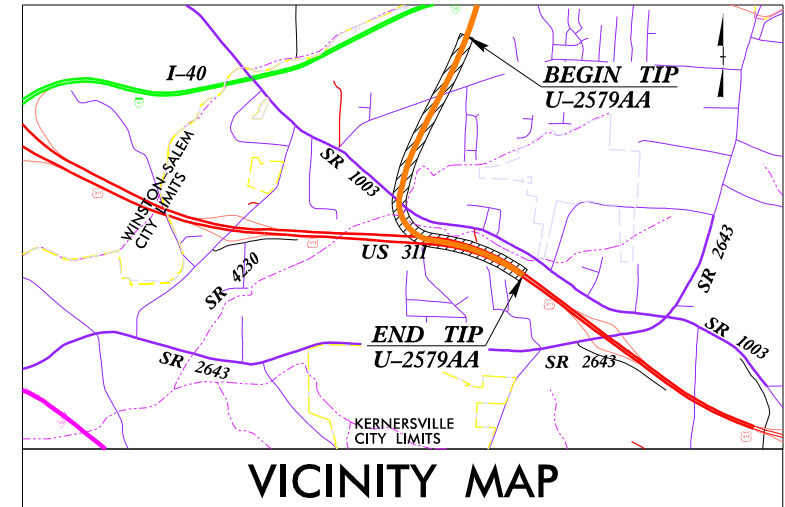


09/08/99

**CONTRACT: TIP PROJECT: U-2579AA**

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



**FDPI PLANS**

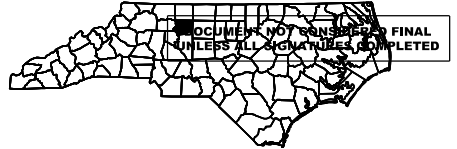
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**FORSYTH COUNTY**

**LOCATION: WINSTON-SALEM NORTHERN BELTWAY EASTERN SECTION  
(FUTURE I-74) FROM US 311 TO I-40**

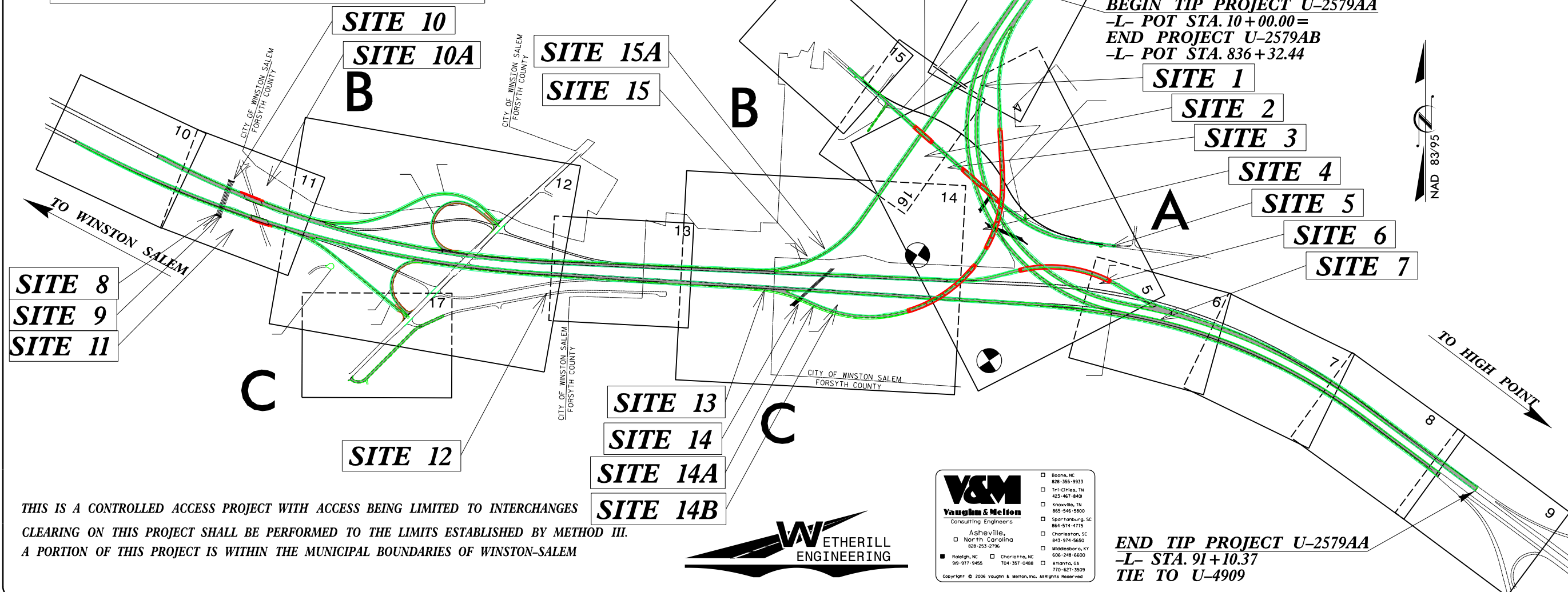
**TYPE OF WORK: GRADING, PAVING, DRAINAGE & STRUCTURES**

**WETLAND AND SURFACE WATER IMPACTS PERMIT**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2579AA	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34839.1.7		PE ROW, UTIL. CONST	



**PERMIT DRAWING  
SHEET 1 OF 32**



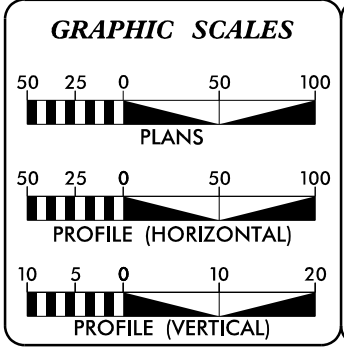
THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES  
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.  
A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF WINSTON-SALEM

**V&M**  
Vaughn & Melton  
Consulting Engineers

Asheville, NC 828-253-2796  
Raleigh, NC 919-977-9455

Boone, NC 828-356-9933  
Tri-Cities, TN 423-467-8401  
Knoxville, TN 865-546-5800  
Spartanburg, SC 864-534-4775  
Charleston, SC 843-974-5650  
Milledgeville, KY 606-248-6500  
Atlanta, GA 770-627-3509

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**DESIGN DATA**

ADT 2020 = 10,733  
ADT 2040 = 16,400

K = 9 %  
D = 60 %  
T = 7 % \*  
V = 70 MPH

\* (TTST = 4% & DUAL = 3%)

CLASS = INTERSTATE  
TIER

**PROJECT LENGTH**

LENGTH OF ROADWAY TIP PROJECT U-2579AA = 1.524 MILES  
LENGTH OF STRUCTURES TIP PROJECT U-2579AA = 0.012 MILES  
TOTAL LENGTH TIP PROJECT U-2579AA = 1.536 MILES

Prepared In the Office of:  
**VAUGHN & MELTON, INC**  
3509 Haworth Dr. #100, Raleigh NC, 27609 Phone (919)-977-9455

2018 STANDARD SPECIFICATIONS  
**RIGHT OF WAY DATE:** AUGUST 17, 2018

**LETTING DATE:** SEPTEMBER 15, 2020

**NCDOT CONTACT:** TATIA L. WHITE, PE, PLS

**JOHN LANSFORD, PE**  
PROJECT ENGINEER

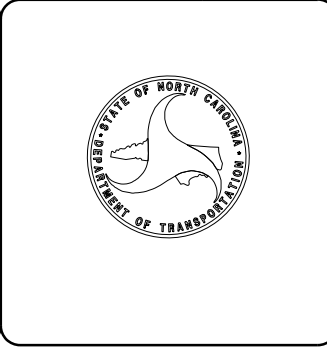
**KEITH BRIDGERS**  
PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

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

**ROADWAY DESIGN ENGINEER**

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

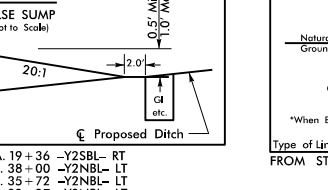
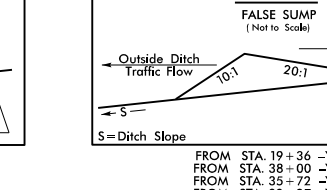
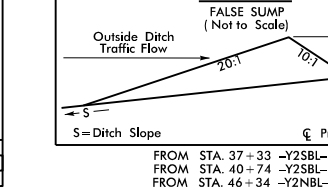
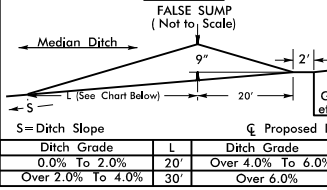
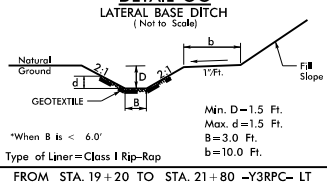
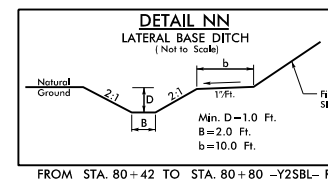
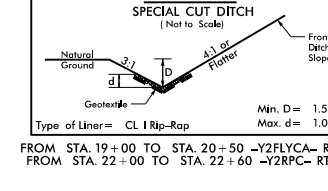
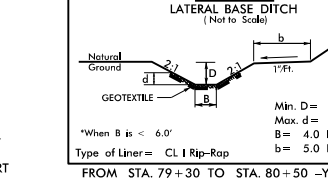
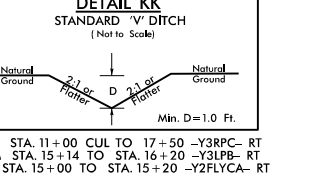
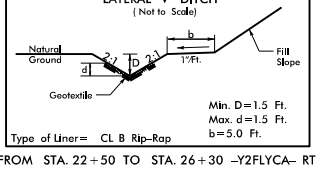
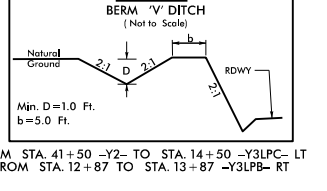
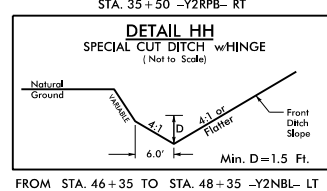
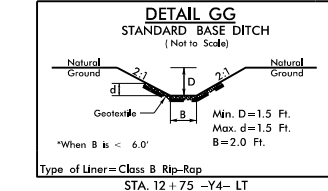
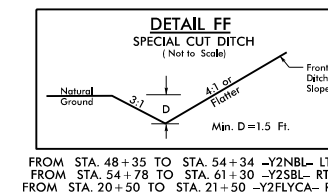
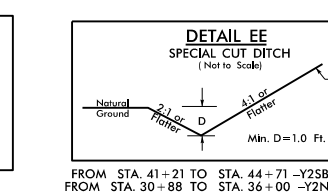
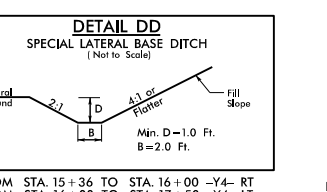
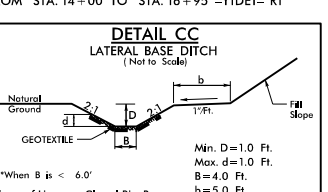
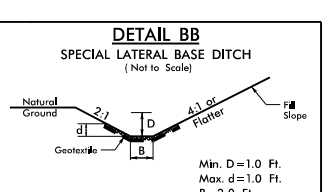
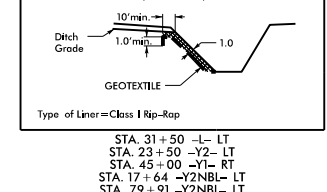
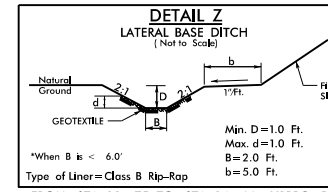
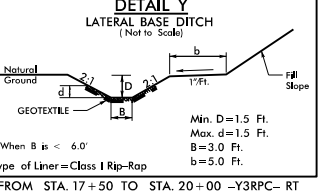
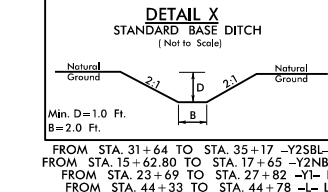
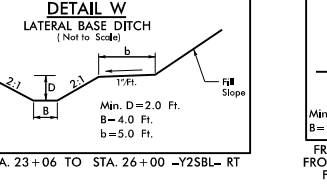
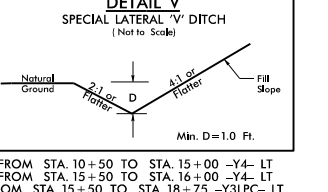
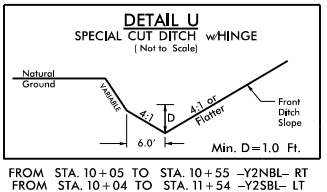
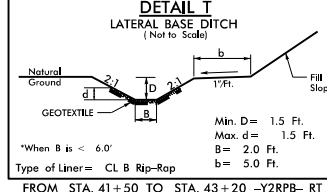
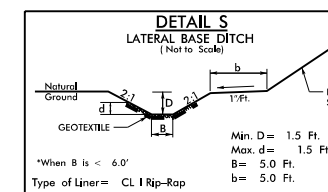
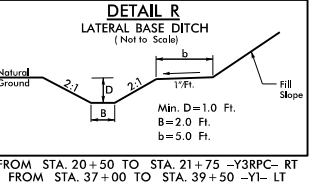
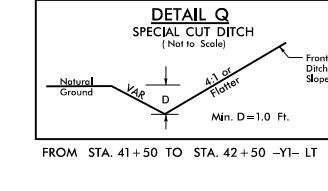
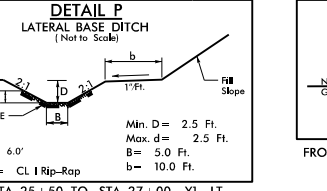
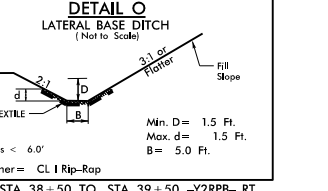
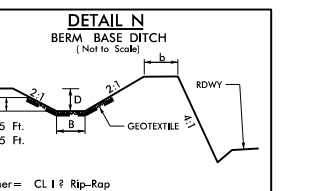
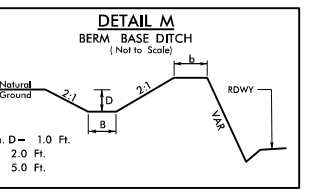
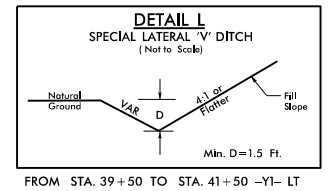
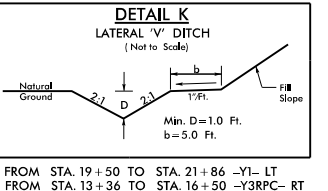
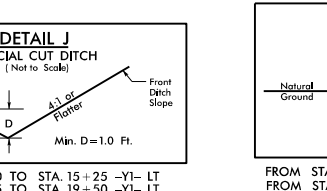
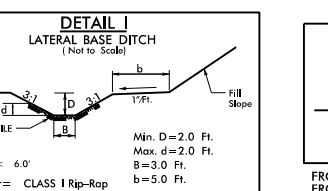
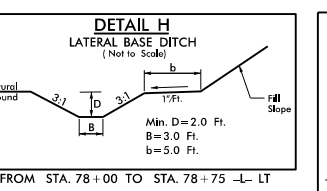
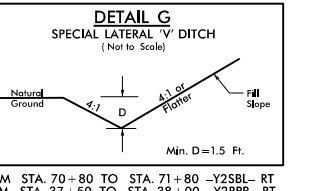
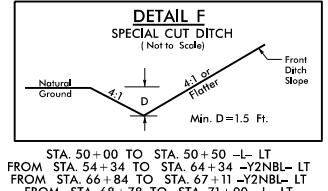
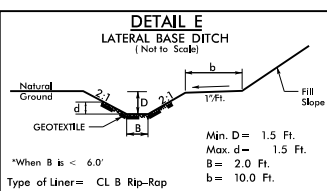
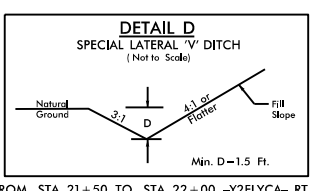
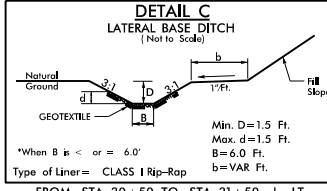
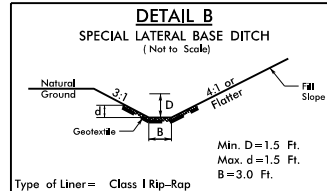
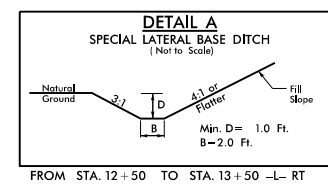


11/6/2018  
F:\Brooks  
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INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 2 OF 32



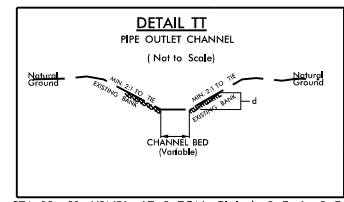
REVISIONS

11/6/2018  
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B.17/99

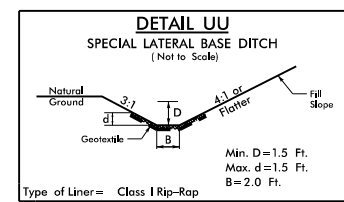
**INCOMPLETE PLANS**  
DO NOT USE FOR A/W ACQUISITION

**DOCUMENT NOT CONSIDERED FINAL**  
UNLESS ALL SIGNATURES COMPLETED

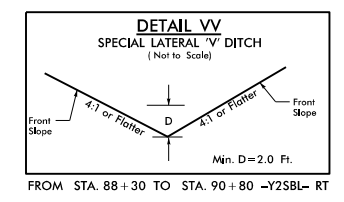
**PERMIT DRAWING**  
**SHEET 3 OF 32**



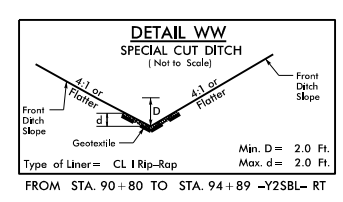
STA. 18+81 -Y2NBL- LT; 3 TON CL I; d=3 Ft; L=8 Ft  
STA. 21+62 -Y2NBL- LT; 4 TON CL I; d=3 Ft; L=8 Ft  
STA. 22+95 -Y2NBL- LT; 4 TON CL I; d=3 Ft; L=8 Ft  
STA. 54+35 -L- RT; 16 TON CL I; d=5 Ft; L=35 Ft



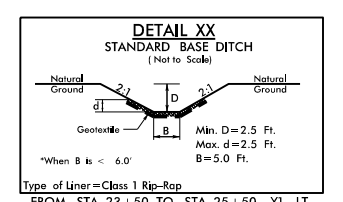
Type of Liner = Class I Rip-Rap  
FROM STA. 50+50 TO STA. 51+00 -Y2FLYCA- LT  
Min. D=1.5 Ft.  
Max. d=1.5 Ft.  
B=2.0 Ft.



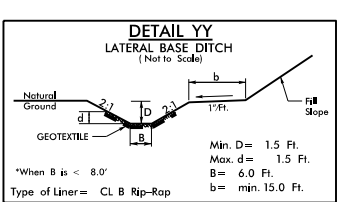
FROM STA. 88+30 TO STA. 90+80 -Y2SBL- RT  
Min. D=2.0 Ft.



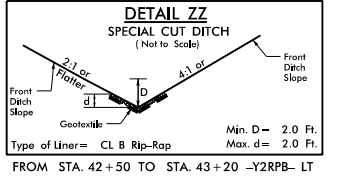
FROM STA. 90+80 TO STA. 94+89 -Y2SBL- RT  
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Min. D=2.0 Ft.  
Max. d=2.0 Ft.



