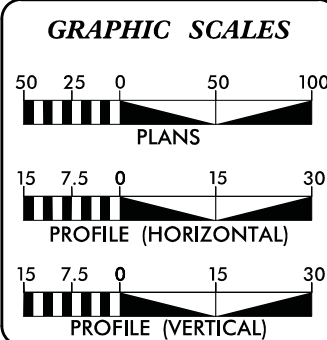
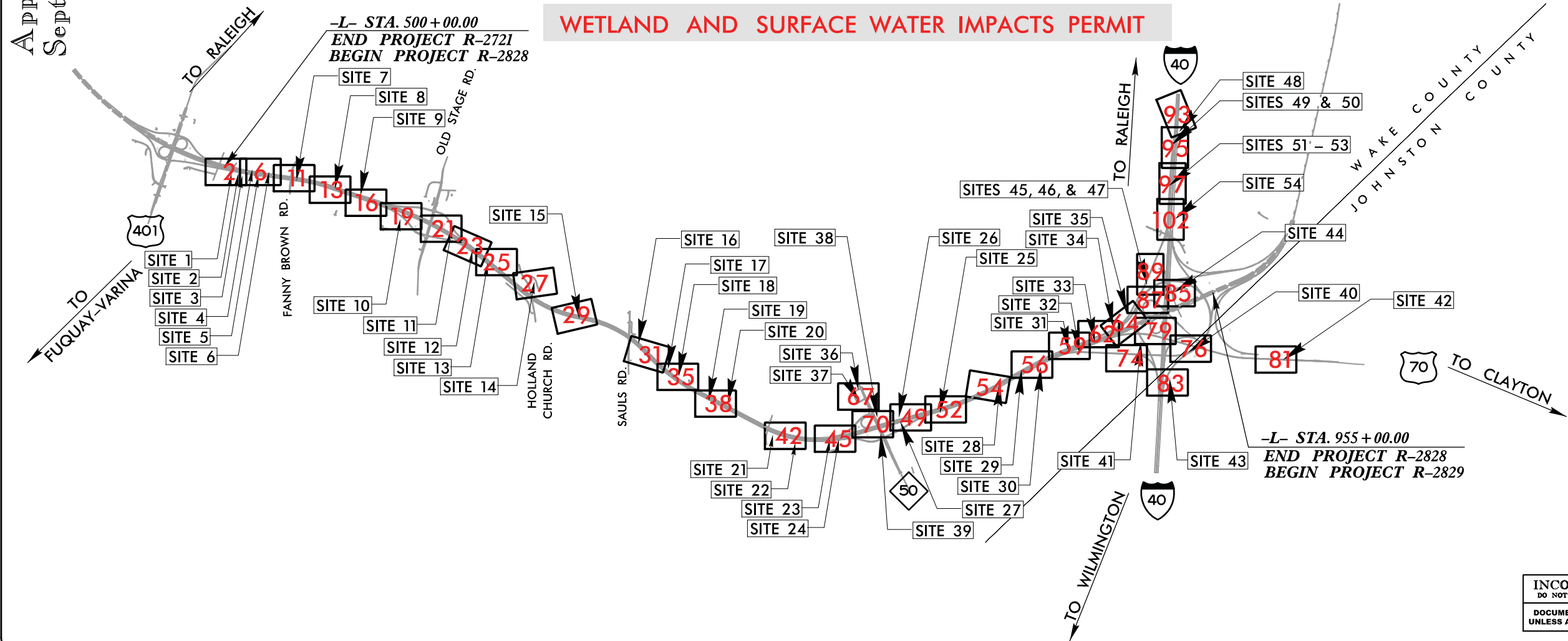


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gavidooper

CONTRACT: **TIP PROJECT: R-2828**

Approved Preliminary Design
September 2017

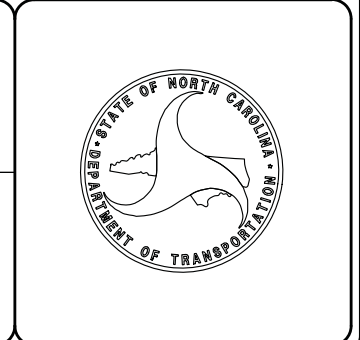


DESIGN DATA	
ADT 2016 =	28,400
ADT 2040 =	53,400
DHV =	12 %
D =	65 %
T =	11 % *
V =	75 MPH
* TTST	7% DUAL 4%
FUNC. CLASS. = INTERSTATE	

PROJECT LENGTH	
LENGTH ROADWAY STATE TIP PROJECT R-2828 =	8.617 Miles
TOTAL LENGTH STATE TIP PROJECT R-2828 =	8.617 Miles

Prepared In the Offices of:	
LOCHNER H. W. LOCHNER, INC. 2840 PLAZA PLACE, SUITE 202 RALEIGH, NC 27612 (919) 571-7111	ECOLOGICAL ENGINEERING 1115 W. GARY STREET, SUITE 101 RALEIGH, NC 27611 (919) 555-0929
2012 STANDARD SPECIFICATIONS	
RIGHT OF WAY DATE:	BRIAN K. EASON, PE PROJECT ENGINEER
LETTING DATE:	PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER	
SIGNATURE:	P.E.
ROADWAY DESIGN ENGINEER	
SIGNATURE:	P.E.



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE & JOHNSTON COUNTY

LOCATION: COMPLETE 540 - FROM EAST OF HWY 401 TO EAST OF I-40

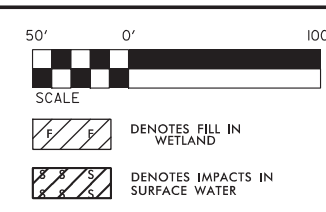
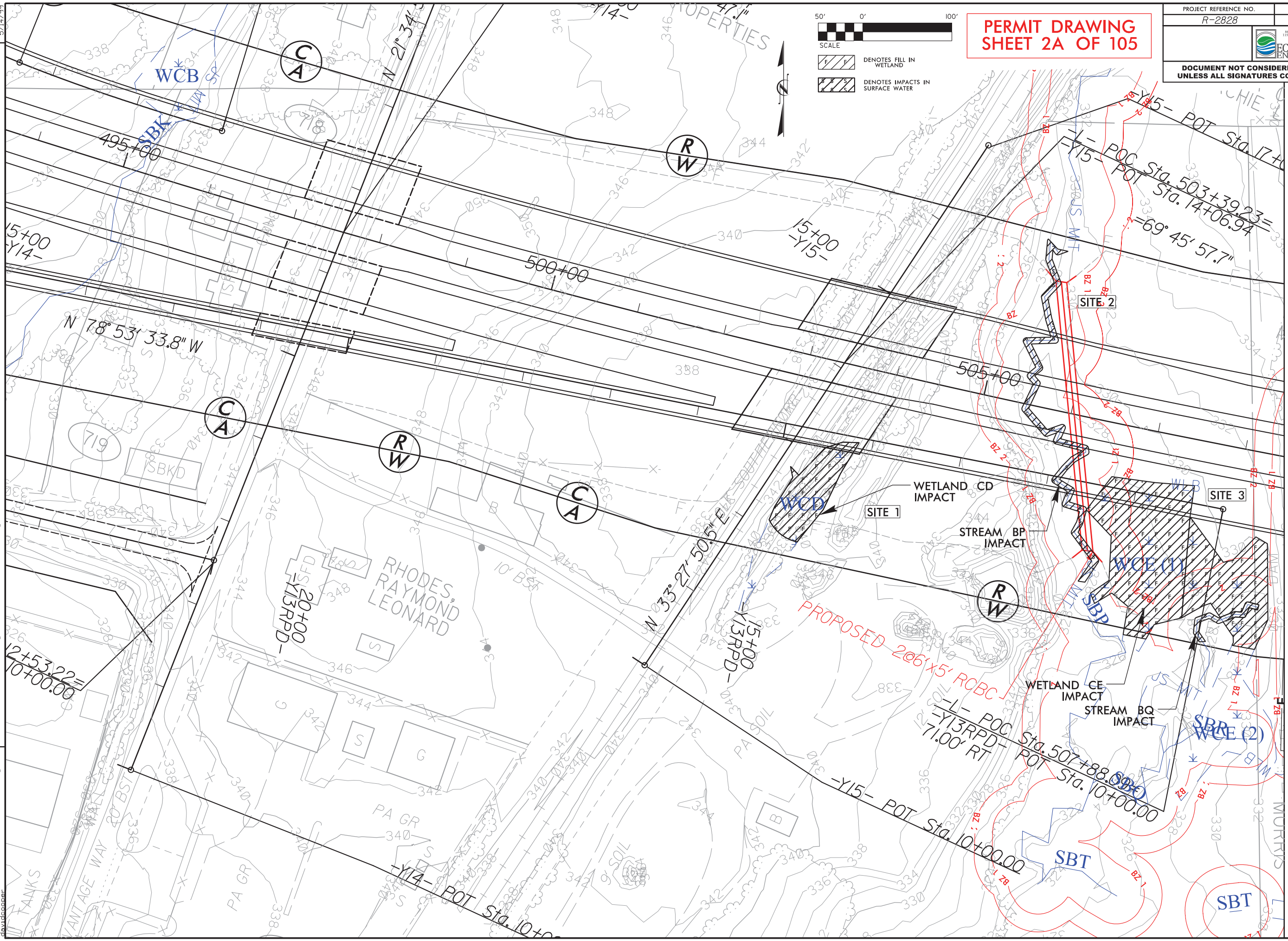
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURES

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N.C.	R-2828	TS	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
6.401079	STP-540(20)	PE	


PERMIT DRAWING
SHEET 1 OF 105

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

8/14/99
5/14/99
REVISIONS
8/3/26 AM
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davidcooper



**PERMIT DRAWING
SHEET 2A OF 105**

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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

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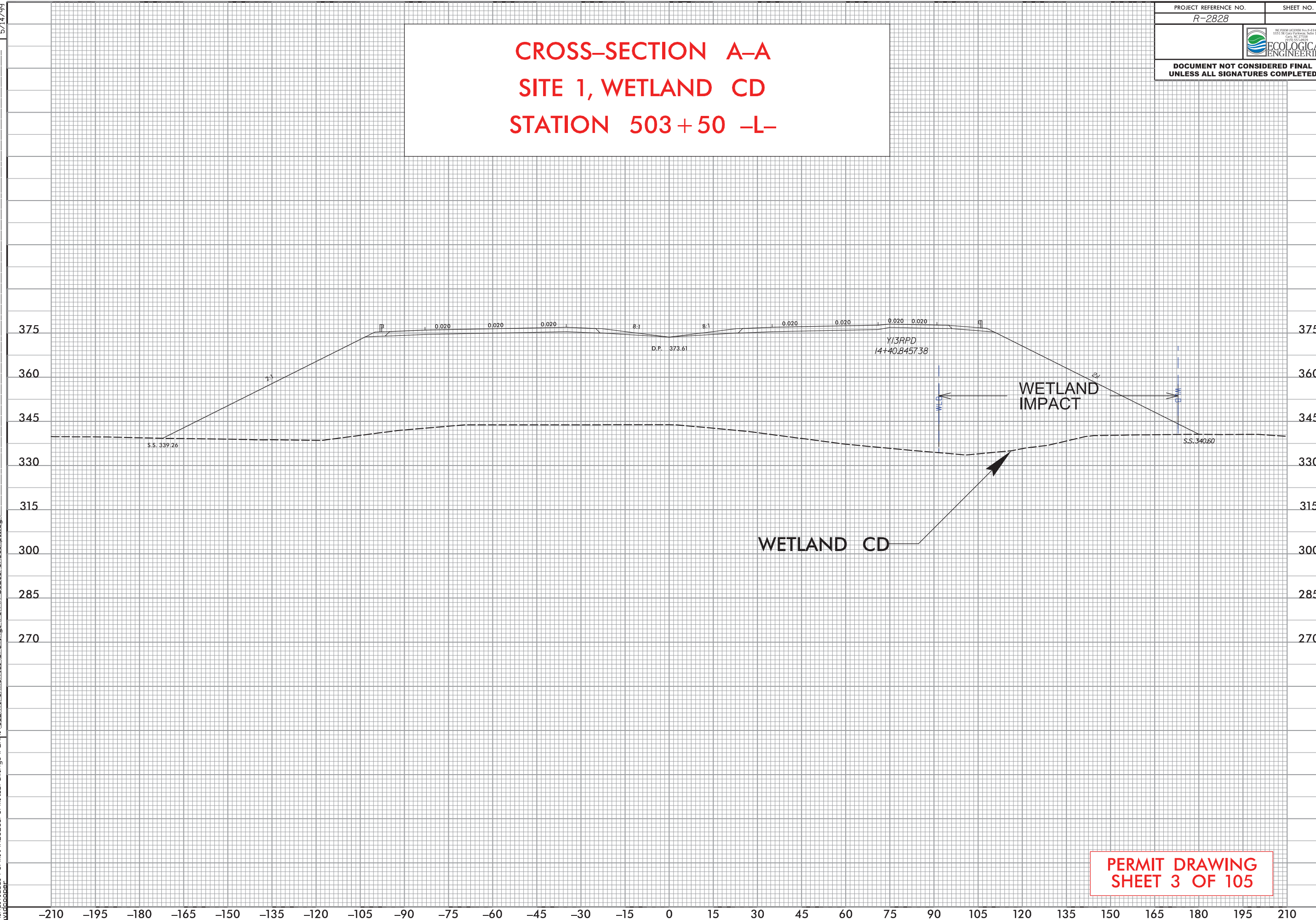
SHEET NO.

STREET NO. _____



**ED FINAL
COMPLETED**

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SITE 1, WETLAND CD
STATION 503+50 -L-



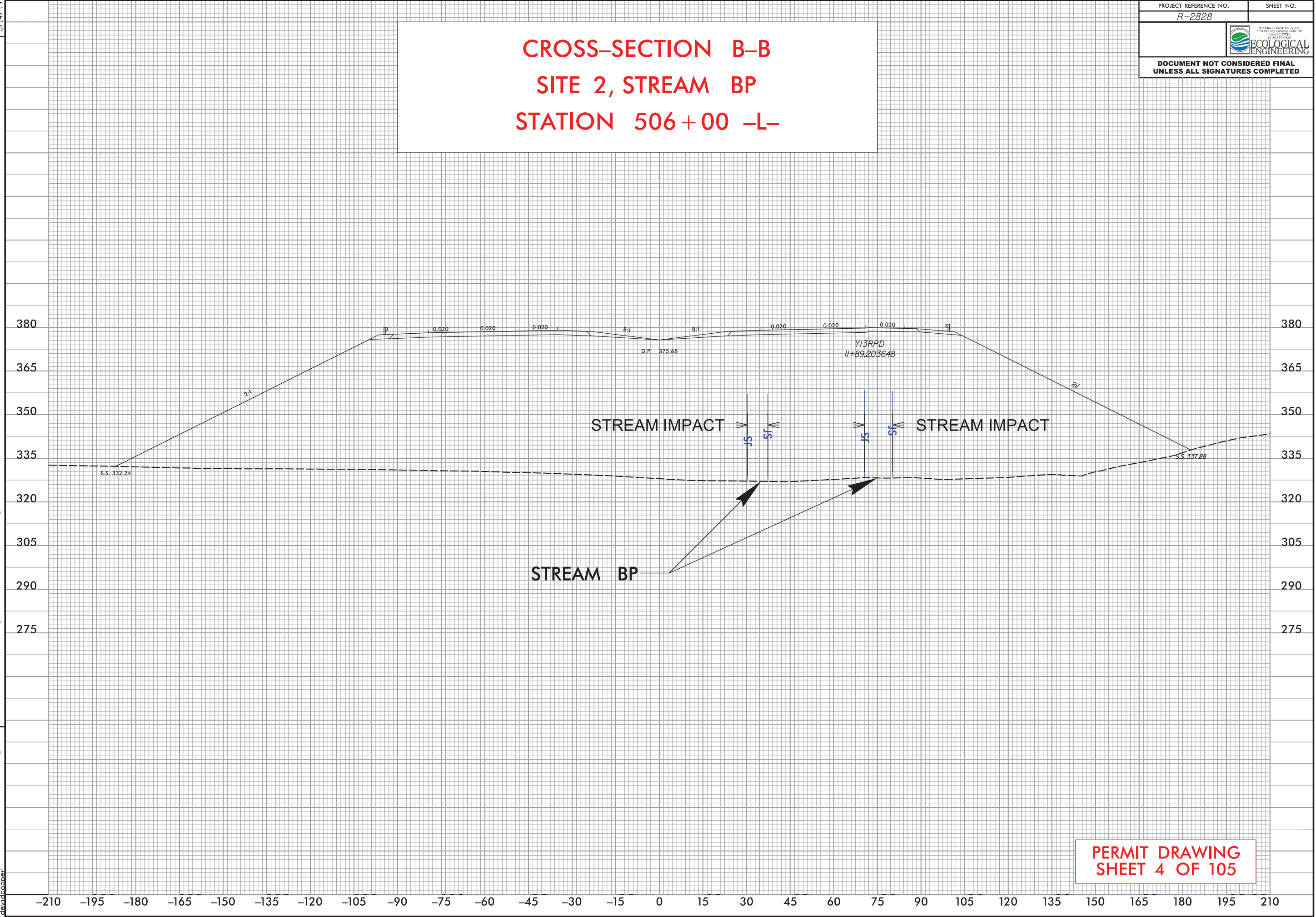
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SHEET 3 OF 105

E 114/99

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REVISIONS

CROSS-SECTION B-B
SITE 2, STREAM BP
STATION 506+00 -L-

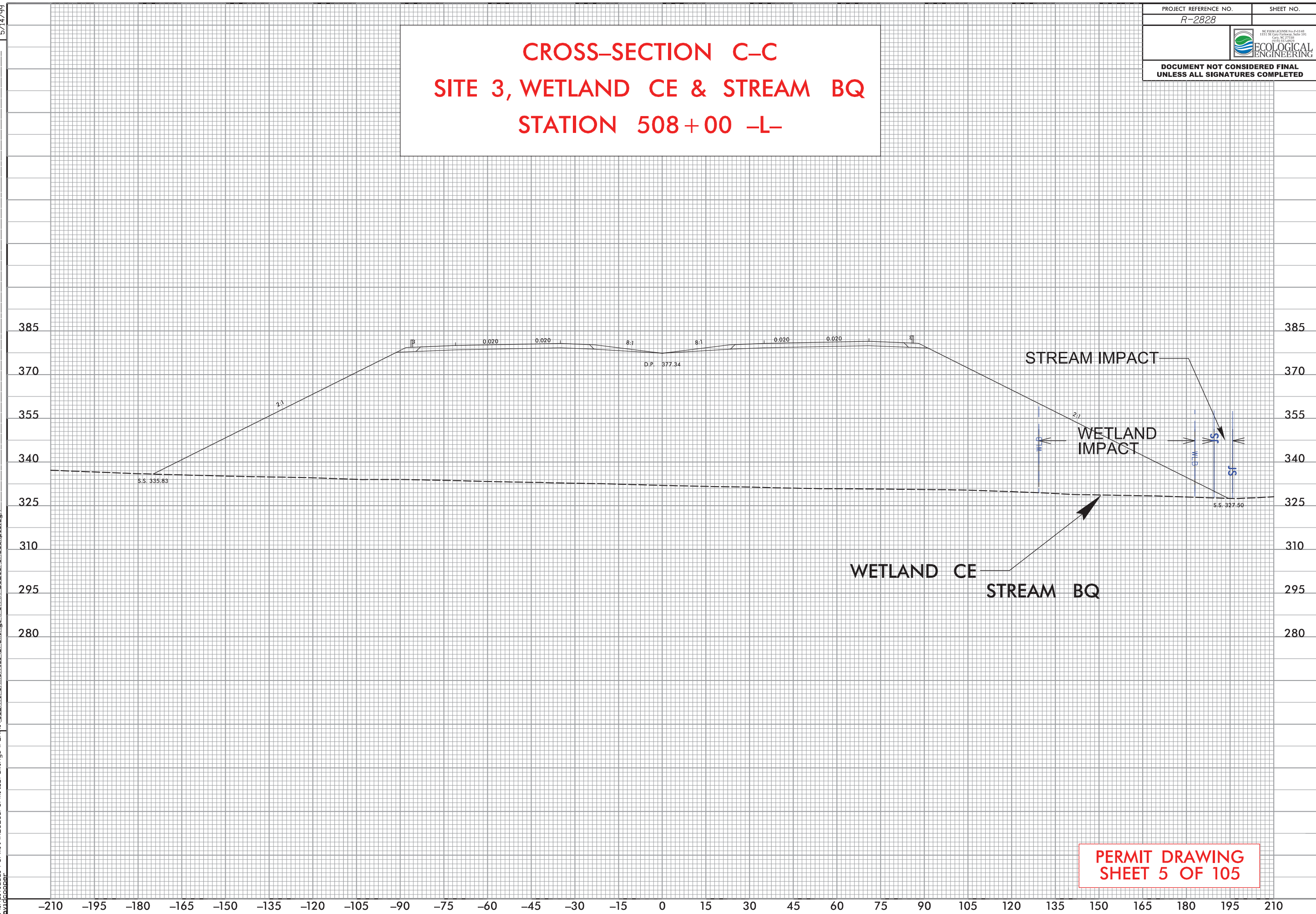


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SHEET 4 OF 105

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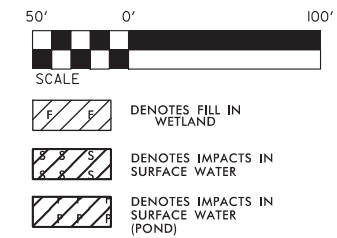
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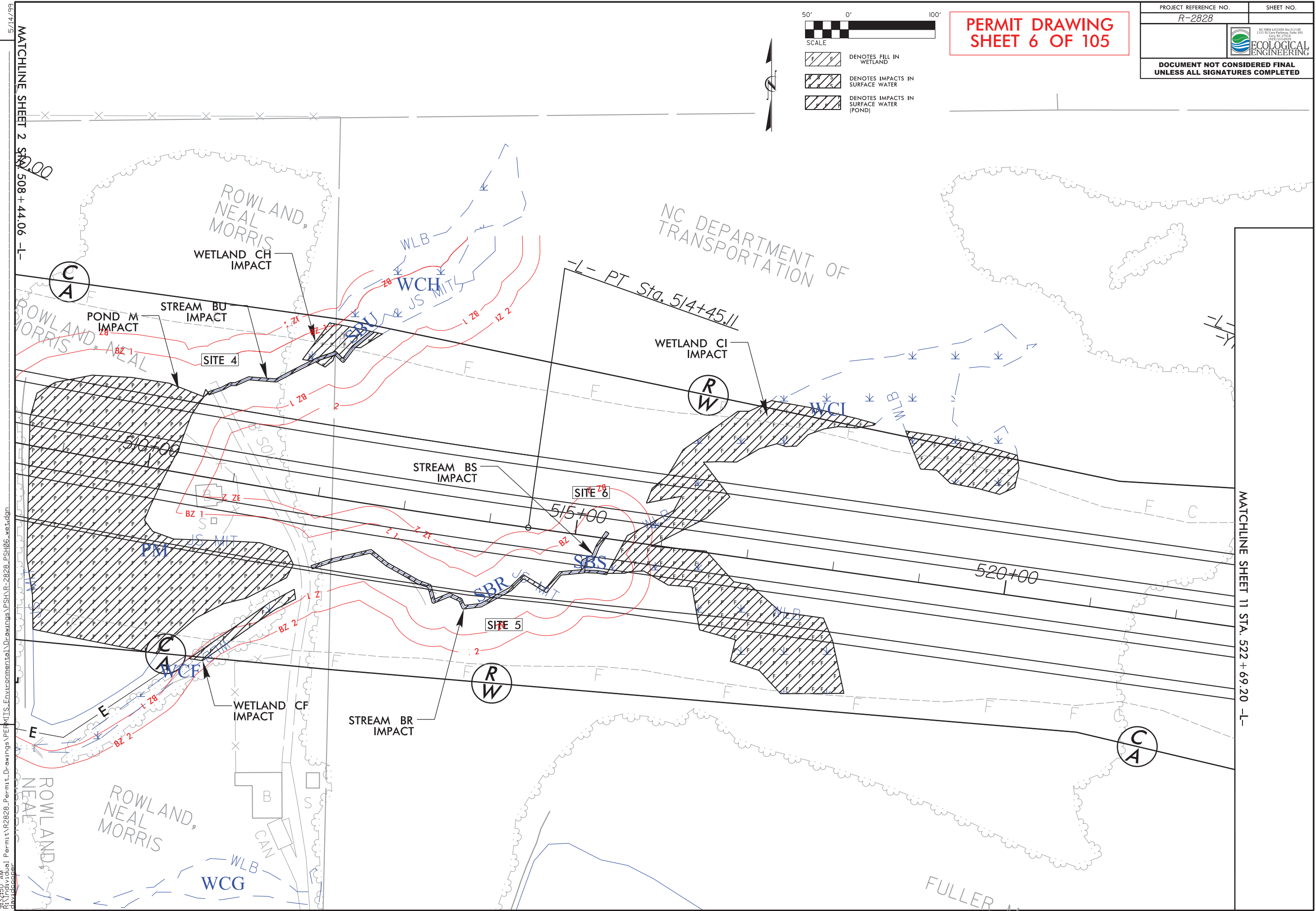
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SHEET 5 OF 105

REVISIONS

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David Cooper





PERMIT DRAWING
SHEET 6 OF 105




50' 0' 100'

SCALE

 DENOTES FILL IN WETLAND

 DENOTES IMPACTS IN SURFACE WATER

 DENOTES IMPACTS IN SURFACE WATER (POND)

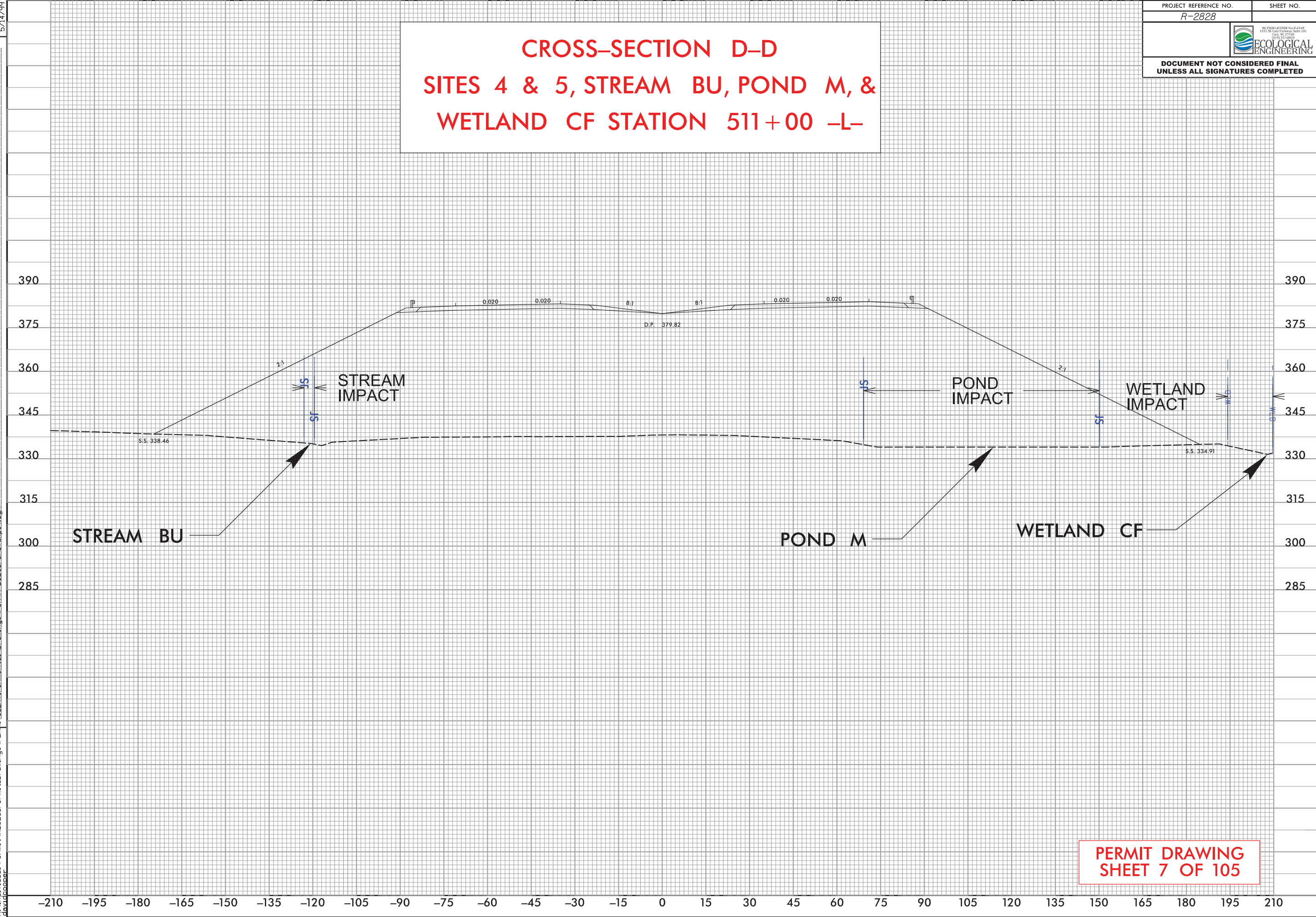


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david cooper

REVISIONS

CROSS-SECTION D-D
SITES 4 & 5, STREAM BU, POND M, &
WETLAND CF STATION 511+00 -L-

PROJECT REFERENCE NO.	SHEET NO.
R-2828	
 ECOLOGICAL ENGINEERING	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



CROSS-SECTION E-E
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STATION 512 + 00 -L-



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E 114 / 99

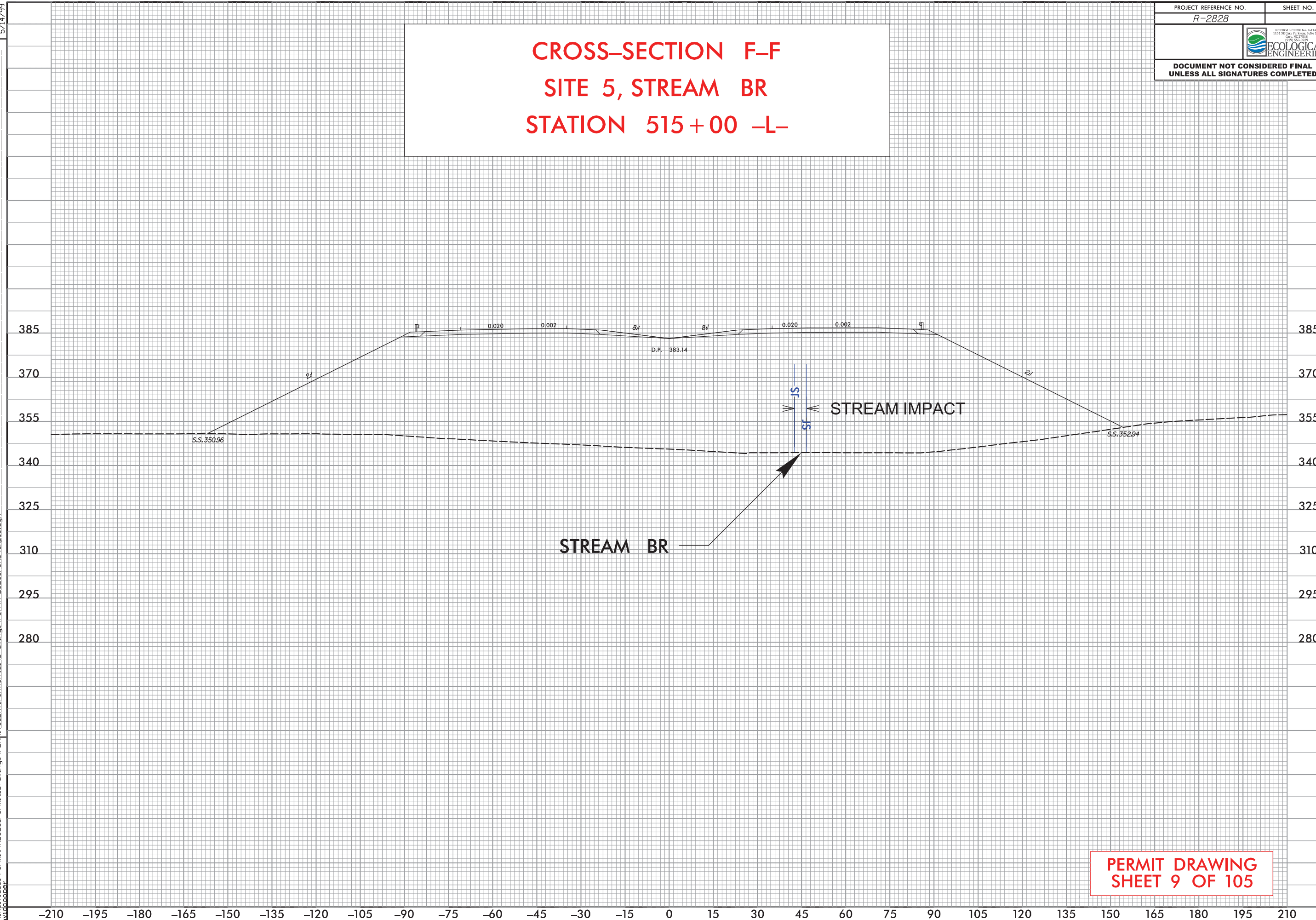
SHEET NO.

STREET NO. _____



**ERED FINAL
COMPLETED**

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SITE 5, STREAM BR
STATION 515 + 00 -L-



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SHEET 9 OF 105


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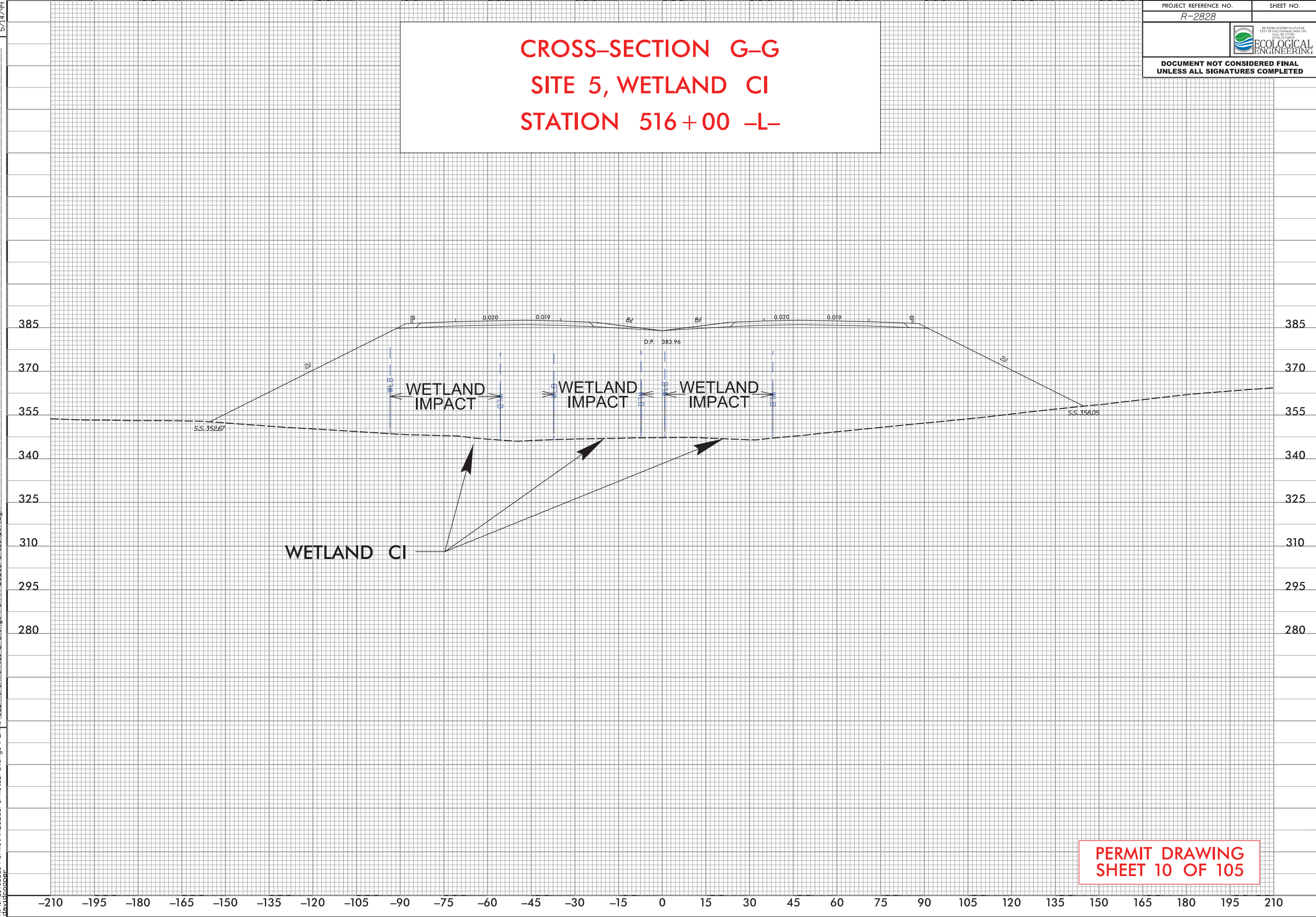
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REVISIONS

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davidcopper

CROSS-SECTION G-G
SITE 5, WETLAND CI
STATION 516 + 00 -L-

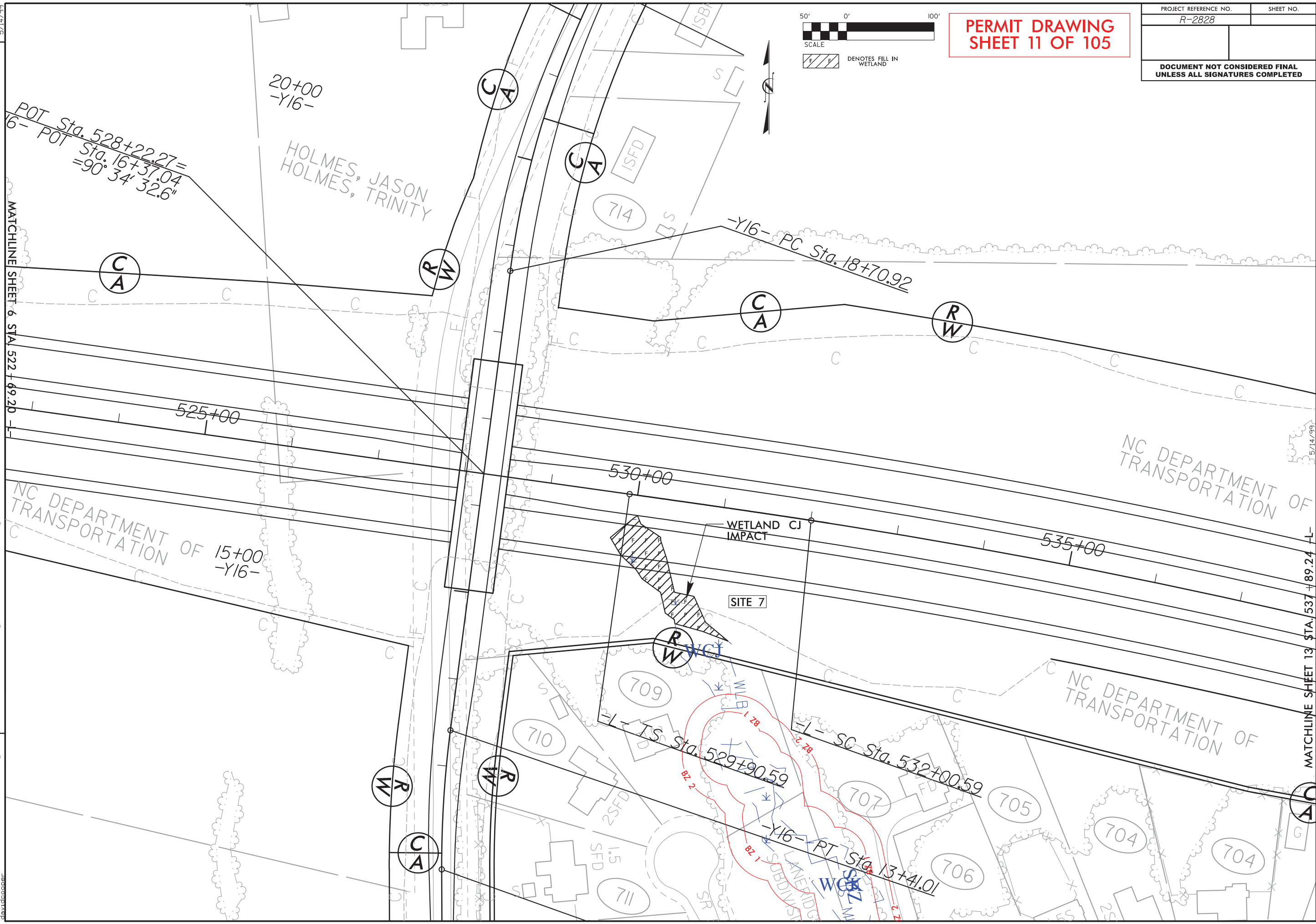
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daivdcooper

REVISIONS

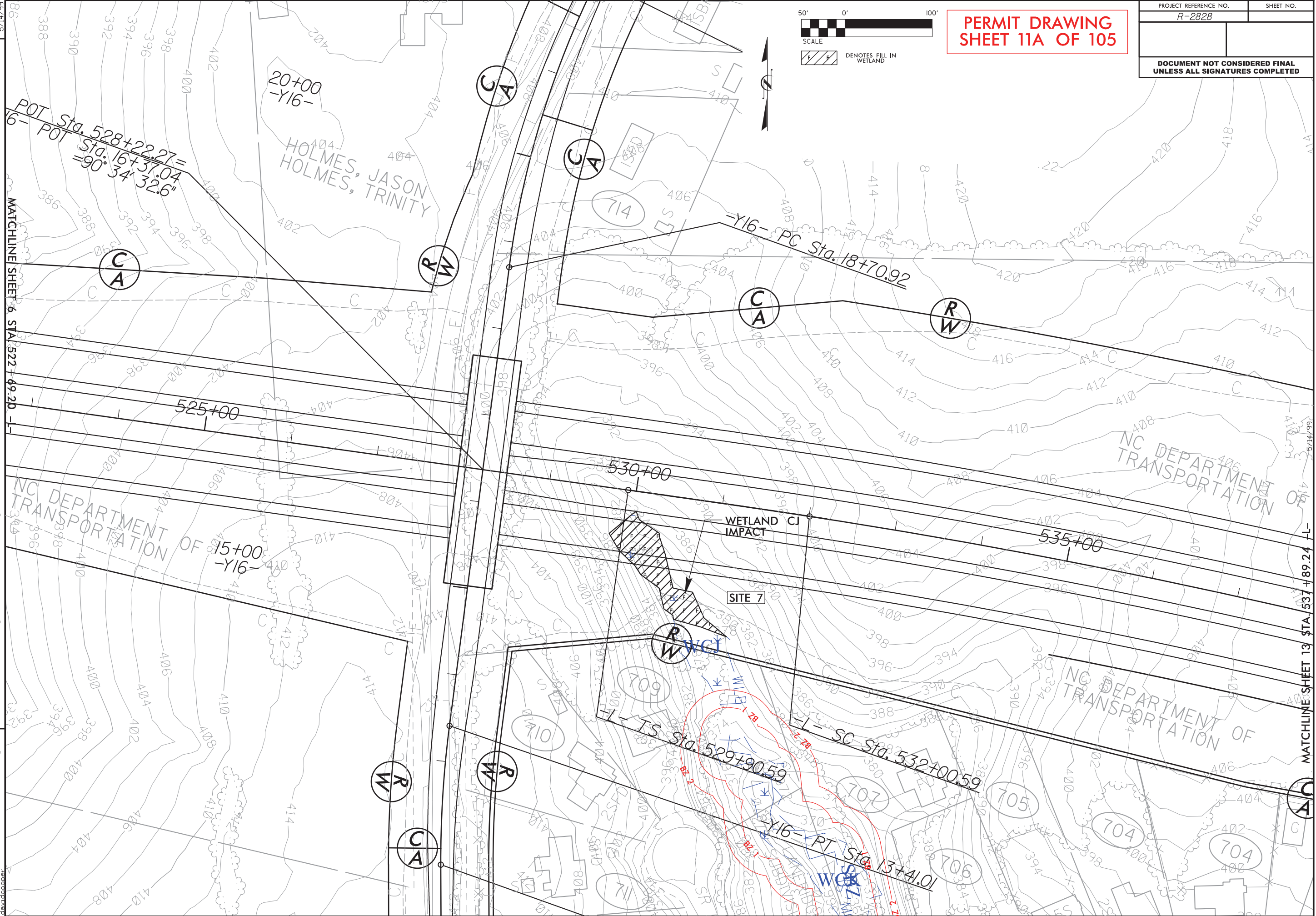


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SHEET 11 OF 105

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davidcooper

REVISIONS



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PERMIT DRAWING
SHEET 11A OF 105

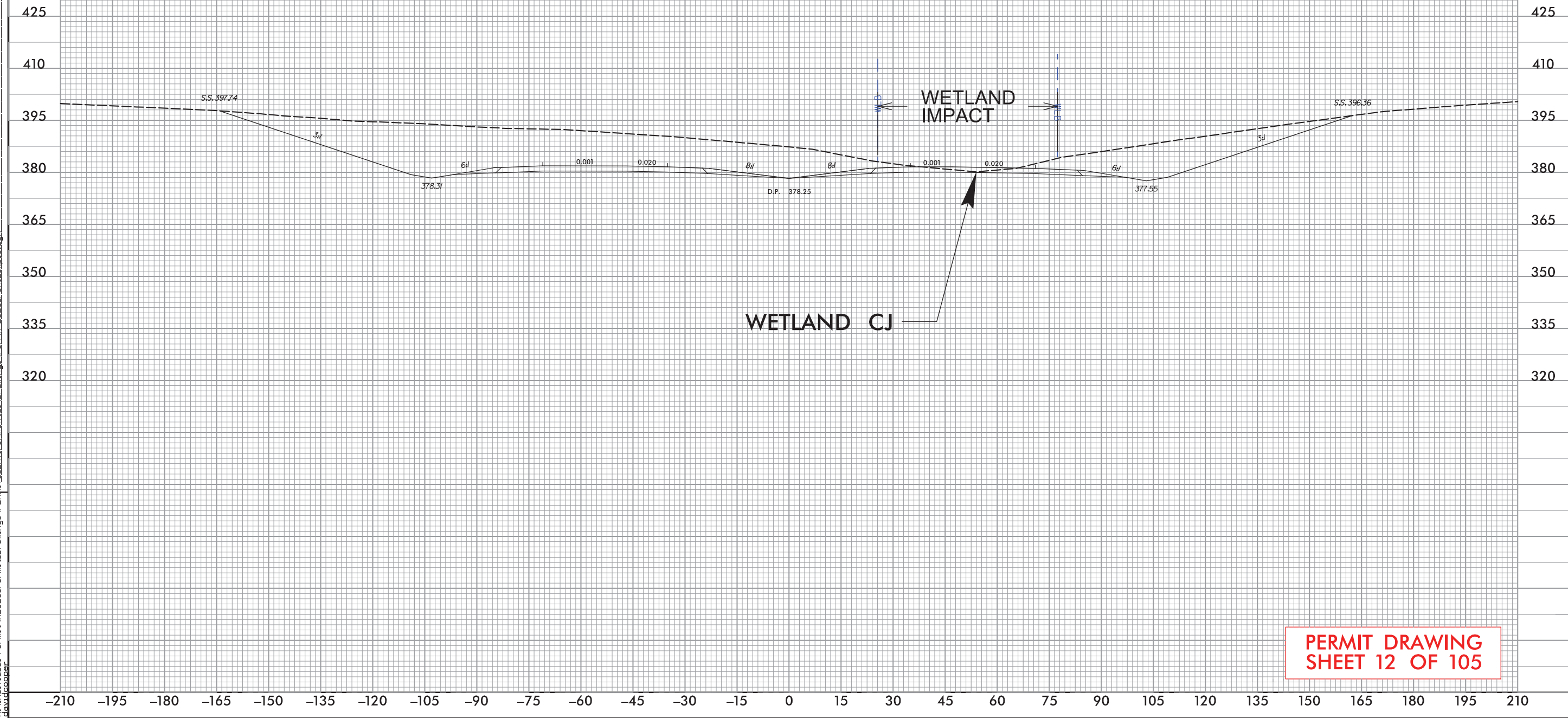
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REVISIONS

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davidcooper

CROSS-SECTION H-H
SITE 7, WETLAND CJ
STATION 530+00 -L-

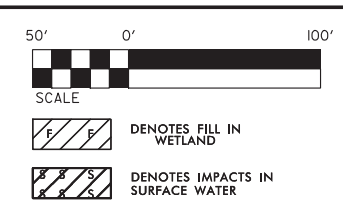
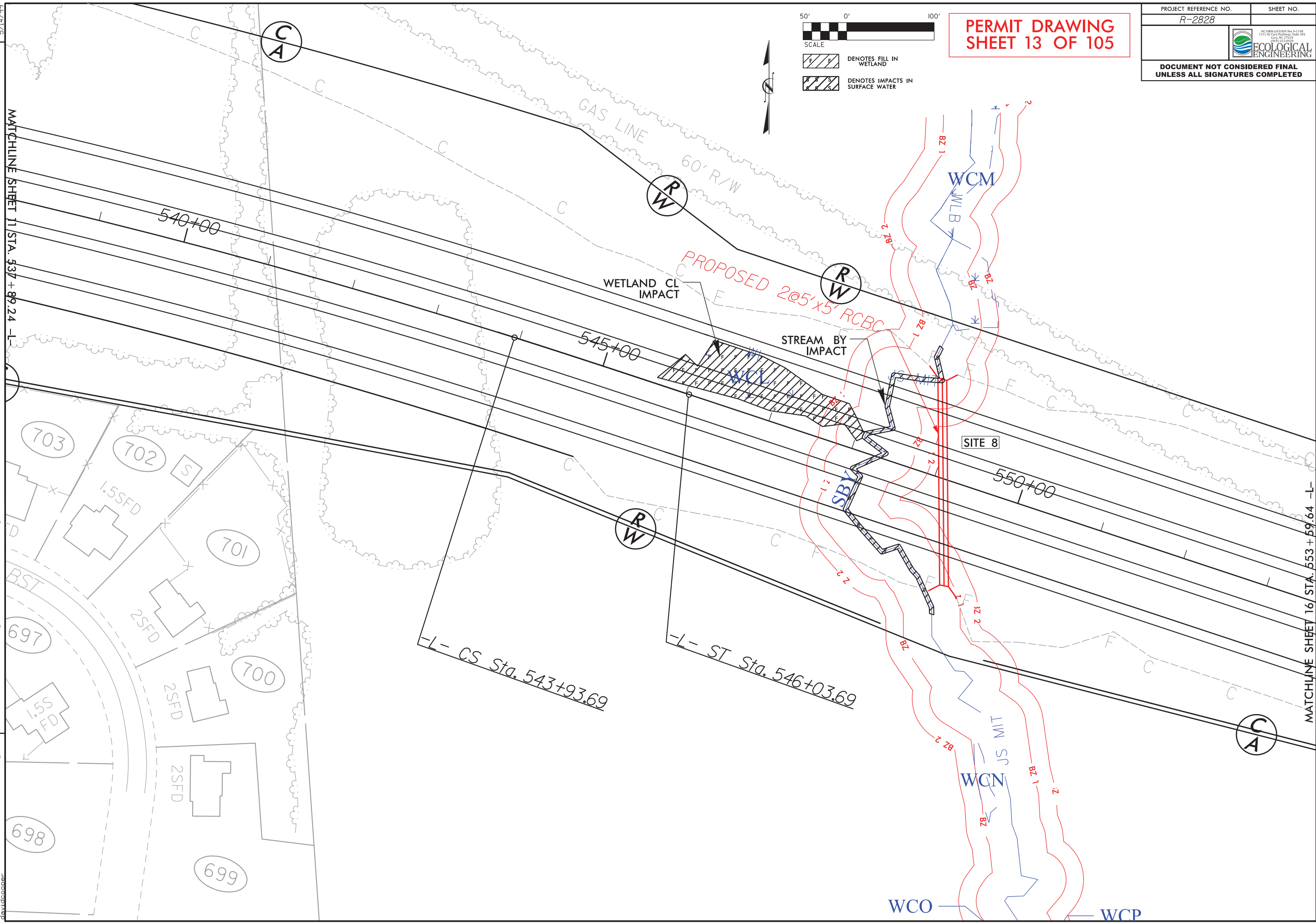
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PERMIT DRAWING
SHEET 12 OF 105

5/14/99
MATCHLINE SHEET 11 STA. 537+89.24 -L-
MATCHLINE SHEET 16 STA. 553+59.64 -L-
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david cooper

