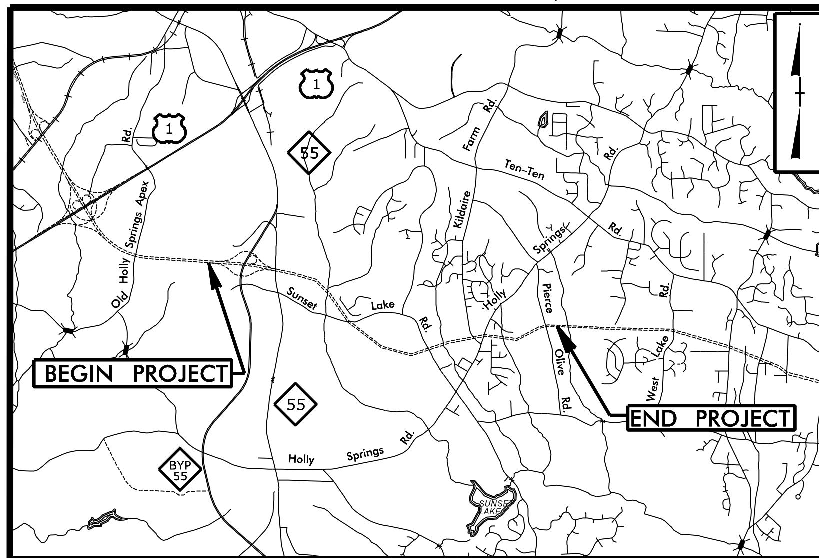
TIP PROJECT: R-2721A

CONTRACT: C204196

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



VICINITY MAP
(NOT TO SCALE)

PRELIMINARY PLAN SUBMITTAL

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

NAD 83 /2011

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2721A	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
37673.3.GV3 (A)	NHP-0540(041)	PE, R/W

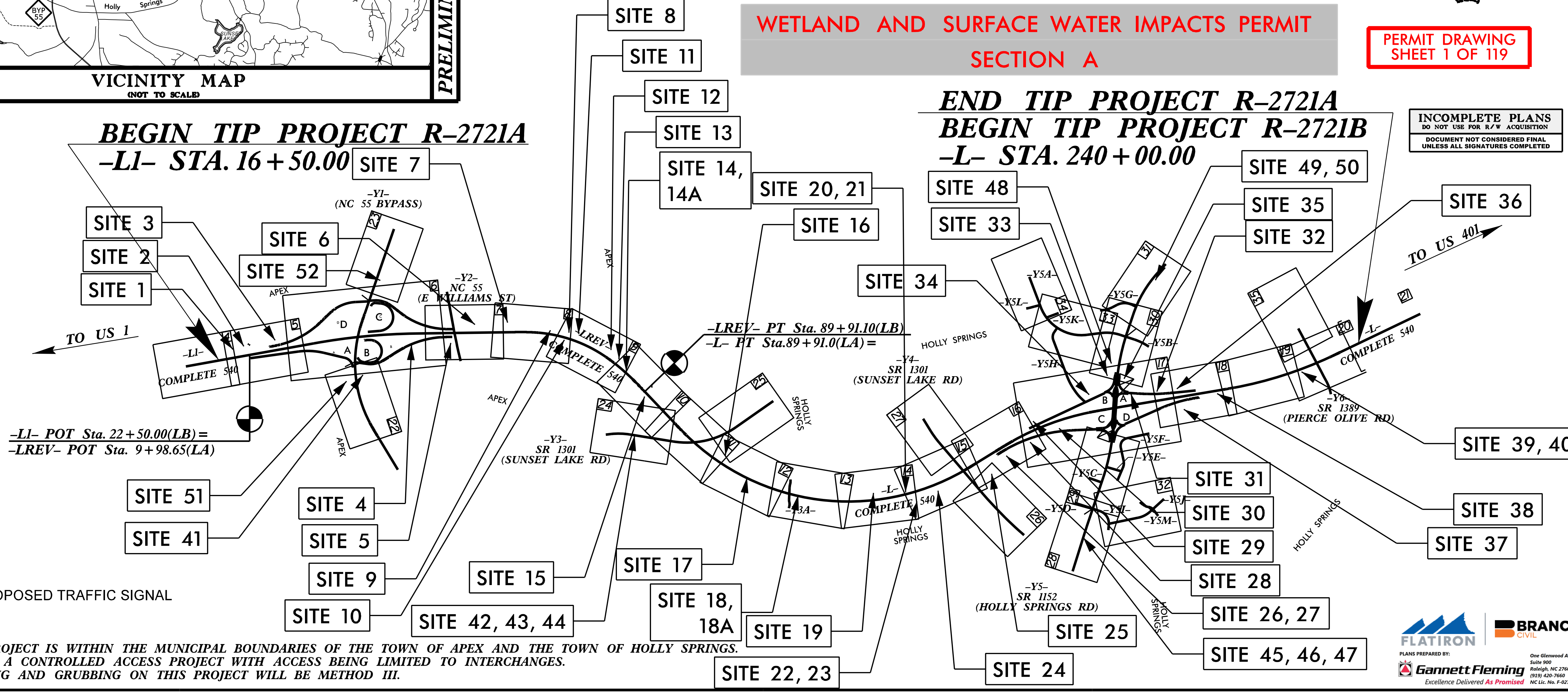
LOCATION: COMPLETE 540 - FROM WEST OF NC55 BYPASS TO EAST OF PIERCE OLIVE ROAD (SR 1389)

TYPE OF WORK: DESIGN-BUILD AS SPECIFIED IN THE SCOPE OF WORK CONTAINED IN THE REQUEST FOR PROPOSALS

WETLAND AND SURFACE WATER IMPACTS PERMIT
SECTION A

PERMIT DRAWING
SHEET 1 OF 119

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



NOTES:
THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE TOWN OF APEX AND THE TOWN OF HOLLY SPRINGS.
THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.
CLEARING AND GRUBBING ON THIS PROJECT WILL BE METHOD III.

FLATIRON | BRANCH CIVIL

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue, Suite 900, Raleigh, NC 27603, (919) 420-7660, NC Lic. No. F-0270

GRAPHIC SCALES

50' 25' 0 50' 100'
PLANS

50' 25' 0 50' 100'
PROFILE (HORIZONTAL)

10' 5' 0 10' 20'
PROFILE (VERTICAL)

DESIGN DATA

ADT 2020 = 22,800
ADT 2040 = 49,200
K = 12 %
D = 65 %
T = 11 % *
V = 75 MPH
* TTST = 4% DUAL 7%

FUNC CLASS = FREEWAY
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2721A	=	4.311 Miles
LENGTH STRUCTURES	=	0.159 Miles*
TOTAL LENGTH TIP PROJECT R-2721A	=	4.470 Miles

*LENGTH BASED ON EB BRIDGES

NCDOT CONTACT: RODGER ROCHELLE, PE
TURNPIKE AUTHORITY
CHIEF ENGINEER, INNOVATIVE DELIVERY

Prepared for the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
April 16, 2019

LETTING DATE:
April 16, 2019

THOMAS K. GOODWIN, PE
PROJECT ENGINEER

JERRY P. PAGE, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

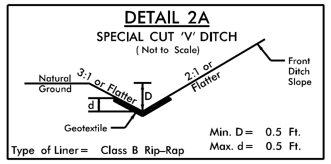
12/4/2019
O:\RA\0372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721A_Hyd_prm_wet_psh_01.dgn
jburgess

PROJECT REFERENCE NO.	SHEET NO.
R–2721A	2D–1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

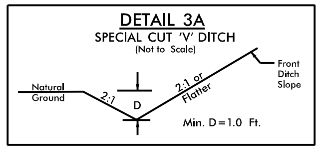
PERMIT DRAWING
SHEET 2 OF 119

DETAIL 2A
SPECIAL CUT 'V' DITCH
(Not to Scale)



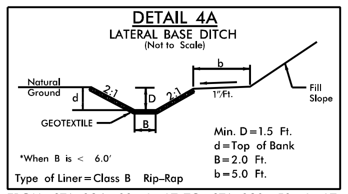
FROM STA. 11+00 –Y5E– RT TO STA. 11+65 –Y5E– RT

DETAIL 3A
SPECIAL CUT 'V' DITCH
(Not to Scale)



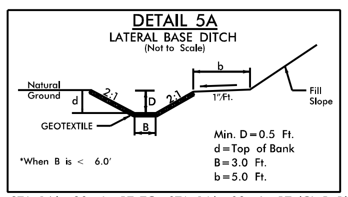
FROM STA. 153+50 –L– LT TO STA. 154+00 –L– LT
FROM STA. 213+00 –L– LT TO STA 215+65 –L– LT
FROM STA. 27+19 –Y1– RT TO STA. 27+85 –Y1– RT
FROM STA. 18+49 –Y5A– RT TO STA. 25+00 –Y5A– RT
FROM STA. 26+61 –Y5A– RT TO STA. 28+00 –Y5A– RT
FROM STA. 29+64 –Y5A– LT TO STA. 31+00 –Y5A– LT
FROM STA. 12+40 –Y5F– LT TO STA. 14+00 –Y5F– LT
FROM STA. 14+75 –Y5F– LT TO STA. 17+00 –Y5F– LT
FROM STA. 18+50 –Y6– RT TO STA. 21+50 –Y6– RT

DETAIL 4A
LATERAL BASE DITCH
(Not to Scale)



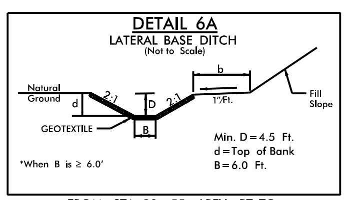
FROM STA. 204+32 –L– LT TO STA. 208+52 –L– LT
FROM STA. 210+00 –L– LT TO STA. 211+02 –L– LT
FROM STA. 211+70 –L– LT TO STA. 213+00 –L– LT
FROM STA. 68+36 –Y5– RT TO STA. 69+00 –Y5– RT
FROM STA. 11+80 –Y5A– RT TO STA. 15+11 –Y5A– RT
FROM STA. 24+08 –Y5RPB– RT TO STA. 26+08.65 –Y5RPB– RT

DETAIL 5A
LATERAL BASE DITCH
(Not to Scale)



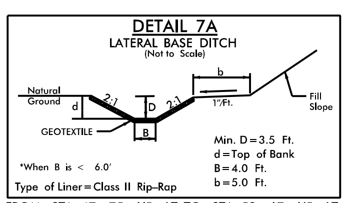
FROM STA. 146+00 –L– RT TO STA. 146+80 –L– RT (CL B RIPRAP)
FROM STA. 148+54 –L– RT TO STA. 151+80 –L– RT (CL I RIPRAP)
FROM STA. 151+80 –L– RT TO STA. 153+50 –L– RT (CL B RIPRAP)

DETAIL 6A
LATERAL BASE DITCH
(Not to Scale)



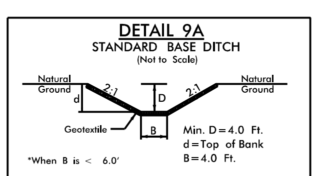
FROM STA. 80+55 –LREV– RT TO
STA. 82+83 –LREV– RT (b=5.0 Ft., CL I RIPRAP)
FROM STA. 13+20 –Y5RPA– RT TO
STA. 14+80 –Y5RPA– RT (b=VAR., CL II RIPRAP)

DETAIL 7A
LATERAL BASE DITCH
(Not to Scale)



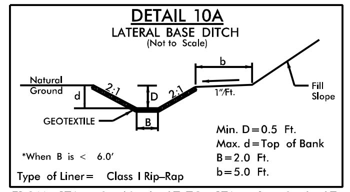
FROM STA. 47+75 –Y5– LT TO STA. 52+67 –Y5– LT

DETAIL 9A
STANDARD BASE DITCH
(Not to Scale)



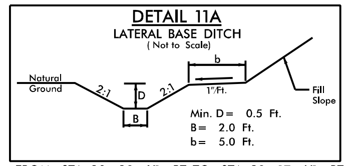
FROM STA. 52+67 –Y5– 148' LT (ELEV.=372.5')
TO STA. 55+02 –Y5– 292' LT (ELEV.=380.3'), L=290'

DETAIL 10A
LATERAL BASE DITCH
(Not to Scale)



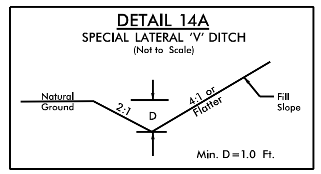
FROM STA. 170+68 –L– LT TO STA. 173+70 –L– LT

DETAIL 11A
LATERAL BASE DITCH
(Not to Scale)



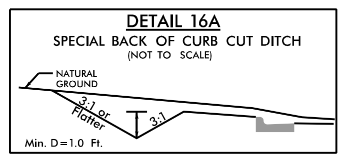
FROM STA. 29+20 –Y1– RT TO STA. 30+17 –Y1– RT

DETAIL 14A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



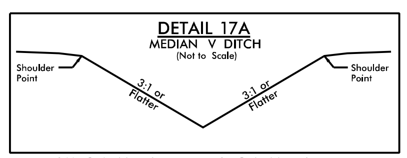
FROM STA. 18+50 –Y1RPBREV– RT TO STA. 21+00 –Y1RPBREV– RT
FROM STA. 13+44 –Y1LPBREV– LT TO STA. 14+95 –Y1LPBREV– LT

DETAIL 16A
SPECIAL BACK OF CURB CUT DITCH
(NOT TO SCALE)



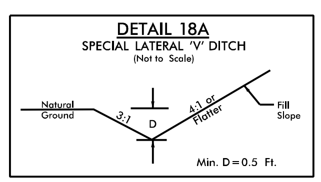
FROM STA. 26+90 –Y5– RT TO STA. 30+75 –Y5– RT
FROM STA. 31+70 –Y5– RT TO STA. 33+80 –Y5– RT
FROM STA. 11+00 –Y5I– LT TO STA. 13+50 –Y5I– LT
FROM STA. 13+50 –Y5I– LT TO STA. 14+23 –Y5I– LT
FROM STA. 10+50 –Y5J– LT TO STA. 10+66.50 –Y5J– LT

DETAIL 17A
MEDIAN V DITCH
(Not to Scale)



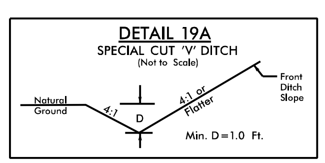
FROM STA. 32+10 –LREV– TO STA. 33+50 –LREV–
FROM STA. 169+21 –L– TO STA. 170+54 –L–
FROM STA. 39+00 –Y1– TO STA. 42+00 –Y1–
FROM STA. 43+88 –Y1– TO STA. 44+20 –Y1–

DETAIL 18A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



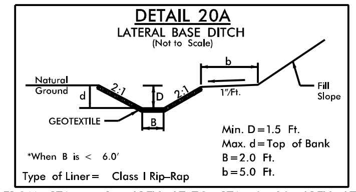
FROM STA. 27+00 –Y5– LT TO STA. 27+72 –Y5– LT
FROM STA. 11+50 –Y5C– RT TO STA. 11+87 –Y5C– RT
FROM STA. 11+50 –Y5C– LT TO STA. 11+89 –Y5C– LT

DETAIL 19A
SPECIAL CUT 'V' DITCH
(Not to Scale)



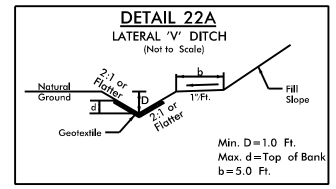
FROM STA. 103+50 –L– RT TO STA. 106+50 –L– RT
FROM STA. 227+92 –L– LT TO STA. 230+50 –L– LT

DETAIL 20A
LATERAL BASE DITCH
(Not to Scale)



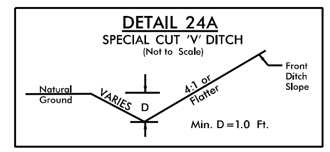
FROM STA. 15+35 –LREV– LT TO STA. 18+28 –LREV– LT
FROM STA. 50+50 –Y5– RT TO STA. 55+95 –Y5– RT
FROM STA. 209+85 –L– RT TO STA. 210+50 –L– RT
FROM STA. 15+84 –Y3– RT TO STA. 16+43 –Y3– RT
FROM STA. 24+00 –Y5RPB– LT TO STA. 24+40 –Y5RPB– LT

DETAIL 22A
LATERAL 'V' DITCH
(Not to Scale)



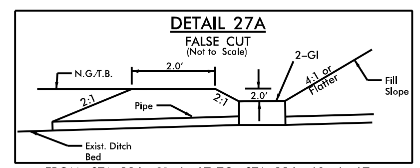
FROM STA. 36+08 –LREV– RT TO STA. 37+30 –LREV– RT (CL B Rip–Rap)
FROM STA. 69+05 –Y5– LT TO STA. 70+50 –Y5– LT (CL II Rip–Rap)

DETAIL 24A
SPECIAL CUT 'V' DITCH
(Not to Scale)



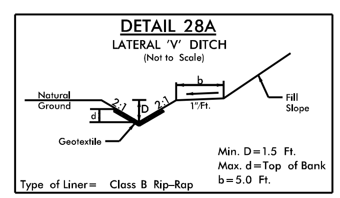
FROM STA. 193+50 –L– LT TO STA. 195+50 –L– LT
FROM STA. 228+00 –L– RT TO STA. 228+50 –L– RT
FROM STA. 39+50 –Y1– RT TO STA. 41+25 –Y1– RT
FROM STA. 41+77 –Y1– RT TO STA. 42+50 –Y1– RT
FROM STA. 34+26 –Y4– LT TO STA. 37+00 –Y4– LT
FROM STA. 22+00 –Y1RPCREV– LT TO STA. 23+50 –Y1RPCREV– LT

DETAIL 27A
FALSE CUT
(Not to Scale)



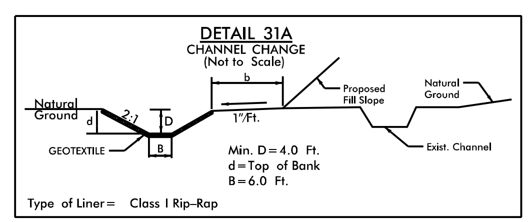
FROM STA. 226+01 –L– LT TO STA. 226+69 –L– LT
FROM STA. 227+37 –L– LT TO STA. 227+92 –L– LT
FROM STA. 41+25 –Y1– RT TO STA. 41+77 –Y1– RT

DETAIL 28A
LATERAL 'V' DITCH
(Not to Scale)



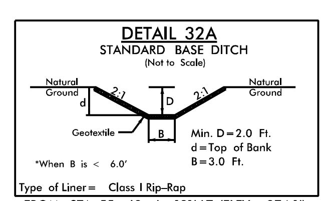
FROM STA. 115+87 –L– RT TO STA. 116+50 –L– RT

DETAIL 31A
CHANNEL CHANGE
(Not to Scale)



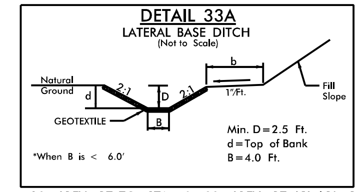
FROM STA. 66+50 –LREV– LT TO STA. 67+20 –LREV– LT (b=VAR.)
FROM STA. 68+14 –LREV– LT TO STA. 68+84 –LREV– LT (b=VAR.)
FROM STA. 69+89 –LREV– LT TO STA. 76+17 –LREV– LT (b=10 Ft.)

DETAIL 32A
STANDARD BASE DITCH
(Not to Scale)



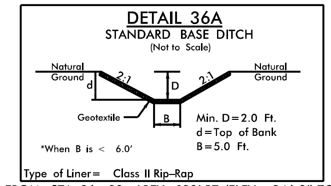
FROM STA. 55+62 –L– 181' LT (ELEV.=374.1')
TO STA. 56+02 –L– 199' LT (ELEV.=371.2'), L=44 Ft.
FROM STA. 83+25 –LREV– LT TO STA. 85+39 –LREV– LT

DETAIL 33A
LATERAL BASE DITCH
(Not to Scale)



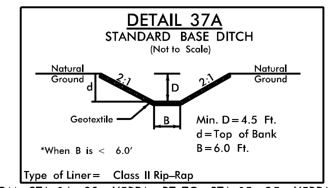
FROM STA. 77+20 –LREV– RT TO STA. 79+00 –LREV– RT, (CL I Rip–Rap, b=2.0 Ft.)
FROM STA. 16+26 –Y5– RT TO STA. 17+00 –Y5– RT, (CL II Rip–Rap, b=5.0 Ft.)

DETAIL 36A
STANDARD BASE DITCH
(Not to Scale)



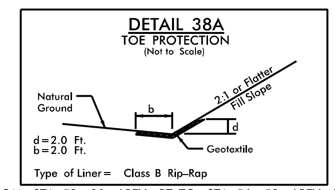
FROM STA. 86+98 –LREV– 130' RT (ELEV.=346.0') TO
STA. 86+98 –LREV– 179' RT (ELEV.=345.2'), L=49 Ft.

DETAIL 37A
STANDARD BASE DITCH
(Not to Scale)



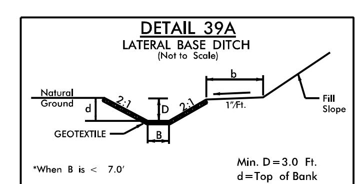
FROM STA. 14+80 –Y5RPA– RT TO STA. 15+25 –Y5RPA– RT

DETAIL 38A
TOE PROTECTION
(Not to Scale)



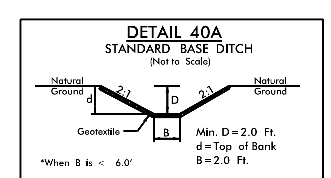
FROM STA. 52+30 –LREV– RT TO STA. 56+53 –LREV– RT
FROM STA. 58+02 –LREV– RT TO STA. 61+01 –LREV– RT
FROM STA. 69+79 –LREV– RT TO STA. 77+16 –LREV– RT
FROM STA. 79+92 –LREV– LT TO STA. 81+00 –LREV– LT
FROM STA. 84+86 –LREV– LT TO STA. 88+52 –LREV– LT
FROM STA. 87+22 –LREV– RT TO STA. 90+00 –LREV– RT
FROM STA. 115+53 –L– RT TO STA. 115+83 –L– RT
FROM STA. 123+50 –L– RT TO STA. 124+70 –L– RT
FROM STA. 123+70 –L– LT TO STA. 124+17 –L– LT
FROM STA. 124+51 –L– LT TO STA. 125+66 –L– LT
FROM STA. 125+02 –L– RT TO STA. 125+82 –L– RT
FROM STA. 125+91 –L– LT TO STA. 127+50 –L– LT
FROM STA. 126+06 –L– RT TO STA. 127+49 –L– RT
FROM STA. 140+81 –L– RT TO STA. 142+23 –L– RT
FROM STA. 141+17 –L– LT TO STA. 141+71 –L– LT
FROM STA. 146+80 –L– RT TO STA. 147+18 –L– RT
FROM STA. 146+68 –L– LT TO STA. 147+66 –L– LT
FROM STA. 147+89 –L– LT TO STA. 153+00 –L– LT
FROM STA. 166+00 –L– RT TO STA. 169+03 –L– RT
FROM STA. 166+00 –L– LT TO STA. 168+59 –L– LT
FROM STA. 210+86 –L– LT TO STA. 211+72 –L– LT
FROM STA. 224+50 –L– RT TO STA. 227+50 –L– RT
FROM STA. 226+16 –L– LT TO STA. 226+59 –L– LT
FROM STA. 227+35 –L– LT TO STA. 227+92 –L– LT
FROM STA. 22+51 –Y1RPB– LT TO STA. 23+67 –Y1RPB– LT
FROM STA. 12+00 –Y3– RT TO STA. 15+28 –Y3– RT
FROM STA. 13+66 –Y3– LT TO STA. 15+08 –Y3– LT
FROM STA. 15+81 –Y3– LT TO STA. 19+50 –Y3– LT
FROM STA. 22+50 –Y3– RT TO STA. 25+34 –Y3– RT
FROM STA. 29+13 –Y3– LT TO STA. 31+50 –Y3– LT
FROM STA. 16+33 –Y5– LT TO STA. 17+94 –Y5– LT
FROM STA. 17+00 –Y5– RT TO STA. 19+29 –Y5– RT
FROM STA. 68+46 –Y5– RT TO STA. 69+00 –Y5– RT
FROM STA. 23+37 –Y5RPB– LT TO STA. 24+76 –Y5RPB– LT
FROM STA. 11+69 –Y5RPBSB– LT TO STA. 12+47 –Y5RPBSB– LT
FROM STA. 16+50 –Y5RPC– RT TO STA. 17+00 –Y5RPC– RT
FROM STA. 18+39 –Y5RPC– RT TO STA. 20+41 –Y5RPC– RT
FROM STA. 13+10 –Y5RPD– LT TO STA. 15+70 –Y5RPD– LT
FROM STA. 14+00 –Y6– RT TO STA. 14+83 –Y6– RT

DETAIL 39A
LATERAL BASE DITCH
(Not to Scale)



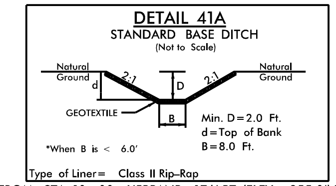
FROM STA. 50+41 –LREV– LT TO STA. 56+00 –LREV– LT (B=3.0')
FROM STA. 56+00 –LREV– LT TO STA. 57+74 –LREV– LT (B=6.0')

DETAIL 40A
STANDARD BASE DITCH
(Not to Scale)



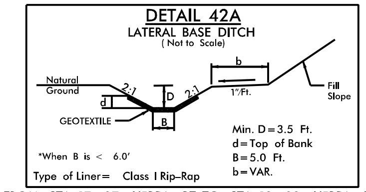
FROM STA. 150+66 –L– 111' LT (ELEV.=371.8')
TO STA. 150+81 –L– 125' LT (ELEV.=382.3'), L=20 Ft.
FROM STA. 192+52 –L– 213' RT (ELEV.=387.3')
TO STA. 193+67 –L– 149' RT (ELEV.=376.0'), L=136 Ft.
FROM STA. 226+29 –L– 141' LT (ELEV.=368')
TO STA. 226+38 –L– 123' LT (ELEV=367.5', L=20 Ft.
FROM STA. 227+46 –L– 154' LT (ELEV.=370.2')
TO STA. 227+50 –L– 129' LT (ELEV.=368.3'), L=25 Ft.

DETAIL 41A
STANDARD BASE DITCH
(Not to Scale)



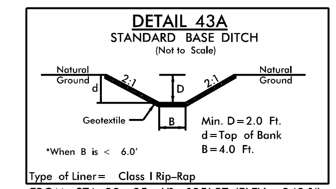
FROM STA. 10+00 –Y5RPANB– 176' RT (ELEV.=355.0') TO
STA. 12+14 –Y5RPANB– 166' RT (ELEV.=355.6), L=30 Ft.

DETAIL 42A
LATERAL BASE DITCH
(Not to Scale)



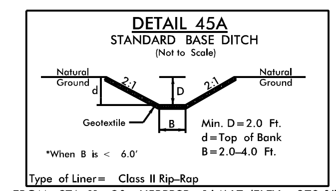
FROM STA. 17+37 –Y5RPA– RT TO STA. 19+39 –Y5RPA– RT

DETAIL 43A
STANDARD BASE DITCH
(Not to Scale)



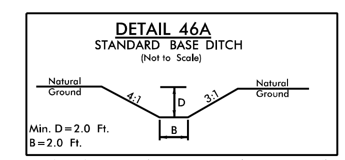
FROM STA. 29+95 –Y1– 185' RT (ELEV.=343.1')
TO STA. 30+23 –Y1– 136' RT (ELEV.=341.10), L=55 Ft.
FROM STA. 15+10 –Y5A– 123' RT (ELEV.=391.0')
TO STA. 15+29 –Y5A– 154' RT (ELEV.=392.4'), L=35 Ft.

DETAIL 45A
STANDARD BASE DITCH
(Not to Scale)



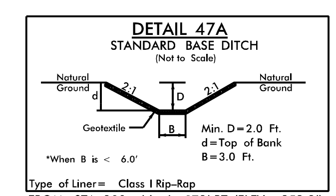
FROM STA. 11+20 –Y5RPBSB– 164' LT (ELEV.=379.0')
TO STA. 12+52 –Y5RPBSB– 116' LT (ELEV.=370.7'), L=73 Ft.

DETAIL 46A
STANDARD BASE DITCH
(Not to Scale)



FROM STA. 21+86 –Y5J– 50' LT (ELEV.=403.3')
TO STA. 22+24 –Y5J– 124' LT (ELEV.=402.8'), L=84 Ft.

DETAIL 47A
STANDARD BASE DITCH
(Not to Scale)



FROM STA. 209+66 –L– 173' RT (ELEV.=352.3')
TO STA. 209+83 –L– 156' RT (ELEV.=352.6'), L=24 Ft.
FROM STA. 210+94 –L– 150' LT (ELEV.=362.4')
TO STA. 210+97 –L– 127' LT (ELEV.=361.7'), L=23 Ft.
FROM STA. 225+99 –L– 121' RT (ELEV.=361.1')
TO STA. 225+99 –L– 144' RT (ELEV.=360.9'), L=23 Ft.

5/14/99

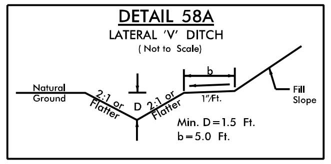
12/4/2019
R2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_02A1_Detail.dgn

PERMIT DRAWING
SHEET 3 OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	2D-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

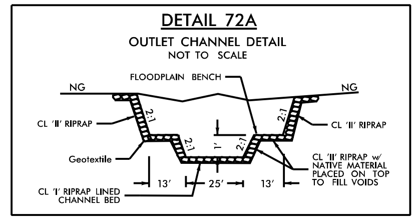
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL 58A



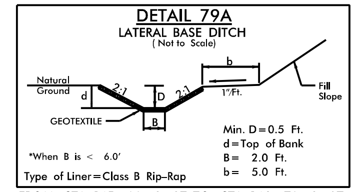
FROM STA. 45+00 -LREV- LT TO STA. 49+15 -LREV- LT

DETAIL 72A



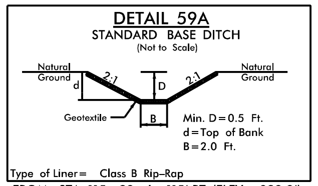
STA. 15+65 -Y3- (L=60 Ft.)

DETAIL 79A



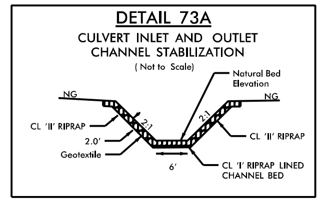
FROM STA. 145+00 -L- LT TO STA. 146+70 -L- LT

DETAIL 59A



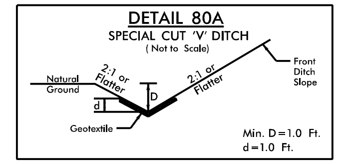
FROM STA. 115+83 -L- 115' RT (ELEV.=389.9')
TO STA. 115+83 -L- 135' RT (ELEV.=389.8'), L=20 Ft.

DETAIL 73A



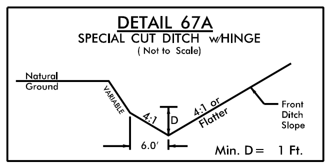
STA. 125+86 -L- Inlet L=40 Ft., Outlet L=40 Ft.
STA. 141+68 -L- Inlet L=60 Ft., Outlet L=72 Ft.
STA. 147+58 -L- Inlet L=45 Ft., Outlet L=45 Ft.

DETAIL 80A



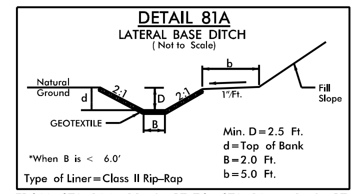
FROM STA. 69+00 -Y5- RT TO STA. 69+50 -Y5- RT, (CL B Rip-Rap)
FROM STA. 13+50 -Y5G- LT TO STA. 15+50 -Y5G- LT, (CL B Rip-Rap)
FROM STA. 13+66 -Y5G- RT TO STA. 15+50 -Y5G- RT, (CL I Rip-Rap)
FROM STA. 20+85 -Y5RPD- LT TO STA. 23+00 -Y5RPD- LT, (CL B Rip-Rap)

DETAIL 67A



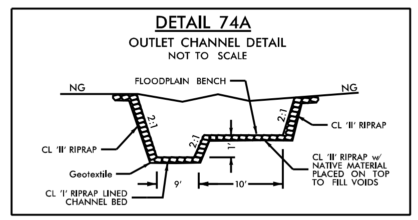
FROM STA. 90+50 -LREV- RT TO STA. 97+50 -LREV- RT
FROM STA. 16+00 -Y1RPCREV- RT TO STA. 17+00 -Y1RPCREV- RT

DETAIL 81A



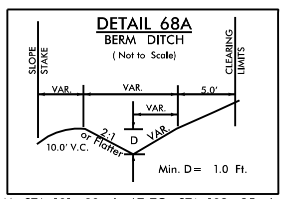
FROM STA. 204+38 -L- RT TO STA. 205+59 -L- RT

DETAIL 74A



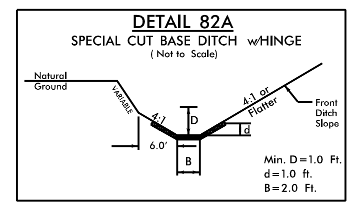
STA. 169+21 -L- (L=68 Ft.)

DETAIL 68A



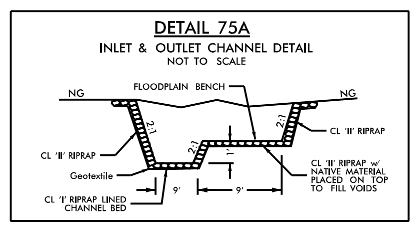
FROM STA. 101+00 -L- LT TO STA. 103+25 -L- LT
FROM STA. 114+60 -L- LT TO STA. 118+60 -L- LT
FROM STA. 158+00 -L- RT TO STA. 159+00 -L- RT
FROM STA. 218+50 -L- LT TO STA. 220+70 -L- LT
FROM STA. 229+50 -L- RT TO STA. 230+00 -L- RT
FROM STA. 231+60 -L- RT TO STA. 233+75 -L- RT
FROM STA. 23+40 -Y5- RT TO STA. 24+39 -Y5- RT
FROM STA. 24+70 -Y5- RT TO STA. 26+50 -Y5- RT

DETAIL 82A



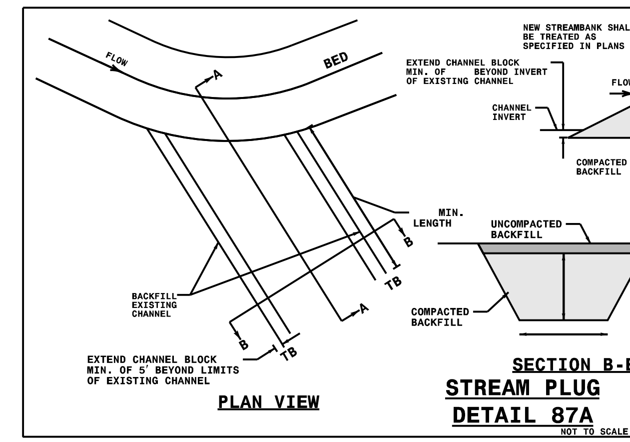
FROM STA. 63+00 -Y5- RT TO STA. 65+50 -Y5- RT, (CL B RIPRAP)
FROM STA. 63+13 -Y5- LT TO STA. 65+75 -Y5- LT, (CL I RIPRAP)

DETAIL 75A



STA. 16+14 -Y5- Inlet L=80 Ft., Outlet L=50 Ft.

STREAM PLUG DETAIL 87A



NOTES:
1) CHANNEL BLOCK SHALL BE INSTALLED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
2) BLOCK SHOULD BE INSTALLED AT THE INTERFACE BETWEEN EXISTING CHANNEL AND PROPOSED CHANNEL.
3) BOTTOM OF BLOCK SHOULD BE A MINIMUM OF 2′ BELOW THE INVERT OF THE EXISTING CHANNEL.
4) BLOCK SHOULD EXTEND A MINIMUM OF 5′ BEYOND THE LIMITS OF THE EXISTING STREAM CHANNEL.
5) INSTALL EROSION CONTROL MATTING AND SEED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS IMMEDIATELY AFTER GRADING.
6) COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.

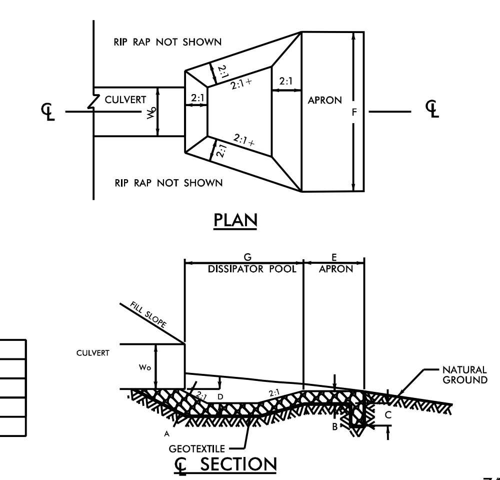
STA. 66+51 -LREV- LT
STA. 66+84 -LREV- LT
STA. 68+34 -LREV- LT
STA. 68+71 -LREV- LT
STA. 70+31 -LREV- LT
STA. 80+76 -LREV- RT
STA. 82+42 -LREV- RT
STA. 85+47 -LREV- LT
STA. 202+52 -L- LT
STA. 203+98 -L- LT
STA. 15+78 -Y5- LT
STA. 52+41 -Y5- LT
STA. 69+18 -Y5- LT
STA. 69+32 -Y5- LT
STA. 17+82 -Y5RPA- RT
STA. 18+70 -Y5RPA- RT
STA. 20+34 -Y5RPA- RT

DETAIL 88A

RIP-RAPPED ENERGY DISSIPATOR BASIN

DIM (ft)	RIP RAP BASIN # 1
A	4.5
B	3.0
C	2.0
D	1.5
E	6.0
F	15.0
G	12.0

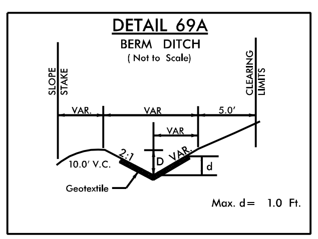
ALL DIMENSIONS APPROXIMATE



BASIN #	LOCATION (AT OUTLET)
1	STA. 15+16 -Y5I- RT

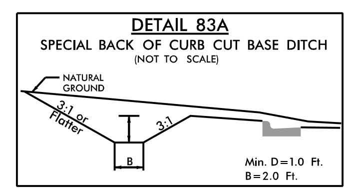
7/08

DETAIL 69A



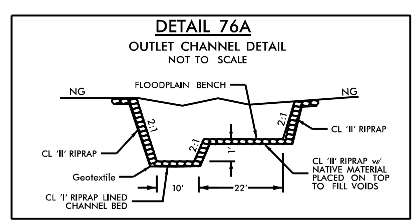
FROM STA. 103+25 -L- LT TO STA. 104+30 -L- LT, (CL I Rip-Rap, D=1.5 Ft.)
FROM STA. 109+00 -L- LT TO STA. 111+00 -L- LT, (CL II Rip-Rap, D=2.0 Ft.)
FROM STA. 155+00 -L- RT TO STA. 158+00 -L- RT, (CL I Rip-Rap, D=1.0 Ft)
FROM STA. 230+00 -L- RT TO STA. 230+50 -L- RT, (CL B Rip-Rap, D=1.5 Ft)
FROM STA. 14+40 -Y5RPB- LT TO STA. 15+71.50 -Y5RPB- LT, (CL B Rip-Rap, D=1.5 Ft)
FROM STA. 15+71.50 -Y5RPB- LT TO STA. 19+04 -Y5RPB- LT, (CL II Rip-Rap, D=1.5 Ft)

DETAIL 83A



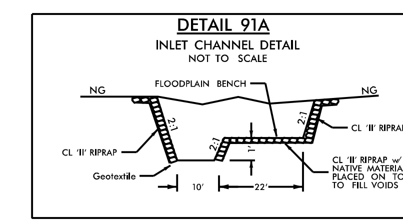
FROM STA. 10+66.50 -Y5J- LT TO STA. 15+50 -Y5J- LT

DETAIL 76A



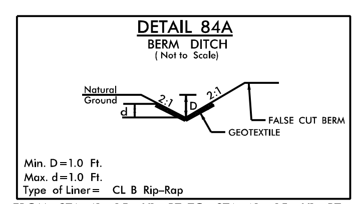
STA. 205+69 -L- (L=55 Ft)

DETAIL 91A



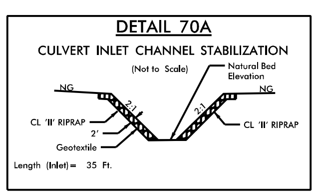
STA. 204+14 -L- (L=150 Ft.)

DETAIL 84A



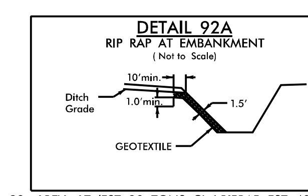
FROM STA. 41+25 -Y1- RT TO STA. 42+35 -Y1- RT

DETAIL 70A



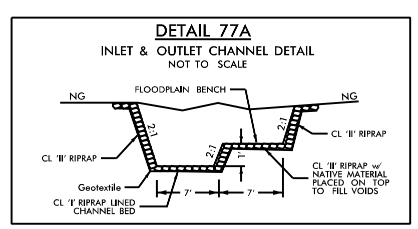
STA. 19+36 -L1-

DETAIL 92A



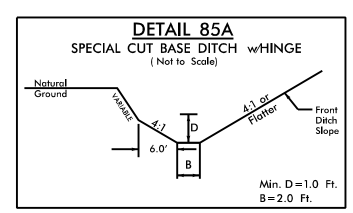
STA. 83+30 -LREV- LT (EST. 28 TONS CL I RIPRAP, EST. 40 SY GEOTEXTILE)
STA. 86+96 -LREV- RT (EST. 16 TONS CL II RIPRAP, EST. 22 SY GEOTEXTILE)

DETAIL 77A



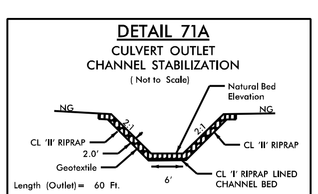
STA. 68+38 -Y5- Inlet L=42 Ft., Outlet L=35 Ft.

DETAIL 85A



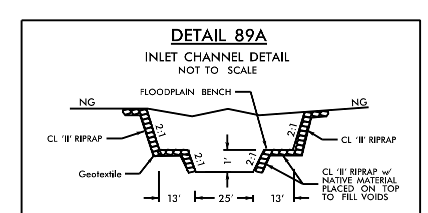
FROM STA. 60+00 -Y5- RT TO STA. 61+00 -Y5- RT
FROM STA. 62+00 -Y5- RT TO STA. 62+20 -Y5- RT
FROM STA. 62+85 -Y5- RT TO STA. 63+00 -Y5- RT

DETAIL 71A



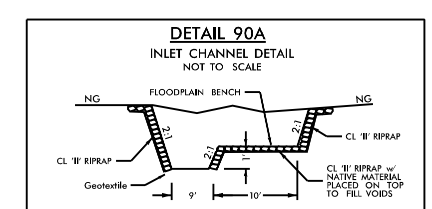
STA. 77+49 -L-

DETAIL 89A



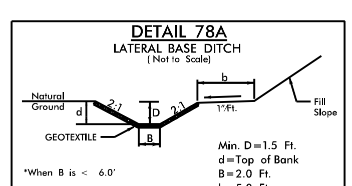
STA. 15+45 -Y3- (L=60 Ft.)

DETAIL 90A



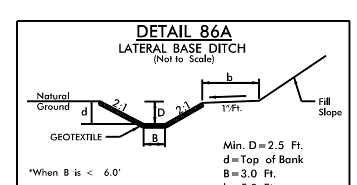
STA. 168+79 -L- (L=50 Ft.)

DETAIL 78A



FROM STA. 66+67 -Y5- LT TO STA. 68+35 -Y5- LT
FROM STA. 68+56 -Y5- LT TO STA. 69+59 -Y5- LT

DETAIL 86A



FROM STA. 141+50 -L- RT TO STA. 142+36 -L- RT

PERMIT DRAWING
SHEET 8 OF 119

F F — DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

E E — DENOTES EXCAVATION IN WETLAND

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 25' 0 50' 100'
SCALE: 1" = 100'

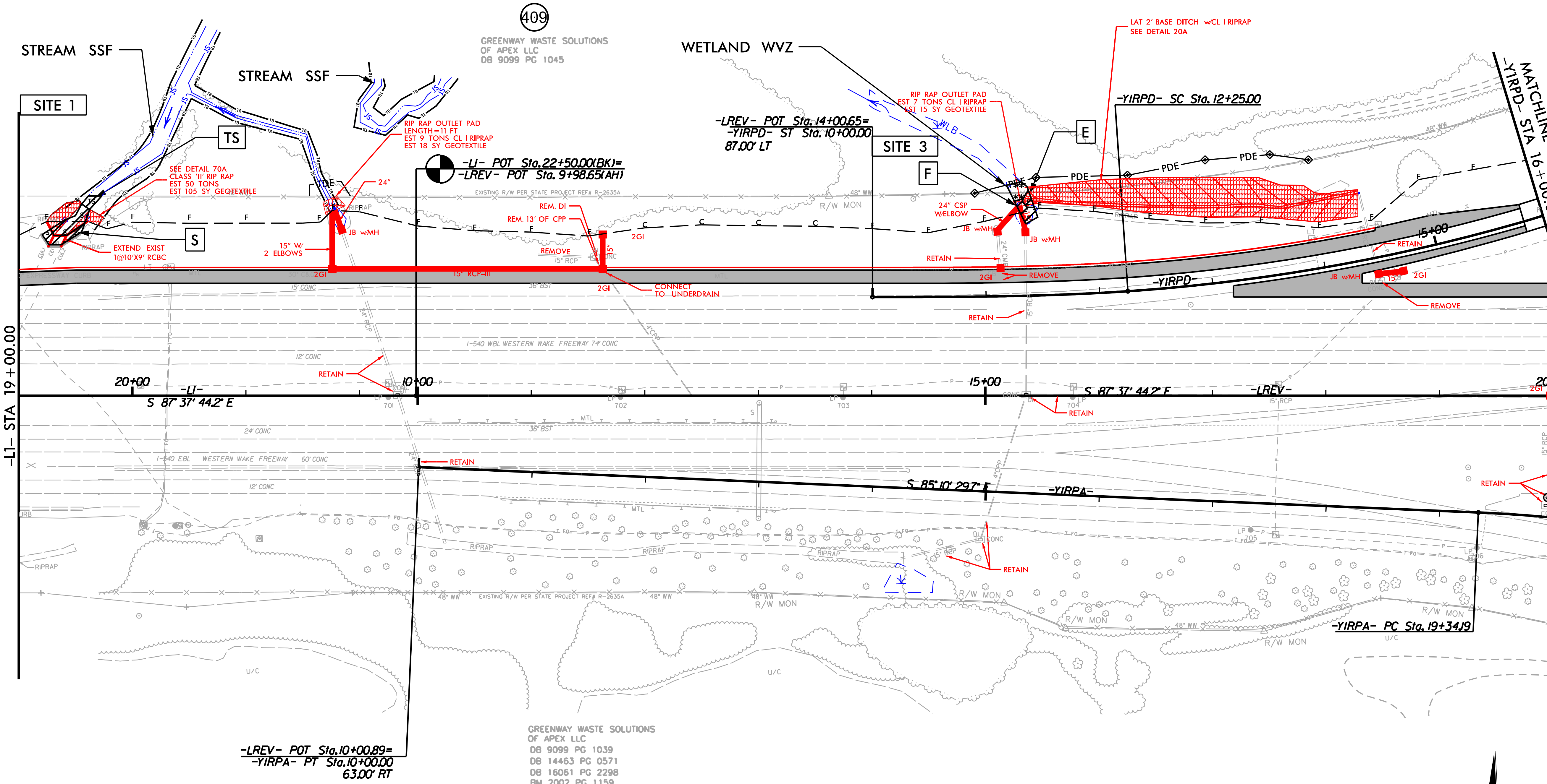
FLATIRON | BRANCH CIVIL

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PAVED SHOULDER

PAVEMENT REMOVAL

ALL INTERSECTION RADII ARE 40' WIDE UNLESS OTHERWISE NOTED.

ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

SEE SHEET 36 FOR -L1-/-LREV- PROFILE
SEE SHEET 48 FOR -YIRPD- PROFILE

514499

12/4/2019 R:\2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_05.dgn

PERMIT DRAWING
SHEET 9 OF 119

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

SCALE: 1″ = 100′

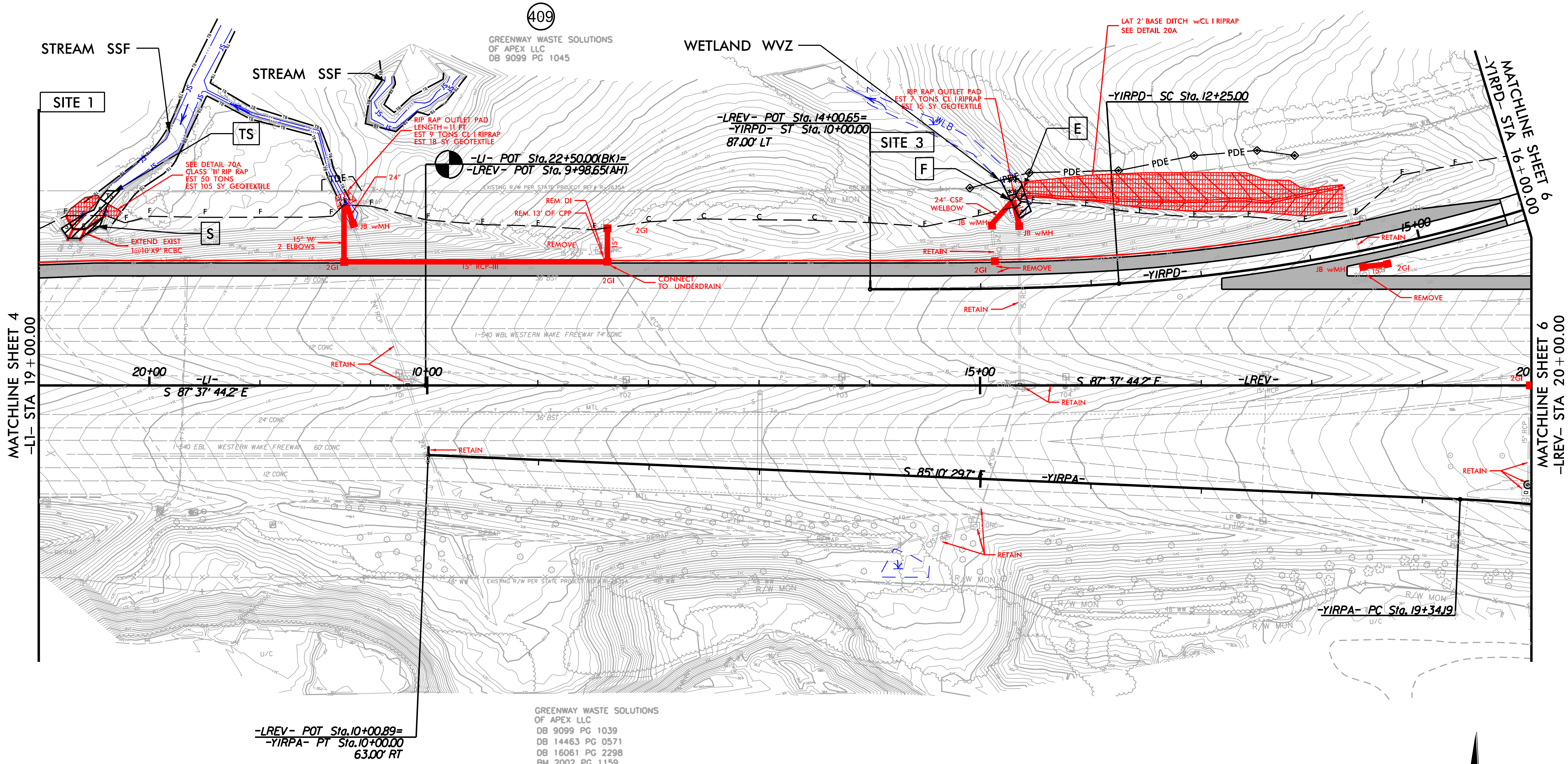
FLATIRON | BRANCH CIVIL

PLANS PREPARED BY: Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PAVED SHOULDER
PAVEMENT REMOVAL

ALL INTERSECTION RADII ARE 40′ WIDE UNLESS OTHERWISE NOTED.

ALL 6″ CONCRETE DRIVEWAYS ARE 20′ WIDE UNLESS OTHERWISE NOTED.

SEE SHEET 36 FOR -L1-/-LREV- PROFILE
SEE SHEET 48 FOR -YIRPD- PROFILE

12/4/2019
R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_05a.dgn

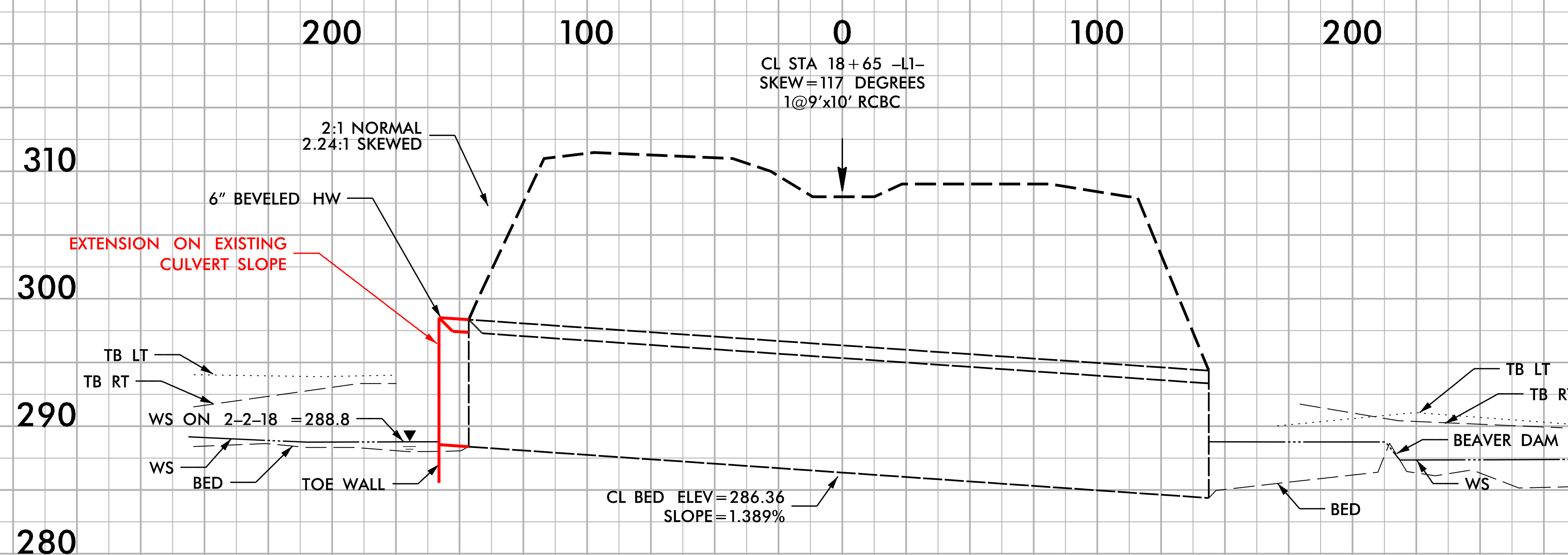
5/14/99

PERMIT DRAWING
SHEET 10 OF 119

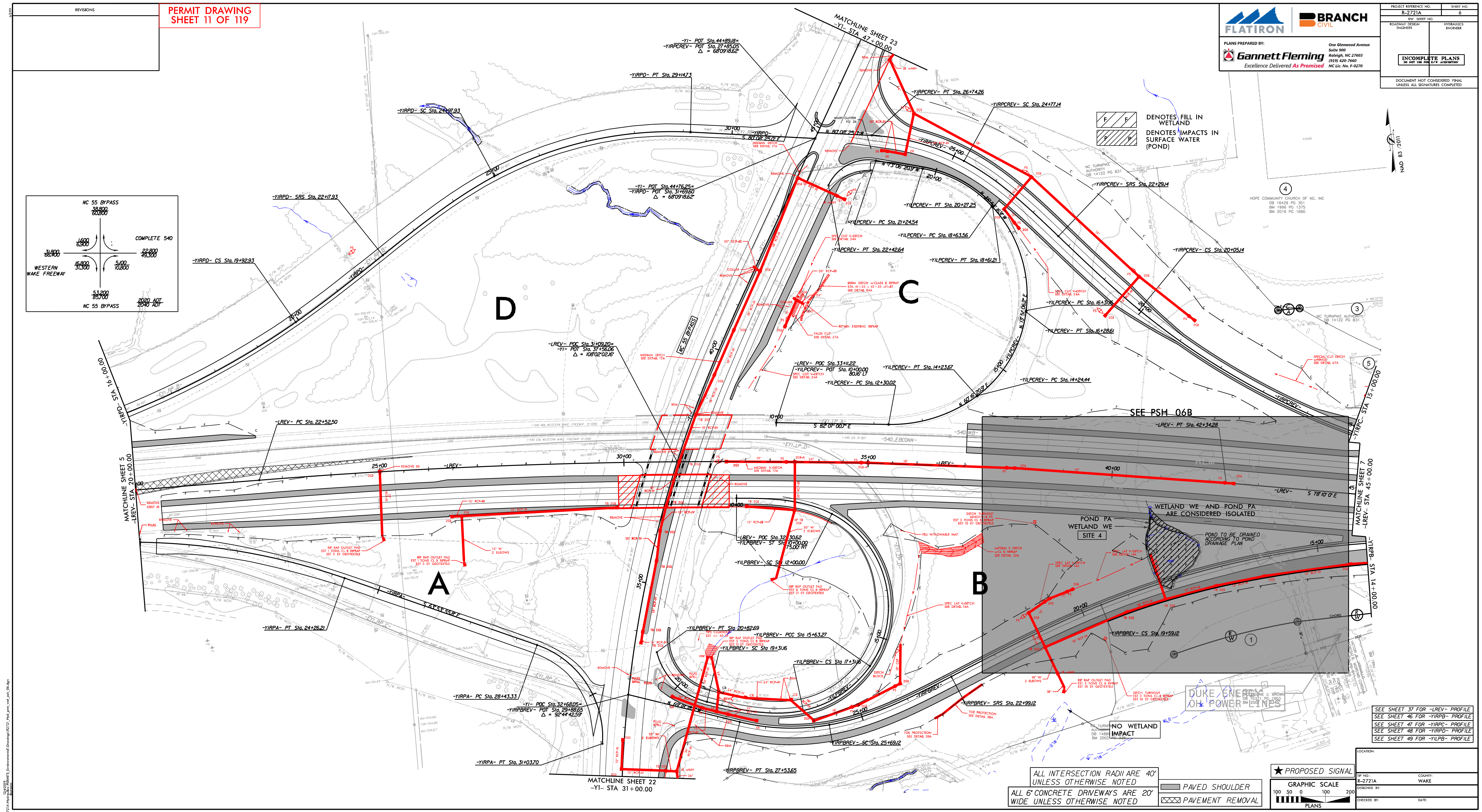
PROJECT REFERENCE NO.	SHEET NO.
U-2721	5B
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



12/4/2019
O:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_05b_sec.dgn
Burgess



PERMIT DRAWING
SHEET 11 OF 119
REVISIONS
FLATIRON
BRANCH CIVIL
PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270
PROJECT REFERENCE NO.
SHEET NO.
R-2721A
6
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER (POND)
NAD 83 / 2011
MATCHLINE SHEET 23
-Y1- STA 47+00.00
MATCHLINE SHEET 22
-Y1- STA 31+00.00
MATCHLINE SHEET 5
-LREV- STA 20+00.00
MATCHLINE SHEET 7
-LREV- STA 45+00.00
-YIRPD- STA 16+00.00
-YIRPC- STA 15+00.00
-YIRPB- STA 14+00.00
NC 55 BYPASS
WESTERN WAKE FREEWAY
COMPLETE 540
2020 ADT
2040 ADT
A
B
C
D
SEE PSH 06B
WETLAND WE AND POND PA ARE CONSIDERED ISOLATED
POND PA
WETLAND WE
SITE 4
POND TO BE DRAINED ACCORDING TO POND DRAINAGE PLAN
NO WETLAND IMPACT
DUKE ENERGY OH POWER LINES
HOPE COMMUNITY CHURCH OF NC, INC
NC TURNPIKE AUTHORITY
-Y1- POT Sta. 44+89.18=
-YIRPCREV- POT Sta. 27+85.05
-YIRPD- PT Sta. 29+14.73
-YIRPD- SC Sta. 24+97.93
-YIRPD- SRS Sta. 22+17.93
-YIRPD- CS Sta. 19+92.93
-YIRPCREV- PT Sta. 26+74.26
-YIRPCREV- SC Sta. 24+77.14
-YIRPCREV- SRS Sta. 22+29.14
-YIRPCREV- CS Sta. 20+05.14
-YILPCREV- PT Sta. 20+27.25
-YILPCREV- PC Sta. 21+24.54
-YILPCREV- PC Sta. 18+63.56
-YILPCREV- PT Sta. 22+42.64
-YILPCREV- PT Sta. 18+61.21
-YILPCREV- PC Sta. 16+37.16
-YILPCREV- PT Sta. 16+28.61
-YILPCREV- PT Sta. 14+23.67
-YILPCREV- PC Sta. 14+24.44
-YILPCREV- PC Sta. 12+30.02
-LREV- POC Sta. 33+11.22
-YILPCREV- POT Sta. 10+00.00
-LREV- POC Sta. 31+09.20=
-Y1- POT Sta. 37+56.06
-LREV- PC Sta. 22+52.50
-LREV- PT Sta. 42+34.28
-LREV- POC Sta. 32+30.62
-YILPBREV- ST Sta. 10+00.00
-YILPBREV- SC Sta. 12+00.00
-YILPBREV- PT Sta. 20+82.69
-YILPBREV- PCC Sta. 15+63.27
-YILPBREV- SC Sta. 19+31.16
-YILPBREV- CS Sta. 17+31.16
-YIRPBREV- CS Sta. 19+59.12
-YIRPBREV- SRS Sta. 22+99.12
-YIRPBREV- SC Sta. 25+69.12
-YIRPBREV- PT Sta. 27+53.65
-YIRPA- PT Sta. 24+26.21
-YIRPA- PC Sta. 28+43.33
-Y1- POC Sta. 32+68.05=
-YIRPBREV- POT Sta. 29+88.65
-YIRPA- PT Sta. 31+03.70
SEE SHEET 37 FOR -LREV- PROFILE
SEE SHEET 46 FOR -YIRPB- PROFILE
SEE SHEET 47 FOR -YIRPC- PROFILE
SEE SHEET 48 FOR -YIRPD- PROFILE
SEE SHEET 49 FOR -YILPB- PROFILE
ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED
ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED
PAVED SHOULDER
PAVEMENT REMOVAL
PROPOSED SIGNAL
GRAPHIC SCALE
PLANS
LOCATION:
TIP NO.
R-2721A
COUNTY:
WAKE
DESIGNED BY:
CHECKED BY:
DATE:

PERMIT DRAWING
SHEET 12 OF 119

REVISIONS

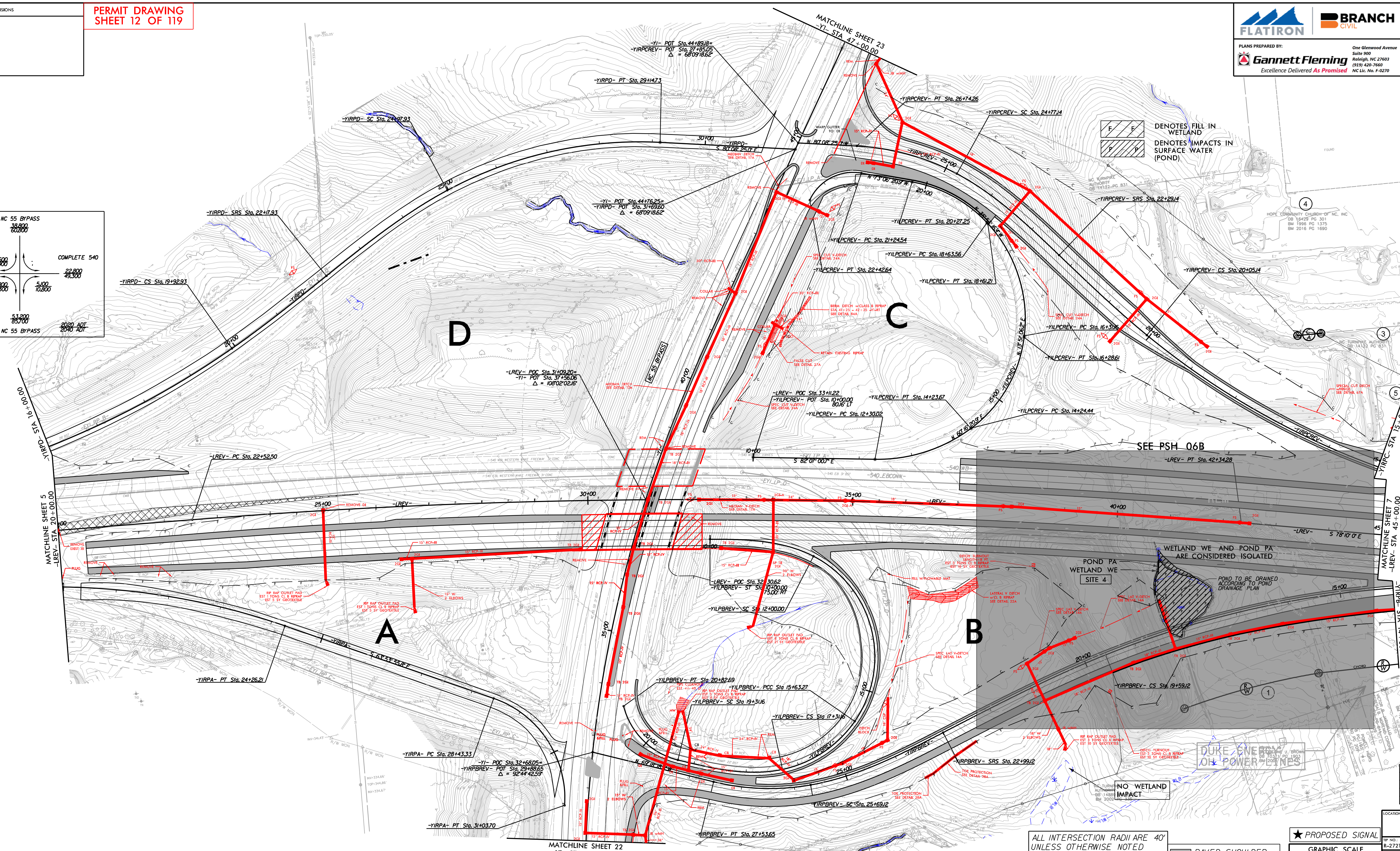
FLATIRON | BRANCH CIVIL

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SEE SHEET 37 FOR -LREV- PROFILE
SEE SHEET 46 FOR -YIRPB- PROFILE
SEE SHEET 47 FOR -YIRPC- PROFILE
SEE SHEET 48 FOR -YIRPD- PROFILE
SEE SHEET 49 FOR -YILPB- PROFILE

ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED

ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED

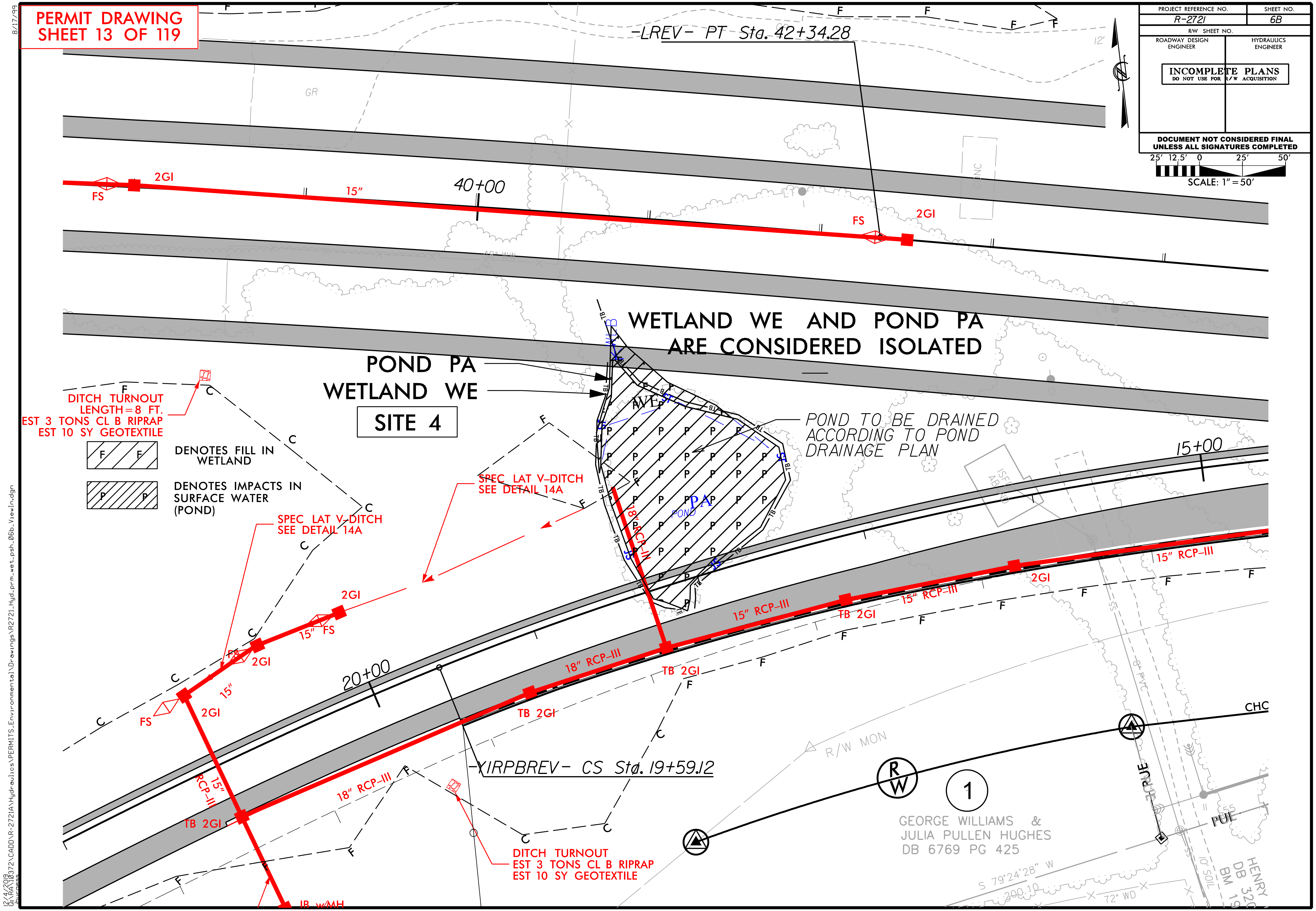
PAVED SHOULDER

PAVEMENT REMOVAL

★ PROPOSED SIGNAL

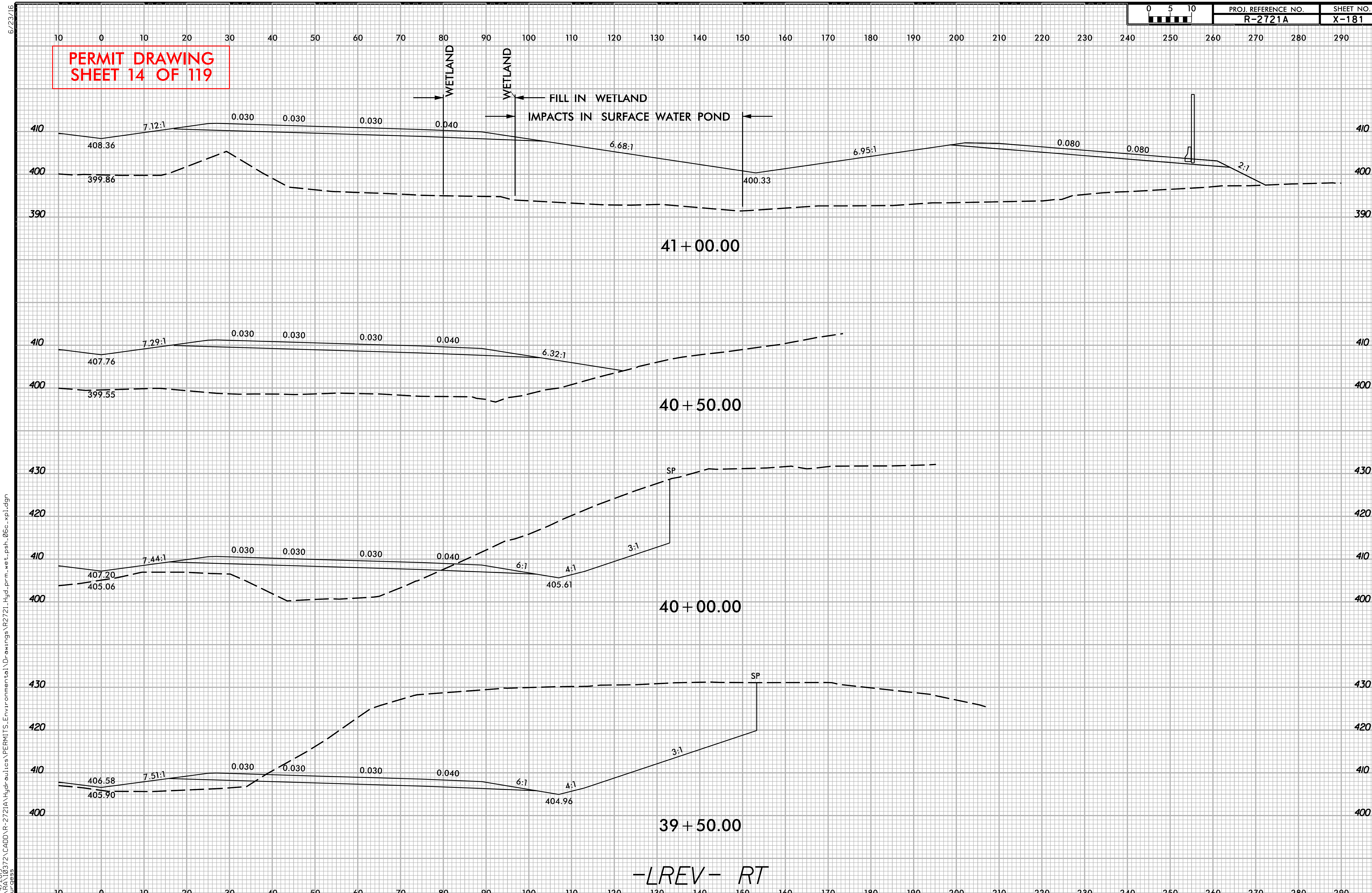
GRAPHIC SCALE
100 50 0 100 200
PLANS

LOCATION:	
TIP NO.: R-2721A	COUNTY: WAKE
DESIGNED BY:	
CHECKED BY:	DATE:

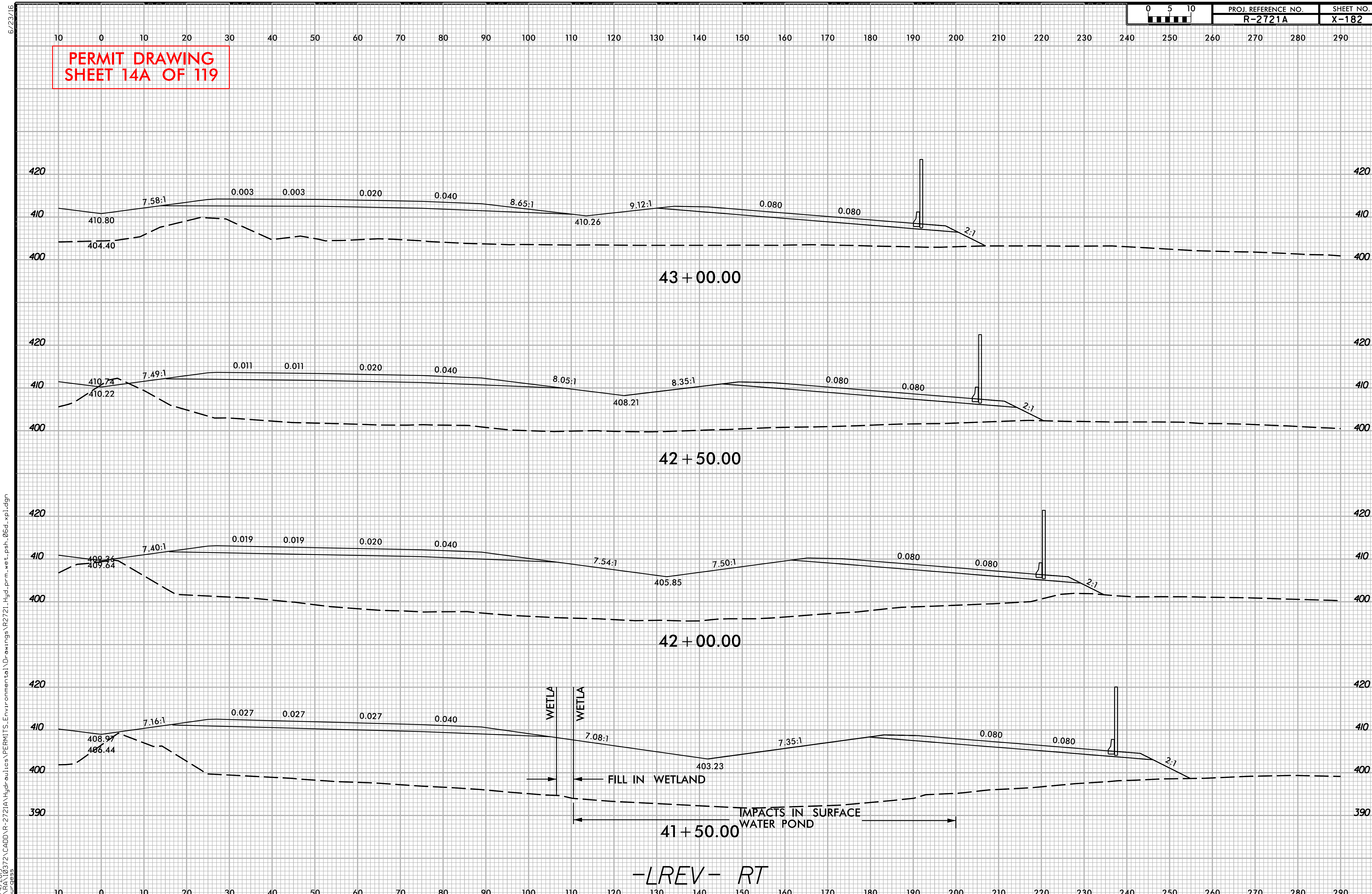


PERMIT DRAWING
SHEET 13 OF 119
8/17/99
PROJECT REFERENCE NO.
R-2721
SHEET NO.
6B
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
SCALE: 1" = 50'
-LREV- PT Sta. 42+34.28
40+00
WETLAND WE AND POND PA ARE CONSIDERED ISOLATED
POND PA
WETLAND WE
SITE 4
POND TO BE DRAINED ACCORDING TO POND DRAINAGE PLAN
DITCH TURNOUT
LENGTH = 8 FT.
EST 3 TONS CL B RIPRAP
EST 10 SY GEOTEXTILE
DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER (POND)
SPEC LAT V-DITCH
SEE DETAIL 14A
SPEC LAT V-DITCH
SEE DETAIL 14A
15+00
20+00
18" RCP-III
15" RCP-III
TB 2GI
-YIRPBREV- CS Sta. 19+59.12
R/W MON
DITCH TURNOUT
EST 3 TONS CL B RIPRAP
EST 10 SY GEOTEXTILE
GEORGE WILLIAMS &
JULIA PULLEN HUGHES
DB 6769 PG 425
S 79°24'28" W
IB w/MH
CHC
PUE

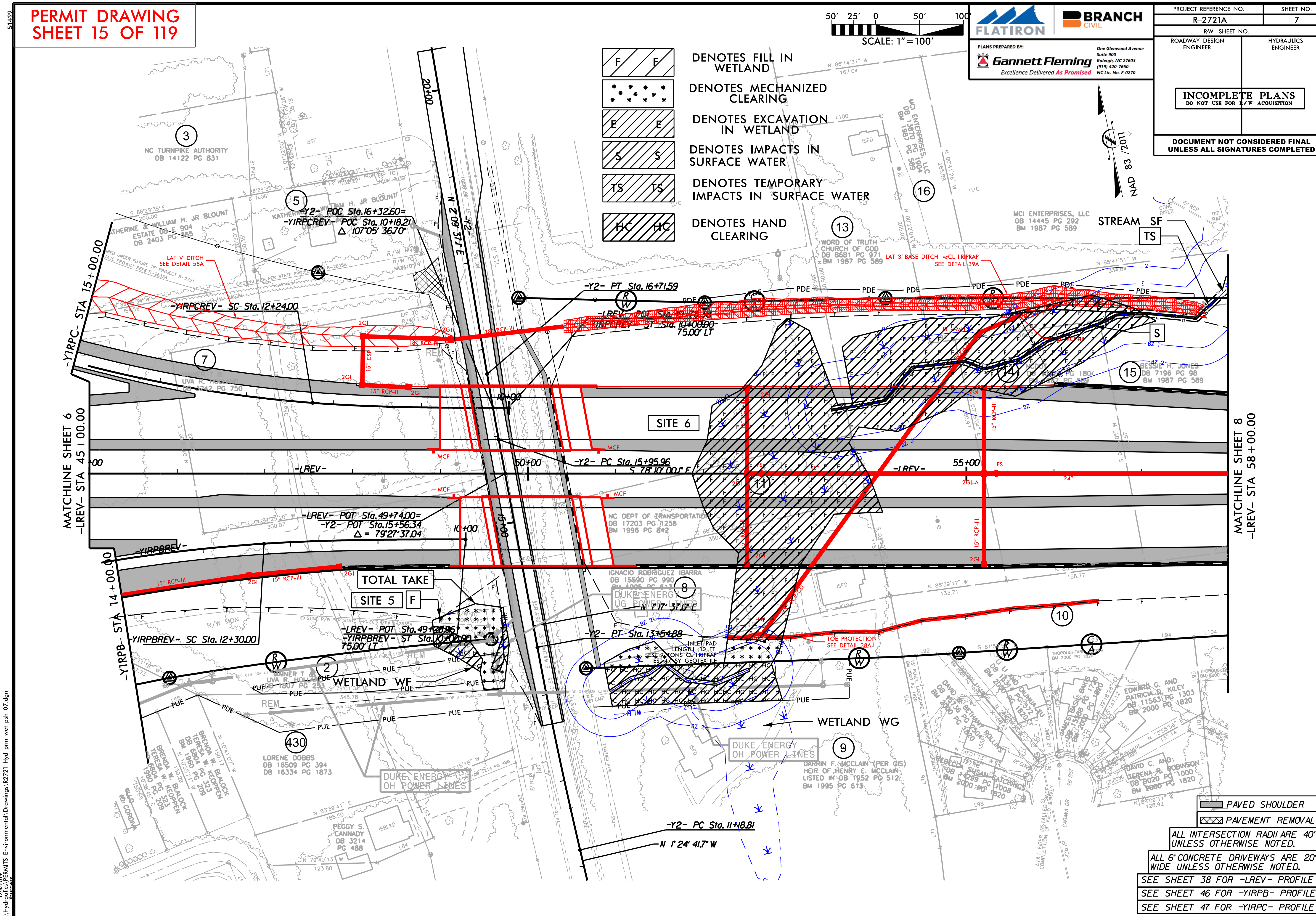
6/23/16



12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_06c_xpl.dgn
hburgess



6/23/16
12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_06d_xpl.dgn
hburgess



12/4/2019
R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_07.dgn

PERMIT DRAWING
SHEET 16 OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

FLATIRON | BRANCH CIVIL

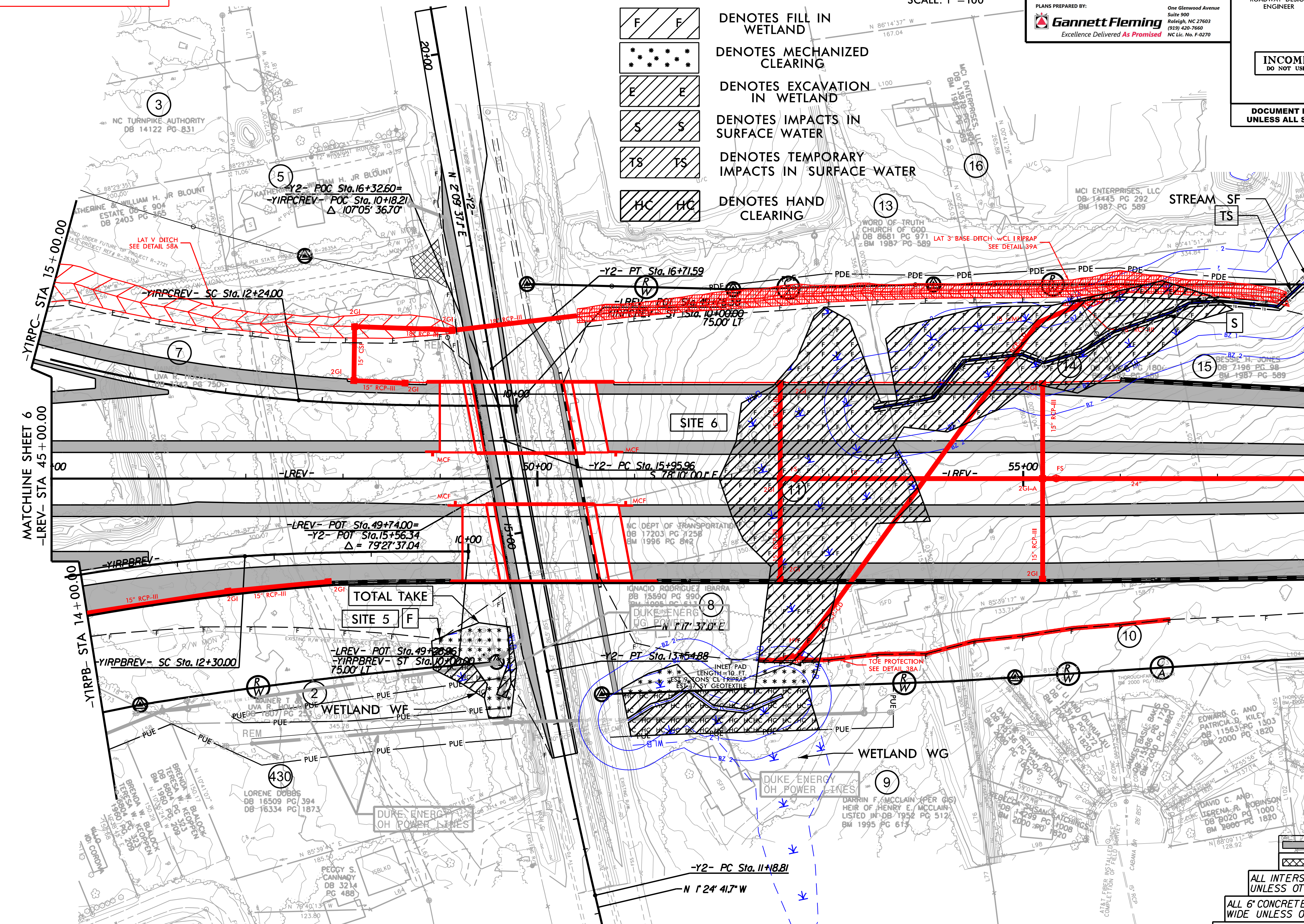
PLANS PREPARED BY: Gannett Fleming — Excellence Delivered As Promised
One Glenwood Avenue, Suite 900, Raleigh, NC 27603, (919) 420-7660, NC Lic. No. F-0270

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SCALE: 1" = 100'

F F	DENOTES FILL IN WETLAND
(dots)	DENOTES MECHANIZED CLEARING
E E	DENOTES EXCAVATION IN WETLAND
S S	DENOTES IMPACTS IN SURFACE WATER
TS TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
HC HC	DENOTES HAND CLEARING



PAVED SHOULDER
PAVEMENT REMOVAL

ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.

ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

SEE SHEET 38 FOR -LREV- PROFILE
SEE SHEET 46 FOR -YIRPB- PROFILE
SEE SHEET 47 FOR -YIRPC- PROFILE

12/4/2019
R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_07a.dgn

PERMIT DRAWING
SHEET 17 OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	38

FLATIRON | BRANCH CIVIL

PLANS PREPARED BY: Gannett Fleming — Excellence Delivered As Promised — One Glenwood Avenue, Suite 900, Raleigh, NC 27603, (919) 420-7660, NC Lic. No. F-0270

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

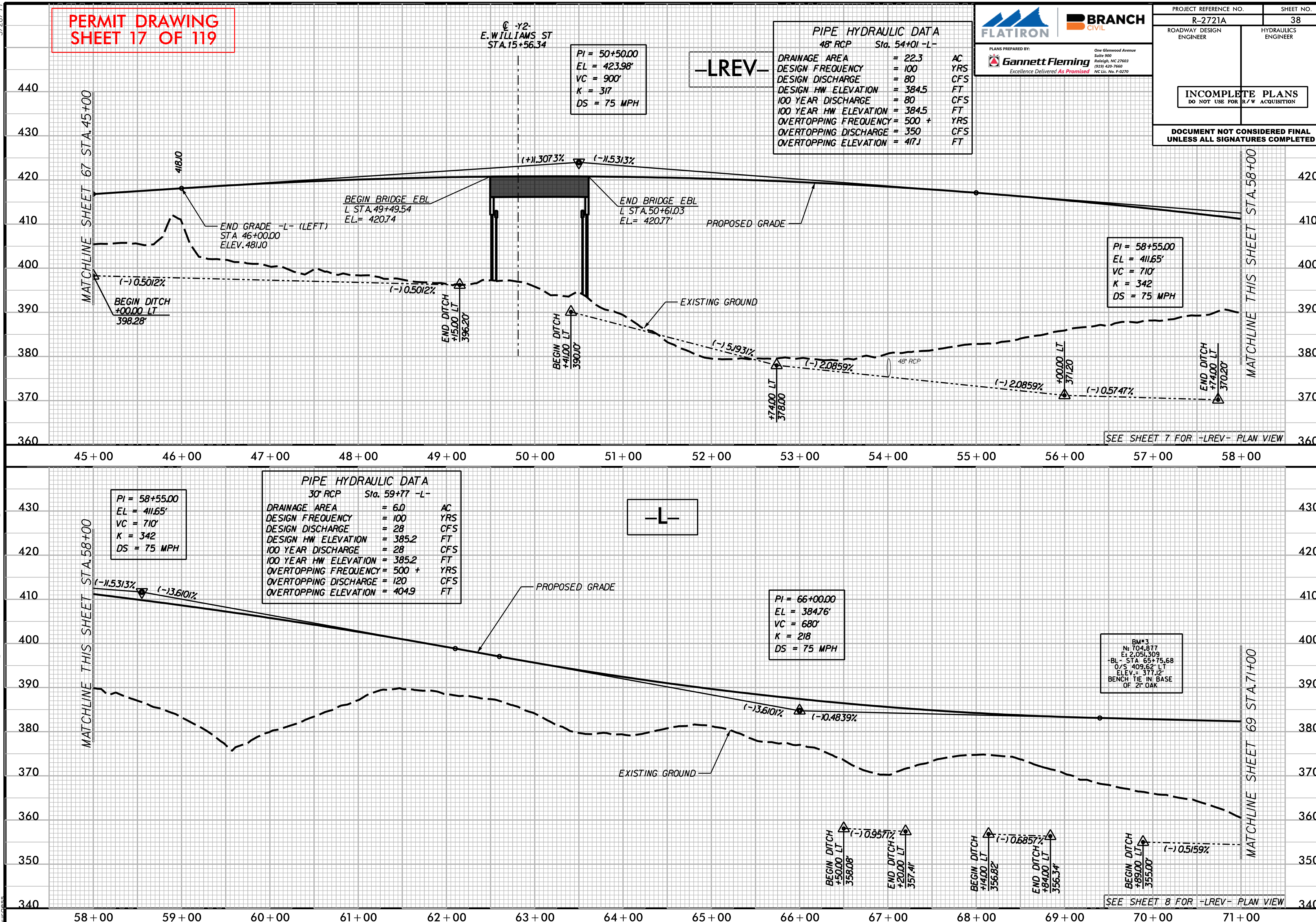
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PIPE HYDRAULIC DATA
48" RCP Sta. 54+01 -L-

DRAINAGE AREA	=	22.3	AC
DESIGN FREQUENCY	=	100	YRS
DESIGN DISCHARGE	=	80	CFS
DESIGN HW ELEVATION	=	384.5	FT
100 YEAR DISCHARGE	=	80	CFS
100 YEAR HW ELEVATION	=	384.5	FT
OVERTOPPING FREQUENCY	=	500 +	YRS
OVERTOPPING DISCHARGE	=	350	CFS
OVERTOPPING ELEVATION	=	417.1	FT

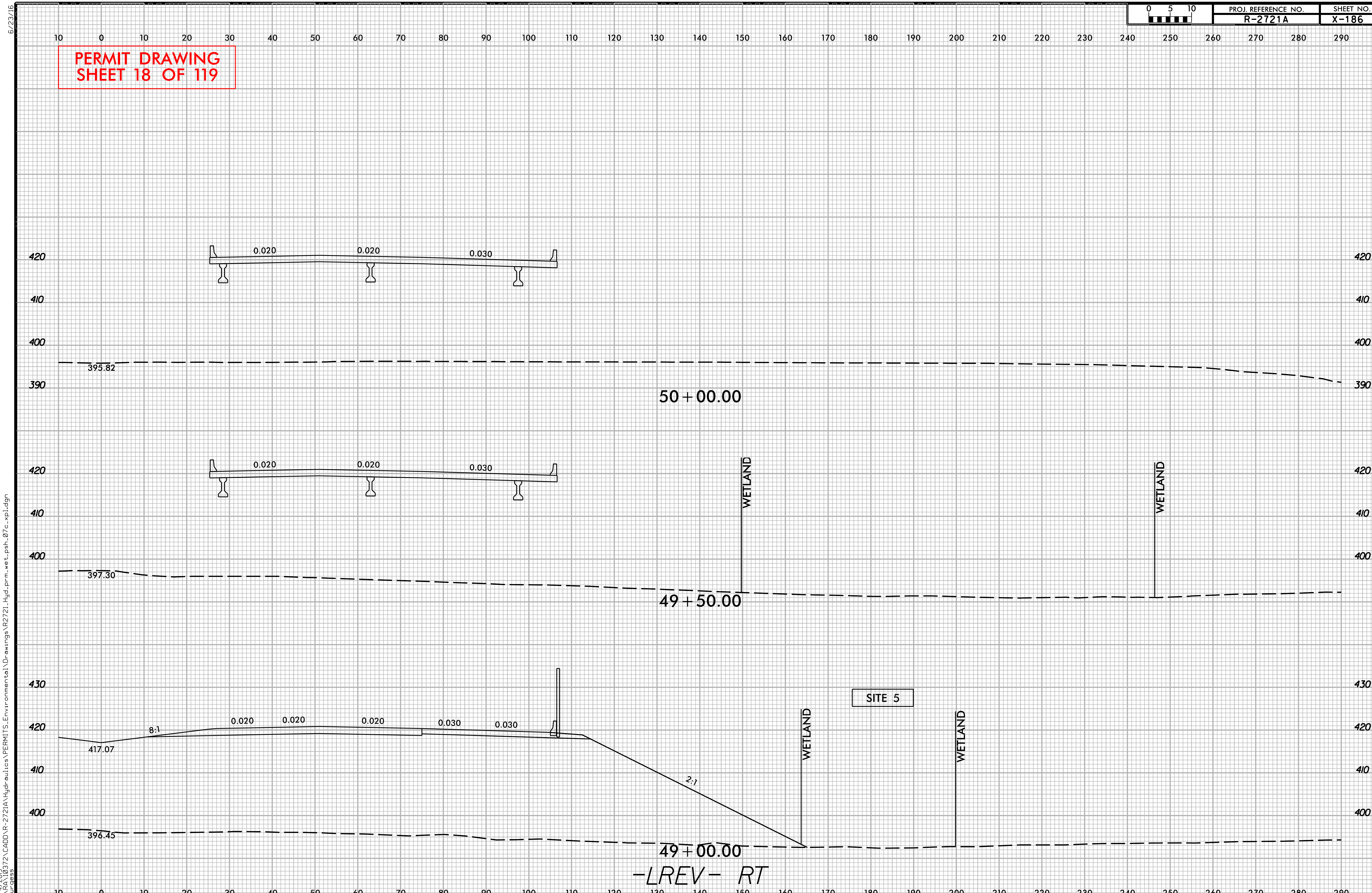
PIPE HYDRAULIC DATA
30" RCP Sta. 59+77 -L-

DRAINAGE AREA	=	6.0	AC
DESIGN FREQUENCY	=	100	YRS
DESIGN DISCHARGE	=	28	CFS
DESIGN HW ELEVATION	=	385.2	FT
100 YEAR DISCHARGE	=	28	CFS
100 YEAR HW ELEVATION	=	385.2	FT
OVERTOPPING FREQUENCY	=	500 +	YRS
OVERTOPPING DISCHARGE	=	120	CFS
OVERTOPPING ELEVATION	=	404.9	FT



5/28/99

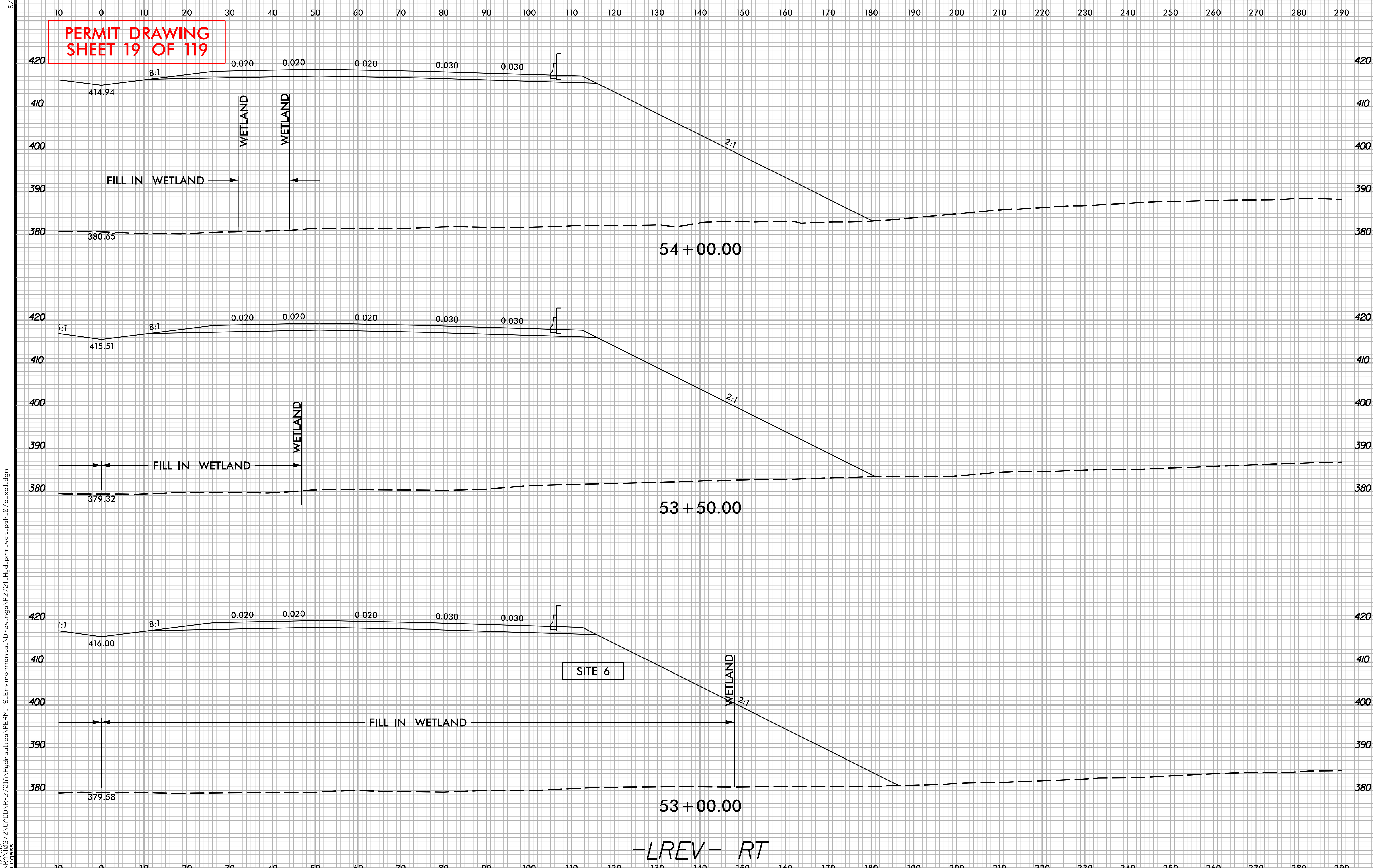
12/4/2019
G:\RA10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_07b_pfl.dgn



PERMIT DRAWING
SHEET 18 OF 119
PROJ. REFERENCE NO.
R-2721A
SHEET NO.
X-186
0 5 10
50+00.00
395.82
0.020
0.020
0.030
49+50.00
397.30
WETLAND
WETLAND
49+00.00
396.45
417.07
8:1
2:1
0.020
0.020
0.020
0.030
0.030
SITE 5
WETLAND
WETLAND
-LREV- RT
6/23/16
12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_07a_xpl.dgn
burgess

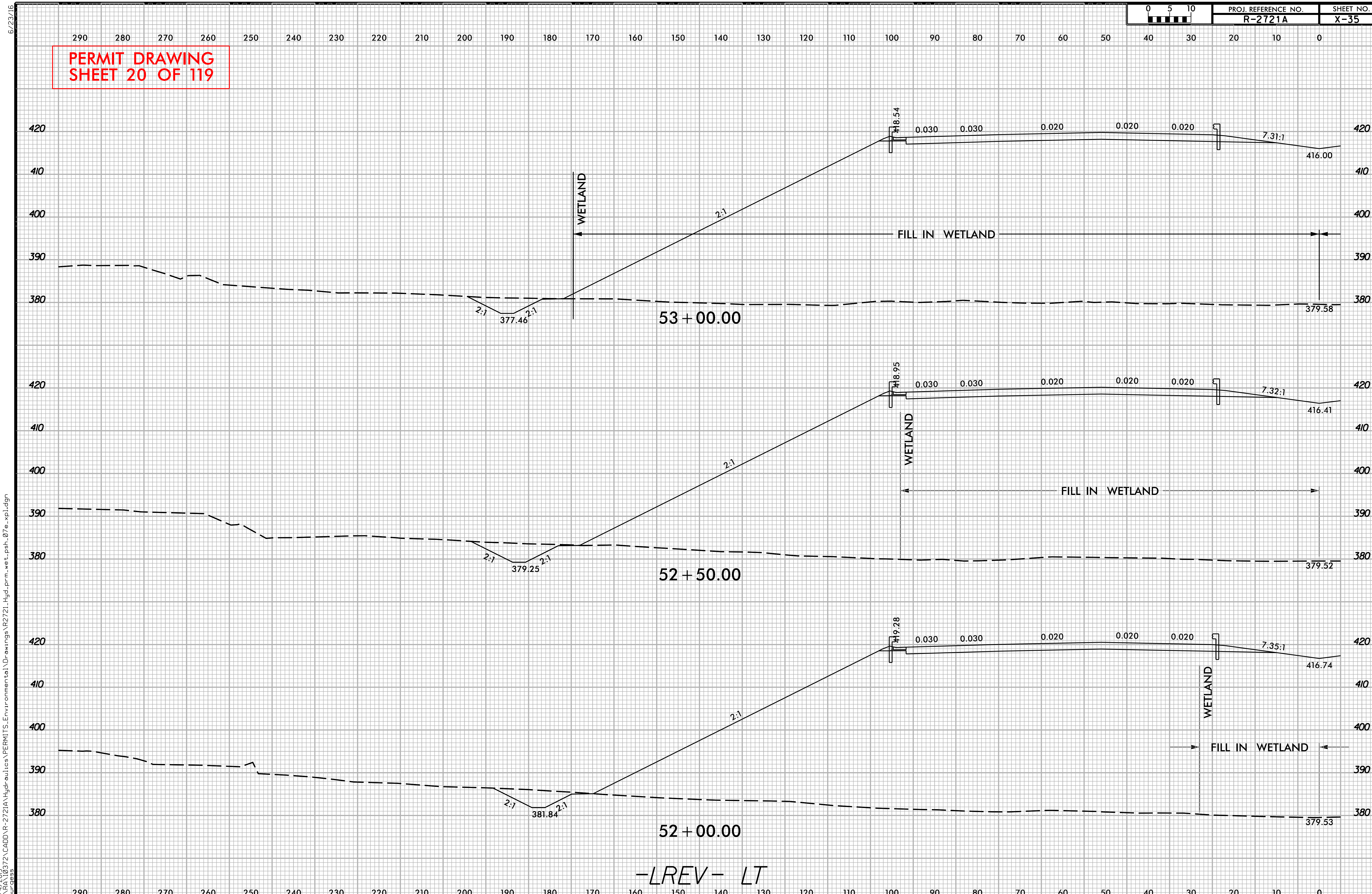
PERMIT DRAWING
SHEET 19 OF 119

PROJ. REFERENCE NO.	SHEET NO.
R-2721A	X-189



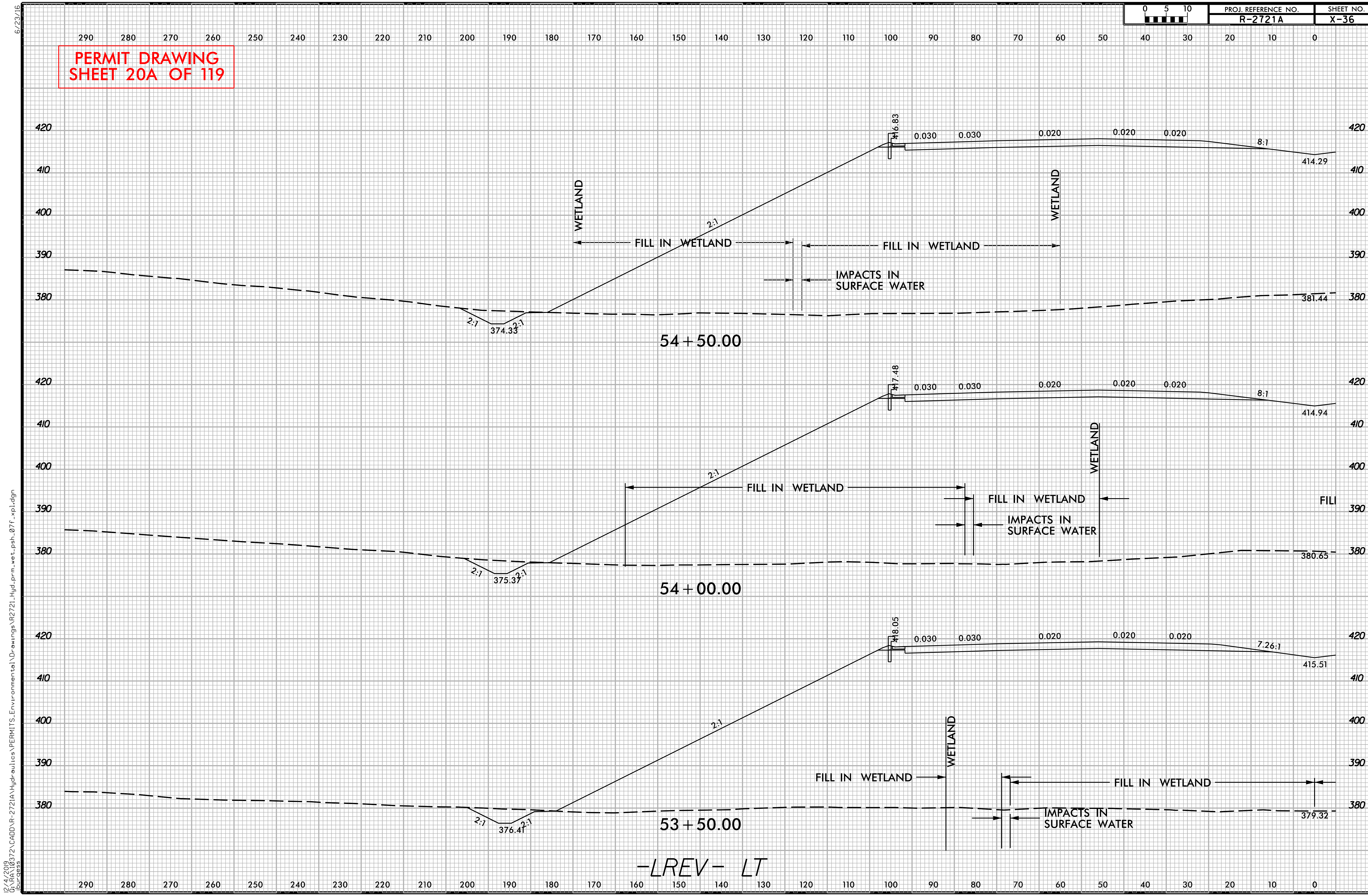
-LREV- RT

6/23/16
12/4/2019
G:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_07d_xpl.dgn



6/23/16

12/4/2019 O:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_07e_xpl.dgn Burgess



6/23/16
0 5 10
PROJ. REFERENCE NO.
R-2721A
SHEET NO.
X-36
PERMIT DRAWING
SHEET 20A OF 119
290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
420
410
400
390
380
416.83
0.030
0.030
0.020
0.020
0.020
8:1
414.29
WETLAND
WETLAND
2:1
FILL IN WETLAND
FILL IN WETLAND
IMPACTS IN
SURFACE WATER
381.44
2:1
374.33
2:1
54+50.00
417.48
0.030
0.030
0.020
0.020
0.020
8:1
414.94
WETLAND
2:1
FILL IN WETLAND
FILL IN WETLAND
FILL
IMPACTS IN
SURFACE WATER
380.65
2:1
375.37
2:1
54+00.00
418.05
0.030
0.030
0.020
0.020
0.020
7.26:1
415.51
2:1
WETLAND
FILL IN WETLAND
FILL IN WETLAND
IMPACTS IN
SURFACE WATER
379.32
2:1
376.41
2:1
53+50.00
-LREV- LT
12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_07f_xpl.dgn
hburgess

PERMIT DRAWING
SHEET 21 OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

FLATIRON | BRANCH CIVIL

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

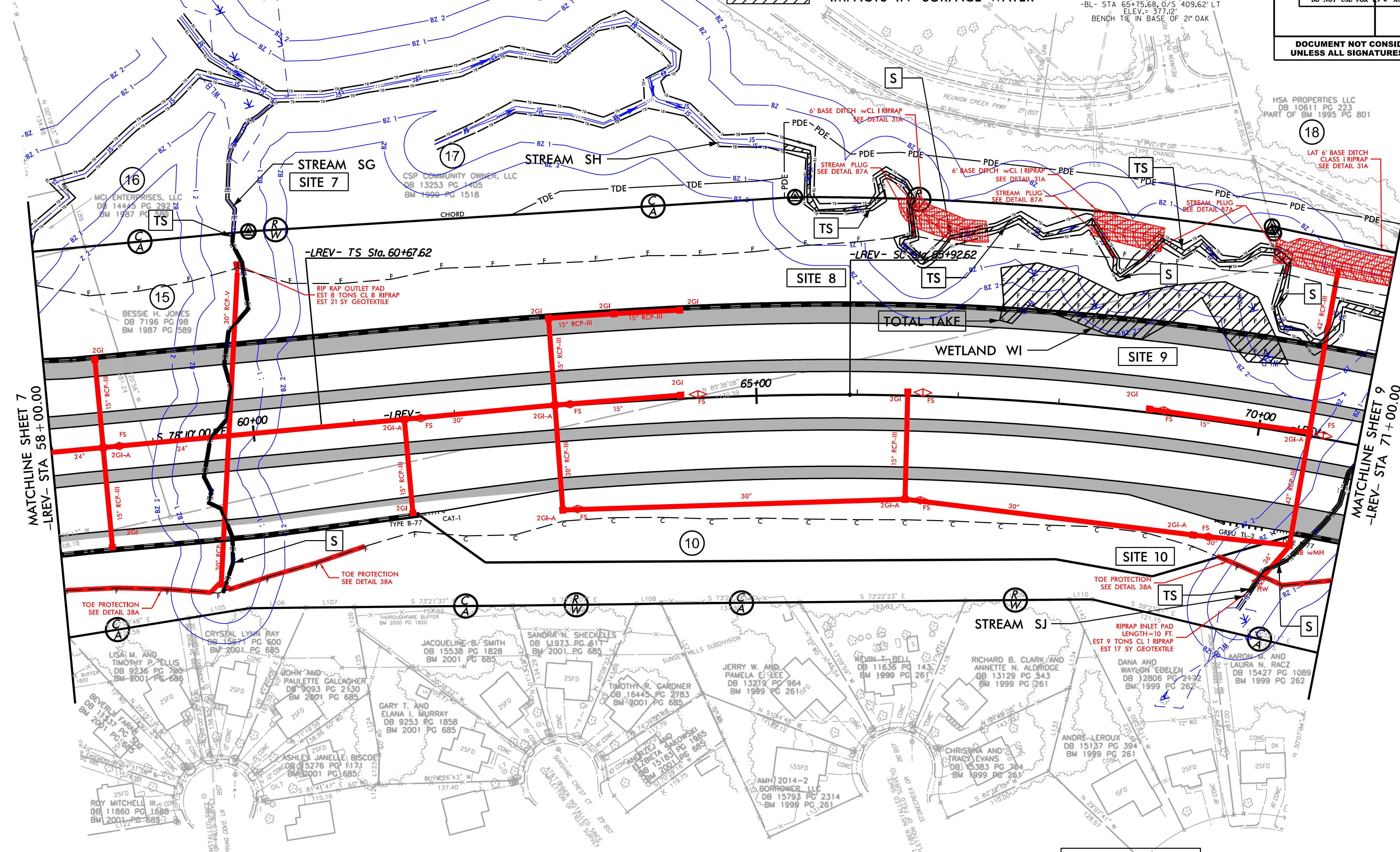
SCALE: 1" = 100'
50' 25' 0 50' 100'

F F DENOTES FILL IN WETLAND

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

BM#3
N: 704,877, E: 2,051,309
-BL- STA 65+75.68, O/S 409.62' LT
ELEV.= 377.12'
BENCH TIE IN BASE OF 21" OAK



PAVED SHOULDER

PAVEMENT REMOVAL

ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.

ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

SEE SHEET 38 FOR -LREV- PROFILE

514599

12/4/2019
R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_08.dgn

PERMIT DRAWING
SHEET 22 OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

FLATIRON | BRANCH CIVIL

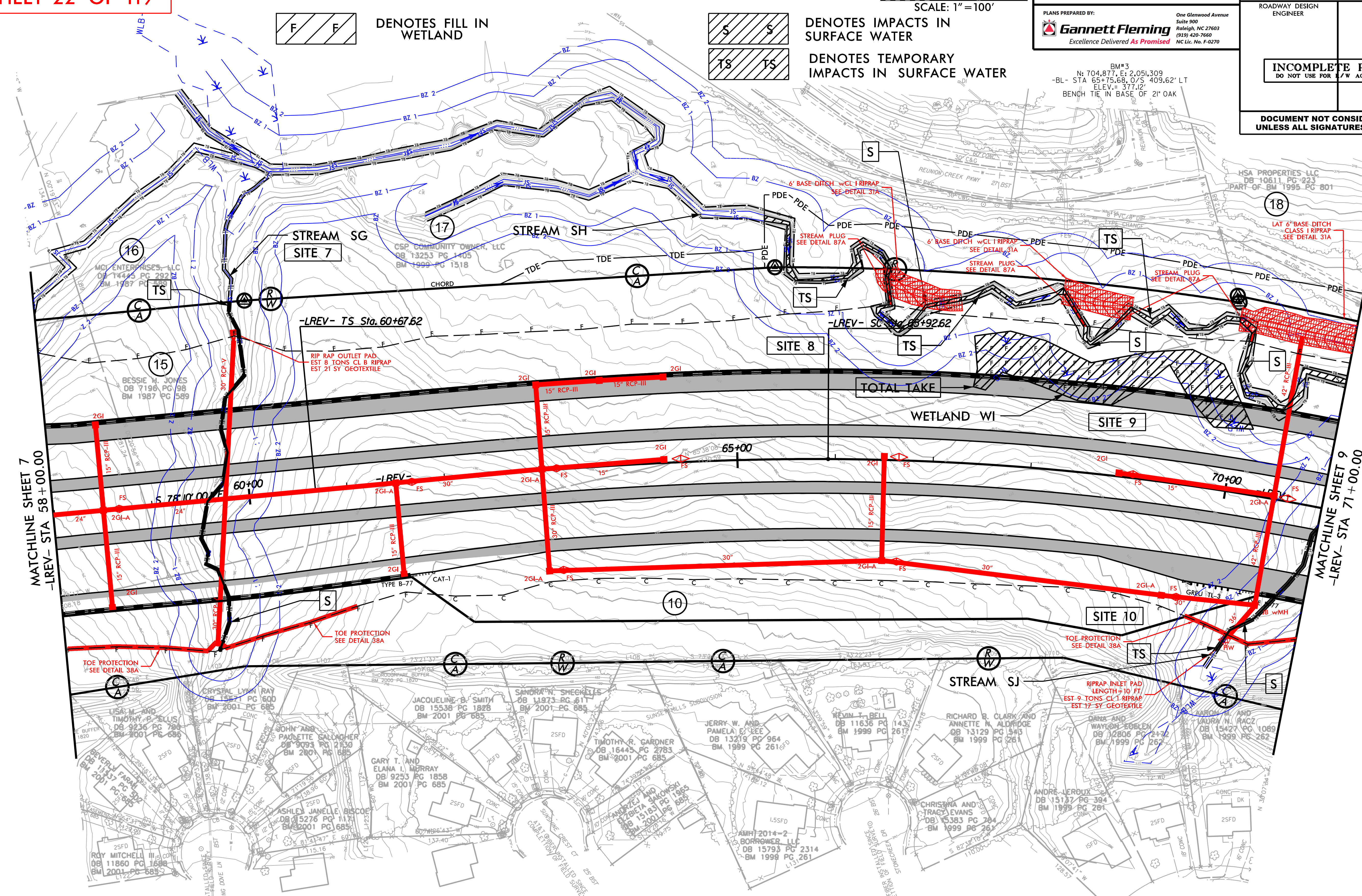
PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

SCALE: 1" = 100'

F F — DENOTES FILL IN WETLAND

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER



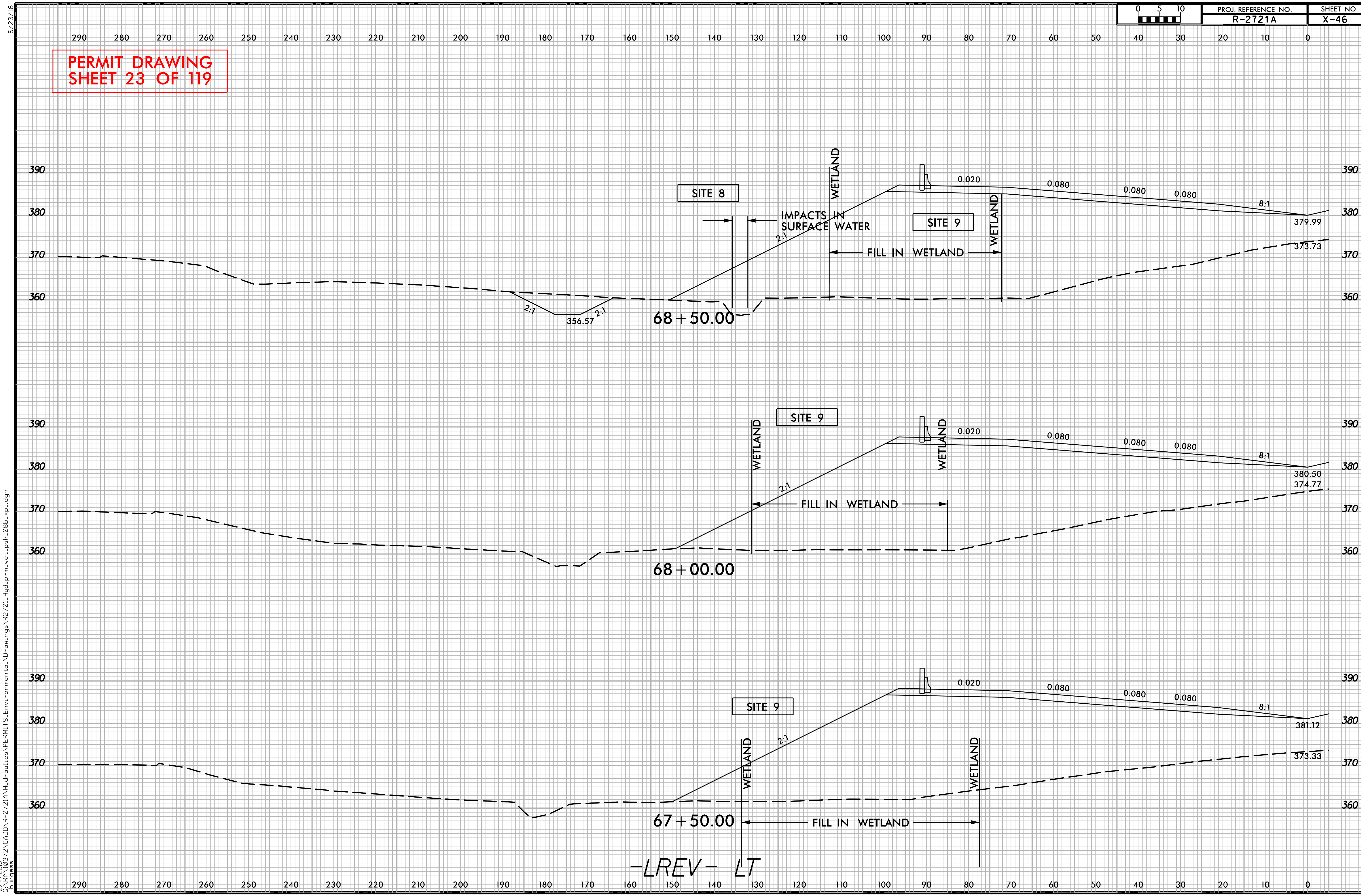
PAVED SHOULDER
PAVEMENT REMOVAL

ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.

ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

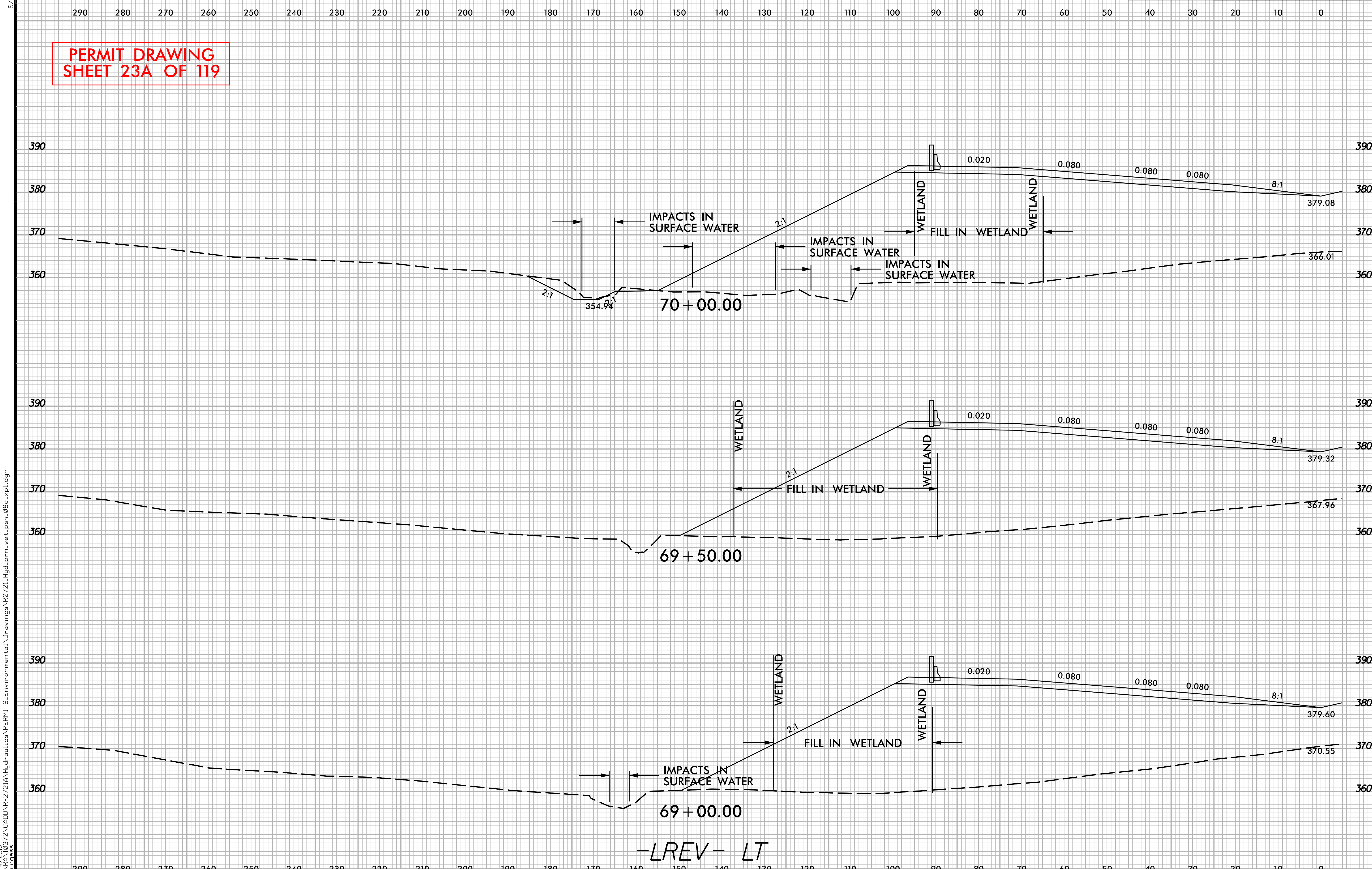
SEE SHEET 38 FOR -LREV- PROFILE

12/4/2019
R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_08a.dgn


PERMIT DRAWING
SHEET 23 OF 119
PROJ. REFERENCE NO.
R-2721A
SHEET NO.
X-46
SITE 8
SITE 9
IMPACTS IN
SURFACE WATER
WETLAND
FILL IN WETLAND
0.020
0.080
8:1
2:1
379.99
373.73
356.57
68+50.00
380.50
374.77
68+00.00
381.12
373.33
67+50.00
-LREV- LT

PROJ. REFERENCE NO.	SHEET NO.
R-2721A	X-47

PERMIT DRAWING
SHEET 23A OF 119



6/23/16

12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_08c_xpl.dgn
burgess

PERMIT DRAWING
SHEET 24 OF 119

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

SCALE: 1" = 100'

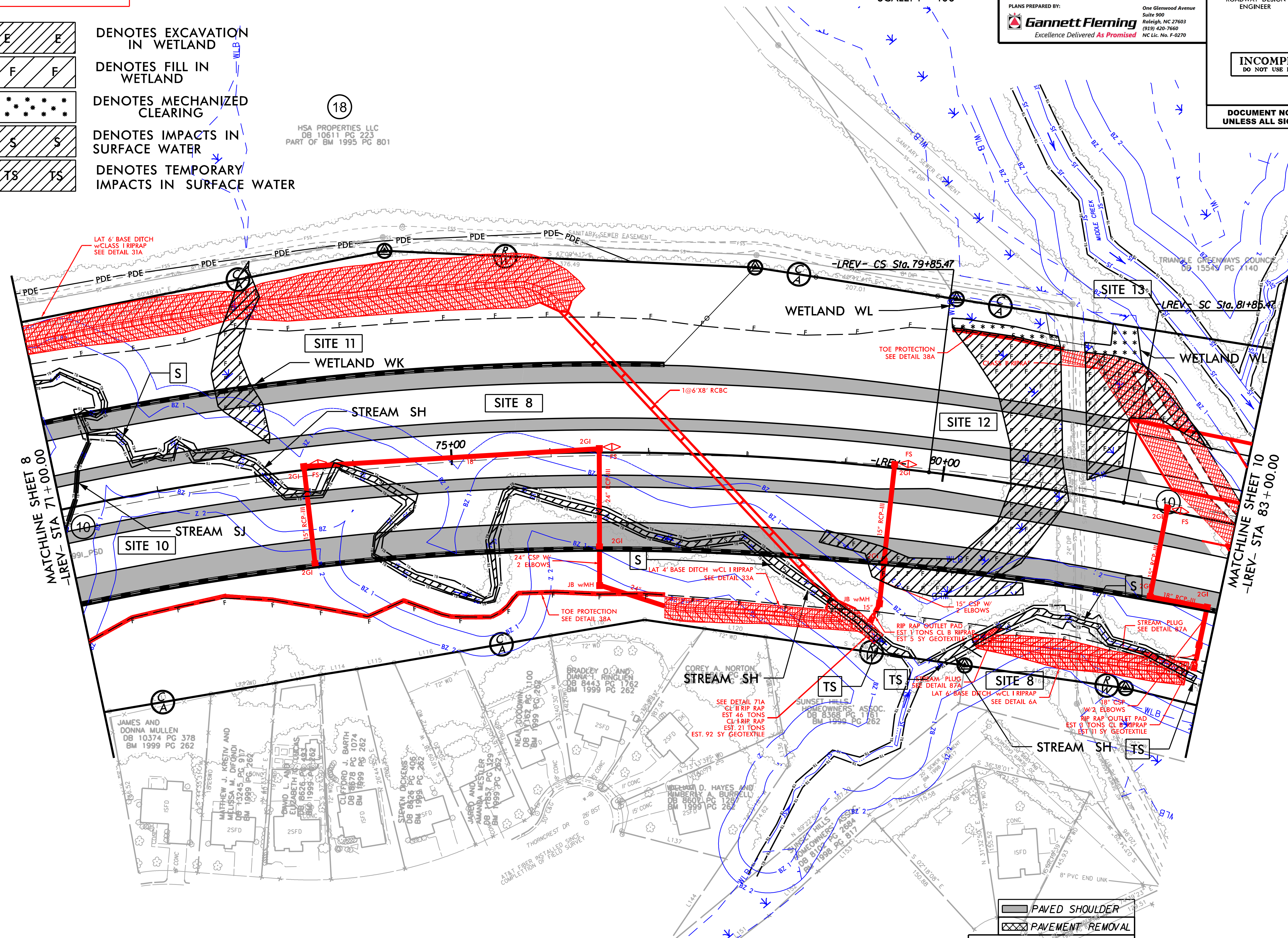
FLATIRON | BRANCH CIVIL

PLANS PREPARED BY: Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PAVED SHOULDER
PAVEMENT REMOVAL

ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.

ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

SEE SHEET 39 FOR -LREV- PROFILE

12/4/2019 R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_09.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	9

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

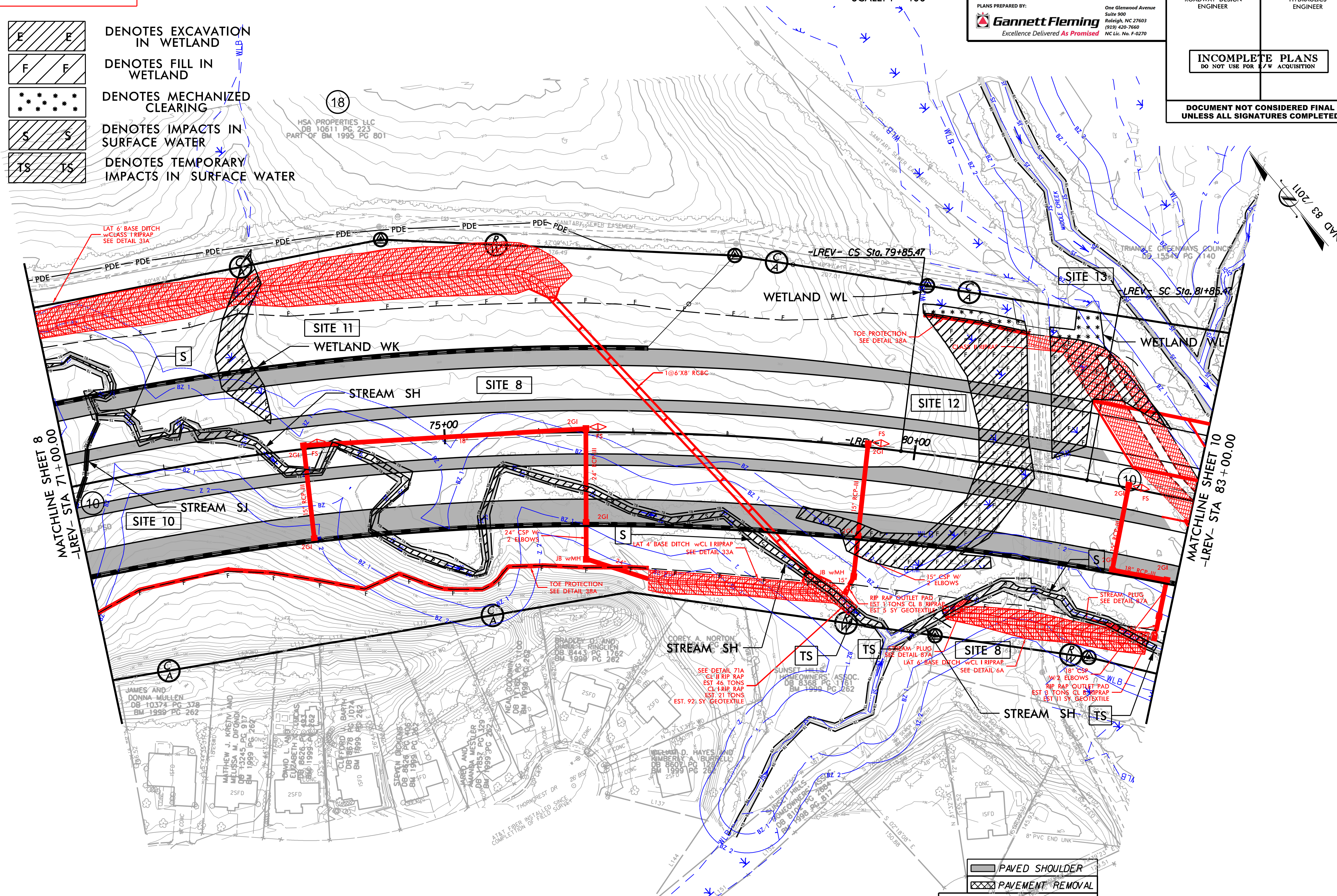
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

FLATIRON | BRANCH CIVIL

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

50' 25' 0 50' 100'
SCALE: 1" = 100'

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



▭	PAVED SHOULDER
⊠	PAVEMENT REMOVAL

ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.

ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

SEE SHEET 39 FOR -LREV- PROFILE

5/14/99

12/4/2019
...\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_09a.dgn
jburgess

PERMIT DRAWING
SHEET 26 OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	39

FLATIRON | BRANCH CIVIL

PLANS PREPARED BY: Gannett Fleming — Excellence Delivered As Promised — One Glenwood Avenue, Suite 900, Raleigh, NC 27603, (919) 420-7660, NC Lic. No. F-0270

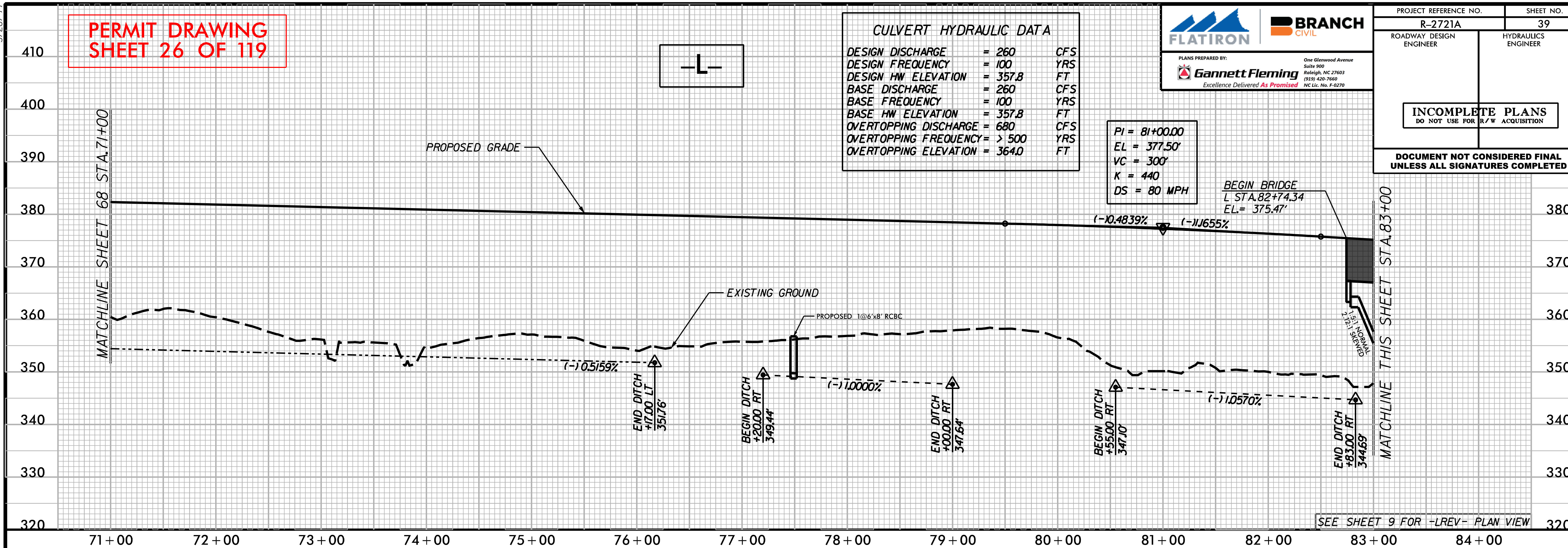
ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

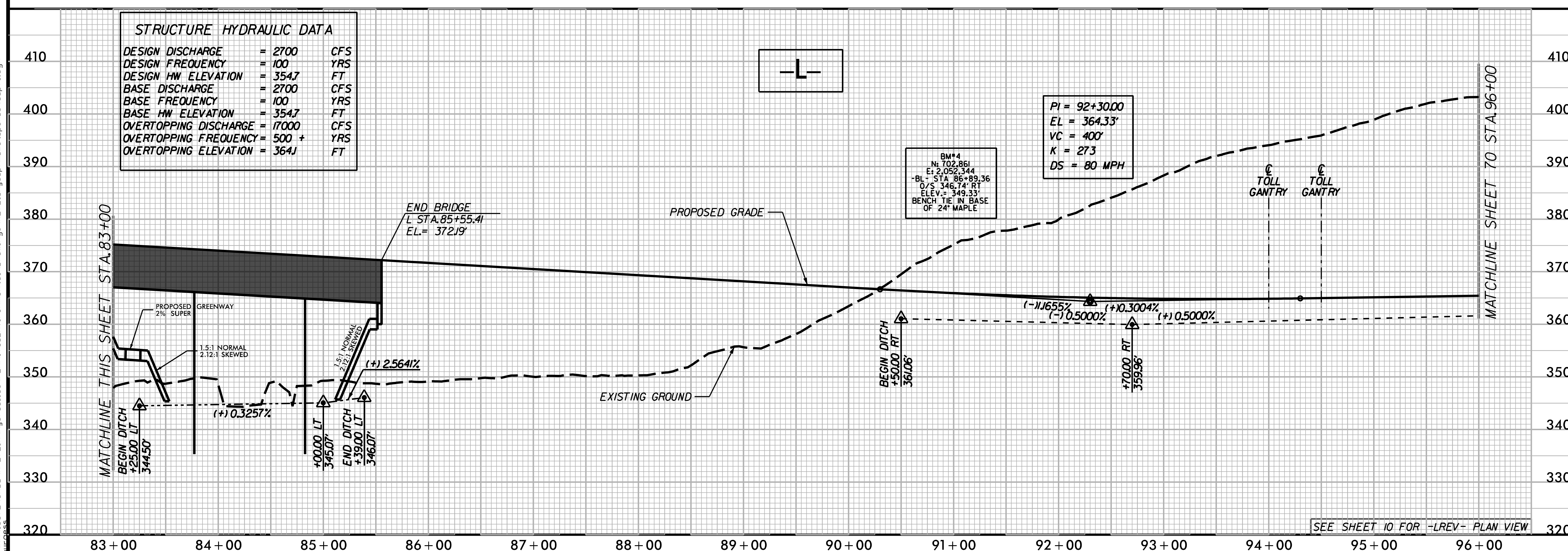
CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	=	260	CFS
DESIGN FREQUENCY	=	100	YRS
DESIGN HW ELEVATION	=	357.8	FT
BASE DISCHARGE	=	260	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	357.8	FT
OVERTOPPING DISCHARGE	=	680	CFS
OVERTOPPING FREQUENCY	=	> 500	YRS
OVERTOPPING ELEVATION	=	364.0	FT



STRUCTURE HYDRAULIC DATA

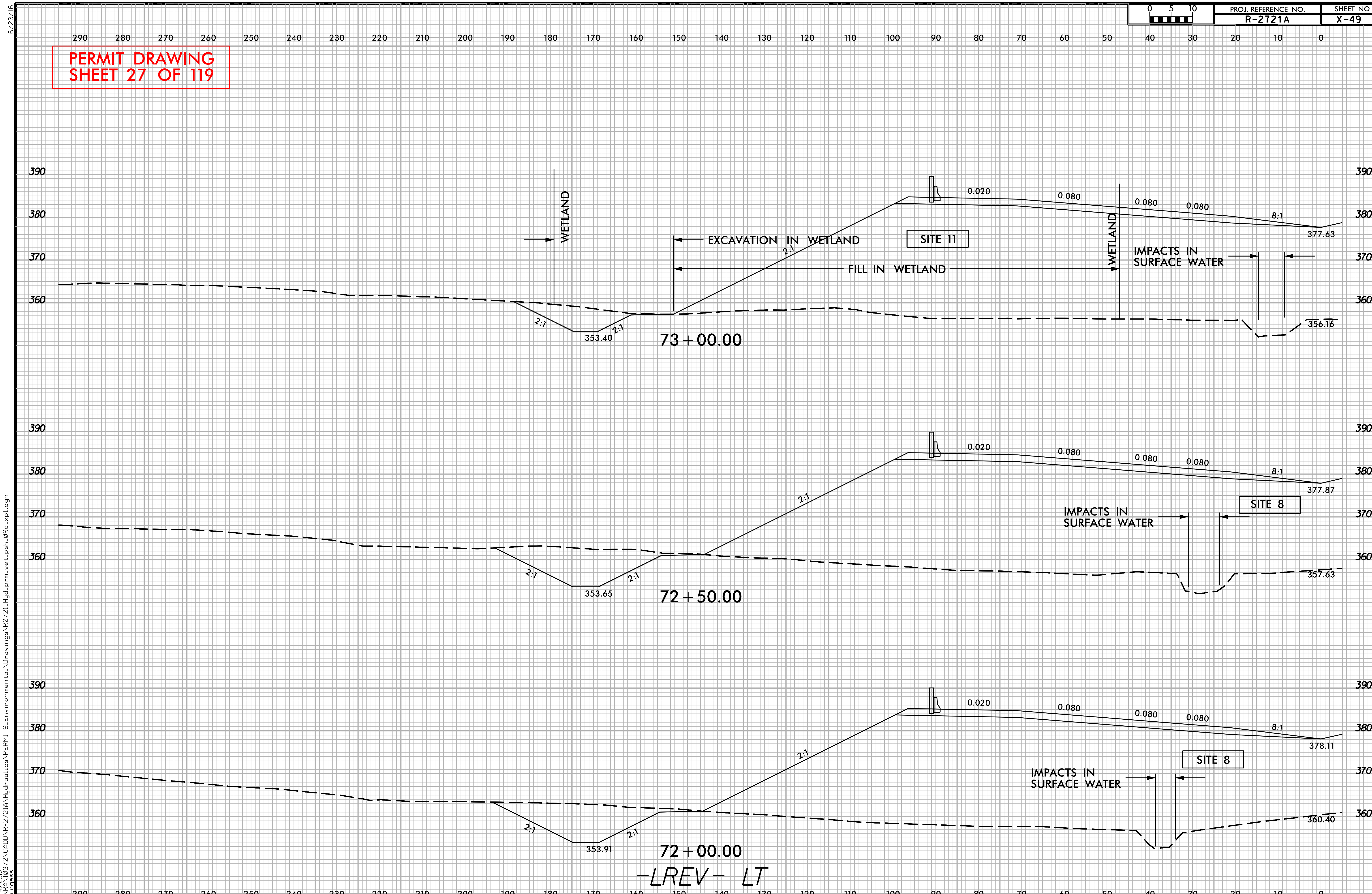
DESIGN DISCHARGE	=	2700	CFS
DESIGN FREQUENCY	=	100	YRS
DESIGN HW ELEVATION	=	354.7	FT
BASE DISCHARGE	=	2700	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	354.7	FT
OVERTOPPING DISCHARGE	=	17000	CFS
OVERTOPPING FREQUENCY	=	500 +	YRS
OVERTOPPING ELEVATION	=	364.1	FT



5/28/99
12/4/2019
O:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_09b_pfl.dgn

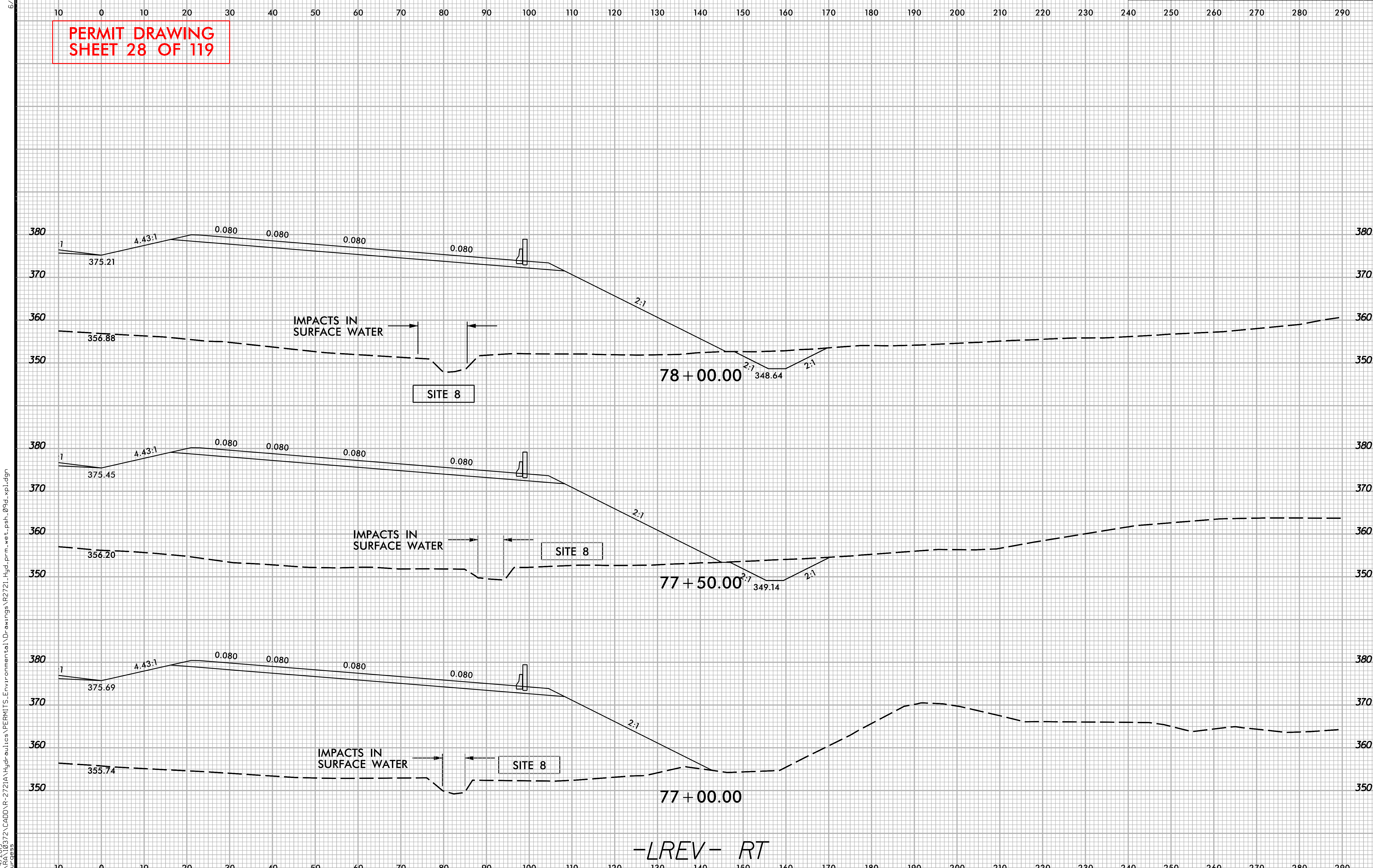
PROJ. REFERENCE NO.	SHEET NO.
R-2721A	X-49

PERMIT DRAWING
SHEET 27 OF 119



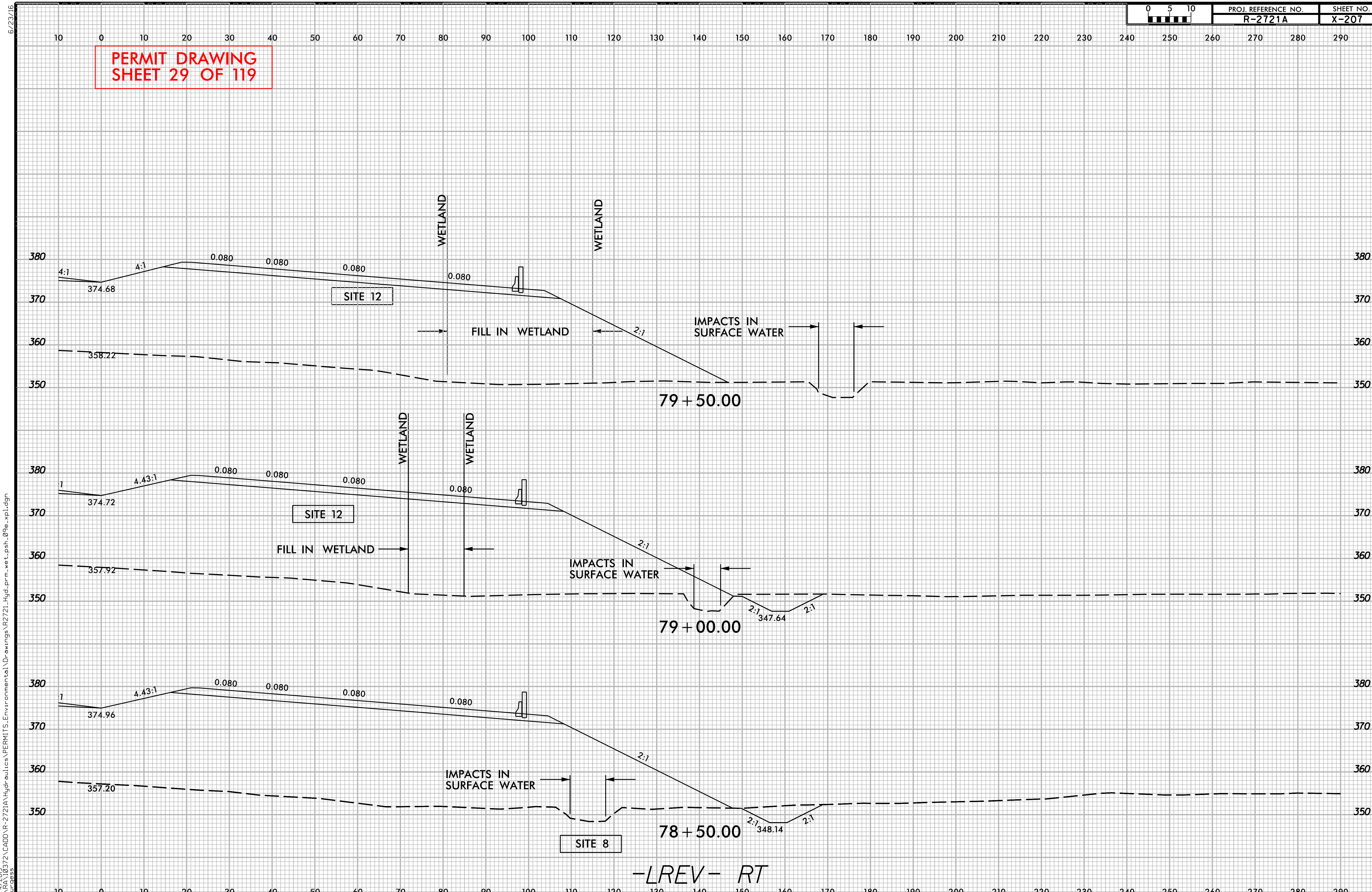
6/23/16
12/4/2019
O:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_09c_xpl.dgn
burgess