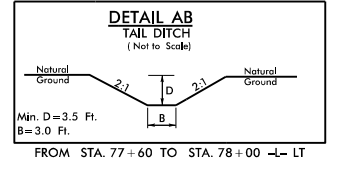
Type of Liner = Class I Rip-Rap  
FROM STA. 23+50 TO STA. 25+50 -Y1- LT  
FROM STA. 19+00 TO STA. 27+30 -Y1DET- RT  
Min. D=2.5 Ft.  
Max. d=2.5 Ft.  
B=5.0 Ft.  
\*When B is < 6.0'



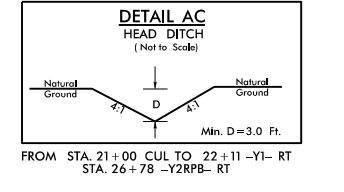
FROM STA. 40+86 TO STA. 42+50 -Y2RPB- LT  
Type of Liner = CL B Rip-Rap  
Min. D=1.5 Ft.  
Max. d=1.5 Ft.  
B=6.0 Ft.  
b= min. 15.0 Ft.  
\*When B is < 8.0'



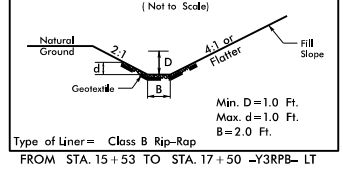
FROM STA. 42+50 TO STA. 43+20 -Y2RPB- LT  
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Min. D=2.0 Ft.  
Max. d=2.0 Ft.



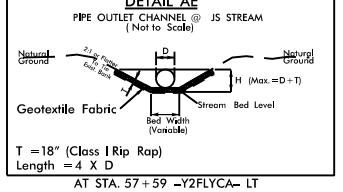
FROM STA. 77+60 TO STA. 78+00 -L- LT  
Min. D=3.5 Ft.  
B=3.0 Ft.



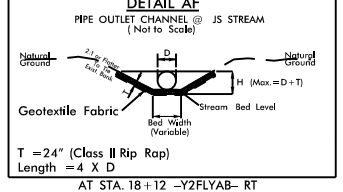
FROM STA. 21+00 CUL TO STA. 22+11 -Y1- RT  
STA. 26+78 -Y2RPB- RT  
Min. D=3.0 Ft.



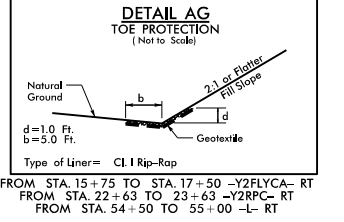
FROM STA. 15+53 TO STA. 17+50 -Y3RPB- LT  
Type of Liner = Class B Rip-Rap  
Min. D=1.0 Ft.  
Max. d=1.0 Ft.  
B=2.0 Ft.



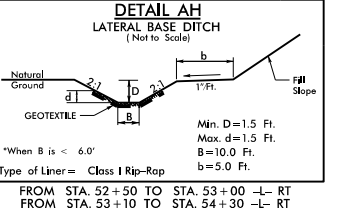
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T=18" (Class I Rip Rap)  
Length = 4 X D



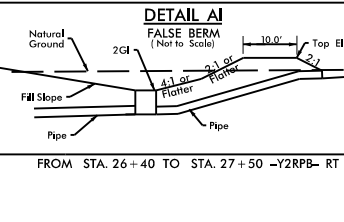
AT STA. 18+12 -Y2FLYAB- RT  
T=24" (Class II Rip Rap)  
Length = 4 X D



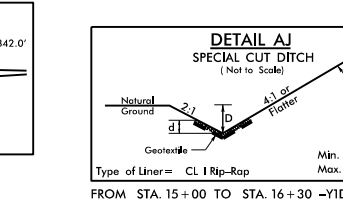
FROM STA. 15+75 TO STA. 17+50 -Y2FLYCA- RT  
FROM STA. 22+63 TO STA. 23+63 -Y2RPC- RT  
FROM STA. 54+50 TO STA. 55+00 -L- RT  
Type of Liner = CL I Rip-Rap



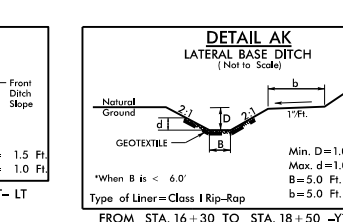
FROM STA. 52+50 TO STA. 53+00 -L- RT  
FROM STA. 53+10 TO STA. 54+30 -L- RT  
Type of Liner = Class I Rip-Rap  
Min. D=1.5 Ft.  
Max. d=1.5 Ft.  
B=10.0 Ft.  
b=5.0 Ft.  
\*When B is < 6.0'



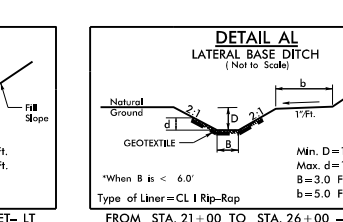
FROM STA. 26+40 TO STA. 27+50 -Y2RPB- RT



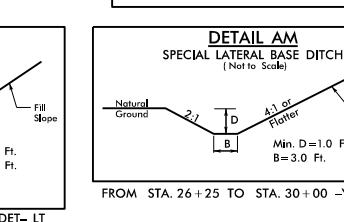
FROM STA. 15+00 TO STA. 16+30 -Y1DET- LT  
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Max. d=1.0 Ft.



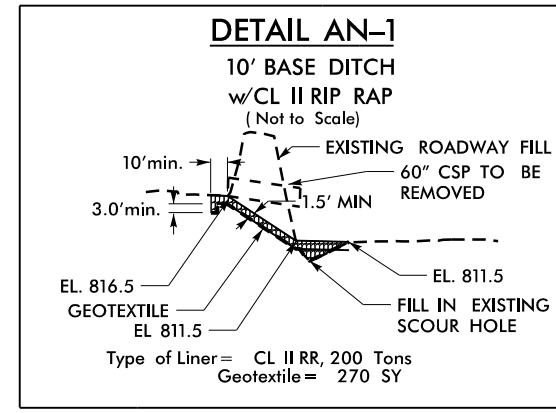
FROM STA. 16+30 TO STA. 18+50 -Y1DET- LT  
Type of Liner = Class I Rip-Rap  
Min. D=1.0 Ft.  
Max. d=1.0 Ft.  
B=5.0 Ft.  
b=5.0 Ft.  
\*When B is < 6.0'



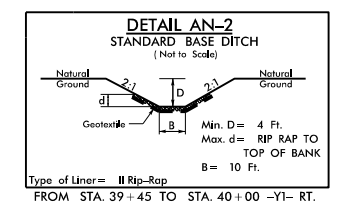
FROM STA. 21+00 TO STA. 26+00 -Y1DET- LT  
Type of Liner = CL I Rip-Rap  
Min. D=1.0 Ft.  
Max. d=1.0 Ft.  
B=3.0 Ft.  
b=5.0 Ft.  
\*When B is < 6.0'



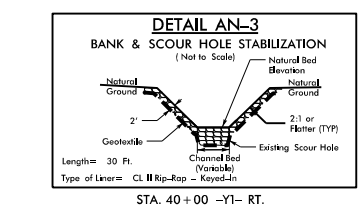
FROM STA. 26+25 TO STA. 30+00 -Y1DET- LT  
Min. D=1.0 Ft.  
B=3.0 Ft.



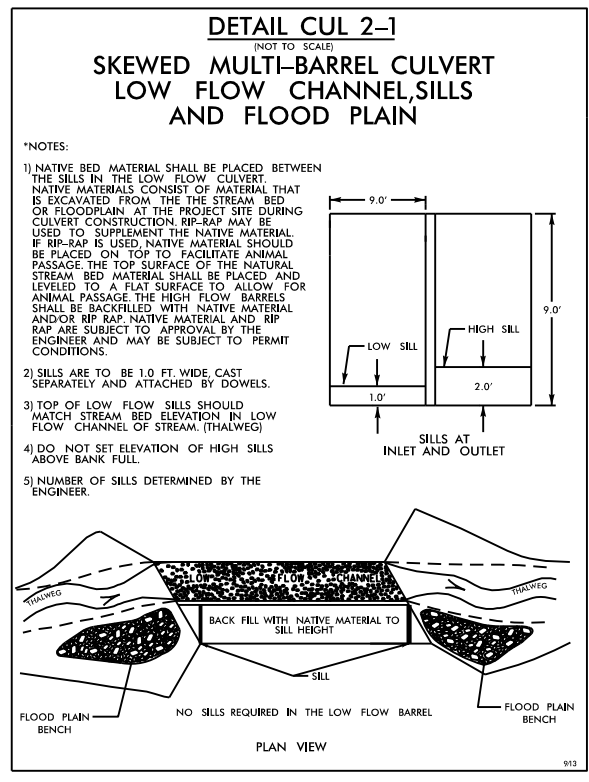
FROM STA. 39+45 TO STA. 40+00 -Y1- RT.  
Type of Liner = CL II RR, 200 Tons  
Geotextile = 270 SY



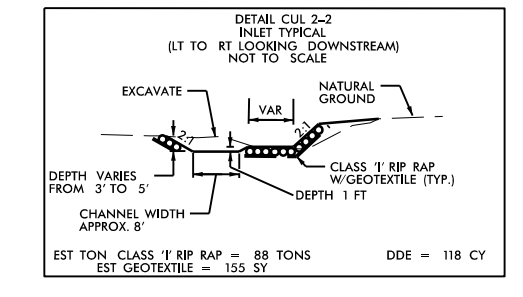
FROM STA. 39+45 TO STA. 40+00 -Y1- RT.  
Type of Liner = II Rip-Rap  
Min. D=4 Ft.  
Max. d=1.0 Ft.  
B=10 Ft.



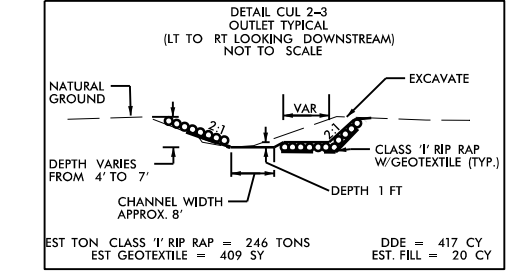
STA. 40+00 -Y1- RT.  
Type of Liner = CL II Rip-Rap - Keyed-In



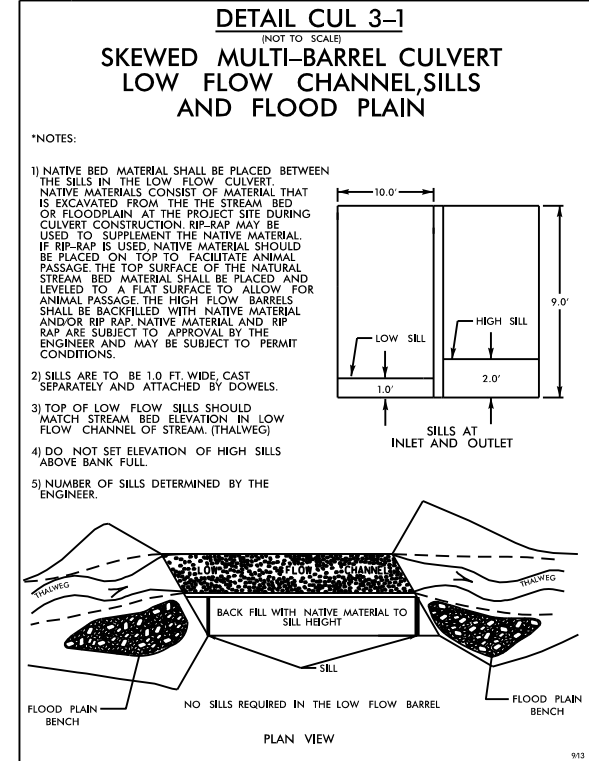
- \*NOTES:
- 1) NATIVE BED MATERIAL SHALL BE PLACED BETWEEN THE SILLS IN THE LOW FLOW CULVERT. NATIVE MATERIALS CONSIST OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. RIP-RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IF RIP-RAP IS USED. NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FACILITATE ANIMAL PASSAGE. THE TOP SURFACE OF THE NATURAL STREAM BED MATERIAL SHALL BE PLACED AND LEVELED TO A FLAT SURFACE TO ALLOW FOR ANIMAL PASSAGE. THE HIGH FLOW BARRELS SHALL BE BACKFILLED WITH NATIVE MATERIAL AND/OR RIP RAP. NATIVE MATERIAL AND RIP RAP ARE SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.
  - 2) SILLS ARE TO BE 1.0 FT. WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.
  - 3) TOP OF LOW FLOW SILLS SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)
  - 4) DO NOT SET ELEVATION OF HIGH SILLS ABOVE BANK FULL.
  - 5) NUMBER OF SILLS DETERMINED BY THE ENGINEER.



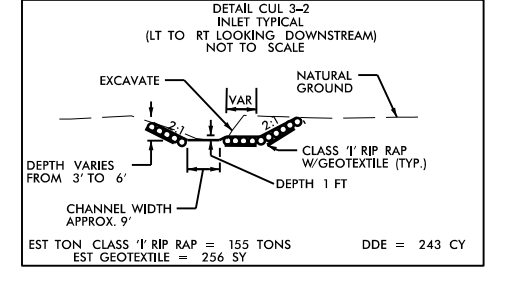
EST TON CLASS 'I' RIP RAP = 88 TONS  
EST GEOTEXTILE = 155 SY  
DDE = 118 CY



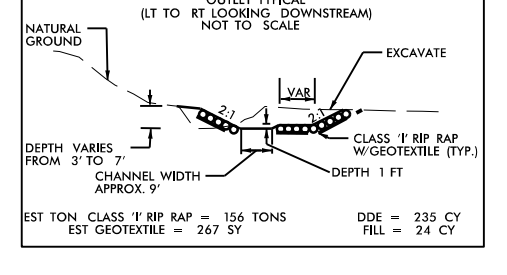
EST TON CLASS 'I' RIP RAP = 246 TONS  
EST GEOTEXTILE = 409 SY  
DDE = 417 CY  
EST. FILL = 20 CY



- \*NOTES:
- 1) NATIVE BED MATERIAL SHALL BE PLACED BETWEEN THE SILLS IN THE LOW FLOW CULVERT. NATIVE MATERIALS CONSIST OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. RIP-RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IF RIP-RAP IS USED. NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FACILITATE ANIMAL PASSAGE. THE TOP SURFACE OF THE NATURAL STREAM BED MATERIAL SHALL BE PLACED AND LEVELED TO A FLAT SURFACE TO ALLOW FOR ANIMAL PASSAGE. THE HIGH FLOW BARRELS SHALL BE BACKFILLED WITH NATIVE MATERIAL AND/OR RIP RAP. NATIVE MATERIAL AND RIP RAP ARE SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.
  - 2) SILLS ARE TO BE 1.0 FT. WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.
  - 3) TOP OF LOW FLOW SILLS SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)
  - 4) DO NOT SET ELEVATION OF HIGH SILLS ABOVE BANK FULL.
  - 5) NUMBER OF SILLS DETERMINED BY THE ENGINEER.



EST TON CLASS 'I' RIP RAP = 155 TONS  
EST GEOTEXTILE = 256 SY  
DDE = 243 CY



EST TON CLASS 'I' RIP RAP = 156 TONS  
EST GEOTEXTILE = 267 SY  
DDE = 235 CY  
FILL = 24 CY

REVISIONS

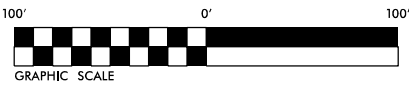
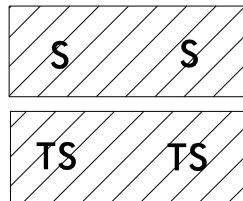
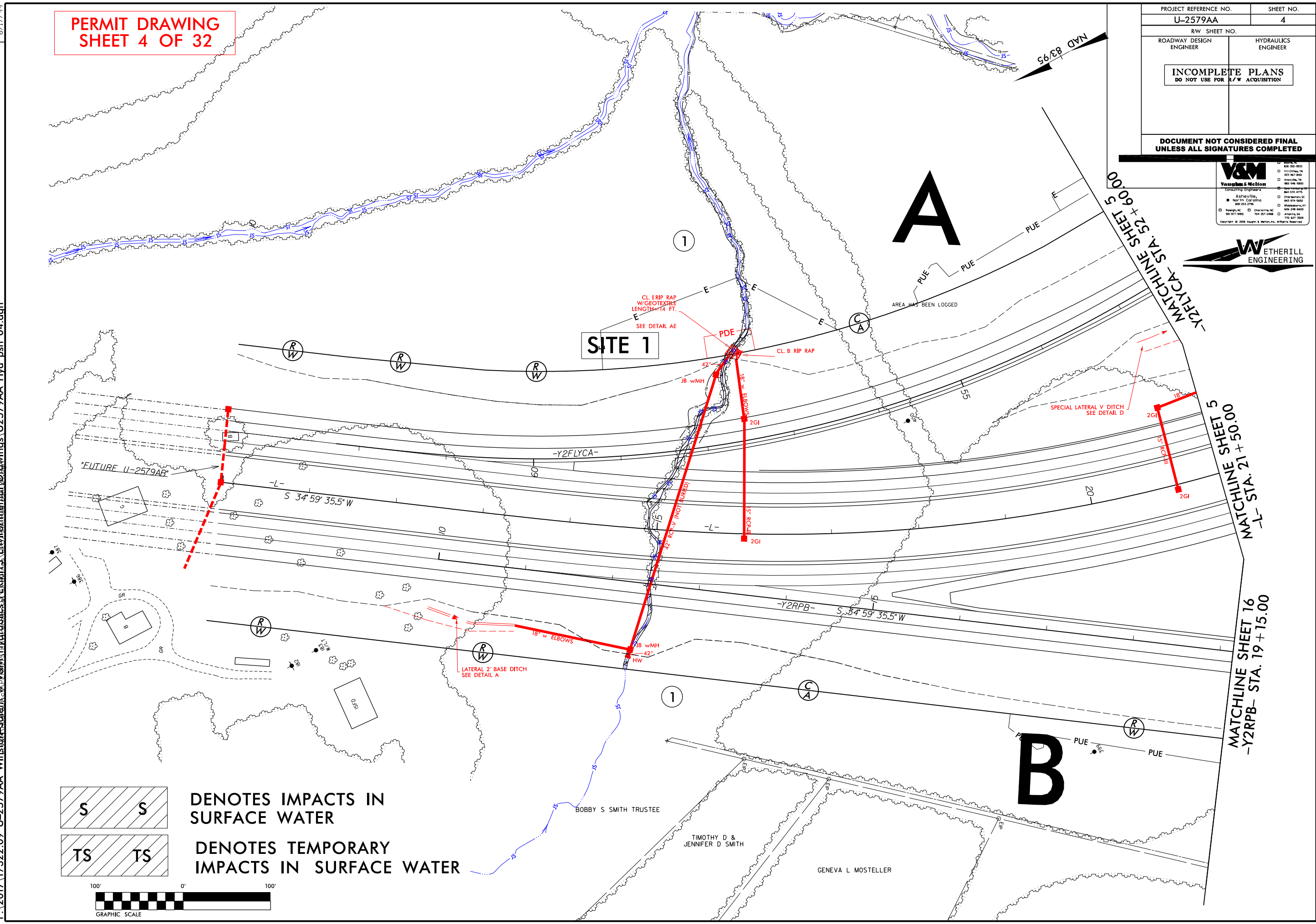
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PERMIT DRAWING  
SHEET 4 OF 32

PROJECT REFERENCE NO. U-2579AA	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	
<b>DOCUMENT NOT CONSIDERED FINAL</b> UNLESS ALL SIGNATURES COMPLETED	

**V&M**  
 Consulting Engineers  
 Asheville, NC  
 Raleigh, NC  
 Charlotte, NC  
 Winston-Salem, NC  
 Durham, NC  
 Greensboro, NC  
 Fayetteville, NC  
 Hickory, NC  
 Kinston, NC  
 Lenoir, NC  
 New Bern, NC  
 Norfolk, VA  
 Roanoke, VA  
 Virginia Beach, VA  
 Wilmington, NC  
 Raleigh, NC  
 Charlotte, NC  
 Winston-Salem, NC  
 Durham, NC  
 Greensboro, NC  
 Fayetteville, NC  
 Hickory, NC  
 Kinston, NC  
 Lenoir, NC  
 New Bern, NC  
 Norfolk, VA  
 Roanoke, VA  
 Virginia Beach, VA  
 Wilmington, NC