REVISIONS

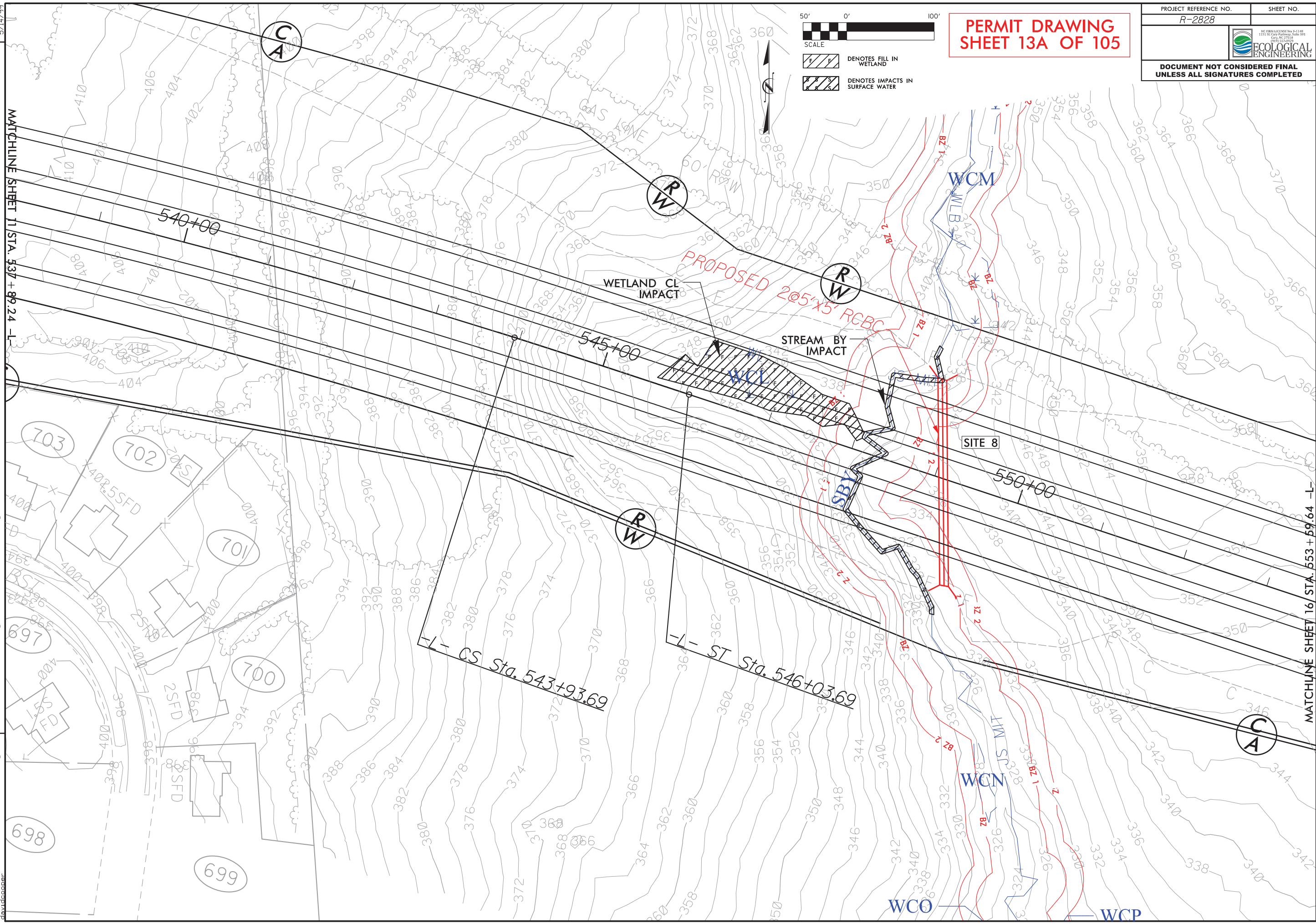


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SHEET 13 OF 105**

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david cooper

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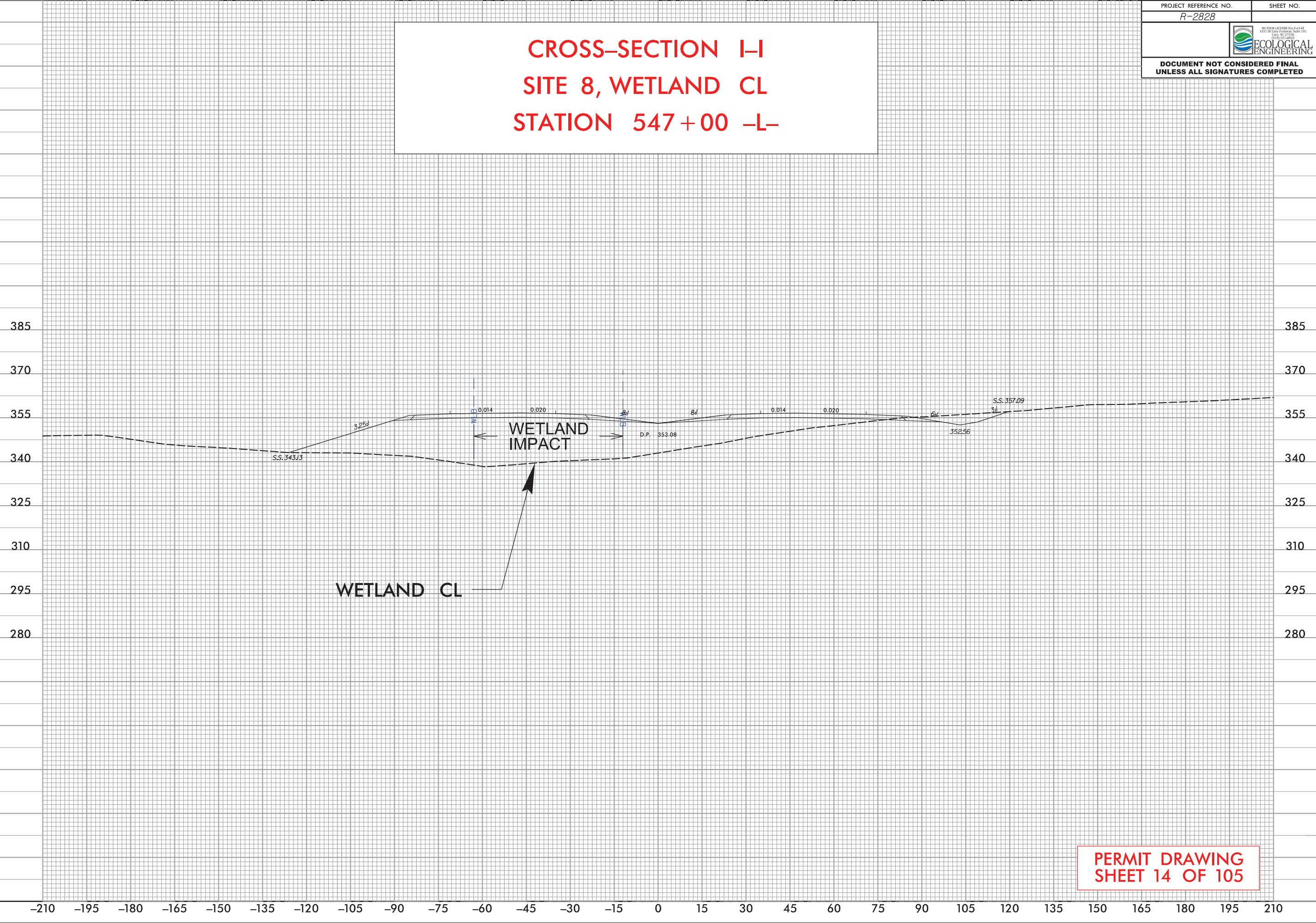
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REVISIONS

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David Cooper

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SITE 8, WETLAND CL
STATION 547+00 -L-

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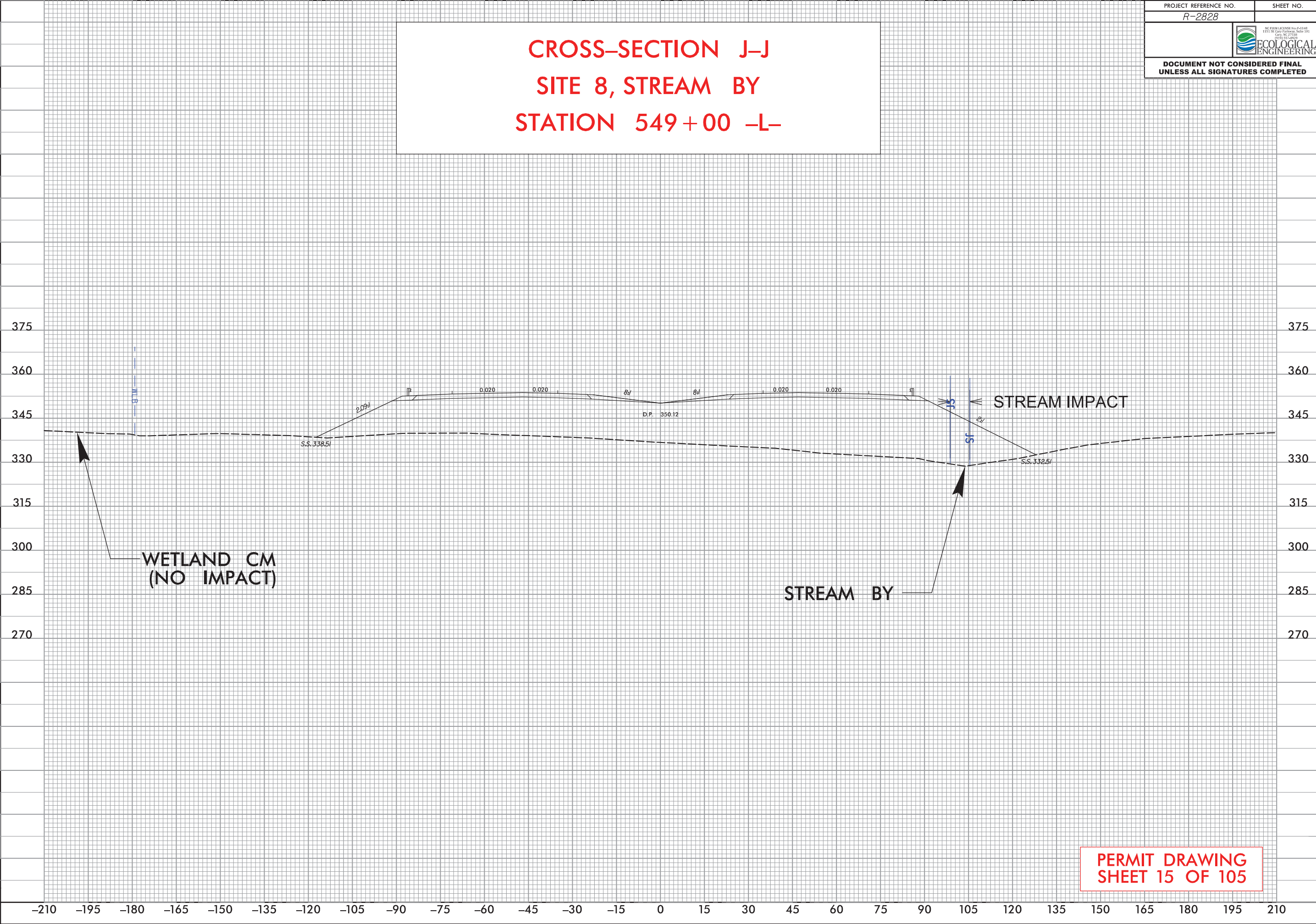
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davidcopper

REVISIONS

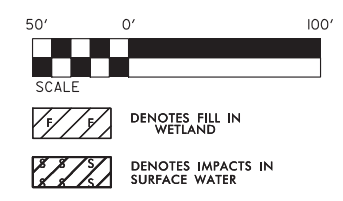
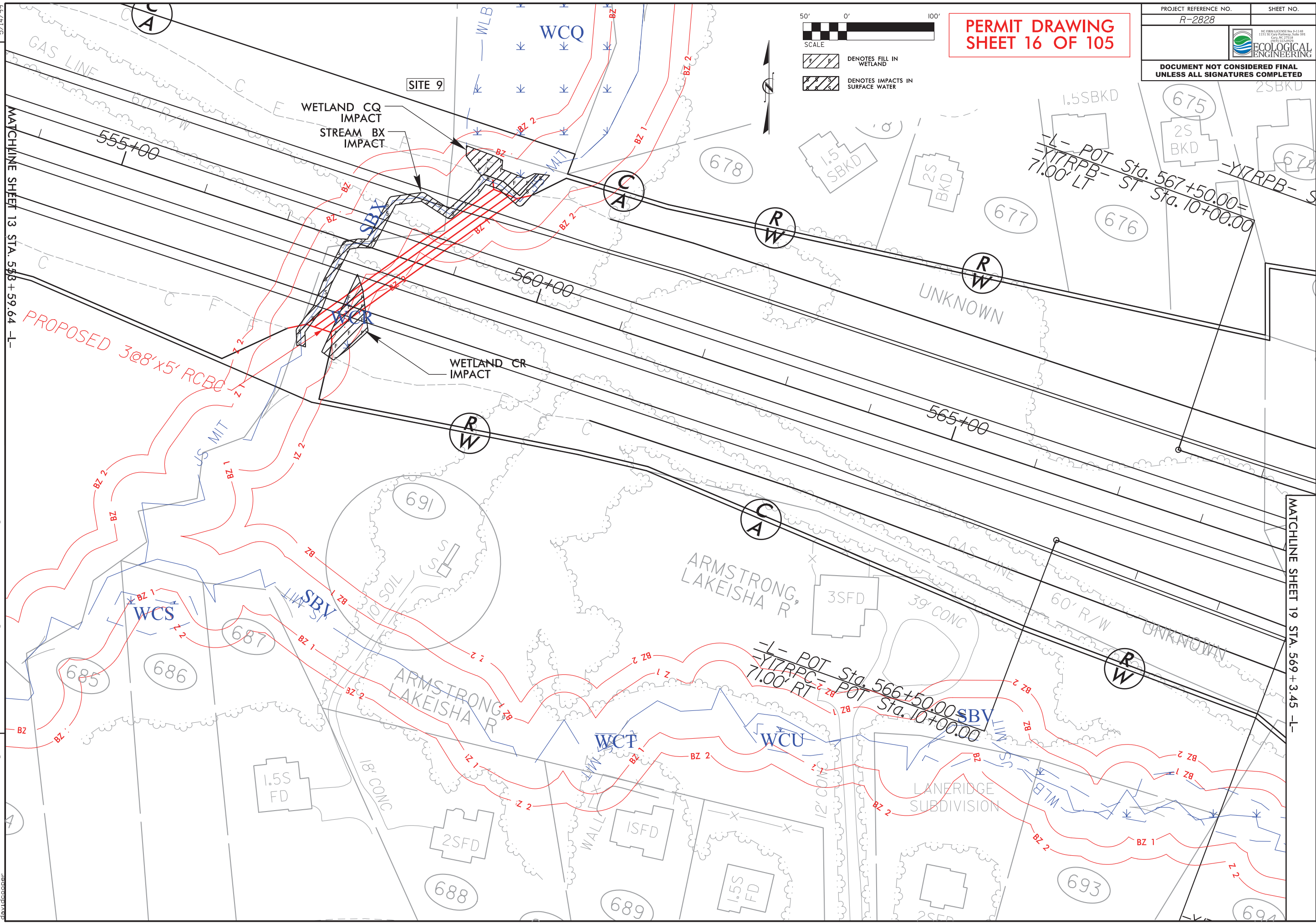
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SITE 8, STREAM BY
STATION 549+00 -L-

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5/14/99
MATCHLINE SHEET 13 STA. 558+59.64 -L-
MATCHLINE SHEET 19 STA. 569+3.45 -L-
9/24/09 AM
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david cooper

REVISIONS





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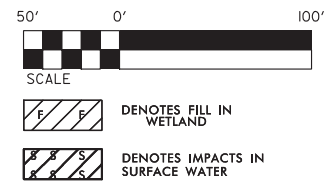
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

50' 0' 100'

SCALE

 DENOTES FILL IN WETLAND

 DENOTES IMPACTS IN SURFACE WATER



DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN
SURFACE WATER

WETLAND CQ-
IMPACT
STREAM BX
IMPACT

~~WETLAND CR
IMPACT~~

MA/CHLORINE SHEET 13 SIA. 54.3 + 59.64 -L-

MAIL CHINESE 17 31A: 307 + 3:43 -E-

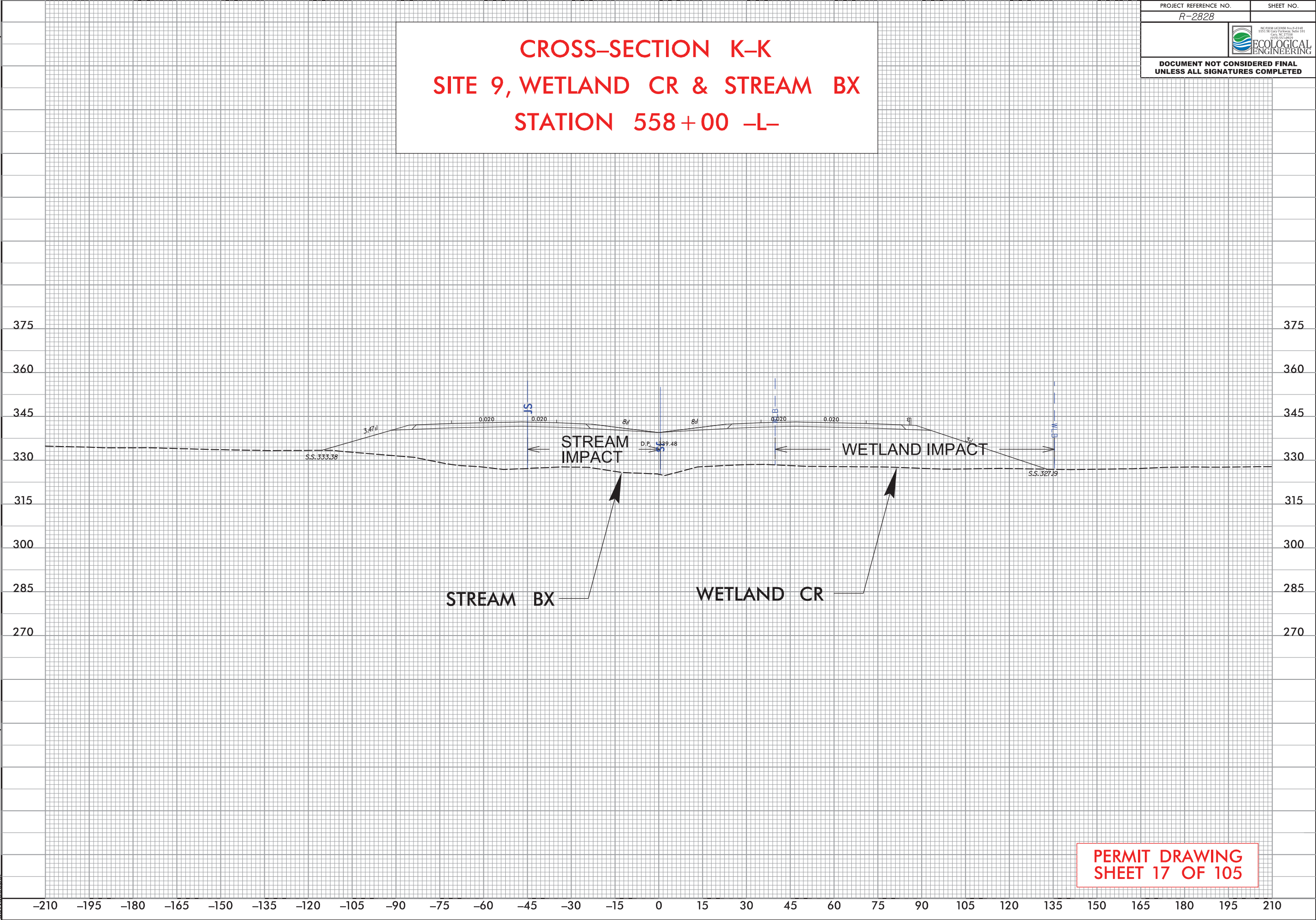
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davidcooper

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david cooper

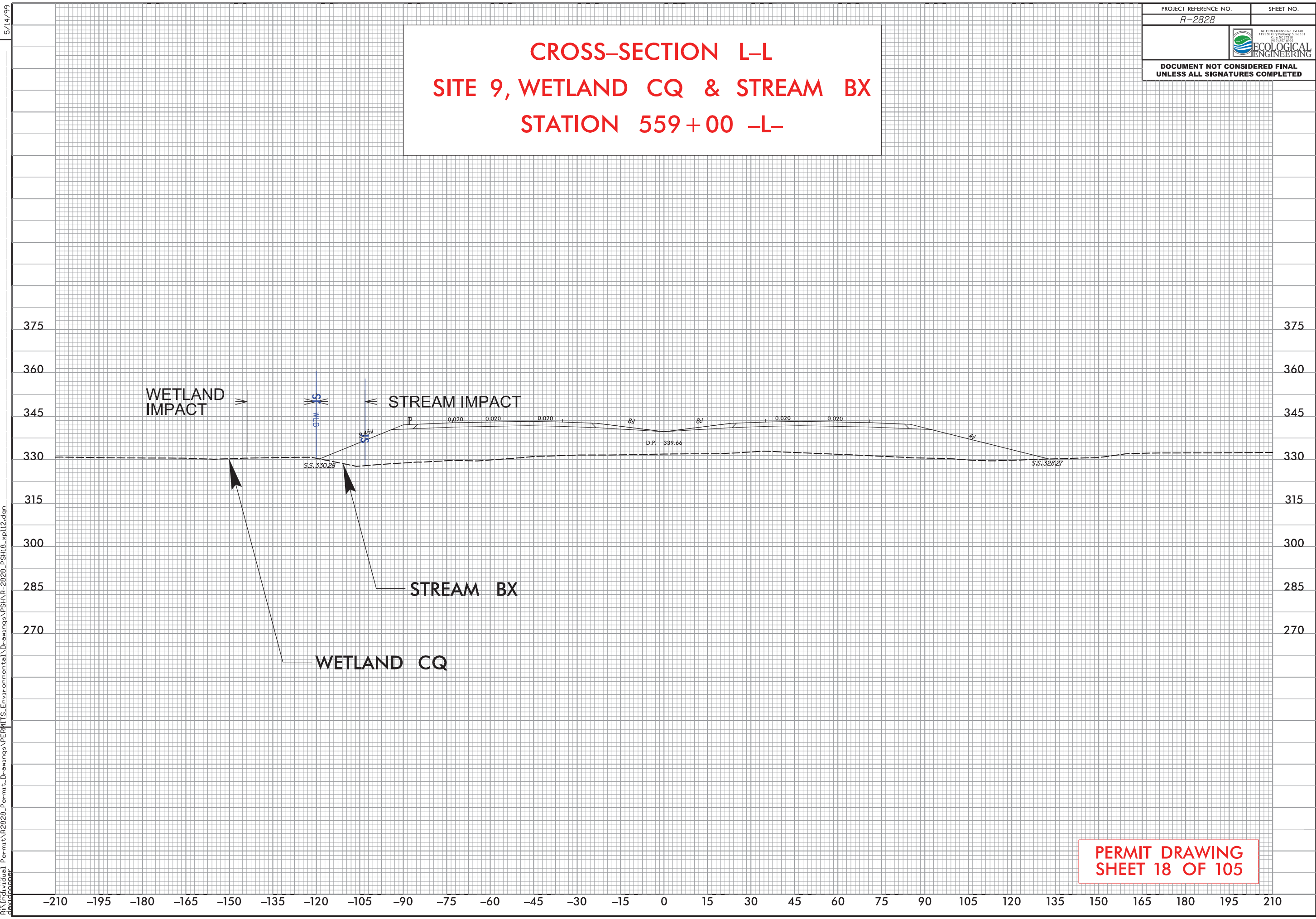
CROSS-SECTION K-K
SITE 9, WETLAND CR & STREAM BX
STATION 558+00 -L-

PROJECT REFERENCE NO.	SHEET NO.
R-2828	
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



PERMIT DRAWING
SHEET 17 OF 105

CROSS-SECTION L-L
SITE 9, WETLAND CQ & STREAM BX
STATION 559+00 -L-

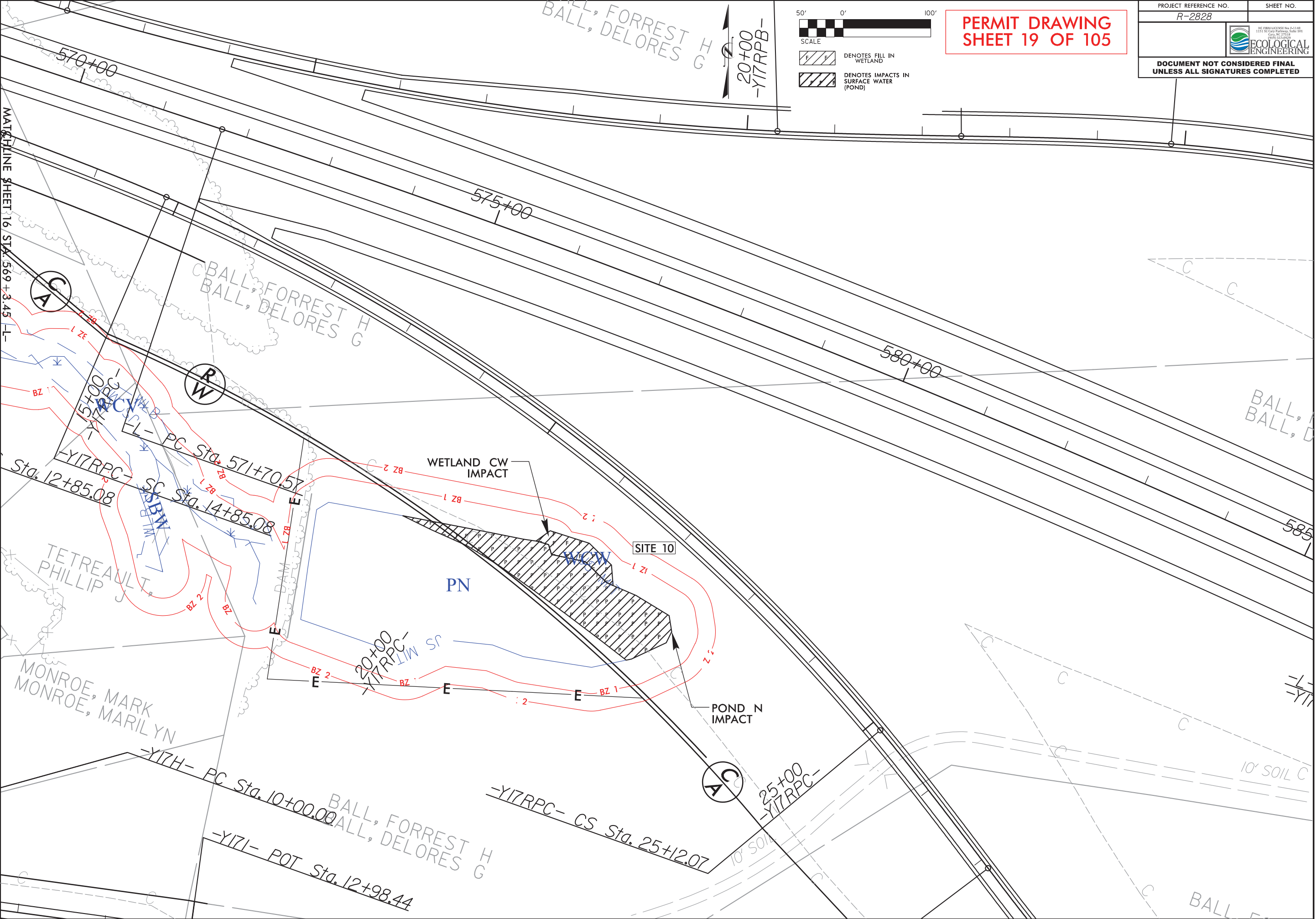


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david cooper

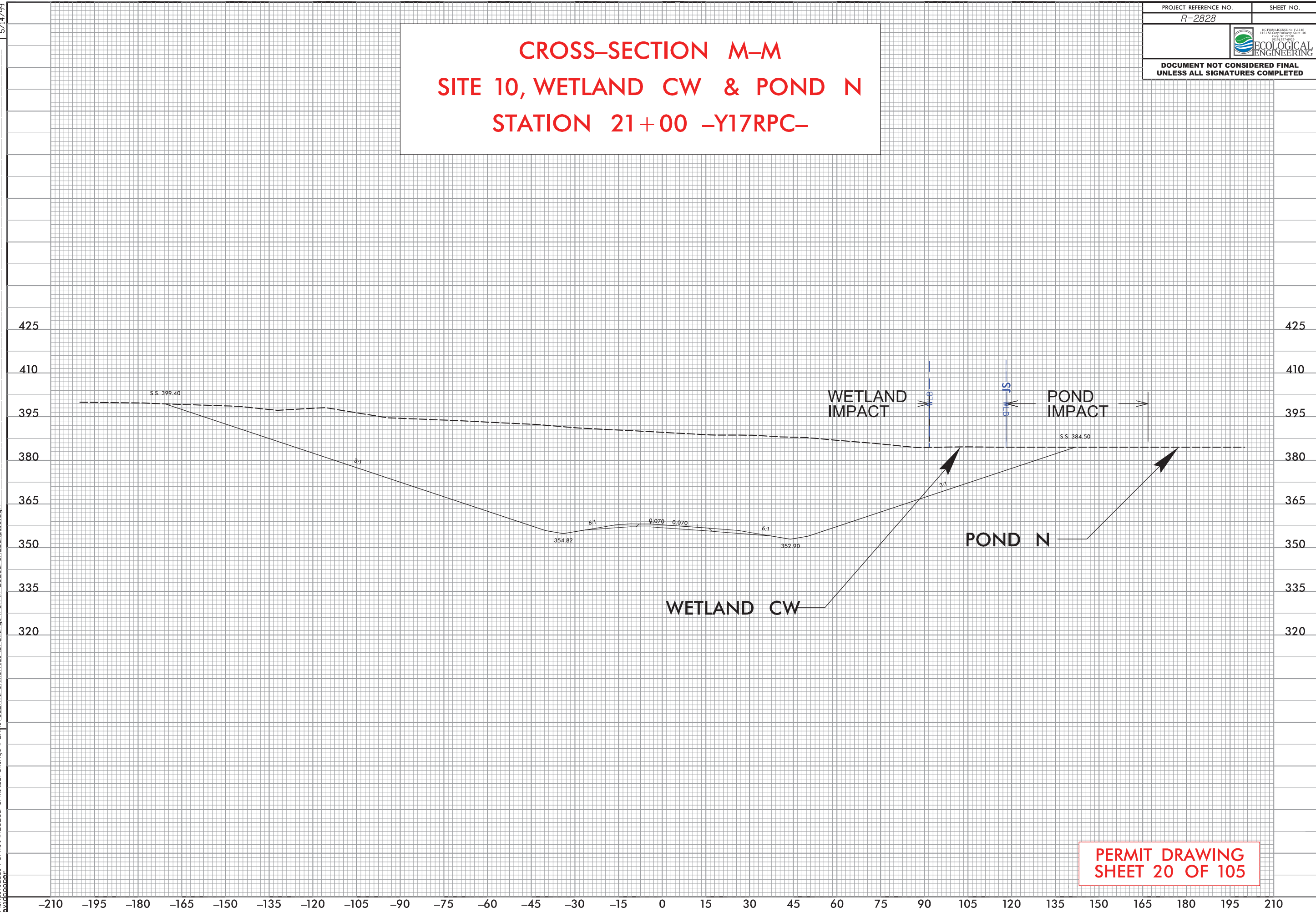
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SHEET 19 OF 105

PROJECT REFERENCE NO.	SHEET NO.
R-2828	
 ECOLOGICAL ENGINEERING	
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CROSS-SECTION M-M
SITE 10, WETLAND CW & POND N
STATION 21+00 -Y17RPC-




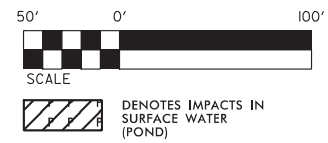
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David Cooper

50' 0' 100'

SCALE

 DENOTES IMPACTS IN SURFACE WATER (POND)



DENOTES IMPACTS IN
SURFACE WATER
(POND)

— POND P
IMPACT

25+00
-Y17RPA-

MARY T BALL
PROPERTIES LLC

SITE 11

MATCHLINE SHEET 23 STA. 600+92.95 -L-

10' GR

8' SOIL

COMFORT
HOMES INC

MARY T BALL
PROPERTIES LLC

RACKLEY,
SALLIE

25+00
-Y17RPD-

-Y17RPD-^C ST Sta 2

REVISIONS

[illegible]

PERMIT DRAWING
SHEET 21A OF 105



DENOTES IMPACTS IN
SURFACE WATER
(POND)



POND P IMPACT

25+00
-Y17RPA-

MARY T BALL
PROPERTIES LLC

SITE 11

COMFORT
HOMES INC

MARY T BALL
PROPERTIES LLC

RACKLEY,
SALLIE

25+00
-Y17RPD-

-Y17RPD- ST Sta

REVISIONS

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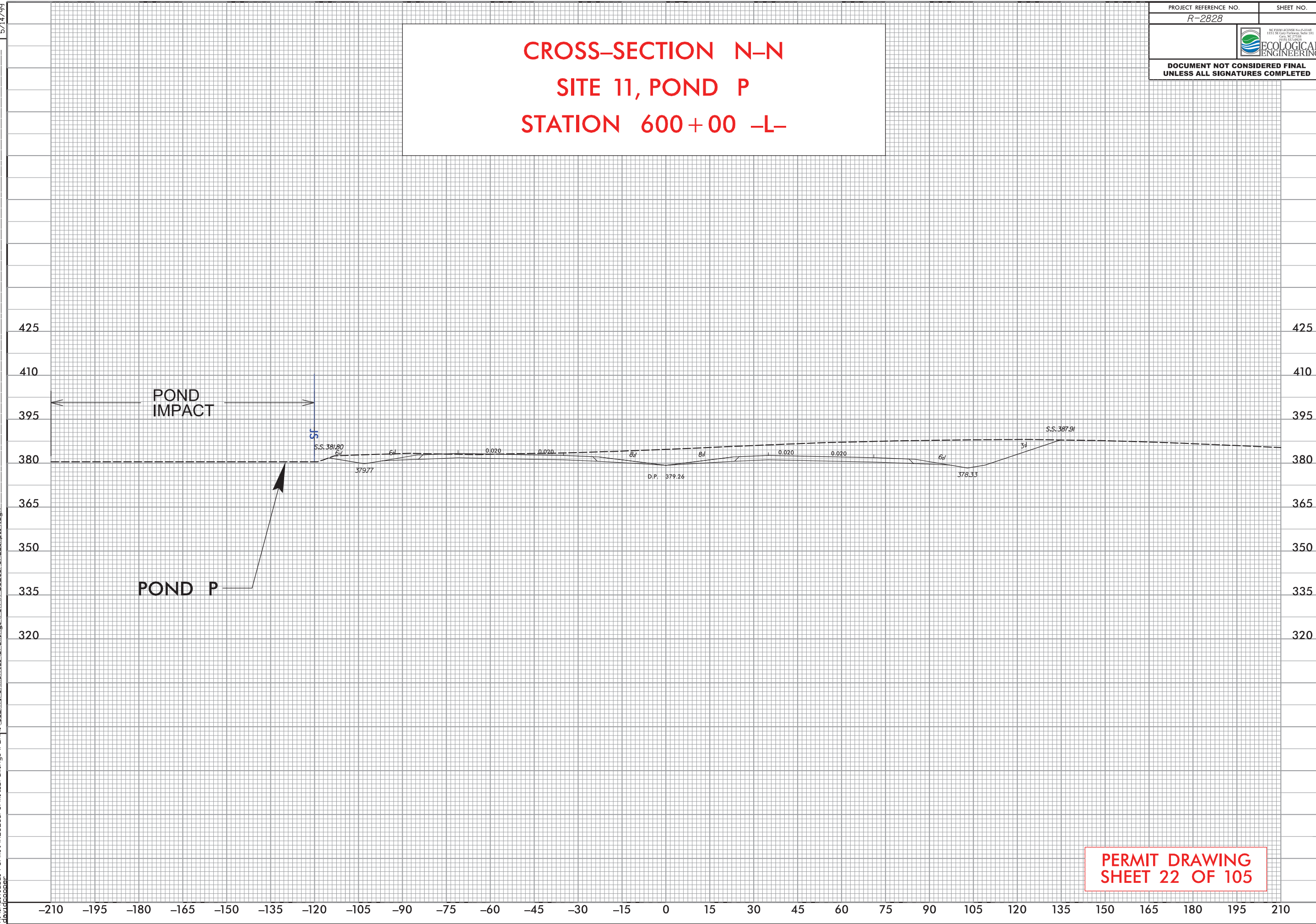
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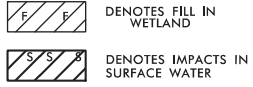
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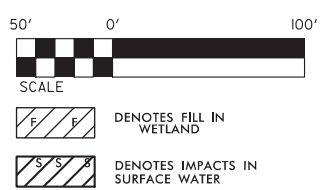
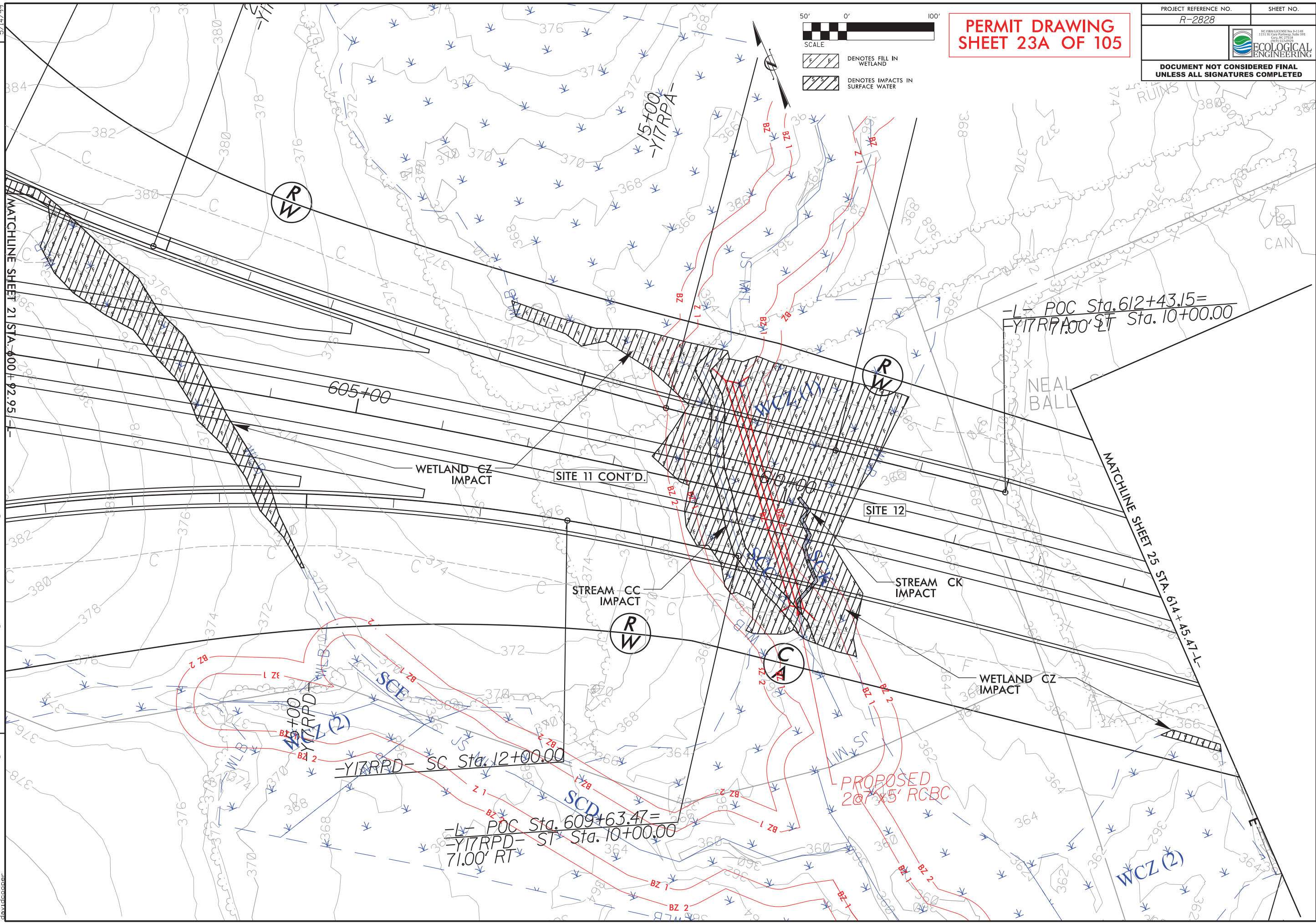
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davidcooper

9/5/18 AM
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david cooper

REVISIONS



**PERMIT DRAWING
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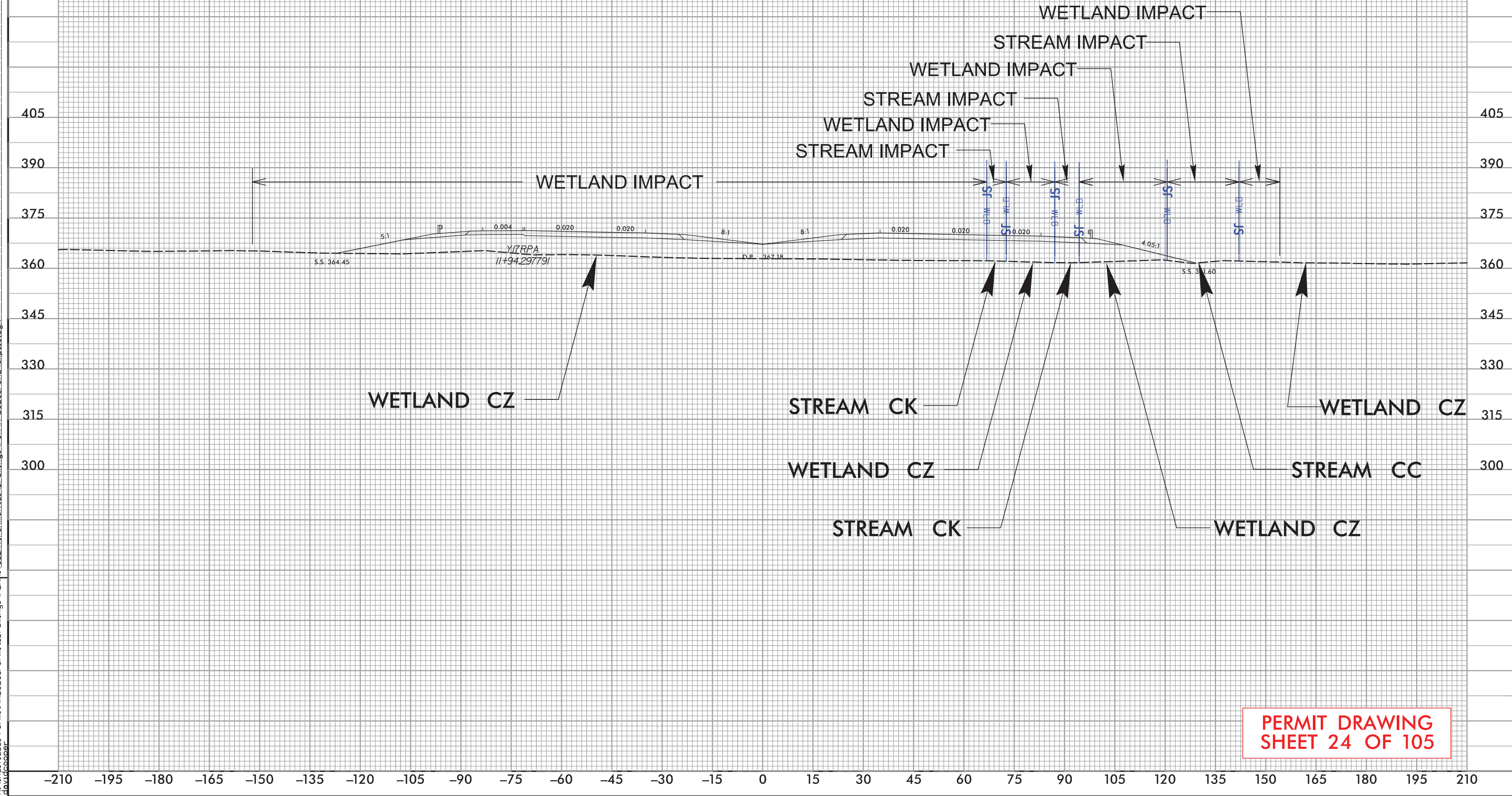
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R-2828	
	
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david cooper

REVISIONS

CROSS-SECTION O-O, SITES 11 & 12,
WETLAND CZ, STREAM CK, &
STREAM CC STATION 610+50 -L-



PERMIT DRAWING
SHEET 25 OF 105



 DENOTES FILL IN WETLAND

 DENOTES IMPACTS IN SURFACE WATER (POND)

SHERRY
DAVID W UPCHURCH
/TR

~~MATCHLINE SHEET 23 STA. 614+45.47-L-~~

~~POND Q
IMPACT~~

SITE 13

—POND R IMPACT

NEAL, SHERRY
BALL, DAVID W UPCHURCH
/TR

PT Sta. 6/6+66.65

SHERRY
DAVID W UPCHURCH
/TR

WETLAND CZ
IMPACT

SITE 11 CONT'D.