PROJ. REFERENCE NO.	SHEET NO.
R-2721A	X-206

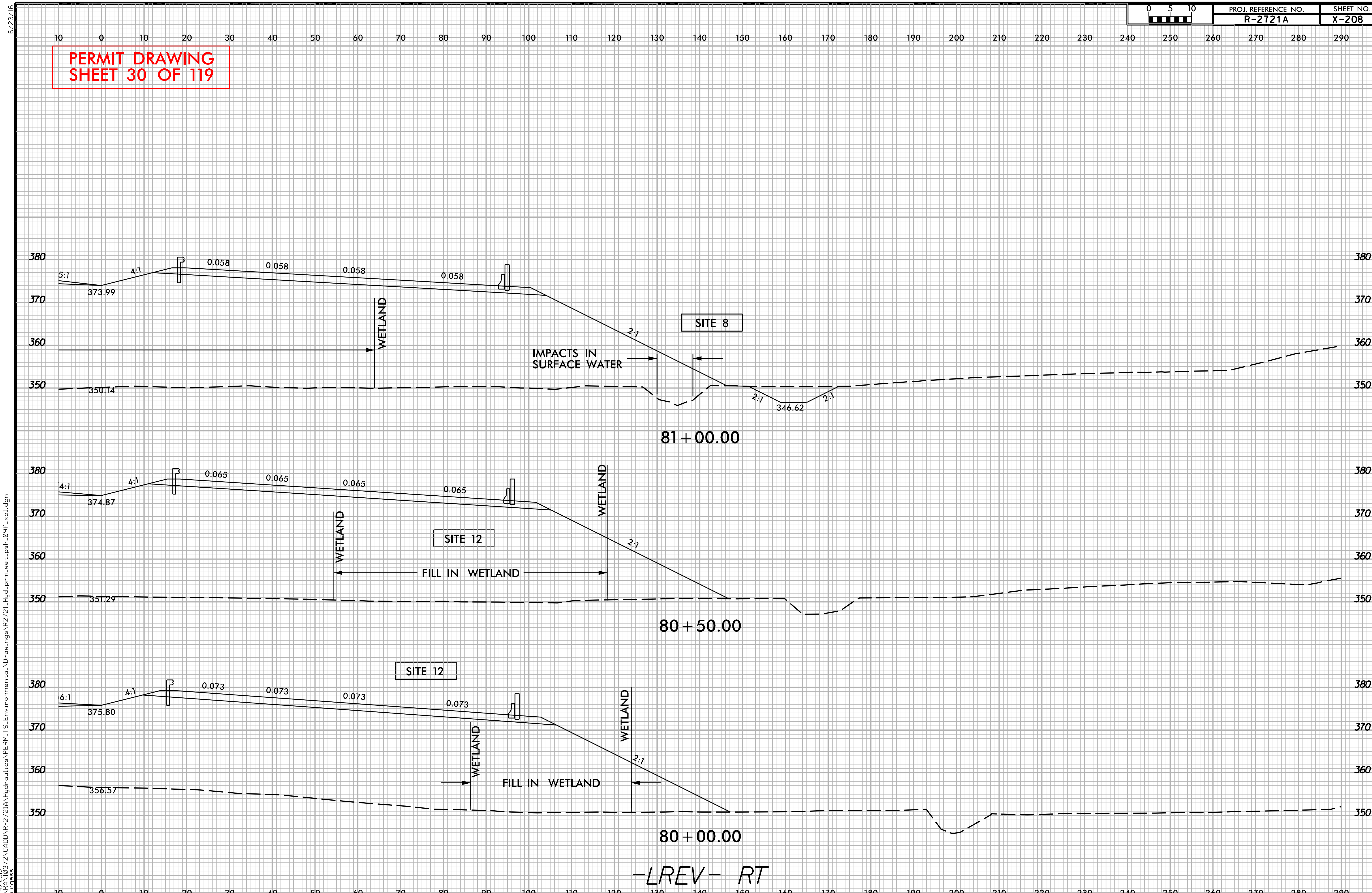


6/23/16
12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_09d_xpl.dgn

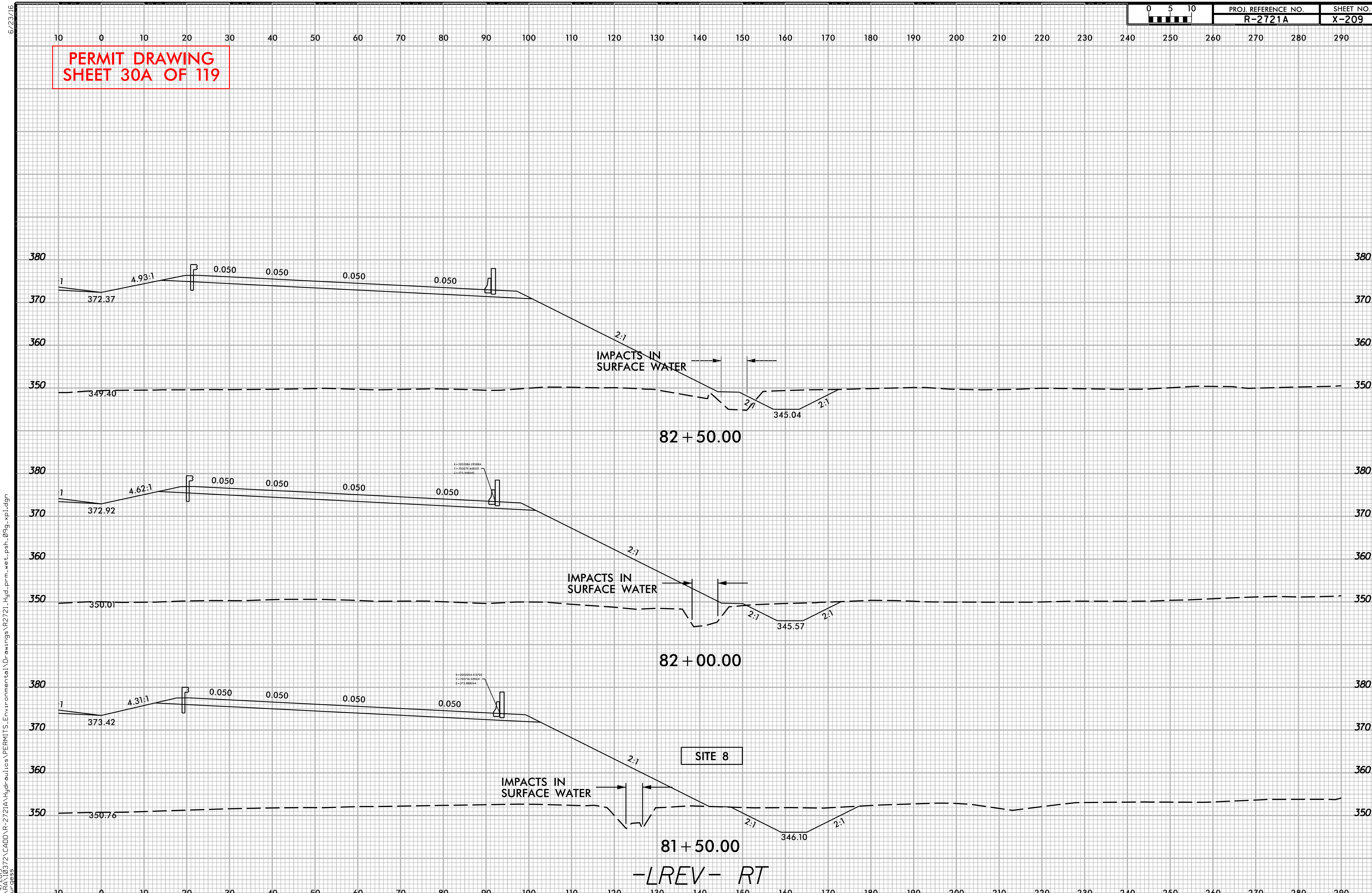
6/23/16



12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_09e_xpl.dgn
hburgess


PROJ. REFERENCE NO.
R-2721A
SHEET NO.
X-208
PERMIT DRAWING
SHEET 30 OF 119
SITE 8
IMPACTS IN
SURFACE WATER
WETLAND
373.99
350.14
346.62
0.058
5:1
4:1
2:1
81+00.00
SITE 12
FILL IN WETLAND
WETLAND
374.87
351.29
0.065
80+50.00
SITE 12
FILL IN WETLAND
WETLAND
375.80
356.57
0.073
6:1
80+00.00
-LREV- RT

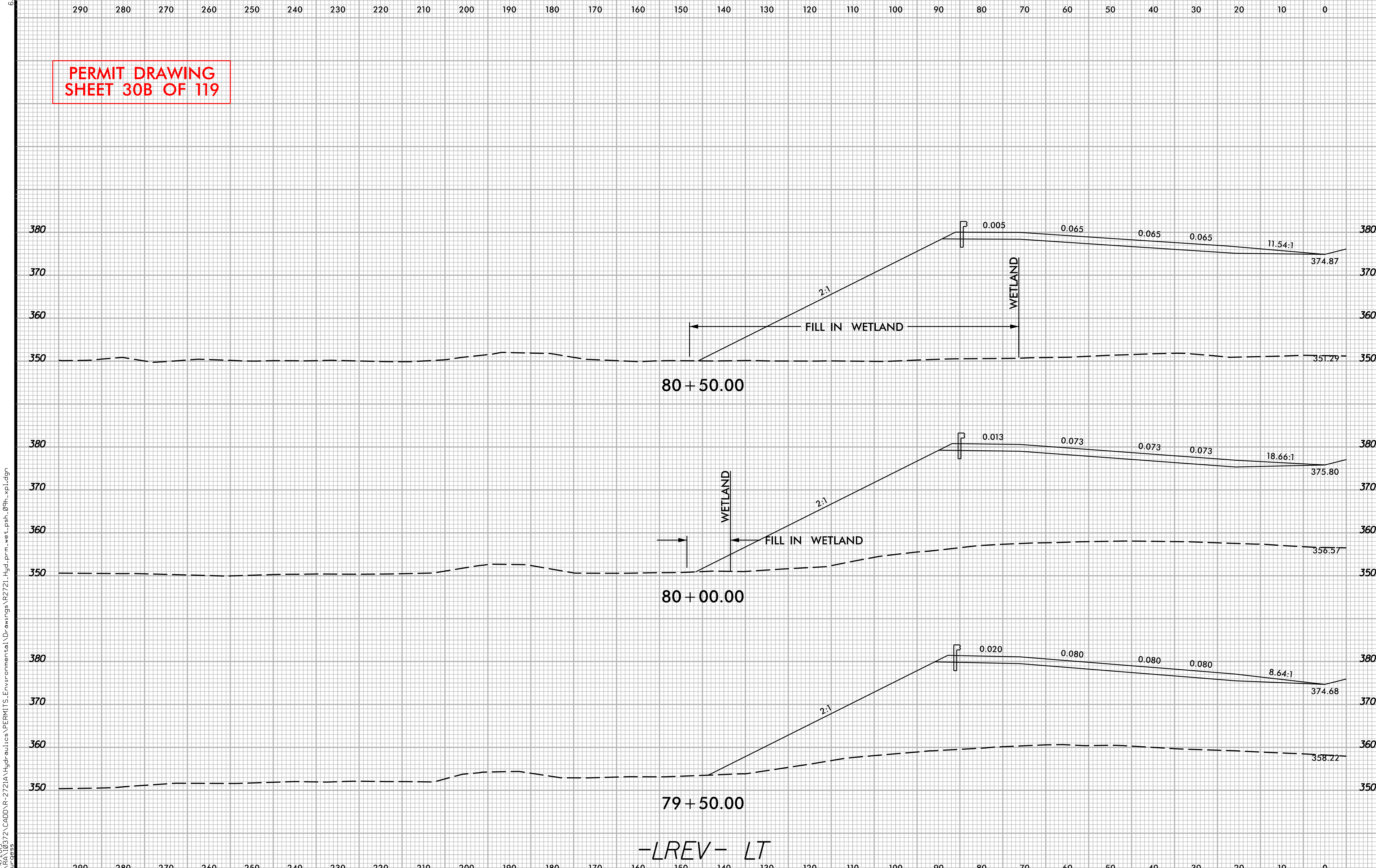
6/23/16



12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_09g_xpl.dgn

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2721A	X-54

PERMIT DRAWING
SHEET 30B OF 119

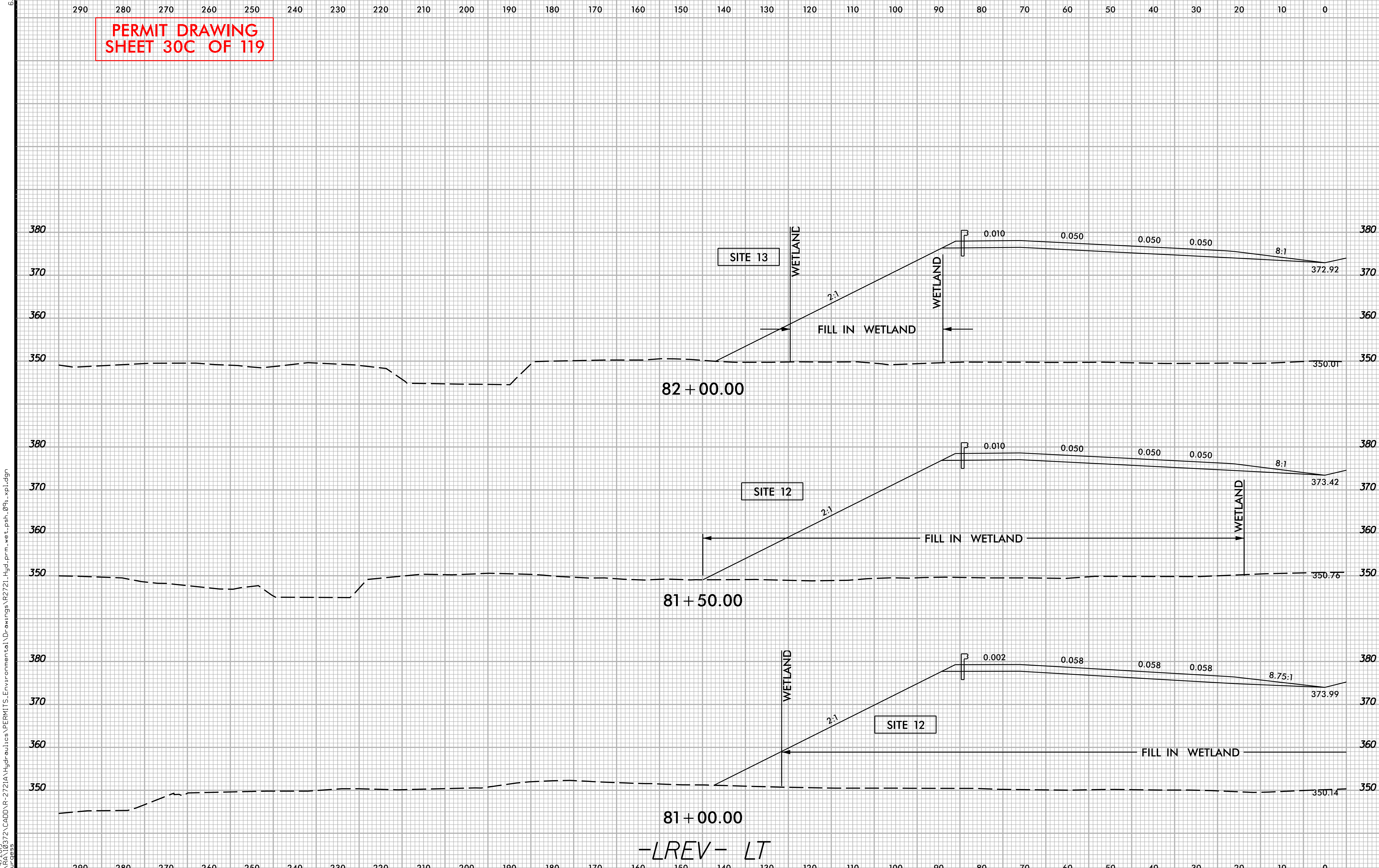


-LREV- LT

6/23/16

12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_09h_xpl.dgn
burgess

PERMIT DRAWING
SHEET 30C OF 119



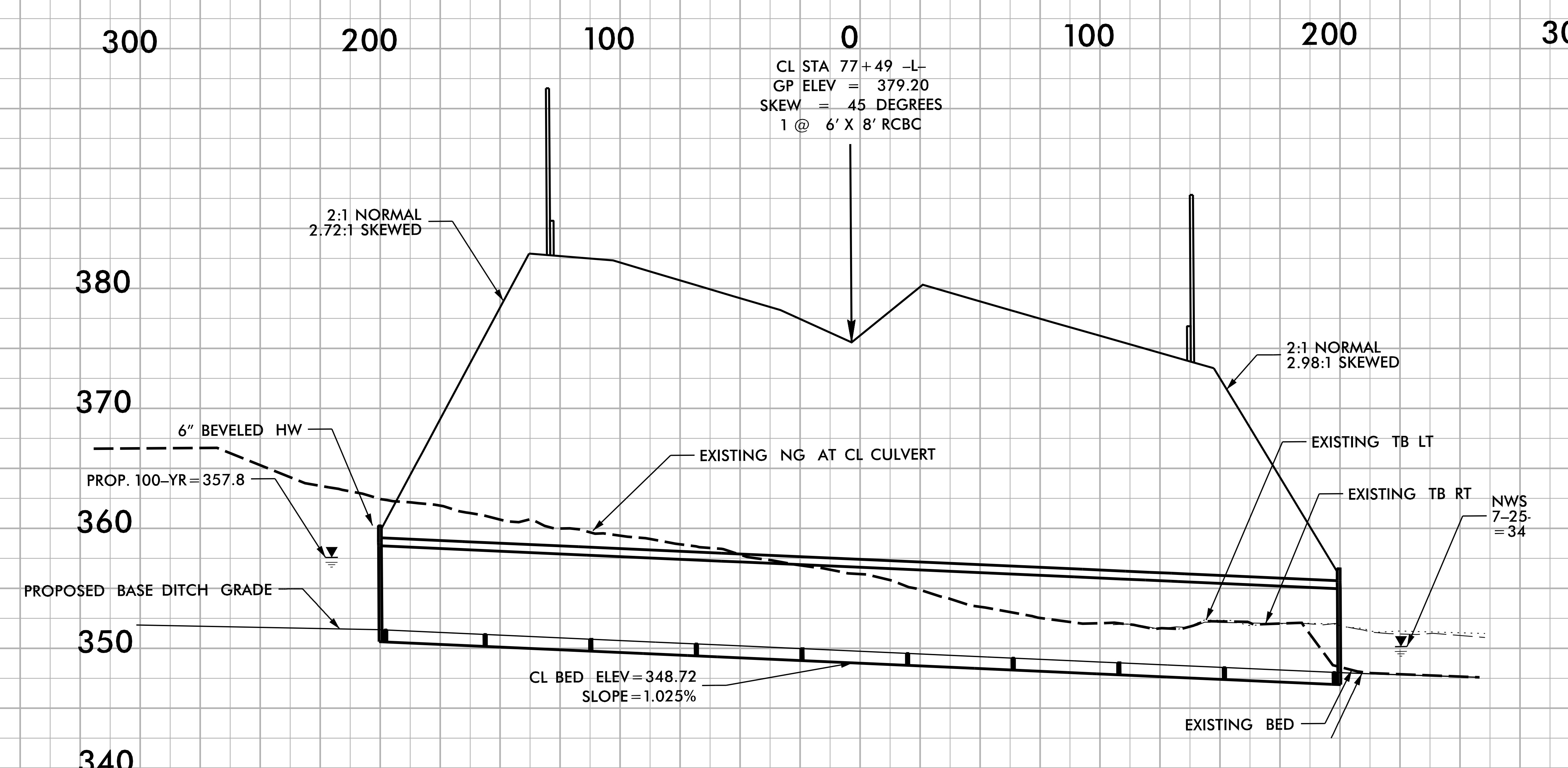
6/23/16
12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_09_xpl.dgn
Burgess

PERMIT DRAWING
SHEET 30D OF 119

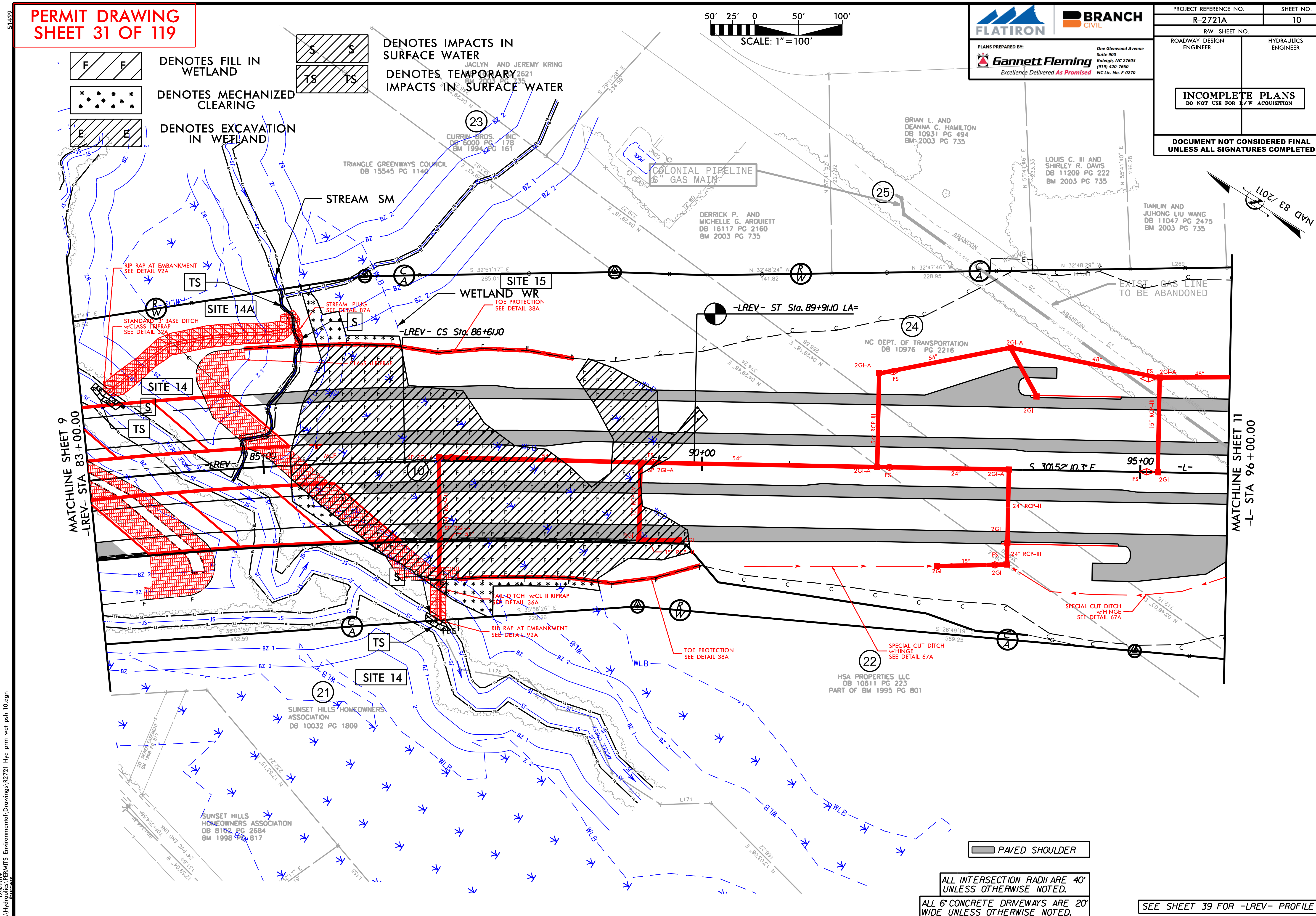
PROJECT REFERENCE NO.	SHEET NO.
U-2721	9G
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

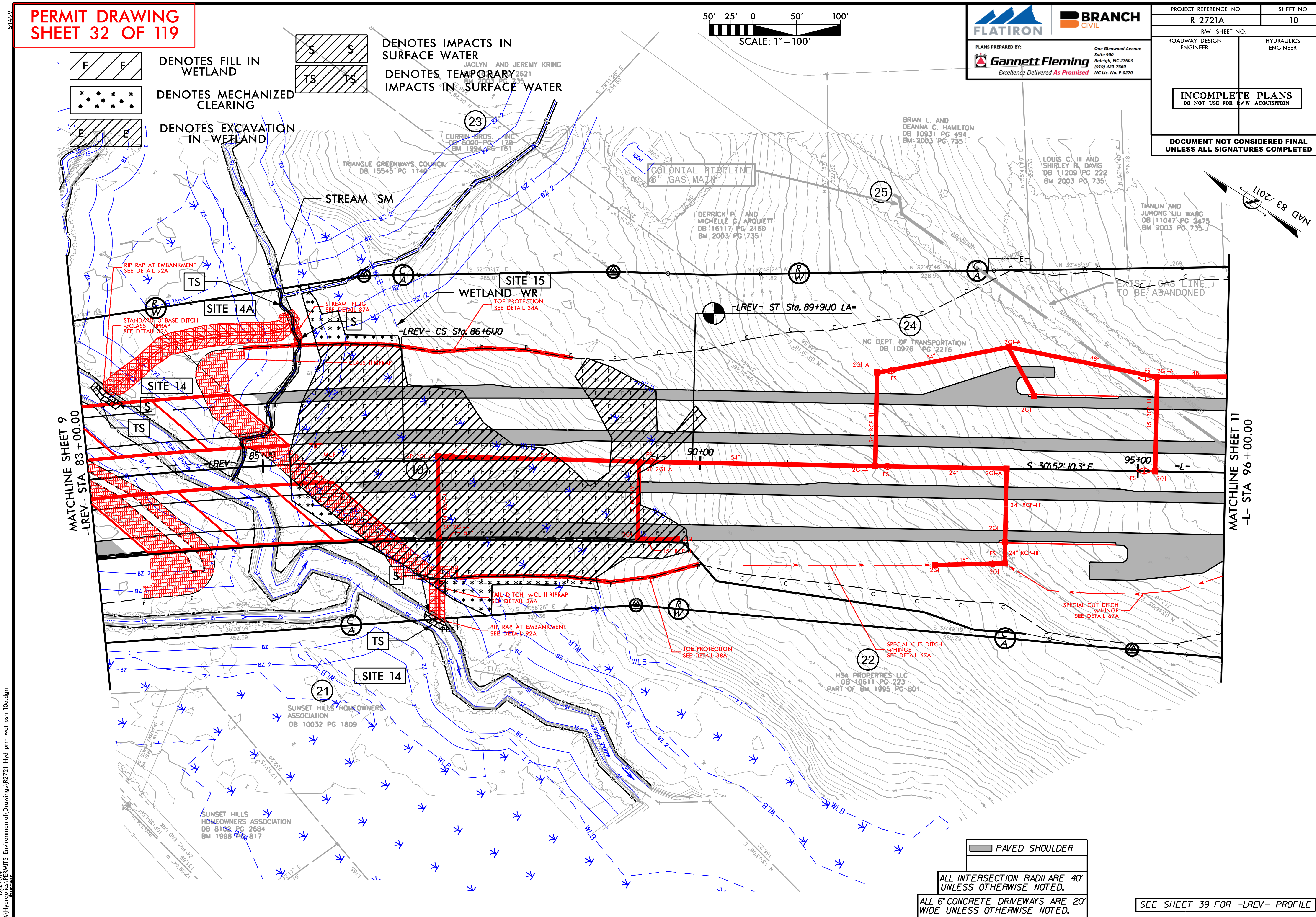
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

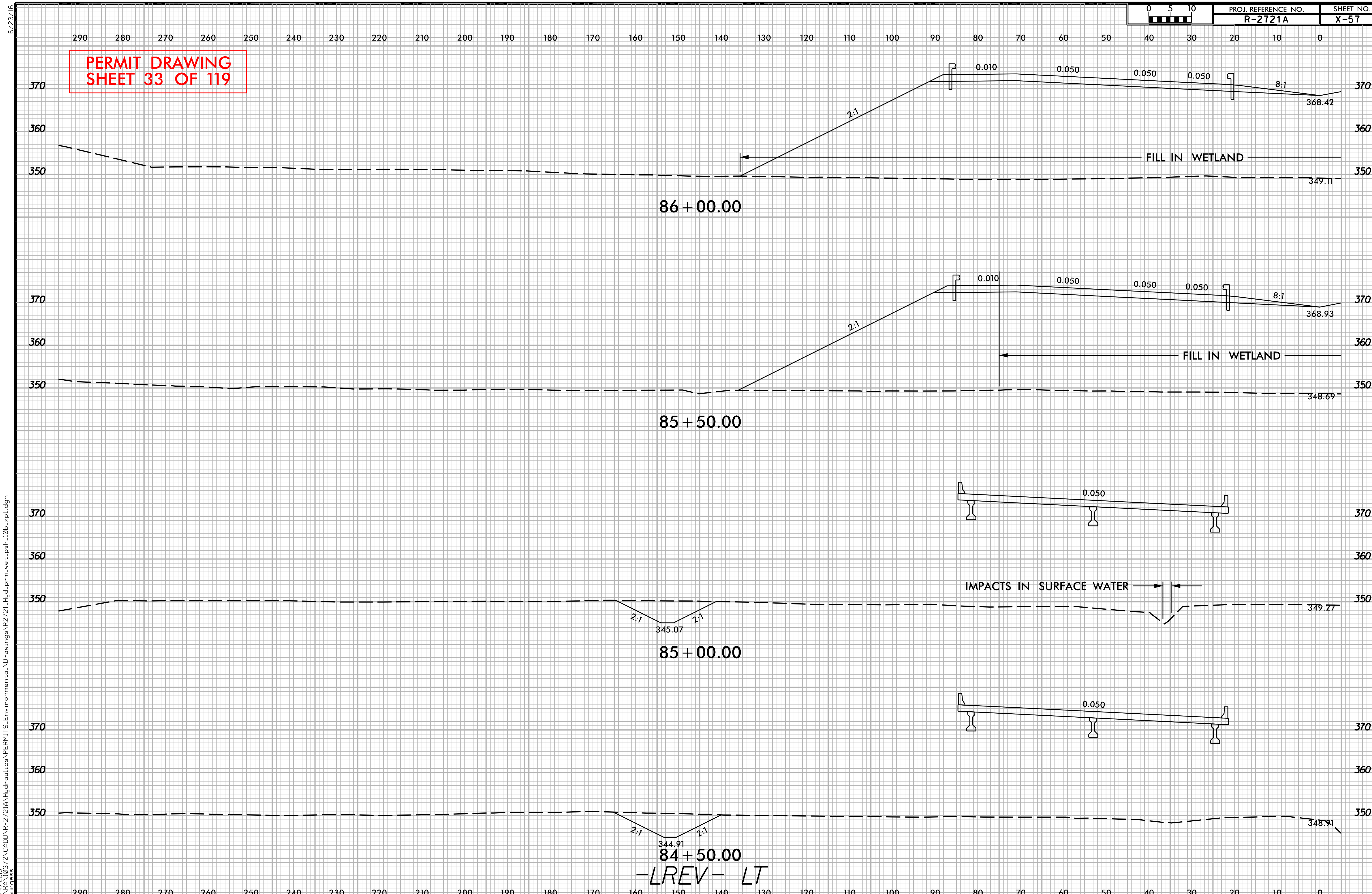


PERMIT DRAWING
SHEET 31 OF 119



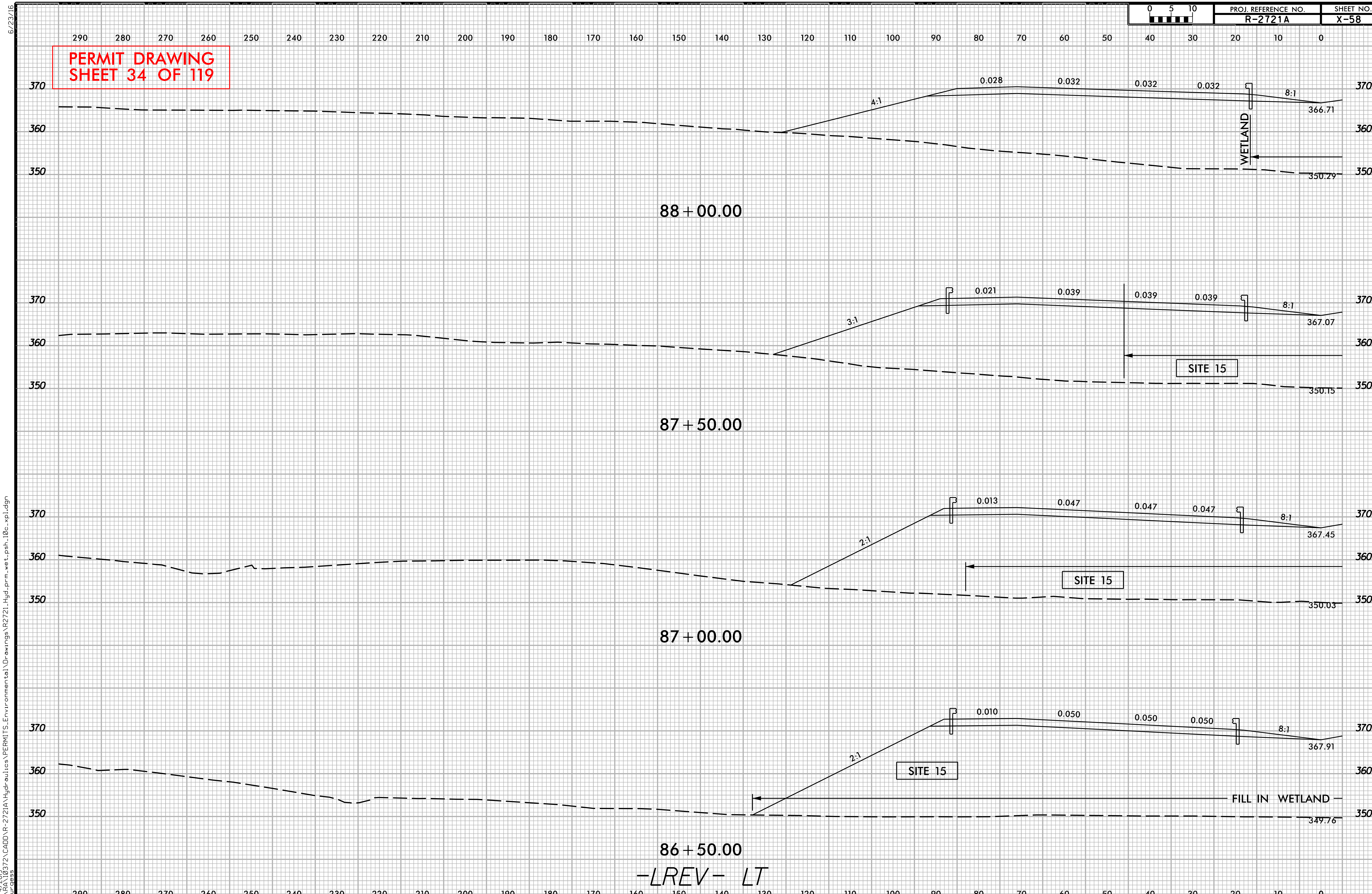


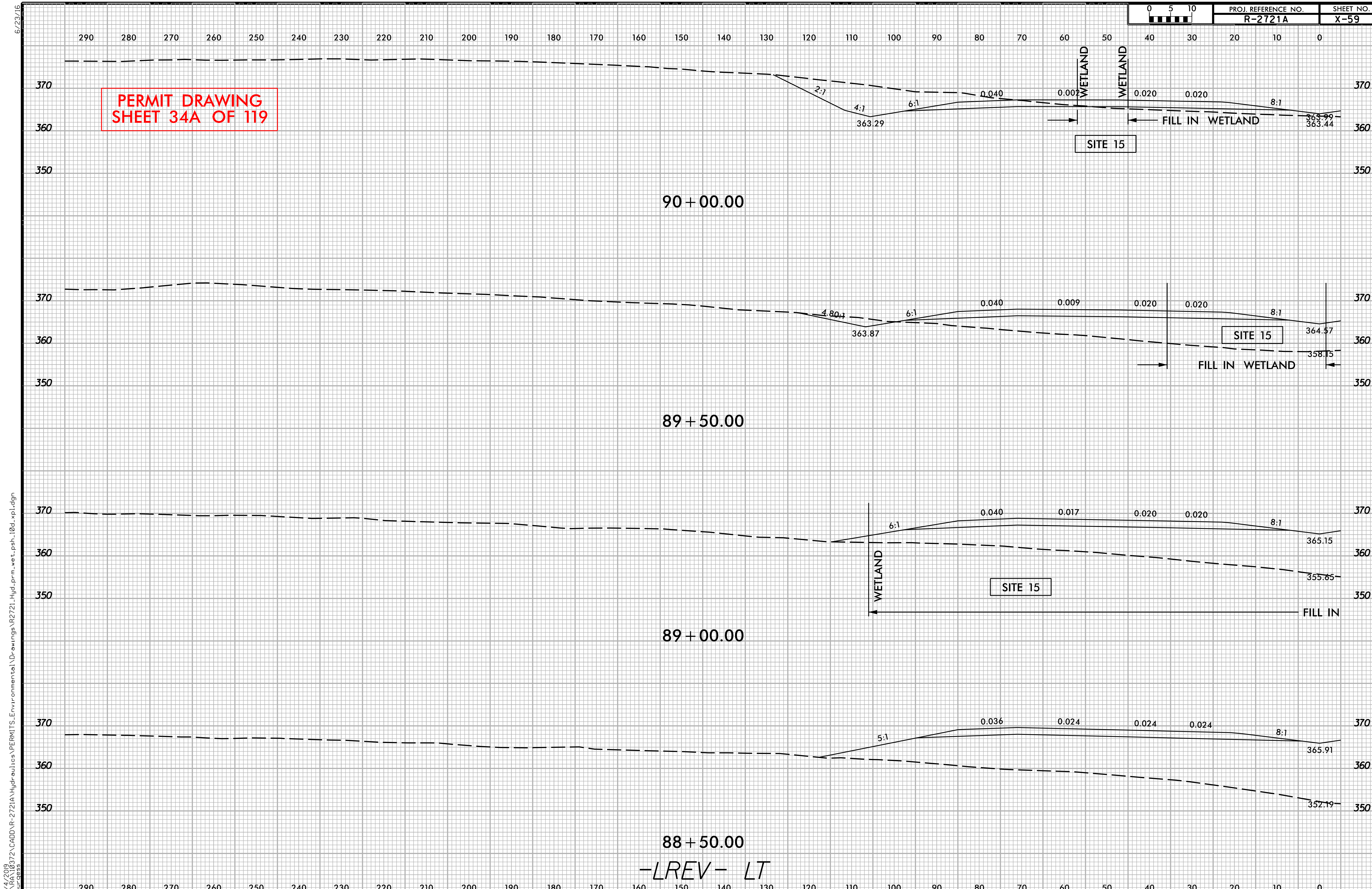
PERMIT DRAWING
SHEET 32 OF 119
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
DENOTES EXCAVATION IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
SCALE: 1" = 100'
FLATIRON
BRANCH CIVIL
PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270
PROJECT REFERENCE NO.
R-2721A
SHEET NO.
10
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
NAD 83/2011
STREAM SM
WETLAND WR
SITE 15
SITE 14A
SITE 14
JACLYN AND JEREMY KRING
CURRIN BROS. INC
TRIANGLE GREENWAYS COUNCIL
BRIAN L. AND DEANNA C. HAMILTON
LOUIS C. III AND SHIRLEY R. DAVIS
TIANLIN AND JUHONG LIU WANG
DERRICK P. AND MICHELLE G. ARQUETT
COLONIAL PIPELINE 6" GAS MAIN
EXIST. GAS LINE TO BE ABANDONED
NC DEPT. OF TRANSPORTATION
HSA PROPERTIES LLC
SUNSET HILLS HOMEOWNERS ASSOCIATION
-LREV- ST Sta. 89+91.10 LA=
-LREV- CS Sta. 86+61.10
RIP RAP AT EMBANKMENT SEE DETAIL 92A
STANDARD 3' BASE DITCH w/CLASS I RIPRAP SEE DETAIL 32A
STREAM PLUG SEE DETAIL 87A
TOE PROTECTION SEE DETAIL 38A
CLASS II RIPRAP
FALL DITCH w/CL II RIPRAP SEE DETAIL 36A
SPECIAL CUT DITCH w/HINGE SEE DETAIL 67A
85+00
90+00
95+00
S 30°52'10.3" E
MATCHLINE SHEET 9 -LREV- STA 83+00.00
MATCHLINE SHEET 11 -L- STA 96+00.00
PAVED SHOULDER
ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.
ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.
SEE SHEET 39 FOR -LREV- PROFILE
12/4/2019
R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_10a.dgn

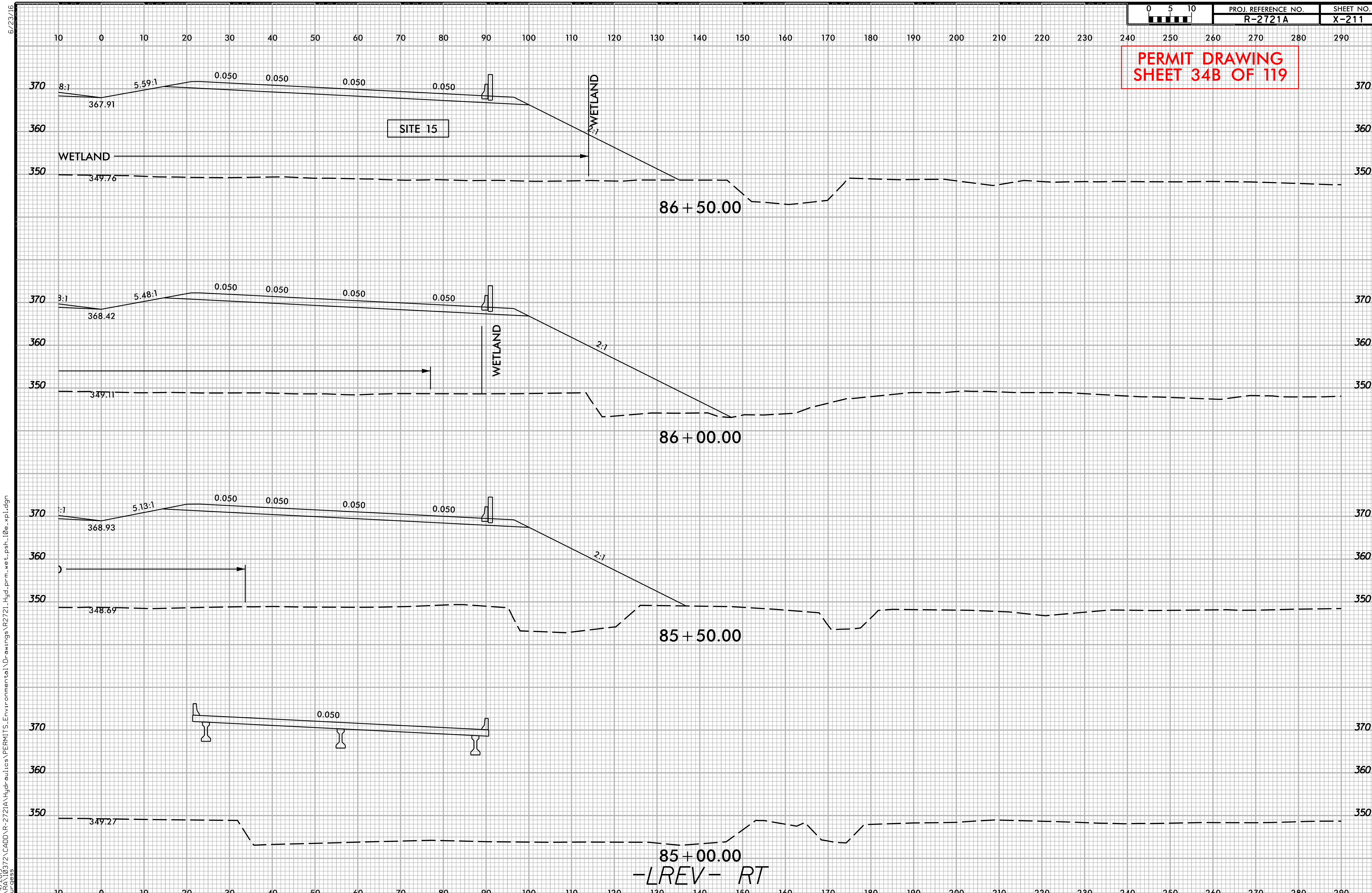


6/23/16
12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_10b_xpl.dgn
Burgess

PERMIT DRAWING
SHEET 34 OF 119



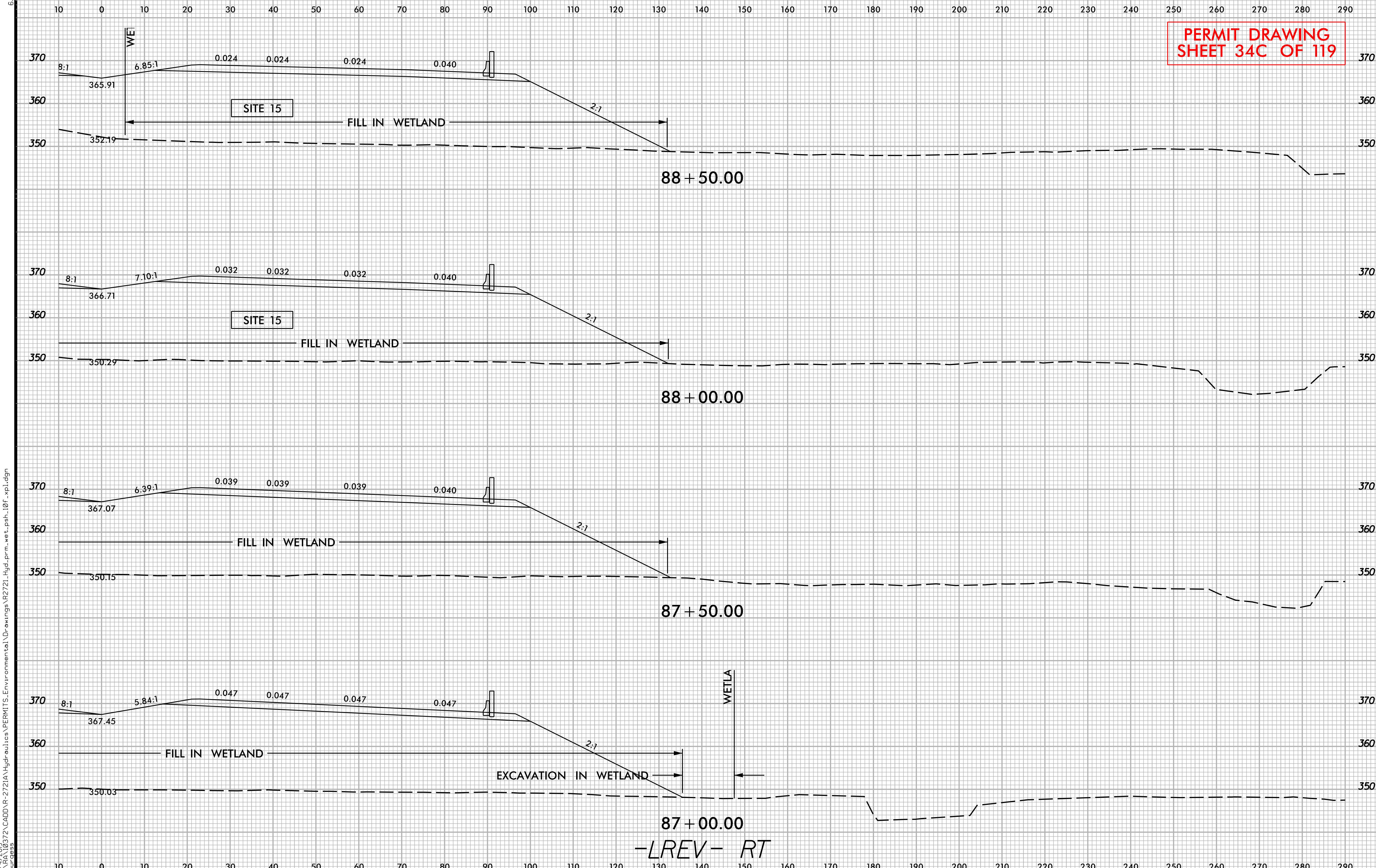

PROJ. REFERENCE NO.
R-2721A
SHEET NO.
X-59
0 5 10
PERMIT DRAWING
SHEET 34A OF 119
90+00.00
WETLAND
WETLAND
2:1
4:1
6:1
0.040
0.002
0.020
0.020
8:1
363.29
363.99
363.44
FILL IN WETLAND
SITE 15
89+50.00
4.80:1
6:1
0.040
0.009
0.020
0.020
8:1
363.87
364.57
358.15
SITE 15
FILL IN WETLAND
89+00.00
6:1
0.040
0.017
0.020
0.020
8:1
365.15
355.65
WETLAND
SITE 15
FILL IN
88+50.00
5:1
0.036
0.024
0.024
0.024
8:1
365.91
352.19
-LREV- LT
6/23/16
12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_10d_xpl.dgn
Burgess



PROJ. REFERENCE NO.
R-2721A
SHEET NO.
X-211
0 5 10
PERMIT DRAWING
SHEET 34B OF 119
8:1
5.59:1
367.91
0.050
0.050
0.050
0.050
WETLAND
2:1
SITE 15
WETLAND
349.76
86+50.00
5.48:1
368.42
0.050
0.050
0.050
0.050
2:1
WETLAND
349.11
86+00.00
5.13:1
368.93
0.050
0.050
0.050
0.050
2:1
348.69
85+50.00
0.050
349.27
85+00.00
-LREV- RT

PROJ. REFERENCE NO.	SHEET NO.
R-2721A	X-212

PERMIT DRAWING
SHEET 34C OF 119

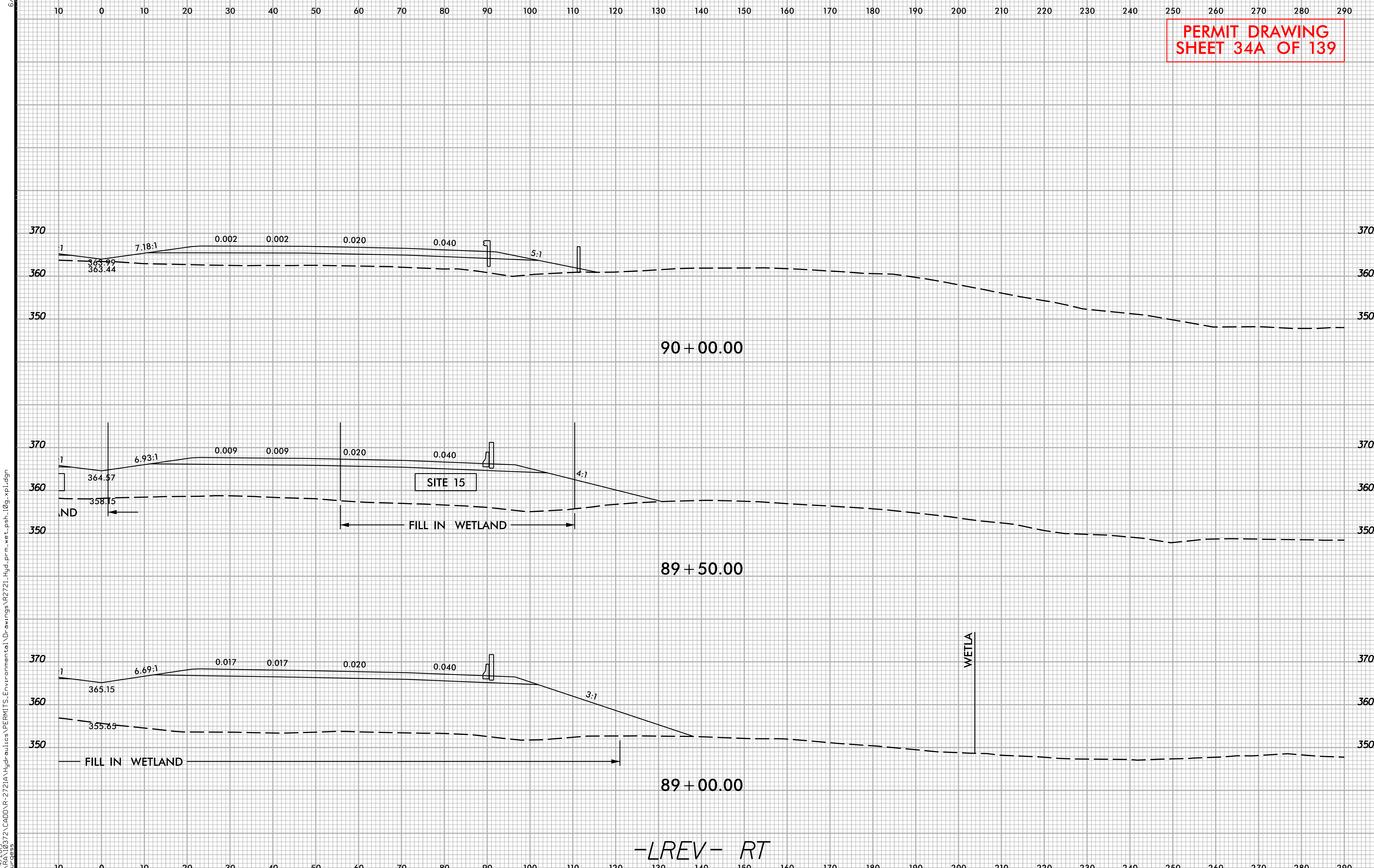


6/23/16

12/4/2019
G:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_10f_xpl.dgn
Burgess

PROJ. REFERENCE NO.	SHEET NO.
R-2721A	X-213

PERMIT DRAWING
SHEET 34A OF 139



6/23/16

12/4/2019
G:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_10g_xpl.dgn
hburgess

PERMIT DRAWING
SHEET 35 OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

FLATIRON | BRANCH CIVIL

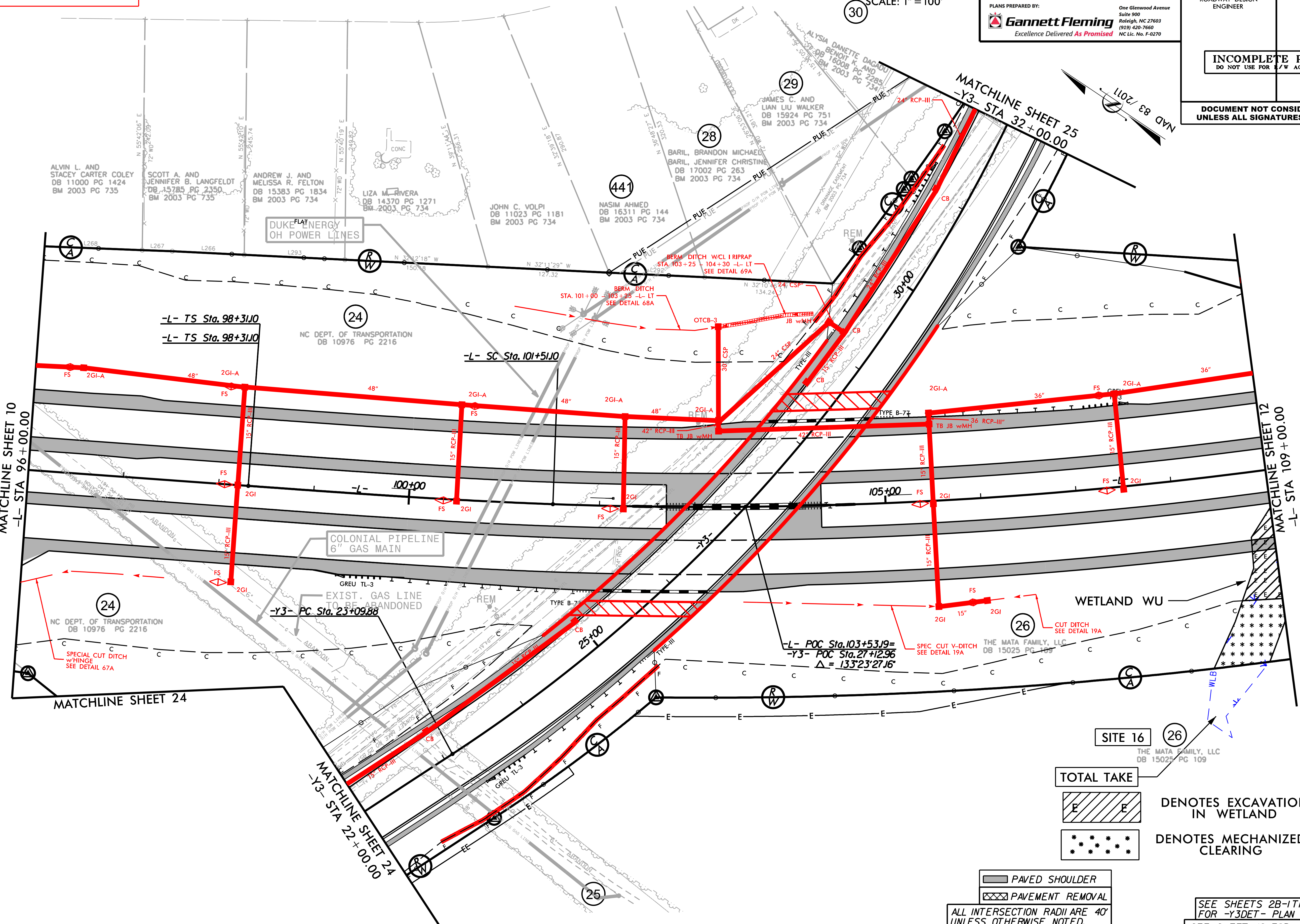
PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

SCALE: 1" = 100'

NAD 83 /2011



SITE 16

THE MATA FAMILY, LLC
DB 15025 PG 109

TOTAL TAKE

DENOTES EXCAVATION IN WETLAND

DENOTES MECHANIZED CLEARING

PAVED SHOULDER

PAVEMENT REMOVAL

ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.

ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

SEE SHEETS 2B-1 THRU 2B-2 FOR -Y3DET- PLAN VIEW

SEE SHEET 40 FOR -L- PROFILE

SEE SHEET 50 FOR -Y3- PROFILE

12/4/2019
R:\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_11.dgn

PERMIT DRAWING
SHEET 36 OF 119

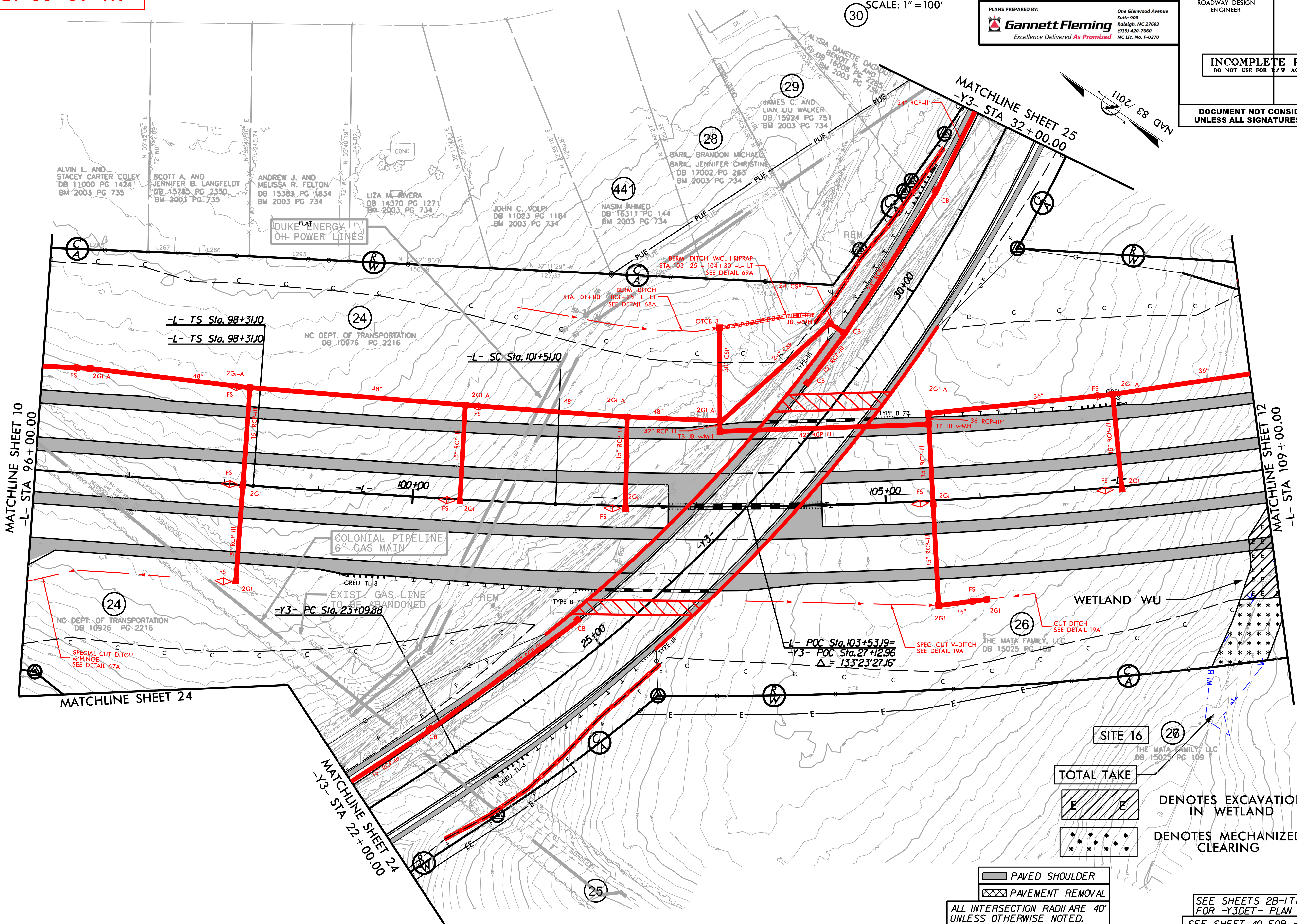
PROJECT REFERENCE NO.	SHEET NO.
R-2721A	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

FLATIRON | BRANCH CIVIL

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



DENOTES EXCAVATION IN WETLAND

DENOTES MECHANIZED CLEARING

PAVED SHOULDER
PAVEMENT REMOVAL

ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.

ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

SEE SHEETS 2B-1 THRU 2B-2 FOR -Y3DET- PLAN VIEW

SEE SHEET 40 FOR -L- PROFILE

SEE SHEET 50 FOR -Y3- PROFILE

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

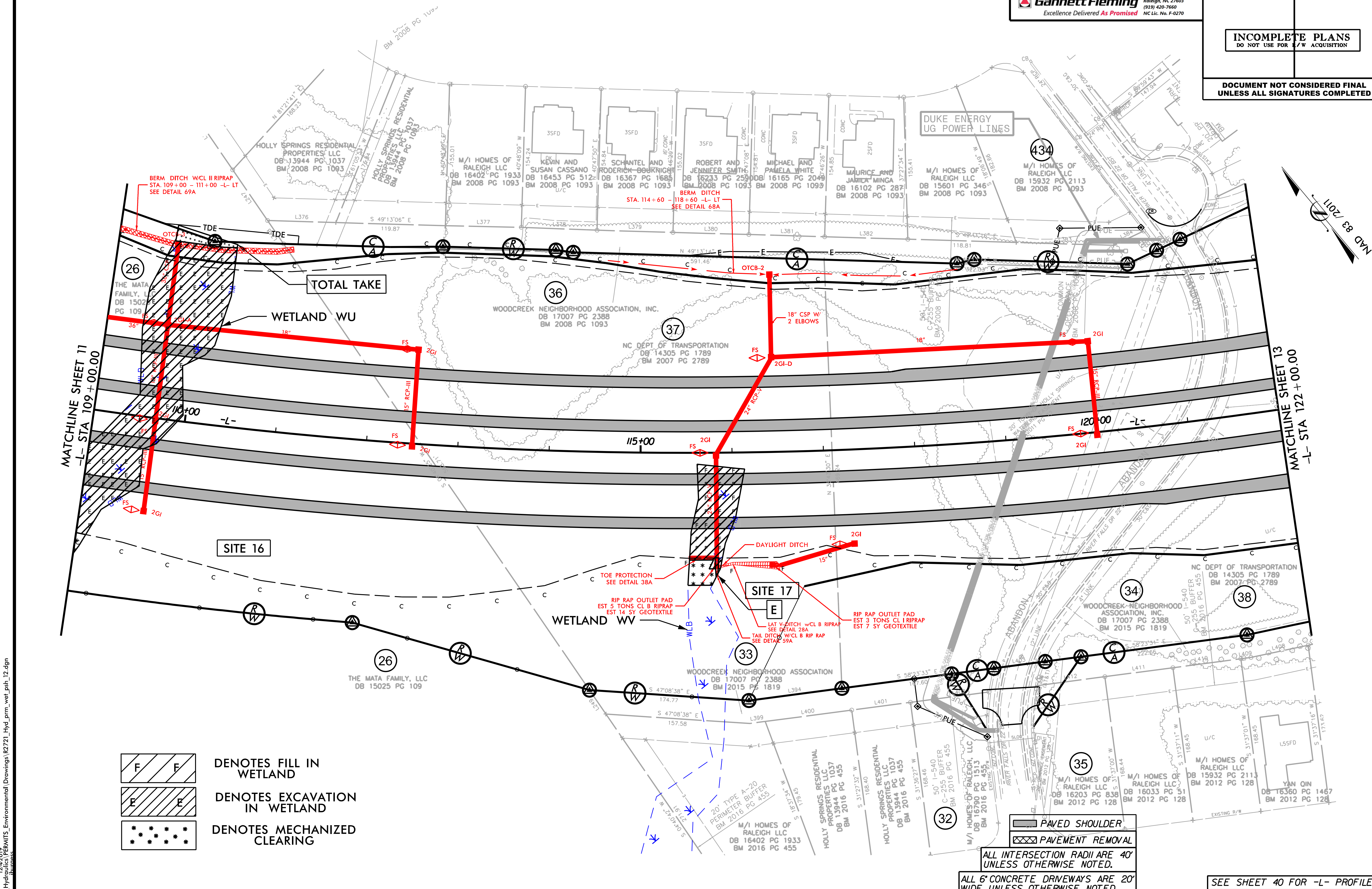
FLATIRON BRANCH CIVIL

PLANS PREPARED BY: Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

SCALE: 1" = 100'



SEE SHEET 40 FOR -L- PROFILE

12/4/2019
R:\2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_12.dgn

PERMIT DRAWING
SHEET 38 OF 119

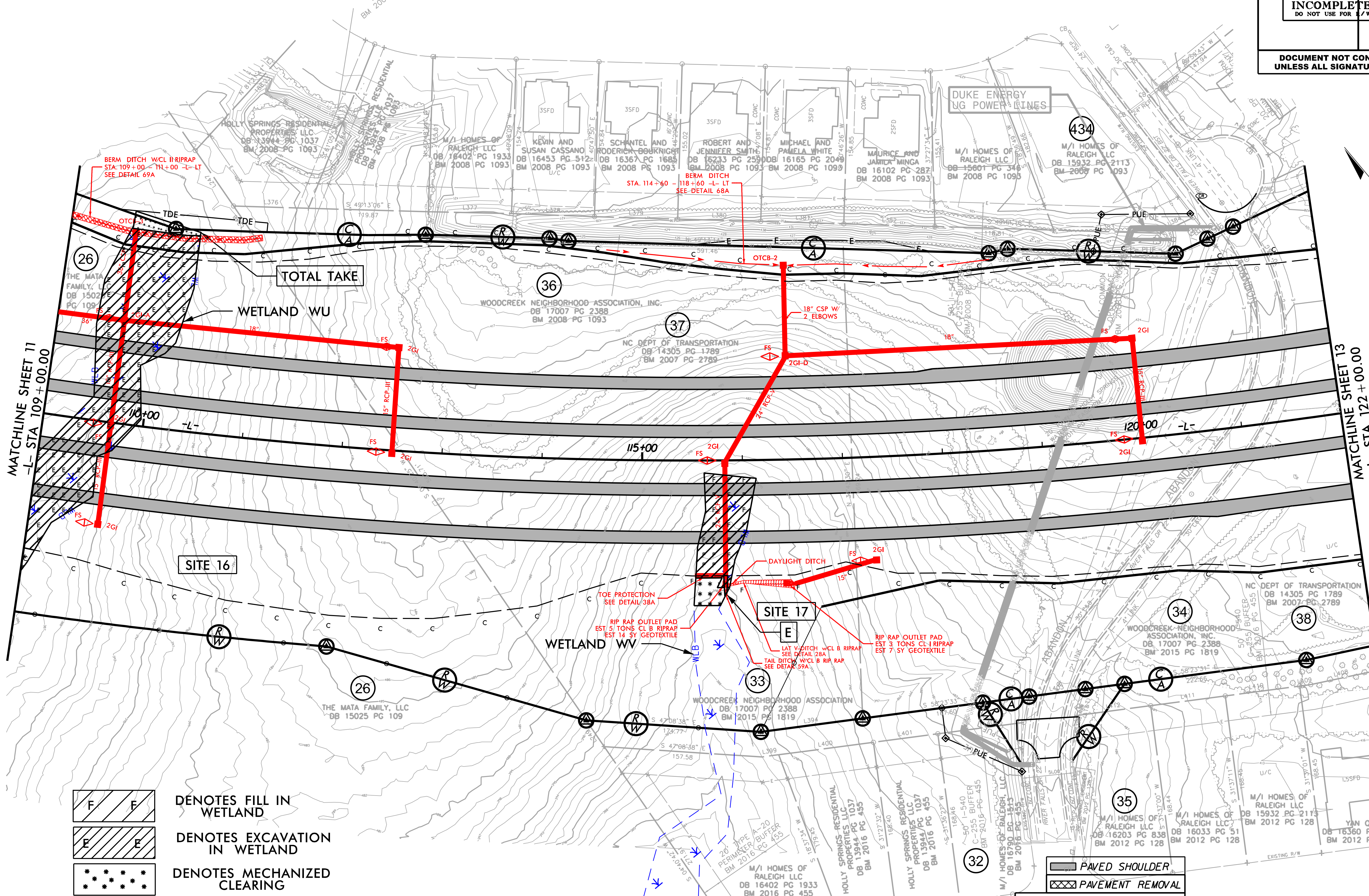
PROJECT REFERENCE NO.	SHEET NO.
R-2721A	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

FLATIRON | BRANCH CIVIL

PLANS PREPARED BY: Gannett Fleming — Excellence Delivered As Promised — One Glenwood Avenue, Suite 900, Raleigh, NC 27603, (919) 420-7660, NC Lic. No. F-0270

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



F F	DENOTES FILL IN WETLAND
E E	DENOTES EXCAVATION IN WETLAND
* * *	DENOTES MECHANIZED CLEARING

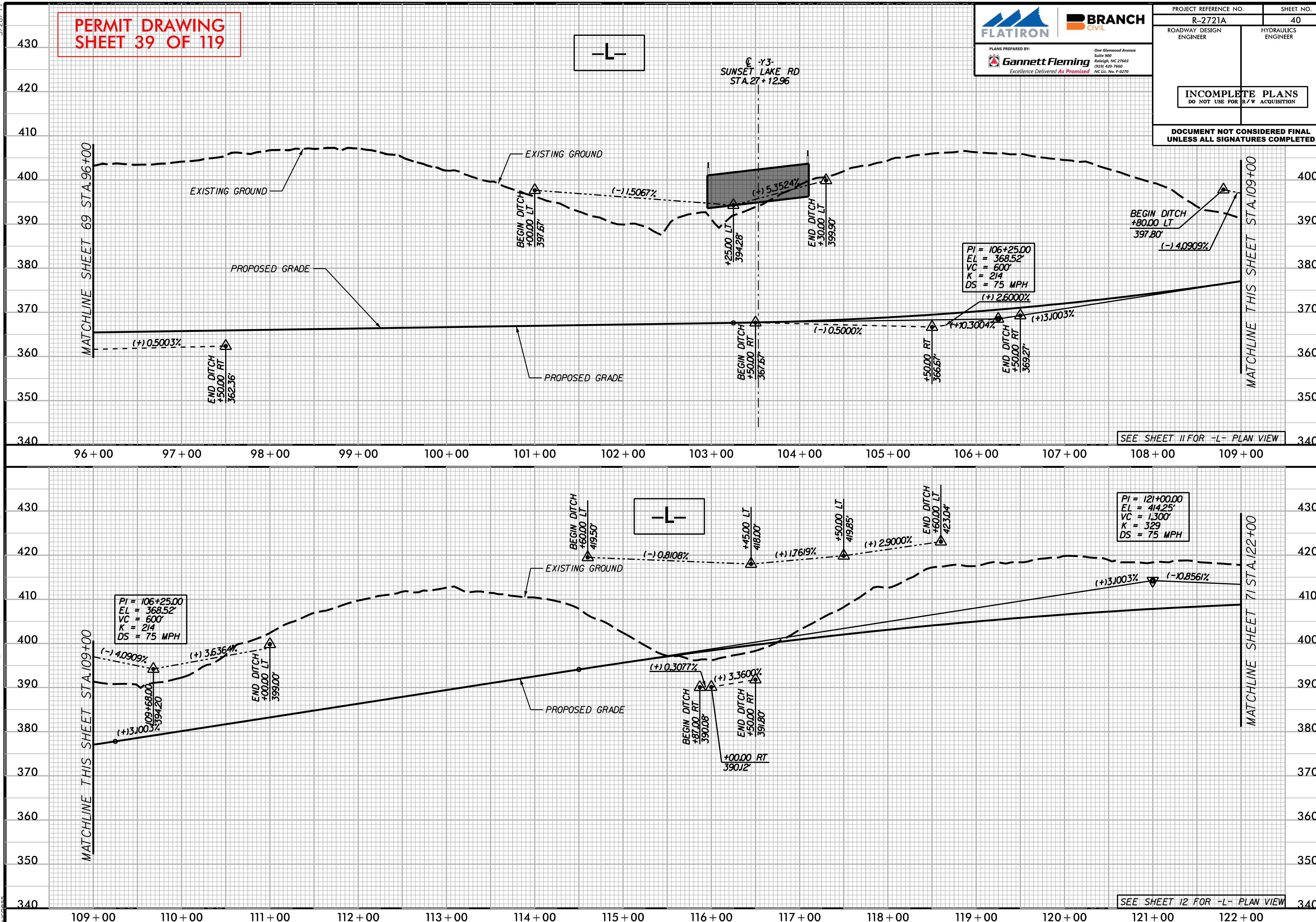
PAVED SHOULDER
PAVEMENT REMOVAL

ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.