**WETHERILL ENGINEERING**



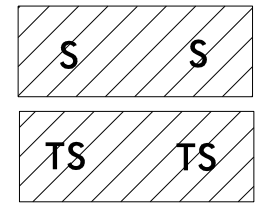
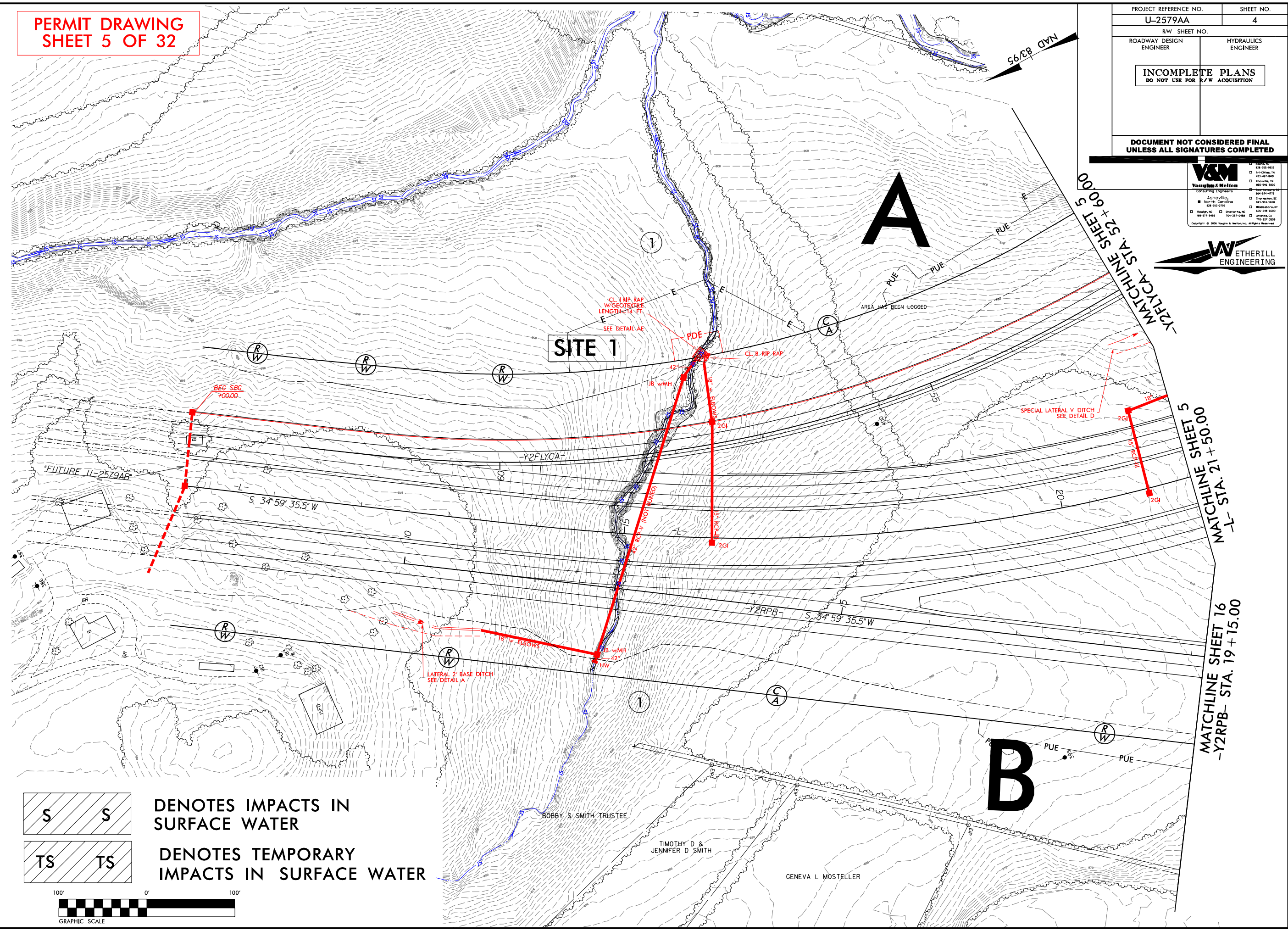
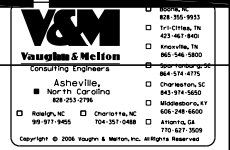
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REVISIONS

8.17.99

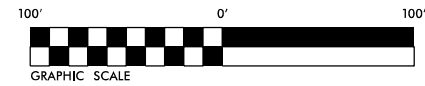
PERMIT DRAWING  
SHEET 5 OF 32

PROJECT REFERENCE NO.	SHEET NO.
U-2579AA	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	
<b>DOCUMENT NOT CONSIDERED FINAL</b> UNLESS ALL SIGNATURES COMPLETED	



**S** DENOTES IMPACTS IN SURFACE WATER

**TS** DENOTES TEMPORARY IMPACTS IN SURFACE WATER

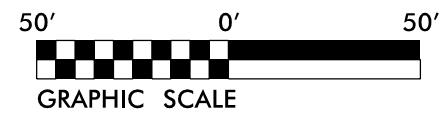


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REVISIONS

8.17.99

**PERMIT DRAWING  
SHEET 6 OF 32**



PROJECT REFERENCE NO.	SHEET NO.
U-2579AA	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION</b>	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

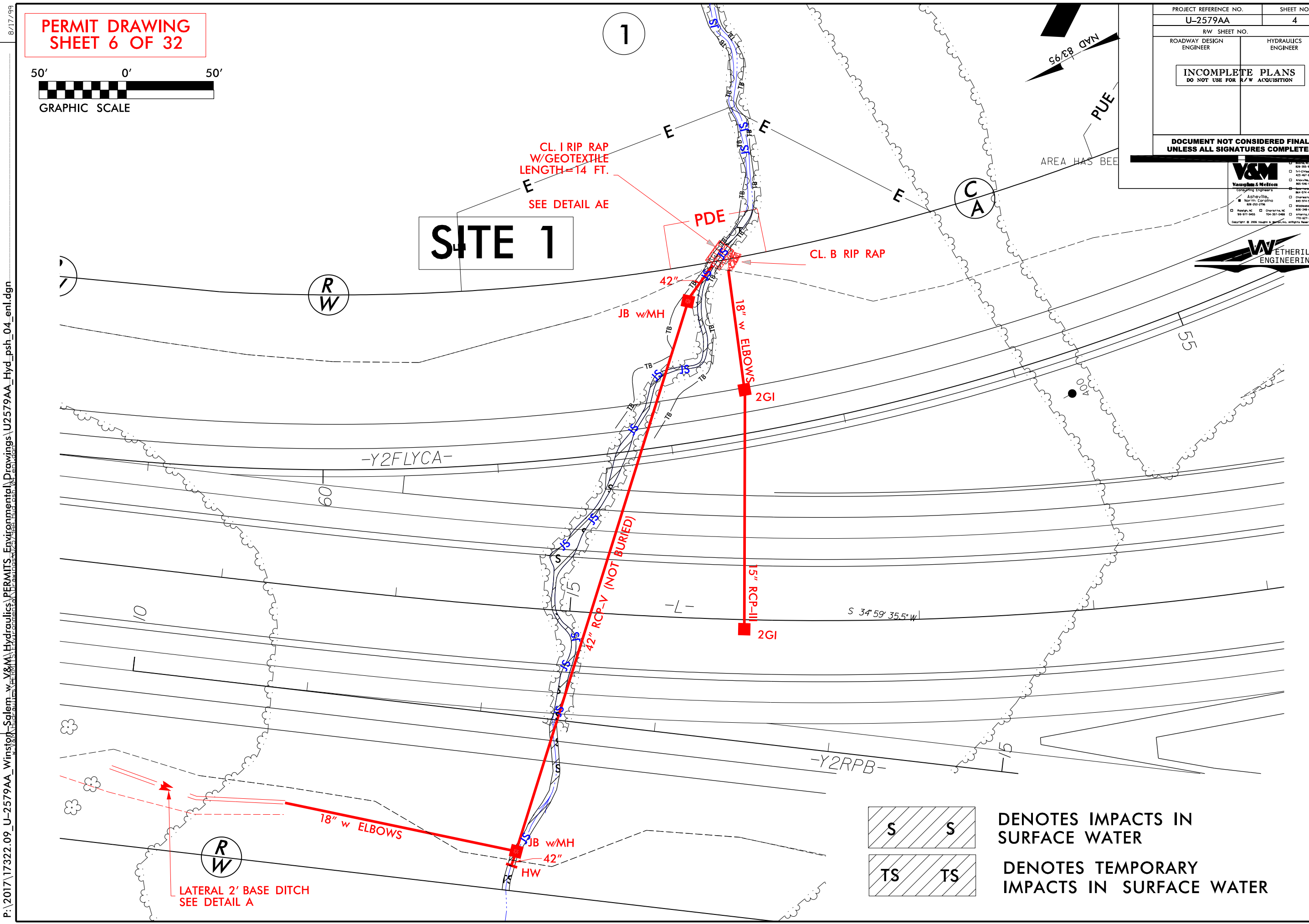
**V&M**  
Vaughan & Melton  
Consulting Engineers

Asheville, NC  
North Carolina  
828-253-2786  
90-977-9955

Chapel Hill, NC  
Durham, NC  
Mooresville, NC  
Atlanta, GA  
770-421-3509

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**WETHERILL**  
ENGINEERING



S S	DENOTES IMPACTS IN SURFACE WATER
TS TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

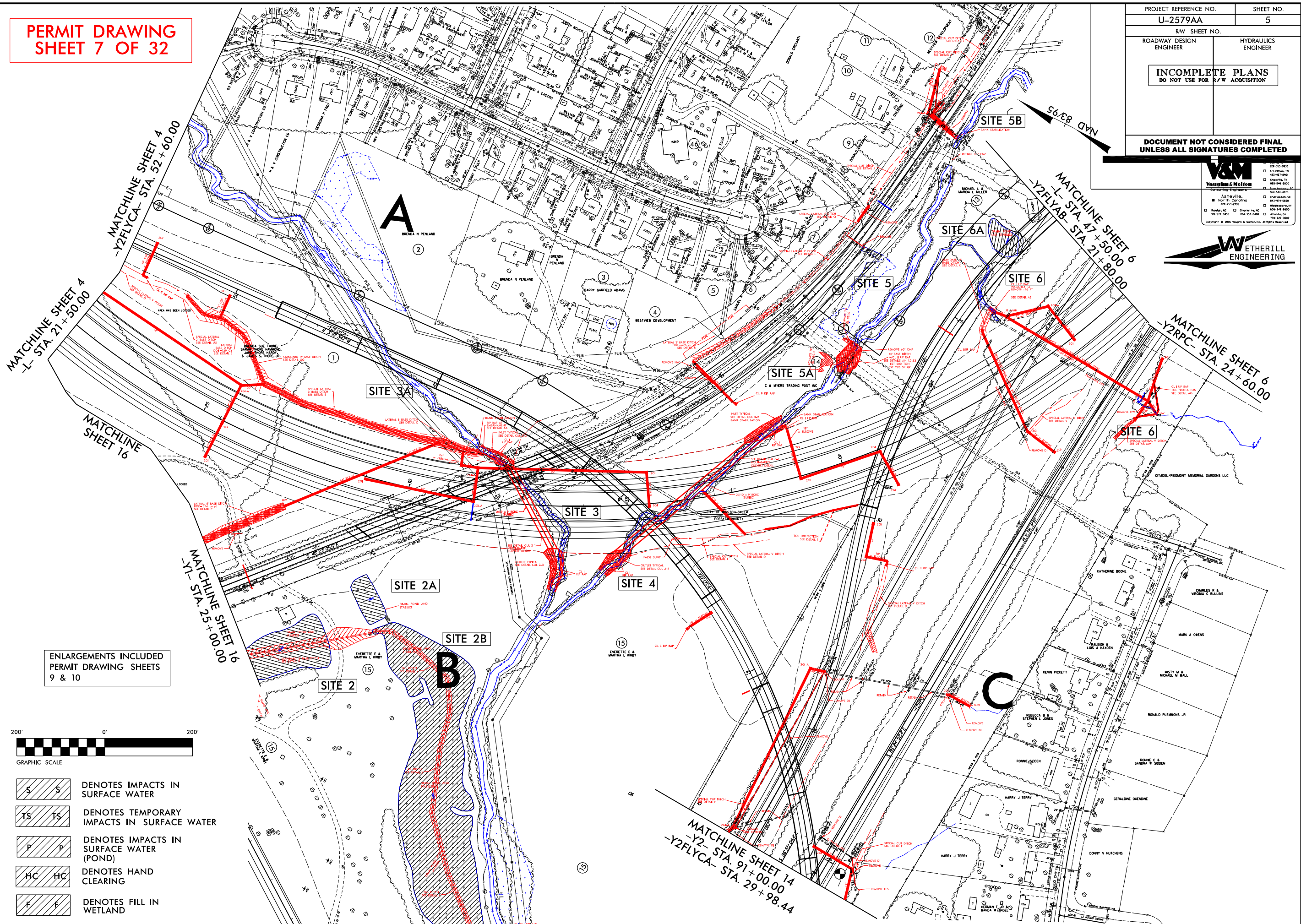
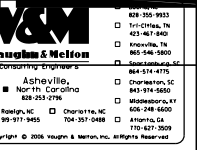
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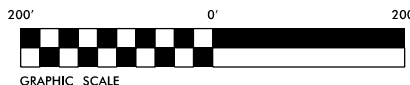
REVISIONS

**PERMIT DRAWING  
SHEET 7 OF 32**

PROJECT REFERENCE NO.	SHEET NO.
U-2579AA	5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION</b>	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	



ENLARGEMENTS INCLUDED  
PERMIT DRAWING SHEETS  
9 & 10



- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES IMPACTS IN SURFACE WATER (POND)
- DENOTES HAND CLEARING
- DENOTES FILL IN WETLAND

REVISIONS

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FBrooks  
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**PERMIT DRAWING  
SHEET 8 OF 32**

PROJECT REFERENCE NO.	SHEET NO.
U-2579AA	5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	
<b>DOCUMENT NOT CONSIDERED FINAL</b> UNLESS ALL SIGNATURES COMPLETED	

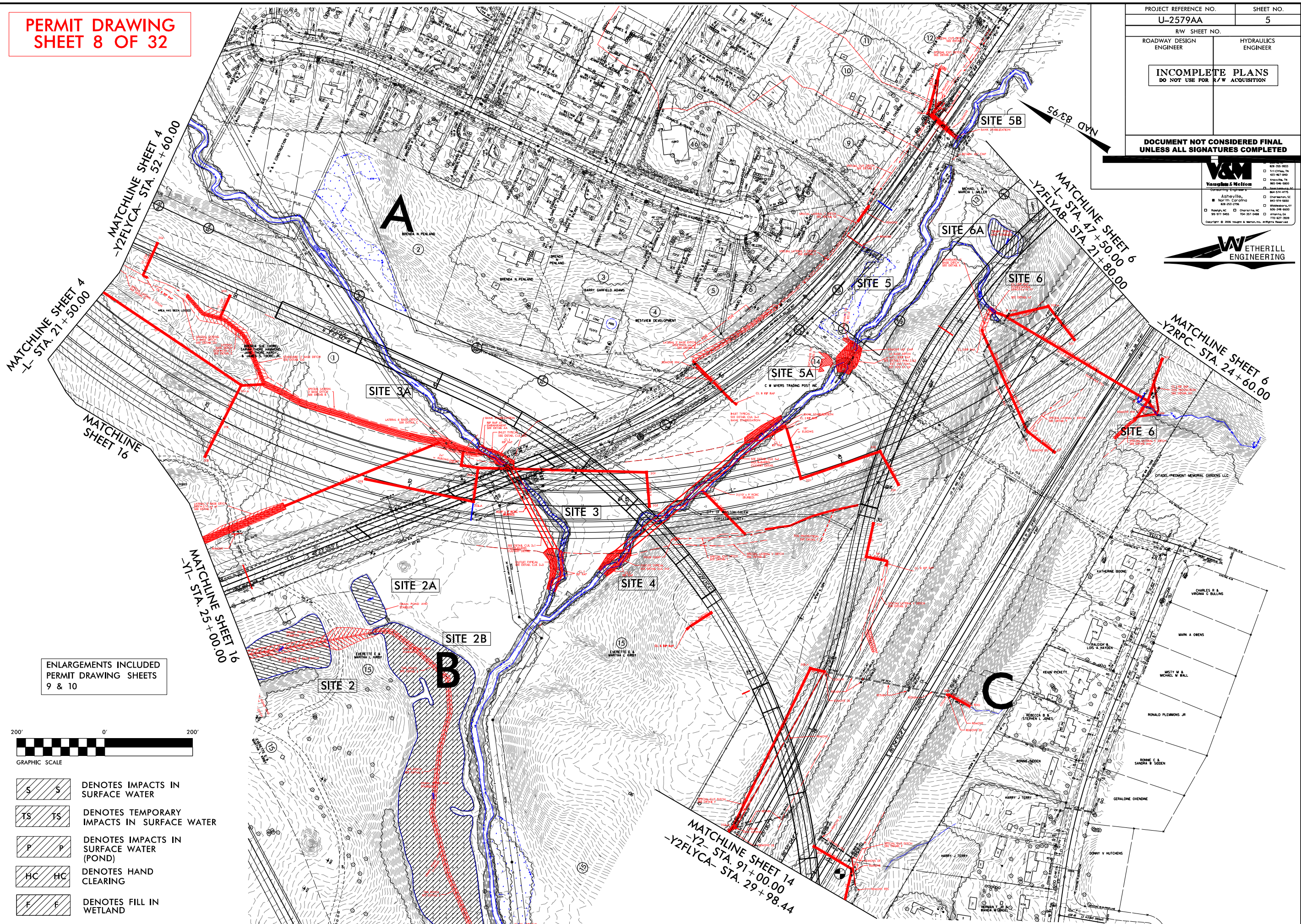
**V&M**  
Vannoy & McNeil  
CORPORATE ENGINEERS

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311-0166, TN  
423-467-8400  
404-251-1100  
865-548-5800  
844-314-4775

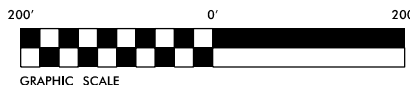
4500 W. 10th St.  
Aurora, CO 80015  
950-917-9465

4500 W. 10th St.  
Aurora, CO 80015  
950-917-9465

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ENLARGEMENTS INCLUDED  
PERMIT DRAWING SHEETS  
9 & 10



- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES IMPACTS IN SURFACE WATER (POND)
- DENOTES HAND CLEARING
- DENOTES FILL IN WETLAND