WCZ (1)

35+00 -Y18-

10' SOIL

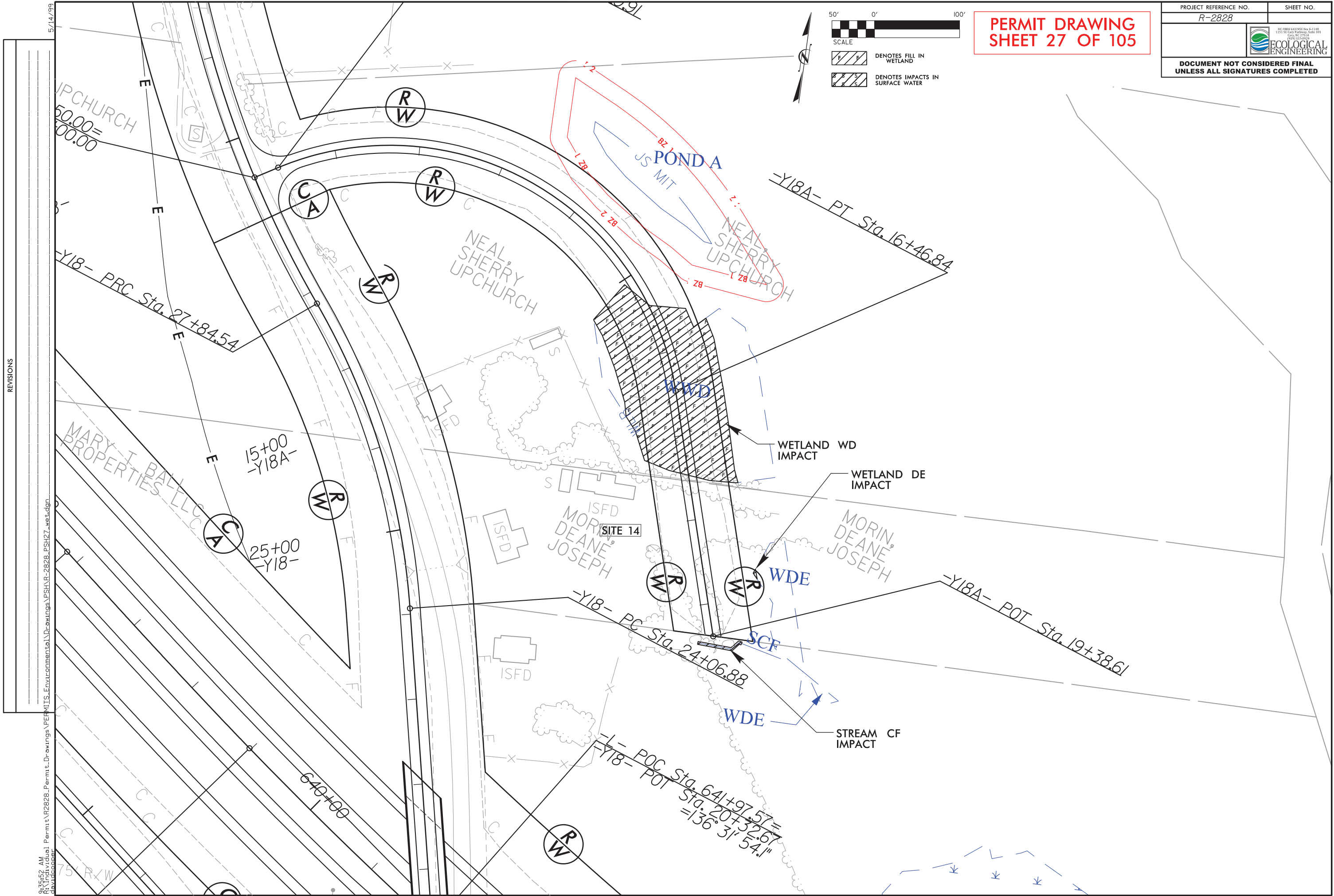
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REVISIONS

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davidcooper

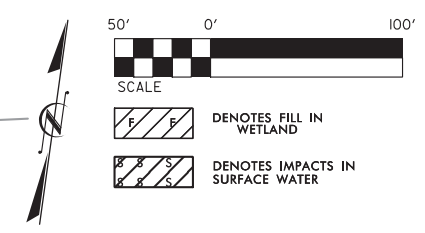
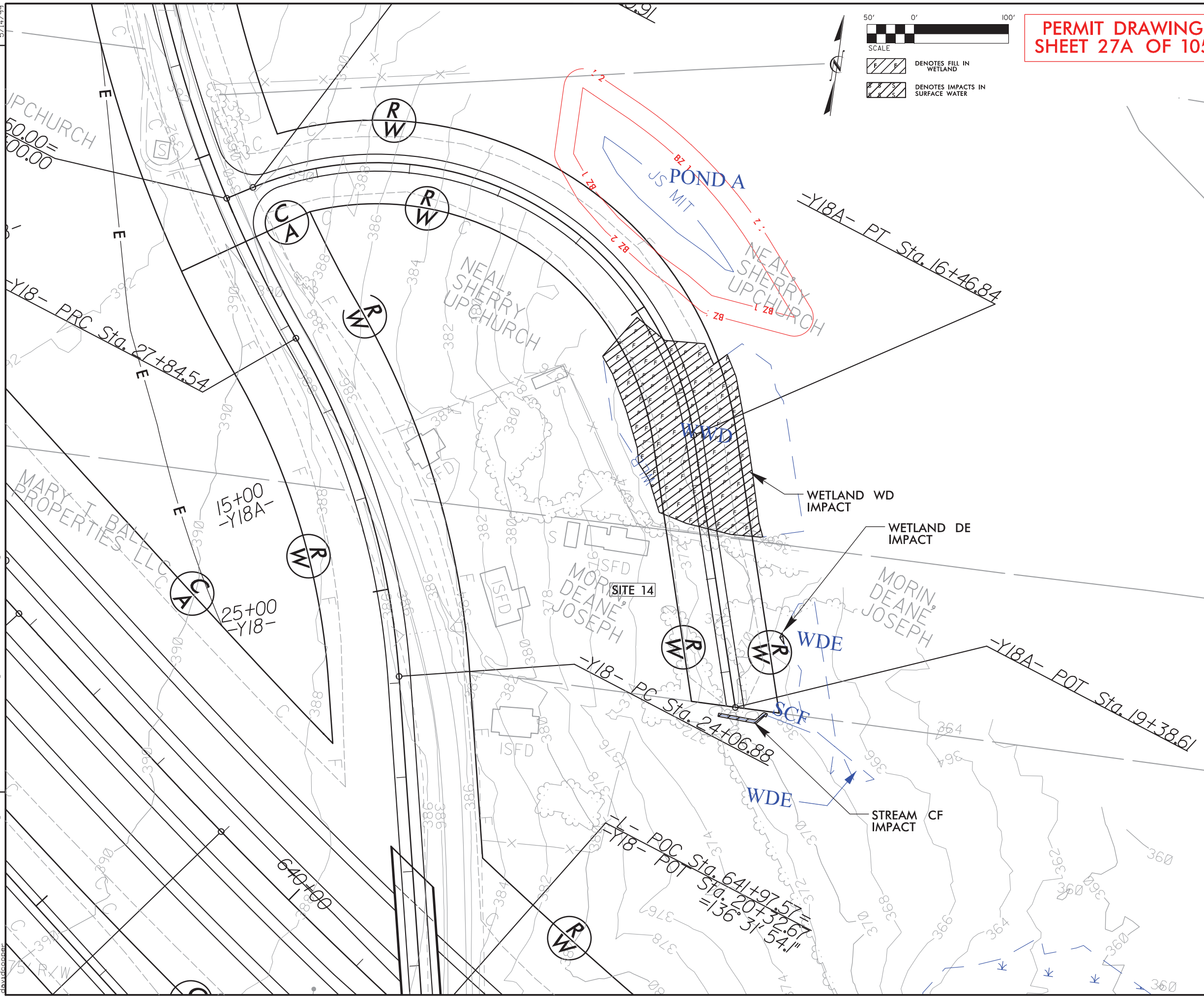
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SITE 13, PONDS Q & R
STATION 617+00 -L-






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david cooper

REVISIONS



**PERMIT DRAWING
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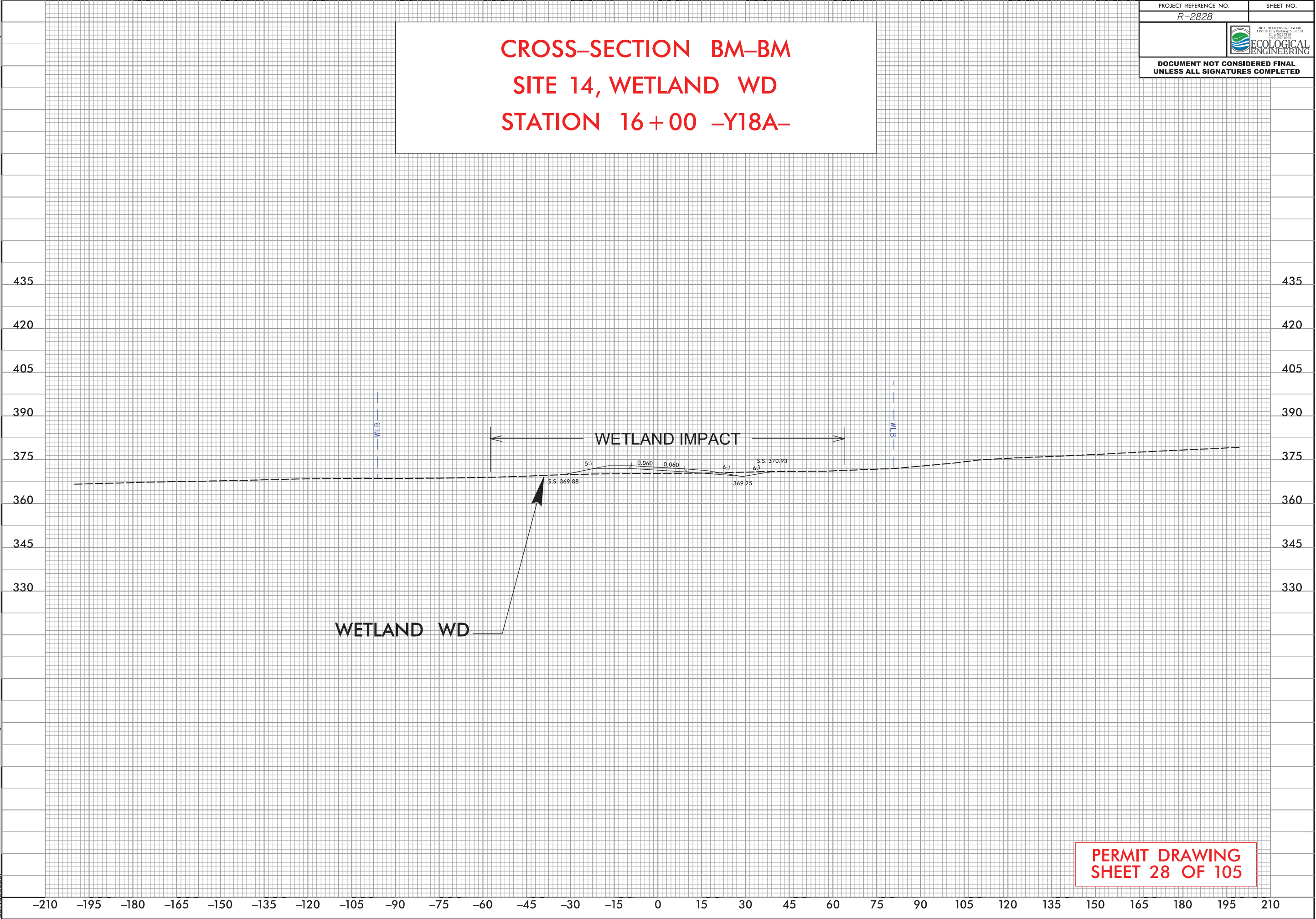
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R-2828	
	
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5/14/99

REVISIONS

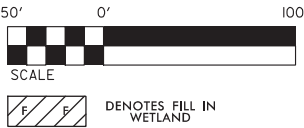
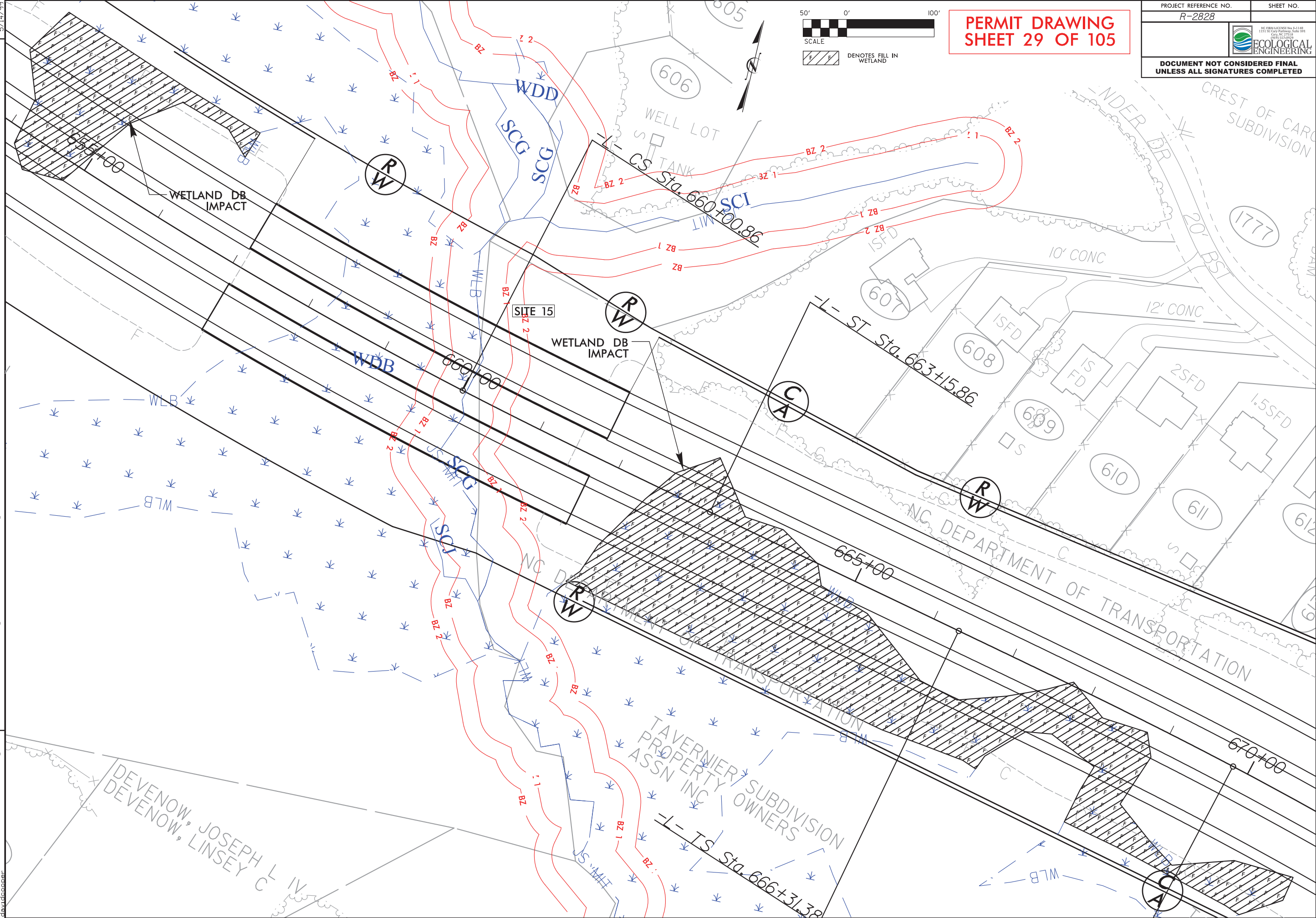
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davidcopper

CROSS-SECTION BM-BM
SITE 14, WETLAND WD
STATION 16+00 -Y18A-



5/14/99
93642.dwg
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davidcooper

REVISIONS



PERMIT DRAWING
SHEET 29 OF 105

PROJECT REFERENCE NO. R-2828	SHEET NO.
 ECOLOGICAL ENGINEERING NC PERMIT LICENSE No. P-1148 1151 3rd Corp Parkway, Suite 101 Cary, NC 27513 (919) 555-2828	
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50' 0' 100'

SCALE

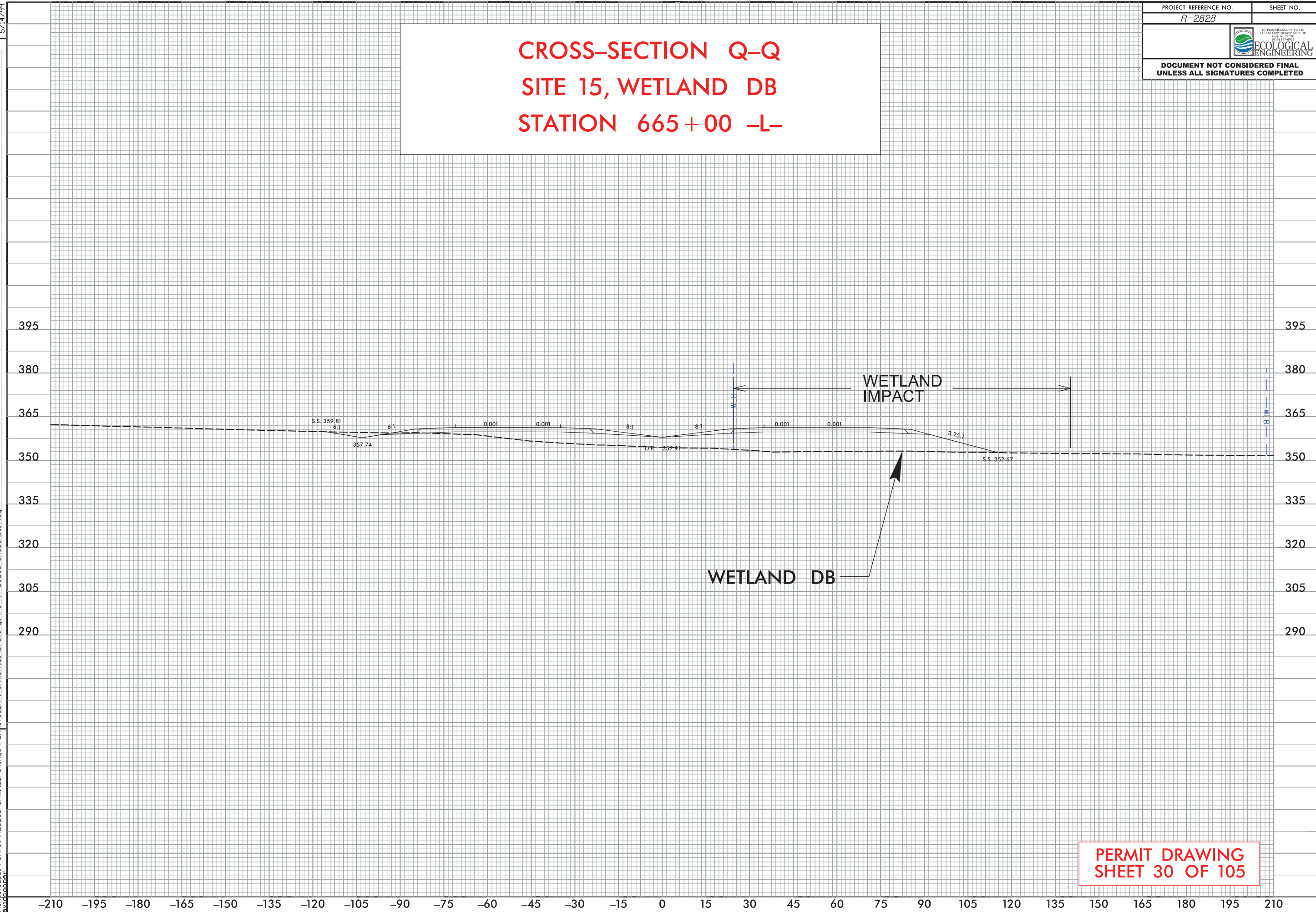
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DENOTES FILL IN WETLAND



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davidcooper

CROSS-SECTION Q-Q
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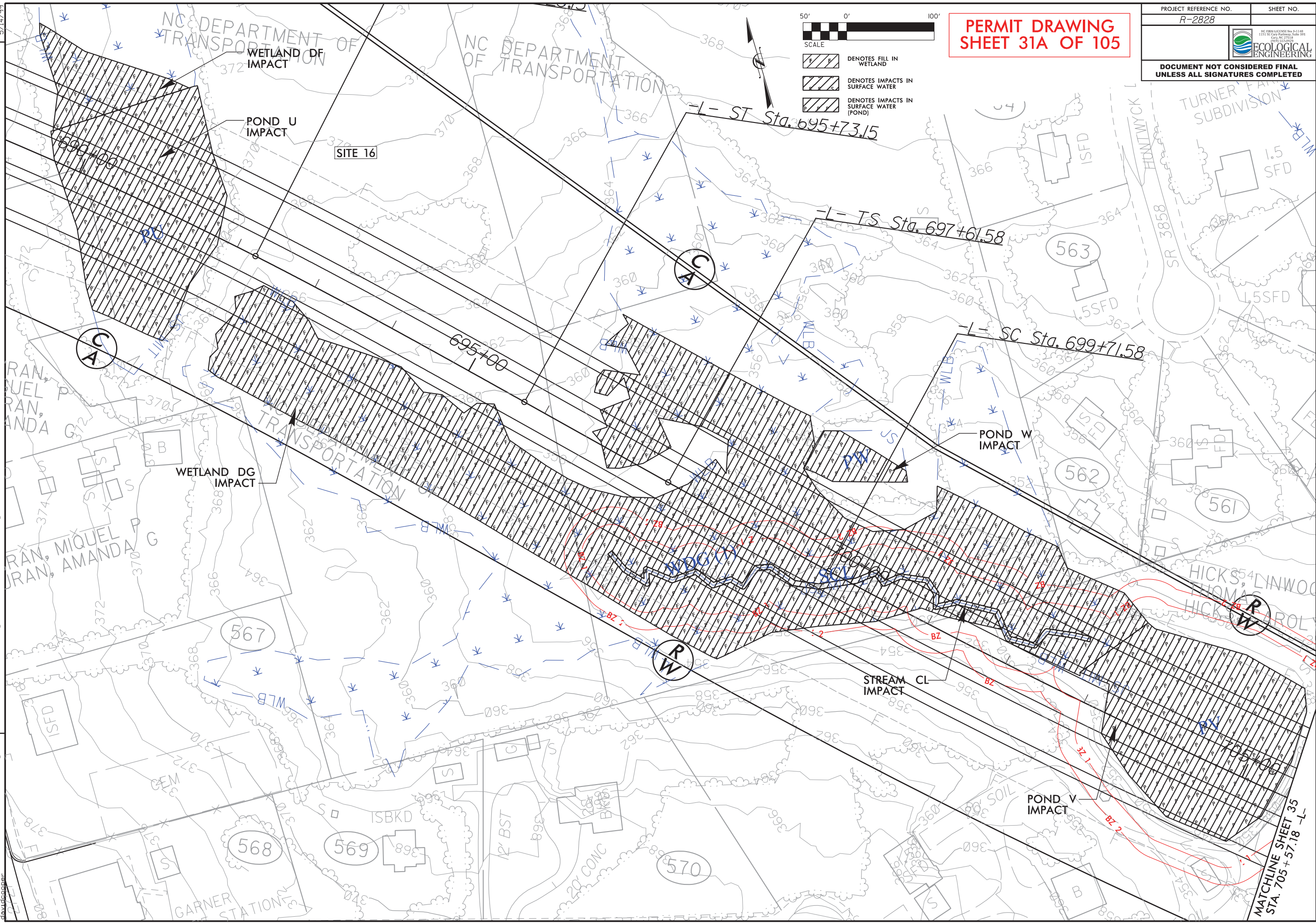
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SHEET 30 OF 105

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David Cooper

5/14/99
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davidcooper

REVISIONS



50' 0' 100'

SCALE

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

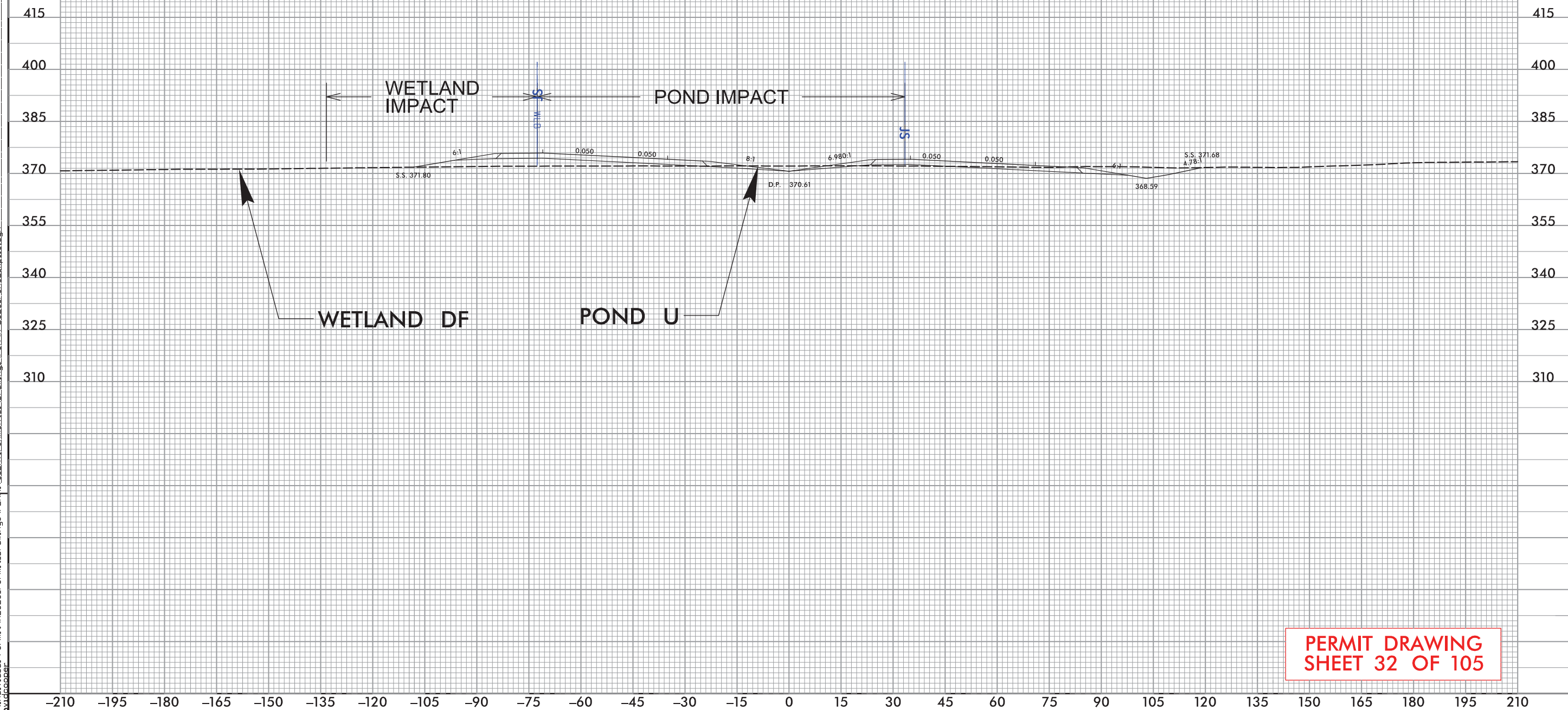
DENOTES IMPACTS IN SURFACE WATER (POND)

**PERMIT DRAWING
SHEET 31A OF 105**

PROJECT REFERENCE NO. R-2828	SHEET NO.
 ECOLOGICAL ENGINEERING	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

MATCHLINE SHEET 35
STA. 705+57.18 -L-

CROSS-SECTION R-R
SITE 16, WETLAND DF & POND U
STATION 690+00 -L-



PERMIT DRAWING
SHEET 32 OF 105

REVISIONS

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David Cooper

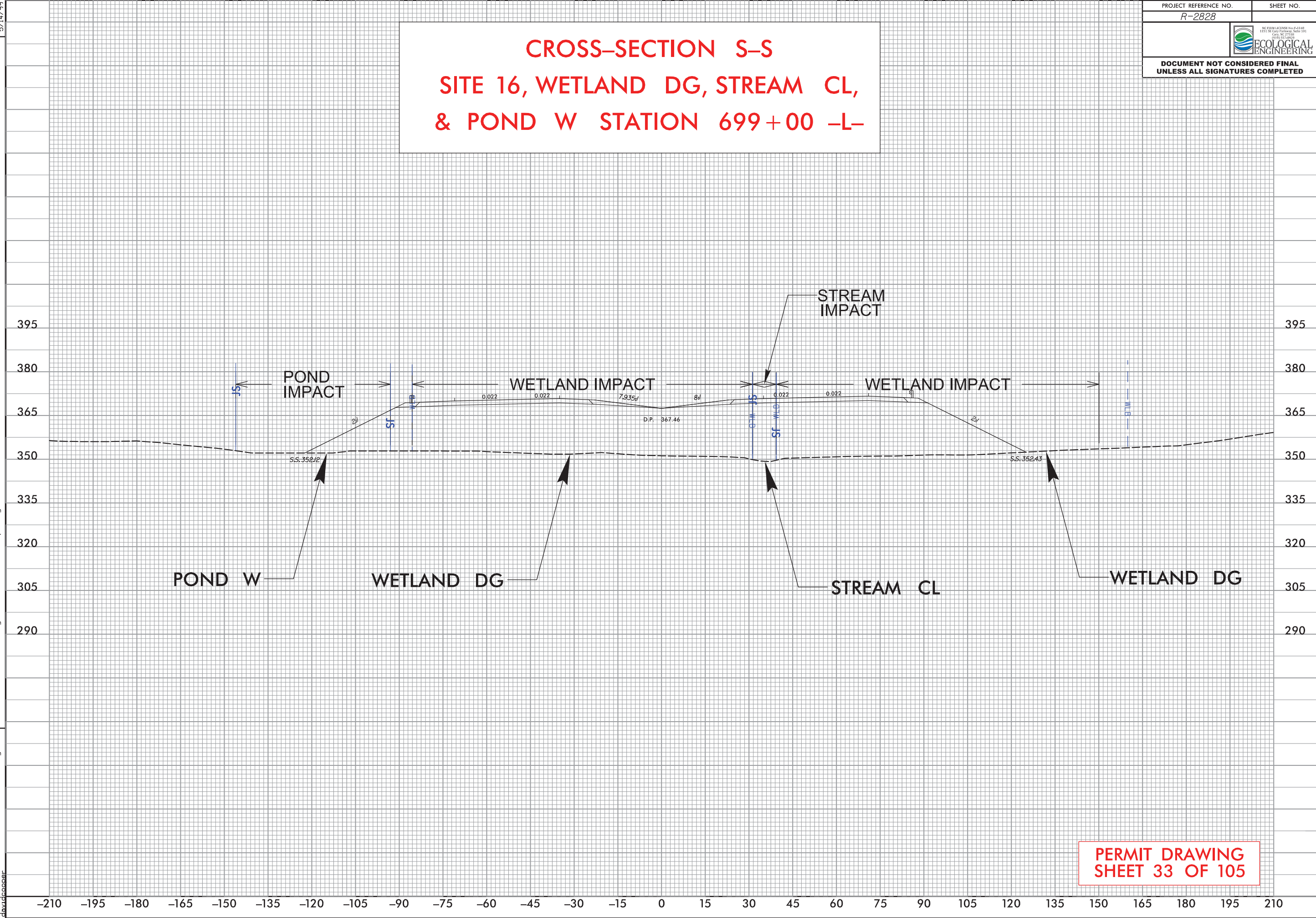
5/14/99

REVISIONS

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david cooper

CROSS-SECTION S-S
SITE 16, WETLAND DG, STREAM CL,
& POND W STATION 699+00 -L-

PROJECT REFERENCE NO.	SHEET NO.
R-2828	
 ECOLOGICAL ENGINEERING MC FIRM LICENSE No. F-1148 1151 38 Corp Parkway, Suite 101 Cape MC 27518 (919) 555-9979	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



PERMIT DRAWING
SHEET 33 OF 105

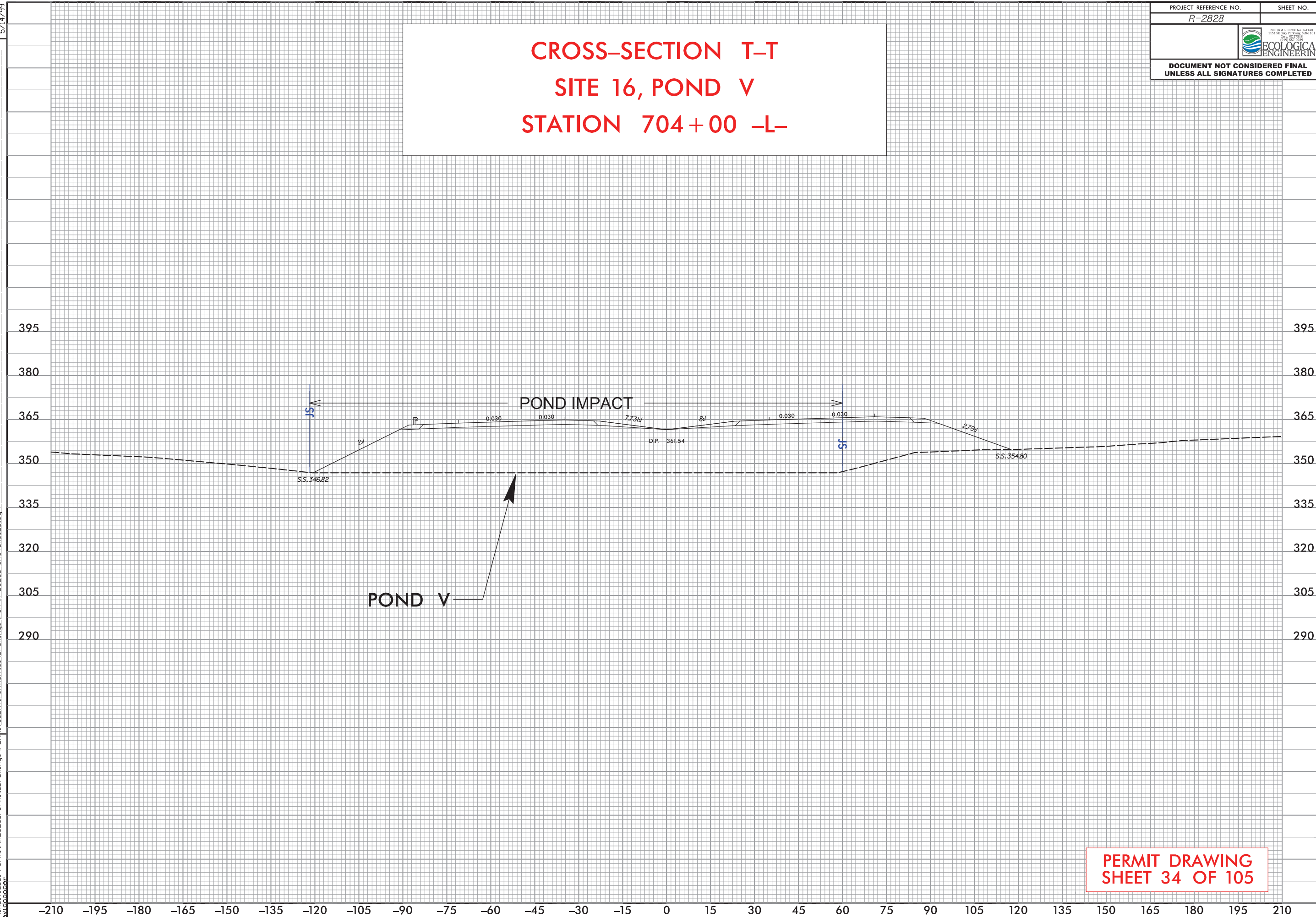
SHEET NO.

STREET NO. _____



**ERED FINAL
COMPLETED**

CROSS-SECTION T-T
SITE 16, POND V
STATION 704+00 -L-



PERMIT DRAWING
SHEET 34 OF 105

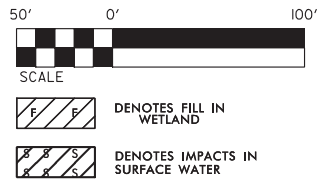
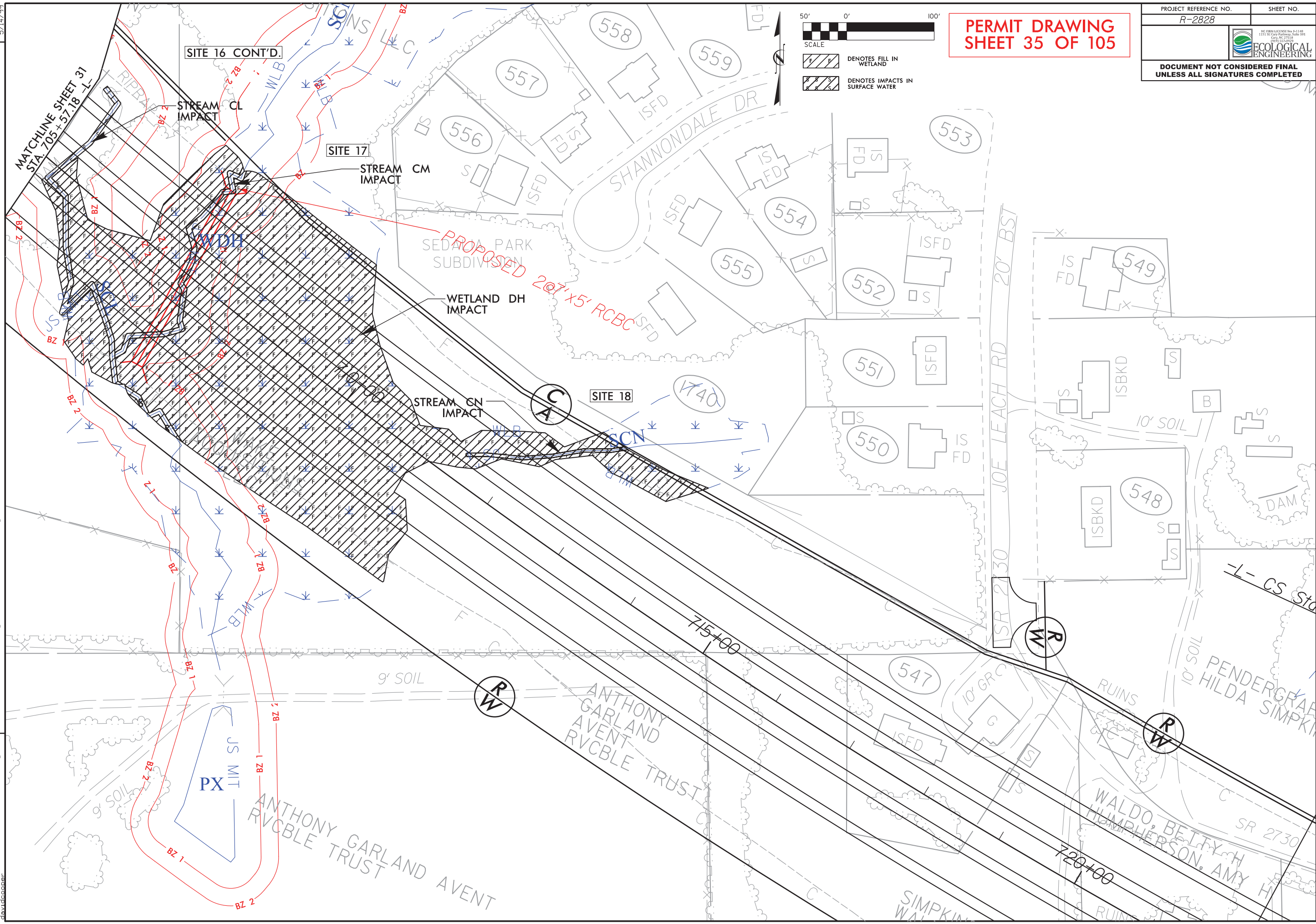
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REVISIONS

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davidcooper

REVISIONS



**PERMIT DRAWING
SHEET 35 OF 105**

PROJECT REFERENCE NO. R-2828	SHEET NO.
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

PERMIT DRAWING
SHEET 35A OF 105



DENOTES FILL IN
WETLAND

DENOTES IMPACTS IN
SURFACE WATER

REVISIONS

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david cooper

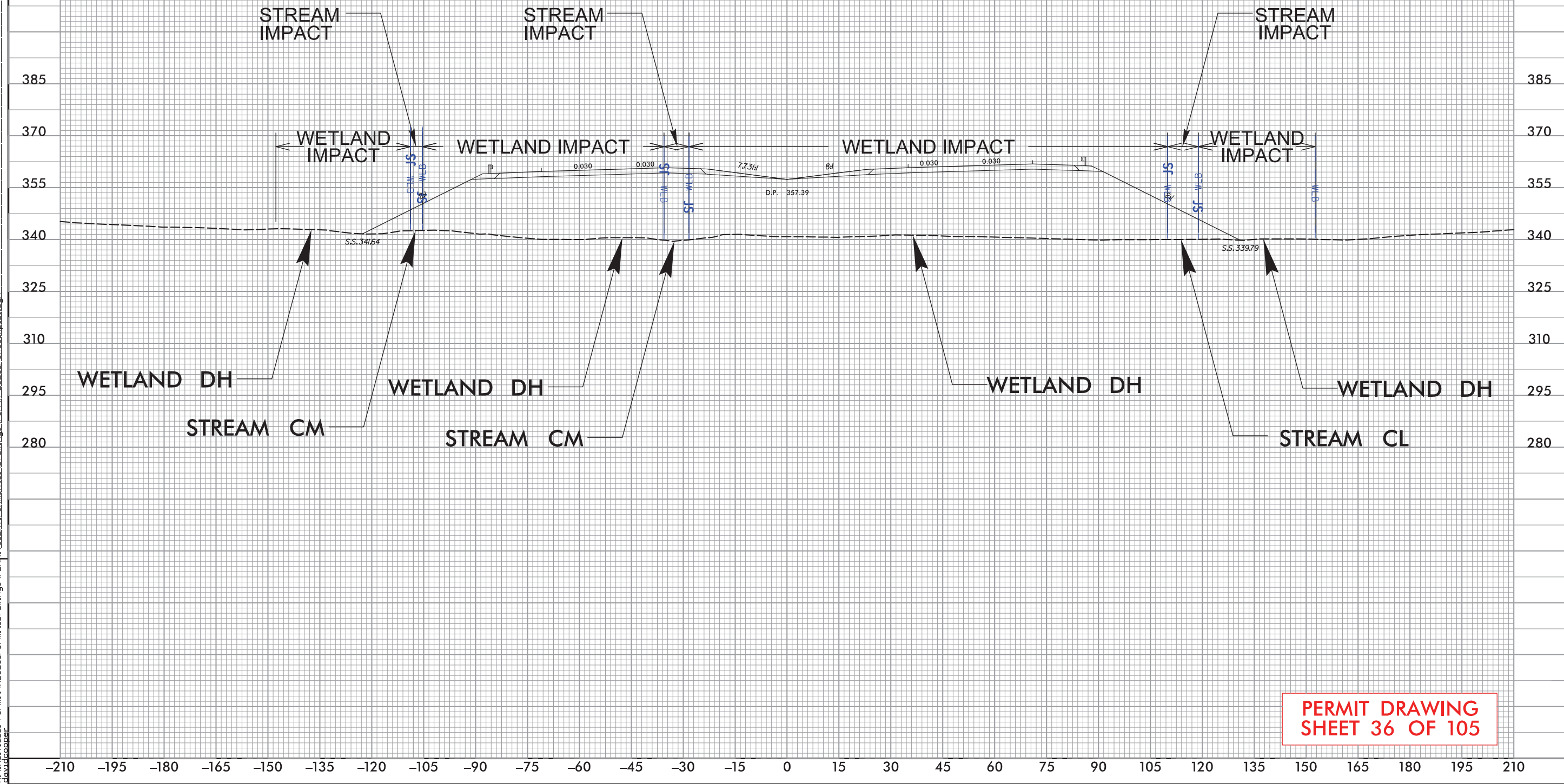
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REVISIONS

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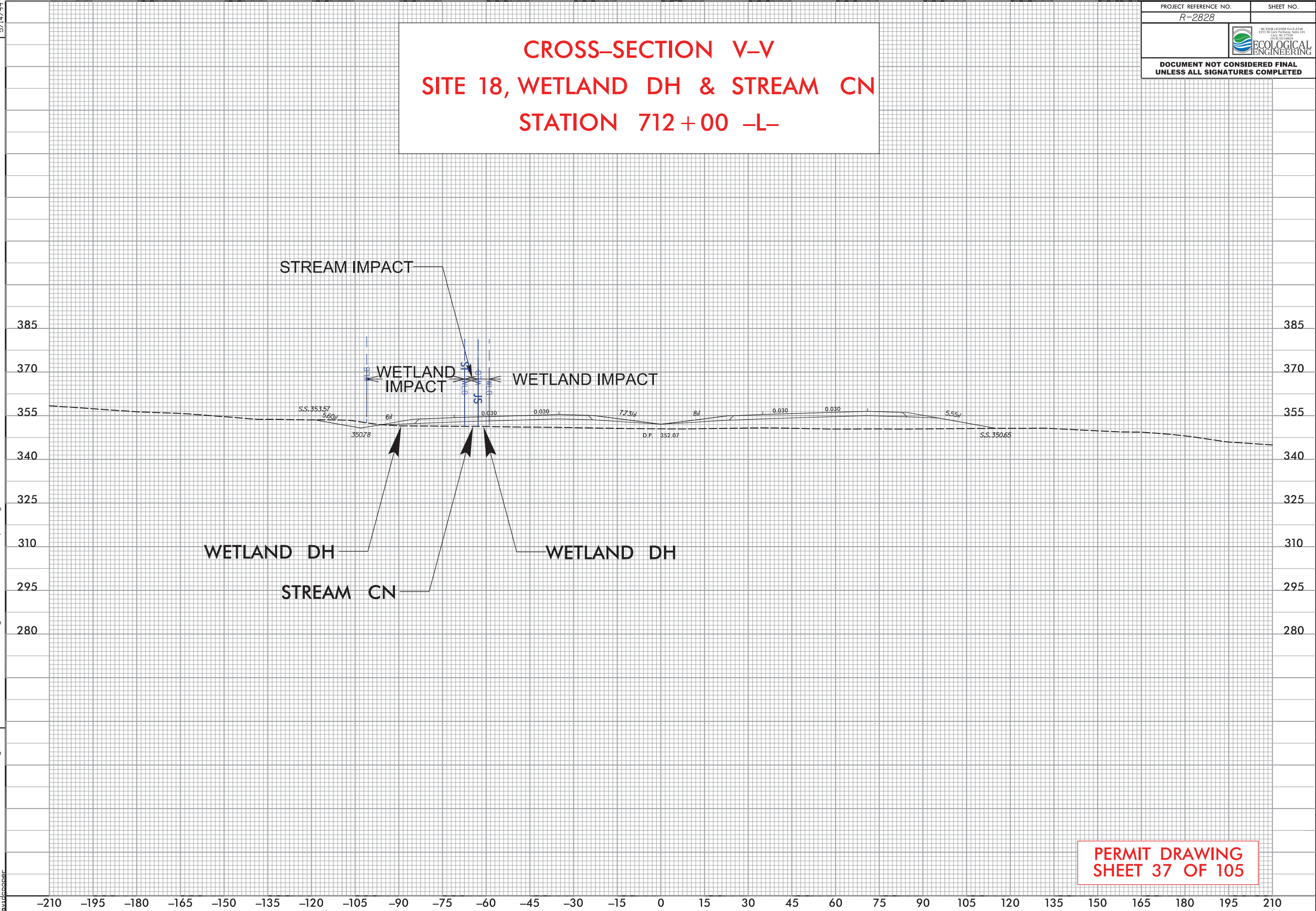
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WETLAND DH, STREAM CL,
& STREAM CM STATION 707+50 -L-

PROJECT REFERENCE NO.	SHEET NO.
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 ECOLOGICAL ENGINEERING NC FIRM LICENSE No. F-1148 1151 38 Carr Parkway, Suite 101 Cape Fear, NC 27416 (919) 555-9977	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



PERMIT DRAWING
SHEET 36 OF 105

CROSS-SECTION V-V
SITE 18, WETLAND DH & STREAM CN
STATION 712 + 00 -L-

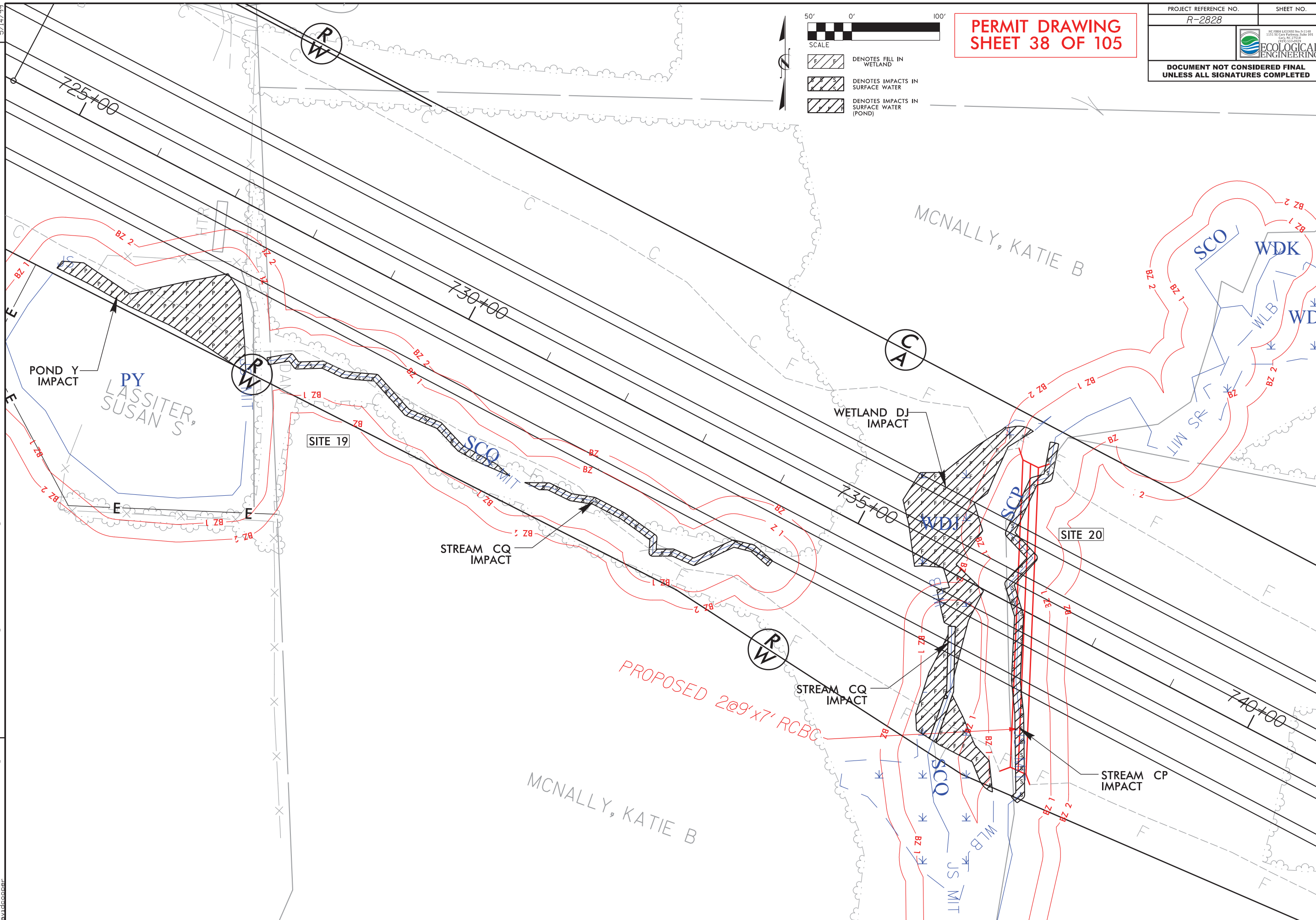
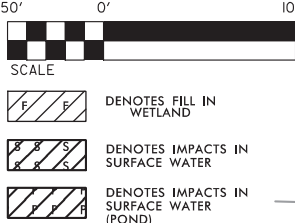


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SHEET 37 OF 105

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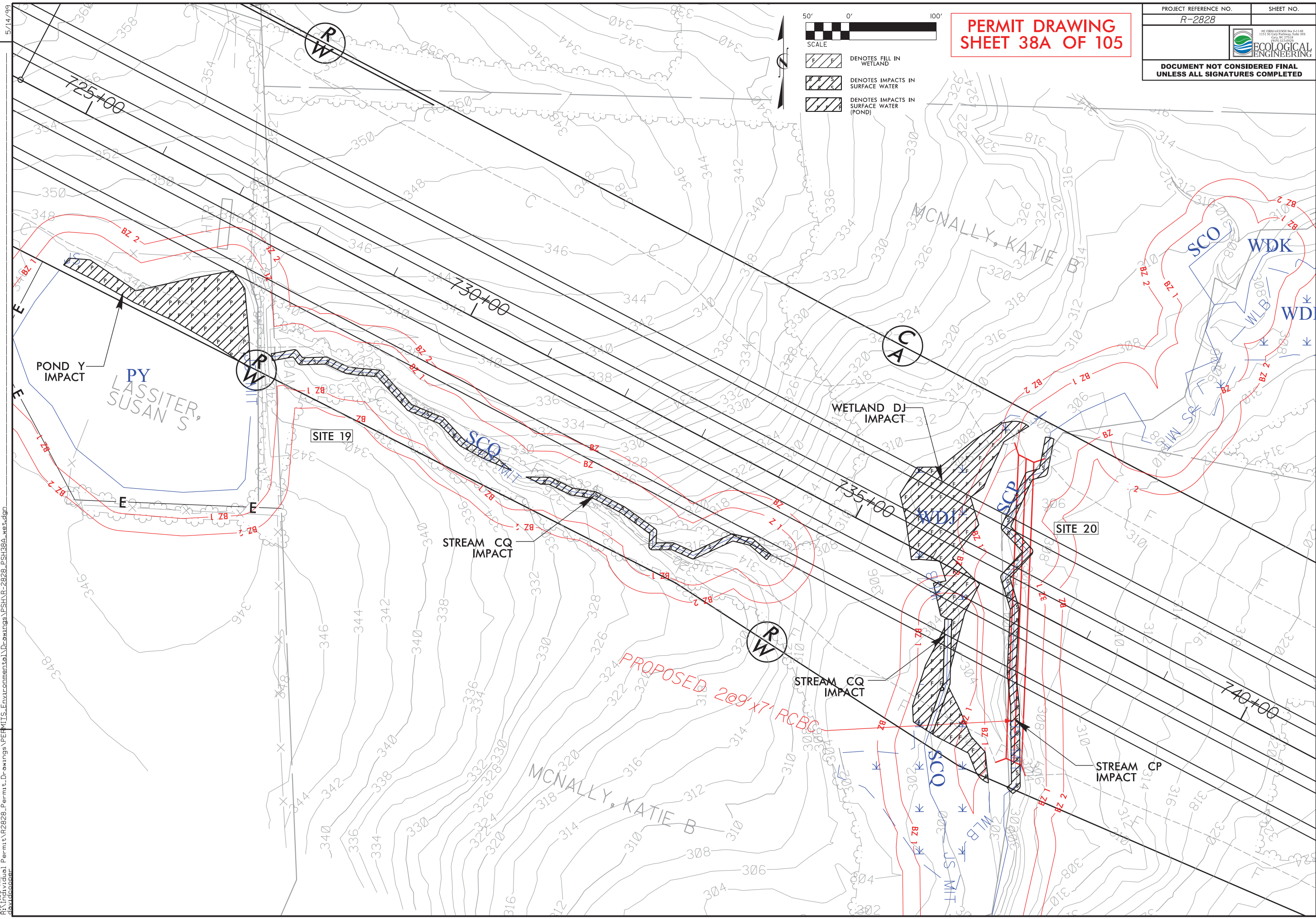
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PERMIT DRAWING
SHEET 38 OF 105



9/7/23 AM
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davidcooper

REVISIONS



50' 0' 100'


SCALE

Denotes Fill in Wetland

Denotes Impacts in Surface Water

Denotes Impacts in Surface Water (Pond)

PERMIT DRAWING
SHEET 38A OF 105

PROJECT REFERENCE NO. R-2828	SHEET NO.
 ECOLOGICAL ENGINEERING	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

CROSS-SECTION W-W
SITE 19, POND Y
STATION 727+00 -L-



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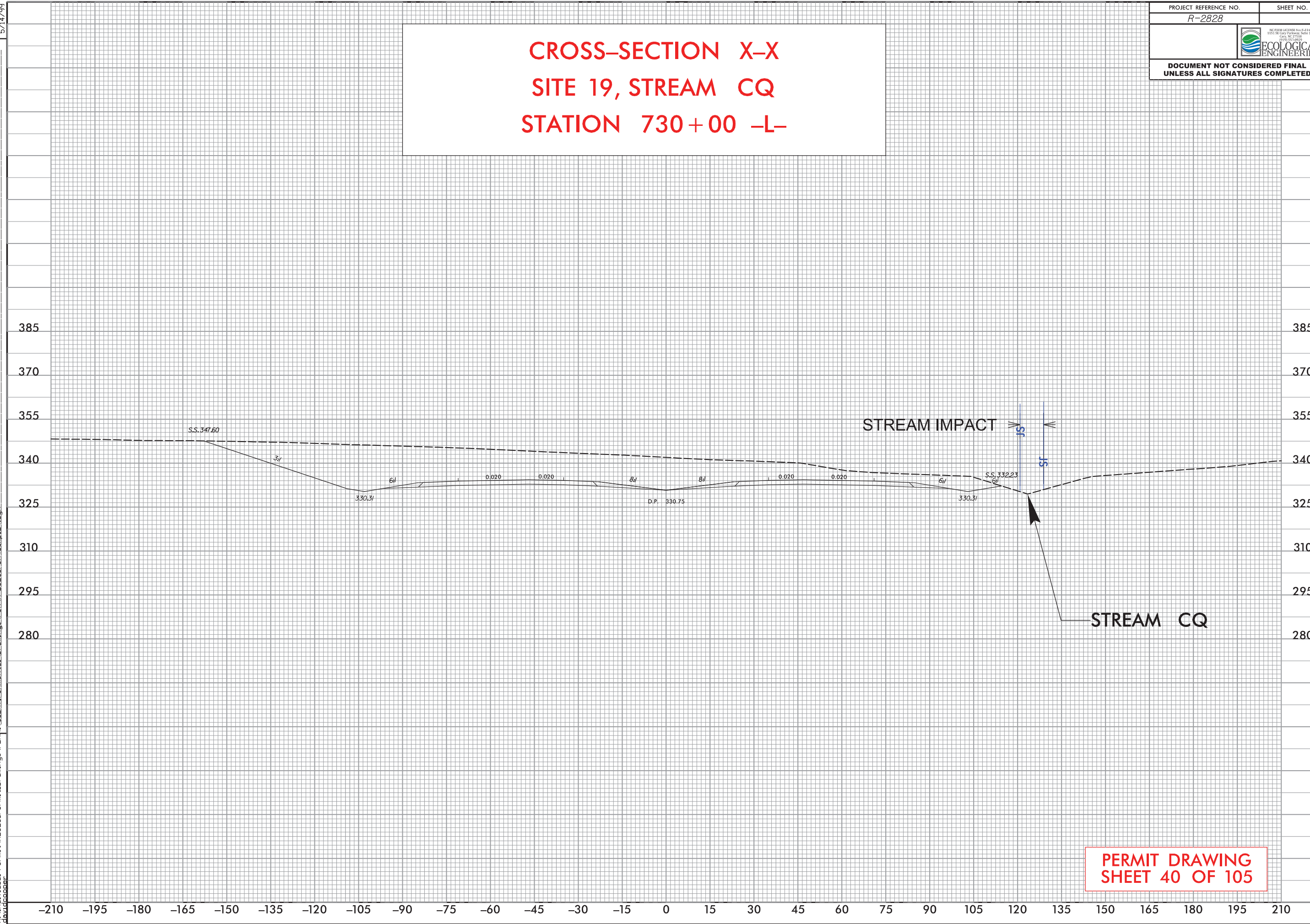
SHEET NO.