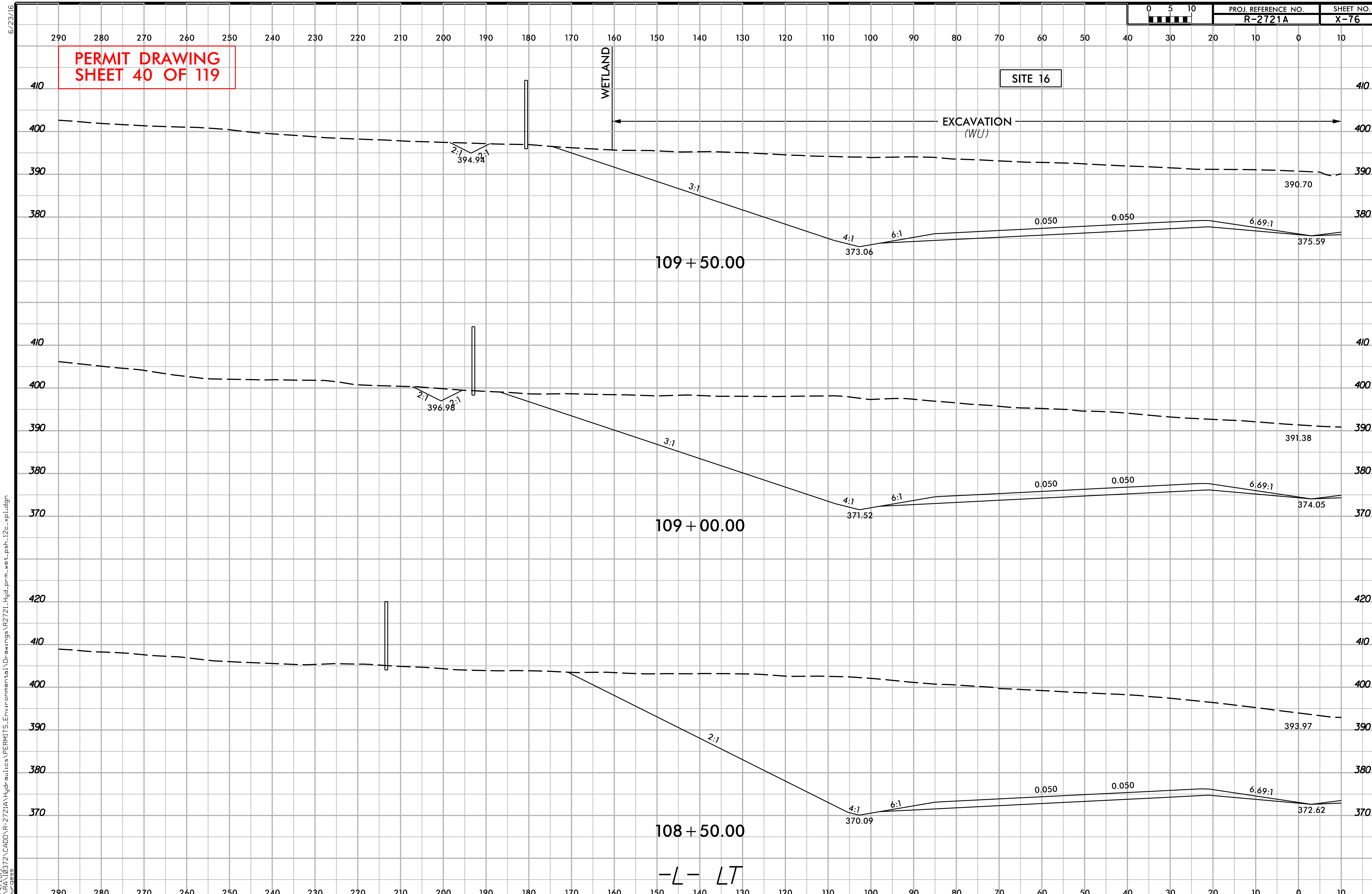
ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

SEE SHEET 40 FOR -L- PROFILE

12/4/2019
R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_12a.dgn



PERMIT DRAWING
SHEET 39 OF 119
PROJECT REFERENCE NO. R-2721A
SHEET NO. 40
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
FLATIRON
BRANCH CIVIL
PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
-L-
℄ -Y3-
SUNSET LAKE RD
STA.27+12.96
EXISTING GROUND
EXISTING GROUND
PROPOSED GRADE
PROPOSED GRADE
MATCHLINE SHEET 69 STA.96+00
MATCHLINE THIS SHEET STA.109+00
(+) 0.5003%
END DITCH +50.00 RT 362.36'
BEGIN DITCH +00.00 LT 397.67'
(-) 1.5067%
(+) 5.3524%
+25.00 LT 394.28'
END DITCH +30.00 LT 399.90'
BEGIN DITCH +50.00 RT 367.67'
(-) 0.5000%
+50.00 RT 366.67'
(+) 10.3004%
(+) 2.6000%
END DITCH +50.00 RT 369.27'
(+) 3.1003%
PI = 106+25.00
EL = 368.52'
VC = 600'
K = 214
DS = 75 MPH
BEGIN DITCH +80.00 LT 397.80'
(-) 4.0909%
SEE SHEET 11 FOR -L- PLAN VIEW
96+00 97+00 98+00 99+00 100+00 101+00 102+00 103+00 104+00 105+00 106+00 107+00 108+00 109+00
430 420 410 400 390 380 370 360 350 340
-L-
BEGIN DITCH +60.00 LT 419.50'
(-) 0.8108%
+45.00 LT 418.00'
(+) 1.7619%
+50.00 LT 419.85'
(+) 2.9000%
END DITCH +60.00 LT 423.04'
PI = 121+00.00
EL = 414.25'
VC = 1,300'
K = 329
DS = 75 MPH
(+) 3.1003%
(-) 0.8561%
PI = 106+25.00
EL = 368.52'
VC = 600'
K = 214
DS = 75 MPH
(-) 4.0909%
(+) 3.6364%
109+68.00 394.20
END DITCH +00.00 LT 399.00'
(+) 3.1003%
EXISTING GROUND
PROPOSED GRADE
(+) 0.3077%
BEGIN DITCH +87.00 RT 390.08'
(+) 3.3600%
END DITCH +50.00 RT 391.80'
+00.00 RT 390.12'
MATCHLINE THIS SHEET STA.109+00
MATCHLINE SHEET 71 STA.122+00
SEE SHEET 12 FOR -L- PLAN VIEW
109+00 110+00 111+00 112+00 113+00 114+00 115+00 116+00 117+00 118+00 119+00 120+00 121+00 122+00
430 420 410 400 390 380 370 360 350 340

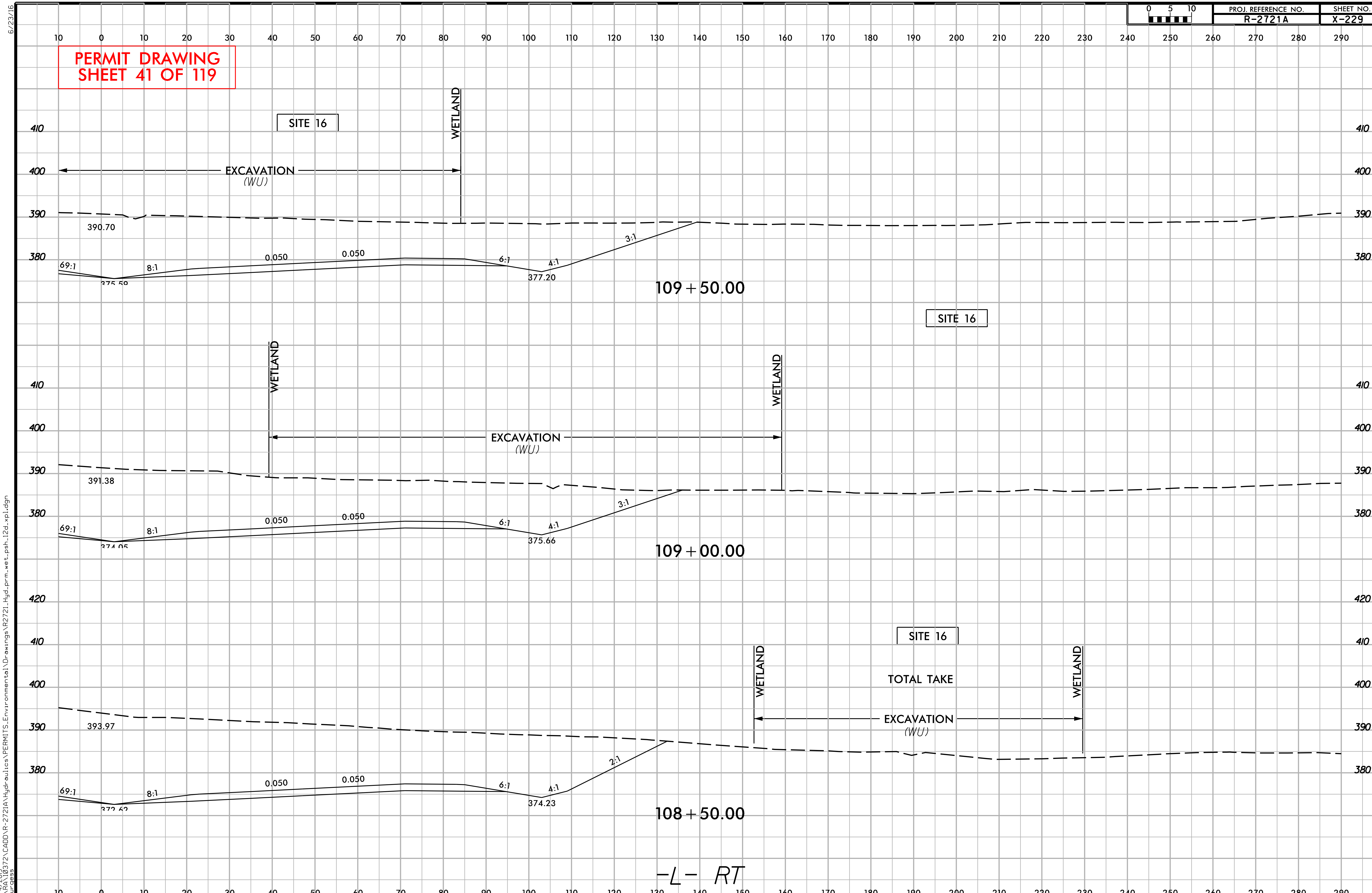


6/23/16

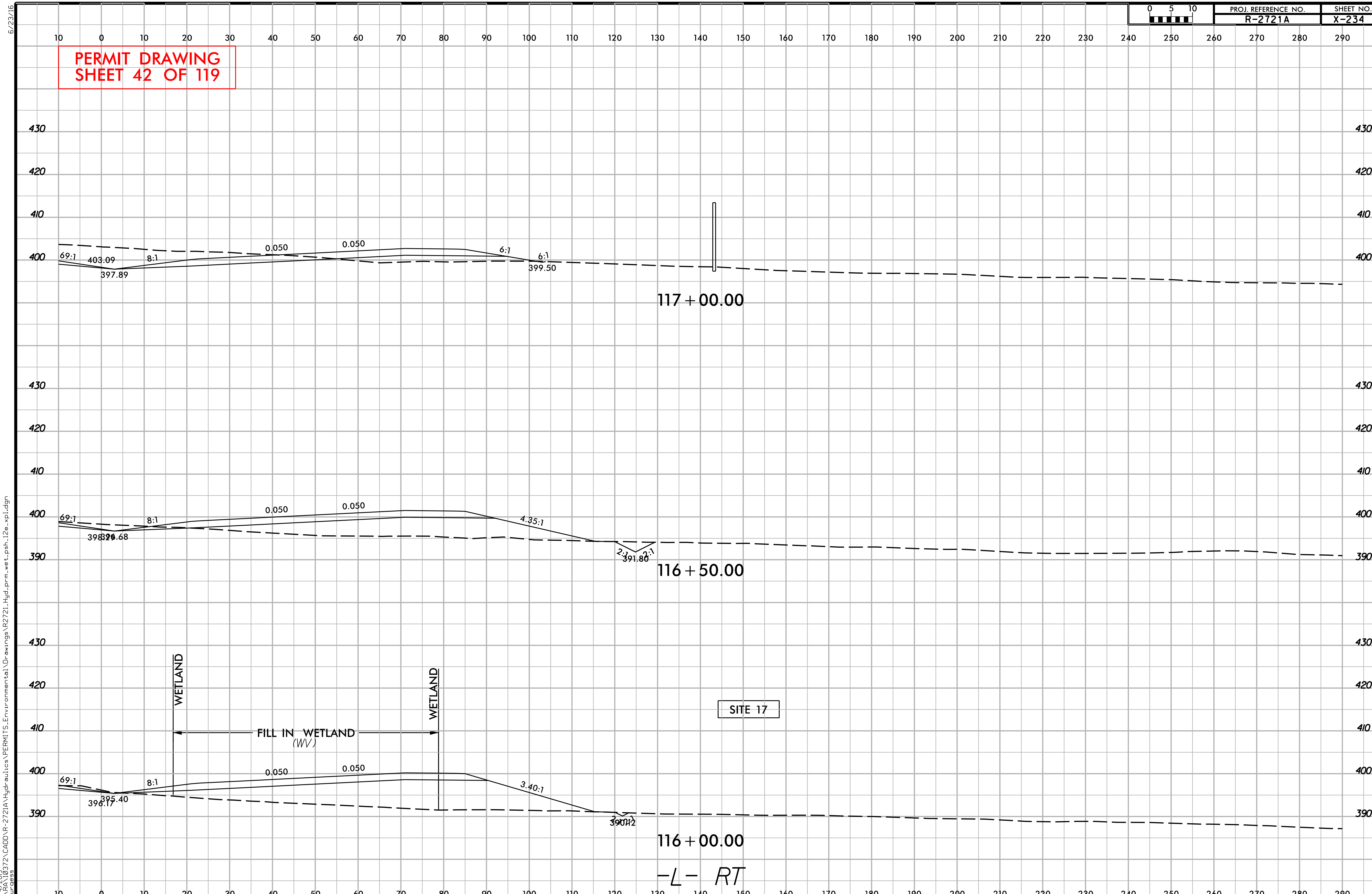
12/4/2019
G:\RA10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_12c_xpl.dgn
Burgess

PERMIT DRAWING
SHEET 41 OF 119

PROJ. REFERENCE NO.	SHEET NO.
R-2721A	X-229



6/23/16
12/4/2019
G:\RA10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_12d_xpl.dgn
burgess



6/23/16

12/4/2019
Q:\RA10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_12e_xpl.dgn
hburgess

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

FLATIRON BRANCH CIVIL

PLANS PREPARED BY: Gannett Fleming, Excellence Delivered As Promised

One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

50' 25' 0 50' 100'
SCALE: 1" = 100'

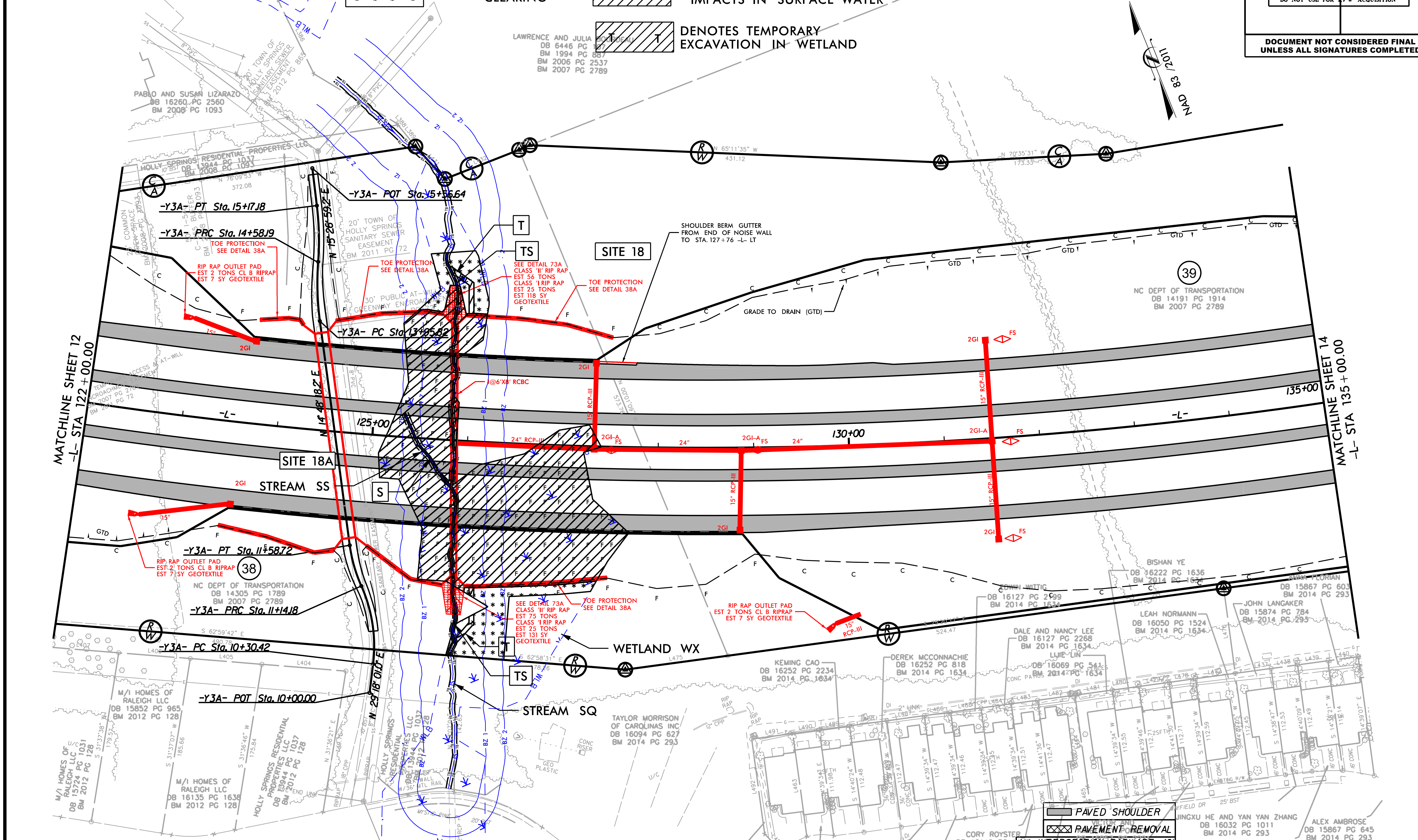
F F — DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

T T — DENOTES TEMPORARY EXCAVATION IN WETLAND



PAVED SHOULDER
PAVEMENT REMOVAL

ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.

ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

SEE SHEET 41 FOR -L- PROFILE
SEE SHEET 51 FOR -Y3A- PROFILE

12/4/2019
R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_13.dgn

PERMIT DRAWING
SHEET 44 OF 119

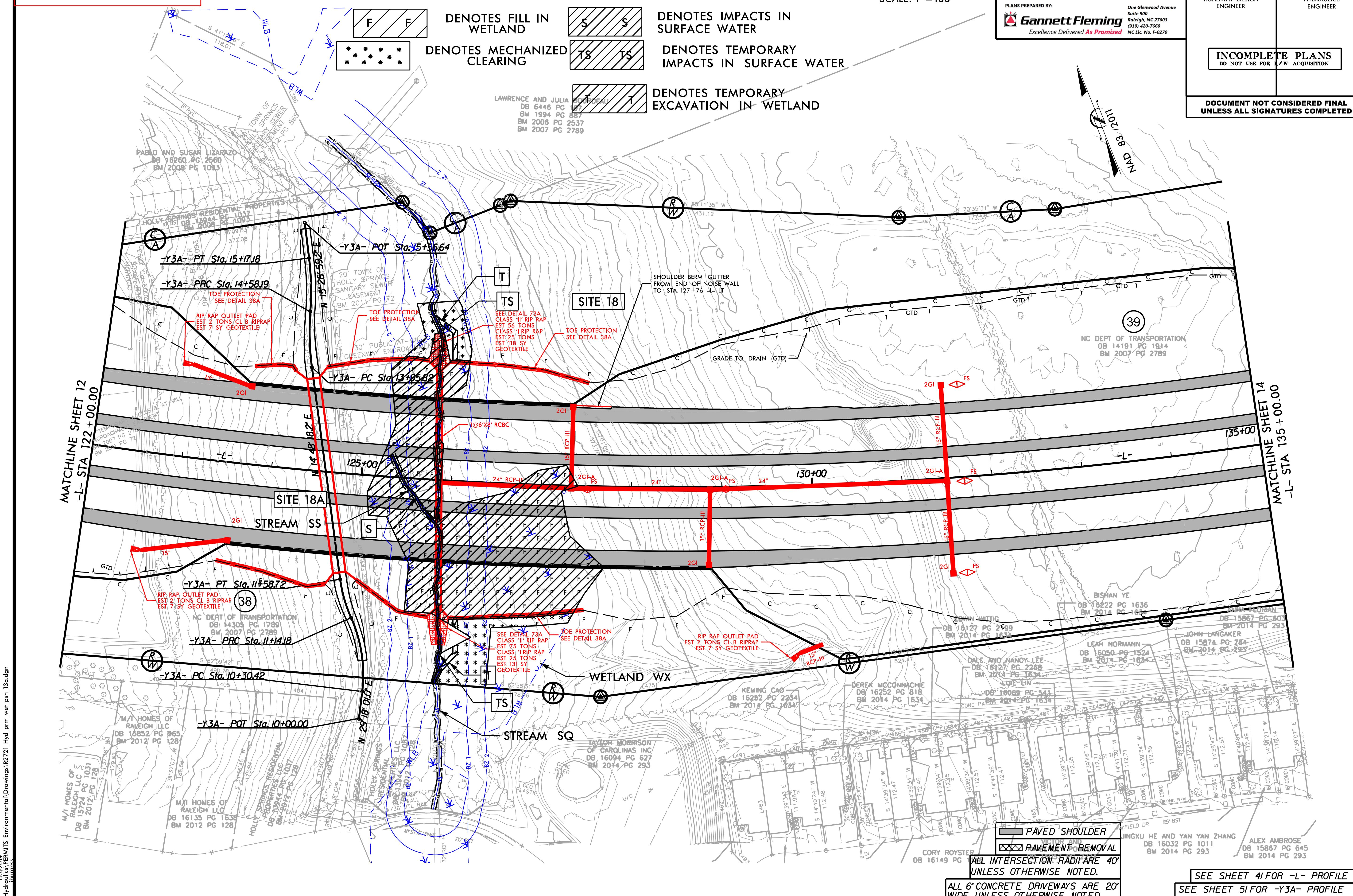
PROJECT REFERENCE NO.	SHEET NO.
R-2721A	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

FLATIRON BRANCH CIVIL

PLANS PREPARED BY: Gannett Fleming — Excellence Delivered As Promised
One Glenwood Avenue, Suite 900, Raleigh, NC 27603, (919) 420-7660, NC Lic. No. F-0270

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PERMIT DRAWING
SHEET 45 OF 119

FLATIRON | BRANCH CIVIL

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	41
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

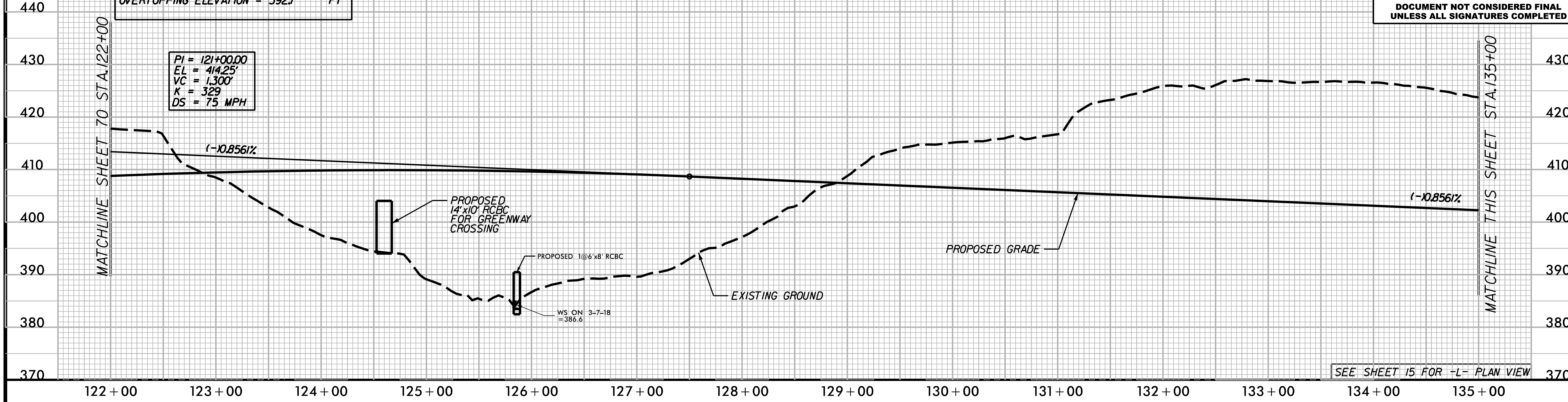
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

5/28/99

-L-

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 160	CFS
DESIGN FREQUENCY	= 100	YRS
DESIGN HW ELEVATION	= 390.3	FT
BASE DISCHARGE	= 160	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 390.3	FT
OVERTOPPING DISCHARGE	= 310	CFS
OVERTOPPING FREQUENCY	= > 500	YRS
OVERTOPPING ELEVATION	= 392.7	FT



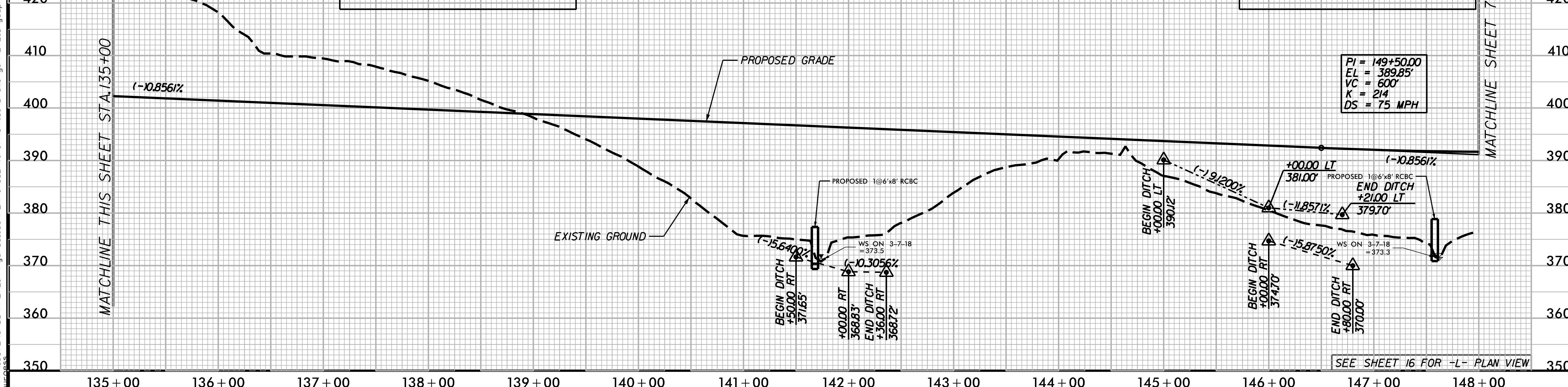
-L-

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 190	CFS
DESIGN FREQUENCY	= 100	YRS
DESIGN HW ELEVATION	= 377.4	FT
BASE DISCHARGE	= 190	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 377.4	FT
OVERTOPPING DISCHARGE	= 960	CFS
OVERTOPPING FREQUENCY	= > 500	YRS
OVERTOPPING ELEVATION	= 391.4	FT

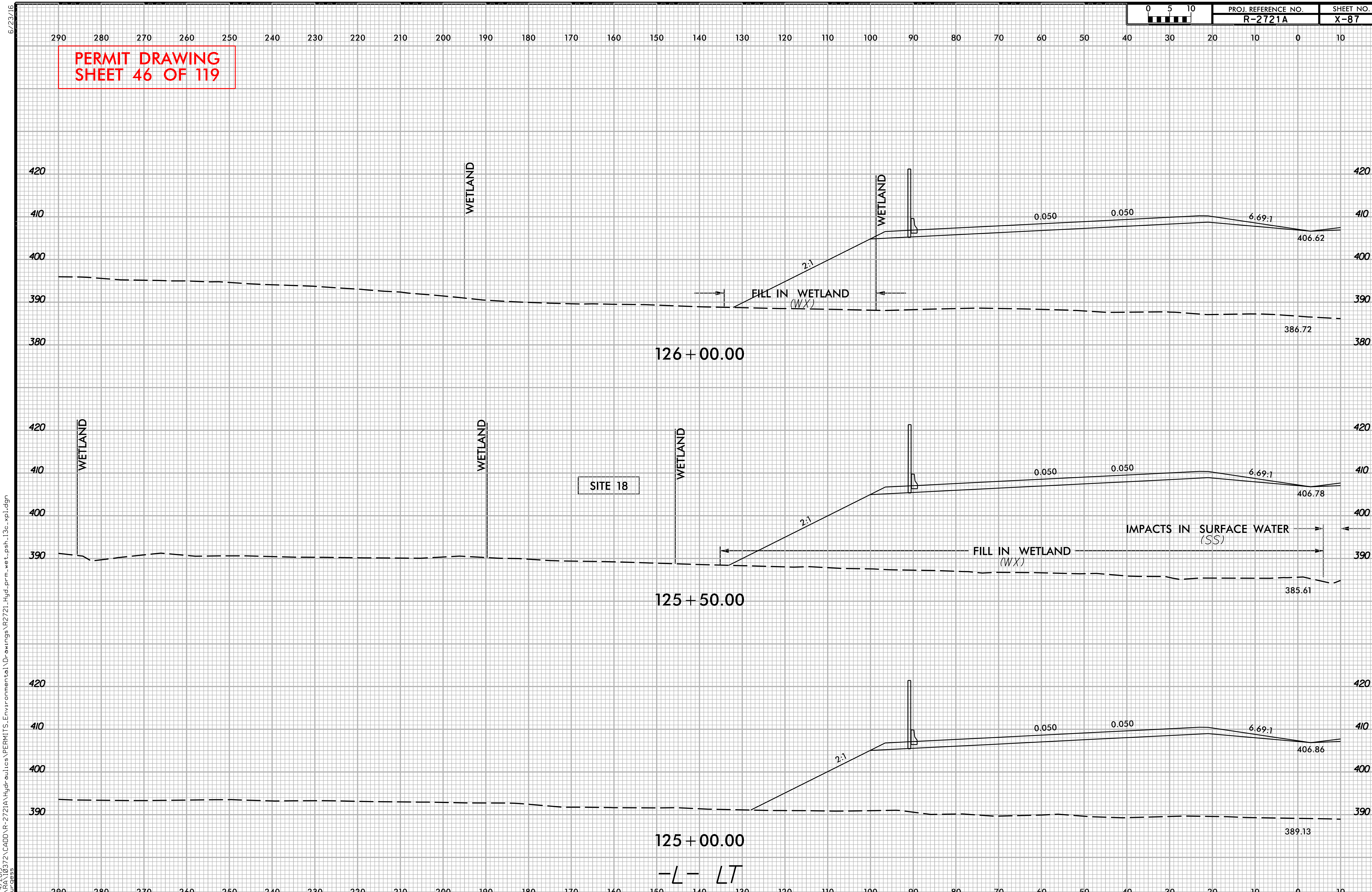
CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 150	CFS
DESIGN FREQUENCY	= 100	YRS
DESIGN HW ELEVATION	= 377.7	FT
BASE DISCHARGE	= 150	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 377.7	FT
OVERTOPPING DISCHARGE	= 610	CFS
OVERTOPPING FREQUENCY	= > 500	YRS
OVERTOPPING ELEVATION	= 383.5	FT

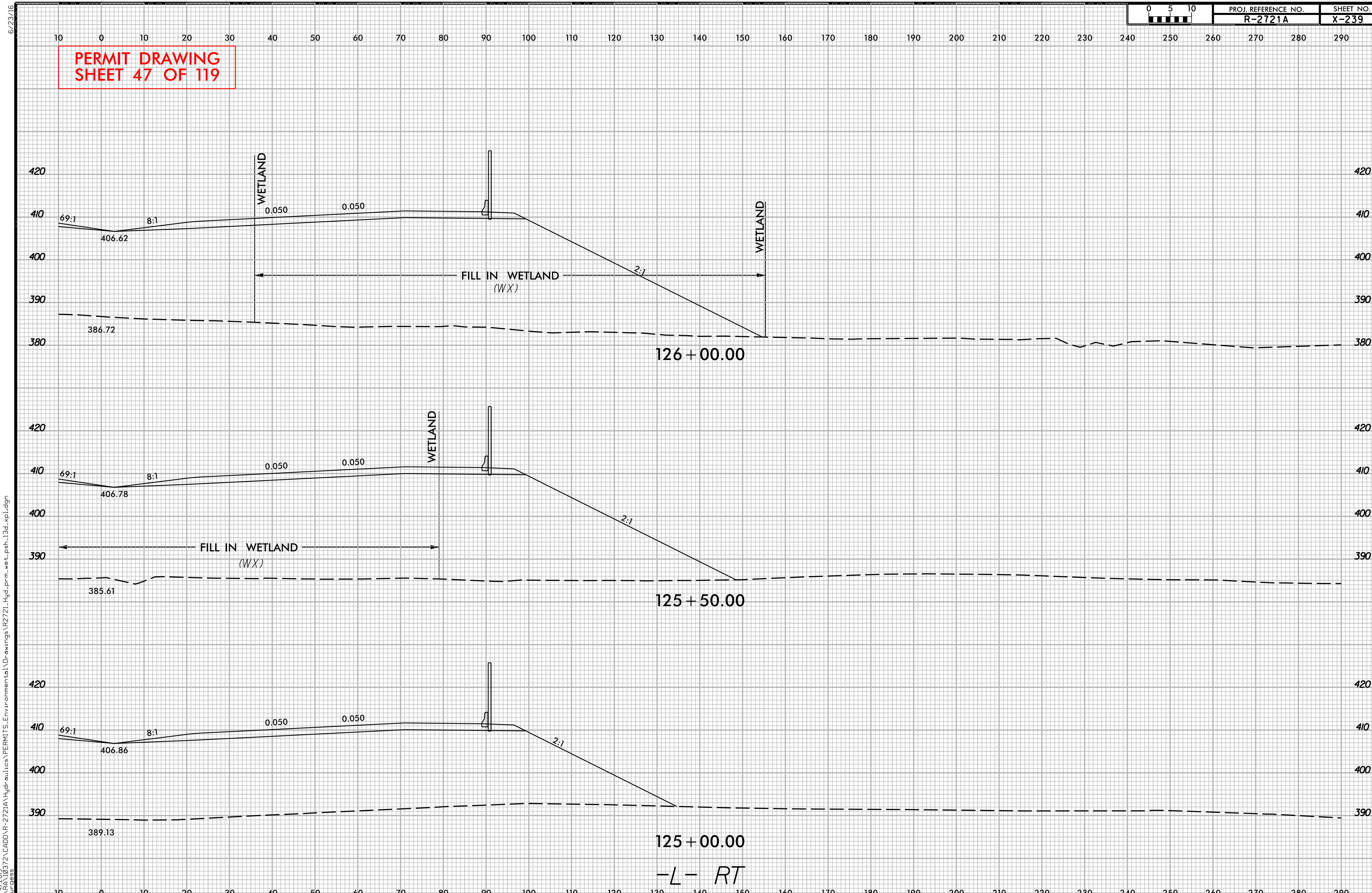


12/4/2019
O:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_13b_pfl.dgn

6/23/16



12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_13c_xpl.dgn
hburgess


PERMIT DRAWING
SHEET 47 OF 119
PROJ. REFERENCE NO.
R-2721A
SHEET NO.
X-239
0 5 10
6/23/16
WETLAND
0.050
0.050
69:1
8:1
406.62
2:1
WETLAND
FILL IN WETLAND
(WX)
386.72
126+00.00
WETLAND
0.050
0.050
69:1
8:1
406.78
2:1
FILL IN WETLAND
(WX)
385.61
125+50.00
0.050
0.050
69:1
8:1
406.86
2:1
389.13
125+00.00
-L- RT
12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_13d_xpl.dgn
burgess

PERMIT DRAWING
SHEET 48 OF 119

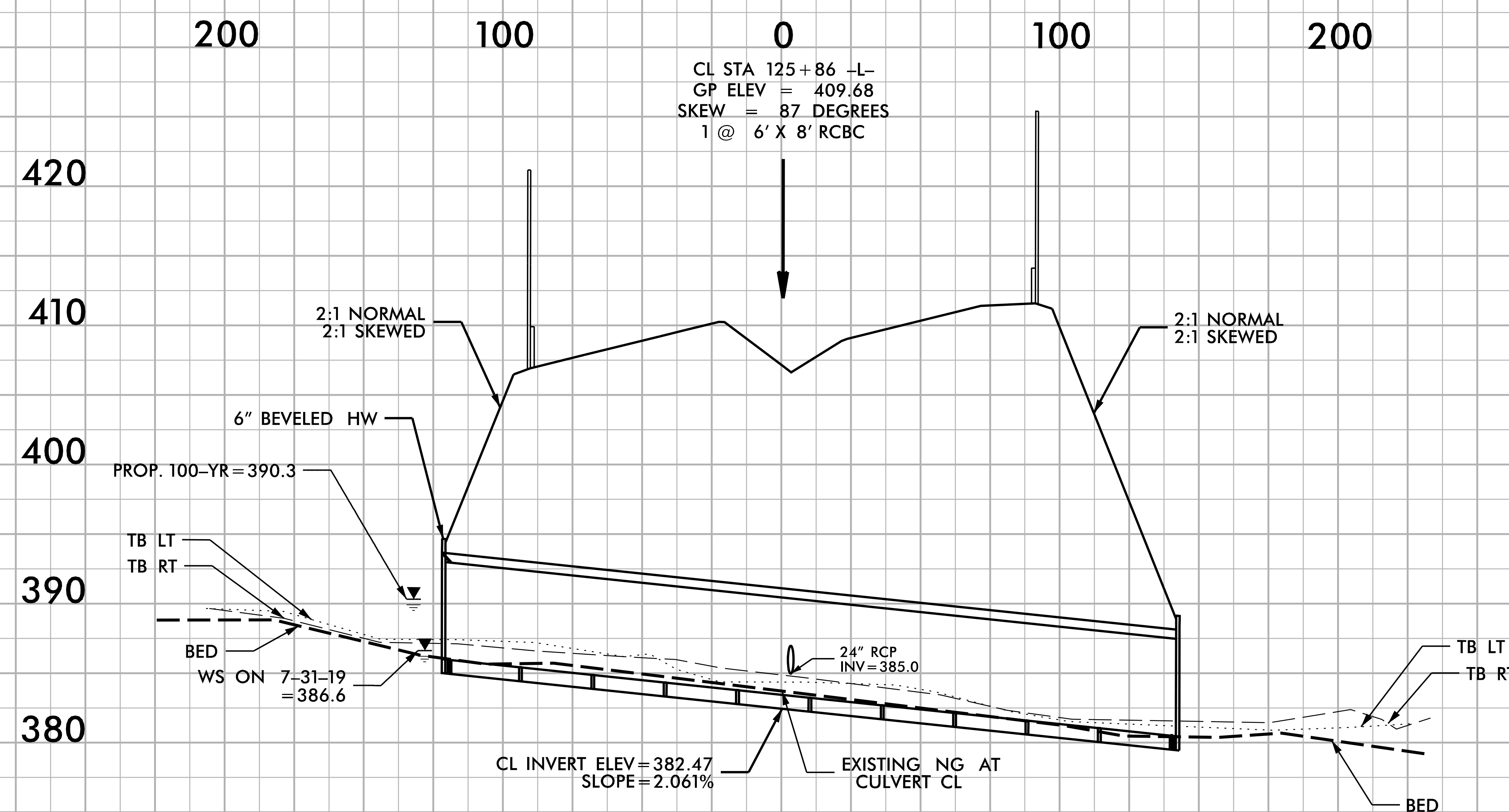
PROJECT REFERENCE NO.	SHEET NO.
R-2721	13E

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

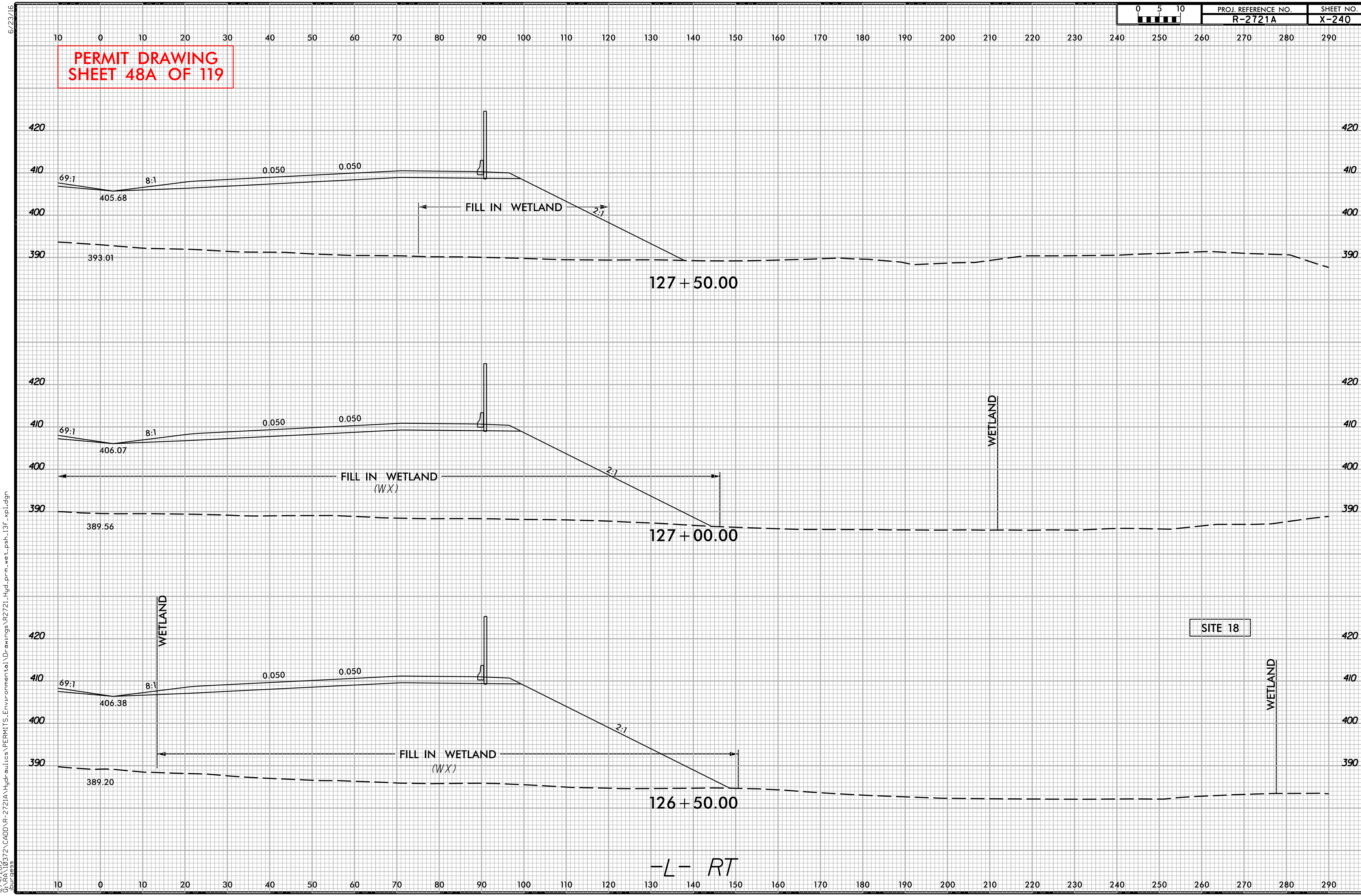
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



5/14/99

12/4/2019
G:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_13e_sec.dgn

6/23/16



12/4/2019
G:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_13f_xpl.dgn
Burgess

PERMIT DRAWING
SHEET 49 OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

FLATIRON | BRANCH CIVIL

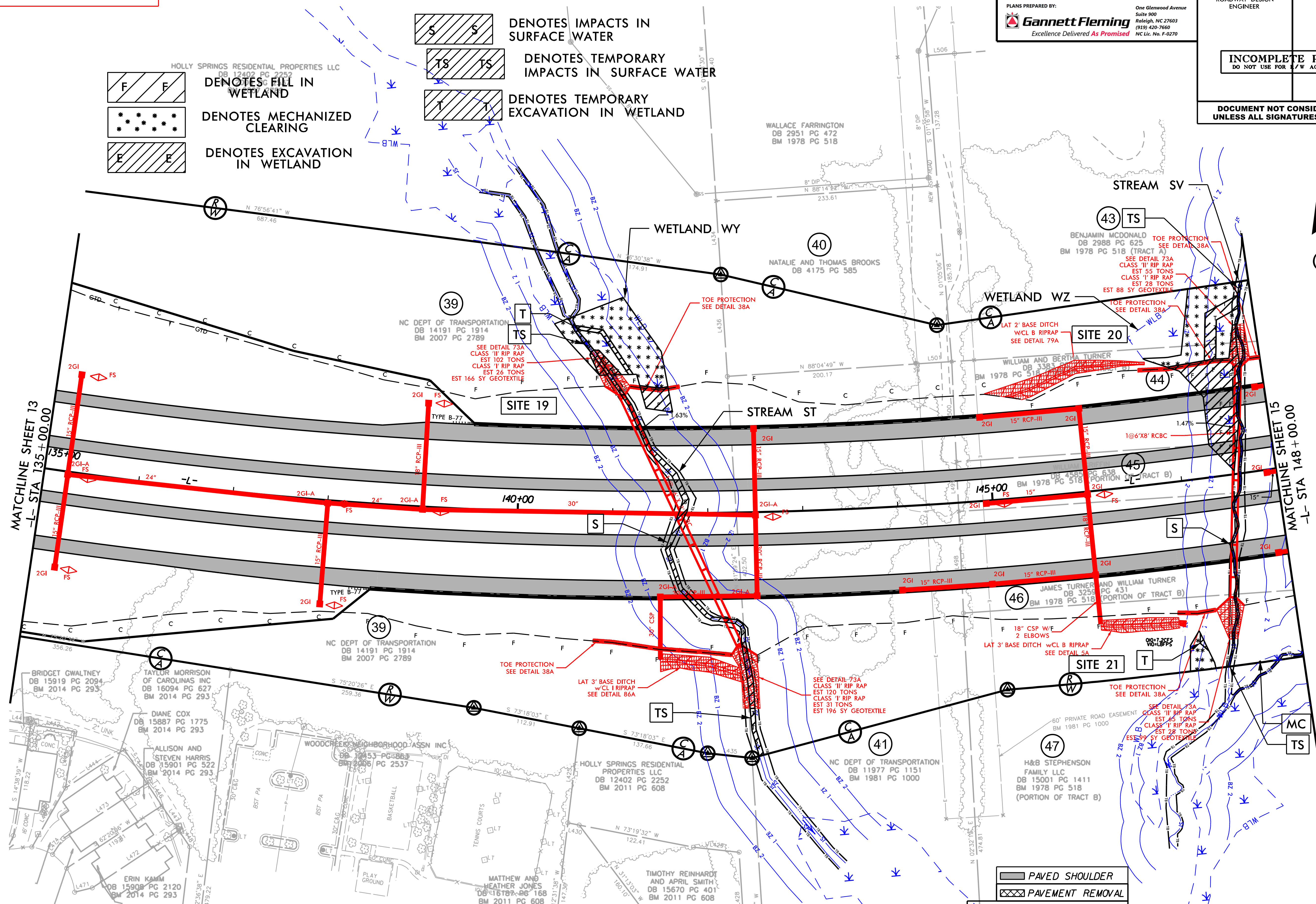
PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SCALE: 1" = 100'

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



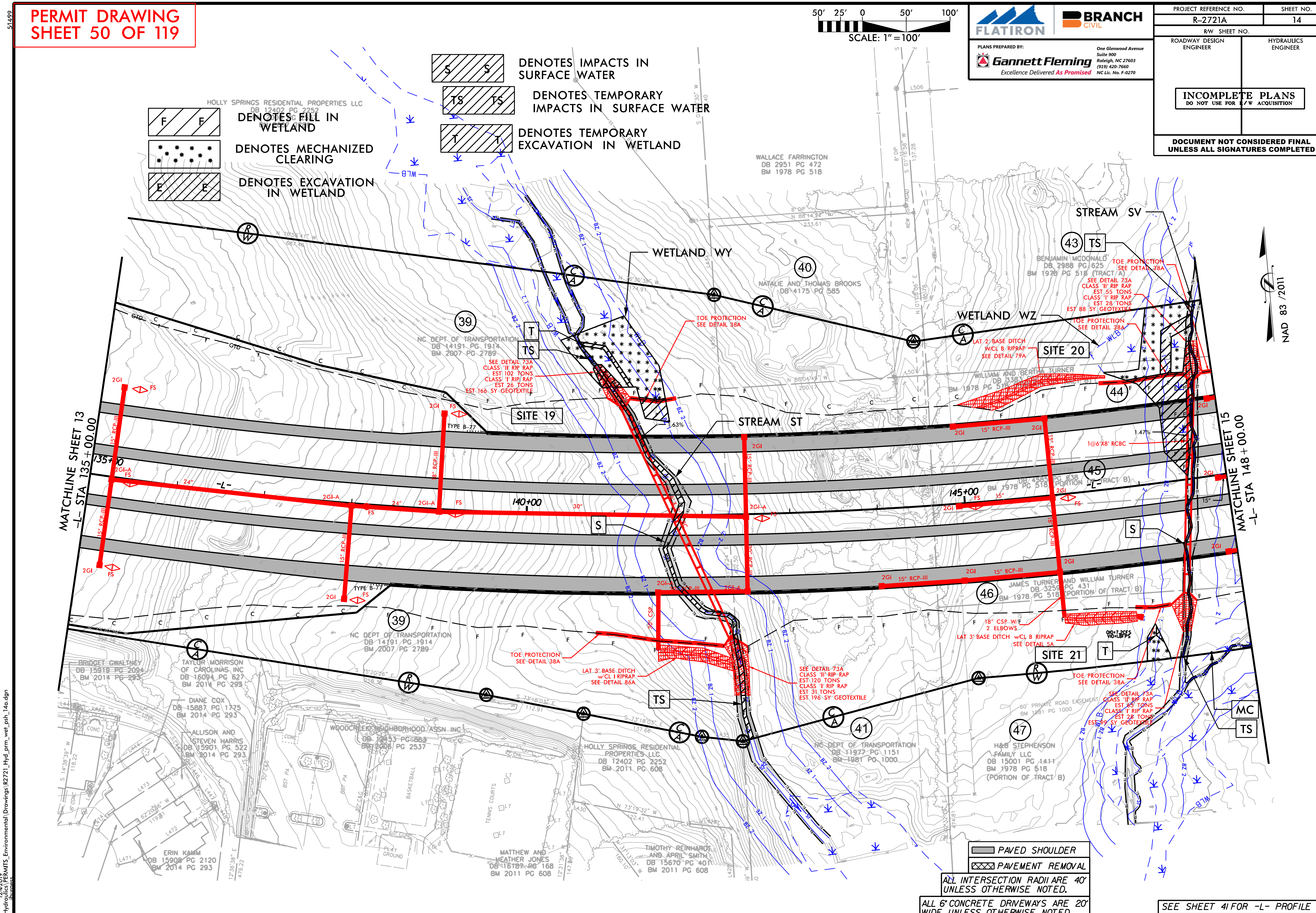
PAVED SHOULDER
PAVEMENT REMOVAL

ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.

ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

SEE SHEET 41 FOR -L- PROFILE

12/4/2019
R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_14.dgn



PROJECT REFERENCE NO.	SHEET NO.
R-2721A	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

FLATIRON | BRANCH CIVIL

PLANS PREPARED BY: Gannett Fleming — Excellence Delivered As Promised — One Glenwood Avenue, Suite 900, Raleigh, NC 27603, (919) 420-7660, NC Lic. No. F-0270

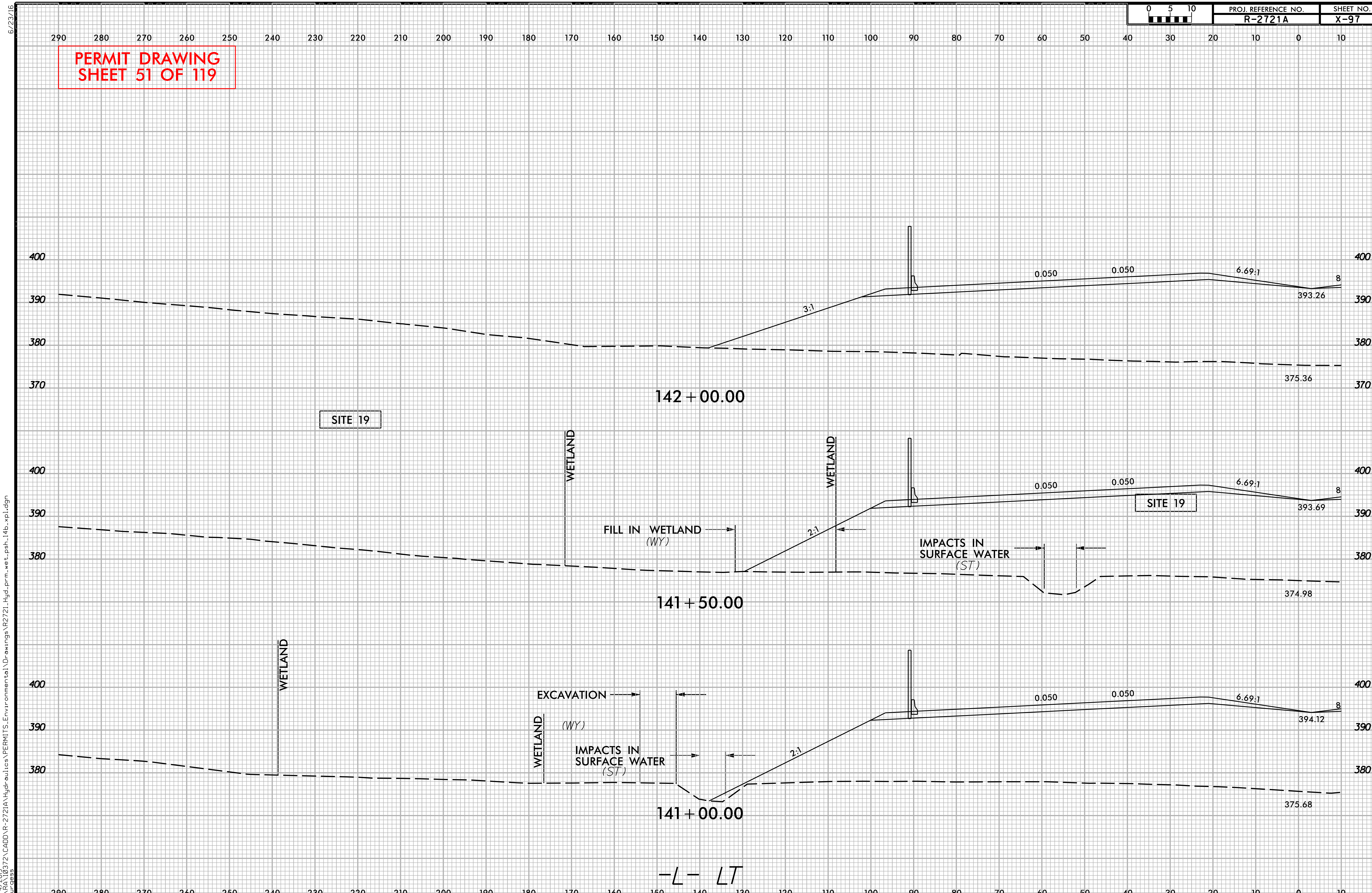
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

12/4/2019
R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_14a.dgn

PERMIT DRAWING
SHEET 51 OF 119

PROJ. REFERENCE NO.	SHEET NO.
R-2721A	X-97

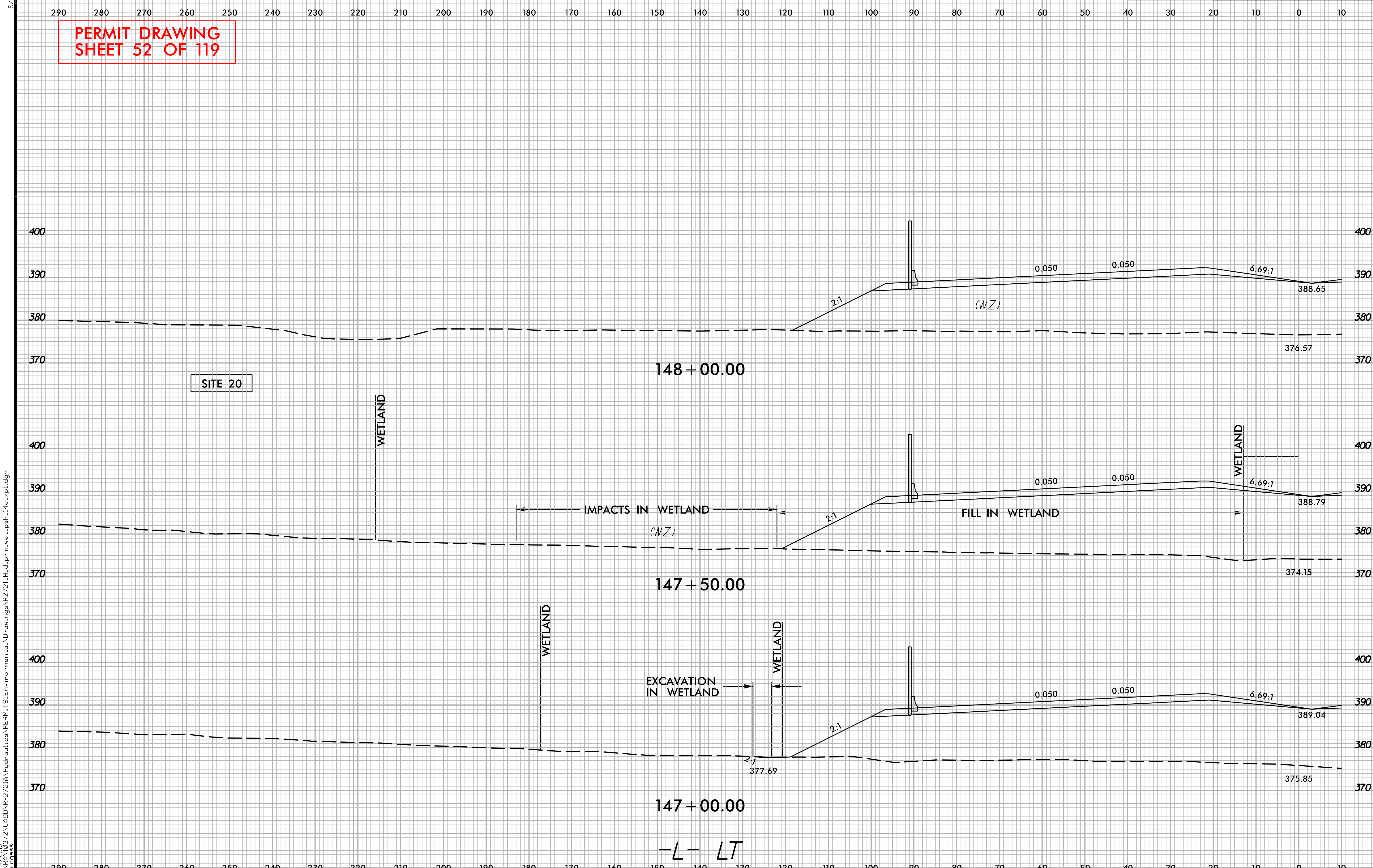


6/23/16

12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_14b_xpl.dgn
hburgess

PROJ. REFERENCE NO.	SHEET NO.
R-2721A	X-101

PERMIT DRAWING
SHEET 52 OF 119



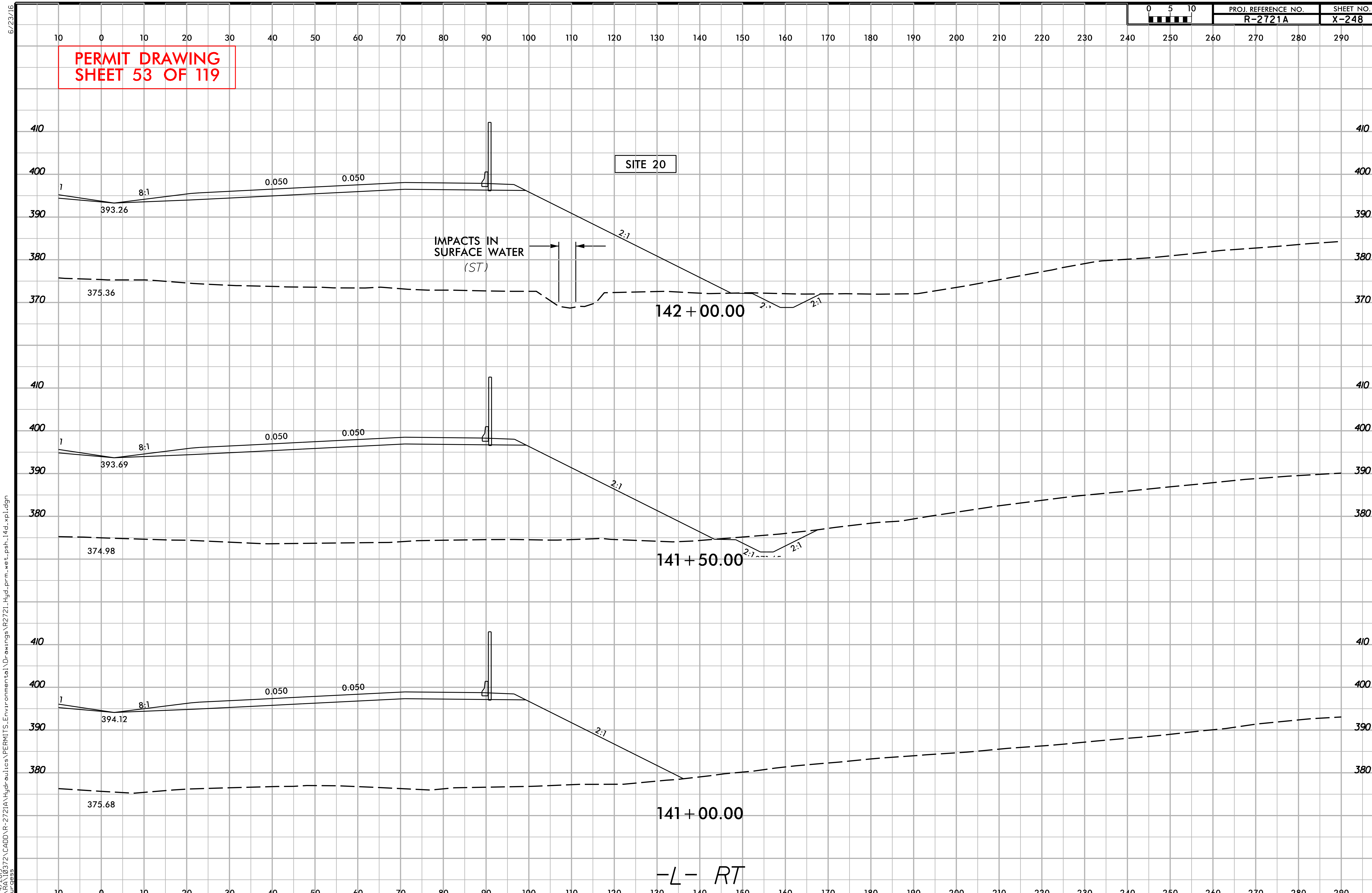
6/23/16

12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_14c_xpl.dgn
jburgess

PROJ. REFERENCE NO. R-2721A

SHEET NO. X-248

PERMIT DRAWING
SHEET 53 OF 119



6/23/16

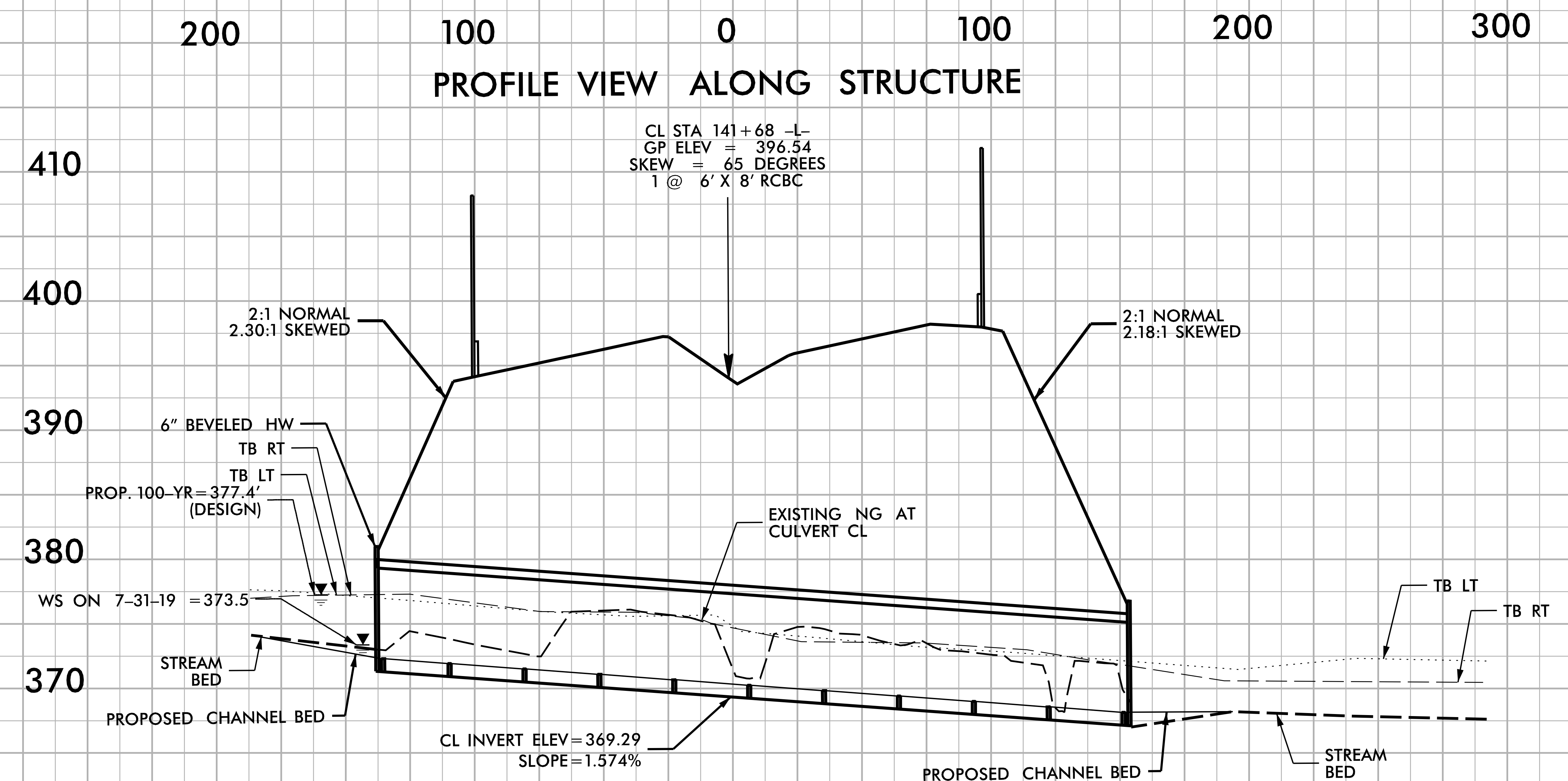
12/4/2019
G:\RA10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_14d_xpl.dgn
hburgess

PERMIT DRAWING
SHEET 54 OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721	14E
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



5/14/99

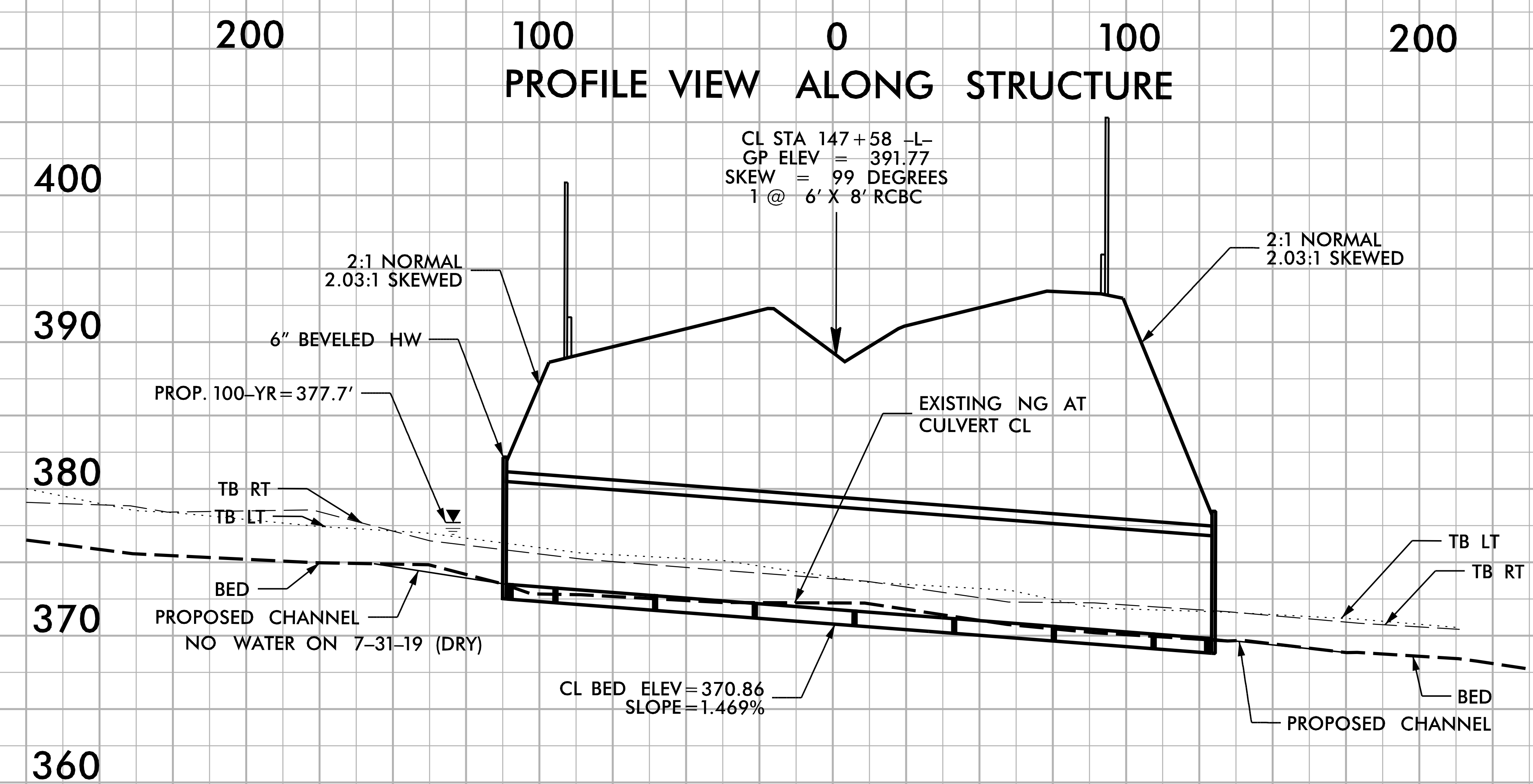
12/4/2019
O:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_14e_sec.dgn

PERMIT DRAWING
SHEET 54A OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721	14F
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PERMIT DRAWING
SHEET 55 OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

FLATIRON | BRANCH CIVIL

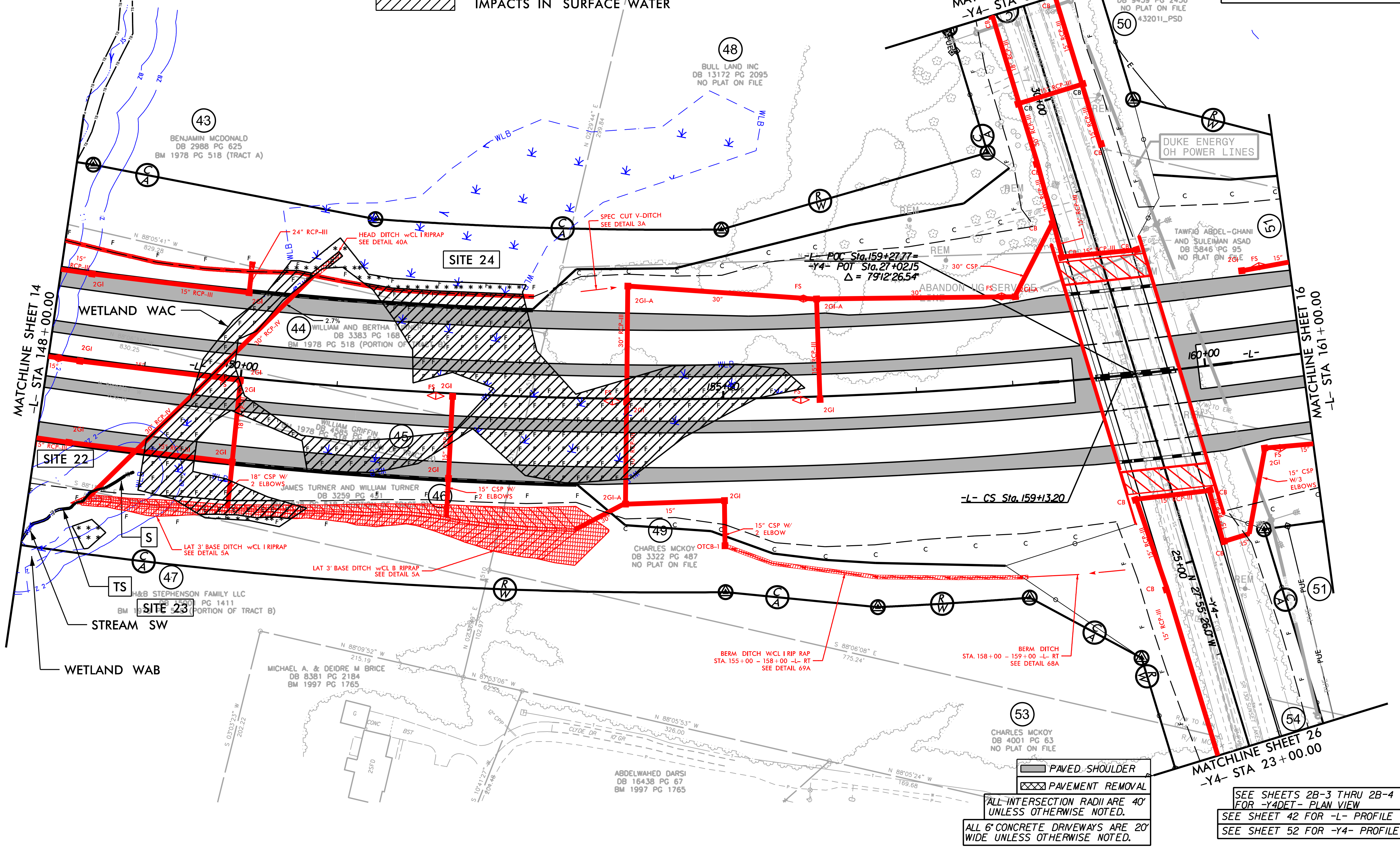
PLANS PREPARED BY: Gannett Fleming — Excellence Delivered As Promised
One Glenwood Avenue, Suite 900, Raleigh, NC 27603, (919) 420-7660, NC Lic. No. F-0270

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SCALE: 1" = 100'

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



ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.

ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

SEE SHEETS 2B-3 THRU 2B-4 FOR -Y4DET- PLAN VIEW
SEE SHEET 42 FOR -L- PROFILE
SEE SHEET 52 FOR -Y4- PROFILE

12/4/2019
R:\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_15.dgn

PERMIT DRAWING
SHEET 56 OF 119

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

50' 25' 0 50' 100'
SCALE: 1" = 100'

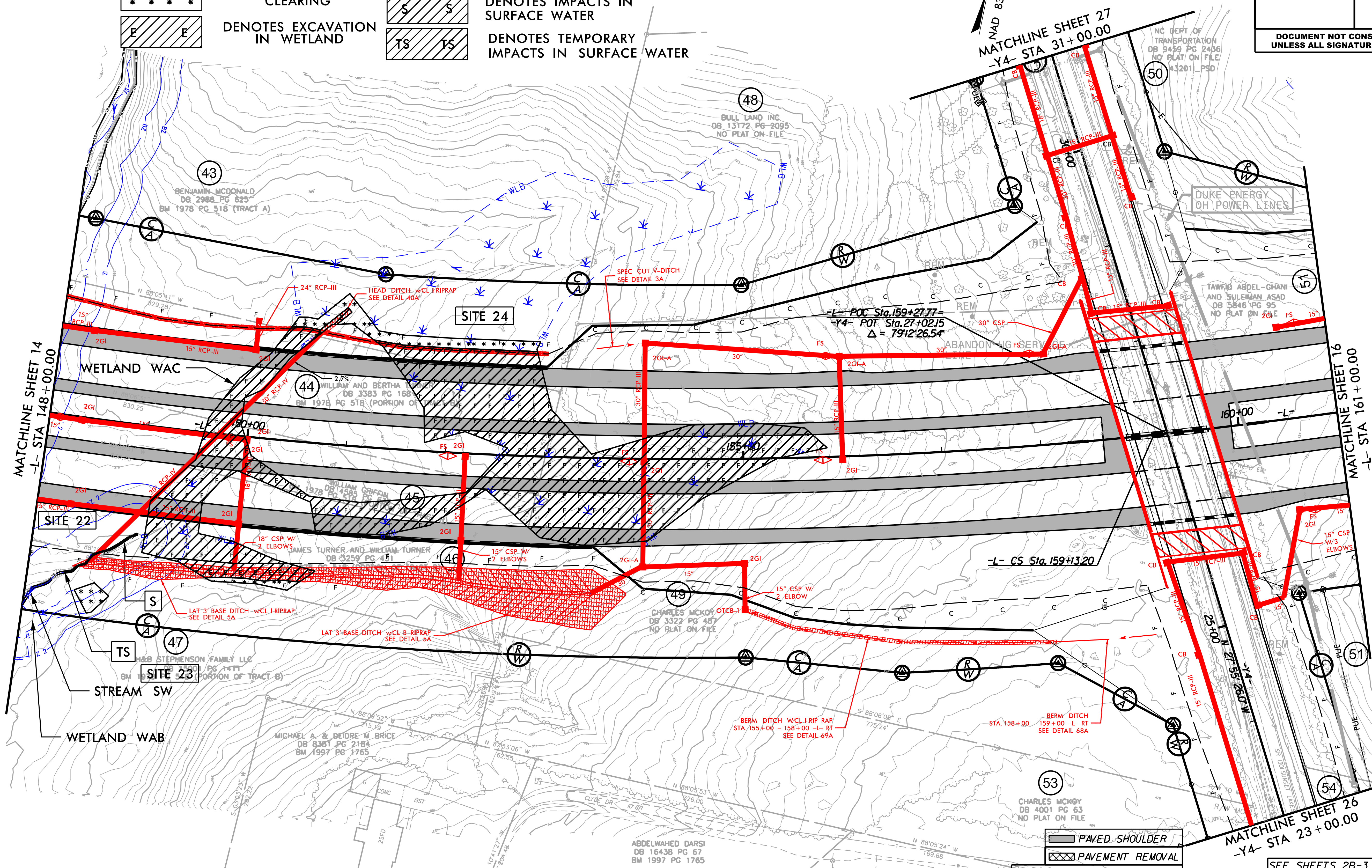
FLATIRON | BRANCH CIVIL

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



▭	PAVED SHOULDER
▨	PAVEMENT REMOVAL

ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.

ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

SEE SHEETS 2B-3 THRU 2B-4 FOR -Y4DET- PLAN VIEW
SEE SHEET 42 FOR -L- PROFILE
SEE SHEET 52 FOR -Y4- PROFILE

514499
12/4/2019
R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_15a.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	42

ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER

FLATIRON | BRANCH CIVIL

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

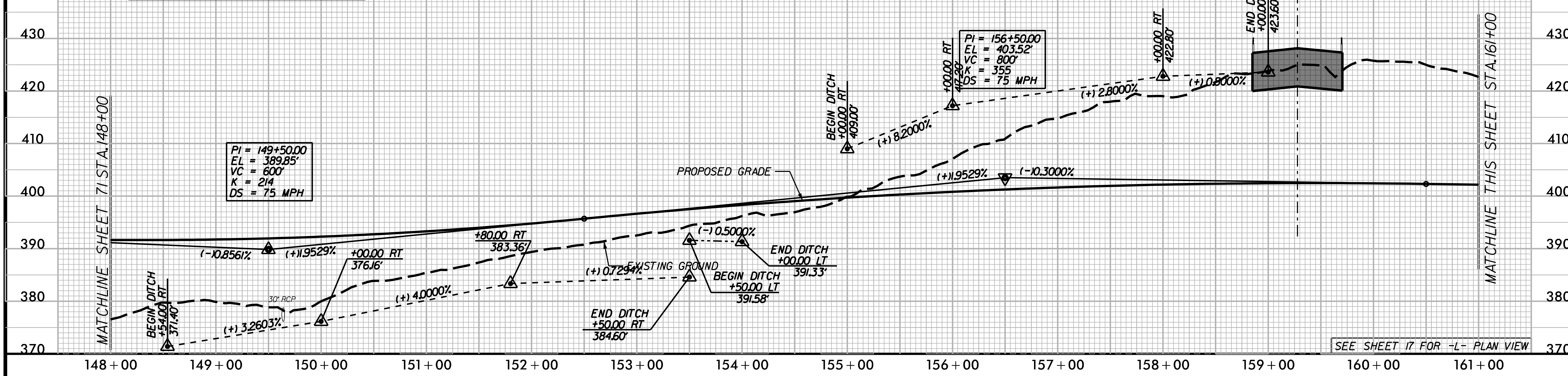
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PIPE HYDRAULIC DATA

30" RCP Sta. 149+75 -L-

DRAINAGE AREA	= 8.8	AC
DESIGN FREQUENCY	= 100	YRS
DESIGN DISCHARGE	= 23	CFS
DESIGN HW ELEVATION	= 384.1	FT
100 YEAR DISCHARGE	= 23	CFS
100 YEAR HW ELEVATION	= 384.1	FT
OVERTOPPING FREQUENCY	= 500 +	YRS
OVERTOPPING DISCHARGE	= 61	CFS
OVERTOPPING ELEVATION	= 388.3	FT



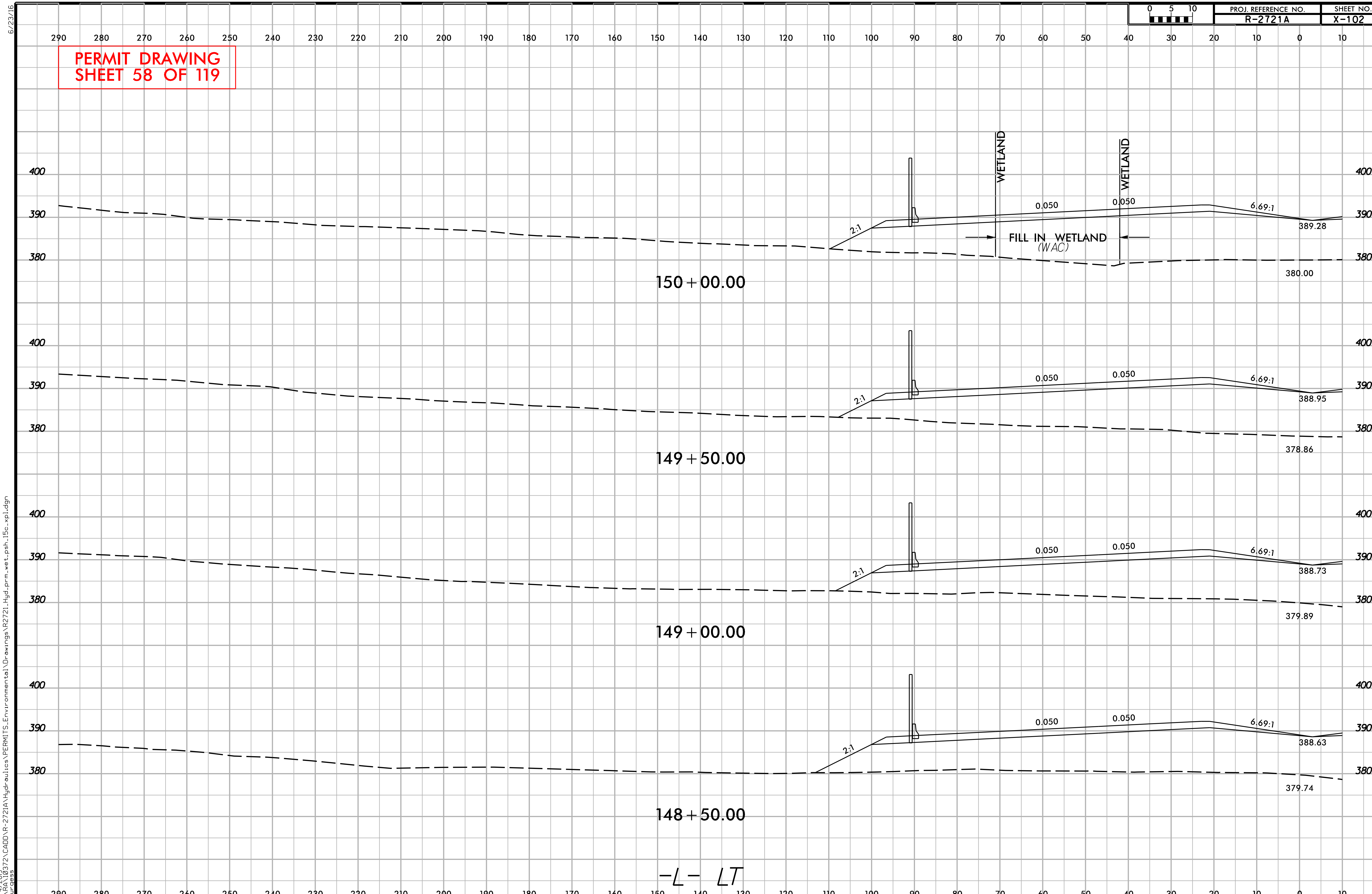
CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 910	CFS
DESIGN FREQUENCY	= 100	YRS
DESIGN HW ELEVATION	= 375.6	FT
BASE DISCHARGE	= 910	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 375.6	FT
OVERTOPPING DISCHARGE	= 3100	CFS
OVERTOPPING FREQUENCY	= 500 +	YRS
OVERTOPPING ELEVATION	= 399.0	FT

5/28/99
12/4/2019
O:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_15b_pfl.dgn

PERMIT DRAWING
SHEET 58 OF 119

PROJ. REFERENCE NO.	SHEET NO.
R-2721A	X-102

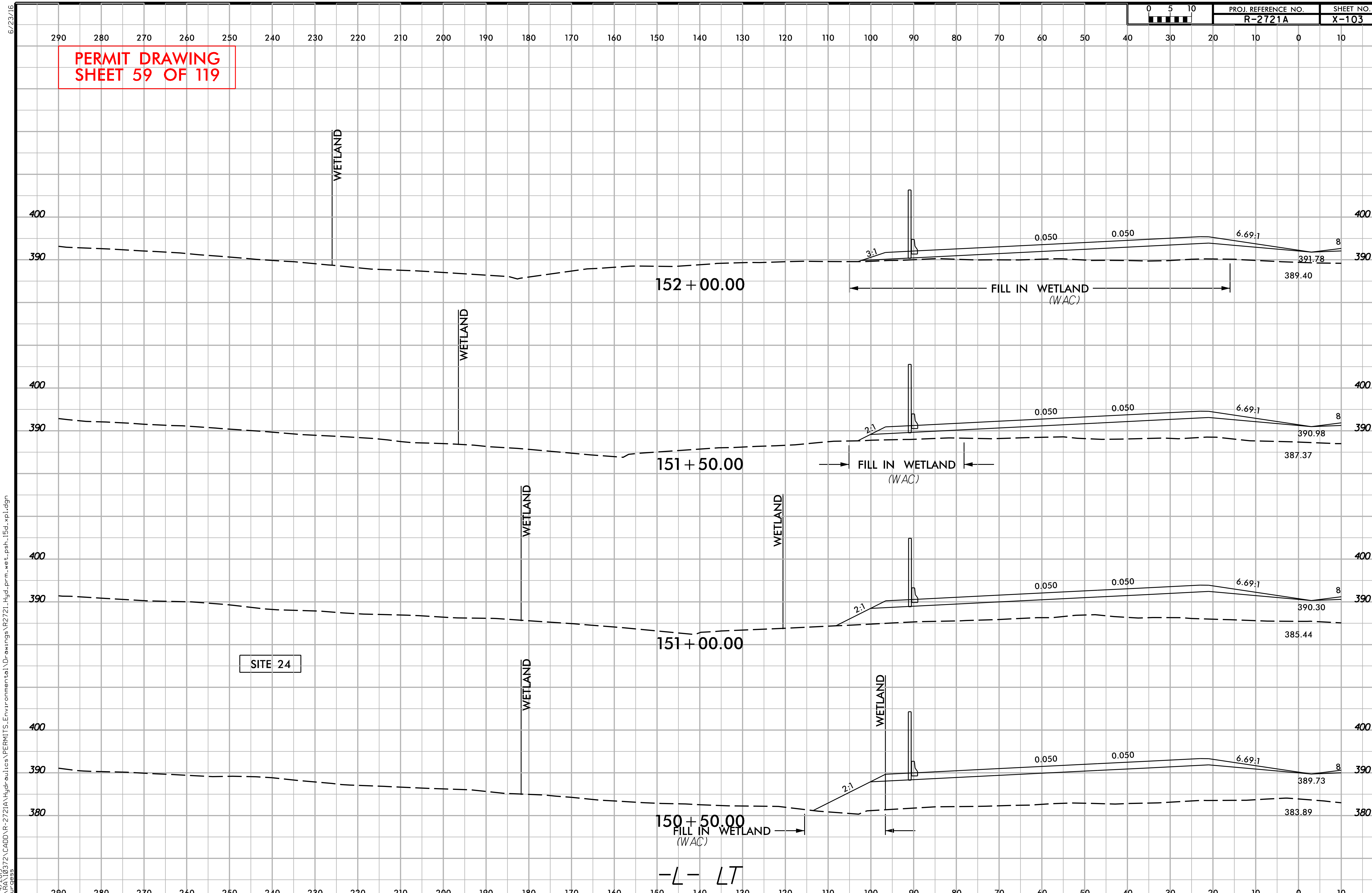


6/23/16

12/4/2019
Q:\RA10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_15c_xpl.dgn
Burgess

PROJ. REFERENCE NO.	SHEET NO.
R-2721A	X-103

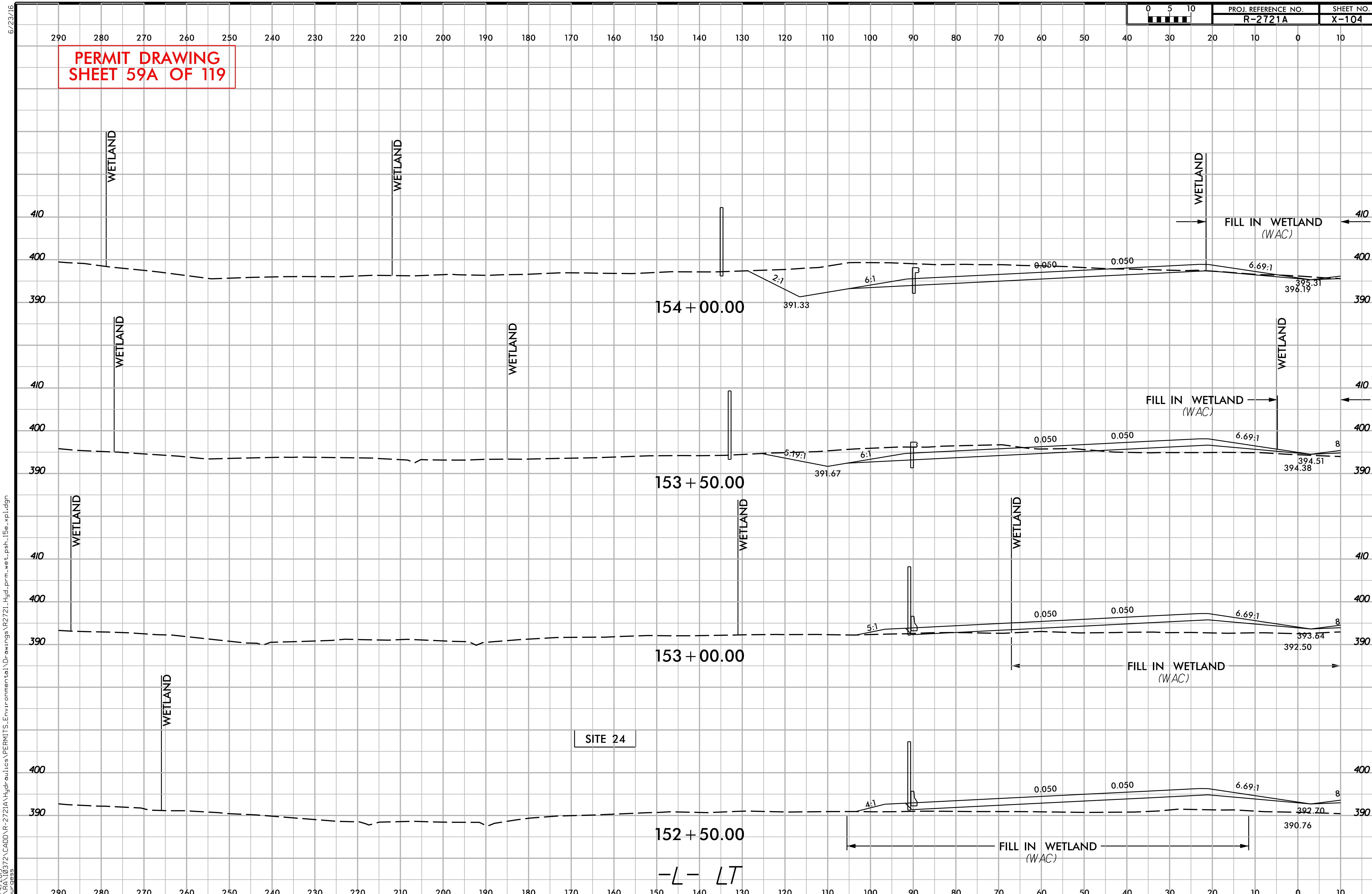
PERMIT DRAWING
SHEET 59 OF 119



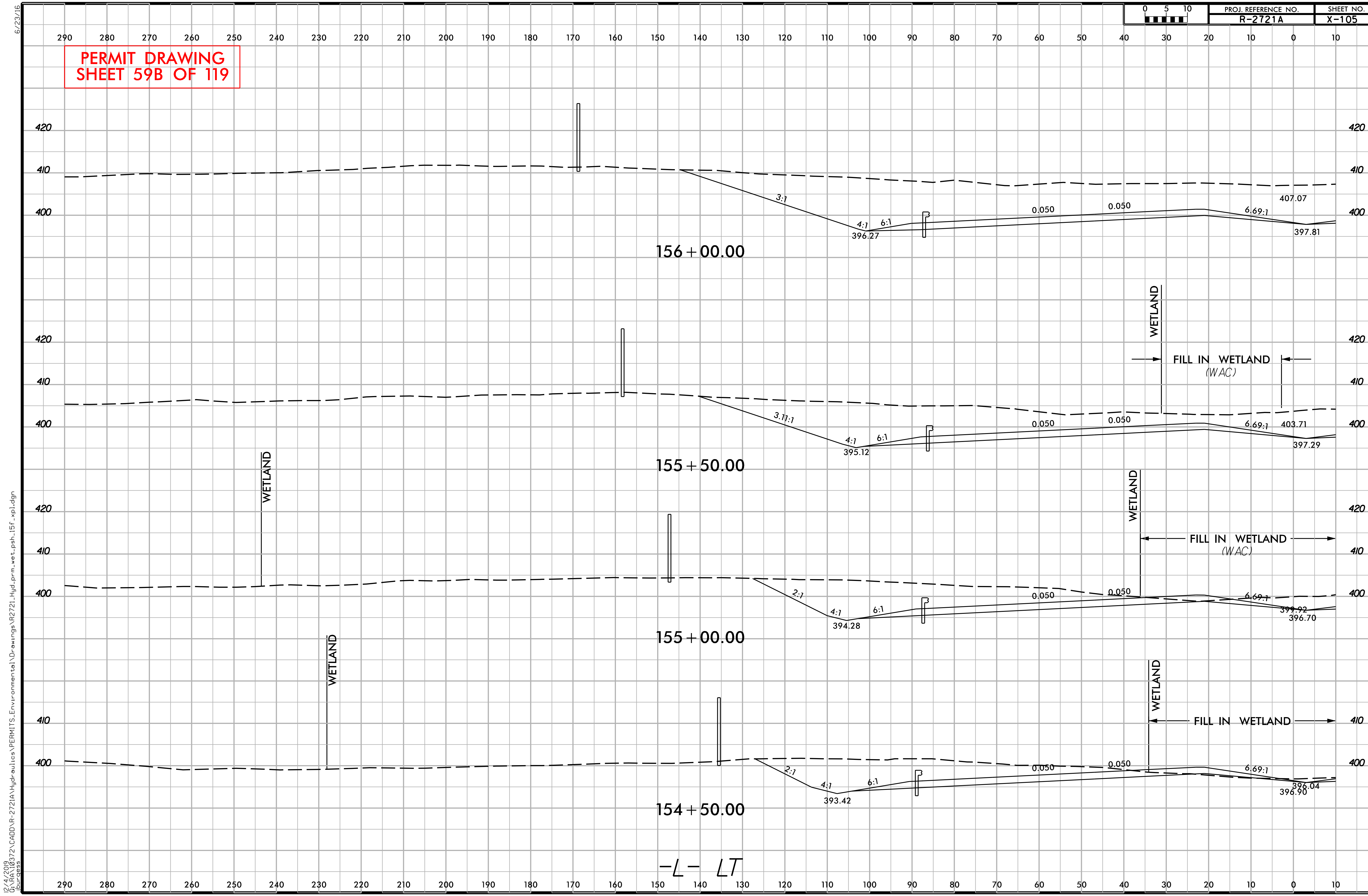
6/23/16

12/4/2019
G:\RA10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_15d_xpl.dgn
Burgess

6/23/16

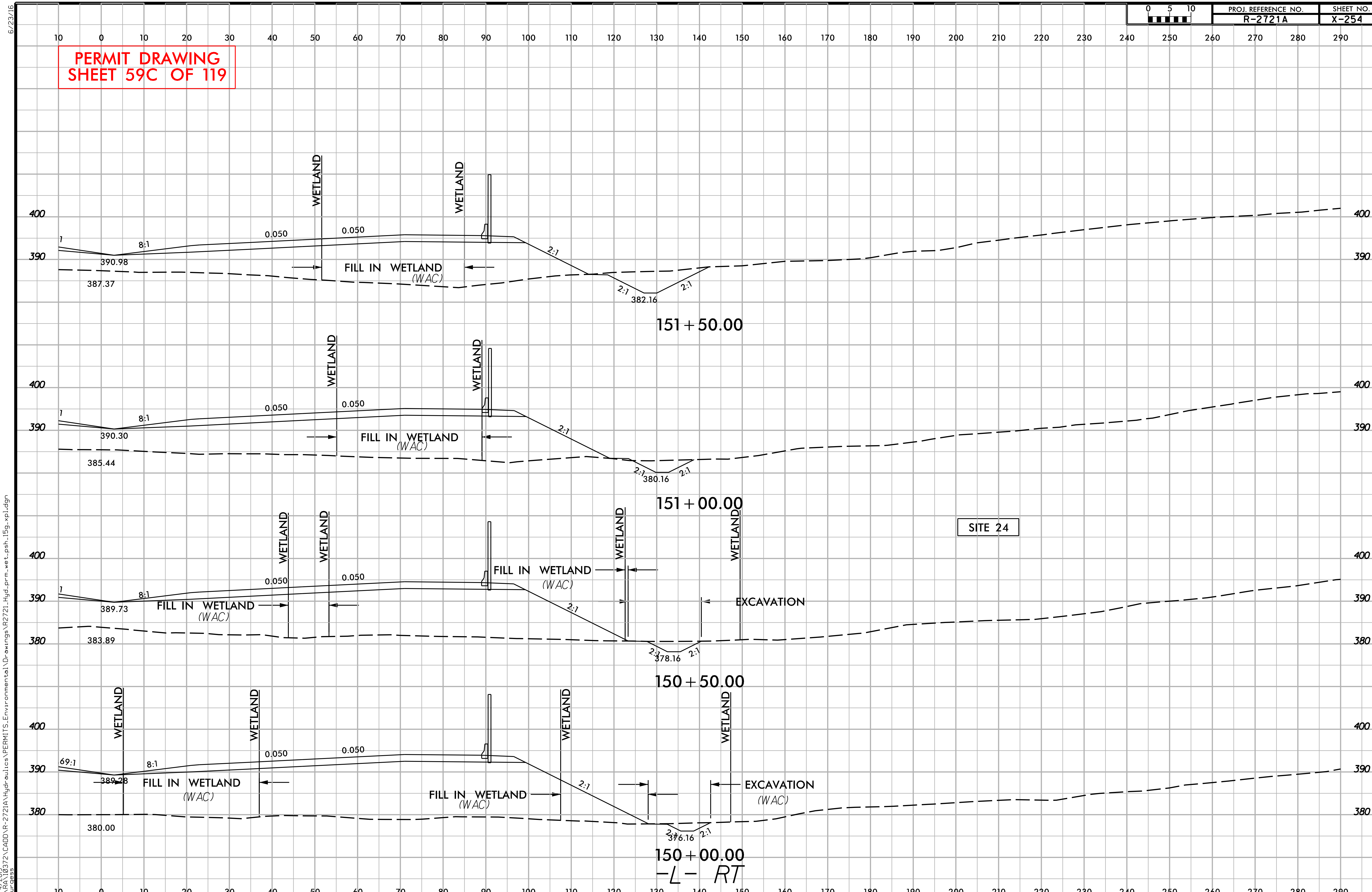


12/4/2019
G:\RA10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_15e_xpl.dgn
hburgess



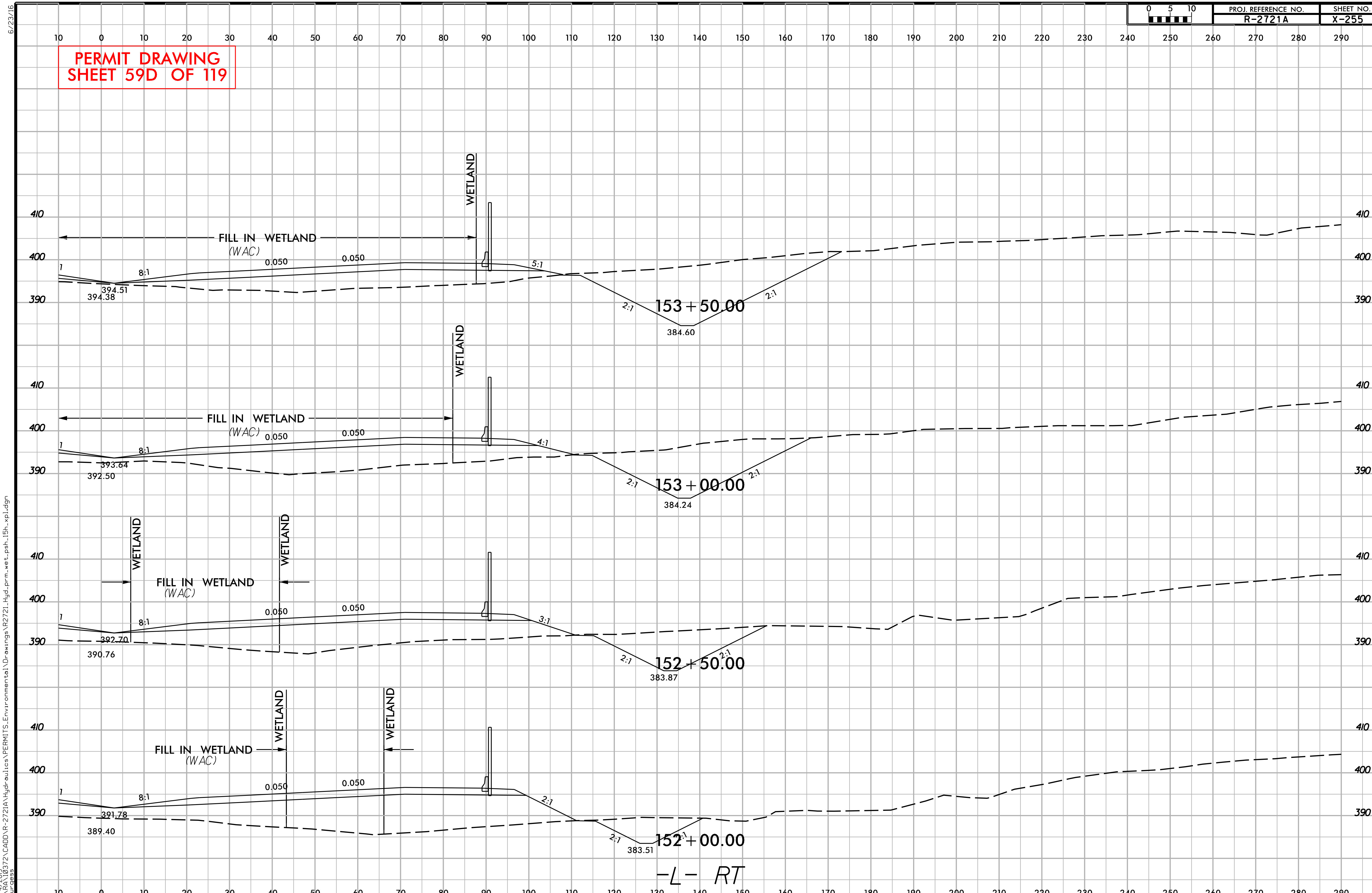
PROJ. REFERENCE NO.
R-2721A
SHEET NO.
X-105
PERMIT DRAWING
SHEET 59B OF 119
156+00.00
3:1
4:1
6:1
396.27
0.050
0.050
407.07
6.69:1
397.81
155+50.00
WETLAND
FILL IN WETLAND
(WAC)
3.11:1
4:1
6:1
395.12
0.050
0.050
6.69:1
403.71
397.29
155+00.00
WETLAND
WETLAND
FILL IN WETLAND
(WAC)
2:1
4:1
6:1
394.28
0.050
0.050
6.69:1
399.92
396.70
154+50.00
WETLAND
WETLAND
FILL IN WETLAND
2:1
4:1
6:1
393.42
0.050
0.050
6.69:1
396.04
396.90
-L- LT
6/23/16
12/4/2019
Q:\RA10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_15f_xpl.dgn
burgess

6/23/16

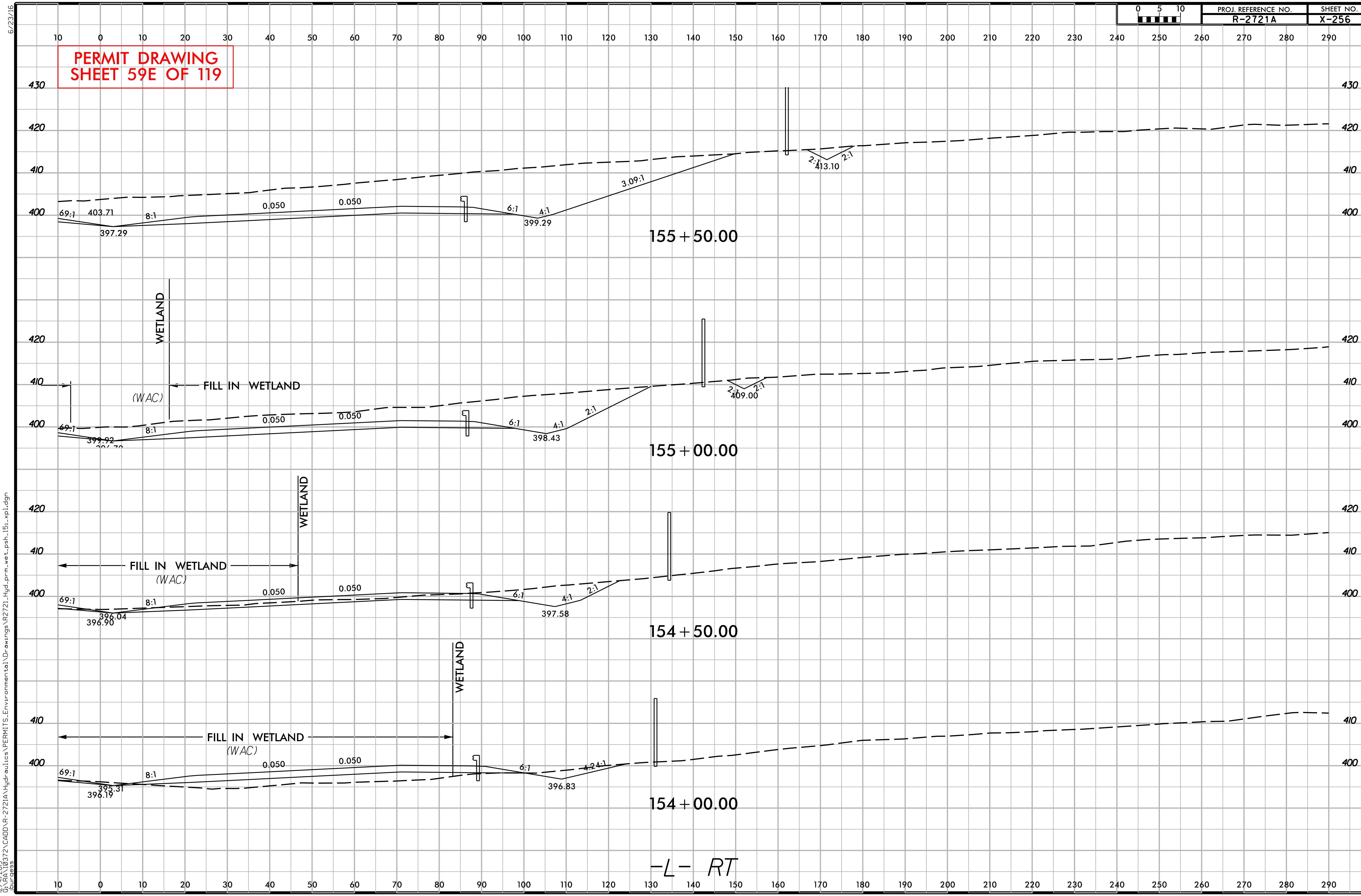


12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_15g_xpl.dgn
burgess

6/23/16



12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_15h_xpl.dgn
lburgess



PERMIT DRAWING
SHEET 59E OF 119
PROJ. REFERENCE NO.
R-2721A
SHEET NO.
X-256
155+50.00
155+00.00
154+50.00
154+00.00
WETLAND
FILL IN WETLAND
(WAC)
403.71
397.29
399.29
413.10
409.00
398.43
397.58
396.04
396.90
396.83
395.31
396.19
0.050
69:1
8:1
6:1
4:1
2:1
3.09:1
-L- RT
6/23/16
12/4/2019

PERMIT DRAWING
SHEET 60 OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

FLATIRON | BRANCH CIVIL

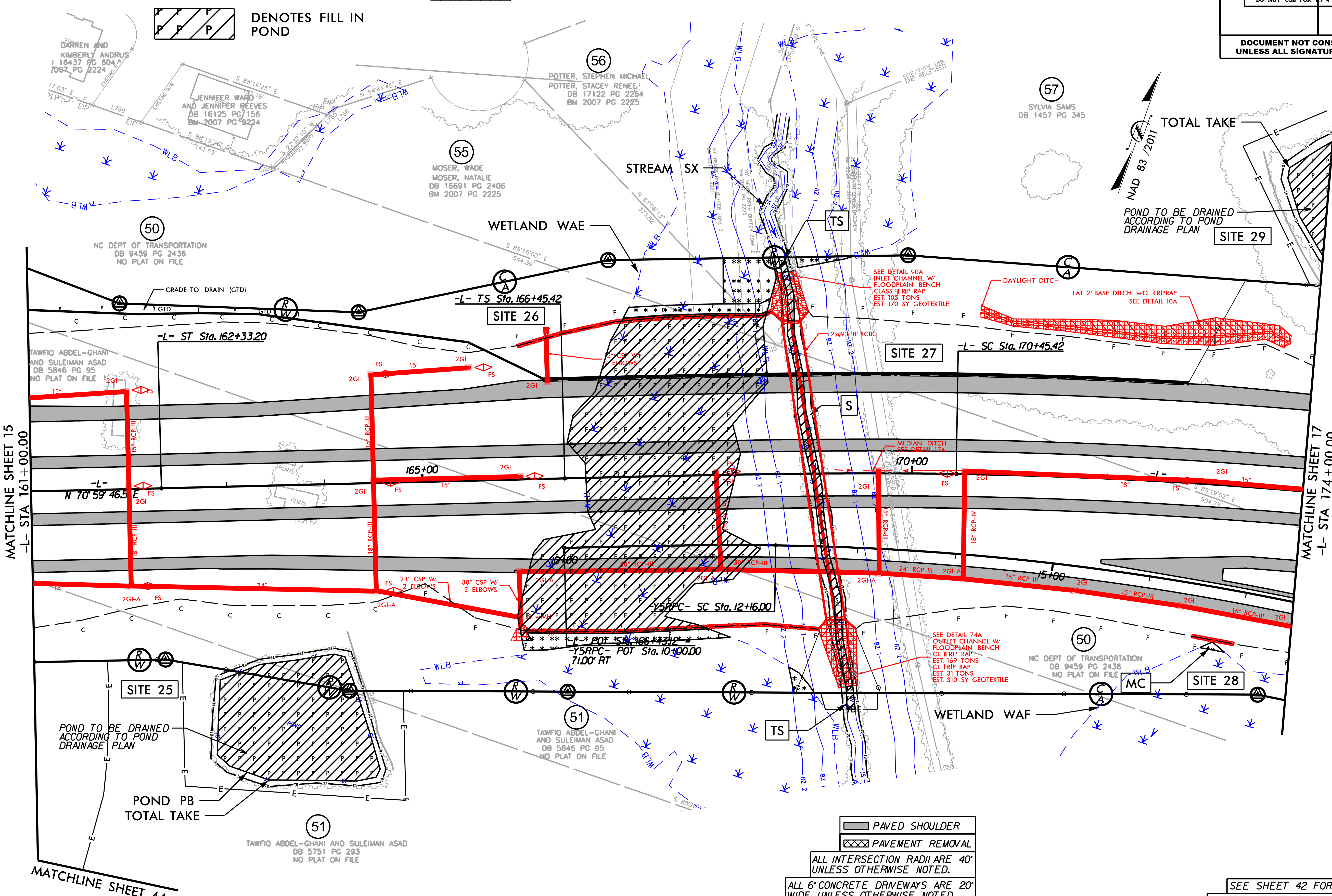
PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

SCALE: 1" = 100'
50' 25' 0 50' 100'

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



PAVED SHOULDER
PAVEMENT REMOVAL

ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.

ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

SEE SHEET 42 FOR -L- PROFILE
SEE SHEET 58 FOR -Y5RPC- PROFILE

12/4/2019
R:\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_16.dgn

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

DENOTES FILL IN POND

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER

SCALE: 1" = 100'

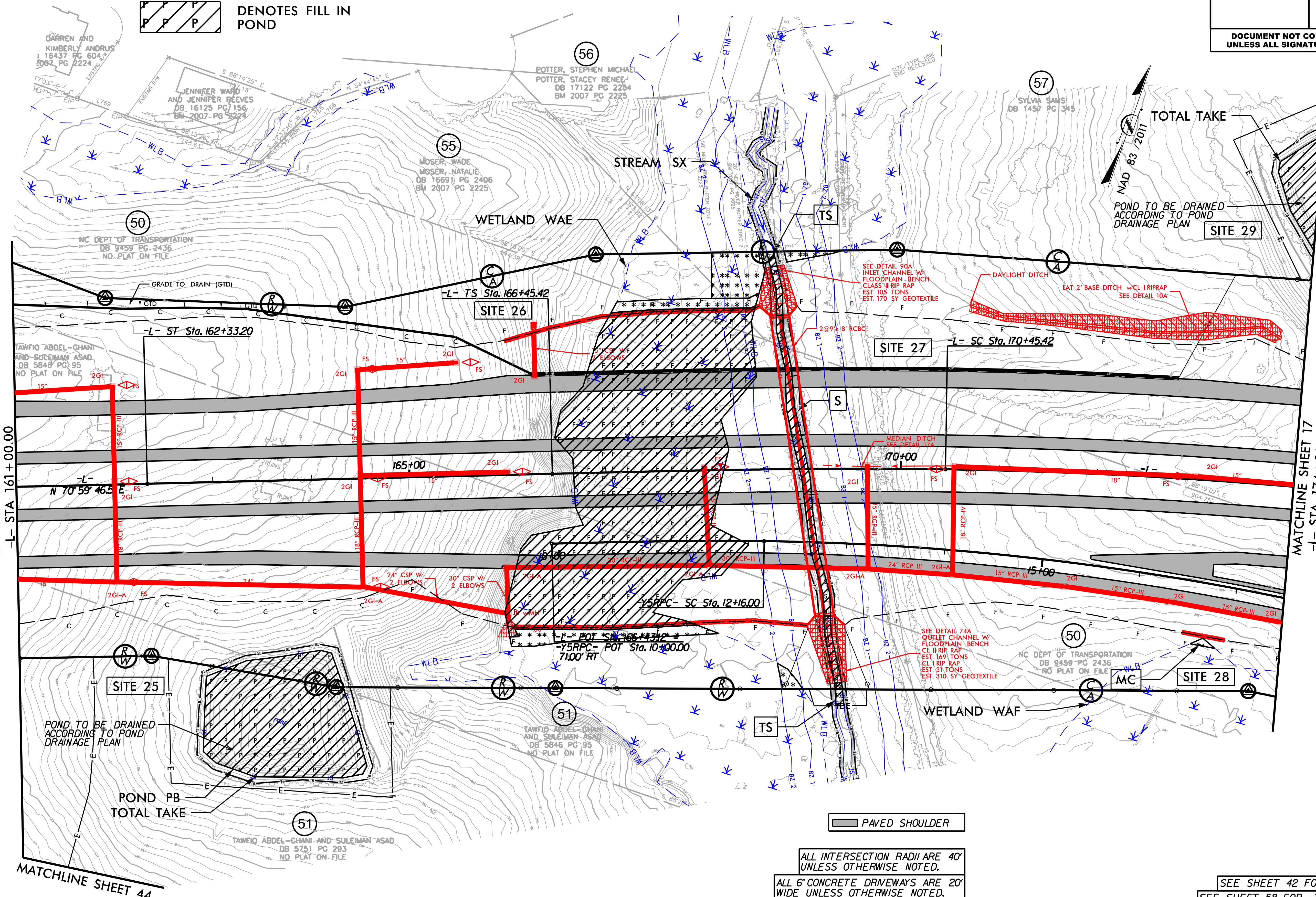
FLATIRON | BRANCH CIVIL

PLANS PREPARED BY: Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



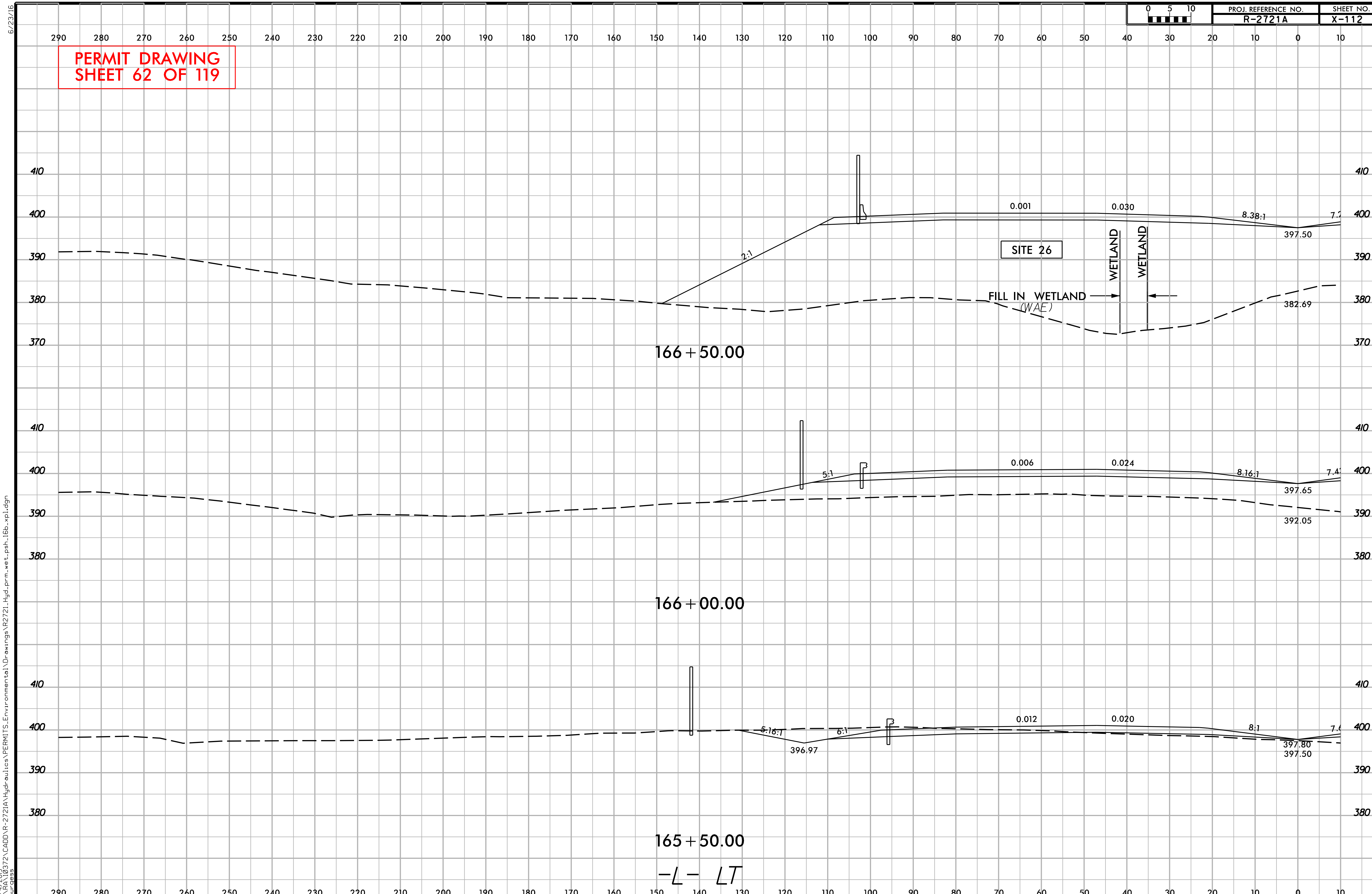
PAVED SHOULDER

ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.

ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

SEE SHEET 42 FOR -L- PROFILE
SEE SHEET 58 FOR -Y5RPC- PROFILE

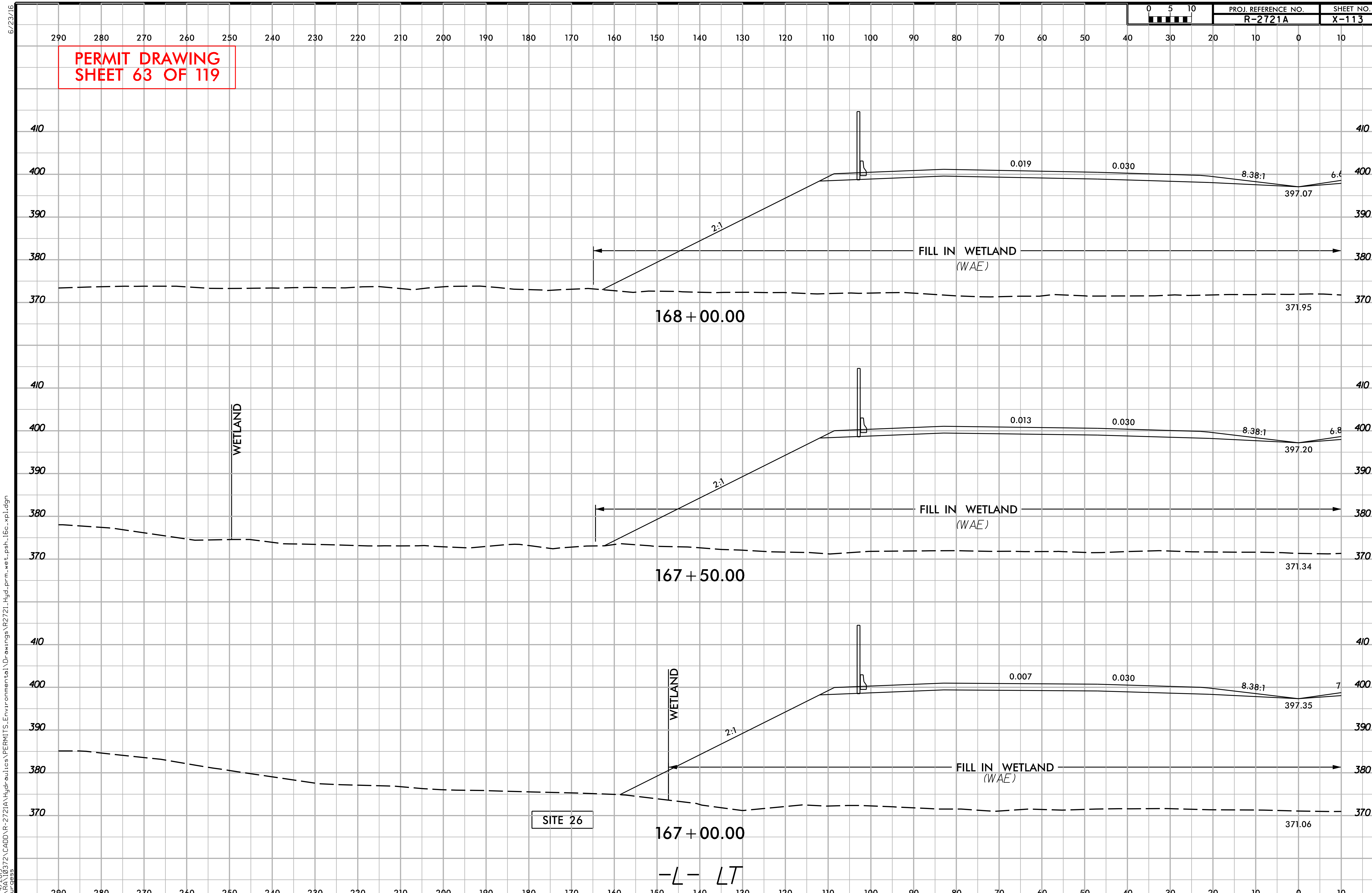
12/4/2019
R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_16a.dgn



6/23/16

12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS-Environmental\Drawings\R2721_Hyd_prm_wet_psh_16b_xpl.dgn
hburgess

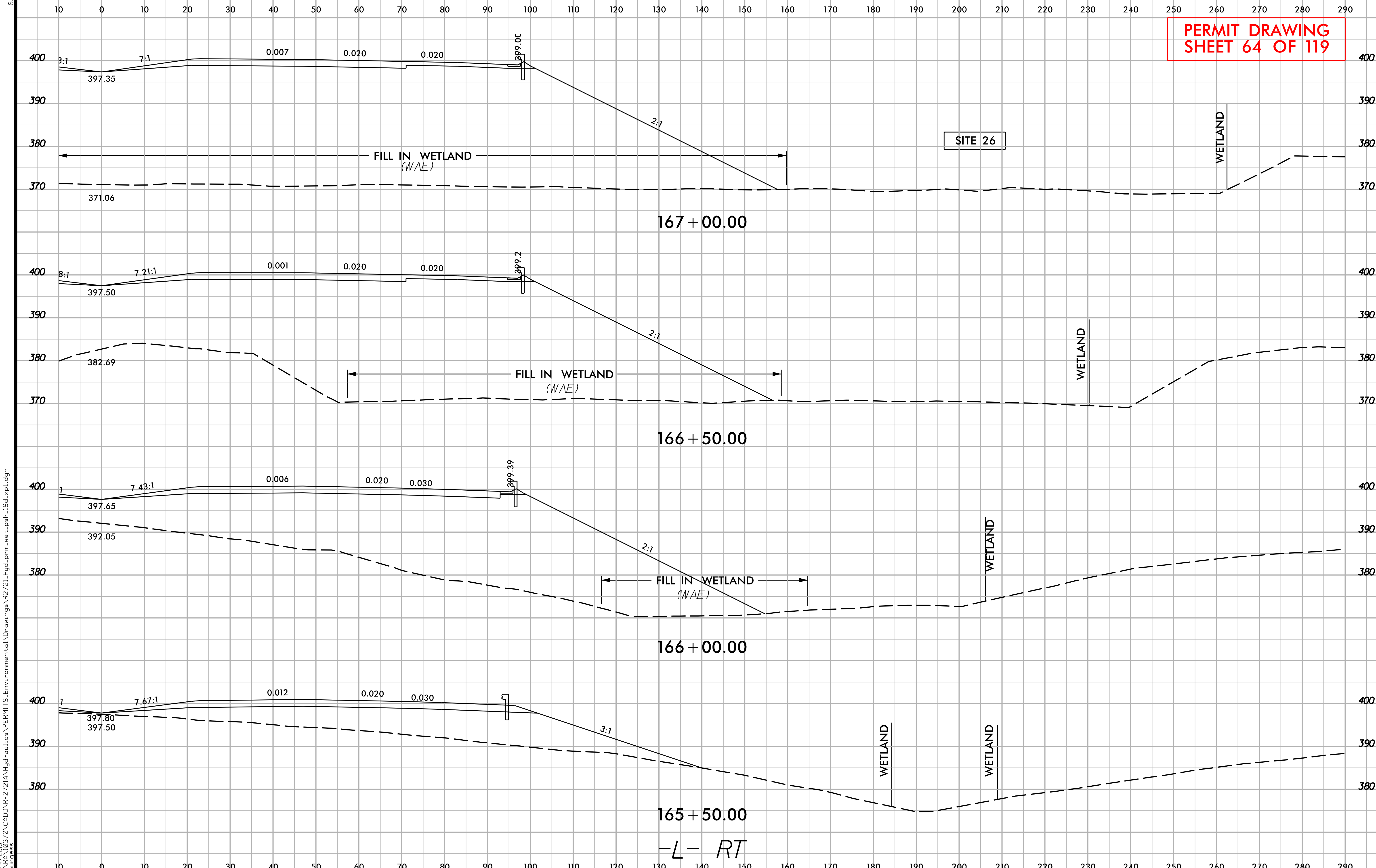
PERMIT DRAWING
SHEET 63 OF 119



6/23/16

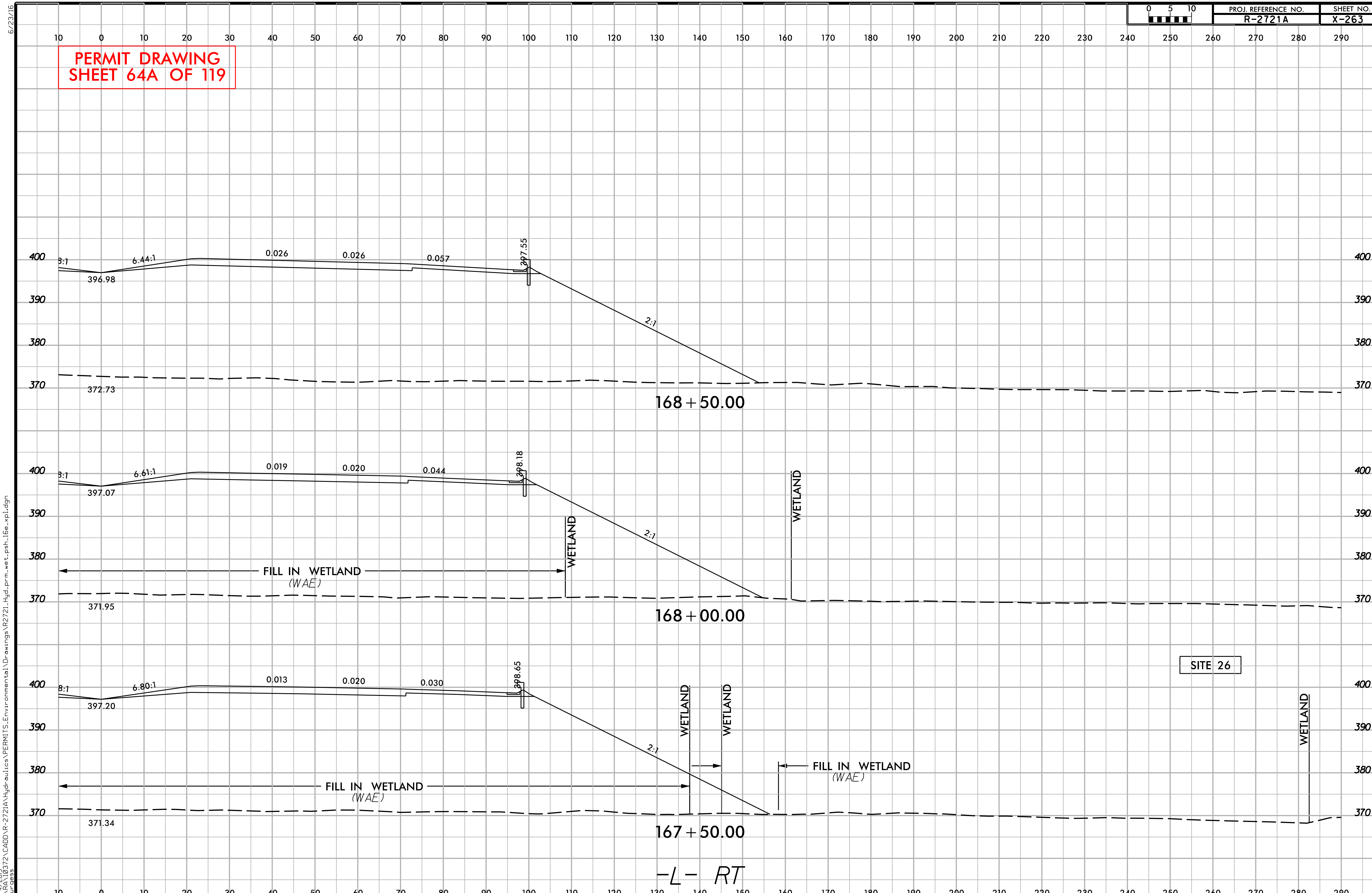
PROJ. REFERENCE NO.	SHEET NO.
R-2721A	X-262

PERMIT DRAWING
SHEET 64 OF 119



12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_16d_xpl.dgn
jburgess

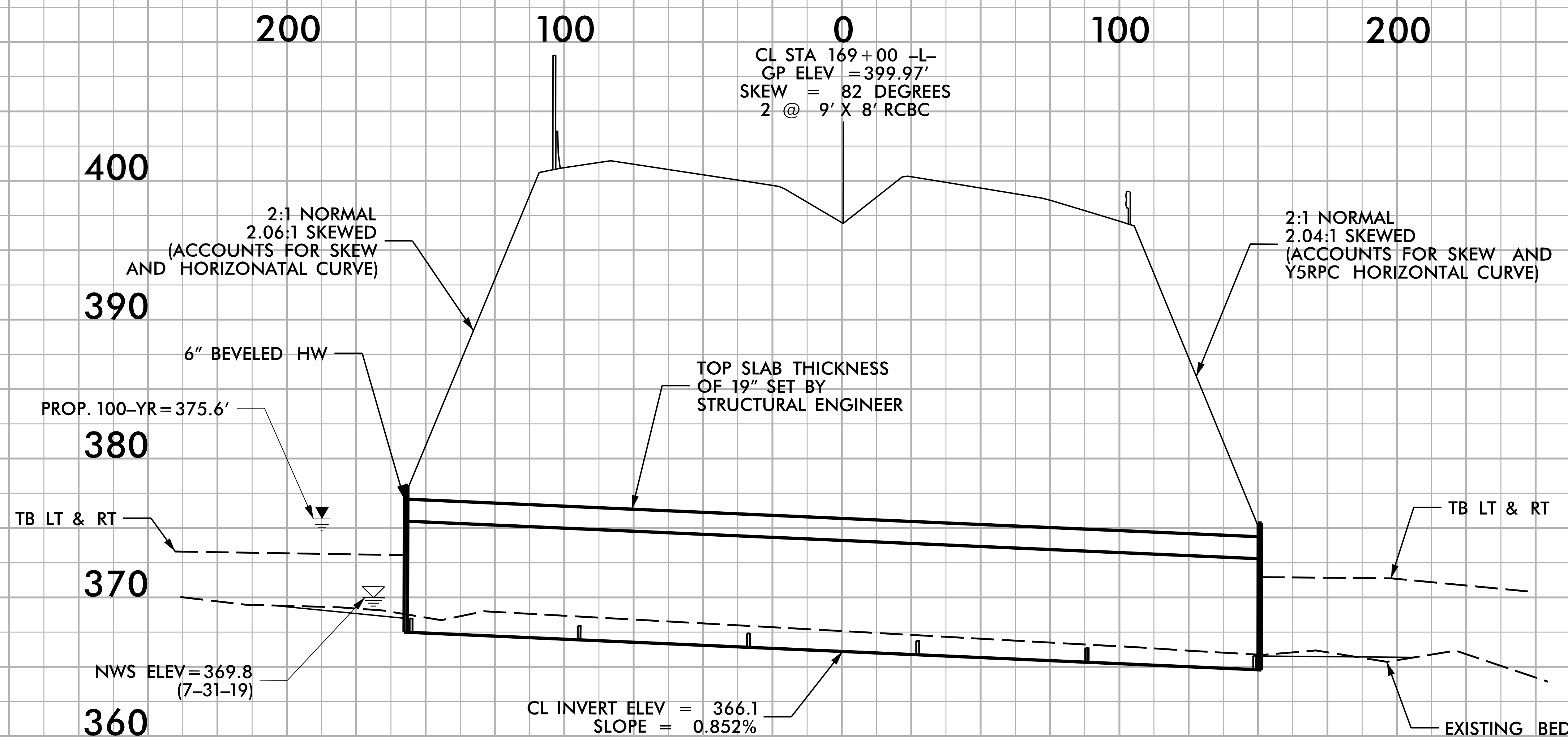
PERMIT DRAWING
SHEET 64A OF 119



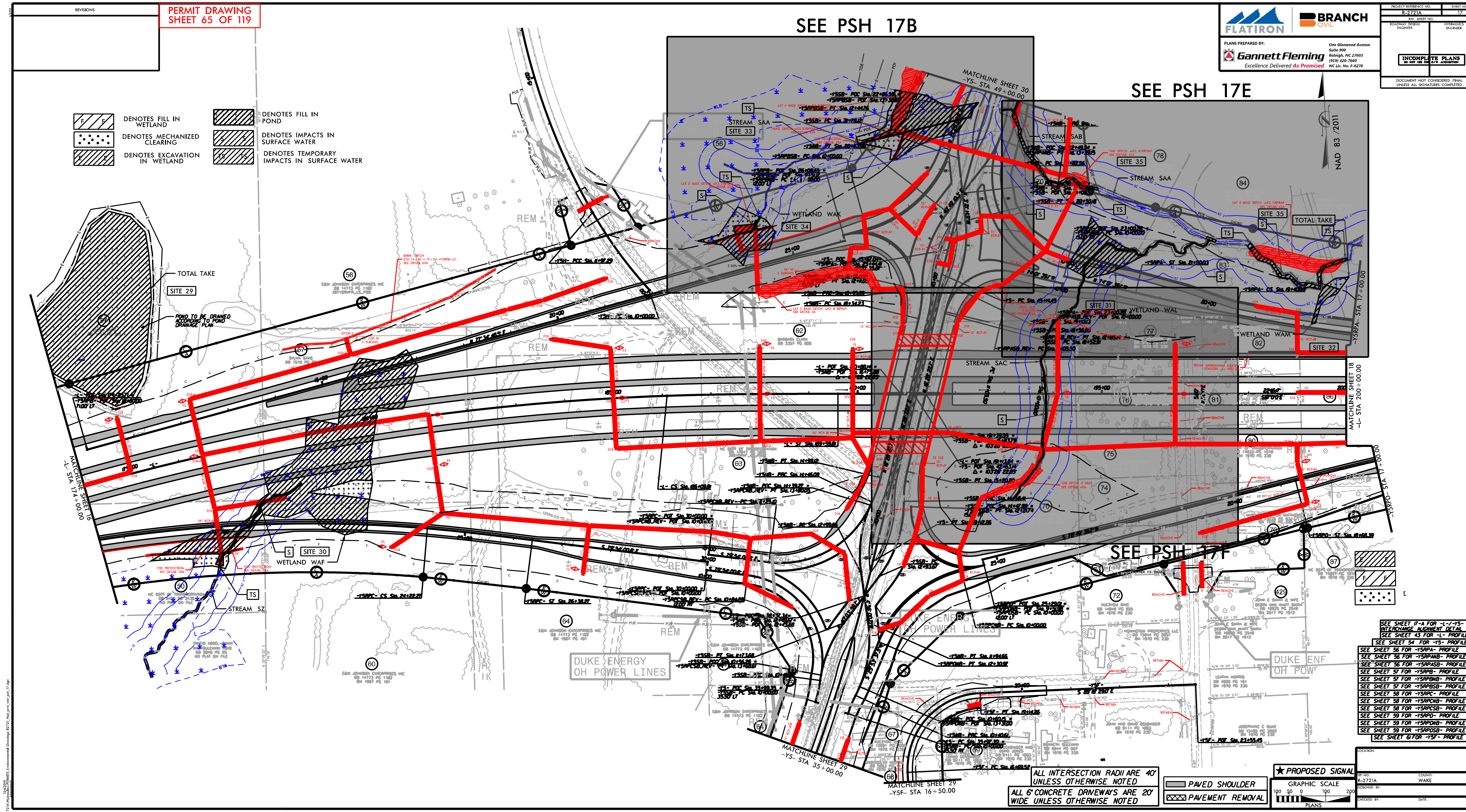
PERMIT DRAWING
SHEET 64B OF 119

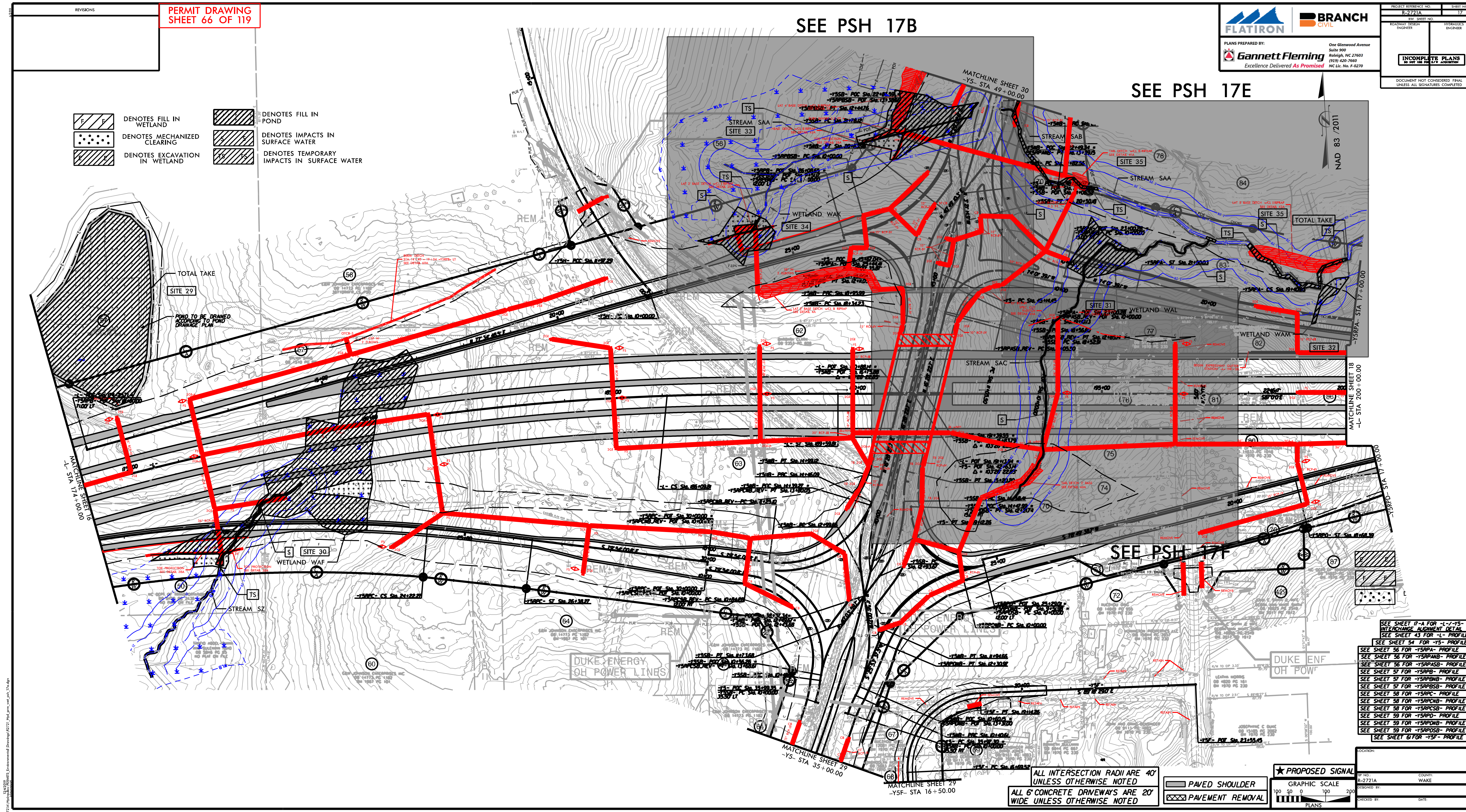
PROJECT REFERENCE NO.	SHEET NO.
R-2721	16F
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



5/14/99

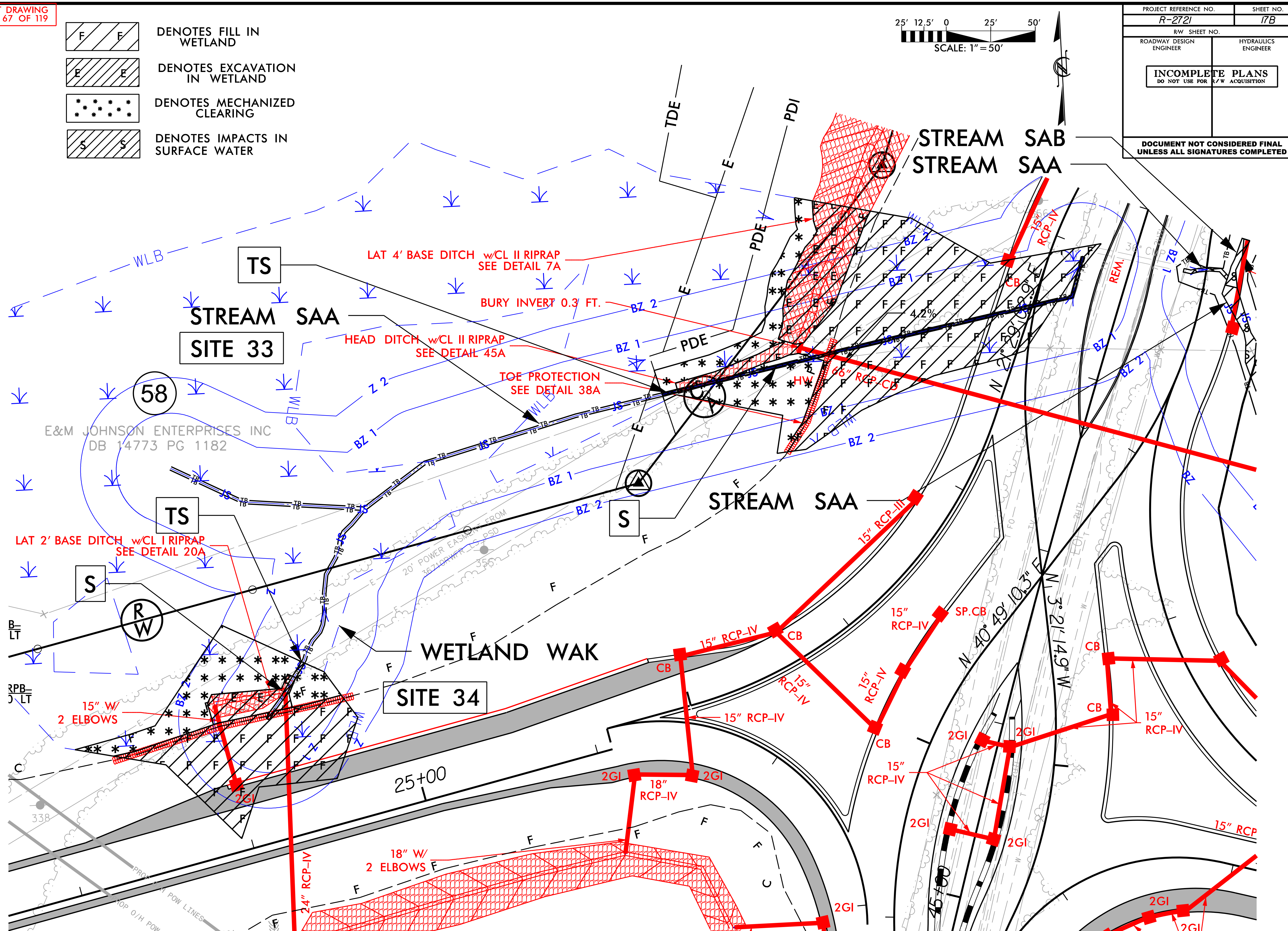

PERMIT DRAWING
SHEET 65 OF 119
REVISIONS
SEE PSH 17B
SEE PSH 17E
SEE PSH 17F
PROJECT REFERENCE NO.
R-2721A
SHEET NO.
17
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
FLATIRON
BRANCH CIVIL
PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270
NAD 83 /2011
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
DENOTES EXCAVATION IN WETLAND
DENOTES FILL IN POND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
TOTAL TAKE
SITE 29
POND TO BE DRAINED ACCORDING TO POND DRAINAGE PLAN
SITE 30
WETLAND WAF
STREAM SZ
SITE 33
STREAM SAA
SITE 34
WETLAND WAK
STREAM SAB
SITE 35
STREAM SAA
TOTAL TAKE
SITE 31
WETLAND WAL
WETLAND WAM
SITE 32
STREAM SAC
MATCHLINE SHEET 30
-Y5- STA 49+00.00
MATCHLINE SHEET 16
-L- STA 174+00.00
MATCHLINE SHEET 18
-L- STA 200+00.00
MATCHLINE SHEET 29
-Y5- STA 35+00.00
MATCHLINE SHEET 29
-Y5F- STA 16+50.00
DUKE ENERGY
OH POWER LINES
SEE SHEET 17-A FOR -L-/-Y5- INTERCHANGE ALIGNMENT DETAIL
SEE SHEET 43 FOR -L- PROFILE
SEE SHEET 54 FOR -Y5- PROFILE
SEE SHEET 56 FOR -Y5RPA- PROFILE
SEE SHEET 56 FOR -Y5RPANB- PROFILE
SEE SHEET 56 FOR -Y5RPASB- PROFILE
SEE SHEET 57 FOR -Y5RPB- PROFILE
SEE SHEET 57 FOR -Y5RPBNB- PROFILE
SEE SHEET 57 FOR -Y5RPBSB- PROFILE
SEE SHEET 58 FOR -Y5RPC- PROFILE
SEE SHEET 58 FOR -Y5RPCNB- PROFILE
SEE SHEET 58 FOR -Y5RPCSB- PROFILE
SEE SHEET 59 FOR -Y5RPD- PROFILE
SEE SHEET 59 FOR -Y5RPDNB- PROFILE
SEE SHEET 59 FOR -Y5RPDSB- PROFILE
SEE SHEET 61 FOR -Y5F- PROFILE
ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED
ALL 6' CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED
PAVED SHOULDER
PAVEMENT REMOVAL
PROPOSED SIGNAL
GRAPHIC SCALE
100 50 0 100 200
PLANS
LOCATION:
TIP NO.:
R-2721A
COUNTY:
WAKE
DESIGNED BY:
CHECKED BY:
DATE:


PERMIT DRAWING
SHEET 66 OF 119
REVISIONS
SEE PSH 17B
SEE PSH 17E
SEE PSH 17F
FLATIRON
BRANCH CIVIL
PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270
R-2721A
17
INCOMPLETE PLANS
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
NAD 83/2011
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
DENOTES EXCAVATION IN WETLAND
DENOTES FILL IN POND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
TOTAL TAKE
SITE 29
POND TO BE DRAINED ACCORDING TO POND DRAINAGE PLAN
SITE 30
WETLAND WAF
STREAM SZ
SITE 31
WETLAND WAL
SITE 32
WETLAND WAM
SITE 33
STREAM SAA
SITE 34
WETLAND WAK
SITE 35
STREAM SAB
STREAM SAC
MATCHLINE SHEET 16 -L- STA 174+00.00
MATCHLINE SHEET 18 -L- STA 200+00.00
MATCHLINE SHEET 29 -Y5- STA 35+00.00
MATCHLINE SHEET 29 -Y5F- STA 16+50.00
MATCHLINE SHEET 30 -Y5- STA 49+00.00
-Y5RPA- STA 17+00.00
DUKE ENERGY OH POWER LINES
SEE SHEET 17-A FOR -L-/-Y5- INTERCHANGE ALIGNMENT DETAIL
SEE SHEET 43 FOR -L- PROFILE
SEE SHEET 54 FOR -Y5- PROFILE
SEE SHEET 56 FOR -Y5RPA- PROFILE
SEE SHEET 56 FOR -Y5RPAMB- PROFILE
SEE SHEET 56 FOR -Y5RPASB- PROFILE
SEE SHEET 57 FOR -Y5RPB- PROFILE
SEE SHEET 57 FOR -Y5RPBNB- PROFILE
SEE SHEET 57 FOR -Y5RPBSB- PROFILE
SEE SHEET 58 FOR -Y5RPC- PROFILE
SEE SHEET 58 FOR -Y5RPCNB- PROFILE
SEE SHEET 58 FOR -Y5RPCSB- PROFILE
SEE SHEET 59 FOR -Y5RPD- PROFILE
SEE SHEET 59 FOR -Y5RPDNB- PROFILE
SEE SHEET 59 FOR -Y5RPDSB- PROFILE
SEE SHEET 61 FOR -Y5F- PROFILE
ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED
ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED
PAVED SHOULDER
PAVEMENT REMOVAL
PROPOSED SIGNAL
GRAPHIC SCALE
PLANS
LOCATION:
COUNTY:
WAKE
DESIGNED BY:
CHECKED BY:
DATE:

PROJECT REFERENCE NO.	SHEET NO.
R-2721	17B

R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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



8/17/99
12/4/2019

PERMIT DRAWING
SHEET 67A OF 119

FLATIRON | BRANCH CIVIL

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	17C

R/W SHEET NO.

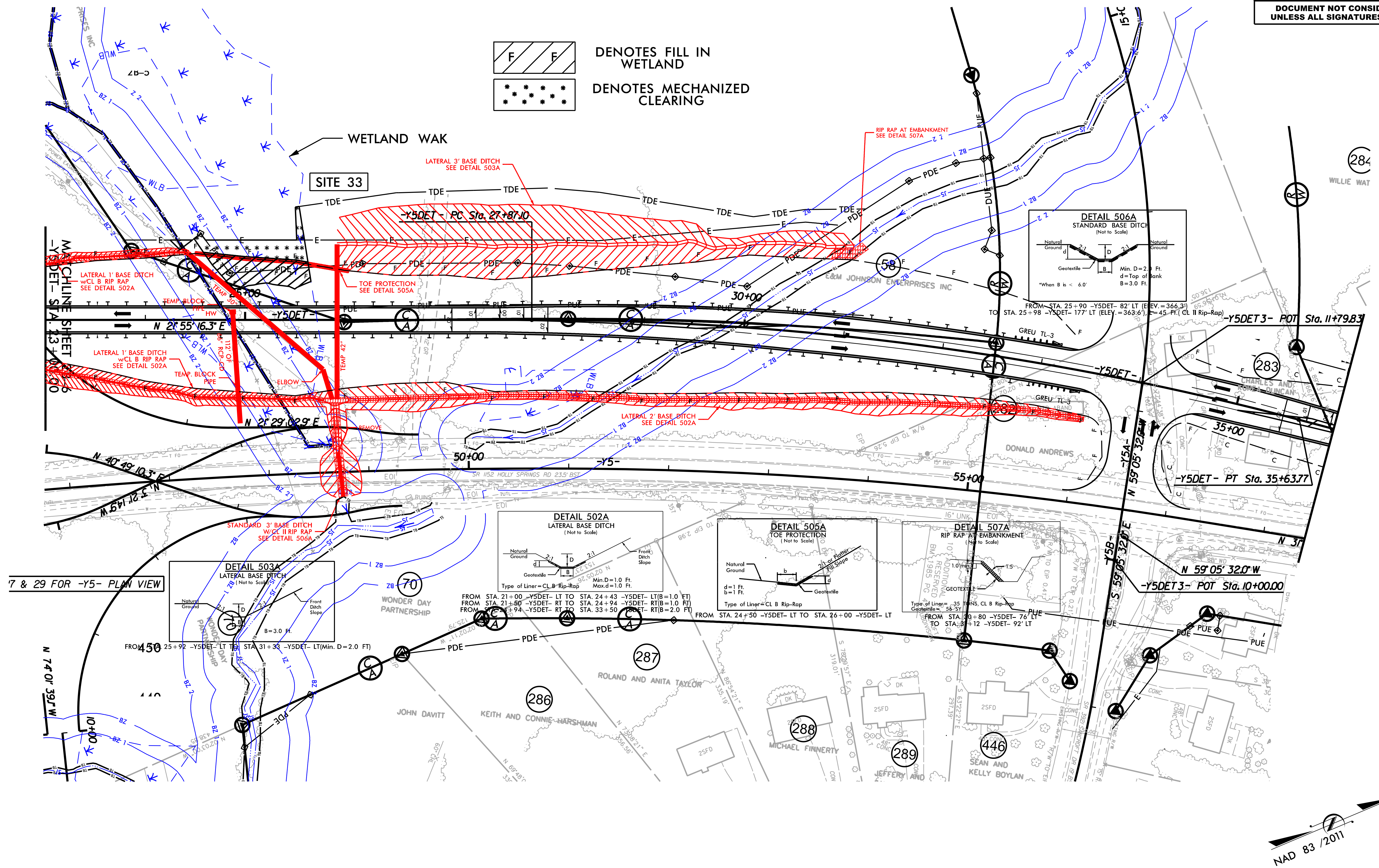
ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-Y5DET-
SR 1152
HOLLY SPRINGS RD.