REVISIONS

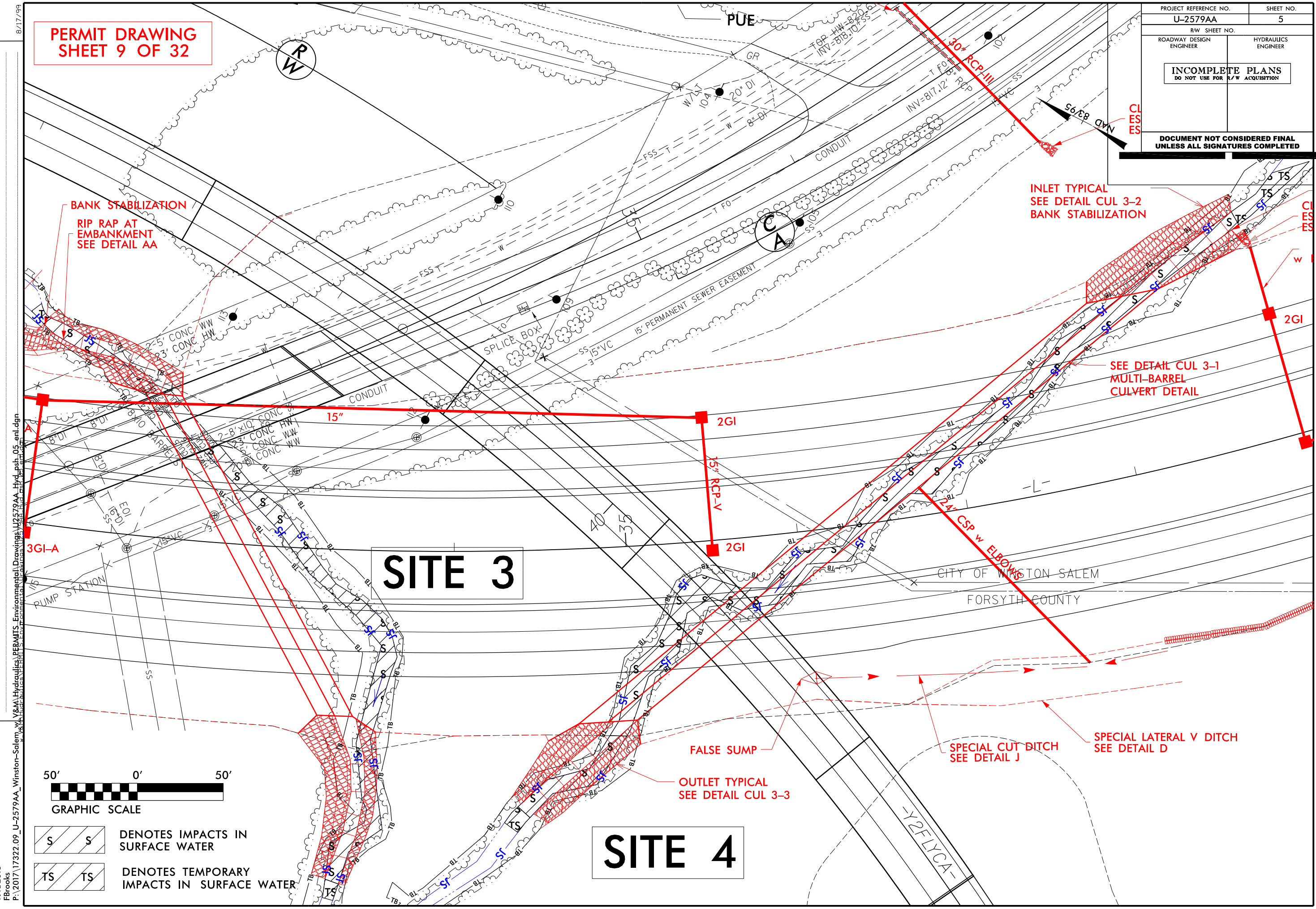
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**PERMIT DRAWING  
SHEET 9 OF 32**

PROJECT REFERENCE NO. <b>U-2579AA</b>	SHEET NO. <b>5</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION</b>	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	



**BANK STABILIZATION  
RIP RAP AT  
EMBANKMENT  
SEE DETAIL AA**

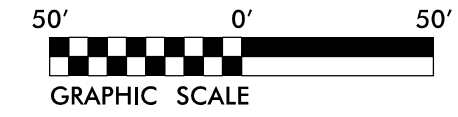
**INLET TYPICAL  
SEE DETAIL CUL 3-2  
BANK STABILIZATION**

**SEE DETAIL CUL 3-1  
MULTI-BARREL  
CULVERT DETAIL**

**FALSE SUMP  
OUTLET TYPICAL  
SEE DETAIL CUL 3-3**

**SPECIAL CUT DITCH  
SEE DETAIL J**

**SPECIAL LATERAL V DITCH  
SEE DETAIL D**



**S S** DENOTES IMPACTS IN SURFACE WATER  
**TS TS** DENOTES TEMPORARY IMPACTS IN SURFACE WATER

**SITE 3**

**SITE 4**

REVISIONS

11/6/2018  
 FBrooks  
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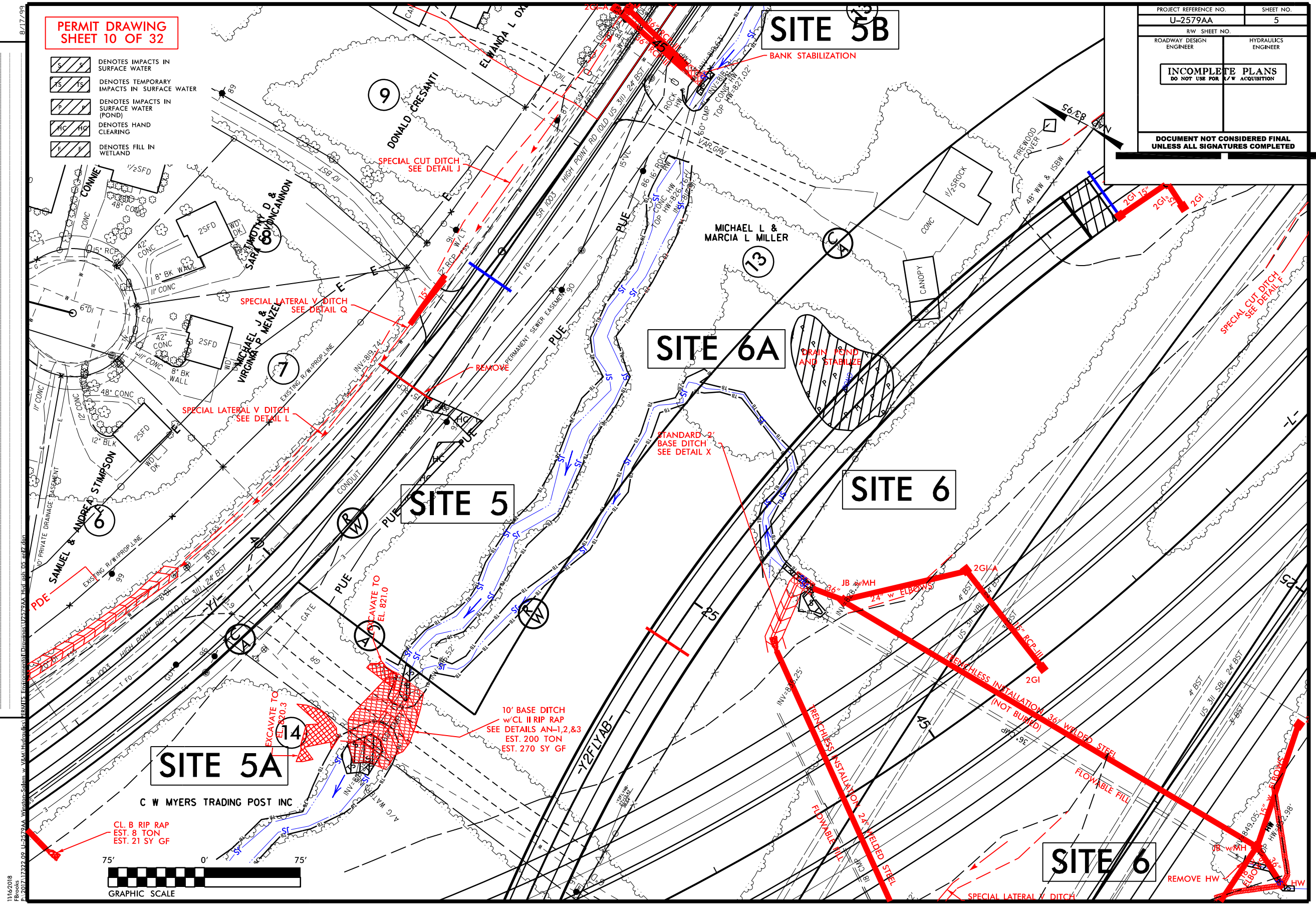
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**PERMIT DRAWING  
SHEET 10 OF 32**

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES IMPACTS IN SURFACE WATER (POND)
- DENOTES HAND CLEARING
- DENOTES FILL IN WETLAND

PROJECT REFERENCE NO. U-2579AA	SHEET NO. 5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	
<b>DOCUMENT NOT CONSIDERED FINAL</b> UNLESS ALL SIGNATURES COMPLETED	

REVISIONS



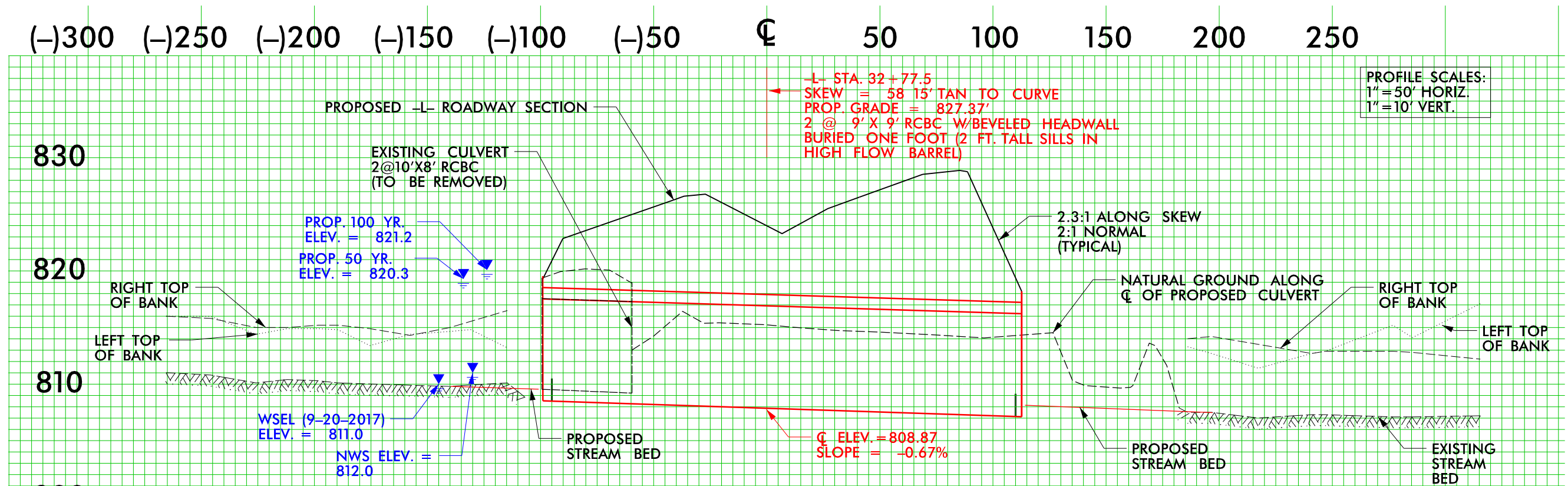
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8/17/99

PROJECT REFERENCE NO. U-2579AA		SHEET NO.	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

# SITE 3

**PERMIT DRAWING  
SHEET 11 OF 32**

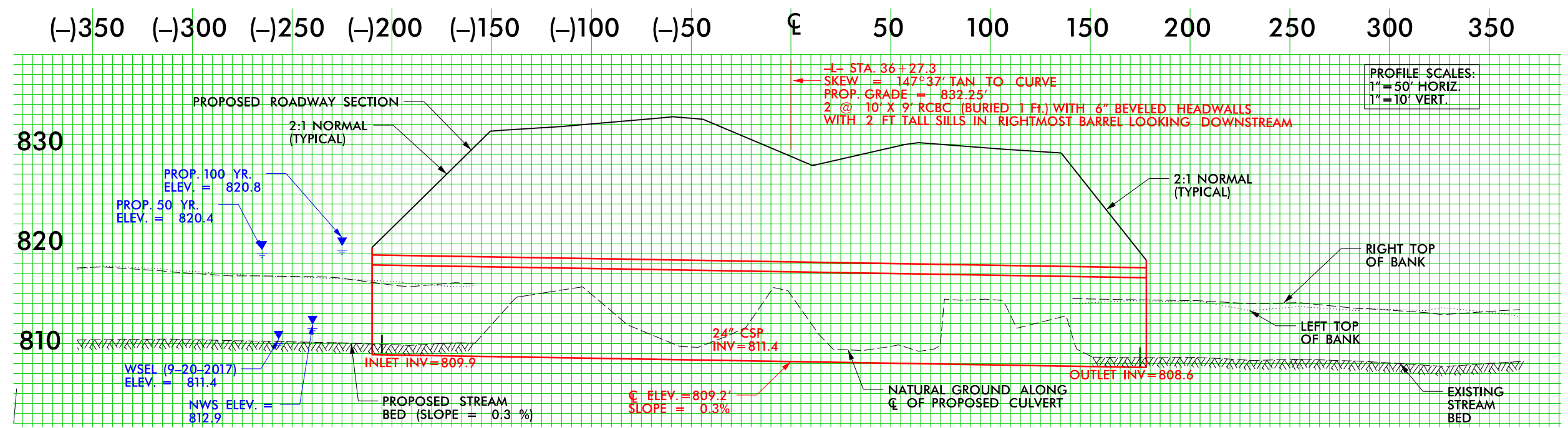


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PROJECT REFERENCE NO.		SHEET NO.	
U-2579AA			
RW SHEET NO.			
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER		
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

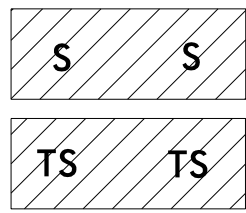
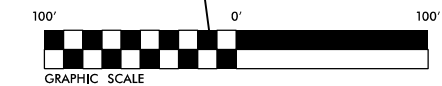
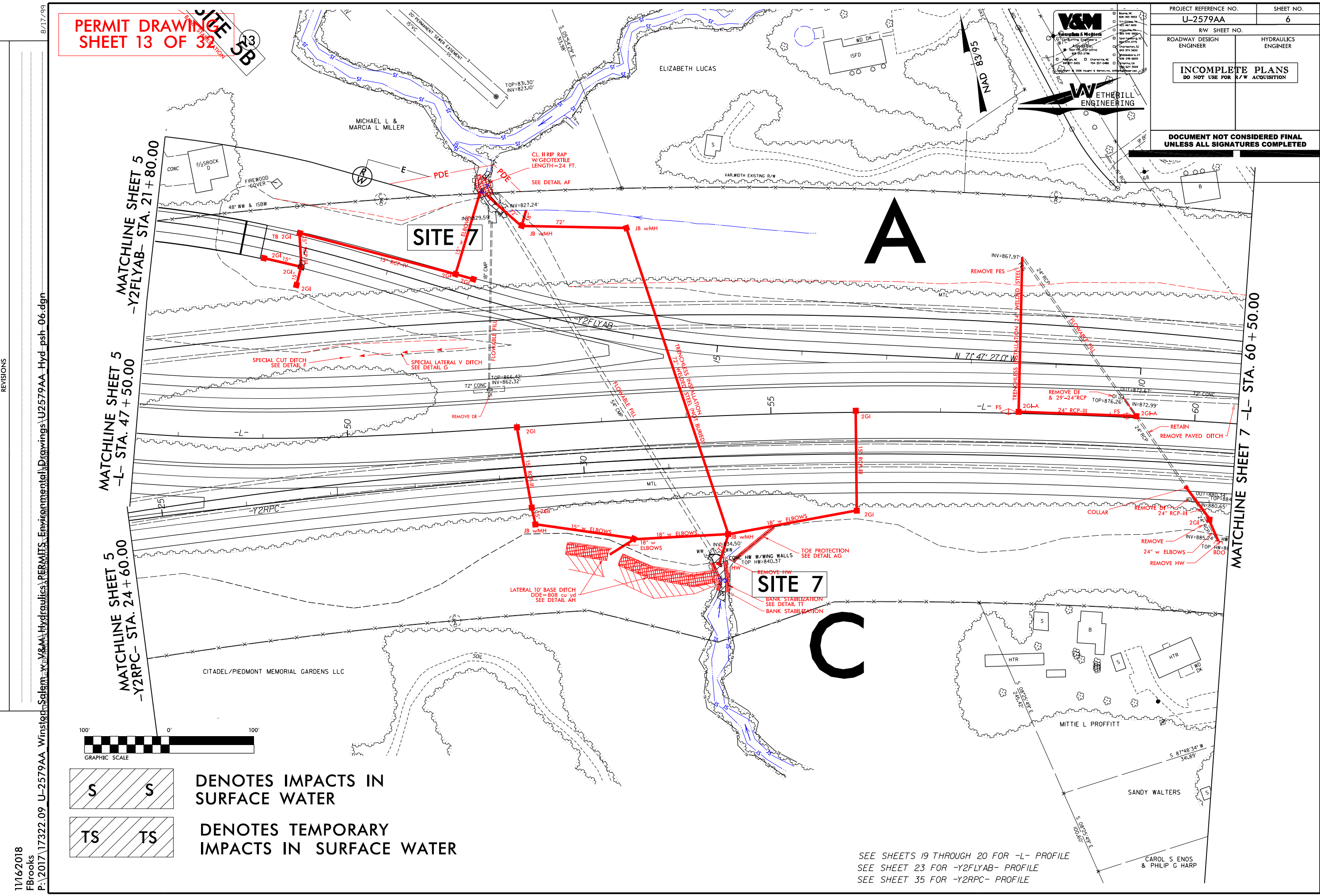
# SITE 4

PERMIT DRAWING  
SHEET 12 OF 32



**PERMIT DRAWING  
SHEET 13 OF 32**

PROJECT REFERENCE NO. <b>U-2579AA</b>	SHEET NO. <b>6</b>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION</b>	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	



**S** DENOTES IMPACTS IN SURFACE WATER

**TS** DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SEE SHEETS 19 THROUGH 20 FOR -L- PROFILE  
SEE SHEET 23 FOR -Y2FLYAB- PROFILE  
SEE SHEET 35 FOR -Y2RPC- PROFILE

1/16/2018  
 FBrooks  
 P:\2017\17322.09\_U-2579AA\_Winsted\Salem\_w.V&M\Hydraulics\PERMITS\_Environmental\Drawings\U2579AA\_Hyd\_psh\_06.dgn

MATCHLINE SHEET 5  
 -Y2FLYAB- STA. 21 + 80.00  
  
 MATCHLINE SHEET 5  
 -L- STA. 47 + 50.00  
  
 MATCHLINE SHEET 5  
 -Y2RPC- STA. 24 + 60.00

MATCHLINE SHEET 7  
 -L- STA. 60 + 50.00

**SITE 7**

**SITE 7**

**A**

**C**

REVISIONS

8.17.99

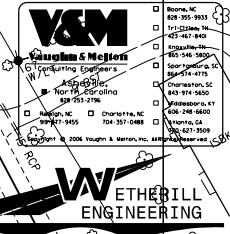
CITADEL/PIEDMONT MEMORIAL GARDENS LLC

ELIZABETH LUCAS

MITTIE L PROFFITT

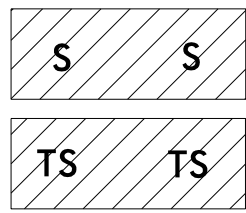
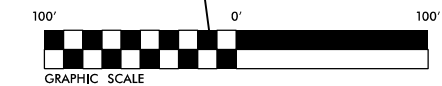
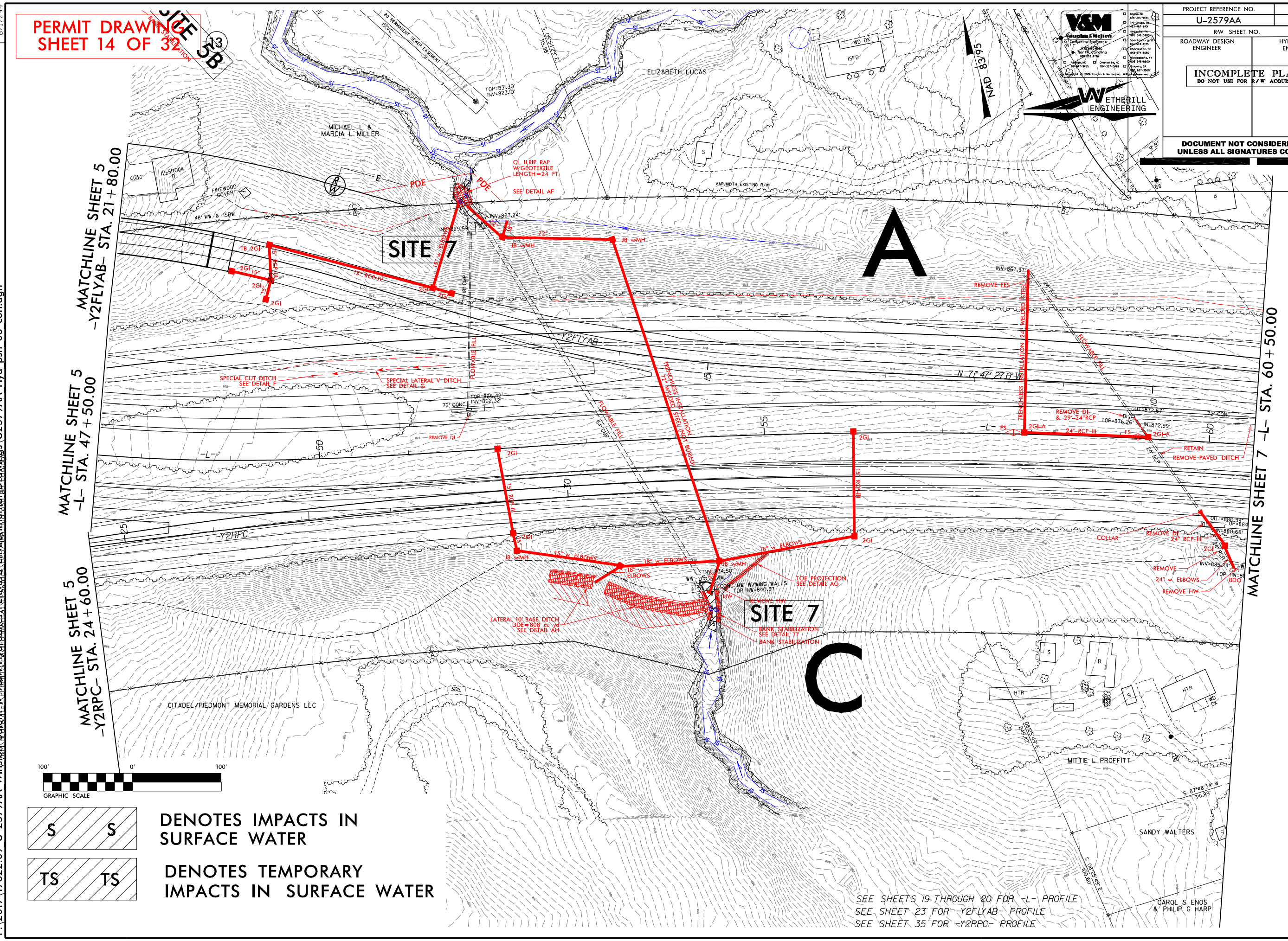
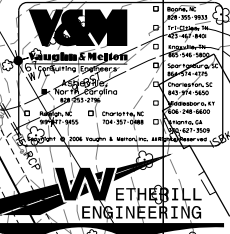
SANDY WALTERS