STREET NO. _____



**ERED FINAL
COMPLETED**

CROSS-SECTION X-X
SITE 19, STREAM CQ
STATION 730+00 -L-



PERMIT DRAWING
SHEET 40 OF 105

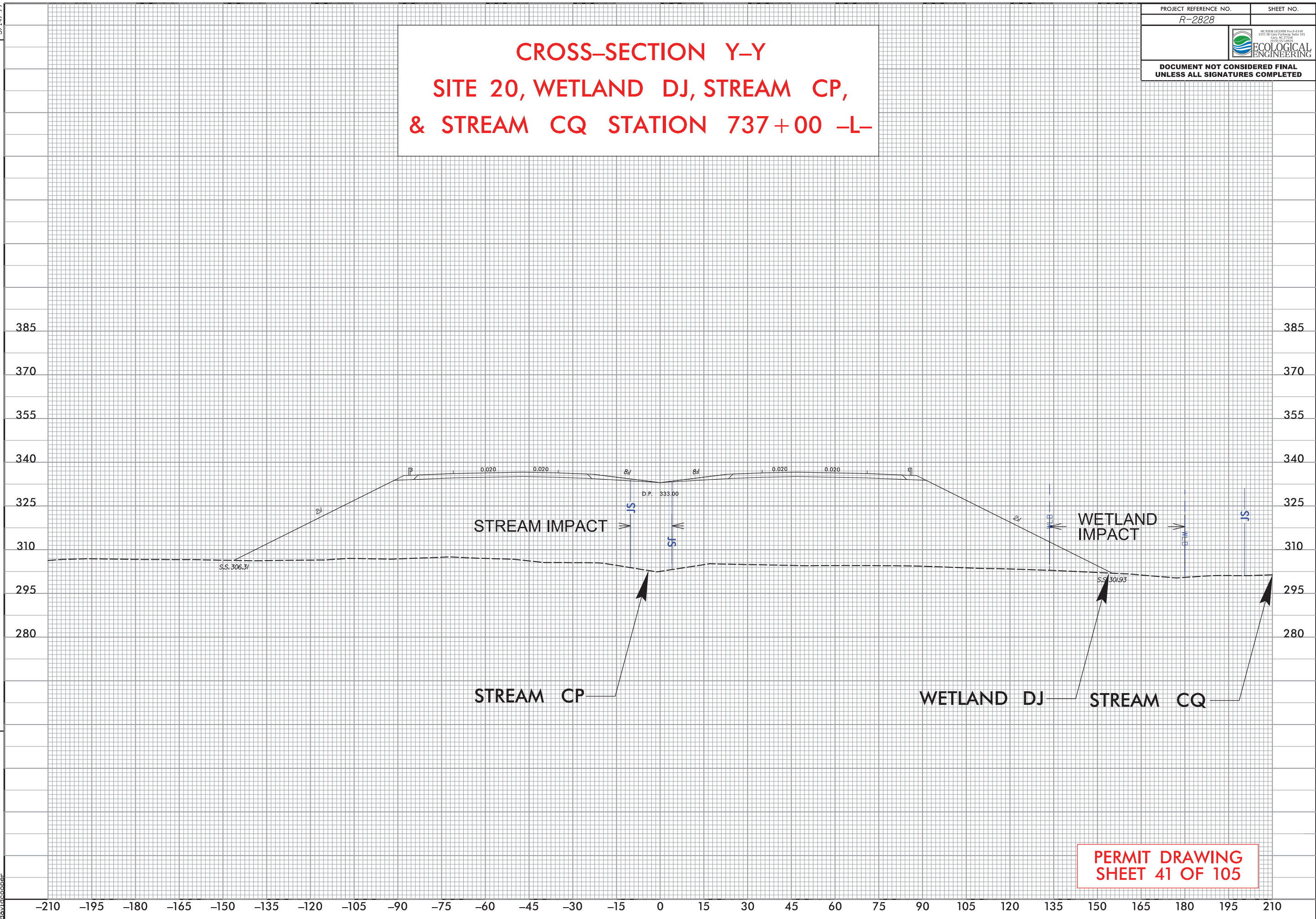
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5/14/99

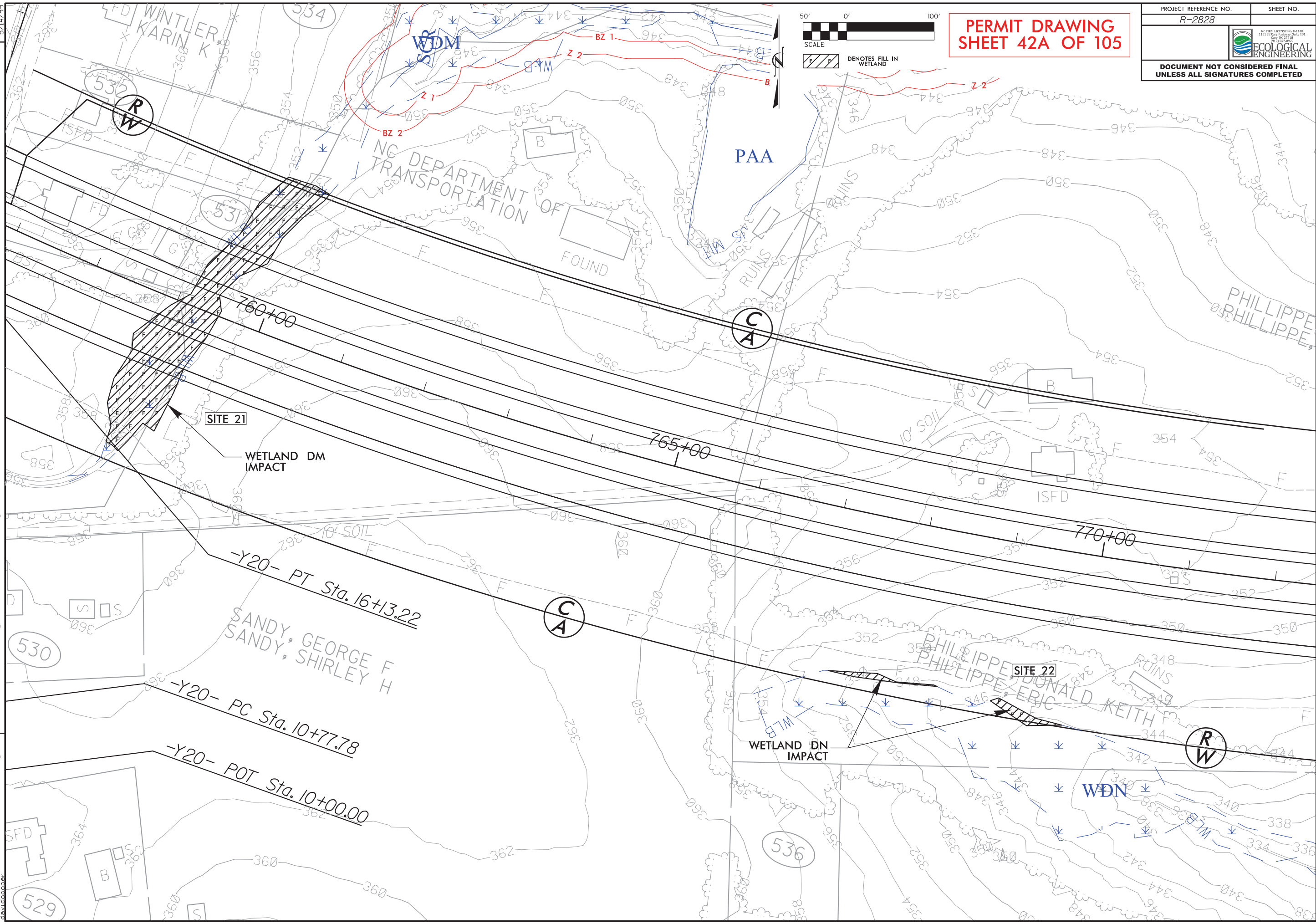
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david cooper

CROSS-SECTION Y-Y
SITE 20, WETLAND DJ, STREAM CP,
& STREAM CQ STATION 737+00 -L-



5/14/99
REVISIONS
9/30/03 AM
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david cooper



CROSS-SECTION Z-Z
SITE 21, WETLAND DM
STATION 759+00 -L-



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SITE 22, WETLAND DN
STATION 768+00 -L-




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SHEET 44 OF 105


[illegible]



50' 0' 100'

SCALE

 DENOTES FILL IN WETLAND

 DENOTES IMPACTS IN SURFACE WATER



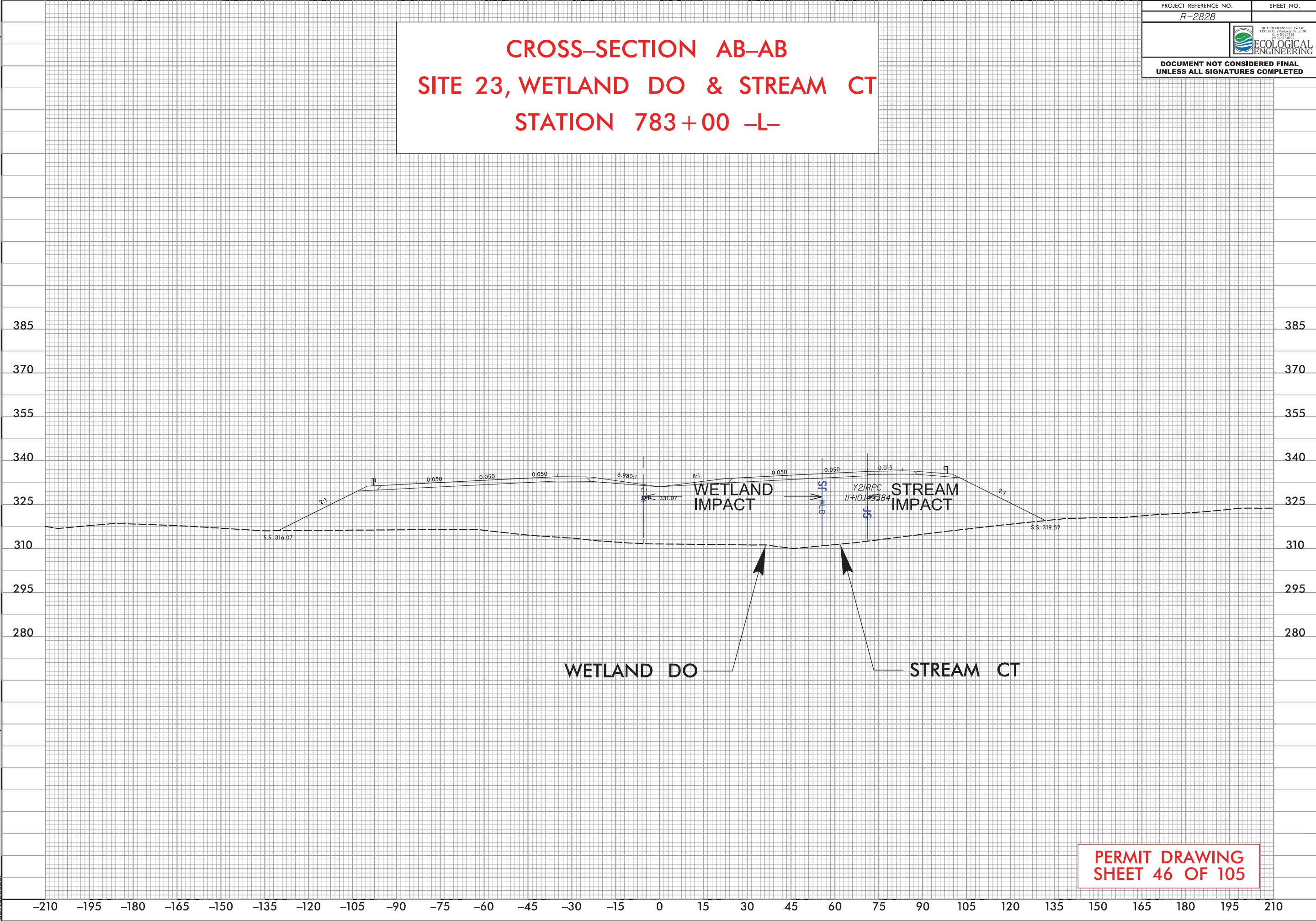
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REVISIONS

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David Cooper

CROSS-SECTION AB-AB
SITE 23, WETLAND DO & STREAM CT
STATION 783+00 -L-

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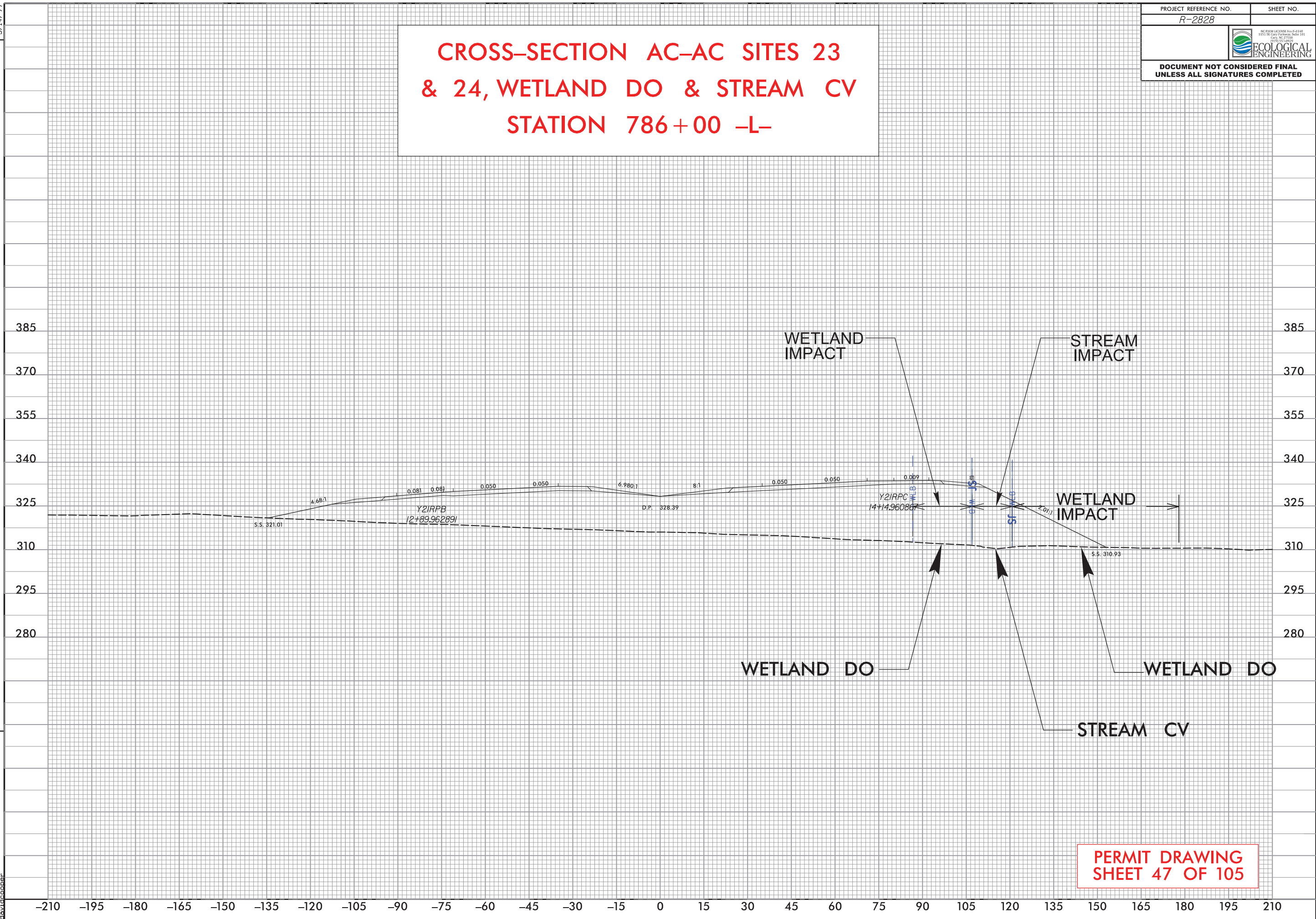


PERMIT DRAWING
SHEET 46 OF 105

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davidcopper

REVISIONS

CROSS-SECTION AC-AC SITES 23
& 24, WETLAND DO & STREAM CV
STATION 786+00 -L-




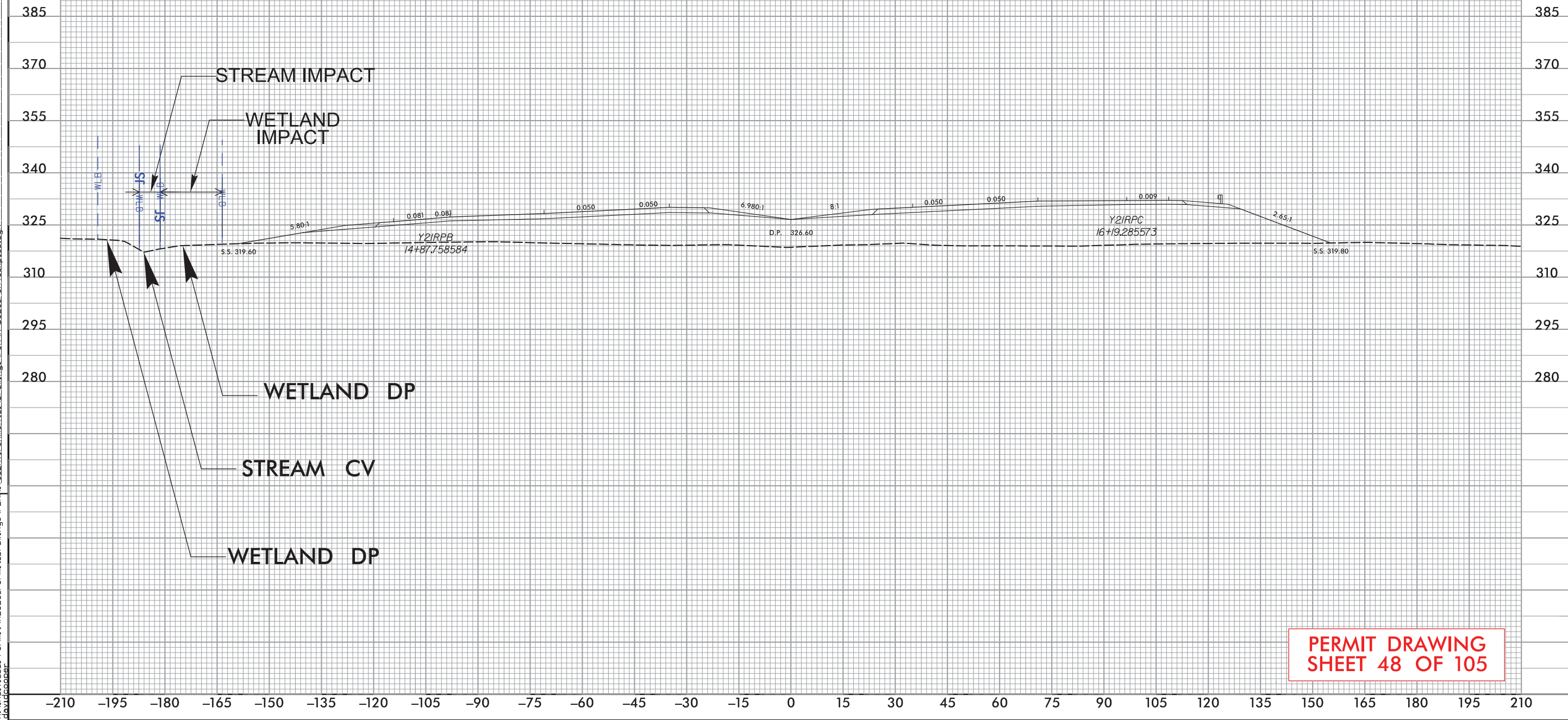
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REVISIONS

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David Cooper


CROSS-SECTION AD-AD
SITE 24, WETLAND DP & STREAM CV
STATION 788+00 -L-


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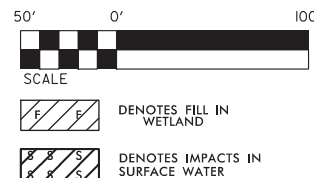


50' 0' 100'

SCALE

 DENOTES FILL IN WETLAND

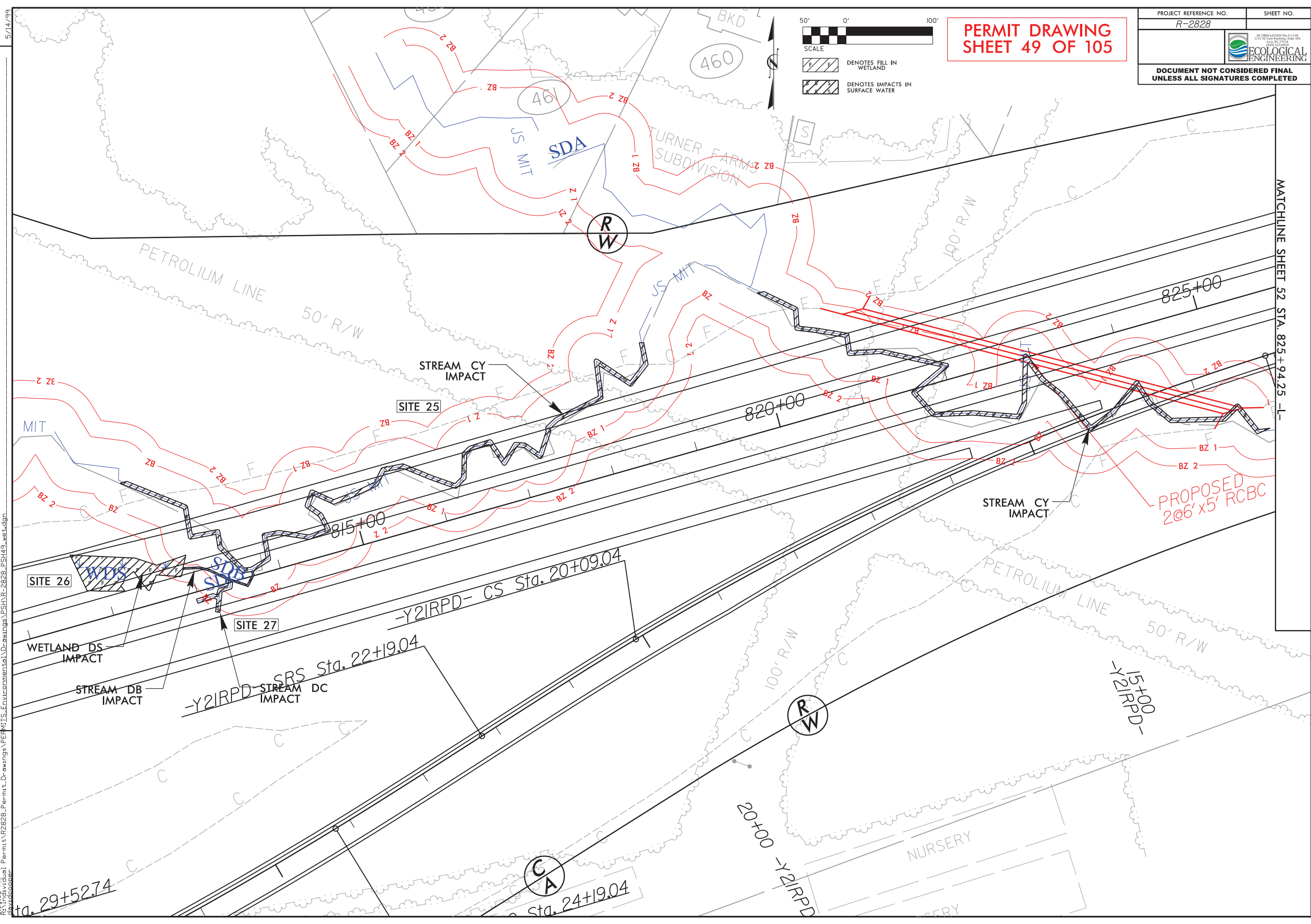
 DENOTES IMPACTS IN SURFACE WATER



MA1CHINE SHEET 32 31A. 823 + 74.23 =E

REVISIONS

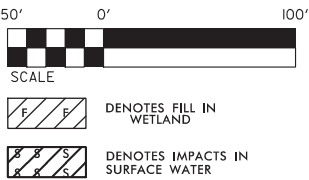
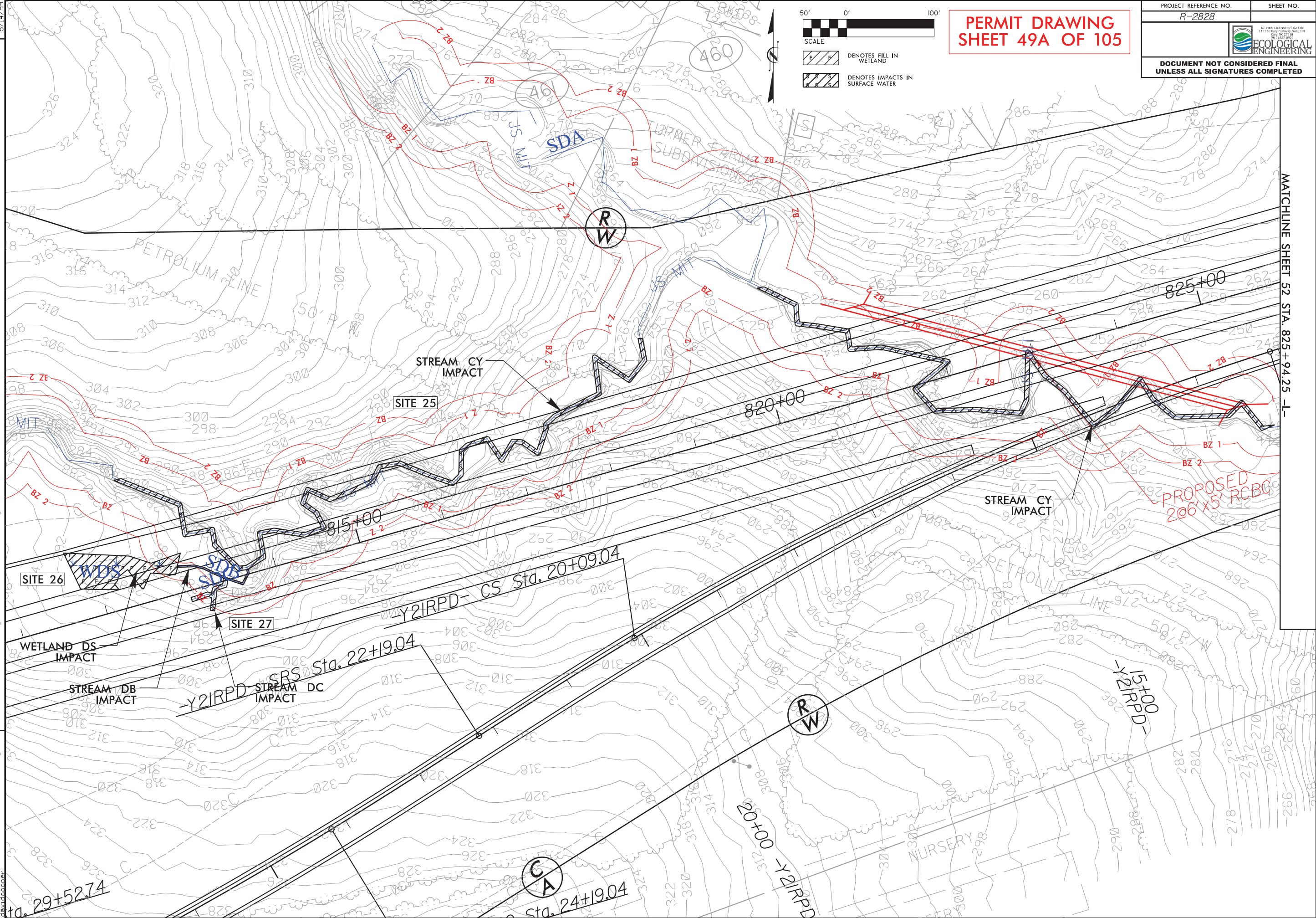
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 dayidcooper




5/14/99

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David Cooper

REVISIONS



PERMIT DRAWING
SHEET 49A OF 105

PROJECT REFERENCE NO.	SHEET NO.
R-2828	
	
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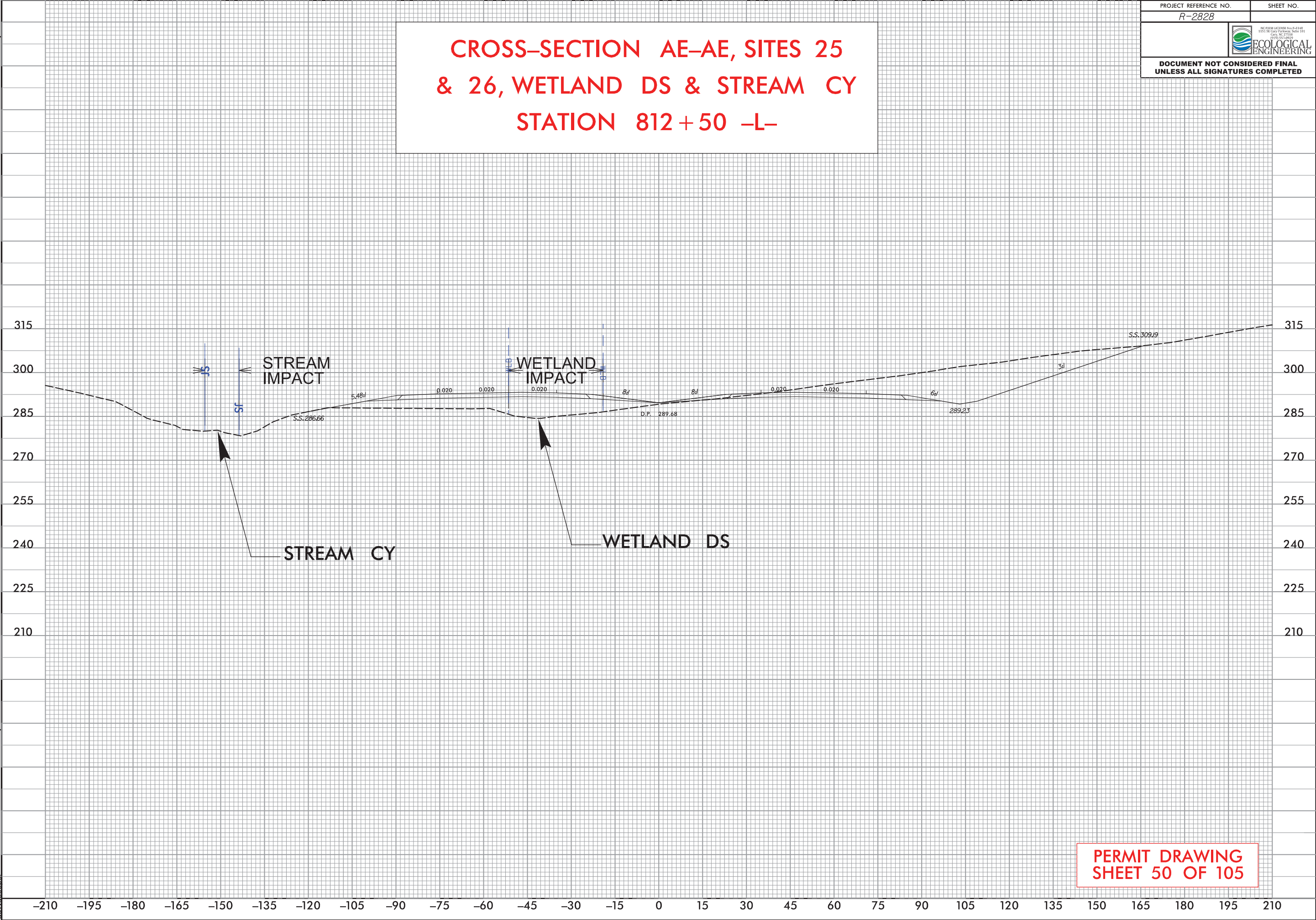
MATCHLINE SHEET 52 STA. 825+94.25 -L-

5/14/99

REVISIONS

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david cooper

CROSS-SECTION AE-AE, SITES 25
& 26, WETLAND DS & STREAM CY
STATION 812 + 50 -L-



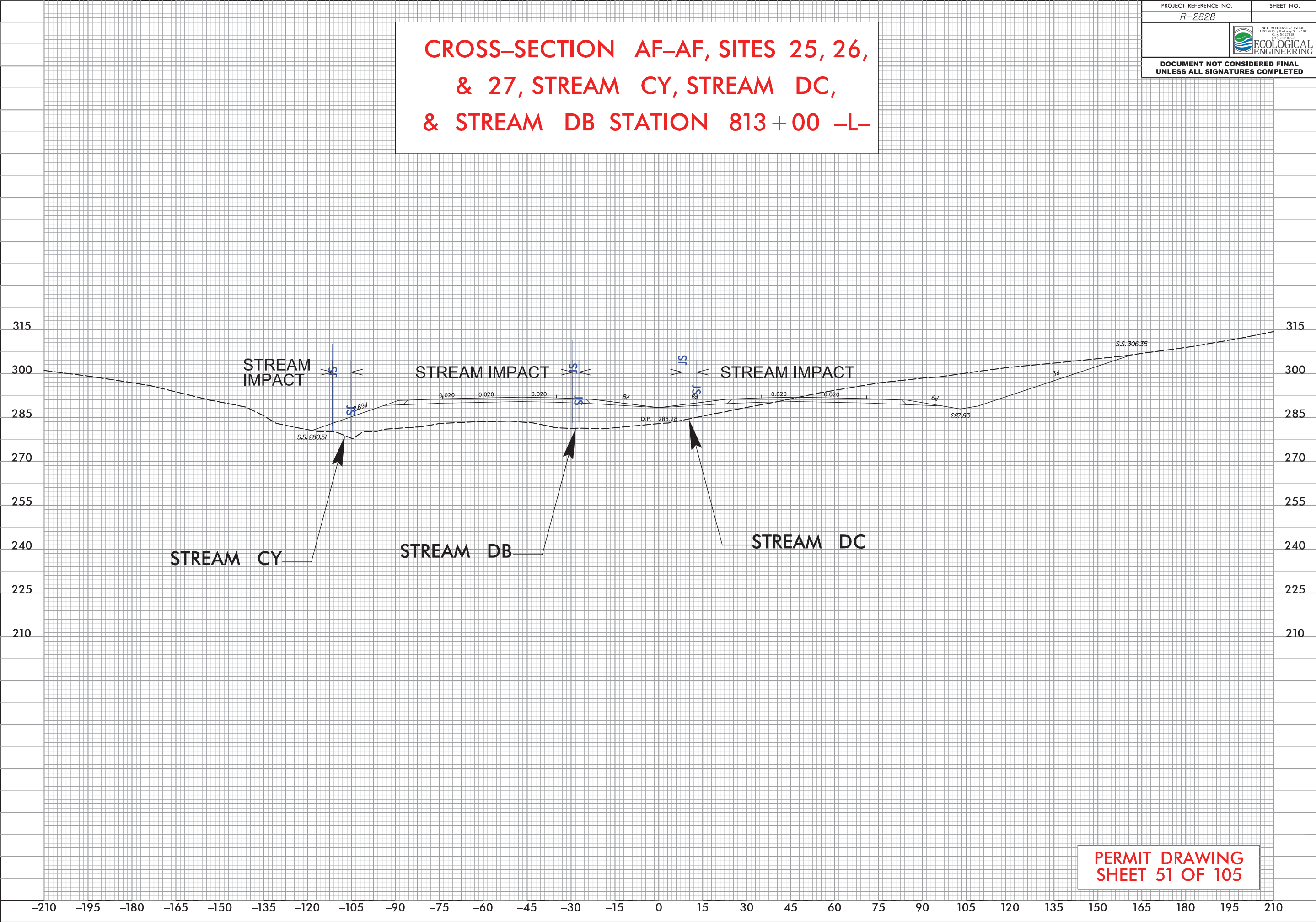
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davidson

REVISIONS

CROSS-SECTION AF-AF, SITES 25, 26,
& 27, STREAM CY, STREAM DC,
& STREAM DB STATION 813+00 -L-


PROJECT REFERENCE NO.	SHEET NO.
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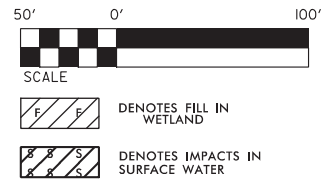
PERMIT DRAWING
SHEET 51 OF 105

50' 0' 100'

SCALE

 DENOTES FILL IN WETLAND

 DENOTES SURFACE IMPACTS IN WATER



 DENOTES FILL IN WETLAND

 DENOTES IMPACTS IN SURFACE WATER

MANDA
TEVE



MATCHLINE SHEET 49 STA. 825 + 94.25

~~STREAM CY-~~
IMPACT

SITE 25 CONT'D.

$$\frac{\text{Sta. } 8+27 + 71.30 =}{\text{Sta. } 10+00.00}$$

~~-Y2IRPD- SC Sta. 12+10.00~~

WETLAND
IMPACT

—STREAM CY
IMPACT

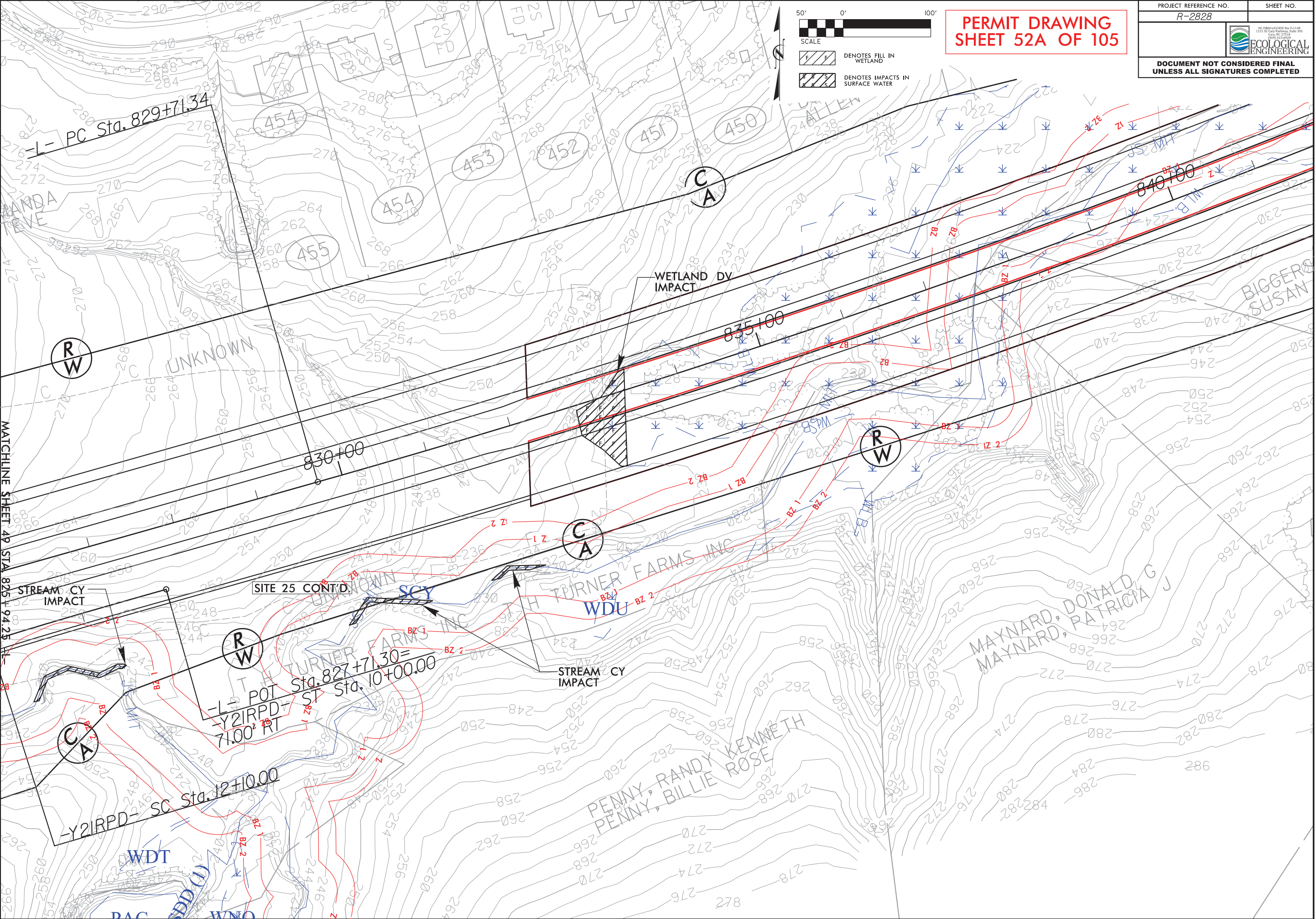
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MAYNARD, PATRICIA J

PENNY, RANDY KENNETH
PENNY, BILLIE ROSE

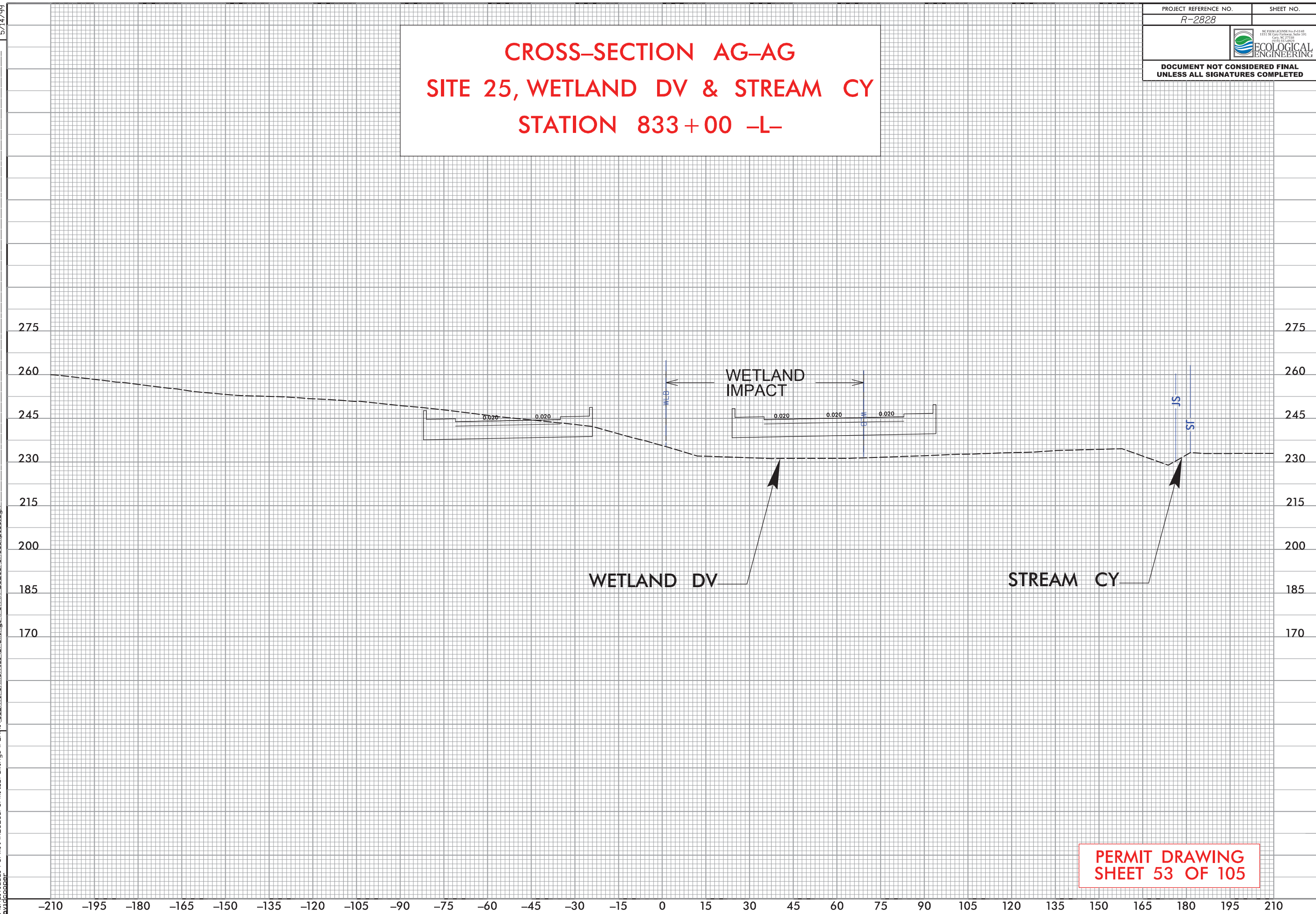
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david cooper

REVISIONS



CROSS-SECTION AG-AG
SITE 25, WETLAND DV & STREAM CY
STATION 833+00 -L-



PERMIT DRAWING
SHEET 53 OF 105

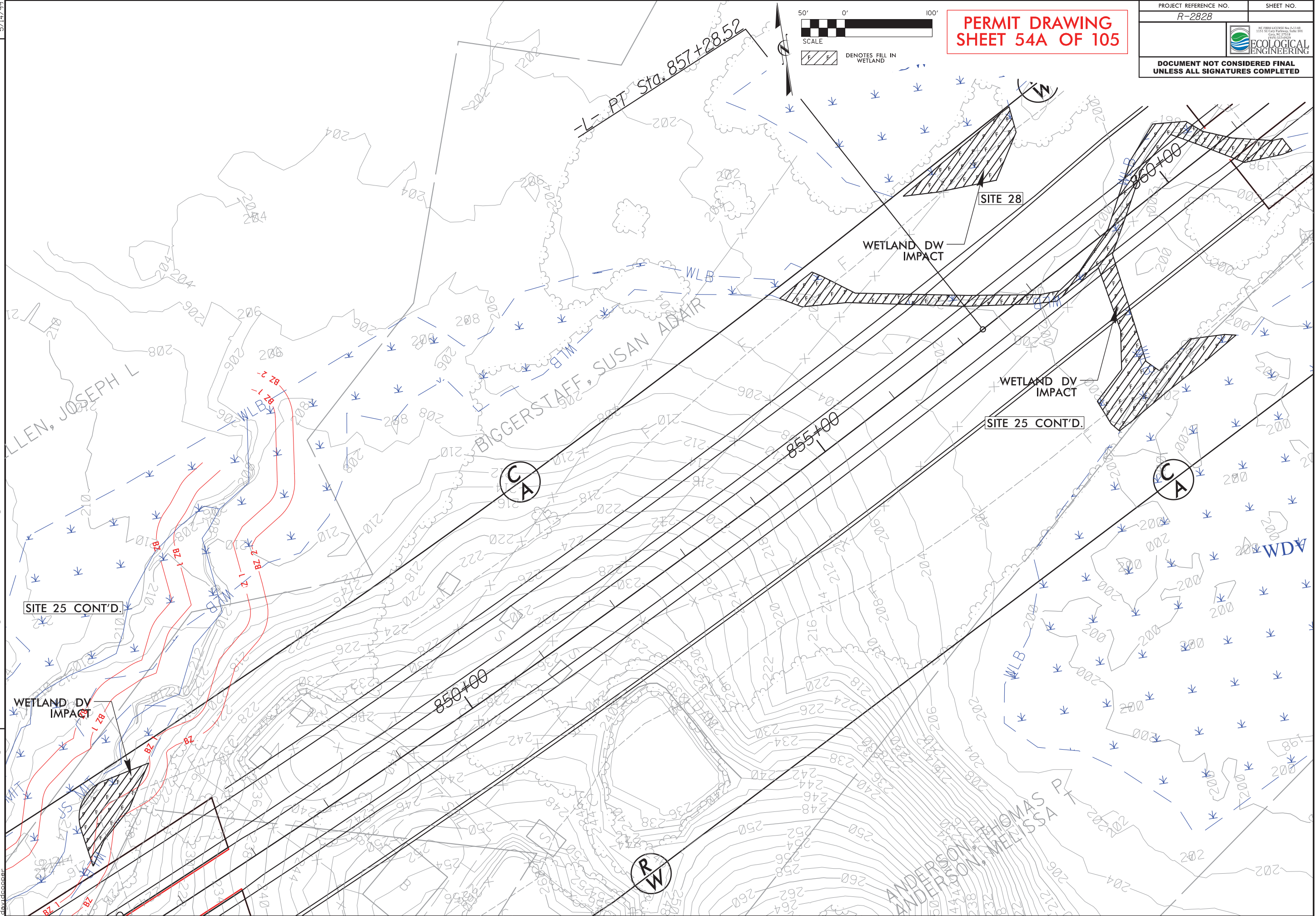
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David Cooper

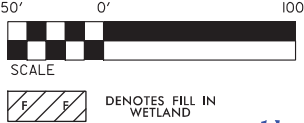
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REVISIONS

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davidcooper



**PERMIT DRAWING
SHEET 54A OF 105**



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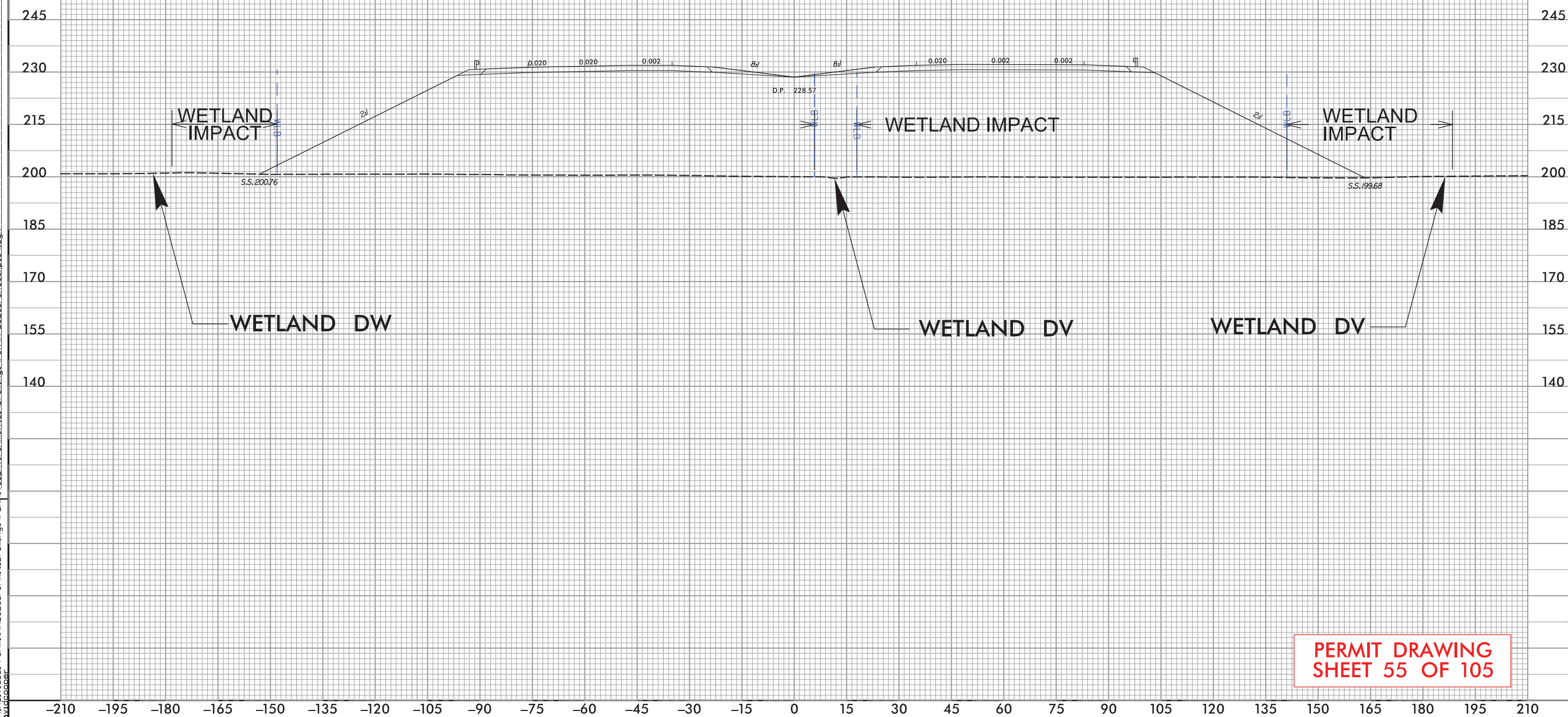
SHEET NO.