12/4/2019
R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_17c.dgn

PERMIT DRAWING
SHEET 67B OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	17D

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

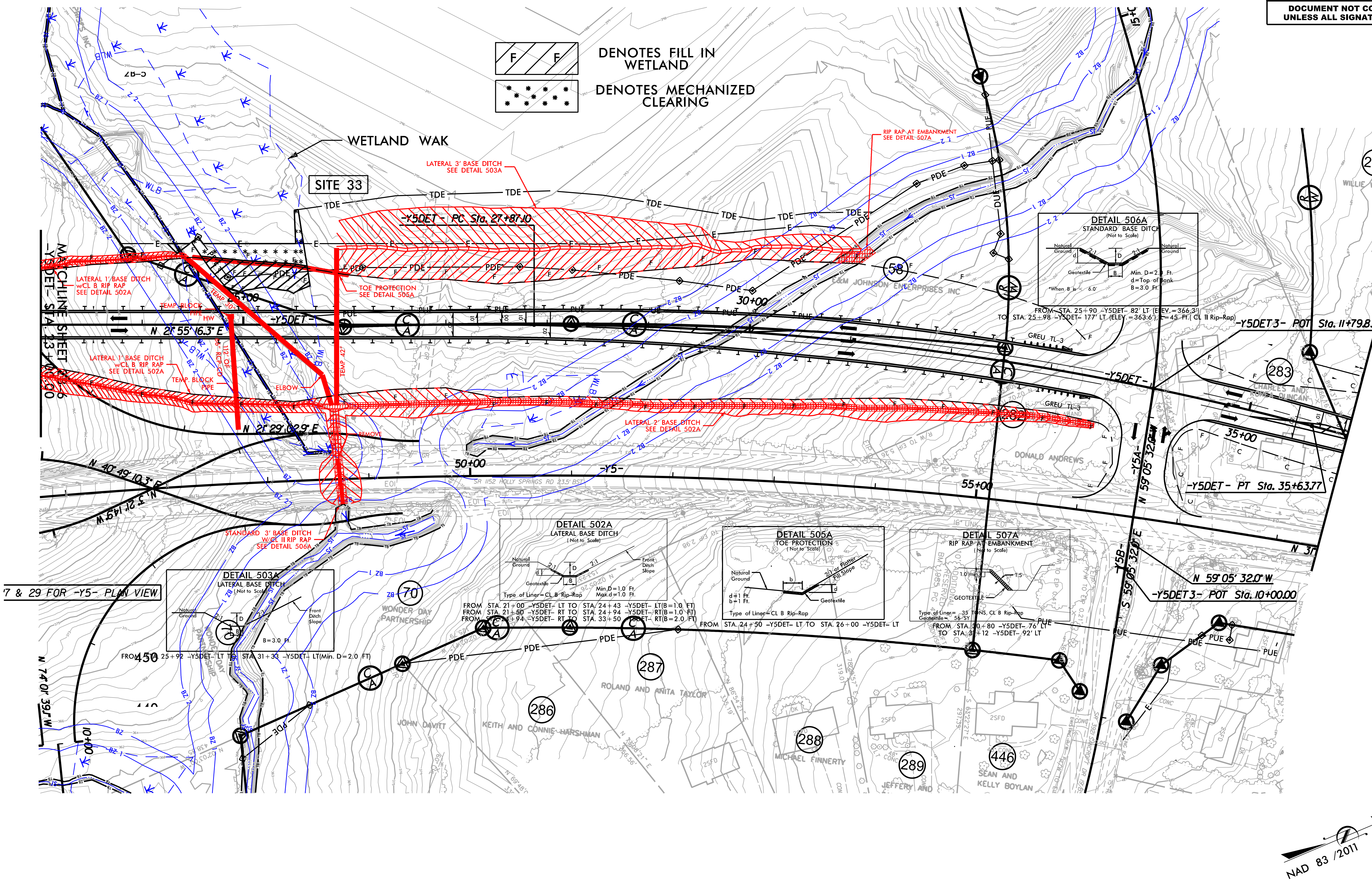
FLATIRON
BRANCH CIVIL

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

-Y5DET-
SR 1152
HOLLY SPRINGS RD.

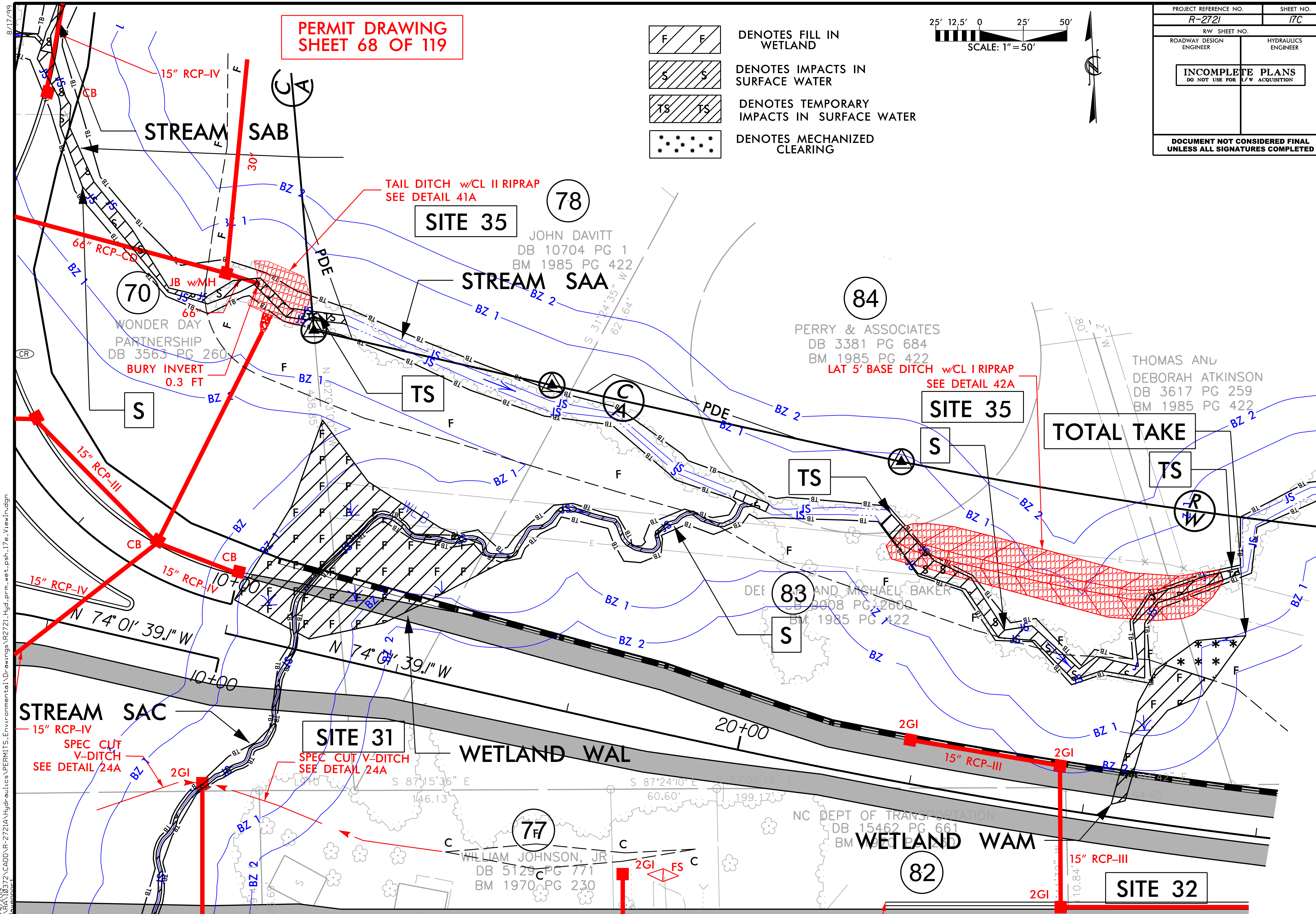
DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

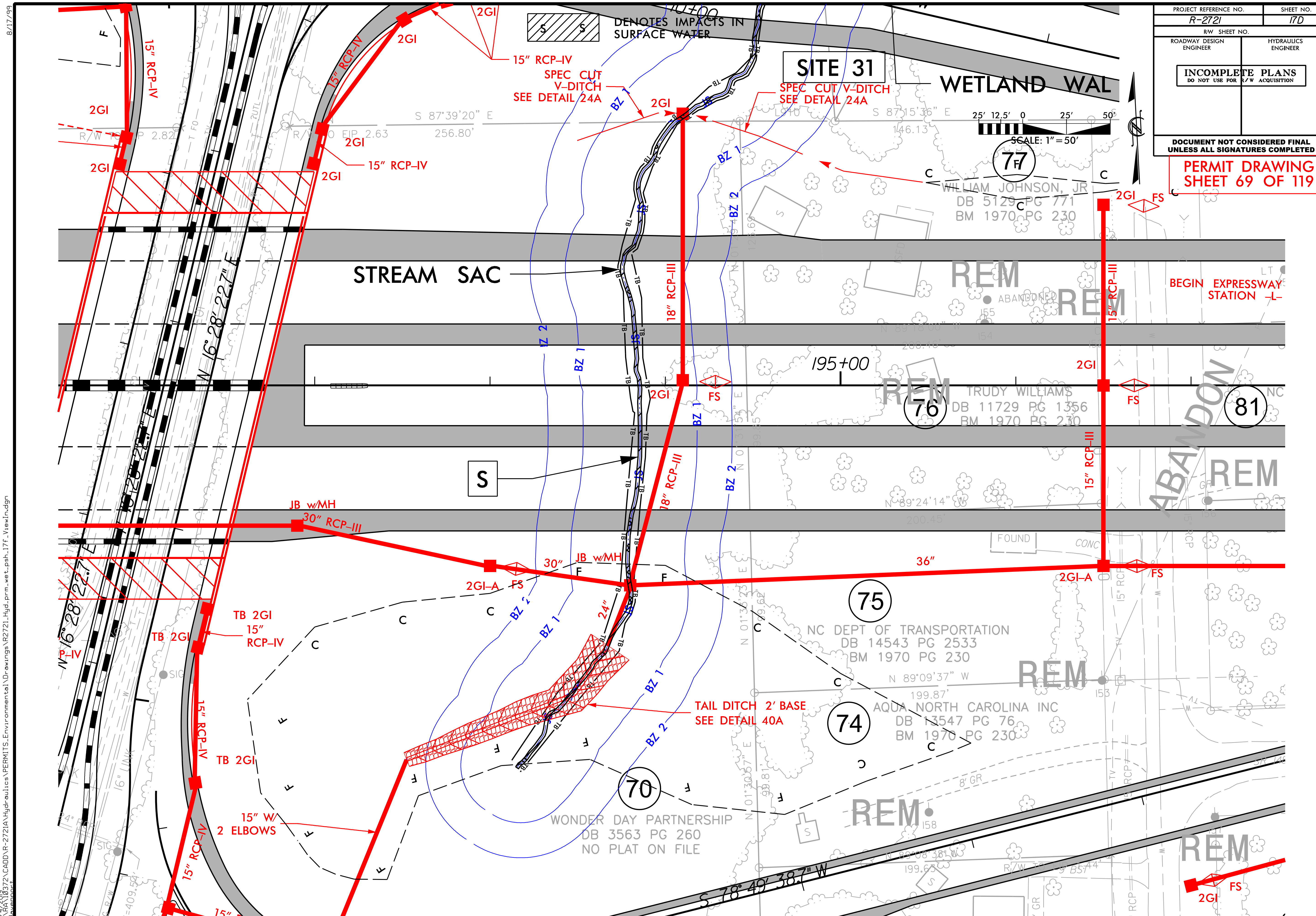


12/4/2019
R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_17d.dgn

8/17/99



12/4/2019
d:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_17e_Viewin.dgn
daveneport



8/17/99

12/4/2019
d:\RA\0372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_17f_Viewin.dgn
davenport

PERMIT DRAWING
SHEET 70 OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	43

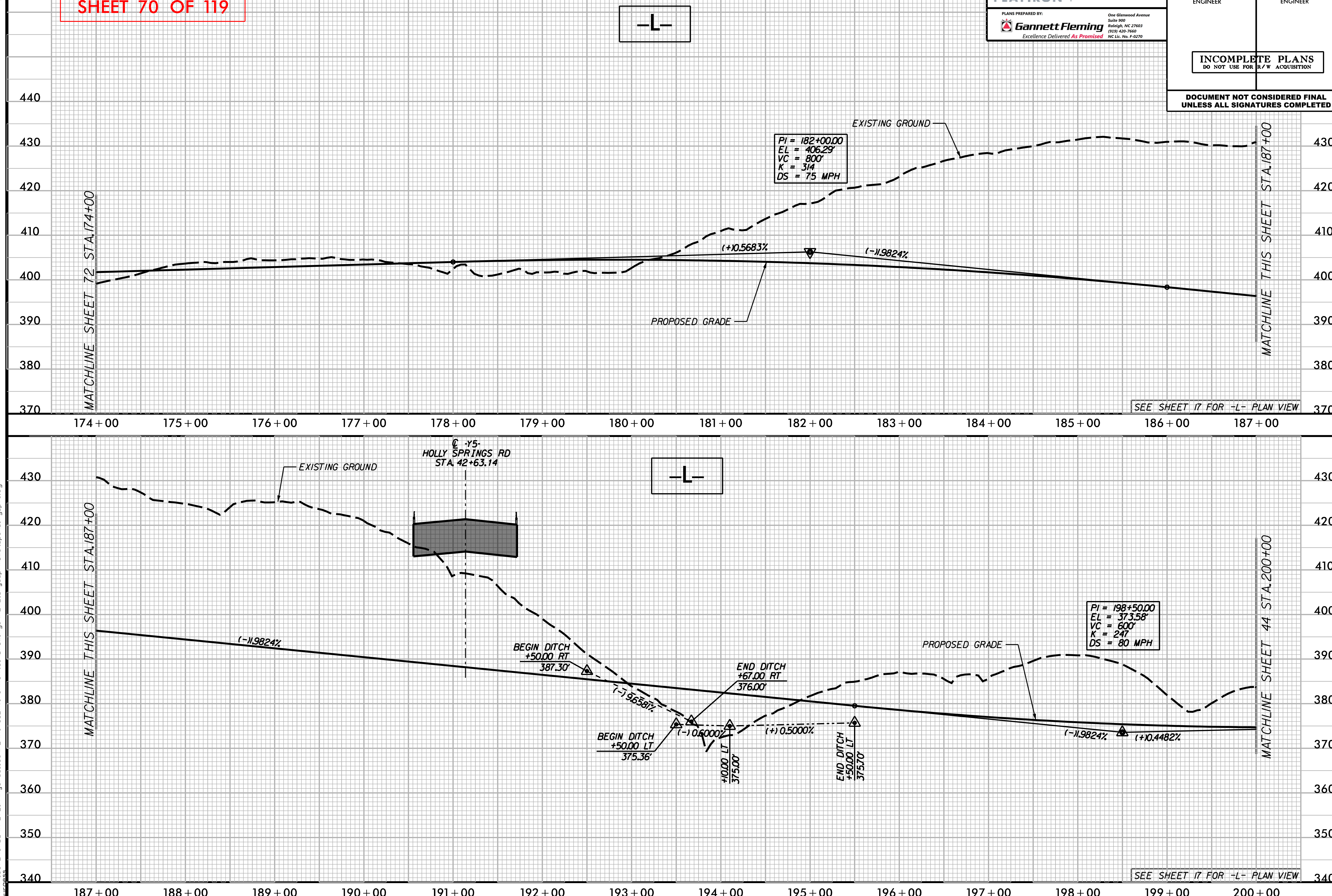
FLATIRON BRANCH CIVIL

PLANS PREPARED BY: Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

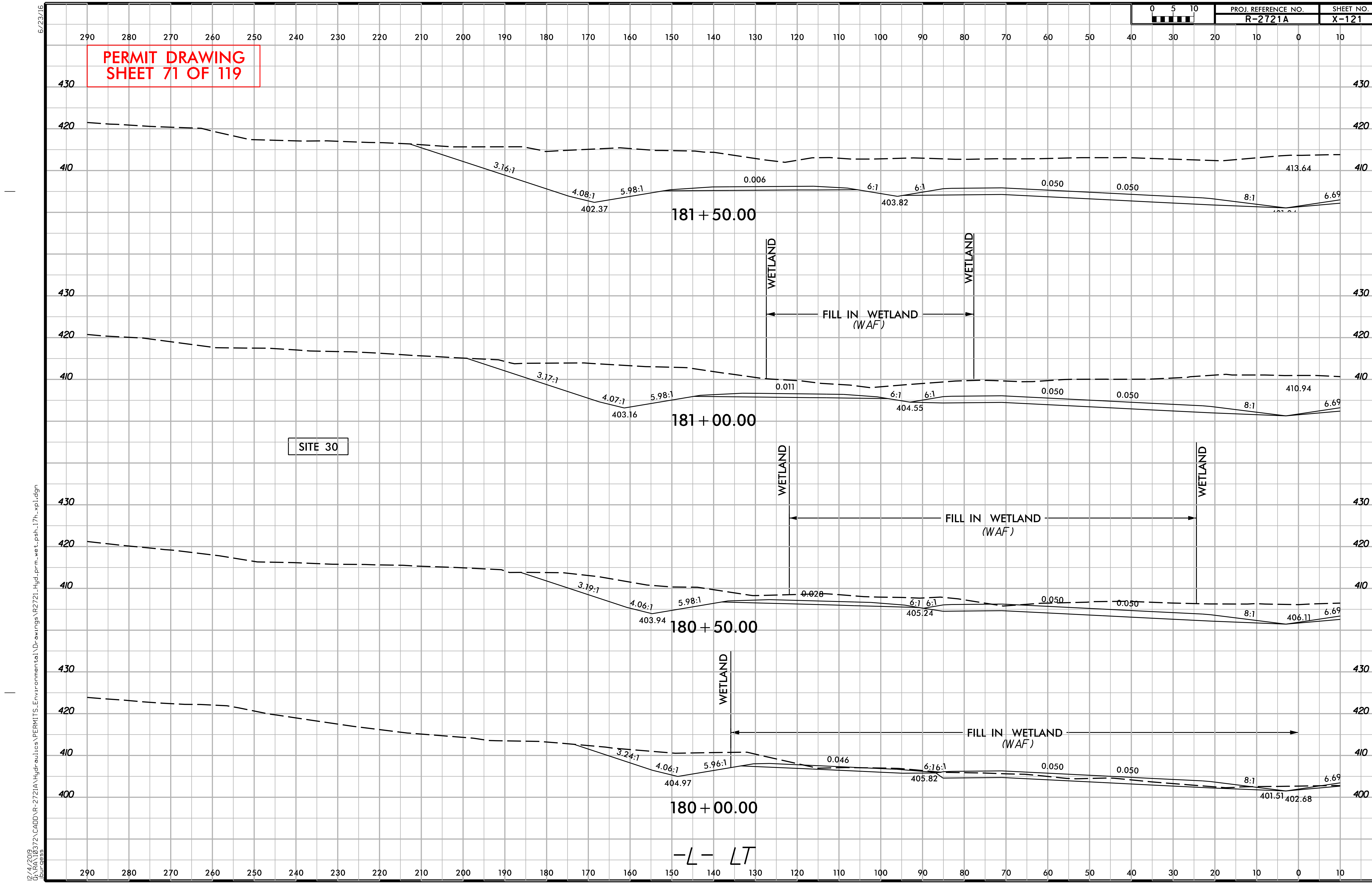
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

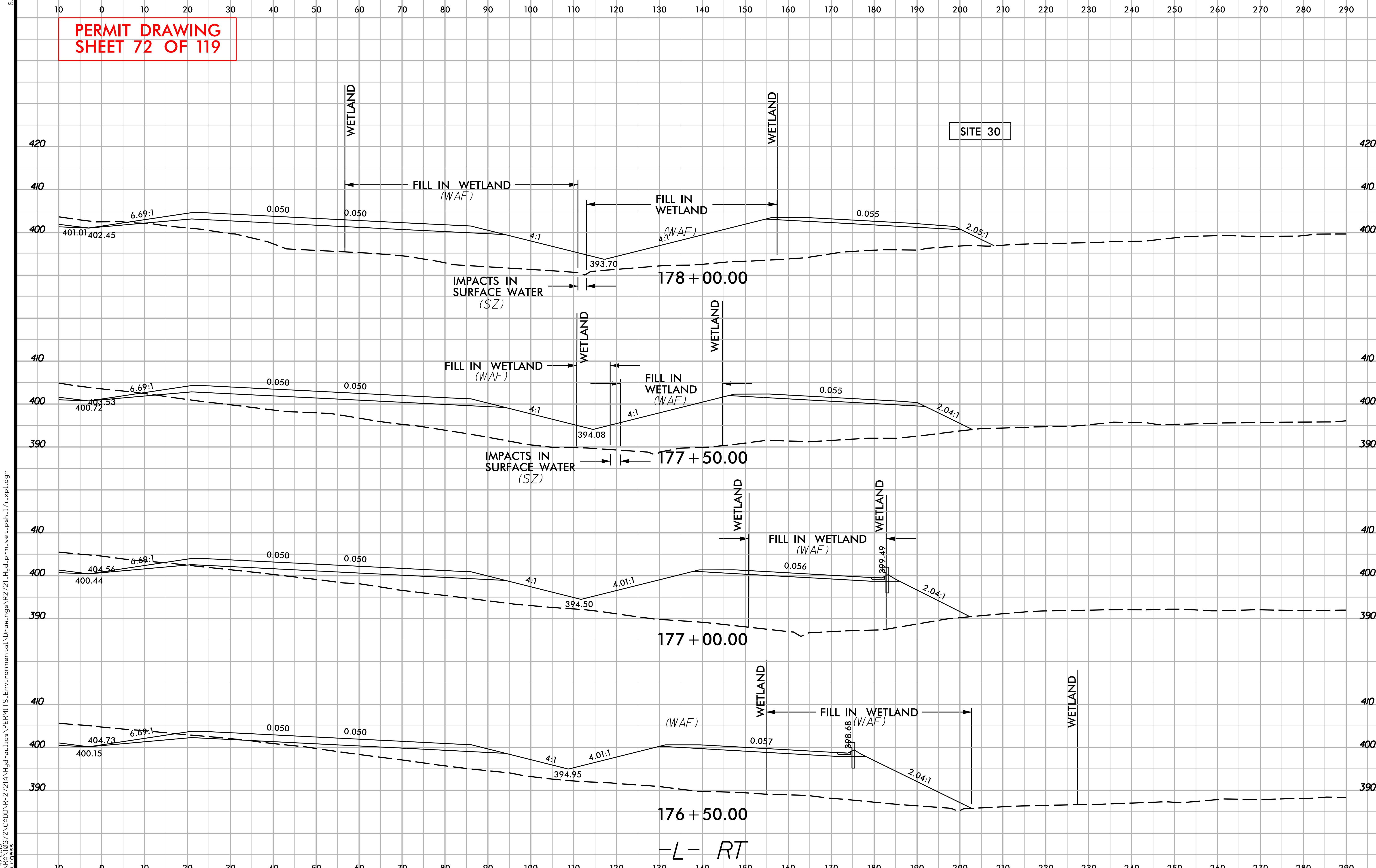


5/28/99
12/4/2019
Q:\RA10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_17g_pfl.dgn


PERMIT DRAWING
SHEET 71 OF 119
PROJ. REFERENCE NO. R-2721A
SHEET NO. X-121
181 + 50.00
181 + 00.00
180 + 50.00
180 + 00.00
SITE 30
WETLAND
FILL IN WETLAND
(WAF)
-L- LT
402.37
403.82
413.64
403.16
404.55
410.94
403.94
405.24
406.11
404.97
405.82
401.51
402.68
6/23/16
12/4/2019
G:\RA10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_17h_xpl.dgn

PERMIT DRAWING
SHEET 72 OF 119

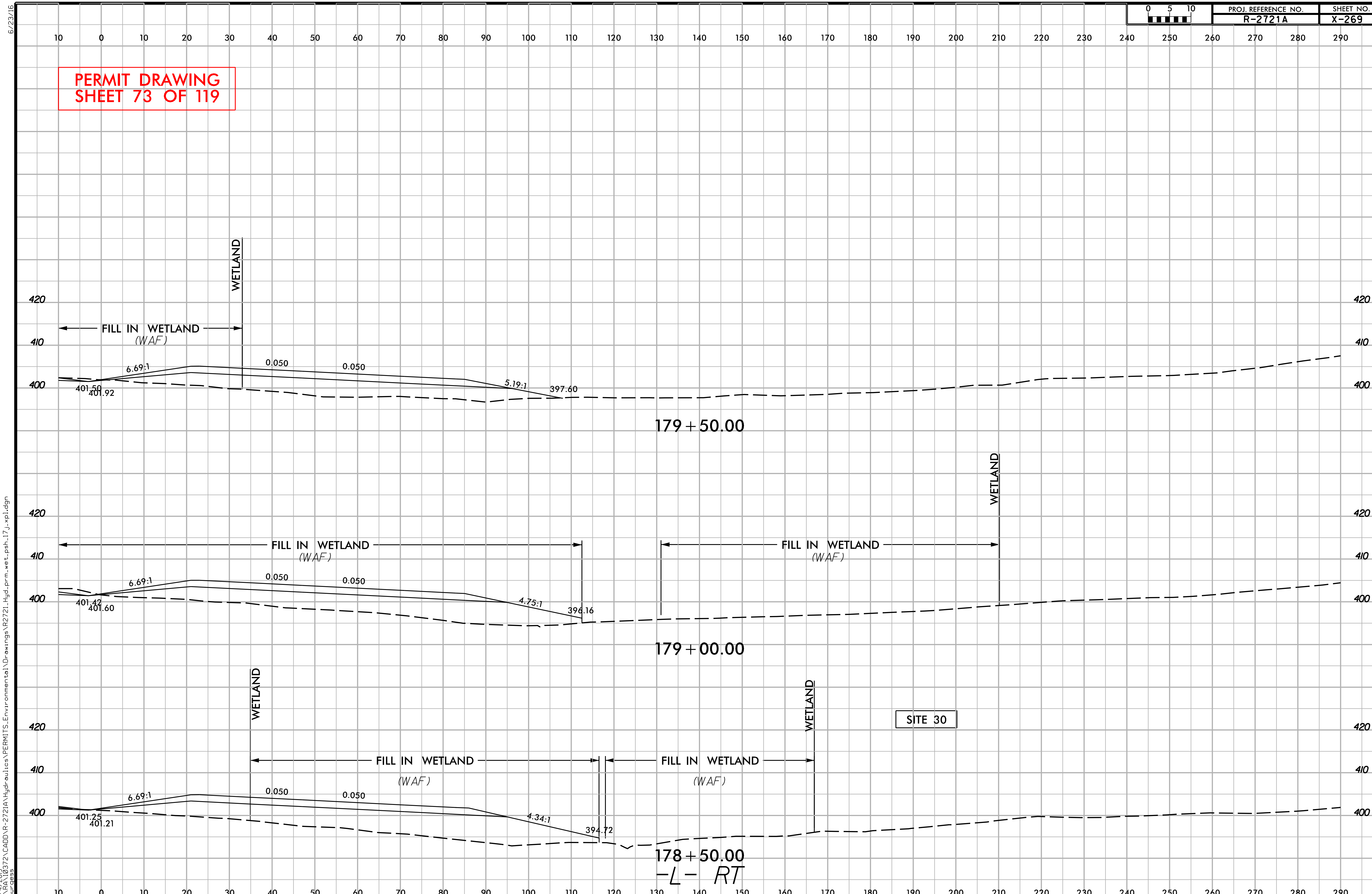
PROJ. REFERENCE NO.	SHEET NO.
R-2721A	X-268



6/23/16

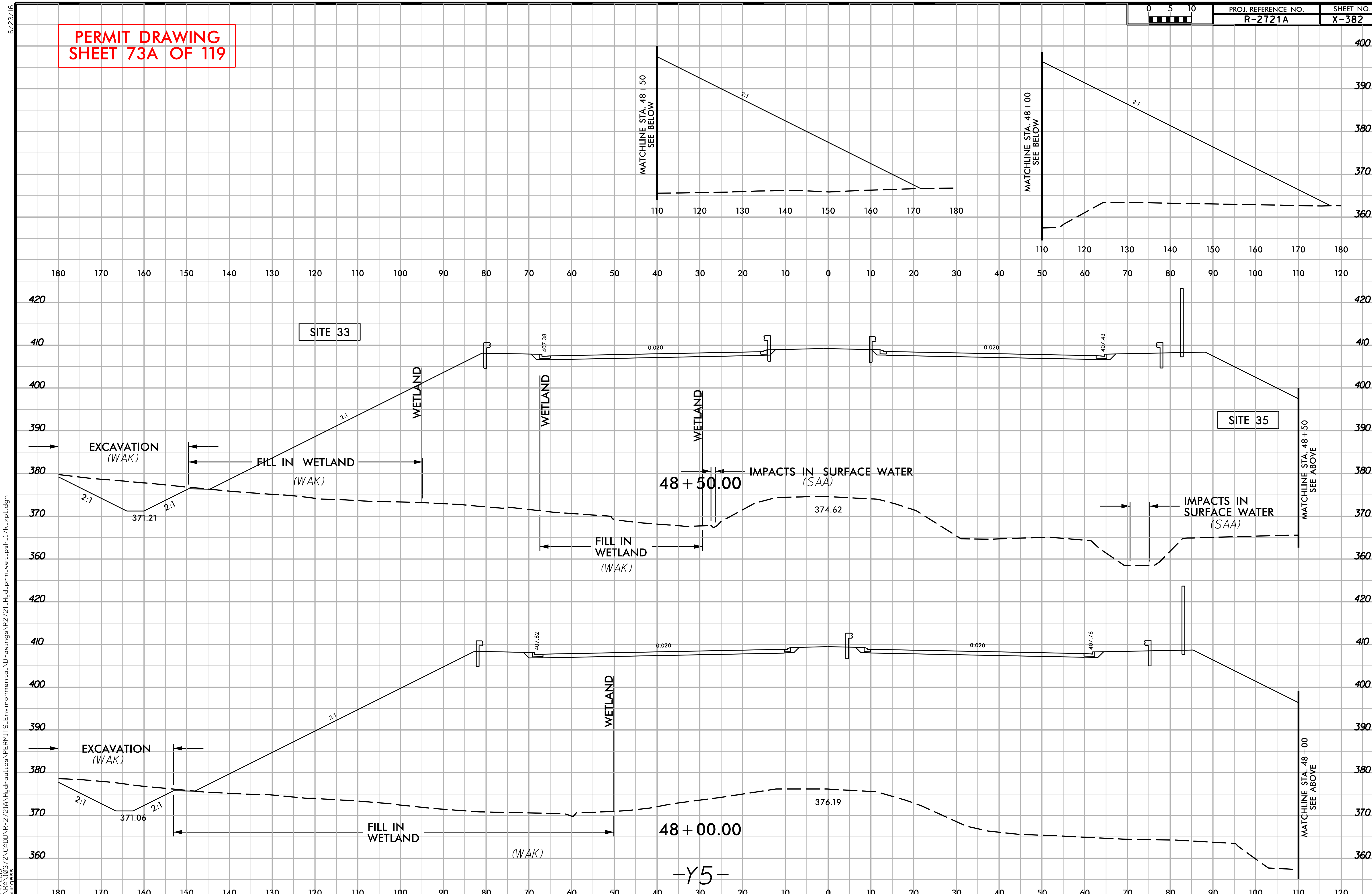
12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_17i_xpl.dgn
hburgess

6/23/16

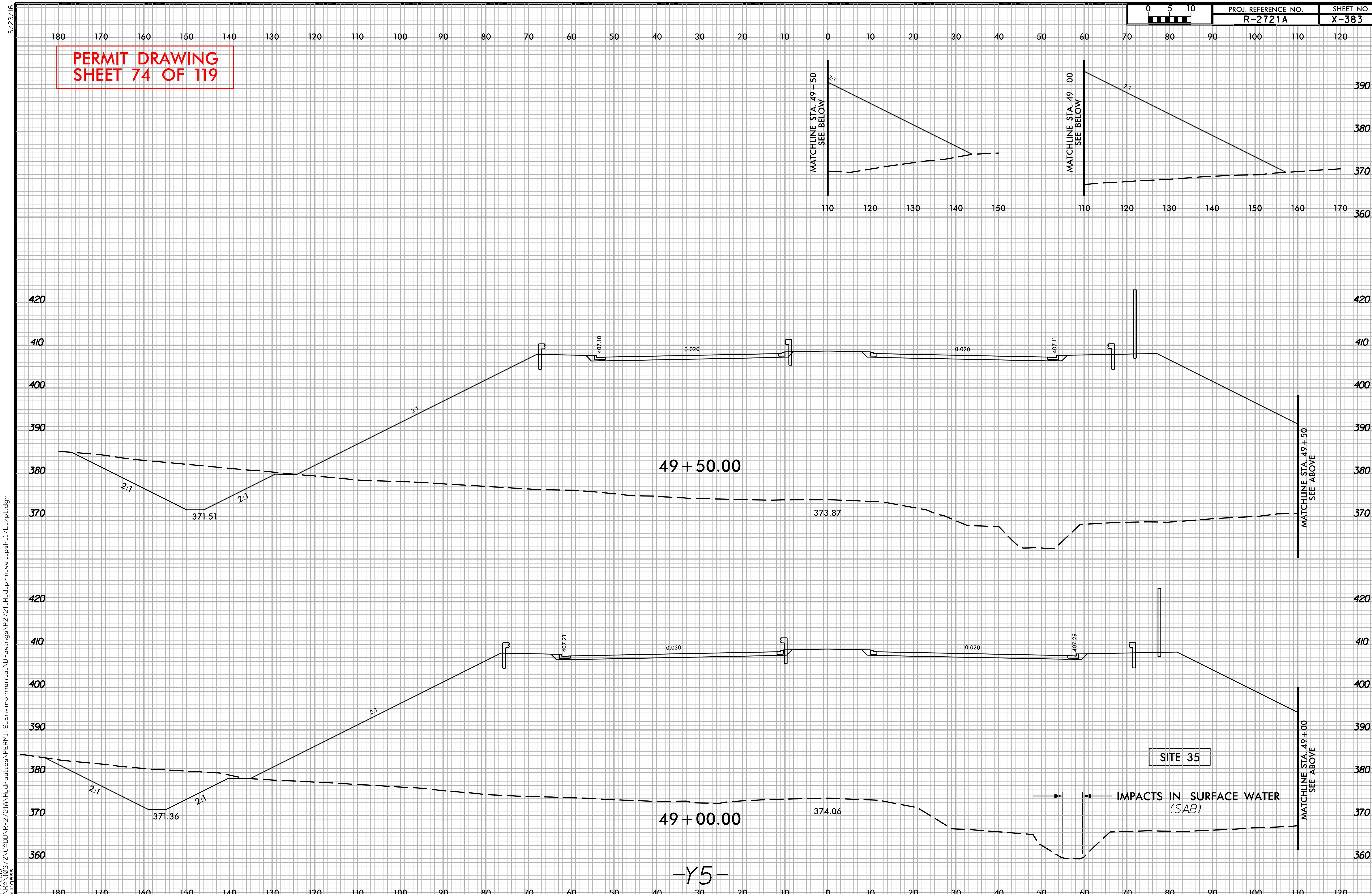


12/4/2019
G:\RA10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_17j_xpl.dgn
burgess

PERMIT DRAWING
SHEET 73A OF 119



6/23/16
12/4/2019
Q:\RA10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_17k_xpl.dgn
hburgess

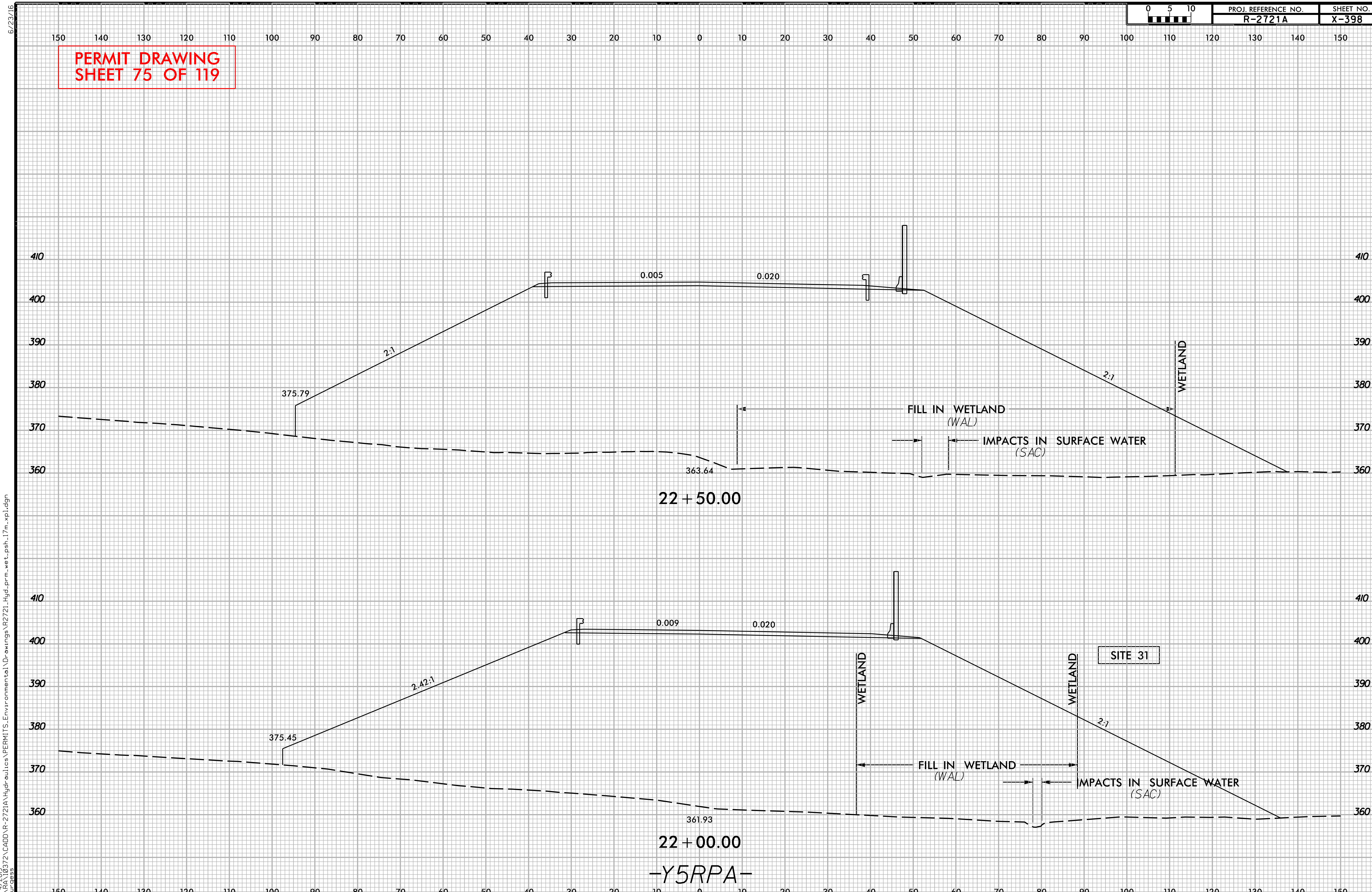


6/23/16

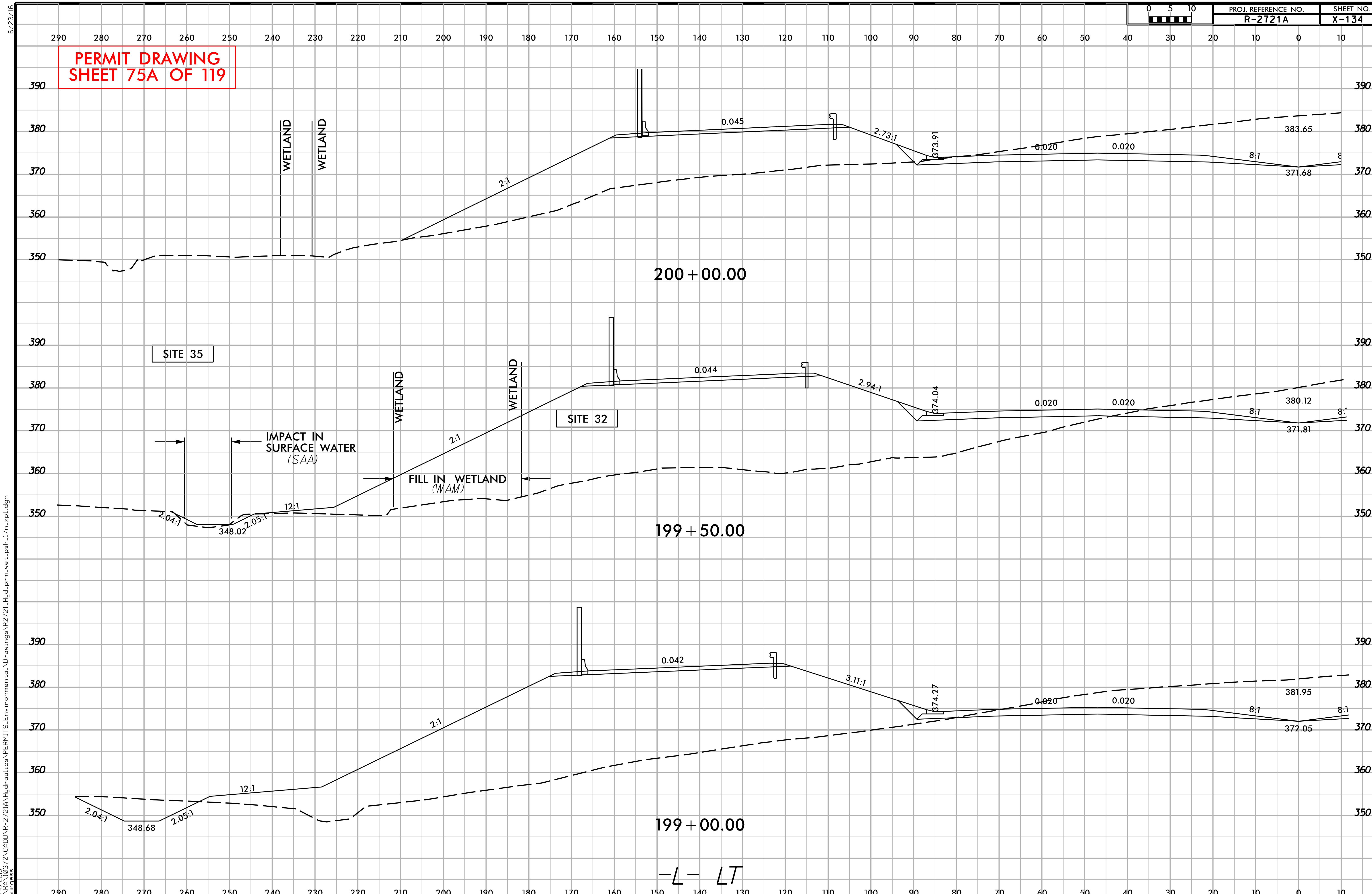
12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_17L_xpl.dgn
hburgess

6/23/16

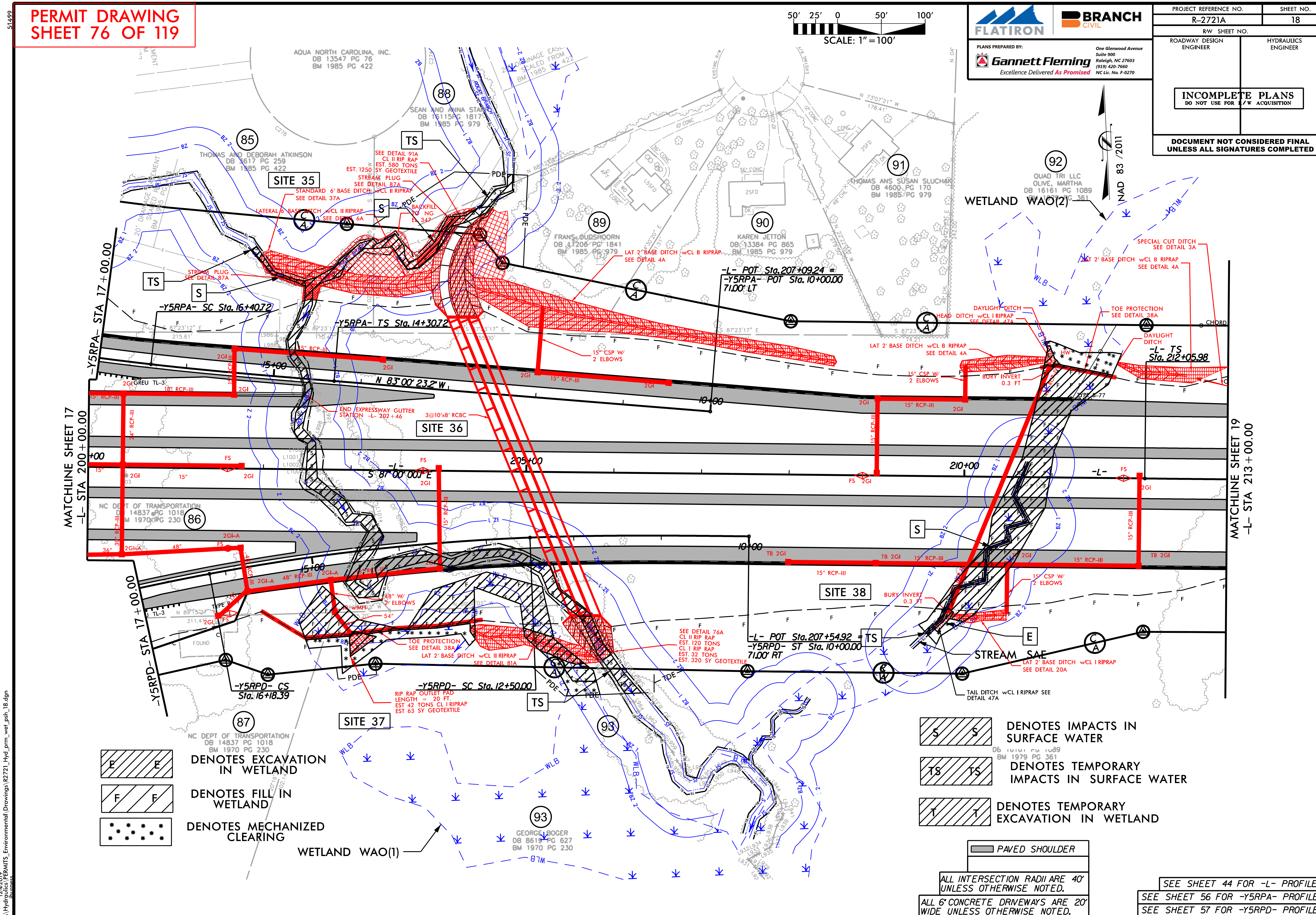
PROJ. REFERENCE NO.	SHEET NO.
R-2721A	X-398



12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_17m_xpl.dgn
jburgess



PROJ. REFERENCE NO.
R-2721A
SHEET NO.
X-134
PERMIT DRAWING
SHEET 75A OF 119
WETLAND
WETLAND
0.045
2.73:1
373.91
0.020
0.020
383.65
8:1
371.68
2:1
200+00.00
SITE 35
SITE 32
0.044
2.94:1
374.04
0.020
0.020
380.12
8:1
371.81
WETLAND
WETLAND
2:1
IMPACT IN
SURFACE WATER
(SAA)
FILL IN WETLAND
(WAM)
12:1
2.04:1
348.02
2.05:1
199+50.00
0.042
3.11:1
374.27
0.020
0.020
381.95
8:1
8:1
372.05
2:1
12:1
2.04:1
348.68
2.05:1
199+00.00
-L- LT
6/23/16
12/4/2019
Burgess


PROJECT REFERENCE NO. R-2721A
SHEET NO. 18
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
FLATIRON
BRANCH CIVIL
PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270
SCALE: 1"=100'
NAD 83 /2011
SITE 35
SITE 36
SITE 37
SITE 38
WETLAND WAO(1)
WETLAND WAO(2)
MATCHLINE SHEET 17 -L- STA 200+00.00
MATCHLINE SHEET 19 -L- STA 213+00.00
-Y5RPA- STA 17+00.00
-Y5RPD- STA 17+00.00
-L- POT Sta. 207+09.24 = -Y5RPA- POT Sta. 10+00.00 71.00' LT
-L- POT Sta. 207+54.92 = -Y5RPD- ST Sta. 10+00.00 71.00' RT
-Y5RPA- SC Sta. 16+40.72
-Y5RPA- TS Sta. 14+30.72
-Y5RPD- CS Sta. 16+18.39
-Y5RPD- SC Sta. 12+50.00
-L- TS Sta. 212+05.98
N 83°00'23.2" W
S 87°00'00.7" E
3@10'x8' RCBC
AQUA NORTH CAROLINA, INC. DB 13547 PG 76 BM 1985 PG 422
SEAN AND ANNA STARR DB 16115 PG 1817 BM 1985 PG 979
THOMAS AND DEBORAH ATKINSON DB 3617 PG 259 BM 1985 PG 422
FRANS OUDSHOORN DB 11206 PG 1841 BM 1985 PG 979
KAREN JETTON DB 13384 PG 865 BM 1985 PG 979
THOMAS AND SUSAN SLUCHAK DB 4600 PG 170 BM 1985 PG 979
QUAD TRI LLC OLIVE, MARTHA DB 16161 PG 1089
NC DEPT OF TRANSPORTATION DB 14837 PG 1018 BM 1970 PG 230
GEORGE I. BOGER DB 8619 PG 627 BM 1970 PG 230
STREAM SAE
DENOTES EXCAVATION IN WETLAND
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES TEMPORARY EXCAVATION IN WETLAND
PAVED SHOULDER
ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.
ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.
SEE SHEET 44 FOR -L- PROFILE
SEE SHEET 56 FOR -Y5RPA- PROFILE
SEE SHEET 57 FOR -Y5RPD- PROFILE

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	18

R/W SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

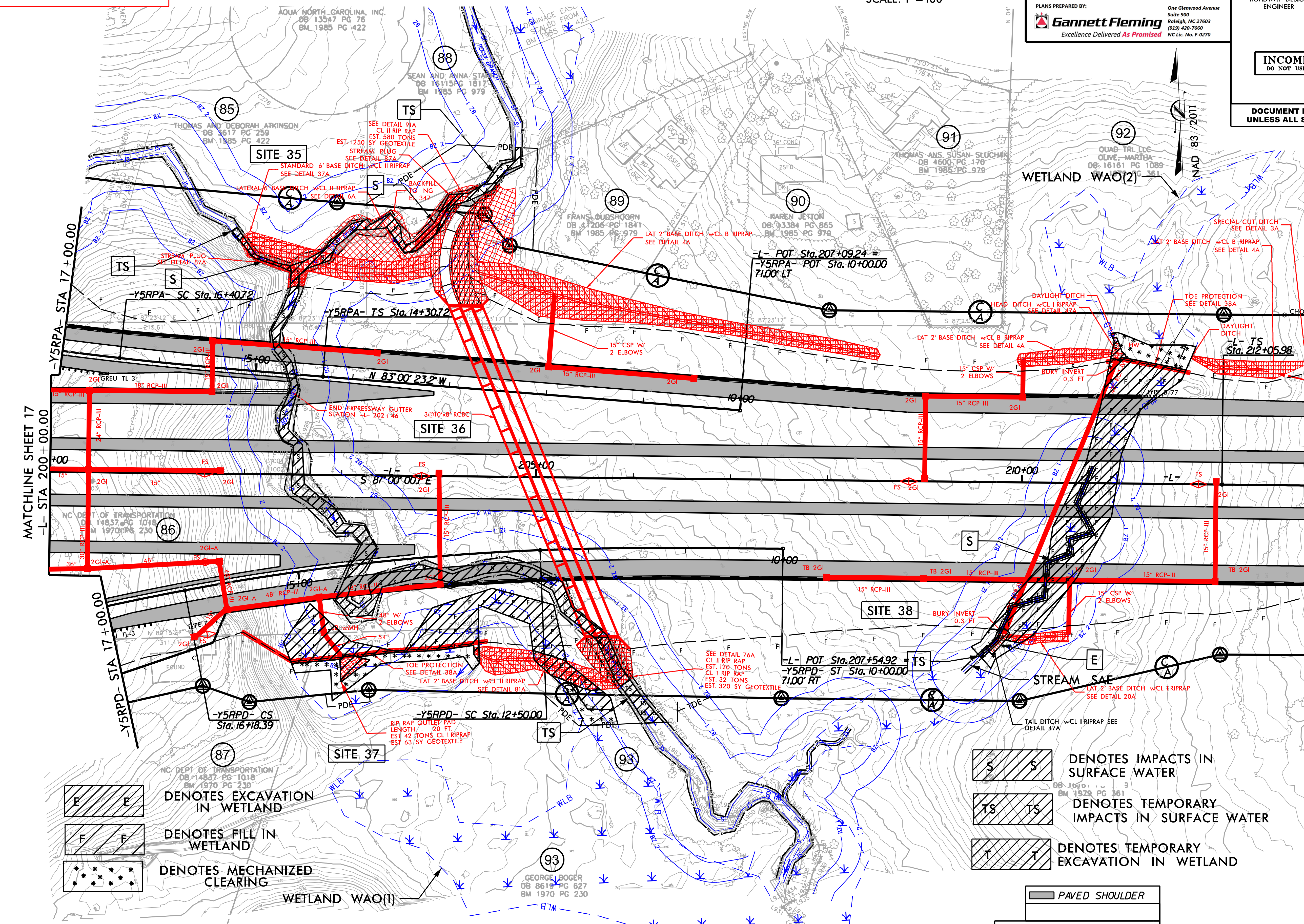
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

FLATIRON | BRANCH CIVIL

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

SCALE: 1" = 100'

NAD 83/2011



E E — DENOTES EXCAVATION IN WETLAND

F F — DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

T T — DENOTES TEMPORARY EXCAVATION IN WETLAND

PAVED SHOULDER

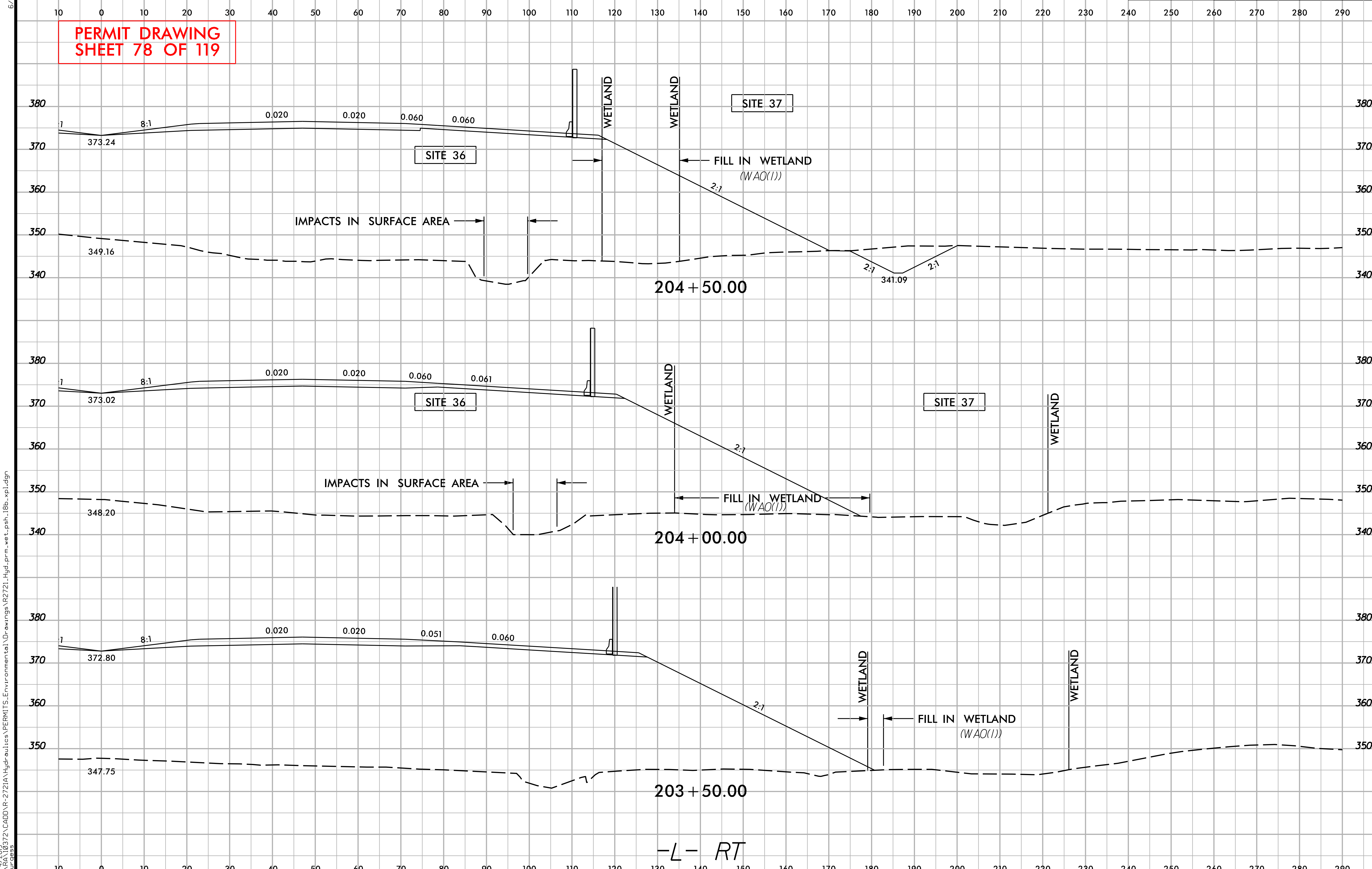
ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.

ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

SEE SHEET 44 FOR -L- PROFILE
SEE SHEET 56 FOR -Y5RPA- PROFILE
SEE SHEET 57 FOR -Y5RPD- PROFILE

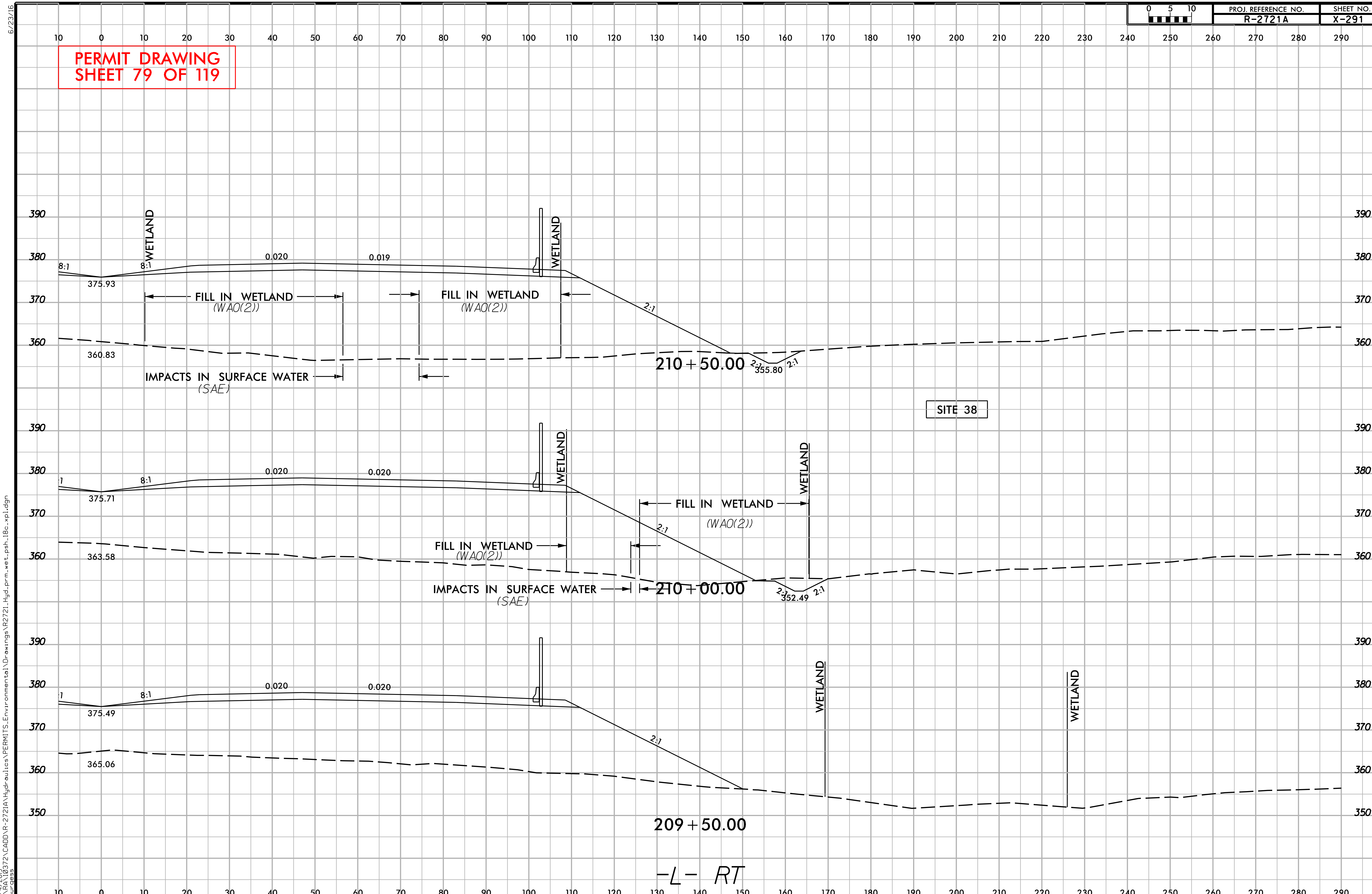
PROJ. REFERENCE NO.	SHEET NO.
R-2721A	X-286

PERMIT DRAWING
SHEET 78 OF 119



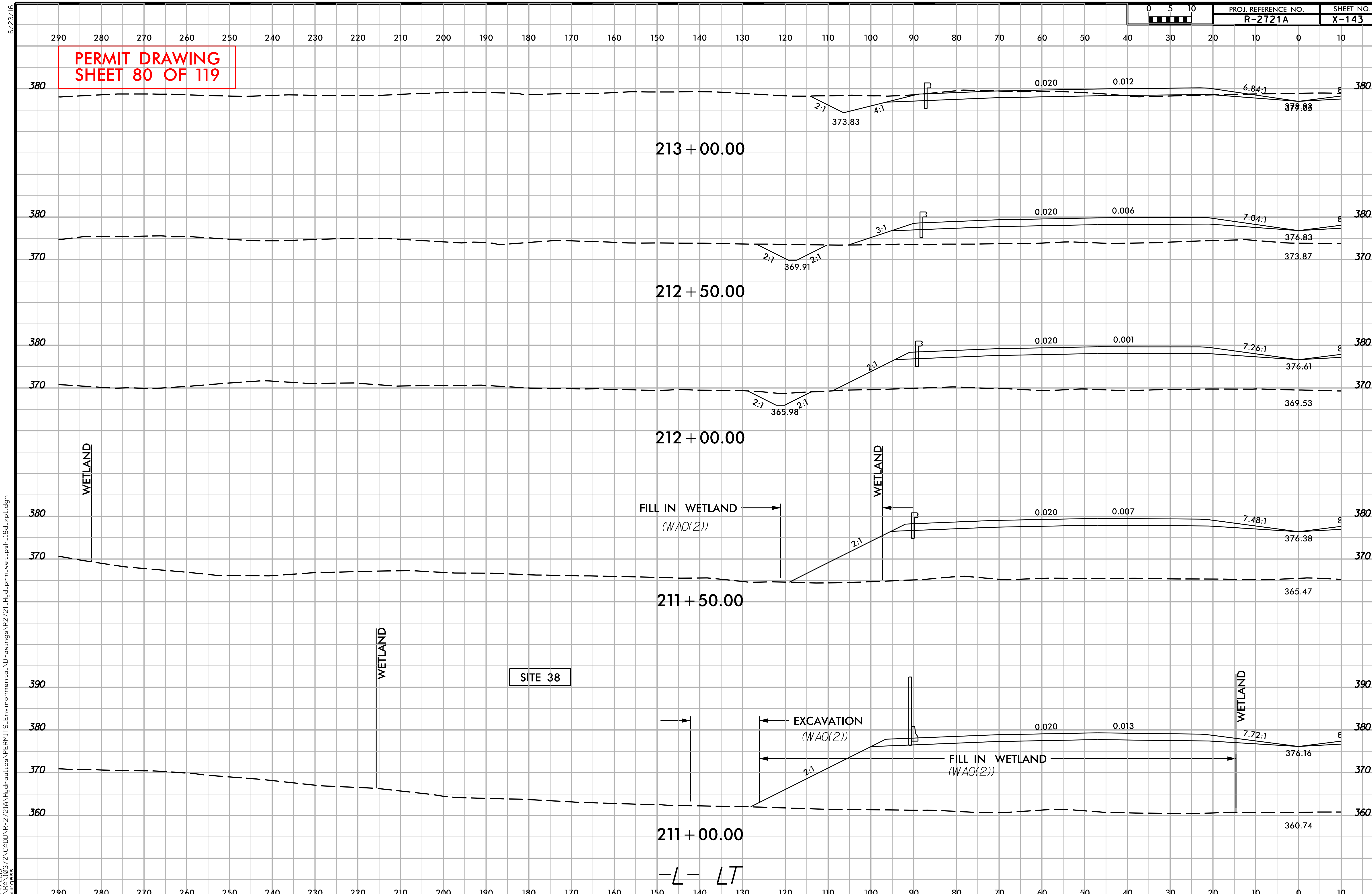
6/23/16
12/4/2019
Q:\RA10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_18b_xpl.dgn
jburgess

6/23/16

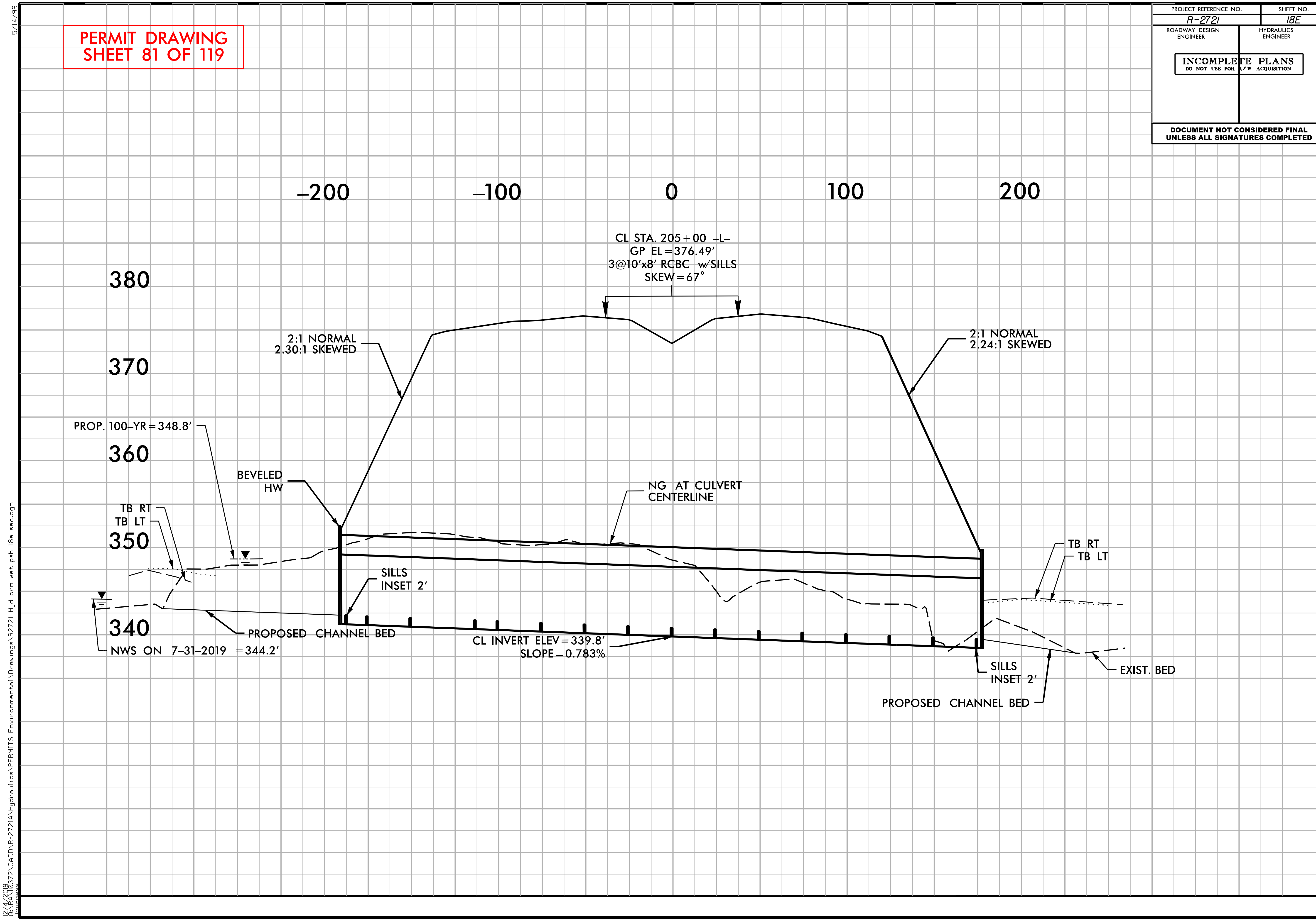


12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_18c_xpl.dgn
jburgess

6/23/16



12/4/2019
G:\RA10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_18d_xpl.dgn
Burgess


PERMIT DRAWING
SHEET 81 OF 119
PROJECT REFERENCE NO.
R-2721
SHEET NO.
18E
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED
-200
-100
0
100
200
380
370
360
350
340
CL STA. 205+00 -L-
GP EL=376.49'
3@10'x8' RCBC w/SILLS
SKEW=67°
2:1 NORMAL
2.30:1 SKEWED
2:1 NORMAL
2.24:1 SKEWED
PROP. 100-YR=348.8'
BEVELED
HW
NG AT CULVERT
CENTERLINE
TB RT
TB LT
SILLS
INSET 2'
PROPOSED CHANNEL BED
NWS ON 7-31-2019 =344.2'
CL INVERT ELEV=339.8'
SLOPE=0.783%
TB RT
TB LT
SILLS
INSET 2'
EXIST. BED
PROPOSED CHANNEL BED
5/14/99
12/4/2019
O:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_18e_sec.dgn

PERMIT DRAWING
SHEET 82 OF 119

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

50' 25' 0 50' 100'
SCALE: 1" = 100'

NAD 83 /2011

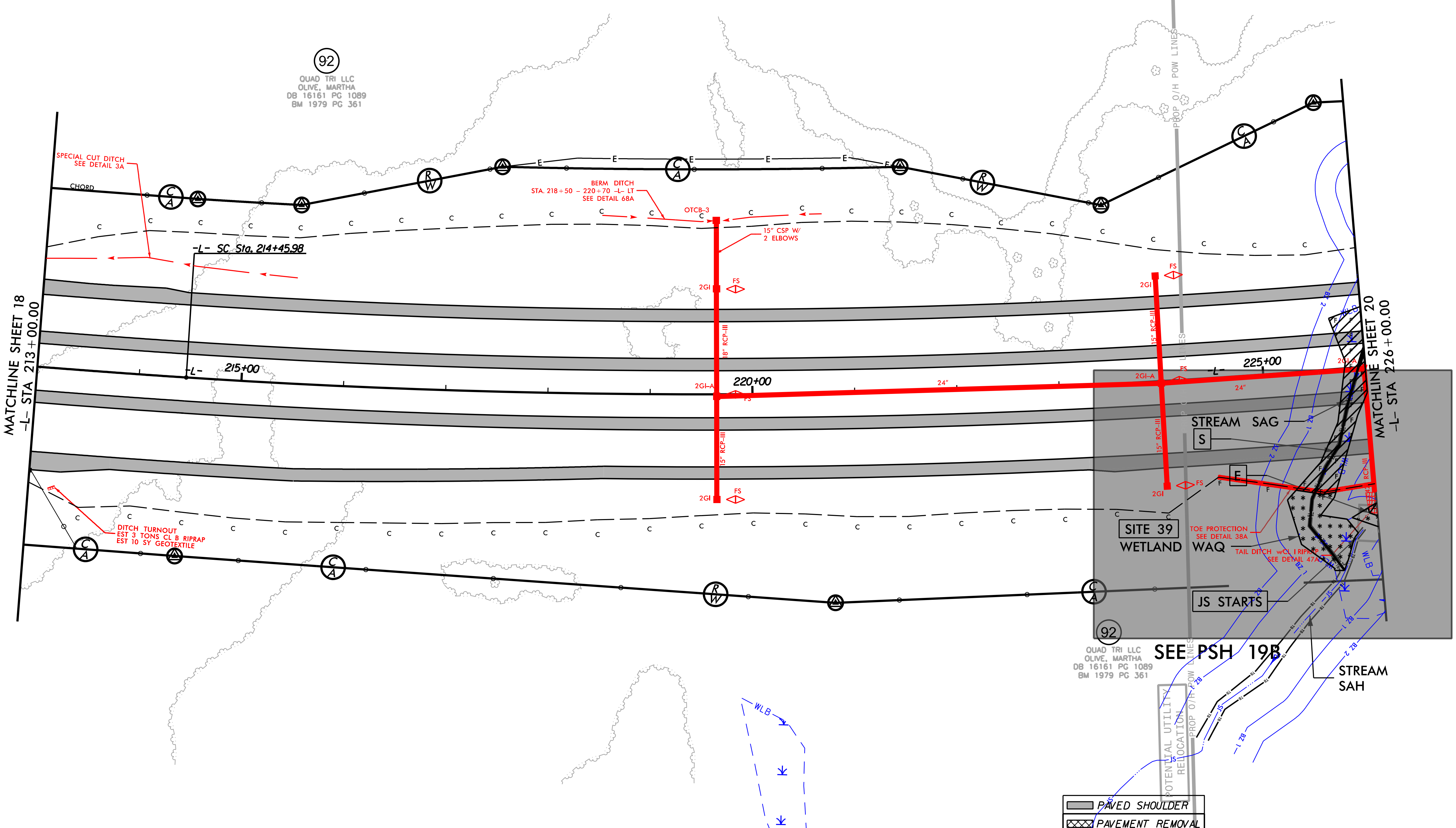
FLATIRON | BRANCH CIVIL

PLANS PREPARED BY: Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



(shaded)	PAVED SHOULDER
(hatched)	PAVEMENT REMOVAL

ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.

ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

SEE SHEET 44 FOR -L- PROFILE

12/4/2019
R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_19.dgn

PERMIT DRAWING
SHEET 83 OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

FLATIRON BRANCH CIVIL

PLANS PREPARED BY: Gannett Fleming — Excellence Delivered As Promised — One Glenwood Avenue, Suite 900, Raleigh, NC 27603, (919) 420-7660, NC Lic. No. F-0270

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SCALE: 1" = 100' (50' 25' 0 50' 100')

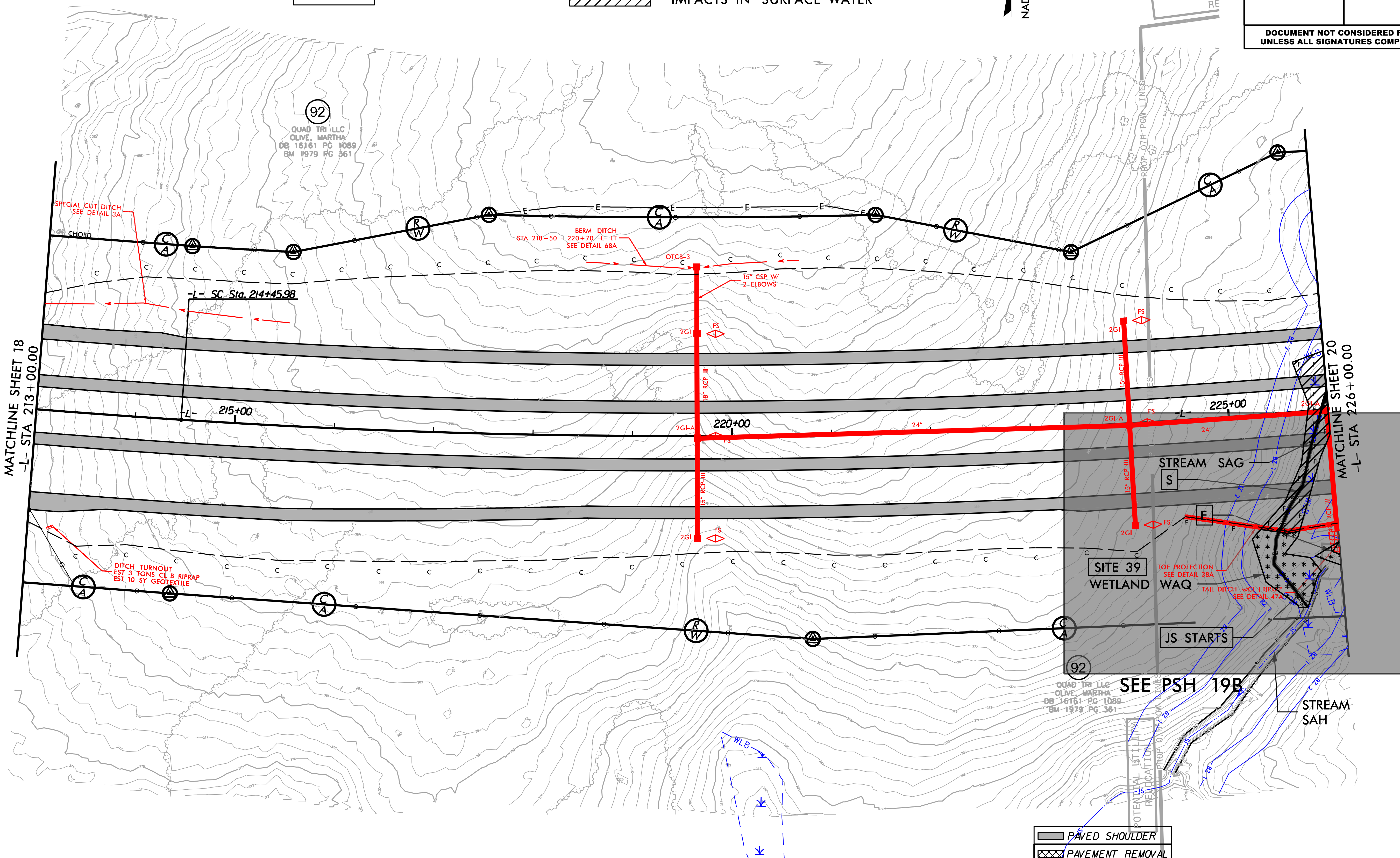
NAD 83 /2011

F F — DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER



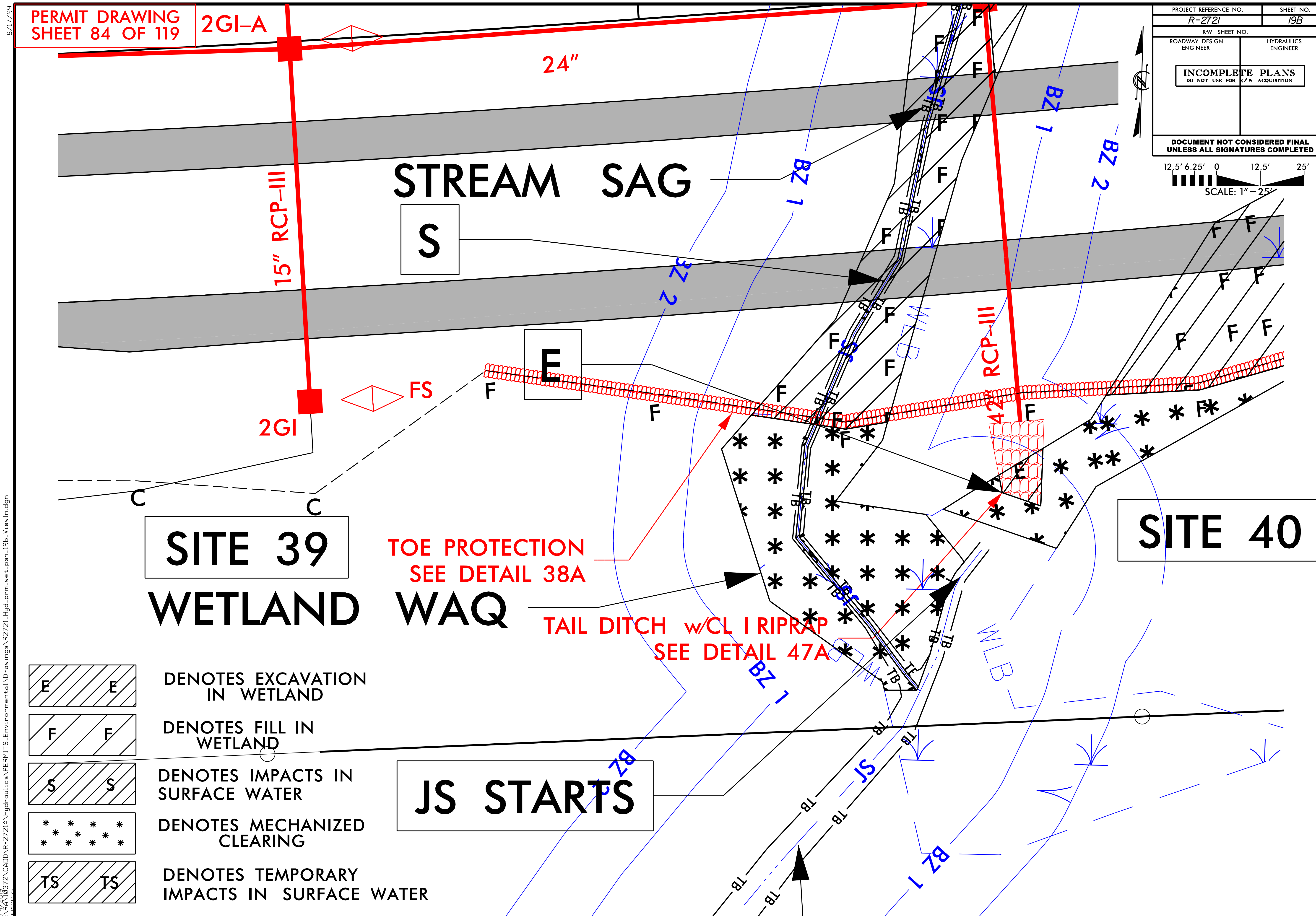
PAVED SHOULDER	
PAVEMENT REMOVAL	

ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.

ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

SEE SHEET 44 FOR -L- PROFILE

12/4/2019
R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_19a.dgn
jburgess



PERMIT DRAWING
SHEET 84 OF 119
2GI–A
24"
15" RCP–III
STREAM SAG
S
E
FS
2GI
F
C
C
SITE 39
WETLAND WAQ
TOE PROTECTION
SEE DETAIL 38A
TAIL DITCH w/CL I RIPRAP
SEE DETAIL 47A
42" RCP–III
SITE 40
JS STARTS
BZ 1
BZ 2
WLB
JS
TB
PROJECT REFERENCE NO.
R-2721
SHEET NO.
19B
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED
12.5' 6.25' 0 12.5' 25'
SCALE: 1" = 25'
DENOTES EXCAVATION IN WETLAND
DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES MECHANIZED CLEARING
DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING
SHEET 85 OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	44
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

FLATIRON | BRANCH CIVIL

PLANS PREPARED BY: Gannett Fleming — Excellence Delivered As Promised — One Glenwood Avenue, Suite 900, Raleigh, NC 27603, (919) 420-7660, NC Lic. No. F-0270

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

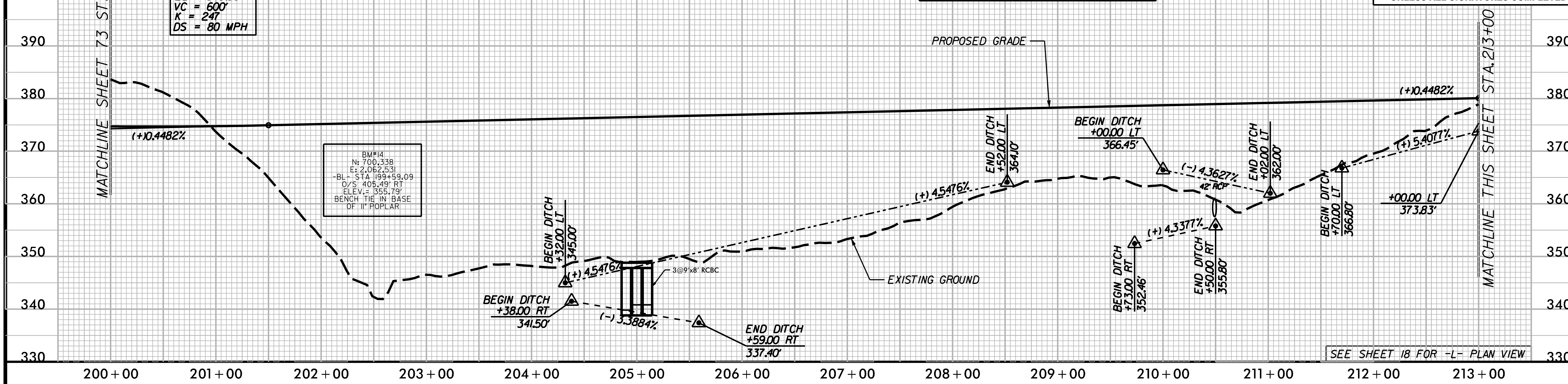
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

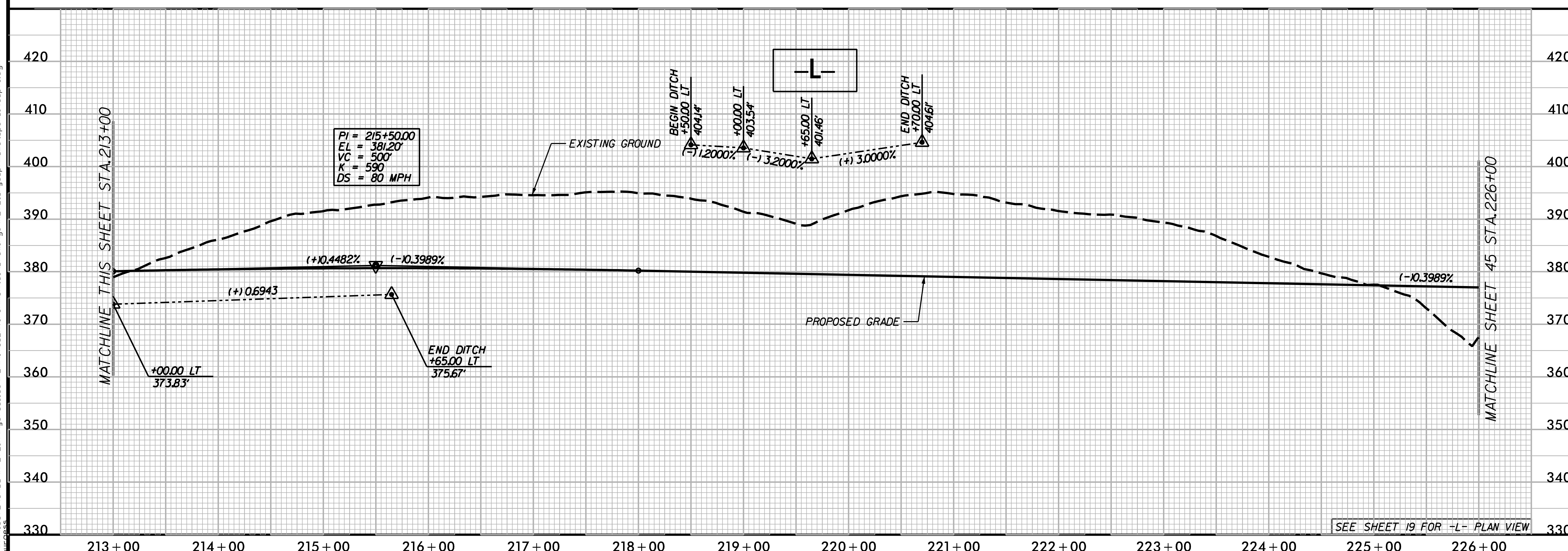
CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	=	1287	CFS
DESIGN FREQUENCY	=	100	YRS
DESIGN HW ELEVATION	=	348.6	FT
BASE DISCHARGE	=	1287	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	348.6	FT
OVERTOPPING DISCHARGE	=	4800	CFS
OVERTOPPING FREQUENCY	=	500 +	YRS
OVERTOPPING ELEVATION	=	377.9	FT

PIPE HYDRAULIC DATA
42" RCP Sta. 210+45 -L-

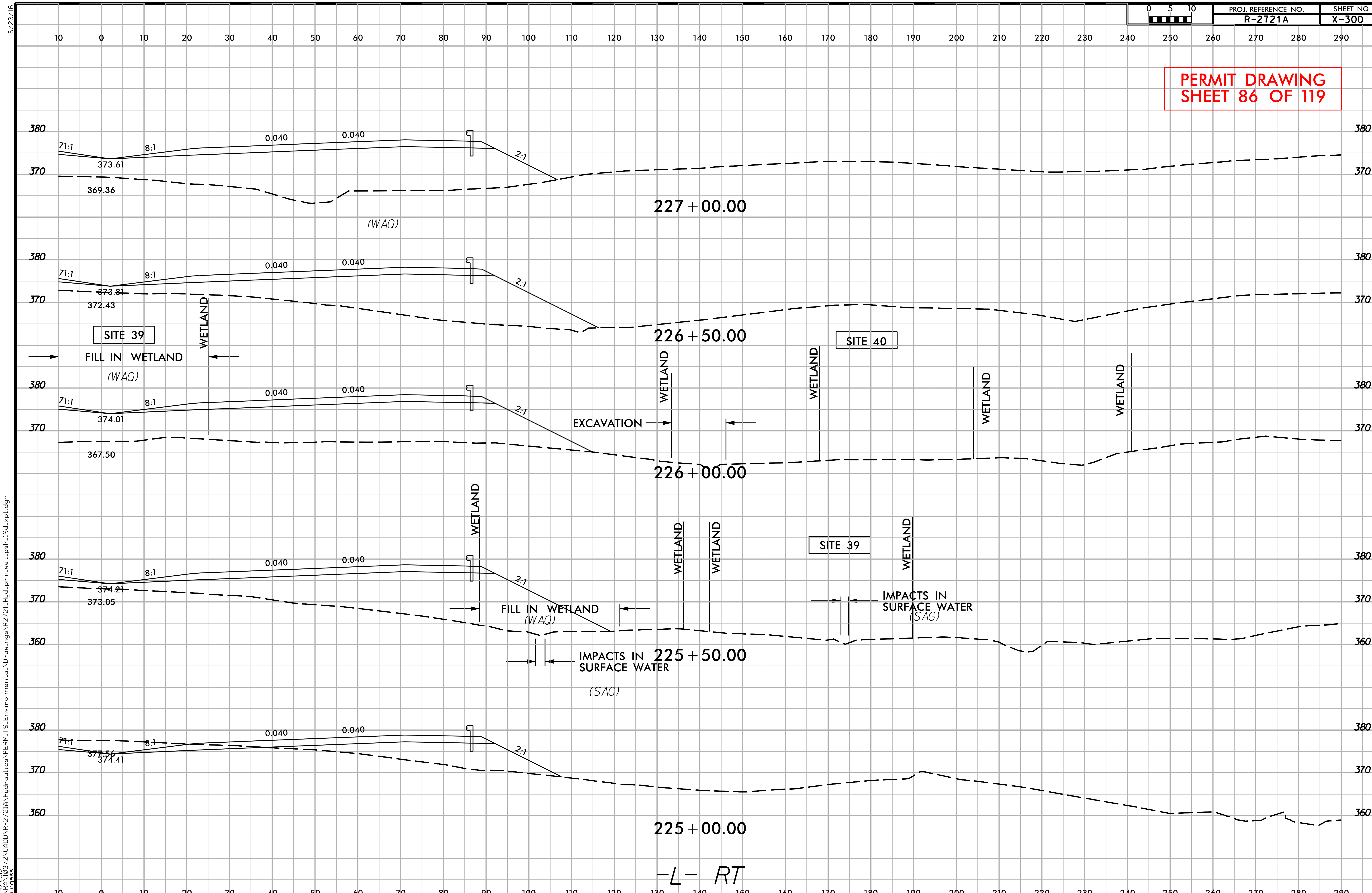
DRAINAGE AREA	=	12	AC
DESIGN FREQUENCY	=	100	YRS
DESIGN DISCHARGE	=	50	CFS
DESIGN HW ELEVATION	=	365.1	FT
100 YEAR DISCHARGE	=	50	CFS
100 YEAR HW ELEVATION	=	365.1	FT
OVERTOPPING FREQUENCY	=	500 +	YRS
OVERTOPPING DISCHARGE	=	200	CFS
OVERTOPPING ELEVATION	=	381.2	FT



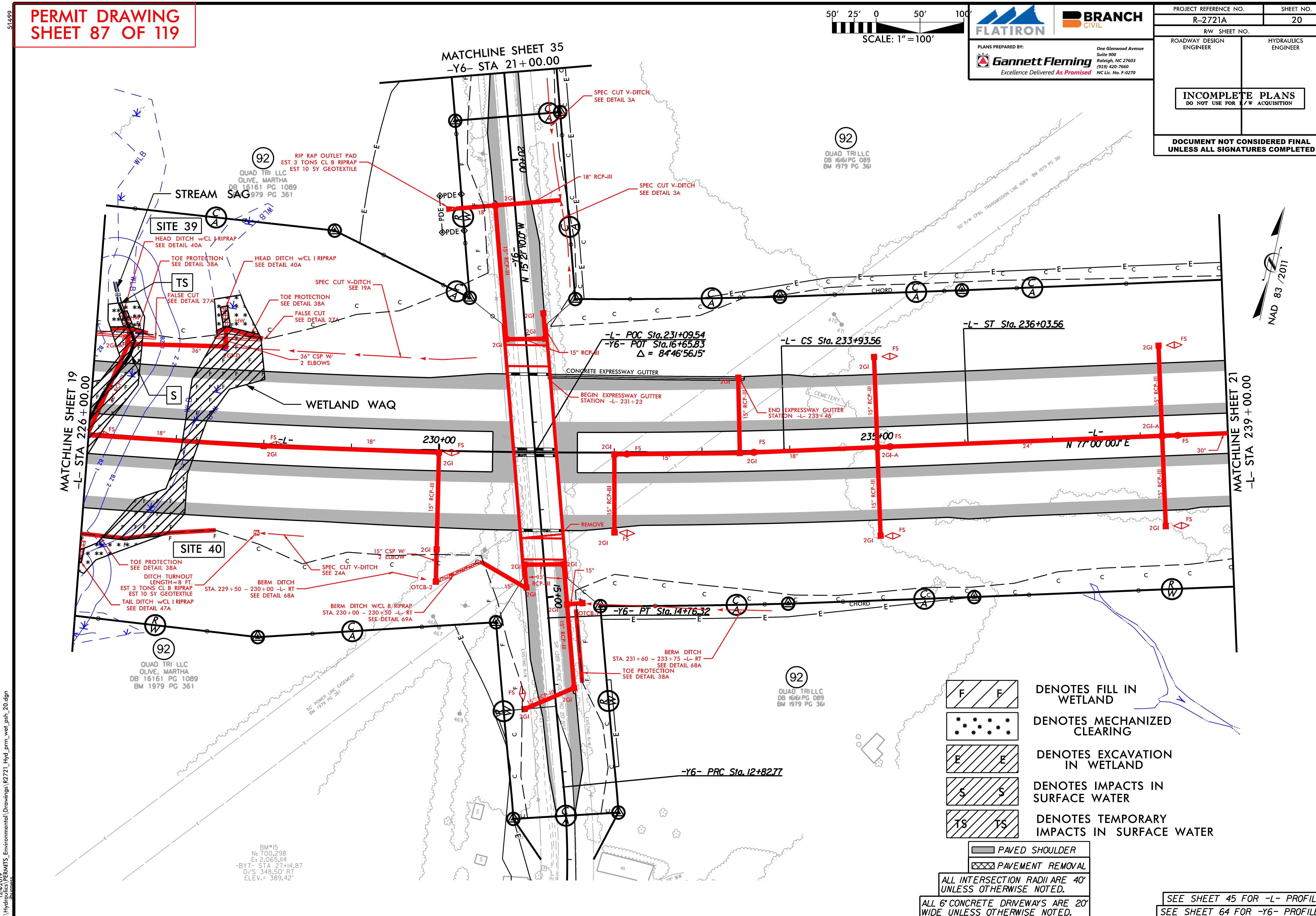


5/28/99
12/4/2019
O:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_19c_pfl.dgn

6/23/16



12/4/2019
G:\RA10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_19d_xpl.dgn
rburgess



PERMIT DRAWING
SHEET 87 OF 119
MATCHLINE SHEET 35
-Y6- STA 21+00.00
SCALE: 1"=100'
FLATIRON
BRANCH CIVIL
PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270
PROJECT REFERENCE NO.
R-2721A
SHEET NO.
20
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
STREAM SAG
SITE 39
SITE 40
WETLAND WAQ
QUAD TRI LLC
OLIVE, MARTHA
DB 16161 PG 1089
BM 1979 PG 361
RIP RAP OUTLET PAD
EST 3 TONS CL B RIPRAP
EST 10 SY GEOTEXTILE
HEAD DITCH w/CL I RIPRAP
SEE DETAIL 40A
TOE PROTECTION
SEE DETAIL 38A
FALSE CUT
SEE DETAIL 27A
SPEC CUT V-DITCH
SEE DETAIL 3A
SEE DETAIL 19A
36" CSP W/ 2 ELBOWS
-L- POC Sta.231+09.54
-Y6- POT Sta.16+65.83
Δ = 84°46'56.5"
-L- CS Sta. 233+93.56
-L- ST Sta. 236+03.56
CONCRETE EXPRESSWAY GUTTER
BEGIN EXPRESSWAY GUTTER STATION -L- 231+23
END EXPRESSWAY GUTTER STATION -L- 233+46
N 77°00'00.1" E
N 15°21'10.1" W
MATCHLINE SHEET 19
-L- STA 226+00.00
MATCHLINE SHEET 21
-L- STA 239+00.00
NAD 83/2011
DITCH TURNOUT LENGTH=8 FT.
EST 3 TONS CL B RIPRAP
EST 10 SY GEOTEXTILE
TAIL DITCH w/CL I RIPRAP
SEE DETAIL 47A
STA. 229+50 - 230+00 -L- RT
BERM DITCH
SEE DETAIL 68A
15" CSP W/ 2 ELBOW
SPEC CUT V-DITCH
SEE 24A
BERM DITCH W/CL B RIPRAP
STA. 230+00 - 230+50 -L- RT
SEE DETAIL 69A
REMOVE
-Y6- PT Sta.14+76.32
BERM DITCH
STA. 231+60 - 233+75 -L- RT
SEE DETAIL 68A
-Y6- PRC Sta.12+82.77
BM#15
N: 700,298
E: 2,065,114
-BY7- STA 27+14.87
O/S 348.50' RT
ELEV.= 389.42'
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
DENOTES EXCAVATION IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
PAVED SHOULDER
PAVEMENT REMOVAL
ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.
ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.
SEE SHEET 45 FOR -L- PROFILE
SEE SHEET 64 FOR -Y6- PROFILE

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

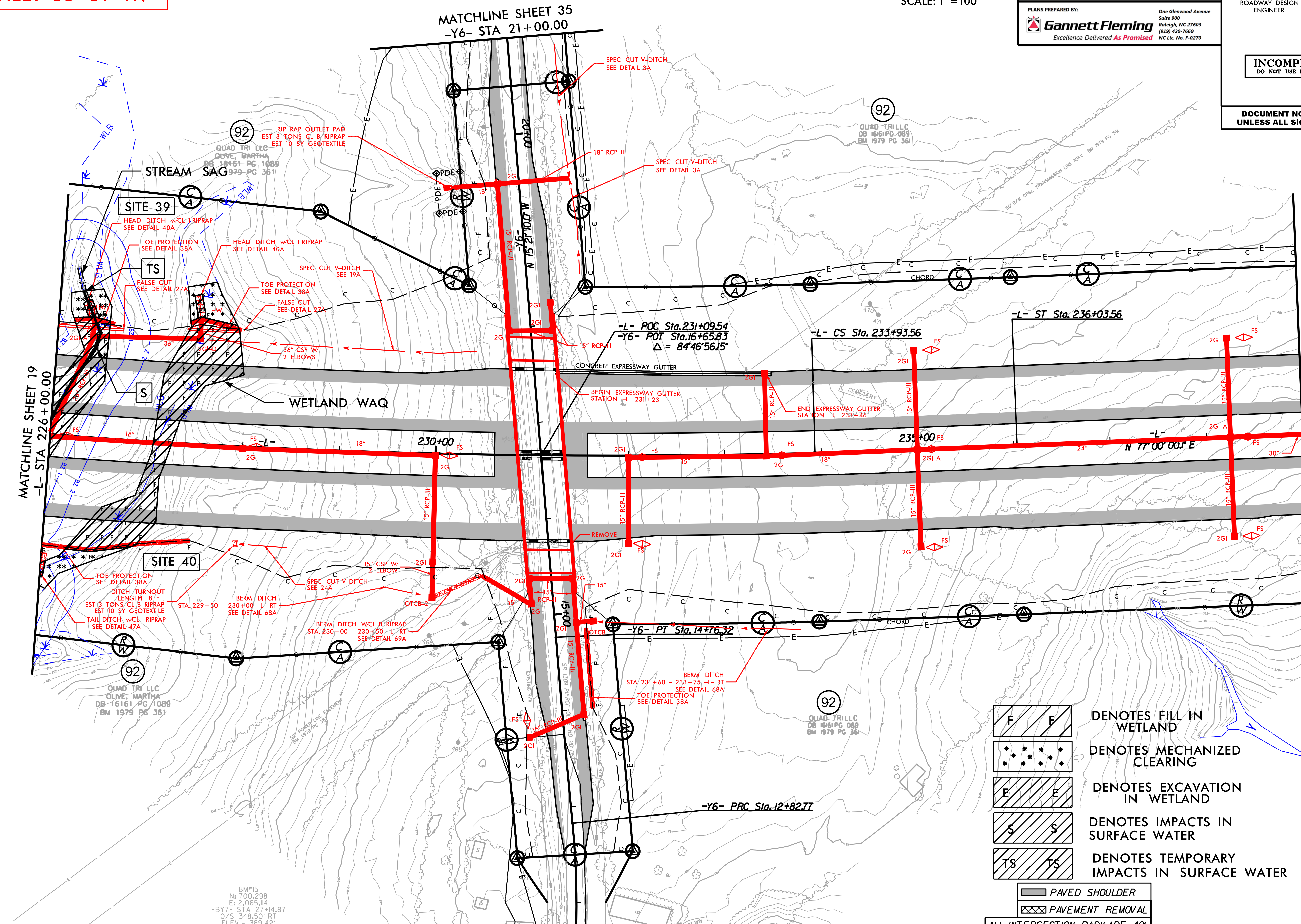
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

FLATIRON BRANCH CIVIL

PLANS PREPARED BY: Gannett Fleming Excellence Delivered As Promised
One Glenwood Avenue Suite 900 Raleigh, NC 27603 (919) 420-7660 NC Lic. No. F-0270

SCALE: 1" = 100'



F F — DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

E E — DENOTES EXCAVATION IN WETLAND

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PAVED SHOULDER

PAVEMENT REMOVAL

ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.

ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

SEE SHEET 45 FOR -L- PROFILE
SEE SHEET 64 FOR -Y6- PROFILE

12/4/2019
R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_20a.dgn

PERMIT DRAWING
SHEET 89 OF 119

FLATIRON | BRANCH CIVIL

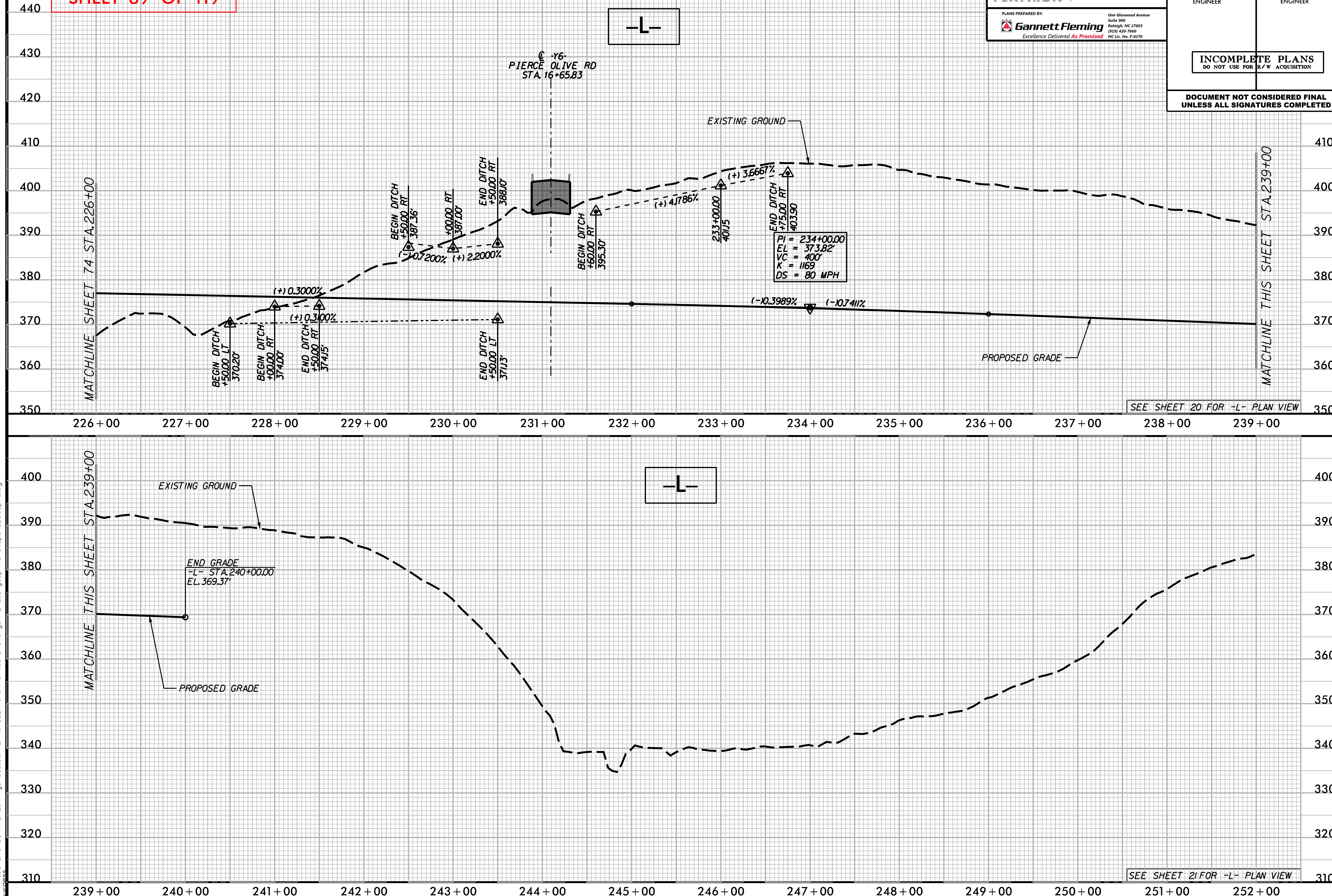
PLANS PREPARED BY: Gannett Fleming — Excellence Delivered As Promised
One Glenwood Avenue, Suite 900, Raleigh, NC 27603, (919) 420-7660, NC Lic. No. F-0270

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	45

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

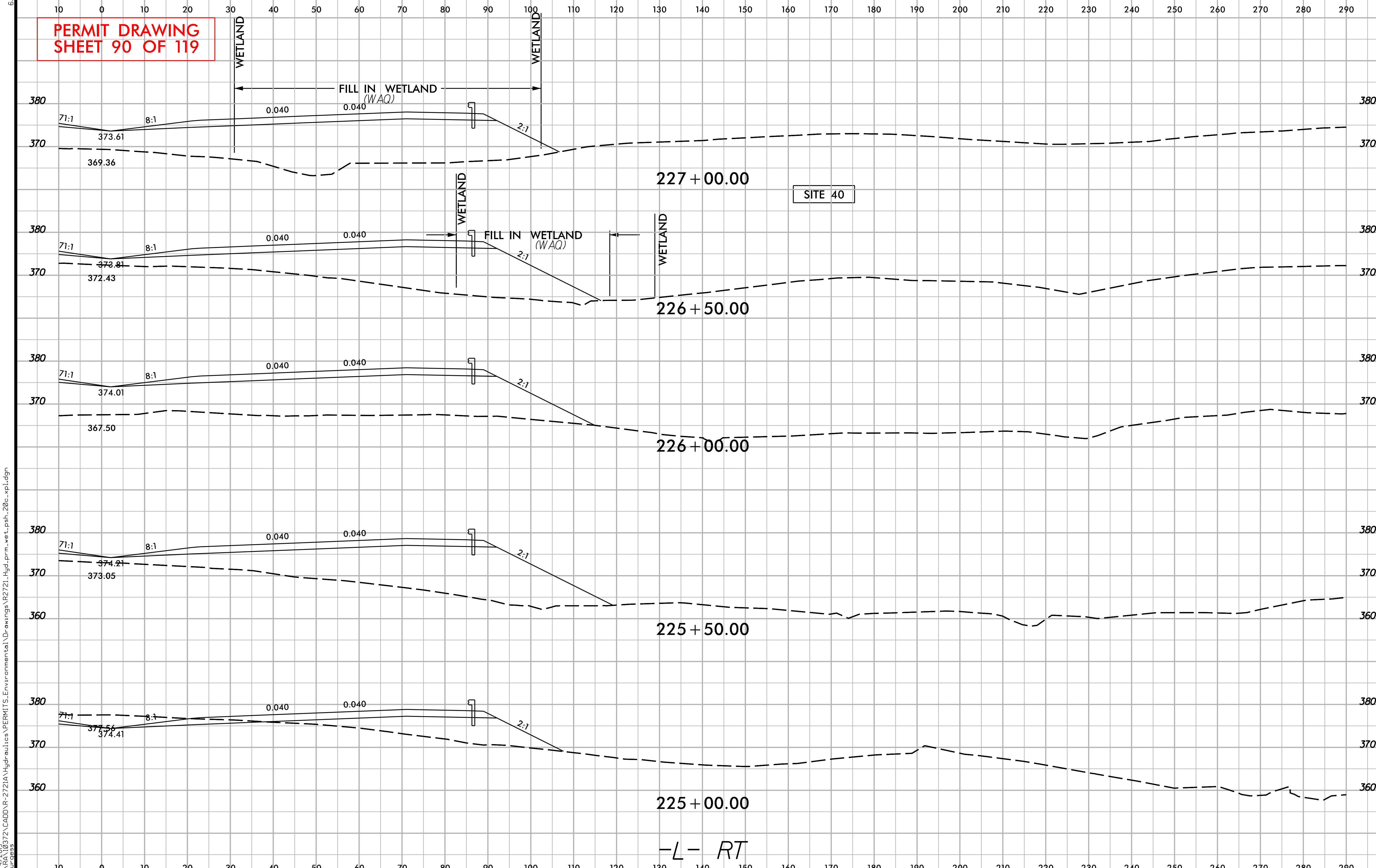
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



5/28/99
12/4/2019
O:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_20b_pfl.dgn

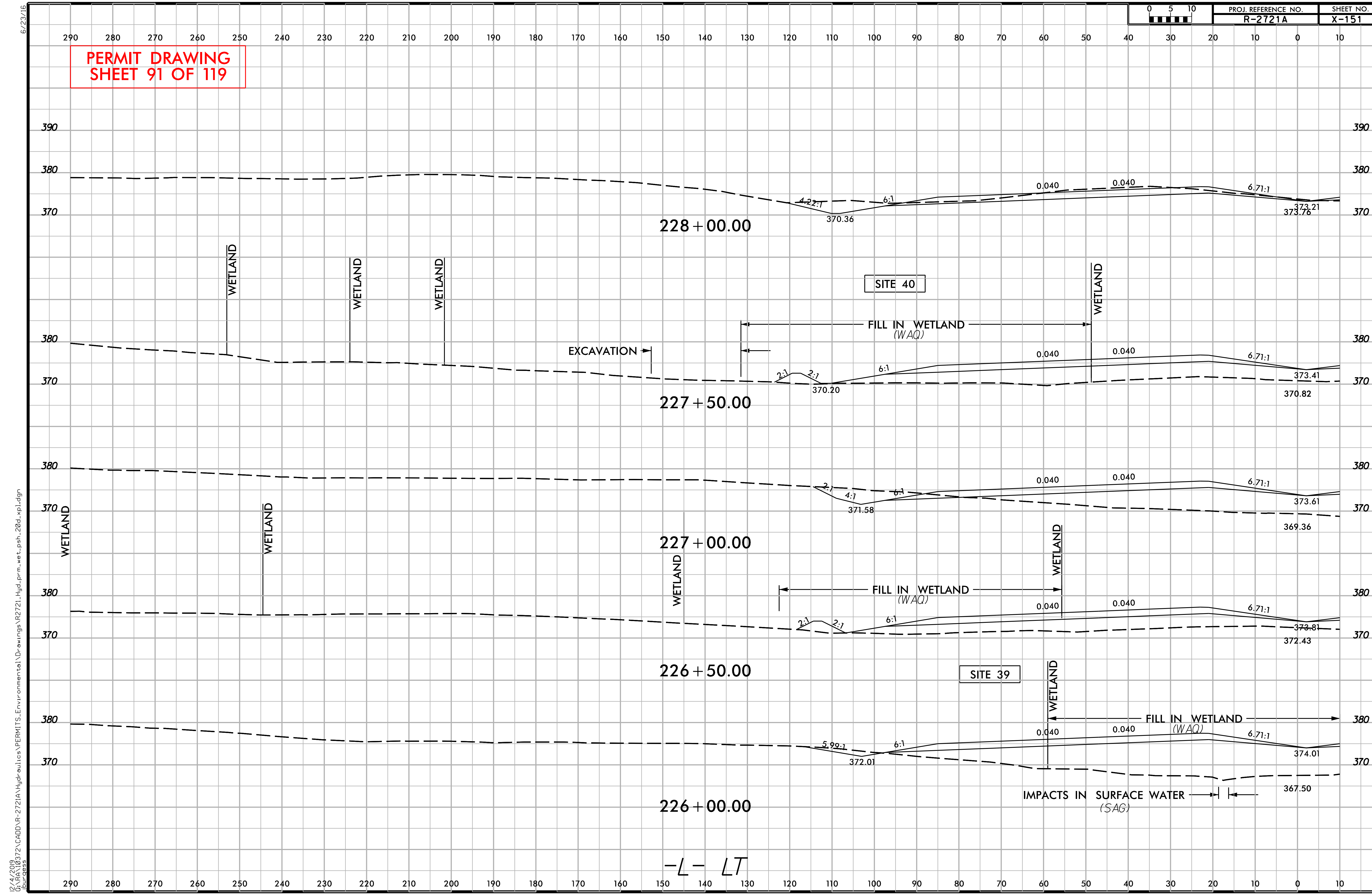
PROJ. REFERENCE NO.	SHEET NO.
R-2721A	X-300

PERMIT DRAWING
SHEET 90 OF 119



6/23/16

12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_20c_xpl.dgn
jburgess



PERMIT DRAWING
SHEET 91 OF 119
PROJ. REFERENCE NO.
R-2721A
SHEET NO.
X-151
0 5 10
228+00.00
370.36
373.76
373.21
4.22:1
6:1
0.040
0.040
6.71:1
SITE 40
WETLAND
FILL IN WETLAND
(WAQ)
EXCAVATION
227+50.00
2:1
2:1
6:1
370.20
373.41
370.82
227+00.00
4:1
371.58
373.61
369.36
226+50.00
372.43
373.81
SITE 39
226+00.00
5.99:1
372.01
374.01
367.50
IMPACTS IN SURFACE WATER
(SAG)
-L- LT
390
380
370
290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10
6/23/16
12/4/2019

PERMIT DRAWING
SHEET 93 OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

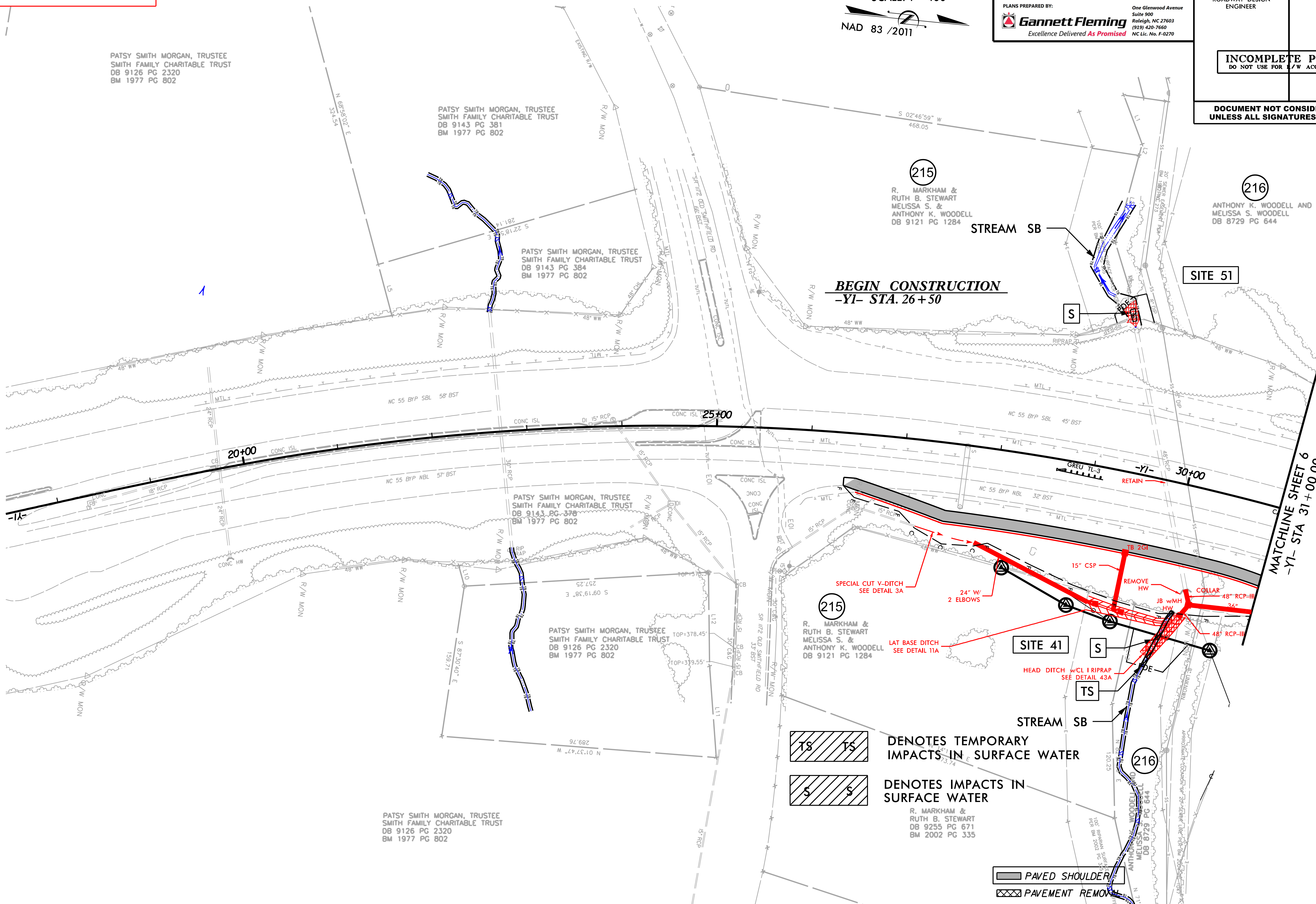
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

FLATIRON
BRANCH CIVIL

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

SCALE: 1" = 100'
50' 25' 0 50' 100'
NAD 83 /2011



TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

PAVED SHOULDER

PAVEMENT REMOVAL

ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.

ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

12/4/2019
R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_22.dgn

PERMIT DRAWING
SHEET 94 OF 119

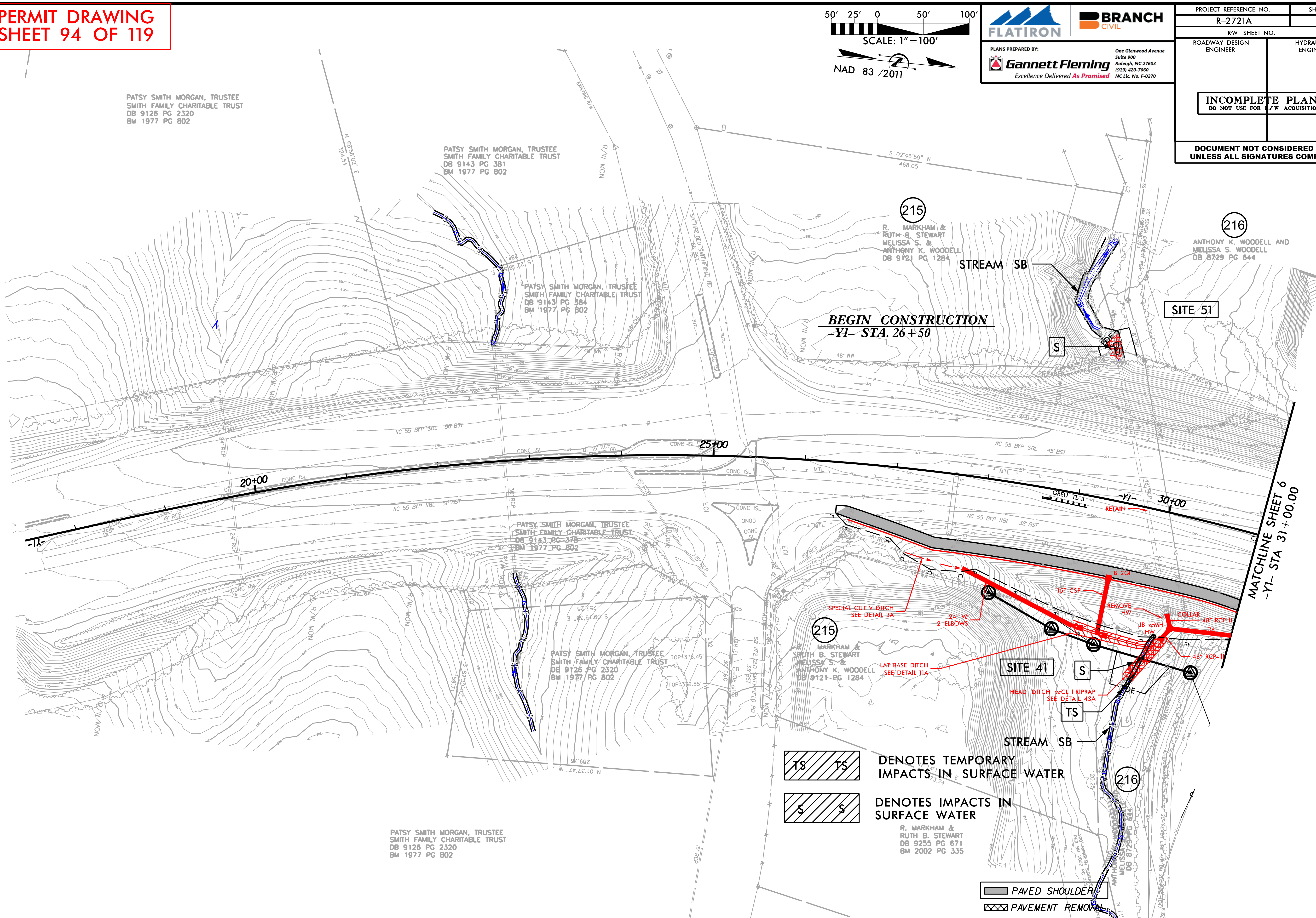
PROJECT REFERENCE NO.	SHEET NO.
R-2721A	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

FLATIRON
BRANCH CIVIL

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

PAVED SHOULDER

PAVEMENT REMOVAL

ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.

ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

12/4/2019
...R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_22a.dgn
jburgess

PERMIT DRAWING
SHEET 94A OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	23
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

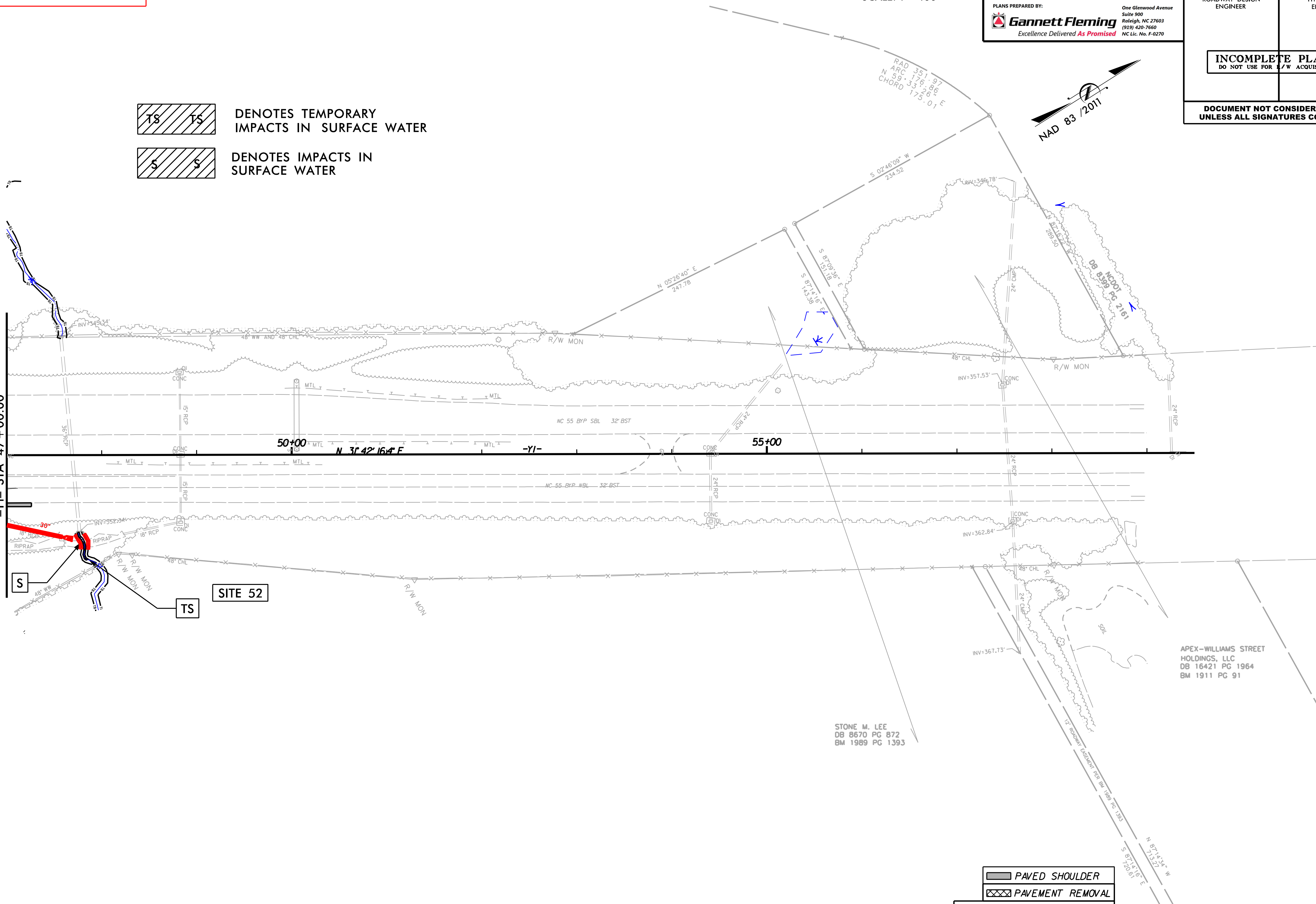
FLATIRON BRANCH CIVIL

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

SCALE: 1" = 100'

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER



PAVED SHOULDER

PAVEMENT REMOVAL

ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.

ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

12/4/2019
R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_23.dgn

PERMIT DRAWING
SHEET 94B OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	23

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

FLATIRON | BRANCH CIVIL

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

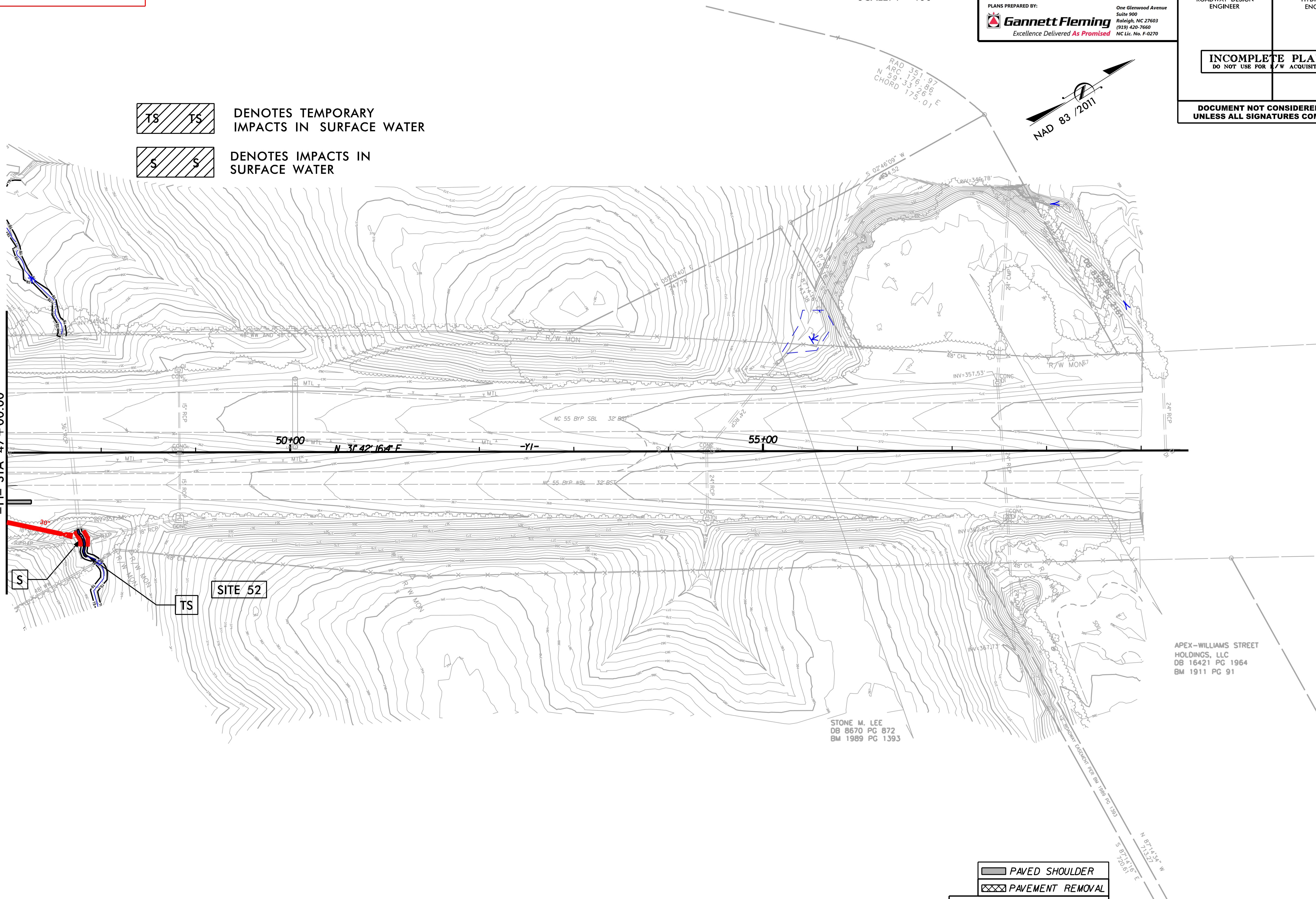
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

50' 25' 0 50' 100'
SCALE: 1" = 100'

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES IMPACTS IN SURFACE WATER



PAVED SHOULDER

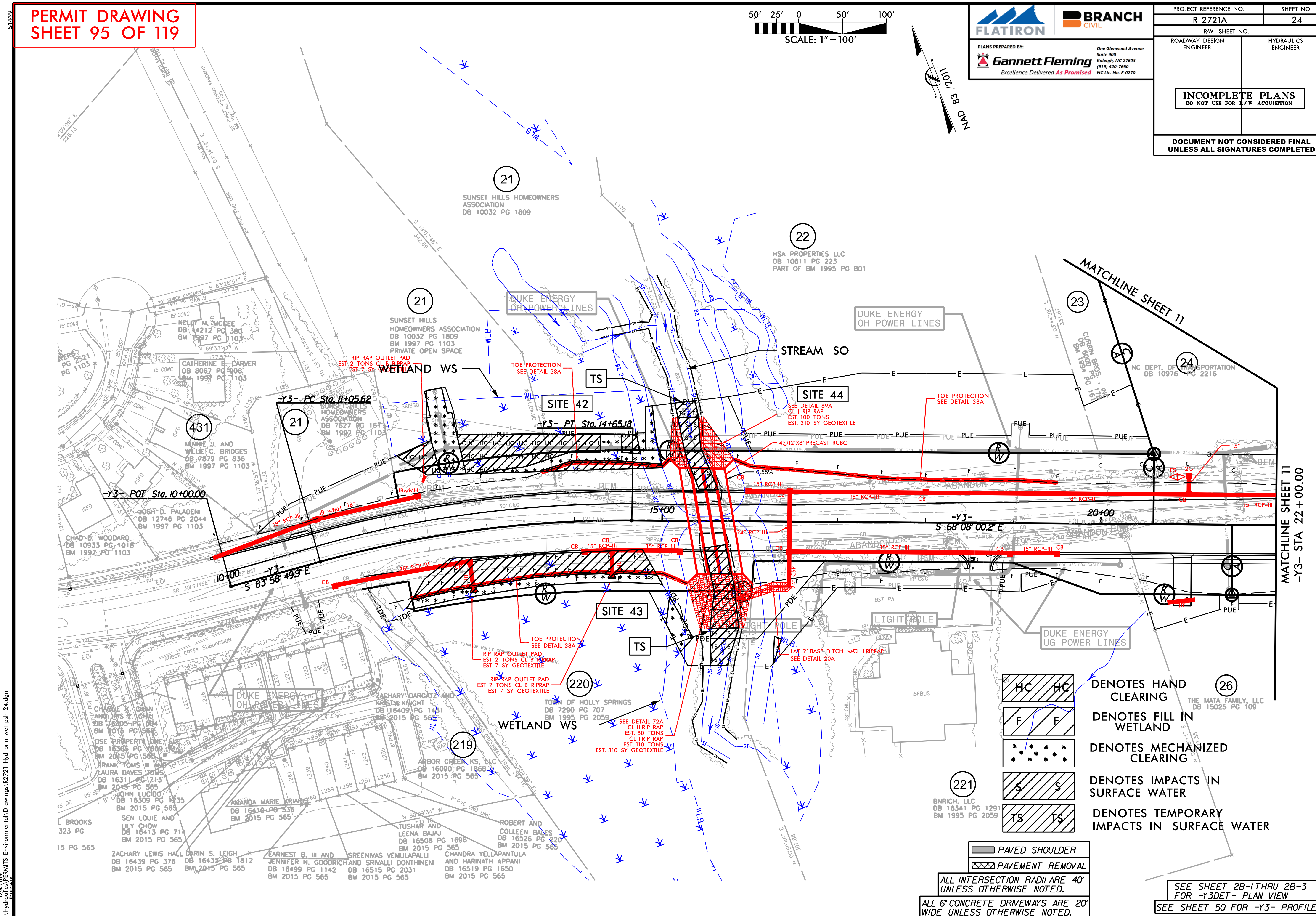
PAVEMENT REMOVAL

ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.

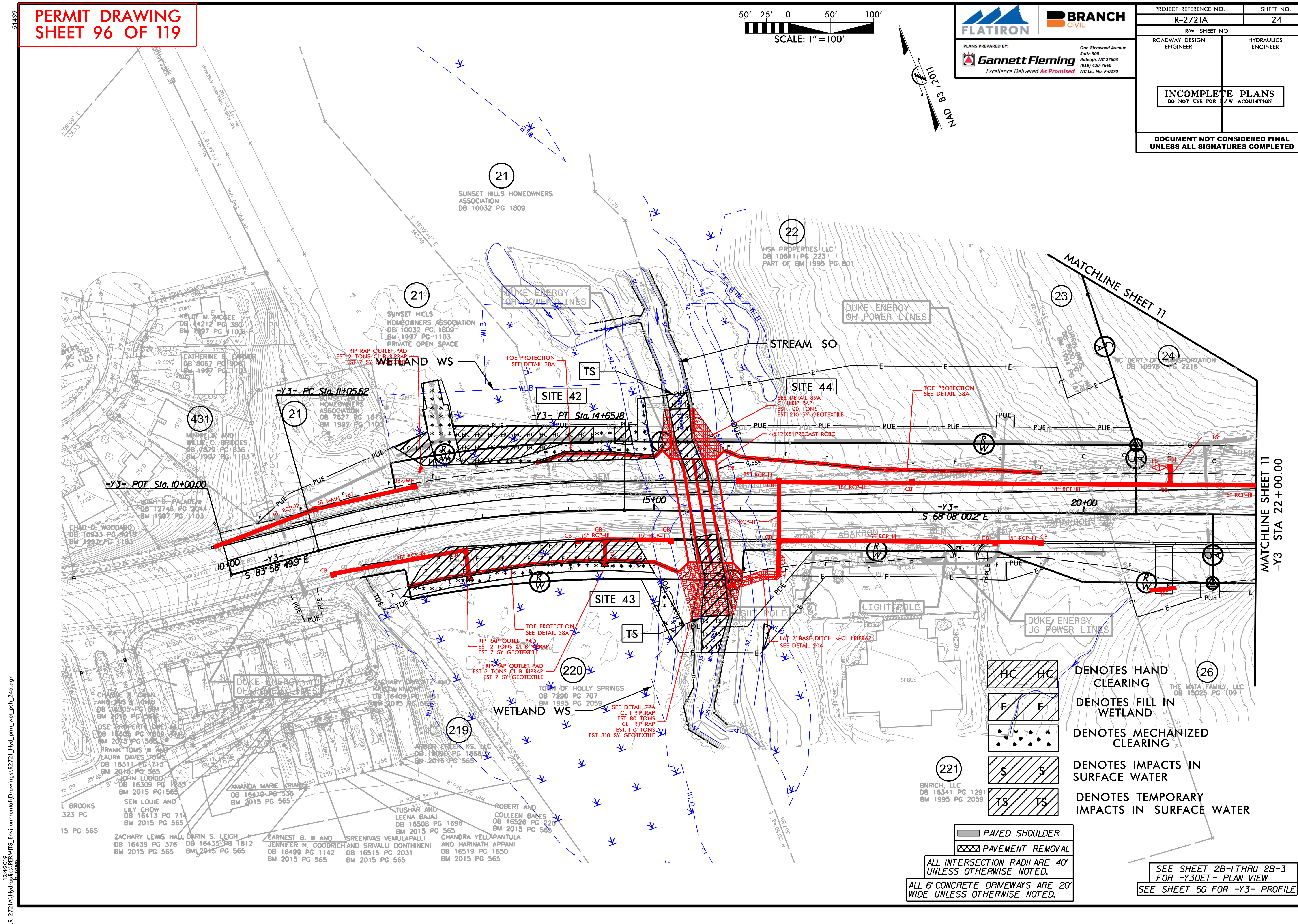
ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

12/4/2019
...\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_23a.dgn
jburgess

51499



12/4/2019
R:\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_24.dgn



PERMIT DRAWING
SHEET 96 OF 119
SCALE: 1" = 100'
50' 25' 0 50' 100'
NAD 83 /2011
FLATIRON
BRANCH CIVIL
PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue Suite 900 Raleigh, NC 27603 (919) 420-7660 NC Lic. No. F-0270
PROJECT REFERENCE NO. R-2721A
SHEET NO. 24
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
SUNSET HILLS HOMEOWNERS ASSOCIATION DB 10032 PG 1809
HSA PROPERTIES LLC DB 10611 PG 223 PART OF BM 1995 PG 801
MATCHLINE SHEET 11
MATCHLINE SHEET 11 -Y3- STA 22+00.00
NC DEPT. OF TRANSPORTATION DB 10976 PG 2216
DUKE ENERGY OH POWER LINES
DUKE ENERGY UG POWER LINES
STREAM SO
WETLAND WS
SITE 42
SITE 43
SITE 44
TS
-Y3- PC Sta. 11+05.62
-Y3- PT Sta. 14+65.18
-Y3- POT Sta. 10+00.00
-Y3- S 83°58'49.9" E
-Y3- S 68°08'00.2" E
10+00
15+00
20+00
RIP RAP OUTLET PAD EST 2 TONS CL B RIPRAP EST 7 SY GEOTEXTILE
TOE PROTECTION SEE DETAIL 38A
SEE DETAIL 89A CL II RIP RAP EST. 100 TONS EST. 210 SY GEOTEXTILE
4@12'X8' PRECAST RCBC
SEE DETAIL 72A CL II RIP RAP EST. 80 TONS CL I RIP RAP EST. 110 TONS EST. 310 SY GEOTEXTILE
LAT 2' BASE DITCH w/CL I RIPRAP SEE DETAIL 20A
TOWN OF HOLLY SPRINGS DB 7290 PG 707 BM 1995 PG 2059
ARBOR CREEK KS, LLC DB 16090 PG 1868 BM 2015 PG 565
BNRICH, LLC DB 16341 PG 1291 BM 1995 PG 2059
THE MATA FAMILY, LLC DB 15025 PG 109
KELLY M. MCGEE DB 14212 PG 380 BM 1997 PG 1103
CATHERINE E. CARVER DB 8067 PG 906 BM 1997 PG 1103
MINNIE D. AND WILLIE C. BRIDGES DB 7879 PG 836 BM 1997 PG 1103
JOSH D. PALADENI DB 12746 PG 2044 BM 1997 PG 1103
CHAD D. WOODARD DB 10933 PG 1018 BM 1997 PG 1103
21 22 23 24 26 219 220 221 431
HC HC DENOTES HAND CLEARING
F F DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
S S DENOTES IMPACTS IN SURFACE WATER
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
PAVED SHOULDER
PAVEMENT REMOVAL
ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.
ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.
SEE SHEET 2B-1 THRU 2B-3 FOR -Y3DET- PLAN VIEW
SEE SHEET 50 FOR -Y3- PROFILE
12/4/2019
R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_24a.dgn

FLATIRON | BRANCH CIVIL

PLANS PREPARED BY: Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

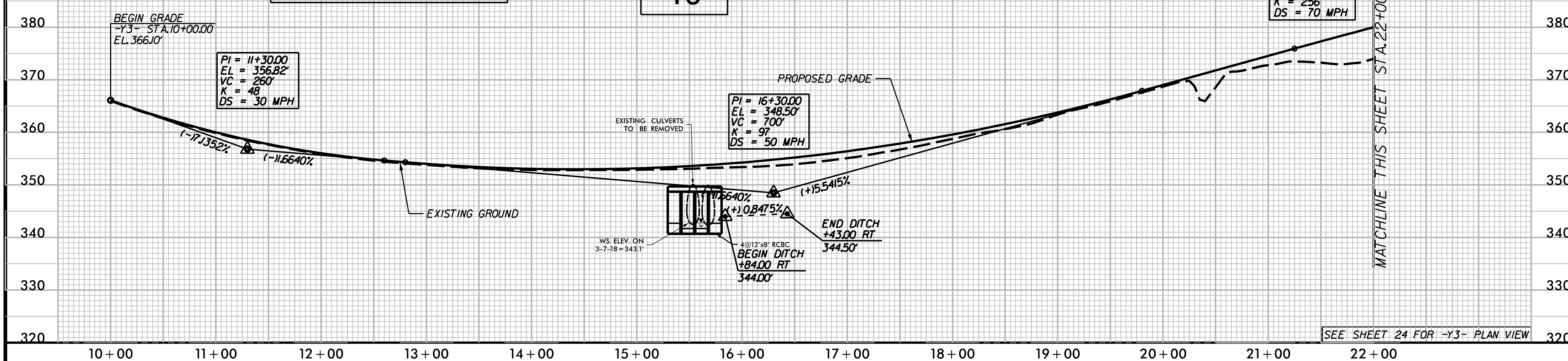
PROJECT REFERENCE NO.	SHEET NO.
R-2721A	50
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

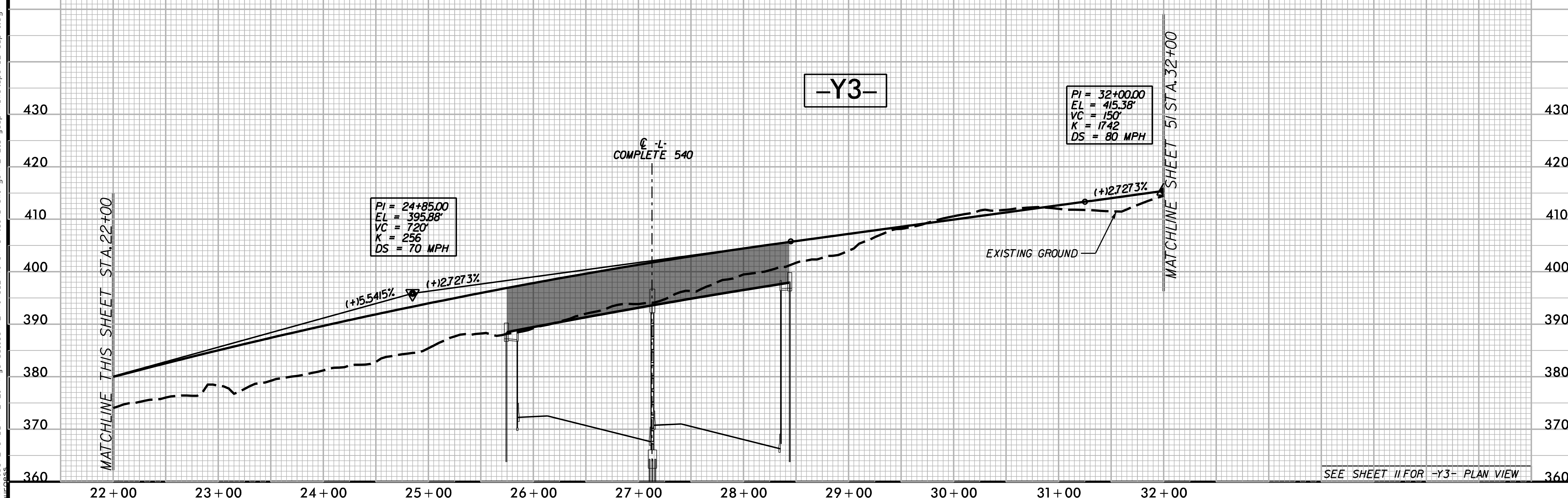
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CULVERT HYDRAULIC DATA

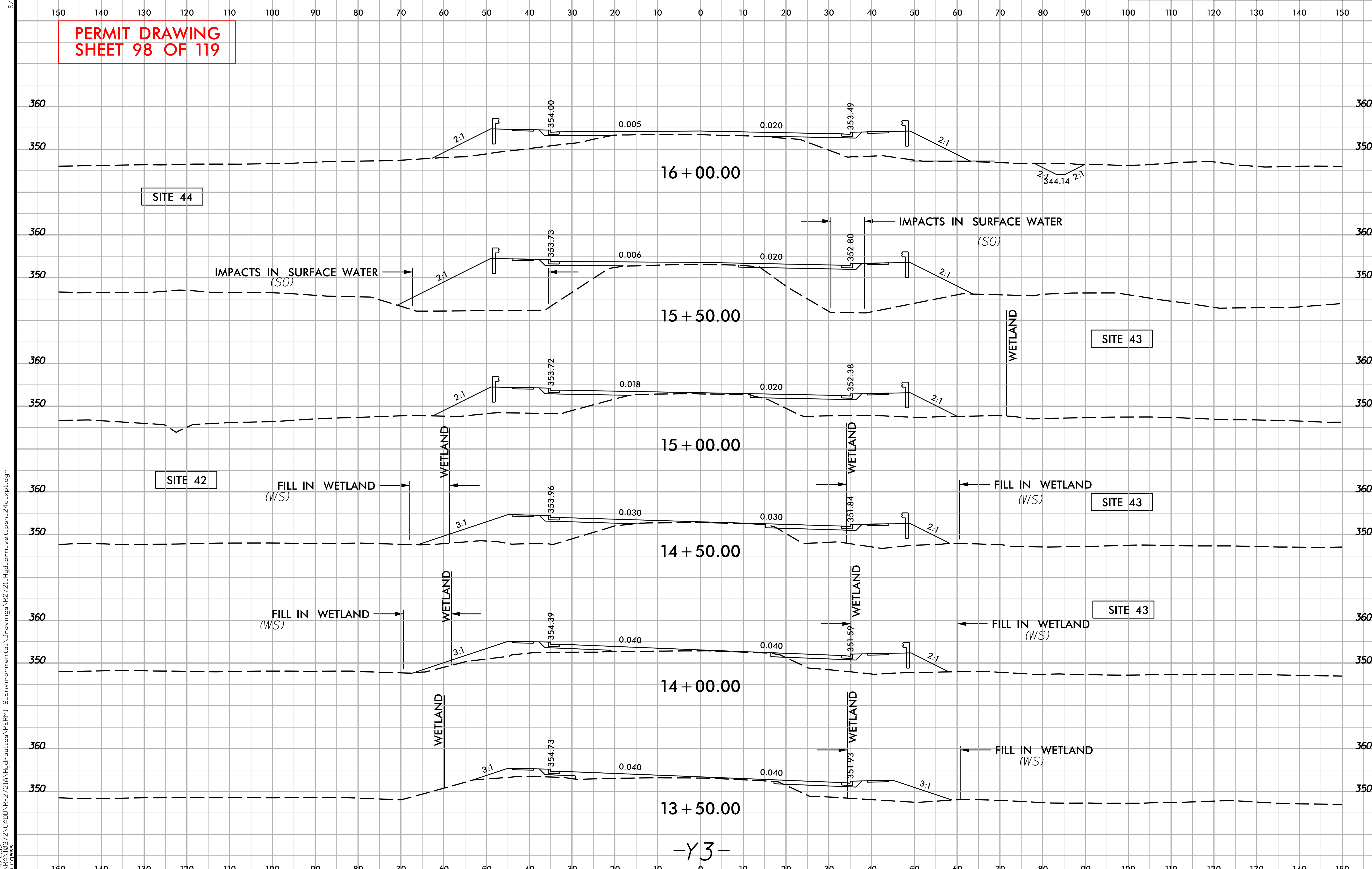
DESIGN DISCHARGE	= 2600	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 351.3	FT
BASE DISCHARGE	= 2900	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 351.7	FT
OVERTOPPING DISCHARGE	= 4000	CFS
OVERTOPPING FREQUENCY	= 500 +	YRS
OVERTOPPING ELEVATION	= 354.5	FT





PROJ. REFERENCE NO.	SHEET NO.
R-2721A	X-342

PERMIT DRAWING
SHEET 98 OF 119



6/23/16

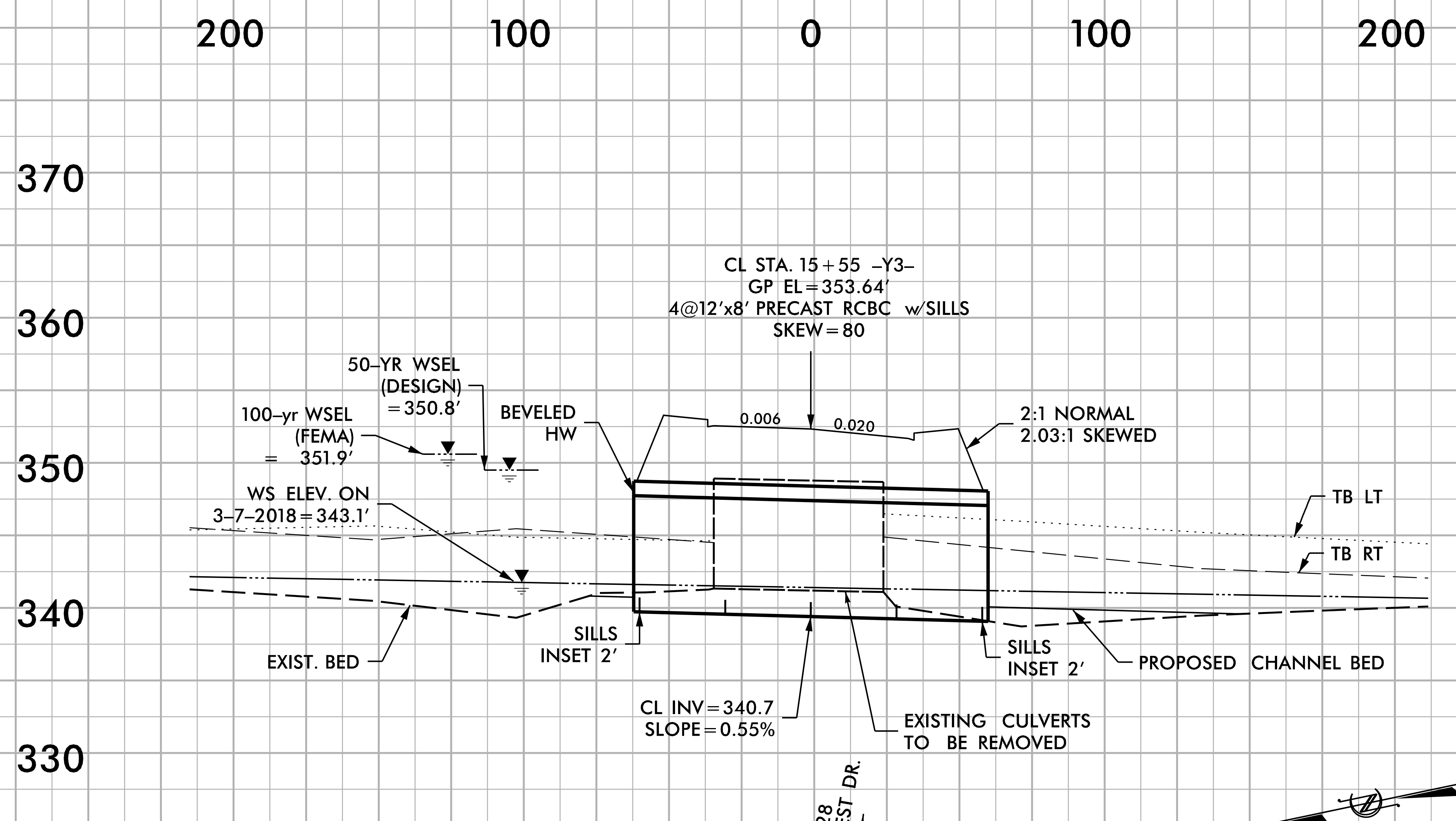
12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_24c_xpl.dgn
burgess