CAROL S ENOS & PHILIP G HARP



**PERMIT DRAWING  
SHEET 14 OF 32**

PROJECT REFERENCE NO. <b>U-2579AA</b>	SHEET NO. <b>6</b>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION</b>	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	



**S** DENOTES IMPACTS IN SURFACE WATER

**TS** DENOTES TEMPORARY IMPACTS IN SURFACE WATER

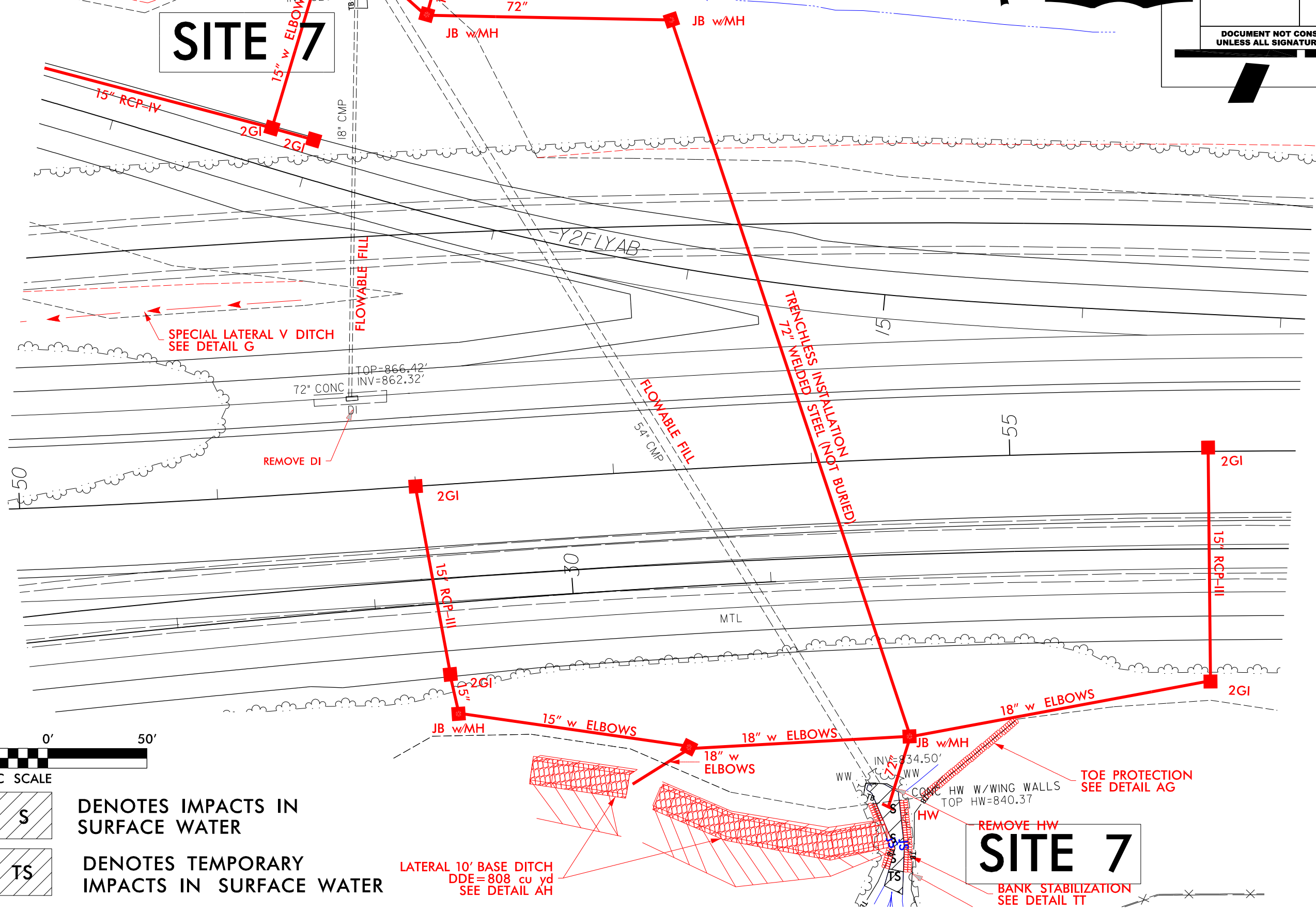
SEE SHEETS 19 THROUGH 20 FOR -L- PROFILE  
SEE SHEET 23 FOR -Y2FLYAB- PROFILE  
SEE SHEET 35 FOR -Y2RPC- PROFILE

11/16/2018 FBrooks P:\2017\17322.09 U-2579AA Winsted Salem, W. V&M Hydraulics, PERMITS, Environmental Drawings U2579AA\_Hyd\_psh\_06\_con.dgn

REVISIONS

8.17.99

# SITE 7



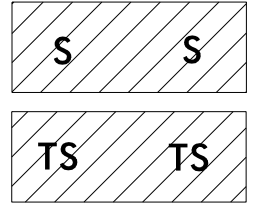
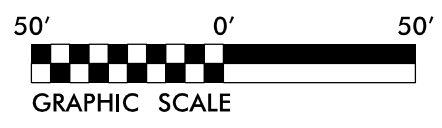
SPECIAL LATERAL V DITCH  
SEE DETAIL G

72" CONC  
TOP=866.42'  
INV=862.32'

REMOVE DI

FLOWABLE FILL  
5.4' CMP

TRENCHES INSTALLATION  
72" WELDED STEEL (NOT BURIED)



**S** DENOTES IMPACTS IN SURFACE WATER

**TS** DENOTES TEMPORARY IMPACTS IN SURFACE WATER

LATERAL 10' BASE DITCH  
DDE=808 cu yd  
SEE DETAIL AH

# SITE 7

REMOVE HW  
BANK STABILIZATION  
SEE DETAIL TT

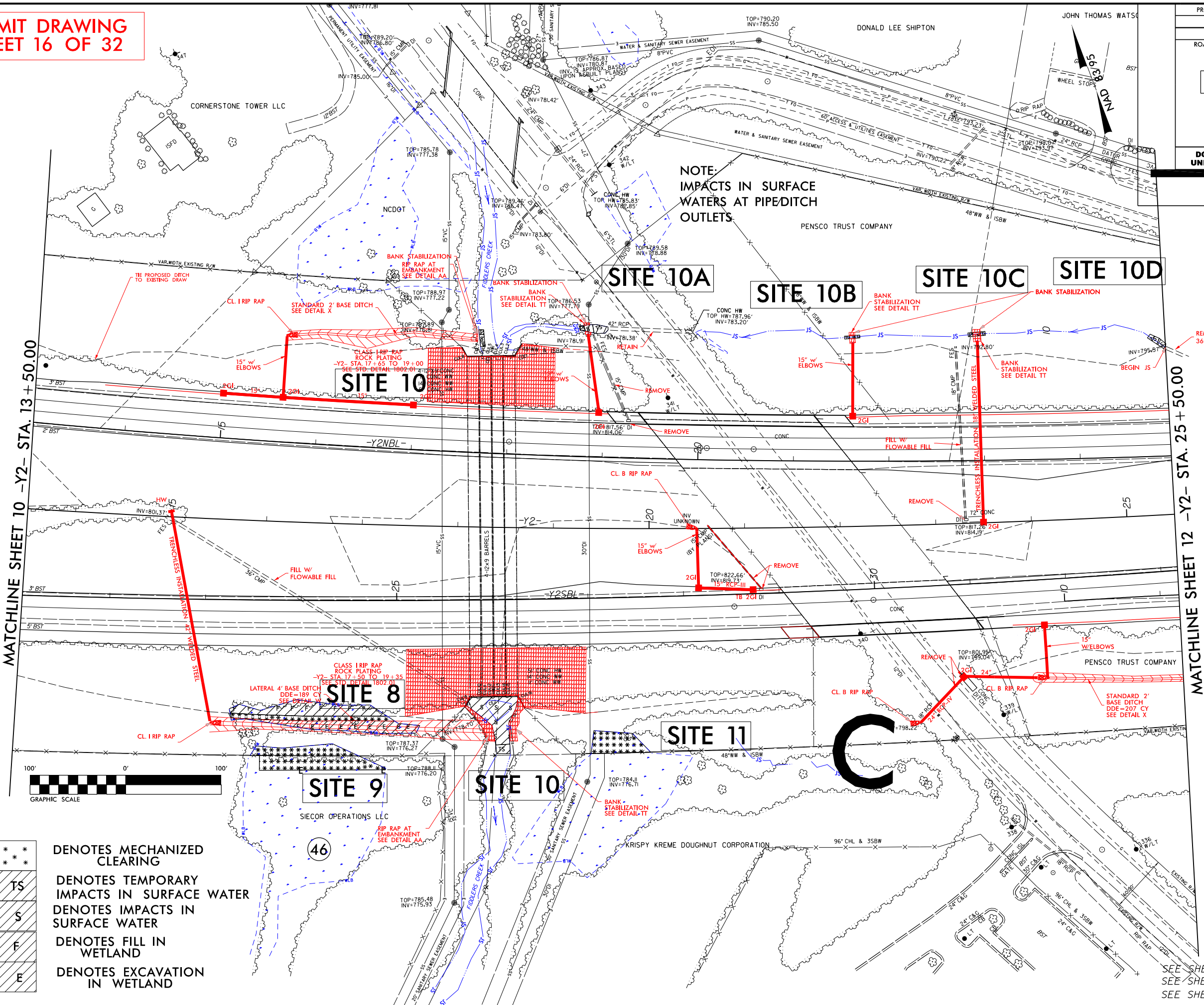
TOE PROTECTION  
SEE DETAIL AG

11/16/2018  
 FBrooks  
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 P:\2017\17322.09\_U-2579AA\_Winston-Salem\_w V&M Hydraulics PERMITS Environmental\Drawings\U2579AA\_Hyd\_psh\_06\_enl.dgn

REVISIONS

**PERMIT DRAWING  
SHEET 16 OF 32**

PROJECT REFERENCE NO. <b>U-2579AA</b>	SHEET NO. <b>11</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION</b>	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	



*****	*****
TS TS	TS TS
S S	S S
F F	F F
E E	E E

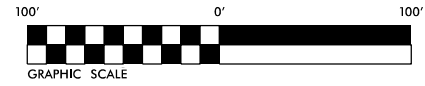
\*\*\*\*\*  
DENOTES MECHANIZED CLEARING

TS TS  
DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S  
DENOTES IMPACTS IN SURFACE WATER

F F  
DENOTES FILL IN WETLAND

E E  
DENOTES EXCAVATION IN WETLAND



SEE SHEET 26 FOR -Y2NBL- PROFILE  
SEE SHEET 29 FOR -Y2SBL- PROFILE  
SEE SHEET 38 FOR -Y3RCP- PROFILE

1/16/2018  
 FBrooks  
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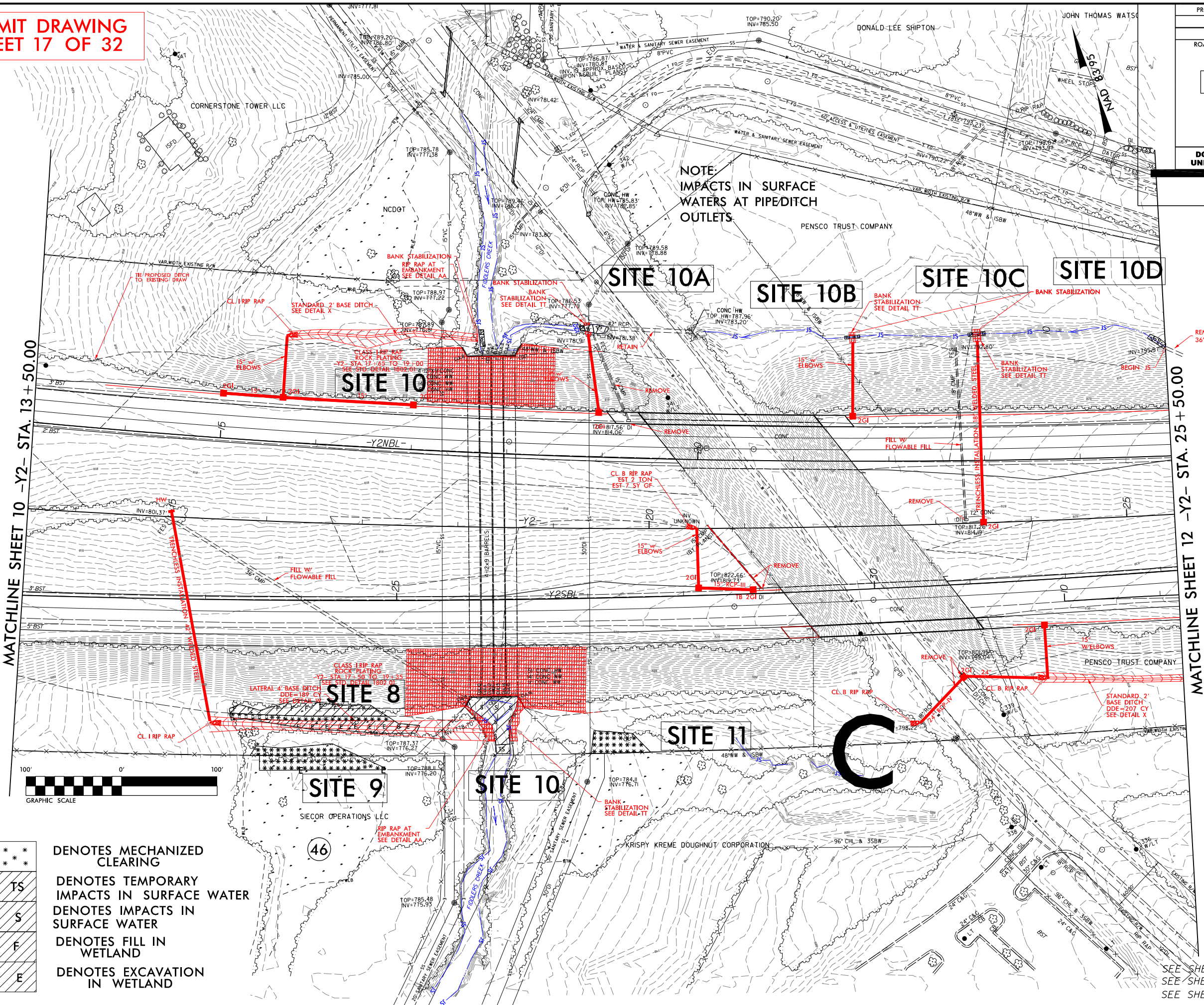
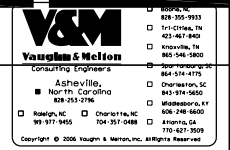
REVISIONS

8.17.99



**PERMIT DRAWING  
SHEET 17 OF 32**

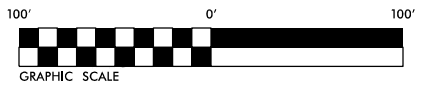
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RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION</b>	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	



**NOTE:  
IMPACTS IN SURFACE  
WATERS AT PIPEDITCH  
OUTLETS**

MATCHLINE SHEET 10 -Y2- STA. 13 + 50.00

MATCHLINE SHEET 12 -Y2- STA. 25 + 50.00



*****	*****
TS TS	TS TS
S S	S S
F F	F F
E E	E E

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

SEE SHEET 26 FOR -Y2NBL- PROFILE  
 SEE SHEET 29 FOR -Y2SBL- PROFILE  
 SEE SHEET 38 FOR -Y3RCP- PROFILE

1/16/2018 FBrooks P:\2017\17322.09 U-2579AA Winston-Salem\_V&M\_Hydraulics\_PERMITS\_Environmental Drawings\U2579AA Hyd psh 11-con.dgn  
 REVISIONS

8/17/99

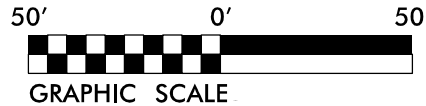
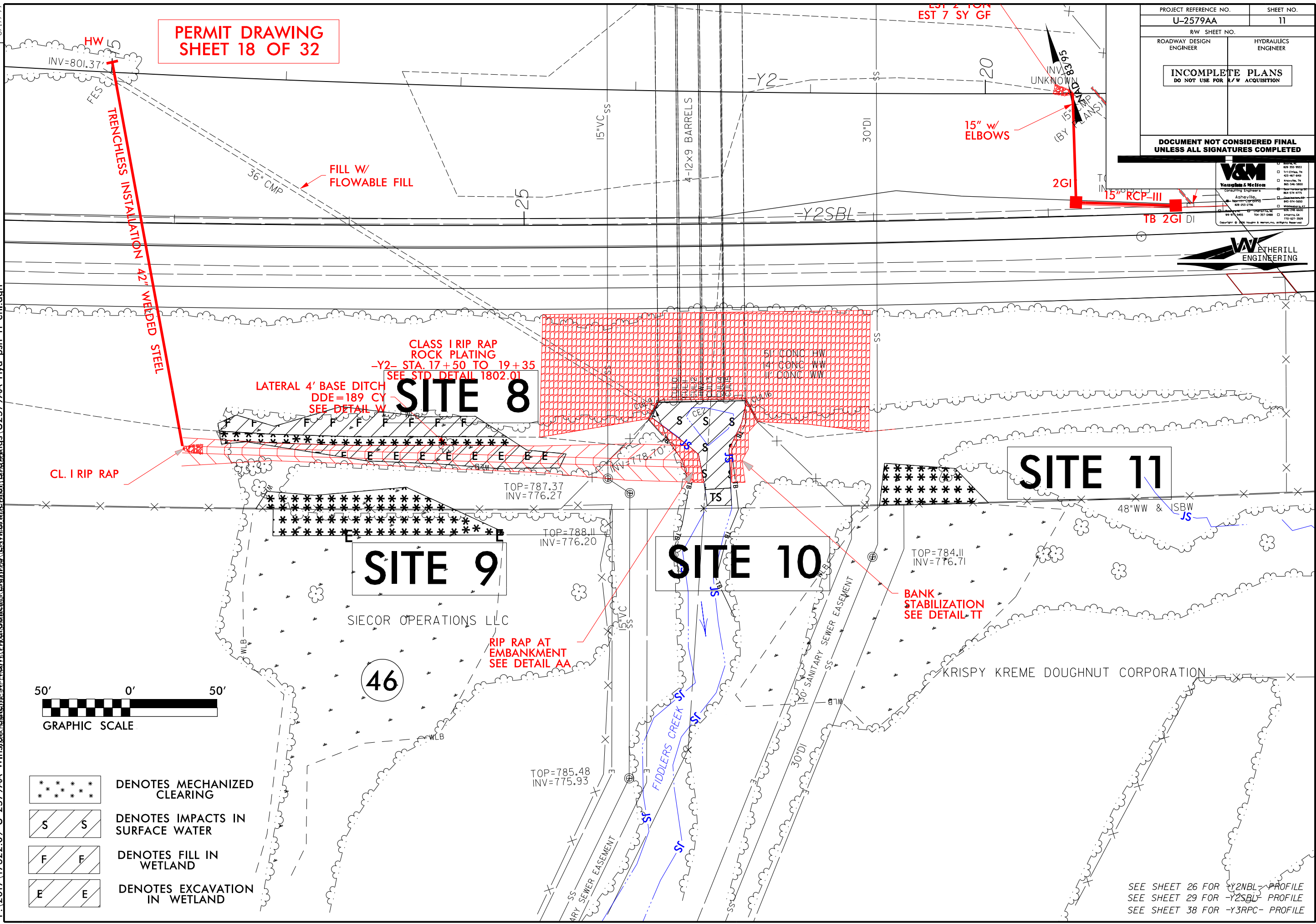
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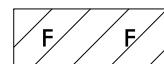
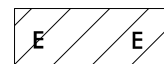
PERMIT DRAWING SHEET 18 OF 32