STREET NO. _____



**ERED FINAL
COMPLETED**

CROSS-SECTION AH-AH SITES 25
& 28, WETLAND DV & WETLAND DW
STATION 858+00 -L-



PERMIT DRAWING
SHEET 55 OF 105

E 114/00

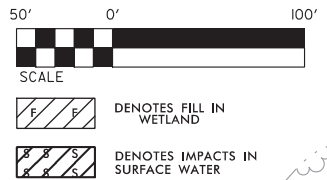
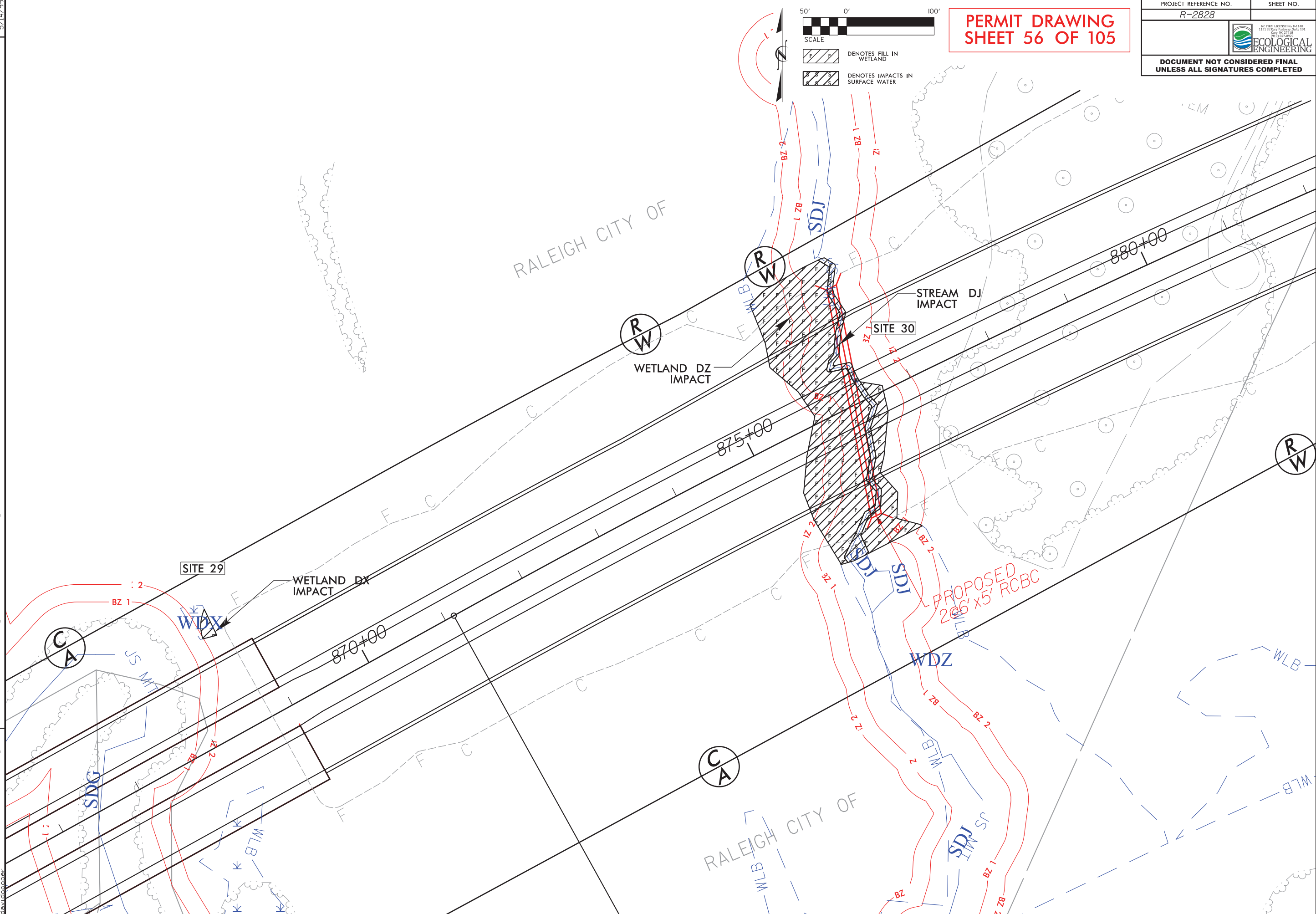
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REVISIONS

8/4/00 AM
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david cooper

REVISIONS

5/14/99



PERMIT DRAWING
SHEET 56 OF 105

PROJECT REFERENCE NO.	SHEET NO.
R-2828	
	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

PERMIT DRAWING
SHEET 56A OF 105



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davidcooper

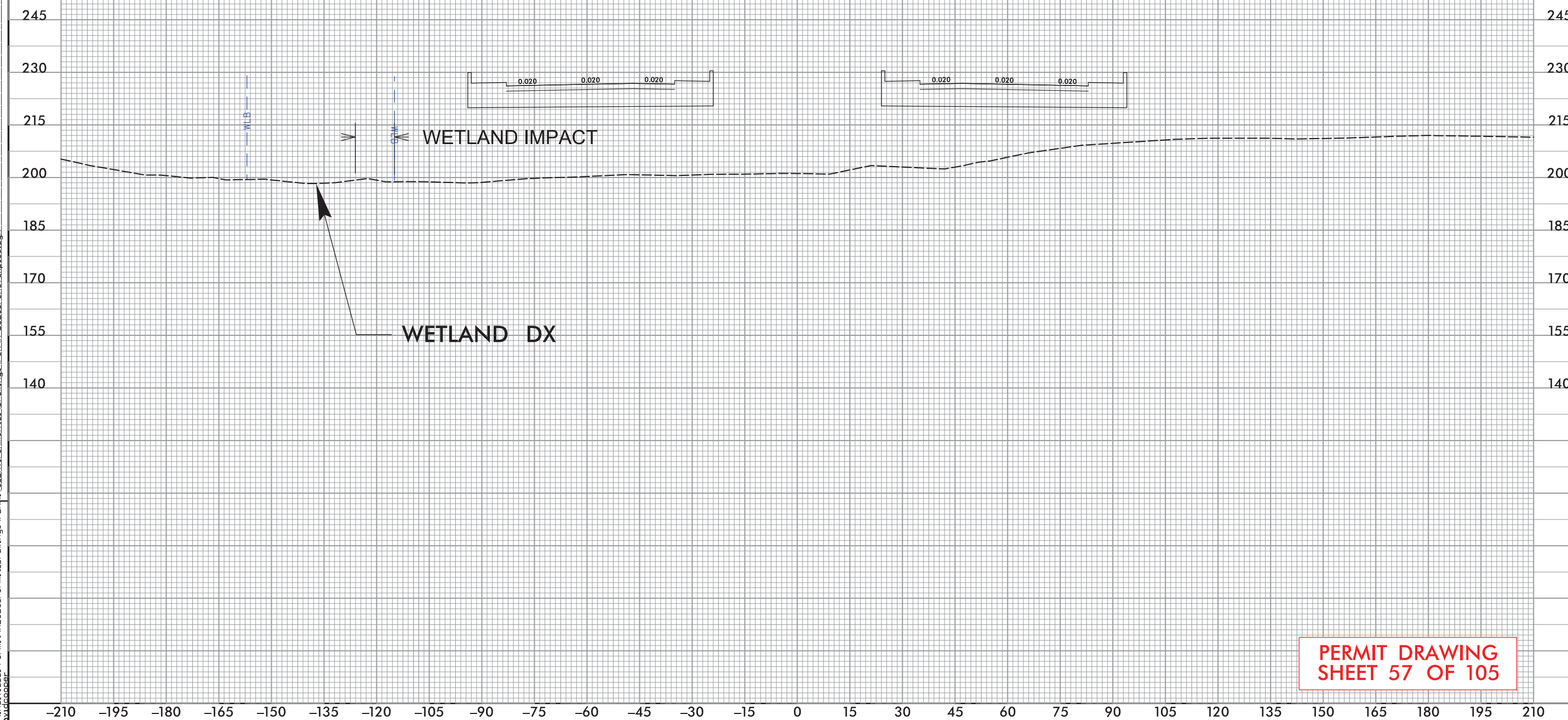
SHEET NO.

STREET NO. _____



**ERED FINAL
COMPLETED**

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SITE 29, WETLAND DX
STATION 868+50 -L-



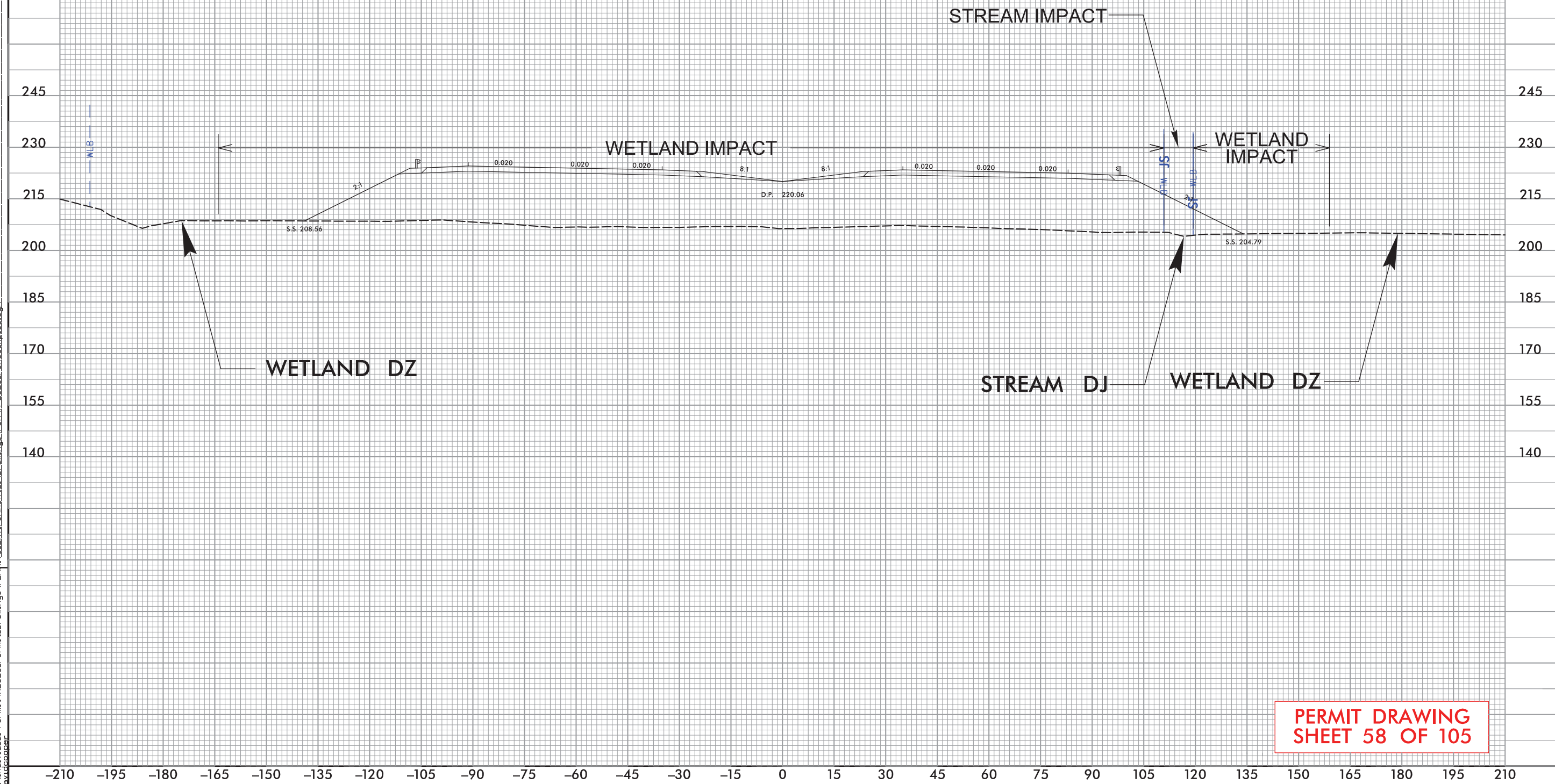
PERMIT DRAWING
SHEET 57 OF 105

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REVISIONS

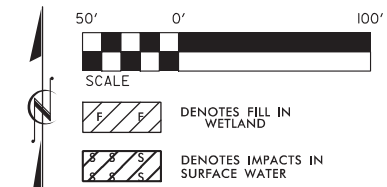
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SITE 30, WETLAND DZ & STREAM DJ
STATION 876+00 -L-



PERMIT DRAWING
SHEET 58 OF 105

REVISIONS

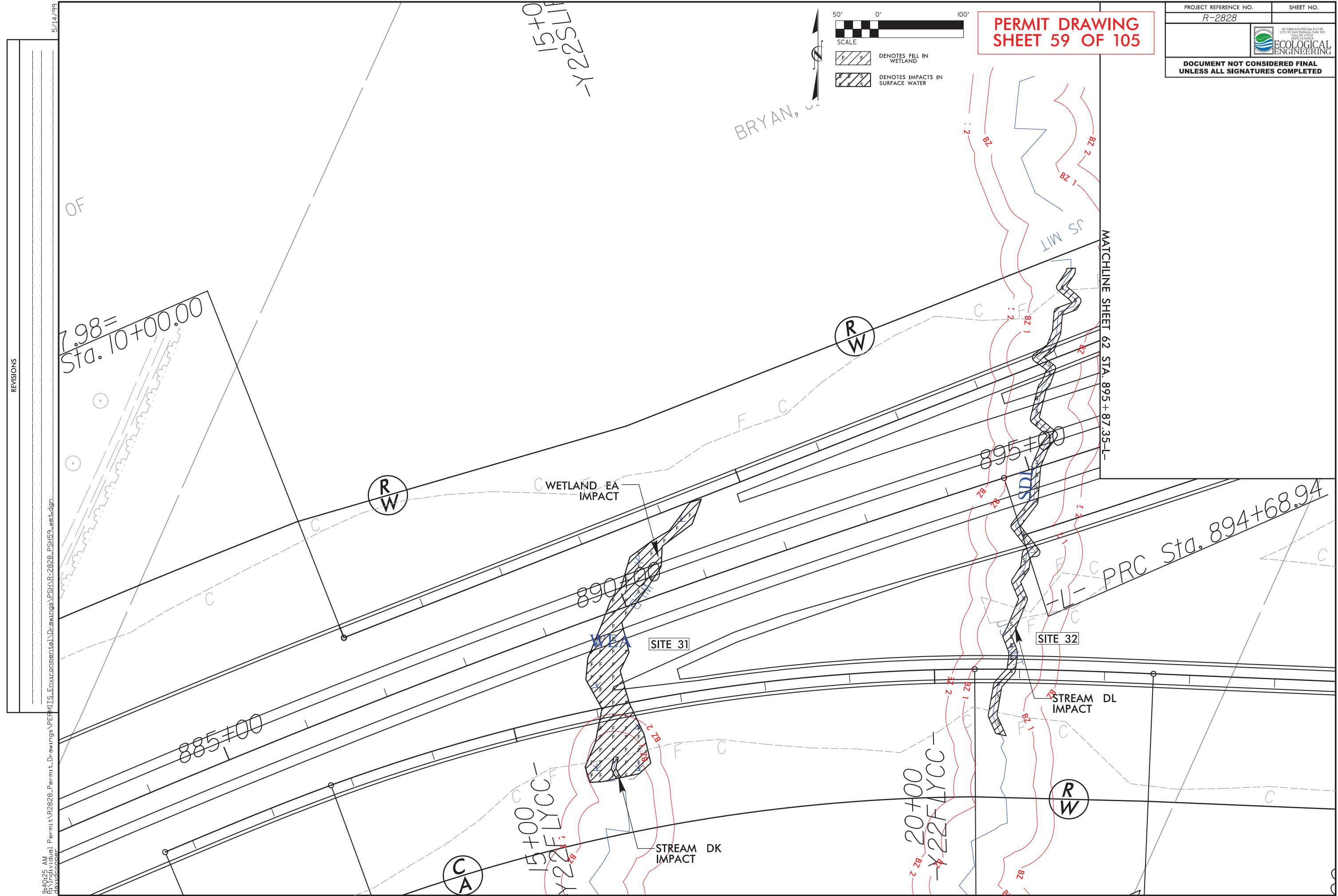
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David Cooper



PERMIT DRAWING
SHEET 59 OF 105

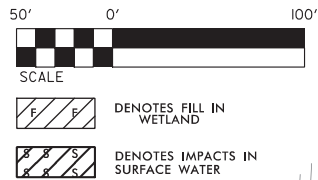
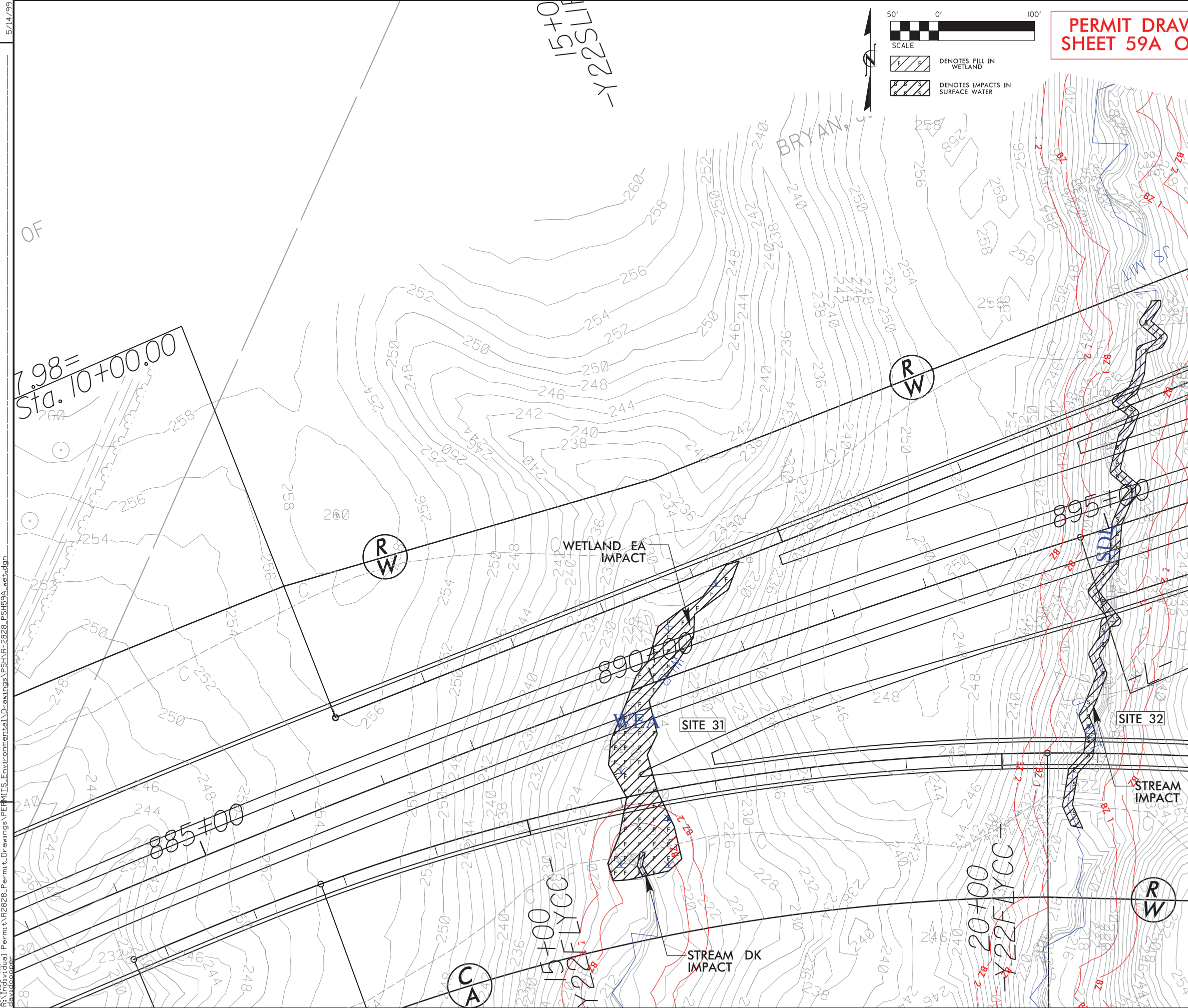


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UNLESS ALL SIGNATURES COMPLETED**



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davidcooper

REVISIONS



PERMIT DRAWING
SHEET 59A OF 105


PROJECT REFERENCE NO.	SHEET NO.
R-2828	
 ECOLOGICAL ENGINEERING NC FIRM LICENSE No. F-1148 1151 SW Cary Parkway, Suite 100 Cary, NC 27513 (919) 555-8229	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

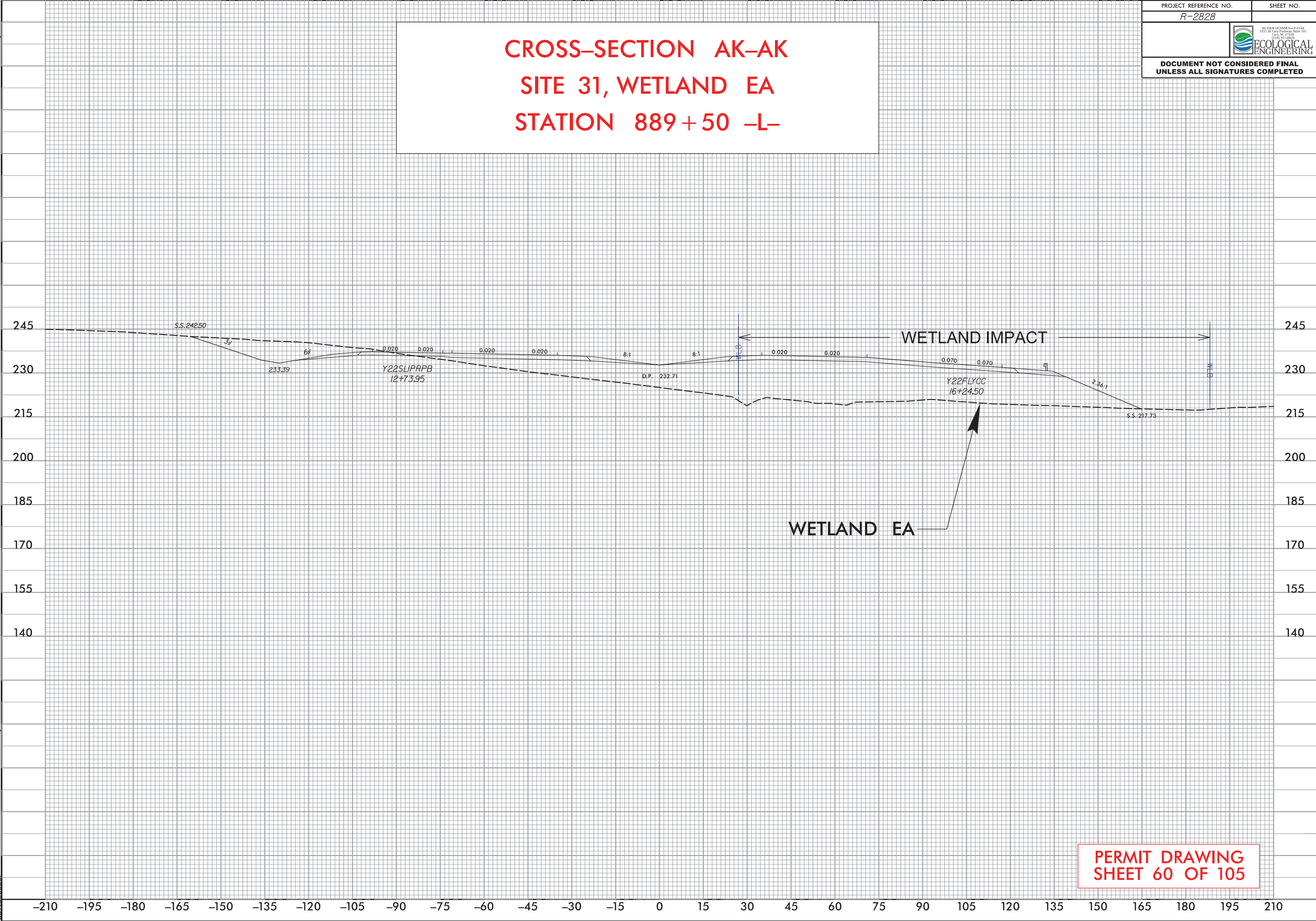
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david cooper

REVISIONS

CROSS-SECTION AK-AK
SITE 31, WETLAND EA
STATION 889 + 50 -L-

PROJECT REFERENCE NO.	SHEET NO.
R-2828	
 ECOLOGICAL ENGINEERING MC FIRM LICENSE No. F-1148 1151 38 Corp Parkway, Suite 101 Cape MEXICO, NC 27518 (919) 555-9800	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



PERMIT DRAWING
SHEET 60 OF 105

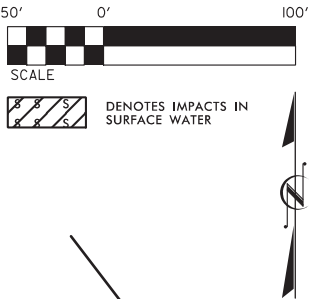
CROSS-SECTION AL-AL
SITE 32, STREAM DL
STATION 895+00 -L-



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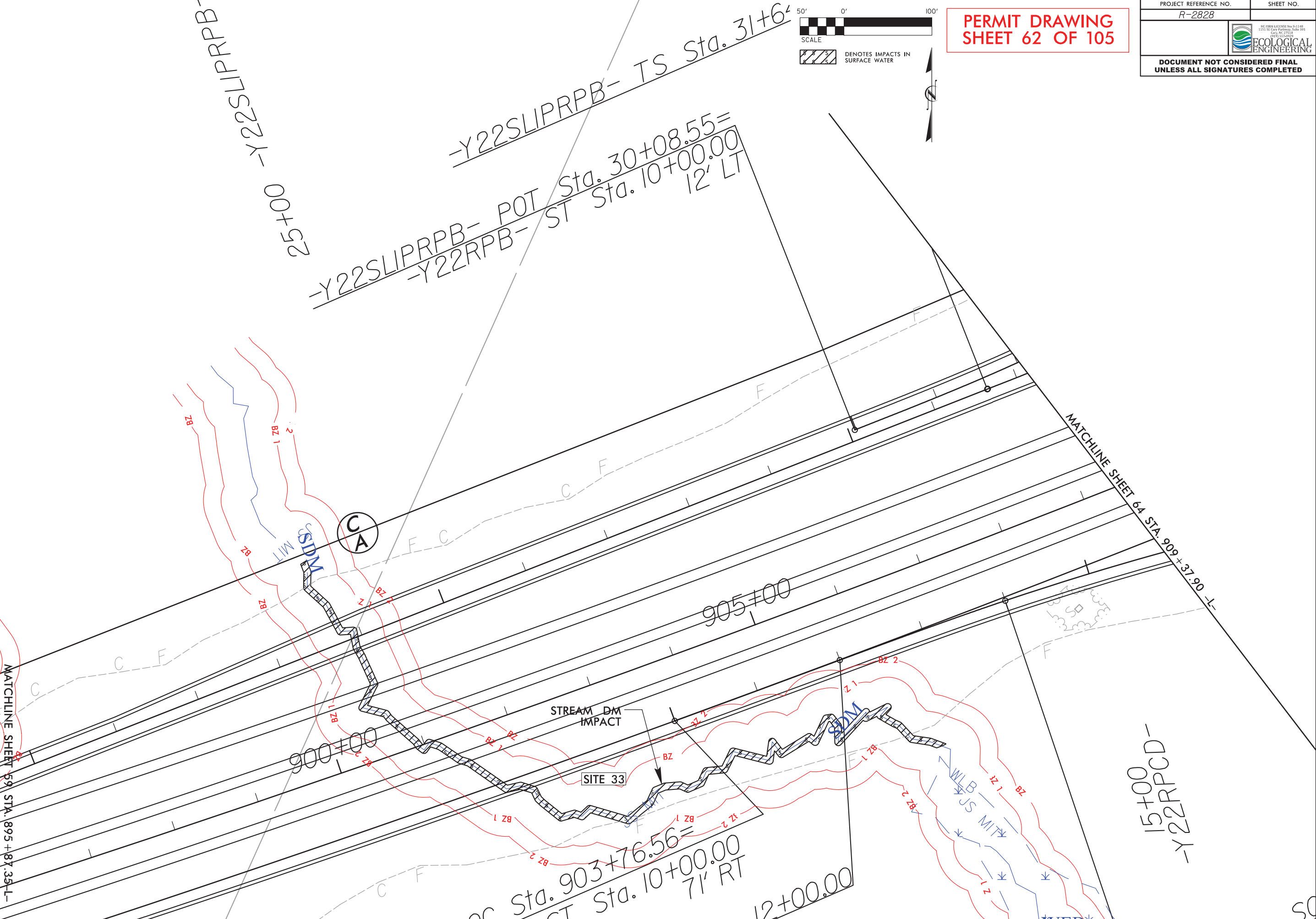
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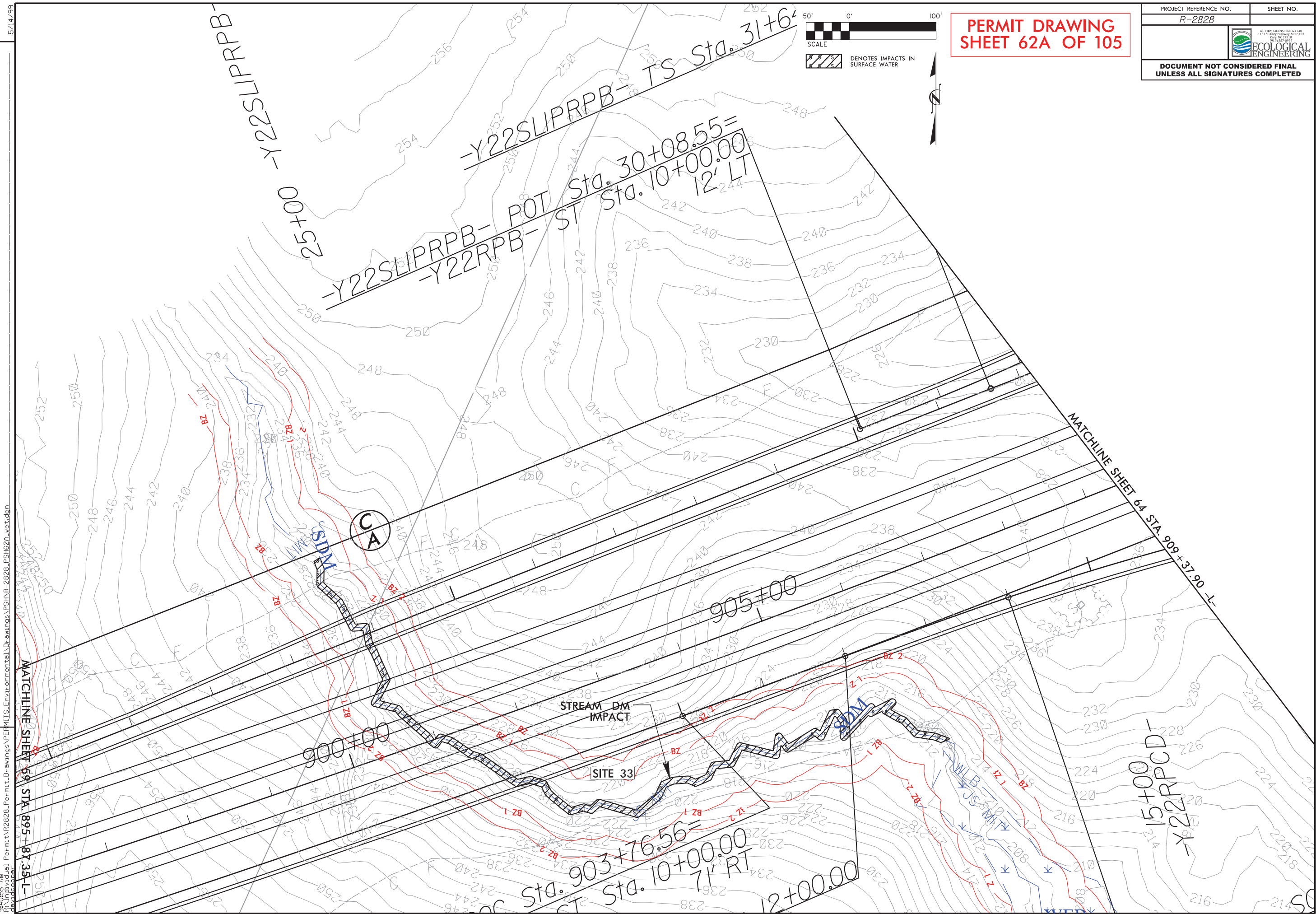
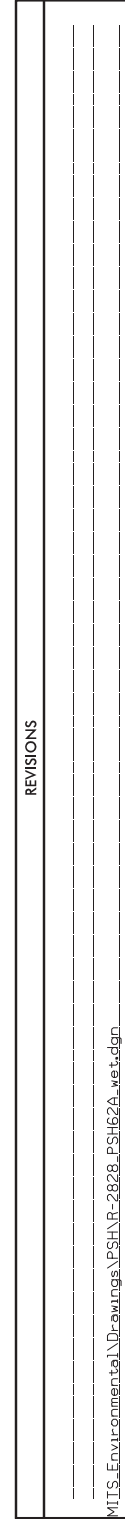
REVISIONS



PERMIT DRAWING
SHEET 62 OF 105

PROJECT REFERENCE NO.	SHEET NO.
R-2828	
 ECOLOGICAL ENGINEERING	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	





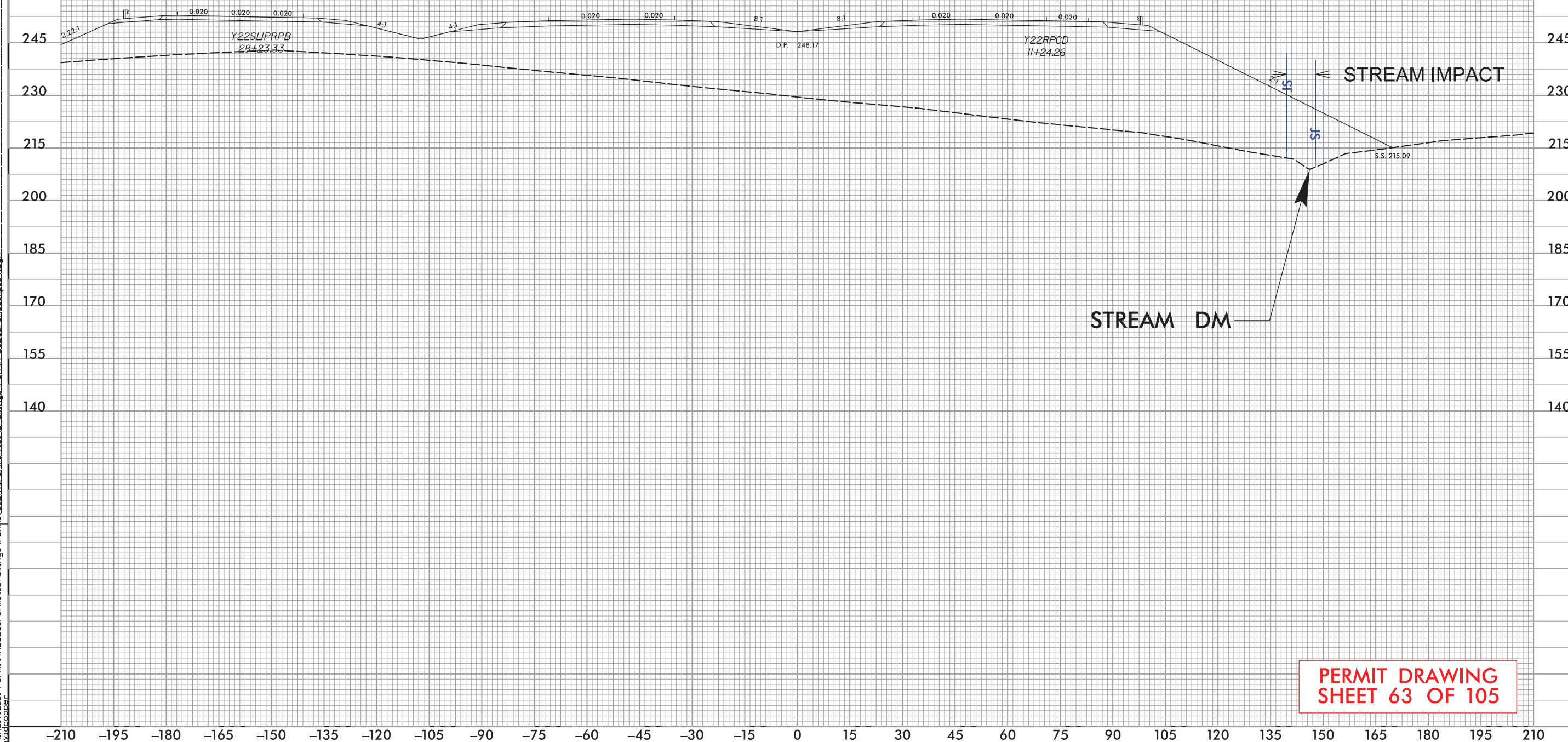
SHEET NO.

STREET NO. _____



**ERED FINAL
COMPLETED**

CROSS-SECTION AM-AM
SITE 33, STREAM DM
STATION 905+00 -L-



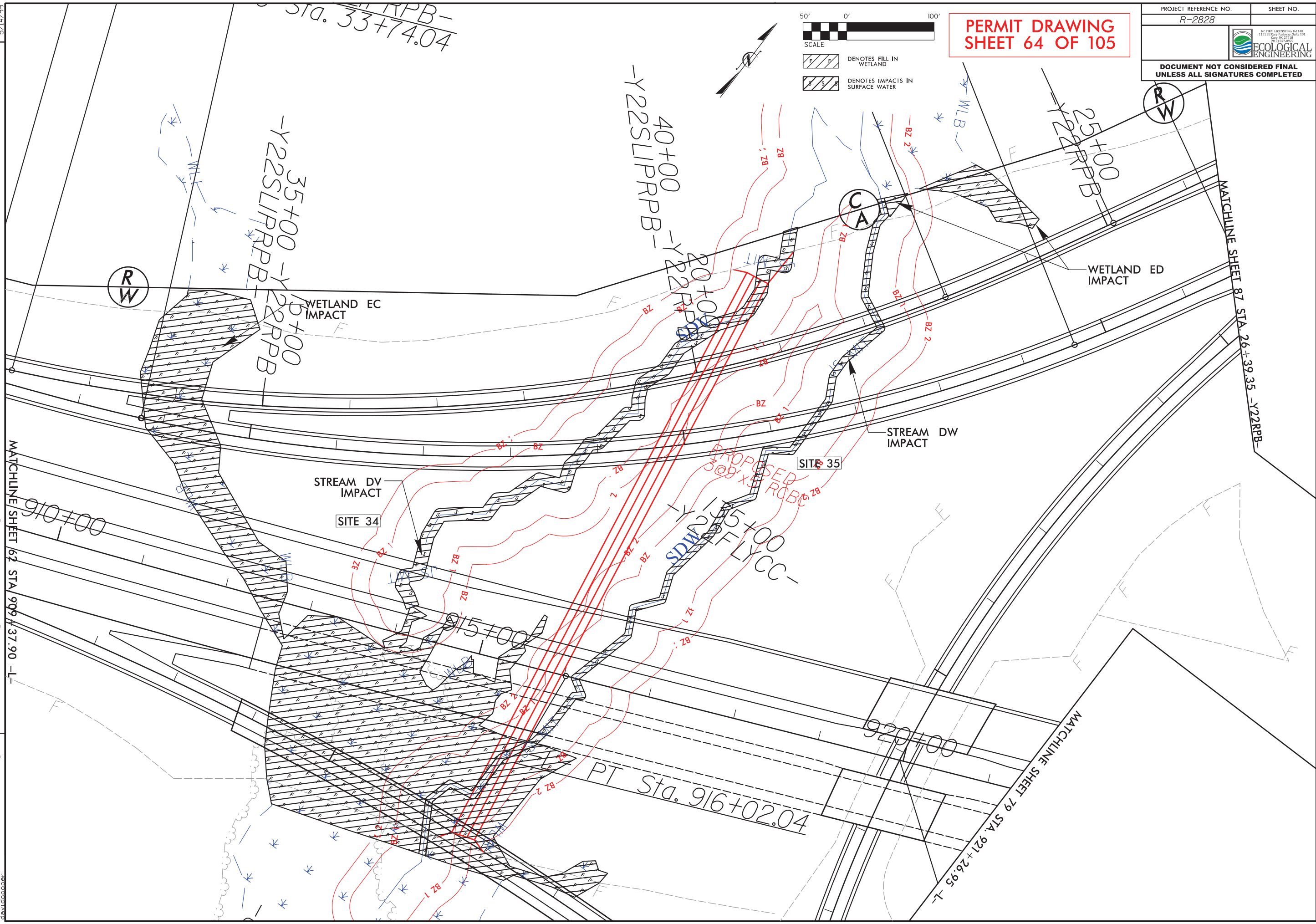
PERMIT DRAWING
SHEET 63 OF 105

5/14/99

3/4/02 AM
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5/14/99
8/4/10 AM
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daivdaoper

REVISIONS



50' 0' 100'

SCALE

Denotes Fill in Wetland

Denotes Impacts in Surface Water

PERMIT DRAWING
SHEET 64 OF 105

PROJECT REFERENCE NO.	SHEET NO.
R-2828	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

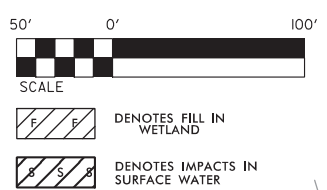
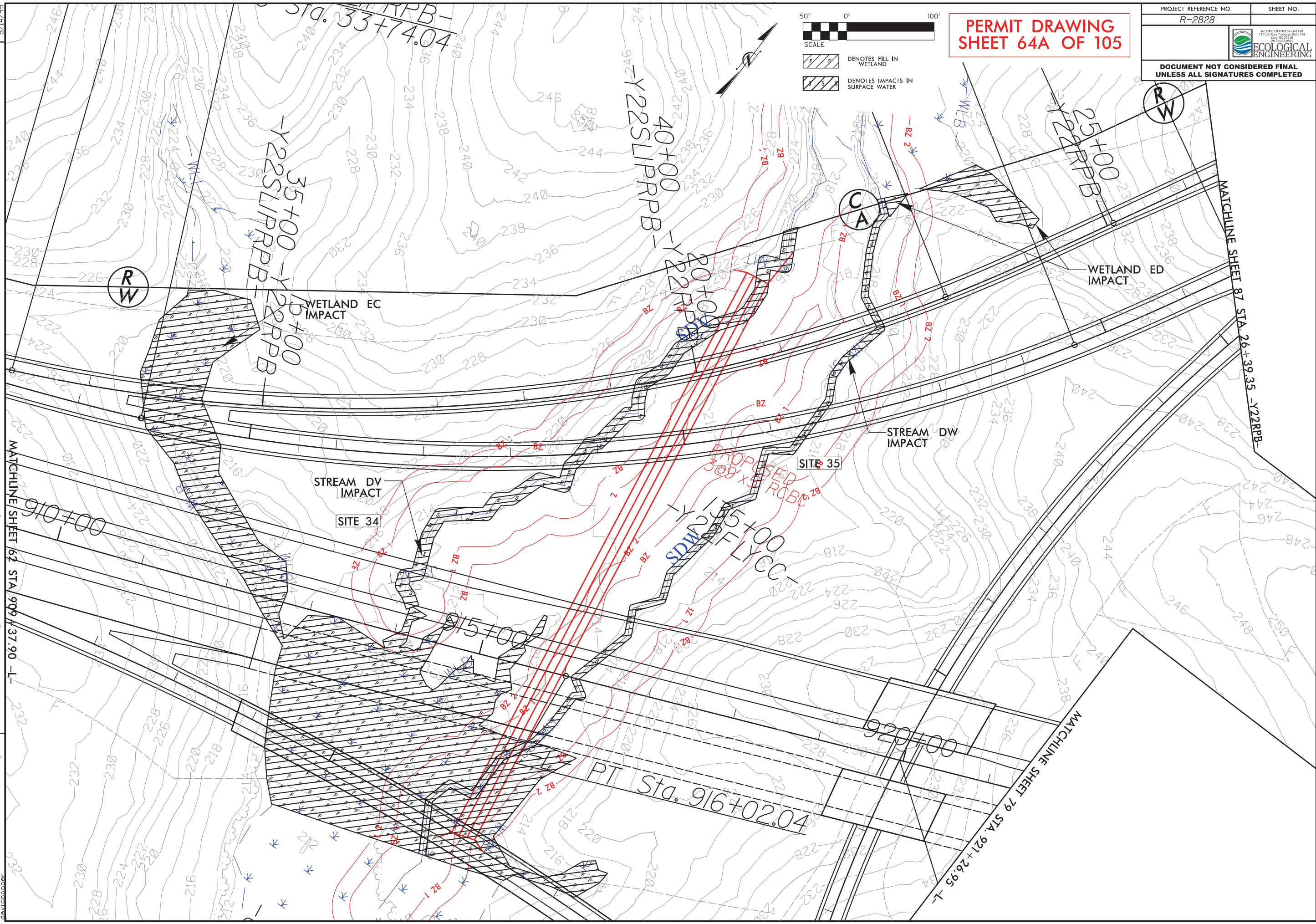
MATCHLINE SHEET 62 STA 909+37.90 -L-

MATCHLINE SHEET 87 STA 26+39.35 -Y22RPB-

MATCHLINE SHEET 79 STA 921+26.95 -L-

5/14/99
8:41:15 AM
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daivdcooper

REVISIONS



**PERMIT DRAWING
SHEET 64A OF 105**


PROJECT REFERENCE NO. R-2828	SHEET NO.
 ECOLOGICAL ENGINEERING 1151 3rd Street, Suite 100 Durham, NC 27601 (919) 555-5555	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

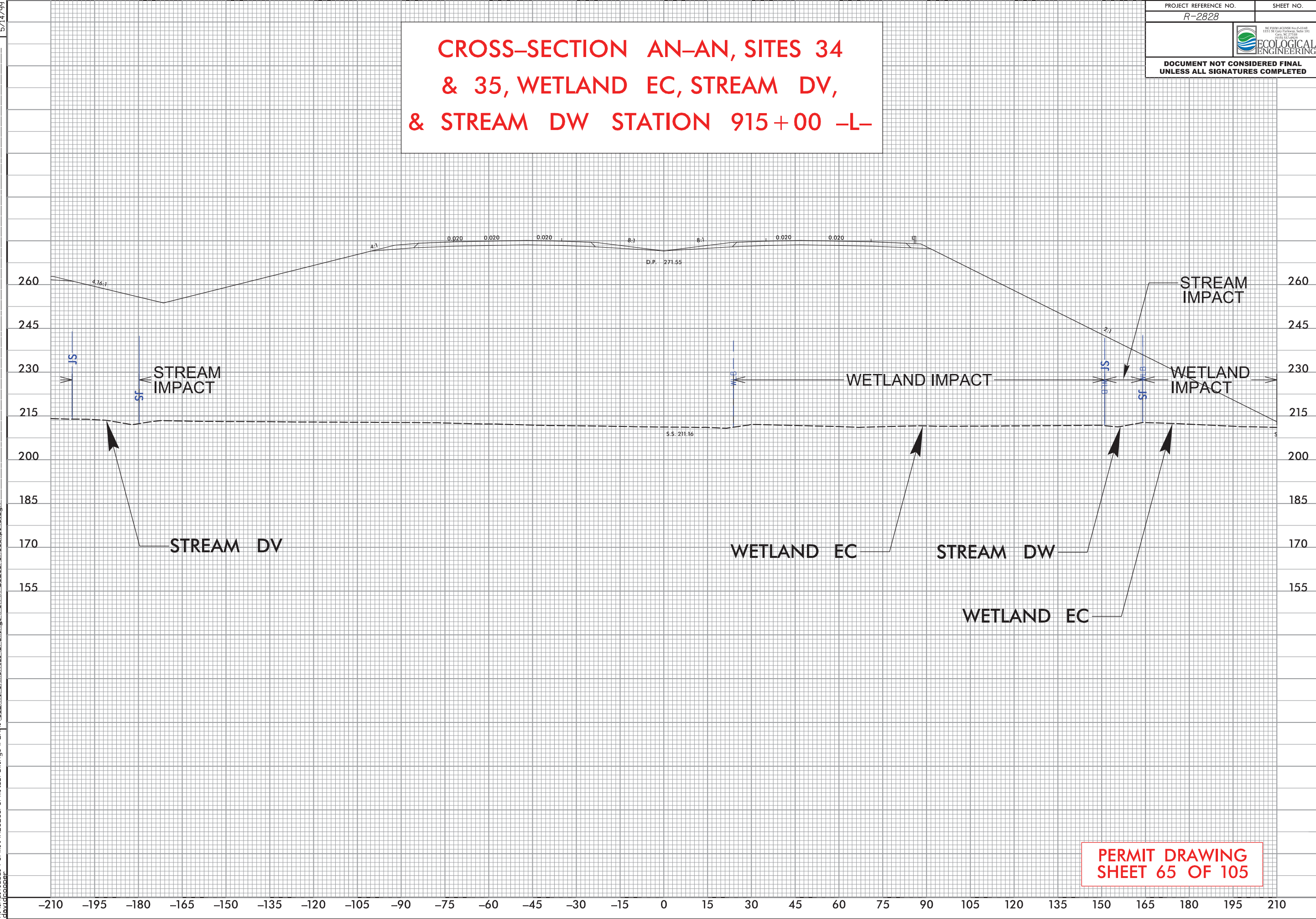
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davidson

REVISIONS

CROSS-SECTION AN-AN, SITES 34
& 35, WETLAND EC, STREAM DV,
& STREAM DW STATION 915+00 -L-

PROJECT REFERENCE NO.	SHEET NO.
R-2828	
 ECOLOGICAL ENGINEERING	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



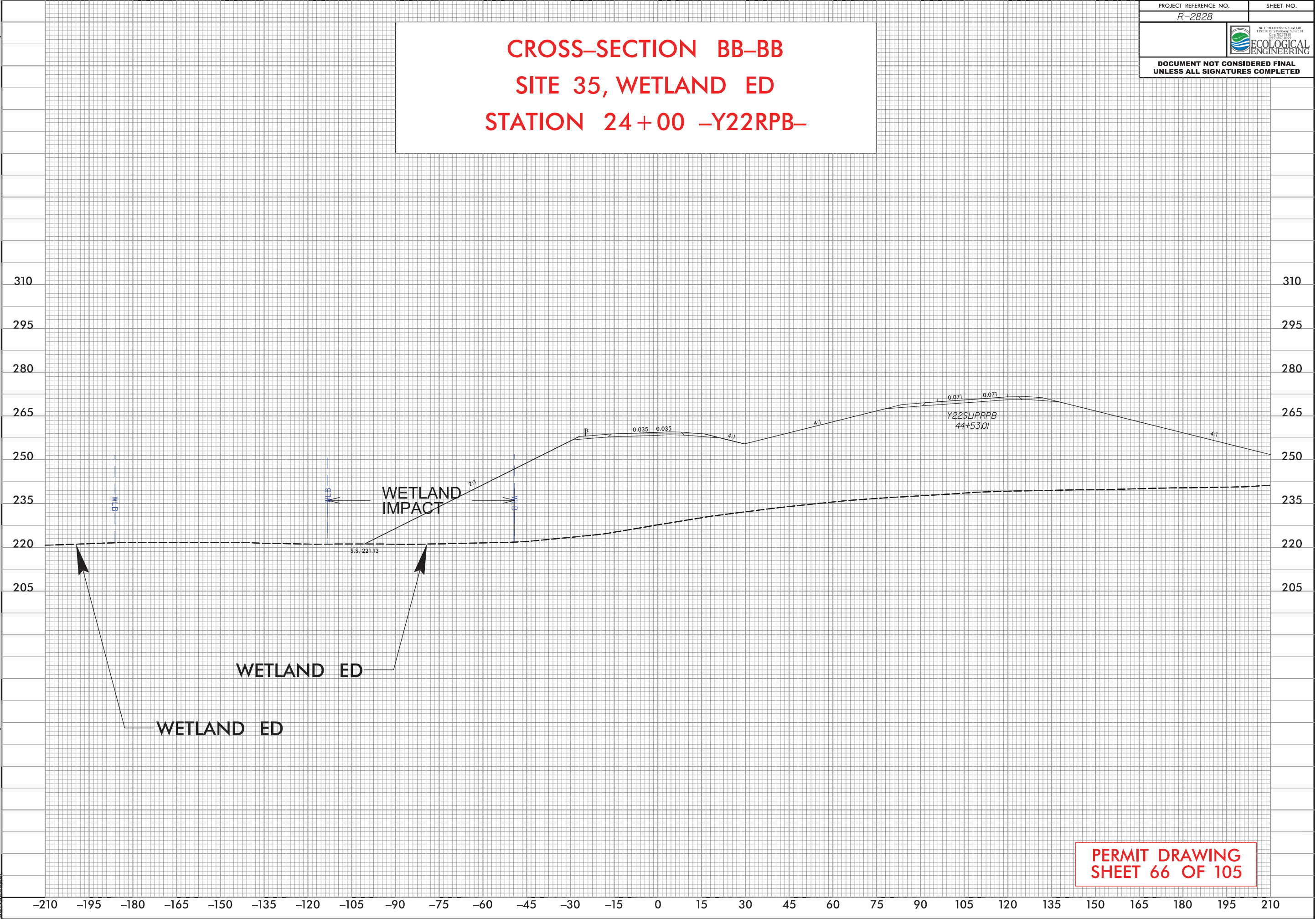
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SHEET 65 OF 105

