.02'	T = 71.34'
R = 100.00'	R = 600.00'	R = 100.00'

NOTE: ALL CSP OR CAAP WILL BE ROD LUG AND GASKET CONNECTOR

SEE SHEET 61 FOR -PR2B- PROFILE

104.001.001/u2519cb/Roadway/proj/u2519cb_rdy.psh31