PROJECT REFERENCE NO. <b>U-2579AA</b>	SHEET NO. <b>11</b>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR A/W ACQUISITION	
<b>DOCUMENT NOT CONSIDERED FINAL</b> UNLESS ALL SIGNATURES COMPLETED	

**V&M**  
Vaughan & Melton  
Consulting Engineers  
Asheville, NC  
Newport-Spring, NC  
Raleigh, NC  
Wilmington, NC

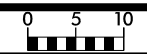
**WETHERILL**  
ENGINEERING



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

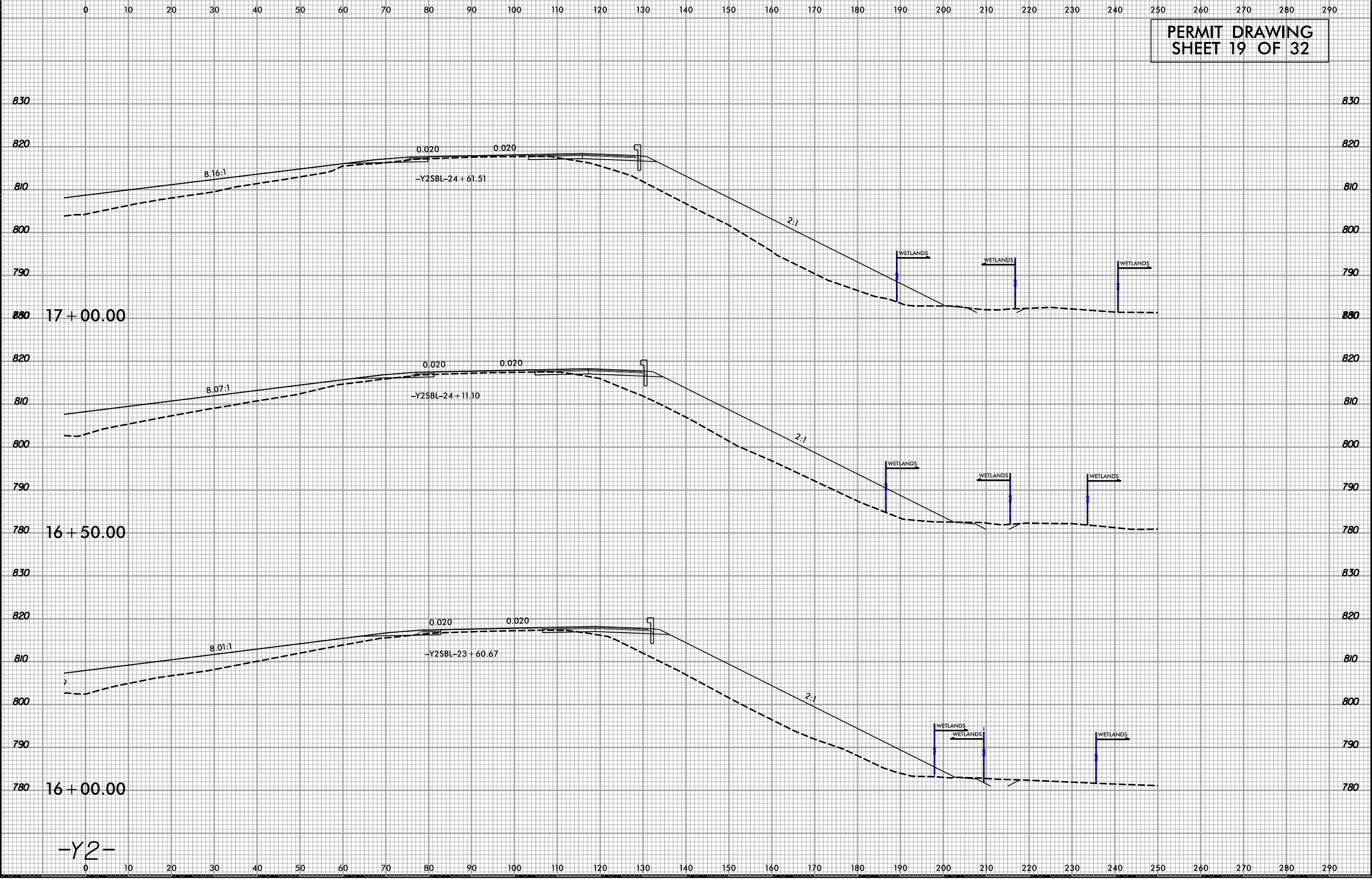
SEE SHEET 26 FOR -Y2NBL- PROFILE  
SEE SHEET 29 FOR -Y2SBL- PROFILE  
SEE SHEET 38 FOR -Y3RPC- PROFILE

6/23/16



PROJ. REFERENCE NO.	SHEET NO.
U-2579AA	X-176

PERMIT DRAWING  
SHEET 19 OF 32



1/16/2018  
 PR: 2017.17322.09 U-2579AA - Winston-Salem, v. V&M Hydraulics | PERMITS - Environmental Drawings | U-2579AA - v. XPL Y2, R.T.dgn

-Y2-

6/23/16



PROJ. REFERENCE NO. U-2579AA SHEET NO. X-178

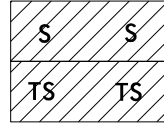
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1/16/2018  
PR: 2017.17322.09 U-2579AA Winston-Salem, v. V&M Hydrolics\PERMITS Environmental Drawings\2579aa.tbl Y2.RIT.dgn

-Y2-

**PERMIT DRAWING  
SHEET 21 OF 32**

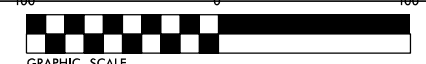


**S** DENOTES IMPACTS IN SURFACE WATER  
**TS** DENOTES TEMPORARY IMPACTS IN SURFACE WATER

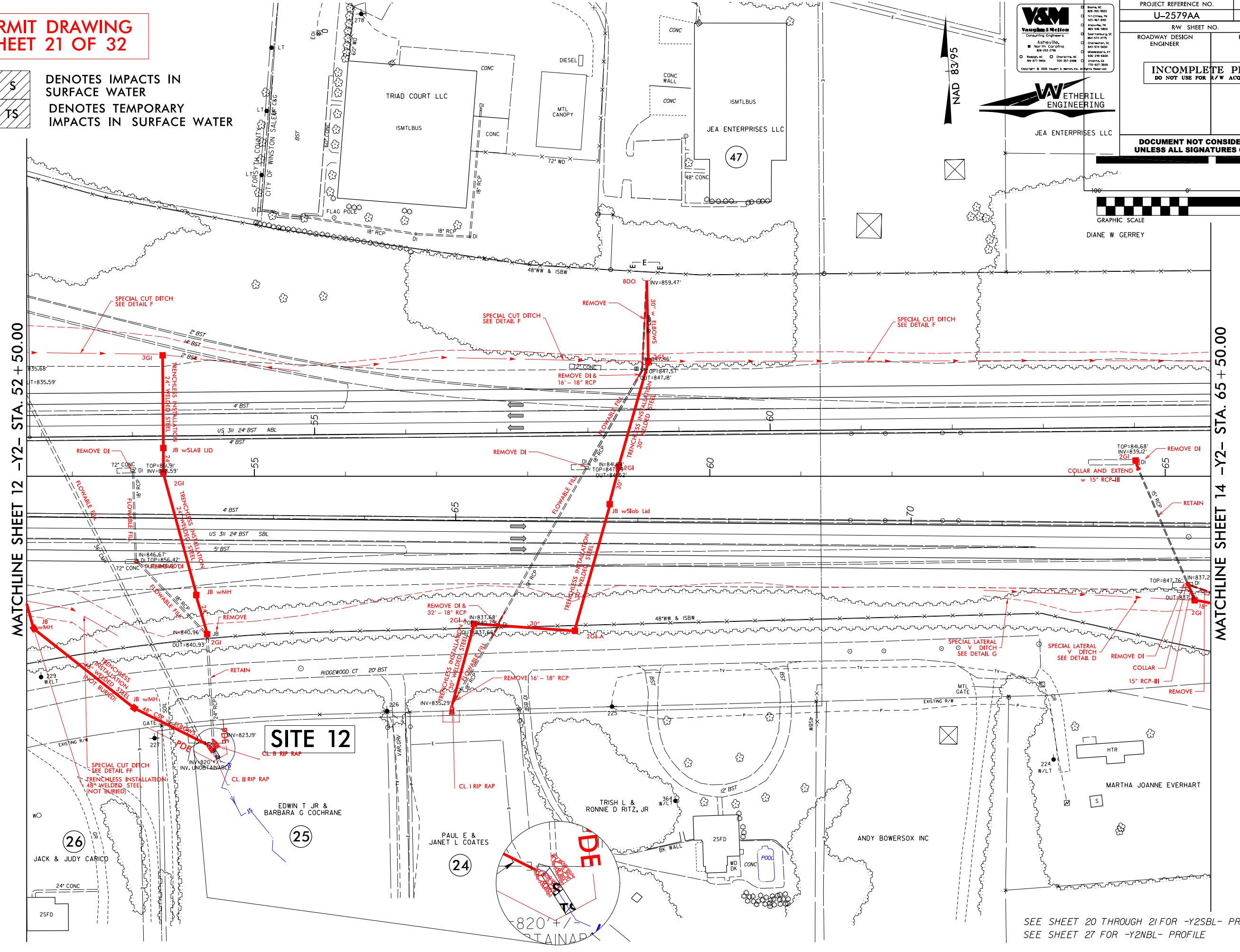
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ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<b>INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION</b>			
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>			



JEA ENTERPRISES LLC

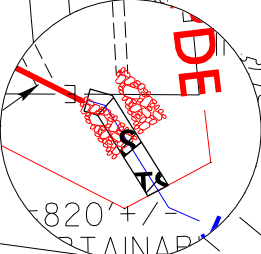


DIANE W GERREY



MATCHLINE SHEET 12 -Y2- STA. 52 + 50.00

MATCHLINE SHEET 14 -Y2- STA. 65 + 50.00

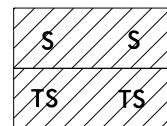


SEE SHEET 20 THROUGH 21 FOR -Y2SBL- PROFILE  
SEE SHEET 27 FOR -Y2NBL- PROFILE

REVISIONS

11/6/2018  
FBrooks  
P. 2017.17322.09 U-2579AA\_Winston-Salem\_w&M\_Hydraulics-Permits-Environmental-Drawings\_U-2579AA\_Invd-sh113.rvt

**PERMIT DRAWING  
SHEET 22 OF 32**

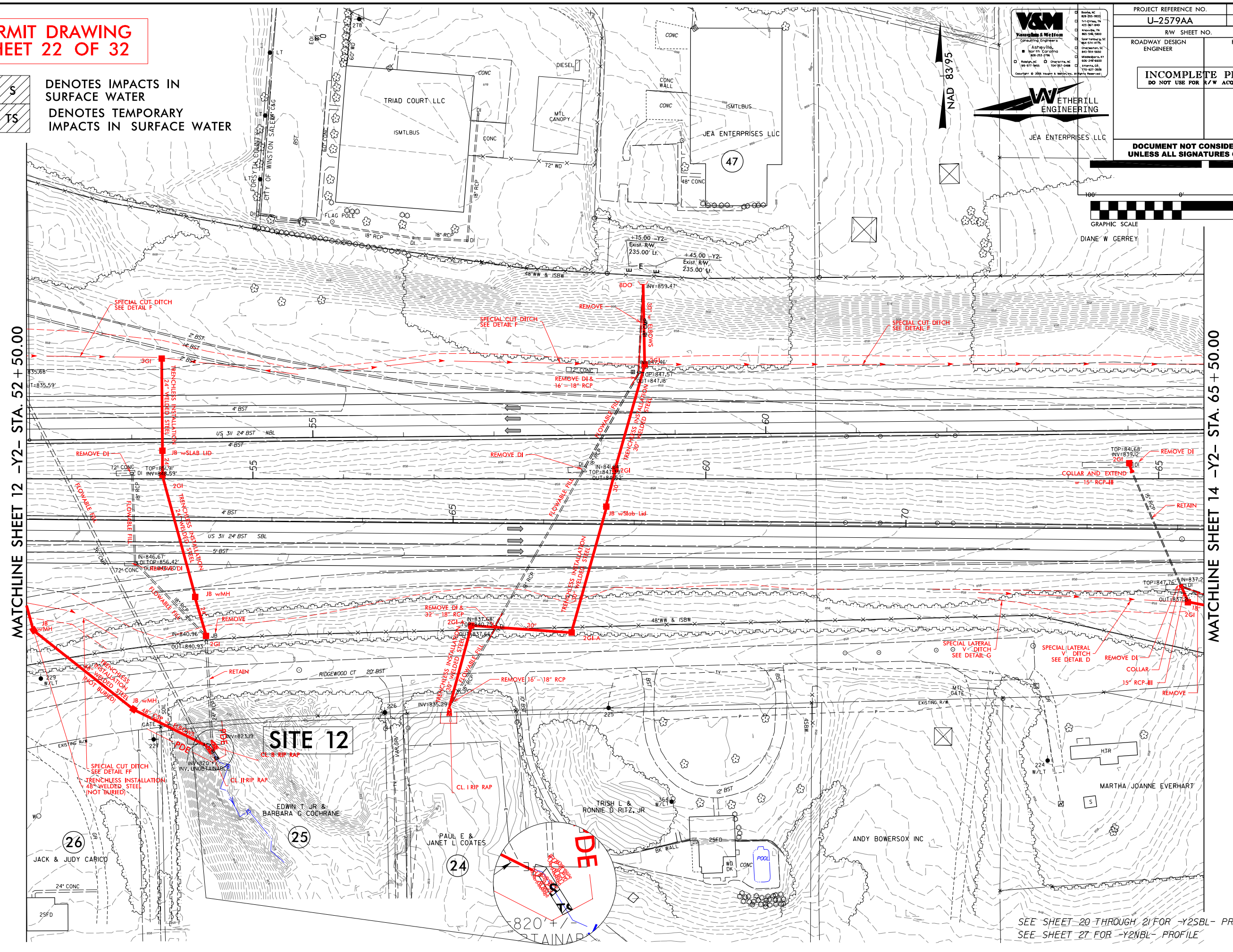


**S** DENOTES IMPACTS IN SURFACE WATER  
**TS** DENOTES TEMPORARY IMPACTS IN SURFACE WATER

**V&M**  
Vanishing & Motion  
Consulting Engineers  
Asheville, NC  
Winston-Salem, NC  
Charlotte, NC  
Greenville, SC  
Spartanburg, SC  
Cherokee, NC  
Mooresville, NC  
Durham, NC  
Raleigh, NC  
Cary, NC  
Chapel Hill, NC  
Durham, NC  
Charlotte, NC  
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Cary, NC  
Chapel Hill, NC

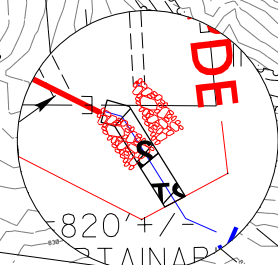
**WETHERILL ENGINEERING**  
JEAN ENTERPRISES LLC

PROJECT REFERENCE NO. <b>U-2579AA</b>	SHEET NO. <b>13</b>
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION</b>	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	



MATCHLINE SHEET 12 -Y2- STA. 52 + 50.00

MATCHLINE SHEET 14 -Y2- STA. 65 + 50.00



SEE SHEET 20 THROUGH 21 FOR -Y2SBL- PROFILE  
SEE SHEET 27 FOR -Y2NBL- PROFILE

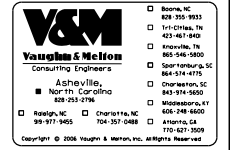
REVISIONS

11/6/2018  
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8/17/99  
11/16/2018  
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PERMIT DRAWING  
SHEET 23 OF 32

PROJECT REFERENCE NO.	SHEET NO.
U-2579AA	14
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	
<b>DOCUMENT NOT CONSIDERED FINAL</b> UNLESS ALL SIGNATURES COMPLETED	

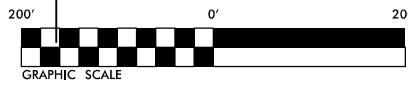





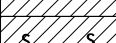
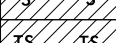
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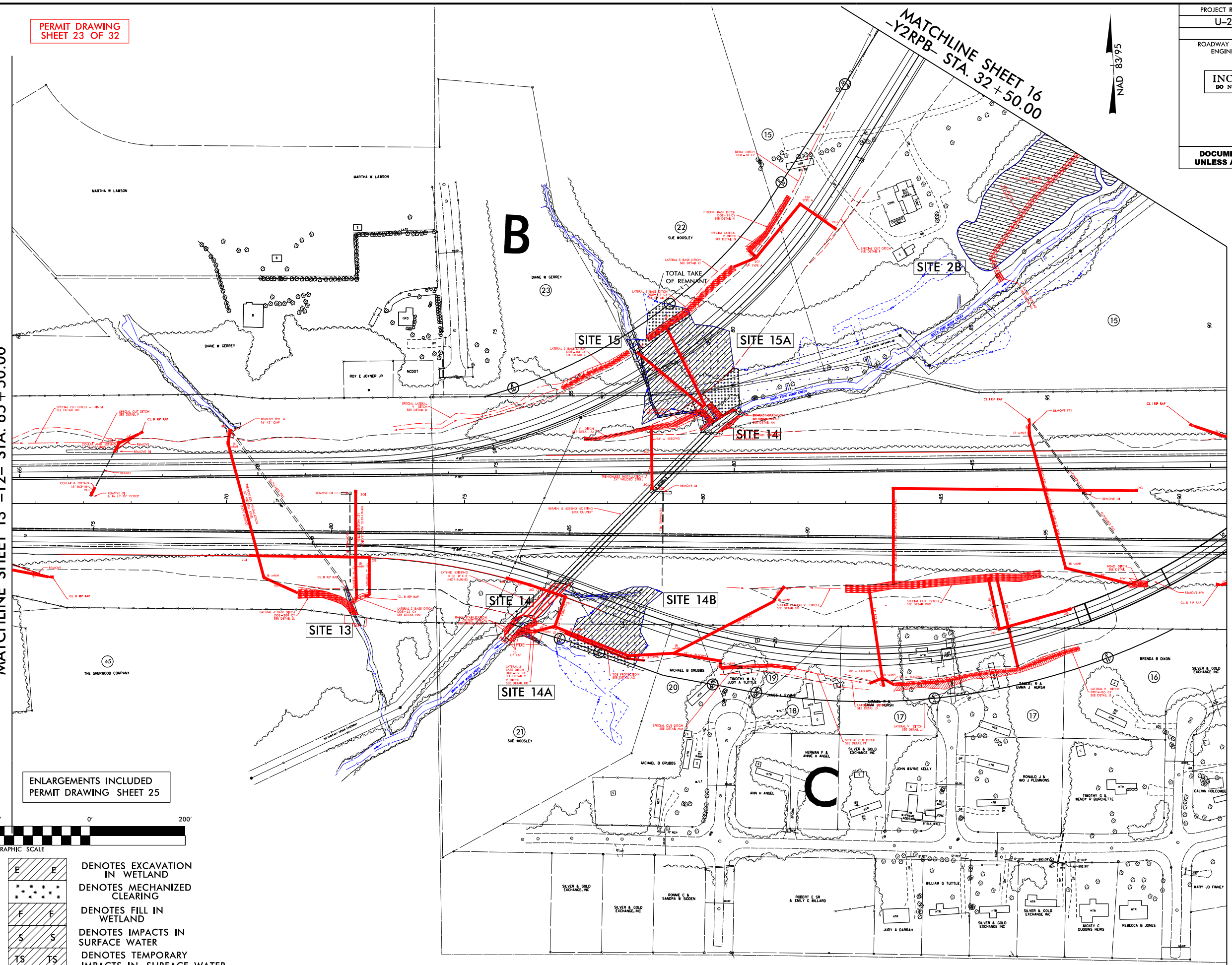
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-Y2RPB- STA. 32 + 50.00