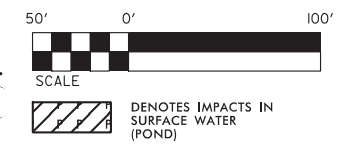
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REVISIONS

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david cooper

CROSS-SECTION BB-BB
SITE 35, WETLAND ED
STATION 24+00 -Y22RPB-

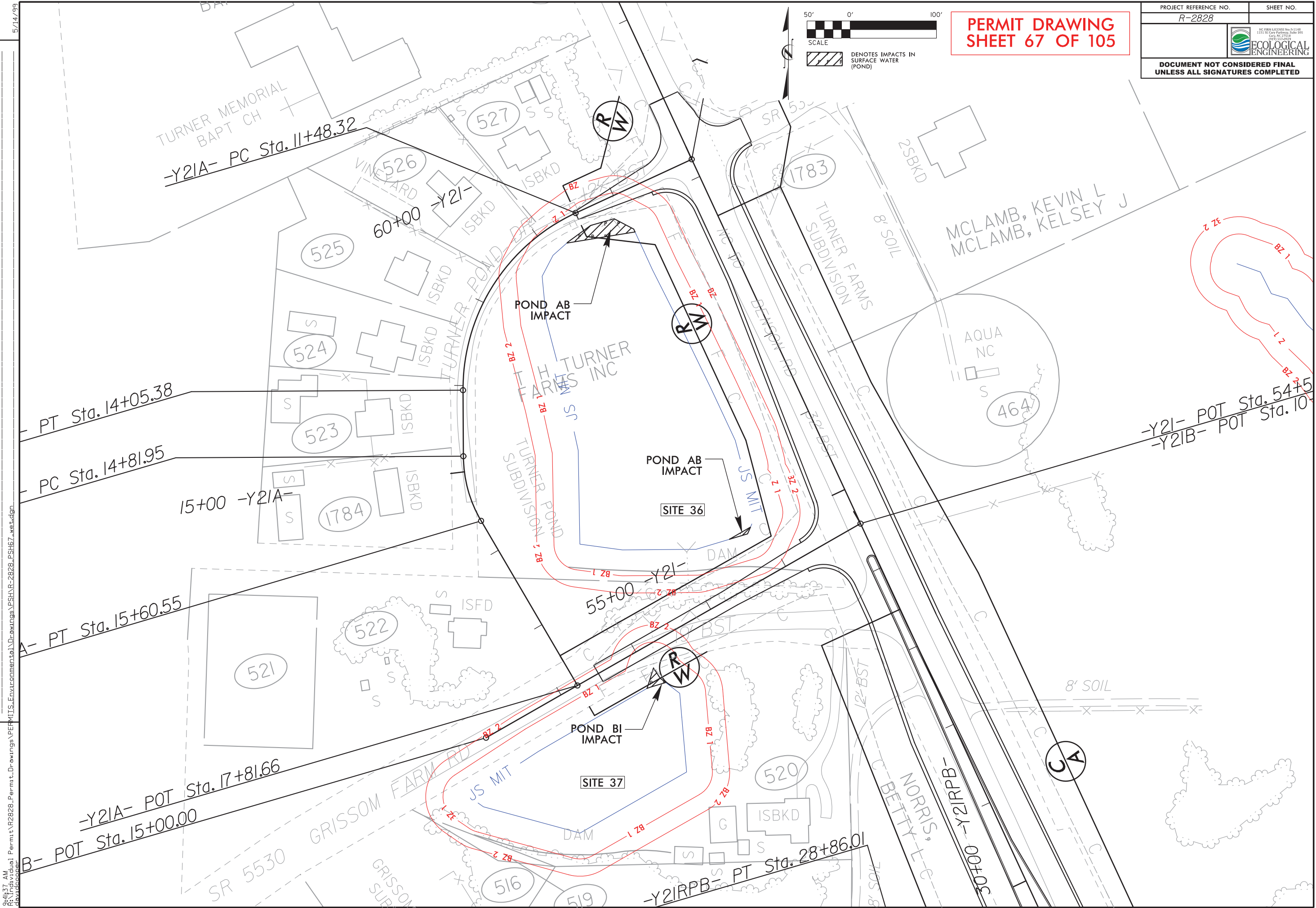




PERMIT DRAWING
SHEET 67 OF 105



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

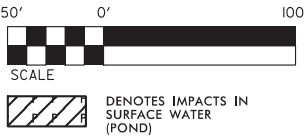
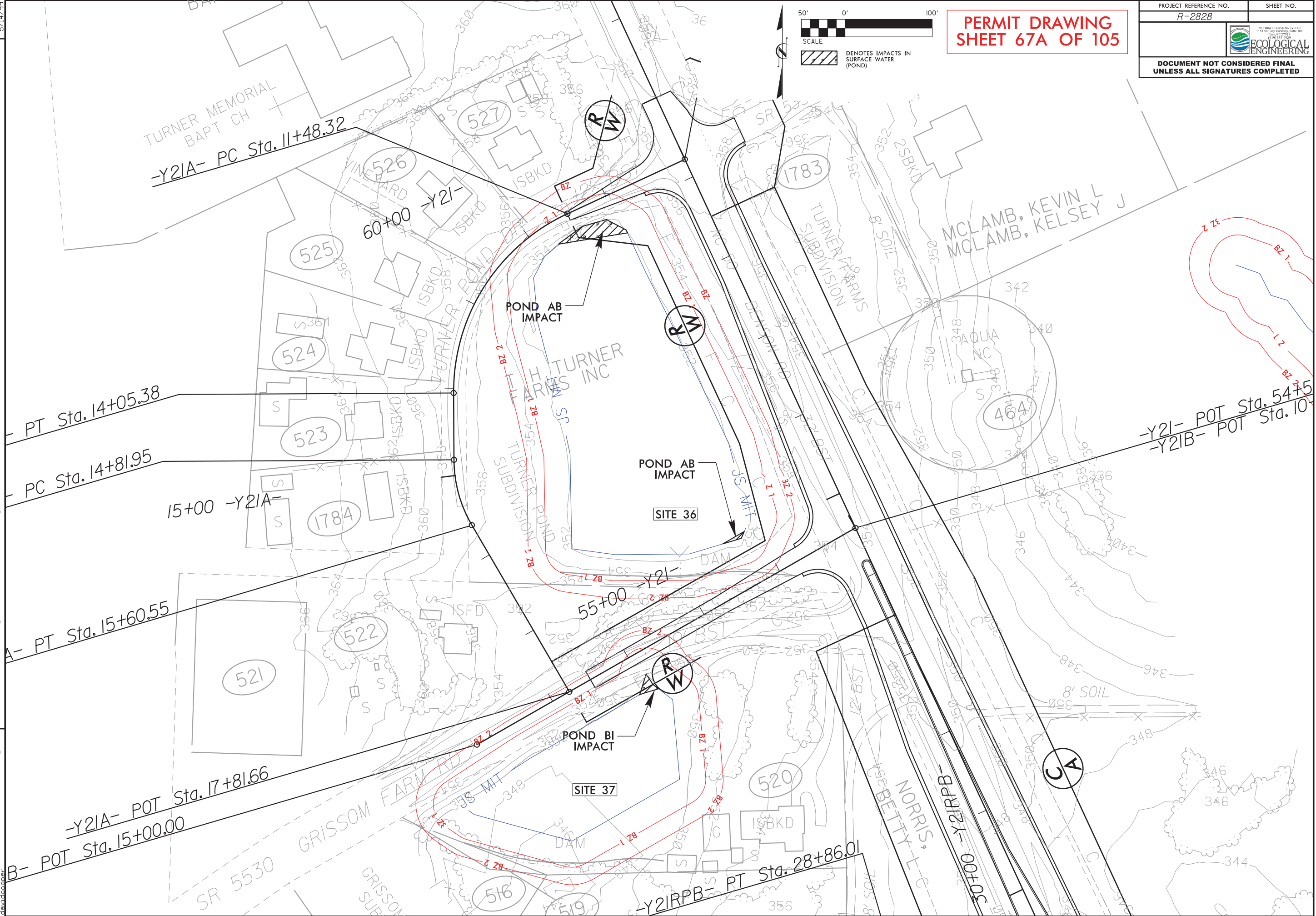


REVISIONS

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develcooper

5/14/99
8/4/42 AM
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david cooper

REVISIONS



**PERMIT DRAWING
SHEET 67A OF 105**

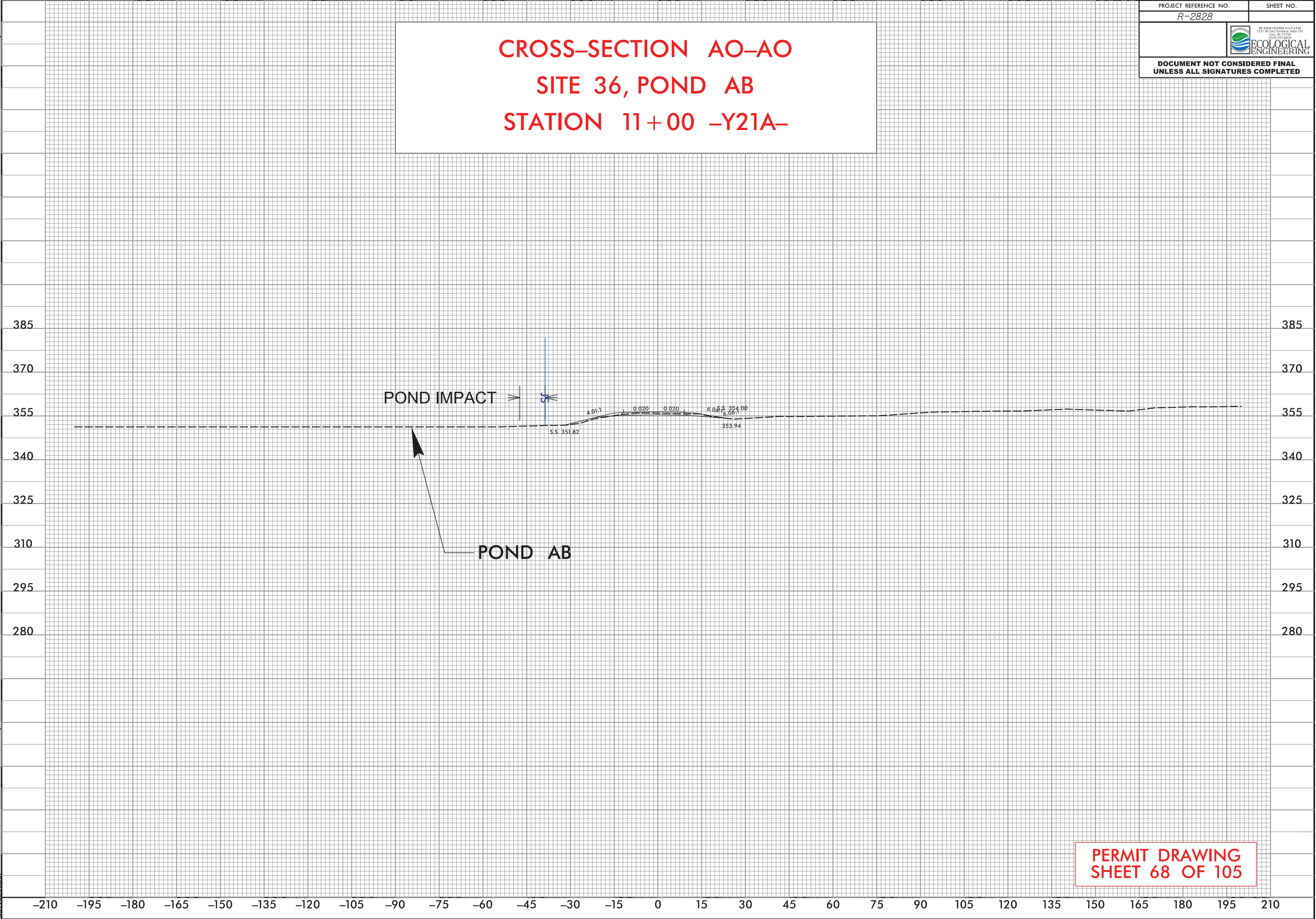
PROJECT REFERENCE NO.	SHEET NO.
R-2828	
 ECOLOGICAL ENGINEERING INC. FIRM LICENSE NO. E-1148 1151 SW Cary Parkway, Suite 100 Cary, NC 27513 (919) 555-2929	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

5/14/99

REVISIONS

8:41:48 AM
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david cooper

CROSS-SECTION AO-AO
SITE 36, POND AB
STATION 11+00 -Y21A-




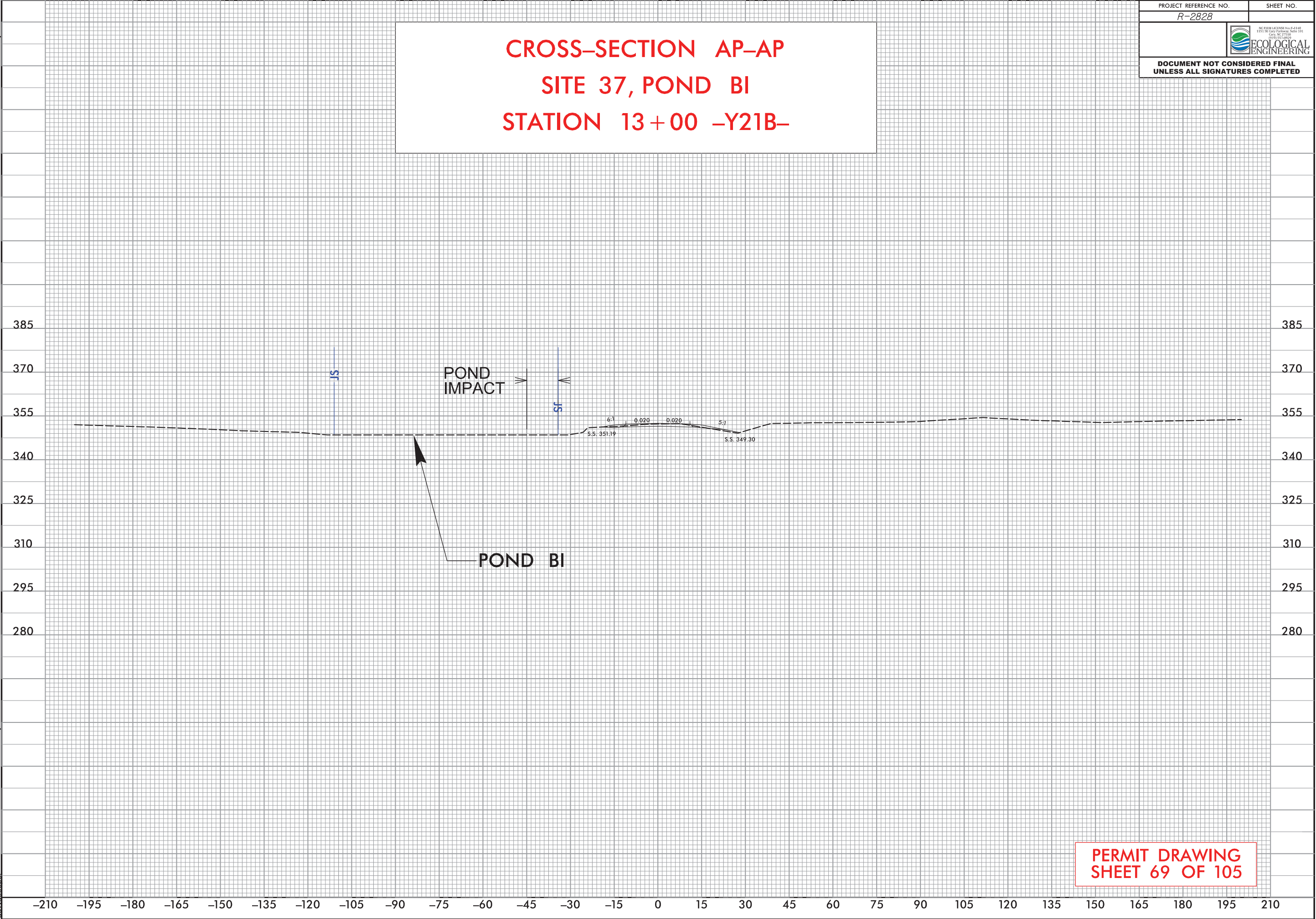
5/14/99

REVISIONS

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davidcopper


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SITE 37, POND BI
STATION 13+00 -Y21B-


PROJECT REFERENCE NO.	SHEET NO.
R-2828	
 ECOLOGICAL ENGINEERING	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

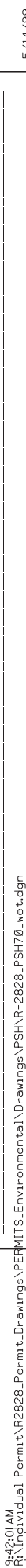


50' 0' 100'

SCALE

 DENOTES FILL IN WETLAND

 DENOTES IMPACTS IN SURFACE WATER



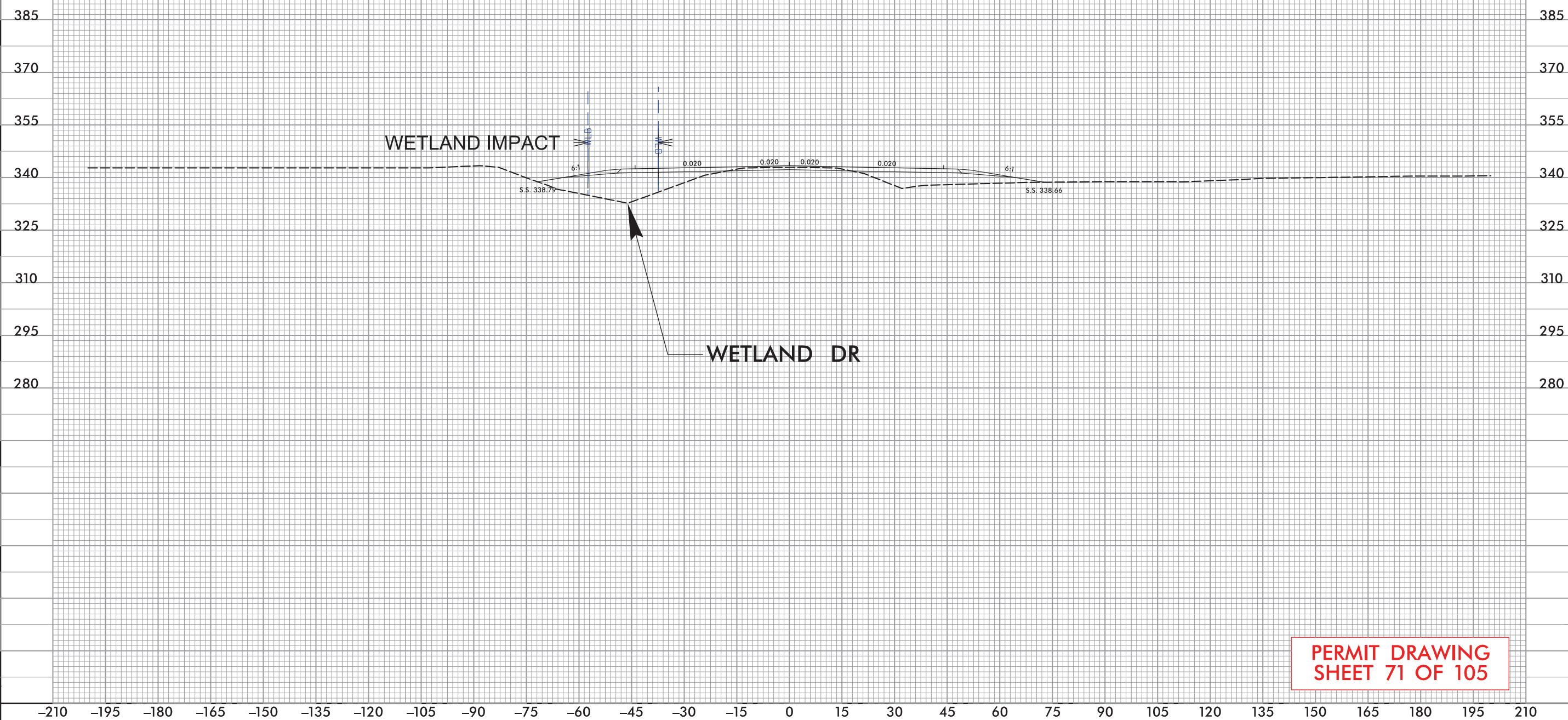
SHEET NO.

STREET NO. _____



**ERED FINAL
COMPLETED**

CROSS-SECTION AQ-AQ
SITE 39, WETLAND DR
STATION 40+00 -Y21-



PERMIT DRAWING
SHEET 71 OF 105

5/14/99

9:42:13 AM
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REVISIONS

CROSS-SECTION AR-AR, SITES 25
& 38, STREAM CY & STREAM CZ
STATION 44+50 -Y21-



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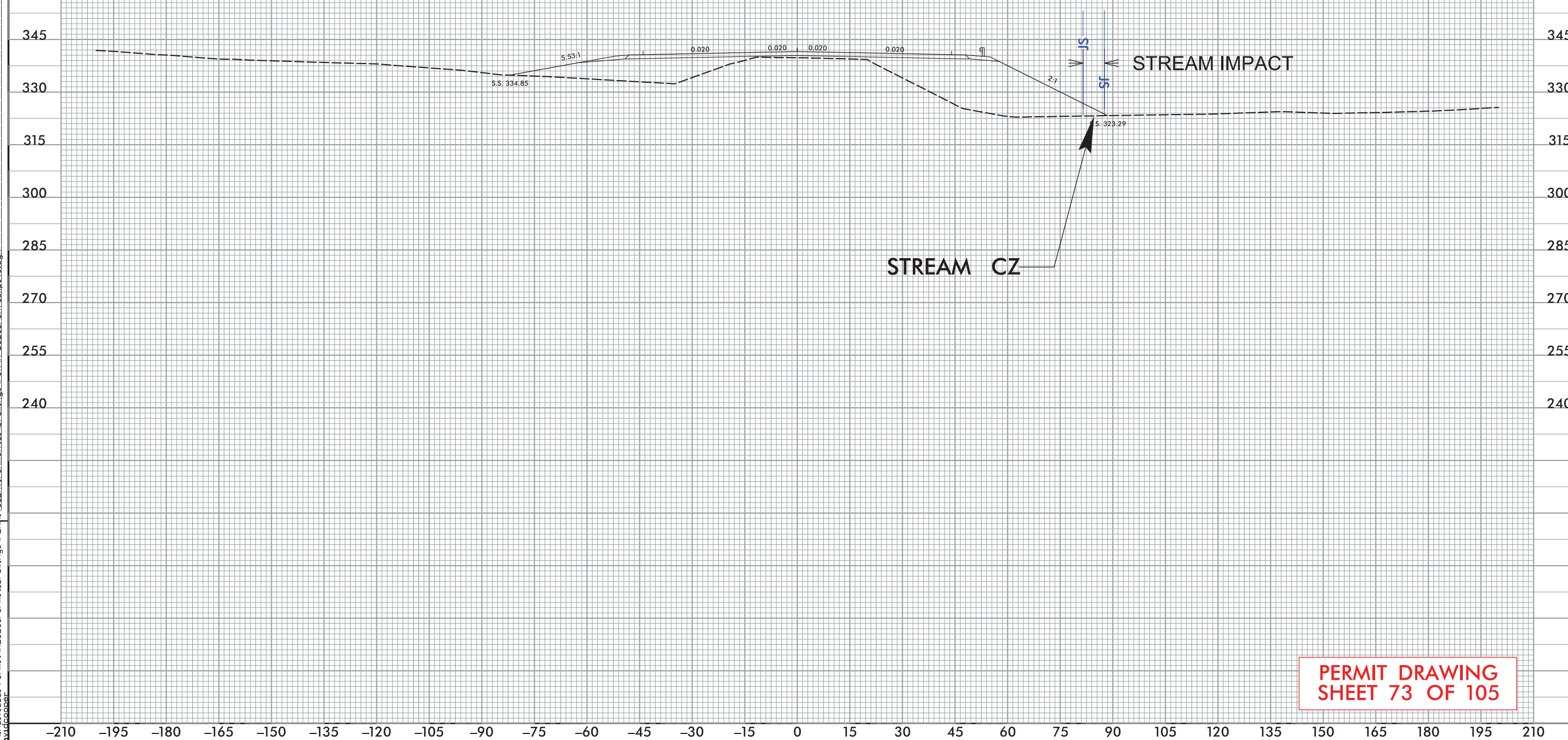
SHEET NO.

STREET NO. _____



**ERED FINAL
COMPLETED**

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SITE 38, STREAM CZ
STATION 45+50 -Y21-

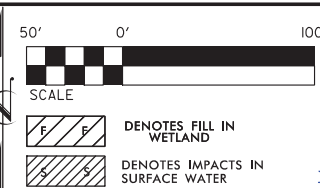


PERMIT DRAWING
SHEET 73 OF 105

E 114/00

3:42:23 AM
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REVISIONS



PERMIT DRAWING
SHEET 74 OF 105

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NC FIRM LICENSE No: F-1148
1151 SE Cary Parkway, Suite 101
Cary, NC 27518
(919) 557-0929

**ECOLOGICAL
ENGINEERING**

UNLESS ALL SIGNATURES C

LEGEND: S DENOTES IMPACTS IN SURFACE WATER

Stationing and Labels:

- 145+00
- SC Sta. 145+81.98
- POT Sta. 50+64.93 =
- POC Sta. 150+02.25
- Y22FLYCC-
- Y22FLYCC-
- Y22FLYCC-

150+00
-Y22FLYCC-

45+00
-Y22FLYCC-
15+00
-Y22RPC-

201

WETLAND EC
IMPACT

WEC

SITE 34 CONT'D.

WEB

SDM

~~WETLAND EC~~ IMPACT

– STREAM DV
IMPACT

40+00
-Y22FLYCC-

A hand-drawn diagram of a road layout. The road is represented by two parallel lines. Along the road, several points are marked with blue arrows pointing downwards. The road is labeled with stationing: "Sta. 42+69.54" and "Sta. 10+00.00". The road is also labeled with "Y22F LYCC" and "Y22R RPC". A dashed line connects the two main points. A cloud-like shape is drawn at the bottom of the diagram.

Y22RPC- SC Sta. 12+40.00

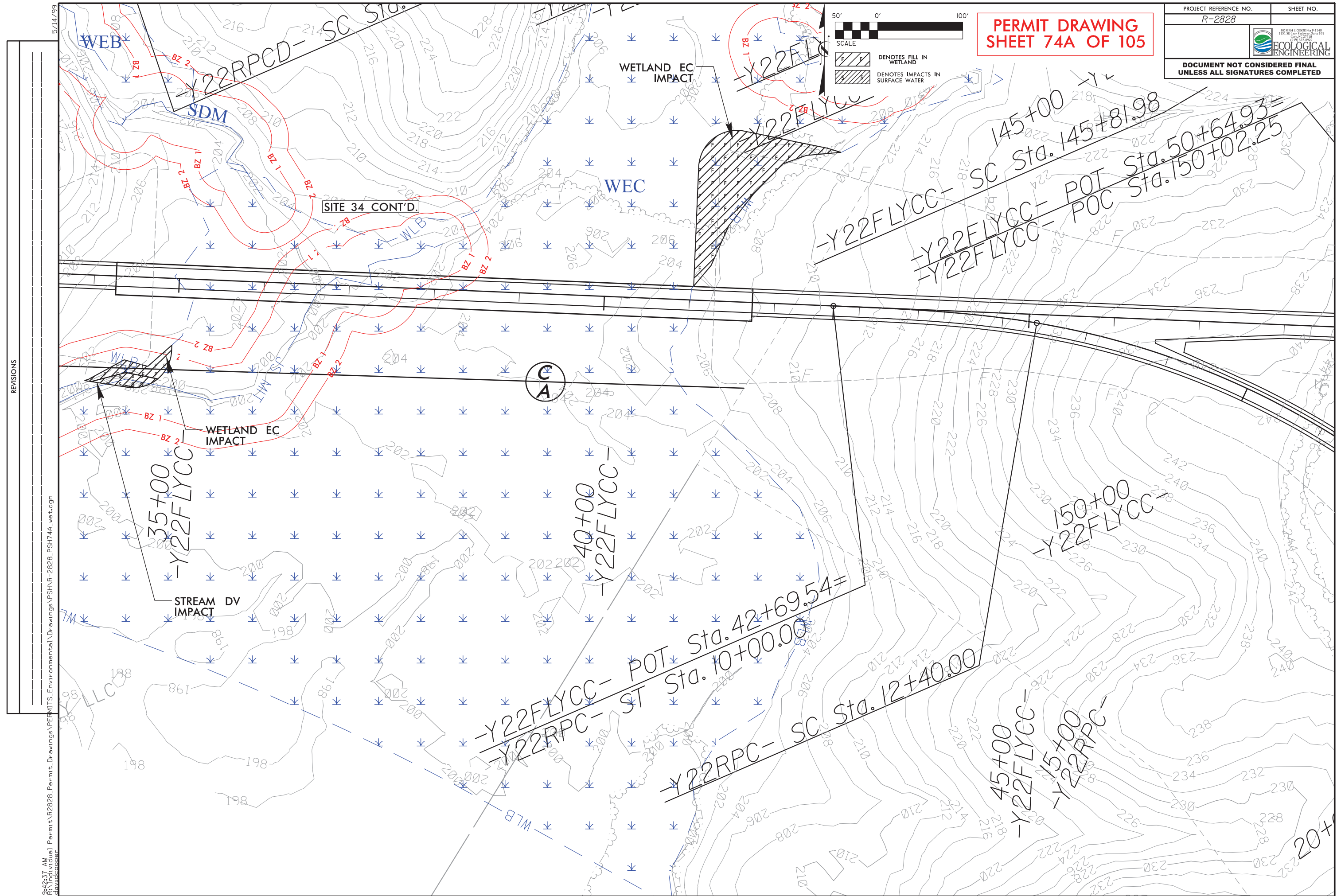
45+00
-Y22FLYCC-
15+00
-Y22RPC-

22/11/2015
-Y15+00
-22RPC-

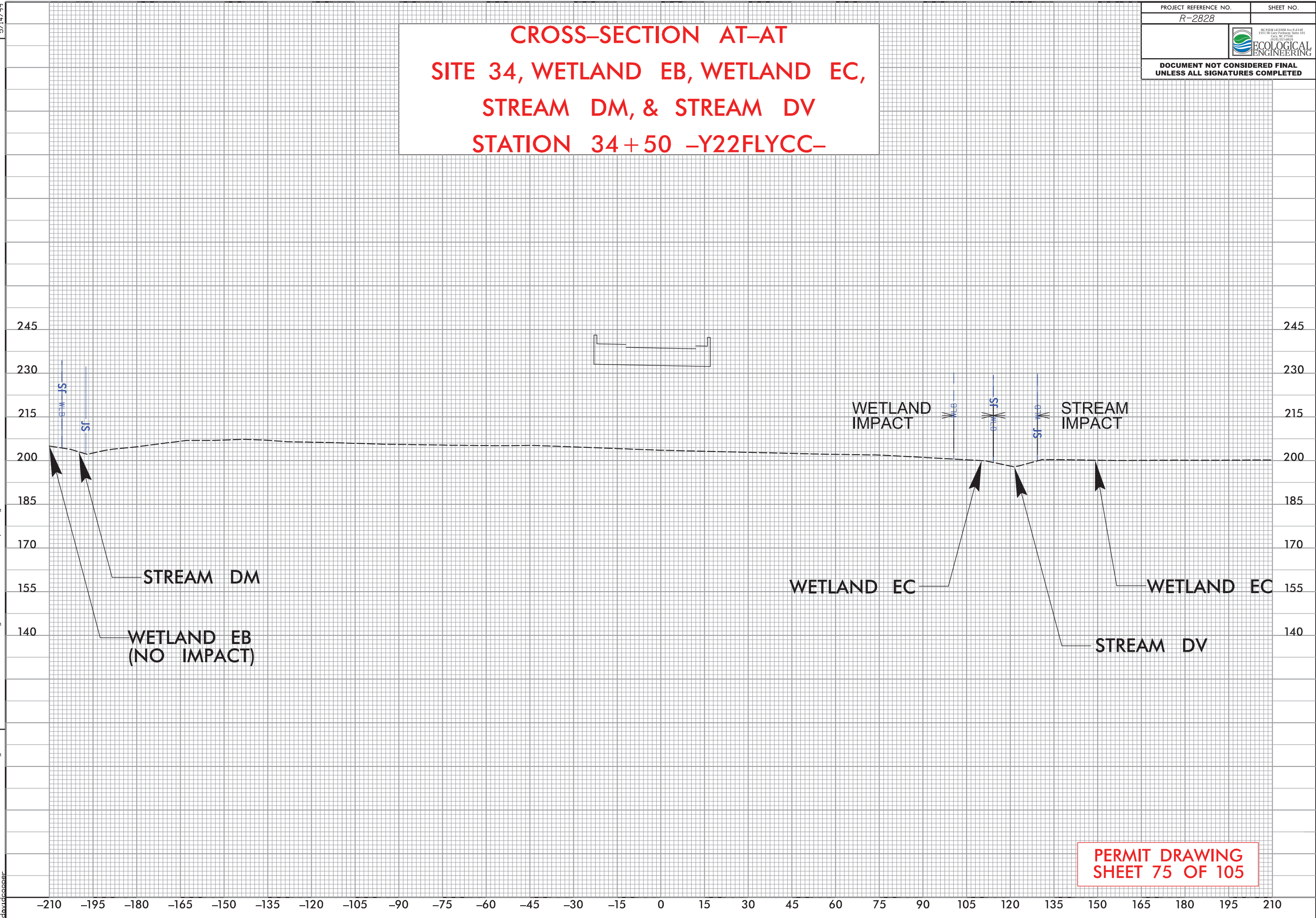
5/14/99

REVISIONS

9:42:32 AM Permit Drawings\PERMITS-Environmental\Drawings\PSH\R-2828_PSH74_wet.dgn
davidcooper



CROSS-SECTION AT-AT
SITE 34, WETLAND EB, WETLAND EC,
STREAM DM, & STREAM DV
STATION 34+50 -Y22FLYCC-

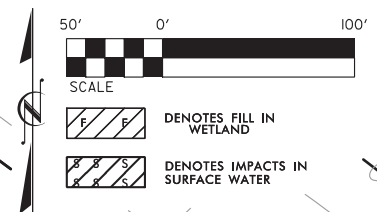


PERMIT DRAWING
SHEET 75 OF 105


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5/14/99

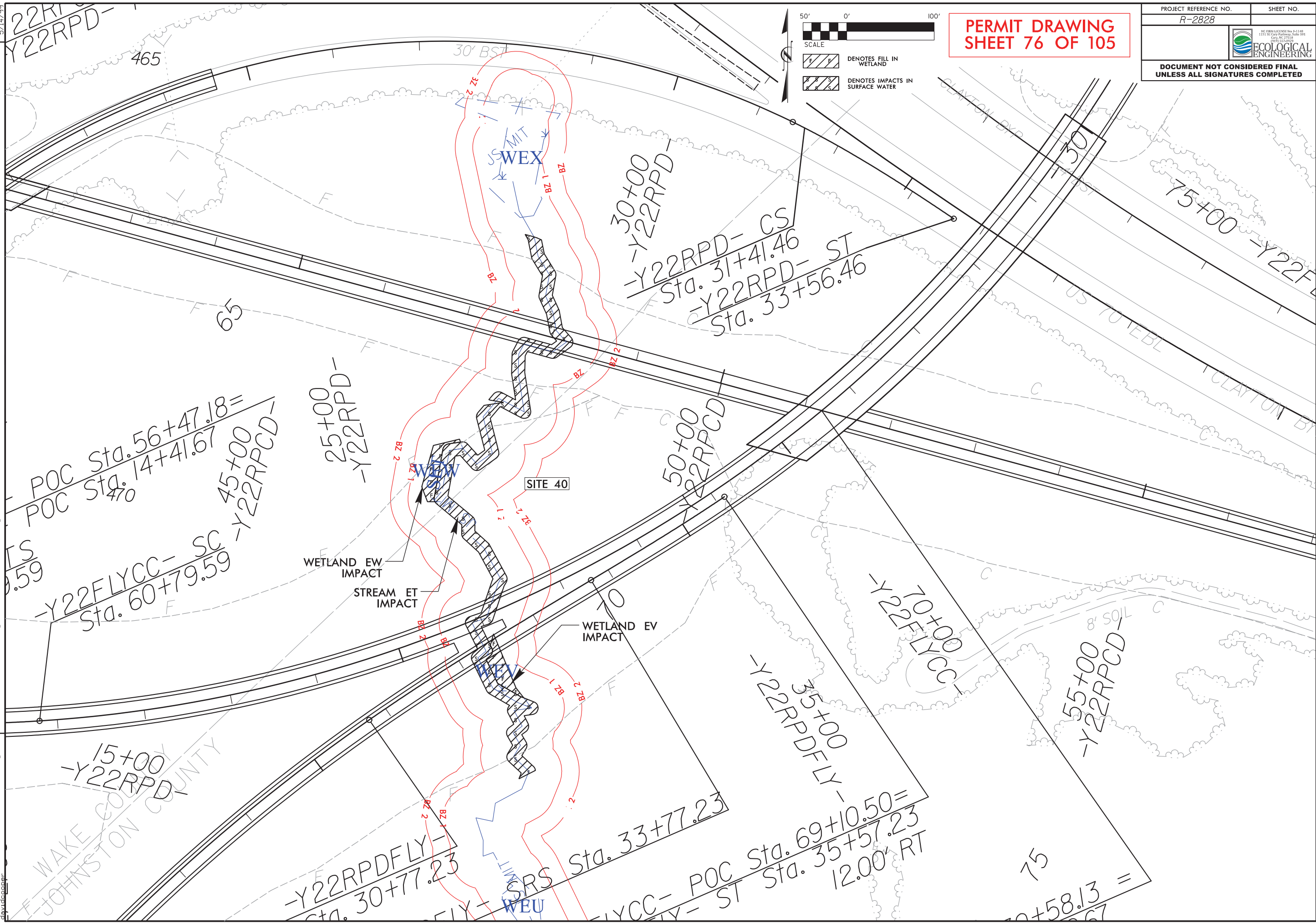
5/14/99
22RPT
Y22RPD-
465
65
POC Sta. 56+47.18=
POC Sta. 14+41.67
470
IS
0.59
-Y22FLYCC- SC
Sta. 60+79.59
45+00
-Y22RPPCD-
15+00
-Y22RPD-
WAKE COUNTY
JOHNSTON COUNTY
8/2/52 AM
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David Cooper

REVISIONS



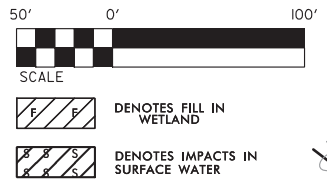
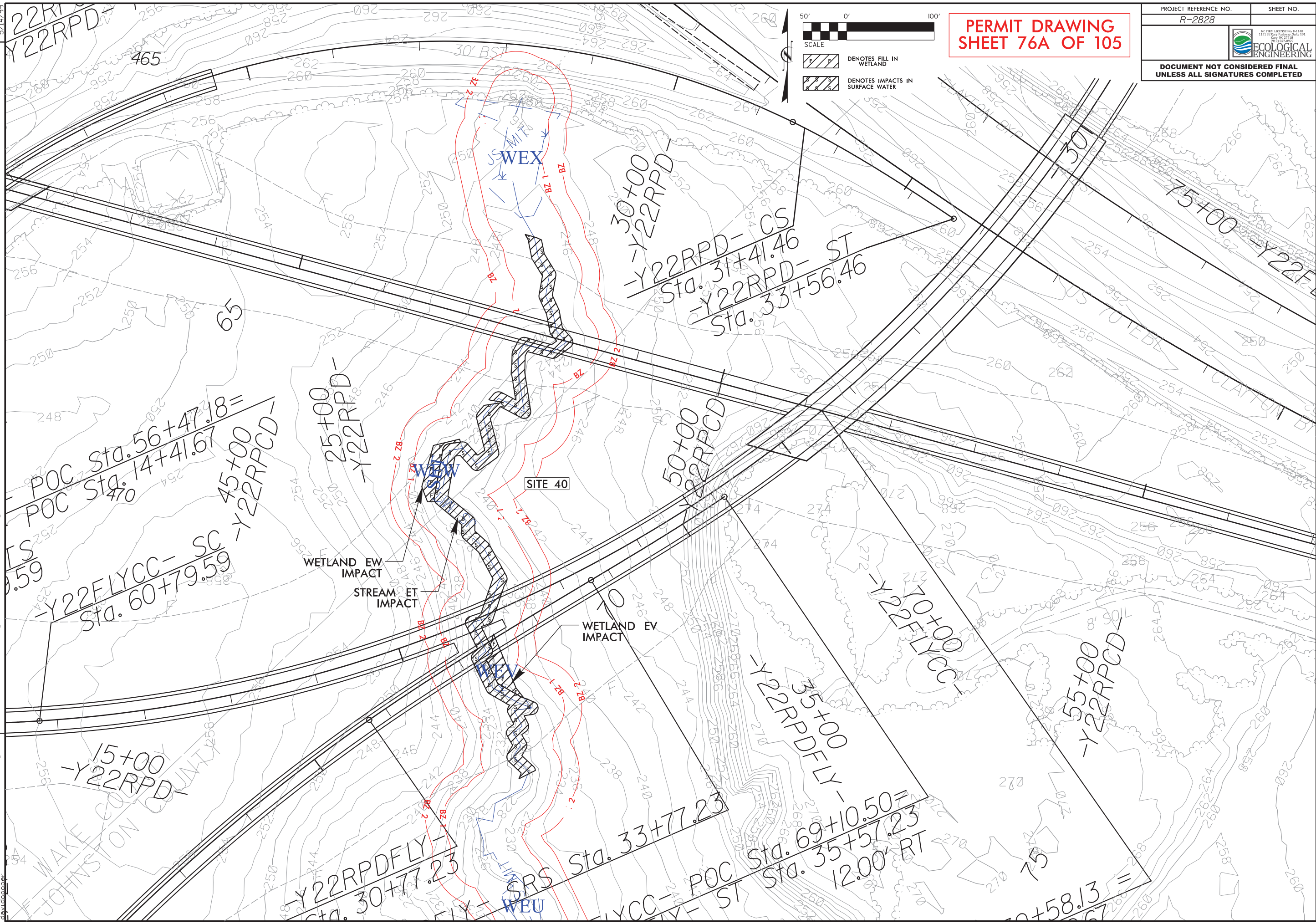
PERMIT DRAWING
SHEET 76 OF 105

PROJECT REFERENCE NO.	SHEET NO.
R-2828	
 ECOLOGICAL ENGINEERING	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



5/14/99
8/4/57 AM
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david cooper

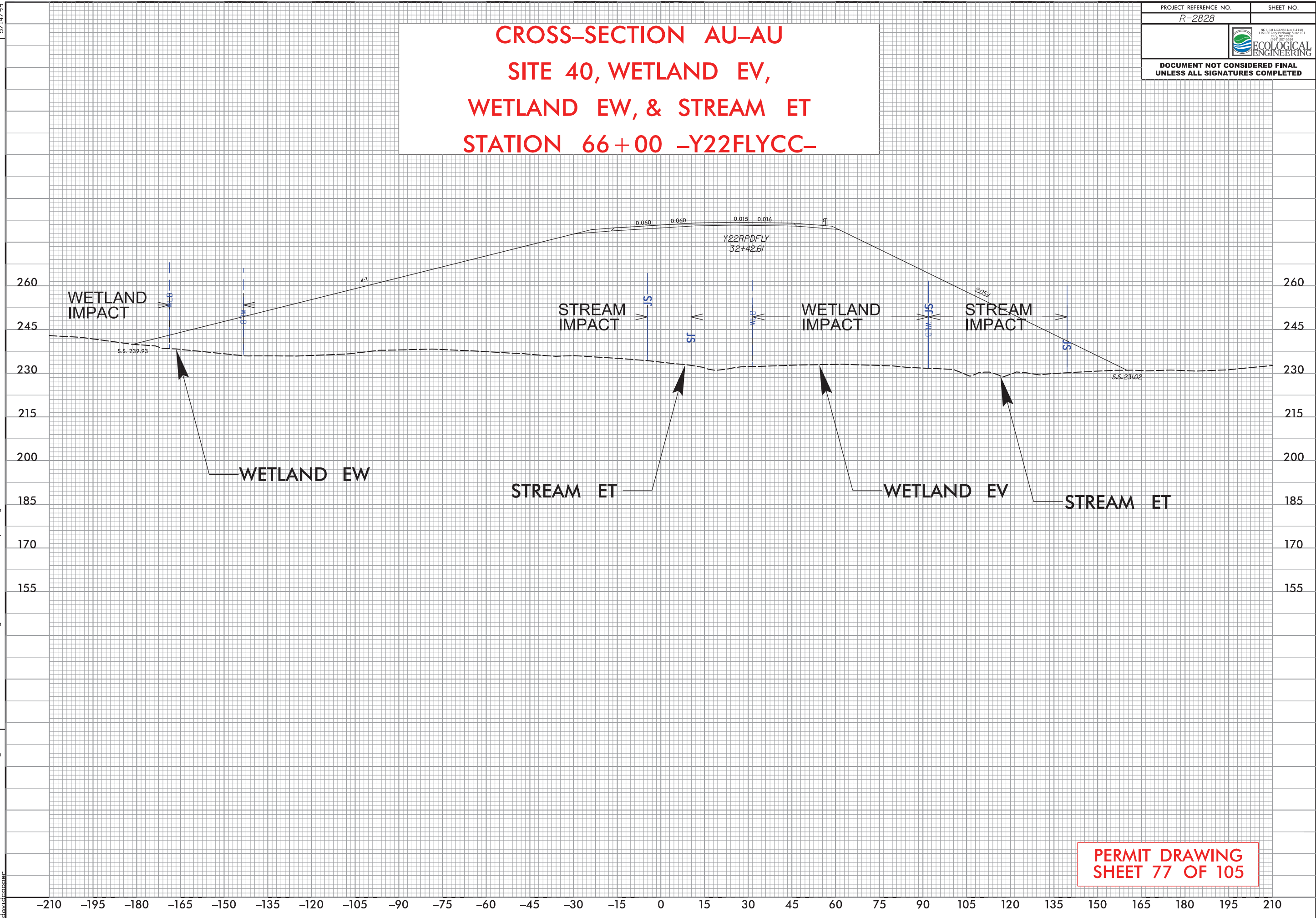
REVISIONS



**PERMIT DRAWING
SHEET 76A OF 105**

PROJECT REFERENCE NO. R-2828	SHEET NO.
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

CROSS-SECTION AU-AU
SITE 40, WETLAND EV,
WETLAND EW, & STREAM ET
STATION 66+00 -Y22FLYCC-



PERMIT DRAWING
SHEET 77 OF 105

8:43:04 AM
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 davidcooper
 5/14/99

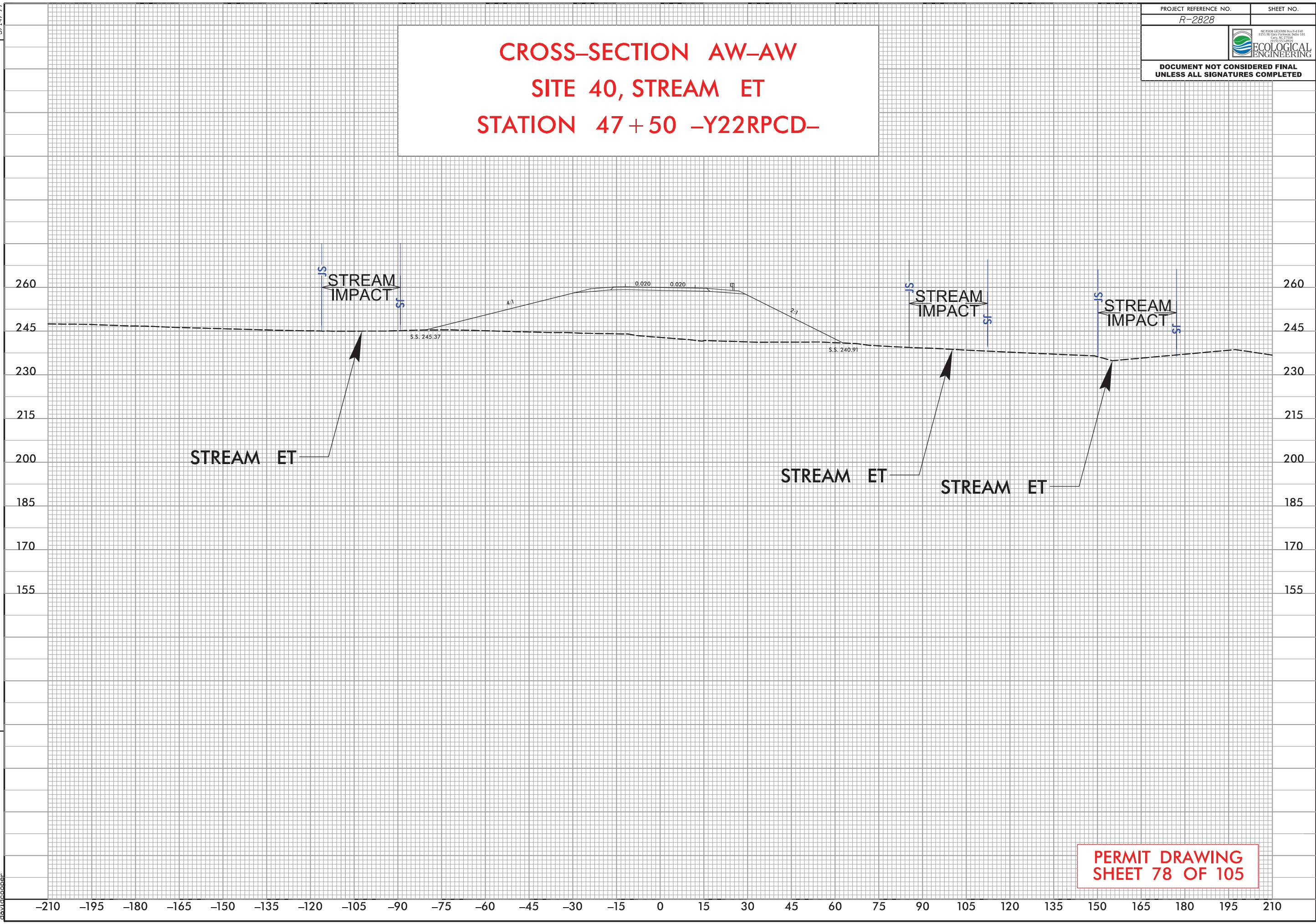
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REVISIONS

8/4/08 AM
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david cooper


CROSS-SECTION AW-AW
SITE 40, STREAM ET
STATION 47+50 -Y22RPCD-

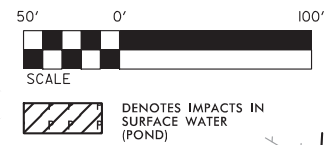
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R-2828	
 <div>NC FIRM LICENSE No. F-1148 1151 38 Carr Parkway, Suite 101 Cape Fear, NC 27416 (910) 551-9977</div>	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



50' 0' 100'