PERMIT DRAWING
SHEET 99 OF 119

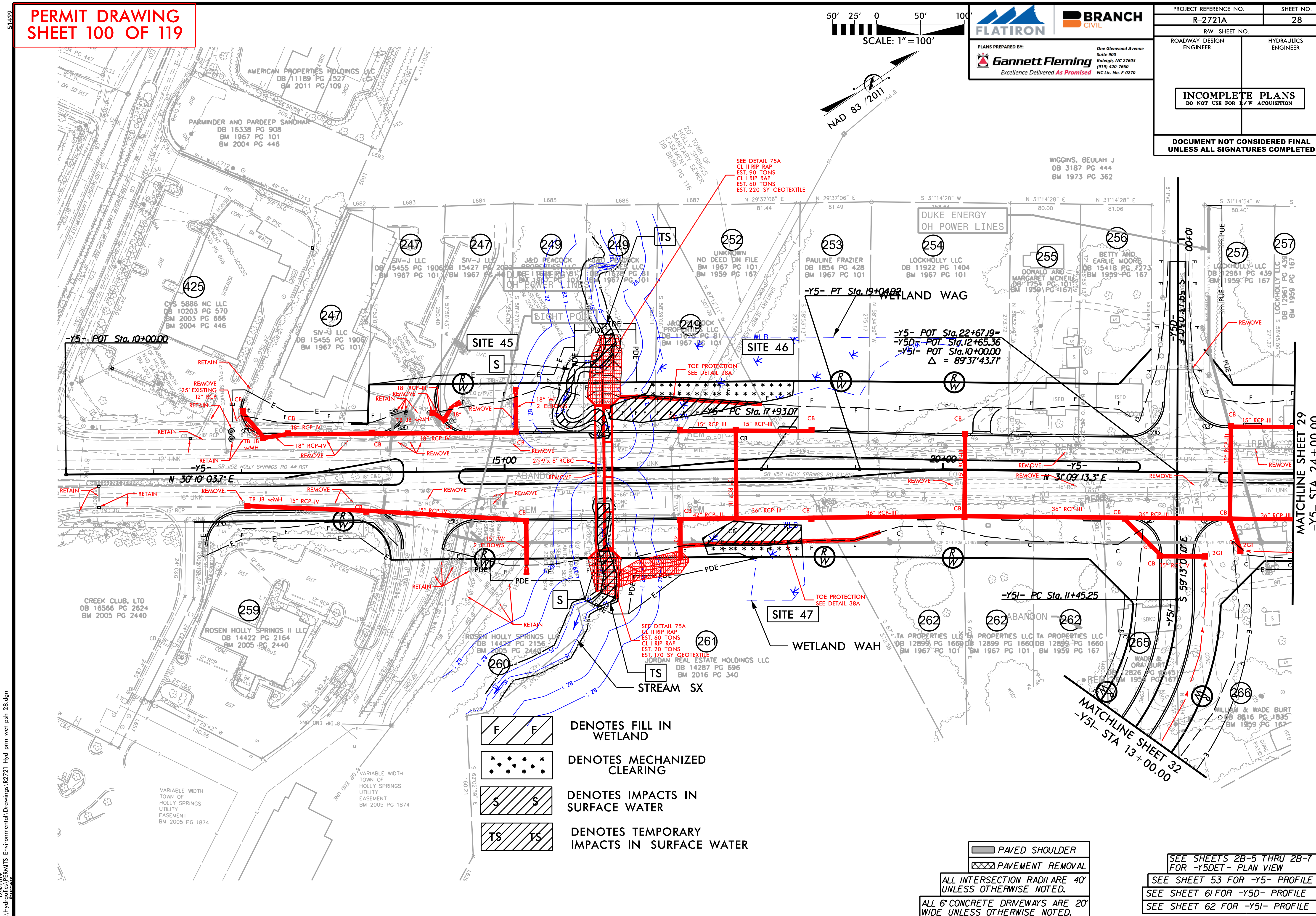
PROJECT REFERENCE NO.	SHEET NO.
R-2721	24D
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



PERMIT DRAWING
SHEET 100 OF 119



PERMIT DRAWING
SHEET 101 OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	28
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

FLATIRON | BRANCH CIVIL

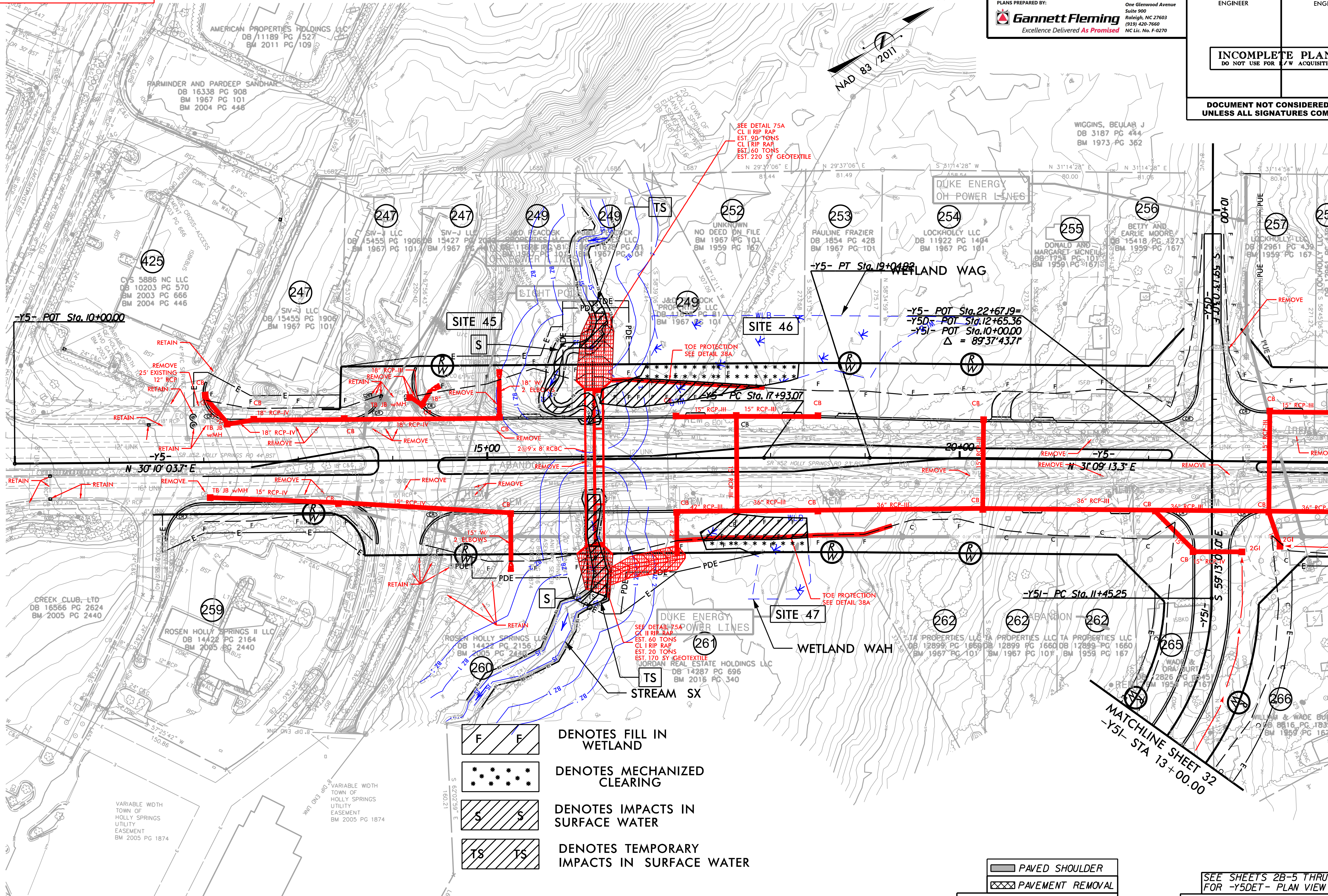
PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

SCALE: 1" = 100'

NAD 83 / 2011



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

PAVED SHOULDER
PAVEMENT REMOVAL
ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.
ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

SEE SHEETS 2B-5 THRU 2B-7 FOR -Y5DET- PLAN VIEW
SEE SHEET 53 FOR -Y5- PROFILE
SEE SHEET 61 FOR -Y5D- PROFILE
SEE SHEET 62 FOR -Y5I- PROFILE

12/4/2019
R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_28a.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	53
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

FLATIRON | BRANCH CIVIL

PLANS PREPARED BY: Gannett Fleming — Excellence Delivered As Promised — One Glenwood Avenue, Suite 900, Raleigh, NC 27603, (919) 420-7660, NC Lic. No. F-0270

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

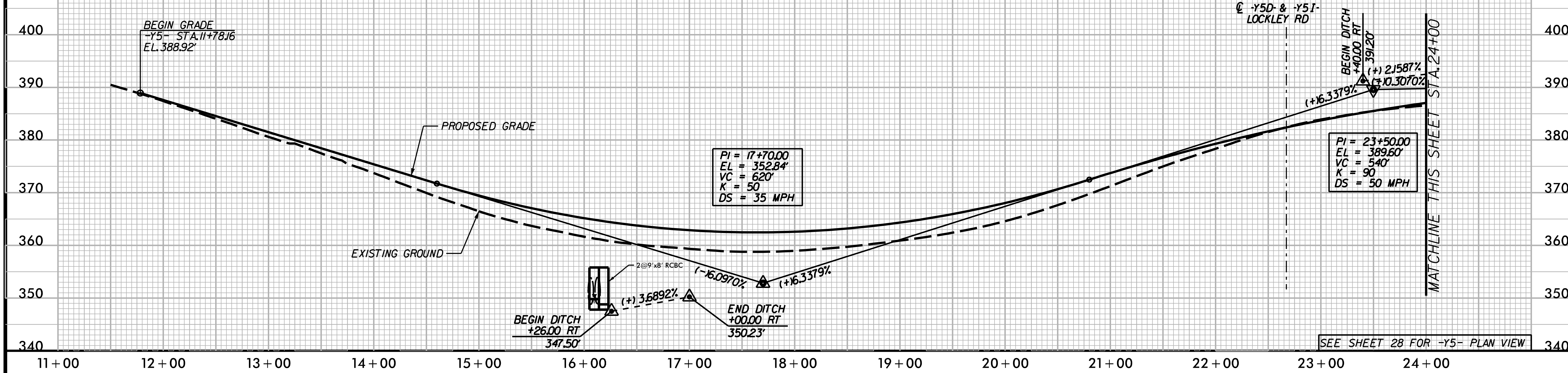
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 102 OF 119

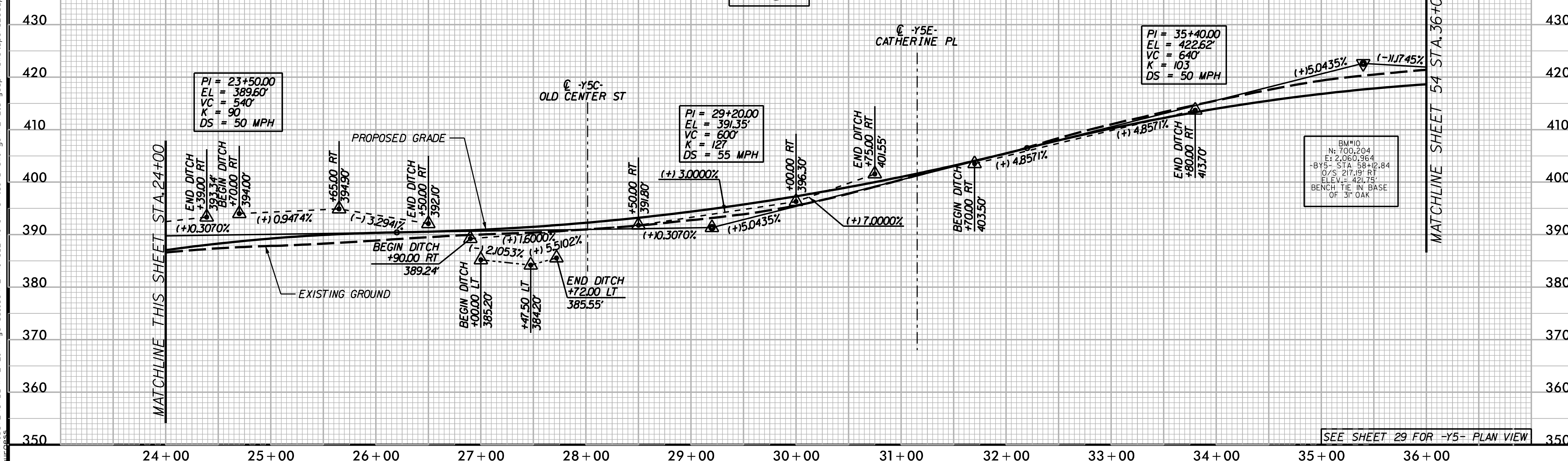
CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 930	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 356.9	FT
BASE DISCHARGE	= 1030	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 357.4	FT
OVERTOPPING DISCHARGE	= 1900	CFS
OVERTOPPING FREQUENCY	= 500 +	YRS
OVERTOPPING ELEVATION	= 362.4	FT

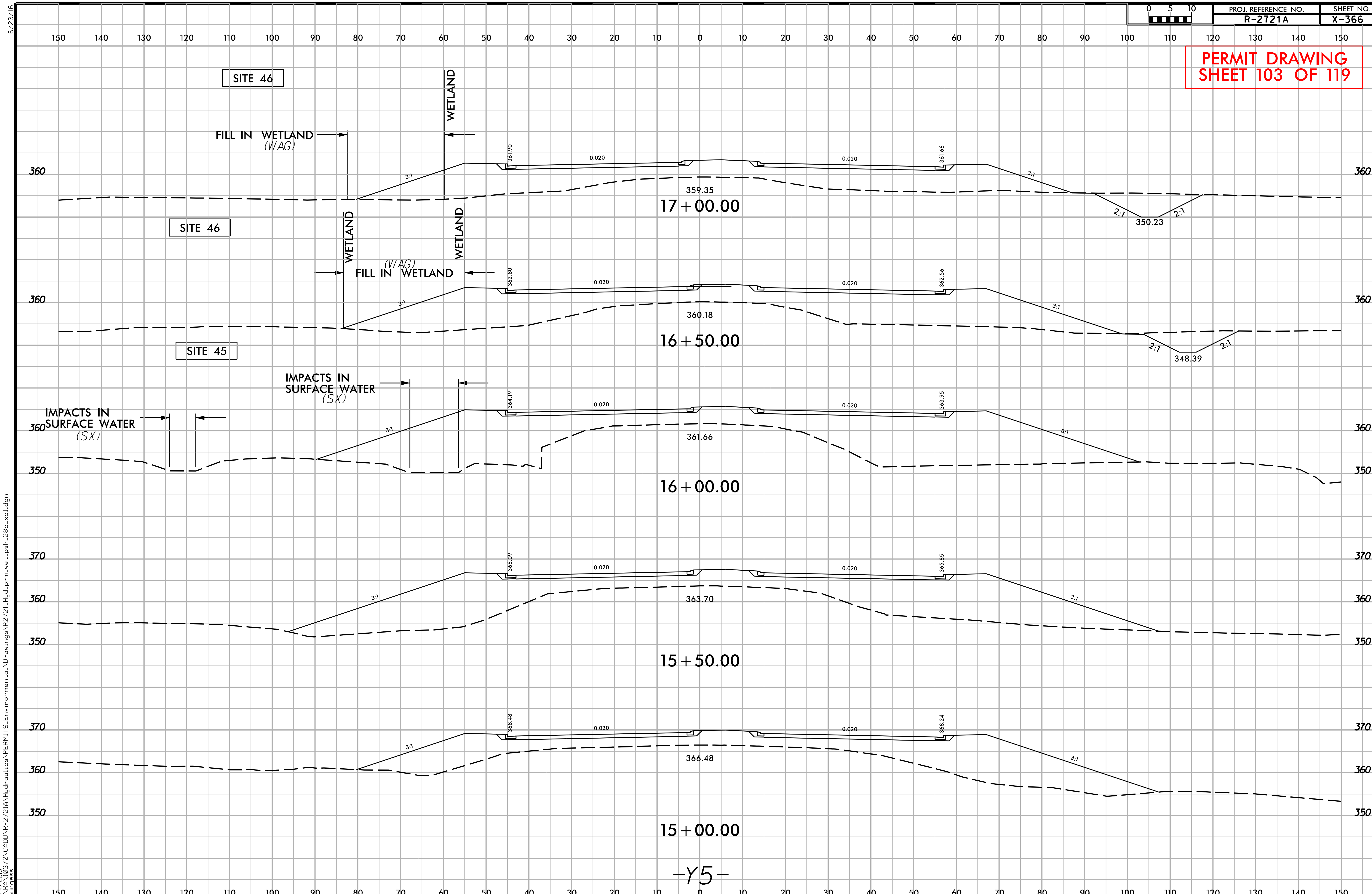
-Y5-



-Y5-

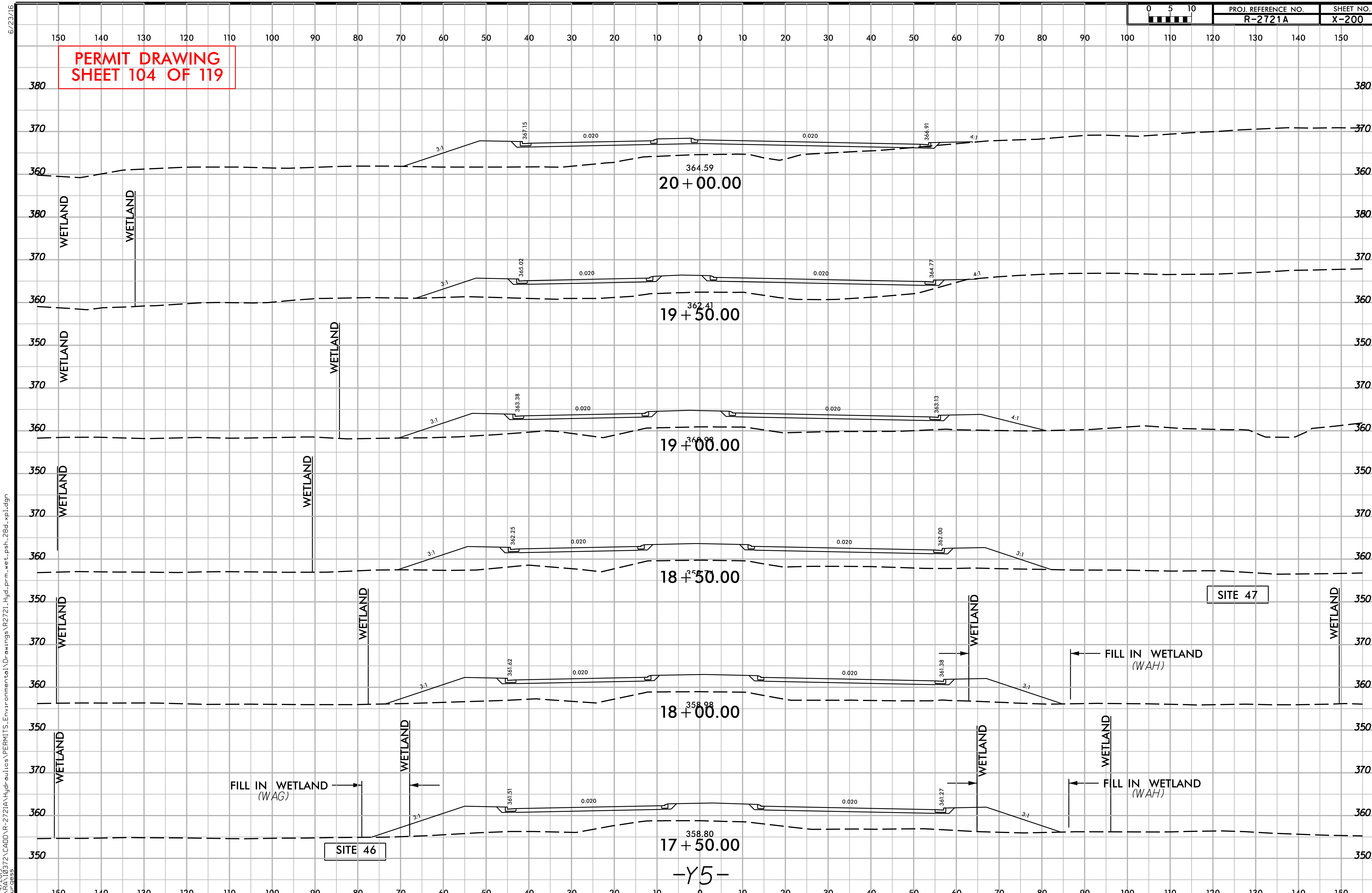


5/28/99
12/4/2019
O:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_28b_pf1.dgn



6/23/16

12/4/2019
Q:\RA10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_28c_xpl.dgn
lburgess



6/23/16

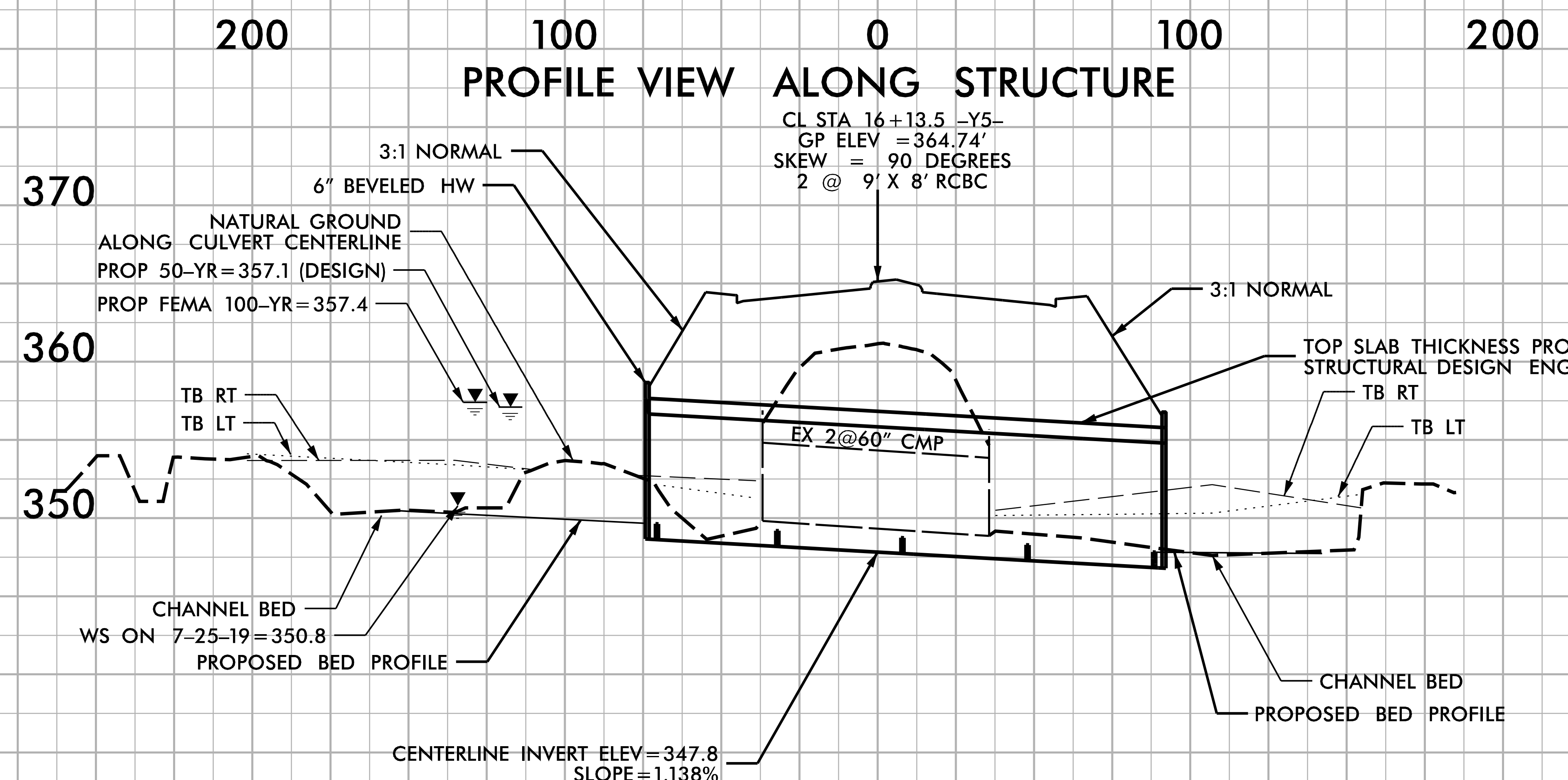
12/4/2019
G:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_28d_xpl.dgn
Burgess

PERMIT DRAWING
SHEET 105 OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721	28E
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



5/14/99

12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_28e_sec.dgn

PERMIT DRAWING
SHEET 106 OF 119

F F — DENOTES FILL IN WETLAND

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 25' 0 50' 100'
SCALE: 1" = 100'

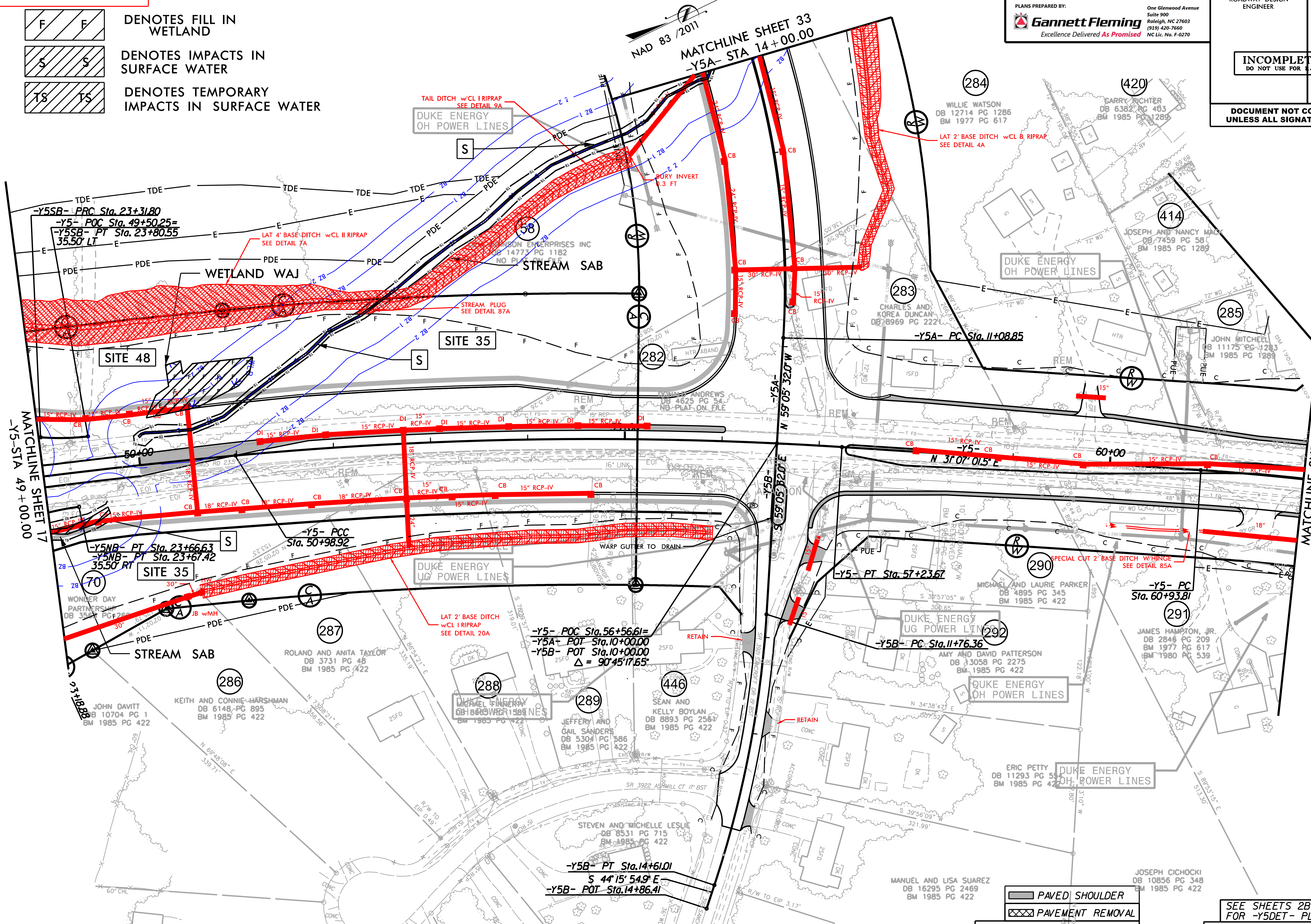
FLATIRON | BRANCH CIVIL

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	30
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PAVED SHOULDER
PAVEMENT REMOVAL

ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.

ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

SEE SHEETS 2B-5 THRU 2B-7 FOR -Y5DET- PLAN VIEW
SEE SHEET 55 FOR -Y5- PROFILE
SEE SHEET 60 FOR -Y5A- PROFILE
SEE SHEET 61 FOR -Y5B- PROFILE

12/4/2019
R:\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_30.dgn

F F DENOTES FILL IN WETLAND

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	30
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

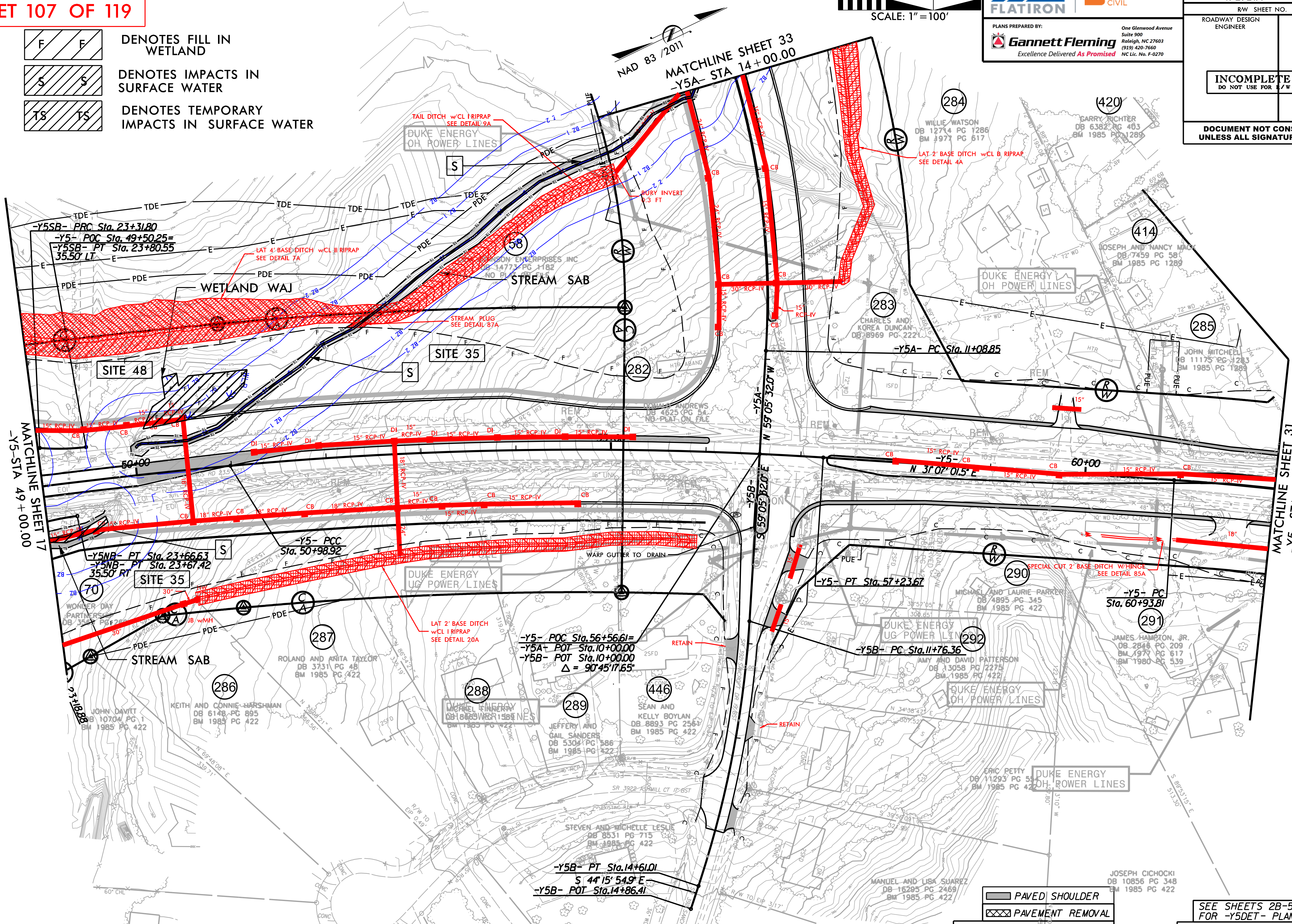
FLATIRON BRANCH CIVIL

PLANS PREPARED BY: Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SCALE: 1" = 100'



PAVED SHOULDER

PAVEMENT REMOVAL

ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.

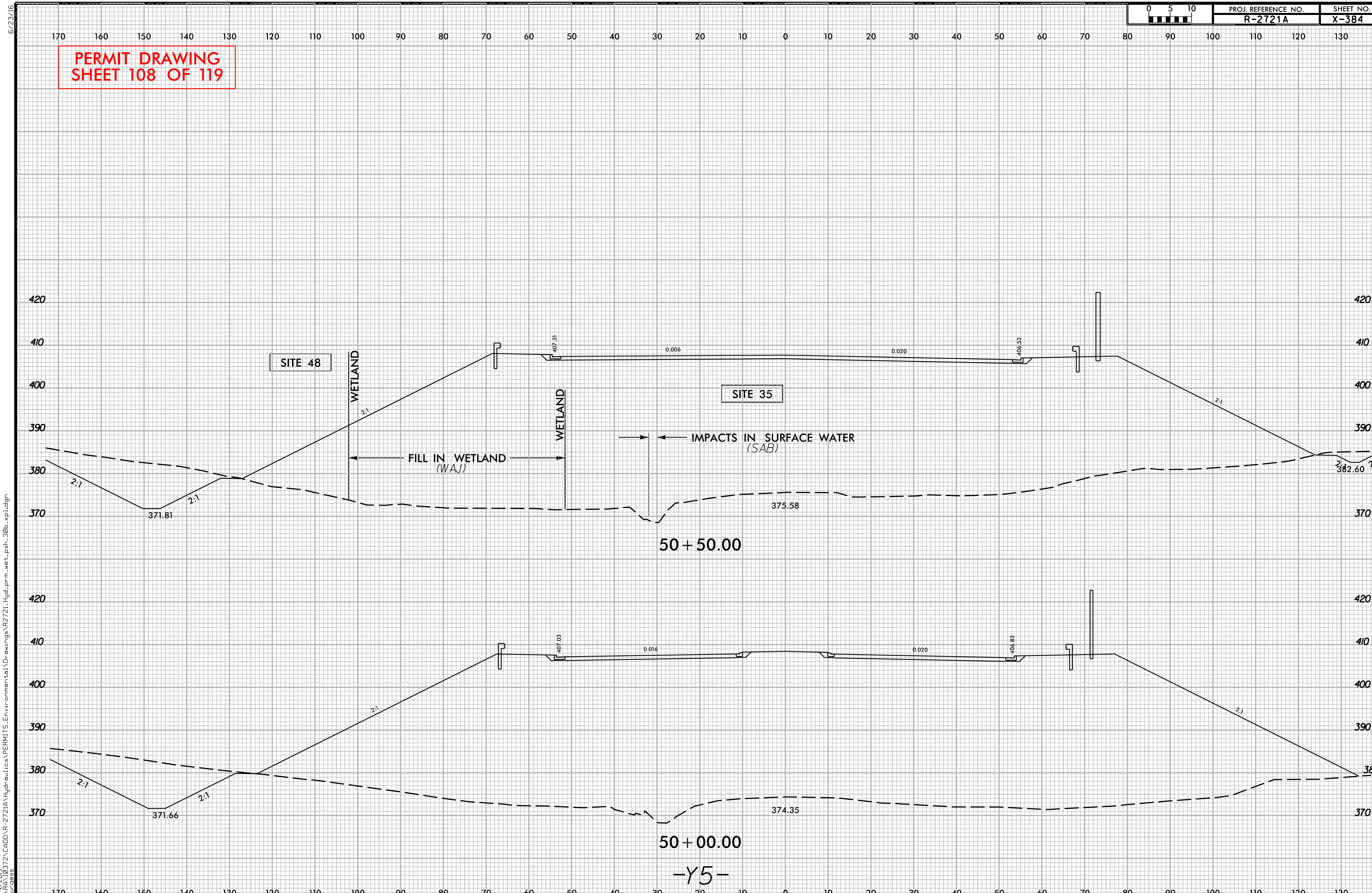
ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

SEE SHEETS 2B-5 THRU 2B-7 FOR -Y5DET- PLAN VIEW
SEE SHEET 55 FOR -Y5- PROFILE
SEE SHEET 60 FOR -Y5A- PROFILE
SEE SHEET 61 FOR -Y5B- PROFILE

12/4/2019
R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_30a.dgn

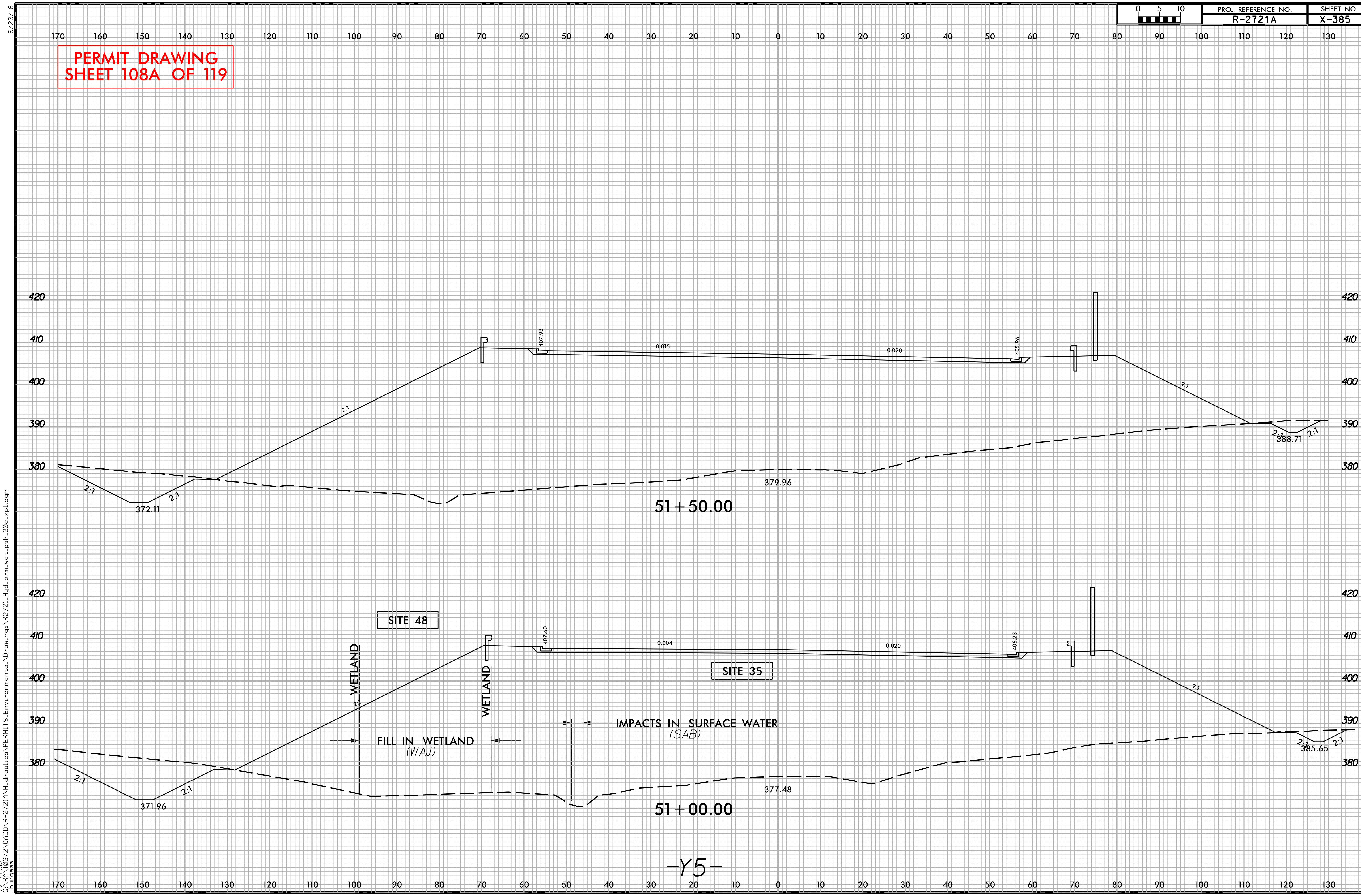
PROJ. REFERENCE NO.	SHEET NO.
R-2721A	X-384

PERMIT DRAWING
SHEET 108 OF 119



-Y5-

12/4/2019
Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_30b_xpl.dgn
Burgess
6/23/16



6/23/16

12/4/2019
G:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_30c_xpl.dgn
Burgess

PERMIT DRAWING
SHEET 109 OF 119

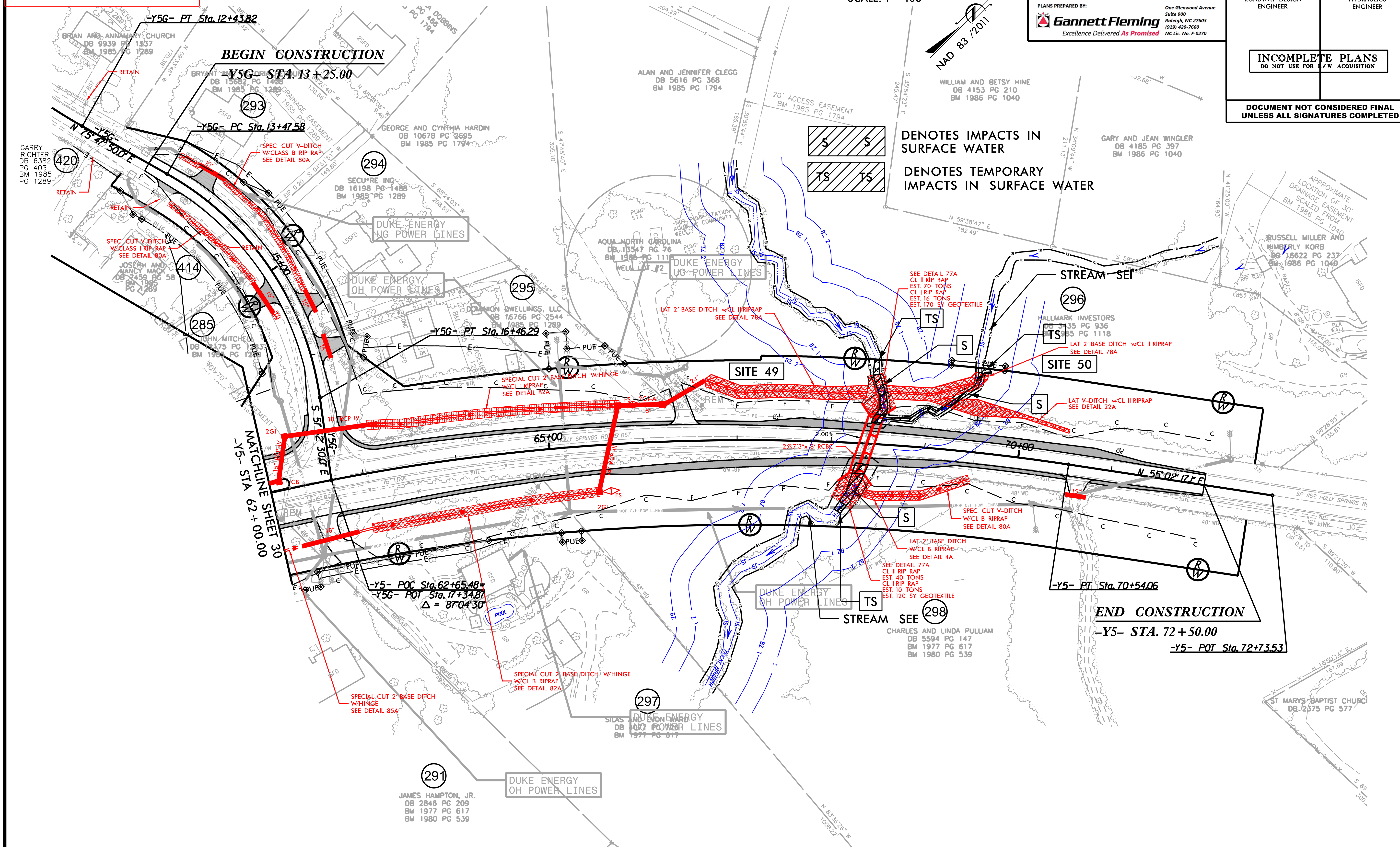
PROJECT REFERENCE NO.	SHEET NO.
R-2721A	31
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

FLATIRON | BRANCH CIVIL

PLANS PREPARED BY: Gannett Fleming — Excellence Delivered As Promised — One Glenwood Avenue, Suite 900, Raleigh, NC 27603, (919) 420-7660, NC Lic. No. F-0270

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PAVED SHOULDER
PAVEMENT REMOVAL

ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.

ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

SEE SHEETS 2B-5 THRU 2B-7 FOR -Y5DET- PLAN VIEW
SEE SHEET 55 FOR -Y5- PROFILE
SEE SHEET 62 FOR -Y5G- PROFILE

12/4/2019
D:\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_31.dgn

PERMIT DRAWING
SHEET 110 OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	31
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

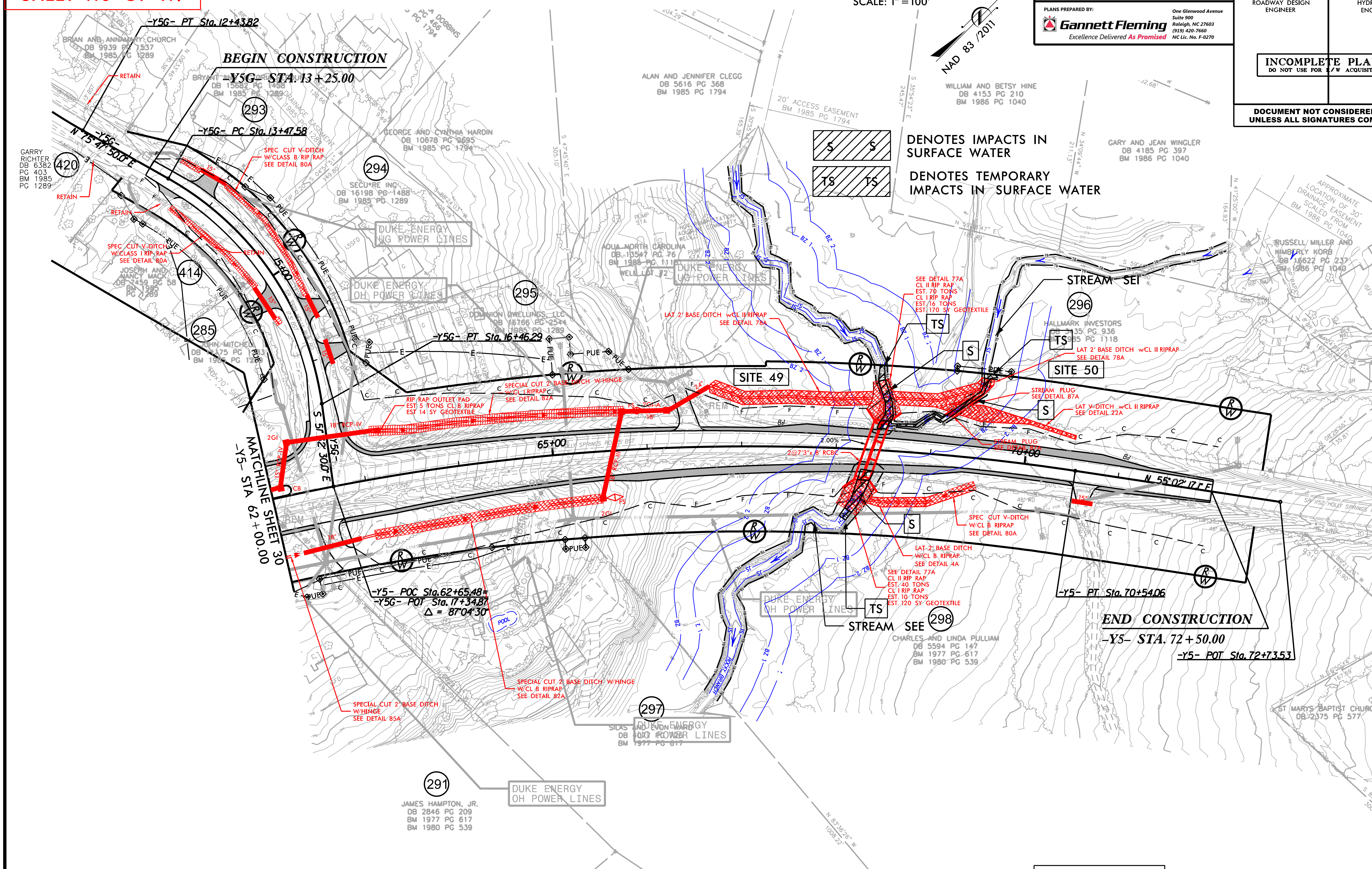
FLATIRON BRANCH CIVIL

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SCALE: 1" = 100'



PAVED SHOULDER
PAVEMENT REMOVAL

ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.
ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

SEE SHEETS 2B-5 THRU 2B-7 FOR -Y5DET- PLAN VIEW
SEE SHEET 55 FOR -Y5- PROFILE
SEE SHEET 62 FOR -Y5G- PROFILE

12/4/2019
R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_31a.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	55
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

FLATIRON BRANCH CIVIL

PLANS PREPARED BY: Gannett Fleming — Excellence Delivered As Promised
One Glenwood Avenue, Suite 900, Raleigh, NC 27603, (919) 420-7660, NC Lic. No. F-0270

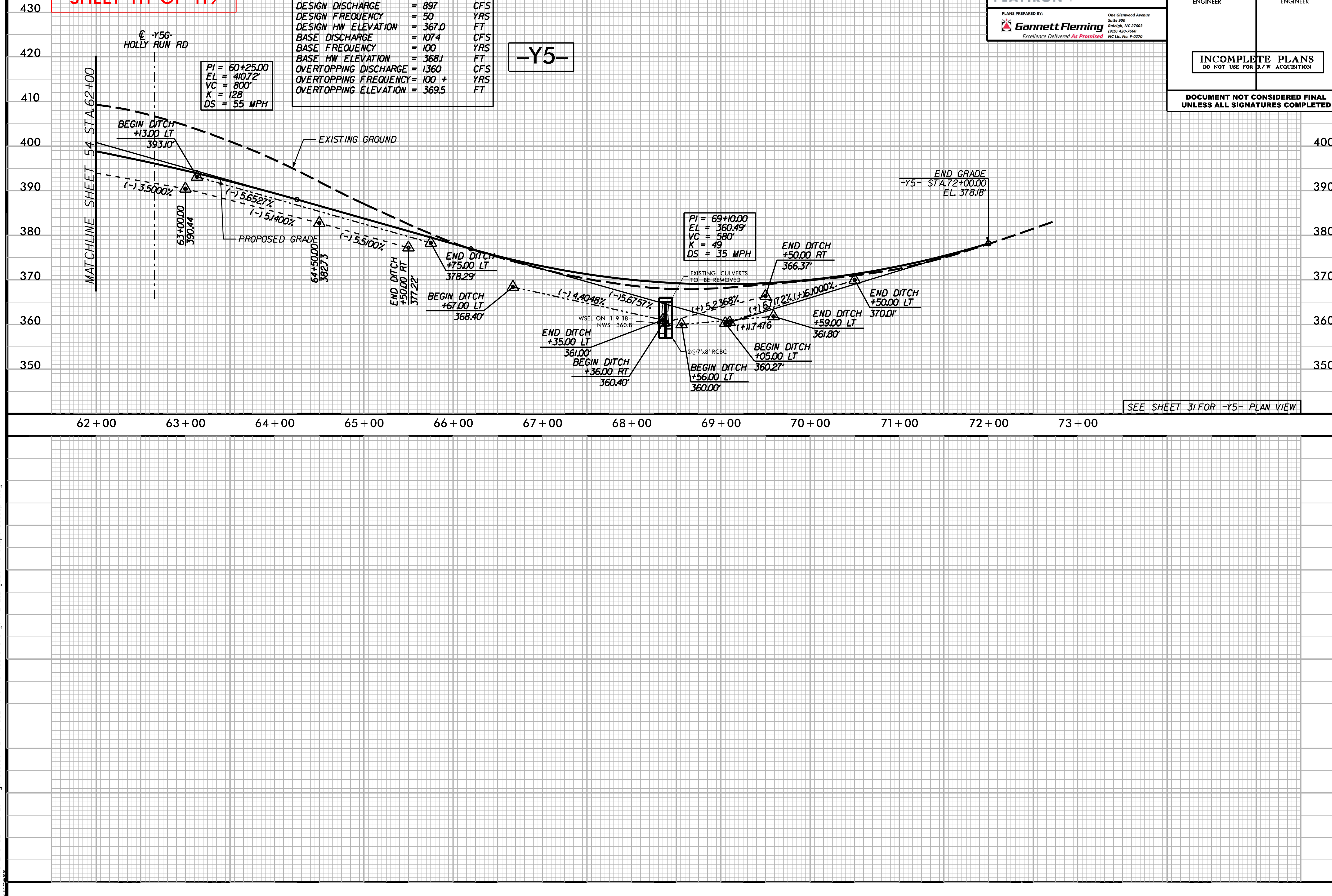
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	=	897	CFS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	367.0	FT
BASE DISCHARGE	=	1074	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	368.1	FT
OVERTOPPING DISCHARGE	=	1360	CFS
OVERTOPPING FREQUENCY	=	100 +	YRS
OVERTOPPING ELEVATION	=	369.5	FT

-Y5-



5/28/99
12/4/2019 Q:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_31b_pfl.dgn

PERMIT DRAWING
SHEET 112 OF 119

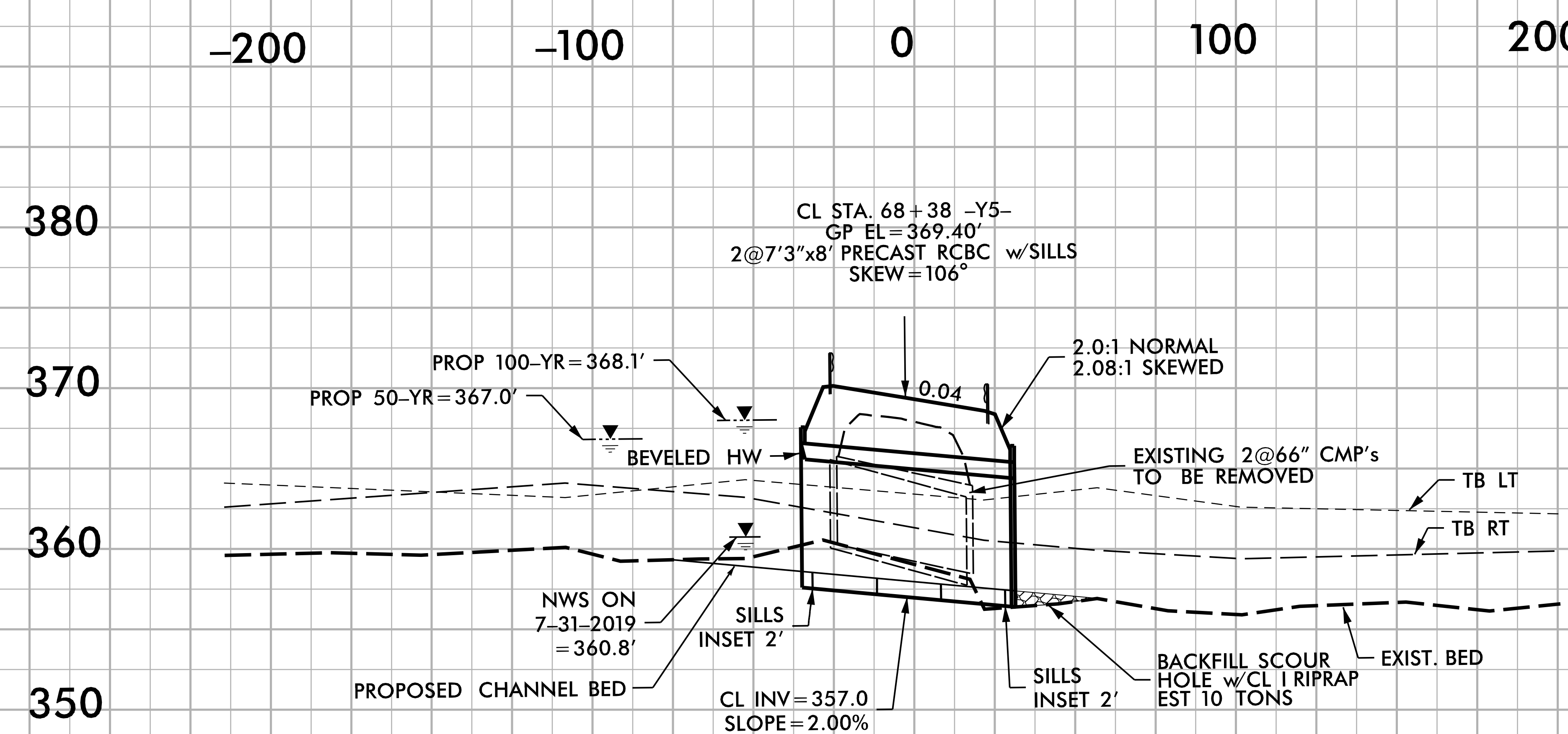
PROJECT REFERENCE NO.	SHEET NO.
R-2721	31C

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



5/14/99

12/4/2019
O:\RA\10372\CADD\R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_31c_sec.dgn
Burgess

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	33

R/W SHEET NO.

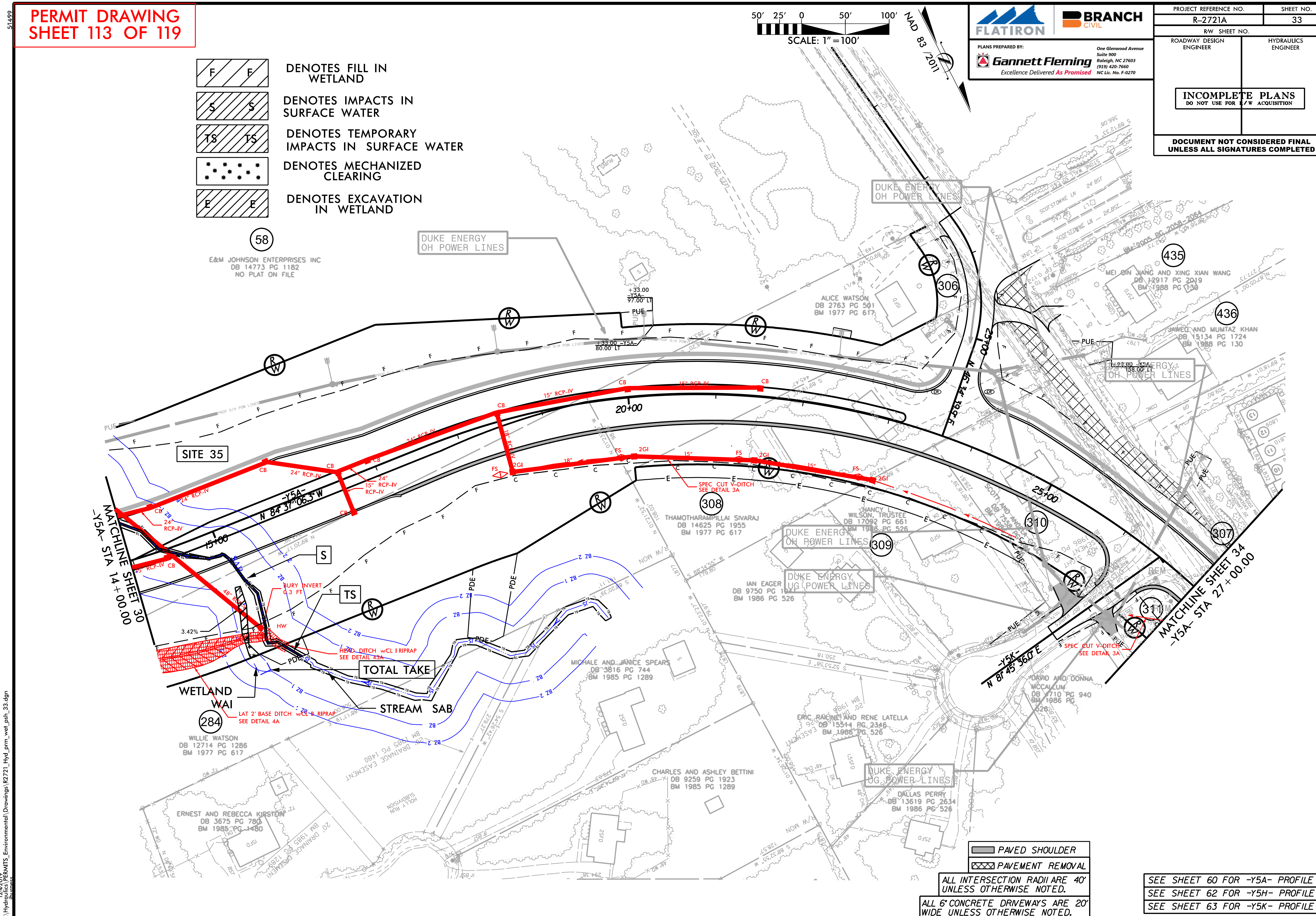
ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY: Gannett Fleming — Excellence Delivered As Promised
One Glenwood Avenue, Suite 900, Raleigh, NC 27603, (919) 420-7660, NC Lic. No. F-0270

FLATIRON | BRANCH CIVIL



ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.

ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

SEE SHEET 60 FOR -Y5A- PROFILE
SEE SHEET 62 FOR -Y5H- PROFILE
SEE SHEET 63 FOR -Y5K- PROFILE

PERMIT DRAWING
SHEET 114 OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721A	33

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

FLATIRON BRANCH CIVIL

PLANS PREPARED BY:
Gannett Fleming
Excellence Delivered As Promised
One Glenwood Avenue
Suite 900
Raleigh, NC 27603
(919) 420-7660
NC Lic. No. F-0270

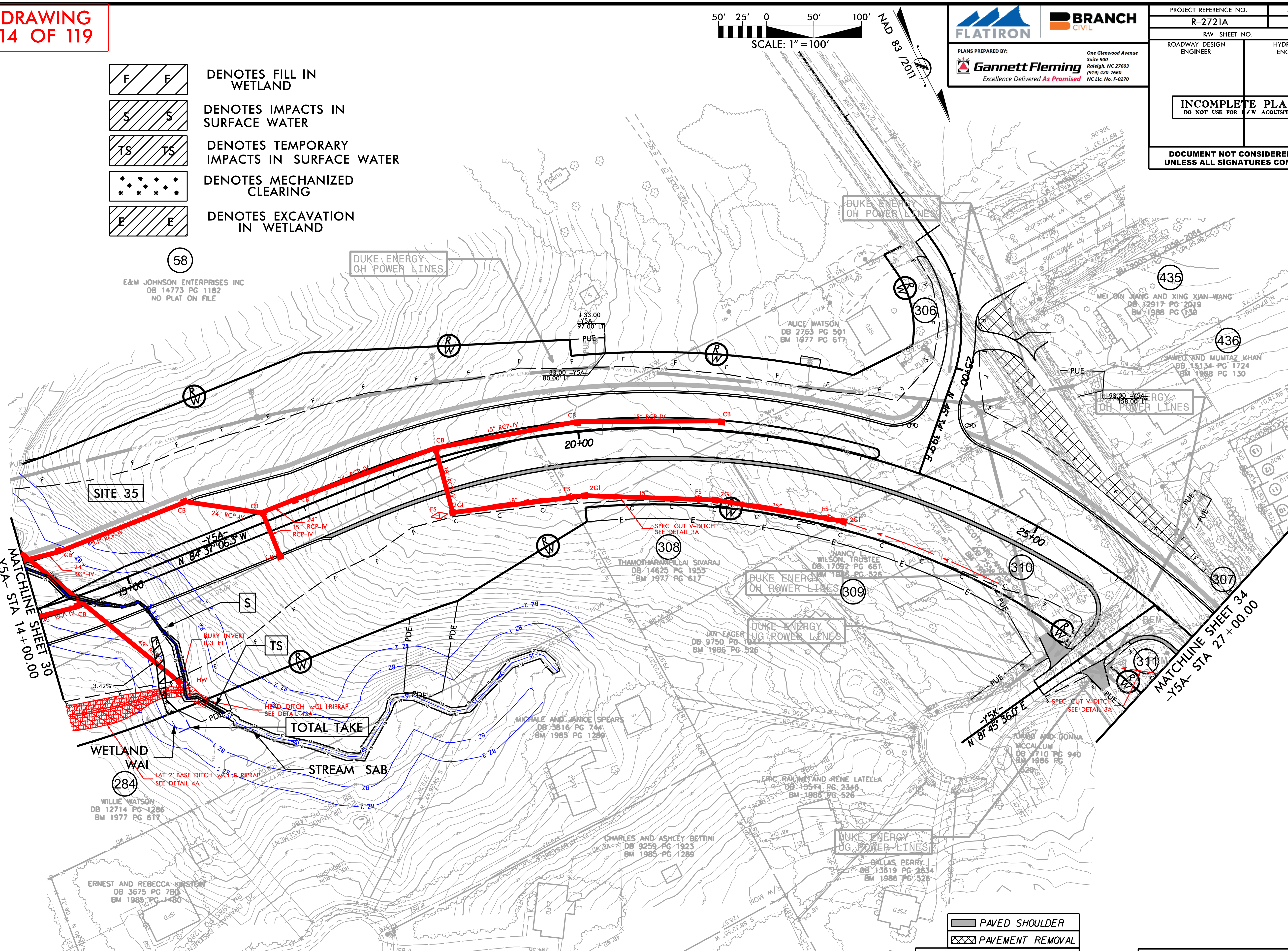
F F DENOTES FILL IN WETLAND

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

E E DENOTES EXCAVATION IN WETLAND



PAVED SHOULDER

PAVEMENT REMOVAL

ALL INTERSECTION RADII ARE 40' UNLESS OTHERWISE NOTED.

ALL 6" CONCRETE DRIVEWAYS ARE 20' WIDE UNLESS OTHERWISE NOTED.

SEE SHEET 60 FOR -Y5A- PROFILE
SEE SHEET 62 FOR -Y5H- PROFILE
SEE SHEET 63 FOR -Y5K- PROFILE

12/4/2019
R-2721A\Hydraulics\PERMITS_Environmental\Drawings\R2721_Hyd_prm_wet_psh_33a.dgn
jburgess

WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Excavation 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	19+20 to 19+73 -L1-LT	CULVERT						< 0.01		10		
		BANK STABILIZATION						< 0.01	< 0.01	33	13	
3	15+18 to 15+46-LREV-LT	15" PIPE/ 24"CSP	< 0.01		< 0.01	< 0.01						
4	40+78 to 41+92-LREV-RT	ROADWAY FILL	0.02									
		POND						0.21				
5	48+91 to 49+79-LREV-RT	ROADWAY FILL	< 0.01		< 0.01	0.09	0.03					
6	51+87 to 57+80 -LREV-	48" RCP	1.57		0.03	0.07	0.18	0.02	< 0.01	463	10	
7	59+46 to 60+07-LREV-	30" RCP						< 0.01	< 0.01	372	16	
8	66+34 to 79+65-LREV-	ROADWAY FILL						0.20	0.05	1945	514	
		STABILIZATION						< 0.01	< 0.01	64	37	
9	67+37 to 70+18-LREV-LT	ROADWAY FILL	0.28									
10	70+17 to 71+41-LREV-	30" RCP						< 0.01	< 0.01	250	10	
		STABILIZATION						< 0.01		9		
11	72+71 to 73+27-LREV-LT	ROADWAY FILL	0.08		0.03							
12	78+80 to 81+30-LREV-	ROADWAY FILL	0.47			0.03						
13	81+19 to 82+63-L-LT	ROADWAY FILL	0.17			0.03						
14	83+13 to 83+46-LREV-	BANK STABILIZATION						< 0.01	< 0.01	57	10	
14A	84+63 to 85+49-LREV-LT	ROADWAY FILL						0.01	< 0.01	237	29	
15	85+31 to 90+05-L-	ROADWAY FILL	1.80		< 0.01	0.16						
16	108+15 to 110+35-L-	ROADWAY FILL			0.51	0.15						
17	115+52 to 116+14 -L-RT	ROADWAY FILL	0.10		< 0.01	0.02						
18	125+08 to 127+71L-L	1@6'x8' RCBC	0.88	0.01		0.15		0.01		271		
		STABILIZATION						< 0.01	< 0.01	81	82	
TOTALS*:			5.39	0.01	0.59	0.69	0.21	0.50	0.07	3792	721	0

*Rounded totals are sum of actual impacts

NOTES:
Site 2: Removed
Site 4: Wetland considered Isolated
Site 5: Wetland Total Take
Site 9: Wetland Total Take
Site 16: Wetland Total Take

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
12/3/2019
WAKE COUNTY
R-2721
6.401078

Revised 2018 Feb

WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Excavation 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)
18a	125+31 to 125+85-L-	ROADWAY FILL						< 0.01		91		
19	140+59 to 142+46 -L-	1@6'x8' RCBC	0.02	< 0.01	< 0.01	0.12		0.04		331		
		STABILIZATION						0.01	< 0.01	121	93	
20	146+70 to 147+85-L-	1@6'x8' RCBC	0.10	0.02		0.08		0.01		249		
		STABILIZATION						< 0.01	< 0.01	92	65	
21	146+88 to 147+06-L-LT	ROADWAY FILL		< 0.01		0.02						
22	148+36 to 149+02-L-RT	30" RCP						< 0.01	< 0.01	70	15	
23	148+41 to 149+02-L-RT	ROADWAY FILL				0.01						
24	149+09 to 155+85-L-	ROADWAY FILL	1.25		0.05	0.08						
25	162+84 to 164+50-L-RT	POND						0.40				
26	165+94 to 168+54 -L-	ROADWAY FILL	1.25			0.09						
27	168+51 to 169+40-L-	2@9'x8' RCBC				0.07		0.06		311		
		STABILIZATION						0.02	< 0.01	120	37	
28	172+97 to 173+41-L-RT	ROADWAY FILL				< 0.01						
29	173+60 to 176+39-L-LT	POND						1.53				
30	174+63 to 181+12-L-	ROADWAY FILL	1.32			0.12		0.01	< 0.01	257	4	
31	193+15 to 197+24-L-	ROADWAY FILL	0.20					0.04		871		
32	199+29 to 199+93-L-LT	ROADWAY FILL	0.03			0.01						
33	47+12 to 48+74 -Y5-LT(SAA)	66" RCP	0.25		0.05	0.07		< 0.01	< 0.01	251	9	
34	23+30 to 24+76-Y5RPB-LT	24" RCP	0.11		0.01	0.07		< 0.01	< 0.01			
35	47+58 to 49+64-Y5-RT(SAA,SAB)	ROADWAY FILL						0.04		304		
		STABILIZATION						< 0.01	< 0.01	35	24	
35	197+97 to 200+02-L-LT(SAA)	ROADWAY FILL						0.04	< 0.01	226	40	
TOTALS*:			4.51	0.03	0.11	0.74		2.22	0.03	3329	287	0

*Rounded totals are sum of actual impacts

NOTES:

Site 23: Wetland no longer impacted.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
12/3/2019
WAKE COUNTY
R-2721
6.401078

WETLAND AND SURACE WATER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	WETLAND IMPACTS: Temp. Excavation In Wetlands (ac)	WETLAND IMPACTS: Excavation in Wetlands (ac)	WETLAND IMPACTS: Mechanized Clearing in Wetlands (ac)	WETLAND IMPACTS: Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	SURFACE WATER IMPACTS: Temp. SW impacts (ac)	SURFACE WATER IMPACTS: Existing Channel Impacts Permanent (ft)	SURFACE WATER IMPACTS: Existing Channel Impacts Temp. (ft)	SURFACE WATER IMPACTS: Natural Stream Design (ft)
35	201+82 to 202+45-L-LT(SAA)	ROADWAY FILL						< 0.01	< 0.01	62	12	
35	50+01-Y5- to 15+32-Y5A-(SAB	ROADWAY FILL/48" RCP	0.01		< 0.01	< 0.01		0.04		941		
		STABILIZATION						0.03	0.03	89	104	
36	202+26 to 206+22-L-	3@9'x8' RCBC						0.22		954		
		STABILIZATION						0.03	< 0.01	94	31	
37	202+42 to 205+59-L-RT	ROADWAY FILL	0.20	0.01	0.03	0.08						
38	209+59 to 211+77-L-	42" RCP	0.31		< 0.01	0.05		0.01		239		
		STABILIZATION						< 0.01	< 0.01	26	10	
39	225+15 to 226+55-L-	42" RCP	0.19		< 0.01	0.09		< 0.01		358		
		STABILIZATION						< 0.01	< 0.01	18	11	
40	225+72 to 227+98-L-	ROADWAY FILL	0.24		< 0.01	0.06						
41	29+93 to 30+17-Y1-RT	48" RCP						< 0.01	< 0.01	56	10	
42	12+90 to15+00-Y3-LT	ROADWAY FILL	0.03			0.13	0.15					
43	11+86 to 15+02-Y3-RT	ROADWAY FILL	0.18			0.06						
44	15+00 to 15+88-Y3-	4@12'x8' RCBC						0.03		58		
		STABILIZATION				0.02		0.07	0.03	123	60	
45	15+60 to 16+27-Y5-	2@9'x8' RCBC						0.04		211		
		STABILIZATION						0.03	< 0.01	100	34	
46	16+20 to 18+23-Y5-LT	ROADWAY FILL	0.07			0.07						
47	17+25 to 18+39-Y5-RT	ROADWAY FILL	0.06			0.03						
48	50+12 to 51+25-Y5-LT	ROADWAY FILL	0.08									
49	68+06 to 68+58-Y5-	2@7'x8' RCBC						< 0.01		20		
		STABILIZATION						0.02	< 0.01	81	20	
TOTALS*:			1.36	0.01	0.05	0.61	0.15	0.53	0.09	3430	292	0

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
12/3/2019
WAKE COUNTY
R-2721
6.401078

Revised 2018 Feb

WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Excavation 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)
50	68+54 to 69+62-Y5-LT	ROADWAY FILL						0.01	< 0.01	128	6	
51	29+06 to 29+15-Y1-LT	RIP RAP						< 0.01		13		
52	47+74 to 47+85-Y1-RT	STABILIZATION						< 0.01	< 0.01	20	12	
	TOTAL PAGE 118							0.02	< 0.01	161	18	
	TOTAL PAGE 115		5.39	0.01	0.59	0.69	0.21	0.50	0.07	3792	721	
	TOTAL PAGE 116		4.52	0.03	0.11	0.74		2.22	0.03	3329	287	
	TOTAL PAGE 117		1.36	0.01	0.05	0.61	0.15	0.53	0.09	3430	292	
TOTALS*:			11.27	0.06	0.76	2.05	0.36	3.28	0.19	10712	1318	0

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
12/3/2019
WAKE COUNTY
R-2721
6.401078

Revised 2018 Feb

WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	SITE	REMOVED										
2	SITE	REMOVED										
33	24+50 to 25+66-Y5DET-LT	ROADWAY FILL	0.06			0.05						
TOTALS*:			0.06			0.05				0	0	0

*Rounded totals are sum of actual impacts

NOTES:
Site 1 - Detour moved impacts no longer required.
Site 2 - Detour moved impacts no longer required.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
12/3/2019
WAKE COUNTY
R-2721 Detour
6.401078

Revised 2018 Feb