MATCHLINE SHEET 5  
-Y2- STA. 91 + 00.00  
-Y2FLYCA- STA. 29 + 98.44

ENLARGEMENTS INCLUDED  
PERMIT DRAWING SHEET 25



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



SEE SHEET 25 FOR -Y2FLYCA- PROFILE  
SEE SHEETS 27 THROUGH 28 FOR -Y2NBL- PROFILE  
SEE SHEETS 31 THROUGH 32 FOR -Y2SBL- PROFILE  
SEE SHEETS 33 THROUGH 34 FOR -Y2RPB- PROFILE

PERMIT DRAWING  
SHEET 24 OF 32

PROJECT REFERENCE NO. U-2579AA	SHEET NO. 14
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR A/W ACQUISITION	
<b>DOCUMENT NOT CONSIDERED FINAL</b> UNLESS ALL SIGNATURES COMPLETED	

**V&M**  
Vaughan & Melton  
Consulting Engineers

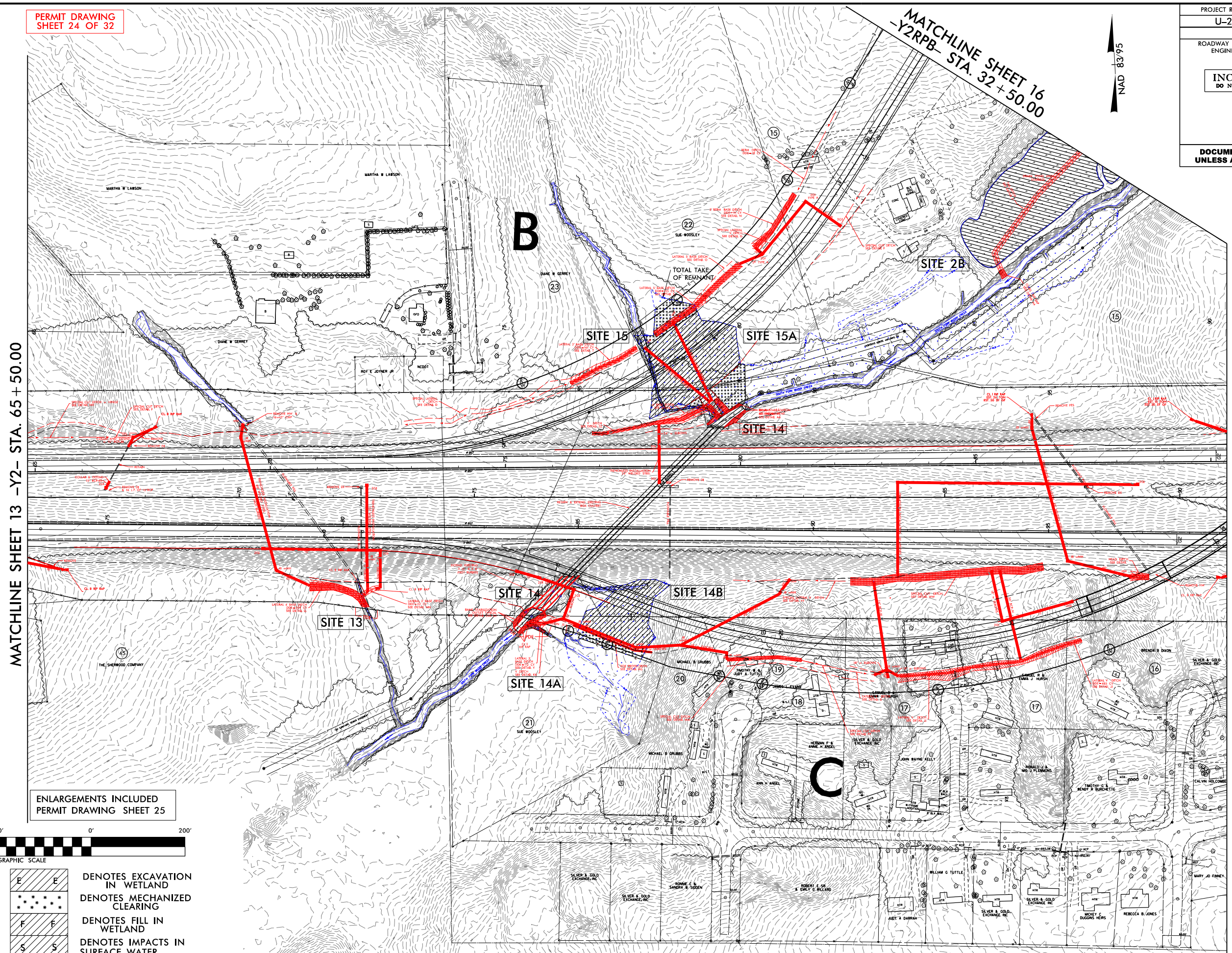
Asheville, NC  
North Carolina  
919-251-9796

Charlotte, NC  
919-917-9405

Atlanta, GA  
770-427-5000

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ENGINEERING

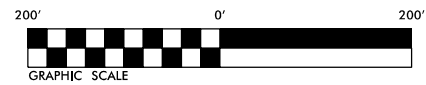


MATCHLINE SHEET 13 -Y2- STA. 65 + 50.00

MATCHLINE SHEET 16  
-Y2RPB- STA. 32 + 50.00

MATCHLINE SHEET 5  
-Y2- STA. 91 + 00.00  
-Y2FLYCA- STA. 29 + 98.44

ENLARGEMENTS INCLUDED  
PERMIT DRAWING SHEET 25



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

SEE SHEET 25 FOR -Y2FLYCA- PROFILE  
SEE SHEETS 27 THROUGH 28 FOR -Y2NBL- PROFILE  
SEE SHEETS 31 THROUGH 32 FOR -Y2SBL- PROFILE  
SEE SHEETS 33 THROUGH 34 FOR -Y2RPB- PROFILE

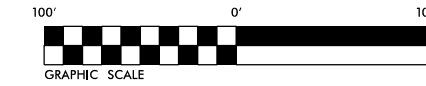
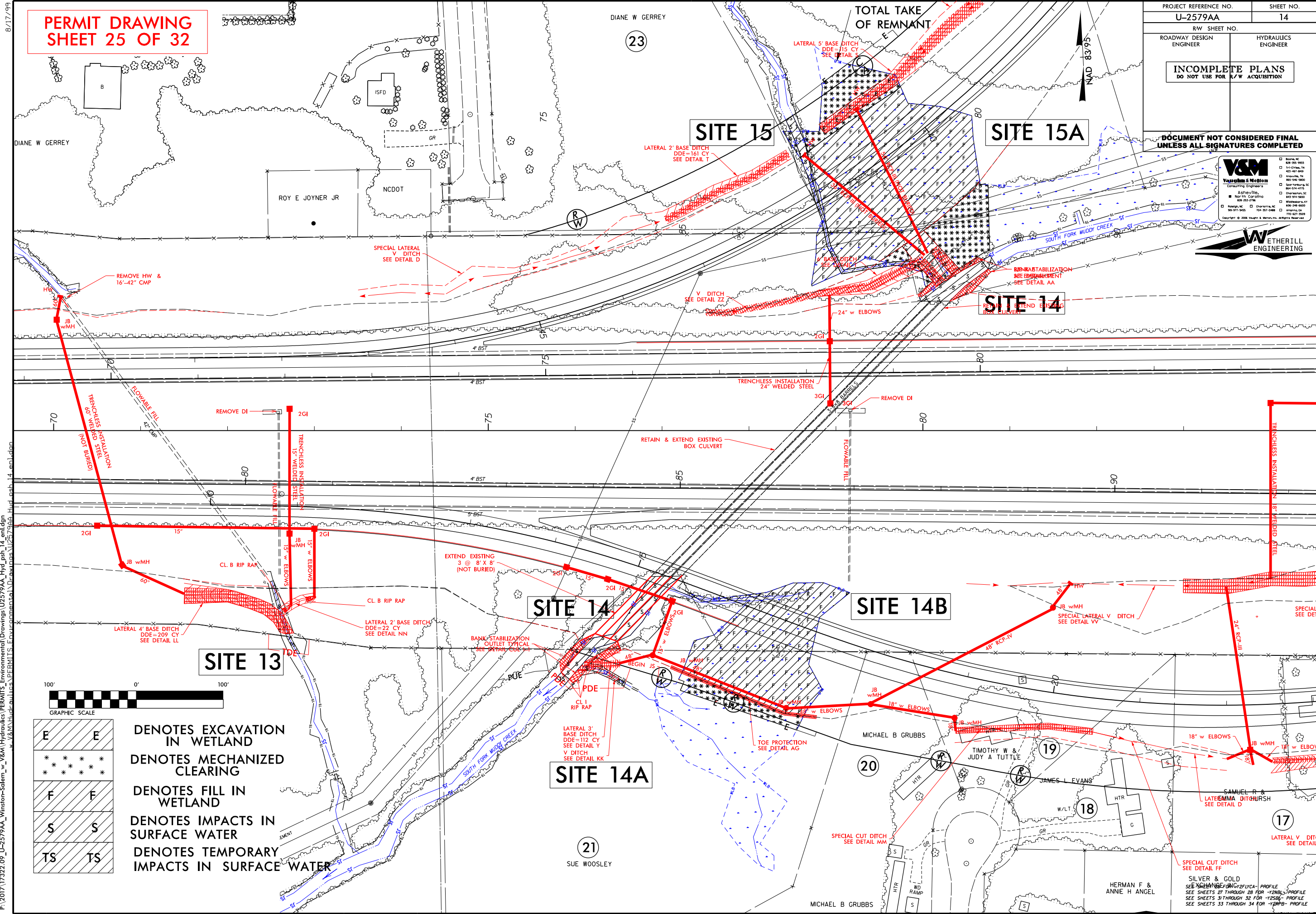
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 8.17.99



**PERMIT DRAWING  
SHEET 25 OF 32**

PROJECT REFERENCE NO. <b>U-2579AA</b>	SHEET NO. <b>14</b>
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
<b>INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION</b>	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

<b>V&amp;M</b> Vannoy & McElroy Consulting Engineers A Division of North Carolina 828-251-2786 919-977-9955 Copyright © 2008 Vannoy & McElroy, Inc. All Rights Reserved.	<input type="checkbox"/> Boone, NC <input type="checkbox"/> Charlotte, NC <input type="checkbox"/> Durham, NC <input type="checkbox"/> Fayetteville, NC <input type="checkbox"/> Hickory, NC <input type="checkbox"/> Raleigh, NC <input type="checkbox"/> Salisbury, NC <input type="checkbox"/> Winston-Salem, NC <input type="checkbox"/> Greensboro, NC <input type="checkbox"/> High Point, NC <input type="checkbox"/> Lenoir, NC <input type="checkbox"/> New Bern, NC <input type="checkbox"/> Norfolk, VA <input type="checkbox"/> Roanoke, VA <input type="checkbox"/> Virginia Beach, VA <input type="checkbox"/> Wilmington, NC <input type="checkbox"/> Yadkin County, NC <input type="checkbox"/> Zebulon, NC
---	--



E	E
*	*
F	F
S	S
TS	TS

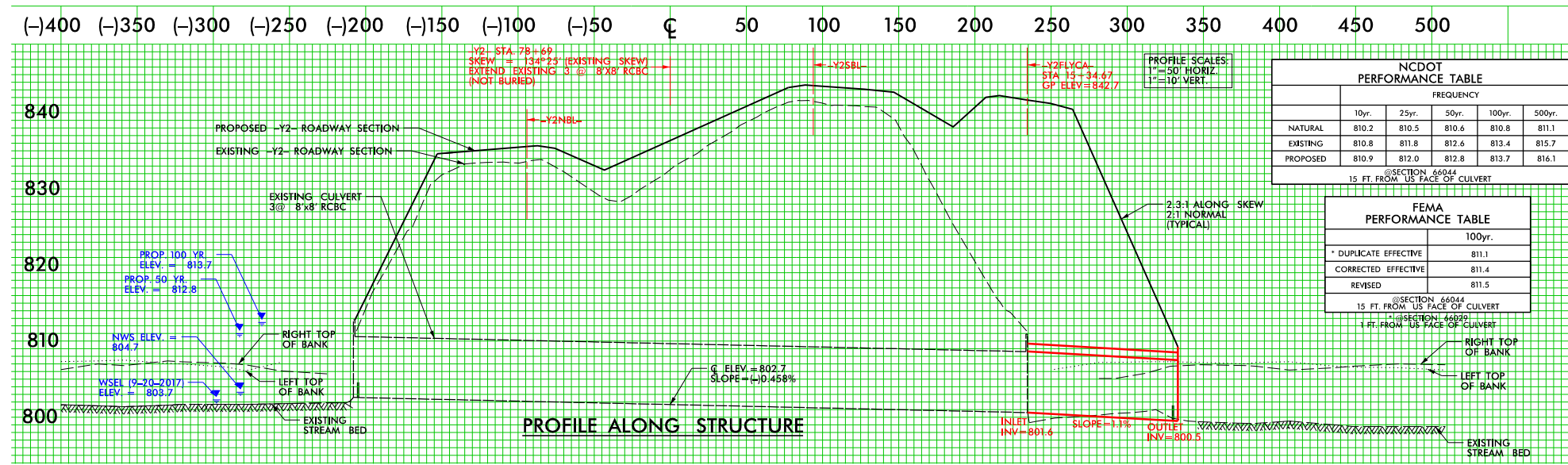
**E** DENOTES EXCAVATION IN WETLAND  
**\*** DENOTES MECHANIZED CLEARING  
**F** DENOTES FILL IN WETLAND  
**S** DENOTES IMPACTS IN SURFACE WATER  
**TS** DENOTES TEMPORARY IMPACTS IN SURFACE WATER

11/16/2018  
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 V&M\Hydraulics\PERMITS\Environmental\Drawings\U2579AA\_Hyd\_psh\_14\_enl.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-2579AA	
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

# SITE 14

**PERMIT DRAWING  
 SHEET 26 OF 32**



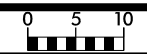
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	10yr.	25yr.	50yr.	100yr.	500yr.
NATURAL	810.2	810.5	810.6	810.8	811.1
EXISTING	810.8	811.8	812.6	813.4	815.7
PROPOSED	810.9	812.0	812.8	813.7	816.1

@SECTION 66044  
15 FT. FROM US FACE OF CULVERT

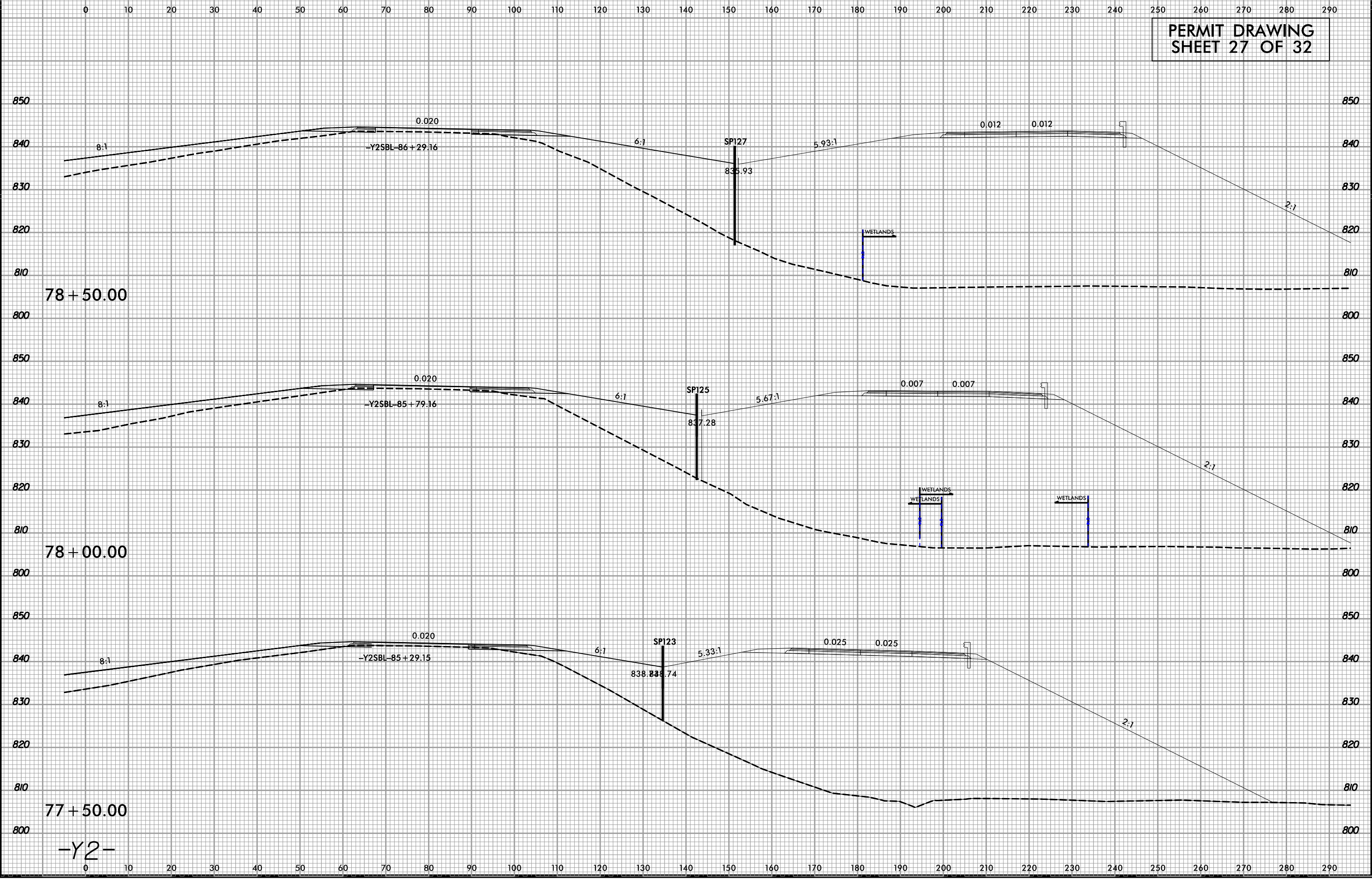
	100yr.
	* DUPLICATE EFFECTIVE
CORRECTED EFFECTIVE	811.4
REVISED	811.5

@SECTION 66044  
15 FT. FROM US FACE OF CULVERT  
 @SECTION 4400  
1 FT. FROM US FACE OF CULVERT

6/23/16



PERMIT DRAWING  
SHEET 27 OF 32



1/16/2018  
 PR: 2017.17322.09 U-2579AA Winston-Salem, v. V&M Hydrolics PERMITS Environmental Drawings v2579aa.tbl XPL Y2.RIT.dgn