SCALE

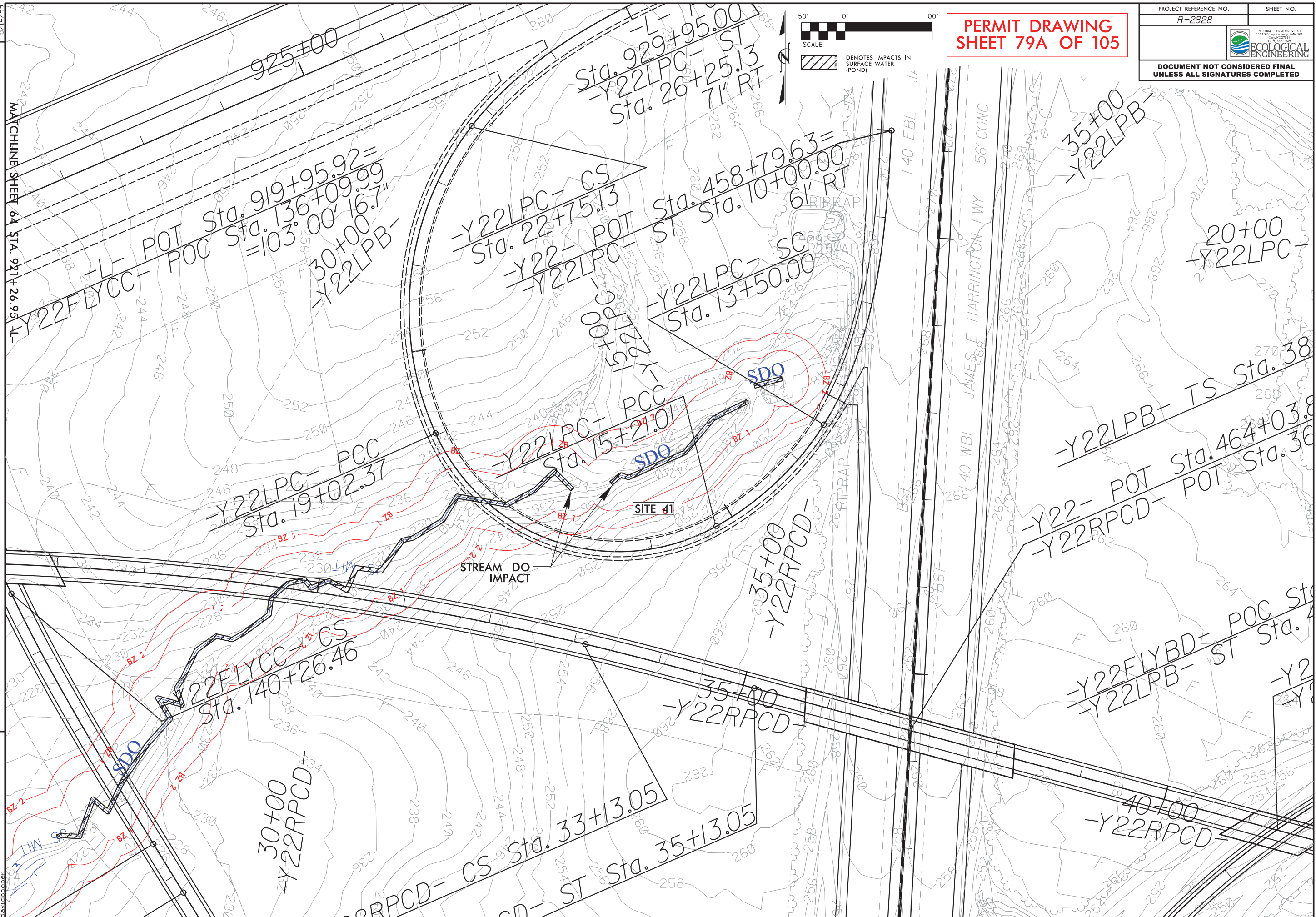
 DENOTES IMPACTS IN SURFACE WATER (POND)



 DENOTES IMPACTS IN
SURFACE WATER
(POND)

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

3/4/22 AM
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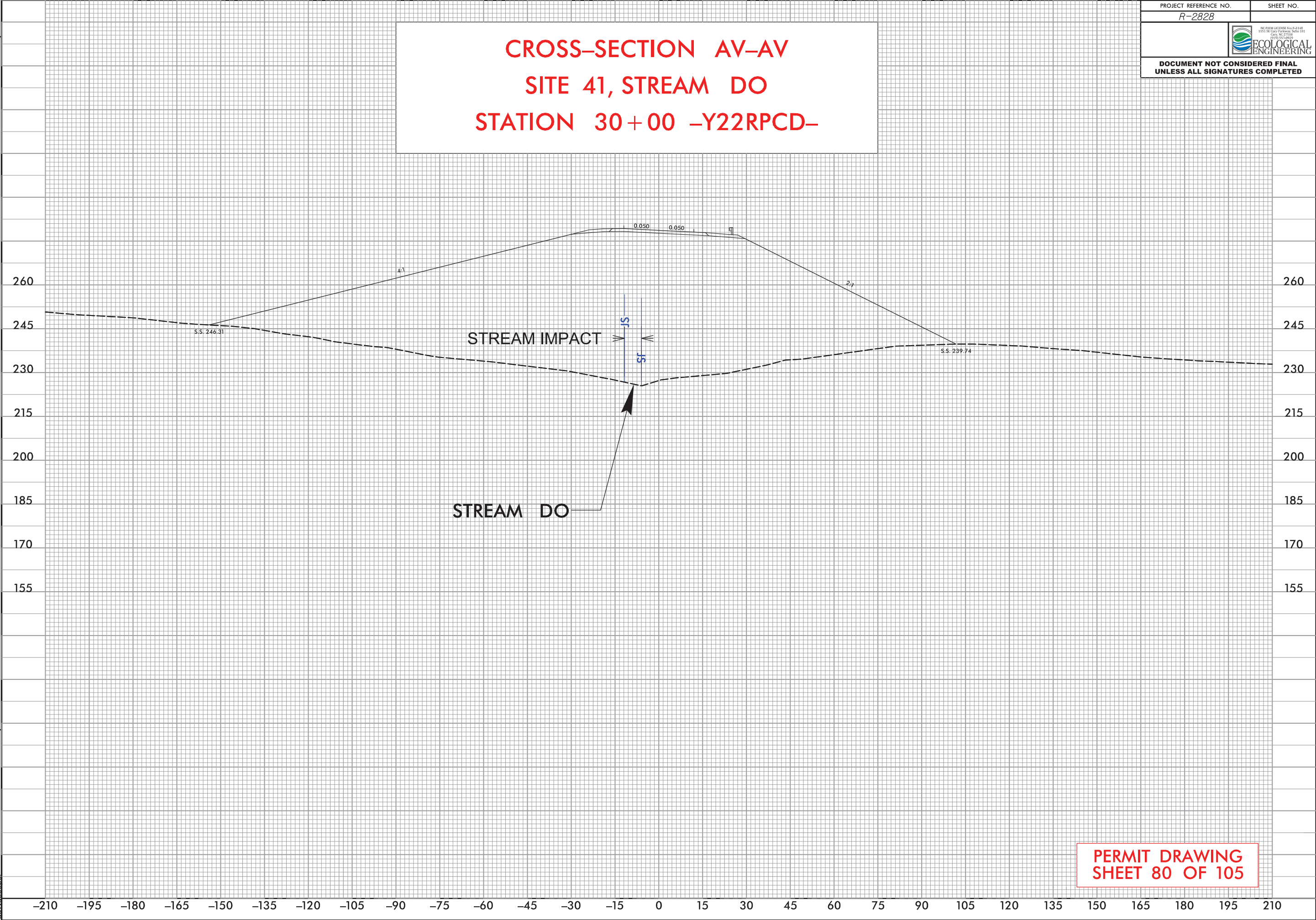
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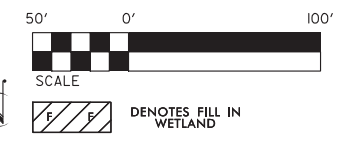
REVISIONS

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davidcopper

CROSS-SECTION AV-AV
SITE 41, STREAM DO
STATION 30+00 -Y22RPCD-

PROJECT REFERENCE NO.	SHEET NO.
R-2828	
 <div>ECOLOGICAL ENGINEERING</div>	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	






WFN (2)

REVISIONS

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David Cooper

50' 0' 100'

SCALE

 DENOTES FILL IN WETLAND



9:43:43 AM
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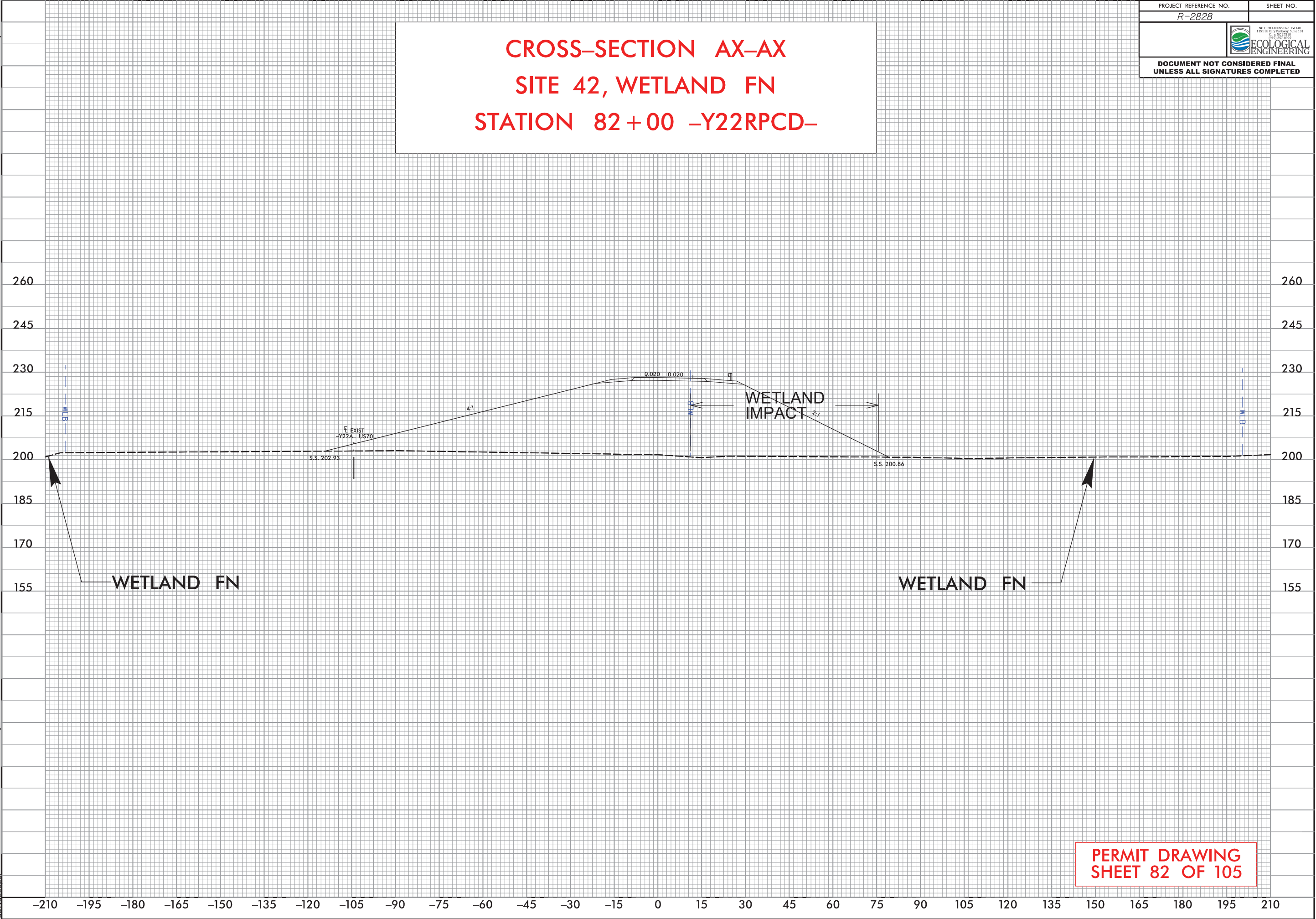
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REVISIONS

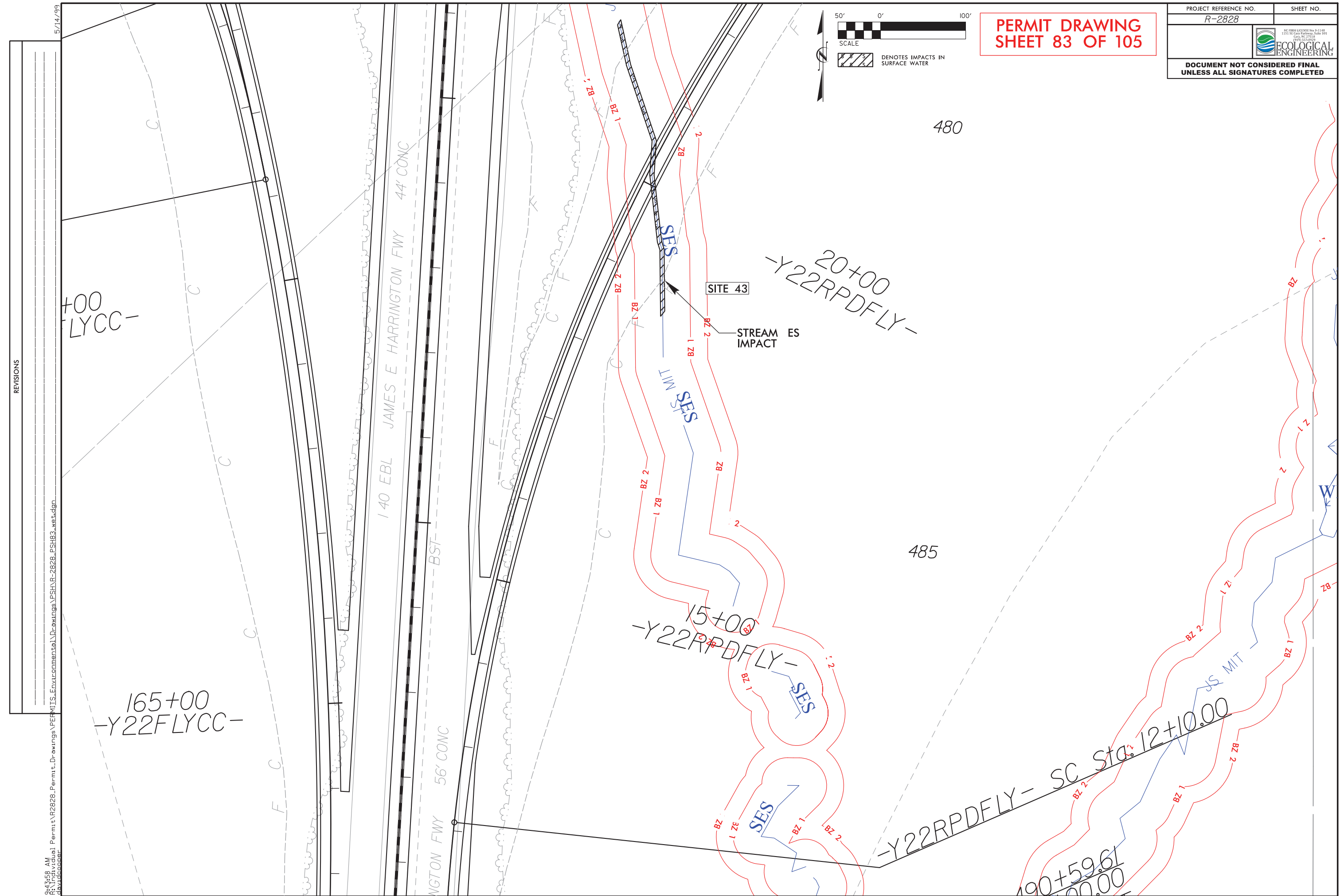
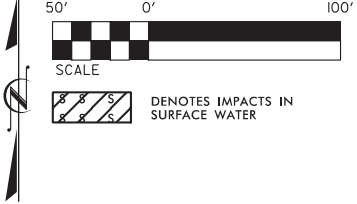
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david cooper

CROSS-SECTION AX-AX
SITE 42, WETLAND FN
STATION 82 + 00 -Y22RPCD-

PROJECT REFERENCE NO.	SHEET NO.
R-2828	
 <div>ECOLOGICAL ENGINEERING</div>	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

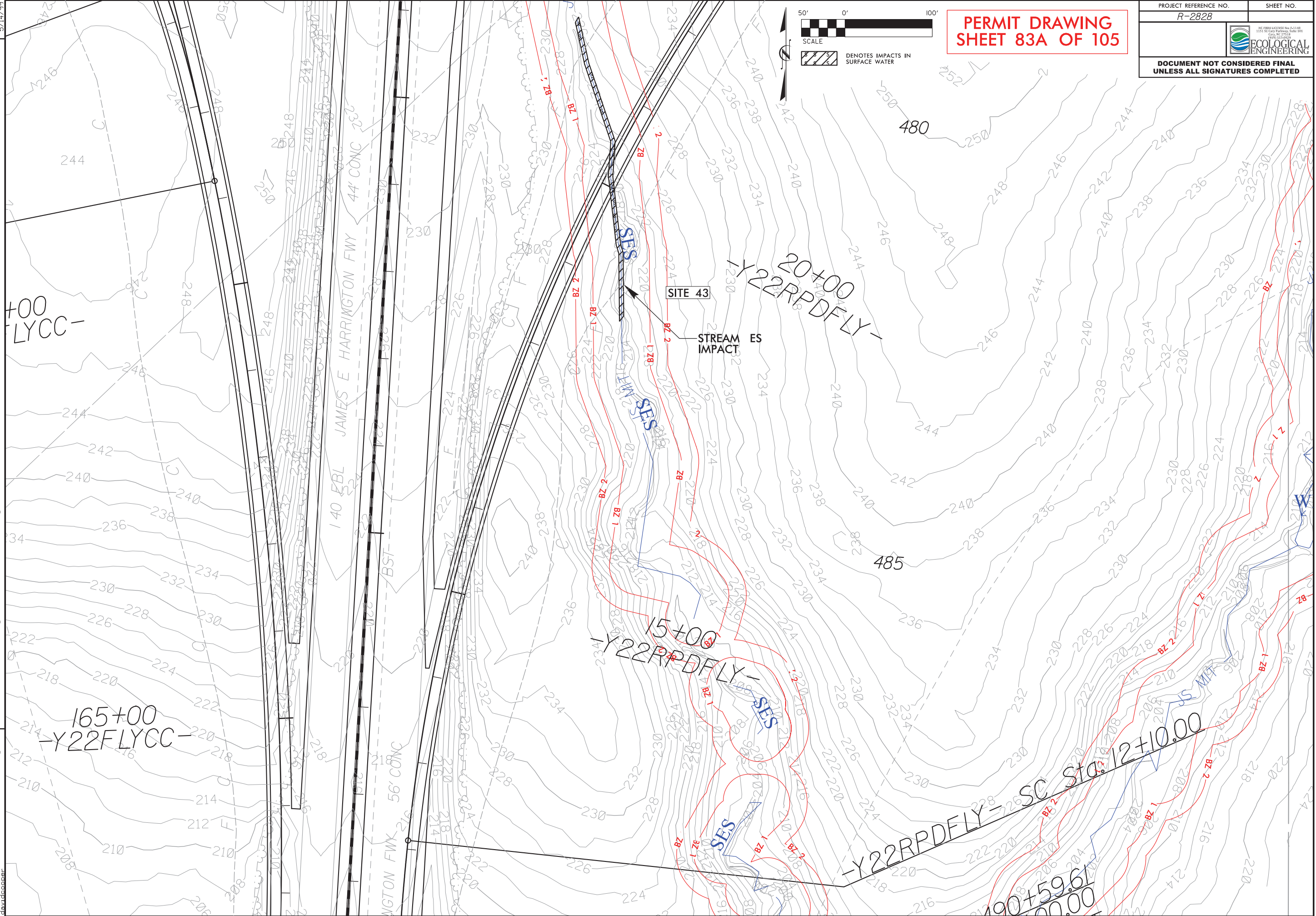


PERMIT DRAWING
SHEET 83 OF 105



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5/14/99

REVISIONS

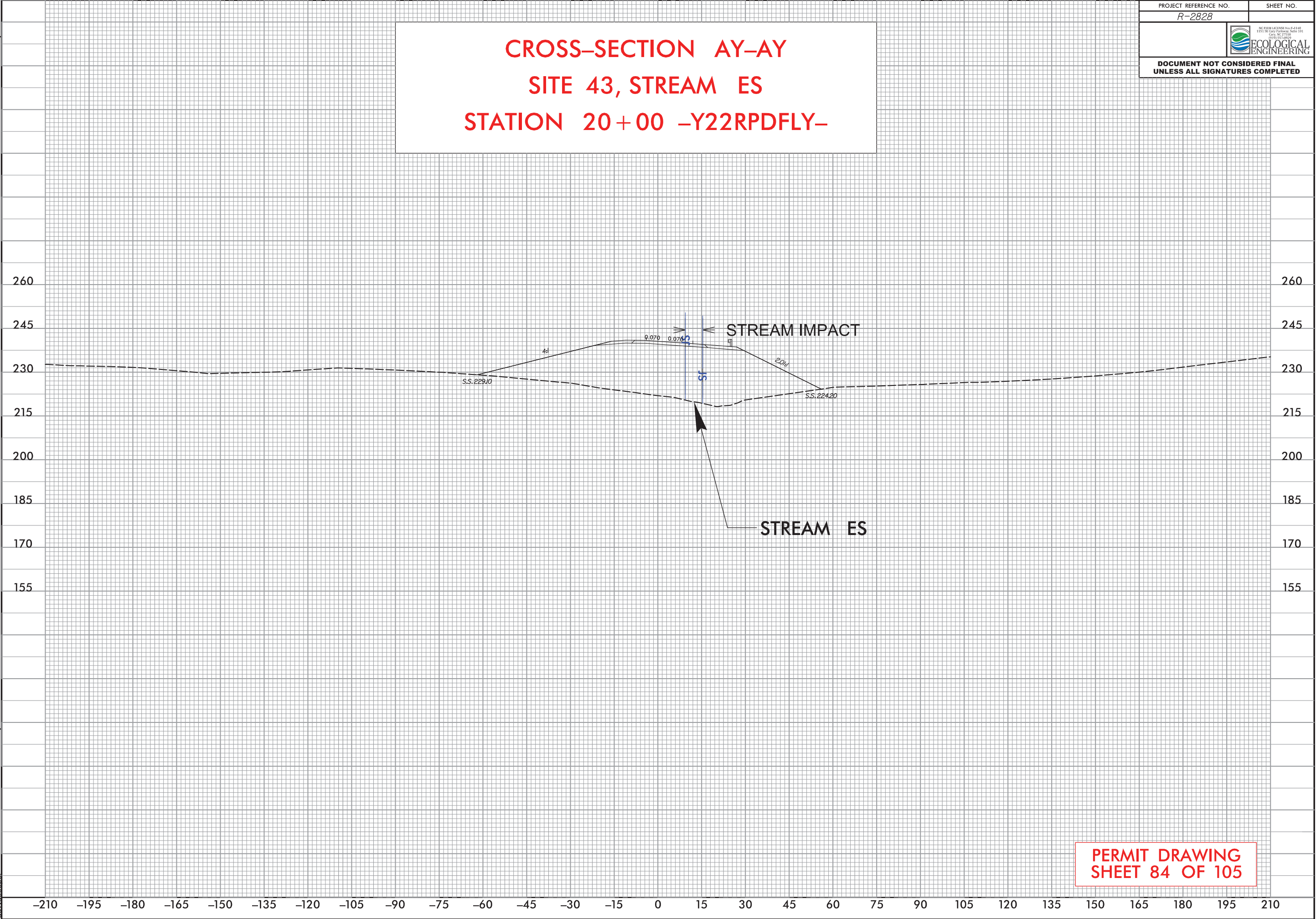


5/14/99

REVISIONS

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davidcopper

CROSS-SECTION AY-AY
SITE 43, STREAM ES
STATION 20+00 -Y22RPDFLY-



$$4\psi \sim$$


Y22FZYC
105+00

140 EBL JAMES E HARRINGTON FWY 70' CONC
---BSF---

JAMES E HARRINGTON FWY

110+00
22F LYCC-

Y2ZFLYC-

00

— STREAM DT
IMPACT

SITE 44

WETLAND FD
IMPACT \

WETLAND FD
IMPACT

-Y22RPEA- POC
Sta. 51+21.52=
-Y22LPA- ST
Sta. 10+00.00
12' RT

00.0
 12' RT
 -L- POT
 Sta. 940+62.94 =
 -Y 22 LPA - ST
 Sta. 27+63.6
 71' L

Sta. 933+62.00 =
-Y 22LPB- POT
Sta. 31+34.98
-67° 10' 47.6"

945#00

NIXON, JO

SR 2703 NEW BETHEL CHURCH RD

1529 PROPERTIES LLC

~~-Y22LPA- SC~~
~~Sta. 25+13.66~~

50

445

GR

15' CONC

IS
BKD


REVISIONS


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5/14/99

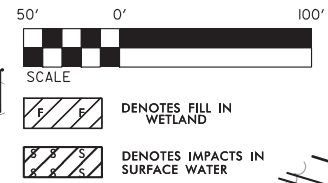
~~MATCHLINE SHEET 87 STA. 452+00.90 -Y22~~

50' 0' 100'

SCALE

 DENOTES FILL IN WETLAND

 DENOTES IMPACTS IN SURFACE WATER



 DENOTES FILL IN WETLAND

 DENOTES IMPACTS IN SURFACE WATER

 DENOTES IMPACTS IN SURFACE WATER

~~MATCHLINE SHEET 87 STA. 452+00.90~~

REVISIONS

9:44:24 AM
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David Cooper

5/14/99

00.0
12' RT
-L- POT
Sta. 940+62.94 =
-Y22LPA- ST
Sta. 27+63.66
7' LT
450

$$\frac{-Y22LPA - SC}{Std. 25 + 13.66}$$

WFB



WETLAND FC IMPACT

WETLAND FD
IMPACT

— STREAM DT
IMPACT

SITE 44

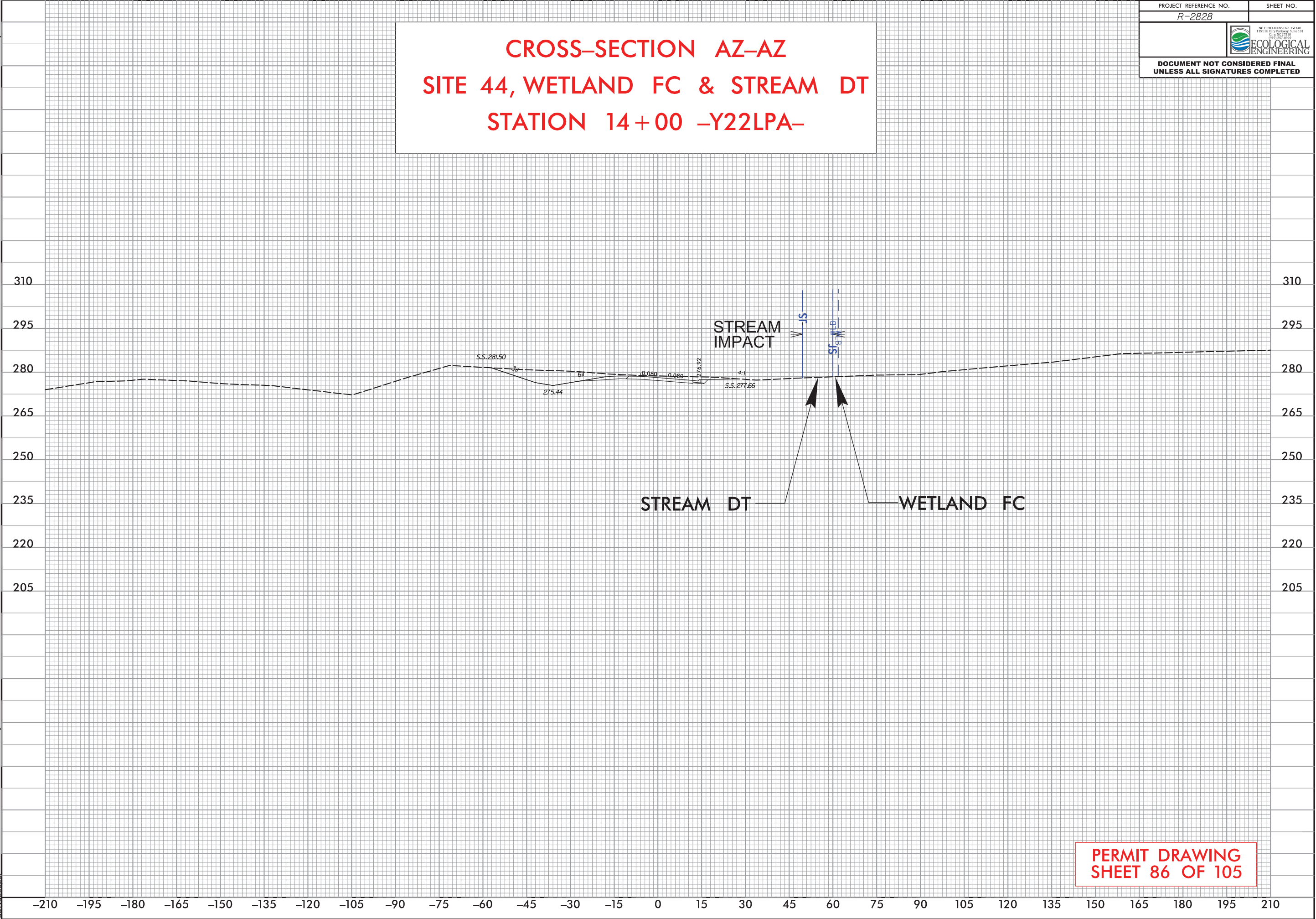
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REVISIONS

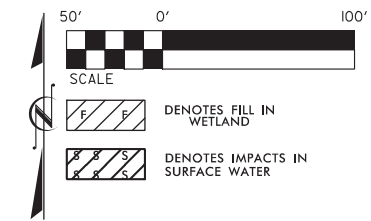
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david cooper

CROSS-SECTION AZ-AZ
SITE 44, WETLAND FC & STREAM DT
STATION 14+00 -Y22LPA-

PROJECT REFERENCE NO.	SHEET NO.
R-2828	
 <div>ECOLOGICAL ENGINEERING</div>	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



PERMIT DRAWING
SHEET 87 OF 105



MATCHLINE SHEET 89 STA. 34+22.41 -Y22RPB-

~~-Y22FLYCC- POC Sta. 1121~~
~~-Y22RPAFLY- ST Sta. 68+80~~
12'

WETLAND EL
IMPACT

SITE 44 CONT'D.

STREAM DT
IMPACT

220+00
B-1

NC DEPARTMENT OF
TRANSPORTATION

~~-Y22LPB-CS~~
~~Sta. 24+23.65~~

25+00
-Y22LPB-
Sta. 26+73.65

15+00
-Y22LPB-

$$\begin{aligned} & \text{Sta. } 929 + 47.83 = \text{POT} \\ & \text{FY22LPB} - \text{ST} \\ & \text{Sta. } 10 + 00.00 \\ & 71' \text{ LT} \end{aligned}$$

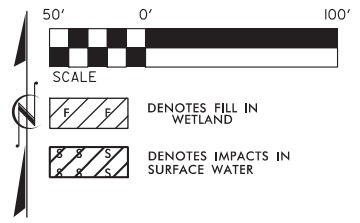
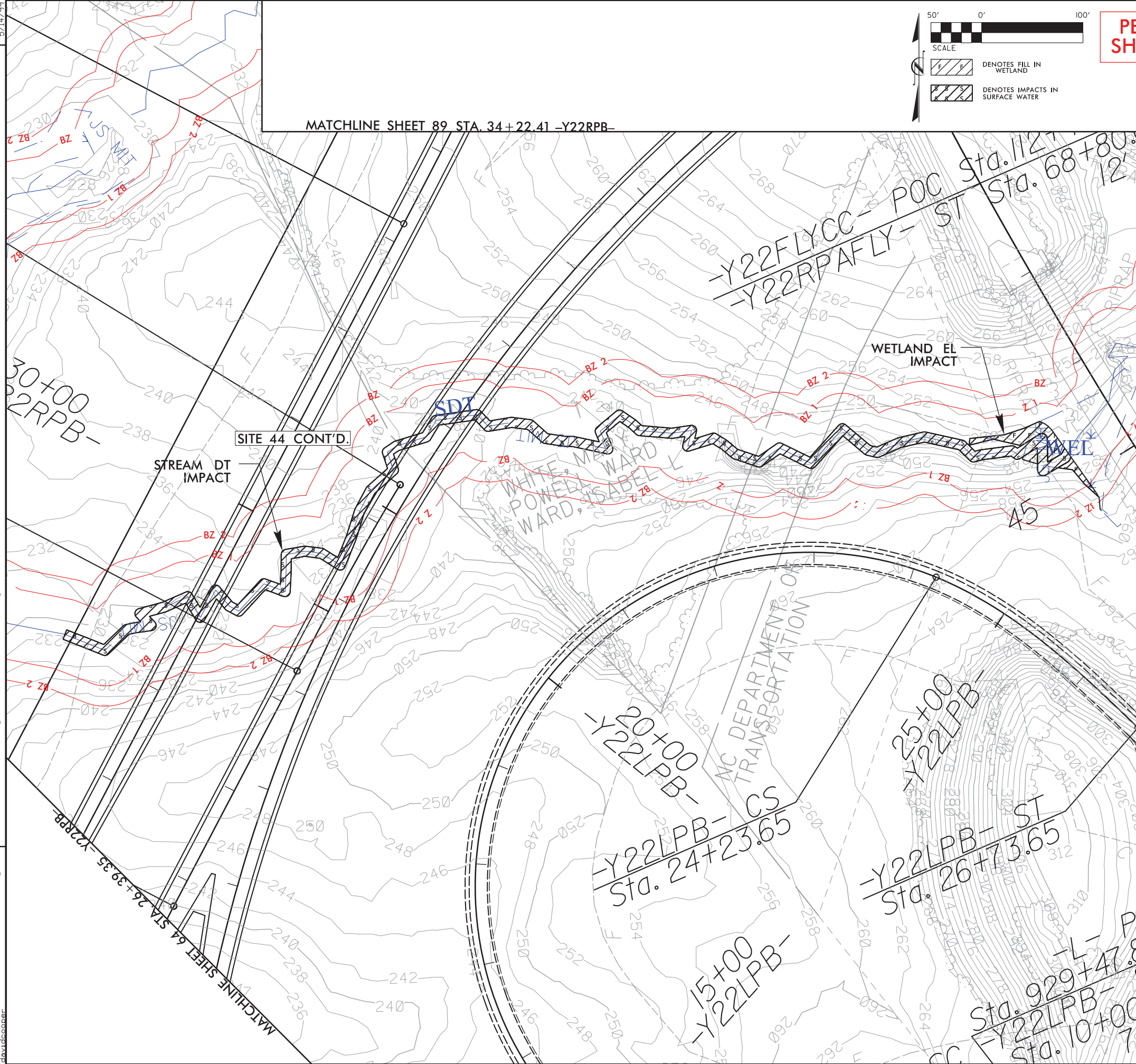
MATCHLINE SHEET 85 STA. 452+00.90 -Y22-

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REVISIONS

5/14/99
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david cooper

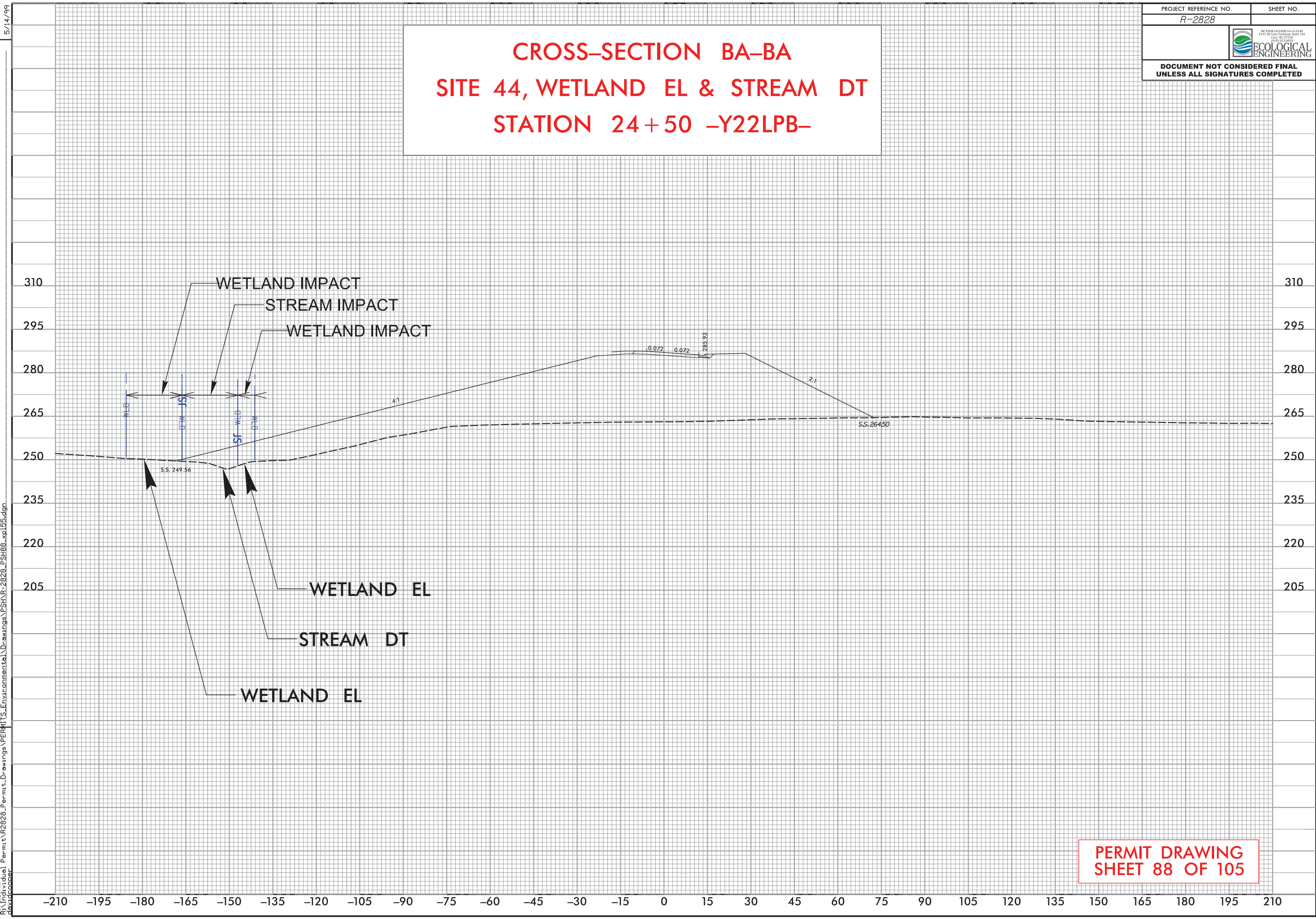
REVISIONS



PERMIT DRAWING
SHEET 87A OF 105

PROJECT REFERENCE NO.	SHEET NO.
R-2828	
 ECOLOGICAL ENGINEERING NC PERMITS LICENSE No. E-1148 1151 3rd Corp Parkway, Suite 101 Cary, NC 27513 (919) 555-5250	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

CROSS-SECTION BA-BA
SITE 44, WETLAND EL & STREAM DT
STATION 24+50 -Y22LPB-

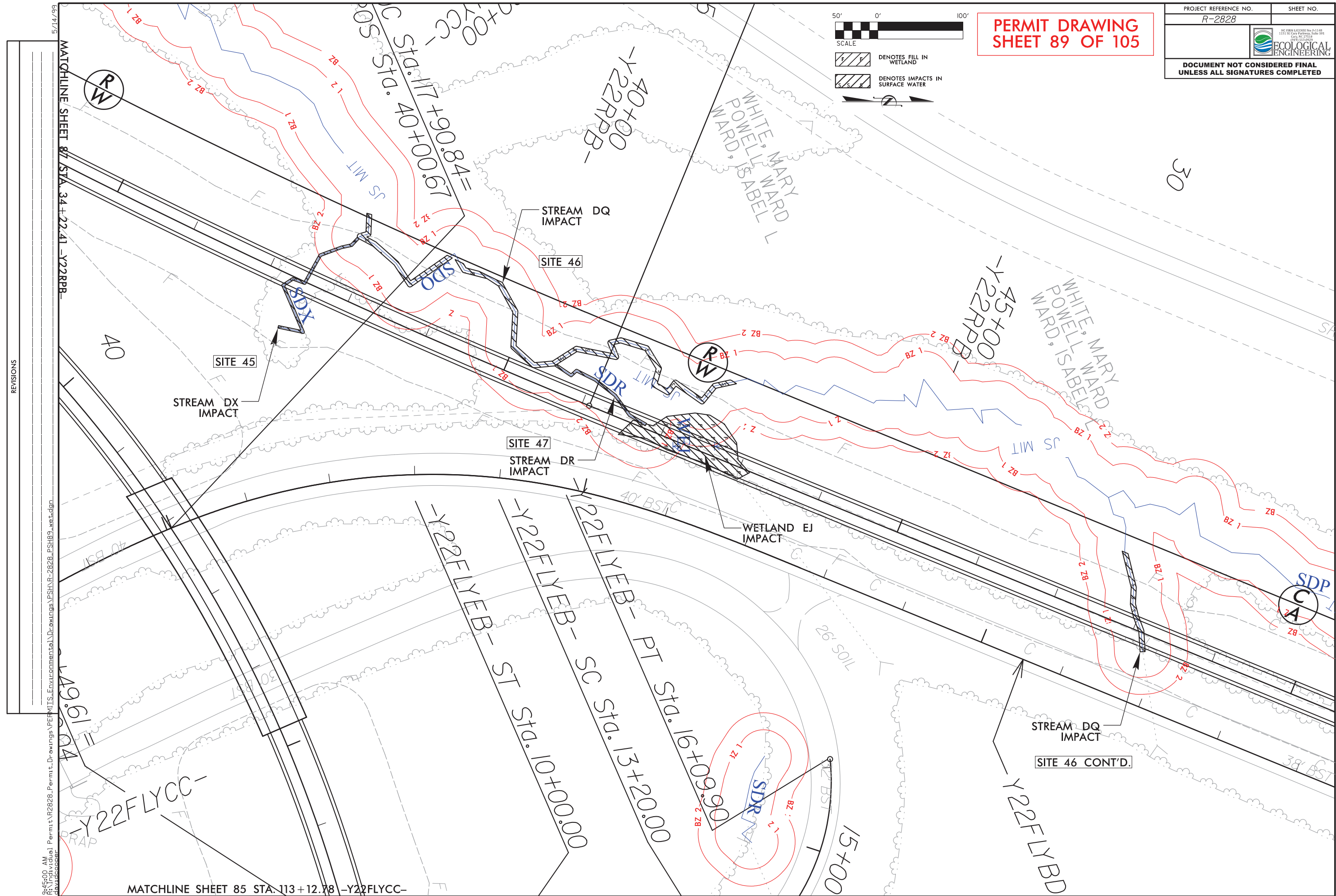
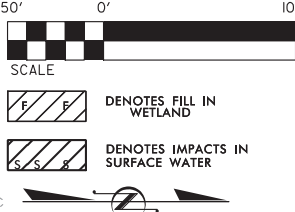


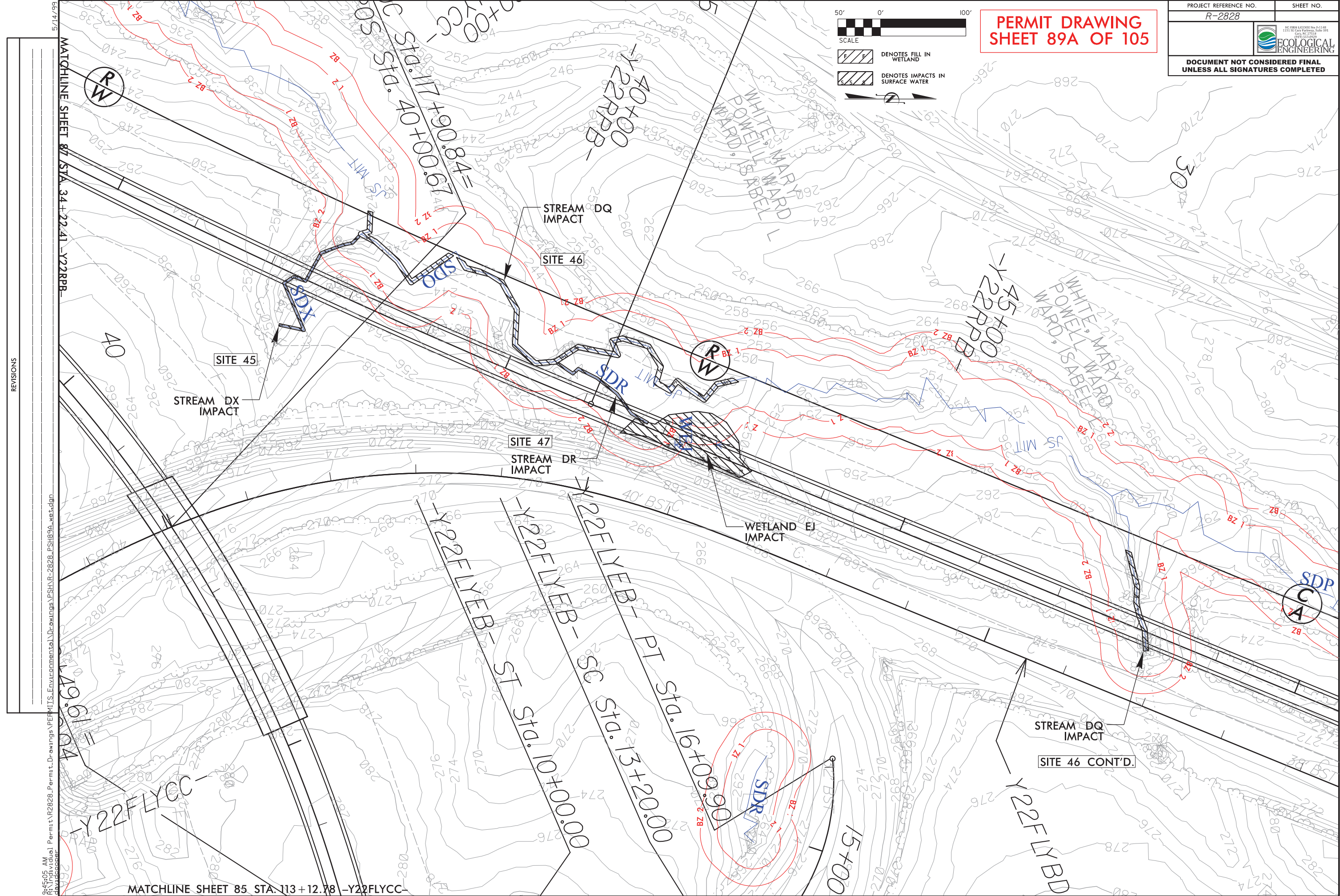
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SHEET 88 OF 105

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PERMIT DRAWING
SHEET 89 OF 105





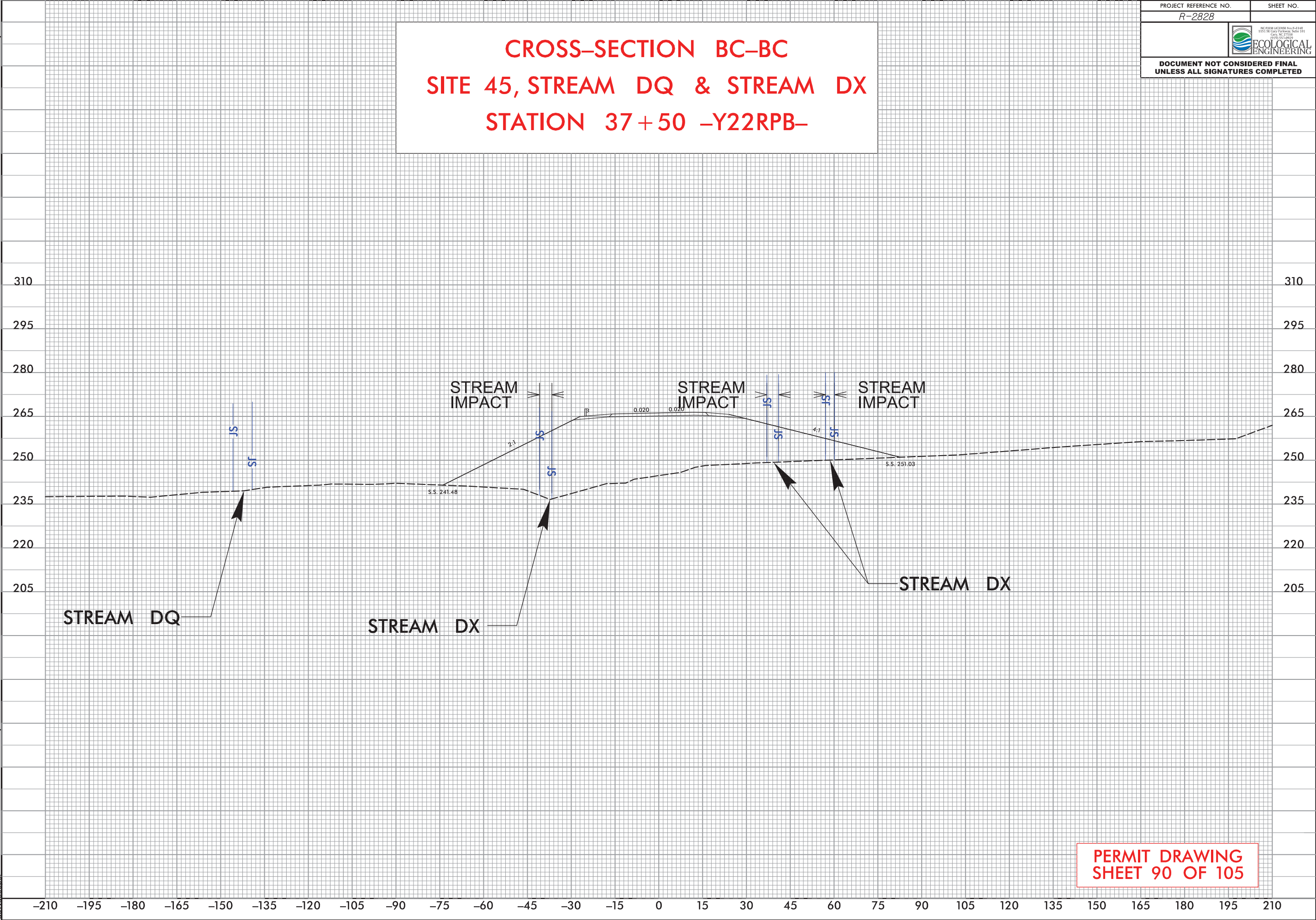
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david cooper

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REVISIONS

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davidcooper

CROSS-SECTION BC-BC
SITE 45, STREAM DQ & STREAM DX
STATION 37+50 -Y22RPB-

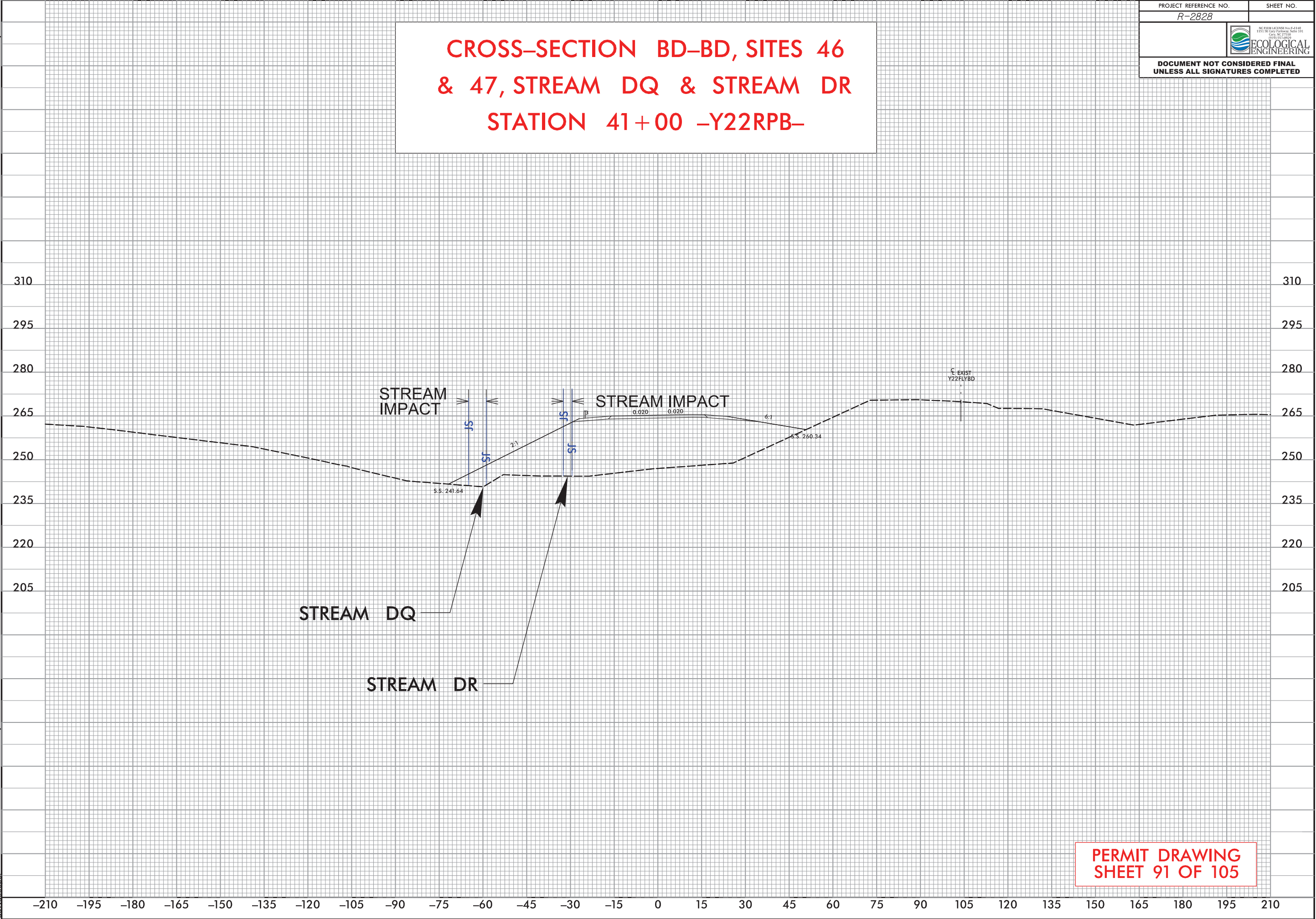


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REVISIONS

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davidcopper

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& 47, STREAM DQ & STREAM DR
STATION 41+00 -Y22RPB-