-Y2-

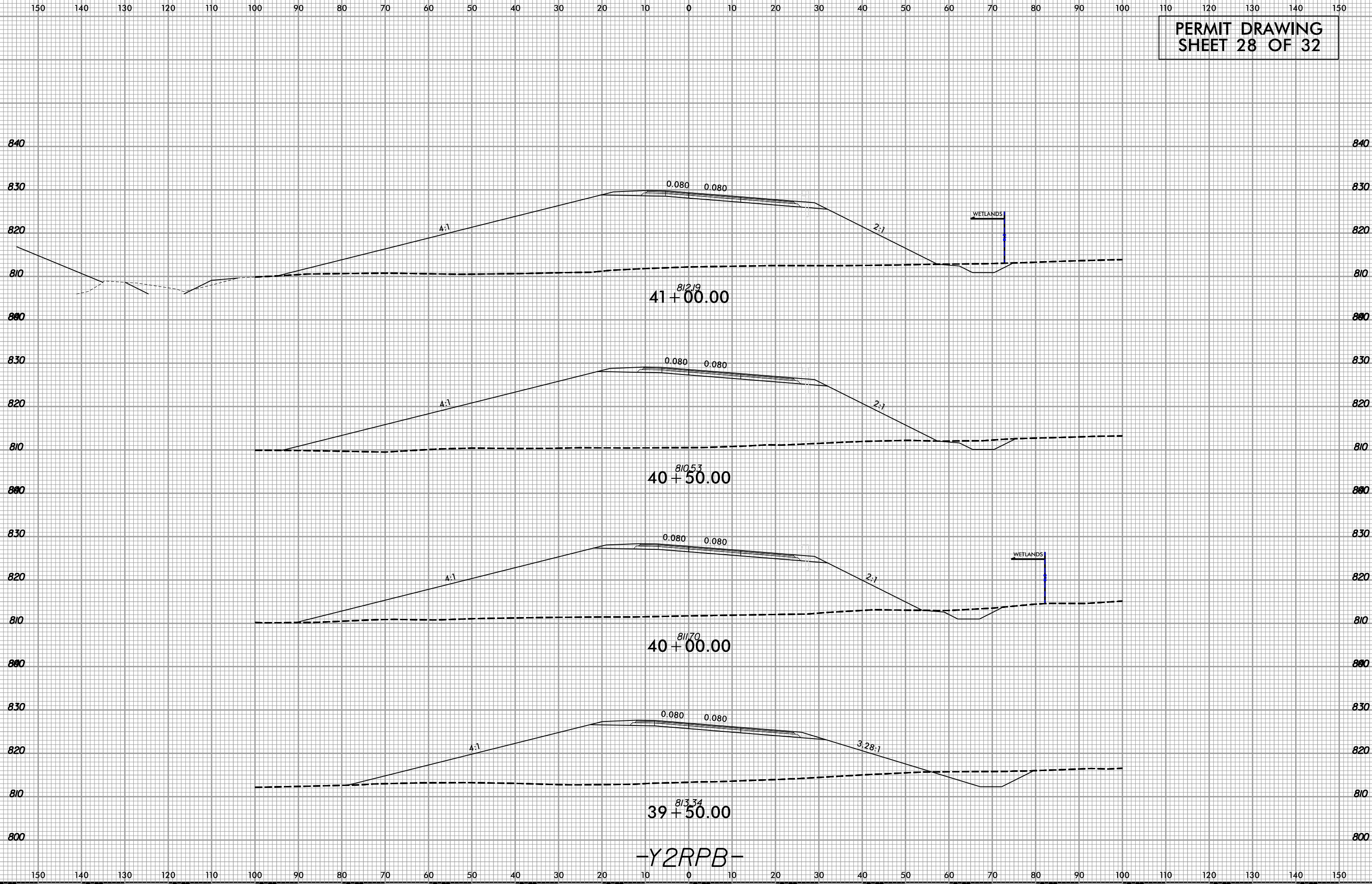
6/23/16



PROJ. REFERENCE NO.  
R-2579AA

SHEET NO.  
X-274

PERMIT DRAWING  
SHEET 28 OF 32



-Y2RPB-

1/16/2018  
PR: 2017.17322.09 U-2579AA Winston-Salem, v. V&M Hydrolics\PERMITS Environmental\Drawings\2579aa.tbl Y2RPB.dgn

11/16/2018  
 Brooks  
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 8/17/99

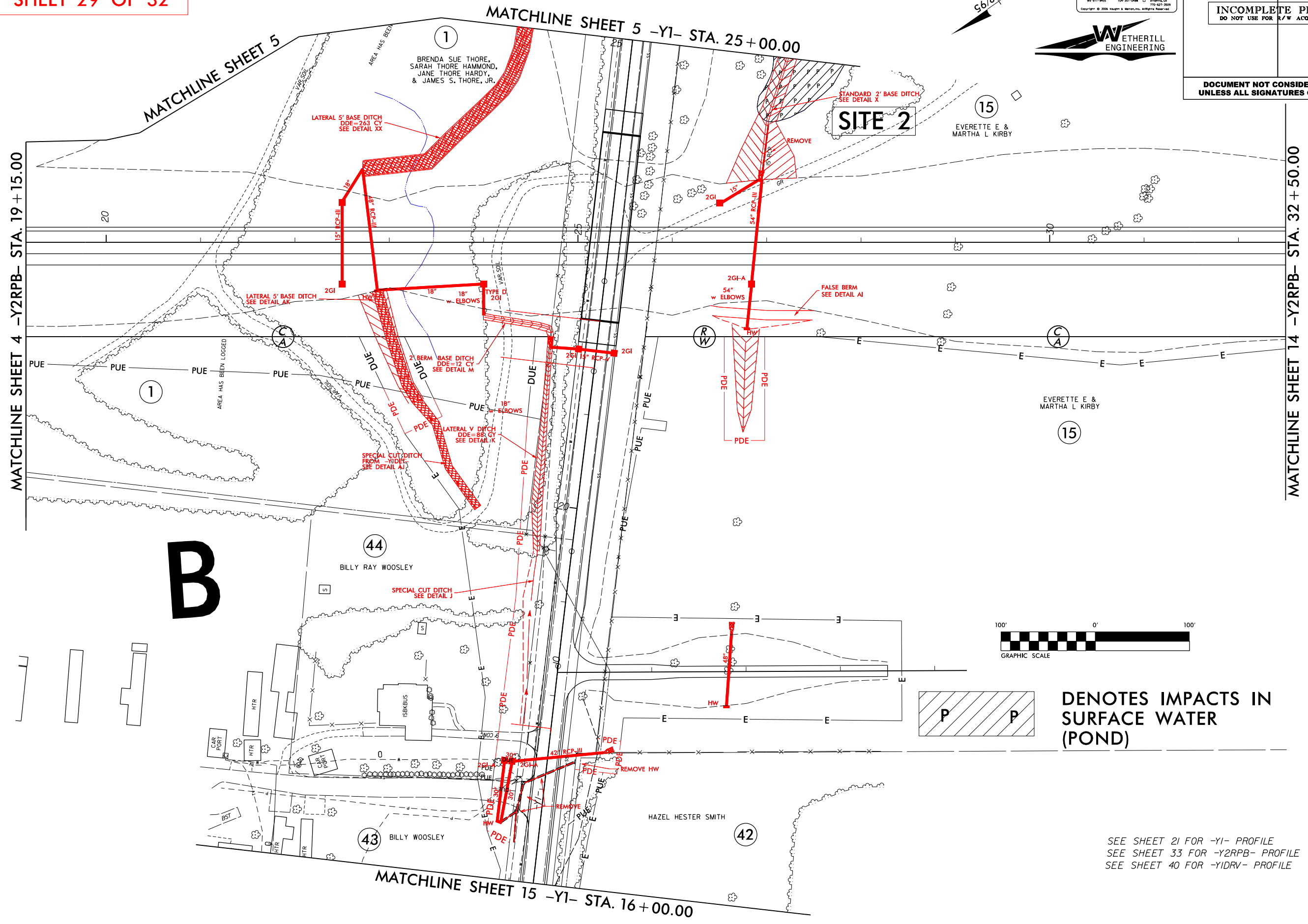
PERMIT DRAWING  
 SHEET 29 OF 32

V&M

Vaughan & Melton  
 Consulting Engineers  
 Asheville, NC  
 North Carolina  
 828-253-2786  
 919-877-1855

Raleigh, NC  
 919-877-1855  
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PROJECT REFERENCE NO. <b>U-2579AA</b>	SHEET NO. <b>16</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	
<b>DOCUMENT NOT CONSIDERED FINAL</b> <b>UNLESS ALL SIGNATURES COMPLETED</b>	



**P**

DENOTES IMPACTS IN  
 SURFACE WATER  
 (POND)

SEE SHEET 21 FOR -Y1- PROFILE  
 SEE SHEET 33 FOR -Y2RPB- PROFILE  
 SEE SHEET 40 FOR -Y1DRV- PROFILE

8.17.99  
11/4/2018  
Brooks  
P:\2017\1722.DP U-2579AA Winston-Salem w. V&M Hydraulics\EGM\818\Hydraulics\Download\1722.DP U-2579AA\_Hud\_csh\_16\_cad.dwg

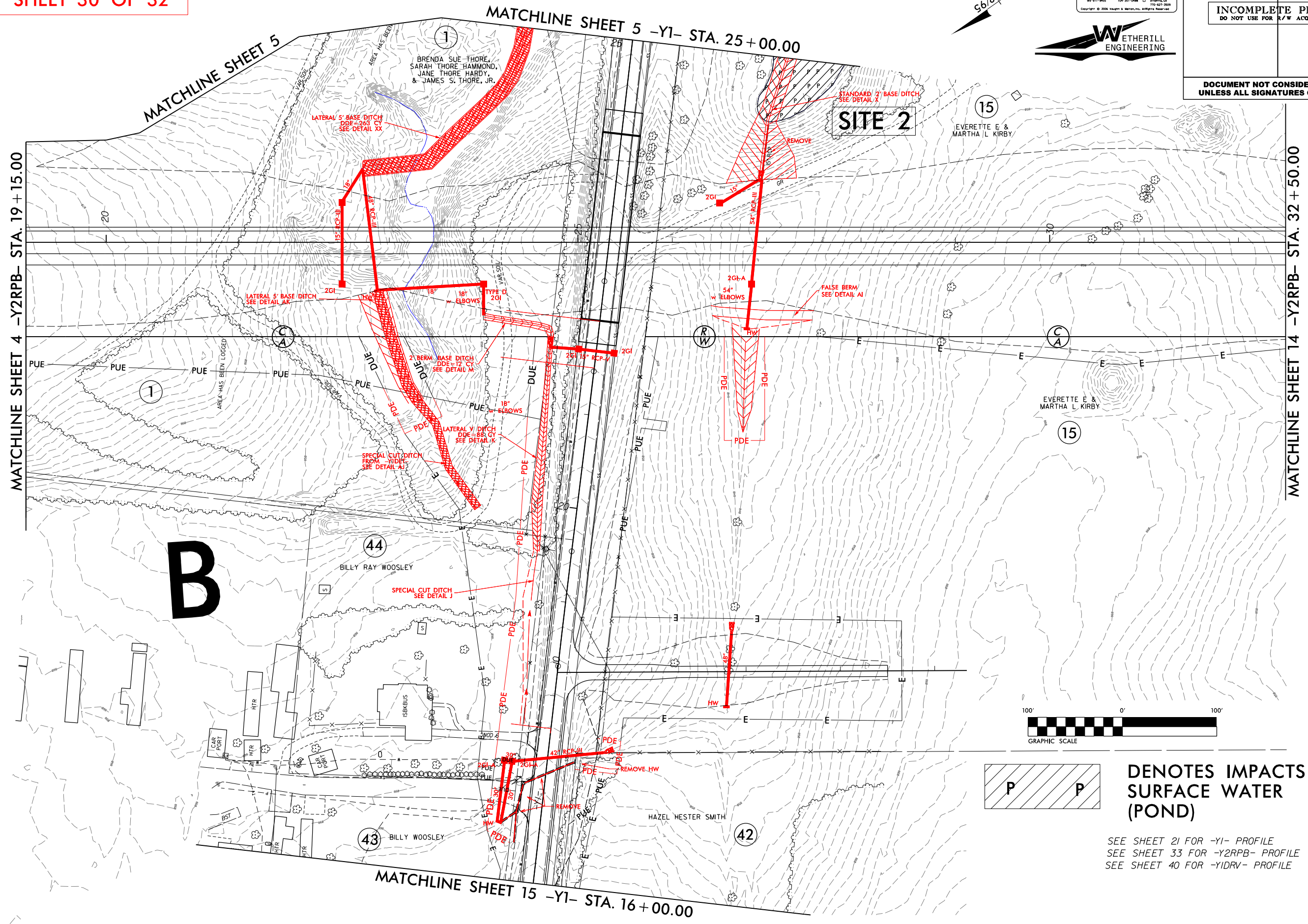
**PERMIT DRAWING  
SHEET 30 OF 32**

**V&M**  
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ENGINEERING

PROJECT REFERENCE NO. <b>U-2579AA</b>	SHEET NO. <b>16</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION</b>	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

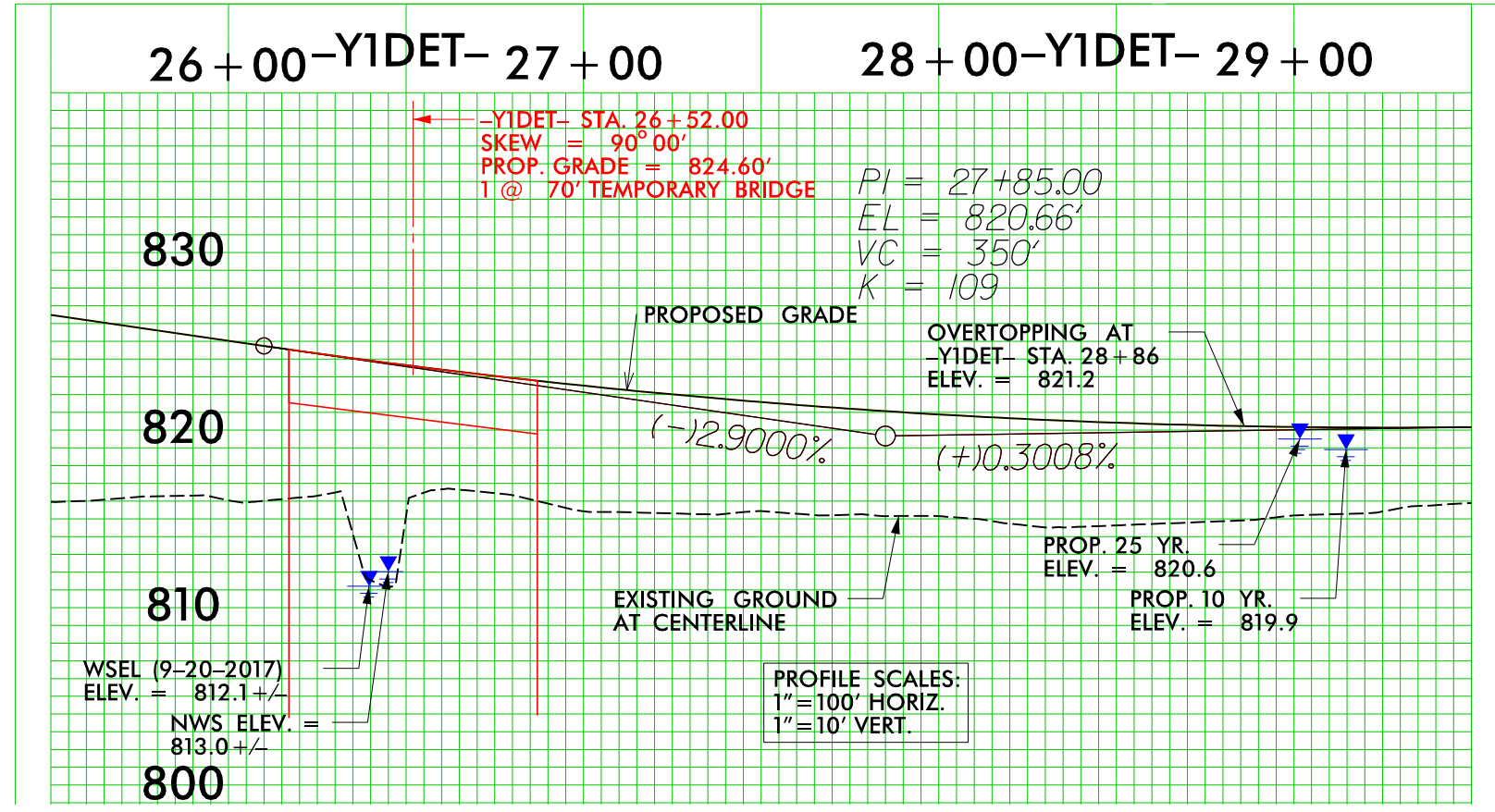


**P P** DENOTES IMPACTS IN SURFACE WATER (POND)

SEE SHEET 21 FOR -Y1- PROFILE  
SEE SHEET 33 FOR -Y2RPB- PROFILE  
SEE SHEET 40 FOR -Y1DRV- PROFILE

PROJECT REFERENCE NO. U-2579AA	SHEET NO.
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

**PERMIT DRAWING**  
**SHEET 31 OF 32**



WETLAND PERMIT IMPACT SUMMARY												
Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L- 15+12	42" RCP-V (Not Buried)							< 0.01	406	40	
2	-Y1- 25+60 RT	Drain and Stabilize Pond						0.50				
2A	-Y1- 28+00 RT	Drain and Stabilize Pond						0.12				
2B	-Y1- 28+60 RT	Drain and Stabilize Pond						2.31				
3	-Y1-32+78	2 @ 9'x9' RCBC						0.07	< 0.01	364	20	
3		Bank Stabilization						< 0.01		26		
3A	-Y1 Det- 26+40	Temp. Road									40	
4	-L- 36+28	2 @ 10'x9' RCBC						0.12	0.01	505	45	
4		Bank Stabilization						0.01		80		
5	-Y1- 41+70 RT	15" Pipe Removal	< 0.01									
5A	-Y1- 39+50 RT	60" Pipe Removal						0.01	< 0.01	42	20	
5B	-Y1- 45+00 RT	Bank Stabilization						< 0.01	< 0.01	20	10	
6	-L- 45+60	36" Welded Steel						< 0.01	< 0.01	78	20	
6A	-Y2 FLYAB- 23+00	Drain and Stabilize Pond						0.11				
7	-L- 54+04	72" Alt/Welded Steel						0.01	< 0.01	60	20	
7		Bank Stabilization						< 0.01		35		
8	-Y2- 15+70 to 17+65 RT	4' Base Ditch	0.04		0.03	0.02						
9	-Y2- 15+92 to 17+31 RT	Erosion Control Practices				0.06						
10	-Y2- 18+36	Bank Stabilization						0.04	< 0.01	60	20	
10A	-Y2- 19+50 LT	Bank Stabilization						< 0.01	< 0.01	9	22	
10B	-Y2- 22+10 LT	Bank Stabilization						< 0.01	< 0.01	8	10	
10C	-Y2- 23+50 LT	Bank Stabilization						< 0.01	< 0.01	8	10	
10D	-Y2- 25+50 LT	Bank Stabilization						< 0.01	< 0.01	10	10	
11	-Y2- 19+40 to 20+01 RT	Erosion Control Practices				0.26						
12	-Y2- 52+14	RR Pad Outlet						< 0.01	< 0.01	12	10	
13	-Y2- 72+48 RT	60" Alt/Welded Steel						< 0.01	< 0.01	63	25	
14	-Y2- 78+70	3 @ 8'x8' RCBC Extension						0.06	< 0.01	150	20	
14		Bank Stabilization						0.03		97		
14A	-Y2FLYCA- 14+75 to 15+30	3' Base Ditch						< 0.01	< 0.01	50	10	
14B	-Y2FLYCA- 15+68 to 17+46	Y2 FLYCA	0.38			0.05						
15	-Y2RPB- 41+50	36" RCP-III						0.03	0.01	265	50	
15A	-Y2RPB- 39+50 to 42+00	Y2RPB	0.64		0.07	0.21						
TOTALS*:			1.06		0.11	0.60	0.02	3.48	0.06	2348	402	0

\*Rounded totals are sum of actual impacts

NOTES:

15A - There will be total take of the remnant, shown in the quantities.

NC DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 10/17/2018  
 Forsythe Co.  
 U-2579AA