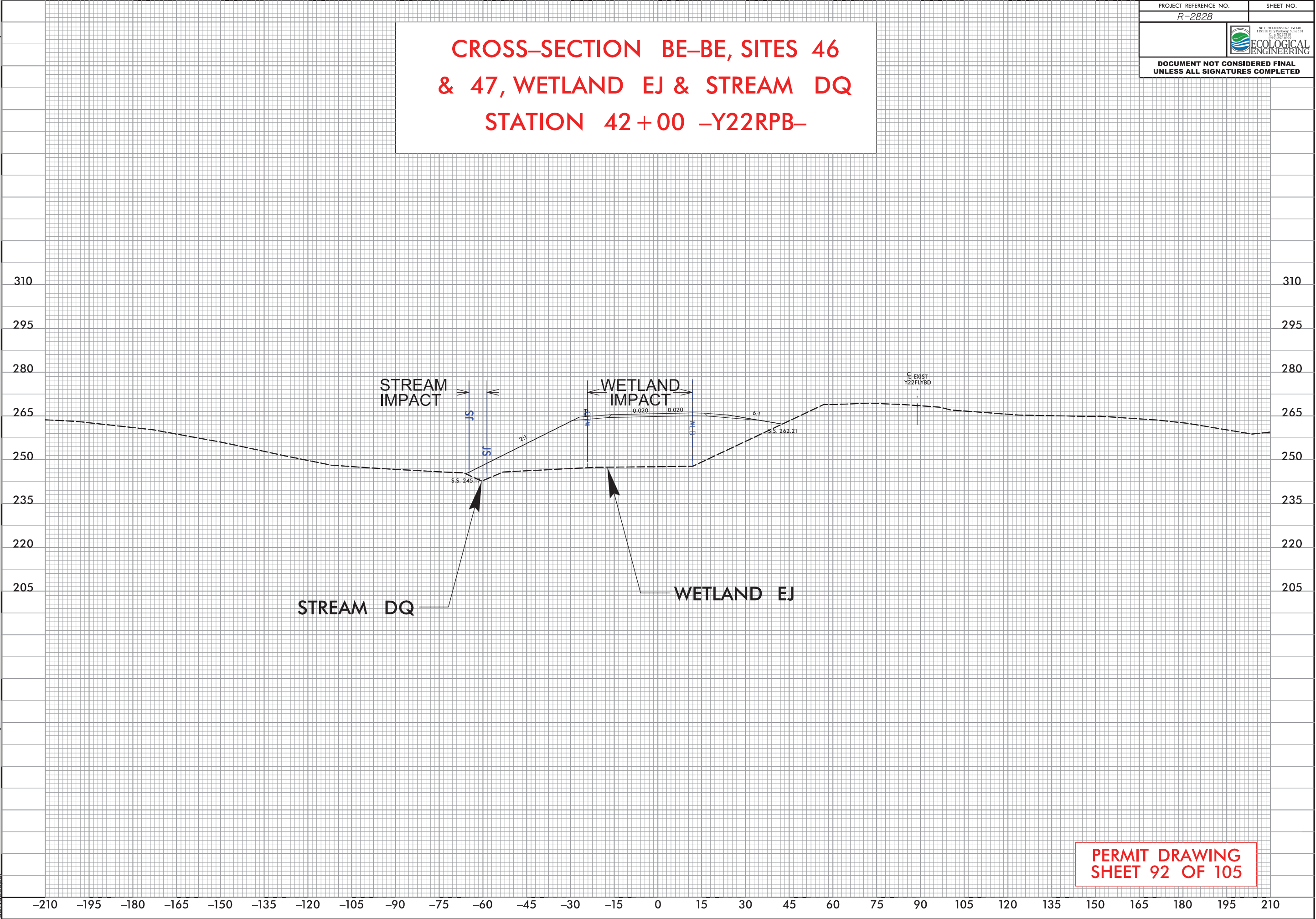


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REVISIONS

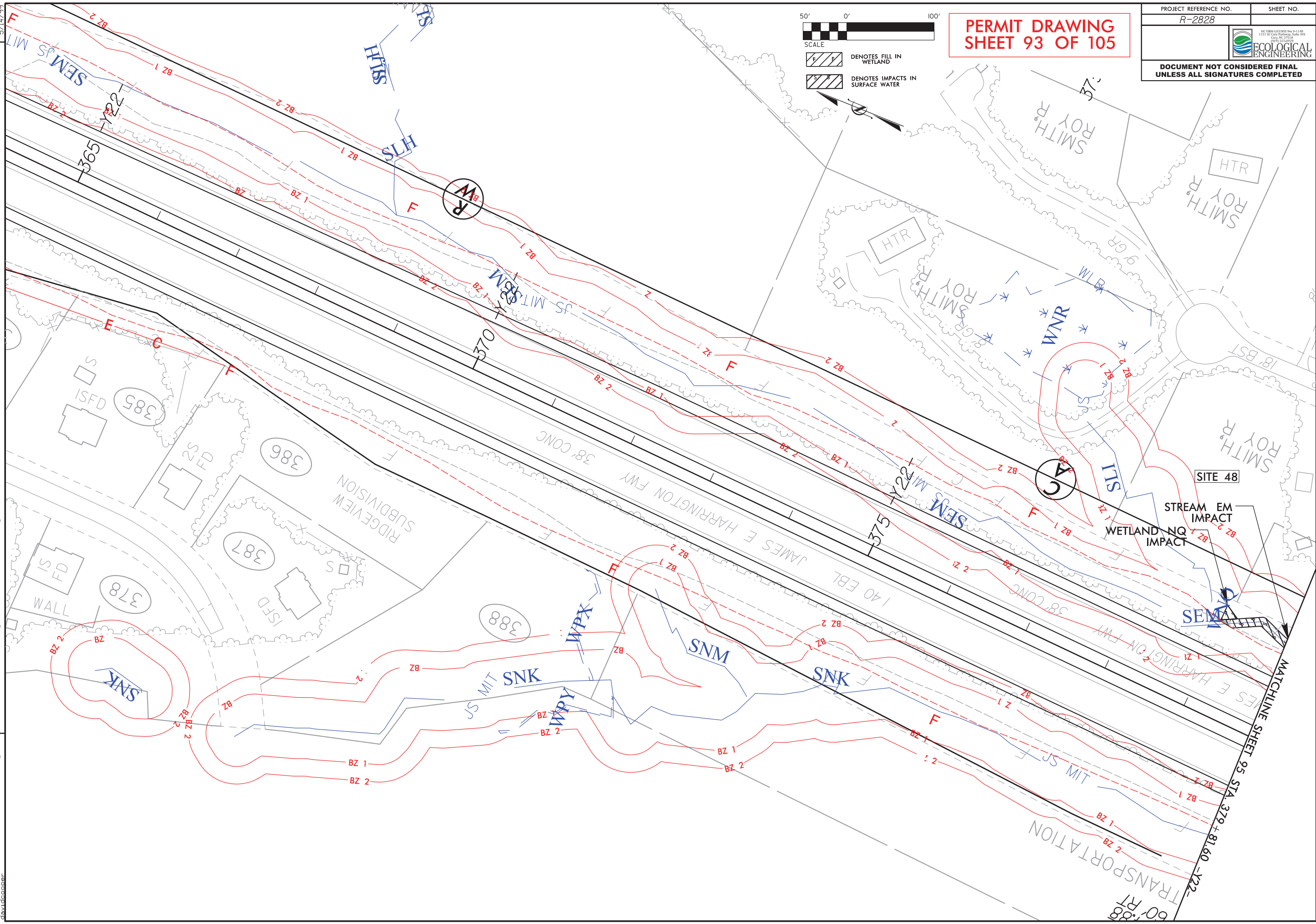
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david cooper

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& 47, WETLAND EJ & STREAM DQ
STATION 42+00 -Y22RPB-



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PSH93
davidcooper

REVISIONS



PERMIT DRAWING
SHEET 93 OF 105

50' 0' 100'

SCALE

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-2828	
 ECOLOGICAL ENGINEERING INC. FIRM LICENSE No. F-1148 1151 SW Cary Parkway, Suite 100 Cary, NC 27513 (919) 555-2529	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

SITE 48

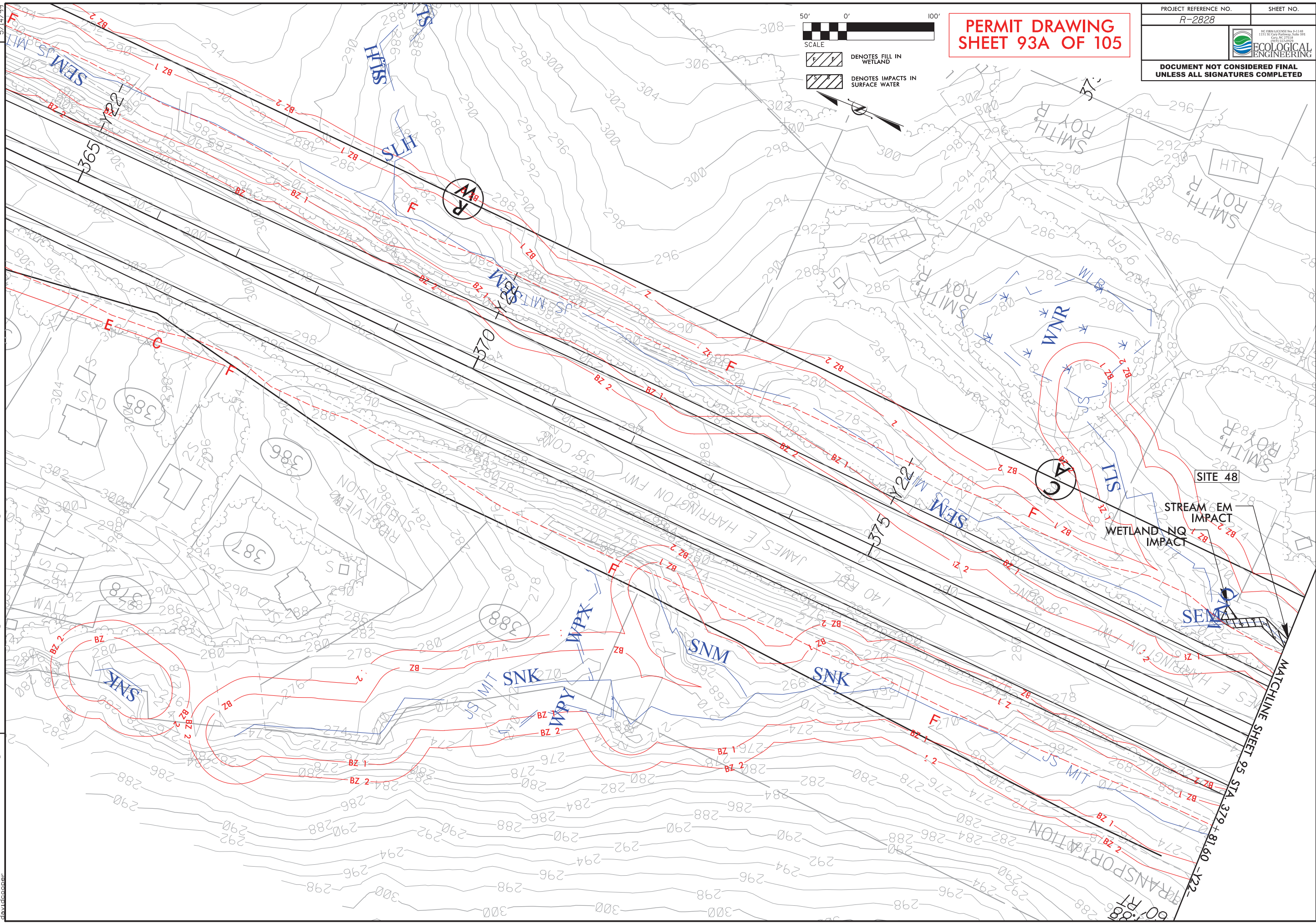
STREAM EM IMPACT

WETLAND NQ IMPACT

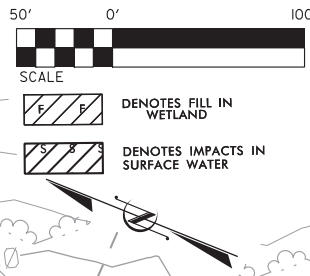
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david cooper

REVISIONS



PERMIT DRAWING
SHEET 93A OF 105



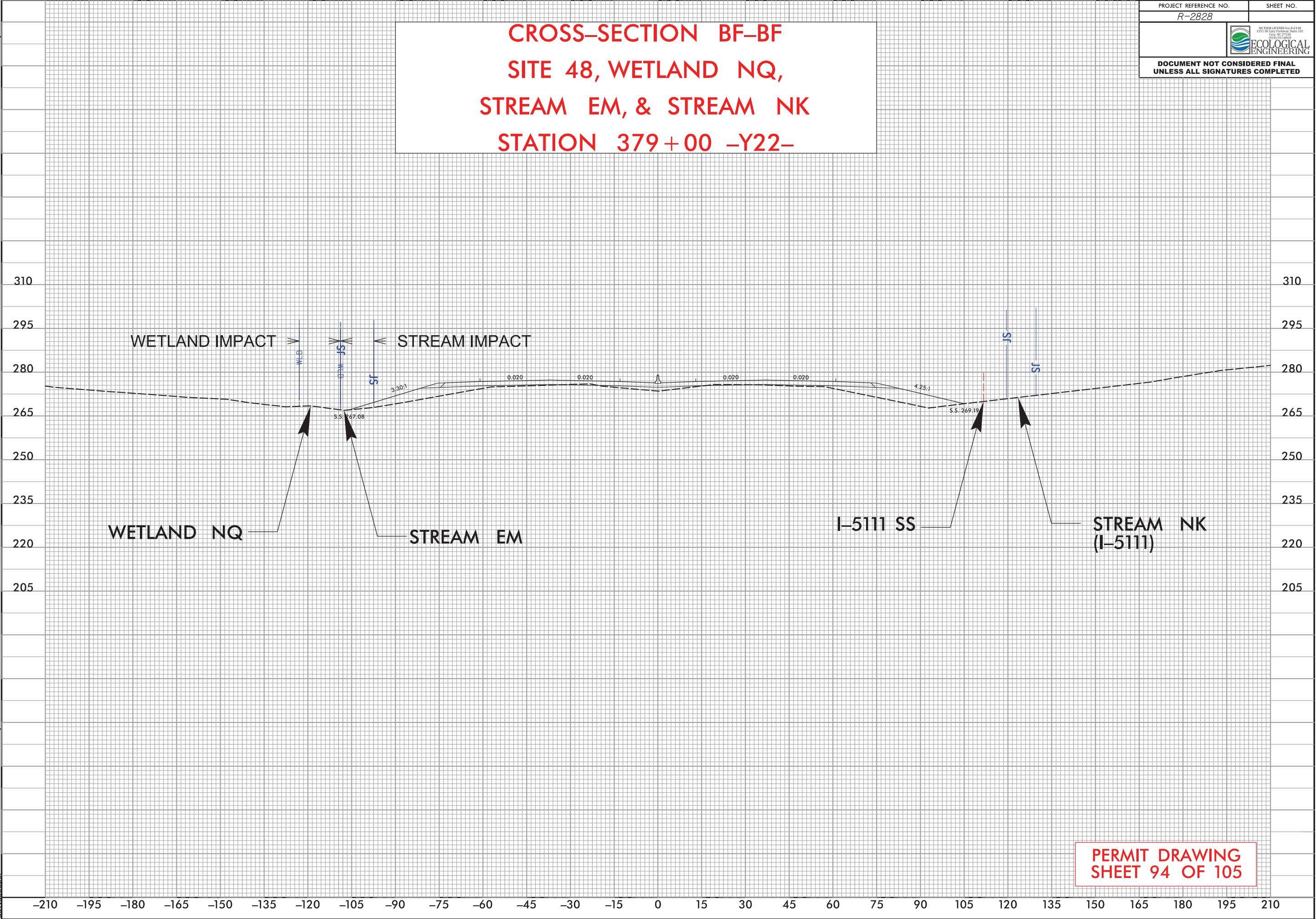
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ECOLOGICAL ENGINEERING INC. FIRM LICENSE NO. E-1148 1151 3rd Street, Suite 100 Durham, NC 27701 (919) 555-0000	
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REVISIONS

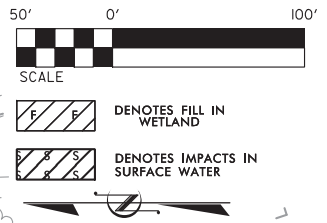
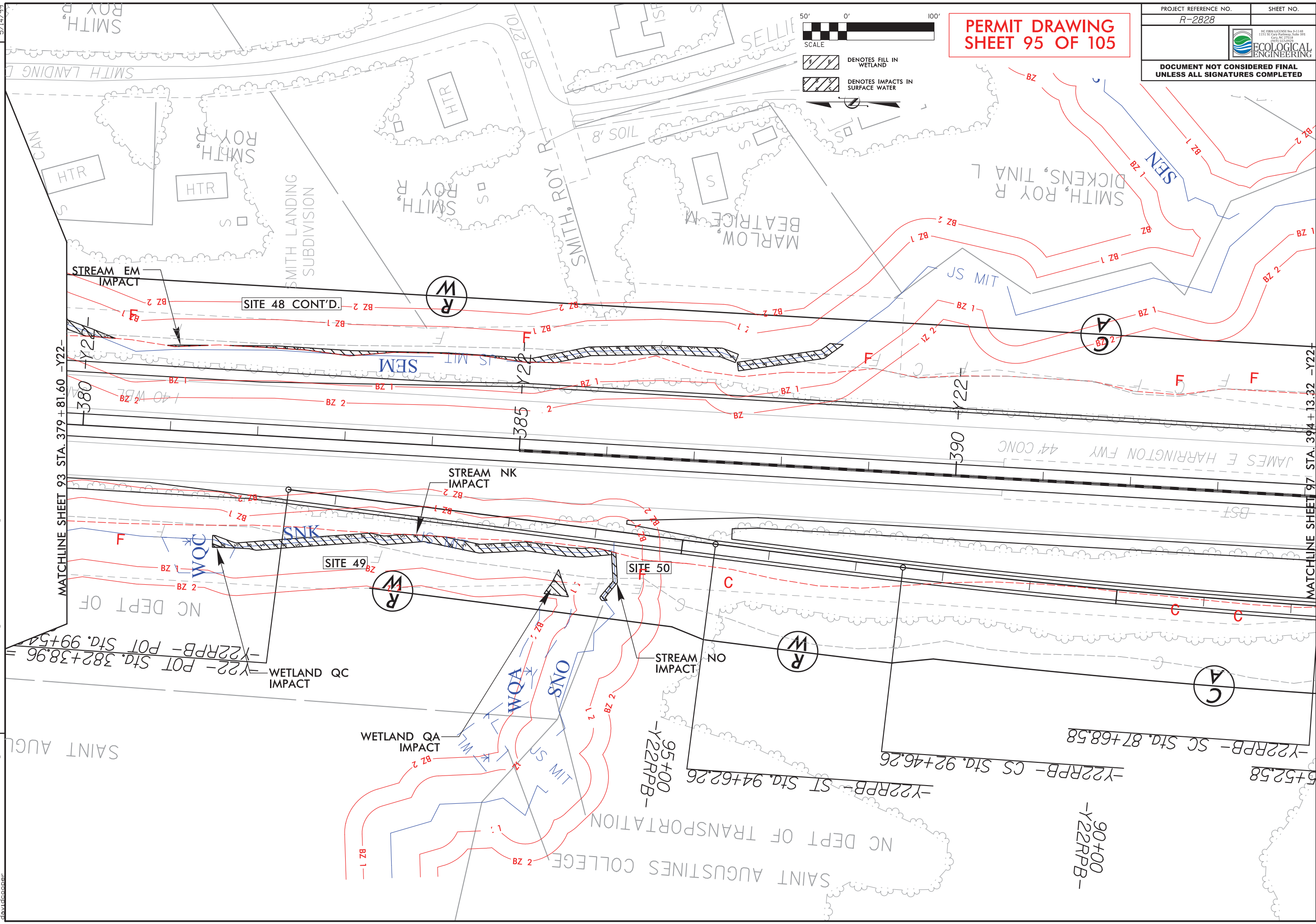
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david cooper

CROSS-SECTION BF-BF
SITE 48, WETLAND NQ,
STREAM EM, & STREAM NK
STATION 379+00 -Y22-



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davidcooper

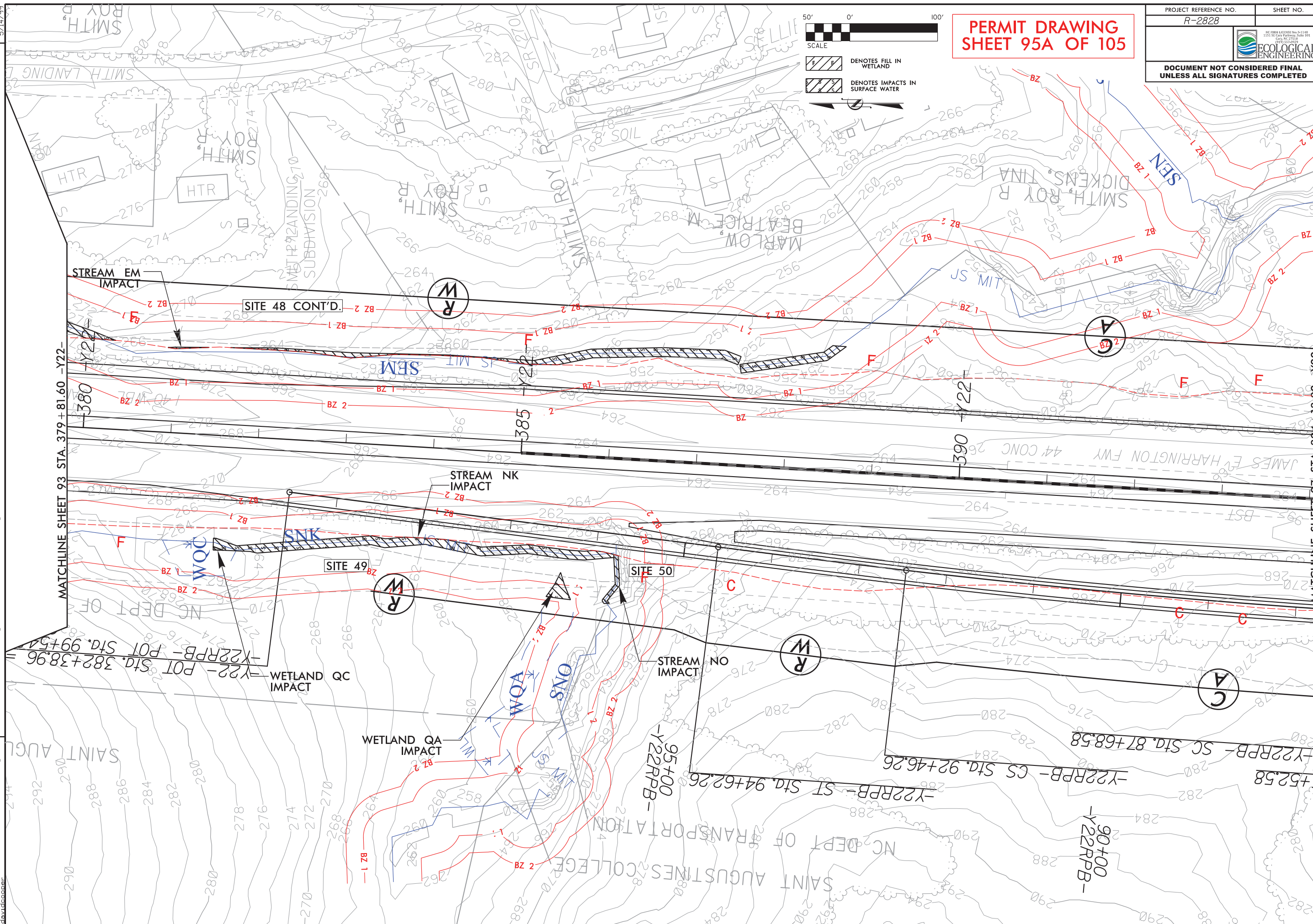
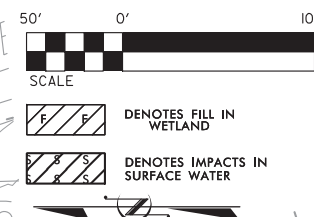
REVISIONS



PERMIT DRAWING
SHEET 95 OF 105

PROJECT REFERENCE NO. R-2828	SHEET NO.
 NC PERMITS LICENSE No. P-1148 1151 36th Street, Suite 100 Cary, NC 27513 (919) 555-2029	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

PERMIT DRAWING
SHEET 95A OF 105



REVISIONS

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David Cooper

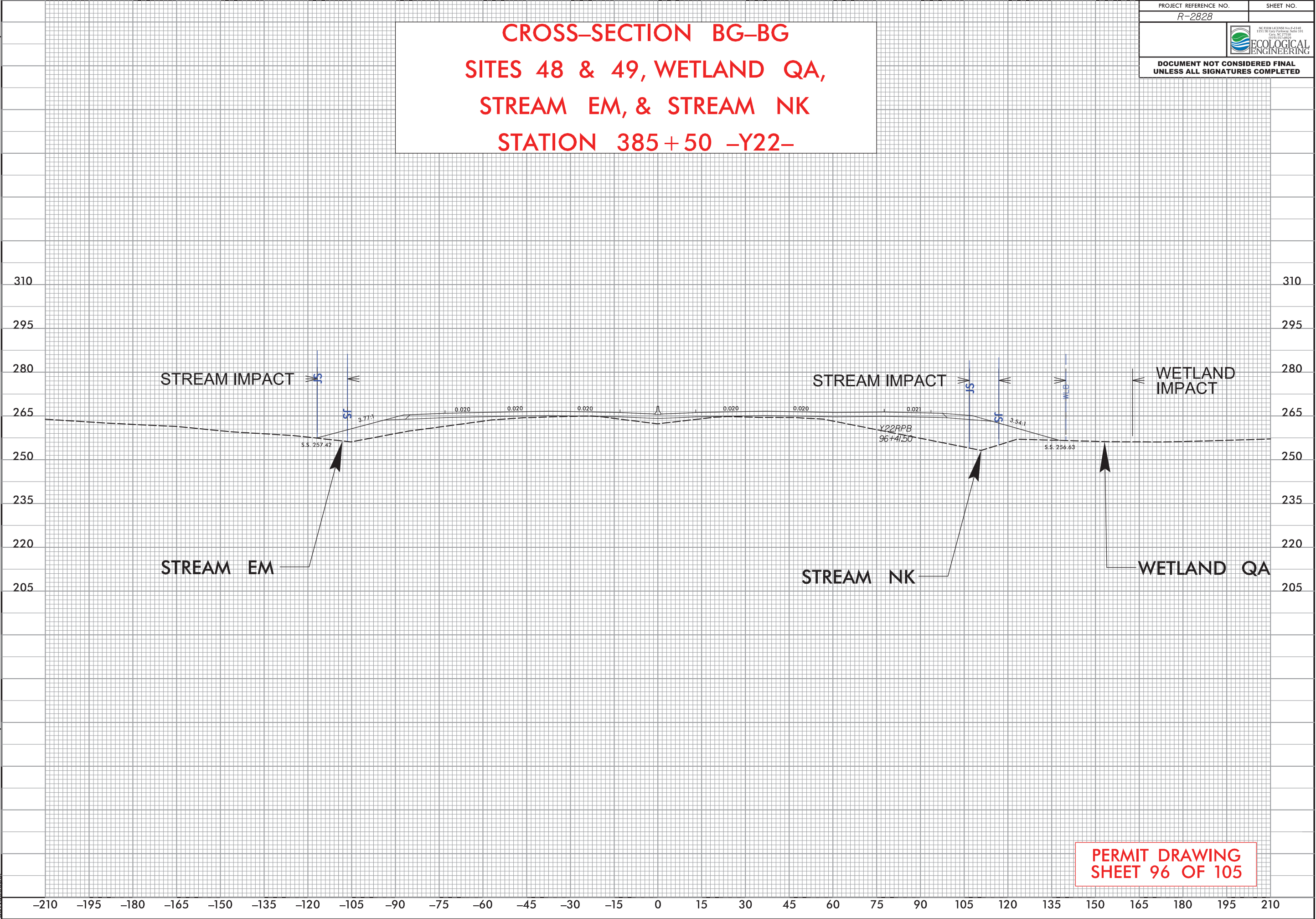
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REVISIONS

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david cooper

CROSS-SECTION BG-BG
SITES 48 & 49, WETLAND QA,
STREAM EM, & STREAM NK
STATION 385+50 -Y22-

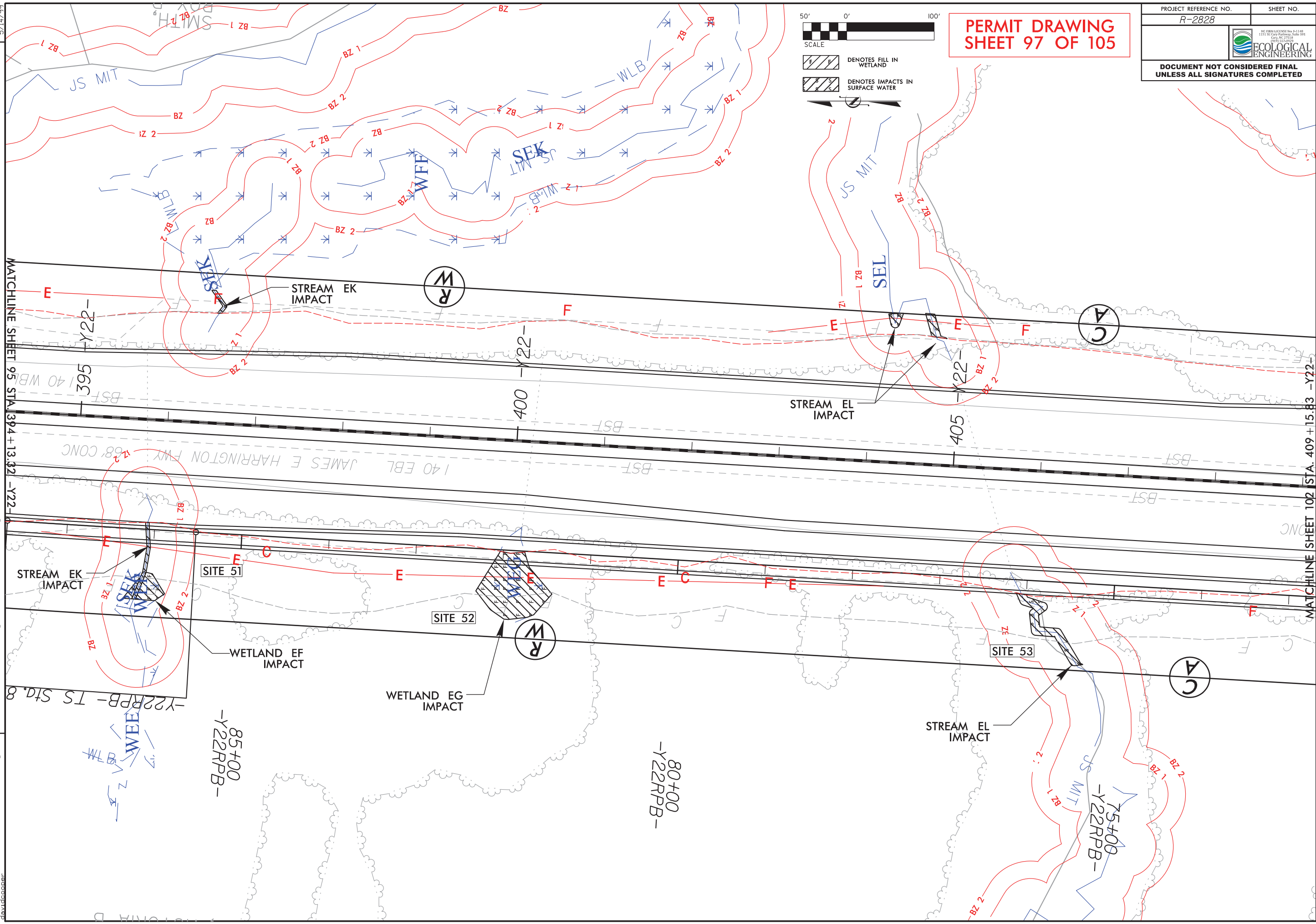
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R-2828	
 ECOLOGICAL ENGINEERING	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



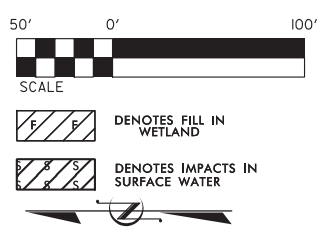
PERMIT DRAWING
SHEET 96 OF 105


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david cooper

REVISIONS



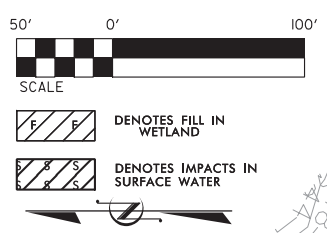
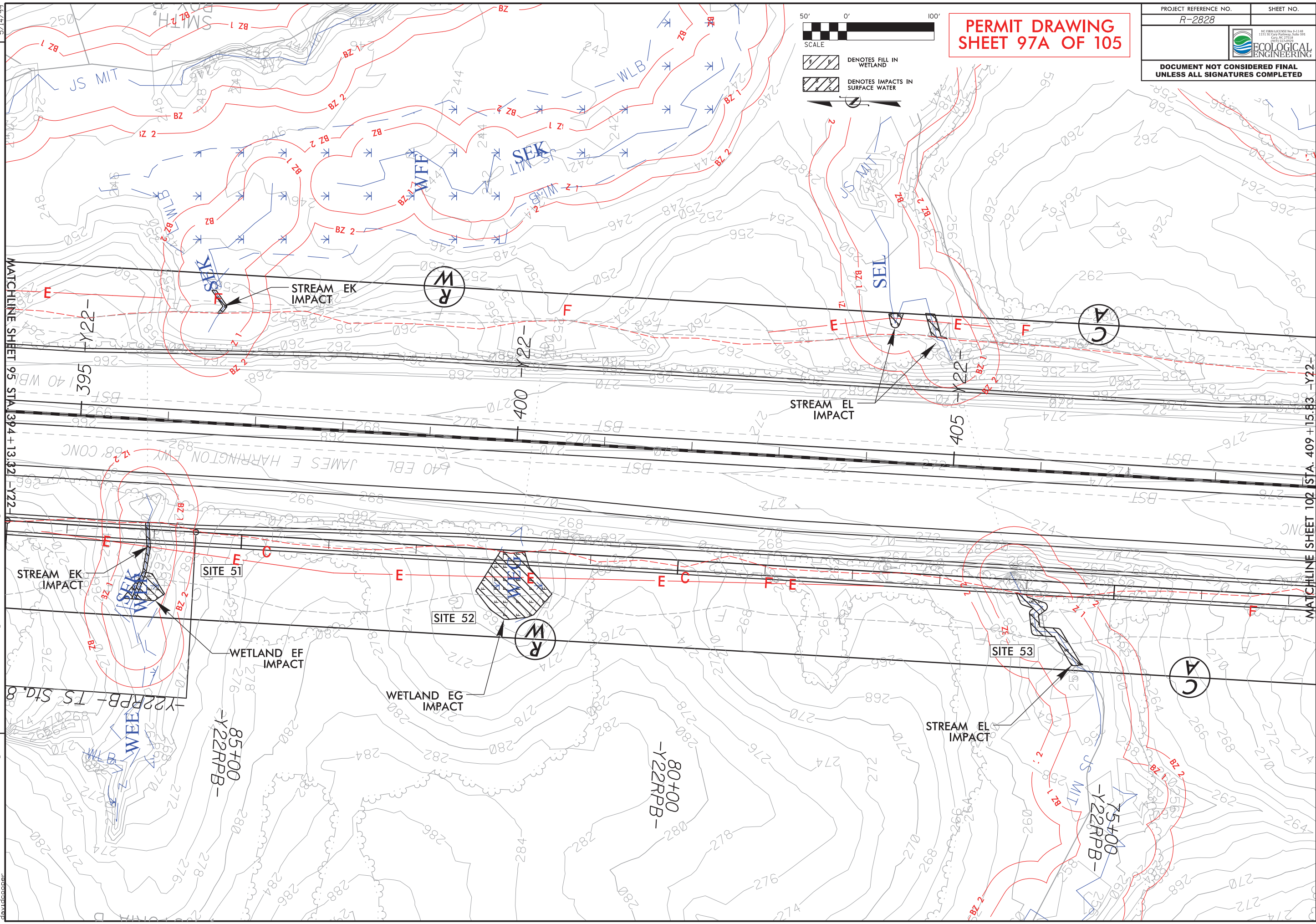
**PERMIT DRAWING
SHEET 97 OF 105**



PROJECT REFERENCE NO.	SHEET NO.
R-2828	
 ECOLOGICAL ENGINEERING	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

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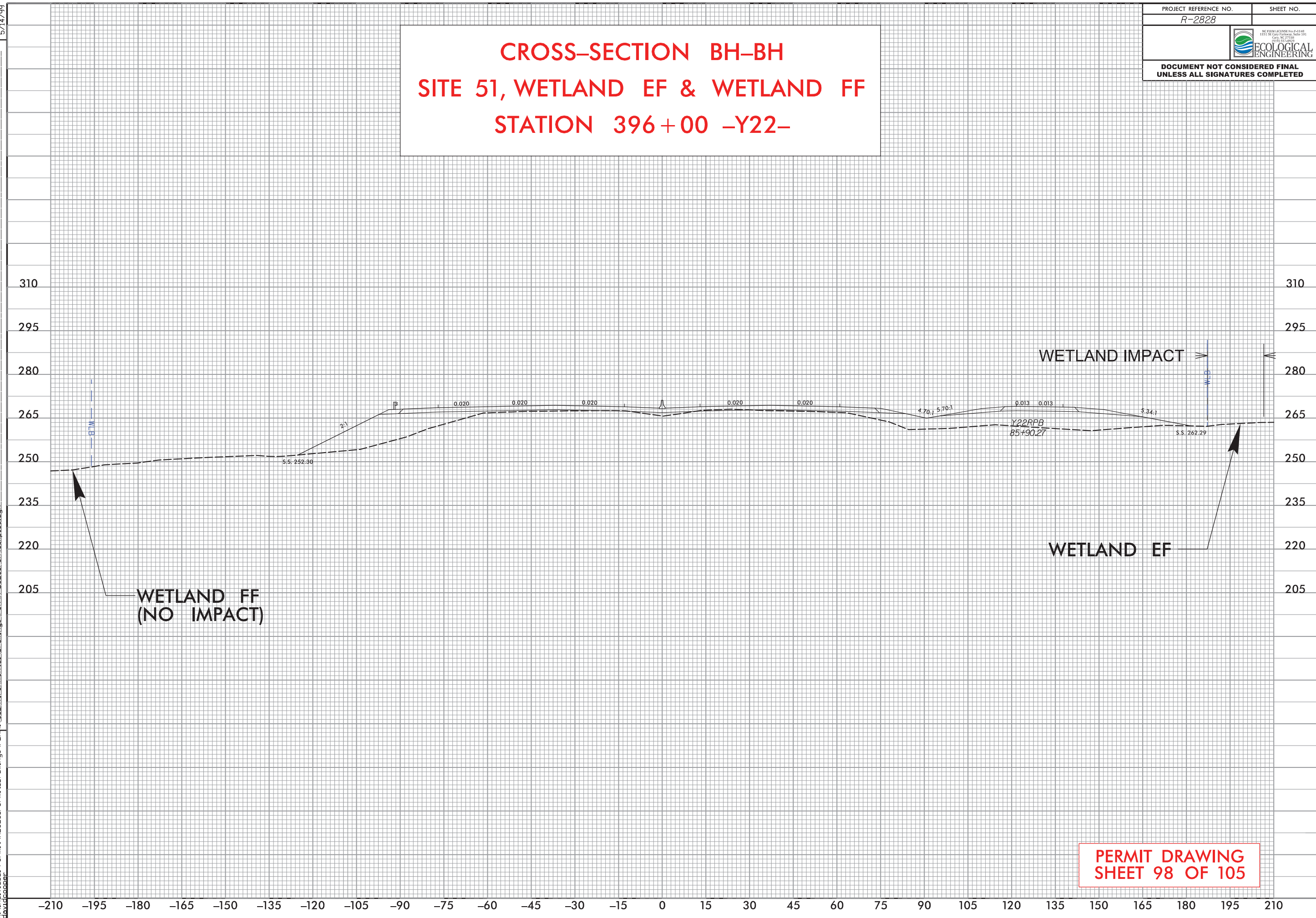
REVISIONS



**PERMIT DRAWING
SHEET 97A OF 105**

PROJECT REFERENCE NO. R-2828	SHEET NO.
 ECOLOGICAL ENGINEERING INC. FIRM LICENSE No. E-1148 1151 3rd Corp Parkway, Suite 100 Cary, NC 27513 (919) 552-9099	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

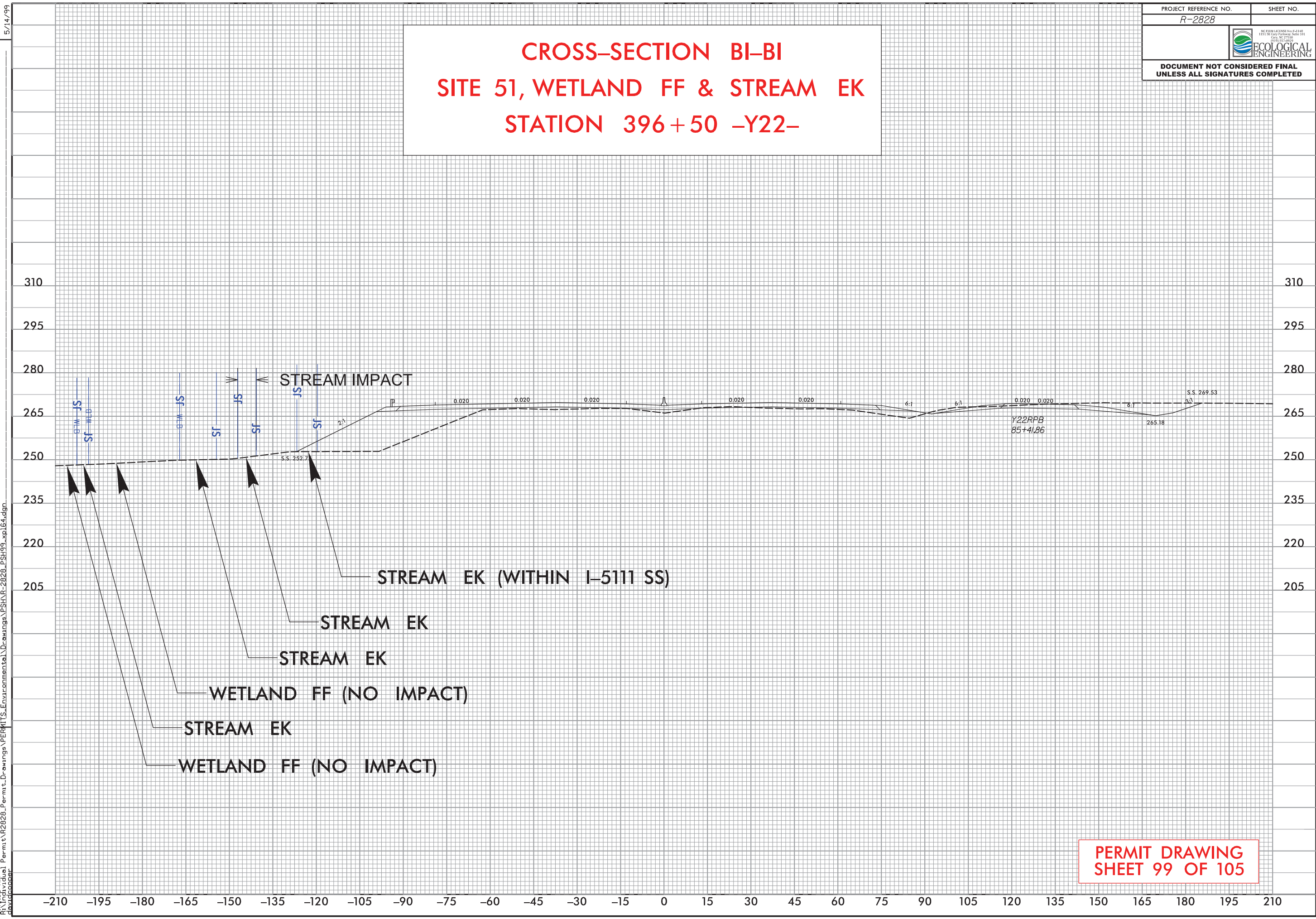
CROSS-SECTION BH-BH
SITE 51, WETLAND EF & WETLAND FF
STATION 396+00 -Y22-



PERMIT DRAWING
SHEET 98 OF 105

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CROSS-SECTION BI-BI
SITE 51, WETLAND FF & STREAM EK
STATION 396+50 -Y22-



PERMIT DRAWING
SHEET 99 OF 105

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 davidcooper

CROSS-SECTION BJ-BJ
SITE 52, WETLAND EG
STATION 400+00 -Y22-



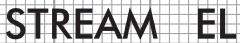
PERMIT DRAWING
SHEET 100 OF 105

REVISIONS

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CROSS-SECTION BK-BK
SITE 53, STREAM EL
STATION 406 + 00 -Y22-

PERMIT DRAWING
SHEET 101 OF 105


REVISIONS

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50' 0' 100'



SCALE



DENOTES IMPACTS IN SURFACE WATER



CROSS-SECTION BL-BL
SITE 54 STREAM EV
STATION 416+00 -Y22-



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WETLAND AND SURFACE WATER IMPACTS SUMMARY															
			WETLAND IMPACTS						SURFACE WATER IMPACTS						
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Permanent Fill In Isolated Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (Pond) (ac)	Permanent SW impacts (Isolated Pond) (ac)	Permanent SW impacts (Stream) (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	503+50 -L-	ROADWAY FILL		0.11											
2	506+00 -L-	2@6'x5' RCBC									0.09		576		
3	506+00-L-/508+00-L-	ROADWAY FILL	0.53								0.19		107		
4	508+50-L-/512+00-L-	ROADWAY FILL	0.05						1.36		0.02		218		
5	511+00-L-/520+00-L-	ROADWAY FILL	0.87								0.04		431		
6	515+00-L-	ROADWAY FILL									< 0.01		28		
7	530+00-L-/531+00-L-	ROADWAY FILL	0.11												
8	545+00-L-/549+00-L-	2@5'X5' RCBC	0.22								0.06		493		
9	557+00-L-/560+00-L-	3@8'X5' RCBC	0.09								0.10		430		
10	575+00-L-/579+00-L-	ROADWAY FILL	0.04						0.31						
11	596+00-L-/623+00-L-	2@7'X5' RCBC	1.80						1.04		0.13		377		
12	16+00 -Y18A-	ROADWAY FILL									0.01		168		
13	615+50-L-/620+00-L-	ROADWAY FILL							1.14						
14	5+00-Y18A-/17+50-Y18A	ROADWAY FILL	0.55								< 0.01		55		
15	653+50-L-/671+00-L-	ROADWAY FILL	2.41												
16	689+00-L-/709+00-L-	ROADWAY FILL	3.78						1.92		0.16		1252		
17	706+00-L-/714+00-L-	2@7'X5' RCBC	2.79								0.04		330		
18	711+00-L-/713+00-L-	ROADWAY FILL									0.02		183		
19	725+50-L-/737+00-L-	ROADWAY FILL							0.21		0.14		761		
20	737+00-L-/738+00-L-	2@9'X7' RCBC	0.41								0.10		451		
21	758+50-L-/760+00-L-	ROADWAY FILL	0.42												
22	767+00-L-/769+00-L-	ROADWAY FILL	0.02												
23	782+00-L-/787+00-L-	2@8'X6' RCBC	0.70								0.10		442		
24	785+50-L-/787+00-L-	ROADWAY FILL	0.02								0.04		470		
25	804+00-L-/861+50-L-	2@6'X5' RCBC, BRIDGE	0.62								0.26		2250		
26	811+50-L-/814+00-L-	ROADWAY FILL	0.08								< 0.01		99		
27	813+00-L-/813+50-L-	ROADWAY FILL									< 0.01		79		
TOTALS* THIS SHEET:			15.51	0.11					5.99		1.51		9200		
TOTALS* ENTIRE R-2828:			19.30	0.30	0	0	0	0	5.99	0.02	3.62	0.00	20086	0	0

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
JULY 2018
WAKE & JOHNSTON COUNTIES
TIP R-2828
STATE PROJ. # 6.401079

Revised 2016 09 09

SHEET 104 OF 105

WETLAND AND SURACE WATER IMPACTS SUMMARY															
Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS						SURFACE WATER IMPACTS						
			Permanent Fill In Wetlands (ac)	Permanent Fill In Isolated Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (Pond) (ac)	Permanent SW impacts (Isolated Pond) (ac)	Permanent SW impacts (Stream) (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
28	857+50-L-/859+50-L-	ROADWAY FILL	0.12												
29	868+50-L-/869+00-L-	BRIDGE	< 0.01												
30	875+00-L-/877+00-L-	2@6'X5' RCBC	0.61								0.06		442		
31	889+00-L-/891+00-L-	ROADWAY FILL	0.28								< 0.01		26		
32	894+00-L-/896+00-L-	ROADWAY FILL									0.15		656		
33	900+00-L-/907+00-L-	ROADWAY FILL									0.20		1092		
34	910+00-L-/917+00-L-	3@9'X5' RCBC	2.33								0.27		777		
35	915+00-L-/918+00-L-	ROADWAY FILL	0.09								0.19		1051		
36	55+00-Y21-/59+00-Y21-	ROADWAY FILL								0.02					
37	54+00-Y21-	ROADWAY FILL							< 0.01						
38	45+00-Y21-/46+00-Y21	ROADWAY FILL									< 0.01		65		
39	38+50-Y21-/41+00-Y21-	ROADWAY FILL		0.09											
40	47+00-Y22RPCD-/49+00-Y22RPCD-	ROADWAY FILL	0.04								0.31		919		
41	29+00-Y22RPCD-/31+00-Y22RPCD-	ROADWAY FILL									0.13		1129		
42	82+00-Y22RPCD-/87+50-Y22RPCD-	BRIDGE	0.09												
43	3+00-Y22RPDFLY-/21+00-Y22RPDFL	ROADWAY FILL									0.04		350		
44	15+00-Y22LPA-/29+00-Y22RPB-	ROADWAY FILL	0.06								0.33		1469		
45	37+00-Y22RPB-/37+00-Y22RPB-	ROADWAY FILL									0.01		209		
46	38+00-Y22RPB-/48+00-Y22RPB-	ROADWAY FILL									0.11		792		
47	40+50-Y22RPB-/43+00-Y22RPB-	ROADWAY FILL	0.13								< 0.01		139		
48	379+00-Y22-/389+00-Y22-	ROADWAY FILL	< 0.01								0.13		868		
49	381+50-Y22-/386+00-Y22-	ROADWAY FILL	< 0.01								0.10		456		
50	386+00-Y22-/386+50-Y22-	ROADWAY FILL	< 0.01								< 0.01		61		
51	396+00-Y22-/397+00-Y22-	ROADWAY FILL	0.02								0.01		123		
52	400+00-Y22-	ROADWAY FILL		0.10											
53	404+00-Y22-/406+00-Y22-	ROADWAY FILL									0.04		183		
54	415+50-Y22-/416+50-Y22-	ROADWAY FILL									0.01		78		
TOTALS* THIS SHEET:			3.79	0.19					< 0.01	0.02	2.11		10886		
TOTAL ENTIRE R-2828:			19.30	0.30	0	0	0	0	5.99	0.02	3.62	0.00	20086	0	0
*Rounded totals are sum of actual impacts															
NOTES:															
NC DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS JULY 2018 WAKE & JOHNSTON COUNTIES TIP R-2828 STATE PROJ. # 6.401079 SHEET 105 OF 105															